Narrow Beam GaAsP Lamps

Optoelectronic Products

FLV104
FLV104A

General Description

The FLV104 and FLV104A, narrow beam visible lamps, are high-intensity sources specifically intended for excitation of photosensors, especially photodiodes and transistors, when the separation distances are measured from millimeters to several meters.

The FLV104 and FLV104A are visible beam companion devices to the FPE104 infrared LED. All three devices have identical optics and therefore identical radiation patterns.

Very High Axial Intensity
Narrow Beamwidth
FLV104 8°
FLV104A 4°
Detectable at 30 ft

Absolute Maximum Ratings

Maximum Temperatures and Humidity

Storage Temperature	−55°C to +100°C
Operating Temperature	−55°C to +125°C
Pin Temperature (Soldering, 5 s)	260°C
Relative Humidity at 65°C	98%

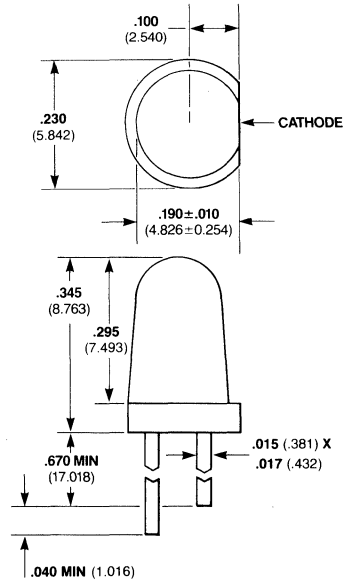
Maximum Power Dissipation

Total Dissipation at T_A = 25°C	200 mW
Derate Linearly from 25°C	2.6 mW/°C

Maximum Voltages and Currents

V_R	Reverse Voltage	3.0 V
I_F	Forward dc Current	1.0 A
I_{pk}	Peak Forward Current (100 μs pulsewidth, 1% duty cycle)	100 mA

Package Outline



Notes
All dimensions in inches **bold** and millimeters (parentheses)
Tolerance unless specified = ±.**015** (±.381)

Electrical Characteristics T_A = 25°C

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_F	Forward Voltage		2.0	2.5	V	I_F = 100 mA
BV_R	Reverse Breakdown Voltage	3.0	8.0		V	I_R = 10 μA

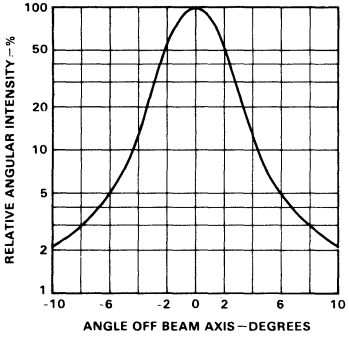
Typical Electrical Characteristics

FLV104
FLV104A

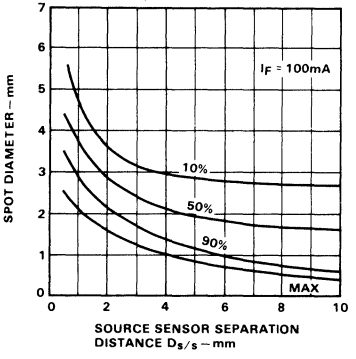
Optoelectronic Characteristics I_F = 100 mA, T_A = 25°C

Symbol	Characteristic	Min	Typ	Max	Units
I_L	Axial Luminous Intensity	50	150		mcd
I	Axial Radiometric Intensity		4.0		mw/sr
L	Average Effective Luminance		5.0		cd/cm²
N	Average Effective Radiance (Axial)		140		mw/sr/cm²
A_S	Effective Emitting Source Area (Axial)		0.028		cm²
$\Delta I/\Delta T$	Temperature Coefficient of Intensity (Note 1)		0.5		%/°C
$\Delta I\Delta I_F$	Excitation Coefficient of Intensity (Note 1)		1.0		%/°C
λpk	Peak Spectral Wavelength		670		nm
$\Delta\lambda$	Spectral Bandwidth		20		nm
$\Delta\lambda pk/\Delta T$	Temperature Spectral Shift Coefficient (Note 2)		0.17		nm/°C
$\Delta\lambda pk/\Delta T_F$	Excitation Spectral Shift Coefficient (Note 2)		0.1		nm/mA
$\theta 50$	Beam Angle at 50% Axial Intensity		4.3		degrees
$\Delta\theta A$	Beam Axis to Mechanical Axis		1.5		degrees
t_r and t_f	Light Output Rise and Fall Time (Note 3)		10		ns
C_O	Capacitance (V = 0, f = 1.0 MHz)		100		pF

Beam Pattern of Intensity



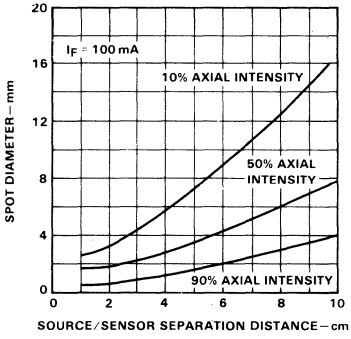
Spot Diameter vs Separation Distance (Near Field)



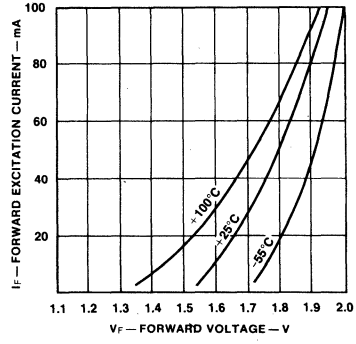
Typical Electrical Characteristic Curves

FLV104
FLV104A

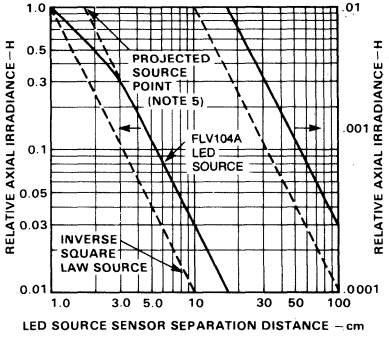
Spot Diameter vs Separation Distance (Near Field)



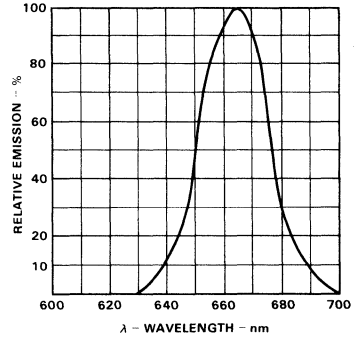
Forward V-I Characteristics



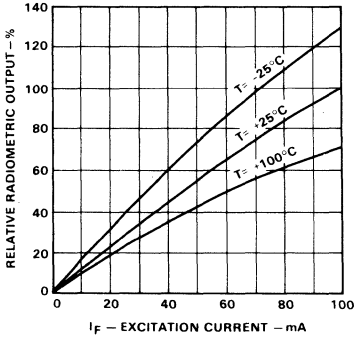
Average Axial Irradiance, H (Note 6)



Emission Spectrum



Relative Radiometric Output (Note 4)



Notes

1. $\Delta I/\Delta T$ and $\Delta I/\Delta I_F$ are the percentage derating factors for all radiometric output characteristics referenced to their typical value at 25°C ambient and I_F = 100 mA.
2. $\Delta\lambda pk/\Delta T$ and $\Delta\lambda pk/\Delta I_F$ are the derating factors for all wavelength characteristics referenced to their typical value at 25°C ambient and I_F = 100 mA.
3. Time for a 10% to 90% change in light intensity with a step change in current.
4. Normalization: LED intensity $\simeq$ 10 mW/sr sensor 1 mm^2 area.
5. Projected source point is the distance, Sp from which LED inverse square LAW characteristics may be computed for S $\geq$ 5 cm.

$$H = \frac{1.0\ mW}{cm^2} \times \frac{SP^2}{(S - Sp)^2} \qquad 1 < Sp < Scm$$

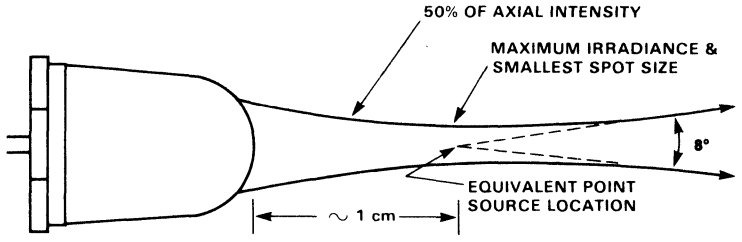
6. Irradiance (H) normalized to 4 mW/cm^2 @ S = 1 cm.

Narrow Beam Shape

FLV104
FLV104A

Narrow Beam Shape

FLV104



FLV104A