

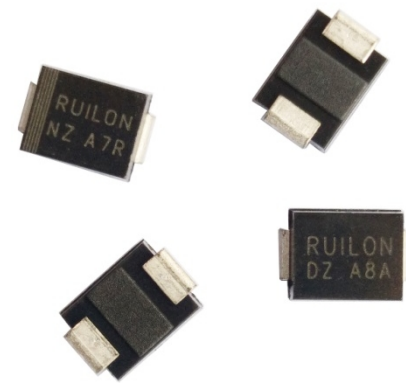
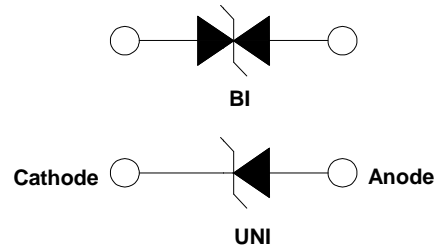
**Mechanical Data**

- I Case: Molded plastic
- I Epoxy: UL 94V-0 rate flame retardant
- I Lead: Solderable per MIL-STD-750, method 2026
- I Polarity: Color band denotes cathode end except Bipolar
- I Mounting position: Any

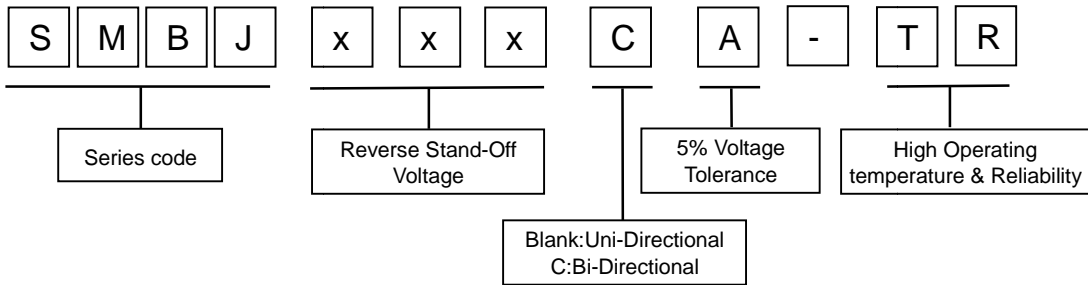
**Features**

- I Glass passivated chip
- I 600 W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetitive rate (duty cycle):0.01 %
- I High reliability application and automotive grade
- I AEC Q101 qualified
- I Low leakage
- I Uni and Bidirectional unit
- I Excellent clamping capability
- I Very fast response time
- I RoHS compliant

**Electrical symbol**



**Part Number Code**



**Mechanical Characteristics**

Rating	Symbol	Value	Units
Peak power dissipation with a 10/1000 $\mu$ s waveform (Fig.4)(Note 1)	P <sub>PP</sub>	600	W
Power Dissipation on Infinite Heat Sink at T <sub>L</sub> =75°C(Fig.3)	P <sub>D</sub>	5.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 2)	I <sub>FSM</sub>	100	A
Maximum instantaneous forward voltage at 50 A for unidirectional only <sup>(2)</sup>	V <sub>F</sub>	3.5/5.0	V
Operating Temperature Range Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

Notes:

1. Non-repetitive current pulse, per Fig.2 and derated above T<sub>A</sub>=25° C per Fig. 1.
2. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.



#### Electrical Characteristics

Type Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage		Test Current	Max. Clamping Voltage 10/1000µs	Max. Peak Pulse Current 10/1000µs	Reverse Leakage
					V <sub>BR</sub> @I <sub>T</sub>					
				UNI	BI	UNI	BI	V <sub>RWM</sub>	Min	Max
				V	V	V	mA	V	A	µA
SMBJ11A-TR	SMBJ11CA-TR	KZA	AZA	11.0	12.2	13.5	1	18.2	32.97	1
SMBJ12A-TR	SMBJ12CA-TR	LEA	BEA	12.0	13.3	14.7	1	19.9	30.15	1
SMBJ13A-TR	SMBJ13CA-TR	LGA	BGA	13.0	14.4	15.9	1	21.5	27.91	1
SMBJ14A-TR	SMBJ14CA-TR	LKA	BKA	14.0	15.6	17.2	1	23.2	25.86	1
SMBJ15A-TR	SMBJ15CA-TR	LMA	BMA	15.0	16.7	18.5	1	24.4	24.59	1
SMBJ16A-TR	SMBJ16CA-TR	LPA	BPA	16.0	17.8	19.7	1	26.0	23.08	1
SMBJ17A-TR	SMBJ17CA-TR	LRA	BRA	17.0	18.9	20.9	1	27.6	21.74	1
SMBJ18A-TR	SMBJ18CA-TR	LTA	BTA	18.0	20.0	22.1	1	29.2	20.55	1
SMBJ19A-TR	SMBJ19CA-TR	LBA	BBA	19.0	21.1	23.3	1	30.8	19.49	1
SMBJ20A-TR	SMBJ20CA-TR	LVA	BVA	20.0	22.2	24.5	1	32.4	18.52	1
SMBJ22A-TR	SMBJ22CA-TR	LXA	BXA	22.0	24.4	26.9	1	35.5	16.90	1
SMBJ24A-TR	SMBJ24CA-TR	LZA	BZA	24.0	26.7	29.5	1	38.9	15.42	1
SMBJ26A-TR	SMBJ26CA-TR	MEA	CEA	26.0	28.9	31.9	1	42.1	14.25	1
SMBJ28A-TR	SMBJ28CA-TR	MGA	CGA	28.0	31.1	34.4	1	45.4	13.22	1
SMBJ30A-TR	SMBJ30CA-TR	MKA	CKA	30.0	33.3	36.8	1	48.4	12.40	1
SMBJ33A-TR	SMBJ33CA-TR	MMA	CMA	33.0	36.7	40.6	1	53.3	11.26	1
SMBJ36A-TR	SMBJ36CA-TR	MPA	CPA	36.0	40.0	44.2	1	58.1	10.33	1
SMBJ40A-TR	SMBJ40CA-TR	MRA	CRA	40.0	44.4	49.1	1	64.5	9.30	1
SMBJ43A-TR	SMBJ43CA-TR	MTA	CTA	43.0	47.8	52.8	1	69.4	8.65	1
SMBJ45A-TR	SMBJ45CA-TR	MVA	CVA	45.0	50.0	55.3	1	72.7	8.25	1
SMBJ48A-TR	SMBJ48CA-TR	MXA	CXA	48.0	53.3	58.9	1	77.4	7.75	1
SMBJ51A-TR	SMBJ51CA-TR	MZA	CZA	51.0	56.7	62.7	1	82.4	7.28	1
SMBJ54A-TR	SMBJ54CA-TR	NEA	DEA	54.0	60.0	66.3	1	87.1	6.89	1
SMBJ58A-TR	SMBJ58CA-TR	NGA	DGA	58.0	64.4	71.2	1	93.6	6.41	1
SMBJ60A-TR	SMBJ60CA-TR	NKA	DKA	60.0	66.7	73.7	1	96.8	6.20	1
SMBJ64A-TR	SMBJ64CA-TR	NMA	DMA	64.0	71.1	78.6	1	103.0	5.83	1
SMBJ70A-TR	SMBJ70CA-TR	NPA	DPA	70.0	77.8	86.0	1	113.0	5.31	1
SMBJ75A-TR	SMBJ75CA-TR	NRA	DRA	75.0	83.3	92.1	1	121.0	4.96	1
SMBJ78A-TR	SMBJ78CA-TR	NTA	DTA	78.0	86.7	95.8	1	126.0	4.76	1
SMBJ85A-TR	SMBJ85CA-TR	NVA	DVA	85.0	94.4	104.0	1	137.0	4.38	1

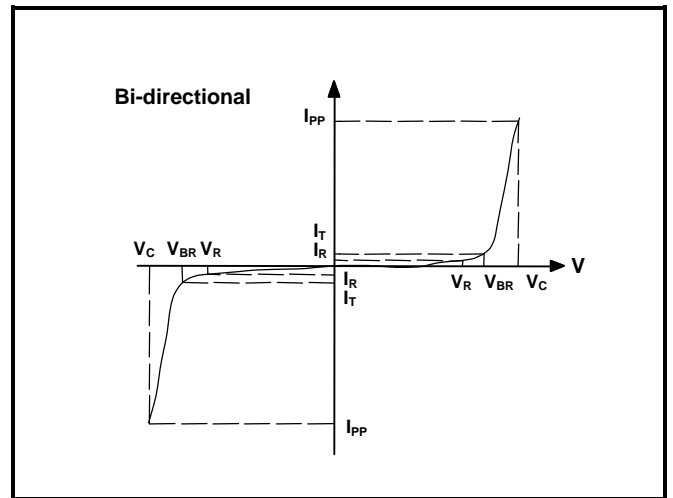
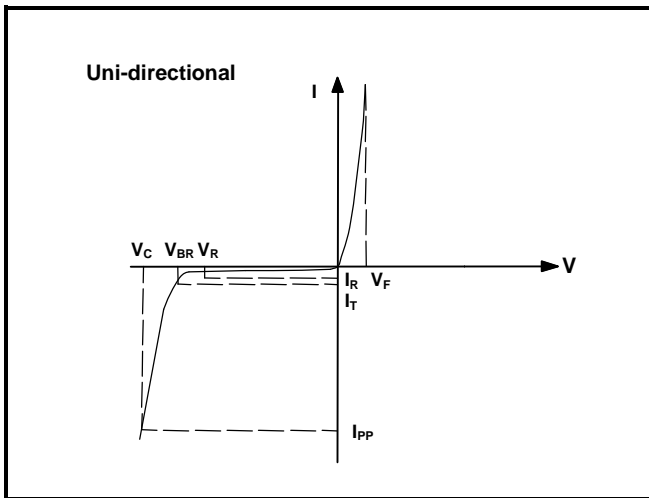


**Electrical Characteristics**

Type Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage		Test Current	Max. Clamping Voltage 10/1000µs	Max. Peak Pulse Current 10/1000µs	Reverse Leakage
					$V_{BR} @ I_T$					
				UNI	BI	UNI	BI	$V_{RWM}$	Min	Max
				V	V	V	mA	V	A	µA
SMBJ90A-TR	SMBJ90CA-TR	NXA	DXA	90.0	100.0	111.0	1	146.0	4.11	1
SMBJ100A-TR	SMBJ100CA-TR	NZA	DZA	100.0	111.0	123.0	1	162.0	3.70	1
SMBJ110A-TR	SMBJ110CA-TR	PEA	EEA	110.0	122.0	135.0	1	177.0	3.39	1
SMBJ120A-TR	SMBJ120CA-TR	PGA	EGA	120.0	133.0	147.0	1	193.0	3.11	1
SMBJ130A-TR	SMBJ130CA-TR	PKA	EKA	130.0	144.0	159.0	1	209.0	2.87	1
SMBJ140A-TR	SMBJ140CA-TR	PBA	EBA	140.0	155.0	171.0	1	226.8	2.65	1
SMBJ150A-TR	SMBJ150CA-TR	PMA	EMA	150.0	167.0	185.0	1	243.0	2.47	1
SMBJ160A-TR	SMBJ160CA-TR	PPA	EPA	160.0	178.0	197.0	1	259.0	2.32	1
SMBJ170A-TR	SMBJ170CA-TR	PRA	ERA	170.0	189.0	209.0	1	275.0	2.18	1

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

**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 though the TVS at a specified test current ( $I_T$ )

$V_C$  Clamping Voltage -- Peak voltage measured across the TVS 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 ( $T_A=25^\circ\text{C}$  unless otherwise noted)

Figure 1 - Pulse Derating Curve

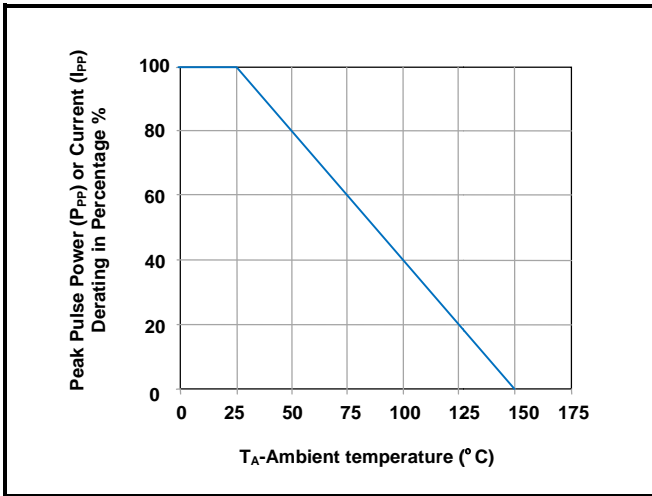


Figure 2 - Pulse Waveform

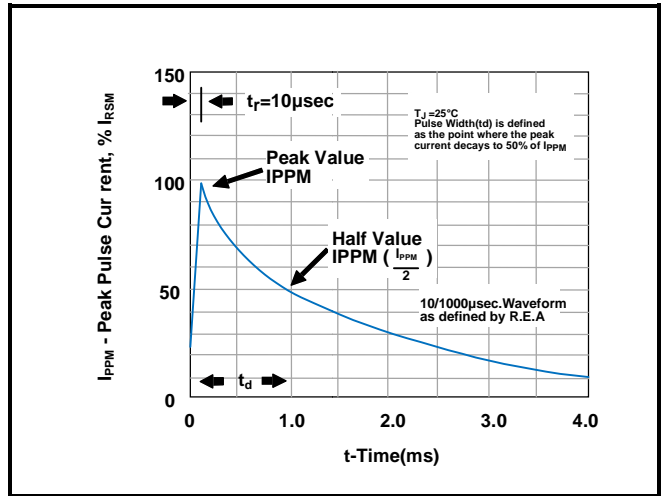


Figure 3 - Steady State Power Derating Curve

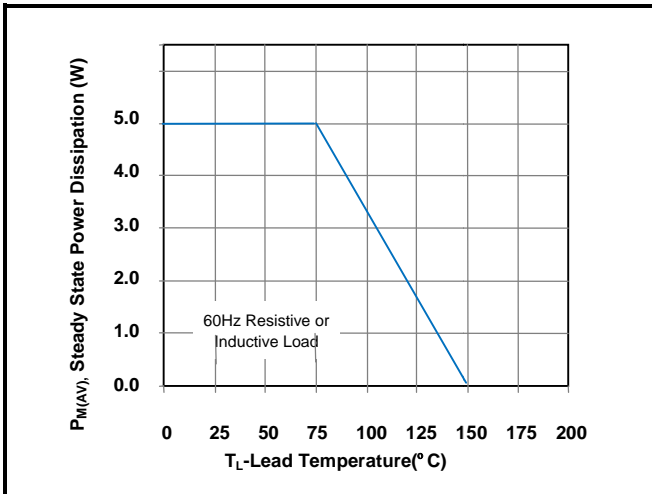


Figure 4 - Peak Pulse Power Rating Curve

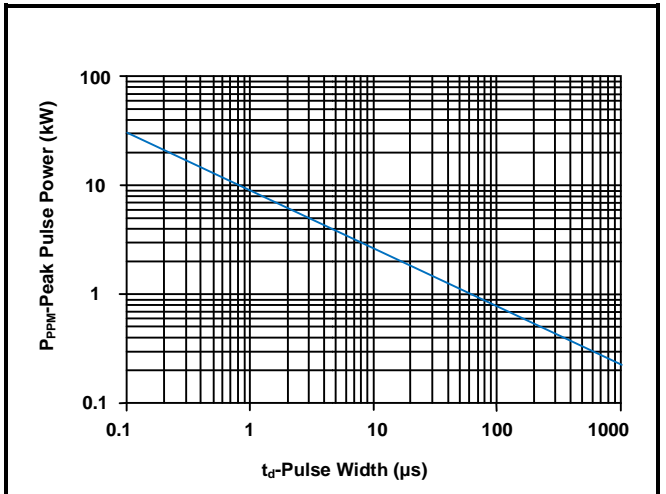


Figure 5 - Maximum Non-Repetitive Surge Current

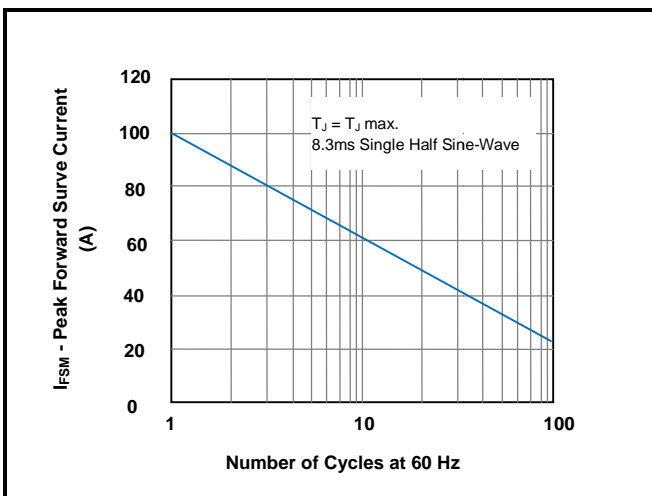
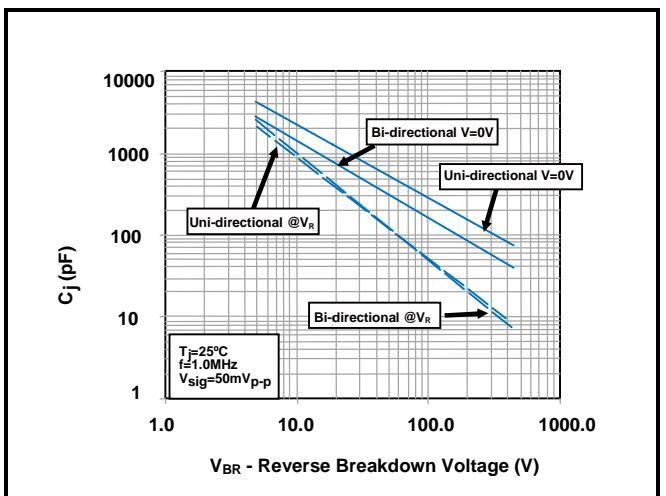
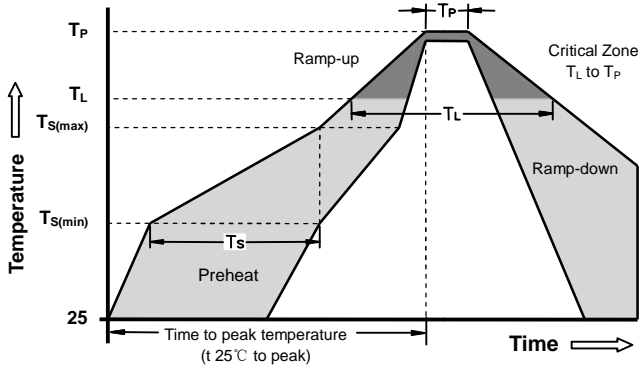


Figure 6 - Typical Junction Capacitance

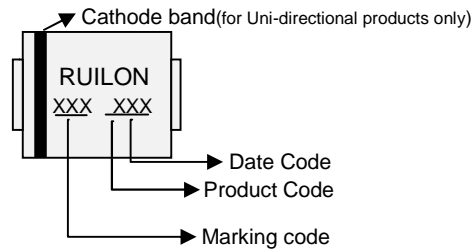


**Soldering Parameters - Reflow Soldering (Surface Mount Devices)**

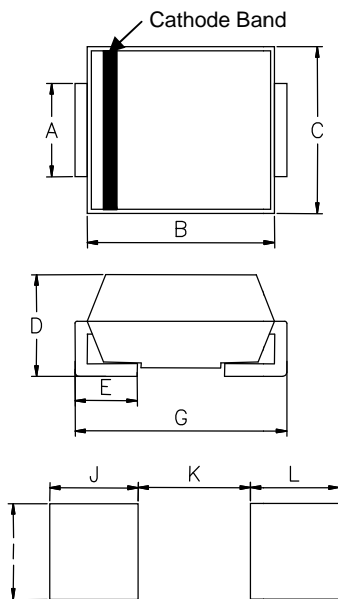


Reflow Condition		Pb - Free assembly
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	150°C
	-Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 -180 Seconds
Average ramp up rate ( Liquids Temp $T_L$ to peak)		3°C/second max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/second max
Reflow	- Temperature ( $T_L$ ) (Liquids)	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		260°C

**Part Marking System**



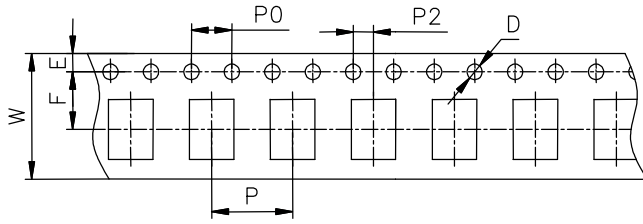
**Dimensions**



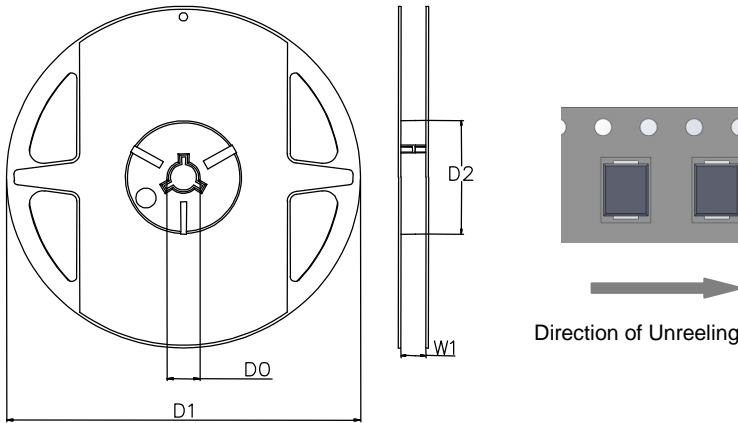
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.96	2.20	0.078	0.086
B	4.35	4.85	0.171	0.191
C	3.30	3.75	0.130	0.148
D	2.13	2.44	0.084	0.096
E	0.75	1.51	0.030	0.059
G	5.10	5.50	0.201	0.217
I	2.26	-	0.089	-
J	2.16	-	0.085	-
K	-	2.74	-	0.107
L	2.16	-	0.085	-



**Taping and Reel Specifications**



Symbol	Millimeters	Inches
W	12±0.3	0.472±0.012
P	8±0.1	0.315±0.004
F	5.5±0.1	0.217±0.004
E	1.75±0.1	0.069±0.004
D	1.5+0.1/-0.0	0.059+0.004/-0.0
P0	4±0.1	0.157±0.004
P2	2±0.1	0.079±0.004
D0	16.7±0.15	0.657±0.006
D1	178±2	7.007±0.079
D2	59.6+1/-2	2.346+0.039/-0.079
W1	12.64±0.4	0.498±0.016



Part Number	Component package	Quantity	Packaging option	Packaging specification
SMBJXXXA/CA-TR	DO-214AA(SMB)	500	Tape&Reel-12mm/7"tape	EIA STD RS-481

