BCD/7-Segment Decoders/Drivers

General Description

The 46A, 47A and LS47 feature active-low outputs designed for driving common-anode LED's or incandescent indicators directly; and the 48, LS48 and LS49 feature active-high outputs for driving lamp buffers or common-cathode LED's. All of the circuits except the LS49 have full ripple-blanking input/output controls and a lamp test input. The LS49 features a direct blanking input. Segment identification and resultant displays are shown on a following page. Display patterns for BCD input counts above nine are unique symbols to authenticate input conditions.

All of the circuits except the LS49 incorporate automatic leading and/or trailing-edge, zero-blanking control (RBI and RBO). Lamp test (LT) of these devices may be performed at any time when the BI/RBO node is at a high logic level. All types (including LS49) contain an overriding blanking input (BI) which can be used to control the lamp intensity (by pulsing), or to inhibit the outputs.

Features

- All circuit types feature lamp intensity modulation capability

5446A/7446A, 5447A/7447A, 54LS47/74LS47

- Open-collector outputs drive indicators directly
- Lamp-test provision
- Leading/trailing zero suppression

5448/7448, 54LS48/74LS48

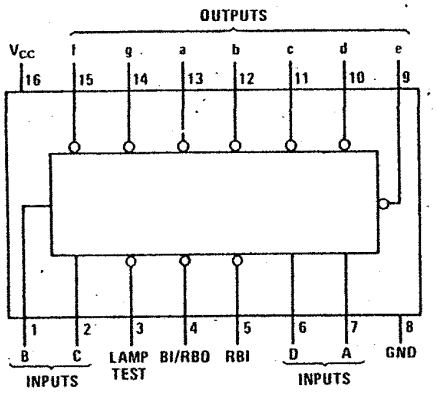
- Internal pull-ups eliminate need for external resistors
- Lamp-test provision
- Leading/trailing zero suppression

54LS49/74LS49

- Open-collector outputs
- Blanking input

TYPE	DRIVER OUTPUTS				TYPICAL POWER DISSIPATION	PACKAGES
	ACTIVE LEVEL	OUTPUT CONFIGURATION	SINK CURRENT	MAX VOLTAGE		
DM5446A	low	open-collector	40 mA	30V	320 mW	J, N, W
DM5447A	low	open-collector	40 mA	15V	320 mW	J, N, W
DM5448	high	2-kΩ pull-up	6.4 mA	5.5V	265 mW	J, N, W
DM54LS47	low	open-collector	12 mA	15V	35 mW	J, N, W
DM54LS48	high	2 kΩ pull-up	2 mA	5.5V	125 mW	J, N, W
DM54LS49	high	open-collector	4 mA	5.5V	40 mW	J, N, W
DM7446A	low	open-collector	40 mA	30V	320 mW	J, N, W
DM7447A	low	open-collector	40 mA	15V	320 mW	J, N, W
DM7448	high	2-kΩ pull-up	6.4 mA	5.5V	265 mW	J, N, W
DM74LS47	low	open-collector	24 mA	15V	35 mW	J, N, W
DM74LS48	high	2 kΩ pull-up	6 mA	5.5V	125 mW	J, N, W
DM74LS49	high	open-collector	8 mA	5.5V	40 mW	J, N, W

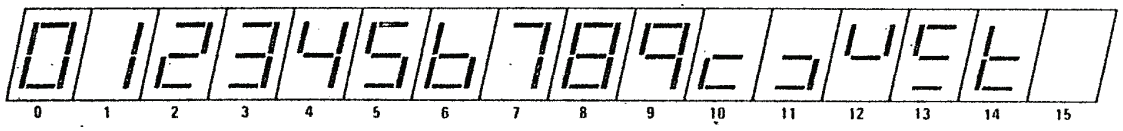
Connection Diagrams



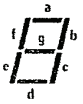
5446A/7446A(J), (N), (W);
5447A/7447A(J), (N), (W);

Output Display

NUMERICAL DESIGNATIONS AND RESULTANT DISPLAYS



SEGMENT IDENTIFICATION



Truth Tables

46A, 47A, LS47

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

48, LS48

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

Notes

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

(2) 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.

(3) When a low logic level is applied directly to the blanking input (BI), all segment outputs are H regardless of the level of any other input.

(4) When ripple-blanking input (RBI) and inputs A, B, C, and D are at a low level with the lamp test input high, all segment outputs go H and the ripple-blanking output (RBO) goes to a low level (response condition).

(5) When the blanking input/ripple blanking output (BI/RBO) is open or held high and a low is applied to the lamp-test input, all segment outputs are L.

H = High Level, L = Low Level, X = Don't Care