



# LITEON<sup>®</sup>

LITE-ON SEMICONDUCTOR CORP.

- BRIDGE RECTIFIERS
- STANDARD GPP
- SS-TRANSISTOR
- SS-SWITCHING DIODE
- SS-SCHOTTKY DIODE
- SS-ZENER
- MOSFET SCHOTTKY RECTIFIERS
- SCHOTKY RECTIFIERS
- FAST RECOVERY RECTIFIERS
- SUPER FAST&ULTRA RECOVERY RECTIFIERS
- SILICON CARBIDE SCHOTTKY BARRIER DIODE
- SCR/TRIAC/SIDAC
- TSPD
- TVS
- ESD ARRAY
- AUTOMOTIVE
- POWER IC
- APPLICATION NOTE
- SOLDERING TECHNIQUES
- OUTLINE DIMENSIONS
- SOLDERING PAD
- PACKAGING METHOD

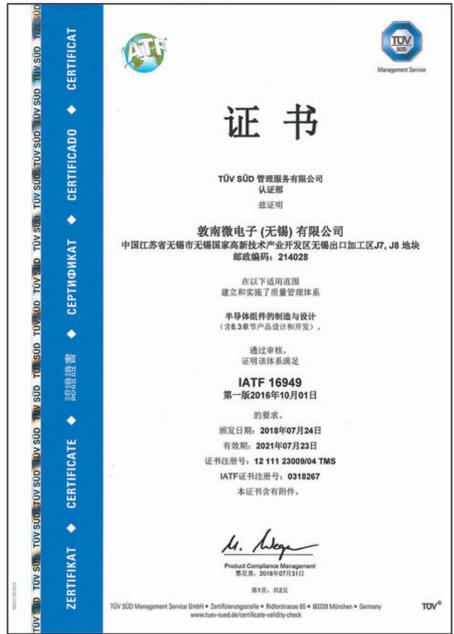
Excellent Quality Customer First

卓越品質 以客為尊

# Crate First-Class Quality, On-Time Delivery And Satisfy Customers' Requirements



敦南微电子(无锡)有限公司 ISO9001:2015 證書

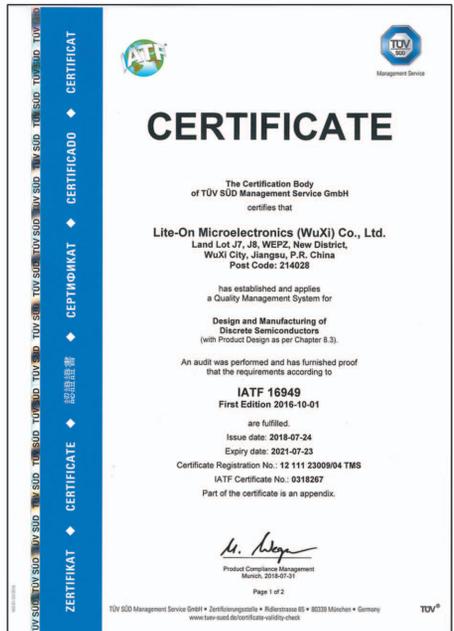


敦南微电子(无锡)有限公司 IATF16949 證書



Lite-on Microelectronics(Wuxi)Co.,Ltd.

ISO 9001:2015 Certificate



Lite-on Microelectronics(Wuxi)Co.,Ltd.

IATF16949 Certificate

# LITE-ON Semiconductors

## A powerful force in your future

As one of the world's largest independent manufacturers of power semiconductor devices, Lite-On Semiconductor offers a comprehensive-range of reliable and economical power semiconductor design solutions. The company manufactures high-quality silicon and glass passivated standard and fast recovery diodes, and Schottky barrier diodes, including SMD and bridge rectifiers. All its bridge rectifiers utilize GPP structure technology, which has been proven superior to standard diode assembled or etching-dice bridges in terms of thermal performance

Lite-On Semiconductor operates highly automated production facilities in Taiwan and Mainland China, which have been awarded the internationally recognized ISO-9001/QS-9000/ISO/TS 16949: 2002/ISO-14000: 2004 certification. All the company's plants utilize the very latest in automated production and testing equipment, much of which was custom-designed by its own engineers to maximize manufacturing capacity and ensure truly world class levels of product quality.

After years of experience in meeting the stringent technology and quality requirements of its prestigious customers, the company complements its complete range of high-performance power semiconductor products with superior manufacturing flexibility, short delivery lead times, economical pricing and personalized after-sales support.

In addition, the company has the necessary experience and expertise for providing customer design solutions to meet the special needs of its customers, and has also built up an extensive worldwide manufacturing, service and distribution.

The completion of manufacturing facility in China, has allowed Lite-On Semiconductor to more than double its production capacity while maintaining the same high standards of product reliability and performance. As a further step in its expansion, the company acquired an advanced EPI fabrication facility in Kansas, City, Missouri, from AT&T Microelectronics in February 1996, and established Fabtech, Inc, a major owned subsidiary. The plant manufactures a full range of schottky diodes.

These steps have also enabled the company to install state-of-the-art SMD production lines in China for manufacturing its high-end products. As a result, Lite-On Semiconductor now possesses the capacity technology and product line to further strengthen its partnerships with its customers.

## CONTENT

BRIDGE RECTIFIERS.....	PAGE	03-10
STANDARD GPP.....	PAGE	11-14
SS-TRANSISTOR.....	PAGE	15-16
SS-SWITCHING DIODE.....	PAGE	17-20
SS-SCHOTTKY DIODE.....	PAGE	21-24
SS-ZENER .....	PAGE	25-30
MOSFET SCHOTTKY RECTIFIERS.....	PAGE	31-36
SCHOTTKY RECTIFIERS.....	PAGE	37-62
FAST RECOVERY RECTIFIERS.....	PAGE	63-66
SUPER FAST&ULTRA RECOVERY RECTIFIERS.....	PAGE	67-74
SILICON CARBIDE SCHOTTKY BARRIER DIODE.....	PAGE	75-76
SCR/TRIAC/SIDAC.....	PAGE	77-82
TSPD.....	PAGE	83-86
TVS.....	PAGE	87-144
ESD ARRAY.....	PAGE	145-150
AUTOMOTIVE.....	PAGE	151-170
POWER IC .....	PAGE	171-174
APPENDIX .....	PAGE	175-215





## **BRIDGE RECTIFIERS**

---



GBP



KBP



GBU



GBL



KBJ



GBJ



## DIP Bridge Rectifiers

Part Number	Electrical Characteristics						VFmax at IF		Package
	VR =VRRM	IFAV	IFSM at 25°C/8.3ms	IR at VR=VRRM Tj)					
	V	A	A	25 °C	100 °C	V	A		
<b>Leaded Rectifiers - Glass Passivated</b>									
KBP06G	600	1.5	40	5	500 1)	1.1	1.5	KBP	
KBP08G	800	1.5	40	5	500 1)	1.1	1.5	KBP	
KBP10G	1000	1.5	40	5	500 1)	1.1	1.5	KBP	
KBP206G	600	2.0	75	5	500 1)	1.1	2	KBP	
KBP208G	800	2.0	75	5	500 1)	1.1	2	KBP	
KBP210G	1000	2.0	75	5	500 1)	1.1	2	KBP	
KBP306G	600	3.0	90	5	500 1)	1.1	3	KBP	
KBP308G	800	3.0	90	5	500 1)	1.1	3	KBP	
KBP310G	1000	3.0	90	5	500 1)	1.1	3	KBP	
KBP406G	600	4.0	130	5	500 1)	1.1	4	KBP	
KBP408G	800	4.0	130	5	500 1)	1.1	4	KBP	
KBP410G	1000	4.0	130	5	500 1)	1.1	4	KBP	
GBL206	600	2.0	120	5	500 1)	0.95	1	GBL	
GBL208	800	2.0	120	5	500 1)	0.95	1	GBL	
GBL210	1000	2.0	120	5	500 1)	0.95	1	GBL	
GBL406	600	4.0	150	5	500 1)	1.0	2	GBL	
GBL408	800	4.0	150	5	500 1)	1.0	2	GBL	
GBL410	1000	4.0	150	5	500 1)	1.0	2	GBL	
GBP206	600	2.0	75	5	500 1)	1.05	1	GBP	
GBP208	800	2.0	75	5	500 1)	1.05	1	GBP	
GBP210	1000	2.0	75	5	500 1)	1.05	1	GBP	
GBP306	600	3.0	90	5	500 1)	1.05	1.5	GBP	
GBP308	800	3.0	90	5	500 1)	1.05	1.5	GBP	
GBP310	1000	3.0	90	5	500 1)	1.05	1.5	GBP	
GBP406	600	4.0	150	5	500 1)	1.0	2	GBP	
GBP408	800	4.0	150	5	500 1)	1.0	2	GBP	
GBP410	1000	4.0	150	5	500 1)	1.0	2	GBP	
GBP808N	800	8.0	165	1	100 1)	1.05	4	GBP	

1) Tj-125°C

\* : New Product



GBP



KBP



GBU



GBL



KBJ



GBJ

## DIP Bridge Rectifiers

Part Number	Electrical Characteristics						VFmax at IF		Package
	VR =VRRM	IFAV	IFSM at 25°C/8.3ms	IR at VR=VRRM TJ					
				25 °C	100 °C	V	A		
	V	A	A	µA	µA	V	A		
<b>Leaded Rectifiers - Glass Passivated</b>									
GBU406	600	4.0	160	5	500 1)	1.0	2	GBU	
GBU408	800	4.0	160	5	500 1)	1.0	2	GBU	
GBU410	1000	4.0	160	5	500 1)	1.0	2	GBU	
GBU606	600	6.0	175	5	500 1)	1.0	3	GBU	
GBU608	800	6.0	175	5	500 1)	1.0	3	GBU	
GBU610	1000	6.0	175	5	500 1)	1.0	3	GBU	
GBU806	600	8.0	220	5	500 1)	1.0	4	GBU	
GBU808	800	8.0	220	5	500 1)	1.0	4	GBU	
GBU810	1000	8.0	220	5	500 1)	1.0	4	GBU	
GBU1006	600	10	240	5	500 1)	1.0	5	GBU	
GBU1008	800	10	240	5	500 1)	1.0	5	GBU	
GBU1010	1000	10	240	5	500 1)	1.0	5	GBU	
GBU1506	600	15	220	5	500 1)	1.1	7.5	GBU	
GBU1508	800	15	220	5	500 1)	1.1	7.5	GBU	
GBU1510	1000	15	220	5	500 1)	1.1	7.5	GBU	
*GBU2508 <sub>2)</sub>	800	25	350	10	NA	1.05	12.5	GBU	
KBJ406G	600	4.0	135	5	500 1)	1.0	2	KBJ	
KBJ408G	800	4.0	135	5	500 1)	1.0	2	KBJ	
KBJ410G	1000	4.0	135	5	500 1)	1.0	2	KBJ	
KBJ606G	600	6.0	170	5	500 1)	1.0	3	KBJ	
KBJ608G	800	6.0	170	5	500 1)	1.0	3	KBJ	
KBJ610G	1000	6.0	170	5	500 1)	1.0	3	KBJ	
KBJ1006G	600	10	170	5	500 1)	1.1	5	KBJ	
KBJ1008G	800	10	170	5	500 1)	1.1	5	KBJ	
KBJ1010G	1000	10	170	5	500 1)	1.1	5	KBJ	
KBJ2006G	600	20	200	5	500 1)	1.1	10	KBJ	
KBJ2008G	800	20	200	5	500 1)	1.1	10	KBJ	

1) Tj-125°C

2) Tj-175°C

\* : New Product

BRIDGE RECTIFIERS



GBPC/W



KBPCG/W



GBJ

## DIP Bridge Rectifiers

Part Number	Electrical Characteristics						VFmax at IF		Package
	VR =VRRM	IFAV	IFSM at 25°C/8.3ms	IR at VR=VRRM TJ					
	V	A	A	25 °C	100 °C	V	A		
<b>Leaded Rectifiers - Glass Passivated</b>									
GBJ608	800	6.0	170	5	500 1)	1.0	3	GBJ	
GBJ610	1000	6.0	170	5	500 1)	1.0	3	GBJ	
GBJ806	600	8.0	170	5	500 1)	1.0	4	GBJ	
GBJ808	800	8.0	170		500 1)	1.0	4	GBJ	
GBJ810	1000	8.0	170	5	500 1)	1.0	4	GBJ	
GBJ1006	600	10	170	10	500 1)	1.05	5	GBJ	
GBJ1008	800	10	170	10	500 1)	1.05	5	GBJ	
GBJ1010	1000	10	170	10	500 1)	1.05	5	GBJ	
GBJ1506	600	15	240	10	500 1)	1.05	7.5	GBJ	
GBJ1508	800	15	240	10	500 1)	1.05	7.5	GBJ	
GBJ1510	1000	15	240	10	500 1)	1.05	7.5	GBJ	
GBJ2006	600	20	240	10	500 1)	1.05	10	GBJ	
GBJ2008	800	20	240	10	500 1)	1.05	10	GBJ	
GBJ2010	1000	20	240	10	500 1)	1.05	10	GBJ	
GBJ2506	600	25	350	10	500 1)	1.05	12.5	GBJ	
GBJ2508	800	25	350	10	500 1)	1.05	12.5	GBJ	
GBJ2510	1000	25	350	10	500 1)	1.05	12.5	GBJ	
GBJ3508	800	35	400	10	500 1)	1.10	17.5	GBJ	
GBJ3510	1000	35	400	10	500 1)	1.10	17.5	GBJ	
GBPC1504/W	400	15.0	300	5	500 1)	1.10	7.5	GBPC/W	
GBPC1506/W	600	15.0	300	5	500 1)	1.10	7.5	GBPC/W	
GBPC1508/W	800	15.0	300	5	500 1)	1.10	7.5	GBPC/W	
GBPC1510/W	1000	15.0	300	5	500 1)	1.10	7.5	GBPC/W	

1) TJ=125°C

\* : New Product



GBPC/W



KBPCG/W



GBJ

## DIP Bridge Rectifiers

Part Number	Electrical Characteristics						VFmax at IF		Package
	VR = VRRM	IFAV	IFSM at 25°C/8.3ms	IR at VR=VRRM TJ					
	V			A	25 °C	100 °C	V	A	
<b>Leaded Rectifiers - Glass Passivated</b>									
KBPC1504G/W	400	15	300	5	500 1)	1.1	7.5	KBPCG/W	
KBPC1506G/W	600	15	300	5	500 1)	1.1	7.5	KBPCG/W	
KBPC1508G/W	800	15	300	5	500 1)	1.1	7.5	KBPCG/W	
KBPC1510G/W	1000	15	300	5	500 1)	1.1	7.5	KBPCG/W	
GBPC2504W	400	25	350	5	500 1)	1.1	12.5	GBPCW	
GBPC2506W	600	25	350	5	500 1)	1.1	12.5	GBPCW	
GBPC2508W	800	25	350	5	500 1)	1.1	12.5	GBPCW	
GBPC2510W	1000	25	350	5	500 1)	1.1	12.5	GBPCW	
KBPC2504G/W	400	25	350	5	500 1)	1.1	12.5	KBPCG/W	
KBPC2506G/W	600	25	350	5	500 1)	1.1	12.5	KBPCG/W	
KBPC2508G/W	800	25	350	5	500 1)	1.1	12.5	KBPCG/W	
KBPC2510G/W	1000	25	350	5	500 1)	1.1	12.5	KBPCG/W	
KBPC3504G/W	400	35	400	5	500 1)	1.1	17.5	KBPCG/W	
KBPC3506G/W	600	35	400	5	500 1)	1.1	17.5	KBPCG/W	
KBPC3508G/W	800	35	400	5	500 1)	1.1	17.5	KBPCG/W	
KBPC3510G/W	1000	35	400	5	500 1)	1.1	17.5	KBPCG/W	
GBPC3504W	400	35	400	5	500 1)	1.1	17.5	GBPCW	
GBPC3506W	600	35	400	5	500 1)	1.1	17.5	GBPCW	
GBPC3508W	800	35	400	5	500 1)	1.1	17.5	GBPCW	
GBPC3510W	1000	35	400	5	500 1)	1.1	17.5	GBPCW	

1) TJ-125°C

\* : New Product



**GBU**



**GBJ**



**LVF Bridge Rectifiers (continued)**

Part Number	Electrical Characteristics						VF(typ) at IF		Package
	VR =VRRM	IFAV	IFSM at 25°C/8.3ms	IR at VR=VRRM Tj					
	V			A	25 °C	125 °C			
GBU10V06	600	10	250	5	500	0.90	5	GBU	
GBU10V08	800	10	250	5	500	0.90	5	GBU	
*GBJ15V10	1000	15	280	5	500	0.90	7.5	GBJ	
*GBJ25V06	600	25	450	5	500	0.90	12.5	GBJ	
*GBJ25V08	800	25	450	5	500	0.90	12.5	GBJ	
*GBU15JL	600	15	170	10	500	0.86	7.5	GBU	
*GBJ15JL	600	15	170	10	500	0.86	7.5	GBJ	
*GBJ25JL	600	25	320	10	500	0.87	12.5	GBJ	
*MSB25JL	600	2.5	90	5	500	0.84	1.25	M2	
*MSB30JL	600	3	100	5	500	0.83	1.5	M2	

1) Tj-125°C

\* : New Product



## SMD Bridge Rectifiers

Part Number	Electrical Characteristics						VFmax at IF		Package
	VR = VRRM	IFAV	IFSM at 25°C/8.3ms	IR at VR=VRRM TJ					
	V			A	25 °C	100 °C	V	A	
<b>Surface Mount Rectifiers (Glass Passivated)</b>									
MSB15MH	1000	1.5	70	5	500 1)	1.02	0.75	M2	
MSB25MH	1000	2.5	80	5	500 1)	1.02	1.25	M2	
MSB30M	1000	3.0	100	5	500 1)	1.02	1.5	M2	
MSB30KH	800	3.0	110	5	500 1)	1.02	1.5	M2	
HDO6	600	0.8	30	5	500 1)	1.0	0.4	HD	
HD08	800	0.8	30	5	500 1)	1.0	0.4	HD	
HD10	1000	0.8	30	5	500 1)	1.0	0.4	HD	
*HDS10M	1000	1.0	30	5	500 1)	0.95	0.5	HDS	
*HDS20M	1000	2.0	50	5	500 1)	0.95	1	HDS	
TD10JN	600	1.0	30	2	150 1)	0.95	0.5	TD	
TD10KN	800	1.0	30	2	150 1)	0.95	0.5	TD	
TD10M	1000	1.0	30	10	150 1)	0.95	0.5	TD	
*ABS10M	1000	1	30	10	100 1)	0.95	0.5	ABS	
*ABS20M	1000	2	55	10	100 1)	0.95	1	ABS	
*ABS20MH	1000	2	60	10	100 1)	0.95	1	ABS	
DF06S	600	1.0	50	10	500 1)	1.1	1	DF-S	
DF08S	800	1.0	50	10	500 1)	1.1	1	DF-S	
DF10S	1000	1.0	50	10	500 1)	1.1	1	DF-S	
DF1506S	600	2	50	10	500 1)	1.1	1.5	DF-S	
DF1508S	800	2	50	10	500 1)	1.1	1.5	DF-S	
DF1510S	1000	2	50	10	500 1)	1.1	1.5	DF-S	
*DF1512S	1200	2	50	10	500 1)	1.1	1.5	DF-S	
DF06M	600	1.0	50	10	500 1)	1.1	1	DFM	
DF08M	800	1.0	50	10	500 1)	1.1	1	DFM	
DF10M	1000	1.0	50	10	500 1)	1.1	1	DFM	

1) TJ=125°C

\* : New Product



## SMD Bridge Rectifiers

Part Number	Electrical Characteristics							Package
	VR =VRRM	IFAV	IFSM at 25°C/8.3ms	IR at VR=VRRM Tj)		VFmax at IF		
				25 °C	100 °C	V	A	
	V	A	A	µA	µA	V	A	
<b>Surface Mount Rectifiers (Glass Passivated)</b>								
DF1506M	600	1.5	50	10	500 1)	1.1	1.5	DFM
DF1508M	800	1.5	50	10	500 1)	1.1	1.5	DFM
DF1510M	1000	1.5	50	10	500 1)	1.1	1.5	DFM
TT208	800	2.0	60	5	500 1)	1.1	2	TT
TT210	1000	2.0	60	5	500 1)	1.1	2	TT
TT308	800	3.0	100	5	500 1)	0.95	1.5	TT
TT310	1000	3.0	100	5	150 1)	0.95	1.5	TT
*TT410	1000	3.0	135	5	150 1)	0.95	1.5	TT

1) Tj-125°C

\* : New Product



## **STANDARD GPP**

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## Standard Recovery Rectifiers (標準回覆整流器)

整流二極管因單邊導通特性，所以被用在把交流電轉為直流電的線路上。

當整流二極管順向電流停止時，將會產生一短暫時間的逆向電流，從順向電流停止到逆向電流降為零的這段時間稱為逆向回覆時間，逆向回覆時間快速恢復整流器大約 100ns 以上。



SMA



SMB



SMC



DO-221AC

Part Number	Electrical Characteristics						$V_{Fmax}$ at IF		Package
	$V_R = V_{RRM}$	$I_{FAV}$	$I_{FSM}$	IR at $V_R = V_{RRM}$ (Tj)					
				25 °C	100 °C	V	A		
<b>Surface Mount Rectifiers ( Glass Passivated)</b>									
S1G	400	1.0	30	5	100 1)	1.1	1	SMA	
S1J	600	1.0	30	5	100 1)	1.1	1	SMA	
S1K	800	1.0	30	5	100 1)	1.1	1	SMA	
S1M	1000	1.0	30	5	100 1)	1.1	1	SMA	
S1GB	400	1.0	30	5	100 1)	1.1	1	SMB	
S1JB	600	1.0	30	5	100 1)	1.1	1	SMB	
S1KB	800	1.0	30	5	100 1)	1.1	1	SMB	
S1MB	1000	1.0	30	5	100 1)	1.1	1	SMB	
S2G	400	1.5	50	5	125 1)	1.15	1.5	SMB	
S2J	600	1.5	50	5	125 1)	1.15	1.5	SMB	
S2K	800	1.5	50	5	125 1)	1.15	1.5	SMB	
S2M	1000	1.5	50	5	125 1)	1.15	1.5	SMB	
S2GA	400	1.5	50	5	125 1)	1.15	1.5	SMA	
S2JA	600	1.5	50	5	125 1)	1.15	1.5	SMA	
S2KA	800	1.5	50	5	125 1)	1.15	1.5	SMA	
S2MA	1000	1.5	50	5	125 1)	1.15	1.5	SMA	
S2GHA	400	2.0	50	5	125 1)	1.15	2.0	SMA	
S2JHA	600	2.0	50	5	125 1)	1.15	2.0	SMA	
S2KMA	800	2.0	50	5	125 1)	1.15	2.0	SMA	
S2MHA	1000	2.0	50	5	125 1)	1.15	2.0	SMA	
S2GH	400	2.0	50	5	125 1)	1.15	2.0	SMB	
S2JH	600	2.0	50	5	125 1)	1.15	2.0	SMB	
S2KM	800	2.0	50	5	125 1)	1.15	2.0	SMB	
S2MH	1000	2.0	50	5	125 1)	1.15	2.0	SMB	

1) Tj = 125°C

2) Tj = 150°C



SMB



SMC



F3D



F1A



F3(SMA-Flat)

## Standard Recovery Rectifiers

Part Number	Electrical Characteristics							Package
	$V_R = V_{FRM}$	$I_{FAV}$	$I_{FSM}$	IR at $V_R = V_{FRM}$ Tj)		$V_{Fmax}$ at IF		
	V	A	A	25 °C	100 °C	V	A	
				uA	uA			
<b>Surface Mount Rectifiers ( Glass Passivated)</b>								
S3G	400	3.0	100	10	250 1)	1.15	3	SMC
S3J	600	3.0	100	10	250 1)	1.15	3	SMC
S3K	800	3.0	100	10	250 1)	1.15	3	SMC
S3M	1000	3.0	100	10	250 1)	1.15	3	SMC
S3GB	400	3.0	100	10	250 1)	1.15	3	SMB
S3JB	600	3.0	100	10	250 1)	1.15	3	SMB
S3KB	800	3.0	100	10	250 1)	1.15	3	SMB
S3MB	1000	3.0	100	10	250 1)	1.15	3	SMB
S5GC	400	5.0	100	10	250 1)	1.15	5	SMC
S5JC	600	5.0	100	10	250 1)	1.15	5	SMC
S5KC	800	5.0	100	10	250 1)	1.15	5	SMC
S5MC	1000	5.0	100	10	250 1)	1.15	5	SMC
S8GC	400	8.0	200	10	250 1)	0.985	8.0	SMC
S8JC	600	8.0	200	10	250 1)	0.985	8.0	SMC
S8KC	800	8.0	200	10	250 1)	0.985	8.0	SMC
S8MC	1000	8.0	200	10	250 1)	0.985	8.0	SMC
FS1ME	1000	1.0	30	5	500	1.1	1.0	F1A
FS2MA	1000	2.0	60	5	500	1.2	2.0	SMA-Flat
FS2MD	1000	2.0	60	5	500	1.2	2.0	F3-D

1) Tj= 125°C

2) Tj= 150°C



STANDARD GPP

## Standard Recovery Rectifiers (continued)

Part Number	Electrical Characteristics							Package
	VR =VRRM	IFAV	IFSM	IR at VR=VRRM (Tj)		VFMmax at IF		
				25 °C	100 °C	V	A	
V	A	A	µA	µA	V	A		
<b>Leaded Rectifiers - Glass Passivated</b>								
D4G	400	1.0	30	5	50	1.0	1	T1
D5G	600	1.0	30	5	50	1.0	1	T1
D6G	800	1.0	30	5	50	1.0	1	T1
D7G	1000	1.0	30	5	50	1.0	1	T1
1N4004G	400	1.0	30	5	50 1)	1.1	1	DO-41
1N4005G	600	1.0	30	5	50 1)	1.1	1	DO-41
1N4006G	800	1.0	30	5	50 1)	1.1	1	DO-41
1N4007G	1000	1.0	30	5	50 1)	1.1	1	DO-41
LT1504G	400	1.5	50	5	200 1)	1.1	1.5	DO-15
LT1505G	600	1.5	50	5	200 1)	1.1	1.5	DO-15
LT1506G	800	1.5	50	5	200 1)	1.1	1.5	DO-15
LT1507G	1000	1.5	50	5	200 1)	1.1	1.5	DO-15
LT2A04G	400	2.0	65	5	200 1)	1.1	2	DO-15
LT2A05G	600	2.0	65	5	200 1)	1.1	2	DO-15
LT2A06G	800	2.0	65	5	200 1)	1.1	2	DO-15
LT2A07G	1000	2.0	65	5	200 1)	1.1	2	DO-15
1N5404G	400	3.0	125	5	100 1)	1.1	3	DO-201AD
1N5406G	600	3.0	125	5	100 1)	1.1	3	DO-201AD
1N5407G	800	3.0	125	5	100 1)	1.1	3	DO-201AD
1N5408G	1000	3.0	125	5	100 1)	1.1	3	DO-201AD

1) Tj=125°C

2) Tj=150°C



# SS-TRANSISTOR

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## Small Single Transistor (小訊號電晶體)

場效應電晶體 (英語: field-effect transistor, 縮寫: FET) 是一種通過電場效應控制電流的電子元件。它依靠電場去控制導電通道形狀, 因此能控制半導體材料中某種類型載子的通道的導電性。場效應電晶體有時被稱為單極性電晶體, 以它的單載子型作用對比雙極性電晶體 (bipolar junction transistors, 縮寫: BJT)。



SOT-23



SOT-323



SOT-363

Part Number	Configura-tion	Type	P <sub>D</sub>	V <sub>CEO</sub>	I <sub>C</sub>	hfe		V <sub>CE(sat)</sub>	F <sub>T</sub>	Package
			mW	Volts	mA	Min (Volts)	Max (Volts)	Volts	MHz	
MMBT3904	Single	NPN	200	40	200	100	400	0.3	300	SOT-23
MMBT3906	Single	PNP	200	-40	-200	100	300	-0.4	300	SOT-23
MMBT2222A	Single	NPN	250	40	600	100	300	0.3	300	SOT-23
MMBT2907A	Single	PNP	250	-60	-600	100	300	-0.4	200	SOT-23
MMBT4401	Single	NPN	300	40	600	100	300	0.4	250	SOT-23
MMBT4403	Single	PNP	300	-40	-600	100	300	-0.4	200	SOT-23
MMBT5551	Single	NPN	300	160	600	100	300	0.15	100	SOT-23
MMDT3904	Multi-Chip	NPN/NPN	200	40	200	100	300	0.2	300	SOT-363
MMDT3906	Multi-Chip	PNP/PNP	200	-40	-200	100	300	-0.25	250	SOT-363
MMDT5401	Multi-Chip	PNP/PNP	200	-150	-200	100	300	-0.2	100	SOT-363
MMDT5551	Multi-Chip	NPN/NPN	200	160	200	100	300	0.15	100	SOT-363
MMDT5541	Multi-Chip	NPN/NPN	225	140	600	80	250	0.2	100	SOT-363
MMST3904	Single	NPN	200	40	200	100	400	0.3	300	SOT-323
MMST3906	Single	PNP	200	-40	-200	100	300	-0.4	300	SOT-323
MMST2222A	Single	NPN	200	40	600	100	300	0.3	300	SOT-323
MMST2907A	Single	PNP	200	-60	-600	100	300	-0.4	200	SOT-323
MMST4401	Single	NPN	300	40	600	100	300	0.4	250	SOT-323
MMST4403	Single	PNP	300	-40	-600	100	300	-0.4	200	SOT-323
MMDT2222A	Single	NPN	250	40	600	100	300	0.3	300	SOT-363
MMDT2907A	Multi-Chip	PNP/PNP	200	-60	-200	100	300	-0.4	200	SOT-363
MMDT4401	Multi-Chip	NPN/NPN	200	40	600	100	300	0.4	250	SOT-363
MMDT4403	Multi-Chip	PNP/PNP	200	-40	-600	100	300	-0.4	200	SOT-363
MMBTA42	Single	PNP	225	-300	-500	-25	-	-0.5	50	SOT-23
MMBTA92	Single	NPN	225	300	500	25	-	0.5	50	SOT-23
MMBTA05	Single	NPN	300	60	500	100	-	0.25	100	SOT-23
MMBTA06	Single	NPN	300	80	500	100	-	0.25	100	SOT-23
MMBTA55	Single	PNP	-225	-60	-500	100	-	0.25	100	SOT-23
MMBTA56	Single	PNP	-225	-80	-500	100	-	0.25	100	SOT-23
MMBTA44	Single	NPN	350	400	200	80	300	0.3	50	SOT-23
MMBTA94	Single	PNP	-350	-400	200	80	300	0.3	50	SOT-23
MMBTA13	Multi-Chip	NPN/NPN	300	30	300	5000	10000	1.5	2	SOT-23
MMBTA14	Multi-Chip	NPN/NPN	300	30	300	10000	20000	1.5	2	SOT-23



## **SS-SWITCHING DIODE**

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## Small Single Switching Diode (小訊號開關二極體)

整流二極管因單邊導通特性，所以被用在把交流電轉為直流電的線路上。當整流二極管順向電流停止時，將會產生一短暫時間的逆向電流，從順向電流停止到逆向電流降為零的這段時間稱為逆向回覆時間，逆向回覆時間 快速恢復整流器大約 1000ns 以上，電流在 0.5A 以下。



## Switching Diode

Part Number	Electrical Characteristics								Package	Equivalent Circuit Diagram
	Max Average Rectifier Current	Min Peak Repetitive Reverse Voltage	Max Peak Forward Surge Current	Max Forward Voltage		Max Reverse Current		Reverse Breakdown Voltage		
	$I_{FAV}$	$V_{RRM}$	$I_{FSM}$	$V_{Fmax}$ at $I_F$		IR at VR		VBR		
	mA	V	mA	V	mA	$\mu$ A	V	V		
1N4148W	150	100	2000	1.25	150	1	75	75	SOD-123	
1N4148WF	150	75	---	1.0	10	5	75	75	SOD-123F	--
1N4148WS	150	75	---	1.0	10	5	75	75	SOD-323	--
1N4148WSF	150	75	---	1.0	10	5	75	75	SOD-323F	--
1SS355	225	90	500	1.20	100	0.1	80	80	SOD-323	--
1SS400	225	90	500	1.20	100	0.1	80	80	SOD-523	--
BAS16W	150	100	2000	1.25	150	1.0	75	75	SOT-323	3.1
BAS21	200	250	2500	1.25	200	1.0	200	250	SOT-23	3.1
BAS21A	200	250	2500	1.25	200	1.0	200	250	SOT-23	3.2
BAS21C	200	250	2500	1.25	200	1.0	200	250	SOT-23	3.3
BAS21S	200	250	2500	1.25	200	1.0	200	250	SOT-23	3.4
BAV21WF	200	250	---	1.25	200	0.1	200	250	SOD-123F	--
BAV70	200	70	500	1.25	150	2.5	75	70	SOT-23	3.3
BAV70T	75	85	---	1.25	150	2.0	75	85	SOT-523	3.3
BAV70W	150	100	2000	1.25	150	2.5	75	75	SOT-323	3.3
BAV99	200	70	500	1.25	150	2.5	75	70	SOT-23	3.4
BAV99W	150	100	2000	1.25	150	2.5	75	75	SOT-323	3.4
BAW56	200	70	500	1.25	150	2.5	75	70	SOT-23	3.2
MMBD7000	200	100	---	1.10	100	1.0	50	50	SOT-23	3.4
BAV21W	200	250	625	1.00	100	0.1	100	250	SOD-123	
BAV21WS	200	250	625	1.00	100	0.1	100	250	SOD-323	

Equivalent Circuit Diagram : SOT-23 / SOT-323 / SOT-523

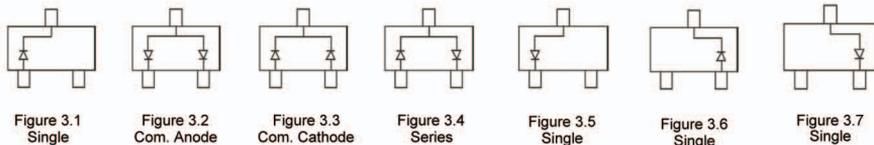


Figure 3.1 Single

Figure 3.2 Com. Anode

Figure 3.3 Com. Cathode

Figure 3.4 Series

Figure 3.5 Single

Figure 3.6 Single

Figure 3.7 Single



## Switching Diode (continued)

Part Number	Electrical Characteristics								Package	Equivalent Circuit Diagram
	Max Average Rectifier Current	Min Peak Repetitive Reverse Voltage	Max Peak Forward Surge Current	Max Forward Voltage		Max Reverse Current		Reverse Breakdown Voltage		
	$I_{FAV}$	$V_{RRM}$	$I_{FSM}$	$V_{Fmax}$ at $I_F$		IR at VR		VBR		
	mA	V	mA	V	mA	µA	V	V		
1N4148	150	100	2000	1.25	150	1.0	75	75	DO-35	--
1N4148WTF	150	75	---	1.0	10	5	75	75	SOD-523F	--
1N4448WTF	150	75	---	1.0	100	5	75	75	SOD-523F	--
1SS355F	150	80	---	1.2	100	0.1	80	80	SOD-323F	--
1SS400F	200	100	---	1.2	100	0.1	80	100	SOD-523F	--
BAS16F	200	75	---	1.3	100	1	75	75	SOD-523F	--
BAV21WSF	200	250	---	1.2	200	0.1	200	250	SOD-323F	--
LL4148	150	100	2000	1.0	10	1	100	100	LL-34	--

Equivalent Circuit Diagram : SOT-23 / SOT-323 / SOT-523



Figure 3.1  
Single



Figure 3.2  
Com. Anode



Figure 3.3  
Com. Cathode



Figure 3.4  
Series



Figure 3.5  
Single



Figure 3.6  
Single

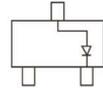


Figure 3.7  
Single

SS-SWITCHING DIODE





## **SS-SCHOTTKY DIODE**

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## Small Single Schottky Diode (小訊號蕭特基二極體)

一種導通電壓降較低、允許高速切換的二極體，蕭特基二極體的導通電壓非常低。一般的二極體在電流流過時，會產生約 0.7-1.7 伏特的電壓降，不過蕭特基二極體的電壓降只有 0.15-0.45 伏特，因此可以提昇系統的效率。蕭特基二極體是利用金屬-蕭特基勢壘的特性使得蕭特基二極體的導通電壓降較低，而且可以提高切換的速度。



SS-SCHOTTKY DIODE

Part Number	Electrical Characteristics									Package	Equivalent Circuit Diagram
	Max Average Rectifier Current	Min Peak Repetitive Reverse Voltage	Max Peak Forward Surge Current	Max Forward Voltage		Max Reverse Current		Reverse Breakdown Voltage			
	$I_{FAV}$ mA	$V_{RRM}$ V	$I_{FSM}$ mA	$V_{Fmax}$ at IF		IR at VR		VBR			
BAT54	200	30	---	1	100	2	25	30	SOT-23	3.1	
BAT54A	200	30	---	1	100	2	25	30	SOT-23	3.2	
BAT54C	200	30	---	1	100	2	25	30	SOT-23	3.3	
BAT54S	200	30	---	1	100	2	25	30	SOT-23	3.4	
BAS40	200	40	---	1	40	0.2	30	40	SOT-23	3.1	
BAS40-04	200	40	---	1	40	0.2	30	40	SOT-23	3.4	
BAS40-05	200	40	---	1	40	0.2	30	40	SOT-23	3.3	
BAS40-06	200	40	---	1	40	0.2	30	40	SOT-23	3.2	
BAS70	70	70	---	0.75	10	10	70	---	SOT-23	3.1	
BAS70-04	70	70	---	0.75	10	10	70	---	SOT-23	3.4	
BAS70-05	70	70	---	0.75	10	10	70	---	SOT-23	3.3	
BAS70-06	70	70	---	0.75	10	10	70	---	SOT-23	3.2	
BAT54X	200	30	600	1	100	2	25	21	SOD-523	--	
BAT54WS	200	30	600	1	100	2	25	21	SOD-323	--	
SD103AW	350	40	---	0.6	200	5	30	28	SOD-123	--	
SD103AWS	350	40	---	0.6	200	5	30	28	SOD-323	--	
BAT54AW	200	30	---	1	100	2	25	30	SOT-323	3.2	
BAT54CW	200	30	---	1	100	2	25	30	SOT-323	3.3	
BAT54SW	200	30	---	1	100	2	25	30	SOT-323	3.4	
BAT54W	200	30	---	1	100	2	25	30	SOT-323	3.1	
BAT54WS	200	30	---	1	100	2	25	30	SOD-323	--	
RB715F	30	40	200	0.37	1	1	10	40	SOT-323	3.3	
RB551V-30F	500	30	5000	0.47	500	100	20	30	SOD-323F	--	
RB501V-40F	100	40	1000	0.55	100	30	10	42	SOD-323F	--	

Equivalent Circuit Diagram : SOT-23 / SOT-323 / SOT-523



Figure 3.1  
Single



Figure 3.2  
Com. Anode



Figure 3.3  
Com. Cathode



Figure 3.4  
Series



Figure 3.5  
Single



Figure 3.6  
Single

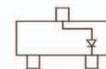


Figure 3.7  
Single



### Small Single Schottky Diode

Part Number	Electrical Characteristics								Package	Equivalent Circuit Diagram
	Max Average Rectifier Current	Min Peak Repetitive Reverse Voltage	Max Peak Forward Surge Current	Max Forward Voltage		Max Reverse Current		Reverse Breakdown Voltage		
	$I_{FAV}$ mA	$V_{RRM}$ V	$I_{FSM}$ mA	$V_{Fmax}$ at IF		IR at VR		VBR		
RB520S-30F	200	30	---	0.6	200	1	10	30	SOD-523F	--
RB520S-40F	200	40	---	0.6	200	1	10	40	SOD-523F	--
RB521S-30F	200	30	---	0.5	200	30	10	30	SOD-523F	--
RB751S-40F	30	30	---	0.37	1	0.5	30	30	SOD-523F	--
**RB520V-30G	100	30	---	0.45	0.01	0.5	10	---	SOD-723	---
**RB521V-30G	100	30	---	0.35	0.01	10	10	---	SOD-723	---
**RB520V-40BS	200	40	---	0.39	0.01	1	10	---	SOD-882	---
**RB521V-40BS	200	40	---	0.35	0.01	10	10	---	SOD-882	---
**RB521V-30BS	100	30	---	0.35	0.01	10	10	---	SOD-882	---
**RB551V-30BS	500	30	---	0.36	0.1	100	10	---	SOD-882	---
**RB520V-30CS	100	30	---	0.45	0.01	0.5	10	---	SOD-923	---
**RB521V-40CS	100	40	---	0.35	0.01	10	10	---	SOD-923	---
**RB521V-30CS	100	30	---	0.35	0.01	10	10	---	SOD-923	---

Equivalent Circuit Diagram : SOT-23 / SOT-323 / SOT-523

\*\* : Under Development



Figure 3.1  
Single



Figure 3.2  
Com. Anode



Figure 3.3  
Com. Cathode



Figure 3.4  
Series



Figure 3.5  
Single



Figure 3.6  
Single

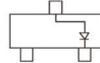


Figure 3.7  
Single

SS-SCHOTTKY DIODE



SOD-123FL



SOD-323HE

## Small Single Schottky Diode (continued)

Part Number	Electrical Characteristics									Package
	Max Average Rectifier Current	Min Peak Repetitive Reverse Voltage	Max Peak Forward Surge Current	Max Forward Voltage		Max Reverse Current		Reverse Breakdown Voltage		
	$I_{FAV}$	$V_{RRM}$	$I_{FSM}$	$V_{Fmax}$ at IF		IR at VR		VBR		
	mA	V	mA	V	mA	uA	V	V		
FB0520L	0.5	20	3000	0.43	50	250	---	---	SOD123-FL	
FB0530L	0.5	30	3000	0.45	50	130	---	---	SOD123-FL	
FB0540L	0.5	40	3000	0.55	50	40	---	---	SOD123-FL	
FB1020L	1	20	3000	0.5	100	500	---	---	SOD123-FL	
FB1030L	1	30	3000	0.5	100	500	---	---	SOD123-FL	
FB1040L	1	40	3000	0.55	100	500	---	---	SOD123-FL	
FB1050L	1	50	3000	0.7	100	500	---	---	SOD123-FL	
FB1060L	1	60	3000	0.7	100	500	---	---	SOD123-FL	
FB1080L	1	80	3000	0.85	100	500	---	---	SOD123-FL	
**FB1100L	1	100	3000	0.85	100	500	---	---	SOD123-FL	
**FB1500L	1	150	3000	0.9	100	500	---	---	SOD123-FL	
**FB1200L	1	200	3000	0.92	100	500	---	---	SOD123-FL	
FB2020L	2	20	5000	0.5	200	500	---	---	SOD123-FL	
FB2030L	2	30	5000	0.5	200	500	---	---	SOD123-FL	
FB2040L	2	40	5000	0.5	200	500	---	---	SOD123-FL	
FB2050L	2	50	5000	0.7	200	500	---	---	SOD123-FL	
FB2060L	2	60	5000	0.7	200	500	---	---	SOD123-FL	
FB2080L	2	80	5000	0.85	200	500	---	---	SOD123-FL	
**FB2100L	2	100	5000	0.85	100	500	---	---	SOD123-FL	
**FB2500L	2	150	5000	0.9	100	500	---	---	SOD123-FL	
**FB2200L	2	200	5000	0.92	100	500	---	---	SOD123-FL	
FB3020L	3	20	8000	0.5	300	500	---	---	SOD123-FL	
FB3030L	3	30	8000	0.5	300	500	---	---	SOD123-FL	
FB3040L	3	40	8000	0.5	300	500	---	---	SOD123-FL	
FB3050L	3	50	8000	0.7	300	500	---	---	SOD123-FL	
FB3060L	3	60	8000	0.7	300	500	---	---	SOD123-FL	
FB3080L	3	80	8000	0.85	300	500	---	---	SOD123-FL	
**FB3100L	3	100	8000	0.85	100	500	---	---	SOD123-FL	
**FB3150L	3	150	8000	0.9	100	500	---	---	SOD123-FL	
**FB3200L	3	200	8000	0.92	100	500	---	---	SOD123-FL	
FB0520H	0.5	20	2200	0.43	50	250	---	---	SOD-323HE	
FB0530H	0.5	30	2200	0.45	50	130	---	---	SOD-323HE	
FB0540H	0.5	40	2200	0.55	50	40	---	---	SOD-323HE	
FB1020H	1	20	2200	0.55	100	250	---	---	SOD-323HE	
FB1030H	1	30	2200	0.55	100	130	---	---	SOD-323HE	
FB1040H	1	40	2200	0.55	100	20	---	---	SOD-323HE	
FB1050H	1	50	2200	0.7	100	20	---	---	SOD-323HE	
FB1060H	1	60	2200	0.7	100	20	---	---	SOD-323HE	
FB1080H	1	80	2200	0.85	100	20	---	---	SOD-323HE	

\*\* : Under Development

SS-SCHOTTKY DIODE



## **SS-ZENER**

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## Zener Diode (穩壓二極體)

齊納二極體，是利用二極體在逆向電壓作用下的稽納擊穿（崩潰）效應，製造而成的一種具有穩定電壓功能的電子技術元件，因此又稱為「穩壓管」。



SOD-123F

Part Number	Power Rating	Zener Voltage Rang			Test Current	Maximum Reverse Current		Package
	P <sub>d</sub> mW	V <sub>Z</sub> @ I <sub>ZT</sub>			I <sub>ZT</sub>	I <sub>IR</sub> @ V <sub>R</sub>		
		Min. (V)	Nom (V)	Max (V)	mA	μA	V	
MMSZ5221BF	500	2.28	2.4	2.52	20	100	1	SOD-123F
MMSZ5222BF	500	2.38	2.5	2.63	20	100	1	SOD-123F
MMSZ5223BF	500	2.57	2.7	2.84	20	75	1	SOD-123F
MMSZ5224BF	500	2.66	2.8	2.94	20	75	1	SOD-123F
MMSZ5225BF	500	2.85	3	3.15	20	50	1	SOD-123F
MMSZ5226BF	500	3.14	3.3	3.47	20	25	1	SOD-123F
MMSZ5227BF	500	3.42	3.6	3.78	20	15	1	SOD-123F
MMSZ5228BF	500	3.71	3.9	4.1	20	10	1	SOD-123F
MMSZ5229BF	500	4.09	4.3	4.52	20	5	1	SOD-123F
MMSZ5230BF	500	4.47	4.7	4.94	20	5	2	SOD-123F
MMSZ5231BF	500	4.85	5.1	5.36	20	5	2	SOD-123F
MMSZ5232BF	500	5.32	5.6	5.88	20	5	3	SOD-123F
MMSZ5233BF	500	5.7	6	6.3	20	5	3.5	SOD-123F
MMSZ5234BF	500	5.89	6.2	6.51	20	5	4	SOD-123F
MMSZ5235BF	500	6.46	6.8	7.14	20	3	5	SOD-123F
MMSZ5236BF	500	7.13	7.5	7.88	20	3	6	SOD-123F
MMSZ5237BF	500	7.79	8.2	8.61	20	3	6.5	SOD-123F
MMSZ5238BF	500	8.27	8.7	9.14	20	3	6.5	SOD-123F
MMSZ5239BF	500	8.65	9.1	9.56	20	3	7	SOD-123F
MMSZ5240BF	500	9.5	10	10.5	20	3	8	SOD-123F
MMSZ5241BF	500	10.45	11	11.55	20	2	8.4	SOD-123F
MMSZ5242BF	500	11.4	12	12.6	20	1	9.1	SOD-123F
MMSZ5243BF	500	12.35	13	13.65	9.5	0.5	9.9	SOD-123F
MMSZ5244BF	500	13.3	14	14.7	9	0.1	10	SOD-123F
MMSZ5245BF	500	14.25	15	15.75	8.5	0.1	11	SOD-123F
MMSZ5246BF	500	15.2	16	16.8	7.8	0.1	12	SOD-123F
MMSZ5247BF	500	16.15	17	17.85	7.4	0.1	13	SOD-123F
MMSZ5248BF	500	17.1	18	18.9	7	0.1	14	SOD-123F
MMSZ5249BF	500	18.05	19	19.95	6.6	0.1	14	SOD-123F
MMSZ5250BF	500	19	20	21	6.2	0.1	15	SOD-123F
MMSZ5251BF	500	20.9	22	23.1	5.6	0.1	17	SOD-123F
MMSZ5252BF	500	22.8	24	25.2	5.2	0.1	18	SOD-123F
MMSZ5253BF	500	23.75	25	26.25	5	0.1	19	SOD-123F
MMSZ5254BF	500	25.65	27	28.35	4.6	0.1	21	SOD-123F
MMSZ5255BF	500	26.6	28	29.4	4.5	0.1	21	SOD-123F
MMSZ5256BF	500	28.5	30	31.5	4.2	0.1	23	SOD-123F
MMSZ5257BF	500	31.35	33	34.65	3.8	0.1	25	SOD-123F
MMSZ5258BF	500	34.2	36	37.8	3.4	0.1	27	SOD-123F
MMSZ5259BF	500	37.05	39	40.95	3.2	0.1	30	SOD-123F
MMSZ5260BF	500	40.85	43	45.15	3	0.1	33	SOD-123F
MMSZ5261BF	500	44.65	47	49.35	2.7	0.1	36	SOD-123F
MMSZ5262BF	500	48.45	51	53.55	2.5	0.1	39	SOD-123F



SOD-123F

## Zener Diode (continued)

Part Number	Power Rating	Zener Voltage Rang			Test Current	Maximum Reverse Current		Package
	P <sub>d</sub> mW	V <sub>Z</sub> @I <sub>ZT</sub>			I <sub>ZT</sub> mA	I <sub>R</sub> @V <sub>R</sub>		
		Min (V)	Nom (V)	Max (V)		μA	V	
MMSZ5263BF	500	53.2	56	58.8	2.2	0.1	43	SOD-123F
MMSZ5264BF	500	57	60	63	2.1	0.1	46	SOD-123F
MMSZ5265BF	500	58.9	62	65.1	2	0.1	47	SOD-123F
MMSZ5266BF	500	64.6	68	71.4	1.8	0.1	52	SOD-123F
MMSZ5267BF	500	71.25	75	78.75	1.7	0.1	56	SOD-123F
MMSZ2V4CWF	500	2.28	2.4	2.52	5	45	1	SOD-123F
MMSZ2V7CWF	500	2.57	2.7	2.84	5	18	1	SOD-123F
MMSZ3V0CWF	500	2.85	3	3.15	5	9	1	SOD-123F
MMSZ3V3CWF	500	3.14	3.3	3.47	5	4.5	1	SOD-123F
MMSZ3V6CWF	500	3.42	3.6	3.78	5	4.5	1	SOD-123F
MMSZ3V9CWF	500	3.71	3.9	4.1	5	2.7	1	SOD-123F
MMSZ4V3CWF	500	4.09	4.3	4.52	5	2.7	1	SOD-123F
MMSZ4V7CWF	500	4.47	4.7	4.94	5	2.7	2	SOD-123F
MMSZ5V1CWF	500	4.85	5.1	5.36	5	1.8	2	SOD-123F
MMSZ5V6CWF	500	5.32	5.6	5.88	5	0.9	2	SOD-123F
MMSZ6V2CWF	500	5.89	6.2	6.51	5	2.7	4	SOD-123F
MMSZ6V8CWF	500	6.46	6.8	7.14	5	1.8	4	SOD-123F
MMSZ7V5CWF	500	7.11	7.5	7.86	5	0.9	5	SOD-123F
MMSZ8V2CWF	500	7.79	8.2	8.61	5	0.63	5	SOD-123F
MMSZ9V1CWF	500	8.65	9.1	9.56	5	0.45	6	SOD-123F
MMSZ10VCWF	500	9.5	10	10.5	5	0.18	7	SOD-123F
MMSZ11VCWF	500	10.45	11	11.55	5	0.09	8	SOD-123F
MMSZ12VCWF	500	11.4	12	12.6	5	0.09	8	SOD-123F
MMSZ13VCWF	500	12.35	13	13.65	5	0.09	8	SOD-123F
MMSZ15VCWF	500	14.25	15	15.75	5	0.045	10.5	SOD-123F
MMSZ16VCWF	500	15.2	16	16.8	5	0.045	11.2	SOD-123F
MMSZ18VCWF	500	17.1	18	18.9	5	0.045	12.6	SOD-123F
MMSZ20VCWF	500	19	20	21	5	0.045	14	SOD-123F
MMSZ22VCWF	500	20.9	22	23.1	5	0.045	15.4	SOD-123F
MMSZ24VCWF	500	22.8	24	25.2	5	0.045	16.8	SOD-123F
MMSZ27VCWF	500	25.65	27	28.35	2	0.045	18.9	SOD-123F
MMSZ30VCWF	500	28.5	30	31.5	2	0.045	21	SOD-123F
MMSZ33VCWF	500	31.35	33	34.65	2	0.045	23	SOD-123F
MMSZ36VCWF	500	34.2	36	37.8	2	0.045	25.2	SOD-123F
MMSZ39VCWF	500	37.05	39	40.95	2	0.045	27.3	SOD-123F
MMSZ43VCWF	500	40.85	43	45.15	2	0.045	30.1	SOD-123F
MMSZ47VCWF	500	44.65	47	49.35	2	0.045	33	SOD-123F
MMSZ51VCWF	500	48.45	51	53.55	2	0.045	35.7	SOD-123F
MMSZ56VCWF	500	53.2	56	58.8	2	0.045	39.2	SOD-123F
MMSZ62VCWF	500	58.9	62	65.1	2	0.045	43.4	SOD-123F
MMSZ68VCWF	500	64.6	68	71.4	2	0.045	47.6	SOD-123F
MMSZ75VCWF	500	71.25	75	78.75	2	0.045	52.5	SOD-123F



SOD-323F

**Zener Diode (continued)**

Part Number	Power Rating	Zener Voltage Rang			Test Current	Maximum Reverse Current		Package
	P <sub>d</sub>	V <sub>Z</sub> @I <sub>ZT</sub>			I <sub>ZT</sub>	I <sub>R</sub> @V <sub>R</sub>		
	mW	Min (V)	Nom (V)	Max (V)	mA	μA	V	
MM3Z2V4CWF	200	2.28	2.4	2.52	5	45	1	SOD-323F
MM3Z2V7CWF	200	2.57	2.7	2.84	5	18	1	SOD-323F
MM3Z3V0CWF	200	2.85	3	3.15	5	9	1	SOD-323F
MM3Z3V3CWF	200	3.14	3.3	3.47	5	4.5	1	SOD-323F
MM3Z3V6CWF	200	3.42	3.6	3.78	5	4.5	1	SOD-323F
MM3Z3V9CWF	200	3.71	3.9	4.1	5	2.7	1	SOD-323F
MM3Z4V3CWF	200	4.09	4.3	4.52	5	2.7	1	SOD-323F
MM3Z4V7CWF	200	4.47	4.7	4.94	5	2.7	2	SOD-323F
MM3Z5V1CWF	200	4.85	5.1	5.36	5	1.8	2	SOD-323F
MM3Z5V6CWF	200	5.32	5.6	5.88	5	0.9	2	SOD-323F
MM3Z6V2CWF	200	5.89	6.2	6.51	5	2.7	4	SOD-323F
MM3Z6V8CWF	200	6.46	6.8	7.14	5	1.8	4	SOD-323F
MM3Z7V5CWF	200	7.11	7.5	7.86	5	0.9	5	SOD-323F
MM3Z8V2CWF	200	7.79	8.2	8.61	5	0.63	5	SOD-323F
MM3Z9V1CWF	200	8.65	9.1	9.56	5	0.45	6	SOD-323F
MM3Z10VCWF	200	9.5	10	10.5	5	0.18	7	SOD-323F
MM3Z11VCWF	200	10.45	11	11.55	5	0.09	8	SOD-323F
MM3Z12VCWF	200	11.4	12	12.6	5	0.09	8	SOD-323F
MM3Z13VCWF	200	12.35	13	13.65	5	0.09	8	SOD-323F
MM3Z15VCWF	200	14.25	15	15.75	5	0.045	10.5	SOD-323F
MM3Z16VCWF	200	15.2	16	16.8	5	0.045	11.2	SOD-323F
MM3Z18VCWF	200	17.1	18	18.9	5	0.045	12.6	SOD-323F
MM3Z20VCWF	200	19	20	21	5	0.045	14	SOD-323F
MM3Z22VCWF	200	20.9	22	23.1	5	0.045	15.4	SOD-323F
MM3Z24VCWF	200	22.8	24	25.2	5	0.045	16.8	SOD-323F
MM3Z27VCWF	200	25.65	27	28.35	2	0.045	18.9	SOD-323F
MM3Z30VCWF	200	28.5	30	31.5	2	0.045	21	SOD-323F
MM3Z33VCWF	200	31.35	33	34.65	2	0.045	23	SOD-323F
MM3Z36VCWF	200	34.2	36	37.8	2	0.045	25.2	SOD-323F
MM3Z39VCWF	200	37.05	39	40.95	2	0.045	27.3	SOD-323F
MM3Z43VCWF	200	40.85	43	45.15	2	0.045	30.1	SOD-323F
MM3Z47VCWF	200	44.65	47	49.35	2	0.045	33	SOD-323F
MM3Z51VCWF	200	48.45	51	53.55	2	0.045	35.7	SOD-323F
MM3Z56VCWF	200	53.2	56	58.8	2	0.045	39.2	SOD-323F
MM3Z62VCWF	200	58.9	62	65.1	2	0.045	43.4	SOD-323F
MM3Z68VCWF	200	64.6	68	71.4	2	0.045	47.6	SOD-323F
MM3Z75VCWF	200	71.25	75	78.75	2	0.045	52.5	SOD-323F

SS-ZENER



SOD-523F

## Zener Diode (continued)

Part Number	Power Rating	Zener Voltage Rang			Test Current	Maximum Reverse Current		Package
	$P_d$	$V_Z @ I_{ZT}$			$I_{ZT}$	$I_R @ V_R$		
	mW	Min (V)	Nom (V)	Max (V)	mA	$\mu A$	V	
MM5Z2V4CF	200	2.35	2.4	2.45	5	45	1	SOD-523F
MM5Z2V7CF	200	2.65	2.7	2.75	5	18	1	SOD-523F
MM5Z3V0CF	200	2.94	3	3.06	5	9	1	SOD-523F
MM5Z3V3CF	200	3.23	3.3	3.37	5	4.5	1	SOD-523F
MM5Z3V6CF	200	3.53	3.6	3.67	5	4.5	1	SOD-523F
MM5Z3V9CF	200	3.82	3.9	3.98	5	2.7	1	SOD-523F
MM5Z4V3CF	200	4.21	4.3	4.39	5	2.7	1	SOD-523F
MM5Z4V7CF	200	4.61	4.7	4.79	5	2.7	2	SOD-523F
MM5Z5V1CF	200	5	5.1	5.2	5	1.8	2	SOD-523F
MM5Z5V6CF	200	5.49	5.6	5.71	5	0.9	2	SOD-523F
MM5Z6V2CF	200	6.08	6.2	6.32	5	2.7	4	SOD-523F
MM5Z6V8CF	200	6.66	6.8	6.94	5	1.8	4	SOD-523F
MM5Z7V5CF	200	7.35	7.5	7.65	5	0.9	5	SOD-523F
MM5Z8V2CF	200	8.04	8.2	8.36	5	0.63	5	SOD-523F
MM5Z9V1CF	200	8.92	9.1	9.28	5	0.45	6	SOD-523F
MM5Z10VCF	200	9.8	10	10.2	5	0.18	7	SOD-523F
MM5Z11VCF	200	10.78	11	11.22	5	0.09	8	SOD-523F
MM5Z12VCF	200	11.76	12	12.24	5	0.09	8	SOD-523F
MM5Z13VCF	200	12.74	13	13.26	5	0.09	8	SOD-523F
MM5Z15VCF	200	14.7	15	15.3	5	0.045	10.5	SOD-523F
MM5Z16VCF	200	15.68	16	16.32	5	0.045	11.2	SOD-523F
MM5Z18VCF	200	17.64	18	18.36	5	0.045	12.6	SOD-523F
MM5Z20VCF	200	19.6	20	20.4	5	0.045	14	SOD-523F
MM5Z22VCF	200	21.56	22	22.44	5	0.045	15.4	SOD-523F
MM5Z24VCF	200	23.52	24	24.48	5	0.045	16.8	SOD-523F
MM5Z27VCF	200	26.46	27	27.54	2	0.045	18.9	SOD-523F
MM5Z30VCF	200	29.4	30	30.6	2	0.045	21	SOD-523F
MM5Z33VCF	200	32.34	33	33.66	2	0.045	23	SOD-523F
MM5Z36VCF	200	35.28	36	36.72	2	0.045	25.2	SOD-523F
MM5Z39VCF	200	38.22	39	39.78	2	0.045	27.3	SOD-523F
MM5Z43VCF	200	42.14	43	43.86	2	0.045	30.1	SOD-523F
MM5Z47VCF	200	46.06	47	47.94	2	0.045	33	SOD-523F
MM5Z51VCF	200	49.98	51	52.02	2	0.045	35.7	SOD-523F
MM5Z56VCF	200	54.88	56	57.12	2	0.045	39.2	SOD-523F
MM5Z62VCF	200	60.76	62	63.24	2	0.045	43.4	SOD-523F
MM5Z68VCF	200	66.64	68	69.36	2	0.045	47.6	SOD-523F
MM5Z75VCF	200	73.5	75	76.5	2	0.045	52.5	SOD-523F



SOD-323

## Zener Diode (continued)

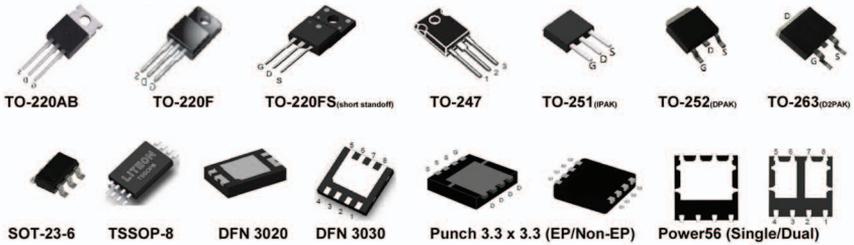
Part Number	Power Rating	Zener Voltage Rang			Test Current	Maximum Reverse Current		Package
	P <sub>d</sub>	V <sub>Z</sub> @I <sub>ZT</sub>			I <sub>ZT</sub>	I <sub>R</sub> @V <sub>R</sub>		
	mW	Min (V)	Nom (V)	Max (V)	mA	μA	V	
UDZS2V4B	400	2.43	---	2.63	5	100	1	SOD-323
UDZS2V7B	400	2.69	---	2.91	5	100	1	SOD-323
UDZS3V0B	400	3.01	---	3.22	5	50	1	SOD-323
UDZS3V3B	400	3.32	---	3.53	5	20	1	SOD-323
UDZS3V9B	400	3.89	---	4.16	5	10	1	SOD-323
UDZS4V3B	400	4.17	---	4.43	5	5	1	SOD-323
UDZS4V7B	400	4.55	---	4.75	5	5	1	SOD-323
UDZS5V1B	400	4.98	---	5.2	5	2	1.5	SOD-323
UDZS5V6B	400	5.49	---	5.73	5	2	2.5	SOD-323
UDZS6V2B	400	6.06	---	6.33	5	1	3	SOD-323
UDZS6V8B	400	6.65	---	6.33	5	1	3.5	SOD-323
UDZS7V5B	400	7.28	---	7.6	5	0.5	4	SOD-323
UDZS8V2B	400	8.02	---	8.36	5	0.5	5	SOD-323
UDZS9V1B	400	8.85	---	9.23	5	0.5	6	SOD-323
UDZS10VB	400	9.77	---	10.21	5	0.5	7	SOD-323
UDZS11VB	400	10.76	---	11.22	5	0.1	8	SOD-323
UDZS12VB	400	11.74	---	12.24	5	0.1	9	SOD-323
UDZS13VB	400	12.91	---	13.49	5	0.1	10	SOD-323
UDZS15VB	400	14.34	---	14.98	5	0.1	11	SOD-323
UDZS16VB	400	15.85	---	16.51	5	0.1	12	SOD-323
UDZS18VB	400	17.56	---	18.35	5	0.1	13	SOD-323
UDZS20VB	400	19.52	---	20.39	5	0.1	15	SOD-323
UDZS22VB	400	21.54	---	22.47	5	0.1	17	SOD-323
UDZS24VB	400	23.72	---	24.78	5	0.1	19	SOD-323
UDZS27VB	400	26.19	---	27.53	5	0.1	21	SOD-323
UDZS30VB	400	29.19	---	30.69	5	0.1	23	SOD-323
UDZS33VB	400	32.15	---	33.79	5	0.1	25	SOD-323
UDZS36VB	400	35.07	---	36.87	5	0.1	27	SOD-323

SS-ZENER



# **MOSFET SCHOTTKY RECTIFIERS**

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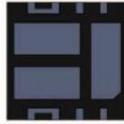


## MOSFET

Part Number	Package	ESD Diode	Type	V <sub>DS</sub> (V)	V <sub>GS</sub> (±V)	I <sub>D</sub> (A)				V <sub>th</sub>			
						25°C	10V	4.5V	2.5V	1.8V	Min	Typ	Max
LTC8205K	TSOP6	Y	Dual N	20	10	6		24.5	38		0.5		1
LTC8205A	TSOP6	N	Dual N	20	12	6		20	35		0.5		1
LTS8810	TSSOP-8	Y	Dual N	20	12	6		20	35		0.5		1
LK8D5C02K	DFN3020	Y	Dual N	24	12	8		8.5	13		0.5		1
LK17C02K	DFN3020	Y	Dual N	24	12	7		17	25		0.5		1
LTC3018KW	SOT-323	Y	Dual N	30	20	0.1		8			0.5		1.5
G1L9N06	DFN3030	N	N	60	20	28	9	13.3			1		3
G1NP4D7N06	Power56	N	N	60	20	90	4.7	5.2			1		3
G1NP7D7N06	Power56	N	N	60	20	35	7.7	9.5			1		3
G1V4D7N06	SOP-8	N	N	60	20	35	4.7				1		3
LTP85N07	TO-220	N	N	75	20	85	9				2		4
GV12N10	SOP-8	N	N	100	20	12	12	14			1		2.5
GV20N10	SOP-8	N	N	100	20	8	20	22			1		2.5
GPF10N10	ITO-220	N	N	100	20	70	10	12			1		2.5
GPF5N10	ITO-220	N	N	100	20	130	5				2		4
GNP10N10	Power56	N	N	100	20	24	10	12			1		2.5
LZD3N50	TO-252	N	N	500	30	3	3000				2		4
LZD2N60	TO-252	N	N	600	30	2	4500				2		4
LZPF4N65K	ITO-220	Y	N	650	20	4	2500				2		4
S2D420N65R	TO-252	N	N	650	30	10.5	420				2		4
S2D580N65AR	TO-252	N	N	650	30	8	580				2		4
S2D760N65R	TO-252	N	N	650	30	7	760				2		4
S2D900N65R	TO-252	N	N	650	30	5	900				2		4
S2D1R4N65R	TO-252	N	N	650	30	4	1400				2		4
S2D2R0N65R	TO-252	N	N	650	30	3	2000				2		4
S2D2R4N65R	TO-252	N	N	650	30	2	2400				2		4
S2DP200N65R	TO-263	N	N	650	30	20	200				2		4
S2DP290N65R	TO-263	N	N	650	30	15	290				2		4

Part Number	Package	ESD Diode	Type	V <sub>DS</sub> (V)	V <sub>GS</sub> (±V)	I <sub>D</sub> (A) 25°C	R <sub>DS(ON)</sub> (mΩ max) at V <sub>GS</sub> =			V <sub>th</sub>			
							10V	4.5V	2.5V	1.8V	Min	Typ	Max
S2DP380N65R	TO-263	N	N	650	30	11	380				2		4
S2DP420N65R	TO-263	N	N	650	30	10.5	420				2		4
S2DP580N65AR	TO-263	N	N	650	30	8	580				2		4
S2DP760N65R	TO-263	N	N	650	30	7	760				2		4
S2DP900N65R	TO-263	N	N	650	30	5	900				2		4
S2DP1R4N65R	TO-263	N	N	650	30	4	1400				2		4
S2P200N65R	TO-220	N	N	650	30	20	200				2		4
S2P290N65R	TO-220	N	N	650	30	15	290				2		4
S2P380N65R	TO-220	N	N	650	30	11	380				2		4
S2P420N65R	TO-220	N	N	650	30	10.5	420				2		4
S2P580N65AR	TO-220	N	N	650	30	8	580				2		4
S2P760N65R	TO-220	N	N	650	30	7	760				2		4
S2P900N65R	TO-220	N	N	650	30	5	900				2		4
S2P1R4N65R	TO-220	N	N	650	30	4	1400				2		4
S2PF99N65	ITO-220	N	N	650	30	40	99				2		4
S2PF200N65R	ITO-220	N	N	650	30	20	200				2		4
S2PF290N65R	ITO-220	N	N	650	30	15	290				2		4
S2PF380N65R	ITO-220	N	N	650	30	11	380				2		4
S2PF420N65R	ITO-220	N	N	650	30	10.5	420				2		4
S2PF580N65AR	ITO-220	N	N	650	30	8	580				2		4
S2PF760N65R	ITO-220	N	N	650	30	7	760				2		4
S2PF900N65R	ITO-220	N	N	650	30	5	900				2		4
S2PF1R4N65R	ITO-220	N	N	650	30	4	1400				2		4
S2U420N65R	TO-251	N	N	650	30	10.5	420				2		4
S2U580N65AR	TO-251	N	N	650	30	8	580				2		4
S2U760N65R	TO-251	N	N	650	30	7	760				2		4
S2U900N65R	TO-251	N	N	650	30	5	900				2		4
S2U1R4N65R	TO-251	N	N	650	30	4	1400				2		4
S2U2R0N65R	TO-251	N	N	650	30	3	2000				2		4
S2U2R4N65R	TO-251	N	N	650	30	2	2400				2		4
S2QT200N65R	DFN8080	N	N	650	30	18	200				2		4
S2QT290N65R	DFN8080	N	N	650	30	16	290				2		4
S2QT380N65R	DFN8080	N	N	650	30	14	380				2		4
S2TB200N65R	TO-247	N	N	650	30	20	200				2		4
S2TB41N65F	TO-247	N	N	650	30	78	41				2		4
S2TB42N65	TO-247	N	N	650	30	78	42				2		4
S2TB99N65	TO-247	N	N	650	30	32	99				2		4
S2TB99N65F	TO-247	N	N	650	30	32	99				2		4
S2PP200N65R	TO-220W	N	N	650	30	20	200				2		4
S2UP200N65R	TO-262	N	N	650	30	20	200				2		4
S2PF1R4N70	ITO-220	N	N	700	30	4	1400				2		4
S2PF1R0N70	ITO-220	N	N	700	30	5	1000				2		4
S2PF750N70	ITO-220	N	N	700	30	7	750				2		4
S2PF500N70	ITO-220	N	N	700	30	10	500				2		4

Part Number	Package	ESD Diode	Type	V <sub>DS</sub> (V)	V <sub>GS</sub> (±V)	I <sub>D</sub> (A)				R <sub>DS(ON)</sub> (mΩ max) at V <sub>GS</sub> =			V <sub>th</sub>		
						25°C	10V	4.5V	2.5V	1.8V	Min	Typ	Max		
S2PF350N70	ITO-220	N	N	700	30	12	350					2		4	
S2U1R4N70	TO-251	N	N	700	30	4	1400					2		4	
S2U1R0N70	TO-251	N	N	700	30	5	1000					2		4	
S2U750N70	TO-251	N	N	700	30	7	750					2		4	
S2U500N70	TO-251	N	N	700	30	10	500					2		4	
S2U350N70	TO-251	N	N	700	30	12	350					2		4	
S2P1R4N70	TO-220	N	N	700	30	4	1400					2		4	
S2P1R0N70	TO-220	N	N	700	30	5	1000					2		4	
S2P750N70	TO-220	N	N	700	30	7	750					2		4	
S2P500N70	TO-220	N	N	700	30	10	500					2		4	
S2P350N70	TO-220	N	N	700	30	12	350					2		4	
S2D1R4N70	TO-252	N	N	700	30	4	1400					2		4	
S2D1R0N70	TO-252	N	N	700	30	5	1000					2		4	
S2D750N70	TO-252	N	N	700	30	7	750					2		4	
S2D500N70	TO-252	N	N	700	30	10	500					2		4	
S2D350N70	TO-252	N	N	700	30	12	350					2		4	



DFN4040

**MOSFET + Schottky Rectifier**

Part Number	Package	ESD Diode	Type	VLL (V)	leak max (VLL±10V)	IO (A)		R <sub>DS(on)</sub> (Ω max) at V <sub>GS</sub> =	SCHOTTKY (IF=1.0A)	VR=20V	MOSFET Vth		
						25°C	10V		4.5V	VF	IR	Min	Typ
SMLU1232	DFN4040	N	Rectifier	20	1000uA	2.2	26	32	0.39V	7uA	1		2.2





## **SCHOTTKY RECTIFIERS**

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Popular	ABS	R6
Popular		
JEDEC		
		

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics							Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		TJ	
	V	A	A	mA	V	$I_{FAV(A)}$	°C	
<b>BRIDGE</b>								
**BABS140	40	1	25	0.2000	0.48	1	125	ABS
**BABS260	60	3	50	0.0200	0.70	2	150	ABS
<b>SOLAR</b>								
10SQ050	50	10	250	0.0500	0.55	10	150	R6
15SQ045	45	15	275	1.0000	0.55	15	150	R6
SL1560R6	60	15	400	0.0200	0.70	15	150	R6
20SQ040	40	20	275	1.0000	0.55	20	150	R6
20SQ045	45	20	275	1.0000	0.55	20	150	R6
20SQ45R6	45	20	275	0.3000	0.55	20	150	R6
SL2050R6	50	20	370	0.0900	0.53	20	150	R6
SL20U50R6	50	20	370	0.2100	0.47	20	150	R6
SL20H50R6	50	20	370	0.0900	0.49	20	150	R6

Popular	DO-216AA	F1	F1A	SMA
Popular		Mite_Flat		
JEDEC	DO-216AA	DO-222AA	DO-219	DO-214AC
				

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 1A</math></b>							
MB120L	20	1	50	0.4000	0.45	1	DO-216AA
MB120E	20	1	50	0.0100	0.53	1	DO-216AA
FB120M	20	1	50	0.2000	0.46	1	MITE-FLAT(F1)
FB120LM	20	1	50	0.4000	0.38	1	MITE-FLAT(F1)
FB130M	30	1	50	0.2000	0.46	1	MITE-FLAT(F1)
FB130LM	30	1	50	0.4000	0.38	1	MITE-FLAT(F1)
FB140MZ	40	1	30	0.5000	0.50	1	MITE-FLAT(F1)
FB140LM	40	1	25	1.0000	0.45	1	MITE-FLAT(F1)
FB150LM	50	1	30	0.5000	0.50	1	MITE-FLAT(F1)
FB160LM	60	1	50	0.1000	0.50	1	MITE-FLAT(F1)
FB1100M	100	1	40	0.0100	0.77	1	MITE-FLAT(F1)
FB130E	30	1	30	0.0250	0.68	1	DO-219AA(F1A)
FB140E	40	1	30	0.0250	0.68	1	DO-219AA(F1A)
FB145E	45	1	30	0.0250	0.68	1	DO-219AA(F1A)
FB150E	50	1	30	0.0250	0.68	1	DO-219AA(F1A)
FB160E	60	1	30	0.0250	0.68	1	DO-219AA(F1A)
B120	20	1	30	0.1000	0.50	1	SMA
B120L	20	1	25	1.0000	0.41	1	SMA
B130	30	1	30	0.1000	0.50	1	SMA
B140	40	1	30	0.1000	0.50	1	SMA
B140Z	40	1	30	0.5000	0.50	1	SMA
B140L	40	1	30	1.0000	0.45	1	SMA
B150	50	1	30	0.0500	0.70	1	SMA
B160	60	1	30	0.0500	0.70	1	SMA
B170	70	1	30	0.0200	0.79	1	SMA
B180	80	1	30	0.0200	0.79	1	SMA
B190	90	1	30	0.0200	0.79	1	SMA
B1100	100	1	30	0.0200	0.79	1	SMA

Popular	DO-41	F3	SMB
Popular		SMA_Flat	
JEDEC	DO-41	DO-221AC	DO-214AA
			

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 1A</math></b>							
SB120	20	1	40	0.1000	0.50	1	DO-41
1N5817	20	1	25	0.2500	0.45	1	DO-41
SB130	30	1	40	0.1000	0.50	1	DO-41
1N5818	30	1	25	0.1000	0.55	1	DO-41
SB140	40	1	40	0.1000	0.50	1	DO-41
1N5819	40	1	25	0.1000	0.60	1	DO-41
SB150	50	1	40	0.0500	0.70	1	DO-41
SB160	60	1	40	0.0500	0.70	1	DO-41
SB170	70	1	40	0.0200	0.79	1	DO-41
SB180	80	1	40	0.0200	0.79	1	DO-41
SB190	90	1	40	0.0200	0.79	1	DO-41
SB1100	100	1	40	0.0200	0.79	1	DO-41
FB130A	30	1	50	1.0000	0.460	1	SMA-FLAT(F3)
FB140A	40	1	50	1.0000	0.460	1	SMA-FLAT(F3)
FB140AZ	40	1	30	0.5000	0.500	1	SMA-FLAT(F3)
FB140LA	40	1	30	1.0000	0.450	1	SMA-FLAT(F3)
FB150LA	50	1	30	0.5000	0.500	1	SMA-FLAT(F3)
FB160A	60	1	40	0.0250	0.675	1	SMA-FLAT(F3)
B120B	20	1	30	0.1000	0.500	1	DO-214AA (SMB)
B130B	30	1	30	0.1000	0.500	1	DO-214AA (SMB)
B140B	40	1	30	0.1000	0.500	1	DO-214AA (SMB)
B150B	50	1	30	0.5000	0.700	1	DO-214AA (SMB)
B160B	60	1	30	0.5000	0.700	1	DO-214AA (SMB)
B170LB	70	1	50	0.5000	0.750	1	DO-214AA (SMB)
B180LB	80	1	50	0.5000	0.750	1	DO-214AA (SMB)
B190LB	90	1	50	0.5000	0.750	1	DO-214AA (SMB)
B1100B	100	1	30	0.0200	0.790	1	DO-214AA (SMB)
B1100LB	100	1	50	0.5000	0.750	1	DO-214AA (SMB)

SCHOTTKY RECTIFIERS

Popular	F1	F1A	SMA	F3	SOD-323EP
Popular	Mite_Flat			SMA_Flat	
JEDEC	DO-222AA	DO-219	DO-214AC	DO-221AC	SOD-323EP
					

\* New Product

\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 2A</math></b>							
FB220M	20	2	50	0.2000	0.50	2	MITE-FLAT(F1)
FB220LM	20	2	50	0.4000	0.44	2	MITE-FLAT(F1)
FB230M	30	2	50	0.2000	0.50	2	MITE-FLAT(F1)
FB230LM	30	2	50	0.4000	0.44	2	MITE-FLAT(F1)
FB240M	40	2	50	0.2000	0.50	2	MITE-FLAT(F1)
FB240LM	40	2	50	0.5000	0.44	2	MITE-FLAT(F1)
FB250M	50	2	50	0.1000	0.70	2	MITE-FLAT(F1)
FB260M	60	2	50	0.1000	0.70	2	MITE-FLAT(F1)
FB230E	30	2	50	0.0250	0.68	2	DO-219AA(F1A)
FB240E	40	2	50	0.0250	0.68	2	DO-219AA(F1A)
FB245E	45	2	50	0.0250	0.68	2	DO-219AA(F1A)
FB250E	50	2	50	0.0250	0.68	2	DO-219AA(F1A)
FB260E	60	2	50	0.0250	0.68	2	DO-219AA(F1A)
B220A	20	2	50	0.1500	0.50	2	SMA
B230A	30	2	50	0.1500	0.50	2	SMA
B240A	40	2	50	0.1500	0.50	2	SMA
B240AZ	40	2	25	2.0000	0.50	2	SMA
B240LA	40	2	25	2.0000	0.43	2	SMA
B240LAZ	40	2	25	2.0000	0.48	2	SMA
B250A	50	2	50	0.0500	0.70	2	SMA
B260A	60	2	50	0.0500	0.70	2	SMA
B2100A	100	2	50	0.0200	0.79	2	SMA
B2150A	150	2	60	0.0015	0.82	2	SMA
FB240A	40	2	50	0.5000	0.50	2	SMA-FLAT(F3)
FB240LA	40	2	50	0.5000	0.44	2	SMA-FLAT(F3)
FB230H	30	2	25	0.0600	0.60	2	SOD-323EP

Popular	DO-41	DO-15	SMB
Popular			
JEDEC	DO-41	DO-15	DO-214AA
			

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
$I_{FAV} = 2A$							
SB240S	40	2	60	0.1500	0.55	2	DO-41
SB220	20	2	60	0.1500	0.55	2	DO-15
SB230	30	2	60	0.1500	0.55	2	DO-15
SB240	40	2	60	0.1500	0.55	2	DO-15
SB250	50	2	60	0.0500	0.70	2	DO-15
SB260	60	2	60	0.0500	0.70	2	DO-15
SB270	70	2	60	0.0100	0.79	2	DO-15
SB280	80	2	60	0.0100	0.79	2	DO-15
SB290	90	2	60	0.0100	0.79	2	DO-15
SB2100	100	2	60	0.0100	0.79	2	DO-15
B220	20	2	50	0.1500	0.50	2	DO-214AA (SMB)
B230	30	2	50	0.1500	0.50	2	DO-214AA (SMB)
B240	40	2	50	0.1500	0.50	2	DO-214AA (SMB)
B240L	40	2	25	2.0000	0.43	2	DO-214AA (SMB)
B250	50	2	50	0.0500	0.70	2	DO-214AA (SMB)
B260	60	2	50	0.0500	0.70	2	DO-214AA (SMB)
B270	70	2	50	0.0100	0.79	2	DO-214AA (SMB)
B280	80	2	50	0.0100	0.79	2	DO-214AA (SMB)
B290	90	2	50	0.0100	0.79	2	DO-214AA (SMB)
B2100	100	2	50	0.007	0.79	2	DO-214AA (SMB)

SCHOTTKY RECTIFIERS

Popular	F1	F1A	SMA	F3	F3D	* New Product
Popular	Mite_Flat			SMA_Flat	SMA_Flat	** Future Product
JEDEC	DO-222AA	DO-219	DO-214AC	DO-221AC	DO-221AC	
						

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 3A</math></b>							
FB330M	30	3	50	0.2000	0.58	3	MITE-FLAT(F1)
FB340M	40	3	50	0.2000	0.58	3	MITE-FLAT(F1)
FB340LM	40	3	75	0.4000	0.47	3	MITE-FLAT(F1)
FB3H40M	40	3	50	0.0800	0.55	3	MITE-FLAT(F1)
FB330E	30	3	50	0.0250	0.595	3	DO-219AA(F1A)
FB340E	40	3	50	0.0250	0.595	3	DO-219AA(F1A)
FB345E	45	3	50	0.0250	0.595	3	DO-219AA(F1A)
FB350E	50	3	50	0.0250	0.695	3	DO-219AA(F1A)
FB360E	60	3	50	0.0250	0.695	3	DO-219AA(F1A)
B320A	20	3	100	0.1500	0.50	3	SMA
B330A	30	3	100	0.1500	0.50	3	SMA
B340A	40	3	100	0.1500	0.50	3	SMA
B340LA	40	3	70	1.0000	0.45	3	SMA
B340HA	40	3	80	0.5000	0.50	3	SMA
B340LAZ	40	3	25	0.2000	0.48	3	SMA
B345A	45	3	80	0.1500	0.55	3	SMA
B350A	50	3	100	0.0500	0.70	3	SMA
B360A	60	3	100	0.0500	0.70	3	SMA
FB320LA	20	3	50	0.5000	0.40	3	SMA-FLAT(F3)
FB330LA	30	3	50	0.5000	0.40	3	SMA-FLAT(F3)
FB340A	40	3	70	0.2000	0.55	3	SMA-FLAT(F3)
FB340LAZ	40	3	70	0.2000	0.48	3	SMA-FLAT(F3)
FB340LA	40	3	50	0.5000	0.40	3	SMA-FLAT(F3)
FB340D	40	3	75	0.2000	0.47	3	SMA-FLAT(F3D)
FB345D	45	3	80	0.1500	0.55	3	SMA-FLAT(F3D)
FB3H45D	45	3	50	0.0800	0.53	3	SMA-FLAT(F3D)
FB3A45D	45	3	50	0.5000	0.48	3	SMA-FLAT(F3D)
FB350D	50	3	100	0.0250	0.695	3	SMA-FLAT(F3D)
FB360D	60	3	100	0.0250	0.695	3	SMA-FLAT(F3D)
FB3100D	100	3	70	0.0060	0.835	3	SMA-FLAT(F3D)
FB3150D	150	3	100	0.0060	0.875	3	SMA-FLAT(F3D)

Popular	DO-201AD	SMB	SMC
Popular			
JEDEC	DO-201AD	DO-214AA	DO-214AB
			

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
$I_{FAV} = 3A$							
SB320	20	3	80	0.1500	0.50	3	DO-201AD
1N5820	20	3	80	0.1500	0.48	3	DO-201AD
SB330	30	3	80	0.1500	0.50	3	DO-201AD
1N5821	30	3	80	0.1500	0.50	3	DO-201AD
SB340	40	3	80	0.1500	0.50	3	DO-201AD
1N5822	40	3	80	0.1500	0.53	3	DO-201AD
SB350	50	3	80	0.0500	0.70	3	DO-201AD
SB360	60	3	80	0.0500	0.70	3	DO-201AD
SB370	70	3	80	0.0200	0.79	3	DO-201AD
SB380	80	3	80	0.0200	0.79	3	DO-201AD
SB390	90	3	80	0.0200	0.79	3	DO-201AD
SB3100	100	3	80	0.0200	0.79	3	DO-201AD
SB3150	150	3	150	0.0100	0.95	3	DO-201AD
B320B	20	3	100	0.1500	0.50	3	DO-214AA (SMB)
B330B	30	3	100	0.1500	0.50	3	DO-214AA (SMB)
B340B	40	3	100	0.1500	0.50	3	DO-214AA (SMB)
B340HB	40	3	100	0.5000	0.50	3	DO-214AA (SMB)
B340LB	40	3	70	1.0000	0.45	3	DO-214AA (SMB)
B350B	50	3	100	0.0500	0.70	3	DO-214AA (SMB)
B360B	60	3	100	0.0500	0.70	3	DO-214AA (SMB)
B370B	70	3	100	0.5000	0.79	3	DO-214AA (SMB)
B380B	80	3	100	0.5000	0.79	3	DO-214AA (SMB)
B390B	90	3	100	0.5000	0.79	3	DO-214AA (SMB)
B3100B	100	3	100	0.0100	0.79	3	DO-214AA (SMB)
B3200B	200	3	80	0.2000	0.90	3	DO-214AA (SMB)
B320	20	3	100	0.1500	0.50	3	DO-214AB (SMC)
B330	30	3	100	0.1500	0.50	3	DO-214AB (SMC)
B340	40	3	100	0.1500	0.50	3	DO-214AB (SMC)
B350	50	3	100	0.0500	0.70	3	DO-214AB (SMC)
B360	60	3	100	0.0500	0.70	3	DO-214AB (SMC)
B370	70	3	100	0.0200	0.79	3	DO-214AB (SMC)
B380	80	3	100	0.0200	0.79	3	DO-214AB (SMC)
B390	90	3	100	0.0200	0.79	3	DO-214AB (SMC)
B3100	100	3	100	0.0200	0.79	3	DO-214AB (SMC)

Popular	F3D	SMA	SMB	SMC
Popular	SMA_Flat			
JEDEC	DO-221AC	DO-214AC	DO-214AA	DO-214AB
				

\* New Product  
 \*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 5A</math></b>							
FB540D	40	5	140	0.0250	0.60	5	SMA-FLAT(F3D)
FB545D	45	5	125	0.0250	0.60	5	SMA-FLAT(F3D)
*C545A	45	5	100	0.3000	0.46	5	SMA
*C545D	45	5	100	0.3000	0.46	5	SMA-FLAT(F3D)
FB550D	50	5	125	0.0250	0.68	5	SMA-FLAT(F3D)
FB560D	60	5	140	0.0250	0.68	5	SMA-FLAT(F3D)
FB5100D	100	5	125	0.0060	0.84	5	SMA-FLAT(F3D)
FB5150D	150	5	125	0.0060	0.88	5	SMA-FLAT(F3D)
G545B	45	5	125	0.3000	0.51	5	DO-214AA (SMB)
B520C	20	5	125	0.1500	0.55	5	DO-214AB (SMC)
B530C	30	5	125	0.1500	0.55	5	DO-214AB (SMC)
B540C	40	5	125	0.1500	0.55	5	DO-214AB (SMC)
G545C	45	5	125	0.3000	0.51	5	DO-214AB (SMC)
B550C	50	5	125	0.2500	0.70	5	DO-214AB (SMC)
B560C	60	5	125	0.2500	0.70	5	DO-214AB (SMC)
B5100C	100	5	100	0.0200	0.85	5	DO-214AB (SMC)
B5150C	150	5	125	0.0080	0.92	5	DO-214AB (SMC)

Popular	DO-201AD	TO-220AC	ITO-220AC
Popular			
JEDEC	DO-201AD	TO-220AC	ITO-220AC
			

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 5A</math></b>							
SB520	20	5	150	0.1500	0.55	5	DO-201AD
SB530	30	5	150	0.1500	0.55	5	DO-201AD
SB540	40	5	150	0.1500	0.55	5	DO-201AD
SB550	50	5	150	0.2000	0.70	5	DO-201AD
SB560	60	5	150	0.1000	0.70	5	DO-201AD
SB560L	60	5	150	0.1000	0.55	5	DO-201AD
SB570	70	5	125	0.0200	0.85	5	DO-201AD
SB580	80	5	125	0.0200	0.85	5	DO-201AD
SB590	90	5	125	0.0200	0.85	5	DO-201AD
SB5100	100	5	125	0.0200	0.85	5	DO-201AD
SB5120	120	5	150	0.0080	0.86	5	DO-201AD
SB5150	150	5	125	0.0080	0.92	5	DO-201AD
SBL530	30	5	175	0.5000	0.55	5	TO-220AC
SBL535	35	5	175	0.5000	0.55	5	TO-220AC
SBL540	40	5	175	0.5000	0.55	5	TO-220AC
SBL545	45	5	175	0.5000	0.55	5	TO-220AC
SBL550	50	5	175	0.5000	0.70	5	TO-220AC
SBL560	60	5	175	0.5000	0.70	5	TO-220AC
SBL560L	60	5	150	0.1000	0.55	5	TO-220AC
SBF530	30	5	150	0.5000	0.55	5	ITO-220AC
SBF535	35	5	150	0.5000	0.55	5	ITO-220AC
SBF540	40	5	150	0.5000	0.55	5	ITO-220AC
SBF545	45	5	150	0.5000	0.55	5	ITO-220AC

Popular	TO-220AC	DO-201AD	ITO-220AC	SMC
Popular				
JEDEC	TO-220AC	DO-201AD	ITO-220AC	DO-214AB
				

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 7.5A</math></b>							
MBR730	30	7.5	150	0.1000	0.84	15	TO-220AC
MBR735	35	7.5	150	0.1000	0.84	15	TO-220AC
MBR740	40	7.5	150	0.1000	0.84	15	TO-220AC
MBR745	45	7.5	150	0.1000	0.84	15	TO-220AC
MBR750	50	7.5	150	0.5000	0.75	7.5	TO-220AC
MBR760	60	7.5	150	0.5000	0.75	7.5	TO-220AC
<b><math>I_{FAV} = 8A</math></b>							
SB830	30	8	175	0.5000	0.55	8	DO-201AD
SB840	40	8	175	0.5000	0.55	8	DO-201AD
SB845	45	8	175	0.5000	0.55	8	DO-201AD
SB8100	100	8	150	0.0200	0.92	8	DO-201AD
SB8150	150	8	150	0.0100	1.02	8	DO-201AD
SBL830	30	8	175	0.5000	0.55	8	TO-220AC
MBR830	30	8	150	0.1000	0.70	8	TO-220AC
SBL835	35	8	175	0.5000	0.55	8	TO-220AC
MBR835	35	8	150	0.1000	0.70	8	TO-220AC
SBL840	40	8	175	0.5000	0.55	8	TO-220AC
MBR840	40	8	150	0.1000	0.70	8	TO-220AC
SBL845	45	8	175	0.5000	0.55	8	TO-220AC
MBR845	45	8	150	0.1000	0.70	8	TO-220AC
SBL850	50	8	175	0.5000	0.70	8	TO-220AC
MBR850	50	8	150	0.1000	0.80	8	TO-220AC
SBL860	60	8	175	0.5000	0.70	8	TO-220AC
MBR860	60	8	150	0.1000	0.80	8	TO-220AC
MBR870	70	8	125	0.5500	0.85	8	TO-220AC
MBR870L	70	8	230	0.5500	0.72	8	TO-220AC
MBR880	80	8	125	0.5500	0.85	8	TO-220AC
MBR880L	80	8	230	0.5500	0.72	8	TO-220AC
MBR890	90	8	125	0.5500	0.85	8	TO-220AC
MBR890L	90	8	230	0.5500	0.72	8	TO-220AC
MBR8100	100	8	125	0.5500	0.85	8	TO-220AC

Popular	TO-220AC	DO-201AD	ITO-220AC	SMC
Popular				
JEDEC	TO-220AC	DO-201AD	ITO-220AC	DO-214AB
				

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
MBR8100L	100	8	230	0.5500	0.72	8	TO-220AC
MBRF845	45	8	150	0.1000	0.70	8	ITO-220AC
MBRF8100	100	8	125	0.1000	0.85	8	ITO-220AC
B860C	60	8	175	0.1000	0.70	8	SMC

Popular	TO-220AB	F4	F5
Popular		TO-277_Plus	D2PAK_Flat
JEDEC	TO-220AB		
			

\* New Product  
 \*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 10A</math></b>							
MBR1030CT	30	10	125	0.1000	0.70	5	TO-220AB
MBR1035CT	35	10	125	0.1000	0.70	5	TO-220AB
SBL1040CTW	40	10	125	0.2000	0.55	5	TO-220AB
MBR1040CT	40	10	125	0.1000	0.70	5	TO-220AB
SBL1045CTW	45	10	125	0.2000	0.55	5	TO-220AB
MBR1045CT	45	10	125	0.1000	0.70	5	TO-220AB
MBR1050CT	50	10	125	0.1000	0.80	5	TO-220AB
SBL1060CTW	60	10	125	0.3000	0.70	5	TO-220AB
SBL10H60CT	60	10	125	0.5000	0.70	5	TO-220AB
MBR1060CT	60	10	125	0.1000	0.80	5	TO-220AB
MBR1070CT	70	10	120	0.0100	0.85	5	TO-220AB
MBR1080CT	80	10	120	0.0100	0.85	5	TO-220AB
MBR1090CT	90	10	120	0.0100	0.85	5	TO-220AB
MBR10100CT	100	10	120	0.0100	0.85	5	TO-220AB
MBR10100CTW	100	10	150	0.0100	0.85	5	TO-220AB
G10100CTW	100	10	150	0.1500	0.68	5	TO-220AB
G10E100CTW	100	10	150	0.0300	0.68	5	TO-220AB
*G10E120CTW	120	10	130	0.0250	0.76	5	TO-220AB
MBR10125CT	125	10	120	0.0080	0.92	5	TO-220AB
MBR10150CT	150	10	120	0.0080	0.92	5	TO-220AB
MBR10150CTW	150	10	180	0.0080	1.00	10	TO-220AB
**G10H150CTW	150	10	180	0.0900	0.78	5	TO-220AB
MBR10200CT	200	10	120	0.0080	0.92	5	TO-220AB
*MBR10200CTW	200	10	120	0.0080	0.92	10	TO-220AB
**G10H200CTW	200	10	180	0.0900	0.81	5	TO-220AB
G10L45F4	45	10	275	0.3000	0.47	10	F4
G10100F4	100	10	120	0.1200	0.80	10	F4
G10100F5	100	10	150	0.1500	0.79	10	F5
G10120F5	120	10	120	0.1500	0.91	10	F5

Popular	ITO-220AB	ITO-220AC	P5
Popular			DFN56
JEDEC	ITO-220AB	ITO-220AC	
			

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 10A</math></b>							
SBF1030CT	30	10	150	0.2000	0.55	5	ITO-220AB
MBRF1030CT	30	10	125	0.1000	0.70	5	ITO-220AB
SBF1035CT	35	10	150	0.2000	0.55	5	ITO-220AB
SBF1040CT	40	10	150	0.2000	0.55	5	ITO-220AB
SBF20V40CTL	40	10	180	0.5000	0.50	10	ITO-220AB
MBRF1040CT	40	10	125	0.1000	0.70	5	ITO-220AB
SBF1045CT	45	10	150	0.2000	0.55	5	ITO-220AB
MBRF1045CT	45	10	125	0.1000	0.70	5	ITO-220AB
SBF1050CT	50	10	150	0.3000	0.70	5	ITO-220AB
SBF1060CT	60	10	150	0.3000	0.70	5	ITO-220AB
SBF20V60CTL	60	10	200	0.1000	0.60	10	ITO-220AB
MBRF1060CT	60	10	125	0.0200	0.80	5	ITO-220AB
MBRF10100CT	100	10	120	0.0100	0.85	5	ITO-220AB
MBRF10100CTW	100	10	150	0.0100	0.85	5	ITO-220AB
G10100CTFW	100	10	150	0.1500	0.68	5	ITO-220AB
G10E100CTFW	100	10	150	0.0300	0.68	5	ITO-220AB
*G10E120CTSW	120	10	130	0.0250	0.76	5	TO-220AB(S)
MBRF10150CT	150	10	120	0.0080	1.00	10	ITO-220AB
*MBRF10150CTW	150	10	120	0.0080	0.92	10	ITO-220AB
**G10H150CTFW	150	10	180	0.0900	0.78	5	ITO-220AB
MBRF10200CT	200	10	120	0.0080	1.00	10	ITO-220AB
*MBRF10200CTW	200	10	120	0.0080	1.00	10	ITO-220AB
**G10H200CTFW	200	10	180	0.0900	0.81	5	ITO-220AB
SBF1040	40	10	250	1.0000	0.60	10	ITO-220AC
MBRF1045	45	10	150	0.1000	0.57	10	ITO-220AC
SBF1060	60	10	250	1.0000	0.75	10	ITO-220AC
MBRF1060	60	10	150	0.1000	0.65	10	ITO-220AC
MBRF10100	100	10	150	0.1000	0.85	10	ITO-220AC
*MBRF10200W	200	10	180	0.0080	0.92	10	ITO-220AC
G10U45P5	45	10	275	0.2000	0.47	10	P5
B10U45P5	45	10	275	1.0000	0.45	10	P5

Popular	TO-220AC	DPAK	F4	TO-220AB
Popular			TO-277_Plus	
JEDEC	TO-220AC	TO-252		TO-220AB
				

\* New Product

\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 10A</math></b>							
SBL1025L	25	10	200	0.8000	0.45	10	TO-220AC
SBL1030	30	10	250	1.0000	0.60	10	TO-220AC
SBL1030L	30	10	200	0.8000	0.45	10	TO-220AC
MBR1030	30	10	150	0.0200	0.84	20	TO-220AC
SBL1035	35	10	250	1.0000	0.60	10	TO-220AC
MBR1035	35	10	150	0.0200	0.84	20	TO-220AC
SBL1040	40	10	250	1.0000	0.60	10	TO-220AC
MBR1040	40	10	150	0.0200	0.84	20	TO-220AC
SBL1045	45	10	250	1.0000	0.60	10	TO-220AC
MBR1045	45	10	150	0.0200	0.84	20	TO-220AC
SBL1050	50	10	250	1.0000	0.75	10	TO-220AC
MBR1050	50	10	150	0.0200	0.95	20	TO-220AC
SBL1060	60	10	250	1.0000	0.75	10	TO-220AC
MBR1060	60	10	150	0.0200	0.95	20	TO-220AC
MBR1070	70	10	150	0.1000	0.85	10	TO-220AC
MBR1080	80	10	150	0.1000	0.85	10	TO-220AC
MBR1090	90	10	150	0.1000	0.85	10	TO-220AC
MBR10100	100	10	150	0.1000	0.85	10	TO-220AC
C1045DW	45	10	120	0.3000	0.54	10	DPAK
G10E100DW	100	10	250	0.0300	0.72	10	DPAK
*G10E120DW	120	10	250	0.0300	0.83	10	DPAK
<b><math>I_{FAV} = 12A</math></b>							
G12U50F4	50	12	260	0.3000	0.50	12	F4
<b><math>I_{FAV} = 15A</math></b>							
MBR1530CT	30	15	150	0.1000	0.84	15	TO-220AB
MBR1535CT	35	15	150	0.1000	0.84	15	TO-220AB
MBR1540CT	40	15	150	0.1000	0.84	15	TO-220AB
MBR1545CT	45	15	150	0.1000	0.84	15	TO-220AB
MBR1550CT	50	15	150	1.0000	0.90	15	TO-220AB
MBR1560CT	60	15	150	1.0000	0.90	15	TO-220AB
G15U50F4	50	15	260	0.3000	0.45	15	F4
G15120F4	120	15	120	0.1200	0.93	15	F4

Popular	TO-220AC	TO-220AB	ITO-220AB
Popular			
JEDEC	TO-220AC	TO-220AB	ITO-220AB
			

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 16A</math></b>							
SBL1630	30	16	275	1.00	0.57	16	TO-220AC
SBL1635	35	16	275	1.00	0.57	16	TO-220AC
SBL1640	40	16	275	1.00	0.57	16	TO-220AC
SBL1645	45	16	275	1.00	0.57	16	TO-220AC
SBL1650	50	16	275	1.00	0.75	16	TO-220AC
SBL1660	60	16	275	1.00	0.75	16	TO-220AC
MBR1630	30	16	150	0.20	0.63	16	TO-220AC
MBR1635	35	16	150	0.20	0.63	16	TO-220AC
MBR1640	40	16	150	0.20	0.63	16	TO-220AC
MBR1645	45	16	150	0.20	0.63	16	TO-220AC
MBR1650	50	16	150	1.00	0.75	16	TO-220AC
MBR1660	60	16	150	1.00	0.75	16	TO-220AC
SBL1630CT	30	16	175	0.15	0.55	8	TO-220AB
SBL1635CT	35	16	175	0.15	0.55	8	TO-220AB
SBL1640CT	40	16	175	0.15	0.55	8	TO-220AB
SBL1645CT	45	16	175	0.15	0.55	8	TO-220AB
SBL1650CT	50	16	175	0.15	0.70	8	TO-220AB
SBL1660CT	60	16	175	0.15	0.70	8	TO-220AB
MBR1670CT	70	16	125	0.10	0.85	8	TO-220AB
MBR1680CT	80	16	125	0.10	0.85	8	TO-220AB
MBR1690CT	90	16	125	0.10	0.85	8	TO-220AB
MBR16100CT	100	16	125	0.10	0.85	8	TO-220AB
SBF1630CT	30	16	175	0.50	0.55	8	ITO-220AB
SBF1635CT	35	16	175	0.50	0.55	8	ITO-220AB
SBF1640CT	40	16	175	0.50	0.55	8	ITO-220AB
SBF1645CT	45	16	175	0.50	0.55	8	ITO-220AB
SBF1650CT	50	16	175	0.10	0.70	8	ITO-220AB
SBF1660CT	60	16	175	0.10	0.70	8	ITO-220AB
MBRF16100CT	100	16	125	0.10	0.95	16	ITO-220AB

SCHOTTKY RECTIFIERS

Popular	ITO-220AB
Popular	
JEDEC	ITO-220AB
	

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	V <sub>RRM</sub>	I <sub>FAV</sub>	I <sub>FSM</sub> 8.3ms	IR at V <sub>RRM</sub> 25°C	VF at I <sub>FAV</sub> 25°C		
	V	A	A	mA	V	I <sub>FAV (A)</sub>	
<b>I<sub>FAV</sub> = 20A</b>							
SBF2030CT	30	20	225	0.40	0.55	10	ITO-220AB
MBRF2030CT	30	20	150	0.02	0.84	20	ITO-220AB
SBF2035CT	35	20	225	0.40	0.55	10	ITO-220AB
SBF2040CT	40	20	225	0.40	0.55	10	ITO-220AB
MBRF2040CT	40	20	150	0.02	0.84	20	ITO-220AB
SBF2045CT	45	20	225	0.40	0.55	10	ITO-220AB
MBRF2045CT	45	20	150	0.02	0.84	20	ITO-220AB
G2045CTFW	45	20	180	0.50	0.50	10	ITO-220AB
C2045CTFW	45	20	120	0.30	0.54	10	ITO-220AB
SBF2050CT	50	20	225	0.10	0.75	10	ITO-220AB
SBF2060CT	60	20	225	0.10	0.75	10	ITO-220AB
SBF20V60CT	60	20	200	0.10	0.60	10	ITO-220AB
MBRF2060CT	60	20	150	0.02	0.95	20	ITO-220AB
G2060CTFW	60	20	200	0.25	0.57	10	ITO-220AB
G20S60CTFW	60	20	150	0.10	0.75	10	ITO-220AB
MBRF2070CT	70	20	150	0.01	0.95	20	ITO-220AB
MBRF2090CT	90	20	150	0.10	0.95	20	ITO-220AB
MBRF20100CT	100	20	150	0.01	0.95	20	ITO-220AB
MBRF20100CTW	100	20	150	0.01	0.85	20	ITO-220AB
G20100CTFW	100	20	150	0.15	0.79	10	ITO-220AB
G20E100CTFW	100	20	250	0.03	0.72	10	ITO-220AB
G20E100CTSW	100	20	250	0.03	0.72	10	ITO-220AB(S)
G20H100CTFW	100	20	280	0.004	0.77	10	ITO-220AB
G20U100CTFW	100	20	200	0.10	0.64	10	ITO-220AB
G20C100CTFW	100	20	150	0.10	0.80	10	ITO-220AB

Popular	ITO-220AB
Popular	
JEDEC	ITO-220AB
	

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
MBRF20120CTW	120	20	120	0.70	0.90	10	ITO-220AB
G20120CTFW	120	20	120	0.15	0.84	10	ITO-220AB
G20120CTSW	120	20	250	0.15	0.84	10	ITO-220AB(S)
G20C120CTFW	120	20	130	0.03	0.98	10	ITO-220AB(S)
G20E120CTFW	120	20	250	0.03	0.83	10	ITO-220AB
G20E120CTSW	120	20	250	0.03	0.83	10	ITO-220AB(S)
**G20H120CTFW	120	20	280	0.01	0.83	10	ITO-220AB(S)
**G20H150CTFW	150	20	280	0.03	0.82	10	ITO-220AB(S)
MBRF20150CT	150	20	180	0.008	1.00	20	ITO-220AB
*MBRF20150CTW	150	20	180	0.008	0.92	20	ITO-220AB
MBRF20200CT	200	20	180	0.008	1.00	20	ITO-220AB
*MBRF20200CTW	200	20	180	0.008	0.92	20	ITO-220AB
**G20H200CTFW	200	20	180	0.02	0.84	10	ITO-220AB(S)

Popular	TO-220AB
Popular	
JEDEC	TO-220AB
	

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 20A</math></b>							
SBL2040CTW	40	20	225	0.40	0.55	10	TO-220AB
SBL2045CTW	45	20	225	0.40	0.55	10	TO-220AB
MBRH2045CT	45	20	150	0.01	0.84	20	TO-220AB
MBR2045CTW	45	20	150	0.02	0.65	10	TO-220AB
G2045CTW	45	20	180	0.50	0.50	10	TO-220AB
C2045CTW	45	20	120	0.30	0.54	10	TO-220AB
SBL2050CT	50	20	225	0.10	0.75	10	TO-220AB
SBL2060CT	60	20	225	0.10	0.75	10	TO-220AB
SBL20V60CT	60	20	200	0.10	0.6	10	TO-220AB
MBR2060CT	60	20	150	0.02	0.80	10	TO-220AB
G2060CTW	60	20	200	0.25	0.57	10	TO-220AB
G20S60CTW	60	20	150	0.10	0.75	10	TO-220AB
MBR2070CT	70	20	150	0.01	0.95	20	TO-220AB
MBR2090CT	90	20	150	0.01	0.95	20	TO-220AB
SBL20V100CT	100	20	180	0.10	0.78	10	TO-220AB
MBR20100CT	100	20	150	0.01	0.95	20	TO-220AB
MBR20H100CT	100	20	250	0.005	0.88	20	TO-220AB
MBR20100CTW	100	20	150	0.01	0.85	10	TO-220AB
G20100CTW	100	20	150	0.15	0.79	10	TO-220AB
G20E100CTW	100	20	250	0.03	0.72	10	TO-220AB
G20H100CTW	100	20	280	0.004	0.77	10	TO-220AB
G20U100CTW	100	20	200	0.10	0.64	10	TO-220AB
G20C100CTW	100	20	150	0.10	0.80	10	TO-220AB
MBR20120CTW	120	20	120	0.01	0.90	10	TO-220AB
G20120CTW	120	20	120	0.15	0.84	10	TO-220AB
G20C120CTW	120	20	120	0.03	0.98	10	TO-220AB
G20E120CTW	120	20	250	0.03	0.83	10	TO-220AB
**G20H120CTW	120	20	280	0.01	0.83	10	TO-220AB
MBR20150CT	150	20	180	0.008	1.00	20	TO-220AB
*MBR20150CTW	150	20	180	0.008	1.00	20	TO-220AB
**G20H150CTW	150	20	280	0.03	0.82	10	TO-220AB

Popular	TO-220AB
Popular	
JEDEC	TO-220AB
	

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{ESM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
**G20H200CTW	200	20	180	0.02	0.84	10	TO-220AB
MBR20200CT	200	20	180	0.008	1.00	20	TO-220AB
**MBR20200CTW	200	20	180	0.008	0.92	20	TO-220AB

Popular	F5	D2PAK	DPAK	TO-220AB
Popular	D2PAK_Flat			
JEDEC		TO-252	TO-252	TO-220AB
				

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 20A</math></b>							
G2045CF5	45	20	180	0.25	0.50	10	F5
G2060CF5	60	20	200	0.25	0.57	10	F5
G20100CF5	100	20	150	0.15	0.79	10	F5
G20120CF5	120	20	120	0.15	0.84	10	F5
*MBR20200CG	200	20	200	0.01	0.93	20	D2PAK
G20S63CDW	63	20	150	0.10	0.65	10	DPAK
*G20E100DW	100	20	250	0.03	0.83	20	DPAK
*G20E120DW	120	20	250	0.04	1.05	20	DPAK
<b><math>I_{FAV} = 25A</math></b>							
MBR2530CT	30	25	150	0.2000	0.82	30	TO-220AB

Popular	TO-220AB	ITO-220AB
Popular		
JEDEC	TO-220AB	ITO-220AB
		

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
$I_{FAV} = 30A$							
SBL3030CT	30	30	250	0.500	0.55	15	TO-220AB
MBR2535CT	35	30	150	0.200	0.82	30	TO-220AB
SBL3040CT	40	30	250	0.500	0.55	15	TO-220AB
MBR2540CT	40	30	150	0.200	0.82	30	TO-220AB
SBL3045CT	45	30	250	0.500	0.55	15	TO-220AB
MBR2545CT	45	30	150	1.000	0.75	15	TO-220AB
MBRH3045CT	45	30	200	0.010	0.7	15	TO-220AB
MBR3045CTW	45	30	200	0.020	0.7	15	TO-220AB
G3045CTW	45	30	250	0.500	0.52	15	TO-220AB
SBL3050CT	50	30	250	1.000	0.70	15	TO-220AB
MBR2550CT	50	30	150	1.000	0.65	15	TO-220AB
SBL3060CT	60	30	250	1.000	0.70	15	TO-220AB
MBR2560CT	60	30	150	1.000	0.75	15	TO-220AB
G3060CTW	60	30	250	0.500	0.58	15	TO-220AB
SBL30V100CT	100	30	250	0.200	0.79	15	TO-220AB
MBR30100CT	100	30	250	0.100	0.80	15	TO-220AB
MBR30100CTW	100	30	250	0.100	0.80	15	TO-220AB
MBR30H100CT	100	30	250	0.005	0.80	15	TO-220AB
G30100CTW	100	30	160	0.240	0.79	15	TO-220AB
G30C100CTW	100	30	250	0.030	0.81	15	TO-220AB
G30E100CTW	100	30	250	0.030	0.77	15	TO-220AB
**G30H100CTW	100	30	280	0.010	0.79	15	TO-220AB
MBR30120CTW	120	30	250	0.010	0.90	15	TO-220AB
G30120CTW	120	30	150	0.240	0.93	15	TO-220AB
G30C120CTW	120	30	200	0.035	0.97	15	TO-220AB
G30E120CTW	120	30	270	0.040	0.91	15	TO-220AB
**G30H120CTW	120	30	280	0.010	0.84	15	TO-220AB
*MBR30150CTW	150	30	180	0.070	0.93	15	TO-220AB
**G30H150CTW	150	30	250	0.090	0.87	15	TO-220AB
G3045CTFW	45	30	250	0.500	0.52	15	ITO-220AB
G3060CTFW	60	30	250	0.500	0.58	15	ITO-220AB
G30100CTFW	100	30	160	0.240	0.79	15	ITO-220AB

Popular	TO-220AB	ITO-220AB
Popular		
JEDEC	TO-220AB	ITO-220AB
		

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
G30C100CTFW	100	30	250	0.030	0.81	15	ITO-220AB
G30E100CTFW	100	30	250	0.030	0.77	15	ITO-220AB
G30E100CTSW	100	30	250	0.030	0.77	15	ITO-220AB(S)
**G30H100CTFW	100	30	280	0.010	0.79	15	ITO-220AB(S)
MBRF30100CT	100	30	250	0.100	0.80	15	ITO-220AB
MBRF30100CTW	100	30	250	0.100	0.80	15	ITO-220AB
MBRF30120CTW	120	30	250	0.010	0.90	15	ITO-220AB
G30120CTFW	120	30	150	0.240	0.93	15	ITO-220AB
G30C120CTFW	120	30	200	0.035	0.97	15	ITO-220AB
G30E120CTFW	120	30	270	0.040	0.91	15	ITO-220AB
G30E120CTSW	120	30	270	0.040	0.91	15	ITO-220AB(S)
**G30H120CTFW	120	30	280	0.010	0.84	15	ITO-220AB
*MBRF30100CTW	150	30	250	0.100	0.80	15	ITO-220AB
**G30H150CTFW	150	30	250	0.090	0.87	15	ITO-220AB

Popular	TO-247	F5
Popular		D2PAK_Flat
JEDEC	TO-247	
		

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 30A</math></b>							
MBR3045PTW	45	30	200	1.00		15	TO-247
SBL3060PTW	60	30	275	0.20	0.70	15	TO-247
MBR30100PTW	100	30	250	0.10	0.80	15	TO-247
G3045CF5	45	30	250	0.50	0.52	15	F5
G3060CF5	60	30	250	0.50	0.58	15	F5
G30100CF5	100	30	160	0.24	0.79	15	F5
G30120CF5	120	30	150	0.24	0.98	15	F5

Popular	TO-220AB	ITO-220AB	TO-247	F5
Popular				D2PAK_Flat
JEDEC	TO-220AB	ITO-220AB	TO-247	
				

\* New Product  
 \*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
<b><math>I_{FAV} = 40A</math></b>							
SBL40V100CT	100	40	280	0.20	0.84	20	TO-220AB
G40100CTW	100	40	250	0.40	0.73	20	TO-220AB
G40C100CTW	100	40	250	0.03	0.84	20	TO-220AB
G40E100CTW	100	40	300	0.10	0.71	20	TO-220AB
**G40H100CTW	100	40	250	0.01	0.79	20	TO-220AB
G40120CTW	120	40	250	0.40	0.86	20	TO-220AB
G40C120CTW	120	40	250	0.05	0.98	20	TO-220AB
G40E120CTW	120	40	300	0.06	0.82	20	TO-220AB
G40100CTFW	100	40	250	0.40	0.73	20	ITO-220AB
G40C100CTFW	100	40	250	0.03	0.84	20	ITO-220AB
G40E100CTFW	100	40	300	0.10	0.71	20	ITO-220AB
G40E100CTSW	100	40	300	0.10	0.71	20	ITO-220AB(S)
**G40H100CTFW	100	40	250	0.01	0.79	20	ITO-220AB
G40120CTFW	120	40	250	0.40	0.86	20	ITO-220AB
G40C120CTFW	120	40	250	0.05	0.98	20	ITO-220AB
G40E120CTFW	120	40	300	0.06	0.82	20	ITO-220AB
G40E120CTSW	120	40	300	0.06	0.82	20	ITO-220AB(S)
SBL4045PTW	45	40	375	0.50	0.58	20	TO-247
MBR4045PTW	45	40	400	0.10	0.70	20	TO-247
SBL4060PTW	60	40	375	0.20	0.70	20	TO-247
MBR4060PTW	60	40	400	0.10	0.8	20	TO-247
G40100CF5	100	40	250	0.40	0.73	20	F5
G40E100CF5	100	40	300	0.10	0.71	20	F5
G40120CF5	120	40	250	0.40	0.86	20	F5

Popular	TO-247
Popular	
JEDEC	TO-247
	

\* New Product  
\*\* Future Product

Part Number	Electrical Characteristics						Package
	$V_{RRM}$	$I_{FAV}$	$I_{FSM}$ 8.3ms	IR at $V_{RRM}$ 25°C	VF at $I_{FAV}$ 25°C		
	V	A	A	mA	V	$I_{FAV(A)}$	
$I_{FAV} = 60A$							
SBL6040PTW	40	60	450	10.00	0.55	30	TO-247
MBR6045PTW	45	60	400	1.00	0.62	30	TO-247
SBL6060PTW	60	60	450	10.00	0.70	30	TO-247
MBR6060PTW	60	60	400	1.00	0.72	30	TO-247



## FAST RECOVERY RECTIFIERS

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## Fast Recovery Rectifiers(快速恢復整流器)

整流二極管因單邊導通特性，所以被用在把交流電轉為直流電的線路上。當整流二極管順向電流停止時，將會產生一短暫時間的逆向電流，從順向電流停止到逆向電流降為零的這段時間稱為逆向回覆時間，逆向回覆時間 快速恢復整流器大約100ns 以上。



Part Number	Electrical Characteristics								Package
	VR =V <sub>R<sub>RRM</sub></sub>	I <sub>FAV</sub>	I <sub>FSM</sub>	IR at VR=V <sub>RRM</sub> T <sub>J</sub>		V <sub>Fmax</sub> at IF		T <sub>rr</sub> (max) @RG1 CKT	
	V	A	A	25 °C uA	100 °C uA	V	A	nS	
<b>Surface Mount Rectifiers (Glass Passivated)</b>									
RS1JN	600	1.0	30	5	200 1)	1.3	1	250	SMA
RS1MN	1000	1.0	30	5	200 1)	1.3	1	500	SMA
RS1D	200	1.0	30	5	200 1)	1.3	1	150	SMA
RS1G	400	1.0	30	5	200 1)	1.3	1	150	SMA
RS1J	600	1.0	30	5	200 1)	1.3	1	250	SMA
RS1K	800	1.0	30	5	200 1)	1.3	1	500	SMA
RS1J	600	1.0	30	5	200 1)	1.3	1	250	SMA
FRS1JD	600	1.0	30	5	200 1)	1.3	1	250	SMA Flat
FRS1MD	1000	1.0	30	5	200 1)	1.3	1	500	SMA Flat
FRS1JE	600	1.0	30	5	200 1)	1.3	1	250	DO-219
FRS1ME	1000	1.0	30	5	200 1)	1.3	1	500	DO-219
RS1DB	200	1.0	30	5	200 1)	1.3	1	150	SMB
RS1GB	400	1.0	30	5	200 1)	1.3	1	150	SMB
RS1JB	600	1.0	30	5	200 1)	1.3	1	250	SMB
RS1KB	800	1.0	30	5	200 1)	1.3	1	500	SMB
RS1MB	1000	1.0	30	5	200 1)	1.3	1	500	SMB
RS2D	200	1.5	50	5	200 1)	1.3	1.5	150	SMB
RS2G	400	1.5	50	5	200 1)	1.3	1.5	150	SMB
RS2J	600	1.5	50	5	200 1)	1.3	1.5	250	SMB
RS2K	800	1.5	50	5	200 1)	1.3	1.5	500	SMB
RS2M	1000	1.5	50	5	200 1)	1.3	1.5	500	SMB
FRS2DD	200	1.5	50	5	200 1)	1.3	1.5	150	SMA Flat
FRS2GD	400	1.5	50	5	200 1)	1.3	1.5	150	SMA Flat
FRS2JD	600	1.5	50	5	200 1)	1.3	1.5	250	SMA Flat
FRS2MD	1000	1.5	50	5	200 1)	1.3	1.5	500	SMA Flat
RS2DA	200	1.5	30	5	200 1)	1.3	1.5	150	SMA
RS2GA	400	1.5	50	5	200 1)	1.3	1.5	150	SMA
RS2JA	600	1.5	50	5	200 1)	1.3	1.5	250	SMA

1) T<sub>J</sub>=125 °C    2) T<sub>J</sub>=150°C



DO-222AA



DO-221AC



SMA



SMB



SMC

**Fast Recovery Rectifiers (continued)**

Part Number	Electrical Characteristics								Package
	VR =VRRM	IFAV	IFSM	IR at VR=VRRM TJ		VFmax at IF		Trr (max) @RG1 CKT	
	V	A	A	25 °C µA	100 °C µA	V	A	nS	
<b>Surface Mount Rectifiers (Glass Passivated)</b>									
RS2KA	800	1.5	50	5	200 1)	1.3	1.5	500	SMA
RS2MA	1000	1.5	50	5	200 1)	1.3	1.5	500	SMA
RS3D	200	3.0	100	5	250 1)	1.3	3	150	SMC
RS3G	400	3.0	100	5	250 1)	1.3	3	150	SMC
RS3J	600	3.0	100	5	250 1)	1.3	3	250	SMC
RS3K	800	3.0	100	5	250 1)	1.3	3	500	SMC
RS3M	1000	3.0	100	5	250 1)	1.3	3	500	SMC
RS3DB	200	3.0	100	5	250 1)	1.3	3	150	SMB
RS3GB	400	3.0	100	5	250 1)	1.3	3	150	SMB
RS3JB	600	3.0	100	5	250 1)	1.3	3	250	SMB
RS3KB	800	3.0	100	5	250 1)	1.3	3	500	SMB
RS3MB	1000	3.0	100	5	250 1)	1.3	3	500	SMB
FRS3MB	1000	3.0	100	5	250 1)	1.3	3	250	DO-221AA
RS3MBR	1000	3.0	100	5	250 1)	1.3	3	250	SMB

1) TJ=125 °C

2) TJ=150 °C



DO-41



DO-15



DO-201AD

## Fast Recovery Rectifiers (continued)

Part Number	Electrical Characteristics								Package
	VR =V <sub>RRM</sub>	I <sub>FAV</sub>	I <sub>FSM</sub>	IR at VR=V <sub>RRM</sub> T <sub>J</sub>		V <sub>Fmax</sub> at IF		T <sub>rr</sub> (max) @RG1 CKT	
	V	A	A	25 °C uA	100 °C uA	V	A	nS	
<b>Leaded Rectifiers - Glass Passivated</b>									
1N4936G	400	1.0	30	5	50	1.3	1	130	DO-41
1N4937G	600	1.0	30	5	50	1.3	1	130	DO-41
PR1003G	200	1.0	30	5	50	1.3	1	150	DO-41
PR1004G	400	1.0	30	5	50	1.3	1	150	DO-41
PR1005G	600	1.0	30	5	50	1.3	1	250	DO-41
PR1006G	800	1.0	30	5	50	1.3	1	500	DO-41
PR1007G	1000	1.0	30	5	50	1.3	1	500	DO-41
PR1006R	800	1.0	30	5	50	1.3	1	300	DO-41
PR1007R	1000	1.0	30	5	50	1.3	1	300	DO-41
PR1504G	400	1.5	50	5	100 <sup>1)</sup>	1.3	1.5	150	DO-15
PR1505G	600	1.5	50	5	100 <sup>1)</sup>	1.3	1.5	250	DO-15
PR1506G	800	1.5	50	5	100 <sup>1)</sup>	1.3	1.5	500	DO-15
PR1507G	1000	1.5	50	5	100 <sup>1)</sup>	1.3	1.5	500	DO-15
PR2003G	200	2.0	80	5	100 <sup>1)</sup>	1.3	2	150	DO-15
PR2004G	400	2.0	80	5	100 <sup>1)</sup>	1.3	2	150	DO-15
PR2005G	600	2.0	80	5	100 <sup>1)</sup>	1.3	2	250	DO-15
PR2006G	800	2.0	80	5	100 <sup>1)</sup>	1.3	2	500	DO-15
PR2007G	1000	2.0	80	5	100 <sup>1)</sup>	1.3	2	500	DO-15
PR3003G	200	3.0	125	5	100 <sup>1)</sup>	1.3	3	150	DO-201AD
PR3004G	400	3.0	125	5	100 <sup>1)</sup>	1.3	3	150	DO-201AD
PR3005G	600	3.0	125	5	100 <sup>1)</sup>	1.3	3	250	DO-201AD
PR3006G	800	3.0	125	5	100 <sup>1)</sup>	1.3	3	500	DO-201AD
PR3007G	1000	3.0	125	5	100 <sup>1)</sup>	1.3	3	500	DO-201AD

1) T<sub>J</sub>=125 °C

2) T<sub>J</sub>=150 °C



## **SUPER FAST & ULTRA RECOVERY RECTIFIERS**

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## Super Fast & Ultra Fast Recovery Rectifiers

整流二極管因單邊導通特性，所以被用在把交流電轉為直流電的線路上。當整流二極管順向電流停止時，將會產生一短暫時間的逆向電流，從順向電流停止到逆向電流降為零的這段時間稱為逆向回覆時間，依逆向回覆時間 高效整流器二極體大約50~100 ns、超快速整流器二極體大約50ns 以下。高效整流器二極體&超快速整流器二極體提供降低功耗和最小的反向恢復特性。



DO-221AC



SMA



SMB



SMC

Part Number	Electrical Characteristics								Package
	VR =VRRM	IFAV	IFSM	IR at VR=VRRM Tj)		V <sub>Fmax</sub> at IF		T <sub>rr</sub> (max) @RG1 CKT	
	V	A	A	uA	uA	V	A	nS	
<b>Surface Mount Rectifiers (Glass Passivated)</b>									
US1DN	200	1.0	30	5	50	1.0	1	50	SMA
US1GN	400	1.0	30	5	100	1.3	1	50	SMA
US1JN	600	1.0	30	5	100	1.7	1	75	SMA
US1MN	1000	1.0	30	5	200	1.7	1	75	SMA
US1D	200	1.0	30	5	100	1.0	1	50	SMA
US1G	400	1.0	30	5	100	1.3	1	50	SMA
US1J	600	1.0	30	5	100	1.7	1	75	SMA
US1K	800	1.0	30	5	100	1.7	1	75	SMA
US1M	1000	1.0	30	5	100	1.7	1	75	SMA
ES1DN	200	1.0	30	5	200 <sup>1)</sup>	0.95	1	35	SMA
ES1GN	400	1.0	30	5	200 <sup>1)</sup>	1.3	1	35	SMA
ES1JN	600	1.0	30	5	200 <sup>1)</sup>	1.7	1	35	SMA
ES1D	200	1.0	30	5	200 <sup>1)</sup>	0.92	1	25	SMA
ES1G	400	1.0	30	5	200 <sup>1)</sup>	1.25	1	25	SMA
ES1J	600	1.0	30	5	200 <sup>1)</sup>	1.3	1	35	SMA
US2D	200	2.0	50	5	100 <sup>1)</sup>	1.0	2	50	SMB
US2G	400	2.0	50	5	100 <sup>1)</sup>	1.3	2	50	SMB
US2J	600	2.0	50	5	100 <sup>1)</sup>	1.7	2	75	SMB
US2K	800	2.0	50	5	100 <sup>1)</sup>	1.7	2	75	SMB
US2M	1000	2.0	50	5	100 <sup>1)</sup>	1.7	2	75	SMB
ES2D	200	2.0	50	5	350 <sup>1)</sup>	0.92	2	25	SMB
ES2G	400	2.0	50	5	350 <sup>1)</sup>	1.25	2	25	SMB
ES2J	600	2.0	50	5	350 <sup>1)</sup>	1.3	2	35	SMB
ES2DA	200	2.0	50	5	350 <sup>1)</sup>	0.92	2	25	SMA
ES2GA	400	2.0	50	5	350 <sup>1)</sup>	1.25	2	25	SMA
ES2JA	600	2.0	50	5	350 <sup>1)</sup>	1.3	2	35	SMA
ES3D	200	3.0	100	10	500 <sup>1)</sup>	0.92	3	25	SMC
ES3G	400	3.0	100	10	500 <sup>1)</sup>	1.25	3	25	SMC
ES3J	600	3.0	100	10	500 <sup>1)</sup>	1.3	3	35	SMC

1) Tj=125 °C

2) Tj=150 °C



DO-221AC



SMA



SMB



SMC

**Super-Fast & Ultra-Fast Recovery Rectifiers**

Part Number	Electrical Characteristics								Package
	VR =V <sub>R<sub>RM</sub></sub>	I <sub>FAV</sub>	I <sub>FSM</sub>	IR at VR=V <sub>RRM</sub> T <sub>J</sub>		V <sub>Fmax</sub> at IF		T <sub>rr</sub> (max) @RG1 CKT	
	V	A	A	25 °C	100 °C	V	A	nS	
<b>Surface Mount Rectifiers (Glass Passivated)</b>									
FUS1DD	200	1.0	30	5	100	1.0	1	50	SMA Flat
FUS1JD	600	1.0	30	5	100	1.7	1	75	SMA Flat
FUS1MD	1000	1.0	30	5	100	1.7	1	75	SMA Flat
FES1DD	200	1.0	30	5	200 1)	0.92	1	25	SMA Flat
FES1JD	600	1.0	30	5	200 1)	1.3	1	35	SMA Flat
FES2DD	200	2.0	50	5	350 1)	0.92	2	25	SMA Flat
FES2GD	400	2.0	50	5	350 1)	1.25	2	25	SMA Flat
FES2JD	600	2.0	50	5	350 1)	1.3	2	35	SMA Flat
FUS2DD	200	2.0	50	5	100 1)	1	2	50	SMA Flat
FUS2GD	400	2.0	50	5	100 1)	1.3	2	50	SMA Flat
FUS2JD	600	2.0	50	5	100 1)	1.7	2	75	SMA Flat
FUS2MD	1000	2.0	50	5	100 1)	1.7	2	75	SMA Flat
FES2DE	200	2.0	50	5	350 1)	0.92	2	25	DO-219
FES2GE	400	2.0	50	5	350 1)	1.25	2	25	DO-219
FES2JE	600	2.0	50	5	350 1)	1.3	2	35	DO-219
ES3DB	200	3.0	100	10	500 1)	0.92	3	25	SMB
ES3GB	400	3.0	100	10	500 1)	1.25	3	25	SMB
ES3JB	600	3.0	100	10	500 1)	1.3	3	35	SMB
MURS120	200	1.0	40	2	50 2)	0.875	1	25	SMB
MURS140	400	1.0	35	5	150 2)	1.25	1	50	SMB
MURS160	600	1.0	35	5	150 2)	1.25	1	50	SMB
MURS360B	600	3.0	100	3	150 2)	1.25	3	50	SMB
MURS320	200	3.0	75	5	100 2)	0.875	3	25	SMC
MURS360	600	3.0	100	3	150 2)	1.25	3	50	SMC
MURS460C	600	4.0	110	3	250 2)	1.25	4	50	SMC
MURS4100	1000	4.0	70	25	900 2)	1.85	4	75	SMC

1) T<sub>J</sub>=125 °C      2) T<sub>J</sub>=150 °C

SUPER FAST & ULTRA RECOVERY RECTIFIERS



DO-41



DO-15



DO-201

**Super-Fast & Ultra-Fast Recovery Rectifiers (continued)**

Part Number	Electrical Characteristics								Package
	VR =VRRM	I <sub>FAV</sub>	I <sub>FSM</sub>	IR at VR=VRRM T <sub>J</sub>		V <sub>Fmax</sub> at IF		T <sub>rr</sub> (max) @RG1 CKT	
	V	A	A	25 °C	100 °C	V	A	nS	
<b>Leaded Rectifiers - Glass Passivated</b>									
UG1003	200	1.0	30	5	100	1	1	50	DO-41
UG1004	400	1.0	30	5	100	1.3	1	50	DO-41
UG1005	600	1.0	30	5	100	1.7	1	75	DO-41
UG1006	800	1.0	30	5	100	1.7	1	75	DO-41
UG1007	1000	1.0	30	5	100	1.7	1	75	DO-41
SF10DG	200	1.0	30	5	100	0.95	1	35	DO-41
SF10GG	400	1.0	30	5	100	1.25	1	40	DO-41
SF10JG	600	1.0	30	5	100	1.3	1	50	DO-41
MUR120	200	1.0	35	2	50 <sup>2)</sup>	0.875	1	25	DO-41
MUR140	400	1.0	35	5	150 <sup>2)</sup>	1.25	1	50	DO-41
MUR160	600	1.0	35	5	150 <sup>2)</sup>	1.25	1	50	DO-41
UG2003	200	2.0	60	5	100	1	2	50	DO-15
UG2004	400	2.0	60	5	100	1.3	2	50	DO-15
UG2005	600	2.0	60	5	100	1.7	2	75	DO-15
UG2006	800	2.0	60	5	100	1.7	2	75	DO-15
UG2007	1000	2.0	60	5	100	1.7	2	75	DO-15
SF20DG	200	2.0	60	5	100	0.95	2	35	DO-15
SF20GG	400	2.0	60	5	100	1.25	2	40	DO-15
SF20JG	600	2.0	60	5	100	1.3	2	50	DO-15
UG5402	200	3.0	125	5	100	1.0	3.0	50	DO-201

1) T<sub>J</sub>=125 °C

2) T<sub>J</sub>=150 °C



DO-201AD

TO-220AC

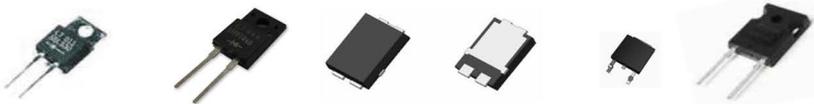
ITO-220AC

F5

## Super-Fast & Ultra-Fast Recovery Rectifiers (continued)

Part Number	Electrical Characteristics								Package
	VR =V <sub>RRM</sub>	I <sub>FAV</sub>	I <sub>FSM</sub>	IR at VR=V <sub>RRM</sub> T <sub>J</sub> )		V <sub>Fmax</sub> at IF		T <sub>rr</sub> (max) @RG1 CKT	
	V	A	A	25 °C	100 °C	V	A	nS	
<b>Glass Passivated</b>									
UG3003	200	3.0	125	5	100	1.0	3	50	DO-201AD
UG3004	400	3.0	125	5	100	1.3	3	50	DO-201AD
UG3005	600	3.0	125	5	100	1.7	3	75	DO-201AD
UG3006	800	3.0	125	5	100	1.7	3	75	DO-201AD
UG3007	1000	3.0	125	5	100	1.7	3	75	DO-201AD
SF30DG	200	3.0	125	5	100	0.95	3	35	DO-201AD
SF30GG	400	3.0	125	5	100	1.25	3	40	DO-201AD
SF30JG	600	3.0	125	5	100	1.3	3	50	DO-201AD
SF40DG	200	4.0	150	5	100	0.95	4	35	DO-201AD
SF40GG	400	4.0	150	5	100	1.25	4	40	DO-201AD
SF40JG	600	4.0	150	5	100	1.3	4	50	DO-201AD
MUR460	600	4.0	110	10	250 <sub>2)</sub>	1.28	4	50	DO-201AD
MUR460D	600	4.0	110	10	250 <sub>2)</sub>	1.28	4	50	DO-201AD
SF50DG	200	5.0	150	5	300	0.95	5	35	DO-201AD
SF50GG	400	5.0	150	5	300	1.25	5	40	DO-201AD
SF50JG	600	5.0	150	5	300	1.3	5	50	DO-201AD
STPR506D	600	5.0	60	50	2000 <sub>1)</sub>	1.75	5	25	TO-220AC
STPR520D	200	5.0	55	10	500 <sub>1)</sub>	1.1	5	30	TO-220AC
STPR540D	400	5.0	55	10	500 <sub>1)</sub>	1.3	5	35	TO-220AC
STPR560D	600	5.0	55	10	500 <sub>1)</sub>	1.5	5	50	TO-220AC
STPF520D	200	5.0	55	10	500 <sub>1)</sub>	1.1	5	30	ITO-220AC
STPR620D	200	6.0	60	10	500 <sub>1)</sub>	1.1	6	30	TO-220AC
STPR640D	400	6.0	60	10	500 <sub>1)</sub>	1.3	6	35	TO-220AC
STPR660D	600	6.0	60	10	500 <sub>1)</sub>	1.5	6	50	TO-220AC
STPR820D	200	8.0	90	10	1000 <sub>1)</sub>	1.1	8	30	TO-220AC
STPR840D	400	8.0	90	10	1000 <sub>1)</sub>	1.3	8	35	TO-220AC
STPR860D	600	8.0	90	10	1000 <sub>1)</sub>	1.5	8	50	TO-220AC
STPF820D	200	8.0	90	10	500 <sub>1)</sub>	1.1	8	30	ITO-220AC
ES640CF5	400	6	125	5	100	1.25	3	40	F5

1) T<sub>J</sub>=125 °C2) T<sub>J</sub>=150 °C



TO-220AC

I TO-220AC

F5

DPAK

TO247

## Super-Fast & Ultra-Fast Recovery Rectifiers (continued)

Part Number	Electrical Characteristics								Package
	VR	I <sub>FAV</sub>	I <sub>FSM</sub>	IR at VR=VRRM T <sub>J</sub>		V <sub>Fmax</sub> at IF		T <sub>rr</sub> (max)	
	=V <sub>R</sub> RM	A	A	25 °C	150 °C	V	A	@RG1 CKT	
	V	A	A	uA	uA	V	A	nS	
<b>Glass Passivated</b>									
LTTTH806SDW	600	8.0	70	15	200 <sup>1)</sup>	3.4	8	18	TO-220AC
LTTTH806RW	600	8.0	80	30	400 <sup>1)</sup>	2.9	8	25	TO-220AC
LTTTH806EW	600	8.0	125	30	400 <sup>1)</sup>	2.9	8	25	TO-220AC
LTTTH806SDFW	600	8.0	70	15	200 <sup>1)</sup>	3.4	8	18	ITO-220AC
LTTTH806RFW	600	8.0	80	30	400 <sup>1)</sup>	2.9	8	25	ITO-220AC
LTTTH806EFW	600	8.0	125	30	400 <sup>1)</sup>	2.9	8	25	ITO-220AC
LTTTH806LW	600	8.0	120	8	200 <sup>2)</sup>	1.30	8	70	TO-220AC
LTTTH806LFW	600	8.0	120	8	200 <sup>2)</sup>	1.30	8	70	ITO-220AC
LTTTH806RDW	600	8.0	80	30	400 <sup>1)</sup>	2.9	8	25	DPAK
LTTTH1006LW	600	10.0	120	8	200 <sup>2)</sup>	1.30	8	70	TO-220AC
LTTTH1006LFW	600	10.0	120	8	200 <sup>2)</sup>	1.30	8	70	ITO-220AC
LTTTH1006LDW	600	10.0	120	8	200 <sup>2)</sup>	1.30	8	70	DPAK
LTTTH806RF5	600	8.0	80	30	400 <sup>1)</sup>	2.9	8	25	F5
LTTTH806LDW	600	8.0	120	8	200 <sup>2)</sup>	1.30	8	70	DPAK
LTTTH1206DW	600	12.0	120	45	600 <sup>1)</sup>	2.90	12	25	TO-220AC
LTTTH1206DFW	600	12.0	120	45	600 <sup>1)</sup>	2.90	12	25	ITO-220AC
LTTTH1506D	600	15.0	120	60	800 <sup>1)</sup>	2.90	15	30	TO-220AC
LTTTH1506DF	600	15.0	120	60	800 <sup>1)</sup>	2.90	15	30	ITO-220AC
LTTTH810DW	1000	8.0	80	5	20 <sup>2)</sup>	2.00	8	80	TO-220AC
LTTTH810DFW	1000	8.0	80	5	20 <sup>2)</sup>	2.00	8	80	ITO-220AC
LTTTH3060PW	600	30.0	390	10	500 <sup>2)</sup>	2.40	30	45	TO247
LTTTH806AW	600	8.0	80	10	100 <sup>2)</sup>	2.30	8	25	TO-220AC
LTTTH1006AW	600	10.0	110	10	100 <sup>2)</sup>	2.30	10	25	TO-220AC
LTTTH1506AW	600	15.0	150	10	100 <sup>2)</sup>	2.30	15	25	TO-220AC
LTTTH806AFW	600	8.0	80	10	100 <sup>2)</sup>	2.30	8	25	ITO-220AC
LTTTH1006AFW	600	10.0	110	10	100 <sup>2)</sup>	2.30	10	25	ITO-220AC
LTTTH1506AFW	600	15.0	150	10	100 <sup>2)</sup>	2.30	15	25	ITO-220AC
*LTTTH812W	1200	8.0	80	8	50 <sup>2)</sup>	2.00	8	100	TO-220AC
*LTTTH812FW	1200	8.0	80	8	50 <sup>2)</sup>	2.00	8	100	ITO-220AC
*LTTTH8065PW	650	60.0	400	100	500 <sup>2)</sup>	2.40	60	60	TO247
*LTTTH3060W	600	30.0	390	10	500 <sup>2)</sup>	2.40	30	45	TO-220AC
*LTTTH3060FW	600	30.0	390	10	500 <sup>2)</sup>	2.40	30	45	ITO-220AC

\* Under development

1) T<sub>J</sub>=125 °C 2) T<sub>J</sub>=150 °C



TO-220AC



TO-220AB



I TO-220AC



I TO-220AB

**Super-Fast & Ultra-Fast Recovery Rectifiers (continued)**

Part Number	Electrical Characteristics								Package
	VR =VRRM	I <sub>FAV</sub>	I <sub>FSM</sub>	IR at VR=VRRM T <sub>J</sub>		V <sub>Fmax</sub> at IF		T <sub>rr</sub> (max) @RG1 CKT	
	V	A	A	25 °C µA	100 °C µA	V	A	nS	
<b>Glass Passivated</b>									
STPF860D	600	8	90	10	1000 <sub>1)</sub>	1.5	8	50	ITO-220AC
STPR1020D	200	10.0	125	10	1000 <sub>1)</sub>	1.1	10	30	TO-220AC
STPR1040D	400	10.0	125	10	1000 <sub>1)</sub>	1.3	10	35	TO-220AC
STPR1060D	600	10.0	125	10	1000 <sub>1)</sub>	1.5	10	50	TO-220AC
STPF1020D	200	10.0	125	10	500	1.1	10	30	ITO-220AC
STPR1020CTW	200	10.0	80	10	250	1.25	10	30	TO-220AB
STPR1040CTW	400	10.0	80	10	250	1.50	10	35	TO-220AB
STPR1020CT	200	10.0	55	10	250	1.25	10	30	TO-220AB
STPR1040CT	400	10.0	55	10	250	1.50	10	35	TO-220AB
STPR1060CT	600	10.0	55	10	250	1.70	10	50	TO-220AB
STPF1020CT	200	10.0	55	10	250	1.25	10	30	ITO-220AB
STPF1060CT	600	10.0	130	10	250	1.70	10	50	ITO-220AB
STPR1220CTW	200	12.0	90	10	250	1.25	12	30	TO-220AB
STPR1240CTW	400	12.0	90	10	250	1.50	12	35	TO-220AB
STPR1220CT	200	12.0	60	10	250	1.25	12	30	TO-220AB
STPR1240CT	400	12.0	60	10	250	1.50	12	35	TO-220AB
STPR1260CT	600	12.0	60	10	250	1.70	12	50	TO-220AB
STPR1620CTW	200	16.0	90	10	500	1.25	16	30	TO-220AB
STPR1620CT	200	16.0	90	10	500	1.25	16	30	TO-220AB
STPR1640CT	400	16.0	90	10	500	1.50	16	35	TO-220AB
STPR1660CT	600	16.0	90	10	500	1.70	16	50	TO-220AB
STPF1620CT	200	16.0	90	10	500	1.25	16	30	ITO-220AB
STPF1660CT	600	16.0	90	10	500	1.70	16	50	ITO-220AB
STPR2020CTW	200	20.0	125	10	500	1.25	20	30	TO-220AB
STPR2020CT	200	20.0	125	10	500	1.25	20	30	TO-220AB
STPR2040CT	400	20.0	125	10	500	1.50	20	35	TO-220AB
STPR2060CT	600	20.0	125	10	500	1.70	20	50	TO-220AB
STPF2020CT	200	20.0	125	10	500 <sub>1)</sub>	1.25	20	30	ITO-220AB

1) T<sub>J</sub>=125 °C    2) T<sub>J</sub>=150 °C



I TO-220AB



I TO-220AB



R6

**Super-Fast & Ultra-Fast Recovery Rectifiers (continued)**

Part Number	Electrical Characteristics								Package
	VR =VRRM	IFAV	IFSM	IR at VR=VRRM TJ		VFmax at IF		Trr (max) @RG1 CKT	
	V	A	A	25 °C µA	150 °C µA	V	A	nS	
<b>Glass Passivated</b>									
STPR1640CTW	400	16.0	90	10	500	1.50	16	35	TO-220AB
STPR1660CTW	600	16.0	90	10	500	1.70	16	50	TO-220AB
STPR2020CTW	200	20.0	125	10	500	1.25	20	30	TO-220AB
STPR2040CTW	400	20.0	125	10	500	1.50	20	35	TO-220AB
STPR2060CTW	600	20.0	125	10	500	1.70	20	50	TO-220AB
STPR1620CTSW	200	16.0	90	10	500	1.25	16	30	ITO-220AB
STPR1640CTSW	400	16.0	90	10	500	1.50	16	35	ITO-220AB
STPR1660CTSW	600	16.0	90	10	500	1.70	16	50	ITO-220AB
STPR2020CTSW	200	20.0	125	10	500	1.25	20	30	ITO-220AB
STPR2040CTSW	400	20.0	125	10	500	1.50	20	35	ITO-220AB
STPR2060CTSW	600	20.0	125	10	500	1.70	20	50	ITO-220AB
*F1200DE	150	12.0	390	5	100	0.95	12	300	R6

\* Under development

SUPER FAST & ULTRA RECOVERY RECTIFIERS



# SILICON CARBIDE SCHOTTKY BARRIER DIODE

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ABS

M2

TT

KEP

TO-220AC

I TO-220AC

DPAK

## Silicon Carbide Schottky Barrier Diode

Part Number	Electrical Characteristics								Package
	VR =VRRM	IFAV	IFSM	IR at VR=VRRM (Tj)		VFmax at IF		Trr (max) @RG1 CKT	
	V	A	A	25 °C µA	175 °C µA	V	A	nS	
RABS20M	1000	2	60	1	200	1.3	2	250	ABS
MRS30M	1000	3	100	5	100	1.3	3	250	M2
RKBP410	1000	4	100	5	200	1.3	4	250	KBP
*RTT410	1000	4	100	5	200	1.3	4	250	TT
LSC02120DW	1200	2.0	24	128	200	1.40	2.0	11	DPAK
LSC05120DW	1200	5.0	60	190	500	1.60	5.0	20	DPAK
*LSC10120DW	1200	10.0	120	640	1000	1.60	10.0	51	DPAK
LSC02120W	1200	2.0	24	128	200	1.40	2.0	11	TO-220AC
LSC05120W	1200	5.0	60	190	500	1.60	5.0	20	TO-220AC
*LSC10120W	1200	10.0	120	640	1000	1.60	10.0	51	TO-220AC
LSC02120FW	1200	2.0	24	128	200	1.40	2.0	11	ITO-220AC
LSC05120FW	1200	5.0	60	190	500	1.60	5.0	20	ITO-220AC
*LSC10120FW	1200	10.0	120	640	1000	1.60	10.0	51	ITO-220AC
LSC04065W	650	4.0	28	170	550	1.70	4.0	14	TO-220AC
LSC06065W	650	6.0	36	200	640	1.70	6.0	16	TO-220AC
LSC08065W	650	8.0	48	230	700	1.70	8.0	17	TO-220AC
LSC10065W	650	10.0	60	250	800	1.70	10.0	23	TO-220AC
LSC04065Q8	650	4.0	28	170	550	1.70	4.0	14	DFN8*8
LSC06065Q8	650	6.0	36	200	640	1.70	6.0	16	DFN8*8
LSC08065Q8	650	8.0	48	230	700	1.70	8.0	16	DFN8*8
LSC10065Q8	650	10.0	60	250	800	1.70	10.0	23	DFN8*8
LSC04065FW	650	4.0	28	170	550	1.70	4.0	14	ITO-220AC
LSC06065FW	650	6.0	36	200	640	1.70	6.0	16	ITO-220AC
LSC08065FW	650	8.0	48	230	700	1.70	8.0	17	ITO-220AC
LSC10065FW	650	10.0	60	250	800	1.70	10.0	23	ITO-220AC
LSC04065DW	650	4.0	28	170	550	1.70	4.0	14	DPAK
LSC06065DW	650	6.0	36	200	640	1.70	6.0	16	DPAK
LSC08065DW	650	8.0	48	230	700	1.70	8.0	17	DPAK
LSC10065DW	650	10.0	60	250	800	1.70	10.0	23	DPAK

\* Under development



## Triode for Alternating Current, TRIAC(雙向可控矽)

雙向可控矽是屬於NPNPN五層器件，能代替兩個反極性並聯的單向可控矽，而且僅需一個觸發電路。因該器件可以雙向導通，故除控制極G以外的兩個電極統稱為主端子，用MT1、MT2。表示，不再劃分成陽極或陰極。其特點是，當G極和MT2極相對於MT1，的電壓均為正時，MT2是陽極，MT1是陰極。反之，當G極和MT2極相對於MT1的電壓均為負時，MT1變成陽極，MT2為陰極。雙向可控矽由於正、反向特性曲線具有對稱性，所以它可在任何一個方向導通。主要應用在交流開關電路中，例如交流馬達開關，電熱器開關等。



TO-92



TO-220AB



TO-252

Part Number	I <sub>T</sub> (RMS)	V <sub>DRM</sub> V <sub>RRM</sub>	Electrical Characteristics								dv/dt (Typ) V/us	Package		
			I <sub>TSM</sub>	I <sub>GT</sub>		I <sub>H</sub> max	I <sub>DRM</sub> @ V <sub>DRM</sub> T <sub>J</sub>		V <sub>TM</sub> at I <sub>TM</sub>					
				(I ~ III) max	(IV)		μA	mA					V	A
**T1M5T800A	0.8	600	10	5	7	10	10	0.1 <sub>1)</sub>	1.9	1.0	2 (min)	TO-92		
**T1M5T800G	0.8	600	10	5	7	10	10	0.1 <sub>1)</sub>	1.9	1.0	100	SOT-223		
*T1M10T800A	0.8	600	10	5	7	10	10	0.1 <sub>1)</sub>	1.9	1.0	100	TO-92		
**T1M10T800G	0.8	600	10	10	---	12	10	0.1 <sub>1)</sub>	1.5	1.0	100	SOT-223		
T1M5F600A	1.0	600	10	5	7	10	10	0.1 <sub>1)</sub>	1.9	1.0	60	TO-92		
T1M5F600AL	1.0	600	12	5	7	10	10	0.1 <sub>1)</sub>	1.9	1.0	210	TO-92		
T1M10T800A	1.0	800	13.7	10	---	12	10	0.1 <sub>1)</sub>	1.5	1.0	600 (min)	TO-92		
*T4M10T800HE	4.0	800	27	10	---	12	10	2 <sub>5)</sub>	1.6	6	200 (min)	D-PAK		
**T4M10T800HB	4.0	800	27	10	---	12	10	2 <sub>5)</sub>	1.6	6	200 (min)	TO-220AB		
T4M3F600B	4.0	600	40	3	5	15	10	2 <sub>1)</sub>	1.6	6	5 (min)	TO-220AB		
T4M10T600B	4.0	600	40	10	---	15	10	2	1.6	6	150	TO-220AB		
T4M35T600B	4.0	600	40	35	---	35	10	2	1.6	6	1500	TO-220AB		
T6M10F600B	6.0	600	60	10	20	15	10	2	1.6	8.5	50	TO-220AB		
T8M10T600E	8.0	600	70	10	---	15	10	2	1.6	11	200	D-PAK		
T8M30T800HE	8.0	800	80	35	---	35	5	2 <sub>5)</sub>	1.5	11	1000(min)	D-PAK		
T8M30T800HC	8.0	800	80	35	---	35	5	0.5	1.5	11	1000(min)	ITO-220AB		
**T8M10T800HB	8.0	800	80	35	---	35	5	0.5	1.5	11	1000(min)	TO-220AB		
T8M5T600B	8.0	600	70	5	---	10	10	2 <sub>1)</sub>	1.85	11	75	TO-220AB		
T8M5F600B	8.0	600	80	5	10	10	10	2 <sub>1)</sub>	1.65	11	25	TO-220AB		
T8M10F600B	8.0	600	80	10	20	15	10	2	1.8	11	50	TO-220AB		
T8M25F600B	8.0	600	100	25 <sub>3)</sub>	60	30	10	2 <sub>2)</sub>	2.0	11	60 (min)	TO-220AB		
T8M35T600B	8.0	600	80	35	---	40	10	2	1.6	11	400 (min)	TO-220AB		
T8M50T600B	8.0	600	80	50	---	50	10	2	1.6	11	500 (min)	TO-220AB		
T8M50F600B	8.0	600	100	50 <sub>4)</sub>	75	40	10	2 <sub>2)</sub>	1.55	11	5	TO-220AB		
T12M35T800HC	12	800	100	35	---	35	5	2 <sub>5)</sub>	1.5	17	500 (min)	ITO-220AB		
*T12M35T800HB	12	800	100	35	---	35	5	2 <sub>5)</sub>	1.5	17	500 (min)	TO-220AB		
**T12M50T800HD	12	800	115	50	---	60	5	2 <sub>5)</sub>	1.55	18	1000 (min)	TO-220AB		
T12M5T600B	12	600	90	5	---	10	10	2 <sub>1)</sub>	1.85	17	40	TO-220AB		
T12M25F600B	12	600	100	25 <sub>3)</sub>	60	30	10	2 <sub>2)</sub>	2.0	17	60 (min)	TO-220AB		
T12M35T600B	12	600	100	35	---	40	10	2	1.85	17	400 (min)	TO-220AB		
T12M50F600B	12	600	100	50	6	50	10	2	1.75	17	100	TO-220AB		



TO-92



TO-220AB



TO-252

Part Number	$I_T$ (RMS)	$V_{DRM}$ $V_{RRM}$	Electrical Characteristics										dv/dt (Typ) V/us	Package
			$I_{TSM}$	$I_{GT}$		$I_H$ max	$I_{DRM} @ V_{DRM}$ $T_J$		$V_{TM} @ I_{TM}$					
				(I ~ III) (max)	(IV) mA		25 °C uA	125 °C mA						
												V		
T12M50T600B	12	600	100	50	----	60	10	2	1.85	17	600 (min)	TO-220AB		
T16M35T800HC	16	800	150	35	----	35	5	2 <sub>5)</sub>	1.5	21	500 (min)	ITO-220AB		
**T16M35T800HB	16	800	150	35	----	35	5	2 <sub>5)</sub>	1.5	21	500 (min)	TO-220AB		
T16M5T600B	16	600	120	5	----	10	10	2 <sub>1)</sub>	1.8	21	75	TO-220AB		
T16M25F600B	16	600	150	25	50	30	10	2	1.6	21	250 (min)	TO-220AB		
T16M35T600B	16	600	150	35	----	50	10	2	1.6	21	600 (min)	TO-220AB		
T16M50T600B	16	600	150	50	----	50	10	2	1.6	21	500 (min)	TO-220AB		
**T16M10T800HD	16	800	160	10	----	15	5	2 <sub>5)</sub>	1.55	22.5	40 (min)	TO-220ABI		
**T16M25F800HD	16	800	160	25	----	25	5	2 <sub>5)</sub>	1.55	22.5	200 (min)	TO-220ABI		
**T16M35T800HD	16	800	160	35	----	35	5	2 <sub>5)</sub>	1.55	22.5	500 (min)	TO-220ABI		
**T16M50T800HD	16	800	160	50	----	50	5	2 <sub>5)</sub>	1.55	22.5	1000 (min)	TO-220ABI		
**T25M35T800HD	25	800	250	35	----	50	5	3 <sub>5)</sub>	1.55	35	500 (min)	TO-220ABI		

1)  $T_J = 110^\circ C$     2)  $T_J = 100^\circ C$     3)  $I_{GT(II)} = 60mA$     4)  $I_{GT(II)} = 75mA$     5)  $T_J = 150^\circ C$

\*\* : New Product

\*\*\* : Under Development

## Silicon Controlled Rectifier, SCR(單向可控硅)

單向可控硅是PNPN四層結構，形成三個PN結，可以等效為PNP、NPN兩電晶體組成的複合管，具有三個外電極：陽極A(Anode)，陰極K(Cathode)和控制極G(Gate)。在A、K之間加上正電壓後，管子並不導通；當控制極G加上正電壓(相對於陰極K而言)後才導通；此時再去掉控制極的電壓，管子依然能夠保持導通。主要應用在交流電路中，需要高阻斷電壓的應用，例如漏電保護開關。



TO-92



TO-220AB



TO-126

Part Number	$I_T$ (RMS)	$V_{DRM}$ $V_{RRM}$	Electrical Characteristics							$dv/dt$ (Typ) V/us	Package
			$I_{TSM}$	$I_{GT}$	$I_H$	$I_{DRM} @ V_{DRM} T_J$		$V_{TM} @ I_{TM}$			
						max	max				
						(mA)	(mA)	25 °C	125 °C		
MCR100-6	0.8	400	10	0.05	5	10	0.1 <sub>1)</sub>	1.7	1.6	20 (min)	TO-92
MCR100-8	0.8	600	10	0.2	5	10	0.1 <sub>1)</sub>	1.5	1.6	20 (min)	SOT-23
S08U25600A	0.8	600	10	0.025	0	10	0.1 <sub>1)</sub>	1.7	1.6	20 (min)	TO-92
S08U50600A	0.8	600	10	0.05	5	10	0.1 <sub>1)</sub>	1.7	1.6	20 (min)	TO-92
S08M02600A	0.8	600	10	0.2	5	10	0.1 <sub>1)</sub>	1.7	1.6	20 (min)	TO-92
S1U50700A	1	700	10	0.05	5	10	0.1 <sub>1)</sub>	1.7	1	35	TO-92
R1U50600A	1	600	10	0.05	1	10	0.1 <sub>1)</sub>	1.7	1	35	TO-92
S1VM02600A	1.5	600	15	0.2	5	10	0.2 <sub>1)</sub>	1.7	3	25	TO-92
S4M02600F	4	600	25	0.2	5	10	0.2 <sub>1)</sub>	2.2	8.2	10	TO-126
S8M02600B	8	600	80	0.2	6	10	0.5 <sub>1)</sub>	1.8	16	15	TO-220AB
S8M15600B	8	600	80	15	30	10	2.0	1.8	16	250	TO-220AB
S12M8600B	12	600	100	8	20	10	2.0	2.2	24	250	TO-220AB
S12M15600B	12	600	125	15	40	10	2.0	2.2	24	250	TO-220AB

1)  $T_J=110\text{ }^\circ\text{C}$

### Silicon Diode for Alternating Current, SIDAC(高壓觸發二極體)

高壓觸發管SIDAC，雙向晶閘管導通的二極管，或更簡單地為雙向晶閘管二極管，它在技術上是指定作為雙邊電壓觸發開關。在DIAC它的操作是類似的，但鎖存導通狀態與低電壓下降，SIDAC始終是一個5層的設備，更像無柵極電壓觸發雙向可控矽。在一般情況下，SIDACs具有較高的比兩端交流開關元件的導通電壓和電流處理能力，所以它們可以被直接使用，用於切換和不只是用於觸發另一個交換裝置。

SIDAC的操作的功能是類似的火花間隙。直到所施加的電壓達到或超過其額定擊穿電壓，的SIDAC仍然不導電。一旦進入這種導電狀態，通過負的動態阻力區域，SIDAC繼續進行，無論電壓，直到所施加的電流低於其額定控股的電流。此時，SIDAC返回到其初始的非導通狀態，以再次開始循環。主要應用在脈衝產生的電路中，例如高壓金屬燈的觸發器，瓦斯點火器及負離子產生器等。



Part Number	I <sub>T</sub> (RMS)	V <sub>DRM</sub> V <sub>RRM</sub>	Electrical Characteristics								di/dt (Typ) V/us	Package
			I <sub>TSM</sub>	V <sub>BO</sub> at I <sub>BO</sub>			I <sub>H</sub>	I <sub>DRM</sub> @ V <sub>DRM</sub> T <sub>J</sub> = 25 °C	V <sub>TM</sub> at I <sub>TM</sub>			
				min	max	max			max	V		
H105C	0.3	90	14	95	110	35	50	5	1.5	0.3	80	SOT-23
H105H	0.3	90	2	95	110	35	50	5	1.4	0.3	80	SOD-123
H220H	0.3	180	2	220	250	35	50	5	1.4	0.3	80	SOD-123
H105D	0.6	90	3	95	110	35	100	5	1.5	0.6	120	T-1
H120D	0.6	90	3	110	130	35	100	5	1.5	0.6	120	T-1
H160D	0.6	90	3	150	170	35	100	5	1.5	0.6	120	T-1
H220D	0.6	180	3	210	230	35	100	5	1.5	0.6	120	T-1
H240D	0.6	180	3	220	250	35	100	5	1.5	0.6	120	T-1
SD09A105D	0.9	90	4	95	110	35	100	5	1.5	0.9	120	T-1
SD09A120D	0.9	90	4	110	130	35	100	5	1.5	0.9	120	T-1
SD09A130D	0.9	90	4	120	140	35	100	5	1.5	0.9	120	T-1
SD09A160D	0.9	90	4	150	170	35	100	5	1.5	0.9	120	T-1
SD09A220D	0.9	180	4	210	230	35	100	5	1.5	0.9	120	T-1
SD09A240D	0.9	180	4	220	250	35	100	5	1.5	0.9	120	T-1
SD09A105E	0.9	90	4	95	110	35	100	5	1.5	0.9	120	DO-41
SD09A120E	0.9	90	4	110	130	35	100	5	1.5	0.9	120	DO-41
SD09A130E	0.9	90	4	120	140	35	100	5	1.5	0.9	120	DO-41
SD09A160E	0.9	90	4	150	170	35	100	5	1.5	0.9	120	DO-41
SD09A220E	0.9	180	4	210	230	35	100	5	1.5	0.9	120	DO-41
SD09A240E	0.9	180	4	220	250	35	100	5	1.5	0.9	120	DO-41
SD1A120GW	1	90	25	110	130	5	50	10	1.5	1.0	80	DO-15
SD1A210GW	1	180	16	201	219	500	65	10	3	1.0	80	DO-15
SD1A240GW	1	180	20	216	234	500	65	5	3	1.0	80	DO-15
SD1A220HG	1	180	20	210	230	200	50	10	1.5	1.0	180	DO-15
SD1A130G	1	100	120	120	140	5	60	10	1.5	1.0	80	DO-15

SCR TRIAC SIDAC



Part Number	$I_T$ (RMS)	$V_{DRM}$ $V_{RRM}$	Electrical Characteristics								di/dt (Typ) V/us	Package
			$I_{TSM}$	$V_{BO}$ at $I_{BO}$			$I_H$ max	$I_{DRM}$ @ $V_{DRM}$ $T_J = 25^\circ C$	$V_{TM}$ at $I_{TM}$			
				+/- A	+/- V	+/- A			min (V)	max (V)		
SD1A150G	1	120	120	140	160	5	60	10	1.5	1.0	80	DO-15
SD1A180G	1	150	120	170	190	5	60	10	1.5	1.0	80	DO-15
SD1A200G	1	170	120	190	210	5	60	10	1.5	1.0	80	DO-15
SD1A220G	1	180	120	210	230	5	60	10	1.5	1.0	80	DO-15
SD1A240G	1	210	120	230	250	5	60	10	1.5	1.0	80	DO-15
*H105E	0.6	90	14	95	110	35	50	5	1.5	0.3	80	DO-219
*SD1A130A	1	100	120	120	140	5	60	10	1.5	1.0	80	SMA
*SD1A150A	1	120	120	140	160	5	60	10	1.5	1.0	80	SMA
*SD1A180A	1	150	120	170	190	5	60	10	1.5	1.0	80	SMA
*SD1A200A	1	170	120	190	210	5	60	10	1.5	1.0	80	SMA
*SD1A220A	1	180	120	210	230	5	60	10	1.5	1.0	80	SMA
*SD1A240A	1	210	120	230	250	5	60	10	1.5	1.0	80	SMA

\*\*\* : New product



**TSPD**

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## Thyristor Surge Protection Devices, TSPD(晶閘管浪湧保護器)

浪湧保護硅管 主要應用於浪湧保護電路。TSPD，這些晶閘管系列器件可以看作具有特性很像火花間隙或一個GDT (Gas discharge tube)，但可以操作快得多。他們是相關的TVS二極管，但可以“轉折”，類似的離子化，並進行火花間隙低箝位電壓。觸發後，低箝位電壓允許大浪湧電流的流動，同時限制在設備的散熱。



SMA



DO-219



SOT23-6L



U.L. RECOGNIZED  
FILE# E219635

## Surface Mount Thyristor Surge Protective Device

Part Number	Rated Repetitive Off-State Voltage	Off-State Leakage Current @V <sub>DRM</sub>	Breakover Voltage	On-State Voltage @ I <sub>T</sub> =1A	Non-repetitive Peak impulse current @10/1000us	Breakover Current		Holding Current		Package
	V <sub>DRM</sub>	I <sub>DRM</sub>	V <sub>BO</sub>	V <sub>T</sub>	I <sub>PP</sub>	I <sub>BO</sub>		I <sub>H</sub>		
	Min (V)	Max (uA)	Max (V)	Max. (V)	(A)	Min (mA)	Max (mA)	Min (mA)	Max (mA)	
*TA0800LL	6	5	25	3.5	50	50	800	50	150	SMA
TA0640L	58	5	77	3.5	50	50	800	150	800	SMA
TA0720L	65	5	88	3.5	50	50	800	150	800	SMA
TA0900L	75	5	98	3.5	50	50	800	150	800	SMA
TA1100L	90	5	130	3.5	50	50	800	150	800	SMA
TA1300L	120	5	160	3.5	50	50	800	150	800	SMA
TA1500L	140	5	180	3.5	50	50	800	150	800	SMA
TA1800L	160	5	220	3.5	50	50	800	150	800	SMA
TA2300L	190	5	265	3.5	50	50	800	150	800	SMA
TA2600L	220	5	300	3.5	50	50	800	150	800	SMA
TA3100L	275	5	350	3.5	50	50	800	150	800	SMA
TA3500L	320	5	400	3.5	50	50	800	150	800	SMA
TA4000L	360	5	450	3.5	50	50	800	150	800	SMA
*TE3100L	275	5	350	3.5	50	50	800	150	800	DO-219
*TDP0240CG-3	19	0.1	29	N/A	30(1)	10	~	35	~	SOT23-6L
*TDP0190HC-3	19	0.1	29	N/A	30(1)	10	~	35	~	SOT23-6L

(1)tp= 8/20us

\*New Product



## SMB

## Surface Mount Thyristor Surge Protective Device

Part Number	Rated Repetitive Off-State Voltage	Off-State Leakage Current @ $V_{DRM}$	Breakover Voltage	On-State Voltage @ $I_T=1A$	Non-repetitive Peak impulse current @ 10/1000us	Breakover Current		Holding Current		Package
	$V_{DRM}$	$I_{DRM}$	$V_{BO}$	$V_T$	$I_{PP}$	$I_{BO}$		$I_H$		
	Min (V)	Max (uA)	Max (V)	Max. (V)	(A)	Min (mA)	Max (mA)	Min (mA)	Max (mA)	
TB0640L	58	5	77	3.5	50	50	800	150	800	SMB
TB0720L	65	5	88	3.5	50	50	800	150	800	SMB
TB0900L	75	5	98	3.5	50	50	800	150	800	SMB
TB1100L	90	5	130	3.5	50	50	800	150	800	SMB
TB1300L	120	5	160	3.5	50	50	800	150	800	SMB
TB1500L	140	5	180	3.5	50	50	800	150	800	SMB
TB1800L	160	5	220	3.5	50	50	800	150	800	SMB
TB2100L	180	5	240	3.5	50	50	800	150	800	SMB
TB2300L	190	5	265	3.5	50	50	800	150	800	SMB
TB2600L	220	5	300	3.5	50	50	800	150	800	SMB
TB3100L	275	5	350	3.5	50	50	800	150	800	SMB
TB3500L	320	5	400	3.5	50	50	800	150	800	SMB
TB4000L	360	5	450	3.5	50	50	800	150	800	SMB
*TB0800ML	6	5	25	3.5	80	50	800	50	150	SMB
TB0640M	58	5	77	3.5	80	50	800	150	800	SMB
TB0720M	65	5	88	3.5	80	50	800	150	800	SMB
TB0900M	75	5	98	3.5	80	50	800	150	800	SMB
TB1100M	90	5	130	3.5	80	50	800	150	800	SMB
TB1300M	120	5	160	3.5	80	50	800	150	800	SMB
TB1500M	140	5	180	3.5	80	50	800	150	800	SMB
TB1800M	160	5	220	3.5	80	50	800	150	800	SMB
TB2300M	190	5	265	3.5	80	50	800	150	800	SMB
TB2600M	220	5	300	3.5	80	50	800	150	800	SMB
TB3100M	275	5	350	3.5	80	50	800	150	800	SMB
TB3500M	320	5	400	3.5	80	50	800	150	800	SMB
TB4000M	360	5	450	3.5	80	50	800	150	800	SMB
*TB0800HL	6	5	25	3.5	100	50	800	50	150	SMB
TB0640H	58	5	77	3.5	100	50	800	150	800	SMB
TB0720H	65	5	88	3.5	100	50	800	150	800	SMB
TB0900H	75	5	98	3.5	100	50	800	150	800	SMB
TB1100H	90	5	130	3.5	100	50	800	150	800	SMB
TB1300H	120	5	160	3.5	100	50	800	150	800	SMB



**SMB**

**Surface Mount Thyristor Surge Protective Device**

Part Number	Rated Repetitive Off-State Voltage	Off-State Leakage Current @V <sub>DRM</sub>	Breakover Voltage	On-State Voltage @ I <sub>T</sub> =1A	Non-repetitive Peak impulse current @10/1000us	Breakover Current		Holding Current		Package
	V <sub>DRM</sub>	I <sub>DRM</sub>	V <sub>BO</sub>	V <sub>T</sub>	I <sub>PP</sub>	I <sub>BO</sub>		I <sub>H</sub>		
	Min (V)	Max (uA)	Max (V)	Max. (V)	(A)	Min (mA)	Max (mA)	Min (mA)	Max (mA)	
TB1500H	140	5	180	3.5	100	50	800	150	800	SMB
TB1800H	160	5	220	3.5	100	50	800	150	800	SMB
TB2300H	190	5	265	3.5	100	50	800	150	800	SMB
TB2600H	220	5	300	3.5	100	50	800	150	800	SMB
TB3100H	275	5	350	3.5	100	50	800	150	800	SMB
TB3500H	320	5	400	3.5	100	50	800	150	800	SMB
TB4000H	360	5	450	3.5	100	50	800	150	800	SMB
TB4600HL	400	5	520	3.5	100	50	800	150	800	SMB

Mark<sup>\*\*\*</sup> denote under development device.



**TVS**

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## Transient Voltage Suppressor, TVS(瞬態電壓抑制器)

瞬態電壓抑制器 (Transient Voltage Suppressor) 簡稱TVS，是一種二極管形式的高效能保護器件。當TVS二極管的兩極受到反向瞬態高能量衝擊時，它能以10-12秒量級的速度，將其兩極間的高阻抗變為低阻抗，吸收高達數千瓦的浪湧功率，使兩極間的電壓箝位於一個預定值，有效地保護電子線路中的精密元器件，免受各種浪湧脈衝的損壞。且TVS具有響應時間快、瞬態功率大、低漏電流、擊穿電壓偏差小、箝位電壓較易控制、無損壞極限、體積小 ... 等等之優點。



DO-216AA



DO-222AA

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)	Package
			VRWM(Volts)	Min.	Max.				
LT2M5.0A	N/A	5.0	6.40	7.07	10	50	21.7	9.2	DO-216AA
LT2M12A	N/A	12.0	13.30	14.70	1	1	10.1	19.9	DO-216AA
LT2M16A	N/A	16.0	17.10	18.90	1	1	7.7	26.0	DO-216AA
LT2M24A	N/A	24.0	25.7	28.4	1	1	5.1	38.9	DO-216AA
LT2MF5.0A	N/A	5.0	6.4	7.07	10	50	21.7	9.2	DO-222AA
LT2MF6.0A	N/A	6.0	6.7	7.4	10	50	19.4	10.3	DO-222AA
LT2MF8.5A	N/A	8.5	9.4	10.4	1	10	13.9	14.4	DO-222AA
LT2MF10A	N/A	10.0	11.1	12.3	1	5	11.8	17.0	DO-222AA
LT2MF12A	N/A	12.0	13.3	14.7	1	1.0	10.1	19.9	DO-222AA
LT2MF13A	N/A	13.0	14.4	15.9	1	1.0	9.3	21.5	DO-222AA
LT2MF15A	N/A	15.0	16.7	18.5	1	1.0	8.2	24.4	DO-222AA
LT2MF16A	N/A	16.0	17.1	18.9	1	1.0	7.7	26.0	DO-222AA
LT2MF18A	N/A	18.0	20.0	22.1	1	1.0	6.9	29.2	DO-222AA
LT2MF20A	N/A	20.0	22.2	24.5	1	1.0	6.2	32.4	DO-222AA
LT2MF22A	N/A	22.0	24.4	27.0	1	1.0	5.6	35.5	DO-222AA
LT2MF24A	N/A	24.0	25.7	28.4	1	1.0	5.1	38.9	DO-222AA
LT2MF26A	N/A	26.0	28.9	31.9	1	1.0	4.8	42.1	DO-222AA
LT2MF28A	N/A	28.0	31.1	34.4	1	1.0	4.4	45.4	DO-222AA
LT2MF30A	N/A	30.0	33.3	36.8	1	1.0	4.1	48.4	DO-222AA
LT2MF36A	N/A	36.0	40.0	44.2	1	1.0	3.4	58.1	DO-222AA
LT2MF40A	N/A	40.0	44.4	49.1	1	1.0	3.1	64.5	DO-222AA
LT2MF43A	N/A	43.0	47.8	52.8	1	1.0	2.88	69.4	DO-222AA
LT2MF45A	N/A	45.0	50.0	55.3	1	1.0	2.75	72.7	DO-222AA
LT2MF48A	N/A	48.0	53.3	58.9	1	1.0	2.58	77.4	DO-222AA
LT2MF51A	N/A	51.0	56.7	62.7	1	1.0	2.43	82.4	DO-222AA

## LT4ME SERIES 400W DO-219 Transient Voltage Suppressor



DO-219

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage VRWM(Volts)	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM IR (uA)	Maximum Reverse Surge Current IRSM(Amps)	Maximum Reverse Voltage at IRSM (Clamping Voltage) VRSM(Volts)	Package
			Min.	Max.	@IT( mA)				
LT4ME5.0A	LT4ME5.0CA	5.0	6.40	7.07	10	800 / 1600	43.5	9.2	DO-219
LT4ME6.0A	LT4ME6.0CA	6.0	6.67	7.37	10	800 / 1600	38.8	10.3	DO-219
LT4ME6.5A	LT4ME6.5CA	6.5	7.22	7.98	10	500 / 1000	35.7	11.2	DO-219
LT4ME7.0A	LT4ME7.0CA	7.0	7.78	8.60	10	200 / 400	33.3	12.0	DO-219
LT4ME7.5A	LT4ME7.5CA	7.5	8.33	9.21	1	100 / 200	31.0	12.9	DO-219
LT4ME8.0A	LT4ME8.0CA	8.0	8.89	9.83	1	50 / 100	29.4	13.6	DO-219
LT4ME8.5A	LT4ME8.5CA	8.5	9.44	10.43	1	10 / 20	27.7	14.4	DO-219
LT4ME9.0A	LT4ME9.0CA	9.0	10.00	11.10	1	5 / 10	26.0	15.4	DO-219
LT4ME10A	LT4ME10CA	10.0	11.10	12.30	1	5 / 10	23.5	17.0	DO-219
LT4ME11A	LT4ME11CA	11.0	12.20	13.50	1	0.5	22.0	18.2	DO-219
LT4ME12A	LT4ME12CA	12.0	13.30	14.70	1	0.5	20.1	19.9	DO-219
LT4ME13A	LT4ME13CA	13.0	14.40	15.90	1	0.5	18.6	21.5	DO-219
LT4ME14A	LT4ME14CA	14.0	15.60	17.20	1	0.5	17.2	23.2	DO-219
LT4ME15A	LT4ME15CA	15.0	16.70	18.50	1	0.5	16.4	24.4	DO-219
LT4ME16A	LT4ME16CA	16.0	17.80	19.70	1	0.5	15.3	26.0	DO-219
LT4ME17A	LT4ME17CA	17.0	18.90	20.90	1	0.5	14.5	27.6	DO-219
LT4ME18A	LT4ME18CA	18.0	20.00	22.10	1	0.5	13.7	29.2	DO-219
LT4ME20A	LT4ME20CA	20.0	22.20	24.50	1	0.5	12.3	32.4	DO-219
LT4ME22A	LT4ME22CA	22.0	24.40	27.00	1	0.5	11.2	35.5	DO-219
LT4ME24A	LT4ME24CA	24.0	26.70	29.50	1	0.5	10.3	38.9	DO-219
LT4ME26A	LT4ME26CA	26.0	28.90	31.90	1	0.5	9.5	42.1	DO-219
LT4ME28A	LT4ME28CA	28.0	31.10	34.40	1	0.5	8.8	45.4	DO-219
LT4ME30A	LT4ME30CA	30.0	33.30	36.80	1	0.5	8.3	48.4	DO-219
LT4ME33A	LT4ME33CA	33.0	36.70	40.60	1	0.5	7.5	53.3	DO-219
LT4ME36A	LT4ME36CA	36.0	40.00	44.20	1	0.5	6.9	58.1	DO-219
LT4ME40A	LT4ME40CA	40.0	44.40	49.10	1	0.5	6.2	64.5	DO-219
LT4ME43A	LT4ME43CA	43.0	47.80	52.80	1	0.5	5.7	69.4	DO-219
LT4ME45A	LT4ME45CA	45.0	50.00	55.30	1	0.5	5.5	72.7	DO-219
LT4ME48A	LT4ME48CA	48.0	53.30	58.90	1	0.5	5.2	77.4	DO-219
LT4ME51A	LT4ME51CA	51.0	56.70	62.70	1	0.5	4.9	82.4	DO-219
LT4ME54A	LT4ME54CA	54.0	60.00	66.30	1	0.5	4.6	87.1	DO-219

## LT4ME SERIES 400W DO-219 Transient Voltage Suppressor



DO-219

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)	Package
			VRWM(Volts)	Min.	Max.				
LT4ME58A	LT4ME58CA	58.0	64.40	71.20	1	0.5	4.3	93.6	DO-219
LT4ME60A	LT4ME60CA	60.0	66.70	73.70	1	0.5	4.1	96.8	DO-219
LT4ME64A	LT4ME64CA	64.0	71.10	78.60	1	0.5	3.9	103	DO-219
LT4ME70A	LT4ME70CA	70.0	77.80	86.00	1	0.5	3.5	113	DO-219
LT4ME75A	LT4ME75CA	75.0	83.30	92.10	1	0.5	3.3	121	DO-219
LT4ME78A	LT4ME78CA	78.0	86.70	95.80	1	0.5	3.2	126	DO-219
LT4ME85A	LT4ME85CA	85.0	94.40	104.00	1	0.5	2.9	137	DO-219
LT4ME90A	LT4ME90CA	90.0	100.00	111.00	1	0.5	2.7	146	DO-219
LT4ME100A	LT4ME100CA	100.0	111.00	123.00	1	0.5	2.5	162	DO-219
LT4ME110A	LT4ME110CA	110.0	122.00	135.00	1	0.5	2.3	177	DO-219
LT4ME120A	LT4ME120CA	120.0	133.00	147.00	1	0.5	2	193	DO-219
LT4ME130A	LT4ME130CA	130.0	144.00	159.00	1	0.5	1.9	209	DO-219
LT4ME150A	LT4ME150CA	150.0	167.00	185.00	1	0.5	1.6	243	DO-219
LT4ME160A	LT4ME160CA	160.0	178.00	197.00	1	0.5	1.5	259	DO-219
LT4ME170A	LT4ME170CA	170.0	189.00	209.00	1	0.5	1.4	275	DO-219
LT4ME188A	LT4ME188CA	188.0	209.00	231.00	1	0.5	1.2	328	DO-219
LT4ME200A	LT4ME200CA	200.0	224.00	248.00	1	0.5	1.2	324	DO-219

NOTES :

1. Suffix 'A ' denotes 5% tolerance device.
2. Add suffix 'C 'or ' CA ' after part number to specify Bi-directional devices.
3. For Bi-Directional devices having VR of 10 volts and under, the IR limit is double .
4. For Uni-Directional devices VF max=3.5v at if=25 A 300us square wave pulse



SMA

**Transient Voltage Suppressor**

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at Vrwm	Maximum Reverse Surge Current	Maximum Reverse Voltage at Irsm (Clamping Voltage)
			Vrwm(Volts)	Min.	Max.			
SMAJ4.0		4.0	5.40	6.50	10	1000	46.5	8.6
SMAJ5.0A	SMAJ5.0CA	5.0	6.40	7.07	10	800	43.5	9.2
SMAJ6.0A	SMAJ6.0CA	6.0	6.67	7.37	10	800	38.8	10.3
SMAJ6.5A	SMAJ6.5CA	6.5	7.22	7.98	10	500	35.7	11.2
SMAJ7.0A	SMAJ7.0CA	7.0	7.78	8.60	10	200	33.3	12.0
SMAJ7.5A	SMAJ7.5CA	7.5	8.33	9.21	1	100	31.0	12.9
SMAJ8.0A	SMAJ8.0CA	8.0	8.89	9.83	1	50	29.4	13.6
SMAJ8.5A	SMAJ8.5CA	8.5	9.44	10.43	1	10	27.8	14.4
SMAJ9.0A	SMAJ9.0CA	9.0	10.0	11.1	1	5	26.0	15.4
SMAJ10A	SMAJ10CA	10.0	11.1	12.3	1	5	23.5	17.0
SMAJ11A	SMAJ11CA	11.0	12.2	13.5	1	5	22.0	18.2
SMAJ12A	SMAJ12CA	12.0	13.3	14.7	1	5	20.1	19.9
SMAJ13A	SMAJ13CA	13.0	14.4	15.9	1	5	18.6	21.5
SMAJ14A	SMAJ14CA	14.0	15.6	17.2	1	5	17.2	23.2
SMAJ15A	SMAJ15CA	15.0	16.7	18.5	1	5	16.4	24.4
SMAJ16A	SMAJ16CA	16.0	17.8	19.7	1	5	15.4	26.0
SMAJ17A	SMAJ17CA	17.0	18.9	20.9	1	5	14.5	27.6
SMAJ18A	SMAJ18CA	18.0	20.0	22.1	1	5	13.7	29.2
SMAJ20A	SMAJ20CA	20.0	22.2	24.5	1	5	12.3	32.4
SMAJ22A	SMAJ22CA	22.0	24.4	27.0	1	5	11.3	35.5
SMAJ24A	SMAJ24CA	24.0	26.7	29.5	1	5	10.3	38.9
SMAJ26A	SMAJ26CA	26.0	28.9	31.9	1	5	9.5	42.1
SMAJ28A	SMAJ28CA	28.0	31.1	34.4	1	5	8.8	45.4
SMAJ30A	SMAJ30CA	30.0	33.3	36.8	1	5	8.3	48.4
SMAJ33A	SMAJ33CA	33.0	36.7	40.6	1	5	7.5	53.3
SMAJ36A	SMAJ36CA	36.0	40.0	44.2	1	5	6.9	58.1
SMAJ40A	SMAJ40CA	40.0	44.4	49.1	1	5	6.2	64.5
SMAJ43A	SMAJ43CA	43.0	47.8	52.8	1	5	5.8	69.4
SMAJ45A	SMAJ45CA	45.0	50.0	55.3	1	5	5.5	72.7
SMAJ48A	SMAJ48CA	48.0	53.3	58.9	1	5	5.2	77.4
SMAJ51A	SMAJ51CA	51.0	56.7	62.7	1	5	4.9	82.4
SMAJ54A	SMAJ54CA	54.0	60.0	66.3	1	5	4.6	87.1

T/S



SMA



U.L. RECOGNIZED  
FILE# E219635

## Transient Voltage Suppressor

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at V <sub>RWM</sub>	Maximum Reverse Surge Current	Maximum Reverse Voltage at I <sub>RSM</sub> (Clamping Voltage)
			V <sub>RWM</sub> (Volts)	Min.	Max.			
SMAJ58A	SMAJ58CA	58.0	64.4	71.2	1	5	4.3	93.6
SMAJ60A	SMAJ60CA	60.0	66.7	73.7	1	5	4.1	96.8
SMAJ64A	SMAJ64CA	64.0	71.1	78.6	1	5	3.9	103.0
SMAJ70A	SMAJ70CA	70.0	77.8	86.0	1	5	3.5	113.0
SMAJ75A	SMAJ75CA	75.0	83.3	92.1	1	5	3.3	121.0
SMAJ78A	SMAJ78CA	78.0	86.7	95.8	1	5	3.2	126.0
SMAJ85A	SMAJ85CA	85.0	94.4	104.3	1	5	2.9	137.0
SMAJ90A	SMAJ90CA	90.0	100.0	110.5	1	5	2.7	146.0
SMAJ100A	SMAJ100CA	100.0	111.0	122.7	1	5	2.5	162.0



U.L. RECOGNIZED  
FILE# E219635

SMA

## Transient Voltage Suppressor (Continue)

Device Uni-directional	Device Bi-directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)
			VRWM(Volts)	Min.	Max.			
SMAJ110A	SMAJ110CA	110.0	122.0	134.8	1	5	2.3	177.0
SMAJ120A	SMAJ120CA	120.0	133.0	147.0	1	5	2.1	193.0
SMAJ130A	SMAJ130CA	130.0	144.0	159.2	1	5	1.9	209.0
SMAJ150A	SMAJ150CA	150.0	167.0	184.6	1	5	1.6	243.0
SMAJ160A	SMAJ160CA	160.0	178.0	196.7	1	5	1.5	259.0
SMAJ170A	SMAJ170CA	170.0	189.0	208.9	1	5	1.5	275.0
SMAJ188A	SMAJ188CA	188.0	209.0	231.0	1	5	1.2	328.0
SMAJ200A	SMAJ200CA	200.0	224.0	248	1	1	1.2	324.0
* SMAJ220A	* SMAJ220CA	220.0	246.0	272	1	0.5	1.1	356.0
* SMAJ250A	* SMAJ250CA	250.0	279.0	308	1	0.5	1.0	405.0
* SMAJ300A	* SMAJ300CA	300.0	335.0	370	1	0.5	0.8	486.0
* SMAJ350A	* SMAJ350CA	350.0	391.0	432	1	0.5	0.7	567.0

### NOTES :

- Suffix 'A' denotes 5% tolerance device, no suffix denotes 10% tolerance device.
  - Add suffix 'C' or 'CA' after part number to specify Bi-directional devices.
  - For Bi-Directional devices having VR of 10 volts and under, the IR limit is double.
- \*\* : Under Development

**SMA6J SERIES 600W SMA Transient Voltage Suppressor**



SMA



**Transient Voltage Suppressor**

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at V <sub>RM</sub>	Maximum Reverse Surge Current	Maximum Reverse Voltage at I <sub>RSM</sub> (Clamping Voltage)
			V <sub>RM</sub> (Volts)	Min.	Max.			
SMA6J5.0A	SMA6J5.0CA	5.0	6.40	7.07	10	800	65.2	9.2
SMA6J6.0A	SMA6J6.0CA	6.0	6.67	7.37	10	800	58.3	10.3
SMA6J6.5A	SMA6J6.5CA	6.5	7.22	7.98	10	500	53.6	11.2
SMA6J7.0A	SMA6J7.0CA	7.0	7.78	8.60	10	200	50.0	12.0
SMA6J7.5A	SMA6J7.5CA	7.5	8.33	9.21	1	100	46.5	12.9
SMA6J8.0A	SMA6J8.0CA	8.0	8.89	9.83	1	50	44.1	13.6
SMA6J8.5A	SMA6J8.5CA	8.5	9.44	10.43	1	20	41.7	14.4
SMA6J9.0A	SMA6J9.0CA	9.0	10.0	11.1	1	10	39.0	15.4
SMA6J10A	SMA6J10CA	10.0	11.1	12.3	1	5	35.3	17.0
SMA6J11A	SMA6J11CA	11.0	12.2	13.5	1	5	33.0	18.2
SMA6J12A	SMA6J12CA	12.0	13.3	14.7	1	5	30.2	19.9
SMA6J13A	SMA6J13CA	13.0	14.4	15.9	1	5	27.9	21.5
SMA6J14A	SMA6J14CA	14.0	15.6	17.2	1	5	25.9	23.2
SMA6J15A	SMA6J15CA	15.0	16.7	18.5	1	5	24.6	24.4
SMA6J16A	SMA6J16CA	16.0	17.8	19.7	1	5	23.1	26.0
SMA6J17A	SMA6J17CA	17.0	18.9	20.9	1	5	21.7	27.6
SMA6J18A	SMA6J18CA	18.0	20.0	22.1	1	5	20.5	29.2
SMA6J20A	SMA6J20CA	20.0	22.2	24.5	1	5	18.5	32.4
SMA6J22A	SMA6J22CA	22.0	24.4	27.0	1	5	16.9	35.5
SMA6J24A	SMA6J24CA	24.0	26.7	29.5	1	5	15.4	38.9
SMA6J26A	SMA6J26CA	26.0	28.9	31.9	1	5	14.3	42.1
SMA6J28A	SMA6J28CA	28.0	31.1	34.4	1	5	13.2	45.4
SMA6J30A	SMA6J30CA	30.0	33.3	36.8	1	5	12.4	48.4
SMA6J33A	SMA6J33CA	33.0	36.7	40.6	1	5	11.3	53.3
SMA6J36A	SMA6J36CA	36.0	40.0	44.2	1	5	10.3	58.1
SMA6J40A	SMA6J40CA	40.0	44.4	49.1	1	5	9.3	64.5
SMA6J43A	SMA6J43CA	43.0	47.8	52.8	1	5	8.6	69.4
SMA6J45A	SMA6J45CA	45.0	50.0	55.3	1	5	8.3	72.7
SMA6J48A	SMA6J48CA	48.0	53.3	58.9	1	5	7.8	77.4
SMA6J51A	SMA6J51CA	51.0	56.7	62.7	1	5	7.3	82.4

T/S

## SMA6J SERIES 600W SMA Transient Voltage Suppressor



SMA



U.L. RECOGNIZED

FILE# E219635

## Transient Voltage Suppressor

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at $V_{RWM}$	Maximum Reverse Surge Current	Maximum Reverse Voltage at $I_{RSM}$ (Clamping Voltage)
			$V_{RWM}$ (Volts)	Min.	Max.			
SMA6J54A	SMA6J54CA	54.0	60.0	66.3	1	5	6.9	87.1
SMA6J58A	SMA6J58CA	58.0	64.4	71.2	1	5	6.4	93.6
SMA6J60A	SMA6J60CA	60.0	66.7	73.7	1	5	6.2	96.8
SMA6J64A	SMA6J64CA	64.0	71.1	78.6	1	5	5.8	103.0
SMA6J70A	SMA6J70CA	70.0	77.8	86.0	1	5	5.3	113.0
SMA6J75A	SMA6J75CA	75.0	83.3	92.1	1	5	5.0	121.0
SMA6J78A	SMA6J78CA	78.0	86.7	95.8	1	5	4.8	126.0
SMA6J85A	SMA6J85CA	85.0	94.4	104.3	1	5	4.4	137.0
SMA6J90A	SMA6J90CA	90.0	100.0	110.5	1	5	4.1	146.0
SMA6J100A	SMA6J100CA	100.0	111.0	122.7	1	5	3.7	162.0



**SMA**



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**FILE# E219635**

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)
			VRWM(Volts)	Min.	Max.			
SMA6J110A	SMA6J110CA	110.0	122.0	134.8	1	5	3.4	177.0
SMA6J120A	SMA6J120CA	120.0	133.0	147.0	1	5	3.1	193.0
SMA6J130A	SMA6J130CA	130.0	144.0	159.2	1	5	2.9	209.0
SMA6J150A	SMA6J150CA	150.0	167.0	184.6	1	5	2.5	243.0
SMA6J160A	SMA6J160CA	160.0	178.0	196.7	1	5	2.3	259.0
SMA6J170A	SMA6J170CA	170.0	189.0	208.9	1	5	2.2	275.0
SMA6J188A	SMA6J188CA	188.0	209.0	231.0	1	5	1.83	328.0

**NOTES :**

1. Suffix 'A' denotes 5% tolerance device, no suffix denotes 10 % tolerance device.
  2. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices.
  3. For Bi-Directional devices having VR of 10 volts and under, the IR limit is double .
- \*\* : Under Development



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FILE# E219635

SMB

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at $V_{RWM}$	Maximum Reverse Surge Current	Maximum Reverse Voltage at $I_{RSM}$ (Clamping Voltage)
			$V_{RWM}$ (Volts)	Min.	Max.			
SMBJ5.0A	SMBJ5.0CA	5.0	6.40	7.07	10	800	65.2	9.2
SMBJ6.0A	SMBJ6.0CA	6.0	6.67	7.37	10	800	58.3	10.3
SMBJ6.5A	SMBJ6.5CA	6.5	7.22	7.98	10	500	53.6	11.2
SMBJ7.0A	SMBJ7.0CA	7.0	7.78	8.60	10	200	50.0	12.0
SMBJ7.5A	SMBJ7.5CA	7.5	8.33	9.21	1	100	46.5	12.9
SMBJ8.0A	SMBJ8.0CA	8.0	8.89	9.83	1	50	44.1	13.6
SMBJ8.5A	SMBJ8.5CA	8.5	9.44	10.43	1	20	41.7	14.4
SMBJ9.0A	SMBJ9.0CA	9.0	10.0	11.1	1	10	39.0	15.4
SMBJ10A	SMBJ10CA	10.0	11.1	12.3	1	5	35.3	17.0
SMBJ11A	SMBJ11CA	11.0	12.2	13.5	1	5	33.0	18.2
SMBJ12A	SMBJ12CA	12.0	13.3	14.7	1	5	30.2	19.9
SMBJ13A	SMBJ13CA	13.0	14.4	15.9	1	5	27.9	21.5
SMBJ14A	SMBJ14CA	14.0	15.6	17.2	1	5	25.9	23.2
SMBJ15A	SMBJ15CA	15.0	16.7	18.5	1	5	24.6	24.4
SMBJ16A	SMBJ16CA	16.0	17.8	19.7	1	5	23.1	26.0
SMBJ17A	SMBJ17CA	17.0	18.9	20.9	1	5	21.7	27.6
SMBJ18A	SMBJ18CA	18.0	20.0	22.1	1	5	20.5	29.2
SMBJ20A	SMBJ20CA	20.0	22.2	24.5	1	5	18.5	32.4
SMBJ22A	SMBJ22CA	22.0	24.4	27.0	1	5	16.9	35.5
SMBJ24A	SMBJ24CA	24.0	26.7	29.5	1	5	15.4	38.9
SMBJ26A	SMBJ26CA	26.0	28.9	31.9	1	5	14.3	42.1
SMBJ28A	SMBJ28CA	28.0	31.1	34.4	1	5	13.2	45.4
SMBJ30A	SMBJ30CA	30.0	33.3	36.8	1	5	12.4	48.4
SMBJ33A	SMBJ33CA	33.0	36.7	40.6	1	5	11.3	53.3
SMBJ36A	SMBJ36CA	36.0	40.0	44.2	1	5	10.3	58.1
SMBJ40A	SMBJ40CA	40.0	44.4	49.1	1	5	9.3	64.5
SMBJ43A	SMBJ43CA	43.0	47.8	52.8	1	5	8.6	69.4
SMBJ45A	SMBJ45CA	45.0	50.0	55.3	1	5	8.3	72.7
SMBJ48A	SMBJ48CA	48.0	53.3	58.9	1	5	7.8	77.4
SMBJ51A	SMBJ51CA	51.0	56.7	62.7	1	5	7.3	82.4



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**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at V <sub>RWM</sub>	Maximum Reverse Surge Current	Maximum Reverse Voltage at I <sub>RSM</sub> (Clamping Voltage)
			V <sub>RWM</sub> (Volts)	Min.	Max.			
SMBJ54A	SMBJ54CA	54.0	60.0	66.3	1	5	6.9	87.1
SMBJ58A	SMBJ58CA	58.0	64.4	71.2	1	5	6.4	93.6
SMBJ60A	SMBJ60CA	60.0	66.7	73.7	1	5	6.2	96.8
SMBJ64A	SMBJ64CA	64.0	71.1	78.6	1	5	5.8	103.0
SMBJ70A	SMBJ70CA	70.0	77.8	86.0	1	5	5.3	113.0
SMBJ75A	SMBJ75CA	75.0	83.3	92.1	1	5	5.0	121.0
SMBJ78A	SMBJ78CA	78.0	86.7	95.8	1	5	4.8	126.0
SMBJ85A	SMBJ85CA	85.0	94.4	104.3	1	5	4.4	137.0
SMBJ90A	SMBJ90CA	90.0	100.0	110.5	1	5	4.1	146.0
SMBJ100A	SMBJ100CA	100.0	111.0	122.7	1	5	3.7	162.0



## SMB

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at $V_{RWM}$	Maximum Reverse Surge Current	Maximum Reverse Voltage at $I_{RSM}$ (Clamping Voltage)
			$V_{RWM}$ (Volts)	Min.	Max.			
SMBJ110A	SMBJ110CA	110.0	122.0	134.8	1	5	3.4	177.0
SMBJ120A	SMBJ120CA	120.0	133.0	147.0	1	5	3.1	193.0
SMBJ130A	SMBJ130CA	130.0	144.0	159.2	1	5	2.9	209.0
SMBJ150A	SMBJ150CA	150.0	167.0	184.6	1	5	2.5	243.0
SMBJ160A	SMBJ160CA	160.0	178.0	196.7	1	5	2.3	259.0
SMBJ170A	SMBJ170CA	170.0	189.0	209	1	5	2.2	275.0
SMBJ188A	SMBJ188CA	188.0	209	231	1	5	1.83	328.0
SMBJ200A	SMBJ200CA	200.0	224	247	1	5	1.9	324.0
SMBJ220A	SMBJ220CA	220.0	246	272	1	5	1.7	356.0
* SMBJ250A	* SMBJ250CA	250.0	279	309	1	5	1.5	405.0
* SMBJ300A	* SMBJ300CA	300.0	335	371	1	5	1.3	486.0
SMBJ350A	* SMBJ350CA	350.0	391	432	1	5	1.1	567.0

## NOTES :

- Suffix 'A' denotes 5% tolerance device.
  - Add suffix 'C' or 'CA' after part number to specify Bi-directional devices.
  - For Bi-Directional devices having VR of 10 volts and under, the IR limit is double .
- \*\* : Under Development



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**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at V <sub>RWM</sub>	Maximum Reverse Surge Current	Maximum Reverse Voltage at I <sub>RSM</sub> (Clamping Voltage)
			V <sub>RWM</sub> (Volts)	Min.	Max.			
SMB6J5.0AT	SMB6J5.0CA	5.0	6.40	7.07	10	800	65.2	9.2
SMB6J6.0AT	SMB6J6.0CA	6.0	6.67	7.37	10	800	58.3	10.3
SMB6J6.5AT	SMB6J6.5CA	6.5	7.22	7.98	10	500	53.6	11.2
SMB6J7.0AT	SMB6J7.0CA	7.0	7.78	8.60	10	200	50.0	12.0
SMB6J7.5AT	SMB6J7.5CA	7.5	8.33	9.21	1	100	46.5	12.9
SMB6J8.0AT	SMB6J8.0CA	8.0	8.89	9.83	1	50	44.1	13.6
SMB6J8.5AT	SMB6J8.5CA	8.5	9.44	10.43	1	20	41.7	14.4
SMB6J9.0AT	SMB6J9.0CA	9.0	10.0	11.1	1	10	39.0	15.4
SMB6J10AT	SMB6J10CA	10.0	11.1	12.3	1	5	35.3	17.0
SMB6J11AT	SMB6J11CA	11.0	12.2	13.5	1	5	33.0	18.2
SMB6J12AT	SMB6J12CA	12.0	13.3	14.7	1	5	30.2	19.9
SMB6J13AT	SMB6J13CA	13.0	14.4	15.9	1	5	27.9	21.5
SMB6J14AT	SMB6J14CA	14.0	15.6	17.2	1	5	25.9	23.2
SMB6J15AT	SMB6J15CA	15.0	16.7	18.5	1	5	24.6	24.4
SMB6J16AT	SMB6J16CA	16.0	17.8	19.7	1	5	23.1	26.0
SMB6J17AT	SMB6J17CA	17.0	18.9	20.9	1	5	21.7	27.6
SMB6J18AT	SMB6J18CA	18.0	20.0	22.1	1	5	20.5	29.2
SMB6J20AT	SMB6J20CA	20.0	22.2	24.5	1	5	18.5	32.4
SMB6J22AT	SMB6J22CA	22.0	24.4	27.0	1	5	16.9	35.5
SMB6J24AT	SMB6J24CA	24.0	26.7	29.5	1	5	15.4	38.9
SMB6J26AT	SMB6J26CA	26.0	28.9	31.9	1	5	14.3	42.1
SMB6J28AT	SMB6J28CA	28.0	31.1	34.4	1	5	13.2	45.4
SMB6J30AT	SMB6J30CA	30.0	33.3	36.8	1	5	12.4	48.4
SMB6J33AT	SMB6J33CA	33.0	36.7	40.6	1	5	11.3	53.3
SMB6J36AT	SMB6J36CA	36.0	40.0	44.2	1	5	10.3	58.1
SMB6J40AT	SMB6J40CA	40.0	44.4	49.1	1	5	9.3	64.5
SMB6J43AT	SMB6J43CA	43.0	47.8	52.8	1	5	8.6	69.4
SMB6J45AT	SMB6J45CA	45.0	50.0	55.3	1	5	8.3	72.7
SMB6J48AT	SMB6J48CA	48.0	53.3	58.9	1	5	7.8	77.4
SMB6J51AT	SMB6J51CA	51.0	56.7	62.7	1	5	7.3	82.4

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SMB

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at $V_{RWM}$	Maximum Reverse Surge Current	Maximum Reverse Voltage at $I_{RSM}$ (Clamping Voltage)
			$V_{RWM}$ (Volts)	Min.	Max.			
SMB6J54AT	SMB6J54CA	54.0	60.0	66.3	1	5	6.9	87.1
SMB6J58AT	SMB6J58CA	58.0	64.4	71.2	1	5	6.4	93.6
SMB6J60AT	SMB6J60CA	60.0	66.7	73.7	1	5	6.2	96.8
SMB6J64AT	SMB6J64CA	64.0	71.1	78.6	1	5	5.8	103.0
SMB6J70AT	SMB6J70CA	70.0	77.8	86.0	1	5	5.3	113.0
SMB6J75AT	SMB6J75CA	75.0	83.3	92.1	1	5	5.0	121.0
SMB6J78AT	SMB6J78CA	78.0	86.7	95.8	1	5	4.8	126.0
SMB6J85AT	SMB6J85CA	85.0	94.4	104.3	1	5	4.4	137.0
SMB6J90AT	SMB6J90CA	90.0	100.0	110.5	1	5	4.1	146.0
SMB6J100AT	SMB6J100CA	100.0	111.0	122.7	1	5	3.7	162.0



SMB

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)
			VRWM(Volts)	Min.	Max.			
SMB6J110AT	SMB6J110CA	110.0	122.0	134.8	1	5	3.4	177.0
SMB6J120AT	SMB6J120CA	120.0	133.0	147.0	1	5	3.1	193.0
SMB6J130AT	SMB6J130CA	130.0	144.0	159.2	1	5	2.9	209.0
SMB6J150AT	SMB6J150CA	150.0	167.0	184.6	1	5	2.5	243.0
SMB6J160AT	SMB6J160CA	160.0	178.0	196.7	1	5	2.3	259.0
SMB6J170AT	SMB6J170CA	170.0	189.0	209	1	5	2.2	275.0

**NOTES :**

1. Suffix 'A ' denotes 5% tolerance device, no suffix denotes 10 % tolerance device.
  2. Add suffix 'C 'or ' CA ' after part number to specify Bi-directional devices.
  3. For Bi-Directional devices having VR of 10 volts and under, the IR limit is double .
- \*\* : Under Development



SMC

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at $V_{RWM}$	Maximum Reverse Surge Current	Maximum Reverse Voltage at $I_{RSM}$ (Clamping Voltage)
			$V_{RWM}$ (Volts)	Min.	Max.			
SMCJ5.0A	SMCJ5.0CA	5.0	6.40	7.07	10	1000	163.0	9.2
SMCJ6.0A	SMCJ6.0CA	6.0	6.67	7.37	10	1000	145.6	10.3
SMCJ6.5A	SMCJ6.5CA	6.5	7.22	7.98	10	500	133.9	11.2
SMCJ7.0A	SMCJ7.0CA	7.0	7.78	8.60	10	200	125.0	12.0
SMCJ7.5A	SMCJ7.5CA	7.5	8.33	9.21	1	100	116.3	12.9
SMCJ8.0A	SMCJ8.0CA	8.0	8.89	9.83	1	50	110.3	13.6
SMCJ8.5A	SMCJ8.5CA	8.5	9.44	10.43	1	20	104.2	14.4
SMCJ9.0A	SMCJ9.0CA	9.0	10.0	11.1	1	10	97.4	15.4
SMCJ10A	SMCJ10CA	10.0	11.1	12.3	1	5	88.2	17.0
SMCJ11A	SMCJ11CA	11.0	12.2	13.5	1	5	82.4	18.2
SMCJ12A	SMCJ12CA	12.0	13.3	14.7	1	5	75.4	19.9
SMCJ13A	SMCJ13CA	13.0	14.4	15.9	1	5	69.8	21.5
SMCJ14A	SMCJ14CA	14.0	15.6	17.2	1	5	64.7	23.2
SMCJ15A	SMCJ15CA	15.0	16.7	18.5	1	5	61.5	24.4
SMCJ16A	SMCJ16CA	16.0	17.8	19.7	1	5	57.7	26.0
SMCJ17A	SMCJ17CA	17.0	18.9	20.9	1	5	54.3	27.6
SMCJ18A	SMCJ18CA	18.0	20.0	22.1	1	5	51.4	29.2
SMCJ20A	SMCJ20CA	20.0	22.2	24.5	1	5	46.3	32.4
SMCJ20A4	N/A	20.0	22.2	24.5	1	5	63.0	32.4
SMCJ22A	SMCJ22CA	22.0	24.4	27.0	1	5	42.3	35.5
SMCJ24A	SMCJ24CA	24.0	26.7	29.5	1	5	38.6	38.9
SMCJ24A4	N/A	24.0	26.7	29.5	1	5	60.0	38.9
SMCJ26A	SMCJ26CA	26.0	28.9	31.9	1	5	35.6	42.1
SMCJ28A	SMCJ28CA	28.0	31.1	34.4	1	5	33.0	45.4
SMCJ28A4	N/A	28.0	31.1	34.4	1	5	49.0	45.4
SMCJ30A	SMCJ30CA	30.0	33.3	36.8	1	5	31.0	48.4
SMCJ33A	SMCJ33CA	33.0	36.7	40.6	1	5	28.1	53.3
SMCJ36A	SMCJ36CA	36.0	40.0	44.2	1	5	25.8	58.1
SMCJ36A4	N/A	36.0	40.0	44.2	1	5	28.0	58.1
SMCJ40A	SMCJ40CA	40.0	44.4	49.1	1	5	23.3	64.5

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SMC

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at V <sub>RWM</sub>	Maximum Reverse Surge Current	Maximum Reverse Voltage at I <sub>RSM</sub> (Clamping Voltage)
			V <sub>RWM</sub> (Volts)	Min.	Max.			
SMCJ43A	SMCJ43CA	43.0	47.8	52.8	1	5	21.6	69.4
SMCJ45A	SMCJ45CA	45.0	50.0	55.3	1	5	20.6	72.7
SMCJ48A	SMCJ48CA	48.0	53.3	58.9	1	5	19.4	77.4
SMCJ51A	SMCJ51CA	51.0	56.7	62.7	1	5	18.2	82.4
SMCJ54A	SMCJ54CA	54.0	60.0	66.3	1	5	17.2	87.1
SMCJ58A	SMCJ58CA	58.0	64.4	71.2	1	5	16.0	93.6
SMCJ60A	SMCJ60CA	60.0	66.7	73.7	1	5	15.5	96.8
SMCJ64A	SMCJ64CA	64.0	71.1	78.6	1	5	14.6	103.0
SMCJ70A	SMCJ70CA	70.0	77.8	86.0	1	5	13.3	113.0
SMCJ75A	SMCJ75CA	75.0	83.3	92.1	1	5	12.4	121.0



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FILE# E219635

SMC

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage VRWM(Volts)	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM IR (uA)	Maximum Reverse Surge Current IRSM(Amps)	Maximum Reverse Voltage at IRSM (Clamping Voltage) VRSM(Volts)
			Min.	Max.	@IT( mA)			
SMCJ78A	SMCJ78CA	78.0	86.7	95.8	1	5	11.9	126.0
SMCJ85A	SMCJ85CA	85.0	94.4	104.3	1	5	10.9	137.0
SMCJ90A	SMCJ90CA	90.0	100.0	110.5	1	5	10.3	146.0
SMCJ100A	SMCJ100CA	100.0	111.0	122.7	1	5	9.3	162.0
SMCJ110A	SMCJ110CA	110.0	122.0	134.8	1	5	8.5	177.0
SMCJ120A	SMCJ120CA	120.0	133.0	147.0	1	5	7.8	193.0
SMCJ130A	SMCJ130CA	130.0	144.0	159.2	1	5	7.2	209.0
SMCJ150A	SMCJ150CA	150.0	167.0	184.6	1	5	6.2	243.0
SMCJ160A	SMCJ160CA	160.0	178.0	196.7	1	5	5.8	259.0
SMCJ170A	SMCJ170CA	170.0	189.0	208.9	1	5	5.5	275.0
SMCJ188A	SMCJ188CA	188.0	209.0	220.0	1	5	4.6	328.0
SMCJ200A	SMCJ200CA	200.0	224.0	247.0	1	5	4.6	324.0
SMCJ220A	SMCJ220CA	220.0	246.0	272.0	1	5	4.2	356.0

### NOTE :

- Suffix 'A' denotes 5% tolerance device.
- Add suffix 'C' or 'CA' after part number to specify Bi-directional devices.
- For Bi-Directional devices having VR of 10 volts and under, the IR limit is double .

\*\* : Under Development



**SMA**

**Transient Voltage Suppressor**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Clamping Voltage @Ipp	Max. Peak Pulse Current
			VR (V)	Min (V)	Max (V)			
PSMAJ6.8A	PSMAJ6.8CA	5.80	6.45	7.13	10	1000	10.5	38.1
PSMAJ7.5A	PSMAJ7.5CA	6.40	7.13	7.88	10	500	11.3	35.4
PSMAJ8.2A	PSMAJ8.2CA	7.02	7.79	8.61	10	200	12.1	33.1
PSMAJ9.1A	PSMAJ9.1CA	7.78	8.65	9.56	1	50	13.4	29.9
PSMAJ10A	PSMAJ10CA	8.55	9.50	10.50	1	10	14.5	27.6
PSMAJ11A	PSMAJ11CA	9.40	10.5	11.6	1	5	15.6	25.6
PSMAJ12A	PSMAJ12CA	10.20	11.40	12.6	1	5	16.7	24.0
PSMAJ13A	PSMAJ13CA	11.1	12.4	13.7	1	5	18.2	22.0
PSMAJ15A	PSMAJ15CA	12.8	14.3	15.8	1	5	21.2	18.9
PSMAJ16A	PSMAJ16CA	13.6	15.2	16.8	1	5	22.5	17.8
PSMAJ18A	PSMAJ18CA	15.3	17.1	18.9	1	5	25.2	15.9
PSMAJ20A	PSMAJ20CA	17.1	19.0	21.0	1	5	27.7	14.4
PSMAJ22A	PSMAJ22CA	18.8	20.9	23.1	1	5	30.6	13.1
PSMAJ24A	PSMAJ24CA	20.5	22.8	25.2	1	5	33.2	12.0
PSMAJ27A	PSMAJ27CA	23.1	25.7	28.4	1	5	37.5	10.7
PSMAJ30A	PSMAJ30CA	25.6	28.5	31.5	1	5	41.4	9.7
PSMAJ33A	PSMAJ33CA	28.2	31.4	34.7	1	5	45.7	8.8
PSMAJ36A	PSMAJ36CA	30.8	34.2	37.8	1	5	49.9	8.0
PSMAJ39A	PSMAJ39CA	33.3	37.1	41.0	1	5	53.9	7.4
PSMAJ43A	PSMAJ43CA	36.8	40.9	45.2	1	5	59.3	6.7
PSMAJ47A	PSMAJ47CA	40.2	44.7	49.4	1	5	64.8	6.2
PSMAJ51A	PSMAJ51CA	43.6	48.5	53.6	1	5	70.1	5.7
PSMAJ56A	PSMAJ56CA	47.8	53.2	58.8	1	5	77.0	5.2
PSMAJ62A	PSMAJ62CA	53.0	58.9	65.1	1	5	85.0	4.7
PSMAJ68A	PSMAJ68CA	58.1	64.6	71.4	1	5	92.0	4.3
PSMAJ75A	PSMAJ75CA	64.7	71.3	78.8	1	5	103.0	3.9
PSMAJ82A	PSMAJ82CA	70.1	77.9	86.1	1	5	113.0	3.5
PSMAJ91A	PSMAJ91CA	77.8	86.5	95.6	1	5	125.0	3.2
PSMAJ100A	PSMAJ100CA	85.5	95.0	105.0	1	5	137.0	2.9
PSMAJ110A	PSMAJ110CA	94.0	105.0	116.1	1	5	152.0	2.6
PSMAJ120A	PSMAJ120CA	102.0	114.0	126.0	1	5	165.0	2.4

T/S



## SMA

## Transient Voltage Suppressor

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It				Max. Reverse Leakage @VR	Max. Clamping Voltage @Ipp	Max. Peak Pulse Current
			VR (V)	Min (V)	Max (V)	It (mA)			
PSMAJ130A	PSMAJ130CA	111.0	124.0	137.1	1	5	179.0	2.2	
PSMAJ150A	PSMAJ150CA	128.0	143.0	158.1	1	5	207.0	1.9	
PSMAJ160A	PSMAJ160CA	136.0	152.0	168.0	1	5	219.0	1.8	
PSMAJ170A	PSMAJ170CA	145.0	162.0	179.1	1	5	234.0	1.7	
PSMAJ180A	PSMAJ180CA	154.0	171.0	189.0	1	5	246.0	1.6	
PSMAJ200A	PSMAJ200CA	171.0	190.0	210.0	1	5	274.0	1.5	



**SMA**

**Transient Voltage Suppressor**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Clamping Voltage @Ipp	Max. Peak Pulse Current
			VR (V)	Min (V)	Max (V)			
PSMAJ220A	**PSMAJ220CA	185.0	209.0	231.0	1	5	328.0	1.2
PSMAJ250A	**PSMAJ250CA	214.0	237.0	262.0	1	5	344.0	1.2
PSMAJ300A	PSMAJ300CA	256.0	285.0	315.0	1	5	414.0	1.0
PSMAJ350A	PSMAJ350CA	300.0	332.0	367.0	1	5	482.0	0.83
PSMAJ400A	PSMAJ400CA	342.0	380.0	420.0	1	5	548.0	0.73
PSMAJ440A	PSMAJ440CA	376.0	418.0	462.0	1	5	600.0	0.67

**NOTES :**

1. Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device.
2. For Bi-Directional devices having VR of 10 volts and under, the IR limit is doubled .
3. For Uni-Directional devices PSMAJ6.8 to PSMAJ200A, VFmax = 3.5V at IF=25A 300us square wave pulse.  
For Uni-Directional devices PSMAJ220 to PSMAJ400A, VFmax = 5.0V at IF=25A 300us square wave pulse.

\*\* : Under Development



## SMB

## Transient Voltage Suppressor

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			VR (V)	Min (V)	Max (V)			
PSMBJ6.8A	PSMBJ6.8CA	5.8	6.45	7.13	10	1000	57.1	10.5
PSMBJ7.5A	PSMBJ7.5CA	6.4	7.13	7.88	10	500	53.1	11.3
PSMBJ8.2A	PSMBJ8.2CA	7.0	7.79	8.61	10	200	49.6	12.1
PSMBJ9.1A	PSMBJ9.1CA	7.8	8.65	9.56	1	50	44.8	13.4
PSMBJ10A	PSMBJ10CA	8.6	9.50	10.50	1	10	41.4	14.5
PSMBJ11A	PSMBJ11CA	9.4	10.5	11.6	1	5	38.5	15.6
PSMBJ12A	PSMBJ12CA	10.2	11.4	12.6	1	5	35.9	16.7
PSMBJ13A	PSMBJ13CA	11.1	12.4	13.7	1	5	33.0	18.2
PSMBJ15A	PSMBJ15CA	12.8	14.3	15.8	1	5	28.3	21.2
PSMBJ16A	PSMBJ16CA	13.6	15.2	16.8	1	5	26.7	22.5
PSMBJ18A	PSMBJ18CA	15.3	17.1	18.9	1	5	23.8	25.2
PSMBJ20A	PSMBJ20CA	17.1	19.0	21.0	1	5	21.7	27.7
PSMBJ22A	PSMBJ22CA	18.8	20.9	23.1	1	5	19.6	30.6
PSMBJ24A	PSMBJ24CA	20.5	22.8	25.2	1	5	18.1	33.2
PSMBJ27A	PSMBJ27CA	23.1	25.7	28.4	1	5	16.0	37.5
PSMBJ30A	PSMBJ30CA	25.6	28.5	31.5	1	5	14.5	41.4
PSMBJ33A	PSMBJ33CA	28.2	31.4	34.7	1	5	13.1	45.7
PSMBJ36A	PSMBJ36CA	30.8	34.2	37.8	1	5	12.0	49.9
PSMBJ39A	PSMBJ39CA	33.3	37.1	41.0	1	5	11.1	53.9
PSMBJ43A	PSMBJ43CA	36.8	40.9	45.2	1	5	10.1	59.3
PSMBJ47A	PSMBJ47CA	40.2	44.7	49.4	1	5	9.3	64.8
PSMBJ51A	PSMBJ51CA	43.6	48.5	53.6	1	5	8.6	70.1
PSMBJ56A	PSMBJ56CA	47.8	53.2	58.8	1	5	7.8	77.0
PSMBJ62A	PSMBJ62CA	53.0	58.9	65.1	1	5	7.1	85.0
PSMBJ68A	PSMBJ68CA	58.1	64.6	71.4	1	5	6.5	92.0
PSMBJ75A	PSMBJ75CA	64.7	71.3	78.8	1	5	5.8	103.0
PSMBJ82A	PSMBJ82CA	70.1	77.9	86.1	1	5	5.3	113.0
PSMBJ91A	PSMBJ91CA	77.8	86.5	95.6	1	5	4.8	125.0
PSMBJ100A	PSMBJ100CA	85.5	95.0	105.0	1	5	4.4	137.0
PSMBJ110A	PSMBJ110CA	94.0	105.0	116.1	1	5	3.9	152.0
PSMBJ120A	PSMBJ120CA	102.0	114.0	126.0	1	5	3.6	165.0



**SMB**

**Transient Voltage Suppressor**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			VR (V)	Min (V)	Max (V)			
PSMBJ130A	PSMBJ130CA	111.0	124.0	137.1	1	5	3.4	179.0
PSMBJ150A	PSMBJ150CA	128.0	143.0	158.1	1	5	2.9	207.0
PSMBJ160A	PSMBJ160CA	136.0	152.0	168.0	1	5	2.7	219.0
PSMBJ170A	PSMBJ170CA	145.0	162.0	179.1	1	5	2.6	234.0
PSMBJ180A	PSMBJ180CA	154.0	171.0	189.0	1	5	2.4	246.0
PSMBJ200A	PSMBJ200CA	171.0	190.0	210.0	1	5	2.2	274.0
PSMBJ220A	PSMBJ220CA	185.0	209.0	231.0	1	5	1.8	328.0
PSMBJ250A	PSMBJ250CA	214.0	237.0	262.0	1	5	1.7	344.0
PSMBJ300A	PSMBJ300CA	256.0	285.0	315.0	1	5	1.4	414.0
PSMBJ350A	PSMBJ350CA	300.0	332.0	367.0	1	5	1.2	482.0
PSMBJ400A	PSMBJ400CA	342.0	380.0	420.0	1	5	1.1	548.0
PSMBJ440A	PSMBJ440CA	376.0	418.0	462.0	1	5	1.0	600.0

**NOTES :**

- Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device.
  - For bidirectional devices having VR of 10 volts and under, the IR limit is doubled .
- \*\* : Under Development



## SMC

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			VR (V)	Min (V)	Max (V)			
PSMCJ6.8A	PSMCJ6.8CA	5.8	6.45	7.13	10	1000	142.9	10.5
PSMCJ7.5A	PSMCJ7.5CA	6.4	7.13	7.88	10	500	132.7	11.3
PSMCJ8.2A	PSMCJ8.2CA	7.0	7.79	8.61	10	200	124.0	12.1
PSMCJ9.1A	PSMCJ9.1CA	7.8	8.65	9.56	1	50	111.9	13.4
PSMCJ10A	PSMCJ10CA	8.6	9.50	10.50	1	10	103.4	14.5
PSMCJ11A	PSMCJ11CA	9.4	10.5	11.6	1	5	96.2	15.6
PSMCJ12A	PSMCJ12CA	10.2	11.4	12.6	1	5	89.8	16.7
PSMCJ13A	PSMCJ13CA	11.1	12.4	13.7	1	5	82.4	18.2
PSMCJ15A	PSMCJ15CA	12.8	14.3	15.8	1	5	70.8	21.2
PSMCJ16A	PSMCJ16CA	13.6	15.2	16.8	1	5	66.7	22.5
PSMCJ18A	PSMCJ18CA	15.3	17.1	18.9	1	5	59.5	25.2
PSMCJ20A	PSMCJ20CA	17.1	19.0	21.0	1	5	54.2	27.7
PSMCJ22A	PSMCJ22CA	18.8	20.9	23.1	1	5	49.0	30.6
PSMCJ24A	PSMCJ24CA	20.5	22.8	25.2	1	5	45.2	33.2
PSMCJ27A	PSMCJ27CA	23.1	25.7	28.4	1	5	40.0	37.5
PSMCJ30A	PSMCJ30CA	25.6	28.5	31.5	1	5	36.2	41.4
PSMCJ33A	PSMCJ33CA	28.2	31.4	34.7	1	5	32.8	45.7
PSMCJ36A	PSMCJ36CA	30.8	34.2	37.8	1	5	30.1	49.9
PSMCJ39A	PSMCJ39CA	33.3	37.1	41.0	1	5	27.8	53.9
PSMCJ43A	PSMCJ43CA	36.8	40.9	45.2	1	5	25.3	59.3
PSMCJ47A	PSMCJ47CA	40.2	44.7	49.4	1	5	23.1	64.8
PSMCJ51A	PSMCJ51CA	43.6	48.5	53.6	1	5	21.4	70.1
PSMCJ56A	PSMCJ56CA	47.8	53.2	58.8	1	5	19.5	77.0
PSMCJ62A	PSMCJ62CA	53.0	58.9	65.1	1	5	17.6	85.0
PSMCJ68A	PSMCJ68CA	58.1	64.6	71.4	1	5	16.3	92.0
PSMCJ75A	PSMCJ75CA	64.7	71.3	78.8	1	5	14.6	103.0
PSMCJ82A	PSMCJ82CA	70.1	77.9	86.1	1	5	13.3	113.0
PSMCJ91A	PSMCJ91CA	77.8	86.5	95.6	1	5	12.0	125.0
PSMCJ100A	PSMCJ100CA	85.5	95.0	105.0	1	5	10.9	137.0
PSMCJ110A	PSMCJ110CA	94.0	105.0	116.1	1	5	9.9	152.0
PSMCJ120A	PSMCJ120CA	102.0	114.0	126.0	1	5	9.1	165.0



**SMC**

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			VR (V)	Min (V)	Max (V)			
PSMCJ130A	PSMCJ130CA	111.0	124.0	137.1	1	5	8.4	179.0
PSMCJ150A	PSMCJ150CA	128.0	143.0	158.1	1	5	7.2	207.0
PSMCJ160A	PSMCJ160CA	136.0	152.0	168.0	1	5	6.8	219.0
PSMCJ170A	PSMCJ170CA	145.0	162.0	179.1	1	5	6.4	234.0
PSMCJ180A	PSMCJ180CA	154.0	171.0	189.0	1	5	6.1	246.0
PSMCJ200A	PSMCJ200CA	171.0	190.0	210.0	1	5	5.5	274.0
PSMCJ220A	*PSMCJ220CA	185.0	209.0	231.0	1	5	4.6	328.0
PSMCJ250A	PSMCJ250CA	214.0	237.0	262.0	1	5	4.4	344.0
* PSMCJ300A	* PSMCJ300CA	256.0	285.0	315.0	1	5	3.6	414.0
* PSMCJ350A	* PSMCJ350CA	300.0	332.0	367.0	1	5	3.1	482.0
* PSMCJ400A	* PSMCJ400CA	342.0	380.0	420.0	1	5	2.7	548.0
* PSMCJ440A	* PSMCJ440CA	376.0	418.0	462.0	1	5	2.5	600.0

**NOTES:**

1. Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device.
  2. For bidirectional devices having VR of 10 volts and under, the IR limit is doubled .
  3. For unidirectional devices PSMCJ6.8A to PSMCJ200A, VFmax = 3.5V at IF = 100A 300us square wave pulse.
- \*\* : Under Development



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FILE# E219635

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
3.0SMCJ5.0A	3.0SMCJ5.0CA	5.0	6.40	7.07	10	1000	326.1	9.2
#3.0SMCJ5.0A6	N/A	5.0	6.40	7.07	10	1000	326.1	9.2
3.0SMCJ6.0A	3.0SMCJ6.0CA	6.0	6.67	7.37	10	1000	291.3	10.3
3.0SMCJ6.5A	3.0SMCJ6.5CA	6.5	7.22	7.98	10	500	267.9	11.2
3.0SMCJ7.0A	3.0SMCJ7.0CA	7.0	7.78	8.60	10	200	250.0	12.0
3.0SMCJ7.5A	3.0SMCJ7.5CA	7.5	8.33	9.21	1	100	232.6	12.9
3.0SMCJ8.0A	3.0SMCJ8.0CA	8.0	8.89	9.83	1	50	220.6	13.6
3.0SMCJ8.5A	3.0SMCJ8.5CA	8.5	9.44	10.43	1	25	208.3	14.4
3.0SMCJ9.0A	3.0SMCJ9.0CA	9.0	10.00	11.05	1	10	194.8	15.4
3.0SMCJ10A	3.0SMCJ10CA	10.0	11.10	12.27	1	5	176.5	17.0
3.0SMCJ11A	3.0SMCJ11CA	11.0	12.2	13.5	1	5	164.8	18.2
3.0SMCJ12A	3.0SMCJ12CA	12.0	13.3	14.7	1	5	150.8	19.9
3.0SMCJ13A	3.0SMCJ13CA	13.0	14.4	15.9	1	5	139.5	21.5
3.0SMCJ14A	3.0SMCJ14CA	14.0	15.6	17.2	1	5	129.3	23.2
3.0SMCJ15A	3.0SMCJ15CA	15.0	16.7	18.5	1	5	124.0	24.2
3.0SMCJ16A	3.0SMCJ16CA	16.0	17.8	19.7	1	5	115.4	26.0
3.0SMCJ17A	3.0SMCJ17CA	17.0	18.9	20.9	1	5	108.7	27.6
3.0SMCJ18A	3.0SMCJ18CA	18.0	20.0	22.1	1	5	102.7	29.2
3.0SMCJ20A	3.0SMCJ20CA	20.0	22.2	24.5	1	5	92.6	32.4
#3.0SMCJ20A6	N/A	20.0	22.2	24.5	1	5	92.6	32.4
3.0SMCJ22A	3.0SMCJ22CA	22.0	24.4	27.0	1	5	84.5	35.5



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FILE# E219635

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**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
3.0SMCJ24A	3.0SMCJ24CA	24.0	26.7	29.5	1	5	77.1	38.9
#3.0SMCJ24A6	N/A	24.0	26.7	29.5	1	5	77.1	38.9
3.0SMCJ26A	3.0SMCJ26CA	26.0	28.9	31.9	1	5	71.3	42.1
3.0SMCJ28A	3.0SMCJ28CA	28.0	31.1	34.4	1	5	66.1	45.4
#3.0SMCJ28A6	N/A	28.0	31.1	34.4	1	5	66.1	45.4
3.0SMCJ30A	3.0SMCJ30CA	30.0	33.3	36.8	1	5	62.0	48.4
3.0SMCJ33A	3.0SMCJ33CA	33.0	36.7	40.6	1	5	56.3	53.3
3.0SMCJ36A	3.0SMCJ36CA	36.0	40.0	44.2	1	5	51.6	58.1
3.0SMCJ40A	3.0SMCJ40CA	40.0	44.4	49.1	1	5	46.5	64.5
3.0SMCJ43A	3.0SMCJ43CA	43.0	47.8	52.8	1	5	43.2	69.4
3.0SMCJ45A	3.0SMCJ45CA	45.0	50.0	55.3	1	5	41.3	72.7
3.0SMCJ48A	3.0SMCJ48CA	48.0	53.3	58.9	1	5	38.8	77.4
3.0SMCJ51A	3.0SMCJ51CA	51.0	56.7	62.7	1	5	36.4	82.4
3.0SMCJ54A	3.0SMCJ54CA	54.0	60.0	66.3	1	5	34.4	87.1
3.0SMCJ58A	3.0SMCJ58CA	58.0	64.4	71.2	1	5	32.1	93.6
3.0SMCJ60A	3.0SMCJ60CA	60.0	66.7	73.7	1	5	31.0	96.8
3.0SMCJ64A	3.0SMCJ64CA	64.0	71.1	78.6	1	5	29.1	103.0
3.0SMCJ70A	3.0SMCJ70CA	70.0	77.8	86.0	1	5	26.5	113.0
3.0SMCJ75A	3.0SMCJ75CA	75.0	83.3	92.1	1	5	24.8	121.0
3.0SMCJ78A	3.0SMCJ78CA	78.0	86.7	95.8	1	5	23.8	126.0
3.0SMCJ85A	3.0SMCJ85CA	85.0	94.4	104.3	1	5	21.9	137.0
3.0SMCJ90A	3.0SMCJ90CA	90.0	100.0	110.5	1	5	20.5	146.0



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FILE# E219635

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It				Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)	It (mA)			
3.0SMCJ100A	3.0SMCJ100CA	100.0	111.0	122.7	1	5	18.5	162.0	
3.0SMCJ110A	3.0SMCJ110CA	110.0	122.0	134.8	1	5	16.9	177.0	
3.0SMCJ120A	3.0SMCJ120CA	120.0	133.0	147.0	1	5	15.5	193.0	
3.0SMCJ130A	3.0SMCJ130CA	130.0	144.0	159.2	1	5	14.4	209.0	
3.0SMCJ150A	3.0SMCJ150CA	150.0	167.0	184.6	1	5	12.3	243.0	
3.0SMCJ160A	3.0SMCJ160CA	160.0	178.0	196.7	1	5	11.6	259.0	
3.0SMCJ170A	3.0SMCJ170CA	170.0	189.0	208.9	1	5	10.9	275.0	
3.0SMCJ180A	3.0SMCJ180CA	180.0	198.0	218.8	1	5	10.3	292.0	
3.0SMCJ190A	3.0SMCJ190CA	190.0	209.0	231.0	1	5	9.7	308.0	
3.0SMCJ200A	3.0SMCJ200CA	200.0	220.0	243.2	1	5	9.3	324.0	
3.0SMCJ210A	3.0SMCJ210CA	210.0	231.0	255.3	1	5	8.8	340.0	
3.0SMCJ220A	3.0SMCJ220CA	220.0	242.0	267.5	1	5	8.4	356.0	

### NOTES:

- Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device, no suffix denotes 10% tolerance device.
- For Bi-Directional devices having VR of 10 volts and under, the IR limit is doubled.
- Mark "#" denote that comply IEC 61000-4-5 Severity levels, 6KV. For data lines requiring a 42Ω source impedance, the short-circuit current waveform is defined as 8/20us.



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FILE# E219635

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It				Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)	It (mA)			
4.0SMCJ5.0A	4.0SMCJ5.0CA	5.0	6.40	7.07	10	1000	434.8	9.2	
4.0SMCJ6.0A	4.0SMCJ6.0CA	6.0	6.67	7.37	10	1000	388.3	10.3	
4.0SMCJ6.5A	4.0SMCJ6.5CA	6.5	7.22	7.98	10	500	357.1	11.2	
4.0SMCJ7.0A	4.0SMCJ7.0CA	7.0	7.78	8.60	10	200	333.3	12.0	
4.0SMCJ7.5A	4.0SMCJ7.5CA	7.5	8.33	9.21	1	100	310.1	12.9	
4.0SMCJ8.0A	4.0SMCJ8.0CA	8.0	8.89	9.83	1	50	294.1	13.6	
4.0SMCJ8.5A	4.0SMCJ8.5CA	8.5	9.44	10.43	1	25	277.8	14.4	
4.0SMCJ9.0A	4.0SMCJ9.0CA	9.0	10.00	11.05	1	10	259.7	15.4	
4.0SMCJ10A	4.0SMCJ10CA	10.0	11.10	12.27	1	2	235.3	17.0	
4.0SMCJ11A	4.0SMCJ11CA	11.0	12.2	13.5	1	2	219.8	18.2	
4.0SMCJ12A	4.0SMCJ12CA	12.0	13.3	14.7	1	2	201.0	19.9	
4.0SMCJ13A	4.0SMCJ13CA	13.0	14.4	15.9	1	2	186.0	21.5	
4.0SMCJ14A	4.0SMCJ14CA	14.0	15.6	17.2	1	2	172.4	23.2	
4.0SMCJ15A	4.0SMCJ15CA	15.0	16.7	18.5	1	2	165.2	24.2	
4.0SMCJ16A	4.0SMCJ16CA	16.0	17.8	19.7	1	2	153.8	26.0	
4.0SMCJ17A	4.0SMCJ17CA	17.0	18.9	20.9	1	2	144.9	27.6	
4.0SMCJ18A	4.0SMCJ18CA	18.0	20.0	22.1	1	2	137.0	29.2	
4.0SMCJ20A	4.0SMCJ20CA	20.0	22.2	24.5	1	2	123.5	32.4	
4.0SMCJ22A	4.0SMCJ22CA	22.0	24.4	27.0	1	2	112.7	35.5	
4.0SMCJ24A	4.0SMCJ24CA	22.0	24.4	27.0	1	2	102.8	38.9	
4.0SMCJ26A	4.0SMCJ26CA	22.0	24.4	27.0	1	2	95.0	42.1	
4.0SMCJ28A	4.0SMCJ28CA	28.0	31.1	34.4	1	2	88.1	45.4	
4.0SMCJ30A	4.0SMCJ30CA	30.0	33.3	36.8	1	2	82.6	48.4	
4.0SMCJ33A	4.0SMCJ33CA	33.0	36.7	40.6	1	2	75.0	53.3	
4.0SMCJ36A	4.0SMCJ36CA	36.0	40.0	44.2	1	2	68.8	58.1	
4.0SMCJ40A	4.0SMCJ40CA	40.0	44.4	49.1	1	2	62.0	64.5	
4.0SMCJ43A	4.0SMCJ43CA	43.0	47.8	52.8	1	2	57.6	69.4	
4.0SMCJ45A	4.0SMCJ45CA	45.0	50.0	55.3	1	2	55.0	72.7	
4.0SMCJ48A	4.0SMCJ48CA	48.0	53.3	58.9	1	2	51.7	77.4	
4.0SMCJ51A	4.0SMCJ51CA	51.0	56.7	62.7	1	2	48.5	82.4	

**NOTES:**

1. Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device, no suffix denotes 10% tolerance device .
2. For Bi-Directional devices having VR of 10 volts and under, the IR limit is doubled .

\*\* : Under Development



SMC

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
5.0SMDJ12A	5.0SMDJ12CA	12.0	13.3	14.7	10	800	251.3	19.9
5.0SMDJ13A	5.0SMDJ13CA	13.0	14.4	15.9	10	500	232.6	21.5
5.0SMDJ14A	5.0SMDJ14CA	14.0	15.6	17.2	10	200	215.5	23.2
5.0SMDJ15A	5.0SMDJ15CA	15.0	16.7	18.5	1	100	204.9	24.4
5.0SMDJ16A	5.0SMDJ16CA	16.0	17.8	19.7	1	50	192.3	26.0
5.0SMDJ17A	5.0SMDJ17CA	17.0	18.9	20.9	1	20	181.2	27.6
5.0SMDJ18A	5.0SMDJ18CA	18.0	20.0	22.1	1	10	171.2	29.2
5.0SMDJ19A	5.0SMDJ19CA	19.0	21.1	23.3	1	10	162.4	30.8
5.0SMDJ20A	5.0SMDJ20CA	20.0	22.2	24.5	1	5	154.3	32.4
5.0SMDJ22A	5.0SMDJ22CA	22.0	24.4	27.0	1	5	140.8	35.5
5.0SMDJ24A	5.0SMDJ24CA	24.0	26.7	29.5	1	5	128.5	38.9
5.0SMDJ26A	5.0SMDJ26CA	26.0	28.9	31.9	1	5	118.8	42.1
5.0SMDJ28A	5.0SMDJ28CA	28.0	31.1	34.4	1	5	110.1	45.4
5.0SMDJ30A	5.0SMDJ30CA	30.0	33.3	36.8	1	5	103.3	48.4
5.0SMDJ33A	5.0SMDJ33CA	33.0	36.7	40.6	1	5	93.8	53.3
5.0SMDJ36A	5.0SMDJ36CA	36.0	40.0	44.2	1	5	96.1	58.1
5.0SMDJ40A	5.0SMDJ40CA	40.0	44.4	49.1	1	5	77.5	64.5
5.0SMDJ43A	5.0SMDJ43CA	43.0	47.8	52.8	1	5	72.0	69.4
5.0SMDJ45A	5.0SMDJ45CA	45.0	50.0	55.3	1	5	68.8	72.7
5.0SMDJ48A	5.0SMDJ48CA	48.0	53.3	58.9	1	5	64.6	77.4
5.0SMDJ51A	5.0SMDJ51CA	51.0	56.7	62.7	1	5	60.7	82.4
5.0SMDJ54A	5.0SMDJ54CA	54.0	60.0	66.3	1	5	57.4	87.1
5.0SMDJ58A	5.0SMDJ58CA	58.0	64.4	71.2	1	5	53.4	93.6
5.0SMDJ60A	5.0SMDJ60CA	60.0	66.7	73.7	1	5	51.7	96.8
5.0SMDJ64A	5.0SMDJ64CA	64.0	71.1	78.6	1	5	48.5	103.0
5.0SMDJ70A	5.0SMDJ70CA	70.0	77.8	86.0	1	5	44.2	113.0
5.0SMDJ75A	5.0SMDJ75CA	75.0	83.3	92.1	1	5	41.3	121.0
5.0SMDJ78A	5.0SMDJ78CA	78.0	86.7	95.8	1	5	39.7	126.0
5.0SMDJ80A	5.0SMDJ80CA	80.0	88.8	97.5	1	5	38.6	129.6
5.0SMDJ85A	5.0SMDJ85CA	85.0	94.4	104.3	1	5	36.5	137.0
5.0SMDJ90A	5.0SMDJ90CA	90.0	100.0	110.5	1	5	34.2	146.0
5.0SMDJ100A	5.0SMDJ100CA	100.0	111.0	122.7	1	5	30.9	162.0

## NOTES:

1. Suffix 'A' denotes 5% tolerance device, no suffix denotes 10% tolerance device .

\*\* : Under Development



**SMB FLAT**

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at V <sub>RWM</sub>	Maximum Reverse Surge Current	Maximum Reverse Voltage at I <sub>RSM</sub> (Clamping Voltage)
			V <sub>RWM</sub> (Volts)	Min.	Max.			
SMBT5.0A	N/A	5.0	6.40	7.07	10	800	65.2	9.2
SMBT6.0A	N/A	6.0	6.67	7.37	1	800	58.3	10.3
SMBT6.5A	N/A	6.5	7.22	7.98	1	500	53.6	11.2
SMBT7.0A	N/A	7.0	7.78	8.60	1	200	50.0	12.0
SMBT7.5A	N/A	7.5	8.33	9.21	1	100	46.5	12.9
SMBT8.0A	N/A	8.0	8.89	9.83	1	50.0	44.1	13.6
SMBT8.5A	N/A	8.5	9.44	10.4	1	20.0	41.7	14.4
SMBT9.0A	N/A	9.0	10.0	11.1	1	10.0	39.0	15.4
SMBT10A	N/A	10.0	11.1	12.3	1	5.0	35.3	17.0
SMBT11A	N/A	11.0	12.2	13.5	1	5.0	33.0	18.2
SMBT12A	N/A	12.0	13.3	14.7	1	5.0	30.2	19.9
SMBT13A	N/A	13.0	14.4	15.9	1	5.0	27.9	21.5
SMBT14A	N/A	14.0	15.6	17.2	1	5.0	25.8	23.2
SMBT15A	N/A	15.0	16.7	18.5	1	5.0	24.0	24.4
SMBT16A	N/A	16.0	17.8	19.7	1	5.0	23.1	26.0
SMBT17A	N/A	17.0	18.9	20.9	1	5.0	21.7	27.6
SMBT18A	N/A	18.0	20.0	22.1	1	5.0	20.5	29.2
SMBT20A	N/A	20.0	22.2	24.5	1	5.0	18.5	32.4
SMBT22A	N/A	22.0	24.4	27.0	1	5.0	16.9	35.5
SMBT24A	N/A	24.0	26.7	29.5	1	5.0	15.4	38.9



U.L. RECOGNIZED  
FILE# E219635

DO-41

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			VR (V)	Min (V)	Max (V)			
<b>AXIAL LEAD TVS</b>								
P4KE6.8A	P4KE6.8CA	5.8	6.45	7.13	10	1000	38.1	10.5
P4KE7.5A	P4KE7.5CA	6.4	7.13	7.88	10	500	35.4	11.3
P4KE8.2A	P4KE8.2CA	7.0	7.79	8.61	10	200	33.1	12.1
P4KE9.1A	P4KE9.1CA	7.8	8.65	9.56	1	50	29.9	13.4
P4KE10A	P4KE10CA	8.6	9.50	10.50	1	10	27.6	14.5
P4KE11A	P4KE11CA	9.4	10.5	11.6	1	5	25.6	15.6
P4KE12A	P4KE12CA	10.2	11.4	12.6	1	5	24.0	16.7
P4KE13A	P4KE13CA	11.1	12.4	13.7	1	5	22.0	18.2
P4KE15A	P4KE15CA	12.8	14.3	15.8	1	5	18.9	21.2
P4KE16A	P4KE16CA	13.6	15.2	16.8	1	5	17.8	22.5
P4KE18A	P4KE18CA	15.3	17.1	18.9	1	5	15.9	25.2
P4KE20A	P4KE20CA	17.1	19.0	21.0	1	5	14.4	27.7
P4KE22A	P4KE22CA	18.8	20.9	23.1	1	5	13.1	30.6
P4KE24A	P4KE24CA	20.5	22.8	25.2	1	5	12.0	33.2
P4KE27A	P4KE27CA	23.1	25.7	28.4	1	5	10.7	37.5
P4KE30A	P4KE30CA	25.6	28.5	31.5	1	5	9.7	41.4
P4KE33A	P4KE33CA	28.2	31.4	34.7	1	5	8.8	45.7
P4KE36A	P4KE36CA	30.8	34.2	37.8	1	5	8.0	49.9
P4KE39A	P4KE39CA	33.3	37.1	41.0	1	5	7.4	53.9
P4KE43A	P4KE43CA	36.8	40.9	45.2	1	5	6.7	59.3
P4KE47A	P4KE47CA	40.2	44.7	49.4	1	5	6.2	64.8
P4KE51A	P4KE51CA	43.6	48.5	53.6	1	5	5.7	70.1
P4KE56A	P4KE56CA	47.8	53.2	58.8	1	5	5.2	77.0
P4KE62A	P4KE62CA	53.0	58.9	65.1	1	5	4.7	85.0
P4KE68A	P4KE68CA	58.1	64.6	71.4	1	5	4.3	92.0
P4KE75A	P4KE75CA	64.7	71.3	78.8	1	5	3.9	103.0
P4KE82A	P4KE82CA	70.1	77.9	86.1	1	5	3.5	113.0
P4KE91A	P4KE91CA	77.8	86.5	95.6	1	5	3.2	125.0
P4KE100A	P4KE100CA	85.5	95.0	105.0	1	5	2.9	137.0
P4KE110A	P4KE110CA	94.0	105.0	116.1	1	5	2.6	152.0



U.L. RECOGNIZED  
FILE# E219635

DO-41

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			VR (V)	Min (V)	Max (V)			
P4KE120A	P4KE120CA	102.0	114.0	126.0	1	5	2.4	165.0
P4KE130A	P4KE130CA	111.0	124.0	137.1	1	5	2.2	179.0
P4KE150A	P4KE150CA	128.0	143.0	158.1	1	5	1.9	207.0
P4KE160A	P4KE160CA	136.0	152.0	168.0	1	5	1.8	219.0
P4KE170A	P4KE170CA	145.0	162.0	179.1	1	5	1.7	234.0
P4KE180A	P4KE180CA	154.0	171.0	189.0	1	5	1.6	246.0
P4KE200A	P4KE200CA	171.0	190.0	210.0	1	5	1.5	274.0
P4KE220A	P4KE220CA	185.0	209.0	231.0	1	5	1.3	328.0
P4KE250A	P4KE250CA	214.0	237.0	262.0	1	5	1.2	344.0



DO-41



## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			VR (V)	Min (V)	Max (V)			
P4KE300A	P4KE300CA	256.0	285.0	315.0	1	5	1.0	414.0
P4KE350A	P4KE350CA	300.0	332.0	367.0	1	5	0.83	482.0
P4KE400A	P4KE400CA	342.0	380.0	420.0	1	5	0.73	548.0
P4KE440A	P4KE440CA	376.0	418.0	462.0	1	5	0.67	600.0

### NOTE:

- Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device .
- For Bi-Directional devices having VR of 10 volts and under, the IR limit is doubled .



U.L. RECOGNIZED  
FILE# E219635

DO-15

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
P6KE6.8A	P6KE6.8CA	5.8	6.45	7.13	10	1000	57.1	10.5
P6KE7.5A	P6KE7.5CA	6.4	7.13	7.88	10	500	53.1	11.3
P6KE8.2A	P6KE8.2CA	7.0	7.79	8.61	10	200	49.6	12.1
P6KE9.1A	P6KE9.1CA	7.8	8.65	9.56	1	50	44.8	13.4
P6KE10A	P6KE10CA	8.6	9.50	10.50	1	10	41.4	14.5
P6KE11A	P6KE11CA	9.4	10.5	11.6	1	5	38.5	15.6
P6KE12A	P6KE12CA	10.2	11.4	12.6	1	5	35.9	16.7
P6KE13A	P6KE13CA	11.1	12.4	13.7	1	5	33.0	18.2
P6KE15A	P6KE15CA	12.8	14.3	15.8	1	5	28.3	21.2
P6KE16A	P6KE16CA	13.6	15.2	16.8	1	5	26.7	22.5
P6KE18A	P6KE18CA	15.3	17.1	18.9	1	5	23.8	25.2
P6KE20A	P6KE20CA	17.1	19.0	21.0	1	5	21.7	27.7
P6KE22A	P6KE22CA	18.8	20.9	23.1	1	5	19.6	30.6
P6KE24A	P6KE24CA	20.5	22.8	25.2	1	5	18.1	33.2
P6KE27A	P6KE27CA	23.1	25.7	28.4	1	5	16.0	37.5
P6KE30A	P6KE30CA	25.6	28.5	31.5	1	5	14.5	41.4
P6KE33A	P6KE33CA	28.2	31.4	34.7	1	5	13.1	45.7
P6KE36A	P6KE36CA	30.8	34.2	37.8	1	5	12.0	49.9
P6KE39A	P6KE39CA	33.3	37.1	41.0	1	5	11.1	53.9
P6KE43A	P6KE43CA	36.8	40.9	45.2	1	5	10.1	59.3
P6KE47A	P6KE47CA	40.2	44.7	49.4	1	5	9.3	64.8
P6KE51A	P6KE51CA	43.6	48.5	53.6	1	5	8.6	70.1
P6KE56A	P6KE56CA	47.8	53.2	58.8	1	5	7.8	77.0
P6KE62A	P6KE62CA	53.0	58.9	65.1	1	5	7.1	85.0
P6KE68A	P6KE68CA	58.1	64.6	71.4	1	5	6.5	92.0
P6KE75A	P6KE75CA	64.7	71.3	78.8	1	5	5.8	103.0
P6KE82A	P6KE82CA	70.1	77.9	86.1	1	5	5.3	113.0
P6KE91A	P6KE91CA	77.8	86.5	95.6	1	5	4.8	125.0
P6KE100A	P6KE100CA	85.5	95.0	105.0	1	5	4.4	137.0
P6KE110A	P6KE110CA	94.0	105.0	116.1	1	5	3.9	152.0
P6KE120A	P6KE120CA	102.0	114.0	126.0	1	5	3.6	165.0

T/S



DO-15



U.L. RECOGNIZED

FILE# E219635

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
P6KE130A	P6KE130CA	111.0	124.0	137.1	1	5	3.4	179.0
P6KE150A	P6KE150CA	128.0	143.0	158.1	1	5	2.9	207.0
P6KE160A	P6KE160CA	136.0	152.0	168.0	1	5	2.7	219.0
P6KE170A	P6KE170CA	145.0	162.0	179.1	1	5	2.6	234.0
P6KE180A	P6KE180CA	154.0	171.0	189.0	1	5	2.4	246.0
P6KE200A	P6KE200CA	171.0	190.0	210.0	1	5	2.2	274.0
P6KE220A	P6KE220CA	185.0	209.0	231.0	1	5	1.8	328.0
P6KE250A	P6KE250CA	214.0	237.0	262.0	1	5	1.7	344.0
P6KE300A	P6KE300CA	256.0	285.0	315.0	1	5	1.4	414.0



U.L. RECOGNIZED  
FILE# E219635

DO-15

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
P6KS300A	P6KS300CA	256.0	285.0	315.0	1	5	1.4	414.0
P6KE350A	P6KE350CA	300.0	332.0	367.0	1	5	1.2	482.0
P6KS350A	P6KS350CA	300.0	332.0	367.0	1	5	1.2	482.0
P6KE400A	P6KE400CA	342.0	380.0	420.0	1	5	1.1	548.0
P6KS400A	P6KS400CA	342.0	380.0	420.0	1	5	1.1	548.0
P6KE440A	P6KE440CA	376.0	418.0	462.0	1	5	1.0	600.0
P6KS440A	P6KS440CA	376.0	418.0	462.0	1	5	1.0	600.0
P6KS480A	P6KS480CA	408.0	456.0	504.0	1	5	0.91	658.0
P6KE550A	P6KE550CA	467.5	522.5	577.5	1	4	0.80	753.5

**NOTES:**

1. Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device .
2. For Bi-Directional devices having VR of 10 volts and under, the IR limit is doubled .



U.L. RECOGNIZED  
FILE# E219635

DO-15

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
EP6KE6.8A	EP6KE6.8CA	5.8	6.45	7.13	10	1000	57.1	10.5
EP6KE7.5A	EP6KE7.5CA	6.4	7.13	7.88	10	500	53.1	11.3
EP6KE8.2A	EP6KE8.2CA	7.0	7.79	8.61	10	200	49.6	12.1
EP6KE9.1A	EP6KE9.1CA	7.8	8.65	9.56	1	50	44.8	13.4
EP6KE10A	EP6KE10CA	8.6	9.50	10.50	1	10	41.4	14.5
EP6KE11A	EP6KE11CA	9.4	10.5	11.6	1	5	38.5	15.6
EP6KE12A	EP6KE12CA	10.2	11.4	12.6	1	5	35.9	16.7
EP6KE13A	EP6KE13CA	11.1	12.4	13.7	1	5	33.0	18.2
EP6KE15A	EP6KE15CA	12.8	14.3	15.8	1	5	28.3	21.2
EP6KE16A	EP6KE16CA	13.6	15.2	16.8	1	5	26.7	22.5
EP6KE18A	EP6KE18CA	15.3	17.1	18.9	1	5	23.8	25.2
EP6KE20A	EP6KE20CA	17.1	19.0	21.0	1	5	21.7	27.7
EP6KE22A	EP6KE22CA	18.8	20.9	23.1	1	5	19.6	30.6
EP6KE24A	EP6KE24CA	20.5	22.8	25.2	1	5	18.1	33.2
EP6KE27A	EP6KE27CA	23.1	25.7	28.4	1	5	16.0	37.5
EP6KE30A	EP6KE30CA	25.6	28.5	31.5	1	5	14.5	41.4
EP6KE33A	EP6KE33CA	28.2	31.4	34.7	1	5	13.1	45.7
EP6KE36A	EP6KE36CA	30.8	34.2	37.8	1	5	12.0	49.9
EP6KE39A	EP6KE39CA	33.3	37.1	41.0	1	5	11.1	53.9
EP6KE43A	EP6KE43CA	36.8	40.9	45.2	1	5	10.1	59.3
EP6KE47A	EP6KE47CA	40.2	44.7	49.4	1	5	9.3	64.8
EP6KE51A	EP6KE51CA	43.6	48.5	53.6	1	5	8.6	70.1
EP6KE56A	EP6KE56CA	47.8	53.2	58.8	1	5	7.8	77.0
EP6KE62A	EP6KE62CA	53.0	58.9	65.1	1	5	7.1	85.0
EP6KE68A	EP6KE68CA	58.1	64.6	71.4	1	5	6.5	92.0
EP6KE75A	EP6KE75CA	64.7	71.3	78.8	1	5	5.8	103.0
EP6KE82A	EP6KE82CA	70.1	77.9	86.1	1	5	5.3	113.0
EP6KE91A	EP6KE91CA	77.8	86.5	95.6	1	5	4.8	125.0
EP6KE100A	EP6KE100CA	85.5	95.0	105.0	1	5	4.4	137.0
EP6KE110A	EP6KE110CA	94.0	105.0	116.1	1	5	3.9	152.0
EP6KE120A	EP6KE120CA	102.0	114.0	126.0	1	5	3.6	165.0



U.L. RECOGNIZED  
FILE# E219635

DO-15

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR IR (uA)	Max. Peak Pulse Current Ipp (A)	Max. Clamping Voltage @Ipp Vc (V)
			VR (V)	Min (V)	Max (V)			
EP6KE130A	EP6KE130CA	111.0	124.0	137.1	1	5	3.4	179.0
EP6KE150A	EP6KE150CA	128.0	143.0	158.1	1	5	2.9	207.0
EP6KE160A	EP6KE160CA	136.0	152.0	168.0	1	5	2.7	219.0
EP6KE170A	EP6KE170CA	145.0	162.0	179.1	1	5	2.6	234.0
EP6KE180A	EP6KE180CA	154.0	171.0	189.0	1	5	2.4	246.0
EP6KE200A	EP6KE200CA	171.0	190.0	210.0	1	5	2.2	274.0
EP6KE220A	EP6KE220CA	185.0	209.0	231.0	1	5	1.8	328.0
EP6KE250A	EP6KE250CA	214.0	237.0	262.0	1	5	1.7	344.0
EP6KE300A	EP6KE300CA	256.0	285.0	315.0	1	5	1.4	414.0



DO-15



U.L. RECOGNIZED  
FILE# E219635

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
EP6KE350A	EP6KE350CA	300.0	332.0	367.0	1	5	1.2	482.0
EP6KE400A	EP6KE400CA	342.0	380.0	420.0	1	5	1.1	548.0
EP6KE440A	EP6KE440CA	376.0	418.0	462.0	1	5	1.0	600.0

### NOTES:

- Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device .
- For Bi-Directional devices having VR of 10 volts and under, the IR limit is doubled .



U.L. RECOGNIZED  
FILE# E219635

DO-201

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
1.5KE6.8A	1.5KE6.8CA	5.8	6.45	7.13	10	1000	142.9	10.5
1.5KE7.5A	1.5KE7.5CA	6.4	7.13	7.88	10	500	132.7	11.3
1.5KE8.2A	1.5KE8.2CA	7.0	7.79	8.61	10	200	124.0	12.1
1.5KE9.1A	1.5KE9.1CA	7.8	8.65	9.56	1	50	111.9	13.4
1.5KE10A	1.5KE10CA	8.6	9.50	10.50	1	10	103.4	14.5
1.5KE11A	1.5KE11CA	9.4	10.5	11.6	1	5	96.2	15.6
1.5KE12A	1.5KE12CA	10.2	11.4	12.6	1	5	89.8	16.7
1.5KE13A	1.5KE13CA	11.1	12.4	13.7	1	5	82.4	18.2
1.5KE15A	1.5KE15CA	12.8	14.3	15.8	1	5	70.8	21.2
1.5KE16A	1.5KE16CA	13.6	15.2	16.8	1	5	66.7	22.5
1.5KE18A	1.5KE18CA	15.3	17.1	18.9	1	5	59.5	25.2
1.5KE20A	1.5KE20CA	17.1	19.0	21.0	1	5	54.2	27.7
1.5KE22A	1.5KE22CA	18.8	20.9	23.1	1	5	49.0	30.6
1.5KE24A	1.5KE24CA	20.5	22.8	25.2	1	5	45.2	33.2
1.5KE27A	1.5KE27CA	23.1	25.7	28.4	1	5	40.0	37.5
1.5KE30A	1.5KE30CA	25.6	28.5	31.5	1	5	36.2	41.4
1.5KE33A	1.5KE33CA	28.2	31.4	34.7	1	5	32.8	45.7
1.5KE36A	1.5KE36CA	30.8	34.2	37.8	1	5	30.1	49.9
1.5KE39A	1.5KE39CA	33.3	37.1	41.0	1	5	27.8	53.9
1.5KE43A	1.5KE43CA	36.8	40.9	45.2	1	5	25.3	59.3
1.5KE47A	1.5KE47CA	40.2	44.7	49.4	1	5	23.1	64.8
1.5KE51A	1.5KE51CA	43.6	48.5	53.6	1	5	21.4	70.1
1.5KE56A	1.5KE56CA	47.8	53.2	58.8	1	5	19.5	77.0
1.5KE62A	1.5KE62CA	53.0	58.9	65.1	1	5	17.6	85.0
1.5KE68A	1.5KE68CA	58.1	64.6	71.4	1	5	16.3	92.0
1.5KE75A	1.5KE75CA	64.7	71.3	78.8	1	5	14.6	103.0
1.5KE82A	1.5KE82CA	70.1	77.9	86.1	1	5	13.3	113.0
1.5KE91A	1.5KE91CA	77.8	86.5	95.6	1	5	12.0	125.0
1.5KE100A	1.5KE100CA	85.5	95.0	105.0	1	5	10.9	137.0
1.5KE110A	1.5KE110CA	94.0	105.0	116.1	1	5	9.9	152.0
1.5KE120A	1.5KE120CA	102.0	114.0	126.0	1	5	9.1	165.0

T/S



U.L. RECOGNIZED  
FILE# E219635

DO-201

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @V <sub>R</sub>	Max. Peak Pulse Current	Max. Clamping Voltage @I <sub>pp</sub>
			V <sub>R</sub> (V)	Min (V)	Max (V)			
1.5KE130A	1.5KE130CA	111.0	124.0	137.1	1	5	8.4	179.0
1.5KE150A	1.5KE150CA	128.0	143.0	158.1	1	5	7.2	207.0
1.5KE160A	1.5KE160CA	136.0	152.0	168.0	1	5	6.8	219.0
1.5KE170A	1.5KE170CA	145.0	162.0	179.1	1	5	6.4	234.0
1.5KE180A	1.5KE180CA	154.0	171.0	189.0	1	5	6.1	246.0
1.5KE200A	1.5KE200CA	171.0	190.0	210.0	1	5	5.5	274.0
1.5KE220A	1.5KE220CA	185.0	209.0	231.0	1	5	4.6	328.0
1.5KE250A	1.5KE250CA	214.0	237.0	262.0	1	5	4.4	344.0
1.5KE300A	1.5KE300CA	256.0	285.0	315.0	1	5	3.6	414.0



U.L. RECOGNIZED  
FILE# E219635

DO-201

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
1.5KE350A	1.5KE350CA	300.0	332.0	367.0	1	5	3.1	482.0
1.5KE400A	1.5KE400CA	342.0	380.0	420.0	1	5	2.7	548.0
1.5KE440A	1.5KE440CA	376.0	418.0	462.0	1	5	2.5	600.0
1.5KS300A	1.5KS300CA	256.0	285.0	315.0	1	5	3.6	414.0
1.5KE350A	1.5KS350CA	300.0	332.0	367.0	1	5	3.1	482.0
1.5KS400A	1.5KS400CA	342.0	380.0	420.0	1	5	2.7	548.0
1.5KS440A	1.5KS440CA	376.0	418.0	462.0	1	5	2.5	600.0

**NOTES:**

1. Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device.
2. For Bi-Directional devices having VR of 10 volts and under, the IR limit is doubled.



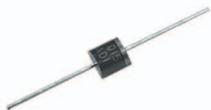
R-6



U.L. RECOGNIZED  
FILE# E219635

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
3KP5.0	3KP5.0C	5.0	6.40	7.82	10	1000	312.5	9.6
3KP5.0A	3KP5.0CA	5.0	6.40	7.07	10	1000	326.1	9.2
3KP6.0	3KP6.0C	6.0	6.67	8.15	10	1000	263.2	11.4
3KP6.0A	3KP6.0CA	6.0	6.67	7.37	10	1000	291.3	10.3
3KP6.5	3KP6.5C	6.5	7.22	8.82	10	500	243.9	12.3
3KP6.5A	3KP6.5CA	6.5	7.22	7.98	10	500	267.9	11.2
3KP7.0	3KP7.0C	7.0	7.78	9.51	10	200	225.6	13.3
3KP7.0A	3KP7.0CA	7.0	7.78	8.60	10	200	250.0	12.0
3KP7.5	3KP7.5C	7.5	8.33	10.18	1	100	209.8	14.3
3KP7.5A	3KP7.5CA	7.5	8.33	9.21	1	100	232.6	12.9
3KP8.0	3KP8.0C	8.0	8.89	10.86	1	50	200.0	15.0
3KP8.0A	3KP8.0CA	8.0	8.89	9.83	1	50	220.6	13.6
3KP8.5	3KP8.5C	8.5	9.44	11.54	1	25	188.7	15.9
3KP8.5A	3KP8.5CA	8.5	9.44	10.43	1	25	208.3	14.4
3KP9.0	3KP9.0C	9.0	10.00	12.22	1	10	177.5	16.9
3KP9.0A	3KP9.0CA	9.0	10.00	11.05	1	10	194.8	15.4
3KP10	3KP10C	10.0	11.10	13.56	1	5	159.6	18.8
3KP10A	3KP10CA	10.0	11.10	12.27	1	5	176.5	17.0
3KP11	3KP11C	11.0	12.2	14.9	1	5	149.3	20.1
3KP11A	3KP11CA	11.0	12.2	13.5	1	5	164.8	18.2
3KP12	3KP12C	12.0	13.3	16.3	1	5	136.4	22.0
3KP12A	3KP12CA	12.0	13.3	14.7	1	5	150.8	19.9
3KP13	3KP13C	13.0	14.4	17.6	1	5	126.1	23.8
3KP13A	3KP13CA	13.0	14.4	15.9	1	5	139.5	21.5
3KP14	3KP14C	14.0	15.6	19.1	1	5	116.3	25.8
3KP14A	3KP14CA	14.0	15.6	17.2	1	5	129.3	23.2
3KP15	3KP15C	15.0	16.7	20.4	1	5	111.5	26.9
3KP15A	3KP15CA	15.0	16.7	18.5	1	5	124.0	24.2
3KP16	3KP16C	16.0	17.8	21.8	1	5	104.2	28.8
3KP16A	3KP16CA	16.0	17.8	19.7	1	5	115.4	26.0
3KP17	3KP17C	17.0	18.9	23.1	1	5	98.4	30.5



R-6



U.L. RECOGNIZED  
FILE# E219635

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
3KP17A	3KP17CA	17.0	18.9	20.9	1	5	108.7	27.6
3KP18	3KP18C	18.0	20.0	24.4	1	5	93.2	32.2
3KP18A	3KP18CA	18.0	20.0	22.1	1	5	102.7	29.2
3KP20	3KP20C	20.0	22.2	27.1	1	5	83.8	35.8
3KP20A	3KP20CA	20.0	22.2	24.5	1	5	92.6	32.4
3KP22	3KP22C	22.0	24.4	29.8	1	5	76.1	39.4
3KP22A	3KP22CA	22.0	24.4	27.0	1	5	84.5	35.5
3KP24	3KP24C	24.0	26.7	32.6	1	5	69.8	43.0
3KP24A	3KP24CA	24.0	26.7	29.5	1	5	77.1	38.9



U.L. RECOGNIZED  
FILE# E219635

R-6

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current Ipp (A)	Max. Clamping Voltage @Ipp
			Min (V)	Max (V)	It (mA)			
3KP26	3KP26C	26.0	28.9	35.3	1	5	64.4	46.6
3KP26A	3KP26CA	26.0	28.9	31.9	1	5	71.3	42.1
3KP28	3KP28C	28.0	31.1	38.0	1	5	60.0	50.0
3KP28A	3KP28CA	28.0	31.1	34.4	1	5	66.1	45.4
3KP30	3KP30C	30.0	33.3	40.7	1	5	56.1	53.5
3KP30A	3KP30CA	30.0	33.3	36.8	1	5	62.0	48.4
3KP33	3KP33C	33.0	36.7	44.8	1	5	50.8	59.0
3KP33A	3KP33CA	33.0	36.7	40.6	1	5	56.3	53.3
3KP36	3KP36C	36.0	40.0	48.9	1	5	46.7	64.3
3KP36A	3KP36CA	36.0	40.0	44.2	1	5	51.6	58.1
3KP40	3KP40C	40.0	44.4	54.3	1	5	42.0	71.4
3KP40A	3KP40CA	40.0	44.4	49.1	1	5	46.5	64.5
3KP43	3KP43C	43.0	47.8	58.4	1	5	39.1	76.7
3KP43A	3KP43CA	43.0	47.8	52.8	1	5	43.2	69.4
3KP45	3KP45C	45.0	50.0	61.1	1	5	37.4	80.3
3KP45A	3KP45CA	45.0	50.0	55.3	1	5	41.3	72.7
3KP48	3KP48C	48.0	53.3	65.1	1	5	35.1	85.5
3KP48A	3KP48CA	48.0	53.3	58.9	1	5	38.8	77.4
3KP51	3KP51C	51.0	56.7	69.3	1	5	32.9	91.1
3KP51A	3KP51CA	51.0	56.7	62.7	1	5	36.4	82.4
3KP54	3KP54C	54.0	60.0	73.3	1	5	31.2	96.3
3KP54A	3KP54CA	54.0	60.0	66.3	1	5	34.4	87.1
3KP58	3KP58C	58.0	64.4	78.7	1	5	29.1	103.0
3KP58A	3KP58CA	58.0	64.4	71.2	1	5	32.1	93.6
3KP60	3KP60C	60.0	66.7	81.5	1	5	28.0	107.0
3KP60A	3KP60CA	60.0	66.7	73.7	1	5	31.0	96.8
3KP64	3KP64C	64.0	71.1	86.9	1	5	26.3	114.0
3KP64A	3KP64CA	64.0	71.1	78.6	1	5	29.1	103.0
3KP70	3KP70C	70.0	77.8	95.1	1	5	24.0	125.0
3KP70A	3KP70CA	70.0	77.8	86.0	1	5	26.5	113.0
3KP75	3KP75C	75.0	83.3	101.8	1	5	22.4	134.0



R-6

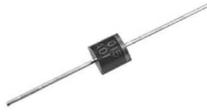


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FILE# E219635

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
		V <sub>R</sub> (V)	Min (V)	Max (V)	It (mA)	IR (uA)	Ipp (A)	Vc (V)
3KP75A	3KP75CA	75.0	83.3	92.1	1	5	24.8	121.0
3KP78	3KP78C	78.0	86.7	105.9	1	5	21.6	139.0
3KP78A	3KP78CA	78.0	86.7	95.8	1	5	23.8	126.0
3KP85	3KP85C	85.0	94.4	115.4	1	5	19.9	151.0
3KP85A	3KP85CA	85.0	94.4	104.3	1	5	21.9	137.0
3KP90	3KP90C	90.0	100.0	122.2	1	5	18.8	160.0
3KP90A	3KP90CA	90.0	100.0	110.5	1	5	20.5	146.0
3KP100	3KP100C	100.0	111.0	135.6	1	5	16.8	179.0
3KP100A	3KP100CA	100.0	111.0	122.7	1	5	18.5	162.0



R-6



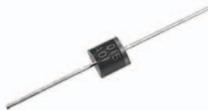
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FILE# E219635

## Transient Voltage Suppressor (continued)

Device Uni-directional	Device Bi-directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
3KP110	3KP110C	110.0	122.0	149.1	1	5	15.3	196.0
3KP110A	3KP110CA	110.0	122.0	134.8	1	5	16.9	177.0
3KP120	3KP120C	120.0	133.0	162.5	1	5	14.0	214.0
3KP120A	3KP120CA	120.0	133.0	147.0	1	5	15.5	193.0
3KP130	3KP130C	130.0	144.0	176.0	1	5	13.0	231.0
3KP130A	3KP130CA	130.0	144.0	159.2	1	5	14.4	209.0
3KP150	3KP150C	150.0	167.0	204.1	1	5	11.2	268.0
3KP150A	3KP150CA	150.0	167.0	184.6	1	5	12.3	243.0
3KP160	3KP160C	160.0	178.0	217.5	1	5	10.5	287.0
3KP160A	3KP160CA	160.0	178.0	196.7	1	5	11.6	259.0
3KP170	3KP170C	170.0	189.0	231.0	1	5	9.9	304.0
3KP170A	3KP170CA	170.0	189.0	208.9	1	5	10.9	275.0
3KP180	3KP180C	180.0	198.0	242.0	1	5	9.3	322.0
3KP180A	3KP180CA	180.0	198.0	218.8	1	5	10.3	292.0
3KP190	3KP190C	190.0	209.0	255.4	1	5	8.8	340.0
3KP190A	3KP190CA	190.0	209.0	231.0	1	5	9.7	308.0
3KP200	3KP200C	200.0	220.0	268.8	1	5	8.4	358.0
3KP200A	3KP200CA	200.0	220.0	243.2	1	5	9.3	324.0
3KP210	3KP210C	210.0	231.0	282.3	1	5	8.0	376.0
3KP210A	3KP210CA	210.0	231.0	255.3	1	5	8.8	340.0
3KP220	3KP220C	220.0	242.0	295.7	1	5	7.6	394.0
3KP220A	3KP220CA	220.0	242.0	267.5	1	5	8.4	356.0

### NOTES:

1. Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device, no suffix denotes 10% tolerance device .
2. For bidirectional devices having VR of 10 volts and under, the IR limit is doubled .



U.L. RECOGNIZED  
FILE# E219635

R-6

**Transient Voltage Suppressor (continued)**

Device Uni-directional	Device Bi-directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
5KP5.0	5KP5.0C	5.0	6.40	7.82	50	5000	520.8	9.6
5KP5.0A	5KP5.0CA	5.0	6.40	7.07	50	5000	543.5	9.2
5KP6.0	5KP6.0C	6.0	6.67	8.15	50	5000	438.6	11.4
5KP6.0A	5KP6.0CA	6.0	6.67	7.37	50	5000	485.4	10.3
5KP6.5	5KP6.5C	6.5	7.22	8.82	50	2000	406.5	12.3
5KP6.5A	5KP6.5CA	6.5	7.22	7.98	50	2000	446.4	11.2
5KP7.0	5KP7.0C	7.0	7.78	9.51	50	1000	375.9	13.3
5KP7.0A	5KP7.0CA	7.0	7.78	8.60	50	1000	416.7	12.0
5KP7.5	5KP7.5C	7.5	8.33	10.18	5.0	250	349.7	14.3
5KP7.5A	5KP7.5CA	7.5	8.33	9.21	5.0	250	387.6	12.9
5KP8.0	5KP8.0C	8.0	8.89	10.86	5.0	150	333.3	15.0
5KP8.0A	5KP8.0CA	8.0	8.89	9.83	5.0	150	367.6	13.6
5KP8.5	5KP8.5C	8.5	9.44	11.54	5.0	50	314.5	15.9
5KP8.5A	5KP8.5CA	8.5	9.44	10.43	5.0	50	347.2	14.4
5KP9.0	5KP9.0C	9.0	10.00	12.22	5.0	20	295.9	16.9
5KP9.0A	5KP9.0CA	9.0	10.00	11.05	5.0	20	324.7	15.4
5KP10	5KP10C	10.0	11.10	13.56	5.0	15	266.0	18.8
5KP10A	5KP10CA	10.0	11.10	12.27	5.0	15	294.1	17.0
5KP11	5KP11C	11.0	12.2	14.9	5.0	10	248.8	20.1
5KP11A	5KP11 CA	11.0	12.2	13.5	5.0	10	274.7	18.2
5KP12	5KP12C	12.0	13.3	16.3	5.0	10	227.3	22.0
5KP12A	5KP12CA	12.0	13.3	14.7	5.0	10	251.3	19.9
5KP13	5KP13C	13.0	14.4	17.6	5.0	10	210.1	23.8
5KP13A	5KP13CA	13.0	14.4	15.9	5.0	10	232.6	21.5
5KP14	5KP14C	14.0	15.6	19.1	5.0	10	193.8	25.8
5KP14A	5KP14CA	14.0	15.6	17.2	5.0	10	215.5	23.2
5KP15	5KP15C	15.0	16.7	20.4	5.0	10	185.9	26.9
5KP15A	5KP15CA	15.0	16.7	18.5	5.0	10	206.6	24.2
5KP16	5KP16C	16.0	17.8	21.8	5.0	10	173.6	28.8
5KP16A	5KP16CA	16.0	17.8	19.7	5.0	10	192.3	26.0
5KP17	5KP17C	17.0	18.9	23.1	5.0	10	163.9	30.5

T/S



R-6



U.L. RECOGNIZED  
FILE# E219635

## Transient Voltage Suppressor (continued)

Device Uni-directional	Device Bi-directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
5KP17A	5KP17CA	17.0	18.9	20.9	5.0	10	181.2	27.6
5KP18	5KP18C	18.0	20.0	24.4	5.0	10	155.3	32.2
5KP18A	5KP18CA	18.0	20.0	22.1	5.0	10	171.2	29.2
5KP20	5KP20C	20.0	22.2	27.1	5.0	10	139.7	35.8
5KP20A	5KP20CA	20.0	22.2	24.5	5.0	10	154.3	32.4
5KP22	5KP22C	22.0	24.4	29.8	5.0	10	126.9	39.4
5KP22A	5KP22CA	22.0	24.4	27.0	5.0	10	140.8	35.5
5KP24	5KP24C	24.0	26.7	32.6	5.0	10	116.3	43.0
5KP24A	5KP24CA	24.0	26.7	29.5	5.0	10	128.5	38.9



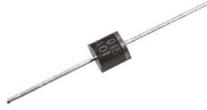
U.L. RECOGNIZED  
FILE# E219635

R-6

**Transient Voltage Suppressor (continued)**

Device Uni-directional	Device Bi-directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
5KP26	5KP26C	26.0	28.9	35.3	5.0	10	107.3	46.6
5KP26A	5KP26CA	26.0	28.9	31.9	5.0	10	118.8	42.1
5KP28	5KP28C	28.0	31.1	38.0	5.0	10	100.0	50.0
5KP28A	5KP28CA	28.0	31.1	34.4	5.0	10	110.1	45.4
5KP30	5KP30C	30.0	33.3	40.7	5.0	10	93.5	53.5
5KP30A	5KP30CA	30.0	33.3	36.8	5.0	10	103.3	48.4
5KP33	5KP33C	33.0	36.7	44.8	5.0	10	84.7	59.0
5KP33A	5KP33CA	33.0	36.7	40.6	5.0	10	93.8	53.3
5KP36	5KP36C	36.0	40.0	48.9	5.0	10	77.8	64.3
5KP36A	5KP36CA	36.0	40.0	44.2	5.0	10	86.1	58.1
5KP40	5KP40C	40.0	44.4	54.3	5.0	10	70.0	71.4
5KP40A	5KP40CA	40.0	44.4	49.1	5.0	10	77.5	64.5
5KP43	5KP43C	43.0	47.8	58.4	5.0	10	65.2	76.7
5KP43A	5KP43CA	43.0	47.8	52.8	5.0	10	72.0	69.4
5KP45	5KP45C	45.0	50.0	61.1	5.0	10	62.3	80.3
5KP45A	5KP45CA	45.0	50.0	55.3	5.0	10	68.8	72.7
5KP48	5KP48C	48.0	53.3	65.1	5.0	10	58.5	85.5
5KP48A	5KP48CA	48.0	53.3	58.9	5.0	10	64.6	77.4
5KP51	5KP51 C	51.0	56.7	69.3	5.0	10	54.9	91.1
5KP51A	5KP51 CA	51.0	56.7	62.7	5.0	10	60.7	82.4
5KP54	5KP54C	54.0	60.0	73.3	5.0	10	51.9	96.3
5KP54A	5KP54CA	54.0	60.0	66.3	5.0	10	57.4	87.1
5KP58	5KP58C	58.0	64.4	78.7	5.0	10	48.5	103.0
5KP58A	5KP58CA	58.0	64.4	71.2	5.0	10	53.4	93.6
5KP60	5KP60C	60.0	66.7	81.5	5.0	10	46.7	107.0
5KP60A	5KP60CA	60.0	66.7	73.7	5.0	10	51.7	96.8
5KP64	5KP64C	64.0	71.1	86.9	5.0	10	43.9	114.0
5KP64A	5KP64CA	64.0	71.1	78.6	5.0	10	48.5	103.0
5KP70	5KP70C	70.0	77.8	95.1	5.0	10	40.0	125.0
5KP70A	5KP70CA	70.0	77.8	86.0	5.0	10	44.2	113.0

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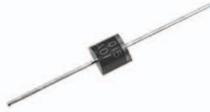


U.L. RECOGNIZED  
FILE# E219635

R-6

## Transient Voltage Suppressor (continued)

Device Uni-directional	Device Bi-directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			VR (V)	Min (V)	Max (V)			
5KP75	5KP75C	75.0	83.3	101.8	5.0	10	37.3	134.0
5KP75A	5KP75A	75.0	83.3	92.1	5.0	10	41.3	121.0
5KP78	5KP78C	78.0	86.7	105.9	5.0	10	36.0	139.0
5KP78A	5KP78CA	78.0	86.7	95.8	5.0	10	39.7	126.0
5KP85	5KP85C	85.0	94.4	115.4	5.0	10	33.1	151.0
5KP85A	5KP85CA	85.0	94.4	104.3	5.0	10	36.5	137.0
5KP90	5KP90C	90.0	100.0	122.2	5.0	10	31.3	160.0
5KP90A	5KP90CA	90.0	100.0	110.5	5.0	10	34.2	146.0
5KP100	5KP100C	100.0	111.0	135.6	5.0	10	27.9	179.0
5KP110	5KP110C	110.0	122.0	149.1	5.0	10	25.5	196.0



U.L. RECOGNIZED  
FILE# E219635

R-6

**Transient Voltage Suppressor (continued)**

Device Uni-directional	Device Bi-directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @I <sub>t</sub>			Max. Reverse Leakage @V <sub>R</sub>	Max. Peak Pulse Current	Max. Clamping Voltage @I <sub>pp</sub>
			V <sub>R</sub> (V)	Min (V)	Max (V)			
5KP120	5KP120C	120.0	133.0	162.5	5.0	10	23.4	214.0
5KP150	5KP150C	150.0	167.0	204.1	5.0	10	18.7	268.0
5KP180	N/A	180.0	198.0	242.0	5.0	10	15.5	322.0

**NOTES:**

1. Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device, no suffix denotes 10% tolerance device .
2. For Bi-Directional devices having V<sub>R</sub> of 10 volts and under, the I<sub>R</sub> limit is doubled .



U.L. RECOGNIZED  
FILE# E219635

R-6

## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
15KP17A	15KP17CA	17.0	18.9	20.9	50	5000	511.9	29.3
15KP18A	15KP18CA	18.0	20.0	22.1	50	5000	485.4	30.9
15KP20A	15KP20CA	20.0	22.2	24.5	20	1500	437.3	34.3
15KP22A	15KP22CA	22.0	24.4	27.0	10	500	404.3	37.1
15KP24A	15KP24CA	24.0	26.7	29.5	5	150	370.4	40.5
15KP26A	15KP26CA	26.0	28.9	31.9	5	50	340.9	44.0
15KP28A	15KP28CA	28.0	31.1	34.4	5	25	315.8	47.5
15KP30	15KP30C	30.0	33.3	40.7	5	15	280.4	53.5
15KP30A	15KP30CA	30.0	33.3	36.8	5	15	309.9	48.4
15KP33	15KP33C	33.0	36.7	44.8	5	10	247.5	60.6
15KP33A	15KP33CA	33.0	36.7	40.6	5	10	273.7	54.8
15KP36	15KP36C	36.0	40.0	48.9	5	10	233.3	64.3
15KP36A	15KP36CA	36.0	40.0	44.2	5	10	258.2	58.1
15KP40	15KP40C	40.0	44.4	54.3	5	10	210.1	71.4
15KP40A	15KP40CA	40.0	44.4	49.1	5	10	232.6	64.5
15KP43	15KP43C	43.0	47.8	58.4	5	10	195.6	76.7
15KP43A	15KP43CA	43.0	47.8	52.8	5	10	216.1	69.4
15KP45	15KP45C	45.0	50.0	61.1	5	10	186.8	80.3
15KP45A	15KP45CA	45.0	50.0	55.3	5	10	206.3	72.7
15KP48	15KP48	48.0	53.3	65.1	5	10	175.4	85.5
15KP48A	15KP48CA	48.0	53.3	58.9	5	10	193.8	77.4
15KP51	15KP51	51.0	56.7	69.3	5	10	164.7	91.1
15KP51A	15KP51CA	51.0	56.7	62.7	5	10	182.0	82.4
15KP54	15KP54C	54.0	60.0	73.3	5	10	155.8	96.3
15KP54A	15KP54CA	54.0	60.0	66.3	5	10	172.2	87.1
15KP58	15KP58C	58.0	64.4	78.7	5	10	145.6	103.0
15KP58A	15KP58CA	58.0	64.4	71.2	5	10	160.3	93.6
15KP60	15KP60C	60.0	66.7	81.5	5	10	140.2	107.0
15KP60A	15KP60CA	60.0	66.7	73.7	5	10	155.0	96.8
15KP64	15KP64C	64.0	71.1	86.9	5	10	131.6	114.0
15KP64A	15KP64CA	64.0	71.1	78.6	5	10	145.6	103.0



R-6



U.L. RECOGNIZED  
FILE# E219635

**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
15KP70	15KP70C	70.0	77.8	95.1	5	10	120.0	125.0
15KP70A	15KP70CA	70.0	77.8	86.0	5	10	132.7	113.0
15KP75	15KP75C	75.0	83.3	101.8	5	10	111.9	134.0
15KP75A	15KP75CA	75.0	83.3	92.1	5	10	124.0	121.0
15KP78	15KP78C	78.0	86.7	105.9	5	10	107.9	139.0
15KP78A	15KP78CA	78.0	86.7	95.8	5	10	119.0	126.0
15KP85	15KP85C	85.0	94.4	115.4	5	10	99.3	151.0
15KP85A	15KP85CA	85.0	94.4	104.3	5	10	109.5	137.0
15KP90	15KP90C	90.0	100.0	122.2	5	10	93.8	160.0
15KP90A	15KP90CA	90.0	100.0	110.5	5	10	102.7	146.0



U.L. RECOGNIZED  
FILE# E219635

R-6

## Transient Voltage Suppressor (continued)

Device Uni-directional	Device Bi-directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
15KP100	15KP100C	100.0	111.0	135.6	5	10	83.8	179.0
15KP110	15KP110C	110.0	122.0	149.1	5	10	76.5	196.0
15KP120	15KP120C	120.0	133.0	162.5	5	10	70.1	214.0
15KP130	15KP130C	130.0	144.0	176.0	5	10	64.9	231.0
15KP150	15KP150C	150.0	167.0	204.1	5	10	56.0	268.0
15KP160	*15KP160C	160.0	178.0	217.5	5	10	52.3	287.0
15KP170	*15KP170C	170.0	189.0	231.0	5	10	49.3	304.0
15KP180	*15KP180C	180.0	200.0	242.0	5	10	46.6	322.0
15KP200	*15KP200C	200.0	222.0	268.8	5	10	41.9	358.0

### NOTES:

1. Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device, no suffix denotes 10% tolerance device .

\*\* : Under Development





## ESD ARRAY

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## ESD Protection Device

ESD是代表英文ElectroStatic Discharge 即"靜電放電"的意思。ESD是中期以來形成的以研究靜電的產生與衰減、靜電放電模型、靜電放電效流熱（火花）效應（如靜電引起的著火與爆炸）及和電磁效應（如電磁等的學科。

近年來隨著科學技術的飛速發展、微電子技術的廣泛應用及電磁環境趨雜，對靜電放電的電磁場效應如電磁干擾（EMI）及電磁相容性（EMC）來越重視。靜電放電(ESD)保護需求正隨著若干關鍵技術趨勢而改變。速介面會影響訊號完整性；而微縮的製程也會使下一代IC更容易受到ES響。敦南科技 ESD保護二極體及陣列/EMI濾波器，可提供電子系統產靜電放電（ESD）防護需求。



SOD-323      SOD-523

## Surface Mount ESD Protection Device

Part Number	Peak Power Dissipation 8x20µs	Reverse standoff voltage	Max Reverse Leakage @ VR	Max Clamping Voltage @8x20µs	Peak Pulse Current 8x20µs	Off-State Capacitance 1MHz Zero DC Bias	Package
	W	VR	IR	Vc	Ipp	Co	
	W	V	µA	V	A	pF	
L35L3V3CB2	350	3.3	5	18.5	19	0.7	SOD-323
L35L5V0CB2	350	5	5	20.6	17	0.6	SOD-323
L35L8V0CB2	350	8	2	25	14	0.6	SOD-323
L35L12VCB2	350	12	1	39	9	0.6	SOD-323
L35L15VCB2	350	15	1	41	8.5	0.6	SOD-323
L35L18VCB2	350	18	1	58	6	0.6	SOD-323
L35L24VCB2	350	24	1	74.5	4.7	0.6	SOD-323
L09ESD3V3CB2	90	3.3	0.5	18	5	15	SOD-323
L13ESD5V0CB2	130	5	0.1	14	12	45	SOD-323
L25L5V0CB2	250	5	5	21	17	3	SOD-323
L35ESD12VCB2	350	12	1	24	15	100	SOD-323
L35ESD5V0CB2	350	5	10	14.5	24	200	SOD-323
L60L5V0CB2	500	5	5	20	25	3.5	SOD-323
L03ESDL5V0CA2	30	5	0.1	15	2	3.5	SOD-523
L09ESD3V3CA2	90	3.3	0.5	18	5	15	SOD-523
L13ESD5V0CA2	130	5	0.1	14	12	45	SOD-523
L16ESD24VA2	160	24	0.05	55	3	35	SOD-523

\* : New Product      \*\* : Under Development



SOT-23



SOT-23-5L



SOT-23-6L



SOD-882



SLP0603P2

## Surface Mount ESD Filter Protection Device (continued)

Part Number	Peak Power Dissipation 8x20µs	Reverse standoff voltage	Max Reverse Leakage @ VR	Max Clamping Voltage @8x20µs	Peak Pulse Current 8x20µs	Off-State Capacitance 1MHz Zero DC Bias	Package
		VR	IR	Vc	Ipp	Co	
		V	µA	V	A	pF	
L03ESDL5V0CQ2	30	5	0.1	15	2	3.5	SLP0603P2
*L02U5V0CQ2C	20	5	1	11	1.5	0.27	SLP0603P2
**LS2U5V0CQ2C	20	5	1	8	1.5	0.27	SLP0603P2
L03ESDL5V0CE2	30	5	0.1	15	2	3.5	SOD-882
L05ESDU5V0CE2	50	5	1	12.5	4	0.6	SOD-882
L06ESDU5V0CE2	60	5	1	25	2.5	0.5	SOD-882
L09ESD3V3CE2	90	3.3	0.5	18	5	15	SOD-882
L13ESD5V0CE2	130	5	0.1	14	12	45	SOD-882
L15ESD12VE2	150	12	0.05	25	6	75	SOD-882
L15ESD24VE2	150	24	0.05	50	3	50	SOD-882
L04ESD5V0CP2	40	5	0.1	12.5	3.5	4.5	SOD-923
L06ESDL5V0H4-2	60	5	1	24	2.5	1	SOT-143
L03ESDL5V0CC3-2	30	5	0.1	15	2	3.5	SOT-23
*L05L5V0C3-2C	50	5	1	8.5	5.5	0.7	SOT-23
L09E3V3CC3-2C	90	3.3	0.5	18	5	15	SOT-23
L18ESD5V0C3-2	180	5	1	15	12	140	SOT-23
L18ESD3V3CC3-2C	180	3.3	0.5	9	20	130	SOT-23
L30ESD12VC3-2	300	12	1	25	12	100	SOT-23
L30ESD24VC3-2	300	24	1	43	4	60	SOT-23
L30ESD5V0C3-2	300	5	1	20	15	160	SOT-23
L30ESD5V0AC3-2	300	5	1	20	15	160	SOT-23
L30ESDL5V0C3-2	340	5	5	20	17	1.2	SOT-23
L13ESD5V0CC5-4	130	5	0.1	13	10	15	SOT23-5L
*L05L5V0C6-4C	50	5	1	8.5	5.5	0.7	SOT23-6L
L15ESDL5V0C6-4C	150	5	1	30	5	1.5	SOT23-6L
L30ESDL5V0C6-4C	300	5	5	25	12	5	SOT23-6L
L18ESD5V0C6-4	180	5	0.7	12	15	200	SOT23-6L
**L40L5V0C6-4C	400	5	1	16	25	3	SOT23-6L

\*: New Product

\*\*: Under Development



## Surface Mount ESD Filter Protection Device (continued)

Part Number	Peak Power Dissipation 8x20µs W	Reverse standoff voltage	Max Reverse Leakage @ VR	Max Clamping Voltage @8x20µs	Peak Pulse Current 8x20µs	Off-State Capacitance 1MHz Zero DC Bias	Package
		VR	IR	Vc	Ipp	Co	
		V	µA	V	A	pF	
L1KL2V5K8-4	1000	2.5	1	17	30	3	POWER56
L1KL3V3K8-4	1000	3.3	1	17	30	3	POWER56
L2KE3V3K8-2	2400	3.3	1	24	100	12	POWER56
L60L2V8K8-4	600	2.8	1	17	30	3	POWER56
*L05L5V0M6-4	50	5	5	6	6.5	1.1	SLP1616P6
L15ESDL5V0N6-2	150	5	1	15	5	0.4	SLP1610P4
*L05L5V0M6-4	50	5	0.1	9	6.5	1.6	SLP1616P6
*L04U3V3NA-4	40	3.3	1	22	4	0.3	SLP2510P8
*L02U5V0NA-4	20	5	1	11	1.5	0.3	SLP2510P8
L05ESDL5V0NA-4	50	5	1	10	4.5	0.8	SLP2510P8
L15ESDL5V0NA-4	150	5	1	15	5	0.8	SLP2510P8
L2KESD3V3MA-2	2500	3.3	1	25	100	25	SLP2626P10
*L02U5V0CMA-6	20	5	1	15	3	0.3	SLP4120P10
L15ESDL3V3H4-2	150	3.3	1	15	10	3	SOT-143
L45ESDL5V0H4-2C	450	5	5	9.8	25	10	SOT-143
L50ESDL12VH4-2	500	12	1	31	16	10	SOT-143
L50ESDL5V0H4-2	500	5	5	20	25	10	SOT-143
LES70VH4-2	---	70	0.5	7	24	10	SOT-143
L05ESDL5V0D3-2	50	5	1	20	2.5	0.8	SOT-323
L02ESD5V0D5-4	25	5.25	1	13	2	9.5	SOT-353
*L05L5V0D6-4	50	5	0.1	9	6.5	1.6	SOT-363
L02ESD5V0D6-5	25	5	0.025	12	2.5	19	SOT-363
L03ESDL5V0CG3-2	30	5	0.1	15	2	3.5	SOT-523

Part Number	Peak Power Dissipation 8x20 $\mu$ s	Reverse standoff voltage	Max Reverse Leakage @ VR	Max Clamping Voltage @8x20 $\mu$ s	Peak Pulse Current 8x20 $\mu$ s	Off-State Capacitance 1MHz Zero DC Bias	Package
		VR	IR	Vc	Ipp	Co	
		V	$\mu$ A	V	A	pF	
L12ESDL5V0G3-2	120	5	1	30	4	1	SOT-523
L18ESD12VA2	180	12	0.05	30	6	75	SOD-523
L26ESD5V0A2	260	5	1	17	15	140	SOD-523
L02ESD5V0F6-5	25	5	0.025	12	2.5	19	SOT-563
L05ESDL5V0F6-2	50	5	1	16	3	0.9	SOT-563

\*\* : Under Development





**AUTOMOTIVE**

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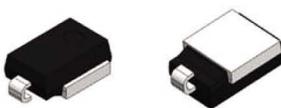


U.L. RECOGNIZED

**DO-218**

**Transient Voltage Suppressors (Power Zener Diode)**

Part Number	Breakdown Voltage		Test Current	Stand-off Voltage	Maximum Reverse Leakage at VWM	Maximum Leakage at VWM TJ = 175 °C	Max. Peak Pulse Current at 10/1000 μs	Maximum Clamping Voltage at IPPM	Package	AEC-Q 101 qualified
	VBR									
	Min. V	Max. V	IT mA	VWM V	ID μA	ID μA	Ipp A	VC V		
ALS5W10A	11.1	12.3	5.0	10.0	15.0	250.0	211.0	17.0	DO-218	V
ALS5W11A	12.2	13.5	5.0	11.0	10.0	150.0	198.0	18.2	DO-218	V
ALS5W12A	13.3	14.7	5.0	12.0	10.0	150.0	181.0	19.9	DO-218	V
ALS5W13A	14.4	15.9	5.0	13.0	10.0	150.0	167.0	21.5	DO-218	V
ALS5W14A	15.6	17.2	5.0	14.0	10.0	150.0	155.0	23.2	DO-218	V
ALS5W15A	16.7	18.5	5.0	15.0	10.0	150.0	148.0	24.4	DO-218	V
ALS5W16A	17.8	19.7	5.0	16.0	10.0	150.0	138.0	26.0	DO-218	V
ALS5W17A	18.9	20.9	5.0	17.0	10.0	150.0	130.0	27.6	DO-218	V
ALS5W18A	20.0	22.1	5.0	18.0	10.0	150.0	123.0	29.2	DO-218	V
ALS5W20A	22.2	24.5	5.0	20.0	10.0	150.0	111.0	32.4	DO-218	V
ALS5W22A	24.4	26.9	5.0	22.0	10.0	150.0	101.0	35.5	DO-218	V
ALS5W24A	26.7	29.5	5.0	24.0	10.0	150.0	93.0	38.9	DO-218	V
ALS5W26A	28.9	31.9	5.0	26.0	10.0	150.0	86.0	42.1	DO-218	V
ALS5W27A	24.0	30.0	10.0	22.0	0.2	10.0	90.0	40.0	DO-218	V
ALS5W28A	31.1	34.4	5.0	28.0	10.0	150.0	79.0	45.4	DO-218	V
ALS5W30A	33.3	36.8	5.0	30.0	10.0	150.0	74.0	48.4	DO-218	V
ALS5W33A	36.7	40.6	5.0	33.0	10.0	150.0	68.0	53.3	DO-218	V
ALS5W36A	40.0	44.2	5.0	36.0	10.0	150.0	62.0	58.1	DO-218	V
ALS5W40A	44.4	49.1	5.0	40.0	10.0	150.0	56.0	64.5	DO-218	V
ALS5W43A	47.8	52.8	5.0	43.0	10.0	150.0	52.0	69.4	DO-218	V
ALS6W10A	11.1	12.3	5.0	10.0	15.0	250.0	271.0	17.0	DO-218	V
ALS6W11A	12.2	13.5	5.0	11.0	10.0	150.0	253.0	18.2	DO-218	V
ALS6W12A	13.3	14.7	5.0	12.0	10.0	150.0	231.0	19.9	DO-218	V
ALS6W13A	14.4	15.9	5.0	13.0	10.0	150.0	214.0	21.5	DO-218	V
ALS6W14A	15.6	17.2	5.0	14.0	10.0	150.0	198.0	23.2	DO-218	V
ALS6W15A	16.7	18.5	5.0	15.0	10.0	150.0	189.0	24.4	DO-218	V
ALS6W16A	17.8	19.7	5.0	16.0	10.0	150.0	177.0	26.0	DO-218	V



**DO-218**

**Transient Voltage Suppressors (Power Zener Diode)**

Part Number	Breakdown Voltage		Test Current	Stand-off Voltage	Maximum Reverse Leakage at VWM	Maximum Leakage at VWM TJ = 175 °C	Max. Peak Pulse Current at 10/1000 μs	Maximum Clamping Voltage at IPPM	Package	AEC-Q 101 qualified
	VBR									
	Min. V	Max. V								
ALS6W17A	18.9	20.9	5.0	17.0	10.0	150.0	167.0	27.6	DO-218	V
ALS6W18A	20.0	22.1	5.0	18.0	10.0	150.0	158.0	29.2	DO-218	V
ALS6W20A	22.2	24.5	5.0	20.0	10.0	150.0	142.0	32.4	DO-218	V
ALS6W22A	24.4	26.9	5.0	22.0	10.0	150.0	130.0	35.5	DO-218	V
ALS6W24A	26.7	29.5	5.0	24.0	10.0	150.0	118.0	38.9	DO-218	V
ALS6W26A	28.9	31.9	5.0	26.0	10.0	150.0	109.0	42.1	DO-218	V
ALS6W27A	24.0	30.0	10.0	22.0	0.5	20.0	115.0	40.0	DO-218	V
ALS6W28A	31.1	34.4	5.0	28.0	10.0	150.0	101.0	45.4	DO-218	V
ALS6W30A	33.3	36.8	5.0	30.0	10.0	150.0	95.0	48.4	DO-218	V
ALS6W33A	36.7	40.6	5.0	33.0	10.0	150.0	86.0	53.3	DO-218	V
ALS6W36A	40.0	44.2	5.0	36.0	10.0	150.0	79.0	58.1	DO-218	V
ALS6W40A	44.4	49.1	5.0	40.0	10.0	150.0	71.0	64.5	DO-218	V
ALS6W43A	47.8	52.8	5.0	43.0	10.0	150.0	66.0	69.4	DO-218	V
ALS8W10A	11.1	12.3	5.0	10.0	15.0	250.0	388.0	17.0	DO-218	V
ALS8W11A	12.2	13.5	5.0	11.0	10.0	150.0	363.0	18.2	DO-218	V
ALS8W12A	13.3	14.7	5.0	12.0	10.0	150.0	332.0	19.9	DO-218	V
ALS8W13A	14.4	15.9	5.0	13.0	10.0	150.0	307.0	21.5	DO-218	V
ALS8W14A	15.6	17.2	5.0	14.0	10.0	150.0	284.0	23.2	DO-218	V
ALS8W15A	16.7	18.5	5.0	15.0	10.0	150.0	270.0	24.4	DO-218	V
ALS8W16A	17.8	19.7	5.0	16.0	10.0	150.0	254.0	26.0	DO-218	V
ALS8W17A	18.9	20.9	5.0	17.0	10.0	150.0	239.0	27.6	DO-218	V
ALS8W18A	20.0	22.1	5.0	18.0	10.0	150.0	226.0	29.2	DO-218	V
ALS8W20A	22.2	24.5	5.0	20.0	10.0	150.0	204.0	32.4	DO-218	V
ALS8W22A	24.4	26.9	5.0	22.0	10.0	150.0	188.0	35.5	DO-218	V
ALS8W24A	26.7	29.5	5.0	24.0	10.0	150.0	170.0	38.9	DO-218	V
ALS8W26A	28.9	31.9	5.0	26.0	10.0	150.0	157.0	42.1	DO-218	V
ALS8W27A	24.0	30.0	10.0	22.0	1.0	50.0	165.0	40.0	DO-218	V
ALS8W28A	31.1	34.4	5.0	28.0	10.0	150.0	145.0	45.4	DO-218	V
ALS8W30A	33.3	36.8	5.0	30.0	10.0	150.0	136.0	48.4	DO-218	V
ALS8W33A	36.7	40.6	5.0	33.0	10.0	150.0	124.0	53.3	DO-218	V
ALS8W36A	40.0	44.2	5.0	36.0	10.0	150.0	114.0	58.1	DO-218	V
ALS8W40A	44.4	49.1	5.0	40.0	10.0	150.0	102.0	64.5	DO-218	V
ALS8W43A	47.8	52.8	5.0	43.0	10.0	150.0	95.1	69.4	DO-218	V

## Standard Recovery Rectifiers(標準回覆整流器)

整流二極管因單邊導通特性，所以被用在把交流電轉為直流電的線路上。當整流二極管順向電流停止時，將會產生一短暫時間的逆向電流，從順向電流停止到逆向電流降為零的這段時間稱為逆向回覆時間，逆向回覆時間 快速恢復整流器大約1000ns 以上。



Part Number	Electrical Characteristics							Package
	VR =V <sub>R<sub>RM</sub></sub>	I <sub>FAV</sub>	I <sub>FSM</sub>	IR at VR=V <sub>R<sub>RM</sub></sub> T <sub>J</sub>		V <sub>Fmax</sub> at IF		
				25 °C	100 °C	V	A	
	V	A	A	uA	uA	V	A	
<b>Surface Mount Rectifiers ( Glass Passivated)</b>								
AS1A	50	1.0	30	5	100 <sup>1)</sup>	1.1	1	SMA
AS1B	100	1.0	30	5	100 <sup>1)</sup>	1.1	1	SMA
AS1D	200	1.0	30	5	100 <sup>1)</sup>	1.1	1	SMA
AS1G	400	1.0	30	5	100 <sup>1)</sup>	1.1	1	SMA
AS1J	600	1.0	30	5	100 <sup>1)</sup>	1.1	1	SMA
AS1K	800	1.0	30	5	100 <sup>1)</sup>	1.1	1	SMA
AS1M	1000	1.0	30	5	100 <sup>1)</sup>	1.1	1	SMA
AS2A	50	1.5	50	5	125 <sup>1)</sup>	1.15	1.5	SMB
AS2B	100	1.5	50	5	125 <sup>1)</sup>	1.15	1.5	SMB
AS2D	200	1.5	50	5	125 <sup>1)</sup>	1.15	1.5	SMB
AS2G	400	1.5	50	5	125 <sup>1)</sup>	1.15	1.5	SMB
AS2J	600	1.5	50	5	125 <sup>1)</sup>	1.15	1.5	SMB
AS2K	800	1.5	50	5	125 <sup>1)</sup>	1.15	1.5	SMB
AS2M	1000	1.5	50	5	125 <sup>1)</sup>	1.15	1.5	SMB
AS3A	50	3.0	100	10	250 <sup>1)</sup>	1.15	3	SMC
AS3B	100	3.0	100	10	250 <sup>1)</sup>	1.15	3	SMC
AS3D	200	3.0	100	10	250 <sup>1)</sup>	1.15	3	SMC
AS3G	400	3.0	100	10	250 <sup>1)</sup>	1.15	3	SMC
AS3J	600	3.0	100	10	250 <sup>1)</sup>	1.15	3	SMC
AS3K	800	3.0	100	10	250 <sup>1)</sup>	1.15	3	SMC
AS3M	1000	3.0	100	10	250 <sup>1)</sup>	1.15	3	SMC
AFS1ME	1000	1.0	30	5	500	1.1	1.0	F1A

1) T<sub>J</sub>=125 °C

2) T<sub>J</sub>=150 °C



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FILE# E219635

SMA

## Transient Voltage Suppressor

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)
			VRWM(Volts)	Min.	Max.			
ASMAJ5.0A	ASMAJ5.0CA	5.0	6.40	7.07	10	800	43.5	9.2
ASMAJ6.0A	ASMAJ6.0CA	6.0	6.67	7.37	10	800	38.8	10.3
ASMAJ6.5A	ASMAJ6.5CA	6.5	7.22	7.98	10	500	35.7	11.2
ASMAJ7.0A	ASMAJ7.0CA	7.0	7.78	8.60	10	200	33.3	12.0
ASMAJ7.5A	ASMAJ7.5CA	7.5	8.33	9.21	1	100	31.0	12.9
ASMAJ8.0A	ASMAJ8.0CA	8.0	8.89	9.83	1	50	29.4	13.6
ASMAJ8.5A	ASMAJ8.5CA	8.5	9.44	10.43	1	10	27.8	14.4
ASMAJ9.0A	ASMAJ9.0CA	9.0	10.0	11.1	1	5	26.0	15.4
ASMAJ10A	ASMAJ10CA	10.0	11.1	12.3	1	5	23.5	17.0
ASMAJ11A	ASMAJ11CA	11.0	12.2	13.5	1	5	22.0	18.2
ASMAJ12A	ASMAJ12CA	12.0	13.3	14.7	1	5	20.1	19.9
ASMAJ13A	ASMAJ13CA	13.0	14.4	15.9	1	5	18.6	21.5
ASMAJ14A	ASMAJ14CA	14.0	15.6	17.2	1	5	17.2	23.2
ASMAJ15A	ASMAJ15CA	15.0	16.7	18.5	1	5	16.4	24.4
ASMAJ16A	ASMAJ16CA	16.0	17.8	19.7	1	5	15.4	26.0
ASMAJ17A	ASMAJ17CA	17.0	18.9	20.9	1	5	14.5	27.6
ASMAJ18A	ASMAJ18CA	18.0	20.0	22.1	1	5	13.7	29.2
ASMAJ20A	ASMAJ20CA	20.0	22.2	24.5	1	5	12.3	32.4
ASMAJ22A	ASMAJ22CA	22.0	24.4	27.0	1	5	11.3	35.5
ASMAJ24A	ASMAJ24CA	24.0	26.7	29.5	1	5	10.3	38.9
ASMAJ26A	ASMAJ26CA	26.0	28.9	31.9	1	5	9.5	42.1
ASMAJ28A	ASMAJ28CA	28.0	31.1	34.4	1	5	8.8	45.4
ASMAJ30A	ASMAJ30CA	30.0	33.3	36.8	1	5	8.3	48.4
ASMAJ33A	ASMAJ33CA	33.0	36.7	40.6	1	5	7.5	53.3
ASMAJ36A	ASMAJ36CA	36.0	40.0	44.2	1	5	6.9	58.1



AUTOMOTIVE

**SMA**

**Transient Voltage Suppressor**

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)
			VRWM(Volts)	Min.	Max.			
ASMAJ40A	ASMAJ40CA	40.0	44.4	49.1	1	5	6.2	64.5
ASMAJ43A	ASMAJ43CA	43.0	47.8	52.8	1	5	5.8	69.4
ASMAJ45A	ASMAJ45CA	45.0	50.0	55.3	1	5	5.5	72.7
ASMAJ48A	ASMAJ48CA	48.0	53.3	58.9	1	5	5.2	77.4
ASMAJ51A	ASMAJ51CA	51.0	56.7	62.7	1	5	4.9	82.4
ASMAJ54A	ASMAJ54CA	54.0	60.0	66.3	1	5	4.6	87.1
ASMAJ58A	ASMAJ58CA	58.0	64.4	71.2	1	5	4.3	93.6
ASMAJ60A	ASMAJ60CA	60.0	66.7	73.7	1	5	4.1	96.8
ASMAJ64A	ASMAJ64CA	64.0	71.1	78.6	1	5	3.9	103.0
ASMAJ70A	ASMAJ70CA	70.0	77.8	86.0	1	5	3.5	113.0
ASMAJ75A	ASMAJ75CA	75.0	83.3	92.1	1	5	3.3	121.0

**NOTES :**

1. Suffix 'A ' denotes 5% tolerance device, no suffix denotes 10 % tolerance device.
  2. Add suffix 'C 'or ' CA ' after part number to specify Bi-directional devices.
  3. For Bi-Directional devices having VR of 10 volts and under, the IR limit is double .
- \*\* : Under Development



## SMB



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## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)
			VRWM(Volts)	Min.	Max.			
ASMBJ5.0A	ASMBJ5.0CA	5.0	6.40	7.07	10	800	65.2	9.2
ASMBJ6.0A	ASMBJ6.0CA	6.0	6.67	7.37	10	800	58.3	10.3
ASMBJ6.5A	ASMBJ6.5CA	6.5	7.22	7.98	10	500	53.6	11.2
ASMBJ7.0A	ASMBJ7.0CA	7.0	7.78	8.60	10	200	50.0	12.0
ASMBJ7.5A	ASMBJ7.5CA	7.5	8.33	9.21	1	100	46.5	12.9
ASMBJ8.0A	ASMBJ8.0CA	8.0	8.89	9.83	1	50	44.1	13.6
ASMBJ8.5A	ASMBJ8.5CA	8.5	9.44	10.43	1	20	41.7	14.4
ASMBJ9.0A	ASMBJ9.0CA	9.0	10.0	11.1	1	10	39.0	15.4
ASMBJ10A	ASMBJ10CA	10.0	11.1	12.3	1	5	35.3	17.0
ASMBJ11A	ASMBJ11CA	11.0	12.2	13.5	1	5	33.0	18.2
ASMBJ12A	ASMBJ12CA	12.0	13.3	14.7	1	5	30.2	19.9
ASMBJ13A	ASMBJ13CA	13.0	14.4	15.9	1	5	27.9	21.5
ASMBJ14A	ASMBJ14CA	14.0	15.6	17.2	1	5	25.9	23.2
ASMBJ15A	ASMBJ15CA	15.0	16.7	18.5	1	5	24.6	24.4
ASMBJ16A	ASMBJ16CA	16.0	17.8	19.7	1	5	23.1	26.0
ASMBJ17A	ASMBJ17CA	17.0	18.9	20.9	1	5	21.7	27.6
ASMBJ18A	ASMBJ18CA	18.0	20.0	22.1	1	5	20.5	29.2
ASMBJ20A	ASMBJ20CA	20.0	22.2	24.5	1	5	18.5	32.4
ASMBJ22A	ASMBJ22CA	22.0	24.4	27.0	1	5	16.9	35.5
ASMBJ24A	ASMBJ24CA	24.0	26.7	29.5	1	5	15.4	38.9
ASMBJ26A	ASMBJ26CA	26.0	28.9	31.9	1	5	14.3	42.1
ASMBJ28A	ASMBJ28CA	28.0	31.1	34.4	1	5	13.2	45.4
ASMBJ30A	ASMBJ30CA	30.0	33.3	36.8	1	5	12.4	48.4
ASMBJ33A	ASMBJ33CA	33.0	36.7	40.6	1	5	11.3	53.3
ASMBJ36A	ASMBJ36CA	36.0	40.0	44.2	1	5	10.3	58.1



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**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)
			VRWM(Volts)	Min.	Max.			
ASMBJ40A	ASMBJ40CA	40.0	44.4	49.1	1	5	9.3	64.5
ASMBJ43A	ASMBJ43CA	43.0	47.8	52.8	1	5	8.6	69.4
ASMBJ45A	ASMBJ45CA	45.0	50.0	55.3	1	5	8.3	72.7
ASMBJ48A	ASMBJ48CA	48.0	53.3	58.9	1	5	7.8	77.4
ASMBJ51A	ASMBJ51CA	51.0	56.7	62.7	1	5	7.3	82.4
ASMBJ54A	ASMBJ54CA	54.0	60.0	66.3	1	5	6.9	87.1
ASMBJ58A	ASMBJ58CA	58.0	64.4	71.2	1	5	6.4	93.6
ASMBJ60A	ASMBJ60CA	60.0	66.7	73.7	1	5	6.2	96.8
ASMBJ64A	ASMBJ64CA	64.0	71.1	78.6	1	5	5.8	103.0
ASMBJ70A	ASMBJ70CA	70.0	77.8	86.0	1	5	5.3	113.0
ASMBJ75A	ASMBJ75CA	75.0	83.3	92.1	1	5	5.0	121.0

**NOTES :**

1. Suffix 'A' denotes 5% tolerance device.
2. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices.
3. For Bi-Directional devices having VR of 10 volts and under, the IR limit is double .
4. 5V~17V, 40V~75V estimate to be released by end of Q218.

\*\* : Under Development



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## Transient Voltage Suppressor

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			VR (V)	Min (V)	Max (V)			
APSMBJ6.8A	APSMBJ6.8CA	5.8	6.45	7.13	10	1000	57.1	10.5
APSMBJ7.5A	APSMBJ7.5CA	6.4	7.13	7.88	10	500	53.1	11.3
APSMBJ8.2A	APSMBJ8.2CA	7.0	7.79	8.61	10	200	49.6	12.1
APSMBJ9.1A	APSMBJ9.1CA	7.8	8.65	9.56	1	50	44.8	13.4
APSMBJ10A	APSMBJ10CA	8.6	9.50	10.50	1	10	41.4	14.5
APSMBJ11A	APSMBJ11CA	9.4	10.5	11.6	1	5	38.5	15.6
APSMBJ12A	APSMBJ12CA	10.2	11.4	12.6	1	0.5	35.9	16.7
APSMBJ13A	APSMBJ13CA	11.1	12.4	13.7	1	0.5	33.0	18.2
APSMBJ15A	APSMBJ15CA	12.8	14.3	15.8	1	0.5	28.3	21.2
APSMBJ16A	APSMBJ16CA	13.6	15.2	16.8	1	0.5	26.7	22.5
APSMBJ18A	APSMBJ18CA	15.3	17.1	18.9	1	0.5	23.8	25.2
APSMBJ20A	APSMBJ20CA	17.1	19.0	21.0	1	0.5	21.7	27.7
APSMBJ22A	APSMBJ22CA	18.8	20.9	23.1	1	0.5	19.6	30.6
APSMBJ24A	APSMBJ24CA	20.5	22.8	25.2	1	0.5	18.1	33.2
APSMBJ27A	APSMBJ27CA	23.1	25.7	28.4	1	0.5	16.0	37.5
APSMBJ30A	APSMBJ30CA	25.6	28.5	31.5	1	0.5	14.5	41.4
APSMBJ33A	APSMBJ33CA	28.2	31.4	34.7	1	0.5	13.1	45.7
APSMBJ36A	APSMBJ36CA	30.8	34.2	37.8	1	0.5	12.0	49.9
APSMBJ39A	APSMBJ39CA	33.3	37.1	41.0	1	0.5	11.1	53.9
APSMBJ43A	APSMBJ43CA	36.8	40.9	45.2	1	0.5	10.1	59.3
APSMBJ47A	APSMBJ47CA	40.2	44.7	49.4	1	0.5	9.3	64.8
APSMBJ51A	APSMBJ51CA	43.6	48.5	53.6	1	0.5	8.6	70.1
APSMBJ56A	APSMBJ56CA	47.8	53.2	58.8	1	0.5	7.8	77.0
APSMBJ62A	APSMBJ62CA	53.0	58.9	65.1	1	0.5	7.1	85.0
APSMBJ68A	APSMBJ68CA	58.1	64.6	71.4	1	0.5	6.5	92.0
APSMBJ75A	APSMBJ75CA	64.7	71.3	78.8	1	0.5	5.8	103.0
APSMBJ82A	APSMBJ82CA	70.1	77.9	86.1	1	0.5	5.3	113.0

### NOTES :

1. Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device.
2. For bidirectional devices having VR of 10 volts and under, the IR limit is doubled .
3. 6.8V~20V, 43V~82V estimate to released by end of Jun18

\*\* : Under Development



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## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)
			VRWM(Volts)	Min.	Max.			
ASMCJ5.0A	ASMCJ5.0CA	5.0	6.40	7.07	10	1000	163.0	9.2
ASMCJ6.0A	ASMCJ6.0CA	6.0	6.67	7.37	10	1000	145.6	10.3
ASMCJ6.5A	ASMCJ6.5CA	6.5	7.22	7.98	10	500	133.9	11.2
ASMCJ7.0A	ASMCJ7.0CA	7.0	7.78	8.60	10	200	125.0	12.0
ASMCJ7.5A	ASMCJ7.5CA	7.5	8.33	9.21	1	100	116.3	12.9
ASMCJ8.0A	ASMCJ8.0CA	8.0	8.89	9.83	1	50	110.3	13.6
ASMCJ8.5A	ASMCJ8.5CA	8.5	9.44	10.43	1	20	104.2	14.4
ASMCJ9.0A	ASMCJ9.0CA	9.0	10.0	11.1	1	10	97.4	15.4
ASMCJ10A	ASMCJ10CA	10.0	11.1	12.3	1	5	88.2	17.0
ASMCJ11A	ASMCJ11CA	11.0	12.2	13.5	1	0.5	82.4	18.2
ASMCJ12A	ASMCJ12CA	12.0	13.3	14.7	1	0.5	75.4	19.9
ASMCJ13A	ASMCJ13CA	13.0	14.4	15.9	1	0.5	69.8	21.5
ASMCJ14A	ASMCJ14CA	14.0	15.6	17.2	1	0.5	64.7	23.2
ASMCJ15A	ASMCJ15CA	15.0	16.7	18.5	1	0.5	61.5	24.4
ASMCJ16A	ASMCJ16CA	16.0	17.8	19.7	1	0.5	57.7	26.0
ASMCJ17A	ASMCJ17CA	17.0	18.9	20.9	1	0.5	54.3	27.6
ASMCJ18A	ASMCJ18CA	18.0	20.0	22.1	1	0.5	51.4	29.2
ASMCJ20A	ASMCJ20CA	20.0	22.2	24.5	1	0.5	46.3	32.4
ASMCJ22A	ASMCJ22CA	22.0	24.4	27.0	1	0.5	42.3	35.5
ASMCJ24A	ASMCJ24CA	24.0	26.7	29.5	1	0.5	38.6	38.9
ASMCJ26A	ASMCJ26CA	26.0	28.9	31.9	1	0.5	35.6	42.1
ASMCJ28A	ASMCJ28CA	28.0	31.1	34.4	1	0.5	33.0	45.4
ASMCJ30A	ASMCJ30CA	30.0	33.3	36.8	1	0.5	31.0	48.4
ASMCJ33A	ASMCJ33CA	33.0	36.7	40.6	1	0.5	28.1	53.3
ASMCJ36A	ASMCJ36CA	36.0	40.0	44.2	1	0.5	25.8	58.1



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FILE# E219635

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## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)
			VRWM(Volts)	Min.	Max.			
ASMCJ40A	ASMCJ40CA	40.0	44.4	49.1	1	0.5	23.3	64.5
ASMCJ43A	ASMCJ43CA	43.0	47.8	52.8	1	0.5	21.6	69.4
ASMCJ45A	ASMCJ45CA	45.0	50.0	55.3	1	0.5	20.6	72.7
ASMCJ48A	ASMCJ48CA	48.0	53.3	58.9	1	0.5	19.4	77.4
ASMCJ51A	ASMCJ51CA	51.0	56.7	62.7	1	0.5	18.2	82.4
ASMCJ54A	ASMCJ54CA	54.0	60.0	66.3	1	0.5	17.2	87.1
ASMCJ58A	ASMCJ58CA	58.0	64.4	71.2	1	0.5	16.0	93.6
ASMCJ60A	ASMCJ60CA	60.0	66.7	73.7	1	0.5	15.5	96.8
ASMCJ64A	ASMCJ64CA	64.0	71.1	78.6	1	0.5	14.6	103.0
ASMCJ70A	ASMCJ70CA	70.0	77.8	86.0	1	0.5	13.3	113.0
ASMCJ75A	ASMCJ75CA	75.0	83.3	92.1	1	0.5	12.4	121.0

### NOTE :

1. Suffix 'A ' denotes 5% tolerance device.
  2. Add suffix 'C ' or ' CA ' after part number to specify Bi-directional devices.
  3. For Bi-Directional devices having VR of 10 volts and under, the IR limit is double .
  3. 5V~20V, estimate to released by end of Jul18
- \*\* : Under Development



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**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It				Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			VR (V)	Min (V)	Max (V)	It (mA)			
APSMCJ6.8A	APSMCJ6.8CA	5.8	6.45	7.13	10	1000	142.9	10.5	
APSMCJ7.5A	APSMCJ7.5CA	6.4	7.13	7.88	10	500	132.7	11.3	
APSMCJ8.2A	APSMCJ8.2CA	7.0	7.79	8.61	10	200	124.0	12.1	
APSMCJ9.1A	APSMCJ9.1CA	7.8	8.65	9.56	1	50	111.9	13.4	
APSMCJ10A	APSMCJ10CA	8.6	9.50	10.50	1	10	103.4	14.5	
APSMCJ11A	APSMCJ11CA	9.4	10.5	11.6	1	5	96.2	15.6	
APSMCJ12A	APSMCJ12CA	10.2	11.4	12.6	1	0.5	89.8	16.7	
APSMCJ13A	APSMCJ13CA	11.1	12.4	13.7	1	0.5	82.4	18.2	
APSMCJ15A	APSMCJ15CA	12.8	14.3	15.8	1	0.5	70.8	21.2	
APSMCJ16A	APSMCJ16CA	13.6	15.2	16.8	1	0.5	66.7	22.5	
APSMCJ18A	APSMCJ18CA	15.3	17.1	18.9	1	0.5	59.5	25.2	
APSMCJ20A	APSMCJ20CA	17.1	19.0	21.0	1	0.5	54.2	27.7	
APSMCJ22A	APSMCJ22CA	18.8	20.9	23.1	1	0.5	49.0	30.6	
APSMCJ24A	APSMCJ24CA	20.5	22.8	25.2	1	0.5	45.2	33.2	
APSMCJ27A	APSMCJ27CA	23.1	25.7	28.4	1	0.5	40.0	37.5	
APSMCJ30A	APSMCJ30CA	25.6	28.5	31.5	1	0.5	36.2	41.4	
APSMCJ33A	APSMCJ33CA	28.2	31.4	34.7	1	0.5	32.8	45.7	
APSMCJ36A	APSMCJ36CA	30.8	34.2	37.8	1	0.5	30.1	49.9	
APSMCJ39A	APSMCJ39CA	33.3	37.1	41.0	1	0.5	27.8	53.9	
APSMCJ43A	APSMCJ43CA	36.8	40.9	45.2	1	0.5	25.3	59.3	
APSMCJ47A	APSMCJ47CA	40.2	44.7	49.4	1	0.5	23.1	64.8	
APSMCJ51A	APSMCJ51CA	43.6	48.5	53.6	1	0.5	21.4	70.1	
APSMCJ56A	APSMCJ56CA	47.8	53.2	58.8	1	0.5	19.5	77.0	
APSMCJ62A	APSMCJ62CA	53.0	58.9	65.1	1	0.5	17.6	85.0	
APSMCJ68A	APSMCJ68CA	58.1	64.6	71.4	1	0.5	16.3	92.0	



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FILE# E219635

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## Transient Voltage Suppressor (continued)

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			VR (V)	Min (V)	Max (V)			
APSMCJ75A	APSMCJ75CA	64.7	71.3	78.8	1	0.5	14.6	103.0
APSMCJ82A	APSMCJ82CA	70.1	77.9	86.1	1	0.5	13.3	113.0

### NOTES:

- Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device.
- For bidirectional devices having VR of 10 volts and under, the IR limit is doubled .
- For unidirectional devices PSMCJ6.8A to PSMCJ200A, VFmax = 3.5V at IF = 100A 300us square wave pulse.
- 6.8V~22V, estimate to released by end of Jul18

\*\* : Under Development



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**Transient Voltage Suppressor (continued)**

Device Uni-Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
A3.0SMCJ5.0A	A3.0SMCJ5.0CA	5.0	6.40	7.07	10	1000	326.1	9.2
A3.0SMCJ6.0A	A3.0SMCJ6.0CA	6.0	6.67	7.37	10	1000	291.3	10.3
A3.0SMCJ6.5A	A3.0SMCJ6.5CA	6.5	7.22	7.98	10	500	267.9	11.2
A3.0SMCJ7.0A	A3.0SMCJ7.0CA	7.0	7.78	8.60	10	200	250.0	12.0
A3.0SMCJ7.5A	A3.0SMCJ7.5CA	7.5	8.33	9.21	1	100	232.6	12.9
A3.0SMCJ8.0A	A3.0SMCJ8.0CA	8.0	8.89	9.83	1	50	220.6	13.6
A3.0SMCJ8.5A	A3.0SMCJ8.5CA	8.5	9.44	10.43	1	25	208.3	14.4
A3.0SMCJ9.0A	A3.0SMCJ9.0CA	9.0	10.00	11.05	1	10	194.8	15.4
A3.0SMCJ10A	A3.0SMCJ10CA	10.0	11.10	12.27	1	5	176.5	17.0
A3.0SMCJ11A	A3.0SMCJ11CA	11.0	12.2	13.5	1	5	164.8	18.2
A3.0SMCJ12A	A3.0SMCJ12CA	12.0	13.3	14.7	1	5	150.8	19.9
A3.0SMCJ13A	A3.0SMCJ13CA	13.0	14.4	15.9	1	5	139.5	21.5
A3.0SMCJ14A	A3.0SMCJ14CA	14.0	15.6	17.2	1	5	129.3	23.2
A3.0SMCJ15A	A3.0SMCJ15CA	15.0	16.7	18.5	1	5	124.0	24.2
A3.0SMCJ16A	A3.0SMCJ16CA	16.0	17.8	19.7	1	5	115.4	26.0
A3.0SMCJ17A	A3.0SMCJ17CA	17.0	18.9	20.9	1	5	108.7	27.6
A3.0SMCJ18A	A3.0SMCJ18CA	18.0	20.0	22.1	1	5	102.7	29.2
A3.0SMCJ20A	A3.0SMCJ20CA	20.0	22.2	24.5	1	5	92.6	32.4
A3.0SMCJ22A	A3.0SMCJ22CA	22.0	24.4	27.0	1	5	84.5	35.5
A3.0SMCJ24A	A3.0SMCJ24CA	24.0	26.7	29.5	1	5	77.1	38.9
A3.0SMCJ26A	A3.0SMCJ26CA	26.0	28.9	31.9	1	5	71.3	42.1
A3.0SMCJ28A	A3.0SMCJ28CA	28.0	31.1	34.4	1	5	66.1	45.4
A3.0SMCJ30A	A3.0SMCJ30CA	30.0	33.3	36.8	1	5	62.0	48.4
A3.0SMCJ33A	A3.0SMCJ33CA	33.0	36.7	40.6	1	5	56.3	53.3
A3.0SMCJ36A	A3.0SMCJ36CA	36.0	40.0	44.2	1	5	51.6	58.1

AUTOMOTIVE



SMC



U.L. RECOGNIZED  
FILE# E219635

AUTOMOTIVE

## Transient Voltage Suppressor (continued)

Device Uni- Directional	Device Bi-Directional	Reverse Standoff Voltage	Breakdown Voltage BV Volts @It			Max. Reverse Leakage @VR	Max. Peak Pulse Current	Max. Clamping Voltage @Ipp
			V <sub>R</sub> (V)	Min (V)	Max (V)			
A3.0SMCJ40A	A3.0SMCJ40CA	40.0	44.4	49.1	1	5	46.5	64.5
A3.0SMCJ43A	A3.0SMCJ43CA	43.0	47.8	52.8	1	5	43.2	69.4
A3.0SMCJ45A	A3.0SMCJ45CA	45.0	50.0	55.3	1	5	41.3	72.7
A3.0SMCJ48A	A3.0SMCJ48CA	48.0	53.3	58.9	1	5	38.8	77.4
A3.0SMCJ51A	A3.0SMCJ51CA	51.0	56.7	62.7	1	5	36.4	82.4
A3.0SMCJ54A	A3.0SMCJ54CA	54.0	60.0	66.3	1	5	34.4	87.1
A3.0SMCJ58A	A3.0SMCJ58CA	58.0	64.4	71.2	1	5	32.1	93.6
A3.0SMCJ60A	A3.0SMCJ60CA	60.0	66.7	73.7	1	5	31.0	96.8
A3.0SMCJ64A	A3.0SMCJ64CA	64.0	71.1	78.6	1	5	29.1	103.0
A3.0SMCJ70A	A3.0SMCJ70CA	70.0	77.8	86.0	1	5	26.5	113.0
A3.0SMCJ75A	A3.0SMCJ75CA	75.0	83.3	92.1	1	5	24.8	121.0

### NOTES:

- Suffix 'C' denotes bidirectional device. Suffix 'A' denotes 5% tolerance device, no suffix denotes 10% tolerance device .
- For Bi-Directional devices having VR of 10 volts and under, the IR limit is doubled .
- Mark "#" denote that comply IEC 61000-4-5 Severity levels, 6KV. For data lines requiring a 42Ω source impedance, the short-circuit current waveform is defined as 8/20us.



SMC



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FILE# E219635

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)	Package
			VRWM(Volts)	Min.	Max.				
A5.0SMCJ10A	N/A	10.0	11.1	12.3	1.0	20.0	17.0	294.1	SMC
A5.0SMCJ12A	N/A	12.0	13.3	14.7	1.0	10.0	19.9	251.3	SMC
A5.0SMCJ13A	N/A	13.0	14.4	15.9	1.0	10.0	21.5	232.6	SMC
A5.0SMCJ16A	N/A	16.0	17.8	19.7	1.0	2.0	26.0	192.3	SMC
A5.0SMCJ17A	N/A	17.0	18.9	20.9	1.0	2.0	27.6	181.2	SMC
A5.0SMCJ18A	N/A	18.0	20.0	22.1	1.0	2.0	29.2	171.2	SMC
A5.0SMCJ20A	N/A	20.0	22.2	24.5	1.0	2.0	32.4	154.3	SMC
A5.0SMCJ22A	N/A	22.0	24.4	26.9	1.0	2.0	35.5	140.8	SMC
A5.0SMCJ24A	N/A	24.0	26.7	29.5	1.0	2.0	38.9	128.5	SMC
A5.0SMCJ26A	N/A	26.0	28.9	31.9	1.0	2.0	42.1	118.8	SMC
A5.0SMCJ28A	N/A	28.0	32.1	34.4	1.0	2.0	45.4	110.1	SMC
A5.0SMCJ30A	N/A	30.0	33.3	36.8	1.0	2.0	48.4	103.3	SMC
A5.0SMCJ33A	N/A	33.0	36.7	40.6	1.0	2.0	53.3	93.8	SMC
A5.0SMCJ36A	N/A	36.0	40.0	44.2	1.0	2.0	58.1	86.1	SMC

Notes

- (1) Pulse test:  $t_p \approx 50$  ms
- (2) Surge current waveform per fig. 3 and derated per fig. 2
- (3) All terms and symbols are consistent with ANSI/IEEE C62.35



DO-222AA



U.L. RECOGNIZED

FILE# E219635

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)	Package
			VRWM(Volts)	Min.	Max.				
ALT2MF5.0A	N/A	5.0	6.4	7.07	10	50	21.7	9.2	DO-222AA
ALT2MF6.0A	N/A	6.0	6.7	7.4	10	50	19.4	10.3	DO-222AA
ALT2MF8.5A	N/A	8.5	9.4	10.4	1	10	13.9	14.4	DO-222AA
ALT2MF10A	N/A	10.0	11.1	12.3	1	5	11.8	17.0	DO-222AA
ALT2MF12A	N/A	12.0	13.3	14.7	1	1.0	10.1	19.9	DO-222AA
ALT2MF13A	N/A	13.0	14.4	15.9	1	1.0	9.3	21.5	DO-222AA
ALT2MF15A	N/A	15.0	16.7	18.5	1	1.0	8.2	24.4	DO-222AA
ALT2MF16A	N/A	16.0	17.1	18.9	1	1.0	7.7	26.0	DO-222AA
ALT2MF18A	N/A	18.0	20.0	22.1	1	1.0	6.9	29.2	DO-222AA
ALT2MF20A	N/A	20.0	22.2	24.5	1	1.0	6.2	32.4	DO-222AA
ALT2MF22A	N/A	22.0	24.4	27.0	1	1.0	5.6	35.5	DO-222AA
ALT2MF24A	N/A	24.0	25.7	28.4	1	1.0	5.1	38.9	DO-222AA
ALT2MF26A	N/A	26.0	28.9	31.9	1	1.0	4.8	42.1	DO-222AA
ALT2MF28A	N/A	28.0	31.1	34.4	1	1.0	4.4	45.4	DO-222AA
ALT2MF30A	N/A	30.0	33.3	36.8	1	1.0	4.1	48.4	DO-222AA
ALT2MF36A	N/A	36.0	40.0	44.2	1	1.0	3.4	58.1	DO-222AA
ALT2MF40A	N/A	40.0	44.4	49.1	1	1.0	3.1	64.5	DO-222AA
ALT2MF43A	N/A	43.0	47.8	52.8	1	1.0	2.88	69.4	DO-222AA
ALT2MF45A	N/A	45.0	50.0	55.3	1	1.0	2.75	72.7	DO-222AA
ALT2MF48A	N/A	48.0	53.3	58.9	1	1.0	2.58	77.4	DO-222AA
ALT2MF51A	N/A	51.0	56.7	62.7	1	1.0	2.43	82.4	DO-222AA



**DO-219**



**U.L. RECOGNIZED**  
**FILE# E219635**

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)	Package
			VRWM(Volts)	Min.	Max.				
*ALT4ME5.0A	N/A	5.0	6.4	7.1	10.0	150.0	43.5	9.2	DO-219
*ALT4ME6.0A	N/A	6.0	6.7	7.4	10.0	150.0	38.8	10.3	DO-219
*ALT4ME6.5A	N/A	6.5	7.2	8.0	10.0	150.0	35.7	11.2	DO-219
*ALT4ME7.0A	N/A	7.0	7.8	8.6	10.0	150.0	33.3	12.0	DO-219
*ALT4ME7.5A	N/A	7.5	8.3	9.2	1.0	100.0	31.0	12.9	DO-219
*ALT4ME8.0A	N/A	8.0	8.9	9.8	1.0	50.0	29.4	13.6	DO-219
*ALT4ME8.5A	N/A	8.5	9.4	10.4	1.0	10.0	27.7	14.4	DO-219
*ALT4ME9.0A	N/A	9.0	10.0	11.1	1.0	5.0	26.0	15.4	DO-219
*ALT4ME10A	N/A	10.0	11.1	12.3	1.0	5.0	23.5	17.0	DO-219
*ALT4ME11A	N/A	11.0	12.2	13.5	1.0	0.5	22.0	18.2	DO-219
*ALT4ME12A	N/A	12.0	13.3	14.7	1.0	0.5	20.1	19.9	DO-219
*ALT4ME13A	N/A	13.0	14.4	15.9	1.0	0.5	18.6	21.5	DO-219
*ALT4ME14A	N/A	14.0	15.6	17.2	1.0	0.5	17.2	23.2	DO-219
*ALT4ME15A	N/A	15.0	16.7	18.5	1.0	0.5	16.4	24.4	DO-219
*ALT4ME16A	N/A	16.0	17.8	19.7	1.0	0.5	15.3	26.0	DO-219
*ALT4ME17A	N/A	17.0	18.9	20.9	1.0	0.5	14.5	27.6	DO-219
ALT4ME18A	N/A	18.0	20.0	22.1	1.0	0.5	13.7	29.2	DO-219
ALT4ME20A	N/A	20.0	22.2	24.5	1.0	0.5	12.3	32.4	DO-219
ALT4ME22A	N/A	22.0	24.4	27.0	1.0	0.5	11.2	35.5	DO-219
ALT4ME24A	N/A	24.0	26.7	29.5	1.0	0.5	10.3	38.9	DO-219
ALT4ME26A	N/A	26.0	28.9	31.9	1.0	0.5	9.5	42.1	DO-219
ALT4ME28A	N/A	28.0	31.1	34.4	1.0	0.5	8.8	45.4	DO-219
ALT4ME30A	N/A	30.0	33.3	36.8	1.0	0.5	8.3	48.4	DO-219



DO-219



U.L. RECOGNIZED

FILE# E219635

AUTOMOTIVE

Device Uni-Directional	Device Bi-Directional	Working Peak Reverse Voltage	Breakdown voltage VBR Volts			Maximum Reverse Leakage at VRWM	Maximum Reverse Surge Current	Maximum Reverse Voltage at IRSM (Clamping Voltage)	Package
			VRWM(Volts)	Min.	Max.				
ALT4ME33A	N/A	33.0	36.7	40.6	1.0	0.5	7.5	53.3	DO-219
ALT4ME36A	N/A	36.0	40.0	44.2	1.0	0.5	6.9	58.1	DO-219
ALT4ME40A	N/A	40.0	44.4	49.1	1.0	0.5	6.2	64.5	DO-219
ALT4ME43A	N/A	43.0	47.8	52.8	1.0	0.5	5.7	69.4	DO-219
ALT4ME45A	N/A	45.0	50.0	55.3	1.0	0.5	5.5	72.7	DO-219
ALT4ME48A	N/A	48.0	53.3	58.9	1.0	0.5	5.2	77.4	DO-219
ALT4ME51A	N/A	51.0	56.7	62.7	1.0	0.5	4.9	82.4	DO-219
ALT4ME54A	N/A	54.0	60.0	66.3	1.0	0.5	4.6	87.1	DO-219
ALT4ME58A	N/A	58.0	64.4	71.2	1.0	0.5	4.3	93.6	DO-219
ALT4ME60A	N/A	60.0	66.7	73.7	1.0	0.5	4.1	96.8	DO-219
ALT4ME64A	N/A	64.0	71.1	78.6	1.0	0.5	3.9	103.0	DO-219
ALT4ME70A	N/A	70.0	77.8	86.0	1.0	0.5	3.5	113.0	DO-219
ALT4ME75A	N/A	75.0	83.3	92.1	1.0	0.5	3.3	121.0	DO-219

## NOTE :

1. For " \* " types is product under development.

## ESD Protection Device

ESD是代表英文ElectroStatic Discharge即"靜電放電"的意思。ESD是本世紀中期以來形成的以研究靜電的產生與衰減、靜電放電模型、靜電放電效應如電流熱(火花)效應(如靜電引起的著火與爆炸)及和電磁效應(如電磁干擾)等的學科。近年來隨著科學技術的飛速發展、微電子技術的廣泛應用及電磁環境越來越複雜,對靜電放電的電磁場效應如電磁干擾(EMI)及電磁相容性(EMC)問題越來越重視,靜電放電(ESD)保護需求正隨著若干關鍵技術趨勢而改變。例如高速介面會影響訊號完整性;而微縮的製程也會使下一



SOD-323

## Surface Mount ESD Protection Device

Part Number	Peak Power Dissipation 8x20 $\mu$ s	Reverse standoff voltage	Max Reverse Leakage @ VR	Max Clamping Voltage @8x20 $\mu$ s	Peak Pulse Current 8x20 $\mu$ s	Off-State Capacitance 1MHz Zero DC Bias	Package
		VR	IR	Vc	Ipp	Co	
	W	V	$\mu$ A	V	A	pF	
AESD1LIN24VCB2	160	24	50	70	3	17	SOD-323
AESD1LIN2WCB2	160	15/24	50	70	3	17	SOD-323



## POWER IC

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### Bipolar LDO

Output Current	Part Number	Electrical Characteristics					Package	Status
		MAX. Vin (V)	Vout (V)	Dropout Voltage (V) Max.	IQ (mA) Typ.	PSRR @1KHz (dB) Typ.		
100mA	LSP78LXX	40	3.3, 5, 6, 8, 12, 15, 18, 24	1.7V @ IOUT=0.04A	2	f = 120Hz, 80dB	TO-92, SOT89-3L, SOP-8L	MP
600mA	LSP9807	6.5	1.2, 1.8, 2.5, 3.3	1.4V @ IOUT=0.6A	3	f = 120Hz, 65dB	SOT89-3L	MP
	LSP9800	6.5	Adj.	1.4V @ IOUT=1A	3	f = 120Hz, 65dB	SOT223-3L, TO252-3L	MP
	LSP9808	6.5	1.2, 1.8, 2.5, 3.3	1.4V @ IOUT=1A	3	f = 120Hz, 65dB	SOT223-3L, TO252-3L	MP
	LB1117	20	1.2, 1.8, 2.5, 3.3, 5, ADJ	1.2V @ IOUT=1.2A	6	f = 120Hz, 62dB	SOT89-3L, SOT223-3L, TO252-3L	MP
	LSP78XX	40	5, 6, 8, 9, 10, 12, 15, 18, 24	2V @ IOUT=1A	5	f = 120Hz, 73dB	TO220-3L, TO263-3L, TO252-3L	MP

### CMOS LDO

Topology	Output Current	P/N	Electrical Characteristics					Features					Package	Status	
			Vin (V)	Vout (V)	Dropout Voltage (V) Max.	IQ (μA) Typ.	PSRR @1KHz (dB) Typ.	Enable	Power good	Vout Discharge	Soft start	Protection			Others
LV LDO	300mA	LSP2025	1.7~6.0	Fix: 0.8~5.0 Adj: 0.8 (Typ.)	0.22V@3.3V<=VOUT IOUT=300mA	60	75	•		•		SCP, OTP, OCP	ADJ	SOT23-3L SOT23-5L, SC70-5, DFN11010-4L, SC82-4L	MP
		LSP2015	2.2~5.5	Fix: 1.0~4.1	0.15V@Vout=2.8V Iout=300mA	50	60	•			SCP, OTP, OCP		SOT23-3L, SOT23-5L, SC70-4L, SC70-5L	MP	
	600mA	LSP2008	2.5~5.5	Fix: 1.0~4.1 Adj: 0.8 (Typ.)	0.55V@VOUT=3.3V IOUT=600mA	50	60	•		•	SCP, OTP, OCP	ADJ	SOT223-3L, SOT89-3L, SOT23-3L	MP	
	1A	LSP2009	2.8~6.0	Fix: 1.0~3.3 Adj: 0.8 (Typ.)	0.4V@VOUT=3.3V IOUT=1A	50	60	•	•		•	SCP, OTP, OCP	ADJ	TO263-3L, SOT223-5L, TO252-3L, SOT89-5L, SOT23-5L, ESOP-8L, TO263-3L	MP
	1.5A	LSP2019	2.8~6.0	Fix: 1.0~3.3 Adj: 0.8 (Typ.)	0.4V@VOUT=3.3V IOUT=1.5A	50	60	•	•		•	SCP, OTP, OCP	ADJ	SOT223-3L, TO252-3L, TO263-3L, TO263-5L, TO220-3L, SOP-8L	MP
	3A	LSP2031	1.0~6.0	Adj: 0.8 ~ 3.3	0.21(typ.)@Iout=3A	600	62	•	•		•	SCP, OTP, OCP		ESOP-8L, DFN-10L	MP
HV LDO	100mA	LSP2300	40	Fix: 1.0~3.3 Adj: 0.8 (Typ.)										SOT23, SOT23-5L	Dev

### Hall IC

Part Number	Inout Voltage (V)	Output ON Voltage (V)	Supply Current (mA)	Operating Point Bop (Bops +ve/ Bopn -ve) Gauss (Min)	Operating Point Bop (Bops +ve/ Bopn -ve) Gauss (Max)	Release Point Brp (Brps +ve/ Brpn -ve) Gauss (Min)	Release Point Brp (Brps +ve/ Brpn -ve) Gauss (Max)	Output Rising Time (μs)	Output Falling Time (μs)	Operating Ambient Temperature (°C)	Package	Status
LSP3020	3~24	0.2~0.4	5	10	55	-55	-10	0.45	0.45	-40~125	SOT23-3L, TO62	Dev

**Shunt Regulator**

Part Number	Electrical Characteristics				Package	Schedule
	Input Cathode Voltage (V) Max.	Output Reference Voltage (V)	Accuracy (%)	Minimum Cathode Current (mA) Max.		
LA431	36	Adj: 2.495	±0.4% ±1.0%	0.3	SC-70, TO-92, SOT-23, SOT-89	MP
LF431	36	Adj: 2.495	±0.5% ±1.0%	0.08	TO-92, SOT-23, SOT-25, SOT89	MP
LT433	30	Adj: 1.24	±0.5% ±1.0%	0.3	TO-92, SOT-23	MP
LA432	18	Adj: 1.24	±0.5% ±1.0%	0.08	TO-92, SOT-23	MP

**LV DC-DC Converter**

Part Number	Inout Voltage (V)	Output Current (A)	Switching Frequency (Mhz)	Feedback Voltage (V)	Channel	Power Saving	Package	Status
LSP5311	2.7 ~ 5.5	1	1.5	0.6	1	●	SOT23-5, TSOT23-5, TDFN2020-6	MP
LSP5313	2.7 ~ 5.5	1.5	1.5	0.6	1	●	SOT23-5, TSOT23-5, TDFN2020-6	MP
LSP5312	2.7 ~ 5.5	2	1.2	0.6	1	●	SOT23-5, TSOT23-5	MP
LSP5021	2.5 ~ 5.5	1.5	1.5	0.6	2		TDFN3030-12	MP

**HV DC-DC Converter**

Topology	Outout Current	Part Number	Vin Range (V)	Feedback Voltage (V)	Switch Frequency	Features	Package	Status
Syn.	1A	* LSP5501	4.5-40	1.2	1.5MHz		SOT23-6L	DEV
Syn.	2A	LSP5526	4.5-23	0.925	340KHz		SOP-8L	MP
		LSP5527	4.5-27	0.925	340KHz		SOP-8L	MP
Syn.	3A	LSP5503L	4.5-23	0.925	340KHz		ESOP-8L	MP
		LSP5523	4.5-27	0.925	340KHz		ESOP-8L	MP
non-Syn.	3.4A	LSP5582	8.0-36	1.2	120KHz	CC,CV	ESOP-8L	MP

**Buck Boost**

Product Family	Part Number	Electrical Characteristics				Package	Status
		Vin Range (V)	Feedback Voltage(V)	Iq (Typ) (mA)	Switch Frequency		
1.5A	LSP34063	5~36	1.25	4	100KHz	SOP-8L, DIP-8L	MP

**Operational Amplifier**

Product Number	Channel	VCC	Features	Quiescent	Offset (mV/Typ)	Package	Status
LSP3711	2	9V to 30V	Input Offset Voltage: ±0.5mV @25°C	0.5mA	±0.5	SOP-8	MP
LSP358	2	±1.5V ~ ±16.0V or 3.0V ~ 32.0V		50mA	±5	SOP-8, DIP-8	MP
LA321	1	3V to 30V		0.5mA	±1.5	SOT-25	MP

**Comparator**

Product Number	Features	VCC	Package	Status
LSP393	Dual Differential Comparators	2.0V ~ 36.0V or $\pm 1.0V \sim \pm 18.0V$	SOP-8, DIP-8	MP

**Dual Op Amp and Voltage Reference / CC and CV Controller**

Part Number	Description	Constant Voltage Reference Tolerance (%)	OP1 Reference Voltage (V)	OP2 Reference Voltage (mV)	Vcc Max	Input Offset Voltage (mV)	Supply Current (mA)	Package	Status
LB4310	Dual Op Amp and Voltage Reference	$\pm 0.4$	2.5	ADJ	40	3mV(Max)	0.2	SOP-8L	MP
LB4311	Dual Op Amp and Voltage Reference	$\pm 0.4$	2.5	ADJ	40	1mV(Max)	0.2	SOP-8L	MP
LA4320	CC & CV controller	$\pm 0.4$	2.5	A: 30, B: 50	40		0.25	SOT23-6	MP
LA4313	CC & CV controller	$\pm 0.4$	1.21	200	20		0.6	SOT23-6	Dev

**Precision AC Detector**

Product Number	Features	Package	Status
LSP3700	Precision AC Brown-out Supervisor IC , which could protect the SPS when AC voltage is low	SOT23-6	MP

**Type-C CC Detector IC**

Part Number	Function	MOSFET R <sub>DS</sub>	Standby Current typ (uA)	Package	Status
LSP3361	Vout discharge & External NTC/PTC Thermistor		75	SOT23-6	MP
LSP3362B	With P-MOS & Vout discharge & soft start adj.	25mOhm(Max)	75	SOP8	MP
LSP3363	With P-MOS & Vout discharge function & External NTC/PTC Thermistor	25mOhm(Max)	75	SOP8	MP
LSP3366	With P-MOS & Vout discharge	15mOhm(Max)	75	SOP8	MP



## APPENDIX

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APPENDIX APPLICATION NOTE.....	PAGE 176-177
RECOMMENDED SOLDERING TECHNIQUES.....	PAGE 178-184
OUTLINE DIMENSIONS.....	PAGE 185-199
SUGGESTED PAD LAYOUT.....	PAGE 200-203
PACKAGING METHOD.....	PAGE 204-215

## Application Note ---

### Bending Terminal Leads

When bending the leads, in order to avoid excessive extend in the area where the leads enter the resinous body, use a tool that clamps the point between the package and the bending point. Improper bending will damage the die or separate the resin from the mounting frame, resulting in a degradation in electrical characteristics or a reliability problem such as poor resistance to moisture.

The leads must be bent only once and they should not be bent at an angle of more than 90°. Leads must be formed before fixing them to a printed circuit board or to a heatsink. Never form the leads after soldering.

The load shall be restricted such that the bend starts recommended distance (X) from the body of the component part.

X=2 mm for T-1, DO-41 Mini, DO-41, DO-15 CASE.

X=3 mm for DO-201AD CASE.

X=4 mm for R-6 CASE.

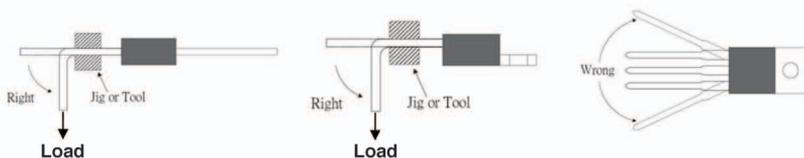


Figure 1. Bending Terminal Leads

### Mounting to Heatsink

The mounting surface of a heatsink should be free from foreign materials and metallic filings, and have enough flatness and finish comparable to that of the back of diode package. Don't screw up the unit from backside (heat sink) and please face the marking surface of unit (front side) while screwing up the unit. Be sure, when mounting devices to a heatsink, that excessive torque may cause a mechanical failure of the device or a reliability problem. (ex. electrical degrade...). Also note, insufficient torque results in poorer heat transmission.

Recommended mounting hole, screw and mounting torque corresponding to our packages are shown in Table.

Package	Mounting hole ( $\psi$ = mm)	Screw	Torque (N*m /kgf*cm)
TO-220	3.81	M3	0.50 / 5.1
TO-3P	3.05		
BRIDGE	---	M3/M5	0.50 / 5.1
ITO-220	3.18	M3	0.50 / 5.1
TO-126F	2.92	M2.5	0.50 / 5.1

Thermal compounds (greases) facilitate interface thermal conduction between device and heatsink. Recommended compounds are hydrophilic oil based. When applied, compounds should be spread evenly in a very thin layer over the whole contact area.

The contact thermal resistance  $R_{th\ j-c}$  in our data sheets are defined with the recommended mounting torque and with the thermal compound.

**Soldering of Through-hole Mounting Devices**

Resistance to soldering heat test is carried out under the condition shown below. Soldering should be completed at a lowest possible temperature for a shortest period.

Temp.  $260 \pm 5^\circ\text{C}$

Duration  $10 \pm 1\text{s}$

Figure 12 shows the Dip duration vs. Solder Temperature Rating for plastic diodes.

General requirements for manual soldering are as follows:

1. Use a soldering iron of 30 watts maximum, that is grounded or with a high insulation resistance.
2. The iron tip is kept away from any resinous body.
3. Attachment should be achieved in not more than 3 seconds.

Be sure again not to put an excessive mechanical stress on devices, such as a rough insertion of device into a through-hole, or manual reforming of leads after soldering.

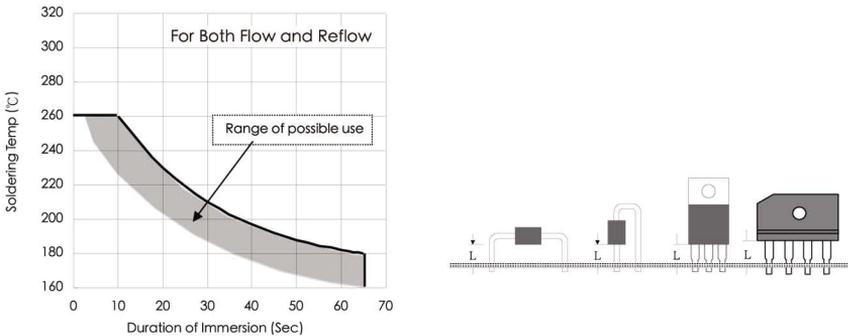


Figure 2. Rated Duration of Immersion vs. Solder Temperature

## Recommended Soldering Techniques

### Introduction

The soldering process is the means by which electronic components are mechanically and electrically connected into the circuit assembly. Adhering to good soldering practices will preserve the inherent reliability of the original components and ensure a good, reliable connection of the component into the circuit assembly.

### Soldering Considerations

Substrates : A substrate is a material which constitutes a printed circuit board, commonly called a PCB.

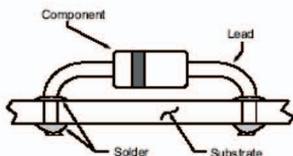


Fig. 1 Axial-Leaded Components

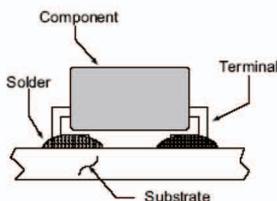


Fig.2 Surface Mount Components

There are many different types of PCB substrate materials. Among the most common are the following:

<u>Substrate</u>	<u>Advantages</u>	<u>Disadvantages</u>
Phenolic	Very inexpensive, easy to punch and drill.	Poor resistance to vibration and mechanical shock.
FR-4	Inexpensive, moderately easy to drill.	Cannot be punched, heavy components need mechanical support.
Alumina	Good resistance to mechanical shock.	Expensive, poor coefficient of expansion match to glass.

To select the most appropriate substrate material for the application, the designer of the circuit assembly must weigh these five factors:

1. coefficients of expansion for all the components which will be soldered onto the PCB,
2. coefficient of expansion for the substrate,
3. cost of the substrate,
4. cost of any secondary operations to the substrate, such as the drilling of “through-holes”, and
5. application-specific issues, such as vibration resistance and weight.

It is important to match the coefficients of expansion for the components to those for the PC board. When a PCB assembly is soldered and the coefficients of expansion for the components and the PC board are not matched, the solder joints may crack or the bodies of the parts may crack or shatter as the assembly cools.

**PCB Pad Layout and Solder Paste Thickness :**

It is important to use proper layout patterns in order to ensure good solder connections, especially for surface mount components soldered by a reflow process. Many surface mount components have more than three terminals which form the "footprint" for the devices. Ideally, every terminal of the device would be formed to create a perfect mounting plane. In the real world, there is a tolerance associated with how close each lead comes to meeting the intended plane. A measure of this characteristic is called coplanarity. In most cases, some of the terminals of a device will not be perfectly aligned with the intended mounting plane. In an infrared reflow solder process, the PCB pads are coated with a solder paste (Figure 3). When the assembly is heated in an oven, the solder paste warms and reflows. As the solder paste liquefies, it forms an apex at the center of the PCB pad. This apex must contact the terminal of the device in order to make contact. When using an IR reflow process, the solder process engineer must take into account the pad layout and the coplanarity of the devices when determining the solder paste thickness. Figure 4 shows a failure mode where the device has poor coplanarity and the solder paste thickness is insufficient for the apex of the liquefied solder to contact the poorly formed terminal.

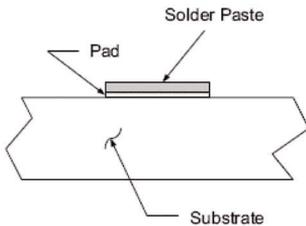


Fig. 3 PCB With Solder Paste Before

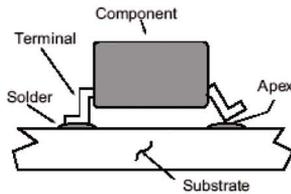


Fig. 4 Device Exhibiting Poor Coplanarity

**Component Insertion and Reflow**

Care must also be taken not to use too much solder paste. Excessive solder paste will result in too much solder on the pad. The terminals of many surface mount components are designed to flex, which allows the terminals of the component to withstand mechanical and thermal stress without fracturing. When excessive solder is applied, the terminals become captivated within the solder and force is transferred away from the terminals and into the internal structure of the device. This can lead to immediate or latent failures. Figure 5 shows a solder connection with the proper amount of solder and figure 6 shows excessive solder.

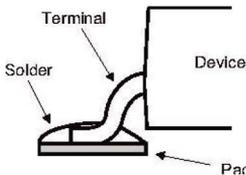


Fig. 5 A Good Solder Connection

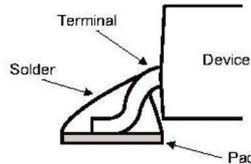


Fig. 6 Excessive Solder

### Fluxing and Cleaning :

Another major consideration in soldering is fluxing. Flux, used in conjunction with solder during the soldering process, is the material that aids the solder in flowing. The selection of the proper flux and its correct application are essential to proper soldering. Fluxes have differing levels of activity, or abilities to remove contaminants from the device terminals and PCB pads.

A key characteristic of fluxes is their solubility. The solubility of the flux determines which wash processes can be used to remove the flux. In the past, many circuit assembly facilities used active, non-water soluble fluxes. Active fluxes are able to remove surface oxides from the leads or terminals of the devices and result in even, smooth solder joints with excellent wettability. However, active fluxes are highly corrosive. When active fluxes are not completely removed, the solder joints are more likely to corrode and the long-term reliability of the assembly may be degraded. Active fluxes must be removed from the PCB. The removal process is called cleaning or washing. Many materials which are highly effective at removing flux (such as freon and trichloroethane) became subject to environmental legislation several years ago, and they are now illegal in environmentally-conscious countries. As a result of these concerns, the following two trends have emerged:

1. Some circuit assemblers have migrated to low activity fluxes. Fluxes are available now which have such low activity levels that it is not necessary to remove them from the PCB. Such fluxes are commonly referred to as "no-wash" "leave-on" fluxes. However, low activity fluxes frequently lead to wettability problems. Wettability is a measure of how well the solder joins the device lead or terminal to the PC board (Figure 7). Two important factors in a low-activity flux process are the cleanliness of the device leads or terminals, and the plating thickness of the leads or terminals. If the terminals of a device are not sufficiently clean, de-wetting can occur. If the plating thickness of the device terminals is insufficient, non-wetting can occur.
  - De-wetting: Fluxes with low activity levels are not as effective at removing oxides and contaminants from device leads or terminals as active fluxes. When contaminants are not properly removed from the pads and/or the leads of the devices, de-wetting can occur. De-wetting is characterized by irregular and dispersed solder droplets on the joint surface, often separated by a thin layer of solder between them.
  - Non-wetting: Solder may not adhere to the leads or terminals of a device if the plating thickness is too thin. This problem especially applies to axial-leaded devices since the solder must bridge across the through-hole from the pad to the lead (Figure 8)

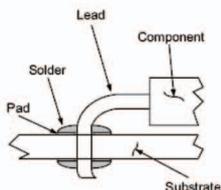


Fig. 7 A Solder Joint Exhibiting Good Wetting

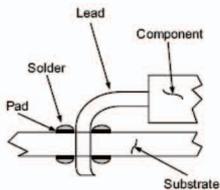


Fig. 8 Non-wetting Solder Joint

2. Due to the aforementioned concerns pertaining to low activity fluxes, the electronics industry has developed highly active fluxes which are water soluble. These new types of fluxes offer the effectiveness of a highly active flux in conjunction with water-solubility for ease of cleaning.

**Plating Composition :**

The leads or terminals of components usually consist of either copper, a copper alloy, or other alloys such as domet. The leads are plated with one or more other metals. Three common plating materials are tin, lead, and silver. The composition of the plating material directly affects the solderability of the device. When an alloy is used for plating, the temperature at which it transitions from its solid to liquid state is called the eutectic temperature. Many axial-leaded components are plated with either 100% Tin (Sn), or 90% Tin (Sn)/10% Lead (Pb). 100% Tin has a melting point of approximately 232°C, and 90Sn/10Pb has a eutectic temperature of approximately 216°C. Many surface mount components are plated with an alloy of 60% Tin, 40% Lead (Pb), which is eutectic at approximately 190°C. The eutectic temperature of the plating alloy determines the minimum limit of the soldering process temperature in order to reflow the plating on the device's leads or terminals.

**Body Composition :**

The body composition of the devices is also pertinent to the soldering process. The body material of many components consists of plastic epoxies, which can be grouped into two main categories:

- Thermoplastics: Thermoplastics can be melted and remolded more than once. One such body material is called Thermoplastics, which melts at around 280°C. Thermoplastics has a melting temperature which is relatively close to the eutectic point of the plating on their leads or terminals. Solder process engineers should make sure that the peak soldering temperature does not exceed the melting temperature of any thermoplastic-bodied devices.
- Thermosetting plastics: In contrast to thermoplastics, thermosetting plastics, such as Duroplast, are formed only once. Subsequent exposures to high temperatures (such as those in the range of most solder processes) cause the material to harden instead of soften. Exposure to excessively high heat causes a thermosetting plastic to crack or crumble.

**Soldering Methods and Process Stages**

Soldering methods commonly used today include:

- Wave soldering: Wave soldering is still widely employed for axial leaded devices and for mixed technology boards. Surface mount components can be wave soldered successfully if the recommendations in this document are followed. Surface mount components must first be mounted to the PCB with an adhesive before they can pass through the solder wave.
- Reflow soldering: Most surface mount components are reflow soldered. The two major types of reflow processes are:
  1. Infrared reflow- the most common type of reflow process.
  2. Vapor phase reflow- rapidly disappearing due to environmental restrictions on fluorocarbons.

There are four process stages in soldering:

1. Preheat: The preheat process is very important in any kind of soldering process. To avoid thermally shocking the components, PCB assemblies must be preheated. Immediate or latent damage can occur to the components if they are not preheated properly.
2. Soak: A soak period is advisable so that components of differing thermal mass will approach a similar temperature prior to the peak stage. During reflow soldering, this is the period where the flux begins to break down the oxides which would inhibit solder adhesion.

## Soldering Methods and Process Stages (continued)

### 3. Peak/Reflow:

- Temperature: The range of the peak soldering temperature depends on several factors, two of which have been described in previous sections: plating and body compositions. The minimum soldering temperature range should be at least 5-10°C higher than the eutectic temperature of the plating alloy. The maximum soldering temperature should be at least 5-10°C lower than the melting temperature of any thermoplastic components (if used).

- Time: The devices must be held at the peak soldering temperature long enough to ensure the proper wetting of the solder connections. However, keeping the peak soldering time to a minimum to avoid the possibility of damage to the devices and to increase throughput, is recommended.

4. Cool down: After the devices are exposed to the peak soldering temperature, they go through a cool down process. Although some manufacturers cool their PCB assemblies in free air, it is better to use a controlled temperature chamber for superior control of the thermal gradient.

## Suggested Thermal Profiles for Soldering Processes

LSC presents the following general thermal profiles for soldering processes (Figures 9 and 10) as examples only. The solder process engineer should always optimize the thermal profile for each circuit assembly based on its specific requirements.

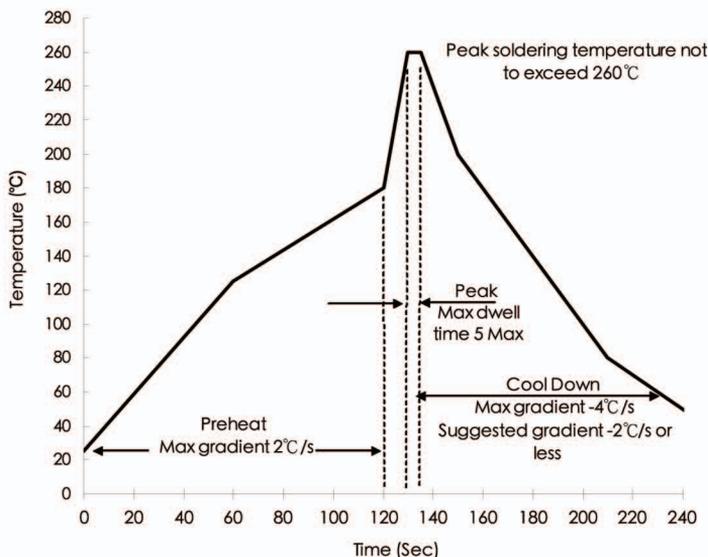


Fig. 9 Typical Wave Soldering Thermal Profile

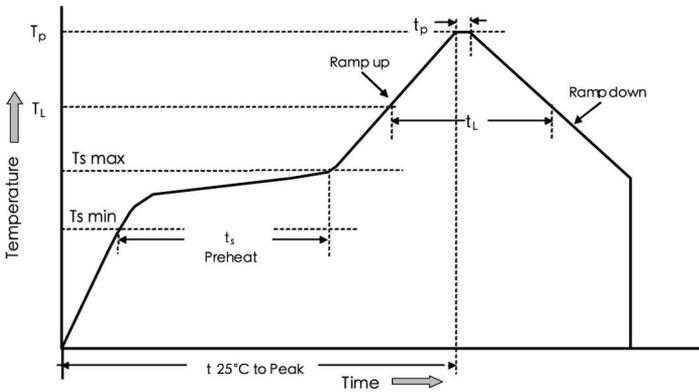


Fig. 10 Typical IR Reflow Soldering Thermal Profile

Table 1- Reflow profile

Reflow condition	Sn-Pb assembly	Pb-free assembly
Average ramp-up rate (Liquidus Temperature (TL) to Peak)	3°C/second max.	3°C/second max.
Preheat		
--Temperature Min, Ts (Min)	100°C	150°C
--Temperature Max, Ts (Max)	150°C	200°C
--Time (min to max, ts)	60-120 seconds	60-180 seconds
Ts(max) to TL - Ramp-up Rate		3°C/second max.
Time maintained above:		
--Temperature(TL)	183°C	217°C
--Time(tL)	60-150 seconds	60-150 seconds
Peak Temperature (Tp)	240 +0/-5°C	260 +0/-5°C
Time within 5°C of actual Peak Temperature(tp)	10-30 seconds	20-40 seconds
Ramp-down Rate	6°C/second max.	6°C/second max.
Time 25°C to Peak Temperature.	6 minutes max.	8 minutes max.

Note: All temperatures refer to topside of the package, measured on the package body surface.

### Soldering Process Suggestions

1. Due to the differing thermal capacities of large and small components and equipment wear, localized "hot spots" and "cold spots" may be generated during reflow soldering. Special care should be taken to avoid the damage of small components in "hot spots" and de-wetting or non-wetting of larger components in "cold spots". A good practice is to mount miniature thermocouples in several locations on the PCB which are suspected to be hot and cold spots. The reflow solder profile can then be adjusted accordingly to result in optimal soldering. A good practice is to place the PCB assemblies at regular, repeated positions on the conveyor system to achieve uniform soldering on successive assemblies.

## Soldering Process Suggestions (continued)

- The leads on most LSC. RoHS compliant (Pb-free) devices have a Matte Tin (Sn) plating finish over an ALLOY 42 Lead Frame. Some devices have silver (Ag) plating. The Matte Tin finish requires a higher solder temperature (235-255°C) than our standard products (217-235°C), which have an tin/lead (Sn-Pb) finish.
- IPC/JEDEC document J-STD-020C provides a reflow profile applicable to both Sn-Pb and Pb-free devices. This profile is not a recommendation for reflow soldering. Rather, it is a temperature vs. time profile that a device must withstand without failure in order to maintain a desired moisture sensitivity level. In that sense, it represents the maximum stress to which a device should be subjected.
- LSC. soldering recommendations are within the JEDEC profile and should be considered a reasonable starting point in developing a profile for reflow soldering. Actual temperatures will depend on your soldering alloy, PCB layout, weight of copper, pad sizes, and other variables. In any event, temperatures in excess of 260°C violate LSC. specifications.

## Recommendations for Rework

### Hot Gas Pencils:

Hot gas pencils should be set up to limit the gas temperature to a maximum of 300°C at a distance of 3mm from the nozzle tip.

### Soldering Irons:

- Only thermostatically-controlled irons should be used. The bit should have a diameter not exceeding 1mm and should be set so that its maximum temperature never exceeds 300°C.
- The bit must not touch the component body. Contact should only be with the component leads or the land pads on the printed circuit board (Figure 11).

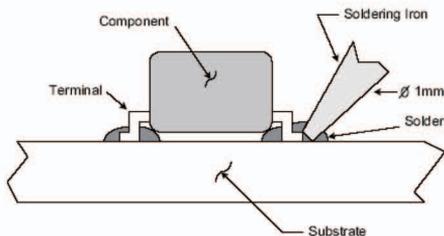


Fig. 11 Rework by Soldering Iron

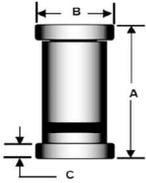
- The maximum permitted temperature-time combination on the component lead is 300°C for 10 sec.

### Attention:

The Maximum number of Heat treatment (reflow or rework) is 3 times for Sn-Pb or Pb-free soldering.

## OUTLINE DIMENSIONS

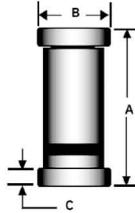
**LL-34**



LL-34		
DIM.	MIN.	MAX.
A	3.30	3.60
B	1.40	1.50
C	0.35	0.5

All Dimensions in millimeter

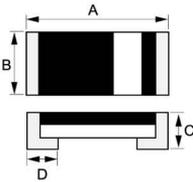
**LL-41**



LL-41		
DIM.	MIN.	MAX.
A	4.80	5.20
B	2.39	2.66
C	0.41	0.55

All Dimensions in millimeter

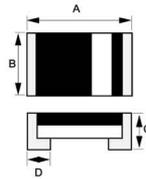
**0603**



0603		
Dim.	Min.	Max.
A	1.45	1.65
B	0.70	0.90
C	0.55	0.75
D	0.25	0.45

All Dimensions in millimeter

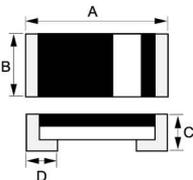
**0805**



0805		
Dim.	Min.	Max.
A	1.80	2.20
B	1.05	1.45
C	0.75	0.95
D	0.25	0.65

All Dimensions in millimeter

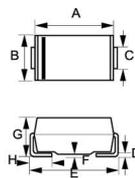
**1206**



1206		
Dim.	Min.	Max.
A	3.00	3.40
B	1.30	1.70
C	0.75	0.95
D	0.35	0.75

All Dimensions in millimeter

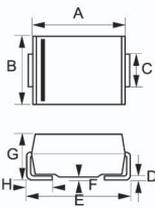
**SMA**



SMA		
DIM.	MIN.	MAX.
A	4.06	4.57
B	2.29	2.92
C	1.27	1.63
D	0.15	0.31
E	4.83	5.59
F	0.05	0.20
G	1.96	2.40
H	0.76	1.52

All Dimensions in millimeter

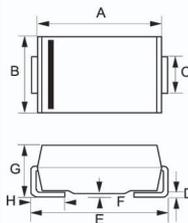
## SMB



SMB		
DIM.	MIN.	MAX.
A	4.06	4.57
B	3.30	3.94
C	1.96	2.21
D	0.15	0.31
E	5.21	5.59
F	0.05	0.20
G	2.01	2.50
H	0.76	1.52

All Dimensions in millimeter

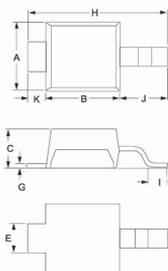
## SMC



SMC		
DIM.	MIN.	MAX.
A	6.60	7.11
B	5.59	6.22
C	2.92	3.18
D	0.15	0.31
E	7.75	8.13
F	0.05	0.20
G	2.01	2.50
H	0.76	1.52

All Dimensions in millimeter

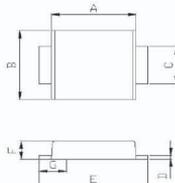
## DO-216AA



DO216AA		
DIM.	MIN.	MAX.
A	1.75	2.05
B	1.80	2.20
C	0.95	1.25
D	0.42	0.68
E	0.70	1.00
F	-0.05	+0.10
G	0.10	0.25
H	3.65	3.95
I	0.40	0.70
J	1.10	1.50
K	0.20	0.80

All Dimensions in millimeter

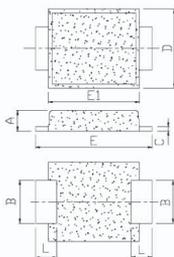
## DO-221AA



SMB FLAT		
DIM.	MIN.	MAX.
A	4.06	4.57
B	3.30	3.94
C	1.96	2.21
D	0.15	0.31
E	5.21	5.59
F	0.90	1.05
G	0.76	1.52

All Dimensions in millimeter

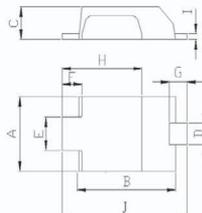
## DO-221AC



DO-221AC		
DIM.	MIN.	MAX.
A	0.90	1.10
B	1.25	1.65
C	0.15	0.40
D	2.25	2.95
E	4.80	5.60
E1	3.95	4.60
L	0.75	1.50

All dimension in millimeter

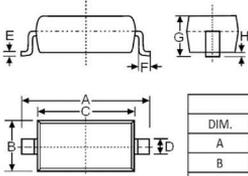
## DO-222AA



DO-222AA		
DIM.	MIN.	MAX.
A	1.75	2.05
B	2.80	3.10
C	0.80	0.95
D	0.40	0.65
E	0.70	1.00
F	0.45	0.75
G	0.50	0.80
H	2.10	2.60
I	0.10	0.25
J	3.60	3.90

All Dimensions in millimeter

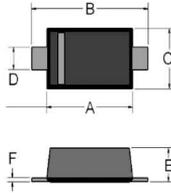
**SOD-123**



SOD-123		
DIM.	MIN.	MAX.
A	3.55	3.85
B	1.50	1.70
C	2.60	2.80
D	0.45	0.65
E	0.08	0.15
F	0.25	0.45
G	1.05	1.25
H	0.00	0.10

All Dimensions in millimeter

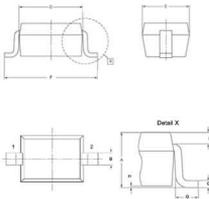
**SOD-123F**



SOD-123F		
DIM.	MIN.	MAX.
A	2.50	2.70
B	3.30	3.70
C	1.50	1.70
D	0.50	0.70
E	0.80	1.00
F	0.05	0.20

All Dimensions in millimeter

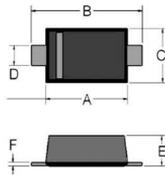
**SOD323**



SOD323		
DIM.	MIN.	MAX.
A	0.80	1.10
B	0.25	0.40
C	0.10	0.25
D	1.60	1.80
E	1.15	1.35
F	2.30	2.70
G	0.15	0.45
H	-	0.05
I	0.15	0.25

All Dimensions in millimeter

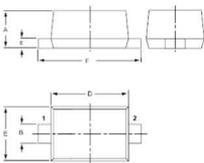
**SOD-323F**



SOD-323F		
DIM.	MIN.	MAX.
A	1.60	1.80
B	2.30	2.70
C	1.15	1.35
D	0.25	0.40
E	0.80	1.00
F	0.05	0.25

All Dimensions in millimeter

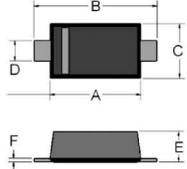
**SOD-523**



SOD-523		
DIM.	MIN.	MAX.
A	0.51	0.77
B	0.25	0.35
C	0.08	0.15
D	1.10	1.30
E	0.75	0.85
F	1.50	1.70

All Dimensions in millimeter

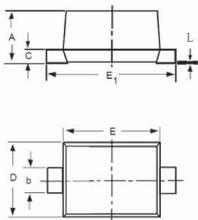
**SOD-523F**



SOD-523F		
DIM.	MIN.	MAX.
A	1.10	1.30
B	1.50	1.70
C	0.7	0.9
D	0.25	0.35
E	0.50	0.70
F	0.05	0.20

All Dimensions in millimeter

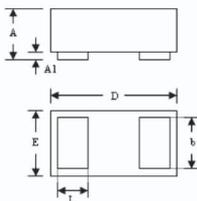
## SOD-723



SOD-723		
DIM.	MIN.	MAX.
A	0.525	0.65
b	0.25	0.35
C	0.08	0.15
D	0.55	0.65
E	0.90	1.10
E1	1.30	1.50
L	0.01	0.07

All Dimensions in millimeter

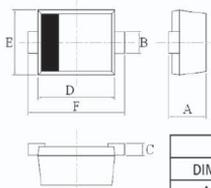
## SOD-882



SOD-882		
DIM.	MIN.	MAX.
A	0.47	0.53
A1	0.00	0.05
b	0.25	0.55
D	0.95	1.075
E	0.55	0.675
L	0.20	0.45

All Dimensions in millimeter

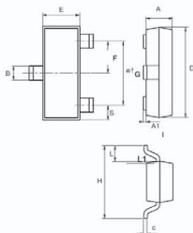
## SOD-923



SOD-923		
DIM.	MIN.	MAX.
A	0.36	0.41
B	0.18	0.26
C	0.08	0.14
D	0.76	0.84
E	0.56	0.64
F	0.92	1.08

All Dimensions in millimeter

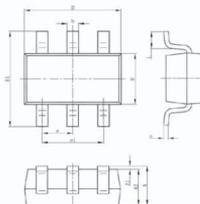
## SOT23



SOT23		
DIM.	MIN.	MAX.
A	0.89	1.05
B	0.30	0.51
C	0.09	0.18
D	2.75	0.04
E	1.20	1.60
F	0.85	1.05
G	1.70	2.10
H	2.10	2.75
I	0.00	0.10
L	0.6 Typ.	
S	0.35	0.65

All Dimensions in millimeter

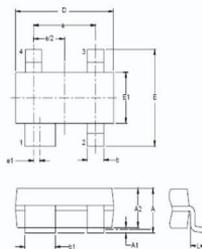
## SOT23-6L



SOT23-6L		
DIM.	MIN.	MAX.
A	0.90	1.45
A1	0.00	0.15
A2	0.90	1.30
b	0.30	0.50
c	0.08	0.22
D	2.45	3.00
E	1.50	1.75
E1	2.80 Typ.	
e	0.95 Typ.	
e1	1.90 Typ.	
L	0.30	0.60

All Dimensions in millimeter

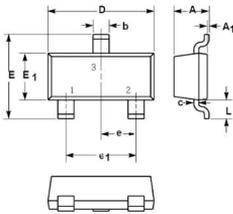
## SOT-143



SOT-143		
DIM.	MIN.	MAX.
A	0.80	1.22
A1	0.013	0.15
A2	0.75	1.07
b	0.30	0.51
b1	0.76	0.94
D	2.80	3.04
E	2.10	2.64
E1	1.20	1.40
e	1.92 BSC	
e1	0.20 BSC	
L	0.40	0.60

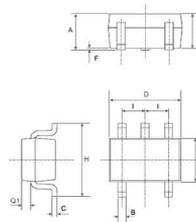
All Dimensions in millimeter

**SOT-323**



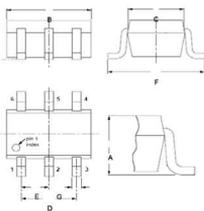
SOT-323		
DIM.	MIN.	MAX.
A	0.90	1.10
A1	0.00	0.10
A2	0.90	1.00
b	0.20	0.40
c	0.08	0.15
D	2.00	2.20
E	1.15	1.35
E1	2.15	2.45
e	0.65 Typ.	
e1	1.20	1.40
L	0.525 REF.	
L1	0.26	0.46
All Dimensions in millimeter		

**SOT353**



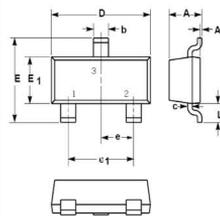
SOT353		
DIM.	MIN.	MAX.
A	0.80	1.10
B	0.15	0.30
C	0.10	0.18
D	1.80	2.20
E	1.15	1.35
F	0.00	0.10
G	0.80	1.00
H	1.80	2.40
I	0.65 Typ.	
Q1	0.10	0.40
All Dimensions in millimeter		

**SOT-363**



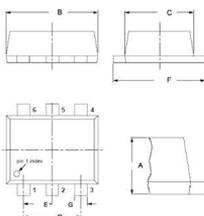
SOT-363		
DIM.	MIN.	MAX.
A	0.80	1.10
B	1.80	2.20
C	1.15	1.40
D	1.30 Typ.	
E	0.65 Typ.	
F	2.00	2.45
G	0.15	0.35
All Dimensions in millimeter		

**SOT-523**



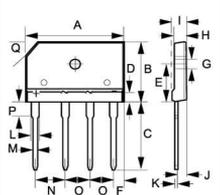
SOT-523		
DIM.	MIN.	MAX.
A	0.70	0.90
A1	0.00	0.10
A2	0.70	0.80
b1	0.15	0.25
b2	0.25	0.33
c	0.10	0.20
D	1.50	1.70
E	0.75	0.85
E1	1.45	1.75
e	0.5 Typ.	
e1	0.90	1.10
L1	0.28	0.44
All Dimensions in millimeter		

**SOT-563**



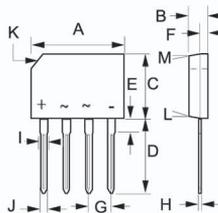
SOT563		
DIM.	MIN.	MAX.
A	0.50	0.60
B	1.50	1.70
C	1.10	1.30
D	1.00 (Typ.)	
E	0.50 (Typ.)	
F	1.50	1.70
G	0.17	0.27
All Dimensions in millimeter		

**GBJ**



GBJ		
DIM.	MIN.	MAX.
A	29.70	30.30
B	19.70	20.30
C	14.00	18.00
D	4.70	4.90
E	10.60	11.20
F	2.30	2.70
G	3.10 $\varnothing$	3.40 $\varnothing$
H	3.40	3.80
I	4.40	4.80
J	2.50	2.90
K	0.60	0.80
L	2.00	2.40
M	0.90	1.10
N	9.80	10.20
O	7.30	7.70
P	3.80	4.20
Q	(3.0) x 45°	
All Dimensions in millimeter		

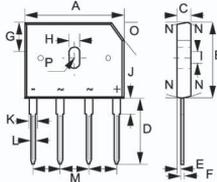
## GBL



GBL		
DIM.	MIN.	MAX.
A	20.2	20.8
B	3.30	3.70
C	10.70	11.30
D	17.50	18.00
E	2.30	2.70
F	0.80	1.20
G	4.83	5.33
H	0.40	0.60
I	1.95	2.35
J	1.02	1.27
K	3.5 Typ.	
L	-	5°
M	-	5°

All Dimensions in millimeter

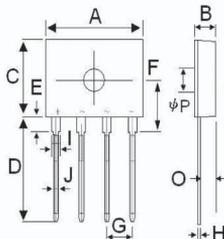
## GBU



GBU		
DIM.	MIN.	MAX.
A	21.80	22.30
B	18.30	18.80
C	3.30	3.56
D	17.50	18.00
E	0.76	1.00
F	0.46	0.56
G	7.40	7.90
H	3.50	4.10
I	1.65	2.16
J	2.25	2.75
K	1.95	2.35
L	1.02	1.27
M	4.83	5.33
N	7.0° TYPICAL	
O	3.2 x 45°	
P	1.90 RADIUS	

All Dimensions in millimeter

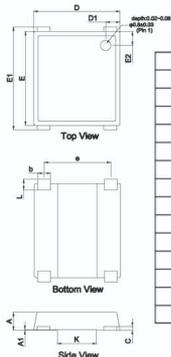
## GBP



GBP		
Dim.	Min.	Max.
A	14.2	14.7
B	2.9	3.3
C	10.1	10.7
D	13.8	14.4
E	1.8	2.2
F	6.65	7.25
G	3.71	3.91
H	0.4	0.6
I	1.20	1.40
J	0.64	0.84
O	1.8	2.4
P	3.1 $\psi$	3.3 $\psi$

All Dimensions in millimeter

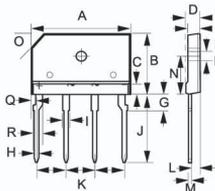
## M2



M2			
DIM.	MIN.	TYP.	MAX.
A	1.30	1.40	1.50
A1	0.04	0.06	0.08
C	0.27	0.30	0.40
D	6.50	6.60	6.70
D1	0.95	1.10	1.25
E	7.20	7.30	7.40
E1	7.90	8.30	8.60
E2	0.95	1.10	1.25
L	0.80	1.00	1.05
b	0.95	1.00	1.15
e	5.00	5.10	5.20
K	2.90	3.00	3.10

All dimensions in millimeter

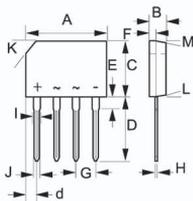
## KBJ



KBJ		
DIM.	MIN.	MAX.
A	24.80	25.20
B	14.70	15.30
C	3.90	4.10
D	4.40	4.80
E	3.40	3.80
F	3.10 $\varnothing$	3.40 $\varnothing$
G	3.30	3.70
H	0.90	1.10
I	1.50	1.90
J	17.2	17.80
K	7.30	7.70
L	2.50	2.90
M	0.60	0.80
N	9.30	9.70
O	3.0 x 45°	
Q	1.05	1.45
R	1.70	2.10

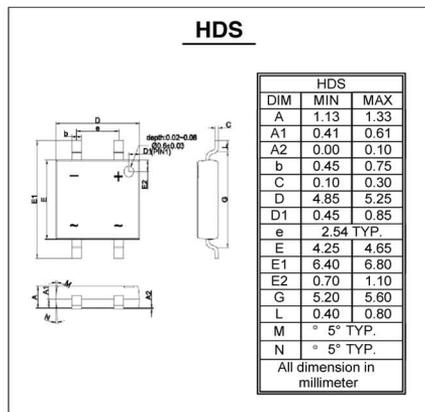
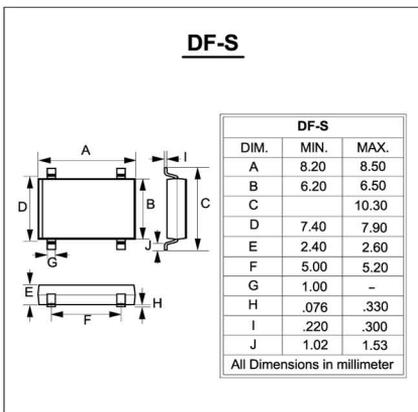
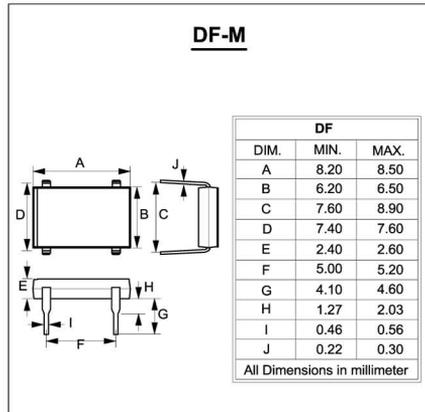
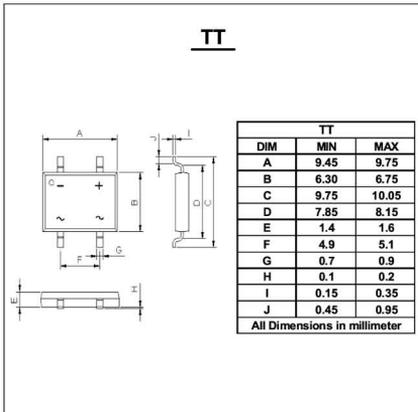
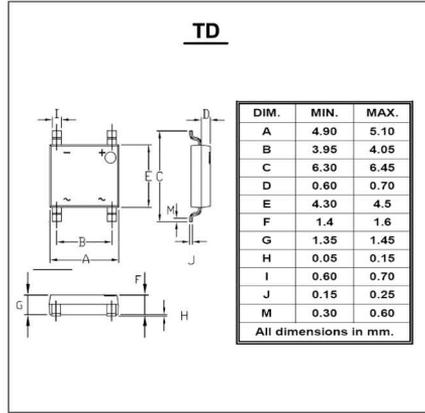
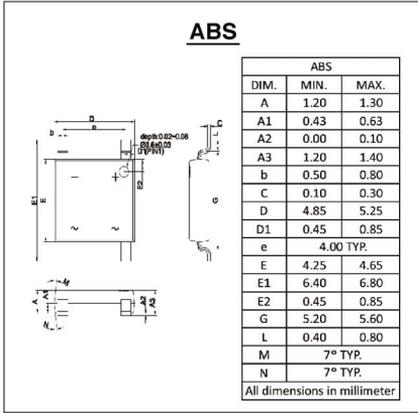
All Dimensions in millimeter

## KBP

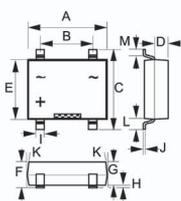


KBP		
DIM.	MIN.	MAX.
A	14.25	14.75
B	3.35	3.65
C	10.20	10.60
D	14.25	14.73
d	1.40	1.70
E	1.80	2.20
F	0.80	1.10
G	3.56	4.06
H	0.35	0.55
I	1.22	1.42
J	0.76	0.86
K	2.7 x 45° (Typ.)	
L	-	3°
M	-	2°

All Dimensions in millimeter



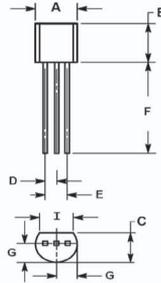
## HDDF



HDDF		
DIM.	MIN.	MAX.
A	4.50	4.90
B	2.30	2.70
C	—	7.00
D	1.20	1.60
E	3.60	4.00
F	—	3.00
G	2.30	2.70
H	—	0.20
I	0.50	0.80
J	0.15	0.35
K	5° TYPICAL	
L	1.30	1.70
M	0.70	1.10

All Dimensions in millimeter

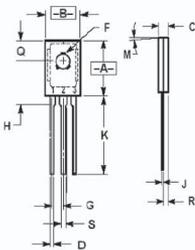
## TO-92 (TO-226AA)



TO-92		
DIM.	MIN.	MAX.
A	4.45	4.70
B	4.32	5.33
C	3.18	4.19
D	1.15	1.39
E	2.42	2.66
F	12.70	—
G	2.04	2.66
I	3.43	—

All Dimensions in millimeter

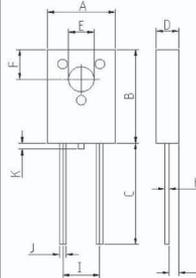
## TO-126



TO-126		
DIM.	MIN.	MAX.
A	10.16	11.43
B	7.12	8.38
C	2.29	3.04
D	0.64	0.88
F	2.54	3.30
G	2.04	2.54
H	—	2.54
J	0.39	0.63
K	15.12	16.63
M	3° Typ.	
Q	3.31	4.44
R	0.89	1.65
S	0.64	0.88

All Dimensions in millimeter

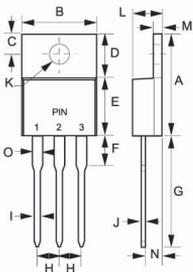
## TO-126F



TO-126F		
DIM.	MIN.	MAX.
A	7.12	8.36
B	10.16	11.43
C	14.48	16.63
D	2.85	3.65
E	3.00 ∅	3.30 ∅
F	3.31	4.44
G	1.75	2.35
H	0.39	0.63
I	4.07	5.08
J	0.65	0.85
K	—	1.20

All Dimensions in millimeter

## TO-220AB

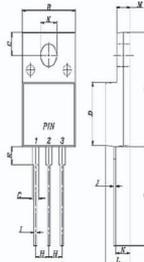


TO-220AB		
DIM.	MIN.	MAX.
A	14.22	15.88
B	9.65	10.67
C	2.54	3.43
D	5.84	6.86
E	8.26	9.28
F	—	6.35
G	12.70	14.73
H	2.29	2.79
J	0.51	1.14
K	0.40	0.67
L	3.53 ∅	4.09 ∅
L	3.56	4.83
M	1.14	1.40
N	2.03	2.92
O	1.17	1.37

All Dimensions in millimeter

\* Only for Thyristor Device  
(Triac & SCR)

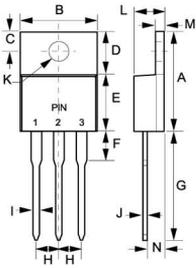
## ITO-220(S)AB



ITO-220(S)AB		
DIM	MIN	MAX
A	14.95	16.85
B	10.00	10.40
C	2.76	3.36
D	8.50	8.80
E	2.10	2.60
F	13.00	13.70
G	1.15	1.37
H	2.40	2.70
I	0.50	0.80
J	0.45	0.70
K	3.00	3.30
L	4.46	4.87
M	2.48	2.80
N	2.50	2.80

All Dimensions in millimeter

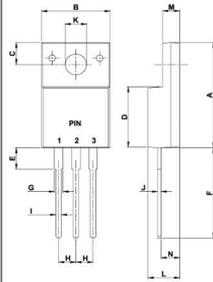
**TO-220AB**



TO-220AB		
DIM.	MIN.	MAX.
A	14.40	15.20
B	9.65	10.67
C	2.54	3.43
D	5.84	6.86
E	8.26	9.28
F	-	4.20
G	12.70	14.73
H	2.29	2.79
I	0.51	1.14
J	0.30	0.64
K	3.53 $\varnothing$	4.09 $\varnothing$
L	3.56	4.83
M	1.14	1.40
N	2.03	2.92

All Dimensions in millimeter

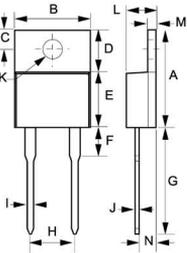
**ITO-220AB**



ITO-220AB		
DIM.	MIN.	MAX.
A	15.50	16.50
B	10.0	10.40
C	3.00	3.50
D	9.00	9.30
E	2.90	3.60
F	13.46	14.22
G	1.15	1.70
H	2.40	2.70
I	0.75	1.00
J	0.45	0.70
K	3.00 $\varnothing$	3.30 $\varnothing$
L	4.36	4.77
M	2.48	2.80
N	2.50	2.80

All Dimensions in millimeter

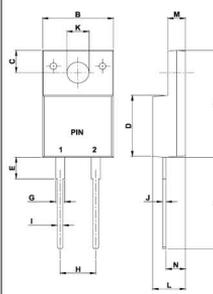
**TO-220AC**



TO-220AC		
DIM.	MIN.	MAX.
A	14.22	15.88
B	9.65	10.67
C	2.54	3.43
D	5.84	6.86
E	8.26	9.28
F	-	6.35
G	12.70	14.73
H	4.83	5.33
I	0.51	1.14
J	0.30	0.64
K	3.53 $\varnothing$	4.09 $\varnothing$
L		
M		
N		

All Dimensions in millimeter

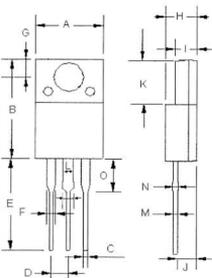
**ITO-220AC**



ITO-220AC		
DIM.	MIN.	MAX.
A	15.50	16.20
B	10.0	10.40
C	3.00	3.50
D	9.00	9.30
E	2.90	3.60
F	13.46	14.22
G	1.15	1.70
H	4.83	5.33
I	0.75	1.00
J	0.45	0.70
K	3.00 $\varnothing$	3.30 $\varnothing$
L	4.36	4.77
M	2.48	2.80
N	2.50	2.80

All Dimensions in millimeter

**TO-220FP**

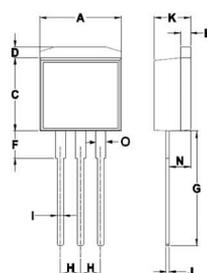


TO-220FP		
DIM.	MIN.	MAX.
A	9.95	10.10
B	15.00	15.30
C	0.55	0.70
D	2.35	2.73
E	13.35	13.55
F	1.11	1.45
G	2.60	2.83
H	4.49	4.50
I	3.10	3.25
J	2.60	2.80
K	6.80	7.10
L	1.48	1.66
M	0.60	0.68
N	0.62	0.78
O	3.60	3.90
P	3.00 $\varnothing$	3.20 $\varnothing$

All Dimensions in millimeter

\* Only for Thyristor Device  
(Triac & SCR)

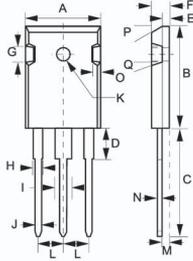
**I<sup>2</sup>PAK**



I <sup>2</sup> PAK		
DIM.	MIN.	MAX.
A	9.65	10.69
B	1.14	1.40
C	8.25	9.25
D	-	1.40
F	-	4.20
G	12.70	14.73
H	2.29	2.79
I	0.51	1.14
J	0.3	0.64
K	3.56	4.83
N	2.03	2.92
O	1.14	1.70

All Dimensions in millimeter

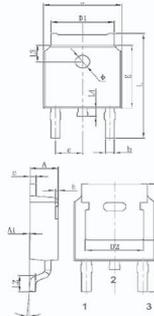
## TO-3P



TO-3P			
DIM.	MIN.	MAX.	
A	15.75	16.25	
B	21.25	21.75	
C	19.60	20.10	
D	3.78	4.38	
E	1.88	2.08	
F	4.87	5.13	
G	-	4.40	
H	1.90	2.16	
I	2.93	3.22	
J	1.12	1.22	
K	2.90 $\varnothing$	3.20 $\varnothing$	
L	5.20	5.70	
M	2.10	2.40	
N	0.51	0.76	
O	1.93	2.18	
P	-	20°	
Q	-	10°	

All Dimensions in millimeter

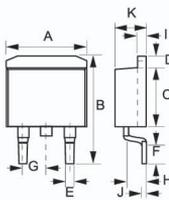
## DPAK



DPAK			
DIM	MIN.	MAX.	
A	2.20	2.40	
A1	0.00	0.13	
b	0.66	0.86	
c	0.46	0.58	
D	6.50	6.70	
D1	5.10	5.46	
D2	4.83 REF.		
E	6.00	6.20	
e	2.19	2.39	
L	9.80	10.40	
L1	2.90 REF.		
L2	1.40	1.70	
L3	1.6 REF.		
L4	0.60	1.00	
$\Phi$	1.10	1.30	
$\theta$	0°	8°	
h	0.00	0.30	
V	5.35 REF.		

All Dimension in millimeter

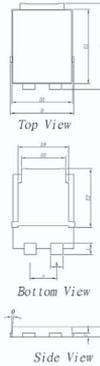
## D<sup>2</sup>PAK



D <sup>2</sup> PAK			
DIM.	MIN.	MAX.	
A	9.65	10.69	
B	14.60	15.88	
C	8.25	9.25	
D	--	1.67	
E	0.51	1.140	
F	2.29	2.79	
G	2.29	2.79	
H	2.03	2.92	
I	1.14	1.40	
J	0.30	0.64	
K	4.37	4.83	

All Dimension in millimeter

## D<sup>2</sup>PAK Flat(F5)



D <sup>2</sup> PAK Flat (F5)			
DIM.	MIN.	TYP.	MAX.
A	1.60	1.80	2.00
b	1.80	2.00	2.30
C	--	0.70	--
D	--	10.40	--
D1	9.80	10.00	10.30
D2	7.00	7.25	7.50
D3	8.10	8.35	8.60
E	14.50	15.00	15.50
E1	12.70	13.00	13.30
E2	10.00	10.25	10.60
e		4.35 REF.	
I	1.70	2.00	2.30
$\theta$	--	--	5°

All Dimension in millimeter

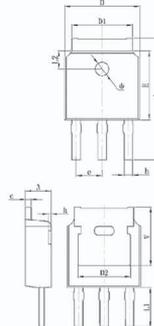
## TO-277 Plus(F4)



TO-277 Plus (F4)			
DIM.	MIN.	TYP.	MAX.
A	1.05	1.15	1.25
B	2.90	3.05	3.20
B1	1.20	1.34	1.50
B2	1.20	1.34	1.50
B3	3.30	3.45	3.60
B4	0.60	0.75	0.90
B5	4.75	4.90	5.05
B6	4.19	4.34	4.49
B7	3.42	3.57	3.72
B8	0.72	0.90	1.08
B9	0.02	0.10	0.20
B10	0.85	1.00	1.15
B11	4.05	4.20	4.35
B12	0.08	0.23	0.38
C	0.15	0.25	0.35
D	5.05	5.20	5.35
E	6.55	6.70	6.85
E1	5.95	6.10	6.25
F4	4.85	5.00	5.15
G	2.10	2.24	2.40
L	0.68	0.82	1.00

All Dimension in millimeter

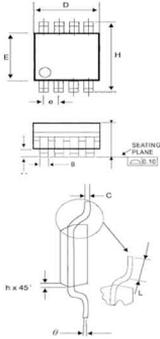
## IPAK-S



IPAK-S		
Dim	Min.	Max.
A	2.2	2.4
b	0.66	0.86
c	0.46	0.58
D	6.5	6.7
D1	5.1	5.46
D2	4.830 REF.	
E	6	6.2
e	2.186	2.386
L	10.4	11
L1	3.500 REF.	
L2	1.600 REF.	
$\Phi$	1.1	1.3
h	0	0.3
V	5.350 REF.	

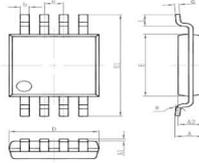
All Dimensions in millimeter

**SOP-8**



DIM	MILLIMETERS	
	MIN	MAX
A	1.35	1.75
A1	0.10	0.25
B	0.35	0.49
C	0.18	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.25
$\theta$	0°	7°

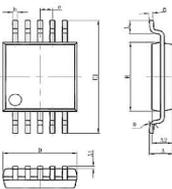
**MSOP-8L**



MOSP-8L		
DIM.	MIN.	MAX.
A	0.82	1.10
A1	0.02	0.15
A2	0.75	0.95
b	0.25	0.38
c	0.09	0.23
D	2.90	3.10
e	0.65 BSC	
E	2.90	3.10
E1	4.75	5.05
L	0.40	0.80

All Dimensions in millimeter

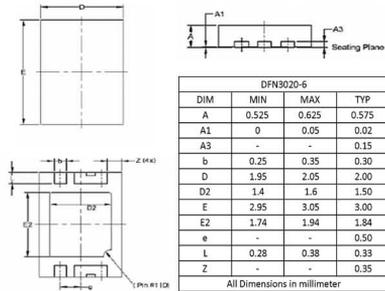
**MSOP-10L**



MSOP-10L		
DIM.	MIN.	MAX.
A	0.82	1.10
A1	0.02	0.15
A2	0.75	0.95
b	0.16	0.28
c	0.09	0.23
D	2.90	3.10
e	0.50 BSC	
E	2.90	3.10
E1	4.75	5.05
L	0.40	0.80
$\theta$	0°	6°

All Dimensions in millimeter

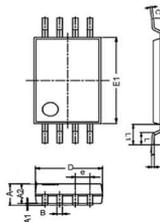
**DFN3020-6**



DFN3020-6			
DIM	MIN	MAX	TYP
A	0.525	0.625	0.575
A1	0	0.05	0.02
A3	-	-	0.15
b	0.25	0.35	0.30
D	1.95	2.05	2.00
D2	1.4	1.6	1.50
E	2.95	3.05	3.00
E2	1.74	1.94	1.84
e	-	-	0.50
L	0.28	0.38	0.33
Z	-	-	0.35

All Dimensions in millimeter

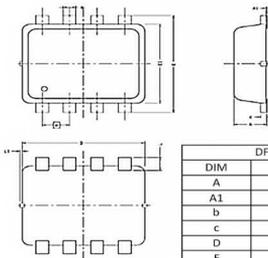
**TSSOP-8**



TSSOP-8		
DIM.	MIN.	MAX.
A	1.00	1.20
A1	0.92	1.08
A2	0.90	1.10
B	0.17	0.27
C	0.077	0.177
D	4.30	4.50
E	6.20	6.60
E1	4.30	4.50
L	0.20	0.60
L1	0.80	1.20
e	0.70	0.80

All Dimension in millimeter

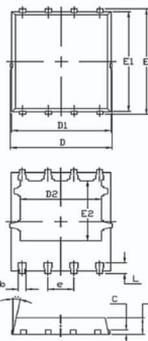
**DFN3030-8**



DFN3030-8		
DIM	MIN	MAX
A	0.70	0.90
A1	0.00	0.10
b	0.24	0.35
c	0.08	0.30
D	2.80	3.00
E	2.70	2.90
E1	2.20	2.40
e	0.65 BSC	
L	0.20	0.50
L1	0.00	0.10

All Dimensions in millimeter

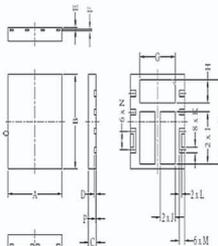
## POWER56



POWER56		
DIM.	MIN.	MAX.
A	0.95	1.05
b	0.30	0.50
C	0.254	
D	5.020	
D1	4.80	5.00
D2	3.91	4.11
E	5.95	6.15
E1	5.60	5.90
E2	3.38	3.58
e	1.27 REF.	
L	0.45	0.65
θ	10°	

All Dimension in millimeter

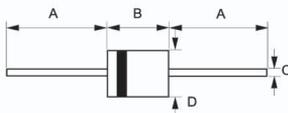
## DFN4040



DFN 4X4			
DIM	MIN	MAX	TYP
A	4.00 BSC		
B	4.00 BSC		
C	0.55	0.60	0.575
D	0.15 REF		
E	0.10	0.05	0.075
F	0.10	0.05	0.075
G	2.50	2.70	2.60
H	0.90	1.10	1.00
I	2.10	2.30	2.20
J	1.00	1.20	1.10
K	0.20	0.30	0.25
L	0.13	0.23	0.18
M	0.30	0.50	0.40
N	0.08 BSC		
O	3.55 BSC		
P	0	0.05	--

All dimension in millimeter

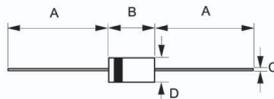
## R-6



R-6		
Dim.	Min.	Max.
A	25.4	-
B	8.60	9.10
C	1.20 ∅	1.30 ∅
D	8.60 ∅	9.10 ∅

All Dimensions in millimeter

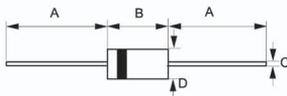
## A-405



A-405		
Dim.	Min.	Max.
A	25.4	-
B	4.10	5.20
C	0.53 ∅	0.64 ∅
D	2.00 ∅	2.70 ∅

All Dimensions in millimeter

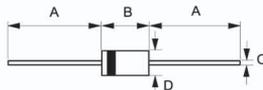
## DO-15



DO-15		
Dim.	Min.	Max.
A	25.4	-
B	5.80	7.60
C	0.71 ∅	0.86 ∅
D	2.60 ∅	3.60 ∅

All Dimensions in millimeter

## DO-41

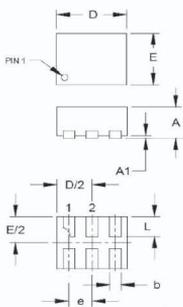


DO-41		
Dim.	Min.	Max.
A	25.4	-
B	4.10	5.20
C	0.71 ∅	0.86 ∅
D	2.00 ∅	2.70 ∅

All Dimensions in millimeter



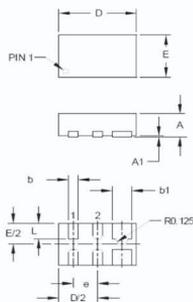
### SLP1210P6



SLP1210P6		
DIM.	MIN.	MAX.
A	0.50	0.65
A1	0.00	0.05
b	0.20	0.25
d	1.10	1.30
E	0.90	1.10
e	0.40 BSC	
L	0.30	0.43

All Dimensions in millimeter

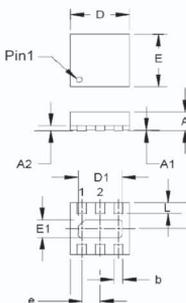
### SLP1610P4



SLP1610P4		
DIM.	MIN.	MAX.
A	0.50	0.65
A1	0.00	0.05
b	0.15	0.25
b1	0.35	0.45
D	1.50	1.70
E	0.90	1.10
e	0.50 BSC	
L	0.30	0.43

All Dimensions in millimeter

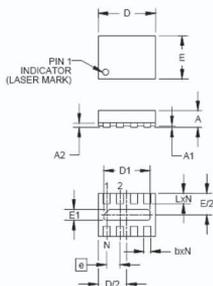
### SLP1616P6



SLP1616P6		
DIM.	MIN.	MAX.
A	0.50	0.65
A1	0.00	0.05
A2	0.15 REF.	
b	0.20	0.30
D	1.50	1.70
D1	1.05	1.30
E	1.50	1.70
E1	0.40	0.65
e	0.50 BSC	
L	0.25	0.40

All Dimensions in millimeter

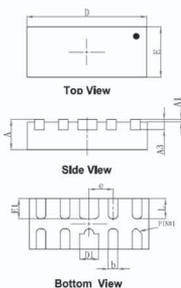
### SLP2116P8



SLP2116P8		
DIM.	MIN.	MAX.
A	0.50	0.65
A1	0.00	0.05
A2	(0.15)	
b	0.20	0.30
D	2.00	2.20
D1	1.55	1.80
E	1.50	1.70
E1	0.25	0.50
e	0.50 BSC	
L	0.28	0.38

All Dimensions in millimeter

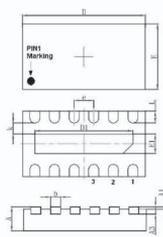
### SLP2510P8



SLP2510P8		
DIM.	MIN.	MAX.
A	0.45	0.55
A1	0.00	0.05
A3	0.152 REF.	
D	2.45	2.55
E	0.95	1.05
D1	0.35	0.45
E1	0.35	0.45
b	0.15	0.25
e	0.50 BSC	
L	0.35	0.45

All Dimensions in millimeter

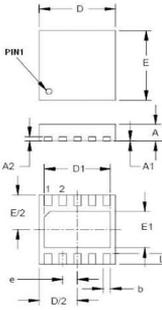
### SLP2513P12



SLP2513P12		
DIM.	MIN.	MAX.
A	0.45	0.65
A1	0.00	0.05
A3	0.13 REF.	
D	2.42	2.58
E	1.27	1.43
D1	1.90	2.10
E1	0.30	0.50
b	0.15	0.25
e	0.40 Typ.	
L	0.17	0.33

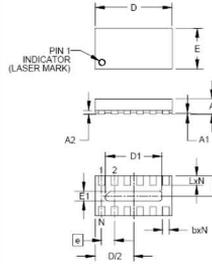
All Dimensions in millimeter

**SLP2626P10**



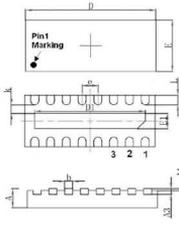
SLP2626P10		
DIM.	MIN.	MAX.
A	0.50	0.65
A1	0.00	0.05
A2	0.17 Typ.	
b	0.20	0.30
D	2.50	2.70
D1	2.00	2.25
E	2.50	2.70
E1	1.11	1.36
e	0.5 Typ.	
L	0.30	0.40
All Dimensions in millimeter		

**SLP3016P12**



SLP3016P12		
DIM.	MIN.	MAX.
A	0.50	0.65
A1	0.00	0.05
A2	0.15 REF.	
b	0.20	0.30
D	2.90	3.10
D1	2.10	2.30
E	1.50	1.70
E1	0.25	0.50
e	0.50 BSC	
L	0.28	0.38
All Dimensions in millimeter		

**SLP3313P16**



SLP3313P16		
DIM.	MIN.	MAX.
A	0.45	0.65
A1	0.00	0.05
A3	0.13 REF.	
D	3.22	3.38
E	1.27	1.43
D1	2.70	2.90
E1	0.30	0.50
b	0.15	0.25
e	0.4 Typ.	
L	0.17	0.33
All Dimensions in millimeter		

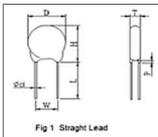


Fig 1 Straight Lead

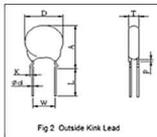


Fig 2 Outside Kink Lead

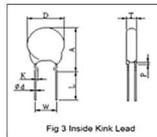


Fig 3 Inside Kink Lead

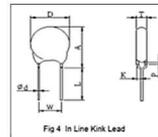


Fig 4 In Line Kink Lead

**Dimension Table**

Unit:mm

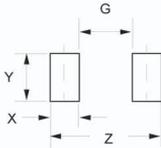
Symbol	Model size	5mm		7mm		10mm		14mm		20mm	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
D		5.5	7.5	7.5	9.0	10.5	14.0	13.5	17.5	19.5	25.0
H		-	10.0	-	12.0	-	17.0	-	20.5	-	28.0
W		4.0	6.0	4.0	6.0	6.5	8.5	6.5	8.5	9.0	11.0
Φd		0.58	0.62	0.58	0.62	0.78	0.82	0.78	0.82	0.98	1.02
P(max.)		3.0									
L(min)		25.0									
K(Kink Lead)		0.8	1.6	0.8	1.6	1.0	1.8	1.0	1.8	1.0	1.8
A(max.)	180KD-271KD	-	13.0	-	15.0	-	19.5	-	22.5	-	30.0
	>271KD	-	13.0	-	15.5	-	20.5	-	23.5	-	31.0
T		See Tmax table									

Remark: 此為產品示意圖，詳細規格請參閱各產品規格書。

## SUGGESTED PAD LAYOUT

FIG.1

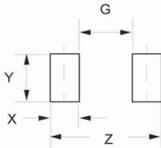
0603 / 0805 / 1206 / SMA / SMB / SMC



Dim.	Millimeters					
	0603	0805	1206	SMA	SMB	SMC
G	0.85	1.22	2.16	2.90	2.90	5.60
X	0.51	0.51	0.64	2.30	2.30	2.30
Y	1.00	1.40	1.70	2.40	3.00	4.00
Z	1.87	2.24	3.43	7.50	7.50	10.20

FIG.2

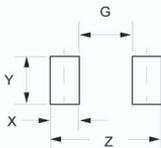
DO-221AA / DO-221AC / DO-219AA(F1A) / DO-219 / LL34 / SOD-123 / SOD-123F



Dim.	Millimeters						
	DO-221AC(F3)	DO-221AA(F2)	DO-219AA(F1A)	DO-219	LL34	SOD-123	SOD-123F
G	2.90	2.90	2.25	2.20	2.20	2.45	1.70
X	2.30	2.30	1.30	1.00	1.40	1.25	1.80
Y	2.40	3.00	1.40	1.50	1.60	1.00	1.10
Z	7.50	7.50	4.20	4.20	5.00	4.95	5.30

FIG.3

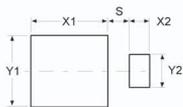
SOD-323F / SOD-523F / SOD-723 / SOD-882 / SOD-923 / SLP0603P2



Dim.	Millimeters					
	SOD-323/F	SOD-523/F	SOD-723	SOD-882	SOD-923	SLP0603P2
G	1.25	0.70	0.40	0.20	0.60	0.15
X	0.90	0.80	1.00	0.55	0.30	0.30
Y	0.70	0.60	0.80	0.80	0.40	0.35
Z	3.05	2.30	2.40	1.30	1.20	0.75

FIG.4

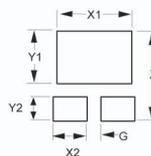
DO-216AA / DO-222AA(F1)



Dim.	Millimeters	
	DO-216AA	DO-222AA(F1)
S	0.625	0.625
X1	2.670	2.67
X2	0.762	0.762
Y1	2.540	2.54
Y2	1.270	1.27

FIG.5

SLP1006P3

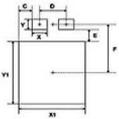


Dim.	Millimeters
	SLP1006P3
G	0.15
X1	0.55
X2	0.20
Y1	0.30
Y2	0.30
Z	1.00

## SUGGESTED PAD LAYOUT

FIG.6

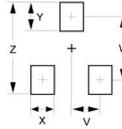
F4 / F5 / D<sup>2</sup>PAK / DPAK



Dim.	Millimeters			
	TO-277 Plus (F4)	D <sup>2</sup> PAK Flat (F5)	D <sup>2</sup> PAK	DPAK
C	0.75	2.00	1.99	0.40
D	2.24	4.35	5.08	3.69
E	0.45	1.40	4.62	2.20
F	3.80	8.70	10.34	6.26
X	1.73	3.00	1.50	1.40
X1	5.50	11.40	10.66	6.50
Y	1.43	3.40	3.05	2.29
Y1	5.30	11.25	8.38	6.18

FIG.7

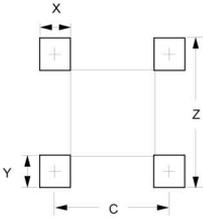
SOT-23 / SOT-323 / SOT-523



Dim.	Millimeters		
	SOT-23	SOT-323	SOT-523
Z	3.20	2.80	2.20
X	0.80	0.70	0.40
W	2.60	1.90	1.40
Y	1.00	0.90	0.80
V	0.95	1.00	0.50

FIG.8

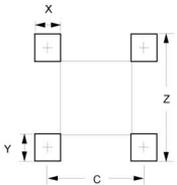
DF-S / HDDF / HDS / TD / TT / ABS



Dim.	Millimeters				
	DF-S	HDDF	TD	TT	ABS
C	(5.10)	(2.50)	(4.00)	(5.00)	(4.00)
X	2.00	1.65	1.20	1.80	1.20
Y	2.55	1.80	1.80	2.10	1.80
Z	10.20	6.80	7.20	11.70	7.20

FIG.9

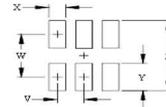
M2 / M1



Dim.	Millimeters	
	M2	M1
C	(5.40)	(4.25)
X	2.00	2.00
Y	2.50	2.50
Z	10.71	8.95

FIG.10

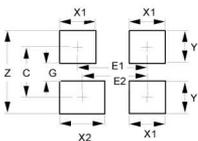
SOT23-6L / SOT-363 / SOT-563



Dim.	Millimeters		
	SOT-23	SOT-323	SOT-523
Z	3.20	2.80	2.20
X	0.80	0.70	0.40
W	2.60	1.90	1.40
Y	1.00	0.90	0.80
V	0.95	1.00	0.50

FIG.11

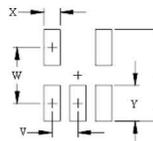
SOT-143



Dim.	Millimeters
C	(2.20)
E1	1.92
E2	1.72
G	0.80
X1	1.00
X2	1.20
Y	1.40
Z	3.60

FIG.12

SOT-353 / SOT23-5L

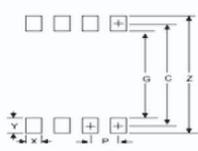


Dim.	Millimeters	
	SOT-353	SOT23-5L
Z	2.70	3.60
X	0.40	0.60
W	1.85	2.50
Y	0.85	1.10
V	0.65	0.95

## SUGGESTED PAD LAYOUT

FIG.13

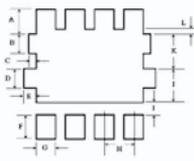
POWER56(ESD)



Dim.	Millimeters
<b>POWER56</b>	
C	(5.50)
G	4.65
P	1.27
X	0.55
Y	0.85
Z	6.35

FIG.14

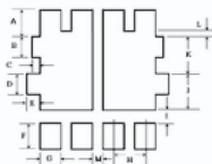
POWER56



Dim.	Millimeters
<b>POWER56</b>	
A	1.000
B	1.000
C	0.215
D	1.000
E	0.430
F	1.000
G	0.750
H	1.270
I	0.870
J	1.745
K	1.935
L	0.075

FIG.15

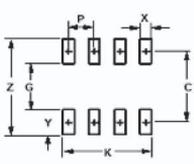
POWER56D



Dim.	Millimeters
<b>POWER56D</b>	
A	1.000
B	1.000
C	0.215
D	1.000
E	0.430
F	1.000
G	0.750
H	1.270
I	0.870
J	1.745
K	1.935
L	0.075
M	0.520

FIG.16

TSSOP-8



Dim.	Millimeters
<b>TSSOP-8</b>	
C	5.94
G	4.16
K	2.37
P	0.65
X	0.42
Y	1.78
Z	7.72

FIG.17

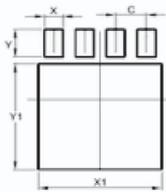
DFN3020-6



Dim.	Millimeters
<b>DFN3020-6</b>	
G	0.22
X	0.35
X1	0.85
X2	1.60
X3	1.35
Y	0.53
Y1	1.80
Y2	3.30

FIG.18

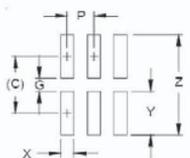
DFN3030-8



Dim.	Millimeters
<b>DFN3030-8</b>	
C	0.65
X	0.39
X1	2.59
Y	0.65
Y1	2.49

FIG.19

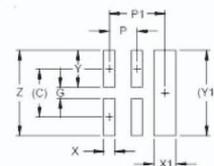
SLP1210P6



Dim.	Millimeters
C	(0.875)
G	0.20
P	0.40
X	0.20
Y	0.675
Z	1.55

FIG.20

SLP1610P4

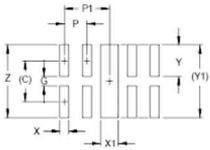


Dim.	Millimeters
C	(0.87)
G	0.19
P	0.50
P1	1.00
X	0.20
X1	0.40
Y	0.68
Y1	1.55
Z	1.55

## SUGGESTED PAD LAYOUT

FIG.21

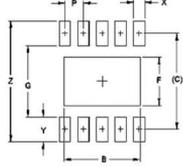
SLP2510P8



Dim.	Millimeters
	SLP2510P8
C	(0.875)
G	0.20
P	0.50
P1	1.00
X	0.20
X1	0.40
Y	0.675
Y1	1.55
Z	1.55

FIG.22

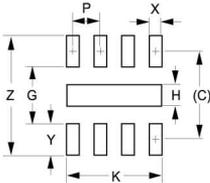
SLP2626P10



Dim.	Millimeters
	SLP2626P10
B	2.05
C	(2.50)
F	1.26
G	1.85
P	0.50
X	0.30
Y	0.65
Z	3.15

FIG.23

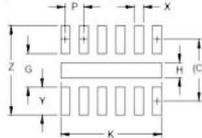
SLP2116P8



Dim.	Millimeters
	SLP2116P8
C	(1.54)
G	0.98
H	0.38
K	1.75
P	0.50
X	0.25
Y	0.56
Z	2.10

FIG.24

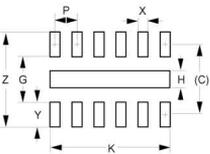
SLP2513P12



Dim.	Millimeters
	SLP2513P12
C	(1.27)
G	0.69
H	0.30
K	2.20
P	0.40
X	0.20
Y	0.58
Z	1.85

FIG.25

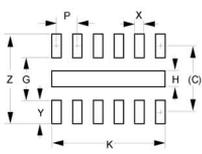
SLP3016P12



Dim.	Millimeters
	SLP3016P12
C	(1.54)
G	0.98
H	0.38
K	2.75
P	0.50
X	0.25
Y	0.56
Z	2.10

FIG.26

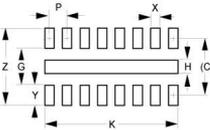
SLP3313P16



Dim.	Millimeters
	SLP3313P16
C	(1.27)
G	0.69
H	0.30
K	3.00
P	0.40
X	0.20
Y	0.58
Z	1.85

FIG.27

SLP4016P16

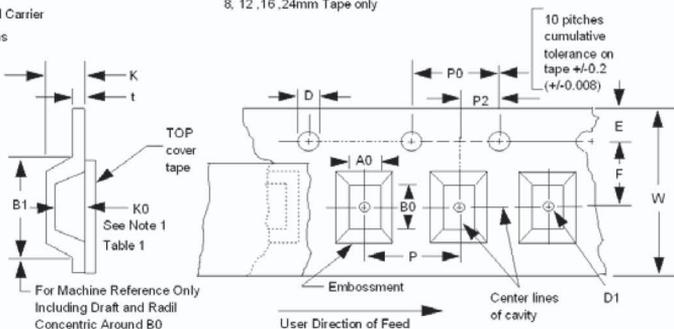


Dim.	Millimeters
	SLP4016P16
C	(1.54)
G	0.98
H	0.38
K	3.75
P	0.50
X	0.25
Y	0.56
Z	2.10

## SURFACE MOUNT PACKAGING

Packed per EIA/JEDEC standard RS-481  
8, 12, 16, 24mm Tape only

Embossed Carrier  
Dimensions



### EMBOSSED TAPE

ALL DIMENSION IN MILLIMETERS

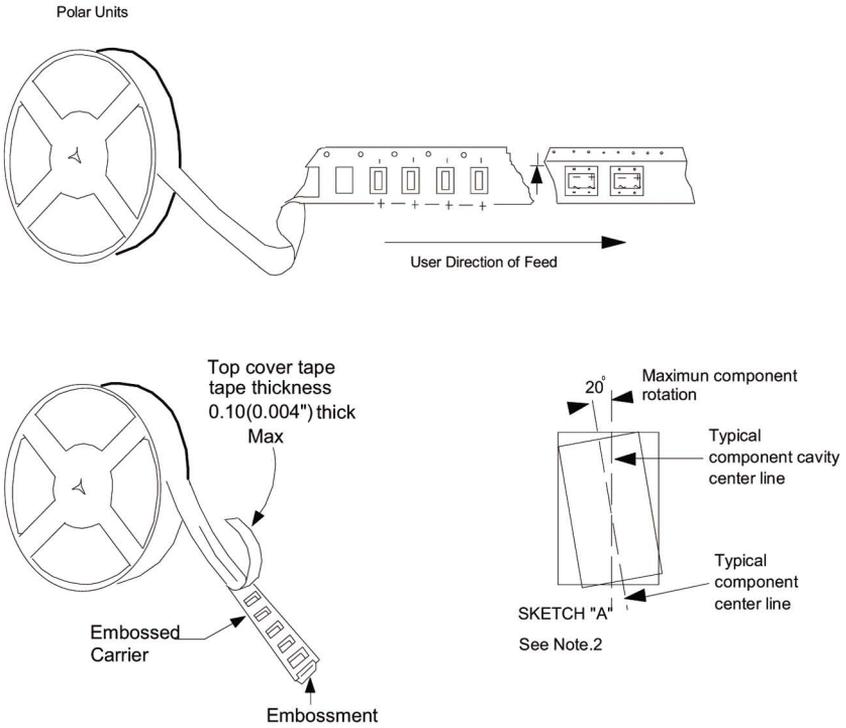
TAPE SIZE	D	E	PO	t (MAX)	A0B0K0	CONSTANT DIMENSION
8mm/ 12mm 16mm/ 24mm	1.55+/-0.10/-0.0	1.75+/-0.10	4.0+/-0.10	0.4	SEE NOTE 1	

PRODUCT TYPE	TAPE SIZE	B1 MAX	D1 MIN	F	K MAX	P2	W	P																														
SOT Series SOD-123 SOD-323 SLP1006P3 SLP1610P4 SLP1616P6 SLP2510P8 SLP2626P10 SLP2513P12 SLP3016P12 FBP-02C FBP-03B LL-34	8mm	4.5	1.0	3.5+/-0.05	2.4	2.0+/-0.05	8.0+/-0.030	4.0+/-0.10	VARIABLE DIMENSIONS																													
SOD-523 SOD-723 SOD-882 SOD-923 SOD-123F SOD-323F SLP2116P8 SLP1210P6 SOD-523F										0.75	0.55	0.4	1.2	1.65	2.0+/-0.05	12.0+/-0.30	2.0+/-0.05																					
SLP5020P8 SLP4016P16 SLP3313P16																		1.0	0.4	3.4	2.4	1.37	8.0+/-0.10	4.0+/-0.10														
LL-41 SOP-8 MSOP-10L DO-222AA DO-221AC DO-216AA																									1.5	0.4	4.5	3.29	2.0+/-0.1	16.0+/-0.30	8.0+/-0.10							
SMA SMB HDDF/ TD/ MSB1 SOT-223																																8.2	0.4	3.7	2.0+/-0.1	24.0+/-0.30	12.0+/-0.10	8.0+/-0.10
SMC DF-S / TT																		12.1	0.4	6.5	2.0+/-0.1	16.0+/-0.30	12.0+/-0.10	8.0+/-0.10														
D2PAK																																						

#### Note 1:

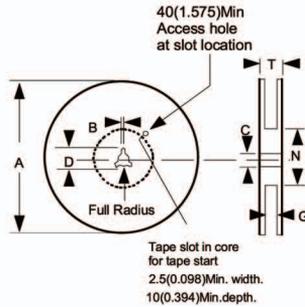
A0B0K0 are determined by component size. The clearance between the component and the cavity must be within 0.05 min. to 0.50 max. for 8 mm tape, 0.05 min. to 0.65 max. for 12mm tape, 0.15 min. to 0.90 max. for 16mm tape and 0.05 min. to 1.00 max. for 24 mm tape and larger.

## SURFACE MOUNT PACKAGING



**NOTE 2:** The component can not rotate more than 20° within the determined cavity, see sketch "A" below

## SURFACE MOUNT PACKAGING



REEL DIMENSIONS

Unit: mm

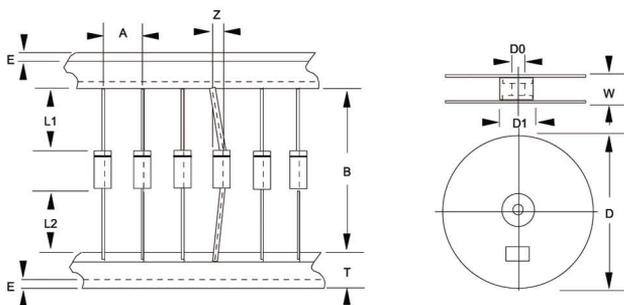
TAPE SIZE	A MAX.	B MAX.	C	D MIN.	N MIN.	G	T MAX.
8mm	178	1.5	13.0+/-0.5	20.2	75	8.4+1.5/-0.0	14.4
12mm	178 / 330					12.4+2.0/-0.0	18.4
16mm						12.4+2.0/-0.0	22.4
4mm						12.4+2.0/-0.0	30.4

DEVICE TYPE	Q'TY/REEL (PCS)	REEL DIA. (mm)	BOX SIZE (mm)	Q'TY/BOX (PCS)	CARTON SIZE (mm)	Q'TY/CARTON (PCS)							
SMA	5000	330	334x334x21	5000	350x350x340	60000							
SMB	3000			3000		36000							
HDDF/ TD / MSB1				3000		36000							
SMC	2000		336x336x48	6000	365x355x445	48000							
MSOP-10L/SOP-8			2000	2000		20000							
TT	1500		338x338x26	1500	350x350x340	15000							
DF-S	800			800		6400							
D2PAK	12000		334x334x21	12000	144000								
DO-222A/DO-216AA	10000			10000		120000							
DO-221AC	2500			353x347x50		5000	360x360x315	30000					
SOT-223	3000	184x184x72	184x184x72	12000	380x380x360	192000							
DO-222A/DO-216AA	1500			6000		96000							
DO-221AC	500		184x184x88	2000		32000							
SMA				500		32000							
SMB	3000	178	206x207x203	45000	438x438x241	90000 / 180000							
SMC							3000	188x183x80	18000	386x265x215			
SOT SERIES											10000	150000	300000
SOD-123/323/523/723													
SOD-882				2500							15000	90000	
FBP-02C/03B													1500
SOD-923				3000							18000	108000	
SLP1006P3, SLP1610P4							8000	120000	480000				
SLP1616P6, SLP2510P8				2500						15000	90000		
SLP2116P8, SLP2626P10,							1500	9000	54000				
SLP2513P12, SLP3016P12,	3000	18000	108000										
SLP1210P6				8000	120000	480000							
SLP4016P16, SLP3313P16	2500	15000	90000										
SLP5020P8				1500	9000	54000							
SOD-882	3000	18000	108000										
SOD-923				8000	120000	480000							
LL-34	2500	15000	90000										
LL-41				1500	9000	54000							
SOD-123F	3000	18000	108000										
SOD-323F/ SOD-523F				8000	120000	480000							

## REEL PACKAGING

Axial devices are packed in accordance with EIA standard RS-296-D and specification.

COMPONENT OUTLINE	COMPONENT PITCH A	COMPONENT PITCH B	CUMULATIVE PITCH TOLERANCE	Q'TY PER REEL	Q'TY PER CARTON	Carton Dimension
T-1	5.0 mm	52.4mm	2.0mm/10 pitch	5000	20K	340x340x340 mm
DO-41				5000	20K	
DO-15				4000	16K	
DO-201/DO-201AD	10 mm	1200	4.8K			
R-6		700	2.8K			



ITEM	SYMBOL	SPECIFICAITON (mm)
Component alignment	Z	1.2 Max.
Tape width	T	6.0 +/-0.4
Exposed adhesive	E	0.8 Max.
Body eccentricity	L1-L2	1.0 Max
Reel outside diameter	D	330
Reel inner diameter	D1	85.7+/-0.3
Feed hole diameter	D0	16.6+/-0.4
Reel width (Note 1)	W	79+/-1.0

NOTE: 1. The reel width 'W' for 26 mm taping is 50.0 +/- 1.0 mm (1.97" +/- 0.040")

## AMMO BOX PACKAGING



### BOX SIZE

Packaging	Products Outline	Dimension "A"	Dimension "B"	Dimension "C"	Q'TY per BOX
26mm Horizontal Ammo Pack	T-1, A-405, DO-41 DO-15	255 ~ 259	50 ~ 54	107 ~ 113	3K 2K
52mm Horizontal Ammo Pack	DO-15	259	83	113	2K
	T-1, A-405, DO-41				3K
	DO-201, DO-201AD				1K
	DO-34 (Glass Seal)	250 ~ 265	76 ~ 80	80 ~ 122	5K/10K
	DO-35 (Glass Seal)				
DO-41 (Glass Seal)	250	80	80	3K	

Unit: mm

### CARTON SIZE

Packaging	Products Outline	Dimension Length	Dimension Width	Dimension Height	Q'TY per Carton
26mm Horizontal Ammo Pack	T-1, A-405, DO-41	530	300	280	54K
	DO-15				36K
52mm Horizontal Ammo Pack	DO-15	545	300	280	24K
	T-1, A-405, DO-41				36K
	DO-201, DO-201AD				12K
	DO-34 (Glass Seal)	405 ~ 430	270 ~ 275	270 ~ 340	100K
	DO-35 (Glass Seal)				
	DO-41 (Glass Seal)				

## BULK PACKAGING

### BOX:

DEVICE TYPE	PACKAGING SIZE (m.m.)		QUANTITY (EA)		APPROX GROSS WEIGHT(KG)	
	BOX	CARTON	BOX	CARTON	BOX	CARTON
A-405	196x84x20	450x210x250	1000	50K	0.29	15.8
DO-41	196x84x20	450x210x250	1000	50K	0.38	20
DO-15	196x84x20	450x210x250	800	40K	0.38	20
DO-201/DO-201AD	305x93x59	395x315x340	1000	20K	1.2	25
R-6	305x93x59	395x315x340	500	10K	1.15	23.6
WOG	-----	-----	1000	10K	1.6	18

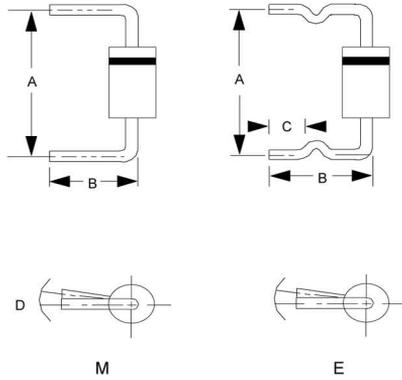
### TUBE:

DEVICE TYPE	PACKAGING SIZE (m.m.)			QUANTITY (EA)			APPROX GROSS WEIGHT(KG)		
	TUBE	BOX	CARTON	TUBE	BOX	CARTON	TUBE	BOX	CARTON
DF	444x15x13.3	490x155x145	510x330x275	50	4000	16K	0.04	3.5	14
TO-220	537x34x 6.0	555x165x95	575x179x225	50	2000	4K	0.14	5.8	14.9
TO-3P	502x46x 8.0	550x150x125	575x180x275	30	840	1.68K	0.24	7.1	15.1
DF-S	444x15x5.9	490x155x145	350x350x340	50	4000	16K	0.03	6.8	14
KBJ	525x37.3x7.1	550x200x110	580x230x270	20	1000	2K	0.16	7.4	15
KBP / GBP	531x29.6x6.2	550x200x122	580x230x270	35	2800	5.6K	0.09	7.3	15.4
GBU	465x41.5x6.2	500x200x120	520x210x265	20	1000	2K	0.132	6.6	14.2
GBJ	475x42.5x7.2	500x200x120	520x210x265	15	600	1.2K	0.16	7.5	17
GBL	535x35x6.5	550x200x122	580x220x260	25	1500	3K	0.095	6.1	13.2

### TRAY:

DEVICE TYPE	PACKAGING SIZE (m.m.)		QUANTITY (EA)		APPROX GROSS WEIGHT(KG)	
	TRAY	CARTON	TRAY	CARTON	TRAY	CARTON
KBPC-G	320x280x30	330x290x210	100	0.5K	2.4	13
KBPC-GW	320x280x30	330x290x210	100	0.5K	2.1	11.5
GBPC	320x280x30	330x290x210	100	0.5K	1.98	11
GBPC-W	320x280x30	330x290x210	100	0.5K	1.70	9.5

## PREFORMED LEAD DRAWING



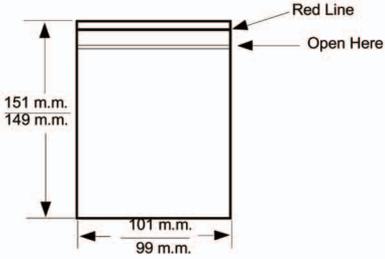
Case type	Preformed type	A (mm)		B (mm)		C (mm)		D (mm)		R (mm)	
		Range	Tolerance	Range	Tolerance	Range	Tolerance	Range	Tolerance	Range	Tolerance
DO-41	M	11.0-20.0	+/-0.5	8.0-20.0	+/-0.5	----	----	1.5	max	----	----
A-405	E	11.0-20.0	+/-0.5	11.0-16.0	+/-1.0	4.0-5.0	+/-0.5	1.5	max	----	----
DO-15	M	13.0-20.0	+/-0.5	8.0-22.0	+/-0.5	----	----	1.5	max	----	----
	E	13.0-20.0	+/-0.5	11.0-16.0	+/-1.0	4.0-5.0	+/-0.5	1.5	max	----	----
DO-201 DO-201AD	M	15.0-20.0	+/-1.0	8.0-22.0	+/-1.0	----	----	2.0	max	----	----
	E	15.0-20.0	+/-1.0	10.0-22.0	+/-1.0	3.0-5.0	+/-0.5	2.0	max	----	----
R-6	M	15.0-20.0	+/-1.0	8.0-22.0	+/-1.0	----	----	2.0	max	----	----

● Press Forming Also Available

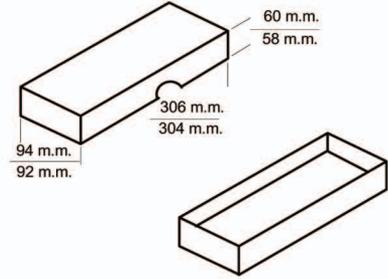
**PACKAGE OF PREFORMED DIODE**

APPENDIX

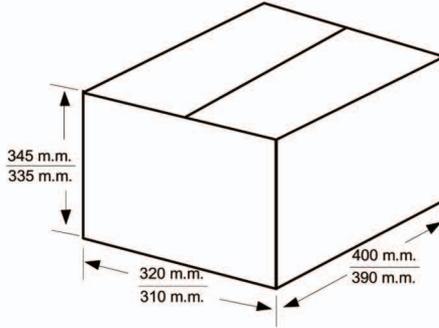
**A. PLASTIC BAG**



**B. BOX**



**C. CARTON**



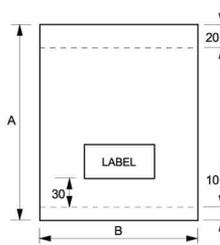
Case Type	Preformed Type	Q'TY/Plastic Bag	Q'TY/Box	Q'TY/Carton	
DO-41	M	Short Type	400	2K	40K
		Long Type	250	1.25K	25K
DO-41L	E	500	2.5K	50K	
	B	250	1.25K	25K	
	C	500	2.5K	50K	
DO-15	M	400	2K	40K	
	E	400	2K	40K	
DO-201 DO-201AD	M	100	500	10K	
	E	100	500	10K	
R-6	M	100	500	10K	

\* Preformed Type see front page.

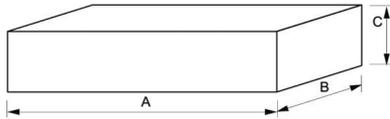
(Unit : PCS)

## PACKAGE OF TO-92 SERIES

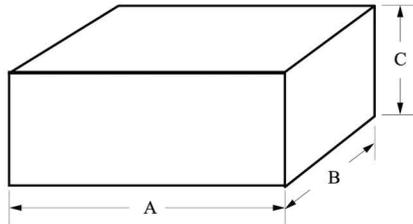
### 1. Plastic Bag



### 2. Inner Box



### 3. Carton



Unit: mm

### BULK PACKAGING

P/N	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	QTY PER	REMARK
PLASTIC BAG	185	125		1K	
INNER BOX	242	170	100	10K	10 PAG
CARTON	520	360	270	100K	10 INNER BOX

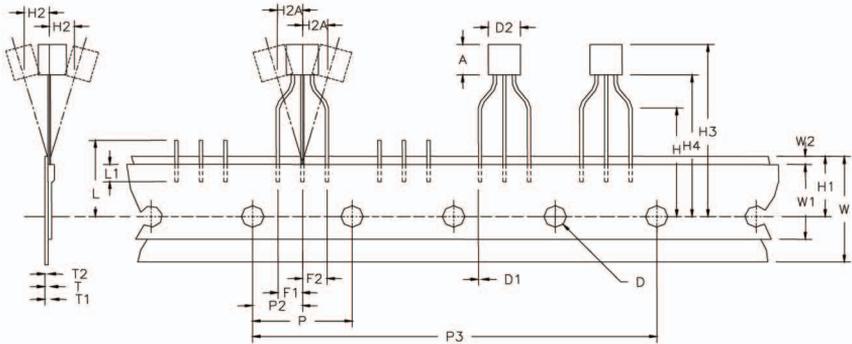
### TAPPING PACKAGING

P/N	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	QTY PER	REMARK
INNER BOX	330	200	41	2K	1 PACK
CARTON	430	360	280	20K	10 INNER BOX

**PACKAGE OF TO-92 SERIES**

Tape reel packing :

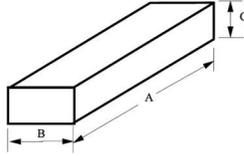
APPENDIX



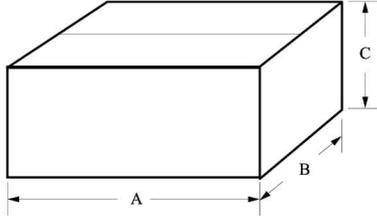
SYMBOL	ITEM	Metric system	Dimensions in inch
A	Body height	4.4-4.8	0.173-0.189
D	Sprocket hole diameter	4.0±0.2	0.158±0.008
D1	Lead-wire diameter	0.45-0.55	0.018-0.022
D2	Body diameter	4.4-4.8	0.173-0.189
F1.F2	Compoment lead spacing	2.5+0.4. -0.1	0.1+0.015. -0.004
H	Lead wire clinch height	16±0.5	0.63±0.02
H1	Sprocket hole position	9±0.5	0.354±0.02
H2	Body shift	1MAX	0.04MAX
H3	Overall height above abscissa	32.0MAX	1.26MAX
H4	Height of component from tape	21.0MAX	0.827MAX
P	Sprocket hole pitch	12.7±0.2	0.5±0.008
P2	Sprocket hole center to lead	6.35±0.4	0.25±0.018
P3	4 Sprocket holes pitch	50.8±0.5	2.0±0.02
T	Total tape thickness	0.55MAX	0.022MAX
W	Total tape width	17.5-19	0.689-0.748
W1	Carrier tape width	5.0-7.0	0.197-0.276
W2	Sprocket hole position	0.5MAX	0.02MAX
—	20 Sprocket holes pitch	254.0±1	10±0.04

## PACKAGE OF TO-220 (SCR/TRIAC/MOSFET)

### 1. INNER BOX



### 2. CARTON



Unit: mm

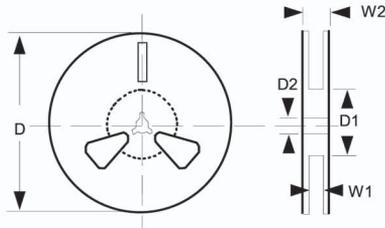
P/N	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	Q'TY PER	REMARK
TUBE	537	34	6	50	
INNER BOX	575	150	50	1K	20 TUBE / 5 FLOORS
CARTON	595	270	170	5K	5 INNER BOX

## PACKAGE OF TO-3P (MOSFET)

Unit: mm

P/N	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	Q'TY PER	REMARK
TUBE	507	48	8	30	
INNER BOX	555	160	130	840	28TUBES
CARTON	565	170	270	1680	2 INNER BOXS

## SWITCHING DIODE REEL PACKAGING



Reel Dimension

Unit: mm (inch)

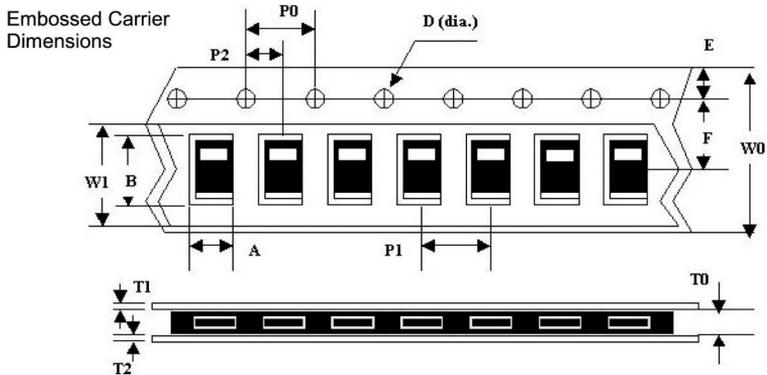
Item	Symbol	Dimension
Feed hold diameter	D2	13.0+/-0.2 (0.512+/-0.008)
Reel inner diameter	D1	60.0+/-0.5 (2.36+/-0.02)
Reel outside diameter	D	178.0+/-1.0 (7.008+/-0.04)
Reel inner width	W1	9.0+/-0.5 (0.354+/-0.02)
Reel outside width	W2	12.0+/-0.15 (0.472+/-0.006)

PACKING

Unit: mm

DEVICE TYPE	Q'TY/REEL (PCS)	REEL DIA. (mm)	BOX SIZE (mm)	Q'TY/BOX (PCS)	CARTON SIZE (mm)	Q'TY/CARTON (PCS)
1206	5000	178	181x181x74	30000	393x367x189	300000
0805						
0603						

## PREFORMED LEAD DRAWING



EMBOSSSED TAPE

Unit: mm

Item	Symbol	Dimension
Punch hole idth	1206	2.00+/-0.2 (0.079+/-0.008)
	0805	1.65+/-0.2 (0.065+/-0.008)
	0603	1.20+/-0.2 (0.047+/-0.008)
Punch hole length	1206	3.50+/-0.2 (0.138+/-0.008)
	0805	2.40+/-0.2 (0.094+/-0.008)
	0603	1.90+/-0.2 (0.075+/-0.008)
Sprocket hole	D	1.60+/-0.05 (0.063+/-0.002)
Sprocket hole position	E	1.75+/-0.10 (0.070+/-0.004)
Punch hole position	F	3.50+/-0.05 (0.140+/-0.002)
Sprocket hole pitch	P0	4.00+/-0.10 (0.160+/-0.004)
Punch hole pitch	P1	4.00+/-0.10 (0.160+/-0.004)
Punch hole center	P2	2.00+/-0.05 (0.08+/-0.002)
Base tape width	W0	8.00+/-0.20 (0.320+/-0.008)
Top/Bottom seal tape width	W1	5.25+/-0.05 (0.210+/-0.002)
Base tape thickness	T0	0.95+/-0.02 (0.038+/-0.008)
Top seal tape thickness	T1	0.0054+/-0.005 (0.002+/-0.0002)
Bottom seal tape thickness	T2	0.042+/-0.05 (0.0016+/-0.0002)



# Crate First-Class Quality, On-Time Delivery And Satisfy Customers' Requirements



**IEC QUALITY ASSESSMENT SYSTEM (IECQ)**  
covering Electronic Components,  
Assemblies, Related Materials and Processes  
For use and issue of the IECQ seal www.iecqc.org

**IECQ Certificate of Conformity  
Hazardous Substance Process Management**

IECQ Certificate No.: IECQH-TUV/RTR 17.0005 Issue No.: 1 Status: Current  
Supervisors: Issue Date: 2017/06/29 Orig Issue: 2017/06/29  
C# Reference No.: PRC-HSPM-2355 Expiration: 2020/06/28

Applicable to:

- European Directive 2011/65/EU ("RoHS – Restriction of the use Of certain Hazardous Substances") in electrical and electronic equipment and its amendments
- Customer specified requirements

**Shanghai Seefull Electronic Co., Ltd.**  
No. 6, Zhenyu Road, Dongjing Industrial Area, Songjiang, 201619 Shanghai  
China

The organization has developed and implemented Hazardous Substance Process Management procedures and related processes which have been assessed and found to comply with the applicable requirements for IECQ HSPM. The organization is approved in accordance with the Basic Rules IECQ D1 and Rules of Procedure IECQ Q3.5 "IECQ Hazardous Substance Process Management" of the IEC Quality Assessment System for Electronic Components (IECQ), and with respect to the IECQ Specification:

- IECQ QC 080000:2012 - Hazardous Substance Process Management System Requirements

**This Certificate is applicable to all electronic components, assemblies, related materials and processes for the following scope of activities:  
Design and Manufacturing of Discrete Semiconductors**

Issued by the Certification Body: TÜV SÜD Group  
29F, Two IFC, 10 Guljaqueunmyung-ro,  
Yeongdeungpo-gu,  
Seoul, 07226  
Korea (Republic Of)

Authorized person:  
**Stefan Hentsch**

The validity of this Certificate is dependent on the organization fulfilling the conditions of the Certificate of Conformity. This Certificate of Conformity may be withdrawn at any time if the organization does not fulfil the conditions of the IECQ system or if the certificate is not renewed in a timely manner. This certificate and its applicability may only be reproduced in full. The certificate is non-transferable and cannot be used for any other purpose. The issuer and authenticity of the certificate may be verified by visiting [www.iecqc.org](http://www.iecqc.org)

– Certified Trademark –  IECQ/China 08

Shanghai Seefull Electronic Co., Ltd.  
IECQ Certificate



**CERTIFICATE**

The Certification Body  
of TÜV SÜD Management Service GmbH  
certifies that

**Shanghai Seefull Electronic Co., Ltd.**  
No. 6, Zhenyu Road, Dongjing Industrial Area, Songjiang,  
Shanghai, P.R. China  
Post Code: 201619

has established and applies  
a Quality Management System for

**Design and Manufacturing of  
Discrete Semiconductors**  
(with Product Design as per Chapter 6.3).

An audit was performed and has furnished proof  
that the requirements according to

**IATF 16949**  
First Edition 2016-10-01

are fulfilled.  
Issue date: 2018-08-06  
Expiry date: 2021-08-05

Certificate Registration No.: 12 111 23008/02 TMS  
IATF Certificate No.: 0320914  
Part of the certificate is an appendix.

*Stefan Hentsch*  
Product Compliance Management  
March, 2018-08-07

Page 1 of 2

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[www.tuev-sued.de/certificates-verify.html](http://www.tuev-sued.de/certificates-verify.html)

TÜV®

Shanghai Seefull Electronic Co., Ltd.  
IATF16949 Certificate



**CERTIFICATE**

The Certification Body  
of TÜV SÜD Management Service GmbH  
certifies that

**Shanghai Seefull Electronic Co., Ltd.**  
No. 6, Zhenyu Road, Dongjing Industrial Area, Songjiang,  
Shanghai, P.R. China  
Post Code: 201619  
Unified social credit code / Organization code: 91310006072387303X

has established and applies  
a Quality Management System for

**Design, Manufacturing and Sales of  
Discrete Semiconductors.**

An audit was performed, Report No. 718842320.  
Proof has been furnished that the requirements  
according to

**ISO 9001:2015**

are fulfilled.

The certificate is valid in conjunction  
with the main certificate from 2018-08-06 until 2021-08-05.

The certified organization shall undergo and pass  
the regular surveillance audit to maintain the validity of this certificate.  
Certificate Registration No.: 12 100 23009/02 TMS

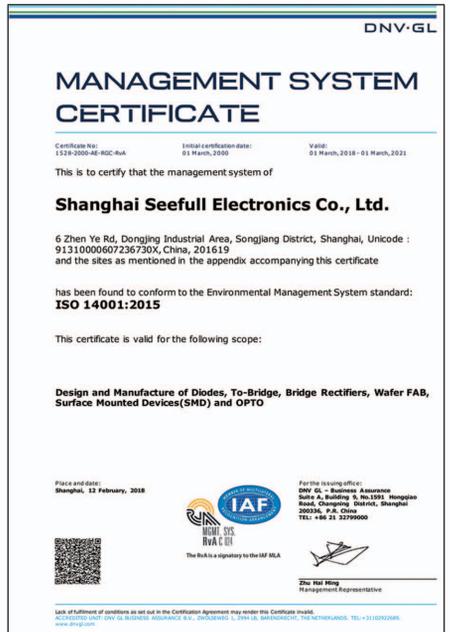
Information about this certificate can be inquired at the official website  
of Certification and Accreditation Administration of the People's Republic of China ([www.ccaaq.com.cn/](http://www.ccaaq.com.cn/))

*Stefan Hentsch*    
Product Compliance Management  
March, 2018-08-09

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[www.tuev-sued.de/certificates-verify.html](http://www.tuev-sued.de/certificates-verify.html)

TÜV®

Shanghai Seefull Electronic Co., Ltd.  
ISO 9001:2015 Certificate



**DNV-GL**

**MANAGEMENT SYSTEM  
CERTIFICATE**

Certificate No.: 1215-2000-4E-ROU-4/A Valid: 01 March, 2018 - 01 March, 2021

This is to certify that the management system of

**Shanghai Seefull Electronic Co., Ltd.**

6 Zhen Ye Rd, Dongjing Industrial Area, Songjiang District, Shanghai, Unicode : 91310006072387303X, China, 201619  
and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Environmental Management System standard:  
**ISO 14001:2015**

This certificate is valid for the following scope:

**Design and Manufacture of Diodes, To-Bridge, Bridge Rectifiers, Wafer FAB,  
Surface Mounted Devices(SMD) and OPTO**

Place and date:  
Shanghai, 12 February, 2018

   
The Mark is a registry to the IAF MSA

*Zhu Hai Hing*  
Management Representative

Link of Fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.  
© CERTIFICATE NO. 1215-2000-4E-ROU-4/A, DATED 12 FEBRUARY 2018, BY DNV-GL, THE NETHERLANDS, TEL: +31 20 2400000,  
[www.dnvgl.com](http://www.dnvgl.com)

Shanghai Seefull Electronic Co., Ltd.  
ISO 14001:2015 Certificate