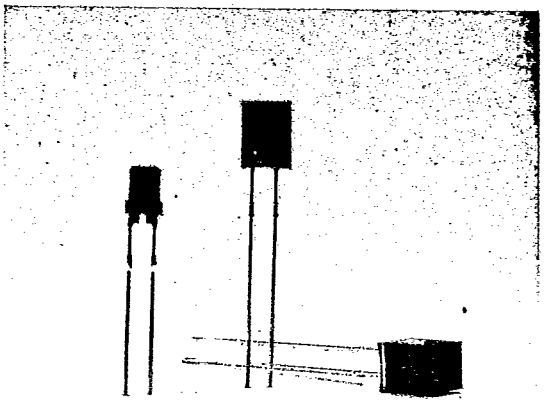
LITON LED SPECIALIST

3.0, 5.0 SQUARE TOP LED LAMPS

LTL-9212A/9213A BRIGHT RED
LTL-9222A/9223A HIGH EFFICIENCY RED
LTL-9232A/9233A GREEN
LTL-9252A/9253A YELLOW
LTL-9272A/9273A AMBER
LTL-9292A/9293A ORANGE

FEATURES

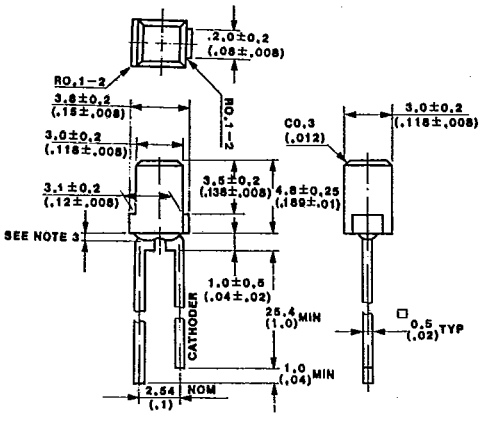
- LOW POWER CONSUMPTION.
- MOST SUITABLE FOR USE LIKE LEVEL INDICATOR.
- EXCELLENT UNIFORMITY OF LIGHT EMITTANCE.
- LONG LIFE-SOLID STATE RELIABILITY.
- I.C. COMPATIBLE.



DESCRIPTION

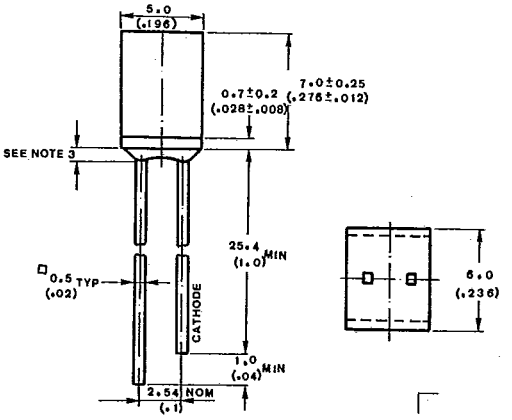
The bright Red source color devices are made with Gallium Phosphide on Gallium Phosphide Red Light Emitting Diode.
The High Efficiency Red and Orange source color devices are made with Gallium Arsenide Phosphide on Gallium Phosphide Orange Light Emitting Diode.
The Green source color devices are made with Gallium Phosphide on Gallium Phosphide Green Light Emitting Diode.
The Yellow and Amber source color devices are made with gallium Arsenide Phosphide on Gallium Phosphide Yellow Light Emitting Diode.

LTL-92x2A Series



PACKAGE DIMENSIONS

LTL-92x3A Series



NOTES:
1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.25mm (.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
	COLOR	DIFFUSION	
9212A	Red	Diffused	Bright Red
9222A	Red	Diffused	Hi.Eff.Red
9232A	Green	Diffused	Green
9252A	Yellow	Diffused	Yellow
9272A	Amber	Diffused	Amber
9292A	Orange	Diffused	Orange

PART NO. LTL-	LENS		SOURCE COLOR
	COLOR	DIFFUSION	
9213A	Red	Diffused	Bright Red
9223A	Red	Diffused	Hi.Eff.Red
9233A	Green	Diffused	Green
9253A	Yellow	Diffused	Yellow
9273A	Amber	Diffused	Amber
9293A	Orange	Diffused	Orange

ABSOLUTE MAXIMUM RATINGS AT T_A = 25°C

PARAMETER	BRIGHT RED	GREEN	YELLOW AMBER	HI.EFF.RED 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	mA/°C
Reverse Voltage	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 (0.063in) From Body]	260°C for 5 Seconds				

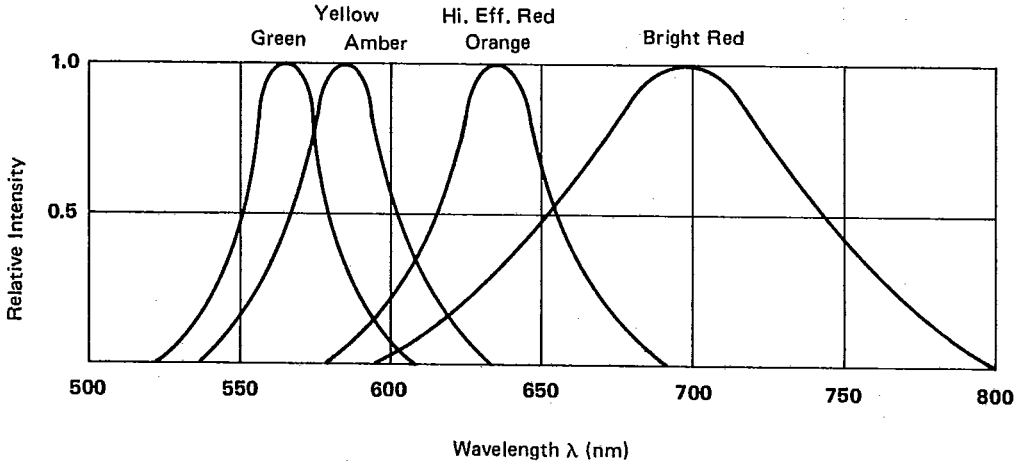


FIG. 1 RELATIVE INTENSITY VS. WAVELENGTH

ELECTRICAL/OPTICAL CHARACTERISTICS AND CURVES AT T_A = 25°C

PARAMETER	SYMBOL	PART NO. LTL-	MIN	TYP	MAX	UNIT	TEST CONDITION
Luminous Intensity	Iv	9212A 9222A 9213A 9223A	0.3 0.5 0.2 0.5	0.8 1.7 0.6 1.7		mcd	IF = 10mA Note 1
Viewing Angle	2θ½	9212A 9222A 9213A 9223A		100 100 150 150		deg.	Note 2 (Fig. 6)
Peak Emission Wavelength	λPEAK	9212A 9222A 9213A 9223A		697 635 697 635		nm	Measurement @ Peak (Fig. 1)
Spectral Line Half Width	Δλ	9212A 9222A 9213A 9223A		90 40 90 40		nm	
Forward Voltage	VF	9212A 9222A 9213A 9223A		2.1 2.0 2.1 2.0	2.8	V	IF = 20mA
Reverse Current	IR	9212A 9222A 9213A 9223A			100	μA	VR = 5V
Capacitance	C	9212A 9222A 9213A 9223A		55 20 55 20		PF	VF = 0 f = 1MHz

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. θ½ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

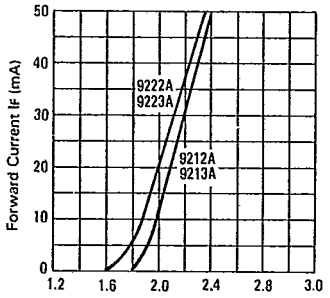


FIG. 2 FORWARD CURRENT VS. FORWARD VOLTAGE

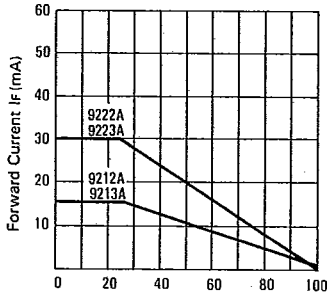


FIG. 3 FORWARD CURRENT DERATING CURVE

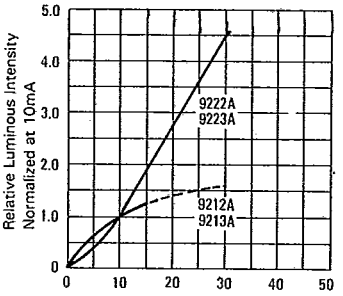


FIG. 4 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

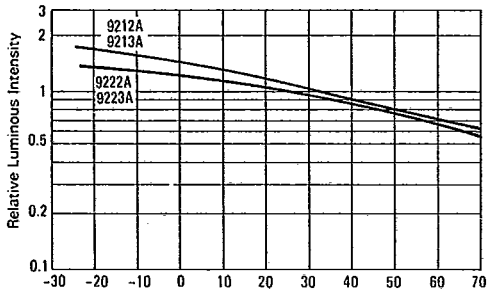


FIG. 5 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

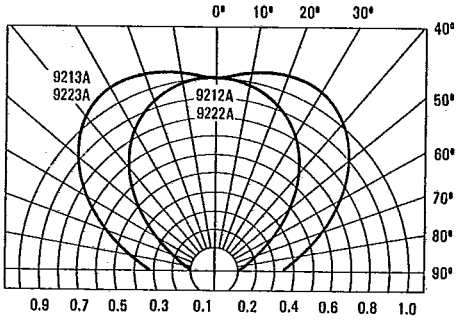


FIG. 6 SPATIAL DISTRIBUTION

ELECTRICAL/OPTICAL CHARACTERISTICS AND CURVES AT $T_A = 25°C$

PARAMETER	SYMBOL	PART NO. LTL-	MIN	TYP	MAX	UNIT	TEST CONDITION
Luminous Intensity	Iv	9232A 9252A 9233A 9253A	0.5 0.5 0.5 0.5	1.7 1.7 1.7 1.7		mcd	I_F = 10mA Note 1
Viewing Angle	$2\theta\frac{1}{2}$	9232A 9252A 9233A 9253A		100 100 150 150		deg.	Note 2 (Fig. 11)
Peak Emission Wavelength	λPEAK	9232A 9252A 9233A 9253A		565 585 565 585		nm	Measurement @ Peak (Fig. 1)
Spectral Line Half Width	$\Delta\lambda$	9232A 9252A 9233A 9253A		30 35 30 35		nm	
Forward Voltage	V_F	9232A 9252A 9233A 9253A		2.1	2.8	V	I_F = 20mA
Reverse Current	I_R	9232A 9252A 9233A 9253A			100	μA	V_R = 5V
Capacitance	C	9232A 9252A 9233A 9253A		35 15 35 15		PF	V_F = 0 f = 1MHz

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

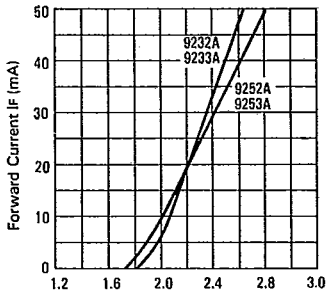


FIG. 7 FORWARD CURRENT VS. FORWARD VOLTAGE

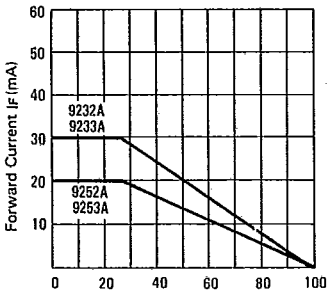


FIG. 8 FORWARD CURRENT DERATING CURVE

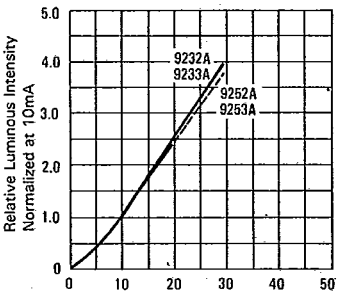


FIG. 9 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

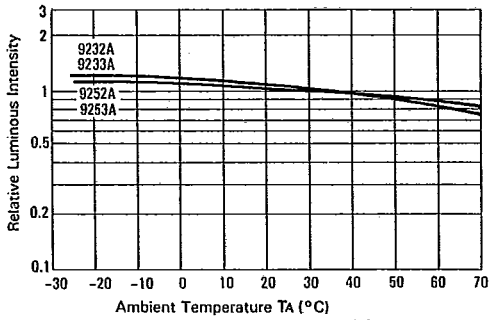


FIG.10 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

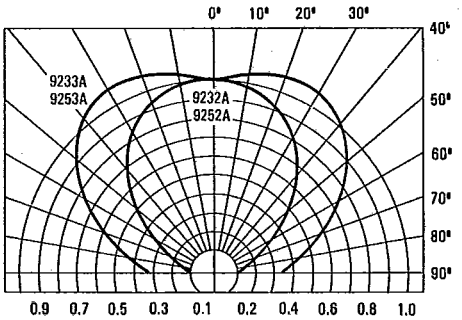


FIG. 11 SPATIAL DISTRIBUTION

ELECTRICAL/OPTICAL CHARACTERISTICS AND CURVES AT T_A = 25°C

PARAMETER	SYMBOL	PART NO. LTL-	MIN	TYP	MAX	UNIT	TEST CONDITION
Luminous Intensity	Iv	9272A 9292A 9273A 9293A	0.5 0.5 0.5 0.5	1.7 1.7 1.7 1.7		mcd	I_F = 10mA Note 1
Viewing Angle	2θ½	9272A 9292A 9273A 9293A		100 100 150 150		deg.	Note 2 (Fig. 16)
Peak Emission Wavelength	λPEAK	9272A 9292A 9273A 9293A		600 630 600 630			Measurement @ Peak (Fig. 1)
Spectral Line Half Width	Δλ	9272A 9292A 9273A 9293A		35 40 35 40		nm	
Forward Voltage	V_F	9272A 9292A 9273A 9293A		2.1 2.0 2.1 2.0	2.8	V	I_F = 20mA
Reverse Current	I_R	9272A 9292A 9273A 9293A			100	μA	V_R = 5V
Capacitance	C	9272A 9292A 9273A 9293A		15 20 15 20		PF	V_F = 0 f = 1MHz

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

2. θ½ is the off-axis angle at which the liminous intensity is half the axial luminous intensity.

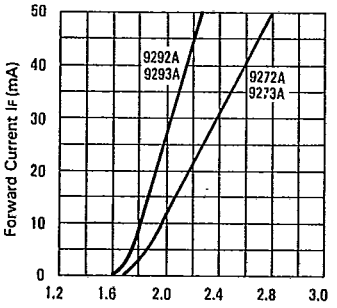


FIG. 12 FORWARD CURRENT VS. FORWARD VOLTAGE

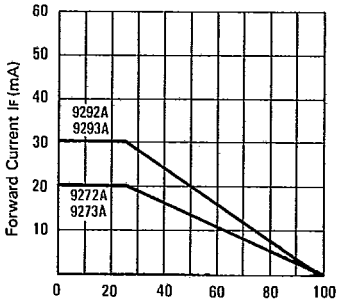


FIG. 13 FORWARD CURRENT DERATING CURVE

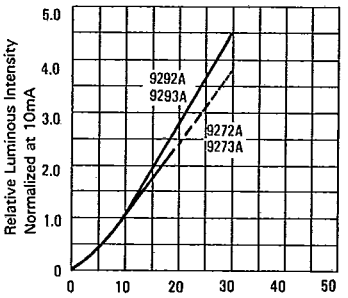


FIG. 14 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

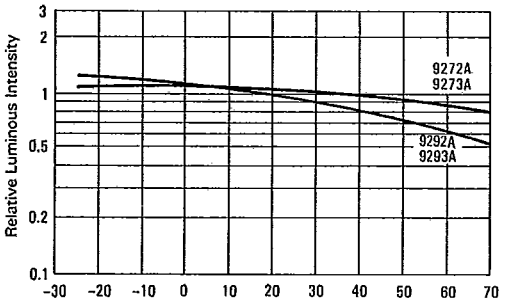


FIG. 15 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

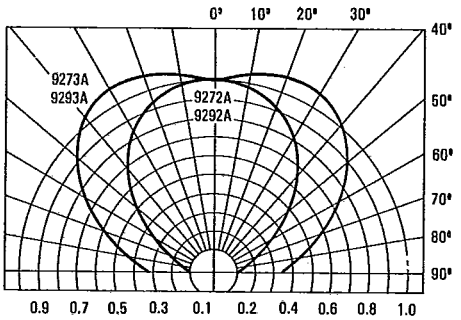


FIG. 16 SPATIAL DISTRIBUTION