

针对功率密度和低 EMI 进行了优化的 LM62460-Q1、LM61480/95-Q1 6A/8A/10A 汽车降压转换器

1 特性

- 符合面向汽车 应用的 16 通道 AFE:
 - 输入电压范围为 3V 至 36V, 可承受 42V 的瞬态
 - 具有滤波器和延迟释放的 $\overline{\text{RESET}}$ 输出
- 可实现低 EMI:
 - 引脚可配置扩频
 - 可调节 SW 节点上升时间
 - 高于和低于 AM 频带运行: 引脚可配置或外部计时
 - 低 EMI 引脚
 - 对于恒定或脉冲频率调制, 轻负载模式是引脚可配置的
- 高效解决方案
 - 在 $V_{\text{IN}} = 12\text{V}$ 、 $V_{\text{OUT}} = 5\text{V}$ 、 $f_{\text{SW}} = 400\text{kHz}$ 时, 对于 8A 负载具有 95% 的效率
 - 可提高效率的自动轻负载转换
 - 在自动模式下空载时具有 5 μA 的输入电流
 - 2 μA 关断电流 (典型值)
- 节省空间
 - 内置补偿、软启动、电流限制、热关断和 UVLO
 - 200kHz – 2.2MHz 的引脚可选频率
 - 具有可湿性侧面的 4.5mm × 3.5mm QFN 封装
- 结温范围: -40°C 至 +150°C

2 应用

- 汽车信息娱乐系统
- 仪表组
- ADAS

3 说明

LM61495-Q1/LM61480-Q1/LM62460-Q1 同步降压稳压器系列是面向汽车的通用稳压器, 可提供 3.3V 固定输出电压、5V 固定输出电压或可调输出电压 (可设置范围为 1V 至预期输入电压的 95%)。这些稳压器可在输入电压低至 3V 的情况下在低负载下继续工作。这些器件可在高达 36V 的输入电压下工作并可承受高达 42V 的瞬态。

该系列是从头开始设计的, 旨在实现最小的 EMI。该器件具有可配置的扩频和可调节的 SW 节点上升时间。跳频设置为 $\pm 5\%$ (典型值), 可大幅降低峰值发射, 并包括先进的调制音调降低技术, 以减少混入输出电压中的低频音调。上升时间可在约 3ns (用于实现高效率) 至约 20ns (用于在频率高于 30MHz 时实现低辐射) 的范围内进行调节。可以在 200kHz 与 2.2MHz 之间设置频率, 从而在低工作频率下提高效率, 或在高频率下缩小尺寸。

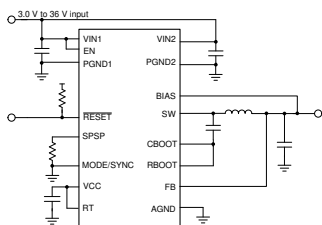
开漏 $\overline{\text{RESET}}$ 输出具有滤波和延迟释放功能, 可提供正确的系统状态指示。自动模式下的轻负载运行可在 PWM 和 PFM 运行模式之间无缝转换, 从而使空载电流消耗仅为 5 μA (通常为 13.5 至 3.3V 的转换)。这可以确保在所有负载下均具有高效率 and 出色的瞬态响应。电气特性额定结温范围为 -40°C 至 +150°C。

器件信息⁽¹⁾

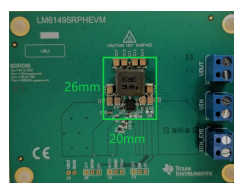
器件型号	封装	封装尺寸 (标称值)
LM61495-Q1	VQFN (16)	4.50mm × 3.50mm
LM61480-Q1		
LM62460-Q1		

(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。

简化原理图



紧凑型低 EMI 布局



4 器件和文档支持

4.1 接收文档更新通知

要接收文档更新通知，请导航至 ti.com.cn 上的器件产品文件夹。单击右上角的通知我进行注册，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。

4.2 支持资源

TI E2E™ support forums are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

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4.3 商标

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4.4 静电放电警告



ESD 可能会损坏该集成电路。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措施和安装程序，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。

4.5 Glossary

[SLYZ022](#) — TI Glossary.

This glossary lists and explains terms, acronyms, and definitions.

5 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的最新可用数据。数据如有变更，恕不另行通知，且不会对此文档进行修订。如需获取此数据表的浏览器版本，请查阅左侧的导航栏。

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
LM61480QRPHRQ1	PREVIEW	VQFN-HR	RPH	16	3000	RoHS & Green	Call TI	Call TI	-40 to 150	61480Q	
LM61495Q3RPHRQ1	ACTIVE	VQFN-HR	RPH	16	3000	RoHS & Green	SN	Level-2-260C-1 YEAR	-40 to 150	1495Q3	Samples
LM61495Q5RPHRQ1	ACTIVE	VQFN-HR	RPH	16	3000	RoHS & Green	SN	Level-2-260C-1 YEAR	-40 to 150	1495Q5	Samples
LM61495QRPHRQ1	ACTIVE	VQFN-HR	RPH	16	3000	RoHS & Green	SN	Level-2-260C-1 YEAR	-40 to 150	61495Q	Samples
LM62460Q3RPHRQ1	ACTIVE	VQFN-HR	RPH	16	3000	RoHS & Green	SN	Level-2-260C-1 YEAR	-40 to 150	6246Q3	Samples
LM62460Q5RPHRQ1	ACTIVE	VQFN-HR	RPH	16	3000	RoHS & Green	SN	Level-2-260C-1 YEAR	-40 to 150	6246Q5	Samples
LM62460QRPHRQ1	ACTIVE	VQFN-HR	RPH	16	3000	RoHS & Green	SN	Level-2-260C-1 YEAR	-40 to 150	62460Q	Samples
PLM61495QRPHRQ1	ACTIVE	VQFN-HR	RPH	16	3000	Non-RoHS & Non-Green	Call TI	Call TI	-40 to 150		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.

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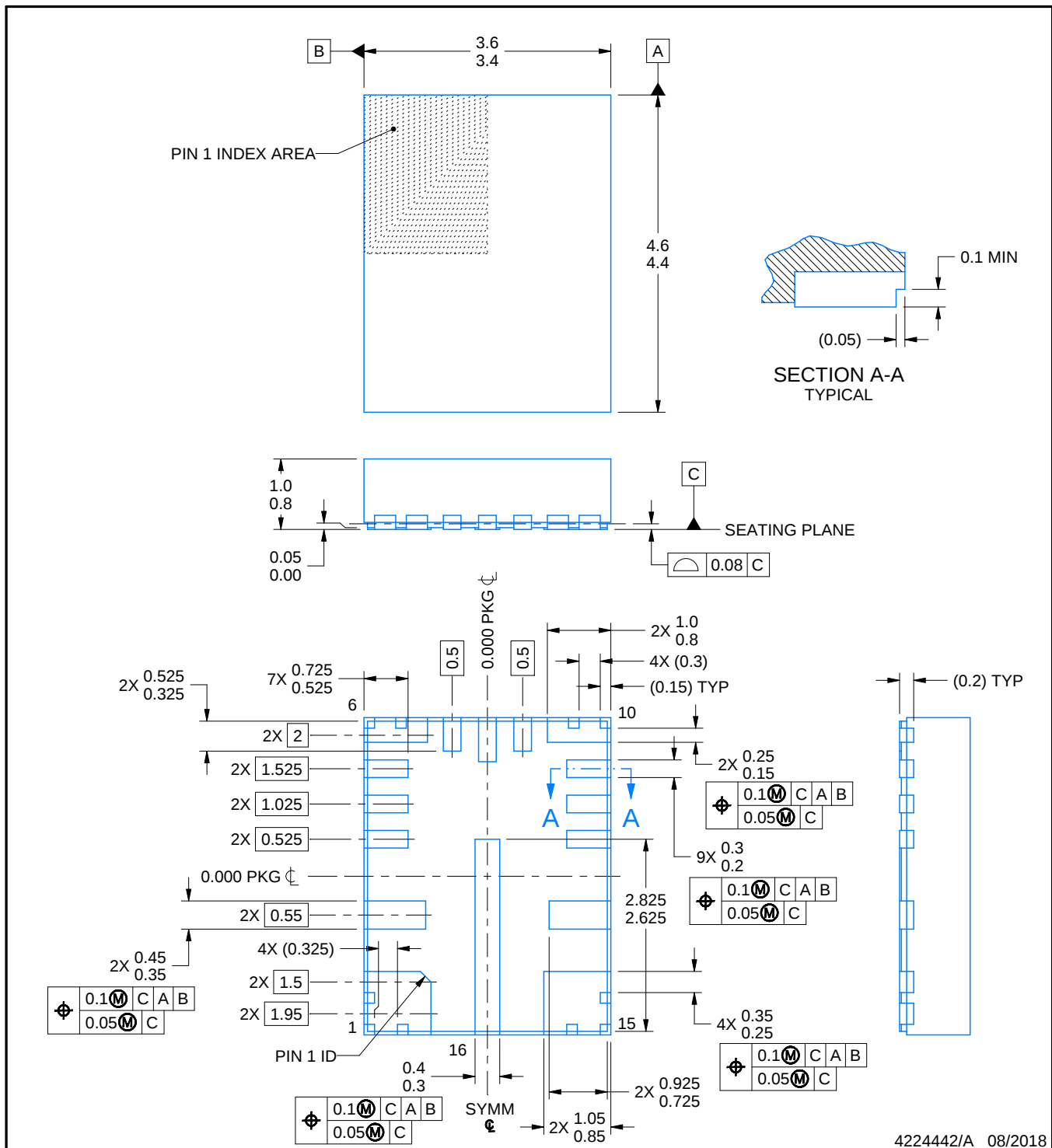
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

OTHER QUALIFIED VERSIONS OF LM61480-Q1, LM61495-Q1, LM62460-Q1 :

- Catalog : [LM61480](#), [LM61495](#), [LM62460](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product



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NOTES:

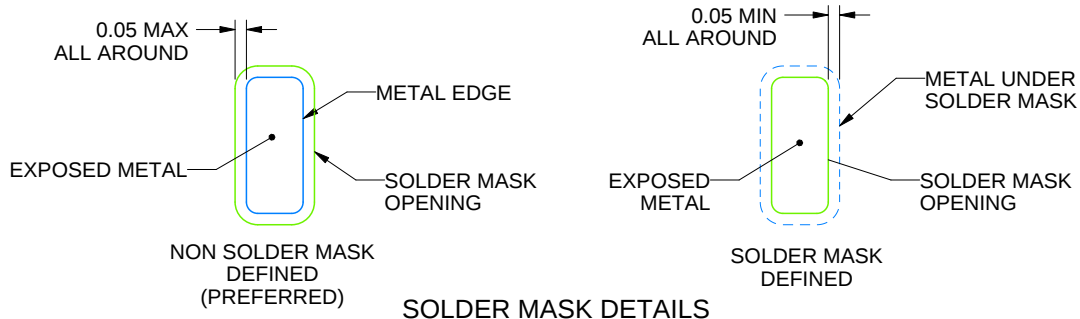
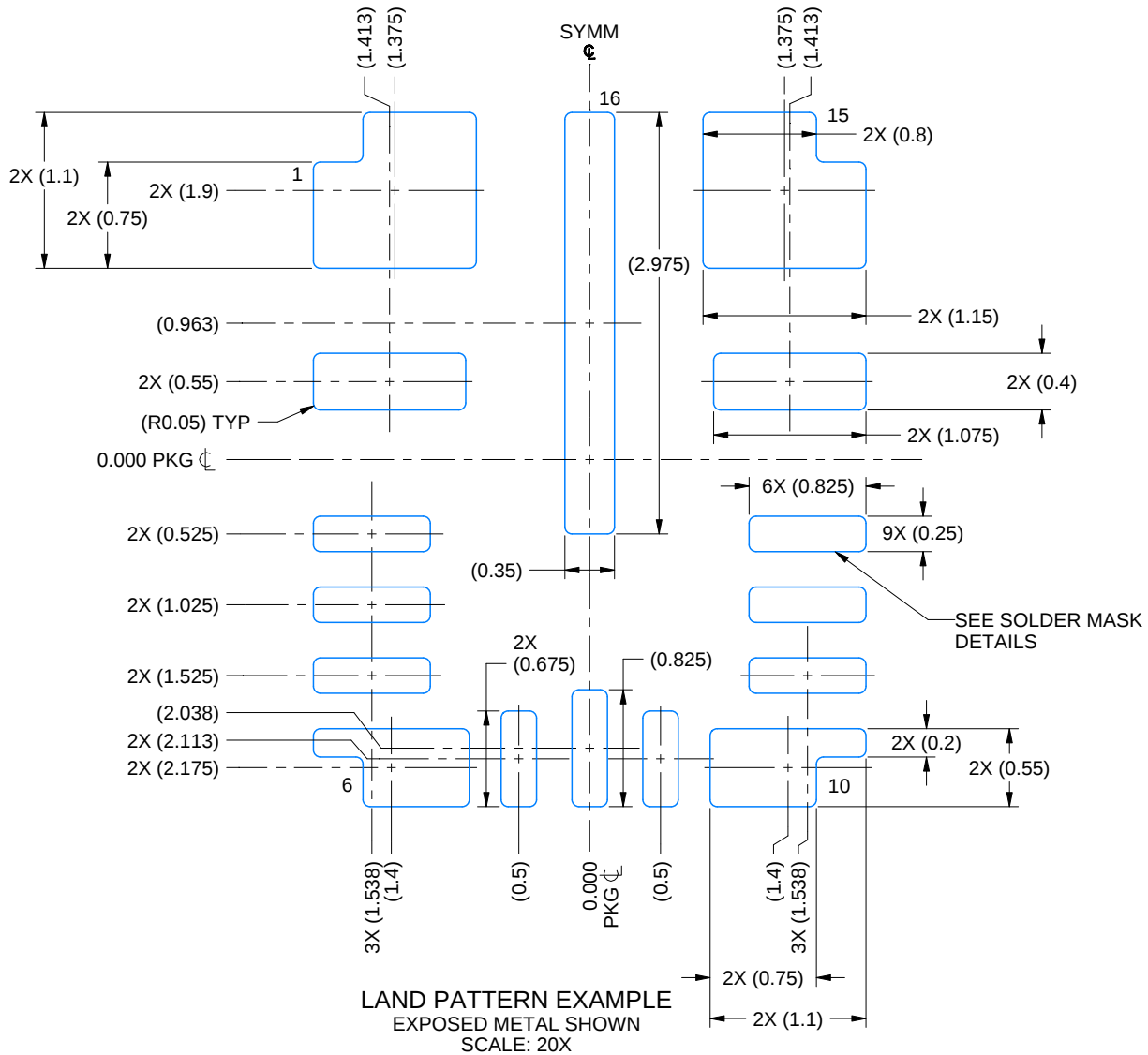
- All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- This drawing is subject to change without notice.
- The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.

EXAMPLE BOARD LAYOUT

RPH0016A

VQFN-HR - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



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NOTES: (continued)

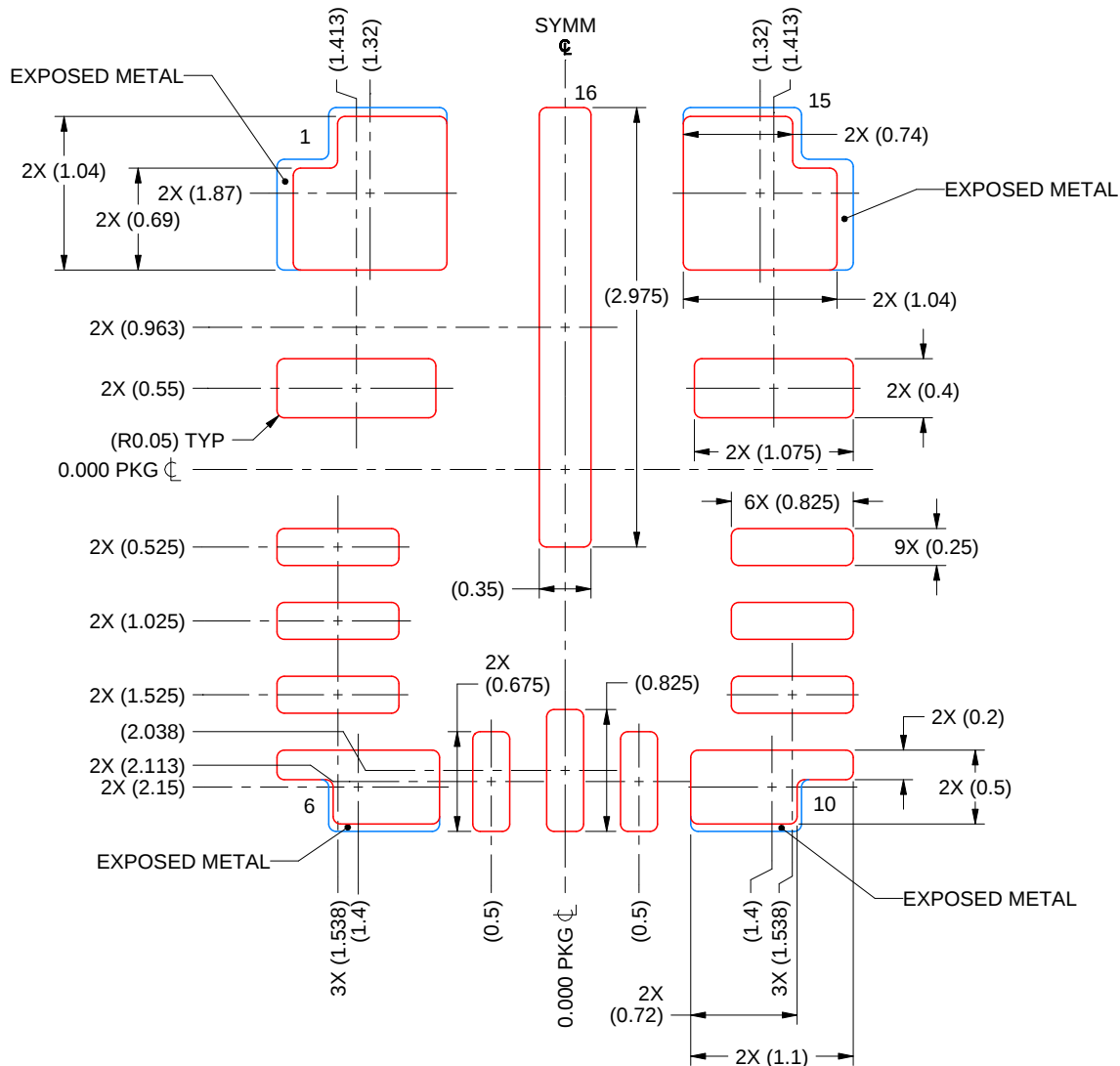
- This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/sluea271).
- Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown on this view. It is recommended that vias under paste be filled, plugged or tented.

EXAMPLE STENCIL DESIGN

RPH0016A

VQFN-HR - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



SOLDER PASTE EXAMPLE
BASED ON 0.125 MM THICK STENCIL
SCALE: 20X

PADS 1 & 15:
85% PRINTED SOLDER COVERAGE BY AREA UNDER PACKAGE
PADS 6 & 10:
90% PRINTED SOLDER COVERAGE BY AREA UNDER PACKAGE

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NOTES: (continued)

6. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

重要声明和免责声明

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