

CDx4HC251、CDx4HCT251 具有三态输出的高速 CMOS 逻辑 8 输入多路复用器

1 特性

- 选择一个二进制数据输入 (共八个)
- 三态输出能力
- 真互补输出
- 当 $V_{CC} = 5V$, $C_L = 15pF$, $T_A = 25^\circ C$ 时的传播延迟典型值为 14ns (数据到输出)
- 扇出 (在温度范围内)
 - 标准输出: 10 个 LSTTL 负载
 - 总线驱动器输出: 15 个 LSTTL 负载
- 宽工作温度范围: $-55^\circ C$ 至 $125^\circ C$
- 平衡的传播延迟及转换时间
- 与 LSTTL 逻辑 IC 相比, 功耗显著降低
- 备选制造商为 Philips (飞利浦)
- HC 类型
 - 工作电压为 2V 至 6V
 - 高抗噪性: 当 $V_{CC} = 5V$ 时, $N_{IL} = 30\%$, $N_{IH} = V_{CC}$ 的 30 %
- HCT 类型
 - 工作电压为 4.5V 至 5.5V
 - 直接 LSTTL 输入逻辑兼容性, $V_{IL} = 0.8V$ (最大值), $V_{IH} = 2V$ (最小值)
 - CMOS 输入兼容性, 当电压为 V_{OL} 、 V_{OH} 时, $I_I \leq 1\mu A$

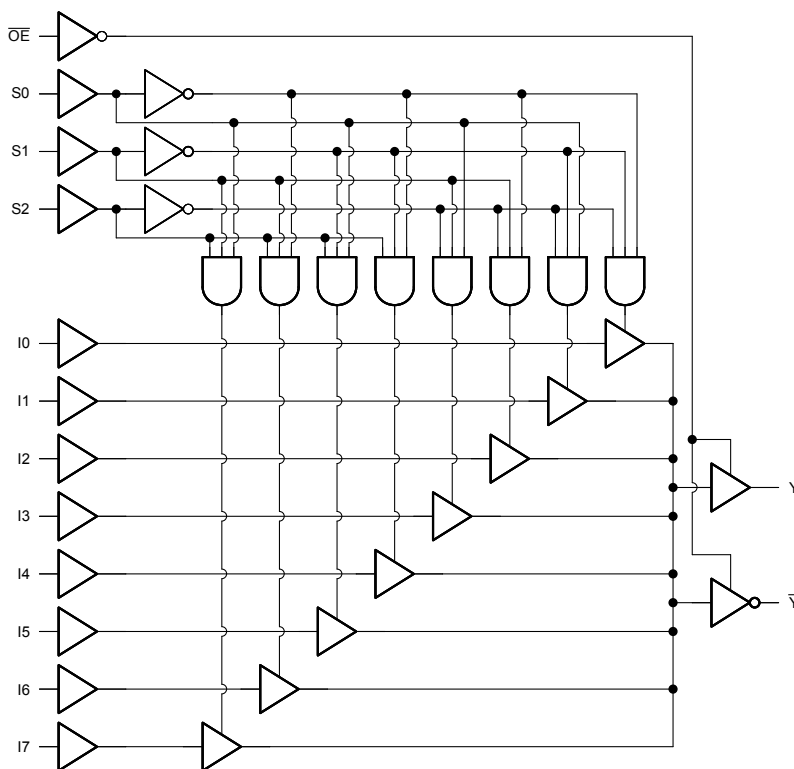
2 说明

'HC251 和 'HCT251 是具有三态输出的 8 通道数字多路复用器, 采用高速硅栅 CMOS 技术制造。它们具有标准 CMOS 集成电路的低功耗特性, 还能够驱动 10 个 LSTTL 负载。由于具有三态特性, 在总线系统中将它们与总线连接是理想做法。

器件信息

| 器件型号 | 封装 ⁽¹⁾ | 封装尺寸 (标称值) |
|-------------|-------------------|------------------|
| CD54HC251F | CDIP (16) | 24.38mm × 6.92mm |
| CD54HCT251F | CDIP (16) | 24.38mm × 6.92mm |
| CD74HC251M | SOIC (16) | 9.90mm × 3.90mm |
| CD74HCT251M | SOIC (16) | 9.90mm × 3.90mm |
| CD74HC251E | PDIP (16) | 19.31mm × 6.35mm |
| CD74HCT251E | PDIP (16) | 19.31mm × 6.35mm |

(1) 如需了解所有可用封装, 请参阅数据表末尾的可订购产品附录。



功能方框图



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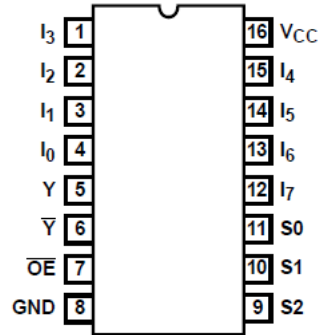
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3 Revision History

注：以前版本的页码可能与当前版本的页码不同

| Changes from Revision C (October 2003) to Revision D (March 2022) | Page |
|--|-------------|
| • 更新了整个文档中的编号、格式、表格、图和交叉参考，以反映现代数据表标准..... | 1 |

4 Pin Configuration and Functions



J, N, or D Package
16-Pin CDIP, PDIP, or SOIC
Top View

5 Specifications

5.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)⁽¹⁾

| | | MIN | MAX | UNIT |
|--|--|--|-----|--------|
| V _{CC} | Supply voltage range | -0.5 | 7 | V |
| I _{IK} | Input diode current ⁽²⁾ | V _I < 0.5 V or V _I > V _{CC} + 0.5 V | | ±20 mA |
| I _{OK} | Output diode current ⁽²⁾ | V _O < - 0.5 V or V _O > V _{CC} + 0.5 V | | ±20 mA |
| I _O | Drain current, per output | - 0.5 V < V _O < V _{CC} + 0.5 V | | ±25 mA |
| I _O | Output source or sink current per output pin | V _O > - 0.5 V or V _O < V _{CC} + 0.5 V | | ±25 mA |
| Continuous current through V _{CC} or GND | | | | ±50 mA |
| T _J | Junction temperature | | | 150 °C |
| T _{stg} | Storage temperature | -65 | 150 | °C |
| Lead temperature (Soldering 10s) (SOIC - lead tips only) | | | | 300 °C |

- 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.
- The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

5.2 Recommended Operating Conditions⁽¹⁾

| | | MIN | MAX | UNIT | |
|---------------------------------|----------------------------|-----------|-----------------|------|---|
| V _{CC} | Supply voltage range | HC Types | 2 | 6 | V |
| | | HCT Types | 4.5 | 5.5 | V |
| V _I , V _O | DC input or output voltage | 0 | V _{CC} | V | |
| t _t | Input rise and fall time | 2 V | 1000 | ns | |
| | | 4.5 V | 500 | | |
| | | 6 V | 400 | | |
| T _A | Temperature range | - 55 | 125 | °C | |

- All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report *Implications of Slow or Floating SMOS Inputs*, literature number [SCBA004](#).

5.3 Thermal Information

| THERMAL METRIC | | D (SOIC) | N (PDIP) | UNIT |
|------------------|---|----------|----------|------|
| | | 16 PINS | 16 PINS | |
| R _{θJA} | Junction-to-ambient thermal resistance ⁽¹⁾ | 67 | 73 | °C/W |

- For more information about traditional and new thermal metrics, see the [Semiconductor and IC package thermal metrics](#) application report.

5.4 Electrical Characteristics

| PARAMETER | TEST CONDITIONS ⁽¹⁾ | V _{CC} (V) | 25°C | | | - 40°C to 85°C | | - 55°C to 125°C | | UNIT |
|-------------------------------------|---|---------------------------|------------|------|---------|----------------|--------|-----------------|--------|------|
| | | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| HC TYPES | | | | | | | | | | |
| V _{IH} | High-level input voltage | | 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 |
| V _{IL} | Low-level input voltage | | 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 |
| V _{OH} | High-level output voltage CMOS loads | I _{OH} = - 20 μA | 2 | 1.9 | | 1.9 | | 1.9 | | V |
| | | I _{OH} = - 20 μA | 4.5 | 4.4 | | 4.4 | | 4.4 | | V |
| | | I _{OH} = - 20 μA | 6 | 5.9 | | 5.9 | | 5.9 | | V |
| | High-level output voltage TTL loads | I _{OH} = - 6mA | 4.5 | 3.98 | | 3.84 | | 3.7 | | V |
| | | I _{OH} = - 7.8mA | 6 | 5.48 | | 5.34 | | 5.2 | | V |
| V _{OL} | Low-level output voltage CMOS loads | I _{OL} = 20 μA | 2 | | 0.1 | | 0.1 | | 0.1 | V |
| | | I _{OL} = 20 μA | 4.5 | | 0.1 | | 0.1 | | 0.1 | V |
| | | I _{OL} = 20 μA | 6 | | 0.1 | | 0.1 | | 0.1 | V |
| | Low-level output voltage TTL loads | I _{OL} = 6mA | 4.5 | | 0.26 | | 0.33 | | 0.4 | V |
| | | I _{OL} = 7.8mA | 6 | | 0.26 | | 0.33 | | 0.4 | V |
| I _I | Input leakage current | V _{CC} or GND | 6 | | ±0.1 | | ±1 | | ±1 | μA |
| I _{CC} | Supply current | V _{CC} or GND | 6 | | 8 | | 80 | | 160 | μA |
| I _{OZ} | Three-state leakage current | | 6 | | ±0.5 | | ±0.5 | | ±10 | μA |
| HCT TYPES | | | | | | | | | | |
| V _{IH} | High-level input voltage | | 4.5 to 5.5 | 2 | | 2 | | 2 | | V |
| V _{IL} | Low-level input voltage | | 4.5 to 5.5 | | 0.8 | | 0.8 | | 0.8 | V |
| V _{OH} | High-level output voltage CMOS loads | I _{OH} = - 20 μA | 4.5 | 4.4 | | 4.4 | | 4.4 | | V |
| | High-level output voltage TTL loads | I _{OH} = - 6mA | 4.5 | 3.98 | | 3.84 | | 3.7 | | V |
| V _{OL} | Low-level output voltage CMOS loads | I _{OL} = 20 μA | 4.5 | | 0.1 | | 0.1 | | 0.1 | V |
| | Low-level output voltage TTL loads | I _{OL} = 6mA | 4.5 | | 0.26 | | 0.33 | | 0.4 | V |
| I _I | Input leakage current | V _{CC} and GND | 5.5 | | ±0.1 | | ±1 | | ±1 | μA |
| I _{CC} | Supply Current | V _{CC} and GND | 5.5 | | 8 | | 80 | | 160 | μA |
| I _{OZ} | Three-state leakage current | | 6 | | ±0.5 | | ±5.0 | | ±10 | μA |
| ΔI _{CC} ^{(2) (3)} | Additional supply current per input pin | S0, S1, S2 | 4.5 to 5.5 | | 55 198 | | 247.5 | | 269.5 | μA |
| | | I0 - I7 | 4.5 to 5.5 | | 50 180 | | 225 | | 245 | μA |
| | | OE | 4.5 to 5.5 | | 265 954 | | 1192.5 | | 1298.5 | μA |

(1) V_I = V_{IH} or V_{IL}, unless otherwise noted.

- (2) For dual-supply systems theoretical worst case ($V_I = 2.4\text{ V}$, $V_{CC} = 5.5\text{ V}$) specification is 1.8 mA..
 (3) Inputs held at $V_{CC} - 2.1$.

5.5 Switching Characteristics

Input $t_i = 6\text{ ns}$. Unless otherwise specified, $C_L = 50\text{ pF}$

| PARAMETER | | V_{CC} (V) | 25°C | | -40°C to 85°C | -55°C to 125°C | UNIT |
|-----------------------------|---|--------------|-------------------|-----|---------------|----------------|------|
| | | | TYP | MAX | MAX | MAX | |
| HC TYPES | | | | | | | |
| t_{pd} | Select to outputs | 2 | | 245 | 305 | 370 | ns |
| | | 4.5 | 21 ⁽¹⁾ | 49 | 61 | 74 | |
| | | 6 | | 42 | 52 | 63 | |
| t_{pd} | Data to outputs | 2 | | 175 | 220 | 265 | ns |
| | | 4.5 | 12 ⁽¹⁾ | 35 | 44 | 53 | |
| | | 6 | | 30 | 37 | 45 | |
| t_{pd} | Enable to high Z and enable from high Z | 2 | | 140 | 175 | 210 | ns |
| | | 4.5 | 11 ⁽¹⁾ | 28 | 35 | 42 | |
| | | 6 | | 24 | 30 | 36 | |
| t_t | Output transition times | 2 | | 75 | 95 | 110 | ns |
| | | 4.5 | | 15 | 19 | 22 | |
| | | 6 | | 13 | 16 | 19 | |
| C_i | Input capacitance | | | 10 | 10 | 10 | pF |
| C_O | Three-state output capacitance | | | 15 | 15 | 15 | pF |
| C_{pd} ^{(3) (4)} | Power dissipation capacitance | 5 | 60 ⁽²⁾ | | | | pF |
| HCT TYPES | | | | | | | |
| t_{pd} | Select to outputs | 4.5 | 18 ⁽¹⁾ | 42 | 53 | 63 | ns |
| t_{pd} | Data to outputs | 4.5 | 12 ⁽¹⁾ | 35 | 44 | 53 | ns |
| t_{pd} | Enable to high Z and enable from high Z | 4.5 | 12 ⁽¹⁾ | 30 | 38 | 45 | ns |
| t_t | Output transition times | 4.5 | | 15 | 19 | 22 | ns |
| C_i | Input capacitance | | | 10 | 10 | 10 | pF |
| C_{pd} ^{(3) (4)} | Power dissipation capacitance | 5 | 60 ⁽²⁾ | | | | pF |

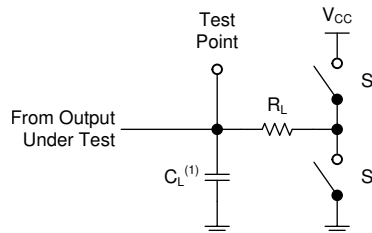
- (1) Typical value tested at 5V, $C_L = 15\text{ pF}$.
 (2) Typical value tested at 5V.
 (3) C_{PD} is used to determine the dynamic power consumption, per channel.
 (4) $P_D = V_{CC}^2 f_i (C_{PD} + C_L)$ where f_i = input frequency, C_L = output load capacitance, V_{CC} = supply voltage.

6 Parameter Measurement Information

Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1 \text{ MHz}$, $Z_O = 50 \Omega$, $t_t < 6 \text{ ns}$.

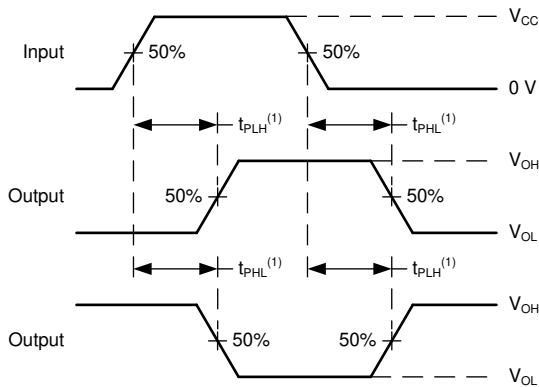
For clock inputs, f_{max} is measured when the input duty cycle is 50%.

The outputs are measured one at a time with one input transition per measurement.



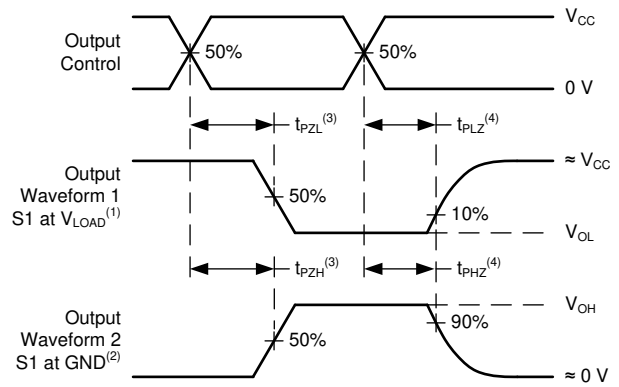
(1) C_L includes probe and test-fixture capacitance.

图 6-1. Load Circuit for 3-State Outputs



(1) The greater between t_{PLH} and t_{PHL} is the same as t_{pd} .

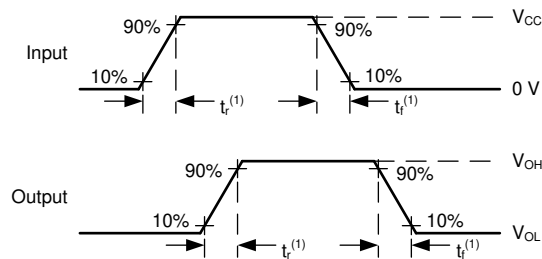
图 6-2. Voltage Waveforms, Propagation Delays for Standard CMOS Inputs



(1) t_{PZL} and t_{PHZ} are the same as t_{dis} .

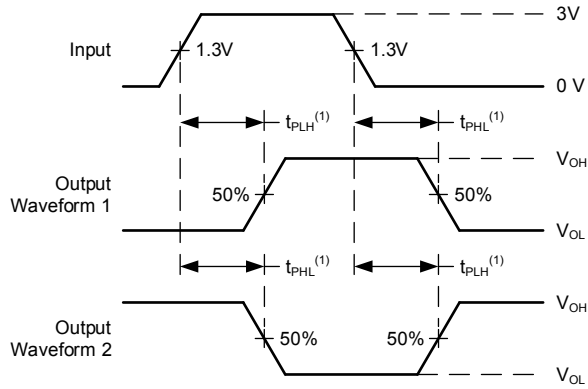
(2) t_{PZL} and t_{PHZ} are the same as t_{en} .

图 6-3. Voltage Waveforms, Standard CMOS Inputs Propagation Delays



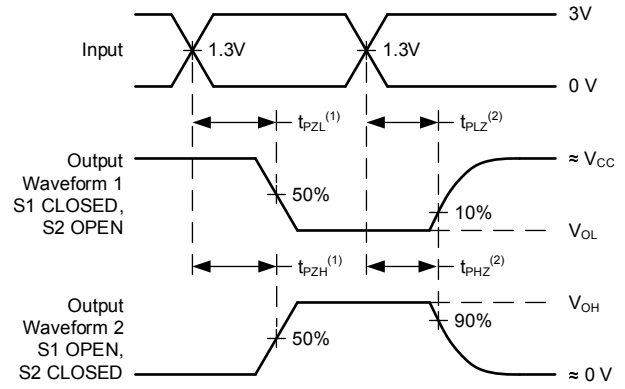
(1) The greater between t_r and t_f is the same as t_t .

图 6-4. Voltage Waveforms, Input and Output Transition Times for Standard CMOS Inputs



(1) The greater between t_{PLH} and t_{PHL} is the same as t_{pd} .

图 6-5. Voltage Waveforms, Propagation Delays for TTL-Compatible Inputs



(1) t_{PLZ} and t_{PHZ} are the same as t_{dis} .

(2) t_{PZL} and t_{PZH} are the same as t_{en} .

图 6-6. Voltage Waveforms, TTL-Compatible CMOS Inputs Propagation Delays

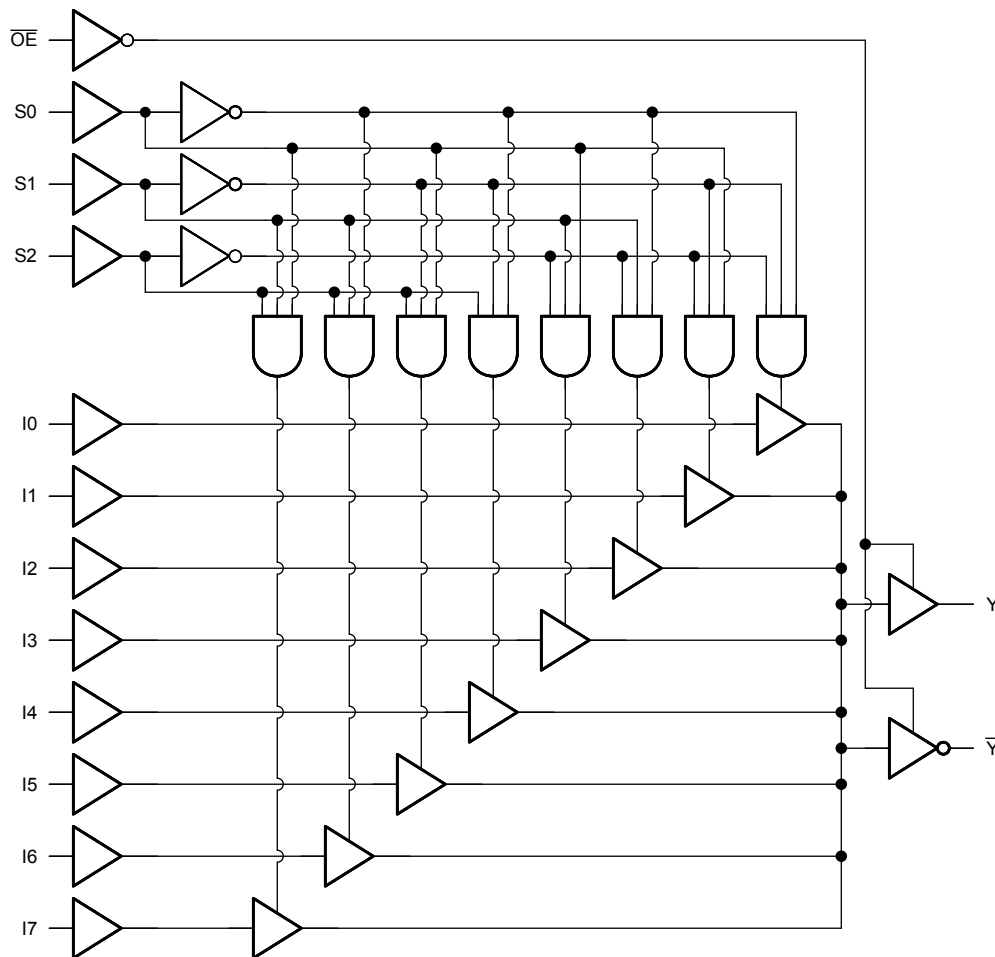
7 Detailed Description

7.1 Overview

The ' HC251 and ' HCT251 are 8-channel digital multiplexers with three-state outputs, fabricated with high-speed silicongate CMOS technology. Together with the low power consumption of standard CMOS integrated circuits, they possess the ability to drive 10 LSTTL loads. The three-state feature makes them ideally suited for interfacing with bus lines in a bus-oriented system.

This multiplexer features both true (Y) and complement (\bar{Y}) outputs as well as an output enable (\overline{OE}) input. The \overline{OE} must be at a low logic level to enable this device. When the \overline{OE} input is high, both outputs are in the high-impedance state. When enabled, address information on the data select inputs determines which data input is routed to the Y and \bar{Y} outputs. The ' HCT251 logic family is speed, function, and pin-compatible with the standard ' LS251.

7.2 Functional Block Diagram



7.3 Device Functional Modes

表 7-1. Truth Table⁽¹⁾

| INPUTS | | | | OUTPUT | |
|--------|----|----|--------------------------------|--------|------------------|
| SELECT | | | OUTPUT CONTROL \overline{OE} | Y | \overline{Y} |
| S2 | S1 | S0 | | | |
| X | X | X | H | Z | Z |
| L | L | L | L | I_0 | \overline{I}_0 |
| L | L | H | L | I_1 | \overline{I}_1 |
| L | H | L | L | I_2 | \overline{I}_2 |
| L | H | H | L | I_3 | \overline{I}_3 |
| H | L | L | L | I_4 | \overline{I}_4 |
| H | L | H | L | I_5 | \overline{I}_5 |
| H | H | L | L | I_6 | \overline{I}_6 |
| H | H | H | L | I_7 | \overline{I}_7 |

- (1) H = High voltage level.
 L = Low voltage level.
 X = Dont care.
 Z = High impedance (Off).
 $I_0, I_1 \dots I_7$ = The level of the respective input.

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- μ F capacitor is recommended for this device. It is acceptable to parallel multiple bypass caps to reject different frequencies of noise. The 0.1- μ F and 1- μ 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 Documentation Support

10.1.1 Related Documentation

10.2 接收文档更新通知

要接收文档更新通知，请导航至 ti.com 上的器件产品文件夹。点击 [订阅更新](#) 进行注册，即可每周接收产品信息更改摘要。有关更改的详细信息，请查看任何已修订文档中包含的修订历史记录。

10.3 支持资源

TI E2E™ [支持论坛](#) 是工程师的重要参考资料，可直接从专家获得快速、经过验证的解答和设计帮助。搜索现有解答或提出自己的问题可获得所需的快速设计帮助。

链接的内容由各个贡献者“按原样”提供。这些内容并不构成 TI 技术规范，并且不一定反映 TI 的观点；请参阅 TI 的 [《使用条款》](#)。

10.4 Trademarks

TI E2E™ is a trademark of Texas Instruments.

所有商标均为其各自所有者的财产。

10.5 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.

10.6 术语表

[TI 术语表](#) 本术语表列出并解释了术语、首字母缩略词和定义。

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 Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead finish/ Ball material (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|------------------|--------------------------------------|----------------------|--------------|--------------------------------------|-------------------------|
| 5962-9052401MEA | ACTIVE | CDIP | J | 16 | 1 | Non-RoHS & Green | SNPB | N / A for Pkg Type | -55 to 125 | 5962-9052401ME A CD54HCT251F3A | Samples |
| CD54HC251F | ACTIVE | CDIP | J | 16 | 1 | Non-RoHS & Green | SNPB | N / A for Pkg Type | -55 to 125 | CD54HC251F | Samples |
| CD54HC251F3A | ACTIVE | CDIP | J | 16 | 1 | Non-RoHS & Green | SNPB | N / A for Pkg Type | -55 to 125 | 8512501EA CD54HC251F3A | Samples |
| CD54HCT251F3A | ACTIVE | CDIP | J | 16 | 1 | Non-RoHS & Green | SNPB | N / A for Pkg Type | -55 to 125 | 5962-9052401ME A CD54HCT251F3A | Samples |
| CD74HC251E | ACTIVE | PDIP | N | 16 | 25 | RoHS & Green | NIPDAU | N / A for Pkg Type | -55 to 125 | CD74HC251E | Samples |
| CD74HC251M | ACTIVE | SOIC | D | 16 | 40 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC251M | Samples |
| CD74HC251M96 | ACTIVE | SOIC | D | 16 | 2500 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC251M | Samples |
| CD74HC251MT | ACTIVE | SOIC | D | 16 | 250 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC251M | Samples |
| CD74HCT251E | ACTIVE | PDIP | N | 16 | 25 | RoHS & Green | NIPDAU | N / A for Pkg Type | -55 to 125 | CD74HCT251E | Samples |
| CD74HCT251M | ACTIVE | SOIC | D | 16 | 40 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HCT251M | Samples |
| CD74HCT251M96 | ACTIVE | SOIC | D | 16 | 2500 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HCT251M | Samples |
| CD74HCT251MT | ACTIVE | SOIC | D | 16 | 250 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HCT251M | 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) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of ≤ 1000 ppm threshold. Antimony trioxide based flame retardants must also meet the ≤ 1000 ppm threshold requirement.

- (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.
- (6) Lead finish/Ball material - Orderable Devices 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.

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OTHER QUALIFIED VERSIONS OF CD54HC251, CD54HCT251, CD74HC251, CD74HCT251 :

- Catalog : [CD74HC251](#), [CD74HCT251](#)
- Military : [CD54HC251](#), [CD54HCT251](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product
- Military - QML certified for Military and Defense Applications

TAPE AND REEL INFORMATION

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE


*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 |
|---------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| CD74HC251M96 | SOIC | D | 16 | 2500 | 330.0 | 16.4 | 6.5 | 10.3 | 2.1 | 8.0 | 16.0 | Q1 |
| CD74HCT251M96 | 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) |
|---------------|--------------|-----------------|------|------|-------------|------------|-------------|
| CD74HC251M96 | SOIC | D | 16 | 2500 | 340.5 | 336.1 | 32.0 |
| CD74HCT251M96 | SOIC | D | 16 | 2500 | 340.5 | 336.1 | 32.0 |

TUBE


*All dimensions are nominal

| Device | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (μm) | B (mm) |
|-------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| CD74HC251E | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| CD74HC251E | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| CD74HC251M | D | SOIC | 16 | 40 | 507 | 8 | 3940 | 4.32 |
| CD74HCT251E | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| CD74HCT251E | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| CD74HCT251M | D | SOIC | 16 | 40 | 507 | 8 | 3940 | 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.
 - 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.
 - 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.

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Publication IPC-7351 is recommended for alternate designs.
 - Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
 - Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

J (R-GDIP-T**)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



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



4040083/F 03/03

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

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



4040049/E 12/2002

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

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