

TOSHIBA Zener Diode Silicon Epitaxial Type

# CRY62 to CRZ39

○ Surge absorber

Unit: mm

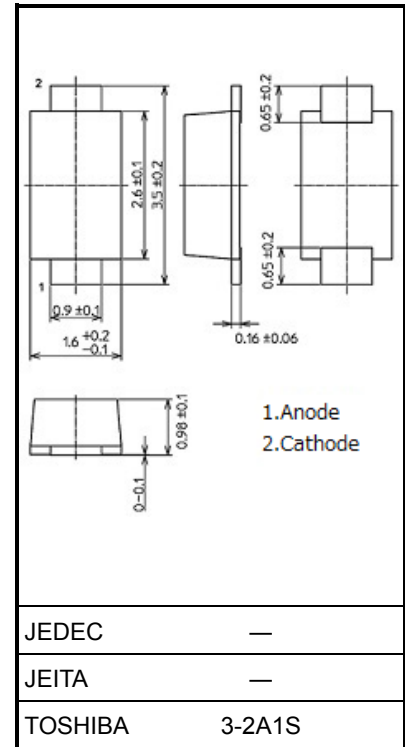
- Average power dissipation :  $P = 0.7 \text{ W}$
- Zener voltage :  $V_Z = 6.2 \text{ to } 39 \text{ V}$
- Suitable for compact assembly due to small surface-mount package "S-FLAT™" (Toshiba package name)

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

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

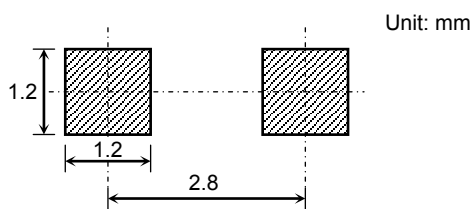
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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



Weight: 0.013 g (typ.)

### Land Pattern Dimensions (reference only)

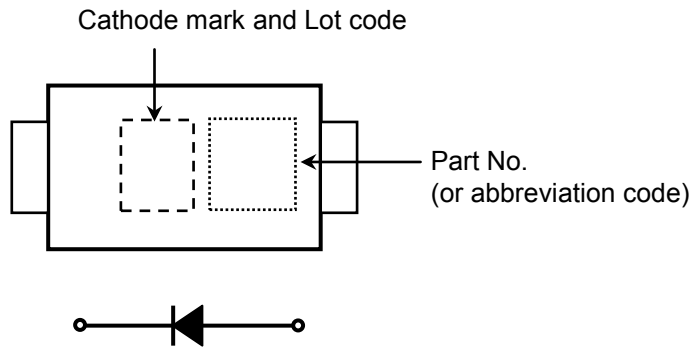


Start of commercial production  
1999-09

## 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)		r <sub>d</sub> (Ω)		Measurement Current I <sub>Z</sub> (mA)	V <sub>F</sub> (V)	Measurement Current I <sub>F</sub> (A)	I <sub>R</sub> (μA)	Measurement Voltage V <sub>R</sub> (V)			
	Min	Typ.	Max	Max						Typ.	Max	Max
CRY62	5.6	6.2	6.8	10	60	10	2	3	1.0	0.2	10	3.0
CRY68	6.2	6.8	7.4	10	60	10	3	4	1.0	0.2	10	3.0
CRY82	7.4	8.2	9.0	10	30	10	4	6	1.0	0.2	10	4.9
CRZ10	9.0	10.0	11.0	10	30	10	6	9	1.0	0.2	10	6.0
CRZ12	10.8	12.0	13.2	10	30	10	8	13	1.0	0.2	10	8.0
CRZ13	11.7	13.0	14.3	10	30	10	9	14	1.0	0.2	10	9.0
CRZ15	13.5	15.0	16.5	10	30	10	11	17	1.0	0.2	10	10.0
CRZ16	14.4	16.0	17.6	10	30	10	12	19	1.0	0.2	10	11.0
CRZ18	16.2	18.0	19.8	10	30	10	14	23	1.0	0.2	10	13.0
CRZ20	18.0	20.0	22.0	10	30	10	16	26	1.0	0.2	10	14.0
CRZ24	21.6	24.0	26.4	10	30	10	20	32	1.0	0.2	10	17.0
CRZ27	24.3	27.0	29.7	10	30	10	23	36	1.0	0.2	10	19.0
CRZ30	27.0	30.0	33.0	10	30	10	25	40	1.0	0.2	10	21.0
CRZ33	29.7	33.0	36.3	10	30	10	26	41	1.0	0.2	10	26.4
CRZ36	32.4	36.0	39.6	9	30	9	28	45	1.0	0.2	10	28.8
CRZ39	35.1	39.0	42.9	8	35	8	30	48	1.0	0.2	10	31.2

**Marking**



Abbreviation Code	Part No.
6.2	CRY62
6.8	CRY68
8.2	CRY82
10	CRZ10
12	CRZ12
13	CRZ13
15	CRZ15
16	CRZ16
18	CRZ18
20	CRZ20
24	CRZ24
27	CRZ27
30	CRZ30
33	CRZ33
36	CRZ36
39	CRZ39

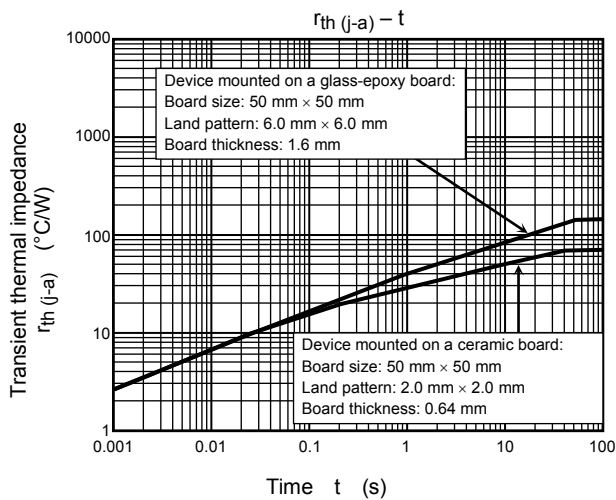
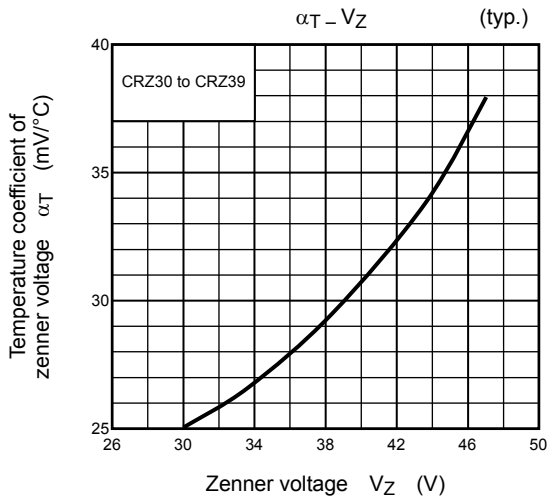
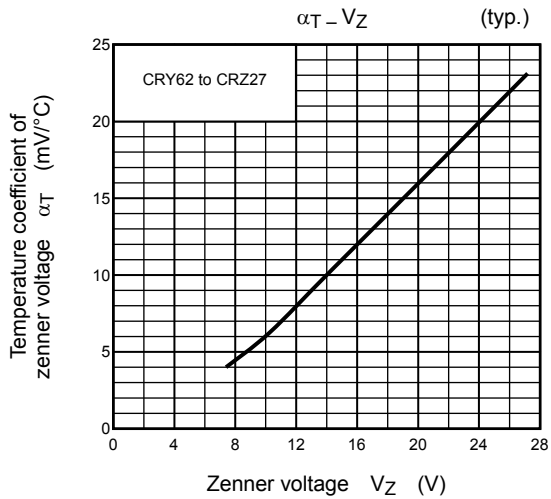
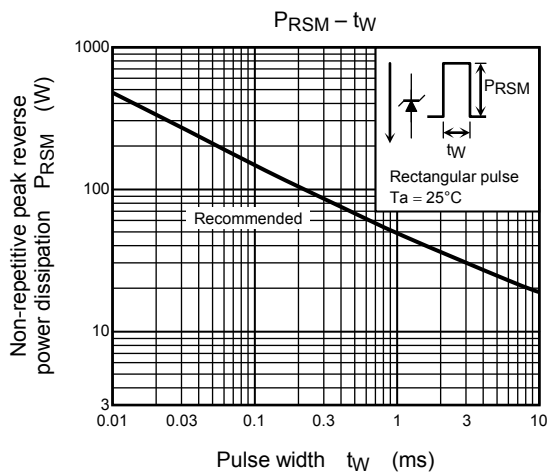
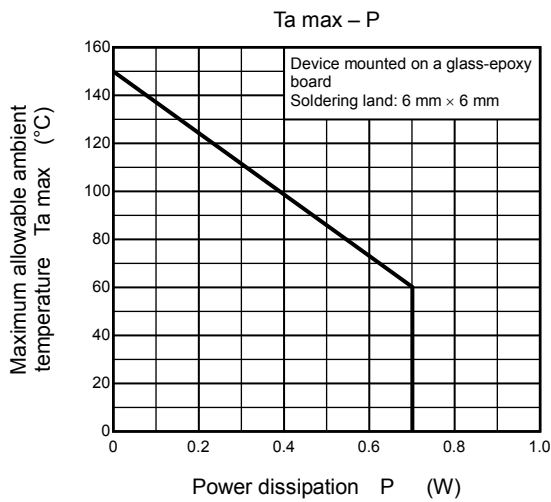
**Handling Precaution**

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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