

SMC 1000 8x25G: Smart Memory Controller

25 Gbps Open Memory Interface (OMI) to DDR4 Memory Controller

Summary

Microchip introduces the industry's first commercially available Open Memory Interface (OMI) to DDR4 memory controller that enables CPUs and other compute-centric SoCs to utilize four times the memory channels of parallel attached DRAM within the same package footprint compared to DDR4. Microchip's serial memory controllers enable higher memory bandwidth and media independence for High Performance Computing (HPC), big data, artificial intelligence and machine learning compute-intensive applications with ultra-low latency.

The SMC 1000 8x25G interfaces to the CPU via a narrow 8-lane differential Open Memory Interface (OMI)-compliant 25 Gbps interface and bridges to memory via a wide 72-bit DDR4 3200 interface. The product supports three DDR4 data rates, DDR4-2666, DDR4-2933, and DDR4-3200. The result is a significant reduction in the required number of host CPU or SoC pins per DDR4 memory channel, allows for more memory channels and therefore increases the memory bandwidth available. Microchip's SMC 1000 8x25 features an innovative low latency design which results in memory systems using the product to have virtually identical bandwidth and latency performance to comparable LRDIMM products.

SMC 1000 8x25G combines data and address into one unified chip compared to LRDIMM which utilizes an RCD buffer and separate data buffers. This device is a foundational building block for a wide range of OMI memory applications. These include Differential Dual-Inline Memory Module (DDIMM) applications such as standard height 1U DDIMMs with capacities from 16 GB to 128 GB and double height 2U DDIMMs with capacities beyond 256 GB. SMC 1000 8x25G also supports chip down applications to off the shelf Registered DIMMs (RDIMM) and NVDIMM-N devices.

SMC 1000 8x25G integrates an on-chip processor that performs control path and monitoring functions such as initialization, temperature monitoring, and diagnostics. The device supports manufacturing test operations of attached DRAM memory. Microchip's Trusted Platform support, including hardware root-of-trust ensures device and firmware authenticity and supports secure firmware update.

Highlights and Benefits

OMI Interface

- 1x8, 1x4 support
- OIF-28G-MR
- Up to 25.6 Gbps Link Rate
- Dynamic low power modes

DDR4 Memory Interface

- x72 bit DDR4-3200, 2933, or 2666 MT/s memory support
- Supports up to 4 ranks
- Supports up to 16 GBit memory devices
- 3D stacked memory support

Persistent Memory Support

- Support for NVDIMM-N modules

Intelligent Firmware

- Open Source Firmware
- On-board processor provides DDR/OMI initialization, and in-band temperature and error monitoring
- ChipLink GUI

Security and Data Protection

- Hardware root-of-trust, secure boot, and secure update
- Single symbol correction/double symbol detection ECC
- Memory scrub with auto correction on errors

Small Package and Low-Power

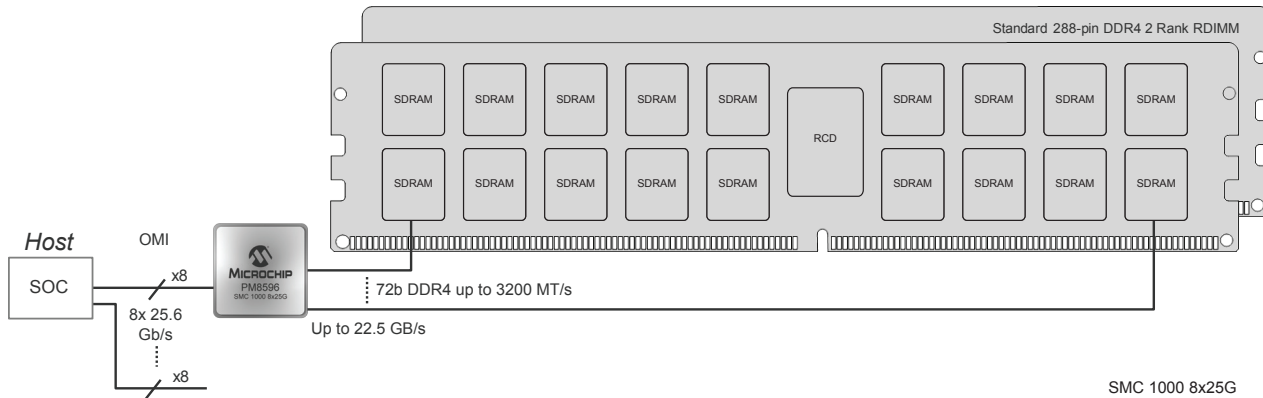
- Power optimized
- 17 mm x 17 mm package

Peripherals Support

- Support for SPI, I²C, GPIO, UART and JTAG/EJTAG

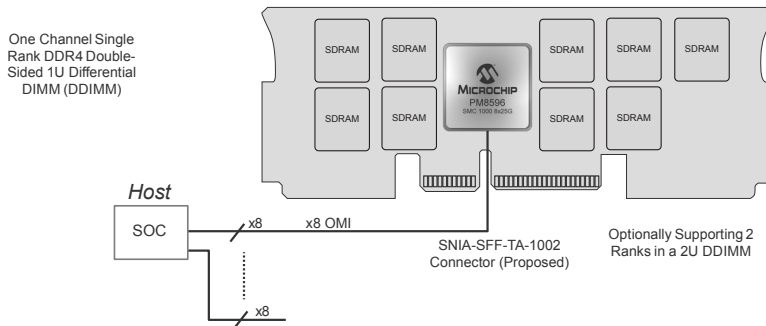
Chip-Down SMC 1000 8x25G With RDIMMs

SMC 1000 8x25G on the main-board or riser interfacing to standard 288-pin DDR4 DIMMs. Support for 4 ranks allows for a single SMC 1000 8x25G to support two industry standard RDIMMs with two ranks each.



SMC 1000 8x25G

SMC 1000 8x25G mounted on an 84-pin DDR4 1U differential DIMM (DDIMM). Dual rank 2U memory modules are supported.



Ordering Information

Number	Product	SOC Interface	Memory
PM8596A1-FEIP	SMC 1000 8x25G	x8 25Gbps OMI	72 b DDR4 3200 MT/s

For More Information

www.microchip.com/smartmemory