

TOSHIBA Infrared LED GaAs Infrared Emitter

TLN108(F)

Lead(Pb)-Free
 Opto-Electronic Switches
 Tape And Card Readers
 Equipment Using Infrared Transmission

- TO-18 metal package
- High radiant intensity: $I_E = 20 \text{ mW/sr}$ (typ.)
- Excellent radiant-intensity linearity. Modulation by pulse operation and high frequency is possible.
- Highly reliable due to hermetic seal

Absolute Maximum Ratings (Ta = 25°C)

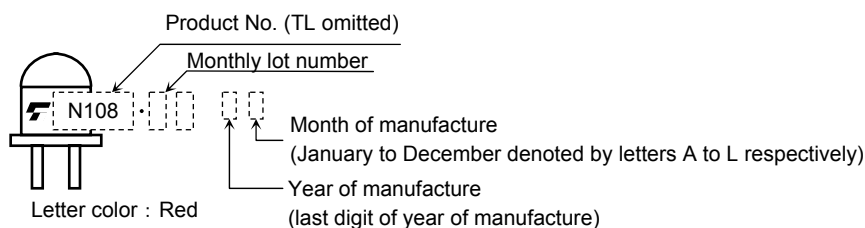
| Characteristic | Symbol | Rating | Unit |
|--------------------------------------|-------------------------------|---------|---------|
| Forward current | I_F | 100 | mA |
| Forward current derating (Ta > 25°C) | $\Delta I_F / ^\circ\text{C}$ | -1 | mA / °C |
| Pulse forward current (Note 1) | I_{FP} | 1 | A |
| Reverse voltage | V_R | 5 | V |
| Operating temperature range | T_{opr} | -40~125 | °C |
| Storage temperature range | T_{stg} | -55~150 | °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.

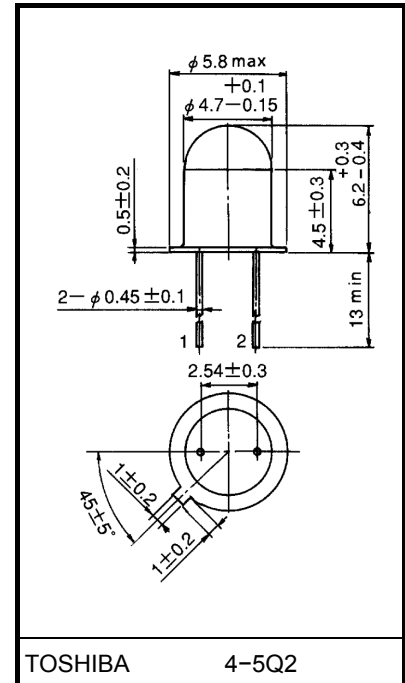
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: Pulse width $\leq 100\mu\text{s}$, repetitive frequency = 100 Hz

Markings

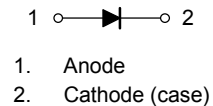


Unit: mm



Weight: 0.33 g (typ.)

Pin Connection



Optical And Electrical Characteristics (Ta = 25°C)

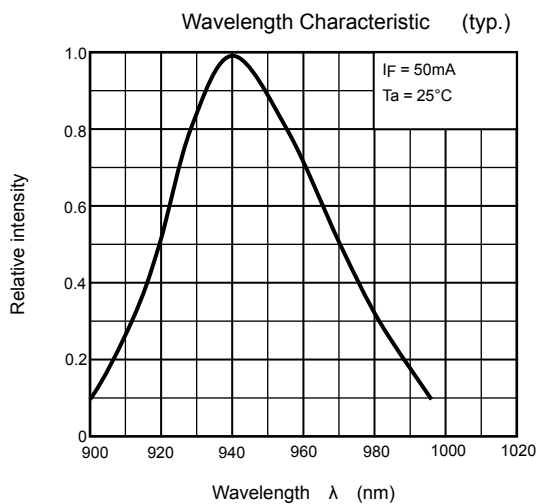
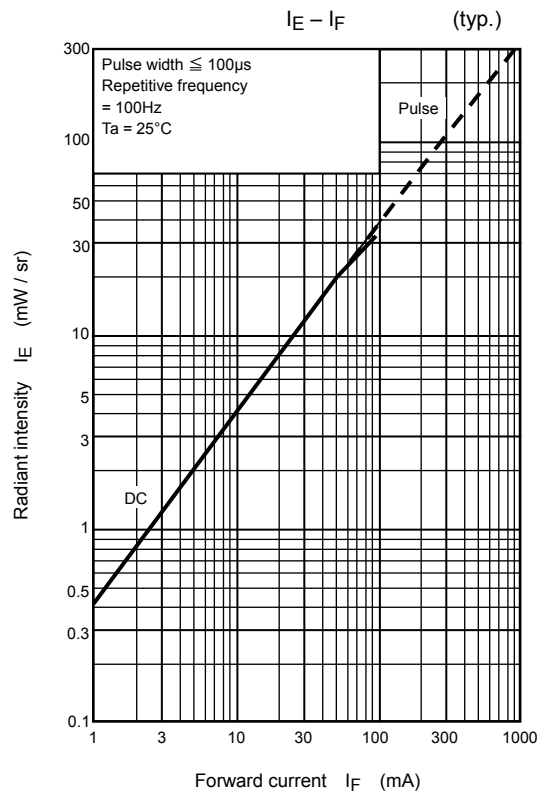
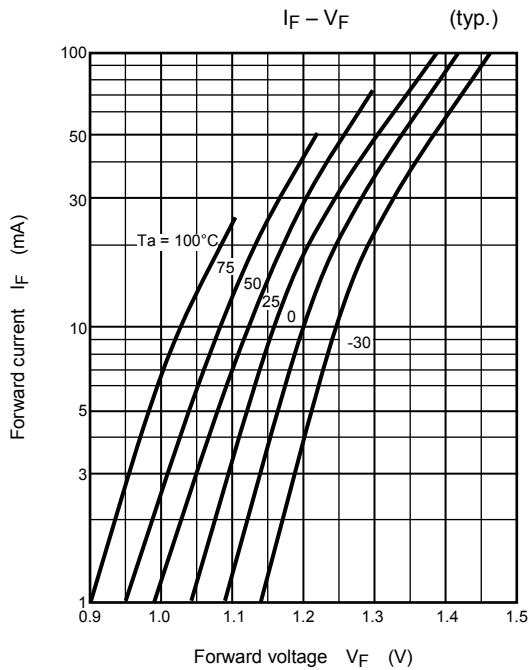
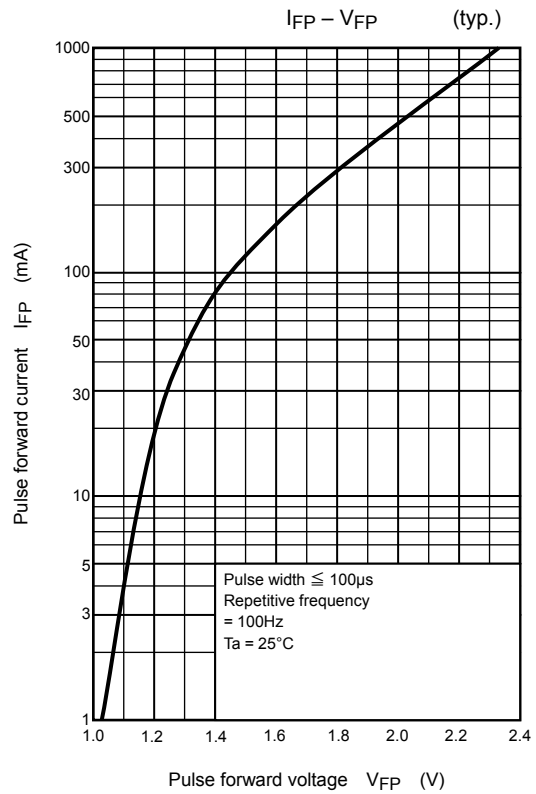
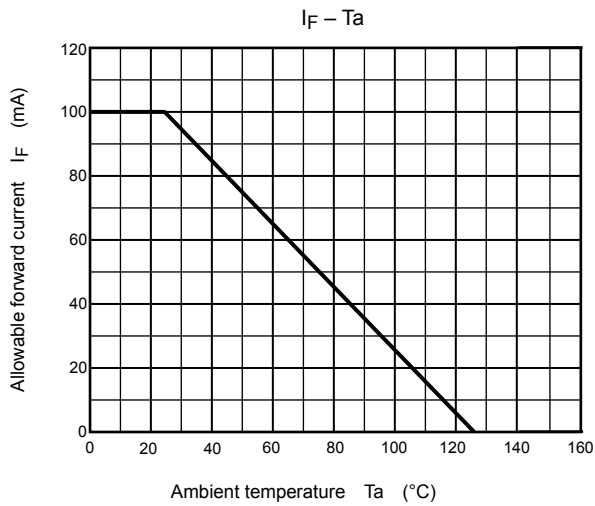
| Characteristic | Symbol | Test Condition | Min | Typ. | Max | Unit |
|--------------------------|------------------------|------------------------------|-----|---------|-----|---------------|
| Forward voltage | V_F | $I_F = 50 \text{ mA}$ | — | 1.3 | 1.4 | V |
| Pulse forward voltage | V_{FP} | $I_{FP} = 1 \text{ A}$ | — | 2.4 | — | V |
| Reverse current | I_R | $V_R = 5 \text{ V}$ | — | — | 10 | μA |
| Radiant intensity | I_E | $I_F = 50 \text{ mA}$ | 10 | 20 | — | mW / sr |
| Radiant power | P_O | $I_F = 50 \text{ mA}$ | — | 3 | — | mW |
| Capacitance | C_T | $V_R = 0, f = 1 \text{ MHz}$ | — | 30 | — | pF |
| Peak emission wavelength | λ_P | $I_F = 50 \text{ mA}$ | — | 940 | — | nm |
| Spectral line half width | $\Delta\lambda$ | $I_F = 50 \text{ mA}$ | — | 50 | — | nm |
| Half value angle | $\theta_{\frac{1}{2}}$ | $I_F = 50 \text{ mA}$ | — | ± 8 | — | ° |

Precautions

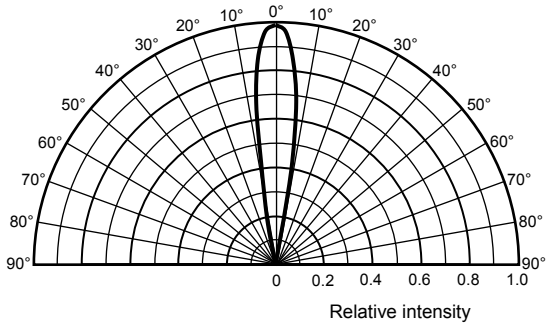
Please be careful of the followings.

1. Soldering temperature: 260°C max
Soldering time: 5s max
(Soldering must be performed 1.5m from the bottom of the package.)
2. When forming the leads, bend each lead under the 2mm from the body of the device.
Soldering must be performed after the leads have been formed.
3. Radiant intensity falls over time due to the current which flows in the infrared LED.
When designing a circuit, take into account this change in radiant power over time.
The ratio of fluctuation in radiation intensity to fluctuation in optical output is 1 : 1.

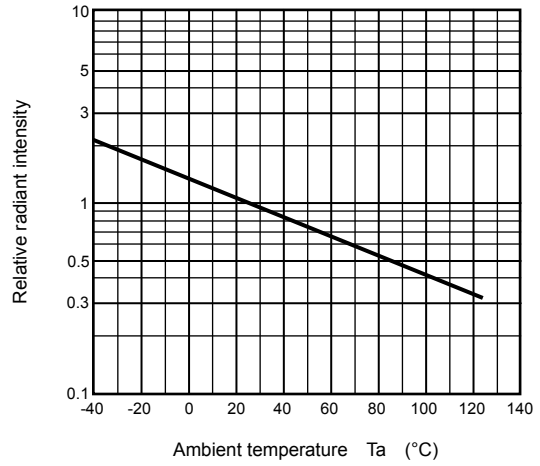
$$\frac{I_E(t)}{I_E(0)} = \frac{P_O(t)}{P_O(0)}$$



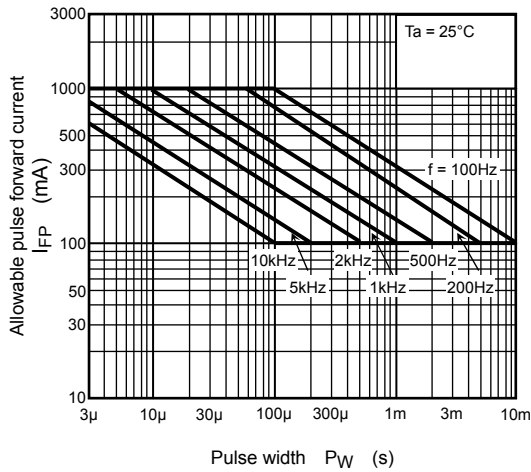
Radiation Pattern (typ.)
(Ta = 25°C)



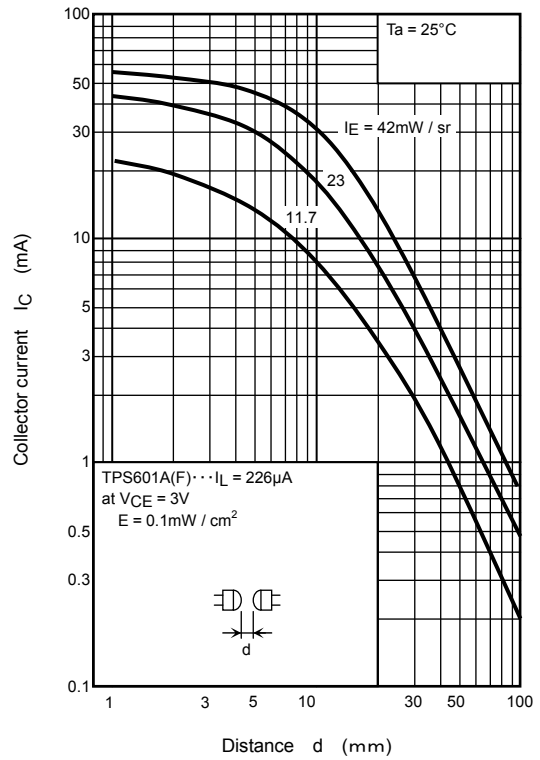
Relative $I_E - T_a$ (typ.)



$I_{FP} - P_W$



Coupling Characteristics With TPS601A(F)



RESTRICTIONS ON PRODUCT USE

20070701-EN

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