SMDJ-Q1 Series

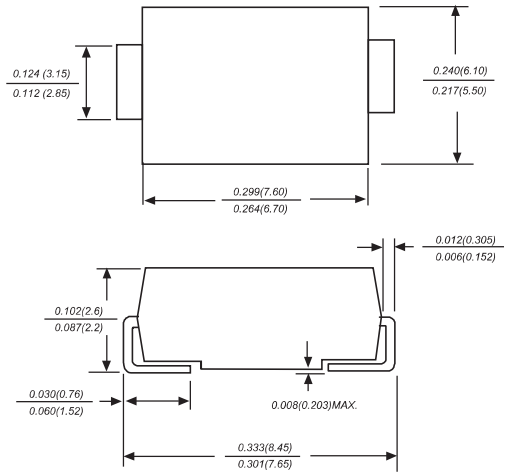
3000W Surface Mount Transient Voltage Suppressors - 5.0V-220V

Features

- 3000W peak pulse power capability with a 10/1000 us waveform, repetition rate (duty cycle): 0.01%.
- Excellent clamping capability.
- Low incremental surge resistance.
- Fast response time from 0V to VBR, typically less than 1 ps for uni-directional & 5 ns for bi-directional types.
- Glass passivated chip junction.
- Lead-free parts meet RoHS requirments.
- Compliant to Halogen-free
- Suffix "-Q1" for AEC-Q101.

Package outline

SMC/DO-214AB



Dimensions in inches and (millimeters)

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AB / SMC
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any

Maximum ratings (AT T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	Value	UNIT
Peak Power Dissipation	with a 10/1000 us waveform, Note 1, 2 & Fig. 1	P_{PPM}	3000	W
Peak Pulse current	with a 10/1000 us waveform	I_{PPM}	See Table 1	A
Steady State Power Dissipation	at T_L=75°C, Note 2	$P_{M(AV)}$	6.5	W
Peak Forward Surge Current	8.3ms Single Half Sine-Wave, Note 3	I_{FSM}	300	A
Maximum Instantaneours Forward Voltage	at 100A For Uni-Directional Types Only,Note 4	V_F	3.5/5.0	V
Operating Temperature range		T_J	-55 ~ +150	°C
Storage Temperature range		T_{STG}	-55 ~ +150	°C

Note 1. Non-repetitive current pulse, per Fig. 3 and derated above T_A=25°C per Fig. 2
2. Mounted on copper pad area of 0.31"x0.31" (8.0x8.0 mm) per Fig 5
3. Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum
4. V_F<3.5V for devices of V_{BR}<200V and V_F<5.0V for devices of V_{BR}>201V.

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Electrical characteristics (at T_A=25°C unless otherwise noted)

Part No.	Reverse Stand-off Voltage	Breakdown Voltage @I_T		Test Current	Maximum Clamping Voltage @I_{PP}		Maximum Reverse Leakage Current	Marking Code	
	V_{RWM}	$V_{BR\ Min}$	$V_{BR\ Max}$	I_T	V_c	I_{PP}	I_R@V_{RWM}		
	Volts	Volts	Volts	mA	Volts	A	μA	UNI	BI
SMDJ5.0(C)A-Q1	5.0	6.40	7.00	10	9.2	326.1	800	RDE	DDE
SMDJ6.0(C)A-Q1	6.0	6.67	7.37	10	10.3	291.3	800	RDG	DDG
SMDJ6.5(C)A-Q1	6.5	7.22	7.98	10	11.2	267.9	500	RDK	DDK
SMDJ7.0(C)A-Q1	7.0	7.78	8.60	10	12.0	250.0	200	PDM	DDM
SMDJ7.5(C)A-Q1	7.5	8.33	9.21	1.0	12.9	232.6	100	PDP	DDP
SMDJ8.0(C)A-Q1	8.0	8.89	9.83	1.0	13.6	220.6	50	PDR	DDR
SMDJ8.5(C)A-Q1	8.5	9.44	10.4	1.0	14.4	208.3	20	PDT	DDT
SMDJ9.0(C)A-Q1	9.0	10.0	11.1	1.0	15.4	194.8	10	PDV	DDV
SMDJ10(C)A-Q1	10	11.1	12.3	1.0	17.0	176.5	5	PDX	DDX
SMDJ11(C)A-Q1	11	12.2	13.5	1.0	18.2	164.8	2	PDZ	DDZ
SMDJ12(C)A-Q1	12	13.3	14.7	1.0	19.9	150.8	2	PEE	DEE
SMDJ13(C)A-Q1	13	14.4	15.9	1.0	21.5	139.5	2	PEG	DEG
SMDJ14(C)A-Q1	14	15.6	17.2	1.0	23.2	129.3	2	PEK	DEK
SMDJ15(C)A-Q1	15	16.7	18.5	1.0	24.4	123.0	2	PEM	DEM
SMDJ16(C)A-Q1	16	17.8	19.7	1.0	26.0	115.4	2	PEP	DEP
SMDJ17(C)A-Q1	17	18.9	20.9	1.0	27.6	108.7	2	PER	DER
SMDJ18(C)A-Q1	18	20.0	22.1	1.0	29.2	102.7	2	PET	DET
SMDJ20(C)A-Q1	20	22.2	24.5	1.0	32.4	92.6	2	PEV	DEV
SMDJ22(C)A-Q1	22	24.4	26.9	1.0	35.5	84.5	2	PEX	DEX
SMDJ24(C)A-Q1	24	26.7	29.5	1.0	38.9	77.1	2	PEZ	DEZ
SMDJ26(C)A-Q1	26	28.9	31.9	1.0	42.1	71.3	2	PFE	DFE
SMDJ28(C)A-Q1	28	31.1	34.4	1.0	45.4	66.1	2	PFG	DFG
SMDJ30(C)A-Q1	30	33.3	36.8	1.0	48.4	62.0	2	PFK	DFK
SMDJ33(C)A-Q1	33	36.7	40.6	1.0	53.3	56.3	2	PFM	DFM
SMDJ36(C)A-Q1	36	40.0	44.2	1.0	58.1	51.6	2	PFP	DFP
SMDJ40(C)A-Q1	40	44.4	49.1	1.0	64.5	46.5	2	PFR	DFR
SMDJ43(C)A-Q1	43	47.8	52.8	1.0	69.4	43.2	2	PFT	DFT
SMDJ45(C)A-Q1	45	50.0	55.3	1.0	72.7	41.3	2	PFV	DFV
SMDJ48(C)A-Q1	48	53.3	58.9	1.0	77.4	38.8	2	PFX	DFX
SMDJ51(C)A-Q1	51	56.7	62.7	1.0	82.4	36.4	2	PFZ	DFZ
SMDJ54(C)A-Q1	54	60.0	66.3	1.0	87.1	34.4	2	PGE	DGE
SMDJ58(C)A-Q1	58	64.4	71.2	1.0	93.6	32.1	2	PGG	DGG
SMDJ60(C)A-Q1	60	66.7	73.7	1.0	96.8	31.0	2	PGK	DGK
SMDJ64(C)A-Q1	64	71.1	78.6	1.0	103.0	29.1	2	PGM	DGM
SMDJ70(C)A-Q1	70	77.8	86.0	1.0	113.0	26.5	2	PGP	DGP
SMDJ75(C)A-Q1	75	83.3	92.1	1.0	121.0	24.8	2	PGR	DGR
SMDJ78(C)A-Q1	78	86.7	95.8	1.0	126.0	23.8	2	PGT	DGT
SMDJ85(C)A-Q1	85	94.4	104	1.0	137.0	21.9	2	PGV	DGV

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Part No.	Reverse Stand-off Voltage	Breakdown Voltage @I_T		Test Current	Maximum Clamping Voltage @I_{PP}		Maximum Reverse Leakage Current	Marking Code	
	V_{RWM}	$V_{BR\ Min}$	$V_{BR\ Max}$	I_T	V_C	I_{PP}	I_R@V_{RWM}		
	Volts	Volts	Volts	mA	Volts	A	μA	UNI	BI
SMDJ90(C)A-Q1	90	100	111	1.0	146.0	20.5	2	PGX	DGX
SMDJ100(C)A-Q1	100	111	123	1.0	162.0	18.5	2	PGZ	DGZ
SMDJ110(C)A-Q1	110	122	135	1.0	177.0	16.9	2	PHE	DHE
SMDJ120(C)A-Q1	120	133	147	1.0	193.0	15.5	2	PHG	DHG
SMDJ130(C)A-Q1	130	144	159	1.0	209.0	14.4	2	PHK	DHK
SMDJ150(C)A-Q1	150	167	185	1.0	243.0	12.3	2	PHM	DHM
SMDJ160(C)A-Q1	160	178	197	1.0	259.0	11.6	2	PHP	DHP
SMDJ170(C)A-Q1	170	189	209	1.0	275.0	10.9	2	PHR	DHR
SMDJ180(C)A-Q1	180	200	222	1.0	292.0	10.3	2	HHT	IHT
SMDJ200(C)A-Q1	200	224	247	1.0	324.0	9.3	2	HHX	IHX
SMDJ220(C)A-Q1	220	246	272	1.0	356.0	8.4	2	HIE	IIE

Note 1. V_{BR} measured after I_T applied for 300us, I_T=square wave pulse or equivalent
2. Surge current waveform per Fig. 3 and derated per Fig. 2
3. For bi-directional types having V_{RWM} of 10 volts and less, the I_R limit is doubled
4. Suffix 'C' denotes bi-directional devices. Suffix 'A' denotes 5% tolerance devices, no suffix denotes 10% tolerance devices.
5. All terms and symbols are consistent with ANS/IEEE C62.35
6. Transient Voltage Suppressors (TVS) are devices used to protect vulnerable circuits from electrical overstress such as that caused by electrostatic discharge, inductive load switching and induced lightning. Within the TVS, damaging voltage spikes are limited by clamping or avalanche action of a rugged silicon pn junction which reduces the amplitude of the transient to a nondestructive level. See Fig. 7 & Fig. 8

Rating and characteristic curves (SMDJ-Q1 Series)

Fig.1 - Pealk Pulse Power Rating Curve

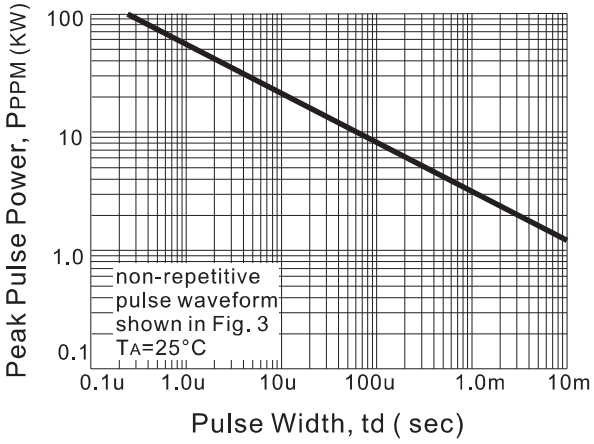
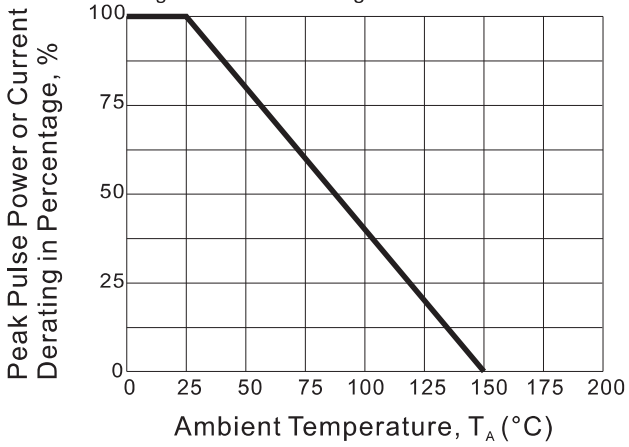


Fig.2 - Pulse Derating Curve



Rating and characteristic curves (SMDJ-Q1 Series)

Fig.3 - Pulse Waveform

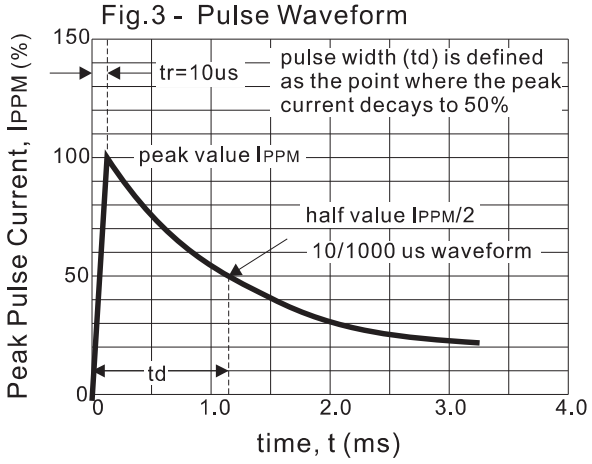


Fig.4 - Typical Junction Capacitance

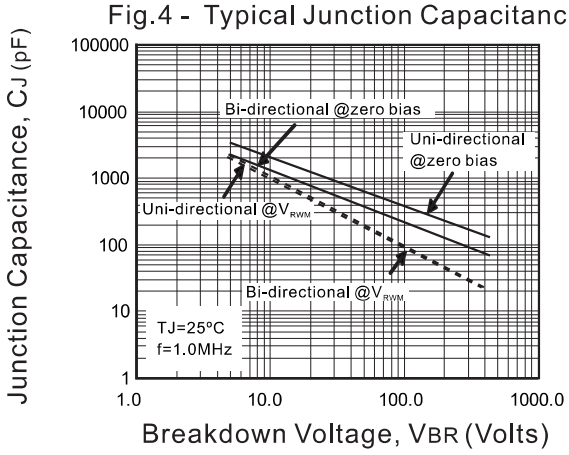


Fig.5 - Steady State Power Derating Curve

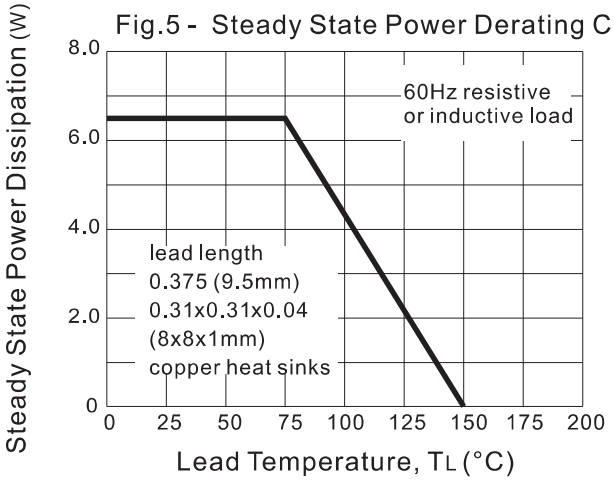


Fig.6 - Maximum Non-Repetitive Forward Surge Current

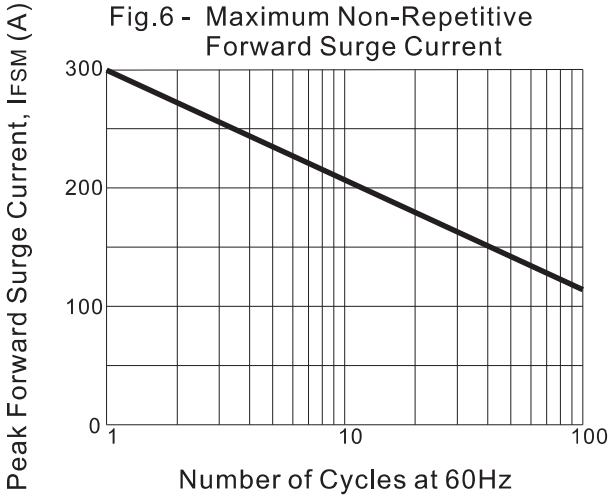


Fig. 7 - Transients of several thousand volts can be clamped to a safe level by the TVS

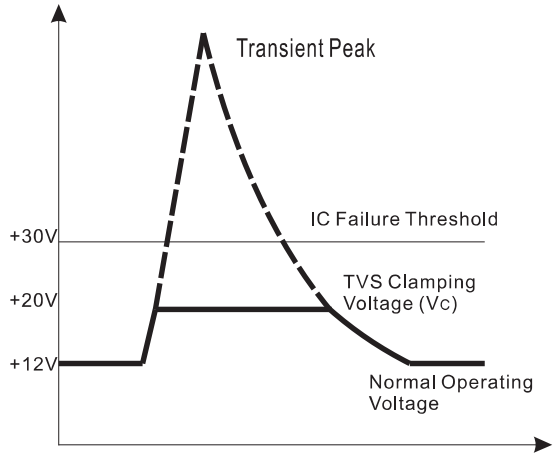
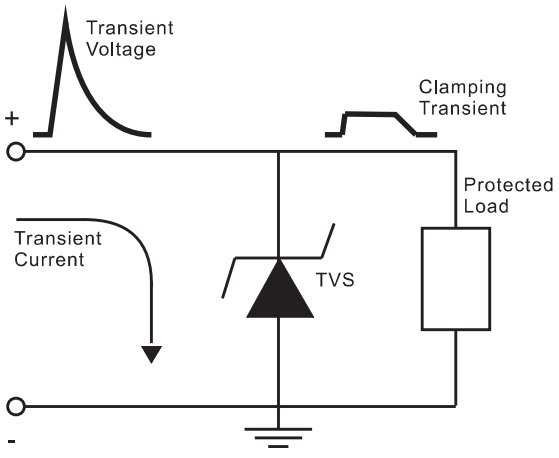


Fig. 8 - Transient current is divered to ground thru TVS; the voltage seen by the protected load is limited to the clamping voltage level



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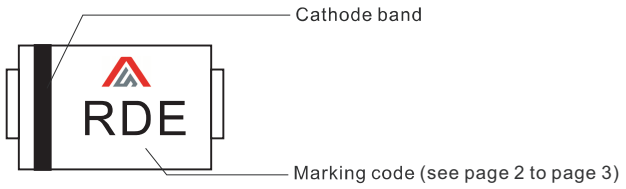
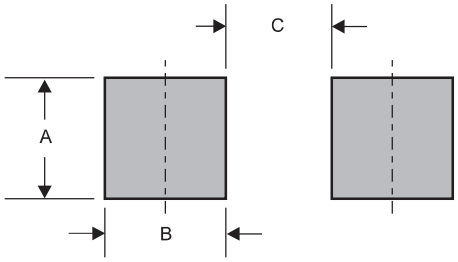
Pinning information

Pin	Simplified outline	Symbol
Uni-Directional Pin1 cathode Pin2 anode		
Bi-Directional		

Marking

Type number	Example
Uni-Directional	
Bi-Directional	

Suggested solder pad layout



Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMC	0.132 (3.30)	0.100 (2.50)	0.176(4.40)