

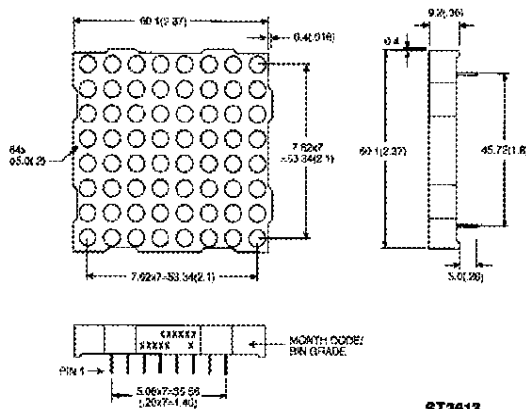


## 2.3" 8x8 DOT MATRIX DISPLAYS

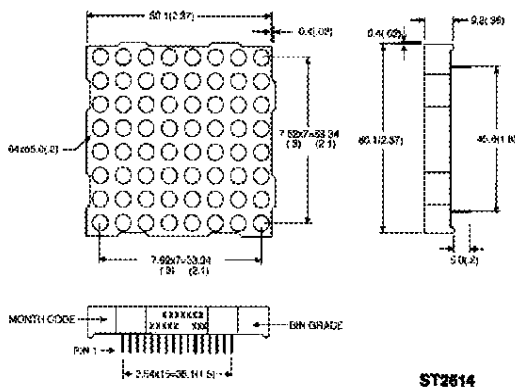
**YELLOW GMA 2888C GMC 2888C**  
**HER GMA 2988C GMC 2988C**  
**GREEN GMA 2488C GMC 2488C**  
**BICOLOR RED/GREEN GMC 2688C**

### PACKAGE DIMENSIONS

#### A. GMX2X88C



#### B. GMC2688C



### DESCRIPTION

These are 8x8 dot matrix displays with large emitting area (0.2" diameter) LED sources. The GMX2X88C series are single color displays with the exception of GMC2688C, a bicolor of red/green displays.

All displays have gray face and white dot color. Other face or dot colors are available with minimum requirement.

The X in GMX denotes row anode or row cathode.

### FEATURES

- 2.3" (58.4mm) character height
- Low power requirement
- High contrast & brightness
- Wide viewing angle 130°
- 8x8 array with X-Y select
- Compatible with USASCII and EBCDIC codes
- X-Y stackable
- Choice of two matrix orientation anode or cathode column
- Easy mounting on PCB
- Categorized for luminous intensity
- Single color displays have the choice of 3 bright color
  - yellow/orange/green
- Multicolor color displays are applicable to 3 bright color—greens, orange (HER) and yellow (green and HER mixed)

#### NOTES:

1. ALL PINS ARE 00.5 (.02).
2. DIMENSIONS IN MILLIMETERS (INCH), TOLERANCE IS ±0.25 (.01) UNLESS OTHERWISE NOTED.



**2.3" 8x8  
DOT MATRIX DISPLAYS**

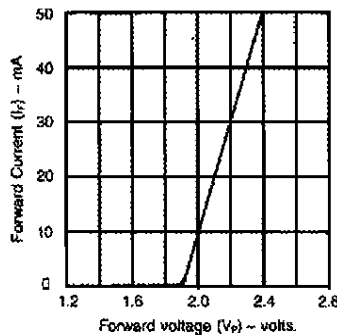
<b>ABSOLUTE MAXIMUM RATING</b> (T <sub>a</sub> = 25°C unless otherwise specified)				
	<b>YELLOW</b>	<b>HER</b>	<b>GREEN</b>	<b>UNITS</b>
Power dissipation per dot/color	60	70	75	mW
Peak forward current per dot/color (duty cycle 1/10, 10KHz)	80	100	100	mA
Continuous I <sub>f</sub> per dot/color	20	25	25	mA
Reverse voltage V <sub>r</sub> per dot/color	5	5	5	V
Operating and storage temperature range				-25°C to +85°C
Soldering time at 260°C (1/16 inch below seating plane)				3 sec

<b>MODEL NUMBERS</b>						
<b>PART NO.</b>			<b>MULTI-COLOR</b>	<b>DESCRIPTION</b>	<b>PACKAGE DIMENSION</b>	<b>INTERNAL CIRCUIT DIAGRAM</b>
<b>YELLOW</b>	<b>HER</b>	<b>GREEN</b>				
GMC2888C	GMC2988C	GMC2488C		Anode column, cathode row	A	A
GMA2888C	GMA2988C	GMA2488C		Cathode column, anode row	A	B
			GMC2688C	Anode column, cathode row	B	C

**ELECTRICAL/OPTICAL CHARACTERISTICS** ( $T_a = 25^\circ\text{C}$  Unless otherwise specified)  
**GMX 288C**

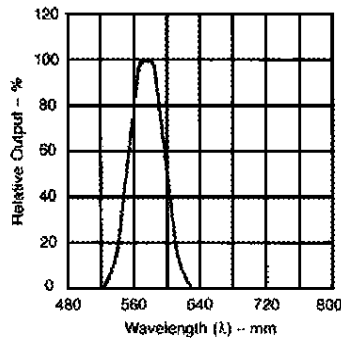
PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Average luminous intensity		3000		$\mu\text{cd}$	$I_f = 20 \text{ mA}$
Peak emission wavelength		585		nm	$I_f = 20 \text{ mA}$
Spectral line half-width		35		nm	$I_f = 20 \text{ mA}$
Forward voltage, any dot		2.1	2.8	V	$I_f = 20 \text{ mA}$
Reverse voltage, any dot			100	$\mu\text{A}$	$V_R = 5\text{V}$

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**  
( $T_a = 25^\circ\text{C}$  Unless otherwise specified)



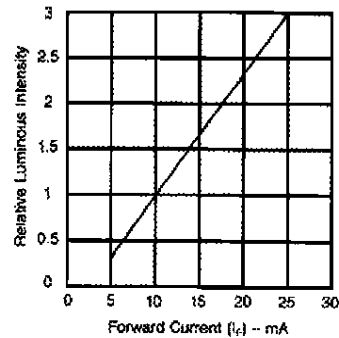
C3037

Fig. 1. Forward Current vs. Forward Voltage



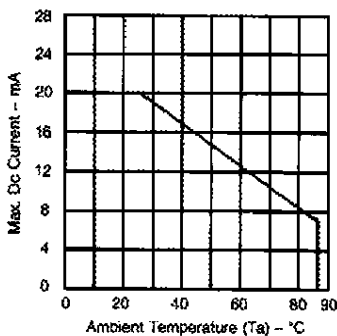
C3038

Fig. 2. Spectral Response



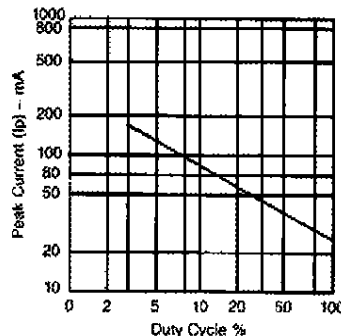
C3039

Fig. 3. Relative Luminous Intensity vs. Forward Current



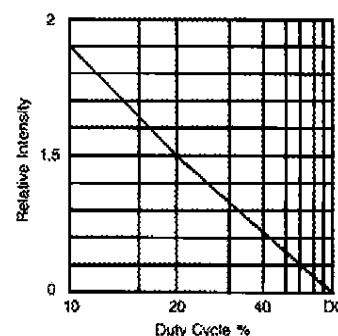
C3040

Fig. 4. Maximum Allowable DC Current Per Segment vs. Ambient Temperature



C3041

Fig. 5. Max Peak Current vs. Duty Cycle % (Refresh Rate  $f = 1 \text{ kHz}$ )

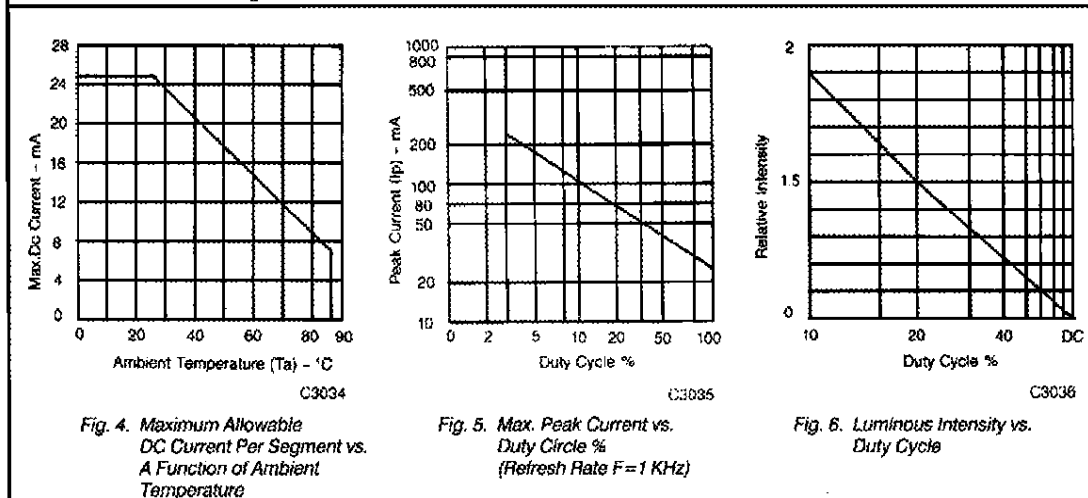
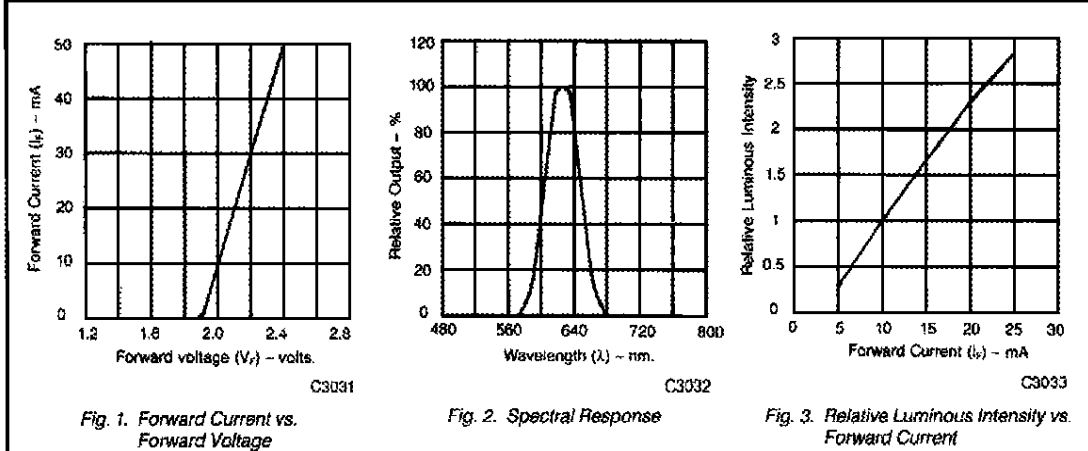


C3042

Fig. 6. Luminous Intensity vs. Duty Cycle % (Average  $I = 10 \text{ mA Per Seg.}$ )

<b>ELECTRICAL/OPTICAL CHARACTERISTICS</b> ( $T_c = 25^\circ\text{C}$ Unless otherwise specified)					
<b>GMX 2988C</b>					
PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Average luminous intensity		3000		$\mu\text{cd}$	$I_f = 20\text{ mA}$
Peak emission wavelength		635		nm	$I_f = 20\text{ mA}$
Spectral line half-width		40		nm	$I_f = 20\text{ mA}$
Forward voltage, any dot		2.1	2.8	V	$I_f = 20\text{ mA}$
Reverse voltage, any dot			100	$\mu\text{A}$	$V_R = 5\text{V}$

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**  
( $T_c = 25^\circ\text{C}$  Unless otherwise specified)



**ELECTRICAL/OPTICAL CHARACTERISTICS** ( $T_c = 25^\circ\text{C}$  Unless otherwise specified)  
**GMX 2488C**

PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Average luminous intensity		3000		$\mu\text{cd}$	$I_f = 20\text{ mA}$
Peak emission wavelength		565		nm	$I_f = 20\text{ mA}$
Spectral line half-width		30		nm	$I_f = 20\text{ mA}$
Forward voltage, any dot		2.1	2.8	V	$I_f = 20\text{ mA}$
Reverse voltage, any dot			100	$\mu\text{A}$	$V_R = 5\text{V}$

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**  
( $T_c = 25^\circ\text{C}$  Unless otherwise specified)

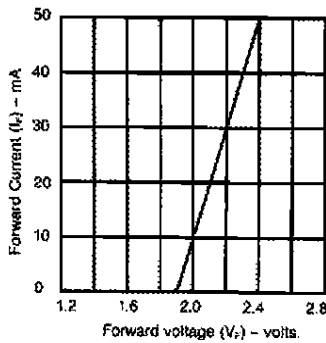


Fig. 1. Forward Current vs. Forward Voltage

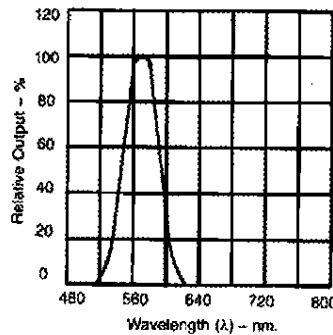


Fig. 2. Spectral Response

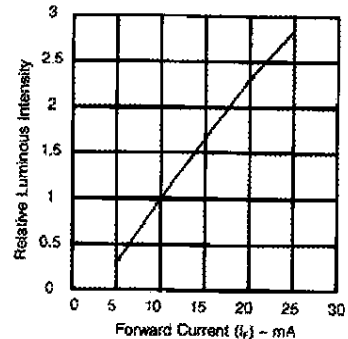


Fig. 3. Relative Luminous Intensity vs. Forward Current

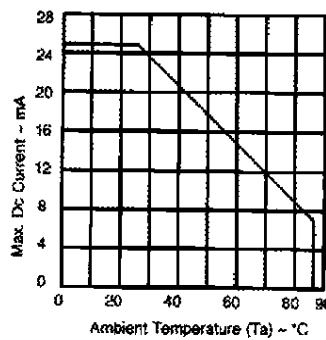


Fig. 4. Maximum Allowable DC Current Per Segment vs. A Function of Ambient Temperature

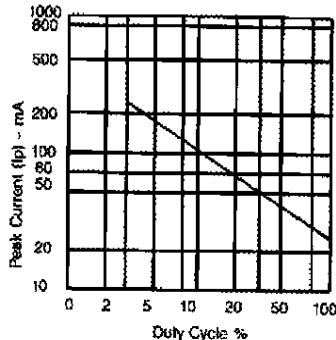


Fig. 5. Max Peak Current vs. Duty Cycle % (Refresh Rate  $f=1\text{ KHz}$ )

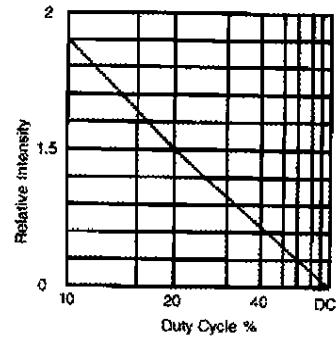


Fig. 6. Luminous Intensity vs. Duty Cycle % (Average  $I=10\text{ mA Per Seg.}$ )



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DOT MATRIX DISPLAYS**

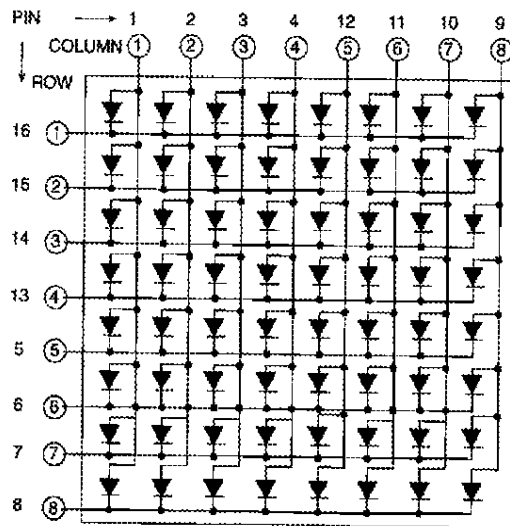
<b>PIN CONNECTION</b>			
<b>PIN NO.</b>	<b>GMC2X88C</b>	<b>GMA2X88C</b>	<b>GMC2688C</b>
1	Anode column 1	Cathode column 1	Anode Column 1b
2	Anode column 2	Cathode column 2	Anode column 1a
3	Anode column 3	Cathode column 3	Anode column 2b
4	Anode column 4	Cathode column 4	Anode column 2a
5	Cathode row 5	Anode row 5	Anode column 3b
6	Cathode row 6	Anode row 6	Anode column 3a
7	Cathode row 7	Anode row 7	Anode column 4b
8	Cathode row 8	Anode row 8	Anode column 4a
9	Anode column 8	Cathode column 8	Cathode row 5b
10	Anode column 7	Cathode column 7	Cathode row 5a
11	Anode column 6	Cathode column 6	Cathode row 6b
12	Anode column 5	Cathode column 5	Cathode row 6a
13	Cathode row 4	Anode row 4	Cathode row 7b
14	Cathode row 3	Anode row 3	Cathode row 7a
15	Cathode row 2	Anode row 2	Cathode row 8b
16	Cathode row 1	Anode row 1	Cathode row 8a
17			Anode column 8b
18			Anode column 8a
19			Anode column 7b
20			Anode column 7a
21			Anode column 6b
22			Anode column 6a
23			Anode column 5b
24			Anode column 5a
25			Cathode row 4b
26			Cathode row 4a
27			Cathode row 3b
28			Cathode row 3a
29			Cathode row 2b
30			Cathode row 2a
31			Cathode row 1b
32			Cathode row 1a



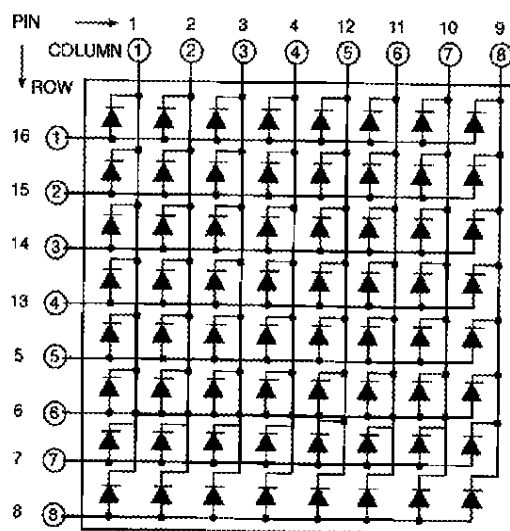
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DOT MATRIX DISPLAYS

INTERNAL CIRCUIT DIAGRAM

A. GMC2X88C



B. GMA2X88C



C. GMC2688C

