

# HD74HC353

## Dual 4-to-1-line Data Selectors/Multiplexers

REJ03D0612-0200  
 (Previous ADE-205-491)  
 Rev.2.00  
 Jan 31, 2006

### Description

Each of these data selectors/multiplexers contains inverters and drivers to supply full binary decoding data selection to the AND-OR-invert gates. Separate strobe inputs (G) are provided for each of the two four-line sections.

The three-state outputs can interface with and drive data lines of bus-organized systems. With all but one of the common output disabled (at a high-impedance state) the low-impedance of the single enable output will drive the bus line to a high or low logic level. Each output has its own strobe (G). The output is disabled when its strobe is high.

### Features

- High Speed Operation:  $t_{pd}$  (Data to Y) = 13 ns typ ( $C_L = 50$  pF)
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage:  $V_{CC} = 2$  to 6 V
- Low Input Current: 1  $\mu$ A max
- Low Quiescent Supply Current:  $I_{CC}$  (static) = 4  $\mu$ A max ( $T_a = 25^\circ\text{C}$ )
- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74HC353P	DILP-16 pin	PRDP0016AE-B (DP16FV)	P	—
HD74HC353RPEL	SOP-16 pin (JEDEC)	PRSP0016DG-A (FP-16DNV)	RP	EL (2,500 pcs/reel)

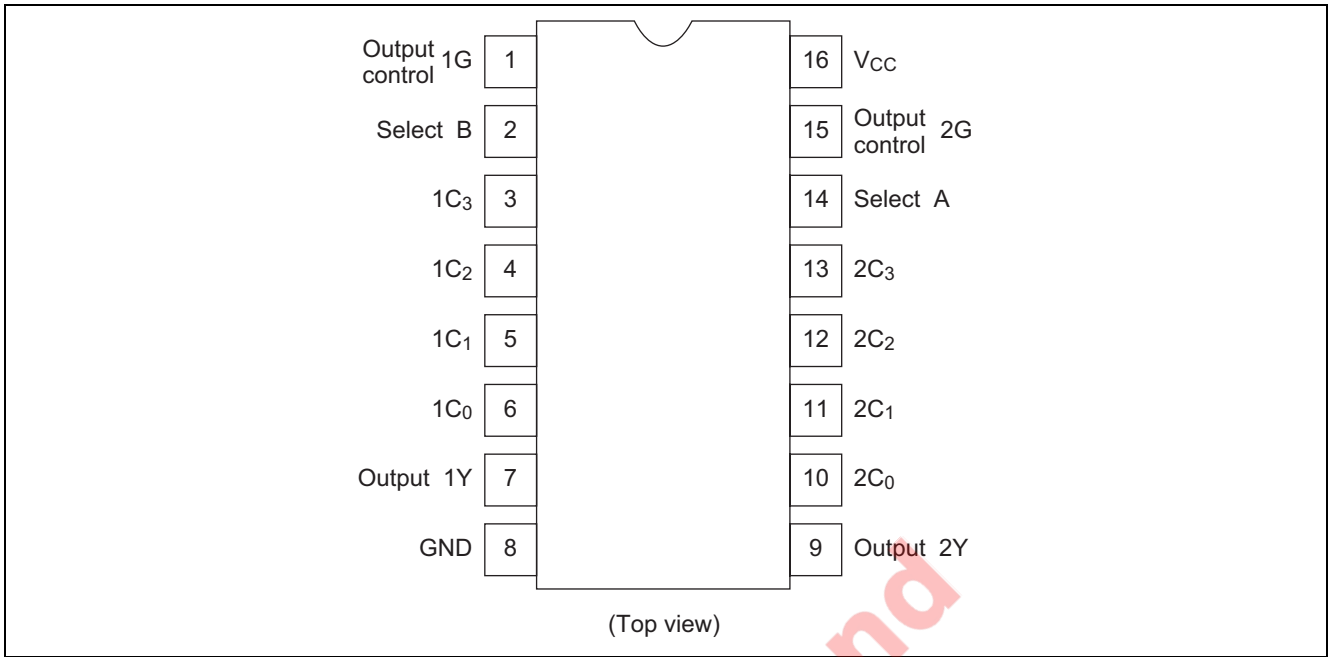
Note: Please consult the sales office for the above package availability.

### Function Table

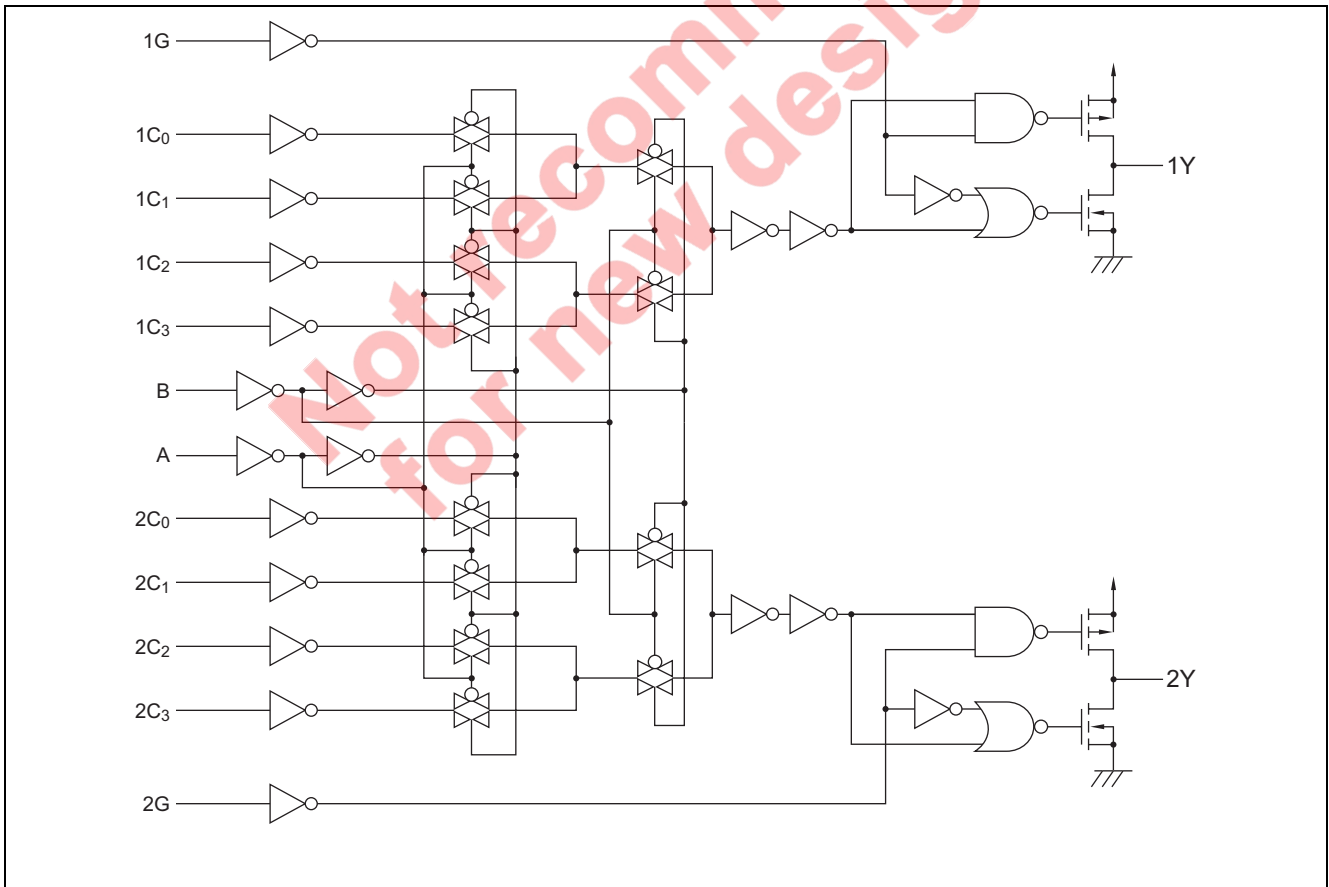
Select Input		Data Inputs				Output Control	Output
B	A	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	G	Y
X	X	X	X	X	X	H	Z
L	L	L	X	X	X	L	H
L	L	H	X	X	X	L	L
L	H	X	L	X	X	L	H
L	H	X	H	X	X	L	L
H	L	X	X	L	X	L	H
H	L	X	X	H	X	L	L
H	H	X	X	X	L	L	H
H	H	X	X	X	H	L	L

Select inputs A and B are common to both sections

Pin Arrangement



Logic Diagram



### Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage range	$V_{CC}$	-0.5 to 7.0	V
Input / Output voltage	$V_{IN}, V_{OUT}$	-0.5 to $V_{CC} + 0.5$	V
Input / Output diode current	$I_{IK}, I_{OK}$	$\pm 20$	mA
Output current	$I_O$	$\pm 25$	mA
$V_{CC}$ , GND current	$I_{CC}$ or $I_{GND}$	$\pm 50$	mA
Power dissipation	$P_T$	500	mW
Storage temperature	$T_{stg}$	-65 to +150	$^{\circ}C$

Note: The absolute maximum ratings are values, which must not individually be exceeded, and furthermore, no two of which may be realized at the same time.

### Recommended Operating Conditions

Item	Symbol	Ratings	Unit	Conditions
Supply voltage	$V_{CC}$	2 to 6	V	
Input / Output voltage	$V_{IN}, V_{OUT}$	0 to $V_{CC}$	V	
Operating temperature	$T_a$	-40 to 85	$^{\circ}C$	
Input rise / fall time <sup>*1</sup>	$t_r, t_f$	0 to 1000	ns	$V_{CC} = 2.0$ V
		0 to 500		$V_{CC} = 4.5$ V
		0 to 400		$V_{CC} = 6.0$ V

Notes: 1. This item guarantees maximum limit when one input switches.

Waveform: Refer to test circuit of switching characteristics.

### Electrical Characteristics

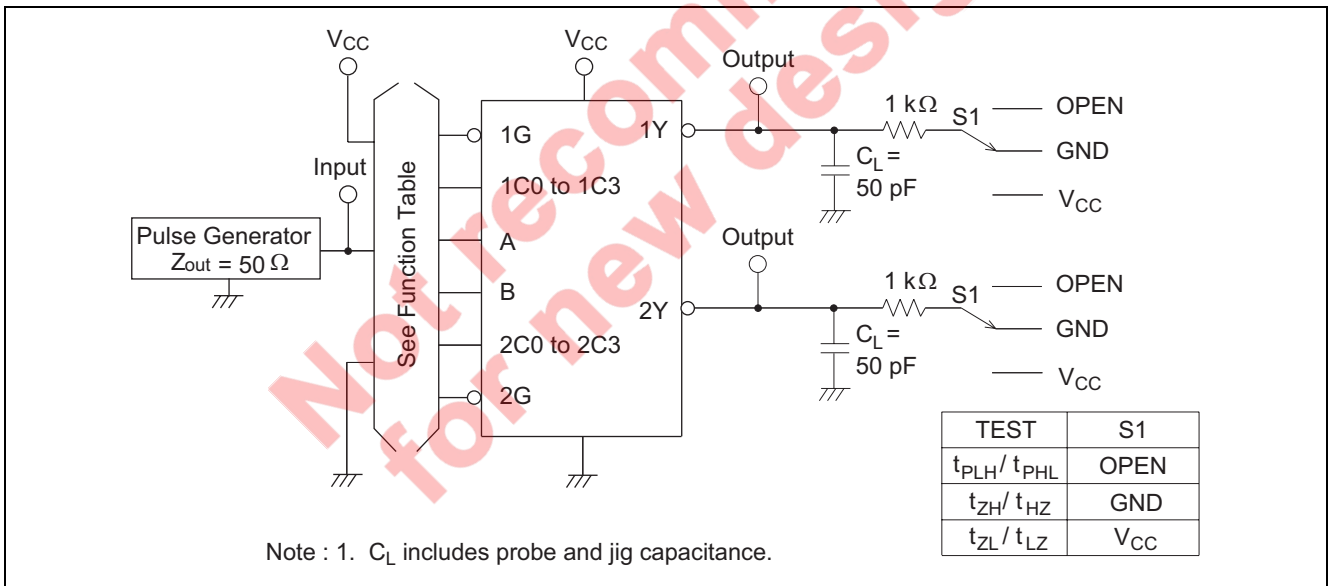
Item	Symbol	$V_{CC}$ (V)	$T_a = 25^{\circ}C$			$T_a = -40$ to $+85^{\circ}C$		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	$V_{IH}$	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	$V_{IL}$	2.0	—	—	0.5	—	0.5	V		
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output voltage	$V_{OH}$	2.0	1.9	2.0	—	1.9	—	V	$V_{in} = V_{IH}$ or $V_{IL}$	$I_{OH} = -20$ $\mu A$
		4.5	4.4	4.5	—	4.4	—			$I_{OH} = -4$ mA
		6.0	5.9	6.0	—	5.9	—			$I_{OH} = -5.2$ mA
		4.5	4.18	—	—	4.13	—			
		6.0	5.68	—	—	5.63	—			
	$V_{OL}$	2.0	—	0.0	0.1	—	0.1	V	$V_{in} = V_{IH}$ or $V_{IL}$	$I_{OL} = 20$ $\mu A$
		4.5	—	0.0	0.1	—	0.1			
		6.0	—	0.0	0.1	—	0.1			
		4.5	—	—	0.26	—	0.33			$I_{OH} = 4$ mA
		6.0	—	—	0.26	—	0.33			$I_{OH} = 5.2$ mA
Input current	$I_{in}$	6.0	—	—	$\pm 0.1$	—	$\pm 1.0$	$\mu A$	$V_{in} = V_{CC}$ or GND	
Off-state output current	$I_{oz}$	6.0	—	—	$\pm 0.5$	—	$\pm 5.0$	$\mu A$	$V_{in} = V_{IH}$ or $V_{IL}$ , $V_{out} = V_{CC}$ or GND	
Quiescent supply current	$I_{CC}$	6.0	—	—	4.0	—	40	$\mu A$	$V_{in} = V_{CC}$ or GND, $I_{out} = 0$ $\mu A$	

Switching Characteristics

( $C_L = 50\text{ pF}$ , Input  $t_r = t_f = 6\text{ ns}$ )

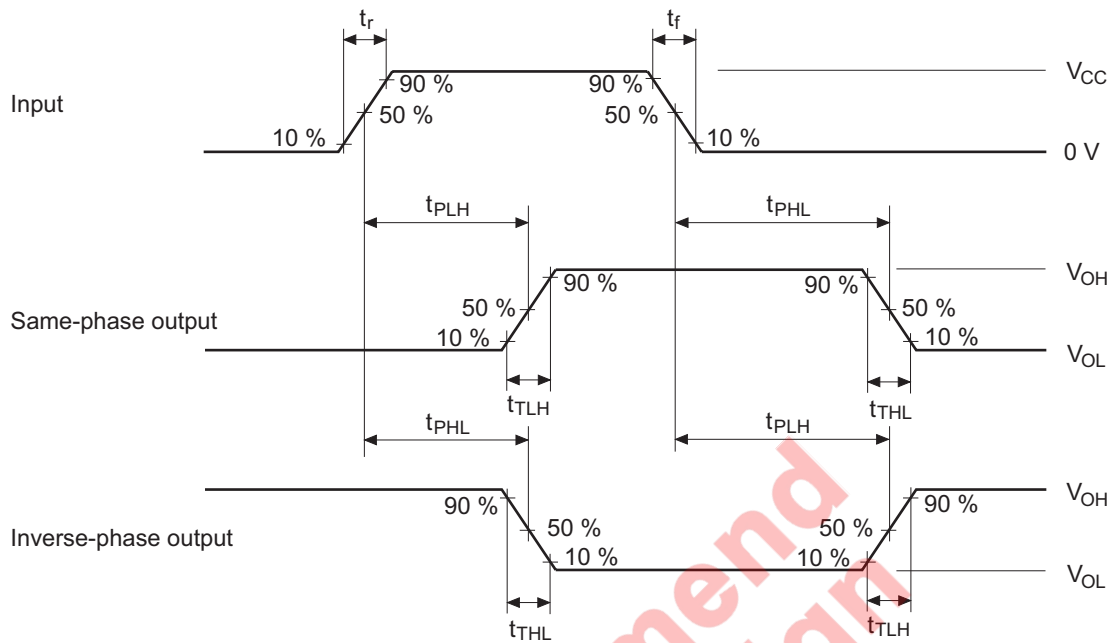
Item	Symbol	$V_{CC}$ (V)	$T_a = 25^\circ\text{C}$			$T_a = -40\text{ to }+85^\circ\text{C}$		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Propagation delay time	$t_{PLH}$	2.0	—	—	125	—	155	ns	Data to Y	
		4.5	—	13	25	—	31			
		6.0	—	—	21	—	26			
	$t_{PHL}$	2.0	—	—	160	—	200	ns		A or B to Y
		4.5	—	14	32	—	40			
		6.0	—	—	27	—	34			
Output enable time	$t_{ZL}$	2.0	—	—	100	—	125	ns		
		4.5	—	8	20	—	25			
	$t_{ZH}$	6.0	—	—	17	—	21			
Output disable time	$t_{LZ}$	2.0	—	—	150	—	190	ns		
		4.5	—	11	30	—	38			
	$t_{HZ}$	6.0	—	—	26	—	33			
Output rise/fall time	$t_{TLH}$	2.0	—	—	75	—	95	ns		
		4.5	—	5	15	—	19			
	$t_{THL}$	6.0	—	—	13	—	16			
Input capacitance	$C_{in}$	—	—	5	10	—	10	pF		

Test Circuit



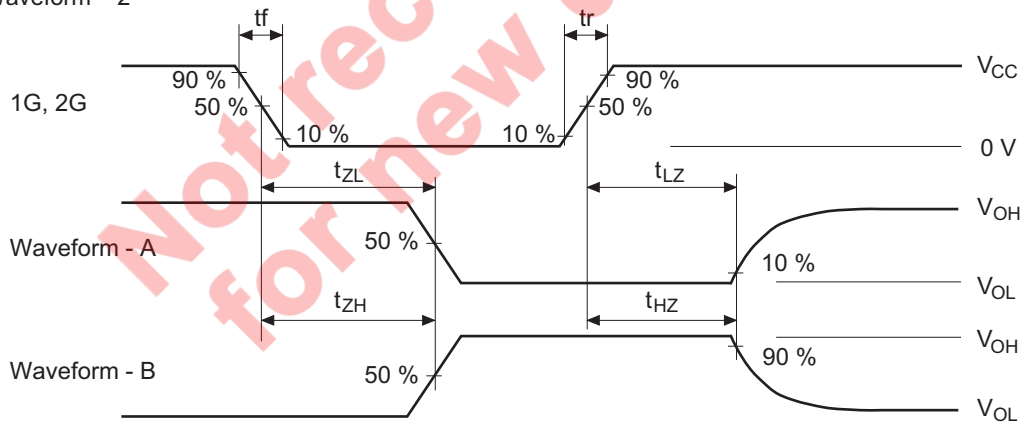
Waveforms

• Waveform – 1



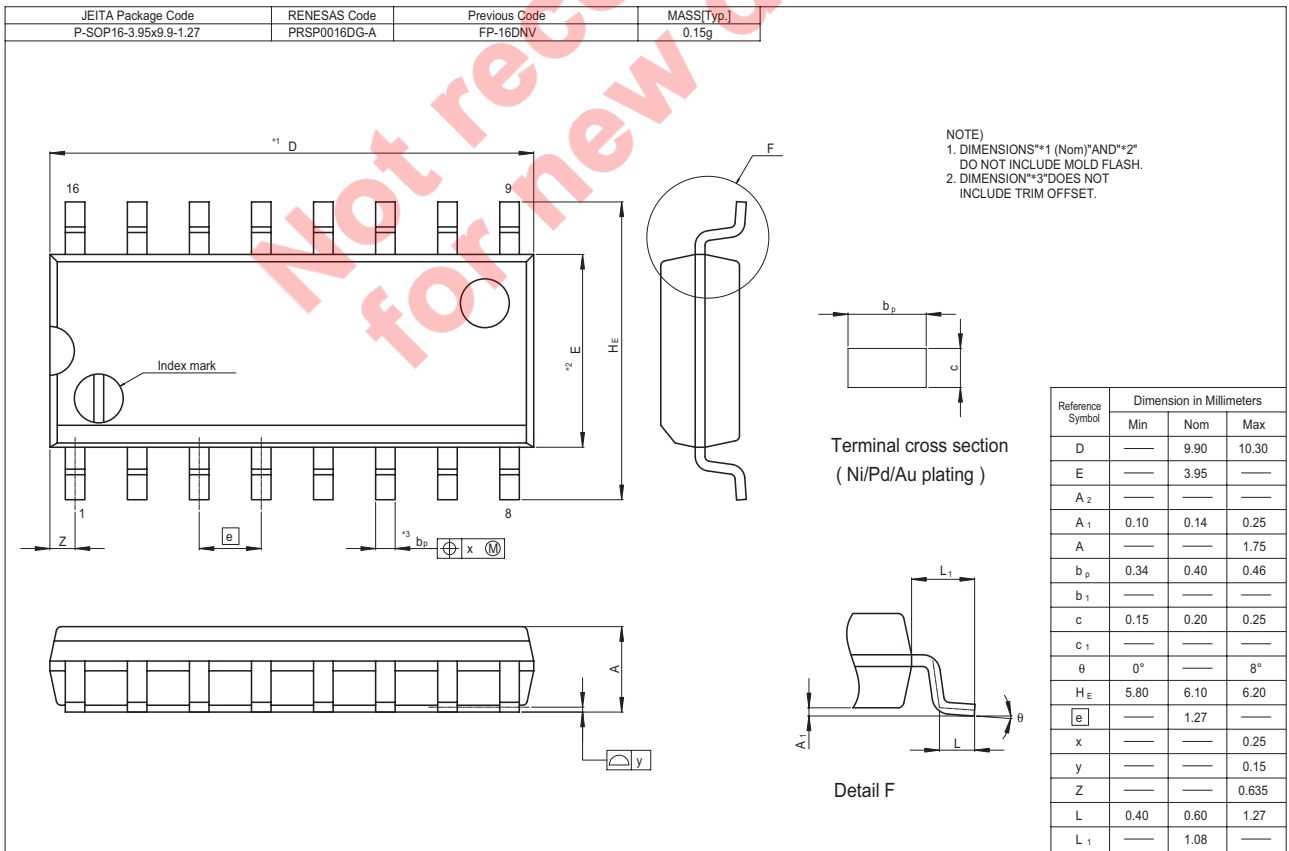
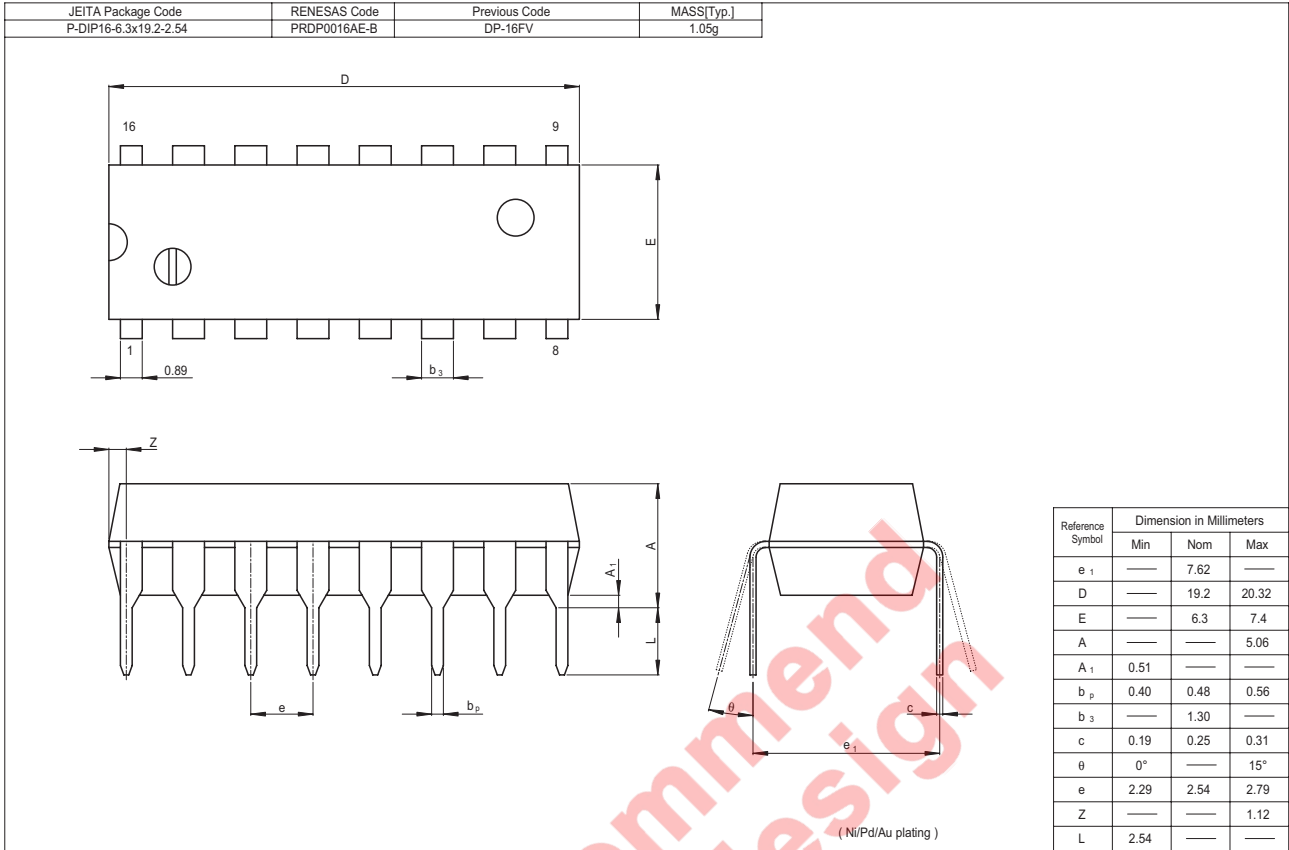
- Notes: 1. Input waveform:  $PRR \leq 1 \text{ MHz}$ ,  $Z_o = 50 \Omega$ ,  $t_r \leq 6 \text{ ns}$ ,  $t_f \leq 6 \text{ ns}$
- 2. The output are measured one at a time with one transition per measurement.

• Waveform – 2



- Notes : 1. Input waveform :  $PRR \leq 1 \text{ MHz}$ , duty cycle 50%,  $t_r \leq 6 \text{ ns}$ ,  $t_f \leq 6 \text{ ns}$
- 2. Waveform– A is for an output with internal conditions such that the output is low except when disabled by the output control.
- 3. Waveform– B is for an output with internal conditions such that the output is high except when disabled by the output control.
- 4. The output are measured one at a time with one transition per measurement.

Package Dimensions



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