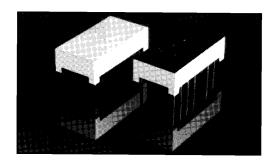




# HIGH EFFICIENCY GREEN MAN3480A ORANGE MAN3680A

# RED MAN78A YELLOW MAN3880A HIGH EFFICIENCY RED MAN3980A



#### DESCRIPTION

The MAN3480A, MAN3680A, MAN78A, MAN3880A and MAN3980A are common cathode displays which provide a choice of color of LED displays. They are pin and functional replacements for the 0.300-inch Hewlett-Packard common cathode displays. The series is complementary to the MAN3400A, MAN3600A, MAN70A, MAN3800A and MAN3900A families of displays. They can be mounted in arrays with 0.400-inch (10.16 mm) center-to-center spacing. Yellow and High Efficiency Green displays are constructed with Grey face and neutral segment color. Red displays have Black faces and Red segment color. Others have face and segment color corresponding to the emitted light.

# **FEATURES**

- Hewlett-Packard compatible common cathode displays
- Red, Yellow, Green, Orange and High Efficiency Red
- Fast switching excellent for multiplexing
- Low power consumption
- Bold solid segments that are highly legible
- Solid state reliability long operation life
- Impact resistant plastic construction
- Directly compatible with integrated circuits
- High brightness with high contrast
- Categorized for Luminous Intensity (See Note 6)
- Standard 10 pin dual-in-line package configuration
- Wide viewing angle ... 150°

#### **APPLICATIONS**

- Digital readout displays
- Instrument panels
- Point of sale terminals
- Calculators
- Digital clocks

PART NO.	COLOR	DESCRIPTION
		DESCRIPTION
MAN3480A	High Efficiency Green	Common Cathode; Right Hand Decimal
MAN3680A	Orange	Common Cathode; Right Hand Decimal
MAN78A	Red	Common Cathode; Right Hand Decimal
MAN3880A	Yellow	Common Cathode; Right Hand Decimal
MAN3980A	High Efficiency Red	Common Cathode; Right Hand Decimal



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		
MAN3480A	Panelgraphic Green 48 Homalite 100-1440 Green	MAN3980A MAN78A	Panelgraphic Red 60 Homalite 100-1605		
MAN3680A	Panelgraphic Scarlet 65 Homalite 100-1670	MAN3880A	Panelgraphic Yellow 25 or Amber 23 Homalite 100-1720 or 100-1726 Panelgraphic Grey 10 Homalite 100-1266 Grey		

ELECTRO-OPTICAL CH (25°C Free Air Temperature Unles	ARACTERIS S Otherwise Spe	STICS cified)			
	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
MAN3480A Luminous Intensity, digit average (See Notes 1 and 3)	750 900	3200 4000		μcd μcd	l <sub>F</sub> =10 mA l <sub>F</sub> =60 mA peak, 1:6 DF
Peak emission wavelength		562		nm	
Spectral line half width		30		nm	
Forward voltage Segment Decimal point		2.2 2.2	3.0 3.0	V V	I <sub>F</sub> =20 mA I <sub>F</sub> =20 mA
Dynamic resistance Segment Decimal point		12 12		$\Omega \ \Omega$	I <sub>F</sub> =20 mA I <sub>F</sub> =20 mA
Capacitance Segment Decimal point		40 40		pF pF	V=0 V=0
Reverse current Segment Decimal point			100 100	μA μA	V <sub>R</sub> =5.0 V V <sub>R</sub> =5.0 V
MAN3680A Luminous Intensity, digit average (See Note 1 and 3)	510	1800		$\mu$ cd	I <sub>F</sub> =10 mA
Peak emission wavelength		630		nm	
Spectral line half width		40		nm	
Forward voltage Segment Decimal point			2.5 2.5	V	I <sub>F</sub> =20 mA I <sub>F</sub> =20 mA
Dynamic resistance Segment Decimal point		26 26		ΩΩ	I <sub>F</sub> =20 mA I <sub>F</sub> =20 mA
Capacitance Segment Decimal point		35 35		pF pF	V=0 V=0
Reverse current Segment Decimal point			100 100	μA μA	V <sub>R</sub> =5.0 V V <sub>R</sub> =5.0 V



ELECTRO-OPTICAL CHA (25°C Free Air Temperature Unless (	RACTERIST Otherwise Specific	ICS ed) (Cont'd)			
	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
MAN78A Luminous Intensity, digit average (See Note 1 and 3)	125	350		μcd	I <sub>F</sub> =10 mA
Peak emission wavelength		660		nm	
Spectral line half width		20	-	nm	
Forward voltage Segment Decimal point			2.0 2.0	V	l <sub>F</sub> =20 mA I <sub>F</sub> =20 mA
Dynamic resistance Segment Decimal point		2 2		ΩΩ	I <sub>pk</sub> =100 mA I <sub>pk</sub> =100 mA
Capacitance Segment Decimal point		35 35	80 80	pF pF	V=0 V=0
Reverse current Segment Decimal point			100 100	μ <b>Α</b> μ <b>Α</b>	V <sub>R</sub> =5.0 V V <sub>R</sub> =5.0 V
MAN3880A Luminous Intensity, digit average (See Note 1 and 3)	450	1700		$\mu$ cd	I <sub>F</sub> =10 mA
Peak emission wavelength		585		nm	
Spectral line half width		40	-	nm	
Forward voltage Segment Decimal point			3.0 3.0	V	I <sub>F</sub> =20 mA I <sub>F</sub> =20 mA
Dynamic resistance Segment Decimal point		26 26		Ω	I <sub>F</sub> =20 mA I <sub>F</sub> =20 mA
Capacitance Segment Decimal point		35 35		pF pF	V=0 V=0
Reverse current Segment Decimal point			100 100	μA μA	V <sub>R</sub> =5.0 V V <sub>R</sub> =5.0 V
MAN3980A Luminous Intensity, digit average (See Note 1 and 3)	450	1900		μcd	I <sub>F</sub> =10 mA
Peak emission wavelength		635	<del>.</del>	nm	
Spectral line half width		40		nm	
Forward voltage Segment Decimal point			2.5 2.5	V	I <sub>F</sub> =20 mA I <sub>F</sub> =20 mA
Dynamic resistance Segment Decimal point		26 26		$\Omega$	I <sub>F</sub> =20 mA I <sub>F</sub> =20 mA
Capacitance Segment Decimal point		35 35		pF pF	V=0 V=0
Reverse current Segment Decimal point	,		100 100	μA μA	V <sub>B</sub> =5.0 V V <sub>B</sub> =5.0 V



ABSOLUTE MAXIMUM RATINGS				
	HIGH EFF. GREEN	RED MAN78A	ORANGE YELLOW HIGH EFF. RED MAN3680A MAN3680A MAN3980A	
Power dissipation at 25°C ambient	600 mW	480 mW	600 mW	
Derate linearly from 50°C	-12 mW/°C	−6.9 mW/°C	-10.3 mW/°C	
Storage and operating temperature	−40°C to +85°C	-40°C to +85°C	-40°C to +85°C	
Total	240 mA	240 mA	200 mA	
Per segment	30 mA	30 mA	25 mA	
Decimal point	30 mA	30 mA	25 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 4 and 5)	5 sec.	5 sec.	5 sec.	

TYPICAL THERMAL CHARACTERISTICS	
GREEN/YELLOW Thermal resistance junction to free air $\Phi_{JA}$ . Wavelength temperature coefficient (case temperature). Forward voltage temperature coefficient	160°C/W
RED/ORANGE/HIGH EFFICIENCY RED         Thermal resistance junction to free air $\Phi_{JA}$ .         Wavelength temperature coefficient (case temperature).         Forward voltage temperature coefficient	1.0Å/°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  $\pm 33.3\%$  between all segments within a digit.
- 2. The curve in Figures 3, 6, 9, and 12 is normalized to the brightness at 25°C to indicate the relative Luminous Intensity over the operating temperature range.
- 3. The decimal point is designed to have the same surface brightness as the segments, therefore, the Luminous Intensity of the decimal point is .3 times the Luminous Intensity of the segments, since the area of the decimal point is .3 times the area of the average segment.

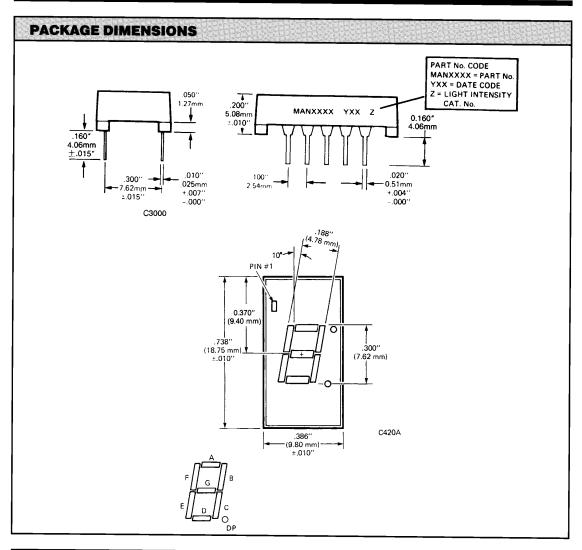
- average segment.

  4. Leads of the device immersed to 1/16 inch from the body. Maximum device surface temperature is 140°C.

  5. For flux removal, Freon TF, Freon TE, Isoproponal or water may be used up to their boiling points.

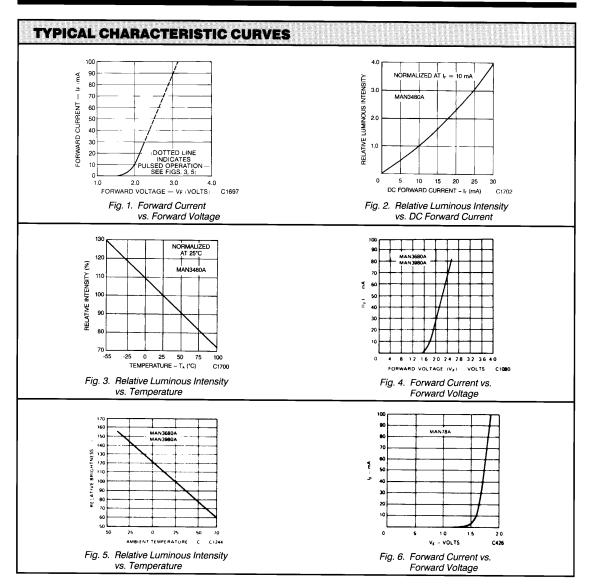
  6. All displays are categorized for Luminous Intensity. The Intensity category is marked on each part as a suffix letter to the part number.



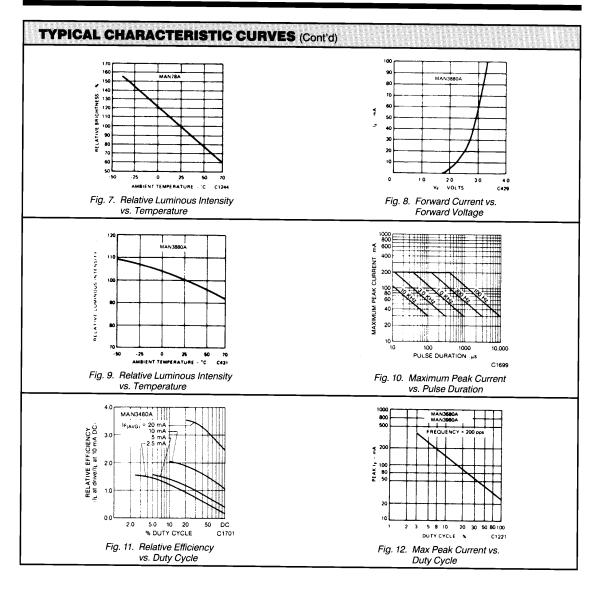


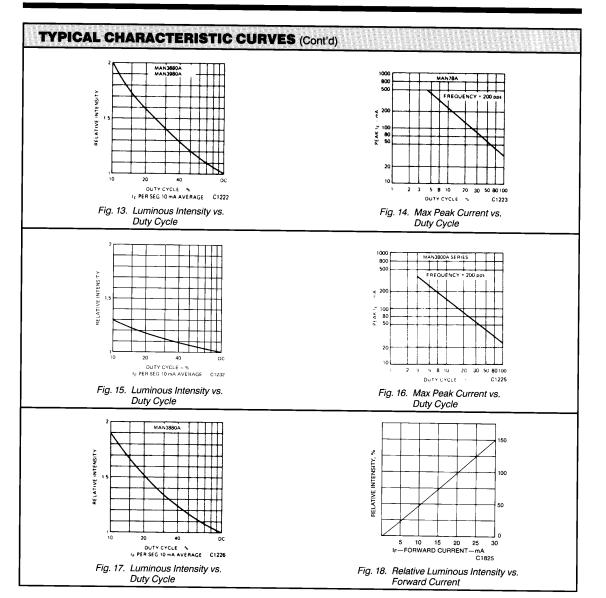
ELECTRICAL CONNECTIONS				
PIN NO.	ELECTRICAL CONNECTIONS			
1	Common Cathode			
2	Anode F			
3	Anode G			
4	Anode E			
5	Anode D			
6	Common Cathode			
7	Anode D.P.			
8	Anode C			
9	Anode B			
10	Anode A			













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