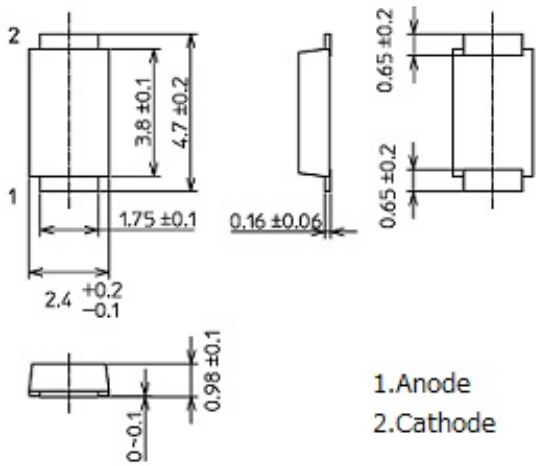
TOSHIBA Zener Diode Silicon Diffused Type

CMZB12 to CMZB51

○ Surge absorber

- Average power dissipation : P = 1 W
- Zener voltage : V_Z = 12 to 51 V
- Suitable for high-density board assembly due to the use of a small surface-mount package, M−FLAT™

Unit: mm



JEDEC	―
JEITA	―
TOSHIBA	3-4E1S

Weight: 0.023 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

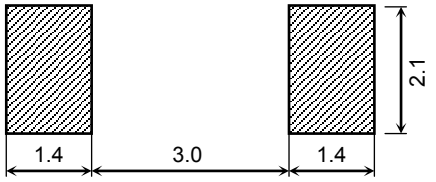
Characteristics	Symbol	Rating	Unit
Power dissipation	P	1 (Note 1)	W
Junction temperature	T_j	−40 to 150	°C
Storage temperature range	T_{stg}	−40 to 150	°C

Note 1: Ta = 40°C
Device mounted on a glass-epoxy board
Board size : 50 mm × 50 mm
Soldering size : 6 mm × 6 mm
Board thickness : 1.6 mm

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).

Land Pattern Dimensions (reference only)

Unit: mm

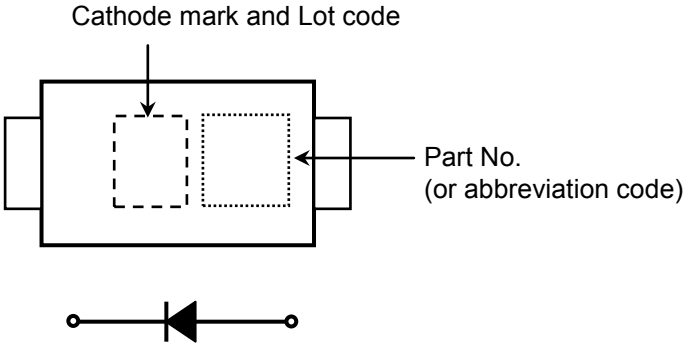


Start of commercial production
2005-09

Electrical Characteristics (Ta = 25°C)

Type	Zener Voltage Vz (V)				Zener Impedance r_d (Ω)		Temperature Coefficient Of Zener αT (mV/°C)		Forward Voltage V_F (V)		Reverse Current I_R (μA)	
	Min	Typ.	Max	Measurement Current I_Z (mA)	Max	Measurement Current I_Z (mA)	Typ.	Max	Max	Measurement Current I_F (A)	Max	Measurement Voltage V_R (V)
CMZB12	10.8	12	13.2	10	30	10	8	13	1.2	0.2	10	8
CMZB13	11.7	13	14.3	10	30	10	9	14	1.2	0.2	10	9
CMZB15	13.5	15	16.5	10	30	10	11	17	1.2	0.2	10	10
CMZB18	16.2	18	19.8	10	30	10	14	23	1.2	0.2	10	13
CMZB20	18.0	20	22.0	10	30	10	16	26	1.2	0.2	10	14
CMZB24	21.6	24	26.4	10	30	10	20	32	1.2	0.2	10	17
CMZB27	24.3	27	29.7	10	30	10	23	36	1.2	0.2	10	19
CMZB30	27.0	30	33.0	10	30	10	25	40	1.2	0.2	10	21
CMZB33	29.7	33	36.3	10	30	10	26	41	1.2	0.2	10	26.4
CMZB36	32.4	36	39.6	9	30	9	28	45	1.2	0.2	10	28.8
CMZB39	35.1	39	42.9	8	35	8	30	48	1.2	0.2	10	31.2
CMZB43	38.7	43	47.3	7	40	7	33	53	1.2	0.2	10	34.4
CMZB47	42.3	47	51.7	6	65	6	38	60	1.2	0.2	10	37.6
CMZB51	45.9	51	56.1	6	65	6	43	68	1.2	0.2	10	40.8

1. Marking



Abbreviation Code	Part No.	Abbreviation Code	Part No.
B12	CMZB12	B30	CMZB30
B13	CMZB13	B33	CMZB33
B15	CMZB15	B36	CMZB36
B18	CMZB18	B39	CMZB39
B20	CMZB20	B43	CMZB43
B24	CMZB24	B47	CMZB47
B27	CMZB27	B51	CMZB51

Handling Precaution

1) 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.

   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.

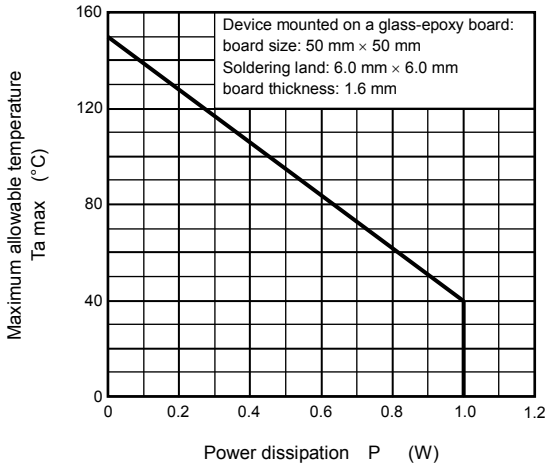
   P_{RSM}: We recommend that a device be used within the recommended area in the figure, P_{RSM}-tw.

   T_j: Derate this rating when using a device in order to ensure high reliability. We recommend that the device be used at T_j of below 120°C.

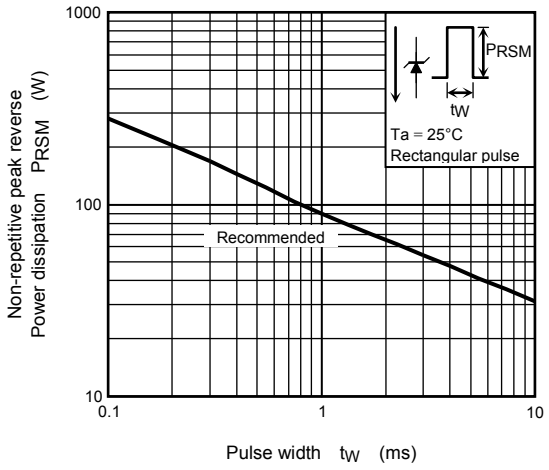
2) Thermal resistance between junction and ambient fluctuates depending on the device's mounting condition. When using a device, design a circuit board and a soldering land size to match the appropriate thermal resistance value.

3) Please refer to the Rectifiers databook for further information.

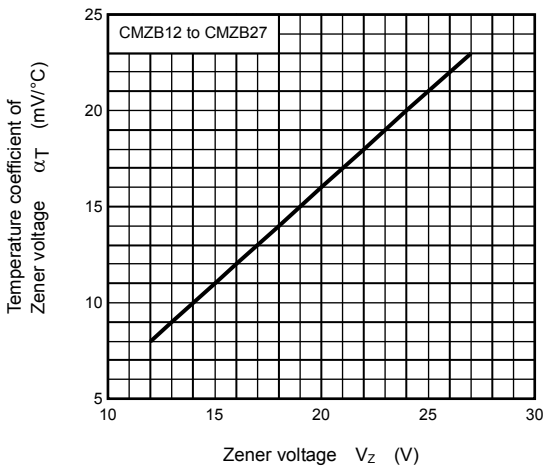
Ta max – P



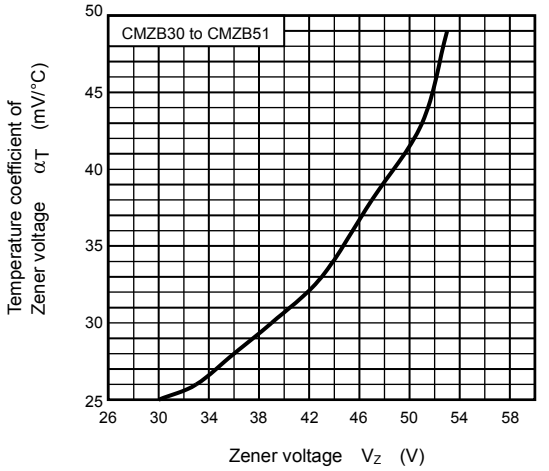
P_{RSM} – t_W (reference value)



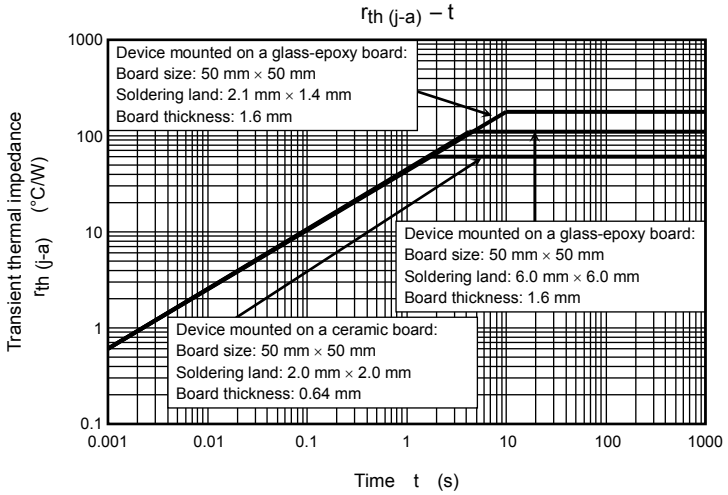
α_T – V_Z (typ.)



α_T – V_Z (typ.)



$r_{th\ (j\text{-}a)}$ – t



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