Texas Optoelectronics, Inc.

4N58
5 x 7 Alphanumeric Display With Logic

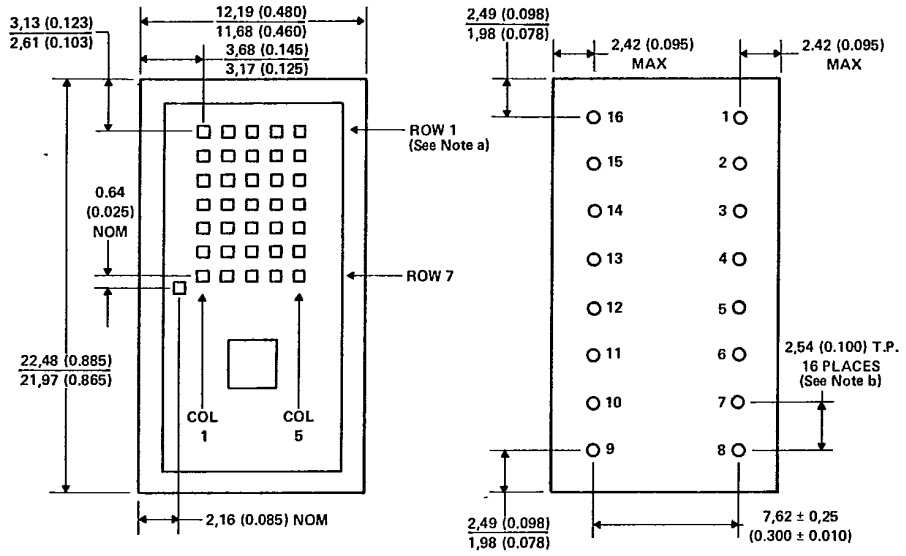
F-19-36
T-41-37

HERMETICALLY SEALED SOLID-STATE DISPLAY WITH INTEGRAL TTL COLUMN DRIVERS

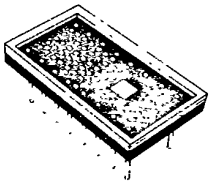
- **Withstands Military Environmental Conditions**
- **7,6-mm (0.300-Inch) Character Height**
- **Integral D-Type Flip-Flop Column Drivers and Series Limiting Resistors**
- **Wide Viewing Angle**
- **Compatible with Most TTL Circuits**
- **High Luminous Intensity**
- **Left Decimal**
- **Available with Screening in Accordance with MIL-D-87157, 4N58-TXV**

***mechanical data**

The display and TTL logic chip are mounted on a ceramic header which is then hermetically sealed to a glass window. Multiple displays may be mounted on 12,2-mm (0.480-inch) centers.



PIN 1 ROW 1
PIN 2 ROW 3
PIN 3 ROW 5
PIN 4 ROW 7 & D.P. ANODE
PIN 5 COLUMN 1
PIN 6 D.P. COLUMN
PIN 7 CLOCK
PIN 8 GROUND
PIN 9 V_{CC}
PIN 10 COLUMN 3
PIN 11 COLUMN 5
PIN 12 COLUMN 4
PIN 13 COLUMN 2
PIN 14 ROW 6
PIN 15 ROW 4
PIN 16 ROW 2



NOTES: a. Vertical and horizontal spacing between centerline of rows and columns is nominally 0,13 mm (0.055 inch).

b. The true-position pin spacing is 2,54 mm (0.100 inch) between centerlines. Each centerline is located within 0,26 mm (0.010 inch) of its true longitudinal position relative to pins 1 and 16.

ALL DIMENSIONS ARE IN MILLIMETERS AND PARENTHETICALLY IN INCHES.

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*JEDEC registered data. This data sheet contains all applicable registered data in effect at the time of publication.

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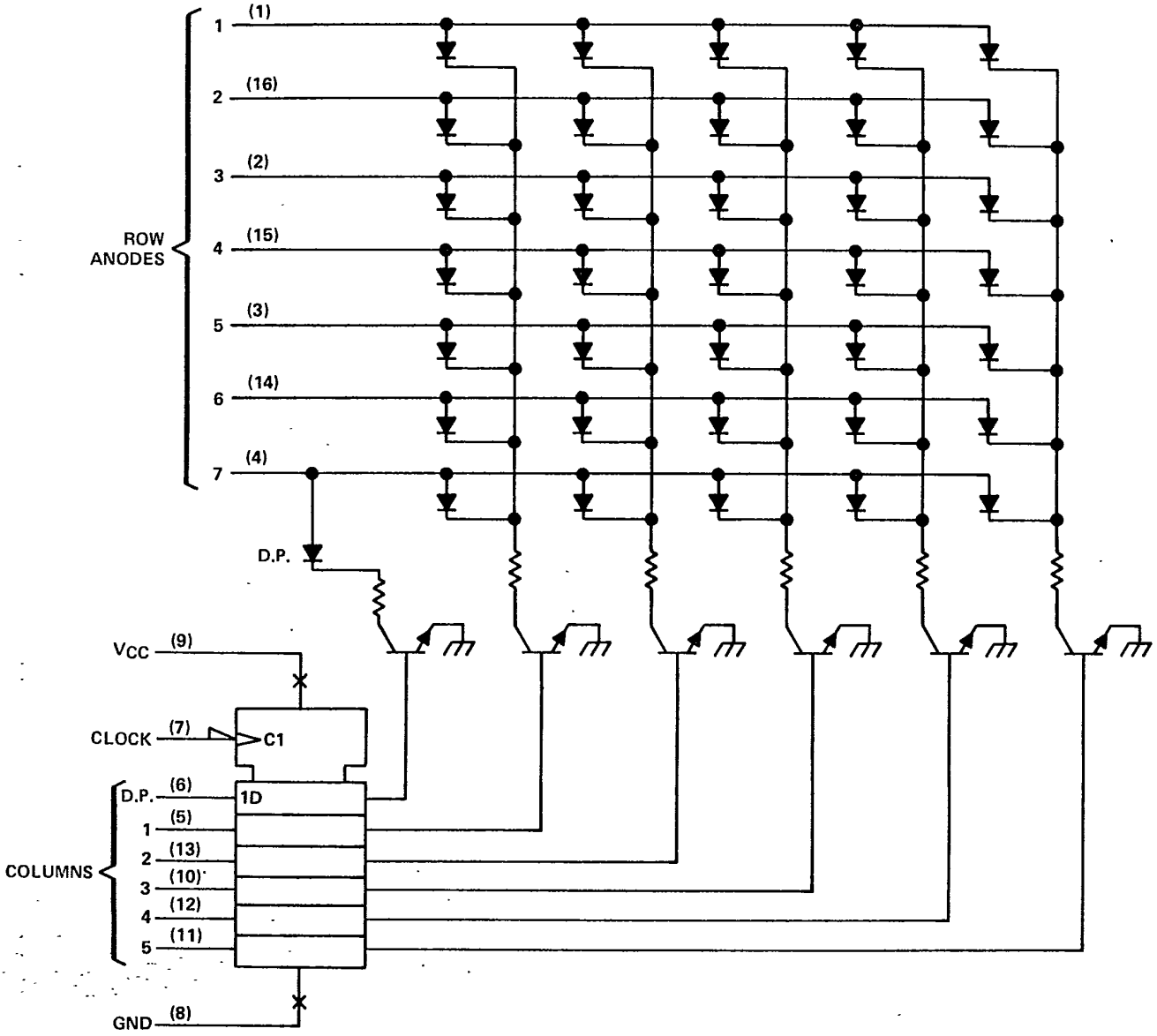
*description

The 4N58 is a 5 X 7 matrix of light-emitting diodes plus a decimal point. The device includes an IC logic chip similar to SN54174 containing six D-type flip-flops that can transfer data from a character generator to the five columns of the matrix and the decimal point. The chip also includes six cathode column drivers with series limiting resistors.

The rows are strobed by sequentially applying a positive voltage to each row input. As each row is strobed the data set up at column inputs are transferred to the column drivers on the rising edge of each clock pulse. A high column input causes the LED to turn on. After the minimum hold time requirement has been satisfied, the column data inputs may change whether the clock is high or low.



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714 Shepherd Drive · Garland, Texas 75042 · 214/487-0085

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***absolute maximum ratings over operating free-air temperature range (unless otherwise noted)**

Logic Supply Voltage, V_{CC} (See Note 1)	7 V
Row Anode Voltage, V_{row}	5.5 V
Input Voltage (Column and Clock)	5.5 V
Operating Free-Air Temperature Range (See Note 4)	-55°C to 85°C
Storage Temperature Range	−65°C to 125°C

***recommended operating conditions**

	MIN	NOM	MAX	UNIT
Logic Supply Voltage	4.5	5	5.5	V
High-Level Row Anode Voltage, V_{row}	3.5†	4	5	V
High-Level Input Voltage, V_{IH}	2			V
Low-Level Input Voltage, V_{IL}			0.8	V
Clock Frequency, f_{clock}		3		MHz
Duration of Clock Pulse, t_w	200			ns
Data Setup Time, t_{su}	50			ns
Data Hold Time, t_h	5			ns
Operating Free-Air Temperature, T_A	−55		85	°C

†Voltage may be reduced to 0 V to control intensity of the display.

***operating characteristics at 25°C free-air temperature**

	PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
I_v	Luminous Intensity (See Note 2)		V_{CC} = 5 V,	I_F = 10 mA	40	110		μcd
λ_p	Wavelength at Peak Emission		V_{CC} = 5 V,	V_{row} = 4 V	640	660	680	nm
$\Delta\lambda$	Spectral Bandwidth					20		nm
V_{IK}	Input Clamp Voltage		V_{CC} = 4.5 V,	I_I = −12 mA			−1.5	V
I_{IH}	High-Level Input Current		V_{CC} = 5.5 V,	V_I = 2.4 V			150	μA
I_{IL}	Low-Level Input Current		V_{CC} = 5.5 V,	V_I = 0.4 V			−1	mA
I_{row}	Row Input Current	Row 1 thru Row 6	See Note 3			500	800	mA
		Row 7				600	1000	
I_{CC}	Logic Supply Current					45	65	

NOTES:
1. Voltage values are with respect to network ground terminal.
2. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (International Commission on Illumination) eye-response curves.
3. Maximum values of row input current and logic supply current are stated for V_{CC} = 5.5 V, V_{row} = 5 V. Typical values are stated for V_{CC} = 5 V, V_{row} = 4 V. All column inputs are high.
4. Θca of mounted display should be less than 40 °C/W

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4N58-TXV 100% processing tests

100% processing tests in accordance with MIL-D-87157 for 4N58-TXV (General Military Specification for Visible Displays)

EXAMINATION OR TEST	MIL-STD-750 METHOD	CONDITIONS
Internal Visual	2072	50X Maginfication max
High Temp Storage	1032	$T_A = 125°C$, t = 24 hrs min
Temperature Cycling	1051	-65 to +125°C, 20 cycles
Constant Acceleration	2006	10KG's, Y_1 orientation
Hermetic Seal	1071	Condition G or H, 3 atm max pressure, $Q = 5 \times 10^{-8}$ max Condition C or D, 30 psi max pressure
Burn-In		MIL-STD-883 Method 1015 $V_{CC} = V_{row} = 5.5V$, $T_A = 25°C$, t = 160 hrs min
Final Electrical Test		Device Data Sheet, PDA = 10%
External Visual		MIL-STD-883 Method 2009

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