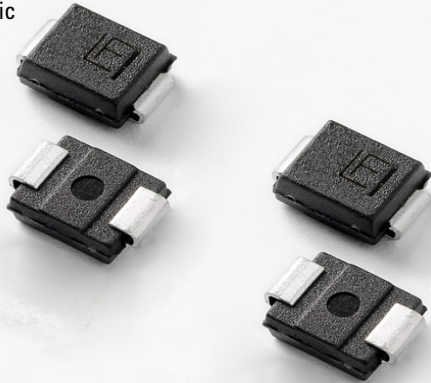


TPSMB Asymmetric Series

Surface Mount – 600W



Asymmetric



Maximum Ratings and Thermal Characteristics

($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation ($I_{PP} \times V_C$) by 10/1000 μs waveform (Fig.1)(Note 1), (Note 2)	P_{PPM}^1	600	W
	P_{PPM}^2		
Power Dissipation on infinite heat sink at $T_J=50^{\circ}\text{C}$	$P_{M(AV)}$	5.0	W
Operating Junction Temperature Range	T_J	-65 to 175	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-65 to 175	$^{\circ}\text{C}$
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	20	$^{\circ}\text{C/W}$
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	100	$^{\circ}\text{C/W}$
Typical Junction Capacitance	C_J	650	pF

Notes:

1. Non-repetitive current pulse, per Fig.4 and derated above $T_A=25^{\circ}\text{C}$ per Fig. 3.
2. Mounted on copper pad area of 0.2x0.2" (5.0 x 5.0mm) to each terminal.

Description

The TPSMB Asymmetric Series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

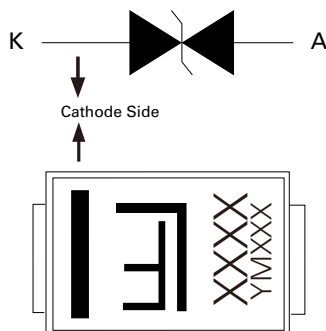
Features

- High reliability application and automotive grade AEC-Q101 qualified
- Surface mount component to optimize board space
- Low profile package
- Typical failure mode is short from over-specified voltage or current
- Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- ESD protection of data lines in accordance with IEC 61000-4-2, 30kV(Air), 30kV (Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- Glass passivated chip junction
- 600W P_{PPM} peak pulse power capability at 10/1000 μs waveform, repetition rate (duty cycles):0.01 %
- Fast response time: typically less than 1.0ns from 0V to V_{BR} min
- Excellent clamping capability
- Low incremental surge resistance
- UL Recognized compound meeting flammability rating V-0.
- Meet MSL level1, per J-STD-020, High temperature soldering guaranteed: 260 $^{\circ}\text{C}$ /10 seconds at terminals
- Matte tin lead-free plated
- Halogen free and RoHS compliant
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD-609A.01)

Applications

TVS components are ideal for the protection of I/O Interfaces, VCC bus and other vulnerable circuits used in Automotive applications.

Pin out & Functional Diagram



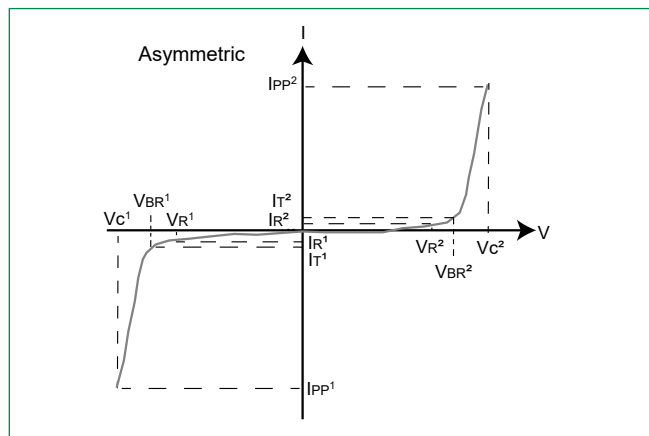
TPSMB Asymmetric Series

Surface Mount – 600W

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Part Number	Marking	K 							 A						
		Maximum Reverse Leakage $I_R^1 @ V_R^1$ (μ A)	Stand off Voltage V_R^1 (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T^1		Maximum Clamping Voltage $V_C^1 @ I_{PP}^1$ (V)	Maximum Peak Pulse Current I_{PP}^1 (A)	Test Current I_T^1 (mA)	Maximum Reverse Leakage $I_R^2 @ V_R^2$ (μ A)	Stand off Voltage V_R^2 (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T^2		Maximum Clamping Voltage $V_C^2 @ I_{PP}^2$ (V)	Maximum Peak Pulse Current I_{PP}^2 (A)	Test Current I_T^2 (mA)
				MIN	MAX						MIN	MAX			
TPSMB2616CA	2616	1	26	28.9	31.9	42.1	14.3	1	1	16	17.8	19.7	26	23.1	1

I-V Curve Characteristics



P_{PPM} Peak Pulse Power Dissipation ($I_{PP} \times V_C$) – Max power dissipation

V_R^1/V_R^2 Stand-off Voltage – Maximum voltage that can be applied to the TVS without operation

V_{BR}^1/V_{BR}^2 Breakdown Voltage – Maximum voltage that flows through the TVS at a specified test current (I_T)

V_C^1/V_C^2 Clamping Voltage – Peak voltage measured across the TVS at a specified I_{PPM} (peak impulse current)

I_R^1/I_R^2 Reverse Leakage Current – Current measured at V_R

Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)

Figure 1:
TVS Transients Clamping Waveform

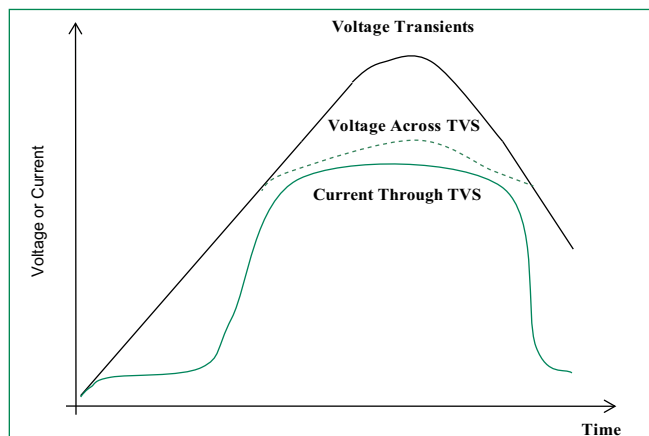
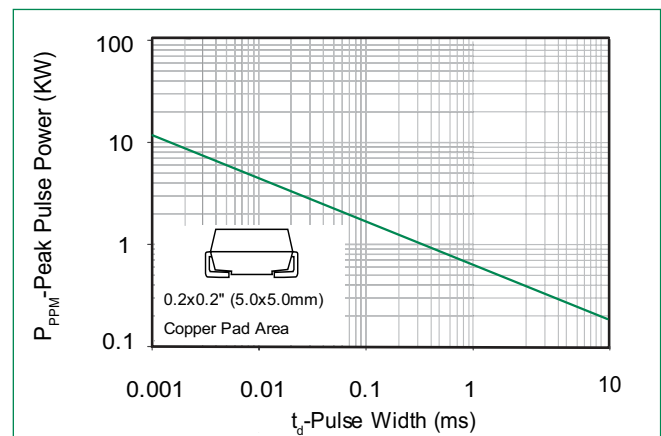


Figure 2:
Peak Pulse Power Rating Curve



TPSMB Asymmetric Series

Surface Mount – 600W

Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise noted) (Continued)

Figure 3:
Peak Pulse Power Derating Curve

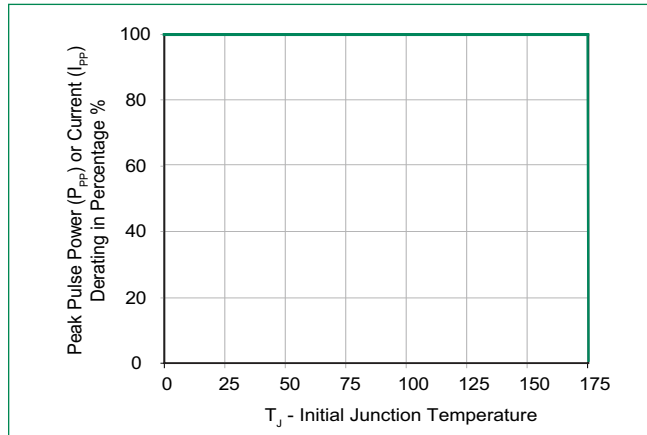
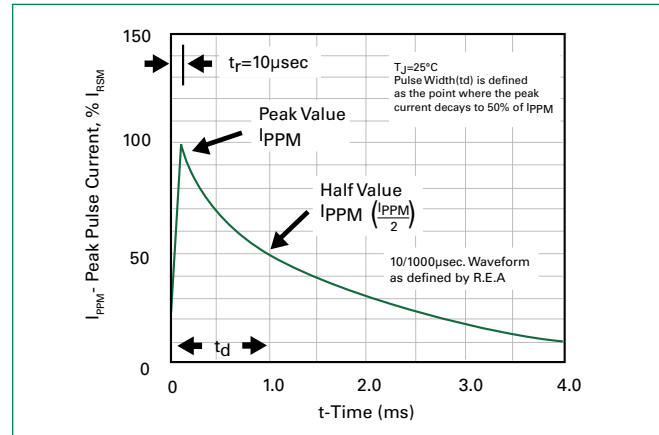
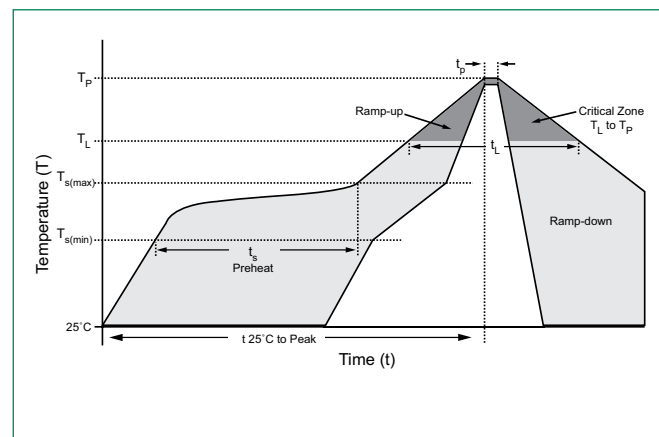


Figure 4:
Pulse Waveform



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 – 120 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (min to max) (t_s)	60 – 150 seconds
Peak Temperature (T_p)		260 $\pm$ 0/-5 °C
Time within 5°C of actual peak Temperature (t_p)		30 seconds max
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

Weight	0.003 ounce, 0.093 grams
Case	JEDEC DO214AA. Molded plastic body over glass passivated junction. Color band denotes cathode for unidirectional components.
Polarity	Matte Tin-plated leads, Solderable per JESD22-B102
Terminal	

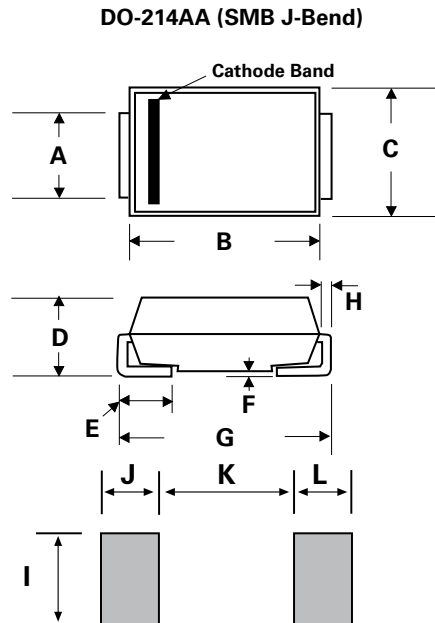
Environmental Specifications

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

TPSMB Asymmetric Series

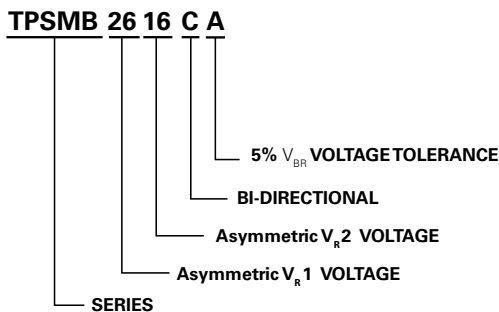
Surface Mount – 600W

Dimensions

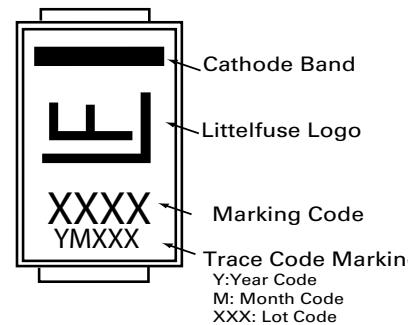


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.077	0.086	1.950	2.200
B	0.160	0.180	4.060	4.570
C	0.130	0.155	3.300	3.940
D	0.084	0.096	2.130	2.440
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.205	0.220	5.210	5.590
H	0.006	0.012	0.152	0.305
I	0.089	-	2.260	-
J	0.085	-	2.160	-
K	-	0.107	-	2.740
L	0.085	-	2.160	-

Part Numbering System



Part Marking System



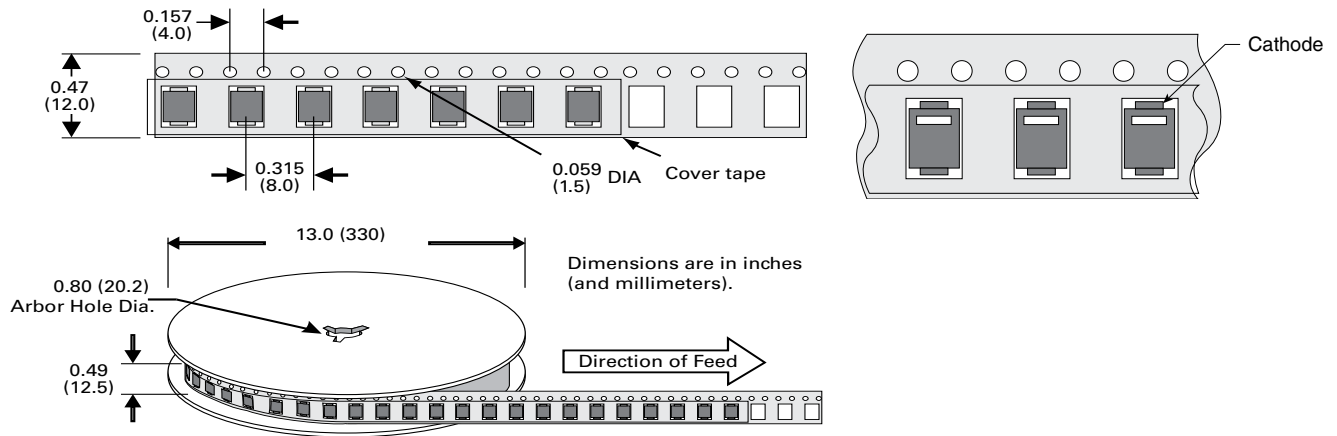
Product Selector & Packaging Option

Part number	Marking Code	Component Package	Quantity	Packaging Option	Packaging Specification
TPSMB2616CA	2616	DO-214AA	3000	Tape & Reel - 12mm tape/13" reel	EIA STD RS-481

TPSMB Asymmetric Series

Surface Mount – 600W

Tape and Reel Specification



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