



DOUBLE 2.0 SQUARE TOP LED LAMPS

LTL-23216A BRIGHT RED
LTL-23236A GREEN
LTL-23256A YELLOW

LTL-23276A AMBER
LTL-23296A ORANGE

TAIWAN LITON ELECTRONIC

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LED LAMPS

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

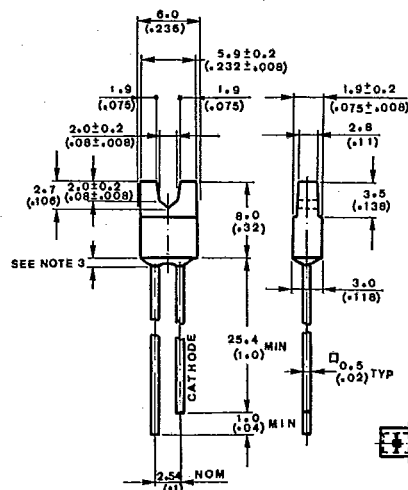
The bright Red source color devices are made with Gallium Phosphide on Gallium Phosphide Red Light Emitting Diode.

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

PACKAGE DIMENSIONS



DEVICES

PART NO. LTL-	LENS		SOURCE COLOR
	COLOR	DIFFUSION	
23216A	Red	Diffused	Bright Red
23236A	Green	Diffused	Green
23256A	Yellow	Diffused	Yellow
23276A	Amber	Diffused	Amber
23296A	Orange	Diffused	Orange

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.

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

PARAMETER	BRIGHT RED	GREEN	YELLOW AMBER	ORANGE	UNIT
Power Dissipation	40	100	60	100	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	60	120	80	120	mA
Continuous Forward Current	15	30	20	30	mA
Derating Linear From 25°C	0.2	0.4	0.25	0.4	$\text{mA}/^\circ\text{C}$
Reverse Voltage	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				

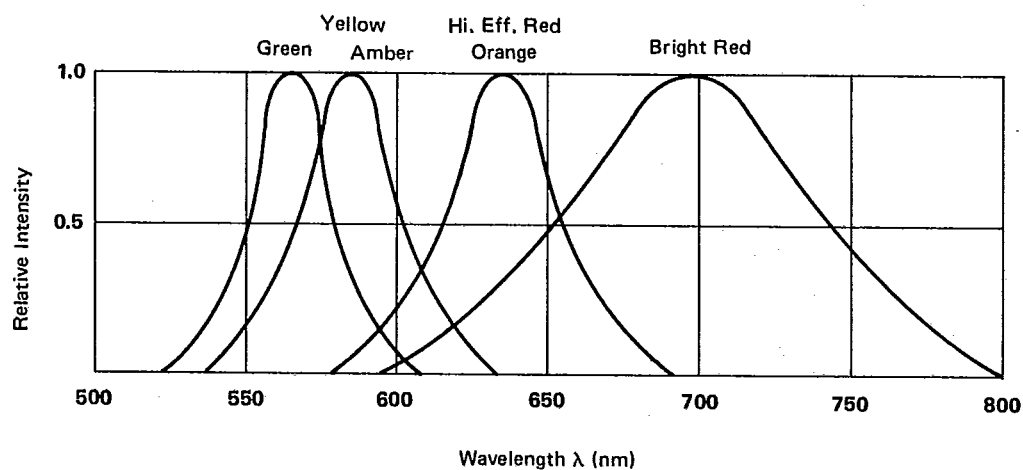


FIG. 1 RELATIVE INTENSITY VS. WAVELENGTH

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	23216A	0.1	0.3		mcd	$I_F = 10\text{mA}$ Note 1
Viewing Angle	$2\theta_{1/2}$	23216A		120		deg.	Note 2 (Fig. 6)
Peak Emission Wavelength	λ_{PEAK}			697		nm	Measurement @ Peak (Fig. 1)
Spectral Line Half Width	$\Delta\lambda$			90		nm	
Forward Voltage	V_F			2.1	2.8	V	$I_F = 20\text{mA}$
Reverse Current	I_R				100	μA	$V_R = 5\text{V}$
Capacitance	C			55		PF	$V_F = 0$ $f = 1\text{MHz}$

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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.

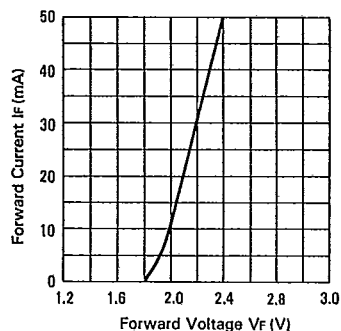


FIG. 2 FORWARD CURRENT VS. FORWARD VOLTAGE.

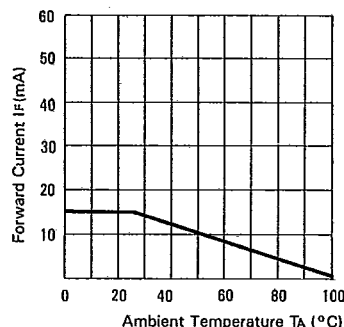


FIG. 3 FORWARD CURRENT DERATING CURVE.

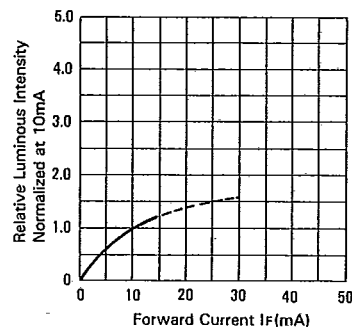


FIG. 4 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT.

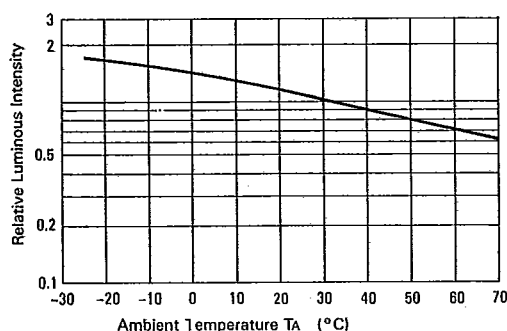


FIG. 5 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

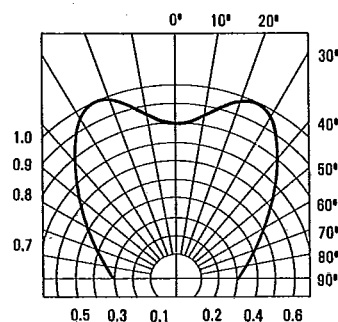


FIG. 6 SPATIAL DISTRIBUTION

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	23236A 23256A	0.4 0.4	1.2 1.2		mcd	$I_F = 10\text{mA}$ Note 1
Viewing Angle	$2\theta_{1/2}$	23236A 23256A		120		deg.	Note 2 (Fig. 11)
Peak Emission Wavelength	λ_{PEAK}	23236A 23256A		565 585		nm	Measurement @ Peak (Fig. 1)
Spectral Line Half Width	$\Delta\lambda$	23236A 23256A		30 35		nm	
Forward Voltage	V_F	23236A 23256A		2.1	2.8	V	$I_F = 20\text{mA}$
Reverse Current	I_R	23236A 23256A			100	μA	$V_R = 5\text{V}$
Capacitance	C	23236A 23256A		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.

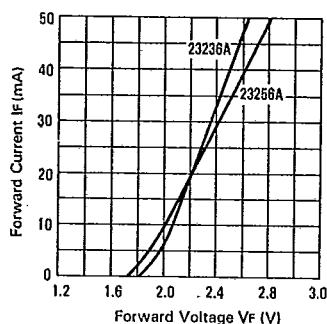


FIG. 7 FORWARD CURRENT VS. FORWARD VOLTAGE

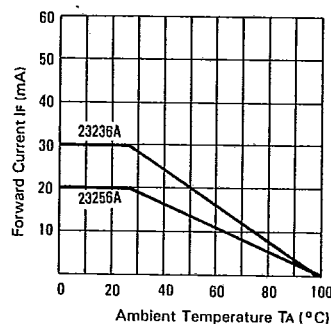


FIG. 8 FORWARD CURRENT DERATING CURVE

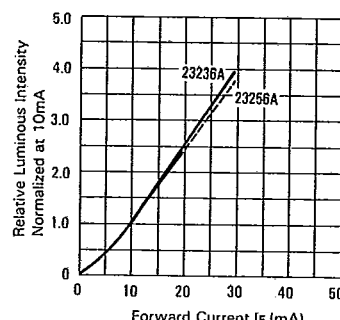


FIG. 9 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

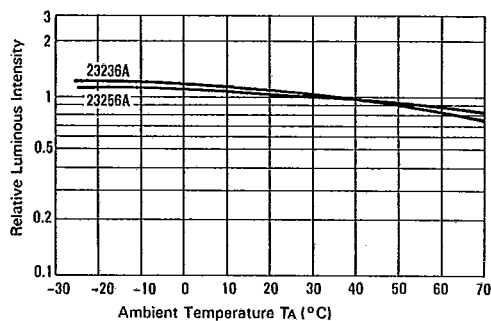


FIG. 10 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

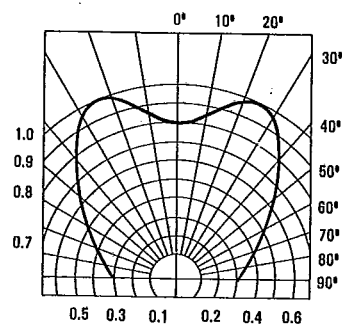


FIG. 11 SPATIAL DISTRIBUTION

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	23276A 23296A	0.4 0.4	1.2 1.2		mcd	$I_F = 10\text{mA}$ Note 1
Viewing Angle	$2\theta_{1/2}$	23276A 23296A		120		deg.	Note 2 (Fig. 16)
Peak Emission Wavelength	λ_{PEAK}	23276A 23296A		600 630		nm	Measurement @ Peak (Fig. 1)
Spectral Line Half Width	$\Delta\lambda$	23276A 23296A		35 40		nm	
Forward Voltage	V_F	23276A 23296A		2.1 2.0	2.8	V	$I_F = 20\text{mA}$
Reverse Current	I_R	23276A 23296A			100	μA	$V_R = 5\text{V}$
Capacitance	C	23276A 23296A		15 20		PF	$V_F = 0$ $f = 1\text{MHz}$

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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.

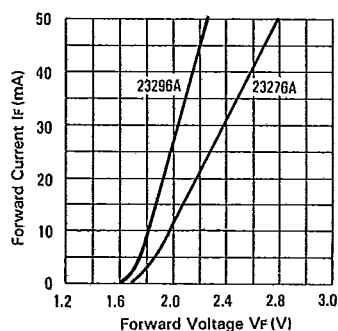


FIG. 12 FORWARD CURRENT VS. FORWARD VOLTAGE

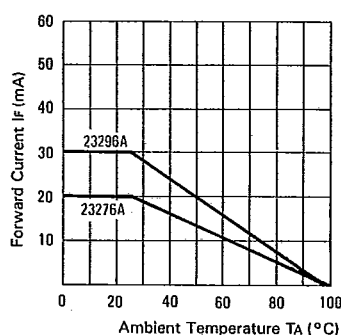


FIG. 13 FORWARD CURRENT DERATING CURVE

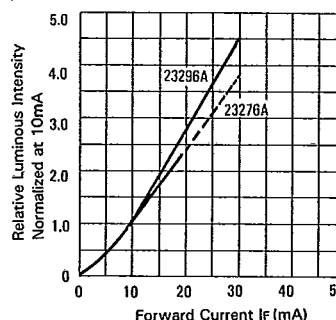


FIG. 14 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

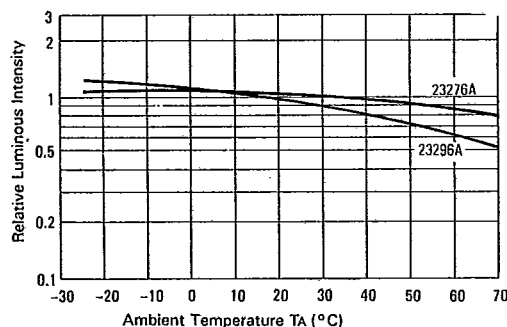


FIG. 15 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

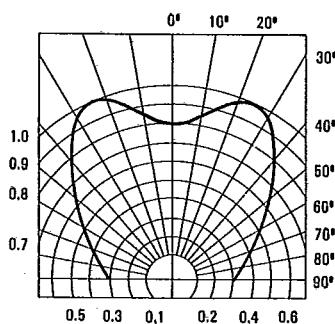


FIG. 16 SPATIAL DISTRIBUTION

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