



LED PANEL DOT INDICATORS

LTL-1204A/717R
LTL-1214A/717P
LTL-1224A/717HR
LTL-1234A/717G

RED
BRIGHT RED
HIGH EFFICIENCY RED
GREEN

LTL-1254A/717Y
LTL-1274A/717A
LTL-1294A

YELLOW
AMBER
ORANGE

LED LAMPS

FEATURES

- LOW POWER CONSUMPTION.
- SUITABLE FOR PULSED OPERATION.
- MOST SUITABLE FOR USE LIKE AUDIO PANEL INDICATOR.
- FITS 2mm HOLE IN PANELS UP TO 4.5 mm (0.177") THICK.
- LONG LIFE-SOLID STATE RELIABILITY.

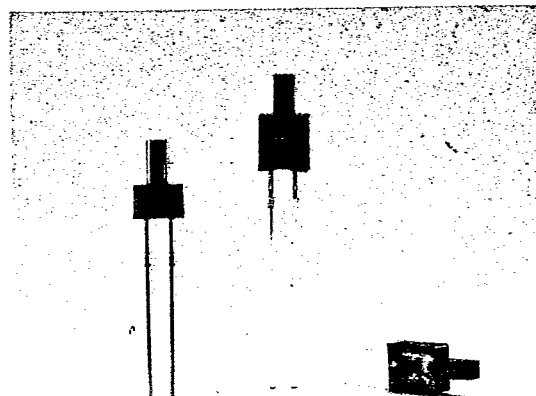
DESCRIPTION

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 Orange Light Emitting Diode.

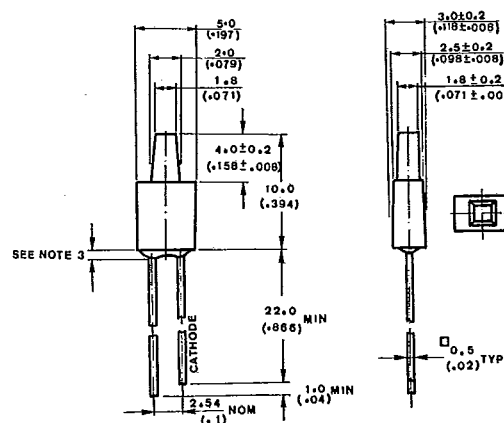
The High Efficiency Red and Orange source color devices are made with Gallium Arsenide Phosphide on Gallium Phosphide Orange Light Emitting Diode. The Green source color devices are made with Gallium Phosphide on Gallium Phosphide Green Light Emitting Diode.

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



PACKAGE DIMENSIONS

LTL-717 x Series

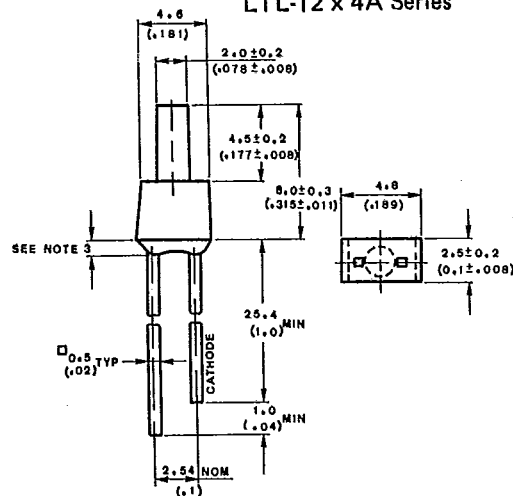


NOTES:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ ($\pm 0.010''$) unless otherwise noted.
3. Protruded resin under flange is 1.5mm ($0.059''$) 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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LTL-12 x 4A Series



DEVICES

PART NO. LTL-	LENS		SOURCE COLOR
	COLOR	DIFFUSION	
1204A	Red	Diffused	Red
1214A	Red	Diffused	Bright Red
1224A	Red	Diffused	Hi. Eff. Red
1234A	Green	Diffused	Green
1254A	Yellow	Diffused	Yellow
1274A	Amber	Diffused	Amber
1294A	Orange	Diffused	Orange

PART NO. LTL-	LENS		SOURCE COLOR
	COLOR	DIFFUSION	
717R	Red	Diffused	Red
717P	Red	Diffused	Bright Red
717HR	Red	Diffused	Hi. Eff. Red
717G	Green	Diffused	Green
717Y	Yellow	Diffused	Yellow
717A	Amber	Diffused	Amber

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					

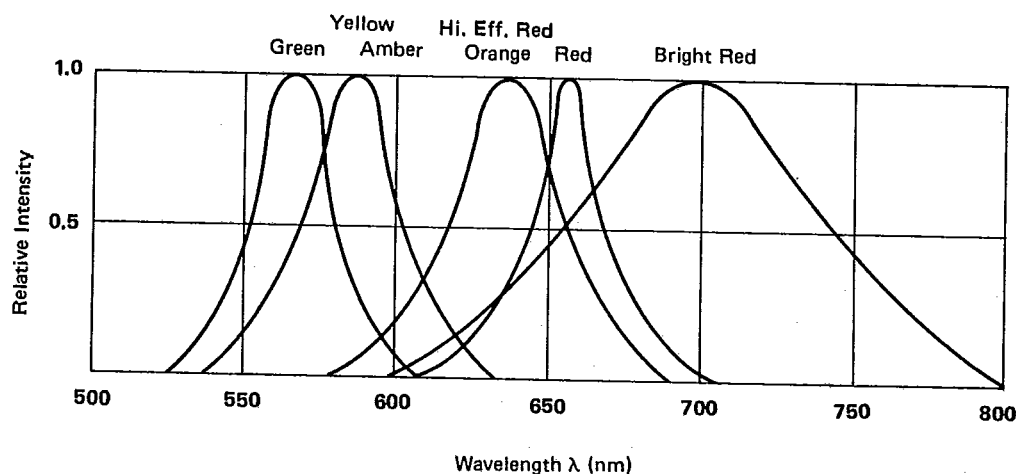


FIG. 1 RELATIVE INTENSITY VS. WAVELENGTH

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	1204A 1214A 717R 717P	0.08 0.2 0.08 0.34	0.1 0.6 0.1 0.75		mcd	$I_F = 10\text{ mA}$ Note 1
Viewing Angle	$2\theta_{1/2}$	1204A 1214A 717R 717P		120 120 110 110		deg.	Note 2 (Fig. 6)
Peak Emission Wavelength	λ_{PEAK}	1204A 1214A 717R 717P		655 697 655 697		nm	Measurement @ Peak (Fig. 1)
Spectral Line Half Width	$\Delta\lambda$	1204A 1214A 717R 717P		24 90 24 90		nm	
Forward Voltage	V_F	1204A 1214A 717R 717P		1.7 2.1 1.7 2.1	2.0 2.8 2.0 2.8	V	$I_F = 20\text{ mA}$
Reverse Current	I_R	1204A 1214A 717R 717P			100	μA	$V_R = 5\text{ V}$
Capacitance	C	1204A 1214A 717R 717P		30 55 30 55		PF	$V_F = 0$ $f = 1\text{ MHz}$

LED LAMPS

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.

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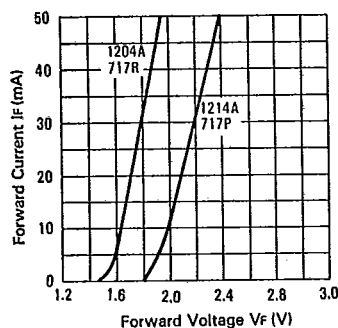


FIG. 2 FORWARD CURRENT VS. FORWARD VOLTAGE.

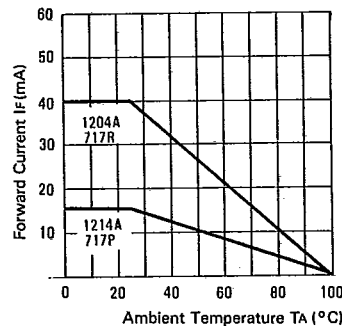


FIG. 3 FORWARD CURRENT DERATING CURVE

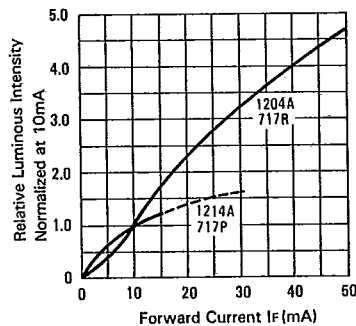


FIG. 4 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT.

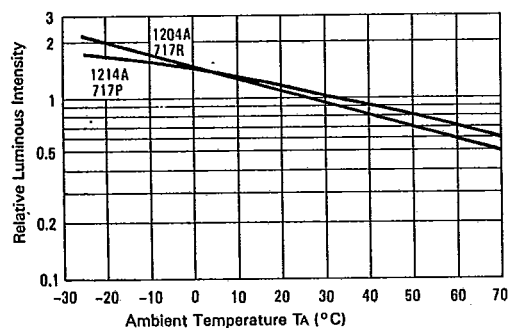


FIG. 5 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

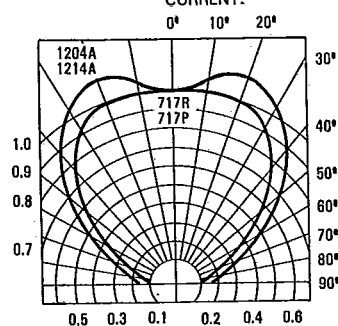


FIG. 6 SPATIAL DISTRIBUTION

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	1224A 717HR	0.4 0.4	1.3 1.3		mcd	$I_F = 10\text{ mA}$ Note 1
Viewing Angle	$2\theta_{1/2}$	1224A 717HR		120 110		deg.	Note 2 (Fig. 11)
Peak Emission Wavelength	λ_{PEAK}	1224A 717HR		635		nm	Measurement @ Peak (Fig. 1)
Spectral Line Half Width	$\Delta\lambda$	1224A 717HR		40		nm	
Forward Voltage	V_F	1224A 717HR		2.0	2.8	V	$I_F = 20\text{ mA}$
Reverse Current	I_R	1224A 717HR			100	μA	$V_R = 5\text{ V}$
Capacitance	C	1224A 717HR		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.

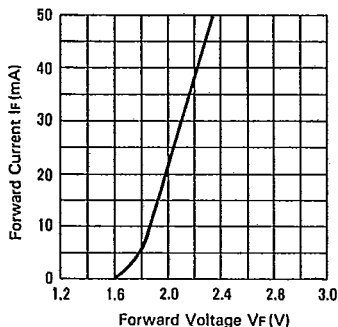


FIG. 7 FORWARD CURRENT VS. FORWARD VOLTAGE

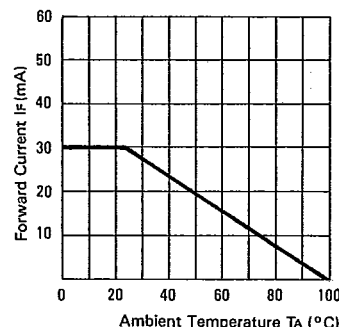


FIG. 8 FORWARD CURRENT DERATING CURVE

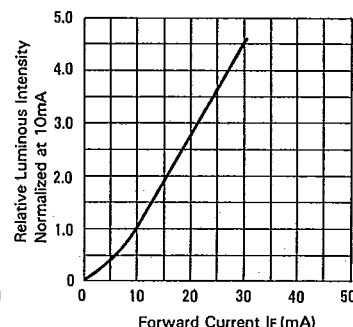


FIG. 9 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

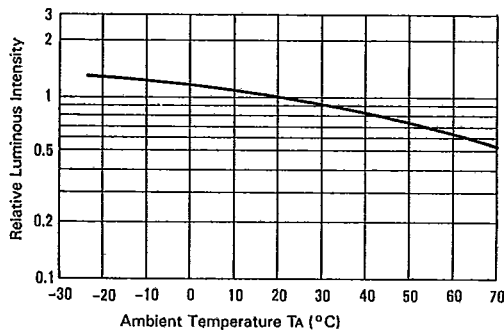


FIG. 10 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

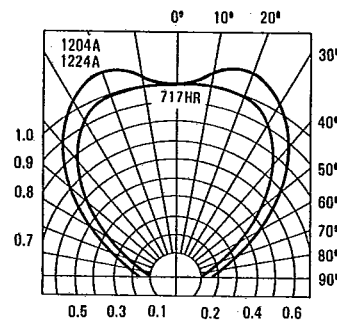


FIG. 11 SPATIAL DISTRIBUTION

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	1234A 1254A 717G 717Y	0.4 0.3 0.6 0.7	1.3 1.0 1.7 2.5		md	$I_F = 10\text{ mA}$ Note 1
Viewing Angle	$2\theta_{1/2}$	1234A 1254A 717G 717Y		120 120 110 110		deg.	Note 2 (Fig. 16)
Peak Emission Wavelength	λ_{PEAK}	1234A 1254A 717G 717Y		585 585 585 585		nm	Measurement @ Peak (Fig. 1)
Spectral Line Half Width	$\Delta\lambda$	1234A 1254A 717G 717Y		30 35 30 35		nm	
Forward Voltage	V_F	1234A 1254A 717G 717Y		2.1	2.8	V	$I_F = 20\text{ mA}$
Reverse Current	I_R	1234A 1254A 717G 717Y			100	μA	$V_R = 5\text{ V}$
Capacitance	C	1234A 1254A 717G 717Y		35 15 35 15		PF	$V_F = 0$ $f = 1\text{ MHz}$

LED LAMPS

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.

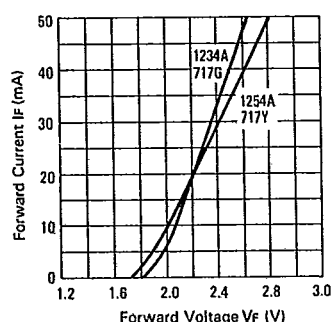


FIG. 12 FORWARD CURRENT VS. FORWARD VOLTAGE

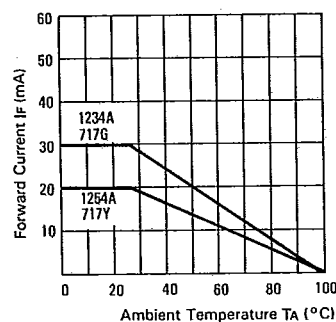


FIG. 13 FORWARD CURRENT DERATING CURVE

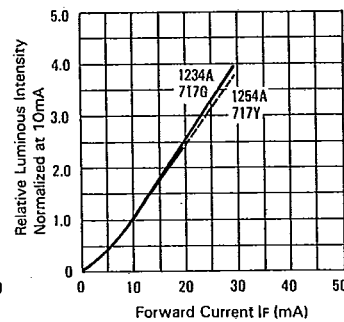


FIG. 14 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

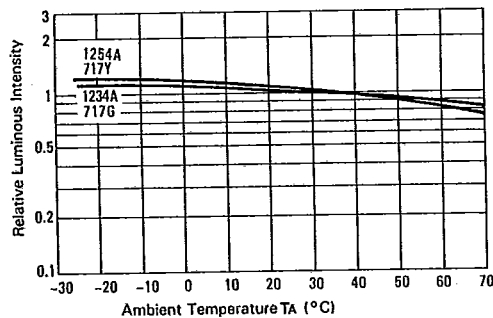


FIG. 15 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

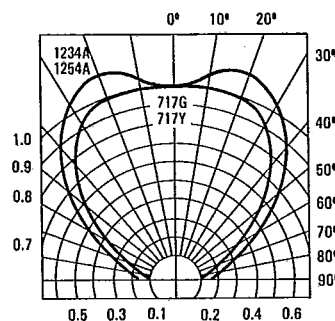


FIG. 16 SPATIAL DISTRIBUTION

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	1274A 1294A 717A	0.3 0.4 0.5	1.0 1.3 1.5		mcd	$I_F = 10\text{ mA}$ Note 1
Viewing Angle	$2\theta_{1/2}$	1274A 1294A 717A		120 120 110		deg.	Note 2 (Fig. 21)
Peak Emission Wavelength	λ_{PEAK}	1274A 1294A 717A		600 630 600		nm	Measurement @ Peak (Fig. 1)
Spectral Line Half Width	$\Delta\lambda$	1274A 1294A 717A		35 40 35		nm	
Forward Voltage	V_F	1274A 1294A 717A		2.1	2.8	V	$I_F = 20\text{ mA}$
Reverse Current	I_R	1274A 1294A 717A			100	μA	$V_R = 5\text{V}$
Capacitance	C	1274A 1294A 717A		15 20 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.

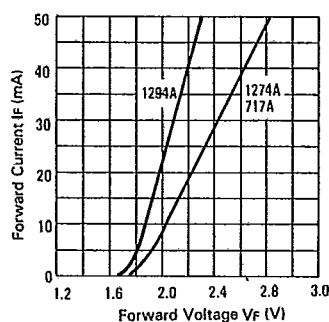


FIG. 17 FORWARD CURRENT VS. FORWARD VOLTAGE

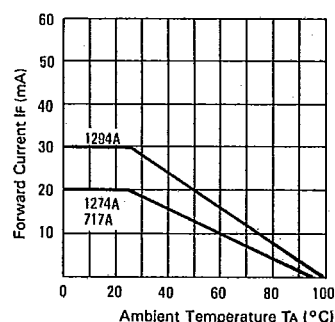


FIG. 18 FORWARD CURRENT DERATING CURVE

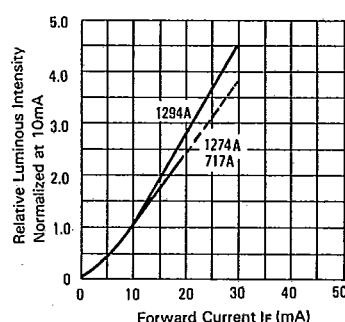


FIG. 19 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

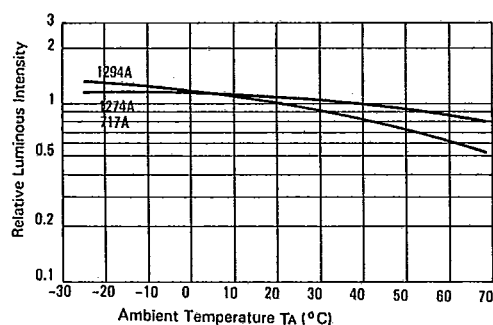


FIG. 20 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

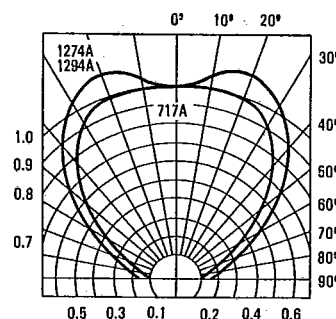


FIG. 21 SPATIAL DISTRIBUTION