To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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HD74LS375

Quadruple Bistable Latches

REJ03D0484–0200
Rev.2.00
Feb.18.2005

The HD74LS375 bistable latch is electrically and functionally identical to the HD74LS75, respectively. Only the arrangement of the terminals has been changed in the HD74LS375. This latch is ideally suited for use as temporary storage for binary information between processing units and input / output or indicator units. Information present at a data (D) input is transferred to the Q output when the enable (G) is high and the Q output will follow the data input as long as the enable remains high. When the enable goes low, the information (that was present at the data input at the time the transition occurred) is retained at the Q output until the enable goes high.

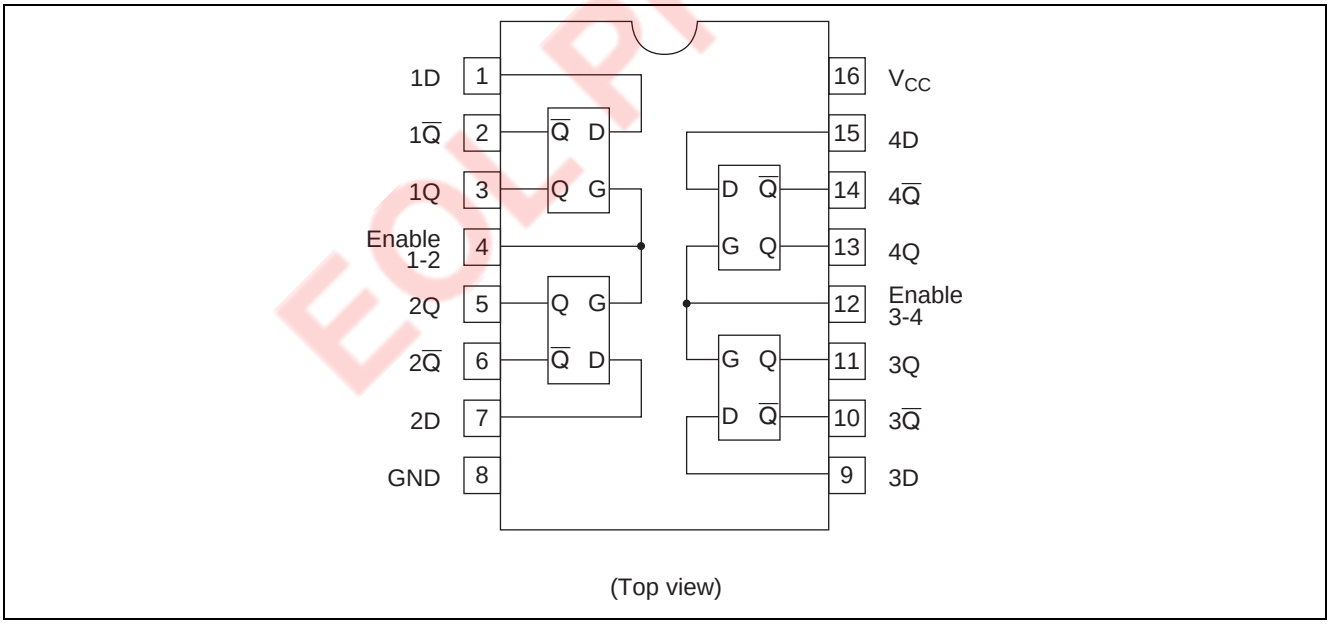
Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS375P	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74LS375FPEL	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



(Top view)

Function Table

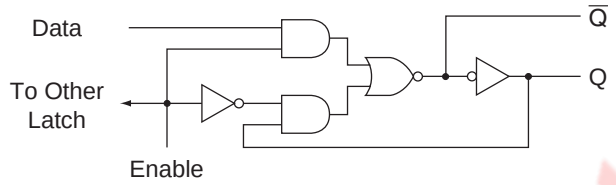
Inputs		Outputs	
D	**G**	**Q**	**$\overline{Q}$**
L	H	L	H
H	H	H	L
X	L	Q_0	$\overline{Q}_0$

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

Q_0; level of Q before the indicated steady state input conditions were established

$\overline{Q}_0$; complement of Q_0 or level of $\overline{Q}$ before the indicated steady state input conditions were established

Block Diagram (1/4)



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}	7	V
Input voltage	V_{IN}	7	V
Power dissipation	P_T	400	mW
Storage temperature	Tstg	–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	µA
	I_{OL}	—	—	8	mA
Operating temperature	Topr	–20	25	75	°C
Enable input pulse width	t_w	20	—	—	ns
Setup time	t_{su}	20	—	—	ns
Hold time	t_h	5	—	—	ns

Electrical Characteristics

(Ta = –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}	2.7	—	—	V	V_{CC} = 4.75 V, V_{IH} = 2 V, V_{IL} = 0.8 V, I_{OH} = –400 µA	
	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		I_{OL} = 8 mA	
Input current	I_{IH}	—	—	20	µA	D	V_{CC} = 5.25 V, V_I = 2.7 V
		—	—	80		G	
	I_{IL}	—	—	–0.4	mA	D	V_{CC} = 5.25 V, V_I = 0.4 V
		—	—	–1.6		G	
	I_I	—	—	0.1	mA	D	V_{CC} = 5.25 V, V_I = 7 V
		—	—	0.4		G	
Short-circuit output current	I_{OS}	–20	—	–100	mA	V_{CC} = 5.25 V	
Supply current**	I_{CC}	—	6.3	12	mA	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, Ta = 25°C

** I_{CC} is measured with all outputs open and all inputs grounded.

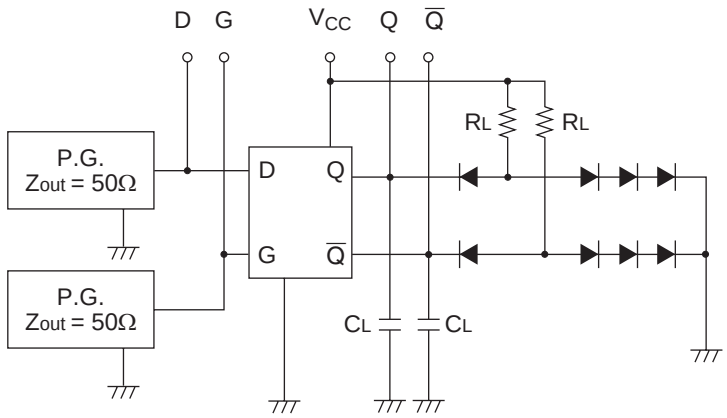
Switching Characteristics

(V_{CC} = 5 V, Ta = 25°C)

Item	Symbol	Inputs	Output	min.	typ.	max.	Unit	Condition
Propagation delay time	t_{PLH}	D	Q	—	15	27	ns	C_L = 15 pF, R_L = 2 kΩ
	t_{PHL}			—	9	17		
	t_{PLH}	D	$\overline{Q}$	—	12	20		
	t_{PHL}			—	7	15		
	t_{PLH}	G	Q	—	15	27		
	t_{PHL}			—	14	25		
	t_{PLH}	G	$\overline{Q}$	—	16	30		
	t_{PHL}			—	7	15		

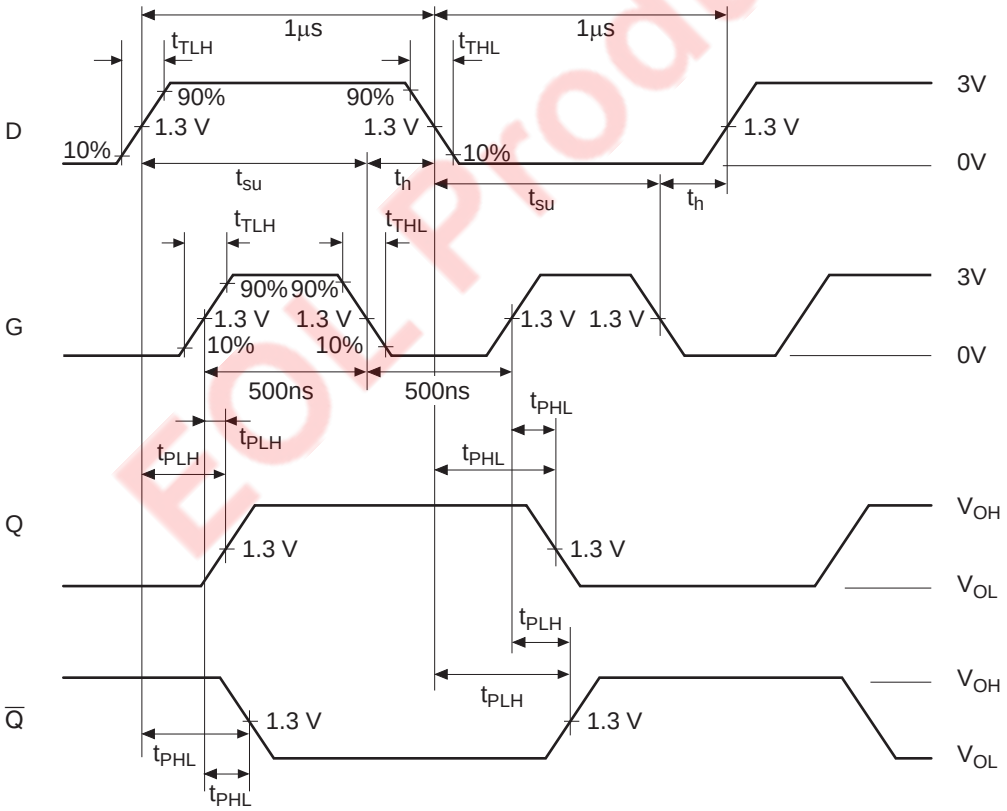
Testing Method

Test Circuit



Notes:
1. Test is put into the each latch.
2. C_L includes prove and jig capacitance.
3. All diodes are 1S2074(H).

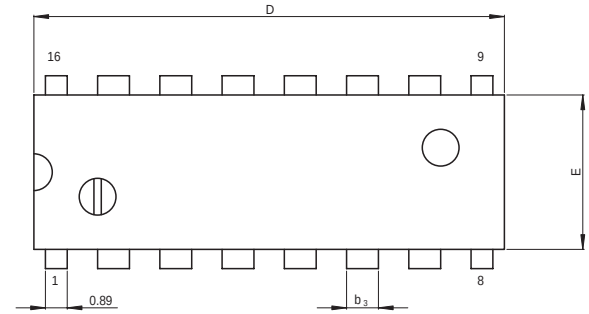
Waveform

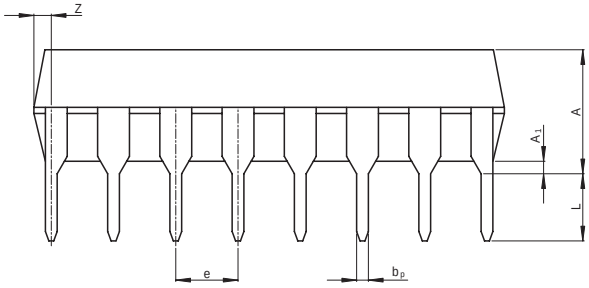


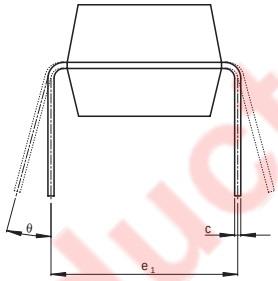
Notes:
1. Input pulse; D input: PRR = 500 kHz, G input: PRR = 1 MHz, $t_{THL} \leq 10$ ns, $t_{TLH} \leq 10$ ns.
2. When measuring propagation delay times from the D input, the corresponding G input must be held high.

Package Dimensions

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-DIP16-6.3x19.2-2.54	PRDP0016AE-B	DP-16FV	1.05g



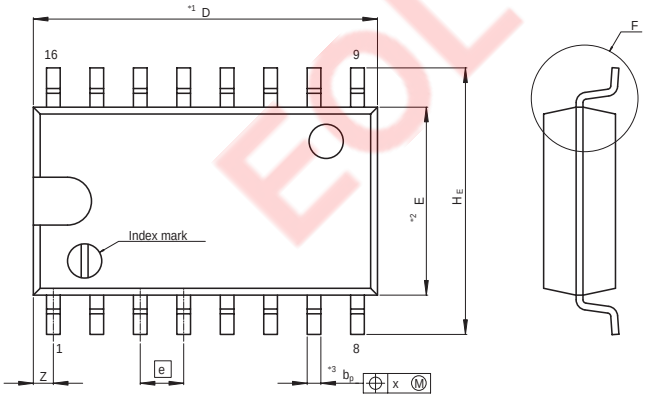


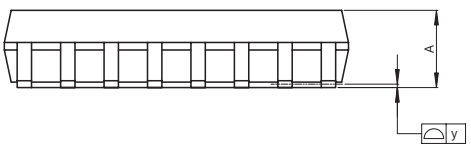


(Ni/Pd/Au plating)

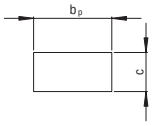
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
e 1	——	7.62	——
D	——	19.2	20.32
E	——	6.3	7.4
A	——	——	5.06
A 1	0.51	——	——
b p	0.40	0.48	0.56
b 3	——	1.30	——
c	0.19	0.25	0.31
θ	0°	——	15°
e	2.29	2.54	2.79
Z	——	——	1.12
L	2.54	——	——

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP16-5.5x10.06-1.27	PRSP0016DH-B	FP-16DAV	0.24g

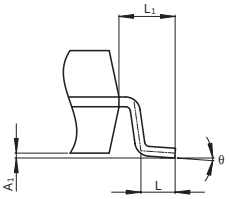




NOTE)
1. DIMENSIONS"*1 (Nom)"AND"*2"
   DO NOT INCLUDE MOLD FLASH.
2. DIMENSION"*3"DOES NOT
   INCLUDE TRIM OFFSET.



Terminal cross section
(Ni/Pd/Au plating)



Detail F

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	——	10.06	10.5
E	——	5.50	——
A 2	——	——	——
A 1	0.00	0.10	0.20
A	——	——	2.20
b p	0.34	0.40	0.46
b 1	——	——	——
c	0.15	0.20	0.25
c 1	——	——	——
θ	0°	——	8°
H E	7.50	7.80	8.00
e	——	1.27	——
x	——	——	0.12
y	——	——	0.15
Z	——	——	0.80
L	0.50	0.70	0.90
L 1	——	1.15	——

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