

TOSHIBA Fast Recovery Diode Silicon Diffused Type

# CMF02

Switching Mode Power Supply Applications  
DC/DC Converter Applications

- Repetitive peak reverse voltage:  $V_{RRM} = 600\text{ V}$
- Average forward current:  $I_F(AV) = 1.0\text{ A}$
- Forward voltage:  $V_{FM} = 2.0\text{ V (max)}$
- Very fast reverse-recovery time:  $t_{rr} = 100\text{ ns (max)}$
- Suitable for high-density board assembly due to the use of a small surface-mount package, M-FLAT™

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

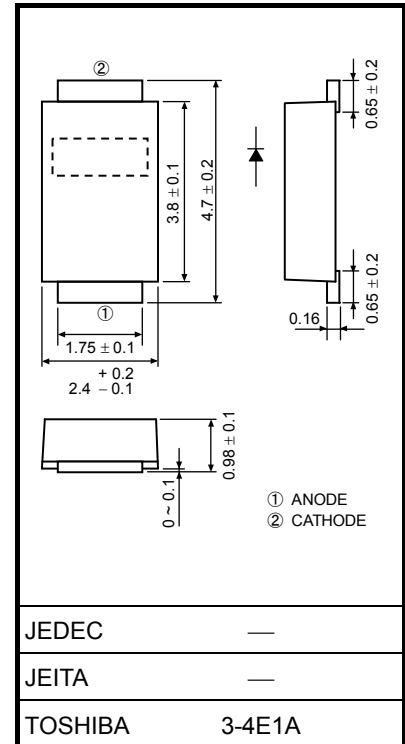
Characteristic	Symbol	Rating	Unit
Repetitive peak reverse voltage	$V_{RRM}$	600	V
Average forward current	$I_{F(AV)}$	1.0 (Note 1)	A
Peak one-cycle surge forward current (non-repetitive)	$I_{FSM}$	10 (50 Hz)	A
Junction temperature	$T_j$	-40 to 150	°C
Storage temperature range	$T_{stg}$	-40 to 150	°C

Note 1:  $T_l = 108^\circ\text{C}$   
Rectangular waveform ( $\alpha = 180^\circ$ )

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.)

Start of commercial production  
2006-07

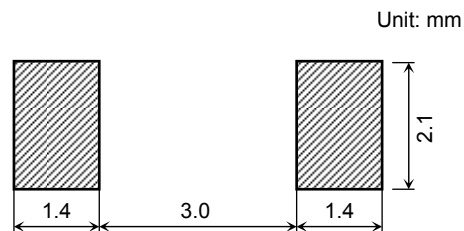
## Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Peak forward voltage	$V_{FM}$	$I_{FM} = 1.0 \text{ A}$ (pulse test)	—	—	2.0	V
Repetitive peak reverse current	$I_{RRM}$	$V_{RRM} = 600 \text{ V}$ (pulse test)	—	—	50	$\mu\text{A}$
Reverse recovery time	$t_{rr}$	$I_F = 1 \text{ A}$ , $di/dt = -30 \text{ A}/\mu\text{s}$	—	—	100	ns
Forward recovery time	$t_{fr}$	$I_F = 1 \text{ A}$	—	270	—	ns
Thermal resistance	$R_{th(j-a)}$	Device mounted on a ceramic board (board size: 50 mm × 50 mm) (soldering land: 2 mm × 2 mm) (board thickness: 0.64 mm)	—	—	60	$^{\circ}\text{C}/\text{W}$
		Device mounted on a glass-epoxy board (board size: 50 mm × 50 mm) (soldering land: 6 mm × 6 mm) (board thickness: 1.6 mm)	—	—	135	
		Device mounted on a glass-epoxy board (board size: 50 mm × 50 mm) (soldering land: 2.1 mm × 1.4 mm) (board thickness: 1.6 mm)	—	—	210	
Thermal resistance (junction to lead)	$R_{th(j-t)}$	—	—	—	16	$^{\circ}\text{C}/\text{W}$

## Marking

Abbreviation Code	Part No.
F2	CMF02

## Standard Soldering Pad



## Handling Precautions

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 we recommend for designing a circuit using this device.

$V_{RRM}$ : We recommend that the worst case voltage, including surge voltage, be no greater than 80% of the absolute maximum rating of  $V_{RRM}$  for a DC circuit and be no greater than 50% of that of  $V_{RRM}$  for an AC circuit.

$V_{RRM}$  has a temperature coefficient of 0.1%/°C. Take this temperature coefficient into account designing a device at low temperature.

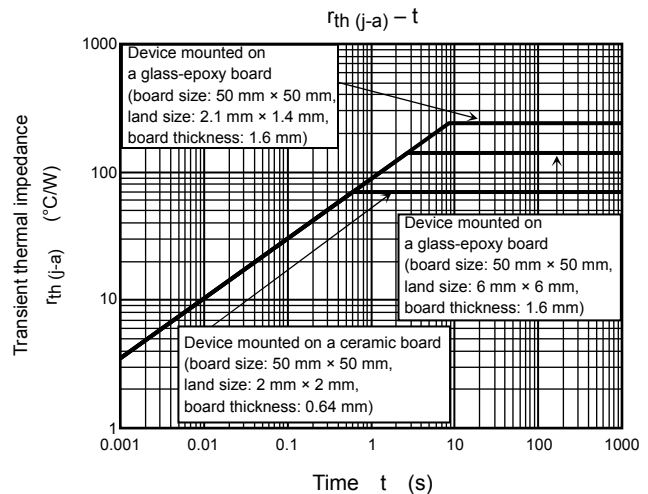
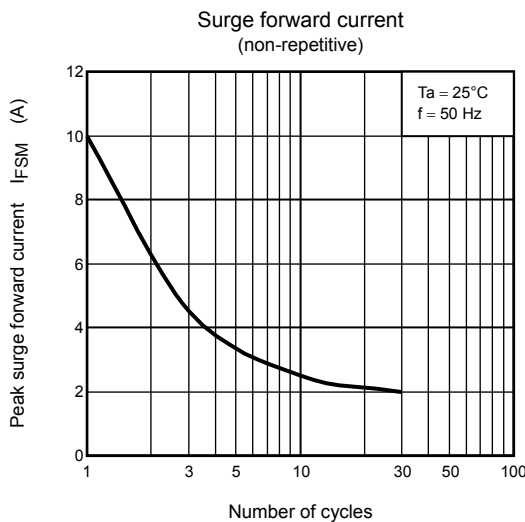
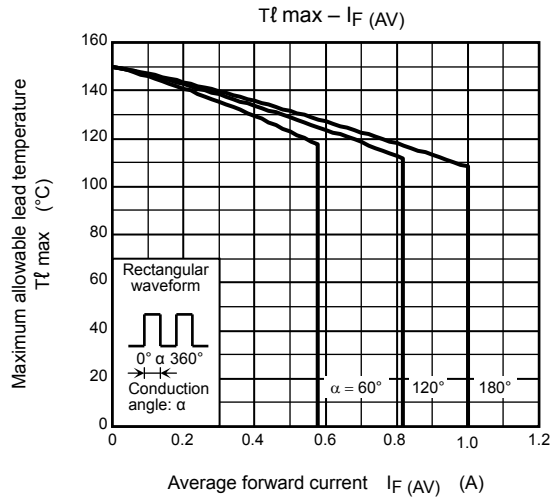
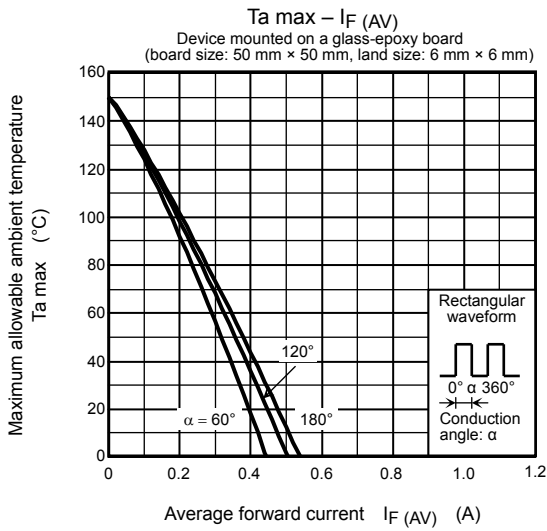
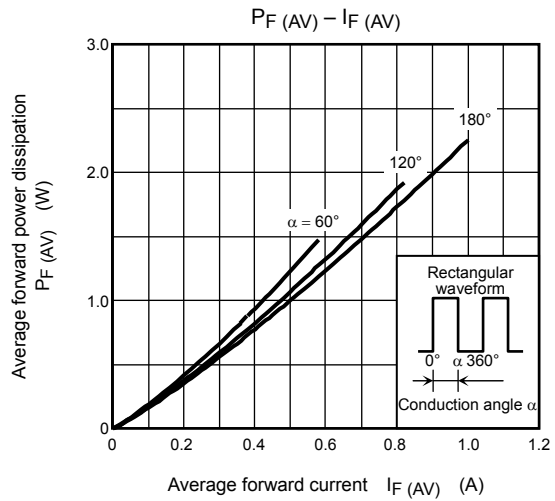
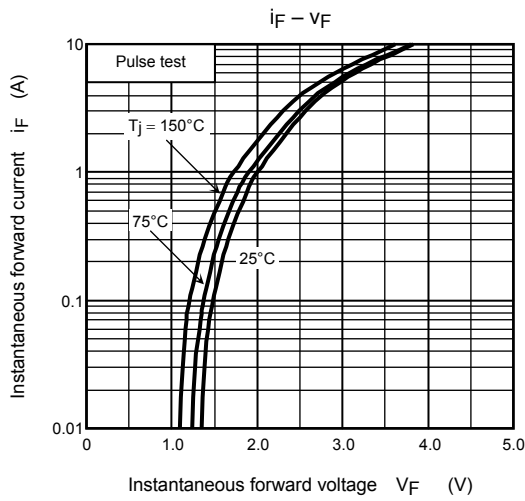
$I_{F(AV)}$ : We recommend that the worst-case current be no greater than 80% of the absolute maximum rating of  $I_{F(AV)}$ . Carry out adequate heat design. If you can't design a circuit with excellent heat radiation, set the margin by using an allowable  $T_a \text{ max-} I_{F(AV)}$  curve.

This rating specifies the non-repetitive peak current in one cycle of a 50-Hz sine wave, condition angle 180. Therefore, this is only applied for an abnormal operation, which seldom occurs during the lifespan of the device.

We recommend that a device be used at  $T_j$  below 120°C under the worst load and heat radiation conditions.

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.

Refer to the Rectifier databook for further information.



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