

# ハイスピード CMOS ロジック、非反転型および反転型、スリー・ステート出力のヘキサ・バッファ / ライン・ドライバ

## 1 特長

- バッファ付き入力
- 大電流バス・ドライバ出力
- $t_{PLH}$ ,  $t_{PHL}$  = 8ns の標準伝搬遅延 ( $V_{CC} = 5V$ ,  $C_L = 15pF$ ,  $T_A = 25^\circ C$ )
- ファンアウト (全温度範囲にわたって)
  - 標準出力: 10 の LSTTL 負荷
  - バス・ドライバ出力: 15 の LSTTL 負荷
- 広い動作温度範囲:  $-55^\circ C \sim 125^\circ C$
- 平衡な伝搬遅延と遷移時間
- LSTTL ロジック IC に比べて消費電力を大幅削減
- HC タイプ
  - 2V~6V で動作
  - 優れたノイズ耐性:  $V_{CC}$  に対して  $N_{IL} = 30\%$ ,  $N_{IH} = 30\%$  ( $V_{CC} = 5V$  時)
- HCT タイプ
  - 4.5V~5.5V で動作
  - LSTTL 入力ロジックと直接互換、 $V_{IL} = 0.8V$  (最大値),  $V_{IH} = 2V$  (最小値)
  - CMOS 入力互換、 $V_{OL}$ ,  $V_{OH}$  で  $I_L \leq 1\mu A$

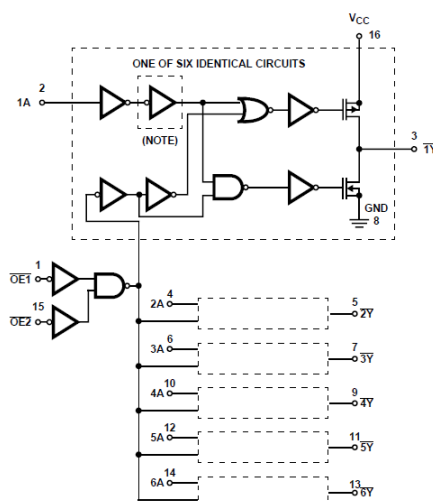
## 製品情報

| 部品番号       | パッケージ <sup>(1)</sup> | 本体サイズ (公称)     |
|------------|----------------------|----------------|
| CD54HC365  | J (CERDIP, 16)       | 19.56 x 6.92mm |
| CD54HC366  | J (CERDIP, 16)       | 19.56 x 6.92mm |
| CD54HCT365 | J (CERDIP, 16)       | 19.56 x 6.92mm |
| CD74HC365  | N (PDIP, 16)         | 19.30 x 6.35mm |
|            | D (SOIC, 16)         | 9.90 x 3.90mm  |
|            | D (SOIC, 16)         | 9.90 x 3.90mm  |
|            | D (SOIC, 16)         | 9.90 x 3.90mm  |
| CD74HC366  | N (PDIP, 16)         | 19.30 x 6.35mm |
|            | D (SOIC, 16)         | 9.90 x 3.90mm  |
|            | D (SOIC, 16)         | 9.90 x 3.90mm  |
| CD74HCT365 | N (PDIP, 16)         | 19.30 x 6.35mm |
|            | D (SOIC, 16)         | 9.90 x 3.90mm  |
|            | D (SOIC, 16)         | 9.90 x 3.90mm  |
|            | D (SOIC, 16)         | 9.90 x 3.90mm  |

(1) 利用可能なパッケージについては、このデータシートの末尾にある注文情報を参照してください。

## 2 概要

'HC365, 'HCT365, 'HC366 シリコン・ゲート CMOS スリー・ステート・バッファは、汎用高速非反転 / 反転バッファです。



HC/HCT365 と HC366 のロジック図 (HC/HCT365 の出力は、1Y、2Y などに示されているものの補完です)

A. インバータは HC/HCT 365 には含まれていません。



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## 3 Revision History

資料番号末尾の英字は改訂を表しています。その改訂履歴は英語版に準じています。

| Changes from Revision C (October 2003) to Revision D (July 2022) | Page     |
|------------------------------------------------------------------|----------|
| • 最新のデータシート規格を反映するように、文書全体の採番、書式設定、表、図、相互参照を更新.....              | <b>1</b> |

## 4 Pin Configuration and Functions

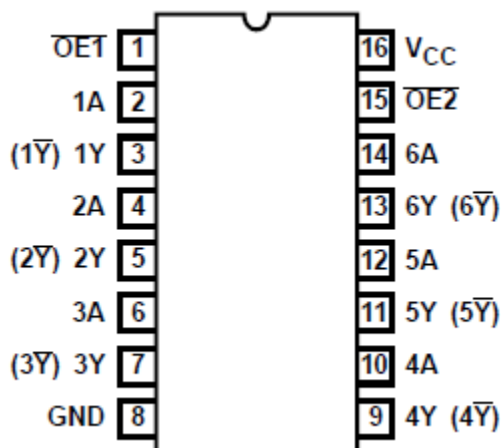


图 4-1. CD54HC365, CD54HCT365, CD54HC366 (CERDIP) CD74HC365, CD74HCT365, CD74HC366 (PDIP, SOIC) Top View

表 4-1. Pin Functions

| PIN |      | TYPE <sup>(1)</sup> | DESCRIPTION                 |
|-----|------|---------------------|-----------------------------|
| NO. | NAME |                     |                             |
| 1   | OE1  | I                   | Output Enable 1, Active Low |
| 2   | 1A   | I                   | 1A Input                    |
| 3   | 1Y   | O                   | 1Y Output                   |
| 4   | 2A   | I                   | 2A Input                    |
| 5   | 2Y   | O                   | 2Y Output                   |
| 6   | 3A   | I                   | 3A Input                    |
| 7   | 3Y   | O                   | 3Y Output                   |
| 8   | GND  | —                   | Ground Pin                  |
| 9   | 4Y   | O                   | 4Y Output                   |
| 10  | 4A   | I                   | 4A Input                    |
| 11  | 5Y   | O                   | 5Y Output                   |
| 12  | 5A   | I                   | 5A Input                    |
| 13  | 6Y   | O                   | 6Y Output                   |
| 14  | 6A   | I                   | 6A Input                    |
| 15  | OE2  | I                   | Output Enable 2, Active Low |
| 16  | VCC  | —                   | Power Pin                   |

(1) Signal Types: I = Input, O = Output, I/O = Input or Output.

## 5 Specifications

### 5.1 Absolute Maximum Ratings<sup>(1)</sup>

|                  |                                                               |                                                                         | MIN  | MAX | UNIT |
|------------------|---------------------------------------------------------------|-------------------------------------------------------------------------|------|-----|------|
| V <sub>CC</sub>  | DC supply voltage                                             |                                                                         | -0.5 | 7   | V    |
| I <sub>IK</sub>  | DC input diode current                                        | For V <sub>I</sub> < -0.5 V or V <sub>I</sub> > V <sub>CC</sub> + 0.5 V |      | ±20 | mA   |
| I <sub>OK</sub>  | DC output diode current                                       | For V <sub>O</sub> < -0.5 V or V <sub>O</sub> > V <sub>CC</sub> + 0.5 V |      | ±20 | mA   |
| I <sub>O</sub>   | DC drain current, per output                                  | For -0.5 V < V <sub>O</sub> < V <sub>CC</sub> + 0.5 V                   |      | ±35 | mA   |
| I <sub>O</sub>   | DC output source or sink current per output pin               | For V <sub>O</sub> > -0.5 V or V <sub>O</sub> < V <sub>CC</sub> + 0.5 V |      | ±25 | mA   |
| I <sub>CC</sub>  | DC V <sub>CC</sub> or ground current                          |                                                                         |      | ±50 | mA   |
| T <sub>J</sub>   | Maximum junction temperature                                  |                                                                         |      | 150 | °C   |
| T <sub>stg</sub> | Maximum storage temperature range                             |                                                                         | -65  | 150 | °C   |
|                  | Maximum lead temperature (soldering 10s)SOIC - lead tips only |                                                                         |      | 300 | °C   |

- (1) Stresses beyond those listed under *absolute maximum ratings* may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under *recommended operating conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

### 5.2 Operating Conditions

|                                 |                            |           | MIN | MAX             | UNIT |
|---------------------------------|----------------------------|-----------|-----|-----------------|------|
| V <sub>CC</sub>                 | Supply voltage range       | HC Types  | 2   | 6               | V    |
|                                 |                            | HCT Types | 4.5 | 5.5             | V    |
| V <sub>I</sub> , V <sub>O</sub> | DC input or output voltage |           | 0   | V <sub>CC</sub> | V    |
|                                 | Input rise and fall time   | 2 V       |     | 1000            | ns   |
|                                 |                            | 4.5 V     |     | 500             |      |
|                                 |                            | 6 V       |     | 400             |      |
| T <sub>A</sub>                  | Temperature range          |           | -55 | 125             | °C   |

### 5.3 Thermal Information

| THERMAL METRIC   |                                                       | N (PDIP) | D (SOIC) | UNIT |
|------------------|-------------------------------------------------------|----------|----------|------|
|                  |                                                       | 16 PINS  | 16 PINS  |      |
| R <sub>θJA</sub> | Junction-to-ambient thermal resistance <sup>(1)</sup> | 67       | 73       | °C/W |

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

## 5.4 Electrical Characteristics

| PARAMETER                                |                                                                     | TEST CONDITIONS                    |                                         | V <sub>CC</sub><br>(V) | 25°C       |     |      | –40°C to 85°C |     | –55°C to 125°C |     | UNIT |
|------------------------------------------|---------------------------------------------------------------------|------------------------------------|-----------------------------------------|------------------------|------------|-----|------|---------------|-----|----------------|-----|------|
|                                          |                                                                     | V <sub>I</sub> (V)                 | I <sub>O</sub> (mA)                     |                        | MIN        | TYP | MAX  | MIN           | MAX | MIN            | MAX |      |
| HC TYPES                                 |                                                                     |                                    |                                         |                        |            |     |      |               |     |                |     |      |
| V <sub>IH</sub> High level input voltage |                                                                     |                                    |                                         | 2                      | 1.5        |     |      | 1.5           |     | 1.5            |     | V    |
|                                          |                                                                     |                                    |                                         | 4.5                    | 3.15       |     |      | 3.15          |     | 3.15           |     |      |
|                                          |                                                                     |                                    |                                         | 6                      | 4.2        |     |      | 4.2           |     | 4.2            |     |      |
| V <sub>IL</sub> Low level input voltage  |                                                                     |                                    |                                         | 2                      | 0.5        |     |      | 0.5           |     | 0.5            |     | V    |
|                                          |                                                                     |                                    |                                         | 4.5                    | 1.35       |     |      | 1.35          |     | 1.35           |     |      |
|                                          |                                                                     |                                    |                                         | 6                      | 1.8        |     |      | 1.8           |     | 1.8            |     |      |
| V <sub>OH</sub>                          | High level output voltage CMOS loads                                | V <sub>IH</sub> or V <sub>IL</sub> | -0.02                                   | 2                      | 1.9        |     |      | 1.9           |     | 1.9            |     | V    |
|                                          |                                                                     |                                    | -0.02                                   | 4.5                    | 4.4        |     |      | 4.4           |     | 4.4            |     |      |
|                                          |                                                                     |                                    | -0.02                                   | 6                      | 5.9        |     |      | 5.9           |     | 5.9            |     |      |
|                                          | High level output voltage TTL loads                                 |                                    | -6                                      | 4.5                    | 3.98       |     |      | 3.84          |     | 3.7            |     |      |
|                                          |                                                                     |                                    | -7.8                                    | 6                      | 5.48       |     |      | 5.34          |     | 5.2            |     |      |
| V <sub>OL</sub>                          | Low level output voltage CMOS loads                                 | V <sub>IH</sub> or V <sub>IL</sub> | 0.02                                    | 2                      | 0.1        |     |      | 0.1           |     | 0.1            |     | V    |
|                                          |                                                                     |                                    | 0.02                                    | 4.5                    | 0.1        |     |      | 0.1           |     | 0.1            |     |      |
|                                          |                                                                     |                                    | 0.02                                    | 6                      | 0.1        |     |      | 0.1           |     | 0.1            |     |      |
|                                          | Low level output voltage TTL loads                                  | 6                                  | 4.5                                     | 0.26                   |            |     | 0.33 |               | 0.4 |                |     |      |
|                                          |                                                                     | 7.8                                | 6                                       | 0.26                   |            |     | 0.33 |               | 0.4 |                |     |      |
| I <sub>I</sub>                           | Input leakage current                                               | V <sub>CC</sub> or GND             |                                         | 6                      | ±0.1       |     |      | ±1            |     | ±1             |     | µA   |
| I <sub>CC</sub>                          | Quiescent device current                                            | V <sub>CC</sub> or GND             | 0                                       | 6                      | 8          |     |      | 80            |     | 160            |     | µA   |
| I <sub>OZ</sub>                          | Three-state leakage current                                         | V <sub>IH</sub> or V <sub>IL</sub> | V <sub>O</sub> = V <sub>CC</sub> or GND | 6                      | ±0.5       |     |      | ±5            |     | ±10            |     | µA   |
| HCT TYPES                                |                                                                     |                                    |                                         |                        |            |     |      |               |     |                |     |      |
| V <sub>IH</sub> High level input voltage |                                                                     |                                    |                                         | 4.5 to 5.5             | 2          |     |      | 2             |     | 2              |     | V    |
| V <sub>IL</sub> Low level input voltage  |                                                                     |                                    |                                         | 4.5 to 5.5             | 0.8        |     |      | 0.8           |     | 0.8            |     | V    |
| V <sub>OH</sub>                          | High level output voltage CMOS loads                                | V <sub>IH</sub> or V <sub>IL</sub> | -0.02                                   | 4.5                    | 4.4        |     |      | 4.4           |     | 4.4            |     | V    |
|                                          | High level output voltage TTL loads                                 |                                    | -4                                      | 4.5                    | 3.98       |     |      | 3.84          |     | 3.7            |     |      |
| V <sub>OL</sub>                          | Low level output voltage CMOS loads                                 | V <sub>IH</sub> or V <sub>IL</sub> | 0.02                                    | 4.5                    | 0.1        |     |      | 0.1           |     | 0.1            |     | V    |
|                                          | Low level output voltage TTL loads                                  |                                    | 4                                       | 4.5                    | 0.26       |     |      | 0.33          |     | 0.4            |     |      |
| I <sub>I</sub>                           | Input leakage current                                               | V <sub>CC</sub> or GND             | 0                                       | 5.5                    | ±0.1       |     |      | ±1            |     | ±1             |     | µA   |
| I <sub>CC</sub>                          | Quiescent device current                                            | V <sub>CC</sub> or GND             | 0                                       | 5.5                    | 8          |     |      | 80            |     | 160            |     | µA   |
| ΔI <sub>CC</sub>                         | Additional supply current per input pin: 1 Unit Load <sup>(1)</sup> | V <sub>CC</sub> - 2.1              |                                         | 4.5 to 5.5             | 100    360 |     |      | 450           |     | 490            |     | µA   |
| I <sub>OZ</sub>                          | Three-state leakage current                                         | V <sub>IL</sub> or V <sub>IH</sub> | V <sub>O</sub> = V <sub>CC</sub> or GND | 5.5                    | ±0.5       |     |      | ±5            |     | ±10            |     | µA   |

(1) For dual-supply systems theoretical worst case (V<sub>I</sub> = 2.4 V, V<sub>CC</sub> = 5.5 V) specification is 1.8 mA

## 5.5 HCT Input Loading Table

| Input            | Unit Loads <sup>(1)</sup> |
|------------------|---------------------------|
| $\overline{OE}1$ | 0.6                       |
| All others       | 0.55                      |

(1) Unit Load is  $\Delta I_{CC}$  limit specified in セクション 5.4, e.g., 360  $\mu A$  max at 25°C.

## 5.6 Switching Characteristics

$t_r, t_f = 6$  ns

| PARAMETER                           |                                                              | TEST CONDITIONS        | V <sub>CC</sub> (V) | 25°C |     | 40°C to 85°C | 55°C to 125°C | UNIT |
|-------------------------------------|--------------------------------------------------------------|------------------------|---------------------|------|-----|--------------|---------------|------|
|                                     |                                                              |                        |                     | TYP  | MAX | MAX          | MAX           |      |
| HC TYPES                            |                                                              |                        |                     |      |     |              |               |      |
| t <sub>PLH</sub> , t <sub>PHL</sub> | Propagation delay, data to outputs<br>HC/HCT 365             | C <sub>L</sub> = 50 pF | 2                   | 105  | 130 | 160          | ns            |      |
|                                     |                                                              |                        | 4.5                 | 21   | 26  | 32           | ns            |      |
|                                     |                                                              |                        | 6                   | 18   | 22  | 27           | ns            |      |
|                                     |                                                              | C <sub>L</sub> = 15 pF | 5                   | 8    |     |              | ns            |      |
| t <sub>PLH</sub> , t <sub>PHL</sub> | Propagation delay, data to outputs<br>HC 366                 | C <sub>L</sub> = 50 pF | 2                   | 110  | 140 | 165          | ns            |      |
|                                     |                                                              |                        | 4.5                 | 22   | 28  | 33           | ns            |      |
|                                     |                                                              |                        | 6                   | 19   | 24  | 28           | ns            |      |
|                                     |                                                              | C <sub>L</sub> = 15 pF | 5                   | 9    |     |              | ns            |      |
| t <sub>PLH</sub> , t <sub>PHL</sub> | Propagation delay time, output enable and disable to outputs | C <sub>L</sub> = 50 pF | 2                   | 150  | 190 | 225          | ns            |      |
|                                     |                                                              |                        | 4.5                 | 30   | 38  | 45           | ns            |      |
|                                     |                                                              |                        | 6                   | 26   | 33  | 38           | ns            |      |
|                                     |                                                              | C <sub>L</sub> = 15 pF | 5                   | 12   |     |              | ns            |      |
| t <sub>TLH</sub> , t <sub>THL</sub> | Output transition time                                       | C <sub>L</sub> = 50 pF | 2                   | 60   | 75  | 90           | ns            |      |
|                                     |                                                              |                        | 4.5                 | 12   | 15  | 18           | ns            |      |
|                                     |                                                              |                        | 6                   | 10   | 13  | 15           | ns            |      |
| C <sub>I</sub>                      | Input capacitance                                            |                        |                     | 10   | 10  | 10           | pF            |      |
| C <sub>O</sub>                      | Three-state ouput capacitance                                |                        |                     | 20   | 20  | 20           | pF            |      |
| C <sub>PD</sub>                     | Power dissipation capacitance <sup>(1)(2)</sup>              |                        | 5                   | 40   |     |              | pF            |      |
| HCT TYPES                           |                                                              |                        |                     |      |     |              |               |      |
| t <sub>PLH</sub> , t <sub>PHL</sub> | Propagation delay, data to outputs<br>HC/HCT 365             | C <sub>L</sub> = 50 pF | 4.5                 | 25   | 31  | 38           | ns            |      |
|                                     |                                                              |                        |                     |      |     |              | ns            |      |
|                                     |                                                              | C <sub>L</sub> = 15 pF | 5                   | 9    |     |              | ns            |      |
|                                     |                                                              |                        |                     |      |     |              | ns            |      |
| t <sub>PLH</sub> , t <sub>PHL</sub> | Propagation delay, data to outputs<br>HC 366                 | C <sub>L</sub> = 50 pF | 4.5                 | 27   | 34  | 41           | ns            |      |
|                                     |                                                              | C <sub>L</sub> = 15 pF | 5                   | 11   |     |              | ns            |      |
| t <sub>PLH</sub> , t <sub>PHL</sub> | Propagation delay time, output enable and disable to ouputs  | C <sub>L</sub> = 50 pF | 4.5                 | 35   | 44  | 53           | ns            |      |
|                                     |                                                              | C <sub>L</sub> = 15 pF | 5                   | 14   |     |              | ns            |      |
| t <sub>TLH</sub> , t <sub>THL</sub> | Output transition time                                       | C <sub>L</sub> = 50 pF | 4.5                 | 12   | 15  | 18           | ns            |      |
| C <sub>IN</sub>                     | Input capacitance                                            |                        |                     | 10   | 10  | 10           | pF            |      |
| C <sub>O</sub>                      | Three-stage capacitance                                      |                        |                     | 20   | 20  | 20           | pF            |      |
| C <sub>PD</sub>                     | Power dissipation capacitance <sup>(1)(2)</sup>              |                        | 5                   | 42   |     |              | pF            |      |

(1)  $C_{PD}$  is used to determine the dynamic power consumption, per buffer.

(2)  $P_D = V_{CC}^2 f_i (C_{PD} + C_I)$  where  $f_i$  = input frequency,  $C_L$  = output load capacitance,  $V_{CC}$  = supply voltage.

## 6 Parameter Measurement Information

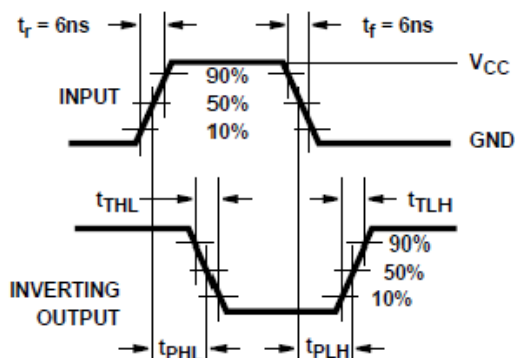


FIG 6-1. HC Transition Times and Propagation Delay Times, Combination Logic

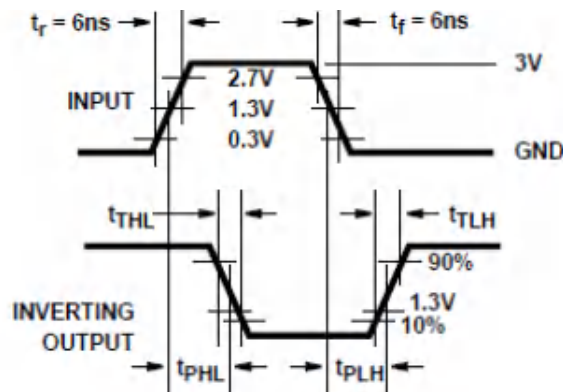


FIG 6-2. HCT Transition Times and Propagation Delay Times, Combination Logic

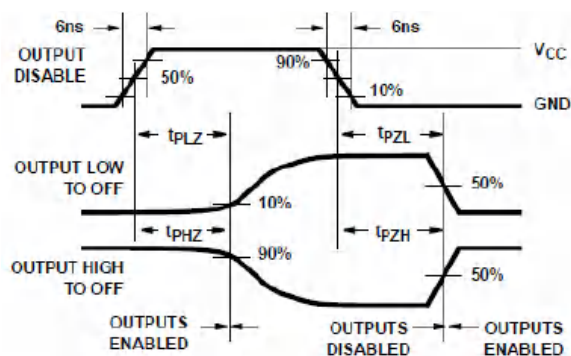


FIG 6-3. HC Three-State Propagation Delay Waveform

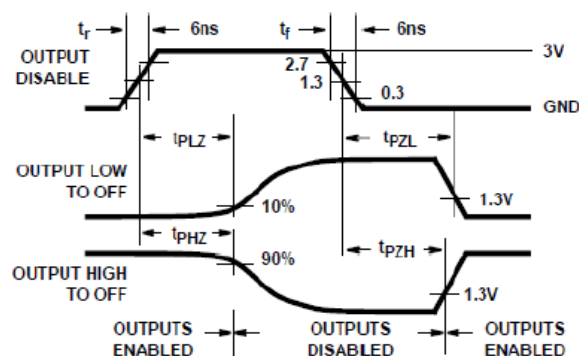
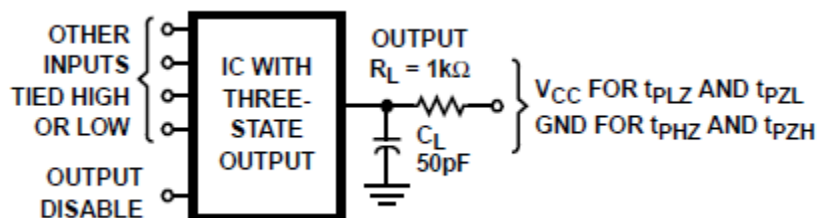


FIG 6-4. HCT Three-State Propagation Delay Waveform



- A. Open drain waveforms  $t_{PLZ}$  and  $t_{PZL}$  are the same as those for three-state shown on the left. The test circuit is output  $R_L = 1\text{ k}\Omega$  to  $V_{CC}$ ,  $C_L = 50\text{ pF}$ .

FIG 6-5. HC and HCT Three-State Propagation Delay Test Circuit

## 7 Detailed Description

### 7.1 Overview

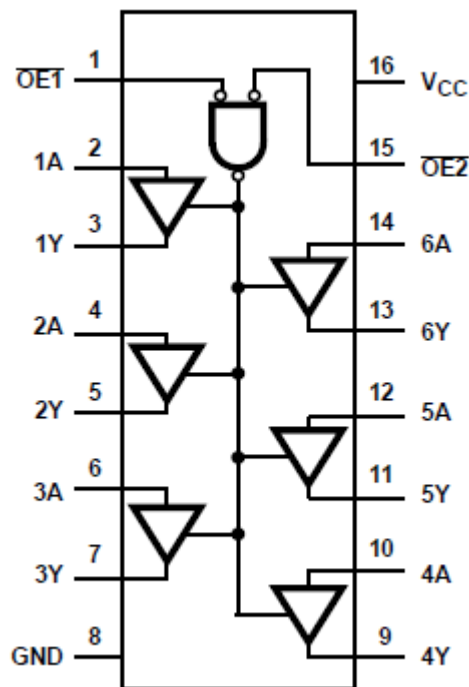
The 'HC365, 'HCT365, and 'HC366 silicon gate CMOS three-state buffers are general purpose high-speed non-inverting and inverting buffers. They have high drive current outputs which enable high speed operation even when driving large bus capacitances. These circuits possess the low power dissipation of CMOS circuitry, yet have speeds comparable to low power Schottky TTL circuits. Both circuits are capable of driving up to 15 low power Schottky inputs.

The 'HC365 and 'HCT365 are non-inverting buffers, whereas the 'HC366 is an inverting buffer. These devices have two three-state control inputs ( $\overline{OE}1$  and  $\overline{OE}2$ ) which are NORed together to control all six gates.

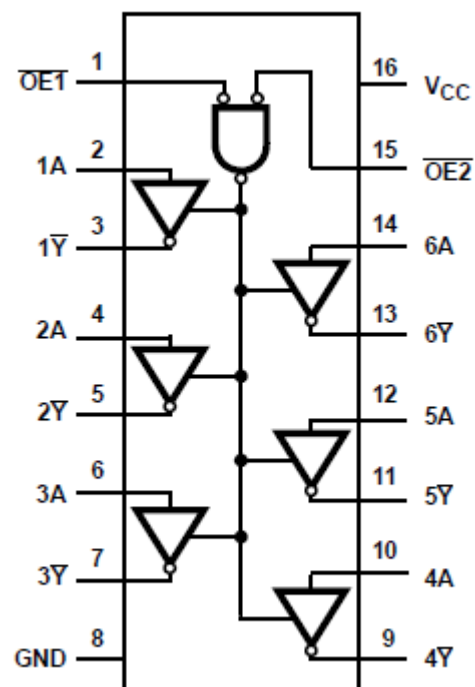
The 'HCT365 logic families are speed, function and pin compatible with the standard LS logic family.

### 7.2 Functional Block Diagram

#### Functional Diagrams



HC365, HCT365



HC366

### 7.3 Device Functional Modes

表 7-1. Function Table

| INPUTS <sup>(1)</sup> |                  |   | OUTPUTS (Y) <sup>(2)</sup> |         |
|-----------------------|------------------|---|----------------------------|---------|
| $\overline{OE}1$      | $\overline{OE}2$ | A | HC/HCT 365                 | HCT 366 |
| L                     | L                | L | L                          | H       |
| L                     | L                | H | H                          | L       |
| X                     | H                | X | Z                          | Z       |
| H                     | X                | X | Z                          | Z       |

(1) H = High Voltage Level, L = Low Voltage Level, X = Don't Care

(2) H = Driving High, L = Driving Low, Z = High Impedance State

## 8 Power Supply Recommendations

The power supply can be any voltage between the minimum and maximum supply voltage rating located in the *Recommended Operating Conditions*. Each  $V_{CC}$  terminal should have a good bypass capacitor to prevent power disturbance. A 0.1- $\mu$ F capacitor is recommended for this device. It is acceptable to parallel multiple bypass caps to reject different frequencies of noise. The 0.1- $\mu$ F and 1- $\mu$ F capacitors are commonly used in parallel. The bypass capacitor should be installed as close to the power terminal as possible for best results.

## 9 Layout

### 9.1 Layout Guidelines

When using multiple-input and multiple-channel logic devices inputs must not ever be left floating. In many cases, functions or parts of functions of digital logic devices are unused; for example, when only two inputs of a triple-input AND gate are used or only 3 of the 4 buffer gates are used. Such unused input pins must not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. All unused inputs of digital logic devices must be connected to a logic high or logic low voltage, as defined by the input voltage specifications, to prevent them from floating. The logic level that must be applied to any particular unused input depends on the function of the device. Generally, the inputs are tied to GND or  $V_{CC}$ , whichever makes more sense for the logic function or is more convenient.

## 10 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

### 10.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on [ti.com](http://ti.com). Click on *Subscribe to updates* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

### 10.2 サポート・リソース

**TI E2E™ サポート・フォーラム**は、エンジニアが検証済みの回答と設計に関するヒントをエキスパートから迅速かつ直接得ることができる場所です。既存の回答を検索したり、独自の質問をしたりすることで、設計に必要な支援を迅速に得ることができます。

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### 10.3 Trademarks

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### 10.4 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

### 10.5 Glossary

[TI Glossary](#) This glossary lists and explains terms, acronyms, and definitions.

## 11 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

## PACKAGING INFORMATION

| Orderable part number         | Status<br>(1) | Material type<br>(2) | Package   Pins | Package qty   Carrier | RoHS<br>(3) | Lead finish/<br>Ball material<br>(4) | MSL rating/<br>Peak reflow<br>(5) | Op temp (°C) | Part marking<br>(6)            |
|-------------------------------|---------------|----------------------|----------------|-----------------------|-------------|--------------------------------------|-----------------------------------|--------------|--------------------------------|
| <a href="#">CD54HC365F3A</a>  | Active        | Production           | CDIP (J)   16  | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8500101EA<br>CD54HC365F3A      |
| <a href="#">CD54HC366F3A</a>  | Active        | Production           | CDIP (J)   16  | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 5962-8682801EA<br>CD54HC366F3A |
| <a href="#">CD54HCT365F3A</a> | Active        | Production           | CDIP (J)   16  | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | CD54HCT365F3A                  |
| <a href="#">CD74HC365E</a>    | Active        | Production           | PDIP (N)   16  | 25   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -55 to 125   | CD74HC365E                     |
| <a href="#">CD74HC365M</a>    | Obsolete      | Production           | SOIC (D)   16  | -                     | -           | Call TI                              | Call TI                           | -55 to 125   | HC365M                         |
| <a href="#">CD74HC365M96</a>  | Active        | Production           | SOIC (D)   16  | 2500   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -55 to 125   | HC365M                         |
| <a href="#">CD74HC365MT</a>   | Obsolete      | Production           | SOIC (D)   16  | -                     | -           | Call TI                              | Call TI                           | -55 to 125   | HC365M                         |
| <a href="#">CD74HC366E</a>    | Active        | Production           | PDIP (N)   16  | 25   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -55 to 125   | CD74HC366E                     |
| <a href="#">CD74HC366M</a>    | Obsolete      | Production           | SOIC (D)   16  | -                     | -           | Call TI                              | Call TI                           | -55 to 125   | HC366M                         |
| <a href="#">CD74HC366M96</a>  | Active        | Production           | SOIC (D)   16  | 2500   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -55 to 125   | HC366M                         |
| <a href="#">CD74HCT365E</a>   | Active        | Production           | PDIP (N)   16  | 25   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -55 to 125   | CD74HCT365E                    |
| <a href="#">CD74HCT365M</a>   | Obsolete      | Production           | SOIC (D)   16  | -                     | -           | Call TI                              | Call TI                           | -55 to 125   | HCT365M                        |
| <a href="#">CD74HCT365M96</a> | Active        | Production           | SOIC (D)   16  | 2500   LARGE T&R      | Yes         | NIPDAU   SN                          | Level-1-260C-UNLIM                | -55 to 125   | HCT365M                        |

<sup>(1)</sup> **Status:** For more details on status, see our [product life cycle](#).

<sup>(2)</sup> **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

<sup>(3)</sup> **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

<sup>(4)</sup> **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

<sup>(5)</sup> **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

<sup>(6)</sup> **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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**OTHER QUALIFIED VERSIONS OF CD54HC365, CD54HC366, CD54HCT365, CD74HC365, CD74HC366, CD74HCT365 :**

- Catalog : [CD74HC365](#), [CD74HC366](#), [CD74HCT365](#)
- Automotive : [CD74HC366-Q1](#), [CD74HC366-Q1](#)
- Military : [CD54HC365](#), [CD54HC366](#), [CD54HCT365](#)

**NOTE: Qualified Version Definitions:**

- Catalog - TI's standard catalog product
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Military - QML certified for Military and Defense Applications

## 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 |
|---------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| CD74HC365M96  | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| CD74HC366M96  | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| CD74HCT365M96 | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |

## TAPE AND REEL BOX DIMENSIONS



\*All dimensions are nominal

| Device        | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|---------------|--------------|-----------------|------|------|-------------|------------|-------------|
| CD74HC365M96  | SOIC         | D               | 16   | 2500 | 353.0       | 353.0      | 32.0        |
| CD74HC366M96  | SOIC         | D               | 16   | 2500 | 353.0       | 353.0      | 32.0        |
| CD74HCT365M96 | SOIC         | D               | 16   | 2500 | 356.0       | 356.0      | 35.0        |

## TUBE



\*All dimensions are nominal

| Device      | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (μm) | B (mm) |
|-------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| CD74HC365E  | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| CD74HC365E  | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| CD74HC366E  | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| CD74HC366E  | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| CD74HCT365E | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| CD74HCT365E | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - $\triangle C$  Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
  - $\triangle D$  Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
  - E. Reference JEDEC MS-012 variation AC.

J (R-GDIP-T\*\*)

14 LEADS SHOWN

# CERAMIC DUAL IN-LINE PACKAGE



| PINS **<br>DIM | 14                     | 16                     | 18                     | 20                     |
|----------------|------------------------|------------------------|------------------------|------------------------|
| A              | 0.300<br>(7,62)<br>BSC | 0.300<br>(7,62)<br>BSC | 0.300<br>(7,62)<br>BSC | 0.300<br>(7,62)<br>BSC |
| B MAX          | 0.785<br>(19,94)       | .840<br>(21,34)        | 0.960<br>(24,38)       | 1.060<br>(26,92)       |
| B MIN          | —                      | —                      | —                      | —                      |
| C MAX          | 0.300<br>(7,62)        | 0.300<br>(7,62)        | 0.310<br>(7,87)        | 0.300<br>(7,62)        |
| C MIN          | 0.245<br>(6,22)        | 0.245<br>(6,22)        | 0.220<br>(5,59)        | 0.245<br>(6,22)        |



4040083/F 03/03

- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. This package is hermetically sealed with a ceramic lid using glass frit.
  - D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
  - E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

## N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE



| PINS **             | 14               | 16               | 18               | 20               |
|---------------------|------------------|------------------|------------------|------------------|
| DIM                 |                  |                  |                  |                  |
| A MAX               | 0.775<br>(19,69) | 0.775<br>(19,69) | 0.920<br>(23,37) | 1.060<br>(26,92) |
| A MIN               | 0.745<br>(18,92) | 0.745<br>(18,92) | 0.850<br>(21,59) | 0.940<br>(23,88) |
| MS-001<br>VARIATION | AA               | BB               | AC               | AD               |



14/18 Pin Only  
20 Pin vendor option

4040049/E 12/2002

- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
  - The 20 pin end lead shoulder width is a vendor option, either half or full width.

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郵送先住所：Texas Instruments, Post Office Box 655303, Dallas, Texas 75265  
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