

# 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。

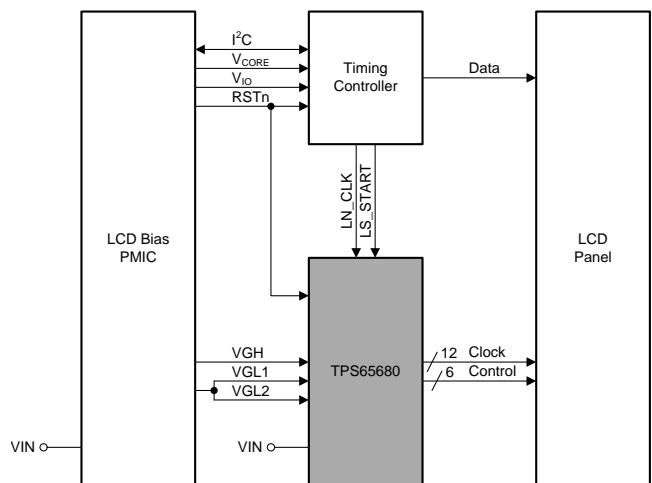
客户定义的图形和配置设置可存储在的片上非易失性存储器中，以用作上电后的默认设置。或者，上电后可使用 I<sup>2</sup>C 接口向器件中写入该数据。TPS65680 器件的可编程性可帮助您更改输出图形，无需重新编程或更改 TCON。因此，一个 PCB 可以支持多种不同面板，从而简化了系统设计、缩短了设计周期并实现了规模效益。

### Device Information<sup>(1)</sup>

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。

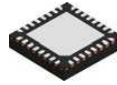
### 5.4 Glossary

[SLYZ022](#) — *TI Glossary*.

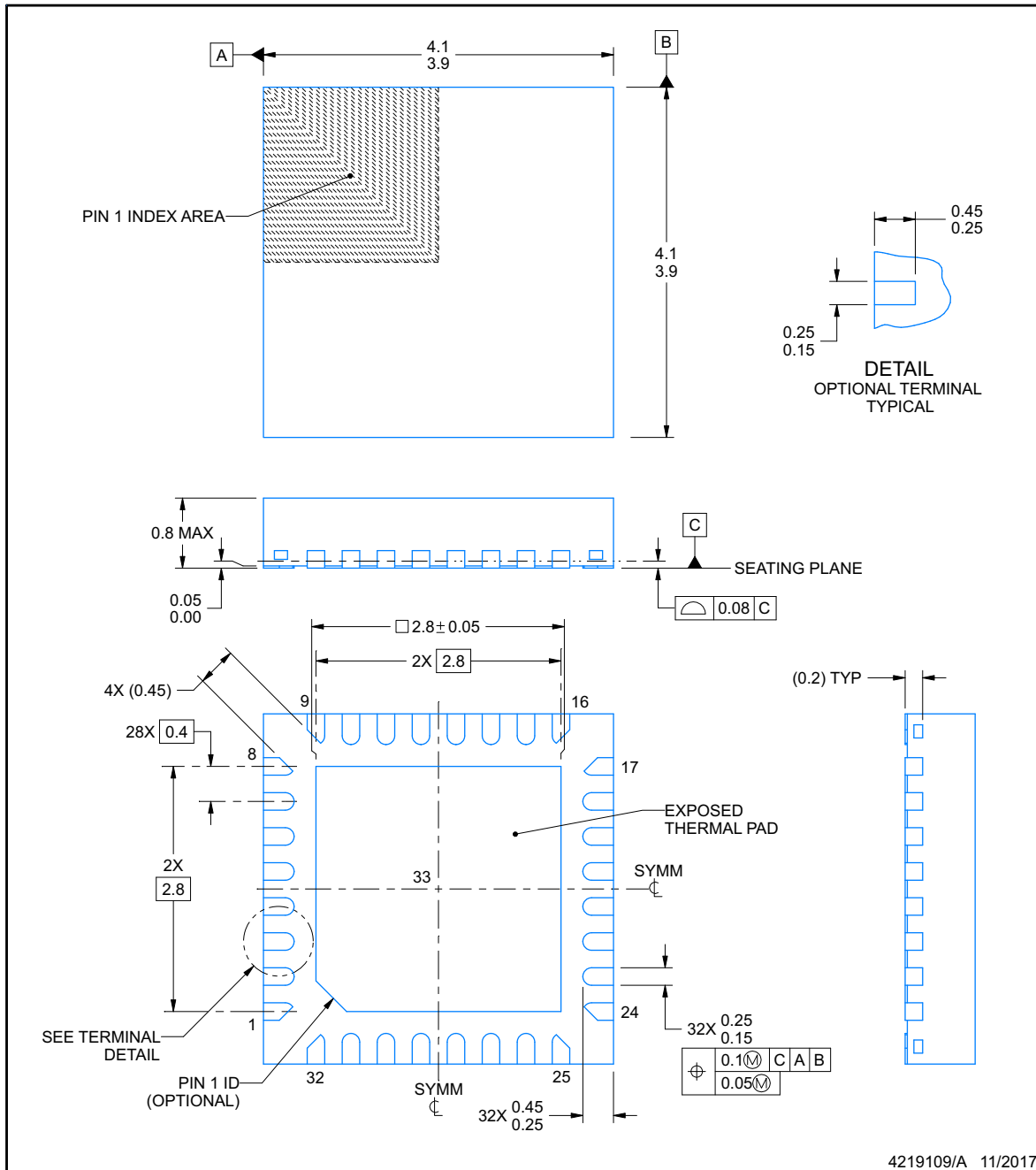
This glossary lists and explains terms, acronyms, and definitions.

## 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。


**RSN0032B**
**PACKAGE OUTLINE**
**WQFN - 0.8 mm max height**

PLASTIC QUAD FLATPACK - NO LEAD



4219109/A 11/2017

**NOTES:**

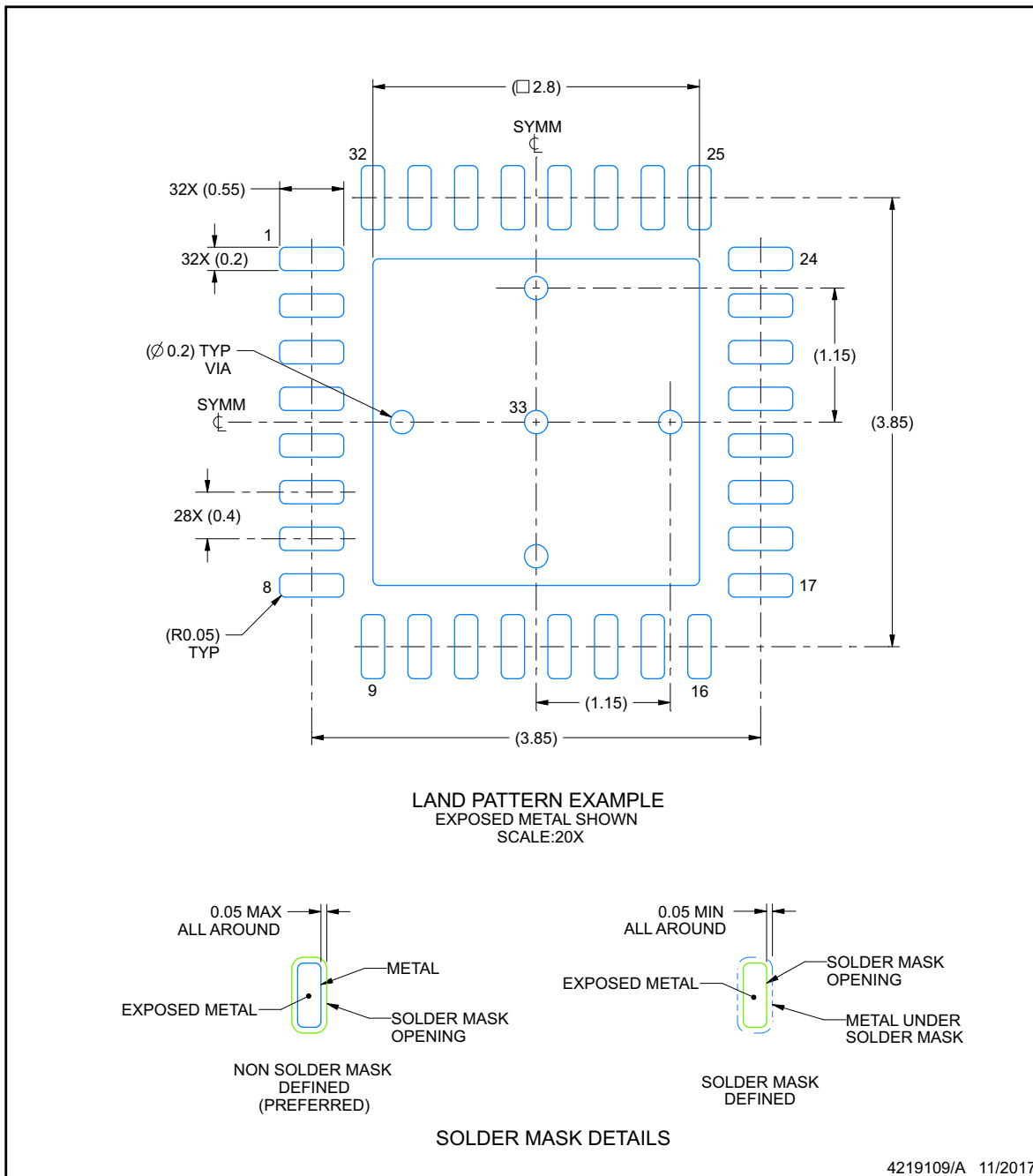
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.

## EXAMPLE BOARD LAYOUT

**RSN0032B**

**WQFN - 0.8 mm max height**

PLASTIC QUAD FLATPACK - NO LEAD



NOTES: (continued)

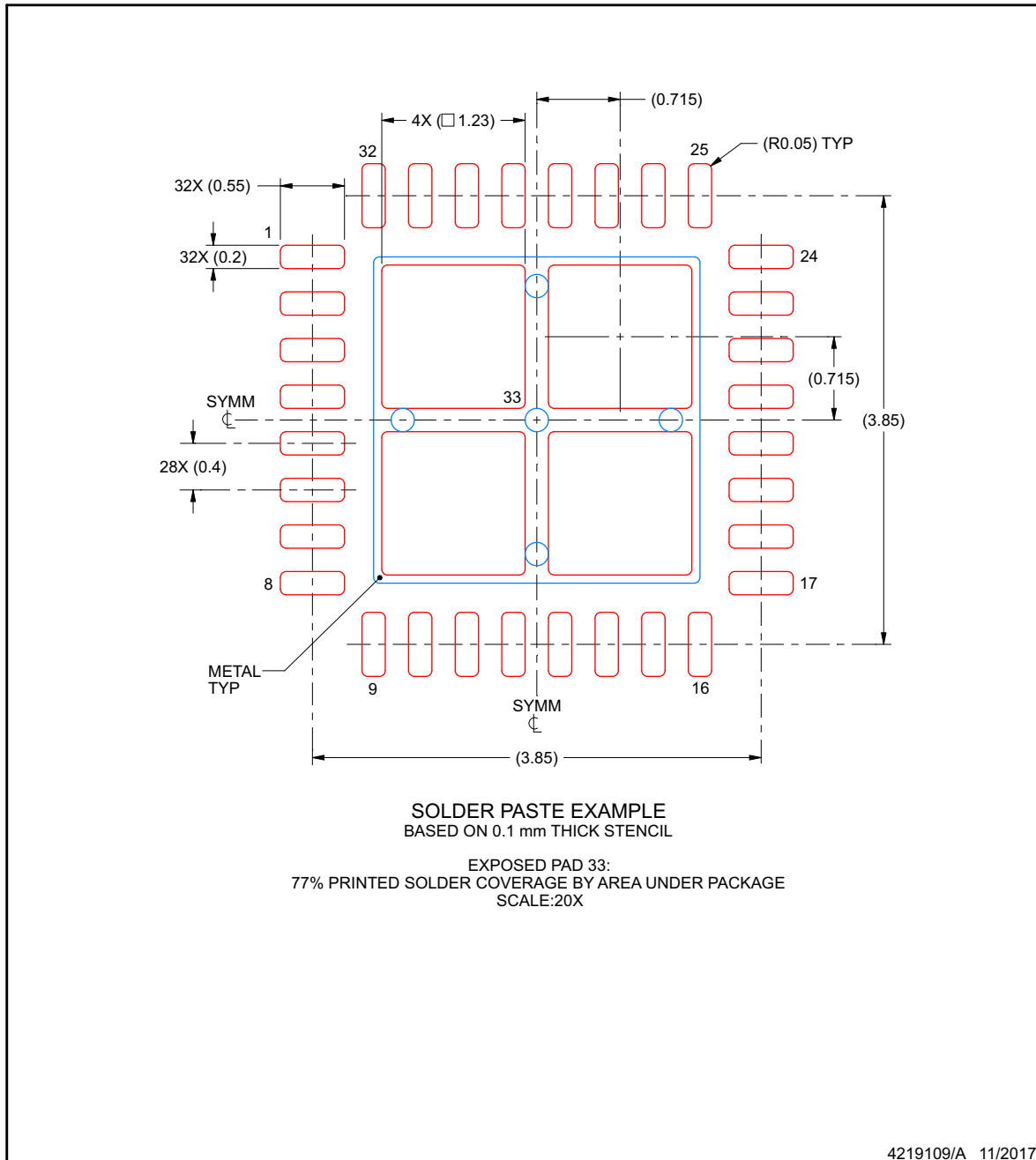
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 ([www.ti.com/lit/sluea271](http://www.ti.com/lit/sluea271)).
5. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, 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 part number	Status (1)	Material type (2)	Package   Pins	Package qty   Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
<a href="#">TPS65680RSNR</a>	Active	Production	QFN (RSN)   32	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	TPS 65680
TPS65680RSNR.A	Active	Production	QFN (RSN)   32	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	TPS 65680
<a href="#">TPS65680RSNT</a>	Active	Production	QFN (RSN)   32	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	TPS 65680
TPS65680RSNT.A	Active	Production	QFN (RSN)   32	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	TPS 65680

<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.

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