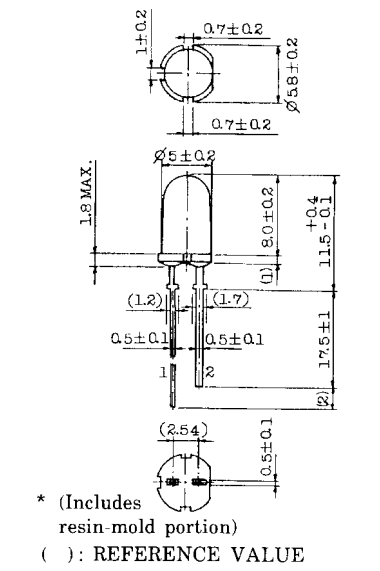
TOSHIBA Infrared LED GaAℓAs Infrared Emitter

T L N 2 3 3

Infrared LED for Space-Optical-Transmission

- High radiant intensity: 80 mW/sr (typ.) at I_F = 50 mA
- Half-angle value: $\theta\frac{1}{2}$ = ±13° (typ.)
- A light source for remote control
- Wireless AV-signal transmission purpose
- High speed data transmission purpose

Unit: mm



TOSHIBA 4-5V3

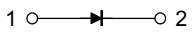
Maximum Ratings (Ta = 25°C)

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

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

Note 2: Soldering must be performed under the stopper.

Pin Connection



1. Anode
2. Cathode

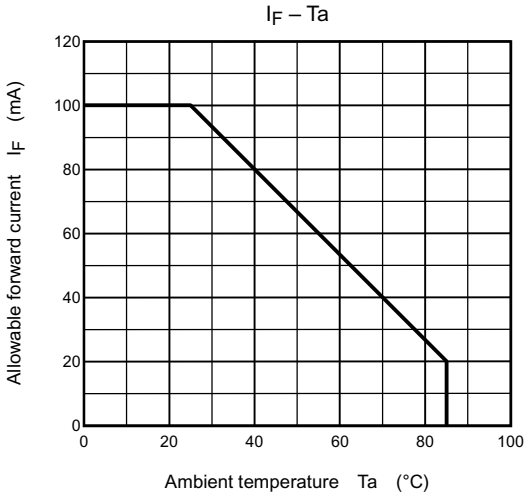
Optical and Electrical Characteristics (Ta = 25°C)

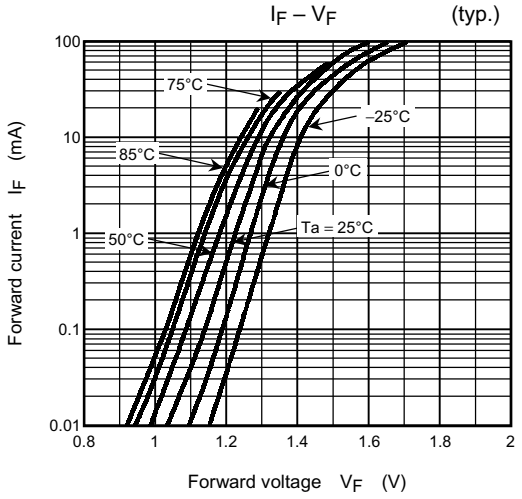
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward voltage	V_F	I_F = 100 mA	—	1.6	2.0	V
Reverse current	I_R	V_R = 4 V	—	—	60	μA
Radiant intensity	I_E	I_F = 50 mA	46	80	—	mW/sr
Radiant power	P_O	I_F = 50 mA	—	30	—	mW
Cut-off frequency	f_c	I_F = 50 mA + 5 mA_{P-P} (Note 3)	—	15	—	MHz
Peak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

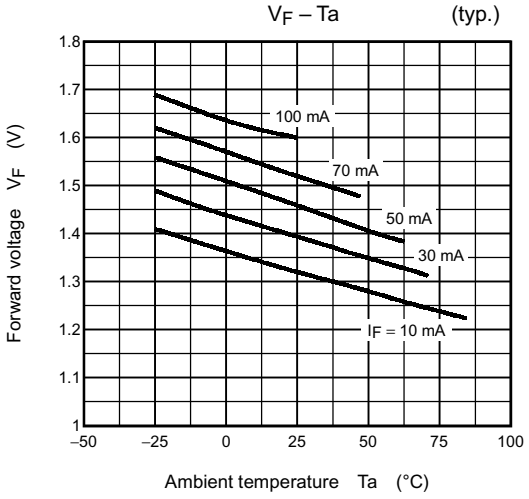
Note 3: Frequency when modulation light power decreases by 3dB from 1 MHz.

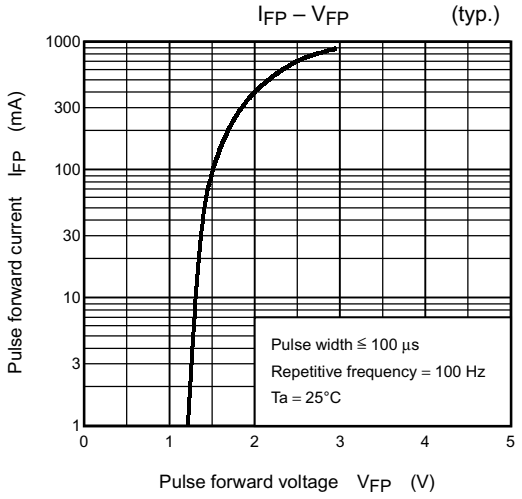
Handling Precautions

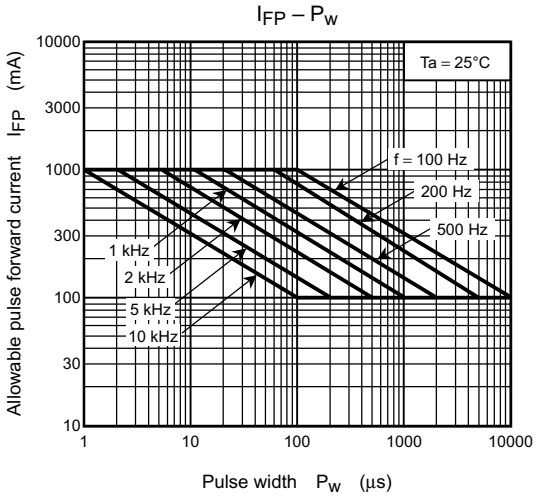
- Soldering must be performed under the stopper.
- When forming the leads, bend each lead under the 5 mm of package body. Soldering must be performed after the leads have been formed.
- The radiant intensity decrease over time due to current flowing in the infrared LED. When designing circuits, the device must 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. $\frac{I_E(t)}{I_E(0)} = \frac{P_O(t)}{P_O(0)}$

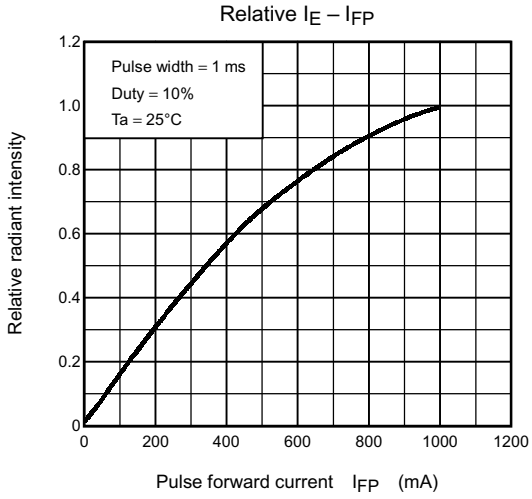

I_F – Ta
Allowable forward current I_F (mA)
Ambient temperature Ta (°C)


I_F – V_F (typ.)
75°C
–25°C
85°C
0°C
50°C
Ta = 25°C
Forward current I_F (mA)
Forward voltage V_F (V)

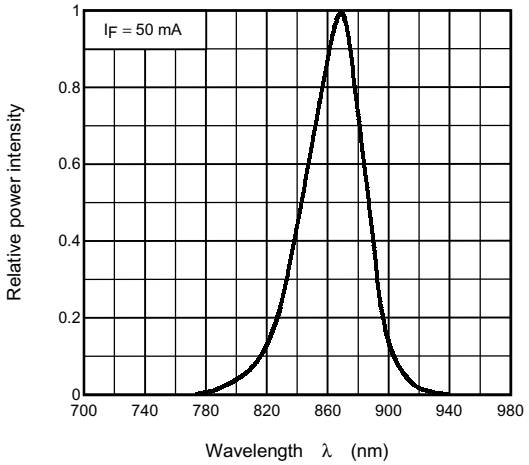

V_F – Ta (typ.)
100 mA
70 mA
50 mA
30 mA
IF = 10 mA
Forward voltage V_F (V)
Ambient temperature Ta (°C)


I_{FP} – V_{FP} (typ.)
Pulse width ≦ 100 μs
Repetitive frequency = 100 Hz
Ta = 25°C
Pulse forward current I_{FP} (mA)
Pulse forward voltage V_{FP} (V)

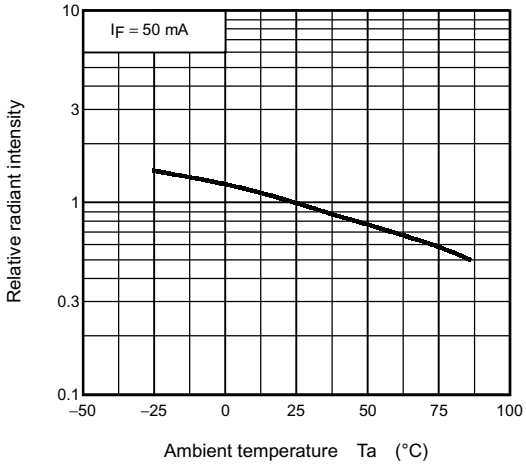

I_{FP} – P_w
Ta = 25°C
f = 100 Hz
200 Hz
500 Hz
1 kHz
2 kHz
5 kHz
10 kHz
Allowable pulse forward current I_{FP} (mA)
Pulse width P_w (μs)


Relative I_E – I_{FP}
Pulse width = 1 ms
Duty = 10%
Ta = 25°C
Relative radiant intensity
Pulse forward current I_{FP} (mA)

Wavelength characteristic

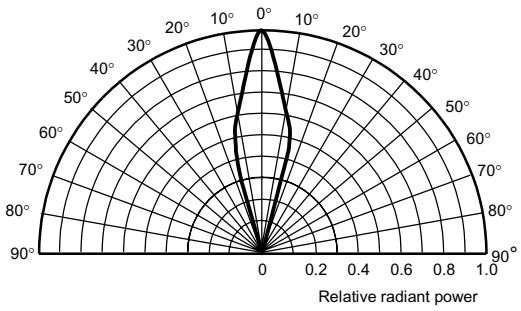


Relative I_E – Ta (typ.)



Radiation pattern (typ.)

Ta = 25°C



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