

SMCJ-Q Series

Surface Mount – 1500W



Additional Information



Resources



Accessories



Samples

Maximum Ratings and Thermal Characteristics

(T_A=25 °C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000µs Waveform(Fig.1)(Note1)(Note2) -Single Die Parts	P _{PPM}	1500	W
Power Dissipation on Infinite Heat Sink at T _L =50°C	P _D	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	I _{FSM}	200	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only (Note 4)	V _F	3.5/5.0	V
Operating Temperature Range	T _J	-55 to 150	°C
Storage Temperature Range	T _{STG}	-55 to 150	°C
Typical Thermal Resistance Junction to Lead	R _{θJL}	15	°C/W
Typical Thermal Resistance Junction to Ambient	R _{θJA}	75	°C/W

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above T_J (initial) =25°C per Fig.2.
2. Mounted on copper pad area of 0.31x0.31" (8.0 x 8.0mm) to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.
4. V_F < 3.5V for single die parts and V_F < 5.0V for stacked-die parts.

Description

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

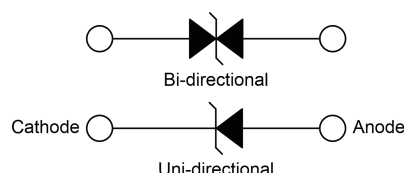
Features

- High reliability application and automotive grade AEC-Q101 qualified
- 1500W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycles):0.01 %
- Excellent clamping capability
- Low incremental surge resistance
- Typical I_R less than 1µA when V_B min>12V
- For surface mounted applications to optimize board space
- Low profile package
- Built-in strain relief
- 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
- ESD protection of data lines in accordance with IEC61000-4-2, 30kV(Air), 30kV (Contact)
- EFT protection of data lines in accordance with IEC61000-4-4
- Fast response time: typically less than 1.0ps from 0V to V_B min
- Glass passivated chip junction
- High temperature to reflow soldering guaranteed: 260 °C/20~40sec.
- V_B @T_J=V_B @25 °C x(1+ α T x(T_J-25)) (α T:Temperature Coefficient, typical value is 0.1%)
- Meet MSL level1, per J-STD-020,LF maximum peak of 260 °C
- Matte tin lead-free plated
- Halogen free and RoHS compliant

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.

Functional Diagram



SMCJ-Q Series

Surface Mount – 1500W

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

Part Number		Type	Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @ I_T		Test Current	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current	Reverse Leakage @ V_R
Uni.	Bi.		Uni.	Bi.	$V_R(V)$	$V_B \text{ Min.}(V)$	$V_B \text{ Max.}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
SMCJ5.0A	SMCJ5.0CA	Q	GDE	BDE	5.0	6.40	7.00	10	9.2	163.0	800
SMCJ6.0A	SMCJ6.0CA	Q	GDG	BDG	6.0	6.67	7.37	10	10.3	145.7	800
SMCJ6.5A	SMCJ6.5CA	Q	GDK	BDK	6.5	7.22	7.98	10	11.2	134.0	500
SMCJ7.0A	SMCJ7.0CA	Q	GDM	BDM	7.0	7.78	8.60	10	12.0	125.0	200
SMCJ7.5A	SMCJ7.5CA	Q	GDP	BDP	7.5	8.33	9.21	1	12.9	116.3	100
SMCJ8.0A	SMCJ8.0CA	Q	GDR	BDR	8.0	8.89	9.83	1	13.6	110.3	50
SMCJ8.5A	SMCJ8.5CA	Q	GDT	BDT	8.5	9.44	10.40	1	14.4	104.2	20
SMCJ9.0A	SMCJ9.0CA	Q	GDV	BDV	9.0	10.00	11.10	1	15.4	97.4	10
SMCJ10A	SMCJ10CA	Q	GDY	BDY	10.0	11.10	12.30	1	17.0	88.3	5
SMCJ11A	SMCJ11CA	Q	GDZ	BDZ	11.0	12.20	13.50	1	18.2	82.5	1
SMCJ12A	SMCJ12CA	Q	GEE	BEE	12.0	13.30	14.70	1	19.9	75.4	1
SMCJ13A	SMCJ13CA	Q	GEG	BEG	13.0	14.40	15.90	1	21.5	69.8	1
SMCJ14A	SMCJ14CA	Q	GEK	BEK	14.0	15.60	17.20	1	23.2	64.7	1
SMCJ15A	SMCJ15CA	Q	GEM	BEM	15.0	16.70	18.50	1	24.4	61.5	1
SMCJ16A	SMCJ16CA	Q	GEP	BEP	16.0	17.80	19.70	1	26.0	57.7	1
SMCJ17A	SMCJ17CA	Q	GER	BER	17.0	18.90	20.90	1	27.6	54.4	1
SMCJ18A	SMCJ18CA	Q	GET	BET	18.0	20.00	22.10	1	29.2	51.4	1
SMCJ20A	SMCJ20CA	Q	GEV	BEV	20.0	22.20	24.50	1	32.4	46.3	1
SMCJ22A	SMCJ22CA	Q	GEX	BEX	22.0	24.40	26.90	1	35.5	42.3	1
SMCJ24A	SMCJ24CA	Q	GEZ	BEZ	24.0	26.70	29.50	1	38.9	38.6	1
SMCJ26A	SMCJ26CA	Q	GFE	BFE	26.0	28.90	31.90	1	42.1	35.7	1
SMCJ28A	SMCJ28CA	Q	GFG	BFG	28.0	31.10	34.40	1	45.4	33.1	1
SMCJ30A	SMCJ30CA	Q	GFK	BFK	30.0	33.30	36.80	1	48.4	31.0	1
SMCJ33A	SMCJ33CA	Q	GFM	BFM	33.0	36.70	40.60	1	53.3	28.2	1
SMCJ36A	SMCJ36CA	Q	GFP	BFP	36.0	40.00	44.20	1	58.1	25.9	1
SMCJ40A	SMCJ40CA	Q	GFR	BFR	40.0	44.40	49.10	1	64.5	23.3	1
SMCJ43A	SMCJ43CA	Q	GFT	BFT	43.0	47.80	52.80	1	69.4	21.7	1
SMCJ45A	SMCJ45CA	Q	GFV	BFV	45.0	50.00	55.30	1	72.7	20.6	1
SMCJ48A	SMCJ48CA	Q	GFX	BFX	48.0	53.30	58.90	1	77.4	19.4	1
SMCJ51A	SMCJ51CA	Q	GFZ	BFZ	51.0	56.70	62.70	1	82.4	18.2	1
SMCJ54A	SMCJ54CA	Q	GGE	BGE	54.0	60.00	66.30	1	87.1	17.3	1
SMCJ58A	SMCJ58CA	Q	GGG	BGG	58.0	64.40	71.20	1	93.6	16.1	1
SMCJ60A	SMCJ60CA	Q	GGK	BGK	60.0	66.70	73.70	1	96.8	15.5	1
SMCJ64A	SMCJ64CA	Q	GGM	BGM	64.0	71.10	78.60	1	103.0	14.6	1
SMCJ70A	SMCJ70CA	Q	GGP	BGP	70.0	77.80	86.00	1	113.0	13.3	1
SMCJ75A	SMCJ75CA	Q	GGR	BGR	75.0	83.30	92.10	1	121.0	12.4	1
SMCJ78A	SMCJ78CA	Q	GGT	BGT	78.0	86.70	95.80	1	126.0	11.9	1
SMCJ85A	SMCJ85CA	Q	GGV	BGV	85.0	94.40	104.00	1	137.0	11.0	1
SMCJ90A	SMCJ90CA	Q	GGX	BGX	90.0	100.00	111.00	1	146.0	10.3	1
SMCJ100A	SMCJ100CA	Q	GGZ	BGZ	100.0	111.00	123.00	1	162.0	9.3	1
SMCJ110A	SMCJ110CA	Q	GHE	BHE	110.0	122.00	135.00	1	177.0	8.5	1
SMCJ120A	SMCJ120CA	Q	GHG	BHG	120.0	133.00	147.00	1	193.0	7.8	1
SMCJ130A	SMCJ130CA	Q	GHK	BHK	130.0	144.00	159.00	1	209.0	7.2	1
SMCJ150A	SMCJ150CA	Q	GHM	BHM	150.0	167.00	185.00	1	243.0	6.2	1
SMCJ160A	SMCJ160CA	Q	GHP	BHP	160.0	178.00	197.00	1	259.0	5.8	1
SMCJ170A	SMCJ170CA	Q	GHR	BHR	170.0	189.00	209.00	1	275.0	5.5	1
SMCJ180A	SMCJ180CA	Q	GHT	BHT	180.0	201.00	222.00	1	292.0	5.1	1
SMCJ190A	SMCJ190CA	Q	GHU	BHU	190.0	211.00	233.00	1	308.0	4.8	1
SMCJ200A	SMCJ200CA	Q	GHV	BHV	200.0	224.00	247.00	1	324.0	4.6	1
SMCJ210A	SMCJ210CA	Q	GHW	BHW	210.0	237.00	263.00	1	340.0	4.4	1
SMCJ220A	SMCJ220CA	Q	GHX	BHX	220.0	246.00	272.00	1	356.0	4.2	1
SMCJ250A	SMCJ250CA	Q	GHZ	BHZ	250.0	279.00	309.00	1	405.0	3.7	1
SMCJ300A	SMCJ300CA	Q	GJE	BJE	300.0	335.00	371.00	1	486.0	3.1	1
SMCJ350A	SMCJ350CA	Q	GJG	BJG	350.0	391.00	432.00	1	567.0	3.5	1
SMCJ400A	SMCJ400CA	Q	GJK	BJK	400.0	447.00	494.00	1	648.0	3.0	1
SMCJ440A	SMCJ440CA	Q	GJM	BJM	440.0	492.00	543.00	1	713.0	2.8	1

Notes:

For bidirectional type having V_R of 10 volts and less, the I_R limit is double.

SMCJ-Q Series

Surface Mount – 1500W

Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)

Figure 1:
Peak Pulse Power Rating Curve

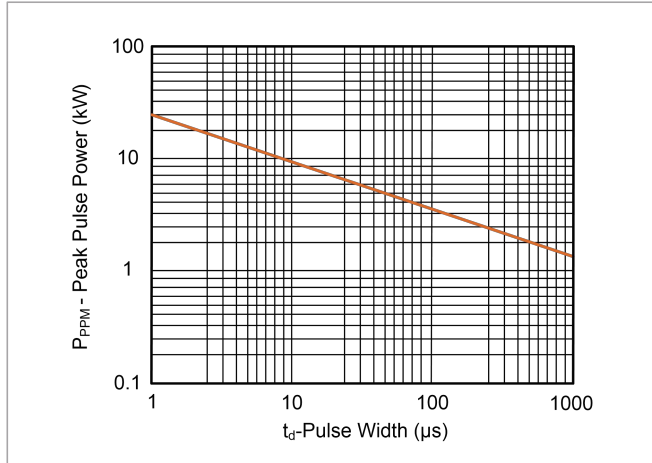


Figure 2:
Pulse Derating Curve

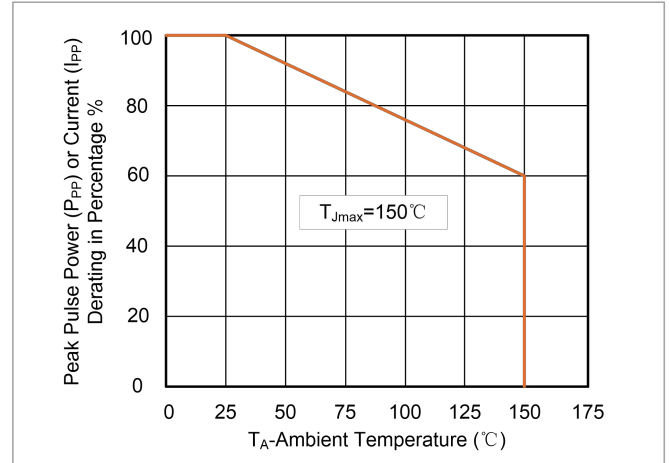


Figure 3:
Pulse Waveform

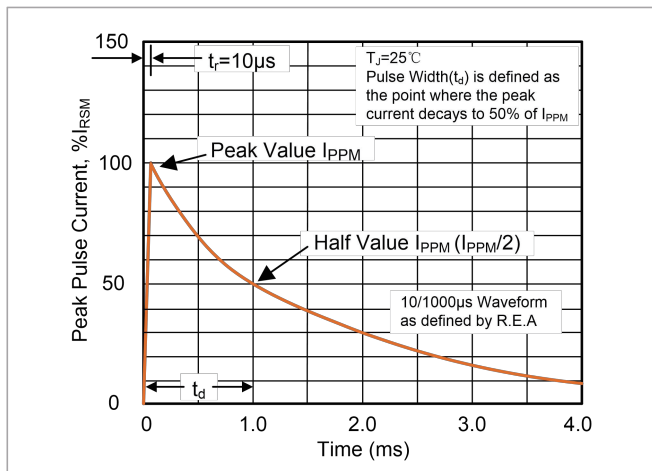


Figure 4:
Typical Junction Capacitance

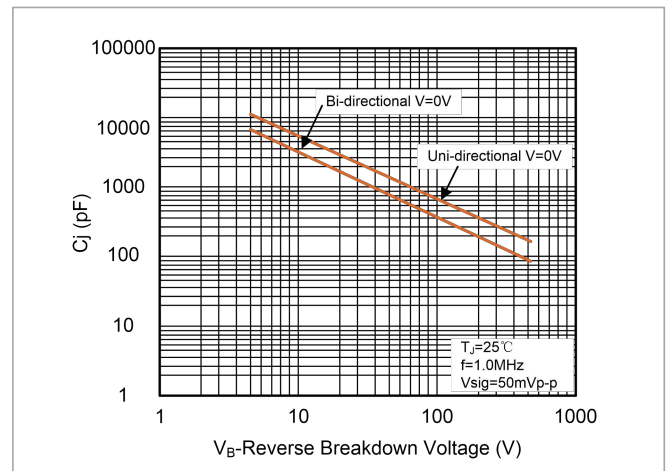


Figure 5:
Steady State Power Dissipation Derating Curve

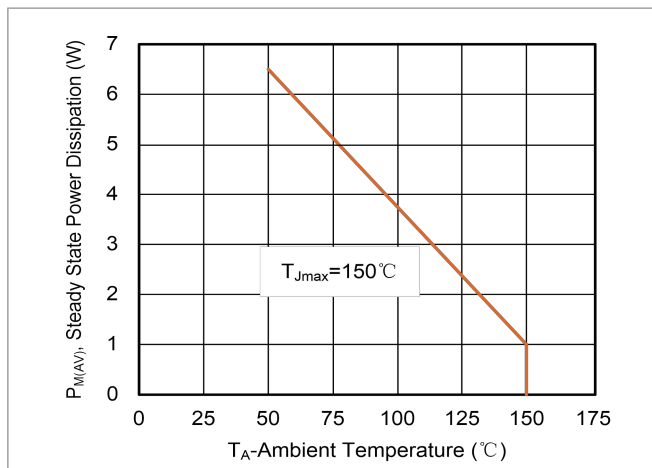
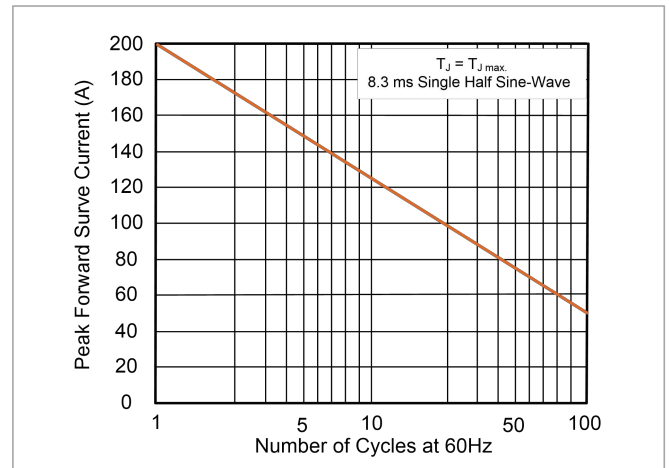


Figure 6:
Maximum Non-Repetitive Forward Surge Current Uni-Directional

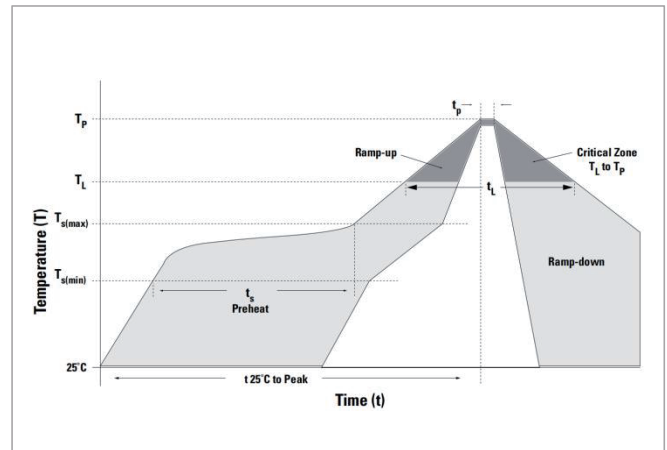


SMCJ-Q Series

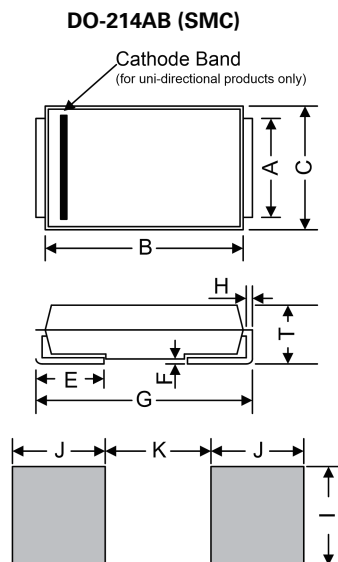
Surface Mount – 1500W

Soldering Parameters

Reflow Condition		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 secs
Average ramp-up rate(Liquidus 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) (Liquidus)	217°C
	-Time (min to max) (t_L)	60-150 seconds
Peak Temperature (T_P)		260°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

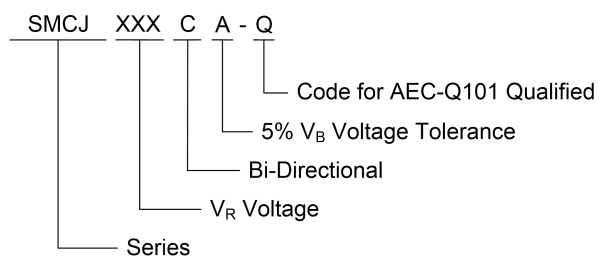


Dimensions

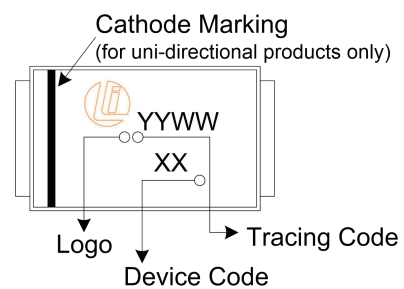


Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.900	3.200	0.114	0.126
B	6.600	7.110	0.260	0.280
C	5.590	6.220	0.220	0.245
E	0.760	1.520	0.030	0.060
F	-	0.203	-	0.008
G	7.750	8.130	0.305	0.320
H	0.152	0.305	0.006	0.012
T	2.200	2.750	0.087	0.108
I	3.300	-	0.129	-
J	2.400	-	0.094	-
K	-	4.200	-	0.165

Part Numbering System



Part Marking System



SMCJ-Q Series

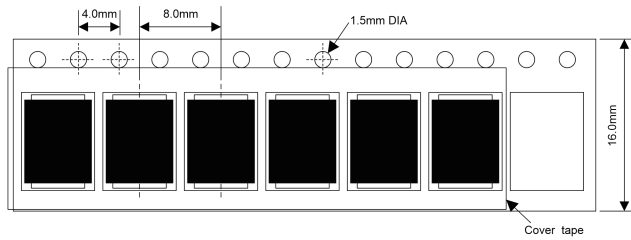
Surface Mount – 1500W

Packaging

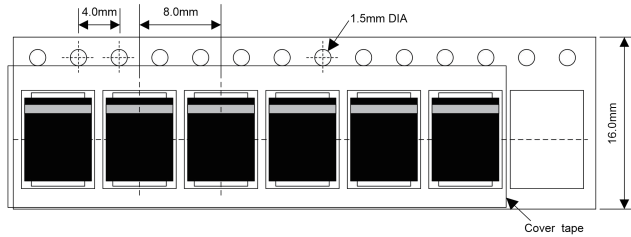
Part number	Component Package	Quantity	Packaging Option	Packaging Specification
SMCJxxxXX-Q	DO-214AB	3000	Tape & Reel - 16mm tape/13" reel	EIA STD RS-481

Tape and Reel Specification

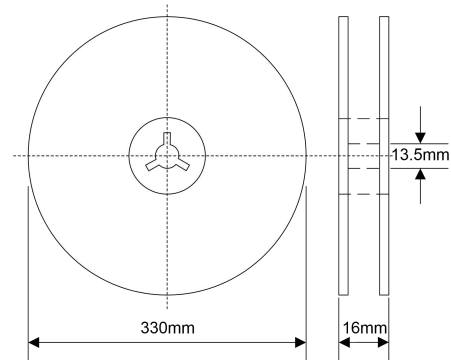
Tape



For Uni-Devices



13 Inches Reel



Quantity: 3000ocs/reel