HF RoHS P6SMB Automotive Series

Agency Approvals

AGENCY	AGENCY FILE NUMBER
®	E230531

Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at T_A=25°C by 10x1000µs waveform (Fig.1)(Note 1), (Note 2)	P_{PPM}	600	W
Power Dissipation on infinite heat sink at T_A=50°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 150	°C
Typical Thermal Resistance Junction to Lead	R_{uJL}	20	°C/W
Typical Thermal Resistance Junction to Ambient	R_{uJA}	100	°C/W

Notes:

1. Non-repetitive current pulse , per Fig. 3 and derated above T_A = 25°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.

Description

The P6SMB Automotive series is designed specifically to protect sensitive automotive equipment from voltage transients.

Features

- Halogen-Free
- RoHS compliant
- For surface mounted applications to optimize board space
- Low profile package
- Built-in strain relief
- Typical maximum temperature coefficient ΔV_{BR} = 0.1% x V_{BR}@25°C x ΔT
- Glass passivated chip junction
- 600W peak pulse power capability at 10×1000µs waveform, repetition rate (duty cycles):0.01%
- Fast response time: typically less than 1.0ps from 0V to BV min
- Excellent clamping capability
- Low incremental surge resistance
- Typical I_R less than 1µA above 12V
- High Temperature soldering guaranteed: 260°C/40 seconds at terminals
- Plastic package has Underwriters Laboratory Flammability 94V-O
- Matte Tin Lead–free Plated

Applications

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

Automotive Transient Voltage Suppression Diodes

Surface Mount – 600W > P6SMB Automotive Series

Electrical Characteristics

Part Number (Uni)	Part Number (Bi)	Marking		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					
P6SMB12AAUTO	P6SMB12CAAUTO	12AA	12CA	10.20	11.40	12.60	1	16.7	36.5	5	X
P6SMB13AAUTO	P6SMB13CAAUTO	13AA	13CA	11.10	12.40	13.70	1	18.2	33.5	1	X
P6SMB15AAUTO	P6SMB15CAAUTO	15AA	15CA	12.80	14.30	15.80	1	21.2	28.8	1	X
P6SMB16AAUTO	P6SMB16CAAUTO	16AA	16CA	13.60	15.20	16.80	1	22.5	27.1	1	X
P6SMB18AAUTO	P6SMB18CAAUTO	18AA	18CA	15.30	17.10	18.90	1	25.5	24.2	1	X
P6SMB20AAUTO	P6SMB20CAAUTO	20AA	20CA	17.10	19.00	21.00	1	27.7	22.0	1	X
P6SMB22AAUTO	P6SMB22CAAUTO	22AA	22CA	18.80	20.90	23.10	1	30.6	19.9	1	X
P6SMB24AAUTO	P6SMB24CAAUTO	24AA	24CA	20.50	22.80	25.20	1	33.2	18.4	1	X
P6SMB27AAUTO	P6SMB27CAAUTO	27AA	27CA	23.10	25.70	28.40	1	37.5	16.3	1	X
P6SMB30AAUTO	P6SMB30CAAUTO	30AA	30CA	25.60	28.50	31.50	1	41.4	14.7	1	X
P6SMB33AAUTO	P6SMB33CAAUTO	33AA	33CA	28.20	31.40	34.70	1	45.7	13.3	1	X
P6SMB36AAUTO	P6SMB36CAAUTO	36AA	36CA	30.80	34.20	37.80	1	49.9	12.2	1	X
P6SMB39AAUTO	P6SMB39CAAUTO	39AA	39CA	33.30	37.10	41.00	1	53.9	11.3	1	X
P6SMB43AAUTO	P6SMB43CAAUTO	43AA	43CA	36.80	40.90	45.20	1	59.3	10.3	1	X
P6SMB47AAUTO	P6SMB47CAAUTO	47AA	47CA	40.20	44.70	49.40	1	64.8	9.4	1	X

The avaliable parts are "A" type only, the parts without A (V_{BR} is ± 10%) is not avaliable.

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

Figure 1 - Peak Pulse Power Rating

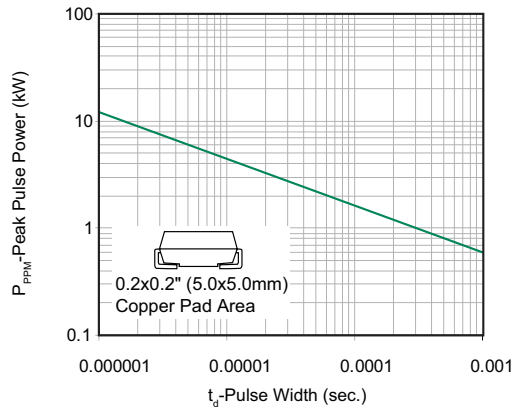


Figure 2 - Pulse Derating Curve

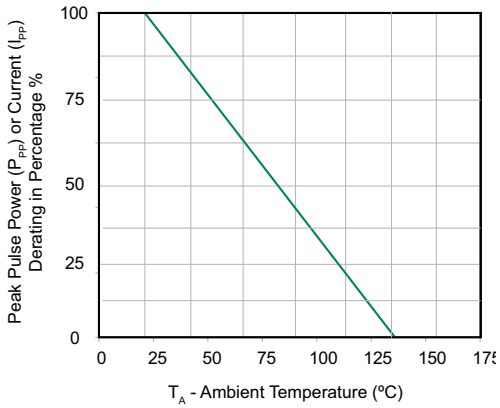


Figure 3 - Pulse Waveform

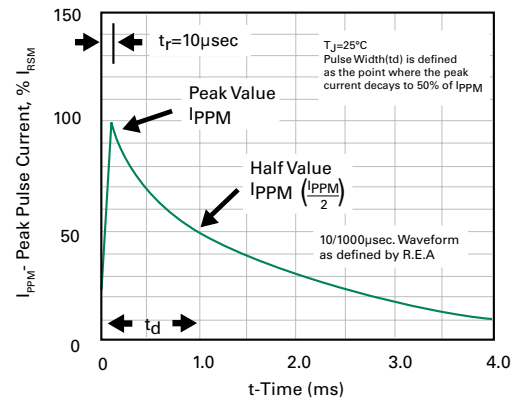


Figure 4 - Typical Junction Capacitance

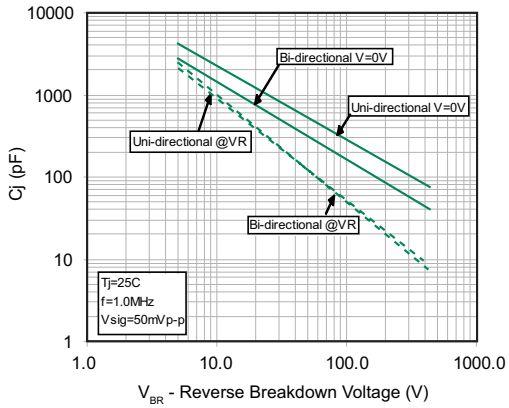


Figure 5 - Steady State Power Dissipation Derating Curve

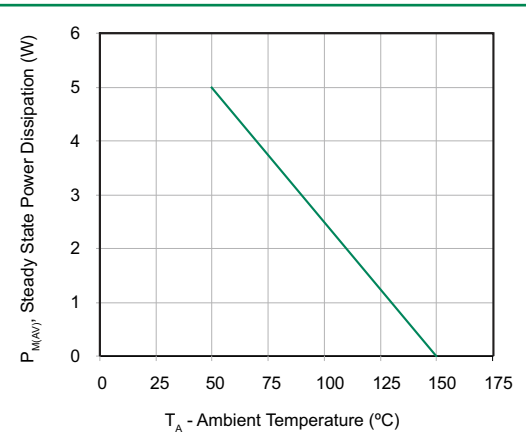
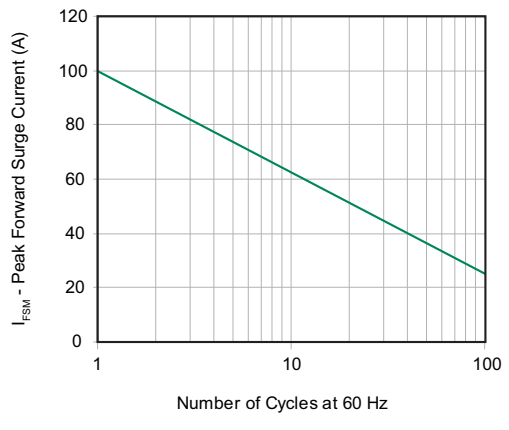
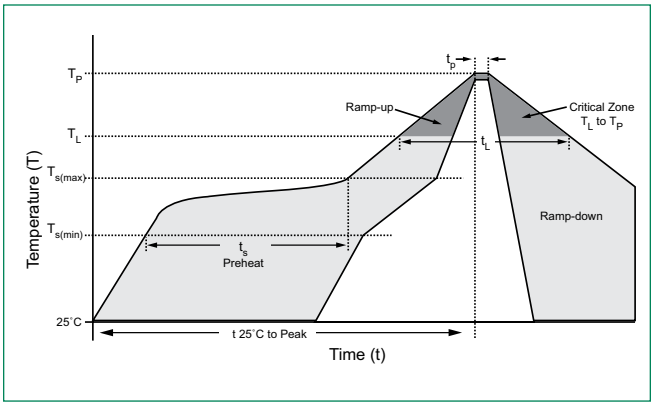


Figure 6 - Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only



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 – 180 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)		20 – 40 seconds
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

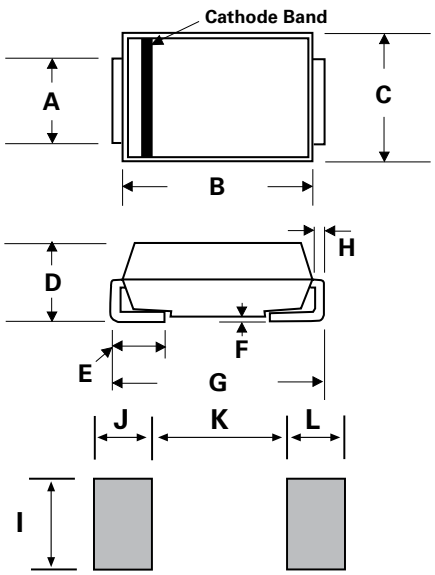
Weight	0.003 ounce, 0.093 grams
Case	JEDEC DO214AA. Molded plastic body over glass passivated junction
Polarity	Color band denotes cathode except Bidirectional.
Terminal	Matte Tin-plated leads, Solderable per JESD22-B102D

Environmental Specifications

Temperature Cycle	JESD22-A104
Pressure Cooker	JESD 22-A102
High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
Thermal Shock	JESD22-A106

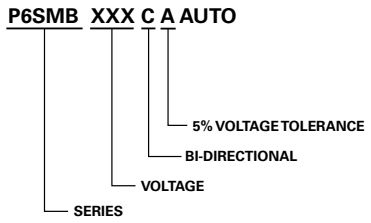
Dimensions

DO-214AA (SMB J-Bend)

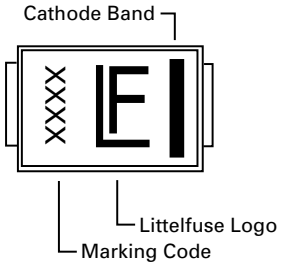


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.077	0.086	1.950	2.200
B	0.160	0.180	4.060	4.570
C	0.130	0.155	3.300	3.940
D	0.077	0.104	1.950	2.650
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.205	0.220	5.210	5.590
H	0.006	0.012	0.152	0.305
I	0.089	-	2.260	-
J	0.085	-	2.160	-
K	-	0.107	-	2.740
L	0.085	-	2.160	-

Part Numbering System



Part Marking System



Packaging

Part number	Component Package	Quantity	Packaging Option	Packaging Specification
P6SMBxxxXXAUTO	DO-214AA	3000	Tape & Reel – 12mm/13" tape	EIA STD RS-481

Revised: August 30, 2009 9:24 AM