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：2^{14} 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）。

ADVANCE INFORMATION

本资源的原文使用英文撰写。为方便起见，TI 提供了译文；由于翻译过程中可能使用了自动化工具，TI 不保证译文的准确性。为确认准确性，请务必访问 ti.com 参考最新的英文版本（控制文档）。

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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

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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.

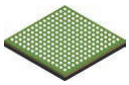
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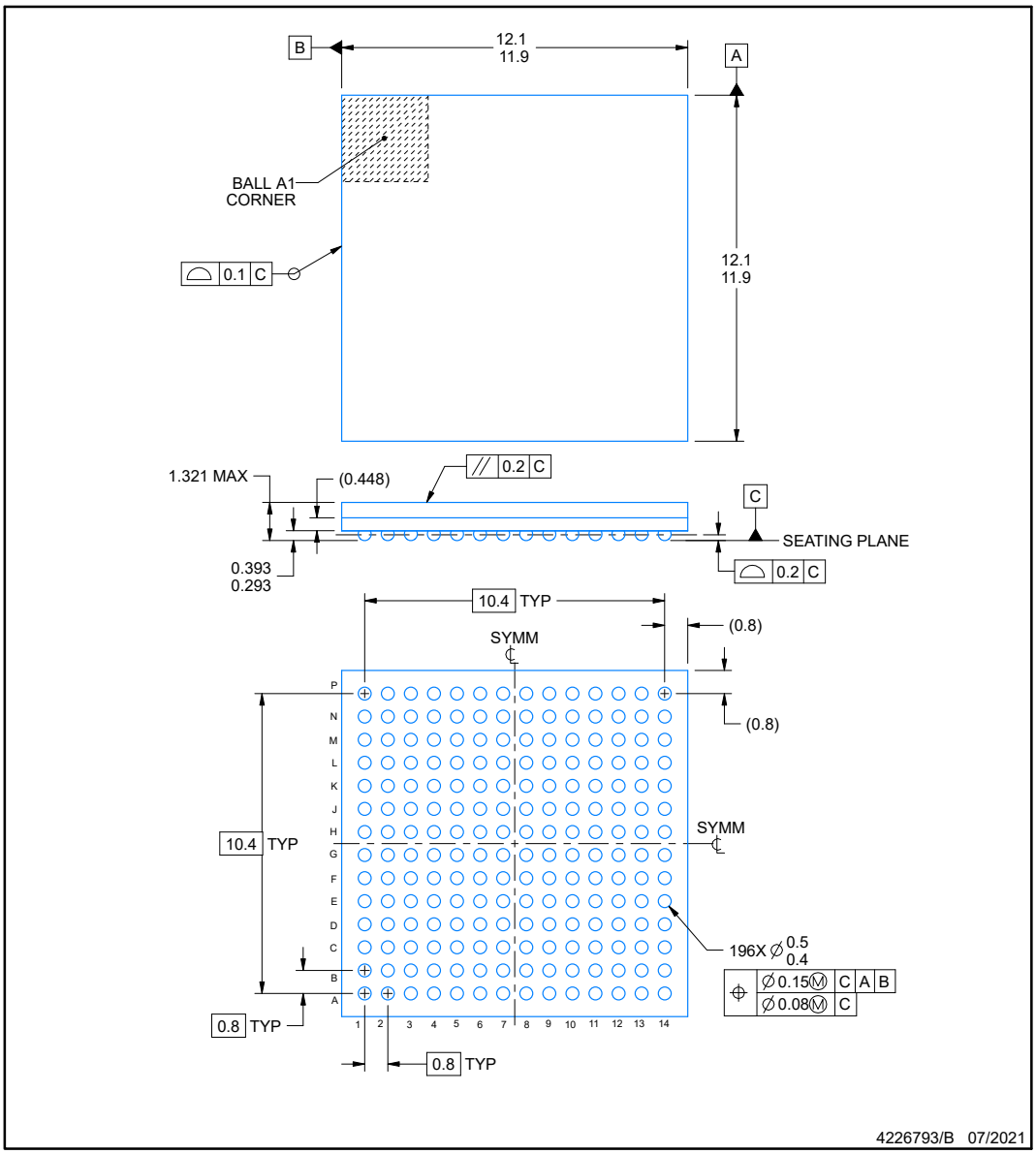
PACKAGE OUTLINE

ACP0196A



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.

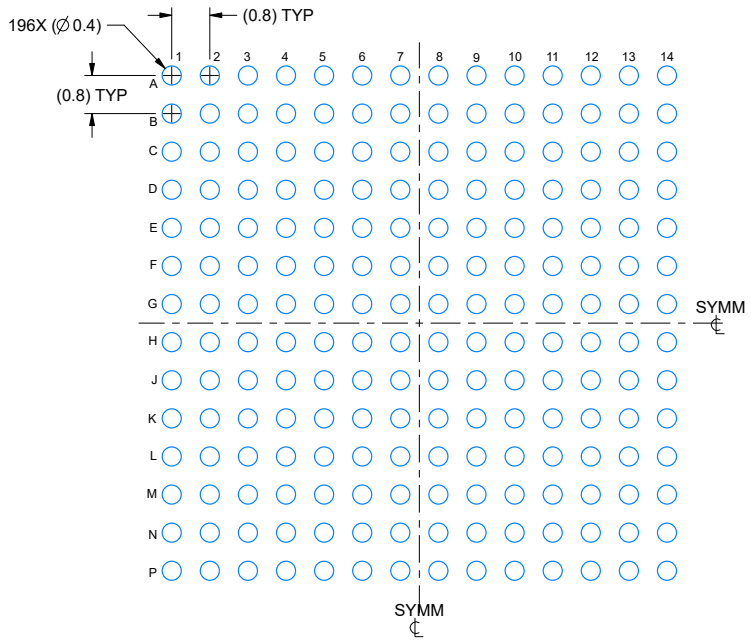
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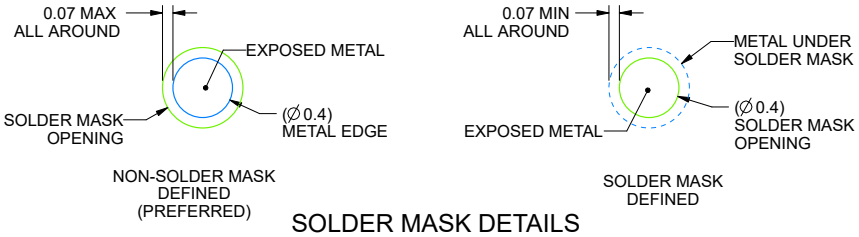
EXAMPLE BOARD LAYOUT

ACP0196A **FCBGA - 1.321 mm max height**

BALL GRID ARRAY



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 8X



SOLDER MASK DETAILS
NOT TO SCALE

4226793/B 07/2021

NOTES: (continued)

3. 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).

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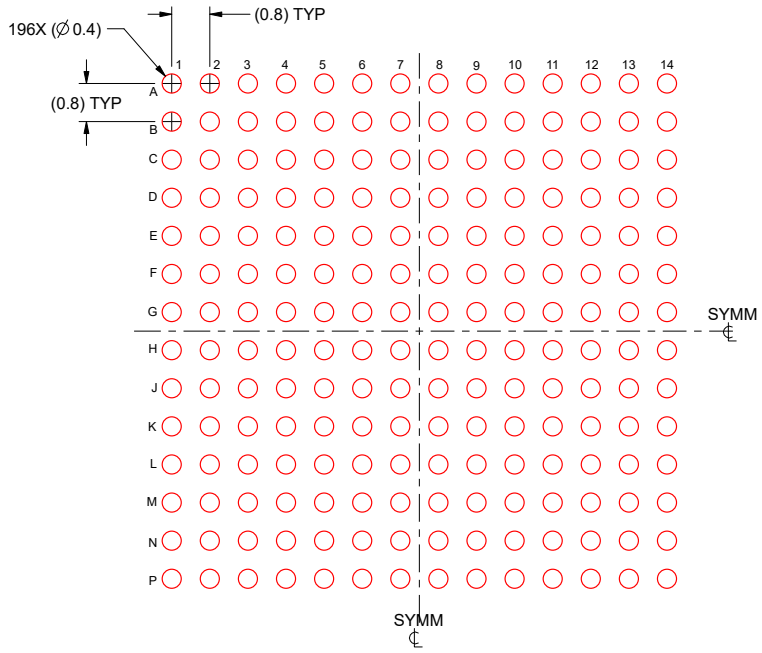
ADVANCE INFORMATION

ADVANCE INFORMATION

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

4226793/B 07/2021

NOTES: (continued)

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

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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)
TX08DACP	Active	Production	FCCSP (ACP) | 196	160 | JEDEC TRAY (5+1)	-	Call TI | Snagcu	Level-3-260C-168 HR	0 to 70	(TX08D, TX7364)

(1) **Status:** For more details on status, see our product life cycle.

(2) **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.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) **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.

(5) **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.

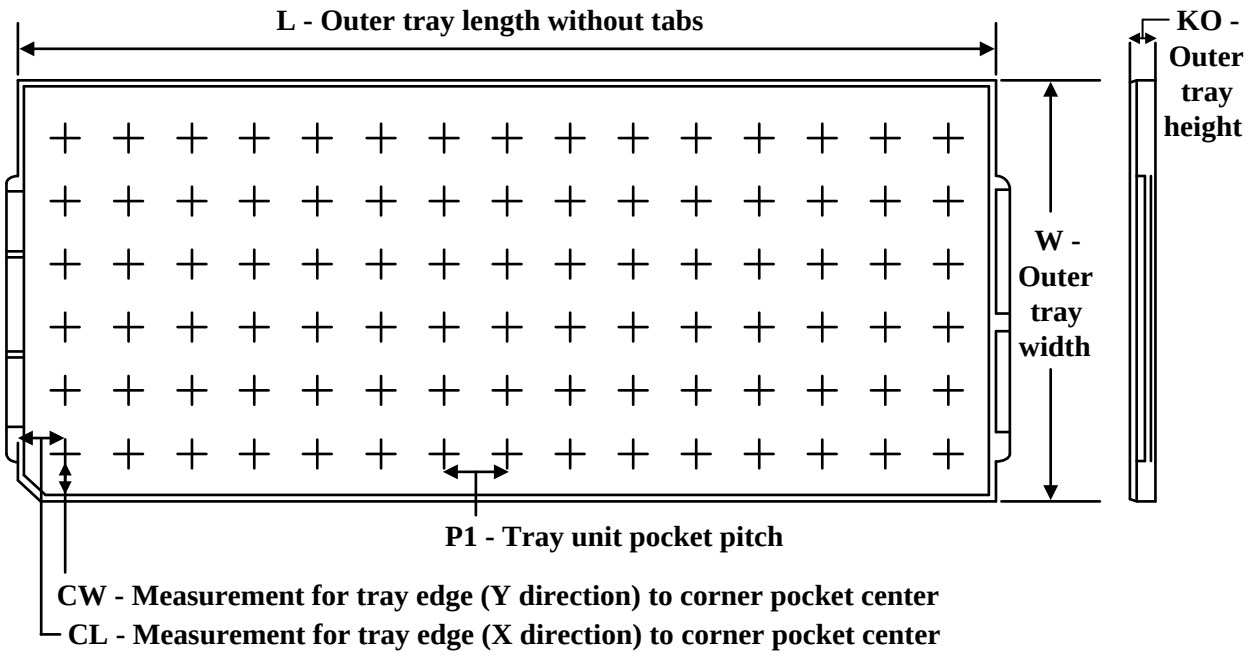
(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

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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TRAY



Chamfer on Tray corner indicates Pin 1 orientation of packed units.

*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	Unit array matrix	Max temperature (°C)	L (mm)	W (mm)	K0 (µm)	P1 (mm)	CL (mm)	CW (mm)
TX08DACP	ACP	FCCSP	196	160	8 x 20	150	315	135.9	7620	15.4	11.2	19.65

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