

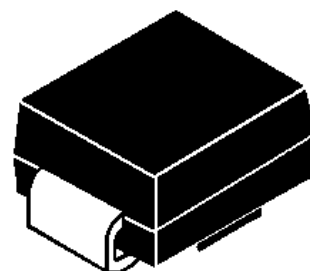


KWSMDJ5.0A---KWSMDJ220CA

3000W Surface Mount Transient Voltage Suppressors

Features

- Working peak reverse voltage range – 5.0V to 440V.
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- Low profile package.
- Excellent clamping capability.
- Glass passivated junction.
- Fast response time: typically less than 1 ns for Uni-direction.
Less than 5 ns for Bi-direction, from 0 Volts to BV min
- Typical IR less than 1uA above 10V.
- Plastic material has UL flammability classification 94V-O
- RoHS compliant in lead-free versions



RATING	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation on 10/1000us waveform (Note1,Note2).	P _{PPM}	3000	Watts
Peak Pulse Current of on 10/1000us waveform(Note1).	I _{PPM}	See Table	Amps
Steady State Power Dissipation at T _A =50°C (Note2).	P _{M(AV)}	6.5	Watts
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only	V _F	3.5	Volts
Peak Forward Surge Current,8.3ms Single Half Sine-Wave Superimposed on Rated Load, (JEDEC Method) (Note 3).	I _{FSM}	300	Amps

NOTES:

1. Non-repetitive current pulse, T_A = 25°C.
2. Mounted on 8.0mm x 8.0mm (0.03mm thick) Copper Pads to each terminal.
3. 8.3ms single half sine-wave, or equivalent square wave for unidirectional device only, Duty cycle=4 pulses per minutes maximum.

THERMAL CONSIDERATIONS

Symbol	Parameter	Value	Unit
T _J	Operating Junction Temperature	-55 to +125	°C
T _S	Storage Temperature Range	-55 to +150	°C
R _{θJA}	Junction to Ambient on printed circuit	75	°C/W



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ELECTRICAL CHARACTERISTICS

Part Number		Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min. @I _T	Breakdown Voltage Max. @I _T	Test Current	Maximum Clamping Voltage @I _{PP}	Peak Pulse Current	Maximum Reverse Leakage @V _{RWM}
UNI	BI	UNI	BI	V _R (V)	V _B (V)	V _B (V)	I _T (mA)	V _C (V)	I _{PP} (A)	I _R (μ A)
KWSMDJ5.0A	KWSMDJ5.0CA	RDE	DDE	5	6.4	7	10	9.2	326.1	800
KWSMDJ6.0A	KWSMDJ6.0CA	RDG	DDG	6	6.67	7.37	10	10.3	291.3	800
KWSMDJ6.5A	KWSMDJ6.5CA	RDK	DDK	6.5	7.22	7.98	10	11.2	267.9	500
KWSMDJ7.0A	KWSMDJ7.0CA	PDM	DDM	7	7.78	8.6	10	12	250	200
KWSMDJ7.5A	KWSMDJ7.5CA	PDP	DDP	7.5	8.33	9.21	1	12.9	232.6	100
KWSMDJ8.0A	KWSMDJ8.0CA	PDR	DDR	8	8.89	9.83	1	13.6	220.6	50
KWSMDJ8.5A	KWSMDJ8.5CA	PDT	DDT	8.5	9.44	10.4	1	14.4	208.3	20
KWSMDJ9.0A	KWSMDJ9.0CA	PDV	DDV	9	10	11.1	1	15.4	194.8	10
KWSMDJ10A	KWSMDJ10CA	PDX	DDX	10	11.1	12.3	1	17	176.5	5
KWSMDJ11A	KWSMDJ11CA	PDZ	DDZ	11	12.2	13.5	1	18.2	164.8	2
KWSMDJ12A	KWSMDJ12CA	PEE	DEE	12	13.3	14.7	1	19.9	150.8	2
KWSMDJ13A	KWSMDJ13CA	PEG	DEG	13	14.4	15.9	1	21.5	139.5	2
KWSMDJ14A	KWSMDJ14CA	PEK	DEK	14	15.6	17.2	1	23.2	129.3	2
KWSMDJ15A	KWSMDJ15CA	PEM	DEM	15	16.7	18.5	1	24.4	123	2
KWSMDJ16A	KWSMDJ16CA	PEP	DEP	16	17.8	19.7	1	26	115.4	2
KWSMDJ17A	KWSMDJ17CA	PER	DER	17	18.9	20.9	1	27.6	108.7	2
KWSMDJ18A	KWSMDJ18CA	PET	DET	18	20	22.1	1	29.2	102.7	2
KWSMDJ20A	KWSMDJ20CA	PEV	DEV	20	22.2	24.5	1	32.4	92.6	2
KWSMDJ22A	KWSMDJ22CA	PEX	DEX	22	24.4	26.9	1	35.5	84.5	2
KWSMDJ24A	KWSMDJ24CA	PEZ	DEZ	24	26.7	29.5	1	38.9	77.1	2
KWSMDJ26A	KWSMDJ26CA	PFE	DFE	26	28.9	31.9	1	42.1	71.3	2
KWSMDJ28A	KWSMDJ28CA	PFG	DFG	28	31.1	34.4	1	45.4	66.1	2
KWSMDJ30A	KWSMDJ30CA	PFK	DFK	30	33.3	36.8	1	48.4	62	2
KWSMDJ33A	KWSMDJ33CA	PFM	DFM	33	36.7	40.6	1	53.3	56.3	2
KWSMDJ36A	KWSMDJ36CA	PFP	DFP	36	40	44.2	1	58.1	51.6	2
KWSMDJ40A	KWSMDJ40CA	PFR	DFR	40	44.4	49.1	1	64.5	46.5	2
KWSMDJ43A	KWSMDJ43CA	PFT	DFT	43	47.8	52.8	1	69.4	43.2	2
KWSMDJ45A	KWSMDJ45CA	PFV	DFV	45	50	55.3	1	72.7	41.3	2
KWSMDJ48A	KWSMDJ48CA	PFX	DFX	48	53.3	58.9	1	77.4	38.8	2
KWSMDJ51A	KWSMDJ51CA	PFZ	DFZ	51	56.7	62.7	1	82.4	36.4	2
KWSMDJ54A	KWSMDJ54CA	RGE	DGE	54	60	66.3	1	87.1	34.4	2
KWSMDJ58A	KWSMDJ58CA	PGG	DGG	58	64.4	71.2	1	93.6	32.1	2
KWSMDJ60A	KWSMDJ60CA	PGK	DGK	60	66.7	73.7	1	96.8	31	2
KWSMDJ64A	KWSMDJ64CA	PGM	DGM	64	71.1	78.6	1	103	29.1	2
KWSMDJ70A	KWSMDJ70CA	PGP	DGP	70	77.8	86	1	113	26.5	2
KWSMDJ75A	KWSMDJ75CA	PGR	DGR	75	83.3	92.1	1	121	24.8	2
KWSMDJ78A	KWSMDJ78CA	PGT	DGT	78	86.7	95.8	1	126	23.8	2
KWSMDJ85A	KWSMDJ85CA	PGV	DGV	85	94.4	104	1	137	21.9	2
KWSMDJ90A	KWSMDJ90CA	PGX	DGX	90	100	111	1	146	20.5	2
KWSMDJ100A	KWSMDJ100CA	PGZ	DGZ	100	111	123	1	162	18.5	2



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Part Number		Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min. @I _T	Breakdown Voltage Max. @I _T	Test Current	Maximum Clamping Voltage @I _{PP}	Peak Pulse Current	Maximum Reverse Leakage @V _{RWM}
UNI	BI	UNI	BI	V _R (V)	V _B (V)	V _B (V)	I _T (mA)	V _C (V)	I _{PP} (A)	I _R (μ A)
KWSMDJ110A	KWSMDJ110CA	PHE	DHE	110	122	135	1	177	16.9	2
KWSMDJ120A	KWSMDJ120CA	PHG	DHG	120	133	147	1	193	15.5	2
KWSMDJ130A	KWSMDJ130CA	PHK	DHK	130	144	159	1	209	14.4	2
KWSMDJ150A	KWSMDJ150CA	PHM	DHM	150	167	185	1	243	12.3	2
KWSMDJ160A	KWSMDJ160CA	PHP	DHP	160	178	197	1	259	11.6	2
KWSMDJ170A	KWSMDJ170CA	PHR	DHR	170	189	209	1	275	10.9	2
KWSMDJ180A	KWSMDJ180CA	PHT	DHT	180	201	222	1	292	10.3	2
KWSMDJ190A	KWSMDJ190CA	PHU	DHU	190	209	243	1	308	9.7	2
KWSMDJ200A	KWSMDJ200CA	PHV	DHV	200	224	247	1	324	9.3	2
KWSMDJ210A	KWSMDJ210CA	PHW	DHW	210	231	269	1	340	8.8	2
KWSMDJ220A	KWSMDJ220CA	PKE	DKE	220	246	272	1	356	8.4	2

RATINGS AND CHARACTERISTIC CURVES ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

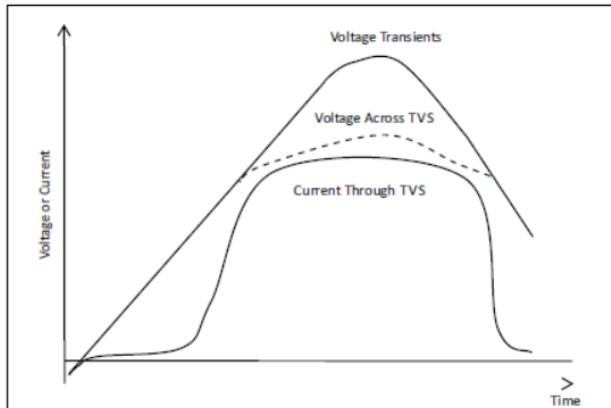


Figure 1.TVS Transients Clamping Waveform

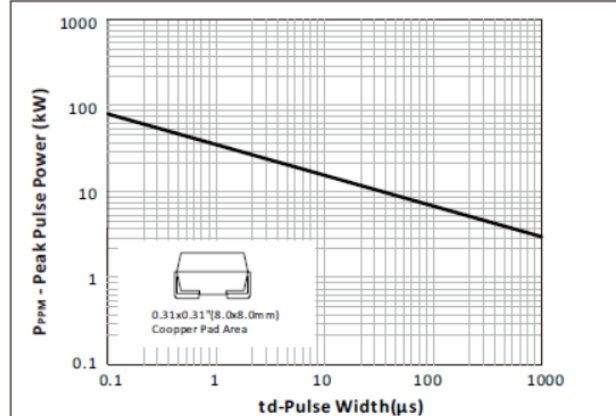


Figure 2. Peak Pulse Power Rating Curve

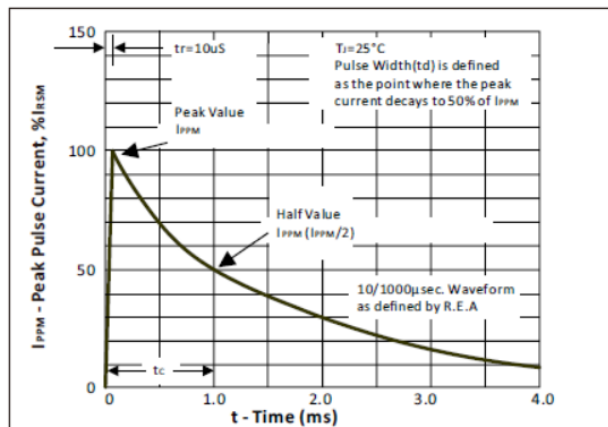


Figure 3. Pulse Waveform

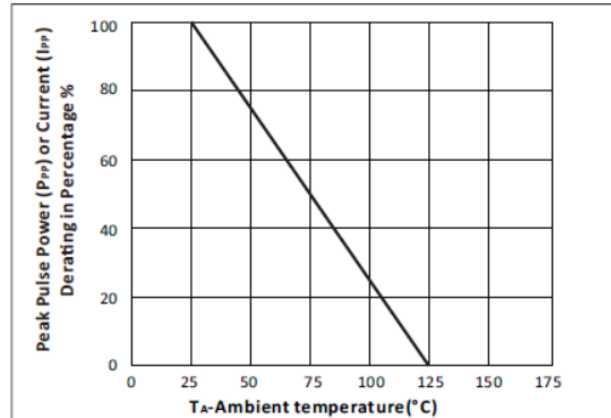


Figure 4. Pulse Derating Curve

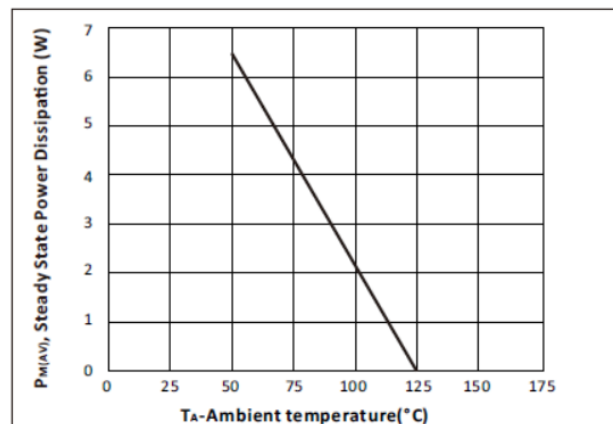


Figure 5. Steady State Power Dissipation Derating Curve

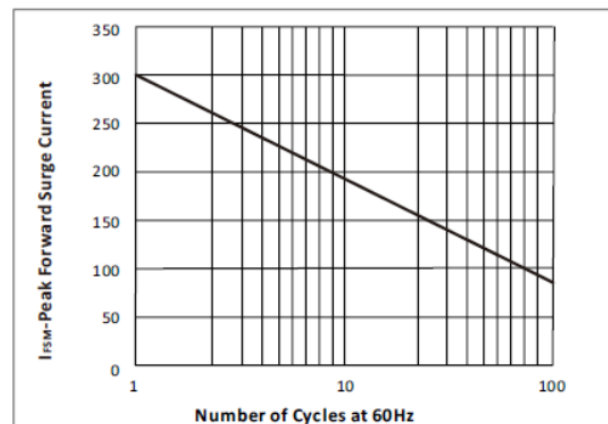
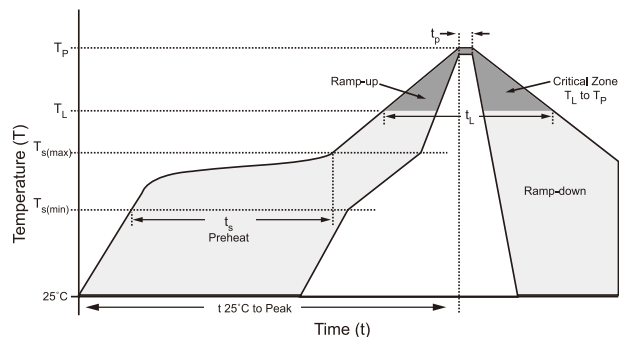


Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

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 (T_P)		8 minutes Max.
Do not exceed		260°C



DO-214AB(SMC) PACKAGE DIMENSIONS

Item	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	6.60	7.11	0.260	0.280
D	5.59	6.22	0.220	0.245
D1	2.90	3.20	0.114	0.126
T	7.75	8.13	0.305	0.320
T1	0.76	1.52	0.030	0.060
d	-	0.20	-	0.008
s	2.06	2.62	0.079	0.103
t	0.152	0.31	0.006	0.012

NOTES:

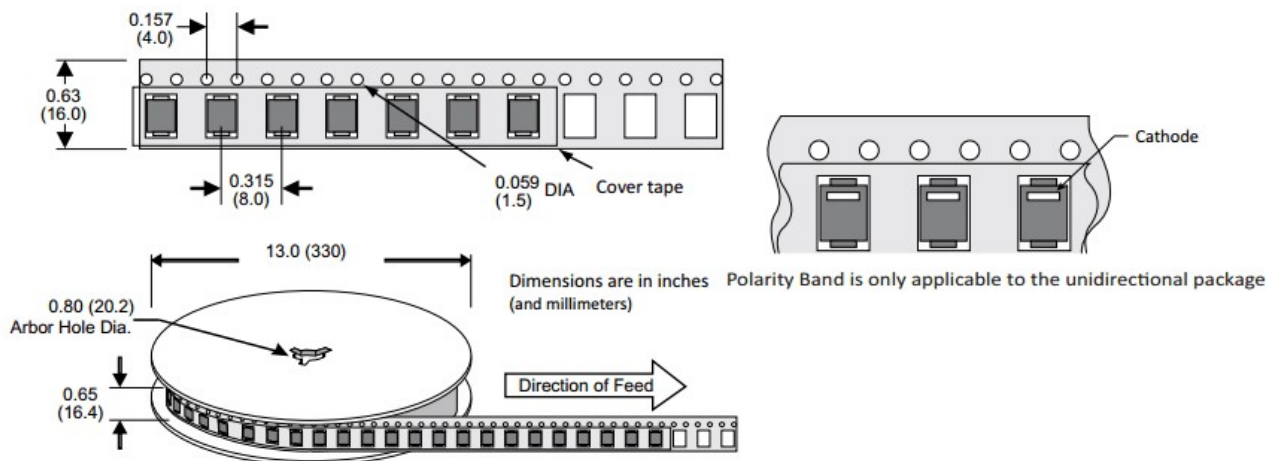
1. Dimensions are exclusive of mold flash and metal burrs
2. Cathode Band is only applicable to the unidirectional package

RECOMMENDED PAD LAYOUT DIMENSIONS

Item	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	3.300	-	0.129	-
B	2.400	-	0.094	-
C	-	4.200	-	0.165
D	2.400	-	0.094	-
E	8.13 REF		0.320 REF	

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Carrier Tape and Reel



Packing Quantity

Reel		Inner Box		Carton	
Size	Quantity Per Reel	Size	Quantity Per Reel	Size	Quantity Per Reel
13 (inch)	3,000pcs	340*340*40 (mm)	6,000pcs	360*360*360 (mm)	48,000pcs