

HD74HC237

3-to-8-line Decoder/Demultiplexer with Address Latch

REJ03D0592-0200
 (Previous ADE-205-469)
 Rev.2.00
 Jan 31, 2006

Description

The HD74HC237 decodes a three-bit Address to one-of-eight active-high outputs. The device has a transparent latch for storage of the Address. Two Chip Selects, one active-low and one active-high, are provided to facilitate the demultiplexing, cascading, and chip-selecting functions.

The demultiplexing function is accomplished by using the Address inputs to select the desired device output, and then by using one of the Chip Selects as a data input while holding the other one active.

The HD74HD237 is the noninverting version of the HD74HC137.

Features

- High Speed Operation: t_{pd} (Data to Y) = 19 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 μ A max
- Low Quiescent Supply Current: I_{CC} (static) = 4 μ A max ($T_a = 25^\circ\text{C}$)
- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74HC237P	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74HC237FPEL	SOP-16 pin (JEITA)	PRSP0016DH-B (FP-16DAV)	FP	EL (2,000 pcs/reel)
HD74HC237RPEL	SOP-16 pin (JEDEC)	PRSP0016DG-A (FP-16DNV)	RP	EL (2,500 pcs/reel)

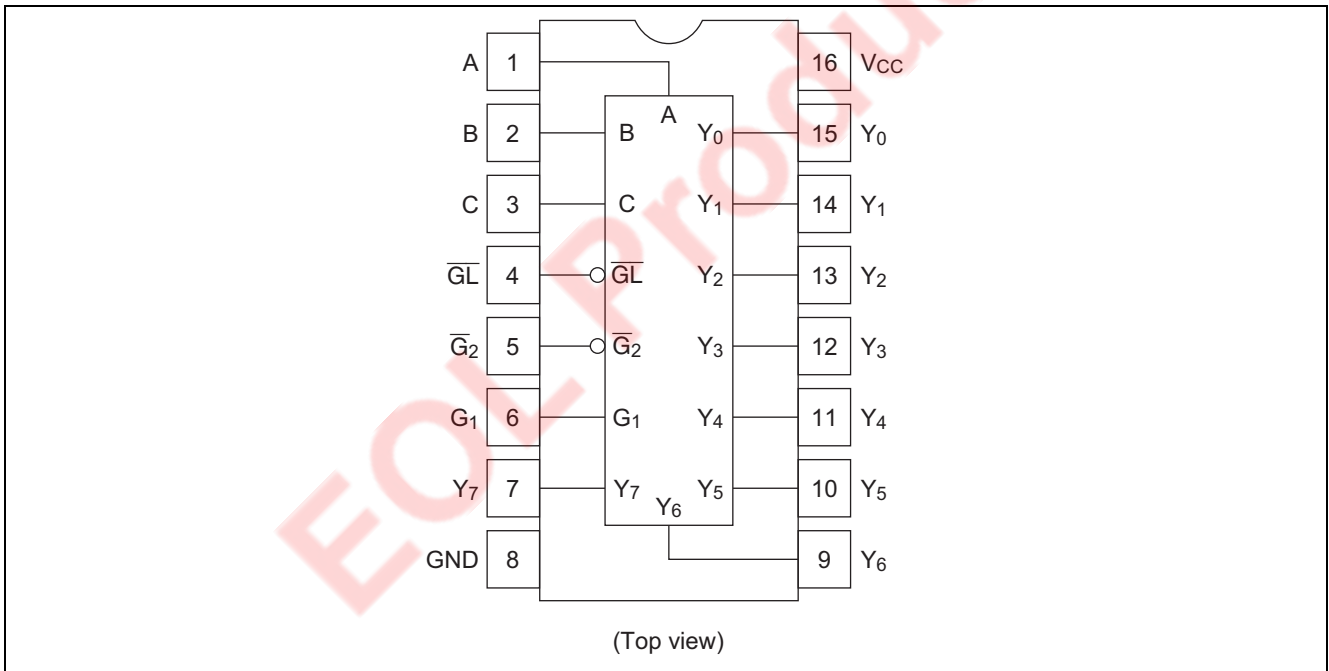
Note: Please consult the sales office for the above package availability.

Function Table

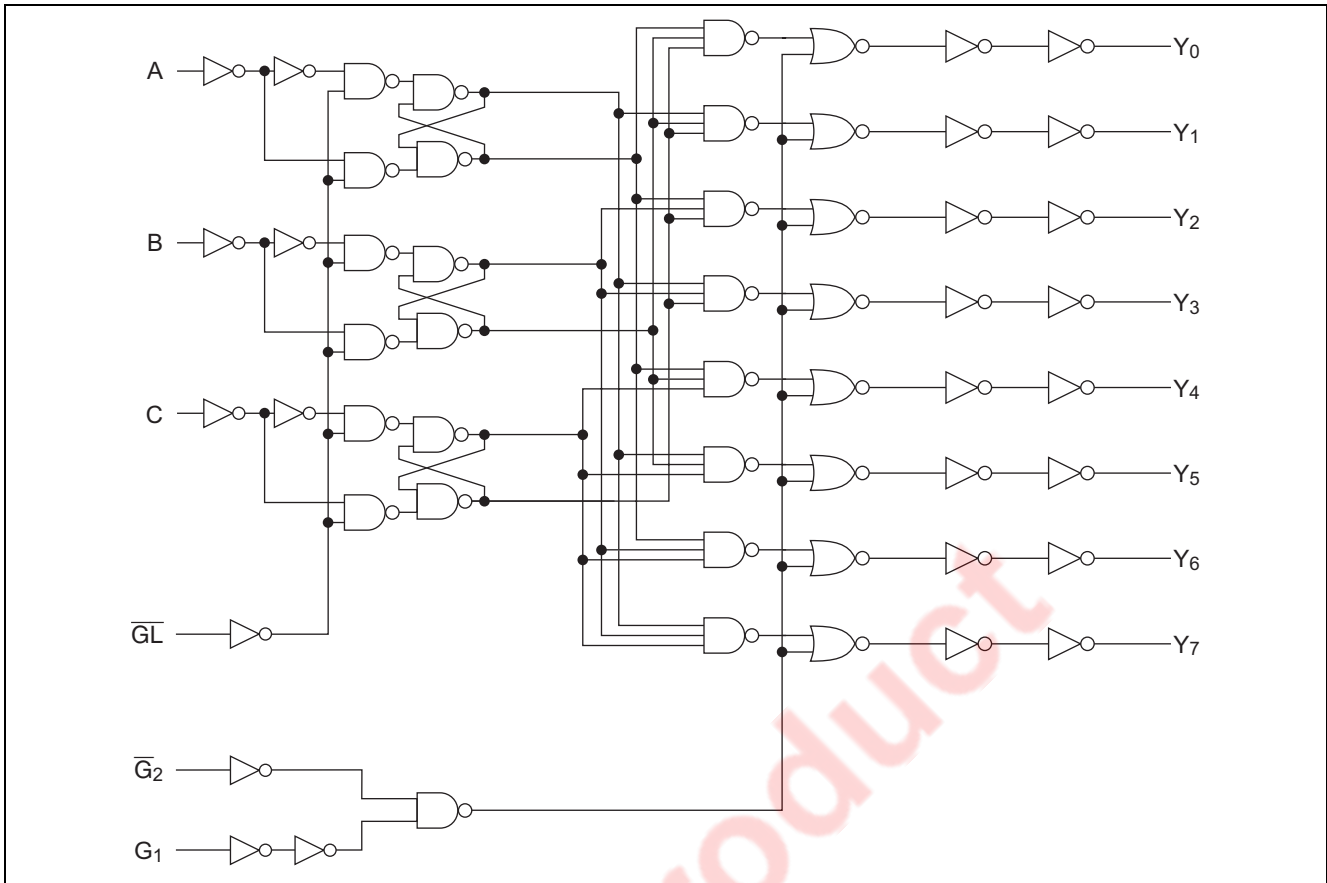
Inputs						Outputs							
Enable			Select										
$\overline{G_L}$	G_1	$\overline{G_2}$	C	B	A	Y_0	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7
X	X	H	X	X	X	L	L	L	L	L	L	L	L
X	L	X	X	X	X	L	L	L	L	L	L	L	L
L	H	L	L	L	L	H	L	L	L	L	L	L	L
L	H	L	L	L	H	L	H	L	L	L	L	L	L
L	H	L	L	H	L	L	L	H	L	L	L	L	L
L	H	L	L	H	H	L	L	L	H	L	L	L	L
L	H	L	H	L	L	L	L	L	L	H	L	L	L
L	H	L	H	L	H	L	L	L	L	L	H	L	L
L	H	L	H	H	L	L	L	L	L	L	L	H	L
L	H	L	H	H	H	L	L	L	L	L	L	L	H
H	H	L	X	X	X	Output corresponding to stored address H; all others L							

H : High level
 L : Low level
 X : Irrelevant

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}	± 20	mA
Output current	I_O	± 25	mA
V_{CC} , GND current	I_{CC} or I_{GND}	± 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 ^{*1}	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

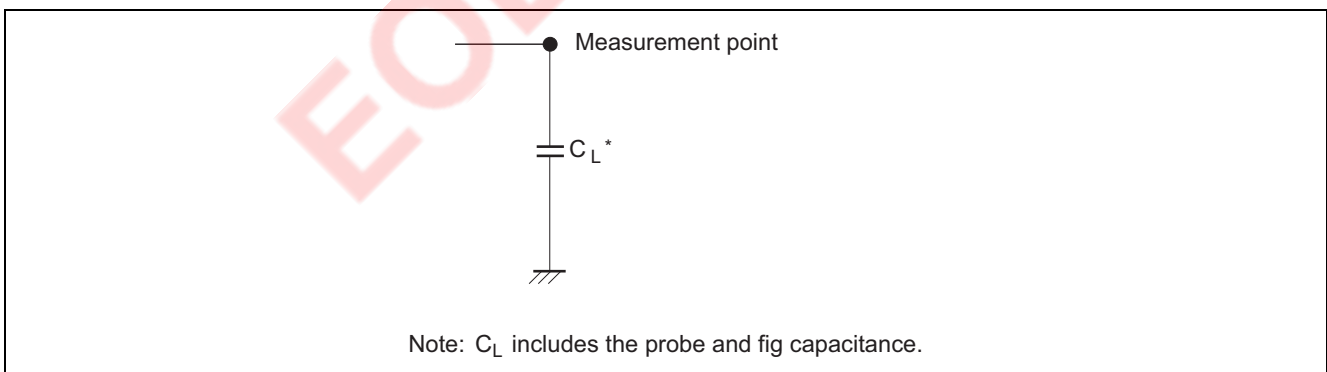
Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to+85°C		Unit	Test Conditions		
			Min	Typ	Max	Min	Max				
Input voltage	V _{IH}	2.0	1.5	—	—	1.5	—	V			
		4.5	3.15	—	—	3.15	—				
		6.0	4.2	—	—	4.2	—				
	V _{IL}	2.0	—	—	0.5	—	0.5	V			
		4.5	—	—	1.35	—	1.35				
		6.0	—	—	1.8	—	1.8				
Output voltage	V _{OH}	2.0	1.9	2.0	—	1.9	—	V	Vin = V _{IH} or V _{IL}	I _{OH} = -20 μA	
		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	Vin = V _{IH} or V _{IL}	I _{OL} = 20 μA	
		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 mA	
		6.0	—	—	0.26	—	0.33			I _{OL} = 5.2 mA	
Input current	I _{in}	6.0	—	—	±0.1	—	±1.0	μA	Vin = V _{CC} or GND		
Quiescent supply current	I _{CC}	6.0	—	—	4.0	—	40	μA	Vin = V _{CC} or GND, I _{out} = 0 μA		

Switching Characteristics

($C_L = 50$ pF, Input $t_r = t_f = 6$ ns)

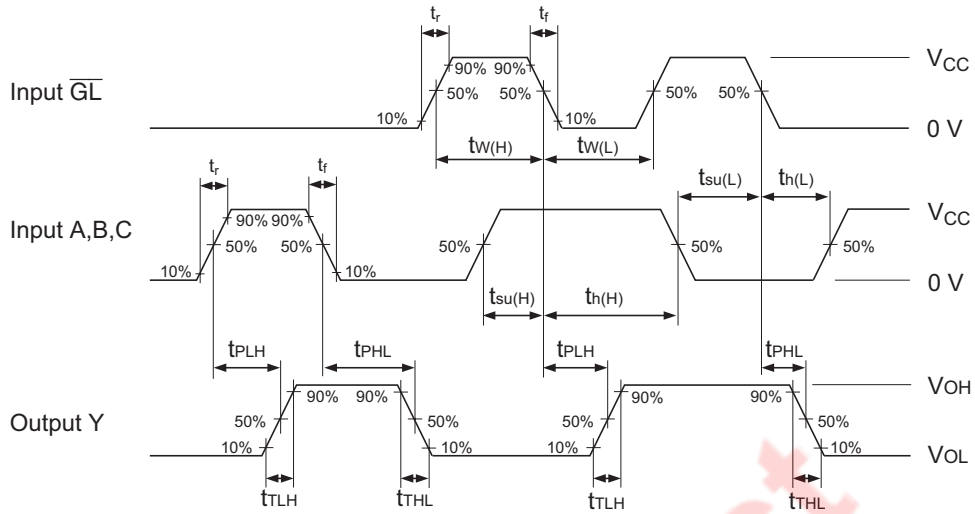
Item	Symbol	V_{CC} (V)	$T_a = 25^\circ\text{C}$			$T_a = -40$ to $+85^\circ\text{C}$		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Propagation delay time	t_{PLH}	2.0	—	—	185	—	230	ns	Data to Y
		4.5	—	19	37	—	46		
		6.0	—	—	31	—	39		
	t_{PHL}	2.0	—	—	145	—	180	ns	\overline{G}_2 to Y
		4.5	—	14	29	—	36		
		6.0	—	—	25	—	31		
	t_{PHL}	2.0	—	—	145	—	180	ns	G_1 to Y
		4.5	—	14	29	—	36		
		6.0	—	—	25	—	31		
	t_{PHL}	2.0	—	—	190	—	240	ns	\overline{G}_L to Y
		4.5	—	21	38	—	48		
		6.0	—	—	32	—	41		
Pulse width	t_w	2.0	80	—	—	100	—	ns	
		4.5	16	8	—	20	—		
		6.0	14	—	—	17	—		
Hold time	t_h	2.0	5	—	—	5	—	ns	
		4.5	5	-4	—	5	—		
		6.0	5	—	—	5	—		
Setup time	t_{su}	2.0	75	—	—	95	—	ns	
		4.5	15	4	—	19	—		
		6.0	13	—	—	16	—		
Output rise/fall time	t_{TLH}	2.0	—	—	75	—	95	ns	
	t_{THL}	4.5	—	5	15	—	19		
	t_{THL}	6.0	—	—	13	—	16		
Input capacitance	C_{in}	—	—	5	10	—	10	pF	

Test Circuit



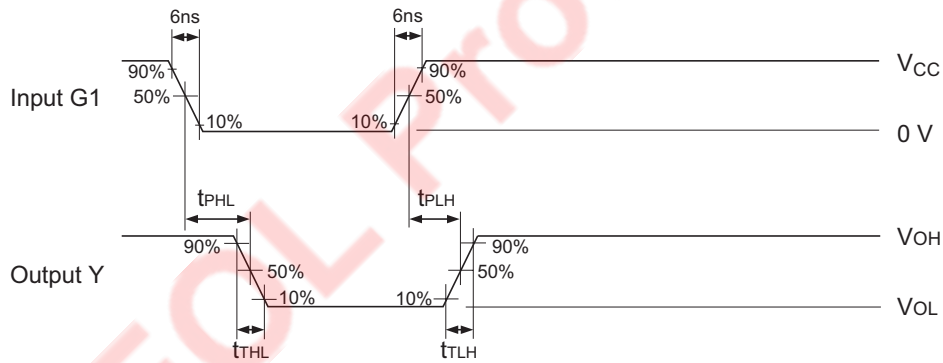
Waveforms

• Waveform – 1



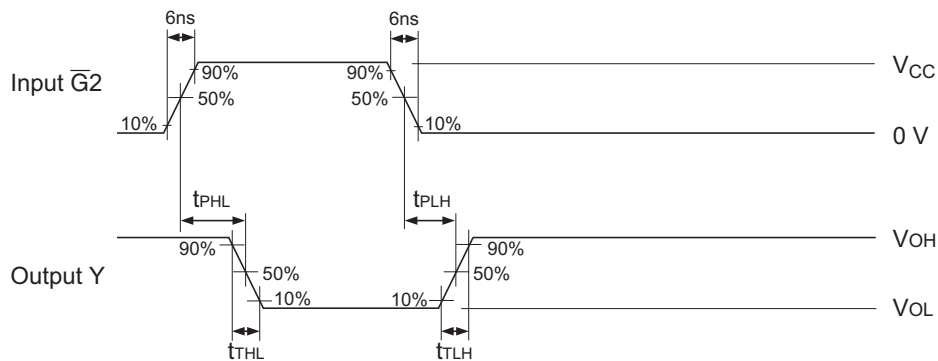
Note : 1. Input pulse : PRR \leq 1 MHz, $Z_o = 50 \Omega$, $t_r \leq 6$ ns, $t_f \leq 6$ ns

• Waveform – 2



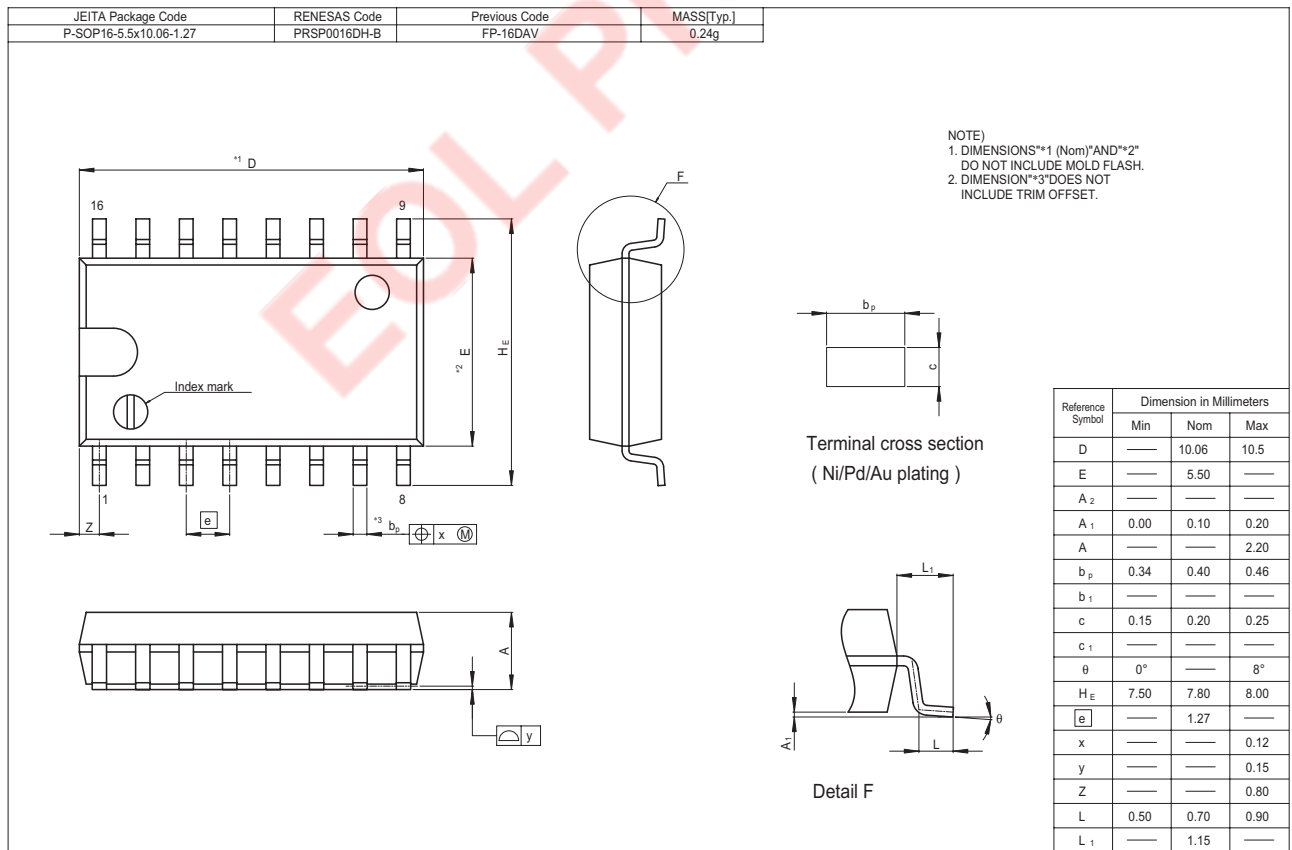
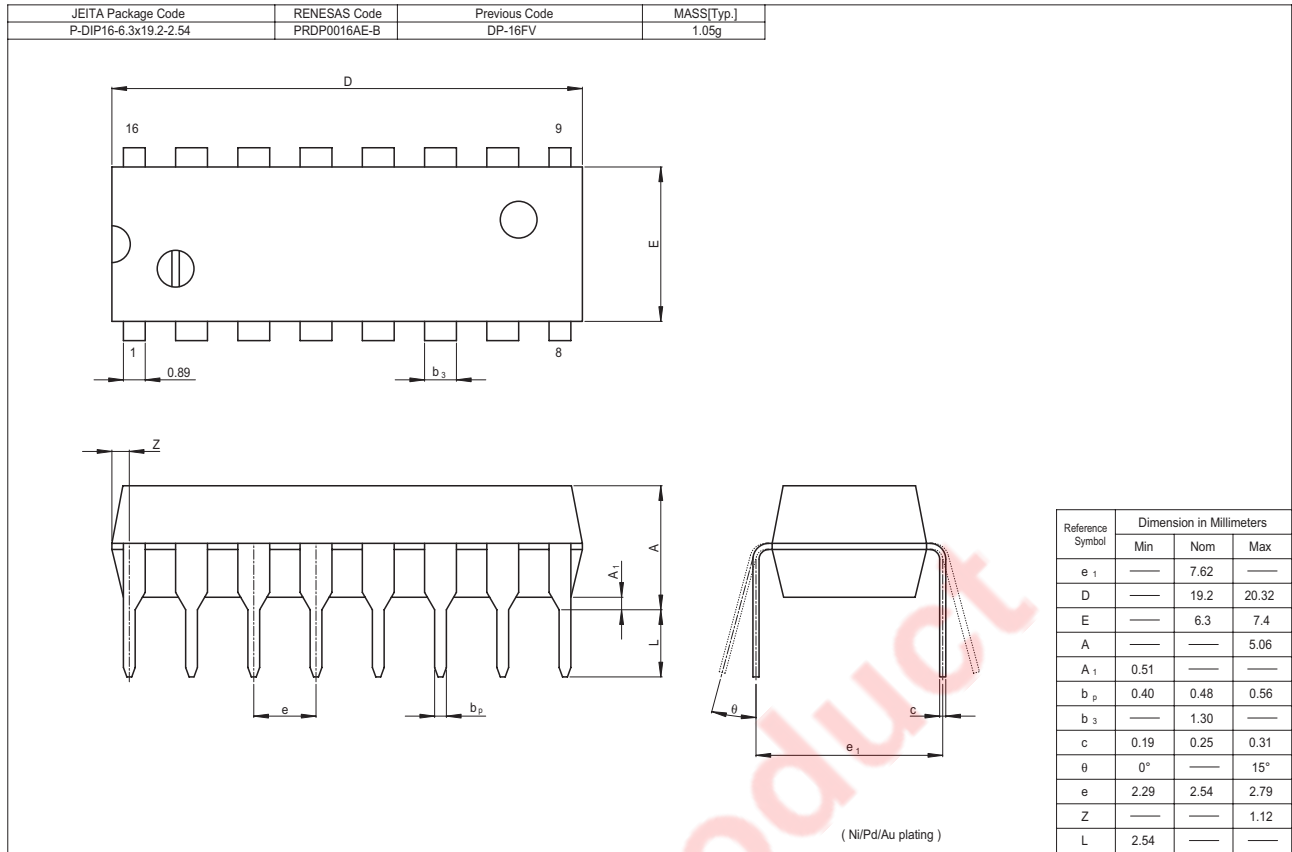
Note : 1. Input pulse : PRR \leq 1 MHz, $Z_o = 50 \Omega$, $t_r \leq 6$ ns, $t_f \leq 6$ ns

• Waveform – 3



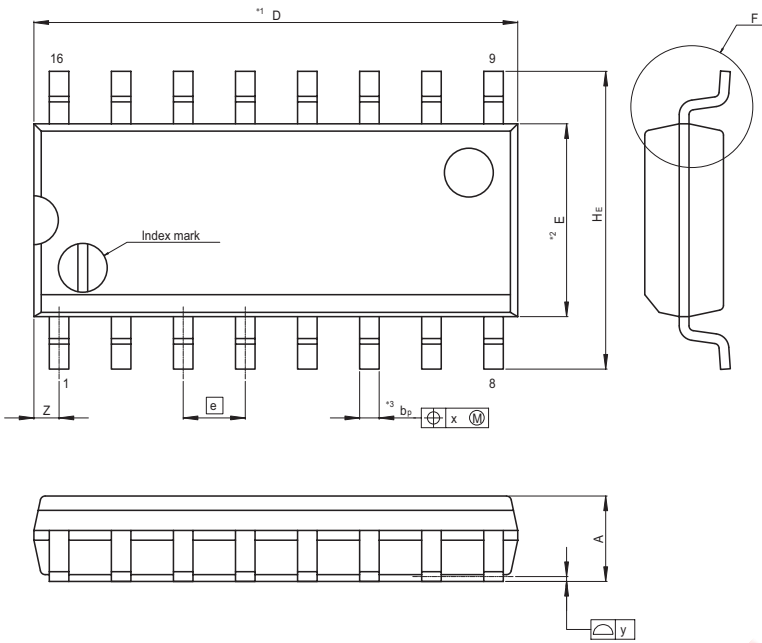
Notes : 1. Input pulse : PRR \leq 1 MHz, $Z_o = 50 \Omega$, $t_r \leq 6$ ns, $t_f \leq 6$ ns
 2. The output are measured one at a time with one transition per measurement.

Package Dimensions

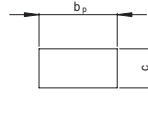


HD74HC237

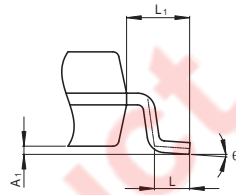
JEITA Package Code P-SOP16-3.95x9.9-1.27	RENESAS Code PRSP0016DG-A	Previous Code FP-16DNV	MASS[Typ.] 0.15g
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NOTE
 1. DIMENSIONS**1 (Nom)**AND**2
 DO NOT INCLUDE MOLD FLASH.
 2. DIMENSION**3**DOES NOT
 INCLUDE TRIM OFFSET.



Terminal cross section
(Ni/Pd/Au plating)



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	9.90	10.30
E	—	3.95	—
A _z	—	—	—
A ₁	0.10	0.14	0.25
A	—	—	1.75
b _p	0.34	0.40	0.46
b ₁	—	—	—
c	0.15	0.20	0.25
c ₁	—	—	—
θ	0°	—	8°
H _E	5.80	6.10	6.20
e	—	1.27	—
x	—	—	0.25
y	—	—	0.15
Z	—	—	0.635
L	0.40	0.60	1.27
L ₁	—	1.08	—

EOL Product

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