TVS P6SMBJ Series — 600W

DO-214AA (SMB)

Features

- Ideal for automated placement
- Glass passivated chip junction
- Available in uni-directional and bi-directional
- 600 W peak pulse power capability with a 10/1000 µs waveform, repetitive rate (duty cycle): 0.01 %
- Very fast response time
- Low incremental surge resistance
- Solder dip 260 °C, 40 seconds

Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	
Peak Pulse Power Dissipation at T_A=25°C by 10x1000µs waveform (Fig.1)(Note 1), (Note 2)	P_{PPM}	600	W
Power Dissipation on infinite heat sink at T_A=50°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	3.5V/5.0	V
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-65 to 150	°C
Typical Thermal Resistance Junction to Lead	R_{uJL}	20	°C/W
Typical Thermal Resistance Junction to Ambient	R_{uJA}	100	°C/W

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above T_A=25°C per Fig. 2.
2. Mounted on 5.0x5.0mm copper pad to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.
4. V_F < 3.5V for $V_{BR} \leq$ 200V and V_F< 6.5V for $V_{BR} \geq$ 201V.

TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive and telecommunication.

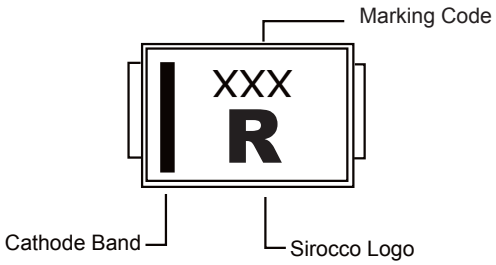
MECHANICAL DATA

Case: DO-214AA (SMB)
Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D

Polarity: Color band denotes cathode end

Part Marking System



Specifications are subject to change without notice
Revision: 15-MAR-2013

ELECTRICAL CHARACTERISTICS (TA = 25 °C unless otherwise noted)

Part Number		Marking		Reverse Stand off Voltage VR	Breakdown Voltage VBR (Volts) @ IT		Test Current IT	Maximum Clamping Voltage VC @ Ipp	Maximum Peak Pulse Current Ipp	Maximum Reverse Leakage IR@ VR
(Uni)	(Bi)	UNI	BI	(Volts)	MIN	MAX	(mA)	(V)	(A)	(µA)
P6SMBJ5.0A	P6SMBJ5.0CA	KE	AE	5.0	6.40	7.00	10	9.2	65.3	800
P6SMBJ6.0A	P6SMBJ6.0CA	KG	AG	6.0	6.67	7.37	10	10.3	58.3	800
P6SMBJ6.5A	P6SMBJ6.5CA	KK	AK	6.5	7.22	7.98	10	11.2	53.6	500
P6SMBJ7.0A	P6SMBJ7.0CA	KM	AM	7.0	7.78	8.60	10	12.0	50.0	200
P6SMBJ7.5A	P6SMBJ7.5CA	KP	AP	7.5	8.33	9.21	1	12.9	46.6	100
P6SMBJ8.0A	P6SMBJ8.0CA	KR	AR	8.0	8.89	9.83	1	13.6	44.2	50
P6SMBJ8.5A	P6SMBJ8.5CA	KT	AT	8.5	9.44	10.40	1	14.4	41.7	20
P6SMBJ9.0A	P6SMBJ9.0CA	KV	AV	9.0	10.00	11.10	1	15.4	39.0	10
P6SMBJ10A	P6SMBJ10CA	KX	AX	10.0	11.10	12.30	1	17.0	35.3	5
P6SMBJ11A	P6SMBJ11CA	KZ	AZ	11.0	12.20	13.50	1	18.2	33.0	1
P6SMBJ12A	P6SMBJ12CA	LE	BE	12.0	13.30	14.70	1	19.9	30.2	1
P6SMBJ13A	P6SMBJ13CA	LG	BG	13.0	14.40	15.90	1	21.5	28.0	1
P6SMBJ14A	P6SMBJ14CA	LK	BK	14.0	15.60	17.20	1	23.2	25.9	1
P6SMBJ15A	P6SMBJ15CA	LM	BM	15.0	16.70	18.50	1	24.4	24.6	1
P6SMBJ16A	P6SMBJ16CA	LP	BP	16.0	17.80	19.70	1	26.0	23.1	1
P6SMBJ17A	P6SMBJ17CA	LR	BR	17.0	18.90	20.90	1	27.6	21.8	1
P6SMBJ18A	P6SMBJ18CA	LT	BT	18.0	20.00	22.10	1	29.2	20.6	1
P6SMBJ20A	P6SMBJ20CA	LV	BV	20.0	22.20	24.50	1	32.4	18.6	1
P6SMBJ22A	P6SMBJ22CA	LX	BX	22.0	24.40	26.90	1	35.5	16.9	1
P6SMBJ24A	P6SMBJ24CA	LZ	BZ	24.0	26.70	29.50	1	38.9	15.5	1
P6SMBJ26A	P6SMBJ26CA	ME	CE	26.0	28.90	31.90	1	42.1	14.3	1
P6SMBJ28A	P6SMBJ28CA	MG	CG	28.0	31.10	34.40	1	45.4	13.3	1
P6SMBJ30A	P6SMBJ30CA	MK	CK	30.0	33.30	36.80	1	48.4	12.4	1
P6SMBJ33A	P6SMBJ33CA	MM	CM	33.0	36.70	40.60	1	53.3	11.3	1
P6SMBJ36A	P6SMBJ36CA	MP	CP	36.0	40.00	44.20	1	58.1	10.4	1
P6SMBJ40A	P6SMBJ40CA	MR	CR	40.0	44.40	49.10	1	64.5	9.3	1
P6SMBJ43A	P6SMBJ43CA	MT	CT	43.0	47.80	52.80	1	69.4	8.7	1
P6SMBJ45A	P6SMBJ45CA	MV	CV	45.0	50.00	55.30	1	72.7	8.3	1
P6SMBJ48A	P6SMBJ48CA	MX	CX	48.0	53.30	58.90	1	77.4	7.8	1
P6SMBJ51A	P6SMBJ51CA	MZ	CZ	51.0	56.70	62.70	1	82.4	7.3	1
P6SMBJ54A	P6SMBJ54CA	NE	DE	54.0	60.00	66.30	1	87.1	6.9	1
P6SMBJ58A	P6SMBJ58CA	NG	DG	58.0	64.40	71.20	1	93.6	6.5	1
P6SMBJ60A	P6SMBJ60CA	NK	DK	60.0	66.70	73.70	1	96.8	6.2	1
P6SMBJ64A	P6SMBJ64CA	NM	DM	64.0	71.10	78.60	1	103.0	5.9	1
P6SMBJ70A	P6SMBJ70CA	NP	DP	70.0	77.80	86.00	1	113.0	5.3	1
P6SMBJ75A	P6SMBJ75CA	NR	DR	75.0	83.30	92.10	1	121.0	5.0	1
P6SMBJ78A	P6SMBJ78CA	NT	DT	78.0	86.70	95.80	1	126.0	4.8	1
P6SMBJ85A	P6SMBJ85CA	NV	DV	85.0	94.40	104.00	1	137.0	4.4	1
P6SMBJ90A	P6SMBJ90CA	NX	DX	90.0	100.00	111.00	1	146.0	4.1	1
P6SMBJ100A	P6SMBJ100CA	NZ	DZ	100.0	111.00	123.00	1	162.0	3.7	1
P6SMBJ110A	P6SMBJ110CA	PE	EE	110.0	122.00	135.00	1	177.0	3.4	1
P6SMBJ120A	P6SMBJ120CA	PG	EG	120.0	133.00	147.00	1	193.0	3.1	1
P6SMBJ130A	P6SMBJ130CA	PK	EK	130.0	144.00	159.00	1	209.0	2.9	1
P6SMBJ150A	P6SMBJ150CA	PM	EM	150.0	167.00	185.00	1	243.0	2.5	1
P6SMBJ160A	P6SMBJ160CA	PP	EP	160.0	178.00	197.00	1	259.0	2.3	1
P6SMBJ170A	P6SMBJ170CA	PR	ER	170.0	189.00	209.00	1	275.0	2.2	1
P6SMBJ180A	P6SMBJ180CA	PT	ET	180.0	201.00	222.00	1	292.0	2.1	1
P6SMBJ200A	P6SMBJ200CA	PV	EV	200.0	224.00	247.00	1	324.0	1.9	1
P6SMBJ220A	P6SMBJ220CA	PX	EX	220.0	246.00	272.00	1	356.0	1.7	1
P6SMBJ250A	P6SMBJ250CA	PZ	EZ	250.0	279.00	309.00	1	405.0	1.5	1
P6SMBJ300A	P6SMBJ300CA	QE	FE	300.0	335.00	371.00	1	486.0	1.3	1
P6SMBJ350A	P6SMBJ350CA	QG	FG	350.0	391.00	432.00	1	567.0	1.1	1
P6SMBJ400A	P6SMBJ400CA	QK	FK	400.0	447.00	494.00	1	648.0	0.9	1
P6SMBJ440A	P6SMBJ440CA	QM	FM	440.0	492.00	543.00	1	713.0	0.9	1

For bidirectional type having V_{RWM} of 10 volts and less, the I_R limit is double.

For parts without A (V_{BR} is ± 10% and V_C is 5% higher than with A parts).

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

Figure 1 - Peak Pulse Power Rating Curve

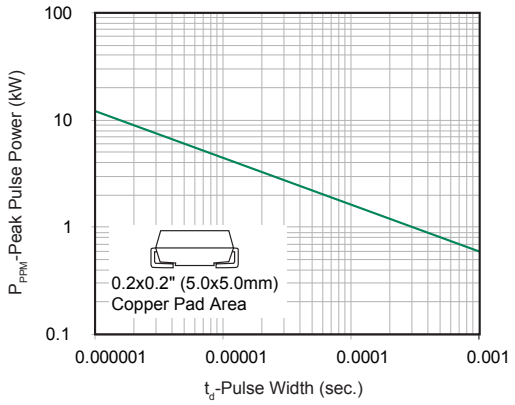


Figure 2 - Pulse Derating Curve

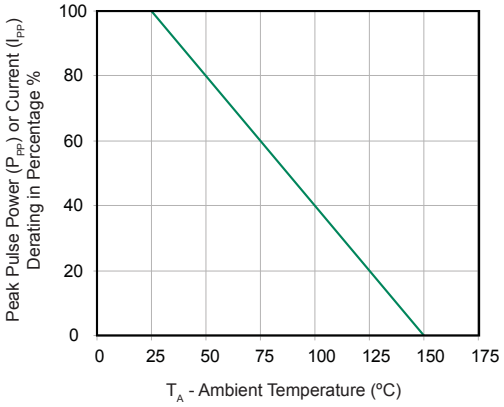


Figure 3 - Pulse Waveform

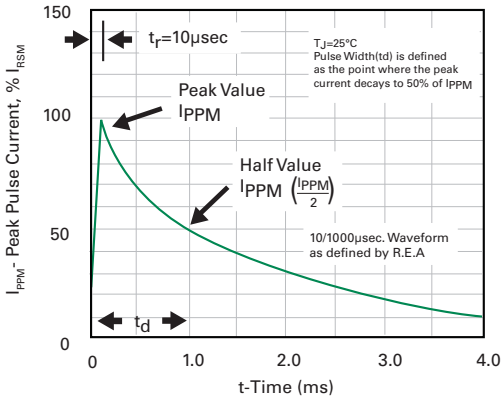


Figure 4 - Typical Junction Capacitance

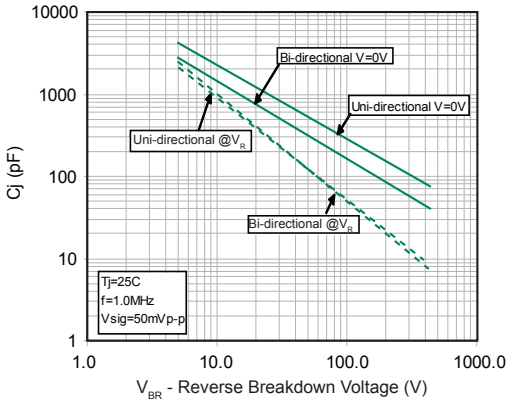


Figure 5 - Steady State Power Dissipation Derating Curve

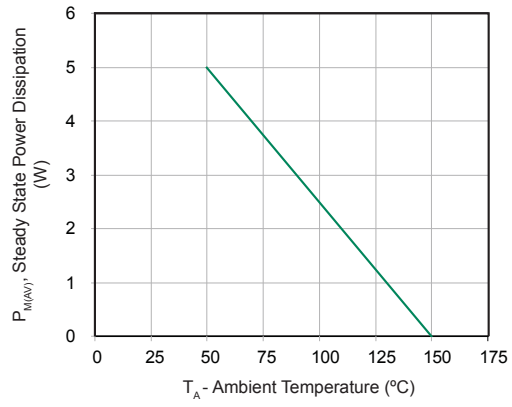
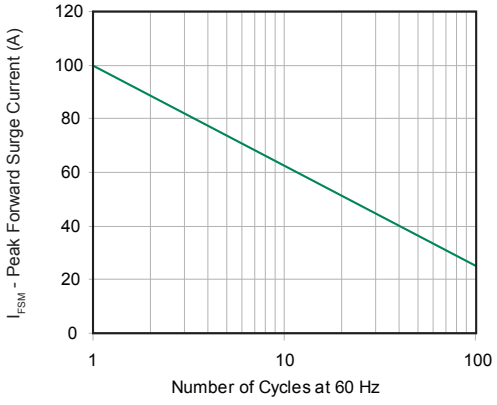


Figure 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



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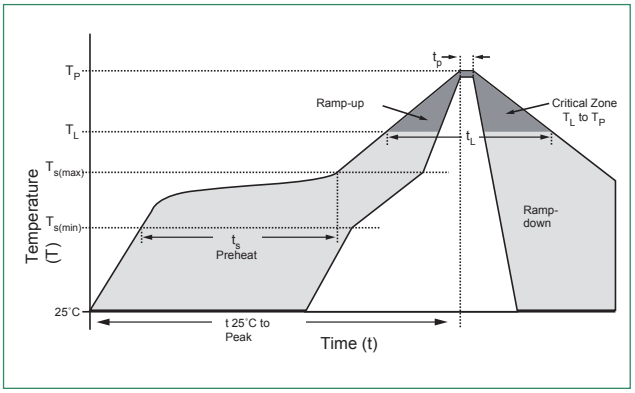
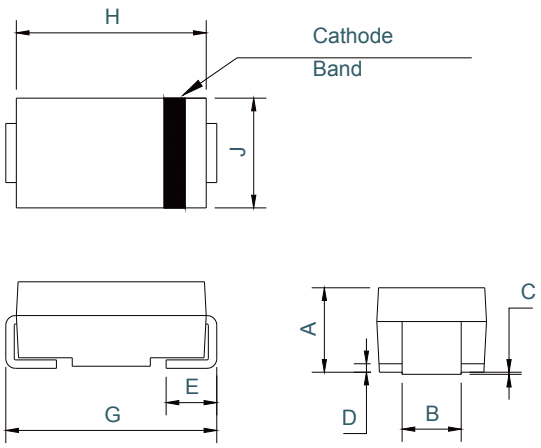
Soldering Parameters

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_s)	60 – 150 seconds
Peak Temperature (T_P)		260+0/-5 °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		280°C



Dimensions

SM**B**-(DO-214A**A**)



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.083	0.096	2.13	2.44	
B	0.075	0.083	1.91	2.11	
C	0.002	0.008	0.051	0.203	
D	——	0.02	——	0.51	
E	0.030	0.060	0.76	1.52	
G	0.189	0.220	4.80	5.59	
H	0.160	0.185	4.06	4.70	
J	0.130	0.155	3.30	3.94	