

# HD74LS38

## Quadruple 2-input Positive NAND Buffers (with Open Collector Outputs)

REJ03D0407-0300

Rev.3.00

Jul.22.2005

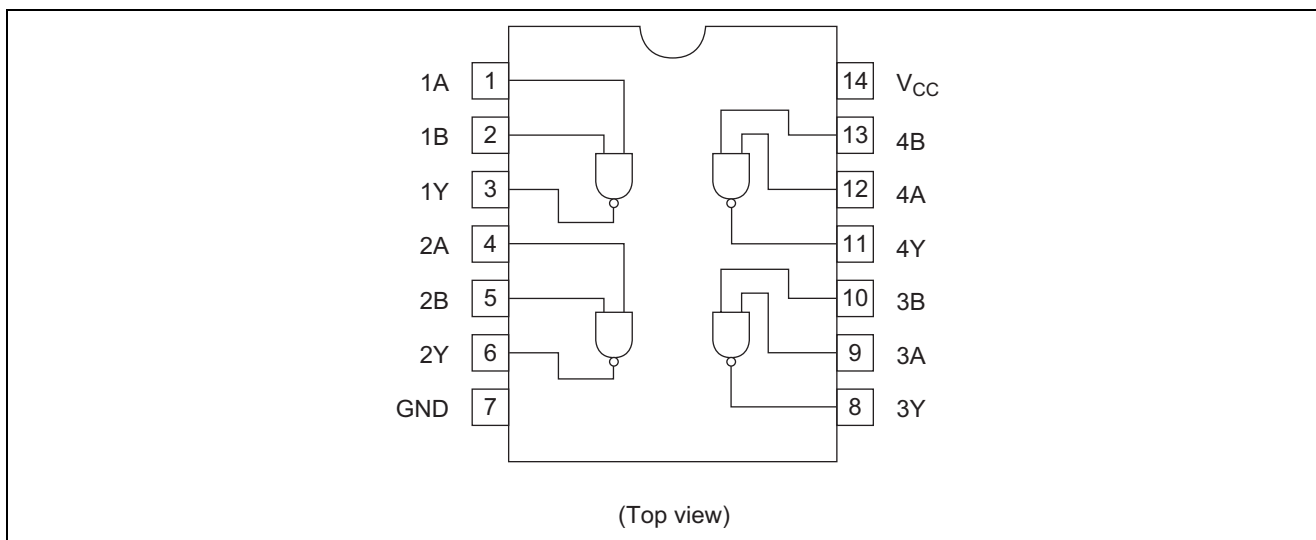
### Features

- Ordering Information

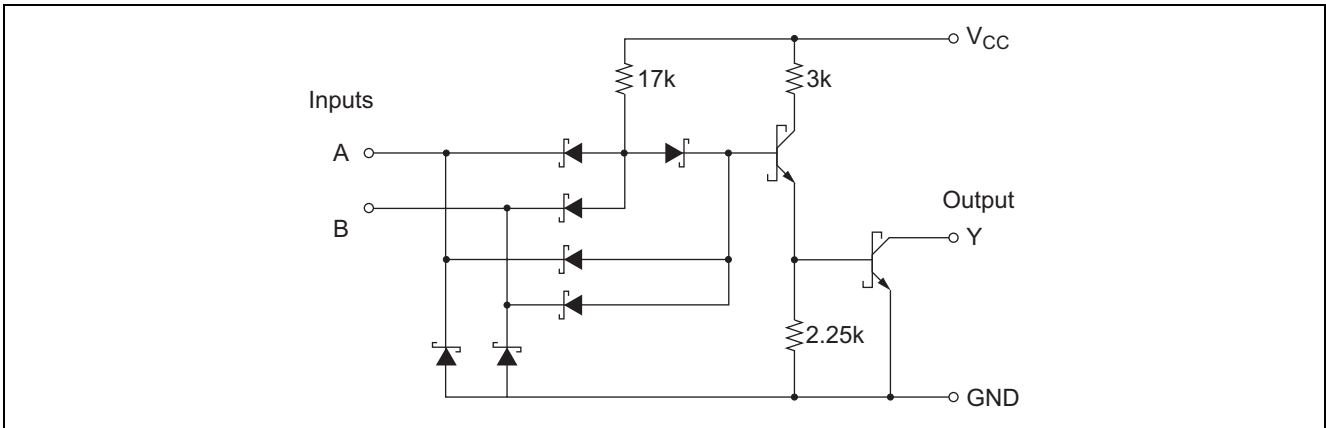
Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS38P	DILP-14 pin	PRDP0014AB-B (DP-14AV)	P	—
HD74LS38FPEL	SOP-14 pin (JEITA)	PRSP0014DF-B (FP-14DAV)	FP	EL (2,000 pcs/reel)
HD74LS38RPEL	SOP-14 pin (JEDEC)	PRSP0014DE-A (FP-14DNV)	RP	EL (2,500 pcs/reel)

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

### Pin Arrangement



Circuit Schematic (1/4)



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	$T_{stg}$	-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 voltage	$V_{OH}$	—	—	5.5	V
Output current	$I_{OL}$	—	—	24	mA
Operating temperature	$T_{opr}$	-20	25	75	°C

## Electrical Characteristics

(Ta = -20 to +75 °C)

Item	Symbol	min.	typ.*	max.	Unit	Condition
Input voltage	V <sub>IH</sub>	2.0	—	—	V	
	V <sub>IL</sub>	—	—	0.8	V	
Output voltage	V <sub>OL</sub>	—	—	0.5	V	I <sub>OL</sub> = 24 mA I <sub>OL</sub> = 12 mA V <sub>CC</sub> = 4.75 V, V <sub>IH</sub> = 2 V
		—	—	0.4		
Output current	I <sub>OH</sub>	—	—	250	μA	V <sub>CC</sub> = 4.75 V, V <sub>I</sub> = 0.8 V, V <sub>OH</sub> = 5.5 V
Input current	I <sub>IH</sub>	—	—	20	μA	V <sub>CC</sub> = 5.25 V, V <sub>I</sub> = 2.7 V
	I <sub>IL</sub>	—	—	-0.4	mA	V <sub>CC</sub> = 5.25 V, V <sub>I</sub> = 0.4 V
	I <sub>I</sub>	—	—	0.1	mA	V <sub>CC</sub> = 5.25 V, V <sub>I</sub> = 7 V
Supply current	I <sub>CCH</sub>	—	0.9	2.0	mA	V <sub>CC</sub> = 5.25 V
	I <sub>CCL</sub>	—	6	12	mA	V <sub>CC</sub> = 5.25 V
Input clamp voltage	V <sub>IK</sub>	—	—	-1.5	V	V <sub>CC</sub> = 4.75 V, I <sub>IN</sub> = -18 mA

Note: \* V<sub>CC</sub> = 5 V, Ta = 25°C

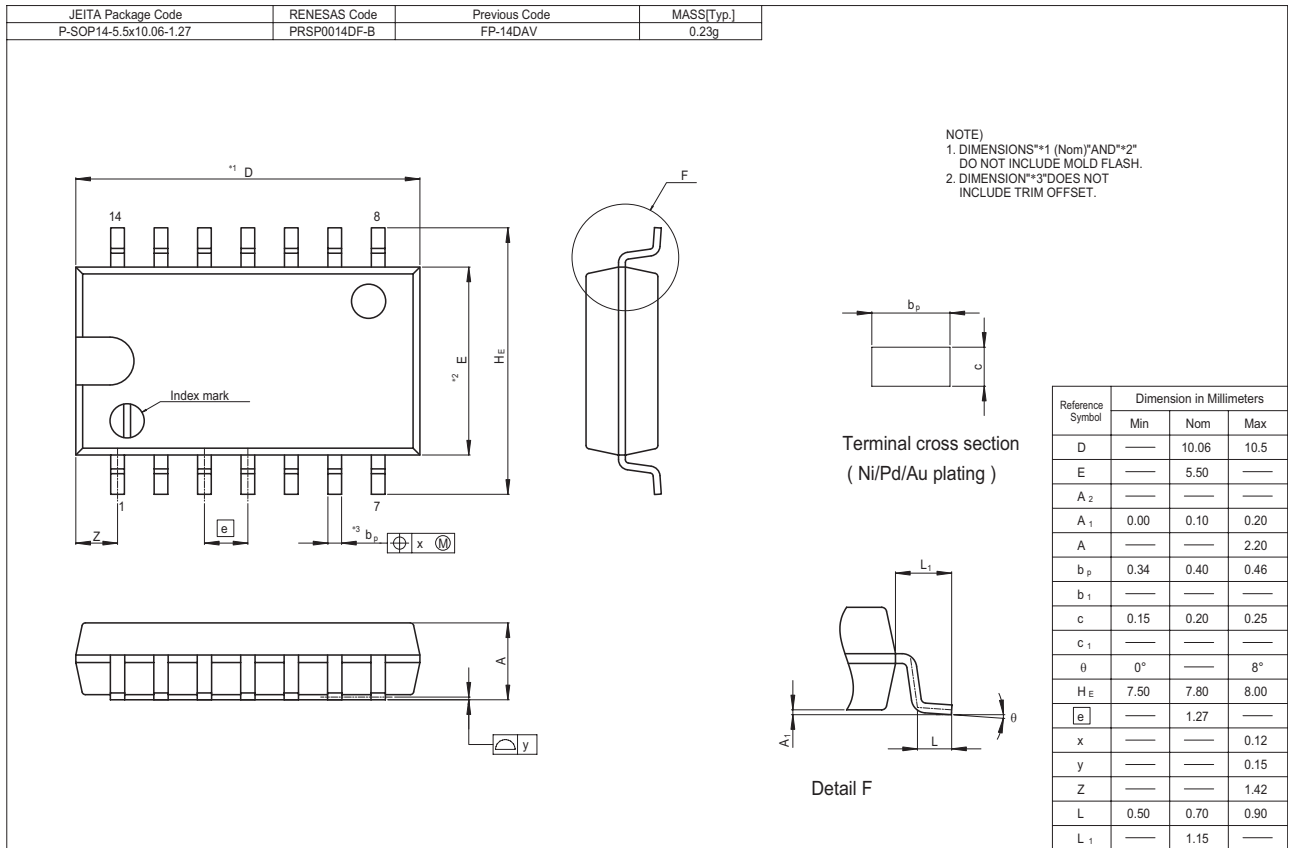
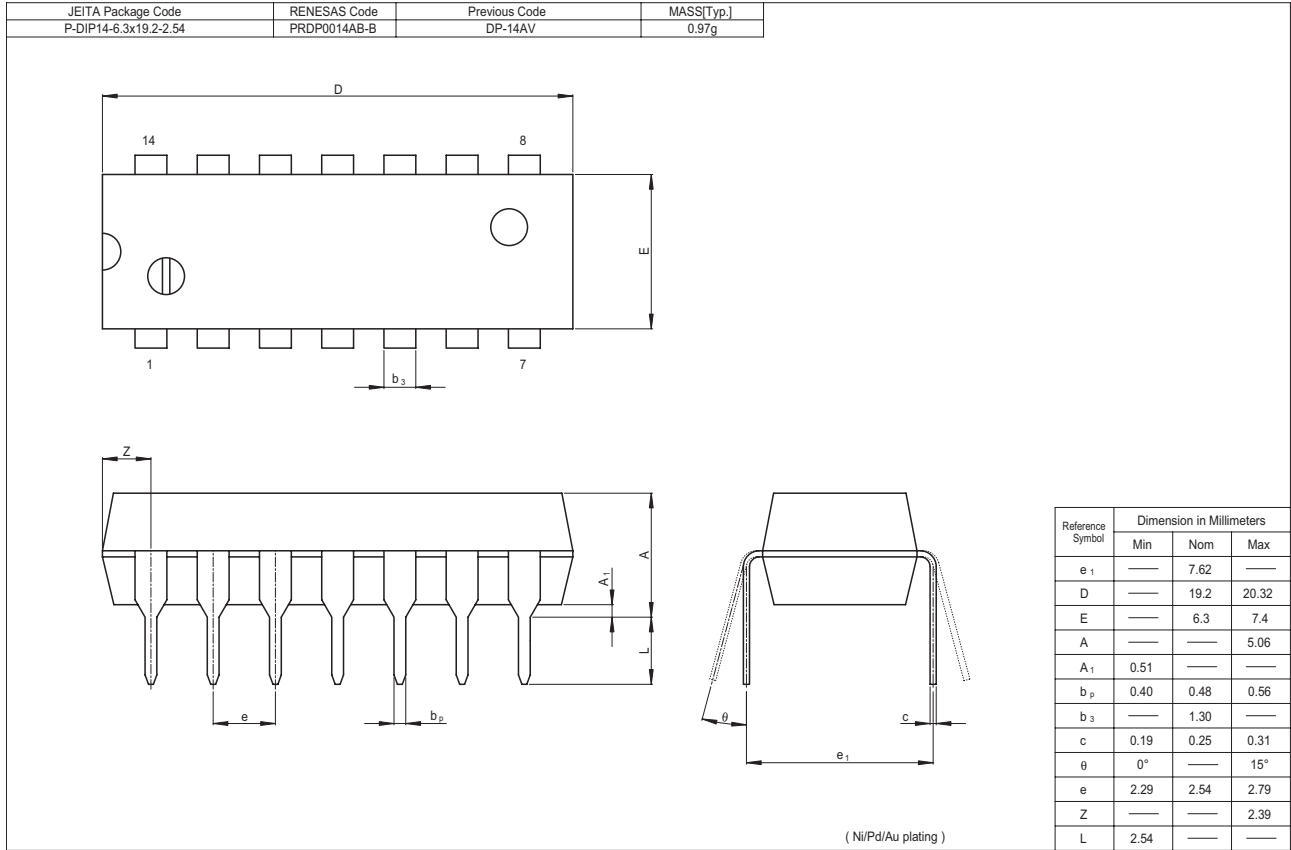
## Switching Characteristics

(V<sub>CC</sub> = 5 V, Ta = 25°C)

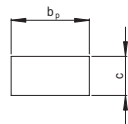
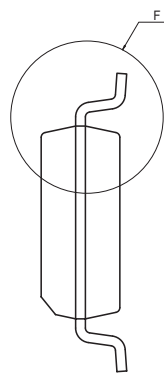
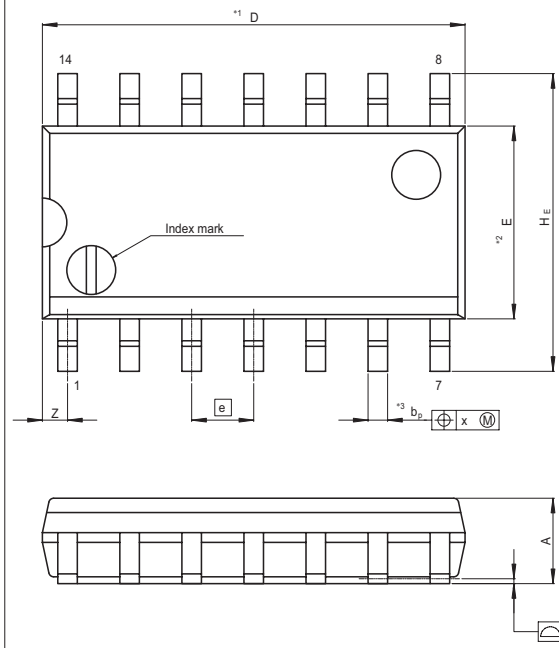
Item	Symbol	min.	typ.	max.	Unit	Condition
Propagation delay time	t <sub>PLH</sub>	—	20	32	ns	C <sub>L</sub> = 45 pF, R <sub>L</sub> = 667 Ω
	t <sub>PHL</sub>	—	18	28	ns	

Note: Refer to Test Circuit and Waveform of the Common Item "TTL Common Matter (Document No.: REJ27D0005-0100)".

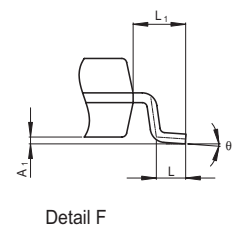
Package Dimensions



JEITA Package Code P-SOP14-3.95x8.65-1.27	RENESAS Code PRSP0014DE-A	Previous Code FP-14DNV	MASS[Typ.] 0.13g
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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
b <sub>1</sub>	—	—	—
c	0.15	0.20	0.25
c <sub>1</sub>	—	—	—
$\theta$	0°	—	8°
H <sub>E</sub>	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 <sub>1</sub>	—	1.08	—

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Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

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Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

#### **Renesas Technology (Shanghai) Co., Ltd.**

Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China  
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#### **Renesas Technology Singapore Pte. Ltd.**

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Tel: <82> 2-796-3115, Fax: <82> 2-796-2145

#### **Renesas Technology Malaysia Sdn. Bhd.**

Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia  
Tel: <603> 7955-9390, Fax: <603> 7955-9510