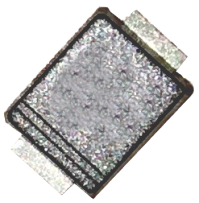
P6SMBF SERIES

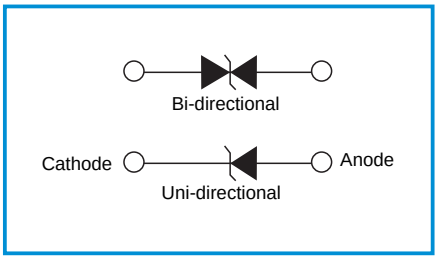
Transient Voltage Suppressors (TVS) Data Sheet

Features

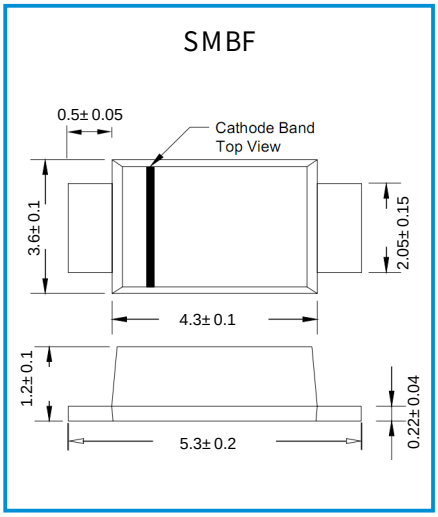


- For surface mounted applications in order to optimize board space
- 600W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycle): 0.01%
- Typical I_R less than 1μA above 10V
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- High Temperature soldering: 260℃/10 seconds at terminals
- Fast response time
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020
- Safety certification: UL: E244458
- AEC-Q101 qualified (P6SMBF6.8~P6SMBF170)

Functional Diagram



Dimensions



Mechanical Data

- Case: SMBF 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
- Standard Packaging: 12mm tape (EIA STD RS-481)
- Weight: 0.10g

Applications

- I/O interface
- Vcc bus
- AC/DC power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

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)	$P_{M(AV)}$	5.0	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note3, Fig.6)	I_{FSM}	100	Amps
Operating junction and Storage Temperature Range.	T_J,T_{STG}	-65 to +150	℃
Typical thermal resistance junction to lead	$R_{\theta JL}$	20	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	100	℃/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	Breakdown Voltage @IT	Test Current	Maximum Clamping Voltage@I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RWM}
UNI-POLAR	Bi-POLAR	Uni	Bi	V_{RWM}(V)	$V_{BR\ MIN}$ (V)	$V_{BR\ MAX}$(V)	I_T(mA)	V_C(V)	I_{PP} (A)	I_R (uA)
P6SMBF6.8A	P6SMBF6.8CA	6V8A	6V8C	5.8	6.46	7.14	10	10.5	58.1	1000
P6SMBF7.5A	P6SMBF7.5CA	7V5A	7V5C	6.4	7.13	7.88	10	11.3	54.0	500
P6SMBF8.2A	P6SMBF8.2CA	8V2A	8V2C	7	7.79	8.61	10	12.1	50.4	200
P6SMBF9.1A	P6SMBF9.1CA	9V1A	9V1C	7.8	8.65	9.56	1	13.4	45.5	50
P6SMBF10A	P6SMBF10CA	10A	10C	8.6	9.5	10.5	1	14.5	42.1	10
P6SMBF11A	P6SMBF11CA	11A	11C	9.4	10.45	11.55	1	15.6	39.1	1
P6SMBF12A	P6SMBF12CA	12A	12C	10.2	11.4	12.6	1	16.7	36.5	1
P6SMBF13A	P6SMBF13CA	13A	13C	11.1	12.35	13.65	1	18.2	33.5	1
P6SMBF15A	P6SMBF15CA	15A	15C	12.8	14.25	15.75	1	21.2	28.8	1
P6SMBF16A	P6SMBF16CA	16A	16C	13.6	15.2	16.8	1	22.5	27.1	1
P6SMBF18A	P6SMBF18CA	18A	18C	15.3	17.1	18.9	1	25.5	24.2	1
P6SMBF20A	P6SMBF20CA	20A	20C	17.1	19	21	1	27.7	22.0	1
P6SMBF22A	P6SMBF22CA	22A	22C	18.8	20.9	23.1	1	30.6	19.9	1
P6SMBF24A	P6SMBF24CA	24A	24C	20.5	22.8	25.2	1	33.2	18.4	1
P6SMBF27A	P6SMBF27CA	27A	27C	23.1	25.65	28.35	1	37.5	16.3	1
P6SMBF30A	P6SMBF30CA	30A	30C	25.6	28.5	31.5	1	41.4	14.7	1
P6SMBF33A	P6SMBF33CA	33A	33C	28.2	31.35	34.65	1	45.7	13.3	1
P6SMBF36A	P6SMBF36CA	36A	36C	30.8	34.2	37.8	1	49.9	12.2	1
P6SMBF39A	P6SMBF39CA	39A	39C	33.3	37.05	40.95	1	53.9	11.3	1
P6SMBF43A	P6SMBF43CA	43A	43C	36.8	40.85	45.15	1	59.3	10.3	1
P6SMBF47A	P6SMBF47CA	47A	47C	40.2	44.65	49.35	1	64.8	9.4	1
P6SMBF51A	P6SMBF51CA	51A	51C	43.6	48.45	53.55	1	70.1	8.7	1
P6SMBF56A	P6SMBF56CA	56A	56C	47.8	53.2	58.8	1	77	7.9	1
P6SMBF62A	P6SMBF62CA	62A	62C	53	58.9	65.1	1	85	7.2	1
P6SMBF68A	P6SMBF68CA	68A	68C	58.1	64.6	71.4	1	92	6.6	1
P6SMBF75A	P6SMBF75CA	75A	75C	64.1	71.25	78.75	1	103	5.9	1
P6SMBF82A	P6SMBF82CA	82A	82C	70.1	77.9	86.1	1	113	5.4	1
P6SMBF91A	P6SMBF91CA	91A	91C	77.8	86.45	95.55	1	125	4.9	1
P6SMBF100A	P6SMBF100CA	100A	100C	85.5	95	105	1	137	4.5	1
P6SMBF110A	P6SMBF110CA	110A	110C	94	104.5	115.5	1	152	4.0	1
P6SMBF120A	P6SMBF120CA	120A	120C	102	114	126	1	165	3.7	1
P6SMBF130A	P6SMBF130CA	130A	130C	111	123.5	136.5	1	179	3.4	1
P6SMBF150A	P6SMBF150CA	150A	150C	128	142.5	157.5	1	207	2.9	1
P6SMBF160A	P6SMBF160CA	160A	160C	136	152	168	1	219	2.8	1
P6SMBF170A	P6SMBF170CA	170A	170C	145	161.5	178.5	1	234	2.6	1

Notes: For bidirectional type having V_R of 10V and less, the I_R limit is double.

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

Figure 1. Peak Pulse Power Rating Curve

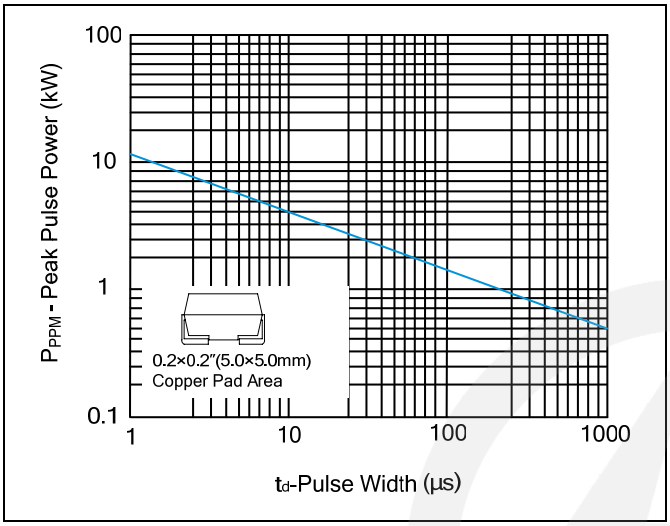


Figure 2. Pulse Derating Curve

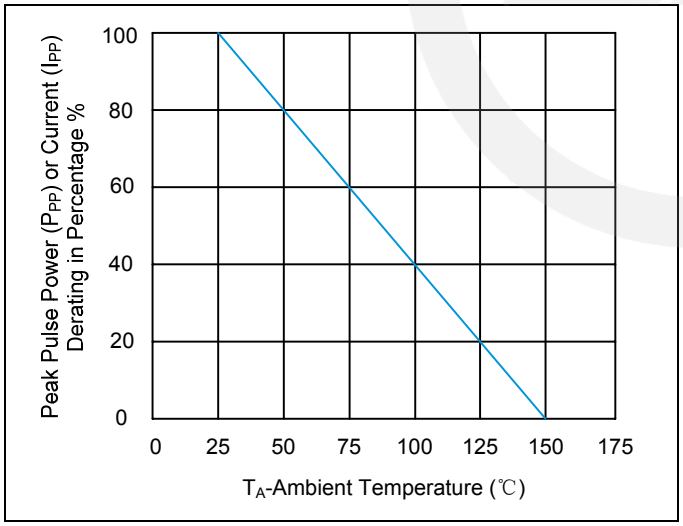


Figure 3. Pulse Waveform

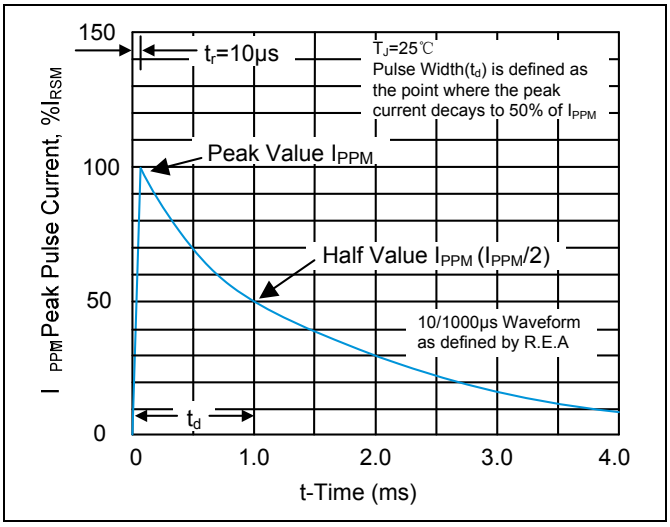


Figure 4. Typical Junction Capacitance

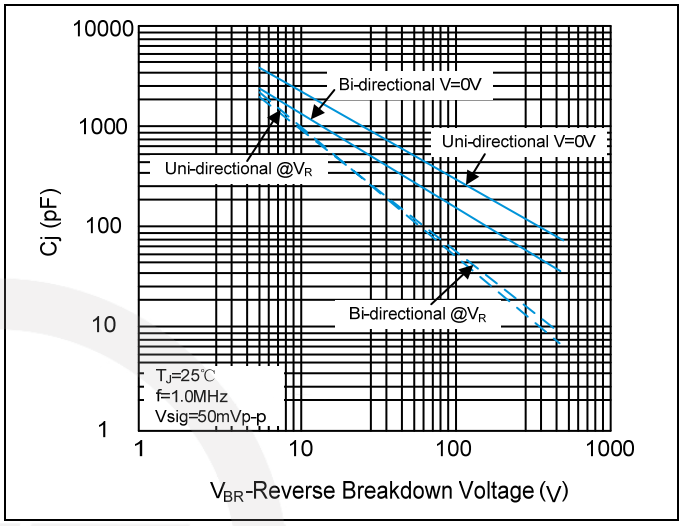


Figure 5. Steady State Power Dissipation Derating Curve

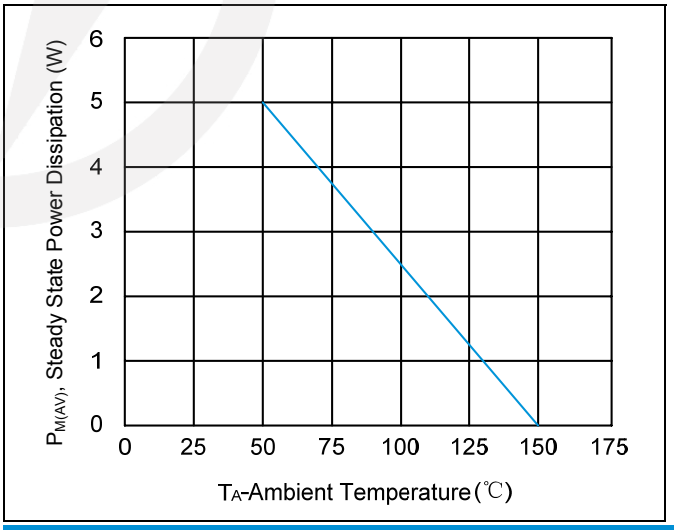
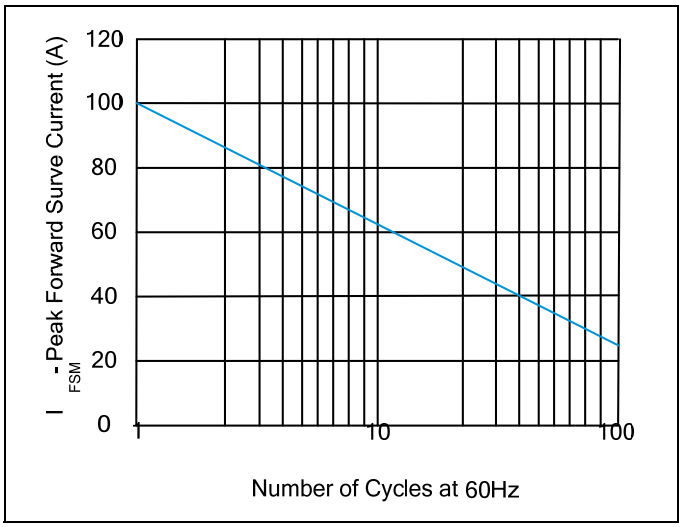
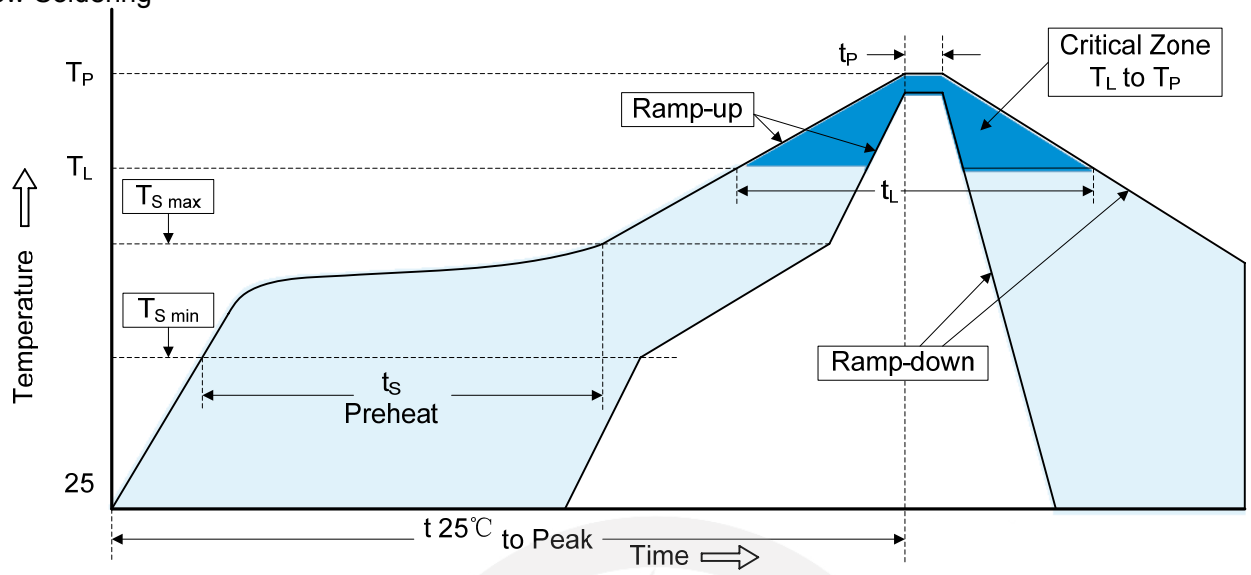


Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



Recommended Soldering Conditions

Reflow Soldering

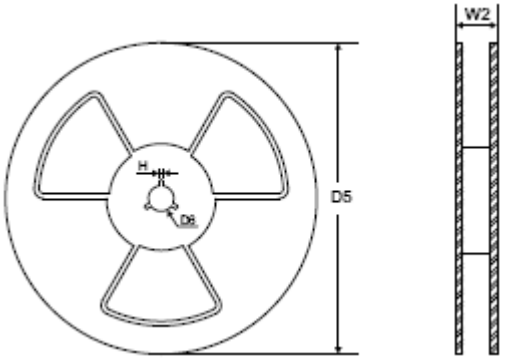


Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3℃/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_S)	 150℃ 200℃ 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	 3℃/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	 217℃ 60-150 seconds
Peak Temperature (T_P)	260℃
Time within 5℃ of actual Peak Temperature (t_P)	20-40 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8 minutes max.

Packaging

13” Reel



D5	Φ330.0±2.0
D6	Φ13.5±0.5
H	2.5±1.0
W2	16.0±2.0
Quantity: 5000PCS	