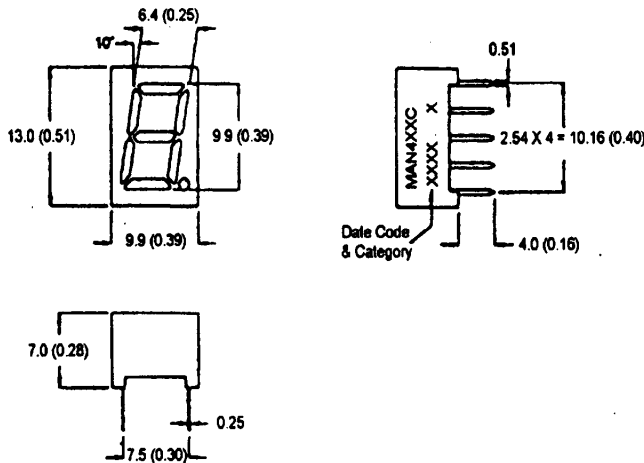


**BRIGHT RED MAN412C, MAN413C  
GREEN MAN442C, MAN443C  
HIGH EFF. RED MAN492C, MAN493C**

**PACKAGE DIMENSIONS**



**NOTES: Dimensions are in mm (inch).  
All pins are 0.5 (0.02) diameter  
Tolerances are ± 0.25 (0.1) unless otherwise noted.**

**FEATURES**

- Easy to read digits.
- Common anode or cathode.
- Low power consumption.
- Bold segments that are highly visible.
- High brightness with high contrast
- White segments on a grey face.
- Directly compatible with integrated circuits.
- Rugged plastic/epoxy construction.

**APPLICATIONS**

- Digital readout displays.
- Instrument panels.

**MODEL NUMBERS**

<u>Part number</u>	<u>Color</u>	<u>Description</u>
MAN412C	Bright Red	1 Digit, Common Anode, Rt. Hand Decimal
MAN413C	Bright Red	1 Digit, Common Cathode, Rt Hand Decimal.
MAN442C	Green	1 Digit, Common Anode, Rt Hand Decimal.
MAN443C	Green	1 Digit, Common Cathode, Rt Hand Decimal.
MAN492C	High Eff. Red	1 Digit, Common Anode, Rt Hand Decimal.
MAN493C	High Eff. Red	1 Digit, Common Cathode, Rt Hand Decimal.

(For other color options, contact your local area Sales Office)

**ABSOLUTE MAXIMUM RATING** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

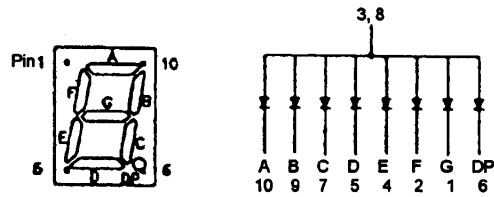
	B.Red MAN 412C 413C	Green MAN 442C 443C	High Eff. Red MAN 492C 493C	Units
Part number				
Continuous forward current ( $I_f$ )				
Per Segment.....	15	25	25	mA
Peak forward current per die ( $I_f$ )..... (at $f = 10.0$ KHz, Duty factor = 1/10)	60	90	90	mA
Power dissipation ( $P_D$ ).....	40*	70*	70*	mW
*Derate Linearly from $25^\circ\text{C}$ .....	0.17	0.33	0.33	mW/ $^\circ\text{C}$
Reverse voltage per dice.....				5V
Operating and Storage temperature range.....				- $40^\circ\text{C}$ to $+85^\circ\text{C}$
Lead soldering time (at 1/16 inch from the bottom of lamp).....				5 seconds @ $230^\circ\text{C}$

**ELECTRO - OPTICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

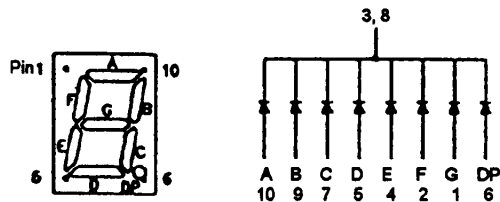
	B. Red MAN 412C 413C	Green MAN 442C 443C	High Eff. Red MAN 492C 493C	Test Condition
<u>Part number</u>				
Luminous intensity (ucd)				
minimum	300	800	900	$I_f = 20$ mA
typical	700	2000	2200	$I_f = 20$ mA
Forward voltage ( $V_f$ )				
typical	2.1	2.1	2.0	$I_f = 20$ mA
maximum	2.6	2.8	2.8	$I_f = 20$ mA
Peak wavelength (nm)	697	570	635	$I_f = 20$ mA
Spectral line half width (nm)	90	30	45	$I_f = 20$ mA
Reverse breakdown voltage ( $V_R$ )	5	5	5	$I_r = 100$ uA

**PINOUT**

**MAN4X2C - Common Anode**



**MAN4X3C - Common Cathode**



**GRAPHICAL DETAIL: Bright Red ( $T_A = 25^\circ\text{C}$  unless otherwise specified)**

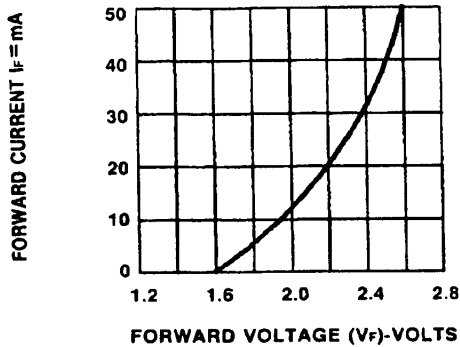


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

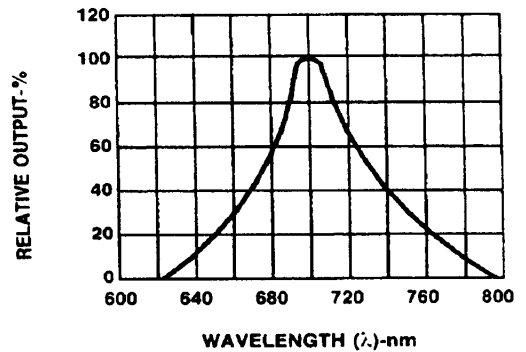


Fig.2 SPECTRAL RESPONSE

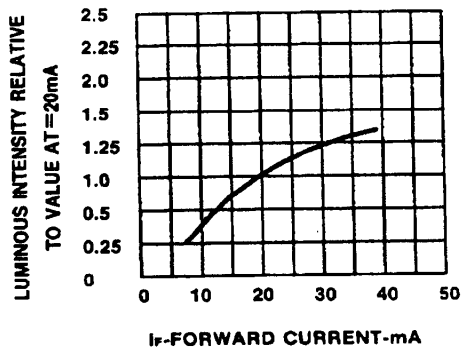


Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

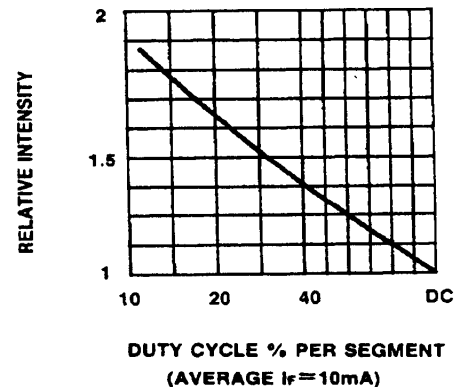


Fig.5 LUMINOUS INTENSITY VS. DUTY CYCLE

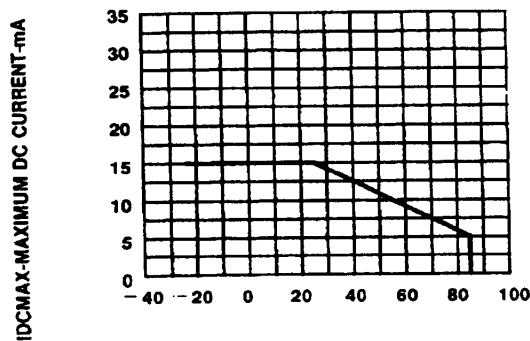


Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT VS. A FUNCTION OF AMBIENT TEMPERATURE.

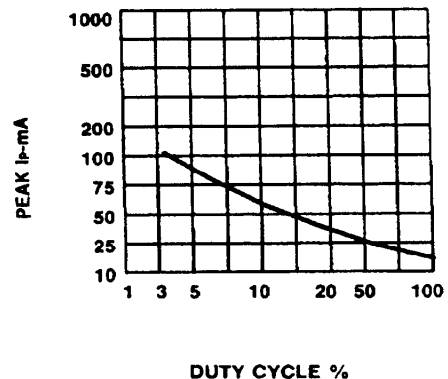
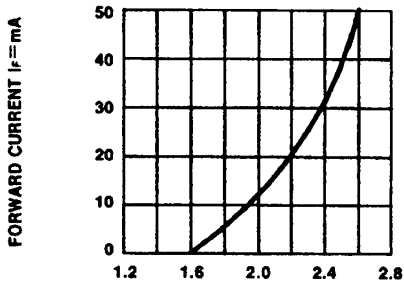
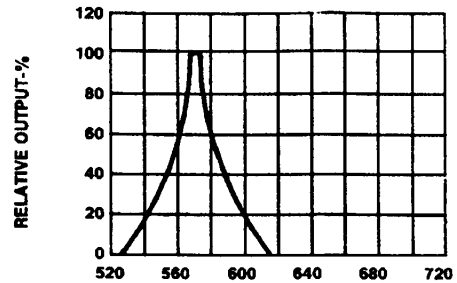


Fig.6 MAX PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE  $f = 1 \text{ KHz}$ )

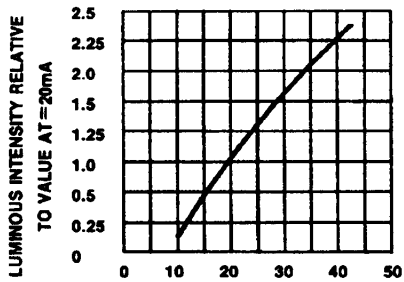
**GRAPHICAL DETAIL: Green** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)



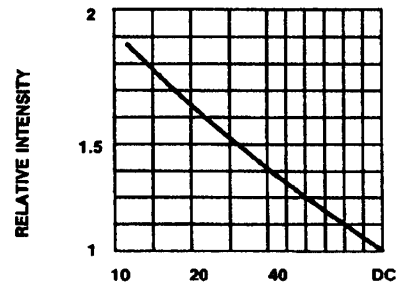
FORWARD VOLTAGE ( $V_f$ )-VOLTS  
Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.



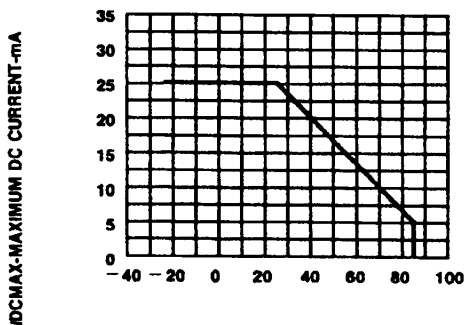
WAVELENGTH ( $\lambda$ )-nm  
Fig.2 SPECTRAL RESPONSE



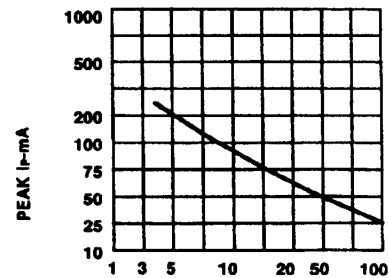
$I_f$ -FORWARD CURRENT-mA  
Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



DUTY CYCLE % PER SEGMENT (AVERAGE  $I_f = 10\text{mA}$ )  
Fig.5 LUMINOUS INTENSITY VS. DUTY CYCLE



$T_A$  AMBIENT TEMPERATURE  $^\circ\text{C}$   
Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT CS. A FUNCTION OF AMBIENT TEMPERATURE.



DUTY CYCLE %  
Fig. 6 MAX PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE  $f = 1\text{KHz}$ )

**GRAPHICAL DETAIL: High Efficiency Red ( $T_A = 25^\circ\text{C}$  unless otherwise specified)**

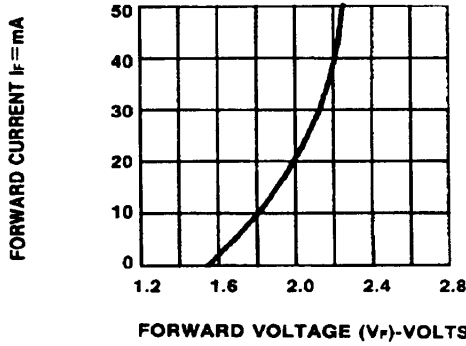


Fig. 1 FORWARD CURRENT VS. FORWARD VOLTAGE.

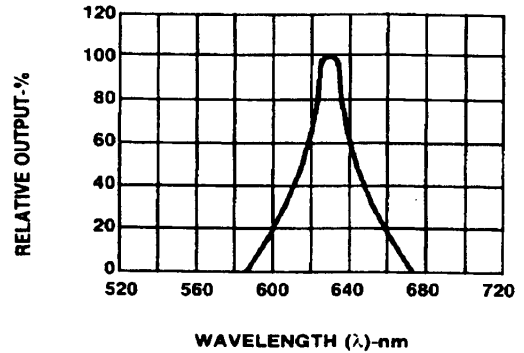


Fig. 2 SPECTRAL RESPONSE

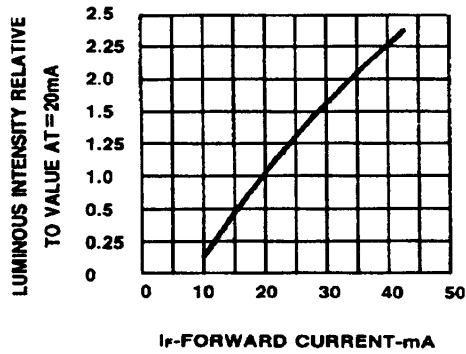


Fig. 3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

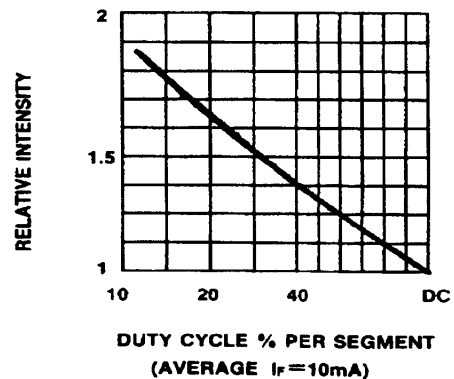


Fig. 5 LUMINOUS INTENSITY VS. DUTY CYCLE

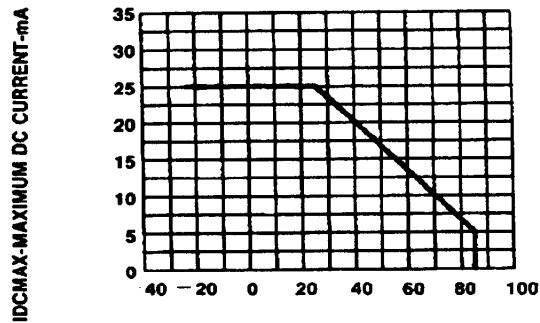


Fig. 4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT VS. A FUNCTION OF AMBIENT TEMPERATURE.

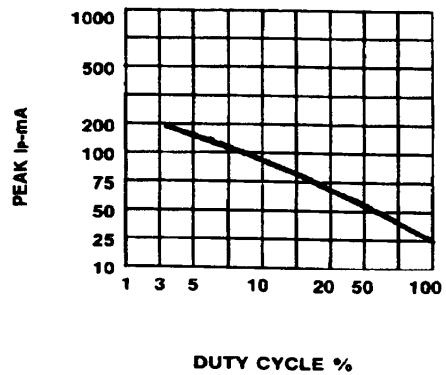


Fig. 6 MAX PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE  $f = 1\text{ KHz}$ )

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