TOSHIBA Infrared LED GaAℓAs Infrared Emitter

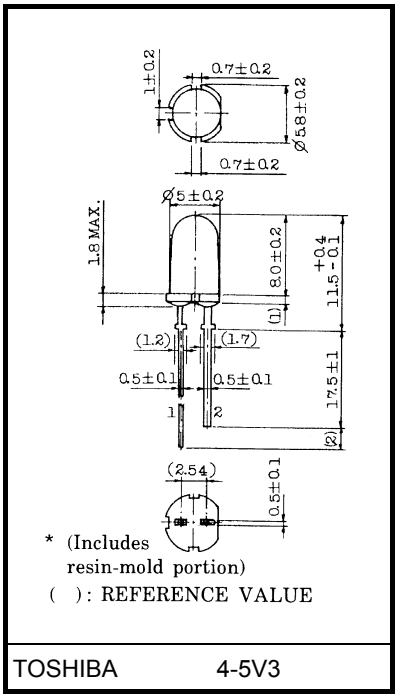
TLN233(F)

Lead(Pb)-Free

Infrared LED for Space-Optical-Transmission

- High radiant intensity: 80 mW/sr (typ.) at I_F = 50 mA
- Half-angle value: θ1/2 = ±13° (typ.)
- A light source for remote control
- Wireless AV-signal transmission purposes
- High-speed data transmission purposes

Unit: mm



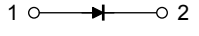
TOSHIBA 4-5V3

Weight: 0.3 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Forward current	I_F	100	mA
Pulse forward current	I_{FP}	1000 (Note 1)	mA
Power dissipation	P_D	200	mW
Reverse voltage	V_R	4	V
Operating temperature range	T_{opr}	−25~85	°C
Storage temperature range	T_{stg}	−30~100	°C
Soldering temperature (5 s), (Note 2)	T_{sol}	260	°C

Pin Connection



1. Anode
2. Cathode

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).

Note 1: f = 100 kHz, duty = 1%

Note 2: Soldering must be performed under the stopper.

Optical and Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward voltage	V_F	I_F = 100 mA	—	1.6	2.0	V
Reverse current	I_R	V_R = 4 V	—	—	60	μA
Radiant intensity	I_E	I_F = 50 mA	46	80	—	mW/sr
Radiant power	P_O	I_F = 50 mA	—	30	—	mW
Cut-off frequency	f_c	I_F = 50 mA + 5 mA_{P-P} (Note 3)	—	15	—	MHz
Peak emission wavelength	λ_P	I_F = 50 mA	—	870	—	nm
Half-angle value	$\theta\frac{1}{2}$	I_F = 50 mA	—	±13	—	°

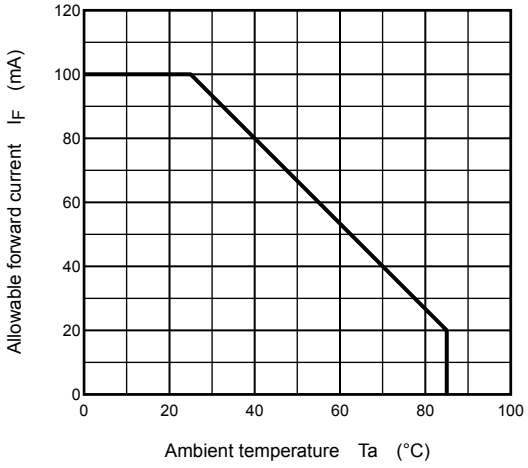
Note 3: This is the frequency when modulation light power decreases by 3 dB from 1 MHz.

Handling Precautions

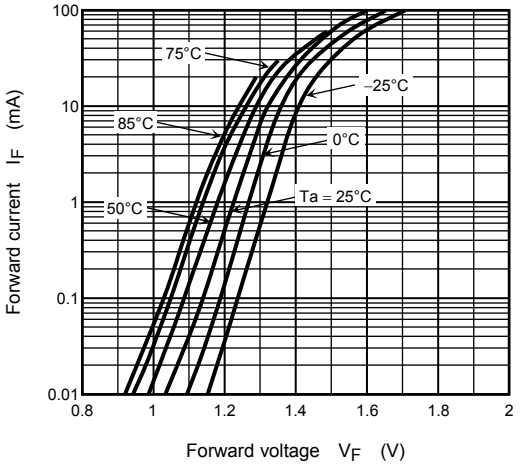
- Soldering must be performed under the stopper.
- When forming the leads, bend each lead at least 5 mm from the package body. Soldering must be performed after the leads have been formed.
- The radiant intensity decreases over time due to current flowing in the infrared LED. When designing circuits, take into account the change in radiant intensity over time. The change in radiant intensity is equal to the reciprocal of the change in LED infrared optical output:

$$\frac{I_E(t)}{I_E(0)} = \frac{P_O(t)}{P_O(0)}.$$

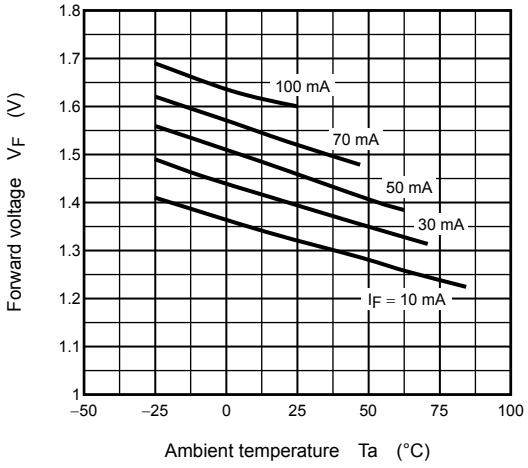
I_F – Ta



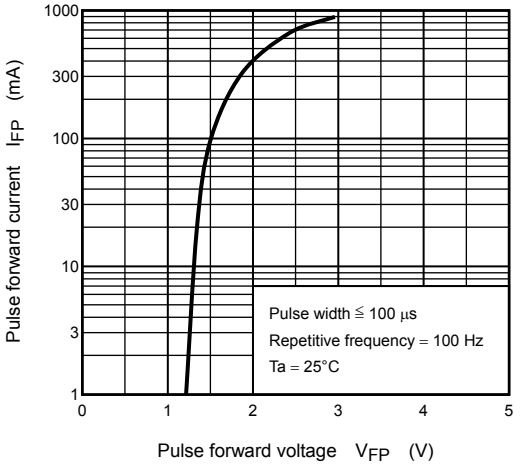
I_F – V_F (typ.)



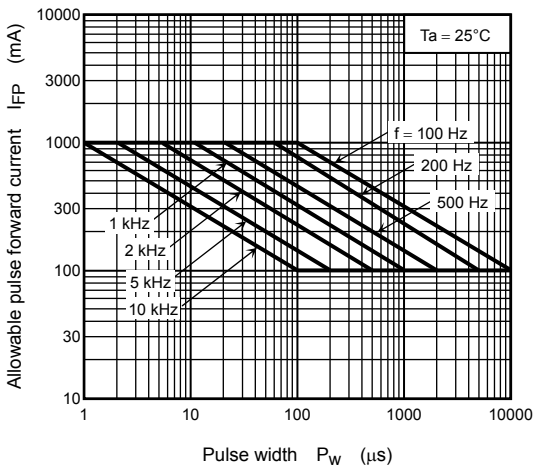
V_F – Ta (typ.)



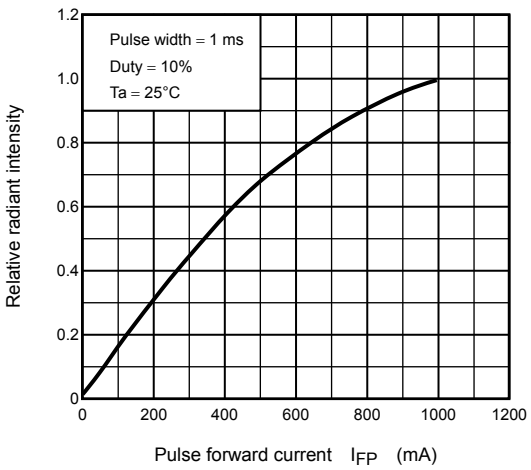
I_{FP} – V_{FP} (typ.)



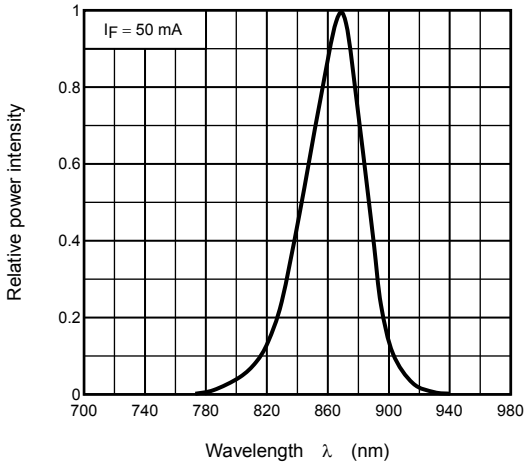
I_{FP} – P_W



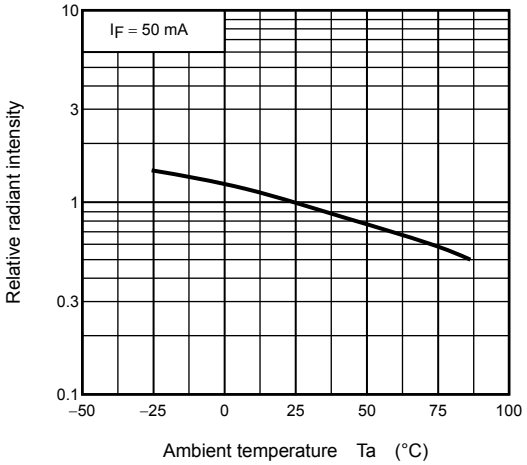
Relative I_E – I_{FP}



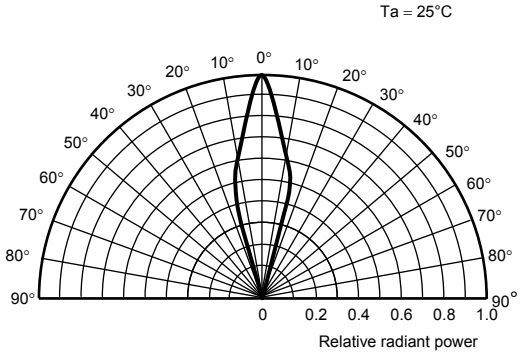
Wavelength characteristic



Relative I_E – Ta (typ.)



Radiation pattern (typ.)



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