TOSHIBA Fast Recovery Diode Silicon Diffused Type

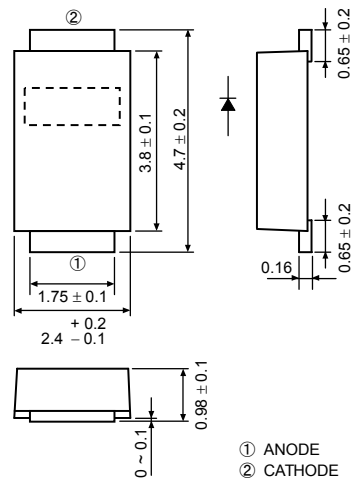
CMF03

Switching Mode Power Supply Applications

DC/DC Converter Applications

- Repetitive peak reverse voltage: V_{RRM} = 900 V
- Average forward current: $I_{F\ (AV)}$ = 0.5 A
- Forward voltage: V_{FM} = 2.5 V (max)
- Very fast reverse-recovery time: t_{rr} = 100 ns (max)
- Suitable for high-density board assembly due to the use of a small surface-mount package, M−FLAT™

Unit: mm



JEDEC	―
JEITA	―
TOSHIBA	3-4E1A

Weight: 0.023 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Repetitive peak reverse voltage	V_{RRM}	900	V
Average forward current	$I_{F(AV)}$	0.5 (Note 1)	A
Peak one-cycle surge forward current (non-repetitive)	I_{FSM}	10 (50 Hz) (Note 3)	A
Junction temperature	T_j	−40 to 125	°C
Storage temperature range	T_{stg}	−40 to 150	°C

Note 1: $T\ell$ = 102°C
Rectangular waveform (α = 180°)

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).

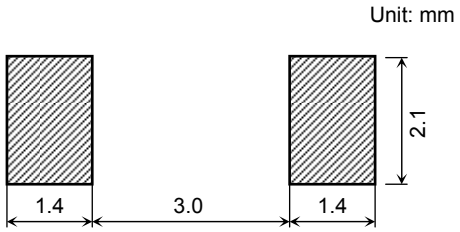
Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Peak forward voltage	V_{FM}	I_{FM} = 0.5 A (pulse test)	—	—	2.5	V
Repetitive peak reverse current	I_{RRM}	V_{RRM} = 900 V (pulse test)	—	—	50	μA
Reverse recovery time	t_{rr}	I_F = 1 A, di/dt =-30 A/μs	—	—	100	ns
Forward recovery time	t_{fr}	I_F = 1 A	—	550	—	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	°C/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)	$R_{th(j-\ell)}$	—	—	—	16	°C/W

Marking

Abbreviation Code	Part No.
F3	CMF03

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%/℃. 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 Ta max- $I_{F(AV)}$ curve.

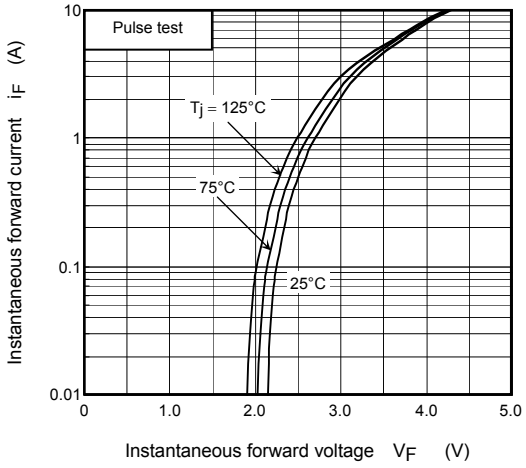
This rating specifies the non-repetitive peak current in one cycle of a 50-Hz sine wave, condition angle 180. Therefore, this is only applied for an abnormal operation, which seldom occurs during the lifespan of the device.

We recommend that a device be used at Tj below 100℃ under the worst load and heat radiation conditions.

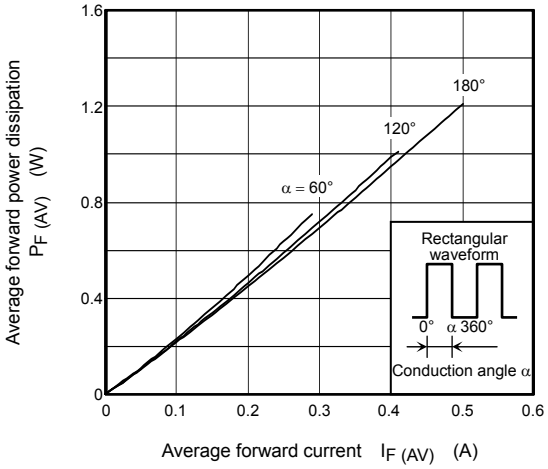
Thermal resistance between junction and ambient fluctuates depending on the device's mounting condition. When using a device, design a circuit board and a soldering land size to match the appropriate thermal resistance value.

Refer to the Rectifier databook for further information.

$i_F - v_F$

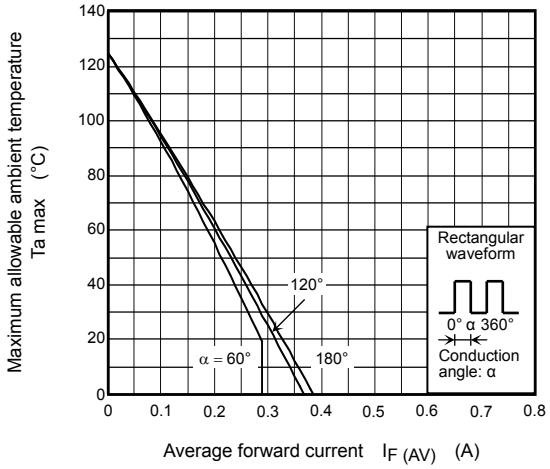


$P_{F\,(AV)} - I_{F\,(AV)}$

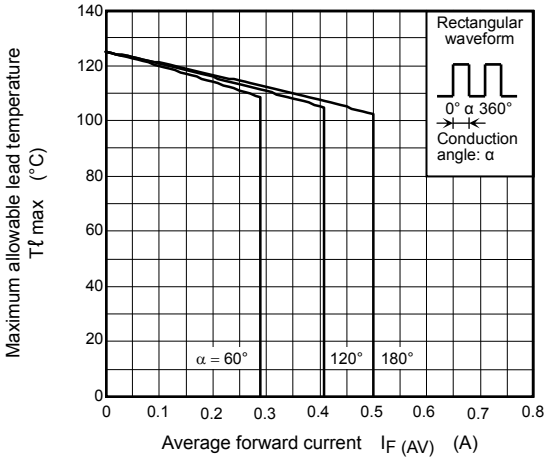


Ta max – $I_{F\,(AV)}$

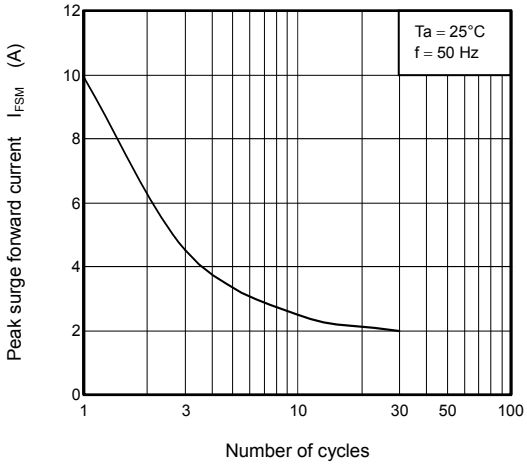
Device mounted on a glass-epoxy board
(board size: 50 mm × 50 mm, land size: 6 mm × 6 mm)



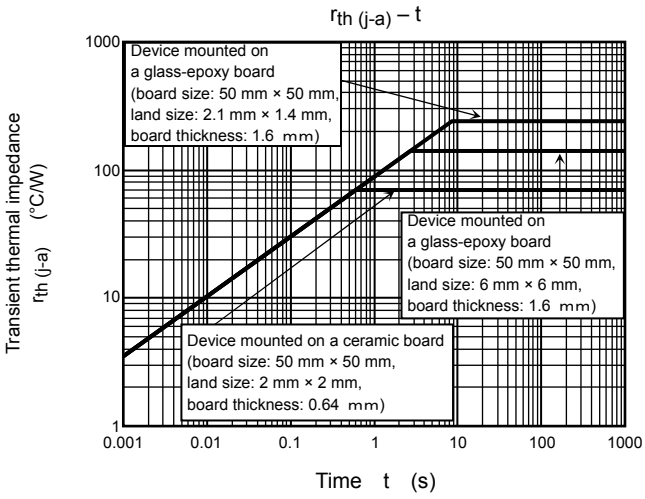
T_ℓ max – $I_{F\,(AV)}$



Surge forward current
(non-repetitive)



$r_{th\,(j\text{-}a)} - t$



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