

# HD74LS251

## 1 of 8 Data Selector / Multiplexer (with strobe and three-state outputs)

REJ03D0467-0300

Rev.3.00

Jul.15.2005

This data selector / multiplexer contains full on-chip binary decoding to select one-of-eight data sources and features a strobe-controlled 3-state output.

The strobe must be at a low logic level to enable this device. The 3-state outputs permit a number of outputs to be connected to a common bus.

When the strobe input is high, both outputs are in a high-impedance state in which both the upper and lower transistors of each totem-pole output are off, and the output neither drives nor loads the bus significantly. When the strobe is low, the outputs are activated and operate as standard TTL totem-pole outputs.

To minimize the possibility that two outputs will attempt to take a common bus to opposite logic levels, the output control circuitry is designed so that the average output disable time is shorter than the average output enable time.

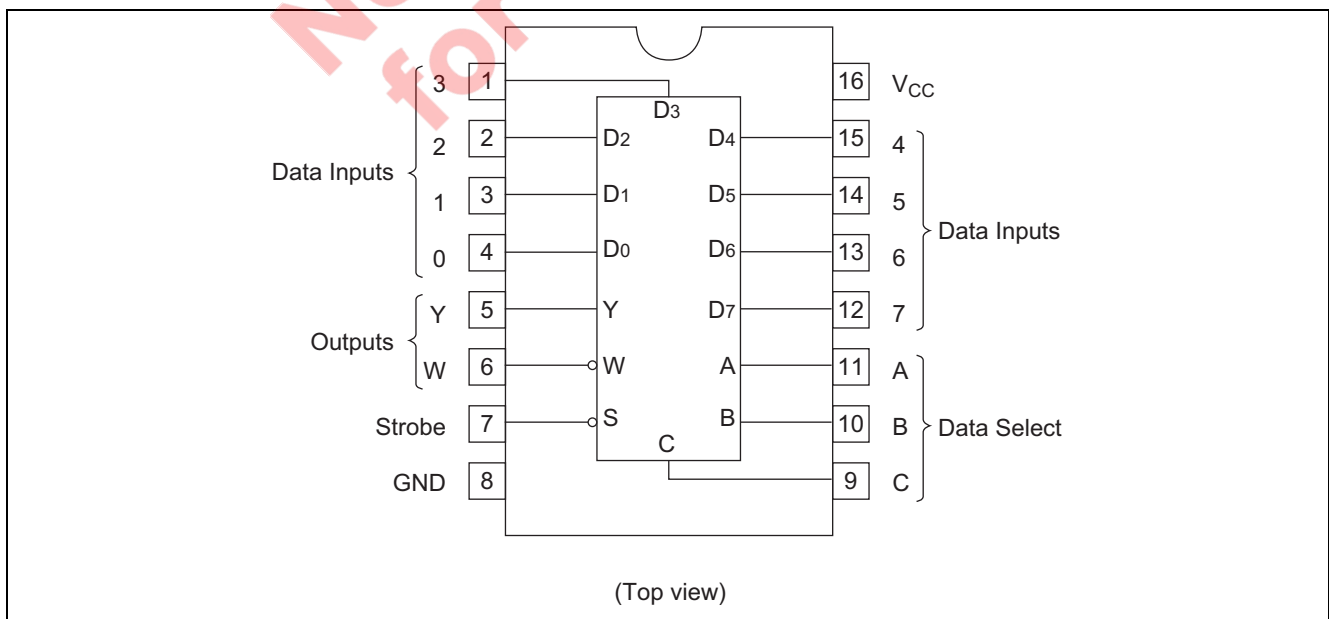
### Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS251P	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74LS251FPEL	SOP-16 pin (JEITA)	PRSP0016DH-B (FP-16DAV)	FP	EL (2,000 pcs/reel)

Note: Please consult the sales office for the above package availability.

### Pin Arrangement

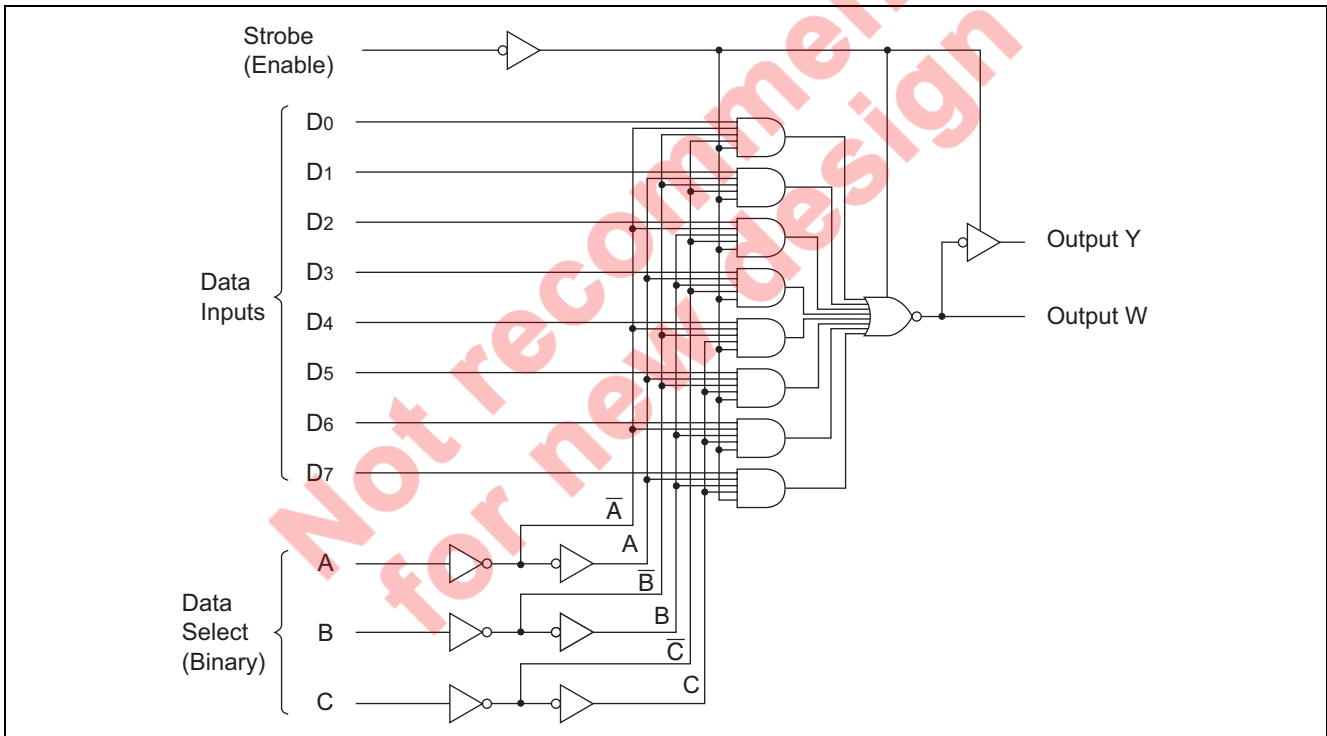


**Function Table**

Inputs				Outputs	
Select			Strobe	Y	W
C	B	A	S		
X	X	X	H	Z	Z
L	L	L	L	D <sub>0</sub>	$\overline{D}_0$
L	L	H	L	D <sub>1</sub>	$\overline{D}_1$
L	H	L	L	D <sub>2</sub>	$\overline{D}_2$
L	H	H	L	D <sub>3</sub>	$\overline{D}_3$
H	L	L	L	D <sub>4</sub>	$\overline{D}_4$
H	L	H	L	D <sub>5</sub>	$\overline{D}_5$
H	H	L	L	D <sub>6</sub>	$\overline{D}_6$
H	H	H	L	D <sub>7</sub>	$\overline{D}_7$

- Notes: 1. H; high level, L; low level, X; irrelevant  
 2. Z; high impedance (off-state)  
 3. D<sub>0</sub> through D<sub>7</sub>; the level of the respective D input.

**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
Output voltage (off-state)	V <sub>O (off)</sub>	5.5	V
Operating temperature	T <sub>opr</sub>	-20 to +75	°C
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	$I_{OH}$	—	—	-2.6	mA
	$I_{OL}$	—	—	8	mA
Operating temperature	$T_{opr}$	-20	25	75	°C

## Electrical Characteristics

( $T_a = -20$  to  $+75$  °C)

Item	Symbol	min.	typ.*	max.	Unit	Condition
Input voltage	$V_{IH}$	2.0	—	—	V	
	$V_{IL}$	—	—	0.8	V	
Output voltage	$V_{OH}$	2.4	—	—	V	$V_{CC} = 4.75$ V, $V_{IH} = 2$ V, $V_{IL} = 0.8$ V, $I_{OH} = -2.6$ mA
	$V_{OL}$	—	—	0.4	V	$I_{OL} = 4$ mA
		—	—	0.5		$V_{CC} = 4.75$ V, $V_{IH} = 2$ V, $V_{IL} = 0.8$ V
Input current	$I_{IH}$	—	—	20	μA	$V_{CC} = 5.25$ V, $V_I = 2.7$ V
	$I_{IL}$	—	—	-0.4	mA	$V_{CC} = 5.25$ V, $V_I = 0.4$ V
	$I_I$	—	—	0.1	mA	$V_{CC} = 5.25$ V, $V_I = 7$ V
Output current	$I_{OZ}$	—	—	20	μA	$V_O = 2.7$ V
		—	—	-20		$V_O = 0.4$ V
						$V_{CC} = 5.25$ V, $V_{IH} = 2$ V
Short-circuit output current	$I_{OS}$	-30	—	-130	mA	$V_{CC} = 5.25$ V
Supply current**	$I_{CC}$	—	6.1	10	mA	Condition A
		—	7.1	12		Condition B
						$V_{CC} = 5.25$ V
Input clamp voltage	$V_{IK}$	—	—	-1.5	V	$V_{CC} = 4.75$ V, $I_{IN} = -18$ mA

Notes: \*  $V_{CC} = 5$  V,  $T_a = 25$  °C

\*\*  $I_{CC}$  is measured with the outputs open and all data and select inputs at 4.5 V under the following conditions.  
A; Strobe grounded, B; Strobe at 4.5 V

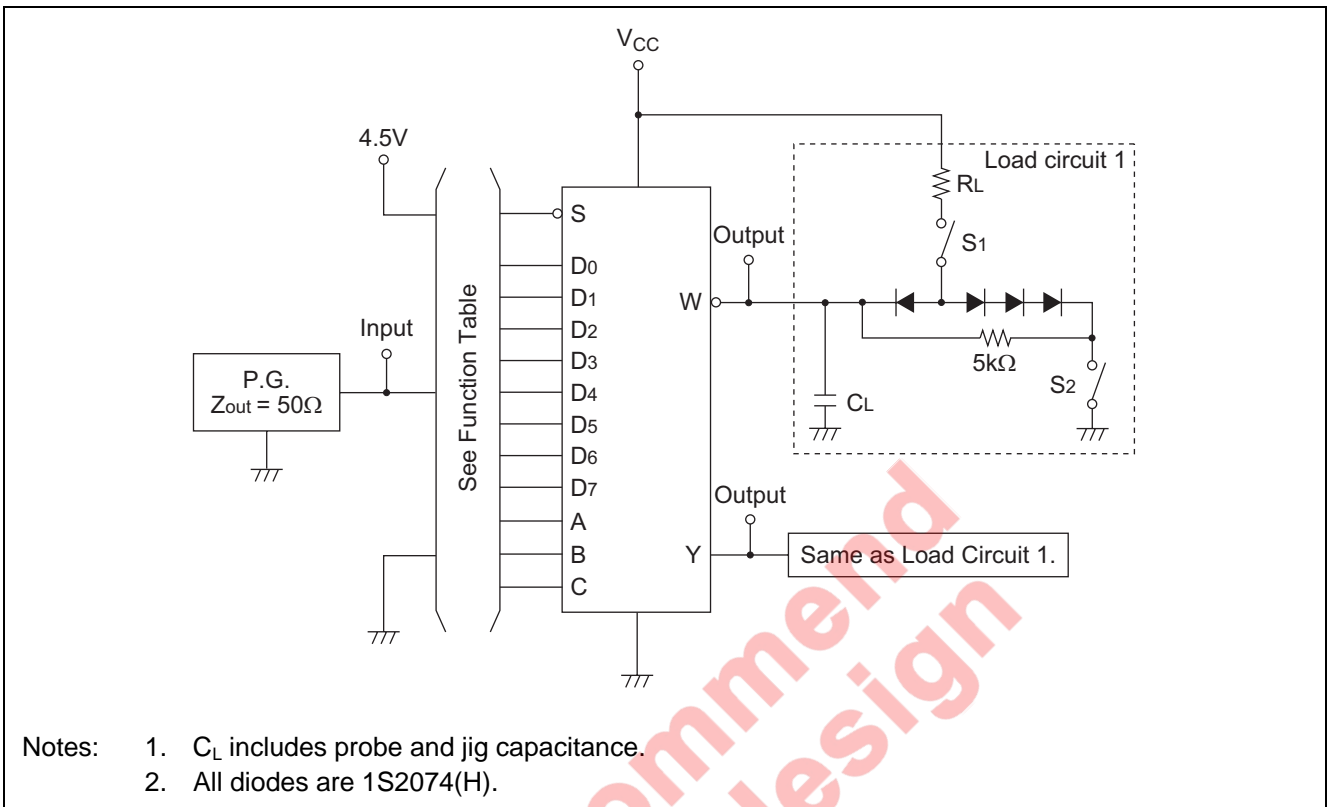
## Switching Characteristics

( $V_{CC} = 5$  V,  $T_a = 25$  °C)

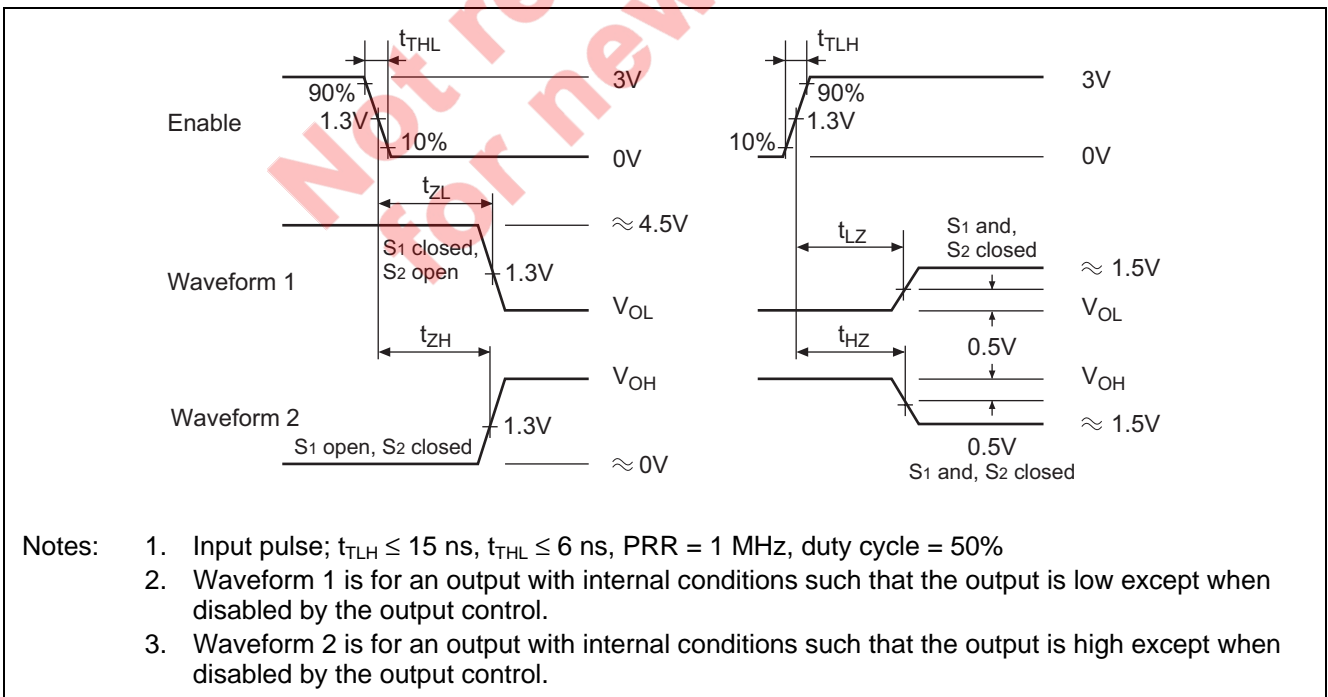
Item	Symbol	Inputs	Outputs	min.	typ.	max.	Unit	Condition
Propagation delay time	$t_{PLH}$	A, B, C (4 level)	Y	—	29	45	ns	$C_L = 15$ pF, $R_L = 2$ kΩ
	$t_{PHL}$			—	28	45		
	$t_{PLH}$	A, B, C (3 level)	W	—	20	33		
	$t_{PHL}$			—	21	33		
	$t_{PLH}$	Data	Y	—	17	28		
	$t_{PHL}$			—	18	28		
	$t_{PLH}$	Data	W	—	10	15		
$t_{PHL}$	—			9	15			
Output enable time	$t_{ZH}$	Strobe	Y	—	30	45	ns	
	$t_{ZL}$			—	26	40		
	$t_{ZH}$	Strobe	W	—	17	27		
	$t_{ZL}$			—	24	40		
Output disable time	$t_{HZ}$	Strobe	Y	—	30	45	ns	$C_L = 5$ pF, $R_L = 2$ kΩ
	$t_{LZ}$			—	15	25		
	$t_{HZ}$	Strobe	W	—	37	55		
	$t_{LZ}$			—	15	25		

## Testing Method

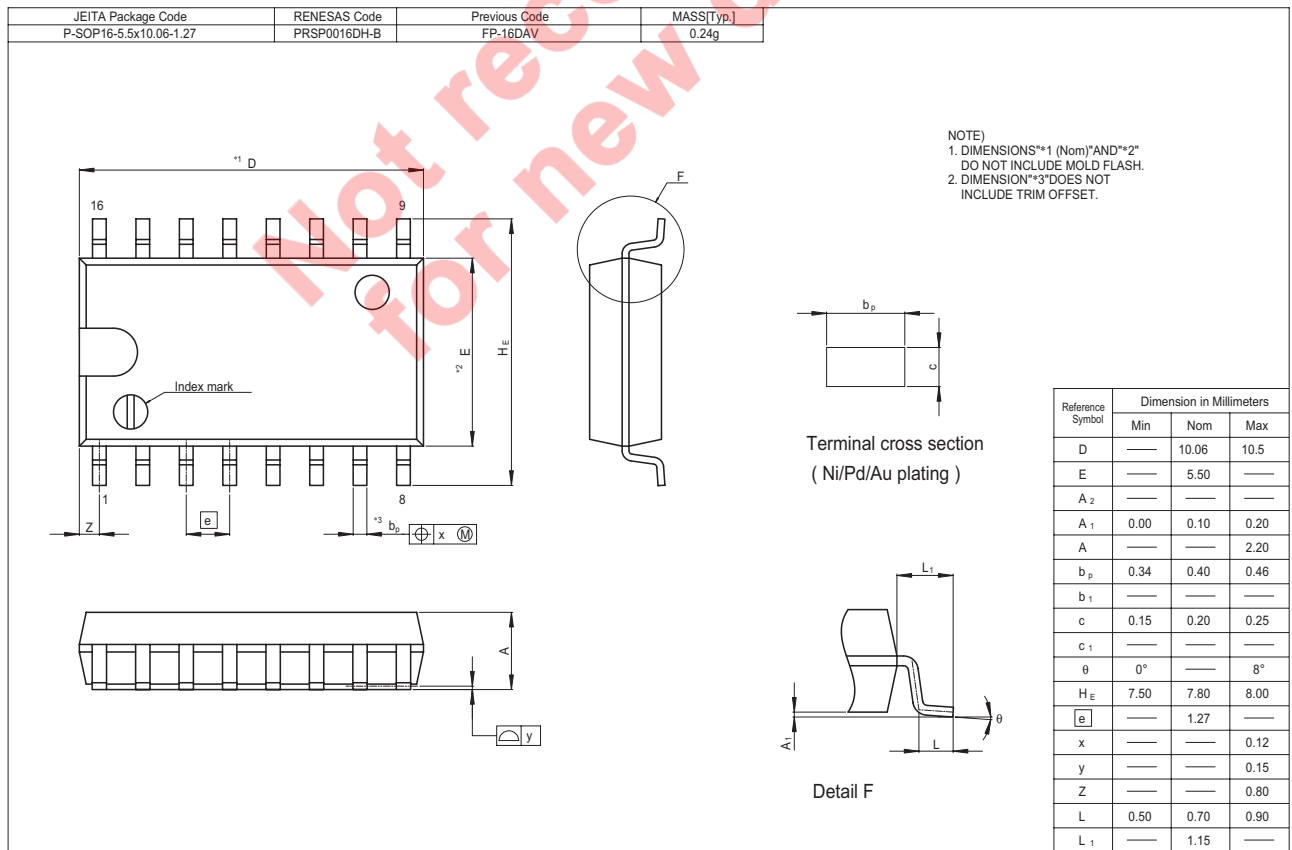
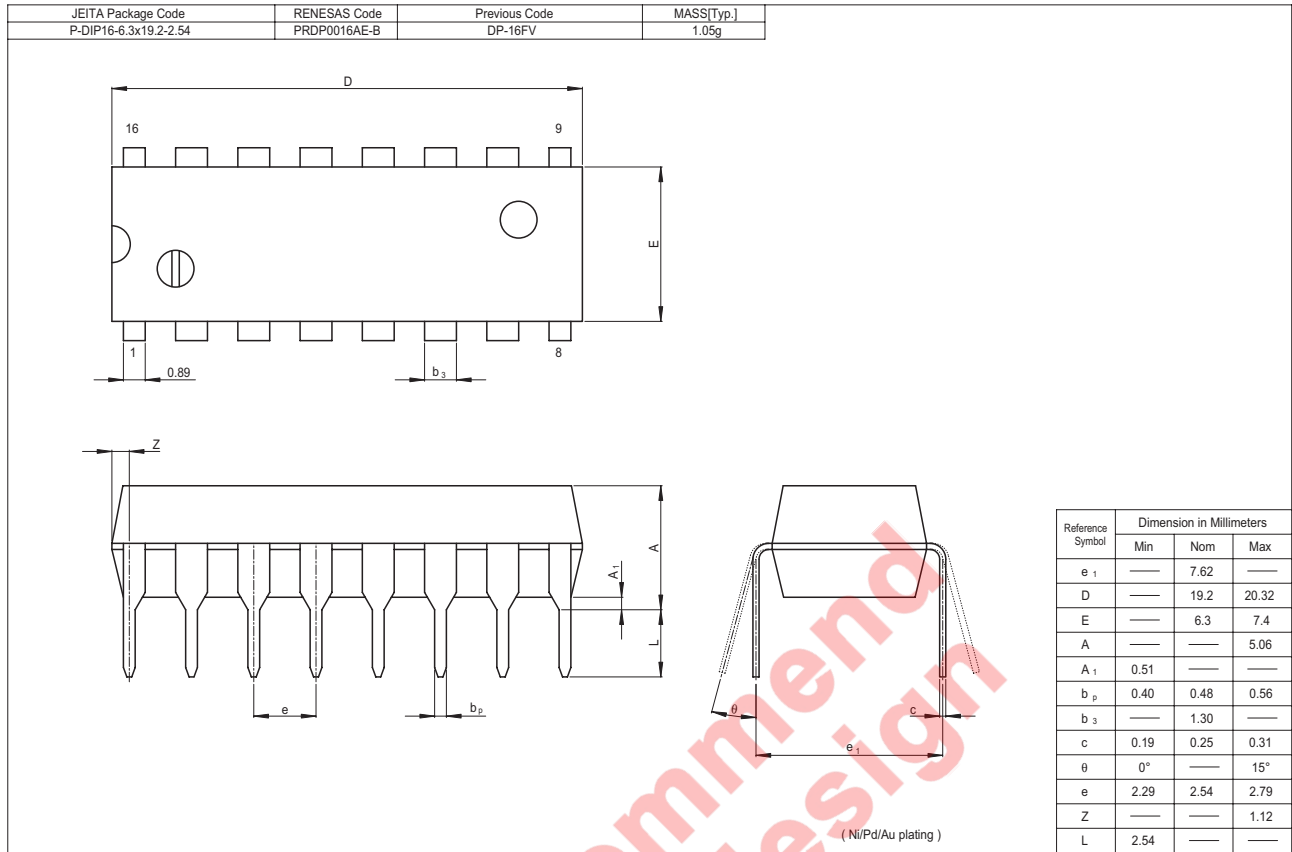
### Test Circuit



### Waveform



Package Dimensions



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