具有可编程 SRAM 的 TPS23880 高功率 8 通道以太网供电 PSE

1 特性

- 适用于 3 类或 4 类 PoE 的 IEEE 802.bt（草案）PSE 解决方案 应用
- 八个独立的 PSE 通道
- SRAM 可编程存储器
- 可选的 2 线对或 4 线对端口电源分配
  - 15.4W、30W、45W、60W、75W 或 90W
- 单一特征和双特征 PD 兼容性
- 各端口专用的 14 位电流 A2D
  - 固有滤波
  - 2% 电流检测精度
  - 100ms 滚动端口电流平均
  - 用于直流断开的防噪 MPS
- 1 位和 3 位快速端口关断输入
- “永不受骗”4 点检测
- 3% 可编程功率限制精度
- 浪涌和运算折返保护
- 425mA 和 1.25A 可选电流限制
- 端口重映射
- 自动发现和功率测量
- 8 位或 16 位 1MHz I^2C 通信
- 灵活的处理器控制运行模式
  - 自动、半自动和手动/诊断
- 各端口电压监控和遥测
- –40°C 至 125°C 工作温度

2 应用

- 企业和 SoHO 交换机和路由器
- 互联 LED 吸顶灯开关
- PoE 直通电源模块
- 网络录像机 (NVR)
- 无线回程和小型蜂窝网络

3 说明

TPS23880 是一款 8 通道供电设备 (PSE) 控制器，旨在按照 IEEE 802.3bt（草案）标准向以太网电缆提供电力。 这 8 个单独的功率通道能够以 2 线对（1 通道）或 4 线对（2 通道）PoE 端口的方式进行任意组合配置。PSE 控制器可以检测具有某一有效特征的受电设备 (PD)，根据其分类确定器件的电源要求并进行供电。

可编程 SRAM 支持通过 I2C 实现现场固件可升级性，从而确保与支持最新 PoE 器件的最大互操作性。 外部 FET 架构可帮助设计人员平衡尺寸、效率、散热和解决方案成本要求。 可编程端口电源限制可在整个工作电压范围内提供稳定的电源限制，并且准确的遥测可确保可靠的系统级电源管理控制。 快速关断 (OSS) 输入可以为要求立即禁用多个端口的 应用 提供多达八个级别的逐端口关断。

端口重映射和与 TPS2388 的引脚对引脚兼容性可轻松实现上一代 PSE 设计的迁移，并支持可互换 2 层 PCB 设计以适应不同系统 PoE 电源配置。

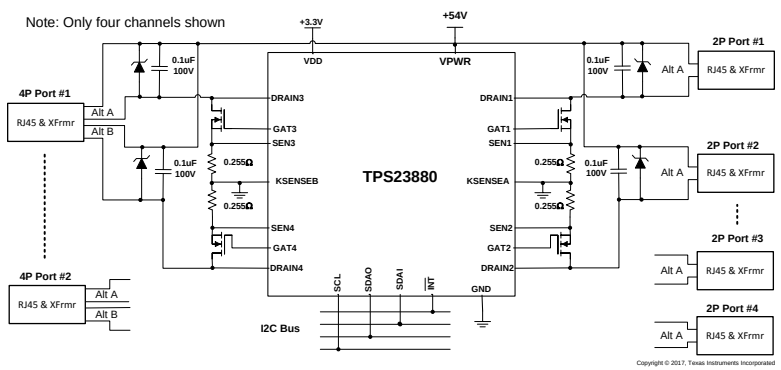
器件信息(1)

器件型号	封装	封装尺寸（标称值）
TPS23880	VQFN (56)	8.00mm x 8.00mm

(1) 如需了解所有可用封装，请参阅产品说明书末尾的可订购产品附录。

ADVANCE INFORMATION

简化原理图



目录

4 修订历史记录

日期	修订版本	说明
2017 年 2018	*	预告信息发布。

ADVANCE INFORMATION

5 器件和文档支持

5.1 接收文档更新通知

要接收文档更新通知，请导航至 TI.com 上的器件产品文件夹。请单击右上角的*提醒我* 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。

5.2 社区资源

下列链接提供到 TI 社区资源的连接。链接的内容由各个分销商“按照原样”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》。

TI E2E™ 在线社区 ***TI 的工程师对工程师 (E2E) 社区。*** **此社区的创建目的在于促进工程师之间的协作。在 e2e.ti.com 中，您可以咨询问题、分享知识、拓展思路并与同行工程师一道帮助解决问题。**

设计支持 ***TI 参考设计支持*** **可帮助您快速查找有帮助的 E2E 论坛、设计支持工具以及技术支持的联系信息。**

5.3 商标

E2E is a trademark of Texas Instruments.

5.4 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。

5.5 Glossary

SLYZ022 — *TI Glossary*.

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

6 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，恕不另行通知和修订此文档。如欲获取此数据表的浏览器版本，请参阅左侧的导航。

ADVANCE INFORMATION

6.1 Package Option Addendum

6.1.1 Packaging Information

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Device Marking(4)(5)
TPS23880RTQR	PREVIEW	VQFN	RTQ	56	2000	Green, RoHS compliant (ECAT G4)	Cu NiPdAu	Level-3-260C-168 HR	–40 to 125	TBD
TPS23880RTQT	PREVIEW	VQFN	RTQ	56	250	Green, RoHS compliant (ECAT G4)	Cu NiPdAu	Level-3-260C-168 HR	–40 to 125	TBD

(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.
PRE_PROD Unannounced device, not in production, not available for mass market, nor on the web, samples not available.
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) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

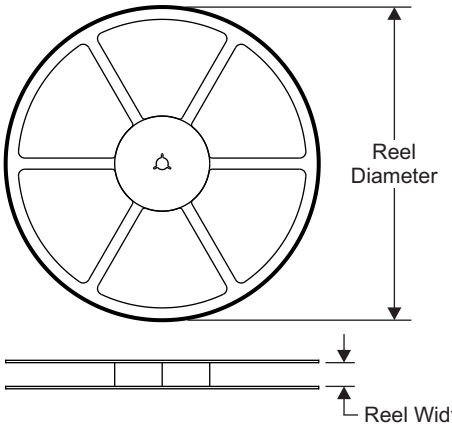
(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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

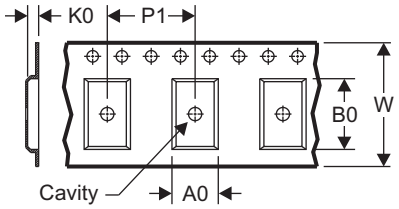
(5) Multiple Device markings will be inside parentheses. Only on Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

6.1.2 Tape and Reel Information

REEL DIMENSIONS

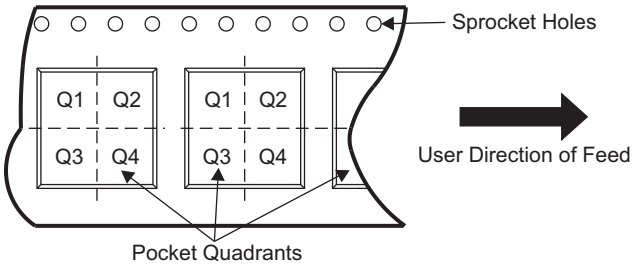


TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

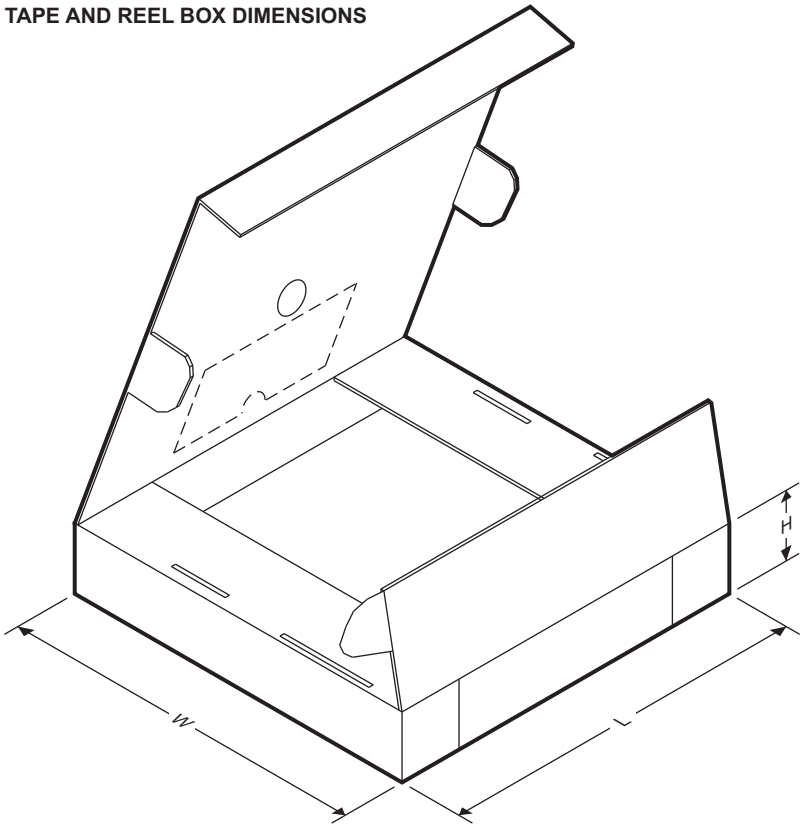
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



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
TPS23880RTQR	VQFN	RTQ	56	2000	330	16.4	8.3	8.3	2.25	12	16	Q2
TPS23880RTQT	VQFN	RTQ	56	250	180	16.4	8.3	8.3	2.25	12	16	Q2

ADVANCE INFORMATION

TAPE AND REEL BOX DIMENSIONS



Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TPS23880RTQR	VQFN	RTQ	56	2000	367.0	367.0	38.0
TPS23880RTQT	VQFN	RTQ	56	250	210.0	185.0	35.0

ADVANCE INFORMATION

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
TPS23880RTQR	ACTIVE	QFN	RTQ	56	2000	RoHS & Green	NIPDAUAG	Level-3-260C-168 HR	-40 to 125	TP23880RTQ	Samples
TPS23880RTQT	ACTIVE	QFN	RTQ	56	250	RoHS & Green	NIPDAUAG	Level-3-260C-168 HR	-40 to 125	TP23880RTQ	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.

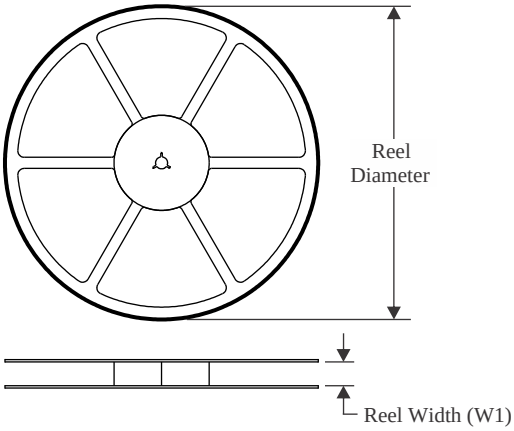
(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(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.

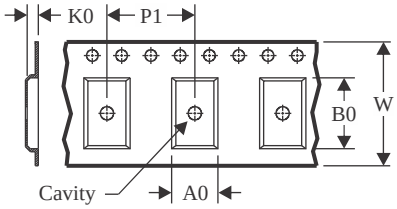
(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

TAPE AND REEL INFORMATION

REEL DIMENSIONS

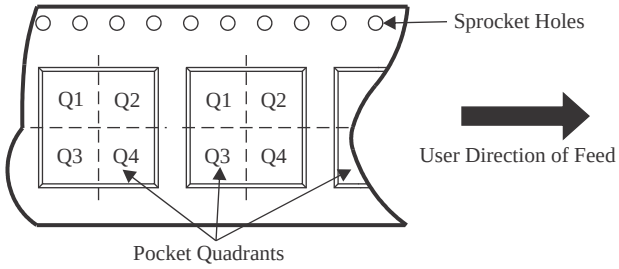


TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

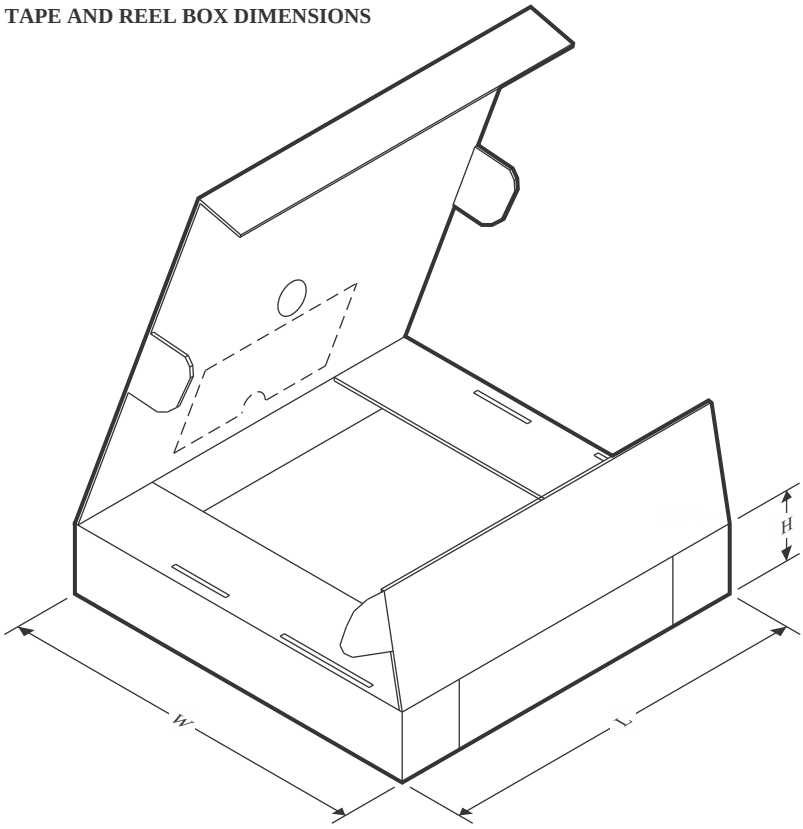
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
TPS23880RTQR	QFN	RTQ	56	2000	330.0	16.4	8.3	8.3	1.1	12.0	16.0	Q2
TPS23880RTQT	QFN	RTQ	56	250	180.0	16.4	8.3	8.3	1.1	12.0	16.0	Q2

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TPS23880RTQR	QFN	RTQ	56	2000	367.0	367.0	38.0
TPS23880RTQT	QFN	RTQ	56	250	210.0	185.0	35.0

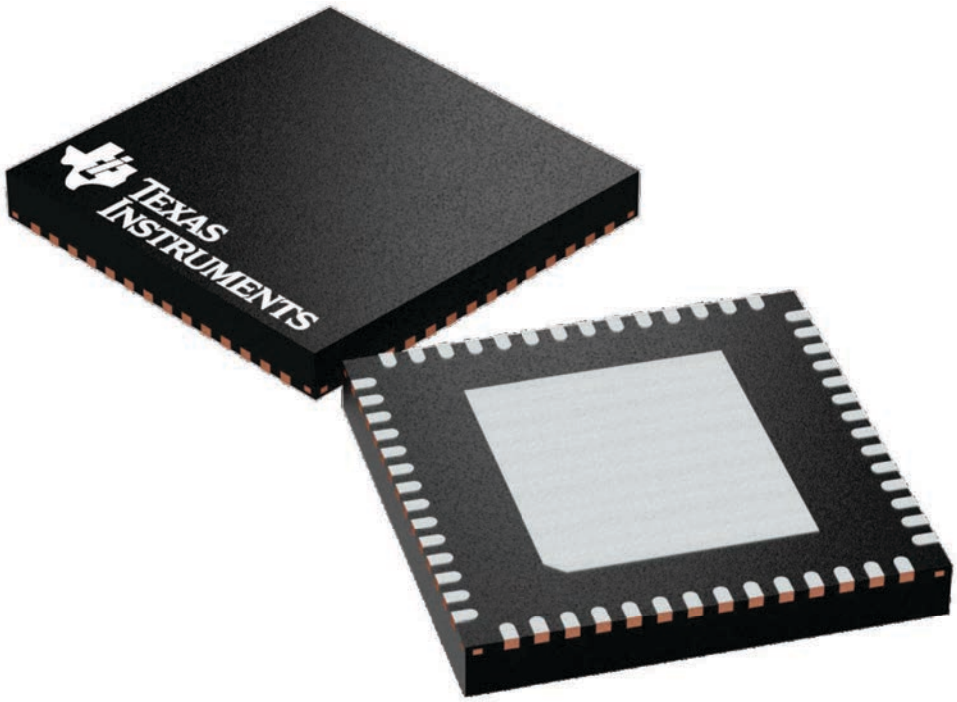
GENERIC PACKAGE VIEW

RTQ 56

VQFN - 1 mm max height

8 x 8, 0.5 mm pitch

PLASTIC QUAD FLATPACK - NO LEAD



Images above are just a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.

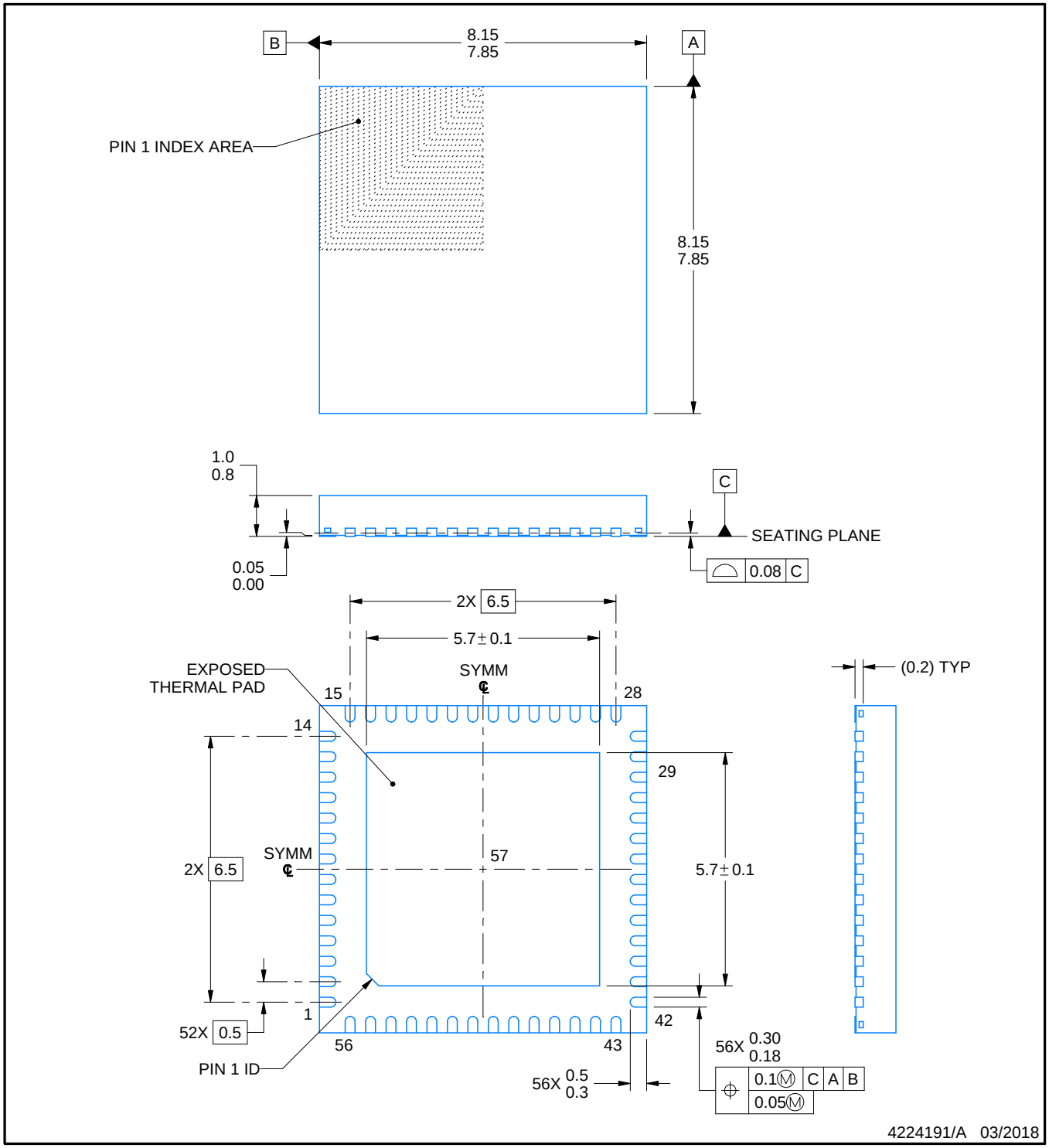
4224653/A

RTQ0056E

PACKAGE OUTLINE

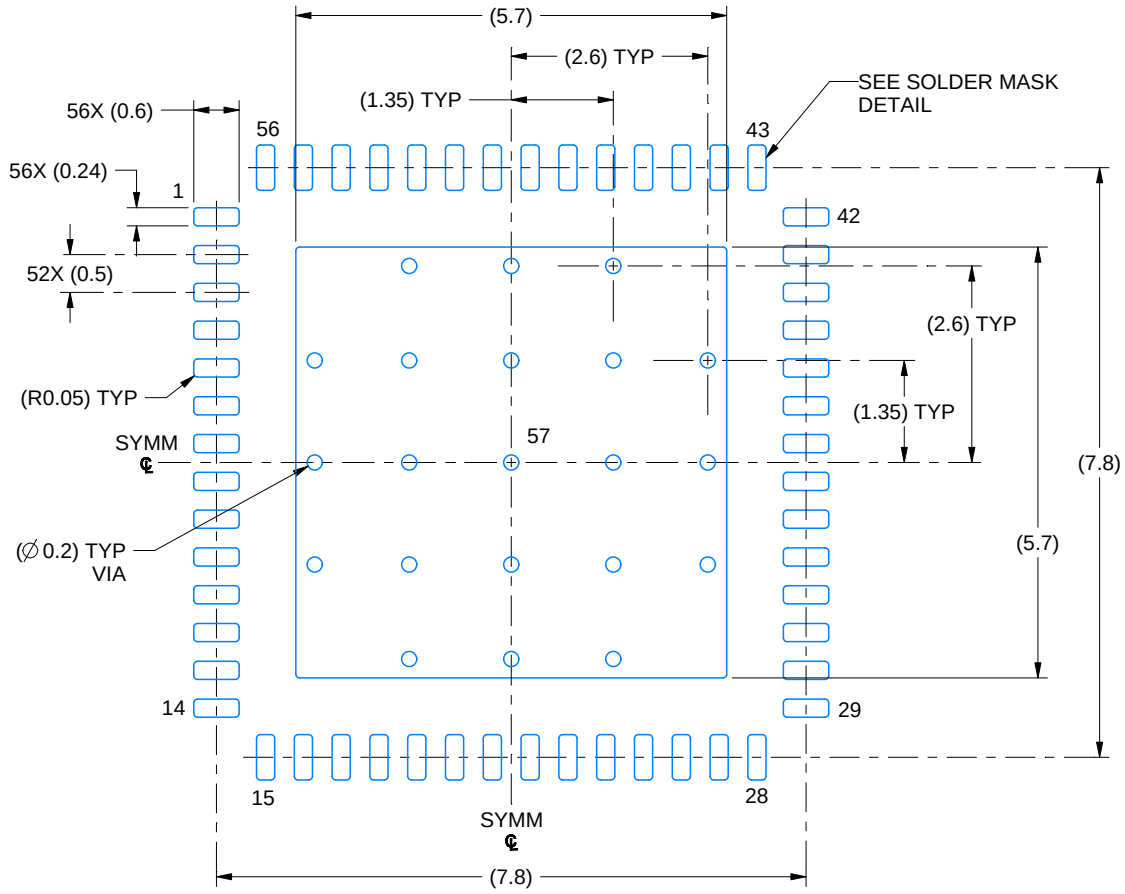
VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD

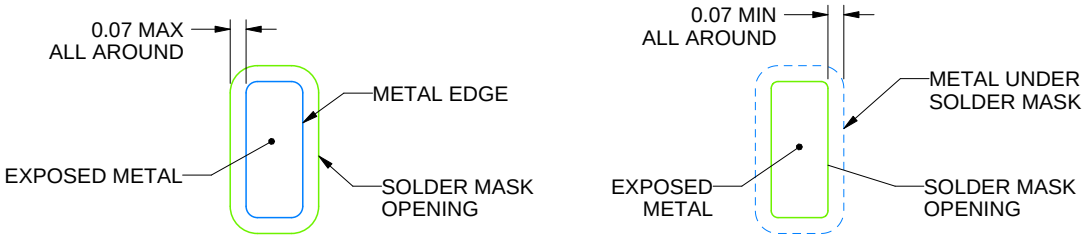


NOTES:

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.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



SOLDER MASK DETAILS

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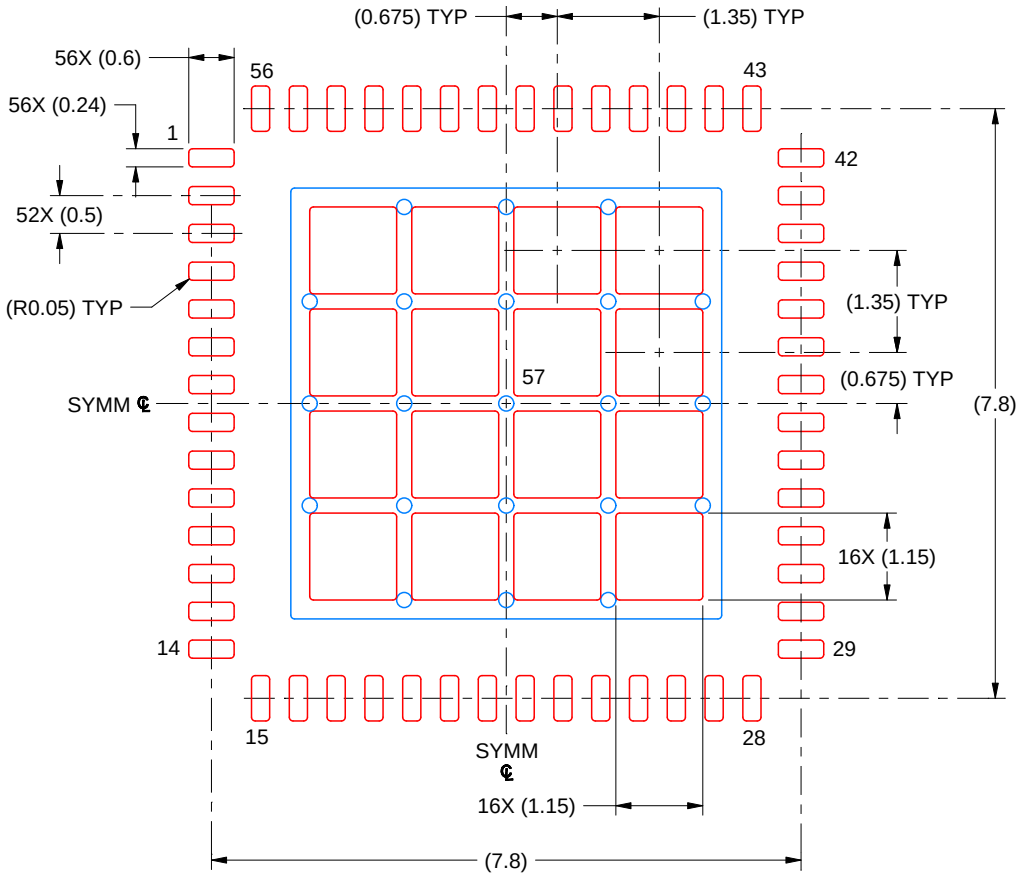
NOTES: (continued)

4. 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).
5. 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.



SOLDER PASTE EXAMPLE
BASED ON 0.125 MM THICK STENCIL
SCALE: 10X

EXPOSED PAD 57
65% 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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