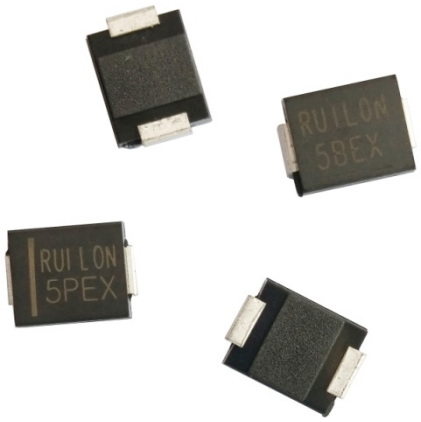
Description

The SMDJ-TR series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.



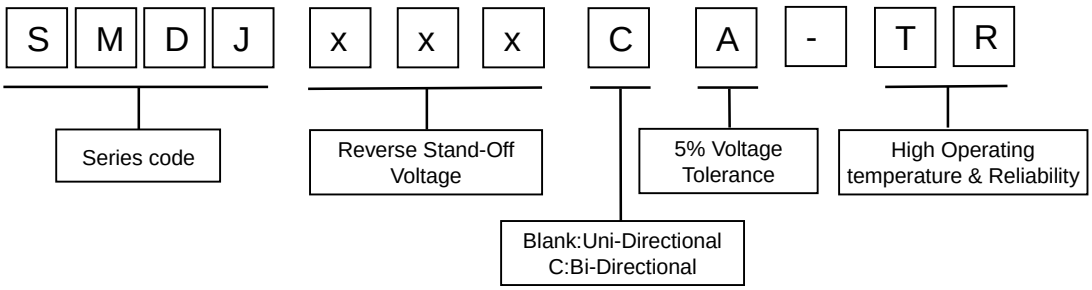
Features

- Glass passivated chip
- 3000 W peak pulse power capability with a 10/1000 μs waveform, repetitive rate (duty cycle):0.01 %
- High reliability application and automotive grade AEC Q101 qualified
- Low leakage
- Uni and Bidirectional unit
- Excellent clamping capability
- Very fast response time
- ROHS compliant

Mechanical Data

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

Part Number Code



Mechanical Characteristics

Rating	Symbol	Value	Units
Peak power dissipation with a 10/1000μs waveform(1)	P_{PP}	3000	W
Power Dissipation on Infinite Heat Sink at T_L=50°C	P_D	6.5	W
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only(2)	I_{FSM}	300	A
Operating junction and Storage Temperature Range.	T_J,T_{STG}	-55 to 150	°C

1. Non-repetitive current pulse per Fig.5 and derated above T_A= 25 °C per Fig.1.
2. Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

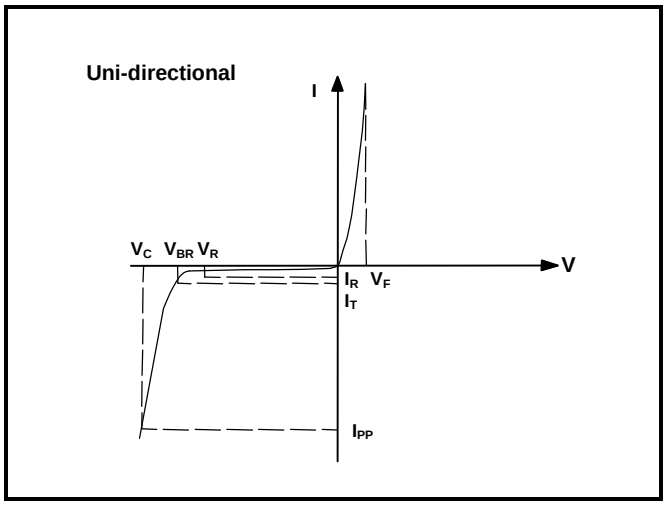
Electrical Characteristics

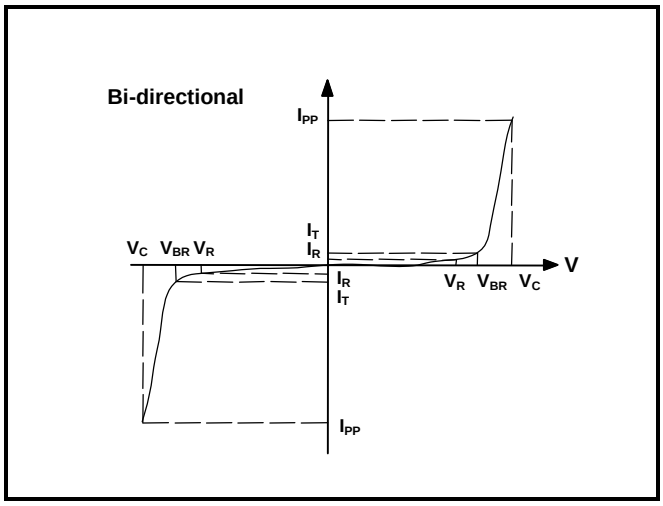
Type Number		Marking		Working Peak Reverse Voltage	Breakdown Voltage		Test Current	Max. Clamping Voltage	Max. Peak Pulse Current	Max. Reverse Leakage
				V_R	V_{BR} @I_T		I_T	V_C@I_{PP}	I_{PP}	I_R@V_R
					Min	Max				
UNI	BI	UNI	BI	V	V	V	mA	V	A	μA
SMDJ10A-TR	SMDJ10CA-TR	PDXA	DDXA	10.0	11.10	12.30	1	17.0	176.47	15
SMDJ11A-TR	SMDJ11CA-TR	PDZA	DDZA	11.0	12.20	13.50	1	18.2	164.84	2
SMDJ12A-TR	SMDJ12CA-TR	PEEA	DEEA	12.0	13.30	14.70	1	19.9	150.75	2
SMDJ13A-TR	SMDJ13CA-TR	PEGA	DEGA	13.0	14.40	15.90	1	21.5	139.53	2
SMDJ14A-TR	SMDJ14CA-TR	PEKA	DEKA	14.0	15.60	17.20	1	23.2	129.31	2
SMDJ15A-TR	SMDJ15CA-TR	PEMA	DEMA	15.0	16.70	18.50	1	24.4	122.95	2
SMDJ16A-TR	SMDJ16CA-TR	PEPA	DEPA	16.0	17.80	19.70	1	26.0	115.38	2
SMDJ17A-TR	SMDJ17CA-TR	PERA	DERA	17.0	18.90	20.90	1	27.6	108.70	2
SMDJ18A-TR	SMDJ18CA-TR	PETA	DETA	18.0	20.00	22.10	1	29.2	102.74	2
SMDJ19A-TR	SMDJ19CA-TR	PEBA	DEBA	19.0	21.10	23.30	1	30.8	97.47	2
SMDJ20A-TR	SMDJ20CA-TR	PEVA	DEVA	20.0	22.20	24.50	1	32.4	92.59	2
SMDJ22A-TR	SMDJ22CA-TR	PEXA	DEXA	22.0	24.40	26.90	1	35.5	84.51	2
SMDJ24A-TR	SMDJ24CA-TR	PEZA	DEZA	24.0	26.70	29.50	1	38.9	77.12	2
SMDJ26A-TR	SMDJ26CA-TR	PFEA	DFEA	26.0	28.90	31.90	1	42.1	71.26	2
SMDJ28A-TR	SMDJ28CA-TR	PFGA	DFGA	28.0	31.10	34.40	1	45.4	66.08	2
SMDJ30A-TR	SMDJ30CA-TR	PFKA	DFKA	30.0	33.30	36.80	1	48.4	61.98	2
SMDJ33A-TR	SMDJ33CA-TR	PFMA	DFMA	33.0	36.70	40.60	1	53.3	56.29	2
SMDJ36A-TR	SMDJ36CA-TR	PFPA	DFPA	36.0	40.00	44.20	1	58.1	51.64	2
SMDJ40A-TR	SMDJ40CA-TR	PFRA	DFRA	40.0	44.40	49.10	1	64.5	46.51	2
SMDJ43A-TR	SMDJ43CA-TR	PFTA	DFTA	43.0	47.80	52.80	1	69.4	43.23	2

Note:

1. Add suffix 'C 'or ' CA ' after part number to specify Bi-directional devices
2. For Bi-Directional devices having V_R of 10 volts , 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 Ippm (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°C unless otherwise noted)

Figure 1 - Pulse Derating Curve

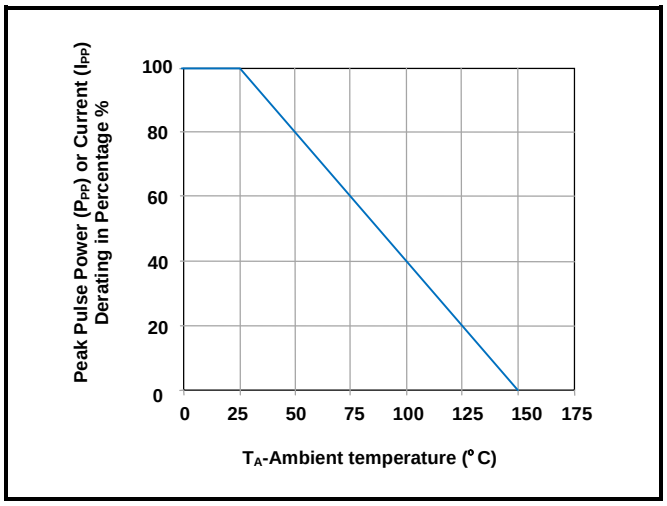


Figure 2 - Maximum Non-Repetitive Surge Current

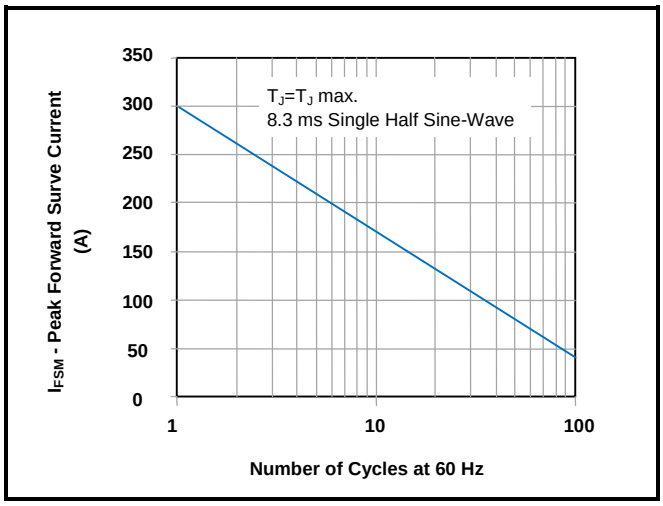


Figure 3 - Steady State Power Derating Curve

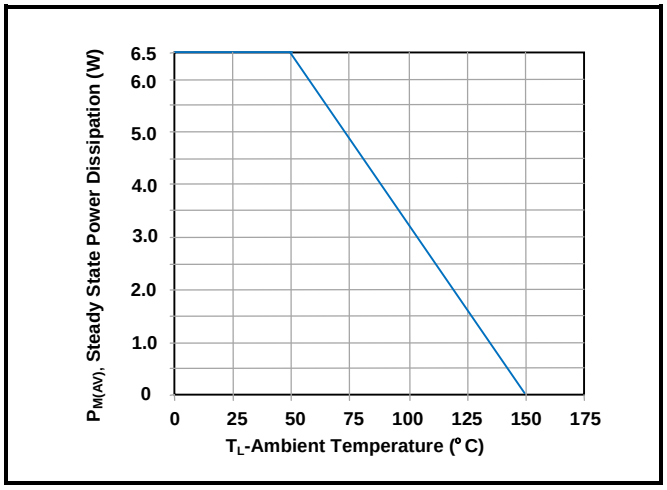


Figure 4 - Peak Pulse Power Rating Curve

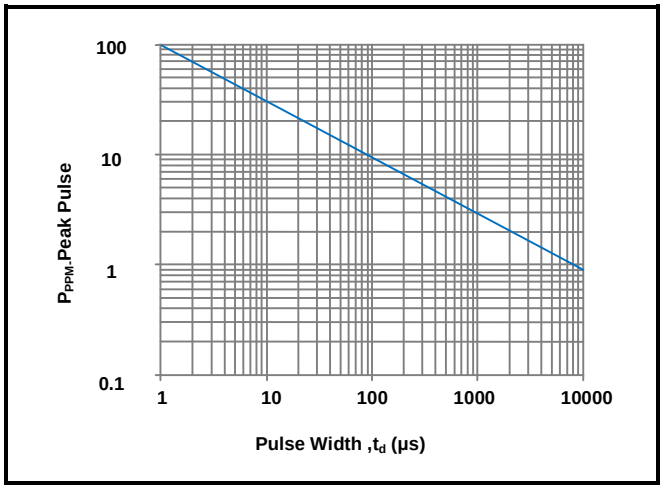


Figure 5 - Pulse Waveform

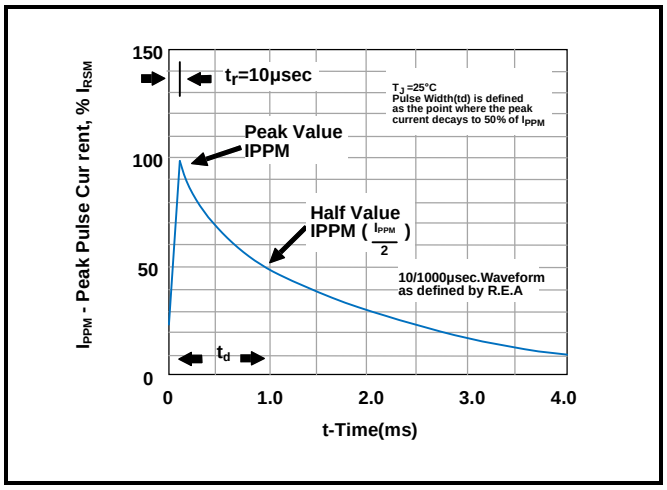
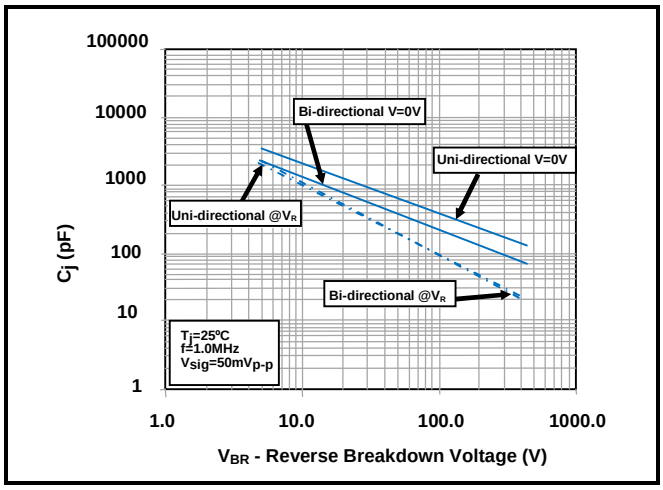
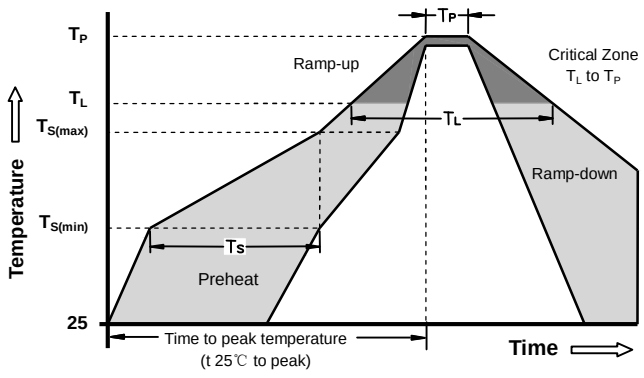


Figure 6 - Typical Junction Capacitance

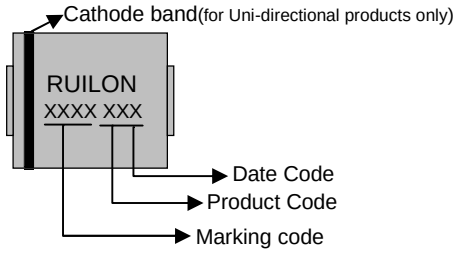


Soldering Parameters - Reflow Soldering (Surface Mount Devices)

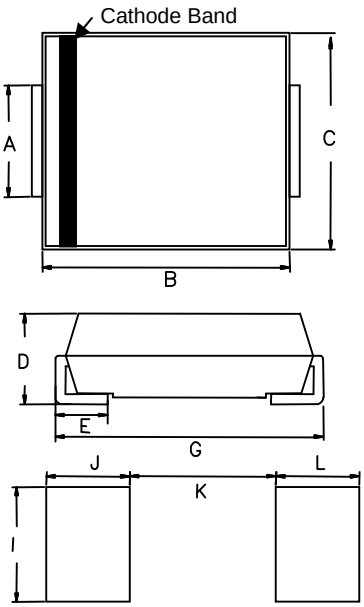


Reflow Condition		Pb - Free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 -180 Seconds
Average ramp up rate (Liquids Temp T_L) to peak		3°C/second max
$T_{S(max)}$ to TL - Ramp-up Rate		3°C/second max
Reflow	- Temperature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

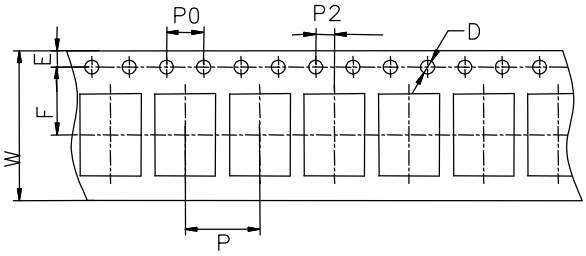


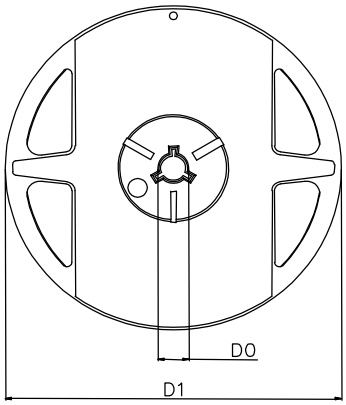
Dimensions

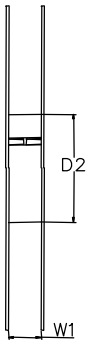


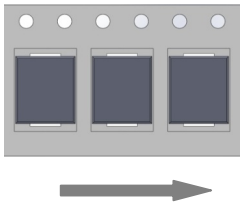
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.90	3.20	0.114	0.126
B	6.60	7.15	0.260	0.281
C	5.55	6.04	0.219	0.238
D	1.98	2.53	0.078	0.10
E	0.75	1.51	0.030	0.059
G	7.75	7.95	0.305	0.313
I	3.30	-	0.129	-
J	2.40	-	0.094	-
K	-	4.20	-	0.165
L	2.40	-	0.094	-

Taping and Reel Specifications









Direction of Unreeling

Symbol	Millimeters	Inches
W	16±0.3	0.630±0.012
P	8±0.1	0.315±0.004
F	7.25±0.1	0.285±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	17.2±0.4	0.677±0.016

Part Number	Component package	Quantity	Packaging option	Packaging specification
SMDJXXXA/CA-TR	DO-214AB(SMC)	500	Tape&Reel-16mm/7”tape	EIA STD RS-481