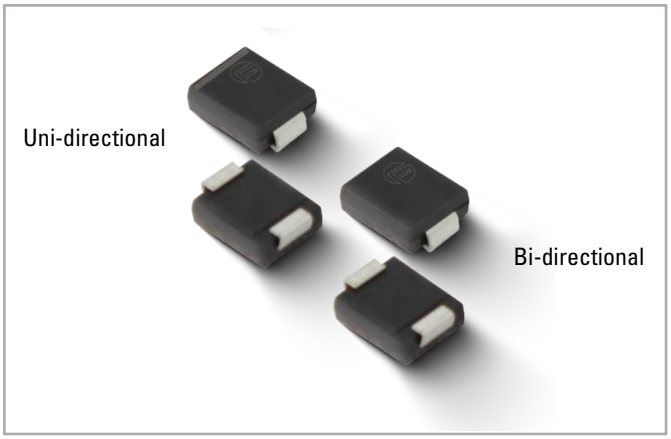
1.5SMC-Q Series
Surface Mount – 1500W

AUTOMOTIVE GRADE HF RoHS Pb e3



Additional Information

Resources | Accessories | Samples

Maximum Ratings and Thermal Characteristics

(T_A=25℃ 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℃	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	℃
Storage Temperature Range	T_{STG}	-55 to 150	℃
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	15	℃/W
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	75	℃/W

Notes:

1. Non-repetitive current pulse , per Fig.3 and derated above T_J (initial) =25℃ 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 1.5SMC-Q series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

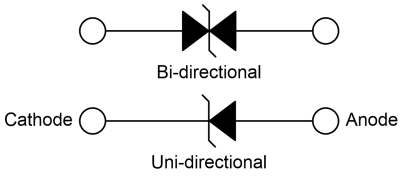
Features

- 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 IEC 61000-4-2, 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℃/20~40sec.
- V_B @ T_J= V_B@25℃ x (1+ α Tx (T_J - 25)) (α T:Temperature Coefficient, typical value is 0.1%)
- Meet MSL level1, per J-STD-020, LF maximum peak of 260℃
- Matte tin lead–free plated
- Halogen free and RoHS compliant
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD-609A.01)

Applications

TVS devices are ideal for the protection of I/O Interfaces, V_{CC} bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Functional Diagram



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Electrical Characteristics (T_A=25℃ 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)	$V_{B\ Min.}$(V)	$V_{B\ Max.}$(V)	I_T(mA)	V_C(V)	I_{PP}(A)	I_R(μA)
1.5SMC6.8A	1.5SMC6.8CA	Q	6V8A	6V8C	5.80	6.45	7.14	10	10.5	144.8	1000
1.5SMC7.5A	1.5SMC7.5CA	Q	7V5A	7V5C	6.40	7.13	7.88	10	11.3	134.5	500
1.5SMC8.2A	1.5SMC8.2CA	Q	8V2A	8V2C	7.02	7.79	8.61	10	12.1	125.6	200
1.5SMC9.1A	1.5SMC9.1CA	Q	9V1A	9V1C	7.78	8.65	9.55	1	13.4	113.4	50
1.5SMC10A	1.5SMC10CA	Q	10A	10C	8.55	9.50	10.50	1	14.5	104.8	10
1.5SMC11A	1.5SMC11CA	Q	11A	11C	9.40	10.50	11.60	1	15.6	97.4	5
1.5SMC12A	1.5SMC12CA	Q	12A	12C	10.20	11.40	12.60	1	16.7	91.0	5
1.5SMC13A	1.5SMC13CA	Q	13A	13C	11.10	12.40	13.70	1	18.2	83.5	1
1.5SMC15A	1.5SMC15CA	Q	15A	15C	12.80	14.30	15.80	1	21.2	71.7	1
1.5SMC16A	1.5SMC16CA	Q	16A	16C	13.60	15.20	16.80	1	22.5	67.6	1
1.5SMC18A	1.5SMC18CA	Q	18A	18C	15.30	17.10	18.90	1	25.2	60.3	1
1.5SMC20A	1.5SMC20CA	Q	20A	20C	17.10	19.00	21.00	1	27.7	54.9	1
1.5SMC22A	1.5SMC22CA	Q	22A	22C	18.80	20.90	23.10	1	30.6	49.7	1
1.5SMC24A	1.5SMC24CA	Q	24A	24C	20.50	22.80	25.20	1	33.2	45.8	1
1.5SMC27A	1.5SMC27CA	Q	27A	27C	23.10	25.70	28.40	1	37.5	40.5	1
1.5SMC30A	1.5SMC30CA	Q	30A	30C	25.60	28.50	31.50	1	41.4	36.7	1
1.5SMC33A	1.5SMC33CA	Q	33A	33C	28.20	31.40	34.70	1	45.7	33.3	1
1.5SMC36A	1.5SMC36CA	Q	36A	36C	30.80	34.20	37.80	1	49.9	30.5	1
1.5SMC39A	1.5SMC39CA	Q	39A	39C	33.30	37.10	41.00	1	53.9	28.2	1
1.5SMC43A	1.5SMC43CA	Q	43A	43C	36.80	40.90	45.20	1	59.3	25.6	1
1.5SMC47A	1.5SMC47CA	Q	47A	47C	40.20	44.70	49.40	1	64.8	23.5	1
1.5SMC51A	1.5SMC51CA	Q	51A	51C	43.60	48.50	53.60	1	70.1	21.7	1
1.5SMC56A	1.5SMC56CA	Q	56A	56C	47.80	53.20	58.80	1	77.0	19.7	1
1.5SMC62A	1.5SMC62CA	Q	62A	62C	53.00	58.90	65.10	1	85.0	17.9	1
1.5SMC68A	1.5SMC68CA	Q	68A	68C	58.10	64.60	71.40	1	92.0	16.5	1
1.5SMC75A	1.5SMC75CA	Q	75A	75C	64.10	71.30	78.80	1	103.0	14.8	1
1.5SMC82A	1.5SMC82CA	Q	82A	82C	70.10	77.90	86.10	1	113.0	13.5	1
1.5SMC91A	1.5SMC91CA	Q	91A	91C	77.80	86.50	95.50	1	125.0	12.2	1
1.5SMC100A	1.5SMC100CA	Q	100A	100C	85.50	95.00	105.00	1	137.0	11.1	1
1.5SMC110A	1.5SMC110CA	Q	110A	110C	94.00	105.00	116.00	1	152.0	10.0	1
1.5SMC120A	1.5SMC120CA	Q	120A	120C	102.00	114.00	126.00	1	165.0	9.2	1
1.5SMC130A	1.5SMC130CA	Q	130A	130C	111.00	124.00	137.00	1	179.0	8.5	1
1.5SMC150A	1.5SMC150CA	Q	150A	150C	128.00	143.00	158.00	1	207.0	7.3	1
1.5SMC160A	1.5SMC160CA	Q	160A	160C	136.00	152.00	168.00	1	219.0	6.9	1
1.5SMC170A	1.5SMC170CA	Q	170A	170C	145.00	162.00	179.00	1	234.0	6.5	1
1.5SMC180A	1.5SMC180CA	Q	180A	180C	154.00	171.00	189.00	1	246.0	6.2	1
1.5SMC200A	1.5SMC200CA	Q	200A	200C	171.00	190.00	210.00	1	274.0	5.5	1
1.5SMC220A	1.5SMC220CA	Q	220A	220C	185.00	209.00	231.00	1	328.0	4.6	1
1.5SMC250A	1.5SMC250CA	Q	250A	250C	214.00	237.00	263.00	1	344.0	4.4	1
1.5SMC300A	1.5SMC300CA	Q	300A	300C	256.00	285.00	315.00	1	414.0	3.7	1
1.5SMC350A	1.5SMC350CA	Q	350A	350C	300.00	332.00	368.00	1	482.0	3.2	1
1.5SMC400A	1.5SMC400CA	Q	400A	400C	342.00	380.00	420.00	1	548.0	2.8	1
1.5SMC440A	1.5SMC440CA	Q	440A	440C	376.00	418.00	462.00	1	602.0	2.5	1
1.5SMC480A	1.5SMC480CA	Q	480A	480C	408.00	456.00	504.00	1	658.0	2.3	1
1.5SMC510A	1.5SMC510CA	Q	510A	510C	434.00	485.00	535.00	1	698.0	2.1	1
1.5SMC530A	1.5SMC530CA	Q	530A	530C	450.00	503.50	556.50	1	725.0	2.1	1
1.5SMC540A	1.5SMC540CA	Q	540A	540C	459.00	513.00	567.00	1	740.0	2.0	1
1.5SMC550A	1.5SMC550CA	Q	550A	550C	467.00	522.50	577.50	1	760.0	2.0	1
1.5SMC600A	1.5SMC600CA	Q	600A	600C	510.00	575.20	628.40	1	828.0	1.8	1

Notes:

For bidirectional type having VR of 10 volts and less, the IR limit is double.

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Ratings and Characteristic Curves (T_A=25℃ unless otherwise noted)

Figure 1:
Peak Pulse Power Rating Curve

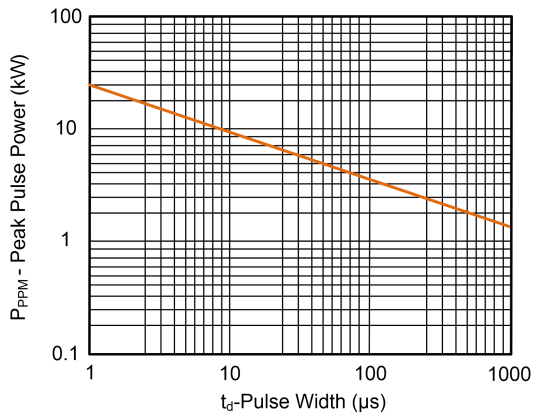


Figure 2:
Pulse Derating Curve

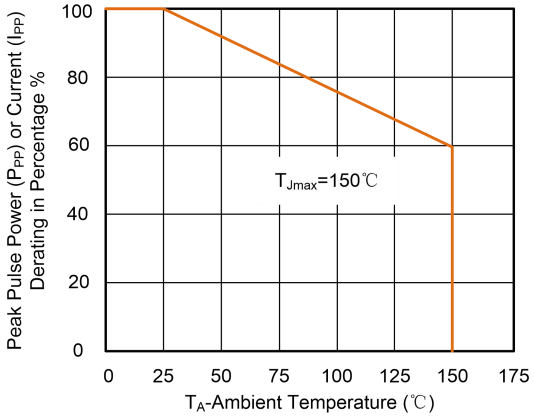


Figure 3:
Pulse Waveform

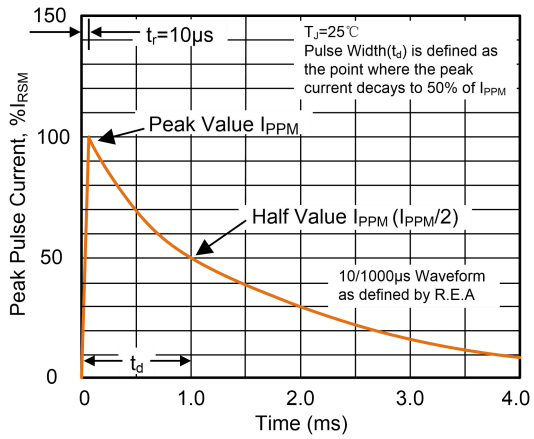


Figure 4:
Typical Junction Capacitance

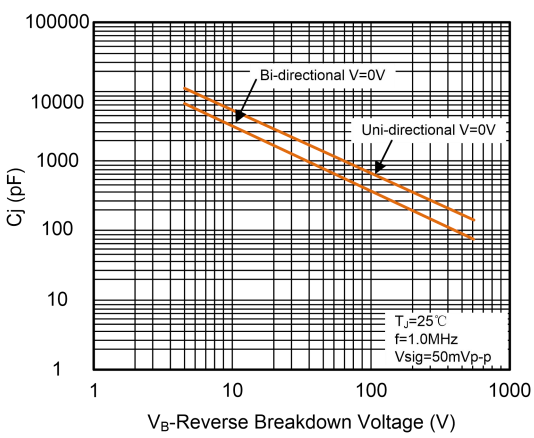


Figure 5:
Steady State Power Dissipation Derating Curve

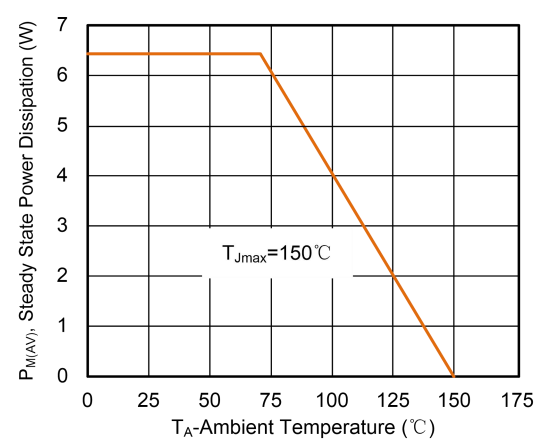
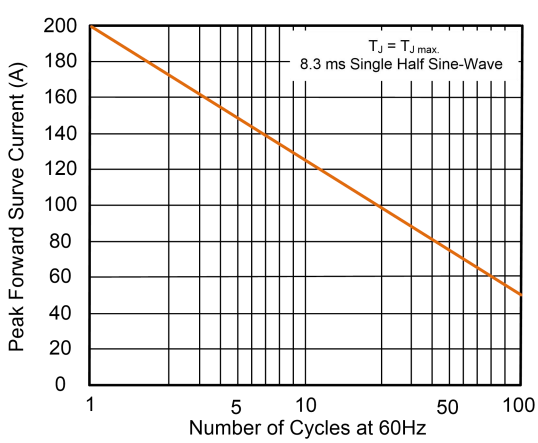


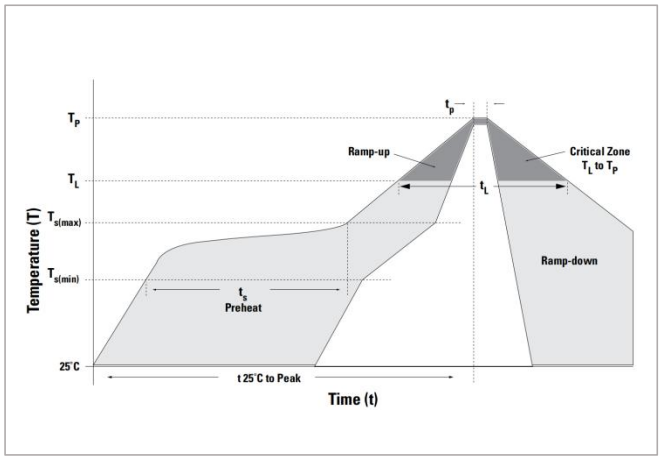
Figure 6:
Maximum Non-Repetitive Forward Surge Current Uni-Directional



1.5SMC-Q Series
Surface Mount – 1500W

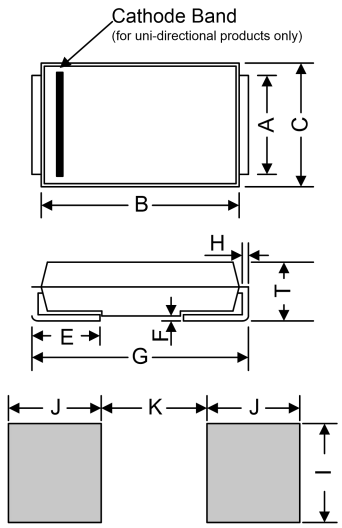
Soldering Parameters

Reflow Condition		Lead–free assembly
Pre Heat	**-Temperature Min ($T_{S\ min}$)**	150℃
	-Temperature Max ($T_{S\ max}$)	200℃
	-Time (min to max) (t_S)	60 – 180 secs
Average ramp-up rate(Liquidus Temp (T_L) to peak		3℃/second max.
$T_{S\ (max)}$ to T_L-Ramp-up Rate		3℃/second max.
Reflow	**-Temperature (T_L) (Liquidus)**	217℃
	-Time (min to max) (t_L)	60-150 seconds
Peak Temperature (T_P)		260℃
Time within 5℃ of actual Peak Temperature (t_P)		20-40 seconds
Ramp-down Rate		6℃/second max.
Time 25℃ to Peak Temperature		8 minutes max.
Do not exceed		260℃



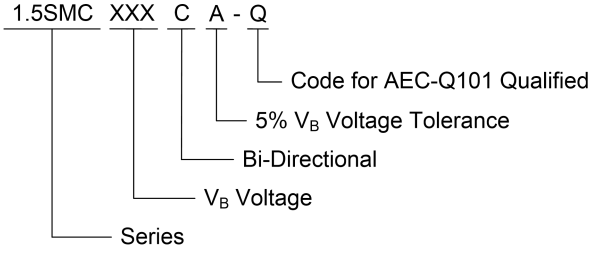
Dimensions

DO-214AB (SMC)

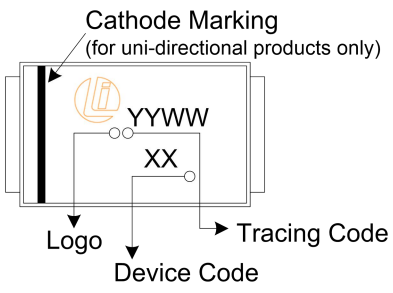


Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.900	3.200	0.114	0.126
B	6.600	7.110	0.260	0.280
C	5.590	6.220	0.220	0.245
E	0.760	1.520	0.030	0.060
F	-	0.203	-	0.008
G	7.750	8.130	0.305	0.320
H	0.152	0.305	0.006	0.012
T	2.200	2.750	0.087	0.108
I	3.300	-	0.129	-
J	2.400	-	0.094	-
K	-	4.200	-	0.165

Part Numbering System



Part Marking System

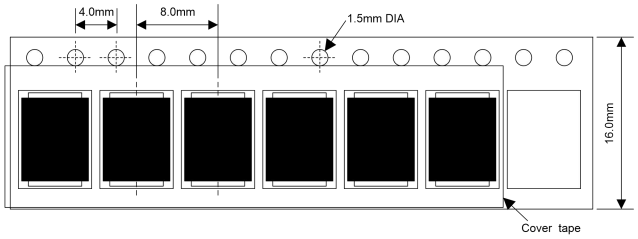


Packaging

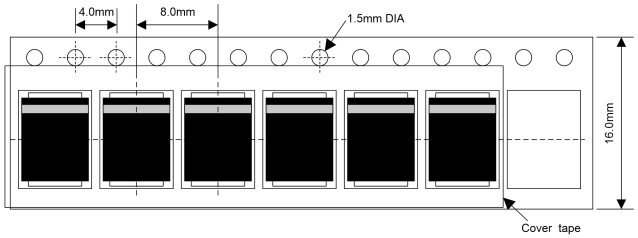
Part number	Component Package	Quantity	Packaging Option	Packaging Specification
1.5SMCxxxXX-Q	DO-214AB	3000	Tape & Reel - 16mm tape/13" reel	EIA STD RS-481

Tape and Reel Specification

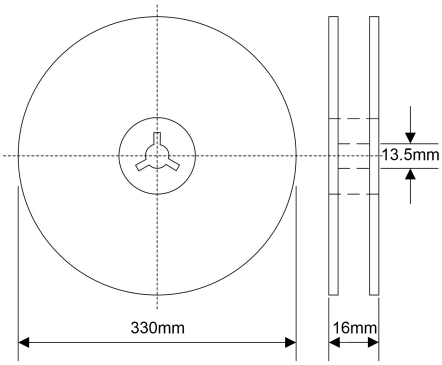
Tape



For Uni-Devices



13 Inches Reel



Quantity：3000pcs/reel