

FEATURES

- * 1.22 inch (31.0 mm) MATRIX HEIGHT.
- * LOW POWER REQUIREMENT.
- * SINGLE PLANE, WIDE VIEWING ANGLE.
- * SOLID STATE RELIABILITY.
- * 8 × 8 ARRAY WITH X-Y SELECT.
- * COMPATIBLE WITH USASCII AND EBCDIC CODES.
- * STACKABLE HORIZONTALLY.
- * CATEGORIZED FOR LUMINOUS INTENSITY.

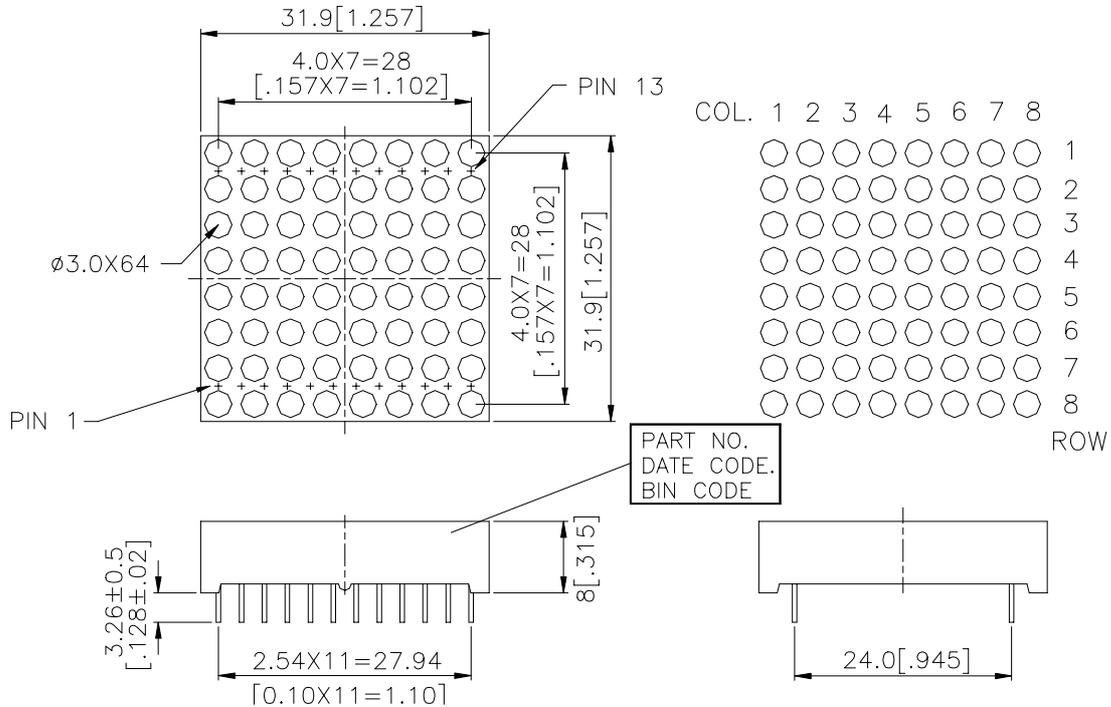
DESCRIPTION

The LTP-12088M-02 is a 1.22 inch (31.0 mm) matrix height 8 × 8 dot matrix display. This device is multi-color applicable display. The green LED chips, which are made from GaP on GaP substrate. The high efficiency red LED chips, which are made from GaAsP on GaP substrate. The device has black face and white dot color. The product is binned by luminous intensity and dominant wavelength in the red mode of operation.

DEVICE

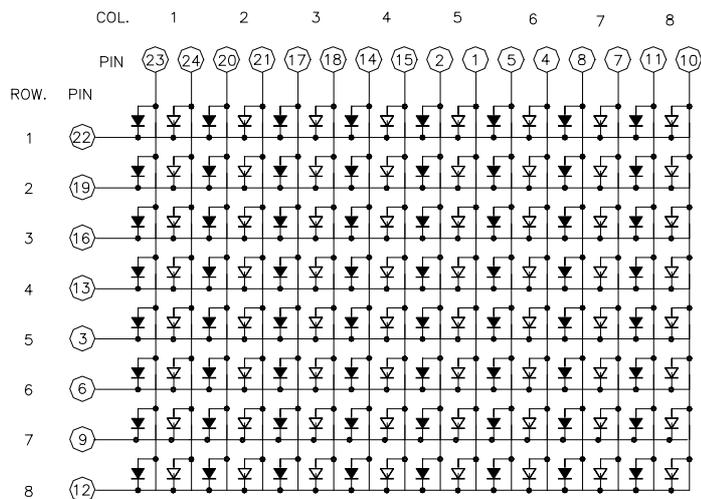
PART NO.	DESCRIPTION
MULTI-COLOR	Anode Column
LTP-12088M-02	Cathode Row

PACKAGE DIMENSIONS



NOTES: All dimensions are in millimeters. Tolerance is ± 0.25 mm (0.01") unless otherwise noted.

INTERNAL CIRCUIT DIAGRAM



The sign " \rightarrow " stands for HI.-EFF.-RED chips.
 The sign " \rightarrow " stands for GREEN chips.

PIN CONNECTION

NO	CONNECTION	NO	CONNECTION
1	ANODE COLUMN 5 GREEN	13	CATHODE ROW 4
2	ANODE COLUMN 5 HI-EFF. RED	14	ANODE COLUMN 4 HI-EFF. RED
3	CATHODE ROW 5	15	ANODE COLUMN 4 GREEN
4	ANODE COLUMN 6 GREEN	16	CATHODE ROW 3
5	ANODE COLUMN 6 HI-EFF. RED	17	ANODE COLUMN 3 HI-EFF. RED
6	CATHODE ROW 6	18	ANODE COLUMN 3 GREEN
7	ANODE COLUMN 7 GREEN	19	CATHODE ROW 2
8	ANODE COLUMN 7 HI-EFF. RED	20	ANODE COLUMN 2 HI-EFF. RED
9	CATHODE ROW 7	21	ANODE COLUMN 2 GREEN
10	ANODE COLUMN 8 GREEN	22	CATHODE ROW 1
11	ANODE COLUMN 8 HI-EFF. RED	23	ANODE COLUMN 1 HI-EFF. RED
12	CATHODE ROW 8	24	ANODE COLUMN 1 GREEN

ABSOLUTE MAXIMUM RATING AT Ta=25°C

PARAMETER	GREEN	UNIT
Average Power Dissipation Per Dot	36	mW
Peak Forward Current Per Dot	100	mA
Average Forward Current Per Dot	13	mA
Derating Linear From 25°C Per Dot	0.17	mA/°C
Reverse Voltage Per Dot	5	V
Operating Temperature Range	-35°C to +85°C	
Storage Temperature Range	-35°C to +85°C	
Solder Temperature: max 260°C for max 3sec at 1.6mm[1/16inch] below seating plane.		

ELECTRICAL / OPTICAL CHARACTERISTICS AT Ta=25°C**GREEN**

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	I _v	1780	4000		μcd	I _p =80mA 1/16Duty
Peak Emission Wavelength	λ _p		565		nm	I _F =20mA
Spectral Line Half-Width	Δλ		30		nm	I _F =20mA
Dominant Wavelength	λ _d		569		nm	I _F =20mA
Forward Voltage any Dot	V _F		2.1	2.6	V	I _F =20mA
			3.0	3.7		I _F =80mA
Reverse Current any Dot	I _R			100	μA	V _R =5V
Luminous Intensity Matching Ratio	I _v -m			2:1		I _F =10mA

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

ABSOLUTE MAXIMUM RATING AT Ta=25°C

PARAMETER	HI-EFF. RED	UNIT
Average Power Dissipation Per Dot	36	mW
Peak Forward Current Per Dot	100	mA
Average Forward Current Per Dot	13	mA
Derating Linear From 25°C Per Dot	0.17	mA/°C
Reverse Voltage Per Dot	5	V
Operating Temperature Range	-35°C to +85°C	
Storage Temperature Range	-35°C to +85°C	
Solder Temperature: max 260°C for max 3sec at 1.6mm[1/16inch] below seating plane.		

ELECTRICAL / OPTICAL CHARACTERISTICS AT Ta=25°C

HI-EFF. RED

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	I _v	1780	4000		μcd	I _p =80mA 1/16Duty
Peak Emission Wavelength	λ _p		650		nm	I _F =20mA
Spectral Line Half-Width	Δλ		40		nm	I _F =20mA
Dominant Wavelength	λ _d		630		nm	I _F =20mA
Forward Voltage any Dot	V _F		2.0	2.6	V	I _F =20mA
			2.6	3.4		I _F =80mA
Reverse Current any Dot	I _R			100	μA	V _R =5V
Luminous Intensity Matching Ratio	I _v -m			2:1		I _F =10mA

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

BIN DISTRIBUTION :

- TEST MODE : The binning specification is testing in RED mode only.
- TEST CONDITION : See note.

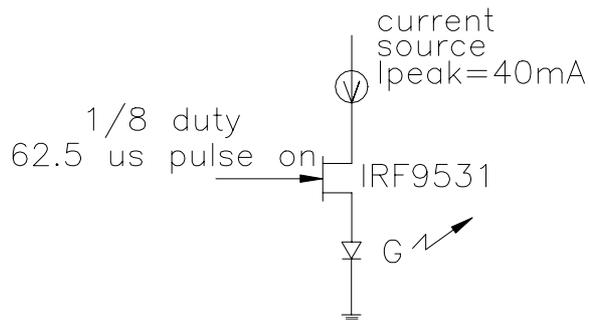
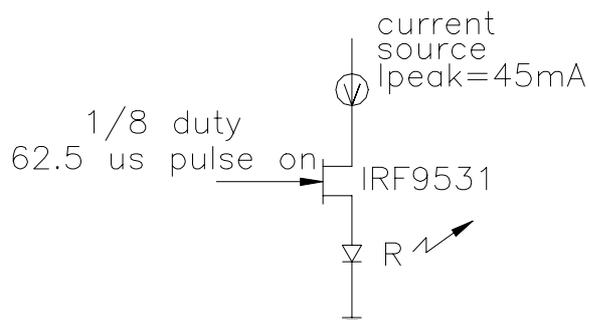
WAVE LENGTH

Code	2	3	4	5	6	7	8	9	10
	618.1	620.1	622.1	624.1	626.1	628.1	630.1	632.1	634.1
nm	:	:	:	:	:	:	:	:	:
	620	622	624	626	628	630	632	634	636

BRIGHTNESS

Code	I	J	K	L	M	N
	0.82	1.11	1.38	1.29	2.31	3.01
mcd	:	:	:	:	:	:
	1.1	1.37	1.78	2.30	3.00	3.90

Note :



TYPICAL ELECTRICAL / OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

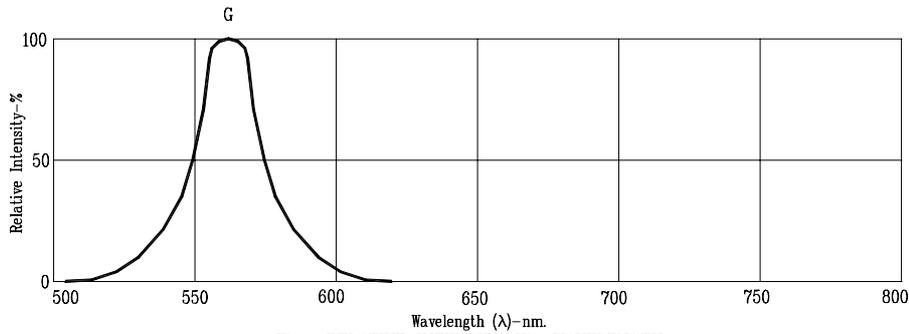


Fig1. RELATIVE INTENSITY VS. WAVELENGTH

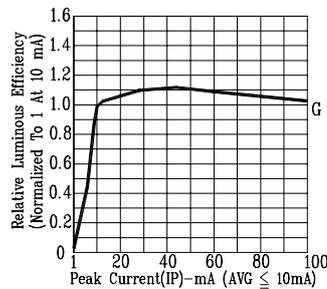


Fig2. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT (REFRESH RATE 1KHz)

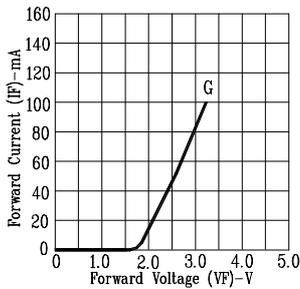


Fig3. FORWARD CURRENT VS. FORWARD VOLTAGE

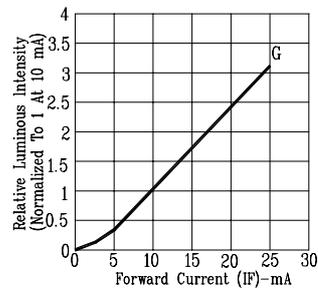


Fig4. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

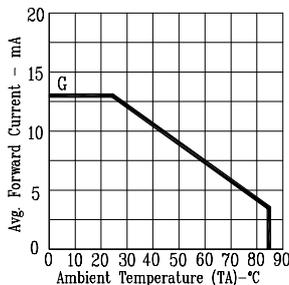


Fig5. MAX. AVERAGE FORWARD CURRENT VS. AMBIENT TEMPERATURE.

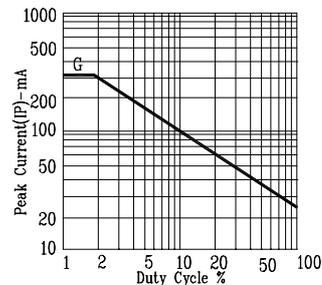


Fig6. MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

NOTE: G=GREEN

TYPICAL ELECTRICAL / OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

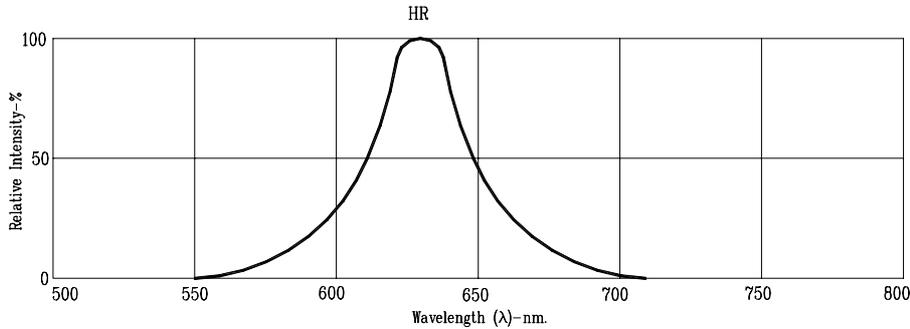


Fig1. RELATIVE INTENSITY VS. WAVELENGTH

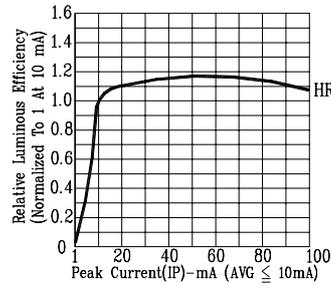


Fig2. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT (REFRESH RATE 1KHz)

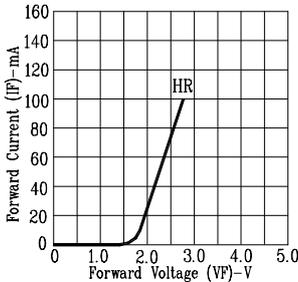


Fig3. FORWARD CURRENT VS. FORWARD VOLTAGE

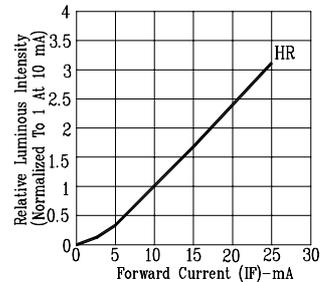


Fig4. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

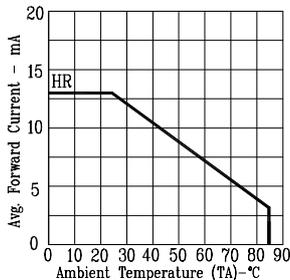


Fig5. MAX. AVERAGE FORWARD CURRENT VS. AMBIENT TEMPERATURE.

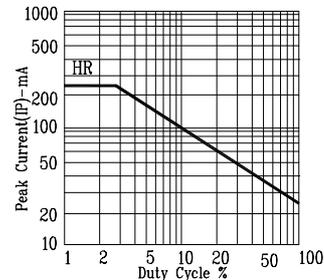


Fig6. MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

NOTE: HR=HI-EFF. RED