

TOSHIBA Schottky Barrier Diode

# CRS15

Switching Mode Power Supply Applications  
 Portable Equipment Battery Applications

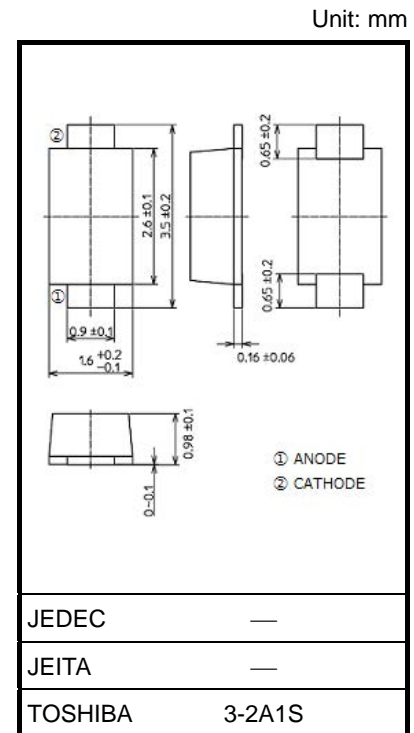
- Repetitive peak reverse voltage :  $V_{RRM} = 30\text{ V}$
- Forward current :  $I_F(\text{DC}) = 3\text{ A}$
- Peak forward voltage :  $V_{FM} = 0.52\text{ V (max)}$
- Small, thin package suitable for high-density board assembly  
 Toshiba Nickname: "S-FLAT™"

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

Characteristics	Symbol	Rating	Unit
Repetitive peak reverse voltage	$V_{RRM}$	30	V
Forward current (DC)	$I_F(\text{DC})$	3 (Note 1)	A
Non-repetitive peak forward surge current	$I_{FSM}$	30 (50 Hz)	A
Junction temperature	$T_j$	-40 to 150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-40 to 150	$^\circ\text{C}$

Note 1:  $T_a = 69^\circ\text{C}$  : Device mounted on a ceramic board  
 Board size : 50 mm × 50 mm  
 Soldering land size : 2 mm × 2 mm  
 Board thickness : 0.64 mm  
 DC waveform

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).



Weight: 0.013 g (typ.)

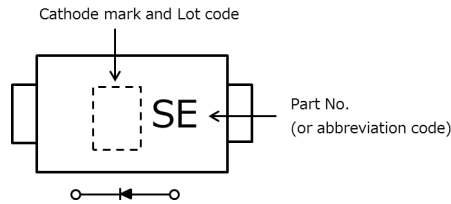
### Electrical Characteristics ( $T_a = 25^\circ\text{C}$ )

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Peak forward voltage	$V_{FM}(1)$	$I_{FM} = 0.1\text{ A}$ (pulse test)	—	0.35	—	V
	$V_{FM}(2)$	$I_{FM} = 1\text{ A}$ (pulse test)	—	0.415	—	
	$V_{FM}(3)$	$I_{FM} = 3\text{ A}$ (pulse test)	—	0.47	0.52	
Repetitive peak reverse current	$I_{RRM}(1)$	$V_{RRM} = 5\text{ V}$ (pulse test)	—	0.8	—	$\mu\text{A}$
	$I_{RRM}(2)$	$V_{RRM} = 30\text{ V}$ (pulse test)	—	10	50	
Junction capacitance	$C_j$	$V_R = 10\text{ V}$ , $f = 1\text{ MHz}$	—	90	—	pF
Thermal resistance (junction to ambient)	$R_{th(j-a)}$	Device mounted on a ceramic board board size : 50 mm × 50 mm soldering land size : 2 mm × 2 mm board thickness : 0.64 mm	—	—	70	$^\circ\text{C/W}$
		Device mounted on a glass-epoxy board board size : 50 mm × 50 mm soldering land size : 6 mm × 6 mm board thickness : 1.6 mm	—	—	140	
Thermal resistance (junction to lead)	$R_{th(j-l)}$	—	—	—	20	$^\circ\text{C/W}$

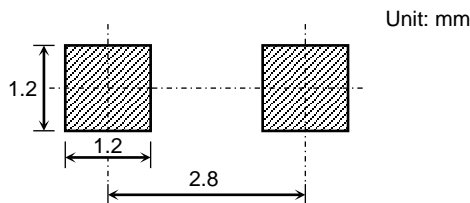
Start of commercial production  
 2008-08

## Marking

Abbreviation Code	Part No.
SE	CRS15



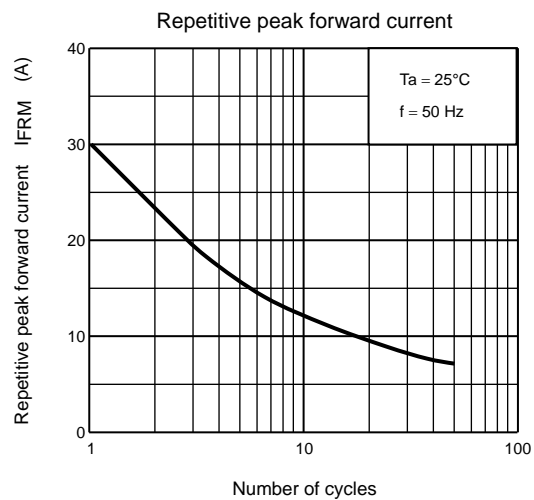
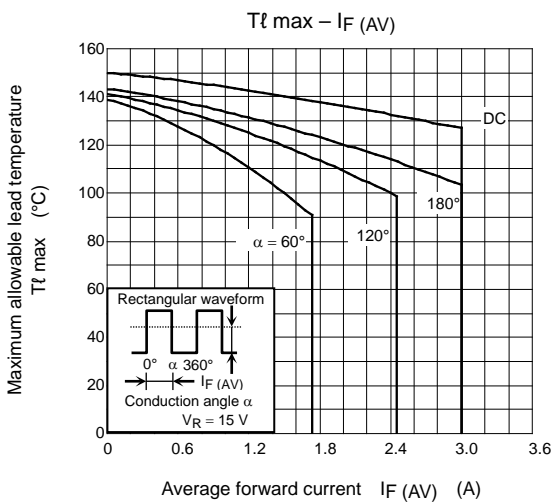
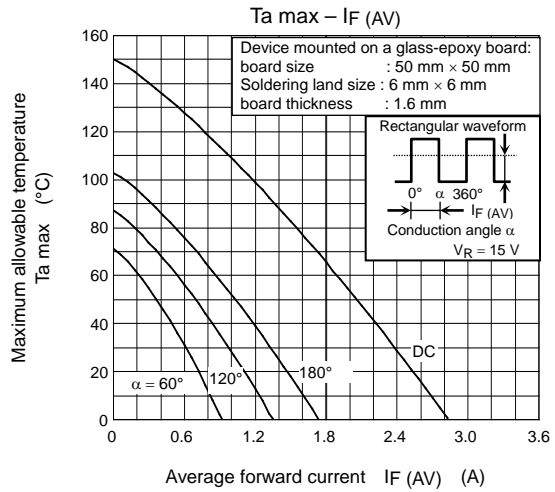
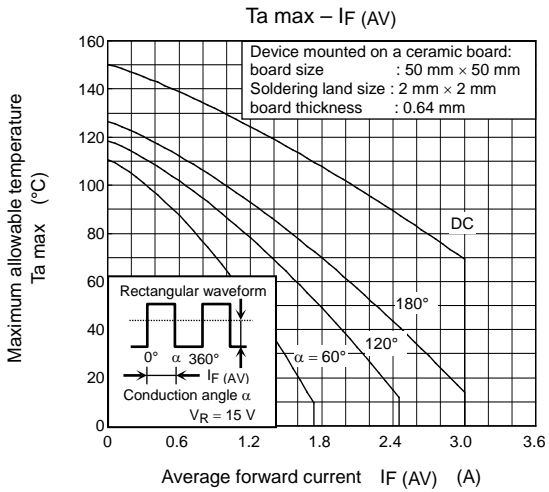
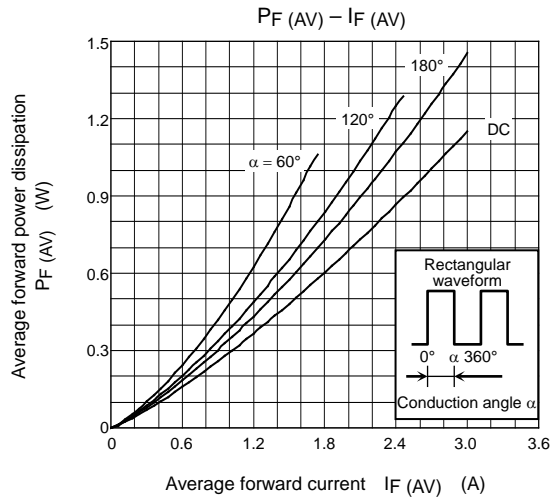
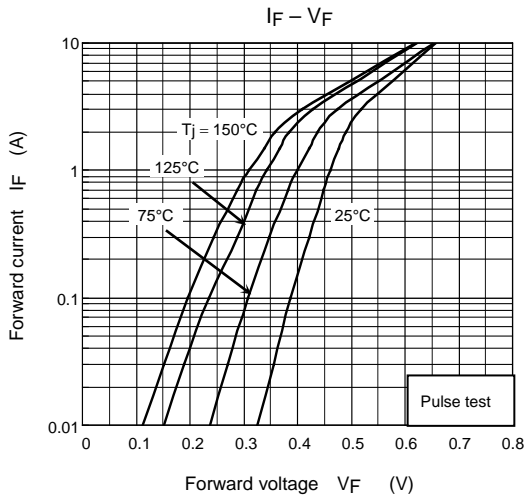
## Land pattern dimensions for reference only

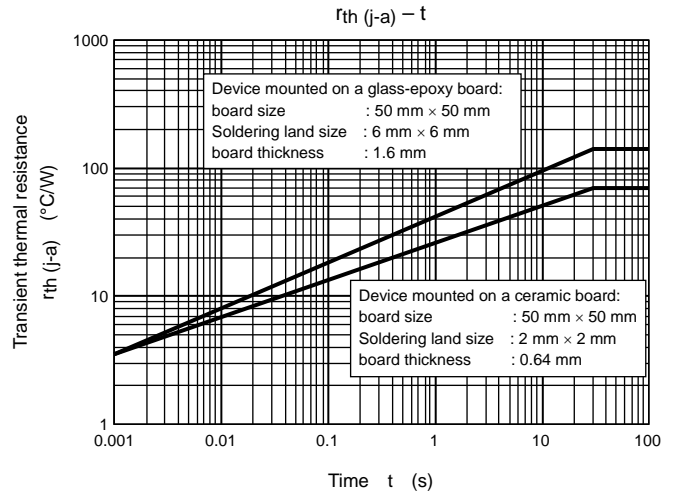
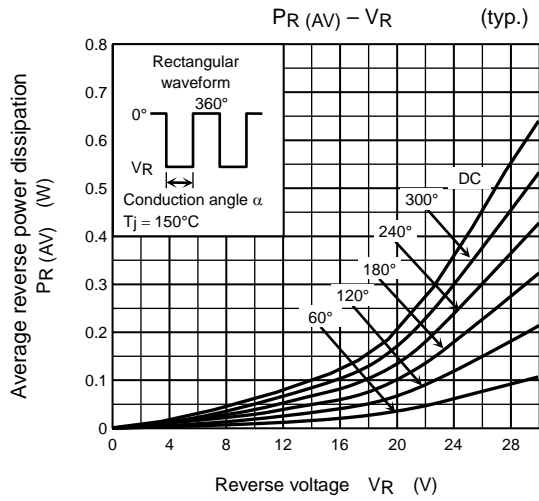
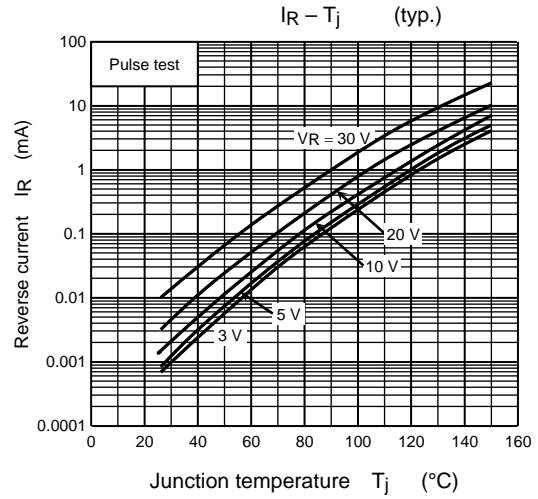
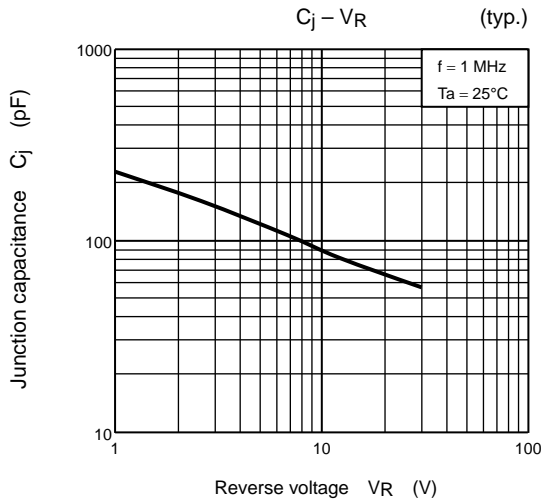


## Handling Precaution

- Schottky barrier diodes have reverse current characteristic compared to other diodes. There is a possibility SBD may cause thermal runaway when it is used under high temperature or high voltage. Please take forward and reverse loss into consideration during design.
- The absolute maximum ratings of a semiconductor device are a set of ratings that must not be exceeded, even for a moment. Do not exceed any of these ratings. The following are the general derating methods that we recommend when you design a circuit with a device.

  - $V_{RRM}$ : Use this rating with reference to the above.  $V_{RRM}$  has a temperature coefficient of 0.1%/°C. Take this temperature coefficient into account designing a device at low temperature.
  - $I_{F(AV)}$  and  $I_{F(DC)}$ : We recommend that the worst case current be no greater than 80% of the absolute maximum rating of  $I_{F(AV)}$  and  $T_j$  be below 120°C. When using this device, take the margin into consideration by using an allowable  $T_a$  max- $I_{F(AV)}$  curve.
  - $I_{FSM}$ : 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.
  - $T_j$ : Derate this rating when using a device in order to ensure high reliability. We recommend that the device be used at a  $T_j$  of below 120°C.
- Thermal resistance between junction and ambient fluctuates depending on the device's mounting condition. When using a device, design a circuit board and a soldering land size to match the appropriate thermal resistance value.
- For other design considerations, see the Toshiba website.





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