



# T-1(3mm) Low Current LED Lamps

LTL-4221NLC/307ELC Low Current Hi.Eff.Red  
 LTL-4231NLC/307GLC Low Current Green  
 LTL-4251NLC/307YLC Low Current Yellow

## Feature

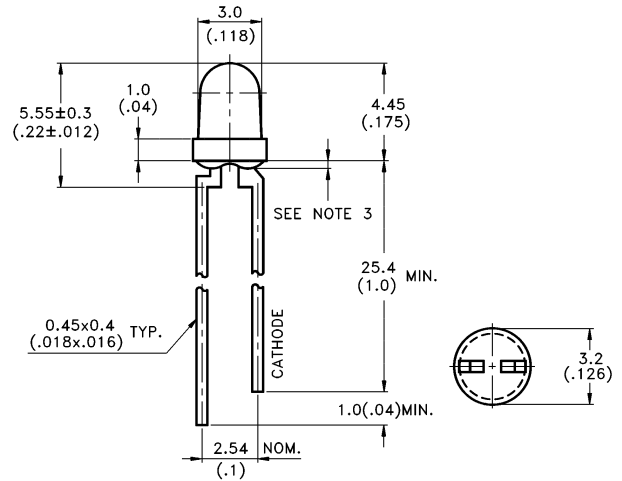
- Low power consumption
- High efficiency
- CMOS/MOS compatible
- TTL compatible
- Wide viewing angle

## Description

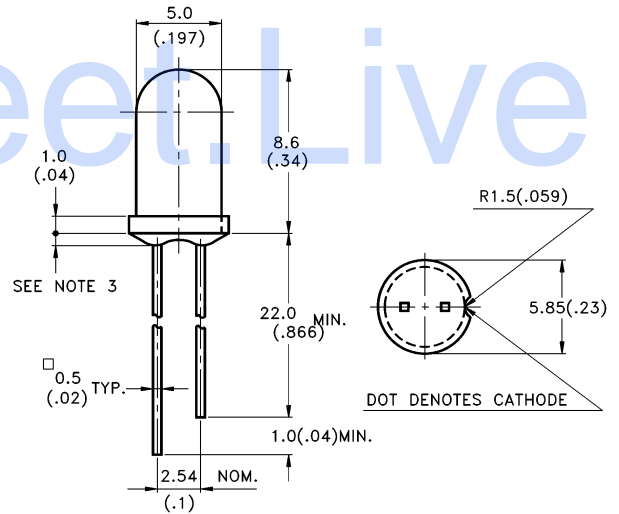
These tinted diffused LED lamps were designed and optimized specifically for low DC current operation. Luminous intensity and forward voltage are tested at 2 mA to assure consistent brightness at TTL output current levels.

## Package Dimensions

LTL-42x1NLC Series



LTL-307xLC Series



### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25\text{mm}$  (0.10") unless otherwise noted.
3. Protruded resin under flange is 1.0mm (.04") max.
4. Lead spacing is measured where the leads emerge from the package.
5. Specifications are subject to change without notice.

## Devices

Part No. LTL-	Lens		Source Color
	Color	Diffusion	
4221NLC	Red	Diffused	Hi. Eff. Red
4231NLC	Green	Diffused	Green
4251NLC	Yellow	Diffused	Yellow

Part No. LTL-	Lens		Source Color
	Color	Diffusion	
307ELC	Red	Diffused	Hi. Eff. Red
307GLC	Green	Diffused	Green
307YLC	Yellow	Diffused	Yellow

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### Absolute Maximum Ratings at Ta=25 °C

Parameter	Maximum Rating		Unit
Power Dissipation Tamb ≤ 90 °C	Hi. Eff. Red Green Yellow	20 20 20	mW
Forward Current	7		mA
Forward Surge Cruuent (10 μ sec Pulse)	500		mA
Reverse Voltage	5		V
Operating Temperature Range	-55 °C to +100 °C		
Storage Temperature Range	-55 °C to +100 °C		
Lead Soldering Temperature [1.6mm (0.063in) From Body]	260 °C for 5 Seconds		

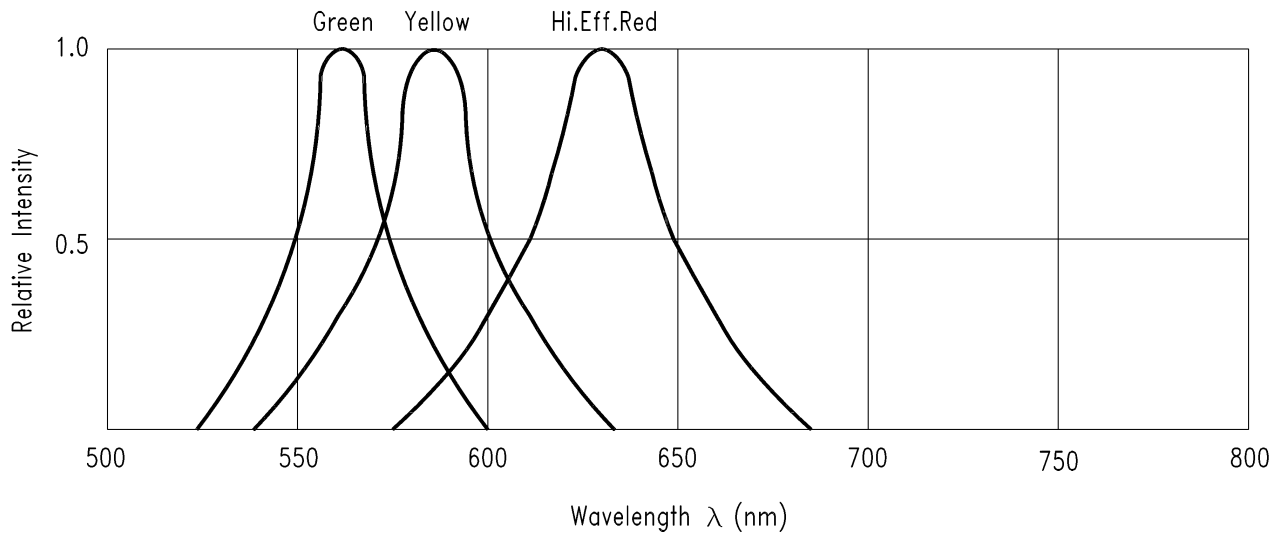


Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

# Electrical /Optical Characteristics and Curves at Ta=25 °C

Parameter	Symbol	Part No. LTL-	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	$I_v$	4221NLC 4231NLC 4251NLC	0.7 0.4 0.4	2.5 1.1 1.1		mcd	$I_F = 2\text{mA}$ Note 1
Viewing Angle	$2\theta_{1/2}$	4221NLC 4231NLC 4251NLC		60		deg	Note 2 (Fig.6)
Peak Emission Wavelength	$\lambda_P$	4221NLC 4231NLC 4251NLC		635 565 585		nm	Measurement @ Peak (Fig.1)
Dominant Wavelength	$\lambda_d$	4221NLC 4231NLC 4251NLC		621 569 588		nm	Note 3
Spectral Line Half-Width	$\Delta\lambda$	4221NLC 4231NLC 4251NLC		40 30 35		nm	
Forward Voltage	$V_F$	4221NLC 4231NLC 4251NLC		1.7 1.9 1.8	2.2 2.2 2.7	V	$I_F = 2\text{mA}$
Reverse Current	$I_R$	4221NLC 4231NLC 4251NLC			10 10 10	$\mu\text{A}$	$V_R = 5\text{V}$

Notes:1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.  
 2.  $\theta_{1/2}$  is the off-axis angle at which the luminous intensity is half the axial luminous intensity.  
 3. The dominant wavelength,  $\lambda_d$  is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

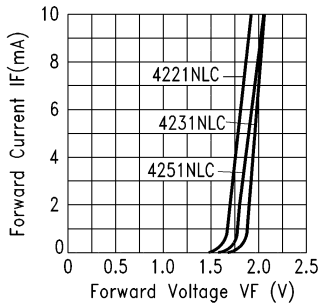


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

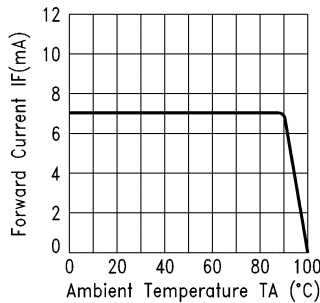


Fig.3 FORWARD CURRENT DERATING CURVE

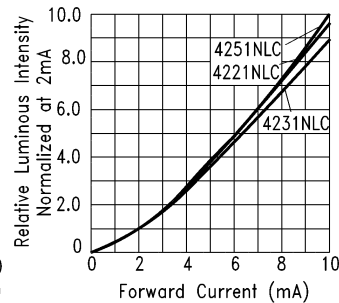


Fig.4 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT  
0° 10° 20°

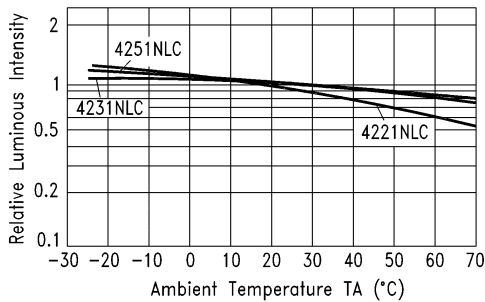


Fig.5 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

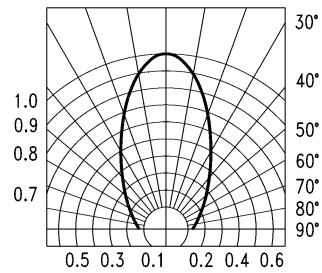


Fig.6 SPATIAL DISTRIBUTION

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# Electrical /Optical Characteristics and Curves at Ta=25 °C

Parameter	Symbol	Part No. LTL-	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	$I_v$	307ELC 307GLC 307YLC	1.1 1.1 1.1	3.7 3.7 3.7		mcd	$I_F = 2\text{mA}$ Note 1
Viewing Angle	$2\theta_{1/2}$	307ELC 307GLC 307YLC		50		deg	Note 2 (Fig.11)
Peak Emission Wavelength	$\lambda_P$	307ELC 307GLC 307YLC		635 565 585		nm	Measurement @ Peak (Fig.1)
Dominant Wavelength	$\lambda_d$	307ELC 307GLC 307YLC		621 569 588		nm	Note 3
Spectral Line Half-Width	$\Delta\lambda$	307ELC 307GLC 307YLC		40 30 35		nm	
Forward Voltage	$V_F$	307ELC 307GLC 307YLC		1.7 1.9 1.8	2.2 2.2 2.7	V	$I_F = 2\text{mA}$
Reverse Current	$I_R$	307ELC 307GLC 307YLC			10 10 10	$\mu\text{A}$	$V_R = 5\text{V}$

- Notes:1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.  
 2.  $\theta_{1/2}$  is the off-axis angle at which the luminous intensity is half the axial luminous intensity.  
 3. The dominant wavelength,  $\lambda_d$  is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

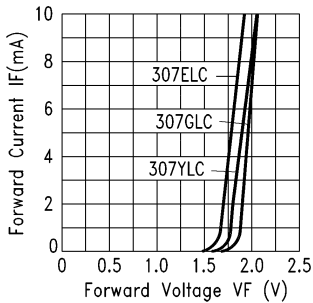


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

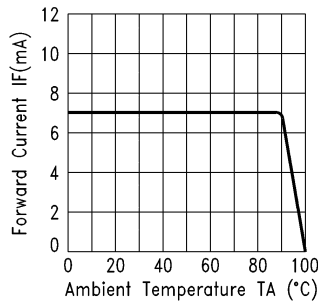


Fig.3 FORWARD CURRENT DERATING CURVE

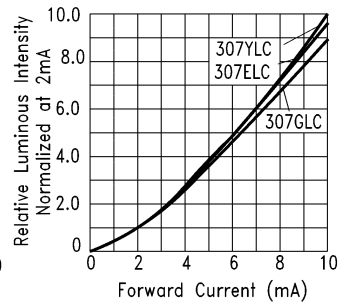


Fig.4 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

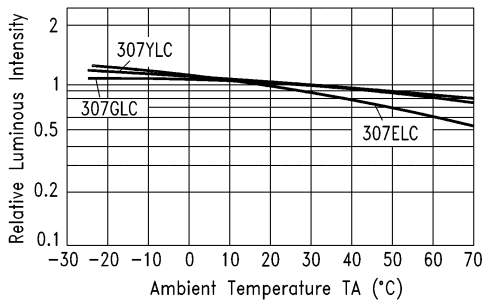


Fig.5 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

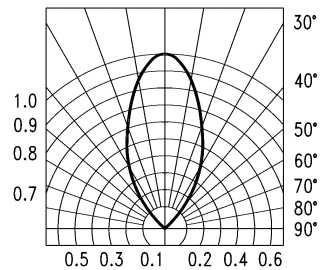


Fig.6 SPATIAL DISTRIBUTION