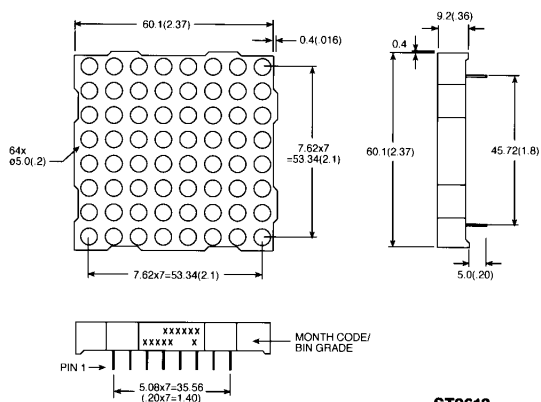


**YELLOW GMA 2888C GMC 2888C**  
**HER GMA 2988C GMC 2988C**  
**GREEN GMA 2488C GMC 2488C**  
**BICOLOR RED/GREEN GMC 2688C**

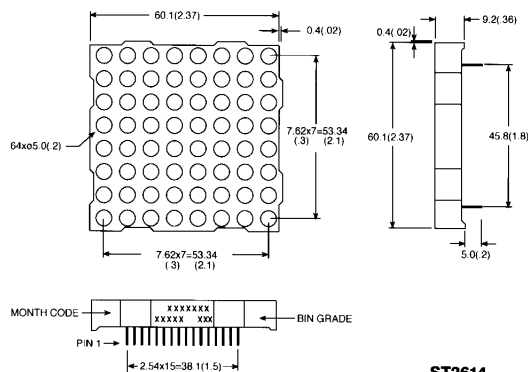
### PACKAGE DIMENSIONS

#### A. GMX2X88C



ST2613

#### B. GMC2688C



ST2614

### DESCRIPTION

These are 8×8 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°
- 8×8 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 0.5 (.02).
2. DIMENSIONS IN MILLIMETERS (INCH), TOLERANCE IS ±0.25 (.01) UNLESS OTHERWISE NOTED.



## 2.3" 8×8 DOT MATRIX DISPLAYS

ABSOLUTE MAXIMUM RATING (T <sub>A</sub> =25°C unless otherwise specified)				
	YELLOW	HER	GREEN	UNITS
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			

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

**ELECTRICAL/OPTICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  Unless otherwise specified)  
**GMX 2888C**

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)

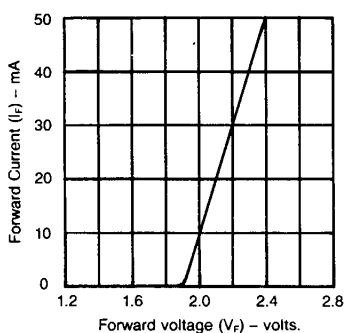


Fig. 1. Forward Current vs. Forward Voltage

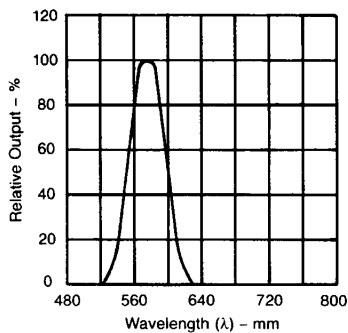


Fig. 2. Spectral Response

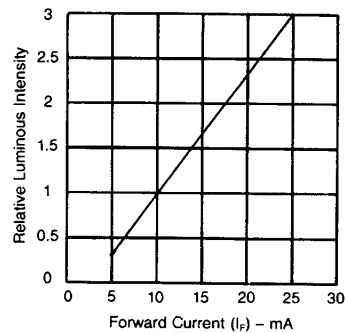


Fig. 3. Relative Luminous Intensity vs. Forward Current

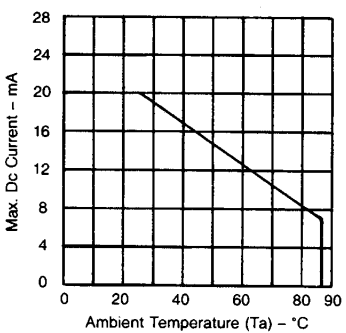


Fig. 4. Maximum Allowable DC Current Per Segment vs. A Function of Ambient Temperature

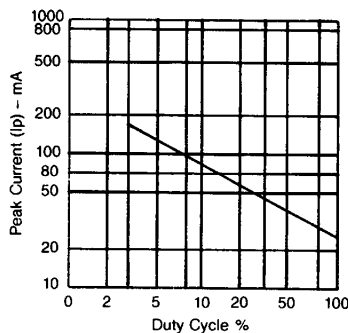


Fig. 5. Max Peak Current vs. Duty Cycle % (Refresh Rate  $f=1\text{ KHz}$ )

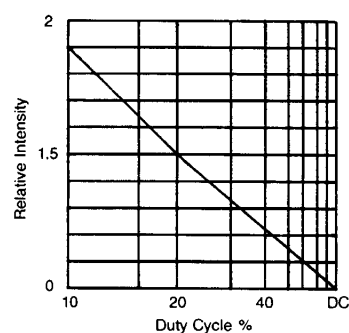


Fig. 6. Luminous Intensity vs. Duty Cycle % (Average  $I=10\text{ mA Per Seg.}$ )

**ELECTRICAL/OPTICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  Unless otherwise specified)  
**GMX 2988C**

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**  
( $T_A = 25^\circ\text{C}$  Unless otherwise specified)

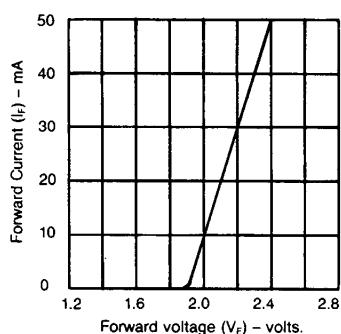


Fig. 1. Forward Current vs. Forward Voltage

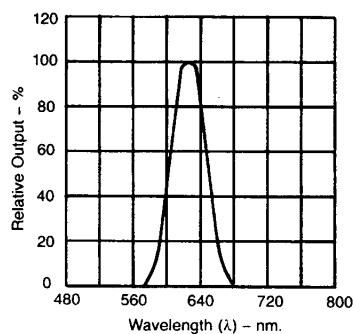


Fig. 2. Spectral Response

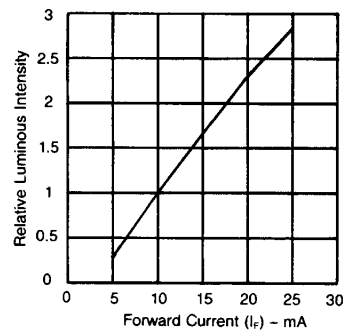


Fig. 3. Relative Luminous Intensity vs. Forward Current

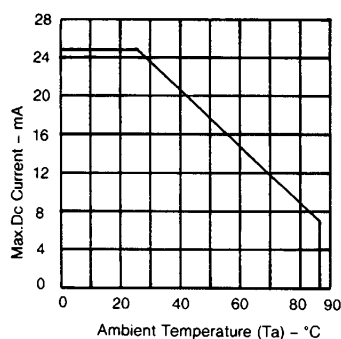


Fig. 4. Maximum Allowable DC Current Per Segment vs. Ambient Temperature

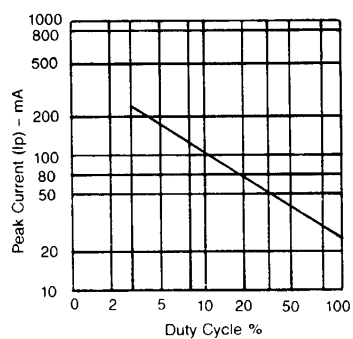


Fig. 5. Max. Peak Current vs. Duty Cycle % (Refresh Rate  $F = 1\text{ KHz}$ )

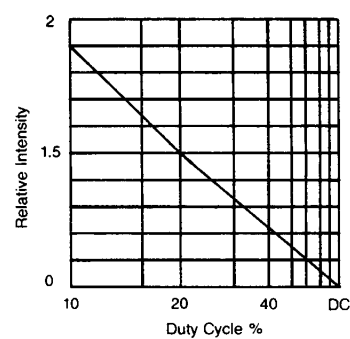


Fig. 6. Luminous Intensity vs. Duty Cycle

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

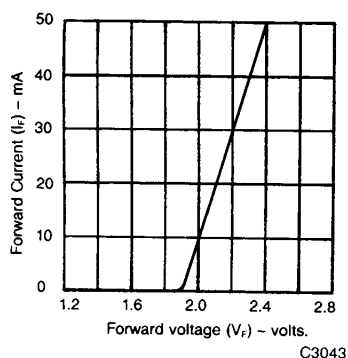


Fig. 1. Forward Current vs. Forward Voltage

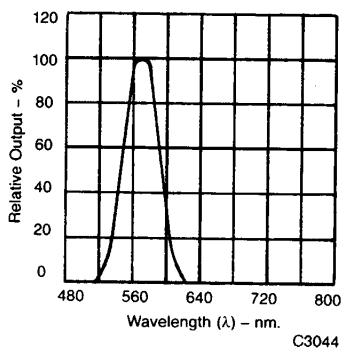


Fig. 2. Spectral Response

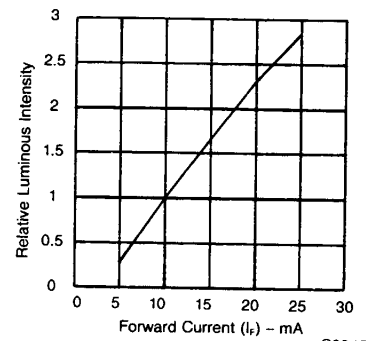


Fig. 3. Relative Luminous Intensity vs. Forward Current

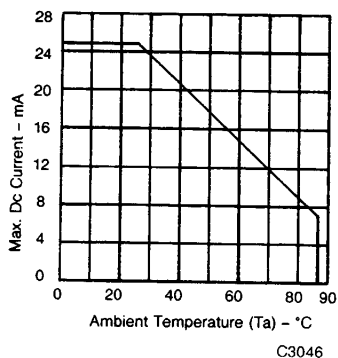


Fig. 4. Maximum Allowable DC Current Per Segment vs. Ambient Temperature

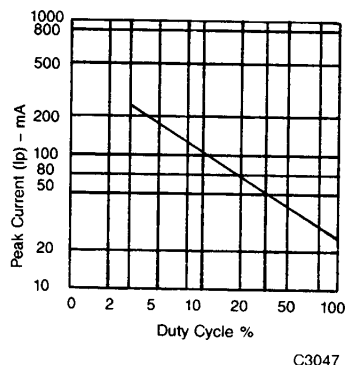


Fig. 5. Max Peak Current vs. Duty Cycle % (Refresh Rate  $f = 1\text{ KHz}$ )

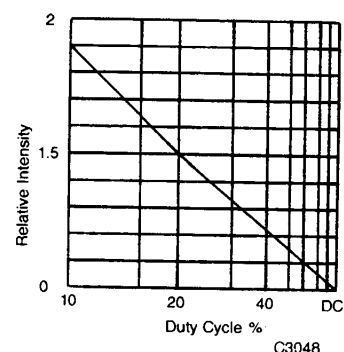


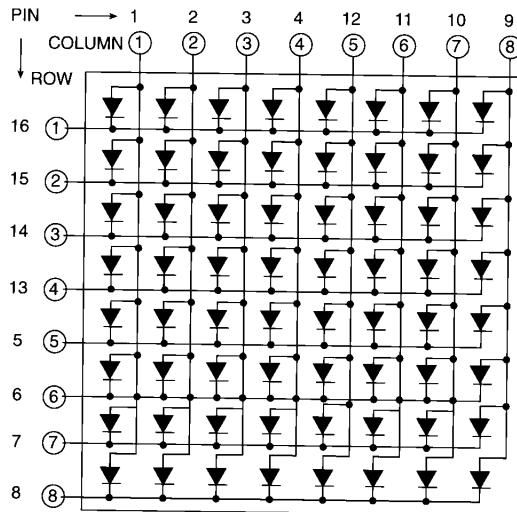
Fig. 6. Luminous Intensity vs. Duty Cycle % (Average  $I = 10\text{ mA Per Seg.}$ )

PIN CONNECTION			
PIN NO.	GMC2X88C	GMA2X88C	GMC2688C
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

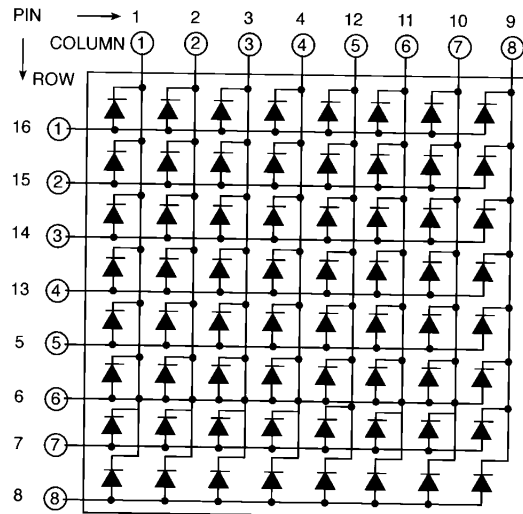
"a" for HEP chip      "b" for green chip

**INTERNAL CIRCUIT DIAGRAM**

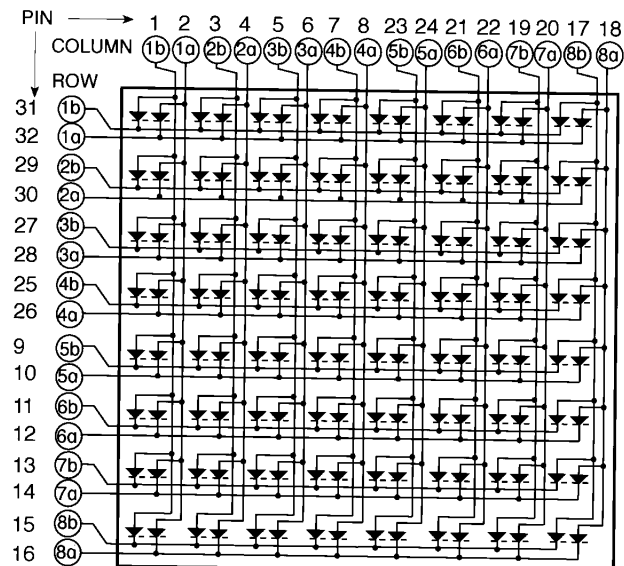
**A. GMC2X88C**



**B. GMA2X88C**



**C. GMC2688C**





## 2.3" 8 X 8 DOT MATRIX DISPLAYS

---

### **DISCLAIMER**

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

### **LIFE SUPPORT POLICY**

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.