

HD74LS153

Dual 4-Line to 1-Line Data Selectors / Multiplexers

REJ03D0439-0200

Rev.2.00

Feb.18.2005

This data selector / multiplexer contains inverters and drivers to supply fully complementary, on-chip, binary decoding data selection to the AND-OR-INVERT gates. Separate strobe inputs are provided for each of the two four-line sections.

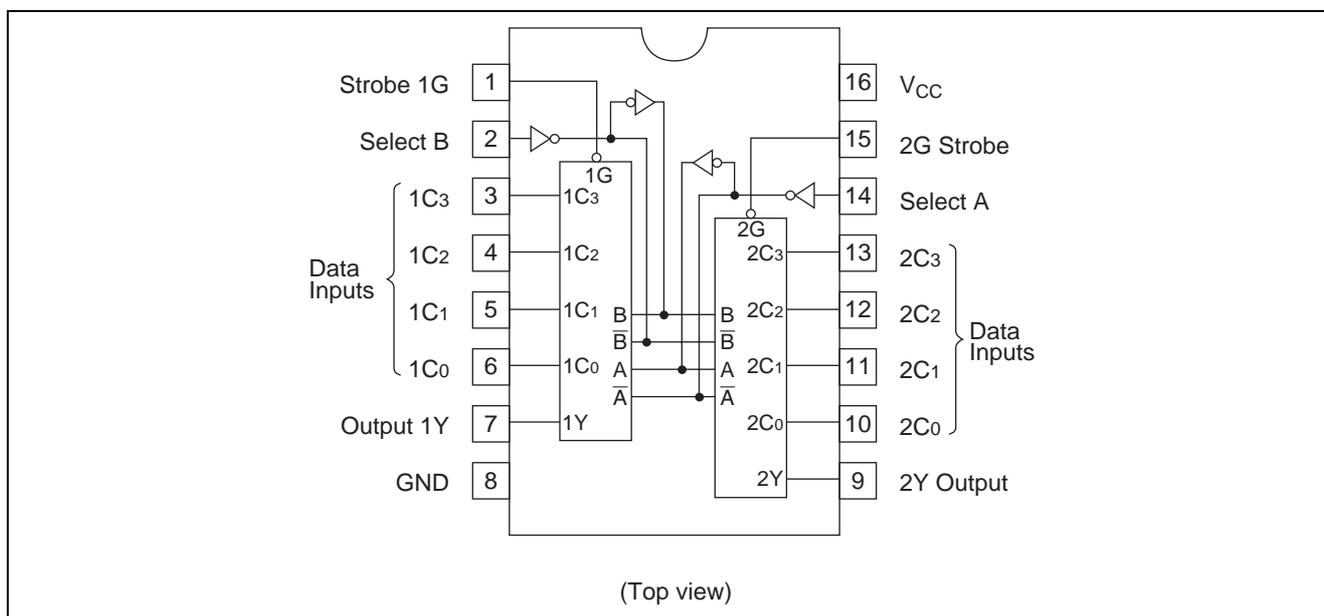
Features

- Ordering Information

| Part Name | Package Type | Package Code (Previous Code) | Package Abbreviation | Taping Abbreviation (Quantity) |
|---------------|--------------------|------------------------------|----------------------|--------------------------------|
| HD74LS153P | DILP-16 pin | PRDP0016AE-B (DP-16FV) | P | — |
| HD74LS153FPEL | SOP-16 pin (JEITA) | PRSP0016DH-B (FP-16DAV) | FP | EL (2,000 pcs/reel) |
| HD74LS153RPEL | SOP-16 pin (JEDEC) | PRSP0016DG-A (FP-16DNV) | RP | EL (2,500 pcs/reel) |

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

Pin Arrangement

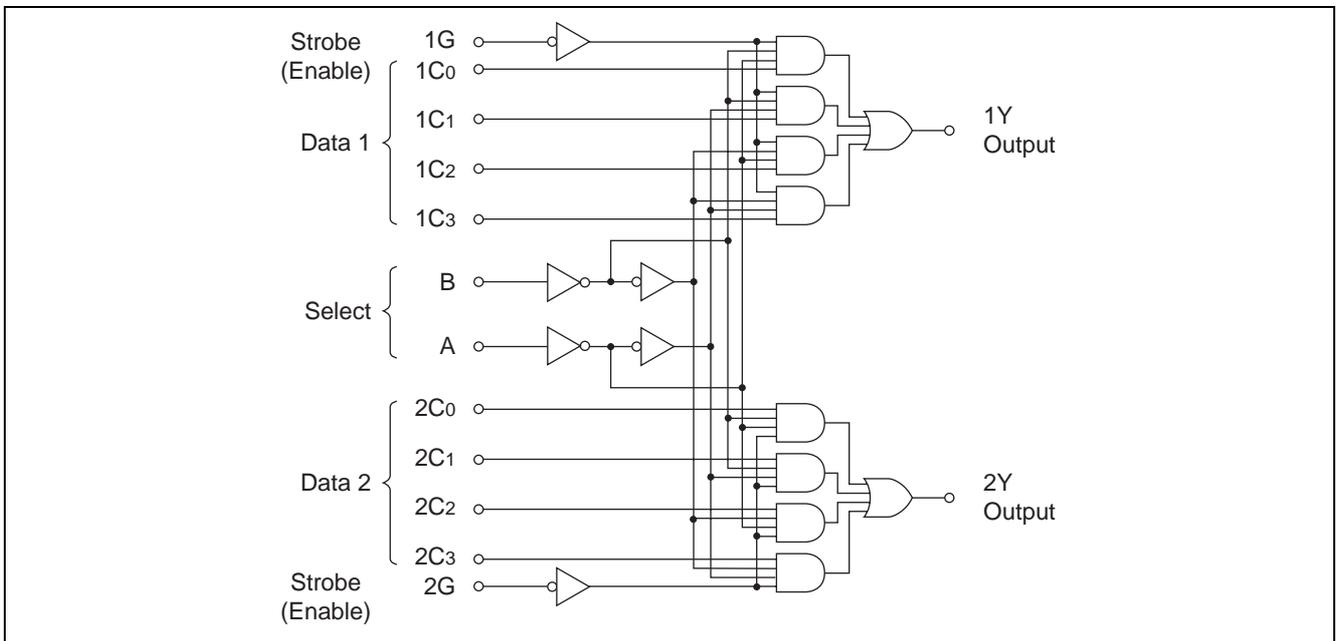


Function Table

| Select | | Data | | | | Strobe G | Outputs Y |
|--------|---|------|----|----|----|-------------|--------------|
| B | A | C0 | C1 | C2 | C3 | | |
| X | X | X | X | X | X | H | L |
| L | L | L | X | X | X | L | L |
| L | L | H | X | X | X | L | H |
| L | H | X | L | X | X | L | L |
| L | H | X | H | X | X | L | H |
| H | L | X | X | L | X | L | L |
| H | L | X | X | H | X | L | H |
| H | H | X | X | X | L | L | L |
| H | H | X | X | X | H | L | H |

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

Block Diagram



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 current | I_{OH} | — | — | -400 | μA |
| | 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 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 | V _{CC} = 4.75 V, V _{IH} = 2 V, V _{IL} = 0.8 V |
| — | | — | 0.5 | | | |
| Input current | I _{IH} | — | — | 20 | μA | V _{CC} = 5.25 V, V _I = 2.7 V |
| | I _{IL} | — | — | -0.4 | mA | V _{CC} = 5.25 V, V _I = 0.4 V |
| | I _I | — | — | 0.1 | mA | V _{CC} = 5.25 V, V _I = 7 V |
| Short-circuit output current | I _{OS} | -20 | — | -100 | mA | V _{CC} = 5.25 V |
| Supply current** | I _{CC} | — | 6.2 | 10 | 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.

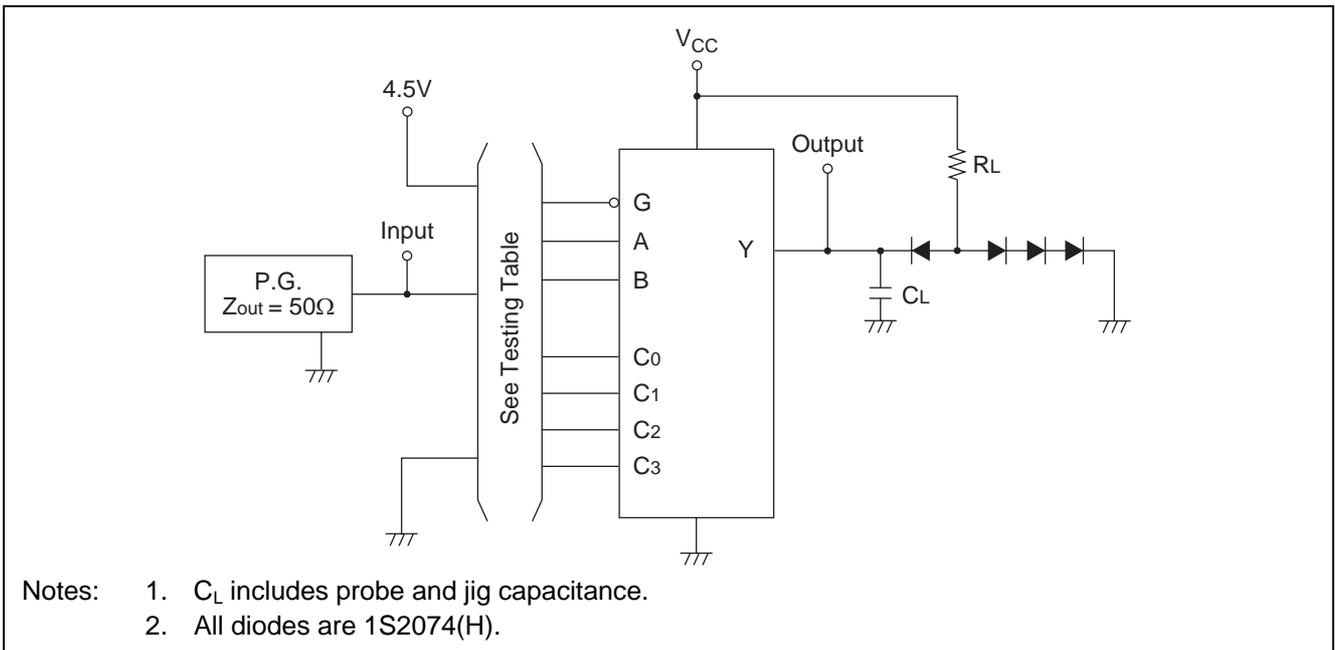
Switching Characteristics

(V_{CC} = 5 V, Ta = 25°C)

| Item | Symbol | Inputs | Outputs | min. | typ. | max. | Unit | Condition |
|------------------------|------------------|--------|---------|------|------|------|------|--|
| Propagation delay time | t _{PLH} | Data | Y | — | 10 | 15 | ns | C _L = 15 pF, R _L = 2 kΩ |
| | t _{PHL} | Data | Y | — | 17 | 26 | ns | |
| | t _{PLH} | Select | Y | — | 19 | 29 | ns | |
| | t _{PHL} | Select | Y | — | 25 | 38 | ns | |
| | t _{PLH} | Strobe | Y | — | 16 | 24 | ns | |
| | t _{PHL} | Strobe | Y | — | 21 | 32 | ns | |

Testing Method

Test Circuit

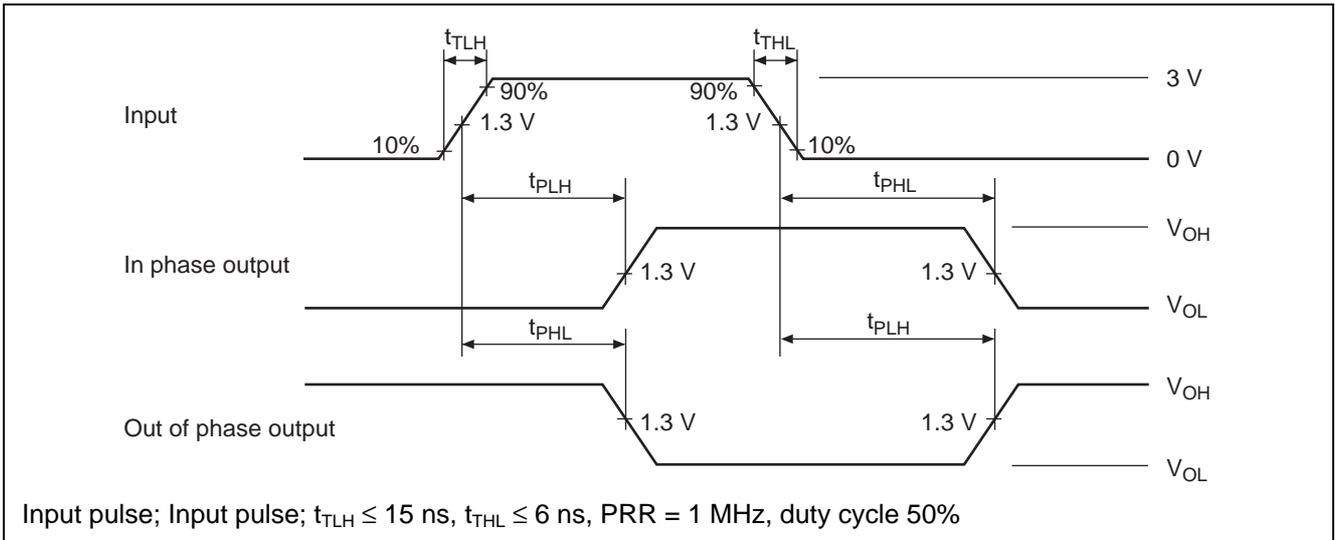


Testing Table

| Item | Inputs | | | | | | | Output |
|--------------------------------------|--------|-------|----------------|----------------|----------------|----------------|-----|--------|
| | B | A | C ₀ | C ₁ | C ₂ | C ₃ | G | Y |
| t _{PLH} t _{PHL} | GND | GND | IN | X | X | X | GND | OUT |
| | GND | 4.5 V | X | IN | X | X | GND | OUT |
| | 4.5 V | GND | X | X | IN | X | GND | OUT |
| | 4.5 V | 4.5 V | X | X | X | IN | GND | OUT |
| | GND | IN | GND | 4.5 V | X | X | GND | OUT |
| | | | 4.5 V | GND | | | | |
| | IN | GND | GND | X | 4.5 V | X | GND | OUT |
| | | | 4.5 V | | GND | | | |
| GND | GND | 4.5 V | X | X | X | IN | OUT | |

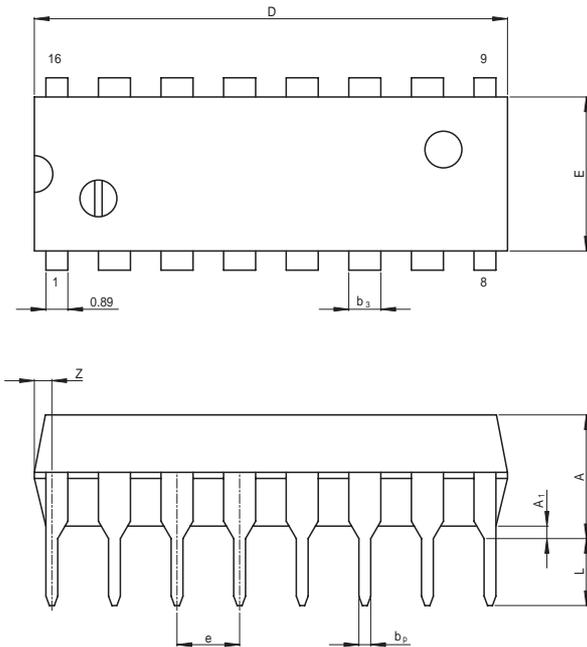
X : "4.5 V" or "GND"

Waveform



Package Dimensions

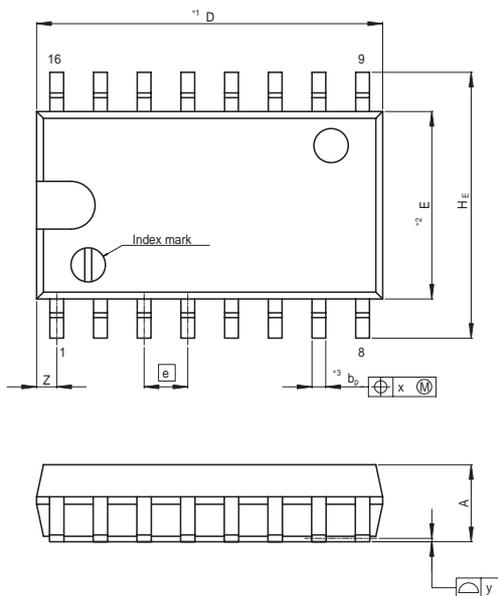
| | | | |
|-----------------------|--------------|---------------|------------|
| JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
| P-DIP16-6.3x19.2-2.54 | PRDP0016AE-B | DP-16FV | 1.05g |



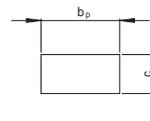
| Reference Symbol | Dimension in Millimeters | | |
|------------------|--------------------------|------|-------|
| | Min | Nom | Max |
| e ₁ | — | 7.62 | — |
| D | — | 19.2 | 20.32 |
| E | — | 6.3 | 7.4 |
| A | — | — | 5.06 |
| A ₁ | 0.51 | — | — |
| b _P | 0.40 | 0.48 | 0.56 |
| b ₃ | — | 1.30 | —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

(Ni/Pd/Au plating)

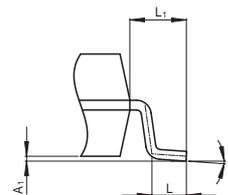
| | | | |
|------------------------|--------------|---------------|------------|
| JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
| P-SOP16-5.5x10.06-1.27 | PRSP0016DH-B | FP-16DAV | 0.24g |



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)

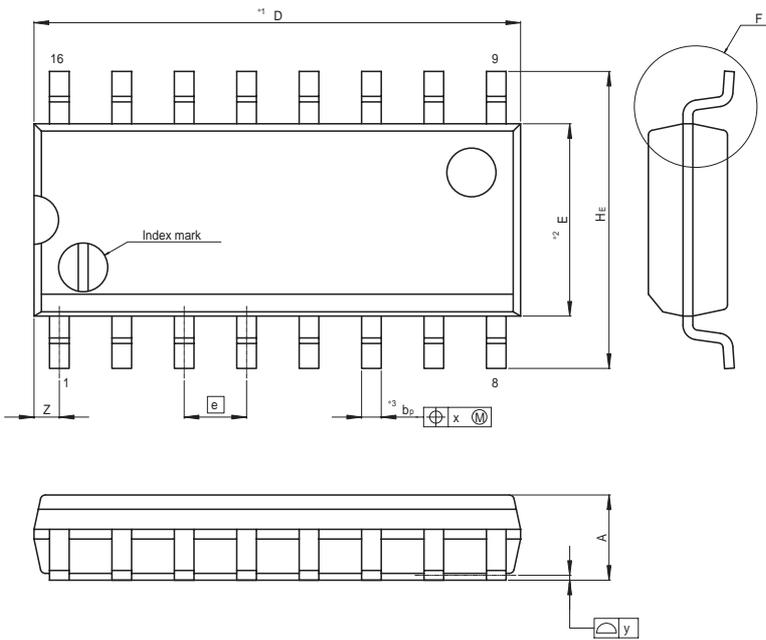


Detail F

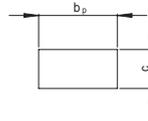
| Reference Symbol | Dimension in Millimeters | | |
|------------------|--------------------------|-------|------|
| | Min | Nom | Max |
| D | — | 10.06 | 10.5 |
| E | — | 5.50 | — |
| A ₂ | — | — | — |
| A ₁ | 0.00 | 0.10 | 0.20 |
| A | — | — | 2.20 |
| b _P | 0.34 | 0.40 | 0.46 |
| b ₁ | — | — | — |
| 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 | — |

HD74LS153

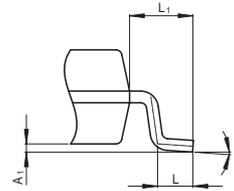
| | | | |
|---|------------------------------|---------------------------|---------------------|
| JEITA Package Code P-SOP16-3.95x9.9-1.27 | RENESAS Code PRSP0016DG-A | Previous Code FP-16DNV | MASS[Typ.] 0.15g |
|---|------------------------------|---------------------------|---------------------|



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 | — | 9.90 | 10.30 |
| E | — | 3.95 | — |
| A ₂ | — | — | — |
| A ₁ | 0.10 | 0.14 | 0.25 |
| A | — | — | 1.75 |
| b _p | 0.34 | 0.40 | 0.46 |
| b ₁ | — | — | — |
| c | 0.15 | 0.20 | 0.25 |
| c ₁ | — | — | — |
| θ | 0° | — | 8° |
| H _E | 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 ₁ | — | 1.08 | — |

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