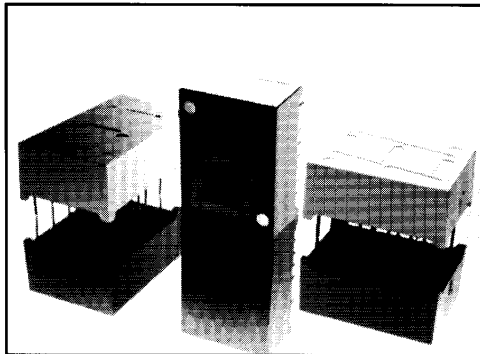
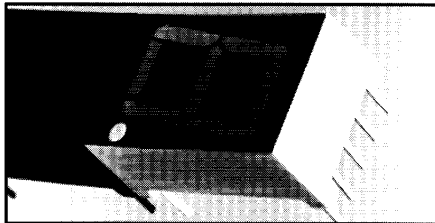
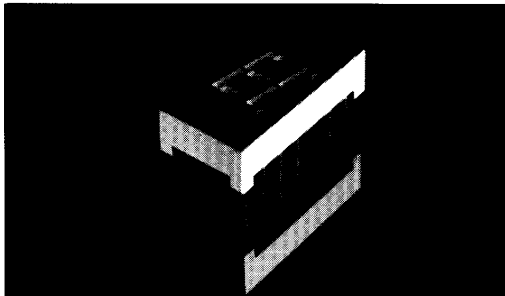


**DOUBLE HETEROJUNCTION  
AlGaAs RED  
SUNLIGHT VIEWABLE DISPLAYS**

**7.6mm (0.3in) MAN32X0A**  
**14.2mm (0.56in) MAN62X0**  
**20.0mm (0.8in) MAN82X0**



**DESCRIPTION**

This line of solid state LED displays uses newly developed Double Heterojunction (DH) AlGaAs/GaAs material technology. This LED material has outstanding light output efficiency over a wide range of drive currents and can either be DC or pulse driven. The color is deep red at the dominant wavelength of 637 nanometers. Viewability of up to 10 meters (MAN8200 Series) is available for applications in bright sunlight such as automotive and avionic instrumentation, portable instruments, point-of-sale terminals and gas pumps.

**FEATURES**

- Sunlight Viewable  
Typical intensity of 15mcd/Seg at 20mA Drive
- Capable of high drive currents
- Excellent for multiplexing long digit strings
- Three Character Sizes  
7.6mm (0.3in), 14.2mm (0.56in), 20.0mm (0.8in)
- Excellent character appearance  
Evenly lighted segments  
Wide viewing angle  
Grey body for optimum contrast
- Categorized for luminous intensity. Use of like categorizes yields a uniform display

**MODEL NUMBERS**

PART NO.	CHARACTER SIZE	DESCRIPTION	PACKAGE DRAWING
MAN3210A	0.3" (7.6mm)	Common anode; right hand decimal	A
MAN3240A		Common cathode; right hand decimal	B
MAN3220A		Common anode; left hand decimal	C
MAN6260	0.56" (14.2mm)	Common anode; right hand decimal	D
MAN6280		Common cathode; right hand decimal	E
MAN8210	0.8" (20mm)	Common anode; right hand decimal	F
MAN8240		Common cathode; right hand decimal	G

<b>ELECTRICAL/OPTICAL CHARACTERISTICS AT T<sub>A</sub>=25°C</b>							
DESCRIPTION	SYMBOL	DEVICE	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Luminous intensity/segment [1.2] (digit average)	I <sub>v</sub>	MAN3200A Series	I <sub>F</sub> =20 mA DC	6.9	12.0		mcd
		MAN6200 Series	I <sub>F</sub> =20 mA DC	9.1	15.0		mcd
		MAN8200 Series	I <sub>F</sub> =20 mA DC	6.0	11.0		mcd
Peak wavelength	λ Peak	All Devices			645		nm
Dominant wavelength [3]	λ <sub>d</sub>	All Devices			637		nm
Forward voltage/segment or DP	V <sub>F</sub>	All Devices	I <sub>F</sub> =100 mA		2.0	3.0	V
Reverse voltage/segment or DP	V <sub>R</sub>	All Devices	I <sub>R</sub> =100 μA	3.0	15		V
Temp. coefficient of V <sub>F</sub> /seg. or DP	ΔV <sub>F</sub> /°C				-2mV		mV/°C
Thermal resistance LED junction— to—pin	RθJ-PIN	MAN3200A			255		°C/W/Seg.
		MAN6200			400		
		MAN8200			430		

<b>NOTES</b>
1. Case temperature of the device immediately prior to the intensity measurement is 25°C.
2. The digits are categorized for luminous intensity with the intensity category designated by a letter on the side of the package.
3. The dominant wavelength, λ <sub>d</sub> , is derived from the CIE chromaticity diagram and is that single wavelength which defines the color of the device.

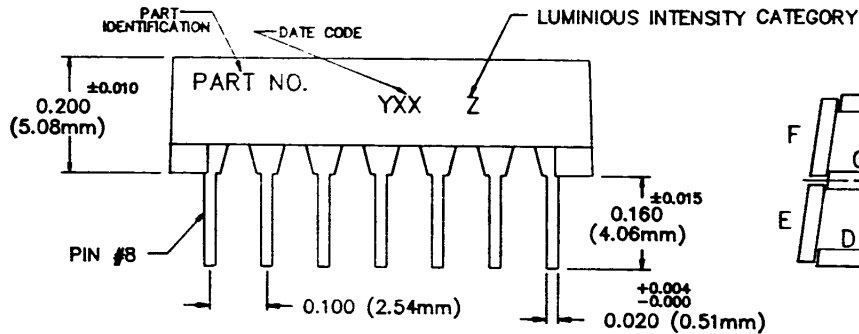
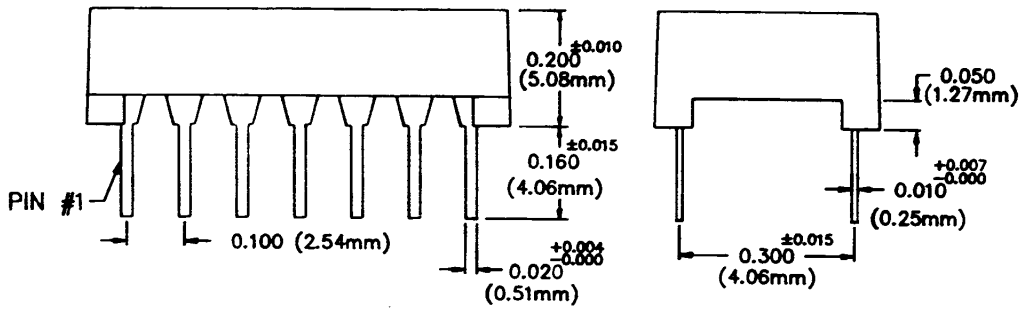
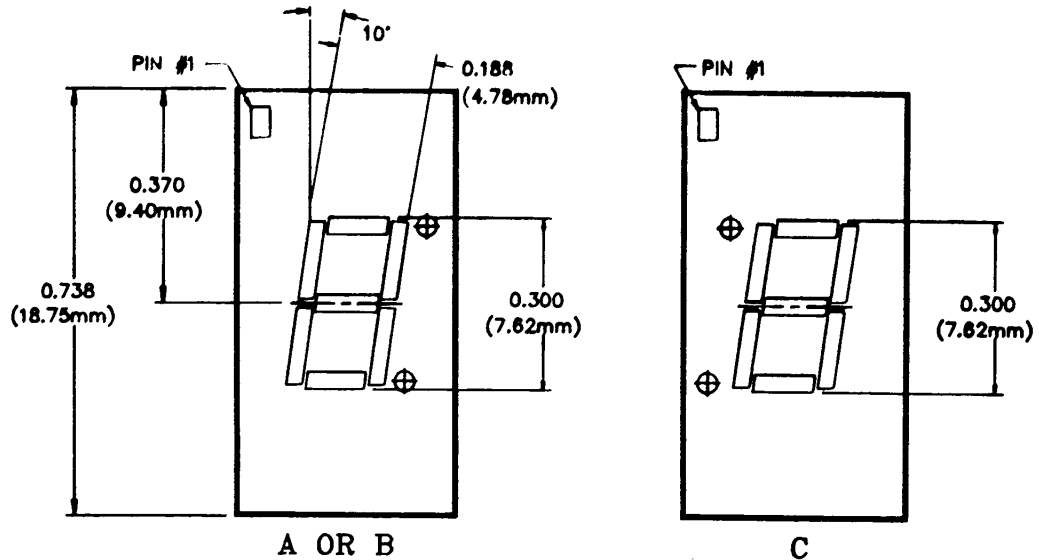
<b>ABSOLUTE MAXIMUM RATINGS</b> (All Products)	
Average power per segment or DP (T <sub>A</sub> =25°C)	96 mW
Peak forward current per segment or DP (T <sub>A</sub> =25°C)[1]	160 mA
Average or DC forward current per segment or DP (T <sub>A</sub> =25°C)	40 mA
Operating temperature range	-20°C to +85°C
Storage temperature range	-40°C to +85°C
Reverse voltage per segment or DP	3.0 V
Lead solder temperature (1.59 mm [1/16"] below seating plane)	260°C for 3 sec.

**NOTES:** 1. Do not exceed maximum average current per segment.

<b>NOTES</b>
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 segment within a digit.
2. Leads of the device immersed to 1/16" from the body. Maximum device surface temperature is 140°C.
3. For flux removal, Freon TF, Freon TE, Isopropanol or water may be used up to their boiling points.
4. All displays are categorized for Luminous Intensity. The intensity category is marked on each part as a suffix letter to the part numbers.

**PACKAGE DIMENSIONS**

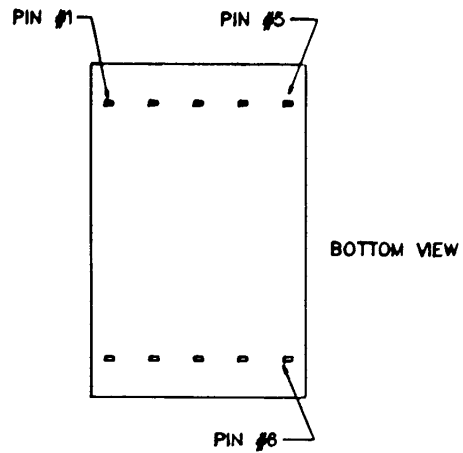
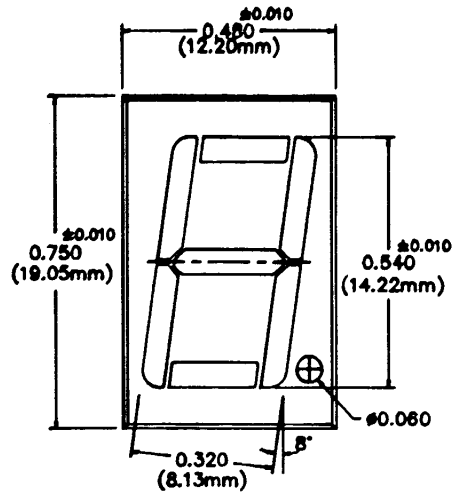
MAN3200A SERIES



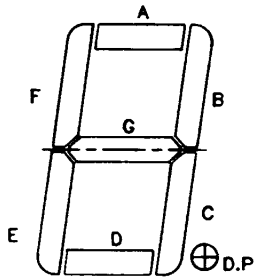
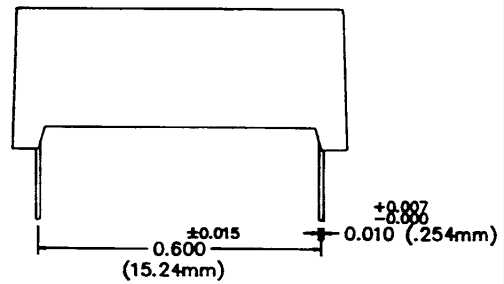
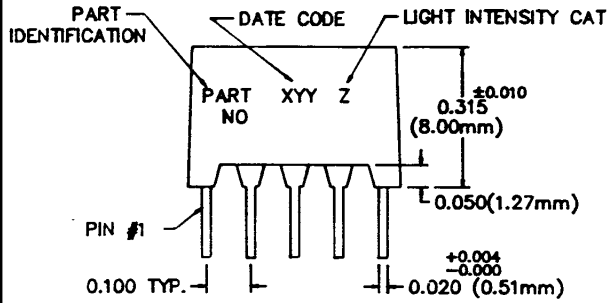
NOTE :  
ALL DIMENSION ARE IN INCHES(mm)

**PACKAGE DIMENSIONS**

MAN6200 SERIES

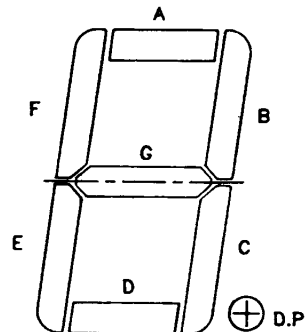
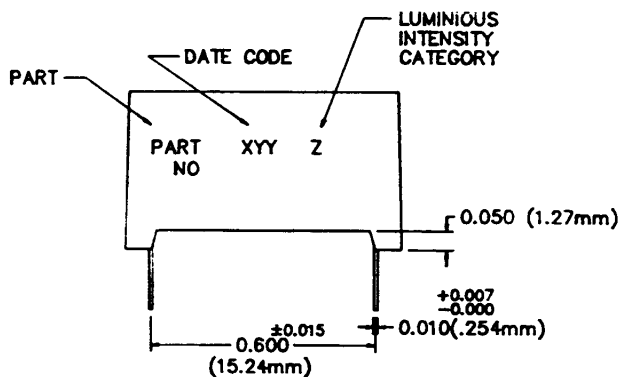
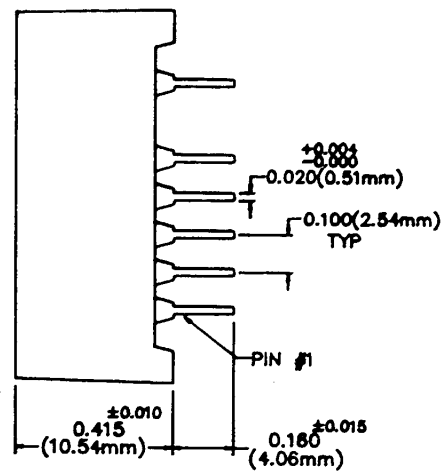
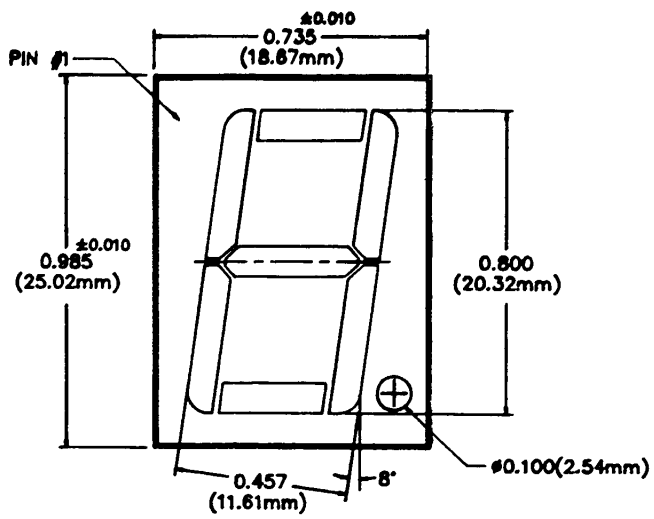


D OR E

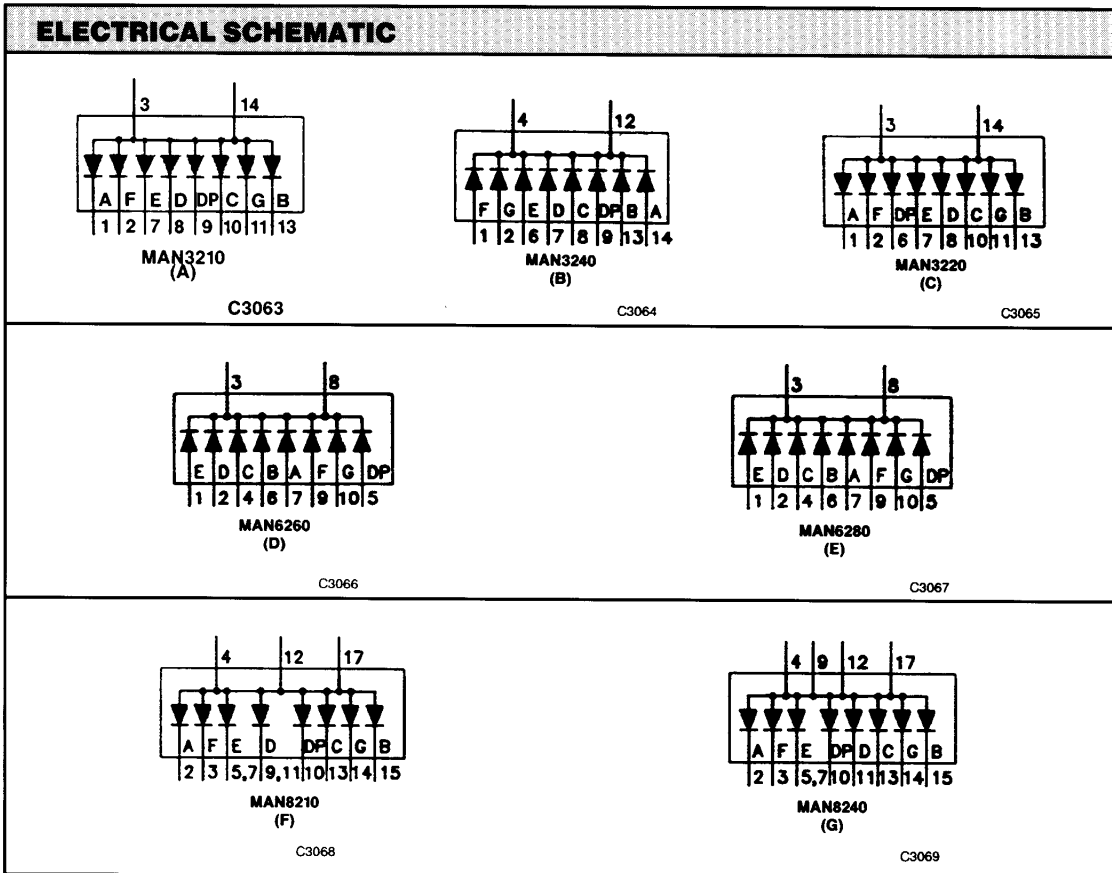


**PACKAGE DIMENSIONS**

MAN8200 SERIES



<b>ELECTRICAL CONNECTIONS</b>							
<b>PIN NO.</b>	<b>A MAN3210A</b>	<b>B MAN3240A</b>	<b>C MAN3220A</b>	<b>D MAN6260</b>	<b>E MAN6280</b>	<b>F MAN8210</b>	<b>G MAN8240</b>
1	Cathode A	Anode F	Cathode A	Cathode E	Anode E	No Connection	No Connection
2	Cathode F	Anode G	Cathode F	Cathode D	Anode D	A Cathode	A Anode
3	Common Anode	No Pin	Common Anode	Common Anode	Common Cathode	F Cathode	F Anode
4	No Pin	Common Cathode	No Pin	Cathode C	Anode C	Common Anode	Common Cathode
5	No Pin	No Pin	No Pin	Cathode D.P	Anode D.P	E Cathode	E Anode
6	No Connection	Anode E	Cathode D.P	Cathode B	Anode B	—	—
7	Cathode E	Anode D	Cathode E	Cathode A	Anode A	E Cathode	E Anode
8	Cathode D	Anode C	Cathode D	Common Anode	Common Cathode	—	—
9	Cathode D.P	Anode D.P	No Connection	Cathode F	Anode F	D Cathode	Common Cathode
10	Cathode C	No Pin	Cathode C	Cathode G	Anode G	D.P Cathode	D.P Anode
11	Cathode G	No Pin	Cathode G			D Cathode	D Anode
12	No Pin	Common Cathode	No Pin			Common Anode	Common Cathode
13	Cathode B	Anode B	Cathode B			C Cathode	C Anode
14	Common Anode	Anode A	Common Anode			G Cathode	G Anode
15						B Cathode	B Anode
16						—	—
17						Common Anode	Common Cathode
18						—	—





## DOUBLE HETEROJUNCTION AlGaAs RED SUNLIGHT VIEWABLE DISPLAYS

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