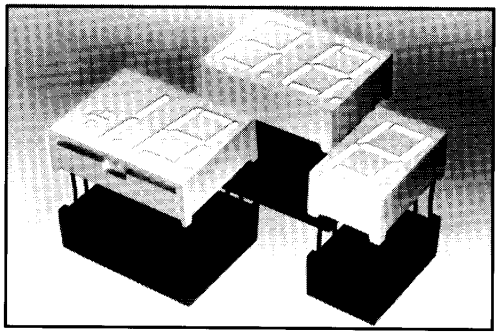
FAIRCHILD
SEMICONDUCTOR™

0.560-INCH SEVEN SEGMENT DISPLAYS

HIGH EFFICIENCY RED MAN6900 SERIES



DESCRIPTION

The MAN6900 Series is a family of large digits which includes double and single digits. The series features the sculptured font which minimizes "gappiness" at the segment intersections. Available models include two-digit, one and one-half digits with polarity sign, and single digits. All models have right hand decimal points and are available in common anode or common cathode configuration. This device has a Red face and Red segments.

FEATURES

- High Efficiency Red nitrogen-doped GaAsP on GaP
- 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 6)
- Wide angle viewing...150°
- Low forward voltage
- Two-digit package simplifies alignment and assembly

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	PACKAGE DRAWING	PIN OUT SPECIFICATION
MAN6910	High Eff. Red	2 Digit; Common Anode; Rt. Hand Decimal	A	A
MAN6930	High Eff. Red	1½ Digit; Common Anode; Overflow ±1.8; Rt. Hand Decimal	B	B
MAN6940	High Eff. Red	2 Digit; Common Cathode; Rt. Hand Decimal	A	C
MAN6950	High Eff. Red	1½ Digit; Common Cathode; Overflow ±1.8; Rt. Hand Decimal	B	D
MAN6960	High Eff. Red	Single Digit; Common Anode; Rt. Hand Decimal	C	E
MAN6980	High Eff. Red	Single Digit; Common Cathode; Rt. Hand Decimal	C	F

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
MAN6900 Series	Panelgraphic Scarlet 65 Homalite 100-1670

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ELECTRO-OPTICAL CHARACTERISTICS
(Per Diode at 25°C Free Air Temperature Unless Otherwise Specified)

	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Luminous Intensity, digit average (See Note 1)	510	2200		μcd	I_F=10 mA
Peak emission wavelength		635		nm	
Spectral line half width		40		nm	
Forward voltage					
Segment			2.5	V	I_F=20 mA
Decimal point			2.5	V	I_F=20 mA
Dynamic resistance					
Segment		26		Ω	I_F=20 mA
Decimal point		26		Ω	I_F=20 mA
Capacitance					
Segment		35		pF	V=0
Decimal point		35		pF	V=0
Reverse current					
Segment			100	μA	V_R=5.0 V
Decimal point			100	μA	V_R=5.0 V

ABSOLUTE MAXIMUM RATINGS

	MAN6910 MAN6940	MAN6930 MAN6950	MAN6960 MAN6980
Power dissipation at 25°C ambient	1200 mW	1050 mW	600 mW
Derate linearly from 50°C	−17.1 mW/°C	−15.0 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
Continuous forward current			
Total	480 mA	420 mA	240 mA
Per segment	30 mA	30 mA	30 mA
Decimal point	30 mA	30 mA	30 mA
Reverse voltage			
Per segment	6.0 V	6.0 V	6.0 V
Decimal point	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.

TYPICAL THERMAL CHARACTERISTICS

Thermal resistance junction to free air Φ_{JA}	160°C/W
Wavelength temperature coefficient (case temperature)	1.0Å/°C
Forward voltage temperature coefficient	−2.0 mV/°C

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 ±33.3% between all segments within a digit.*
2. *The curve in Figure 3 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, Isoproponal 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.*

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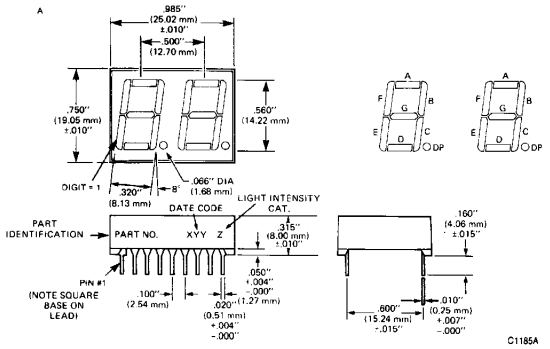
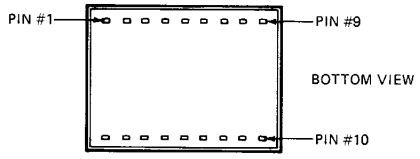
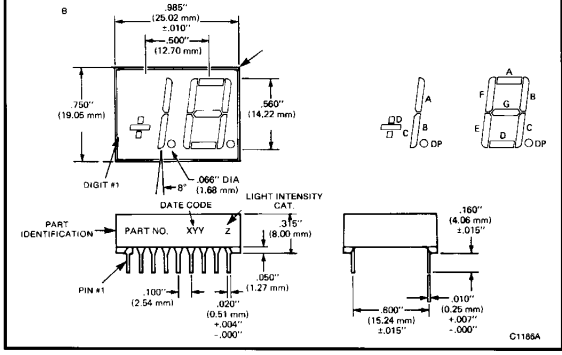
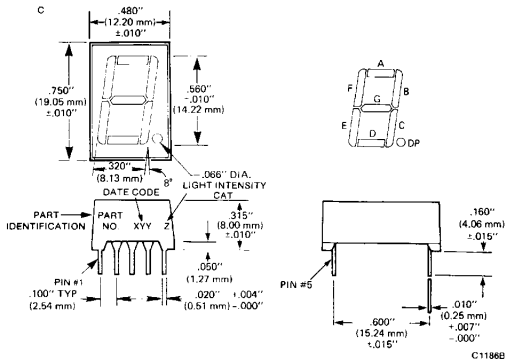
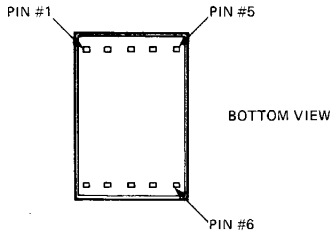
PACKAGE DIMENSIONS











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ELECTRICAL CONNECTIONS

PIN NO.	ELECTRICAL CONNECTIONS					
	A MAN6910	B MAN6930	C MAN6940	D MAN6950	E MAN6960	F MAN6980
1	Cathode E 1	Cathode C 1	Anode E 1	Anode C 1	Cathode E	Anode E
2	Cathode D 1	Cathode D 1	Anode D 1	Anode D 1	Cathode D	Anode D
3	Cathode C 1	Cathode B 1	Anode C 1	Anode B 1	Com. Anode	Com. Cathode
4	Cathode D.P. 1	Cathode D.P. 1	Anode D.P. 1	Anode D.P. 1	Cathode C	Anode C
5	Cathode E 2	Cathode E 2	Anode E 2	Anode E 2	Cathode D.P.	Anode D.P.
6	Cathode D 2	Cathode D 2	Anode D 2	Anode D 2	Cathode B	Anode B
7	Cathode G 2	Cathode G 2	Anode G 2	Anode G 2	Cathode A	Anode A
8	Cathode C 2	Cathode C 2	Anode C 2	Anode C 2	Com. Anode	Com. Cathode
9	Cathode D.P. 2	Cathode D.P. 2	Anode D.P. 2	Anode D.P. 2	Cathode F	Anode F
10	Cathode B 2	Cathode B 2	Anode B 2	Anode B 2	Cathode G	Anode G
11	Cathode A 2	Cathode A 2	Anode A 2	Anode A 2		
12	Cathode F 2	Cathode F 2	Anode F 2	Anode F 2		
13	Anode Digit 2	Anode Digit 2	Cathode Digit 2	Cathode Digit 2		
14	Anode Digit 1	Anode Digit 1	Cathode Digit 1	Cathode Digit 1		
15	Cathode B 1	Cathode A 1	Anode B 1	Anode A 1		
16	Cathode A 1	No Connection	Anode A 1	No Connection		
17	Cathode G 1	No Connection	Anode G 1	No Connection		
18	Cathode F 1	No Connection	Anode F 1	No Connection		

TYPICAL CHARACTERISTIC CURVES

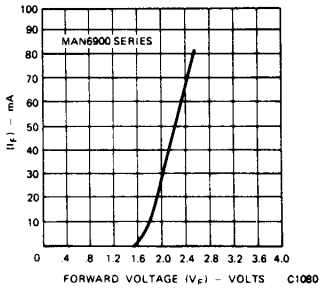

Fig. 1. Forward Current vs. Forward Voltage

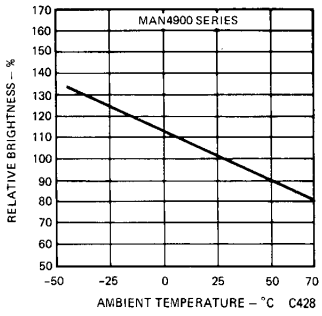

Fig. 2. Luminous Intensity vs. Forward Current

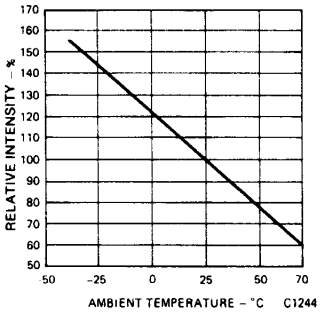

Fig. 3. Luminous Intensity vs. Temperature (See Note 2)

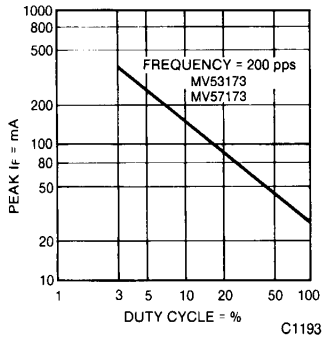

Fig. 4 Max Peak Current vs. Duty Cycle

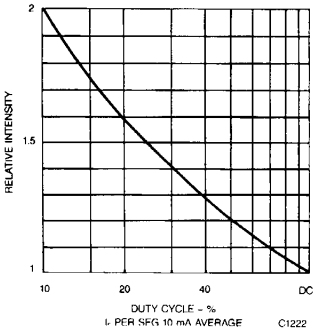

Fig. 5. Luminous Intensity vs. Duty Cycle

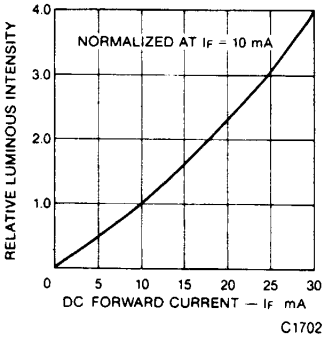

Fig. 6. Relative Luminous Intensity vs. Forward Current

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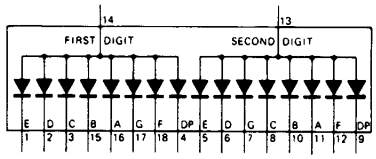
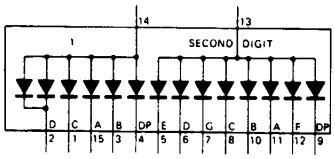
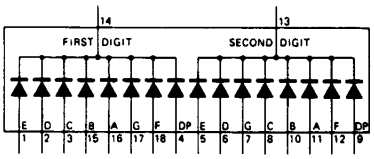
INTERNAL CONNECTIONS



MAN6910 C1195



MAN6930 C1196



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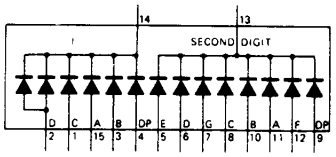

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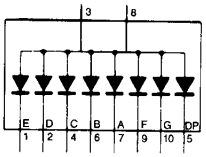

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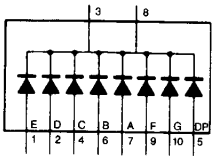

MAN6980 C1239

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.