1.5SMC-Q1 Series

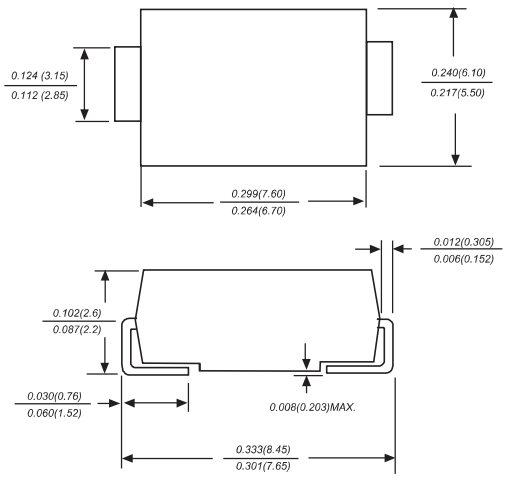
1500W Surface Mount Transient Voltage Suppressors - 6.8V-440V

Features

- 1500W peak pulse power capability with a 10/1000us waveform, repetition rate (duty cycle): 0.05%.
- Excellent clamping capability.
- Low incremental surge resistance.
- Fast response time from 0V to VBR, typically less than 1pS for uni-directional & 5 nS for bi-directional types.
- Ultra high-speed switching.
- Glass passivated chip junction.
- Lead-free parts meet environmental standards of MIL-STD-19500 /228
- 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	1.5KE series	UNIT
Peak power dissipation	with a 10/1000us waveform, note 1& fig.1	P_{PPM}	1500	W
Peak pulse current	with a 10/1000us waveform, note 1& fig.1	I_{PPM}	See Table 1	A
Steady state power dissipation	at T_L=75°C, lead length 0.375"(9.5mm)	$P_{M(AV)}$	6.5	W
Peak forward surge current	8.3ms single half sine-wave superimposed on rated load(JEDEC Mthod), note 2	I_{FSM}	200	A
Maximum instantaneours forward voltage	at 100A for Uni-Directional types only, note 3	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. Measured on 8.3 mS single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum
3. V_F<3.5V . for devices of V_{BR} < 200V, and V_F<5.0V . for devices of V_{BR}>201V

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

Type Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage Min. @I_T	Breakdown Voltage Max. @ I_T	Test Current	Maximum Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RMW}
(Uni)	(Bi)	(Uni)	(Bi)	V_{RMW}(V)	$V_{BR\ MIN}$(V)	$V_{BR\ MAX}$(V)	I_T (mA)	V_C(V)	I_{PP}(A)	I_R(uA)
1.5SMC6.8-Q1	1.5SMC6.8C-Q1	6V8	6V8C	5.50	6.12	7.48	10	10.8	140.7	1000.0
1.5SMC6.8A-Q1	1.5SMC6.8CA-Q1	6V8A	6V8CA	5.80	6.45	7.14	10	10.5	144.8	1000.0
1.5SMC7.5-Q1	1.5SMC7.5C-Q1	7V5	7V5C	6.05	6.75	8.25	10	11.7	129.9	500.0
1.5SMC7.5A-Q1	1.5SMC7.5CA-Q1	7V5A	7V5CA	6.40	7.13	7.88	10	11.3	134.5	500.0
1.5SMC8.2-Q1	1.5SMC8.2C-Q1	8V2	8V2C	6.63	7.38	9.02	10	12.5	121.6	200.0
1.5SMC8.2A-Q1	1.5SMC8.2CA-Q1	8V2A	8V2CA	7.02	7.79	8.61	10	12.1	125.6	200.0
1.5SMC9.1-Q1	1.5SMC9.1C-Q1	9V1	9V1C	7.37	8.19	10.0	1.0	13.8	110.1	50.0
1.5SMC9.1A-Q1	1.5SMC9.1CA-Q1	9V1A	9V1CA	7.78	8.65	9.55	1.0	13.4	113.4	50.0
1.5SMC10-Q1	1.5SMC10C-Q1	10	10C	8.10	9.00	11.0	1.0	15.0	101.3	10.0
1.5SMC10A-Q1	1.5SMC10CA-Q1	10A	10CA	8.55	9.50	10.5	1.0	14.5	104.8	10.0
1.5SMC11-Q1	1.5SMC11C-Q1	11	11C	8.92	9.90	12.1	1.0	16.2	93.8	5.0
1.5SMC11A-Q1	1.5SMC11CA-Q1	11A	11CA	9.40	10.5	11.6	1.0	15.6	97.4	5.0
1.5SMC12-Q1	1.5SMC12C-Q1	12	12C	9.72	10.8	13.2	1.0	17.3	87.9	5.0
1.5SMC12A-Q1	1.5SMC12CA-Q1	12A	12CA	10.2	11.4	12.6	1.0	16.7	91.0	5.0
1.5SMC13-Q1	1.5SMC13C-Q1	13	13C	10.5	11.7	14.3	1.0	19.0	80.0	5.0
1.5SMC13A-Q1	1.5SMC13CA-Q1	13A	13CA	11.1	12.4	13.7	1.0	18.2	83.5	5.0
1.5SMC15-Q1	1.5SMC15C-Q1	15	15C	12.1	13.5	16.5	1.0	22.0	69.1	5.0
1.5SMC15A-Q1	1.5SMC15CA-Q1	15A	15CA	12.8	14.3	15.8	1.0	21.2	71.7	5.0
1.5SMC16-Q1	1.5SMC16C-Q1	16	16C	12.9	14.4	17.6	1.0	23.5	64.7	5.0
1.5SMC16A-Q1	1.5SMC16CA-Q1	16A	16CA	13.6	15.2	16.8	1.0	22.5	67.6	5.0
1.5SMC18-Q1	1.5SMC18C-Q1	18	18C	14.5	16.2	19.8	1.0	26.5	57.4	5.0
1.5SMC18A-Q1	1.5SMC18CA-Q1	18A	18CA	15.3	17.1	18.9	1.0	25.2	60.3	5.0
1.5SMC20-Q1	1.5SMC20C-Q1	20	20C	16.2	18.0	22.0	1.0	29.1	52.2	5.0
1.5SMC20A-Q1	1.5SMC20CA-Q1	20A	20CA	17.1	19.0	21.0	1.0	27.7	54.9	5.0
1.5SMC22-Q1	1.5SMC22C-Q1	22	22C	17.8	19.8	24.2	1.0	31.9	47.6	5.0
1.5SMC22A-Q1	1.5SMC22CA-Q1	22A	22CA	18.8	20.9	23.1	1.0	30.6	49.7	5.0
1.5SMC24-Q1	1.5SMC24C-Q1	24	24C	19.4	21.6	26.4	1.0	34.7	43.8	5.0
1.5SMC24A-Q1	1.5SMC24CA-Q1	24A	24CA	20.5	22.8	25.2	1.0	33.2	45.8	5.0
1.5SMC27-Q1	1.5SMC27C-Q1	27	27C	21.8	24.3	29.7	1.0	39.1	38.9	5.0
1.5SMC27A-Q1	1.5SMC27CA-Q1	27A	27CA	23.1	25.7	28.4	1.0	37.5	40.5	5.0
1.5SMC30-Q1	1.5SMC30C-Q1	30	30C	24.3	27.0	33.0	1.0	43.5	34.9	5.0
1.5SMC30A-Q1	1.5SMC30CA-Q1	30A	30CA	25.6	28.5	31.5	1.0	41.4	36.7	5.0
1.5SMC33-Q1	1.5SMC33C-Q1	33	33C	26.8	29.7	36.3	1.0	47.7	31.9	5.0
1.5SMC33A-Q1	1.5SMC33CA-Q1	33A	33CA	28.2	31.4	34.7	1.0	45.7	33.3	5.0
1.5SMC36-Q1	1.5SMC36C-Q1	36	36C	29.1	32.4	39.6	1.0	52.0	29.2	5.0
1.5SMC36A-Q1	1.5SMC36CA-Q1	36A	36CA	30.8	34.2	37.8	1.0	49.9	30.5	5.0
1.5SMC39-Q1	1.5SMC39C-Q1	39	39C	31.6	35.1	42.9	1.0	56.4	27.0	5.0
1.5SMC39A-Q1	1.5SMC39CA-Q1	39A	39CA	33.3	37.1	41.0	1.0	53.9	28.2	5.0
1.5SMC43-Q1	1.5SMC43C-Q1	43	43C	34.8	38.7	47.3	1.0	61.9	24.6	5.0
1.5SMC43A-Q1	1.5SMC43CA-Q1	43A	43CA	36.8	40.9	45.2	1.0	59.3	25.6	5.0
1.5SMC47-Q1	1.5SMC47C-Q1	47	47C	38.1	42.3	51.7	1.0	67.8	22.4	5.0
1.5SMC47A-Q1	1.5SMC47CA-Q1	47A	47CA	40.2	44.7	49.4	1.0	64.8	23.5	5.0
1.5SMC51-Q1	1.5SMC51C-Q1	51	51C	41.3	45.9	56.1	1.0	73.5	20.7	5.0
1.5SMC51A-Q1	1.5SMC51CA-Q1	51A	51CA	43.6	48.5	53.6	1.0	70.1	21.7	5.0

※ For Bi-directional type having VRWM of 10 Volts and less, the IR limit is double

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

Type Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage Min. @I_T	Breakdown Voltage Max. @ I_T	Test Current	Maximum Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RMW}
(Uni)	(Bi)	(Uni)	(Bi)	V_{RMW}(V)	$V_{BR\ MIN}$(V)	$V_{BR\ MAX}$(V)	I_T (mA)	V_C(V)	I_{PP}(A)	I_R(uA)
1.5SMC56-Q1	1.5SMC56C-Q1	56	56C	45.4	50.4	61.6	1.0	80.5	18.9	5.0
1.5SMC56A-Q1	1.5SMC56CA-Q1	56A	56CA	47.8	53.2	58.8	1.0	77.0	19.7	5.0
1.5SMC62-Q1	1.5SMC62C-Q1	62	62C	50.2	55.8	68.2	1.0	89.0	17.1	5.0
1.5SMC62A-Q1	1.5SMC62CA-Q1	62A	62CA	53.0	58.9	65.1	1.0	85.0	17.9	5.0
1.5SMC68-Q1	1.5SMC68C-Q1	68	68C	55.1	61.2	74.8	1.0	98.0	13.5	5.0
1.5SMC68A-Q1	1.5SMC68CA-Q1	68A	68CA	58.1	64.6	71.4	1.0	92.0	16.5	5.0
1.5SMC75-Q1	1.5SMC75C-Q1	75	75C	60.7	67.5	82.5	1.0	108	14.1	5.0
1.5SMC75A-Q1	1.5SMC75CA-Q1	75A	75CA	64.1	71.3	78.8	1.0	103	14.8	5.0
1.5SMC82-Q1	1.5SMC82C-Q1	82	82C	66.4	73.8	90.2	1.0	118	12.9	5.0
1.5SMC82A-Q1	1.5SMC82CA-Q1	82A	82CA	70.1	77.9	86.1	1.0	113	13.5	5.0
1.5SMC91-Q1	1.5SMC91C-Q1	91	91C	73.7	81.9	100	1.0	131	11.6	5.0
1.5SMC91A-Q1	1.5SMC91CA-Q1	91A	91CA	77.8	86.5	95.5	1.0	125	12.2	5.0
1.5SMC100-Q1	1.5SMC100C-Q1	100	100C	81.0	90.0	110	1.0	144	10.6	5.0
1.5SMC100A-Q1	1.5SMC100CA-Q1	100A	100CA	85.5	95.0	105	1.0	137	11.1	5.0
1.5SMC110-Q1	1.5SMC110C-Q1	110	110C	89.2	99.0	121	1.0	158	9.6	5.0
1.5SMC110A-Q1	1.5SMC110CA-Q1	110A	110CA	94.0	105	116	1.0	152	10.0	5.0
1.5SMC120-Q1	1.5SMC120C-Q1	120	120C	97.2	108	132	1.0	173	8.7	5.0
1.5SMC120A-Q1	1.5SMC120CA-Q1	120A	120CA	102	114	126	1.0	165	9.2	5.0
1.5SMC130-Q1	1.5SMC130C-Q1	130	130C	105	117	143	1.0	187	8.1	5.0
1.5SMC130A-Q1	1.5SMC130CA-Q1	130A	130CA	111	124	137	1.0	179	8.5	5.0
1.5SMC150-Q1	1.5SMC150C-Q1	150	150C	121	135	165	1.0	215	7.1	5.0
1.5SMC150A-Q1	1.5SMC150CA-Q1	150A	150CA	128	143	158	1.0	207	7.3	5.0
1.5SMC160-Q1	1.5SMC160C-Q1	160	160C	130	144	176	1.0	230	6.6	5.0
1.5SMC160A-Q1	1.5SMC160CA-Q1	160A	160CA	136	152	168	1.0	219	6.9	5.0
1.5SMC170-Q1	1.5SMC170C-Q1	170	170C	138	153	187	1.0	244	6.2	5.0
1.5SMC170A-Q1	1.5SMC170CA-Q1	170A	170CA	145	162	179	1.0	234	6.5	5.0
1.5SMC180-Q1	1.5SMC180C-Q1	180	180C	146	162	198	1.0	258	5.9	5.0
1.5SMC180A-Q1	1.5SMC180CA-Q1	180A	180CA	154	171	189	1.0	246	6.2	5.0
1.5SMC200-Q1	1.5SMC200C-Q1	200	200C	162	180	220	1.0	287	5.3	5.0
1.5SMC200A-Q1	1.5SMC200CA-Q1	200A	200CA	171	190	210	1.0	274	5.5	5.0
1.5SMC220-Q1	1.5SMC220C-Q1	220	220C	175	198	242	1.0	344	4.4	5.0
1.5SMC220A-Q1	1.5SMC220CA-Q1	220A	220CA	185	209	231	1.0	328	4.6	5.0
1.5SMC250-Q1	1.5SMC250C-Q1	250	250C	202	225	275	1.0	360	4.2	5.0
1.5SMC250A-Q1	1.5SMC250CA-Q1	250A	250CA	214	237	263	1.0	344	4.4	5.0
1.5SMC300-Q1	1.5SMC300C-Q1	300	300C	243	270	330	1.0	430	3.5	5.0
1.5SMC300A-Q1	1.5SMC300CA-Q1	300A	300CA	256	285	315	1.0	414	3.7	5.0
1.5SMC350-Q1	1.5SMC350C-Q1	350	350C	284	315	385	1.0	504	3.0	5.0
1.5SMC350A-Q1	1.5SMC350CA-Q1	350A	350CA	300	333	368	1.0	482	3.2	5.0
1.5SMC400-Q1	1.5SMC400C-Q1	400	400C	324	360	440	1.0	574	2.6	5.0
1.5SMC400A-Q1	1.5SMC400CA-Q1	400A	400CA	342	380	420	1.0	548	2.8	5.0
1.5SMC440-Q1	1.5SMC440C-Q1	440	440C	356	396	484	1.0	631	2.4	5.0
1.5SMC440A-Q1	1.5SMC440CA-Q1	440A	440CA	376	418	462	1.0	600	2.5	5.0

※ For Bi-directional type having VRWM of 10 Volts and less, the IR limit is double

Rating and characteristic curves (1.5SMC-Q1 Series)

FIG.1 - PEALK PULSE POWER RATING CURVE

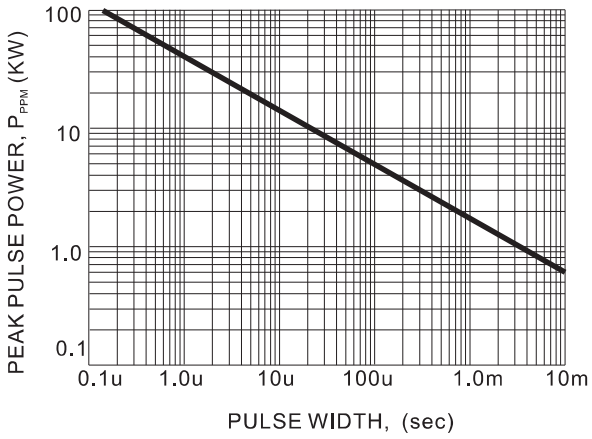


FIG.2 - PULSE DERATING CURVE

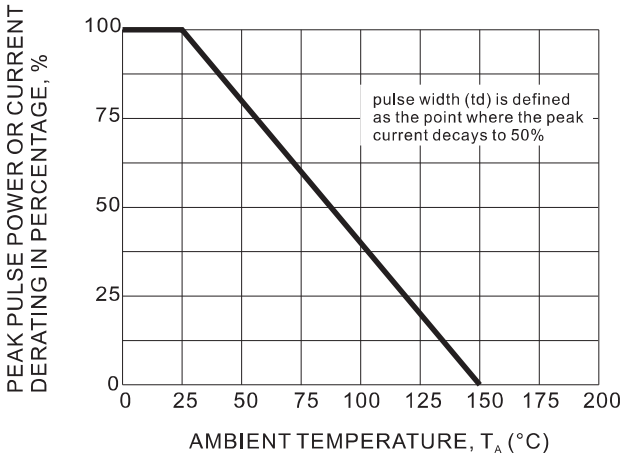


FIG.3 - PULSE WAVEFORM

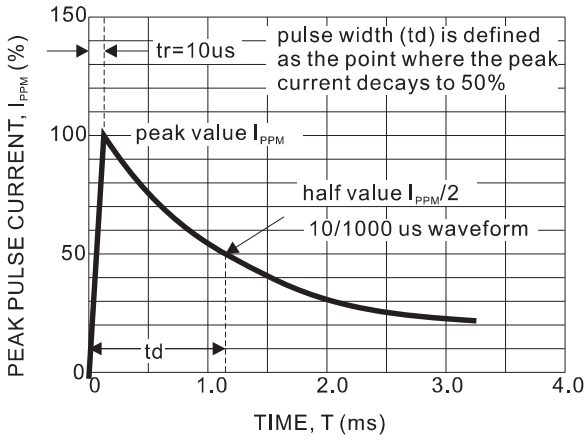


FIG.4 - TYPICAL JUNCTION CAPACITANCE

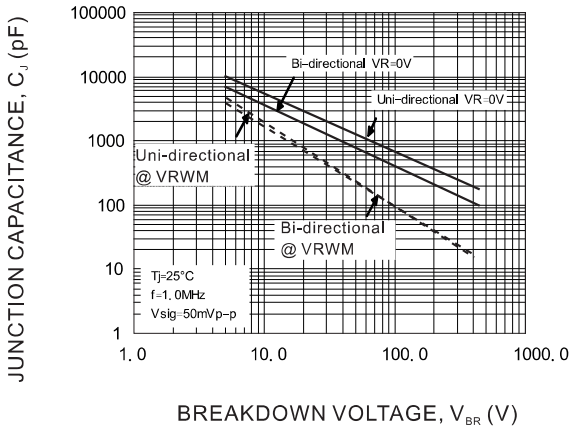


FIG.5 - STEADY STATE POWER DERATING CURVE

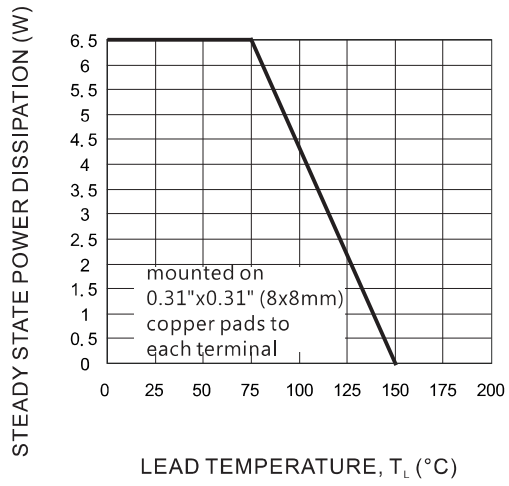
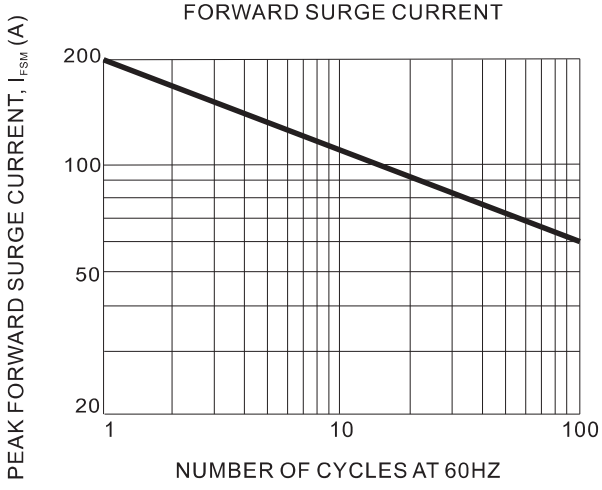


FIG.6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT



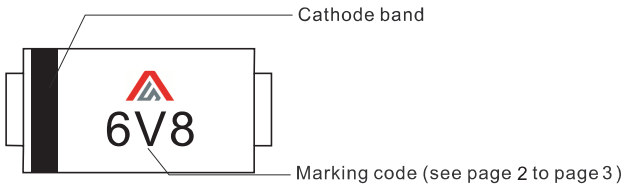
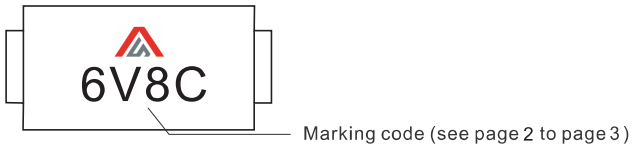
1.5SMC-Q1 Series

1500W Surface Mount Transient Voltage Suppressors - 6.8V-440V

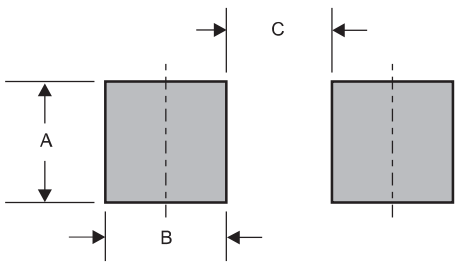
Pinning information

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)