

DS250DF810 25Gbps 多速率 8 通道重定时器

1 特性

- 具有集成信号调节功能的八通道多速率重定时器
- 所有通道均可独立锁定至 20.6Gbps 至 25.8Gbps（包括 10.3125Gbps、12.5Gbps 等子速率）
- 超低延迟：25.78125Gbps 数据速率下的典型延迟 < 500ps
- 单电源，无需低抖动基准时钟，集成了交流耦合电容以降低电路板布线复杂程度并节省物料清单 (BOM) 成本
- 集成 2×2 交叉点
- 自适应性连续时间线性均衡器 (CTLE)
- 自适应判决反馈均衡器 (DFE)
- 带有 3 抽头有限冲激响应 (FIR) 滤波器的低抖动发射器
- 组合式均衡，在 12.9GHz 频率下支持 35dB 以上的通道损耗
- 可调节发送幅值：205 mVppd 至 1225 mVppd（典型值）
- 片上眼图监视器 (EOM)，伪随机二进制序列 (PRBS) 模式校验器/发生器
- 小型 8mm x 13mm 小型球状引脚栅格阵列 (BGA) 封装，可轻松实现直通布线

- 独特的引脚分配支持在封装下对高速信号进行路由
- 提供引脚兼容的中继器

2 应用

- 背板/中板长度延长
- 针对前端口光学模块的抖动消除
- IEEE802.3bj 100GbE、无线带宽增强型数据速率 (EDR) 以及 OIF-CEI-25G-LR/MR/SR/VSR 电气接口
- SFP28、QSFP28、CFP2/CFP4、CDFP

3 描述

DS250DF810 是一款具有集成信号调节功能的八通道多速率重定时器。该器件用于扩展有损且存在串扰的远距离高速串行链路的延伸长度并提升稳定性，同时实现不高于 10^{-15} 的比特误码率 (BER)。

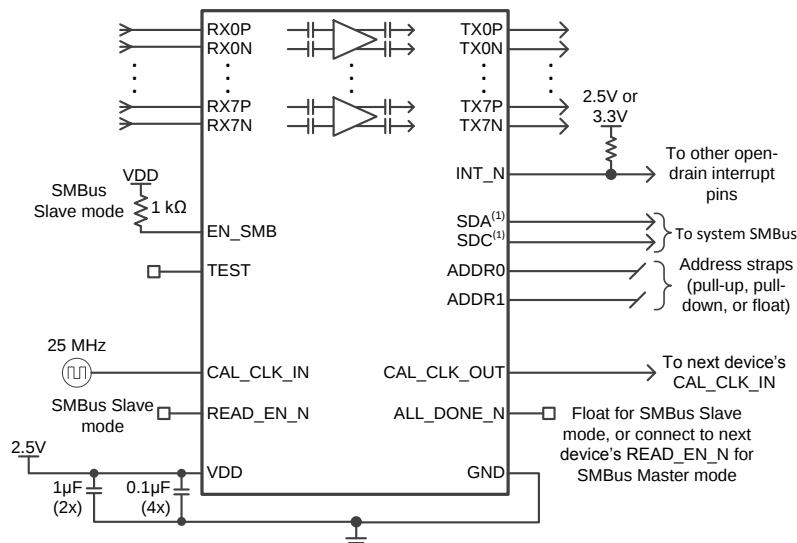
DS250DF810 各通道的串行数据速率均可独立锁定在 20.6Gbps 至 25.8Gbps 的连续范围内或者支持的任意子速率（速率的一半和四分之一），包括 10.3125Gbps 和 12.5Gbps 等关键数据速率，从而允许 DS280BR810 进行独立通道前向纠错 (FEC)。

器件信息⁽¹⁾

器件型号	封装	封装尺寸（标称值）
DS250DF810	135 引脚 FCBGA (135)	8.0mm x 13.0mm

(1) 要了解所有可用封装，请见数据表末尾的可订购产品附录。

4 简化电路原理图



(1) SMBus signals need to be pulled up elsewhere in the system.



An IMPORTANT NOTICE at the end of this data sheet addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers. PRODUCTION DATA.

目录

1	特性	1	7	器件和文档支持	4
2	应用	1	7.1	器件支持	4
3	描述	1	7.2	社区资源	4
4	简化电路原理图	1	7.3	商标	4
5	修订历史记录	2	7.4	静电放电警告	4
6	说明（续）	3	7.5	Glossary	4
			8	机械、封装和可订购信息	4

5 修订历史记录

Changes from Original (September 2015) to Revision A	Page
• 产品预览至量产数据版本	1

6 说明（续）

印刷电路板 (PCB) 上集成了物理交流耦合电容 (TX 与 RX)，无需使用外部电容。DS250DF810 具备一个单电源，能够最大限度地减少外部组件的数量。这些功能可降低 PCB 布线的复杂程度并节省 BOM 成本。

DS250DF810 的高级均衡特性包括：一个低抖动 3 抽头发送有限冲激响应 (FIR) 滤波器、一个自适应连续时间线性均衡器 (CTLE) 以及一个自适应判决反馈均衡器 (DFE)。支持针对具有多个连接器且存在串扰的有损互连和背板进行扩展。集成的时钟和数据恢复 (CDR) 功能可重置抖动预算并对高速串行数据进行重定时，非常适用于前端口光学模块应用。DS250DF810 对每个通道对采用 2x2 交叉点，可为主机同时提供通道交叉和扇出选项。

DS250DF810 可通过 SMBus 或外部 EEPROM 进行配置。单个 EEPROM 最多可由 16 个器件共享。非破坏性片上眼图监视器和 PRBS 发生器/校验器为系统内诊断提供支持。

7 器件和文档支持

7.1 器件支持

7.1.1 开发支持

更多相关信息，请参见 TI 表面贴装技术 (SMT) 参考资料（位于 <http://focus.ti.com/quality/docs> 页面的“质量和无铅 (Pb) 数据”菜单下）。

7.2 社区资源

The following links connect to TI community resources. Linked contents are provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's [Terms of Use](#).

TI E2E™ Online Community *TI's Engineer-to-Engineer (E2E) Community*. Created to foster collaboration among engineers. At e2e.ti.com, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

Design Support *TI's Design Support* Quickly find helpful E2E forums along with design support tools and contact information for technical support.

7.3 商标

E2E is a trademark of Texas Instruments.

7.4 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。

7.5 Glossary

[SLYZ022](#) — *TI Glossary*.

This glossary lists and explains terms, acronyms, and definitions.

8 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 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)
DS250DF810ABVR	Active	Production	FCCSP (ABV) 135	1000 LARGE T&R	Yes	SNAGCU	Level-3-260C-168 HR	-10 to 85	DS250DF8
DS250DF810ABVR.A	Active	Production	FCCSP (ABV) 135	1000 LARGE T&R	Yes	SNAGCU	Level-3-260C-168 HR	-10 to 85	DS250DF8
DS250DF810ABVR.B	Active	Production	FCCSP (ABV) 135	1000 LARGE T&R	Yes	SNAGCU	Level-3-260C-168 HR	-10 to 85	DS250DF8
DS250DF810ABVT	Active	Production	FCCSP (ABV) 135	250 SMALL T&R	Yes	SNAGCU	Level-3-260C-168 HR	-10 to 85	DS250DF8
DS250DF810ABVT.A	Active	Production	FCCSP (ABV) 135	250 SMALL T&R	Yes	SNAGCU	Level-3-260C-168 HR	-10 to 85	DS250DF8
DS250DF810ABVT.B	Active	Production	FCCSP (ABV) 135	250 SMALL T&R	Yes	SNAGCU	Level-3-260C-168 HR	-10 to 85	DS250DF8

⁽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.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

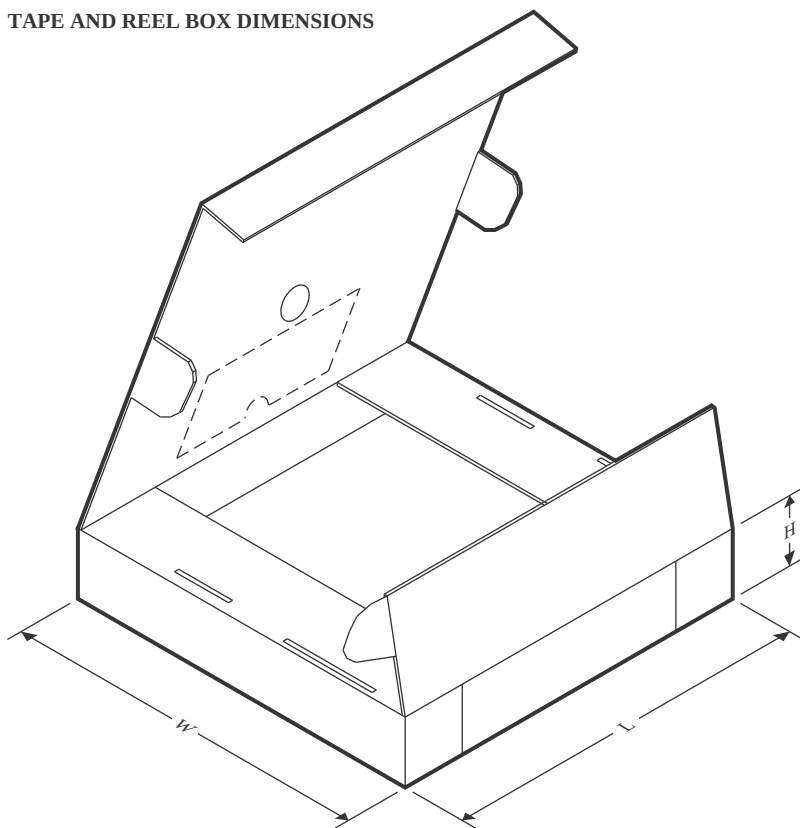
TAPE AND REEL INFORMATION



*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
DS250DF810ABVR	FCCSP	ABV	135	1000	330.0	24.4	8.4	13.4	3.0	12.0	24.0	Q2
DS250DF810ABVT	FCCSP	ABV	135	250	178.0	24.4	8.4	13.4	3.0	12.0	24.0	Q2

TAPE AND REEL BOX DIMENSIONS

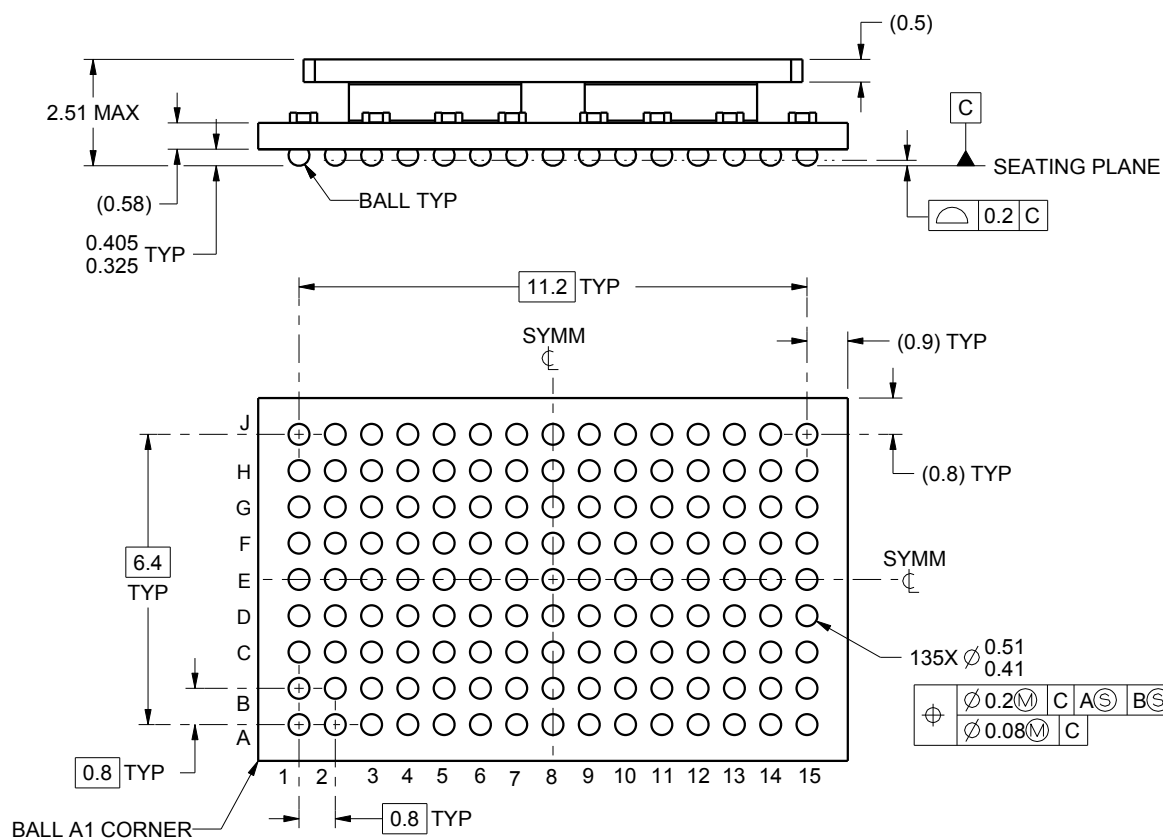


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
DS250DF810ABVR	FCCSP	ABV	135	1000	356.0	356.0	45.0
DS250DF810ABVT	FCCSP	ABV	135	250	213.0	191.0	55.0

FCBGA - 2.51 mm max height

Technical drawing of a rectangular component. The main view shows a rectangle with dimensions 13.2 (width) and 8.2 (height). The width is also labeled as 12.9 and (11). The height is also labeled as 7.9 and (6). The component has a central rectangular area with rounded corners. The corners are labeled "BALL A1 CORNER". The component is shown with a cross-section view on the right, indicating a thickness of 2X (1). The cross-section view shows a rectangular block with a central rectangular hole. The hole has a width of 2X (2.8) and a height of 2X (2.6). The block has a total width of 2X (1). The cross-section view also shows a series of small rectangular features along the top and bottom edges of the block.



NOTES:

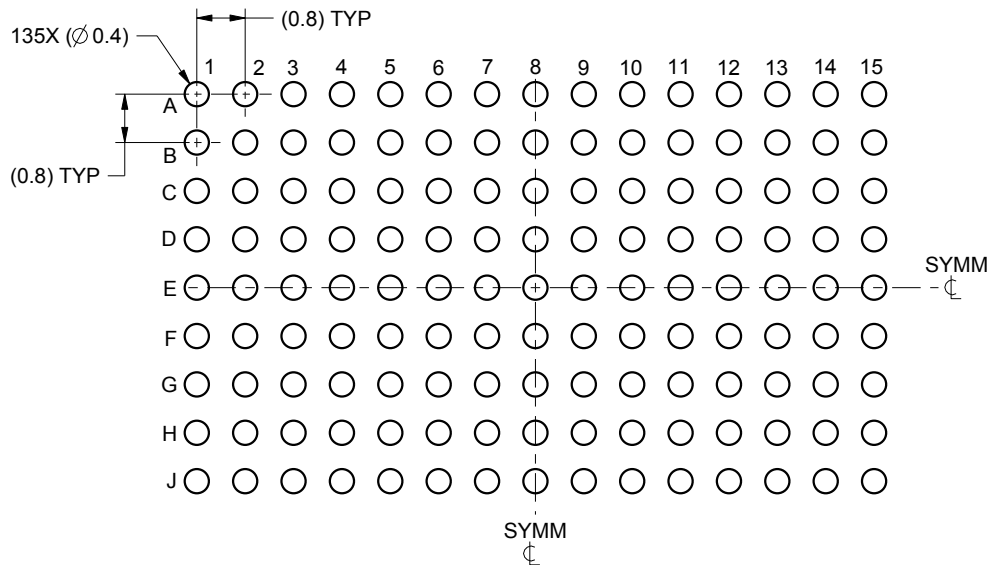
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.

EXAMPLE BOARD LAYOUT

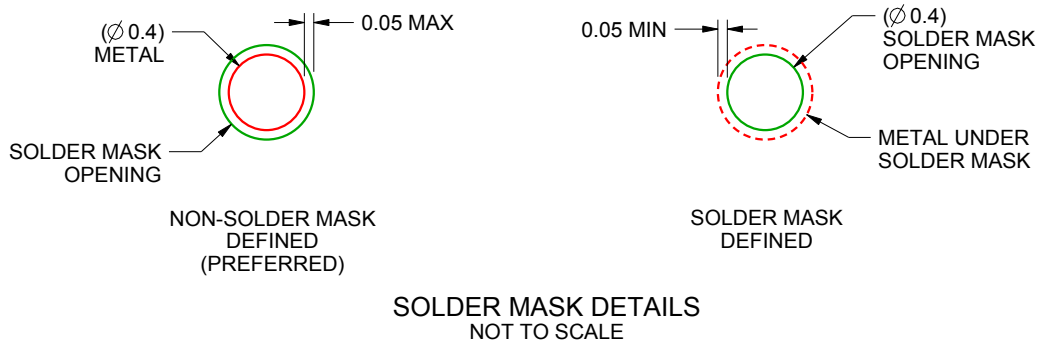
ABV0135A

FCBGA - 2.51 mm max height

BALL GRID ARRAY



LAND PATTERN EXAMPLE
SCALE:8X



SOLDER MASK DETAILS
NOT TO SCALE

4221740/B 02/2016

NOTES: (continued)

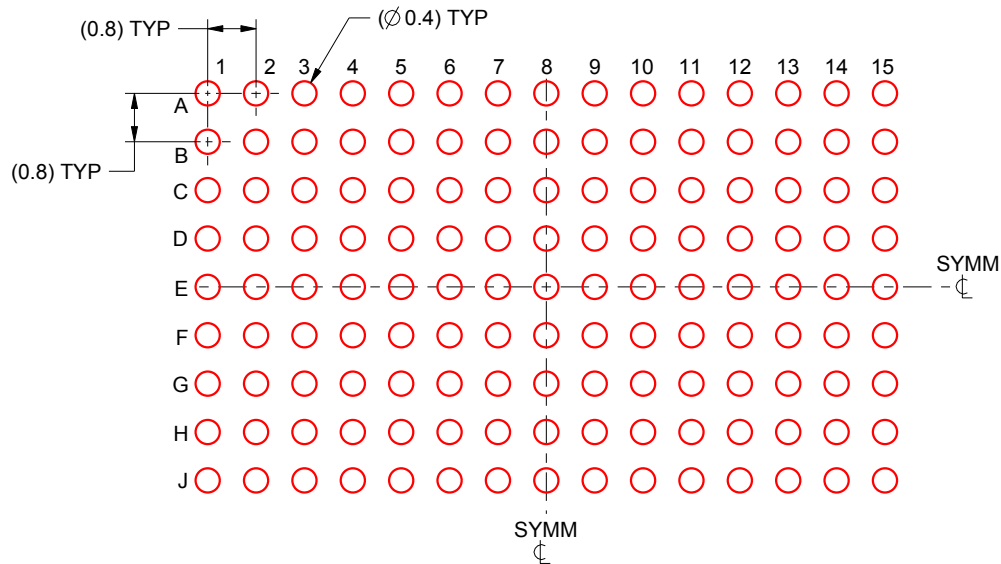
- Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints. For information, see Texas Instruments literature number SPRU811 (www.ti.com/lit/spru811).

EXAMPLE STENCIL DESIGN

ABV0135A

FCBGA - 2.51 mm max height

BALL GRID ARRAY



SOLDER PASTE EXAMPLE
BASED ON 0.15 mm THICK STENCIL
SCALE:8X

4221740/B 02/2016

NOTES: (continued)

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

重要通知和免责声明

TI“按原样”提供技术和可靠性数据（包括数据表）、设计资源（包括参考设计）、应用或其他设计建议、网络工具、安全信息和其他资源，不保证没有瑕疵且不做任何明示或暗示的担保，包括但不限于对适销性、某特定用途方面的适用性或不侵犯任何第三方知识产权的暗示担保。

这些资源可供使用 TI 产品进行设计的熟练开发人员使用。您将自行承担以下全部责任：(1) 针对您的应用选择合适的 TI 产品，(2) 设计、验证并测试您的应用，(3) 确保您的应用满足相应标准以及任何其他功能安全、信息安全、监管或其他要求。

这些资源如有变更，恕不另行通知。TI 授权您仅可将这些资源用于研发本资源所述的 TI 产品的相关应用。严禁以其他方式对这些资源进行复制或展示。您无权使用任何其他 TI 知识产权或任何第三方知识产权。您应全额赔偿因在这些资源的使用中对 TI 及其代表造成的任何索赔、损害、成本、损失和债务，TI 对此概不负责。

TI 提供的产品受 [TI 的销售条款](#) 或 [ti.com](#) 上其他适用条款/TI 产品随附的其他适用条款的约束。TI 提供这些资源并不会扩展或以其他方式更改 TI 针对 TI 产品发布的适用的担保或担保免责声明。

TI 反对并拒绝您可能提出的任何其他或不同的条款。

邮寄地址：Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
版权所有 © 2025，德州仪器 (TI) 公司