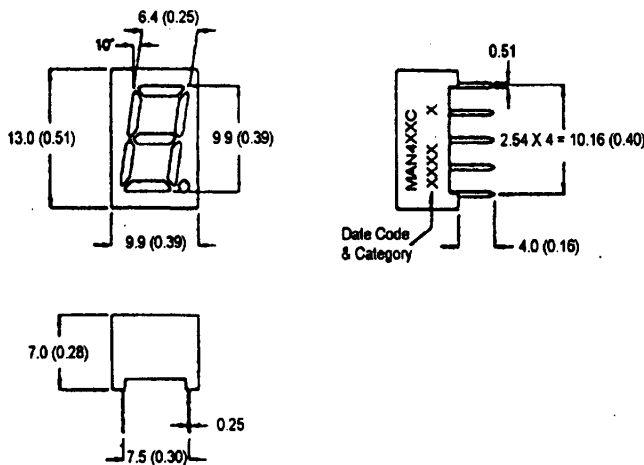


**BRIGHT RED MAN412C, MAN413C
GREEN MAN442C, MAN443C
HIGH EFF. RED MAN492C, MAN493C**

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)

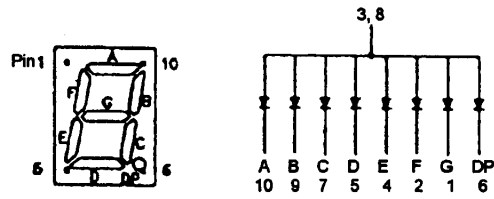
| | B.Red MAN 412C 413C | Green MAN 442C 443C | High Eff. Red MAN 492C 493C | Units |
|--|------------------------------|------------------------------|--------------------------------------|---|
| Part number | | | | |
| Continuous forward current (I_f) | | | | |
| Per Segment..... | 15 | 25 | 25 | 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°C | 0.17 | 0.33 | 0.33 | mW/ $^\circ\text{C}$ |
| Reverse voltage per dice..... | | | | 5V |
| Operating and Storage temperature range..... | | | | - 40°C to $+85^\circ\text{C}$ |
| Lead soldering time (at 1/16 inch from the bottom of lamp)..... | | | | 5 seconds @ 230°C |

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

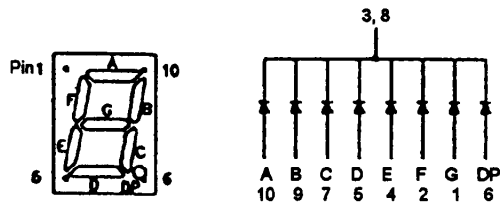
| | B. Red MAN 412C 413C | Green MAN 442C 443C | High Eff. Red MAN 492C 493C | Test Condition |
|-------------------------------------|-------------------------------|------------------------------|--------------------------------------|-------------------|
| <u>Part number</u> | | | | |
| Luminous intensity (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)

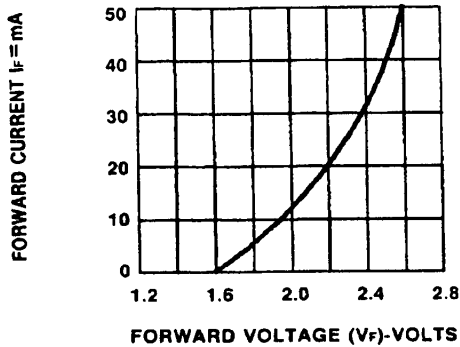


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

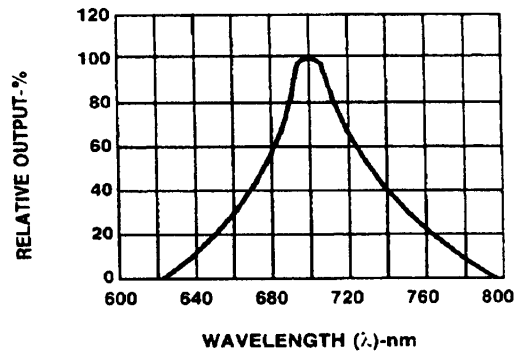


Fig.2 SPECTRAL RESPONSE

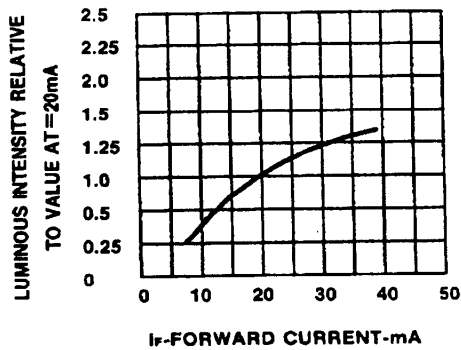


Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

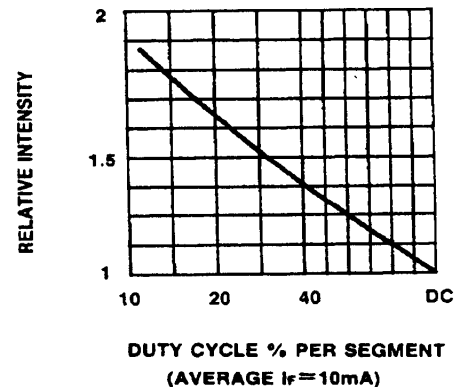


Fig.5 LUMINOUS INTENSITY VS. DUTY CYCLE

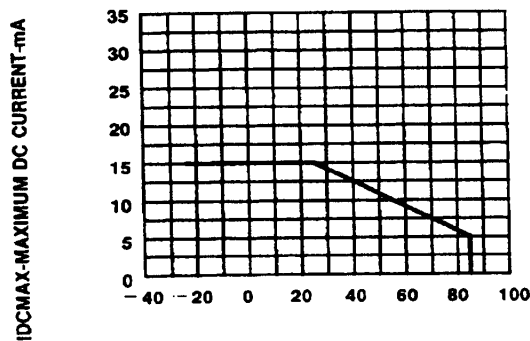


Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT VS. A FUNCTION OF AMBIENT TEMPERATURE.

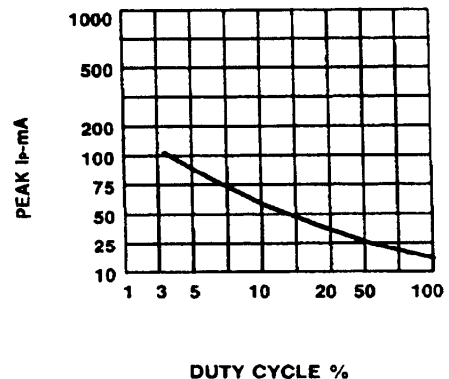


Fig.6 MAX PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE $f = 1 \text{ KHz}$)

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

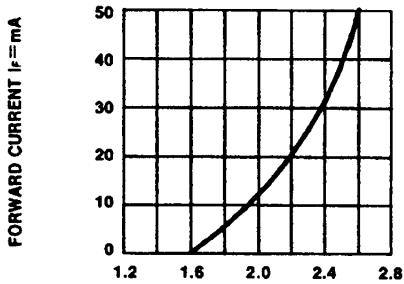


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

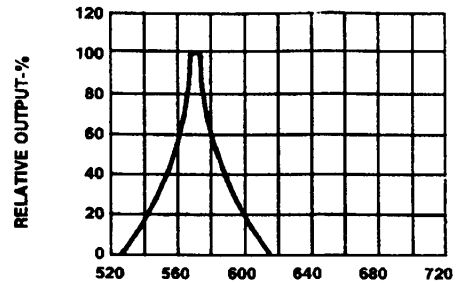


Fig.2 SPECTRAL RESPONSE

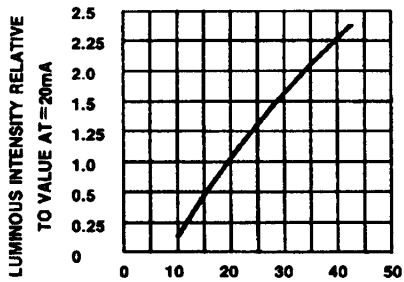


Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

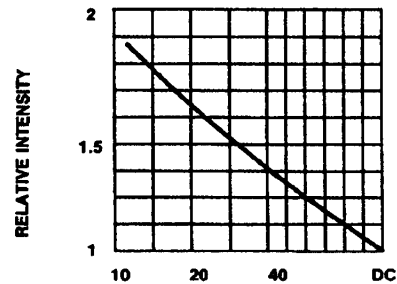


Fig.5 LUMINOUS INTENSITY VS. DUTY CYCLE

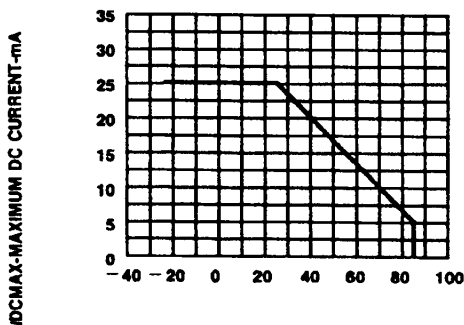


Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT CS. A FUNCTION OF AMBIENT TEMPERATURE.

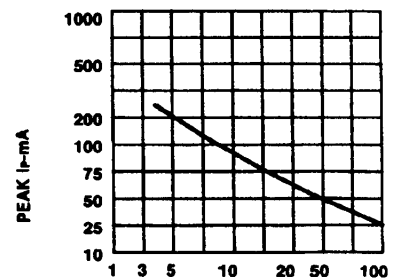


Fig. 6 MAX PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE $f=1\text{KHz}$)

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

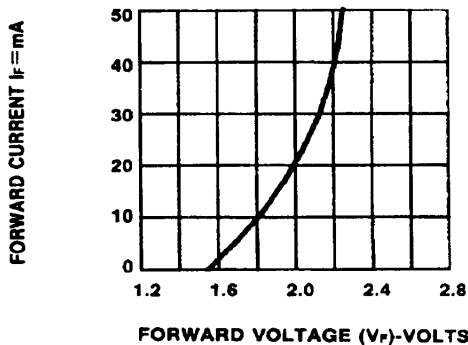


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

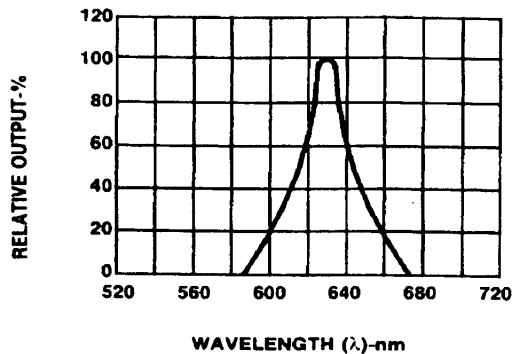


Fig.2 SPECTRAL RESPONSE

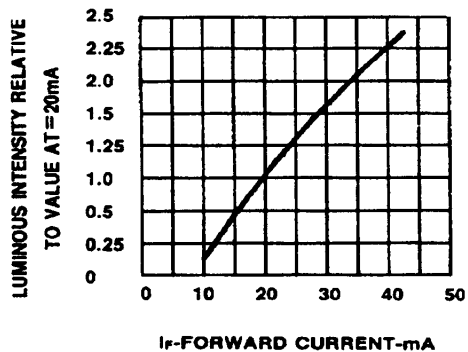


Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

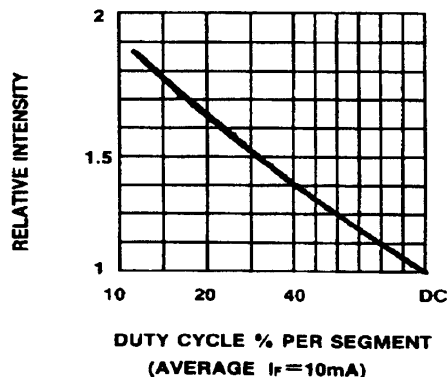


Fig.5 LUMINOUS INTENSITY VS. DUTY CYCLE

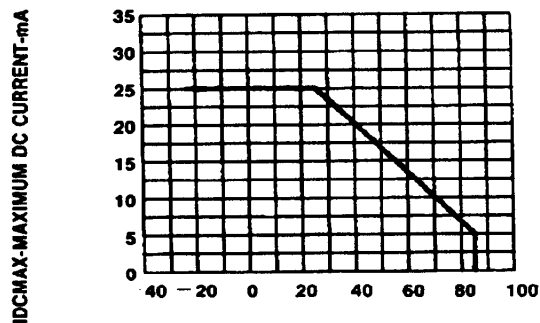


Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT VS. A FUNCTION OF AMBIENT TEMPERATURE.

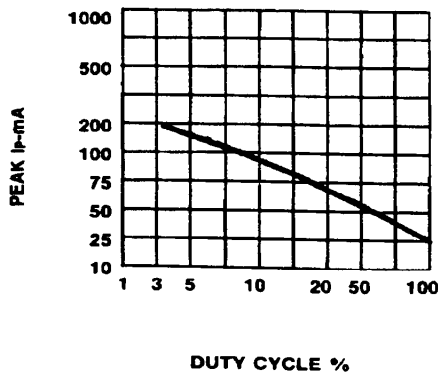


Fig. 6 MAX PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE $f=1\text{ KHz}$)

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