

LITEON

2.4x5.0 RECTANGULAR BAR LED LAMPS

LTL-23201AL RED

LTL-23211AL BRIGHT RED

LTL-23221AL HIGH EFFICIENCY RED

LTL-23231AL GREEN

LTL-23251AL YELLOW

LTL-23291AL ORANGE

LITE-ON INC

31E D 5536367 0002163 4 LTN

FEATURES

- LOW POWER CONSUMPTION.
- MOST SUITABLE FOR USE LIKE LEVEL INDICATOR.
- EXCELLENT UNIFORMITY OF LIGHT EMISSION.
- LONG LIFE-SOLID STATE RELIABILITY.
- I.C. COMPATIBLE.

DESCRIPTION

The Red source color devices are made with Gallium Arsenide Phosphide on Gallium Phosphide 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 and Orange 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.

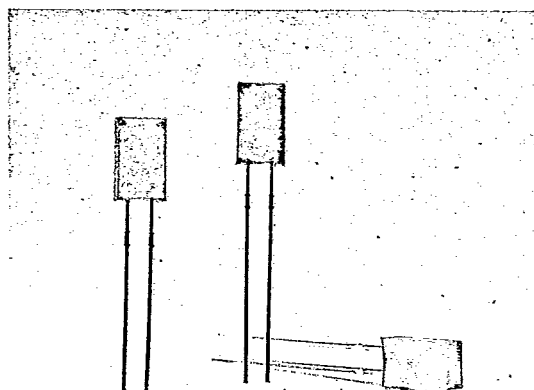
The Yellow source color devices are made with Gallium Arsenide Phosphide on Gallium Phosphide Yellow Light Emitting Diode.

DEVICES

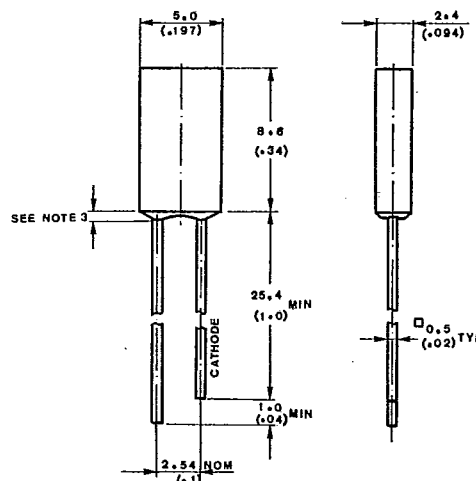
PART NO. LTL-	LENS		SOURCE COLOR
	COLOR	DIFFUSION	
23201AL	Red	Diffused	Red
23211AL	Red	Diffused	Bright Red
23221AL	Red	Diffused	Hi. Eff. Red
23231AL	Green	Diffused	Green
23251AL	Yellow	Diffused	Yellow
23291AL	Orange	Diffused	Orange

2-245

524



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.

ABSOLUTE MAXIMUM RATINGS AT $T_A = 25^\circ\text{C}$

PARAMETER	RED	BRIGHT RED	GREEN	YELLOW	HI. EFF. 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 25°C	0.5	0.2	0.4	0.25	0.4	mA/ $^\circ\text{C}$
Reverse Voltage	5	5	5	5	5	V
Operating Temperature Range	-55°C to $+100^\circ\text{C}$					
Storage Temperature Range	-55°C to $+100^\circ\text{C}$					
Lead Soldering Temperature [1.6mm (0.063in) From Body]	260°C for 5 Seconds					

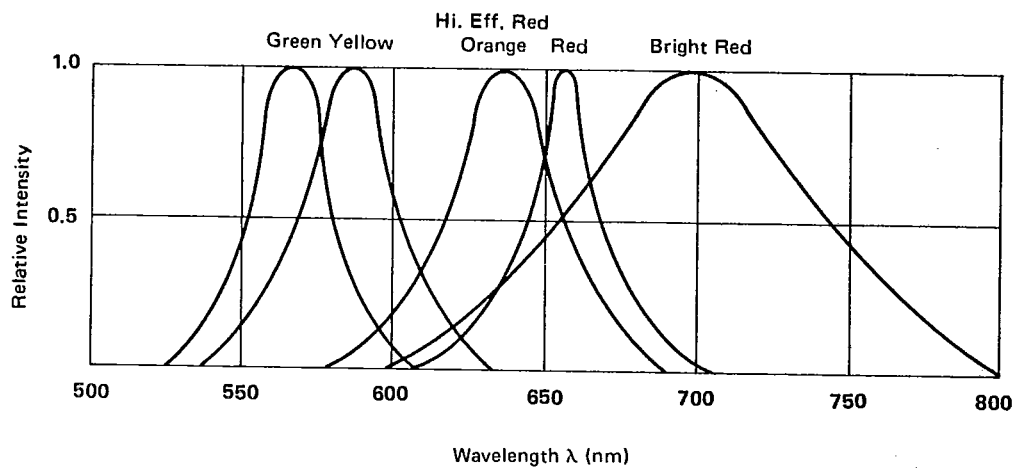


FIG. 1 RELATIVE INTENSITY VS. WAVELENGTH

ELECTRICAL/OPTICAL CHARACTERISTICS AND CURVES AT $T_A = 25^\circ\text{C}$

PARAMETER	SYMBOL	PART NO. LTL-	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Luminous Intensity	I_V	23201AL 23211AL 23221AL	0.08 0.2 0.4	0.2 0.4 1.3		mcd	$I_F = 10\text{ mA}$ Note 1
Viewing Angle	$2\theta_{1/2}$	23201AL 23211AL 23221AL		130		deg.	Note 2 (Fig. 6)
Peak Emission Wavelength	λ_{PEAK}	23201AL 23211AL 23221AL		655 697 635		nm	Measurement @ Peak (Fig. 1)
Spectral Line Half Width	$\Delta\lambda$	23201AL 23211AL 23221AL		24 90 40		nm	
Forward Voltage	V_F	23201AL 23211AL 23221AL		1.7 2.1 2.0	2.0 2.8 2.8	V	$I_F = 20\text{ mA}$
Reverse Current	I_R	23201AL 23211AL 23221AL			100	μA	$V_R = 5\text{V}$
Capacitance	C	23201AL 23211AL 23221AL		30 55 20		PF	$V_F = 0$ $f = 1\text{ MHz}$

NOTES: 1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (Commission Internationale De L'Eclairage) eye-response curve.

2. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

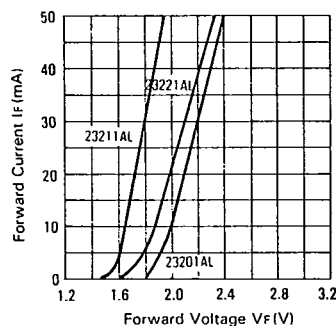


FIG. 2 FORWARD CURRENT VS. FORWARD VOLTAGE

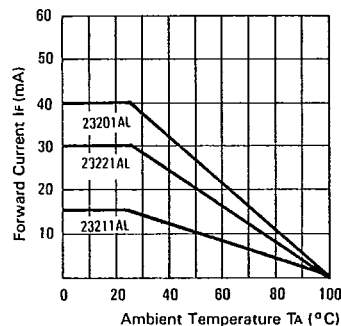


FIG. 3 FORWARD CURRENT DERATING CURVE

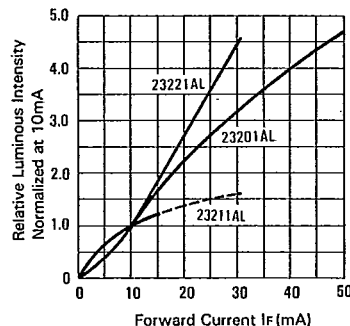


FIG. 4 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT.

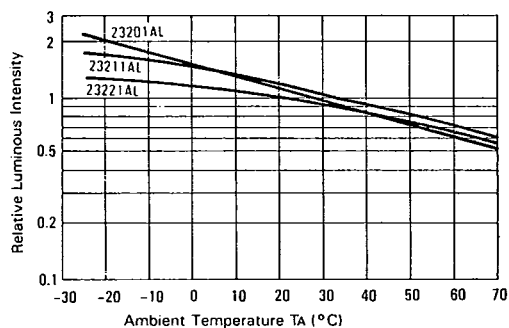


FIG. 5 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

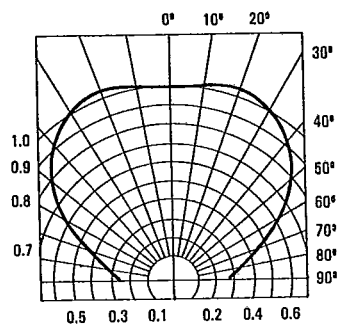


FIG. 6 SPATIAL DISTRIBUTION

ELECTRICAL/OPTICAL CHARACTERISTICS AND CURVES AT $T_A = 25^\circ\text{C}$

PARAMETER	SYMBOL	PART NO. LTL-	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Luminous Intensity	I_v	23231AL 23251AL	0.4 0.4	1.3 1.3		mcd	$I_F = 10\text{ mA}$ Note 1
Viewing Angle	$2\theta_{1/2}$	23231AL 23251AL		130		deg.	Note 2 (Fig. 11)
Peak Emission Wavelength	λ_{PEAK}	23231AL 23251AL		565 585		nm	Measurement @ Peak (Fig. 1)
Spectral Line Half Width	$\Delta\lambda$	23231AL 23251AL		30 35		nm	
Forward Voltage	V_F	23231AL 23251AL		2.1	2.8	V	$I_F = 20\text{ mA}$
Reverse Current	I_R	23231AL 23251AL			100	μA	$V_R = 5\text{ V}$
Capacitance	C	23231AL 23251AL		35 15		PF	$V_F = 0$ $f = 1\text{ MHz}$

NOTES: 1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (Commission Internationale De L'Eclairage) eye-response curve.

2. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

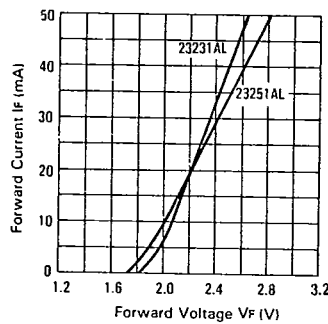


FIG. 7 FORWARD CURRENT VS. FORWARD VOLTAGE

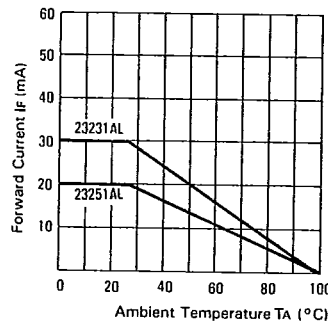


FIG. 8 FORWARD CURRENT DERATING CURVE

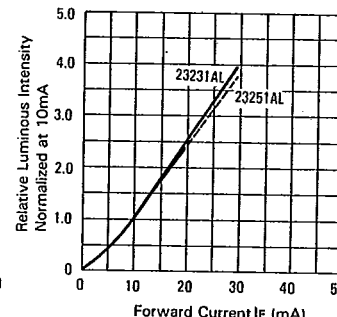


FIG. 9 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

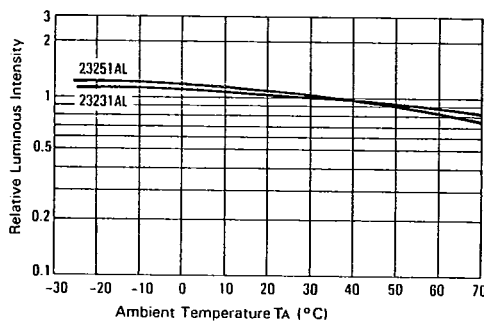


FIG. 10 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

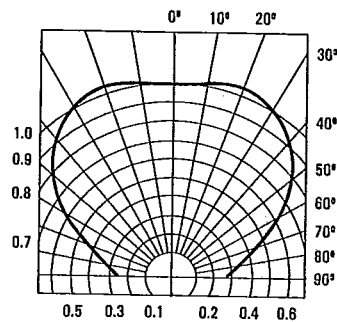


FIG. 11 SPATIAL DISTRIBUTION



ELECTRICAL/OPTICAL CHARACTERISTICS AND CURVES AT $T_A = 25^\circ\text{C}$

PARAMETER	SYMBOL	PART NO. LTL-	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Luminous Intensity	I_v	23291AL	0.4	1.3		mcd	$I_F = 10\text{ mA}$ Note 1
Viewing Angle	$2\theta_{1/2}$	23291AL		130		deg.	Note 2 (Fig. 16)
Peak Emission Wavelength	λ_{PEAK}			630		nm	Measurement @ Peak (Fig. 1)
Spectral Line Half Width	$\Delta\lambda$			40		nm	
Forward Voltage	V_F			2.0	2.8	V	$I_F = 20\text{ mA}$
Reverse Current	I_R				100	μA	$V_R = 5\text{ V}$
Capacitance	C			20		PF	$V_F = 0$ $f = 1\text{ MHz}$

NOTES: 1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (Commission Internationale De L'Eclairage) eye-response curve.

2. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

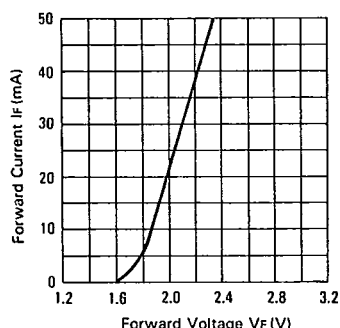


FIG. 12 FORWARD CURRENT VS. FORWARD VOLTAGE

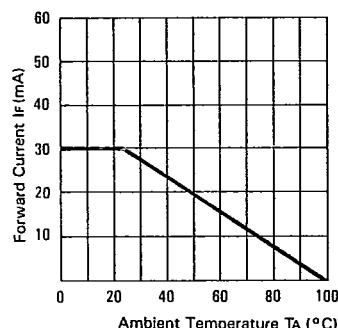


FIG. 13 FORWARD CURRENT DERATING CURVE

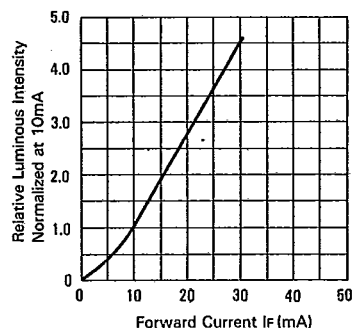


FIG. 14 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

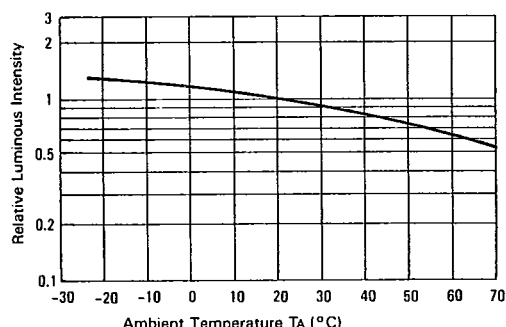


FIG. 15 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

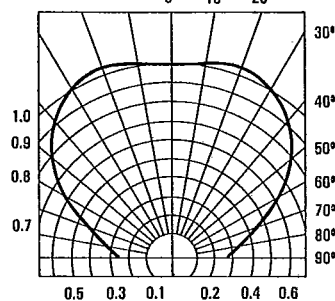


FIG. 16 SPATIAL DISTRIBUTION