

FPGA EMULATION GENERATOR

MEMORY TRANSACTION GENERATORS: LPDDR4

FPGA emulation generators simulate and generate memory access patterns, enabling the testing and validation of memory subsystems under various transaction scenarios.

OVERVIEW

LPDDR4 (Low Power Double Data Rate 4) is a high-performance, low-power DRAM standard optimized for mobile and embedded devices. In FPGA emulation, LPDDR4 enables efficient testing and validation of energy-sensitive applications, ensuring high data transfer rates with minimal power consumption. With its ability to support faster clock speeds and higher densities, LPDDR4 is particularly well-suited for applications such as smartphones, IoT devices, and automotive systems, where power efficiency and performance are critical. Its advanced architecture also allows for seamless multitasking and rapid data access, accelerating development cycles for next-generation low-power technologies.

KEY FEATURES

High Data Rates

- LPDDR4 supports speeds up to 4266 Mbps, providing sufficient bandwidth for high-speed FPGA emulation tasks. It ensures fast and reliable data transfer for memory-intensive applications.

Low Power Consumption

- Operating at a low voltage of 1.1V, LPDDR4 minimizes power usage, making it ideal for energy-efficient FPGA designs.

Increased Density

- With support for up to 32 GB per module, LPDDR4 allows the emulation of systems requiring large memory capacities.

Dual-Channel Architecture

- LPDDR4 features a dual 16-bit channel design, improving parallelism and data handling in FPGA-based applications.

Burst Length Flexibility

- LPDDR4 supports burst lengths of 8, enabling efficient data transfer and reducing latency during emulation.

On-Die Termination (ODT)

- Built-in termination improves signal integrity, ensuring reliable operation in high-speed FPGA environments.

Low Power States

- Advanced low-power modes like Deep Power Down (DPD) and Self-Refresh reduce energy consumption during idle periods.



Improved Signal Integrity

- LPDDR4 includes advanced signaling technologies like Write Levelling and Calibration to enhance data reliability.

Fast Initialization

- LPDDR4's fast initialization process ensures quicker setup times during FPGA emulation cycles.

Backward Compatibility

- LPDDR4 controllers often support legacy modes, making it easier to integrate into existing FPGA setups.

LPDDR4 APPLICATIONS

Smartphones and Tablets

- LPDDR4 emulates memory systems in mobile devices, enabling testing of high-speed and energy-efficient operations. It supports multitasking and real-time applications.

IoT Devices

- LPDDR4 enables FPGA emulation of memory-efficient IoT devices, ensuring low power usage and fast data processing for smart environments.

AR/VR Platforms

- LPDDR4 supports the emulation of AR/VR devices requiring high-speed memory for smooth graphics rendering and immersive experiences.

Wearable Technology

- LPDDR4 emulates low-power memory systems for wearables, ensuring real-time functionality and extended battery life.

Automotive Systems

- LPDDR4 validates memory architectures for infotainment and ADAS systems, ensuring reliability in automotive FPGA applications.

Smart Appliances

- LPDDR4 emulates memory systems in smart home devices, ensuring efficient operation with minimal energy consumption.

Edge Computing

- LPDDR4 supports FPGA emulation for edge devices, enabling fast data processing and low-latency communication in distributed networks.

Drones and Robotics

- LPDDR4 emulates memory systems for autonomous drones and robots, ensuring precise navigation and energy-efficient performance.

Medical Devices

- LPDDR4 enables FPGA emulation of advanced diagnostic tools, supporting high-speed data analysis with low power usage.

Consumer Electronics

- LPDDR4 emulates memory systems in devices like smart TVs and gaming consoles, ensuring optimal performance and user satisfaction.

LPDDR4 ARCHITECTURE



XtremeSilica Technologies Private Limited

494, 2nd Floor, CMH Road, Indiranagar,

Bengaluru, Karnataka 560038 India

www.xtremesilica.com

info@xtremesilica.com

+91 79932 79934