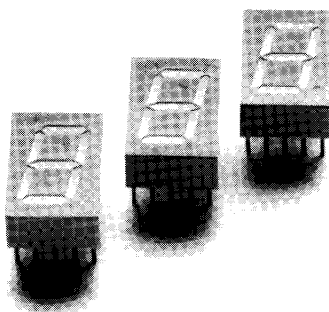




0.510 INCH (13 MM) SEVEN SEGMENT DISPLAYS

YELLOW MAN5350/5360
GREEN MAN5450/5460

RED MAN5750/5760
ORANGE-RED MAN5950/5960



DESCRIPTION

This display series is a family of large digits 0.510 inches in height. All models have right hand decimal points and are available in common anode or common cathode configurations. All units are constructed with untinted segments on grey face to enhance ON/OFF contrast. Standard units are available in red, orange-red, green and yellow.

FEATURES

- Large, easy to read, digits
- Common anode or common cathode models
- Fast switching - excellent for multiplexing
- Low power consumption
- Bold solid segments that are highly legible
- Solid state reliability - long operation life
- Rugged plastic construction
- Directly compatible with integrated circuits
- High brightness with high contrast
- Categorized for luminous intensity (see Note 5)
- Wide angle viewing . . . 150°
- Low forward voltage
- Untinted segments on grey face

APPLICATIONS

For industrial and consumer applications such as:

- Digital readout displays
- Instrument panels
- Point of sale equipment
- Digital clocks
- TV and radios

MODEL NUMBERS

PART NUMBER	COLOR	DESCRIPTION	PIN OUT SPECIFICATION (See Page 5)
MAN5350	Yellow	Common Anode	A
MAN5360	Yellow	Common Cathode	B
MAN5450	Green	Common Anode	A
MAN5460	Green	Common Cathode	B
MAN5750	Red	Common Anode	A
MAN5760	Red	Common Cathode	B
MAN5950	Orange-Red	Common Anode	A
MAN5960	Orange-Red	Common Cathode	B

ELECTRO-OPTICAL CHARACTERISTICS (TA = 25° Unless Otherwise Specified)					
	MIN.	TYP.	MAX.	UNITS	TEST CONDITION
YELLOW MAN5350/MAN5360					
Luminous Intensity, digit average (See Note 1)	820	1200 480		μcd μcd	$I_F = 10\text{ mA}$ $I_F = 5\text{ mA}$
Peak emission wavelength		585		nm	$I_F = 10\text{ mA}$
Dominant wavelength	582		593	nm	$I_F = 10\text{ mA}$
Spectral line half width		40		nm	
Forward voltage		2.4	3.0	V	$I_F = 20\text{ mA}$
Dynamic resistance		26			$I_F = 20\text{ mA}$
Capacitance		35		pF	$V_R = 0, f = 1\text{ MHz}$
Reverse current			10	μA	$V_R = 6.0\text{ V}$
GREEN MAN5450/MAN5460					
Luminous Intensity, digit average (See Note 1)	820	3000 1000		μcd μcd	$I_F = 10\text{ mA}$ $I_F = 5\text{ mA}$
Peak emission wavelength		562		nm	$I_F = 10\text{ mA}$
Dominant wavelength	564		574	nm	$I_F = 10\text{ mA}$
Spectral line half width		30		nm	
Forward voltage		2.4	3.0	V	$I_F = 20\text{ mA}$
Dynamic resistance		12			$I_F = 20\text{ mA}$
Capacitance		40		pF	$V_R = 0, f = 1\text{ MHz}$
Reverse current			10	μA	$V_R = 6.0\text{ V}$

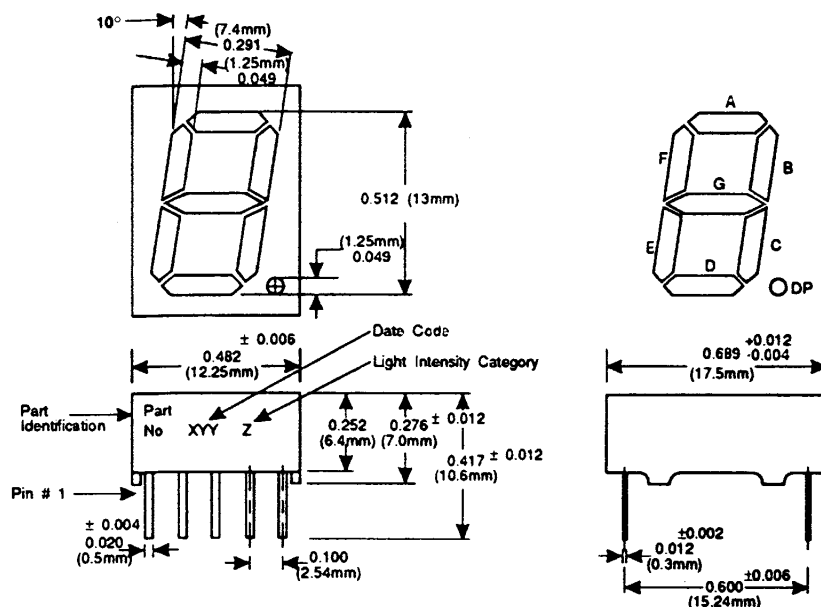
ELECTRO-OPTICAL CHARACTERISTICS (TA = 25° Unless Otherwise Specified)					
	MIN.	TYP.	MAX.	UNITS	TEST CONDITION
RED MAN5750/MAN5760					
Luminous Intensity, digit average (See Note 1)	280	500 250		μcd μcd	$I_F = 10\text{ mA}$ $I_F = 5\text{ mA}$
Peak emission wavelength		655		nm	$I_F = 10\text{ mA}$
Dominant wavelength		645		nm	$I_F = 10\text{ mA}$
Spectral line half width		20		nm	
Forward voltage		1.6	2.0	V	$I_F = 20\text{ mA}$
Dynamic resistance		2			$I_F = 20\text{ mA}$
Capacitance		35		pF	$V_R = 0, f = 1\text{ MHz}$
Reverse current			10	μA	$V_R = 6.0\text{ V}$
ORANGE-RED MAN5950/MAN5960					
Luminous Intensity, digit average (See Note 1)	820	2500 700		μcd μcd	$I_F = 10\text{ mA}$ $I_F = 5\text{ mA}$
Peak emission wavelength		635		nm	$I_F = 10\text{ mA}$
Dominant wavelength	615		630	nm	$I_F = 10\text{ mA}$
Spectral line half width		40		nm	
Forward voltage		2.0	3.0	V	$I_F = 20\text{ mA}$
Dynamic resistance		26			$I_F = 20\text{ mA}$
Capacitance		35		pF	$V_R = 0, f = 1\text{ MHz}$
Reverse current			10	μA	$V_R = 6.0\text{ V}$

ABSOLUTE MAXIMUM RATINGS				
	MAN5350 MAN5360	MAN5450 MAN5460	MAN5750 MAN5760	MAN5950 MAN5960
Power Dissipation at 25°C Ambient	600 mW	570 mW	480 mW	600 mW
Derate linearly from 50°C	-10.3 mW/°C	-12 mW/°C	-6.9 mW/°C	-8.6 mW/°C
Storage and operating temperature	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Continuous forward current				
Total	200 mA	240 mA	240 mA	240 mA
Per segment	25 mA	30 mA	30 mA	30 mA
Decimal point	25 mA	30 mA	30 mA	30 mA
Reverse voltage				
Per segment	6.0 V	6.0 V	6.0 V	6.0 V
Decimal point	6.0 V	6.0 V	6.0 V	6.0 V
Soldering time at 260°C (See Notes 3 and 4)	5 sec.	5 sec.	5 sec.	5 sec.

NOTES
1. The digit average Luminous Intensity is obtained by summing the Luminous Intensity of each segment and dividing by the total number of segments. Intensity will not vary more than $\pm 33.3\%$ between all segments within a digit.
2. The relative luminous intensity in this curve is normalized to the brightness at 25°C to indicate the relative efficiency over the operating temperature range.
3. Leads of the device immersed to 1/16 inch from the body. Maximum device surface temperature is 140°C.
4. For flux removal, Freon TF, Freon TE, Isopropanol or water may be used up to their boiling points.
5. All displays are categorized for Luminous Intensity. The intensity category is marked on each part as a suffix letter to the part number.

RECOMMENDED OPTICAL FILTERS			
For optimum ON and OFF contrast, one of the following filters or equivalents should be used over the display:			
DEVICE TYPE	FILTER	DEVICE TYPE	FILTER
MAN5350 MAN5360	Panelgraphic Yellow 25 or Amber 23 Homalite 100-1720 or 100-1726 Panelgraphic Grey 10 Homalite 100-1266 Grey	MAN5450 MAN5460	Panelgraphic Green 48 Homalite 100-1440 Green Panelgraphic Grey 10 Homalite 100-1266 Grey
MAN5750 MAN5760	Panelgraphic Red 60 Homalite 100-1605	MAN5950 MAN5960	Panelgraphic Scarlet 65 Homalite 100-1670

PACKAGE DIMENSIONS

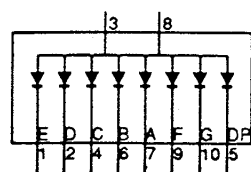


NOTE: Dimensions in inches (mm)
Tolerances ± 0.010" unless otherwise specified

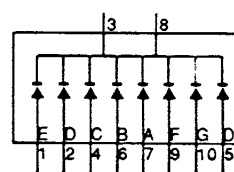
ELECTRICAL CONNECTIONS

PIN NO.	A MAN 5 X 50	B MAN 5 X 60
1	Cathode E	Anode E
2	Cathode D	Anode D
3	Com. Anode	Com. Cathode
4	Cathode C	Anode C
5	Cathode D.P.	Anode D.P.
6	Cathode B	Anode B
7	Cathode A	Anode A
8	Com. Anode	Com. Cathode
9	Cathode F	Anode F
10	Cathode G	Anode G

INTERNAL CONNECTIONS



MAN 5 X 50



MAN 5 X 60

TYPICAL CHARACTERISTIC CURVES

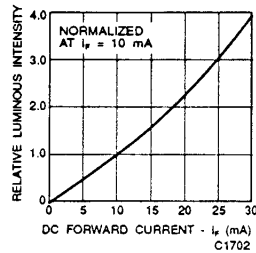


Fig. 1A. Relative Luminous Intensity vs. DC Forward Current

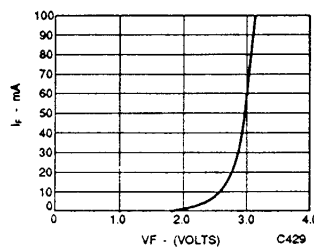


Fig. 1B. Forward Current vs. Forward Voltage

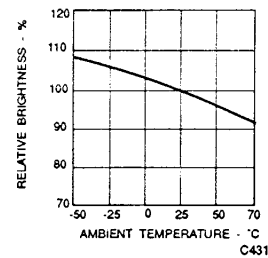


Fig. 1C. Relative Luminous Intensity vs. Temperature (See Note 2)

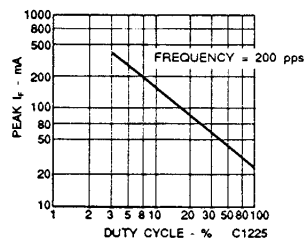


Fig. 1D. Max Peak Current vs. Duty Cycle

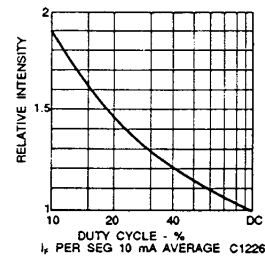


Fig. 1E. Relative Luminous Intensity vs. Duty Cycle

FIGURE 1: MAN5350/MAN5360

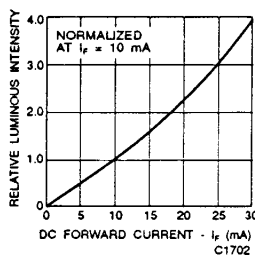


Fig. 2A. Relative Luminous Intensity vs. Forward Current

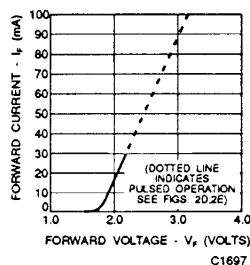


Fig. 2B. Forward Current vs. Forward Voltage

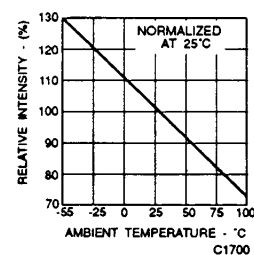


Fig. 2C. Relative Luminous Intensity vs. Temperature (See Note 2)

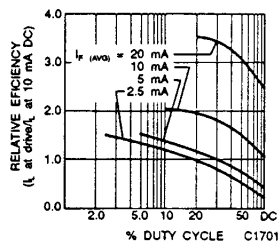


Fig. 2D. Relative Efficiency vs. Duty Cycle

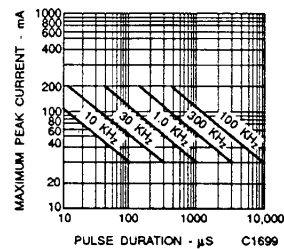


Fig. 2E. Maximum Peak Current vs. Pulse Duration

FIGURE 2: MAN5450/MAN5460

TYPICAL CHARACTERISTIC CURVES

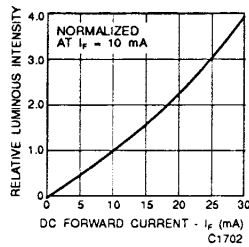


Fig. 3A. Relative Luminous Intensity vs. DC Forward Current

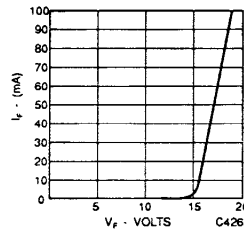


Fig. 3B. Forward Current vs. Forward Voltage

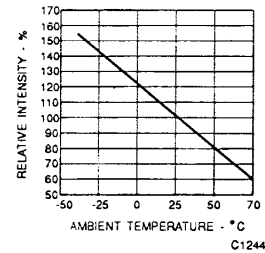


Fig. 3C. Relative Luminous Intensity vs. Temperature (See Note 2)

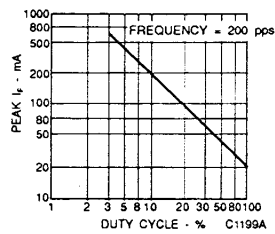


Fig. 3D. Max Peak Current vs. Duty Cycle

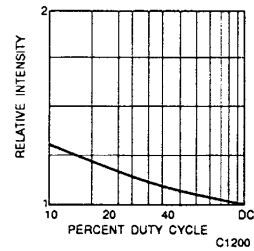


Fig. 3E. Relative Luminous Intensity vs. Duty Cycle

FIGURE 3: MAN5750/MAN5760

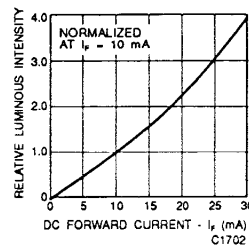


Fig. 4A. Relative Luminous Intensity vs. Forward Current

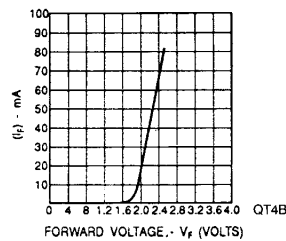


Fig. 4B. Forward Current vs. Forward Voltage

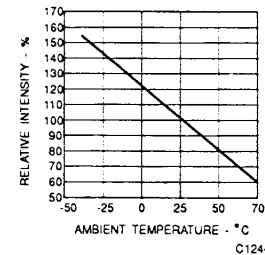


Fig. 4C. Relative Luminous Intensity vs. Temperature (See Note 2)

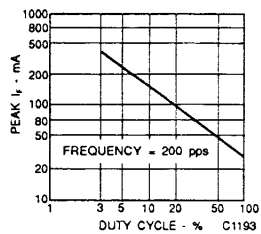


Fig. 4D. Maximum Peak Current vs. Duty Cycle

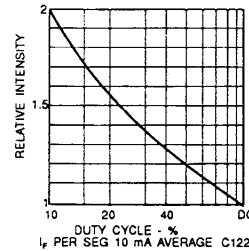


Fig. 4E. Relative Luminous Intensity vs. Duty Cycle

FIGURE 4: MAN5950/MAN5960



0.510 INCH (13MM) SEVEN SEGMENT DISPLAYS

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