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

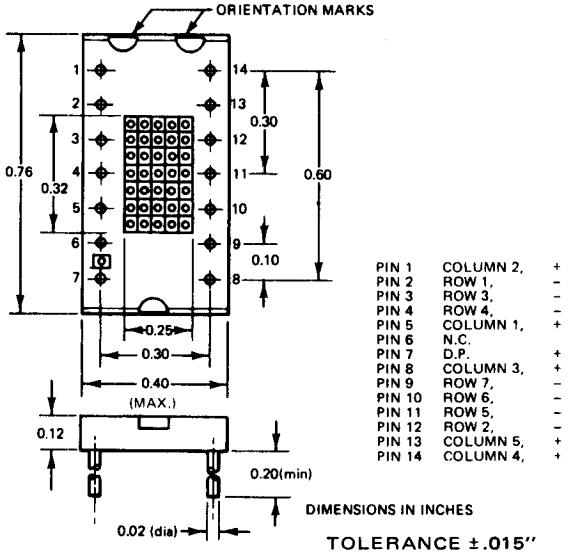
.32" RED ALPHA-NUMERIC DISPLAY

MAN2A

PRODUCT DESCRIPTION

The MAN2A is a 35 diode diffused planar GaAsP LED alpha-numeric array with a decimal point. It is mounted on a dual in-line, 14-pin substrate with a high contrast red epoxy lens. It is capable of displaying the 64 character ASCII code.

PACKAGE DIMENSIONS



PIN 1	COLUMN 2,	+
PIN 2	ROW 1,	–
PIN 3	ROW 3,	–
PIN 4	ROW 4,	–
PIN 5	COLUMN 1,	+
PIN 6	N.C.	
PIN 7	D.P.	+
PIN 8	COLUMN 3,	+
PIN 9	ROW 7,	–
PIN 10	ROW 6,	–
PIN 11	ROW 5,	–
PIN 12	ROW 2,	–
PIN 13	COLUMN 5,	+
PIN 14	COLUMN 4,	+

FEATURES & APPLICATIONS

- Visible, bright red, high contrast display
- 36 light emitting diodes including decimal point
- Capable of displaying 64 ASCII characters
- Single plane, wide angle viewing
- Long life, shock resistant, small size

It is ideal for industrial and military applications such as:

- Keyboard verifier
- Film annotation—2^{36} bits available
- Avionics display
- Computer peripheral displays

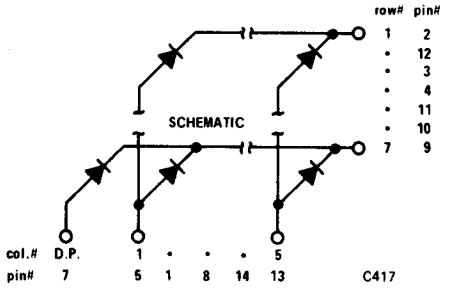
ABSOLUTE MAXIMUM RATINGS

Single Diode

DC forward current	20 mA
Pulsed forward current peak (50 μs, 20% duty cycle)	100 mA
Reverse voltage	5 V
Storage temperature	–40°C to 85°C
Operating temperature	–40°C to 85°C

Diode Array

Average power dissipation @ 25°C ambient	750 mW
Derate linearly from 25°C	12.5 mW/°C
DC current per diode for worst case A/N	20 mA
DC current per diode for all 35 diodes plus DP	11 mA



ELECTRO-OPTICAL CHARACTERISTICS (PER DIODE)

(25°C Ambient Temperature Unless Otherwise Specified)

CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Average Luminous intensity per character (See note 1)	125			μcd	I_F = 10 mA
Peak emission wavelength		660		nm	
Spectral line half width		20		nm	
Forward voltage			2.0	V	I_F = 20 mA
Capacitance		200		pF	V = 0
Reverse current			100	μA	V_R = 5 V

TYPICAL CURVES

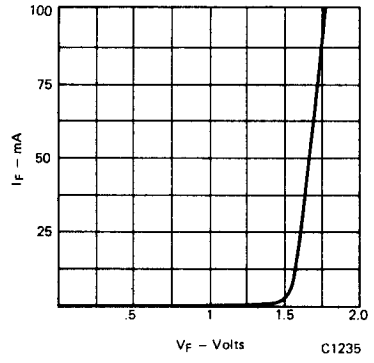


Fig. 1. Forward Current vs. Forward Voltage each LED

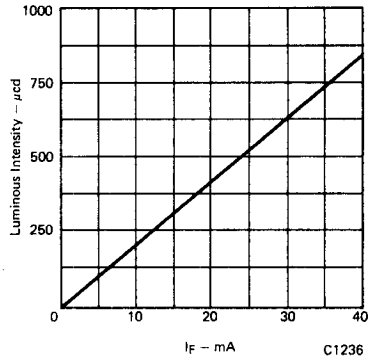


Fig. 2. Light Intensity vs. Forward Current each LED

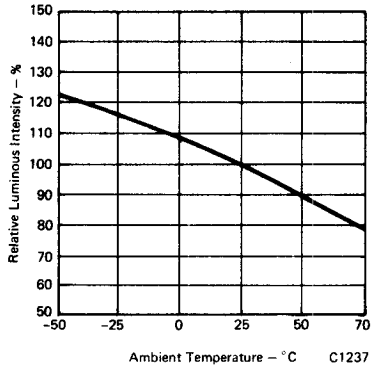


Fig. 3. Relative Luminous Intensity vs. Ambient Temperature

NOTES

1. *The characteristic average luminous intensity is obtained by summing the luminous intensity of each diode and dividing by 35. The standard of measurement is the Photo Research Spectra Microcandela Meter corrected for wavelength error. Intensity will not vary more than ±33.3% between all diodes in a character.*
2. *The curve in Figure 3 is normalized to the brightness of 25°C to indicate the relative luminous intensity over the operating temperature range.*
3. *Leads of the device immersed to 1/16 inches 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.*

RECOMMENDED FILTERS

For optimum on and off contrast, one of the following filters or equivalents should be used over the display:

Panelgraphic Red 60
Homalite 100-1670