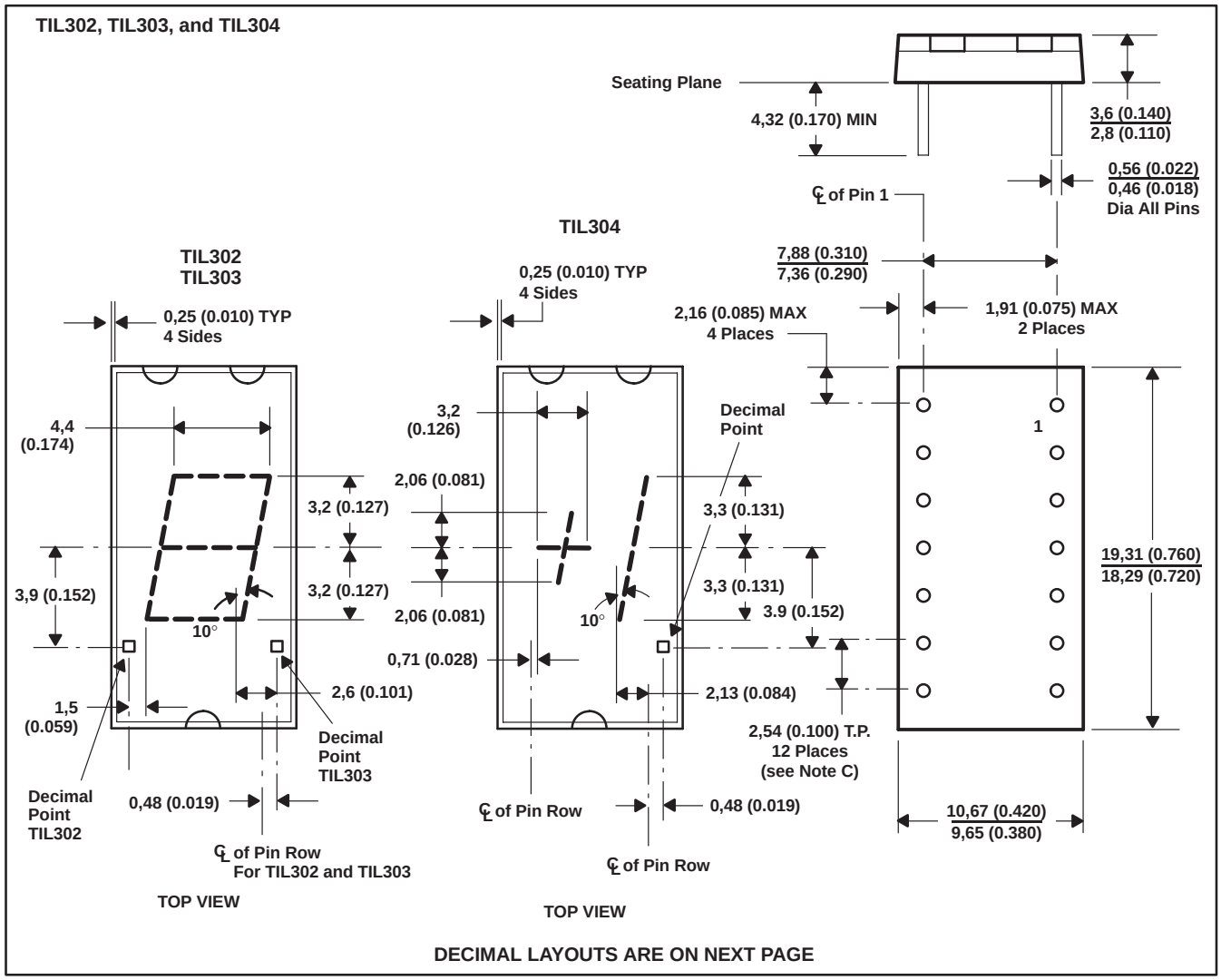
SOES010A, APRIL 1971 − REVISED DECEMBER 1993

- **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.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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TEXAS INSTRUMENTS
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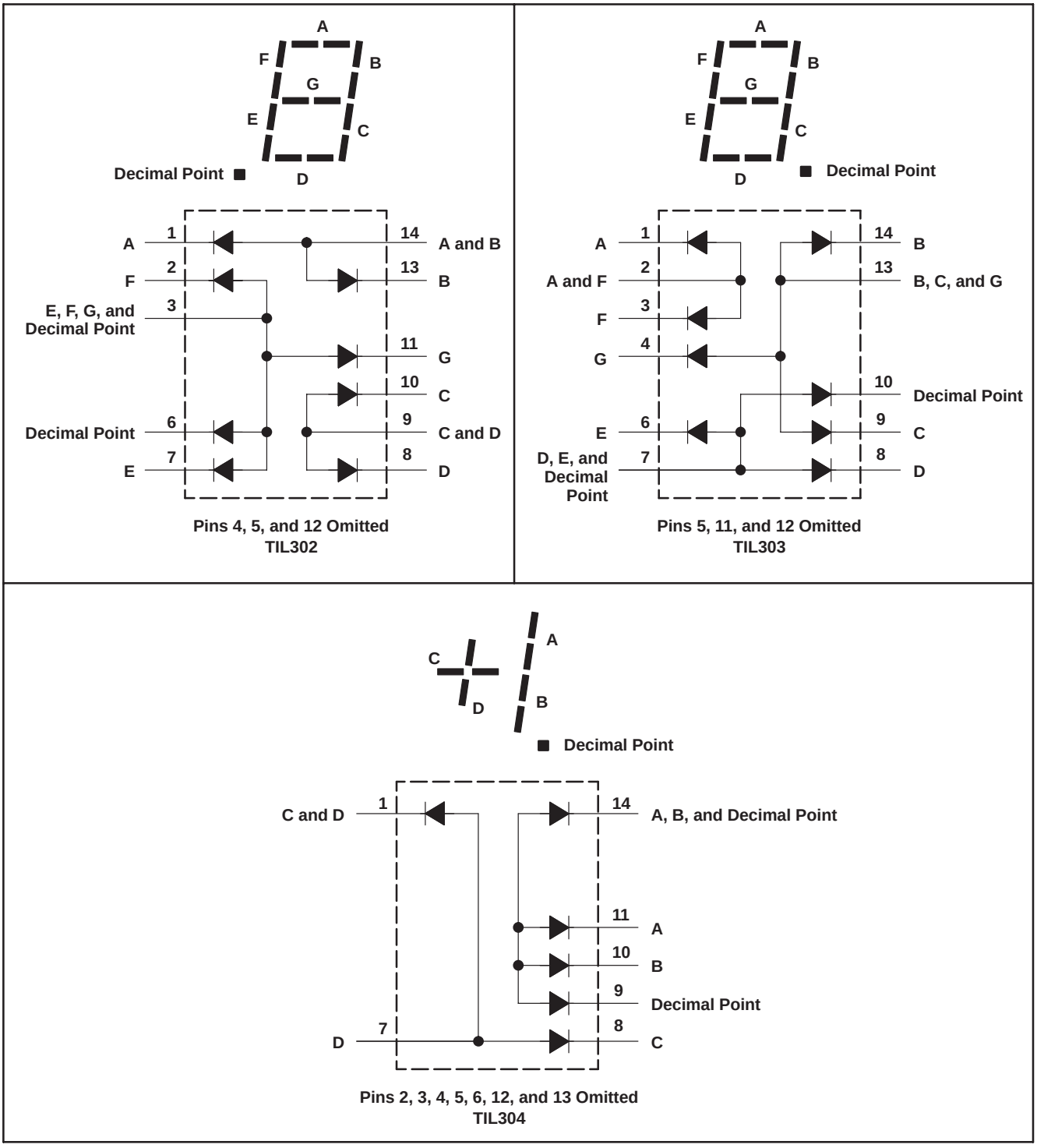
pin layouts


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

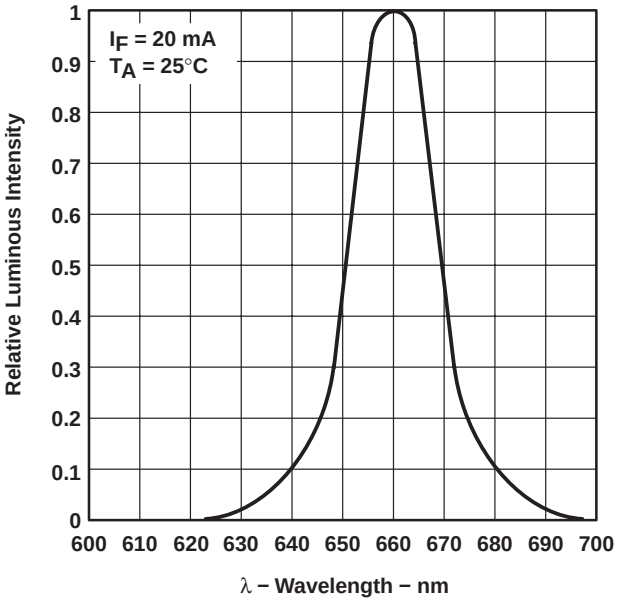


Figure 1

RELATIVE LUMINOUS INTENSITY
vs
FREE-AIR TEMPERATURE

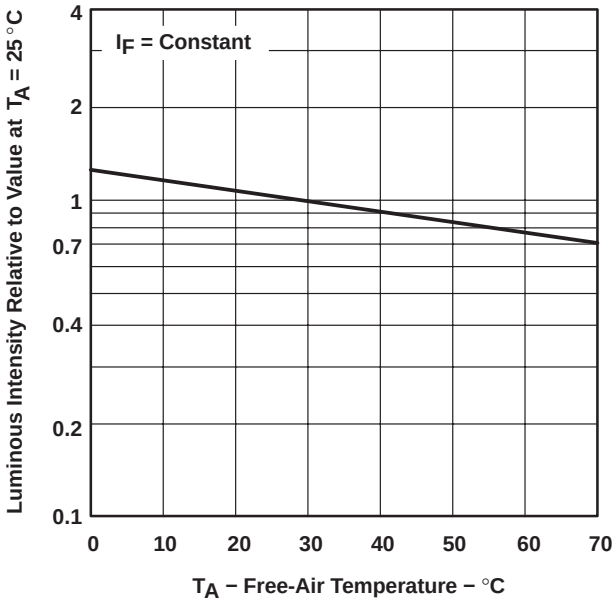


Figure 2

RELATIVE LUMINOUS INTENSITY
vs
FORWARD CURRENT

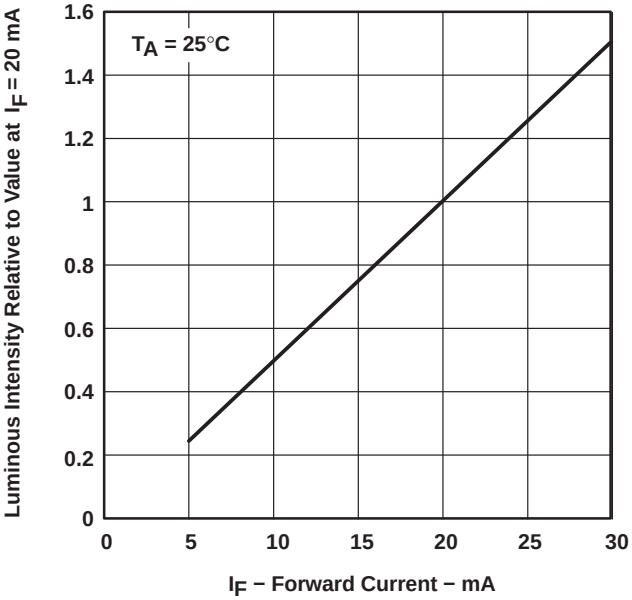


Figure 3

FORWARD-CONDUCTION CHARACTERISTICS

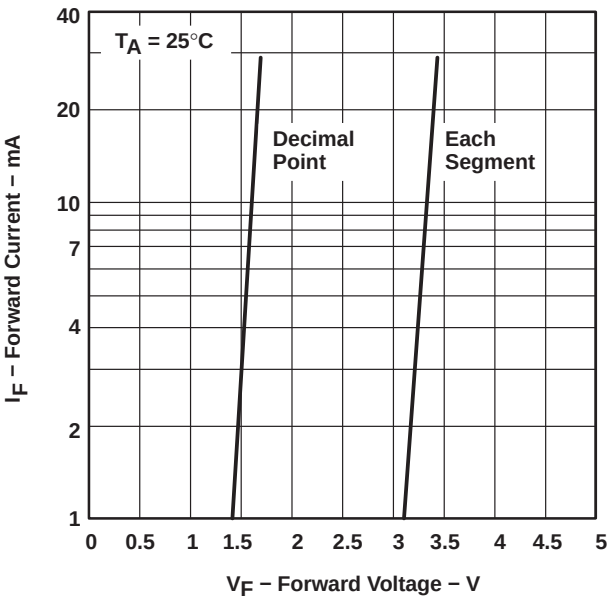
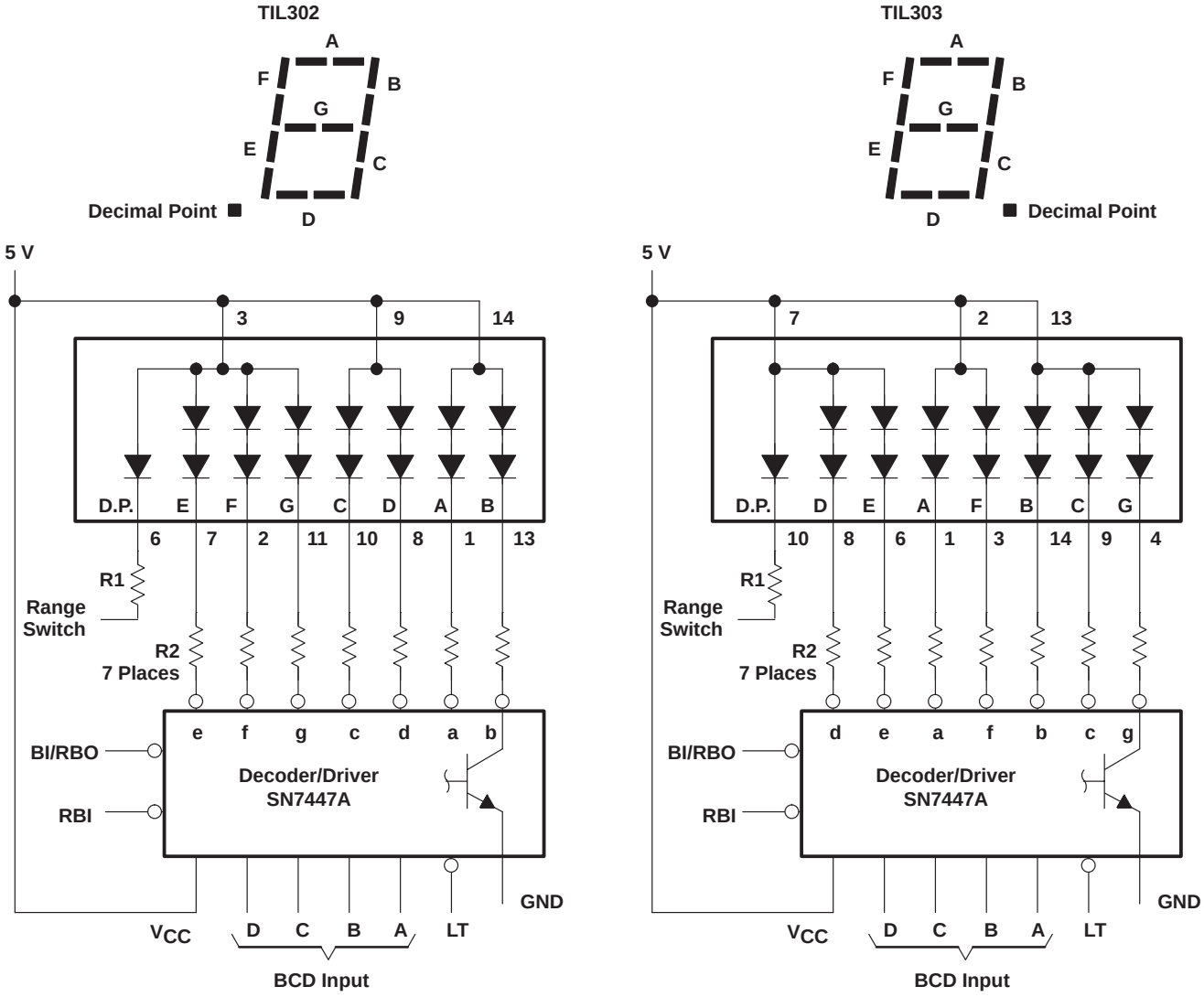


Figure 4

APPLICATION INFORMATION



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

APPLICATION INFORMATION

FUNCTION TABLE
SN7447A

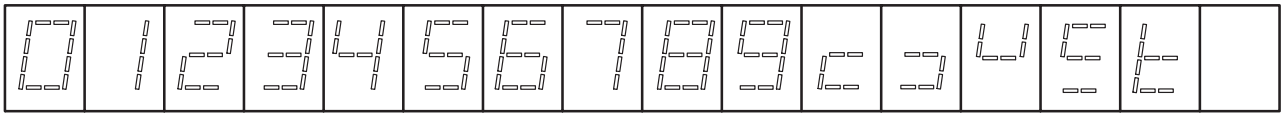
DECIMAL OR FUNCTION	INPUTS						BI/RBO†	SEGMENTS							NOTE
	LT	RBI	D	C	B	A		a	b	c	d	e	f	g	
0	H	H	L	L	L	L	H	ON	ON	ON	ON	ON	ON	OFF	1
1	H	X	L	L	L	H	H	OFF	ON	ON	OFF	OFF	OFF	OFF	1
2	H	X	L	L	H	L	H	ON	ON	OFF	ON	ON	OFF	ON	1
3	H	X	L	L	H	H	H	ON	ON	ON	ON	OFF	OFF	ON	1
4	H	X	L	H	L	L	H	OFF	ON	ON	OFF	OFF	ON	ON	1
5	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

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