



### FEATURES

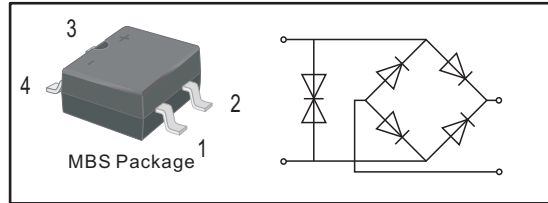
- Lead Free Finish/RoHS Compliant
- Green Molding Compound (No Halogen and Antimony)
- Large withstanding surge current capability : 200A/220A (@8/20 $\mu$ s)
- Lower clamping voltage and excellent performance on ringing waves testing.
- Glass Passivated Chip Junction
- High Surge Current Capability
- Designed for Surface Mount Application

### PINNING

PIN	DESCRIPTION
1	Input Pin ( ~ )
2	Input Pin ( ~ )
3	Output Anode ( + )
4	Output Cathode ( - )

### MECHANICAL DATA

- Case: MBS
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 100mg / 0.0035oz



Maximum Ratings and Thermal Characteristics(TA = 25°C unless otherwise specified)

Ratings at 25 °C ambient temperature unless otherwise specified.

Single phase half-wave 60 Hz, resistive or inductive load, for capacitive load current derate by 20 %.

Parameter of Bridge Rectifier	Symbols	TB120S	TB240S	TB250S	TB120SA	TB240SA	TB250SA	Units
Average Rectified Output Current at T <sub>c</sub> = 125 °C	I <sub>O</sub>	1.0						A
Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method)	I <sub>FSM</sub>	35						A
Maximum Forward Voltage at 1.0 A	V <sub>F</sub>	1.1						V
Maximum DC Reverse Current at Rated DC Blocking Voltage (@VR=1000V)	I <sub>R</sub>	5 40						$\mu$ A
Typical Junction Capacitance ( f=1MHz,4V DC )	C <sub>j</sub>	13						pF
Typical Thermal Resistance ( Note1 )	R <sub>θJA</sub> R <sub>θJC</sub>	80 28						°C/W
Operating and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55 ~ +150						°C

Note: 1. Mounted on glass epoxy PC board with 4×1.5"×1.5" ( 3.81×3.81 cm ) copper pad.

Parameter of TVS	Symbol	TB120S	TB240S	TB250S	TB120SA	TB240SA	TB250SA	Unit
Maximum allowable continuous AC voltage at 50-60Hz	V <sub>RMS</sub>	155	310	380	155	310	380	V
Breakdown voltage @ 1mA	V <sub>BR</sub>	237~263	492~543	551~609	237~263	492~543	551~609	V
Maximum allowable continuous DC voltage	V <sub>DC</sub>	220	440	490	220	440	490	V
Maximum allowable clamping voltage @ 8/20 $\mu$ s(Fig 10)	V <sub>C</sub>	350	700	850	350	700	850	V
Maximum peak current (8/20 $\mu$ s@2 $\Omega$ )(Fig 9)	I <sub>peak</sub>	200			220			A
Peak Pulse Current on 10/1000 us waveform (Note 2, Fig 7)	I <sub>PPM</sub>	See Table 1						A
Operating and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55 ~ +150						°C

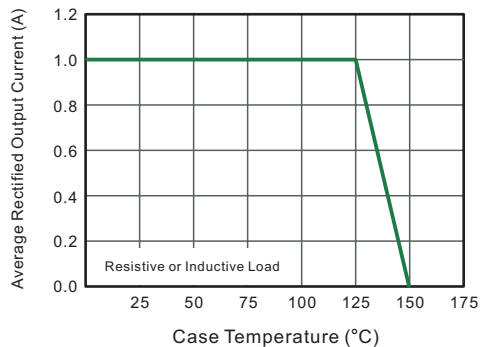
Table 1

Type	Typ. Clamp Voltage V <sub>C</sub> @ I <sub>PP</sub> (V)	Peak Pulse Current@10/1000us I <sub>PP</sub> (A)
TB120S	290	2.2
TB240S	630	1.2
TB250S	680	0.9
TB120SA	290	2.6
TB240SA	630	1.6
TB250SA	680	1.3

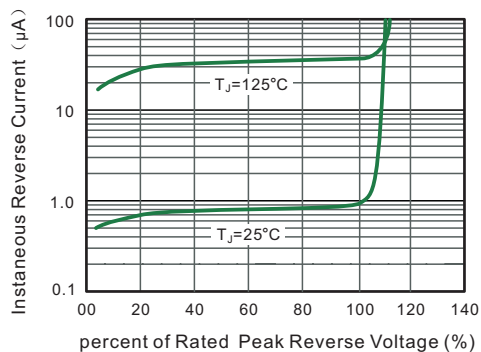
NOTE2:Non-repetitive current pulse, per Fig.8 and derated above TA = 25°C per Fig. 7.



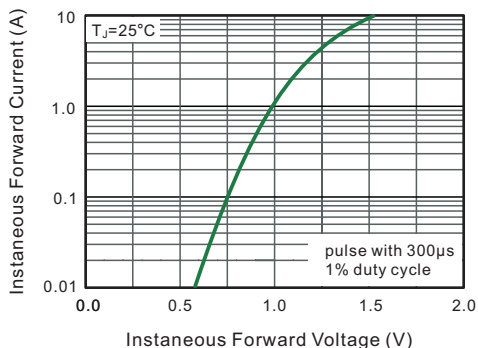
**Fig.1 Average Rectified Output Current Derating Curve**



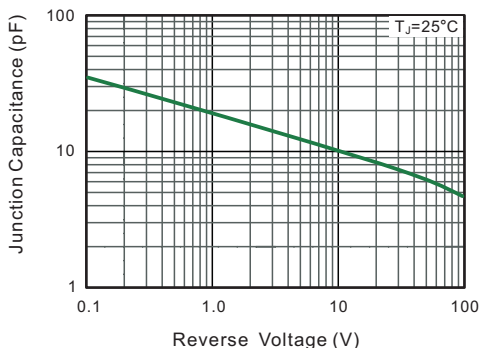
**Fig.2 Typical Reverse Characteristics**



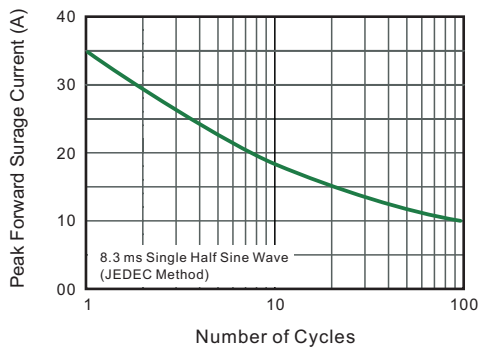
**Fig.3 Typical Instantaneous Forward Characteristics**



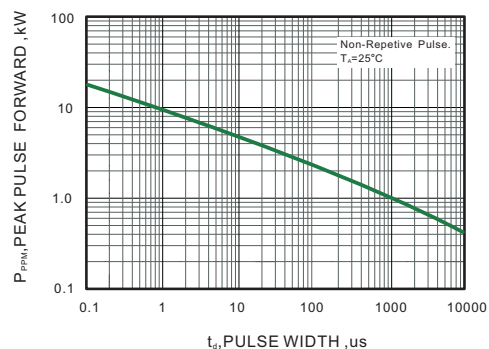
**Fig.4 Typical Junction Capacitance**



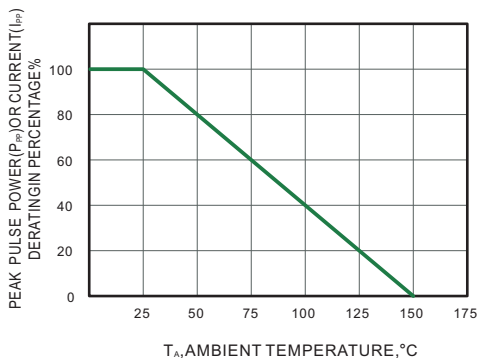
**Fig.5 Maximum Non-Repetitive Peak Forward Surge Current**



**Fig.6 Peak Pulse Power Rating Curve**



**Fig.7 Forward Current Derating Curve**



**Fig.8 Pulse Waveform**

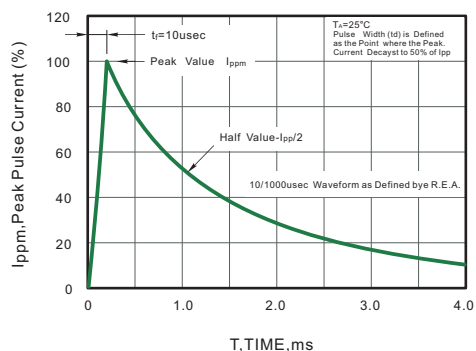




Fig.9 Maximum peak current

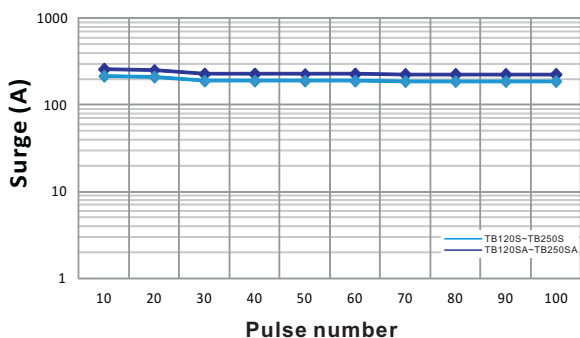


Fig.10 V/I Curve

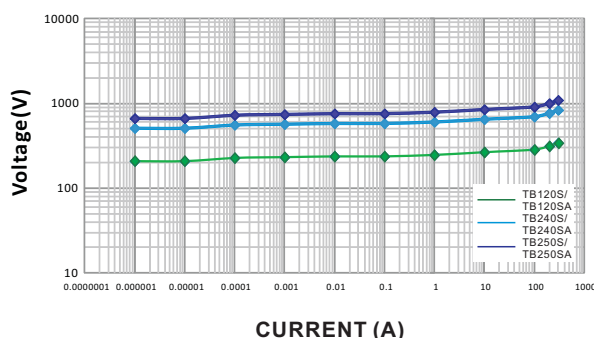
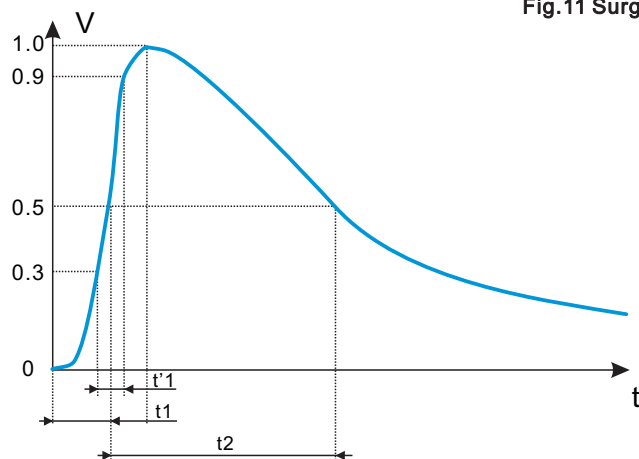


Fig.11 Surge Waveform

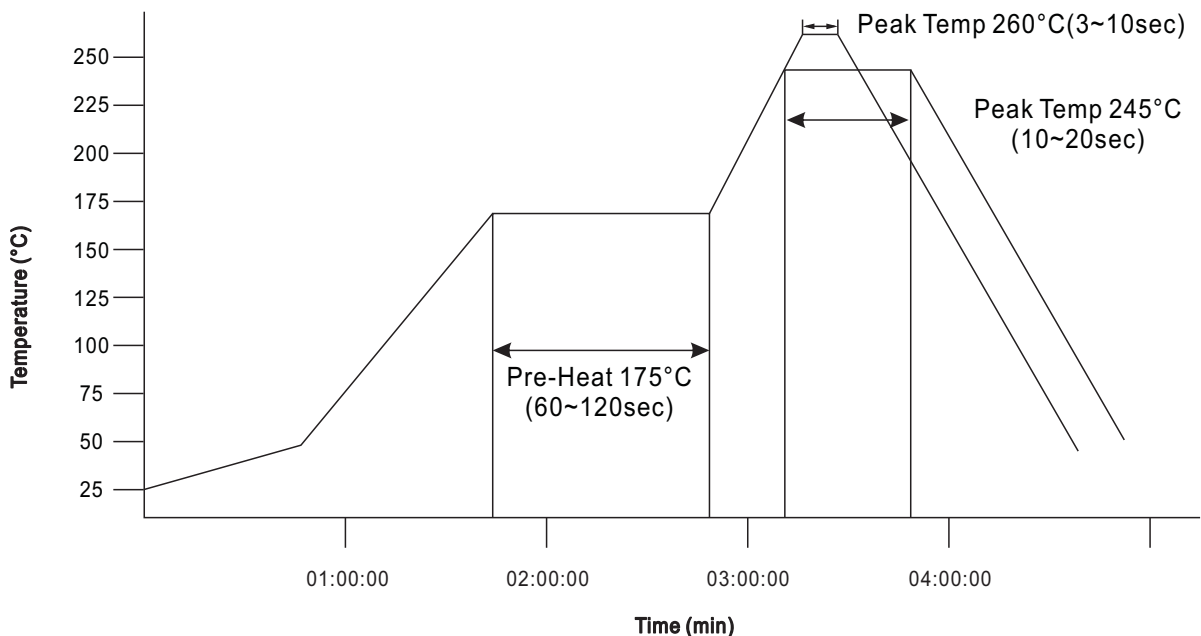


IEC61000-4-5 Standards

SEVERITY LEVEL	T1(=1.67t'1)	T2
1	10us	1000us
2	8us	20us

8/20us waveform current

Fig.12 The Ir reflow and temperature of soldering for Pb free process



**IR reflow Pb free process suggestion profile:**

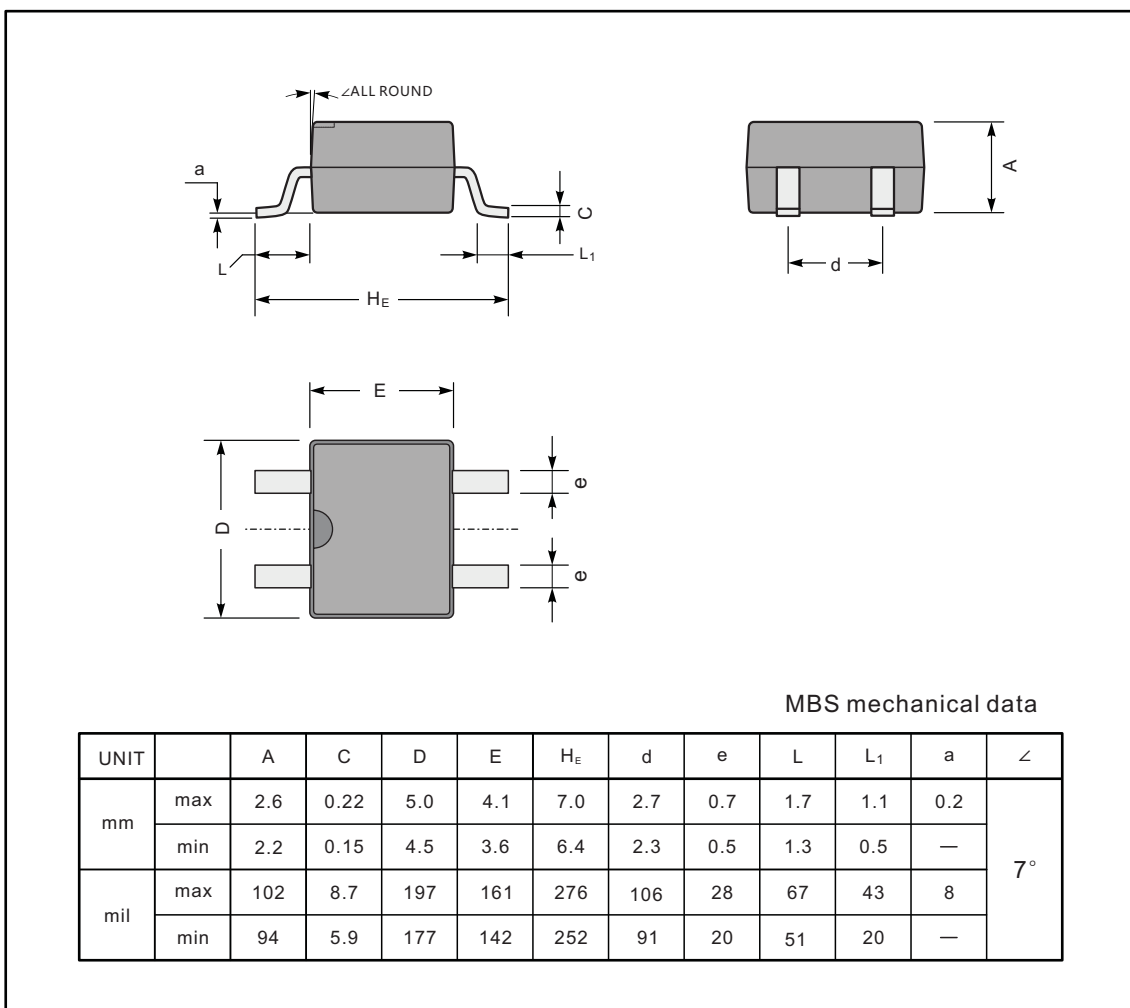
- (1) Ramp-up rate (217°C to peak) +3°C/second max.
- (2) Temp. maintain at 175±25 180seconds max.
- (3) Temp. maintain above 217°C 60~150 seconds
- (4) The peak temperature must be at least 260°C, the time above the 255°C must be within 20s



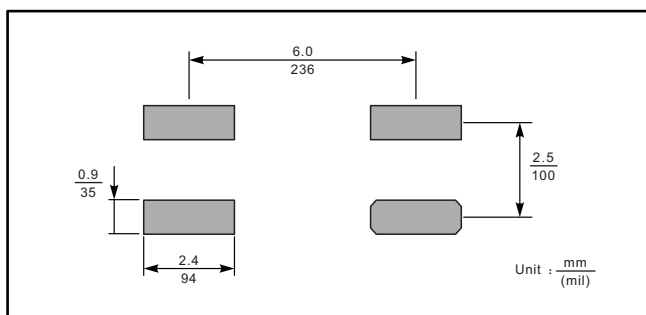
## PACKAGE OUTLINE

Plastic surface mounted package; 4 leads

MBS



### The recommended mounting pad size



### Marking

Type number	Marking code
TB120S	TB120S
TB240S	TB240S
TB250S	TB250S
TB120SA	TB120SA
TB240SA	TB240SA
TB250SA	TB250SA