

## SNx4HC273 具有清零功能的八路 D 类触发器

### 1 特性

- 2V 至 6V 的宽工作电压范围
- 输出可驱动多达 10 个 LSTTL 负载
- 低功耗， $I_{CC}$  最大值为 80 $\mu$ A
- $t_{pd}$  典型值 = 12 ns
- $\pm 4$  mA 输出驱动 (在 5V 时)
- 低输入电流，上限值为 1 $\mu$ A
- 包含 8 个具有单轨输出的触发器
- 直接清零输入
- 为每个触发器提供单独的数据输入
- 对于符合 MIL-PRF-38535 标准的产品，所有参数均经过测试，除非另外注明。对于所有其他产品，生产流程不一定包含对所有参数的测试。

### 2 应用

- 缓冲或存储寄存器
- 移位寄存器
- 图形发生器

### 3 说明

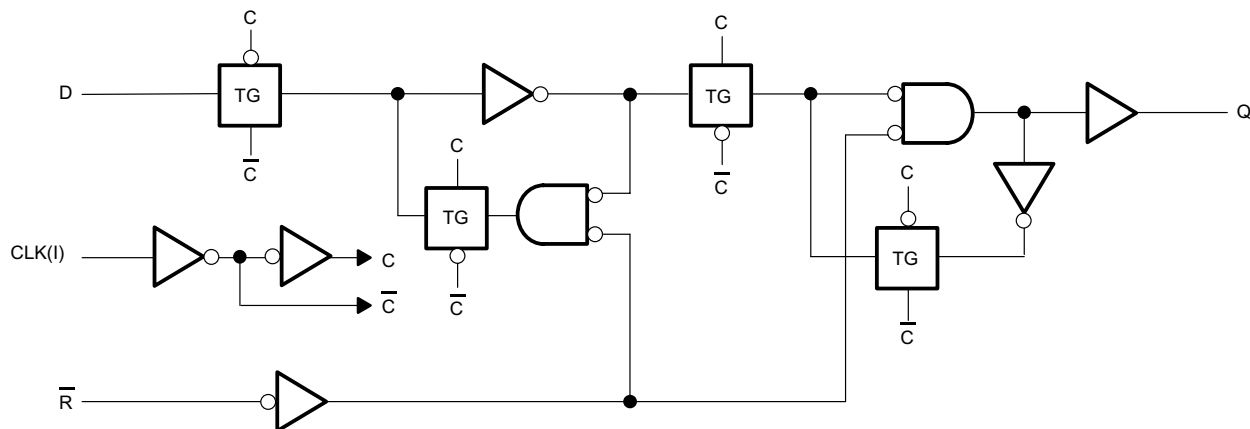
SNx4HC273 器件是具有直接低电平有效清零 ( $\overline{CLR}$ ) 输入的正边沿触发式 D 类触发器。

数据 (D) 输入上满足设置时间要求的信息被发送到时钟 (CLK) 脉冲正向边沿上的 Q 输出。时钟触发在一个特定电压电平下发生，并且不与正向脉冲的转换时间直接相关。当 CLK 处于高电平或低电平时，D 输入对输出无影响。

器件信息<sup>(1)</sup>

| 器件型号        | 封装 (引脚)    | 封装尺寸 (标称值)         |
|-------------|------------|--------------------|
| SN54HC273J  | CDIP (20)  | 24.20mm × 6.92mm   |
| SN54HC273W  | CFP (20)   | 13.09 mm × 6.92 mm |
| SN54HC273FK | LCCC (20)  | 8.89mm × 8.89mm    |
| SN74HC273D  | SOIC (20)  | 12.80mm × 7.50mm   |
| SN74HC273DB | SSOP (20)  | 7.20mm × 5.30mm    |
| SN74HC273NS | SO (20)    | 12.60mm × 5.30mm   |
| SN74HC273N  | PDIP (20)  | 24.33mm × 6.35mm   |
| SN74HC273PW | TSSOP (20) | 6.50mm × 4.40mm    |

(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。



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功能方框图



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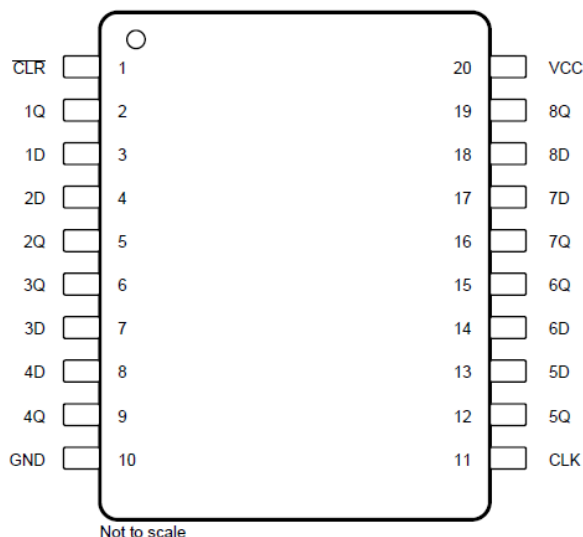
## 4 Revision History

注：以前版本的页码可能与当前版本的页码不同

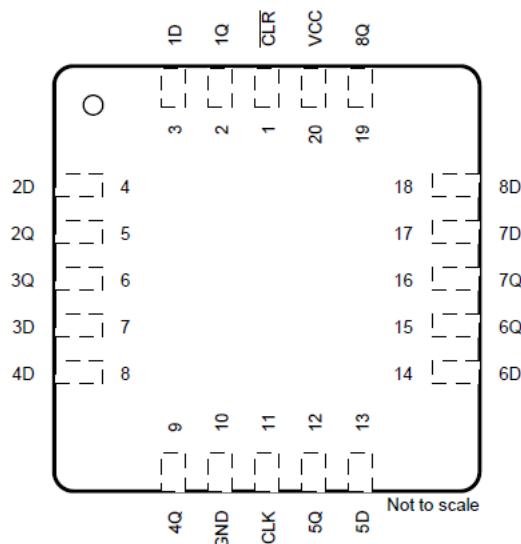
| Changes from Revision E (August 2003) to Revision F (April 2022)                                                                                                                                           | Page |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| • Updated the ESD ratings table to fit modern standards.....                                                                                                                                               | 4    |
| • Changed package thermal impedance, $R_{\theta JA}$ , values from: 90.3 to: 122.7 (DB), from: 77.4 to: 109.1 (DW), from: 45.1 to: 84.6 (N), from: 72.6 to: 113.4 (NS), and from: 98.3 to: 131.8 (PW)..... | 5    |
| • Updated Power Supply Recommendations and Layout Guidelines sections to include current TI terminology...<br>14                                                                                           |      |

| Changes from Revision D (December 1982) to Revision E (July 2016)                     | Page |
|---------------------------------------------------------------------------------------|------|
| • 添加了器件信息表、ESD 等级表、特性说明部分、器件功能模式、应用和实施部分、电源相关建议部分、布局部分、器件和文档支持部分以及机械、封装和可订购信息部分。..... | 1    |
| • 删除了订购信息表，请参阅数据表末尾的 POA.....                                                         | 1    |
| • 向特性中添加了“军用免责声明”.....                                                                | 1    |

## 5 Pin Configuration and Functions



**J, W, DB, DW N, NS, or PW Package,  
20-Pin CDIP, CFP, SSOP, SOIC, SO, PDIP, or TSSOP  
(Top View)**



**FK Package,  
20-Pin LCCC  
(Top View)**

**表 5-1. Pin Functions**

| PIN |                 | TYPE <sup>(1)</sup> | DESCRIPTION            |
|-----|-----------------|---------------------|------------------------|
| NO. | NAME            |                     |                        |
| 1   | CLR             | I                   | Active low clear input |
| 2   | 1Q              | O                   | Output 1               |
| 3   | 1D              | I                   | Input 1                |
| 4   | 2D              | I                   | Input 2                |
| 5   | 2Q              | O                   | Output 2               |
| 6   | 3Q              | O                   | Output 3               |
| 7   | 3D              | I                   | Input 3                |
| 8   | 4D              | I                   | Input 4                |
| 9   | 4Q              | O                   | Output 4               |
| 10  | GND             | —                   | Ground                 |
| 11  | CLK             | I                   | Clock input            |
| 12  | 5Q              | O                   | Output 5               |
| 13  | 5D              | I                   | Input 5                |
| 14  | 6D              | I                   | Input 6                |
| 15  | 6Q              | O                   | Output 6               |
| 16  | 7Q              | O                   | Output 7               |
| 17  | 7D              | I                   | Input 7                |
| 18  | 8D              | I                   | Input 8                |
| 19  | 8Q              | O                   | Output 8               |
| 20  | V <sub>CC</sub> | —                   | Power                  |

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

## 6 Specifications

### 6.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)<sup>(1)</sup>

|                  |                                                   | MIN                                                    | MAX | UNIT        |
|------------------|---------------------------------------------------|--------------------------------------------------------|-----|-------------|
| V <sub>CC</sub>  | Supply voltage                                    | - 0.5                                                  | 7   | V           |
| I <sub>IK</sub>  | Input clamp current <sup>(2)</sup>                | V <sub>I</sub> < 0 or V <sub>I</sub> > V <sub>CC</sub> |     | ±20 mA      |
| I <sub>OK</sub>  | Output clamp current <sup>(2)</sup>               | V <sub>O</sub> < 0 or V <sub>O</sub> > V <sub>CC</sub> |     | ±20 mA      |
| I <sub>O</sub>   | Continuous output current                         | V <sub>O</sub> = 0 to V <sub>CC</sub>                  |     | ±25 mA      |
|                  | Continuous current through V <sub>CC</sub> or GND |                                                        |     | ±50 mA      |
| T <sub>J</sub>   | Junction temperature                              |                                                        |     | 150 °C      |
| T <sub>stg</sub> | Storage temperature                               |                                                        |     | - 65 150 °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.
- (2) The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

### 6.2 ESD Ratings – SN74HC273

|                    |                         | VALUE                                                                 | UNIT  |
|--------------------|-------------------------|-----------------------------------------------------------------------|-------|
| V <sub>(ESD)</sub> | Electrostatic discharge | Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001 <sup>(1)</sup>     | ±2000 |
|                    |                         | Charged device model (CDM), per ANSI/ESDA/JEDEC JS-002 <sup>(2)</sup> | ±500  |

- (1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process. Manufacturing with less than 500-V HBM is possible with the necessary precautions.
- (2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process. Manufacturing with less than 250-V CDM is possible with the necessary precautions.

### 6.3 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)<sup>(1)</sup>

|                 |                                     | MIN                     | NOM  | MAX             | UNIT |
|-----------------|-------------------------------------|-------------------------|------|-----------------|------|
| V <sub>CC</sub> | Supply voltage                      | 2                       | 5    | 6               | V    |
| V <sub>IH</sub> | High-level input voltage            | V <sub>CC</sub> = 2 V   | 1.5  |                 | V    |
|                 |                                     | V <sub>CC</sub> = 4.5 V | 3.15 |                 |      |
|                 |                                     | V <sub>CC</sub> = 6 V   | 4.2  |                 |      |
| V <sub>IL</sub> | Low-level input voltage             | V <sub>CC</sub> = 2 V   |      | 0.5             | V    |
|                 |                                     | V <sub>CC</sub> = 4.5 V |      | 1.35            |      |
|                 |                                     | V <sub>CC</sub> = 6 V   |      | 1.8             |      |
| V <sub>I</sub>  | Input voltage                       | 0                       |      | V <sub>CC</sub> | V    |
| V <sub>O</sub>  | Output voltage                      | 0                       |      | V <sub>CC</sub> | V    |
| Δt/Δv           | Input transition rise and fall time | V <sub>CC</sub> = 2 V   |      | 1000            | ns   |
|                 |                                     | V <sub>CC</sub> = 4.5 V |      | 500             |      |
|                 |                                     | V <sub>CC</sub> = 6 V   |      | 400             |      |
| T <sub>A</sub>  | Operating free-air temperature      | SN54HC273               | - 55 | 125             | °C   |
|                 |                                     | SN74HC273               | - 40 | 85              |      |

- (1) All unused inputs of the device must be held at V<sub>CC</sub> or GND to ensure proper device operation. Refer to the TI application report, [Implications of Slow or Floating CMOS Inputs](#).

## 6.4 Thermal Information

| THERMAL METRIC        |                                                       | SN74HC273 |           |          |         |            | UNIT |
|-----------------------|-------------------------------------------------------|-----------|-----------|----------|---------|------------|------|
|                       |                                                       | DW (SOIC) | DB (SSOP) | N (PDIP) | NS (SO) | PW (TSSOP) |      |
|                       |                                                       | 20 PINS   | 20 PINS   | 20 PINS  | 20 PINS | 20 PINS    |      |
| $R_{\theta JA}$       | Junction-to-ambient thermal resistance <sup>(1)</sup> | 109.1     | 122.7     | 84.6     | 113.4   | 131.8      | °C/W |
| $R_{\theta JC (top)}$ | Junction-to-case (top) thermal resistance             | 76        | 81.6      | 72.5     | 78.6    | 72.2       | °C/W |
| $R_{\theta JB}$       | Junction-to-board thermal resistance                  | 77.6      | 77.5      | 65.3     | 78.4    | 82.8       | °C/W |
| $\Psi_{JT}$           | Junction-to-top characterization parameter            | 51.5      | 46.1      | 55.3     | 47.1    | 21.5       | °C/W |
| $\Psi_{JB}$           | Junction-to-board characterization parameter          | 77.1      | 77.1      | 65.2     | 78.1    | 82.4       | °C/W |
| $R_{\theta JC(bot)}$  | Junction-to-case (bottom) thermal resistance          | N/A       | N/A       | N/A      | N/A     | N/A        | °C/W |

(1) For more information about traditional and new thermal metrics, see [Semiconductor and IC Package Thermal Metrics](#).

## 6.5 Electrical Characteristics

$T_A = 25^\circ\text{C}$  (unless otherwise noted)

| PARAMETER       | TEST CONDITIONS                                                                  |                                                   |                         | MIN  | TYP   | MAX  | UNIT |
|-----------------|----------------------------------------------------------------------------------|---------------------------------------------------|-------------------------|------|-------|------|------|
| V <sub>OH</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                              | I <sub>OH</sub> = - 20 μA                         | V <sub>CC</sub> = 2 V   | 1.9  | 1.998 | V    |      |
|                 |                                                                                  |                                                   | V <sub>CC</sub> = 4.5 V | 4.4  | 4.499 |      |      |
|                 |                                                                                  |                                                   | V <sub>CC</sub> = 6 V   | 5.9  | 5.999 |      |      |
|                 |                                                                                  | I <sub>OH</sub> = - 4 mA, V <sub>CC</sub> = 4.5 V |                         | 3.98 | 4.3   |      |      |
|                 |                                                                                  | I <sub>OH</sub> = - 5.2 mA, V <sub>CC</sub> = 6 V |                         | 5.48 | 5.8   |      |      |
| V <sub>OL</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                              | I <sub>OL</sub> = 20 μA                           | V <sub>CC</sub> = 2 V   |      | 0.002 | 0.1  | V    |
|                 |                                                                                  |                                                   | V <sub>CC</sub> = 4.5 V |      | 0.001 | 0.1  |      |
|                 |                                                                                  |                                                   | V <sub>CC</sub> = 6 V   |      | 0.001 | 0.1  |      |
|                 |                                                                                  | I <sub>OL</sub> = 4 mA, V <sub>CC</sub> = 4.5 V   |                         |      | 0.17  | 0.26 |      |
|                 |                                                                                  | I <sub>OL</sub> = 5.2 mA, V <sub>CC</sub> = 6 V   |                         |      | 0.15  | 0.26 |      |
| I <sub>I</sub>  | V <sub>I</sub> = V <sub>CC</sub> or 0, V <sub>CC</sub> = 6 V                     |                                                   |                         |      | ±0.1  | ±100 | nA   |
| I <sub>CC</sub> | V <sub>I</sub> = V <sub>CC</sub> or 0, I <sub>O</sub> = 0, V <sub>CC</sub> = 6 V |                                                   |                         |      |       | 8    | μA   |
| C <sub>i</sub>  | V <sub>CC</sub> = 2 V to 6 V                                                     |                                                   |                         |      | 3     | 10   | pF   |

## 6.6 Electrical Characteristics – SN54HC273

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

| PARAMETER       | TEST CONDITIONS                                                                  |                                                   |                         | MIN | TYP | MAX   | UNIT |
|-----------------|----------------------------------------------------------------------------------|---------------------------------------------------|-------------------------|-----|-----|-------|------|
| V <sub>OH</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                              | I <sub>OH</sub> = - 20 μA                         | V <sub>CC</sub> = 2 V   | 1.9 |     |       | V    |
|                 |                                                                                  |                                                   | V <sub>CC</sub> = 4.5 V | 4.4 |     |       |      |
|                 |                                                                                  |                                                   | V <sub>CC</sub> = 6 V   | 5.9 |     |       |      |
|                 |                                                                                  | I <sub>OH</sub> = - 4 mA, V <sub>CC</sub> = 4.5 V |                         | 3.7 |     |       |      |
|                 |                                                                                  | I <sub>OH</sub> = - 5.2 mA, V <sub>CC</sub> = 6 V |                         | 5.2 |     |       |      |
| V <sub>OL</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                              | I <sub>OL</sub> = 20 μA                           | V <sub>CC</sub> = 2 V   |     |     | 0.1   | V    |
|                 |                                                                                  |                                                   | V <sub>CC</sub> = 4.5 V |     |     | 0.1   |      |
|                 |                                                                                  |                                                   | V <sub>CC</sub> = 6 V   |     |     | 0.1   |      |
|                 |                                                                                  | I <sub>OL</sub> = 4 mA, V <sub>CC</sub> = 4.5 V   |                         |     |     | 0.4   |      |
|                 |                                                                                  | I <sub>OL</sub> = 5.2 mA, V <sub>CC</sub> = V     |                         |     |     | 0.4   |      |
| I <sub>I</sub>  | V <sub>I</sub> = V <sub>CC</sub> or 0, V <sub>CC</sub> = 6 V                     |                                                   |                         |     |     | ±1000 | nA   |
| I <sub>CC</sub> | V <sub>I</sub> = V <sub>CC</sub> or 0, I <sub>O</sub> = 0, V <sub>CC</sub> = 6 V |                                                   |                         |     |     | 160   | μA   |

## 6.6 Electrical Characteristics - SN54HC273 (continued)

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

| PARAMETER | TEST CONDITIONS                     | MIN | TYP | MAX | UNIT |
|-----------|-------------------------------------|-----|-----|-----|------|
| $C_i$     | $V_{CC} = 2\text{ V to }6\text{ V}$ |     |     | 10  | pF   |

## 6.7 Electrical Characteristics - SN74HC273

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

| PARAMETER       | TEST CONDITIONS                                                                  |                                                   |                         | MIN  | TYP | MAX   | UNIT |
|-----------------|----------------------------------------------------------------------------------|---------------------------------------------------|-------------------------|------|-----|-------|------|
| V <sub>OH</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                              | I <sub>OH</sub> = - 20 μA                         | V <sub>CC</sub> = 2 V   | 1.9  |     |       | V    |
|                 |                                                                                  |                                                   | V <sub>CC</sub> = 4.5 V | 4.4  |     |       |      |
|                 |                                                                                  |                                                   | V <sub>CC</sub> = 6 V   | 5.9  |     |       |      |
|                 |                                                                                  | I <sub>OH</sub> = - 4 mA, V <sub>CC</sub> = 4.5 V |                         | 3.84 |     |       |      |
|                 |                                                                                  | I <sub>OH</sub> = - 5.2 mA, V <sub>CC</sub> = 6 V |                         | 5.34 |     |       |      |
| V <sub>OL</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                              | I <sub>OL</sub> = 20 μA                           | V <sub>CC</sub> = 2 V   |      |     | 0.1   | V    |
|                 |                                                                                  |                                                   | V <sub>CC</sub> = 4.5 V |      |     | 0.1   |      |
|                 |                                                                                  |                                                   | V <sub>CC</sub> = 6 V   |      |     | 0.1   |      |
|                 |                                                                                  | I <sub>OL</sub> = 4 mA, V <sub>CC</sub> = 4.5 V   |                         |      |     | 0.33  |      |
|                 |                                                                                  | I <sub>OL</sub> = 5.2 mA, V <sub>CC</sub> = 6 V   |                         |      |     | 0.33  |      |
| I <sub>I</sub>  | V <sub>I</sub> = V <sub>CC</sub> or 0, V <sub>CC</sub> = 6 V                     |                                                   |                         |      |     | ±1000 | nA   |
| I <sub>CC</sub> | V <sub>I</sub> = V <sub>CC</sub> or 0, I <sub>O</sub> = 0, V <sub>CC</sub> = 6 V |                                                   |                         |      |     | 80    | μA   |
| C <sub>i</sub>  | V <sub>CC</sub> = 2 V to 6 V                                                     |                                                   |                         |      |     | 10    | pF   |

## 6.8 Timing Requirements

$T_A = 25^\circ\text{C}$  (unless otherwise noted)

|                    |                                      |                 |                         | MIN | MAX | UNIT |
|--------------------|--------------------------------------|-----------------|-------------------------|-----|-----|------|
| $f_{\text{clock}}$ | Clock frequency                      |                 | $V_{CC} = 2\text{ V}$   |     | 5   | MHz  |
|                    |                                      |                 | $V_{CC} = 4.5\text{ V}$ |     | 27  |      |
|                    |                                      |                 | $V_{CC} = 6\text{ V}$   |     | 32  |      |
| $t_w$              | Pulse duration                       | CLR low         | $V_{CC} = 2\text{ V}$   | 80  |     | ns   |
|                    |                                      |                 | $V_{CC} = 4.5\text{ V}$ | 16  |     |      |
|                    |                                      |                 | $V_{CC} = 6\text{ V}$   | 14  |     |      |
|                    | Pulse duration                       | CLK high or low | $V_{CC} = 2\text{ V}$   | 80  |     |      |
|                    |                                      |                 | $V_{CC} = 4.5\text{ V}$ | 16  |     |      |
|                    |                                      |                 | $V_{CC} = 6\text{ V}$   | 14  |     |      |
| $t_{su}$           | Setup time before CLK $\uparrow$     | Data            | $V_{CC} = 2\text{ V}$   | 100 |     | ns   |
|                    |                                      |                 | $V_{CC} = 4.5\text{ V}$ | 20  |     |      |
|                    |                                      |                 | $V_{CC} = 6\text{ V}$   | 17  |     |      |
|                    | Setup time before CLK $\uparrow$     | CLR inactive    | $V_{CC} = 2\text{ V}$   | 100 |     |      |
|                    |                                      |                 | $V_{CC} = 4.5\text{ V}$ | 20  |     |      |
|                    |                                      |                 | $V_{CC} = 6\text{ V}$   | 17  |     |      |
| $t_h$              | Hold time, data after CLK $\uparrow$ |                 | $V_{CC} = 2\text{ V}$   | 0   |     | ns   |
|                    |                                      |                 | $V_{CC} = 4.5\text{ V}$ | 0   |     |      |
|                    |                                      |                 | $V_{CC} = 6\text{ V}$   | 0   |     |      |

## 6.9 Timing Requirements – SN54HC273

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

|                    |                                      |                                 | MIN                             | MAX | UNIT |
|--------------------|--------------------------------------|---------------------------------|---------------------------------|-----|------|
| $f_{\text{clock}}$ | Clock frequency                      | $V_{\text{CC}} = 2 \text{ V}$   |                                 | 4   | MHz  |
|                    |                                      | $V_{\text{CC}} = 4.5 \text{ V}$ |                                 | 18  |      |
|                    |                                      | $V_{\text{CC}} = 6 \text{ V}$   |                                 | 21  |      |
| $t_w$              | Pulse duration                       | $\overline{\text{CLR}}$ low     | $V_{\text{CC}} = 2 \text{ V}$   | 120 | ns   |
|                    |                                      |                                 | $V_{\text{CC}} = 4.5 \text{ V}$ | 24  |      |
|                    |                                      |                                 | $V_{\text{CC}} = 6 \text{ V}$   | 20  |      |
|                    | CLK high or low                      |                                 | $V_{\text{CC}} = 2 \text{ V}$   | 120 |      |
|                    |                                      |                                 | $V_{\text{CC}} = 4.5 \text{ V}$ | 24  |      |
|                    |                                      |                                 | $V_{\text{CC}} = 6 \text{ V}$   | 20  |      |
| $t_{\text{su}}$    | Setup time before CLK $\uparrow$     | Data                            | $V_{\text{CC}} = 2 \text{ V}$   | 150 | ns   |
|                    |                                      |                                 | $V_{\text{CC}} = 4.5 \text{ V}$ | 30  |      |
|                    |                                      |                                 | $V_{\text{CC}} = 6 \text{ V}$   | 25  |      |
|                    | $\overline{\text{CLR}}$ inactive     |                                 | $V_{\text{CC}} = 2 \text{ V}$   | 150 |      |
|                    |                                      |                                 | $V_{\text{CC}} = 4.5 \text{ V}$ | 30  |      |
|                    |                                      |                                 | $V_{\text{CC}} = 6 \text{ V}$   | 25  |      |
| $t_h$              | Hold time, data after CLK $\uparrow$ |                                 | $V_{\text{CC}} = 2 \text{ V}$   | 0   | ns   |
|                    |                                      |                                 | $V_{\text{CC}} = 4.5 \text{ V}$ | 0   |      |
|                    |                                      |                                 | $V_{\text{CC}} = 6 \text{ V}$   | 0   |      |

## 6.10 Timing Requirements – SN74HC273

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

|                    |                                      |                                 | MIN                             | MAX | UNIT |
|--------------------|--------------------------------------|---------------------------------|---------------------------------|-----|------|
| $f_{\text{clock}}$ | Clock frequency                      | $V_{\text{CC}} = 2 \text{ V}$   |                                 | 4   | MHz  |
|                    |                                      | $V_{\text{CC}} = 4.5 \text{ V}$ |                                 | 21  |      |
|                    |                                      | $V_{\text{CC}} = 6 \text{ V}$   |                                 | 25  |      |
| $t_w$              | Pulse duration                       | $\overline{\text{CLR}}$ low     | $V_{\text{CC}} = 2 \text{ V}$   | 100 | ns   |
|                    |                                      |                                 | $V_{\text{CC}} = 4.5 \text{ V}$ | 20  |      |
|                    |                                      |                                 | $V_{\text{CC}} = 6 \text{ V}$   | 17  |      |
|                    | CLK high or low                      |                                 | $V_{\text{CC}} = 2 \text{ V}$   | 100 |      |
|                    |                                      |                                 | $V_{\text{CC}} = 4.5 \text{ V}$ | 20  |      |
|                    |                                      |                                 | $V_{\text{CC}} = 6 \text{ V}$   | 17  |      |
| $t_{\text{su}}$    | Setup time before CLK $\uparrow$     | Data                            | $V_{\text{CC}} = 2 \text{ V}$   | 125 | ns   |
|                    |                                      |                                 | $V_{\text{CC}} = 4.5 \text{ V}$ | 25  |      |
|                    |                                      |                                 | $V_{\text{CC}} = 6 \text{ V}$   | 21  |      |
|                    | $\overline{\text{CLR}}$ inactive     |                                 | $V_{\text{CC}} = 2 \text{ V}$   | 125 |      |
|                    |                                      |                                 | $V_{\text{CC}} = 4.5 \text{ V}$ | 25  |      |
|                    |                                      |                                 | $V_{\text{CC}} = 6 \text{ V}$   | 21  |      |
| $t_h$              | Hold time, data after CLK $\uparrow$ |                                 | $V_{\text{CC}} = 2 \text{ V}$   | 0   | ns   |
|                    |                                      |                                 | $V_{\text{CC}} = 4.5 \text{ V}$ | 0   |      |
|                    |                                      |                                 | $V_{\text{CC}} = 6 \text{ V}$   | 0   |      |

## 6.11 Switching Characteristics

$T_A = 25^\circ\text{C}$  and  $C_L = 50\text{ pF}$  (unless otherwise noted; see 图 7-1)

| PARAMETER  | TEST CONDITIONS                                      |                         | MIN | TYP | MAX | UNIT |
|------------|------------------------------------------------------|-------------------------|-----|-----|-----|------|
| $f_{\max}$ |                                                      | $V_{CC} = 2\text{ V}$   | 5   | 11  |     | MHz  |
|            |                                                      | $V_{CC} = 4.5\text{ V}$ | 27  | 50  |     |      |
|            |                                                      | $V_{CC} = 6\text{ V}$   | 32  | 60  |     |      |
| $t_{PHL}$  | From $\overline{\text{CLR}}$ (input) to any (output) | $V_{CC} = 2\text{ V}$   |     | 55  | 160 | ns   |
|            |                                                      | $V_{CC} = 4.5\text{ V}$ |     | 15  | 32  |      |
|            |                                                      | $V_{CC} = 6\text{ V}$   |     | 12  | 27  |      |
| $t_{pd}$   | From CLK (input) to any (output)                     | $V_{CC} = 2\text{ V}$   |     | 56  | 160 | ns   |
|            |                                                      | $V_{CC} = 4.5\text{ V}$ |     | 15  | 32  |      |
|            |                                                      | $V_{CC} = 6\text{ V}$   |     | 13  | 27  |      |
| $t_t$      | To any (output)                                      | $V_{CC} = 2\text{ V}$   |     | 38  | 75  | ns   |
|            |                                                      | $V_{CC} = 4.5\text{ V}$ |     | 8   | 15  |      |
|            |                                                      | $V_{CC} = 6\text{ V}$   |     | 6   | 13  |      |

## 6.12 Switching Characteristics - SN54HC273

over recommended operating free-air temperature range,  $C_L = 50\text{ pF}$  (unless otherwise noted; see 图 7-1)

| PARAMETER  | TEST CONDITIONS                                      |                         | MIN | MAX | UNIT |
|------------|------------------------------------------------------|-------------------------|-----|-----|------|
| $f_{\max}$ |                                                      | $V_{CC} = 2\text{ V}$   | 4   |     | MHz  |
|            |                                                      | $V_{CC} = 4.5\text{ V}$ | 18  |     |      |
|            |                                                      | $V_{CC} = 6\text{ V}$   | 21  |     |      |
| $t_{PHL}$  | From $\overline{\text{CLR}}$ (input) to any (output) | $V_{CC} = 2\text{ V}$   |     | 240 | ns   |
|            |                                                      | $V_{CC} = 4.5\text{ V}$ |     | 48  |      |
|            |                                                      | $V_{CC} = 6\text{ V}$   |     | 41  |      |
| $t_{pd}$   | From CLK (input) to any (output)                     | $V_{CC} = 2\text{ V}$   |     | 240 | ns   |
|            |                                                      | $V_{CC} = 4.5\text{ V}$ |     | 48  |      |
|            |                                                      | $V_{CC} = 6\text{ V}$   |     | 41  |      |
| $t_t$      | To any (output)                                      | $V_{CC} = 2\text{ V}$   |     | 110 | ns   |
|            |                                                      | $V_{CC} = 4.5\text{ V}$ |     | 22  |      |
|            |                                                      | $V_{CC} = 6\text{ V}$   |     | 19  |      |

## 6.13 Switching Characteristics - SN74HC273

over recommended operating free-air temperature range,  $C_L = 50\text{ pF}$  (unless otherwise noted; see 图 7-1)

| PARAMETER  | TEST CONDITIONS                                      |                         | MIN | MAX | UNIT |
|------------|------------------------------------------------------|-------------------------|-----|-----|------|
| $f_{\max}$ |                                                      | $V_{CC} = 2\text{ V}$   | 4   |     | MHz  |
|            |                                                      | $V_{CC} = 4.5\text{ V}$ | 21  |     |      |
|            |                                                      | $V_{CC} = 6\text{ V}$   | 25  |     |      |
| $t_{PHL}$  | From $\overline{\text{CLR}}$ (input) to any (output) | $V_{CC} = 2\text{ V}$   |     | 200 | ns   |
|            |                                                      | $V_{CC} = 4.5\text{ V}$ |     | 40  |      |
|            |                                                      | $V_{CC} = 6\text{ V}$   |     | 34  |      |
| $t_{pd}$   | From CLK (input) to any (output)                     | $V_{CC} = 2\text{ V}$   |     | 200 | ns   |
|            |                                                      | $V_{CC} = 4.5\text{ V}$ |     | 40  |      |
|            |                                                      | $V_{CC} = 6\text{ V}$   |     | 34  |      |

## 6.13 Switching Characteristics - SN74HC273 (continued)

over recommended operating free-air temperature range,  $C_L = 50$  pF (unless otherwise noted; see 图 7-1)

| PARAMETER | TEST CONDITIONS | MIN              | MAX | UNIT |
|-----------|-----------------|------------------|-----|------|
| $t_t$     | To any (output) | $V_{CC} = 2$ V   | 95  | ns   |
|           |                 | $V_{CC} = 4.5$ V | 19  |      |
|           |                 | $V_{CC} = 6$ V   | 16  |      |

## 6.14 Operating Characteristics

$T_A = 25^\circ\text{C}$

| PARAMETER                                            | TEST CONDITIONS | TYP | UNIT |
|------------------------------------------------------|-----------------|-----|------|
| $C_{pd}$ Power dissipation capacitance per flip-flop | No load         | 35  | pF   |

## 6.15 Typical Characteristics

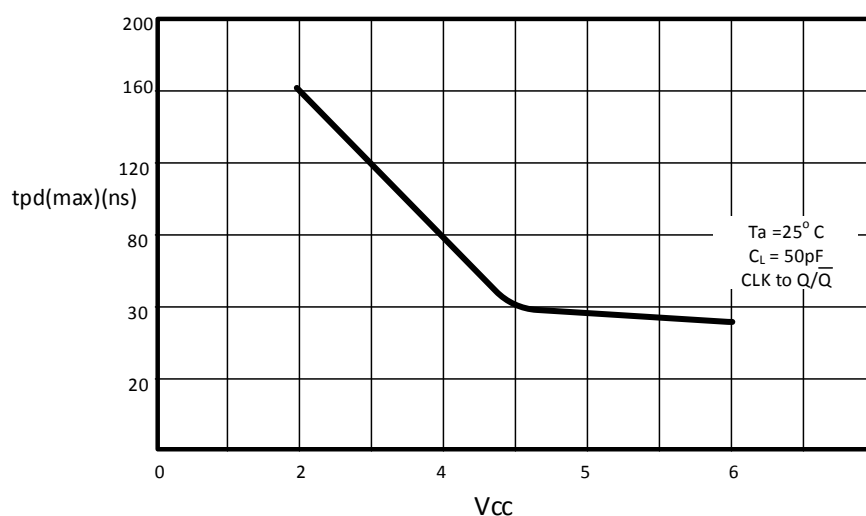
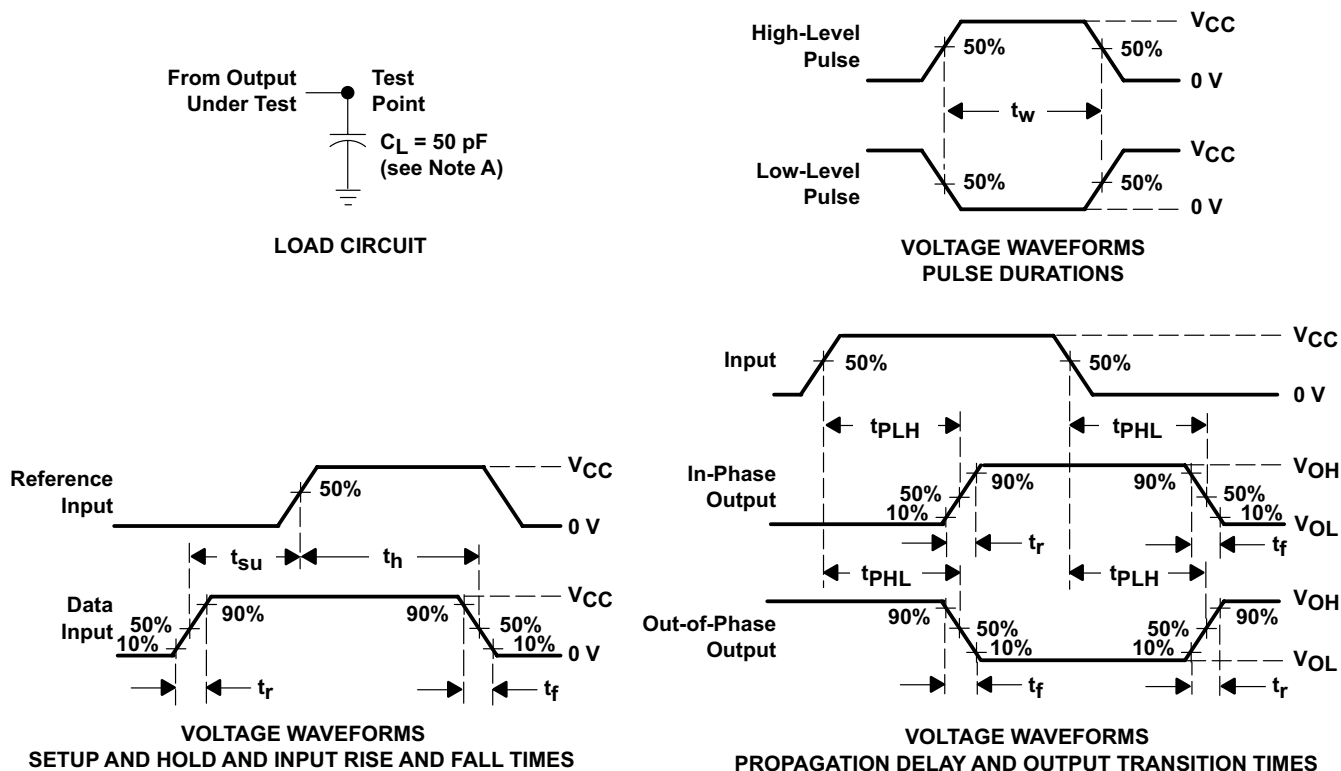


图 6-1. Max  $t_{pd}$  vs  $V_{CC}$

## 7 Parameter Measurement Information



- NOTES: A.  $C_L$  includes probe and test-fixture capacitance.
- B. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics:  $PRR \leq 1 \text{ MHz}$ ,  $Z_O = 50 \Omega$ ,  $t_r = 6 \text{ ns}$ ,  $t_f = 6 \text{ ns}$ .
- C. For clock inputs,  $f_{max}$  is measured when the input duty cycle is 50%.
- D. The outputs are measured one at a time with one input transition per measurement.
- E.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{pd}$ .

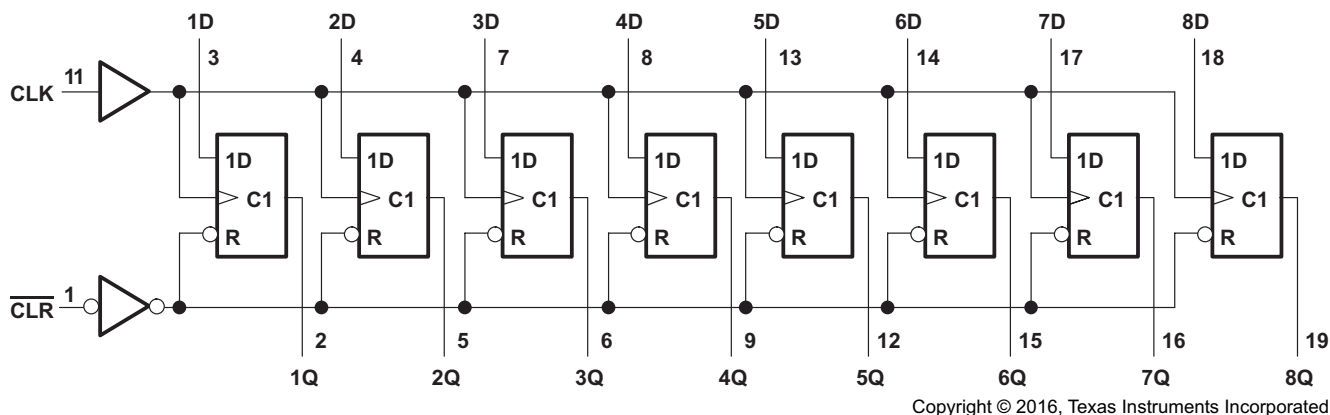
图 7-1. Load Circuit and Voltage Waveforms

## 8 Detailed Description

### 8.1 Overview

The SNx4HC273 contains eight flip-flops with single-rail outputs with individual data input to each flip-flop. The outputs can drive up to 10 LSTTL loads. The device has direct active low clear input.

### 8.2 Functional Block Diagram



### 8.3 Feature Description

The SNx4HC273 has low power consumption with a maximum  $I_{CC}$  of 80  $\mu$ A.

The typical  $t_{pd}$  for the SNx4HC273 is 12 ns and the output drive is  $\pm 4$  mA at 5 V.

The SNx4HC273 also has very low input current, with the maximum set at 1  $\mu$ A.

### 8.4 Device Functional Modes

表 8-1 lists the functional modes of the SNx4HC273.

**表 8-1. Function Table  
(Each Flip-Flop)**

| INPUTS |     |   | OUTPUT<br>Q |
|--------|-----|---|-------------|
| CLR    | CLK | D |             |
| L      | X   | X | L           |
| H      | ↑   | H | H           |
| H      | ↑   | L | L           |
| H      | L   | X | $Q_0$       |

## 9 Application and Implementation

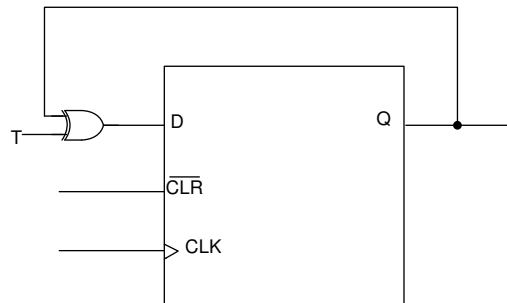
### 备注

以下应用部分中的信息不属于 TI 器件规格的范围，TI 不担保其准确性和完整性。TI 的客户应负责确定器件是否适用于其应用。客户应验证并测试其设计，以确保系统功能。

### 9.1 Application Information

The SNx4HC273 is octal D Flip flop with active low clear input. It has low input current and low power consumption. The D flip-flop can be used as a Toggle flip flop using an XOR gate at the input. The output toggles from the previous state whenever the T input is high.

### 9.2 Typical Application



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#### 9.2.1 Design Requirements

This SNx4Hc273 device uses CMOS technology and has balanced output drive.

#### 9.2.2 Detailed Design Procedure

- Recommended input conditions:
  - Rise time and fall time specifications: see ( $\Delta t / \Delta V$ ) in [Recommended Operating Conditions](#).
  - Specified high and low levels: see ( $V_{IH}$  and  $V_{IL}$ ) in [Recommended Operating Conditions](#).
  - Inputs are not overvoltage tolerant and must not be above any valid  $V_{CC}$  as per [Recommended Operating Conditions](#).
- Absolute maximum output conditions:
  - Continuous output currents must not exceed ( $I_O$  max) per output and must not exceed total current (continuous current through  $V_{CC}$  or GND) for the part. These limits are located in the [Absolute Maximum Ratings](#).
  - Outputs must not be pulled above  $V_{CC}$ .

### 9.2.3 Application Curve

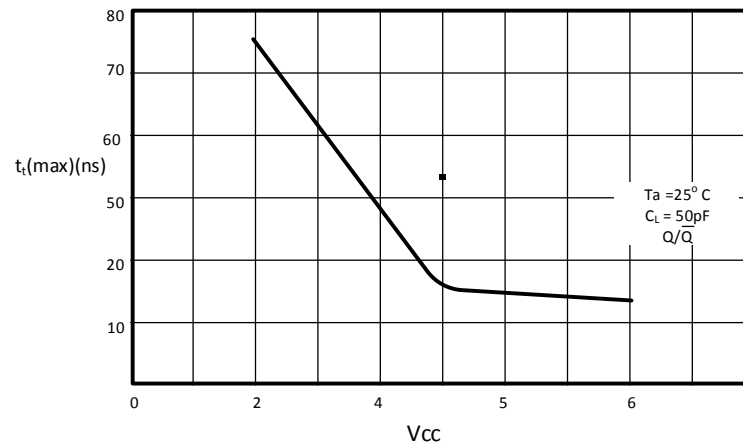


图 9-1. Maximum Transition Time vs  $V_{CC}$

## 10 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.

## 11 Layout

### 11.1 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.

### 11.2 Layout Example

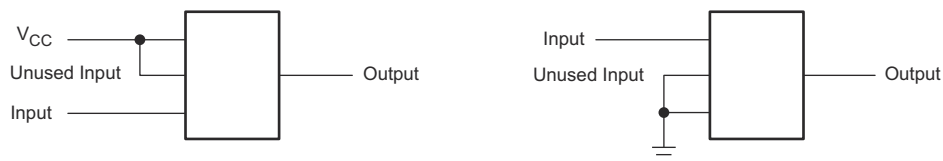


图 11-1. SNx4HC273 Layout

## 12 Device and Documentation Support

### 12.1 Documentation Support

#### 12.1.1 Related Documentation

For related documentation, see the following:

- Texas Instruments, [Implications of Slow or Floating CMOS Inputs application report](#)

### 12.2 Related Links

The table below lists quick access links. Categories include technical documents, support and community resources, tools and software, and quick access to sample or buy.

表 12-1. Related Links

| PARTS     | PRODUCT FOLDER             | SAMPLE & BUY               | TECHNICAL DOCUMENTS        | TOOLS & SOFTWARE           | SUPPORT & COMMUNITY        |
|-----------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| SN54HC273 | <a href="#">Click here</a> | <a href="#">Click here</a> | <a href="#">Click here</a> | <a href="#">Click here</a> | <a href="#">Click here</a> |
| SN74HC273 | <a href="#">Click here</a> | <a href="#">Click here</a> | <a href="#">Click here</a> | <a href="#">Click here</a> | <a href="#">Click here</a> |

### 12.3 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. In the upper right corner, click on *Alert me* 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.

### 12.4 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》。

### 12.5 Trademarks

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### 12.6 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.

### 12.7 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。

## 13 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="#">5962-8409901VRA</a>  | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 5962-8409901VR<br>A<br>SNV54HC273J |
| 5962-8409901VRA.A                | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 5962-8409901VR<br>A<br>SNV54HC273J |
| <a href="#">5962-8409901VSA</a>  | Active        | Production           | CFP (W)   20   | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 5962-8409901VS<br>A<br>SNV54HC273W |
| 5962-8409901VSA.A                | Active        | Production           | CFP (W)   20   | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 5962-8409901VS<br>A<br>SNV54HC273W |
| <a href="#">84099012A</a>        | Active        | Production           | LCCC (FK)   20 | 55   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 84099012A<br>SNJ54HC<br>273FK      |
| <a href="#">8409901RA</a>        | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8409901RA<br>SNJ54HC273J           |
| <a href="#">8409901SA</a>        | Active        | Production           | CFP (W)   20   | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8409901SA<br>SNJ54HC273W           |
| <a href="#">JM38510/65601BRA</a> | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65601BRA               |
| JM38510/65601BRA.A               | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65601BRA               |
| <a href="#">JM38510/65601BSA</a> | Active        | Production           | CFP (W)   20   | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65601BSA               |
| JM38510/65601BSA.A               | Active        | Production           | CFP (W)   20   | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65601BSA               |
| <a href="#">M38510/65601BRA</a>  | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65601BRA               |
| <a href="#">M38510/65601BSA</a>  | Active        | Production           | CFP (W)   20   | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65601BSA               |
| <a href="#">SN54HC273J</a>       | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | SN54HC273J                         |
| SN54HC273J.A                     | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | SN54HC273J                         |
| <a href="#">SN74HC273DBR</a>     | Active        | Production           | SSOP (DB)   20 | 2000   LARGE T&R      | Yes         | NIPDAU   NIPDAU                      | Level-1-260C-UNLIM                | -40 to 85    | HC273                              |

| 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)           |
|--------------------------------|---------------|----------------------|-----------------|-----------------------|-------------|--------------------------------------|-----------------------------------|--------------|-------------------------------|
| SN74HC273DBR.A                 | Active        | Production           | SSOP (DB)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC273                         |
| SN74HC273DBR.B                 | Active        | Production           | SSOP (DB)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC273                         |
| <a href="#">SN74HC273DW</a>    | Obsolete      | Production           | SOIC (DW)   20  | -                     | -           | Call TI                              | Call TI                           | -40 to 85    | HC273                         |
| <a href="#">SN74HC273DWR</a>   | Active        | Production           | SOIC (DW)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC273                         |
| SN74HC273DWR.A                 | Active        | Production           | SOIC (DW)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC273                         |
| SN74HC273DWRE4                 | Active        | Production           | SOIC (DW)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC273                         |
| <a href="#">SN74HC273DWRG4</a> | Active        | Production           | SOIC (DW)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC273                         |
| SN74HC273DWRG4.A               | Active        | Production           | SOIC (DW)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC273                         |
| <a href="#">SN74HC273N</a>     | Active        | Production           | PDIP (N)   20   | 20   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -40 to 85    | SN74HC273N                    |
| SN74HC273N.A                   | Active        | Production           | PDIP (N)   20   | 20   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -40 to 85    | SN74HC273N                    |
| SN74HC273N.B                   | Active        | Production           | PDIP (N)   20   | 20   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -40 to 85    | SN74HC273N                    |
| SN74HC273NE4                   | Active        | Production           | PDIP (N)   20   | 20   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -40 to 85    | SN74HC273N                    |
| <a href="#">SN74HC273NSR</a>   | Active        | Production           | SOP (NS)   20   | 2000   LARGE T&R      | Yes         | NIPDAU   NIPDAU                      | Level-1-260C-UNLIM                | -40 to 85    | HC273                         |
| SN74HC273NSR.A                 | Active        | Production           | SOP (NS)   20   | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC273                         |
| <a href="#">SN74HC273PW</a>    | Obsolete      | Production           | TSSOP (PW)   20 | -                     | -           | Call TI                              | Call TI                           | -40 to 85    | HC273                         |
| <a href="#">SN74HC273PWR</a>   | Active        | Production           | TSSOP (PW)   20 | 2000   LARGE T&R      | Yes         | NIPDAU   NIPDAU                      | Level-1-260C-UNLIM                | -40 to 85    | HC273                         |
| SN74HC273PWR.A                 | Active        | Production           | TSSOP (PW)   20 | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC273                         |
| SN74HC273PWRG4                 | Active        | Production           | TSSOP (PW)   20 | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC273                         |
| <a href="#">SN74HC273PWT</a>   | Obsolete      | Production           | TSSOP (PW)   20 | -                     | -           | Call TI                              | Call TI                           | -40 to 85    | HC273                         |
| <a href="#">SNJ54HC273FK</a>   | Active        | Production           | LCCC (FK)   20  | 55   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 84099012A<br>SNJ54HC<br>273FK |
| SNJ54HC273FK.A                 | Active        | Production           | LCCC (FK)   20  | 55   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 84099012A<br>SNJ54HC<br>273FK |
| <a href="#">SNJ54HC273J</a>    | Active        | Production           | CDIP (J)   20   | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8409901RA<br>SNJ54HC273J      |
| SNJ54HC273J.A                  | Active        | Production           | CDIP (J)   20   | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8409901RA<br>SNJ54HC273J      |
| <a href="#">SNJ54HC273W</a>    | Active        | Production           | CFP (W)   20    | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8409901SA<br>SNJ54HC273W      |
| SNJ54HC273W.A                  | Active        | Production           | CFP (W)   20    | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8409901SA<br>SNJ54HC273W      |

<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 SN54HC273, SN54HC273-SP, SN74HC273 :**

- Catalog : [SN74HC273, SN54HC273](#)
- Automotive : [SN74HC273-Q1, SN74HC273-Q1](#)
- Military : [SN54HC273](#)
- Space : [SN54HC273-SP](#)

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
- Space - Radiation tolerant, ceramic packaging and qualified for use in Space-based application

## 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 |
|----------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74HC273DBR   | SSOP         | DB              | 20   | 2000 | 330.0              | 16.4               | 8.2     | 7.5     | 2.5     | 12.0    | 16.0   | Q1            |
| SN74HC273DWR   | SOIC         | DW              | 20   | 2000 | 330.0              | 24.4               | 10.9    | 13.3    | 2.7     | 12.0    | 24.0   | Q1            |
| SN74HC273DWRG4 | SOIC         | DW              | 20   | 2000 | 330.0              | 24.4               | 10.8    | 13.3    | 2.7     | 12.0    | 24.0   | Q1            |
| SN74HC273NSR   | SOP          | NS              | 20   | 2000 | 330.0              | 24.4               | 8.4     | 13.0    | 2.5     | 12.0    | 24.0   | Q1            |
| SN74HC273PWR   | TSSOP        | PW              | 20   | 2000 | 330.0              | 16.4               | 6.95    | 7.0     | 1.4     | 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) |
|----------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74HC273DBR   | SSOP         | DB              | 20   | 2000 | 353.0       | 353.0      | 32.0        |
| SN74HC273DWR   | SOIC         | DW              | 20   | 2000 | 356.0       | 356.0      | 45.0        |
| SN74HC273DWRG4 | SOIC         | DW              | 20   | 2000 | 356.0       | 356.0      | 45.0        |
| SN74HC273NSR   | SOP          | NS              | 20   | 2000 | 356.0       | 356.0      | 45.0        |
| SN74HC273PWR   | TSSOP        | PW              | 20   | 2000 | 353.0       | 353.0      | 32.0        |

## TUBE



\*All dimensions are nominal

| Device             | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (μm) | B (mm) |
|--------------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| 5962-8409901VSA    | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| 5962-8409901VSA.A  | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| 84099012A          | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| 8409901SA          | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| JM38510/65601BSA   | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| JM38510/65601BSA.A | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| M38510/65601BSA    | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| SN74HC273N         | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| SN74HC273N.A       | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| SN74HC273N.B       | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| SN74HC273NE4       | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| SNJ54HC273FK       | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| SNJ54HC273FK.A     | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| SNJ54HC273W        | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| SNJ54HC273W.A      | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |

W (R-GDFP-F20)

CERAMIC DUAL FLATPACK



## NOTES:

- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only.
- E. Falls within Mil-Std 1835 GDFP2-F20



4220206/A 02/2017

## NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
5. Reference JEDEC registration MO-153.

# EXAMPLE BOARD LAYOUT

PW0020A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



4220206/A 02/2017

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

## EXAMPLE STENCIL DESIGN

PW0020A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE

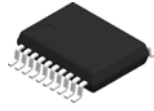


SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE: 10X

4220206/A 02/2017

NOTES: (continued)

8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.



4214851/B 08/2019

## NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
5. Reference JEDEC registration MO-150.

# EXAMPLE BOARD LAYOUT

DB0020A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



SOLDER MASK DETAILS

4214851/B 08/2019

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

## EXAMPLE STENCIL DESIGN

DB0020A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE: 10X

4214851/B 08/2019

NOTES: (continued)

8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

# MECHANICAL DATA

NS (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

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.

## GENERIC PACKAGE VIEW

**FK 20**

**LCCC - 2.03 mm max height**

8.89 x 8.89, 1.27 mm pitch

LEADLESS CERAMIC CHIP CARRIER

This image is a representation of the package family, actual package may vary.  
Refer to the product data sheet for package details.

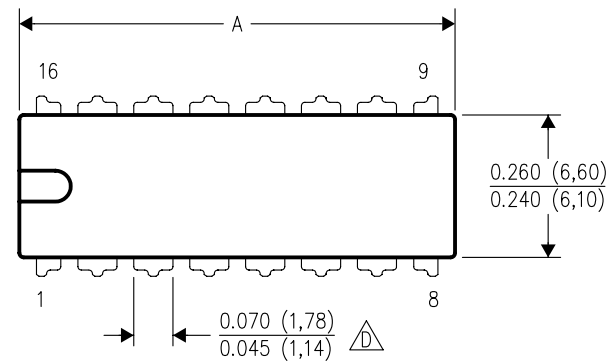


4229370VA\

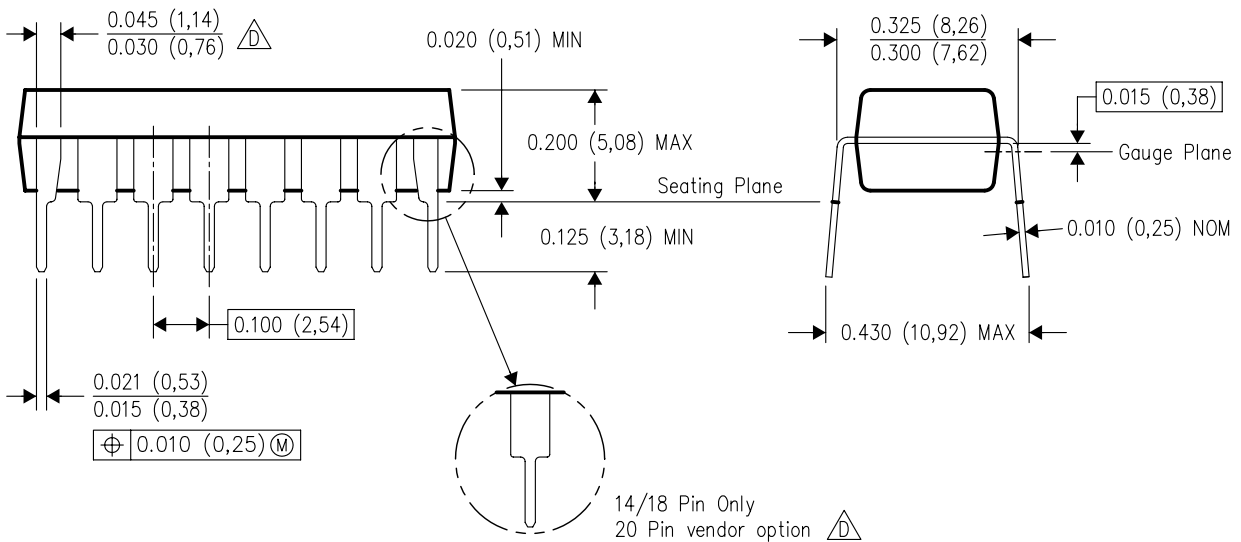
N (R-PDIP-T\*\*)

16 PINS SHOWN

# PLASTIC DUAL-IN-LINE PACKAGE



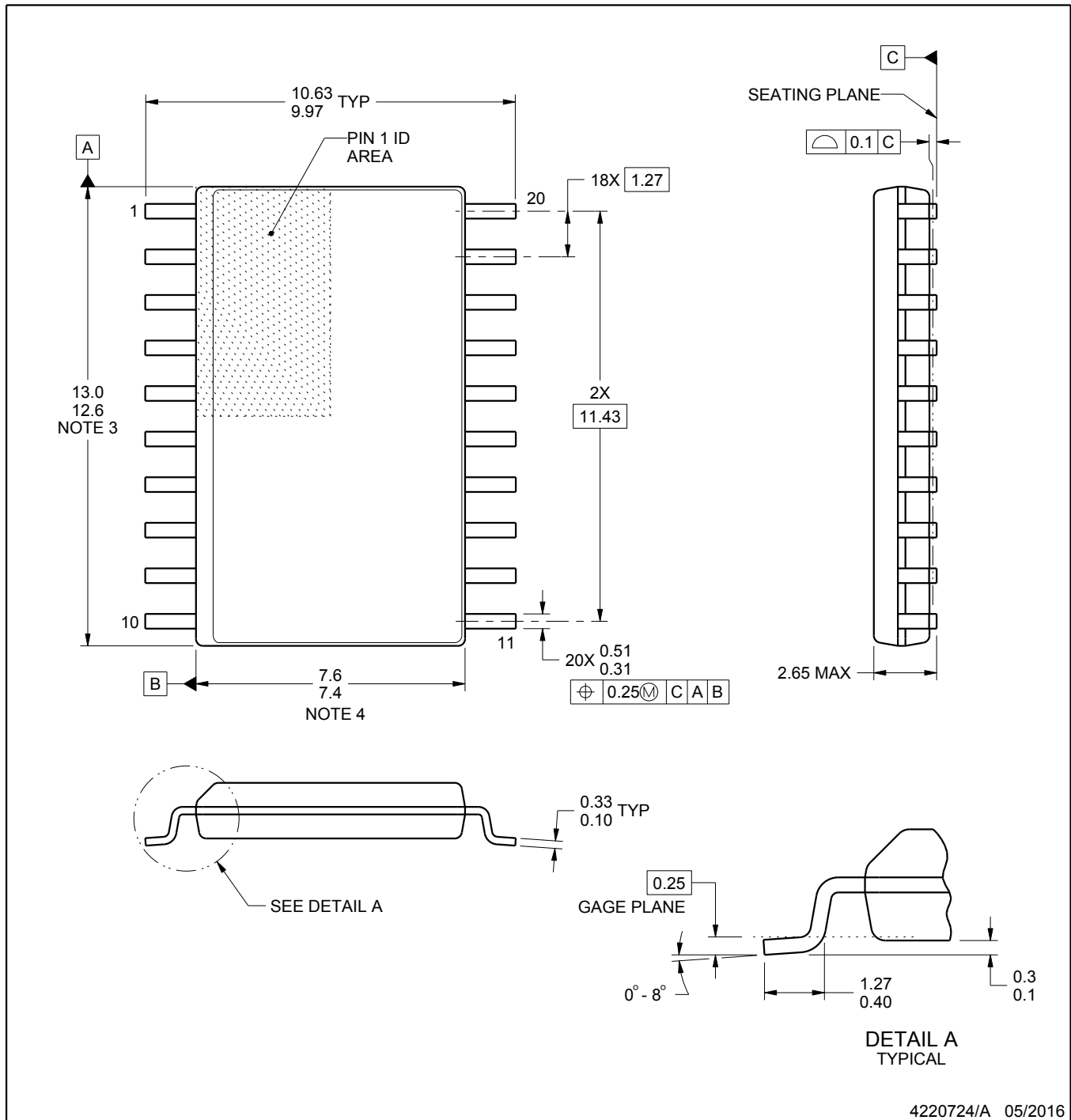
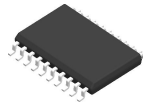
| DIM \ PINS **       | 14               | 16               | 18               | 20               |
|---------------------|------------------|------------------|------------------|------------------|
| A MAX               | 0.775<br>(19,69) | 0.775<br>(19,69) | 0.920<br>(23,37) | 1.060<br>(26,92) |
| 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               |



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.



## NOTES:

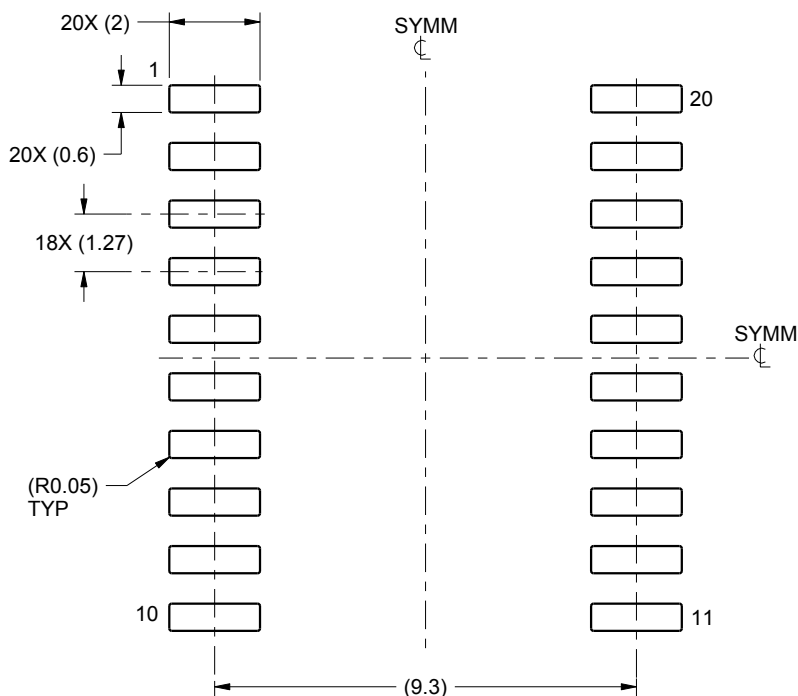
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm per side.
5. Reference JEDEC registration MS-013.

# EXAMPLE BOARD LAYOUT

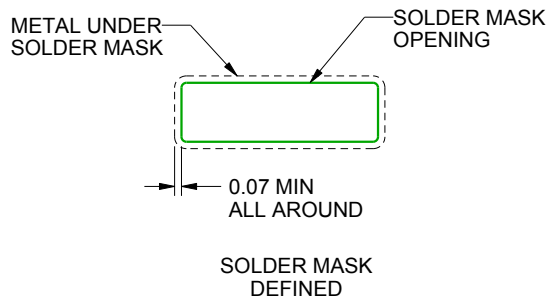
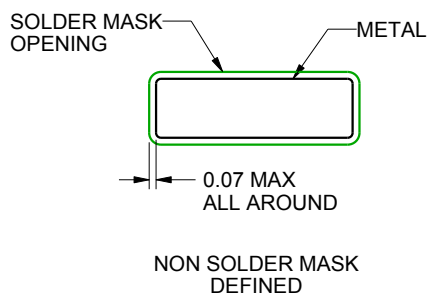
DW0020A

SOIC - 2.65 mm max height

SOIC



LAND PATTERN EXAMPLE  
SCALE:6X



SOLDER MASK DETAILS

4220724/A 05/2016

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

## EXAMPLE STENCIL DESIGN

DW0020A

SOIC - 2.65 mm max height

SOIC



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE:6X

4220724/A 05/2016

NOTES: (continued)

8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

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