![Texas Instruments logo] **TEXAS INSTRUMENTS**

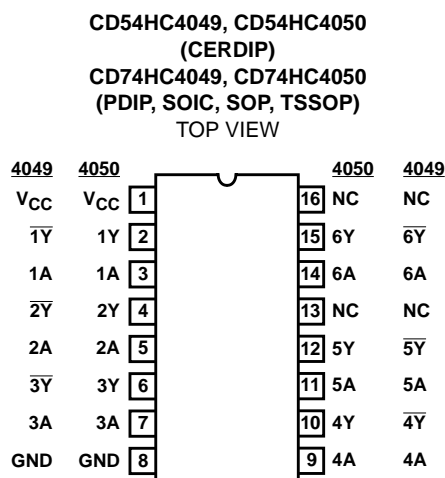# CD54HC4049, CD74HC4049, CD54HC4050, CD74HC4050

February 1998 - Revised February 2005

## High-Speed CMOS Logic
## Hex Buffers, Inverting and Non-Inverting

## Features

- **Typical Propagation Delay: 6ns at $V_{CC}$ = 5V, $C_L$ = 15pF, $T_A$ = 25$^o$C**

- **High-to-Low Voltage Level Converter for up to $V_I$ = 16V**

- **Fanout (Over Temperature Range)**
  - **Standard Outputs . . . . . . . . . . . . . . . 10 LSTTL Loads**
  - **Bus Driver Outputs . . . . . . . . . . . . . 15 LSTTL Loads**

- **Wide Operating Temperature Range . . . –55$^o$C to 125$^o$C**

- **Balanced Propagation Delay and Transition Times**

- **Significant Power Reduction Compared to LSTTL Logic ICs**

- **HC Types**
  - **2V to 6V Operation**
  - **High Noise Immunity: $N_{IL}$ = 30%, $N_{IH}$ = 30% of $V_{CC}$ at $V_{CC}$ = 5V**

## Pinout

**CD54HC4049, CD54HC4050
(CERDIP)
CD74HC4049, CD74HC4050
(PDIP, SOIC, SOP, TSSOP)**
TOP VIEW

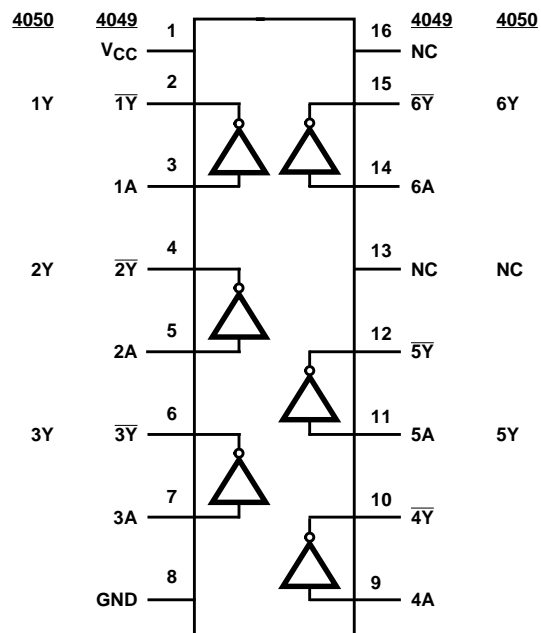| 4049 | 4050 | | | | | 4050 | 4049 |
|------|------|---|---|---|---|------|------|
| $V_{CC}$ | $V_{CC}$ | 1 | | 16 | NC | NC |
| $\overline{1Y}$ | 1Y | 2 | | 15 | 6Y | $\overline{6Y}$ |
| 1A | 1A | 3 | | 14 | 6A | 6A |
| $\overline{2Y}$ | 2Y | 4 | | 13 | NC | NC |
| 2A | 2A | 5 | | 12 | 5Y | $\overline{5Y}$ |
| $\overline{3Y}$ | 3Y | 6 | | 11 | 5A | 5A |
| 3A | 3A | 7 | | 10 | 4Y | $\overline{4Y}$ |
| GND | GND | 8 | | 9 | 4A | 4A |

## Description

The 'HC4049 and 'HC4050 are fabricated with high-speed silicon gate technology. They have a modified input protection structure that enables these parts to be used as logic level translators which convert high-level logic to a low-level logic while operating off the low-level logic supply. For example, 15-V input pulse levels can be down-converted to 0-V to 5-V logic levels. The modified input protection structure protects the input from negative electrostatic discharge. These parts also can be used as simple buffers or inverters without level translation. The 'HC4049 and 'HC4050 are enhanced versions of equivalent CMOS types.

## Ordering Information

| PART NUMBER | TEMP. RANGE ($^o$C) | PACKAGE |
|-------------|---------------------|---------|
| CD54HC4049F3A | –55 to 125 | 16 Ld CERDIP |
| CD54HC4050F3A | –55 to 125 | 16 Ld CERDIP |
| CD74HC4049E | –55 to 125 | 16 Ld PDIP |
| CD74HC4049M | –55 to 125 | 16 Ld SOIC |
| CD74HCT4050MT | –55 to 125 | 16 Ld SOIC |
| CD74HC4049M96 | –55 to 125 | 16 Ld SOIC |
| CD74HC4049NSR | –55 to 125 | 16 Ld SOP |
| CD74HC4049PW | –55 to 125 | 16 Ld TSSOP |
| CD74HC4049PWR | –55 to 125 | 16 Ld TSSOP |
| CD74HC4049PWT | –55 to 125 | 16 Ld TSSOP |
| CD74HC4050E | –55 to 125 | 16 Ld PDIP |
| CD74HC4050M | –55 to 125 | 16 Ld SOIC |
| CD74HC4050MT | –55 to 125 | 16 Ld SOIC |
| CD74HC4050M96 | –55 to 125 | 16 Ld SOIC |
| CD74HC4050NSR | –55 to 125 | 16 Ld SOP |
| CD74HC4050PW | –55 to 125 | 16 Ld TSSOP |
| CD74HC4050PWR | –55 to 125 | 16 Ld TSSOP |
| CD74HC4050PWT | –55 to 125 | 16 Ld TSSOP |

NOTE: When ordering, use the entire part number. The suffixes 96 and R denote tape and reel. The suffix T denotes a small-quantity reel of 250.

## *Functional Diagram*

| 4050 | 4049 | | | | 4049 | 4050 |
|------|------|--|--|--|------|------|

- 4050 / 4049 — 1 — V_CC
- 1Y / 1Y — 2
- 1A — 3
- 2Y / 2Y — 4
- 2A — 5
- 3Y / 3Y — 6
- 3A — 7
- GND — 8
- 16 — NC
- 6Y / 6Y — 15
- 6A — 14
- NC / NC — 13
- 5Y — 12
- 5A / 5Y — 11
- 4Y — 10
- 4A — 9

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## *Logic Diagrams*

**HC4049**

A ○—▷○—▷○—▷○— $\overline{Y}$

**HC4050**

A ○—▷○—▷○— Y

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2

## CD54HC4049, CD74HC4049, CD54HC4050, CD74HC4050

### Absolute Maximum Ratings

DC Supply Voltage, $V_{CC}$ . . . . . . . . . . . . . . . . . . . . . . . –0.5V to 7V
Input Voltage Range . . . . . . . . . . . . . . . . . . . . . . . . . –0.5V to 16V
DC Input Diode Current, $I_{IK}$
  For $V_I$ < –0.5V . . . . . . . . . . . . . . . . . . . . . . . . . . . . . –20mA
DC Output Diode Current, $I_{OK}$
  For $V_O$ < –0.5V or $V_O$ > $V_{CC}$ + 0.5V . . . . . . . . . . . . . . . . . . . ±20mA
DC Output Source or Sink Current per Output Pin, $I_O$
  For $V_O$ > –0.5V or $V_O$ < $V_{CC}$ + 0.5V . . . . . . . . . . . . . . . . . . . ±25mA
DC $V_{CC}$ or Ground Current, $I_{CC}$ or $I_{GND}$ . . . . . . . . . . . . . . . . . ±50mA

### Operating Conditions

Temperature Range ($T_A$) . . . . . . . . . . . . . . . . . . . . . –55$^o$C to 125$^o$C
Supply Voltage Range, $V_{CC}$
  HC Types . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .2V to 6V
  HCT Types . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .4.5V to 5.5V
DC Input Voltage, $V_I$ . . . . . . . . . . . . . . . . . . . . . . . . . . . .0V to 15V
DC Output Voltage, $V_O$ . . . . . . . . . . . . . . . . . . . . . . . . 0V to $V_{CC}$
Input Rise and Fall Time
  2V . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1000ns (Max)
  4.5V . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 500ns (Max)
  6V . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 400ns (Max)

### Thermal Information

Package Thermal Impedance, $\theta_{JA}$ (see Note 1):
  E (PDIP) Package . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .67$^o$C/W
  M (SOIC) Package. . . . . . . . . . . . . . . . . . . . . . . . . . . . . .73$^o$C/W
  NS (SOP) Package . . . . . . . . . . . . . . . . . . . . . . . . . . . . 64$^o$C/W
  PW (TSSOP) Package . . . . . . . . . . . . . . . . . . . . . . . . 108$^o$C/W
Maximum Junction Temperature (Hermetic Package or Die) . . . 175$^o$C
Maximum Junction Temperature (Plastic Package) . . . . . . . . 150$^o$C
Maximum Storage Temperature Range . . . . . . . . . –65$^o$C to 150$^o$C
Maximum Lead Temperature (Soldering 10s) . . . . . . . . . . . . . 300$^o$C
  (SOIC - Lead Tips Only)



VOLTAGE RELATIONSHIPS MAXIMUM LIMITS

*CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.*
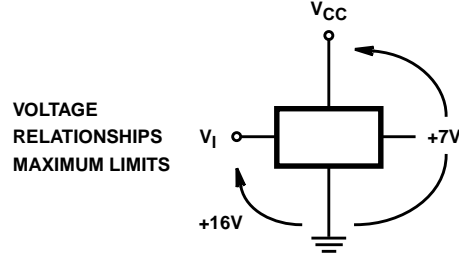
NOTE:

1. The package thermal impedance is calculated in accordance with JESD 51-7.

### DC Electrical Specifications

| PARAMETER | SYMBOL | TEST CONDITIONS | | $V_{CC}$ (V) | 25$^o$C | | | –40$^o$C TO 85$^o$C | | –55$^o$C TO 125$^o$C | | UNITS |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | $V_I$ (V) | $I_O$ (mA) | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| **HC TYPES** | | | | | | | | | | | | |
| High Level Input Voltage | $V_{IH}$ | - | - | 2 | 1.5 | - | - | 1.5 | - | 1.5 | - | V |
| | | | | 4.5 | 3.15 | - | - | 3.15 | - | 3.15 | - | V |
| | | | | 6 | 4.2 | - | - | 4.2 | - | 4.2 | - | V |
| Low Level Input Voltage | $V_{IL}$ | - | - | 2 | - | - | 0.5 | - | 0.5 | - | 0.5 | V |
| | | | | 4.5 | - | - | 1.35 | - | 1.35 | - | 1.35 | V |
| | | | | 6 | - | - | 1.8 | - | 1.8 | - | 1.8 | V |
| High Level Output Voltage CMOS Loads | $V_{OH}$ | $V_{IH}$ or $V_{IL}$ | –0.02 | 2 | 1.9 | - | - | 1.9 | - | 1.9 | - | V |
| | | | –0.02 | 4.5 | 4.4 | - | - | 4.4 | - | 4.4 | - | V |
| | | | –0.02 | 6 | 5.9 | - | - | 5.9 | - | 5.9 | - | V |
| High Level Output Voltage TTL Loads | | | –4 | 4.5 | 3.98 | - | - | 3.84 | - | 3.7 | - | V |
| | | | –5.2 | 6 | 5.48 | - | - | 5.34 | - | 5.2 | - | V |
| Low Level Output Voltage CMOS Loads | $V_{OL}$ | $V_{IH}$ or $V_{IL}$ | 0.02 | 2 | - | - | 0.1 | - | 0.1 | - | 0.1 | V |
| | | | 0.02 | 4.5 | - | - | 0.1 | - | 0.1 | - | 0.1 | V |
| | | | 0.02 | 6 | - | - | 0.1 | - | 0.1 | - | 0.1 | V |
| Low Level Output Voltage TTL Loads | | | 4 | 4.5 | - | - | 0.26 | - | 0.33 | - | 0.4 | V |
| | | | 5.2 | 6 | - | - | 0.26 | - | 0.33 | - | 0.4 | V |
| Input Leakage Current | $I_I$ | $V_{CC}$ or GND | - | 6 | - | - | ±0.1 | - | ±1 | - | ±1 | µA |
| | | 15 | - | 6 | - | - | ±0.5 | - | ±5 | - | ±5 | |

**DC Electrical Specifications** (Continued)

| PARAMETER | SYMBOL | TEST CONDITIONS | | $V_{CC}$ (V) | 25$^o$C | | | –40$^o$C TO 85$^o$C | | –55$^o$C TO 125$^o$C | | UNITS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $V_I$ (V) | $I_O$ (mA) | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| Quiescent Device Current | $I_{CC}$ | $V_{CC}$ or GND | 0 | 6 | - | - | 2 | - | 20 | - | 40 | μA |

**Switching Specifications** Input $t_r$, $t_f$ = 6ns

| PARAMETER | SYMBOL | TEST CONDITIONS | $V_{CC}$ (V) | 25$^o$C | | | –40$^o$C TO 85$^o$C | | –55$^o$C TO 125$^o$C | | UNITS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| **HC TYPES** | | | | | | | | | | | |
| Propagation Delay, nA to n$\overline{Y}$ HC4049 nA to nY HC4050 | $t_{PLH}$, $t_{PHL}$ | $C_L$ = 50pF | 2 | - | - | 85 | - | 105 | - | 130 | ns |
| | | | 4.5 | - | - | 17 | - | 21 | - | 26 | ns |
| | | | 6 | - | - | 14 | - | 18 | - | 22 | ns |
| | | $C_L$ = 15pF | 5 | - | 6 | - | - | - | - | - | ns |
| Transition Times (Figure 1) | $t_{TLH}$, $t_{THL}$ | $C_L$ = 50pF | 2 | - | - | 75 | - | 95 | - | 110 | ns |
| | | | 4.5 | - | - | 15 | - | 19 | - | 22 | ns |
| | | | 6 | - | - | 13 | - | 16 | - | 19 | ns |
| Input Capacitance | $C_I$ | - | - | - | - | 10 | - | 10 | - | 10 | pF |
| Power Dissipation Capacitance (Notes 2, 3) | $C_{PD}$ | - | 5 | - | 35 | - | - | - | - | - | pF |

NOTES:

2. $C_{PD}$ is used to determine the dynamic power consumption, per gate.

3. $P_D = V_{CC}^2 f_i (C_{PD} + C_L)$ where $f_i$ = Input Frequency, $C_L$ = Output Load Capacitance, $V_{CC}$ = Supply Voltage.

## *Test Circuit and Waveform*
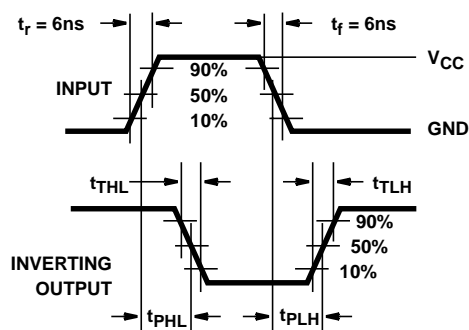


**FIGURE 1. HC AND HCU TRANSITION TIMES AND PROPAGATION DELAY TIMES, COMBINATION LOGIC**

## PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5962-8681901EA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 5962-8681901EA CD54HC4049F3A | Samples |
| 5962-8682001EA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 5962-8682001EA CD54HC4050F3A | Samples |
| CD54HC4049F3A | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 5962-8681901EA CD54HC4049F3A | Samples |
| CD54HC4050F3A | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 5962-8682001EA CD54HC4050F3A | Samples |
| CD74HC4049E | ACTIVE | PDIP | N | 16 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | -55 to 125 | CD74HC4049E | Samples |
| CD74HC4049EE4 | ACTIVE | PDIP | N | 16 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | -55 to 125 | CD74HC4049E | Samples |
| CD74HC4049M | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4049M | Samples |
| CD74HC4049M96 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4049M | Samples |
| CD74HC4049M96E4 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4049M | Samples |
| CD74HC4049M96G4 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4049M | Samples |
| CD74HC4049ME4 | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4049M | Samples |
| CD74HC4049MG4 | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4049M | Samples |
| CD74HC4049MT | ACTIVE | SOIC | D | 16 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4049M | Samples |
| CD74HC4049MTE4 | ACTIVE | SOIC | D | 16 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4049M | Samples |
| CD74HC4049MTG4 | ACTIVE | SOIC | D | 16 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4049M | Samples |
| CD74HC4049NSR | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4049M | Samples |
| CD74HC4049NSRE4 | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4049M | Samples |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CD74HC4049NSRG4 | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4049M | Samples |
| CD74HC4049PW | ACTIVE | TSSOP | PW | 16 | 90 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4049 | Samples |
| CD74HC4049PWE4 | ACTIVE | TSSOP | PW | 16 | 90 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4049 | Samples |
| CD74HC4049PWG4 | ACTIVE | TSSOP | PW | 16 | 90 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4049 | Samples |
| CD74HC4049PWR | ACTIVE | TSSOP | PW | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4049 | Samples |
| CD74HC4049PWRE4 | ACTIVE | TSSOP | PW | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4049 | Samples |
| CD74HC4049PWRG4 | ACTIVE | TSSOP | PW | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4049 | Samples |
| CD74HC4049PWT | ACTIVE | TSSOP | PW | 16 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4049 | Samples |
| CD74HC4049PWTE4 | ACTIVE | TSSOP | PW | 16 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4049 | Samples |
| CD74HC4049PWTG4 | ACTIVE | TSSOP | PW | 16 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4049 | Samples |
| CD74HC4050E | ACTIVE | PDIP | N | 16 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | -55 to 125 | CD74HC4050E | Samples |
| CD74HC4050EE4 | ACTIVE | PDIP | N | 16 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | -55 to 125 | CD74HC4050E | Samples |
| CD74HC4050M | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4050M | Samples |
| CD74HC4050M96 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4050M | Samples |
| CD74HC4050M96E4 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4050M | Samples |
| CD74HC4050M96G4 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4050M | Samples |
| CD74HC4050ME4 | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4050M | Samples |
| CD74HC4050MG4 | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4050M | Samples |

![Texas Instruments logo]

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CD74HC4050MT | ACTIVE | SOIC | D | 16 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4050M | Samples |
| CD74HC4050MTE4 | ACTIVE | SOIC | D | 16 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4050M | Samples |
| CD74HC4050MTG4 | ACTIVE | SOIC | D | 16 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4050M | Samples |
| CD74HC4050NSR | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4050M | Samples |
| CD74HC4050NSRE4 | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4050M | Samples |
| CD74HC4050NSRG4 | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4050M | Samples |
| CD74HC4050PW | ACTIVE | TSSOP | PW | 16 | 90 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4050 | Samples |
| CD74HC4050PWE4 | ACTIVE | TSSOP | PW | 16 | 90 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4050 | Samples |
| CD74HC4050PWG4 | ACTIVE | TSSOP | PW | 16 | 90 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4050 | Samples |
| CD74HC4050PWR | ACTIVE | TSSOP | PW | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4050 | Samples |
| CD74HC4050PWRE4 | ACTIVE | TSSOP | PW | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4050 | Samples |
| CD74HC4050PWRG4 | ACTIVE | TSSOP | PW | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4050 | Samples |
| CD74HC4050PWT | ACTIVE | TSSOP | PW | 16 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4050 | Samples |
| CD74HC4050PWTE4 | ACTIVE | TSSOP | PW | 16 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4050 | Samples |
| CD74HC4050PWTG4 | ACTIVE | TSSOP | PW | 16 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HJ4050 | Samples |

**(1)** The marketing status values are defined as follows:
**ACTIVE:** Product device recommended for new designs.
**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.
**OBSOLETE:** TI has discontinued the production of the device.

**(2)** Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
**TBD:** The Pb-Free/Green conversion plan has not been defined.
**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
**Pb-Free (RoHS Exempt):** This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

**(3)** MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

**(4)** There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

**(5)** Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

**Important Information and Disclaimer:**The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

**OTHER QUALIFIED VERSIONS OF CD54HC4049, CD54HC4050, CD74HC4049, CD74HC4050 :**

● Catalog: CD74HC4049, CD74HC4050

● Military: CD54HC4049, CD54HC4050

NOTE: Qualified Version Definitions:

   ● Catalog - TI's standard catalog product

   ● Military - QML certified for Military and Defense Applications

## TAPE AND REEL INFORMATION

**REEL DIMENSIONS**
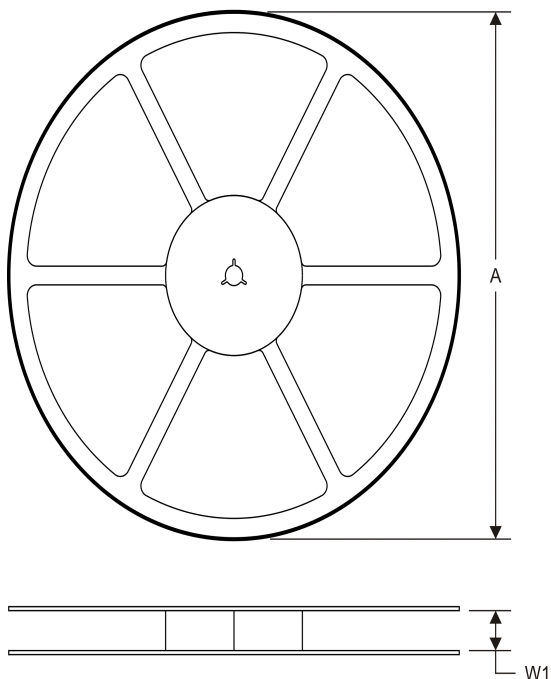
**TAPE DIMENSIONS**
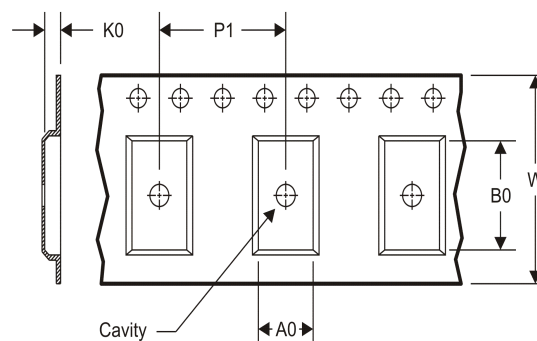


| | |
|---|---|
| A0 | Dimension designed to accommodate the component width |
| B0 | Dimension designed to accommodate the component length |
| K0 | Dimension designed to accommodate the component thickness |
| W | Overall width of the carrier tape |
| P1 | Pitch between successive cavity centers |

**TAPE AND REEL INFORMATION**

*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD74HC4049M96 | SOIC | D | 16 | 2500 | 330.0 | 16.4 | 6.5 | 10.3 | 2.1 | 8.0 | 16.0 | Q1 |
| CD74HC4049NSR | SO | NS | 16 | 2000 | 330.0 | 16.4 | 8.2 | 10.5 | 2.5 | 12.0 | 16.0 | Q1 |
| CD74HC4049PWR | TSSOP | PW | 16 | 2000 | 330.0 | 12.4 | 6.9 | 5.6 | 1.6 | 8.0 | 12.0 | Q1 |
| CD74HC4049PWT | TSSOP | PW | 16 | 250 | 330.0 | 12.4 | 6.9 | 5.6 | 1.6 | 8.0 | 12.0 | Q1 |
| CD74HC4050M96 | SOIC | D | 16 | 2500 | 330.0 | 16.4 | 6.5 | 10.3 | 2.1 | 8.0 | 16.0 | Q1 |
| CD74HC4050NSR | SO | NS | 16 | 2000 | 330.0 | 16.4 | 8.2 | 10.5 | 2.5 | 12.0 | 16.0 | Q1 |
| CD74HC4050PWR | TSSOP | PW | 16 | 2000 | 330.0 | 12.4 | 6.9 | 5.6 | 1.6 | 8.0 | 12.0 | Q1 |
| CD74HC4050PWT | TSSOP | PW | 16 | 250 | 330.0 | 12.4 | 6.9 | 5.6 | 1.6 | 8.0 | 12.0 | Q1 |

**TAPE AND REEL BOX DIMENSIONS**



*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|---|---|---|---|---|---|---|---|
| CD74HC4049M96 | SOIC | D | 16 | 2500 | 333.2 | 345.9 | 28.6 |
| CD74HC4049NSR | SO | NS | 16 | 2000 | 367.0 | 367.0 | 38.0 |
| CD74HC4049PWR | TSSOP | PW | 16 | 2000 | 367.0 | 367.0 | 35.0 |
| CD74HC4049PWT | TSSOP | PW | 16 | 250 | 367.0 | 367.0 | 35.0 |
| CD74HC4050M96 | SOIC | D | 16 | 2500 | 333.2 | 345.9 | 28.6 |
| CD74HC4050NSR | SO | NS | 16 | 2000 | 367.0 | 367.0 | 38.0 |
| CD74HC4050PWR | TSSOP | PW | 16 | 2000 | 367.0 | 367.0 | 35.0 |
| CD74HC4050PWT | TSSOP | PW | 16 | 250 | 367.0 | 367.0 | 35.0 |

# IMPORTANT NOTICE

| Products | | Applications | |
|---|---|---|---|
| Audio | www.ti.com/audio | Automotive and Transportation | www.ti.com/automotive |
| Amplifiers | amplifier.ti.com | Communications and Telecom | www.ti.com/communications |
| Data Converters | dataconverter.ti.com | Computers and Peripherals | www.ti.com/computers |
| DLP® Products | www.dlp.com | Consumer Electronics | www.ti.com/consumer-apps |
| DSP | dsp.ti.com | Energy and Lighting | www.ti.com/energy |
| Clocks and Timers | www.ti.com/clocks | Industrial | www.ti.com/industrial |
| Interface | interface.ti.com | Medical | www.ti.com/medical |
| Logic | logic.ti.com | Security | www.ti.com/security |
| Power Mgmt | power.ti.com | Space, Avionics and Defense | www.ti.com/space-avionics-defense |
| Microcontrollers | microcontroller.ti.com | Video and Imaging | www.ti.com/video |
| RFID | www.ti-rfid.com | | |
| OMAP Applications Processors | www.ti.com/omap | **TI E2E Community** | e2e.ti.com |
| Wireless Connectivity | www.ti.com/wirelessconnectivity | | |