

TOSHIBA Schottky Barrier Rectifier Schottky Barrier Type

## CUS06

Switching Mode Power Supply Applications

Portable Equipment Battery Application

- Forward voltage:  $V_{FM} = 0.45 \text{ V (max) @ } I_F = 0.7 \text{ A}$
- Average forward current:  $I_F (AV) = 1.0 \text{ A}$
- Repetitive peak reverse voltage:  $V_{RRM} = 20 \text{ V}$
- Suitable for high-density board assembly due to the use of a small Surface-mount package, US-FLAT™

Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

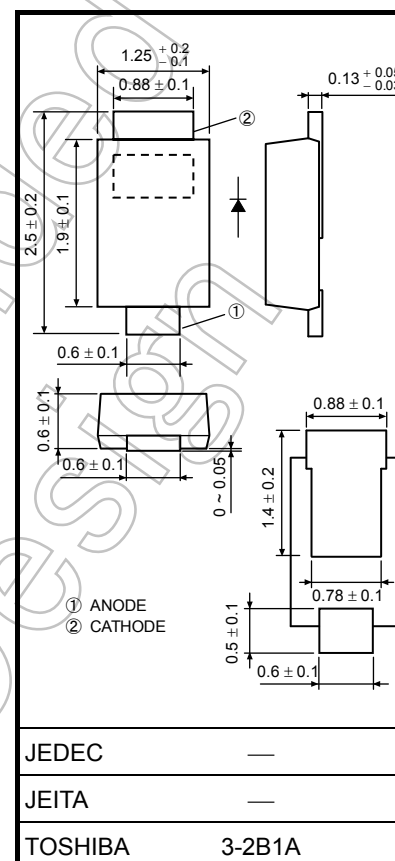
Characteristics	Symbol	Rating	Unit
Repetitive peak reverse voltage	$V_{RRM}$	20	V
Average forward current	$I_F (AV)$	1.0 (Note 1)	A
Peak one cycle surge forward current (Non-repetitive)	$I_{FSM}$	20 (50 Hz)	A
Junction temperature	$T_j$	-40 to 150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-40 to 150	$^\circ\text{C}$

Note 1:  $T_a = 66^\circ\text{C}$ : Device mounted on a glass-epoxy board  
 (Board size: 50 mm × 50 mm,  
 Soldering land: 6 mm × 6 mm)  
 Rectangular waveform ( $\alpha = 180^\circ$ ),  $V_R = 10 \text{ V}$

Note 2: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

Unit: mm



Weight: 0.004 g (typ.)

Start of commercial production  
2007-02

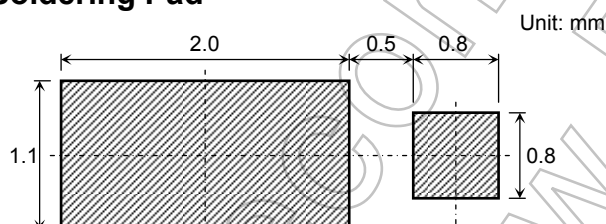
## Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Peak forward voltage	V <sub>FM</sub> (1)	I <sub>FM</sub> = 0.1 A	—	0.35	—	V
	V <sub>FM</sub> (2)	I <sub>FM</sub> = 0.7 A	—	0.42	0.45	
	V <sub>FM</sub> (3)	I <sub>FM</sub> = 1.0 A	—	0.47	—	
Repetitive peak reverse current	I <sub>RRM</sub> (1)	V <sub>RRM</sub> = 5 V	—	0.7	—	μA
	I <sub>RRM</sub> (2)	V <sub>RRM</sub> = 20 V	—	3.0	30	μA
Junction capacitance	C <sub>j</sub>	V <sub>R</sub> = 10 V, f = 1.0 MHz	—	40	—	pF
Thermal resistance (junction to ambient)	R <sub>th</sub> (j-a)	Device mounted on a ceramic board (board size: 50 mm × 50 mm) (soldering land: 2 mm × 2 mm) (board thickness: 0.64 mm)	—	—	75	°C/W
		Device mounted on a glass-epoxy board (board size: 50 mm × 50 mm) (soldering land: 6 mm × 6 mm) (board thickness: 1.6 mm)	—	—	150	
Thermal resistance (junction to lead)	R <sub>th</sub> (j-l)	Junction to lead of cathode side	—	—	30	°C/W

## Marking

Abbreviation Code	Part No.
6	CUS06

## Standard Soldering Pad



## Handling Precaution

Schottky barrier diodes have reverse current characteristic compared to the other diodes.

There is a possibility SBD may cause thermal runaway when it is used under high temperature or high voltage. This device is V<sub>F</sub>-I<sub>RRM</sub> trade-off type, lower V<sub>F</sub> higher I<sub>RRM</sub>; therefore, thermal runaway might occur when voltage is applied. Please take forward and reverse loss into consideration during the design.

The absolute maximum ratings are rated values and must not be exceeded during operation, even for an instant. The following are the general derating methods that we recommend for designing a circuit using this device.

**V<sub>RRM</sub>:** Use this rating with reference to the above. V<sub>RRM</sub> has a temperature coefficient of 0.1%/°C. Take this temperature coefficient into account designing a device at low temperature.

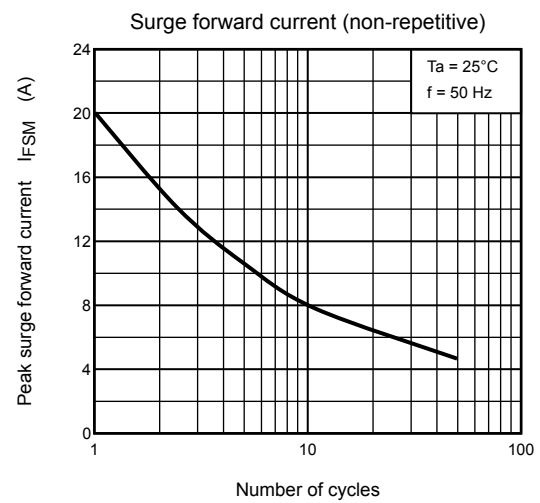
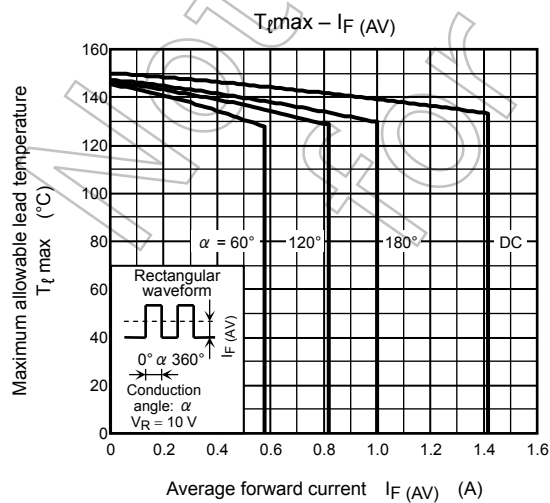
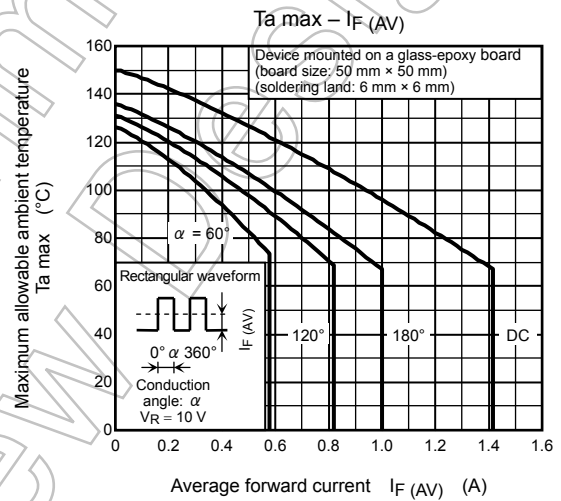
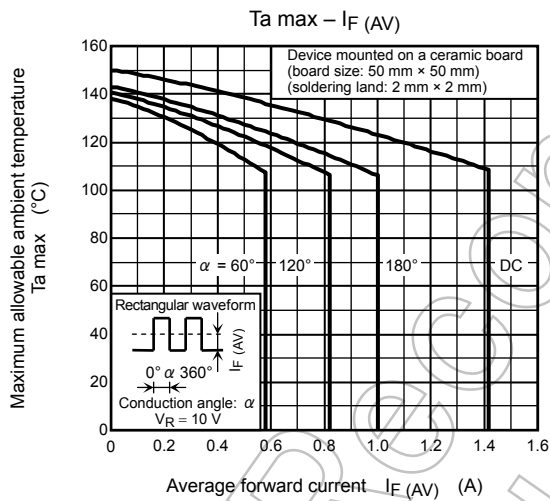
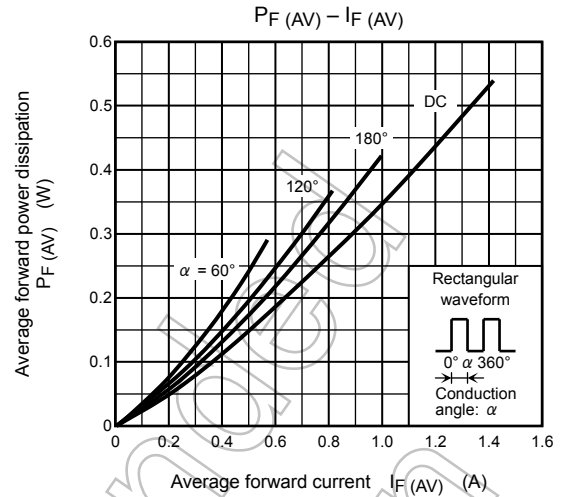
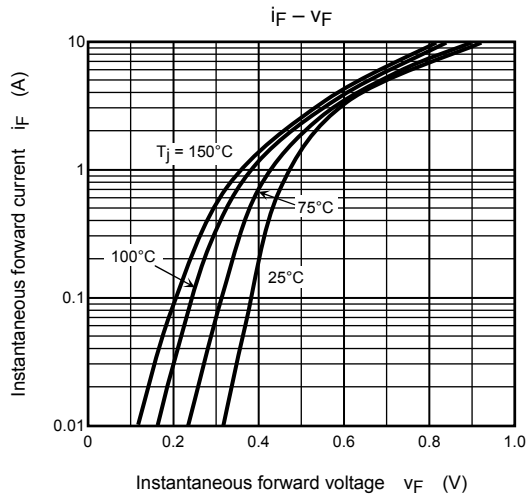
**I<sub>F(AV)</sub>:** We recommend that the worst case current be no greater than 80% of the absolute maximum rating of I<sub>F(AV)</sub> and T<sub>j</sub> be below 120°C. When using this device, take the margin into consideration by using an allowable T<sub>amax</sub>·I<sub>F(AV)</sub> curve.

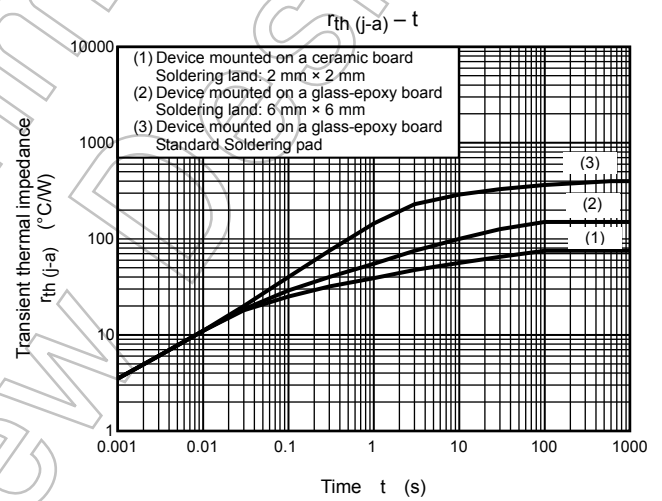
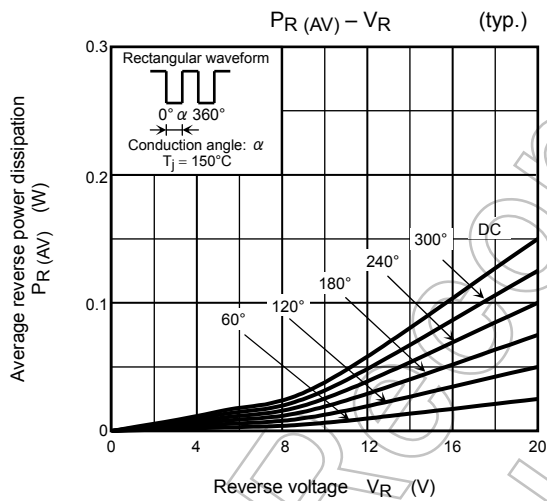
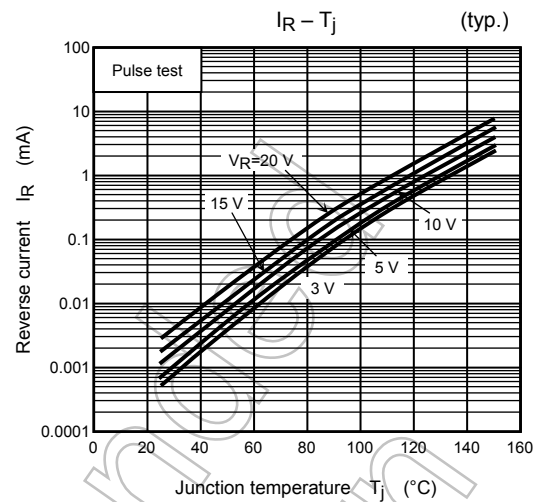
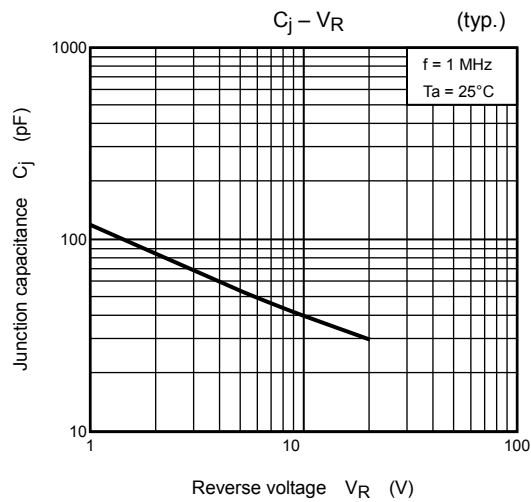
**I<sub>FSM</sub>:** This rating specifies the non-repetitive peak current. This is only applied for an abnormal operation, which seldom occurs during the lifespan of the device.

**T<sub>j</sub>:** Derate this rating when using a device in order to ensure high reliability. We recommend that the device be used at T<sub>j</sub> of below 120°C.

Thermal resistance between junction and ambient fluctuates depending on the device's mounting condition. When using a device, please design a circuit board and a soldering land size to match the appropriate thermal resistance value.

Refer to the Rectifiers databook for further information.





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