

XMC™ and AURIX™ – industrial microcontrollers portfolio

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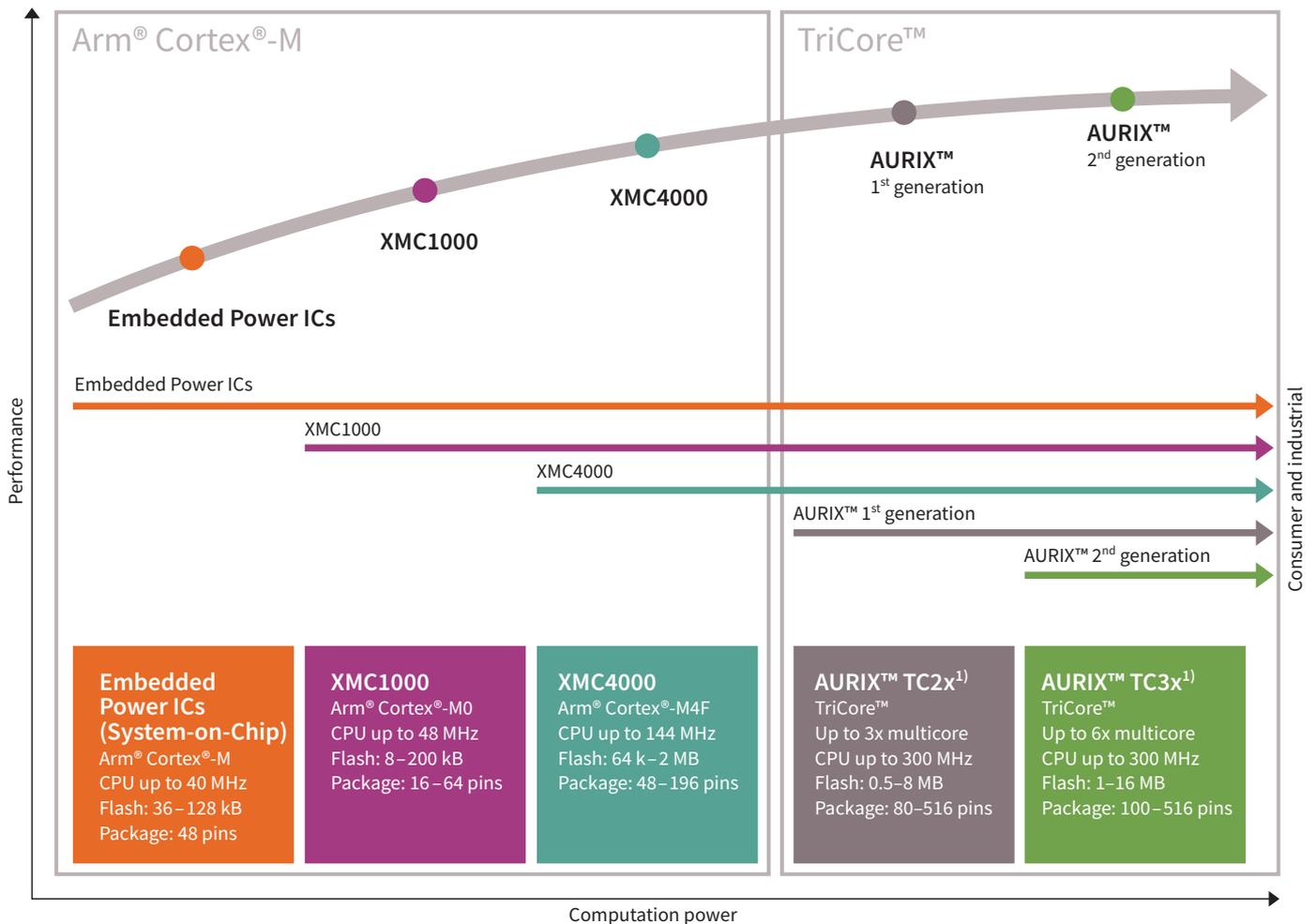
Infineon industrial microcontrollers portfolio

The XMC™ family: One MCU platform. Countless solutions.

The XMC™ microcontroller family is based on ARM® Cortex®-M cores. It is dedicated to applications in the segments of power conversion, factory and building automation, transportation and home appliances. XMC1000 bring together the ARM® Cortex®-M0 core and market-proven and differentiating peripherals in a leading-edge 65 nm manufacturing process. ARM® Cortex®-M4 with a built-in DSP instruction set, powers XMC4000.

The AURIX™ family: Safety joins performance

The AURIX™ microcontroller combines three powerful technologies within one silicon die, achieving new levels of power, speed, and economy for embedded applications. The AURIX™ microcontroller is designed to meet the needs of the most demanding embedded control systems applications where the competing issues of price/performance, real-time responsiveness, computational power, data bandwidth, and power consumption are key design elements.



1) AURIX™ devices add safety and CAN FD

XMC™ for Industrial applications

The XMC™ microcontroller family is based on ARM® Cortex®-M cores. XMC1000 bring together the ARM® Cortex®-M0 core and market-proven and differentiating peripherals in a leading-edge 65 nm manufacturing process. XMC4000 are powered by ARM® Cortex®-M4 with a built-in DSP instruction set.

XMC1000



Cortex®-M0

- > 32–48 MHz
- > Up to 200 kB flash
- > Package
 - LQFP-64
 - TSSOP-16/28/38
 - VQFN-24/40/48/64

XMC4000



Cortex®-M4F

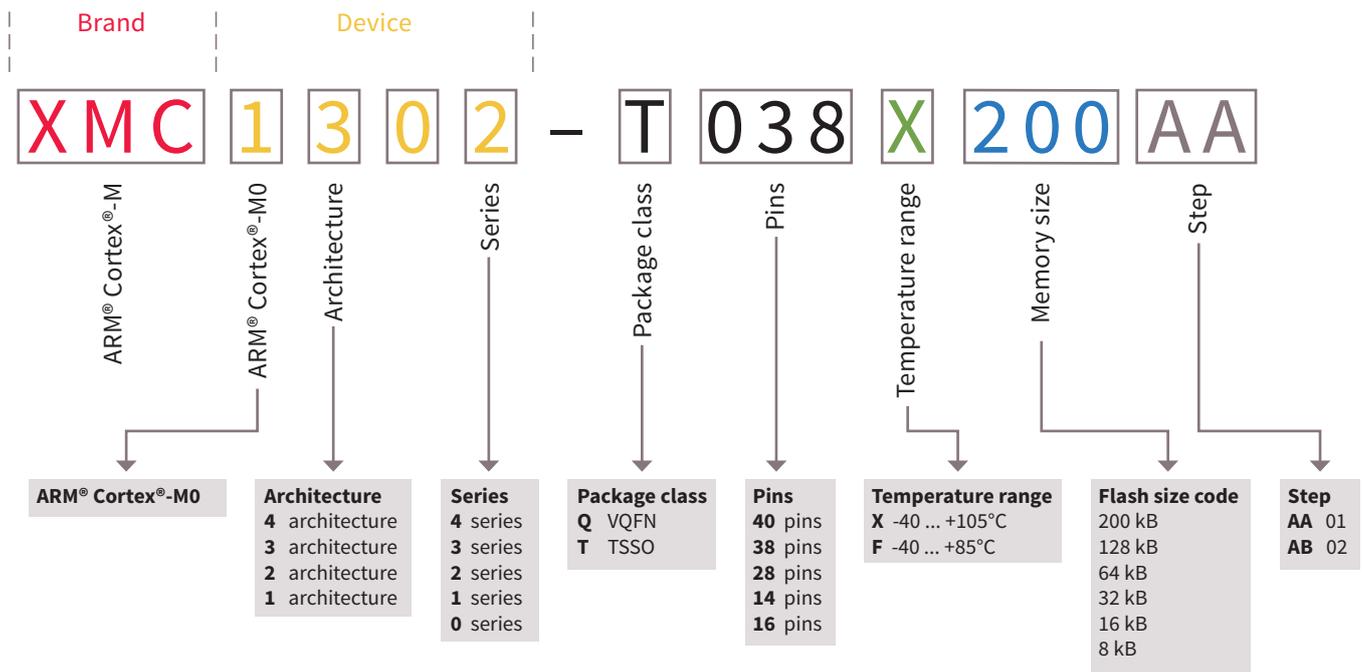
- > 80–144 MHz
- > Up to 2 MB flash
- > Package
 - LFBGA-144/196
 - LQFP-100/144
 - TQFP-64
 - VQFN-48



XMC1000 – optimized peripherals for real-time success

XMC1000 is the number one choice for bringing traditional 8-bit designs to the next level, addressing a broad application spectrum from typical 8-bit applications up to digital power conversion and even field-oriented motor control.

32-bit XMC™ microcontroller – XMC1000 family



ARM® Cortex®-M0	Co-processor	Clocks		Memory	Analog			Timer/PWM				Connectivity		Package
		Frequency [MHz]	Peripherals [MHz]		ADC 12 bit / S&H	Number of channels	Analog comparators	CCU4	CCU8	POSIF	BCCU	USIC	CAN2.0B	
	-	32	64	Flash 8-64 kB RAM 16 kB	1/1	up to 12	-	1x	-	-	-	2x	-	VQFN-24/40 TSSOP-16/38
XMC12x	-	32	64	Flash 16-200 kB RAM 16 kB	1/2	up to 12	up to 3	1x	-	-	•	2x	-	VQFN-24/40 TSSOP-16/28/38
XMC13x	•	32	64	Flash 8-200 kB RAM 16 kB	1/2	up to 12	up to 3	1x	1x	•	•	2x	-	VQFN-24/40 TSSOP-16/38
XMC14x	•	48	96	Flash 32-200 kB RAM 16 kB	1/2	up to 12	up to 4	2x	2x	•	•	4x	•	VQFN-40/48/64 LQFP-64

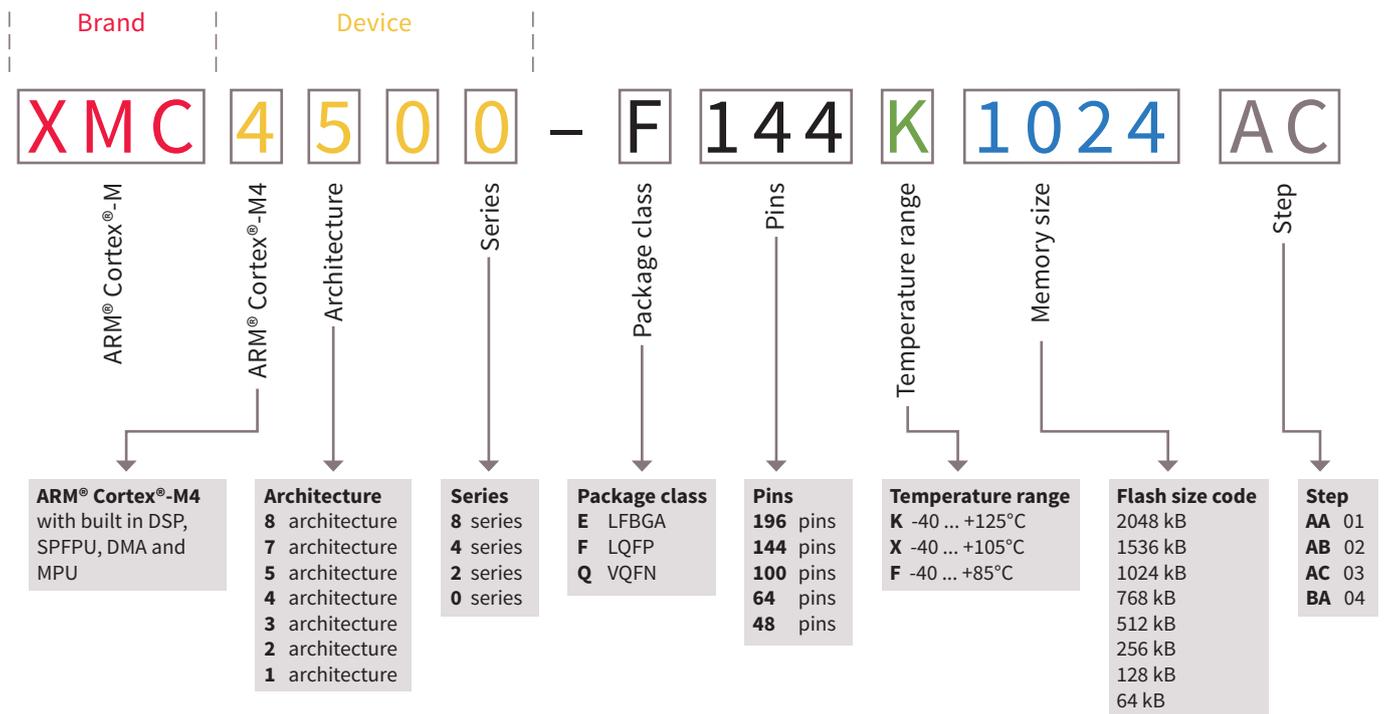
Supply voltage range 1.8-5.5 V
Temperature range -40°C ... 85°C/105°C

BCCU = Brightness and Color Control Unit for LED lighting
 CCU = Capture Compare Unit
 POSIF = Motor Position Interface
 USIC = UART/SCI, SPI, Dual-SPI, Quad-SPI, IIC/I²C, IIS/I²S, LIN

XMC4000 – advanced industrial control and connectivity

The single-precision floating-point unit, Direct Memory Access (DMA) feature and Memory Protection Unit (MPU) are state-of-the-art for all devices – even the smallest XMC4000 runs with up to 80 MHz in core and peripherals. They come with a comprehensive set of common, fast and precise analog/ mixed signal, timer/PWM and communication peripherals.

32-bit XMC™ microcontroller – XMC4000 family



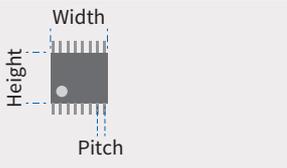
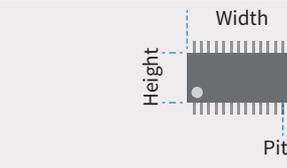
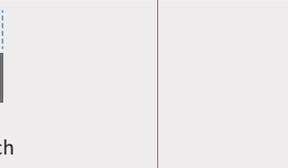
ARM® Cortex®-M4F	Frequency [MHz]	Memory	Analog			Timer/PWM				Connectivity						Package		
			ADC 12 bit / S&H	Number of channels	DAC 12 bit	CCU4 (4 ch)	CCU8 (4 ch)	HRPWM (150 ps)	POSIF	ΔΣ demodulator	USIC	CAN2.0B	USB	Ethernet	EtherCAT®		SDIO/SD/MMC	External Bus Unit (EBU)
XMC41x	80	Flash 64–128 kB RAM 20 kB	2/2	up to 9	2 ch	2x	1x	●	●	–	4x	up to 2	●	–	–	–	–	VQFN-48 TQFP-64
XMC42x	80	Flash 256 kB RAM 40 kB	2/2	up to 9	2 ch	2x	1x	●	●	–	4x	2x	●	–	–	–	–	VQFN-48 TQFP-64
XMC43x	144	Flash 256 kB RAM 128 kB	2/2	14	2 ch	2x	1x	–	–	–	4x	2x	●	●	●	●	–	LQFP-100
XMC44x	120	Flash 256–512 kB RAM 80 kB	4/4	up to 18	2 ch	4x	2x	●	2x	4 ch	4x	2x	●	●	–	–	–	TQFP-64 LQFP-100
XMC45x	120	Flash 512 kB–1 M RAM 128–160 kB	4/4	up to 26	2 ch	4x	2x	–	2x	4 ch	4x	up to 3	●	●	–	●	●	LQFP-100/144 LFBGA-144
XMC47x	144	Flash 1.5–2 MB RAM 276–352 kB	4/4	up to 26	2 ch	4x	2x	–	2x	4 ch	6x	6x	●	●	–	●	●	LFBGA-196
XMC48x	144	Flash 1–2 MB RAM 276–352 kB	4/4	up to 26	2 ch	4x	2x	–	2x	4 ch	6x	6x	●	●	●	●	●	LQFP-100/144 LFBGA-196

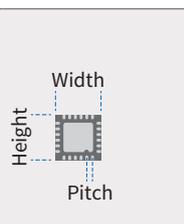
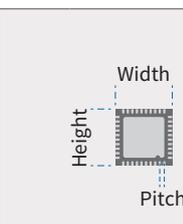
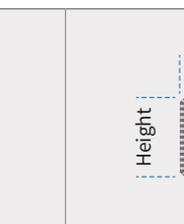
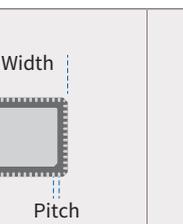
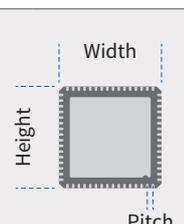
Supply voltage range 3.13 to 3.63 V
Temperature range -40°C ... 85°C/125°C

CCU = Capture Compare Unit
POSIF = Motor Position Interface
USIC = UART/SCI, SPI, Dual-SPI, Quad-SPI, IIC/I²C, IIS/I²S

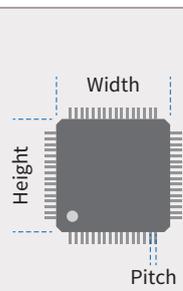
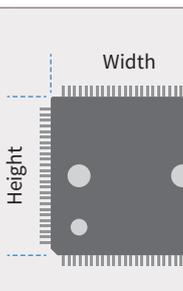
XMC™ package overview

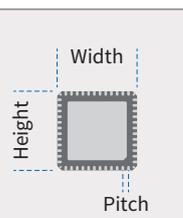
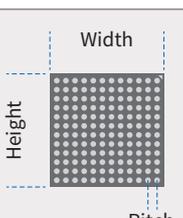
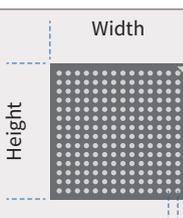
XMC1000

		
TSSOP-16	TSSOP-28	TSSOP-38
Body 4.4 x 5 mm (H x W)	Body 4.4 x 9.7 mm (H x W)	Body 4.4 x 9.7 mm (H x W)
Pitch 0.65 mm	Pitch 0.65 mm	Pitch 0.5 mm

				
VQFN-24	VQFN-40	VQFN-48	VQFN-64	LQFP-64
Body 4 x 4 mm (H x W)	Body 5 x 5 mm (H x W)	Body 7 x 7 mm (H x W)	Body 9 x 9 mm (H x W)	Body 10 x 10 mm (H x W)
Pitch 0.5 mm	Pitch 0.4 mm	Pitch 0.5 mm	Pitch 0.5 mm	Pitch 0.5 mm

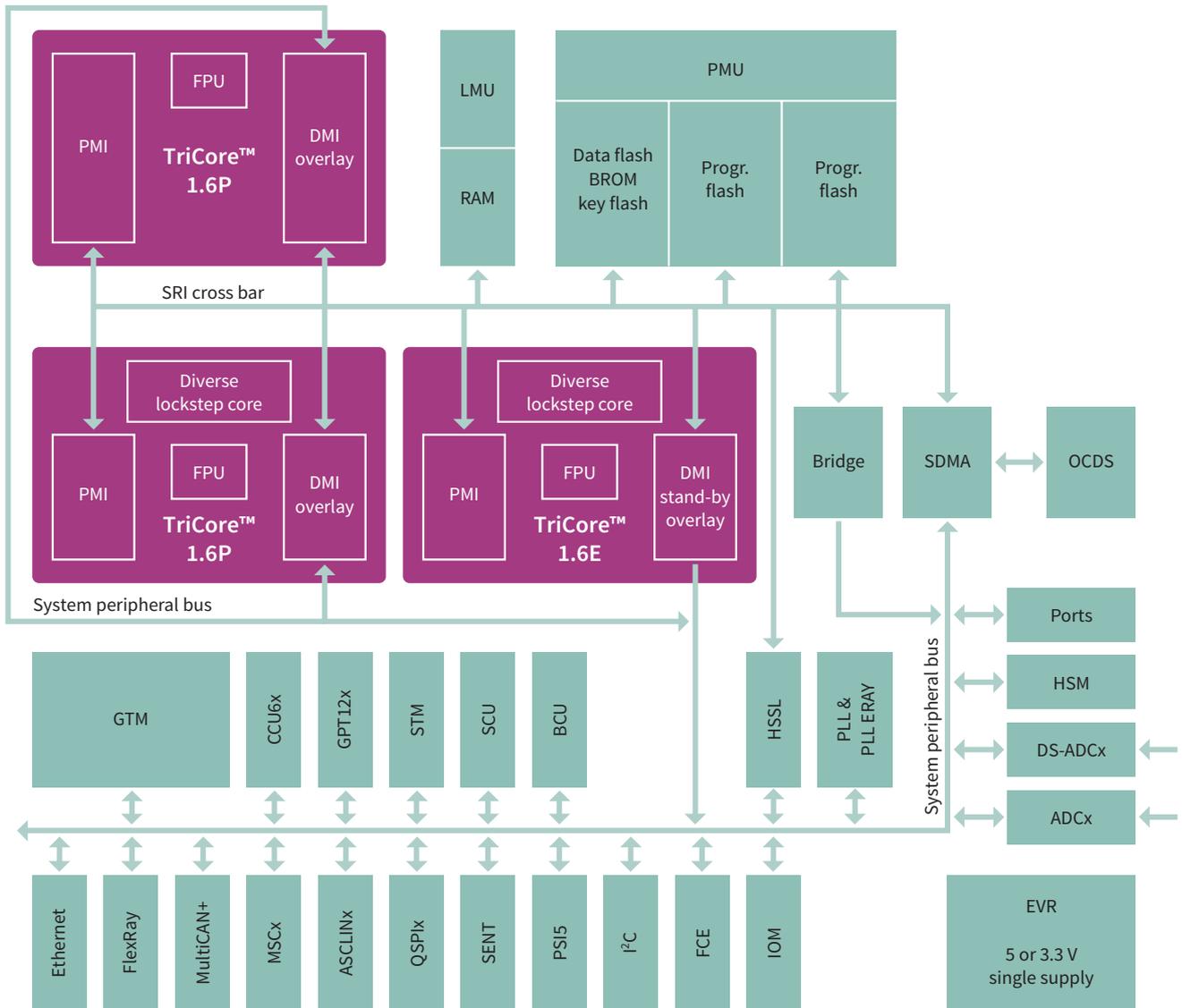
XMC4000

		
TQFP-64	LQFP-100	LQFP-144
Body 10 x 10 mm (H x W)	Body 14 x 14 mm (H x W)	Body 20 x 20 mm (H x W)
Pitch 0.5 mm	Pitch 0.5 mm	Pitch 0.5 mm

		
VQFN-48	LFBGA-144	LFBGA-196
Body 7 x 7 mm (H x W)	Body 10 x 10 mm (H x W)	Body 12 x 12 mm (H x W)
Pitch 0.5 mm	Pitch 0.8 mm	Pitch 0.8 mm

AURIX™ TC2xx family system architecture

Powerful 1st generation AURIX™ TC2xx system architecture



AURIX™ TC2xx family package scalability

9x Series up to 8 MB					TC297 300 MHz	TC298 300 MHz	TC299 300 MHz
7x Series up to 4 MB				TC275 200 MHz	TC277 200 MHz		
6x Series up to 2.5 MB			TC264 200 MHz	TC265 200 MHz	TC267 200 MHz		
3x Series up to 2 MB		TC233 200 MHz	TC234 200 MHz		TC237 200 MHz		
2x Series up to 1 MB	TC222 133 MHz	TC223 133 MHz	TC224 133 MHz				
1x Series up to 512 KB	TC212 133 MHz	TC213 133 MHz	TC214 133 MHz				
Flash Package	TQFP-80	TQFP-100	TQFP-144 LQFP-144	LQFP-176	LFBGA-292	BGA-416	LFBGA-516

↕ Upgrade/downgrade with pin-compatible packages

Evolution from TC2xx to TC3xx – easy migration with focus on reuse

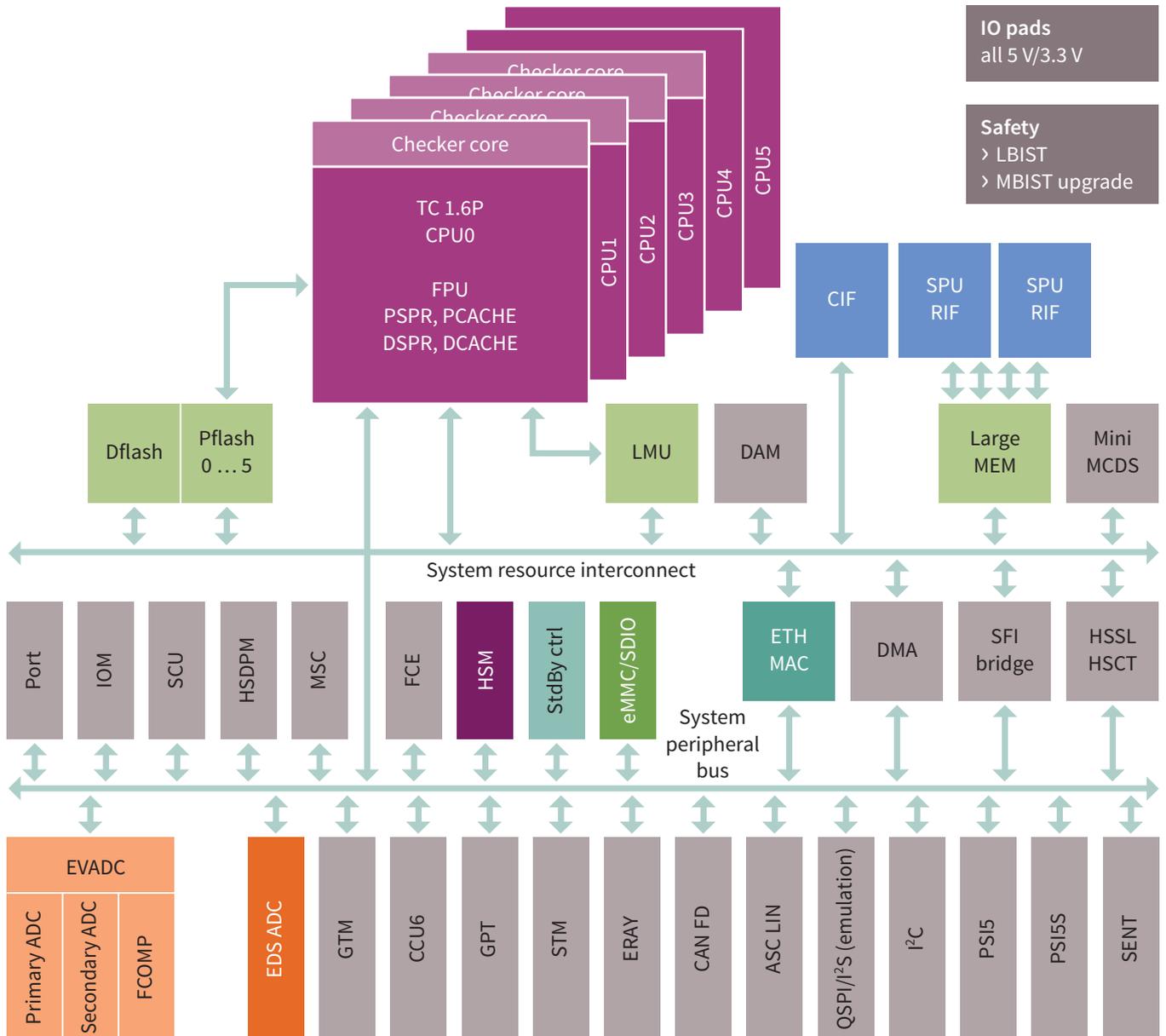
- › Fast conversion of existing AURIX™ TC2xx designs
 - Backwards compatibility
 - High AURIX™ family compatibility to pinout of existing QFP-100/144/176 and BGA packages
- › Flexibility – scalability within the AURIX™ family
 - Up-/downgrade paths for devices in identical packages
 - Compatible pin-out of QFP/BGA package options enabling combination designs
- › Pin to pin compatibility between the devices of AURIX™ TC2xx/TC3xx and from generation to generation
- › A high scalability with a very large portfolio for both AURIX™ TC2xx & TC3xx

AURIX™ TC3xx provides an upgrade on key parameters with focus on SW & HW reuse

	Performance increase & reduction of power	Increased from 3 to 6 cores Developed in 40 nm for power consumption reduction
	Scalable & backwards compatible to TC2xx	Fully compatible devices with focus on HW & SW reuse
	Functional safety	IEC61508 compliant enabling SiL-3 level
	Enhanced security	Upgraded to Full EVITA support
	Improved networking	Richer peripheral set
	SOTA	Full support of SOTA A/B swap

AURIX™ TC3xx family system architecture

AURIX™ TC3xx – scalable family – from low-cost to high-performance applications



Performance

- > New TriCore™ 162 generation
- > New instructions
- > Up to 6 CPUs at 300 MHz
- > New direct flash access path

Memories

- > Larger SRAM
- > SRAM/flash ratio increased
- > Enhanced MPU
- > A/B swap support

Stand-by control unit

- > Low-power modes

HSM: Full EVITA compliance

- > New accelerators ECC256/SHA256
- > Available on all devices

Delta-sigma

- > Enhanced concept

Ethernet

- > 1 Gbit/s ETH
- > QoS services
- > Remote DMA

ADAS

- > LVDS IF
- > Signal processing unit

ADC

- > Improvement of existing ADC
- > Reduction of capacitive load

eMMC/SDIO

- > External NAND flash IF

AURIX™ TC3xx family system architecture

AURIX™ TC3xx family package scalability

6x 300 MHz	9xA Series 16 MB							TC397XA 300 MHz	
6x 300 MHz	9x Series 16 MB	Control and Actuate Sense and Compute						TC397X 300 MHz	TC399X 300 MHz
4x 300 MHz	Ex Series 12 MB							TC3E7Qx 300 MHz	
4x 300 MHz	8x Series 10 MB							TC387Q 300 MHz	TC389Q 300 MHz
3x 300 MHz	7xX Series 6 MB							TC377TX 300 MHz	
3x 300 MHz	7x Series 6 MB					TC375T 300 MHz		TC377T 300 MHz	
2x 300 MHz	6x Series 4 MB			TC364D 300 MHz	TC366D 300 MHz	TC365D 300 MHz		TC367D 300 MHz	
4x 300 MHz	Ax Series 4 MB						TC3A8Q 300 MHz	TC3A7Q 300 MHz	
3x 300 MHz	5xA Series 4 MB				TC356TA 300 MHz			TC357TA 300 MHz	
2x 300 MHz	3xA Series 2 MB				TC336DA 300 MHz			TC337DA 300 MHz	
1x 300 MHz	3x Series 2 MB	TC332L 300 MHz	TC333L 300 MHz	TC334L 300 MHz	TC336L 300 MHz			TC337L 300 MHz	
1x 160 MHz	2x Series 1 MB	TC322L 160 MHz	TC323L 160 MHz	TC324L 160 MHz				TC327L 160 MHz	
Flash Package		TQFP-80	TQFP-100	LQFP-144 TQFP-144	BGA-180	LQFP-176	BGA-233	LFBGA-292	LFBGA-516

- › Advanced package technologies deliver the best price/performance ratio
- › Customers can choose between different devices in the same pin-compatible package

MCU scalability

- › Performance and flash
- › Pin compatibility
- › Binary-compatible cores

Safety/security concept

- › ISO 26262 compliance
- › IEC 61508 compliant



AURIX™ TC3xx

Power consumption

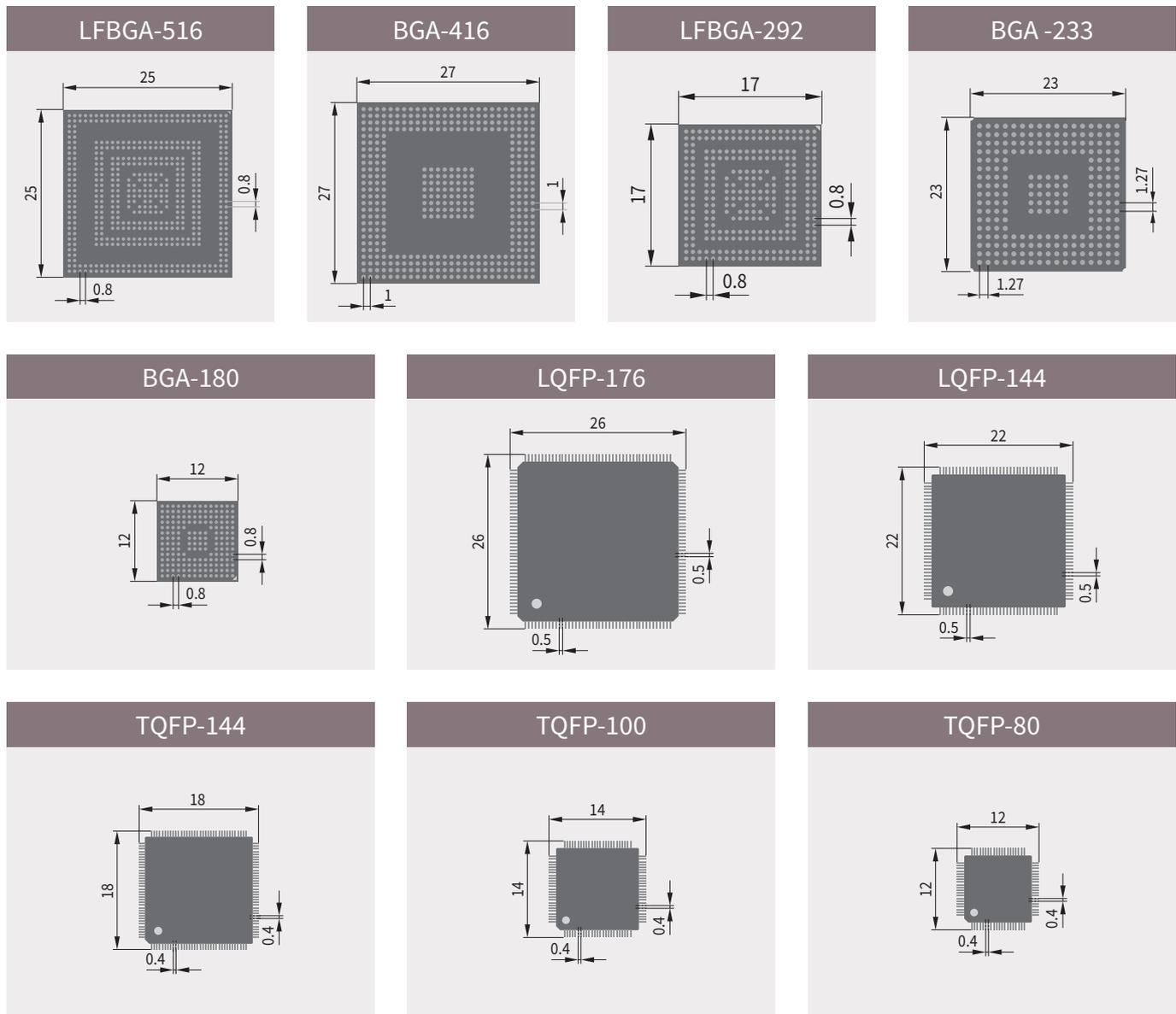
- › On-chip SC DC-DC high-efficiency power supply
- › Integrated stand-by controller

Connectivity

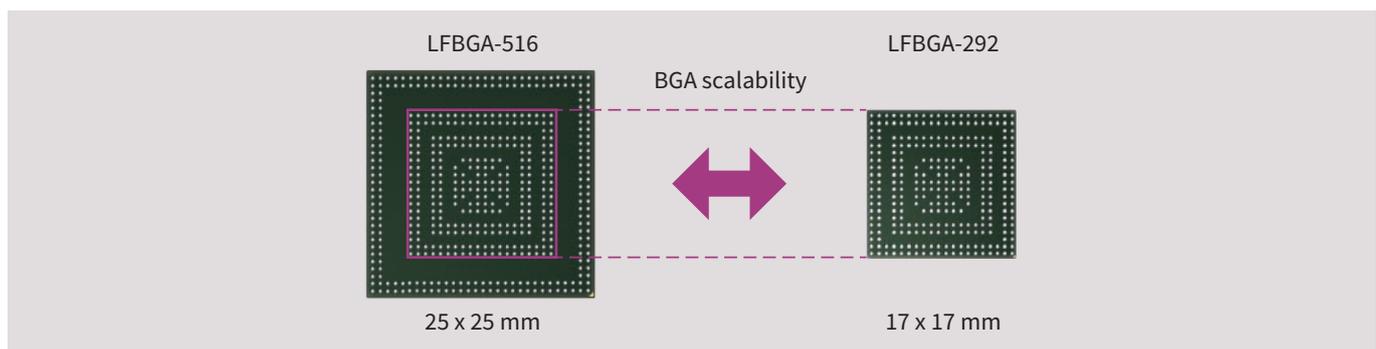
- › Ethernet: up to 2x 1 GB
- › CAN FD: up to 20 channels
- › eMMC IF

AURIX™ family housing options

Package information for maximum scalability



TriCore™ upgrade paths



› LFBGA-292 and LFBGA-516 are ball compatible so that customers can build one PCB for both packages

Peripheral highlights

XMC™ BCCU: Brightness and Colour Control Unit

Highlights

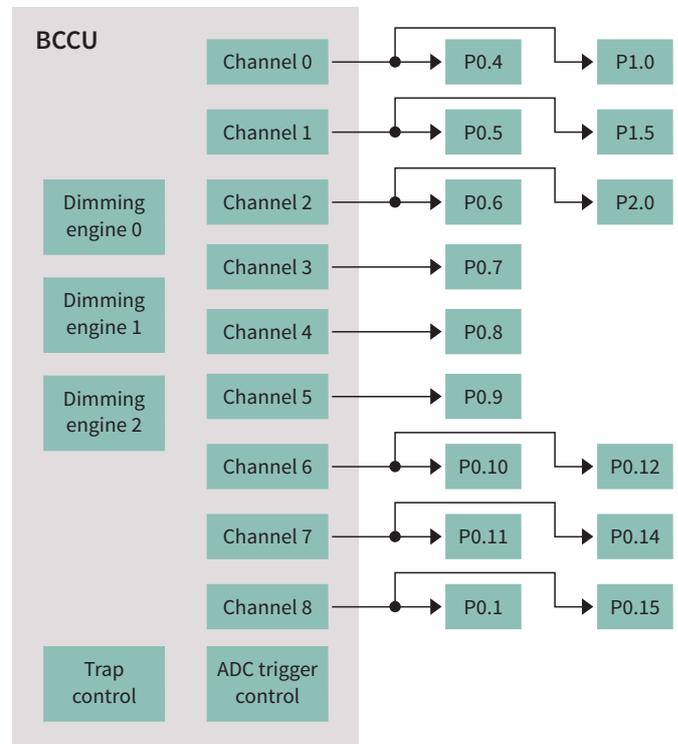
Our XMC™ BCCU is designed to automatically control the dimming level and colour of multi-channel LED lamps. It requires little user code and the transitions appear natural to the human eye.

Key features

- > Automatic high frequency brightness modulation (PDM)
- > Automatic exponential dimming and linear intensity change
- > Controlled rate of switching

Key benefits

- > Completely flicker free; no visible or intrasaccadic flicker; 12 bit resolution
- > Dimming level or color changes appear smooth and natural to the human eye
- > Compatible with a wide range of high power LED drivers



XMC™ CCU8: Capture/Compare Unit 8

Highlights

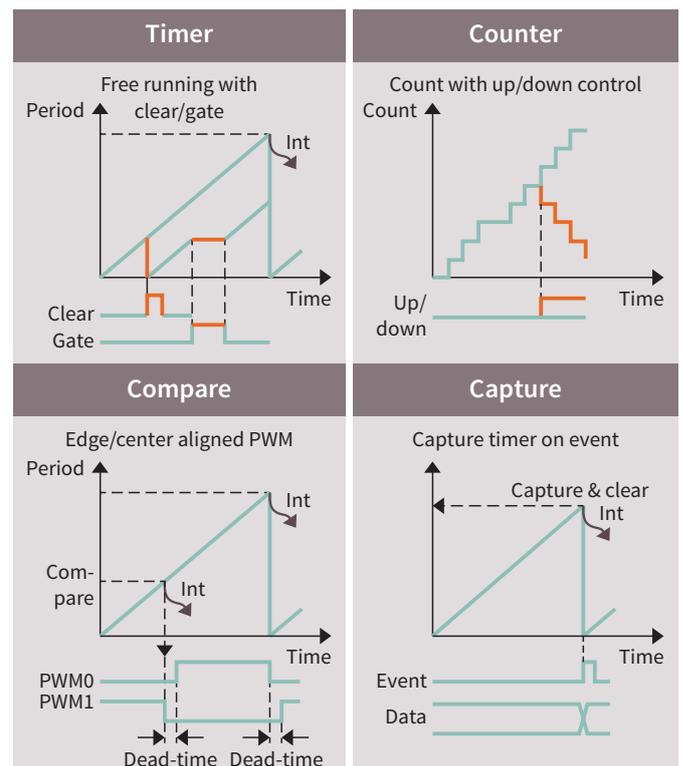
One timer architecture serves any user case. The regular and repetitive slice structure allows portable software and use of code generators. Two compare channels enable the generation of up to 4 complementary PWM signals per timer (16 per CCU8).

Key features

- > CCU8 serves as a timer, counter, capture, compare
- > Shadow and buffer mechanism for coherency
- > Dead-time insertion

Key benefits

- > Adjust the timer to the wanted application
- > Synchronize hardware events to software timing for real-time control
- > Generating complementary PWM signals



XMC™ POSIF: Position Interface

Highlights

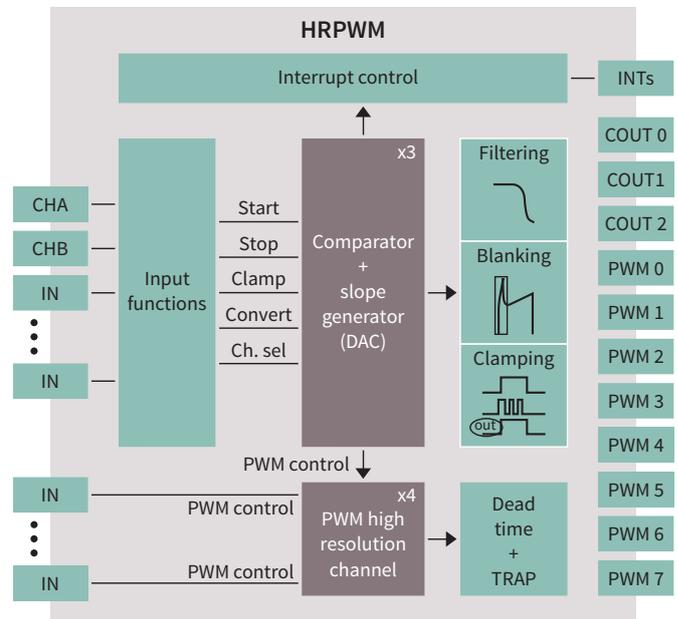
The POSIF module is the ideal solution for motor control applications using hall sensors and quadrature decoders. The user can configure freely the type and usage of the resources to perform an optimized mapping to the wanted application.

Key features

- > Interface for linear or quadrature rotary encoder
- > Interface for hall sensors
- > Stand-alone multi-channel control

Key benefits

- > Application tailored motor position and velocity measurement
- > Tailored solution for 2 or 3 hall sensor applications.
 - Coupling with PWM generation
- > Perform multi-level modulation for PWM
- > Tailored modulation development



XMC™ MATH: MATH co-processor

Highlights

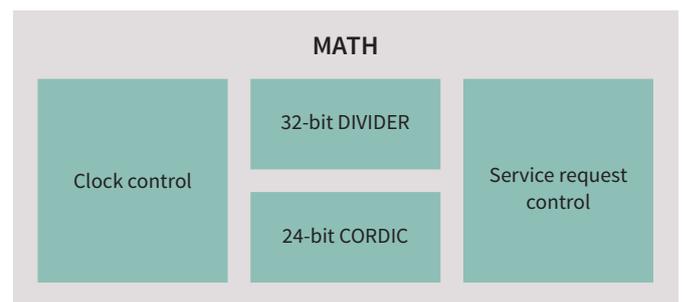
The MATH co-processor provides a 32-bit signed or unsigned divider as well as a 24-bit CORDIC for trigonometric calculations. Both DIVIDER and CORDIC can operate in parallel next to the CORTEX®-M0 CPU core.

Key features

- > 32-bit hardware divide for signed and unsigned long integer numbers
- > Trigonometric functions executed in parallel to CPU operation
- > Vector rotation (PARK transform) executed in 24-bit resolution

Key benefits

- > The calculation time of a divide operation is reduced to 50%
- > Increase of computational power for real time critical tasks
- > Field oriented motor control algorithms are implemented with high resolution



Peripheral highlights

XMC™ POSIF: Position Interface

Highlights

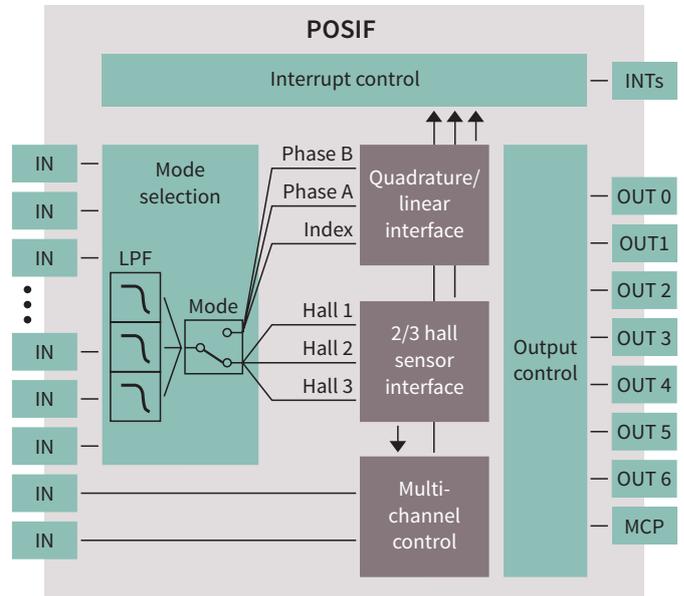
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- › Interface for linear or quadrature rotary encoder
- › Interface for hall sensors
- › Stand-alone multi-channel control

Key benefits

- › Application tailored motor position and velocity measurement
- › Tailored solution for 2 or 3 hall sensor applications. Coupling with PWM generation
- › Perform multi-level modulation for PWM
- › Tailored modulation development



XMC™ ERU: Event Request Unit

Highlights

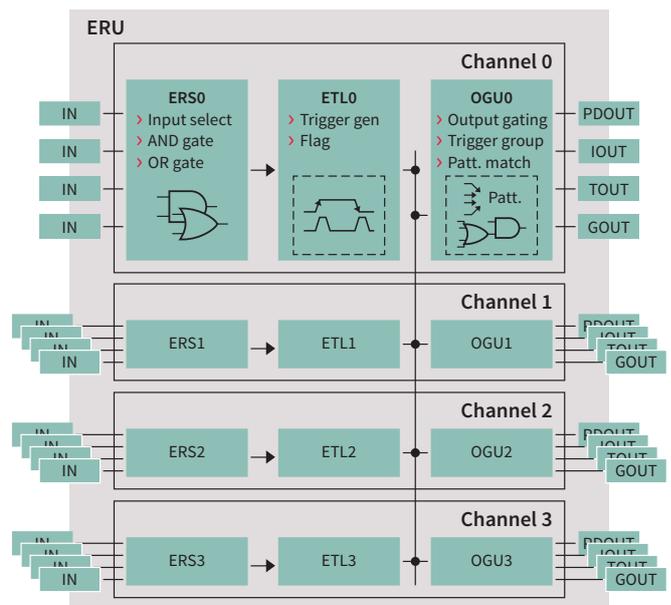
The ERU module can be used to expand the P-to-P connections of the device: ports-to-peripherals, peripherals-to-peripherals and ports-to-ports. It also offers configurable logic, that allows the generation of triggers, pattern detection and real-time signal monitoring.

Key features

- › Connection flexibility
- › External interrupt generation ›
- › Configurable logic

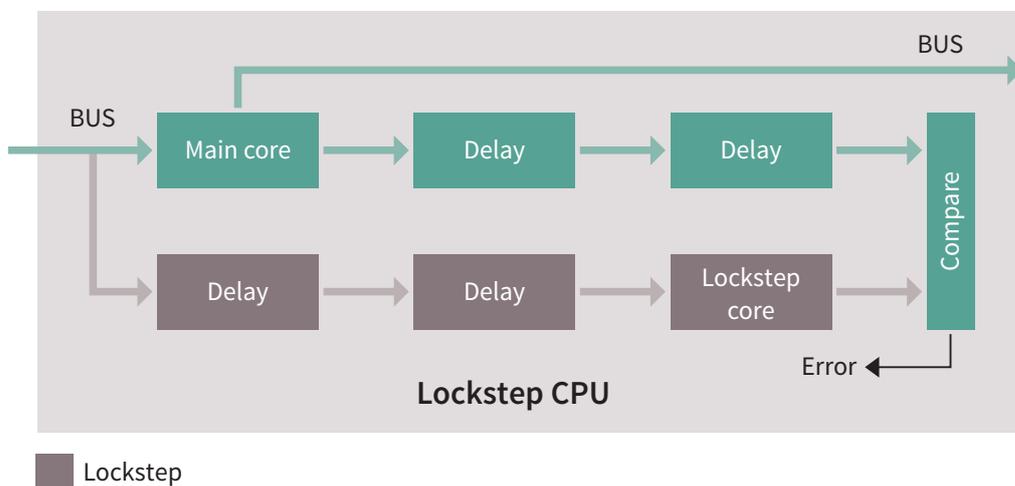
Key benefits

- › Connection expansion for small packages; Increased application case coverage for motor control, power conversion, etc.; peripheral/ port-to-peripheral/port
- › Multiple and parallel interrupt generation from port pins; Conditioning of interrupts with internal signals
- › Real-time conditioning of external signals; Logical functions between peripherals, e.g.: AND, OR



Infineon® diverse lockstep concept

- › Lockstep architecture designed to control and mitigate common cause factors
 - Physical isolation
 - Instruction-level execution diversity: 2-cycle delay
 - Circuit-level design and timing diversity
- › Layout-level diversity
- › Diversity controlled and verified by state-of-the-art design methods
- › Special design of clock and reset networks
- › Careful design of lockstep comparator
- › Main core and diverse lockstep core run the same software in parallel to detect computational errors
- › Like normal locksteps, both cores are physically separated and have a time delay between their execution
- › Diverse lockstep core has been additionally transformed to provide architectural hardware diversity and further reduce common cause failures



AURIX™ family communication innovation

AURIX™ Multi-CAN/CAN FD

- › Up to 20 CAN nodes with FD support available
- › CAN standard V2.0 B active
- › AURIX™ family support ISO 11898-1 DIS 2015
- › Resonator ready with asynchronous operation and choice of clock source
- › Frequency scaling without baud rate change
- › Energy saving: pretended networking and partial networking (ISO 11898-6 transceiver support)
- › Support (also in CAN FD mode)
- › Safety support: countable total amount of bus errors
- › Message objects can be freely assigned among the nodes
- › Configurable FIFO length, automatic gateway mode support
- › Acceptance mask filtering for each message object



Peripheral highlights

AURIX™ Ethernet module

Key highlight features

Ethernet MAC filter

- › MAC/VLAN/protocol filter for fast frame processing

QoS

- › 8 queues/DMAs for frame separation
- › 4 transmit/4 receive
- › IEEE 802.1AS (for IEEE 1588-2008)
- › Shapers for bandwidth control
 - 802.1 credit-based shaper
 - Time-aware shaper

Interfaces

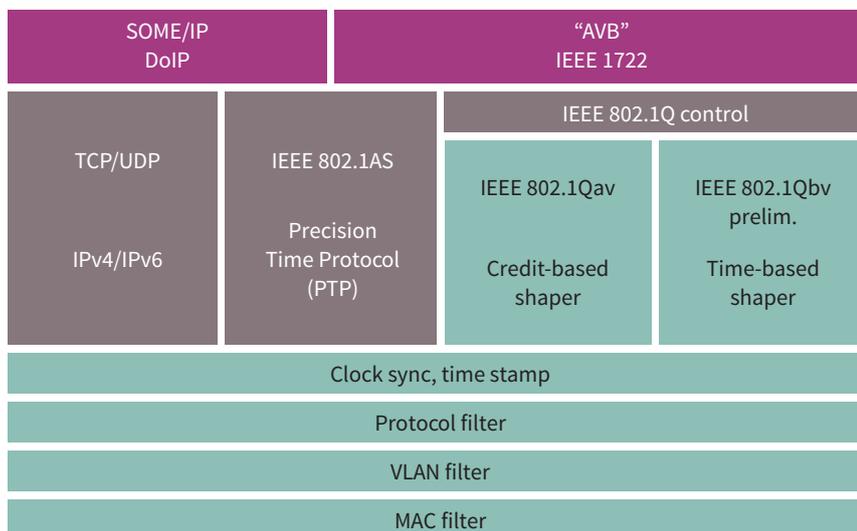
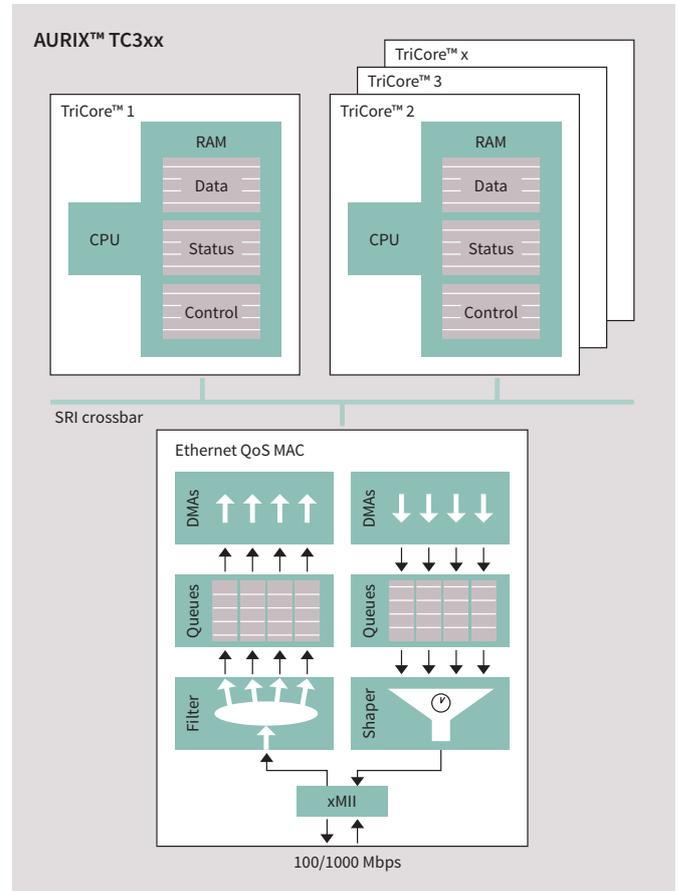
- › MII/RMII for 100 MBaud
- › RGMII for 1 GBaud

Freedom from interference

- › DMA operation → separated by hardware
- › No impact of queue operation on other queues, DMA's etc.
- › Independent control of each queue
- › Status/control in RAM → fast direct stack access

“Remote DMA” – fast data copy – RAM to RAM

- › Data transfer by DMA with no CPU required for transfer
- › Transfers triggered by hardware or by software
- › Transfers are hardware protected (in AURIX™)
- › Full-duplex transfers, low latency mode
- › All Ethernet standards and conformance tests are valid

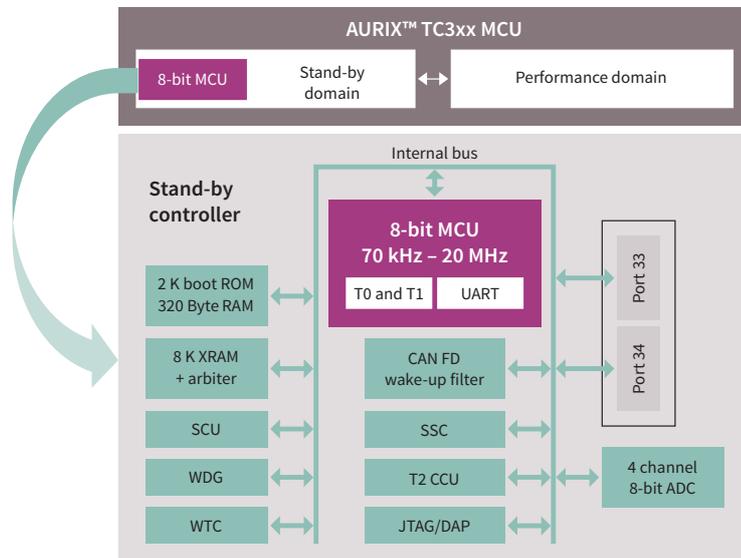


- Software implementation, “Stacks”
- Hardware implementation, available in AURIX™ TC3xx



AURIX™ TC3xx stand-by controller

Low power consumption, higher energy efficiency, easy implementation



Features and benefits

- > Feature available across whole AURIX™ TC3xx family
- > Integrated 8-bit MCU (ISO 26262 QM module)
- > Stand-alone operation
 - Separate power supply at core and IOs
 - Separate clock
 - Separate GPIOs
- > Standard tooling support enabling fast design-in
- > Real-time clock for periodic wake-up
- > Flexible choice of peripherals: LIN/SPI
- > Shared I/O with performance domain
- > Extremely low current consumption ~ μ A range

Application recommendation

- > **Enhanced availability:** continue a limited set of functions while the main CPUs are rebooting after a reset (typ. watchdog reset)
- > **Steering and braking comfort:** temporary torque supply during main MCU
- > **Stand-by operation:** extremely low-power operation while the vehicle is parked
- > **(H)EV battery management:** monitor the battery's state-of-health and charge over a long parking period, e.g. vacation
- > **Keyless-go:** trigger main MCU for key communication
- > **Fuel leakage supervision:** on-board diagnostics and monitoring of tank pressure, e.g. while parked

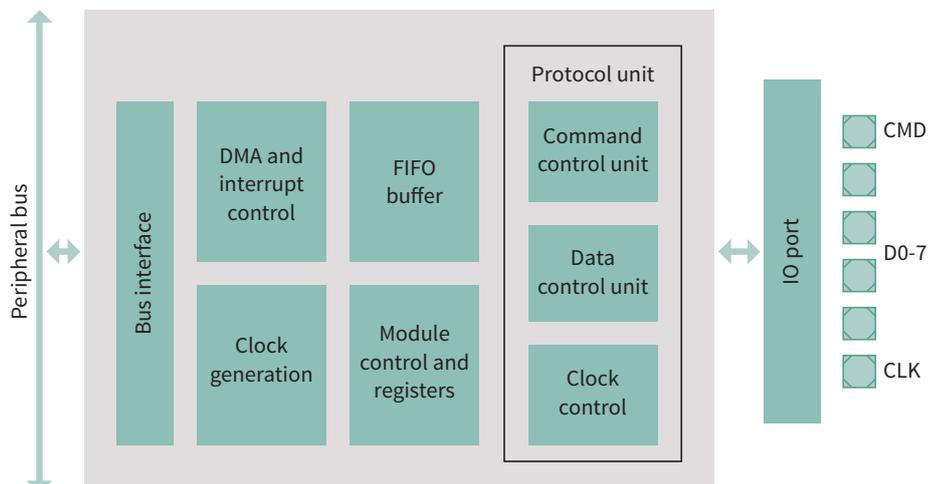
eMMC/SDIO interface on

2 standard protocols supported

- > SDIO 2.0
 - 6 pins: 4 data, CLK, CMD
 - 3.3 V, 50 MHz max. clock
- > eMMC
 - 10 pins: 8 data, CLK, CMD
 - 3.3 V, 20 MHz

Use cases

- > External serial NAND-flash
- > Wi-Fi modems
- > Camera modules



Peripheral highlights

AURIX™ Generic Time Module (GTM)

Aimed to accommodate any kind of timer applications, the AURIX™ Generic Time Module (GTM) is a highly scalable and configurable timer designed with an architecture philosophy where dedicated hardware submodules are located around a central routing unit (called Advanced Routing Unit (ARU)). By combining several sub-modules through the ARU, complex functions can be established, while relieving the CPU or a peripheral core from a high interrupt load.

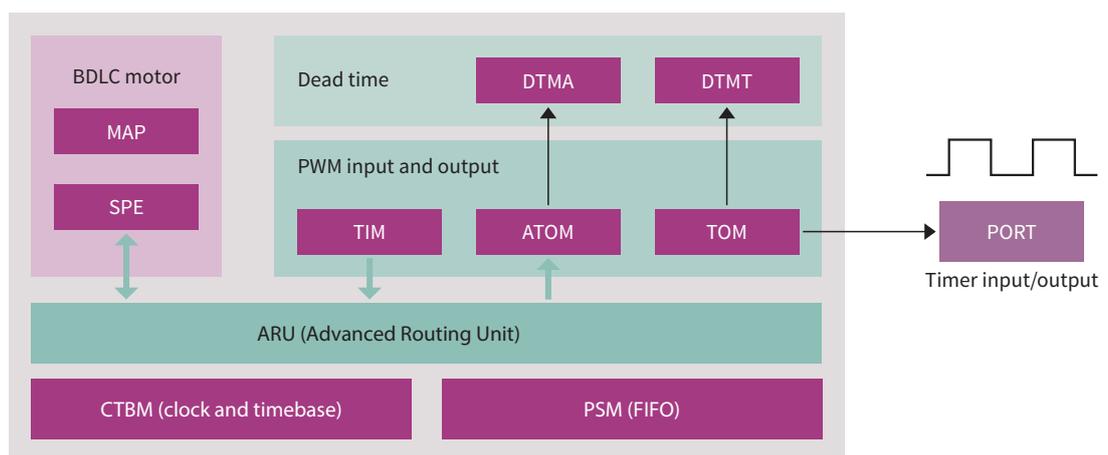
This AURIX™ feature can be extensively used in industrial applications, especially regarding the generation of signals for controlling a motor or acquisition of digital signals with the respective filtering.

AURIX™ GTM key features

- > Dynamic PWM generation with up to 24 bits resolution and 10 ns granularity.
- > Dedicated module for asymmetric Dead Time Generation (DTM)
- > Brushless DC motor control using block commutation mode
- > Provide common time base for system, enabling events synchronization in different sub-modules within GTM
- > Multiple capture/compare of external signals and combination with time stamps
- > Digital signals filtering and characterization

AURIX™ TC3xx family GTM innovations

- > Maximum operation frequency extended up to 200 MHz
- > GTM architecture divided in cluster
- > Up to 12 selectable GTM output resources connected to each port
- > 5 triggers towards ADC
- > Implemented a new multiplexer to connect port and ADC signals to DTM
- > Added new configurable scheduling schemes to the ARU



AURIX™ safety features

As today's systems become increasingly complex by the use of electrical and electronic controls such as Microprocessors and programmable logic controllers, the likelihood of these failing or malfunctioning also increases. Safety standards such as IEC 61508 and ISO 26262, mandate more robust products and functional safety concepts for automotive and industrial applications. The AURIX™ architecture is designed in accordance with ISO 61508 compliant process to efficiently meet SIL 3 requirements. The platform uses up to four cores in a diverse lockstep architecture combined

with cutting-edge safety technology, such as safe internal communication buses or a distributed memory protection system. Innovative encapsulation techniques allow the integration of software with various safety levels from different sources, thereby significantly reducing system complexity. Thanks to this optimized approach, multiple applications and operating systems are seamlessly hosted on a unified platform. This leads to productivity gains of up to 30%, resulting in a smaller development outlay and reduced time-to-market for our customers.



Infineon quality management system
Zero Defect culture



AURIX™ security features

AURIX™ security hardware

Infineon's AURIX™ 32-bit microcontroller family, with its embedded Hardware Security Module (HSM), is a perfect fit for industrial applications where secure communication is required. Infineon not only offers a scalable portfolio of compatible AURIX™ devices with integrated HSM, but also the necessary software packages and support services. Furthermore, a best-in-class solution for security can be achieved by combining AURIX™ microcontrollers with an Infineon embedded SIM (eSIM) and Infineon tamper-proof secure elements (TPM).

AURIX™ Hardware Security Module (HSM)

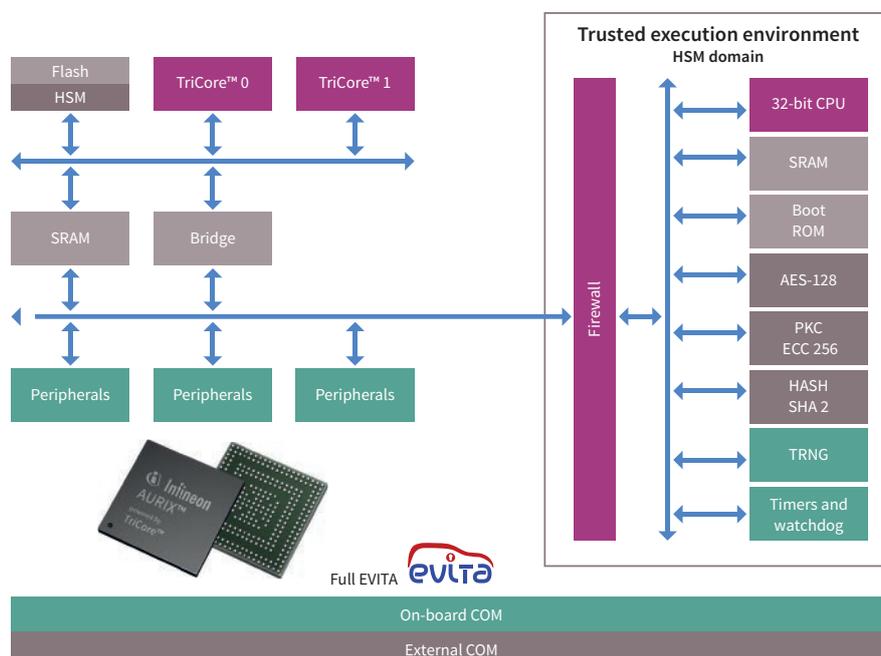
HSM provides a secure computing platform, consisting of a 32-bit CPU, special access-protected memory for storing the cryptographic keys and unique subscriber identifiers and dedicated hardware accelerators for the many industrial use cases. A firewall separates HSM from the rest of the AURIX™ microcontroller.

The AURIX™ hardware security module offers a highly flexible and programmable solution based on:

- › Crypto and algorithm agility via software to support customer-specific solutions powered by a 32-bit CPU
- › AIS31-compliant True Random Number Generator (TRNG) with high random entropy over lifetime
- › State-of-the-art AES-128 hardware accelerator
- › State-of-the-art PKC ECC 256 hardware accelerator for asymmetric encryption (only 2nd generation AURIX™ HSM)
- › State-of-the-art HASH SHA2-256 hardware accelerator for hashing (only 2nd generation AURIX™ HSM)
- › Secured key storage provided by a separated HSM-SFLASH portion. Alternative secure key storage feasible in dedicated HSM-PFLASH sections.

Customer benefits

- › **Secured platform** – HSM provides a secured platform, separated from the rest of the microcontroller by a firewall, thereby creating a trusted execution environment.
- › **Backward compatibility** – AURIX™ security solutions are backward compatible with the security implementations in previous TriCore™ based microcontroller families. Furthermore, the 2nd generation AURIX™ HSM is backward compatible with the 1st generation HSM.
- › **Security differentiation** – customized secure OEM or Tier 1 crypto apps can be processed within a trusted HSM execution environment, therefore allowing an independent HSM-specific software code review with reference to the huge application host software from multiple parties. This helps to harden the security level by reliably avoiding potential security backdoors.
- › **Convergence of security and safety** – AURIX™ microcontrollers address both functional safety as well as IT-security requirements, making sure they are properly integrated and don't conflict with one another.
- › **Secured failure analysis** – AURIX™ HSM offers a 256-bit password for debugger access protection to prevent unauthorized access to the debugging resources.



Ease of use

Solution finder

Infiniteon solution finder is an easy to use online tool for finding, comparing and buying semiconductor products in an application context visualized by block diagrams and combined with electrical and thermal simulations powered by Infineon Designer, PLECS and PowerEsim. Currently it covers motor control and drives from different industries with fo-

cus on power semiconductor and controller, Switched Mode Power Supplies (SMPS), LED lighting and DC-DC Point of Load (PoL) converters. You can choose the suitable AURIX™ TC2xx or XMC™ device according to the application, industry and parameters that you are looking for, in the different filters and solutions that this tool is providing.

Solution finder – check solutions (PLECS)

Integration level **List of suggested solutions** **Compare** **Trade-off ratings** **Actions**

Integration Level	Category & Product	Chip Count	Footprint [mm ²]	Design Target	Price Indication	Actions
Discrete	Controller: 1 x SAK-TC277TP-64F200N DC Gate driver: 3 x 2ED02006-FI + Show more...	13	2609.44	Flexible to design	\$	[Download] [Simulation] [Compare] [Buy]

List of alternative products

Product	Datasheet	Simulation	OPN	Product Status	Package name	Peripheral (macro)	Instruction Set Architecture
<input checked="" type="checkbox"/> SAK-TC277TP-64F200N DC	Download	no	TC277TP64F200NDCKXUMA1	active and preferred	PG-LFBGA-292	A/D Converter DSP Unit (e.g. MAC) On-chip Clock Generation On-chip Voltage Regulator Real Time Clock (RTC) Floating Point Unit Watchdog Timer Oscillator Watchdog	TriCore™ v1.6P (32-bit) TriCore™ v1.8E (32-bit)
<input type="checkbox"/> SAL-TC277TP-64F200N DC	Download	no	TC277TP64F200NDCLXUMA1	active and preferred	PG-LFBGA-292	A/D Converter	TriCore™ v1.6P (32-bit) TriCore™ v1.8E (32-bit)
<input type="checkbox"/> SAL-TC275TP-64F200N DC	Download	no	TC275TP64F200NDCLXUMA1	active and preferred	PG-LQFP-176	A/D Converter	TriCore™ v1.6P (32-bit) TriCore™ v1.8E (32-bit)
<input type="checkbox"/> SAK-TC275TP-64F200N DC	Download	no	TC275TP64F200NDCKXUMA1	active and preferred	PG-LQFP-176	A/D Converter	TriCore™ v1.6P (32-bit) TriCore™ v1.8E (32-bit)
<input type="checkbox"/> SAL-TC270TP-64F200N DC	Download	no	TC270TP64F200NDCLX2SA1	on request	S-B0WB0-0	A/D Converter	TriCore™ v1.6P (32-bit) TriCore™ v1.8E (32-bit)

Selected solutions **Actions to report, partner and buy**

Integration Level	Category & Product	Chip Count	Footprint [mm ²]	Design Target	Price Indication	Actions
Discrete	Controller: 1 x SAK-TC277TP-64F200N DC Gate driver: 3 x 2ED02006-FI Discrete Switch: 6 x IK250N05E85 Sensor: 3 x TLV4908-1TA	13	2609.44	Flexible to design	\$	[Download] [Simulation] [Compare] [Buy]

Solution architecture **Evaluation board (detailed BOM)**

Roll over the block diagram for detailed product information and links.

Integrated in one housing

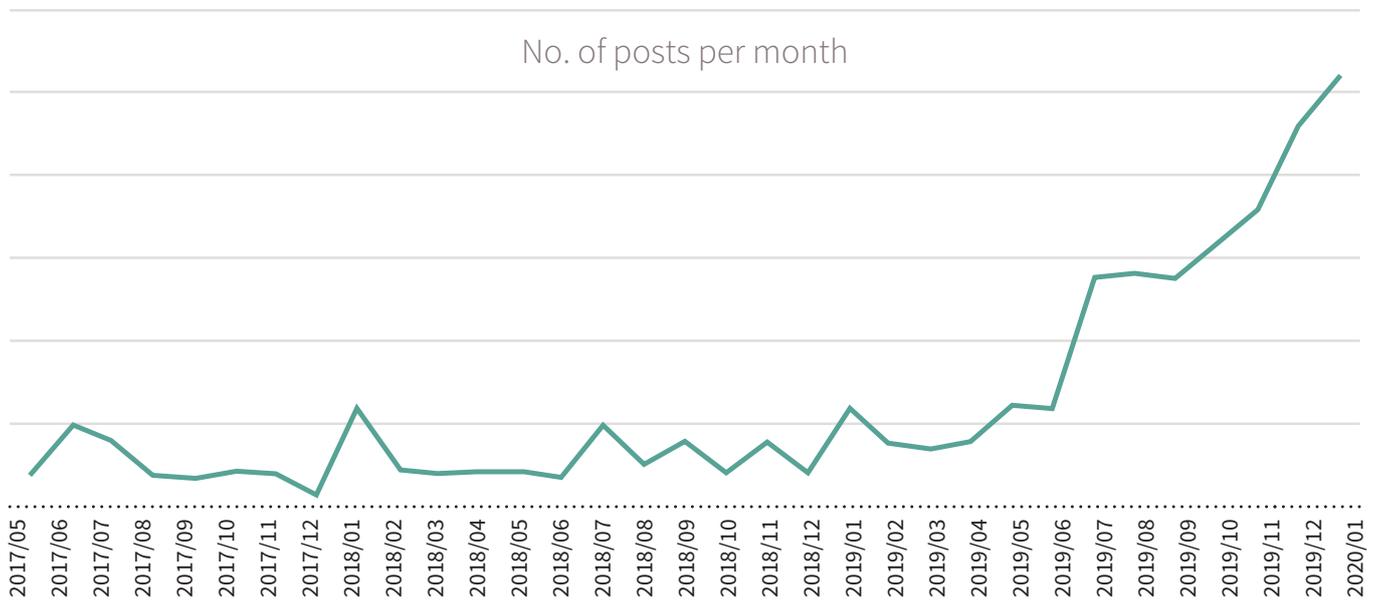
Ease of use

AURIX™ forum

Following the strategy of going wider to the mass market for AURIX™ TC2xx and AURIX™ TC3xx. The AURIX™ Forum came as the first platform of support for our mass market and core account customers. We strongly improved the maintenance of the forum, as it supports the customers to find answers quickly by themselves.

We provided FAQs about the most critical topics, which has strongly increased the traffic in our AURIX™ forum.

Now our customers can find the support needed in our forum.



- > A maintained forum helps customers to find answers quickly by themselves
- > Fundamental support to the mass market customers
- > Promoting materials, trainings, banners & products as support to the mass market customers

Ease of use

Artificial intelligence in AURIX™ TC3xx

Artificial Intelligence is not limited to high end applications anymore and has entered the embedded world within the last decade. We enter a new era of innovation possibilities for the automotive industry, where AI brings much more than the well-known automated driving, with solutions regarding connected cars or safety concerns, among others. AURIX™ performances enable optimizing AI algorithms to face the challenge growing amount of data vs. communication and processing technology.

Partnership



Teraky's Intelligent Signal Processing product running on AURIX™ TC3xx presented at OktoberTech2019. Simultaneously processes 50 signals and reduces the data by 95% at low latency and low percentage of CPU capacity.

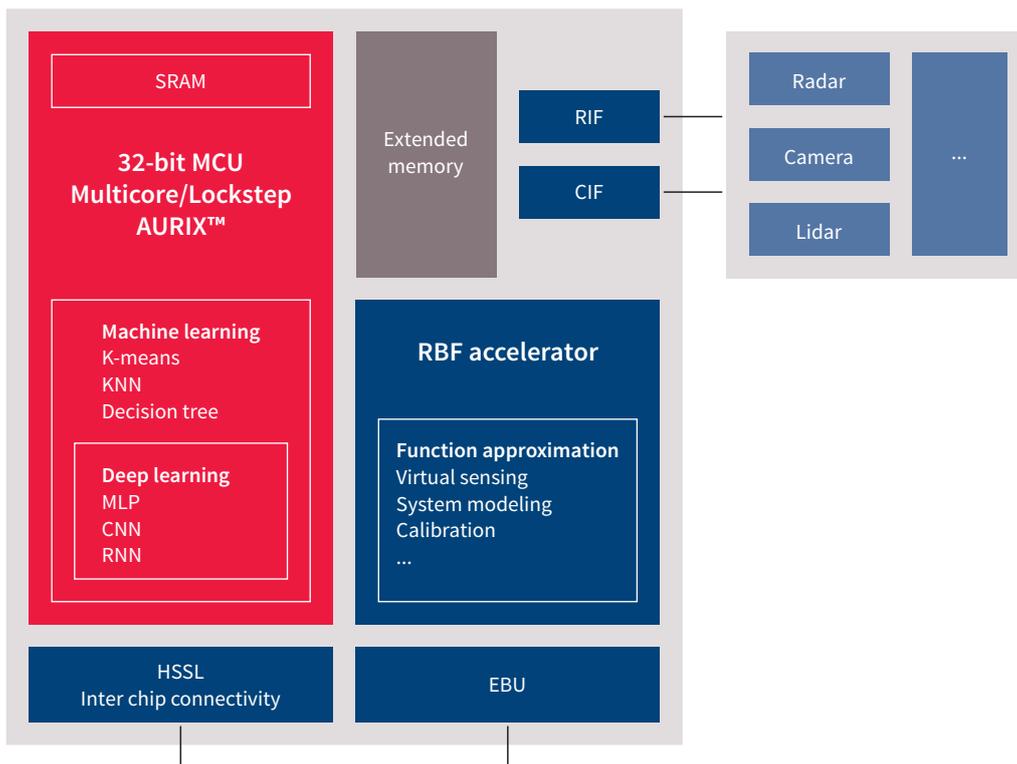
Key benefits

- > Up to 6.9 MB SRAM
- > Up to 1.8 GMACs
- > Up to 6 CPUs @ 300 MHz
- > DSP capability up to 1.8 GFLOPS
- > Up to 4000 DMIPS (with 2400 DMIPS ASILD)
- > Low power consumption

Suggested products

- > TC39x

System diagram



Kits and evaluation boards

XMC4800 automation board V2 – explore XMC4800 microcontroller based on ARM® Cortex®-M4

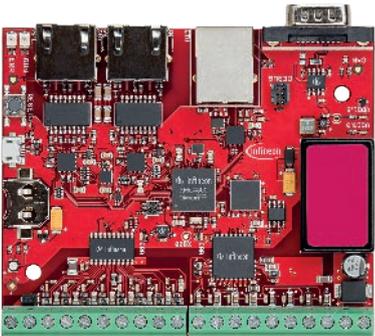
The XMC4800 automation board V2 utilizes Infineon’s industry leading XMC™ ARM® Cortex®-M4 microcontroller in combination with Infineon supply, interface, communication and safety products. The XMC4800 automation board V2 is designed to evaluate the capabilities of the XMC4800 microcontroller especially in EtherCAT® slave applications and can be used with a wide range of development tools including Infineon’s free of charge Eclipse based IDE, DAVE™.

Key features

- › XMC4800-E196 MCU based on ARM® Cortex®-M4 at 144 MHz
- › EtherCAT® slave controller, 2 MB flash and 352 KB RAM
- › OPTIGA™ Trust E embedded security solution (CC EAL6+)
- › Real-time clock crystal
- › SPI FRAM (64 kB non-volatile memory)
- › EtherCAT® slave node (2 EtherCAT® PHY and RJ45 Jacks)
- › 24 V ISOFACE™ 8-channel inputs and 8-channel outputs
- › CAN transceiver
- › CAN transceiver

Customer benefits

- › Complete automation kit gateway
- › Combined MCU with EtherCAT® slave application
- › Isolated interfaces w/ diagnose
- › Ethernet connectivity with soft ware examples available
- › 24 V supply
- › CAN connectivity
- › Full software

XMC4800 automation board V2	Type	Description	Ordering code
 <p>Ordering code: KIT_XMC48_AUT_BASE_V2</p>	KIT_XMC48_AUT_BASE_V2	The XMC4800 Automation Board V2 utilizes Infineon’s industry leading XMC ARM® Cortex®-M4 microcontroller in combination with Infineon supply, interface/communication and safety products.	KITXMC48AUTBASEV2TOBO1
	XMC4800-E196K2048	ARM® Cortex®-M4 microcontroller	XMC4800E196K2048AAXQMA1
	ISO2H823V2.5	24 V 8-channel isolated output	ISO2H823V25XUMA1
	ISO1I813T	24 V 8-channel isolated input	ISO1I813TXUMA1
	SLS 32AIA020A4 USON10	OPTIGA™ Trust E – embedded security solution	SLS32AIA020A4USON10XTMA2
	TLE6250GV33	Infineon CAN transceiver	TLE6250GV33XUMA1
	IFX54441LDV	Infineon voltage regulator	IFX54441LDVXUMA1

XMC™ digital power explorer kit

The new digital power explorer kit is designed with the particular goal of making it easy for engineers to take the first steps into digital power control with XMC™ microcontrollers. It showcases both XMC™ families Cortex®-M microcontrollers: XMC4000 and XMC1000, 30 V dual N-channel OptiMOS™ MOSFETs and IRS2011S gate drivers. The kit includes two different control card options, XMC1300 control card (ARM® Cortex®-M0) and XMC4200 control card (ARM® Cortex®-M4F), which allow designers to evaluate both XMC™ microcontroller families and make the right price/performance choice for their application.

Key features

- › Synchronous buck converter evaluation kit controlled with XMC4200 or XMC1300 ARM® Cortex®-M microcontrollers
- › On-board resistive load banks
- › Featuring BSC0924NDI dual N-channel OptiMOS™ and IRS2011S high and low-side gate driver
- › Different control schemes possible
 - Voltage mode control
 - Peak current mode control (with slope compensation)

Customer benefits

- › Easy entry in digital power control applications
- › Understand the details of voltage/peak current control and how to extract the maximum of XMC™ devices
- › DAVE™ v4 APPs for buck converter and much more examples

XMC™ digital power explorer kit	Specification		Infineon components	
 <p>Ordering code: KITXMCDP01TOB01</p>	V_{IN}	12 V DC	MCU	XMC4200 or XMC1300
	V_{OUT_nom}	3.3 V DC	MOSFETs	OptiMOS™ BSC0924NDI
	I_{OUT}	2 A	MOSFET HB driver	IRS2011S
	P_{OUT}	6 W		

Kits and evaluation boards

100 W motor drive evaluation board with FOC sensorless control

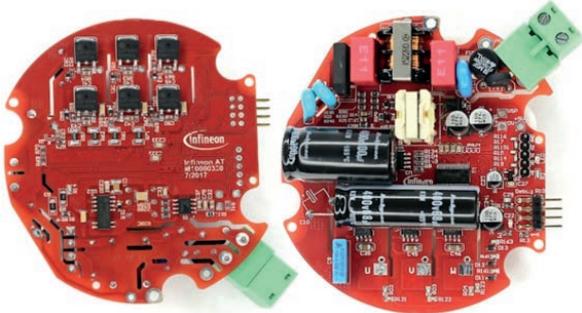
The EVAL_100W_DRIVE_CFD2 motor drive board does not only offer a sensorless synchronous rectification BLDC/PMSM control algorithm to reduce reverse-current hard-commutation stress, but also gives the user the option to change switching frequency up to 20 kHz and to choose between two-phase or three-phase modulation, which helps reduce switching losses.

Summary of features

- > Sensorless field orientated BLDC control (FOC)
- > Best-in-class high voltage MOSFETs for hard commutation topology [B6 inverter]
- > Low bill-of-material cost contributed by CoolMOS™ CFD and XMC™ algorithm
- > Quasi-resonant CoolSET™ offers lower EMI and higher efficiency
- > Graphical User Interface (GUI) allowing ease-of-use

Summary of benefits

- > High efficiency
- > Cost effective
- > Simplified design
- > Near to productive solution

EVAL_100W_DRIVE_CFD2	Configuration	Description
 <p data-bbox="212 1653 608 1682">Ordering code: EVAL100WDRIVECFD2TOB01</p>	<p data-bbox="738 1290 954 1440">IPD65R1k4CFD 2EDL05N06PF ICE5QR4770AG XMC1302-T038X0200 AB FX1763XEJ V50 BAT54W</p>	<p data-bbox="1013 1290 1457 1491">The EVAL_100W_DRIVE_CFD2 motor drive board does not only offer a sensorless synchronous rectification BLDC/PMSM control algorithm to reduce reverse-current hard-commutation stress, but also gives the user the option to change switching frequency up to 20 kHz and to choose between two-phase or three-phase modulation, which helps reduce switching losses.</p>

600 W LLC digital control

600 W LLC digital control evaluation board shows how to design the half-bridge LLC stage of a server SMPS with the target to meet 80+ Titanium standard efficiency requirements. On this purpose the latest CoolMOS™ technologies, 600 V CoolMOS™ C7 or P6 power MOSFET have been applied on the primary side, and OptiMOS™ low voltage power MOSFET in SuperSO8 BSC010N04LS, in the synchronous rectification secondary stage in combination with QR CoolSET™ ICE2QR2280Z, hi-low-side driver 2EDL05N06PF, low-side gate driver 2EDN7524F and a XMC4200 microcontroller.

Key features

- > 600 W LLC half-bridge stage with synchronous rectification (SR)
- > All controlled with XMC4200 including:
 - Start up (PWM to PFM) and burst mode algorithms
 - Adaptive dead time and capacitive mode detection
 - No hard commutation at any condition

Customer benefits

- > Learn LLC topology with a complete system solution from Infineon
 - Hardware and software available
- > Close to customer solution
 - High efficiency → 97.8 %
 - Reliability and power density

600 W LLC digital control	Specification		Infineon components	
 <p>Ordering code: EVAL600W12VLLCCFD7TOBO1</p>	V_{IN}	350–410 V DC	MCU	XMC4200 (VQFN-48)
	V_{OUT_nom}	12 V DC	MOSFET SR	BSC010N04LS
	I_{OUT}	50 A	HB driver	2EDL05N06PF
	P_{OUT}	600 W	LLC HB MOSFET	CoolMOS™ IPP60R190P6
	f_{res}	157 kHz	Auxiliary PSU	ICE2QR2280Z

Kits and evaluation boards

XMC™ starter kits

Xtreme2go

KIT_XMC_2GO_XTR_XMC1400

- › XMC1400 family kit with ADAFRUIT, MikroE and Shields2Go connectivity. Extension for IoT and other cloud applications.
- › **Click on the following to find/purchase the kit:**
www.infineon.com/Xtreme2go
- › The XMC1400 series devices are optimized for motor control, power conversion and LED Lighting applications and Human-Machine Interface (HMI)



Platform2go XMC4400

KIT_XMC_PLT_2GO_XMC4400

- › Equipped with an ARM® Cortex®-M4 based XMC™ microcontroller, the XMC4400 Platform2Go is designed to evaluate the capabilities of Infineon's XMC4400 microcontroller. It can be used with a wide range of development tools including Infineon's free of charge Eclipse based IDE DAVE™
- › **Click on the following to find/purchase the kit:**
www.infineon.com/XMC4400platform2go
- › This kit has the XMC4400 device with debugger plus Ethernet, CAN, Arduino, MikroBUS and Shields2Go form factor.



XMC1400 Arduino

KIT_XMC1400_ARDUINO

- › This kit utilizes Infineon's industry leading ARM® Cortex®M0 microcontroller in combination with Arduino form factor.
- › **Click on the following to find/purchase the kit:**
www.infineon.com/xmc1400_ARDUINO
- › It can be used with a wide range of development tools including Infineon's free of charge Eclipse based IDE, DAVE™ and much more.



Platform2go XMC4200 KIT_XMC_PLT 2GO_XMC 4200

- › Equipped with an ARM® Cortex®-M4 based XMC™ microcontroller from Infineon Technologies AG, the XMC4200 Platform2Go is designed to evaluate the capabilities of Infineon's XMC4200 microcontroller.
- › **Click on the following to find/purchase the kit:**
www.infineon.com/XMC4200platform2go
- › It can be used with a wide range of development tools including Infineon's free of charge Eclipse based IDE DAVE™
- › This kit has the XMC4200 device with debugger plus CAN, Arduino, MikroBUS and Shields2Go form factor.



RGB LED lighting shield KIT_XMC_LED_DALI_20_RGB

- › One of the first intelligent evaluation boards compatible with Arduino as well as Infineon's XMC1100 BOOT KIT.
- › Designed to be easily configurable and combinable for different LED light engines and lamps, for fast prototyping and in-expensive evaluation of LED lighting applications.
- › The RGB LED lighting shield with XMC1302 uses a DC-DC buck topology.
- › **Click on the following to find/purchase the kit:**
www.infineon.com/cms/en/product/evaluation-boards/kit_xmc_led_dali_20_rgb/



Kits and evaluation boards

AURIX™ TC2xx – starter kits

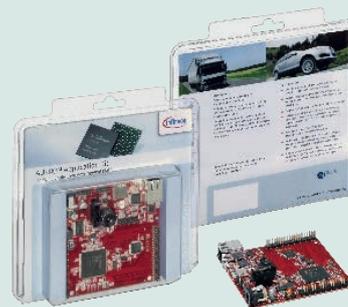
AURIX™ TriBoards kits

- › Full evaluation board for development to write and debug your 1st programs
- › Includes getting started advice, free TriCore™ entry tool chain, technical documentation, compiler and debugger
- › TriBoard available for every silicon



AURIX™ TFT kits

- › Low cost board for early evaluation with limited access to signals
- › Additional touchscreen display for convenient handling
- › TFT board available for every silicon
- › **Click on the following to find/purchase the kit:**
www.infineon.com/aurix-kits



Arduino ShieldBuddy kit

- › The Hitex TC275 ShieldBuddy follows the Arduino standard
- › Compatible with 100's of Arduino application shields
- › Evaluation licenses available
- › Ideal for getting started on a high-end real time embedded industrial or automotive application as well as students and hobbyists



AURIX™ lite kit

- › AURIX™ TC275 device in LQFP-176 package
- › FTDI based debugger with micro USB
- › Use of Arduino Uno/compatible platform
- › Coming soon

NEW

Kits and evaluation boards

AURIX™ TC2xx – application kits

Motor control

KIT_AURIX_TC234_MOTORCTR

- › TC234 application kit with TFT display incl. safety supply TLF35584
- › Driving of a 3-phase PMSM/BLCD (12 V/max. 50 W)
- › BLDC motor from Nanotec integrated
- › Software available with flexible configuration
- › **Click on the following to find/purchase the kit:**
www.infineon.com/cms/en/product/evaluation-boards/kit_aurix_tc234_motorctr/



24 GHz radar

KIT_ATV_24GHZ_RADAR

- › Range-Doppler radar system with two Rx antennas and one Tx antenna based on AURIX™ TC264DA and BGT24ATR12
- › **Click on the following to find/purchase the kit:**
www.infineon.com/cms/en/product/evaluation-boards/kit_atv_24ghz_radar/
- › Allows implementation and testing of 24 GHz radar applications as Doppler movement detectors, FSK or FMCW range/position measurement



Wireless charging

KIT_AURIX_TC21_SC

- › Supports all fast charge smartphones
- › Unique power drive architecture minimizes EMI
- › Improved accuracy Foreign Object Detection (FOD)
- › **Click on the following to find/purchase the kit:**
www.infineon.com/cms/en/product/evaluation-boards/kit_aurix_tc21_sc/



Kits and evaluation boards

AURIX™ TC3xx – starter kits

AURIX™ 2G standard TriBoard

- › Full evaluation board for development to write and debug your 1st programs
- › Includes getting started advice, free TriCore™ entry tool Chain, technical documentation, compiler and debugger.
- › TriBoard available for all productive silicon (TC38x, TC39x)
- › Standard TriBoard availability

AURIX™ 2G TFT application kit

- › Low cost board for early evaluation with limited access to signals
- › Additional touchscreen display for convenient handling
- › Available for standard and ADAS pinout's for selected devices
- › TriBoard available for **all productive silicon (TC38x, TC39x)**
- › Basic application kit TFT availability

Arduino ShieldBuddy kit

- › The Hitex TC375 ShieldBuddy follows the Arduino standard
- › Compatible with 100's of Arduino application shields
- › Evaluation licenses available
- › **Launched at embedded world**



NEW

AURIX™ lite kit

- › AURIX™ TC375 device in LQFP-176 package
- › FTDI based debugger with micro USB
- › Coming soon

NEW

AURIX™ TC3xx – application kits

New hybrid kit for inverter applications

NEW

- > **IFX system offering:** such as power modules, gate drivers, current and position sensors to develop inverter systems
- > **Software** to start development of inverter for 3-phase motors
- > **AURIX™ 2G hardware** optimized logic board for testing different hybrid kits for inverter applications

Gateway 24 V board for CAV, bus, truck

NEW

- > Includes AURIX™ TC397 x2 with & automotive Ethernet switch Realtek RTL9047AA switch available for standard and ADAS pinout's
- > **Click on the following to find/purchase the kit:**
www.infineon.com/24Vgatewayboard
- > Rich connectivity: connect up to: 1000Base-T1, 100Base-T1 x5, CAN-FD x12, LIN x4, and FlexRay devices x4



Automotive secure gateway 12 V

NEW

- > Includes AURIX™ TC377TX with & automotive Ethernet switch Marvell 88Q5050
- > **Click on the following to find/purchase the kit:**
www.infineon.com/12Vgatewayboard
- > Rich connectivity: connect up to: 1000Base-T1 x2, 100Base-T1 x5, CAN-FD x12, LIN x2, and FlexRay devices x2



Motor control board TC3xx

NEW

- > Based on TC397
- > Software FOC (Field Oriented Control) algorithm: encoder as position sensor (GPT12)
- > 3-phase current sensing (EVADC), PWM generation (GTM), communication with drive board (QSPI) commands via TFT display (QSPI)





Applications

AURIX™ for industrial applications

AURIX™ for high-performance, multicore and safety-demanding applications

The AURIX™ 32-bit microcontroller family is based on the Infineon TriCore™ high-performance core concept and provides a highly scalable family from single core to multicore.

The AURIX™ family enables the highest integrated safe memory sizes (SRAM up to 6.9 MB and flash memory up to 16 MB) and all memory is protected by hardware Error Correction Code (ECC). The devices reach more than 600 DMIPS at clock rates of up to 6x 300 MHz and combine MCU and DSP instructions with an integrated FPU.

The integrated peripheral set is primarily targeted toward motor control and power conversion, providing high-performance ADCs, DS ADCs and a full set of diverse high-performance timers. This is one of the very few in the industry that is able to drive the upcoming three-level inverter topologies. Furthermore, the AURIX™ family supports the latest connectivity, such as Ethernet, CAN FD, FlexRay and multiple other high-speed interfaces.

Providing security and functional safety

In a global economy, IP protection and secure communication plays an increasingly important role. This demand is accounted for by the integration of special security modules providing the required means of safe key storage, along with secure boot and encryption on the hardware level. As one of the leaders in functional safety, Infineon has designed the TriCore™ MCUs to meet the growing demand for functional safety in the industrial market as specified in IEC 61508. Via our cooperation partner Hitex, Infineon offers a complete package comprising a microcontroller, safety supply with integrated watchdog TLF35584, software and documentation, achieving safety integrity levels up to SIL3.

The new generation of TriCore™-based microcontrollers – AURIX™ – provides another significant performance milestone by integrating up to six cores in one device. The multicore concept is targeted at running concurrent applications in parallel. Some of the integrated cores integrate lockstep functionality and the peripherals can be allocated to individual cores. This facilitates running a combination of safety-critical tasks, such as controlling an inverter, with non-critical tasks, such as network communication, on a single MCU.

Applications

I/O module

Sense, control, drive, communicate – these tasks are versatile and complex on the field level. However, there is a perfect I/O module for every dedicated task. Either in a cabinet on a DIN rail, in decentralized systems or as splash-proof installations – I/O modules are the backbone of every factory production line. Typically, I/O modules form compact in size, thereby providing limited PCB space, but are demanding in relation to the microcontroller features needed to fulfill their tasks.

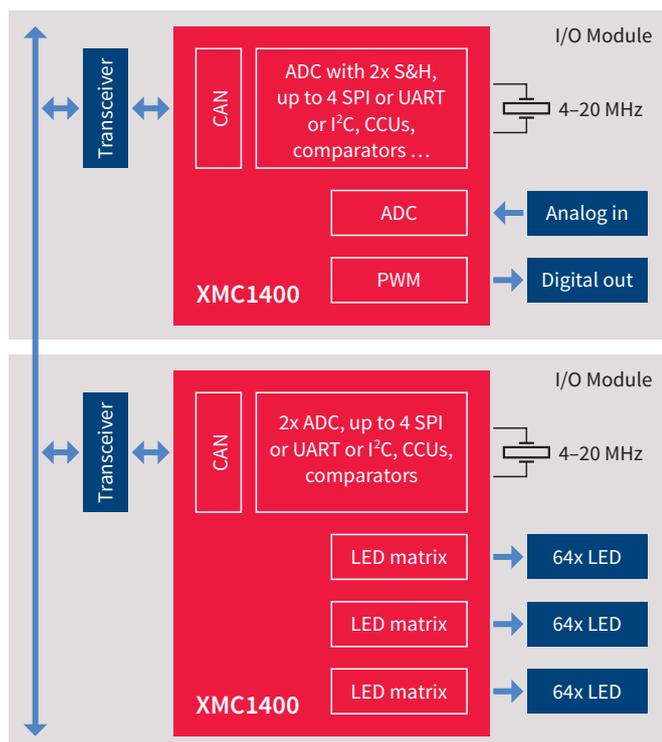
Key benefits

- > XMC1400 series
 - Up to 200 kB of flash
 - Connectivity with up to 2 CAN nodes, 4 serial channels
 - Actuator and sensor control IP
 - 12-bit ADC including 2 sample and holds
 - 4 comparators and 16 PWM channels
 - Small-footprint VQFN packages with 40 to 64 pins and 5 x 5 to 8 x 8 mm² in size.
- > XMC4300 series
 - In the event that the backbone bus requires more bandwidth than CAN or serial communication can provide, the XMC4300 is the right choice. It is equipped with integrated EtherCAT® and an outstanding 256 kB flash to 128 kB RAM ratio.

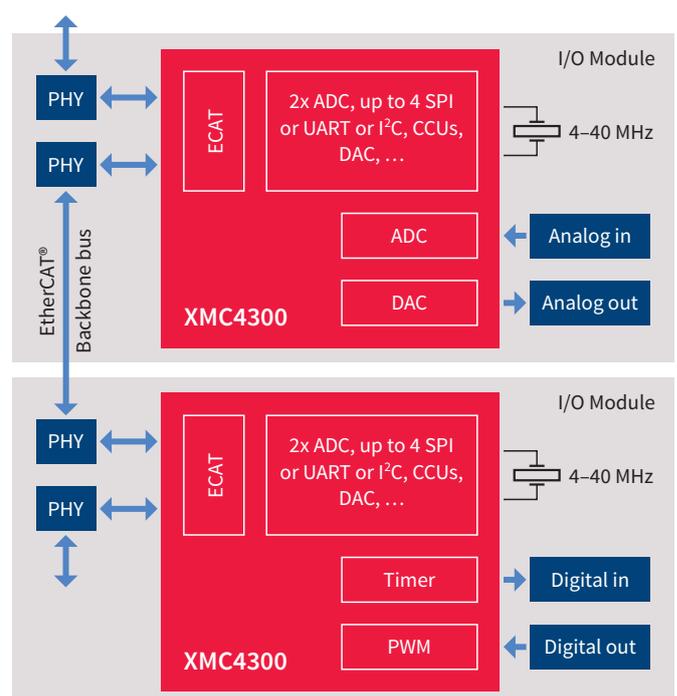
Suggested products

- > XMC14xx
- > XMC43xx
- > XMC48xx

I/O modules with CAN backbone bus



I/O modules with EtherCAT® backbone bus with PHY to PHY connection



Applications

Servo drives

Application features

- > High computing performances
- > High level of accuracy, integration and efficiency
- > Safety management in line with current norms
- > Supports a different variant of drives portfolio
- > Security features that protect intellectual property from counterfeiting

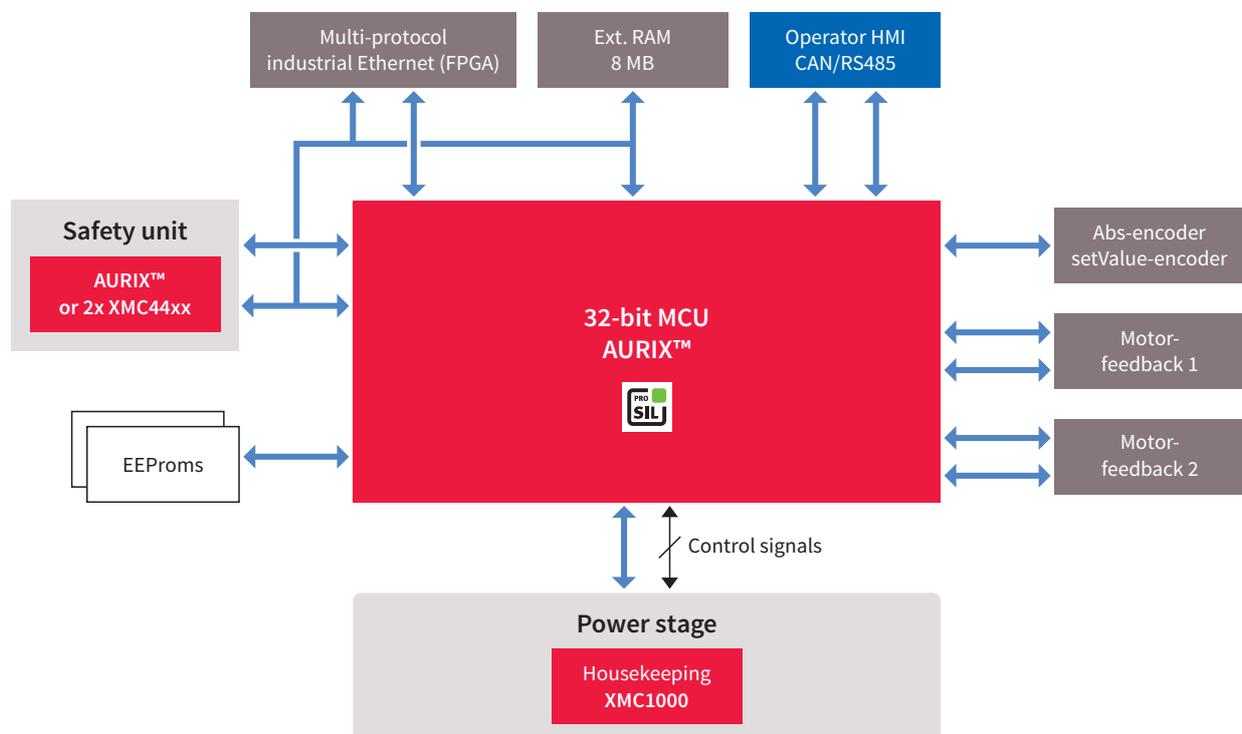
Suggested products

- > TC26x
- > TC27x
- > TC29xT
- > TC33x
- > TC36x
- > TC37x
- > TC38x
- > TC39x
- > XMC1000
- > XMC44xx

System benefits

- > Scalable portfolio
- > High computing performance thanks to multicore architecture
- > Ability to drive numerous servo motors
- > High flexibility thanks to tailored peripherals
- > Integrated safety support
- > Integrated security with hardware security module
- > Large portfolio with long-term availability

Application example



Applications

Industrial robotics

Application features

- > High computing performances
- > High level of accuracy, integration and efficiency
- > Safety management in line with current norms
- > Various topologies for axes, joints and motors
- > Security features that protect intellectual property from counterfeiting

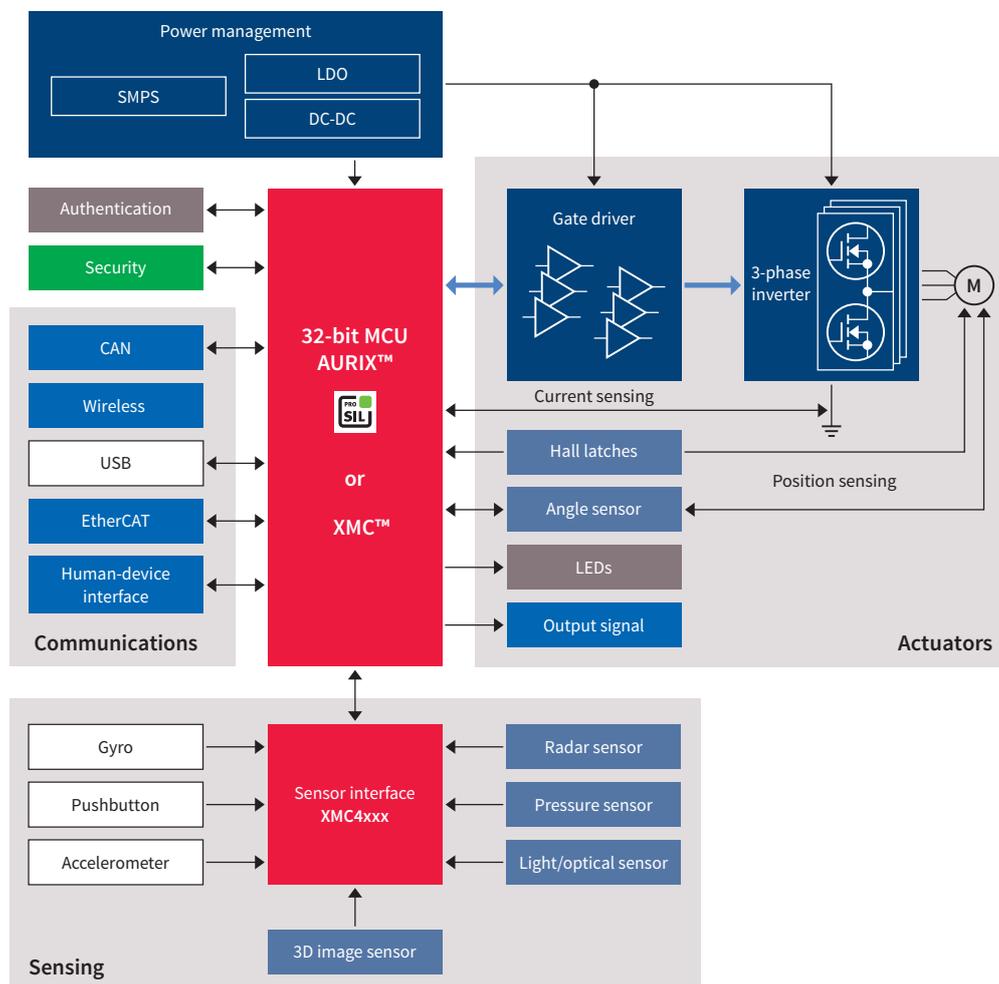
Suggested products

- > TC23x
- > TC33x
- > TC36x
- > TC37x
- > TC38x
- > TC39x
- > XMC4xxx

System benefits

- > High computing performance: up to 6x 300 MHz
- > High flexibility thanks to tailored peripherals
- > Integrated safety support (EN ISO 10218 and ISO/TS15066)
- > Integrated security with hardware security module
- > Robust 3 V-, 5 V-, LVDS – PortPins
- > Large portfolio with long-term availability

Application example



Applications

Industrial motor drives

Industrial motor drives have become more and more sophisticated over the years as they have to drive different motors, a large amount of sensors and communication requirements. But beyond those, Safety becomes key to protect the humans interacting with the machines. Therefore are various redundancy mechanisms required. This is what AURIX™ portfolio offers combined with high reliability and long lifetime management.

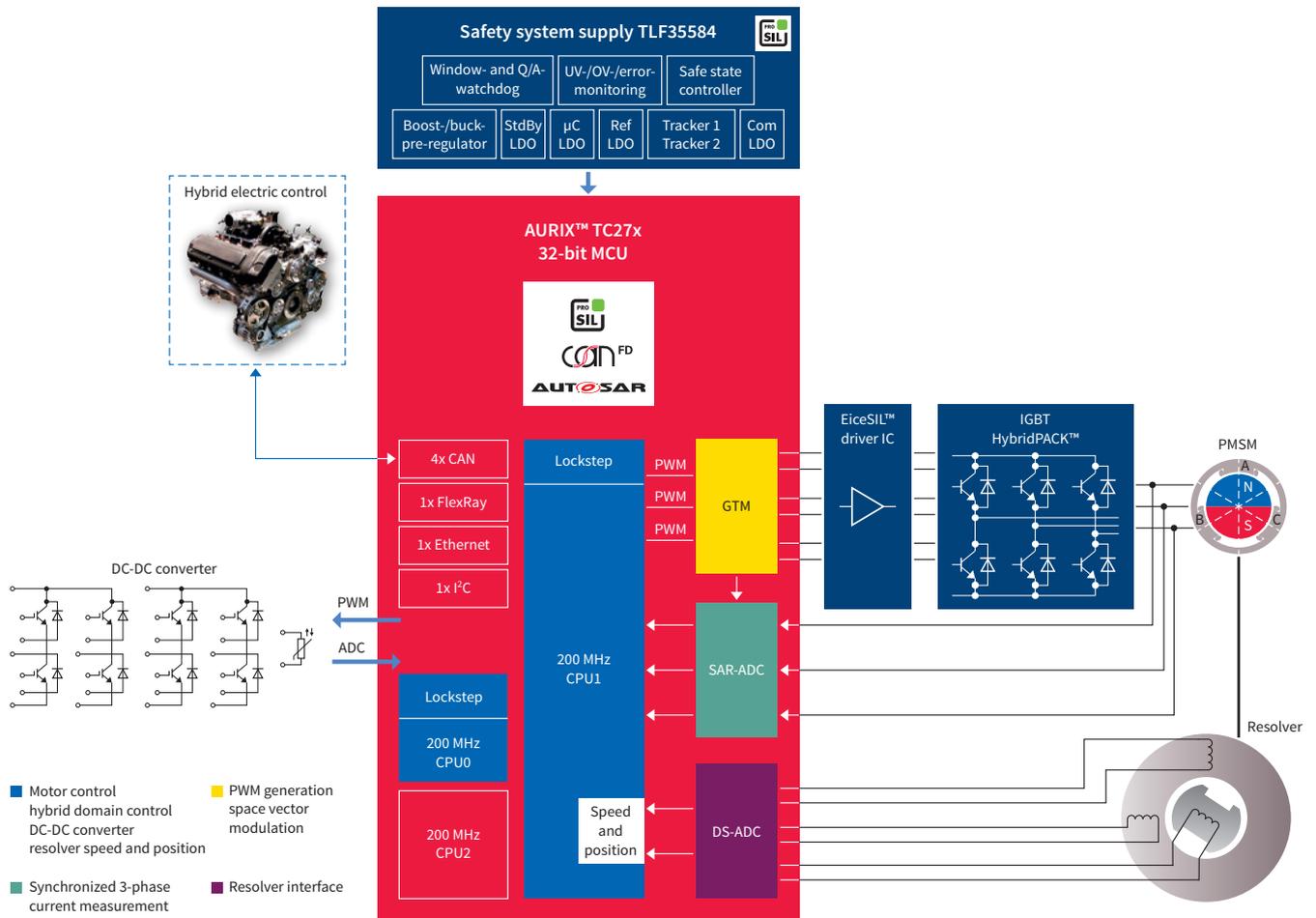
Key benefits

- > Dedicated motor control units: CCU6 & GTM for fine motor tuning
- > Redundant sensors input for safety and sensor fusion
- > DS-ADC-enabled direct resolver to microcontroller
- > Numerous ADC inputs
- > BOM saving
- > Multicore architecture to drive several motor per device
- > Emergency STOP

Suggested products

- > **TC2xx:** TC21x, TC22x, TC23x, TC26x, TC27x, TC29x
- > **TC3xx:** TC32x, TC33x, TC35x, TC36x, TC37x, TC38x, TC39x

Application example



Applications

Switched-mode power supplies

Power supply designs are subject to ever-increasing requirements. Some of them are fueled by customer demands or industry association guidelines (such as higher power density, communication, modularity or the 80 Plus Titanium efficiency standard). Whereas others are driven by the regulators (such as the EN 61000-3-2 PFC standard). These new or more stringent requirements are paving the way for the increased use of digitally controlled switched-mode power supply systems. This growth is also sometimes driven by the flexibility and modularity that MCU-based designs inherently provide.

Key features

- > Advanced and adaptive control algorithms (multiple loops, non-linear), more compact designs enabling high efficiency across a broad range of loads (titanium standard) and operating conditions (input voltage, temperature, aging)
- > Greater flexibility, enabling more costefficient platform solutions (e.g., one design for multiple power supplies, commissioning and field updates, regional specifics, etc.)
- > System monitoring and network connectivity/maintenance (e.g. hot swap or load balancing, PMBus communication, failure prediction)

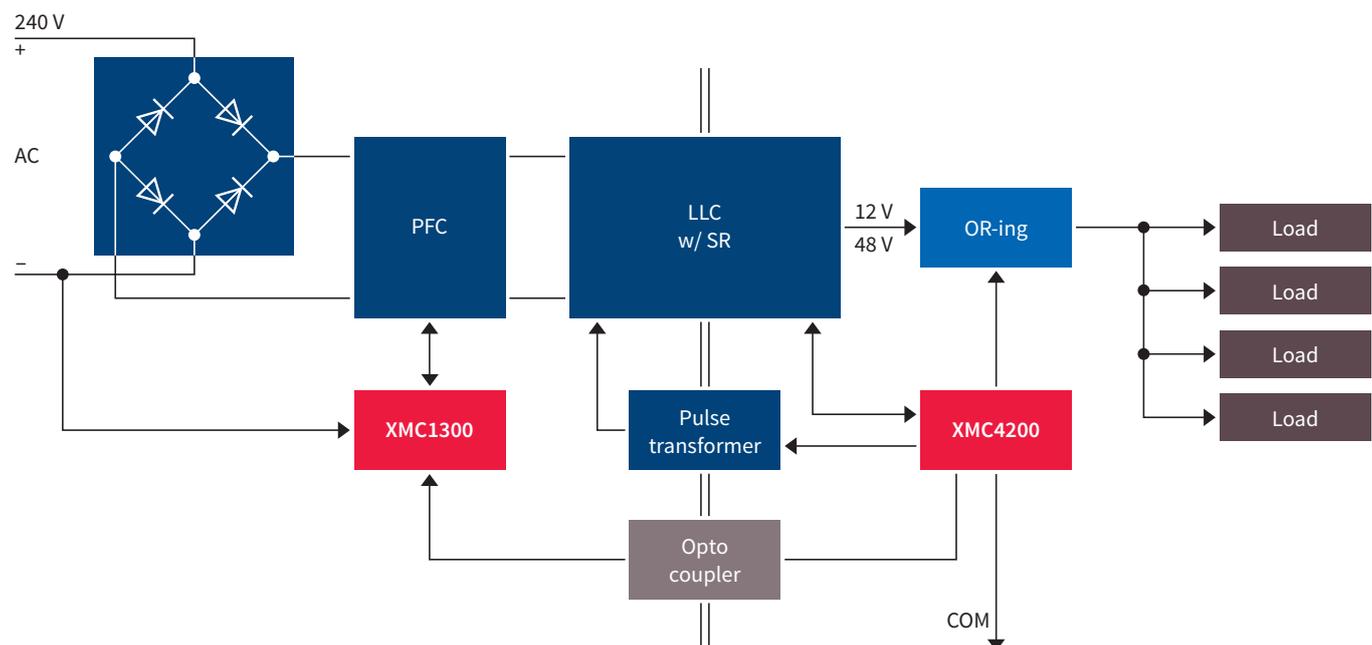
Key benefits

- > 4-channel 150 ps HRPWM timer (XMC4200/4400 series)
- > Rich connectivity: 2x CAN nodes, 4-channel serial COM unit (configurable to SPI, I2C, I2S, UART), USB FS
- > Up to 4x 12-bit ADC with a sample time of 70 ns ensure fast reaction times and tighter control loops
- > Extended temperature range up to an ambient temperature of 125°C (XMC4000 family)
- > Analog comparators with only 3 mV input offset voltage and a propagation delay of 30 ns (XMC1000 family)

Suggested products

- > XMC4xxx
- > XMC4200
- > XMC4400

Server/telecom SMPS with XMC™ for digital control



Applications

Off board charging

Off-board charging, where users can charge plug-in hybrids and pure electrical vehicles on personal garages and open parking lots, demands an optimized solution with high MCU switching frequency to stay efficient and cost competitive. Our XMC4xxx portfolio is a great fit for the application as it integrates all the features needed for off-board-charging.

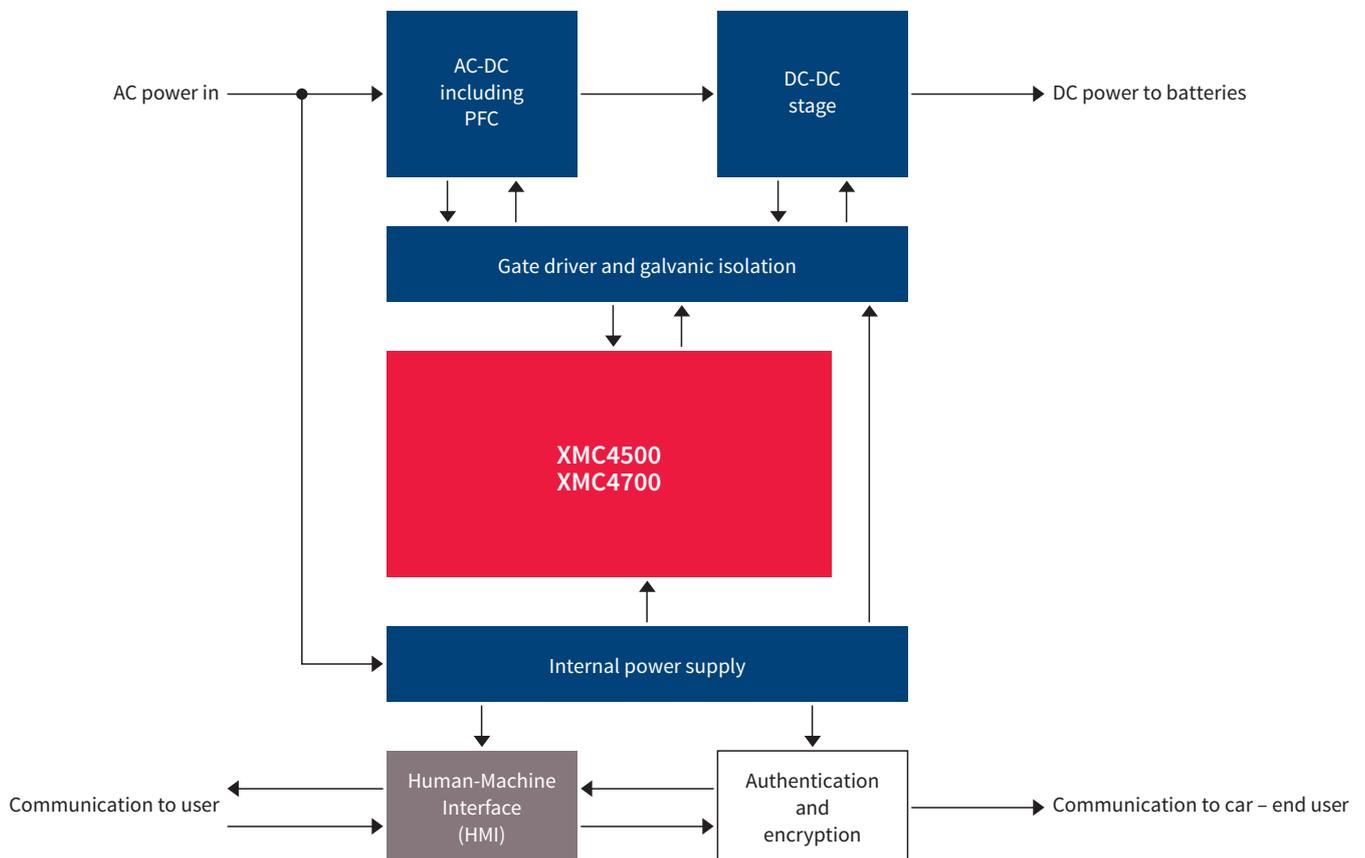
Key benefits

- > Platform concept to allow extensive customization
- > Performance, efficiency and cost competitiveness
- > Great scalability and SW reuse in the all family
- > RAM: 8 kB up to 352 kB
- > Flash: 16 kB up to 2 MB
- > Accurate analog-mixed signal peripherals
- > Fast timer/PMW peripherals
- > Rich communication interfaces
- > 16 pin to 196 pin count packages
- > Long term availability

Suggested products

- > XMC4500
- > XMC4700

Application diagram



Applications

Elevators

Modern elevators have strong safety requirements. The new TriCore™ family AURIX™ with state-of-the-art safety features enables your system to meet the highest safety levels that are required in your system. Combining AURIX™ and XMC™ families from Infineon is enabling you a powerful solution that will reduce your software overhead significantly and help your fast time-to-market.

Key benefits

- > Multiprocessor support for reliability and safety
- > Platform concept to allow extensive customization
- > Up to 12 CAN for communication in system
- > External bus interface (32-bit) with cache
- > SRAM up to 6.9 MB
- > Flash up to 16 MB
- > Long term availability

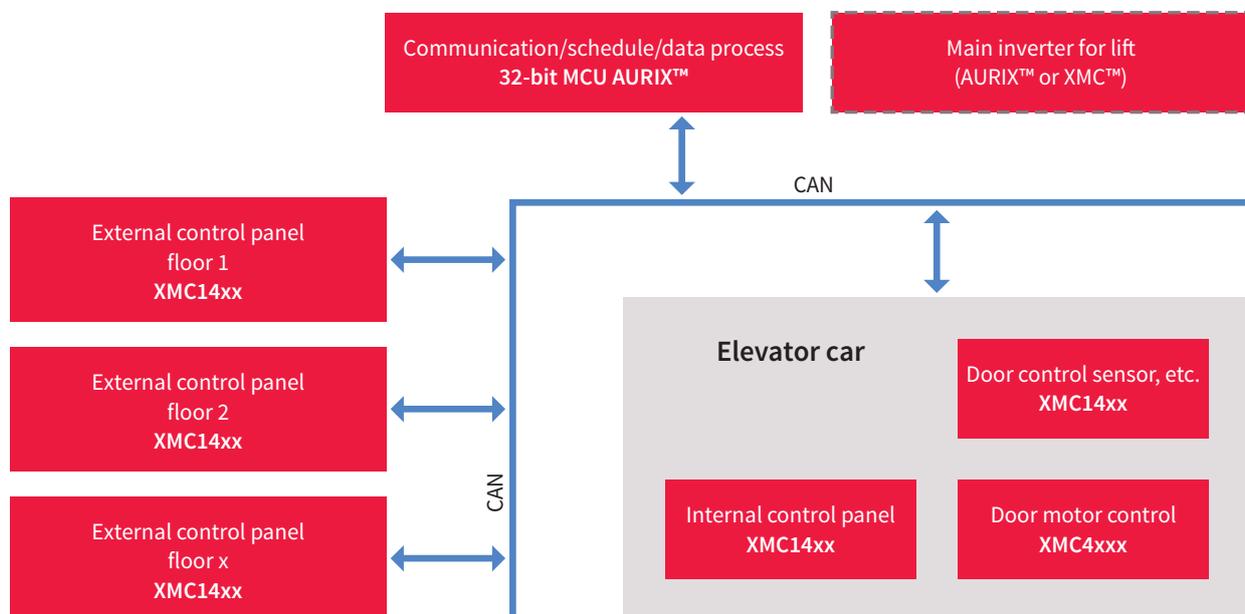
System benefits

- > High computing performance: up to 6x 300 MHz
- > Scalable family with compatibility: SW, pin-out
- > High-speed asymmetric single/dual/triple core
- > Up to 12 CAN or CAN FD nodes
- > Resolver I/F
- > Encoder I/F with digital noise filter
- > Safety requirements supported up to IEC 61508/SIL3

Suggested products

- > AURIX™: TC33x, TC36x, TC37x, TC38x, TC39x
- > XMC™: XMC14xx, XMC4xxx

Application diagram



Applications

Inverters

Inverters are key components and, regardless of whether the motor is synchronous, asynchronous or brushless DC, the inverter always functions in a similar way and is controlled by an integrated PCB, which should be designed to minimize switching losses and maximize thermal efficiency. Infineon is providing you solutions to support those requirements.

Application features

- > Multi-axis controller for two 3-phase complementary PWMs
- > Multiple modulation strategies (SVPWM, DPWM, soft-PWM, direct torque control) to support requirements aimed at reducing noise emissions and increasing efficiency
- > Ready for four Q-inverters, matrix-inverters
- > Field-oriented control with less than 10% CPU load
- > Multiprocessor support for reliability and safety
- > Support for 3-level inverter topologies
- > High computing performance up to 6x 300 MHz
- > Up to 6.9 MB internal RAM

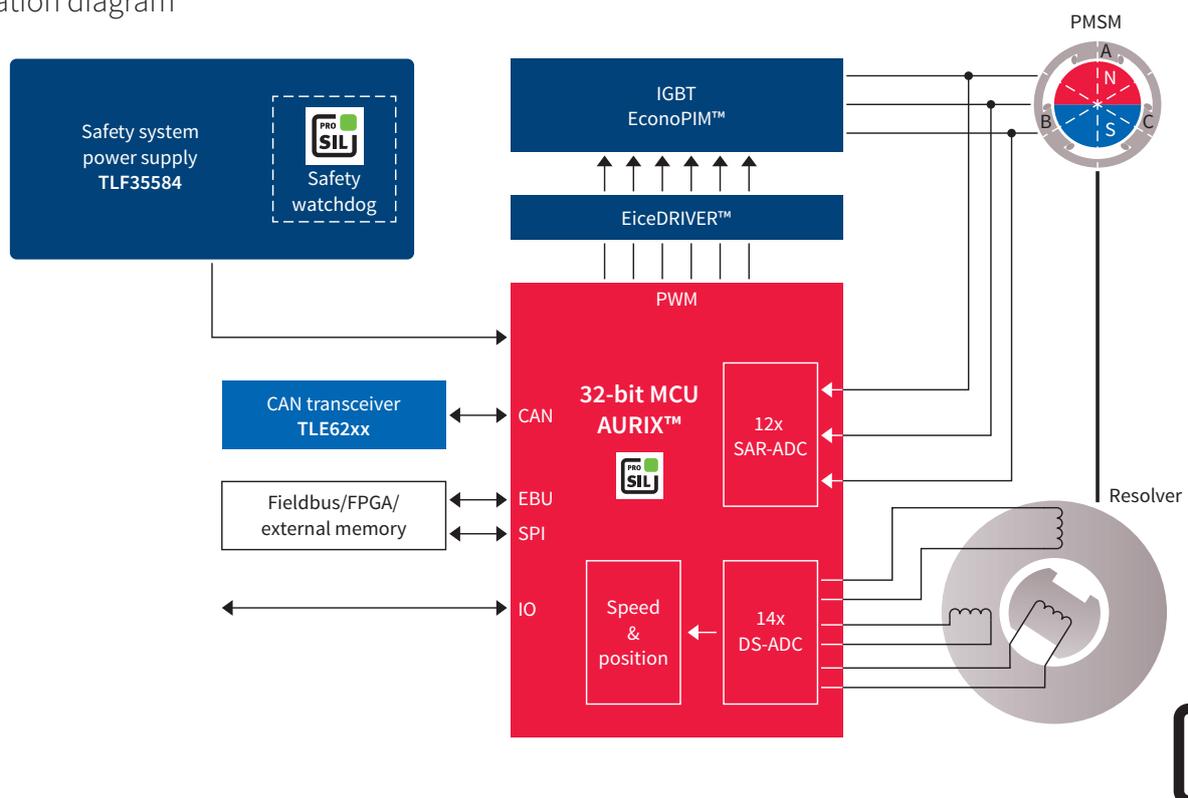
System benefits

- > Scalable and compatible portfolio
- > Diverse high-performance timer architectures
- > Up to 12 SAR-ADCs 12-bit resolution
- > Up to 14 DS-ADC
- > Resolver I/F
- > Encoder I/F with digital noise filter
- > Very fast control loop
- > IEC 61508 support – Safety Integrity Level (SIL) 1 to 3
- > Innovative single power supply concept
- > Large portfolio with long-term availability

Suggested products

- > TC33x > TC38x
- > TC36x > TC39x
- > TC37x

Application diagram



Applications

Wind turbines

New sources of renewable energy, such as wind, are increasing to meet growing demand while helping reduce CO² emissions. In parallel, generation and distribution are driven by strong innovation requirements that can be fulfilled with our strong portfolio.

Our microcontrollers can support the high level of connectivity and dataflow required as well as efficiently manage the high power energy generated with the best cost – performance ratio.

Application features

- > Reliable blade pitch control
- > Increased wind turbine efficiency
- > Multiple modulation strategies (SVPWM, DPWM, soft-PWM, direct torque control) to support requirements aimed at reducing noise emissions and increasing efficiency
- > Multiprocessor support for reliability and safety
- > Support for 3-level inverter topologies

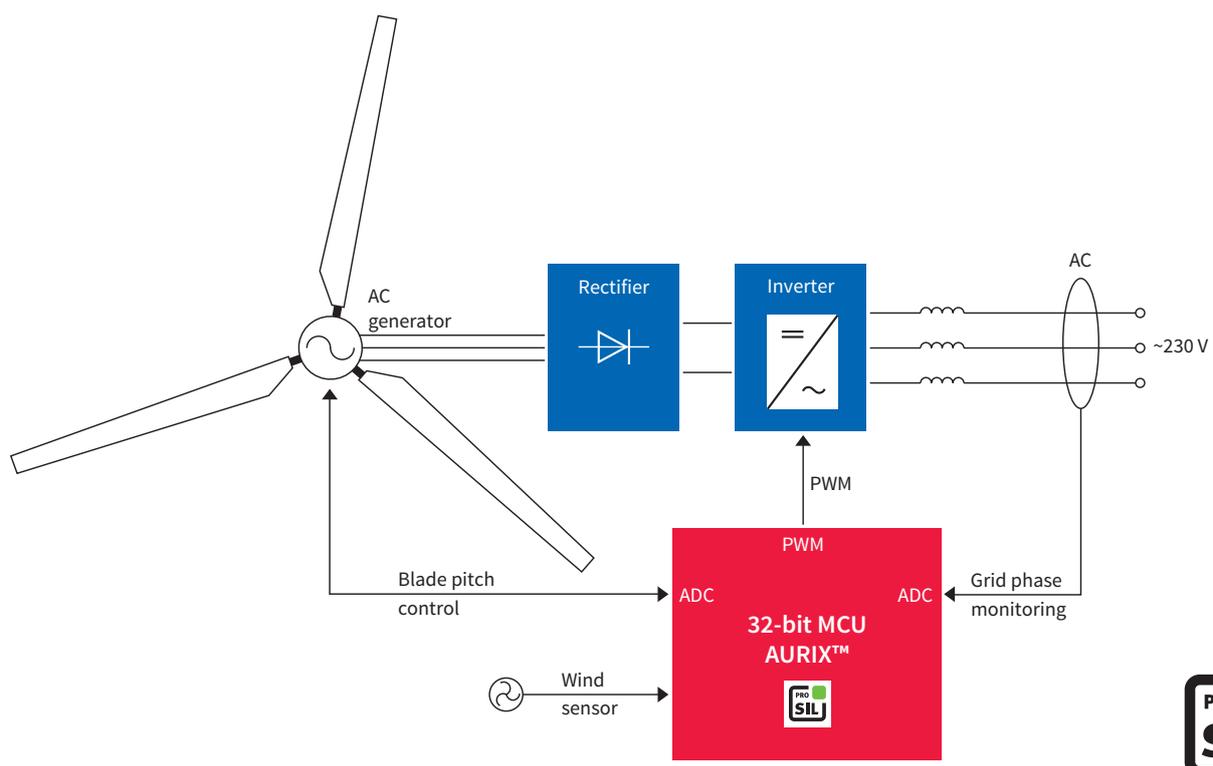
System benefits

- > Scalable and compatible portfolio
- > Diverse high-performance timer architectures
- > Up to 12 SAR-ADCs 12-bit resolution
- > Up to 14 DS-ADC
- > Resolver I/F
- > Encoder I/F with digital noise filter
- > IEC 61508 support – Safety Integrity Level (SIL) 1 to 3
- > Large portfolio with long-term availability

Suggested products

- > TC33x
- > TC36x
- > TC37x
- > TC38x
- > TC39x

Application diagram



Applications

Solar panels

Renewable energy standards require a certain amount of the energy produced to be generated from renewable sources such as wind and solar. Some countries include some more specific requirements which further incentivize the deployment of particular energy technologies. In this context, there is an increasing demand for solar power generation systems.

Application features

- › Multi-phase PWM controller for single or multiple strings
- › Multiple modulation strategies (SVPWM, DPWM, soft-PWM, direct torque control) to support requirements aimed at reducing noise emissions and increasing efficiency
- › Maximum Power Point Tracking (MPPT) to extract maximum power from solar panels
- › Grid phase monitoring and synchronization to ensure power factor unity
- › Current control to avoid disharmony and determine the feed-in refund
- › Support for 3-level inverter topologies

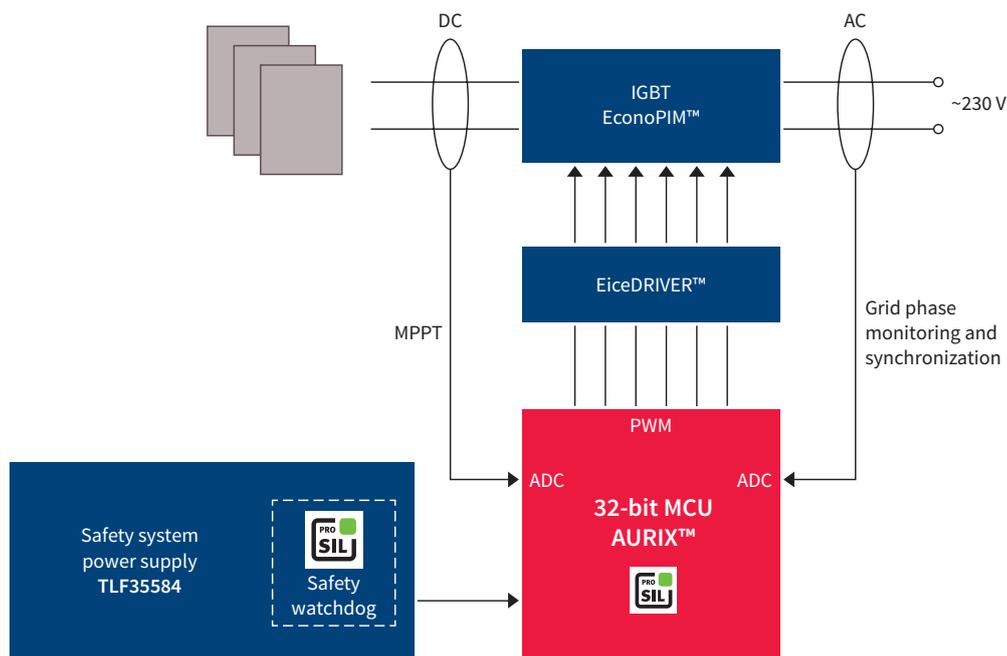
System benefits

- › Scalable and compatible portfolio
- › Diverse high-performance timer architectures
- › Up to 12 SAR-ADCs 12-bit resolution
- › Up to 14 DS-ADC
- › Resolver I/F
- › Encoder I/F with digital noise filter
- › IEC 61508 support – Safety Integrity Level (SIL) 1 to 3
- › DSP library available
- › Large portfolio with long-term availability

Suggested products

- › TC33x
- › TC36x
- › TC37x
- › TC38x
- › TC39x

Application diagram



Applications

Safe PLC

At the heart of most industrial control and factory automation systems is a Programmable Logic Controller (PLC). Commonly referred to as the “brain” of a factory, a PLC controls a wide range of functions by receiving and processing data from sensors and machines. It then uses this data to control and actuate external devices. Because it’s used in industrial applications, a PLC must be robust. Moreover, a successful design must offer reliability, system stability and 100% interoperability with connected automation systems.

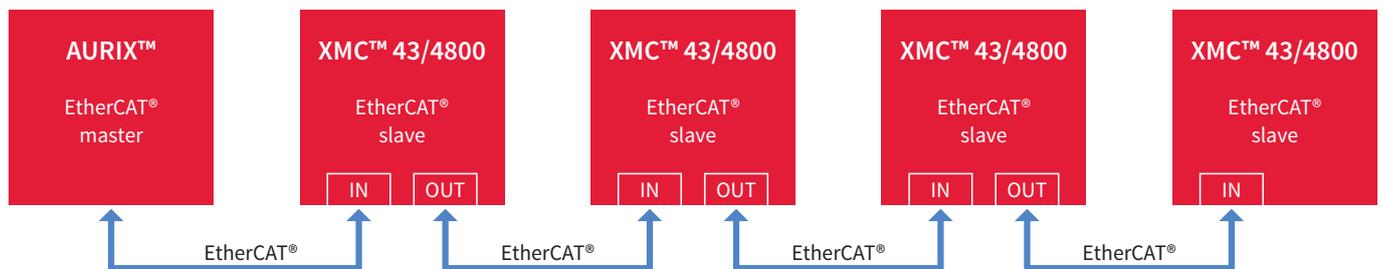
Key benefits

- > AURIX™ as EtherCAT® master
 - SW development via PDH RT labs
 - Safety IEC 61508 (SIL3) high performance
 - Scalability and SW reusability across family
- > XMC™ as EtherCAT® slave controller
 - Certified software available with no license cost
 - No additional external component required
 - BOM and PCB savings
 - Enablement of EtherCAT® technology in harsh environment with 125°C ambient temperature

Suggested products

- > AURIX™ TC2xx
- > AURIX™ TC3xx
- > XMC™ 43xx
- > XMC™ 48xx

Application diagram



Applications

Motor control for power tools

Energy efficiency, mobility and security are some of the main challenges facing modern society. Infineon's motor control solutions address all of these needs, providing out-standing reliability, excellent quality and leading-edge innovations. From toys and power tools, to industrial pumps and industrial automation systems, Infineon's XMC™ microcontrollers and other semiconductor products enable our customers to design the most innovative, efficient, reliable and energy-friendly motor control and drive systems.

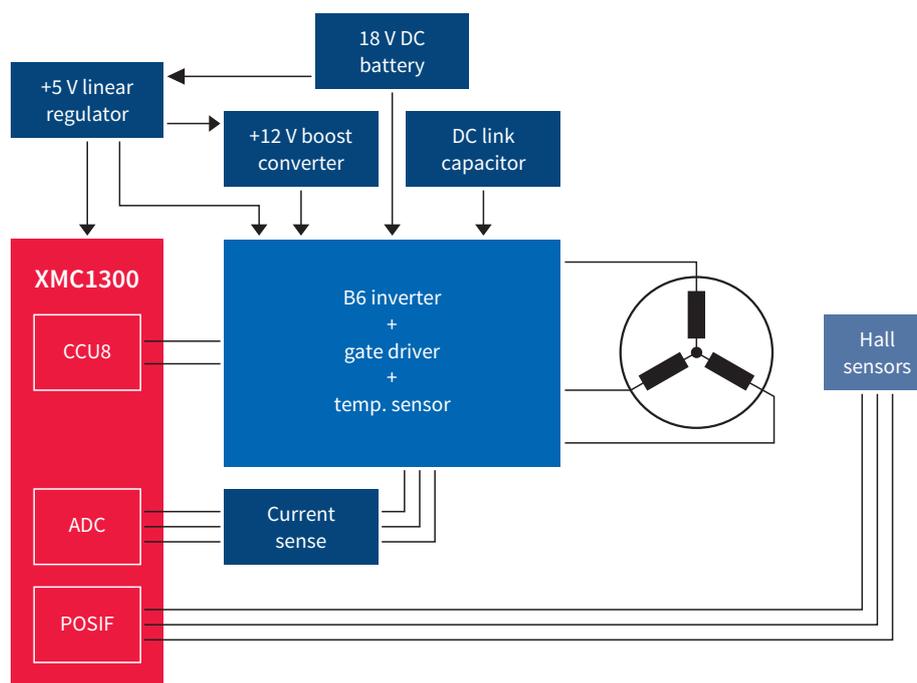
Key benefits

- > Easy 3-phase inverter implementation with a single CCU8 PWM unit, offering shadow register transfer, external input for fault control, binary and floating prescaler, 16-bit to 64-bit width
- > Motor control-specific MATH co-processor providing a 32-bit signed or unsigned divider, as well as a 24-bit CORDIC for trigonometric calculations, working in parallel with the main CPU
- > POSIF interface to directly connect hall sensors and incremental encoder
- > 12-bit ADC with on-chip adjustable gain of x1, x3, x6 or x12
- > 1.8 to 5.5 V supply voltage
- > Flexibility for serial communication, thanks to programmable Universal Serial Interface Channels (USIC)

Suggested products

- > XMC1xxx family
- Focus on:
 - > XMC13xx
 - > XMC14xx

Block diagram of power tool reference design





Applications

Wireless charging

The XMC™ wireless power controller helps the next generation wireless charging systems meet strict safety, environmental and regulatory requirements, while still enabling industry-leading charging performance and efficiency. This controller works seamlessly with Infineon’s power devices in a scalable architecture to provide a complete charging solution for everything from a fast charge smartphone, to a 20 W robot, to a 60 W drone and beyond, to 80 W power tool applications.

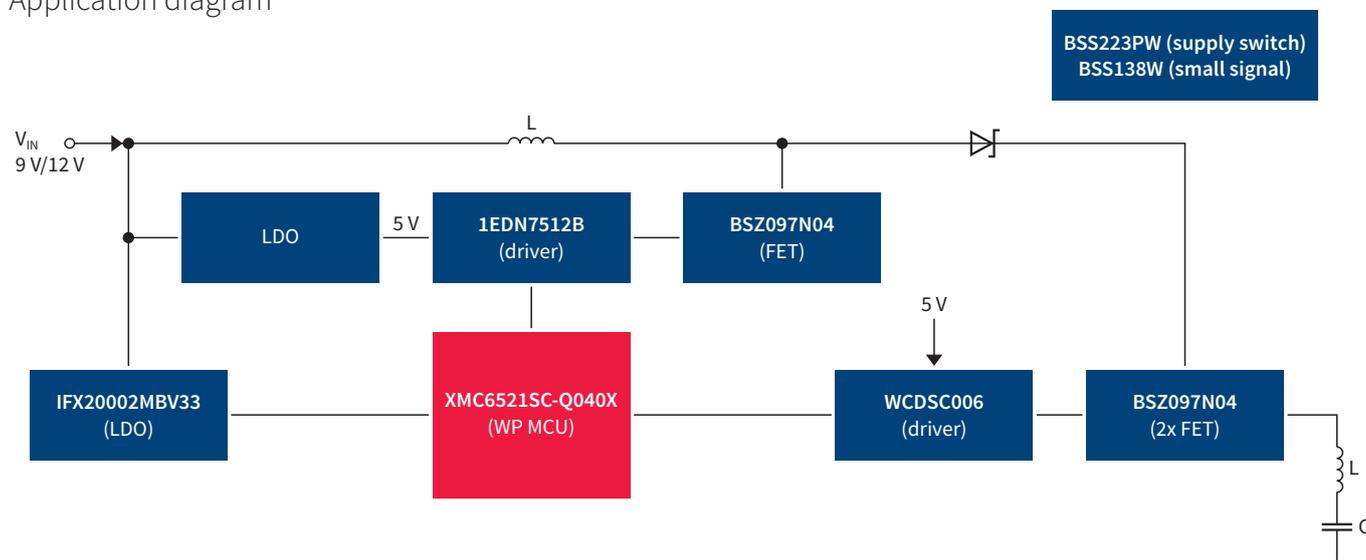
Key benefits

- > Full power without exotic thermal management
- > Achieves charging rates equivalent to wired charging
- > Supports custom charging profiles and industry standards on the same hardware
- > Foreign Object Detection (FOD) with improved accuracy quality-factor monitoring
- > Foreign object detection capability can be extended beyond existing standards to improve detection
- > Supports custom coils and greater than three coils

Suggested products

- > TC21x
- > TC22x
- > TC23x

Application diagram



Applications

Smart lighting

The term smart lighting refers to the expansion of traditional LED illumination technology to include new functionalities, such as wired or wireless connectivity, programmability, sensors, enhanced light quality and sophisticated color mixing. Thanks to special features dedicated to LED lighting, XMC™ microcontrollers help bring this new dimension into traditional LED lighting systems.

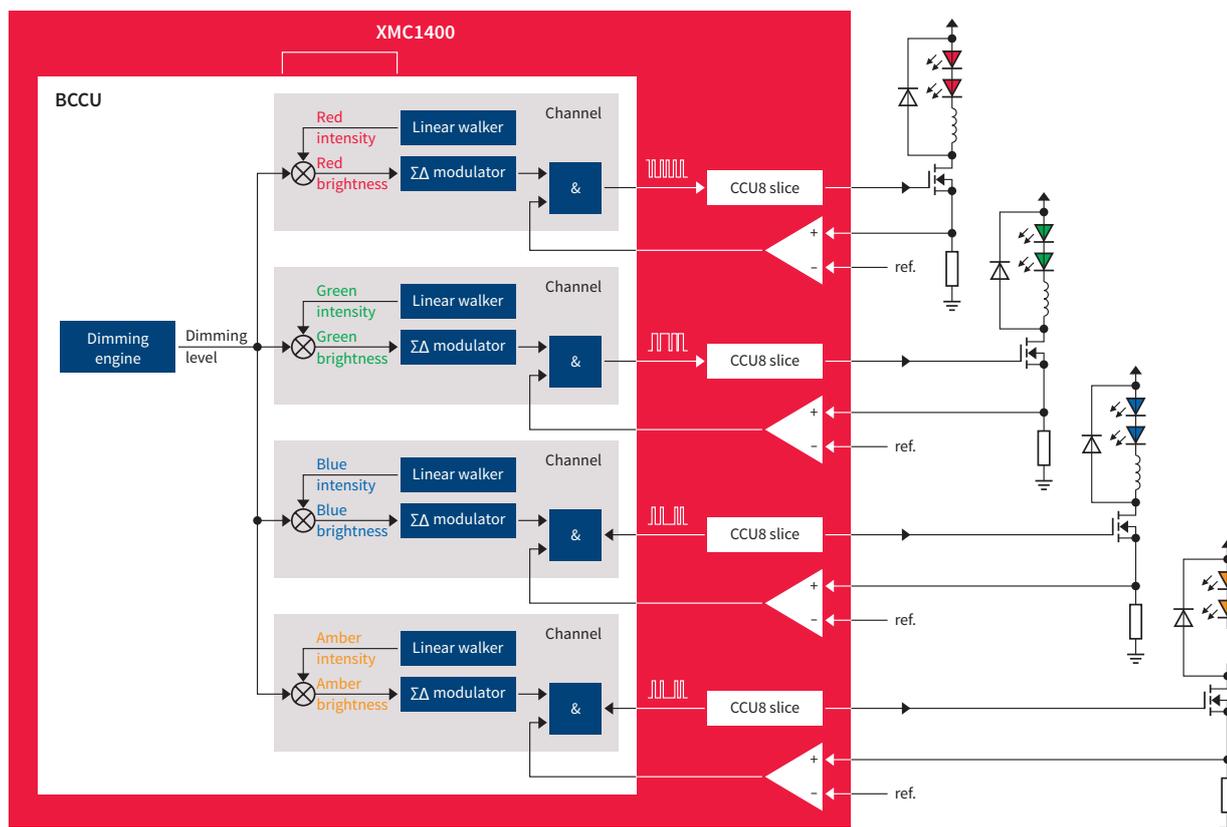
Key benefits

- > Automatic brightness control (using high-frequency pulse density modulation) based on the $\Sigma\Delta$ principle enables
- > Automatic exponential dimming and linear intensity changes make brightness or color changes appear smooth and natural to the human eye
- > Integrated high-speed analog comparators for peak-current control and zero-crossing detection
- > Tightly interconnected peripherals supporting various digital power conversion techniques
- > DALI, DMX and KNX communication capability

Suggested products

- > XMC12xx
- > XMC13xx
- > XMC14xx

The block diagram below shows an example of an XMC1000 family microcontroller in a smart lighting application. The XMC1402 microcontroller is used here for the direct constant-current control of a 4-channel RGBA LED lighting system, while also handling DMX and DALI communication.





Applications

Commercial and Agricultural Vehicles (CAV)

AURIX™ is Infineon’s brand-new family of microcontrollers, designed to precisely meet the needs of the 24–60 V industry in terms of performance, memory, scalability, safety and security.

Its innovative multicore architecture supports the latest trends in connectivity, such as Ethernet and CAN FD, as well as safety (IEC 61508/ISO 25119/ISO 26262) and security.

While supporting a high performance, the innovative supply concept with integrated DC-DC converter leads to best-in-class power consumption.

The scalable AURIX™ family leads to the most optimized cost-performance application fit.

AURIX™ addresses CAV requirements and challenges

External memory extension	Lots of IOs	Safety
<ul style="list-style-type: none"> › Expensive external RAMs › Short life cycles › Design complexity › No memory integrity support 	<ul style="list-style-type: none"> › Hundreds of valves, actuators and LEDs › Many analog signals to be measured › Communication interfaces 	<ul style="list-style-type: none"> › Increasingly rigorous safety standards › Expensive dual-channel approach › Tedious work until certification
<ul style="list-style-type: none"> › Special devices with extended SRAM › Up to 2.7 MB SRAM 	<ul style="list-style-type: none"> › Different packages up to 516 pins › Multiple ADCs, communication interfaces 	<ul style="list-style-type: none"> › IEC 61508 family safety concept › Lockstep › Safety support

Applications

Hydraulic/pneumatic management system

CAVs are under mounting pressure to provide highest possible availability and lowest-possible operating costs as operators strive to maximize profits. Hydraulic or pneumatic system are key applications toward such targets, providing great reliability and low operational cost. The new TriCore™ AURIX™ TC3xx family offers a scalable product portfolio to address all the demands for valve control management. carry out a variety of protective and diagnostic functions.



Hydraulic system overview

Hydraulic management system has to be precise and robust enough to withstand harsh environments and engineered to carry out a variety of protective and diagnostic functions.

Application features

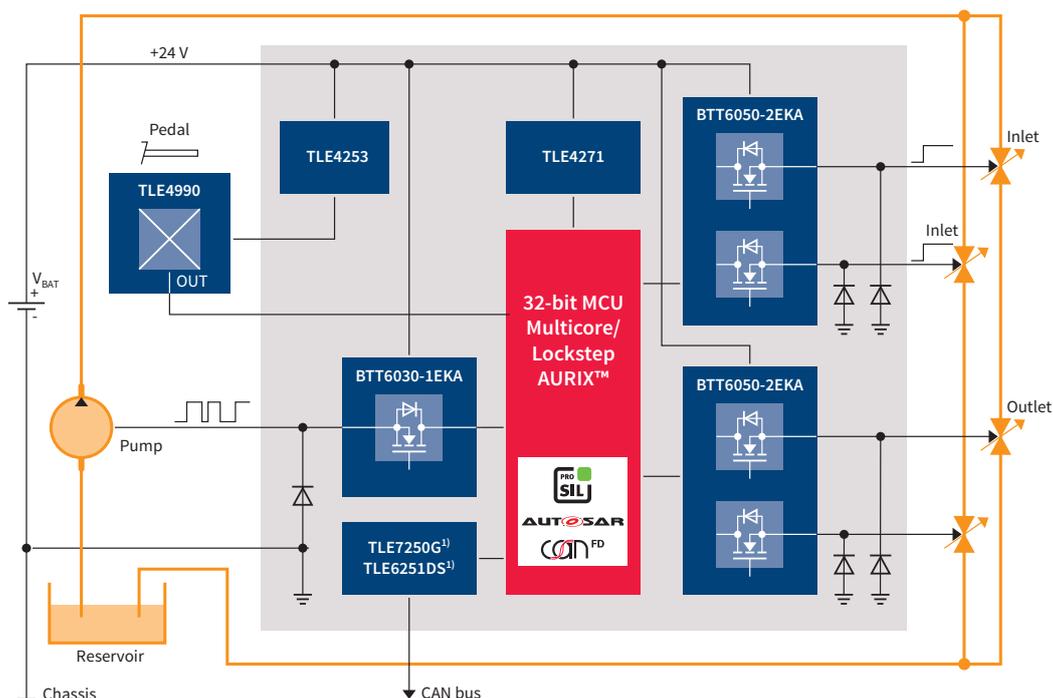
- > Valves and pumps can be driven via linear activation or demand-controlled via PWM signals
- > Integrated solution reduces the design outlay
- > Pin-to-pin and software compatibility
- > AECQ-100 qualified

Key benefits

- > AURIX™ advanced timer unit for dynamic PWM generation and hardware input capture
- > Scalability over flash, RAM and peripherals, offering the best cost-performance ratio
- > High microcontroller junction bare die temperature to withstand high temperature environments.
- > AURIX™ safety requirements supported up ISO 26262 ASIL-D

Suggested products

- > TC32x
- > TC36x
- > TC33x
- > TC37x



1) If ECU permanently supplied, you may need to add external protection against load dump 400 ms above 40 V.



Pneumatic system overview

Pneumatic management system is typically chosen for its cost effectiveness and ease of integration (no need for a reservoir) compared to its hydraulic counterpart.

Application features

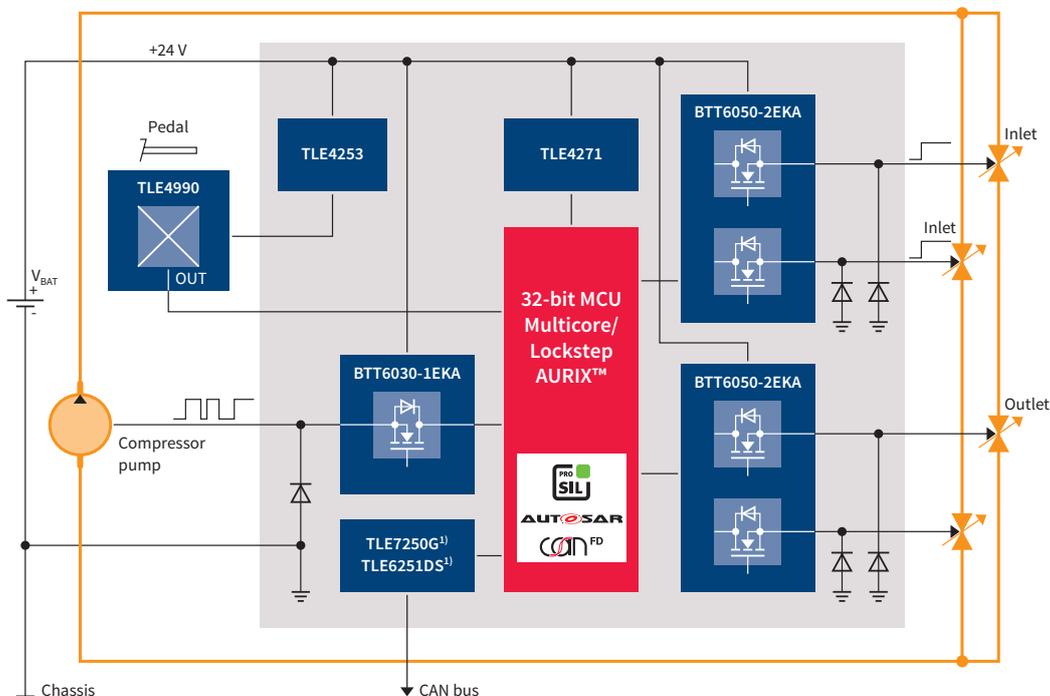
- > Valves and pumps can be driven via linear activation or demand-controlled via PWM signals
- > Integrated solution reduces the design outlay
- > Pin-to-pin and software compatibility
- > AECQ-100 qualified

Key benefits

- > AURIX™ advanced timer unit for dynamic PWM generation and hardware input capture
- > Scalability over flash, RAM and peripherals, offering the best cost-performance ratio
- > High microcontroller junction bare die temperature to withstand high temperature environments.
- > AURIX™ safety requirements supported up to ISO 26262 ASIL-D

Suggested products

- > TC32x
- > TC33x
- > TC36x
- > TC37x



Applications

Radar 24 GHz

Self-driving technologies have the potential to revolutionize the CAV sector. Driverless machines can operate 24/7 – whether on a construction site or the freeway. Autonomous systems eliminate the need for downtime as well as the most common cause of accidents: people. In agriculture, autonomous tractors can spread fertilizer and plant seeds with utmost precision. The new TriCore™ AURIX™ family will enhance classic safety features with dedicated features to meet the needs of 24 GHz radar systems.

Application features

- › High integration leads to significant cost savings
- › Small PCB footprint
- › Hardware compliance with ISO 61508 up to SIL 3 supports safe input for functions such as emergency braking
- › Low cost in BOM as the AURIX™ microcontroller replaces additional DSP and external memory

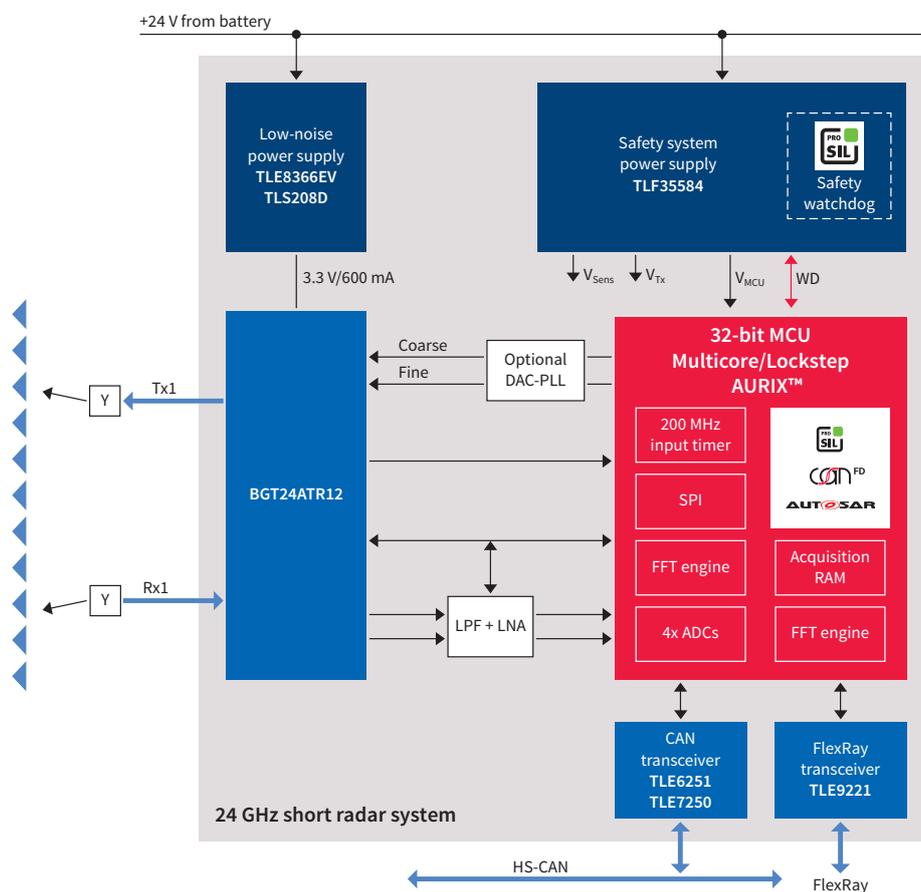
Suggested products

- › TC23xLA
- › TC26xDA
- › TC33xDA

Key benefits

- › Up to 752 KB RAM for radar image storage
- › Radar signal processing with windowing functionality
- › Flexibility in radar signal acquisition with 4x internal ADCs
- › Possibility to connect external ADCs (interface to connect up to 16-bit ADCs)
- › High-precision input/output timers
- › ISO 26262 compliance to support safety requirements up to ASIL-D
- › Continuous, precise and flexible bit-streaming machine (HSPDM) in AURIX™ TC3xx, to replace the external DAC controlling the ramp generator

Application diagram



Applications

Gateway 24 V

Not different from a passenger cars, in order to comply with Megatrends like CO₂ emissions, ADAS and connectivity, CAVs need sophisticated systems which can offer cost efficient and high performant computational power. Such requirements demand high complexity E/E architectures with respect to in-vehicle communication networks, power networks, connectivity, safety and security. In order to reliably and securely transfer different types of data through different network protocols, CAVs make use of a gateway controller, which perform as a hub among all the functional domains that share data. The high computing performance and multiple connectivity interfaces of the new TriCore™ AURIX™ family makes it the ideal microcontroller for gateway applications.

Application features

- > 24 V compliant gateway
- > Enable high complexity E/E architectures
- > Data transfer across different functional domains working in different network protocols
- > Gateway board to reduce the development outlay

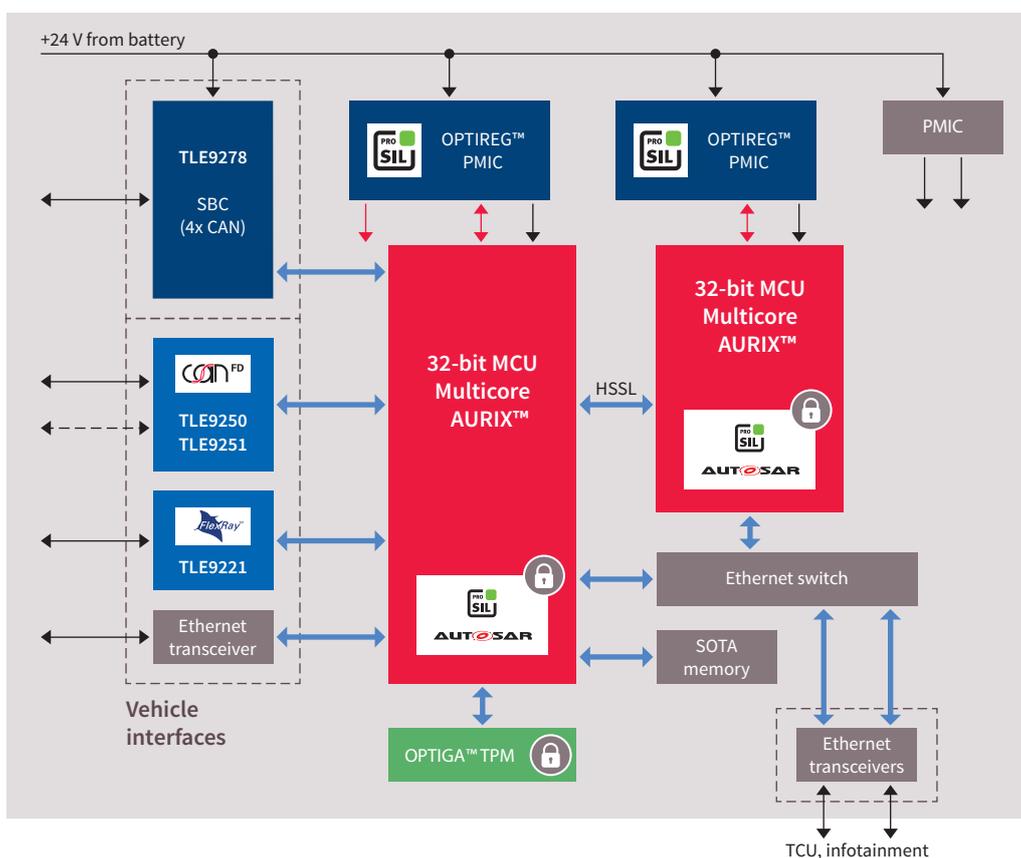
Suggested products

- > TC37x
- > TC39x

Key benefits

- > AURIX™ computing performance, flexibility, scalability, integrated safety and security support
- > AURIX™ multiple connectivity capabilities, including up to 2 Gigabit Ethernet interfaces
- > High integration leads to significant cost savings and reduced complexity
- > AURIX™ Hardware Security Solution (HSM) provides the highest level of security
- > Hardware compliance with ISO 26262 up to ASIL-D

Application diagram



Applications

In cabin wireless charging

As farmers seek to increase crop yields, access to data that like field mapping, planting calculations, spray logs, soil sampling tools and weather predictions, can help them make decisions to maximize output. However, none of this would be possible if, after a long travel to the field, their tablet, phone, personal computer or even a necessary Powertool runs out of battery. Therefore, Infineon has developed a wireless power controller system using AURIX™ family microcontrollers that helps the next-generation wireless charging systems meet strict safety, environmental and regulatory requirements, while still enabling industry-leading charging performance and efficiency in a CAV environment (e.g. armrest of a tractor).

Key features

- › High-efficiency 15 W charging without exotic thermal management
- › Multi-mode supporting Q-inverters and fast charge on the same hardware
- › Supports single and multi-coil charging surfaces
- › Allows the easy addition of custom features for differentiated applications

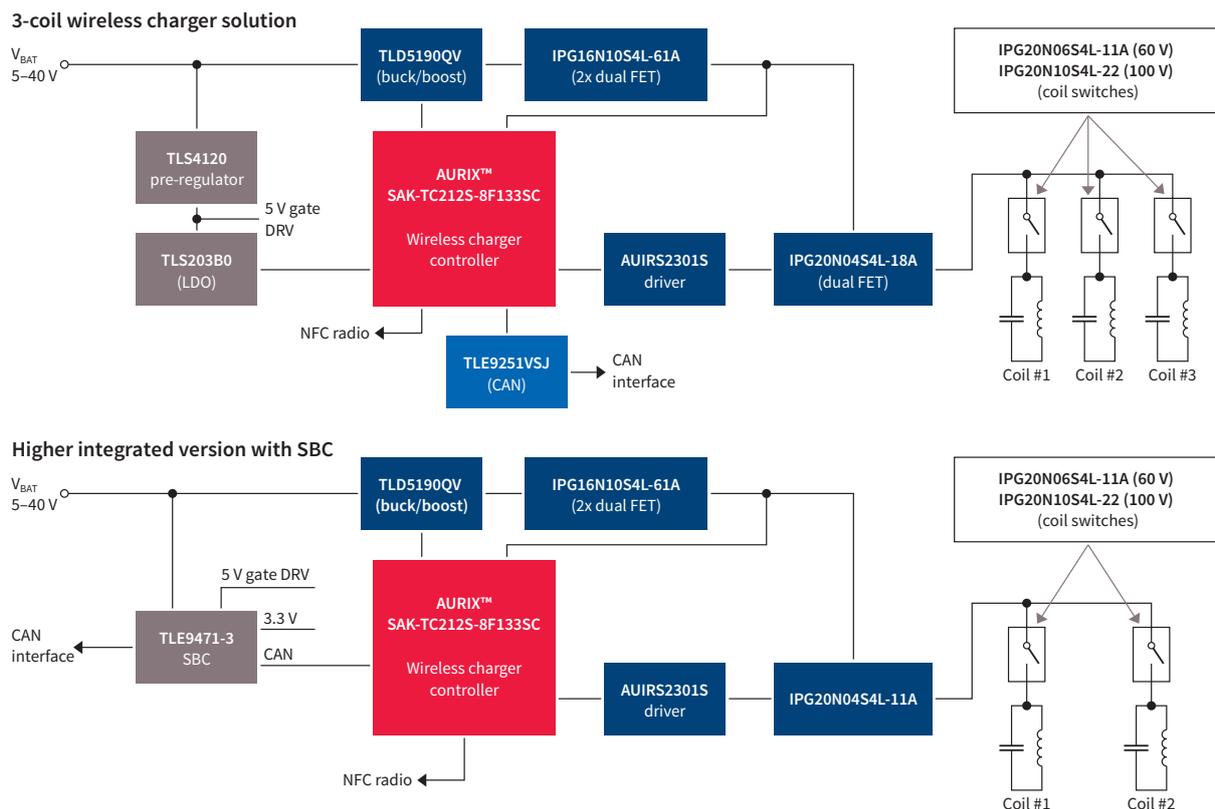
Suggested products

- › TC212S-8F133SC

System benefits

- › Supports greater coil-to-coil Z height than competing solutions
- › Total front-to-back solution ensures maximum efficiency, minimal thermal impact and ease of certification
- › A single AURIX™ device supports wireless charging, system application, CAN and external NFC interface functions
- › One AURIX™ controller can support charging two devices at the same time
- › Built-in security functionality meets the latest CAV/automotive requirements
- › Proven fixed frequency/variable voltage hardware and software architecture
- › Proven EMI performance
- › Certified WPC 1.2.2 (15 W)

Application diagram

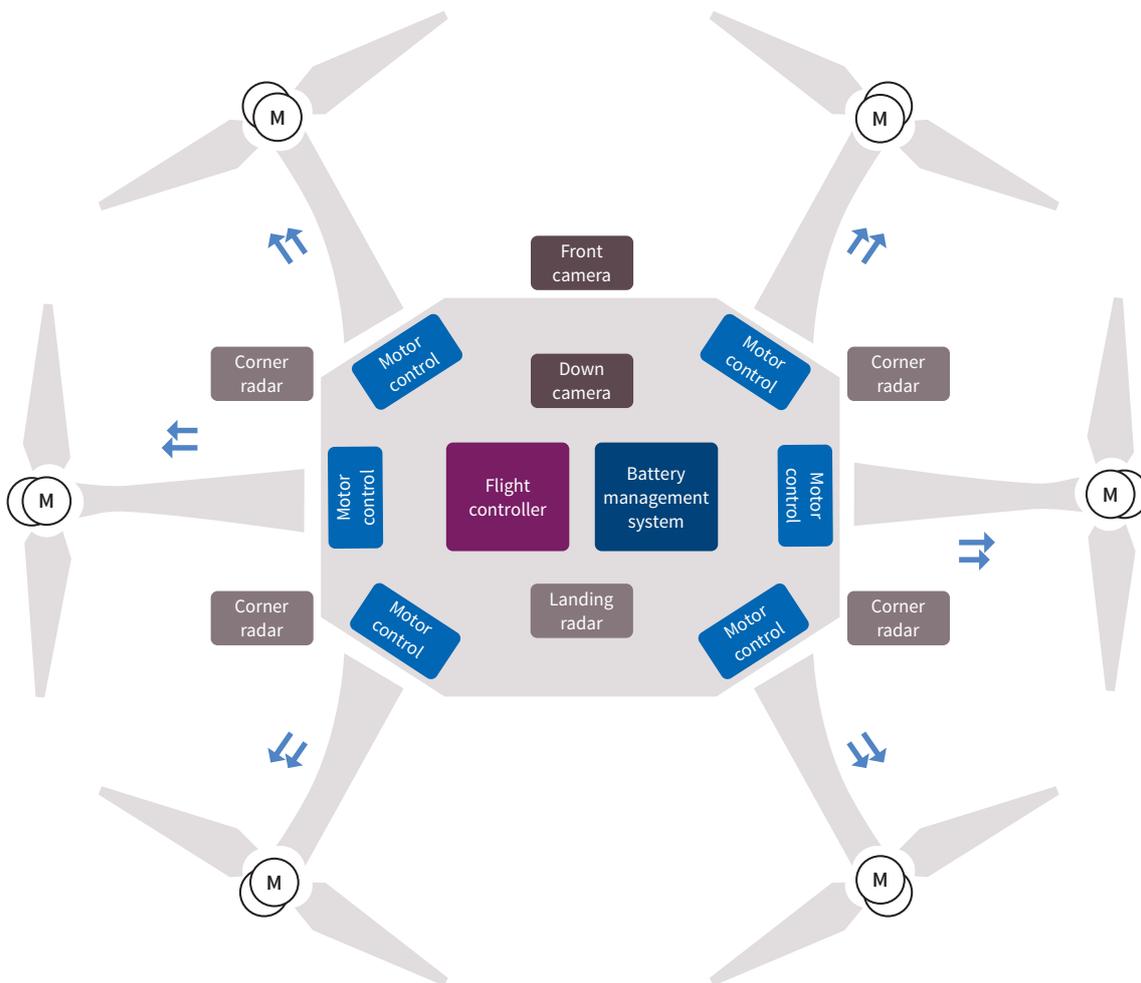


Applications

Drones/multicopter

Infineon's comprehensive portfolio of high-quality products contains the widest spectrum of multicopter components on the market. We offer everything from industrial XMC™ controllers to the AURIX™ family, supporting everything from motor control of the rotors to autonomous flying support with 24 GHz radar. Thanks to an optimized feature set, we can support both consumer (XMC™ family) and commercial drones (AURIX™ family). The new safety requirements can be covered with the AURIX™ family which supports IEC 61508/SIL-3 and ISO 26262/ASIL-D.

Application diagram



Applications

Drones/multicopter

Application features

- > Commercial drone solution based on AURIX™ family
- > Decentralized architecture
- > Single chip solution – AURIX™ for flight control, motor control, radar sensors, BMS and power conversion providing optimum balance between BOM cost and performance

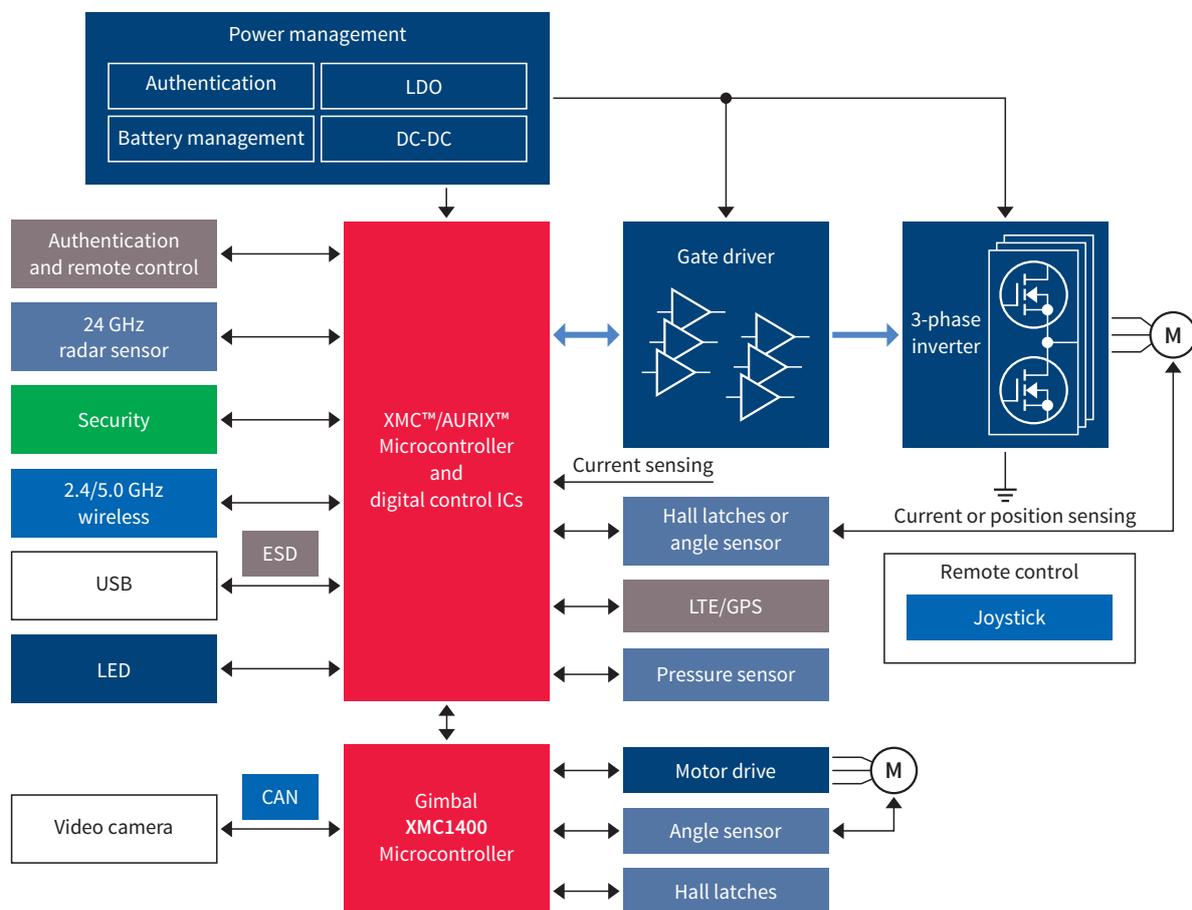
Suggested products

- > TC37x
- > TC39x

Key benefits

- > Dedicated motor control unit using AURIX™ CCU6 & GTM for fine motor tuning, as well as multicore architecture to drive several motor per device
- > Redundant sensors input for safety and sensor fusion enabling a smooth and precise flight control
- > AURIX™ functional safety capabilities compliant with IEC 61508 SIL 3
- > AURIX™ Hardware Security Module (HSM) provides secure authentication for original parts, protection against manipulation and secure SOTA software updates.
- > 24 GHz radar can be used to measure the presence of objects, measure the range, speed/velocity, ascertain proximity, and determine the position of objects

Application diagram



Efficient tools, software and services from evaluation until production – XMC™ ecosystem and enablement

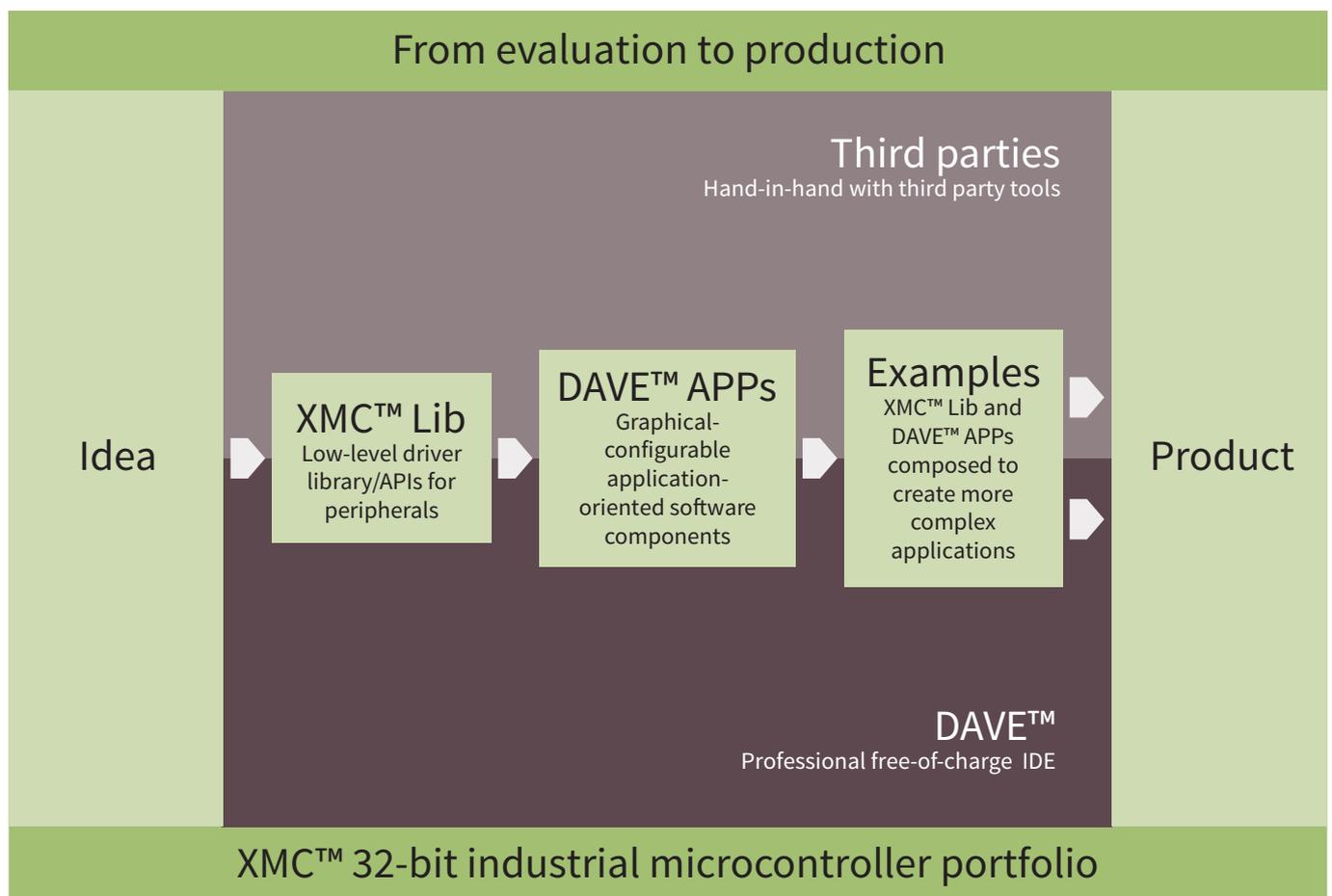


A comprehensive set of development tools, ready-to-use software solutions and support services are available for the XMC™ microcontrollers portfolio. These tools and software products support the complete development cycle to ensure an efficient and fast design process. www.infineon.com/xmc-ecosystem

DAVE™

Free-of-charge IDE using GNU C-compiler, providing graphical system design methods, a wide and configurable code repository and automatic code generator for users of the ARM® Cortex®-M XMC™ industrial microcontroller along the entire process – from Evaluation-to-Production (E2P).

XMC™ Lib and DAVE™ generated code can be used with other third-party tool chains. www.infineon.com/dave





XMC™ library for Embedded Coder® for MATLAB® and Simulink®

The XMC™ library for Embedded Coder® provides support for code generation on all XMC™ microcontrollers from MATLAB® and Simulink®. The free-of-charge XMC™ library for Embedded Coder® lets you control system and peripheral initialization as well as use automatic code generation from MATLAB® and Simulink® for XMC™ microcontrollers.
www.infineon.com/matlab

XMC™ link

Isolated debug probe, based on SEGGER J-Link technology

XMC™ link is a functionally isolated debug probe for all XMC™ microcontrollers.

Its technology is based on SEGGER J-Link and can therefore be used with all well-known ARM® Cortex® compiler/IDEs and tools chains, as well as DAVE™.

www.infineon.com/xmclink

μC/Probe™ XMC™

Graphical dashboard to fine-tune your application – read/write, monitor, modify, and track the internals of XMC™ MCUs.

- › Build our user interface – drag and drop
- › Fine-tune in real-time – nonintrusive access
- › Simple connect and extend debugging capabilities
- › Support all XMC™ MCUs and evaluation boards

www.infineon.com/ucprobexmc



AURIX™ Development Studio

The AURIX™ Development Studio is a free of charge Integrated Development Environment (IDE) for the TriCore™-based AURIX™ microcontroller family. It is a comprehensive development environment, including **Eclipse IDE, C-compiler and multicore debugger**, Infineon Low-Level Driver (iLLD), with no time and code-size limitations that enables editing, compiling, and debugging of application code.

The AURIX™ development studio is supported by **expert trainings**

Code examples, trainings and all the technical documentation you may need are readily available at your fingertips

- › Integrated Development Environment (IDE)
 - › AURIX™ TC2xx microcontroller expert-training: <https://www.infineon.com/aurix-expert-training>
 - › AURIX™ TC2xx microcontroller quick-trainings
 - › GitHub for the code examples: https://github.com/Infineon/AURIX_code_examples?intc=0560030
 - › AURIX™ forum for more questions and support: <https://www.infineonforums.com/>
- You can download the IDE through our webpage: <https://www.infineon.com/aurixdevelopmentstudio>

The AURIX™ Development Studio is composed of three parts, which are linked to each other in a connected system.



KIT_AURIX_TC297_TFT the AURIX™ TC275 ShieldBuddy in combination with AURIX™ Development Studio:

You can use AURIX™ development studio with the following kits

- › [KIT_AURIX_TC275_ARD_SB](#)
- › [KIT_AURIX_TC297_TFT](#)

AURIX™ and XMC™ PDH partners

Preferred Design Houses (PDH) and software resellers

Optimized open-market customer support set up for systems using AURIX™ and XMC™, including software and other Infineon products, such as power products, sensor products and modules.

The preferred design house extends the support force by specifying and customizing the know-how. Furthermore, it brings an additional value for customer service. The preferred design house supports the set up for systems using AURIX™ and XMC™, including software and other Infineon products. Our partners are trained to use AURIX™ and XMC™.

<p>Classic (Free of charge)</p>	<ul style="list-style-type: none"> › 1st level customer support covering Infineon products/solutions › Technical interface and support to the customer 	<ul style="list-style-type: none"> › Driving design at customer › Basic training for design teams at customer › 24 h response time to the customer
<p>Premium (Consultancy mode) To be agreed between customers and PDH</p>	<ul style="list-style-type: none"> › Project management and project-specific application support › Specification of general software defining required layers, control and data flow structure etc. › Specification and implementation of custom device drivers › Optimization of software components with regard to speed/code size 	<ul style="list-style-type: none"> › Software testing › Support for project-specific functional safety engineering › Project-specific support for security solution › Safety support › Security support › Multicore support

Infineon releases its new **Preferred Design Houses (PDH)** partner ecosystem where each PDH partner has its own webpage. The new partners' ecosystem enables our PDHs to better promote their services and facilitate the access to information to our customers.

You can discover our PDH webpage via our PDH table shown in the all MCU webpages (see table below) or you can go directly to www.infineon.com/preferredesignhouse

Click on the logo to get directed to Hitex PDH webpage for a detailed overview on the offered services.

Infineon Preferred Partner	GLOBAL			EMEA																AMERICAS				CHINA	KOREA				
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Autosar	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Motor Control	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Lighting	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
PFC Power conversion	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
AURIX™ general support HW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
AURIX™ general support SW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Safety Support IEC61508	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Safety Support ISO26262	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Security support /SHE+	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
XMC™ general support HW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
XMC™ general support SW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Class B classification	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Capacitive sensing with XMC	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Secure boot for XMC™	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
24 GHz radar	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
77 GHz radar	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Brochure	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Email	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Phone	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
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Basic ●

Essential principles and elementary know-how to support a customer; provision of basic training for design teams

Advanced ●

High-level project-specific application support/consulting

Expert ●

Extensive knowledge and ability to fully support development

Where to buy

Infiniteon distribution partners and sales offices:

www.infineon.com/WhereToBuy

Service hotline

Infiniteon offers its toll-free 0800/4001 service hotline as one central number, available 24/7 in English, Mandarin and German.

- > Germany 0800 951 951 951 (German/English)
- > China, mainland 4001 200 951 (Mandarin/English)
- > India 000 800 4402 951 (English)
- > USA 1-866 951 9519 (English/German)
- > Other countries 00* 800 951 951 951 (English/German)
- > Direct access +49 89 234-0 (interconnection fee, German/English)

*Please note: Some countries may require you to dial a code other than "00" to access this international number.
Please visit www.infineon.com/service for your country!



Mobile product catalog

Mobile app for iOS and Android.

www.infineon.com

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