TASKING®
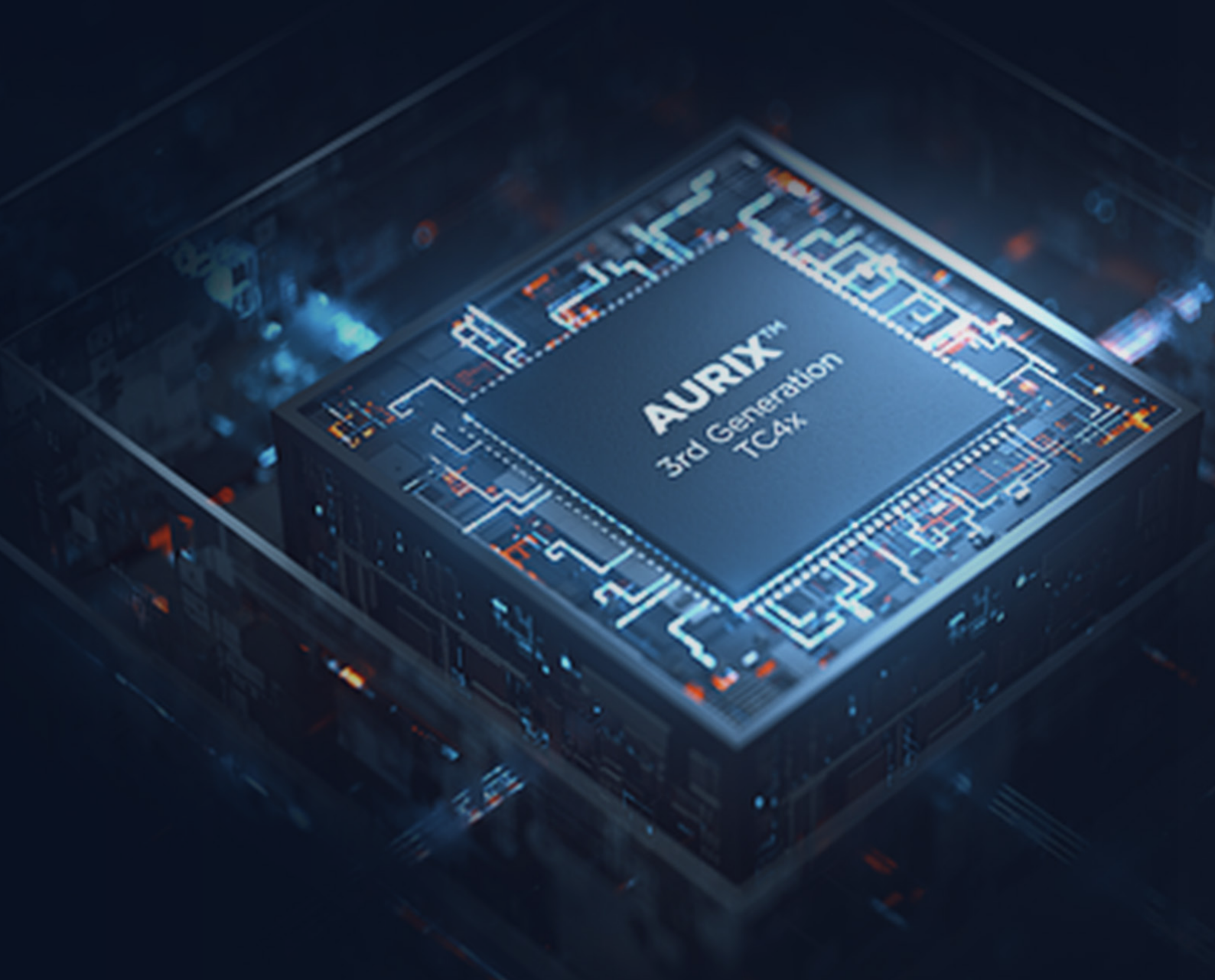
TASKING SMARTCODE

A NEW MULTI-CORE
SOFTWARE DEVELOPMENT ENVIRONMENT
FOR INFINEON NEXT GENERATION
AURIX™ TC4X MICROCONTROLLERS

A COMPLETE DEVELOPMENT SOLUTION

TASKING® SmartCode is a complete development solution for the next generation AURIX™ TC4x microcontroller family from Infineon®. SmartCode produces fast and compact code and is the only software platform that fully supports all architectures and microprocessor cores integrated in the TC4x.

SmartCode provides compiler support for the TriCore TCv1.8, Parallel Processing Unit (PPU) from Synopsys, the latest GTM IP, SCR (XC800) and the cybersecurity real time module (CSRM).

Like its predecessors, SmartCode offers unparalleled code optimization, advanced multi-core support, integration into the Eclipse™ IDE, guaranteed compatibility with leading third-party tool suppliers*, flexible memory allocation, de-bugger, static code analysis, and seamless integration with previous TASKING VX-toolsets .

The TASKING SmartCode compilers are tested for ISO C99 / C11 and ISO C++ conformity against authoritative validation suites, such as Perennial® and Plum Hall®. In addition, the optimization techniques of the compilers are tested with large real-world applications, as well as industry benchmark standards such as Nullstone and EEMBC.

LATEST ADVANCEMENTS FOR SAFETY AND CYBERSECURITY

TASKINGs best-in-class compiler performance has achieved decades-long success in the AURIX development community. SmartCode will provide industry leading safety and security features as the toolset has been developed with Automotive SPICE® Level 2 certification, conforms to the ISO/SAE 21434:2021 cybersecurity standard and is planned for TÜV certification (ISO26262 up to ASIL D).

Product Features

- **Integrated 64-bit Development Environment (IDE) based on Eclipse v4.21**
- **C/C++ Compiler toolset for TriCore TC v1.8**
  - C compiler function qualifiers and flexible ISR return sequence for HyperVisor
  - Assembler and Linker LSL support for Hypervisor instructions and trap tables
  - Conforms to TriCore EABI v3.1 and supports HW debugging via IFX MiniWiggler
  - Improved Floating Point run time library
- **C/C++ Compiler toolset for Parallel Processing Unit**
  - Vector DSP Instruction Set Architecture (Single Instruction Multiple Data SIMD)
  - Provides support for intrinsic Vector DSP instructions, Auto Vectorization, Auto Bundling and Vector ABI
  - Provides PPU Runtime Libraries and Optimized library functions
  - Conforms to Synopsys EABI and Supports HW Debugging via IFX MiniWiggler
- **C Compiler toolset for Generic Timer Module 'GTM' (Bosch GTM IP v4.1) and Standby Controller 'SCR' (XC800)**
- **C/C++ Compiler toolset for Cyber Security Realtime Module 'CSRM' (Previously HSM)**
- **C/C++ compilers have integrated static code analysis for MISRA C and CERT C**
- **Conforms to industry-leading standards:** ISO/IEC 9899:1999(E), ISO/IEC 14882:2011, MISRA C, CERT C, Infineon TriCore EABI, Synopsis ARC EV7xFS EABI, ANSI/IEEE-754, and ELF/DWARF
- **Safety and Cybersecurity Features**
  - Qualified C and runtime libraries according to ISO26262 (up to ASIL D)
  - Safety Manual for TCv1.8 and PPU toolset (ISO26262 up to ASIL D, IEC61508 up to SIL3)
  - Cybersecurity conformance according to ISO/SAE 21434:2021 Road vehicles including Security Manual

*AUTOSAR RTOS (Vector, EB, ETAS), Infineon MCAL Drivers and Hardware debuggers (iSYSTEM, Lauterbach and PLS)

The following table shows a competitive analysis between TASKING SmartCode and our competition:

COMPILER CHECKLIST	TASKING SMARTCODE	COMPETITION
TECHNOLOGY	**PROPRIETARY**	**LLVM OPEN-SOURCE**
AURIX™ TC4x family device support	✔	✔
AURIX™ TC2xx/TC3xx family device support	✖	✖
Reuse of existing AURIX™ TC2xx / TC3xx code	✔	✖
TriCore v1.8 C/C++ compiler toolset	✔	✔
CSRM C/C++ compiler toolset (TriCore v1.8)	✔	✔
GTM/MCS v4.x C compiler toolset	✔	✔
SCR C compiler toolset	✔	✖
PPU C/C++ compiler toolset	✔	some
PPU optimized library functions	✔	✖
Qualified PPU runtime library (ISO26262 up to ASIL D)	✔	✖
Standard simulation and hardware debugger for TriCore TC v1.8	✔	✖
PPU Hardware debugger support (via DAP miniWiggler for AURIX™ TC4x)	✔	✖
Windows Host OS support	✔	✔
Linux Host OS support	✔	✔
Tool Qualification including Safety Manual for TCv1.8 and PPU toolchset (ISO26262 up to ASIL D, IEC61508 up to SIL 3)	✔	certifiable
Qualified C-library according to ISO26262 (up to ASIL D)	✔	certifiable
TÜV Certification	✔	✖
Cybersecurity conform according to ISO/SAE 21434:2021 Road vehicles - Cybersecurity Engineering including Security Manual	✔	✖

DEVICE SUPPORT

The TASKING SmartCode development environment supports all AURIX™ TC4x derivatives, as well as the Infineon Virtual Development Kit (VDK).

EVALUATION LICENSE & ADDITIONAL INFORMATION

For additional information on the TASKING SmartCode toolset including Evaluation Licenses, Product Pricing, Supported License Models, Product Demonstrations and/or Product Usage please contact us at **www.tasking.com/contact** or visit our support page at **www.tasking.com/support**.