



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

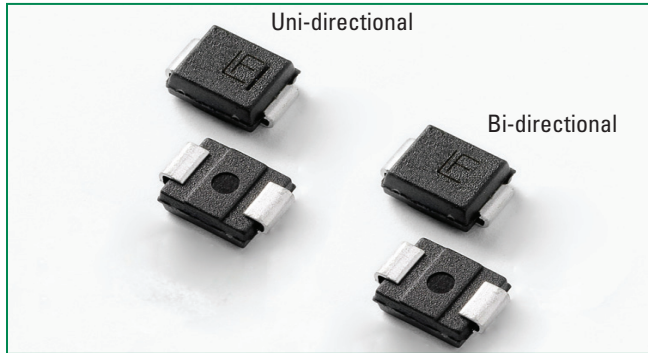
Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



TPSMB Series



Agency Approvals

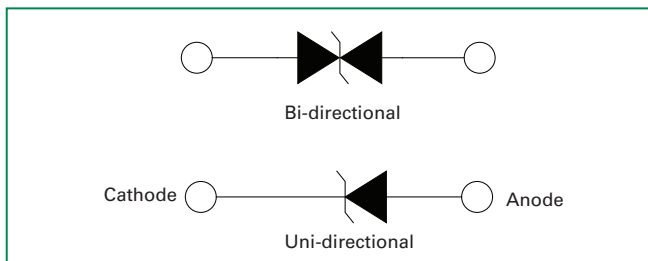
AGENCY	AGENCY FILE NUMBER
	E230531

Maximum Ratings and Thermal Characteristics
($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at $T_A=25^\circ\text{C}$ by 10/1000 μs waveform (Fig.1)(Note 1), (Note 2)	P_{PPM}	600	W
Power Dissipation on infinite heat sink at $T_A=50^\circ\text{C}$	$P_{M(AV)}$	5.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	I_{FSM}	100	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional only	V_F	3.5V	V
Operating Junction and Storage Temperature Range	T_J, 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	$^\circ\text{C/W}$

- Notes:**
1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A = 25^\circ\text{C}$ per Fig. 2.
 2. Mounted on copper pad area of 0.2x0.2" (5.0 x 5.0mm) to each terminal.
 3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

Functional Diagram



Description

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


Features

- Hi reliability application and automotive grade AEC Q101 qualified
- For surface mounted applications 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
- IEC-61000-4-2 ESD 15kV(Air), 8kV (Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2 (IEC801-2)
- EFT protection of data lines in accordance with IEC 61000-4-4 (IEC801-4)
- $V_{BR} @ T_J = V_{BR} @ 25^\circ\text{C} \times (1 + \alpha T \times (T_J - 25))$
(α T: Temperature Coefficient)
- Glass passivated chip junction
- 600W 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 BV min
- Excellent clamping capability
- Low incremental surge resistance
- Typical I_R less than 1 μA above 12V
- High temperature soldering guaranteed: 260 $^\circ\text{C}$ /10 seconds at terminals
- Plastic package has underwriters laboratory flammability 94V-0
- Meet MSL level1, per J-STD-020, LF maximum peak of 260 $^\circ\text{C}$
- Matte tin lead-free plated
- Halogen free and RoHS compliant
- 2nd level interconnect is Pb-free per IPC/JEDEC J-STD-609A.01

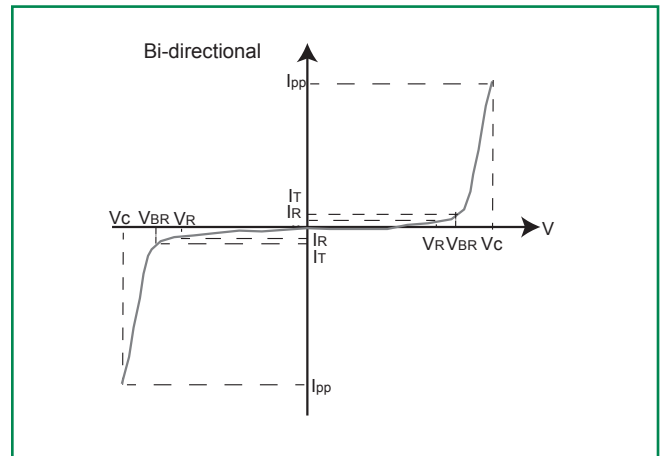
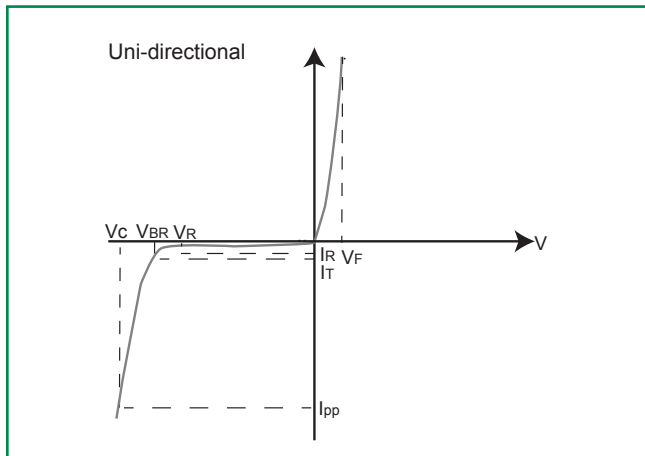
Applications

TVS devices are ideal for the protection of I/O Interfaces, V_{CC} bus and other vulnerable circuits used in Automotive applications.

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

Part Number (Uni)	Part Number (Bi)	Marking		Typical I_R @ 150°C (μA)	Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C @ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R @ V_R (μA)	Agency Approval 
		UNI	BI			MIN	MAX					
TPSMB13A	TPSMB13CA	13AA	13CA	8	11.10	12.40	13.70	1	18.2	33.5	1	X
TPSMB15A	TPSMB15CA	15AA	15CA	8	12.80	14.30	15.80	1	21.2	28.8	1	X
TPSMB16A	TPSMB16CA	16AA	16CA	8	13.60	15.20	16.80	1	22.5	27.1	1	X
TPSMB18A	TPSMB18CA	18AA	18CA	8	15.30	17.10	18.90	1	25.5	24.2	1	X
TPSMB20A	TPSMB20CA	20AA	20CA	8	17.10	19.00	21.00	1	27.7	22.0	1	X
TPSMB22A	TPSMB22CA	22AA	22CA	8	18.80	20.90	23.10	1	30.6	19.9	1	X
TPSMB24A	TPSMB24CA	24AA	24CA	8	20.50	22.80	25.20	1	33.2	18.4	1	X
TPSMB27A	TPSMB27CA	27AA	27CA	8	23.10	25.70	28.40	1	37.5	16.3	1	X
TPSMB30A	TPSMB30CA	30AA	30CA	8	25.60	28.50	31.50	1	41.4	14.7	1	X
TPSMB33A	TPSMB33CA	33AA	33CA	8	28.20	31.40	34.70	1	45.7	13.3	1	X
TPSMB36A	TPSMB36CA	36AA	36CA	8	30.80	34.20	37.80	1	49.9	12.2	1	X
TPSMB39A	TPSMB39CA	39AA	39CA	8	33.30	37.10	41.00	1	53.9	11.3	1	X
TPSMB43A	TPSMB43CA	43AA	43CA	8	36.80	40.90	45.20	1	59.3	10.3	1	X
TPSMB47A	TPSMB47CA	47AA	47CA	8	40.20	44.70	49.40	1	64.8	9.4	1	X
TPSMB51A	TPSMB51CA	51AA	51CA	8	43.60	48.50	53.60	1	70.1	8.7	1	X
TPSMB56A	TPSMB56CA	56AA	56CA	8	47.80	53.20	58.80	1	77.0	7.9	1	X
TPSMB62A	TPSMB62CA	62AA	62CA	8	53.00	58.90	65.10	1	85.0	7.2	1	X
TPSMB68A	TPSMB68CA	68AA	68CA	8	58.10	64.60	71.40	1	92.0	6.6	1	X
TPSMB75A	TPSMB75CA	75AA	75CA	8	64.10	71.30	78.80	1	103.0	5.9	1	X
TPSMB82A	TPSMB82CA	82AA	82CA	8	70.10	77.90	86.10	1	113.0	5.4	1	X
TPSMB91A	TPSMB91CA	91AA	91CA	8	77.80	86.50	95.50	1	125.0	4.9	1	X

I-V Curve Characteristics



- P_{PPM} Peak Pulse Power Dissipation** – Max power dissipation
- V_R Stand-off Voltage** – Maximum voltage that can be applied to the TVS without operation
- V_{BR} Breakdown Voltage** – Maximum voltage that flows through the TVS at a specified test current (I_T)
- V_C Clamping Voltage** – Peak voltage measured across the suppressor at a specified I_{ppm} (peak impulse current)
- I_R Reverse Leakage Current** – Current measured at V_R
- V_F Forward Voltage Drop for Uni-directional**

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

Figure 1 - TVS Transients Clamping Waveform

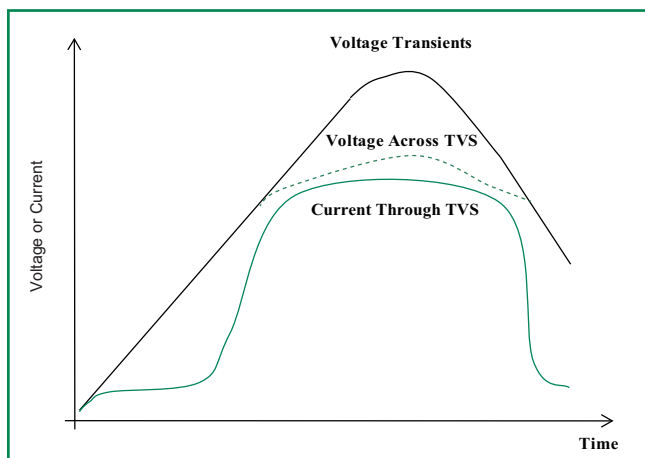
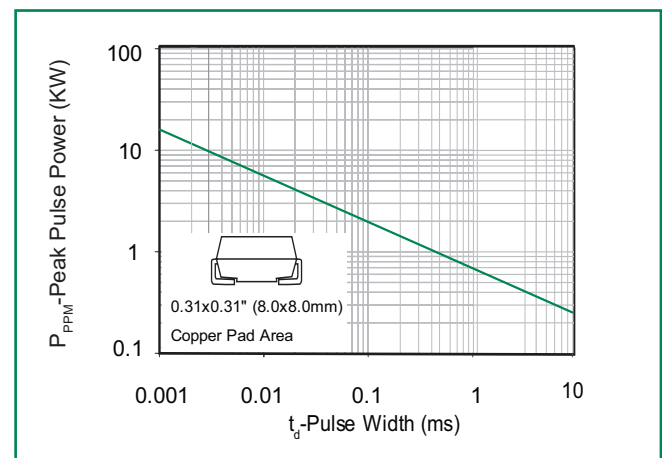


Figure 2 - Peak Pulse Power Rating Curve



continues on next page.

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

Figure 3 - Peak Pulse Power or Current Derating Curve vs Initial Junction Temperature

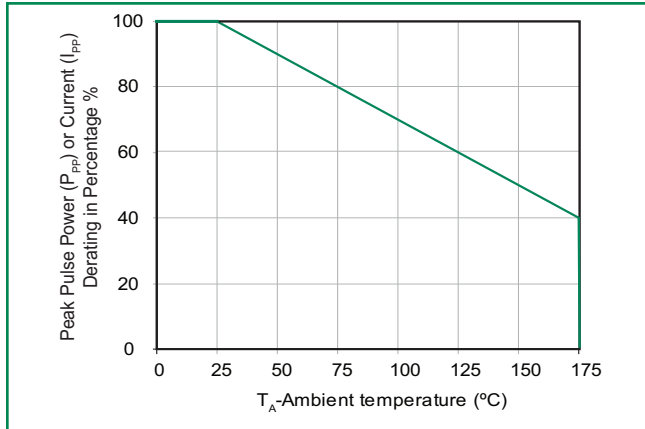


Figure 4 - Pulse Waveform

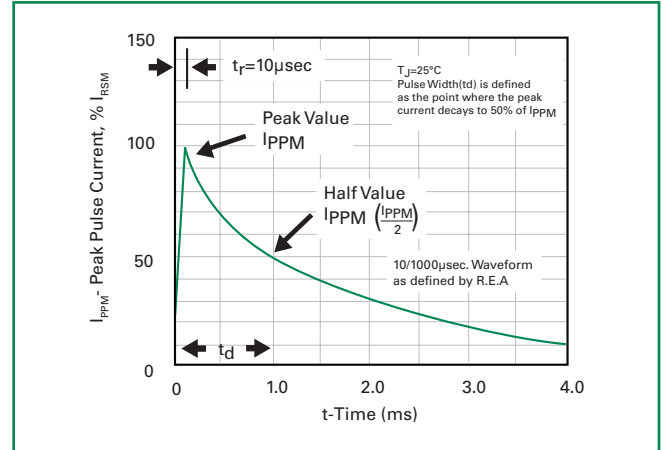


Figure 5 - Typical Junction Capacitance

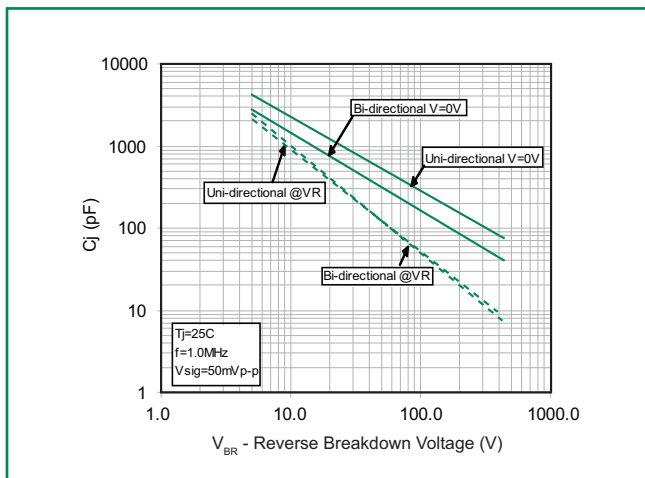
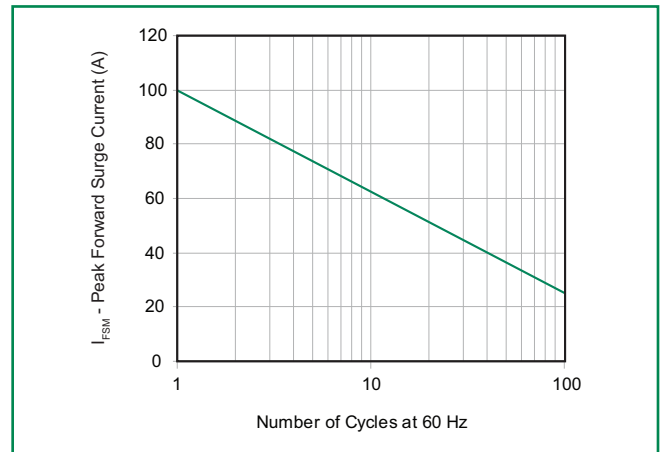
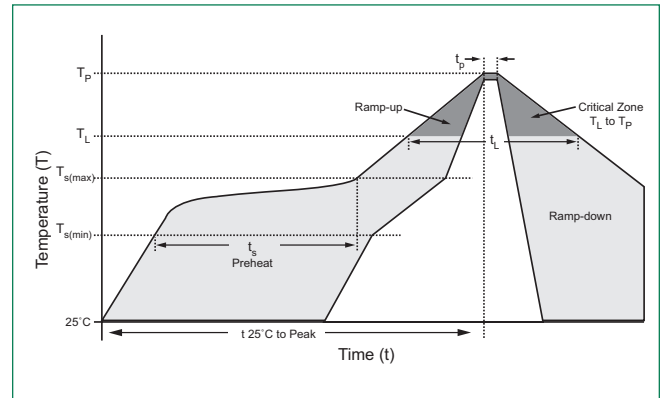


Figure 6 - Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only



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 ^{+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		280°C



Physical Specifications

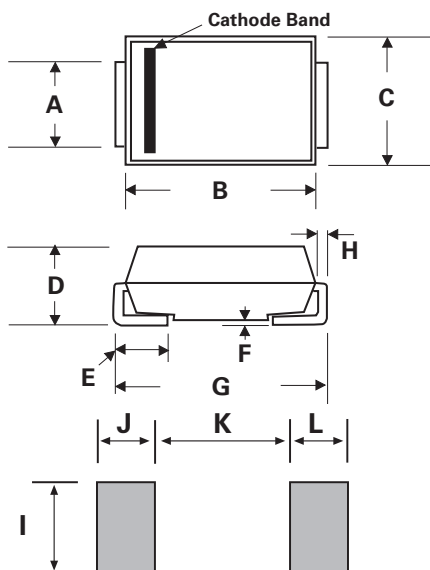
Weight	0.003 ounce, 0.093 grams
Case	JEDEC DO214AA. Molded plastic body over glass passivated junction
Polarity	Color band denotes cathode except Bidirectional.
Terminal	Matte Tin-plated leads, Solderable per JESD22-B102

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-B106

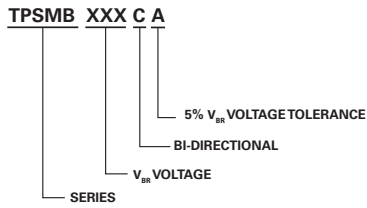
Dimensions

DO-214AA (SMB J-Bend)

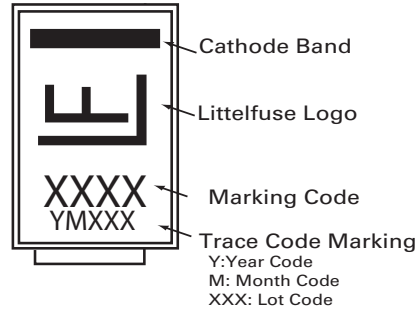


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.077	0.086	1.950	2.200
B	0.160	0.180	4.060	4.570
C	0.130	0.155	3.300	3.940
D	0.084	0.096	2.130	2.440
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.205	0.220	5.210	5.590
H	0.006	0.012	0.152	0.305
I	0.089	-	2.260	-
J	0.085	-	2.160	-
K	-	0.107	-	2.740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

Part Numbering System



Part Marking System



Packaging

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

Tape and Reel Specification

