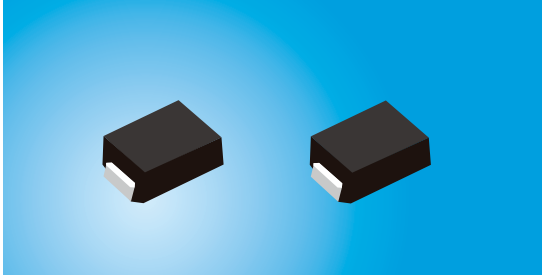


TVS Diodes Surface Mount-3000W KWSMDJ Series



Description

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

Features

- For surface mounted applications in order to optimize board space
- Reliable low cost construction utilizing molded plastic technique
- Plastic material has UL flammability classification 94V-0
- Typical I_R less than 2 μ A above 12V
- Fast response time: typically less than 1.0ps from 0 Volts to V_{BR} min

Maximum Ratings and Thermal Characteristics($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at $T_A=25^\circ\text{C}$ by 10x1000 μ s waveform (Fig.2)(Note 1), (Note 2)	PPPM	3000	W
Power Dissipation on infinite heat sink at $T_A=50^\circ\text{C}$	$P_{M(AV)}$	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	I_{FSM}	300	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional only	V_F	3.5	V
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Typical Thermal Resistance Junction to Lead	R_{UJL}	15	$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Ambient	R_{UJA}	75	$^\circ\text{C/W}$

Notes:

- Non-repetitive current pulse, per Fig.4 and derated above $T_A=25^\circ\text{C}$ per Fig. 3.
- Mounted on 8.0x8.0mm copper pad to each terminal.
- Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.

Electrical Characteristics

Part Number	Part Number	Marking		Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C @ I_{pp} (V)	Maximum Peak Pulse Current I_{pp} (A)	Maximum Reverse Leakage I_R @ V_R (μ A)	I_{pp} 8X20us Amps
		UNI	BI		MIN	MAX					
(Uni)	(Bi)										
KWSMDJ5.0A	KWSMDJ5.0CA	RDE	DDE	5.0	6.40	7.00	10	9.2	326.1	800	500
KWSMDJ6.0A	KWSMDJ6.0CA	RDG	DDG	6.0	6.67	7.37	10	10.3	291.3	800	500
KWSMDJ6.5A	KWSMDJ6.5CA	RDK	DDK	6.5	7.22	7.98	10	11.2	267.9	500	500
KWSMDJ7.0A	KWSMDJ7.0CA	PDM	DDM	7.0	7.78	8.60	10	12.0	250.0	200	500
KWSMDJ7.5A	KWSMDJ7.5CA	PDP	DDP	7.5	8.33	9.21	1	12.9	232.6	100	500
KWSMDJ8.0A	KWSMDJ8.0CA	PDR	DDR	8.0	8.89	9.83	1	13.6	220.6	50	500
KWSMDJ8.5A	KWSMDJ8.5CA	PDT	DDT	8.5	9.44	10.40	1	14.4	208.3	20	500

TVS Diodes Surface Mount-3000W KWSMDJ Series

Electrical Characteristics

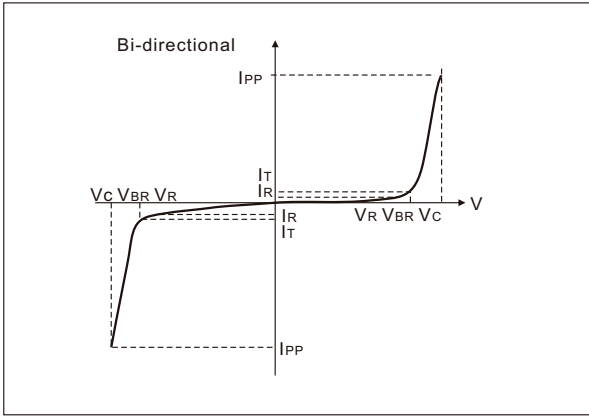
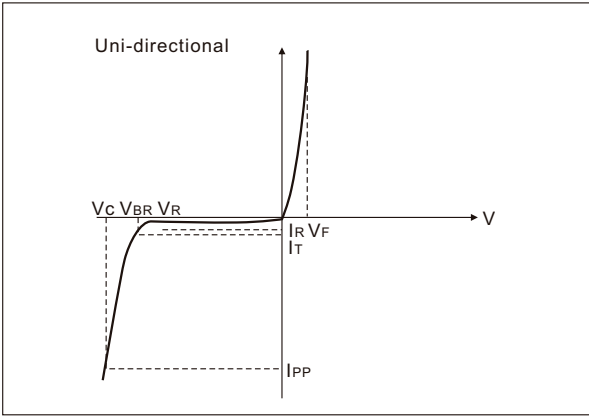
Part Number	Part Number	Marking		Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C @ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R @ V_R (μ A)	I_{PP} 8X20us Amps
		UNI	BI		MIN	MAX					
KWSMDJ9.0A	KWSMDJ9.0CA	PDV	DDV	9.0	10.00	11.10	1	15.4	194.8	10	500
KWSMDJ10A	KWSMDJ10CA	PDX	DDX	10.0	11.10	12.30	1	17.0	176.5	5	500
KWSMDJ11A	KWSMDJ11CA	PDZ	DDZ	11.0	12.20	13.50	1	18.2	164.8	2	500
KWSMDJ12A	KWSMDJ12CA	PEE	DEE	12.0	13.30	14.70	1	19.9	150.8	2	500
KWSMDJ13A	KWSMDJ13CA	PEG	DEG	13.0	14.40	15.90	1	21.5	139.5	2	500
KWSMDJ14A	KWSMDJ14CA	PEK	DEK	14.0	15.60	17.20	1	23.2	129.3	2	500
KWSMDJ15A	KWSMDJ15CA	PEM	DEM	15.0	16.70	18.50	1	24.4	123.0	2	500
KWSMDJ16A	KWSMDJ16CA	PEP	DEP	16.0	17.80	19.70	1	26.0	115.4	2	500
KWSMDJ17A	KWSMDJ17CA	PER	DER	17.0	18.90	20.90	1	27.6	108.7	2	500
KWSMDJ18A	KWSMDJ18CA	PET	DET	18.0	20.00	22.10	1	29.2	102.7	2	500
KWSMDJ20A	KWSMDJ20CA	PEV	DEV	20.0	22.20	24.50	1	32.4	92.6	2	500
KWSMDJ22A	KWSMDJ22CA	PEX	DEX	22.0	24.40	26.90	1	35.5	84.5	2	500
KWSMDJ24A	KWSMDJ24CA	PEZ	DEZ	24.0	26.70	29.50	1	38.9	77.1	2	500
KWSMDJ26A	KWSMDJ26CA	PFE	DFE	26.0	28.90	31.90	1	42.1	71.3	2	500
KWSMDJ28A	KWSMDJ28CA	PFG	DFG	28.0	31.10	34.40	1	45.4	66.1	2	500
KWSMDJ30A	KWSMDJ30CA	PFK	DFK	30.0	33.30	36.80	1	48.4	62.0	2	500
KWSMDJ33A	KWSMDJ33CA	PFM	DFM	33.0	36.70	40.60	1	53.3	56.3	2	500
KWSMDJ36A	KWSMDJ36CA	PFP	DFP	36.0	40.00	44.20	1	58.1	51.6	2	500
KWSMDJ40A	KWSMDJ40CA	PFR	DFR	40.0	44.40	49.10	1	64.5	46.5	2	500
KWSMDJ43A	KWSMDJ43CA	PFT	DFT	43.0	47.80	52.80	1	69.4	43.2	2	500
KWSMDJ45A	KWSMDJ45CA	PFV	DFV	45.0	50.00	55.30	1	72.7	41.3	2	500
KWSMDJ48A	KWSMDJ48CA	PFX	DFX	48.0	53.30	58.90	1	77.4	38.8	2	500
KWSMDJ51A	KWSMDJ51CA	PFZ	DFZ	51.0	56.70	62.70	1	82.4	36.4	2	500
KWSMDJ54A	KWSMDJ54CA	RGE	DGE	54.0	60.00	66.30	1	87.1	34.4	2	500
KWSMDJ58A	KWSMDJ58CA	PGG	DGG	58.0	64.40	71.20	1	93.6	32.1	2	500
KWSMDJ60A	KWSMDJ60CA	PGK	DGK	60.0	66.70	73.70	1	96.8	31.0	2	500
KWSMDJ64A	KWSMDJ64CA	PGM	DGM	64.0	71.10	78.60	1	103.0	29.1	2	500
KWSMDJ70A	KWSMDJ70CA	PGP	DGP	70.0	77.80	86.00	1	113.0	26.5	2	500
KWSMDJ75A	KWSMDJ75CA	PGR	DGR	75.0	83.30	92.10	1	121.0	24.8	2	500
KWSMDJ78A	KWSMDJ78CA	PGT	DGT	78.0	86.70	95.80	1	126.0	23.8	2	500
KWSMDJ85A	KWSMDJ85CA	PGV	DGV	85.0	94.40	104.0	1	137.0	21.9	2	500
KWSMDJ90A	KWSMDJ90CA	PGX	DGX	90.0	100.0	111.0	1	146.0	20.5	2	500
KWSMDJ100A	KWSMDJ100CA	PGZ	DGZ	100.0	111.0	123.0	1	162.0	18.5	2	500
KWSMDJ110A	KWSMDJ110CA	PHE	DHE	110.0	122.0	135.0	1	177.0	16.9	2	500
KWSMDJ120A	KWSMDJ120CA	PHG	DHG	120.0	133.0	147.0	1	193.0	15.5	2	500
KWSMDJ130A	KWSMDJ130CA	PHK	DHK	130.0	144.0	159.0	1	209.0	14.4	2	500
KWSMDJ150A	KWSMDJ150CA	PHM	DHM	150.0	167.0	185.0	1	243.0	12.3	2	500
KWSMDJ160A	KWSMDJ160CA	PHP	DHP	160.0	178.0	197.0	1	259.0	11.6	2	500
KWSMDJ170A	KWSMDJ170CA	PHR	DHR	170.0	189.0	209.0	1	275.0	10.9	2	500
KWSMDJ180A	KWSMDJ180CA	PHT	DHT	180.0	200.0	221.0	1	292.0	10.3	2	500
KWSMDJ220A	KWSMDJ220CA	PKE	DKE	220.0	244.0	270.0	1	356.0	8.4	2	500

For parts without A, the V_{BR} is $\pm 10\%$, and V_C is 5% higher than A parts.

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

**TVS Diodes
Surface Mount-3000W KWSMDJ Series**

I-V Curve Characteristics



- P_{PPM} Peak Pulse Power Dissipation-Max power dissipation
- V_R Stand-off Voltage-Maximum voltage that can be applied to the TVS without operation
- V_{BR} Breakdown Voltage- Maximum voltage that flows though the TVS at a specified test current(I_T)
- V_C Clamping Voltage-Peak voltage measured across the suppressor at a specified I_{ppm} (peak impulse current)
- I_R Reverse Leakage Current-Current measured at V_R
- V_F Forward Voltage Drop for Uni-directional

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

Fig.1-TV S Transients Clamping Waveform

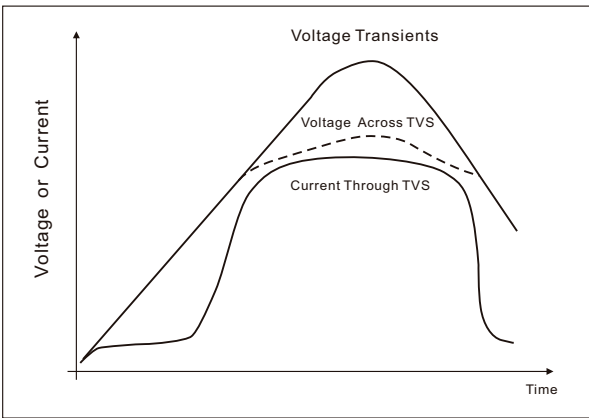
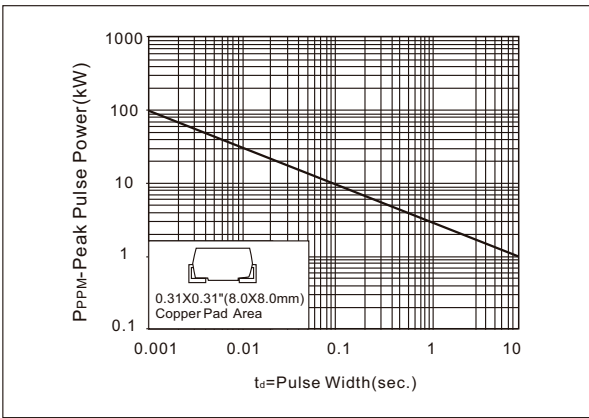


Fig.2-Peak Pulse Power Rating Curve



**TVS Diodes
Surface Mount-3000W KWSMDJ Series**

Fig.3-Pulse Derating Curve

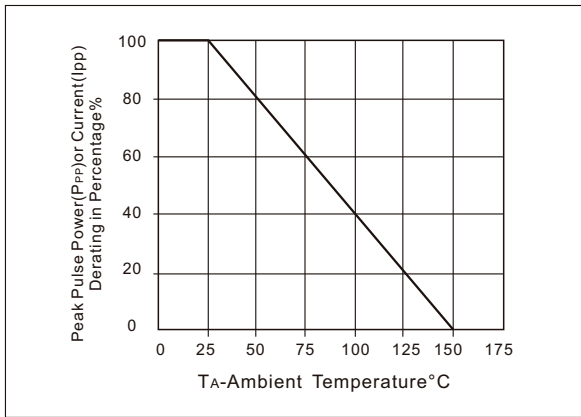


Fig.4-Pulse Waveform

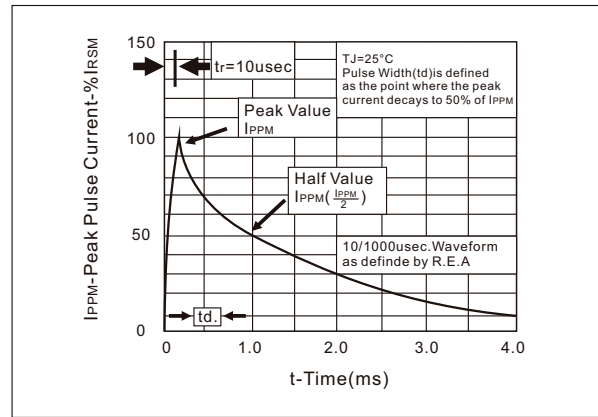


Fig.5-Typical Junction Capacitance

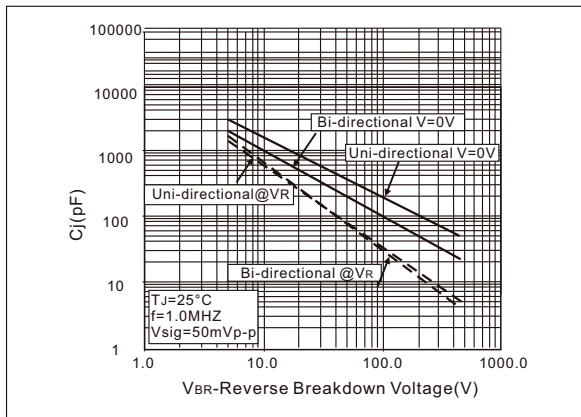


Fig.6-Steady State Power Dissipation Surge Current Uni-Directional Only

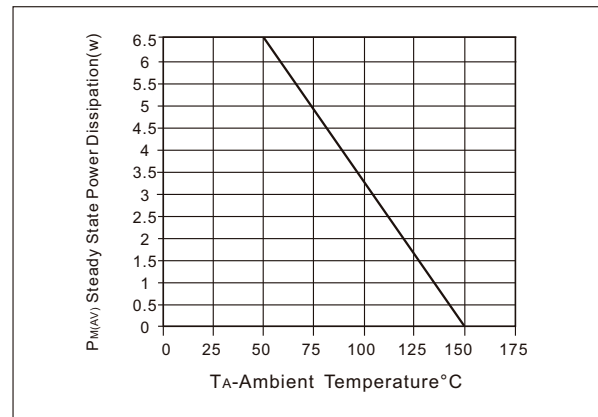
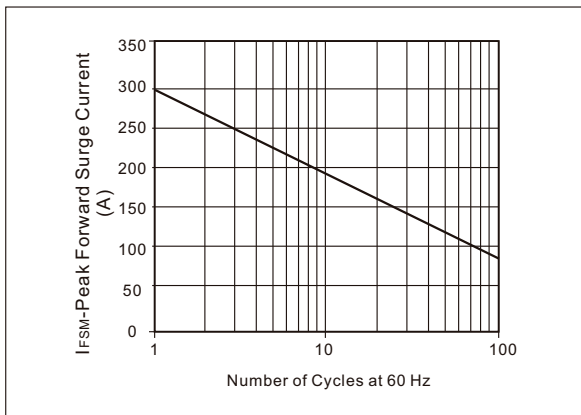


Fig.7-Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

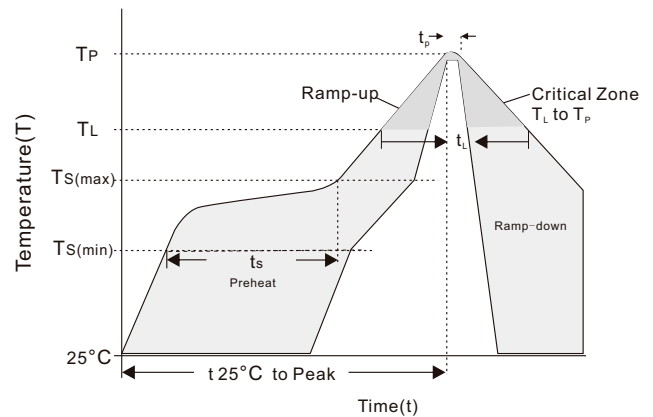


TVS Diodes Surface Mount-3000W KWSMDJ Series

Recommended Conditions

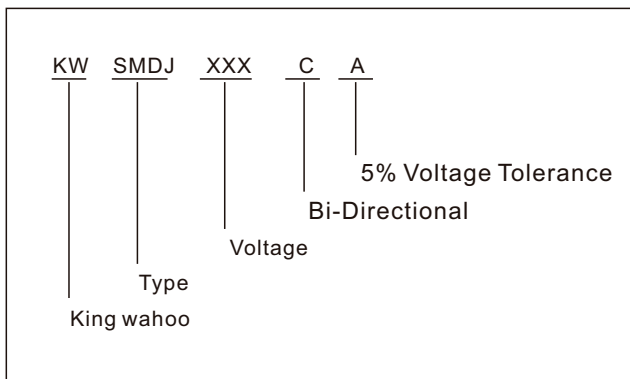
Reflow Condition		Pb – Free assembly
Heat Pre	Temperature Min (Ts)	150°C
	Temperature Max (Ts)	200°C
	Time (Min to Max) (ts)	60 – 180 secs
Average ramp up rate (Liquidus Temp (TL) to peak)		3°C/second max
Ts(max) to TL - Ramp-up Rate		3°C/second max
Reflow	- Temperature (TL) (Liquidus)	217°C
	Time (Min to Max) (ts)	60 – 150 seconds
Peak Temperature (TP)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (tp)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (TP)		8 minutes Max.
Do not exceed		280°C

Recommended Soldering Conditions



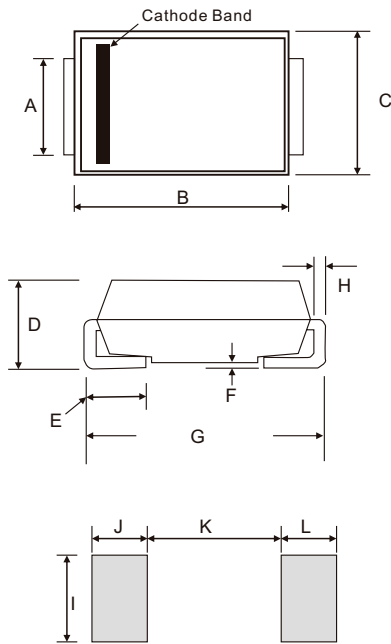
Part Number

Construction of part number




TVS Diodes
Surface Mount-3000W KWSMDJ Series

Dimensions



Dimensions	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
D	2.060	2.820	0.079	0.111
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
I	3.300	-	0.129	-
J	2.400	-	0.094	-
K	-	4.200	-	0.165
L	2.400	-	0.094	-

Packaging Options

Part number	Component Package	Quantity	Parameter Option	Packaging Specification
 KWSMDJ	DO-214AB	500	Tape& Reel-16mm/7" reel	EIA STD RS-481
	DO-214AB	3000	Tape & Reel-16mm/13" reel	EIA STD RS-481

