67023 4N54 RED HERMETIC HEXADECIMAL DISPLAYS

OPTOELECTRONIC PRODUCTS DIVISION

05/26/2009

Features:

- Conforms to MIL-PRF-19500/708
- 4 X 7 dot matrix character
- Memory latch/decoder/driver is TTL compatible
- Categorized for luminous intensity

Applications:

- High reliability systems
- Instrumentation panels
- Communication equipment
- Medical equipment
- Harsh environments

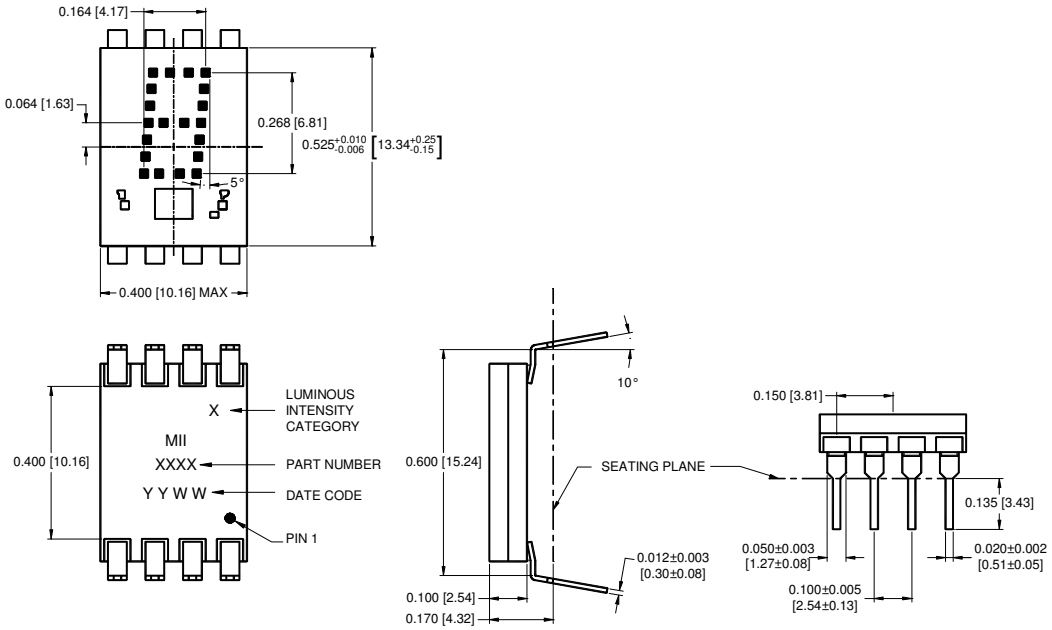
DESCRIPTION

The ***4N54*** is a solid state hexadecimal display for use in high reliability applications. The display features an on-board decoder/driver and memory. This display is hermetically sealed and conforms to MIL-PRF-19500/708, the general specification for light emitting diode displays. The character height is 0.290" (7.37mm).

The 4N54 is a hexadecimal display which decodes positive BCD logic into 16 characters "0-9, A-F". Input is provided to blank the display (all LED's off) without losing the contents of the memory.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage ..... -0.5 V to 7 V
Voltage Applied to Input Logic and Enable Pins ..... -0.5 V to 7 V
Voltage Applied to Blanking Input ..... -0.5 V to 7 V
Storage Temperature ..... -65°C to +125°C
Operating Free-Air Temperature Range. ..... -55°C to +100°C
Lead Solder Temperature (5 seconds, 1/16" below seating plane) ..... 260°C
Total Power Dissipation ..... 935 mW



ALL TOLERANCES ARE ± 0.015 UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].

ELECTRICAL OPTICAL CHARACTERISTICS

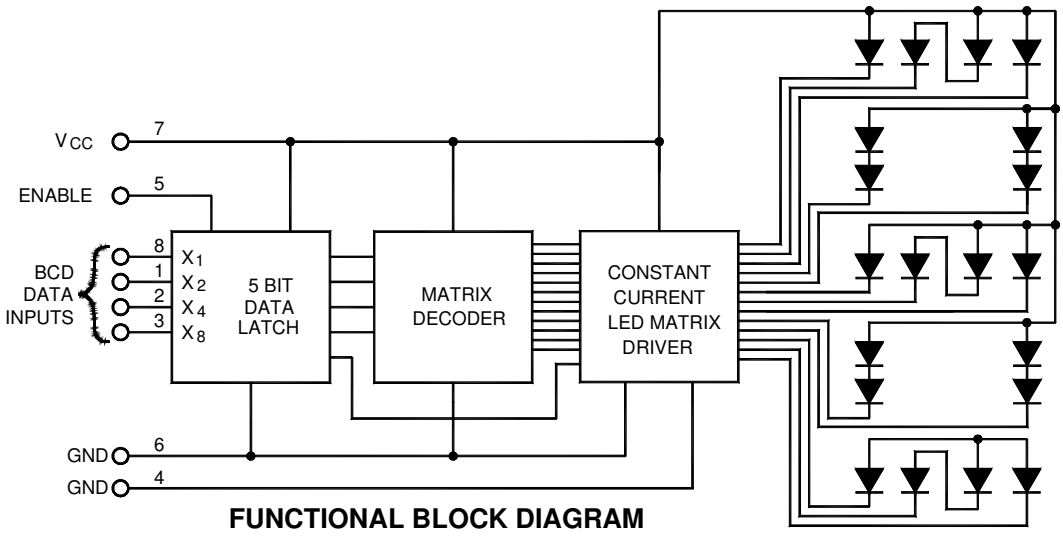
T_A = -55°C to +100°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Supply Current	I_{CC}		112	160	mA	V_{CC} = 5.5V Numeral 5 lighted	1
Power Dissipation	P_T		560	935	mW	V_{CC} = 5.5V Numeral 5 lighted	1
Luminous Intensity per LED	I_V	40	85		µcd	V_{CC} = 5V, T_A = 25°C	
Leak Rate				$5x10^{-8}$		cc/sec	
Blanking Low-Level Input Current	I_{BL}			20	µA	V_{CC} = 5.5V, V_{BL} = 0.8V	
Blanking High-Level Input Current	I_{BH}			0.7	mA	V_{CC} = 5.5V, V_{BH} = 4.5V	
Logic Low-Level Input Current	I_{IL}			-1.5	mA	V_{CC} = 5.5V, V_{IL} = 0.4V	
Logic High-Level Input Current	I_{IH}			50	µA	V_{CC} = 5.5V, V_{IH} = 2.4V	
Enable Low-Level Input Current	I_{EL}			-1.5	mA	V_{CC} = 5.5V, V_{EL} = 0.4V	
Enable High-Level Input Current	I_{EH}			50	µA	V_{CC} = 5.5V, V_{EH} = 2.4V	
Wavelength at Peak Emission	λ_P		655		nm	T_A = 25°C	1
Dominant Wavelength	d		640			T_A = 25°C	2
Weight			1		gm		

NOTES:

1. All typical values at V_{CC} = 5.0 volts, t_A = 25°C.
2. The dominant wavelength, λ_d is a single wavelength that defines the saturated color of monochromatic light, as derived from the CIE chromaticity diagram.

4N54



FUNCTIONAL BLOCK DIAGRAM

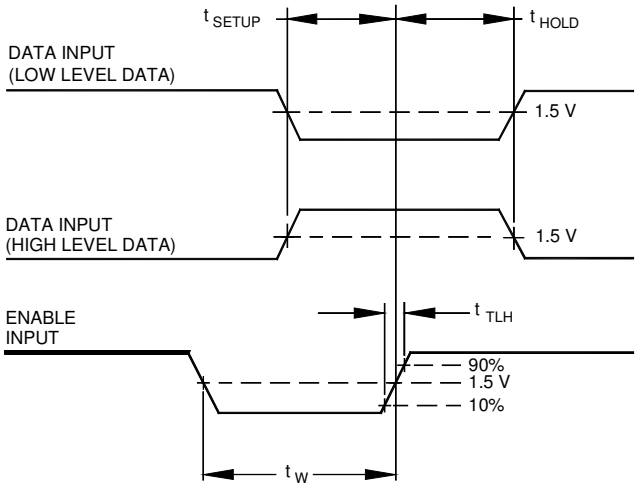
TERMINAL CONNECTIONS

PIN	FUNCTION
	4N54
1	INPUT 2
2	INPUT 4
3	INPUT 8
4	BLANKING CONTROL
5	LATCH ENABLE
6	GROUND
7	Vcc
8	INPUT 1

NOTES:
L = logic low
H = logic high

1. The blanking input controls the LED display drivers, but does not have an effect on the display memory.
2. With the enable high, changes in BCD inputs have no effect upon display memory or display character.

TRUTH TABLE				
BCD DATA				4N54
X8	X4	X2	X1	
L	L	L	L	0
L	L	L	H	1
L	L	H	L	2
L	L	H	H	3
L	H	L	L	4
L	H	L	H	5
L	H	H	L	6
L	H	H	H	7
H	L	L	L	8
H	L	L	H	9
H	L	H	L	A
H	L	H	H	B
H	H	L	L	C
H	H	L	H	D
H	H	H	L	E
H	H	H	H	F
BLANKING 1/				DISPLAY ON V_B - L
				DISPLAY OFF V_B - H
ENABLE 2/				LOAD DATA V_E - L
				LATCH DATA V_E - H



TIMING DIAGRAM

RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Supply Voltage	V_{CC}	4.5	5.5	V
Operating Temperature	T_A	-55	100	℃
Enable Pulse Width	t_W	100		ns
Time data must be held before positive transition of enable line	t_{SETUP}	50		ns
Time data must be held after positive transition of enable line	t_{HOLD}	50		ns
Enable pulse rise time	t_{TLH}		200	ns

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
67023-004	4N54 Commercial
67023-014	JAN4N54XX
67023-104	JANTX4N54XX

Luminous intensity code

LUMINOUS INTENSITY CODE	MINIMUM LUMINOUS INTENSITY	MAXIMUM LUMINOUS INTENSITY
	µcd	µcd
D	59	106
E	79	142
F	106	190
G	142	255
H	190	342
I	257	462
J	343	617
K	457	820

The first X in the DSCC Part number is intensity code. Where a luminous intensity code is required, it must be specified in the contract or order. (Due to the overlapping of the luminous intensity codes, it is recommended that the two adjacent categories be specified).
The second X in the DSCC Part number is the lead finish code.

FINISH LETTER	LEAD FINISH
A	Hot solder dip
C	Gold plate