

# HD74HC151

## 1-of-8-line Data Selector/Multiplexer

REJ03D0575-0200  
 (Previous ADE-205-449)  
 Rev.2.00  
 Oct 11, 2005

### Description

HD74HC151 selects one of the 8 data sources, depending on the address presented on the A, B and C inputs. It features both true (Y) and complement (W) outputs. The strobe input must be at a low logic level to enable this multiplexer. A high logic level at the strobe forces the W output high and the Y output low.

### Features

- High Speed Operation:  $t_{pd}$  (Any D to Y or W) = 18 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)
HD74HC151P	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74HC151FPEL	SOP-16 pin (JEITA)	PRSP0016DH-B (FP-16DAV)	FP	EL (2,000 pcs/reel)
HD74HC151RPEL	SOP-16 pin (JEDEC)	PRSP0016DG-A (FP-16DNV)	RP	EL (2,500 pcs/reel)

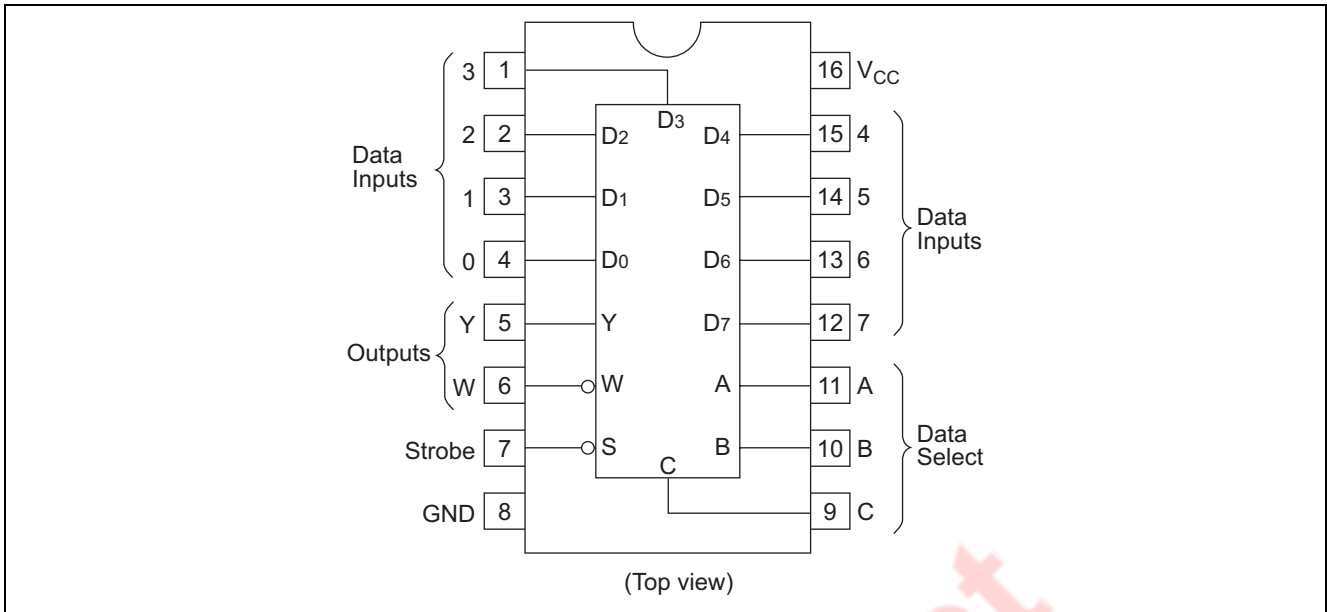
Note: Please consult the sales office for the above package availability.

### Function Table

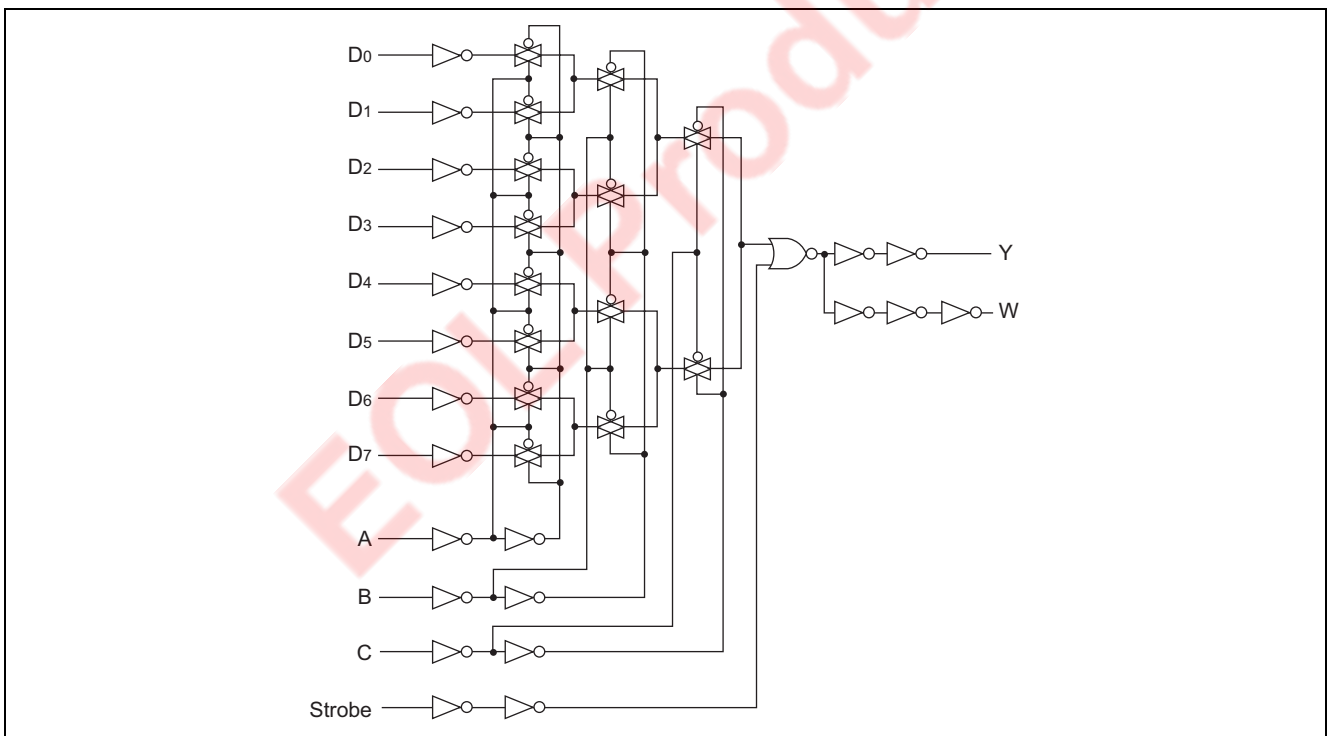
Inputs				Outputs	
Select			Strobe S	Y	W
C	B	A			
X	X	X	H	L	H
L	L	L	L	$D_0$	$\overline{D}_0$
L	L	H	L	$D_1$	$\overline{D}_1$
L	H	L	L	$D_2$	$\overline{D}_2$
L	H	H	L	$D_3$	$\overline{D}_3$
H	L	L	L	$D_4$	$\overline{D}_4$
H	L	H	L	$D_5$	$\overline{D}_5$
H	H	L	L	$D_6$	$\overline{D}_6$
H	H	H	L	$D_7$	$\overline{D}_7$

H : High level  
 L : Low level  
 X : Irrelevant

### Pin Arrangement



### Logic Diagram



### Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage range	$V_{CC}$	-0.5 to +7.0	V
Input voltage	$V_{IN}$	-0.5 to $V_{CC} + 0.5$	V
Output voltage	$V_{OUT}$	-0.5 to $V_{CC} + 0.5$	V
Output current	$I_{OUT}$	$\pm 25$	mA
DC current drain per $V_{CC}$ , GND	$I_{CC}$ , $I_{GND}$	$\pm 50$	mA
DC input diode current	$I_{IK}$	$\pm 20$	mA
DC output diode current	$I_{OK}$	$\pm 20$	mA
Power dissipation per package	$P_T$	500	mW
Storage temperature	$T_{stg}$	-65 to +150	°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	°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

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

Waveform: Refer to test circuit of switching characteristics.

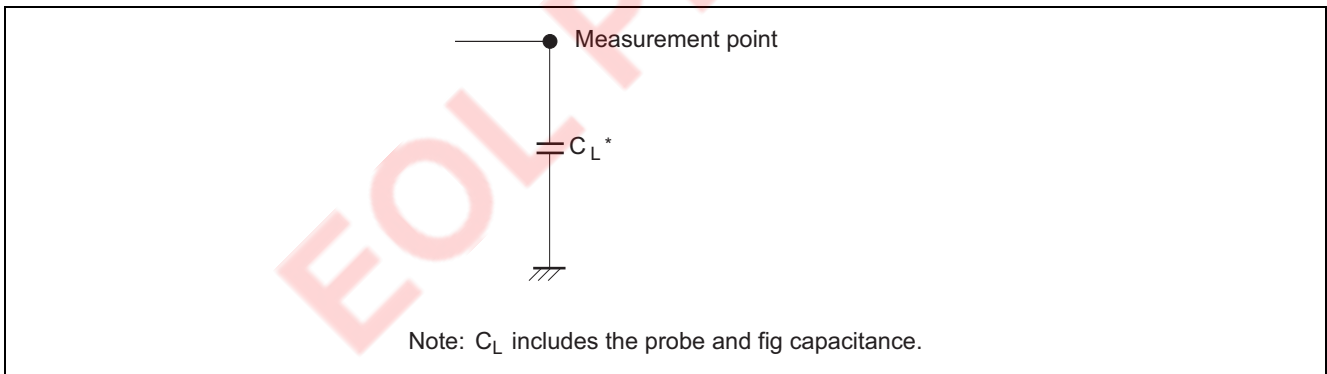
### Electrical Characteristics

Item	Symbol	$V_{CC}$ (V)	$T_a = 25^\circ\text{C}$			$T_a = -40 \text{ to } +85^\circ\text{C}$		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	$V_{in} = V_{IH} \text{ or } V_{IL}$	$I_{OH} = -20 \mu\text{A}$
		4.5	4.4	4.5	—	4.4	—			$I_{OH} = -4 \text{ mA}$
		6.0	5.9	6.0	—	5.9	—			$I_{OH} = -5.2 \text{ mA}$
		4.5	4.18	—	—	4.13	—			
		6.0	5.68	—	—	5.63	—			
	$V_{OL}$	2.0	—	0.0	0.1	—	0.1	V	$V_{in} = V_{IH} \text{ or } V_{IL}$	$I_{OL} = 20 \mu\text{A}$
		4.5	—	0.0	0.1	—	0.1			
		6.0	—	0.0	0.1	—	0.1			
		4.5	—	—	0.26	—	0.33			$I_{OL} = 4 \text{ mA}$
		6.0	—	—	0.26	—	0.33			$I_{OL} = 5.2 \text{ mA}$
Input current	$I_{in}$	6.0	—	—	$\pm 0.1$	—	$\pm 1.0$	$\mu\text{A}$	$V_{in} = V_{CC} \text{ or } \text{GND}$	
Quiescent supply current	$I_{CC}$	6.0	—	—	4.0	—	40	$\mu\text{A}$	$V_{in} = V_{CC} \text{ or } \text{GND}, I_{out} = 0 \mu\text{A}$	

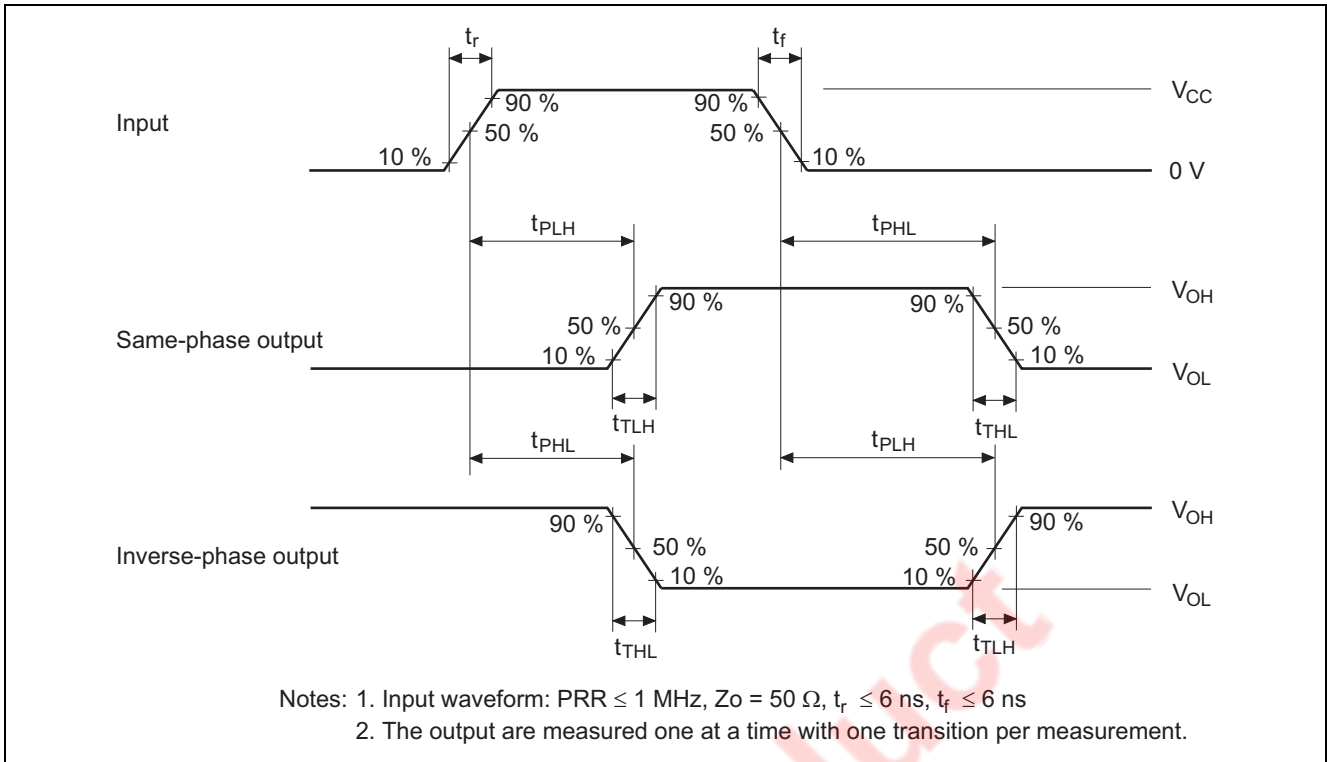
**Switching Characteristics** ( $C_L = 50\text{ pF}$ , Input  $t_r = t_f = 6\text{ ns}$ )

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	$t_{PLH}, t_{PHL}$	2.0	—	—	205	—	255	ns	A, B or C to Y
		4.5	—	18	41	—	51		
		6.0	—	—	35	—	43		
	$t_{PLH}, t_{PHL}$	2.0	—	—	185	—	230	ns	A, B or C to W
		4.5	—	18	37	—	46		
		6.0	—	—	31	—	39		
	$t_{PLH}, t_{PHL}$	2.0	—	—	175	—	220	ns	Any D to Y
		4.5	—	16	35	—	44		
		6.0	—	—	30	—	37		
	$t_{PLH}, t_{PHL}$	2.0	—	—	170	—	215	ns	Any D to W
		4.5	—	16	34	—	43		
		6.0	—	—	29	—	37		
	$t_{PLH}, t_{PHL}$	2.0	—	—	125	—	155	ns	Strobe to Y
		4.5	—	10	25	—	31		
		6.0	—	—	21	—	26		
	$t_{PLH}, t_{PHL}$	2.0	—	—	115	—	145	ns	Strobe to W
		4.5	—	10	23	—	29		
		6.0	—	—	20	—	25		
Output rise/fall time	$t_{TLH}, t_{THL}$	2.0	—	—	75	—	95	ns	
		4.5	—	5	15	—	19		
		6.0	—	—	13	—	16		
Input capacitance	$C_{in}$	—	—	5	10	—	10	pF	

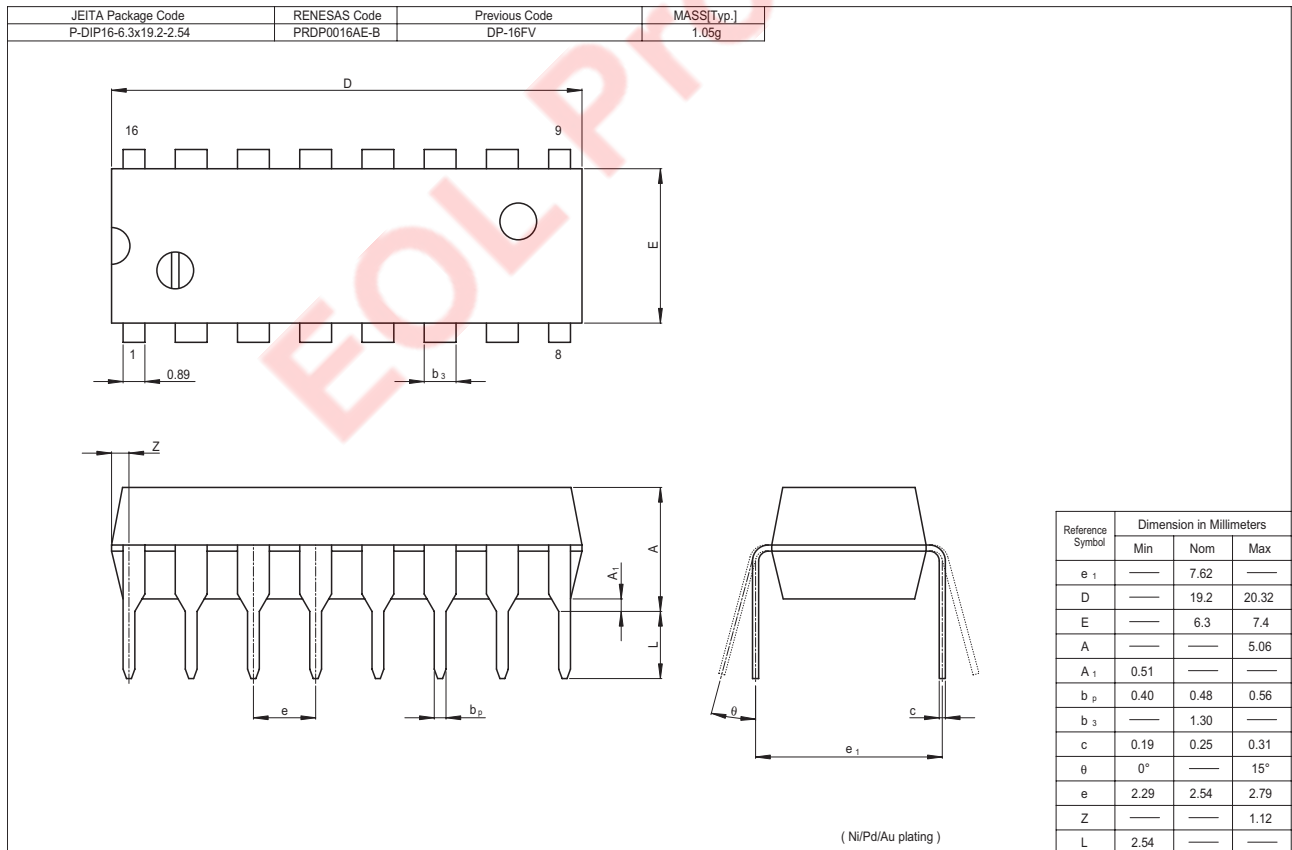
**Test Circuit**



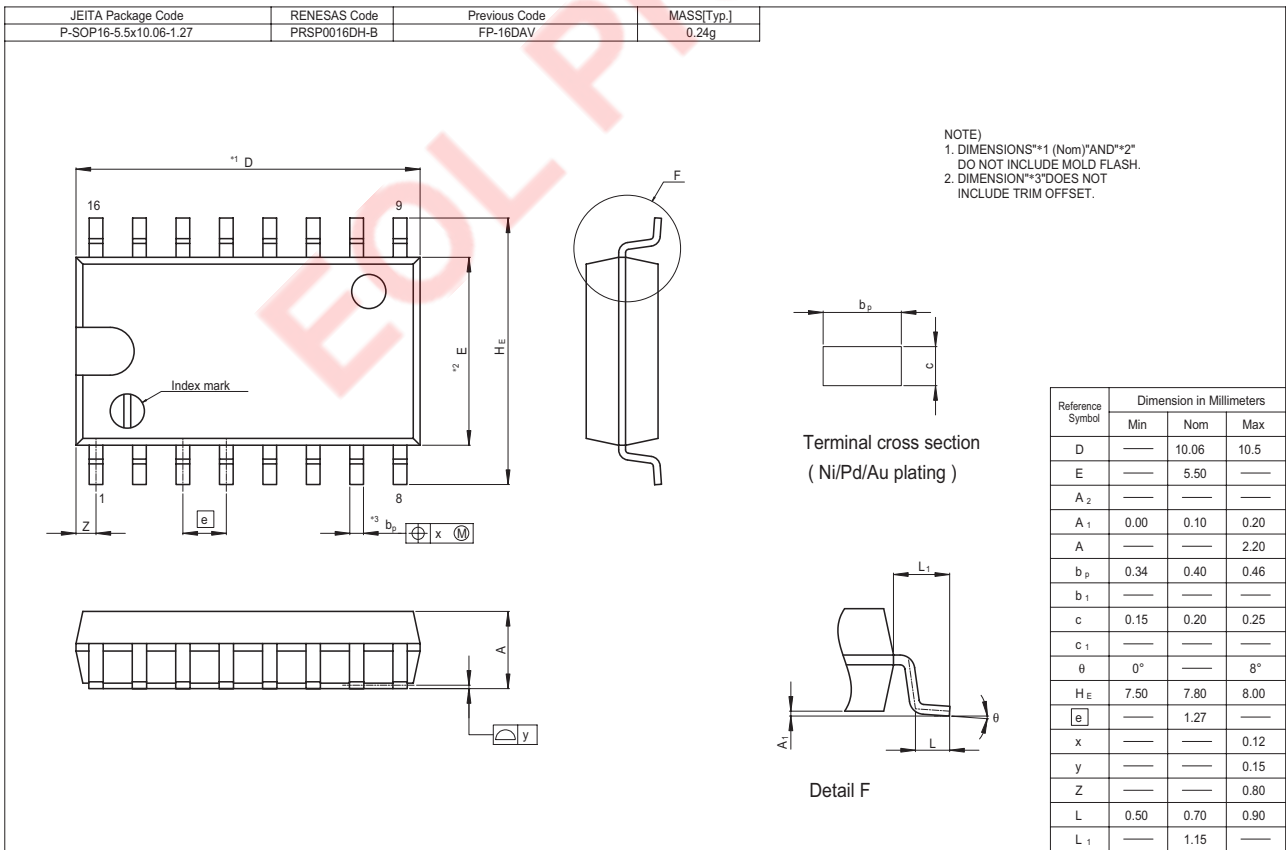
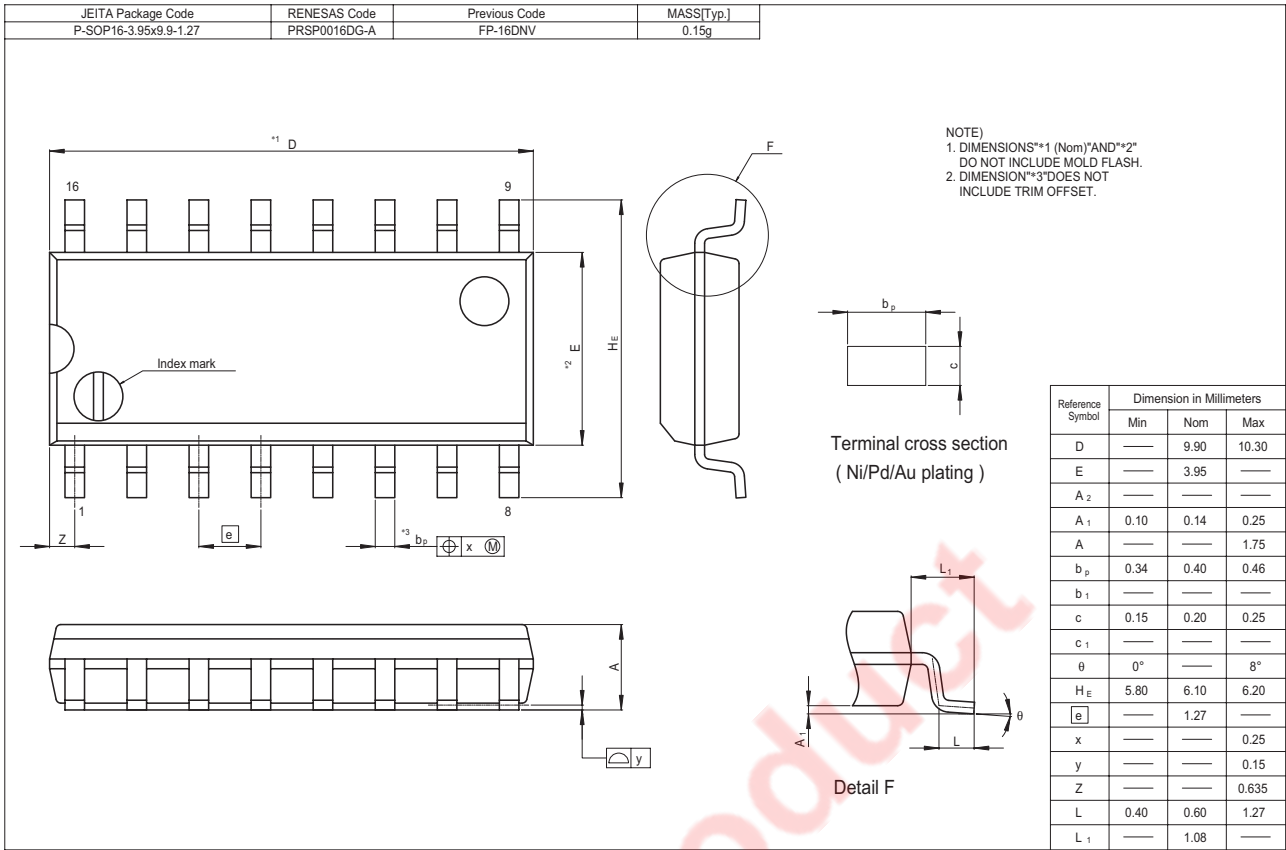
Waveforms



Package Dimensions



Package Dimensions



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