

TOSHIBA Zener Diode    Silicon Epitaxial Type

CRY62~CRZ47

Applications:

Communication, Control and  
Measurement Equipment  
Constant Voltage Regulation  
Transient Suppressors

- Average power dissipation: P = 0.7 W
- Zener voltage: V<sub>Z</sub> = 6.2~47 V
- Suitable for compact assembly due to small surface-mount package  
“S-FLAT™” (Toshiba package name)

Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Power dissipation	P	700	mW
Junction temperature	T <sub>j</sub>	-40 ~ 150	°C
Storage temperature range	T <sub>stg</sub>	-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).

Unit: mm

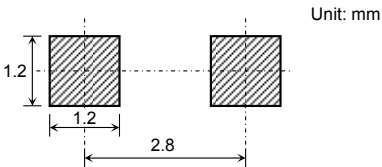
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JEDEC	—
JEITA	—
TOSHIBA	3-2A1A

Weight: 0.013 g (typ.)

Standard Soldering Pad



## Electrical Characteristics (Ta = 25°C)

Product No.	Zener Voltage				Zener Impedance		Temperature Coefficient of Zener Voltage $\alpha_T$ (mV / °C)		Forward Voltage		Reverse Current	
	V <sub>Z</sub> (V)			Measure- ment Current I <sub>Z</sub> (mA)	r <sub>d</sub> (Ω)	Measure- ment Current I <sub>Z</sub> (mA)			V <sub>F</sub> (V)	Measure- ment Current I <sub>F</sub> (A)	I <sub>R</sub> (μA)	Measure- ment Voltage V <sub>R</sub> (V)
	Min	Typ.	Max				Max	Typ.				
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
CRY75	6.8	7.5	8.3	10	30	10	4	5	1.0	0.2	10	4.5
CRY82	7.4	8.2	9.0	10	30	10	4	6	1.0	0.2	10	4.9
CRY91	8.2	9.1	10.0	10	30	10	5	8	1.0	0.2	10	5.5
CRZ10	9.0	10.0	11.0	10	30	10	6	9	1.0	0.2	10	6.0
CRZ11	9.9	11.0	12.1	10	30	10	7	11	1.0	0.2	10	7.0
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
CRZ22	19.8	22.0	24.2	10	30	10	18	28	1.0	0.2	10	16.0
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
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.
6□2	CRY62
6□8	CRY68
7□5	CRY75
8□2	CRY82
9□1	CRY91
□10	CRZ10
□11	CRZ11
□12	CRZ12
□13	CRZ13
□15	CRZ15
□16	CRZ16
□18	CRZ18
□20	CRZ20
□22	CRZ22
□24	CRZ24
□27	CRZ27
□30	CRZ30
□33	CRZ33
□36	CRZ36
□39	CRZ39
□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.

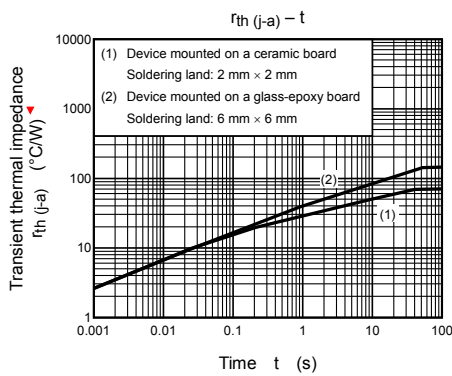
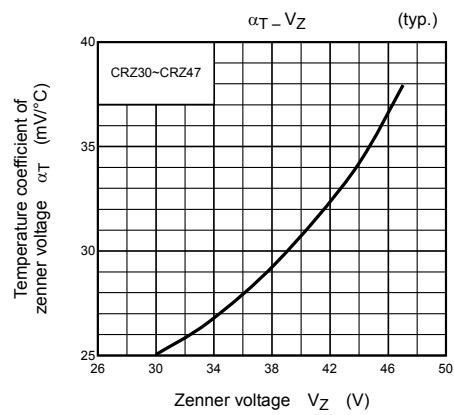
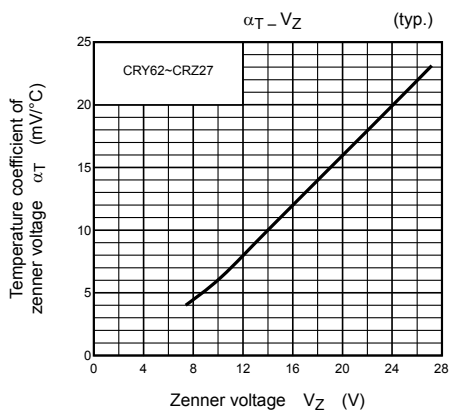
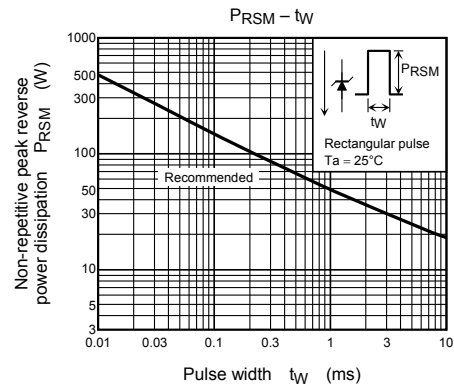
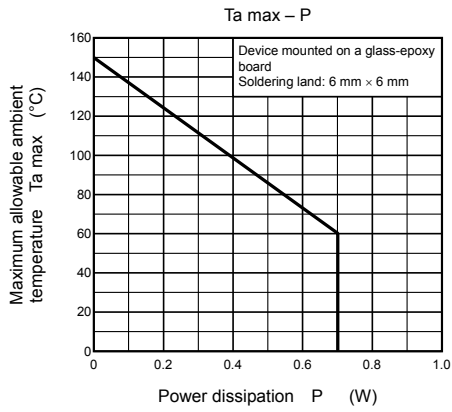
P: We recommend that the worst case power dissipation be no greater than 50% of the absolute maximum rating of power dissipation. Carry out adequate heat design.

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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**RESTRICTIONS ON PRODUCT USE**

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- The information contained herein is subject to change without notice.
- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.  
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