Transient Voltage Suppressors (TVS) Data Sheet

Description

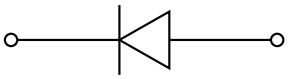
The SMBJ6.8CA is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events

Breakdown Voltage
5.8 V
Peak Pulse Power
600 W

Features

- For surface mounted applications in order to optimize board space
- Low leakage
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 600W peak pulse power capability at 10/1000μs waveform
- Fast response time
- Typical IR less than 5μA above 12.8V
- High Temperature soldering: 260°C /40 seconds at terminals
- Typical maximum temperature coefficient ΔVBR = 0.1% ×VBR@25°C ×ΔT
- Plastic package has Underwriters Laboratory Flammability 94V-0
- Matte tin lead–free Plated
- Halogen free and RoHS compliant
- 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 30KV(Air),30KV(contact)

DO-214AA(SMB)



Applications

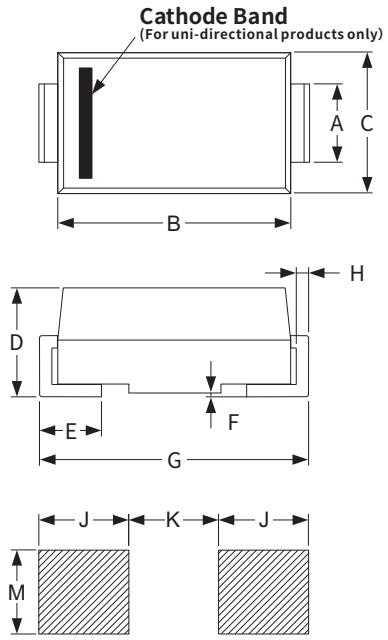
TVS devices are ideal for the protection of I/O interfaces, VCC bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications

Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	VALUE	SYMBOL
Peak Pulse Power Dissipation with a 10/1000μs waveform (Fig.1)(Note 1), (Note 2)	P_{PPM}	600	W
Peak Pulse Current with a 10/1000μs waveform.(Note1,Fig.3)	I_{PP}	See Next Table	A
Power Dissipation on Infinite Heat Sink at T_L=75° 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 25A for Unidirectional Only(Note 4)	V_F	3.5/5.0	V
Operating junction and Storage Temperature Range	T_J , T_{STG}	-55 to +150	°C
Typical thermal resistance junction to lead	$R_{\theta J-L}$	20	°C /W
Typical thermal resistance junction to ambient	$R_{\theta J-A}$	100	°C /W

Note :
(1) Non-repetitive current pulse, per Fig. 3 and derated above Ta = 25°C per Fig. 2.
(2) Mounted on 5.0mm x 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.
(4)V_F <3.5V for V_{BR}<200V and V_F< 6.5V for V_{BR}>201V.

Package Outline Dimensions (SMB/DO-214AA)



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.85	2.21	0.073	0.087
B	4.25	4.85	0.167	0.191
C	3.30	3.94	0.130	0.155
D	2.15	2.65	0.085	0.104
E	0.75	1.52	0.030	0.060
F	-	0.203	-	0.008
G	5.08	5.59	0.200	0.220
H	0.15	0.31	0.006	0.012
M	2.26	-	0.089	-
J	2.10	-	0.085	-
K	-	2.74	-	0.107

Electrical Characteristics (Ta=25°C Unless otherwise specified)

Part Number	Marking	Reverse Stand-Off Voltage	Breakdown Voltage V_{BR} (V) @I_T		Test Current	Maximum Clamping Voltage@I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RWM}
		V_{RWM}(V)	Min.	Max.	I_T(mA)	V_C(V)	I_{PP} (A)	I_R(μA)
SMBJ6.8CA	6V8C	5.8	6.46	7.14	10	10.5	57.1	1000

Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

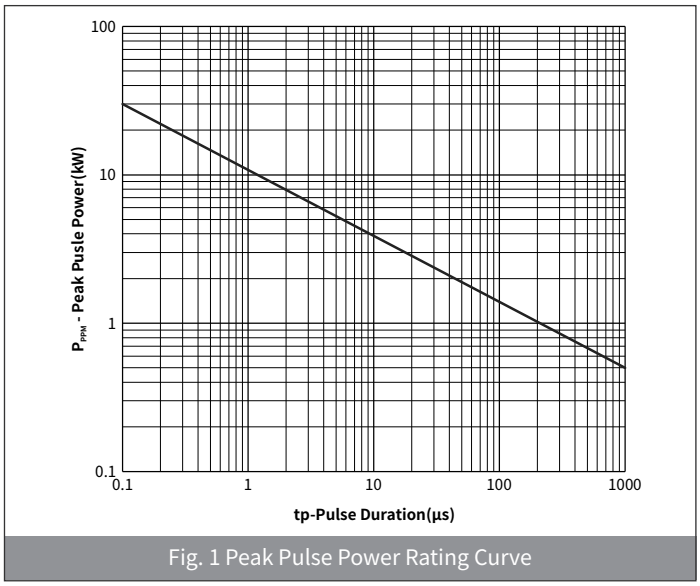


Fig. 1 Peak Pulse Power Rating Curve

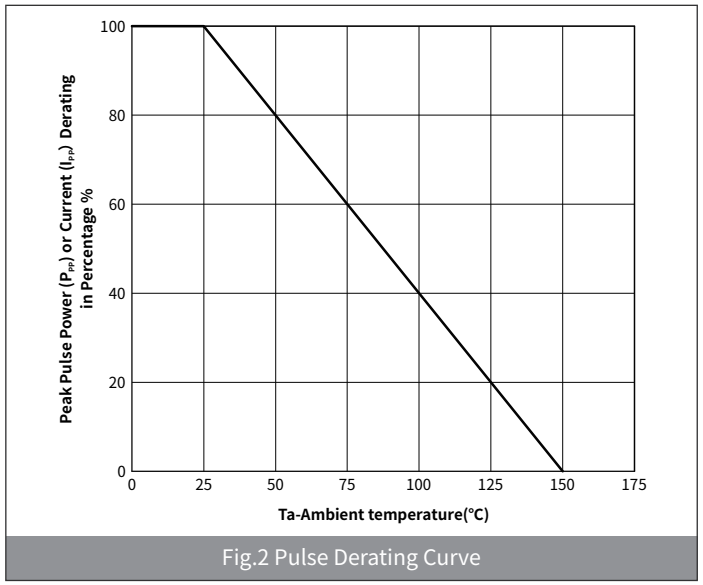


Fig.2 Pulse Derating Curve

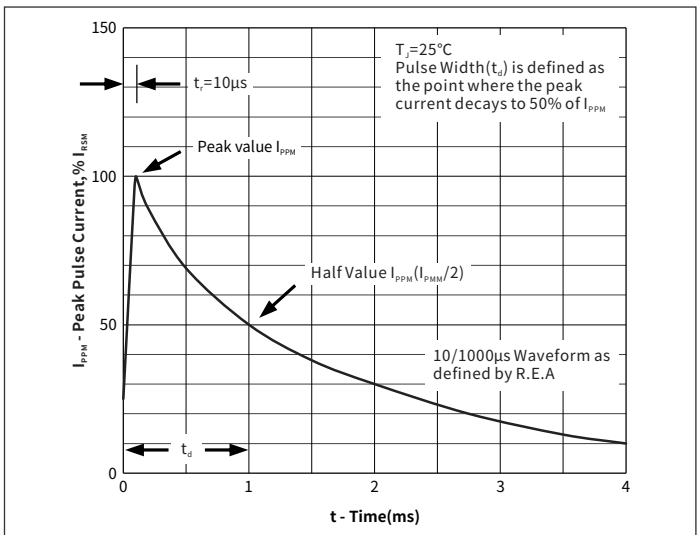


Fig.3 Pulse Waveform

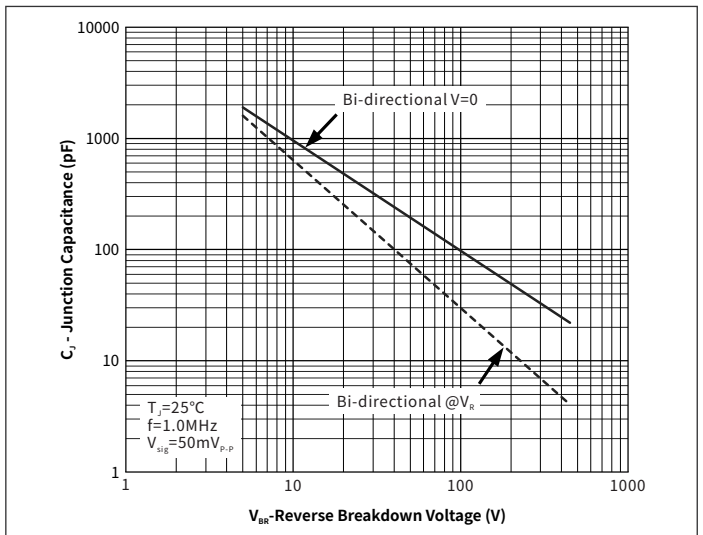


Fig.4 Typical Junction Capacitance

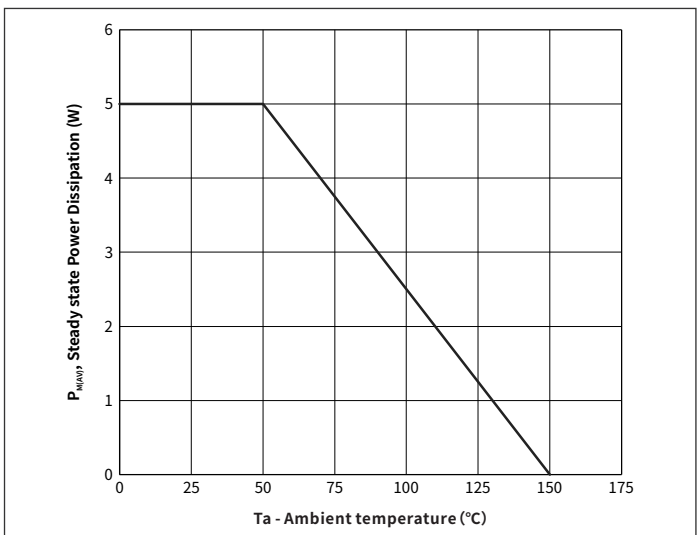


Fig.5 Steady State Power Dissipation Derating Curve

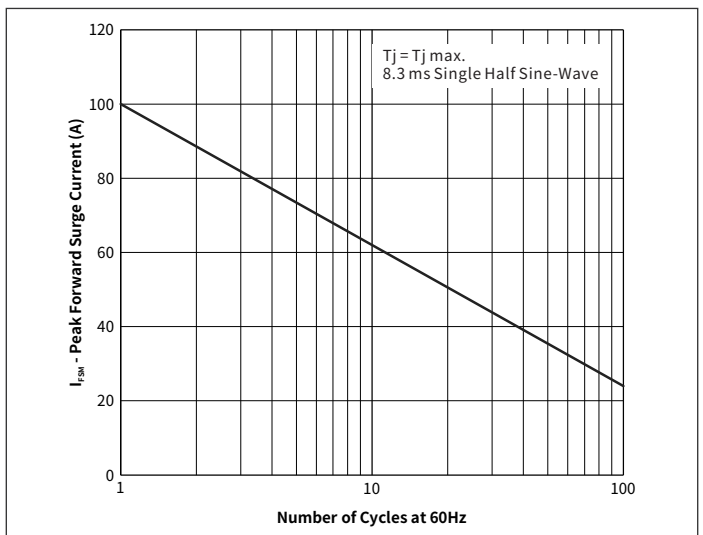
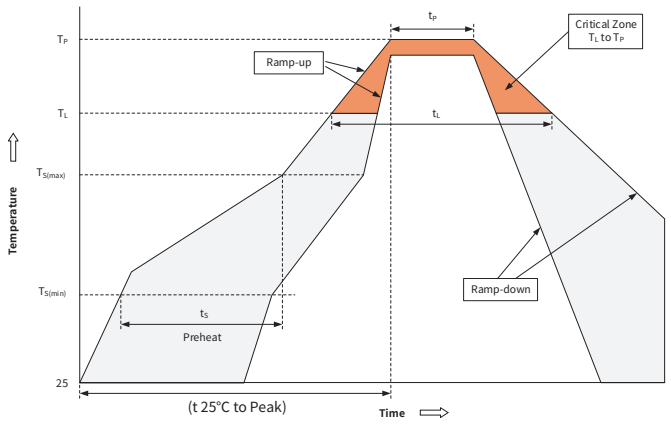


Fig.6 Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

Ordering Information

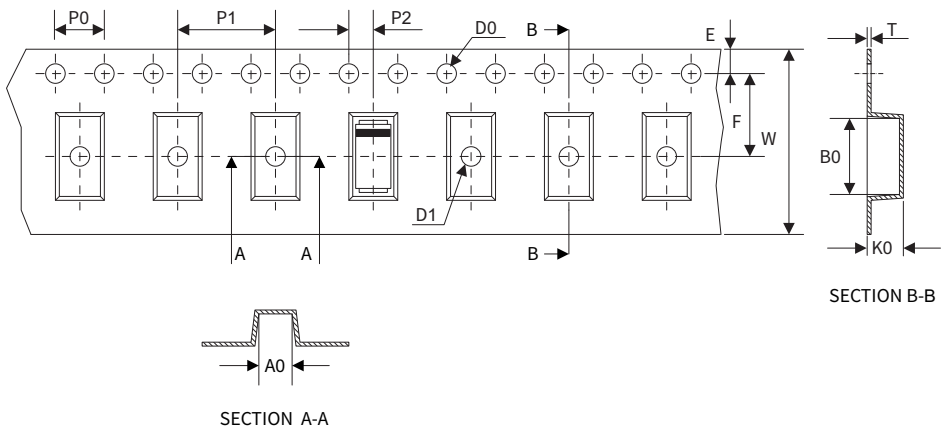
PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SMB	R1	0.098	500	2000	16000	7''
SMB	R3	0.098	3000	6000	48000	13''

Soldering Parameters



Profile Feature		Pb-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 (Liquid us Temp (T_L) to peak)		3°C /sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C /sec. Max
Reflow	Temperature(T_L)(Liquid us)	+217°C
	Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6°C /sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C

Packaging (SMB/DO-214AA)



Symbol	Dimension (mm)
W	12.00±0.20
P0	4.00±0.10
P1	8.00±0.10
P2	2.00±0.10
D0	Φ1.55±0.10
D1	Φ1.5±0.10
E	1.75±0.10
F	5.50±0.05
A0	3.86±0.10
B0	5.65±0.10
K0	2.75±0.15
T	0.25±0.05