# HD74HC677

16-bit Address Comparator

HITACHI

## Description

The HD74HC677 address comparator simplifies addressing of memory boards and/or other peripheral devices. The four P inputs are normally hard wired with a preprogrammed address. An internal decoder determines what input infomation applied to the 16 A inputs must be low or high to cause a low state at the output (Y). For example, a positive-logic bit combination of 0111 (decimal 7) at the P input determines that inputs $A_1$ through $A_7$ must be low and that inputs $A_8$ through $A_{16}$ must be high to cause the output to go low. Equality of the address applied at the A inputs to the preprogrammed address is indicated by the output being low.

The HD74HC677 features an enable input (G). When G is low, the device is enabled. When G is high, the device is disabled and the output is high regardless of the A and P inputs.

## Features

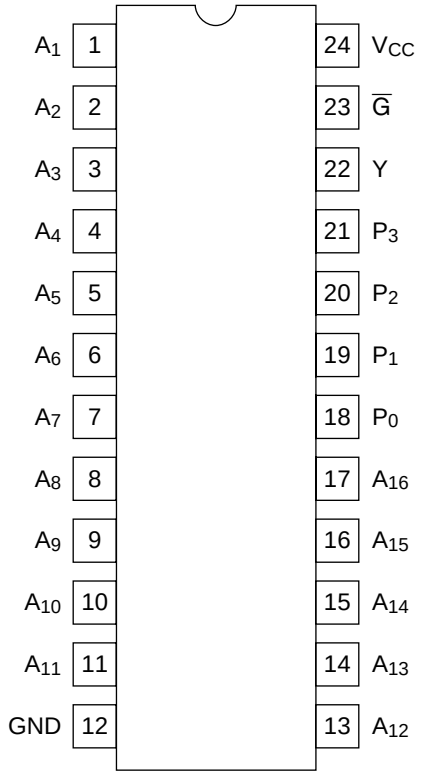
- High Speed Operation: $t_{pd}$ (A to Y) = 17 ns typ ($C_L$ = 50 pF)
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage: $V_{CC}$ = 2 to 6 V
- Low Input Current: 1 µA max
- Low Quiescent Supply Current: $I_{CC}$ (static) = 4 µA max (Ta = 25°C)

Hitachi semiconductor

## Function Table

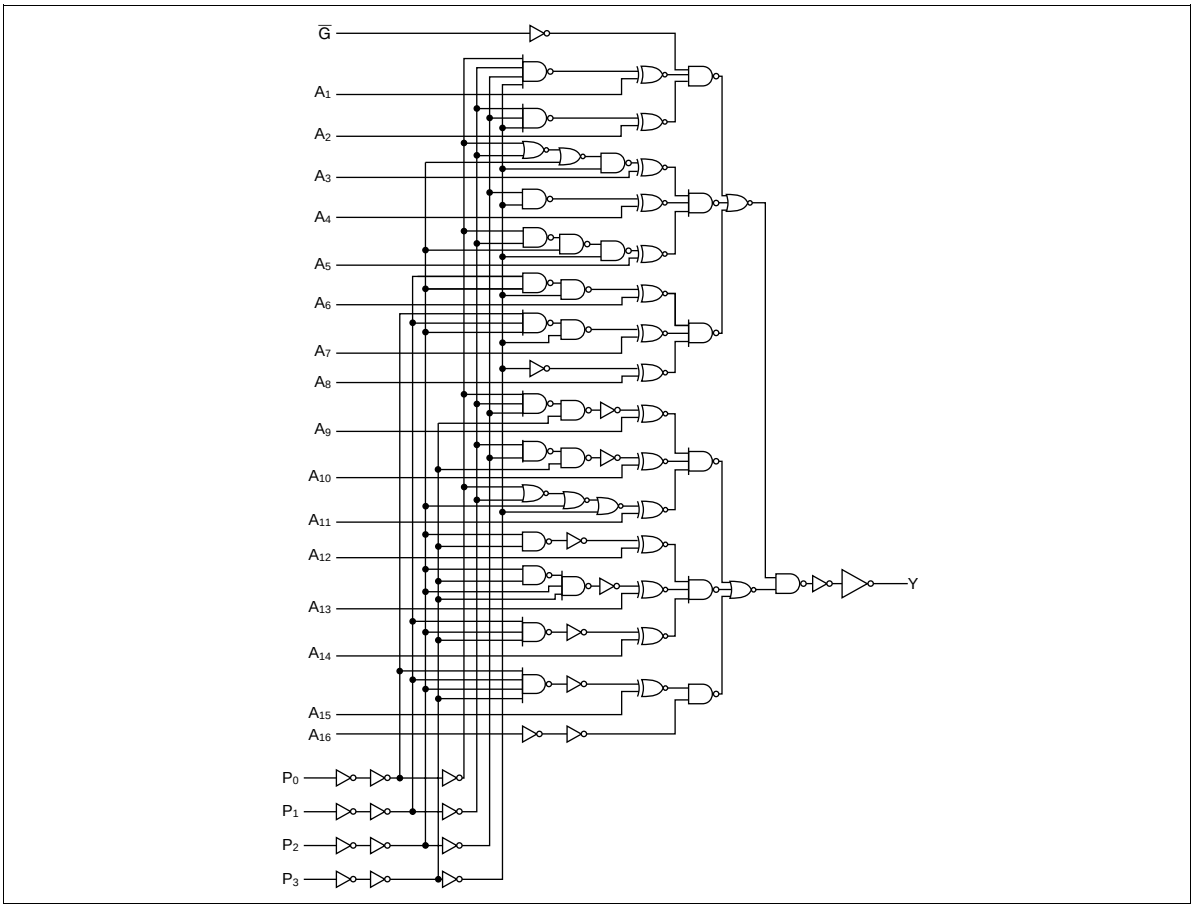
| | Inputs | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $\overline{G}$ | $P_3$ | $P_2$ | $P_1$ | $P_0$ | $A_1$ | $A_2$ | $A_3$ | $A_4$ | $A_5$ | $A_6$ | $A_7$ | $A_8$ | $A_9$ | $A_{10}$ | $A_{11}$ | $A_{12}$ | $A_{13}$ | $A_{14}$ | $A_{15}$ | $A_{16}$ | Output Y |
| L | L | L | L | L | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | L |
| L | L | L | L | H | L | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | L |
| L | L | L | H | L | L | L | H | H | H | H | H | H | H | H | H | H | H | H | H | H | L |
| L | L | L | H | H | L | L | L | H | H | H | H | H | H | H | H | H | H | H | H | H | L |
| L | L | H | L | L | L | L | L | L | H | H | H | H | H | H | H | H | H | H | H | H | L |
| L | L | H | L | H | L | L | L | L | L | H | H | H | H | H | H | H | H | H | H | H | L |
| L | L | H | H | L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | H | H | L |
| L | L | H | H | H | L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | H | L |
| L | H | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | L |
| L | H | L | L | H | L | L | L | L | L | L | L | L | L | H | H | H | H | H | H | H | L |
| L | H | L | H | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | H | L |
| L | H | L | H | H | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | L |
| L | H | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | L |
| L | H | H | L | H | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | L |
| L | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | L |
| L | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | L |
| L | All other combinations | | | | | | | | | | | | | | | | | | | | H |
| H | Any combination | | | | | | | | | | | | | | | | | | | | H |

## Pin Arrangement




(Top view)

## Logic Diagram



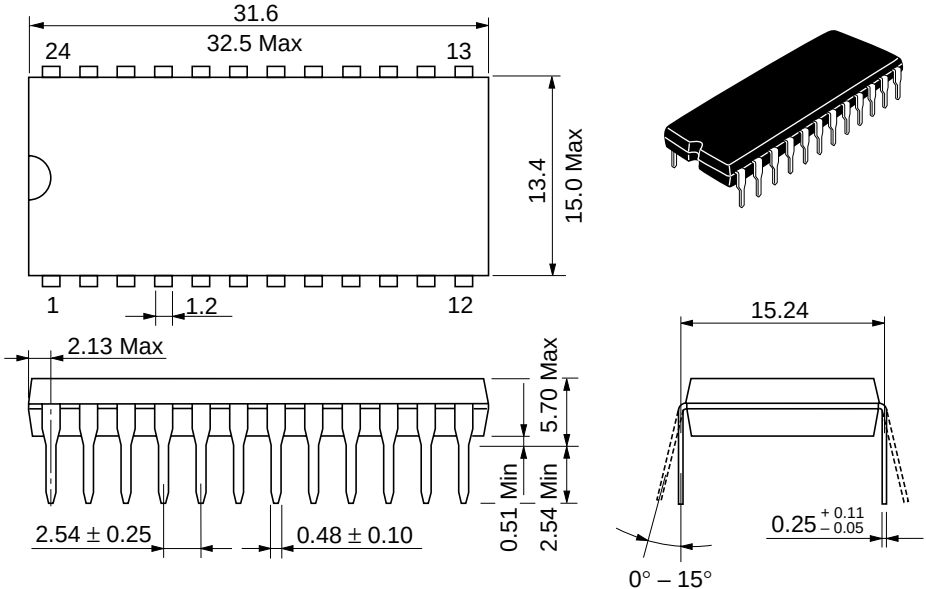
## DC Characteristics

| Item | Symbol | $V_{CC}$ (V) | Ta = 25°C Min | Typ | Max | Ta = –40 to +85°C Min | Max | Unit | Test Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|
| 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 | Vin = $V_{IH}$ or $V_{IL}$ | $I_{OH}$ = –20 µA |
| | | 4.5 | 4.4 | 4.5 | — | 4.4 | — | | | |
| | | 6.0 | 5.9 | 6.0 | — | 5.9 | — | | | |
| | | 4.5 | 4.18 | — | — | 4.13 | — | | | $I_{OH}$ = –4 mA |
| | | 6.0 | 5.68 | — | — | 5.63 | — | | | $I_{OH}$ = –5.2 mA |
| | $V_{OL}$ | 2.0 | — | 0.0 | 0.1 | — | 0.1 | V | Vin = $V_{IH}$ 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 |
| Input current | Iin | 6.0 | — | — | ±0.1 | — | ±1.0 | µA | Vin = $V_{CC}$ or GND | |
| Quiescent supply current | $I_{CC}$ | 6.0 | — | — | 4.0 | — | 40 | µA | Vin = $V_{CC}$ or GND, Iout = 0 µA | |

## AC Characteristics ($C_L$ = 50 pF, Input $t_r = t_f$ = 6 ns)

| | | | Ta = 25°C | | | Ta = –40 to +85°C | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Item** | **Symbol** | **$V_{cc}$ (V)** | **Min** | **Typ** | **Max** | **Min** | **Max** | **Unit** | **Test Conditions** |
| Propagation delay time | $t_{PLH}$ | 2.0 | — | — | 310 | — | 390 | ns | P to Y |
| | $t_{PHL}$ | 4.5 | — | 23 | 62 | — | 78 | | |
| | | 6.0 | — | — | 52 | — | 66 | | |
| | $t_{PLH}$ | 2.0 | — | — | 180 | — | 225 | ns | A to Y |
| | $t_{PHL}$ | 4.5 | — | 17 | 36 | — | 45 | | |
| | | 6.0 | — | — | 31 | — | 38 | | |
| | $t_{PLH}$ | 2.0 | — | — | 125 | — | 155 | ns | $\overline{G}$ to Y |
| | $t_{PHL}$ | 4.5 | — | 13 | 25 | — | 31 | | |
| | | 6.0 | — | — | 21 | — | 26 | | |
| Output rise/fall time | $t_{TLH}$ | 2.0 | — | — | 75 | — | 95 | ns | |
| | $t_{THL}$ | 4.5 | — | 5 | 15 | — | 19 | | |
| | | 6.0 | — | — | 13 | — | 16 | | |
| Input capacitance | Cin | — | — | 5 | 10 | — | 10 | pF | |

Unit: mm




| | |
|---|---|
| Hitachi Code | DP-24 |
| JEDEC | Conforms |
| EIAJ | Conforms |
| Weight (reference value) | 3.1 g |

## Cautions

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