M88P5010/M88P5000

DDR5 Power Management IC (PMIC)

General Description

M88P5010/M88P5000 is a Power Management IC (PMIC) designed for DDR5 Server DIMM applications. Compatible with JEDEC specification, the PMIC contains four DC-DC buck converters and two LDOs (1.8 V and 1.0 V), and supports I²C/I3C serial bus to meet different application requirements.
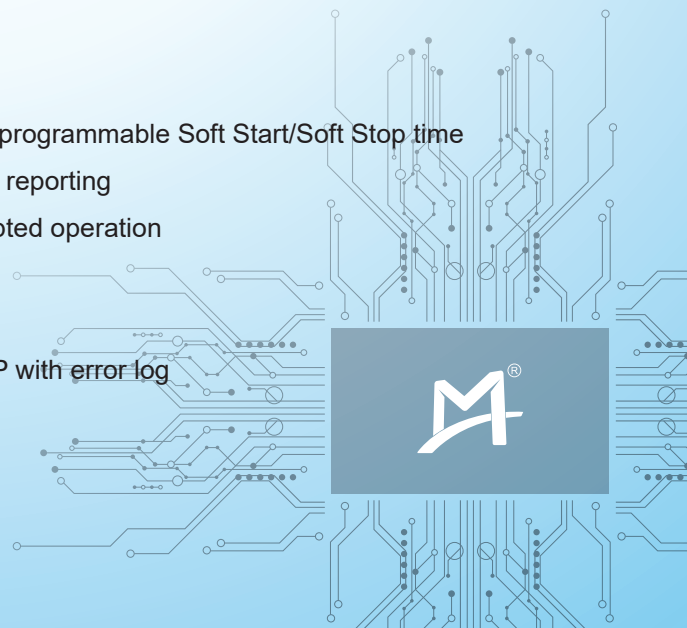
The PMIC is designed to provide power support for other on-DIMM chips such as DRAM, RCD, DB, SPD Hub and TS. The server CPU can communicate with the PMIC via the SPD Hub to realize power management. M88P5010 is designed for low-current RDIMMs, while M88P5000 is designed for high-current RDIMMs and LRDIMMs.

Applications

- DDR5 Server DIMMs
    - M88P5010: Low-current RDIMM
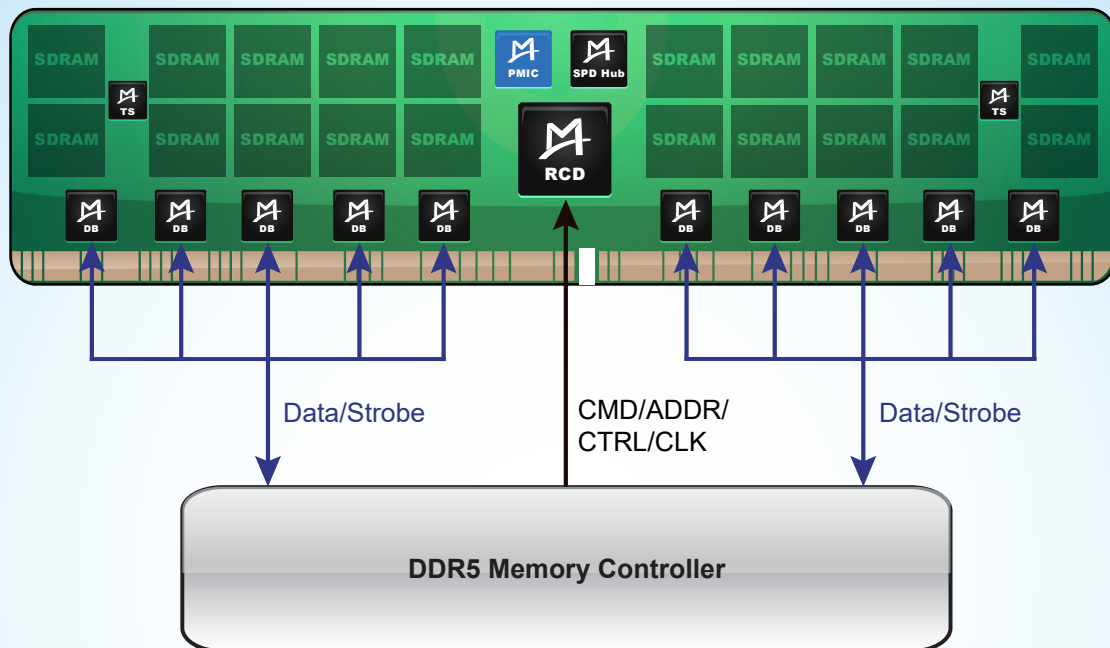   - M88P5000: High-current RDIMM and LRDIMM

Feature List

- Compatible with JEDEC specification
- Wide VIN_BULK voltage range to support 12 V power supply in normal case and 5 V power supply mainly in Switch-Over case
- COT structure to provide fast transient load response
- Selectable FCCM or DCM operation
- Configurable Power On and Power Off sequence with programmable Soft Start/Soft Stop time
- Voltage, output current, output power and temperature reporting
- Input supply Switch Over function to provide uninterrupted operation
- I²C and I3C serial bus interface
- Non-Write Protect mode for debug and validation
- Protection functions, such as OVP, UVP, OCL and OTP with error log counter and data storage
- 35-pin FCQFN package

Application Diagram

DDR5 LRDIMM

Data/Strobe

CMD/ADDR/
CTRL/CLK

Data/Strobe

DDR5 Memory Controller

Notes: Here shows the application of PMIC on the DDR5 LRDIMM as an example.
This LRDIMM contains Montage's DDR5 products (with an "M" logo) as listed below:

1. **SPD Hub**: DDR5 SPD Hub with Integrated Temperature Sensor (x1)
2. **PMIC**: DDR5 Power Management IC (x1)
3. **TS**: DDR5 Temperature Sensor (x2)
4. **RCD**: DDR5 Registering Clock Driver (x1)
5. **DB**: DDR5 Data Buffer (x10)

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