Peripheral - ECAT EtherCAT® slave controller
XMC™ microcontrollers
July 2016
Agenda

1. ECAT overview
2. Key feature: smallest fully integrated EtherCAT® slave
3. Key feature: fully compatible with Beckhoff’s ET1100 ASIC
4. Key feature: multiple on chip trigger connection
5. System integration
6. Application example
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ECAT
EtherCAT® slave controller

Highlights
EtherCAT® is one of the major Industrial Real Time Ethernet protocols with Ultra high-speed right up to the terminal. Outstanding performance, flexible topology which save costs for additional Ethernet equipment (Switches) and simple configuration characterize EtherCAT®.

Key features
- Smallest fully integrated EtherCAT® Slave Node
- Fully compatible with Beckhoff’s ET1100 ASIC
- Multiple on chip trigger connection using Sync/Latch signals

Customer benefits
- Scalable from a 100 QFP package up to a 196 LFBGA fully integrated
- Avoids complex porting of EtherCAT® stacks, reuse of own written stacks
- Use of Sync/Latch signals to trigger the internal ADC/CCU or capture from CCU
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EtherCAT® ASIC’s, SOC and FPGA need additional components
- ASIC’s need a micro
- FPGA need external memory's and are in big BGA
- Clocks must be supported twice in some topologies

XMC4800 combines all that in a 100 QFP
- No external components needed
- Easy to be handled in PCB production
- Many different interfaces available in one package
Scalable from 100 LQFP to 196 LFBGA

- 100 Pin LQFP Pin & Signal compatible to XMC4500 and XMC4400 100 Pin devices
- 144 Pin LQFP Pin & Signal compatible to XMC4500
- 196 LFBGA is an extension of the XMC4500 144 ball LFBGA
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ECAT
Fully compatible with Beckhoff’s ET1100 ASIC

› EtherCAT® implementation of the Beckhoff ET1100 and XMC4800 are compatible
  - 2 x MII Ports for Ethernet PHYs
  - 8 SYNC Manager
  - 8 FMMU’s
  - 8kB Process Data RAM
  - 64 Bit Distributed Clocks

› Register Interface is exactly the same
  - Easy porting of existing software solutions for ET1100 to XMC4800
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Input of Latch signals can be generated by both ERU and pins
- ERUs combine combinatorial signal combinations and module/protocol trigger

Sync outputs are available on pins, can be used as ADC trigger and via ERU connected to CCU4/8, DSD, POSIF
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ECAT
System integration

System integration

Due to the multilayer bus matrix, CPU can operate EtherCAT® data while a Ethernet DMA moves data to an internal memory without timing penalty.

Complex application scenarios can be realized by a highly flexible internal integration of several standard communication interfaces.

Target applications

› Intelligent I/Os and PLCs
› Industrial drives

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Application example
Isolated intelligent I/O’s

In brief
In most automation systems an isolation is needed. The XMC48 offers the possibility for an isolation of the XMC™ MCU and transferring the data over EtherCAT® in a single chip solution.

Overview
EtherCAT® is one of the Industrial Ethernet Protocols which is more and more used in Industrial Automation Systems. Starting from simple I/O slices up to complex inverter architectures, EtherCAT® solves the needs of fast real time communication.
Application example
Isolated EtherCAT® resolver/encoder interface

Overview
EtherCAT® is one of the Industrial Ethernet Protocols which is more and more used in Industrial Automation Systems. Starting from simple I/O slices up to complex inverter architectures, EtherCAT® solves the needs of fast real time communication.

In brief
In combination with the XMC4800 complex solutions like multiple encoder or resolver interfaces in a single chip EtherCAT® solution can be developed. The XMC™ with its huge set of peripherals and hardware trigger using SYNC/LATCH signals demonstrate a ideal solution.
Application example
Dual motor control and EtherCAT®

In brief
Dual Motor control with the XMC4800 using encoder or resolver interfaces in a single chip EtherCAT® solution can be developed.

Overview
EtherCAT® is one of the Industrial Ethernet Protocols which is more and more used in Industrial Automation Systems. Starting from simple I/O slices up to complex inverter architectures, EtherCAT® solves the needs of fast real time communication.
General information
XMC4800 relax kit with EtherCAT® extension

http://www.infineon.com/cms/en/product/productType.html?productType=db3a304433b8a4100133daf9cc041122
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