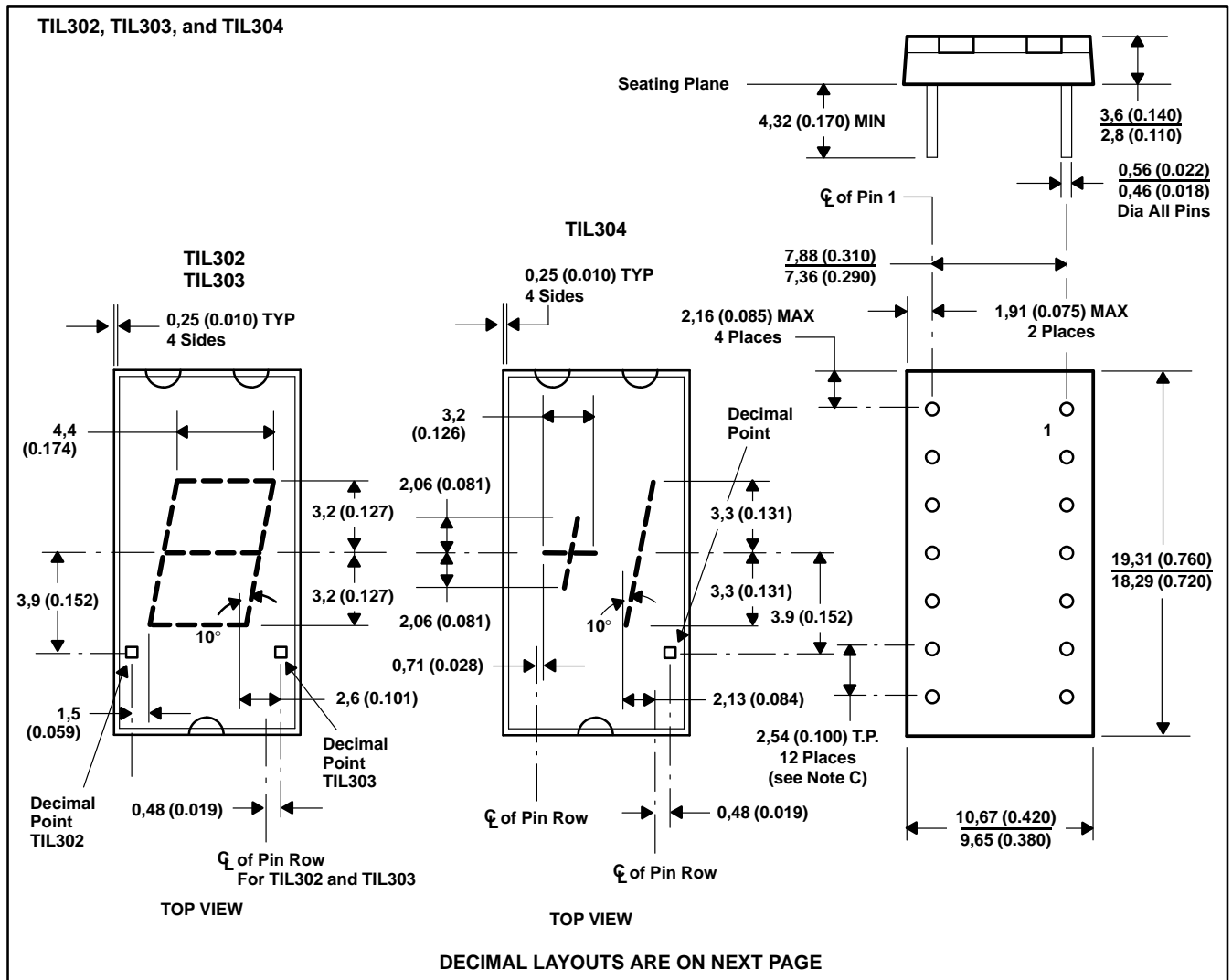


- Red Solid-State Display
- 6,9-mm (0.270-Inch) Character Height
- High Luminous Intensity
- Low Power Requirements
- Each Unit Visually Checked for Uniformity of Elements
- Sign, Overflow, and Left or Right Decimal Capabilities
- Wide Viewing Angle
- Compatible With Most TTL and DTL Circuits

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.

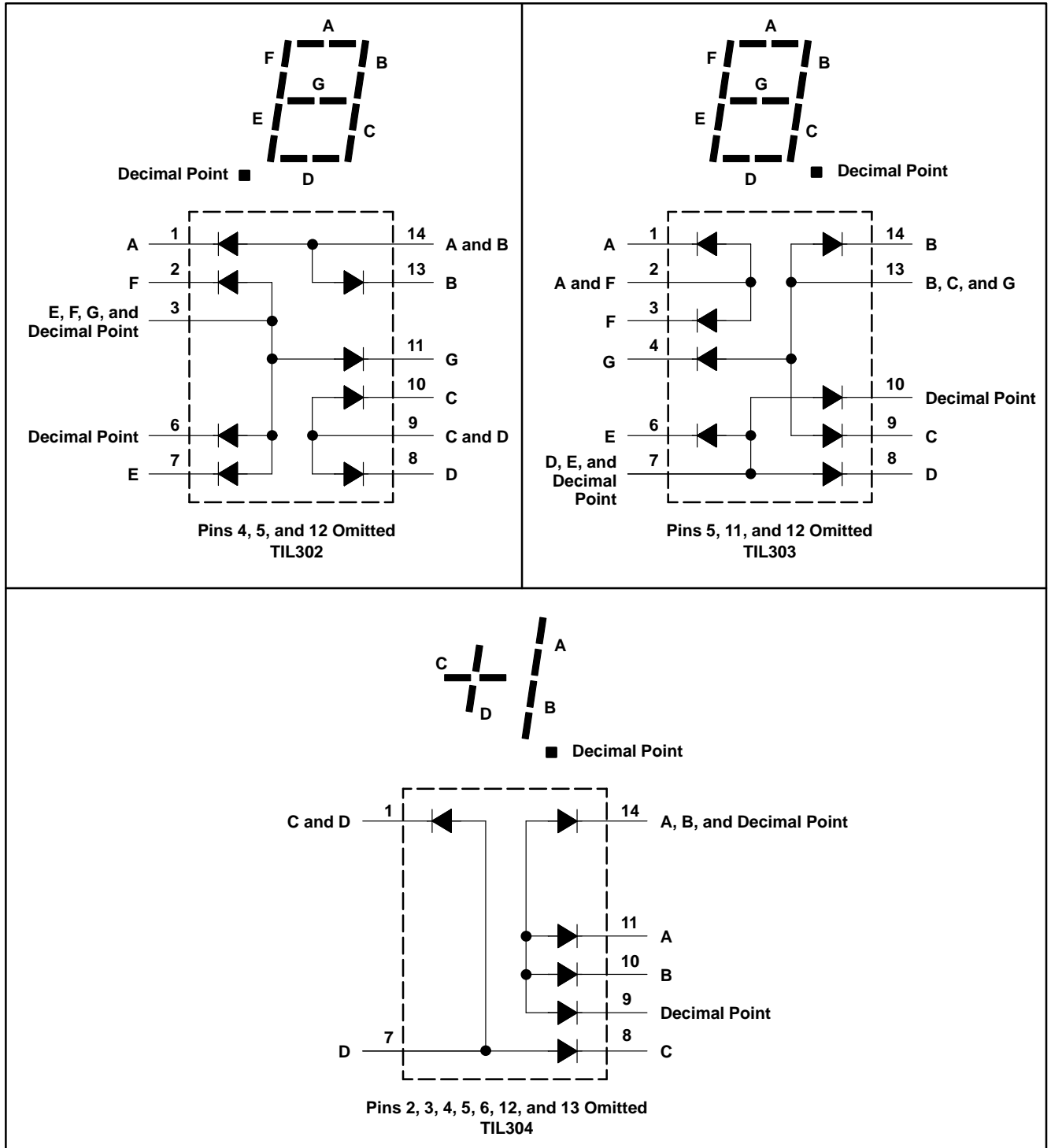


- NOTES: A. All linear dimensions are in millimeters and parenthetically in inches.
 B. Centerlines of character segments are shown as dashed lines. Associated dimensions are nominal.
 C. The true-position pin spacing is 2,54 mm (0.100 inch) between centerlines. Each centerline is located within 0,26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

TIL302, TIL303, TIL304 NUMERIC DISPLAYS

SOES010A, APRIL 1971 – REVISED DECEMBER 1993

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 ≥ 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
Δλ Spectral bandwidth			20		nm
V _F Static forward voltage		3	3.4	3.8	V
α _{V_F} 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
Δλ Spectral bandwidth			20		nm
V _F Static forward voltage		1.5	1.65	2	V
α _{V_F} 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

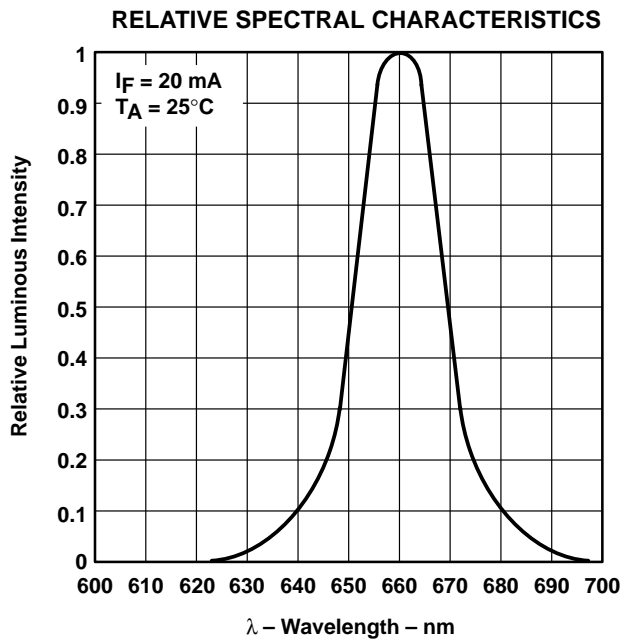


Figure 1

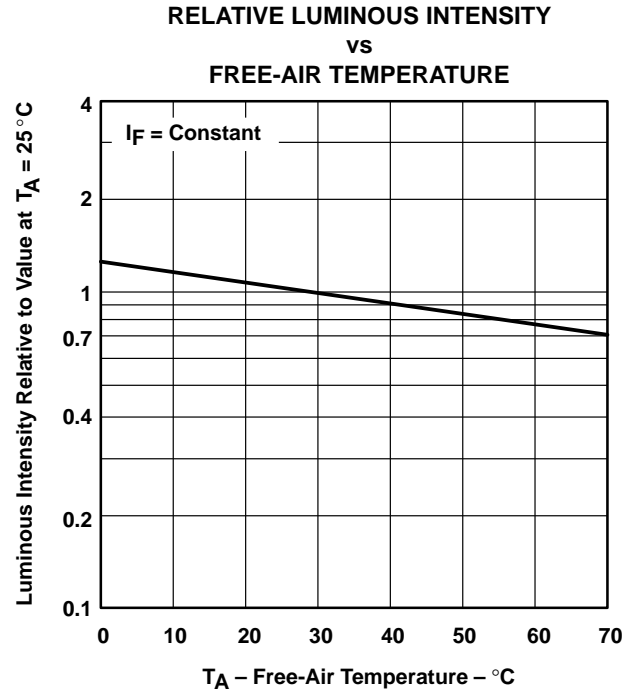


Figure 2

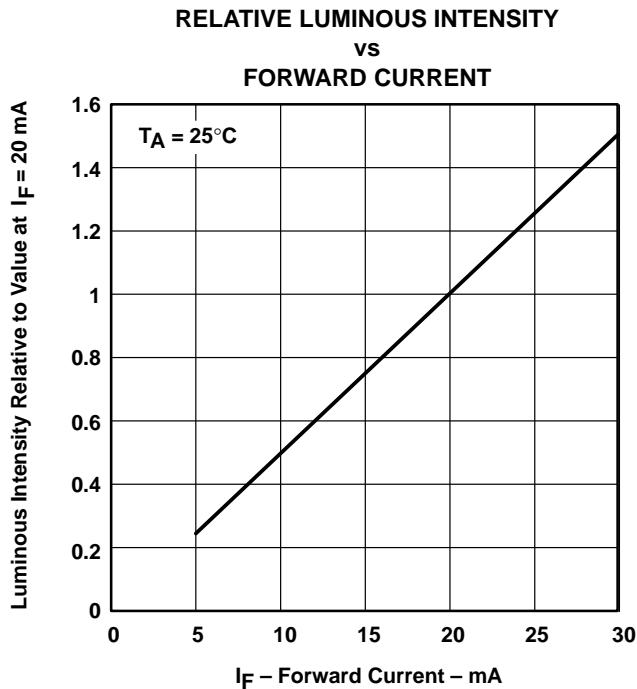


Figure 3

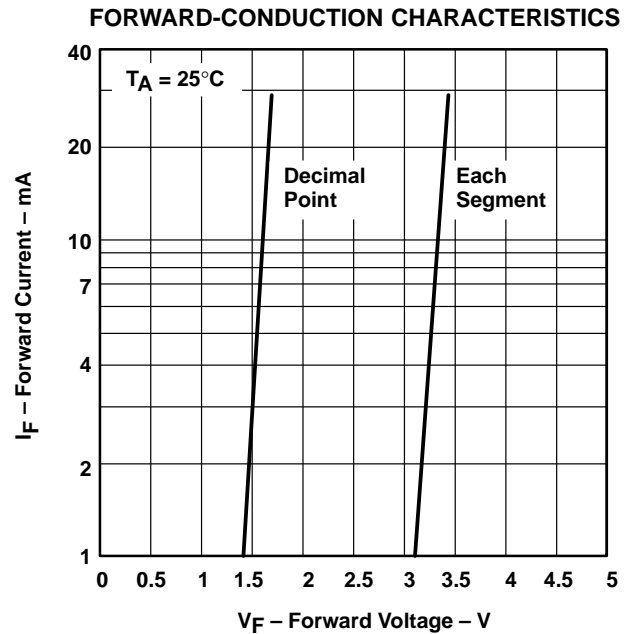
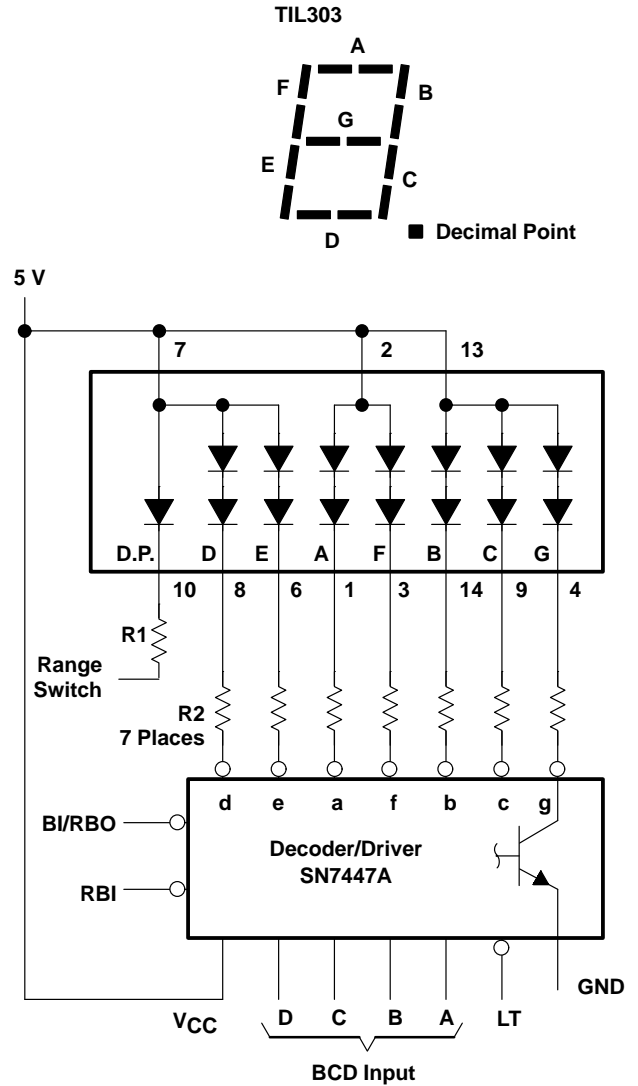
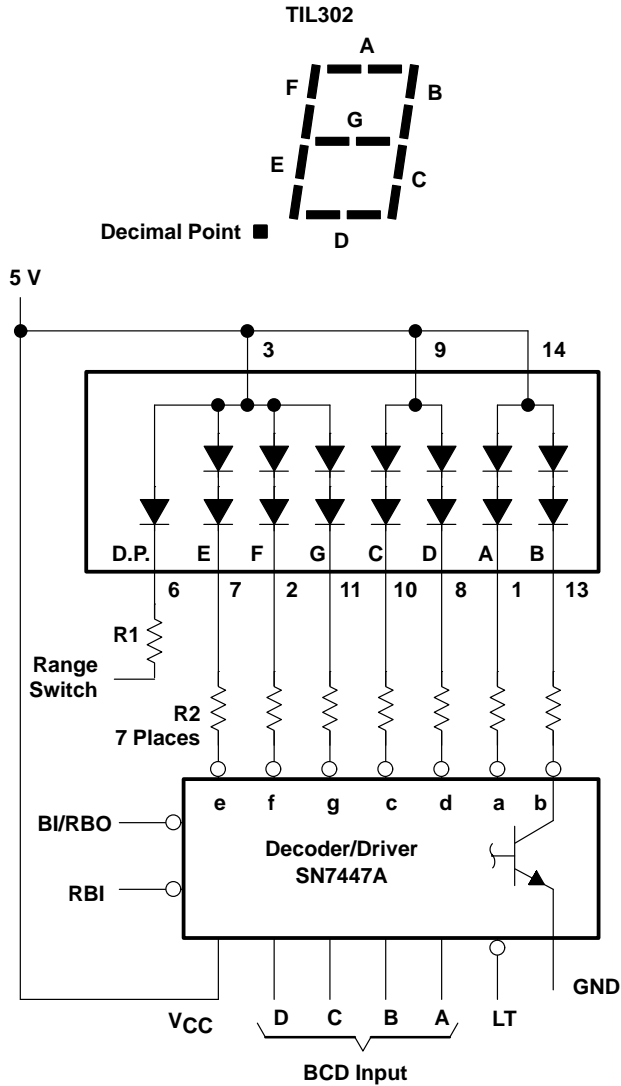


Figure 4

APPLICATION INFORMATION



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

TIL302, TIL303, TIL304 NUMERIC DISPLAYS

SOES010A, APRIL 1971 – REVISED DECEMBER 1993

APPLICATION INFORMATION

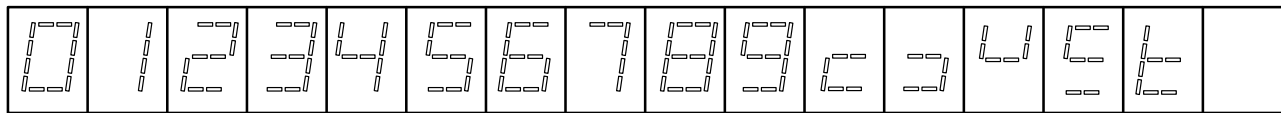
FUNCTION TABLE
SN7447A

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

IMPORTANT NOTICE

Texas Instruments (TI) reserves the right to make changes to its products or to discontinue any semiconductor product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

TI warrants performance of its semiconductor products and related software to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

Certain applications using semiconductor products may involve potential risks of death, personal injury, or severe property or environmental damage ("Critical Applications").

TI SEMICONDUCTOR PRODUCTS ARE NOT DESIGNED, INTENDED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT APPLICATIONS, DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS.

Inclusion of TI products in such applications is understood to be fully at the risk of the customer. Use of TI products in such applications requires the written approval of an appropriate TI officer. Questions concerning potential risk applications should be directed to TI through a local SC sales office.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards should be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or services described herein. Nor does TI warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used.