

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™"

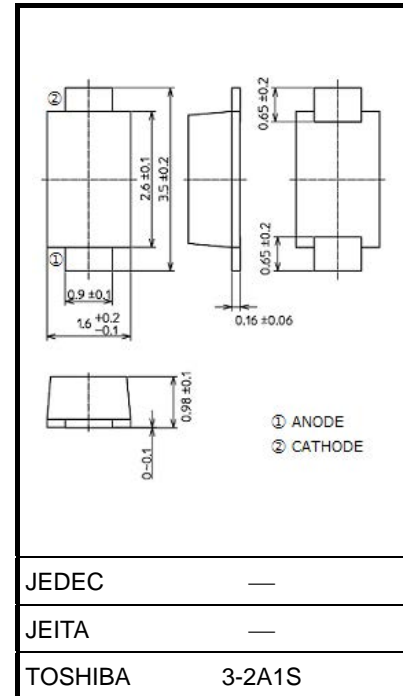
Absolute Maximum Ratings (Ta = 25°C)

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	°C
Storage temperature	T_{stg}	-40 to 150	°C

Note 1: Ta = 69°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).

Unit: mm



Weight: 0.013 g (typ.)

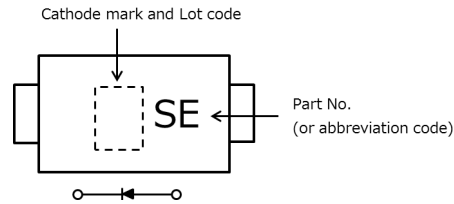
Electrical Characteristics (Ta = 25°C)

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	—	μA
	$I_{RRM}(2)$	$V_{RRM} = 30\text{ V}$ (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	°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	°C/W

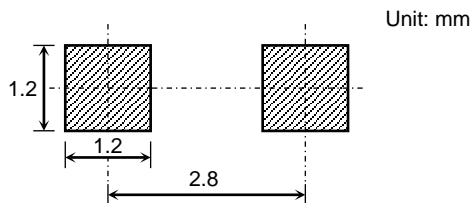
Start of commercial production
 2008-08

Marking

Abbreviation Code	Part No.
SE	CRS15



Land pattern dimensions for reference only



Handling Precaution

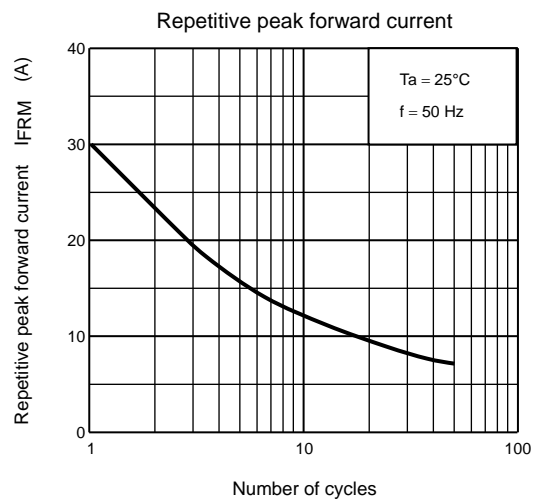
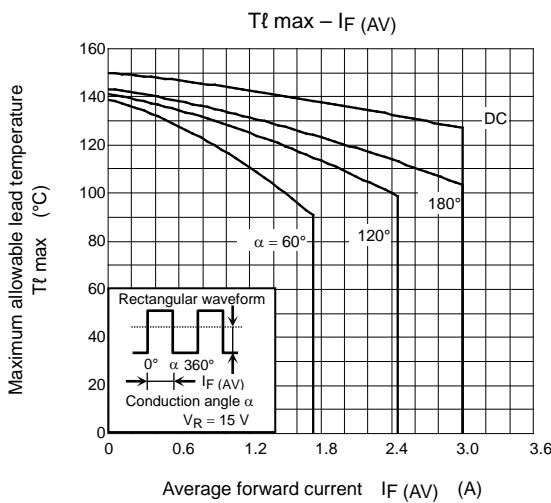
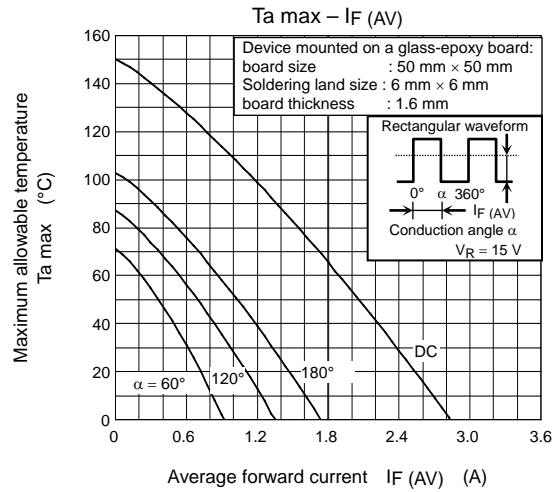
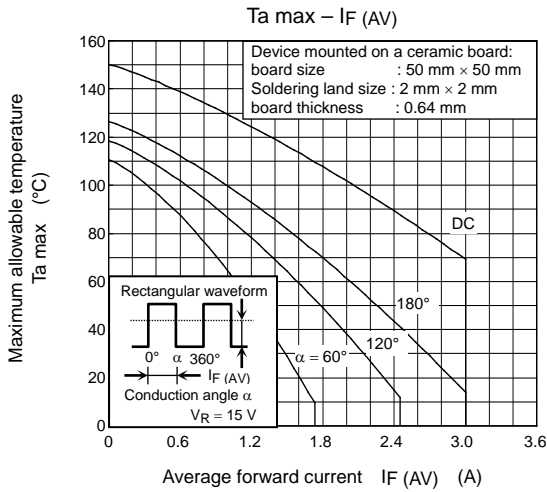
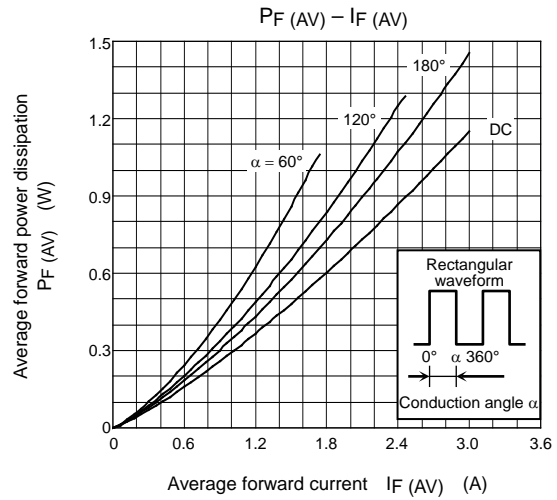
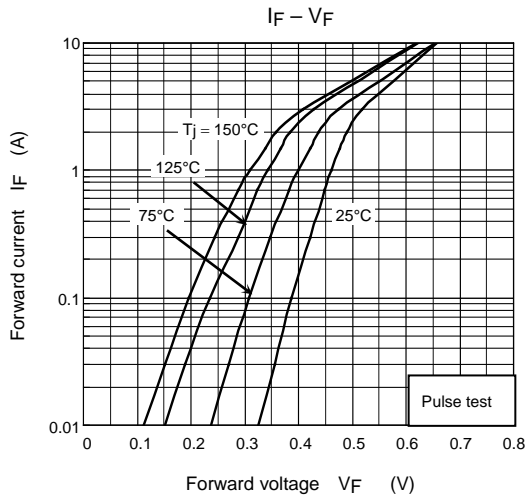
- Schottky barrier diodes have reverse current characteristic compared to other diodes. There is a possibility SBD may cause thermal runaway when it is used under high temperature or high voltage. Please take forward and reverse loss into consideration during design.
- The absolute maximum ratings of 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.

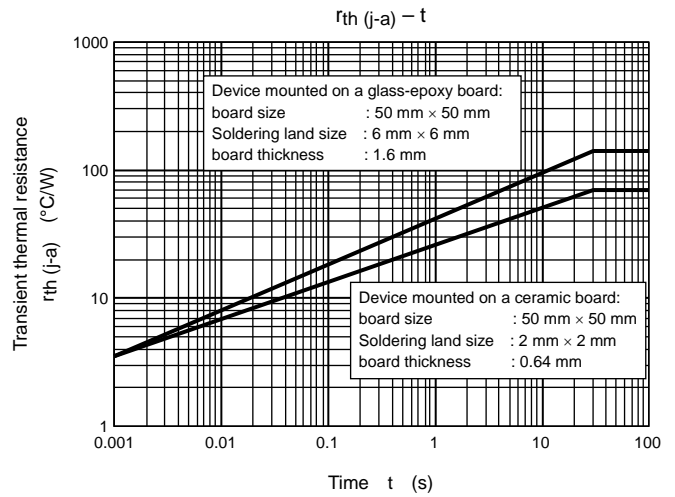
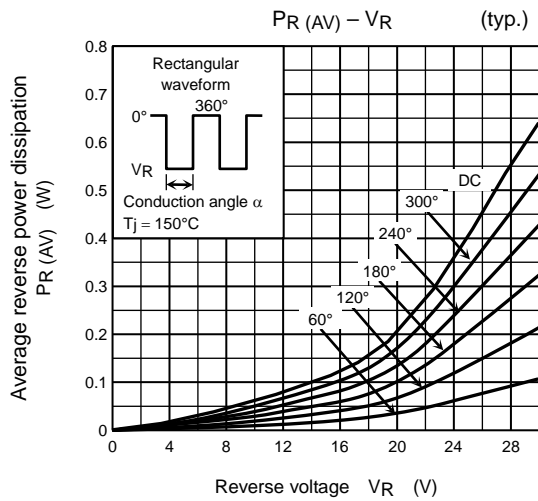
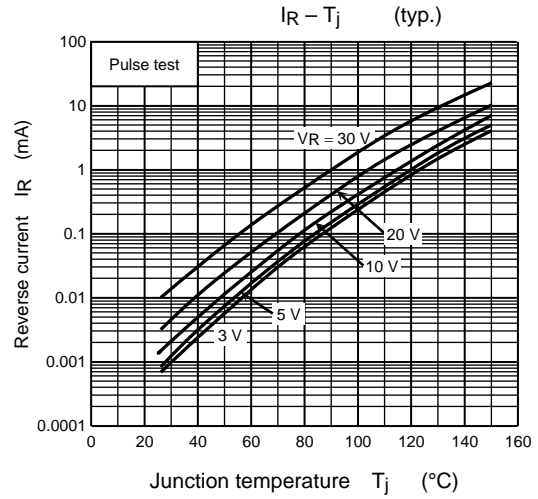
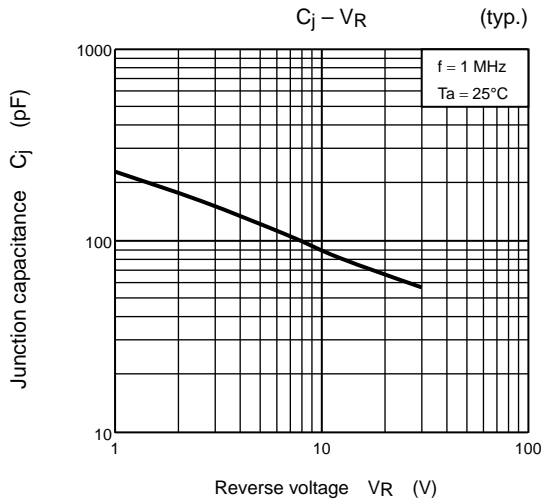
V_{RRM}: Use this rating with reference to the above. V_{RRM} has a temperature coefficient of 0.1%/°C. Take this temperature coefficient into account designing a device at low temperature.

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 Ta 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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