Surface Mount Transient Voltage Suppressors

SOD-123FL

Features

- Excellent clamping capability
- Low leakage current
- Low capacitance
- High surge capability
- Glass passivated chip
- Epoxy resin package
- Built-in strain relief
- Will not fatigue
- RoHS Compliant
- Fast response time:
  typically less than 1.0ps from 0 Volts to V_{BR} min

Mechanical Characteristics

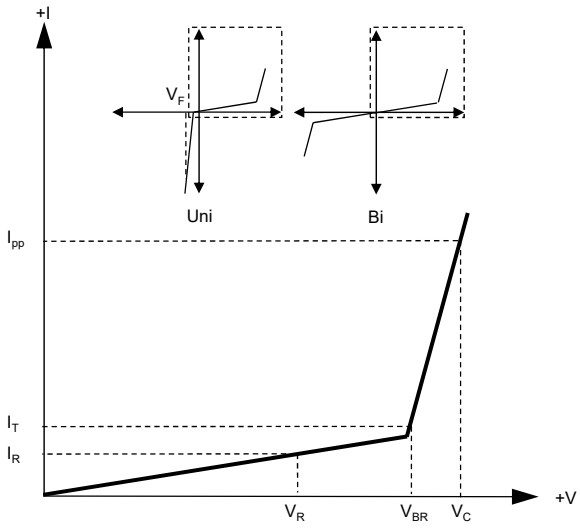
- Package: SOD-123FL plastic package.
- Lead Finish: Matte Tin
- Case Material: Epoxy Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020

Applications

- Cellular phones
- Portable devices
- Business machines
- Power supplies
- Consumer applications

■ Electrical Parameters

Parameter	Definition
C_J	Junction Capacitance - typical capacitance measured with 0V or V_R bias
I_{PP}	Peak Pulse Current - maximum rated peak impulse current
V_C	Clamping Voltage - Peak voltage measured across the suppressor at a specified Ippm (peak impulse current)
V_{BR}	Breakdown Voltage - Maximum voltage that flows though the TVS at a specified test current (I_T)
I_R	Leakage Current - maximum peak off-state current measured at V_R
V_R	Peak Off-state Voltage - maximum voltage that can be applied while maintaining off state



■ Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOD-123FL	Tape/Reel,7" reel	3000	EIA-481-1
	Tape/Reel,13" reel	10000	EIA-481-1

■ Absolute Maximum Ratings (T_A =25°C unless otherwise noted)

Parameter	Symbol	Value	Units	Remarks
Peak Pulse Power Dissipation	P_{PPM}	200	W	(Note1)(Note2)
Steady State Power Dissipation	P_D	1	W	(Note3)
Peak Forward Surge Current	I_{FSM}	20	A	(Note4)
Maximum Instantaneous Forward Voltage at 10A	V_{FM}	3.5	V	(Note5)
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	100	℃/W	
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	220	℃/W	
Operating Temperature Range	T_J	-55 to 150	℃	
Storage Temperature Range	T_{STG}	-55 to 150	℃	

Notes1: Non-repetitive current pulse , 10/1000us Waveform.

Notes2: Mounted on copper pad area of 3×3mm to each terminal.

Notes3: Infinite HeatSink at T_A=50°C

Notes4: Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 perminute maximum.

Notes5: For UnidirectionalOnly.

■ Electrical Characteristics (T_A=25°C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Marking Code		Reverse Stand off Voltage V_R (V)	Breakdown Voltage V_{BR} @ I_T (V)		Test Current I_T (mA)	Maximum Clamping Voltage V_C@ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximun Reverse Leakage I_R @ V_R (μA)
		Uni	Bi		Min	Max				
SMF5.0A	SMF5.0CA	AE	FE	5	6.4	7	10	9.2	21.7	400
SMF6.0A	SMF6.0CA	AG	FG	6	6.67	7.37	10	10.3	19.4	400
SMF6.5A	SMF6.5CA	AK	FK	6.5	7.22	7.98	10	11.2	17.9	250
SMF7.0A	SMF7.0CA	AM	FM	7	7.78	8.6	10	12	16.7	100
SMF7.5A	SMF7.5CA	AP	FP	7.5	8.33	9.21	1	12.9	15.5	50
SMF8.0A	SMF8.0CA	AR	FR	8	8.89	9.83	1	13.6	14.7	25
SMF8.5A	SMF8.5CA	AT	FT	8.5	9.44	10.4	1	14.4	13.9	10
SMF9.0A	SMF9.0CA	AV	FV	9	10	11.1	1	15.4	13	5
SMF10A	SMF10CA	AX	FX	10	11.1	12.3	1	17	11.8	2.5
SMF11A	SMF11CA	AZ	FZ	11	12.2	13.5	1	18.2	11	2.5
SMF12A	SMF12CA	BE	GE	12	13.3	14.7	1	19.9	10.1	2.5
SMF13A	SMF13CA	BG	GG	13	14.4	15.9	1	21.5	9.3	1
SMF14A	SMF14CA	BK	GK	14	15.6	17.2	1	23.2	8.6	1
SMF15A	SMF15CA	BM	GM	15	16.7	18.5	1	24.4	8.2	1
SMF16A	SMF16CA	BP	GP	16	17.8	19.7	1	26	7.7	1
SMF17A	SMF17CA	BR	GR	17	18.9	20.9	1	27.6	7.2	1
SMF18A	SMF18CA	BT	GT	18	20	22.1	1	29.2	6.8	1
SMF20A	SMF20CA	BV	GV	20	22.2	24.5	1	32.4	6.2	1
SMF22A	SMF22CA	BX	GX	22	24.4	26.9	1	35.5	5.6	1

■ Electrical Characteristics (T_A=25°C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Marking Code		Reverse Stand off Voltage V_R (V)	Breakdown Voltage V_{BR} @ I_T (V)		Test Current I_T (mA)	Maximum Clamping Voltage V_C@ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximun Reverse Leakage I_R @ V_R (μA)
		Uni	Bi		Min	Max				
SMF24A	SMF24CA	BZ	GZ	24	26.7	29.5	1	38.9	5.1	1
SMF26A	SMF26CA	CE	HE	26	28.9	31.9	1	42.1	4.8	1
SMF28A	SMF28CA	CG	HG	28	31.1	34.4	1	45.4	4.4	1
SMF30A	SMF30CA	CK	HK	30	33.3	36.8	1	48.4	4.1	1
SMF33A	SMF33CA	CM	HM	33	36.7	40.6	1	53.3	3.8	1
SMF36A	SMF36CA	CP	HP	36	40	44.2	1	58.1	3.4	1
SMF40A	SMF40CA	CR	HR	40	44.4	49.1	1	64.5	3.1	1
SMF43A	SMF43CA	CT	HT	43	47.8	52.8	1	69.4	2.9	1
SMF45A	SMF45CA	CV	HV	45	50	55.3	1	72.7	2.8	1
SMF48A	SMF48CA	CX	HX	48	53.3	58.9	1	77.4	2.6	1
SMF51A	SMF51CA	CZ	HZ	51	56.7	62.7	1	82.4	2.4	1
SMF54A	SMF54CA	DE	IE	54	60	66.3	1	87.1	2.3	1
SMF58A	SMF58CA	DG	IG	58	64.4	71.2	1	93.6	2.1	1
SMF60A	SMF60CA	DK	IK	60	66.7	73.7	1	96.8	1.8	1
SMF64A	SMF64CA	DM	IM	64	71.1	78.6	1	103	1.7	1
SMF70A	SMF70CA	DP	IP	70	77.8	86	1	113	1.5	1
SMF75A	SMF75CA	DR	IR	75	83.3	92.1	1	121	1.4	1
SMF78A	SMF78CA	DT	IT	78	86.7	95.8	1	126	1.4	1
SMF85A	SMF85CA	DV	IV	85	94.4	104	1	137	1.3	1
SMF90A	SMF90CA	DX	IX	90	100	111	1	146	1.2	1
SMF100A	SMF100CA	EZ	JZ	100	111	123	1	162	1.1	1
SMF110A	SMF110CA	EE	JE	110	122	135	1	177	1	1
SMF120A	SMF120CA	EG	JG	120	133	147	1	193	0.9	1
SMF130A	SMF130CA	EK	JK	130	144	159	1	209	0.8	1
SMF150A	SMF150CA	EM	JM	150	167	185	1	243	0.7	1
SMF160A	SMF160CA	EP	JP	160	178	197	1	259	0.7	1
SMF170A	SMF170CA	ER	JR	170	189	209	1	275	0.6	1

■ Rating And Characteristic Curves (T_A=25°C unless otherwise noted)

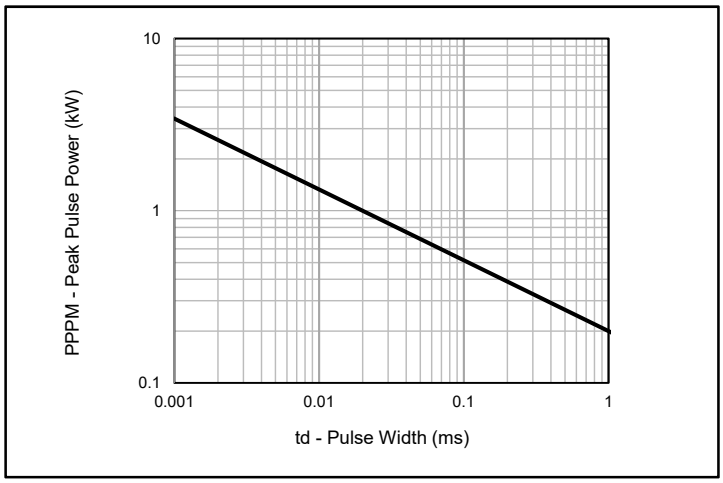


Fig.1 - Peak Pulse Power Rating

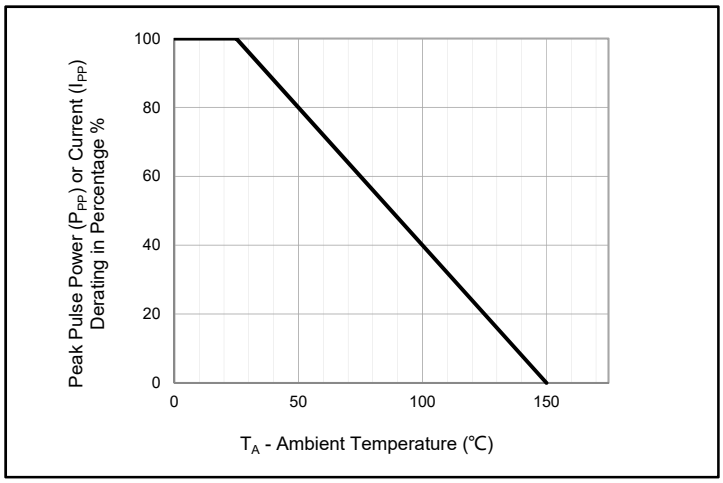


Fig.2 - Pulse Derating Curve

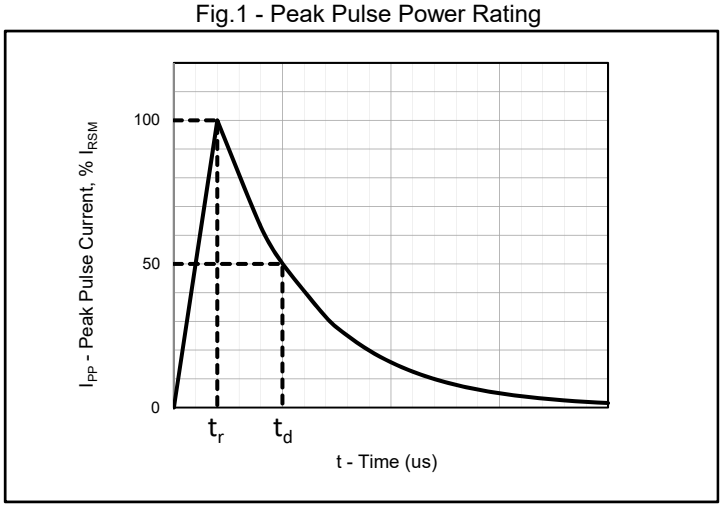


Fig.3 - Pulse Waveform

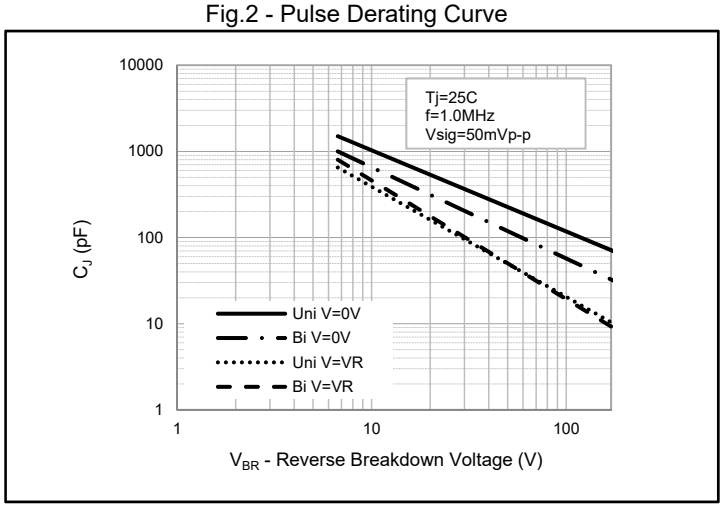


Fig.4 - Typical Junction Capacitance

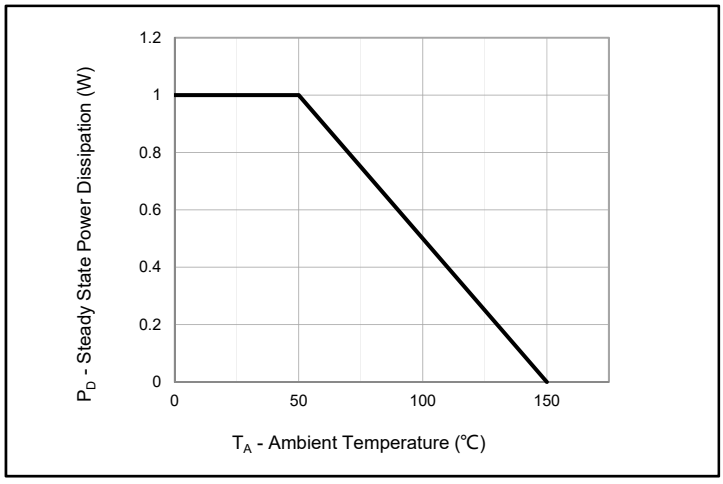


Fig.5 - Steady State Power Dissipation Derating Curve

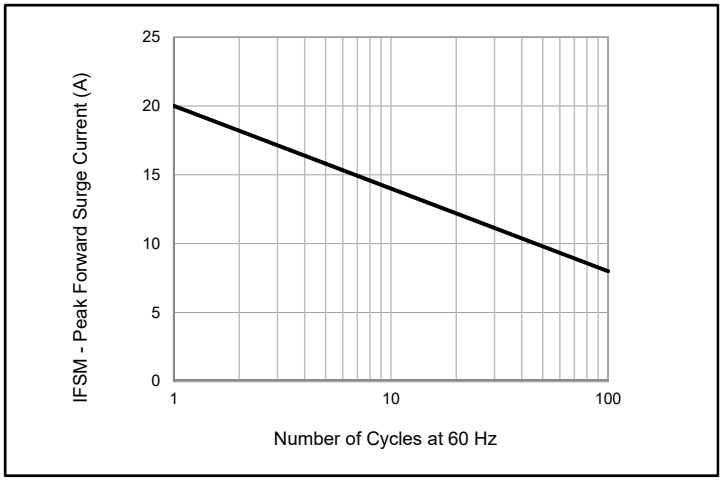
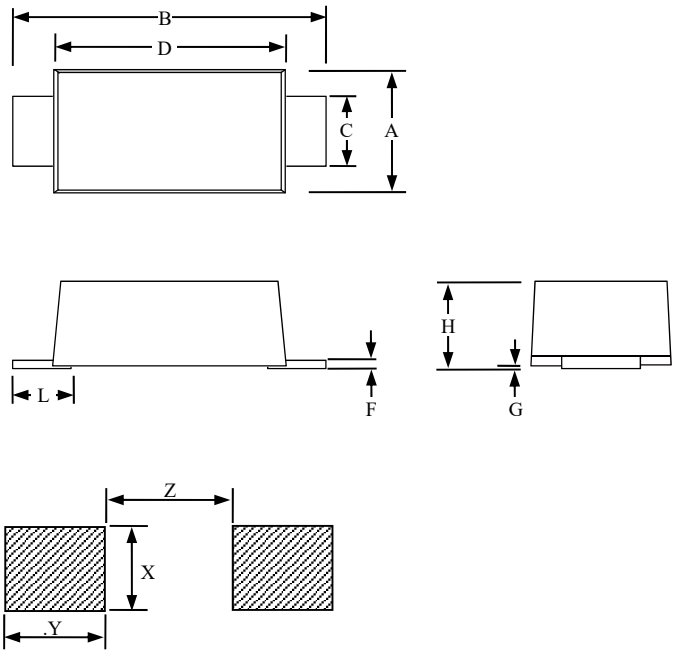


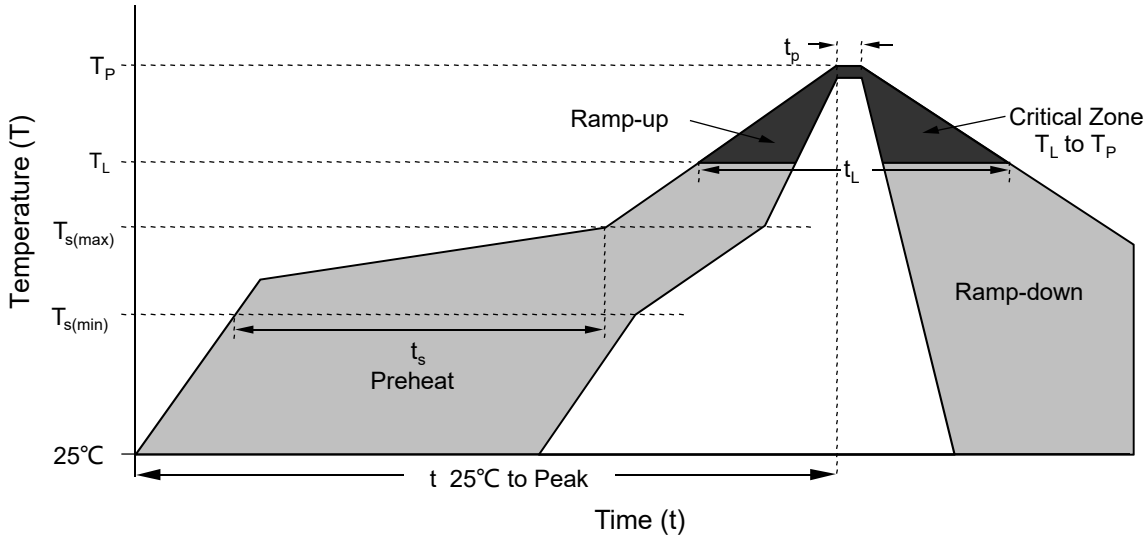
Fig.6 - Maximum Non-Repetitive Peak Forward Surge Current
Uni-Directional Only

■ Package Dimensions



SOD-123FL						
Dimension	Inches			Millimeters		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.059		0.079	1.5		2
B	0.134		0.154	3.4		3.9
C	0.028		0.047	0.7		1.2
D	0.098		0.114	2.5		2.9
F	0.002		0.01	0.05		0.26
G	-		0.004	-		0.1
H	0.037		0.053	0.95		1.35
L	0.014		0.035	0.35		0.9
X		0.055			1.4	
Y		0.051			1.3	
Z		0.063			1.6	

■ 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 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{S(max)}$ to TL - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (t_L)	60 – 150 secs
Peak Temperature (T_P)		$260^{+0/-5\ °C}$
Time within 5°C of actual peak Temperature (t_p)		20 – 40 secs
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (t)		8 minutes Max.
Do not exceed		260°C