Displays

Monsanto offers a variety of standard solid state digital display devices with choices of font style, size, package type, and color. This table is representative of the many types available.

Applications include . . .

- calculators
- instruments
- consumer products
- automobiles
- clocks
- communications equipment
- computers
- POS terminals

QUICK REFERENCE CHART

PRODUCT	DIGIT HEIGHT	COLOR	PEAK WAVE-LENGTH	BRIGHTNESS (ft.-L) OR LUMINOUS INTENSITY (μcd) (per SEG. MIN.)	VOLTS-MAX. (V_F/SEG.)	TEST CONDITION (I_F)	PRODUCT FEATURES	PACKAGE
MAN1A	.270 in.	Red	660 nm	100 ft.-L	4.0 V	20 mA	Low Brightness 7 Segment	A
MAN10A	.270 in.	Red	660 nm	100 ft.-L	4.0 V	10 mA	High Brightness Low Current	A
MAN1001A	.270 in.	Red	660 nm	100 ft.-L	4.0 V	20 mA	Polarity/Overflow for MAN1A	B
MAN101A	.270 in.	Red	660 nm	100 ft.-L	4.0 V	10 mA	Polarity/Overflow for MAN10A	B
MAN2A	.320 in.	Red	650 nm	125 μcd	2.0 V	10 mA	35 Diode Alpha-Numeric	G
MAN3610	.300 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	Common Anode; RHDP	C,N
MAN3620	.300 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	Common Anode; LHDP	D,N
MAN3630	.294 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	Common Anode; RHDP Overflow (±1)	E,N
MAN3640	.300 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	Common Cathode; RHDP	F,N
MAN51	.300 in.	Green	565 nm	125 μcd	3.5 V	10 mA	Common Anode; RHDP	C,N
MAN52	.300 in.	Green	565 nm	125 μcd	3.5 V	10 mA	Common Anode; LHDP	D,N
MAN53	.294 in.	Green	565 nm	125 μcd	3.5 V	10 mA	Common Anode; RHDP Overflow (±1)	E,N
MAN54	.300 in.	Green	565 nm	125 μcd	3.5 V	10 mA	Common Cathode; RHDP	F,N
MAN71	.300 in.	Red	650 nm	125 μcd	2.0 V	10 mA	Common Anode; RHDP	C,N
MAN72	.300 in.	Red	650 nm	125 μcd	2.0 V	10 mA	Common Anode; LHDP	D,N
MAN73	.294 in.	Red	650 nm	125 μcd	2.0 V	10 mA	Common Anode; RHDP Overflow (±1)	E,N
MAN74	.300 in.	Red	650 nm	125 μcd	2.0 V	10 mA	Common Cathode; RHDP	F,N
MAN81	.300 in.	Yellow	590 nm	320 μcd	3.5 V	10 mA	Common Anode; RHDP	C,N
MAN82	.300 in.	Yellow	590 nm	320 μcd	3.5 V	10 mA	Common Anode; LHDP	D,N
MAN83	.294 in.	Yellow	590 nm	320 μcd	3.5 V	10 mA	Common Anode; RHDP (Overflow (±1)	E,N
MAN84	.300 in.	Yellow	590 nm	320 μcd	3.5 V	10 mA	Common Cathode; RHDP	F,N
MAN4610	.400 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	Common Anode; RHDP	H,N
MAN4630	.400 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	Common Anode; RHDP Overflow (±1)	I,N
MAN4640	.400 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	Common Cathode; RHDP	J,N
MAN6610	.560 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	2 Digit; Common Anode; RHDP	K
MAN6630	.560 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	1½ Digit; Common Anode; Overflow (±1.8); RHDP	L
MAN6640	.560 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	2 Digit; Common Cathode; RHDP	K
MAN6650	.560 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	1½ Digit; Common Cathode; Overflow (±1.8); RHDP	L
MAN6660	.560 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	Single digit; Common Anode; RHDP	M
MAN6680	.560 in.	Orange	630 nm	510 μcd	2.5 V	10 mA	Single digit; Common Cathode; RHDP	M
MAN6710	.560 in.	Red	650 nm	125 μcd	2.0 V	10 mA	2 Digit; Common Anode; RHDP	K
MAN6730	.560 in.	Red	650 nm	125 μcd	2.0 V	10 mA	1½ Digit; Common Anode; Overflow (±1.8); RHDP	L
MAN6740	.560 in.	Red	650 nm	125 μcd	2.0 V	10 mA	2 Digit; Common Cathode; RHDP	K
MAN6750	.560 in.	Red	650 nm	125 μcd	2.0 V	10 mA	1½ Digit; Common Cathode; Overflow (±1.8); RHDP	L

Models shown in bold type are industry standard products.

Monsanto

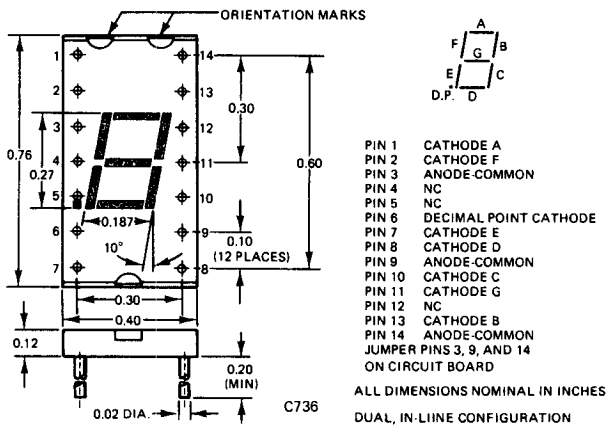
.27" RED SEVEN SEGMENT DISPLAY

MAN1 MAN1A

PRODUCT DESCRIPTION

The MAN1 is a seven segment diffused planar GaAsP light emitting diode array. It is mounted on a dual in-line 14 pin substrate and then encapsulated in clear epoxy for protection. It is capable of displaying all digits and nine distinct letters. The MAN1A has identical specifications, but is encapsulated in high contrast red epoxy.

PACKAGE DIMENSIONS



PIN 1 CATHODE A
PIN 2 CATHODE F
PIN 3 ANODE-COMMON
PIN 4 NC
PIN 5 NC
PIN 6 DECIMAL POINT CATHODE
PIN 7 CATHODE E
PIN 8 CATHODE D
PIN 9 ANODE-COMMON
PIN 10 CATHODE C
PIN 11 CATHODE G
PIN 12 NC
PIN 13 CATHODE B
PIN 14 ANODE-COMMON
JUMPER PINS 3, 9, AND 14 ON CIRCUIT BOARD

ALL DIMENSIONS NOMINAL IN INCHES

DUAL, IN-LIINE CONFIGURATION

FEATURES

- High brightness . . . Typically 350 ft-L @ 20 mA
- Single plane, wide angle viewing . . . 150°
- Unobstructed emitting surface
- Standard 14 pin dual-in-line package configuration
- Long operating life . . . solid state reliability
- Shock resistant
- Operates with IC voltage requirements
- Small size; offering unique styling advantages
- All numbers plus 9 distinct letters
- Usable for wide viewing angle requirements
- Usable in vibrating environment, impervious to vibration
- Directly compatible with integrated circuits

The MAN1 is for industrial and military applications such as:

- Digital readout displays
- Cockpit readout displays

ABSOLUTE MAXIMUM RATINGS

Power dissipation @ 25°C ambient	750 mW
Derate linearly from 25°C	10 mW/°C
Storage and operating temp	-55°C to 100°C
Continuous forward current	
Total	240 mA
Per segment	30 mA
Decimal point	30 mA
Reverse Voltage	
Per segment	6.0 volts
Decimal point	3.0 volts

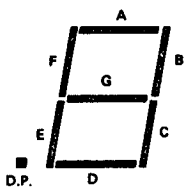
ELECTRO-OPTICAL CHARACTERISTICS

(25°C Ambient Temperature Unless Otherwise Specified)

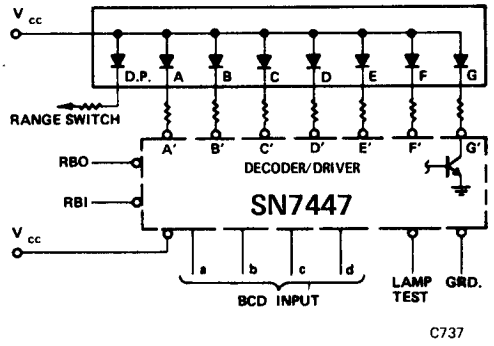
CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Brightness (note 1)					
Segment	100	350		ft-L	I_F=20 mA, λ=650 nm
Decimal point	100	350		ft-L	I_F=20 mA, λ=650 nm
Peak emission wave length	630		700	nm	
Spectral line half width		20		nm	
Forward voltage					
Segment		3.4	4.0	V	I_F=20 mA
Decimal point		1.6	2.0	V	I_F=20 mA
Dynamic resistance					
Segment		11		Ω	I_F=20 mA
Decimal point		5.5		Ω	I_F=20 mA
Capacitance					
Segment		80		pF	V=0
Decimal point		135		pF	V=0
Reverse Current					
Segment			100	μA	V_R=6.0 volts
Decimal point			100	μA	V_R=3.0 volts

MAN1 MAN1A

DECODER/DRIVER FUNCTIONAL DIAGRAM



Monsanto MAN1, MAN1A



TYPICAL TRUTH TABLE

INPUT CODE				OUTPUT STATE							DISPLAY
d	c	b	a	A'	B'	C'	D'	E'	F'	G'	
0	0	0	0	0	0	0	0	0	0	1	0
0	0	0	1	1	0	0	1	1	1	1	1
0	0	1	0	0	0	1	0	0	1	0	2
0	0	1	1	0	0	0	0	1	1	0	3
0	1	0	0	1	0	0	1	1	0	0	4
0	1	0	1	0	1	0	0	1	0	0	5
0	1	1	0	1	1	0	0	0	0	0	6
0	1	1	1	0	0	0	1	1	1	1	7
1	0	0	0	0	0	0	0	0	0	0	8
1	0	0	1	0	0	0	1	1	0	0	9

TYPICAL CURVES

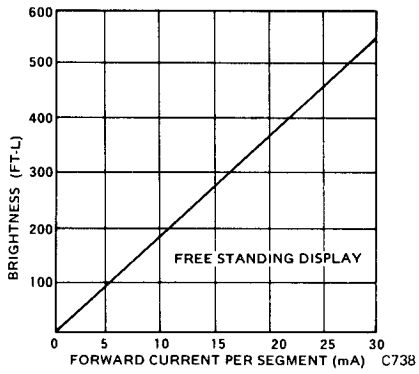


Figure 1 Brightness vs. Forward Current

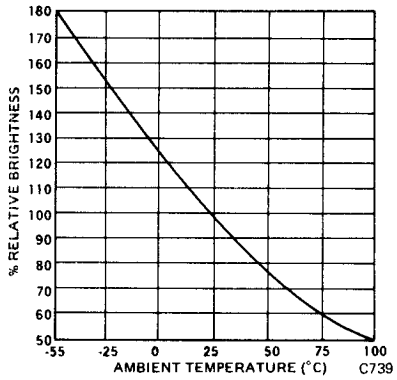


Figure 2 Brightness vs. Temperature

TYPICAL THERMAL CHARACTERISTICS

Thermal Resistance (note 4) Junction to free air Θ_{JA}	440°C/W
Wavelength Temperature Coefficient (case temp)	0.3 nm/°C
Forward Voltage Temperature Coefficient	-4.0 mV/°C

NOTES

1. *As measured with a Photo Research Corp. Spot Brightness Meter with "SPECTAR" L175 lens in the brightest region of the emitting surface. Brightness cannot vary more than ±50% between all segments.*
2. *The curve in Figure 2 is normalized to the brightness at 25°C to indicate the relative efficiency over the operating temperature range.*
3. *For contrast improvement Polaroid HRCP7 circular polarizer filter can be used. Non-glare circular polarizer filter will provide further enhancement in display visibility.*
4. *Thermal resistance (junction to ambient) value of any one segment with all segments in operation.*