

具有过流保护功能的 TPS65680 18 通道图形可编程电平位移器

1 特性

- 可编程输出图形
 - 同一硬件可支持不同的显示屏
 - 非常适合非标准/小体积应用
 - 开发期间易于实施图形更改
- 电平位移器和 TCON 之间具有简单两线制接口
 - 使用更少的 TCON I/O 资源/允许更小的 TCON 封装
 - 简化了 PCB 布局
 - 多个并行运行的电平位移器器件可共享同一个两线制接口
- 12 路高压时钟输出
- 6 路高压控制输出
- 高级功能
 - 栅极电压整形
 - 电荷共享
 - 低频奇/偶输出生成
 - 关断期间面板放电
 - 输出过流保护
 - 过热保护
- 宽电源电压范围
 - V_{IN} 电源电压范围为 2.7V 至 5.5V
 - V_{GH} 电源电压范围为 9V 至 40V
 - V_{GL} 电源电压范围为 -4V 至 -18V
- 4mm × 4mm、32 引脚 QFN 封装

2 应用

- 使用 GIP/GOA/ASG 技术的 LCD 面板
 - 电视
 - 监视器
 - 笔记本电脑/平板电脑
 - 工业设备
 - 公共标牌

3 说明

TPS65680 器件是一款适用于 LCD 面板的完全可编程高压电平位移器解决方案。此器件在共享充电或栅极电压配置中支持多达 12 路高压时钟输出，而且还支持用于生成启动信号、清除/复位信号、低频奇/偶信号和面板放电的 6 路高压控制输出。输出时序基于用户可编程的图形序列，由电平位移器自身生成。它仅需两个连接至时序控制器的连接：一个线路时钟和一个指示新帧开始的启动脉冲。这两个信号可以在多个 TPS65680 器件间共享，条件是应用中的输出通道数必须多于单个器件可生成的数量。

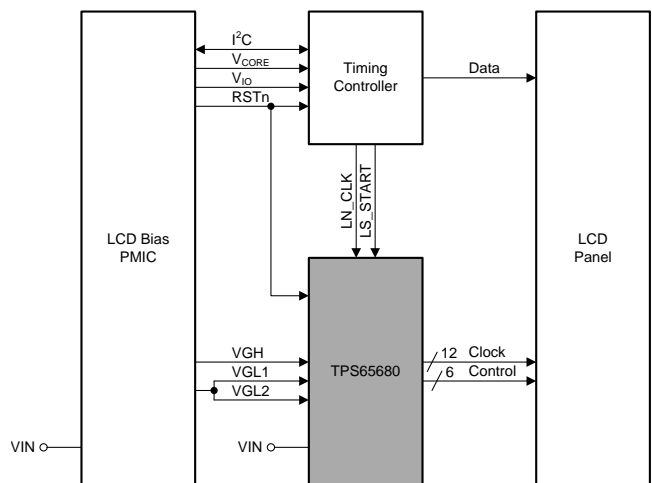
客户定义的图形和配置设置可存储在的片上非易失性存储器中，以用作上电后的默认设置。或者，上电后可使用 I²C 接口向器件中写入该数据。TPS65680 器件的可编程性可帮助您更改输出图形，无需重新编程或更改 TCON。因此，一个 PCB 可以支持多种不同面板，从而简化了系统设计、缩短了设计周期并实现了规模效益。

Device Information⁽¹⁾

PART NUMBER	PACKAGE	BODY SIZE (NOM)
TPS65680	WQFN (32)	4.0mm × 4.0mm

(1) 要了解所有可用封装，请参见数据表末尾的可订购产品附录。

简化原理图



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4 Revision History

DATE	REVISION	NOTES
November 2017	*	预告信息发布。
2018 年 1 月	A	生产数据发布

5 器件和文档支持

5.1 Third-Party Products Disclaimer

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5.3 静电放电警告



这些装置包含有限的内置 ESD 保护。存储或装卸时，应将导线一起截短或将装置放置于导电泡棉中，以防止 MOS 门极遭受静电损伤。

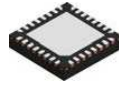
5.4 Glossary

[SLYZ022](#) — *TI Glossary*.

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

6 机械、封装和可订购信息

以下页中包括机械封装、封装和可订购信息。这些信息是针对指定器件可提供的最新数据。数据如有变更，恕不另行通知和修订此文档。如欲获取此产品说明书的浏览器版本，请参阅左侧的导航。

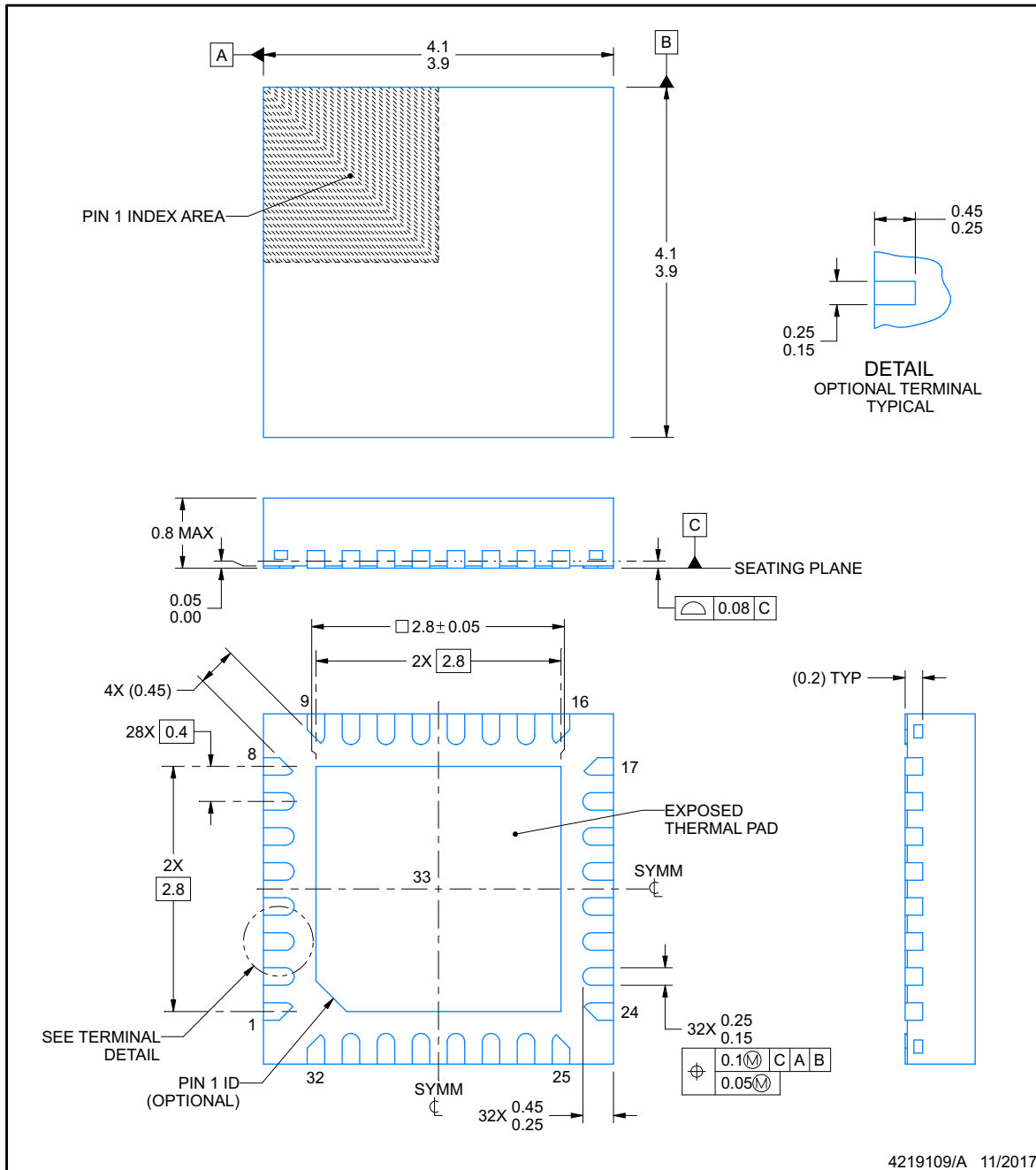


PACKAGE OUTLINE

RSN0032B

WQFN - 0.8 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



NOTES:

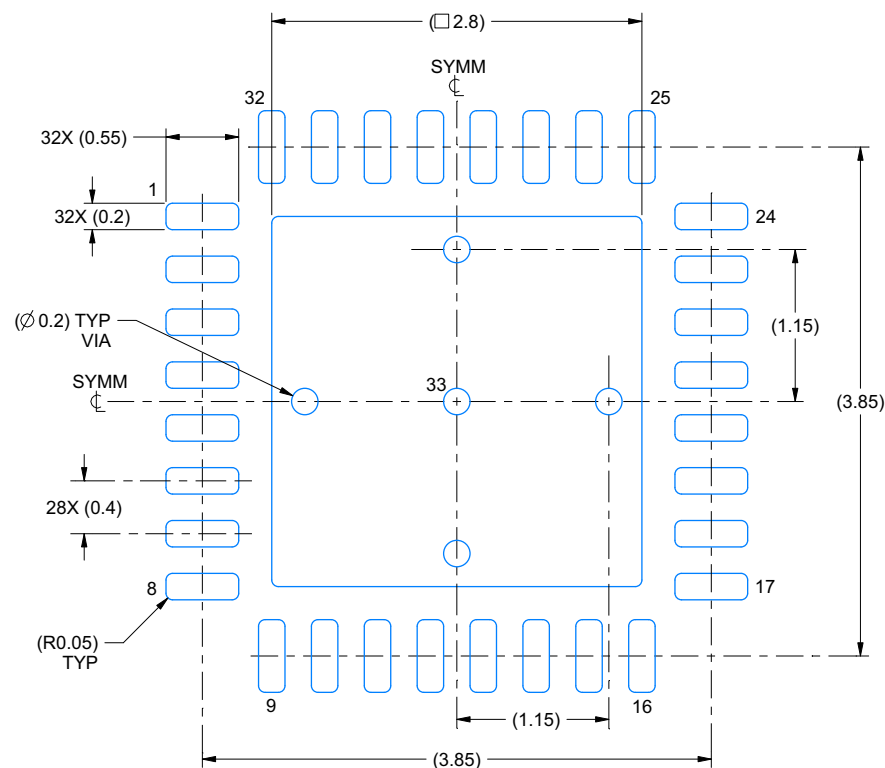
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.

EXAMPLE BOARD LAYOUT

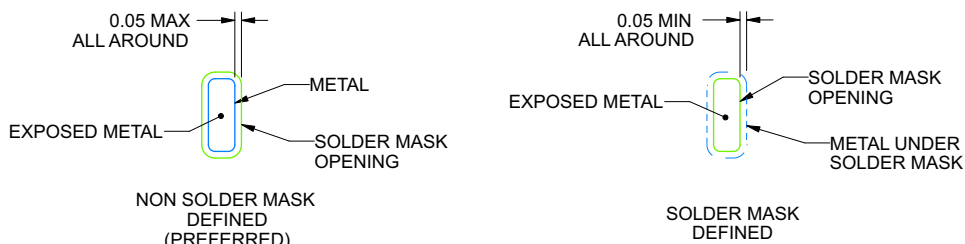
RSN0032B

WQFN - 0.8 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:20X



SOLDER MASK DETAILS

4219109/A 11/2017

NOTES: (continued)

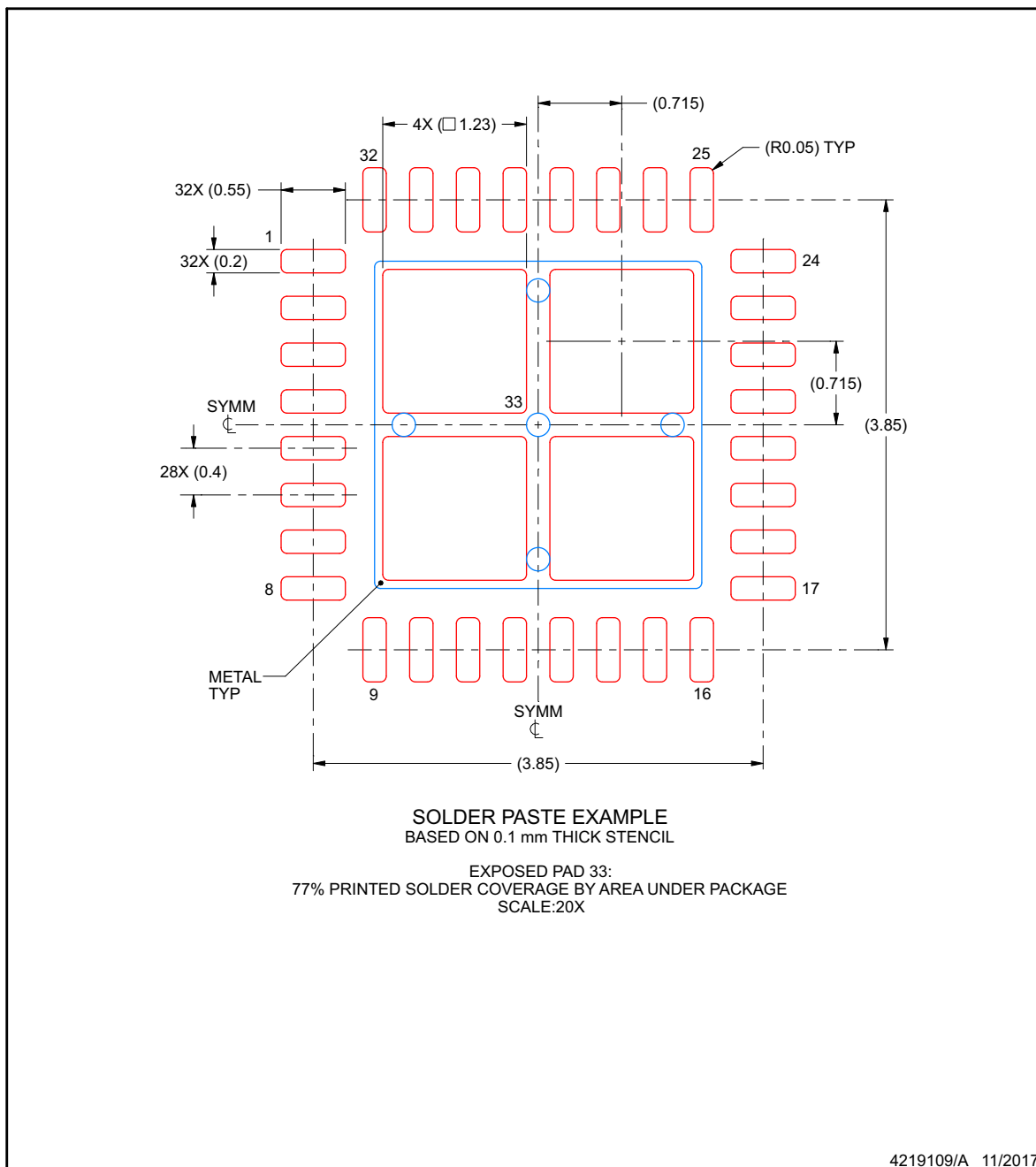
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/sluea271).
5. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown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

EXAMPLE STENCIL DESIGN

RSN0032B

WQFN - 0.8 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



NOTES: (continued)

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

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
TPS65680RSNR	ACTIVE	QFN	RSN	32	3000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	TPS 65680	Samples
TPS65680RSNT	ACTIVE	QFN	RSN	32	250	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	TPS 65680	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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