Transient Voltage Suppressors (TVS) Data Sheet

Features

- Glass passivated junction
- Low zener impedance
- Excellent clamping capability
- 200W peak pulse power capability at 10/1000μs waveform,repetition rate (duty cycle):0.01%
- Compatible with industrial standard package SOD-123FL
- Fast response time
- Typical I_R less than 1μA above 13V.
- Plastic package has underwriters laboratory flammability 94V-0
- IEC61000-4-2 ESD 30KV(air)，30KV(contact)
- Meets MSL level 1, per J-STD-020.
- AEC-Q101 Qualified

Mechanical Data

- Case: JEDEC SOD-123FL Moulded plastic
- Terminal:solderplated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Mounting Position: Any

Applications

- I/O interface
- Vcc BUS
- Low frequency signal transmission line (RS232, RS485, etc.)

Maximum Ratings and Characteristics

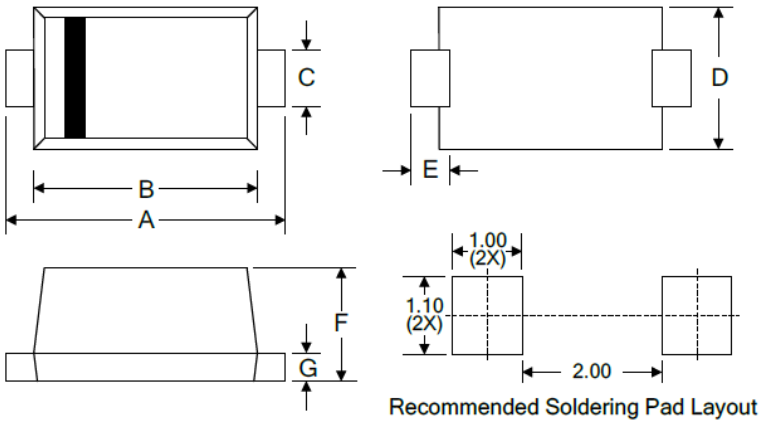
Ratings at 25℃ ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000μs waveform (Note1, Fig.1)	P_{PPM}	Minimum 200	Watts
Peak pulse current of at 10/1000μs waveform (Note 1, Fig.3)	I_{PPM}	See Table	Amps
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note2)	I_{FSM}	20	Amps
Operating junction and Storage Temperature Range.	T_J,T_{STG}	-55 to +150	℃
Typical thermal resistance junction to lead	$R_{\theta JL}$	100	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	220	℃/W

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above T_A=25℃ per Fig.2.

2. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

Dimensions (SOD123FL)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	3.5	3.90	0.138	0.154
B	2.6	3.00	0.102	0.118
C	0.75	1.10	0.030	0.043
D	1.60	2.00	0.063	0.079
E	0.80Typ.		0.031tTyp.	
F	0.90	1.40	0.035	0.055
G	0.18	0.22	0.007	0.009

Electrical Characteristics (T_A=25℃)

Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @I_T	Test Current	Maximum Clamping Voltage@ I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RWM}
Unidirectional	Bidirectional	UNI	BI	V_{RWM}(V)	V_{BR}(V)	I_T(mA)	V_C(V)	I_{PP}(A)	I_R(μA)
SMF5.0A-AR	SMF5.0CA-AR	AE	WE	5.0	6.4~7.0	10	9.2	21.8	800
SMF6.0A-AR	SMF6.0CA-AR	AG	WG	6.0	6.7~7.4	10	10.3	19.4	800
SMF6.5A-AR	SMF6.5CA-AR	AK	WK	6.5	7.2~8.0	10	11.2	17.9	500
SMF7.0A-AR	SMF7.0CA-AR	AM	WM	7.0	7.8~8.6	10	12.0	16.7	200
SMF7.5A-AR	SMF7.5CA-AR	AP	WP	7.5	8.3~9.2	1	12.9	15.5	100
SMF8.0A-AR	SMF8.0CA-AR	AR	WR	8.0	8.9~9.8	1	13.6	14.7	50
SMF8.5A-AR	SMF8.5CA-AR	AT	WT	8.5	9.4~10.4	1	14.4	13.9	10
SMF9.0A-AR	SMF9.0CA-AR	AV	WV	9.0	10.0~11.0	1	15.4	13.0	5
SMF10A-AR	SMF10CA-AR	AX	WX	10.0	11.1~12.3	1	17.0	11.8	5
SMF11A-AR	SMF11CA-AR	AZ	WZ	11.0	12.2~13.5	1	18.2	11.0	1
SMF12A-AR	SMF12CA-AR	BE	XE	12.0	13.3~14.7	1	19.9	10.1	1
SMF13A-AR	SMF13CA-AR	BG	XG	13.0	14.4~15.9	1	21.5	9.3	1
SMF14A-AR	SMF14CA-AR	BK	XK	14.0	15.6~17.2	1	23.2	8.6	1
SMF15A-AR	SMF15CA-AR	BM	XM	15.0	16.7~18.5	1	24.4	8.2	1
SMF16A-AR	SMF16CA-AR	BP	XP	16.0	17.8~19.7	1	26.0	7.7	1
SMF17A-AR	SMF17CA-AR	BR	XR	17.0	18.9~20.9	1	27.6	7.3	1
SMF18A-AR	SMF18CA-AR	BT	XT	18.0	20.0~22.1	1	29.2	6.9	1
SMF20A-AR	SMF20CA-AR	BV	XV	20.0	22.2~24.5	1	32.4	6.2	1
SMF22A-AR	SMF22CA-AR	BX	XX	22.0	24.4~26.9	1	35.5	5.7	1
SMF24A-AR	SMF24CA-AR	BZ	XZ	24.0	26.7~29.5	1	38.9	5.2	1
SMF26A-AR	SMF26CA-AR	CE	YE	26.0	28.9~31.9	1	42.1	4.8	1

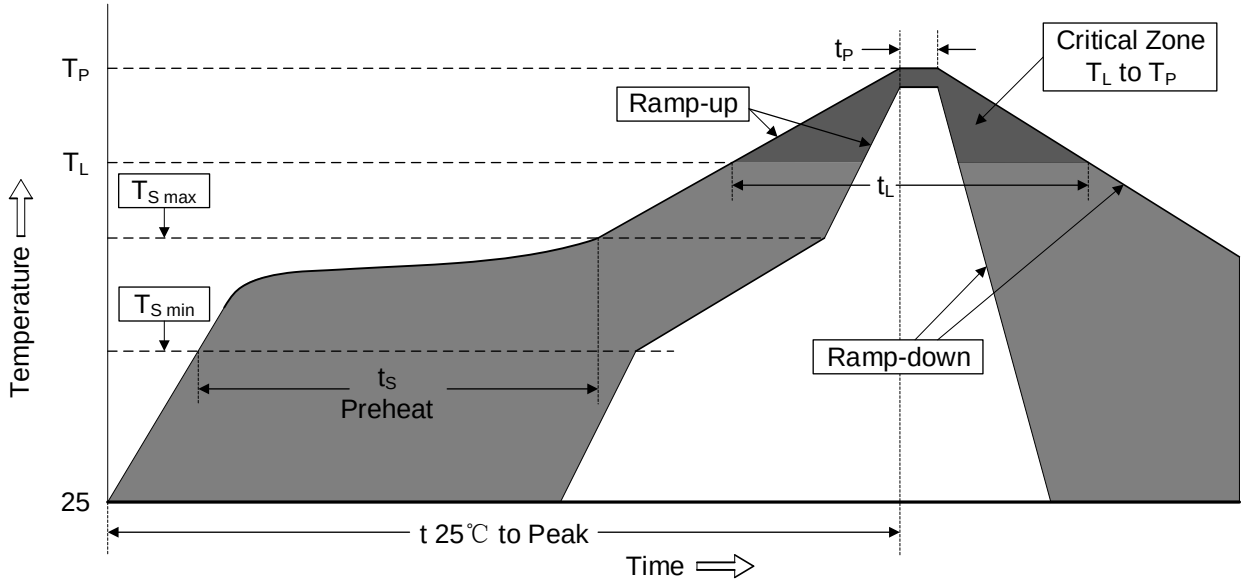
Electrical Characteristics (T_A=25℃)

Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @I_T	Test Current	Maximum Clamping Voltage@ I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RWM}
Unidirectional	Bidirectional	UNI	BI	V_{RWM}(V)	V_{BR}(V)	I_T(mA)	V_C(V)	I_{PP}(A)	I_R(μA)
SMF28A-AR	SMF28CA-AR	CG	YG	28.0	31.1~34.4	1	45.4	4.4	1
SMF30A-AR	SMF30CA-AR	CK	YK	30.0	33.3~36.8	1	48.4	4.2	1
SMF33A-AR	SMF33CA-AR	CM	YM	33.0	36.7~40.6	1	53.3	3.8	1
SMF36A-AR	SMF36CA-AR	CP	YP	36.0	40.0~44.2	1	58.1	3.5	1
SMF40A-AR	SMF40CA-AR	CR	YR	40.0	44.4~49.1	1	64.5	3.1	1
SMF43A-AR	SMF43CA-AR	CT	YT	43.0	47.8~52.8	1	69.4	2.9	1
SMF45A-AR	SMF45CA-AR	CV	YV	45.0	50.0~55.3	1	72.7	2.8	1
SMF48A-AR	SMF48CA-AR	CX	YX	48.0	53.3~58.9	1	77.4	2.6	1
SMF51A-AR	SMF51CA-AR	CZ	YZ	51.0	56.7~62.7	1	82.4	2.5	1
SMF54A-AR	SMF54CA-AR	RE	ZE	54.0	60.0~66.3	1	87.1	2.3	1
SMF58A-AR	SMF58CA-AR	RG	ZG	58.0	64.4~71.2	1	93.6	2.3	1
SMF60A-AR	SMF60CA-AR	RK	ZK	60.0	66.7~73.7	1	96.8	2.1	1
SMF64A-AR	SMF64CA-AR	RM	ZM	64.0	71.1~78.6	1	103.0	2.0	1
SMF70A-AR	SMF70CA-AR	RP	ZP	70.0	77.8~86.0	1	113.0	1.8	1
SMF75A-AR	SMF75CA-AR	RR	ZR	75.0	83.3~92.1	1	121.0	1.7	1
SMF78A-AR	SMF78CA-AR	RT	ZT	78.0	86.7~95.8	1	126.0	1.6	1
SMF85A-AR	SMF85CA-AR	RV	ZV	85.0	94.4~104	1	137.0	1.5	1
SMF90A-AR	SMF90CA-AR	RX	ZX	90.0	100~111	1	146.0	1.4	1
SMF100A-AR	SMF100CA-AR	RZ	ZZ	100.0	111~123	1	162.0	1.3	1
SMF110A-AR	SMF110CA-AR	SE	VE	110.0	122~135	1	177.0	1.2	1
SMF120A-AR	SMF120CA-AR	SG	VG	120.0	133~147	1	193.0	1.1	1
SMF130A-AR	SMF130CA-AR	SK	VK	130.0	144~159	1	209.0	1.0	1
SMF150A-AR	SMF150CA-AR	SM	VM	150.0	167~185	1	243.0	0.8	1
SMF160A-AR	SMF160CA-AR	SP	VP	160.0	178~197	1	259.0	0.8	1
SMF170A-AR	SMF170CA-AR	SR	VR	170.0	189~209	1	275.0	0.8	1
SMF180A-AR	SMF180CA-AR	ST	VT	180.0	201~222	1	292.0	0.7	1
SMF200A-AR	SMF200CA-AR	SV	VV	200.0	224~247	1	324.0	0.6	1

Notes: For bidirectional type having VRWM of 10V and less, the IR limit is double.

Recommended Soldering Conditions

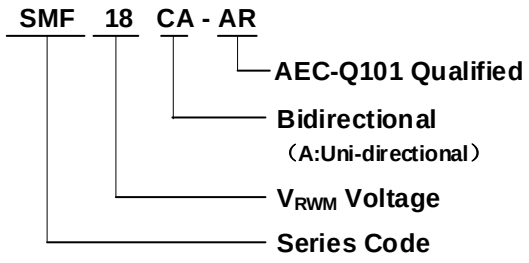
Reflow Soldering

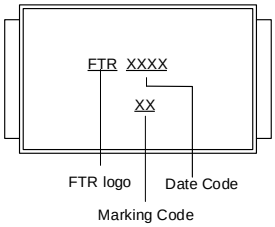


Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate ($T_L$to T_P)	3℃/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max)(t_S)	 150℃ 200℃ 60-180 seconds
$T_{S\ max}$to T_L -Ramp-up Rate	 3℃/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	 217℃ 60-150 seconds
Peak Temperature (T_P)	260℃
Time within 5℃ of actual PeakTemperature (t_P)	20-40 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8 minutes max.

Partnumbercode





Ratings and Characteristic Curves (T_A=25℃ unless otherwise noted)

Figure 1. Peak Pulse Power Rating Curve

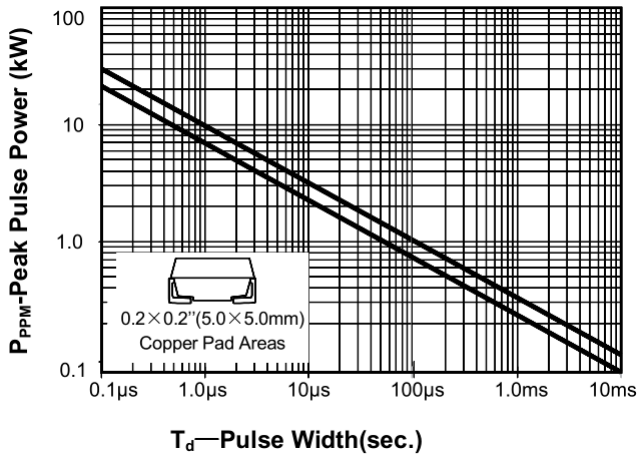


Figure 2. Pulse Derating Curve

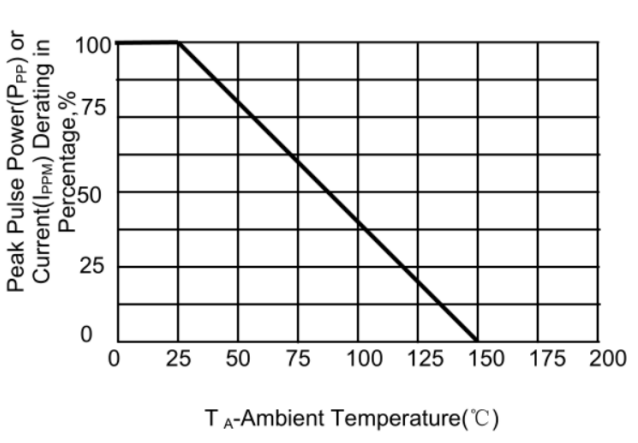


Figure 3. Pulse Waveform

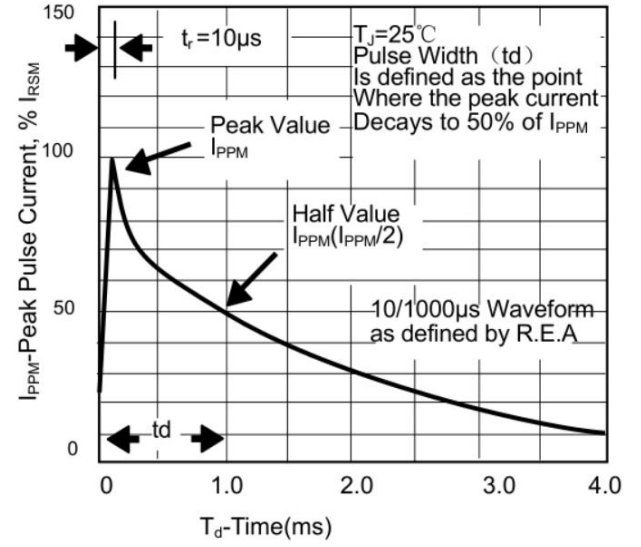
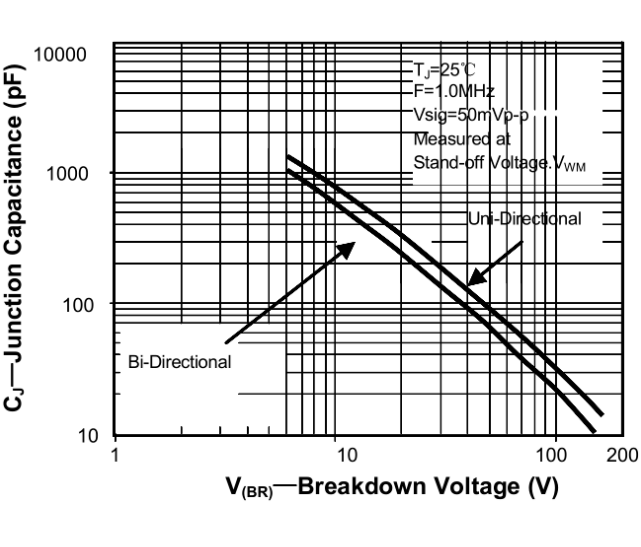
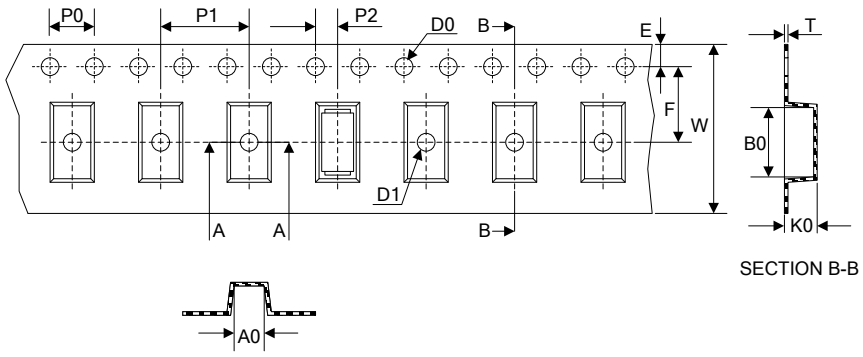


Figure 4. Typical Junction Capacitance



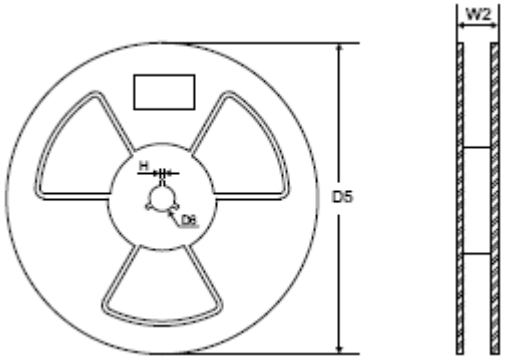
Packaging

Tape



Symbol	Dimension (mm)
W	8.00±0.30
P0	4.00±0.10
P1	4.00±0.10
P2	2.00±0.10
D0	Φ1.50±0.10
D1	Φ1.00±0.05
E	1.75±0.10
F	3.50±0.10
A	2.00±0.10
B	3.95±0.10
K	1.40±0.12
T	0.23±0.10

Reel



D5	Φ178.0±2.0
D6	Φ13
W2	9.5

Quantity: 3000pcs