

TPS53627适用于 VR13 CPU V_{CORE} 和 DDR 内存的两相 D-CAP+™ 降压控制器

1 特性

- 兼容 Intel®VR13 串行 VID (SVID)
- 单相或两相运行
- 支持压降和非压降应用
- 8 位 DAC，具有 10mV 的步长
- 4.5V 至 28V 转换电压范围
- 输出电压范围：0.5V 到 2.3V
- 轻重负载情况下效率均得到优化
- 8 级独立的过冲衰减 (OSR) 和下冲衰减 (USR)
- 无驱动器配置，有助于实现高效的高频开关
- 支持分立式、电源块、功率级™或 DrMOS MOSFET 实施
- 精确可调电压定位
- 300kHz 至 1MHz 的频率选择
- 已获专利 AutoBalance™相位均衡
- 适用于负载瞬态升压的可编程 ON-Pulse 扩展
- 可编程自动 DCM 和 CCM 运行
- 可选 8 级电流限制
- 小型 32 引脚 4mm x 4mm VQFN 封装 PowerPad™封装

2 应用范围

- 适用于 DDR 内存的 VDDQ
- SoC 处理器 V_{CORE} 电源

3 说明

TPS53627 器件是兼容 VR13 SVID 的无驱动器同步降压控制器。高级控制特性（例如具有重叠脉冲的 D-CAP+™架构）支持下冲衰减 (USR) 和过冲衰减 (OSR)，可提供快速瞬态响应、最低输出电容和高效率。该器件还支持在 CCM 和 DCM 运行情况下进行单相运行，从而提高轻负载情况下的效率。该器件集成了一整套 VR13 I/O 特性，包括 $\overline{VR_READY}$ (PGOOD)、 \overline{ALERT} 和 $\overline{VR_HOT}$ 。SVID 接口地址允许在 00h 到 07h 的时间范围内进行编程。输出电压转换率的可调节控制可编程为高达 20mV/uS。

与 TI NexFET™功率级配合使用时，该总体解决方案可提供超高速度和低开关损耗。

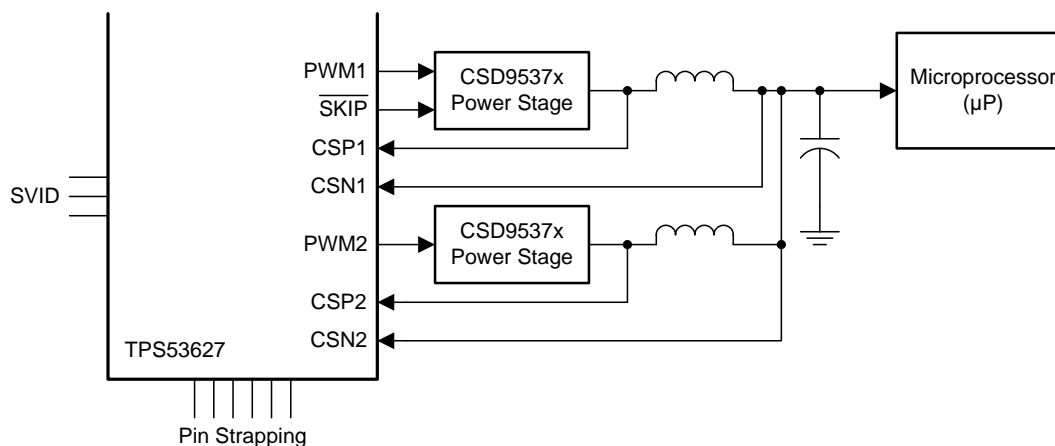
TPS53627 器件采用节省空间的热增强型 32 引脚 VQFN 封装，可在 -40°C 到 +105°C 温度下运行。

器件信息(1)

器件型号	封装	封装尺寸 (标称值)
TPS53627	VQFN (32)	4.00mm x 4.00mm

(1) 要了解所有可用封装，请参阅文档末尾的可订购产品附录。

简化电路原理图



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5 器件和文档支持

5.1 文档支持

5.1.1 相关文档

相关文档如下：

[TPS51604 数据表](#)

5.2 接收文档更新通知

如需接收文档更新通知，请访问 www.ti.com.cn 网站上的器件产品文件夹。点击右上角的**提醒我 (Alert me)** 注册后，即可每周定期收到已更改的产品信息。有关更改的详细信息，请查阅已修订文档中包含的修订历史记录。

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5.5 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。

5.6 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。这些数据会在无通知且不对本文档进行修订的情况下发生改变。欲获得该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
TPS53627RSMR	ACTIVE	VQFN	RSM	32	3000	RoHS & Green	NIPDAU	Level-2-260C-1 YEAR	-40 to 105	TPS 53627	
TPS53627RSMT	ACTIVE	VQFN	RSM	32	250	RoHS & Green	NIPDAU	Level-2-260C-1 YEAR	-40 to 105	TPS 53627	

(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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GENERIC PACKAGE VIEW

RSM 32

VQFN - 1 mm max height

4 x 4, 0.4 mm pitch

PLASTIC QUAD FLATPACK - NO LEAD

This image is a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.



4224982/A

RSM0032B



PACKAGE OUTLINE

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



4219108/B 08/2019

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.

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