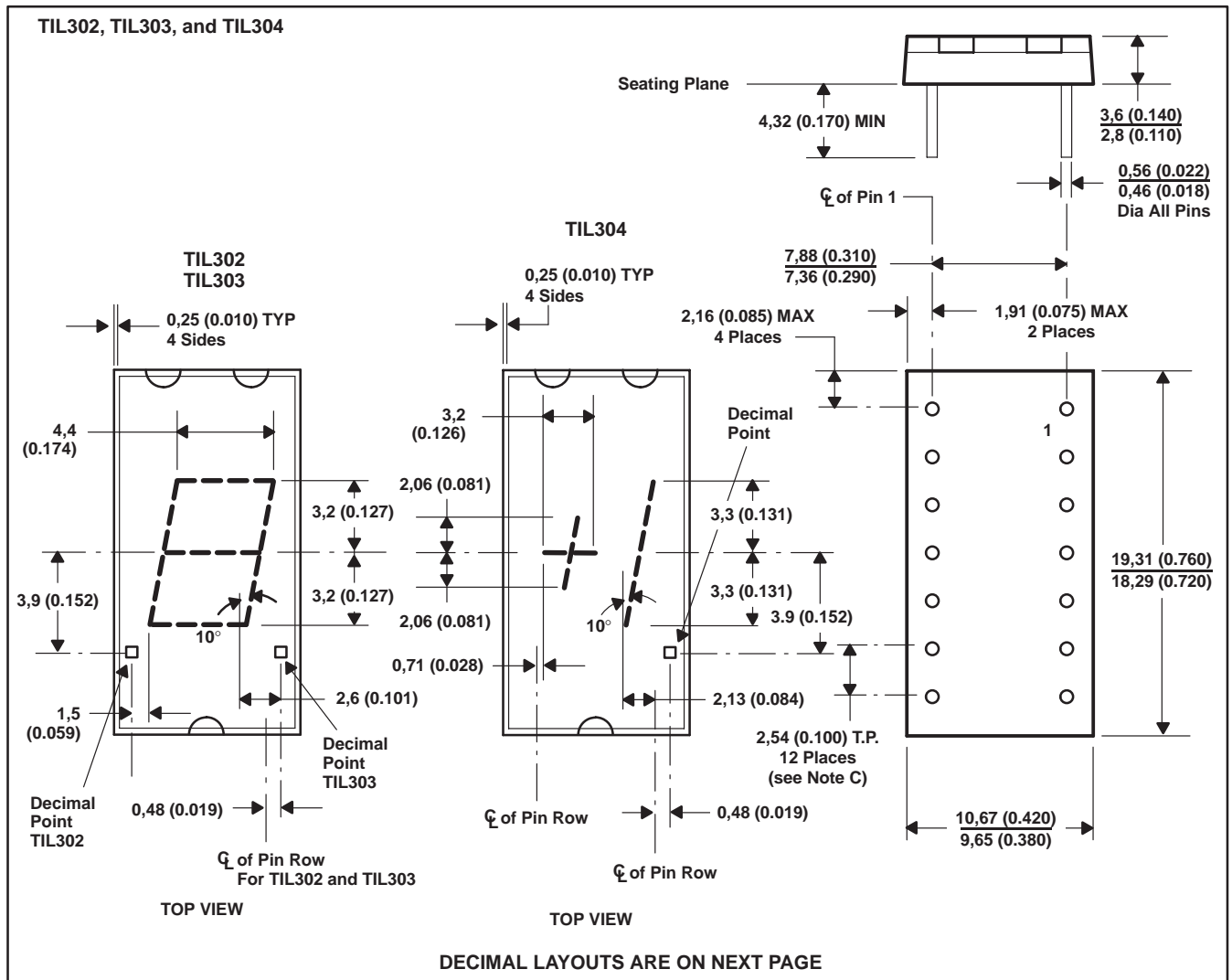


- Red Solid-State Display
- 6,9-mm (0.270-Inch) Character Height
- High Luminous Intensity
- Low Power Requirements
- Each Unit Visually Checked for Uniformity of Elements
- Sign, Overflow, and Left or Right Decimal Capabilities
- Wide Viewing Angle
- Compatible With Most TTL and DTL Circuits

mechanical data

These assemblies consist of display chips mounted on a header with molded plastic body. Multiple displays may be mounted on 11,43-mm (0.450-inch) centers.

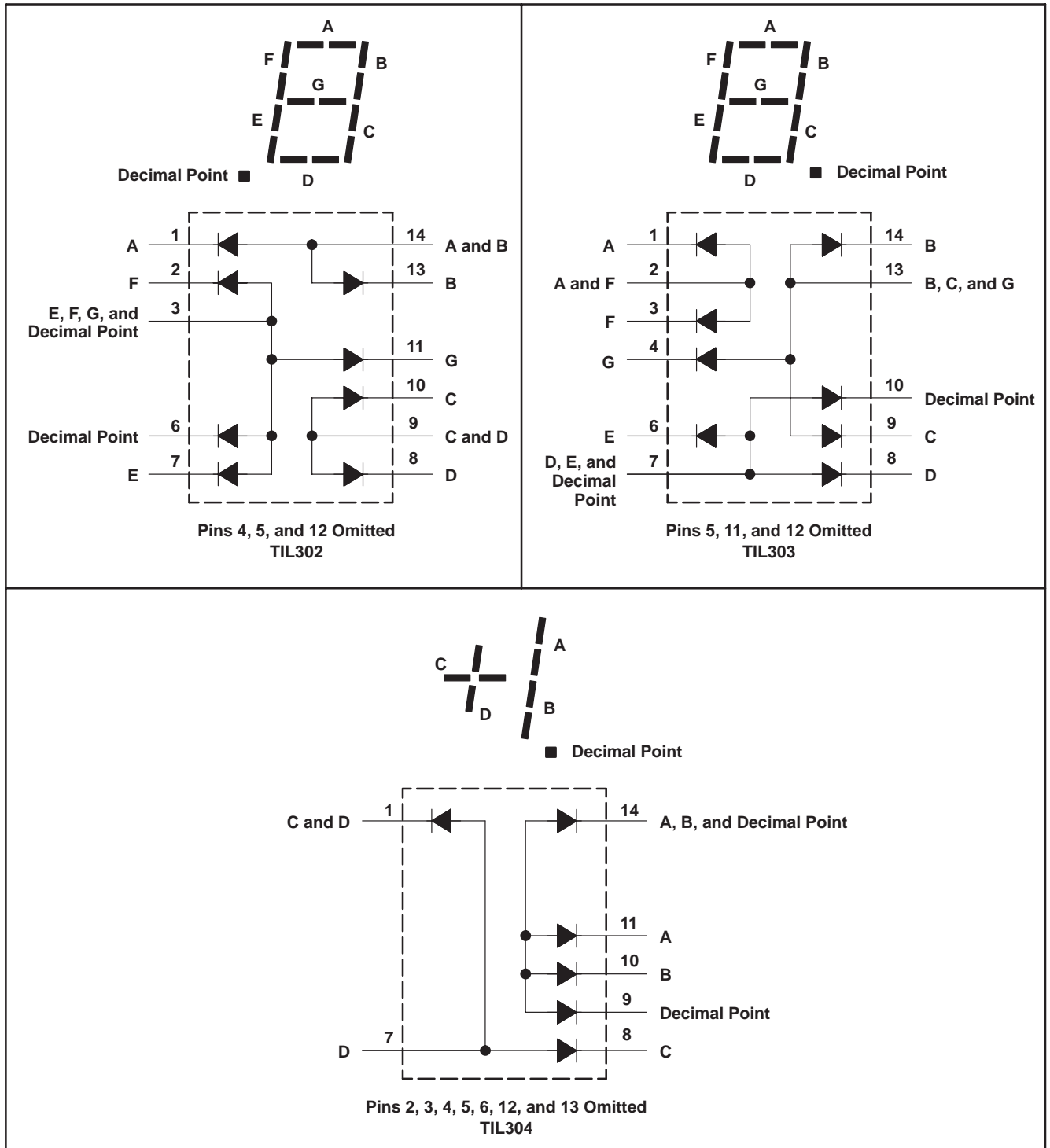


- NOTES: A. All linear dimensions are in millimeters and parenthetically in inches.
 B. Centerlines of character segments are shown as dashed lines. Associated dimensions are nominal.
 C. The true-position pin spacing is 2,54 mm (0.100 inch) between centerlines. Each centerline is located within 0,26 mm (0.010 inch) of its true longitudinal position relative to pins 1 and 11.

TIL302, TIL303, TIL304 NUMERIC DISPLAYS

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pin layouts



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

| | | |
|--|-------------------------------|---------------|
| Reverse voltage at 25°C free-air temperature: | Each segment | 6 V |
| | Decimal point | 3 V |
| Peak forward current, each segment or decimal point (see Note 1) | | 200 mA |
| Continuous forward current: | Each segment or decimal point | 30 mA |
| | Total for TIL302, TIL303 | 240 mA |
| | Total for TIL304 | 150 mA |
| Operating free-air temperature range, T_A | | 0°C to 70°C |
| Storage temperature range | | -25°C to 85°C |

NOTE 1: This value applies for PRR \geq 60 Hz, duty cycle \leq 10%.

operating characteristics of each segment at 25°C free-air temperature (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-----------------|---|---|-----|------|-----|----------------|
| I_V | Luminous intensity (see Note 2) | $I_F = 20 \text{ mA}$ | 100 | 275 | | μcd |
| λ_p | Wavelength at peak emission | | | 660 | | nm |
| $\Delta\lambda$ | Spectral bandwidth | | | 20 | | nm |
| V_F | Static forward voltage | | 3 | 3.4 | 3.8 | V |
| α_{VF} | Average temperature coefficient of static forward voltage | $I_F = 20 \text{ mA}$, $T_A = 0^\circ\text{C to } 70^\circ\text{C}$ | | -2.7 | | mV/°C |
| I_R | Static reverse current | $V_R = 6 \text{ V}$ | | | 100 | μA |
| C | Anode-to-cathode capacitance | $V_R = 0$, $f = 1 \text{ MHz}$ | | 85 | | pF |

operating characteristics of decimal point at 25°C free-air temperature (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-----------------|---|---|-----|------|-----|----------------|
| I_V | Luminous intensity (see Note 2) | $I_F = 20 \text{ mA}$ | 40 | 110 | | μcd |
| λ_p | Wavelength at peak emission | | | 660 | | nm |
| $\Delta\lambda$ | Spectral bandwidth | | | 20 | | nm |
| V_F | Static forward voltage | | 1.5 | 1.65 | 2 | V |
| α_{VF} | Average temperature coefficient of static forward voltage | $I_F = 20 \text{ mA}$, $T_A = 0^\circ\text{C to } 70^\circ\text{C}$ | | -1.4 | | mV/°C |
| I_R | Static reverse current | $V_R = 3 \text{ V}$ | | | 100 | μA |
| C | Anode-to-cathode capacitance | $V_R = 0$, $f = 1 \text{ MHz}$ | | 120 | | pF |

NOTE 2: Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (International Commission on Illumination) eye-response curve.

TYPICAL CHARACTERISTICS

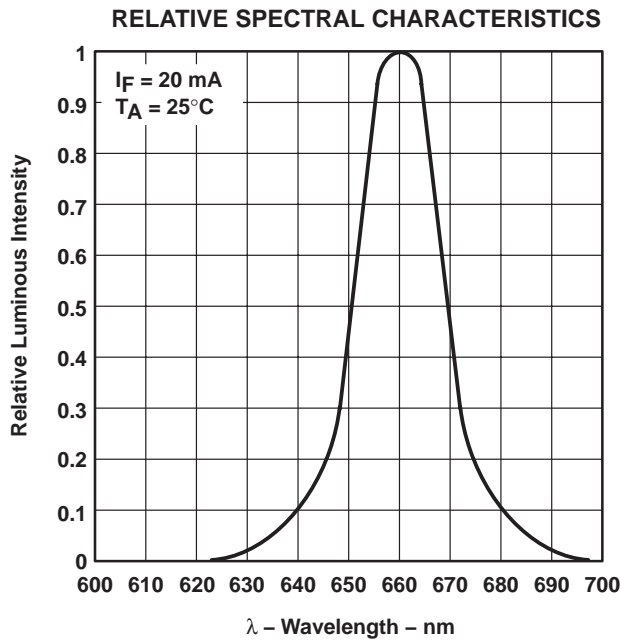


Figure 1

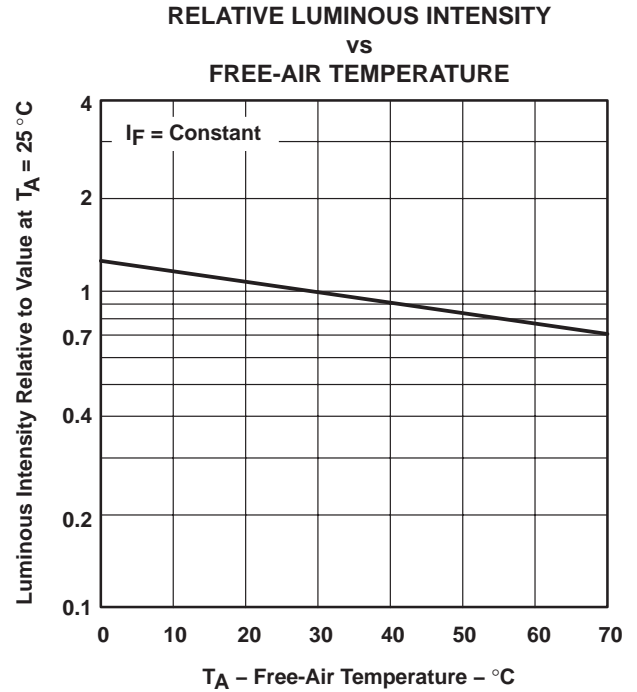


Figure 2

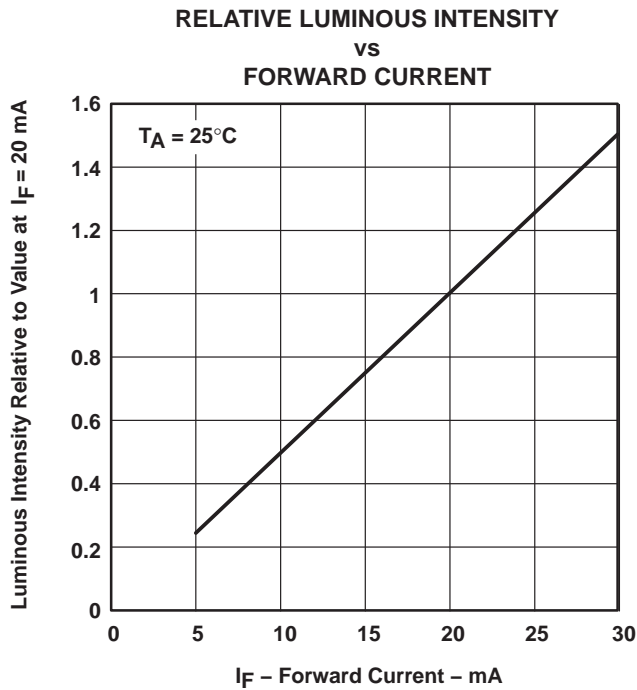


Figure 3

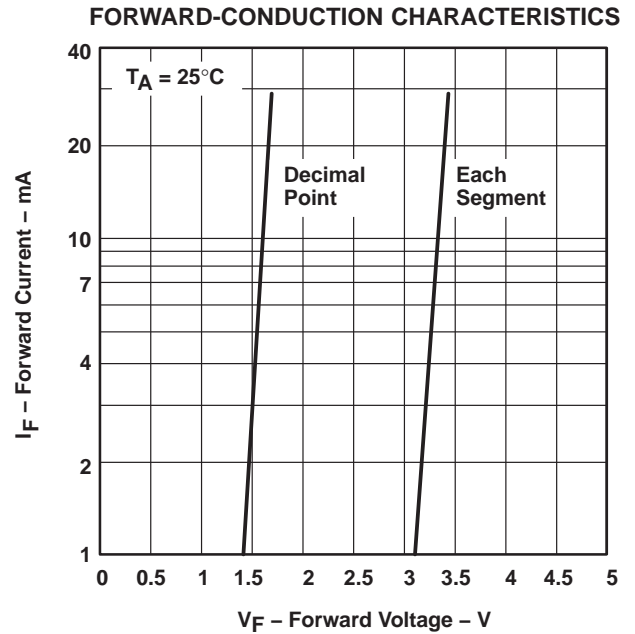
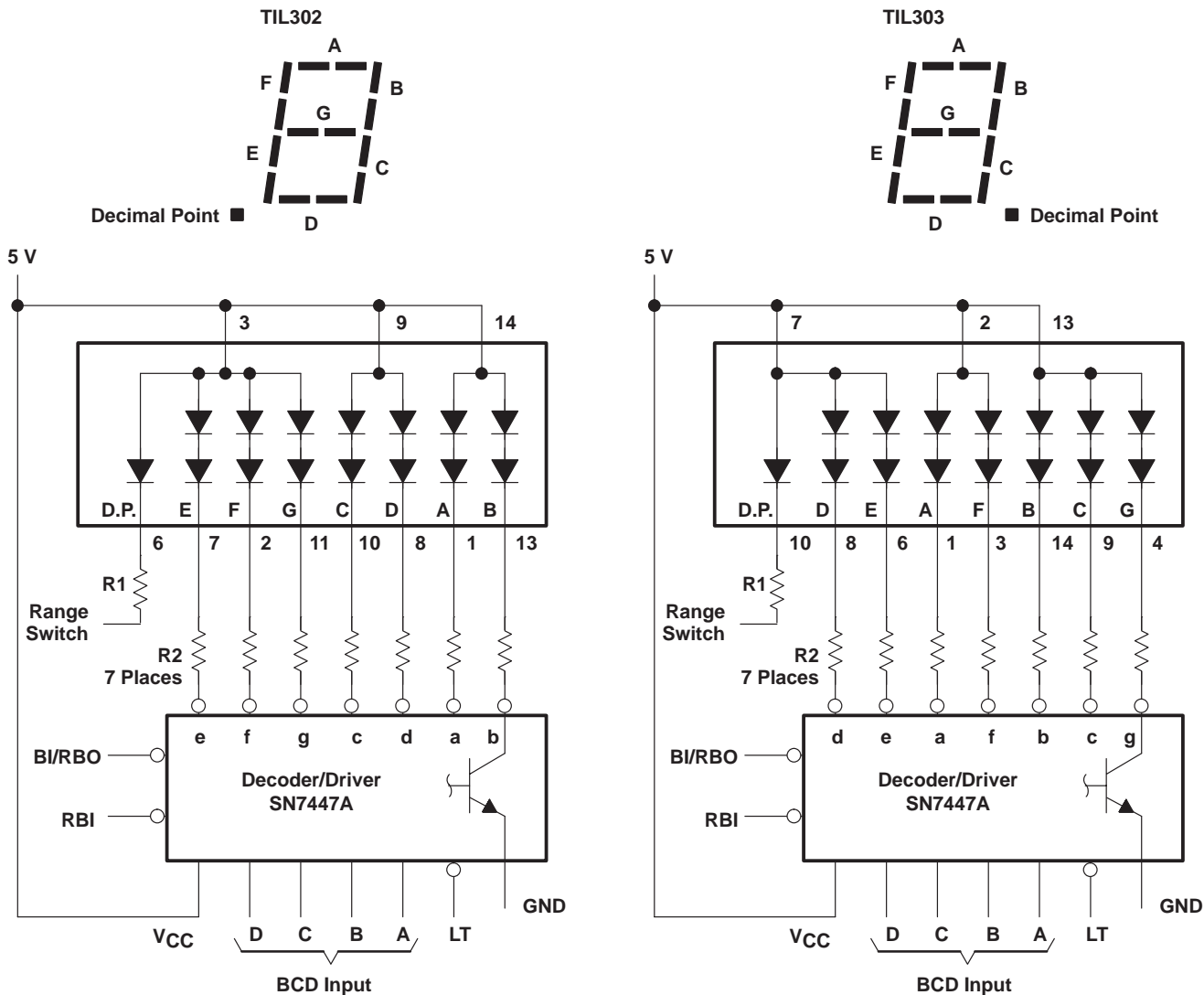


Figure 4

APPLICATION INFORMATION



NOTE A: R1 and R2 are selected for desired brightness.

TIL302, TIL303, TIL304 NUMERIC DISPLAYS

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APPLICATION INFORMATION

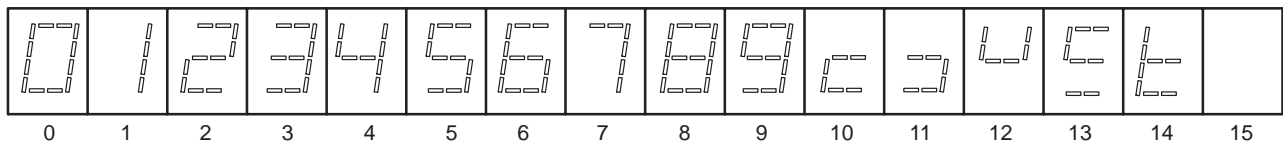
FUNCTION TABLE
SN7447A

| DECIMAL OR FUNCTION | INPUTS | | | | | | BI/RBO† | SEGMENTS | | | | | | | NOTE |
|---------------------------|--------|-----|---|---|---|---|---------|----------|-----|-----|-----|-----|-----|-----|------|
| | LT | RBI | D | C | B | A | | a | b | c | d | e | f | g | |
| 0 | H | H | L | L | L | L | H | ON | ON | ON | ON | ON | ON | OFF | 1 |
| 1 | H | X | L | L | L | H | H | OFF | ON | ON | OFF | OFF | OFF | OFF | 1 |
| 2 | H | X | L | L | H | L | H | ON | ON | OFF | ON | ON | OFF | ON | 1 |
| 3 | H | X | L | L | H | H | H | ON | ON | ON | ON | OFF | OFF | ON | 1 |
| 4 | H | X | L | H | L | L | H | OFF | ON | ON | OFF | OFF | ON | ON | 1 |
| 5 | H | X | L | H | L | H | H | ON | OFF | ON | ON | OFF | ON | ON | 1 |
| 6 | H | X | L | H | H | L | H | OFF | OFF | ON | ON | ON | ON | ON | 1 |
| 7 | H | X | L | H | H | H | H | ON | ON | ON | OFF | OFF | OFF | OFF | 1 |
| 8 | H | X | H | L | L | L | H | ON | ON | ON | ON | ON | ON | ON | 1 |
| 9 | H | X | H | L | L | H | H | ON | ON | ON | OFF | OFF | ON | ON | 1 |
| 10 | H | X | H | L | H | L | H | OFF | OFF | OFF | ON | ON | OFF | ON | 1 |
| 11 | H | X | H | L | H | H | H | OFF | OFF | ON | ON | OFF | OFF | ON | 1 |
| 12 | H | X | H | H | L | L | H | OFF | ON | OFF | OFF | OFF | ON | ON | 1 |
| 13 | H | X | H | H | L | H | H | ON | OFF | OFF | ON | OFF | ON | ON | 1 |
| 14 | H | X | H | H | H | L | H | OFF | OFF | OFF | ON | ON | ON | ON | 1 |
| 15 | H | X | H | H | H | H | H | OFF | OFF | OFF | OFF | OFF | OFF | OFF | 1 |
| BI | X | X | X | X | X | X | L | OFF | OFF | OFF | OFF | OFF | OFF | OFF | 2 |
| RBI | H | L | L | L | L | L | L | OFF | OFF | OFF | OFF | OFF | OFF | OFF | 3 |
| LT | L | X | X | X | X | X | H | ON | ON | ON | ON | ON | ON | ON | 4 |

H = high level (logic 1 in positive logic), L = low level (logic 0 in positive logic), X = irrelevant

† BI/RBO is a wire-AND logic serving as a blanking input (BI) and/or ripple-blanking output (RBO).

- NOTES: 1. The blanking input (BI) must be open or held at a high logic level when output functions 0 through 15 are desired. The ripple-blanking input (RBI) must be open or high if blanking of a decimal zero is not desired.
2. When a low logic level is applied directly to the blanking input (BI), all segment outputs are off regardless of any other input.
3. When the ripple-blanking input (RBI) and inputs A, B, C, and D are at a low logic level with the lamp-test input (LT) high, all segment outputs are off and the ripple-blanking output (RBO) of the decoder goes to a low level (response condition).
4. When the blanking input/ripple-blanking output (BI/RBO) is open or held high and a low is applied to the lamp-test input (LT), all segments are illuminated.



NUMERICAL DESIGNATIONS RESULTANT DISPLAYS

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