

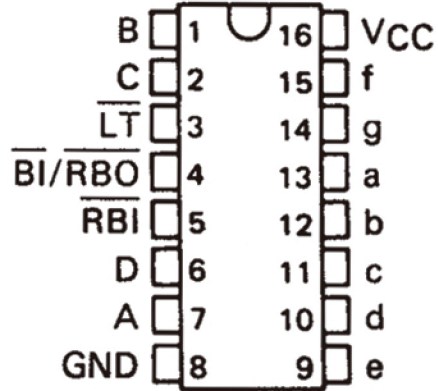
74LS47

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

74LS48

- Internal Pull-Ups Eliminate Need for External Resistors
- Lamp-Test Provision
- Leading/Trailing Zero Suppression

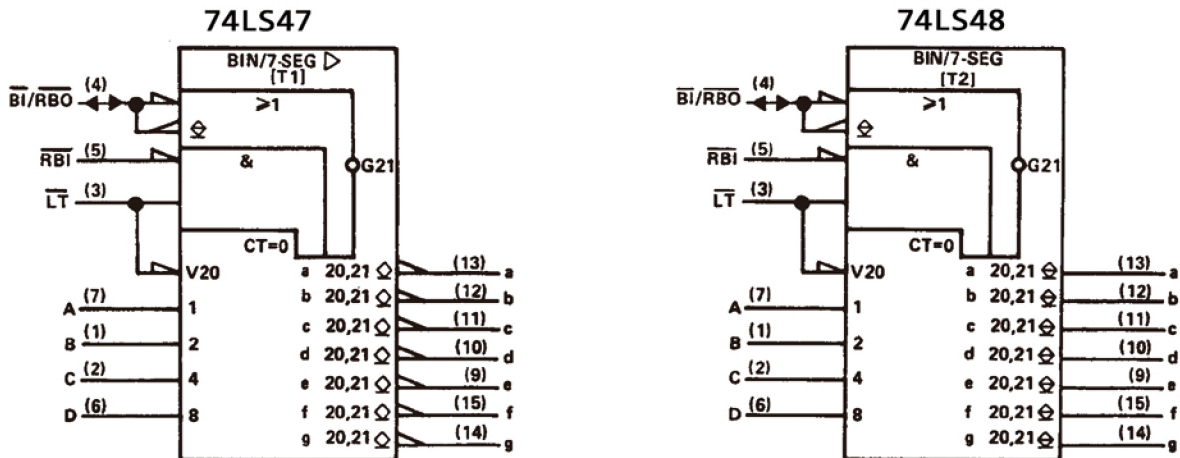
74LS47 74LS48



- All Circuit Types Feature Lamp Intensity Modulation Capability

TYPE	DRIVER OUTPUTS				TYPICAL POWER DISSIPATION	PACKAGES
	ACTIVE LEVEL	OUTPUT CONFIGURATION	SINK CURRENT	MAX VOLTAGE		
74LS47	low	open-collector	24 mA	15 V	35 mW	J, N
74LS48	high	2-kΩ pull-up	6 mA	5.5 V	125 mW	J, N

logic symbols†



XD74LS47 DIP-16 XD74LS48 DIP-16

description

74LS47 feature active-low outputs designed for driving common-anode LEDs or Incandescent indicators directly. 74LS48 feature active-high outputs for driving lamp buffers or common-cathode LEDs. All of the circuits incorporate a direct blanking input. Segment identification and resultant displays V9 shown below. Display patterns for BCD input counts above 9 are unique symbols to authenticate input conditions. 74LS47 and 74LS48 circuits incorporate automatic leading and/or trailing-edge zero-blanking control (RBI and RBO). Lamp test (LT) of these types may be performed at any time when the BI/RBO node is at a high level. All types contain 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.



74LS47

DECIMAL OR FUNCTION	INPUTS						$\overline{BI}/\overline{RBO}$	OUTPUTS							NOTE
	\overline{LT}	\overline{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	
2	H	X	L	L	H	L	H	ON	ON	OFF	ON	ON	OFF	ON	
3	H	X	L	L	H	H	H	ON	ON	ON	ON	OFF	OFF	ON	
4	H	X	L	H	L	L	H	OFF	ON	ON	OFF	OFF	ON	ON	
5	H	X	L	H	L	H	H	ON	OFF	ON	ON	OFF	ON	ON	
6	H	X	L	H	H	L	H	OFF	OFF	ON	ON	ON	ON	ON	
7	H	X	L	H	H	H	H	ON	ON	ON	OFF	OFF	OFF	OFF	
8	H	X	H	L	L	L	H	ON	ON	ON	ON	ON	ON	ON	
9	H	X	H	L	L	H	H	ON	ON	ON	OFF	OFF	ON	ON	
10	H	X	H	L	H	L	H	OFF	OFF	OFF	ON	ON	OFF	ON	
11	H	X	H	L	H	H	H	OFF	OFF	ON	ON	OFF	OFF	ON	
12	H	X	H	H	L	L	H	OFF	ON	OFF	OFF	OFF	ON	ON	
13	H	X	H	H	L	H	H	ON	OFF	OFF	ON	OFF	ON	ON	
14	H	X	H	H	H	L	H	OFF	OFF	OFF	ON	ON	ON	ON	
15	H	X	H	H	H	H	H	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
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 . Mfh tov«1. L . low IM. X ■ irreKvairt
NOTFS: 1. Th* btenklR* put (ffi) mutt ba opM or hetd M . M«h logic Iwel fen output hmctiom 0 throwfh 1» ••• H The Input (ffH) muM ba open or Mfh *f Manlig of • decimal Nf0 Ml no* <Mv«d.
2. WW • low lo- (*•! appttdad dirwtlv to th* blank' input 画.«Noutputs ar* •«, .♦■• •* «*• K •< *V other l«*0wt.
3. When ripplt-btenklnt input (0l) end inpuu A . • C, an« 0 M« M • low M« with the lamp MM Input twgh, alloutput* 00 oH »nd th* rippte-M«nkinf output (WTO) to a towome condhkon).
4. When ttw blanklno input/rippl« btonking output (TT/WI3) li open of held high and • low to appltd to th*Input, all Nfment owtpuu «r« on.
^/RBO h wk* ANO io«4c wrvinv m btonttin* input (BT) and/or rlppte-btonkktg output (fflB).

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74LS48

DECIMAL OR FUNCTION	INPUTS					$\overline{\text{BI}}/\overline{\text{RBO}}^\dagger$	OUTPUTS							NOTE
	$\overline{\text{LT}}$	$\overline{\text{RBI}}$	D	C	B		A	a	b	c	d	e	f	
0	H	H	L	L	L	L	H	H	H	H	H	H	L	1
1	H	X	L	L	L	H	H	L	H	H	L	L	L	
2	H	X	L	L	H	L	H	H	H	L	H	L	H	
3	H	X	L	L	H	H	H	H	H	H	L	L	H	
4	H	X	L	H	L	L	H	L	H	H	L	L	H	
5	H	X	L	H	L	H	H	H	L	H	H	L	H	
6	H	X	L	H	H	L	H	L	L	H	H	H	H	
7	H	X	L	H	H	H	H	H	H	H	L	L	L	
8	H	X	H	L	L	L	H	H	H	H	H	H	H	
9	H	X	H	L	L	H	H	H	H	H	L	L	H	
10	H	X	H	L	H	L	H	L	L	L	H	H	L	
11	H	X	H	L	H	H	H	L	L	H	H	L	L	
12	H	X	H	H	L	L	H	L	H	L	L	L	H	
13	H	X	H	H	L	H	H	H	L	L	H	L	H	
14	H	X	H	H	H	L	H	L	L	L	H	H	H	
15	H	X	H	H	H	H	H	L	L	L	L	L	L	
BI	X	X	X	X	X	X	L	L	L	L	L	L	L	2
RBI	H	L	L	L	L	L	L	L	L	L	L	L	L	3
LT	L	X	X	X	X	X	H	H	H	H	H	H	H	4

H ■ high L ■ low level. X ■ Irrelevant

NOTES: 1. The blanking input (LT) must be open or held at high logic level when output function 1 through 15 is used. The ripple-blanking input must be open or high, if blanking of decimal digits is not desired.

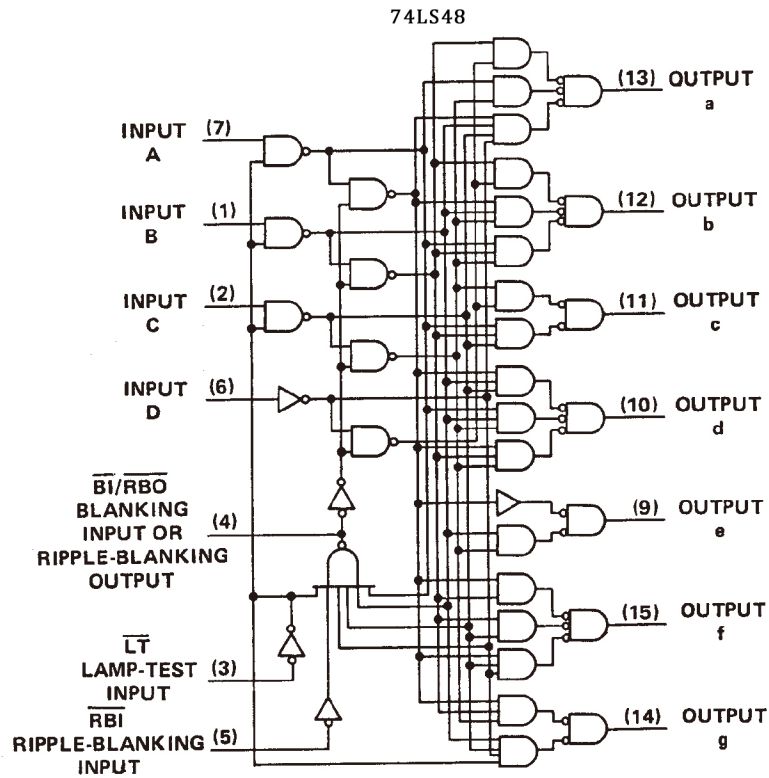
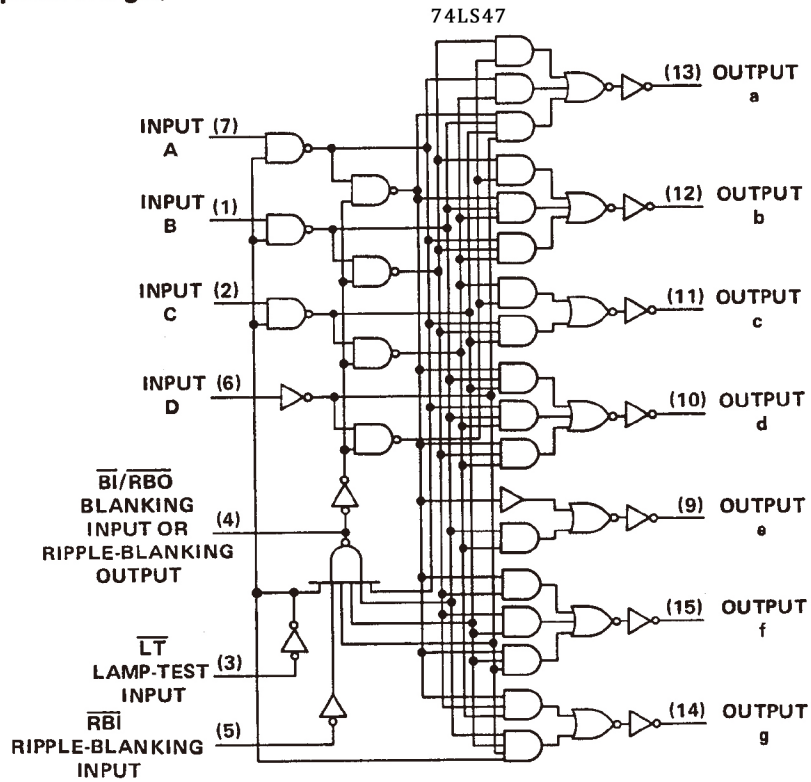
2. When a low level is applied to the blanking input, the output 9 becomes low regardless of the total of any other input.

3. When ripple-blanking input and outputs A, B, C, and D are at low level with the ripple-blanking input high, the output 0 is low and the ripple-blanking output (RBO) comes to low level (ripple condition).

4. The blanking input (LT) or the blanking output (RBO) open or held high and a low is applied to the blanking input, the outputs 0 through 9 are high.

5. The blanking input (LT) and the blanking output (RBO) are active-low inputs.

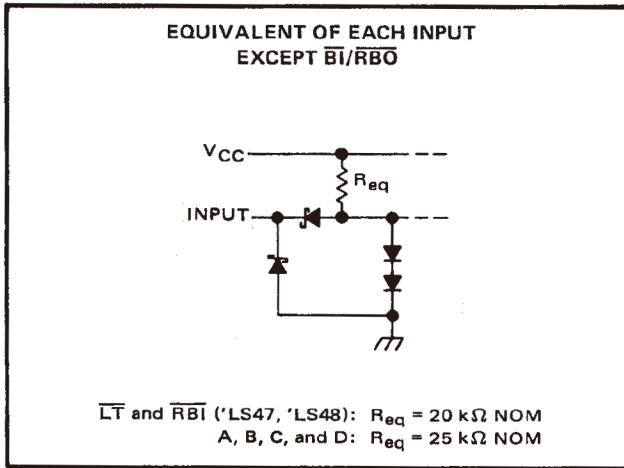
logic diagrams (positive logic)



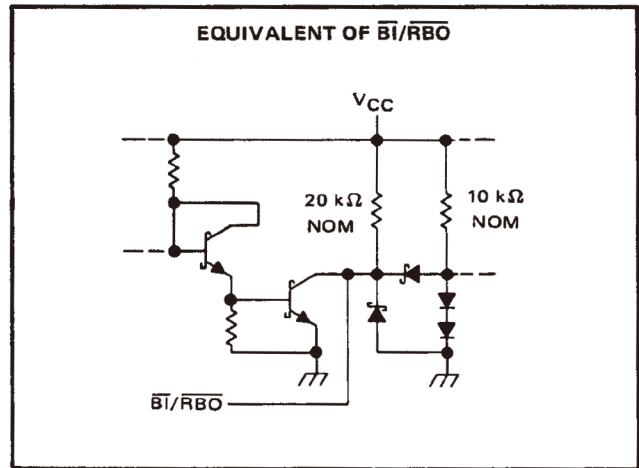
Pin numbers shown are for D, J, N, and W packages.

schematics of inputs and outputs

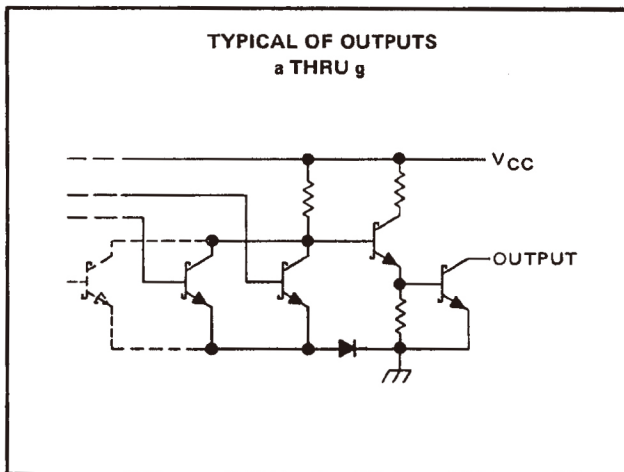
74LS47



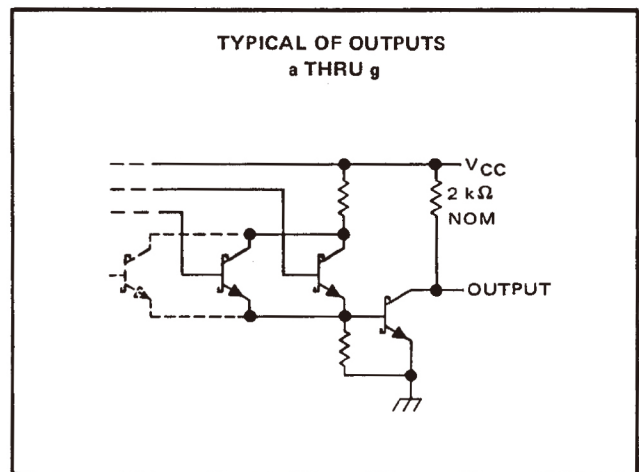
74LS48



74LS47



74LS48



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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage	7 V
Peak output current ($t_w \leq 1$ ms, duty cycle $\leq 10\%$)	200 mA
Current forced into any output in the off state	1 mA
Operating free-air temperature range: 74LS47	0°C to 70°C
Storage temperature range	-65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

	74LS47			UNIT
	MIN	NOM	MAX	
Supply voltage, V_{CC}	4.75	5	5.25	V
Off-state output voltage, $V_{O(off)}$	a thru g			15 V
On-state output current, $I_{O(on)}$	a thru g			24 mA
High-level output current, I_{OH}	$\overline{BI}/\overline{RBO}$			-50 μA
Low-level output current, I_{OL}	$\overline{BI}/\overline{RBO}$			3.2 mA
Operating free-air temperature, T_A	0	70		$^\circ\text{C}$

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	74LS47		UNIT	
		MIN	TYP‡		MAX
V_{IH} High-level input voltage		2		V	
V_{IL} Low-level input voltage		0.8		V	
V_{IK} Input clamp voltage	$V_{CC} = \text{MIN}, I_I = -18$ mA	-1.5		V	
V_{OH} High-level output voltage	$\overline{BI}/\overline{RBO}$ $V_{CC} = \text{MIN}, V_{IH} = 2$ V, $V_{IL} = V_{IL \text{ max}}, I_{OH} = -50$ μA	2.4	4.2	V	
V_{OL} Low-level output voltage	$\overline{BI}/\overline{RBO}$ $V_{CC} = \text{MIN}, V_{IH} = 2$ V, $V_{IL} = V_{IL \text{ max}}$	$I_{OL} = 1.6$ mA	0.25	0.4	V
		$I_{OL} = 3.2$ mA	0.35	0.5	
$I_{O(off)}$ Off-state output current	a thru g $V_{CC} = \text{MAX}, V_{IH} = 2$ V, $V_{IL} = V_{IL \text{ max}}, V_{O(off)} = 15$ V	250		μA	
$V_{O(on)}$ On-state output voltage	a thru g $V_{CC} = \text{MIN}, V_{IH} = 2$ V, $V_{IL} = V_{IL \text{ max}}$	$I_{O(on)} = 12$ mA	0.25	0.4	V
		$I_{O(on)} = 24$ mA	0.35	0.5	
I_I Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 7$ V	0.1		mA	
I_{IH} High-level input current	$V_{CC} = \text{MAX}, V_I = 2.7$ V	20		μA	
I_{IL} Low-level input current	Any input except $\overline{BI}/\overline{RBO}$ $\overline{BI}/\overline{RBO}$ $V_{CC} = \text{MAX}, V_I = 0.4$ V	-0.4		mA	
		-1.2			
I_{OS} Short-circuit output current	$\overline{BI}/\overline{RBO}$ $V_{CC} = \text{MAX}$	-0.3	-2	mA	
I_{CC} Supply current	$V_{CC} = \text{MAX},$ See Note 2	7	13	mA	

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

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

NOTE 2: I_{CC} is measured with all outputs open and all inputs at 4.5 V.

switching characteristics, $V_{CC} = 5$ V, $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
t_{off} Turn-off time from A input	$C_L = 15$ pF, $R_L = 665$ Ω , See Note 3				100	ns
t_{on} Turn-on time from A input					100	
t_{off} Turn-off time from \overline{RBI} input, outputs (a-f) only					100	ns
t_{on} Turn-on time from \overline{RBI} input, outputs (a-f) only					100	

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage	7 V
Operating free-air temperature range: 74LS48	0°C to 70°C
Storage temperature range	-65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

		74LS48			UNIT
		MIN	NOM	MAX	
Supply voltage, V_{CC}		4.75	5	5.25	V
High-level output current, I_{OH}	a thru g	-100			μA
	$\overline{\text{BI}}/\overline{\text{RBO}}$	-50			
Low-level output current, I_{OL}	a thru g	6			mA
	$\overline{\text{BI}}/\overline{\text{RBO}}$	3.2			
Operating free-air temperature, T_A		0		70	$^{\circ}\text{C}$

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS†	74LS48		UNIT	
			MIN	TYP‡		MAX
V_{IH}	High-level input voltage		2		V	
V_{IL}	Low-level input voltage		0.8		V	
V_{IK}	Input clamp voltage	$V_{CC} = \text{MIN}$, $I_I = -18 \text{ mA}$	-1.5		V	
V_{OH}	High-level output voltage	a thru g and $\overline{\text{BI}}/\overline{\text{RBO}}$ $V_{CC} = \text{MIN}$, $V_{IH} = 2 \text{ V}$, $V_{IL} = V_{IL \text{ max}}$, $I_{OH} = \text{MAX}$	2.4	4.2	V	
I_O	Output current	a thru g $V_{CC} = \text{MIN}$, $V_O = 0.85 \text{ V}$, Input conditions as for V_{OH}	-1.3	-2	mA	
V_{OL}	Low-level output voltage	a thru g $V_{CC} = \text{MIN}$, $V_{IH} = 2 \text{ V}$, $V_{IL} = V_{IL \text{ max}}$	$I_{OL} = 2 \text{ mA}$	0.25	0.4	V
			$I_{OL} = 6 \text{ mA}$	0.35	0.5	
	$\overline{\text{BI}}/\overline{\text{RBO}}$	$V_{CC} = \text{MIN}$, $V_{IH} = 2 \text{ V}$, $V_{IL} = V_{IL \text{ max}}$	$I_{OL} = 1.6 \text{ mA}$	0.25	0.4	V
			$I_{OL} = 3.2 \text{ mA}$	0.35	0.5	
I_I	Input current at maximum input voltage	Any input except $\overline{\text{BI}}/\overline{\text{RBO}}$ $V_{CC} = \text{MAX}$, $V_I = 7 \text{ V}$	0.1		mA	
I_{IH}	High-level input current	Any input except $\overline{\text{BI}}/\overline{\text{RBO}}$ $V_{CC} = \text{MAX}$, $V_I = 2.7 \text{ V}$	20		μA	
I_{IL}	Low-level input current	Any input except $\overline{\text{BI}}/\overline{\text{RBO}}$ $V_{CC} = \text{MAX}$, $V_I = 0.4 \text{ V}$	-0.4		mA	
		$\overline{\text{BI}}/\overline{\text{RBO}}$	-1.2			
I_{OS}	Short-circuit output current	$\overline{\text{BI}}/\overline{\text{RBO}}$ $V_{CC} = \text{MAX}$	-0.3	-2	mA	
I_{CC}	Supply current	$V_{CC} = \text{MAX}$, See Note 2	25	38	mA	

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

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

NOTE 2: I_{CC} is measured with all outputs open and all inputs at 4.5 V.

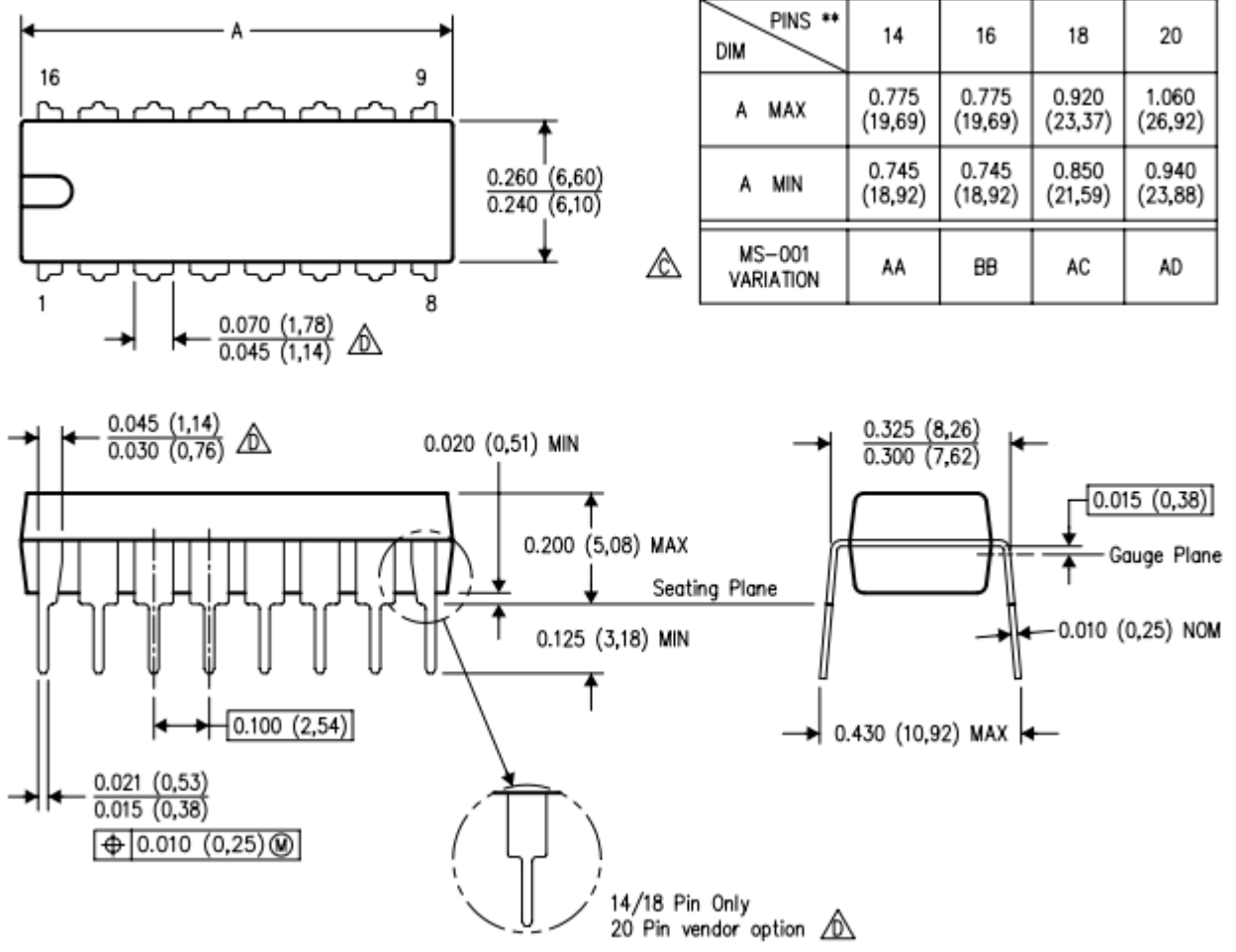
switching characteristics, $V_{CC} = 5 \text{ V}$, $T_A = 25^{\circ}\text{C}$

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PHL} Propagation delay time, high-to-low-level output from A input	$C_L = 15 \text{ pF}$, $R_L = 4 \text{ k}\Omega$, See Note 3	100			ns
t_{PLH} Propagation delay time, low-to-high-level output from A input		100			
t_{PHL} Propagation delay time, high-to-low-level output (a-f only) from $\overline{\text{RBI}}$ input	$C_L = 15 \text{ pF}$, $R_L = 6 \text{ k}\Omega$, See Note 3	100			ns
t_{PLH} Propagation delay time, low-to-high-level output (a-f only) from $\overline{\text{RBI}}$ input		100			

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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DIP16



DIM \ PINS **	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS-001 VARIATION	AA	BB	AC	AD

以上信息仅供参考. 如需帮助联系客服人员. 谢谢 XINLUDA