XMC7000 – high quality grade industrial MCU platform



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XMC7000 extends XMC™ portfolio

XMC4000-ARM® Cortex®-M4 (with FPU)
› CPU Frequency up to **144 MHz**
› Robust Flash technology: **Ta = -40 to 125°C**
› Timers CCU4, CCU8, Hall & Encoder I/F
› USB / Up to 6x CAN nodes / Up to 6x Serial Channels
› Up to 4x 12-bit ADC / 2x DAC

XMC4100/4200
Up to 256 kB Flash / 40 kB RAM
48-64 pins

XMC4400
Up to 512 kB Flash / 80 kB RAM
64-100 pins
› 120 MHz Core
› Ethernet
› ΔΣ Demodulator

XMC4500
Up to 1 MB Flash / 160 kB RAM
100 – 144 pins
› EBU
› SD Card

XMC4700
Up to 2 MB Flash / 352 kB RAM
100 – 196 pins
› 144 MHz Core
› 6-ch CAN

XMC4800
Up to 2 MB Flash / 352 kB RAM
100 – 196 pins
EtherCAT.

XMC4300
256 kB Flash / 352 kB RAM
100 pin

XMC1000-ARM® Cortex®-M0
› Core up to **48 MHz** / Peripherals up to **96 MHz**
› Timers CCU4,CCU8
› 2x Serial Channels
› 12-bit ADC
› **1.8 V-5.5 V**
› Ta = -40 to 105°C

XMC1100
up to 64 kB Flash
16 – 40 pins
› 9-ch LED flicker free control (BCCU)
› 3x Analog Comparators

XMC1200
up to 200 kB Flash
16 – 40 pins
› Math Co-Processor
› CCU8 PWM Timer
› Hall & Encoder I/F

XMC1300
up to 200 kB Flash
16 – 40 pins
› 48 MHz/96 MHz clock
› 2x CAN
› 2x CCU8
› 4x Analog Comparators

>70% performance increase

XMC1400
up to 200 kB Flash
40 – 64 pins

XMC7100
4 MB Flash / 768 kB RAM,
250 MHz single/dual core
100 – 272 pin (QFP/BGA)

XMC7200
8 MB Flash / 1 MB RAM,
350 MHz single/dual core
176 – 272 pin (QFP/BGA)

› **Single** and **dual core** Arm® Cortex®-M7 and Cortex®-M0+
› M7 CPU core frequency up to **350 MHz**
› Temperature range: **Ta = -40 to 125°C**
› **Read While Write (RWW)** Flash capability
› Memory up to **8 MB Flash, 1 MB RAM**
› **TCPWM** timers of 102-ch 16-bit and 16-ch 32-bit
› **Cryptography** engine support
› Interfaces such as CAN-FD, **Gb Ethernet**
› **SMIF** and SDHC interface supported
› Extended voltage operating range: **2.7 to 5.5 V**
› Low power modes(LP/deep sleep, **hibernate**...)
› Add. timer, ADC, CAN FD and Serial COM. Chs



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XMC7100 series

SYSTEM

ARM® Cortex® -M7 (Single/Dual) FPU 250 MHz	1M-4M RWW code flash	I-Cache D-Cashe	Power Mode Management	PLL/FLL
	256 kB work flash	DMA	LVD/BOD	RC Oscillators
ARM® Cortex® -M0+ 100 MHz	512-768 kB SRAM	MPU, PPU	RTC	Event Generation Timer
Crypto	Boot ROM eFuse	HSM	WDT	SWD/JTAG/ Trace

REAL TIME CONTROL

16-bit TCPWM	up to 72-ch ADC (3x SAR ADC)
32-bit TCPWM	Programmable trigger matrix
16-bit Motor TCPWM	

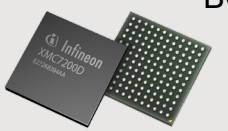
PERIPHERALS

GPIOs	Smart I/Os	8-ch CAN-FD
SMIF	eMMC	I2S/TDM
Up to 11-ch SCB	Ethernet	

Packages



QFP-100
QFP-144
QFP-176



BGA-272

Description

Applications / Target Markets

Industrial motor control and drives, inverters/converters (UPS, solar), High-end eBikes, LEVs, eV Chargers, PLCs

Feature highlights

32-bit MCU Core System
- Single/Dual 250-MHz Arm® Cortex®-M7 and 100 MHz Cortex®-M0+
- Up to 4-MB Flash, up to 768-kB SRAM, I/D-Cache

2.7-V to 5.5-V Supply Voltage

Up to 125°C extended temperature range

Interfaces
- Up to 8-ch CAN FD, up to 11-ch SCB
- eMMC, SMIF (QSPI/HS-SPI), 1-ch 10/100 Mbit Ethernet

AD Converter
- Up to 72-ch, 12-bit with 3x successive approximation ADC (SAR ADC) units

Timers
- Up to 12-ch 16-bit motor control, 63-ch 16-bit timer/counter/pulse-width modulation (TCPWM), and 8-ch 32-bit TCPWM
- Event Generation Timer

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XMC7200 series

SYSTEM

ARM® Cortex® -M7 (Single/Dual) FPU **350 MHz**	8 MB RWW code flash	I-Cache D-Cashe	Power Mode Management	PLL/FLL
	256 kB work flash	DMA	LVD/BOD	RC Oscillators
ARM® Cortex® -M0+ **100 MHz**	1 MB SRAM	MPU, PPU	RTC	Event Generation Timer
Crypto	Boot ROM eFuse	HSM	WDT	SWD/JTAG/ Trace

REAL TIME CONTROL

16-bit TCPWM	up to 96-ch ADC (3x SAR ADC)
32-bit TCPWM	Programmable trigger matrix
16-bit Motor TCPWM	

PERIPHERALS

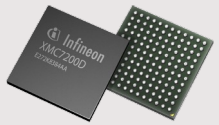
GPIOs	Smart I/Os	10-ch CAN-FD
SMIF	eMMC	I2S/TDM
Up to 11-ch SCB	Gb Ethernet	

Packages

QFP-176



BGA-272



Description

Applications / Target Markets

Industrial motor control and drives, inverters/converters (UPS, solar), LEVs, eV Chargers, PLCs

Feature highlights

32-bit MCU Core System
- Single/Dual 350-MHz Arm® Cortex®-M7 and Cortex®-M0+
- Up to 8-MB Flash, up to 1 MB SRAM, I/D-Cache

2.7-V to 5.5-V Supply Voltage

Up to 125°C extended temperature range

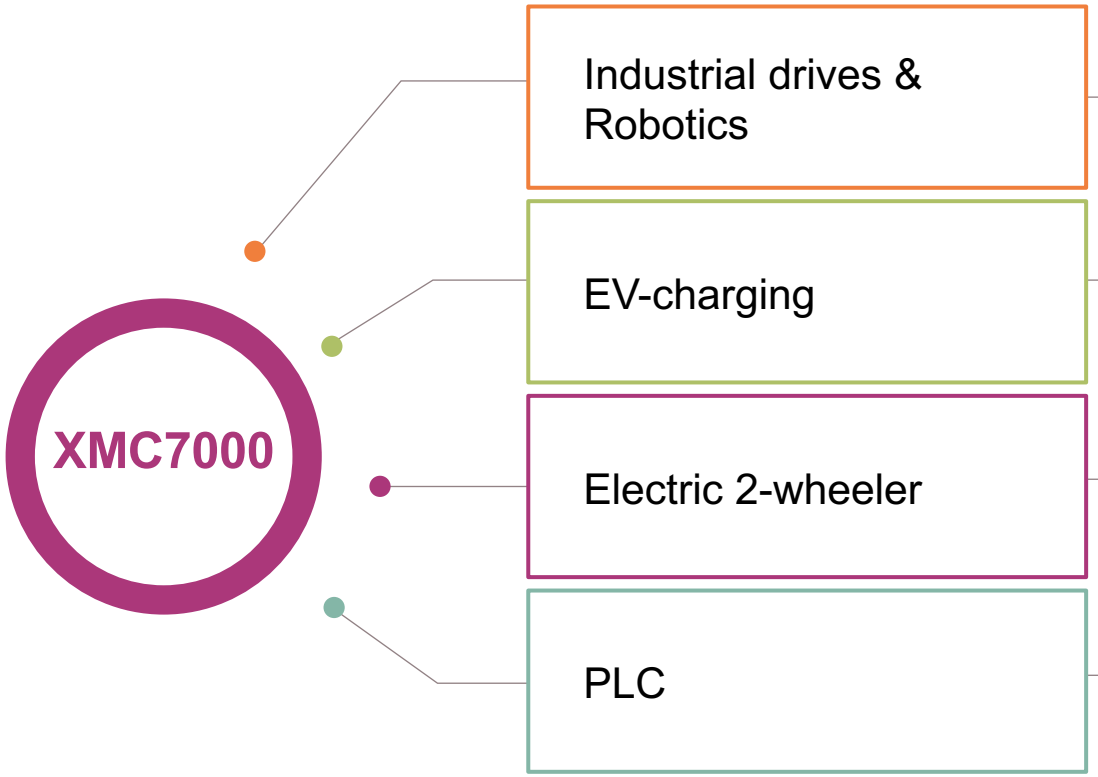
Interfaces
- Up to 10-ch CAN FD, up to 11-ch SCB
- eMMC, SMIF (QSPI/HS-SPI), up to 2-ch 10/100/1000 Mbit Ethernet

AD Converter
- Up to 96-ch, 12-bit with 3x successive approximation ADC (SAR ADC) units

Timers
- Up to 15-ch 16-bit for motor control, 87-ch 16-bit timer/counter/pulse-width modulation (TCPWM) and 16-ch 32-bit TCPWM
- Event Generation Timer

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Target applications and key features



- Up to 350 MHz cloc for low/mid-end industrial drives
- TCPWM: standard 16-bit timers, dedicated to motor control 16-bit counters and 32-bit timers
- Extended voltage range: 2.7-5.5 V
- Up to 125°C extended temperature range

- Large number of specialized TCPWM timers and ADCs
- HW security support
- Up to 125°C extended temperature range
- Interfaces: 10-ch CAN FD and 16-ch UART

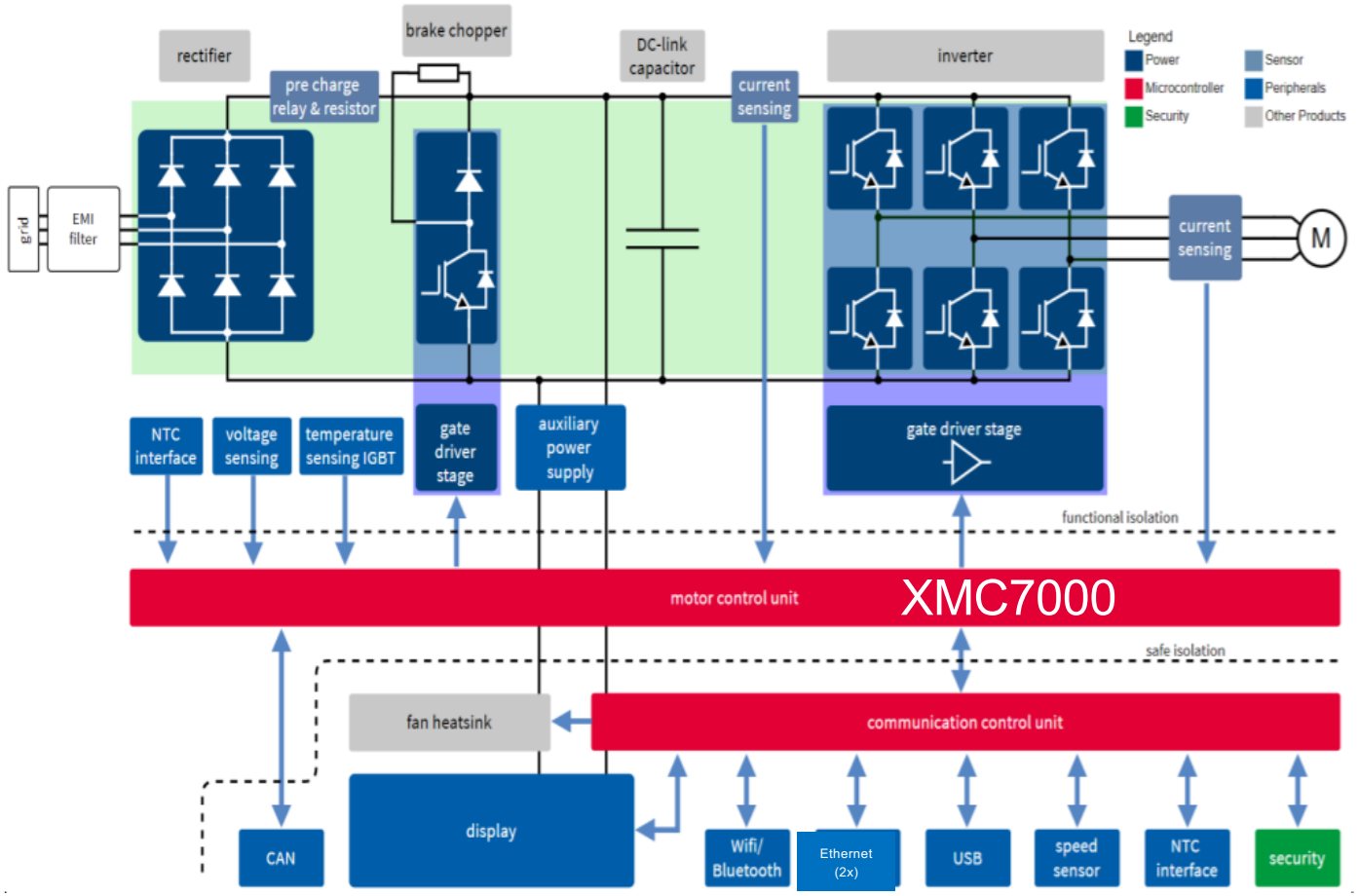
- TCPWM timers, standard (16-bit) and motor control timer (32-bit)
- Interfaces: 10-ch CAN FD and 16-ch UART
- Energy efficient processing power: different power savings mode

- Dual 350-MHz: more robust (redundant) device performance for distributing the tasks
- 10/100/1000 Mbit Ethernet interface
- Up to 8 MB high memory footprint
- 12-bit ADCs with sampling rates of up to 1 Msps

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XMC7000 for industrial drives

Application block diagram



Key features

- 250-MHz clock speed suited for low-end
- Industrial drives
- Dual core Arm® Cortex® M7 with Arm® Cortex® M0
- TCPWM timers (118-ch), 15-ch 16-bit for motor control, 16-ch 32-bit as seperate TCPWM group
- 3 ADC covertor with 99 channels (3 dedicated for motor control)
- 10/100/1000 Mbps Ethernet MAC interface
- Cryptography engine – HW security
- Extended Voltage range: 2.7-5.5 V
- Up to 125°C extended temperature range

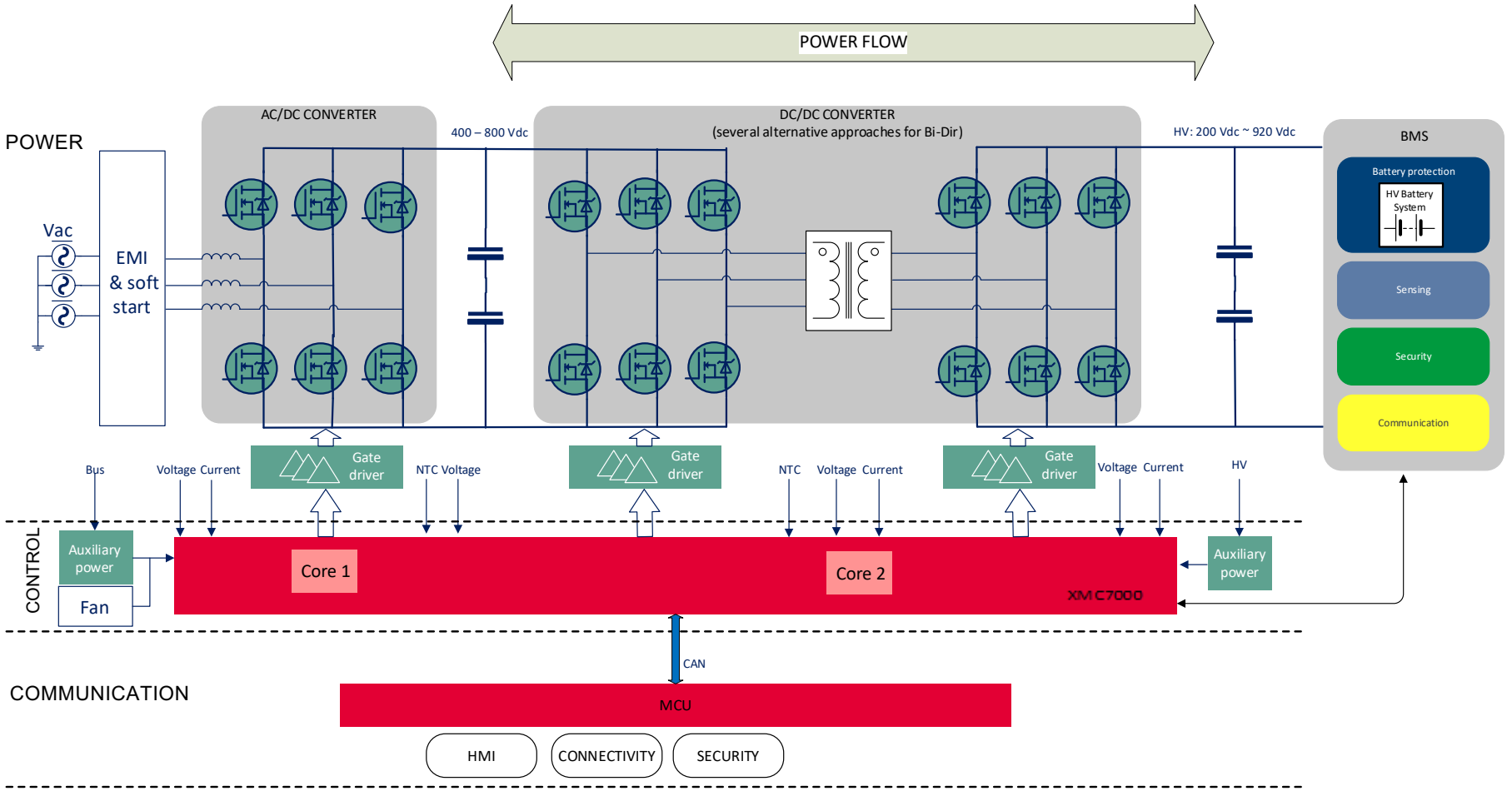
Target applications

- Servo Drives
- GPD –General purpose drives (compact, standard, premium)

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XMC7000 for EV charging

Application block diagram



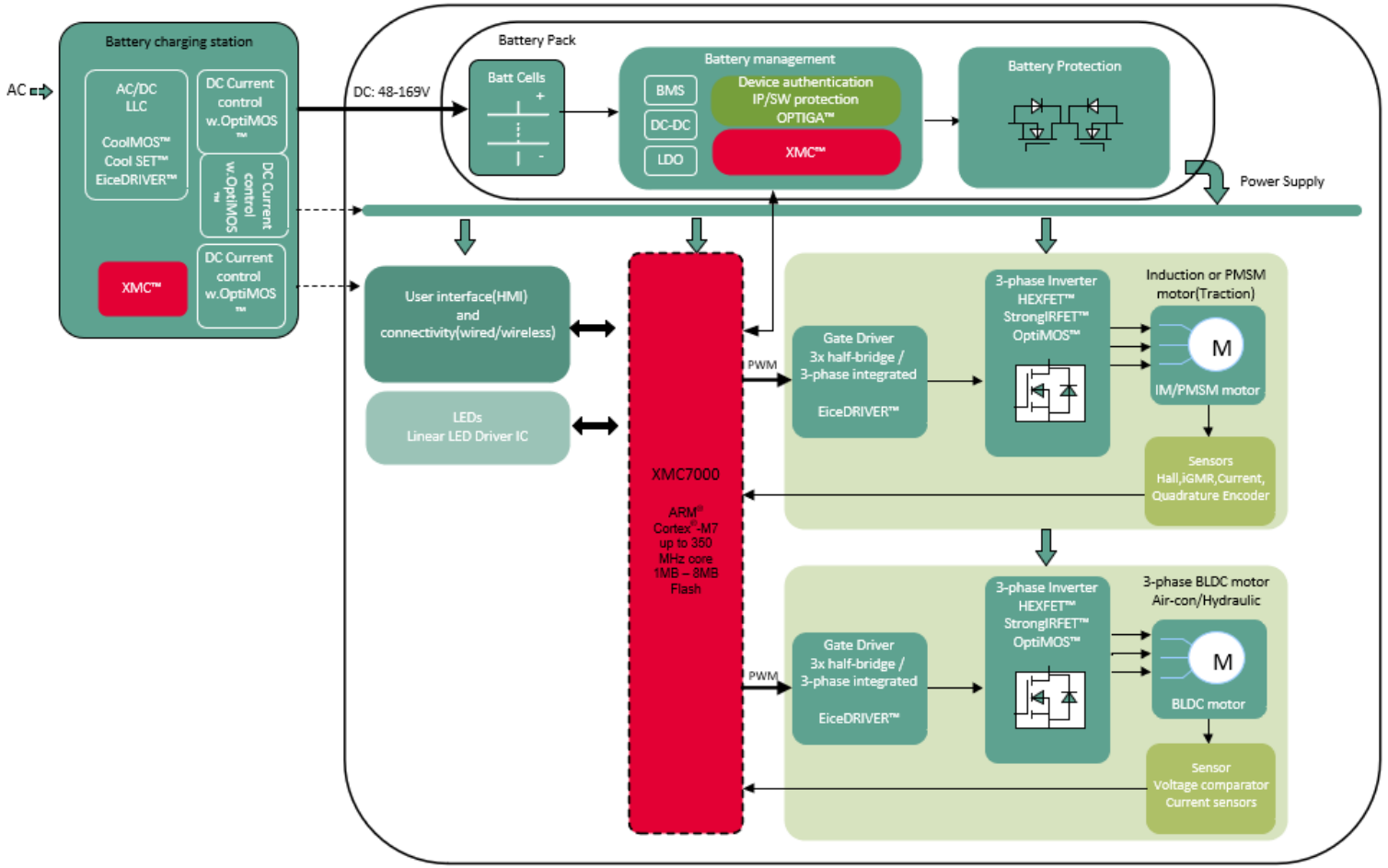
Key features

- 10/100/1000 Mbit Ethernet
- HW security support
- Up to 125°C extended
- Temperature range
- Interfaces: 10-ch CAN FD and 16-ch UART
- Dual 350-MHz: more robust device performance for task distribution
- TCPWM timers
- Large numbers of ADC channels

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XMC7000 for Light Electric Vehicles

Application block diagram



Key features

- Dual core Arm® Cortex® M7 with Arm® Cortex® M0+ for cryptographic engine
- TCPWM: standard 16-bit timers, motor control dedicated 16-bit counters and 32-bit timers
- Timer supporting Quadrature decoding
- Interfaces: 10-ch CAN FD and 16-ch UART
- 5 Smart I/O block to perform Boolean operation
- Energy efficient processing power: different power savings mode

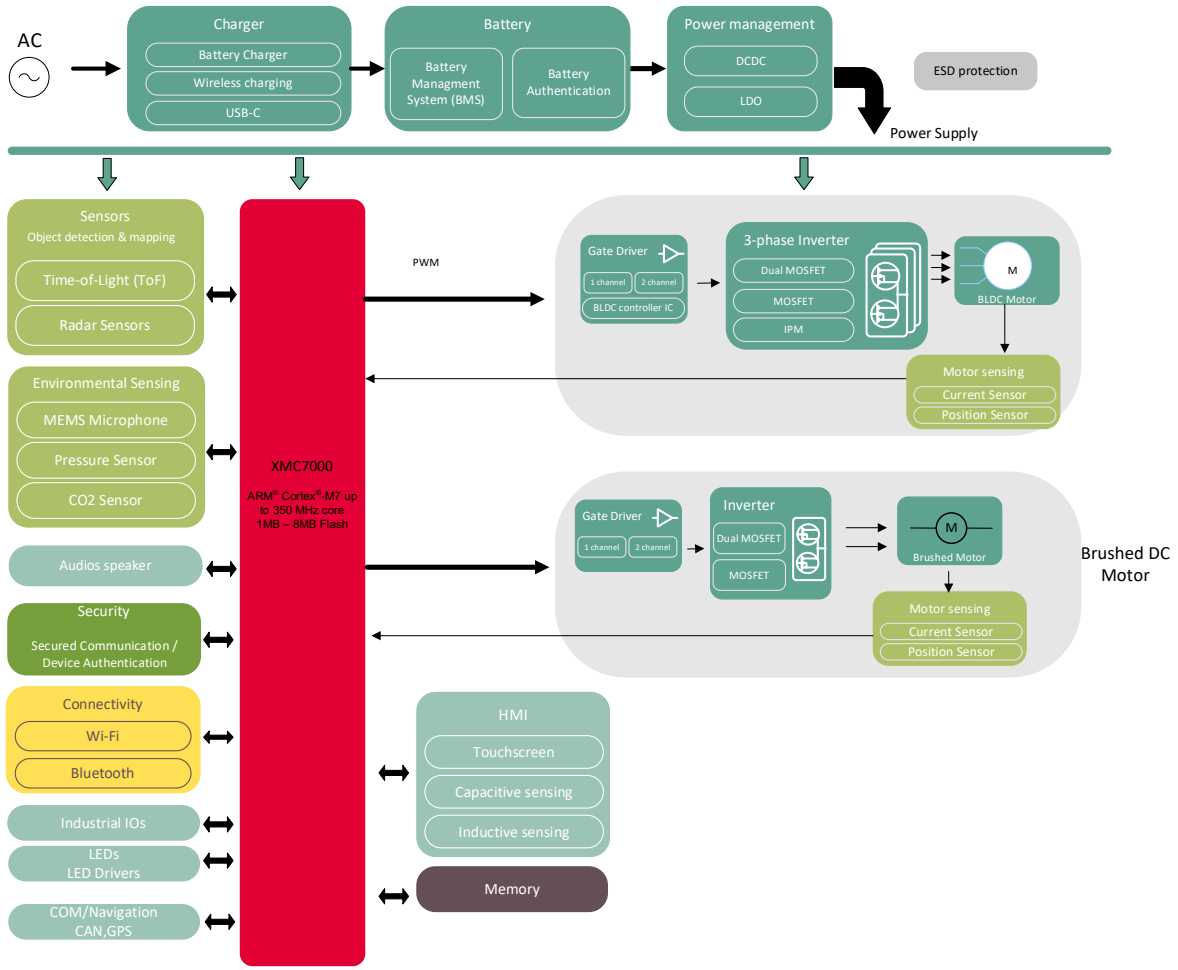
Target applications

- E-forklifts
- E-golf carts
- Low speed E-vehicles(LSEVs/micro Ev)
- E-bikes
- E-scooter (standing, self balancing etc)
- E-Rickshaws or E-three wheeler

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XMC7000 for industrial and residential robotics

Application block diagram



Key features

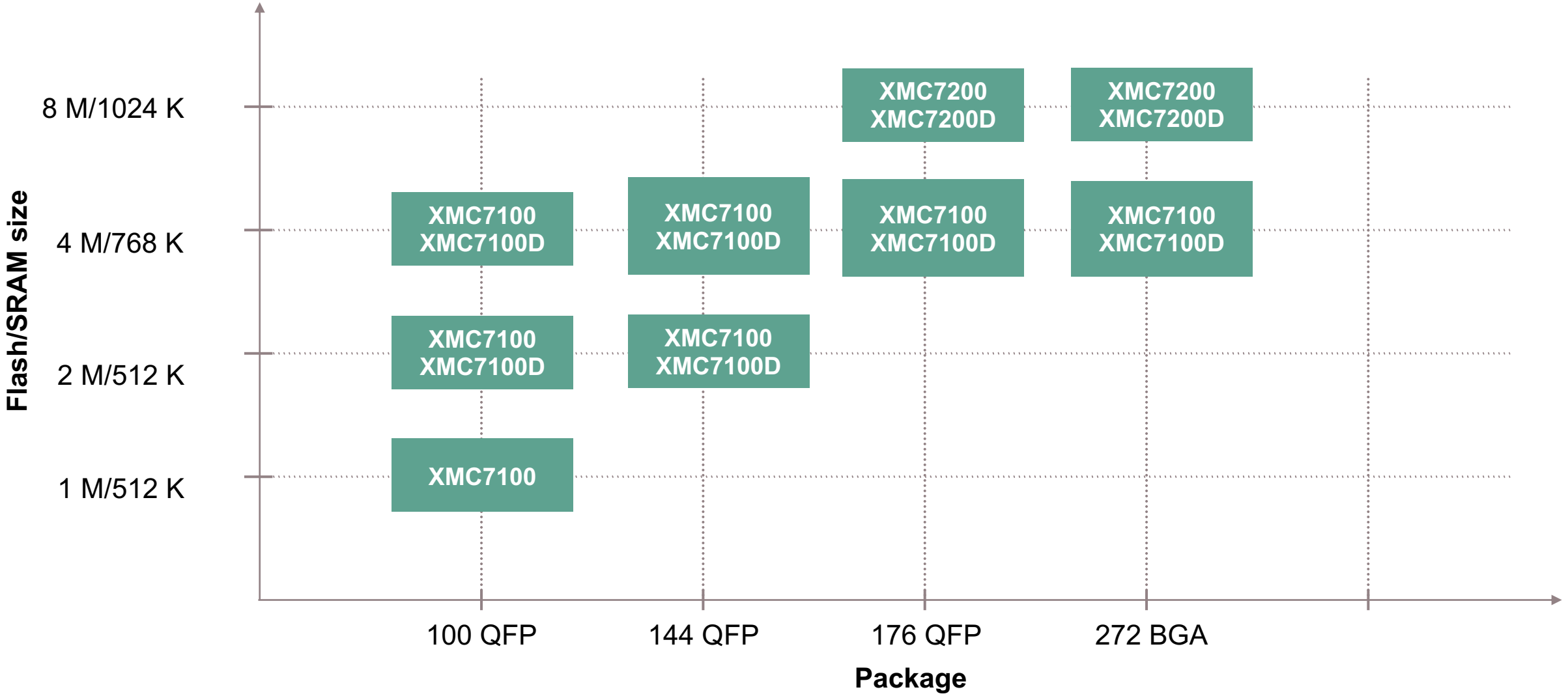
- Dual 350-MHz: more robust device
- performance for task distribution
- Up to 8 MB high Flash memory footprint and 1024 KB SRAM
- 3x 12-bit ADCs with sampling rates of up to 1 MSPS
- Flexibile and powerful TCPWM timers
- External memory – Single, dual, quad, octal SPI or HYPERBUS interface
- Up to 125°C ext Temperature range

Target applications

- Mobile robots (AGV, AMR)
- Industrial robots
- Service robots
- Multicopters and drones
- Cobots (colloborative robots)

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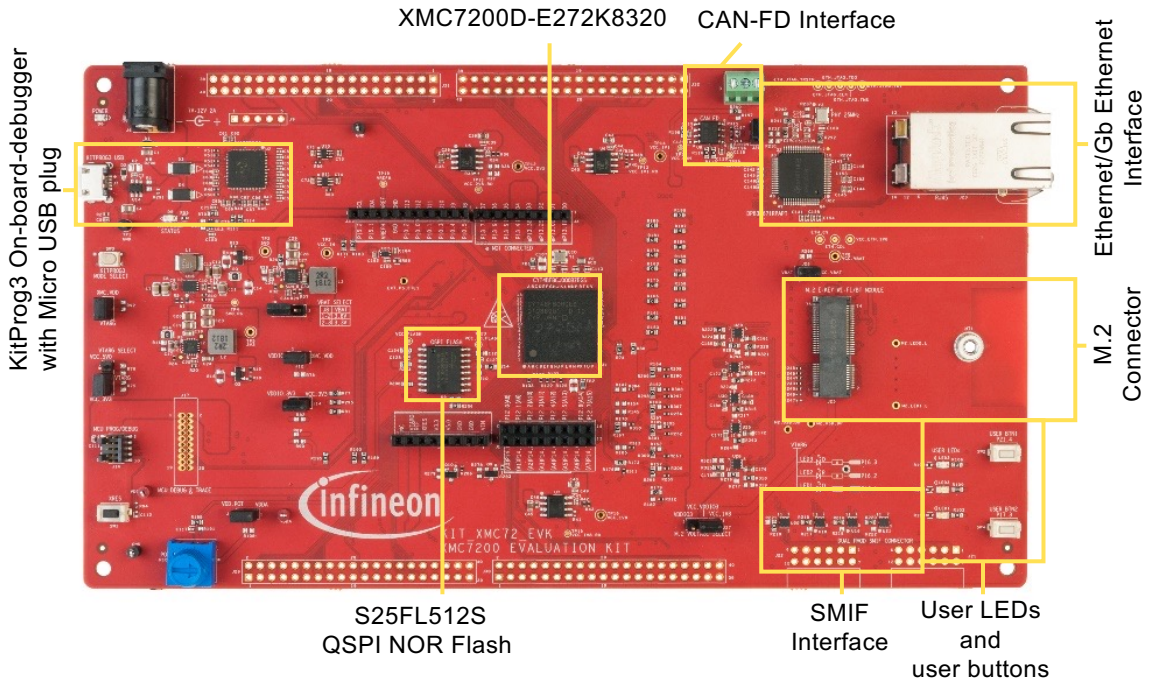
XMC7000 portfolio matrix



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XMC7200 evaluation kit

XMC7200 Evaluation Kit



Applications



Features

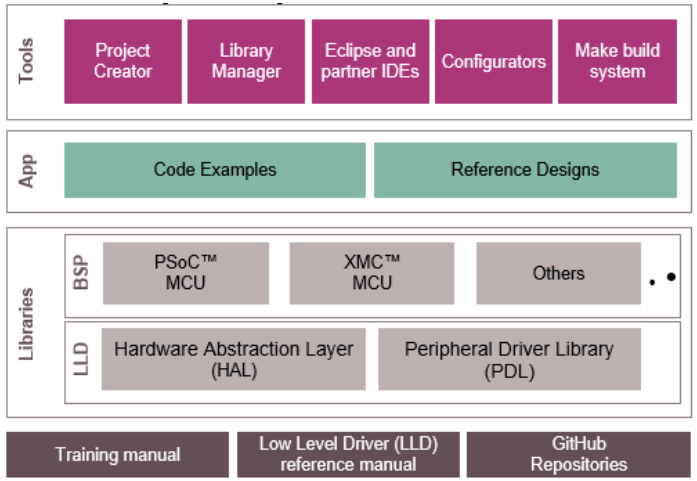
- Evaluation board for XMC7200D-E272K8384 dual-core ARM® Cortex®-M7 device running up to 350 MHz
- Full system approach on the board, featuring Gigabit Ethernet PHY and connector, CAN-FD transceiver, NOR flash memories, user LEDs, buttons and potentiometers
- Modular system enablement through Arduino and M.2 connectors

Customer benefits

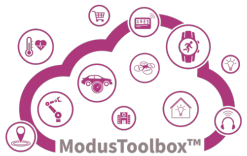
- Out-of-the box experience with on-board-debugger and DC power supply provided
- Full integration in Modus Toolbox IDE through Board Support Package (BSP)
- Easy access and evaluation of all peripherals using code examples available in BSP
- Arduino and M.2 ecosystem access

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XMC7000 in ModusToolbox™ software



- ModusToolbox™ software is a modern, extensible development environment supporting a wide range of Infineon microcontroller devices.
- Provided as collection of development tools, libraries, and embedded runtime assets architected to provide a flexible and comprehensive development experience.



Development Tools

The ModusToolbox™ tools package includes desktop programs that enable the creation of new embedded applications, managing software components, configuring device peripherals and middleware, and embedded development tools for compiling, programming, and debugging.

Run-Time Software

The ModusToolbox™ software includes an extensive collection of GitHub-hosted repositories comprised of code examples, board support packages, middleware, and application support.

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XMC7000 enablement

XMC7000 Toolchains

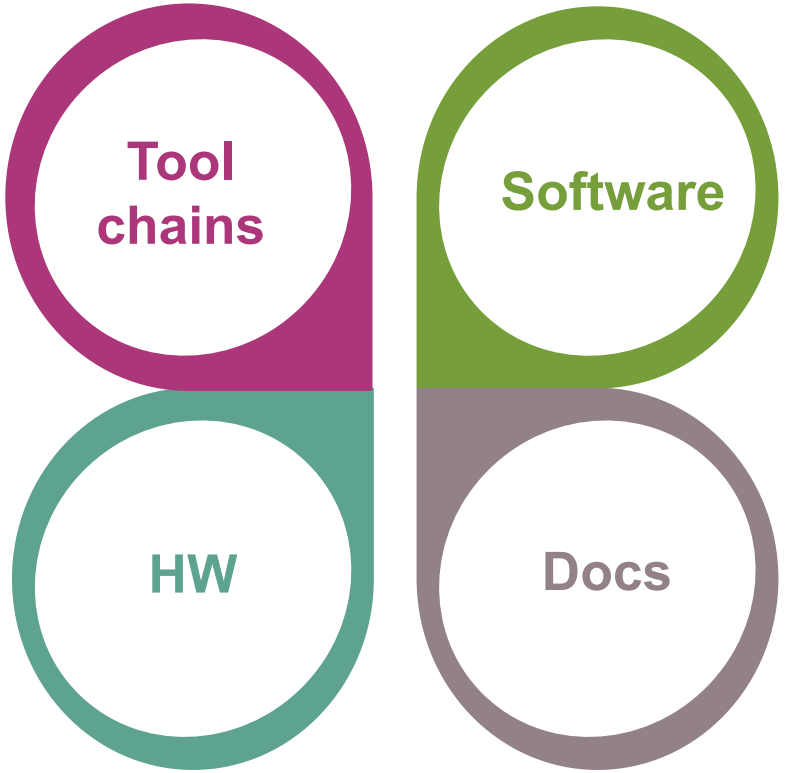
Modus Toolbox 3.0
- MTB 3.0 with multi core debugging
- Project Creator and Library manager tools
- Support C/C++ Compiler – GNU/IAR/Arm®
- Support Debug adaptor- Jlink, I-jet, Miniprog4, Arm® Ulink

XMC7000 Samples/Kits

XMC 7000 Samples
- Samples already available

XMC_7200_Evaluation Kit
- Kit BSP and code support available in MTB
- On board debugger, Ethernet, SMIF, M.2 for Wifi/BLE, Arduino supported

XMC_7000-Motor control: Coming soon



XMC7000 Software

Code examples:
- 38 code examples based on PDL/HAL in MTB
- HAL-PDL libraries
- Middleware for connectivity (connectivity manager, secure sockets, FreeRTOS)

XMC7000 Documents

Datasheet, Family TRM, Register TRMs available
App note
- How to use Timer, Counter & PWM(TCPWM) in XMC700 Family
- How to Control BLDC Motor in XMC7000 Family
- Multi Core Handling Guide in XMC7000
- How to use a SAR ADC in XMC7000 Family… etc.

Training PPTs
- 30 XMC7000 trainings PPTs for peripherals/System completed

Marketing PPTs
- Fight guide, pitch pack, product brief etc.

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Key features and benefits



Infineon's XMC7000 at a glance: high quality grade industrial MCU platform

Key features	Key benefits	Value
Single/Dual Cortex®-M7 Arm® cores, up to 350 MHz and memory up to 8 MB	› Perfect fit for demanding industrial application use cases › Higher processing performance › Ability of task distribution	Best-in-class compute performance
Comprehensive set of advanced peripherals (ADCs, TCPWM Timers) along with competitive set of security offering	› Real time control › Optimal solution for motor control & power conversion applications › Advanced security options	Allowing developers to create feature optimized end products
High quality and temperature grade of 125°C in combination with lower-power modes down to 8 µA	› Low power to support electrification and digitization › Power saving in energy-critical applications › Ability to operate in high ambient environments	Increased flexibility and quality
Four footprint versions available in 17 different part numbers	› XMC7000 is easy to adapt on existing PCB › Different core/memory/package combinations	Optimal device arrangement

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