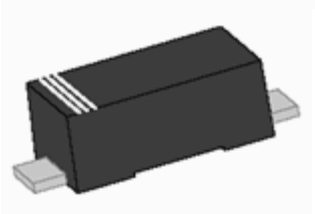
SMFxx(C)AL-AU Series 400W Transient Voltage Suppressor

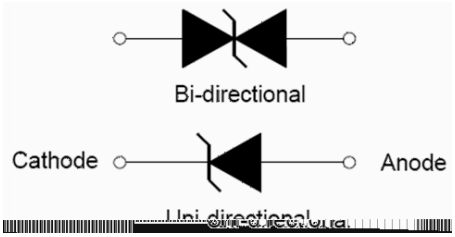
Rev.1.2

RoHS

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

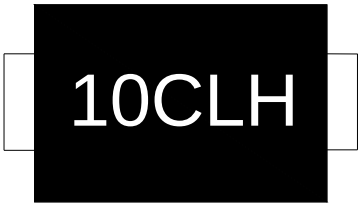


Symbol

- 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.
- IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact).
- For surface mounted applications in order to optimize board space.
- High reliability application and automotive grade (AEC-Q101 qualified).

(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 at 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



10CLH : Device Marking Code

(T_A=25)

Part Number		Marking		V_R	I_R @ V_R	V_{BR} @ I_T		I_T	V_C @ I_{PP}	I_{PP}
Uni-Polar	Bi-Polar	Uni	Bi	V	Max (μA)	Min (V)	Max (V)	mA	Max (V)	A
SMF10AL-AU	SMF10CAL-AU	AXH	10CLH	10.0	2	11.10	12.30	1	17.0	23.5
SMF11AL-AU	SMF11CAL-AU	AZH	11CLH	11.0	1	12.20	13.50	1	18.2	22.0
SMF12AL-AU	SMF12CAL-AU	BEH	12CLH	12.0	1	13.30	14.70	1	19.9	20.1
SMF13AL-AU	SMF13CAL-AU	BGH	13CLH	13.0	1	14.40	15.90	1	21.5	18.6
SMF14AL-AU	SMF14CAL-AU	BKH	14CLH	14.0	1	15.60	17.20	1	23.2	17.2
SMF15AL-AU	SMF15CAL-AU	BMH	15CLH	15.0	1	16.70	18.50	1	24.4	16.4
SMF16AL-AU	SMF16CAL-AU	BPH	16CLH	16.0	1	17.80	19.70	1	26.0	15.4
SMF17AL-AU	SMF17CAL-AU	BRH	17CLH	17.0	1	18.90	20.90	1	27.6	14.5
SMF18AL-AU	SMF18CAL-AU	BTH	18CLH	18.0	1	20.00	22.10	1	29.2	13.7
SMF20AL-AU	SMF20CAL-AU	BVH	20CLH	20.0	1	22.20	24.50	1	32.4	12.3
SMF22AL-AU	SMF22CAL-AU	BXH	22CLH	22.0	1	24.40	26.90	1	35.5	11.3
SMF24AL-AU	SMF24CAL-AU	BZH	24CLH	24.0	1	26.70	29.50	1	38.9	10.3
SMF26AL-AU	SMF26CAL-AU	CEH	26CLH	26.0	1	28.90	31.90	1	42.1	9.5
SMF28AL-AU	SMF28CAL-AU	CGH	28CLH	28.0	1	31.10	34.40	1	45.4	8.8
SMF30AL-AU	SMF30CAL-AU	CKH	30CLH	30.0	1	33.30	36.80	1	48.4	8.3
SMF33AL-AU	SMF33CAL-AU	CMH	33CLH	33.0	1	36.70	40.60	1	53.3	7.5
SMF36AL-AU	SMF36CAL-AU	CPH	36CLH	36.0	1	40.00	44.20	1	58.1	6.9
SMF40AL-AU	SMF40CAL-AU	CRH	40CLH	40.0	1	44.40	49.10	1	64.5	6.2
SMF43AL-AU	SMF43CAL-AU	CTH	43CLH	43.0	1	47.80	52.80	1	69.4	5.8
SMF45AL-AU	SMF45CAL-AU	CVH	45CLH	45.0	1	50.00	55.30	1	72.7	5.5
SMF48AL-AU	SMF48CAL-AU	CXH	48CLH	48.0	1	53.30	58.90	1	77.4	5.2
SMF51AL-AU	-	CZH	-	51.0	1	56.70	62.70	1	82.4	4.9
SMF54AL-AU	-	DCH	-	54.0	1	60.00	66.30	1	87.1	4.6

(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}
Uni-Polar	Bi-Polar	Uni	Bi	V	Max (μA)	Min (V)	Max (V)	mA	Max (V)	A
SMF58AL-AU	-	DEH	-	58.0	1	64.40	71.20	1	93.6	4.3
SMF60AL-AU	-	DGH	-	60.0	1	66.70	73.70	1	96.8	4.1
SMF64AL-AU	-	DMH	-	64.0	1	71.10	78.60	1	103.0	3.9
SMF70AL-AU	-	DPH	-	70.0	1	77.80	86.00	1	113.0	3.5
SMF75AL-AU	-	DRH	-	75.0	1	83.30	92.10	1	121.0	3.3
SMF78AL-AU	-	DTH	-	78.0	1	86.70	95.80	1	126.0	3.2
SMF85AL-AU	-	DVH	-	85.0	1	94.40	104.00	1	137.0	2.9

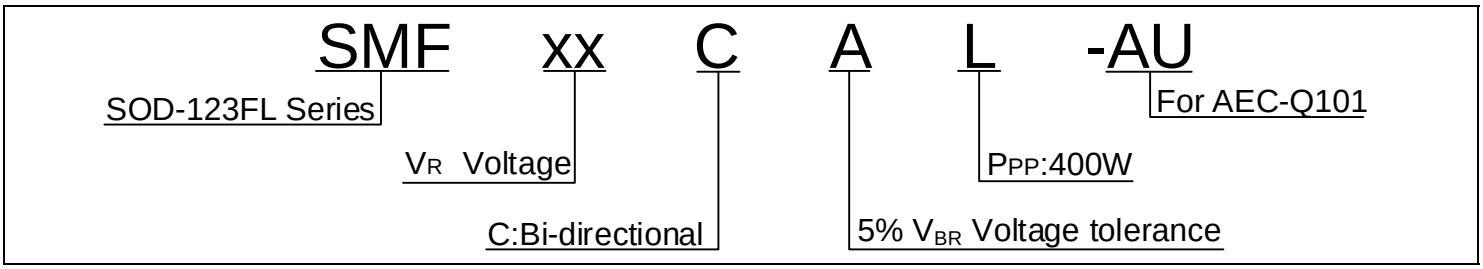
Surge waveform: 10/1000μs

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



(T_A=25 , unless otherwise noted)

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

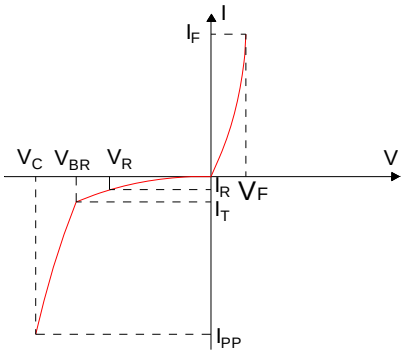


FIG.2:V- I curve characteristics (Bi-directional)

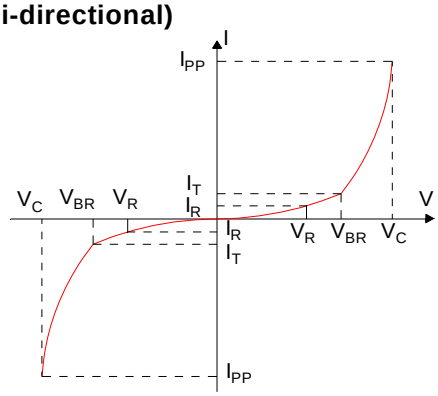


FIG.3: Pulse waveform

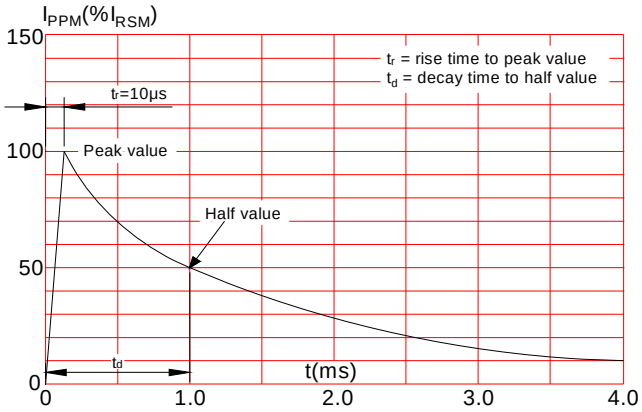


FIG.4: Pulse derating curve

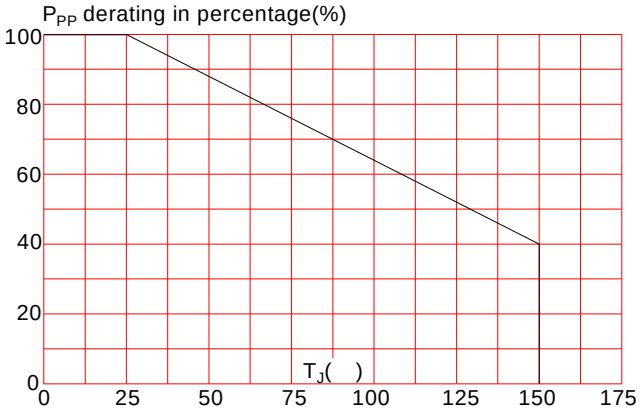
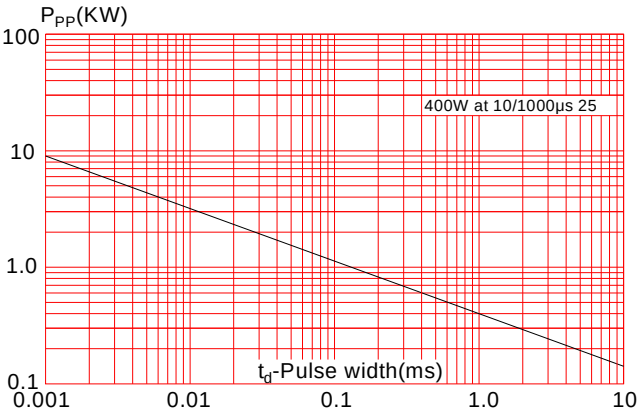
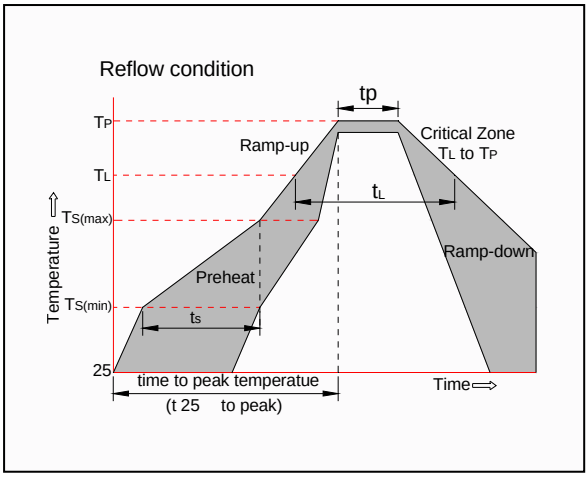
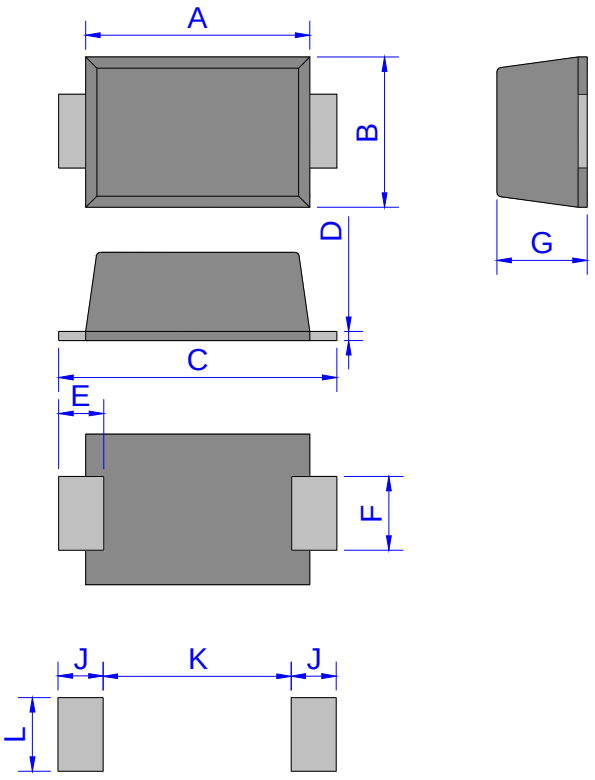


FIG.5:Peak pulse power dissipation vs. pulse width



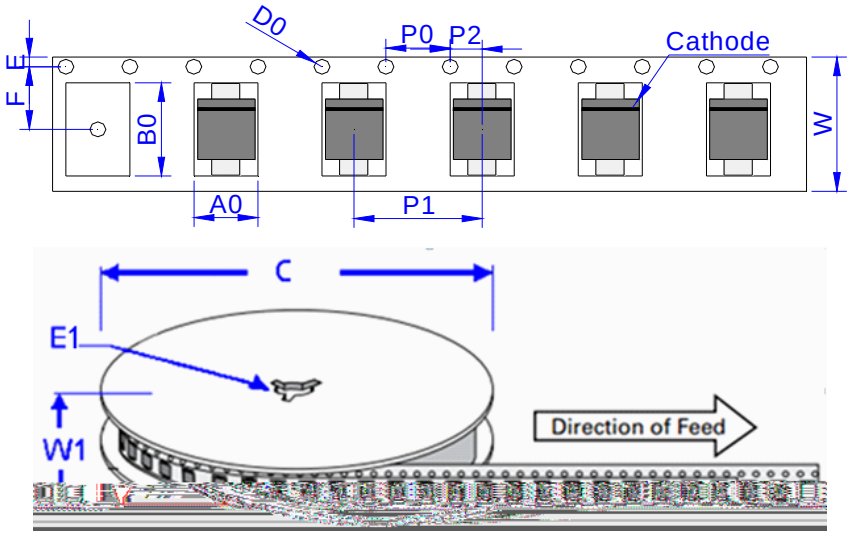
Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150
	-Temperature Max($T_{s(max)}$)	+200
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L)to peak)		3 /sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3 /sec. Max
Reflow	-Temperature(T_L)(Liquidus)	+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





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	



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	REEL (PCS)	PER CARTON (PCS)	DESCRIPTION
SMFxxA/CAL-AU	0.0144	3000	150,000	7 inch reel pack