

TOSHIBA Zener Diode Silicon Epitaxial Type

# CRY75, CRY91, CRZ11, CRZ22, CRZ43, CRZ47

**Applications:**

Communication, Control and  
Measurement Equipment  
Constant Voltage Regulation  
Transient Suppressors

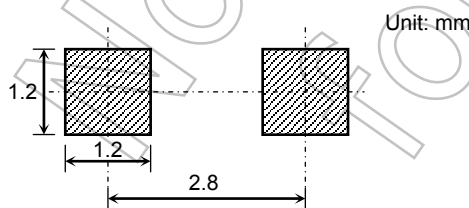
- Average power dissipation:  $P = 0.7 \text{ W}$
- Zener voltage:  $V_Z = 7.5 \sim 47 \text{ V}$
- Suitable for compact assembly due to small surface-mount package  
“S-FLAT™” (Toshiba package name)

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

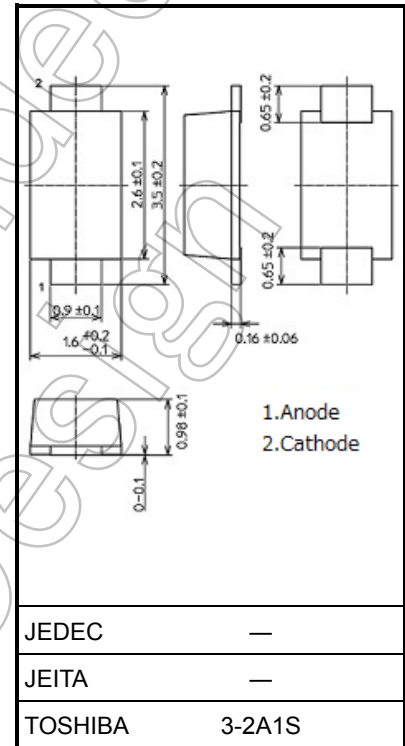
Characteristic	Symbol	Rating	Unit
Power dissipation	P	0.7	W
Junction temperature	$T_j$	-40 ~ 150	°C
Storage temperature range	$T_{stg}$	-40 ~ 150	°C

Note: 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).

**Land Pattern Dimensions (reference only)**



Unit: mm



Weight: 0.013 g (typ.)

Start of commercial production  
1999-09

## Electrical Characteristics (Ta = 25°C)

Product No.	Zener Voltage			Measurement Current I <sub>Z</sub> (mA)	Zener Impedance		Temperature Coefficient of Zener Voltage α <sub>T</sub> (mV / °C)		Forward Voltage		Reverse Current			
	V <sub>Z</sub> (V)	Min	Typ.		Max	r <sub>d</sub> (Ω)	Measurement Current I <sub>Z</sub> (mA)	Typ.	Max	V <sub>F</sub> (V)	Max	Measurement Current I <sub>F</sub> (A)	I <sub>R</sub> (μA)	Max
				Max										
CRY75	6.8	7.5	8.3	10	30	10	4	5	1.0	0.2	10	4.5		
CRY91	8.2	9.1	10.0	10	30	10	5	8	1.0	0.2	10	5.5		
CRZ11	9.9	11.0	12.1	10	30	10	7	11	1.0	0.2	10	7.0		
CRZ22	19.8	22.0	24.2	10	30	10	18	28	1.0	0.2	10	16.0		
CRZ43	38.7	43.0	47.3	7	40	7	33	53	1.0	0.2	10	34.4		
CRZ47	42.3	47.0	51.7	6	65	6	38	60	1.0	0.2	10	37.6		

## Marking

Abbreviation Code	Part No.
7.5	CRY75
9.1	CRY91
11	CRZ11
22	CRZ22
43	CRZ43
47	CRZ47

## Handling Precaution

The absolute maximum ratings denote the absolute maximum ratings, which are rated values and must not be exceeded during operation, even for an instant. The following are the general derating methods that we recommend when you design a circuit with a device.

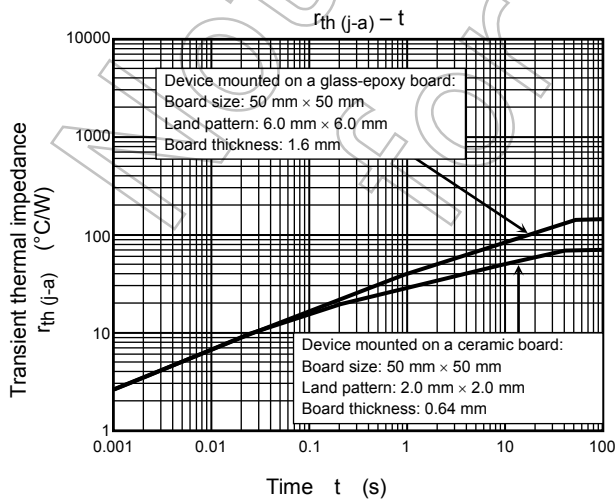
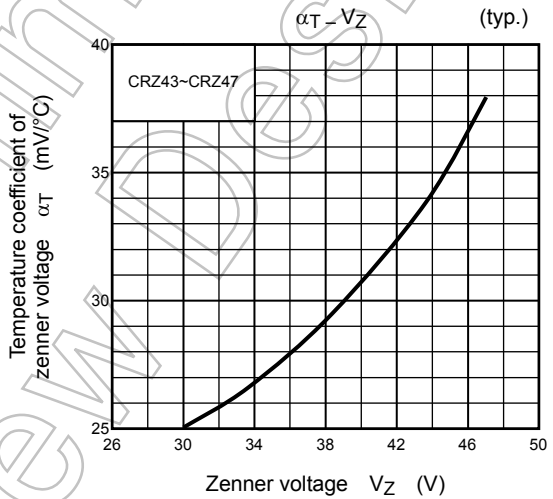
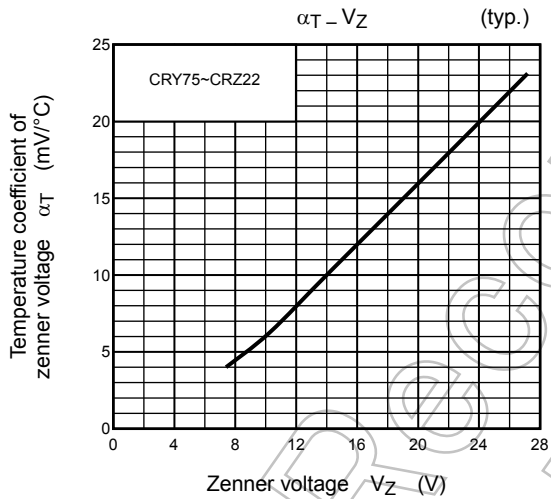
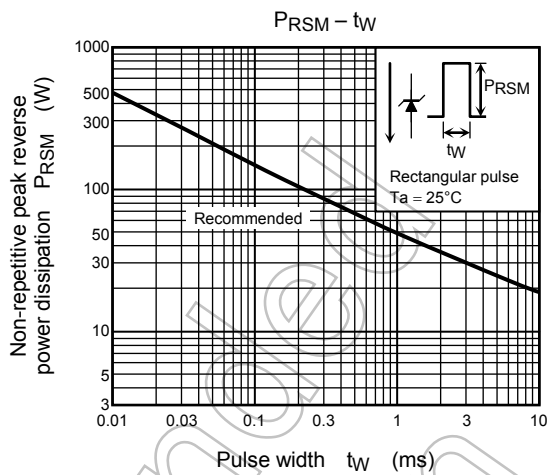
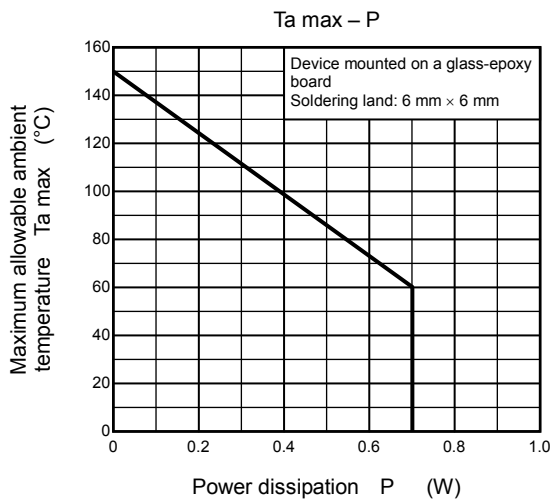
P: We recommend that the worst case power dissipation be no greater than 50% of the absolute maximum rating of power dissipation. Carry out adequate heat design.

PRSM: We recommend that a device be used within the recommended area in the figure, PRSM-tw.

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 a 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, design a circuit board and a soldering land size to match the appropriate thermal resistance value.

Please refer to the Rectifiers databook for further information.



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