



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



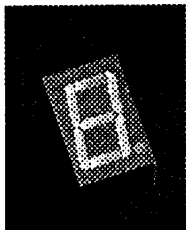
## Contact us

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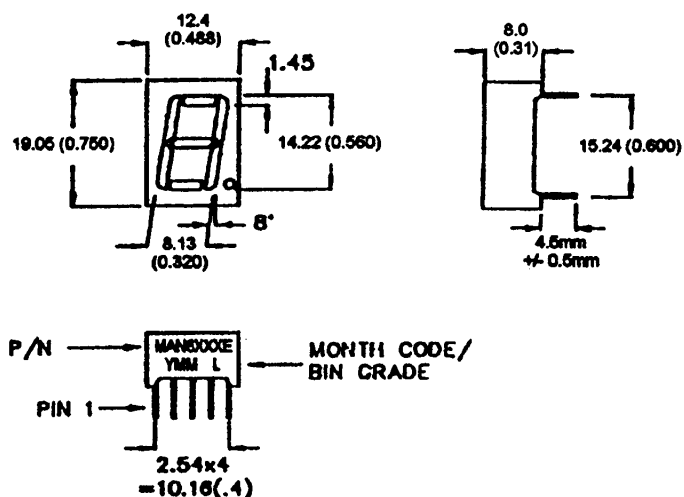
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





**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  $\pm 0.25$  (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)

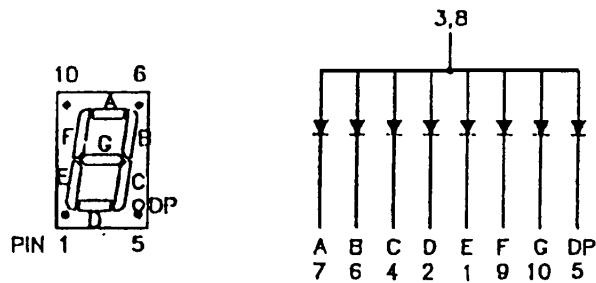
	B.Red MAN 6160E 6180E	Green MAN 6460E 6480E	High Eff. Red MAN 6960E 6980E	Unit
Part number				
Continuous forward current ( $I_f$ ) Per Segment	15	30	30	mA
Peak forward current per die ( $I_p$ ) (at $f = 1.0$ KHz, Duty factor = 1/10)	50	160	160	mA
Power dissipation ( $P_D$ )	45*	100*	100*	mW
*Derate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

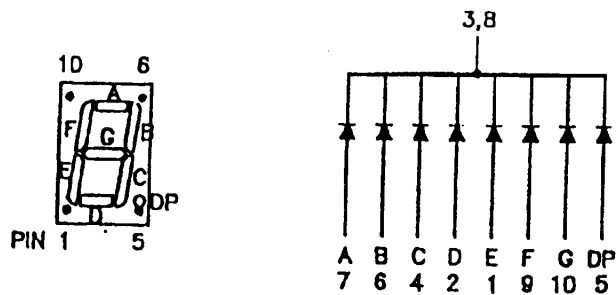
	Bright Red MAN 6160E 6180E	Green MAN 6460E 6480E	High Eff. Red MAN 6960E 6980E	Test Condition
Part number				
Luminous intensity (ucd)				$I_f = 10$ mA
minimum	300	800	900	
typical	700	2200	2200	
Forward voltage ( $V_f$ )				$I_f = 20$ mA
typical	2.1	2.1	2.0	
maximum	2.8	2.8	2.8	
Peak wavelength (nm)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

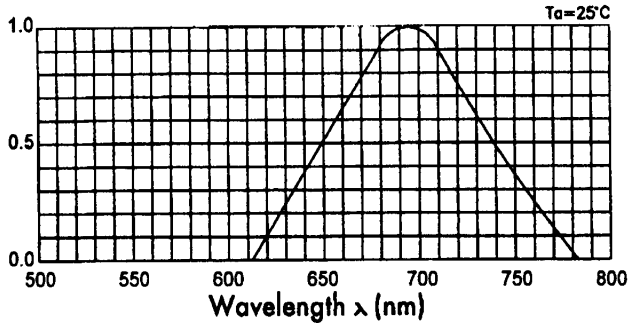
**MAN6X60E - Common Anode**



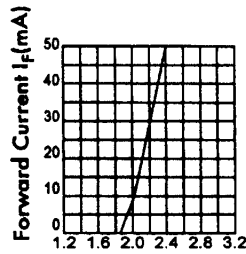
**MAN6X80E - Common Cathode**



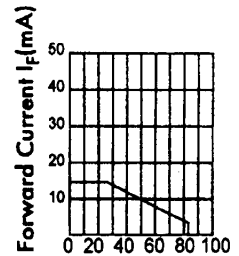
**GRAPHICAL DETAIL: Bright Red** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)



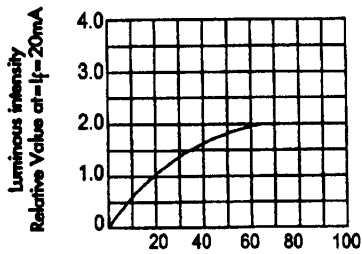
RELATIVE INTENSITY VS. WAVELENGTH



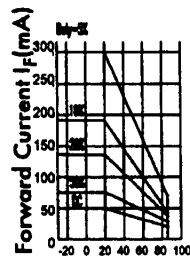
FORWARD VOLTAGE ( $V_f$ )-volts  
FORWARD CURRENT VS.  
FORWARD VOLTAGE



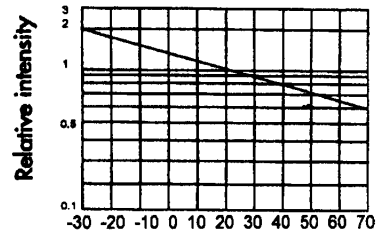
AMBIENT TEMPERATURE  $T_A$  ( $^\circ\text{C}$ )



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

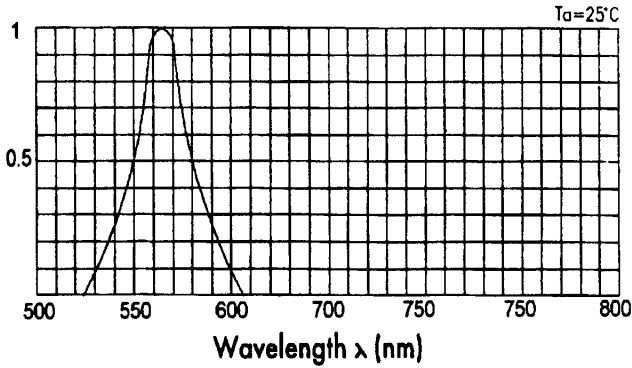


AMBIENT TEMPERATURE ( $^\circ\text{C}$ )  
VS. FORWARD CURRENT CAPACITY

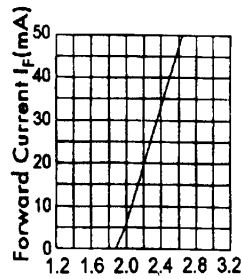


AMBIENT TEMPERATURE  $T_A$  ( $^\circ\text{C}$ )

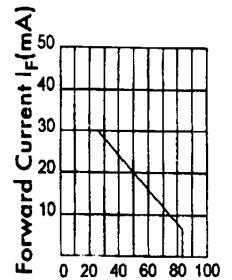
**GRAPHICAL DETAIL: Green** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)



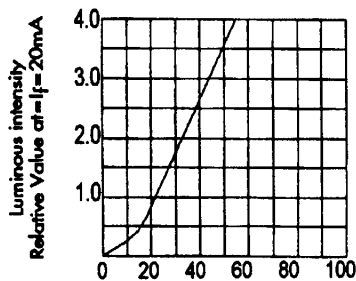
RELATIVE INTENSITY VS. WAVELENGTH



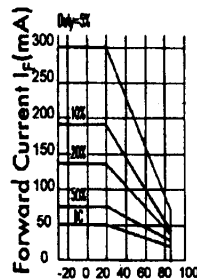
FORWARD VOLTAGE ( $V_f$ )-volts  
FORWARD CURRENT VS.  
FORWARD VOLTAGE



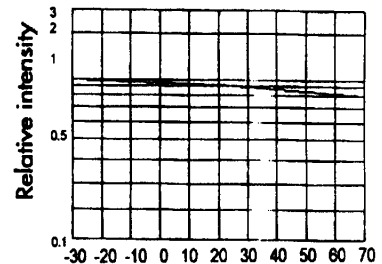
AMBIENT TEMPERATURE  $T_A$  ( $^\circ\text{C}$ )



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

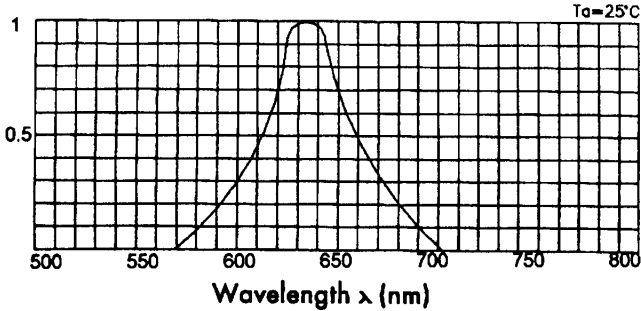


AMBIENT TEMPERATURE ( $^\circ\text{C}$ )  
VS. FORWARD CURRENT CAPACITY

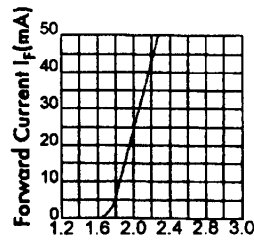


AMBIENT TEMPERATURE  $T_A$  ( $^\circ\text{C}$ )

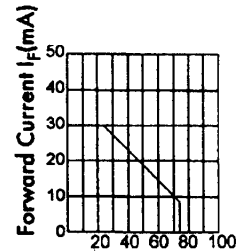
**GRAPHICAL DETAIL: High Efficiency Red** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)



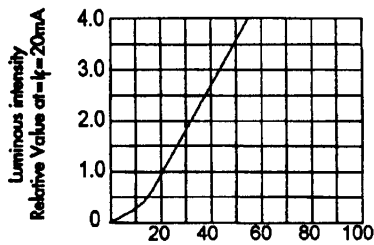
**RELATIVE INTENSITY VS. WAVELENGTH**



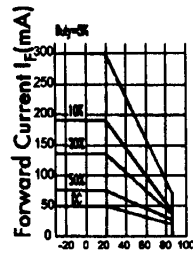
**FORWARD VOLTAGE ( $V_f$ )-volts  
FORWARD CURRENT VS.  
FORWARD VOLTAGE**



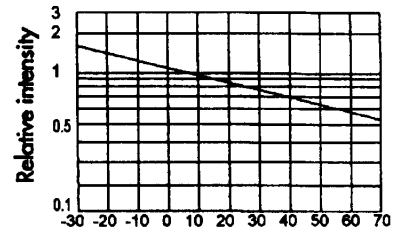
**AMBIENT TEMPERATURE  $T_A$  ( $^\circ\text{C}$ )**



**$I_f$ -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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