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4 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 A (December 2022) to Revision B (June 2023)	Page
• 在 <i>特性</i> 部分添加了 PAM4 串行器或解串器支持.....	1
• 更新了 <i>封装信息</i> 表格式以包含封装引线.....	1
Changes from Revision * (October 2021) to Revision A (December 2022)	Page
• 将数据表的状态从 <i>预告信息</i> 更改为 “ <i>量产数据</i> ”	1

5 说明 (续)

DS560DF810 配有位多路复用器和多路信号分离器齿轮箱，可在主机和模块间轻松实现 NRZ 至 PAM4 或 PAM4 至 NRZ 的转换。该齿轮箱可将一对速率高达 28.9GBd 的 NRZ 输入聚合为一个 28.9GBd PAM4 输出，也可将一个 28.9GBd PAM4 输入解聚为一对 28.9GBd NRZ 输出。

DS560DF810 在 CDR 后的每对相邻通道之间都具有一个完整的 2x2 交叉点开关，可支持快速、灵活的通道切换以实现灵活的 PCB 路由，支持 2 到 1 多路复用和 1 到 2 多路分解以实现故障转移冗余，还支持 1 对 2 扇出以实现诊断监控。此外，PCB 上集成了物理交流耦合电容器 (TX 和 RX)，无需使用外部电容器。这些特性可降低 PCB 布线的复杂程度并节省物料清单 (BOM) 成本。

诊断功能包括无损 PAM4/NRZ 垂直眼高监视器、2D PAM4/NRZ 眼图张开度监视器 (EOM)、具有错误注入模块的 PRBS 图形发生器、PRBS 错误校验器和片上温度传感器。这些特性可帮助测量链路裕量，并用于监测系统随时间推移的运行情况。

DS560DF810 可通过 I²C 或外部 EEPROM 进行配置。单个 EEPROM 最多可由 16 个器件共享。

6 Device and Documentation Support

6.1 Documentation Support

6.1.1 Related Documentation

For related documentation, see the following:

- Texas Instruments, [DS560DFXX0 Programmer's Guide](#)
- Texas Instruments, [DS560DF810EVM User's Guide](#)
- Texas Instruments, [Implementation of TI 56Gbps PAM4 Retimers in Direct Attach Copper Cable Applications](#)

6.2 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 [订阅更新](#) 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。

6.3 支持资源

[TI E2E™ 支持论坛](#) 是工程师的重要参考资料，可直接从专家获得快速、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可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》](#)。

6.4 Trademarks

以太网™ is a trademark of Fuji Xerox Co., Ltd.

InfiniBand™ is a trademark of InfiniBand Trade Association.

TI E2E™ is a trademark of Texas Instruments.

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6.5 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。

6.6 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。

7 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.

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
DS560DF810ALUR	ACTIVE	FCCSP	ALU	135	1000	RoHS (In Work) & Green (In Work)	SNAGCU	Level-3-260C-168 HR	-40 to 85	DS560DF8E0	Samples
DS560DF810ALUT	ACTIVE	FCCSP	ALU	135	250	RoHS (In Work) & Green (In Work)	SNAGCU	Level-3-260C-168 HR	-40 to 85	DS560DF8E0	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.

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.

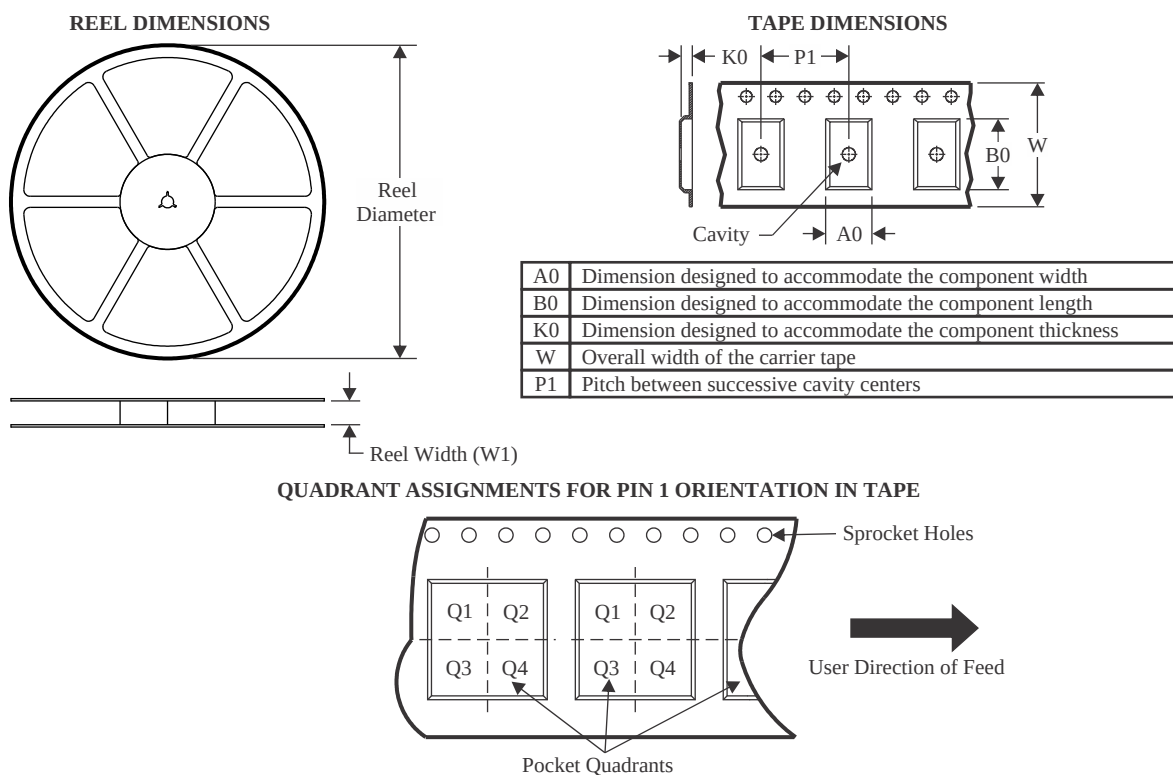
(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(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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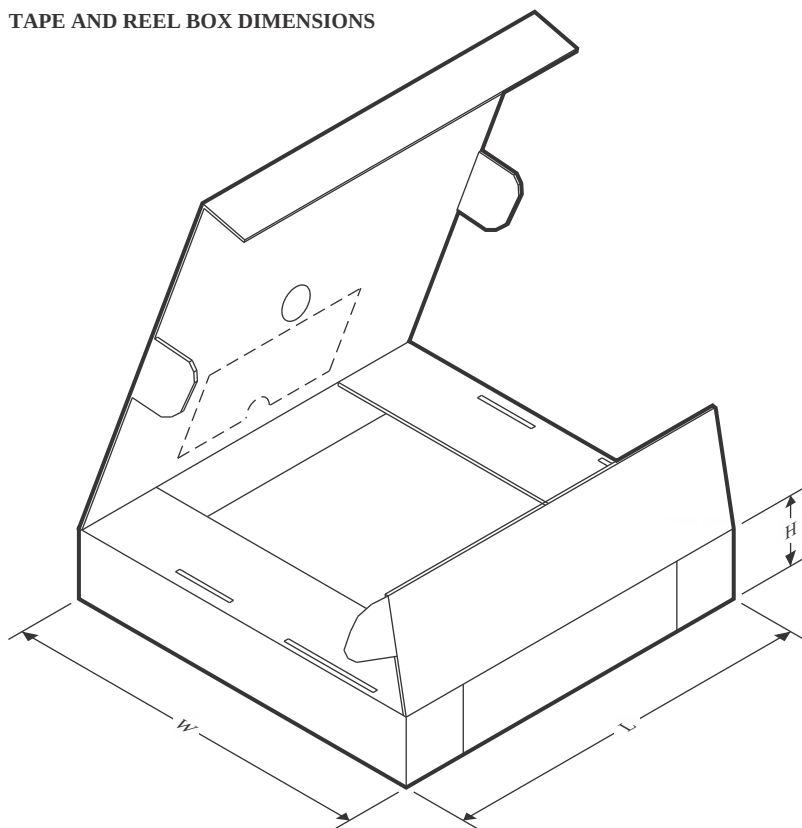
TAPE AND REEL INFORMATION



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
DS560DF810ALUR	FCCSP	ALU	135	1000	330.0	24.4	8.4	13.4	2.45	12.0	24.0	Q2
DS560DF810ALUT	FCCSP	ALU	135	250	330.0	24.4	8.4	13.4	2.45	12.0	24.0	Q2

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

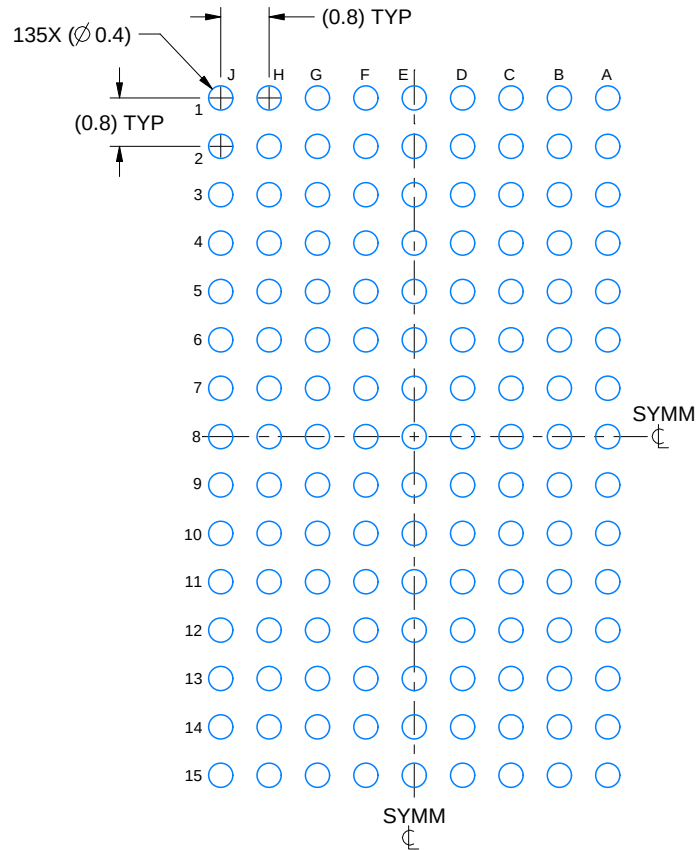
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
DS560DF810ALUR	FCCSP	ALU	135	1000	336.6	336.6	41.3
DS560DF810ALUT	FCCSP	ALU	135	250	336.6	336.6	41.3

EXAMPLE BOARD LAYOUT

ALU0135A

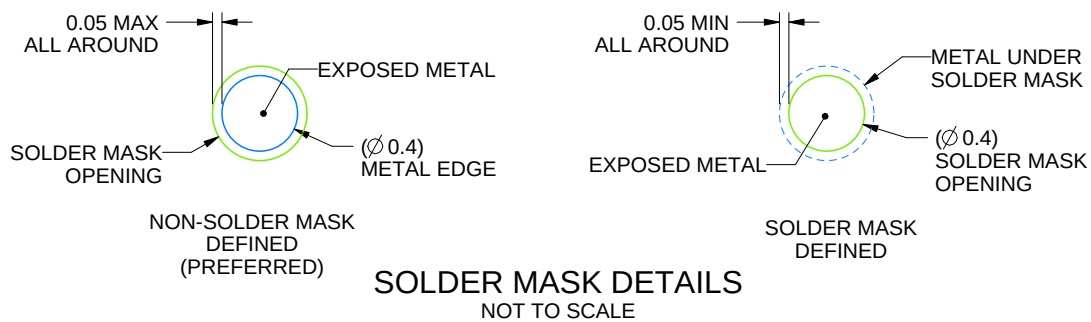
FCBGA - 1.55 mm max height

PLASTIC BALL GRID ARRAY



LAND PATTERN EXAMPLE

EXPOSED METAL SHOWN
SCALE: 8X



SOLDER MASK DETAILS

NOT TO SCALE

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NOTES: (continued)

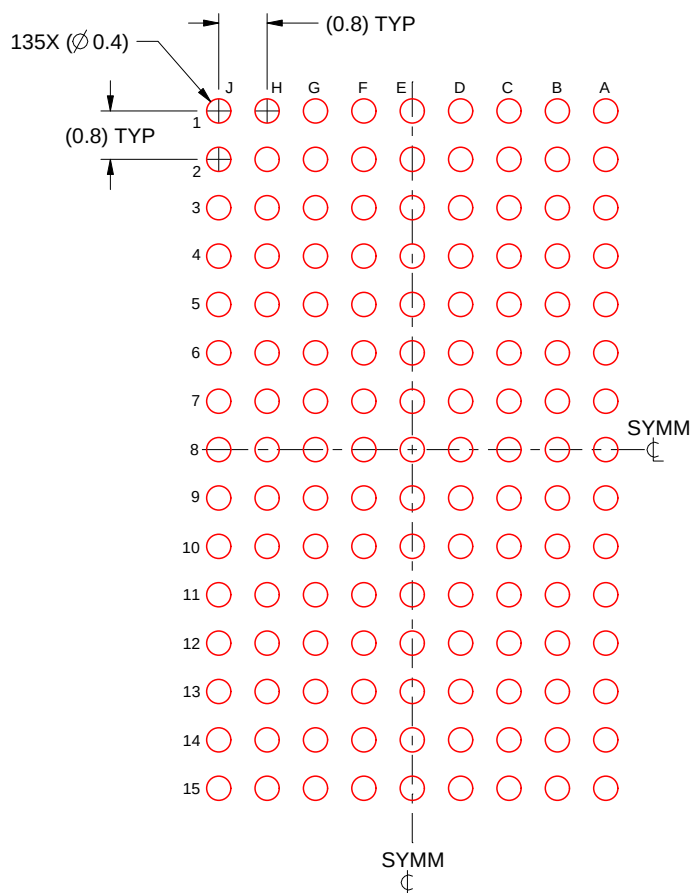
- Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints. For information, see Texas Instruments literature number SPRAA99 (www.ti.com/lit/spraa99).

EXAMPLE STENCIL DESIGN

ALU0135A

FCBGA - 1.55 mm max height

PLASTIC 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.

重要声明和免责声明

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