

TPS61376 具有输入平均电流限制和负载断开功能的 23V_{IN}、25V_{OUT}、4.5A 升压转换器

1 特性

- 宽输入电压和输出电压范围
 - 输入电压范围：2.9 V 至 23 V
 - 输出电压范围：高达 25 V
- 峰值电感器电流限制高达 4.5A
- 可编程输入平均电流限制高达 3A
- 两个开关频率选项
 - TPS61376：1.2MHz
 - TPS61376A：650 kHz
- 集成两个 MOSFET
 - ISO FET：40mΩ
 - 低侧 FET：50mΩ
- 安全、可靠运行的特性
 - 输出过压保护
 - 输入电流限制保护
 - 在关断期间真正断开输入域输出之间的连接
 - 输出过流和短路保护
 - 热关断
- 精密 EN/UVLO 阈值
- 外部环路补偿
- 2.5mm × 2.0mm VQFN 封装

2 应用

- ePOS 零售自动化和支付
- 条形码扫描仪
- 智能扬声器
- 电器

3 说明

TPS61376 是一款具有输入平均电流限制和负载断开连接功能的高压非同步升压转换器。输入平均电流限制阈值可通过 ILIM 引脚在 0.1A 至 3.0A 之间进行编程。当该器件禁用时，VP 和 SW 引脚之间的隔离 FET 将完全切断输入和输出之间的路径。TPS61376 具有 2.9V 至 23V 的宽输入电压范围，输出电压高达 25V。

TPS61376 以自适应关断时间控制拓扑为基础实现了峰值电流模式。在中等到重负载条件下，该器件会在 PWM 模式下工作。在轻载条件下，该器件会进入 PFM 模式，从而在整个负载电流范围内保持高效率。

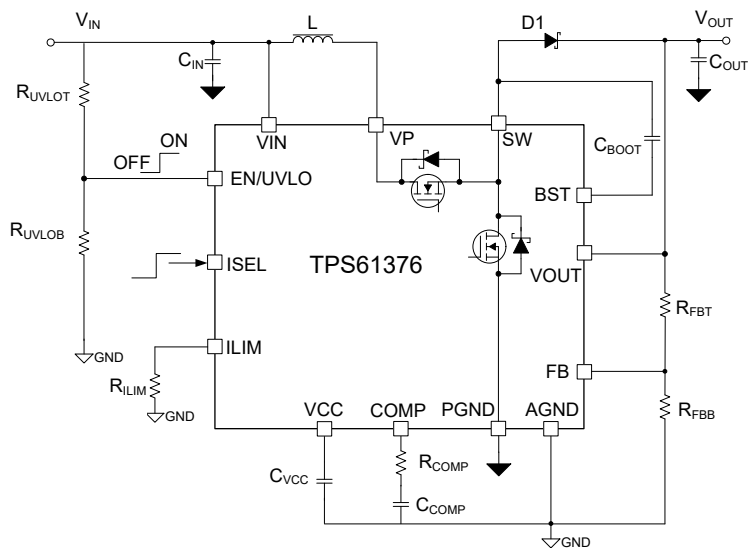
TPS61376 还集成了稳健的保护特性，包括输出过压保护、输出过流和短路保护以及热关断保护。

TPS61376 采用 2.5mm × 2.0mm VQFN 封装，因而拥有非常小巧的解决方案尺寸。

器件信息

器件型号	封装 ⁽¹⁾	封装尺寸 (标称值)
TPS61376	VQFN (13)	2.5mm × 2.0mm

(1) 如需了解所有可用封装，请参阅数据表末尾的可订购产品附录。



典型应用电路



4 Device and Documentation Support

4.1 Device Support

4.1.1 第三方产品免责声明

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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

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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

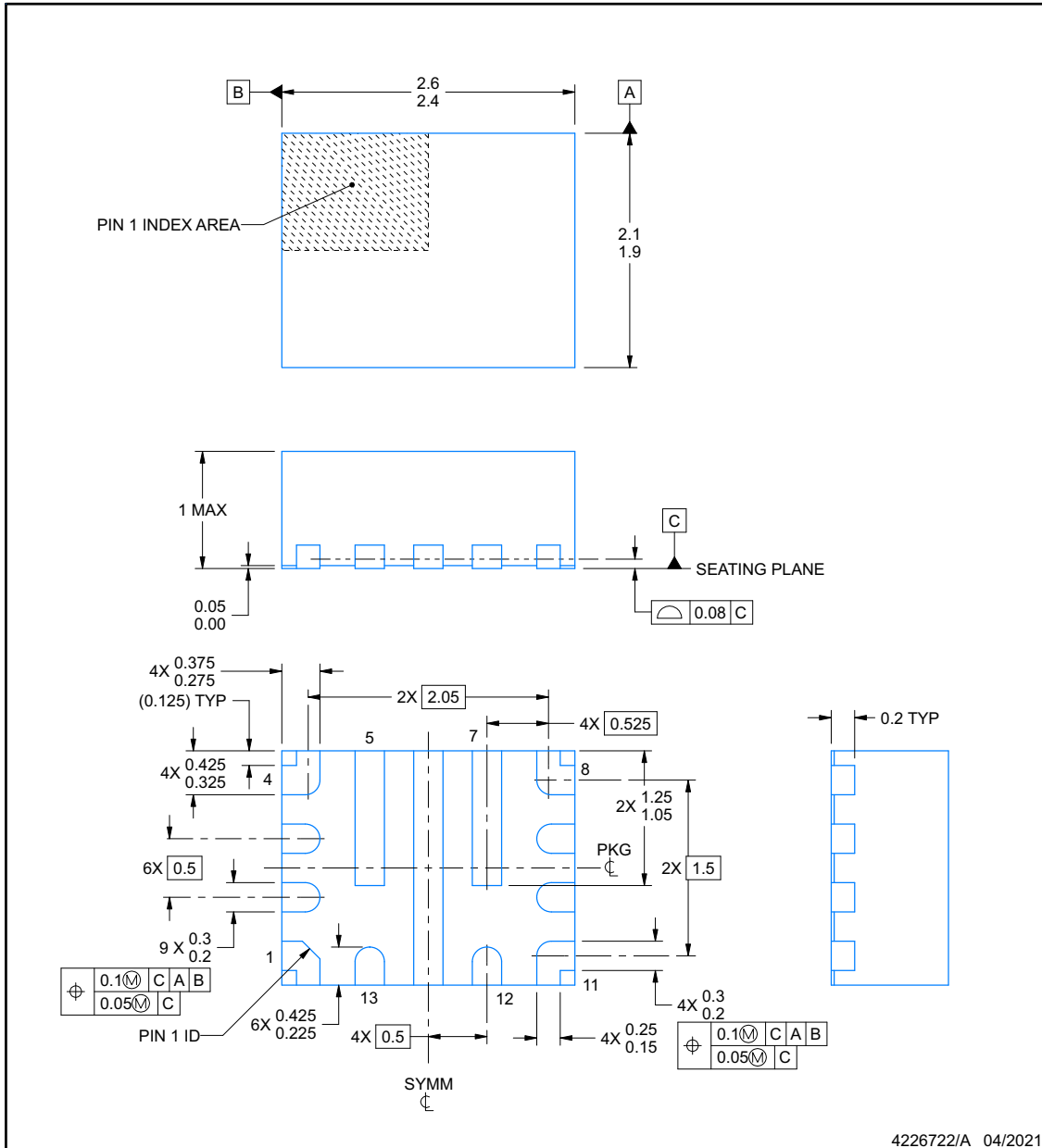
The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.



RYH0013A

PACKAGE OUTLINE
VQFN-HR - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



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.

ADVANCE INFORMATION

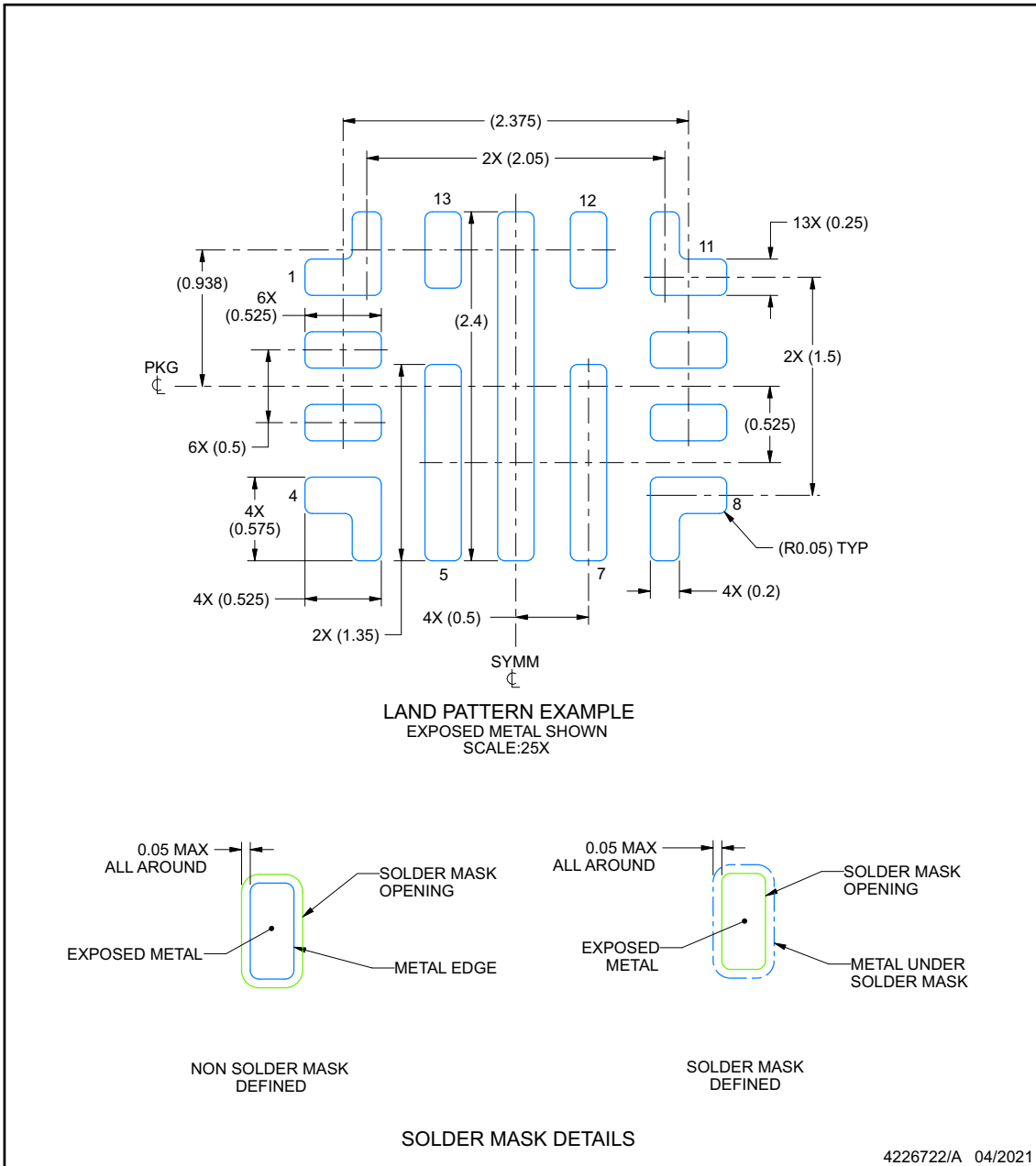
EXAMPLE BOARD LAYOUT

RYH0013A

VQFN-HR - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD

ADVANCE INFORMATION



NOTES: (continued)

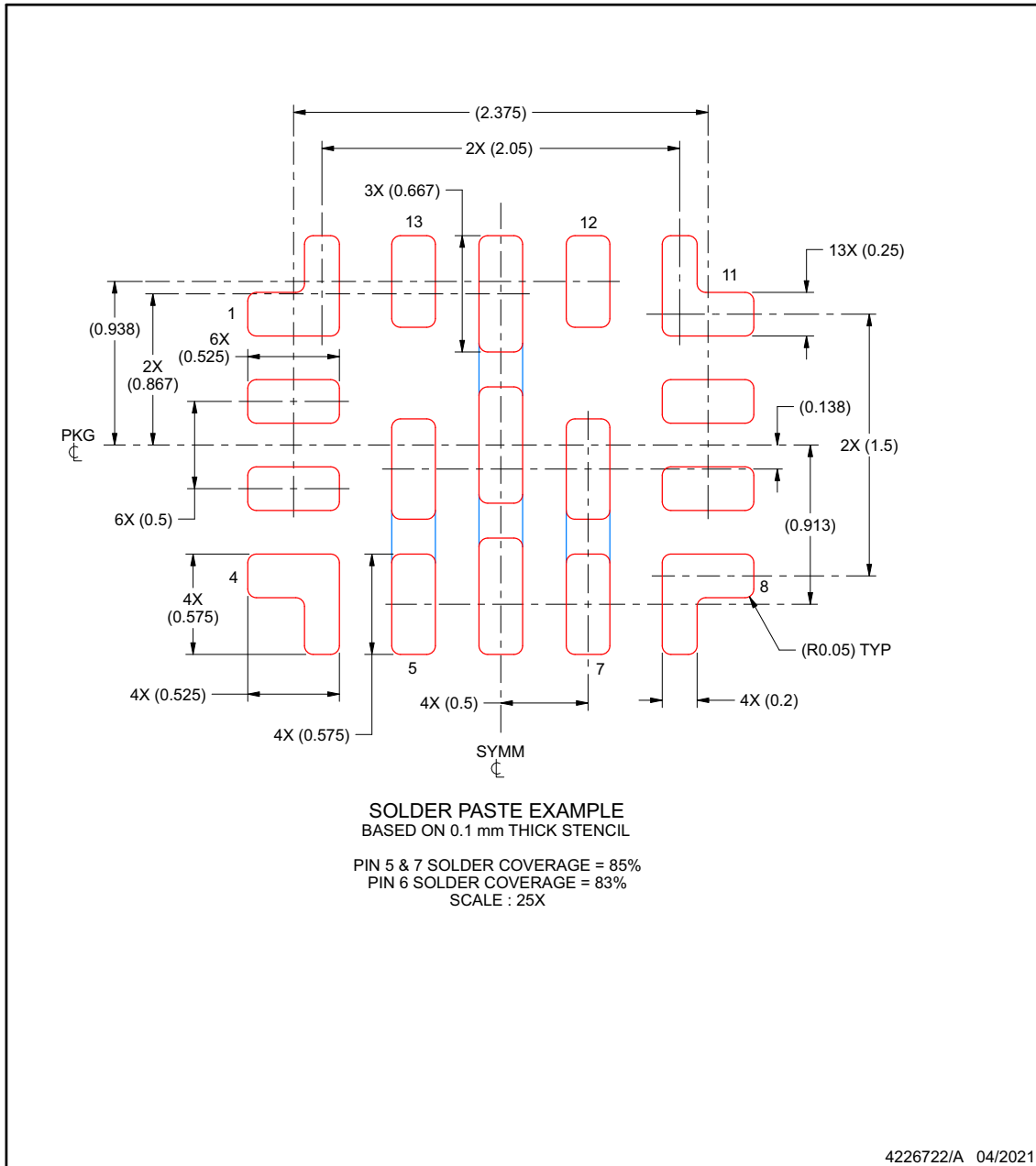
- This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).
- Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

RYH0013A

VQFN-HR - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



ADVANCE INFORMATION

NOTES: (continued)

5. For alternate stencil design recommendations, see IPC-7525 or board assembly site preference.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
TPS61376RYHR	ACTIVE	VQFN-HR	RYH	13	3000	RoHS & Green	SN	Level-2-260C-1 YEAR	-40 to 125	1376	Samples

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSELETE: TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

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

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

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

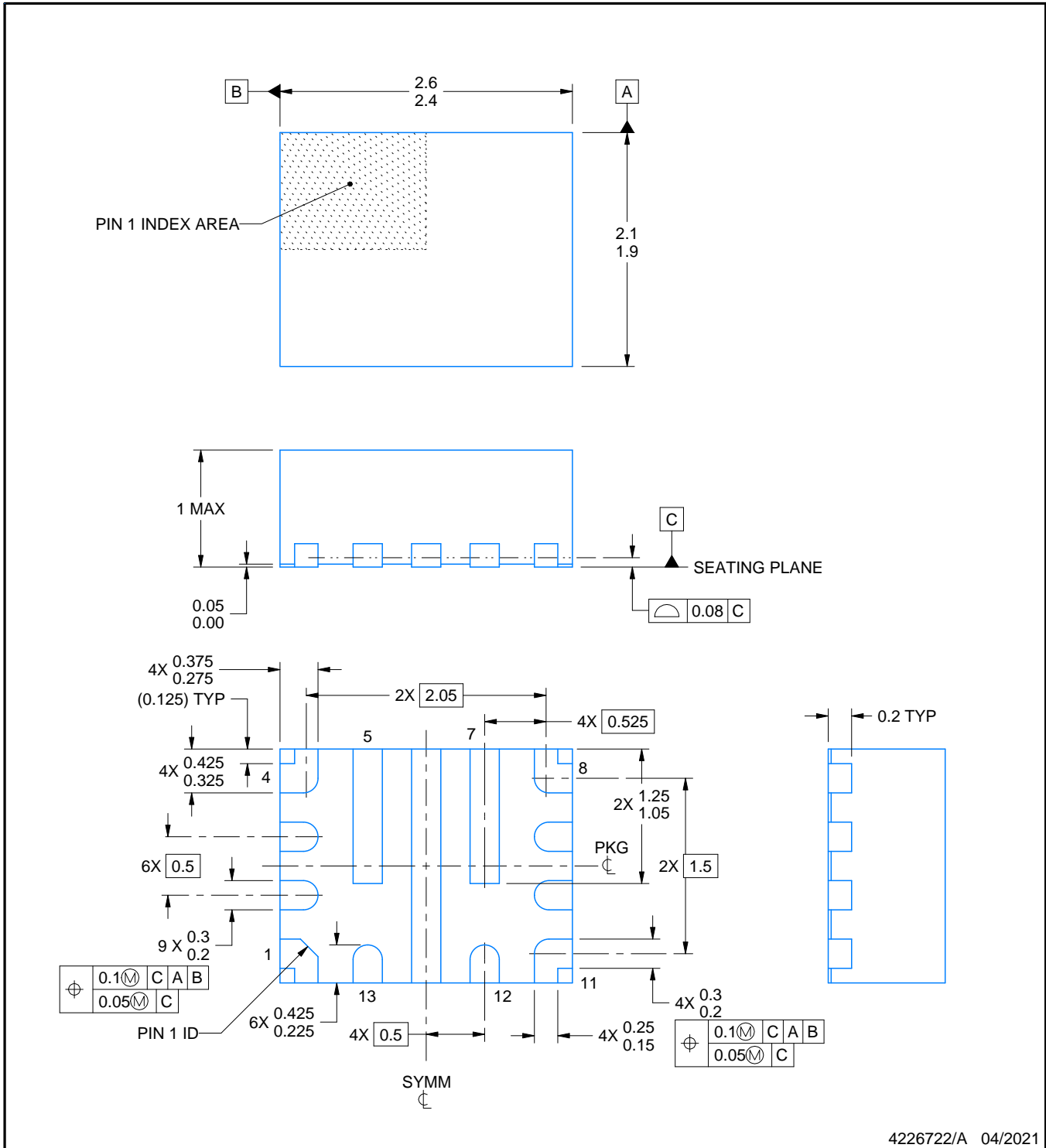
(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

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NOTES:

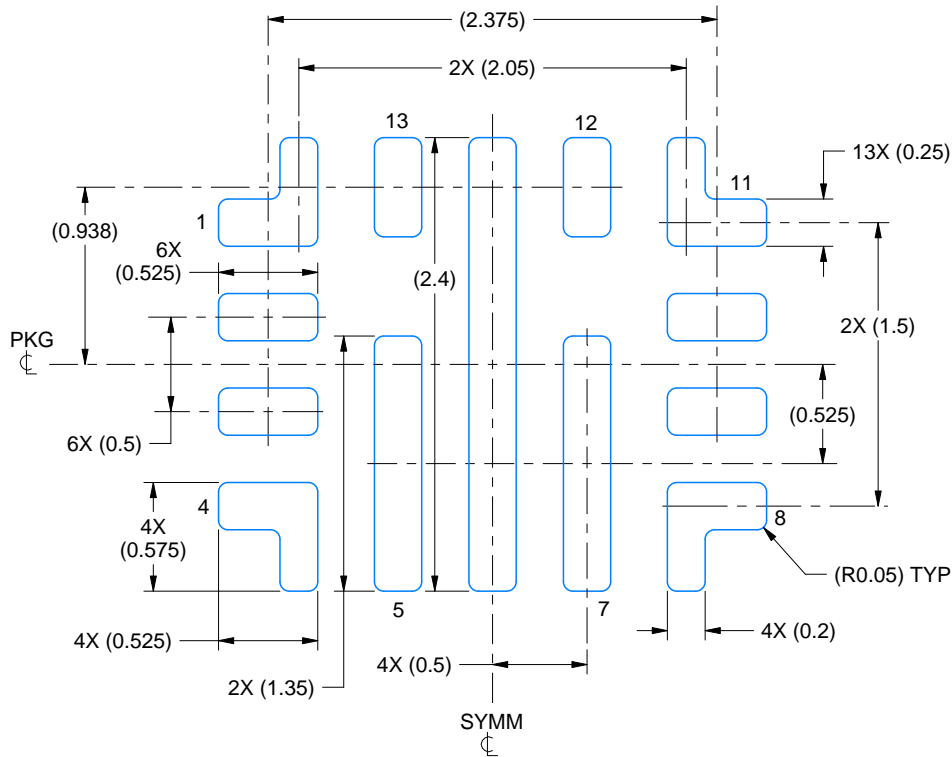
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.

EXAMPLE BOARD LAYOUT

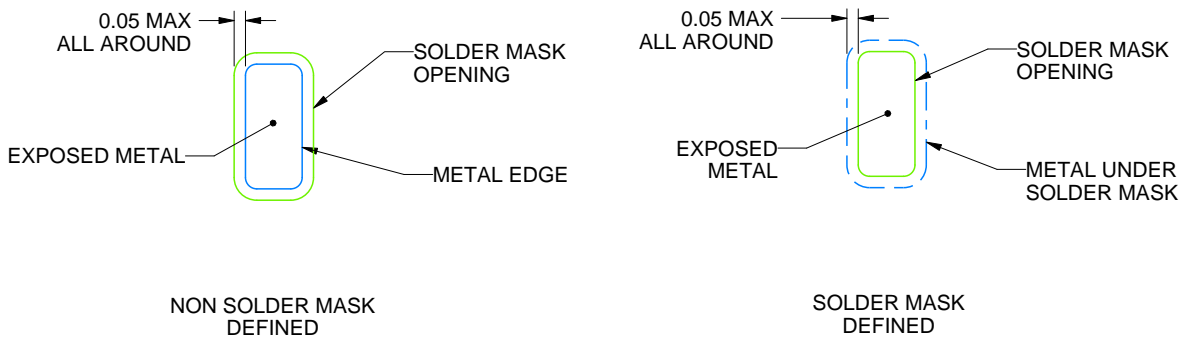
RYH0013A

VQFN-HR - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



LAND PATTERN EXAMPLE
 EXPOSED METAL SHOWN
 SCALE:25X



SOLDER MASK DETAILS

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NOTES: (continued)

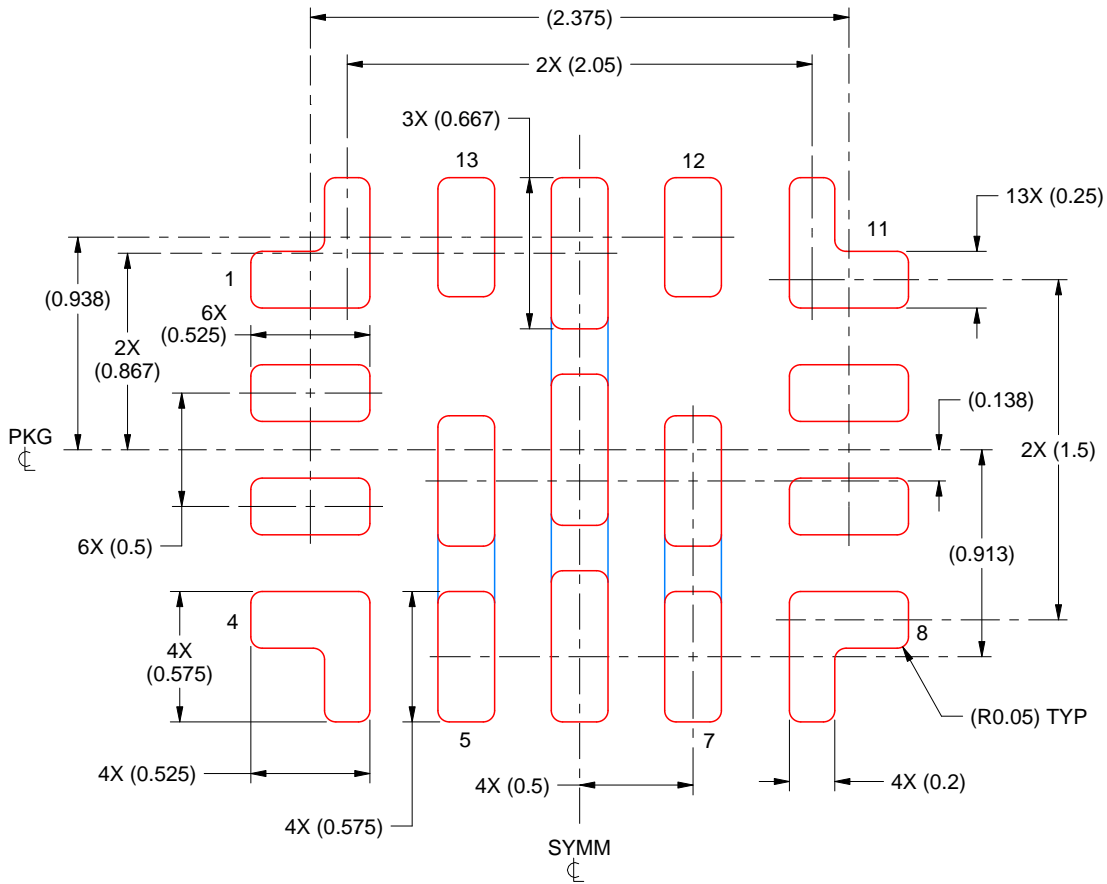
- 3. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/sl原因271).
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EXAMPLE STENCIL DESIGN

RYH0013A

VQFN-HR - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



SOLDER PASTE EXAMPLE
BASED ON 0.1 mm THICK STENCIL

PIN 5 & 7 SOLDER COVERAGE = 85%
 PIN 6 SOLDER COVERAGE = 83%
 SCALE : 25X

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NOTES: (continued)

5. For alternate stencil design recommendations, see IPC-7525 or board assembly site preference.

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