

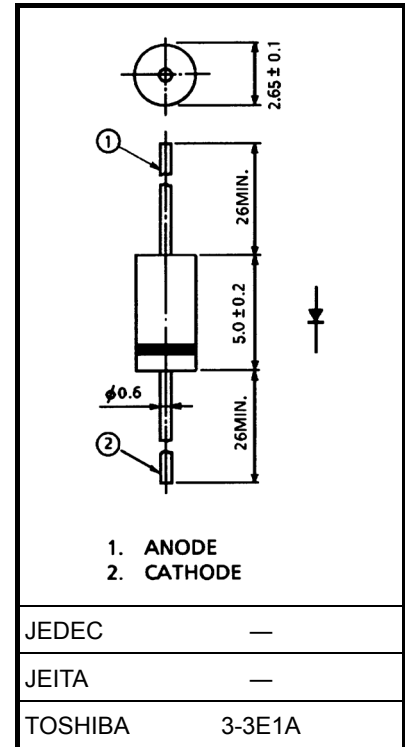
TOSHIBA Fast Recovery Diode Silicon Diffused Type

TFR3N,TFR3T

Strobe Flasher Applications (Fast Recovery)

- Average forward current: $I_F(AV) = 0.2$ A
- Repetitive peak reverse voltage: $V_{RRM} = 1000, 1500$ V
- Reverse recovery time: $t_{rr} = 1.5$ μ s

Unit: mm



Weight: 0.225 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

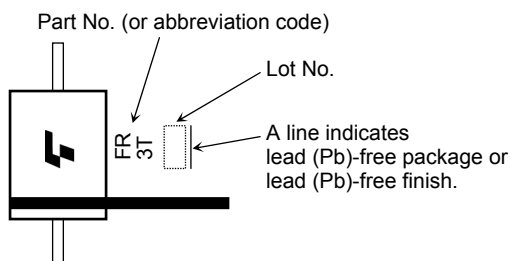
Characteristics	Symbol	Rating	Unit
Repetitive peak reverse voltage	TFR3N	1000	V
	TFR3T	1500	
Average forward current	$I_F(AV)$	0.2	A
I^2t limit value (t = 1 to 10 ms)	I^2t	0.5	A ² s
Peak one cycle surge forward current (non repetitive)	I_{FSM}	10 (50 Hz)	A
		11 (60 Hz)	
Junction temperature	T_j	-40 to 125	°C
Storage temperature range	T_{stg}	-40 to 125	°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).

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Peak forward voltage	V_{FM}	$I_{FM} = 0.1$ A	—	—	1.5	V
Repetitive peak reverse current	I_{RRM}	$V_{RRM} = \text{Rated}$	—	—	5	μ A
Reverse recovery time	t_{rr}	$I_F = 10$ mA, $I_R = 10$ mA	—	—	1.5	μ s

Marking



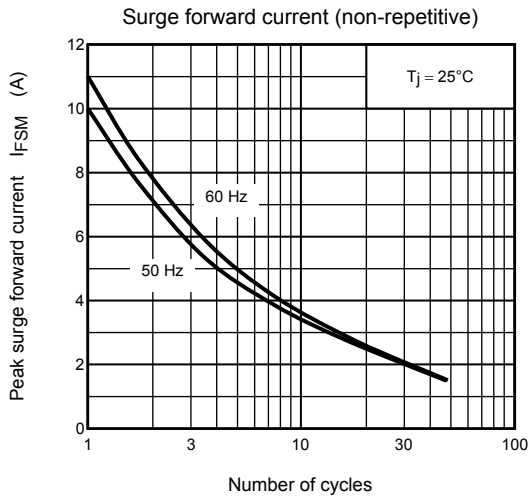
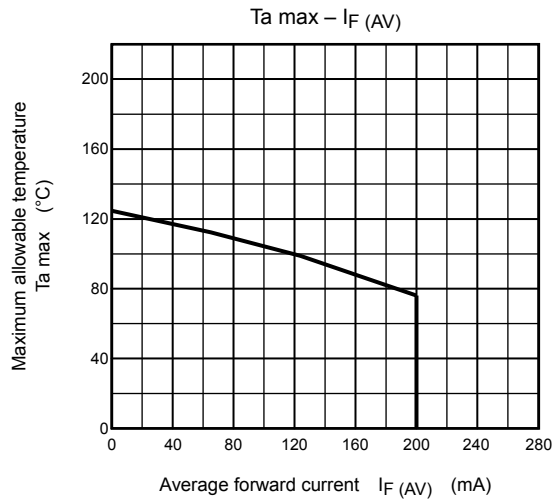
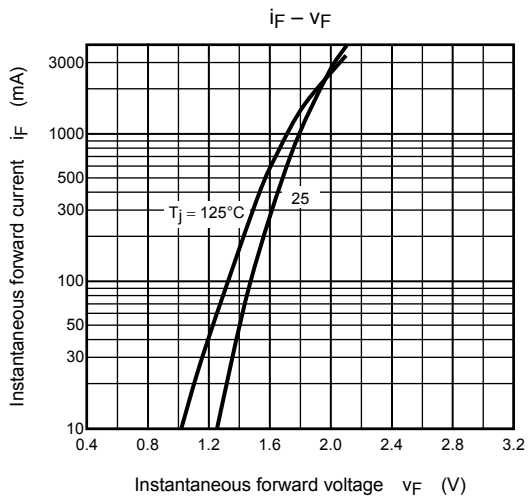
Abbreviation Code	Part No.
FR3N	TFR3N
FR3T	TFR3T

Handling Precaution

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.

- V_{RRM}**: Because this device is developed for use in a strobe flash, we recommend that peak voltage of set's apply voltage that generates pulse be no greater than 80% of the absolute maximum rating of V_{RRM} and DC supply voltage be no greater than 400 V. 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_{amax}-I_{F(AV)} curve.
- I_{FSM}**: 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.
- T_j**: We recommend that a device be used at a T_j of below 100°C under the worst load and heat radiation conditions.

Please refer to the Rectifiers databook for further information.



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- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc.
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