

TX08D 8 通道超声波变送器

1 特性

- 8 通道发送器，每个通道包括：
 - 具有片上波束形成功能的五级脉冲发生器
 - 有源 T/R 开关
 - 集成式浮动电源
- 五级脉冲发生器支持：
 - 输出电压最大值：±100V
 - 输出电压最小值：±1V
 - 最大输出电流：2A
 - 支持 4A 输出电流模式
 - 真正归零以便对地放电
 - 第二谐波在 5MHz 频率下为 -45dBc
 - 3dB 带宽，220Ω || 240pF 负载
 - 20MHz (对于 ±100V 电源)
 - 35MHz (对于 ±100V 电源，4A 电流)
 - 集成抖动：100fs (100Hz 至 20kHz)
 - CW 模式近端相位噪声：-154dBc/Hz (对于 5MHz 信号、1kHz 偏移)
- 有源 T/R 开关，具有：
 - 导通电阻：8Ω
 - 导通和关断时间：300ns
 - 基于通道的 T/R 开关控制
- 用于脉冲发生器的片上波束形成器具有：
 - 基于通道的 T/R 开关控制
 - 延迟分辨率：半个波束形成器时钟周期，不低于 1.56ns
 - 最大延迟：2¹⁴ 个波束形成器时钟周期
 - 每通道 960 x 32 位存储器，用于存储波形和延迟值。

- 高速 (最大值为 400MHz) 双通道 LVDS 串行编程接口
 - 较低编程时间：< 500ns (针对延迟分布更新)
 - 32 位校验和功能可检测错误的 SPI 写入
- 内部温度传感器和自动热关断
- 无需特定电源时序
- 错误标志寄存器，用于检测多种故障情况
- 用于浮动电源和偏置电压的集成无源器件
- 小型封装：FCCSP-196 (12mm x 12mm)，间距为 0.8mm

2 应用

- 超声波脉冲发生器成像系统
- 压电式驱动器

3 说明

TX08D 是一款适用于超声波成像系统的变送器解决方案。该器件支持八个通道，每个通道包括脉冲发生器发送/接收 (T/R) 开关。

封装信息

器件型号	封装 ⁽¹⁾	封装尺寸 ⁽²⁾
TX08D	ACP (FCCSP , 196)	12mm x 12mm

- (1) 如需了解所有可用封装，请参阅数据表末尾的可订购产品附录。
- (2) 封装尺寸 (长 × 宽) 为标称值，并包括引脚 (如适用)。



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4 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

4.1 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。点击 [通知](#) 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。

4.2 支持资源

[TI E2E™ 中文支持论坛](#) 是工程师的重要参考资料，可直接从专家处获得快速、经过验证的解答和设计帮助。搜索现有解答或提出自己的问题，获得所需的快速设计帮助。

链接的内容由各个贡献者“按原样”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](#)。

4.3 Trademarks

TI E2E™ is a trademark of Texas Instruments.
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4.4 静电放电警告



静电放电 (ESD) 会损坏这个集成电路。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。

4.5 术语表

[TI 术语表](#) 本术语表列出并解释了术语、首字母缩略词和定义。

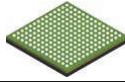
5 Revision History

注：以前版本的页码可能与当前版本的页码不同

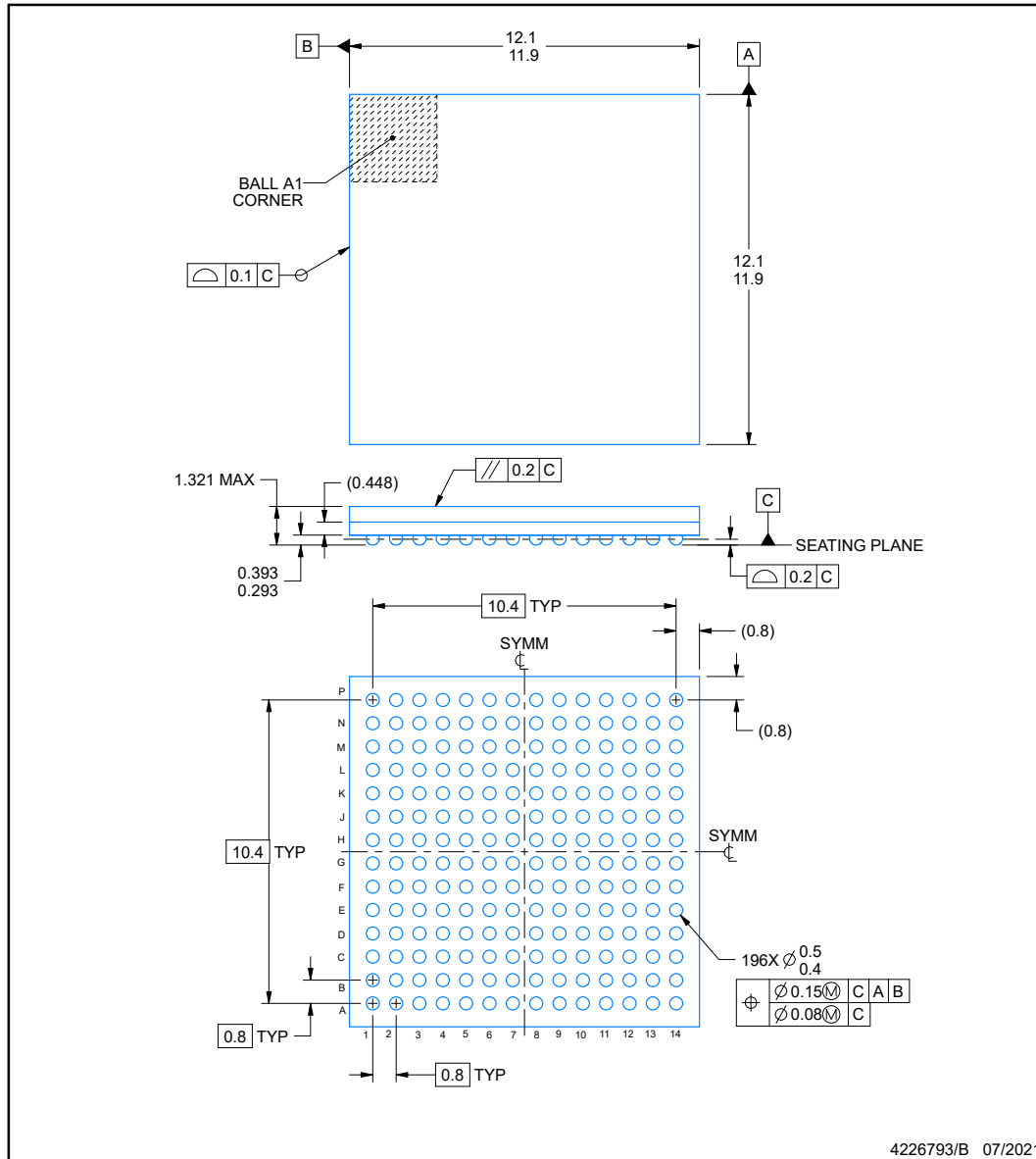
Changes from Revision * (October 2023) to Revision A (January 2024)	Page
• 将数据表标题从“TX08D 8 通道变送器”更改为“TX08D 8 通道超声波变送器”.....	1

6 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

ACP0196A**PACKAGE OUTLINE****FCBGA - 1.321 mm max height**

BALL GRID ARRAY

**NOTES:**

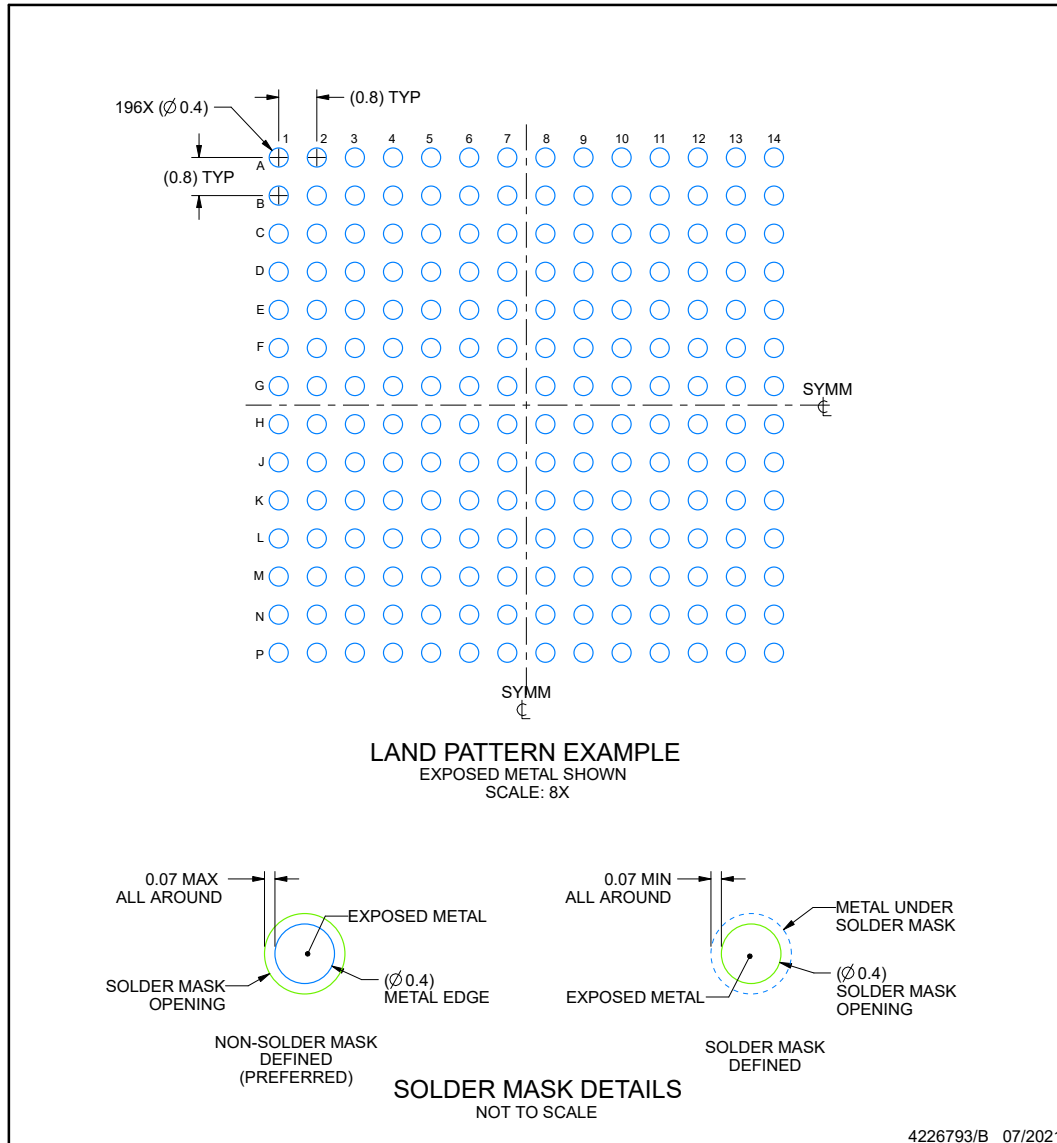
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.

EXAMPLE BOARD LAYOUT

ACP0196A

FCBGA - 1.321 mm max height

BALL GRID ARRAY

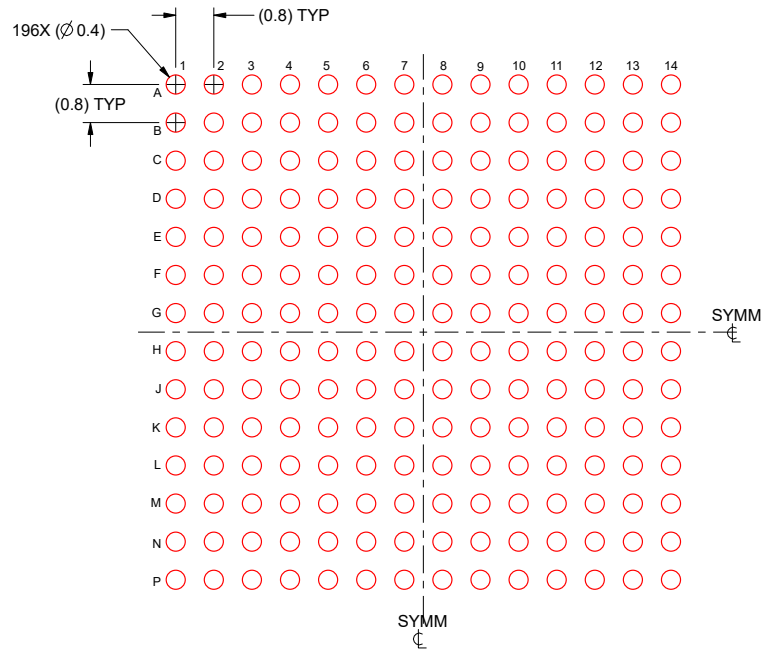


NOTES: (continued)

- Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints. For information, see Texas Instruments literature number SPRAA99 (www.ti.com/lit/spraa99).

EXAMPLE STENCIL DESIGN**ACP0196A****FCBGA - 1.321 mm max height**

BALL GRID ARRAY



SOLDER PASTE EXAMPLE
 BASED ON 0.125 mm THICK STENCIL
 SCALE: 8X

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NOTES: (continued)

4. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release.

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
PTX08DACP	ACTIVE	FCCSP	ACP	196	160	TBD	Call TI	Call TI	0 to 70		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.

OBSELETE: 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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