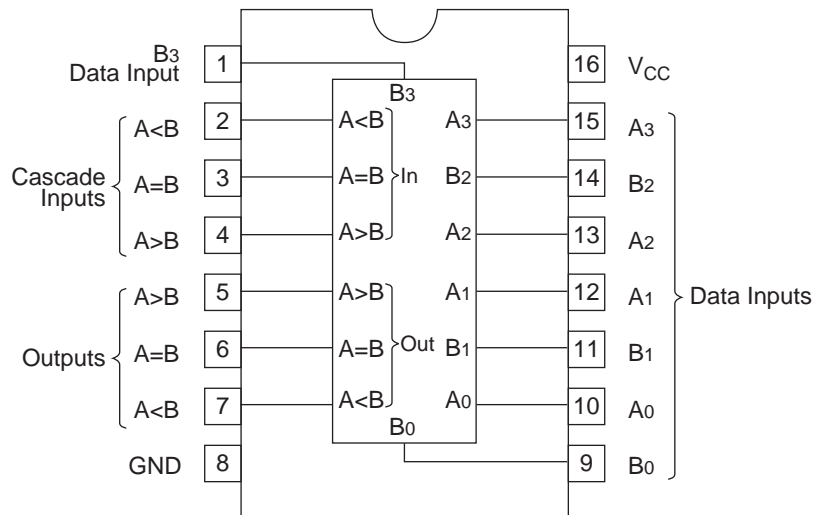


This four bit magnitude comparator performs comparison of straight binary and straight BCD (8-4-2-1) codes. Three fully decoded decisions about two 4-bit words (A, B) are made and are externally available at three outputs. This device is fully expandable to any number of bits without external gates. Words of greater length may be compared by connecting comparators in cascade. The A > B, A < B, and A = B outputs of a stage handling less-significant bits. The stage handling the least- significant bits must have a high-level voltage applied to the A  $\beta$  B input. The cascading path is implemented with only a two-gate-level delay to reduce overall comparison times for long words.

### Pin Arrangement



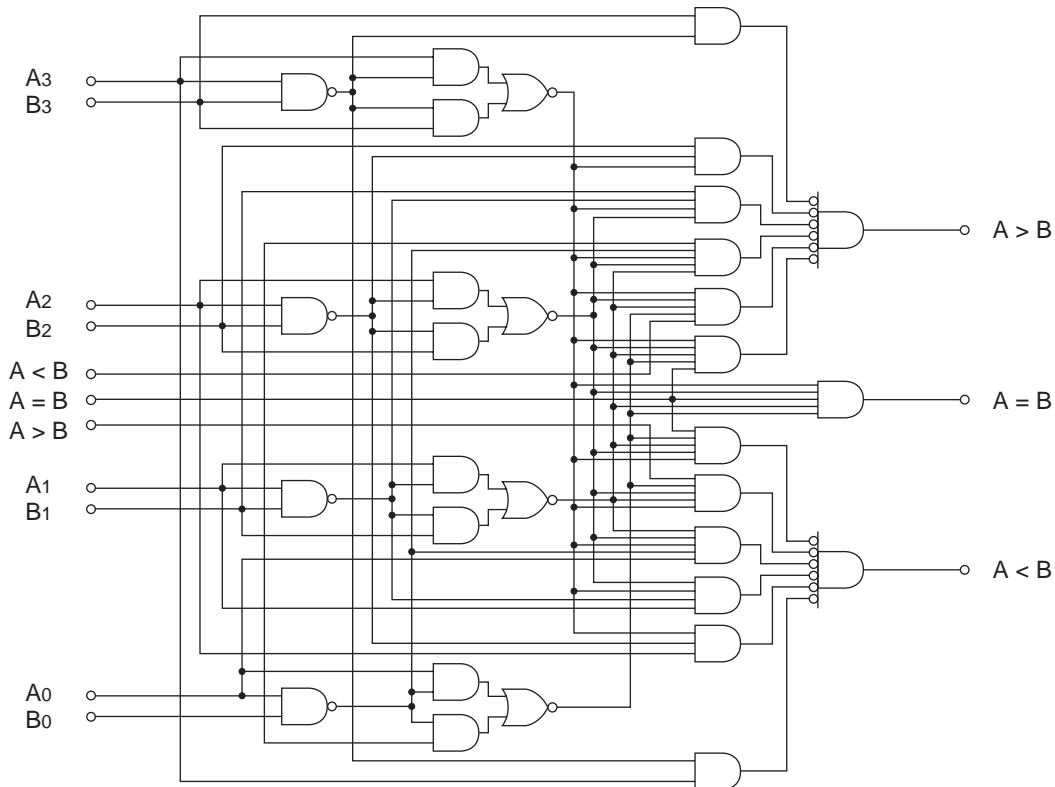
(Top view)

## Function Table

Inputs				Cascading Inputs			Outputs		
A <sub>3</sub> , B <sub>3</sub>	A <sub>2</sub> , B <sub>2</sub>	A <sub>1</sub> , B <sub>1</sub>	A <sub>0</sub> , B <sub>0</sub>	A > B	A < B	A = B	A > B	A < B	A = B
A <sub>3</sub> > B <sub>3</sub>	X	X	X	X	X	X	H	L	L
A <sub>3</sub> < B <sub>3</sub>	X	X	X	X	X	X	L	H	L
A <sub>3</sub> = B <sub>3</sub>	A <sub>2</sub> > B <sub>2</sub>	X	X	X	X	X	H	L	L
A <sub>3</sub> = B <sub>3</sub>	A <sub>2</sub> < B <sub>2</sub>	X	X	X	X	X	L	H	L
A <sub>3</sub> = B <sub>3</sub>	A <sub>2</sub> = B <sub>2</sub>	A <sub>1</sub> > B <sub>1</sub>	X	X	X	X	H	L	L
A <sub>3</sub> = B <sub>3</sub>	A <sub>2</sub> = B <sub>2</sub>	A <sub>1</sub> < B <sub>1</sub>	X	X	X	X	L	H	L
A <sub>3</sub> = B <sub>3</sub>	A <sub>2</sub> = B <sub>2</sub>	A <sub>1</sub> = B <sub>1</sub>	A <sub>0</sub> > B <sub>0</sub>	X	X	X	H	L	L
A <sub>3</sub> = B <sub>3</sub>	A <sub>2</sub> = B <sub>2</sub>	A <sub>1</sub> = B <sub>1</sub>	A <sub>0</sub> < B <sub>0</sub>	X	X	X	L	H	L
A <sub>3</sub> = B <sub>3</sub>	A <sub>2</sub> = B <sub>2</sub>	A <sub>1</sub> = B <sub>1</sub>	A <sub>0</sub> = B <sub>0</sub>	H	L	L	H	L	L
A <sub>3</sub> = B <sub>3</sub>	A <sub>2</sub> = B <sub>2</sub>	A <sub>1</sub> = B <sub>1</sub>	A <sub>0</sub> = B <sub>0</sub>	L	H	L	L	H	L
A <sub>3</sub> = B <sub>3</sub>	A <sub>2</sub> = B <sub>2</sub>	A <sub>1</sub> = B <sub>1</sub>	A <sub>0</sub> = B <sub>0</sub>	X	X	H	L	L	H
A <sub>3</sub> = B <sub>3</sub>	A <sub>2</sub> = B <sub>2</sub>	A <sub>1</sub> = B <sub>1</sub>	A <sub>0</sub> = B <sub>0</sub>	H	H	L	L	L	L
A <sub>3</sub> = B <sub>3</sub>	A <sub>2</sub> = B <sub>2</sub>	A <sub>1</sub> = B <sub>1</sub>	A <sub>0</sub> = B <sub>0</sub>	L	L	L	H	H	L

H; high level, L; low level, X; irrelevant

## Block Diagram



## Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage	V <sub>CC</sub>	7	V
Input voltage	V <sub>IN</sub>	7	V
Power dissipation	P <sub>T</sub>	400	mW
Storage temperature	T <sub>stg</sub>	-65 to +150	°C

Note: Voltage value, unless otherwise noted, are with respect to network ground terminal.

## Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply voltage	$V_{CC}$	4.75	5.00	5.25	V
Output current	$I_{OH}$	—	—	-400	$\mu A$
	$I_{OL}$	—	—	8	mA
Operating temperature	$T_{opr}$	-20	25	75	$^{\circ}C$

## Electrical Characteristics

(Ta = -20 to +75  $^{\circ}C$ )

Item		Symbol	min.	typ.*	max.	Unit	Condition
Input voltage		$V_{IH}$	2.0	—	—	V	
		$V_{IL}$	—	—	0.8	V	
Output voltage		$V_{OH}$	2.7	—	—	V	$V_{CC} = 4.75 V, V_{IH} = 2 V, V_{IL} = 0.8 V, I_{OH} = -400 \mu A$
		$V_{OL}$	—	—	0.4	V	$I_{OL} = 4 mA, V_{CC} = 4.75 V, V_{IH} = 2 V, V_{IL} = 0.8 V$
			—	0.5			
Input current	A < B, A > B inputs	$I_{IH}$	—	—	20	$\mu A$	$V_{CC} = 5.25 V, V_I = 2.7 V$
	Other inputs		—	—	60		
	A < B, A > B inputs	$I_{IL}$	—	—	-0.4	mA	$V_{CC} = 5.25 V, V_I = 0.4 V$
	Other inputs		—	—	-1.2		
	A < B, A > B inputs	$I_I$	—	—	0.1	mA	$V_{CC} = 5.25 V, V_I = 7 V$
Other inputs	—		—	0.3			
Short-circuit output current		$I_{OS}$	-20	—	-100	mA	$V_{CC} = 5.25 V$
Supply current**		$I_{CC}$	—	10.4	20	mA	$V_{CC} = 5.25 V$
Input clamp voltage		$V_{IK}$	—	—	-1.5	V	$V_{CC} = 4.75 V, I_{IN} = -18 mA$

Note: \*  $V_{CC} = 5 V, T_a = 25^{\circ}C$ \*\*  $I_{CC}$  is measured with outputs open, A = B grounded, and all other inputs at 4.5 V.

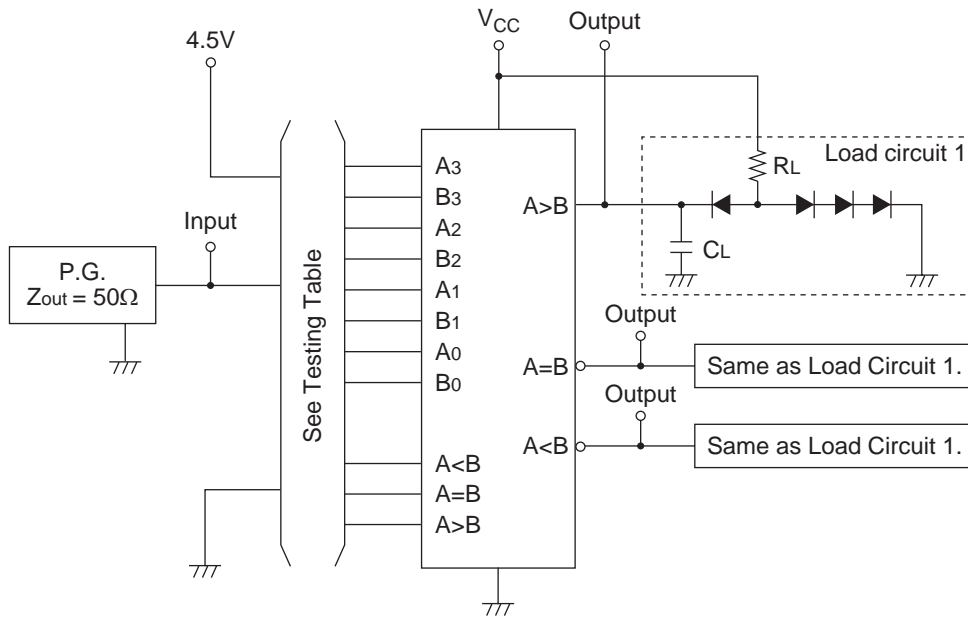
## Switching Characteristics

(V<sub>CC</sub> = 5 V, T<sub>a</sub> = 25 $^{\circ}C$ )

Item	Symbol	Inputs	Outputs	Number of gate levels	min.	typ.	max.	Unit	Condition
Propagation delay time	$t_{PLH}$	Any A or B data input	A < B, A > B	1	—	14	—	ns	$C_L = 15 pF, R_L = 2 k\Omega$
				2	—	19	—		
			3	—	24	36			
			A = B	4	—	27	45		
	$t_{PHL}$	Any A or B data input	A < B, A > B	1	—	11	—		
				2	—	15	—		
			3	—	20	30			
			A = B	4	—	23	45		
	$t_{PHL}$	A < B or A = B	A > B	1	—	14	22		
	$t_{PHL}$			1	—	11	17		
	$t_{PLH}$	A = B	A = B	2	—	13	20		
	$t_{PHL}$			2	—	13	26		
$t_{PLH}$	A > B or A = B	A < B	1	—	14	22			
$t_{PHL}$			1	—	11	17			

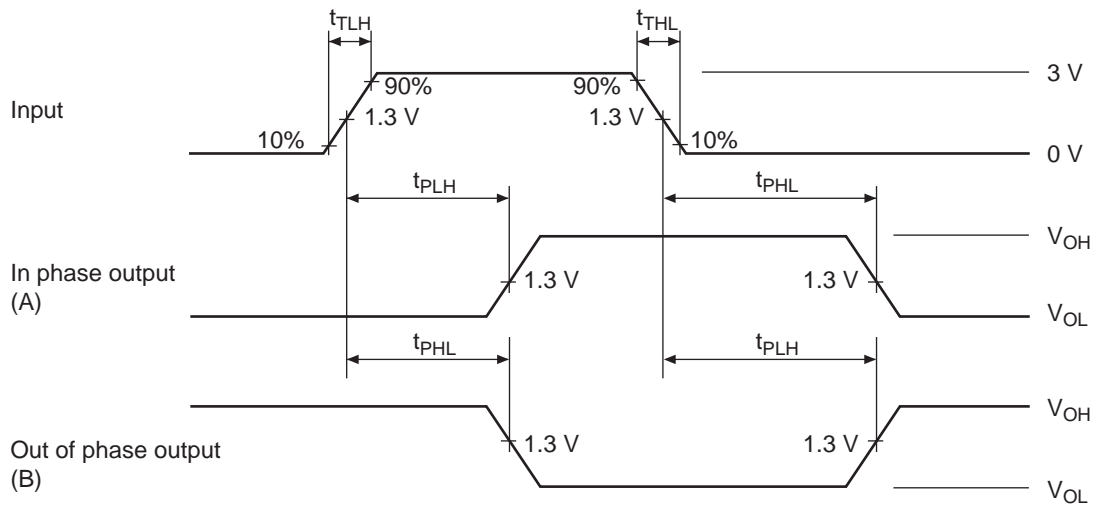
## Testing Method

### Test Circuit



- Notes:
1.  $C_L$  includes probe and jig capacitance.
  2. All diodes are 1S2074(H).

### Waveform



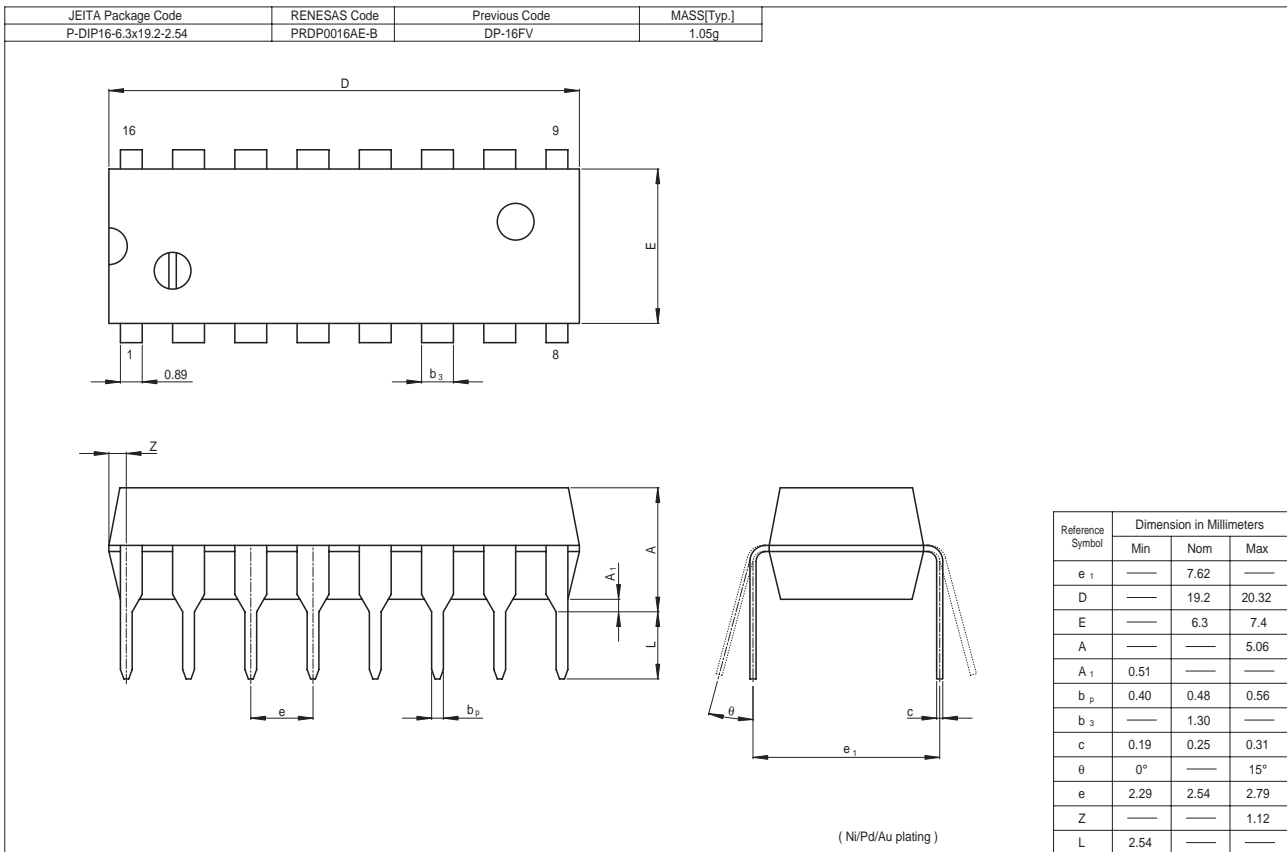
Note: Input pulse;  $t_{TLH} \leq 15$  ns,  $t_{THL} \leq 6$  ns, PRR = 1 MHz, duty cycle = 50%

Testing Table

Item	Inputs										Output waveforms			
	A <sub>3</sub>	B <sub>3</sub>	A <sub>2</sub>	B <sub>2</sub>	A <sub>1</sub>	B <sub>1</sub>	A <sub>0</sub>	B <sub>0</sub>	A > B	A = B	A < B	A > B	A = B	A < B
t <sub>PLH</sub> t <sub>PHL</sub>	IN	4.5 v	4.5 v	GND	GND	GND	GND	GND	GND	GND	GND	A	—	B
	4.5 v	IN	GND	4.5 v	GND	GND	GND	GND	GND	GND	GND	B	—	A
	GND	GND	IN	4.5 v	4.5 v	GND	GND	GND	GND	GND	GND	A	—	B
	GND	GND	4.5 v	IN	GND	4.5 v	GND	GND	GND	GND	GND	B	—	A
	GND	GND	GND	GND	IN	4.5 v	4.5 v	GND	GND	GND	GND	A	—	B
	GND	GND	GND	GND	4.5 v	IN	GND	4.5 v	GND	GND	GND	B	—	A
	GND	GND	GND	GND	GND	GND	IN	4.5 v	4.5 v	GND	GND	A	—	B
	GND	GND	GND	GND	GND	GND	4.5 v	IN	GND	GND	4.5 v	B	—	A
	GND	GND	GND	GND	GND	GND	IN	4.5 v	GND	4.5 v	GND	—	A	B
	GND	GND	GND	GND	GND	GND	4.5 v	IN	GND	4.5 v	GND	B	A	—
	GND	GND	GND	GND	GND	GND	GND	GND	IN	GND	GND	—	—	B
	GND	GND	GND	GND	GND	GND	GND	GND	GND	IN	GND	B	A	B
GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	IN	B	—	—	

## Package Dimensions

## DIP



以上信息仅供参考. 如需帮助联系客服人员。谢谢 XINLUDA

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