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# HD74HC240

Octal Buffers/Line Drivers/Line Receivers  
(with inverted 3-state outputs)

# HITACHI

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## Description

The HD74HC240 is an inverting buffer and has two active low enables ( $\overline{1G}$  and  $\overline{2G}$ ). Each enable independently controls 4 buffers. This device does not have schmitt trigger inputs.

## Features

- High Speed Operation:  $t_{pd} = 10 \text{ ns typ}$  ( $C_L = 50 \text{ pF}$ )
- High Output Current: Fanout of 15 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:  $I_{CC} (\text{static}) = 4 \mu\text{A max}$  ( $T_a = 25^\circ\text{C}$ )

## Function Table

| Inputs         |   | Output |
|----------------|---|--------|
| $\overline{G}$ | A | Y      |
| H              | X | Z      |
| L              | H | L      |
| L              | L | H      |

H : high level

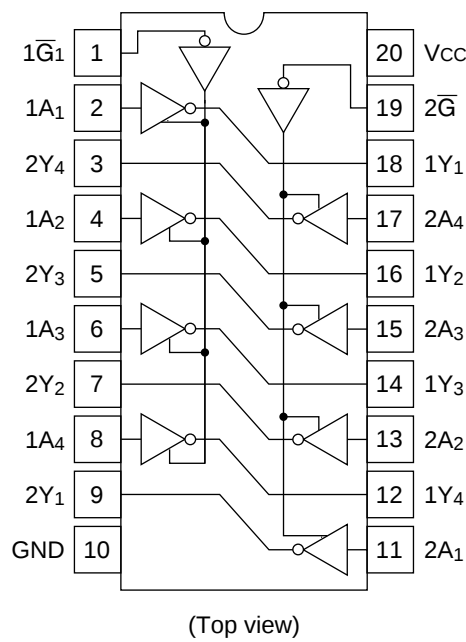
L : low level

X : irrelevant

Z : off (high-impedance) state of a 3-state output

# HD74HC240

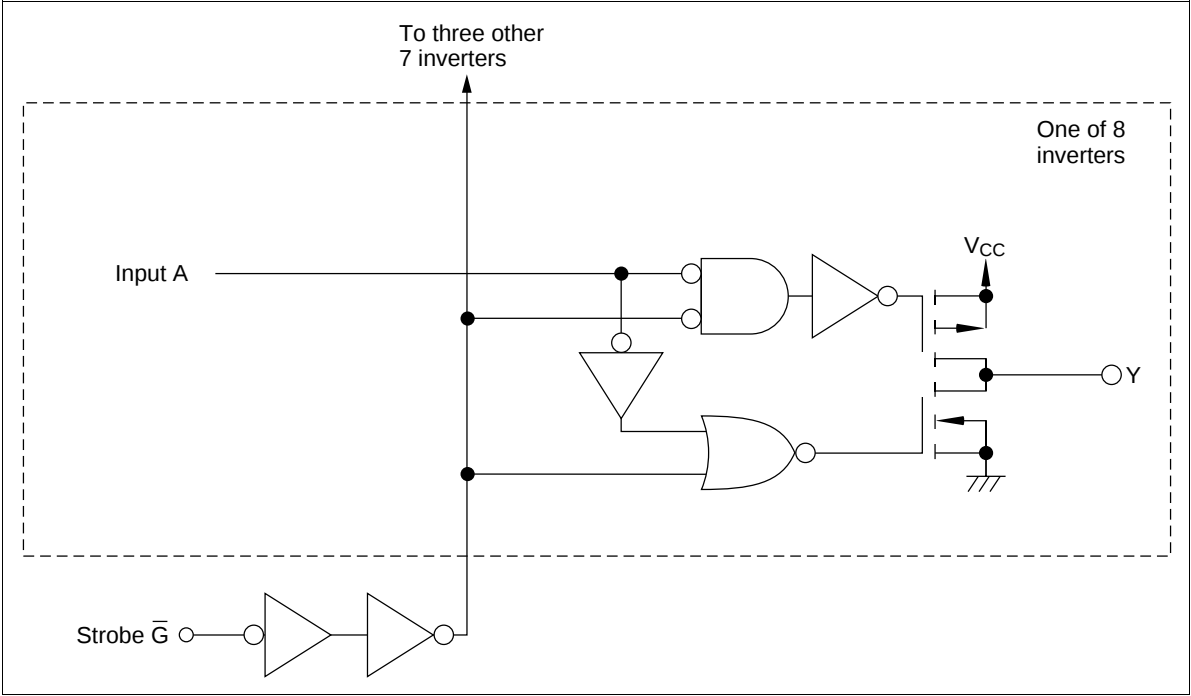
## Pin Arrangement



## Absolute Maximum Ratings

| Item                                | Symbol               | Rating                 | Unit |
|-------------------------------------|----------------------|------------------------|------|
| Supply voltage range                | $V_{CC}$             | -0.5 to +7.0           | V    |
| Input voltage                       | $V_{IN}$             | -0.5 to $V_{CC} + 0.5$ | V    |
| Output voltage                      | $V_{OUT}$            | -0.5 to $V_{CC} + 0.5$ | V    |
| DC current drain per pin            | $I_{OUT}$            | $\pm 35$               | mA   |
| DC current drain per $V_{CC}$ , GND | $I_{CC}$ , $I_{GND}$ | $\pm 75$               | mA   |
| DC input diode current              | $I_{IK}$             | $\pm 20$               | mA   |
| DC output diode current             | $I_{OK}$             | $\pm 20$               | mA   |
| Power dissipation per package       | $P_T$                | 500                    | mW   |
| Storage temperature                 | Tstg                 | -65 to +150            | °C   |

Logic Diagram

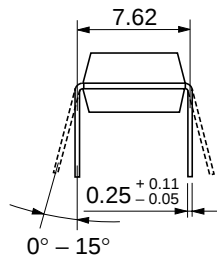
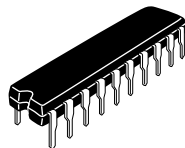
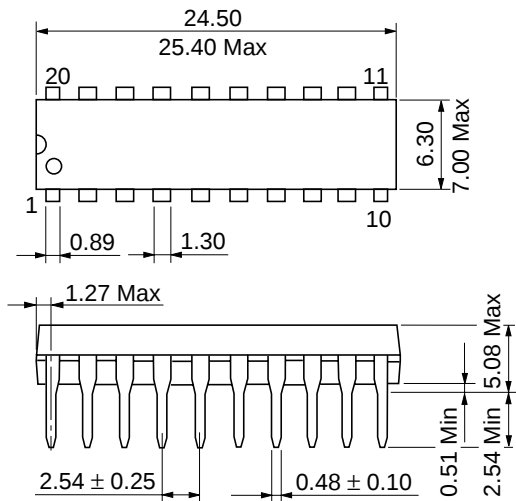


DC Characteristics

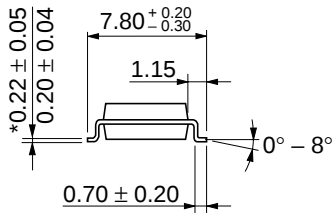
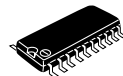
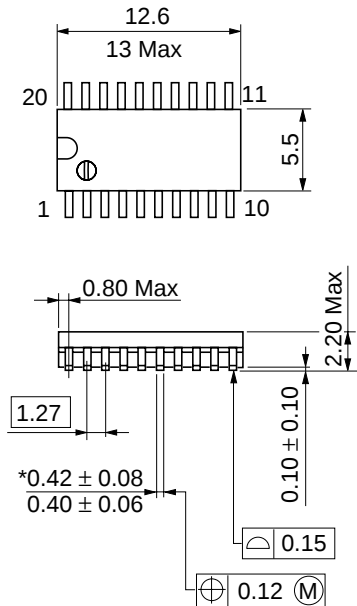
| Item                     | Symbol          | V <sub>CC</sub> (V) | Ta = 25°C |     |      | Ta = -40 to +85°C |      | Unit | Test Conditions                                                          |                           |
|--------------------------|-----------------|---------------------|-----------|-----|------|-------------------|------|------|--------------------------------------------------------------------------|---------------------------|
|                          |                 |                     | Min       | Typ | Max  | Min               | Max  |      |                                                                          |                           |
| Input voltage            | V <sub>IH</sub> | 2.0                 | 1.5       | —   | —    | 1.5               | —    | V    |                                                                          |                           |
|                          |                 | 4.5                 | 3.15      | —   | —    | 3.15              | —    |      |                                                                          |                           |
|                          |                 | 6.0                 | 4.2       | —   | —    | 4.2               | —    |      |                                                                          |                           |
|                          | V <sub>IL</sub> | 2.0                 | —         | —   | 0.5  | —                 | 0.5  | V    |                                                                          |                           |
|                          |                 | 4.5                 | —         | —   | 1.35 | —                 | 1.35 |      |                                                                          |                           |
|                          |                 | 6.0                 | —         | —   | 1.8  | —                 | 1.8  |      |                                                                          |                           |
| Output voltage           | V <sub>OH</sub> | 2.0                 | 1.9       | 2.0 | —    | 1.9               | —    | V    | Vin = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OH</sub> = -20 μA        |                           |
|                          |                 | 4.5                 | 4.4       | 4.5 | —    | 4.4               | —    |      |                                                                          |                           |
|                          |                 | 6.0                 | 5.9       | 6.0 | —    | 5.9               | —    |      |                                                                          |                           |
|                          |                 | 4.5                 | 4.18      | —   | —    | 4.13              | —    |      |                                                                          | I <sub>OH</sub> = -6 mA   |
|                          |                 | 6.0                 | 5.68      | —   | —    | 5.63              | —    |      |                                                                          | I <sub>OH</sub> = -7.8 mA |
|                          | V <sub>OL</sub> | 2.0                 | —         | 0.0 | 0.1  | —                 | 0.1  | V    | Vin = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OL</sub> = 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 <sub>OL</sub> = 6 mA    |
|                          |                 | 6.0                 | —         | —   | 0.26 | —                 | 0.33 |      |                                                                          | I <sub>OL</sub> = 7.8 mA  |
| Off-state output current | I <sub>OZ</sub> | 6.0                 | —         | —   | ±0.5 | —                 | ±5.0 | μA   | Vin = V <sub>IH</sub> or V <sub>IL</sub> , Vout = V <sub>CC</sub> or GND |                           |
| Input current            | I <sub>in</sub> | 6.0                 | —         | —   | ±0.1 | —                 | ±1.0 | μA   | Vin = V <sub>CC</sub> or GND                                             |                           |
| Quiescent supply current | I <sub>CC</sub> | 6.0                 | —         | —   | 4.0  | —                 | 40   | μA   | Vin = V <sub>CC</sub> or GND, Iout = 0 μA                                |                           |

AC Characteristics (C<sub>L</sub> = 50 pF, Input t<sub>r</sub> = t<sub>f</sub> = 6 ns)

| Item                   | Symbol           | V <sub>CC</sub> (V) | Ta = 25°C |     |     | Ta = −40 to +85°C |     | Unit | Test Conditions |
|------------------------|------------------|---------------------|-----------|-----|-----|-------------------|-----|------|-----------------|
|                        |                  |                     | Min       | Typ | Max | Min               | Max |      |                 |
| Propagation delay time | t <sub>PHL</sub> | 2.0                 | —         | —   | 90  | —                 | 115 | ns   |                 |
|                        |                  | 4.5                 | —         | 10  | 18  | —                 | 23  |      |                 |
|                        |                  | 6.0                 | —         | —   | 15  | —                 | 20  |      |                 |
|                        | t <sub>PLH</sub> | 2.0                 | —         | —   | 90  | —                 | 115 | ns   |                 |
|                        |                  | 4.5                 | —         | 10  | 18  | —                 | 23  |      |                 |
|                        |                  | 6.0                 | —         | —   | 15  | —                 | 20  |      |                 |
| Output enable time     | t <sub>ZL</sub>  | 2.0                 | —         | —   | 150 | —                 | 190 | ns   |                 |
|                        |                  | 4.5                 | —         | 11  | 30  | —                 | 38  |      |                 |
|                        |                  | 6.0                 | —         | —   | 26  | —                 | 33  |      |                 |
|                        | t <sub>ZH</sub>  | 2.0                 | —         | —   | 150 | —                 | 190 | ns   |                 |
|                        |                  | 4.5                 | —         | 12  | 30  | —                 | 38  |      |                 |
|                        |                  | 6.0                 | —         | —   | 26  | —                 | 33  |      |                 |
| Output disable time    | t <sub>LZ</sub>  | 2.0                 | —         | —   | 150 | —                 | 190 | ns   |                 |
|                        |                  | 4.5                 | —         | 16  | 30  | —                 | 38  |      |                 |
|                        |                  | 6.0                 | —         | —   | 26  | —                 | 33  |      |                 |
|                        | t <sub>HZ</sub>  | 2.0                 | —         | —   | 150 | —                 | 190 | ns   |                 |
|                        |                  | 4.5                 | —         | 19  | 30  | —                 | 38  |      |                 |
|                        |                  | 6.0                 | —         | —   | 26  | —                 | 33  |      |                 |
| Output rise/fall time  | t <sub>TLH</sub> | 2.0                 | —         | —   | 60  | —                 | 75  | ns   |                 |
|                        | t <sub>THL</sub> | 4.5                 | —         | 4   | 12  | —                 | 15  |      |                 |
|                        |                  | 6.0                 | —         | —   | 10  | —                 | 13  |      |                 |
| Input capacitance      | C <sub>in</sub>  | —                   | —         | 5   | 10  | —                 | 10  | pF   |                 |



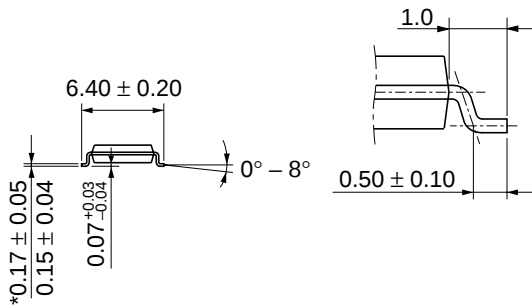
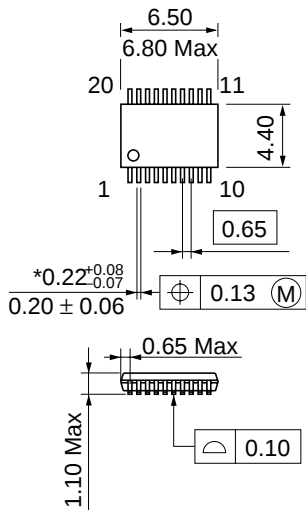
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|--------------------------|----------|
| Hitachi Code             | DP-20N   |
| JEDEC                    | —        |
| EIAJ                     | Conforms |
| Weight (reference value) | 1.26 g   |



\*Dimension including the plating thickness  
Base material dimension

|                          |          |
|--------------------------|----------|
| Hitachi Code             | FP-20DA  |
| JEDEC                    | —        |
| EIAJ                     | Conforms |
| Weight (reference value) | 0.31 g   |





\*Dimension including the plating thickness  
Base material dimension

|                          |          |
|--------------------------|----------|
| Hitachi Code             | TTP-20DA |
| JEDEC                    | —        |
| EIAJ                     | —        |
| Weight (reference value) | 0.07 g   |

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