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NTE74249 Integrated Circuit TTL – BCD-to-Seven-Segment Decoder/Driver

Description:

The NTE74249 is a BCD-to-Seven-Segment Decoder/Driver in a 16-Lead plastic DIP type package incorporating automatic leading and/or trailing-edge zero-blanking control (\overline{RBI} and \overline{RBO}). Lamp test (LT) may be performed at any time when the $\overline{BI}/\overline{RBO}$ node is at a high level. This device also contains an overriding blanking input (BI) which can be used to control the lamp intensity by pulsing or to inhibit the outputs. Inputs and outputs are entirely compatible for use with TTL logic outputs.

Features:

- Open Collector Outputs
- Lamp Test Provision
- Leading/Trailing Zero Suppression

Absolute Maximum Ratings: (Note 1)

Supply Voltage, V_{CC} 7V
 Input Voltage, V_{IN} 5.5V
 Current Forced Into Any Output in the Off-State 1mA
 Operating Temperature Range, T_A 0°C to +70°C
 Storage Temperature Range, T_{stg} -65°C to +150°C

Note 1. Unless otherwise specified, all voltages are referenced to GND.

Recommended Operating Conditions:

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	4.75	5.0	5.25	V
High-Level Output Voltage	V_{OH}	-	-	5.5	V
High-Level Output Current, $\overline{BI}/\overline{RBO}$	I_{OH}	-	-	-200	μA
Low-Level Output Current a through g	I_{OL}	-	-	10	mA
$\overline{BI}/\overline{RBO}$		-	-	8	mA
Operating Temperature Range	T_A	0	-	+70	°C

Electrical Characteristics: (Note 2, Note 3)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
High-Level Input Voltage	V_{IH}		2	-	-	V
Low-Level Input Voltage	V_{IL}		-	-	0.8	V
Input Clamp Voltage	V_{IK}	$V_{CC} = \text{MIN}, I_I = -12\text{mA}$	-	-	-1.5	V
High Level Output Voltage $\overline{BI}/\overline{RBO}$	V_{OH}	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}, I_{OH} = \text{MAX}$	2.4	3.7	-	V
High Level Output Current a through g	I_{OH}	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}, V_{OH} = 5.5\text{V}$	-	-	250	μA
Low Level Output Voltage	V_{OL}	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}, I_{OL} = \text{MAX}$	-	0.27	0.4	V
Input Current Any Input except $\overline{BI}/\overline{RBO}$	I_I	$V_{CC} = \text{MAX}, V_I = 5.5\text{V}$	-	-	1	mA
High Level Input Current Any Input except $\overline{BI}/\overline{RBO}$	I_{IH}	$V_{CC} = \text{MAX}, V_I = 2.4\text{V}$	-	-	40	μA
Low Level Input Current Any Input except $\overline{BI}/\overline{RBO}$	I_{IL}	$V_{CC} = \text{MAX}, V_I = 0.4\text{V}$	-	-	-1.6	mA
$\overline{BI}/\overline{RBO}$			-	-	-4.0	mA
Short-Circuit Output Current $\overline{BI}/\overline{RBO}$	I_{OS}	$V_{CC} = \text{MAX}$	-	-	-4.0	mA
Supply Current	I_{CC}	$V_{CC} = \text{MAX}, \text{Note 4}$	-	53	90	mA

Note 2. For conditions shown as MIN or MAX, use the appropriate value specified under "Recommended Operation Conditions".

Note 3. All typical values are at $V_{CC} = 5\text{V}, T_A = +25^\circ\text{C}$.

Note 4. I_{CC} is measured with all outputs open and all inputs at 4.5V.

Switching Characteristics: ($V_{CC} = 5\text{V}, T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Propagation Delay Time from A Input	t_{PHL}	$R_L = 667\Omega, C_L = 15\text{pF}$	-	-	100	ns
Propagation Delay Time from A Input	t_{PLH}		-	-	100	ns
Propagation Delay Time from \overline{RBI} Input	t_{PHL}		-	-	100	ns
Propagation Delay Time from \overline{RBI} Input	t_{PLH}		-	-	100	ns

Function Table:

Decimal or Function	Inputs						BI/RBO (NOTE)	Outputs							Notes	
	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	
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	H	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		1
9	H	X	H	L	L	H	H	H	H	H	H	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		
$\overline{\text{BI}}$	X	X	X	X	X	X	L	L	L	L	L	L	L	L	2	
$\overline{\text{RBI}}$	H	L	L	L	L	L	L	L	L	L	L	L	L	L	3	
$\overline{\text{LT}}$	L	X	X	X	X	X	H	H	H	H	H	H	H	H	4	

H = HIGH Level

L = LOW Level

X = Irrelevant

NOTE: $\overline{\text{BI}}/\overline{\text{RBO}}$ is wire-AND logic serving as blanking input ($\overline{\text{BI}}$) and/or ripple-blanking output ($\overline{\text{RBO}}$).

Note 1. The blanking input ($\overline{\text{BI}}$) must be open or held at a high logic level when output functions 0 through 15 are desired. The ripple-blanking input ($\overline{\text{RBI}}$) must be open or high if blanking of a decimal zero is not desired.

Note 2. When a low logic level is applied directly to the blanking input ($\overline{\text{BI}}$), all segment outputs are low regardless of the level of any other input.

Note 3. When ripple-blanking input ($\overline{\text{RBI}}$) and inputs A, B, C, and D are at a low level with the lamp test input high, all segment outputs go low and the ripple-blanking output ($\overline{\text{RBO}}$) goes to a low level (response condition).

Note 4. When the blanking input/ripple blanking output ($\overline{\text{BI}}/\overline{\text{RBO}}$) is open or held high and low is applied to the lamp-test input, all segment outputs are high.

Pin Connection Diagram

