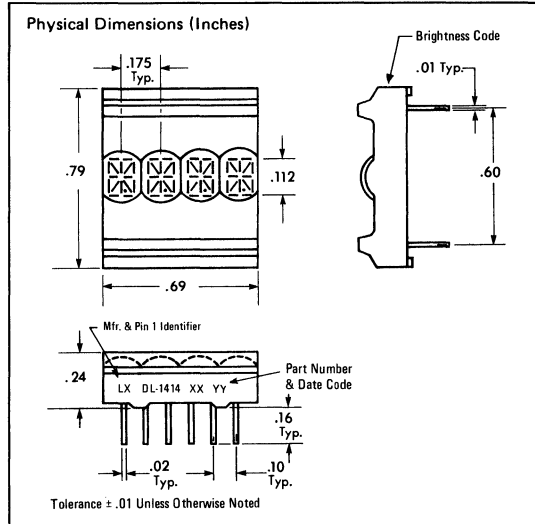
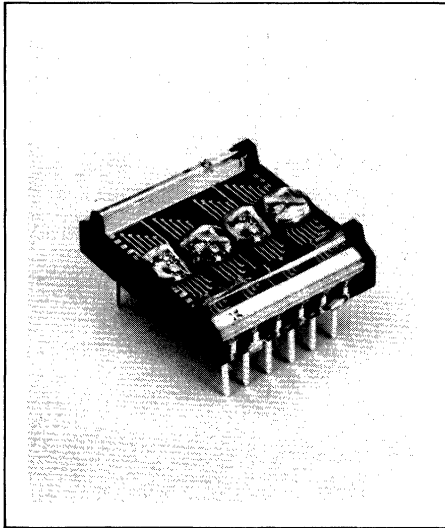


DL-1414

**.112" RED, 4-DIGIT 17-SEGMENT
ALPHANUMERIC Intelligent Display™
WITH MEMORY/DECODER/DRIVER**



FEATURES

- 112 Mil High, Magnified Monolithic Char.
- Wide Viewing Angle, $\pm 40^\circ$
- Close Vertical Row Spacing, .800 Inches
- Rugged Solid Plastic Encapsulated Package
- Fast Access Time, 450 nSEC
- Compact Size For Hand Held Equipment
- Built-In Memory
- Built-In Character Generator
- Built-In Multiplex and LED Drive Circuitry
- Direct Access To Each Digit Independently and Asynchronously
- TTL Compatible, 5 Volt Power
- 17th Segment For Improved Punctuation Marks
- Low Power Consumption, Typically 10 mA per character
- Intensity Coded For Display Uniformity
- End-Stackable, 4-Character Package

DESCRIPTION

The DL1414 is a four digit display module having 16 bar segments plus a decimal segment and a built-in CMOS integrated circuit.

The integrated circuit contains memory, ASCII character generator, and LED multiplexing and drive circuitry.

Inputs are TTL compatible. A single 5-volt power supply is required. Data entry is asynchronous and random access. A display system can be built using any number of DL1414's since each character in any DL1414 can be addressed independently and will continue to display the character last written until it is replaced by another.

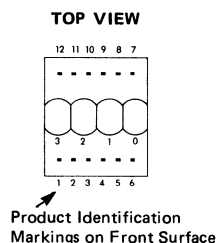
LOADING DATA

Loading data into the DL1414 is straightforward. The desired data code (D_0-D_6) and digit address (A_0, A_1) is presented in parallel and held stable during a write cycle. Data entry may be asynchronous and in random order. (Digit 0 is defined as right hand digit with $A_1 = A_0 = 0 = \text{low}$).

System interconnection is also straightforward. The least significant two address bits (A_0, A_1) are normally connected to the like named inputs of all DL1414's in the system. Data lines are connected to all DL1414's directly and in parallel. Multiple DL1414 systems usually use an external one-of-N decoder chip. The "write" pulse is connected to the CE of the decoder. A 3-to-8 line decoder multiplexer (74138) or a 4-to-16 line decoder/multiplexer (74154) are possible choices. All higher-order address bits (above A_1) become inputs to the decoder.

Specifications Subject To Change Without Notice

Pin	Function	Pin	Function
1	D5 Data Input	7	Gnd
2	D4 Data Input	8	D0 Data Input (LSB)
3	WR Write	9	D1 Data Input
4	A1 Digit Select	10	D2 Data Input
5	A0 Digit Select	11	D3 Data Input
6	V _{CC}	12	D6 Data Input (MSB)



OPTO-ELECTRONIC CHARACTERISTICS @ 25°C

MAXIMUM RATINGS

Voltage, Any Pin
 Respect to GND -5 to +6 VDC
 Operating Temperature -20°C to 65°C
 Storage Temperature -20°C to 70°C
 Relative Humidity (non condensing) @ 65°C, 85%

OPTICAL CHARACTERISTICS (TYPICAL)

Luminous Intensity per digit/8 segments @ 5V 0.5 mcd
 Off Axis Viewing Angle (Note 1) ±40°
 Digit Size 112 mils
 Spectral Peak Wavelength 660 nm

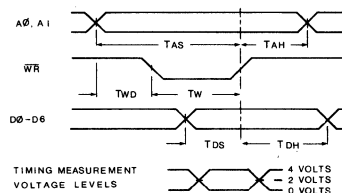
DC CHARACTERISTICS

Parameter	-20°C Typ	+25°C (Note 6)	+65°C Typ	Conditions
I _{CC} 4 Digits on (10 seg/Digit)	100 mA	90 mA Max	70 mA	V _{CC} = 5.0 V
I _{CC} Blank		2.7 mA Max		V _{IN} = 0 V _{CC} = 5.0 V WR = 5.0 V
I _{IL}	180 µA	160 µA Max	100 µA	V _{IN} = .8 V V _{CC} = 5.0 V
V _{IL}		.8 V Max		V _{CC} = 4.5 V
V _{IH} (Note 4)		2.7 V Min 3.3 V Min		V _{CC} = 4.5 V V _{CC} = 5.5 V

TIMING CHARACTERISTICS

AC CHARACTERISTICS MINIMUM TIMING PARAMETERS @ 4.5 V (nanoseconds)			
Parameter	-20°C Typ	25°C Min	+65°C Typ
T _{AS}	300	400	500
T _{WD}	50	75	125
T _W	250	325	375
T _{DS}	200	250	300
T _{DH}	50	50	100
T _{AH}	50	50	100

WRITE CYCLE WAVEFORMS



Note 1: "Off Axis Viewing Angle" is here defined as: "the minimum angle in any direction from the normal to the display surface at which any part of any segment in the display is not visible".

Note 2: This display contains a CMOS integrated circuit. Normal CMOS handling precautions should be taken to avoid damage due to high static voltages or electric fields.

Note 3: Unused inputs must be tied to an appropriate logic voltage level (either V+ or V-).

Note 4: V_{CC} ≥ V_{IH} ≥ 0.6 V_{CC}.

Note 5: **Warning** — Do not use solvents containing alcohol.

Note 6: V_{CC} = +5.0 VDC ±10%

CHARACTER SET

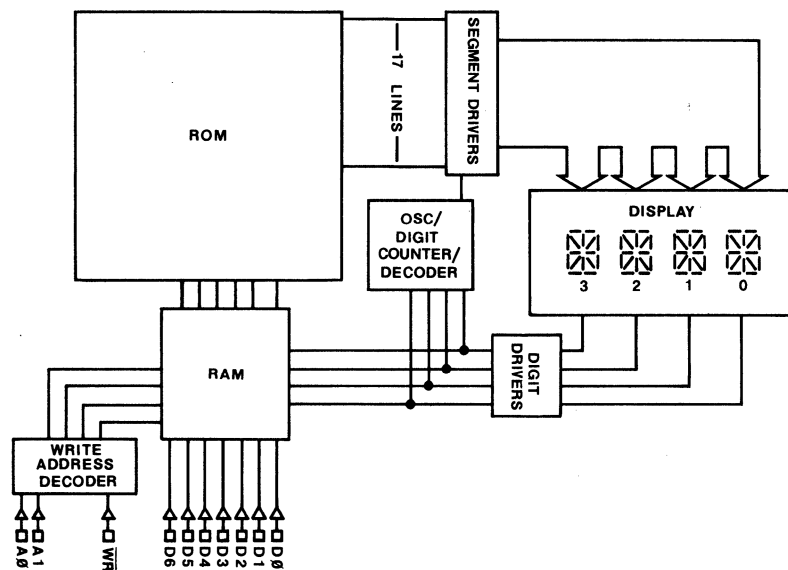
				D0	L	H	L	H	L	H	L	H
				D1	L	L	H	H	L	L	H	H
				D2	L	L	L	L	H	H	H	H
D6	D5	D4	D3									
L	H	L	L		!	"	#	\$	%	&	'	
L	H	L	H		<	>	*	+	,	-	.	/
L	H	H	L		0	1	2	3	4	5	6	7
L	H	H	H		8	9	:	;	<	=	>	?
H	L	L	L		@	A	B	C	D	E	F	G
H	L	L	H		H	I	J	K	L	M	N	O
H	L	H	L		P	Q	R	S	T	U	V	W
H	L	H	H		X	Y	Z	[\]	^	_

All Other Input Codes Display "Blank"

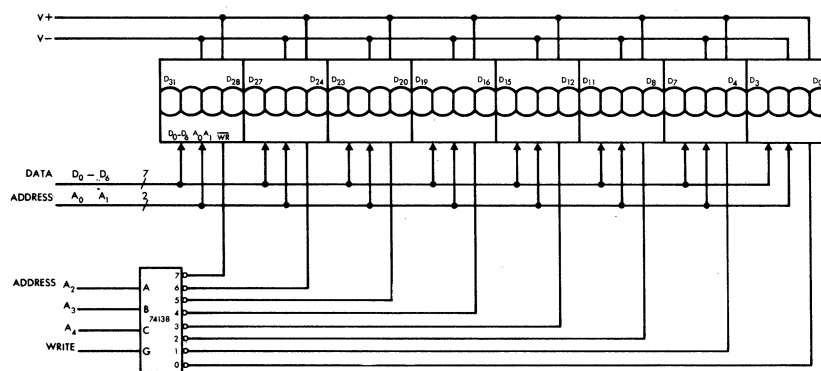
LOADING DATA STATE TABLE

WR		A1	A0	D6	D5	D4	D3	D2	D1	D0	DIGIT			
											3	2	1	0
H				PREVIOUSLY LOADED DISPLAY							G	R	E	Y
L	L	L	H	H	L	L	L	H	L	H	G	R	E	E
L	L	H	L	H	L	L	H	H	L	L	G	R	U	E
L	L	H	H	H	L	L	L	L	H	L	B	L	U	E
L	L	H	H	H	L	L	L	H	L	H	B	L	E	E
L	L	L	L	H	L	H	L	H	H	H	B	L	E	W
L	X	X		SEE CHARACTER CODE							SEE CHARACTER SET			

X = DON'T CARE



DL-1414 Block Diagram



**TYPICAL INTERCONNECTION
FOR 32 DIGITS**