BCD-TO-SEVEN SEGMENT DECODER/DRIVER

N7448

N7448-B

DIGITAL 54/74 TTL SERIES

DESCRIPTION

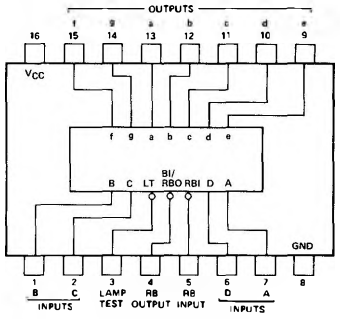
The 7448 BCD-to-Seven Segment Decoder/Driver is a TTL monolithic device consisting of the necessary logic to decode a BCD code to seven segment readout plus selected signs.

Incorporated in this device is a blanking circuit allowing leading and trailing zero suppression. Also included is a lamp test control to turn on all segments.

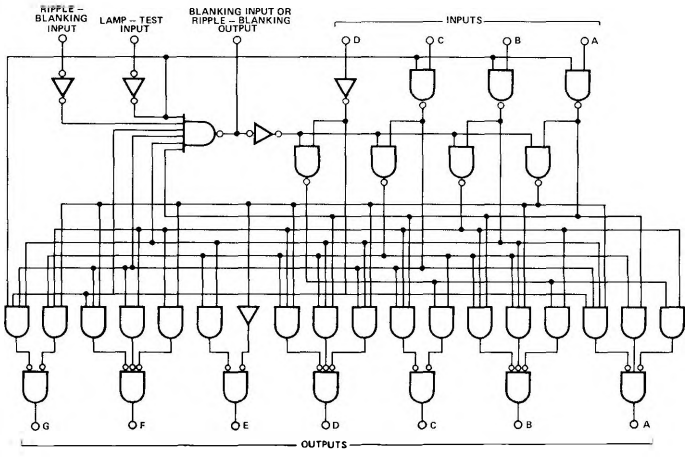
The 7448 has resistor pull up on the outputs to provide source current to drive interface elements.

PIN CONFIGURATIONS

B PACKAGE



LOGIC DIAGRAM



TRUTH TABLE

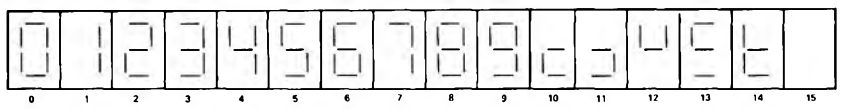
	INPUTS							OUTPUTS							
FUNCTION	LT	RBI	D	C	B	A	BI/RBO	a	b	c	d	e	f	g	NOTE
0	1	1	0	0	0	0	1	1	1	1	1	1	1	0	1
1	1	x	0	0	0	1	1	0	1	1	0	0	0	0	1
2	1	x	0	0	1	0	1	1	1	0	1	1	0	1	
3	1	x	0	0	1	1	1	1	1	1	1	0	0	1	
4	1	x	0	1	0	0	1	0	1	1	0	0	1	1	
5	1	x	0	1	0	1	1	1	0	1	1	0	1	1	
6	1	x	0	1	1	0	1	0	0	1	1	1	1	1	
7	1	x	0	1	1	1	1	1	1	1	0	0	0	0	
8	1	x	1	0	0	0	1	1	1	1	1	1	1	1	
9	1	x	1	0	0	1	1	1	1	1	0	0	1	1	
10	1	x	1	0	1	0	1	0	0	0	1	1	0	1	
11	1	x	1	0	1	1	1	0	0	1	1	0	0	1	
12	1	x	1	1	0	0	1	0	1	0	0	0	1	1	
13	1	x	1	1	0	1	1	1	0	0	1	0	1	1	
14	1	x	1	1	1	0	1	0	0	0	1	1	1	1	
15	1	x	1	1	1	1	1	0	0	0	0	0	0	0	
BI	x	x	x	x	x	x	0	0	0	0	0	0	0	0	2
RBI	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
LT	0	x	x	x	x	x	1	1	1	1	1	1	1	1	4

NOTES:

1. BI/BRO is wire-OR logic serving as blanking input (BI) and/or ripple-blanking output (RBO). The blanking input must be open or held at a logical 1 when output functions 0 through 15 are desired and ripple-blanking input (RBI) must be open or at a logical 1 during the decimal 0 input. X = input may be high or low.
2. When a logical 0 is applied to the blanking input (forced condition) all segment outputs go to a logical 1 regardless of the state of any other input condition.
3. When ripple-blanking input (RBI) is at a logical 0 and A = B = C = D = logical 0, all segment outputs go to a logical 1 and the ripple-blanking output goes to a logical 0 (response condition).
4. When blanking input/ripple-blanking output is open or held at a logical 1, and a logical 0 is applied to lamp-test input, all segment outputs go to a logical 1.

SEGMENT IDENTIFICATION

SEGMENT IDENTIFICATION



NUMERICAL DESIGNATIONS – RESULTANT DISPLAYS

RECOMMENDED OPERATING CONDITIONS

	MIN	NOM	MAX	UNIT
Supply Voltage V_{CC} (See Note 1): N7448 Circuit	4.75	5	5.25	V
Normalized Fan-Out From Outputs a through g to Series 54/74 loads: N7448 Circuits			4	
Normalized Fan-Out From BI/RBO Node to Series 54/74 Loads: N7448 Circuits			5	
Output Sink Current, I_{sink}: N7448 Outputs a through g			6.4	mA
N7448 BI/RBO Node			8	mA

NOTES:
1. These voltage values are with respect to network ground terminal.
2. Input voltage must be zero or positive with respect to network ground terminal.
3. This rating applies when the output is off.

ELECTRICAL CHARACTERISTICS (over recommended operating free-air temperature range unless otherwise noted)

PARAMETER		TEST CONDITIONS *	MIN	TYP **	MAX	UNIT
$V_{in(1)}$	Input voltage required to ensure logical 1 at any input	V_{CC} = MIN	2			V
$V_{in(0)}$	Input voltage required to ensure logical 0 at any input	V_{CC} = MIN			0.8	V
$V_{out(0)}$	Logical 0 output voltage at any output	V_{CC}= MIN, I_{sink} = MAX		0.27	0.4	V
$V_{out(1)}$	Logical 1 level output voltage at outputs a through g	V_{CC} = MIN, I_{load} = -400 μA	2.4	4.2		V
$V_{out(1)}$	Logical 1 level output at BI/RBO node	V_{CC} = MIN, I_{load} = 200 μA	2.4	3.7		V
I_{load}	Load current available at outputs a through g	V_{CC} = MIN, V_{out} = 0.85V	-1.3	-2		mA
$I_{in(0)}$	Logical 0 level input current of any input except BI/RBO node	V_{CC} = MAX, V_{in} = 0.4V			-1.6	mA
$I_{in(0)}$	Logical 0 level input current at BI/RBO node	V_{CC} = MAX, V_{in} = 0.4V			-4.2	mA
$I_{in(1)}$	Logical 1 level input current at any input except BI/RBO node	V_{CC} = MAX, V_{in} = 2.4V			40	μA
		V_{CC} = MAX, V_{in} = 5.5V			1	mA
I_{OS}	Short-circuit output current at any output	V_{CC} = MAX			-4	mA
I_{CC}	Supply current	S5448		53	76	mA
		N7448		53	90	mA

SWITCHING CHARACTERISTICS, V_{CC} = 5V, T_A = 25°C,

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{pd1}	Propagation delay time to logical 1 level from A input to any output	C_L = 15pF			100	ns
t_{pd0}	Propagation delay time to logical 0 level from A input to any output	C_L = 15pF			100	ns
t_{pd1}	Propagation delay time to logical 1 level from RBI input to any output	C_L = 15pF			100	ns
t_{pd0}	Propagation delay time to logical 0 level from RBI input to any output	C_L = 15pF			100	ns

* For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

** All typical values are at V_{CC} = 5V, T_A = 25°C.