

HD74HC27

Triple 3-input NOR Gates

REJ03D0543-0200
 (Previous ADE-205-415)
 Rev.2.00
 Oct 06, 2005

Features

- High Speed Operation: $t_{pd} = 10 \text{ ns typ (} C_L = 50 \text{ pF)}$
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage: $V_{CC} = 2 \text{ to } 6 \text{ V}$
- Low Input Current: $1 \mu\text{A max}$
- Low Quiescent Supply Current: $I_{CC} \text{ (static)} = 1 \mu\text{A max (} T_a = 25^\circ\text{C)}$
- Ordering Information

| Part Name | Package Type | Package Code (Previous Code) | Package Abbreviation | Taping Abbreviation (Quantity) |
|--------------|--------------------|------------------------------|----------------------|--------------------------------|
| HD74HC27P | DILP-14 pin | PRDP0014AB-B (DP-14AV) | P | — |
| HD74HC27FPEL | SOP-14 pin (JEITA) | PRSP0014DF-B (FP-14DAV) | FP | EL (2,000 pcs/reel) |
| HD74HC27RPEL | 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.

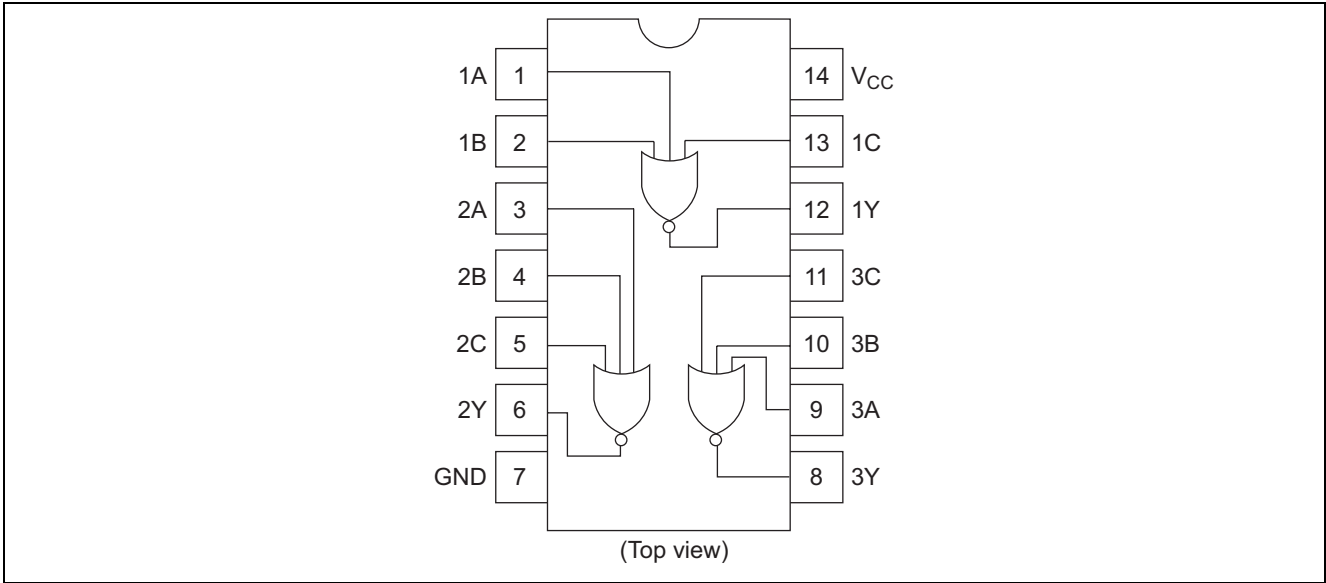
Function Table

| Inputs | | | Output |
|--------|---|---|--------|
| A | B | C | Y |
| L | L | L | H |
| H | L | L | L |
| L | H | L | L |
| H | H | L | L |
| L | L | H | L |
| H | L | H | L |
| L | H | H | L |
| H | H | H | L |

H : High level

L : Low level

Pin Arrangement



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 | | $V_{CC} = 6.0 V$ |

Note: 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 | V _{in} = 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 | — | | | |
| | | 6.0 | 5.68 | — | — | 5.63 | — | | | |
| | V _{OL} | 2.0 | — | 0.0 | 0.1 | — | 0.1 | V | V _{in} = 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 |
| | | 6.0 | — | — | 0.26 | — | 0.33 | | | |
| Input current | I _{in} | 6.0 | — | — | ±0.1 | — | ±1.0 | μA | V _{in} = V _{CC} or GND | |
| Quiescent supply current | I _{CC} | 6.0 | — | — | 1.0 | — | 10 | μA | V _{in} = V _{CC} or GND, I _{out} = 0 μA | |

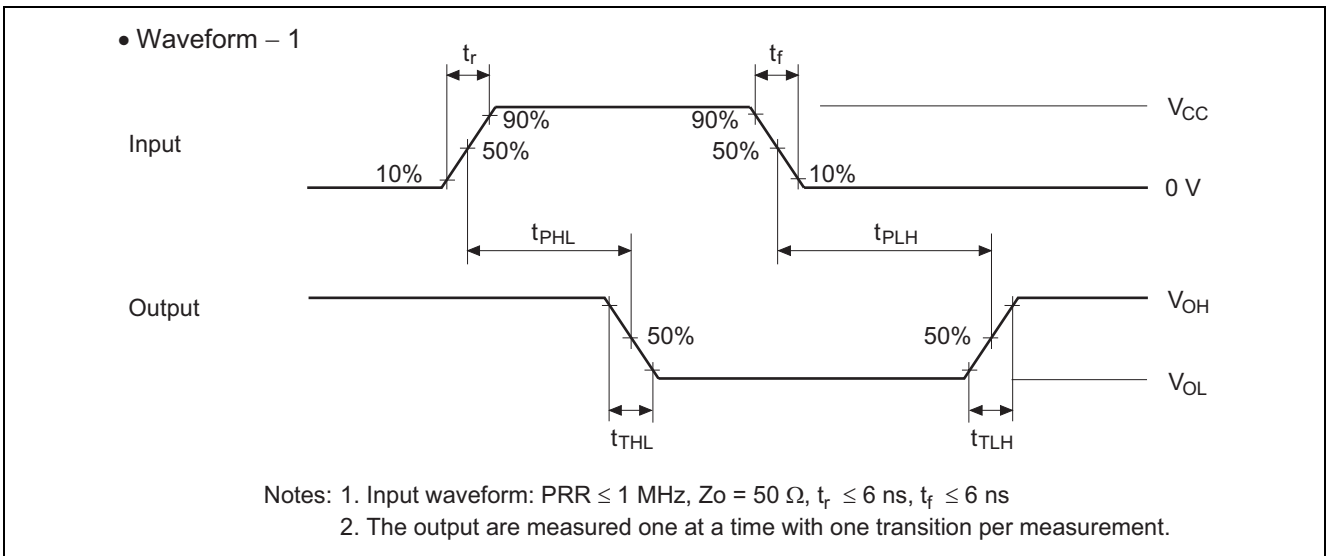
Switching Characteristics (C_L = 50 pF, Input t_r = t_f = 6 ns)

| Item | Symbol | V _{CC} (V) | Ta = 25°C | | | Ta = -40 to +85°C | | Unit | Test Conditions | |
|------------------------|------------------|---------------------|-----------|-----|-----|-------------------|-----|------|-----------------|--|
| | | | Min | Typ | Max | Min | Max | | | |
| Propagation delay time | t _{PLH} | 2.0 | — | — | 90 | — | 115 | ns | | |
| | | 4.5 | — | 10 | 18 | — | 23 | | | |
| | | 6.0 | — | — | 15 | — | 20 | | | |
| | t _{PHL} | 2.0 | — | — | 90 | — | 115 | ns | | |
| | | 4.5 | — | 10 | 18 | — | 23 | | | |
| | | 6.0 | — | — | 15 | — | 20 | | | |
| Output rise time | t _{TLH} | 2.0 | — | — | 75 | — | 95 | ns | | |
| | | 4.5 | — | 5 | 15 | — | 19 | | | |
| | | 6.0 | — | — | 13 | — | 16 | | | |
| Output fall time | t _{THL} | 2.0 | — | — | 75 | — | 95 | ns | | |
| | | 4.5 | — | 5 | 15 | — | 19 | | | |
| | | 6.0 | — | — | 13 | — | 16 | | | |
| Input capacitance | C _{in} | — | — | 5 | 10 | — | 10 | pF | | |

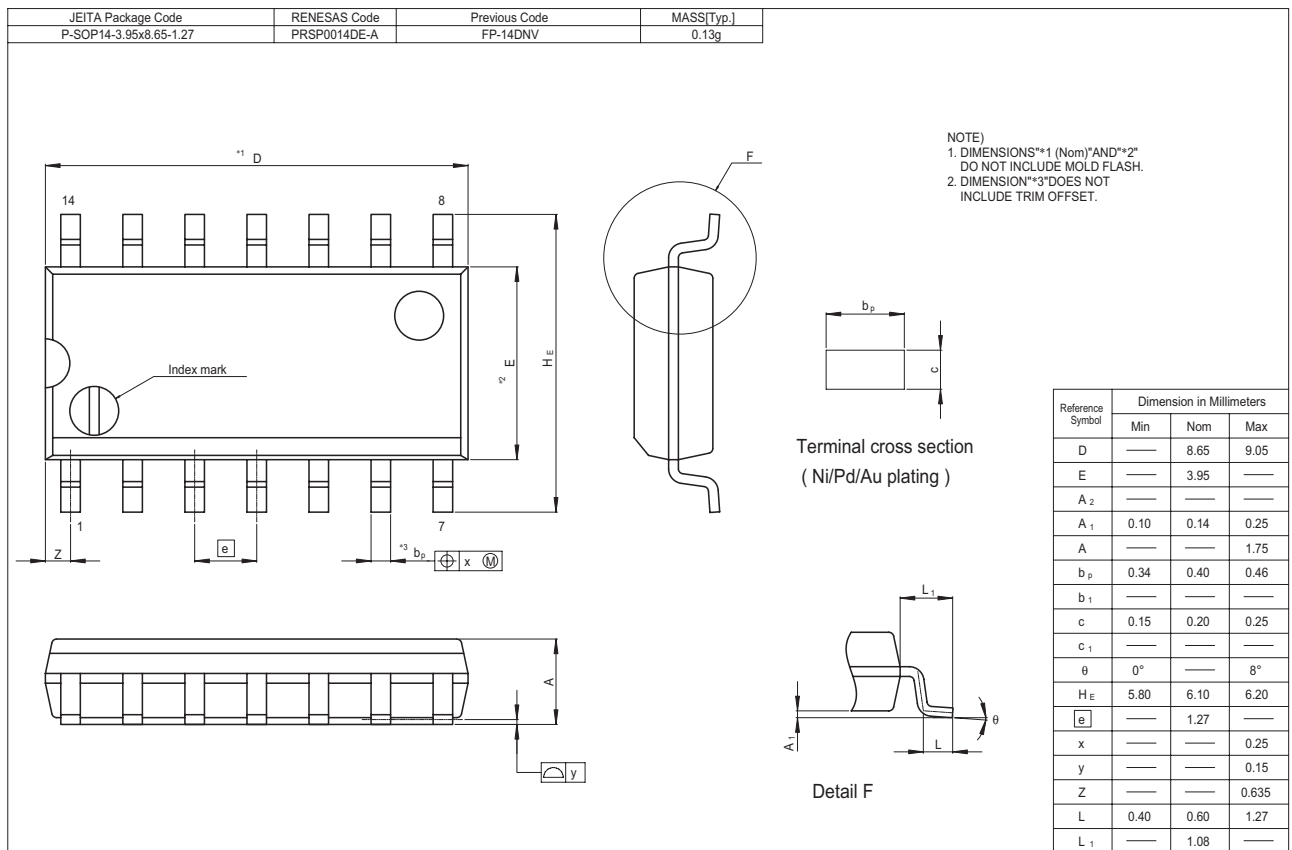
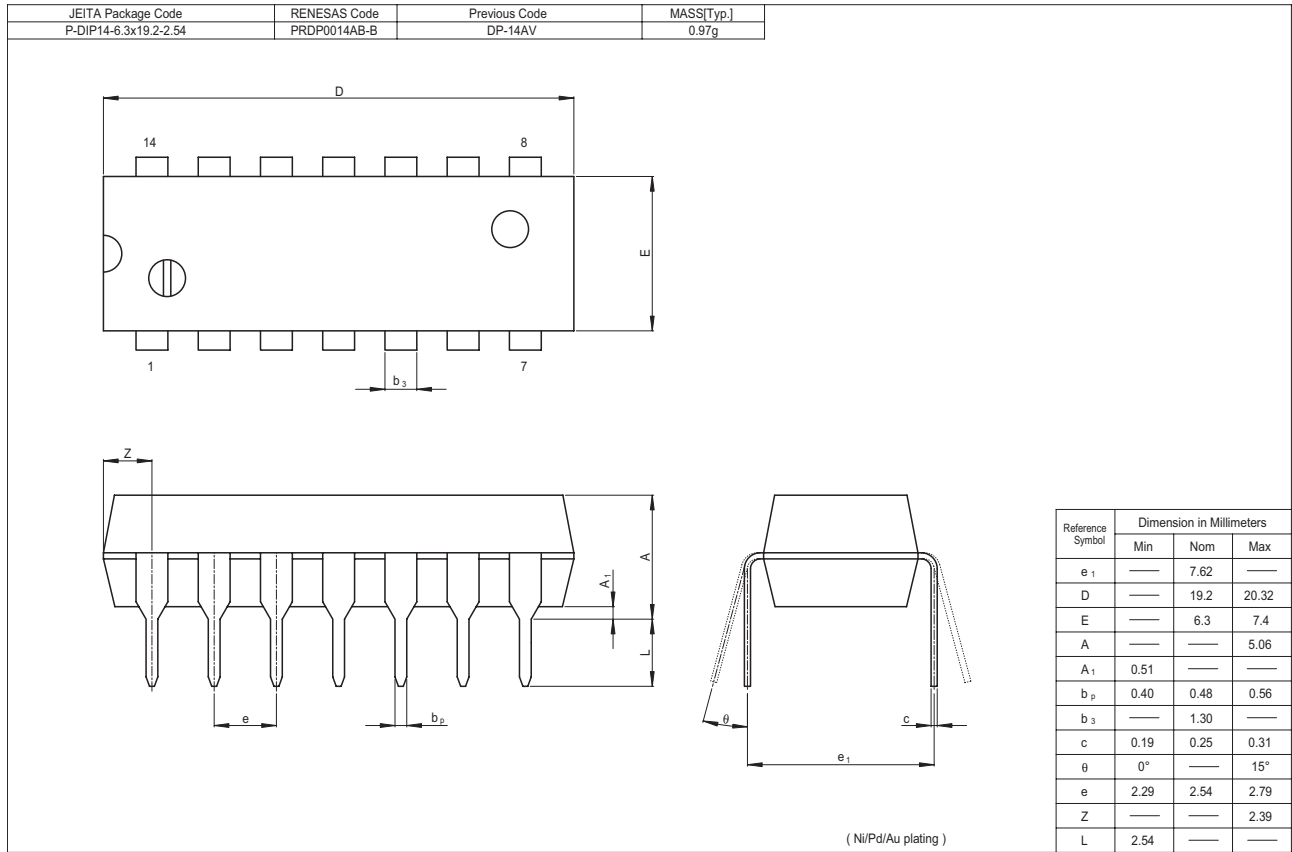
Test Circuit



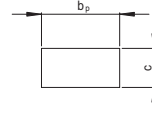
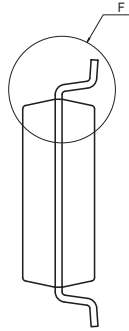
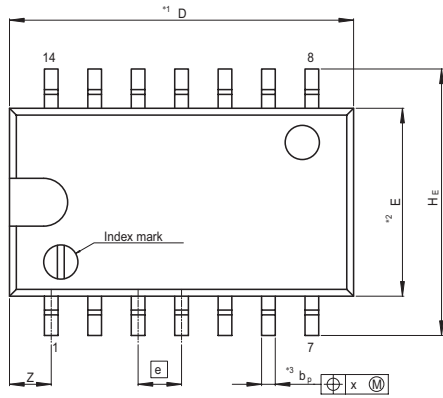
Waveforms



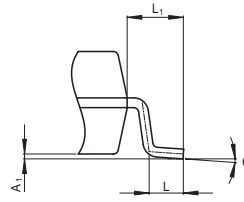
Package Dimensions



| | | | |
|--|------------------------------|---------------------------|---------------------|
| JEITA Package Code P-SOP14-5.5x10.06-1.27 | RENESAS Code PRSP0014DF-B | Previous Code FP-14DAV | MASS[Typ.] 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 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 | — | — | 1.42 |
| L | 0.50 | 0.70 | 0.90 |
| L ₁ | — | 1.15 | — |

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