

Zener Diode Silicon Epitaxial Planar

CMZ12A to 51A

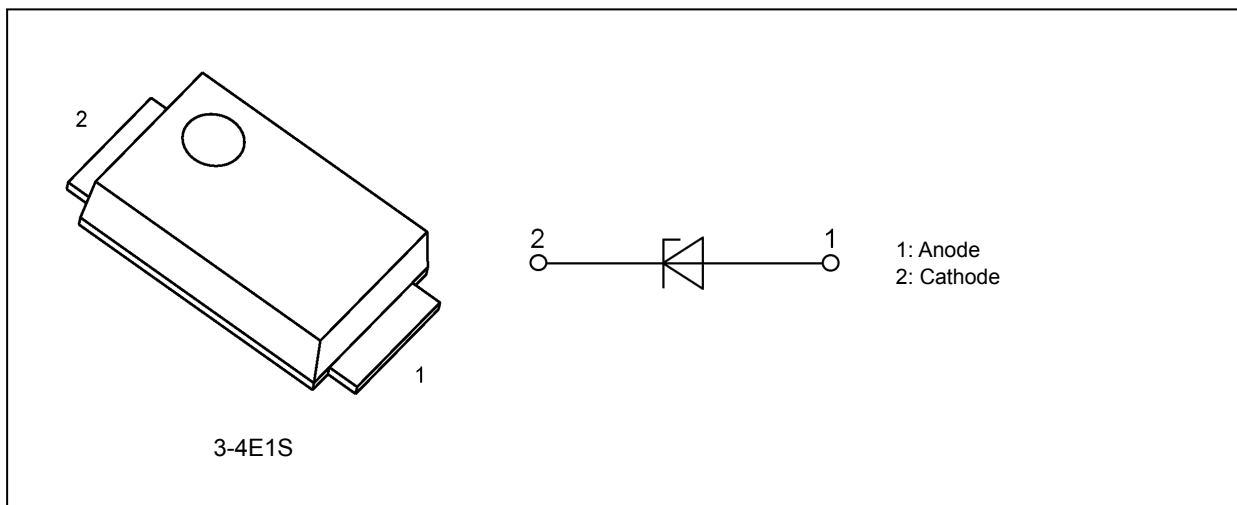
1. Applications

- Surge absorber

2. Features

- (1) Power dissipation : $P_D = 2W$
- (2) Zener voltage : $V_Z = 12$ to $51V$
- (3) The use of small, thin surface-mount package is optimum way for high-density mounting.
Nickname: M-FLAT™

3. Packaging and Internal Circuit



4. Absolute Maximum Ratings (Note) (Unless otherwise specified, $T_a = 25^\circ C$)

| Characteristics | Symbol | Note | Rating | Unit |
|----------------------|-----------|---------|------------|------------|
| Power dissipation | P_D | (Note1) | 2 | W |
| Junction temperature | T_j | | 150 | $^\circ C$ |
| Storage temperature | T_{stg} | | -55 to 150 | $^\circ C$ |

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).

Note1: $T_a = 30^\circ C$ Device mounted on a ceramic board

Board size: 50 mm × 50 mm, Soldering land: 2.0 mm × 2.0 mm, Board thickness: 0.64 mm

Start of commercial production

2024-10

5. Electrical Characteristics (Unless otherwise specified, $T_a = 25^\circ\text{C}$)

| Type | Zener Voltage V_Z (V) | | | | Dynamic Resistance r_d (Ω) | | Temperature of Zener voltage coefficient α_Z (mV/ $^\circ\text{C}$) | | Forward Voltage V_F (V) | | Reverse Current I_R (μA) | |
|--------|-------------------------|-------|-------|-------------------------|---------------------------------------|-------------------------|---|-----|---------------------------|------------------------|---|------------------------|
| | Min | Typ. | Max | Test Current I_Z (mA) | Max | Test Current I_Z (mA) | Typ. | Max | Max | Test Current I_F (A) | Max | Test Voltage V_R (V) |
| CMZ12A | 11.40 | 12.00 | 12.60 | 10 | 20 | 10 | 9 | 11 | 1.2 | 0.2 | 0.5 | 8.0 |
| CMZ13A | 12.35 | 13.00 | 13.65 | 10 | 20 | 10 | 10 | 13 | 1.2 | 0.2 | 0.5 | 9.0 |
| CMZ15A | 14.25 | 15.00 | 15.75 | 10 | 20 | 10 | 12 | 16 | 1.2 | 0.2 | 0.5 | 10.0 |
| CMZ16A | 15.20 | 16.00 | 16.80 | 10 | 20 | 10 | 13 | 17 | 1.2 | 0.2 | 0.5 | 11.0 |
| CMZ18A | 17.10 | 18.00 | 18.90 | 10 | 20 | 10 | 15 | 20 | 1.2 | 0.2 | 0.5 | 13.0 |
| CMZ20A | 19.00 | 20.00 | 21.00 | 10 | 20 | 10 | 17 | 23 | 1.2 | 0.2 | 0.5 | 14.0 |
| CMZ24A | 22.80 | 24.00 | 25.20 | 10 | 20 | 10 | 22 | 29 | 1.2 | 0.2 | 0.5 | 17.0 |
| CMZ27A | 25.65 | 27.00 | 28.35 | 10 | 20 | 10 | 26 | 33 | 1.2 | 0.2 | 0.5 | 19.0 |
| CMZ30A | 28.50 | 30.00 | 31.50 | 10 | 20 | 10 | 29 | 38 | 1.2 | 0.2 | 0.5 | 21.0 |
| CMZ33A | 31.35 | 33.00 | 34.65 | 10 | 20 | 10 | 33 | 43 | 1.2 | 0.2 | 0.5 | 26.4 |
| CMZ36A | 34.20 | 36.00 | 37.80 | 9 | 20 | 9 | 37 | 48 | 1.2 | 0.2 | 0.5 | 28.8 |
| CMZ39A | 37.05 | 39.00 | 40.95 | 8 | 30 | 8 | 41 | 53 | 1.2 | 0.2 | 0.5 | 31.2 |
| CMZ43A | 40.85 | 43.00 | 45.15 | 7 | 30 | 7 | 46 | 60 | 1.2 | 0.2 | 0.5 | 34.4 |
| CMZ47A | 44.65 | 47.00 | 49.35 | 6 | 50 | 6 | 51 | 67 | 1.2 | 0.2 | 0.5 | 37.6 |
| CMZ51A | 48.45 | 51.00 | 53.55 | 6 | 50 | 6 | 57 | 74 | 1.2 | 0.2 | 0.5 | 40.8 |

6. Marking (Note)

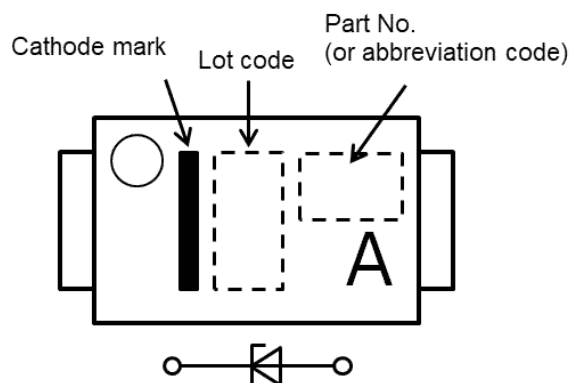


Fig. 6.1 Marking

Note: A dot marking identifies the indication of product Labels.

[[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.

The RoHS is the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

7. Marking List

| Abbreviation Code | Part Number | Abbreviation Code | Part Number |
|-------------------|-------------|-------------------|-------------|
| 12 | CMZ12A | 30 | CMZ30A |
| 13 | CMZ13A | 33 | CMZ33A |
| 15 | CMZ15A | 36 | CMZ36A |
| 16 | CMZ16A | 39 | CMZ39A |
| 18 | CMZ18A | 43 | CMZ43A |
| 20 | CMZ20A | 47 | CMZ47A |
| 24 | CMZ24A | 51 | CMZ51A |
| 27 | CMZ27A | | |

8. Land Pattern Dimensions (for reference only)

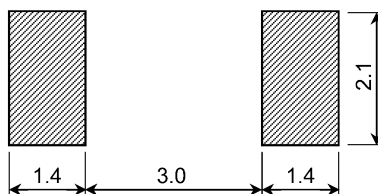


Fig. 8.1 Land Pattern Dimensions for Reference Only (Unit: mm)

9. Characteristics Curves (Note)

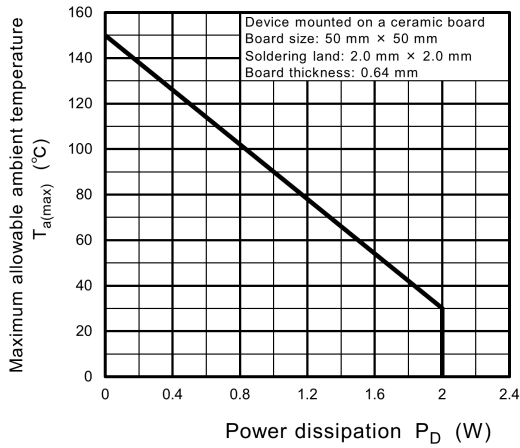


Fig. 9.1 T_a max - P_D

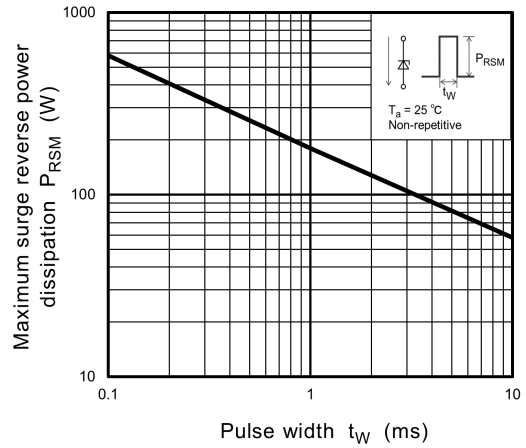


Fig. 9.2 P_{RSM} - t_w

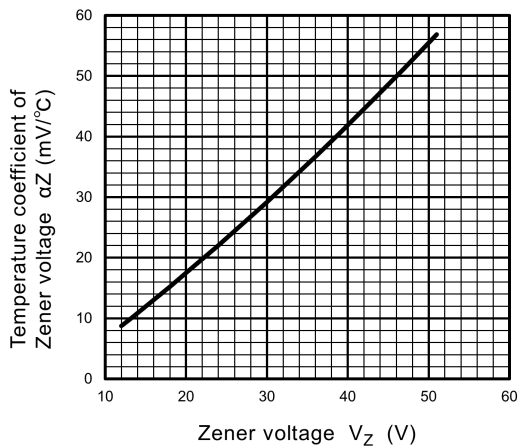


Fig. 9.3 α_Z - V_Z
(reference value)

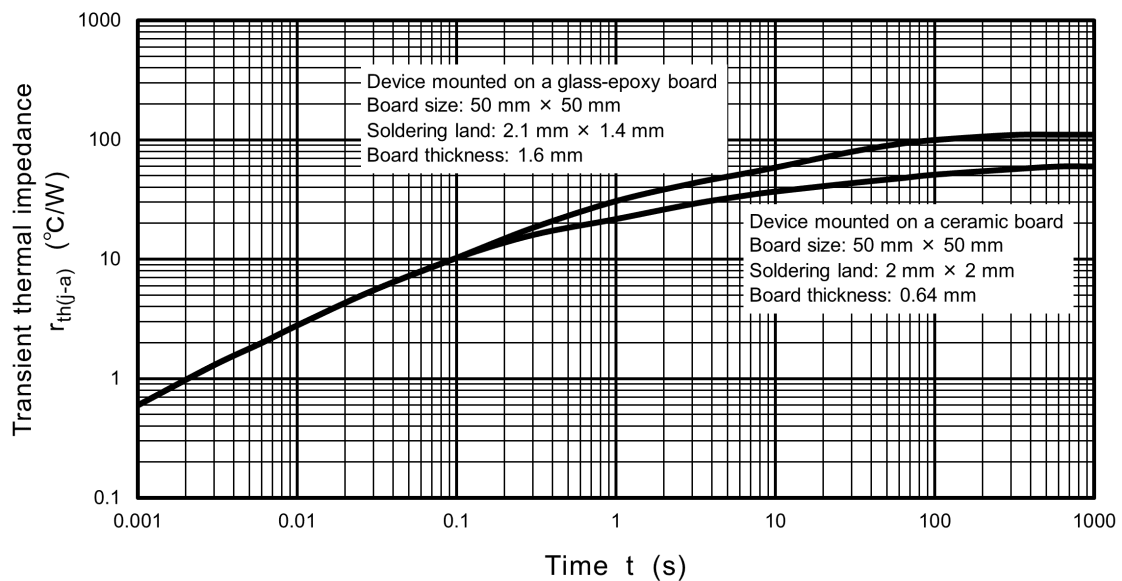
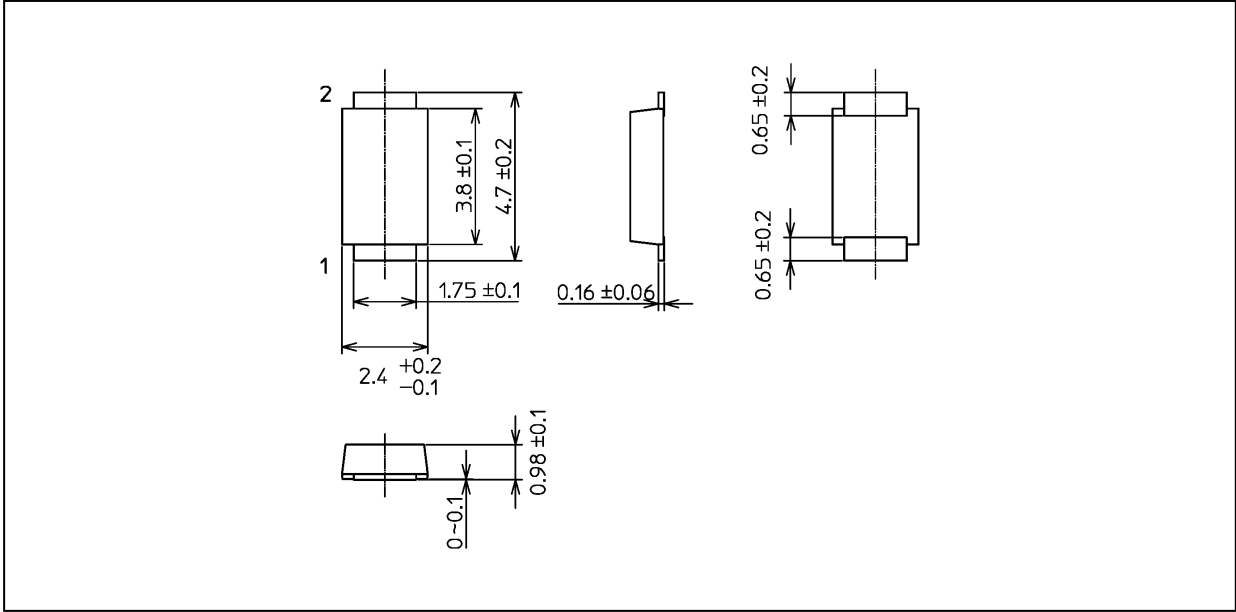


Fig. 9.4 $r_{th(j-a)}$ - t

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Package Dimensions

Unit: mm



Weight: 0.023 g (typ.)

| Package Name(s) |
|------------------|
| TOSHIBA: 3-4E1S |
| Nickname: M-FLAT |

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