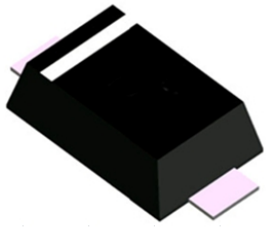
Transient Voltage Suppressors (TVS) Data Sheet

Features



For surface mounted applications in order to optimize board space
Low profile package
Glass passivated junction
Low inductance
Excellent clamping capability
600W peak pulse power capability at 10/1000μs waveform,
repetition rate (duty cycle): 0.01%
Fast response time
Typical I_R less than 1μA above 10V
High Temperature soldering: 260℃/10 seconds at terminals
Plastic package has underwriters laboratory flammability 94V-0
Meets MSL level 1, per J-STD-020
AEC-Q101 qualified (Automotive grade with suffix "Q".)
Exsemi technology

Mechanical Data

Case: JEDEC SMAF. Molded plastic over glass passivated junction
Terminal: Solder plated, solderable per MIL-STD-750, Method 2026
Polarity: Color band denotes cathode except bi-directional models

Applications

AC/DC power supply
I/O interface
Low frequency signal transmission line

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, Note2, Fig.1)	P_{PPM}	Minimum 600	Watts
Peak pulse current of at 10/1000μs waveform (Note 1, Fig.3)	I_{PPM}	See Table	Amps
Steady state power dissipation at T_A=50℃ (Fig.5)	P_D	3.3	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note3, Fig.6)	I_{FSM}	40	Amps
Operating junction and Storage Temperature Range.	T_J,T_{STG}	-65 to +150	℃
Typical thermal resistance junction to lead	$R_{\theta JL}$	30	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	120	℃/W

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above T_A=25℃ per Fig.2.
2. Mounted on 5.0mm×5.0mm (0.03mm thick) copper pads to each terminal.
3. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

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)
SMA6F5.0A	SMA6F5.0CA	FAE	FWE	5.0	6.40~7.00	10	9.2	65.3	800
SMA6F6.0A	SMA6F6.0CA	FAG	FWG	6.0	6.67~7.37	10	10.3	58.3	800
SMA6F6.5A	SMA6F6.5CA	FAK	FWK	6.5	7.22~7.98	10	11.2	53.6	500
SMA6F7.0A	SMA6F7.0CA	FAM	FWM	7.0	7.78~8.60	10	12.0	50	200
SMA6F7.5A	SMA6F7.5CA	FAP	FWP	7.5	8.33~9.21	1	12.9	46.6	100
SMA6F8.0A	SMA6F8.0CA	FAR	FWR	8.0	8.89~9.83	1	13.6	44.2	50
SMA6F8.5A	SMA6F8.5CA	FAT	FWT	8.5	9.44~10.40	1	14.4	41.7	20
SMA6F9.0A	SMA6F9.0CA	FAV	FWV	9.0	10.00~11.10	1	15.4	39	10
SMA6F10A	SMA6F10CA	FAX	FWX	10.0	11.10~12.30	1	17.0	35.3	5
SMA6F11A	SMA6F11CA	FAZ	FWZ	11.0	12.20~13.50	1	18.2	33	1
SMA6F12A	SMA6F12CA	FBE	FXE	12.0	13.30~14.70	1	19.9	30.2	1
SMA6F13A	SMA6F13CA	FBG	FXG	13.0	14.40~15.90	1	21.5	28	1
SMA6F14A	SMA6F14CA	FBK	FXK	14.0	15.60~17.20	1	23.2	25.9	1
SMA6F15A	SMA6F15CA	FBM	FXM	15.0	16.70~18.50	1	24.4	24.6	1
SMA6F16A	SMA6F16CA	FBP	FXP	16.0	17.80~19.70	1	26.0	23.1	1
SMA6F17A	SMA6F17CA	FBR	FXR	17.0	18.90~20.90	1	27.6	21.8	1
SMA6F18A	SMA6F18CA	FBT	FXT	18.0	20.00~22.10	1	29.2	20.6	1
SMA6F20A	SMA6F20CA	FBV	FXV	20.0	22.20~24.50	1	32.4	18.6	1
SMA6F22A	SMA6F22CA	FBX	FXX	22.0	24.40~26.90	1	35.5	17.0	1
SMA6F24A	SMA6F24CA	FBZ	FXZ	24.0	26.70~29.50	1	38.9	15.5	1
SMA6F26A	SMA6F26CA	FCE	FYE	26.0	28.90~31.90	1	42.1	14.3	1
SMA6F28A	SMA6F28CA	FCG	FYG	28.0	31.10~34.40	1	45.4	13.3	1
SMA6F30A	SMA6F30CA	FCK	FYK	30.0	33.30~36.80	1	48.4	12.4	1
SMA6F33A	SMA6F33CA	FCM	FYM	33.0	36.70~40.60	1	53.3	11.3	1
SMA6F36A	SMA6F36CA	FCP	FYP	36.0	40.00~44.20	1	58.1	10.4	1
SMA6F40A	SMA6F40CA	FCR	FYR	40.0	44.40~49.10	1	64.5	9.3	1
SMA6F43A	SMA6F43CA	FCT	FYT	43.0	47.80~52.80	1	69.4	8.7	1
SMA6F45A	SMA6F45CA	FCV	FYV	45.0	50.00~55.30	1	72.7	8.3	1
SMA6F48A	SMA6F48CA	FCX	FYX	48.0	53.30~58.90	1	77.4	7.8	1
SMA6F51A	SMA6F51CA	FCZ	FYZ	51.0	56.70~62.70	1	82.4	7.3	1
SMA6F54A	SMA6F54CA	FRE	FZE	54.0	60.00~66.30	1	87.1	6.9	1
SMA6F58A	SMA6F58CA	FRG	FZG	58.0	64.40~71.20	1	93.6	6.5	1
SMA6F60A	SMA6F60CA	FRK	FZK	60.0	66.70~73.70	1	96.8	6.2	1
SMA6F64A	SMA6F64CA	FRM	FZM	64.0	71.10~78.60	1	103.0	5.9	1
SMA6F70A	SMA6F70CA	FRP	FZP	70.0	77.80~86.00	1	113.0	5.3	1
SMA6F75A	SMA6F75CA	FRR	FZR	75.0	83.30~92.10	1	121.0	5	1
SMA6F78A	SMA6F78CA	FRT	FZT	78.0	86.70~95.80	1	126.0	4.8	1
SMA6F85A	SMA6F85CA	FRV	FZV	85.0	94.40~104.00	1	137.0	4.4	1
SMA6F90A	SMA6F90CA	FRX	FZX	90.0	100.00~111.001		146.0	4.2	1
SMA6F100A	SMA6F100CA	FRZ	FZZ	100.0	111.00~123.00	1	162.0	3.8	1

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

Figure 1. Peak Pulse Power Rating Curve

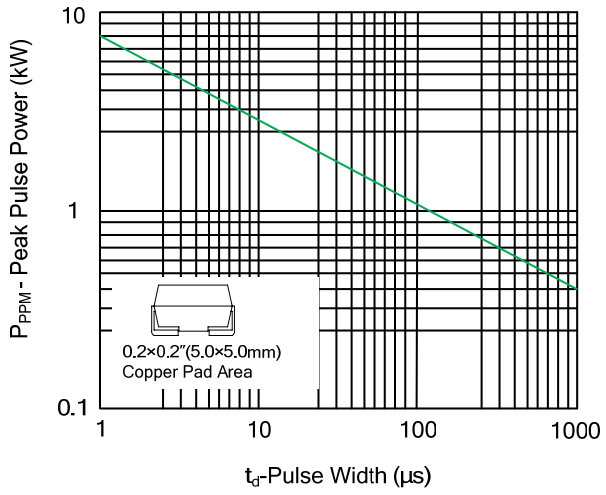


Figure 2. Pulse Derating Curve

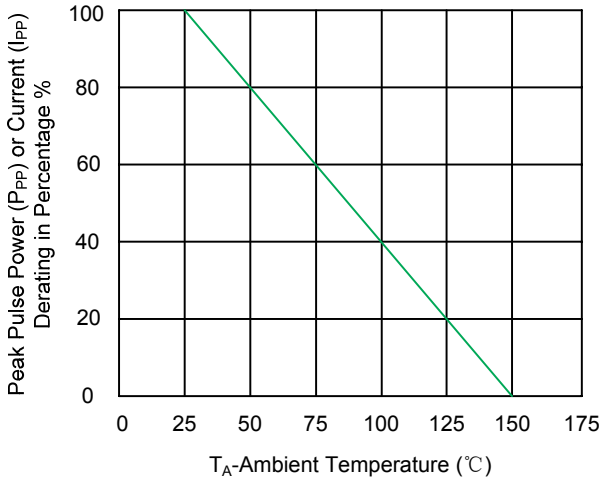


Figure 3. Pulse Waveform

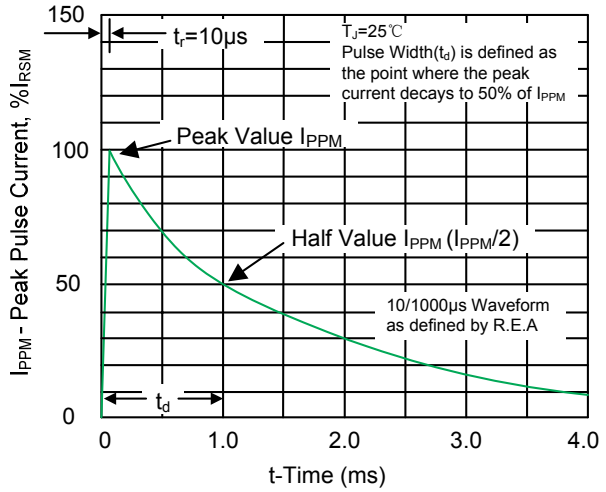


Figure 4. Typical Junction Capacitance

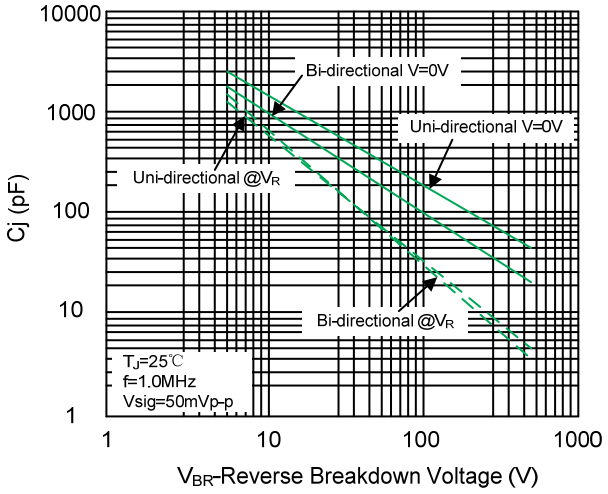


Figure 5. Steady State Power Dissipation Derating Curve

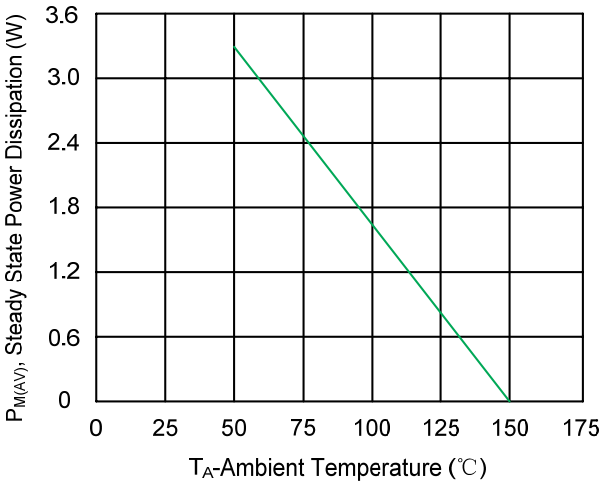
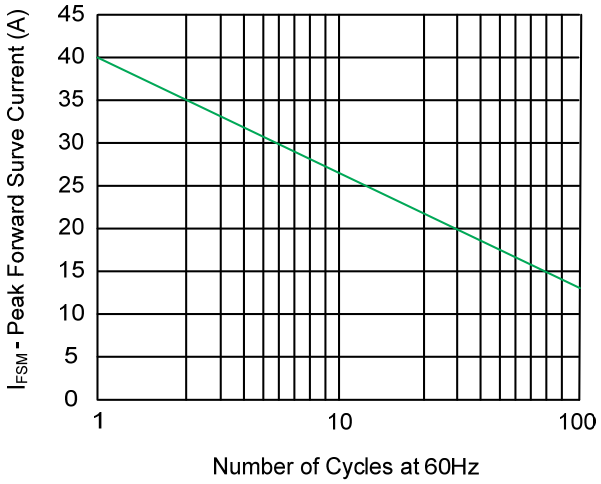


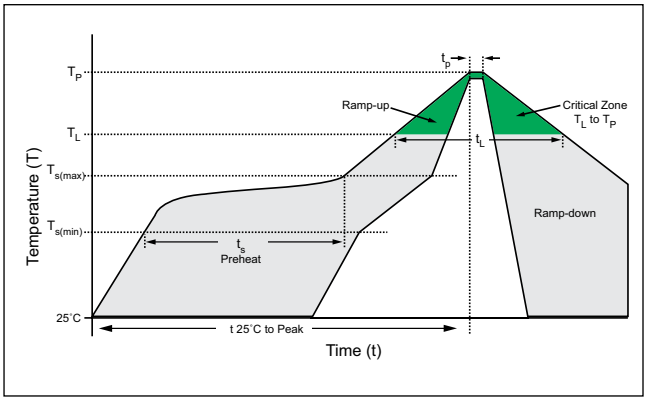
Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



Recommended Soldering Conditions

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_A) to peak		3°C/second max
$T_{S(max)}$ to T_A - Ramp-up Rate		3°C/second max
Reflow	-Temperature (T_A) (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)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		260°C



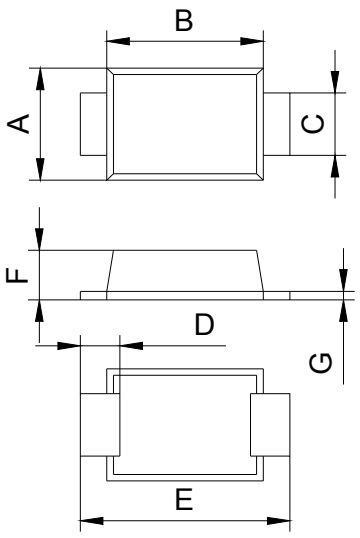
Physical Specifications

Case	JEDEC SMAF Moflded Pflastfic over glass passivated junction
Polarity	Color band denotes cathode except Bipolar
Terminal	Matte Tin-plated leads, Solderable per JESD22-B102

Environmental Specifications

High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
Temperature Cycling	JESD22-A104
MSL	JEDEC-J-STD-020, Level 1
H3TRB	JESD22-A101
RSH	JESD22-A111

Dfimensfions SMAF

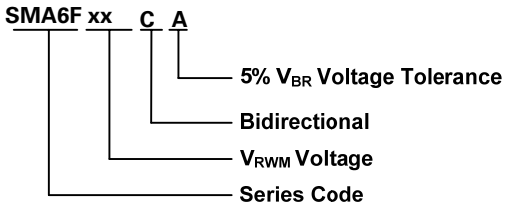


SMAF

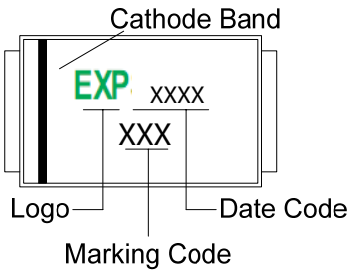
Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.40	2.80	0.094	0.110
B	3.25	3.70	0.128	0.146
C	1.30	1.60	0.051	0.063
D	0.55	1.20	0.022	0.047
E	4.40	4.90	0.173	0.193
F	0.90	1.40	0.035	0.055
G	0.10	0.30	0.004	0.012

Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

Part Numbering System



Part Marking System



Tape and Reel Specification