

# HD74LS14

## Hex Schmitt Trigger Inverters

REJ03D0399-0400

Rev.4.00

Apr 07, 2009

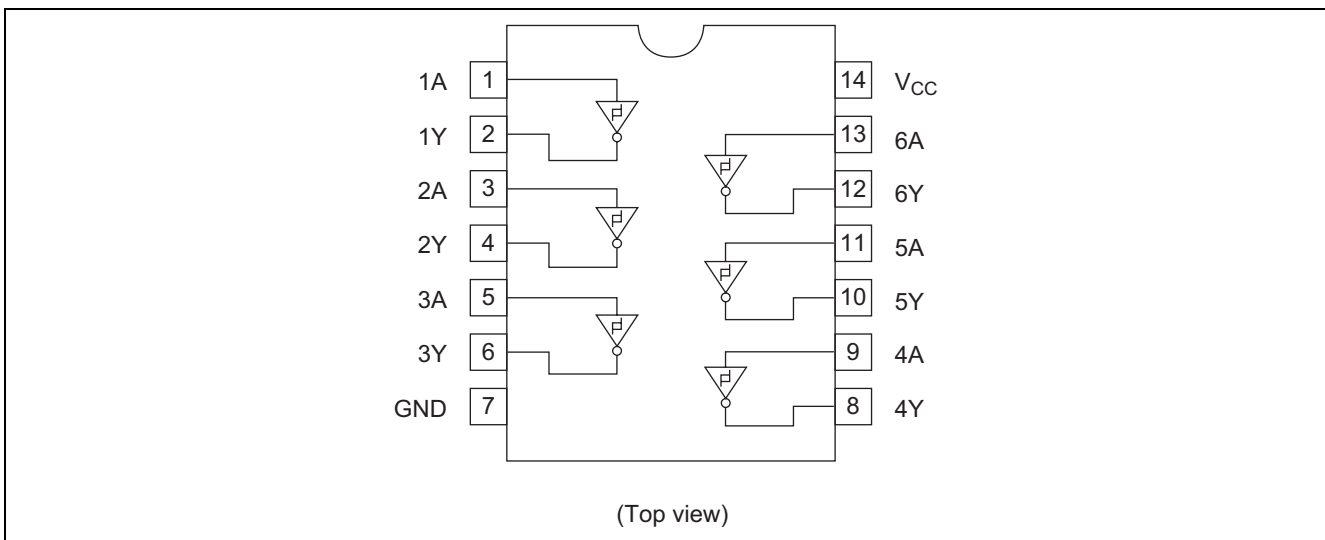
### Features

- Ordering Information

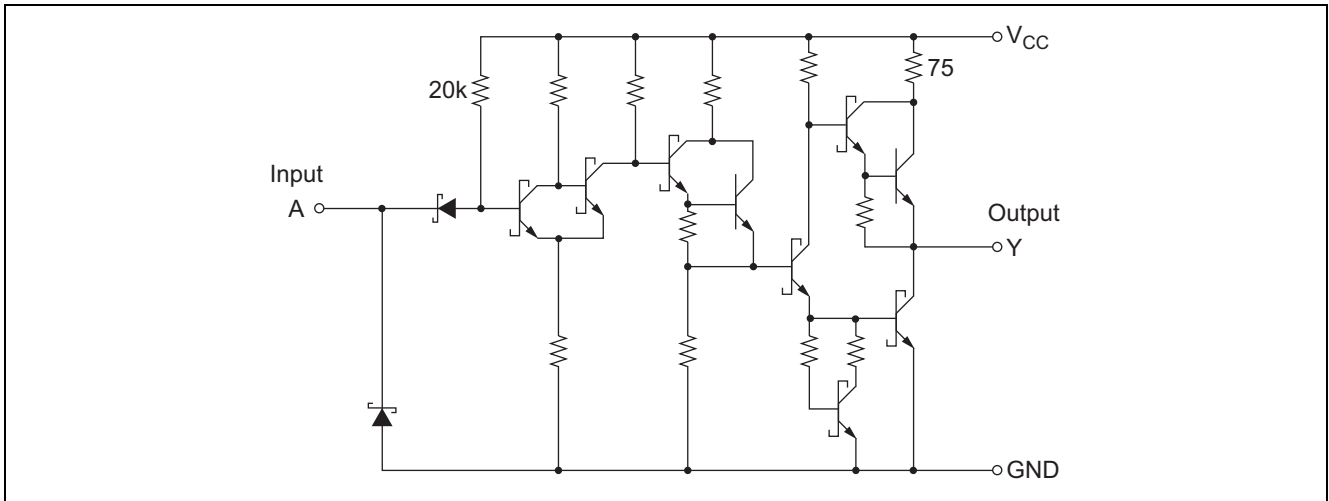
Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS14P	DILP-14 pin	PRDP0014AB-B (DP-14AV)	P	—
HD74LS14FPEL	SOP-14 pin (JEITA)	PRSP0014DF-B (FP-14DAV)	FP	EL (2,000 pcs/reel)
HD74LS14RPEL	SOP-14 pin (JEDEC)	PRSP0014DE-A (FP-14DNV)	RP	EL (2,500 pcs/reel)

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

### Pin Arrangement



Circuit Schematic (1/6)



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Input voltage	$V_{IN}$	7	V
Supply voltage	$V_{CC}$	7	V
Power dissipation	$P_T$	400	mW
Storage temperature	$T_{stg}$	-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	$\mu A$
	$I_{OL}$	—	—	8	mA
Operating temperature	$T_{opr}$	-20	25	75	°C

## Electrical Characteristics

(Ta = -20 to +75 °C)

Item	Symbol	min.	typ.*	max.	Unit	Condition
Input threshold voltage	$V_{T^+}$	1.4	1.6	1.9	V	$V_{CC} = 5\text{ V}$
	$V_{T^-}$	0.5	0.7	1.0	V	$V_{CC} = 5\text{ V}$
Hysteresis	$V_{T^+} - V_{T^-}$	0.4	0.9	—	V	$V_{CC} = 5\text{ V}$
Output voltage	$V_{OH}$	2.7	—	—	V	$V_{CC} = 4.75\text{ V}$ , $V_I = 0.5\text{ V}$ , $I_{OH} = -400\text{ }\mu\text{A}$
	$V_{OL}$	—	—	0.5	V	$V_{CC} = 4.75\text{ V}$ , $V_I = 1.9\text{ V}$
		—	—	0.4		
Input threshold current	$I_{T^+}$	—	-0.14	—	mA	$V_{CC} = 5\text{ V}$ , $V_I = V_{T^+}$
	$I_{T^-}$	—	-0.18	—	mA	$V_{CC} = 5\text{ V}$ , $V_I = V_{T^-}$
Input current	$I_{IH}$	—	—	20	$\mu\text{A}$	$V_{CC} = 5.25\text{ V}$ , $V_I = 2.7\text{ V}$
	$I_{IL}$	—	—	-0.4	mA	$V_{CC} = 5.25\text{ V}$ , $V_I = 0.4\text{ V}$
	$I_I$	—	—	0.1	mA	$V_{CC} = 5.25\text{ V}$ , $V_I = 7\text{ V}$
Short-circuit output current	$I_{OS}$	-20	—	-100	mA	$V_{CC} = 5.25\text{ V}$
Supply current	$I_{CCH}$	—	8.6	16	mA	$V_{CC} = 5.25\text{ V}$
	$I_{CCL}$	—	12	21	mA	$V_{CC} = 5.25\text{ V}$
Input clamp voltage	$V_{IK}$	—	—	-1.5	V	$V_{CC} = 4.75\text{ V}$ , $I_{IN} = -18\text{ mA}$

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

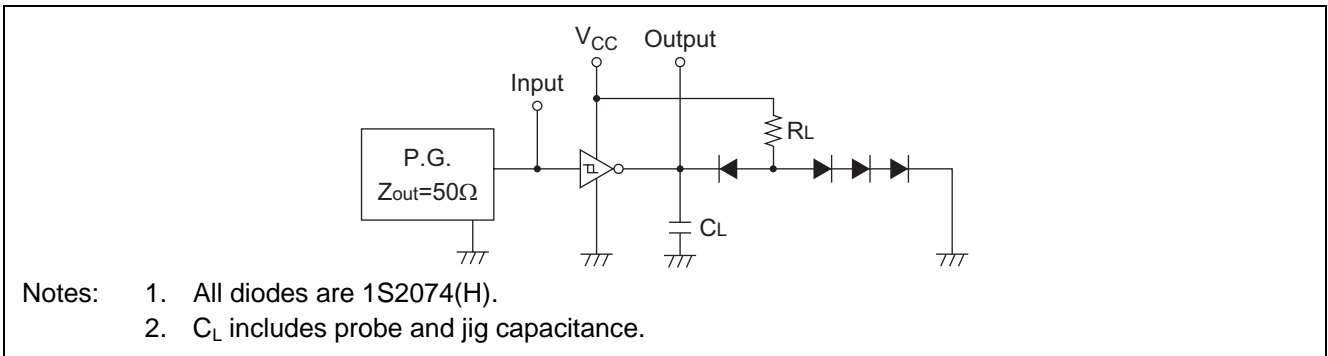
## Switching Characteristics

(V<sub>CC</sub> = 5 V, T<sub>a</sub> = 25°C)

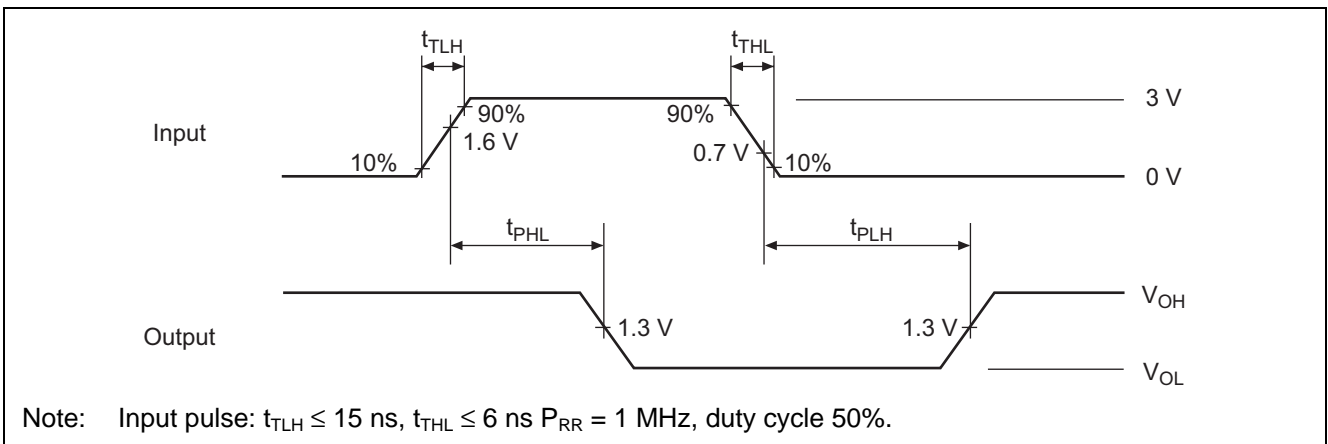
Item	Symbol	min.	typ.	max.	Unit	Condition
Propagation delay time	$t_{PLH}$	—	15	22	ns	$C_L = 15\text{ pF}$ , $R_L = 2\text{ k}\Omega$
	$t_{PHL}$	—	15	22	ns	

## Testing Method

### Test Circuit

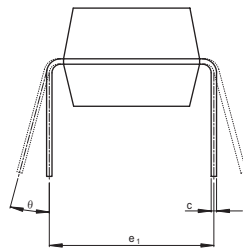
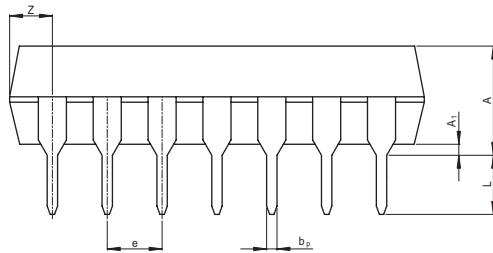
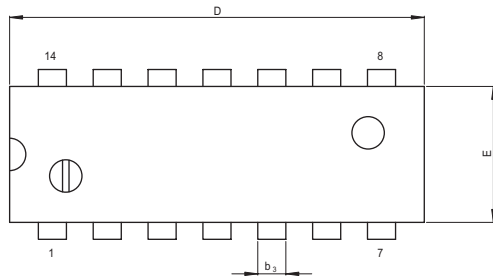


### Waveform



Package Dimensions

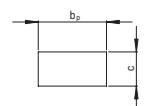
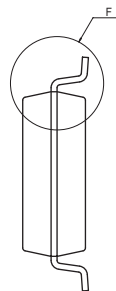
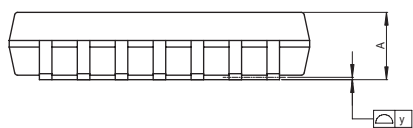
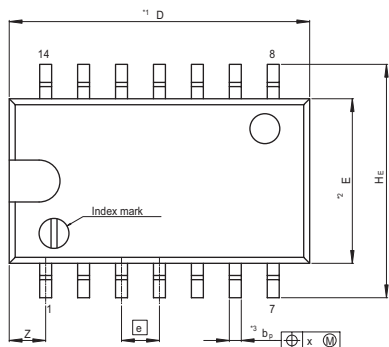
JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-DIP14-6.3x19.2-2.54	PRDP0014AB-B	DP-14AV	0.97g



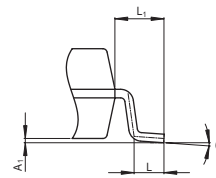
(Ni/Pd/Au plating)

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
e <sub>1</sub>	—	7.62	—
D	—	19.2	20.32
E	—	6.3	7.4
A	—	—	5.06
A <sub>1</sub>	0.51	—	—
b <sub>p</sub>	0.40	0.48	0.56
b <sub>3</sub>	—	1.30	—
c	0.19	0.25	0.31
θ	0°	—	15°
e	2.29	2.54	2.79
Z	—	—	2.39
L	2.54	—	—

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP14-5.5x10.06-1.27	PRSP0014DF-B	FP-14DAV	0.23g



Terminal cross section  
(Ni/Pd/Au plating)



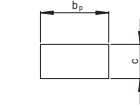
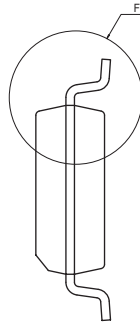
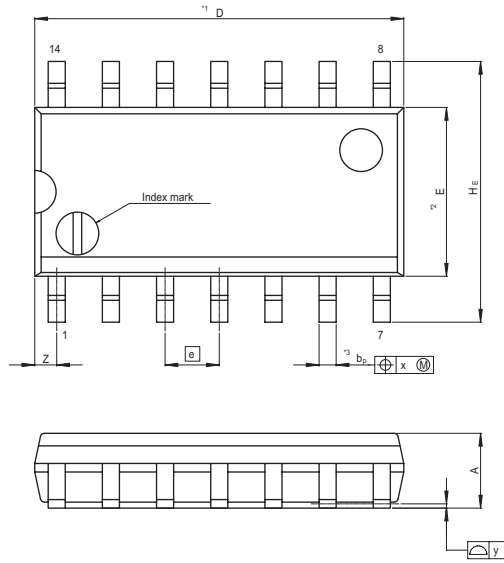
Detail F

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

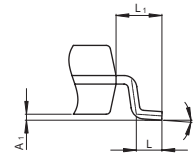
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	10.06	10.5
E	—	5.50	—
A <sub>2</sub>	—	—	—
A <sub>1</sub>	0.00	0.10	0.20
A	—	—	2.20
b <sub>p</sub>	0.34	0.40	0.46
b <sub>1</sub>	—	—	—
c	0.15	0.20	0.25
c <sub>1</sub>	—	—	—
θ	0°	—	8°
H <sub>E</sub>	7.50	7.80	8.00
⓪	—	1.27	—
x	—	—	0.12
y	—	—	0.15
Z	—	—	1.42
L	0.50	0.70	0.90
L <sub>1</sub>	—	1.15	—

# HD74LS14

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP14-3.95x8.65-1.27	PRSP0014DE-A	FP-14DNV	0.13g



Terminal cross section (Ni/Pd/Au plating)



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

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	8.65	9.05
E	—	3.95	—
A <sub>2</sub>	—	—	—
A <sub>1</sub>	0.10	0.14	0.25
A	—	—	1.75
b <sub>p</sub>	0.34	0.40	0.46
d <sub>1</sub>	—	—	—
c	0.15	0.20	0.25
c <sub>1</sub>	—	—	—
θ	0°	—	8°
HE	5.80	6.10	6.20
Ⓜ	—	1.27	—
x	—	—	0.25
y	—	—	0.15
Z	—	—	0.635
L	0.40	0.60	1.27
L <sub>1</sub>	—	1.08	—

Notes:

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