

## SNx4HC245 3 ステート出力オクタール・バス・トランシーバ

### 1 特長

- 広い動作電圧範囲: 2V~6V
- バス・ラインを直接、または最大 15 の LSTTL 負荷を駆動する大電流 3 ステート出力
- 低消費電力、 $I_{CC}$ : 80 $\mu$ A 以下
- $t_{pd} = 12$ ns (標準値)
- 5V で  $\pm 6$ mA の出力駆動能力
- 低い入力電流: 1 $\mu$ A 以下
- MIL-PRF-38535 準拠の製品については、特に記述のない限り、すべてのパラメータはテスト済みです。他のすべての製品については、量産プロセスにすべてのパラメータのテストが含まれているとは限りません。

### 2 アプリケーション

- サーバー
- PC およびノートパソコン
- ネットワーク・スイッチ
- ウェアラブルなヘルスケア / フィットネス機器
- テレコム・インフラストラクチャ
- 電子 POS

### 3 概要

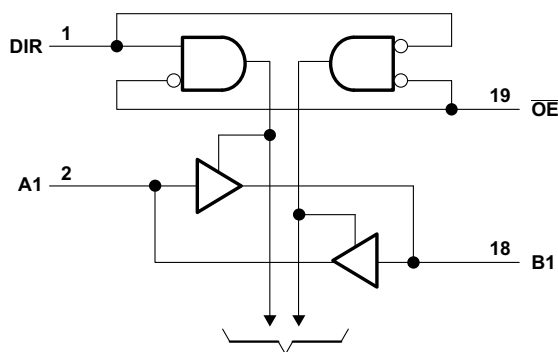
これらのオクタール・バス・トランシーバは、データ・バス間の非同期双方向通信用に設計されています。制御機能を実装しているため、外部のタイミング要件は最小限です。

このデバイスを使うと、方向制御 (DIR) 入力の論理レベルに応じて、A バスから B バス、または B バスから A バスへデータを転送できます。出力イネーブル ( $\overline{OE}$ ) 入力を使用すると、バスが実質的に絶縁されるように本デバイスを無効化できます。

#### 製品情報 (1)

| 部品番号      | パッケージ          | 本体サイズ (公称)       |
|-----------|----------------|------------------|
| SNx4HC245 | DB (SSOP) (20) | 7.20mm × 5.30mm  |
|           | DW (SOIC, 20)  | 12.80mm × 7.50mm |
|           | N (PDIP, 20)   | 24.33mm × 6.35mm |
|           | NS (SO, 20)    | 12.60mm × 5.30mm |
|           | PW (TSSOP, 20) | 6.50mm × 4.40mm  |

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



To Seven Other Channels

論理図 (正論理)



## Table of Contents

|                                                    |          |                                                                  |           |
|----------------------------------------------------|----------|------------------------------------------------------------------|-----------|
| <b>1 特長</b> .....                                  | <b>1</b> | 8.3 Feature Description.....                                     | <b>9</b>  |
| <b>2 アプリケーション</b> .....                            | <b>1</b> | 8.4 Device Functional Modes.....                                 | <b>9</b>  |
| <b>3 概要</b> .....                                  | <b>1</b> | <b>9 Application and Implementation</b> .....                    | <b>10</b> |
| <b>4 Revision History</b> .....                    | <b>2</b> | 9.1 Application Information.....                                 | <b>10</b> |
| <b>5 Pin Configuration and Functions</b> .....     | <b>3</b> | 9.2 Typical Application.....                                     | <b>10</b> |
| <b>6 Specifications</b> .....                      | <b>4</b> | <b>10 Power Supply Recommendations</b> .....                     | <b>12</b> |
| 6.1 Absolute Maximum Ratings.....                  | <b>4</b> | <b>11 Layout</b> .....                                           | <b>12</b> |
| 6.2 ESD Ratings.....                               | <b>4</b> | 11.1 Layout Guidelines.....                                      | <b>12</b> |
| 6.3 Recommended Operating Conditions.....          | <b>4</b> | 11.2 Layout Example.....                                         | <b>12</b> |
| 6.4 Thermal Information.....                       | <b>5</b> | <b>12 Device and Documentation Support</b> .....                 | <b>13</b> |
| 6.5 Electrical Characteristics.....                | <b>5</b> | 12.1 Related Links.....                                          | <b>13</b> |
| 6.6 Switching Characteristics, $C_L = 50$ pF.....  | <b>6</b> | 12.2 Receiving Notification of Documentation Updates.....        | <b>13</b> |
| 6.7 Switching Characteristics, $C_L = 150$ pF..... | <b>6</b> | 12.3 サポート・リソース.....                                              | <b>13</b> |
| 6.8 Operating Characteristics.....                 | <b>7</b> | 12.4 Trademarks.....                                             | <b>13</b> |
| 6.9 Typical Characteristics.....                   | <b>7</b> | 12.5 Electrostatic Discharge Caution.....                        | <b>13</b> |
| <b>7 Parameter Measurement Information</b> .....   | <b>8</b> | 12.6 Glossary.....                                               | <b>13</b> |
| <b>8 Detailed Description</b> .....                | <b>9</b> | <b>13 Mechanical, Packaging, and Orderable Information</b> ..... | <b>13</b> |
| 8.1 Overview.....                                  | <b>9</b> |                                                                  |           |
| 8.2 Functional Block Diagram.....                  | <b>9</b> |                                                                  |           |

## 4 Revision History

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

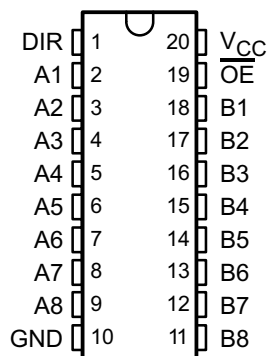
### Changes from Revision E (September 2015) to Revision F (August 2022) Page

- 最新のデータシート規格を反映するように、文書全体にわたって採番方式、書式、表、図、相互参照を更新..... **1**

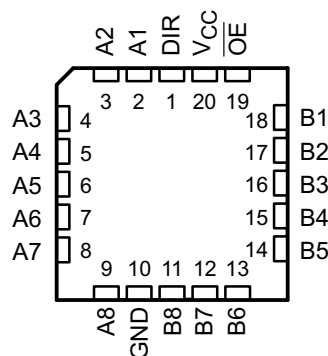
### Changes from Revision D (August 2003) to Revision E (July 2015) Page

- 「デバイスの比較」セクション、「熱に関する情報」セクション、「ESD 定格」セクション、「アプリケーションと実装」セクション、「電源に関する推奨事項」セクション、「レイアウト」セクションを追加。..... **1**
- 「特長」の一覧に軍事利用についての免責事項を追加。..... **1**
- Updated FK package pinout drawing..... **3**

## 5 Pin Configuration and Functions



**5-1. DB, DGV, DW, N, J, W, or PW Package 20-Pin SSOP, TVSOP, SOIC, PDIP CDIP, CFP, or TSSOP Top View**



**5-2. FK Package 20-Pin LCCC Top View**

| PIN |      | TYPE <sup>(1)</sup> | DESCRIPTION     |
|-----|------|---------------------|-----------------|
| NO. | NAME |                     |                 |
| 1   | DIR  | I/O                 | Direction Pin   |
| 2   | A1   | I/O                 | A1 Input/Output |
| 3   | A2   | I/O                 | A2 Input/Output |
| 4   | A3   | I/O                 | A3 Input/Output |
| 5   | A4   | I/O                 | A4 Input/Output |
| 6   | A5   | I/O                 | A5 Input/Output |
| 7   | A6   | I/O                 | A6 Input/Output |
| 8   | A7   | I/O                 | A7 Input/Output |
| 9   | A8   | I/O                 | A8 Input/Output |
| 10  | GND  | —                   | Ground Pin      |
| 11  | B8   | I/O                 | B8 Input/Output |
| 12  | B7   | I/O                 | B7 Input/Output |
| 13  | B6   | I/O                 | B6 Input/Output |
| 14  | B5   | I/O                 | B5 Input/Output |
| 15  | B4   | I/O                 | B4 Input/Output |
| 16  | B3   | I/O                 | B3 Input/Output |
| 17  | B2   | I/O                 | B2 Input/Output |
| 18  | B1   | I/O                 | B1 Input/Output |
| 19  | OE   | I/O                 | Output Enable   |
| 20  | VCC  | —                   | Power Pin       |

(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>                  |     | ±35 mA |
|                  | Continuous current through V <sub>CC</sub> or GND |                                                        |     | ±70 mA |
| T <sub>stg</sub> | Storage temperature                               | -65                                                    | 150 | °C     |
| T <sub>J</sub>   | Junction Temperature                              |                                                        | 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

|                    |                         | VALUE                                                                          | UNIT  |
|--------------------|-------------------------|--------------------------------------------------------------------------------|-------|
| V <sub>(ESD)</sub> | Electrostatic discharge | Human body model (HBM), per ANSI/ESDA/JEDEC JS-001 <sup>(1)</sup>              | ±3000 |
|                    |                         | Charged-device model (CDM), per JEDEC specification JESD22-C101 <sup>(2)</sup> | ±1000 |

- (1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
- (2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

### 6.3 Recommended Operating Conditions

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

|                 |                                     | SN54HC245               |     |                 | SN74HC245 |     |                 | UNIT |
|-----------------|-------------------------------------|-------------------------|-----|-----------------|-----------|-----|-----------------|------|
|                 |                                     | MIN                     | NOM | MAX             | MIN       | NOM | MAX             |      |
| V <sub>CC</sub> | Supply voltage                      | 2                       | 5   | 6               | 2         | 5   | 6               | V    |
| V <sub>IH</sub> | High-level input voltage            | V <sub>CC</sub> = 2 V   |     | 1.5             | 1.5       |     |                 | V    |
|                 |                                     | V <sub>CC</sub> = 4.5 V |     | 3.15            | 3.15      |     |                 |      |
|                 |                                     | V <sub>CC</sub> = 6 V   |     | 4.2             | 4.2       |     |                 |      |
| V <sub>IL</sub> | Low-level input voltage             | V <sub>CC</sub> = 2 V   |     | 0.5             | 0.5       |     |                 | V    |
|                 |                                     | V <sub>CC</sub> = 4.5 V |     | 1.35            | 1.35      |     |                 |      |
|                 |                                     | V <sub>CC</sub> = 6 V   |     | 1.8             | 1.8       |     |                 |      |
| V <sub>I</sub>  | Input voltage                       | 0                       |     | V <sub>CC</sub> | 0         |     | V <sub>CC</sub> | V    |
| V <sub>O</sub>  | Output voltage                      | 0                       |     | V <sub>CC</sub> | 0         |     | V <sub>CC</sub> | V    |
| Δt/Δv           | Input transition rise and fall time | V <sub>CC</sub> = 2 V   |     | 1000            | 1000      |     |                 | ns   |
|                 |                                     | V <sub>CC</sub> = 4.5 V |     | 500             | 500       |     |                 |      |
|                 |                                     | V <sub>CC</sub> = 6 V   |     | 400             | 400       |     |                 |      |
| T <sub>A</sub>  | Operating free-air temperature      | -55                     |     | 125             | -40       |     | 85              | °C   |

- (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*, literature number [SCBA004](#).

## 6.4 Thermal Information

| THERMAL METRIC <sup>(1)</sup> |                                              | SNx4HC245    |              |             |             |               | UNIT |
|-------------------------------|----------------------------------------------|--------------|--------------|-------------|-------------|---------------|------|
|                               |                                              | DB<br>(SSOP) | DW<br>(SOIC) | N<br>(PDIP) | NS<br>(SOP) | PW<br>(TSSOP) |      |
|                               |                                              | 20 PINS      |              |             |             |               |      |
| R <sub>θJA</sub>              | Junction-to-ambient thermal resistance       | 92.1         | 77.0         | 57.0        | 74.1        | 99.7          | °C/W |
| R <sub>θJC(top)</sub>         | Junction-to-case (top) thermal resistance    | 53.9         | 41.5         | 48.6        | 40.6        | 34.0          | °C/W |
| R <sub>θJB</sub>              | Junction-to-board thermal resistance         | 47.2         | 44.8         | 38.0        | 41.6        | 50.7          | °C/W |
| Ψ <sub>JT</sub>               | Junction-to-top characterization parameter   | 16.5         | 16.8         | 25.4        | 14.8        | 1.8           | °C/W |
| Ψ <sub>JB</sub>               | Junction-to-board characterization parameter | 46.8         | 44.3         | 37.8        | 41.2        | 50.1          | °C/W |

(1) For more information about traditional and new thermal metrics, see the *Semiconductor and IC Package Thermal Metrics* application report, [SPRA953](#).

## 6.5 Electrical Characteristics

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

| PARAMETER       |                                                          |                               | TEST CONDITIONS                                              | V <sub>CC</sub>             | T <sub>A</sub> = 25°C |       |       | SN54HC245 |     | SN74HC245 |     | UNIT |
|-----------------|----------------------------------------------------------|-------------------------------|--------------------------------------------------------------|-----------------------------|-----------------------|-------|-------|-----------|-----|-----------|-----|------|
|                 |                                                          |                               |                                                              |                             | MIN                   | TYP   | MAX   | MIN       | MAX | MIN       | MAX |      |
| V <sub>OH</sub> | High-Level Output Voltage                                |                               | V <sub>I</sub> = V <sub>IH</sub><br>or V <sub>IL</sub>       | I <sub>OH</sub> = –20<br>μA | 2 V                   | 1.9   | 1.998 | 1.9       |     | 1.9       |     | V    |
|                 |                                                          |                               |                                                              |                             | 4.5 V                 | 4.4   | 4.499 | 4.4       |     | 4.4       |     |      |
|                 |                                                          |                               |                                                              |                             | 6 V                   | 5.9   | 5.999 | 5.9       |     | 5.9       |     |      |
|                 |                                                          |                               |                                                              | I <sub>OH</sub> = –6<br>mA  | 4.5 V                 | 3.98  | 4.3   | 3.7       |     | 3.84      |     |      |
|                 |                                                          |                               |                                                              |                             | 6 V                   | 5.48  | 5.8   | 5.2       |     | 5.34      |     |      |
| V <sub>OL</sub> | Low-Level Output Voltage                                 |                               | V <sub>I</sub> = V <sub>IH</sub><br>or V <sub>IL</sub>       | I <sub>OL</sub> = 20<br>μA  | 2 V                   | 0.002 | 0.1   | 0.1       |     | 0.1       |     | V    |
|                 |                                                          |                               |                                                              |                             | 4.5 V                 | 0.001 | 0.1   | 0.1       |     | 0.1       |     |      |
|                 |                                                          |                               |                                                              |                             | 6 V                   | 0.001 | 0.1   | 0.1       |     | 0.1       |     |      |
|                 |                                                          |                               |                                                              | I <sub>OL</sub> = 6<br>mA   | 4.5 V                 | 0.17  | 0.26  | 0.4       |     | 0.33      |     |      |
|                 |                                                          |                               |                                                              |                             | 6 V                   | 0.15  | 0.26  | 0.4       |     | 0.33      |     |      |
| I <sub>I</sub>  | Input Current                                            | DIR or $\overline{\text{OE}}$ | V <sub>I</sub> = V <sub>CC</sub> or 0                        | 6 V                         |                       | ±0.1  | ±100  | ±1000     |     | ±1000     |     | nA   |
| I <sub>OZ</sub> | Off-State<br>(High-Impedance<br>State) Output<br>Current | A or B                        | V <sub>O</sub> = V <sub>CC</sub> or 0                        | 6 V                         |                       | ±0.01 | ±0.5  | ±10       |     | ±5        |     | μA   |
| I <sub>CC</sub> | Supply Current                                           |                               | V <sub>I</sub> = V <sub>CC</sub> I <sub>O</sub> = 0<br>or 0, | 6 V                         |                       |       | 8     | 160       |     | 80        |     | μA   |
| C <sub>i</sub>  | Input<br>Capacitance                                     | DIR or $\overline{\text{OE}}$ |                                                              | 2 V to<br>6 V               |                       | 3     | 10    | 10        |     | 10        |     | pF   |

## 6.6 Switching Characteristics, $C_L = 50 \text{ pF}$

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

(see [Figure 7-1](#))

| PARAMETER | FROM<br>(INPUT) | TO<br>(OUTPUT) | $V_{CC}$ | $T_A = 25^\circ\text{C}$ |     |     | SN54HC245 |     | SN74HC245 |     | UNIT |
|-----------|-----------------|----------------|----------|--------------------------|-----|-----|-----------|-----|-----------|-----|------|
|           |                 |                |          | MIN                      | TYP | MAX | MIN       | MAX | MIN       | MAX |      |
| $t_{pd}$  | A or B          | B or A         | 2 V      |                          | 40  | 105 |           | 160 |           | 130 | ns   |
|           |                 |                | 4.5 V    |                          | 15  | 21  |           | 32  |           | 26  |      |
|           |                 |                | 6 V      |                          | 12  | 18  |           | 27  |           | 22  |      |
| $t_{en}$  | $\overline{OE}$ | A or B         | 2 V      |                          | 125 | 230 |           | 340 |           | 290 | ns   |
|           |                 |                | 4.5 V    |                          | 23  | 46  |           | 68  |           | 58  |      |
|           |                 |                | 6 V      |                          | 20  | 39  |           | 58  |           | 49  |      |
| $t_{dis}$ | $\overline{OE}$ | A or B         | 2 V      |                          | 74  | 200 |           | 300 |           | 250 | ns   |
|           |                 |                | 4.5 V    |                          | 25  | 40  |           | 60  |           | 50  |      |
|           |                 |                | 6 V      |                          | 21  | 34  |           | 51  |           | 43  |      |
| $t_t$     |                 | A or B         | 2 V      |                          | 20  | 60  |           | 90  |           | 75  | ns   |
|           |                 |                | 4.5 V    |                          | 8   | 12  |           | 18  |           | 15  |      |
|           |                 |                | 6 V      |                          | 6   | 10  |           | 15  |           | 13  |      |

## 6.7 Switching Characteristics, $C_L = 150 \text{ pF}$

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

(see [Figure 7-1](#))

| PARAMETER | FROM<br>(INPUT) | TO<br>(OUTPUT<br>) | $V_{CC}$ | $T_A = 25^\circ\text{C}$ |     |     | SN54HC245 |     | SN74HC245 |     | UNIT |
|-----------|-----------------|--------------------|----------|--------------------------|-----|-----|-----------|-----|-----------|-----|------|
|           |                 |                    |          | MIN                      | TYP | MAX | MIN       | MAX | MIN       | MAX |      |
| $t_{pd}$  | A or B          | B or A             | 2 V      |                          | 54  | 135 |           | 200 |           | 170 | ns   |
|           |                 |                    | 4.5 V    |                          | 18  | 27  |           | 40  |           | 34  |      |
|           |                 |                    | 6 V      |                          | 15  | 23  |           | 34  |           | 29  |      |
| $t_{en}$  | $\overline{OE}$ | A or B             | 2 V      |                          | 150 | 270 |           | 405 |           | 335 | ns   |
|           |                 |                    | 4.5 V    |                          | 31  | 54  |           | 81  |           | 67  |      |
|           |                 |                    | 6 V      |                          | 25  | 46  |           | 69  |           | 56  |      |
| $t_t$     |                 | A or B             | 2 V      |                          | 45  | 210 |           | 315 |           | 265 | ns   |
|           |                 |                    | 4.5 V    |                          | 17  | 42  |           | 63  |           | 53  |      |
|           |                 |                    | 6 V      |                          | 13  | 36  |           | 53  |           | 45  |      |

## 6.8 Operating Characteristics

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

| PARAMETER |                                               | TEST CONDITIONS | TYP | UNIT |
|-----------|-----------------------------------------------|-----------------|-----|------|
| $C_{pd}$  | Power dissipation capacitance per transceiver | No load         | 40  | pF   |

## 6.9 Typical Characteristics

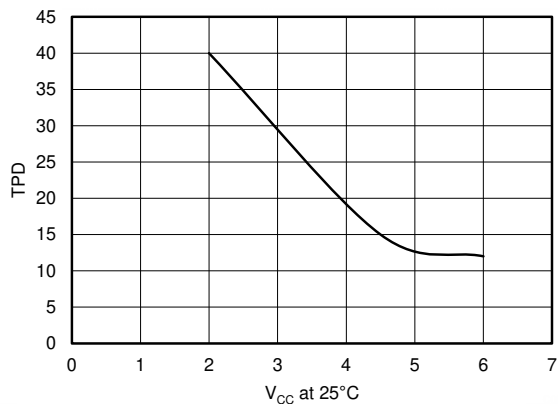


FIG 6-1. TPD vs  $V_{CC}$  at 25°C

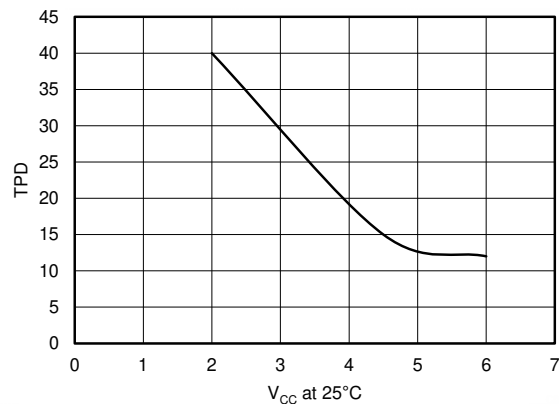
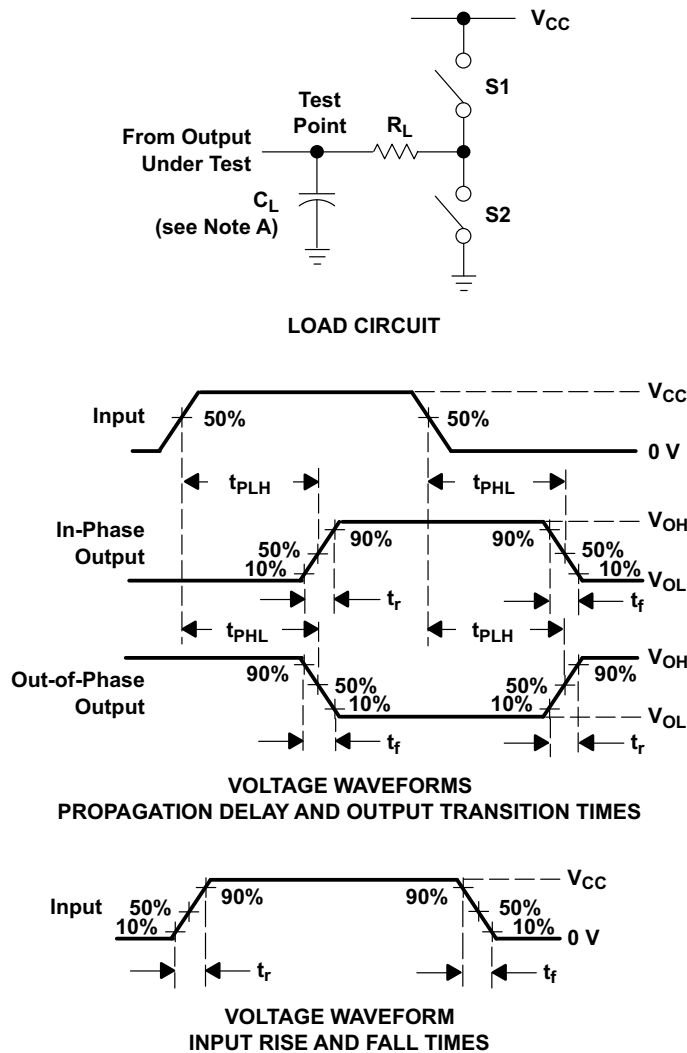


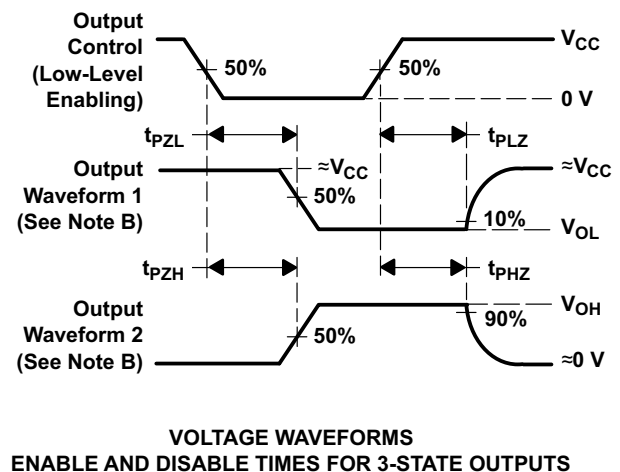
FIG 6-2. TPD vs  $V_{CC}$  at 25°C

## 7 Parameter Measurement Information

### 7.1



| PARAMETER         |           | $R_L$        | $C_L$           | S1     | S2     |
|-------------------|-----------|--------------|-----------------|--------|--------|
| $t_{en}$          | $t_{pZH}$ | 1 k $\Omega$ | 50 pF or 150 pF | Open   | Closed |
|                   | $t_{pZL}$ |              |                 | Closed | Open   |
| $t_{dis}$         | $t_{pHZ}$ | 1 k $\Omega$ | 50 pF           | Open   | Closed |
|                   | $t_{pLZ}$ |              |                 | Closed | Open   |
| $t_{pd}$ or $t_t$ |           | --           | 50 pF or 150 pF | Open   | Open   |

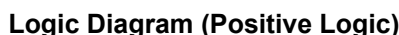


- A.  $C_L$  includes probe and test-fixture capacitance.
- B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
- C. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics:  $PRR \leq 1$  MHz,  $Z_O = 50 \Omega$ ,  $t_r = 6$  ns,  $t_f = 6$  ns.
- D. The outputs are measured one at a time with one input transition per measurement.
- E.  $t_{pLZ}$  and  $t_{pHZ}$  are the same as  $t_{dis}$ .
- F.  $t_{pZL}$  and  $t_{pZH}$  are the same as  $t_{en}$ .
- G.  $t_{pLH}$  and  $t_{pHL}$  are the same as  $t_{pd}$ .

**7-1. Load Circuit and Voltage Waveforms**

## 8.1 Overview

## 8.2 Functional Block Diagram



The SNx4HC245 devices have a wide operating VCC range from 2 V to 6 V with slower edge rates to minimize output ringing.

表 8-1 lists the function modes of the SNx4HC245.

| INPUTS <sup>(1)</sup> |     | OPERATION       |
|-----------------------|-----|-----------------|
| OE                    | DIR |                 |
| L                     | L   | B data to A bus |
| L                     | H   | A data to B bus |
| H                     | X   | Isolation       |

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## 9 Application and Implementation

### 注

以下のアプリケーション情報は、TI の製品仕様に含まれるものではなく、TI ではその正確性または完全性を保証いたしません。個々の目的に対する製品の適合性については、お客様の責任で判断していただくことになります。お客様は自身の設計実装を検証しテストすることで、システムの機能を確認する必要があります。

### 9.1 Application Information

The SNx4HC245 is a low-drive CMOS device that can be used for a multitude of bus interface type applications where output ringing is a concern. The low drive and slow edge rates will minimize overshoot and undershoot on the outputs.

### 9.2 Typical Application

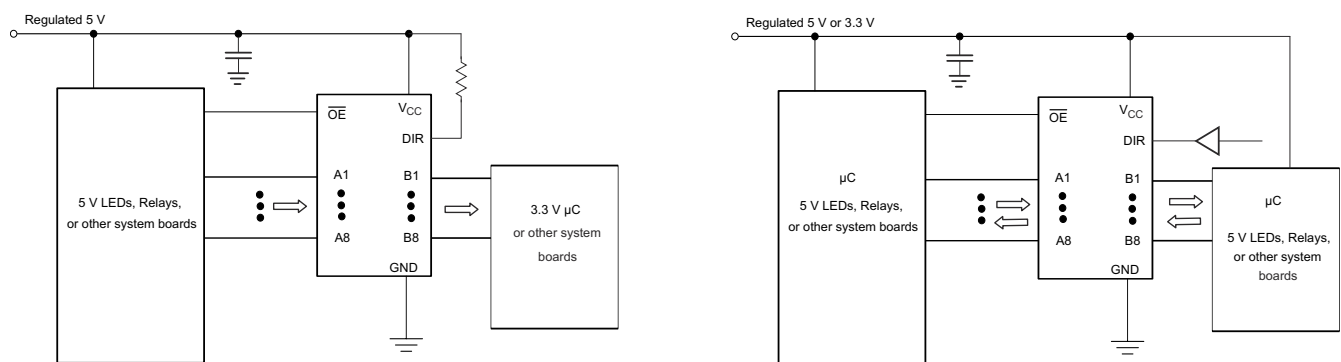


図 9-1. Typical Application Schematic

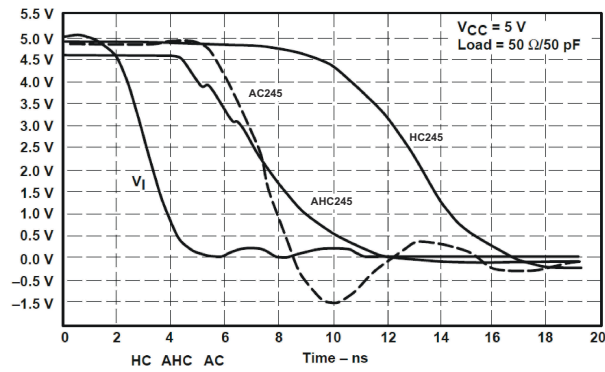
#### 9.2.1 Design Requirements

This device uses CMOS technology and has balanced output drive. Care should be taken to avoid bus contention because it can drive currents that would exceed maximum limits. Outputs can be combined to produce higher drive but the high drive will also create faster edges into light loads, so routing and load conditions should be considered to prevent ringing.

#### 9.2.2 Detailed Design Procedure

- Recommended Input Conditions
  - Rise time and fall time specs: See ( $\Delta t/\Delta V$ ) in the [セクション 6.3](#).
  - Specified high and low levels: See ( $V_{IH}$  and  $V_{IL}$ ) in the [セクション 6.3](#).
- Recommend Output Conditions
  - Load currents should not exceed 25 mA per output and 75 mA total for the part.
  - Outputs should not be pulled above  $V_{CC}$ .

### 9.2.3 Application Curve




**9-2. Switching Characteristics Comparison**

## 10 Power Supply Recommendations

The power supply can be any voltage between the MIN and MAX supply voltage rating located in the [セクション 6.3](#).

Each  $V_{CC}$  pin should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, 0.1  $\mu\text{F}$  is recommended; if there are multiple  $V_{CC}$  pins, then 0.01  $\mu\text{F}$  or 0.022  $\mu\text{F}$  is recommended for each power pin. It is acceptable to parallel multiple bypass caps to reject different frequencies of noise. A 0.1  $\mu\text{F}$  and a 1  $\mu\text{F}$  are commonly used in parallel. The bypass capacitor should be installed as close to the power pin as possible for best results.

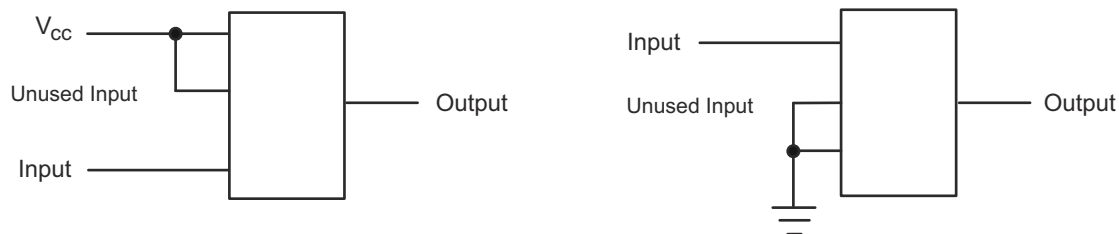
## 11 Layout

### 11.1 Layout Guidelines

When using multiple-bit logic devices, inputs should never float.

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 input pins should not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. [図 11-1](#) specifies the rules that must be observed under all circumstances. All unused inputs of digital logic devices must be connected to a high or low bias to prevent them from floating. The logic level that should be applied to any particular unused input depends on the function of the device. Generally they will be tied to GND or  $V_{CC}$ , whichever makes more sense or is more convenient. It is generally acceptable to float outputs, unless the part is a transceiver. If the transceiver has an output enable pin, it will disable the output section of the part when asserted. This will not disable the input section of the IOs, so they cannot float when disabled.

### 11.2 Layout Example



**図 11-1. Layout Diagram**

## 12 Device and Documentation Support

### 12.1 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        |
|-----------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| SN54HC245 | <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> |
| SN74HC245 | <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> |

### 12.2 Receiving Notification of Documentation Updates

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

### 12.3 サポート・リソース

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

リンクされているコンテンツは、該当する貢献者により、現状のまま提供されるものです。これらは TI の仕様を構成するものではなく、必ずしも TI の見解を反映したものではありません。TI の[使用条件](#)を参照してください。

### 12.4 Trademarks

TI E2E™ is a trademark of Texas Instruments.

すべての商標は、それぞれの所有者に帰属します。

### 12.5 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.

### 12.6 Glossary

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

## 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="#">5962-8408501VRA</a>  | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 5962-8408501VR<br>A<br>SNV54HC245J |
| 5962-8408501VRA.A                | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 5962-8408501VR<br>A<br>SNV54HC245J |
| <a href="#">5962-8408501VSA</a>  | Active        | Production           | CFP (W)   20   | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 5962-8408501VS<br>A<br>SNV54HC245W |
| 5962-8408501VSA.A                | Active        | Production           | CFP (W)   20   | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 5962-8408501VS<br>A<br>SNV54HC245W |
| <a href="#">84085012A</a>        | Active        | Production           | LCCC (FK)   20 | 55   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 84085012A<br>SNJ54HC<br>245FK      |
| <a href="#">8408501RA</a>        | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8408501RA<br>SNJ54HC245J           |
| <a href="#">8408501SA</a>        | Active        | Production           | CFP (W)   20   | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8408501SA<br>SNJ54HC245W           |
| <a href="#">JM38510/65503BRA</a> | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65503BRA               |
| JM38510/65503BRA.A               | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65503BRA               |
| <a href="#">JM38510/65503BSA</a> | Active        | Production           | CFP (W)   20   | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65503BSA               |
| JM38510/65503BSA.A               | Active        | Production           | CFP (W)   20   | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65503BSA               |
| <a href="#">M38510/65503BRA</a>  | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65503BRA               |
| <a href="#">M38510/65503BSA</a>  | Active        | Production           | CFP (W)   20   | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65503BSA               |
| <a href="#">SN54HC245J</a>       | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | SN54HC245J                         |
| SN54HC245J.A                     | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | SN54HC245J                         |
| <a href="#">SN74HC245DBR</a>     | Active        | Production           | SSOP (DB)   20 | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                              |

| 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)           |
|--------------------------------|---------------|----------------------|-----------------|-----------------------|-------------|--------------------------------------|-----------------------------------|--------------|-------------------------------|
| SN74HC245DBR.A                 | Active        | Production           | SSOP (DB)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| SN74HC245DBRG4                 | Active        | Production           | SSOP (DB)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| <a href="#">SN74HC245DW</a>    | Obsolete      | Production           | SOIC (DW)   20  | -                     | -           | Call TI                              | Call TI                           | -40 to 85    | HC245                         |
| <a href="#">SN74HC245DWR</a>   | Active        | Production           | SOIC (DW)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| SN74HC245DWR.A                 | Active        | Production           | SOIC (DW)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| SN74HC245DWRE4                 | Active        | Production           | SOIC (DW)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| SN74HC245DWRG4                 | Active        | Production           | SOIC (DW)   20  | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| <a href="#">SN74HC245N</a>     | Active        | Production           | PDIP (N)   20   | 20   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -40 to 85    | SN74HC245N                    |
| SN74HC245N.A                   | Active        | Production           | PDIP (N)   20   | 20   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -40 to 85    | SN74HC245N                    |
| <a href="#">SN74HC245NSR</a>   | Active        | Production           | SOP (NS)   20   | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| SN74HC245NSR.A                 | Active        | Production           | SOP (NS)   20   | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| SN74HC245NSRE4                 | Active        | Production           | SOP (NS)   20   | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| <a href="#">SN74HC245PW</a>    | Obsolete      | Production           | TSSOP (PW)   20 | -                     | -           | Call TI                              | Call TI                           | -40 to 85    | HC245                         |
| <a href="#">SN74HC245PWR</a>   | Active        | Production           | TSSOP (PW)   20 | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| SN74HC245PWR.A                 | Active        | Production           | TSSOP (PW)   20 | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| <a href="#">SN74HC245PWRG4</a> | Active        | Production           | TSSOP (PW)   20 | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| SN74HC245PWRG4.A               | Active        | Production           | TSSOP (PW)   20 | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC245                         |
| <a href="#">SN74HC245PWT</a>   | Obsolete      | Production           | TSSOP (PW)   20 | -                     | -           | Call TI                              | Call TI                           | -40 to 85    | HC245                         |
| <a href="#">SNJ54HC245FK</a>   | Active        | Production           | LCCC (FK)   20  | 55   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 84085012A<br>SNJ54HC<br>245FK |
| SNJ54HC245FK.A                 | Active        | Production           | LCCC (FK)   20  | 55   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 84085012A<br>SNJ54HC<br>245FK |
| <a href="#">SNJ54HC245J</a>    | Active        | Production           | CDIP (J)   20   | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8408501RA<br>SNJ54HC245J      |
| SNJ54HC245J.A                  | Active        | Production           | CDIP (J)   20   | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8408501RA<br>SNJ54HC245J      |
| <a href="#">SNJ54HC245W</a>    | Active        | Production           | CFP (W)   20    | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8408501SA<br>SNJ54HC245W      |
| SNJ54HC245W.A                  | Active        | Production           | CFP (W)   20    | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8408501SA<br>SNJ54HC245W      |

<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.

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

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

**OTHER QUALIFIED VERSIONS OF SN54HC245, SN54HC245-SP, SN74HC245 :**

- Catalog : [SN74HC245, SN54HC245](#)
- Military : [SN54HC245](#)
- Space : [SN54HC245-SP](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product

- 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 |
|----------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74HC245DBR   | SSOP         | DB              | 20   | 2000 | 330.0              | 16.4               | 8.2     | 7.5     | 2.5     | 12.0    | 16.0   | Q1            |
| SN74HC245DWR   | SOIC         | DW              | 20   | 2000 | 330.0              | 24.4               | 10.9    | 13.3    | 2.7     | 12.0    | 24.0   | Q1            |
| SN74HC245NSR   | SOP          | NS              | 20   | 2000 | 330.0              | 24.4               | 8.4     | 13.0    | 2.5     | 12.0    | 24.0   | Q1            |
| SN74HC245PWR   | TSSOP        | PW              | 20   | 2000 | 330.0              | 16.4               | 6.95    | 7.0     | 1.4     | 8.0     | 16.0   | Q1            |
| SN74HC245PWRG4 | 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) |
|----------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74HC245DBR   | SSOP         | DB              | 20   | 2000 | 353.0       | 353.0      | 32.0        |
| SN74HC245DWR   | SOIC         | DW              | 20   | 2000 | 356.0       | 356.0      | 45.0        |
| SN74HC245NSR   | SOP          | NS              | 20   | 2000 | 356.0       | 356.0      | 45.0        |
| SN74HC245PWR   | TSSOP        | PW              | 20   | 2000 | 353.0       | 353.0      | 32.0        |
| SN74HC245PWRG4 | 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) |
|--------------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| 5962-8408501VSA    | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| 5962-8408501VSA.A  | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| 84085012A          | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| 8408501SA          | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| JM38510/65503BSA   | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| JM38510/65503BSA.A | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| M38510/65503BSA    | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| SN74HC245N         | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| SN74HC245N.A       | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| SNJ54HC245FK       | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| SNJ54HC245FK.A     | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| SNJ54HC245W        | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| SNJ54HC245W.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.



# 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)

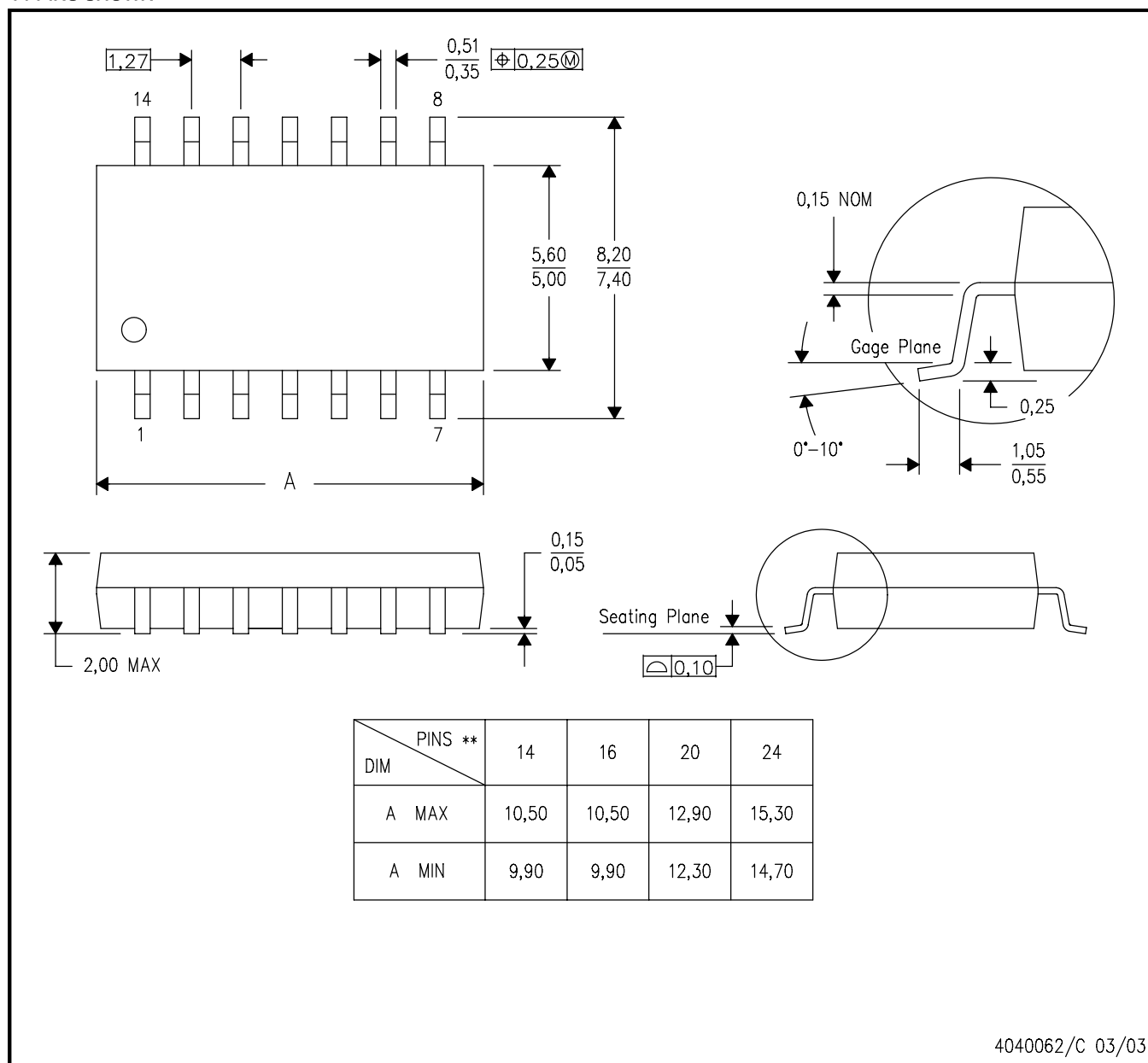
8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

# MECHANICAL DATA

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

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



- NOTES:
- All linear dimensions are in millimeters.
  - This drawing is subject to change without notice.
  - 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



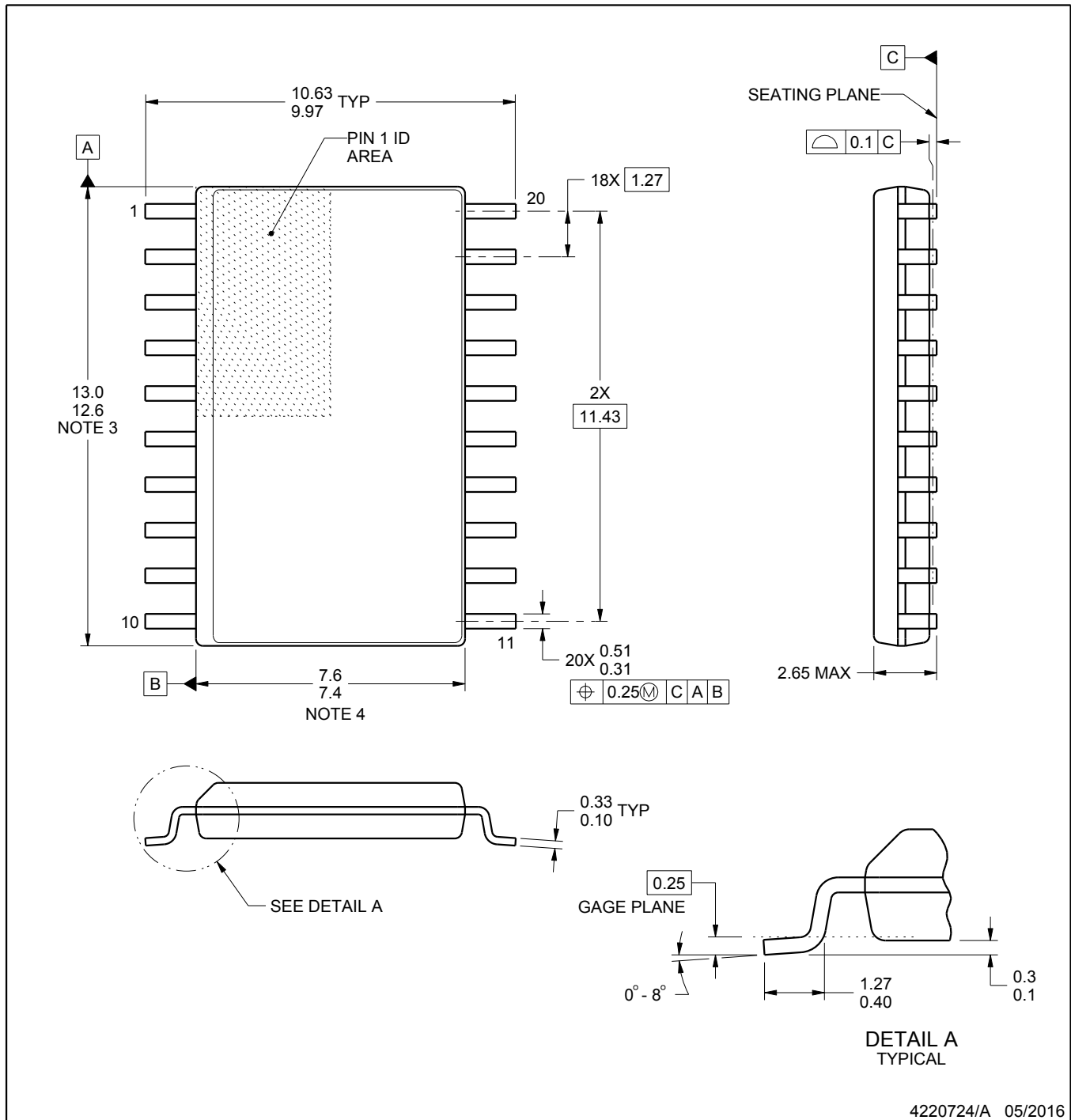
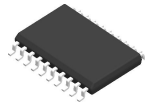
| PINS **             | 14               | 16               | 18               | 20               |
|---------------------|------------------|------------------|------------------|------------------|
| DIM                 |                  |                  |                  |                  |
|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



14/18 Pin Only  
20 Pin vendor option

4040049/E 12/2002

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



4220724/A 05/2016

## NOTES:

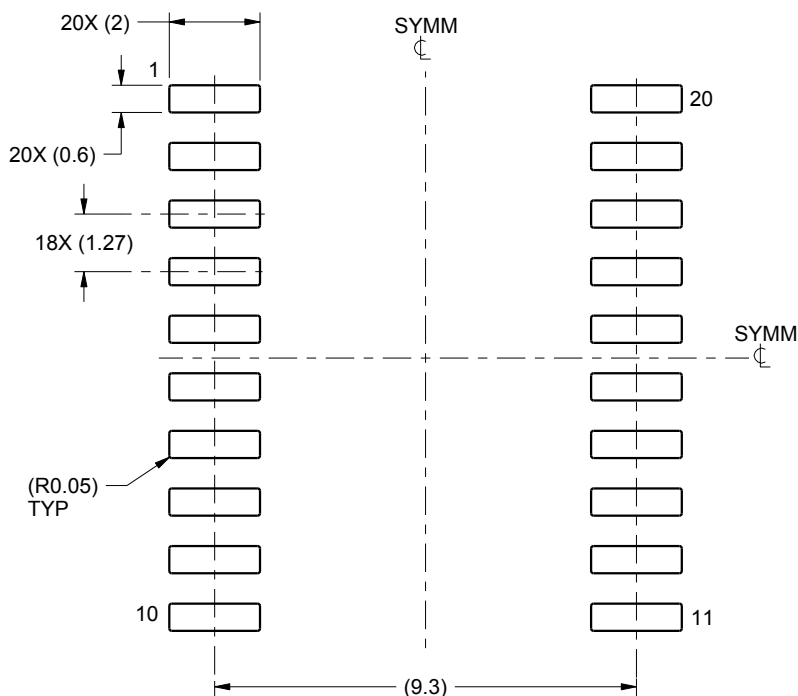
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate 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

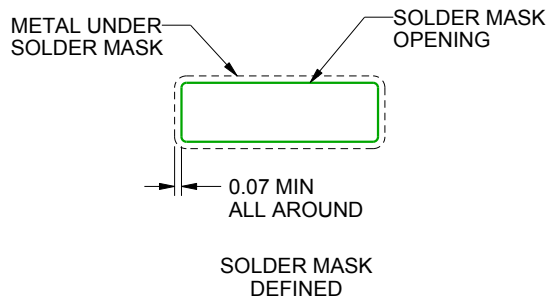
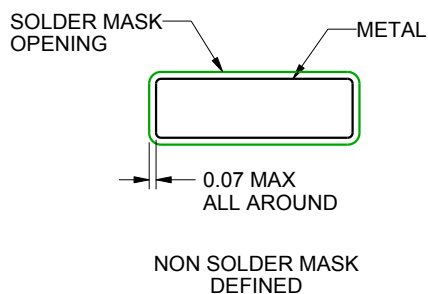
DW0020A

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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