

To all our customers

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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

Cautions

Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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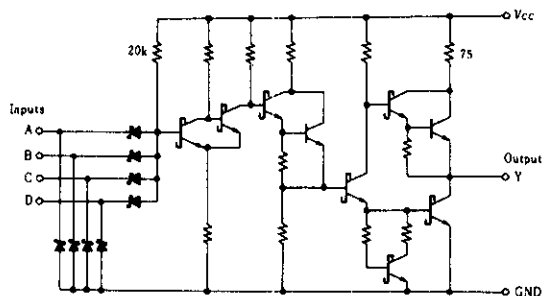
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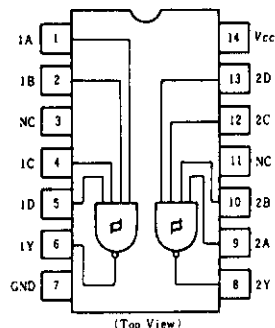
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HD74LS13 ●Dual 4-input Positive NAND Schmitt Triggers

■CIRCUIT SCHEMATIC(1/2)



■PIN ARRANGEMENT



■ELECTRICAL CHARACTERISTICS ($T_a = -20 \sim +75^\circ\text{C}$)

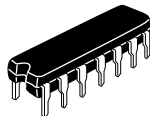
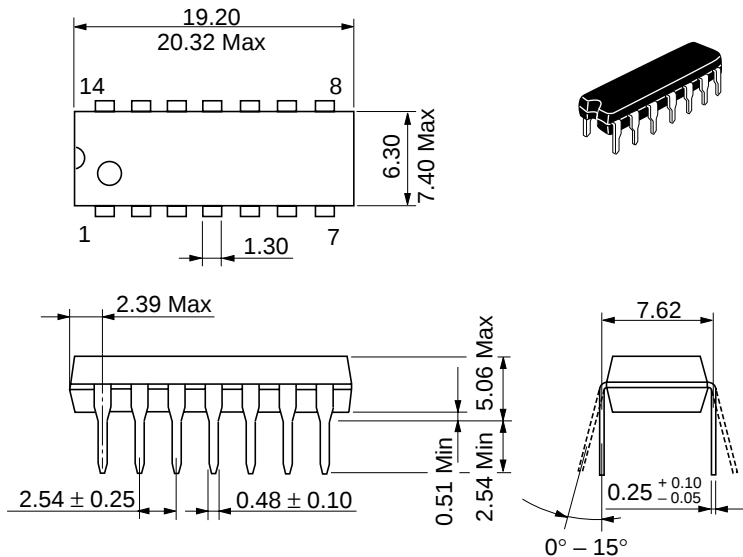
Item	Symbol	Test Conditions	min	typ*	max	Unit
Input threshold voltage	V_{T^+}	$V_{CC} = 5\text{V}$	1.4	1.6	1.9	V
	V_{T^-}	$V_{CC} = 5\text{V}$	0.5	0.7	1.0	V
Hysteresis	$V_{T^+} - V_{T^-}$	$V_{CC} = 5\text{V}$	0.4	0.9	—	V
Output voltage	V_{OH}	$V_{CC} = 4.75\text{V}, I_{OH} = -400\mu\text{A}, V_I = 0.5\text{V}$	2.7	—	—	V
	V_{OL}	$V_{CC} = 4.75\text{V}, V_I = 1.9\text{V}, I_{OL} = 8\text{mA}$	—	—	0.5	V
		$I_{OL} = 4\text{mA}$	—	—	0.4	
Input threshold current	I_{T^+}	$V_{CC} = 5\text{V}, V_I = V_{T^+}$	—	-0.14	—	mA
	I_{T^-}	$V_{CC} = 5\text{V}, V_I = V_{T^-}$	—	-0.18	—	mA
Input current	I_{IH}	$V_{CC} = 5.25\text{V}, V_I = 2.7\text{V}$	—	—	20	μA
	I_{IL}	$V_{CC} = 5.25\text{V}, V_I = 0.4\text{V}$	—	—	-0.4	mA
	I_I	$V_{CC} = 5.25\text{V}, V_I = 7\text{V}$	—	—	0.1	mA
Short-circuit output current	I_{OS}	$V_{CC} = 5.25\text{V}$	-20	—	-100	mA
Supply current	I_{CCH}	$V_{CC} = 5.25\text{V}$	—	2.9	6	mA
	I_{CCL}	$V_{CC} = 5.25\text{V}$	—	4.1	7	mA
Input clamp voltage	V_{IK}	$V_{CC} = 4.75\text{V}, I_{IN} = -18\text{mA}$	—	—	-1.5	V

* $V_{CC} = 5\text{V}, T_a = 25^\circ\text{C}$

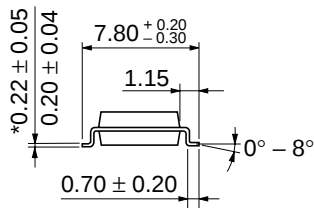
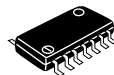
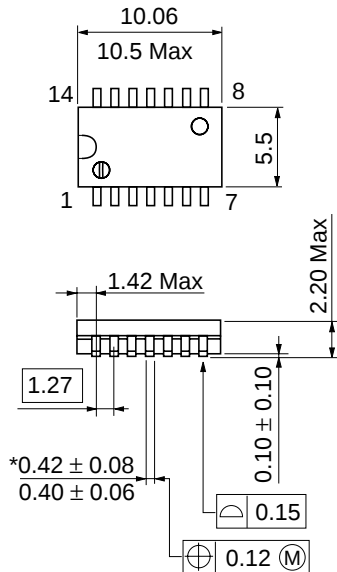
■SWITCHING CHARACTERISTICS ($V_{CC} = 5\text{V}, T_a = 25^\circ\text{C}$)

Item	Symbol	Test Conditions	min	typ	max	Unit
Propagation delay time	t_{PLH}	$C_L = 15\text{pF}, R_L = 2\text{k}\Omega$	—	15	22	ns
	t_{PHL}		—	18	27	ns

Note) Refer to Test Circuit and Waveform of the Common Item

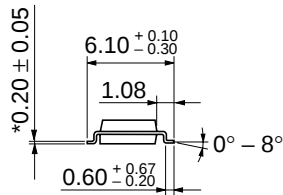
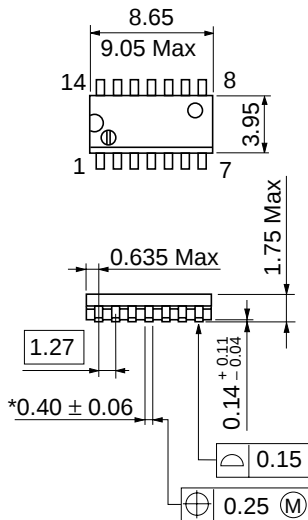


Hitachi Code	DP-14
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.97 g



Hitachi Code	FP-14DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.23 g

*Dimension including the plating thickness
Base material dimension



Hitachi Code	FP-14DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.13 g

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