




DATA SHEET NO.	R0430 - SMAJ12CA00S0XE	
DATE	Apr. 30, 2024	
REVISION	A2	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	<p>SMD Transient Voltage Suppressor (TVS) Diodes, SMA/DO-214AC series, 2 Pads, Bidirectional Type, Stand-off Voltage 12V Peak Pulse Power: 400 Watts Min. , Peak Pulse Current: 20.1A Operating Temp. Range -65°C ~+150°C, Package in Tape/Reel, 5000pcs/Reel RoHS/RoHS III compliant, RoHS Annex III lead Exemption (Exempt per RoHS EU 2015/863)</p>	
CUSTOMER		
CUSTOMER PART NO.		
CROSS REF. PART NO.		
ORIGINAL MFG/PART NO	MDD Diodes/SMAJ12CA	
PART CODE	SMAJ12CA00S0XE	

VENDOR APPROVE		
Issued/Checked/Approved		
		
DATE: Apr. 30, 2024		

CUSTOMER APPROVE	
DATE:	

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES

MAIN FEATURE

- The Plastic Package Carries Underwriters Laboratory Flammability Classification 94V-0
- Low Profile Package
- Built-in Strain Relief
- High Temperature Soldering Guaranteed: 260°C/ 10 Seconds At Terminals
- Glass Passivated Chip Junction
- Low Inductance
- Excellent Clamping Capability
- 400W Peak Pulse Power Capability At 10/1000 μ s Waveform
- Repetition Rate (Duty Cycle): 0.01%
- Fast Response Time
- Repetition Rate (Duty Cycle): 0.01%
- Typical IR Less Than 1 μ a Above 10V
- Cross Competitors Parts and More.
- RoHS/RoHS III Compliant, RoHS Annex III Lead Exemption (Exempt per RoHS EU 2015/863)



APPLICATION

- I/O Interface
- AC/DC Power Supply
- Low Frequency Signal Transmission Line (RS232, RS485, etc.)

ELECTRICAL CHARACTERISTICS

- See Page 5 – Page 11

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES

HOW TO ORDER

- Please follow up Part Code Guide and indicate pat code when you order or RFQ.

PART CODE GUIDE

[RFQ](#)
[Request For Quotation](#)

SMAJ	12CA	00S	0XE
1	2	3	4

1. SMAJ: SMD Transient Voltage Suppressor (TVs) Diodes, SMA /DO-214AC series,
2. 12CA: Bidirectional Type, Stand-off Voltage: 12V
3. 00S: Internal Control Code or Special Parameters Code, Letter A~Z, a~z or digits 0~9
4. 0XE: Marking Code For “XE” On The Case Surface, Different Marking For Different Specification.

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES

DIMENSION (Unit: Inch/mm)

Image for reference

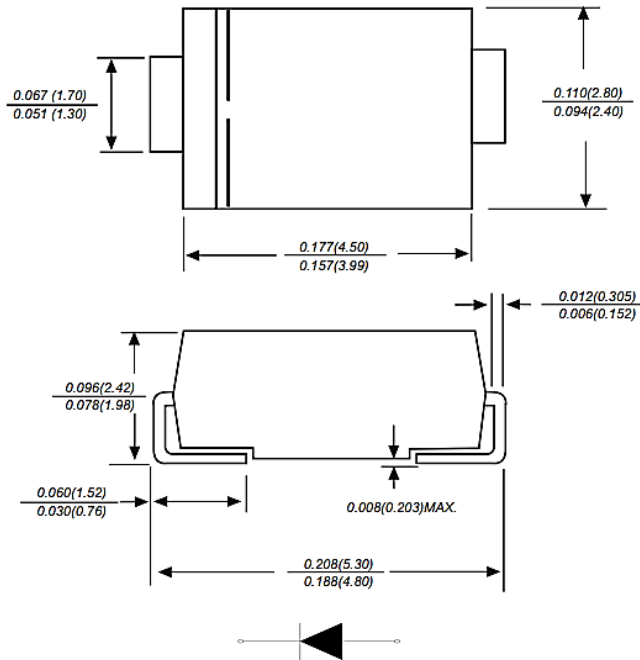


Marking:

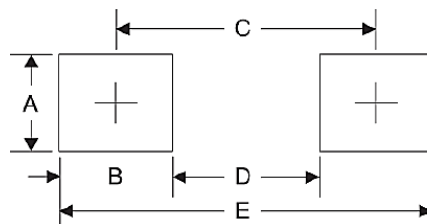
See Page 6~ Page 11

Marking Code List

SMA/DO-214AC



Recommend Pad Layout



Symbol	Unit (Inch)	Unit (mm)
A	0.066	1.680
B	0.060	1.520
C	0.154	3.900
D	0.095	2.410
E	0.215	5.450

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES
MECHANICAL DATA

CASE	TERMINALS	POLARITY	MOUNTING POSITION	MARKING	WEIGHT PER PIECE
JEDEC SMA/DO-214AC Molded Plastic Body	Solderable per MIL-STD- 750, Method 2026	Polarity symbol marking on body	Any	See Marking Code List	0.070 grams

MAX. RATING & CHARACTERISTICS - Ratings at 25°C Ambient Temperature Unless Otherwise Specified.

PARAMETER	SYMBOLS	VALUE	UNITS
Peak Pulse Power Dissipation At 10/1000µs Waveform (Note1, Note2, Fig.1)	P ppm	400	W
Peak Pulse Current On 10/1000 Us Waveform (Note 1, Fig 3)	I PPM	See Page 6~page 11	A
Steady State Power Dissipation At TA=50°C (Fig.5)-	P M(AV)	3.3	W
Peak Forward Surge Current, 8.3ms Single Half Sine-wave Superimposed On Rated Load, (JEDEC Method) (Note3, Fig.6)	I FSM	40	A
Operating Junction And Storage Temperature Range.	T J, T stg	-65 ~ +150	°C
Typical Thermal Resistance Junction To Lead	R θJL	30	°C/W
Typical Thermal Resistance Junction To Ambient	R θJA	120	°C/W

Note

1. Non-repetitive current pulse, per Fig 3 and derated above TA=25 °C per Fig 2
2. Mounted on 5.0*5.0mm (0.03mm Thickness) copper pads to each terminal
3. 8.3ms single half sinewave or equivalent square wave, duty cycle=4 pulsed per minute Max.

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES
UNIDIRECTIONAL TYPE- ELECTRICAL CHARACTERISTICS - Ta = 25°C

Table 1

Part Code	Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Reverse Leakage Max.	Max. Clamp Voltage	Peak Pulse Current	Marking Code
		V BR @ I T						
	V RMV	Min	Max	I T	I R @ V RWM	V C @ I PPM	I PPM	
	V	V	V	mA	µA	V	A	
SMAJ050A00S0AE	5	6.4	7	10	800	9.2	43.5	AE
SMAJ060A00S0AG	6	6.67	7.37	10	800	10.3	38.8	AG
SMAJ065A00S0AK	6.5	7.22	7.98	10	500	11.2	35.7	AK
SMAJ070A00S0AM	7	7.78	8.6	10	200	12	33.3	AM
SMAJ075A00S0AP	7.5	8.33	9.2	1	100	12.9	31	AP
SMAJ080A00S0AR	8	8.89	9.83	1	50	13.6	29.4	AR
SMAJ085A00S0AT	8.5	9.44	10.4	1	20	14.4	27.8	AT
SMAJ090A00S0AV	9	10	11.1	1	10	15.4	26	AV
SMAJ10A000S0AX	10	11.1	12.3	1	5	17	23.5	AX
SMAJ11A000S0AZ	11	12.2	13.5	1	1	18.2	22	AZ
SMAJ12A000S0BE	12	13.3	14.7	1	1	19.9	20.1	BE
SMAJ13A000S0BG	13	14.4	15.9	1	1	21.5	18.6	BG
SMAJ14A000S0BK	14	15.6	17.2	1	1	23.2	17.2	BK
SMAJ15A000S0BM	15	16.7	18.5	1	1	24.4	16.4	BM
SMAJ16A000S0BP	16	17.8	19.7	1	1	26	15.4	BP
SMAJ17A000S0BR	17	18.9	20.9	1	1	27.6	14.5	BR
SMAJ18A000S0BT	18	20	22.1	1	1	29.2	13.7	BT
SMAJ20A000S0BV	20	22.2	24.5	1	1	32.4	12.3	BV
SMAJ22A000S0BX	22	24.4	26.9	1	1	35.5	11.3	BX
SMAJ24A000S0BZ	24	26.7	29.5	1	1	38.9	10.3	BZ

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES
UNIDIRECTIONAL TYPE- ELECTRICAL CHARACTERISTICS - Ta = 25°C

Table 2

Part Code	Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Reverse Leakage Max.	Max. Clamp Voltage	Peak Pulse Current	Marking Code
		V BR @ I T						
	V RMV	Min	Max	I T	I R @ V RWM	V C @ I PPM	I PPM	
	V	V	V	mA	µA	V	A	
SMAJ26A000SOCE	26	28.9	31.9	1	1	42.1	9.5	CE
SMAJ28A000SOCG	28	31.1	34.4	1	1	45.4	8.8	CG
SMAJ30A000SOCK	30	33.3	36.8	1	1	48.4	8.3	CK
SMAJ33A000SOCM	33	36.7	40.6	1	1	53.3	7.5	CM
SMAJ36A000SOCP	36	40	44.2	1	1	58.1	6.9	CP
SMAJ40A000SOCR	40	44.4	49.1	1	1	64.5	6.2	CR
SMAJ43A000SOCT	43	47.8	52.8	1	1	69.4	5.8	CT
SMAJ45A000SOCV	45	50	55.3	1	1	72.7	5.5	CV
SMAJ48A000SOCX	48	53.3	58.9	1	1	77.4	5.2	CX
SMAJ51A000SOCZ	51	56.7	62.7	1	1	82.4	4.9	CZ
SMAJ54A000SORE	54	60	66.3	1	1	87.1	4.6	RE
SMAJ58A000SORG	58	64.4	71.2	1	1	93.6	4.3	RG
SMAJ60A000SORK	60	66.7	73.7	1	1	96.8	4.1	RK
SMAJ64A000SORM	64	71.1	78.6	1	1	103	3.9	RM
SMAJ70A000SORP	70	77.8	86	1	1	113	3.5	RP
SMAJ75A000SORR	75	83.3	92.1	1	1	121	3.3	RR
SMAJ78A000SORT	78	86.7	95.8	1	1	126	3.2	RT
SMAJ85A000SORV	85	94.4	104	1	1	137	2.9	RV
SMAJ90A000SORX	90	100	111	1	1	146	2.7	RX
SMAJ100A00SORZ	100	111	123	1	1	162	2.5	RZ

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES

UNIDIRECTIONAL TYPE- ELECTRICAL CHARACTERISTICS - Ta = 25°C

Table 3

Part Code	Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Reverse Leakage Max.	Max. Clamp Voltage	Peak Pulse Current	Marking Code
		V BR @ I T						
	V RMV	Min	Max	I T	I R @ V RWM	V C @ I PPM	I PPM	
	V	V	V	mA	µA	V	A	
SMAJ110A00S0SE	110	122	135	1	1	177	2.3	SE
SMAJ120A00S0SG	120	133	147	1	1	193	2.1	SG
SMAJ130A00S0SK	130	144	159	1	1	209	1.9	SK
SMAJ150A00S0SM	150	167	185	1	1	243	1.6	SM
SMAJ160A00S0SP	160	178	197	1	1	259	1.5	SP
SMAJ170A00S0SR	170	189	209	1	1	275	1.5	SR
SMAJ180A00S0ST	180	201	222	1	1	292	1.4	ST
SMAJ190A00S0SU	190	211	232	1	1	308	1.3	SU
SMAJ200A00S0SV	200	224	247	1	1	324	1.2	SV
SMAJ210A00S0SW	210	237	263	1	1	340	1.2	SW
SMAJ220A00S0GE	220	246	272	1	1	356	1.1	GE
SMAJ250A00S0SZ	250	279	309	1	1	405	1.0	SZ
SMAJ300A00S0TE	300	335	371	1	1	486	0.8	TE
SMAJ350A00S0TG	350	391	432	1	1	567	0.7	TG
SMAJ400A00S0TK	400	447	494	1	1	648	0.6	TK
SMAJ440A00S0TM	440	492	543	1	1	713	0.6	TM

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES
BIDIRECTIONAL TYPE- ELECTRICAL CHARACTERISTICS - Ta = 25°C

Table 4

Part Code	Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Reverse Leakage Max.	Max. Clamp Voltage	Peak Pulse Current	Marking Code
		V _{BR} @ I _T						
	V _{RMV}	Min	Max	I _T	I _R @ V _{RWM}	V _C @ I _{PPM}	I _{PPM}	
	V	V	V	mA	µA	V	A	
SMAJ050CA0S0WE	5	6.4	7	10	800	9.2	43.5	WE
SMAJ060CA0S0WG	6	6.67	7.37	10	800	10.3	38.8	WG
SMAJ065CA0S0WK	6.5	7.22	7.98	10	500	11.2	35.7	WK
SMAJ070CA0S0WM	7	7.78	8.6	10	200	12	33.3	WM
SMAJ075CA0S0WP	7.5	8.33	9.2	1	100	12.9	31	WP
SMAJ080CA0S0WR	8	8.89	9.83	1	50	13.6	29.4	WR
SMAJ085CA0S0WT	8.5	9.44	10.4	1	20	14.4	27.8	WT
SMAJ090CA0S0WV	9	10	11.1	1	10	15.4	26	WV
SMAJ10CA00S0WX	10	11.1	12.3	1	5	17	23.5	WX
SMAJ11CA00S0WZ	11	12.2	13.5	1	1	18.2	22	WZ
SMAJ12CA00SOXE	12	13.3	14.7	1	1	19.9	20.1	XE
SMAJ13CA00S0XG	13	14.4	15.9	1	1	21.5	18.6	XG
SMAJ14CA00S0XK	14	15.6	17.2	1	1	23.2	17.2	XK
SMAJ15CA00S0XM	15	16.7	18.5	1	1	24.4	16.4	XM
SMAJ16CA00S0XP	16	17.8	19.7	1	1	26	15.4	XP
SMAJ17CA00S0XR	17	18.9	20.9	1	1	27.6	14.5	XR
SMAJ18CA00S0XT	18	20	22.1	1	1	29.2	13.7	XT
SMAJ20CA00S0XV	20	22.2	24.5	1	1	32.4	12.3	XV
SMAJ22CA00S0XX	22	24.4	26.9	1	1	35.5	11.3	XX
SMAJ24CA00S0XZ	24	26.7	29.5	1	1	38.9	10.3	XZ

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES
BIDIRECTIONAL TYPE- ELECTRICAL CHARACTERISTICS - Ta = 25°C

Table 5

Part Code	Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Reverse Leakage Max.	Max. Clamp Voltage	Peak Pulse Current	Marking Code
		V BR @ I T						
	V RMV	Min	Max	I T	I R @ V RWM	V C @ I PPM	I PPM	
	V	V	V	mA	µA	V	A	
SMAJ26CA00SOYE	26	28.9	31.9	1	1	42.1	9.5	YE
SMAJ28CA00SOYG	28	31.1	34.4	1	1	45.4	8.8	YG
SMAJ30CA00SOYK	30	33.3	36.8	1	1	48.4	8.3	YK
SMAJ33CA00SOYM	33	36.7	40.6	1	1	53.3	7.5	YM
SMAJ36CA00SOYP	36	40	44.2	1	1	58.1	6.9	YP
SMAJ40CA00SOYR	40	44.4	49.1	1	1	64.5	6.2	YR
SMAJ43CA00SOYT	43	47.8	52.8	1	1	69.4	5.8	YT
SMAJ45CA00SOYV	45	50	55.3	1	1	72.7	5.5	YV
SMAJ48CA00SOYX	48	53.3	58.9	1	1	77.4	5.2	YX
SMAJ51CA00SOYZ	51	56.7	62.7	1	1	82.4	4.9	YZ
SMAJ54CA00SOZE	54	60	66.3	1	1	87.1	4.6	ZE
SMAJ58CA00SOZG	58	64.4	71.2	1	1	93.6	4.3	ZG
SMAJ60CA00SOZK	60	66.7	73.7	1	1	96.8	4.1	ZK
SMAJ64CA00SOZM	64	71.1	78.6	1	1	103	3.9	ZM
SMAJ70CA00SOZP	70	77.8	86	1	1	113	3.5	ZP
SMAJ75CA00SOZR	75	83.3	92.1	1	1	121	3.3	ZR
SMAJ78CA00SOZT	78	86.7	95.8	1	1	126	3.2	ZT
SMAJ85CA00SOZV	85	94.4	104	1	1	137	2.9	ZV
SMAJ90CA00SOZX	90	100	111	1	1	146	2.7	ZX
SMAJ100CA00SOZZ	100	111	123	1	1	162	2.5	ZZ

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES

BIDIRECTIONAL TYPE- ELECTRICAL CHARACTERISTICS - Ta = 25°C

Table 6

Part Code	Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Reverse Leakage Max.	Max. Clamp Voltage	Peak Pulse Current	Marking Code
		V BR @ I T						
	V RMV	Min	Max	I T	I R @ V RWM	V C @ I PPM	I PPM	
	V	V	V	mA	µA	V	A	
SMAJ110CA0S0VE	110	122	135	1	1	177	2.3	VE
SMAJ120CA0S0VG	120	133	147	1	1	193	2.1	VG
SMAJ130CA0S0VK	130	144	159	1	1	209	1.9	VK
SMAJ150CA0S0VM	150	167	185	1	1	243	1.6	VM
SMAJ160CA0S0VP	160	178	197	1	1	259	1.5	VP
SMAJ170CA0S0VR	170	189	209	1	1	275	1.5	VR
SMAJ180CA0S0VT	180	201	222	1	1	292	1.4	VT
SMAJ190CA0S0YU	190	211	232	1	1	308	1.3	YU
SMAJ200CA0S0VV	200	224	247	1	1	324	1.2	VV
SMAJ210CA0S0YW	210	237	263	1	1	340	1.2	YW
SMAJ220CA0S0VX	220	246	272	1	1	356	1.1	VX
SMAJ250CA0S0VZ	250	279	309	1	1	405	1.0	VZ
SMAJ300CA0S0UE	300	335	371	1	1	486	0.8	UE
SMAJ350CA0S0UG	350	391	432	1	1	567	0.7	UG
SMAJ400CA0S0UK	400	447	494	1	1	648	0.6	UK
SMAJ440CA0S0UM	440	492	543	1	1	713	0.6	UM

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES

RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

Figure 1. Peak Pulse Power Rating Curve

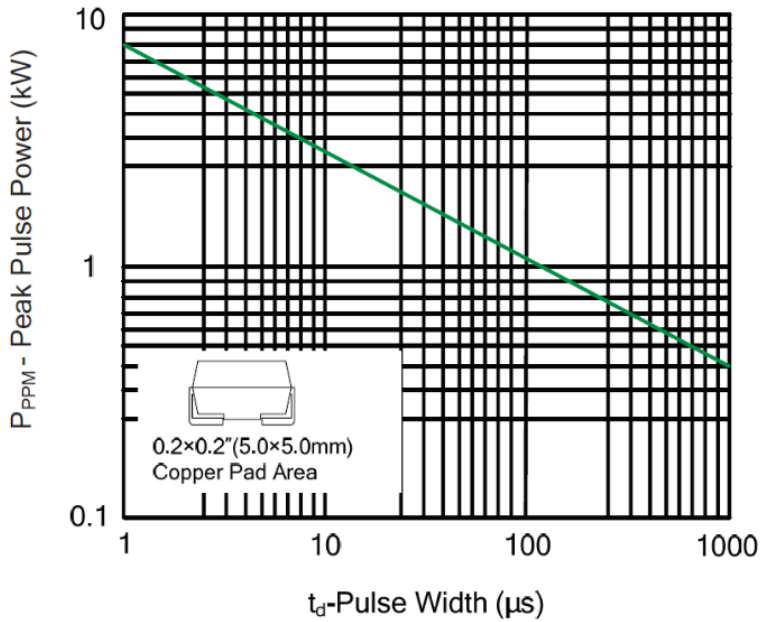
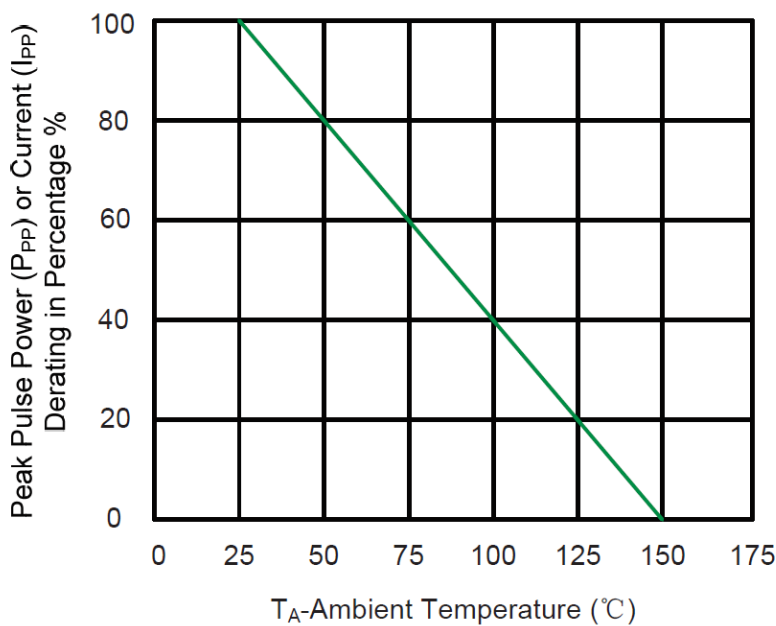


Figure 2. Pulse Derating Curve



SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES

RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

Figure 3. Pulse Waveform

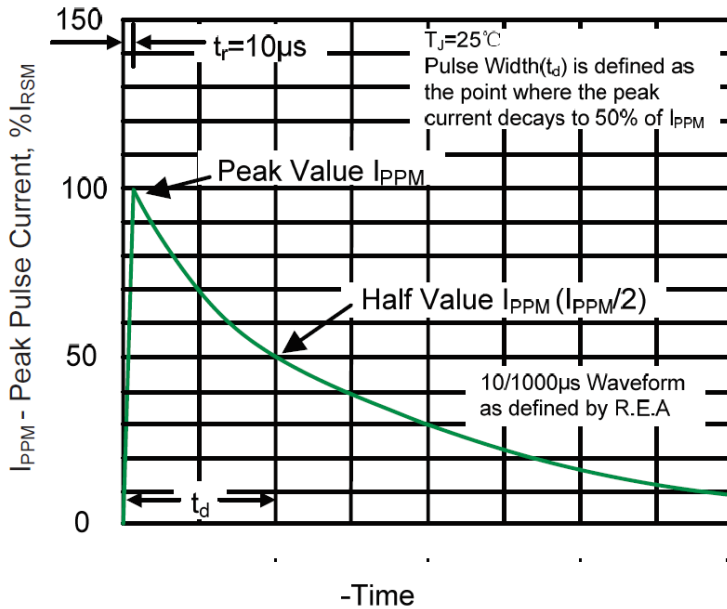
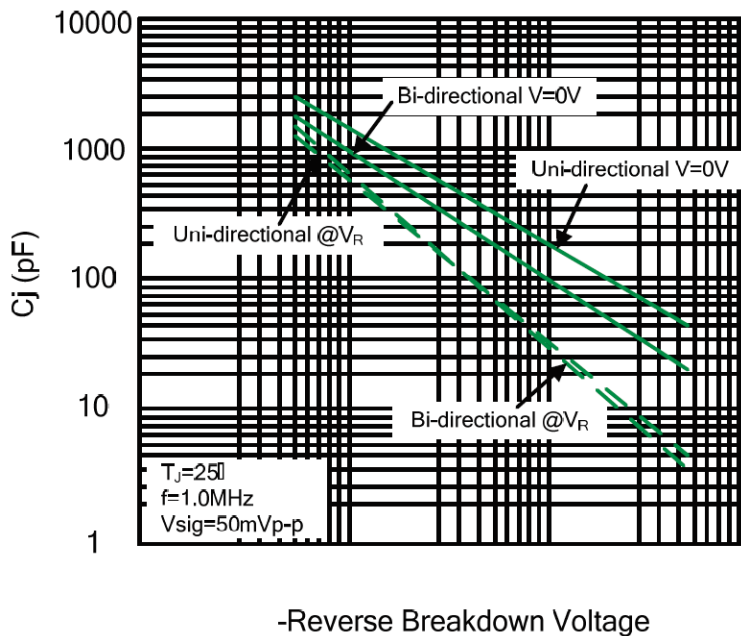


Figure 4. Typical Junction Capacitance



SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES

RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

Figure 5. Steady State Power Dissipation Derating curve

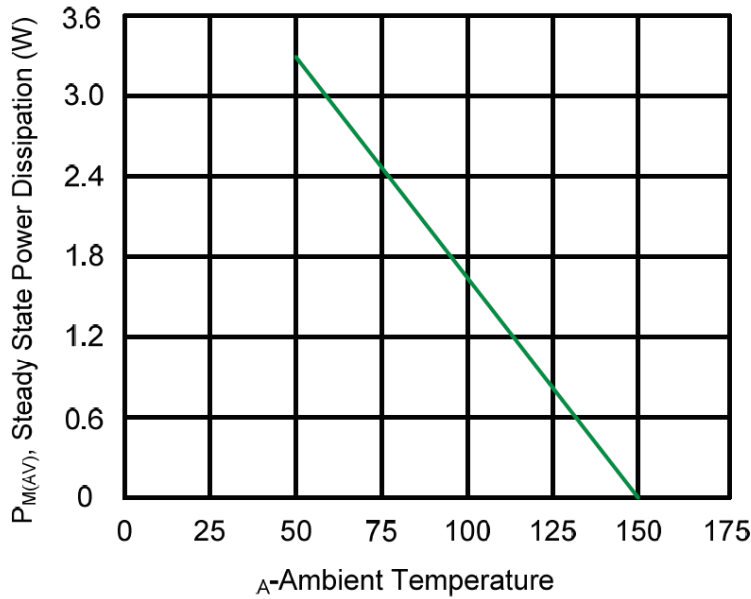
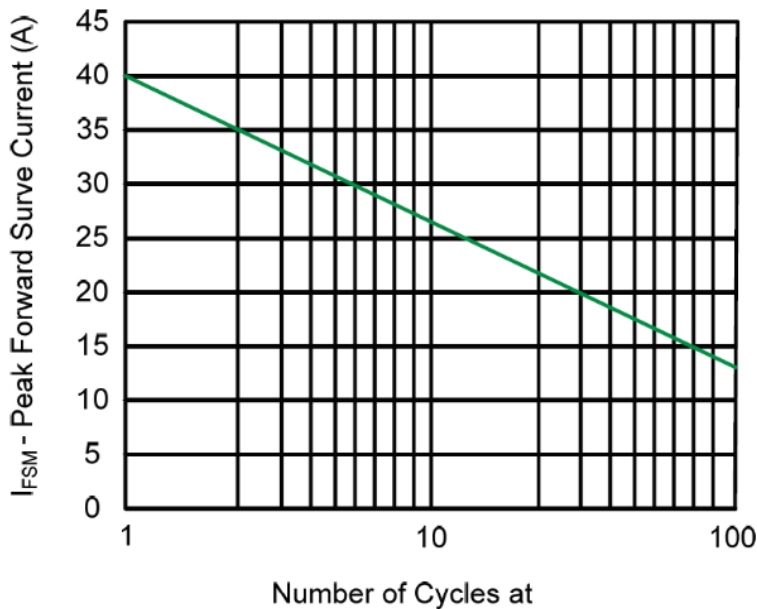


Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES
RELIABILITY

Number	Experiment Items	Experiment Method And Conditions	Reference Documents
1	Solder Resistance Test	Test 260°C± 5°C for 10 ± 2 sec. Immerse body into solder 1/16" ± 1/32"	MIL-STD-750D METHOD-2031.2
2	Solderability Test	230°C ±5°C for 5 sec.	MIL-STD-750D METHOD-2026.1 0
3	Pull Test	1 kg in axial lead direction for 10 sec.	MIL-STD-750D METHOD-2036.4
4	Bend Test	0.5Kg Weight Applied To Each Lead, Bending Arcs 90 °C ± 5 °C For 3 Times	MIL-STD-750D METHOD-2036.4
5	High Temperature Reverse Bias Test	TA=100°C for 1000 Hours at VR=80% Rated VR	MIL-STD-750D METHOD-1038.4
6	Forward Operation Life Test	TA=25°C Rated Average Rectified Current	MIL-STD-750D METHOD-1027.3
7	Intermittent Operation Life Test	On state: 5 min with rated IRMS Power Off state: 5 min with Cool Forced Air. On and off for 1000 cycles.	MIL-STD-750D METHOD-1036.3
8	Pressure Cooker Test	15 PSIG, TA=121°C, 4 hours	MIL-S-19500 APPENOIXC
9	Temperature Cycling Test	-55°C~+125°C; 30 Minutes For Dwelled Time 5 minutes for transferred time. Total: 10 cycles.	MIL-STD-750D METHOD-1051.7
10	Thermal Shock Test	0°C for 5 minutes., 100°C for 5minutes, Total: 10 cycles	MIL-STD-750D METHOD-1056.7
11	Forward Surge Test	8.3ms Single Sale Sine-wave One Surge.	MIL-STD-750D METHOD-4066.4
12	Humidity Test	TA=65°C, RH=98% for 1000 hours.	MIL-STD-750D METHOD-1021.3
13	High Temperature Storage life Test	150°C for 1000 Hours	MIL-STD-750D METHOD-1031.5

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES

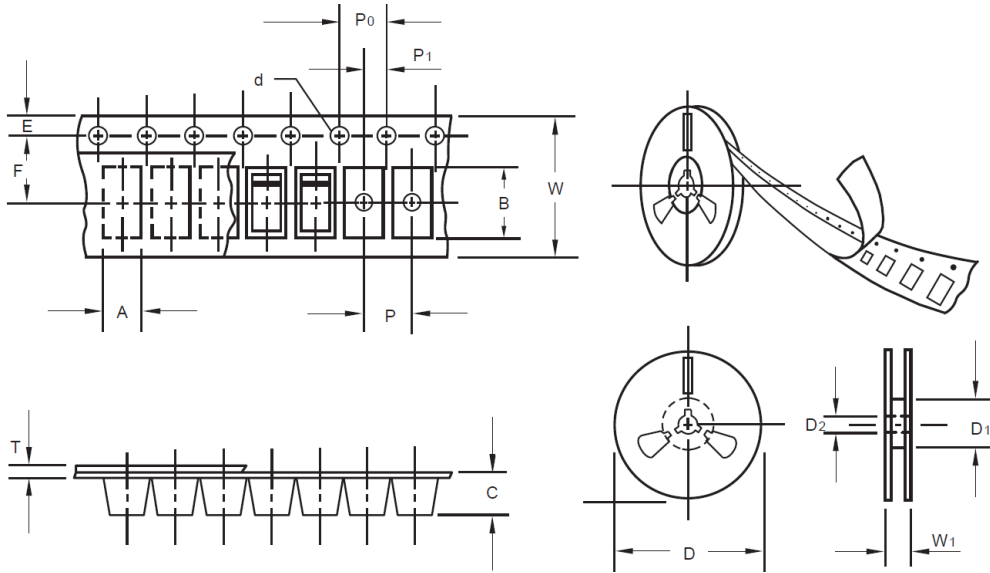
SUGGESTED REFLOW PROFILE (For Reference Only)



Profile Feature		Pb-Free Assembly
Average Ramp-up Rate (Ts Max to Tp)		3°C/second Max
Preheat	Temperature Min (Ts Min.)	150°C
	Temperature Max (Ts Max.)	200°C
	Time (ts Min. to ts Max.)	60 ~ 180 seconds
Time maintained above	Temperature (Tl)	217°C
	Time (tL)	60 ~ 150 seconds
Peak/Classification Temperature (Tp)		260 °C
Time within 5°C of actual Peak Temperature (tp)		20 ~ 40 seconds
Ramp-down rate		6 °C /Second Max.
Time 25 °C to Peak Temperature		8 minutes Max.
Suggest reflow times		3 Times Max.

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES
TAPE/REEL (Unit: mm) (For Reference Only)

All Devices are packed in accordance with EIA standard RS-481-A and specifications.



Item	Symbol	Tolerance	SMA/DO-214AC
Carrier width	A	0.1	2.8
Carrier Length	B	0.1	5.33
Carrier Depth	C	0.1	2.36
Sprocket hole	d	0.05	1.50
13"Reel outside diameter	D	2.0	330.0
13"Reel inner diameter	D1	-	50.0Min.
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	5.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.0
Overall tape thickness	T	0.1	0.28
Tape width	W	0.3	12.00
Reel width	W1	1.0	18.0
Qty./Reel (pcs)	5000		

SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMAJ SERIES

IMPORTANT NOTES AND DISCLAIMER

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