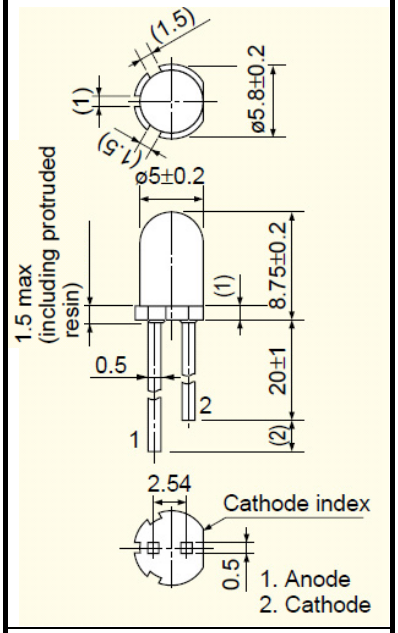
TOSHIBA InGaAℓP LED

TLOU156P(F),TLSU156P(F),TLYU156P(F)

Panel Circuit Indicator

Unit in mm



JEDEC	—
JEITA	—
TOSHIBA	4-5AH2

Weight: 0.31 g(Typ.)

- Lead(Pb)-free products (lead: Sn-Ag-Cu)
- 5mm package
- InGaAℓP LED
- Without stand−offs
- All plastic mold type
- Colorless clear lens
- Lineup: 3 colors (red, orange, yellow)
- Suitable for high−brightness and less electricity consumption.
- All plastic molded lens, provides an excellent on−off contrast ratio.
- Applications: Backlight, light for decoration, switches, various indicator, personal equipment

Lineup

Product	Color	Material
TLOU156P(F)	Orange	InGaAℓP
TLSU156P(F)	Red	InGaAℓP
TLYU156P(F)	Yellow	InGaAℓP

Absolute Maximum Ratings (Ta = 25°C)

Product	Forward Current I_F(mA)	Reverse Voltage V_R(V)	Power Dissipation P_D(mW)	Operating Temperature T_{opr}(°C)	Storage Temperature T_{stg}(°C)
TLOU156P(F)	30	4	72	−30~85	−40~120
TLSU156P(F)	30	4	72	−30~85	−40~120
TLYU156P(F)	30	4	75	−30~85	−40~120

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 and Optical Characteristics (Ta = 25°C)

Product	Typ.Emission Wavelength			Luminous Intensity I_V			Forward Voltage V_F			Reverse Current I_R	
	λ_p	$\Delta\lambda$	I_F	Min	Typ.	I_F	Typ.	Max	I_F	Max	V_R
TLOU156P(F)	(612)	15	20	476	1400	20	2.0	2.4	20	50	4
TLSU156P(F)	(636)	17	20	272	900	20	2.0	2.4	20	50	4
TLYU156P(F)	(590)	13	20	153	500	20	2.1	2.5	20	50	4
Unit	nm		mA	mcd		mA	V		mA	μA	V

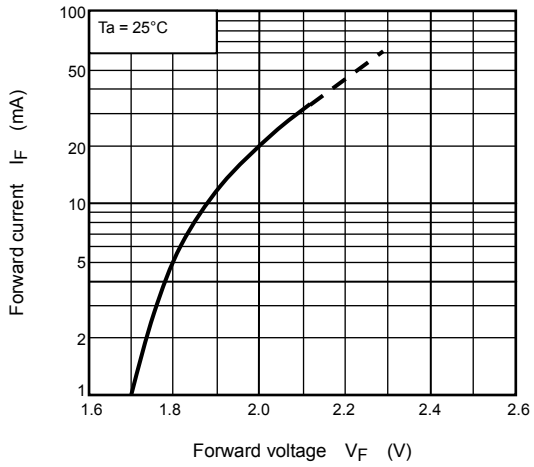
Precaution

Please be careful of the followings

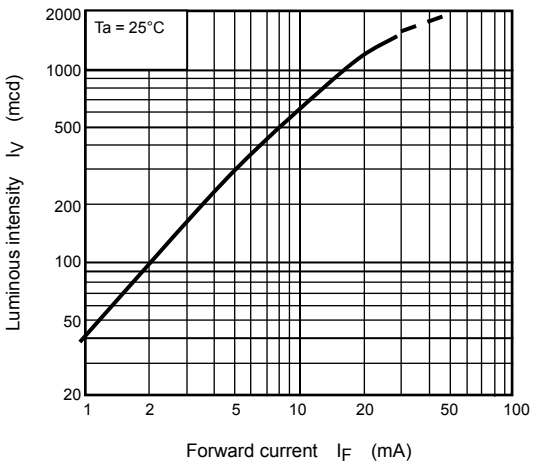
- Soldering temperature: 260°C max Soldering time: 3 s max
  (Soldering portion of lead: Up to 1.6 mm from the body of the device)
- If the lead is formed, the lead should be formed up to 1.6 mm from the body of the device without forming stress to the resin. Soldering should be performed after lead forming.
- This visible LED lamp also emits some IR light. If a photodetector is located near the LED lamp, please ensure that it will not be affected by this IR light.

TLOU156P(F)

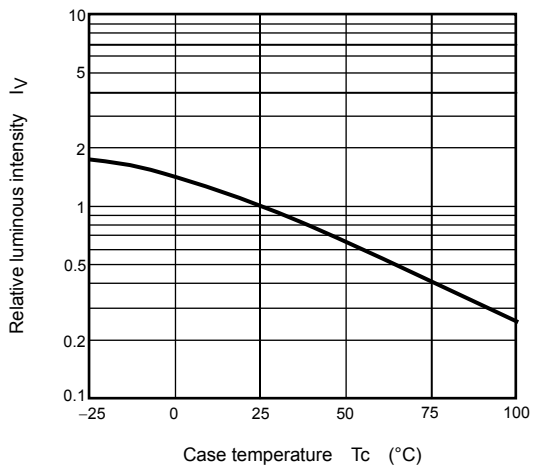
$I_F - V_F$



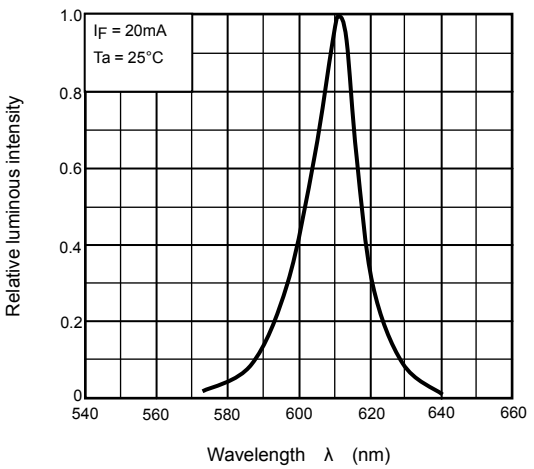
$I_V - I_F$



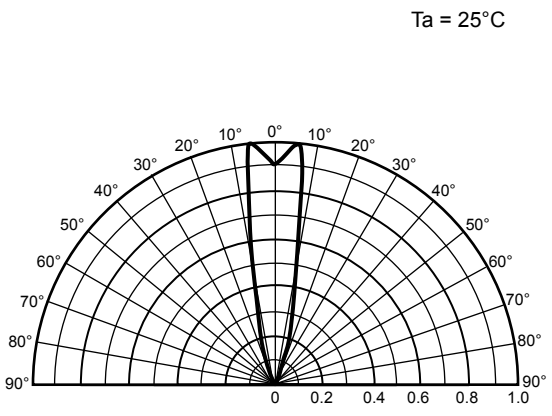
$I_V - Tc$



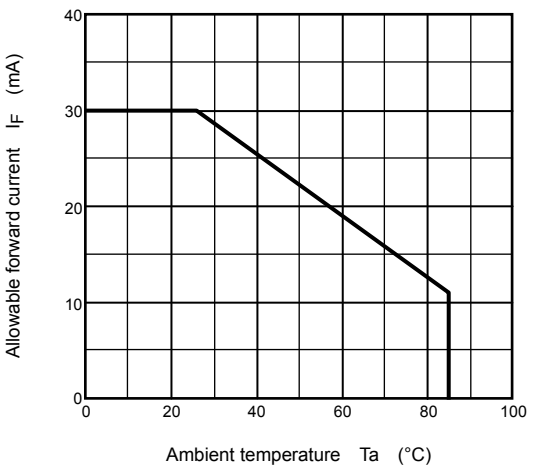
Relative Luminous Intensity – Wavelength



Radiation Pattern

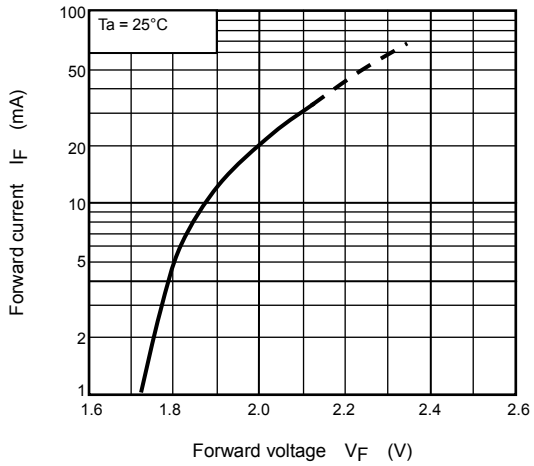


$I_F - Ta$

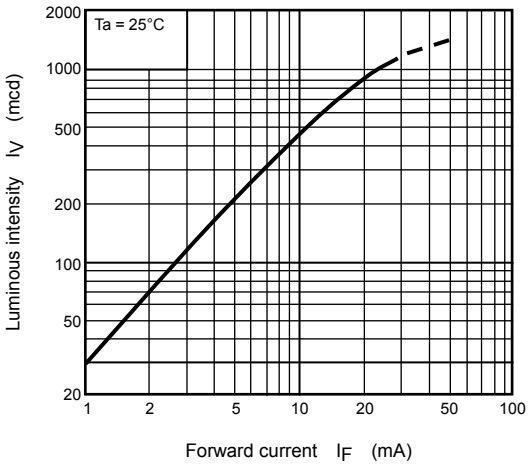


TLSU156P(F)

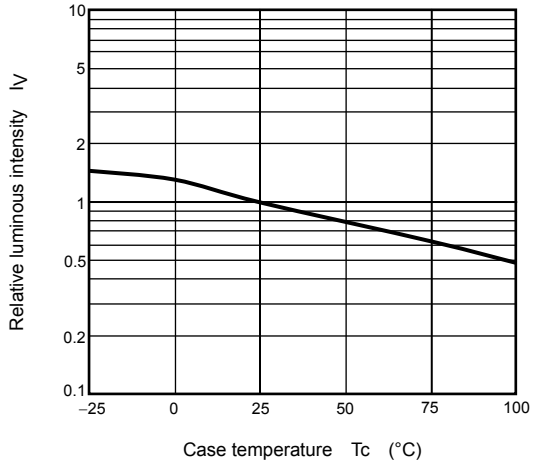
$I_F - V_F$



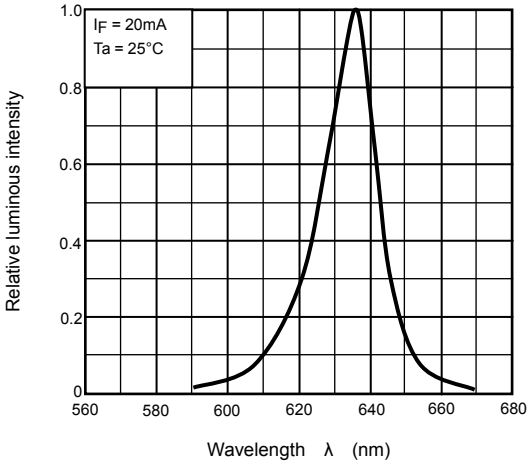
$I_V - I_F$



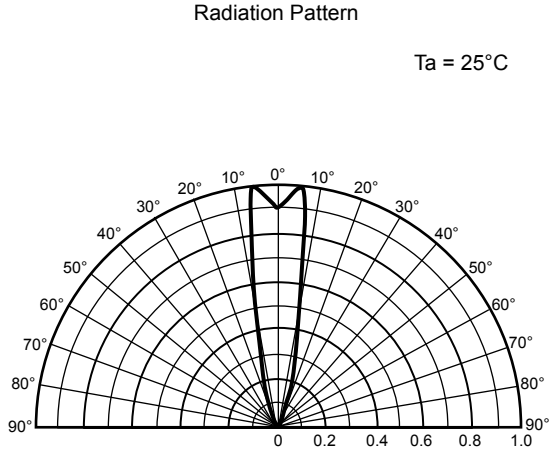
$I_V - Tc$



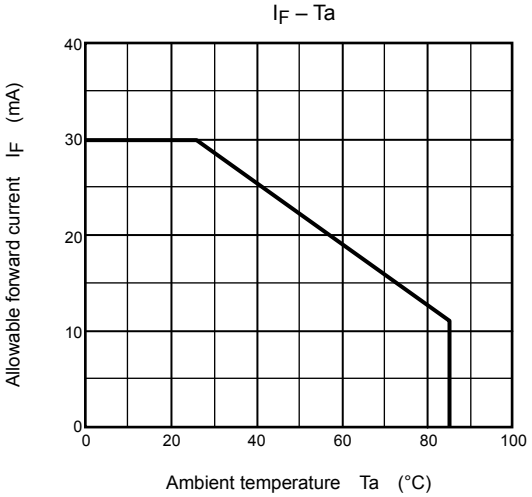
Relative Luminous Intensity – Wavelength



Radiation Pattern

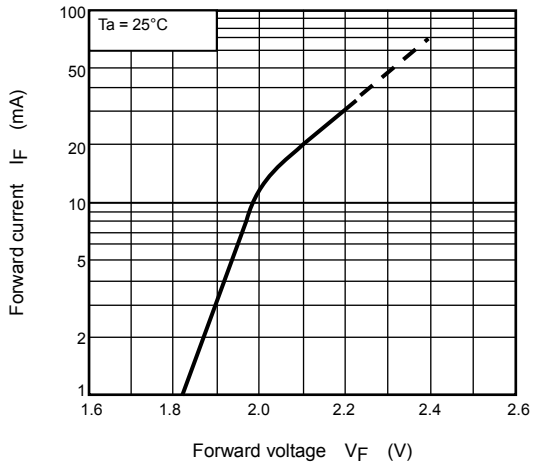


$I_F - Ta$

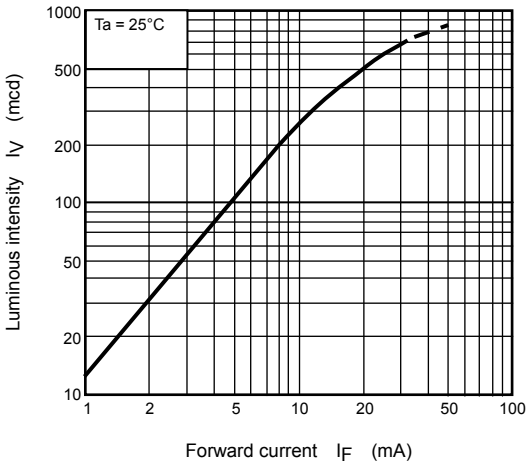


TLYU156P(F)

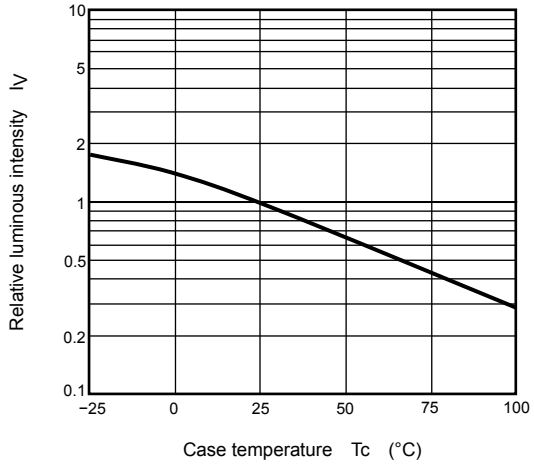
$I_F - V_F$



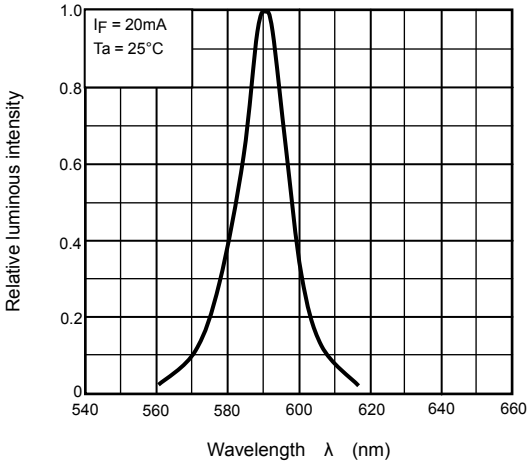
$I_V - I_F$



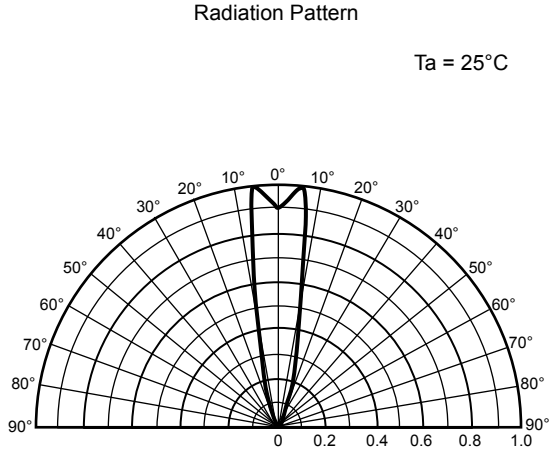
$I_V - Tc$



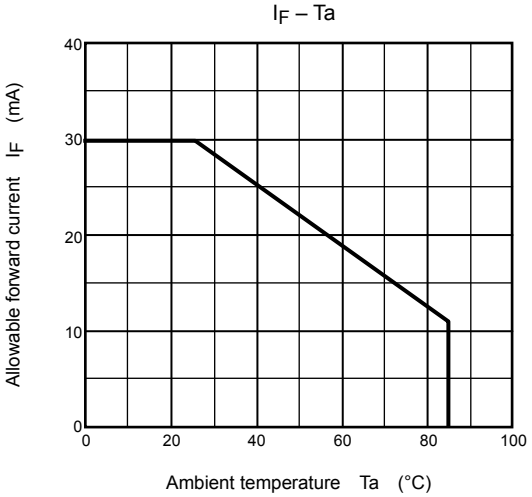
Relative Luminous Intensity – Wavelength



Radiation Pattern



$I_F - Ta$



RESTRICTIONS ON PRODUCT USE

20070701-EN

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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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