Thyristor Surge Suppressors (TSS)

PXXXXDM Series SOD-123FL(SMF) @10/700 μs , 2KV

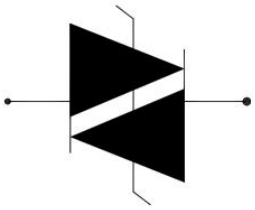
Description

PXXXXDM Series are designed to protect broadband equipment such as modems, line card, CPE and DSL from damaging over-voltage transients. The series provides a surface mount solution that enables equipment to comply with global regulatory standards.

Feature

- Excellent capability of absorbing transient surge
- Quick response to surge voltage (ns Level)
- Eliminates over voltage caused by fast rising transients
- Moisture sensitivity level: Level 1
- Non degenerative
- Response Time is < 1us
- ROHS compliant

Functional Diagram

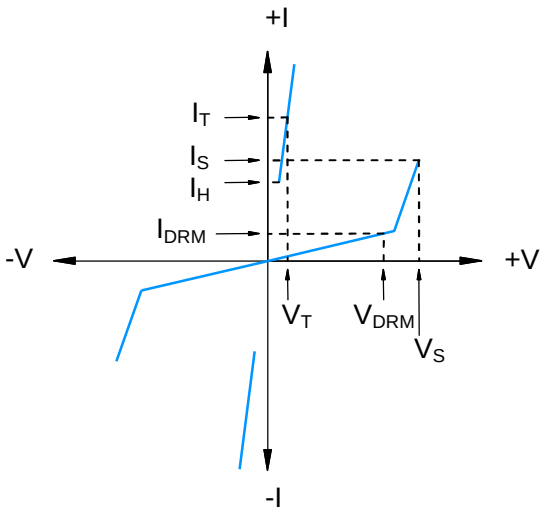


Applicable Global Standards

- TIA-968-A
- ITU K.20/21 Enhanced level
- ITU K.20/21 Basic Level
- GR 1089 Inter building
- GR 1089 Inter building
- IEC 6100-4-5
- YD/T 1082

Electrical Parameters

Parameter	Definition
I_S	**Switching Current** - maximum current required to switch to on state
I_{DRM}	**Leakage Current** - maximum peak off-state current measured at VDRM
I_H	**Holding Current** - minimum current required to maintain on state
I_T	**On-state Current** - maximum rated continuous on-state current
V_S	**Switching Voltage** - maximum voltage prior to switching to on stat
V_{DRM}	**Peak Off-state Voltage** - maximum voltage that can be applied while maintaining off state
V_T	**On-state Voltage** - maximum voltage measured at rated on-state current
C_0	**Off-state Capacitance** - typical capacitance measured in off state



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Electrical Characteristics (@ 25℃ Unless Otherwise Specified)

Part Number	Marking	V_{DRM} @I_{DRM}=5μA	I_{DRM}	V_S @100V/μS	I_S	V_T @I_T=2.2A	I_T	I_H	C_O @1MHz
		V min	μA max	V max	mA max	V max	A max	mA min	pF max
P0080DM	P80DM	6	5	25	800	4	2.2	50	50
P0300DM	P03DM	25	5	40	800	4	2.2	50	70
P0640DM	P64DM	58	5	77	800	4	2.2	150	50
P0720DM	P72DM	65	5	88	800	4	2.2	150	50
P0900DM	P90DM	75	5	98	800	4	2.2	150	45
P1100DM	P11DM	90	5	130	800	4	2.2	150	45
P1300DM	P13DM	120	5	160	800	4	2.2	150	45
P1500DM	P15DM	140	5	180	800	4	2.2	150	40
P1800DM	P18DM	170	5	220	800	4	2.2	150	40
P2000DM	P20DM	180	5	220	800	4	2.2	150	40
P2300DM	P23DM	190	5	260	800	4	2.2	150	35
P2600DM	P26DM	220	5	300	800	4	2.2	150	35
P3100DM	P31DM	275	5	350	800	4	2.2	150	30
P3500DM	P35DM	320	5	400	800	4	2.2	150	30
P3800DM	P38DM	360	5	460	800	4	2.2	150	30
P4200DM	P42DM	400	5	520	800	4	2.2	150	30

Notes:
- Vs is measured at 100KV/s
- Off-state capacitance is measured in VDC=2V, VRMS=1V, f=1MHz

Surge Ratings

Series	2/10μS[1]	8/20μS[1]	10/160μS[1]	10/560μS[1]	10/1000μS[1]	5/310μS[1]	I_{TSM} 50/60 Hz	di/dt
	2/10μS[2]	1.2/50μS[2]	10/160μS[2]	10/560μS[2]	10/1000μS[2]	10/700μS[2]		
	A min	A min	A min	A min	A min	A min	A min	Amps/μs max
A	100	100	60	15	15	50	10	500

Notes:
1. Current waveform in μs
2. Voltage waveform in μs

- Peak pulse current rating (I_{PP}) is repetitive and guaranteed for the life of the product.
- I_{PP} ratings applicable over temperature range of -40ºC to +85ºC
- The device must initially be in thermal equilibrium with -40°C < T_J < +150°C

Thermal Considerations

Package	Symbol	Parameter	Value	Unit
SOD-123FL 	T_J	Operating Junction Temperature Range	- 40 to + 125	°C
	T_S	Storage Temperature Range	- 60 to +150	°C
	$R_{\theta JA}$	Thermal Resistance: Junction to Ambient	90	°C/W

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Characteristic Curves

Figure 1 - V-I Characteristics

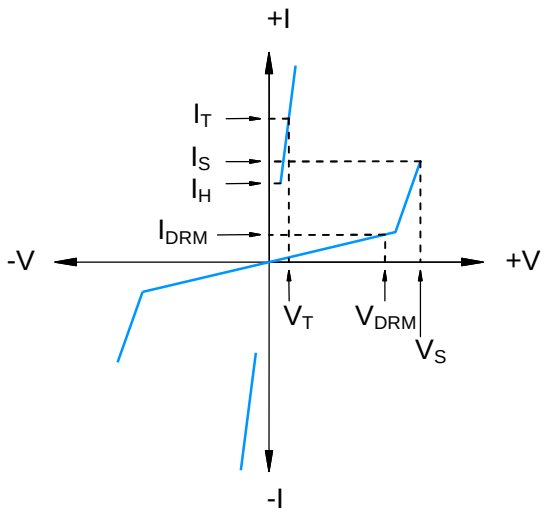


Figure 2 - $t_r \times t_d$ Pulse Waveform

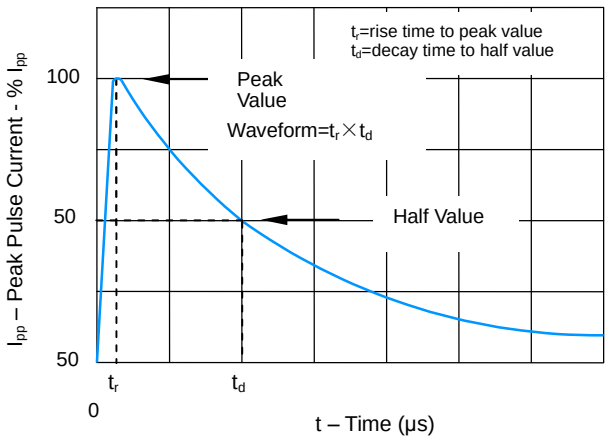


Figure 3 - Normalized V_S Change Versus Junction Temperature

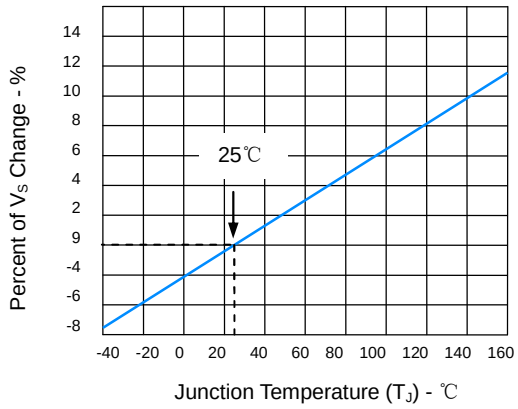
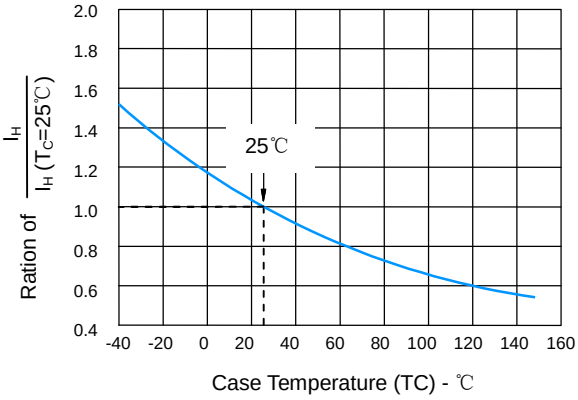


Figure 4 - Normalized DC Holding Current Versus Case Temperature



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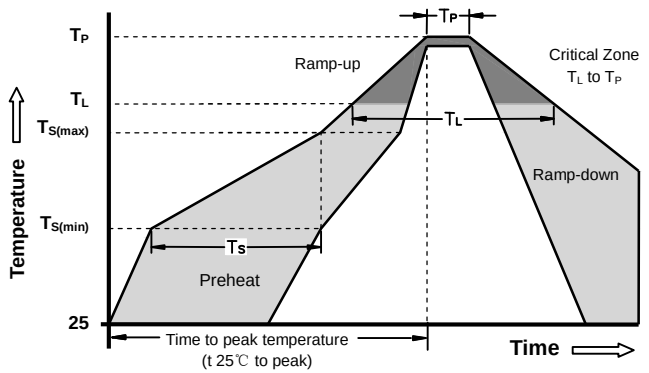
Environmental Specifications

High Temp Voltage Blocking	80% Rated VDRM (VAC Peak) +125°C or +150°C, Lead Material Copper Alloy High Temp Voltage Blocking 504 or 1008 hrs. MIL-STD-750 (Method 1040) JEDEC, JESD22-A-101
Temp Cycling	-65°C to +150°C, 15 min. dwell, 10 up to 100 cycles. MIL-STD-750 (Method 1051) EIA/JEDEC, JESD22-A104
Biased Temp & Humidity	52 VDC (+85°C) 85%RH, 504 up to 1008 hrs. EIA/ JEDEC, JESD22-A-101
High Temp Storage	+150°C 1008 hrs. MIL-STD-750 (Method 1031) JEDEC, JESD22-A-101
Low Temp Storage	-65°C, 1008 hrs.
Thermal Shock	0°C to +100°C, 5 min. dwell, 10 sec. transfer, Thermal Shock 10 cycles. MIL-STD-750 (Method 1056) JEDEC, JESD22-A-106
Autoclave (Pressure Cooker Test)	+121°C, 100%RH, 2atm, 24 up to 168 hrs. EIA/Cooker Test) JEDEC, JESD22-A-102
Resistance to Solder Heat	+260°C, 30 secs. MIL-STD-750 (Method 2031
Moisture Sensitivity Level	85%RH, +85°C, 168 hrs., 3 reflow cycles Level (+260°C Peak). JEDEC-J-STD-020, Level 1

Physical Specifications

Lead Material	Copper Alloy
Terminal Finish	100% Matte-Tin Plated
Body Material	UL recognized epoxy meeting flammability classification 94V-0

Soldering Parameters



Reflow Condition		Lead–free assembly
Pre Heat	**-Temperature Min ($T_{s(min)}$)**	+150°C
	-Temperature Max ($T_{s(max)}$)	+200°C
	-Time (min to max) (t_s)	60 -180 Seconds
Average ramp up rate (Liquidus Temp T_L) to peak		3°C/Second Max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/Second Max
Reflow	**- Temperature (T_L) (Liquidus)**	+217°C
	- Time (min to max) (t_s)	60 -150 Seconds
Peak Temperature (T_P)		260 +0/-5°C
Time within 5°C of actual peak Temperature (t_p)		30 Seconds Max
Ramp-down Rate		6°C/Second Max
Time 25°C to peak Temperature (T_P)		8 minutes Max
Do not exceed		+260°C

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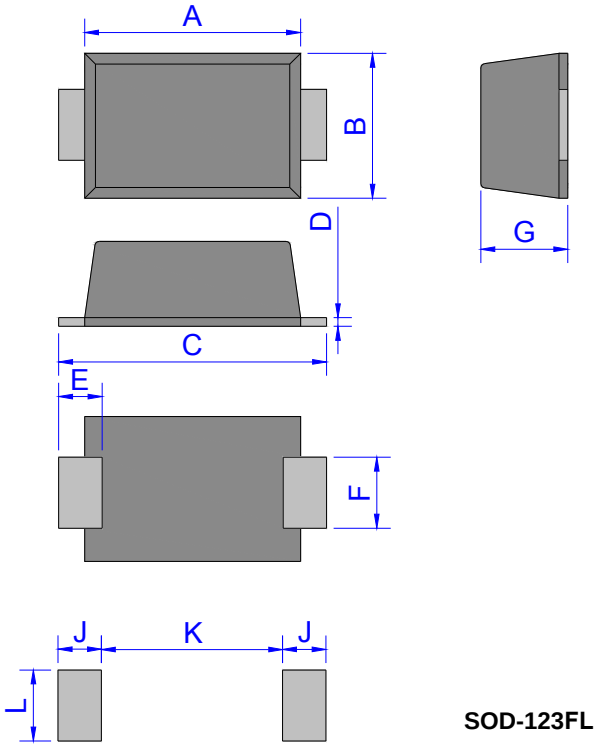
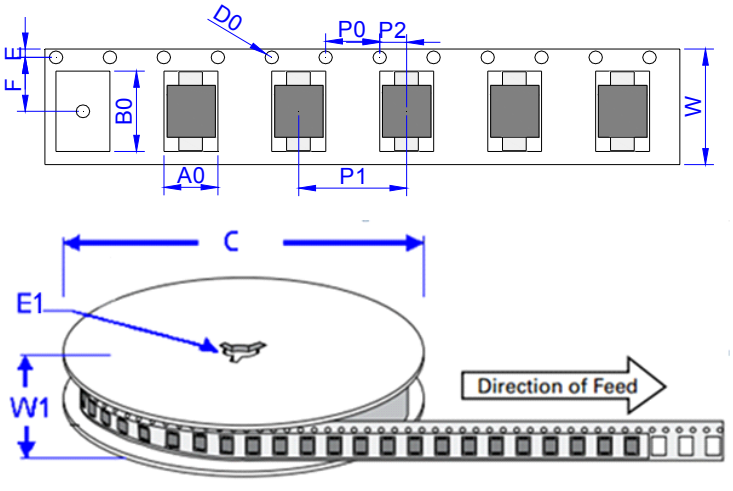
Dimensions



SOD-123FL

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.60	3.00	0.102	0.118
B	1.60	2.00	0.063	0.079
C	3.45	3.95	0.136	0.156
D	0.10	0.25	0.004	0.01
E	0.3	0.9	0.012	0.035
F	0.80	1.20	0.031	0.047
G	0.95	1.35	0.037	0.053
J	1.30		0.051	
K		1.70		0.067
L	1.30		0.051	

Tape and Reel Specifications



Ref.	Dimensions	
	Millimeters	Inches
A0	1.95 ± 0.3	0.077± 0.012
B0	3.95 ± 0.3	0.156 ± 0.012
C	178	7.0
D0	1.55 ± 0.1	0.061 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3 ± 0.3	0.524± 0.012
F	3.50 ± 0.2	0.138 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	4.00 ± 0.2	0.157 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	8.0± 0.2	0.315 ± 0.008
W1	11.5 ± 1.0	0.453 ± 0.039

Packaging

Part Number	Component Package	Quantity	Unit Weight (g/Pcs) typ.	Description
PXXXXDM	SOD-123FL	3000	0.0141	7 inch reel pack