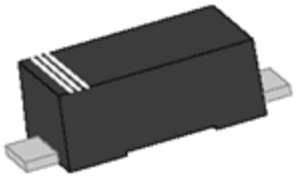
SMFxxALH Series 400W Transient Voltage Suppressor

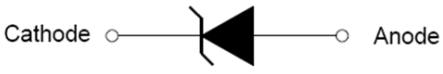
Rev.1.3

DESCRIPTION:

TVS diodes can be used in a wide range of applications which like consumer electronic products, automotive industries, munitions, telecommunications, aerospace industries, and intelligent control systems.



SOD-123FL



Uni-directional

Symbol

FEATURES:

- ✧ Low profile package.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ 400W peak pulse power capability at 10/1000μs waveform.
- ✧ Typical I_R less than 1μA above 10V.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- ✧ High temperature reflow soldering: 260℃/40s at terminals.
- ✧ Plastic package has underwriters laboratory flammability 94V-0.
- ✧ Meets MSL level 1, per J-STD-020, LF maximum peak of 260℃.
- ✧ Terminal: solder plated, solderable per J-STD-002.
- ✧ For surface mounted applications in order to optimize board space.
- ✧ High reliability application and automotive grade (AEC-Q101 qualified).

ABSOLUTE MAXIMUM RATINGS (T_A=25℃, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage and operating junction temperature range	T_{STG}/ T_J	-55 to +150	℃
Peak pulse power dissipation on 10/1000μs waveform	P_{PP}	400	W
Maximum instantaneous forward voltage at 20A for unidirectional	V_F	5.0	V
Typical thermal resistance junction to lead	$R_{\theta JL}$	100	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	220	℃/W

MARKING

AXH : Device Marking Code

ELECTRICAL CHARACTERISTICS (T_A=25℃)

Part Number	Marking	V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-Polar	Uni	V	μA	min(V)	max(V)	mA	max(V)	A
SMF10ALH	AXH	10.0	2	11.10	12.30	1	17.0	23.5
SMF11ALH	AZH	11.0	1	12.20	13.50	1	18.2	22.0
SMF12ALH	BEH	12.0	1	13.30	14.70	1	19.9	20.1
SMF13ALH	BGH	13.0	1	14.40	15.90	1	21.5	18.6
SMF14ALH	BKH	14.0	1	15.60	17.20	1	23.2	17.2
SMF15ALH	BMH	15.0	1	16.70	18.50	1	24.4	16.4
SMF17ALH	BRH	17.0	1	18.90	20.90	1	27.6	14.5
SMF18ALH	BTH	18.0	1	20.00	22.10	1	29.2	13.7
SMF20ALH	BVH	20.0	1	22.20	24.50	1	32.4	12.3
SMF22ALH	BXH	22.0	1	24.40	26.90	1	35.5	11.3
SMF24ALH	BZH	24.0	1	26.70	29.50	1	38.9	10.3
SMF26ALH	CEH	26.0	1	28.90	31.90	1	42.1	9.5
SMF28ALH	CGH	28.0	1	31.10	34.40	1	45.4	8.8
SMF30ALH	CKH	30.0	1	33.30	36.80	1	48.4	8.3
SMF33ALH	CMH	33.0	1	36.70	40.60	1	53.3	7.5
SMF36ALH	CPH	36.0	1	40.00	44.20	1	58.1	6.9
SMF40ALH	CRH	40.0	1	44.40	49.10	1	64.5	6.2
SMF43ALH	CTH	43.0	1	47.80	52.80	1	69.4	5.8
SMF45ALH	CVH	45.0	1	50.00	55.30	1	72.7	5.5
SMF48ALH	CXH	48.0	1	53.30	58.90	1	77.4	5.2
SMF51ALH	CZH	51.0	1	56.70	62.70	1	82.4	4.9
SMF58ALH	DEH	58.0	1	64.40	71.20	1	93.6	4.3
SMF60ALH	DGH	60.0	1	66.70	73.70	1	96.8	4.1
SMF64ALH	DMH	64.0	1	71.10	78.60	1	103.0	3.9

ELECTRICAL CHARACTERISTICS(T_A=25℃,continued)

Part Number	Marking	V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-Polar	Uni	V	μA	min(V)	max(V)	mA	max(V)	A
SMF70ALH	DPH	70.0	1	77.80	86.00	1	113.0	3.5
SMF75ALH	DRH	75.0	1	83.30	92.10	1	121.0	3.3
SMF78ALH	DTH	78.0	1	86.70	95.80	1	126.0	3.2
SMF85ALH	DVH	85.0	1	94.40	104.00	1	137.0	2.9

① Surge waveform:10/1000μs

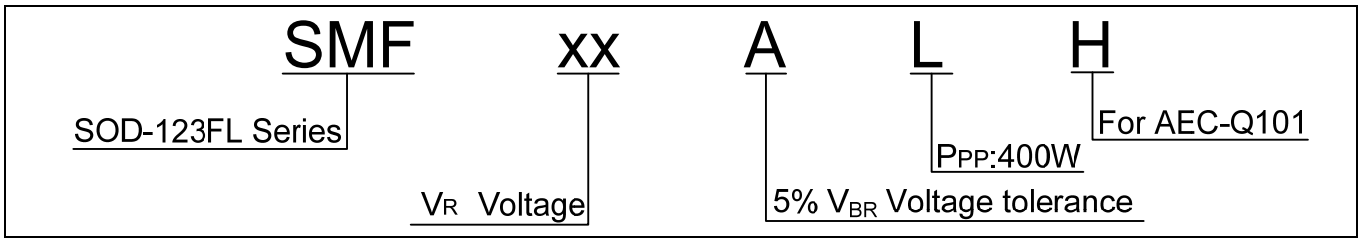
V_R: Stand-off voltage -- maximum voltage that can be applied

V_{BR}: Breakdown voltage

V_C: Clamping voltage -- peak voltage measured across the suppressor at a specified I_{PP}

I_R: Reverse leakage current

ORDERING INFORMATION



RATINGS AND V-I CHARACTERISTICS CURVES (T_A=25℃, unless otherwise noted)

FIG.1:V- I curve characteristics (Uni-directional)

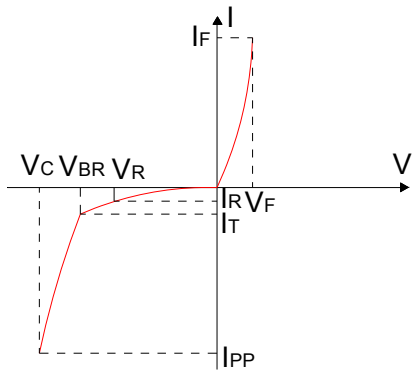


FIG.2: Pulse waveform

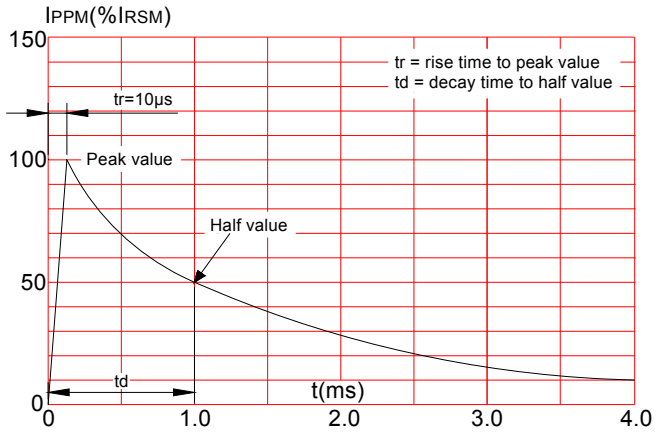
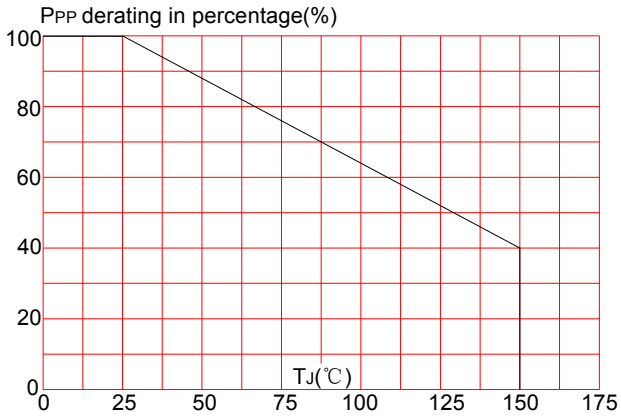
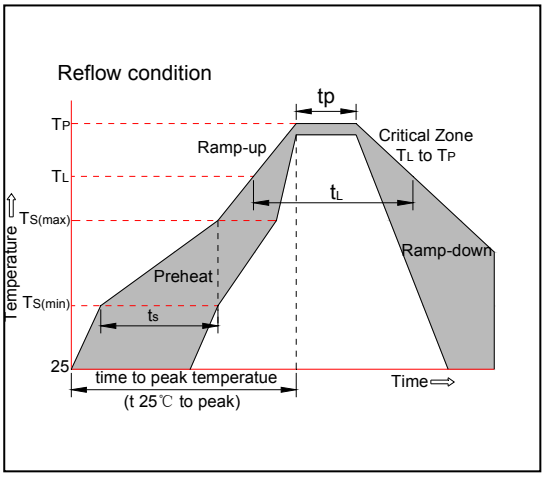


FIG.3: Pulse derating curve

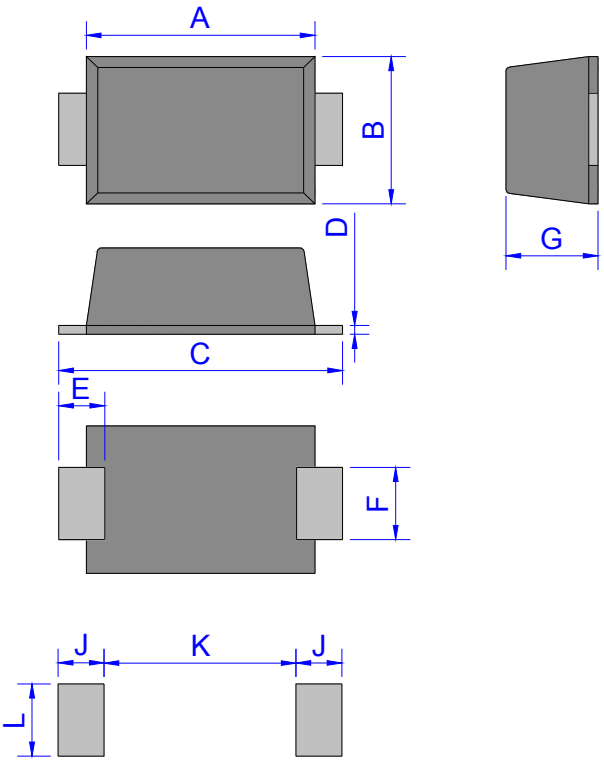


SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L)to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquidus)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		20-40secs.
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃



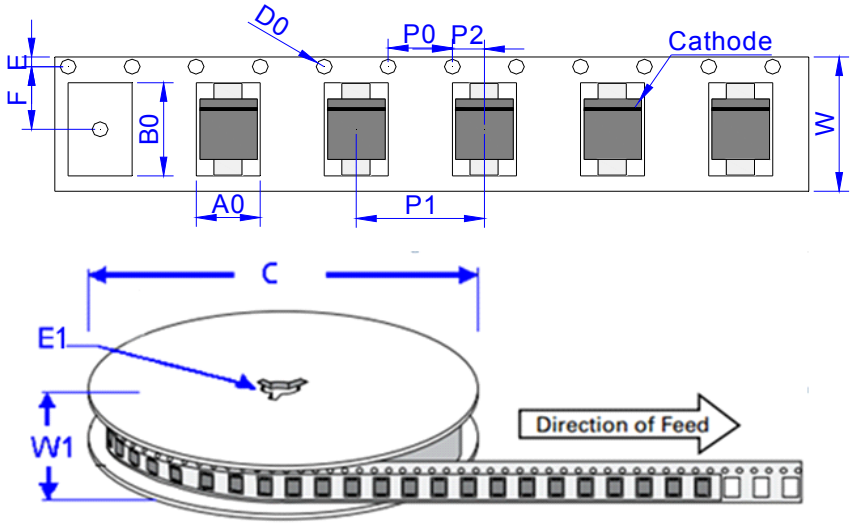
PACKAGE MECHANICAL DATA



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 SPECIFICATION-SOD-123FL



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

PART No.	UNIT WEIGHT (g/PCS) typ.	PACKAGE	REEL (PCS)	DESCRIPTION
SMFxxALH	0.0136	SOD-123FL	3000	7 inch reel pack

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