

FEATURES

- * 2.3 inch (58.42 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.

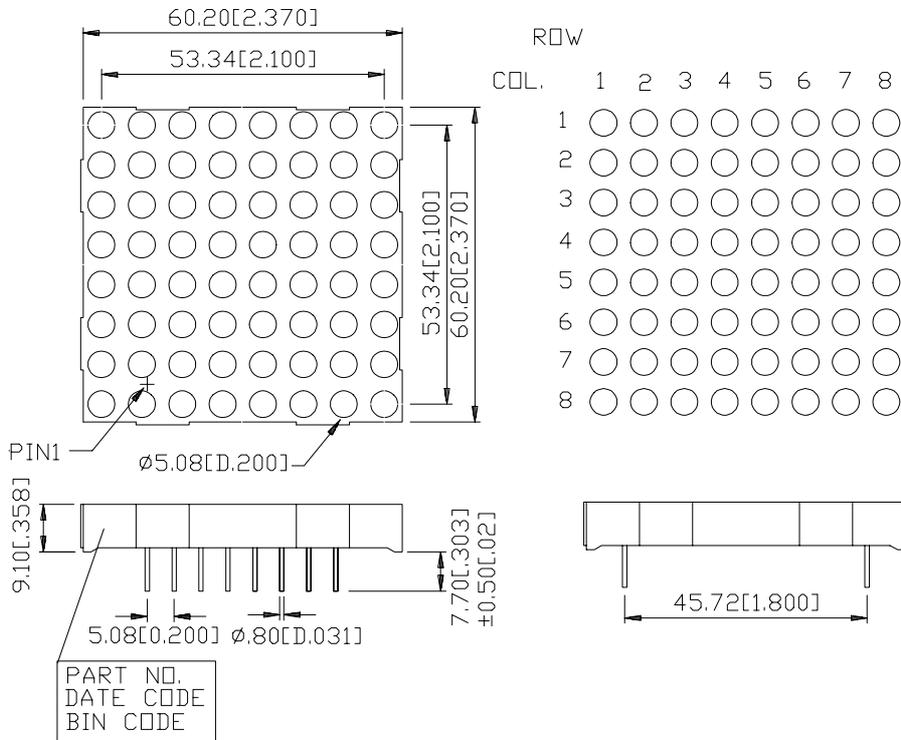
DESCRIPTION

The LTP-2188AA-NB is a 2.3 inch (58.42 mm) matrix height 8× 8 dot matrix displays. This device utilizes Red Orange and green LED chips The Red Orange LED chips are made from GaAsP on GaP substrate, the green LED chips are made from GaP on GaP substrate , and this display has black face and white dots.

DEVICE

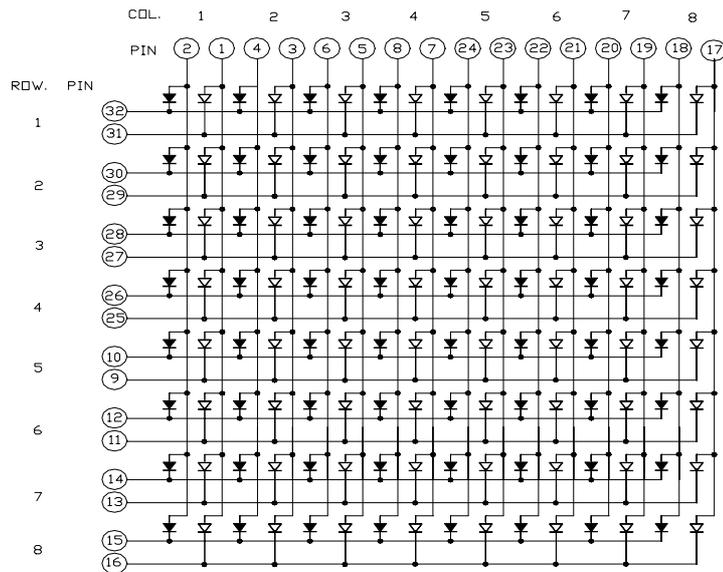
PART NO.	DESCRIPTION
Green & Red Orange	ANODE COLUMN
LTP-2188AA-NB	CATHODE ROW

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 RED ORANGE CHIPS.
 THE SIGN \rightarrow STANDS FOR GREEN CHIPS.

PIN CONNECTION

No.	CONNECTION	No.	CONNECTION
1	ANODE COLUMN 1 GREEN	2	ANODE COIUMN 1 RED ORANGE
3	ANODE COLUMN 2 GREEN	4	ANODE COIUMN 2 RED ORANGE
5	ANODE COLUMN 3 GREEN	6	ANODE COIUMN 3 RED ORANGE
7	ANODE COLUMN 4 GREEN	8	ANODE COIUMN 4 RED ORANGE
9	CATHODE ROW 5 GREEN	10	CATHODE ROW 5 RED ORANGE
11	CATHODE ROW 6 GREEN	12	CATHODE ROW 6 RED ORANGE
13	CATHODE ROW 7 GREEN	14	CATHODE ROW 7 RED ORANGE
15	CATHODE ROW 8 GREEN	16	CATHODE ROW 8 RED ORANGE
17	ANODE COLUMN 8 GREEN	18	ANODE COIUMN 8 RED ORANGE
19	ANODE COLUMN 7 GREEN	20	ANODE COIUMN 7 RED ORANGE
21	ANODE COLUMN 6 GREEN	22	ANODE COIUMN 6 RED ORANGE
23	ANODE COLUMN 5 GREEN	24	ANODE COIUMN 5 RED ORANGE
25	CATHODE ROW 4 GREEN	26	CATHODE ROW 4 RED ORANGE
27	CATHODE ROW 3 GREEN	28	CATHODE ROW 3 RED ORANGE
29	CATHODE ROW 2 GREEN	30	CATHODE ROW 2 RED ORANGE
31	CATHODE ROW 1 GREEN	32	CATHODE ROW 1 RED ORANGE

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	4800		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 (Commision Internationale De L'Eclairage) eye-response curve.

ABSOLUTE MAXIMUM RATING AT Ta=25°C

PARAMETER	RED ORANGE	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

RED ORANGE

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	I _v	1780	4800		μcd	I _p =80mA 1/16Duty
Peak Emission Wavelength	λ _p		630		nm	I _F =20mA
Spectral Line Half-Width	Δλ		40		nm	I _F =20mA
Dominant Wavelength	λ _d		621		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 Internationale De L'Eclairage) eye-response curve.

TYPICAL ELECTRICAL / OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

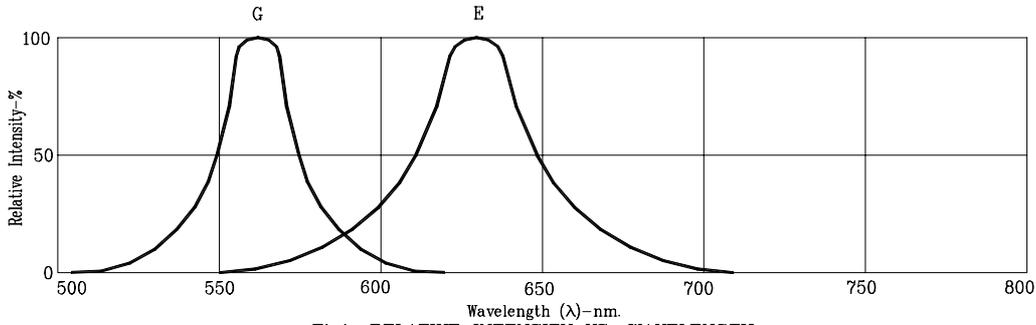


Fig1. RELATIVE INTENSITY VS. WAVELENGTH

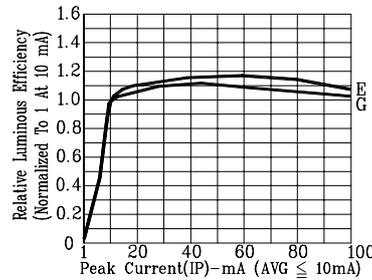


Fig2. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT (REFRESH RATE 1KHz)

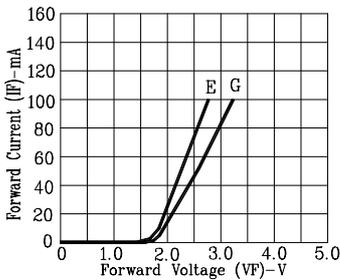


Fig3. FORWARD CURRENT VS. FORWARD VOLTAGE

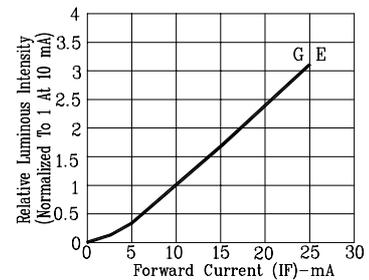


Fig4. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

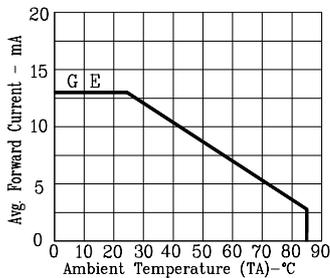


Fig5. MAX. AVERAGE FORWARD CURRENT VS. AMBIENT TEMPERATURE.

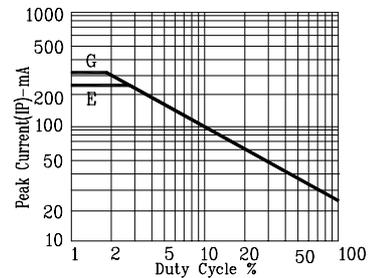


Fig6. MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

NOTE: G=GREEN E=RED ORANGE