

## DESCRIPTION

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

## FEATURES

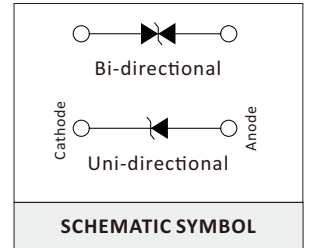
- > Glass passivated chip
- > 600 W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetitive rate (duty cycle):0.01 %
- > High reliability application and automotive grade
- > AEC Q101 qualified
- > Low leakage
- > Uni and Bidirectional unit
- > Excellent clamping capability
- > Very fast response time
- > RoHS compliant

## MECHANICAL DATA

- > Case: Molded plastic
- > Epoxy: UL 94V-0 rate flame retardant
- > Lead: Solderable per MIL-STD-750, method 2026
- > Polarity: Color band denotes cathode end except Bipolar
- > Mounting position: Any



DO-214AA PACKAGE



## MAXIMUM RATINGS( $T_A=25^\circ\text{C}$ HERWISE NOTED)

PARAMETER	SYMBOL	VALUE	UNIT
Peak power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)</sup>	$P_{PP}$	600	W
Peak pulse current with a 10/1000 $\mu$ s waveform <sup>(1)</sup>	$I_{PP}$	See Next Table	A
Power dissipation on infinite heatsink at $T_l = 75^\circ\text{C}$	$P_D$	5.0	W
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only <sup>(2)</sup>	$I_{FSM}$	100	A
Maximum instantaneous forward voltage at 50 A for unidirectional only <sup>(3)</sup>	$V_F$	3.5/5.0	V
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 ~ +150	$^\circ\text{C}$

**Note:**

- (1) Non-repetitive current pulse per Fig.5 and derated above  $T_A = 25^\circ\text{C}$  per Fig.1
- (2) Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum
- (3)  $V_F < 3.5\text{V}$  for devices of  $V_{BR} < 200\text{V}$  and  $V_F < 5.0\text{V}$  for devices of  $V_{BR} > 201\text{V}$

## ELECTRICAL CHARACTERISTICS

PART NUMBER		DEVICE MARKING CODE		BREAKDOWN VOLTAGE $V_{BR}$ @ $I_T$			MAXIMUM REVERSE LEAKAGE	WORKING PEAK REVERSE VOLTAGE	MAXIMUM REVERSE SURGE CURRENT	MAXIMUM CLAMPING VOLTAGE
UNI	BI	UNI	BI	Min.(V)	Max.(V)	$I_T$ (mA)	$I_R$ @ $V_{RWM}$ ( $\mu$ A)	$V_{RWM}$ (V)	$I_{PP}$ (A)	$V_C$ @ $I_{PP}$ (V)
TPSMBJ11A	TPSMBJ11CA	KZA	AZA	12.20	13.50	1	1	11.0	32.97	18.20
TPSMBJ12A	TPSMBJ12CA	LEA	BEA	13.30	14.70	1	1	12.0	30.15	19.90
TPSMBJ13A	TPSMBJ13CA	LGA	BGA	14.40	15.90	1	1	13.0	27.91	21.50
TPSMBJ14A	TPSMBJ14CA	LKA	BKA	15.60	17.20	1	1	14.0	25.86	23.20
TPSMBJ15A	TPSMBJ15CA	LMA	BMA	16.70	18.50	1	1	15.0	24.59	24.40
TPSMBJ16A	TPSMBJ16CA	LPA	BPA	17.80	19.70	1	1	16.0	23.08	26.00



**ELECTRICAL CHARACTERISTICS**

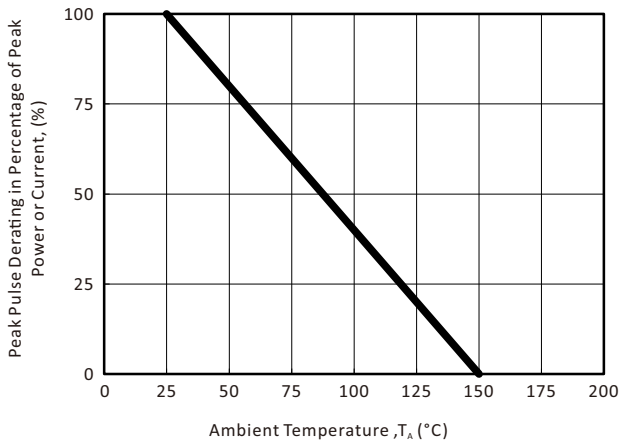
PART NUMBER		DEVICE MARKING CODE		BREAKDOWN VOLTAGE $V_{BR}@I_T$			MAXIMUM REVERSE LEAKAGE	WORKING PEAK REVERSE VOLTAGE	MAXIMUM REVERSE SURGE CURRENT	MAXIMUM CLAMPING VOLTAGE
UNI	BI	UNI	BI	Min.(V)	Max.(V)	$I_T$ (mA)	$I_R@V_{RWM}$ ( $\mu$ A)	$V_{RWM}$ (V)	$I_{PP}$ (A)	$V_C@I_{PP}$ (V)
TPSMBJ18A	TPSMBJ18CA	LTA	BTA	20.00	22.10	1	1	18.0	20.55	29.20
TPSMBJ20A	TPSMBJ20CA	LVA	BVA	22.20	24.50	1	1	20.0	18.52	32.40
TPSMBJ22A	TPSMBJ22CA	LXA	BXA	24.40	26.90	1	1	22.0	16.90	35.50
TPSMBJ24A	TPSMBJ24CA	LZA	BZA	26.70	29.50	1	1	24.0	15.42	38.90
TPSMBJ26A	TPSMBJ26CA	MEA	CEA	28.90	31.90	1	1	26.0	14.25	42.10
TPSMBJ28A	TPSMBJ28CA	MGA	CGA	31.10	34.40	1	1	28.0	13.22	45.40
TPSMBJ30A	TPSMBJ30CA	MKA	CKA	33.30	36.80	1	1	30.0	12.40	48.40
TPSMBJ33A	TPSMBJ33CA	MMA	CMA	36.70	40.60	1	1	33.0	11.26	53.30
TPSMBJ36A	TPSMBJ36CA	MPA	CPA	40.00	44.20	1	1	36.0	10.33	58.10
TPSMBJ40A	TPSMBJ40CA	MRA	CRA	44.40	49.10	1	1	40.0	9.30	64.50
TPSMBJ43A	TPSMBJ43CA	MTA	CTA	47.80	52.80	1	1	43.0	8.65	69.40
TPSMBJ45A	TPSMBJ45CA	MVA	CVA	50.00	55.30	1	1	45.0	8.25	72.70
TPSMBJ48A	TPSMBJ48CA	MXA	CXA	53.30	58.90	1	1	48.0	7.75	77.40
TPSMBJ51A	TPSMBJ51CA	MZA	CZA	56.70	62.70	1	1	51.0	7.28	82.40
TPSMBJ54A	TPSMBJ54CA	NEA	DEA	60.00	66.30	1	1	54.0	6.89	87.10
TPSMBJ58A	TPSMBJ58CA	NGA	DGA	64.40	71.20	1	1	58.0	6.41	93.60
TPSMBJ60A	TPSMBJ60CA	NKA	DKA	66.70	73.70	1	1	60.0	6.20	96.80
TPSMBJ64A	TPSMBJ64CA	NMA	DMA	71.10	78.60	1	1	64.0	5.83	103.0
TPSMBJ70A	TPSMBJ70CA	NPA	DPA	77.80	86.00	1	1	70.0	5.31	113.0
TPSMBJ75A	TPSMBJ75CA	NRA	DRA	83.30	92.10	1	1	75.0	4.96	121.0
TPSMBJ78A	TPSMBJ78CA	NTA	DTA	86.70	95.80	1	1	78.0	4.76	126.0
TPSMBJ85A	TPSMBJ85CA	NVA	DVA	94.40	92.10	1	1	85.0	4.38	137.0
TPSMBJ90A	TPSMBJ90CA	NXA	DXA	100.0	111.0	1	1	90.0	4.11	146.0
TPSMBJ100A	TPSMBJ100CA	NZA	DZA	111.0	123.0	1	1	100.0	3.70	162.0
TPSMBJ110A	TPSMBJ110CA	PEA	EEA	122.0	135.0	1	1	110.0	3.39	177.0
TPSMBJ120A	TPSMBJ120CA	PGA	EGA	133.0	147.0	1	1	120.0	3.11	193.0
TPSMBJ130A	TPSMBJ130CA	PKA	EKA	144.0	159.0	1	1	130.0	2.87	209.0
TPSMBJ140A	TPSMBJ140CA	PBA	EBA	155.0	171.0	1	1	140.0	2.65	226.8
TPSMBJ150A	TPSMBJ150CA	PMA	EMA	167.0	185.0	1	1	150.0	2.47	243.0
TPSMBJ160A	TPSMBJ160CA	PPA	EPA	178.0	197.0	1	1	160.0	2.32	259.0
TPSMBJ170A	TPSMBJ170CA	PRA	ERA	189.0	209.0	1	1	170.0	2.18	275.0

**Note:**

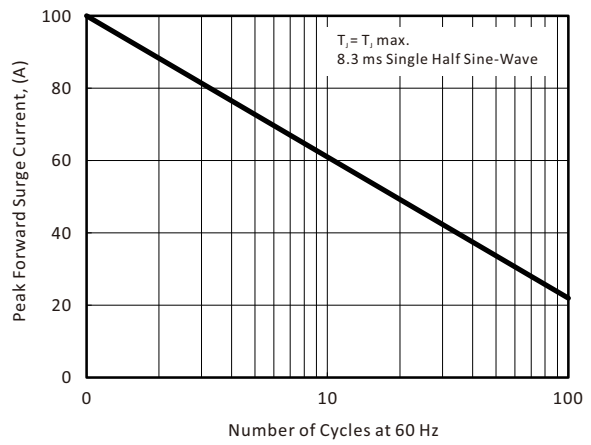
1. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
2. For Bi-Directional devices having  $V_s$  of 10 volts and under, the  $I_R$  limit is double



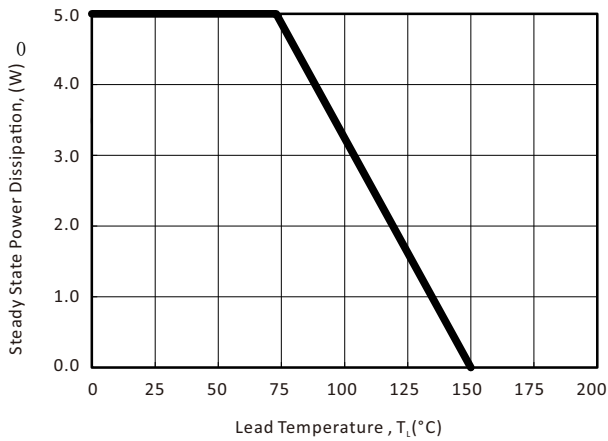
**RATINGS AND CHARACTERISTICS CURVES ( $T_A=25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**



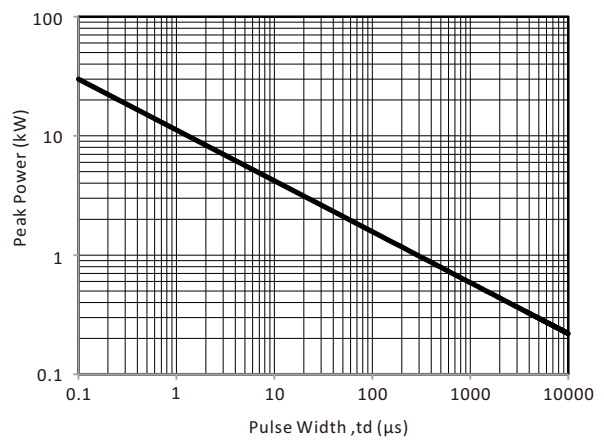
**Fig. 1 - Pulse Derating Curve**



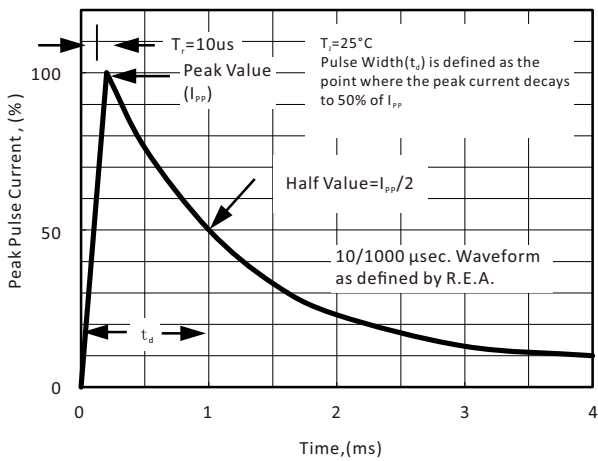
**Fig. 2 - Maximum Non-Repetitive Surge Current**



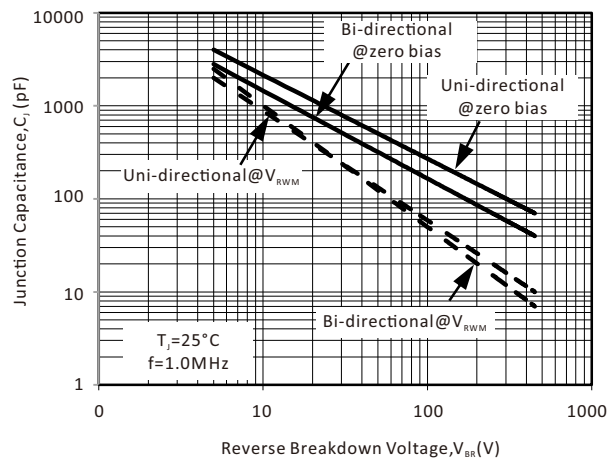
**Fig. 3 - Steady State Power Derating Curve**



**Fig. 4 - Peak Pulse Power Rating Curve**



**Fig. 5 - Pulse Waveform**



**Fig. 6 - Typical Junction Capacitance**



### DO-214AA(SMB) PACKAGE DIMENSIONS

SMB PACKAGE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.96	2.20	0.077	0.087
B	4.35	4.85	0.171	0.191
C	3.30	3.94	0.130	0.155
D	2.20	2.50	0.087	0.098
E	0.76	1.52	0.030	0.060
F	0.02	0.20	0.001	0.008
G	5.08	5.59	0.200	0.220
H	0.15	0.30	0.006	0.012

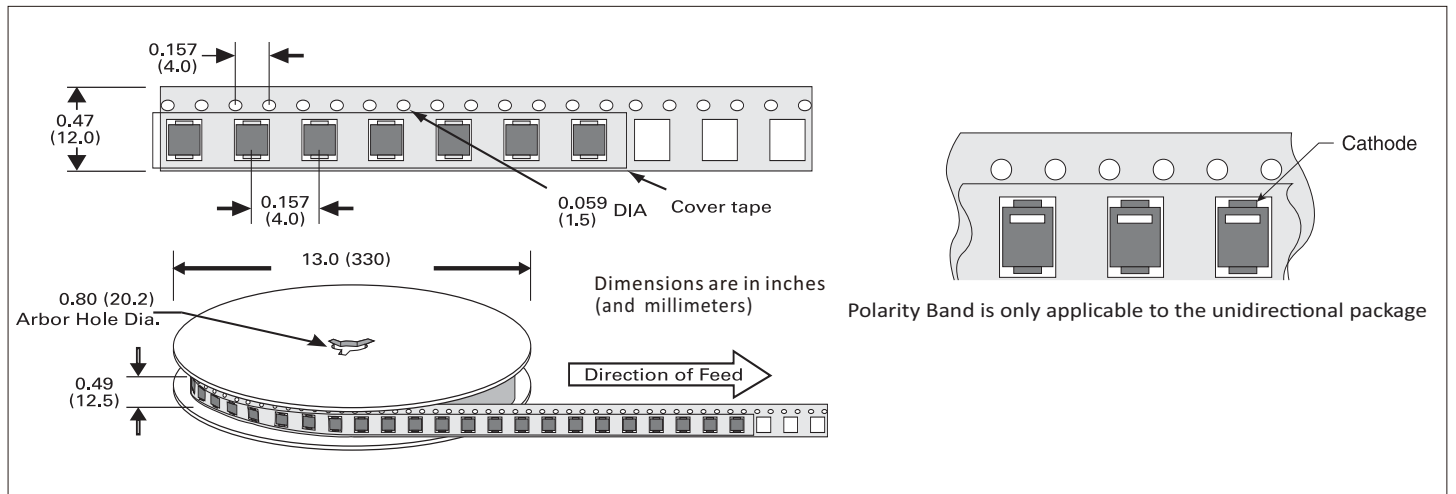
**NOTES:**

- Dimensions are exclusive of mold flash and metal burrs
- Polarity Band is only applicable to the unidirectional package

### RECOMMENDED PAD LAYOUT DIMENSIONS

RECOMMENDED PAD LAYOUT DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.20	-	0.087	-
B	1.45	-	0.057	-
C	-	2.55	-	0.100
D	1.45	-	0.057	-
E	5.60 REF		0.220 REF	

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