T-1¾ 670 nm High Radiant Intensity Emitter

Technical Data

HEMT-3300

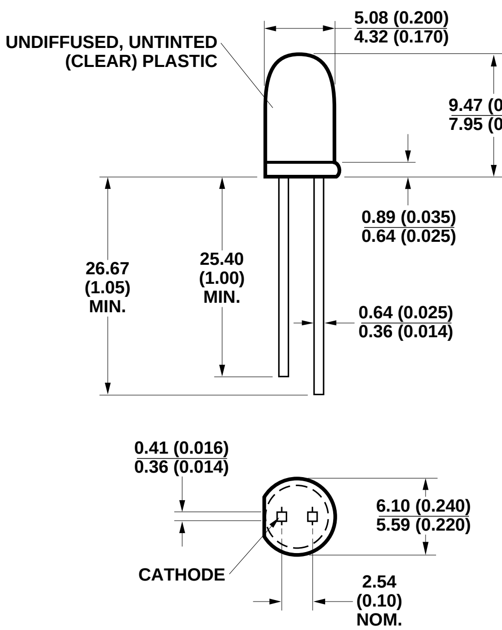
Features

- **High Efficiency**
- **Nonsaturating Output**
- **Narrow Beam Angle**
- **Visible Flux Aids Alignment**
- **Bandwidth: DC to 3 MHz**
- **IC Compatible/Low Current Requirement**

Description

The HEMT-3300 is a visible, near-IR, source using a GaAsP on GaP LED chip optimized for maximum quantum efficiency at 670 nm. The emitter's beam is sufficiently narrow to minimize stray flux problems, yet broad enough to simplify optical alignment. This product is suitable for use in consumer and industrial applications such as optical transducers and encoders, smoke detectors, assembly line monitors, small parts counters, paper tape readers, and fiber optic drivers.

Package Dimensions



NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS (INCHES).
2. LEADS ARE MILD STEEL, SOLDER DIPPED.
3. AN EPOXY MENISCUS MAY EXTEND ABOUT 1 mm (0.040 in) DOWN THE LEADS.

Absolute Maximum Ratings at T_A = 25°C

Power Dissipation .... 120 mW
(derate linearly from 50°C at 1.6 mW/°C)
Average Forward Current ....30 mA
(derate linearly from 50°C at 0.4 mA/°C)
Peak Forward Current .... See Figure 5
Operating and Storage Temperature Range .... -55°C to +100°C
Lead Soldering Temperature................................. 260°C for 5 seconds
(1.6 mm [0.063 in.] from body)

Electrical/Optical Characteristics at T_A = 25°C

Symbol	Description	Min.	Typ.	Max.	Units	Test Conditions	Fig.
I_e	Axial Radiant Intensity	200	500		μW/sr	I_F = 10 mA	3, 4
K_e	Temperature Coefficient of Intensity		-0.009		$°C^{-1}$	I_F = 10 mA, Note 1	
η_v	Luminous Efficacy		22		lm/W	Note 2	
$2\theta_{1/2}$	Half Intensity Total Angle		22		deg.	Note 3, I_F = 10 mA	6
λ_{PEAK}	Peak Wavelength		670		nm	Measured at Peak	1
$\Delta\lambda_{PEAK}/\Delta T$	Spectral Shift Temperature Coefficient		0.089		nm/°C	Measured at Peak, Note 4	
t_r	Output Rise Time (10% to 90%)		120		ns	I_{PEAK} = 10 mA	
t_f	Output Fall Time (90% to 10%)		50		ns	I_{PEAK} = 10 mA	
C_O	Capacitance		15		pF	V_F = 0; f = 1 MHz	
BV_R	Reverse Breakdown Voltage	5.0			V	I_R = 100 μA	
V_F	Forward Voltage		1.9	2.5	V	I_F = 10 mA	2
$\Delta V_F/\Delta T$	Temperature Coefficient of V_F		-2.2		mV/°C	I_F = 100 μA	
$R\theta_{J\text{-}PIN}$	Thermal Resistance		260		°C/W	LED Junction to Cathode Lead.	

Notes:
1. $I_e(T) = I_e(25°C)\exp[K_e(T - 25°C)]$.
2. $I_V = \eta_v I_e$ where I_v is in candela, I_e in watts/steradian and η_v in lumen/watt.
3. $\theta_{1/2}$ is the off-axis angle at which the radiant intensity is half the axial intensity.
4. $\lambda_{PEAK}(T) = \lambda_{PEAK}(25°C) + (\Delta\lambda_{PEAK}/\Delta T)(T - 25°C)$.

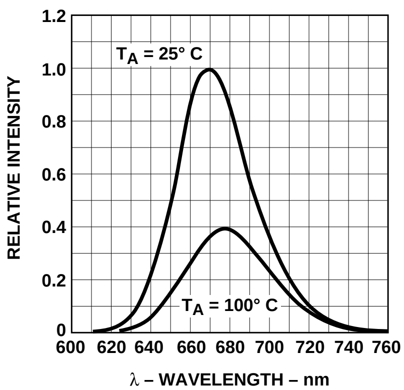


Figure 1. Relative Intensity vs. Wavelength.

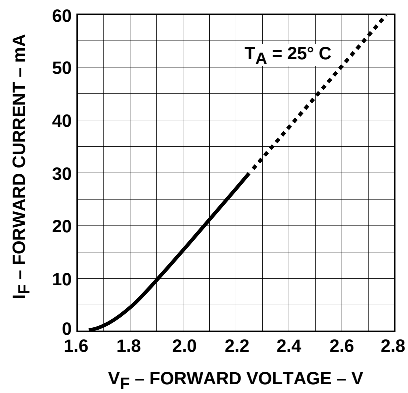


Figure 2. Forward Current vs. Forward Voltage.

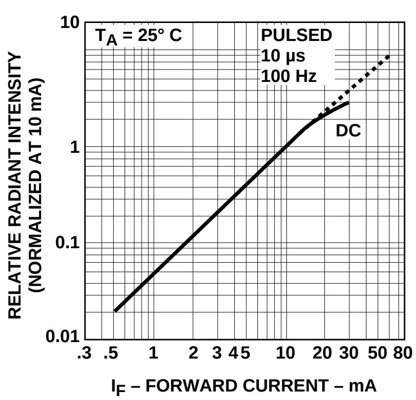


Figure 3. Relative Radiant Intensity vs. Forward Current.

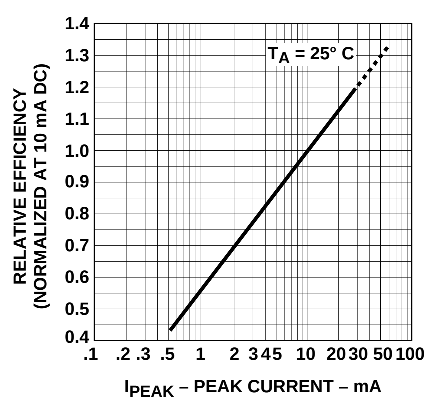


Figure 4. Relative Efficiency (Radiant Intensity per Unit Current) vs. Peak Current.

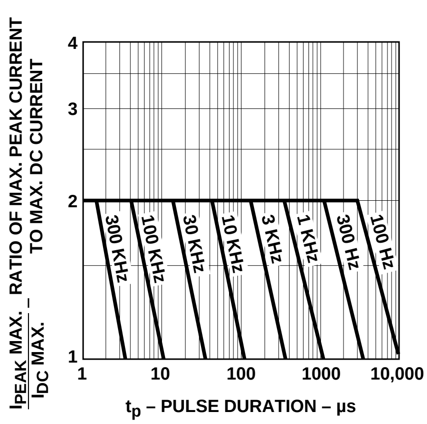


Figure 5. Maximum Tolerable Peak Current vs. Pulse Duration. (I_{DC} MAX as per MAX Ratings)

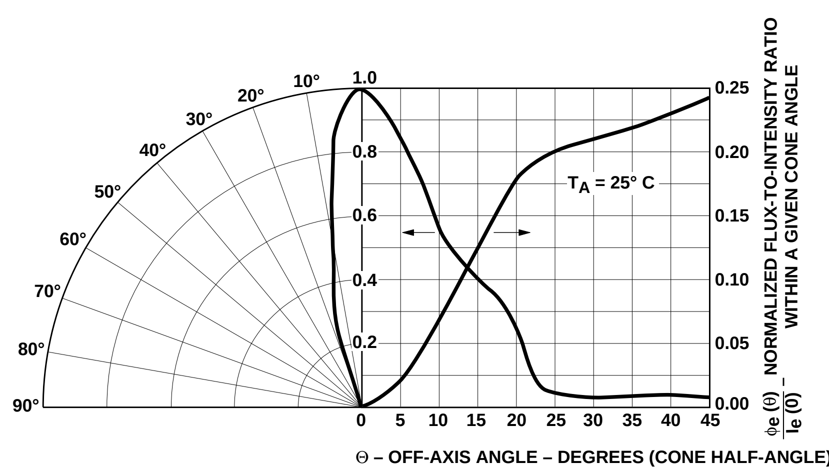


Figure 6. Far-Field Radiation Pattern.

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