

# 具有多通道 ADC、双极 DAC、温度传感器和 GPIO 端口的 AMC7924 24 通道 12 位模拟监控器和控制器

## 1 特性

- 24 个单调性 12 位 DAC
  - 可编程范围：- 10V 至 0V、- 5V 至 0V、0V 至 5V 和 0V 至 10V
  - 高电流驱动能力
  - 自动范围检测器
- 24 个输入，12 位 SAR ADC
  - 高采样率：250kSPS
  - 输入范围：0V 到 5V 和 0V 到 2.5V
  - 可编程超限报警
- 6 个 FlexIO 引脚；可配置的 ADC 和 GPIO
- 内置时序控制特性
- 内部 2.5V 基准电压
- 内部温度传感器
  - 精度：±2.5°C，最大值
  - 分辨率：0.0625°C
- 与 SPI 兼容的 4 线接口
  - 1.65V 至 5.5V 工作电压
- 额定温度范围：- 40°C 至 +125°C
- 工作温度范围：- 40°C 至 +150°C

## 2 应用

- 有源天线系统 mMIMO (AAS)
- 宏远程无线电单元 (RRU)
- 雷达
- 数据采集 (DAQ)

## 3 说明

AMC7924 是一款高度集成的模拟监控器和控制器件，专为高密度通用监控器和控制系统而设计。AMC7924 包含 24 个 12 位数模转换器 (DAC)，其输出范围可通过编程实现。器件还包含带有可编程阈值检测器、温度传感器和内部基准的多路复用 12 位模数转换器 (ADC)。AMC7924 的高集成度可显著减少组件数量并简化闭环系统设计，从而使该器件成为布板空间至关重要的高密度应用的理想选择。

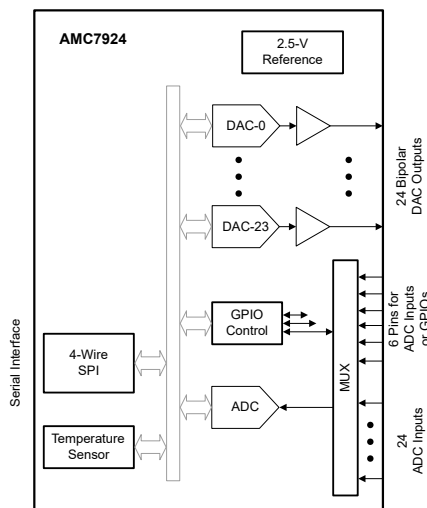
器件包括 24 个专用 ADC 输入和 6 个灵活输入/输出 (FlexIO) 引脚，可配置为 ADC 的附加模拟输入或 GPIO。与器件之间的通信通过与 SPI 兼容的 4 线接口实现。

AMC7924 具有高集成度和宽工作温度范围等优势，因此非常适合用作多通道射频通信系统中功率放大器 (PA) 的一体化偏置控制电路。凭借灵活的 DAC 输出范围和内置时序控制特性，该器件可用作面向多种晶体管技术（例如 LDMOS、GaA 和 GaN）的偏置控制器。AMC7924 功能集对通用监控器和控制系统而言同样有益。

### 器件信息

| 器件型号    | 封装 <sup>(1)</sup> | 封装尺寸 (标称值)        |
|---------|-------------------|-------------------|
| AMC7924 | HTQFP (64)        | 10.00mm × 10.00mm |

(1) 如需了解所有可用封装，请参阅产品说明书末尾的封装选项附录。



简化版原理图



## 4 Device and Documentation Support

### 4.1 Documentation Support

#### 4.1.1 Related Documentation

For related documentation see the following:

- Texas Instruments, [AMC7924EVM user's guide](#)
- Texas Instruments, [Temperature Compensation of Power Amplifier FET Bias Voltages application note](#)

### 4.2 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 [订阅更新](#) 进行注册，即可每周接收产品信息更改摘要。有关更改的详细信息，请查看任何已修订文档中包含的修订历史记录。

### 4.3 支持资源

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

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

### 4.4 Trademarks

TI E2E™ is a trademark of Texas Instruments.

所有商标均为其各自所有者的财产。

### 4.5 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.

### 4.6 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。

## 5 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="#">AMC7924PAPR</a> | Active        | Production           | HTQFP (PAP)   64 | 1000   LARGE T&R      | Yes         | NIPDAU                               | Level-3-260C-168 HR               | -40 to 125   | AMC7924             |
| AMC7924PAPR.A               | Active        | Production           | HTQFP (PAP)   64 | 1000   LARGE T&R      | Yes         | NIPDAU                               | Level-3-260C-168 HR               | -40 to 125   | AMC7924             |
| AMC7924PAPRG4               | Active        | Production           | HTQFP (PAP)   64 | 1000   LARGE T&R      | Yes         | NIPDAU                               | Level-3-260C-168 HR               | -40 to 125   | AMC7924             |
| AMC7924PAPRG4.A             | Active        | Production           | HTQFP (PAP)   64 | 1000   LARGE T&R      | Yes         | NIPDAU                               | Level-3-260C-168 HR               | -40 to 125   | AMC7924             |
| <a href="#">AMC7924PAPT</a> | Active        | Production           | HTQFP (PAP)   64 | 250   SMALL T&R       | Yes         | NIPDAU                               | Level-3-260C-168 HR               | -40 to 125   | AMC7924             |
| AMC7924PAPT.A               | Active        | Production           | HTQFP (PAP)   64 | 250   SMALL T&R       | Yes         | NIPDAU                               | Level-3-260C-168 HR               | -40 to 125   | AMC7924             |

<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.



## GENERIC PACKAGE VIEW

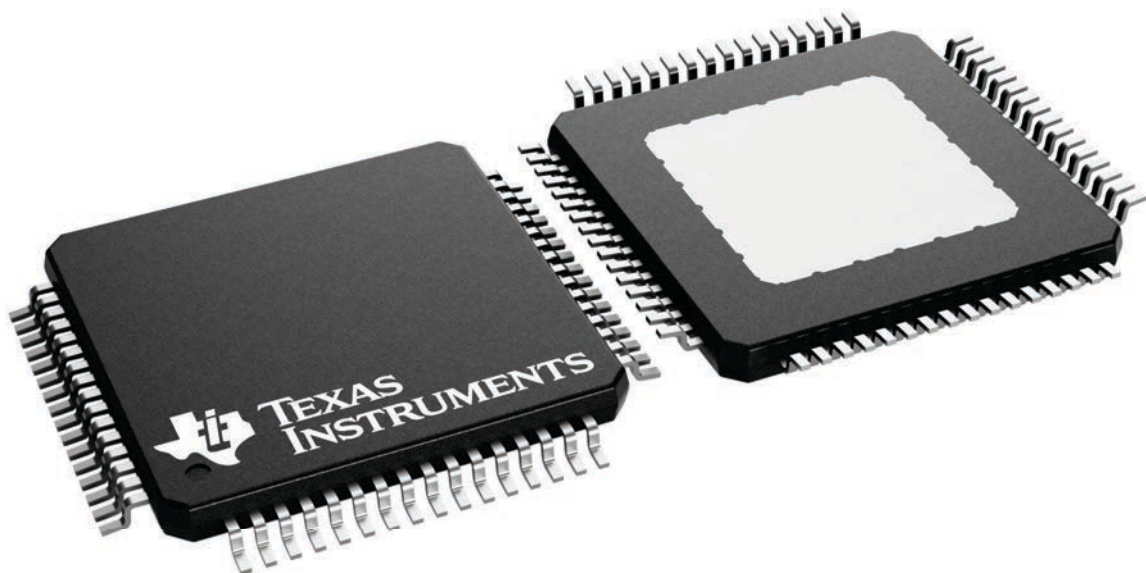
**PAP 64**

**HTQFP - 1.2 mm max height**

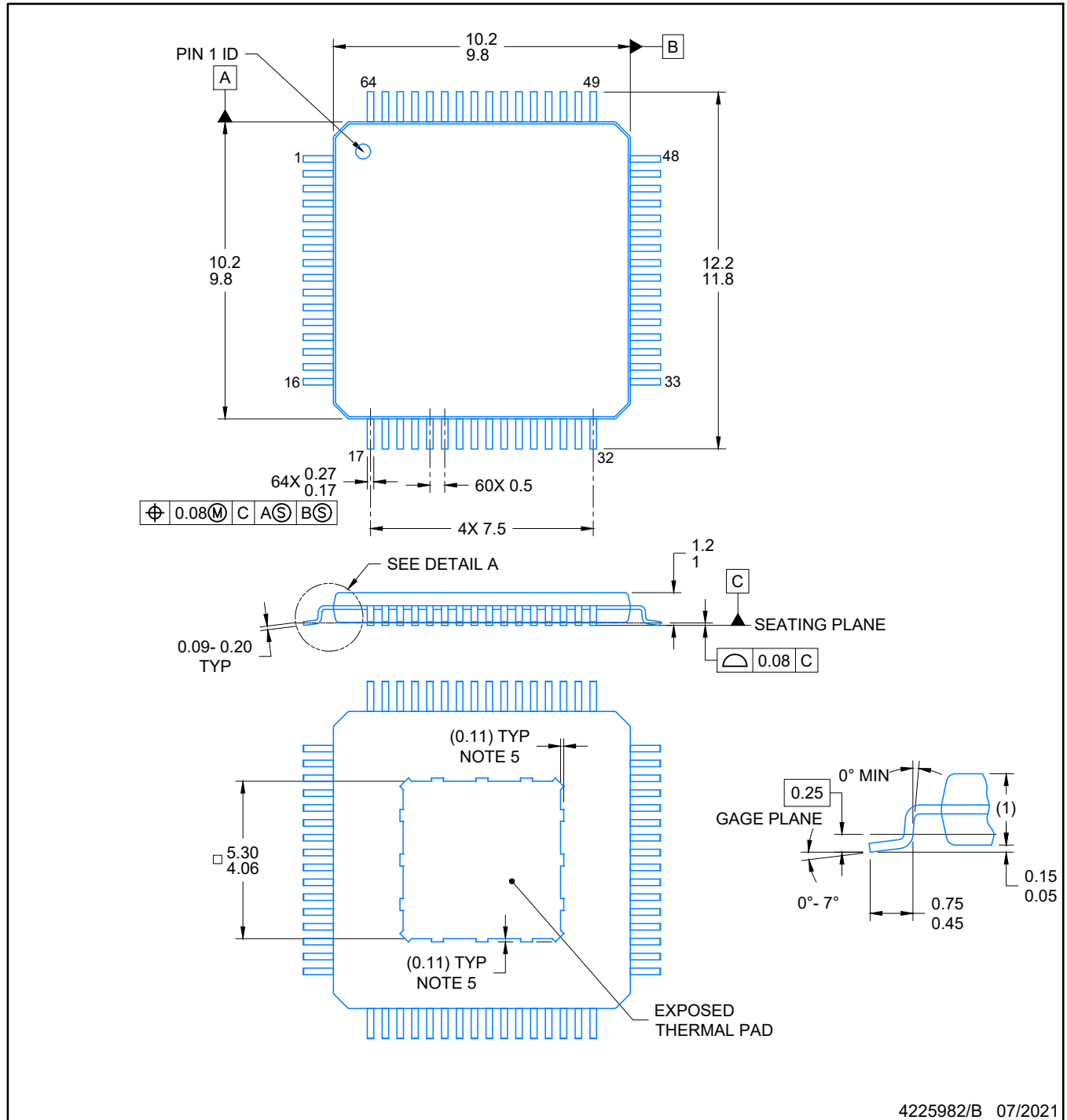
10 x 10, 0.5 mm pitch

QUAD FLATPACK

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



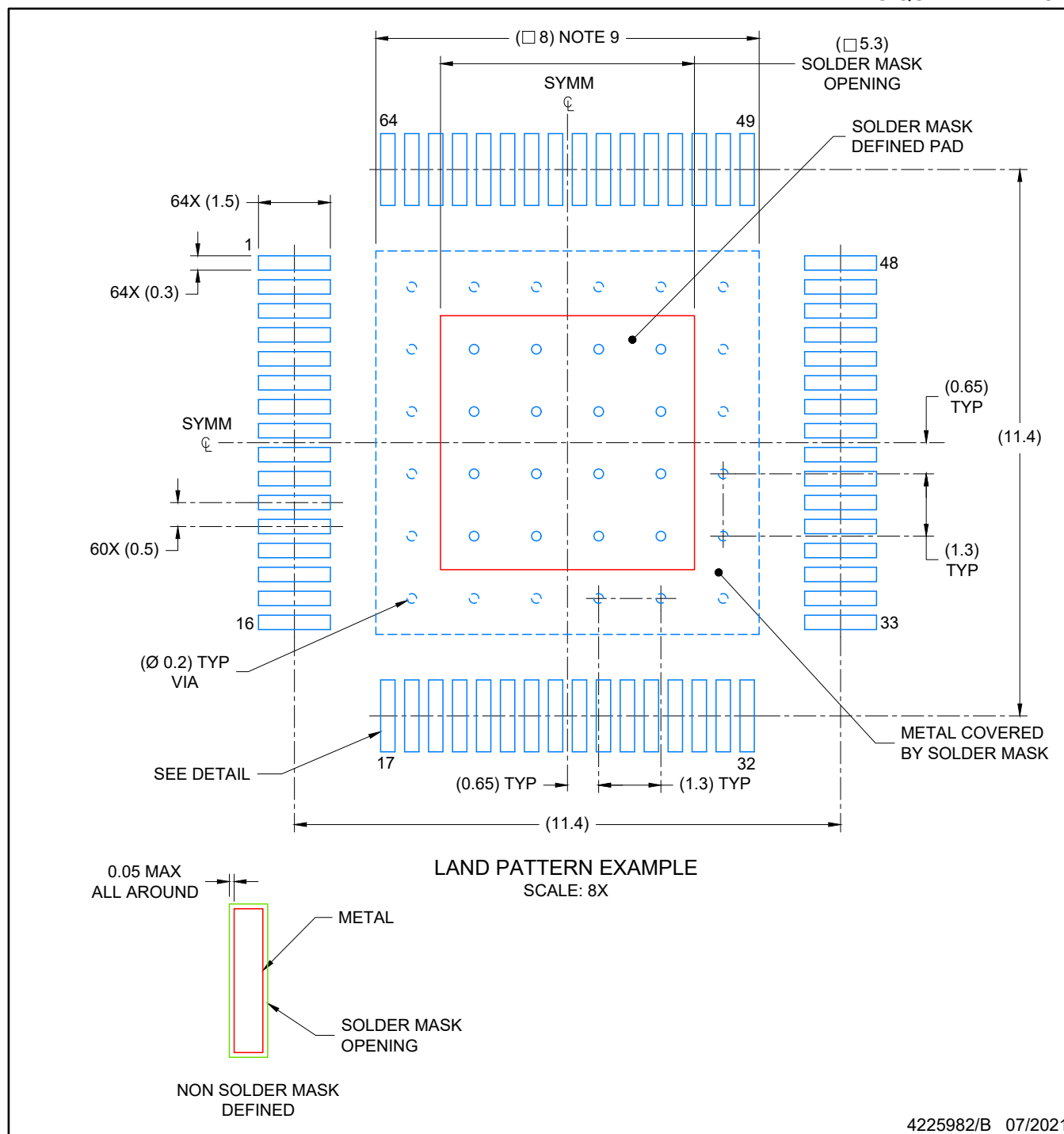
4226442/A



NOTES:

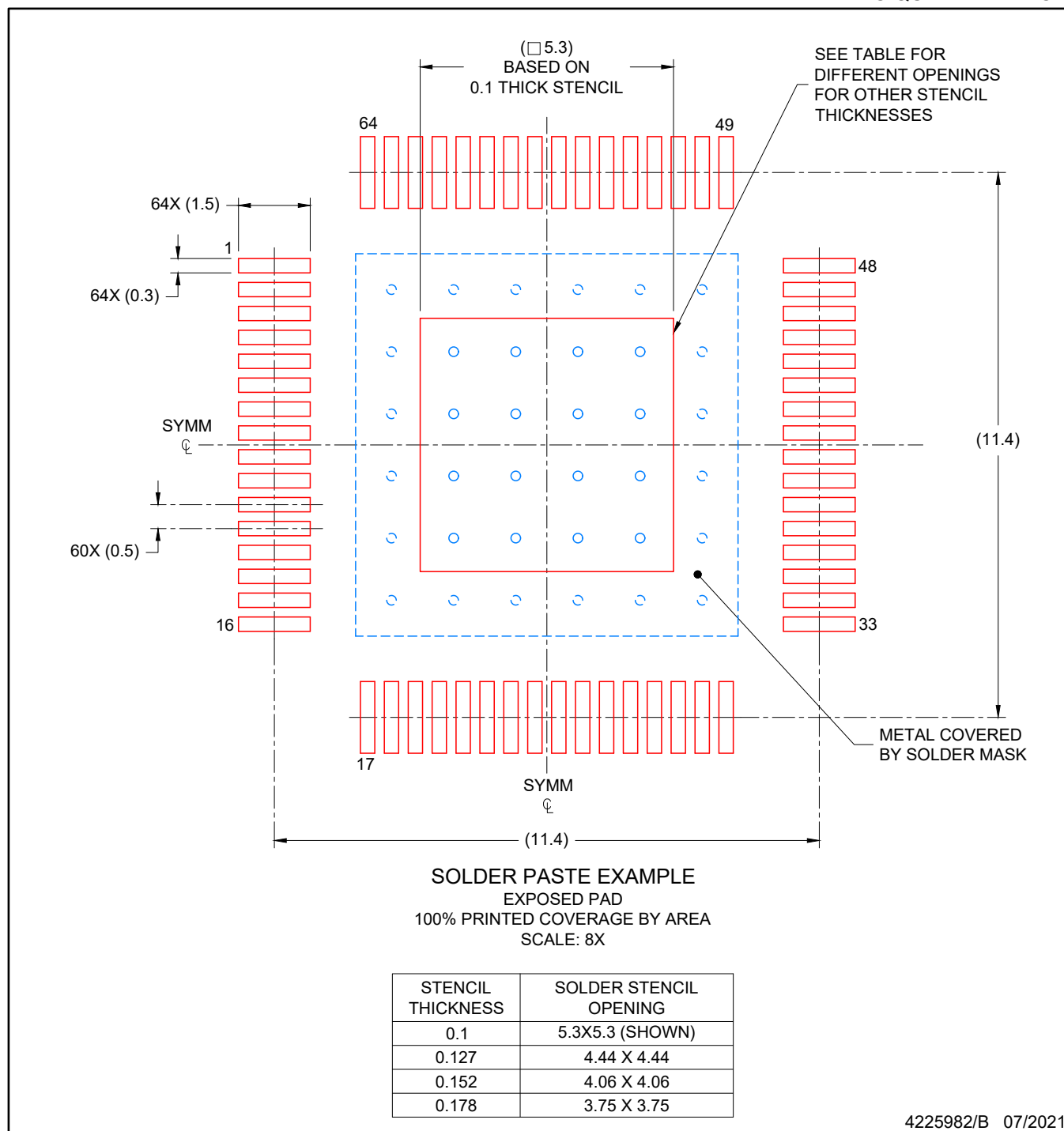
PowerPAD is a trademark of Texas Instruments

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. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 per side.
4. Body width does not include interlead flash. Interlead flash shall not exceed 0.50 per side.
5. Strap features may not be present.
6. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.



## NOTES: (continued)

7. Publication IPC-7351 may have alternate designs.
8. Solder mask tolerances between and around signal pads can vary based on board fabrication site.
9. This package is designed to be soldered to a thermal pad on the board. Refer to technical brief, PowerPAD Thermally Enhanced Package, Texas Instruments Literature No. 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)).



NOTES: (continued)

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



## 重要通知和免责声明

TI“按原样”提供技术和可靠性数据（包括数据表）、设计资源（包括参考设计）、应用或其他设计建议、网络工具、安全信息和其他资源，不保证没有瑕疵且不做任何明示或暗示的担保，包括但不限于对适销性、与某特定用途的适用性或不侵犯任何第三方知识产权的暗示担保。

这些资源可供使用 TI 产品进行设计的熟练开发人员使用。您将自行承担以下全部责任：(1) 针对您的应用选择合适的 TI 产品，(2) 设计、验证并测试您的应用，(3) 确保您的应用满足相应标准以及任何其他安全、安保法规或其他要求。

这些资源如有变更，恕不另行通知。TI 授权您仅可将这些资源用于研发本资源所述的 TI 产品的相关应用。严禁以其他方式对这些资源进行复制或展示。您无权使用任何其他 TI 知识产权或任何第三方知识产权。对于因您对这些资源的使用而对 TI 及其代表造成的任何索赔、损害、成本、损失和债务，您将全额赔偿，TI 对此概不负责。

TI 提供的产品受 [TI 销售条款](#)、[TI 通用质量指南](#) 或 [ti.com](#) 上其他适用条款或 TI 产品随附的其他适用条款的约束。TI 提供这些资源并不会扩展或以其他方式更改 TI 针对 TI 产品发布的适用的担保或担保免责声明。除非德州仪器 (TI) 明确将某产品指定为定制产品或客户特定产品，否则其产品均为按确定价格收入目录的标准通用器件。

TI 反对并拒绝您可能提出的任何其他或不同的条款。

版权所有 © 2025，德州仪器 (TI) 公司

最后更新日期：2025 年 10 月