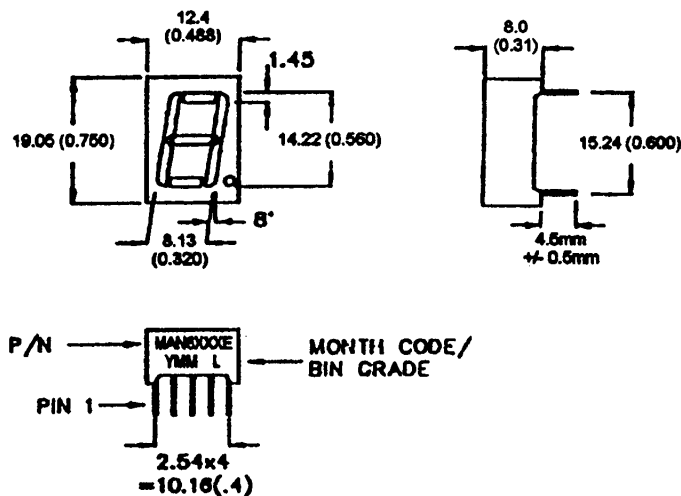


BRIGHT RED MAN6160E, MAN6180E
GREEN MAN6460E, MAN6480E
HIGH EFF. RED MAN6960E, MAN6980E

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 digit
- Common anode or cathode
- Low power consumption
- Highly visible bold segments
- High brightness with high contrast
- White segments on a grey face for MAN64X0E and MAN61X0E.
- Red segments and red face for MAN69X0E
- 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>
MAN6160E	Bright Red	Common Anode; right hand decimal
MAN6180E	Bright Red	Common Cathode; right hand decimal
MAN6460E	Green	Common Anode; right hand decimal
MAN6480E	Green	Common Cathode; right hand decimal
MAN6960E	High efficiency red	Common Anode; right hand decimal
MAN6980E	High efficiency red	Common Cathode; right hand decima

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

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

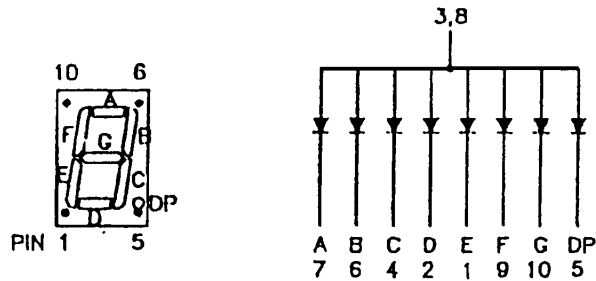
Part number	B.Red MAN 6160E 6180E	Green MAN 6460E 6480E	High Eff. Red MAN 6960E 6980E	Unit
Continuous forward current (I_f) Per Segment	15	30	30	mA
Peak forward current per die (I_p) (at $f = 1.0$ KHz, Duty factor = 1/10)	50	160	160	mA
Power dissipation (P_D) *Derate linearly from 25°C	45*	100*	100*	mW
Reverse voltage per dice.....	See graphical data attached			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)

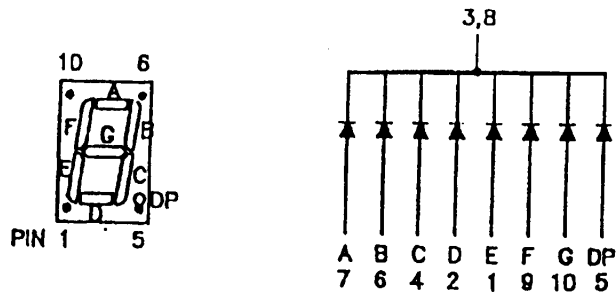
Part number	Bright Red MAN 6160E 6180E	Green MAN 6460E 6480E	High Eff. Red MAN 6960E 6980E	Test Condition
Luminous intensity (ucd) minimum	300	800	900	$I_f = 10$ mA
typical	700	2200	2200	
Forward voltage (V_f) typical	2.1	2.1	2.0	$I_f = 20$ mA
maximum	2.8	2.8	2.8	
Peak wavelength (nm)	697	570	635	$I_f = 20$ 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

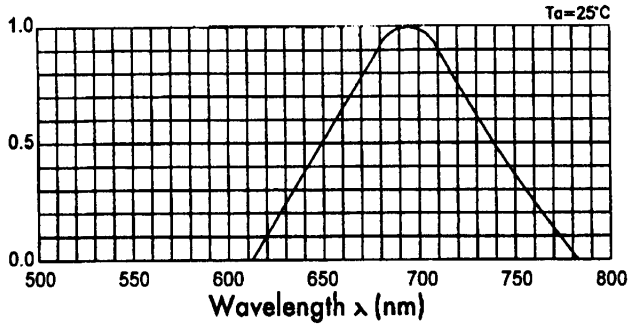
MAN6X60E - Common Anode



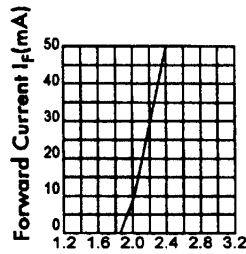
MAN6X80E - Common Cathode



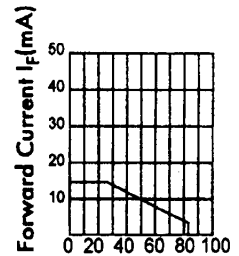
GRAPHICAL DETAIL: Bright Red ($T_A = 25^\circ\text{C}$ unless otherwise specified)



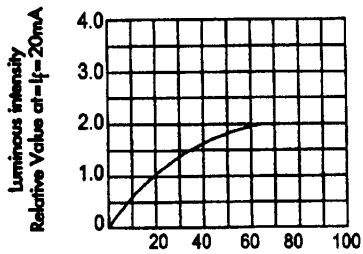
RELATIVE INTENSITY VS. WAVELENGTH



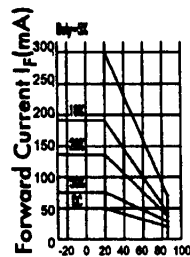
**FORWARD VOLTAGE (V_f)-volts
FORWARD CURRENT VS.
FORWARD VOLTAGE**



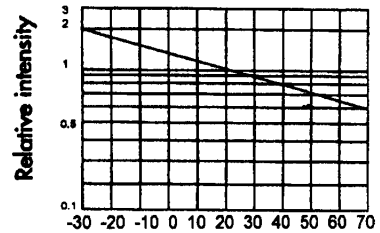
AMBIENT TEMPERATURE T_A ($^\circ\text{C}$)



**I_f -Forward current-mA
RELATIVE LUMINOUS INTENSITY
VS. FORWARD CURRENT**

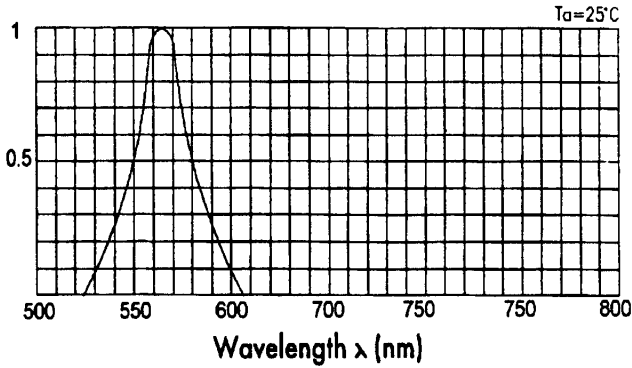


**AMBIENT TEMPERATURE ($^\circ\text{C}$)
VS. FORWARD CURRENT CAPACITY**

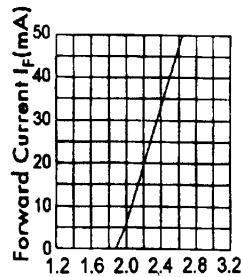


AMBIENT TEMPERATURE T_A ($^\circ\text{C}$)

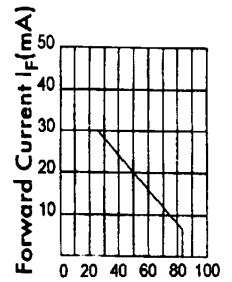
GRAPHICAL DETAIL: Green ($T_A = 25^\circ\text{C}$ unless otherwise specified)



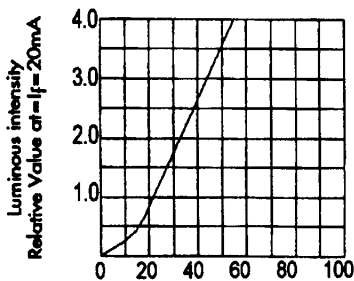
RELATIVE INTENSITY VS. WAVELENGTH



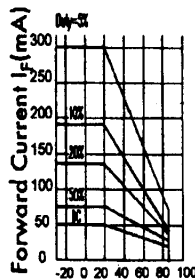
FORWARD VOLTAGE (V_f)-volts
FORWARD CURRENT VS.
FORWARD VOLTAGE



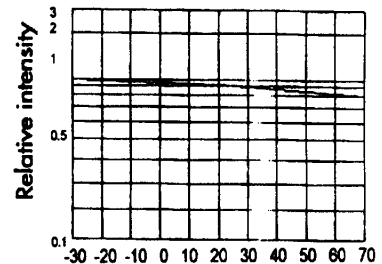
AMBIENT TEMPERATURE T_A ($^\circ\text{C}$)



I_f -Forward current-mA
RELATIVE LUMINOUS INTENSITY
VS. FORWARD CURRENT

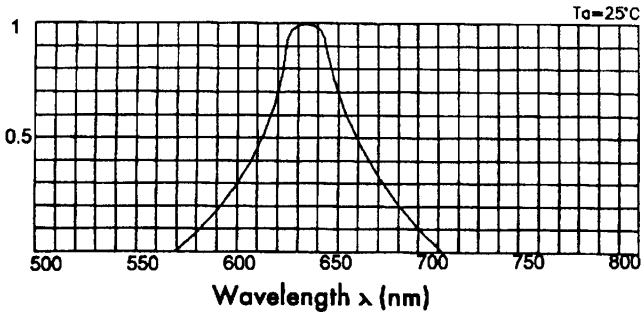


AMBIENT TEMPERATURE ($^\circ\text{C}$)
VS. FORWARD CURRENT CAPACITY

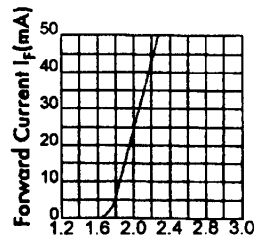


AMBIENT TEMPERATURE T_A ($^\circ\text{C}$)

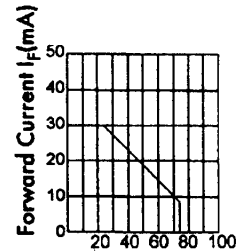
GRAPHICAL DETAIL: High Efficiency Red ($T_A = 25^\circ\text{C}$ unless otherwise specified)



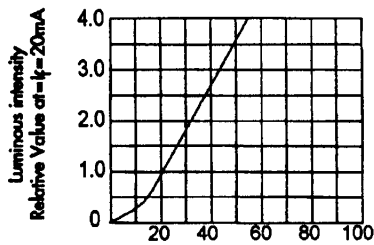
RELATIVE INTENSITY VS. WAVELENGTH



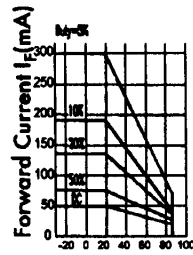
**FORWARD VOLTAGE (V_f)-volts
FORWARD CURRENT VS.
FORWARD VOLTAGE**



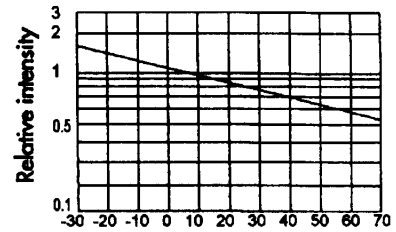
AMBIENT TEMPERATURE T_A ($^\circ\text{C}$)



**I_f -Forward current-mA
RELATIVE LUMINOUS INTENSITY
VS. FORWARD CURRENT**



**AMBIENT TEMPERATURE ($^\circ\text{C}$)
VS. FORWARD CURRENT CAPACITY**



AMBIENT TEMPERATURE T_A ($^\circ\text{C}$)

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