MEMORY INTERFACE PRODUCTS

The only complete provider of all memory interface products for DDR5 servers and client DIMMs

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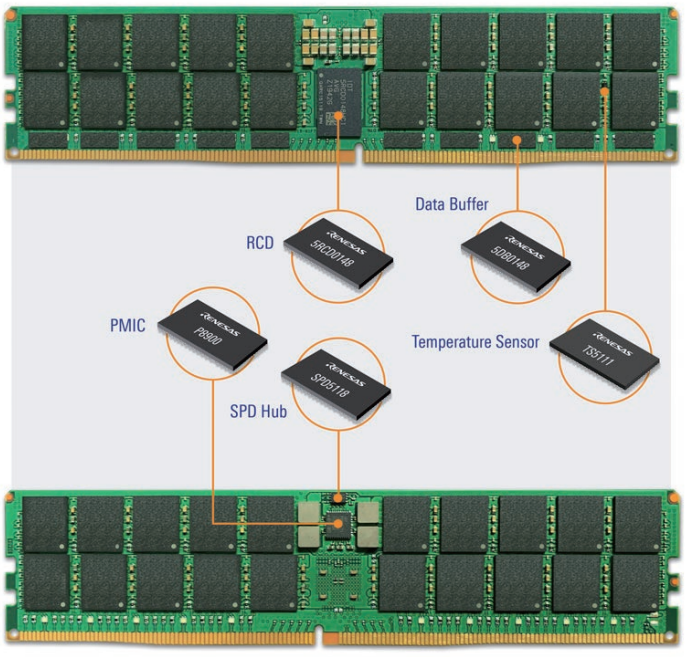
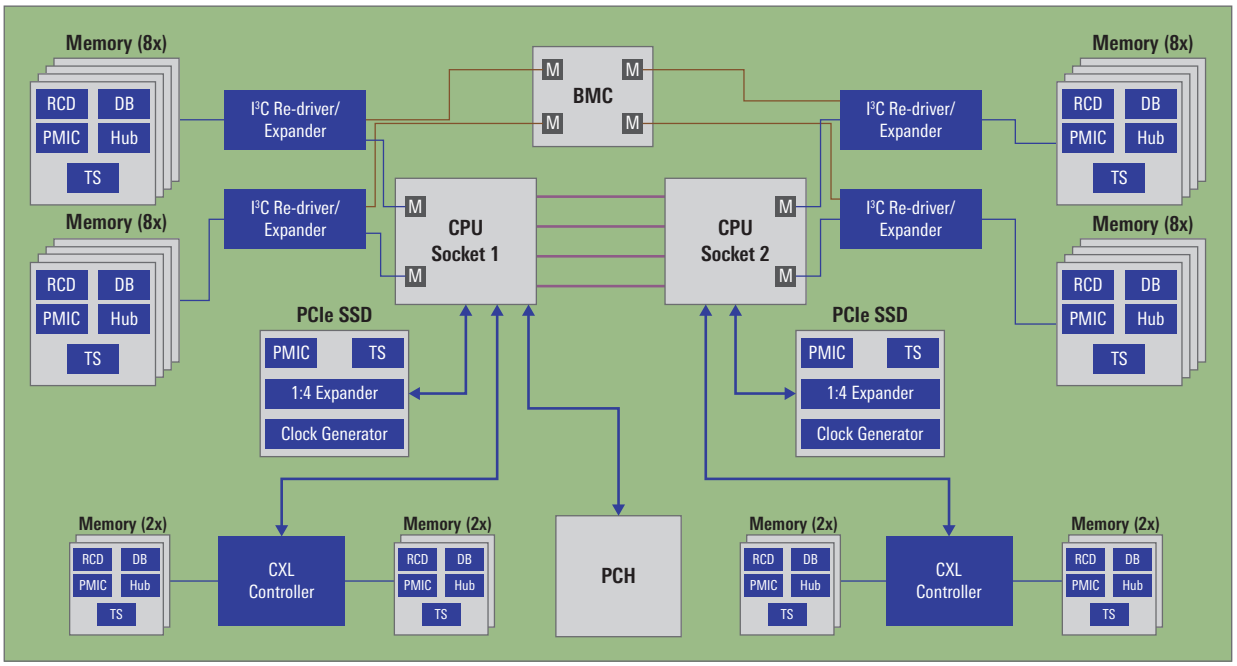




Renesas Memory Interface Products shown in blue.

Memory Interface Products

As the industry leader for over 20 years and the only full system solution supplier of memory interface products for DDR5 modules, Renesas offers a wide array of JEDEC-compliant registered clock drivers (RCD), client clock driver (CKD), data buffers (DB), power management ICs (PMIC), temperature sensors, and SPD hubs to meet the tight timing budget requirement of dual in-line memory modules (DIMM).
With a focus on low power, high performance, and thorough validation through each new generation of memory technology, Renesas has established its position as the unquestioned market leader in memory interface solutions.

DDR5 Solutions

For DDR5 RDIMM, MCR DIMM, LRDIMM, NVDIMM, UDIMM, SODIMM, gaming DIMM, and memory interface products for server and client memory down applications.

DDR4 Solutions

For DDR4 RDIMM and LRDIMM.

DDR3 Solutions

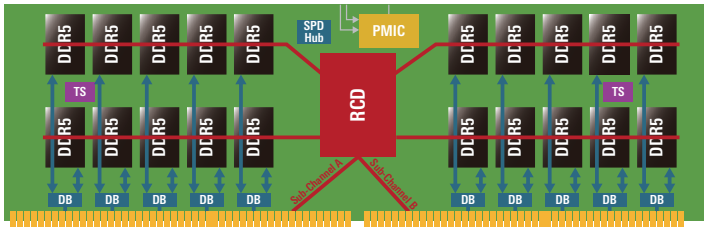
For DDR3 RDIMM and ECC UDIMM.

I³C Intelligent Switches and Expanders

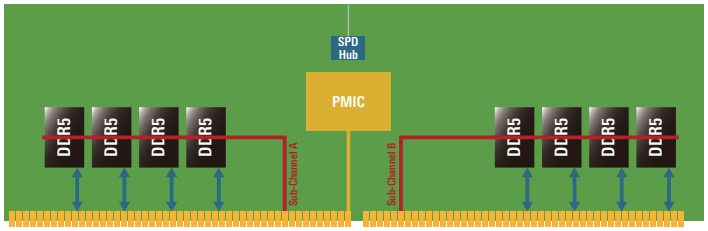
For memory and control plane expanders to improve signal integrity and performance on server motherboards.

DDR5 Solutions

DDR5 Server DIMM



Client DIMM



DDR5 memory is projected to double the bandwidth of DDR4, and as with previous generations of DDR memory, Renesas' devices are leading the market in performance and reliability. Renesas has a complete family of ICs to develop high-performance DDR5 RDIMM, MCR DIMM, LRDIMM, NVDIMM, UDIMM, SODIMM, gaming DIMM, and memory interface products for server and client memory down applications. Renesas' portfolio includes power management ICs (PMICs), SPD hubs, registered clock drivers, temperature sensors, data buffers, and I³C re-driver and expander products. Renesas' family of DDR5 and I³C expander ICs enables the next generation of server and client DIMM as well as server and client motherboard solutions to efficiently scale to greater performance, density, and reliability while reducing overall system power.

Renesas also offers an industrial temp DDR5 RCD that supports temperatures as low as -40°C and as high as 105°C for DDR5 industrial temperature dual inline memory modules (DIMMs) and memory-down applications.

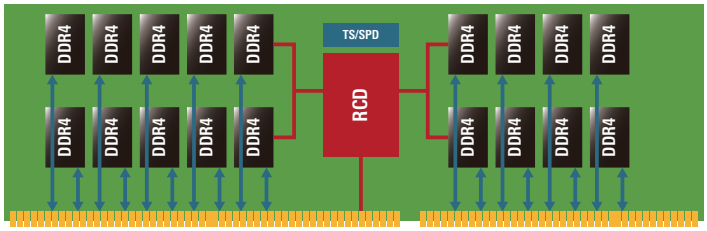
With a deep history of delivering industry-leading memory interface chipsets for all DDR generations, Renesas' devices will provide reliable performance to meet the most demanding enterprise and data center applications.

Product Lineup

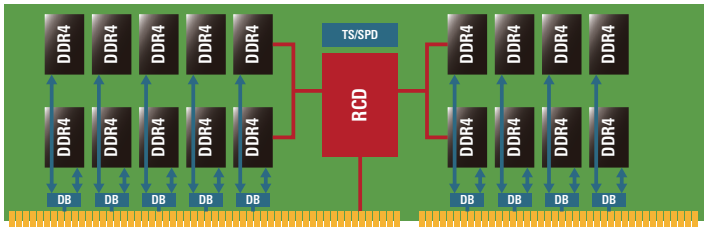
Part Number	Function	Description	Supply Voltage (V)
5DB0148	DDR5 Data Buffer	Data Buffer for DDR5 Memory Modules	1.07 – 1.17
5RCD0148	DDR5 Gen 1.0 Server RCD	DDR5 Register Command Address up to 4800MT/s	1.04 – 1.16
P8900	DDR5 Server PMIC	PMIC for DDR5 RDIMMs and LRDIMMs	3 – 3.6
P8910	DDR5 Server PMIC	PMIC for DDR5 RDIMMs, LRDIMMs and NVDIMMs	3 – 3.6
P8911	DDR5 Client PMIC	PMIC for DDR5 RDIMMs, LRDIMMs and NVDIMMs	4.25 – 5.5
RG5C172	DDR5 Client Clock Driver	DDR5 Client Clock Driver for UDIMM, SODIMMs, Over Clocking DIMMs and Memory Down	1.07 – 1.17
RG5D188	DDR5 MDB	MDB for DDR5 MCR DIMM	1.07 – 1.17
RG5R188	DDR5 MRCD	MRCD for DDR5 MCR DIMM	1.07 – 1.17
RG5R256	DDR5 Gen 2.0 Server RCD	DDR5 Register Command Address up to 5600MT/s	1.06 – 1.16
RG5R364	DDR5 Gen 3.0 Server RCD	DDR5 Register Command Address up to 6400MT/s	1.06 – 1.16
SPD5118	SPD Hub for DDR5 Memory Modules	SPD HUB for DDR5 Memory Modules	3 – 3.6
TS5111	Temperature Sensor	Temperature Sensor for DDR5 Memory Modules	1.7 – 1.98

DDR4 Solutions

DDR4 RDIMM



DDR4 LRDIMM



Renesas' DDR4 registered clock driver, data buffer and temp sensor make up the industry's first complete chipset for DDR4 registered dual inline memory modules (RDIMMs) and load reduced dual inline memory modules (LRDIMMs). With DDR4 data rates climbing to 3.2Gb/s and higher, the clear advantages afforded by RDIMM and LRDIMM as a speed-scalable memory technology are expected to drive adoption across a broad array of memory-intensive computing and storage applications.

Renesas also offers an industrial temp DDR4 RCD that supports temperatures as low as -40°C and as high as 105°C for existing DDR4 applications. Through flexible I/O control, timing and voltage calibration, and control register programmability, the Renesas DDR4 registered clock drivers and data buffers enable faster data rates at higher densities on all JEDEC® defined DDR4 LRDIMM and RDIMM topologies. DIMM topology configuration and DRAM information are stored in Renesas' temperature sensor EEPROM.

With a deep knowledge of memory interface chipsets based on successful chipset introductions for all DDR generations, Renesas' devices will provide reliable performance for your application.

Product Lineup

Part Number	Function	Description	Supply Voltage (V)	SDRAM Type
4DB0232KD	Data Buffer	Data Buffer for DDR4 Memory Module	1.2, 1.14 – 1.26	DDR4 up to 3200
4RCD0124K	Register + PLL	DDR4 Register Clock Driver (RCD)	1.2	DDR4 up to 2400
4RCD0229K	Register + PLL	DDR4 Register Clock Driver (RCD)	1.2	DDR4 up to 2667
4RCD0229K	Register + PLL	DDR4 Register Clock Driver (RCD)	1.2	DDR4 up to 2667
4RCD0232K	Register + PLL	DDR4 Register Clock Driver (RCD)	1.2	DDR4 up to 3200

DDR3 Solutions

DDR3 memory offers significant advantages in power, bandwidth, capacity, and reliability versus previous generations of memory technology. Renesas offers both Register/PLL and temperature sensor products for the DDR3 memory module market.
Fully compliant with all JEDEC specifications, the Renesas DDR3 Register/PLL is an essential building block for advanced memory subsystems in applications such as servers, workstations, and communications equipment.
DDR3 RDIMMs and ECC UDIMMs all require the use of a temperature sensor with an integrated SPD. Renesas offers digital temperature sensors with accuracy up to ±0.5°C typical, that is designed for memory modules demanding the highest level of temperature readout.

Product Lineup

Part Number	Function	Description	Supply Voltage (V)	Temp. Range
SSTE32882KB1	Register + PLL (Low Power)	Low Power DDR5 Register + PLL	1.25, 1.35, 1.5	0 to 70°C

I³C Intelligent Switches and Expanders

Renesas has a family of control plane (I³C) switches and expanders to significantly improve signal integrity and performance in a wide variety of applications, including CPU/BMC/DIMM management for servers and data centers.
Renesas control plane (I³C) switches and expanders enable intelligent management of CPU, BMC, DIMM, and other peripherals with significant performance and power benefits over other serial communication interfaces with easy-to-use bidirectional signaling capabilities in a small footprint.

Product Lineup

Part Number	Function	Description	Supply Voltage (V)	Temp. Range	Package Type	Lead Count
RG3M47B12	I³C 2:4 Intelligent Switch	I³C 2:4 Intelligent Switch User-configured	3.3	-40 to 85°C	VFQFPN	28
RG3M48B12	I³C 2:4 Intelligent Switch	I³C 2:4 Intelligent Switch Pre-configured	3.3	-40 to 85°C	VFQFPN	28
RG3M87B12	I³C 2:8 Intelligent Switch	I³C 2:8 Intelligent Switch User-configured	3.3	-40 to 85°C	VFQFPN	28
RG3M88B12	I³C 2:8 Intelligent Switch	I³C 2:8 Intelligent Switch Pre-configured	3.3	-40 to 85°C	VFQFPN	28
IML3112	I³C 1:2 Bus Multiplexer	1:2 I³C Expander	1.8	-40 to 125°C	DFN	8
IMX3102	I³C 2:1 Bus Multiplexer	2:1 I³C Expander	1.8	-40 to 125°C	DFN	8
IMX3112	I³C 1:2 Bus Multiplexer	1:2 I³C Expander	1.8	-40 to 125°C	DFN	8

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