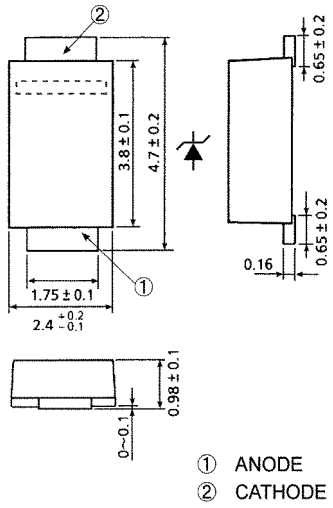
TOSHIBA Zener Diode Silicon Diffused Type

CMZ12~CMZ53

Applications:
Communication, Control and
Measurement Equipment
Constant Voltage Regulation
Transient Suppressors

- Average power dissipation : P = 2.0 W
- Zener voltage : V_Z = 12 V ~ 53 V
- Suitable for compact assembly due to small surface-mount package "M−FLAT™" (Toshiba package name)

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	3-4E1A

Weight: 0.023 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

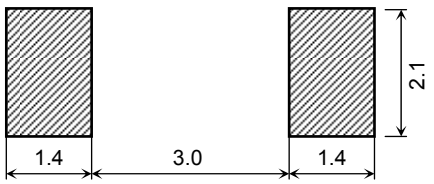
Characteristics	Symbol	Rating	Unit
Power dissipation	P	2.0 (Note 1)	W
Junction temperature	T_j	−40~150	°C
Storage temperature range	T_{stg}	−40~150	°C

Note 1: Ta = 30°C
Device mounted on a ceramic board
Board size: 50 mm × 50 mm
Soldering size: 2 mm × 2 mm
Board thickness: 0.64 t

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).

Standard Soldering Pad

Unit: mm



Start of commercial production
2002-10

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)
CMZ12	10.8	12	13.2	10	30	10	8	13	1.2	0.2	10	8
CMZ13	11.7	13	14.3	10	30	10	9	14	1.2	0.2	10	9
CMZ15	13.5	15	16.5	10	30	10	11	17	1.2	0.2	10	10
CMZ16	14.4	16	17.6	10	30	10	12	19	1.2	0.2	10	11
CMZ18	16.2	18	19.8	10	30	10	14	23	1.2	0.2	10	13
CMZ20	18.0	20	22.0	10	30	10	16	26	1.2	0.2	10	14
CMZ22	19.8	22	24.2	10	30	10	18	28	1.2	0.2	10	16
CMZ24	21.6	24	26.4	10	30	10	20	32	1.2	0.2	10	17
CMZ27	24.3	27	29.7	10	30	10	23	36	1.2	0.2	10	19
CMZ30	27.0	30	33.0	10	30	10	25	40	1.2	0.2	10	21
CMZ33	29.7	33	36.3	10	30	10	26	41	1.2	0.2	10	26.4
CMZ36	32.4	36	39.6	9	30	9	28	45	1.2	0.2	10	28.8
CMZ39	35.1	39	42.9	8	35	8	30	48	1.2	0.2	10	31.2
CMZ43	38.7	43	47.3	7	40	7	33	53	1.2	0.2	10	34.4
CMZ47	42.3	47	51.7	6	65	6	38	60	1.2	0.2	10	37.6
CMZ51	45.9	51	56.1	6	65	6	43	68	1.2	0.2	10	40.8
CMZ53	47.7	53	58.3	5	85	5	49	77	1.2	0.2	10	42.4

Marking

Abbreviation Code	Part No.
12	CMZ12
13	CMZ13
15	CMZ15
16	CMZ16
18	CMZ18
20	CMZ20
22	CMZ22
24	CMZ24
27	CMZ27
30	CMZ30
33	CMZ33
36	CMZ36
39	CMZ39
43	CMZ43
47	CMZ47
51	CMZ51
53	CMZ53

Handling Precaution

1) 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.

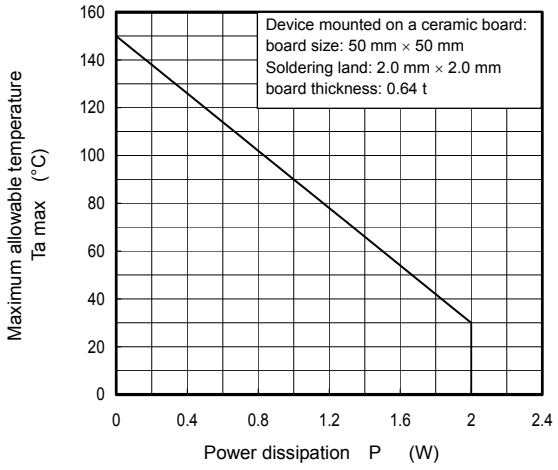
P_{RSM} : We recommend that a device be used within the recommended area in thefigure, P_{RSM}-tw.

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

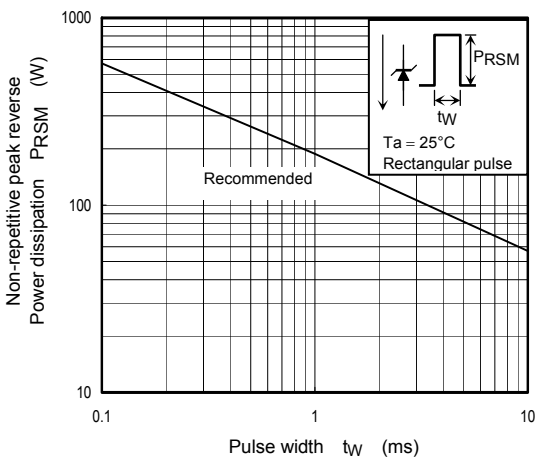
2) Thermal resistance between junction and ambient fluctuates depending on the device's mounting condition. When using a device, design a circuit board and a soldering land size to match the appropriate thermal resistance value.

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

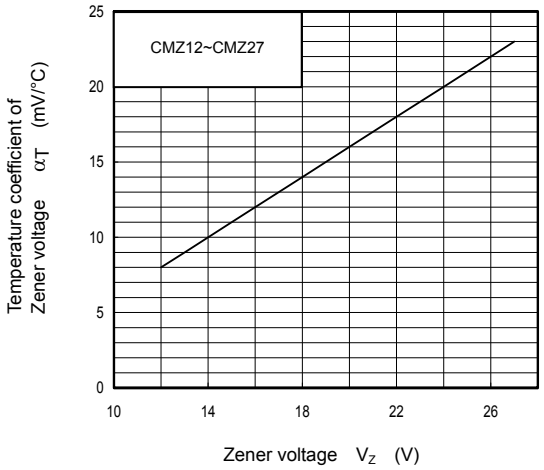
Ta max – P



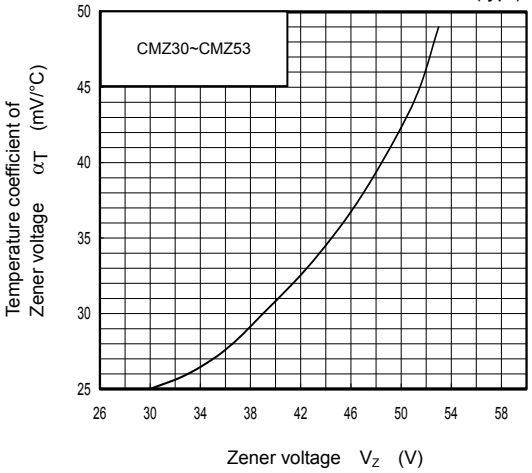
P_{RSM} – t_W (reference value)



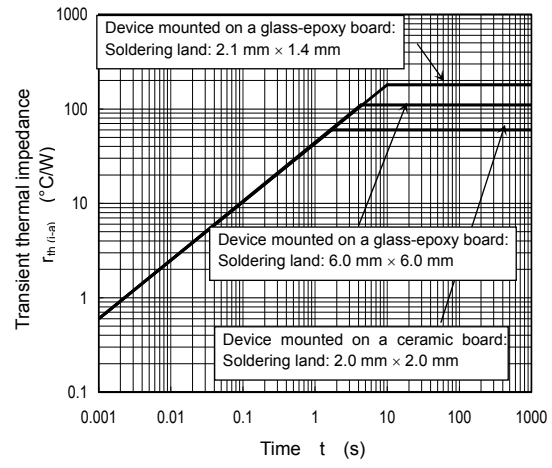
α_T – V_Z (typ.)



α_T – V_Z (typ.)



$r_{th\ (j\text{-}a)}$ – t



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