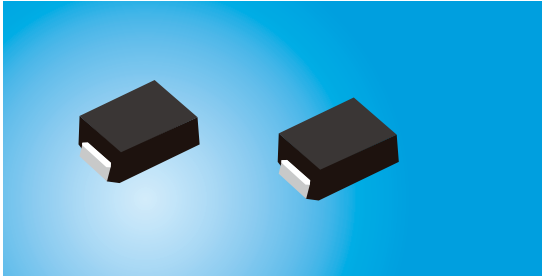


## TVS Diodes Surface Mount-600W KWSMBJ Series



### Description

The KWSMBJ 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 1uA 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 $\mu\text{s}$ waveform (Fig.2)(Note 1), (Note 2)	PPPM	600	W
Power Dissipation on infinite heat sink at $T_A=50^{\circ}\text{C}$	$P_{M(AV)}$	5.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	$I_{FSM}$	100	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional only (Note 4)	$V_F$	3.5/5.0	V
Operating Junction and Storage Temperature Range	$T_{J,TSTG}$	-55 to 150	$^{\circ}\text{C}$
Typical Thermal Resistance Junction to Lead	$R_{UJL}$	20	$^{\circ}\text{C}/\text{W}$
Typical Thermal Resistance Junction to Ambient	$R_{UJA}$	100	$^{\circ}\text{C}/\text{W}$

### Notes:

- Non-repetitive current pulse, per Fig.4 and derated above  $T_A=25^{\circ}\text{C}$  per Fig. 3.
- Mounted on 5.0x5.0mm 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 $I_R$ @ $V_R$ ( $\mu\text{A}$ )	Ipp 8X20us Amps
		UNI	BI		MIN	MAX					
KWSMBJ5.0A	KWSMBJ5.0CA	KE	AE	5.0	6.40	7.00	10	9.2	65.3	800	500
KWSMBJ6.0A	KWSMBJ6.0CA	KG	AG	6.0	6.67	7.37	10	10.3	58.3	800	500
KWSMBJ6.5A	KWSMBJ6.5CA	KK	AK	6.5	7.22	7.98	10	11.2	53.6	500	500
KWSMBJ7.0A	KWSMBJ7.0CA	KM	AM	7.0	7.78	8.60	10	12.0	50.0	200	500
KWSMBJ7.5A	KWSMBJ7.5CA	KP	AP	7.5	8.33	9.21	1	12.9	46.6	100	500
KWSMBJ8.0A	KWSMBJ8.0CA	KR	AR	8.0	8.89	9.83	1	13.6	44.2	50	500
KWSMBJ8.5A	KWSMBJ8.5CA	KT	AT	8.5	9.44	10.40	1	14.4	41.7	20	500

## TVS Diodes Surface Mount-600W KWSMBJ Series

### Electrical Characteristics

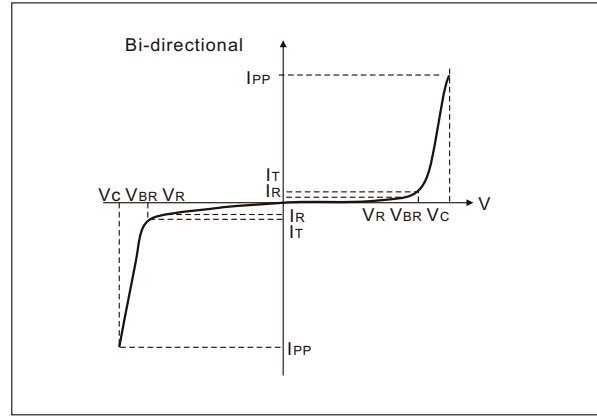
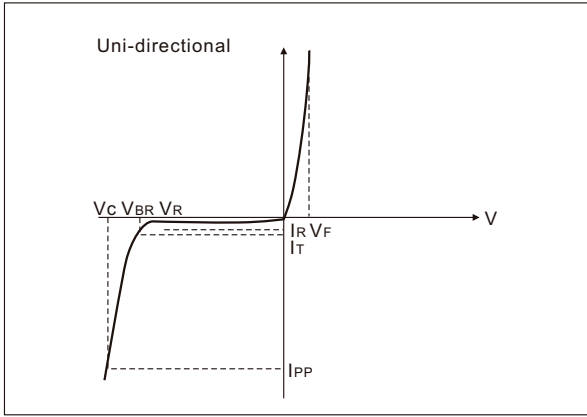
Part Number (Uni)	Part Number (Bi)	Marking		Reverse Stand off Voltage $V_R$ (Volts)	Breakdown Voltage $V_{BR}$ (Volts) @ $I_T$		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C$ @ $I_{pp}$ (V)	Maximum Peak Pulse Current $I_{pp}$ (A)	Maximum Reverse Leakage $I_R$ @ $V_R$ ( $\mu$ A)	$I_{pp}$ 8X20us Amps
		UNI	BI		MIN	MAX					
KWSMBJ9.0A	KWSMBJ9.0CA	KV	AV	9.0	10.00	11.10	1	15.4	39.0	10	500
KWSMBJ10A	KWSMBJ10CA	KX	AX	10.0	11.10	12.30	1	17.0	35.3	5	500
KWSMBJ11A	KWSMBJ11CA	KZ	AZ	11.0	12.20	13.50	1	18.2	33.0	1	500
KWSMBJ12A	KWSMBJ12CA	LE	BE	12.0	13.30	14.70	1	19.9	30.2	1	500
KWSMBJ13A	KWSMBJ13CA	LG	BG	13.0	14.40	15.90	1	21.5	28.0	1	500
KWSMBJ14A	KWSMBJ14CA	LK	BK	14.0	15.60	17.20	1	23.2	25.9	1	500
KWSMBJ15A	KWSMBJ15CA	LM	BM	15.0	16.70	18.50	1	24.4	24.6	1	500
KWSMBJ16A	KWSMBJ16CA	LP	BP	16.0	17.80	19.70	1	26.0	23.1	1	500
KWSMBJ17A	KWSMBJ17CA	LR	BR	17.0	18.90	20.90	1	27.6	21.8	1	500
KWSMBJ18A	KWSMBJ18CA	LT	BT	18.0	20.00	22.10	1	29.2	20.6	1	500
KWSMBJ20A	KWSMBJ20CA	LV	BV	20.0	22.20	24.50	1	32.4	18.6	1	500
KWSMBJ22A	KWSMBJ22CA	LX	BX	22.0	24.40	26.90	1	35.5	16.9	1	500
KWSMBJ24A	KWSMBJ24CA	LZ	BZ	24.0	26.70	29.50	1	38.9	15.5	1	500
KWSMBJ26A	KWSMBJ26CA	ME	CE	26.0	28.90	31.90	1	42.1	14.3	1	500
KWSMBJ28A	KWSMBJ28CA	MG	CG	28.0	31.10	34.40	1	45.4	13.3	1	500
KWSMBJ30A	KWSMBJ30CA	MK	CK	30.0	33.30	36.80	1	48.4	12.4	1	500
KWSMBJ33A	KWSMBJ33CA	MM	CM	33.0	36.70	40.60	1	53.3	11.3	1	500
KWSMBJ36A	KWSMBJ36CA	MP	CP	36.0	40.00	44.20	1	58.1	10.4	1	500
KWSMBJ40A	KWSMBJ40CA	MR	CR	40.0	44.40	49.10	1	64.5	9.3	1	500
KWSMBJ43A	KWSMBJ43CA	MT	CT	43.0	47.80	52.80	1	69.4	8.7	1	500
KWSMBJ45A	KWSMBJ45CA	MV	CV	45.0	50.00	55.30	1	72.7	8.3	1	500
KWSMBJ48A	KWSMBJ48CA	MX	CX	48.0	53.30	58.90	1	77.4	7.8	1	500
KWSMBJ51A	KWSMBJ51CA	MZ	CZ	51.0	56.70	62.70	1	82.4	7.3	1	500
KWSMBJ54A	KWSMBJ54CA	NE	DE	54.0	60.00	66.30	1	87.1	6.9	1	500
KWSMBJ58A	KWSMBJ58CA	NG	DG	58.0	64.40	71.20	1	93.6	6.5	1	500
KWSMBJ60A	KWSMBJ60CA	NK	DK	60.0	66.70	73.70	1	96.8	6.2	1	500
KWSMBJ64A	KWSMBJ64CA	NM	DM	64.0	71.10	78.60	1	103.0	5.9	1	500
KWSMBJ70A	KWSMBJ70CA	NP	DP	70.0	77.80	86.00	1	113.0	5.3	1	500
KWSMBJ75A	KWSMBJ75CA	NR	DR	75.0	83.30	92.10	1	121.0	5.0	1	500
KWSMBJ78A	KWSMBJ78CA	NT	DT	78.0	86.70	95.80	1	126.0	4.8	1	500
KWSMBJ85A	KWSMBJ85CA	NV	DV	85.0	94.40	104.0	1	137.0	4.4	1	500
KWSMBJ90A	KWSMBJ90CA	NX	DX	90.0	100.0	111.0	1	146.0	4.1	1	500
KWSMBJ100A	KWSMBJ100CA	NZ	DZ	100.0	111.0	123.0	1	162.0	3.7	1	500
KWSMBJ110A	KWSMBJ110CA	PE	EE	110.0	122.0	135.0	1	177.0	3.4	1	500
KWSMBJ120A	KWSMBJ120CA	PG	EG	120.0	133.0	147.0	1	193.0	3.1	1	500
KWSMBJ130A	KWSMBJ130CA	PK	EK	130.0	144.0	159.0	1	209.0	2.9	1	500
KWSMBJ150A	KWSMBJ150CA	PM	EM	150.0	167.0	185.0	1	243.0	2.5	1	500
KWSMBJ160A	KWSMBJ160CA	PP	EP	160.0	178.0	197.0	1	259.0	2.3	1	500
KWSMBJ170A	KWSMBJ170CA	PR	ER	170.0	189.0	209.0	1	275.0	2.2	1	500
KWSMBJ180A	KWSMBJ180CA	PT	ET	180.0	201.0	222.0	1	292.0	2.1	1	500
KWSMBJ188A	KWSMBJ188CA	PB	EB	188.0	209.0	231.0	1	304.0	2.0	1	500
KWSMBJ200A	KWSMBJ200CA	PV	EV	200.0	224.0	247.0	1	324.0	1.9	1	500
KWSMBJ220A	KWSMBJ220CA	PX	EX	220.0	246.0	272.0	1	356.0	1.7	1	500
KWSMBJ250A	KWSMBJ250CA	PZ	EZ	250.0	279.0	309.0	1	405.0	1.5	1	500
KWSMBJ300A	KWSMBJ300CA	QE	FE	300.0	335.0	371.0	1	486.0	1.3	1	500
KWSMBJ350A	KWSMBJ350CA	QG	FG	350.0	391.0	432.0	1	567.0	1.1	1	500
KWSMBJ400A	KWSMBJ400CA	QK	FK	400.0	447.0	494.0	1	648.0	0.9	1	500
KWSMBJ440A	KWSMBJ440CA	QM	FM	440.0	492.0	543.0	1	713.0	0.9	1	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-600W KWSMBJ 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 thogh 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

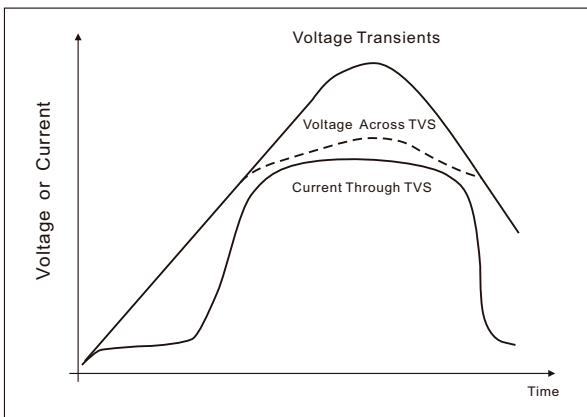
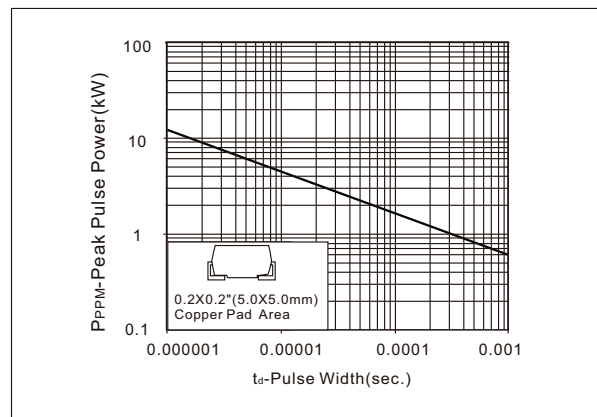
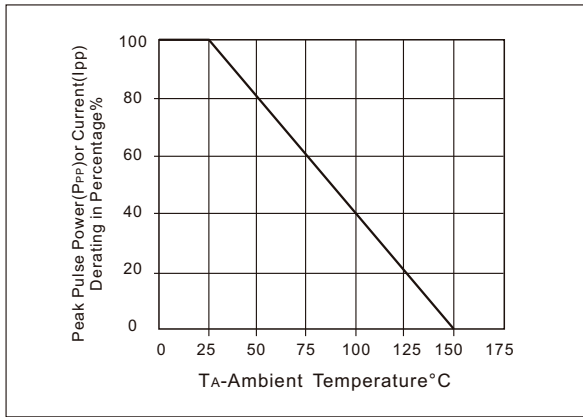


Fig.2-Peak Pulse Power Rating Curve

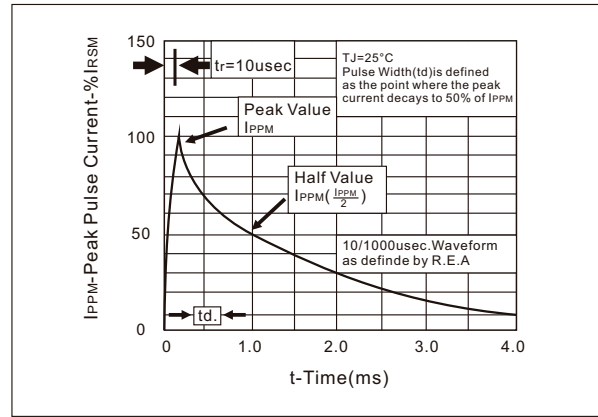


**TVS Diodes**  
**Surface Mount-600W KWSMBJ Series**

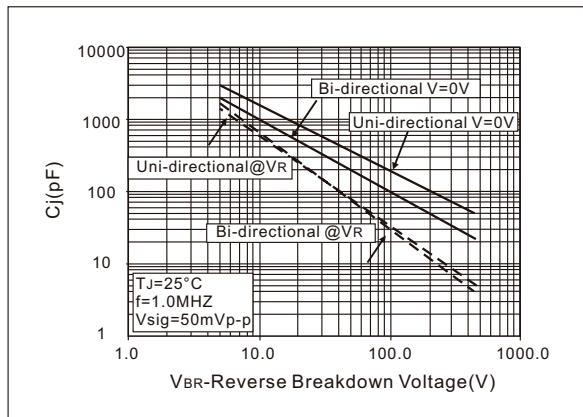
**Fig.3-Pulse Derating Curve**



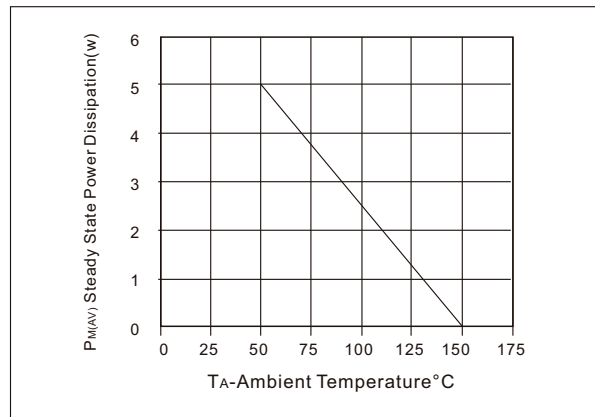
**Fig.4-Pulse Waveform**



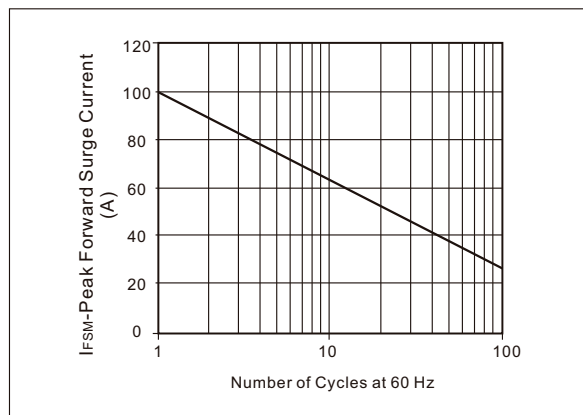
**Fig.5-Typical Junction Capacitance**



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



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

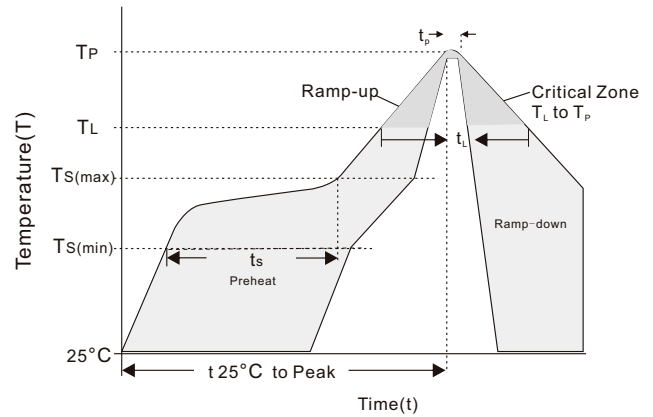


# TVS Diodes Surface Mount-600W KWSMBJ Series

## Recommended Conditions

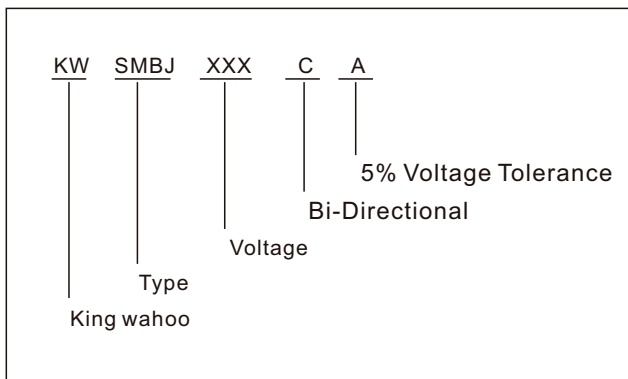
Reflow Condition		Pb – Free assembly
Heat Pre	Temperature Min (Ts)	150°C
	Temperature Max (Ts)	200°C
	Time (Min to Max) (ts)	60 – 180 secs
Average ramp up rate (Liquidus Temp (TL) to peak)		3°C/second max
Ts(max) to TL - Ramp-up Rate		3°C/second max
Reflow	- Temperature (TL) (Liquidus)	217°C
	Time (Min to Max) (ts)	60 – 150 seconds
Peak Temperature (TP)		260 <sup>+0/-5</sup> °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



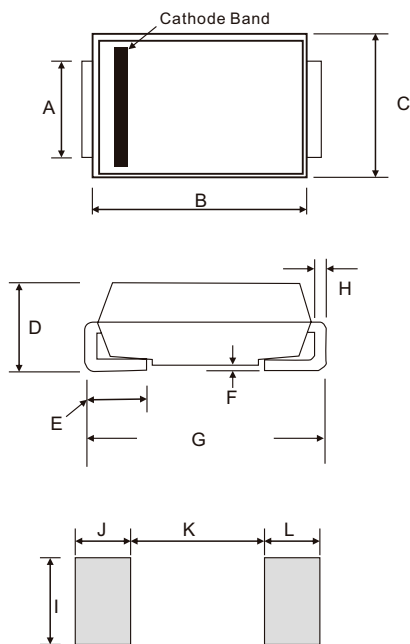
## Part Number

Construction of part number




# TVS Diodes Surface Mount-600W KWSMBJ Series

## Dimensions



Dimensions	Millimeters		Inches	
	Min	Max	Min	Max
A	1.950	2.200	0.077	0.086
B	4.060	4.570	0.160	0.180
C	3.300	3.940	0.130	0.155
D	2.130	2.440	0.084	0.096
E	0.760	1.520	0.030	0.060
F	-	0.203	-	0.008
G	5.210	5.590	0.205	0.220
H	0.152	0.305	0.006	0.012
I	2.260	-	0.089	-
J	2.160	-	0.085	-
K	-	2.740	-	0.107
L	2.160	-	0.085	-

## Packaging Options

Part number	Component Package	Quantity	Parameter Option	Packaging Specification
KWSMBJ 	DO-214AA	3000	Tape & Reel-12mm/13" reel	EIA STD RS-481

