

CMS03

Switching Mode Power Supply Applications

Portable Equipment Battery Applications

- Repetitive peak reverse voltage : $V_{RRM} = 30\text{ V}$
- Average forward current : $I_{F(AV)} = 3\text{ A}$
- Peak forward voltage : $V_{FM} = 0.45\text{ V (max)}$
- Suitable for compact assembly due to small surface-mount package “M-FLAT™” (Toshiba package name)

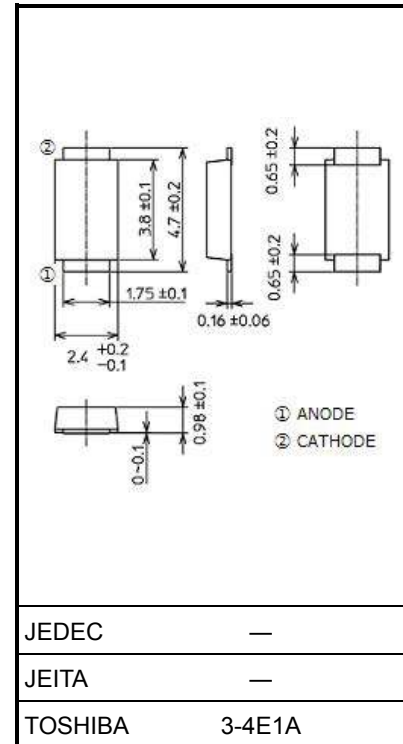
Absolute Maximum Ratings (Ta = 25°C)

| Characteristics | Symbol | Rating | Unit |
|-------------------------------------------|-------------|------------|------|
| Repetitive peak reverse voltage | V_{RRM} | 30 | V |
| Average forward current | $I_{F(AV)}$ | 3 (Note 1) | A |
| Non-repetitive peak forward surge current | I_{FSM} | 40 (50 Hz) | A |
| Junction temperature | T_j | -40 to 150 | °C |
| Storage temperature | T_{stg} | -40 to 150 | °C |

Note 1: $T_l = 117.6^\circ\text{C}$ Rectangular waveform ($\alpha = 180^\circ$), $V_R = 15\text{ V}$
 $T_a = 28.4^\circ\text{C}$ Device mounted on a ceramic board
 Board size : 50 mm × 50 mm
 Soldering land size : 2 mm × 2 mm
 Board thickness : 0.64 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).

Unit: mm



Weight: 0.023 g (typ.)

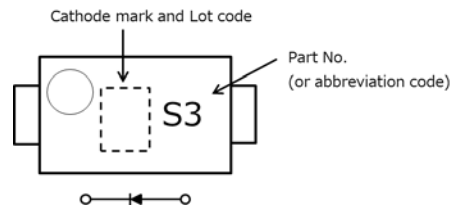
Electrical Characteristics (Ta = 25°C)

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-----------------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------|-----|------|------|---------------|
| Peak forward voltage | $V_{FM(1)}$ | $I_{FM} = 0.5\text{ A}$ (pulse test) | — | 0.35 | — | V |
| | $V_{FM(2)}$ | $I_{FM} = 1\text{ A}$ (pulse test) | — | 0.37 | — | |
| | $V_{FM(3)}$ | $I_{FM} = 3\text{ A}$ (pulse test) | — | 0.42 | 0.45 | |
| Repetitive peak reverse current | $I_{RRM(1)}$ | $V_{RRM} = 5\text{ V}$ (pulse test) | — | 3 | — | μA |
| | $I_{RRM(2)}$ | $V_{RRM} = 30\text{ V}$ (pulse test) | — | 30 | 500 | |
| Junction capacitance | C_j | $V_R = 10\text{ V}$, $f = 1\text{ MHz}$ | — | 190 | — | pF |
| Thermal resistance(junction to ambient) | $R_{th(j-a)}$ | Device mounted on a ceramic board board size : 50 mm × 50 mm soldering land size : 2 mm × 2 mm board thickness : 0.64 mm | — | — | 60 | °C/W |
| | | Device mounted on a glass-epoxy board board size : 50 mm × 50 mm soldering land size : 6 mm × 6 mm board thickness : 1.6 mm | — | — | 135 | |
| Thermal resistance (junction to lead) | $R_{th(j-t)}$ | — | — | — | 16 | |

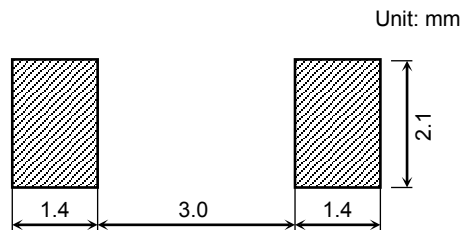
Start of commercial production
2000-07

Marking

| | |
|-------------------|----------|
| Abbreviation Code | Part No. |
| S3 | CMS03 |

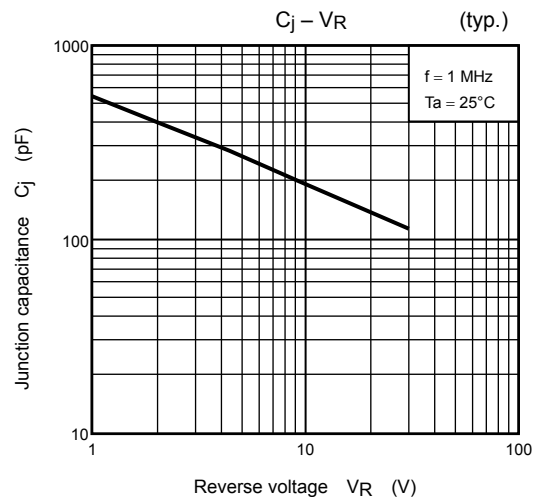
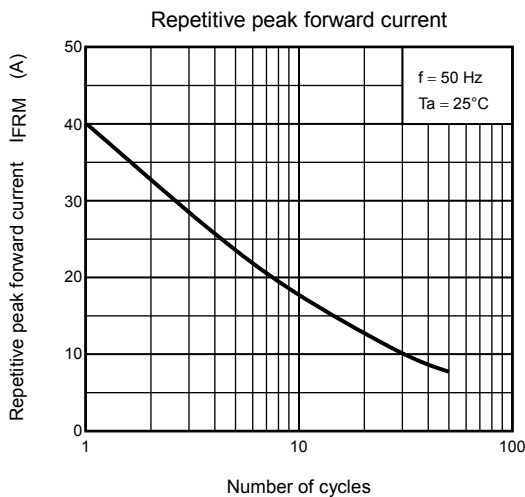
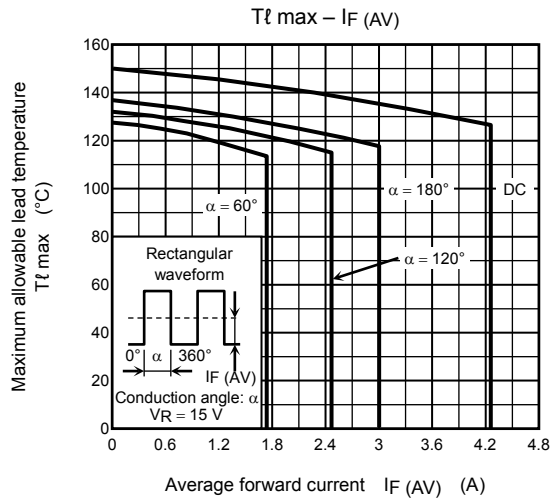
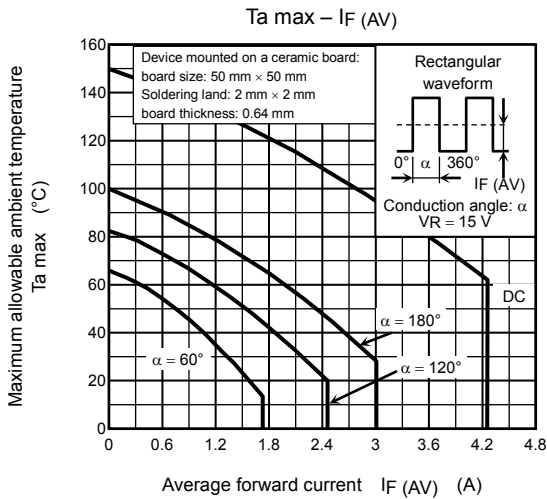
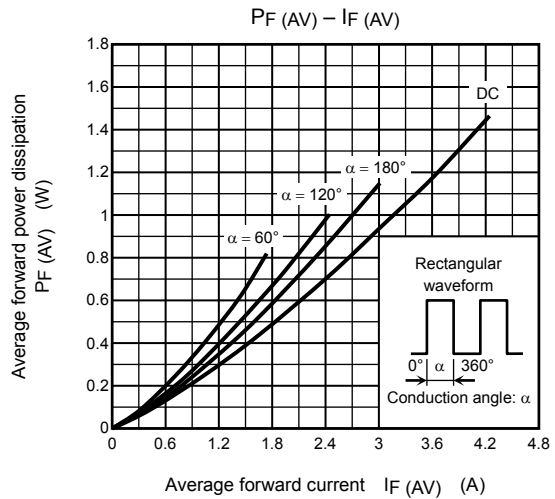
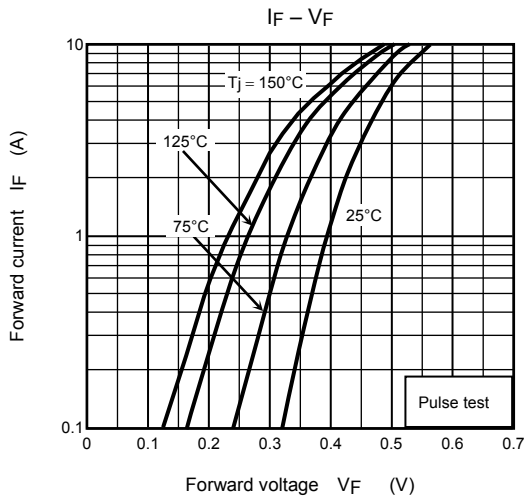


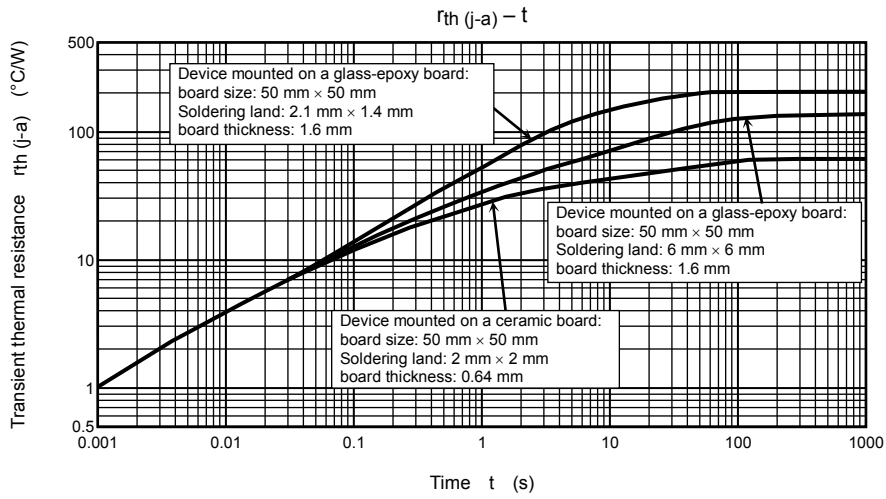
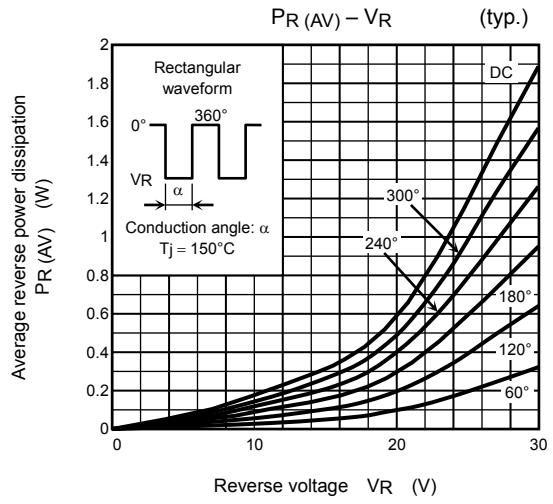
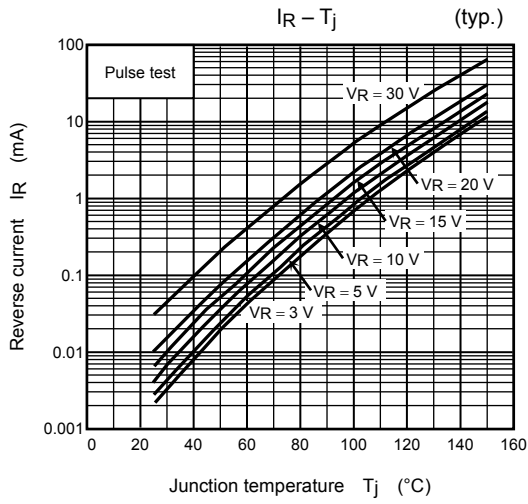
Land pattern dimensions for reference only



Handling Precaution

- 1) Schottky barrier diodes (SBDs) have reverse current greater than other types of diodes. This makes SBDs more vulnerable to damage due to thermal runaway under high-temperature and high-voltage conditions. Thus, both forward and reverse power losses of SBDs should be considered for thermal and safety design.
- 2) The absolute maximum ratings are rated values that must not be exceeded during operation, even for an instant. The following are the recommended general derating methods for designing a circuit board using this device.
 - V_{RRM} : Use this rating with reference to 1) above. V_{RRM} has a temperature coefficient of $0.1\%/^{\circ}\text{C}$ at low temperatures. Take this coefficient into account when designing a circuit board that will be operated in a low-temperature environment.
 - $I_{F(AV)}$: We recommend that the worst-case current be no greater than 80% of the absolute maximum rating of $I_{F(AV)}$ and that the worst-case junction temperature, T_j , be kept below 120°C . When using this device, allow margins, referring to the $T_{a(max)}-I_{F(AV)}$ curve.
 - I_{FSM} : This rating specifies peak non-repetitive forward surge current. This only applies to an abnormal operation, which seldom occurs during the lifespan of a device.
 - T_j : Derate device parameters in proportion to this rating in order to ensure high reliability. We recommend that the junction temperature (T_j) of a device be kept below 120°C .
- 3) Thermal resistance (junction-to-ambient) varies with the mounting conditions of a device on a circuit board. An appropriate thermal resistance value should be used, considering the heatsink, circuit board design and land pattern dimensions (provided for reference only).
- 4) For other design considerations, see the Rectifiers databook or the Toshiba website.





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