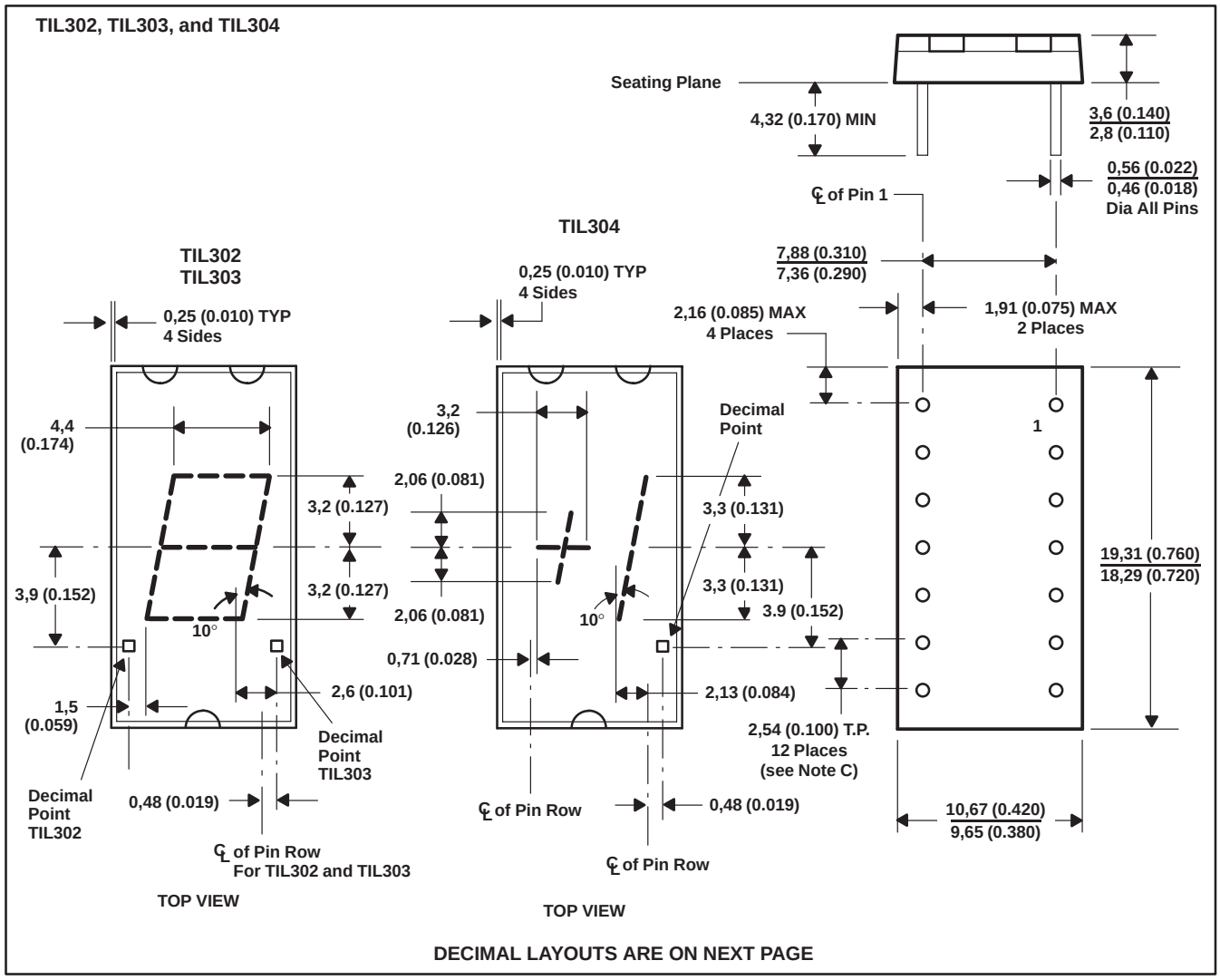
SOES010A, APRIL 1971 – REVISED DECEMBER 1993

- **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

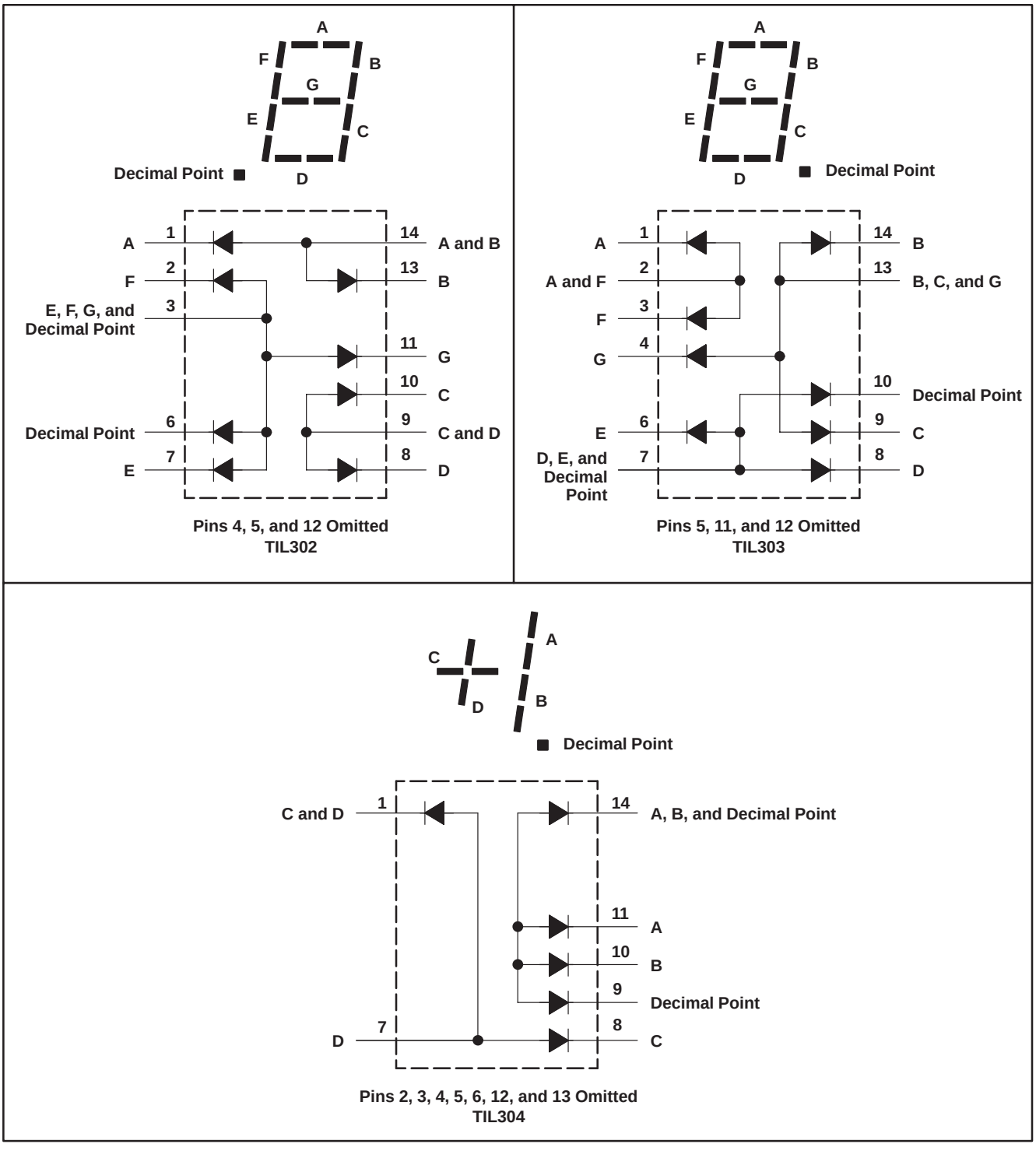
These assemblies consist of display chips mounted on a header with molded plastic body. Multiple displays may be mounted on 11,43-mm (0.450-inch) centers.



DECIMAL LAYOUTS ARE ON NEXT PAGE

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.

pin layouts


A
F
B
G
E
C
D
Decimal Point
A
1
F
2
E, F, G, and Decimal Point
3
Decimal Point
6
E
7
14
A and B
13
B
11
G
10
C
9
C and D
8
D
Pins 4, 5, and 12 Omitted
TIL302
A
F
B
G
E
C
D
Decimal Point
A
1
A and F
2
F
3
G
4
E
6
D, E, and Decimal Point
7
14
B
13
B, C, and G
10
Decimal Point
9
C
8
D
Pins 5, 11, and 12 Omitted
TIL303
C
A
D
B
Decimal Point
C and D
1
14
A, B, and Decimal Point
11
A
10
B
9
Decimal Point
D
7
8
C
Pins 2, 3, 4, 5, 6, 12, and 13 Omitted
TIL304

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 ≥ 60 Hz, duty cycle ≤ 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 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 mA, T_A = 0°C to 70°C		–2.7		mV/°C
I_R	Static reverse current	V_R = 6 V			100	µA
C	Anode-to-cathode capacitance	V_R = 0, f = 1 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 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 mA, T_A = 0°C to 70°C		–1.4		mV/°C
I_R	Static reverse current	V_R = 3 V			100	µA
C	Anode-to-cathode capacitance	V_R = 0, f = 1 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

RELATIVE SPECTRAL CHARACTERISTICS

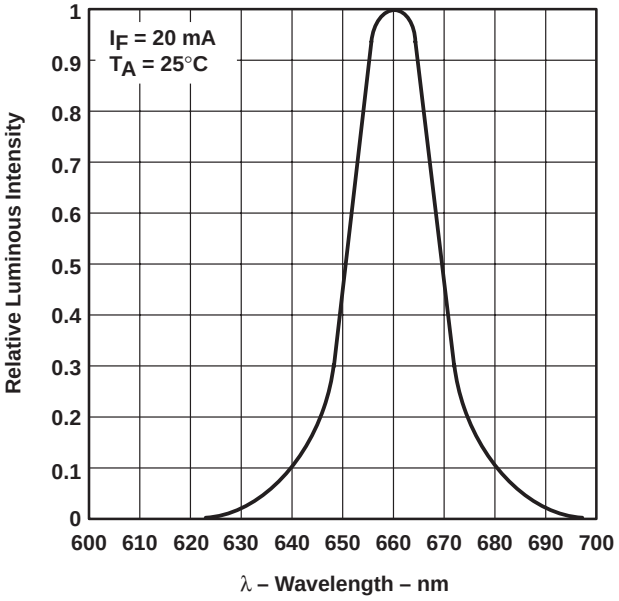


Figure 1

RELATIVE LUMINOUS INTENSITY vs FREE-AIR TEMPERATURE

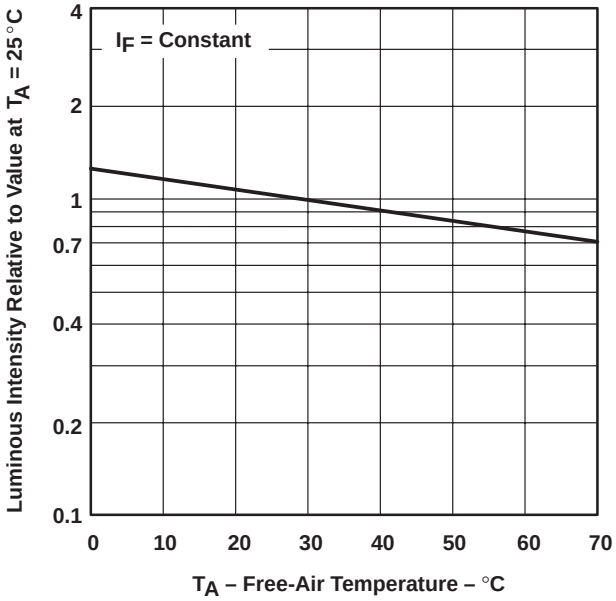


Figure 2

RELATIVE LUMINOUS INTENSITY vs FORWARD CURRENT

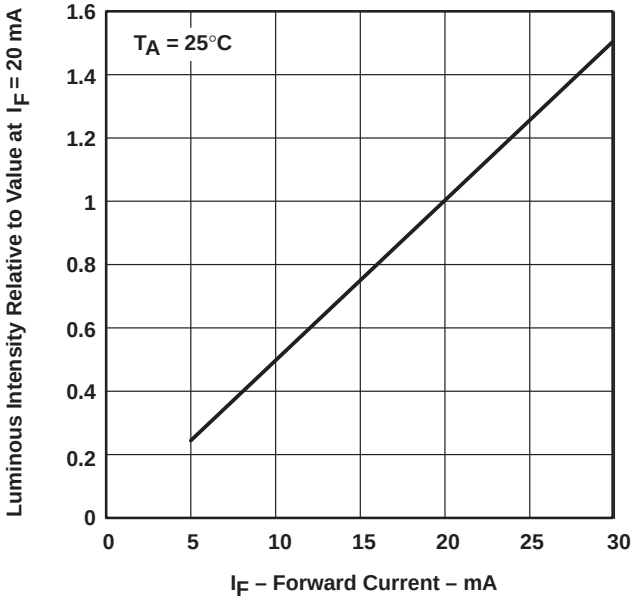


Figure 3

FORWARD-CONDUCTION CHARACTERISTICS

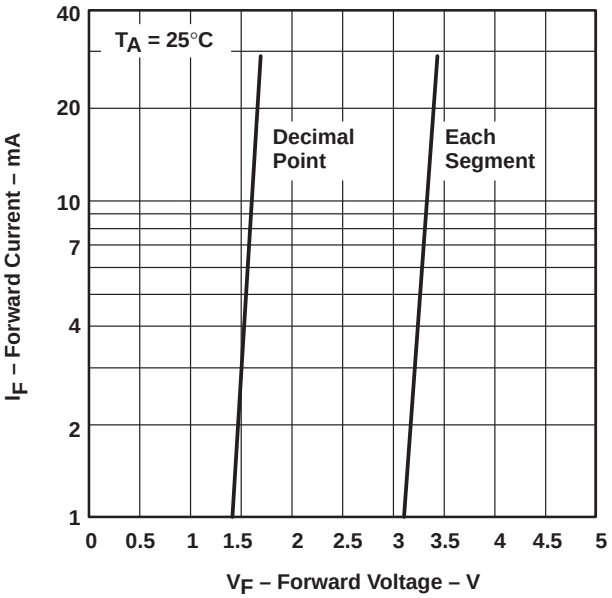
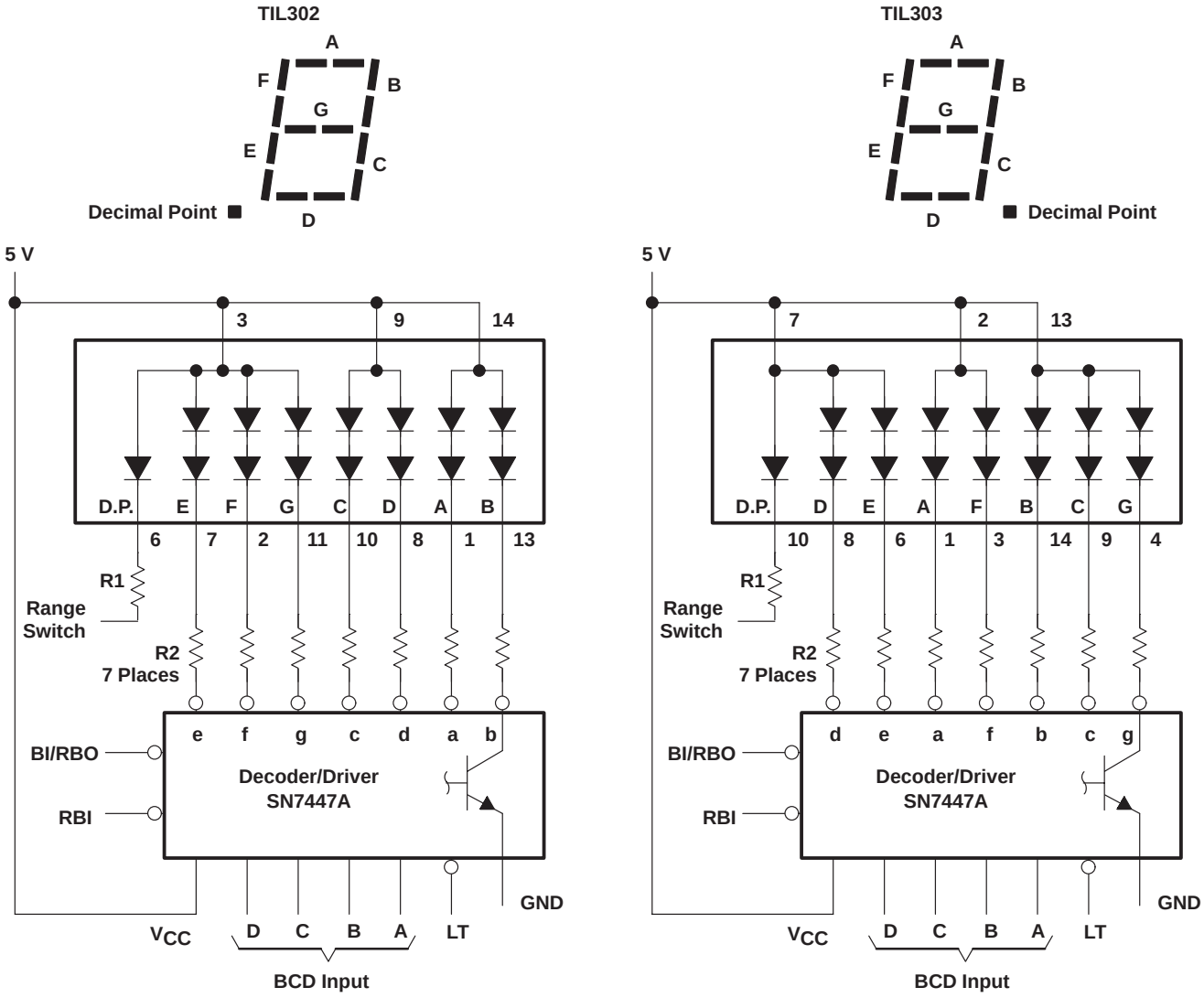


Figure 4

APPLICATION INFORMATION



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

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

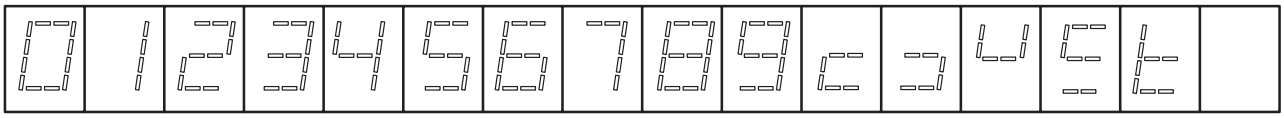
† BI/RBO is a wire-AND logic serving as a blanking input (BI) and/or ripple-blanking output (RBO).

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.



0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

NUMERICAL DESIGNATIONS RESULTANT DISPLAYS

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