

配备可编程增益放大器的 ADS1287D 双路、同步采样、低功耗、1000SPS 模数转换器

1 特性

- SNR: 114dB (50Hz–200Hz, 增益 = 1)
- 功耗: 2.2mW (每个 ADC)
- THD: –115dB
- CMRR: 110dB
- 高阻抗 CMOS PGA:
 - 增益: 1、2、4、8 和 16
- 数据传输速率: 62.5SPS 至 1000SPS
- 灵活的数字滤波器:
 - 正弦 + 有限脉冲响应 (FIR) + 无限脉冲响应 (IIR) (可选)
 - 线性 and 最小相位响应
 - 可编程高通滤波器
- 传感器测试电流源
- 偏移和增益校准
- 同步控制
- SPI™- 兼容接口
- 模拟电源: 5V 或 ±2.5V
- 数字电源: 2.5V 至 3.3V

2 应用

- 能量勘探
- 无源地震监测
- 便携式仪表

3 说明

ADS1287D 器件是一款双路、同步采样模数转换器 (ADC), 配备集成式可编程增益放大器 (PGA) 和有限脉冲响应 (FIR) 数字滤波器。该 ADC 可满足低功耗地震数据采集的严苛要求。

该 ADC 配备可编程增益的高阻抗放大器, 适用于通过范围较广的输入信号 ($\pm 2.5V$ 至 $\pm 0.156V$) 将地震检波器和水听器传感器直接连接到 ADC。双路 100nA 电流源集成到 ADC 输入端, 用于传感器的现场测试。

该 ADC 包含内在稳定的四阶 Delta-Sigma ($\Delta\Sigma$) 调制器。调制器数字输出由内部的 FIR 数字滤波器过滤和抽取, 以生成 ADC 转换结果。

FIR 数字滤波器的数据速率高达每秒 1000 个样本 (SPS)。高通滤波器 (HPF) 可从转换结果中移除直流和低频分量。片上增益和偏移调节寄存器支持系统校准。

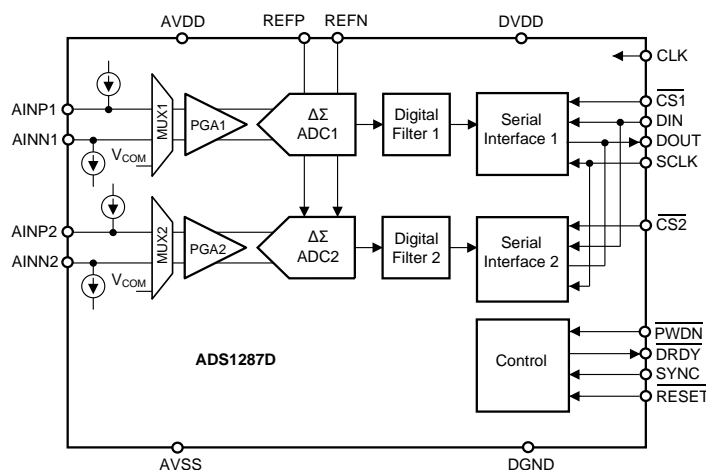
器件的总功耗为 4.4mW。该 ADC 采用紧凑的 5mm × 5mm VQFN 封装, 额定工作温度范围为 $-40^{\circ}C$ 至 $+85^{\circ}C$ 。

器件信息⁽¹⁾

器件型号	封装	封装尺寸 (标称值)
ADS1287D	VQFN (32)	5.00mm × 5.00mm

(1) 如需了解所有可用封装, 请参阅数据表末尾的封装选项附录。

功能框图



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4 器件和文档支持

4.1 商标

SPI is a trademark of Motorola Mobility LLC.

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4.2 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。

4.3 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。这些数据如有变更，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。

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
ADS1287DIRHBR	ACTIVE	VQFN	RHB	32	3000	RoHS & Green	NIPDAU	Level-3-260C-168 HR	-40 to 85	ADS 1287D	
ADS1287DIRHBT	ACTIVE	VQFN	RHB	32	250	RoHS & Green	NIPDAU	Level-3-260C-168 HR	-40 to 85	(ADS, XADS) 1287D	

(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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