



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





# 2x5 Rectangular Bar LED Lamps

LTL-3201A Red

LTL-3211A Bright Red

LTL-3221A High Efficiency Red

LTL-3291A Red Orange

LTL-3231A Green

LTL-3251A Yellow

## Features

- Low power consumption.
- Most suitable for use like level indicator.
- Excellent uniformity of light emittance.
- Long life-solid state reliability.
- I.C compatible.

## Description

The Red source color devices are made with Gallium Arsenide Phosphide on Gallium Arsenide Red Light Emitting Diode.

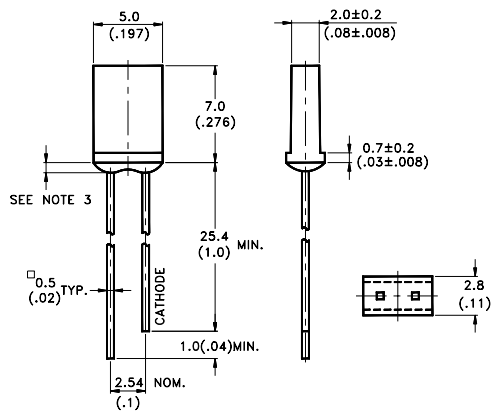
The Bright Red source color devices are made with Gallium Phosphide on Gallium Phosphide Red Light Emitting Diode.

The High Efficiency Red source color devices are made with Gallium Arsenide Phosphide on Gallium Phosphide Orange Light Emitting Diode.

The Green source color devices are made with Gallium Phosphide on Gallium Phosphide Green Light Emitting Diode.

The Yellow source color devices are made with Gallium Arsenide Phosphide on Gallium Phosphide Yellow Light Emitting Diode.

## Package Dimensions



### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25\text{mm}$  (.010") unless otherwise noted.
3. Protruded resin under flange is 1.5mm (.059") 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
3210A	Red Diffused	Red
3211A	Red Diffused	Bright Red
3221A	Red Diffused	Hi. Eff. Red
3231A	Green Diffused	Green
3251A	Yellow Diffused	Yellow
3291A	Orange Diffused	Red Orange

## Absolute Maximum Ratings at Ta=25°C

Parameter	Red	Bright Red	Green	Yellow	Hi. Eff. Red Red Orange	Unit
Power Dissipation	80	40	100	60	100	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	200	60	120	80	120	mA
Continuous Forward Current	40	15	30	20	30	mA
Derating Linear From 50°C	0.5	0.2	0.4	0.25	0.4	mA/°C
Reverse Voltage	5	5	5	5	5	V
Operating Temperature Range	-55°C to +100°C					
Storage Temperature Range	-55°C to +100°C					
Lead Soldering Temperature [1.6mm (.063 in.) from body]	260°C for 5 Seconds					

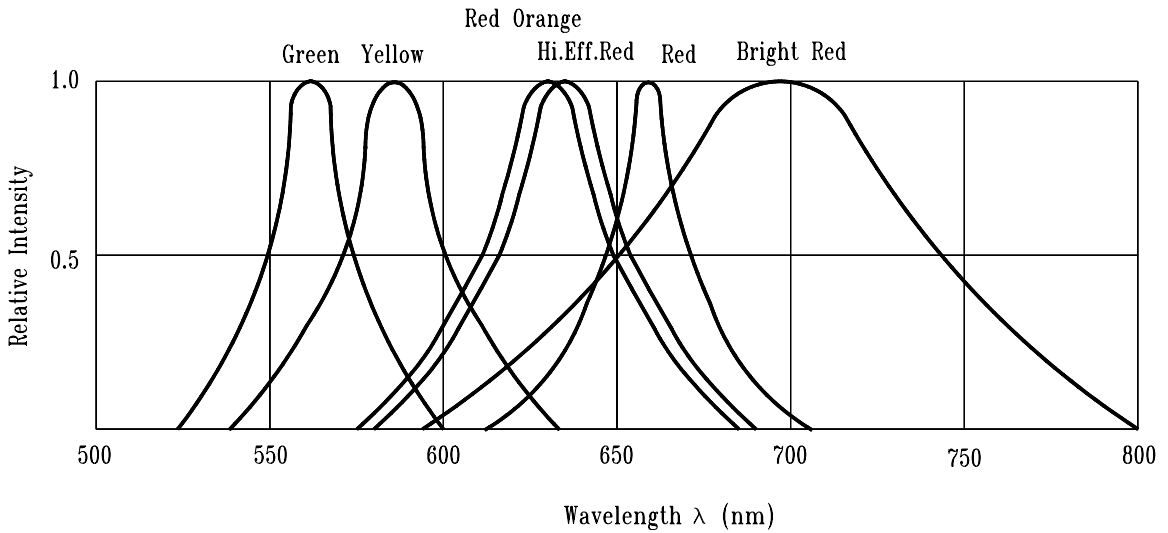


Fig.1 Relative Intensity vs. Wavelength

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

Parameter	Symbol	Part No. LTL-	Min.	Typ.	Max.	Unit.	Test Condition.
Luminous Intensity	Iv	3201A	0.1	0.3		mcd	If=10 mA Note 1,4
		3211A	0.4	1.1			
		3221A	1.1	3.7			
		3231A	0.7	2.5			
		3251A	1.1	3.7			
		3291A	1.1	3.7			
Viewing Angle	$2\theta^{1/2}$	32x1A		140		deg	Note 2 (Fig.7)
Peak Emission Wavelength	$\lambda P$	3201A		655		nm	Measurement @Peak (Fig.1)
		3211A		697			
		3221A		635			
		3231A		565			
		3251A		585			
		3291A		630			
Dominant Wavelength	$\lambda d$	3201A		651		nm	Note 3
		3211A		657			
		3221A		623			
		3231A		569			
		3251A		588			
		3291A		621			
Spectral Line Half Width	$\Delta\lambda$	3201A		24		nm	
		3211A		90			
		3221A		40			
		3231A		30			
		3251A		35			
		3291A		40			
Forward Voltage	VF	3201A		1.7	2.0	V	If=20mA
		3211A		2.1	2.6		
		3221A		2.0	2.6		
		3231A		2.1	2.6		
		3251A		2.1	2.6		
		3291A		2.0	2.6		
Reverse Current	IR	32x1A			100	$\mu A$	VR=5V
Capacitance	C	3201A		30		pF	VF=0, f=1MHz
		3211A		55			
		3221A		20			
		3231A		35			
		3251A		15			
		3291A		20			

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.

4.Iv needs  $\pm 15\%$  additionaly for guaranteed limits.

# Typical Electrical/Optical Characteristic Curves (25°C Ambient Temperature Unless Otherwise Noted)

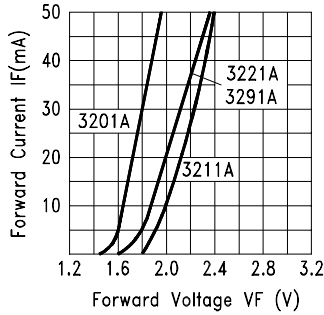


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

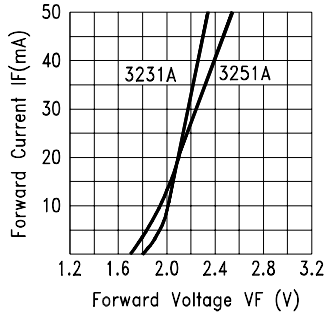


Fig.3 FORWARD CURRENT VS. FORWARD VOLTAGE

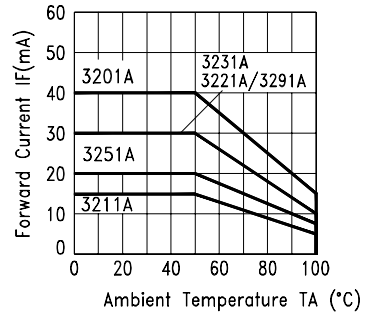


Fig.4 FORWARD CURRENT DERATING CURVE

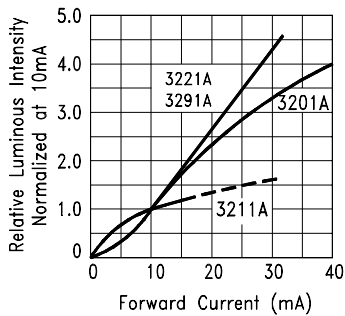


Fig.5 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

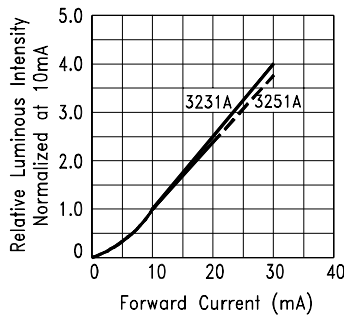


Fig.6 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

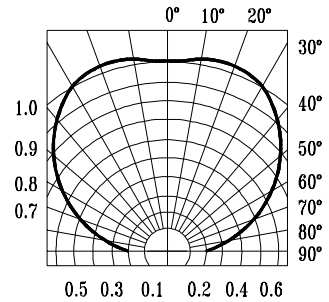


Fig.7 SPATIAL DISTRIBUTION

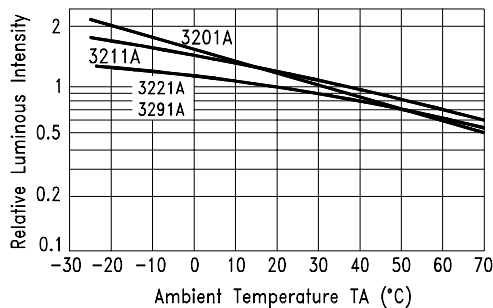


Fig.8 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

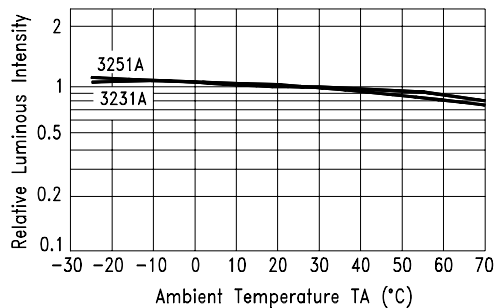


Fig.9 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE