




<b>DATA SHEET NO.</b>	R0419 - SMF45CA00S45CA	
<b>DATE</b>	Apr.19, 2024	
<b>REVISION</b>	A3	Updated With Most Recent Data
<b>DESCRIPTION AND MAIN PARAMETRICS</b>	<p>SMD Transient Voltage Suppressor (TVs) Diodes, SMF/SOD-123FL series,                  2 Pads, Bidirectional Type, Stand-off Voltage 45V,                  Peak Pulse Power: 200 Watts, Peak Pulse Current: 2.8A Max.                  Operating Temp. Range -55°C ~+150°C                  Package in Tape/Reel, 3000pcs/Reel                  REACH/RoHS/RoHS III Compliant</p>	
<b>CUSTOMER</b>		
<b>CUSTOMER PART NO.</b>		
<b>CROSS REF. PART NO.</b>		
<b>ORIGINAL MFG/PART NO</b>	MDD SMF45CA	
<b>PART CODE</b>	SMF45CA00S45CA	

<b>VENDOR APPROVE</b>			
Issued/Checked/Approved			
DATE: Apr. 19, 2024			

<b>CUSTOMER APPROVE</b>	
DATE:	

**SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES**

**MAIN FEATURE**

- Low Profile Package
- Glass Passivated Chip Junction
- Low Inductance
- Plastic Package Has Underwriters Laboratory Flammability



**APPLICATION**

- For SMD application

**ELECTRICAL CHARACTERISTICS**

- See Page 4~ Page 10

**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

SMF	45CA	00S	45CA
1	2	3	4

1. SMF: SMD Transient Voltage Suppressor (TVs) Diodes, SMF/SOD-123FL series
2. 45CA: Bidirectional Type, Stand-off Voltage: 45V
3. 00S: Internal Control Code or Special Parameters Code, Letter A~Z, a~z or digits 0~9
4. 45CA: Marking code "45CA" on the case surface.

**SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES**

**DIMENSION** (Unit: Inch/mm)

Image for reference

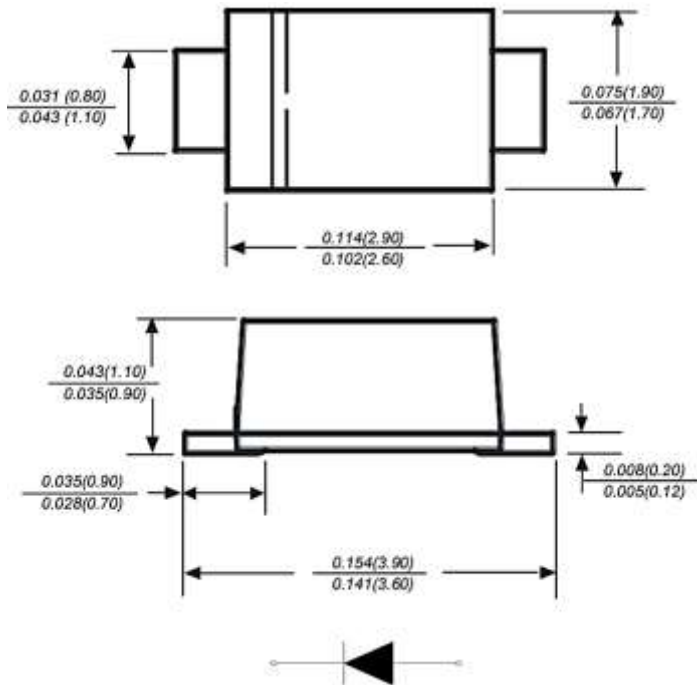


Marking:

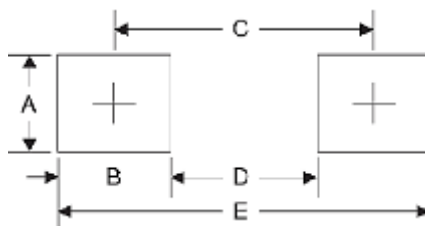
See Page 5~ Page 10

Marking Code List

SMF/SOD-123FL



Recommend Pad Layout



Symbol	Unit (Inch)	Unit (mm)
A	0.047	1.20
B	0.047	1.20
C	0.126	3.20
D	0.079	2.00
E	0.173	4.40

**SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES**
**MECHANICAL DATA**

CASE	TERMINALS	POLARITY	MOUNTING POSITION	MARKING	WEIGHT PER PIECE
JEDEC SMF/SOD-123FL molded plastic body	Solderable per MIL-STD- 750,Method 2026	Polarity symbol marking on body	Any	See Marking Code List	0.00048 ounce, 0.015 grams

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

PARAMETER	SYMBOLS	VALUE	UNITS
Peak Pulse Power Dissipation on TA=25°C (Note 1,2,5 Fig 1)	P ppm	200	W
Peak Forward Surge Current 8.3ms Single Half Sine Wave (Note 3) -	I FSM (UNI)	20	A
Steady State Power Dissipation (Note 4)	P M(AV)	1.0	W
Peak Pulse Current on 10/1000 us waveform (Note 1) Fig 2	I PPM	See Table 1~Table 6	A
Operating junction temperature range	T J	-55 ~ +150	°C
Storage temperature range	T stg	-55 ~ +150	°C
Typical Thermal Resistance	R θJA	180	°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 copper pads to each terminal
3. 8.3ms single half sinewave or equivalent square wave, duty cycle=4 pulsed per minute Max.
4. Lead temperature at T L =75 °C
5. Peak pulse power waveform is tp =10/1000µs
6. A transient suppressor is selected according to the working peak reverse voltage (V RWM), which should be equal to or great than the DC or continuous peak operating voltage level.

**SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF 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 <sub>BR</sub> @ I <sub>T</sub>						
	V <sub>RMV</sub>	Min	Max	I <sub>T</sub>	I <sub>R</sub> @ V <sub>RWM</sub>	V <sub>C</sub> @ I <sub>PPM</sub>	I <sub>PPM</sub>	
	V	V	V	mA	µA	V	A	
SMF050A00S050A	5	6.4	7	10	400	9.2	21.7	5.0A
SMF060A00S060A	6	6.67	7.37	10	400	10.3	19.4	6.0A
SMF065A00S065A	6.5	7.22	7.98	10	250	11.2	17.9	6.5A
SMF070A00S070A	7	7.78	8.6	10	100	12	16.7	7.0A
SMF075A00S075A	7.5	8.33	9.2	1	50	12.9	15.5	7.5A
SMF080A00S080A	8	8.89	9.83	1	25	13.6	14.7	8.0A
SMF085A00S085A	8.5	9.44	10.4	1	10	14.4	13.9	8.5A
SMF090A00S090A	9	10	11.1	1	5	15.4	13	9.0A
SMF10A0000S10A	10	11.1	12.3	1	2.5	17	11.8	10A
SMF11A0000S11A	11	12.2	13.5	1	2.5	18.2	11	11A
SMF12A0000S12A	12	13.3	14.7	1	2.5	19.9	10.1	12A
SMF13A0000S13A	13	14.4	15.9	1	1	21.5	9.3	13A
SMF14A0000S14A	14	15.6	17.2	1	1	23.2	8.6	14A
SMF15A0000S15A	15	16.7	18.5	1	1	24.4	8.2	15A
SMF16A0000S16A	16	17.8	19.7	1	1	26	7.7	16A
SMF17A0000S17A	17	18.9	20.9	1	1	27.6	7.2	17A
SMF18A0000S18A	18	20	22.1	1	1	29.2	6.8	18A
SMF20A0000S20A	20	22.2	24.5	1	1	32.4	6.2	20A
SMF22A0000S22A	22	24.4	26.9	1	1	35.5	5.6	22A
SMF24A0000S24A	24	26.7	29.5	1	1	38.9	5.1	24A

**SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF 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	
SMF26A0000S26A	26	28.9	31.9	1	1	42.1	4.8	26A
SMF28A0000S28A	28	31.1	34.4	1	1	45.4	4.4	28A
SMF30A0000S30A	30	33.3	36.8	1	1	48.4	4.1	30A
SMF33A0000S33A	33	36.7	40.6	1	1	53.3	3.8	33A
SMF36A0000S36A	36	40	44.2	1	1	58.1	3.4	36A
SMF40A0000S40A	40	44.4	49.1	1	1	64.5	3.1	40A
SMF43A0000S43A	43	47.8	52.8	1	1	69.4	2.9	43A
SMF45A0000S45A	45	50	55.3	1	1	72.7	2.8	45A
SMF48A0000S48A	48	53.3	58.9	1	1	77.4	2.6	48A
SMF51A0000S51A	51	56.7	62.7	1	1	82.4	2.4	51A
SMF54A0000S54A	54	60	66.3	1	1	87.1	2.3	54A
SMF58A0000S58A	58	64.4	71.2	1	1	93.6	2.1	58A
SMF60A0000S60A	60	66.7	73.7	1	1	96.8	1.8	60A
SMF64A0000S64A	64	71.1	78.6	1	1	103	1.7	64A
SMF70A0000S70A	70	77.8	86	1	1	113	1.5	70A
SMF75A0000S75A	75	83.3	92.1	1	1	121	1.4	75A
SMF78A0000S78A	78	86.7	95.8	1	1	126	1.4	78A
SMF85A0000S85A	85	94.4	104	1	1	137	1.3	85A
SMF90A0000S90A	90	100	111	1	1	146	1.2	90A
SMF100A00S100A	100	111	123	1	1	162	1.1	100A

**SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF 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 <sub>BR</sub> @ I <sub>T</sub>						
	V <sub>RMV</sub>	Min	Max	I <sub>T</sub>	I <sub>R</sub> @ V <sub>RWM</sub>	V <sub>C</sub> @ I <sub>PPM</sub>	I <sub>PPM</sub>	
V	V	V	mA	µA	V	A		
SMF110A00S110A	110	122	135	1	1	177	1	110A
SMF120A00S120A	120	133	147	1	1	193	0.9	120A
SMF130A00S130A	130	144	159	1	1	209	0.8	130A
SMF150A00S150A	150	167	185	1	1	243	0.7	150A
SMF160A00S160A	160	178	197	1	1	259	0.7	160A
SMF170A00S170A	170	189	209	1	1	275	0.6	170A
SMF180A00S180A	180	201	222	1	1	292	0.5	180A
SMF190A00S190A	190	211	232	1	1	308	0.5	190A
SMF200A00S200A	200	224	247	1	1	324	0.5	200A
SMF220A00S220A	220	246	272	1	1	356	0.5	220A
SMF250A00S250A	250	279	309	1	1	405	0.5	250A
SMF300A00S300A	300	335	371	1	1	486	0.45	300A
SMF350A00S350A	350	391	432	1	1	567	0.4	350A
SMF400A00S400A	400	447	494	1	1	648	0.35	400A
SMF440A00S440A	440	492	543	1	1	713	0.3	440A

**SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF 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 <sub>BR</sub> @ I <sub>T</sub>						
	V <sub>RMV</sub>	Min	Max	I <sub>T</sub>	I <sub>R</sub> @ V <sub>RWM</sub>	V <sub>C</sub> @ I <sub>PPM</sub>	I <sub>PPM</sub>	
V	V	V	mA	µA	V	A		
SMF050CAS050CA	5	6.4	7	10	400	9.2	21.7	5.0CA
SMF060CAS060CA	6	6.67	7.37	10	400	10.3	19.4	6.0CA
SMF065CAS065CA	6.5	7.22	7.98	10	250	11.2	17.9	6.5CA
SMF070CAS070CA	7	7.78	8.6	10	100	12	16.7	7.0CA
SMF075CAS075CA	7.5	8.33	9.2	1	50	12.9	15.5	7.5CA
SMF080CAS080CA	8	8.89	9.83	1	25	13.6	14.7	8.0CA
SMF085CAS085CA	8.5	9.44	10.4	1	10	14.4	13.9	8.5CA
SMF090CAS090CA	9	10	11.1	1	5	15.4	13	9.0CA
SMF10CA00S10CA	10	11.1	12.3	1	2.5	17	11.8	10CA
SMF11CA00S11CA	11	12.2	13.5	1	2.5	18.2	11	11CA
SMF12CA00S12CA	12	13.3	14.7	1	2.5	19.9	10.1	12CA
SMF13CA00S13CA	13	14.4	15.9	1	1	21.5	9.3	13CA
SMF14CA00S14CA	14	15.6	17.2	1	1	23.2	8.6	14CA
SMF15CA00S15CA	15	16.7	18.5	1	1	24.4	8.2	15CA
SMF16CA00S16CA	16	17.8	19.7	1	1	26	7.7	16CA
SMF17CA00S17CA	17	18.9	20.9	1	1	27.6	7.2	17CA
SMF18CA00S18CA	18	20	22.1	1	1	29.2	6.8	18CA
SMF20CA00S20CA	20	22.2	24.5	1	1	32.4	6.2	20CA
SMF22CA00S22CA	22	24.4	26.9	1	1	35.5	5.6	22CA
SMF24CA00S24CA	24	26.7	29.5	1	1	38.9	5.1	24CA



**SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF 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 <sub>BR</sub> @ I <sub>T</sub>						
	V <sub>RMV</sub>	Min	Max	I <sub>T</sub>	I <sub>R</sub> @ V <sub>RWM</sub>	V <sub>C</sub> @ I <sub>PPM</sub>	I <sub>PPM</sub>	
	V	V	V	mA	µA	V	A	
SMF26CA00S26CA	26	28.9	31.9	1	1	42.1	4.8	26CA
SMF28CA00S28CA	28	31.1	34.4	1	1	45.4	4.4	28CA
SMF30CA00S30CA	30	33.3	36.8	1	1	48.4	4.1	30CA
SMF33CA00S33CA	33	36.7	40.6	1	1	53.3	3.8	33CA
SMF36C00AS36CA	36	40	44.2	1	1	58.1	3.4	36CA
SMF40CA00S40CA	40	44.4	49.1	1	1	64.5	3.1	40CA
SMF43CA00S43CA	43	47.8	52.8	1	1	69.4	2.9	43CA
<b>SMF45CA00S45CA</b>	<b>45</b>	<b>50</b>	<b>55.3</b>	<b>1</b>	<b>1</b>	<b>72.7</b>	<b>2.8</b>	<b>45CA</b>
SMF48CA00S48CA	48	53.3	58.9	1	1	77.4	2.6	48CA
SMF51CA00S51CA	51	56.7	62.7	1	1	82.4	2.4	51CA
SMF54CA00S54CA	54	60	66.3	1	1	87.1	2.3	54CA
SMF58CA00S58CA	58	64.4	71.2	1	1	93.6	2.1	58CA
SMF60CA00S60CA	60	66.7	73.7	1	1	96.8	1.8	60CA
SMF64CA00S64CA	64	71.1	78.6	1	1	103	1.7	64CA
SMF70CA00S70CA	70	77.8	86	1	1	113	1.5	70CA
SMF75CA00S75CA	75	83.3	92.1	1	1	121	1.4	75CA
SMF78CA00S78CA	78	86.7	95.8	1	1	126	1.4	78CA
SMF85CA00S85CA	85	94.4	104	1	1	137	1.3	85CA
SMF90CA00S90CA	90	100	111	1	1	146	1.2	90CA
SMF100CAS100CA	100	111	123	1	1	162	1.1	100CA

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

Table 6

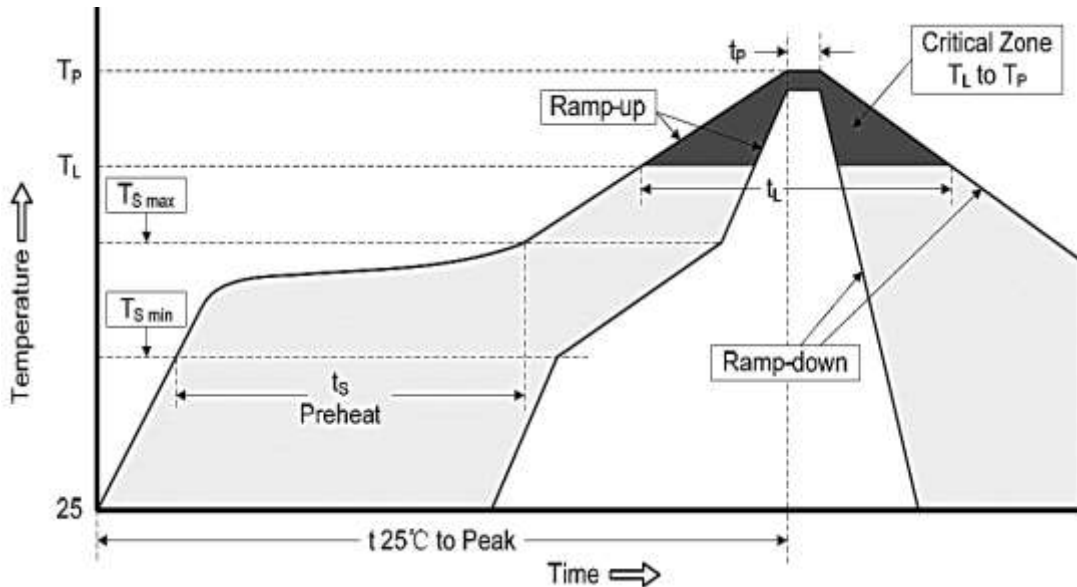
Part Code	Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Reverse Leakage Max.	Max. Clamp Voltage	Peak Pulse Current	Marking Code
		V <sub>BR</sub> @ I <sub>T</sub>						
	V <sub>RMV</sub>	Min	Max	I <sub>T</sub>	I <sub>R</sub> @ V <sub>RWM</sub>	V <sub>C</sub> @ I <sub>PPM</sub>	I <sub>PPM</sub>	
V	V	V	mA	μA	V	A		
SMF110CAS110CA	110	122	135	1	1	177	1	110CA
SMF120CAS120CA	120	133	147	1	1	193	0.9	120CA
SMF130CAS130CA	130	144	159	1	1	209	0.8	130CA
SMF150CAS150CA	150	167	185	1	1	243	0.7	150CA
SMF160CAS160CA	160	178	197	1	1	259	0.7	160CA
SMF170CAS170CA	170	189	209	1	1	275	0.6	170CA
SMF180CAS180CA	180	201	222	1	1	292	0.5	180CA
SMF190CAS190CA	190	211	232	1	1	308	0.5	190CA
SMF200CAS200CA	200	224	247	1	1	324	0.5	200CA
SMF220CAS220CA	220	246	272	1	1	356	0.5	220CA
SMF250CAS250CA	250	279	309	1	1	405	0.5	250CA
SMF300CAS300CA	300	335	371	1	1	486	0.45	300CA
SMF350CAS350CA	350	391	432	1	1	567	0.4	350CA
SMF400CAS400CA	400	447	494	1	1	648	0.35	400CA
SMF440CAS440CA	440	492	543	1	1	713	0.3	440CA

**SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF 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 SMF SERIES**

**SUGGESTED REFLOW PROFILE** (For Reference Only)

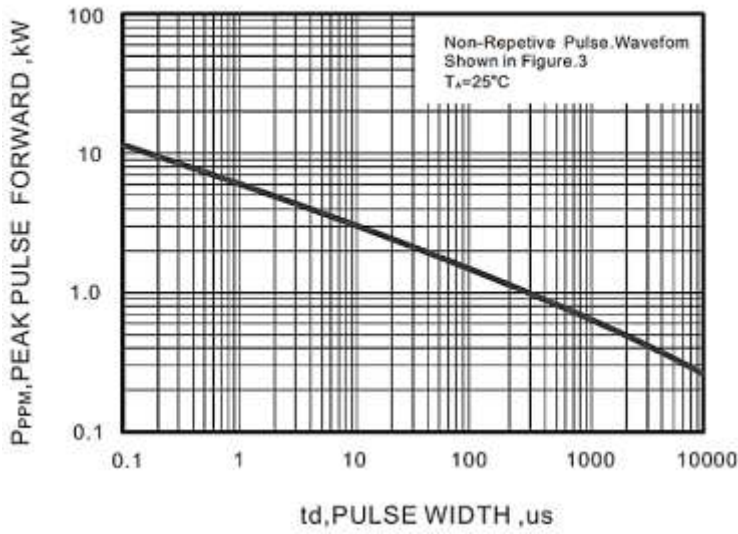


Profile Feature		Pb-Free Assembly
Average Ramp-up Rate (Ts Max to Tp)		3°C/second Max
Preheat	Temperature Min (Ts Min.)	150°C
	Temperature Max (Ts Max.)	200°C
	Time (ts Min. to ts Max.)	60 ~ 180 seconds
Time maintained above	Temperature (Tl)	217°C
	Time (tl)	60 ~ 150 seconds
Peak/Classification Temperature (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.

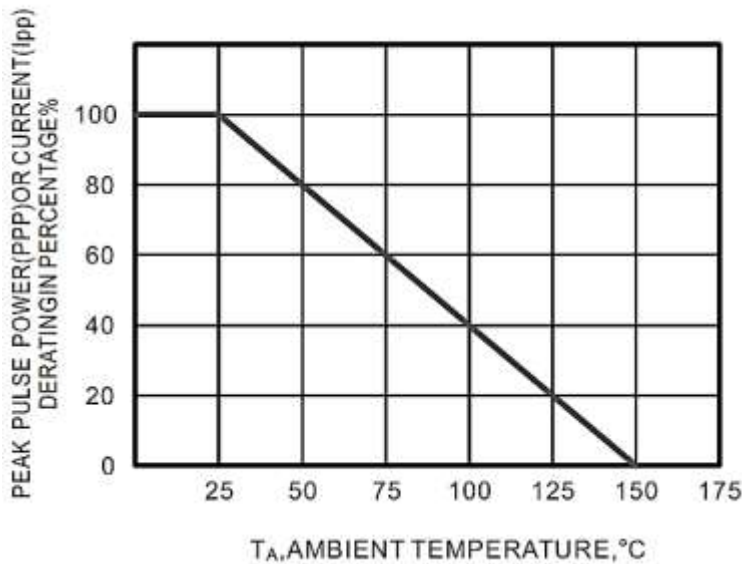
**SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES**

**RATINGS AND CHARACTERISTIC CURVES** (For Reference Only)

**Fig.1 Peak Pulse Power Rating Curve**



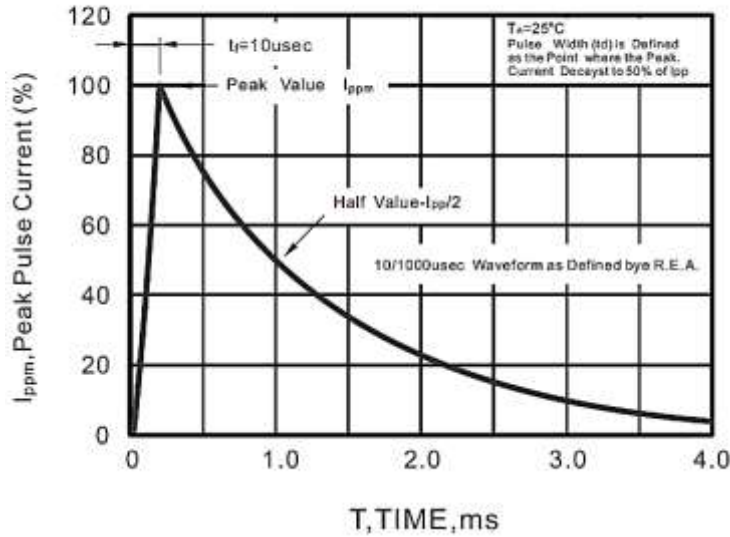
**Fig.2 Forward Current Derating Curve**



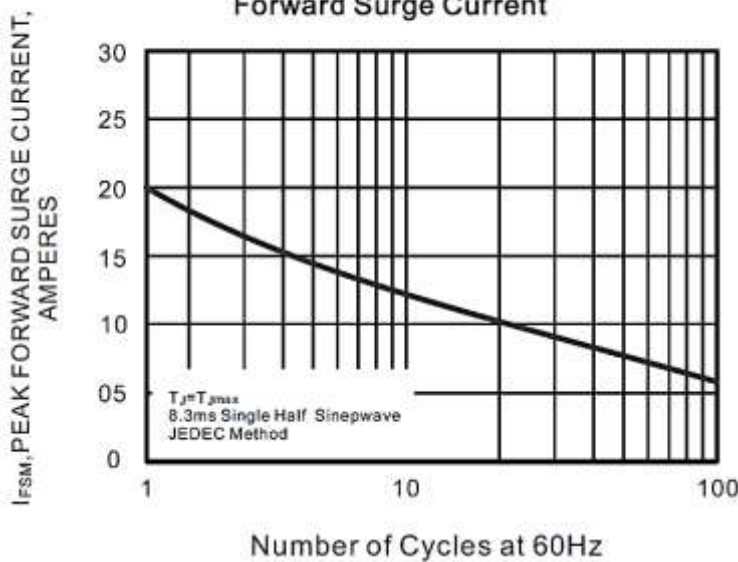
**SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES**

**RATINGS AND CHARACTERISTIC CURVES** (For Reference Only)

**Fig.3 Pulse Waveform**



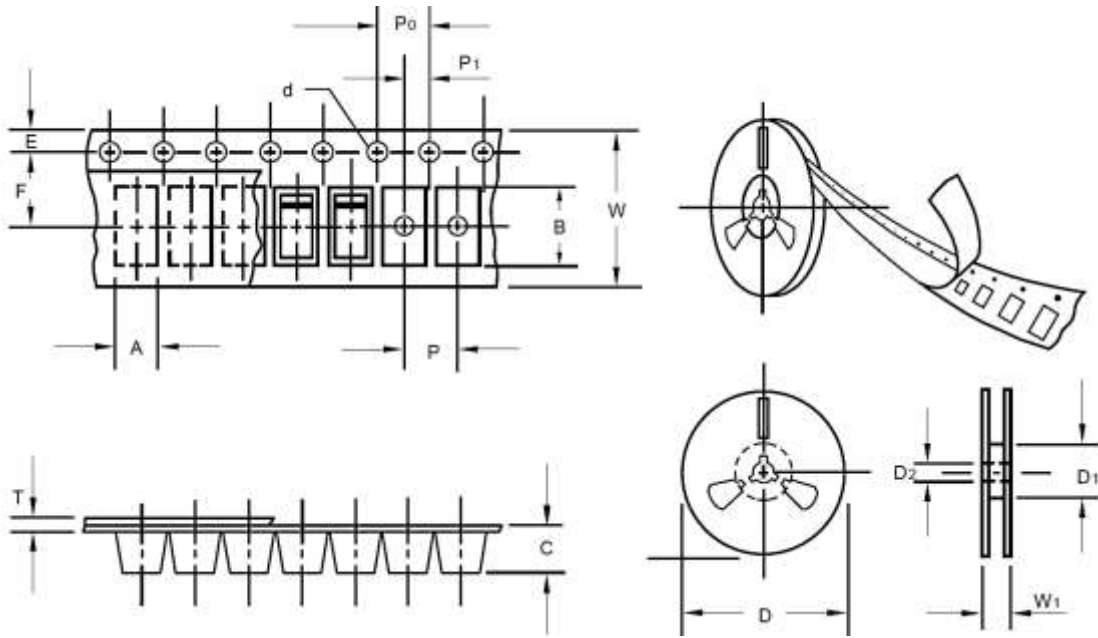
**Fig.4 Maximum Non-Repetitive Peak Forward Surge Current**



**SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES**

**TAPE/REEL (Unit: mm)**

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



Item	Symbol	Tolerance	SMF/SOD-123FL
Carrier width	A	0.1	2.10
Carrier Length	B	0.1	4.00
Carrier Depth	C	0.1	1.60
Sprocket hole	d	0.05	1.55
7"Reel outside diameter	D	2.0	178.00
7"Reel inner diameter	D1	Min.	50.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.25
Tape width	W	0.3	8.15
Reel width	W1	1.0	10.50
Package	3000pcs/Reel, 2 Reels/ Box		
G.W/Box	1 LB		

## SMD TRANSIENT VOLTAGE SUPPRESSORS DIODES SMF SERIES

### IMPORTANT NOTES AND DISCLAIMER

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