EC-1

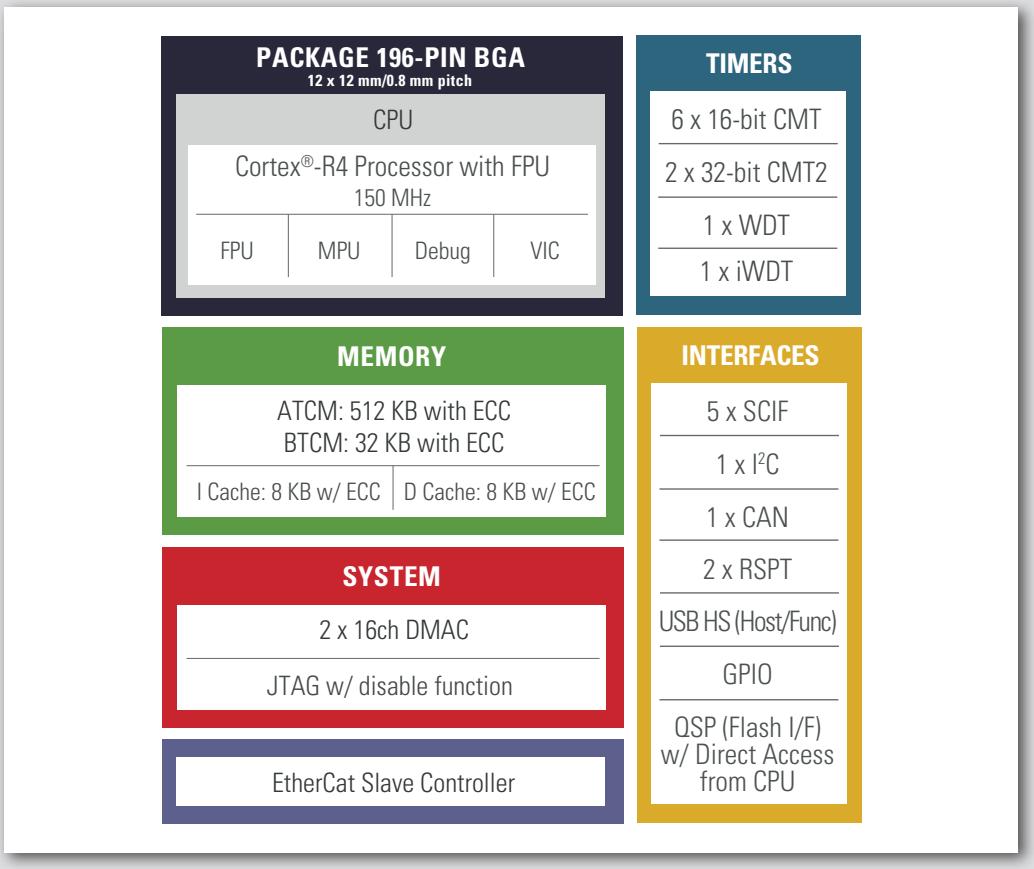
High Performance EtherCAT Communication Device

EC-1 is a dedicated EtherCAT® communication system-on-chip. It is targeted at slave applications that require higher CPU performance such as intelligent I/O modules equipped with EtherCAT® communication.

EC-1 features a standard ARM® Cortex®-R4 controller with on-chip RAM memory and a two port EtherCAT Slave Controller. The ARM® Cortex®-R4 processor delivers real-time responsiveness and determinism. Clocked at 150 MHz it ensures high-performance for handling both the communication and the application requirements. The integrated Floating Point Unit is scaled for fast interrupt handling and offers very good energy efficiency while the 500 Kbyte of low latency tightly-coupled memory with Error Correcting Code (ECC) makes the overall system even more performant and deterministic.

The EC-1 based remote I/O solution kit simplifies the shift to EtherCAT communication protocol leaving developers more time to concentrate on target applications. It features a robust remote I/O board, software, documentation, and circuit diagrams.

Block Diagram



Main Specifications of the EC-1

Package

- 196-pin FBGA

CPU (Frequency)

- ARM® Cortex®-R4 Processor with FPU (150 MHz)

FPU

- Supports single-precision and double-precision addition, subtraction, multiplication, division, multiply-accumulation, and square root calculation

Tightly-coupled memory

- ATCM: 512 KB (with ECC), BTCM: 32 KB (with ECC)

Cache memory

- Instruction cache: 8 KB (with ECC)
- Data cache: 8 KB (with ECC)

Clocks

- External clock/ resonator input frequency: 25 MHz
- CPU clock frequency: 150 MHz
- Low-speed on-chip oscillator (LOCO): 240 KHz

Timers

- 8 expanded timer functions
- 16-bit CMT(6 channels), 32-bit CMTW, 2 channels

Industrial Ethernet communication

- EtherCAT® Slave Controller

Communications

- USB2.0 high-speed host/function : 1 channel
- CAN ISO11898-1 compliant: 1 channel
- 16-byte SCIFA with FIFO: 5 channels
- I²C bus interface: 1 channel of up to 400 Kbps transfer speed
- RSPIa: 2 channels
- SPIBSC: 1 channel of multi-I/O serial flash memory connectable

DMA

- 16 channels x 2 units

Other functions

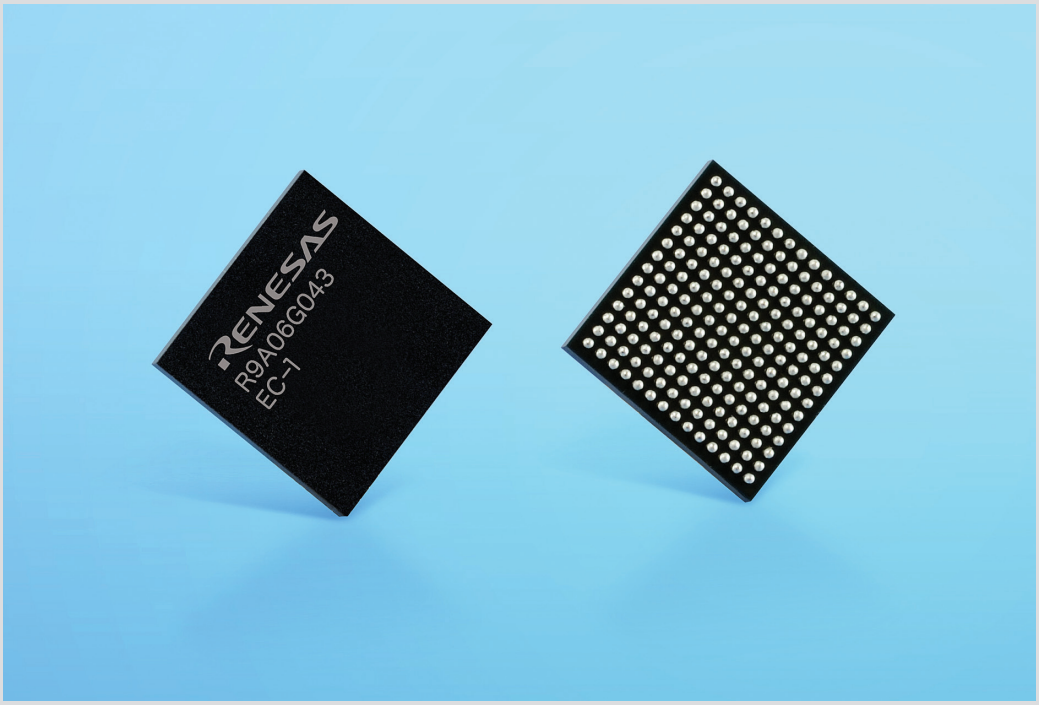
- Safety features (register write protection, input clock oscillation stop detection, CRC, IWDTa, error control module, etc.)

Power supply voltage

- 3.3 V (I/O), 1.2 V (internal)

Operating temperature range

- Tj = -40° C – +125 °C



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