

## SNx4HC240 具有三态输出的八路缓冲器和线路驱动器

### 1 特性

- 2V 至 6V 的宽工作电压范围
- 高电流输出可驱动多达 15 个 LSTTL 负载
- 低功耗， $I_{CC}$  最大值为 80  $\mu$ A
- $t_{pd}$  典型值 = 9ns
- 5V 时，输出驱动为  $\pm 6$ mA
- 低输入电流，最大值 1 $\mu$ A
- 三态输出驱动总线或缓冲存储器地址寄存器

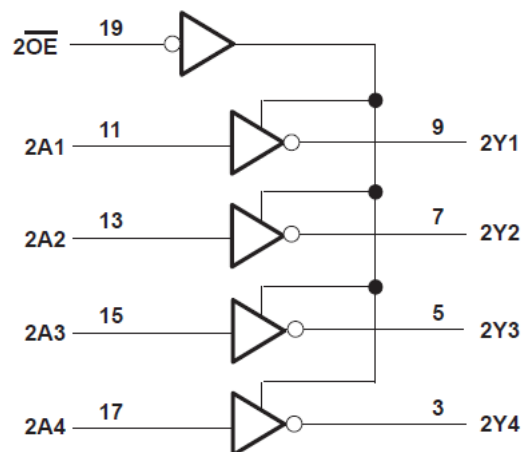
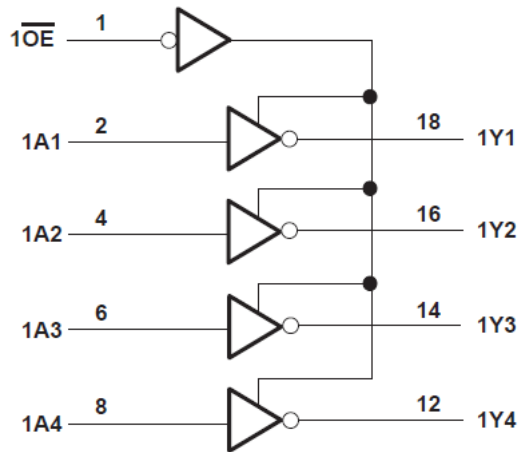
### 2 说明

这些八路缓冲器和线路驱动器专门设计用于提高三态存储器地址驱动器、时钟驱动器以及总线导向接收器和发送器的性能和密度。'HC240 器件配置为两个具有独立输出使能 ( $\overline{OE}$ ) 输入的 4 位缓冲器/驱动器。当  $\overline{OE}$  为低电平时，该器件将来自 A 输入的反相数据传递到 Y 输出。当  $\overline{OE}$  为高电平时，输出处于高阻态。

#### 器件信息

| 器件型号      | 封装 <sup>(1)</sup> | 封装尺寸 <sup>(2)</sup> | 本体尺寸 <sup>(3)</sup> |
|-----------|-------------------|---------------------|---------------------|
| SN74HC240 | DW (SOIC, 20)     | 12.80mm x 10.3mm    | 12.80mm x 7.50mm    |
|           | DB (SSOP, 20)     | 7.2mm x 7.8mm       | 7.2mm x 5.30mm      |
|           | DGS (VSSOP, 20)   | 5.1mm x 4.9mm       | 5.1mm x 3mm         |
|           | PDIP (20)         | 24.33mm x 9.4mm     | 24.33mm x 6.35mm    |
|           | NS (SOP, 20)      | 12.6mm x 7.8mm      | 12.6mm x 5.3mm      |
|           | PW (TSSOP, 20)    | 6.50mm x 6.4mm      | 6.50mm x 4.40mm     |
| SNx4HC240 | J (CDIP, 20)      | 24.2mm x 7.62mm     | 24.2mm x 6.92mm     |
|           | FK (LCCC, 20)     | 8.9mm x 8.9mm       | 8.9mm x 8.9mm       |
|           | W (CFP, 20)       | 13.09mm x 8.13mm    | 13.09mm x 6.92mm    |

- (1) 有关更多信息，请参阅机械、封装和可订购信息。
- (2) 封装尺寸 (长 × 宽) 为标称值，并包括引脚 (如适用)。
- (3) 本体尺寸 (长 × 宽) 为标称值，不包括引脚。



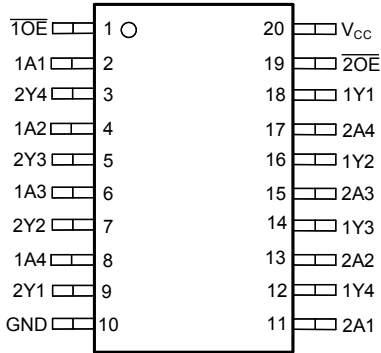
功能方框图



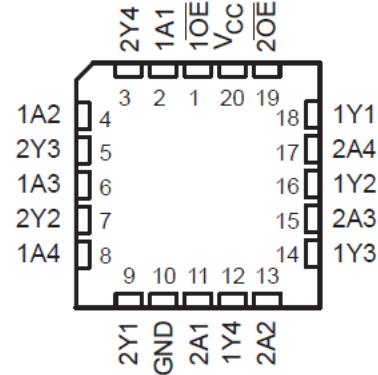
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### 3 引脚配置和功能



J、W、DB、DGS、DW、N、NS 或 PW 封装  
20 引脚 CDIP、CFP、SSOP、SOIC、PDIP、SO、  
TSSOP  
(顶视图)



FK 封装  
20 引脚 LCCC  
(顶视图)

表 3-1. 引脚功能

| 名称 1 | 引脚 | 类型 | 说明     |
|------|----|----|--------|
| 1OE  | 1  | I  | 输出使能 1 |
| 1A1  | 2  | I  | 1A1 输入 |
| 2Y4  | 3  | O  | 2Y4 输出 |
| 1A2  | 4  | I  | 1A2 输入 |
| 2Y3  | 5  | O  | 2Y3 输出 |
| 1A3  | 6  | I  | 1A3 输入 |
| 2Y2  | 7  | O  | 2Y2 输出 |
| 1A4  | 8  | I  | 1A4 输入 |
| 2Y1  | 9  | O  | 2Y1 输出 |
| GND  | 10 | —  | 接地引脚   |
| 2A1  | 11 | I  | 2A1 输入 |
| 1Y4  | 12 | O  | 1Y4 输出 |
| 2A2  | 13 | I  | 2A2 输入 |
| 1Y3  | 14 | O  | 1Y3 输出 |
| 2A3  | 15 | I  | 2A3 输入 |
| 1Y2  | 16 | O  | 1Y2 输出 |
| 2A4  | 17 | I  | 2A4 输入 |
| 1Y1  | 18 | O  | 1Y1 输出 |
| 2OE  | 19 | I  | 输出使能 2 |
| VCC  | 20 | —  | 电源引脚   |

1. I = 输入、O = 输出、P = 电源、FB = 反馈、GND = 接地、N/A = 不适用

## 4 规格

### 4.1 绝对最大额定值

在自然通风条件下的工作温度范围内测得 (除非另有说明) <sup>(1)</sup>

|                                |                       | 最小值   | 最大值 | 单位     |
|--------------------------------|-----------------------|---|-----|--------|
| V <sub>CC</sub>                | 电源电压范围                | -0.5  | 7   | V      |
| I <sub>IK</sub>                | 输入钳位电流 <sup>(2)</sup> | V <sub>I</sub> < 0 或 V <sub>I</sub> > V <sub>CC</sub> |     | ±20 mA |
| I <sub>OK</sub>                | 输出钳位电流 <sup>(2)</sup> | V <sub>O</sub> < 0 或 V <sub>O</sub> > V <sub>CC</sub> |     | ±20 mA |
| I <sub>O</sub>                 | 持续输出电流                | V <sub>O</sub> = 0 至 V <sub>CC</sub>                  |     | ±35 mA |
| 通过 V <sub>CC</sub> 或 GND 的持续电流 |                       |   |     | ±70 mA |
| T <sub>J</sub>                 | 结温                    |   |     | 150 °C |
| T <sub>stg</sub>               | 贮存温度范围                | -65   | 150 | °C     |
| 引线温度 (焊接 10s) (SOIC - 仅限引线尖端)  |                       |   |     | 300 °C |

- (1) 超出最大绝对额定值下列出的值的应力可能会对器件造成永久损坏。这些仅为在应力额定值下的工作情况，对于额定值下的器件的功能性操作以及在超出推荐的运行条件下标明的任何其它条件下的操作，在此并未说明。长时间处于绝对最大额定条件下可能会影响器件的可靠性。
- (2) 如果遵守输入和输出电流额定值，有可能超过输入负电压和输出电压额定值。

### 4.2 建议运行条件

在自然通风条件下的工作温度范围内测得 (除非另有说明) <sup>(1)</sup>

|                 |                | SN54HC240              |     |                 | SN74HC240 |                 |     | 单位 |
|-----------------|----------------|------------------------|-----|-----------------|-----------|-----------------|-----|----|
|                 |                | 最小值                    | 标称值 | 最大值             | 最小值       | 标称值             | 最大值 |    |
| V <sub>CC</sub> | 电源电压           | 2                      | 5   | 6               | 2         | 5               | 6   | V  |
| V <sub>IH</sub> | 高电平输入电压        | V <sub>CC</sub> = 2V   |     | 1.5             | 1.5       |                 | V   |    |
|                 |                | V <sub>CC</sub> = 4.5V |     | 3.15            | 3.15      |                 |     |    |
|                 |                | V <sub>CC</sub> = 6V   |     | 4.2             | 4.2       |                 |     |    |
| V <sub>IL</sub> | 低电平输入电压        | V <sub>CC</sub> = 2V   |     |                 | 0.5       | 0.5             | V   |    |
|                 |                | V <sub>CC</sub> = 4.5V |     |                 | 1.35      | 1.35            |     |    |
|                 |                | V <sub>CC</sub> = 6V   |     |                 | 1.8       | 1.8             |     |    |
| V <sub>I</sub>  | 输入电压           | 0                      |     | V <sub>CC</sub> | 0         | V <sub>CC</sub> | V   |    |
| V <sub>O</sub>  | 输出电压           | 0                      |     | V <sub>CC</sub> | 0         | V <sub>CC</sub> | V   |    |
| Δt/Δv           | 输入转换上升和下降时间    | V <sub>CC</sub> = 2V   |     |                 | 1000      | 1000            | ns  |    |
|                 |                | V <sub>CC</sub> = 4.5V |     |                 | 500       | 500             |     |    |
|                 |                | V <sub>CC</sub> = 6V   |     |                 | 400       | 400             |     |    |
| T <sub>A</sub>  | 自然通风条件下的工作温度范围 | -55                    |     | 125             | -40       | 85              | °C  |    |

- (1) 器件所有的未使用输入必须保持在 V<sub>CC</sub> 或 GND 以确保器件正常运行。请参阅 TI 应用报告 *CMOS 输入缓慢或悬空的影响*，文献编号 SCBA004。

### 4.3 热性能信息

| 热指标                   |                       | SN74HC240 |           |             |          |          |            | 单位   |
|-----------------------|-----------------------|-----------|-----------|-------------|----------|----------|------------|------|
|                       |                       | DW (SOIC) | DB (SSOP) | DGS (VSSOP) | N (PDIP) | NS (SOP) | PW (TSSOP) |      |
|                       |                       | 20 引脚     | 20 引脚     | 20 引脚       | 20 引脚    | 20 引脚    | 20 引脚      |      |
| R <sub>θJA</sub>      | 结至环境热阻 <sup>(1)</sup> | 109.1     | 122.7     | 130.6       | 84.6     | 113.4    | 131.8      | °C/W |
| R <sub>θJC(top)</sub> | 结至外壳 (顶部) 热阻          | 76        | 81.6      | 68.7        | 72.5     | 78.6     | 72.2       | °C/W |
| R <sub>θJB</sub>      | 结至电路板热阻               | 77.6      | 77.5      | 85.4        | 65.3     | 78.4     | 82.8       | °C/W |
| Ψ <sub>JT</sub>       | 结至顶部特征参数              | 51.5      | 46.1      | 10.5        | 55.3     | 47.1     | 21.5       | °C/W |

### 4.3 热性能信息 (续)

| 热指标                  |              | SN74HC240 |           |             |          |          |            | 单位   |
|----------------------|--------------|-----------|-----------|-------------|----------|----------|------------|------|
|                      |              | DW (SOIC) | DB (SSOP) | DGS (VSSOP) | N (PDIP) | NS (SOP) | PW (TSSOP) |      |
|                      |              | 20 引脚     | 20 引脚     | 20 引脚       | 20 引脚    | 20 引脚    | 20 引脚      |      |
| $\Psi_{JB}$          | 结至电路板特征参数    | 77.1      | 77.1      | 85.0        | 65.2     | 78.1     | 82.4       | °C/W |
| $R_{\theta JC(bot)}$ | 结至外壳 (底部) 热阻 | 不适用       | 不适用       | 不适用         | 不适用      | 不适用      | 不适用        | °C/W |

(1) 有关新旧热指标的更多信息, 请参阅 [半导体和 IC 封装热指标](#) 应用报告。

### 4.4 电气特性

在自然通风条件下的建议运行温度范围内测得 (除非另有说明)

| 参数       | 测试条件                          | $V_{CC}$                  | $T_A = 25^\circ\text{C}$ |            |           | SN54HC240 |            | SN74HC240 |            | 单位            |      |
|----------|-------------------------------|---------------------------|--------------------------|------------|-----------|-----------|------------|-----------|------------|---------------|------|
|          |                               |                           | 最小值                      | 典型值        | 最大值       | 最小值       | 最大值        | 最小值       | 最大值        |               |      |
| $V_{OH}$ | $V_I = V_{IH}$ 或 $V_{IL}$     | $I_{OH} = -20\mu\text{A}$ | 2V                       | 1.9        | 1.998     |           | 1.9        |           | 1.9        | V             |      |
|          |                               |                           | 4.5V                     | 4.4        | 4.499     |           | 4.4        |           | 4.4        |               |      |
|          |                               |                           | 6V                       | 5.9        | 5.999     |           | 5.9        |           | 5.9        |               |      |
|          |                               | $I_{OH} = -6\text{mA}$    | 4.5V                     | 3.98       | 4.3       |           | 3.7        |           | 3.84       |               |      |
|          |                               |                           | 6V                       | 5.48       | 5.8       |           | 5.2        |           | 5.34       |               |      |
| $V_{OL}$ | $V_I = V_{IH}$ 或 $V_{IL}$     | $I_{OL} = 20\mu\text{A}$  | 2V                       |            | 0.002     | 0.1       |            | 0.1       |            | V             |      |
|          |                               |                           | 4.5V                     |            | 0.001     | 0.1       |            | 0.1       |            |               |      |
|          |                               |                           | 6V                       |            | 0.001     | 0.1       |            | 0.1       |            |               |      |
|          |                               | $I_{OL} = 6\text{mA}$     | 4.5V                     |            | 0.17      | 0.26      |            | 0.4       |            |               | 0.33 |
|          |                               |                           | 6V                       |            | 0.15      | 0.26      |            | 0.4       |            |               | 0.33 |
| $I_I$    | $V_I = V_{CC}$ 或 0            | 6V                        |                          | $\pm 0.1$  | $\pm 100$ |           | $\pm 1000$ |           | $\pm 1000$ | nA            |      |
| $I_{OZ}$ | $V_O = V_{CC}$ 或 0            | 6V                        |                          | $\pm 0.01$ | $\pm 0.5$ |           | $\pm 10$   |           | $\pm 5$    | $\mu\text{A}$ |      |
| $I_{CC}$ | $V_I = V_{CC}$ 或 0, $I_O = 0$ | 6V                        |                          |            | 8         |           | 160        |           | 80         | $\mu\text{A}$ |      |
| $C_i$    |                               | 2V 至 6V                   |                          | 3          | 10        |           | 10         |           | 10         | pF            |      |

### 4.5 开关特性

在自然通风条件下的建议工作温度范围内测得,  $C_L = 50\text{pF}$  (除非另有说明) (请参阅图 5-1)

| 参数        | 从 (输入)          | 至 (输出) | $V_{CC}$ | $T_A = 25^\circ\text{C}$ |     |     | SN54HC240 |     | SN74HC240 |     | 单位 |
|-----------|-----------------|--------|----------|--------------------------|-----|-----|-----------|-----|-----------|-----|----|
|           |                 |        |          | 最小值                      | 典型值 | 最大值 | 最小值       | 最大值 | 最小值       | 最大值 |    |
| $t_{pd}$  | A               | Y      | 2V       |                          | 50  | 100 |           | 150 |           | 125 | ns |
|           |                 |        | 4.5V     |                          | 10  | 20  |           | 30  |           | 25  |    |
|           |                 |        | 6V       |                          | 9   | 17  |           | 25  |           | 21  |    |
| $t_{en}$  | $\overline{OE}$ | Y      | 2V       |                          | 75  | 150 |           | 225 |           | 190 | ns |
|           |                 |        | 4.5V     |                          | 15  | 30  |           | 45  |           | 38  |    |
|           |                 |        | 6V       |                          | 13  | 26  |           | 38  |           | 32  |    |
| $t_{dis}$ | $\overline{OE}$ | Y      | 2V       |                          | 44  | 150 |           | 225 |           | 190 | ns |
|           |                 |        | 4.5V     |                          | 22  | 30  |           | 45  |           | 38  |    |
|           |                 |        | 6V       |                          | 21  | 26  |           | 38  |           | 32  |    |
| $t_t$     |                 | Y      | 2V       |                          | 28  | 60  |           | 90  |           | 75  | ns |
|           |                 |        | 4.5V     |                          | 8   | 12  |           | 18  |           | 15  |    |
|           |                 |        | 6V       |                          | 6   | 10  |           | 15  |           | 13  |    |

## 4.6 开关特性

在自然通风条件下的建议工作温度范围内测得， $C_L = 150\text{pF}$ （除非另有说明）（请参阅图 5-1）

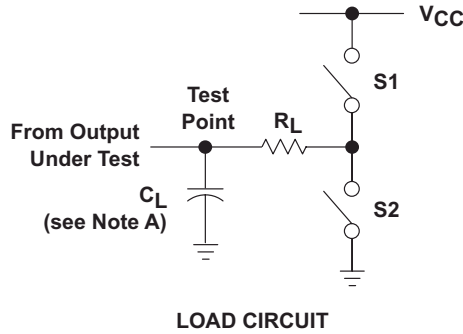
| 参数       | 从<br>(输入) | 至<br>(输出) | $V_{CC}$ | $T_A = 25^\circ\text{C}$ |     |     | SN54HC240 |     | SN74HC240 |     | 单位 |
|----------|-----------|-----------|----------|--------------------------|-----|-----|-----------|-----|-----------|-----|----|
|          |           |           |          | 最小值                      | 典型值 | 最大值 | 最小值       | 最大值 | 最小值       | 最大值 |    |
| $t_{pd}$ | A         | Y         | 2V       | 75                       | 150 | 225 | 190       | ns  |           |     |    |
|          |           |           | 4.5V     | 15                       | 30  | 45  | 38        |     |           |     |    |
|          |           |           | 6V       | 13                       | 26  | 38  | 32        |     |           |     |    |
| $t_{en}$ | OE        | Y         | 2V       | 100                      | 200 | 300 | 250       | ns  |           |     |    |
|          |           |           | 4.5V     | 20                       | 40  | 60  | 50        |     |           |     |    |
|          |           |           | 6V       | 17                       | 34  | 51  | 43        |     |           |     |    |
| $t_t$    |           | Y         | 2V       | 45                       | 210 | 315 | 265       | ns  |           |     |    |
|          |           |           | 4.5V     | 17                       | 42  | 63  | 53        |     |           |     |    |
|          |           |           | 6V       | 13                       | 36  | 53  | 45        |     |           |     |    |

## 4.7 工作特性

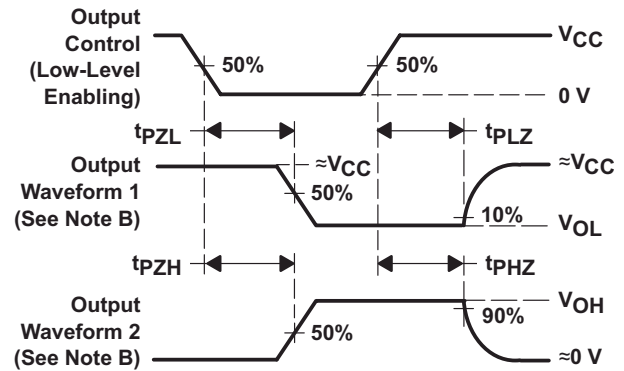
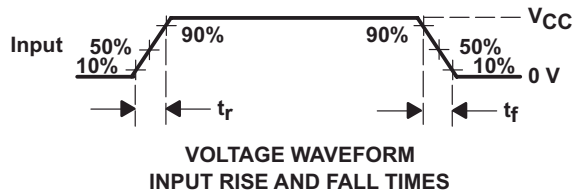
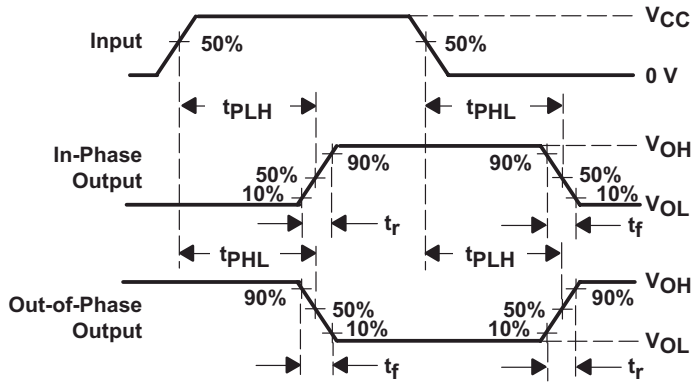
$T_A = 25^\circ\text{C}$

| 参数                        | 测试条件 | 典型值 | 单位 |
|---------------------------|------|-----|----|
| $C_{pd}$ 每个缓冲器/驱动器的功率耗散电容 | 空载   | 35  | pF |

## 5 参数测量信息



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



- NOTES:
- 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  $t_{pd}$ .

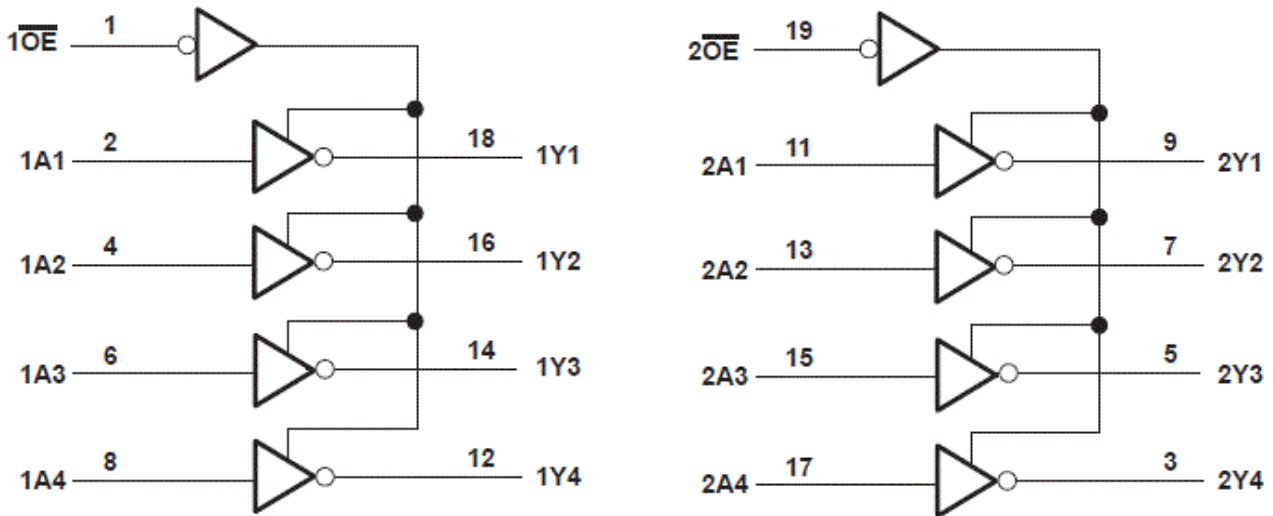
图 5-1. 负载电路和电压波形

## 6 详细说明

### 6.1 概述

这些八路缓冲器和线路驱动器专门设计用于提高三态存储器地址驱动器、时钟驱动器以及总线导向接收器和发送器的性能和密度。' HC240 器件配置为两个具有独立输出使能 ( $\overline{OE}$ ) 输入的 4 位缓冲器/驱动器。当  $\overline{OE}$  为低电平时，该器件将来自 A 输入的反相数据传递到 Y 输出。当  $\overline{OE}$  为高电平时，输出处于高阻态。

### 6.2 功能方框图



### 6.3 器件功能模式

表 6-1. 功能表  
(每个缓冲器/驱动器)

| 输入              |   | 输出 |
|-----------------|---|----|
| $\overline{OE}$ | A | Y  |
| L               | H | L  |
| L               | L | H  |
| H               | X | Z  |

## 7 应用和实施

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### 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。

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### 7.1 电源相关建议

电源可以是 *建议运行条件* 中最小和最大电源电压额定值之间的任何电压。每个  $V_{CC}$  端子均应具有一个良好的旁路电容器，以防止功率干扰。建议为该器件使用  $0.1\ \mu\text{F}$  电容器。可以并联多个旁路电容器以抑制不同的噪声频率。 $0.1\ \mu\text{F}$  和  $1\ \mu\text{F}$  电容器通常并联使用。为了获得最佳效果，旁路电容器必须尽可能靠近电源端子安装。

### 7.2 布局

#### 7.2.1 布局指南

使用多输入和多通道逻辑器件时，输入不得悬空。在许多情况下，未使用数字逻辑器件的全部或部分功能；例如，仅使用三输入与门的两个输入或仅使用 4 个缓冲门中的 3 个。此类未使用的输入引脚不得悬空，因为外部连接处的未定义电压会导致未定义的操作状态。数字逻辑器件的所有未使用输入必须连接到由输入电压规范定义的逻辑高电平电压或逻辑低电平电压，以防止其悬空。必须应用于任何特定未使用输入的逻辑电平取决于器件的功能。通常，输入连接到 **GND** 或  $V_{CC}$ ，以对逻辑功能更有意义或更方便者为准。

## 8 器件和文档支持

TI 提供广泛的开发工具。下面列出了用于评估器件性能、生成代码和开发解决方案的工具和软件。

### 8.1 文档支持

#### 8.1.1 相关文档

### 8.2 接收文档更新通知

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

### 8.3 支持资源

[TI E2E™ 中文支持论坛](#) 是工程师的重要参考资料，可直接从专家处获得快速、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，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](#)。

### 8.4 商标

TI E2E™ is a trademark of Texas Instruments.

所有商标均为其各自所有者的财产。

### 8.5 静电放电警告



静电放电 (ESD) 会损坏这个集成电路。德州仪器 (TI) 建议通过适当的预防措施处理所有集成电路。如果不遵守正确的处理和安装程序，可能会损坏集成电路。

ESD 的损坏小至导致微小的性能降级，大至整个器件故障。精密的集成电路可能更容易受到损坏，这是因为非常细微的参数更改都可能会导致器件与其发布的规格不相符。

### 8.6 术语表

[TI 术语表](#) 本术语表列出并解释了术语、首字母缩略词和定义。

## 9 修订历史记录

注：以前版本的页码可能与当前版本的页码不同

### Changes from Revision G (April 2022) to Revision H (August 2024) Page

- 向 [器件信息表](#)、[引脚配置和功能](#) 部分以及 [热性能信息表](#) 中添加了 DGS 封装.....1
- 向 [器件信息表](#) 添加了封装尺寸.....1
- 添加了 [引脚功能表](#).....3

### Changes from Revision F (December 2021) to Revision G (April 2022) Page

- 添加了 [应用和实施](#) 部分.....9

## 10 机械、封装和可订购信息

以下页面包含机械、封装和可订购信息。这些信息是指定器件可用的最新数据。数据如有变更，恕不另行通知，且不会对此文档进行修订。有关此数据表的浏览器版本，请查阅左侧的导航栏。

**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="#">84074012A</a>        | Active        | Production           | LCCC (FK)   20   | 55   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 84074012A<br>SNJ54HC<br>240FK |
| <a href="#">8407401RA</a>        | Active        | Production           | CDIP (J)   20    | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8407401RA<br>SNJ54HC240J      |
| <a href="#">8407401SA</a>        | Active        | Production           | CFP (W)   20     | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8407401SA<br>SNJ54HC240W      |
| <a href="#">JM38510/65703B2A</a> | Active        | Production           | LCCC (FK)   20   | 55   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65703B2A          |
| JM38510/65703B2A.A               | Active        | Production           | LCCC (FK)   20   | 55   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65703B2A          |
| <a href="#">JM38510/65703BRA</a> | Active        | Production           | CDIP (J)   20    | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65703BRA          |
| JM38510/65703BRA.A               | Active        | Production           | CDIP (J)   20    | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65703BRA          |
| <a href="#">M38510/65703B2A</a>  | Active        | Production           | LCCC (FK)   20   | 55   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65703B2A          |
| <a href="#">M38510/65703BRA</a>  | Active        | Production           | CDIP (J)   20    | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | JM38510/<br>65703BRA          |
| <a href="#">SN54HC240J</a>       | Active        | Production           | CDIP (J)   20    | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | SN54HC240J                    |
| SN54HC240J.A                     | Active        | Production           | CDIP (J)   20    | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | SN54HC240J                    |
| <a href="#">SN74HC240DBR</a>     | NRND          | Production           | SSOP (DB)   20   | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC240                         |
| SN74HC240DBR.A                   | NRND          | Production           | SSOP (DB)   20   | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC240                         |
| <a href="#">SN74HC240DGSR</a>    | Active        | Production           | VSSOP (DGS)   20 | 5000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 125   | HC240                         |
| SN74HC240DGSR.A                  | Active        | Production           | VSSOP (DGS)   20 | 5000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 125   | HC240                         |
| <a href="#">SN74HC240DW</a>      | Obsolete      | Production           | SOIC (DW)   20   | -                     | -           | Call TI                              | Call TI                           | -40 to 85    | HC240                         |
| <a href="#">SN74HC240DWR</a>     | Active        | Production           | SOIC (DW)   20   | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC240                         |
| SN74HC240DWR.A                   | Active        | Production           | SOIC (DW)   20   | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC240                         |
| <a href="#">SN74HC240N</a>       | Active        | Production           | PDIP (N)   20    | 20   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -40 to 85    | SN74HC240N                    |
| SN74HC240N.A                     | Active        | Production           | PDIP (N)   20    | 20   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -40 to 85    | SN74HC240N                    |
| SN74HC240NE4                     | Active        | Production           | PDIP (N)   20    | 20   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -40 to 85    | SN74HC240N                    |
| <a href="#">SN74HC240NSR</a>     | Active        | Production           | SOP (NS)   20    | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC240                         |

| 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)           |
|------------------------------|---------------|----------------------|-----------------|-----------------------|-------------|--------------------------------------|-----------------------------------|--------------|-------------------------------|
| SN74HC240NSR.A               | Active        | Production           | SOP (NS)   20   | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC240                         |
| <a href="#">SN74HC240PWR</a> | Active        | Production           | TSSOP (PW)   20 | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC240                         |
| SN74HC240PWR.A               | Active        | Production           | TSSOP (PW)   20 | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC240                         |
| SN74HC240PWRG4               | Active        | Production           | TSSOP (PW)   20 | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -40 to 85    | HC240                         |
| <a href="#">SNJ54HC240FK</a> | Active        | Production           | LCCC (FK)   20  | 55   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 84074012A<br>SNJ54HC<br>240FK |
| SNJ54HC240FK.A               | Active        | Production           | LCCC (FK)   20  | 55   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 84074012A<br>SNJ54HC<br>240FK |
| <a href="#">SNJ54HC240J</a>  | Active        | Production           | CDIP (J)   20   | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8407401RA<br>SNJ54HC240J      |
| SNJ54HC240J.A                | Active        | Production           | CDIP (J)   20   | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8407401RA<br>SNJ54HC240J      |
| <a href="#">SNJ54HC240W</a>  | Active        | Production           | CFP (W)   20    | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8407401SA<br>SNJ54HC240W      |
| SNJ54HC240W.A                | Active        | Production           | CFP (W)   20    | 25   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | 8407401SA<br>SNJ54HC240W      |

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

**(2) 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.

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

**(4) 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.

**(5) 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.

**(6) 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 SN54HC240, SN74HC240 :**

- Catalog : [SN74HC240](#)
- Military : [SN54HC240](#)

NOTE: Qualified Version Definitions:

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

**TAPE AND REEL INFORMATION**

**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**


\*All dimensions are nominal

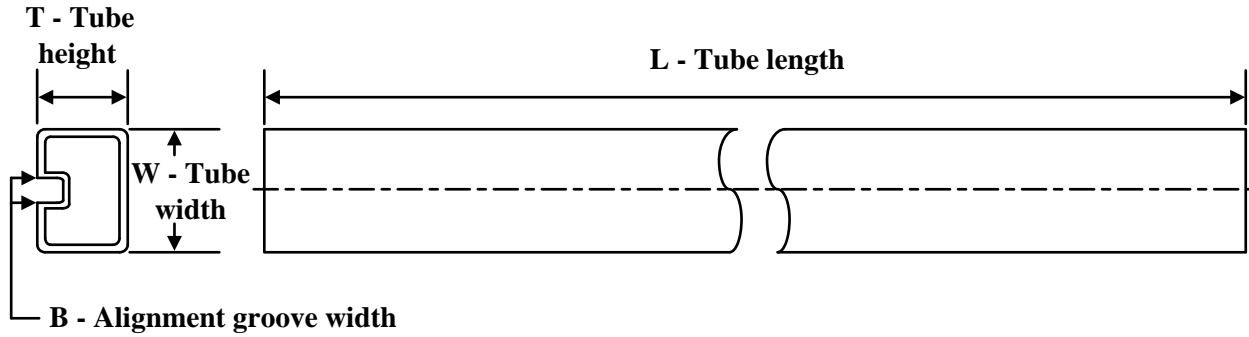
| Device        | Package Type | Package Drawing | Pins | SPQ  | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|---------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74HC240DBR  | SSOP         | DB              | 20   | 2000 | 330.0              | 16.4               | 8.2     | 7.5     | 2.5     | 12.0    | 16.0   | Q1            |
| SN74HC240DGSR | VSSOP        | DGS             | 20   | 5000 | 330.0              | 16.4               | 5.4     | 5.4     | 1.45    | 8.0     | 16.0   | Q1            |
| SN74HC240DWR  | SOIC         | DW              | 20   | 2000 | 330.0              | 24.4               | 10.9    | 13.3    | 2.7     | 12.0    | 24.0   | Q1            |
| SN74HC240NSR  | SOP          | NS              | 20   | 2000 | 330.0              | 24.4               | 8.4     | 13.0    | 2.5     | 12.0    | 24.0   | Q1            |
| SN74HC240PWR  | 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) |
|---------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74HC240DBR  | SSOP         | DB              | 20   | 2000 | 353.0       | 353.0      | 32.0        |
| SN74HC240DGSR | VSSOP        | DGS             | 20   | 5000 | 353.0       | 353.0      | 32.0        |
| SN74HC240DWR  | SOIC         | DW              | 20   | 2000 | 356.0       | 356.0      | 45.0        |
| SN74HC240NSR  | SOP          | NS              | 20   | 2000 | 356.0       | 356.0      | 45.0        |
| SN74HC240PWR  | 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) |
|--------------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| 84074012A          | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| 8407401SA          | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| JM38510/65703B2A   | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| JM38510/65703B2A.A | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| M38510/65703B2A    | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| SN74HC240N         | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| SN74HC240N.A       | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| SN74HC240NE4       | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| SNJ54HC240FK       | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| SNJ54HC240FK.A     | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| SNJ54HC240W        | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |
| SNJ54HC240W.A      | W            | CFP          | 20   | 25  | 506.98 | 26.16  | 6220   | NA     |

# DB0020A



# PACKAGE OUTLINE

## SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



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 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



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

## 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\*\*)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- 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.

# DW0020A



# PACKAGE OUTLINE

## SOIC - 2.65 mm max height

SOIC



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

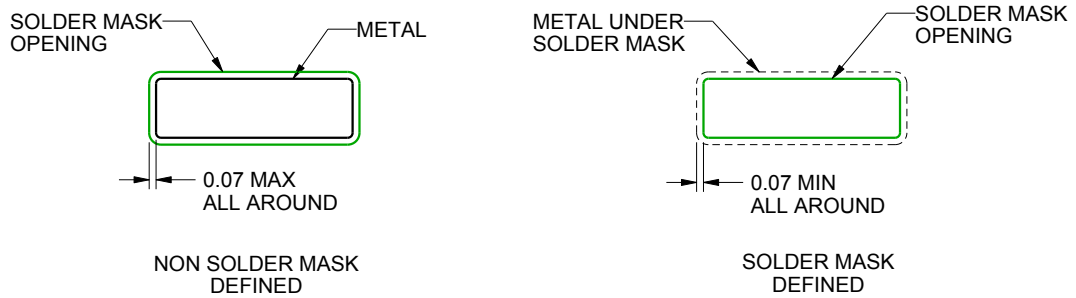
DW0020A

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.

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

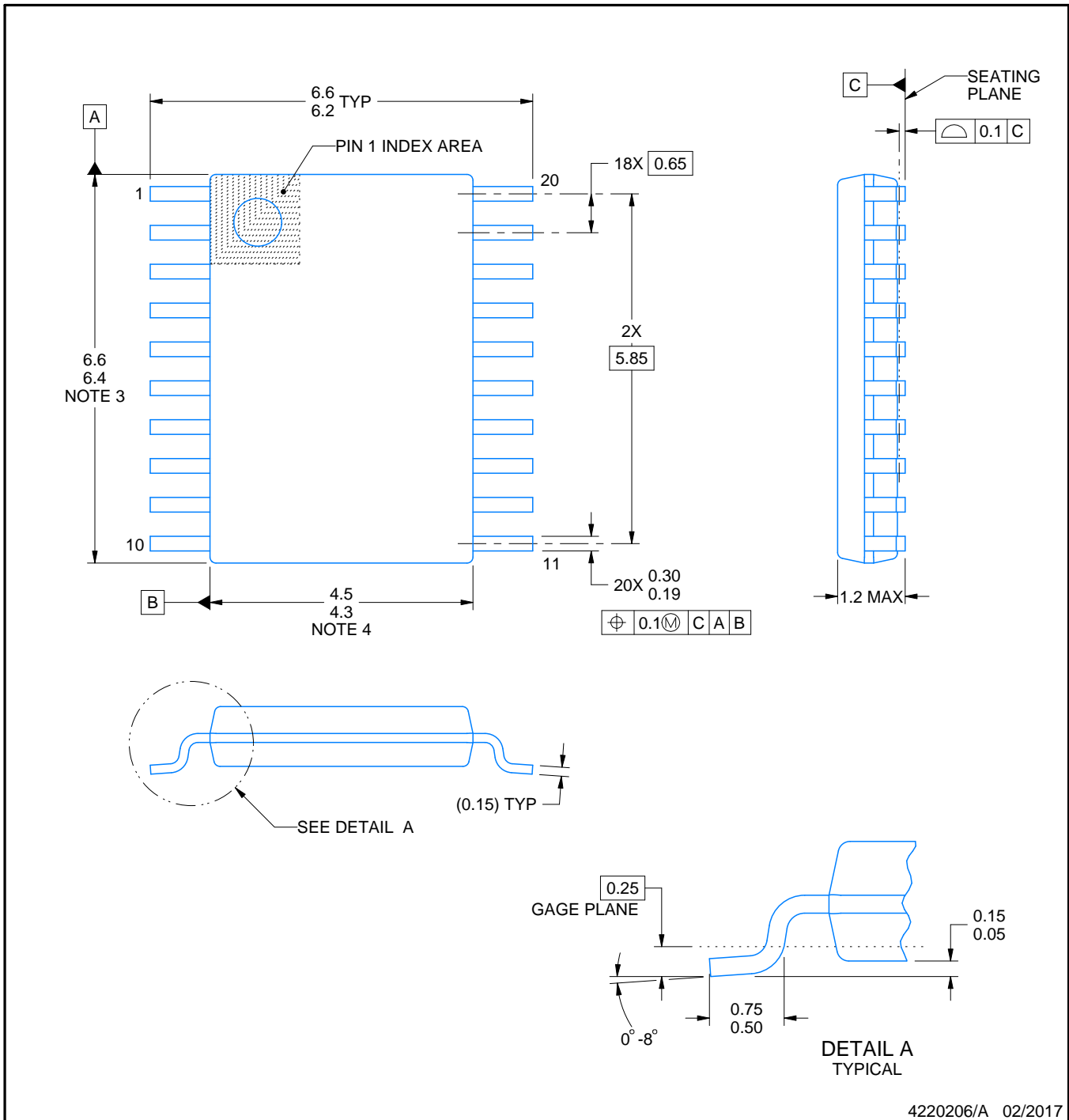
PW0020A



# PACKAGE OUTLINE

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



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



SOLDER MASK DETAILS

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.

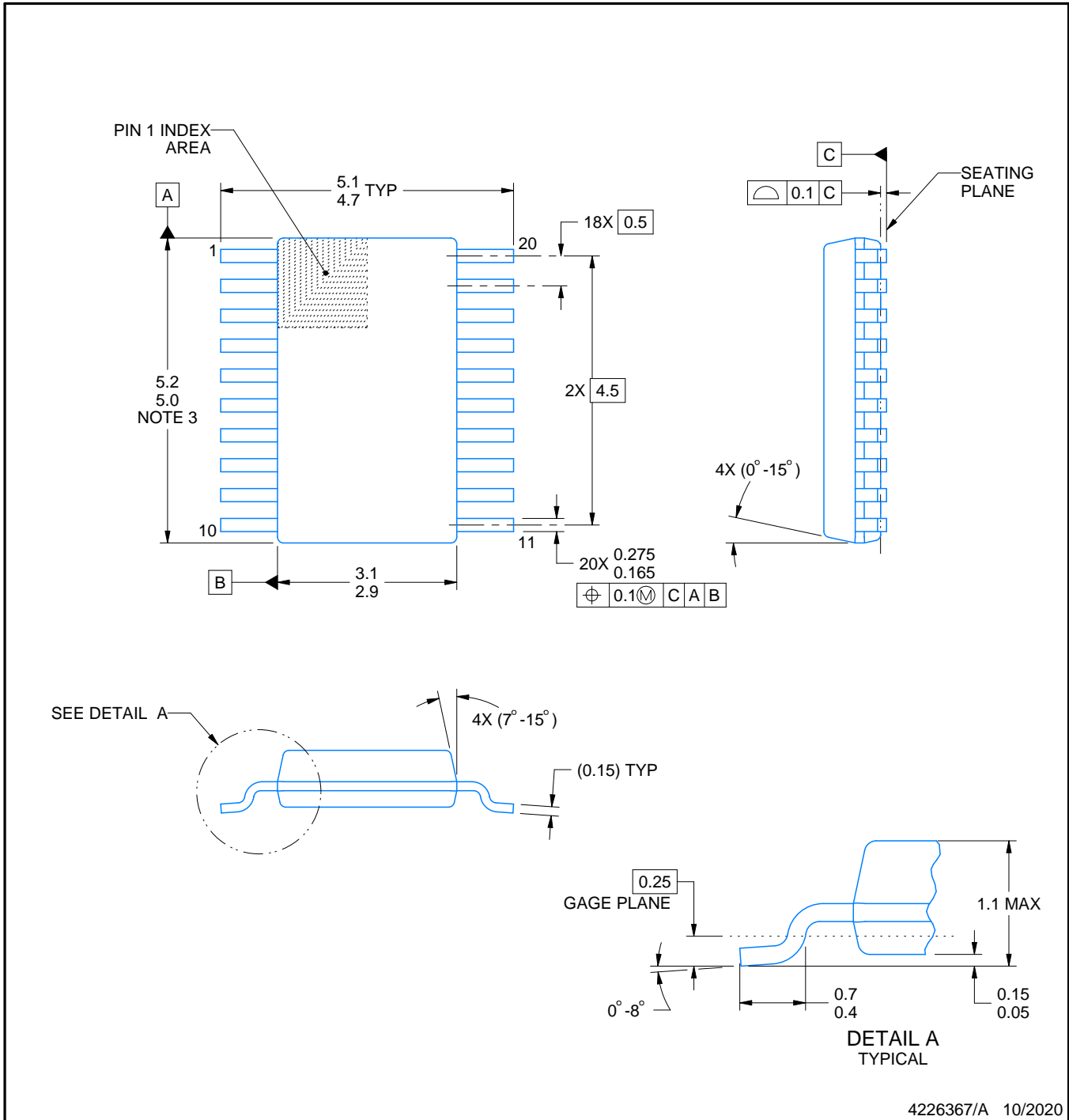
# DGS0020A



# PACKAGE OUTLINE

VSSOP - 1.1 mm max height

SMALL OUTLINE PACKAGE



4226367/A 10/2020

**NOTES:**

PowerPAD is a trademark of Texas Instruments.

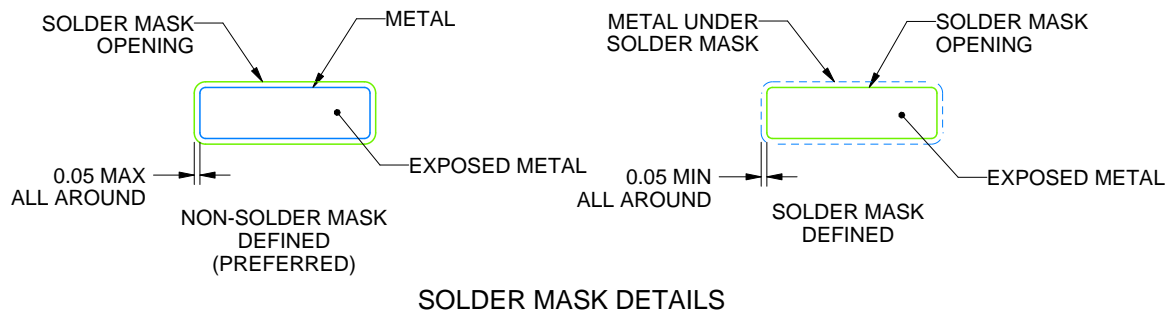
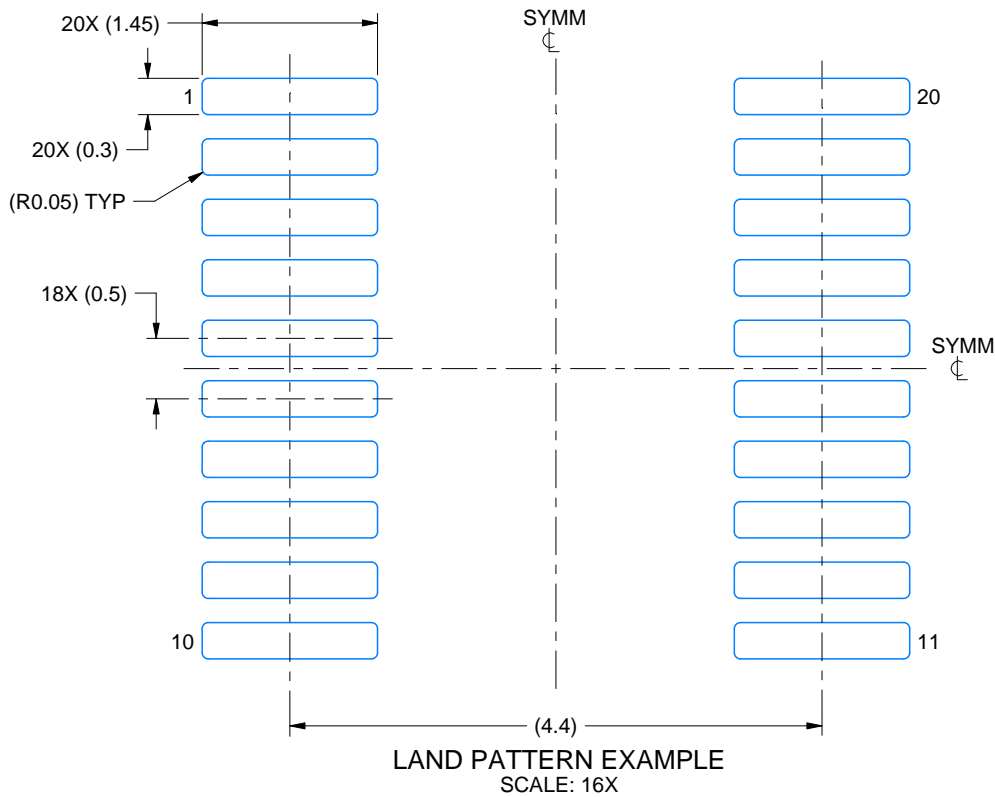
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. No JEDEC registration as of September 2020.
5. Features may differ or may not be present.

# EXAMPLE BOARD LAYOUT

DGS0020A

VSSOP - 1.1 mm max height

SMALL OUTLINE PACKAGE



4226367/A 10/2020

NOTES: (continued)

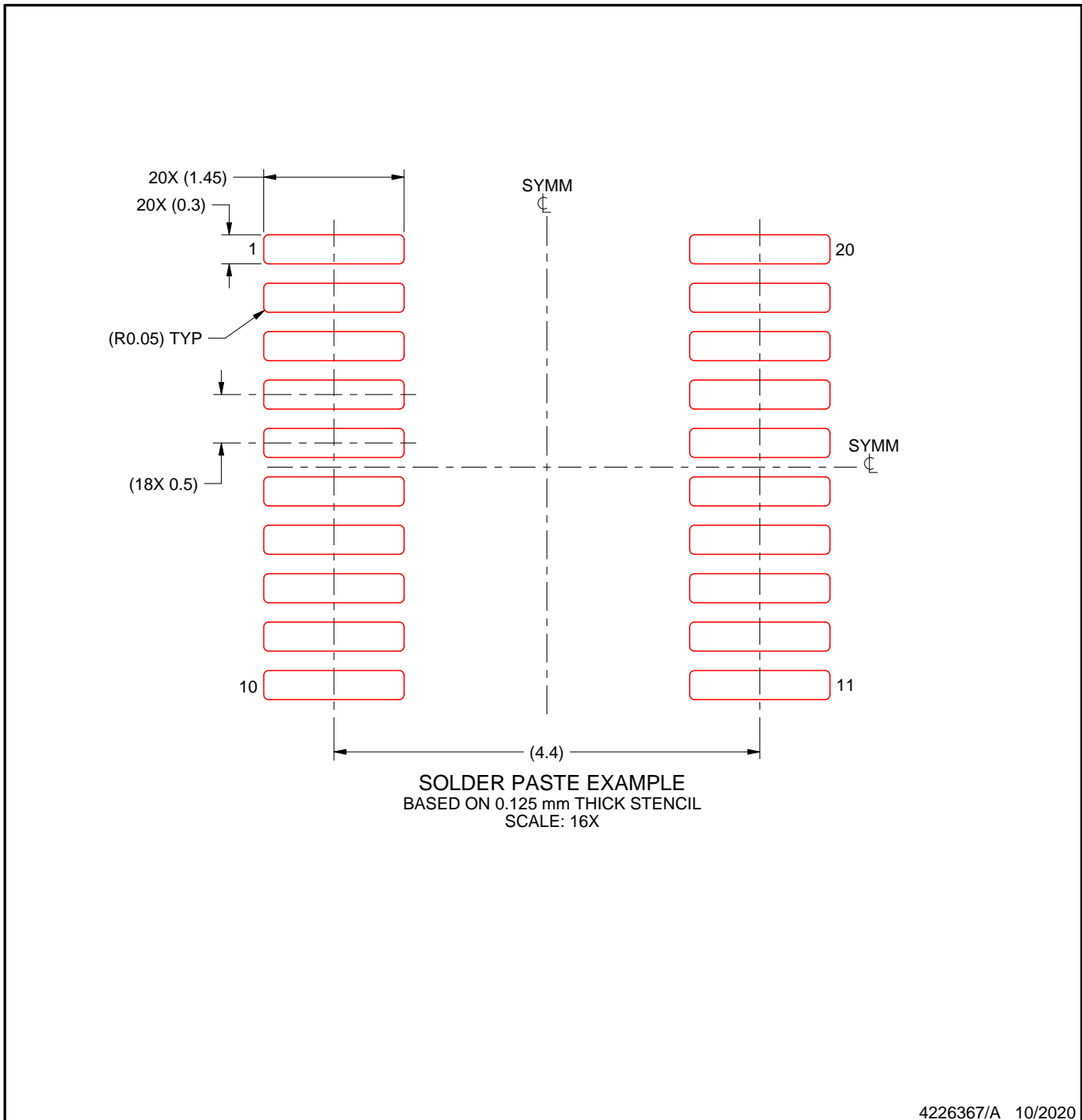
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.
8. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature numbers SLMA002 ([www.ti.com/lit/slma002](http://www.ti.com/lit/slma002)) and SLMA004 ([www.ti.com/lit/slma004](http://www.ti.com/lit/slma004)).
9. Size of metal pad may vary due to creepage requirement.
10. Vias are optional depending on application, refer to device data sheet. It is recommended that vias under paste be filled, plugged or tented.

# EXAMPLE STENCIL DESIGN

DGS0020A

VSSOP - 1.1 mm max height

SMALL OUTLINE PACKAGE



NOTES: (continued)

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

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