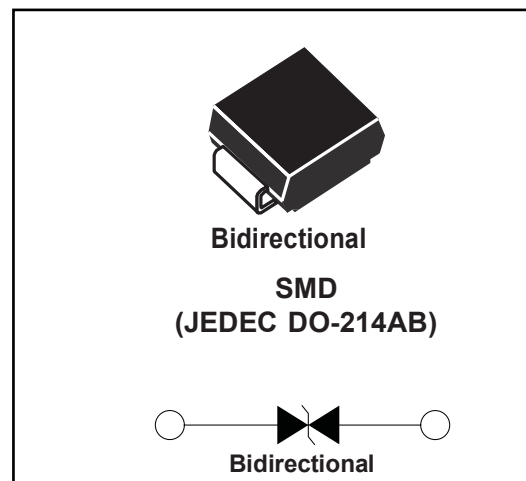


Automotive 5000W

Features

- For surface mounted applications
- Low-profile package
- Ideal for automated placement
- Available in Unidirectional and Bidirectional
- 5000W peak pulse power capability with a 10/1000µs waveform
- Low incremental surge resistance, excellent clamping capability
- Very fast response time
- High temperature soldering guaranteed: 260 °C/10 s at terminals



Typical Applications

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, telecommunication.

Maximum Ratings and Characteristics

(Ratings at 25°C ambient temperature unless otherwise specified.)

Parameter	Symbol	Value	Unit
Peak Power Dissipation at $T_L=25^{\circ}\text{C}$ by 10/1000µs waveform ⁽¹⁾⁽²⁾ (Fig.2)	P_{PPM}	5000	W
Peak Power Dissipation on Infinite Heat Sink at $T_L=50^{\circ}\text{C}$	P_D	6.5	W
Peak Forward Surge Current, 8.3ms single half sinewave superimposed on rated load (JEDEC Method) ⁽³⁾	I_{FSM}	300	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only	V_F	5.0	V
Operating Temperature Range	T_J	-65 to 150	°C
Storage Temperature Range	T_{STG}	-65 to 175	°C
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	15	°C/W
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	75	°C/W

Notes

1. Non-repetitive current pulse, per Fig. 4 and derated above $T_J(\text{initial})=25^{\circ}\text{C}$ per Fig. 3
2. Mounted on 8.0mm² land areas
3. Measured of 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted) Table 1

Model	Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_{WM}	Maximum Reverse Leakage $I_R@V_{WM}$	Maximum Peak Pulse Current I_{PPM} (10/1000 μs)	Maximum Clamping Voltage $V_C@I_{PPM}$ (10/1000 μs)	Maximum Peak Pulse Current I_{PPM} (8/20 μs)	Maximum Clamping Voltage $V_C@I_{PPM}$ (8/20 μs)
	Min	Max							
	(V)	(V)	(mA)	(V)	(μA)	(A)	(V)	(A)	(V)
SMD50J84B	86.0	95.0	1	84.0	15.0	39.7	126.0	297.8	162.8

For bidirectional type having VR of 20 volts and less, the IR limit is double.

For parts without A , the V BR is $\pm 10\%$ and V C is 5% higher than with A parts, the parts without A are currently available, but not recommended for new designs. The parts with A are preferred.

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

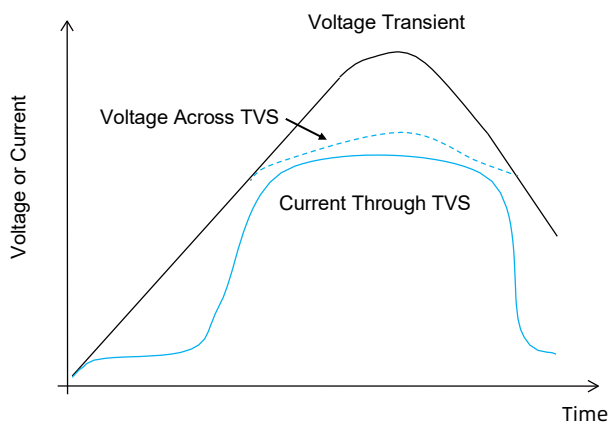


Fig.1 TVS Transients Clamping Waveform

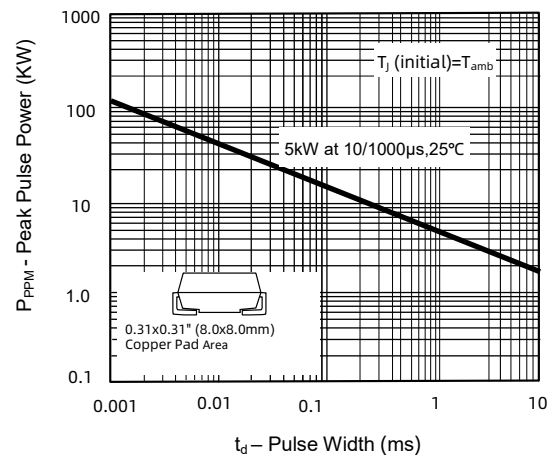


Fig.2 Peak Pulse Power Rating Curve

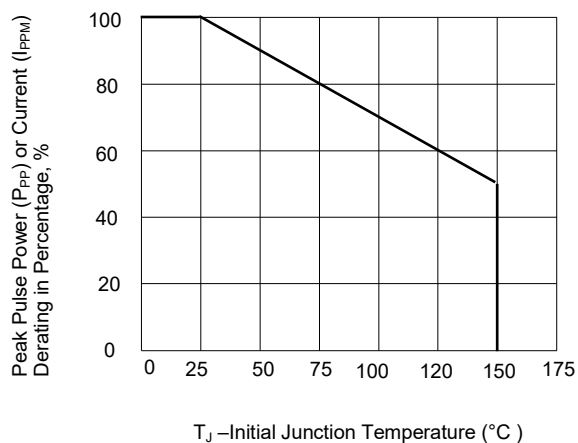


Fig.3 Peak Pulse Power Derating Curve

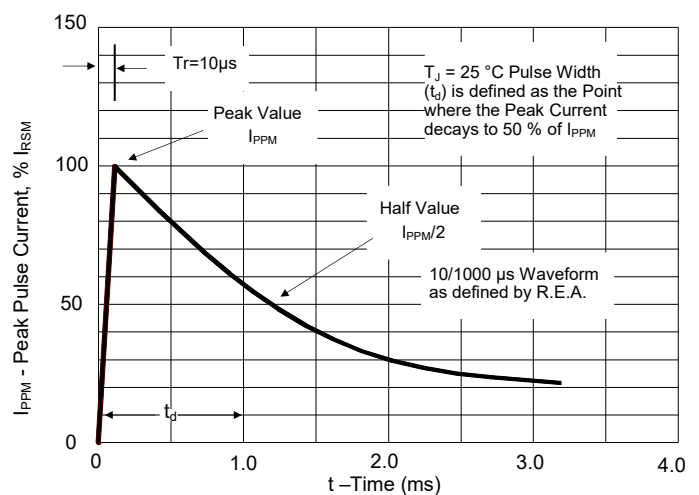


Fig.4 Pulse Waveform

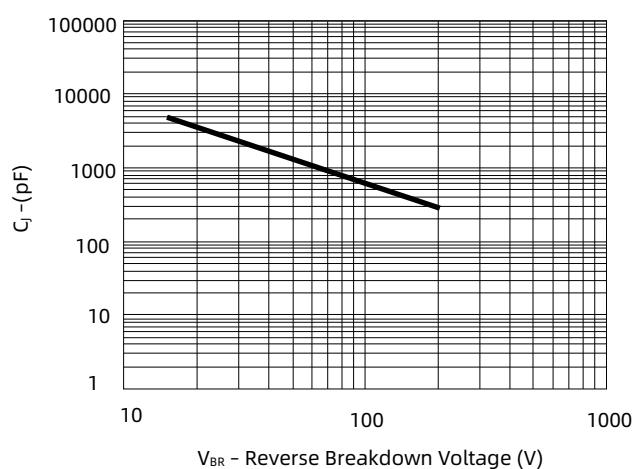


Fig.5 Typical Junction Capacitance

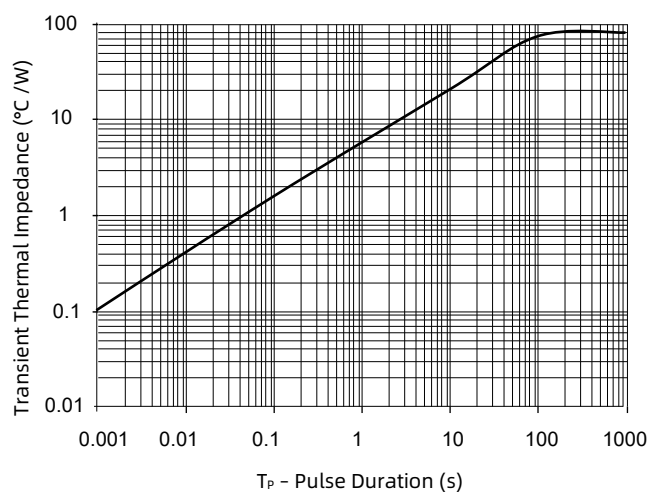


Fig.6 Typical Transient Thermal Impedance

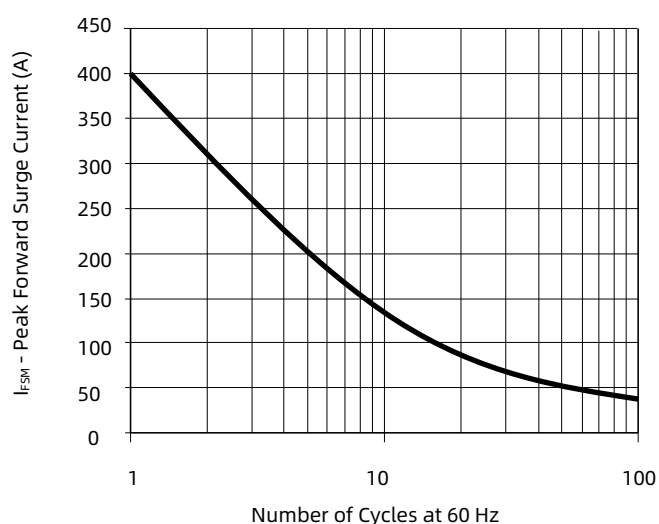


Fig.7 Maximum Non-Repetitive Forward Surge Current
Uni-Directional only

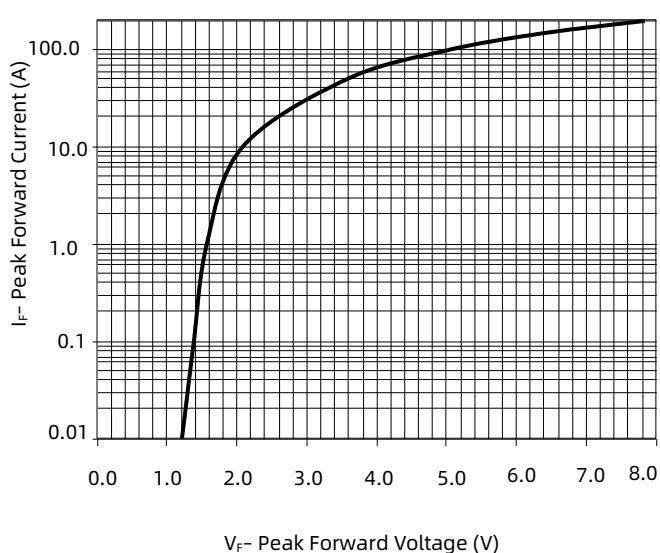
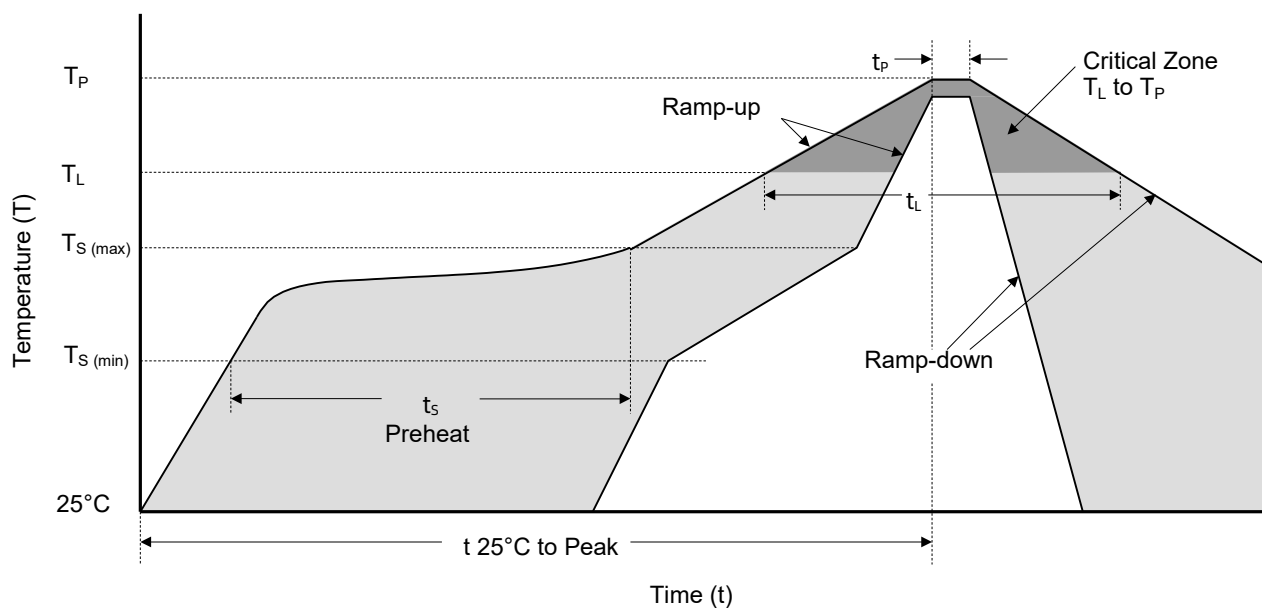


Fig.8 Peak Forward Drop vs Peak Forward Current
(Typical Values)

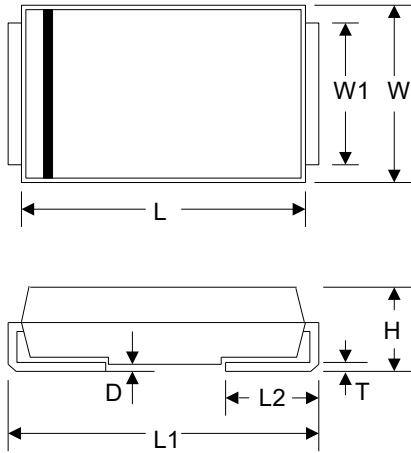
Soldering Parameters



Reflowing Soldering Curve

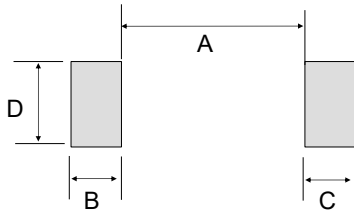
Soldering Parameters		Lead-Free Assembly
Pre-heat	-Temperature Min ($T_{S(min)}$)	150°C
	-Temperature Max ($T_{S(max)}$)	200°C
	-Time (min to max) (t_s)	60-180 seconds
Average ramp-up rate (Liquidus Temp (T_L) to Peak Temp (T_P))		3°C/second max.
$T_S(max)$ to T_L -Ramp-up Rate		3°C/second max.
Reflow	-Temperature (T_L)	217°C
	-Time (t_L)	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		8 minutes max.
Do not exceed		260°C

Package Outline Dimensions (DO-214AB)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	6.600	7.110	0.260	0.280
W	5.590	6.220	0.220	0.245
W1	2.900	3.200	0.114	0.126
H	2.060	2.620	0.079	0.103
T	0.1520	0.305	0.006	0.012
L1	7.750	8.130	0.305	0.320
L2	0.760	1.520	0.030	0.060
D	-	0.203	-	0.008

■ **Suggested pad layout**



Dim	Min
A	4.2
B	2.4
C	2.4
D	3.3