



# New product introduction **TRAVEO™ T2G** Automotive solutions

Jan., 2025



002-28416 \*Tc

Cluser overview

# TRAVEO™ T2G features





# Infineon scalable platform solutions

- Deliver full range of silicon products per platform
- Enable OEM/Tier 1 SW reuse (consistent across platform, generations)
- Deliver best-in-class, auto-quality solution components
- Reduce risk: Infineon is an established Automotive Semiconductor supplier

## Infineon Automotive solution architecture

**System software (customer/partner)**

**Auto-quality software (for example, MCAL)**

**Entry silicon**

**Mid-range silicon**

**High-end silicon**

**Auto-quality IP blocks (for example: compute, connectivity, graphics, and storage)**

# Key features TRAVEO™ T2G Cluster



<sup>1</sup> eSHE: enhanced secure hardware extension

<sup>2</sup> HSM: Hardware security module

<sup>3</sup> FOTA: Firmware update over-the-air

<sup>4</sup> RWW: Read while write

<sup>5</sup> Embedded multimedia card

## Low-power

- Energy-efficient processing power

## Performance

- Dual Arm® Cortex®-M7
- 1500DMIPS

## Scalability

- Complete portfolio,
- Memory density,
- Package lineup and Performance

## Safety

- ISO 26262 ASIL-B

## Graphics Audio

- 2.5D graphics engine
- Sound module, I<sup>2</sup>S/TDM, PCM-PWM and DAC

## Security

- Hardware security module: HSM<sup>2</sup>
- Evita full
- ISO21434 ready

## Connectivity

- LIN CXPI SMIF
- CAN FD
- 1 Gb ethernet

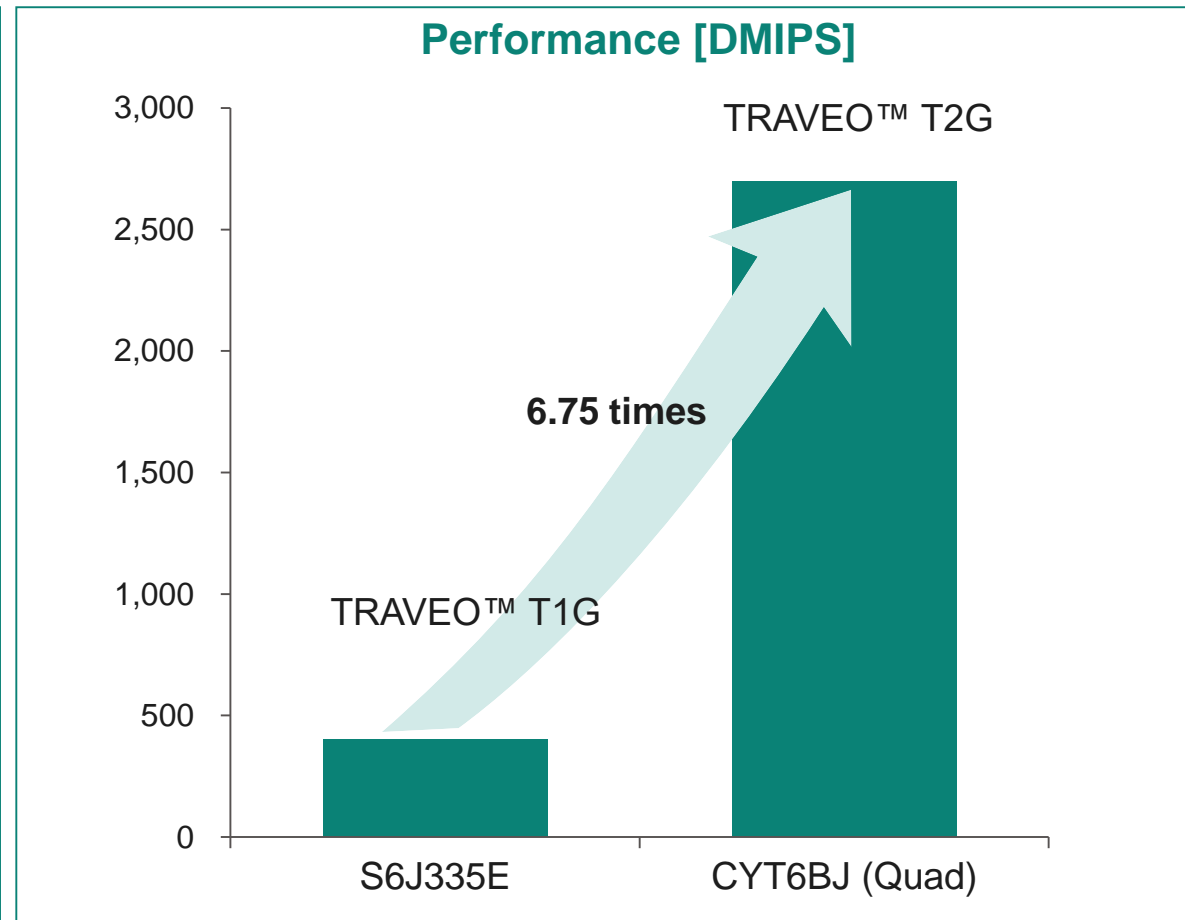
## Updatability

- FOTA<sup>3</sup> with RWW<sup>4</sup> flash
- eMMC<sup>5</sup>
- QSPI/HS-SPI



# High-performance MCU

- Arm® Cortex®-M cores
  - Single M4 up to Quad M7\*
  - Dedicated M0+ for security
  - Performance up to 2700 DMIPS\*  
\*: Up to Dual M7 and 1500 DMIPS for graphics products
- Hi-speed embedded flash with prefetch/cache
- Dedicated memory- and peripheral-DMA for CPU offloading
- Gigabit ethernet and CAN-FD for Hi-speed vehicle communication

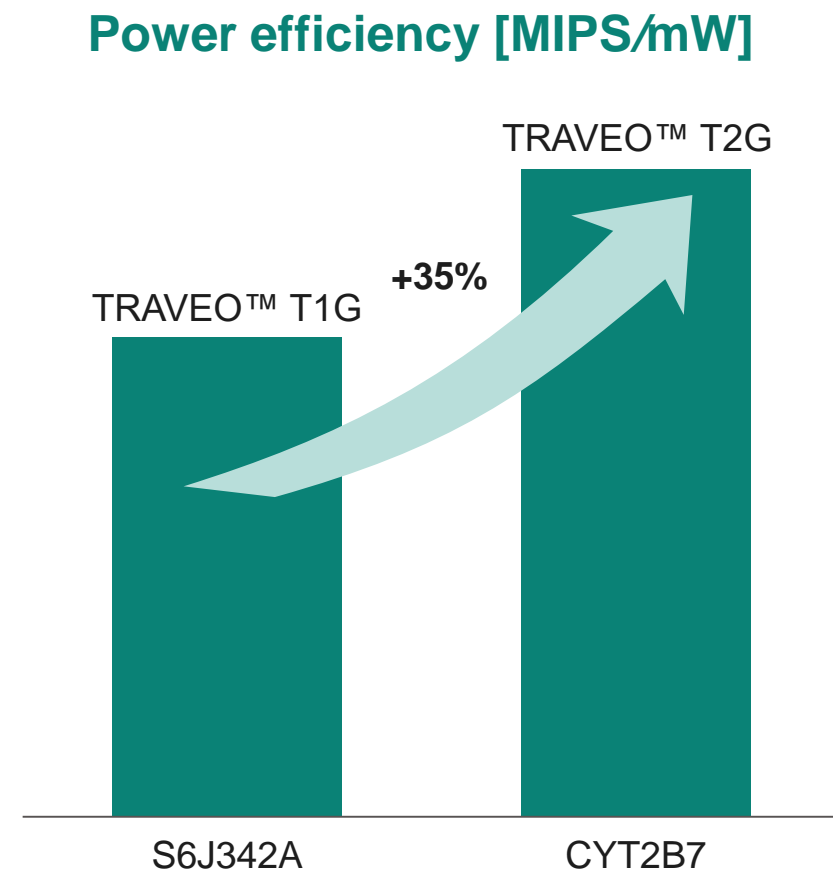


**TRAVEO™ T2G provides world-class performance**



# Power efficiency

- 35% improvement in power efficiency
- More power saving modes
  - Low-power Active
  - Sleep
  - Low-power Sleep
  - Deep Sleep
  - Hibernate
- Deep Sleep mode as low as 35  $\mu$ A (typical)
- Hibernate mode as low as 5  $\mu$ A (typical)



**TRAVEO™ T2G achieves world-class energy efficiency**

# CAN, LIN, ethernet – automotive networks

## Infineon supports state-of-the-art in-vehicle communication

### CAN-FD

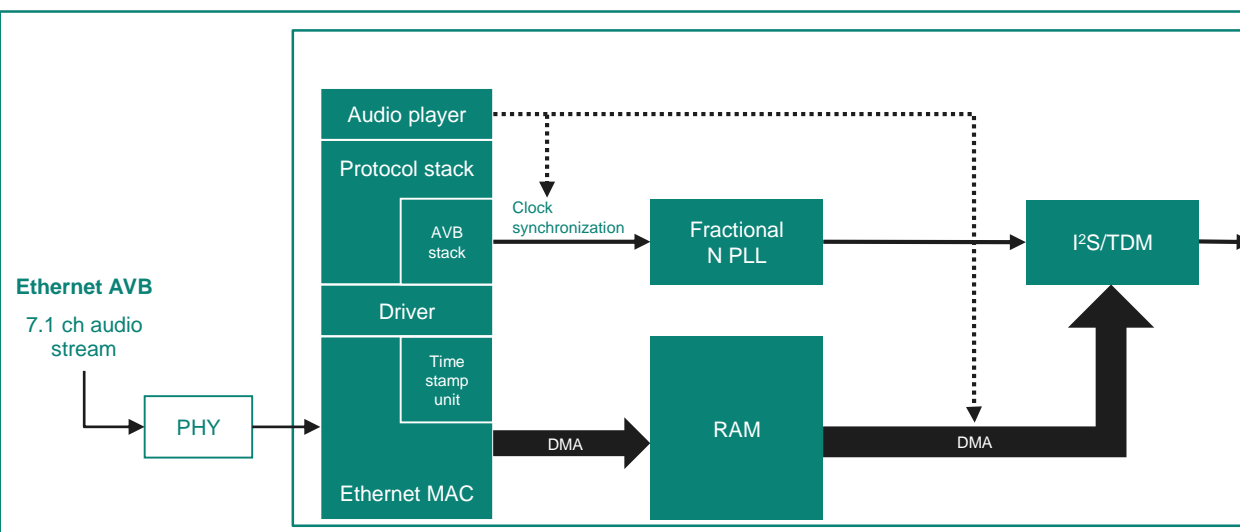
- Proven compliance to ISO11898-1 and ISO 16485
- implements the time-triggered CAN (TTCAN) protocol specified in ISO 11898-4 (TTCAN protocol levels 1 and 2) completely in hardware
- Maximum 8 Mbps supported
- Fully retained in Deep Sleep mode
- Shared message RAM with ECC protection
- DMA access to receive FIFOs

### LIN

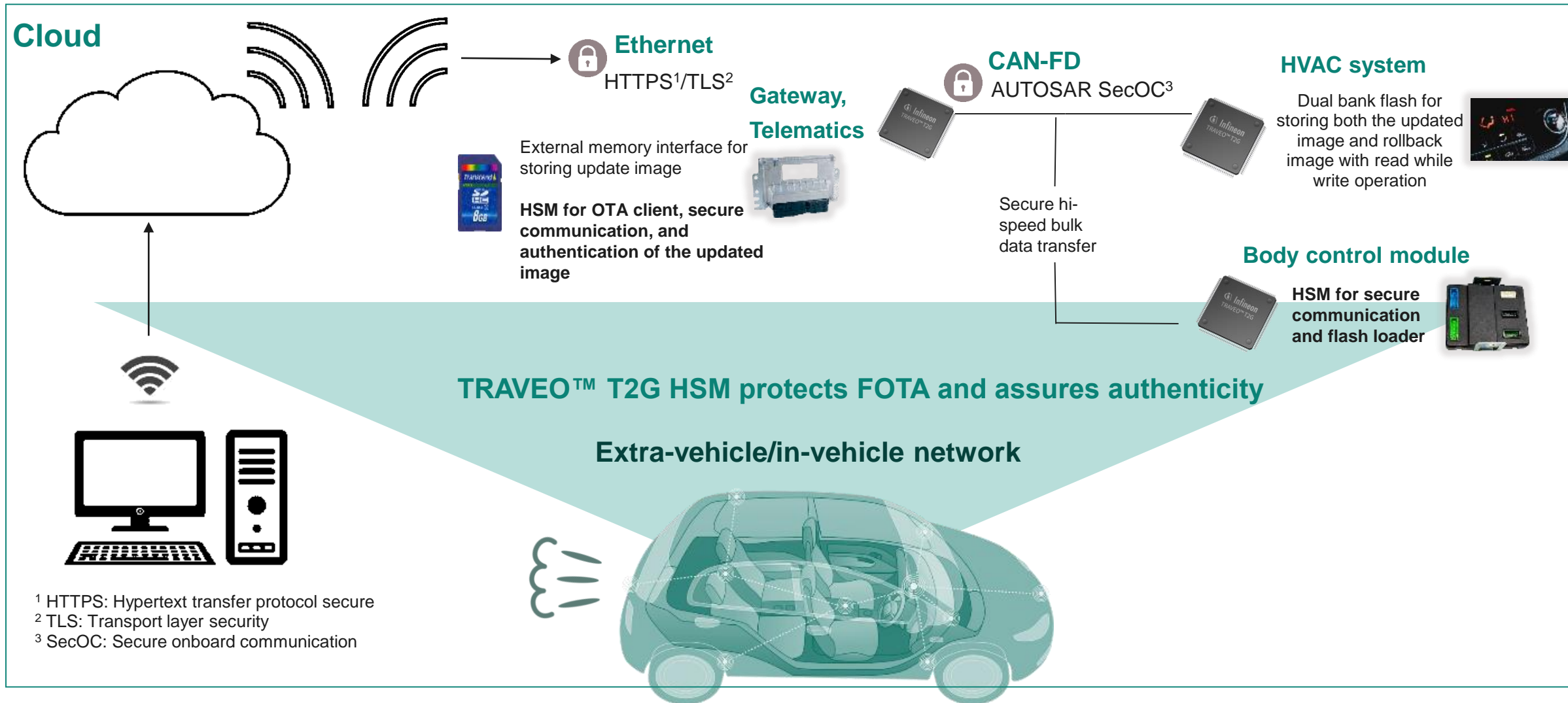
- LIN protocol support in hardware according to ISO 17987
- Master and slave functionality
- Autonomous header transmission/reception
- Autonomous response transmission and reception
- Message buffer for PID, data, and checksum fields

### Ethernet

- 10/100/1000 Mbps ethernet MAC compatible with IEEE 802.3 and IEEE-1588 PTP
- Support of MII, RMII, and RGMII PHYs
- DMA interface
- Supports ethernet AVB and integrates fractional PLL for clock synchronization
- Supports full-duplex data transport using external PHY devices



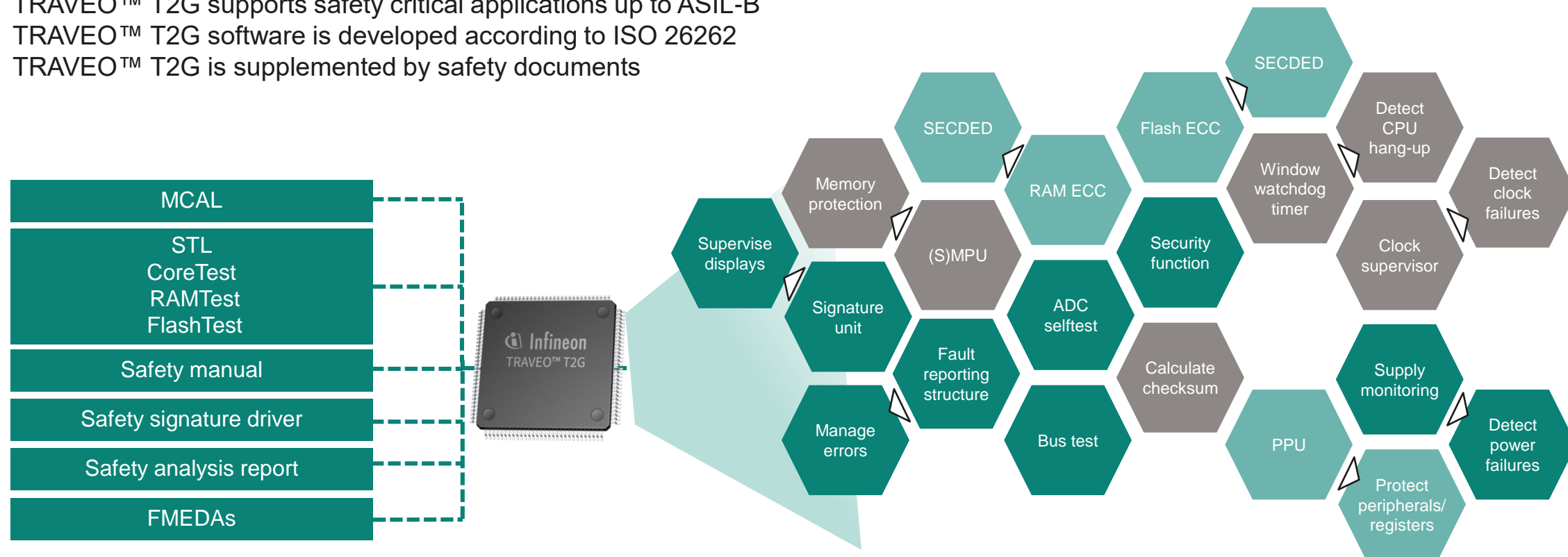
## TRAVEO™ T2G use case: Firmware over-the-air (FOTA) update





# Functional safety: A holistic system-level approach

- TRAVEO™ T2G is an ISO 26262 safety-element-out-of-context product
- TRAVEO™ T2G supports safety critical applications up to ASIL-B
- TRAVEO™ T2G software is developed according to ISO 26262
- TRAVEO™ T2G is supplemented by safety documents



**TRAVEO™ T2G offers safety hardware, software, and documents**

# Functional safety with TRAVEO™ T2G

- Infineon provides the following support for enabling safe applications with TRAVEO™ T2G



HW safety  
manual

FMEDAs  
  
for individual  
TRAVEO™  
T2G products

SW products  
  
including safety  
documentation

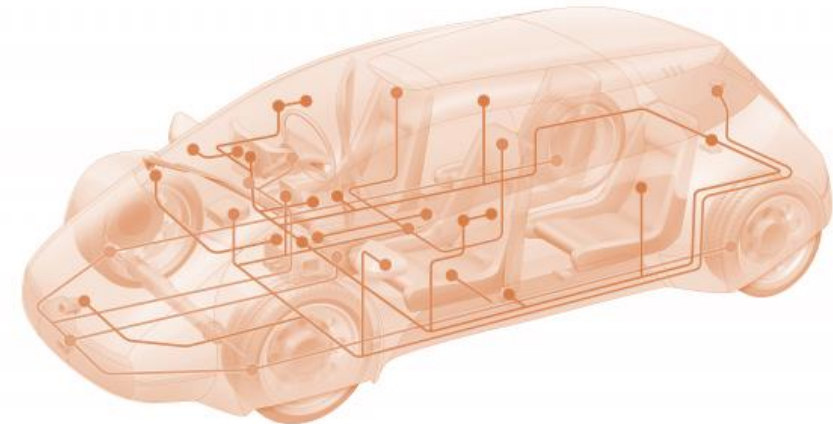
- These documents help to achieve functional safety at the system level
- Requirements have been derived to detect potential failure modes and to achieve the hardware architectural metrics for ASIL-B



ADAS, autonomous driving, and new digital service models require authentication and secure communication  
TRAVEO™ T2G integrates HSM to support secure applications

## Connected car at security risk

- Wiretapping
- Disguised identity
- Privacy/identity theft
- Unauthorized feature activation
- Unauthorized tuning
- Unlocking speed limit
- Forgery of driving record
- Hardware/property theft
- Manipulation of safety mechanism

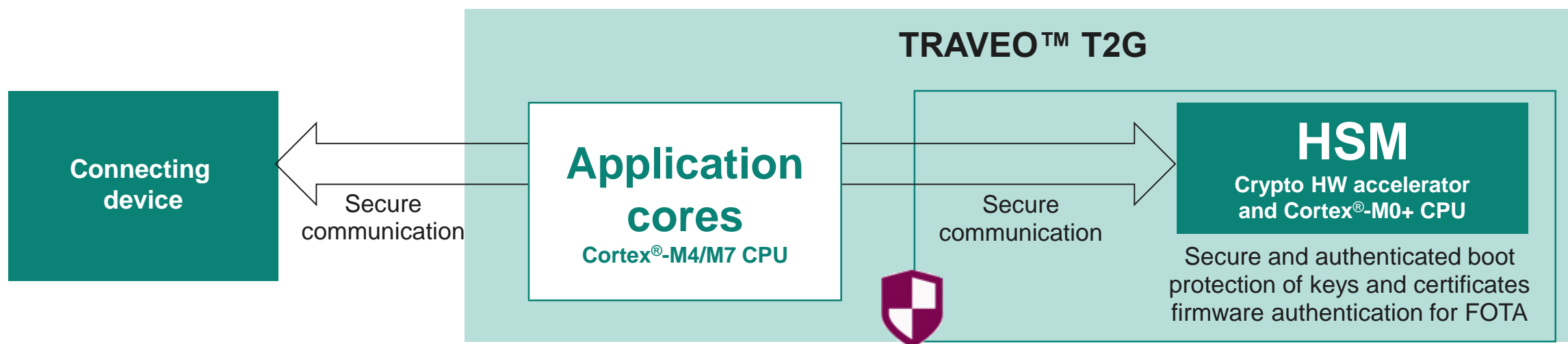


**TRAVEO™ T2G keeps connected car secure**

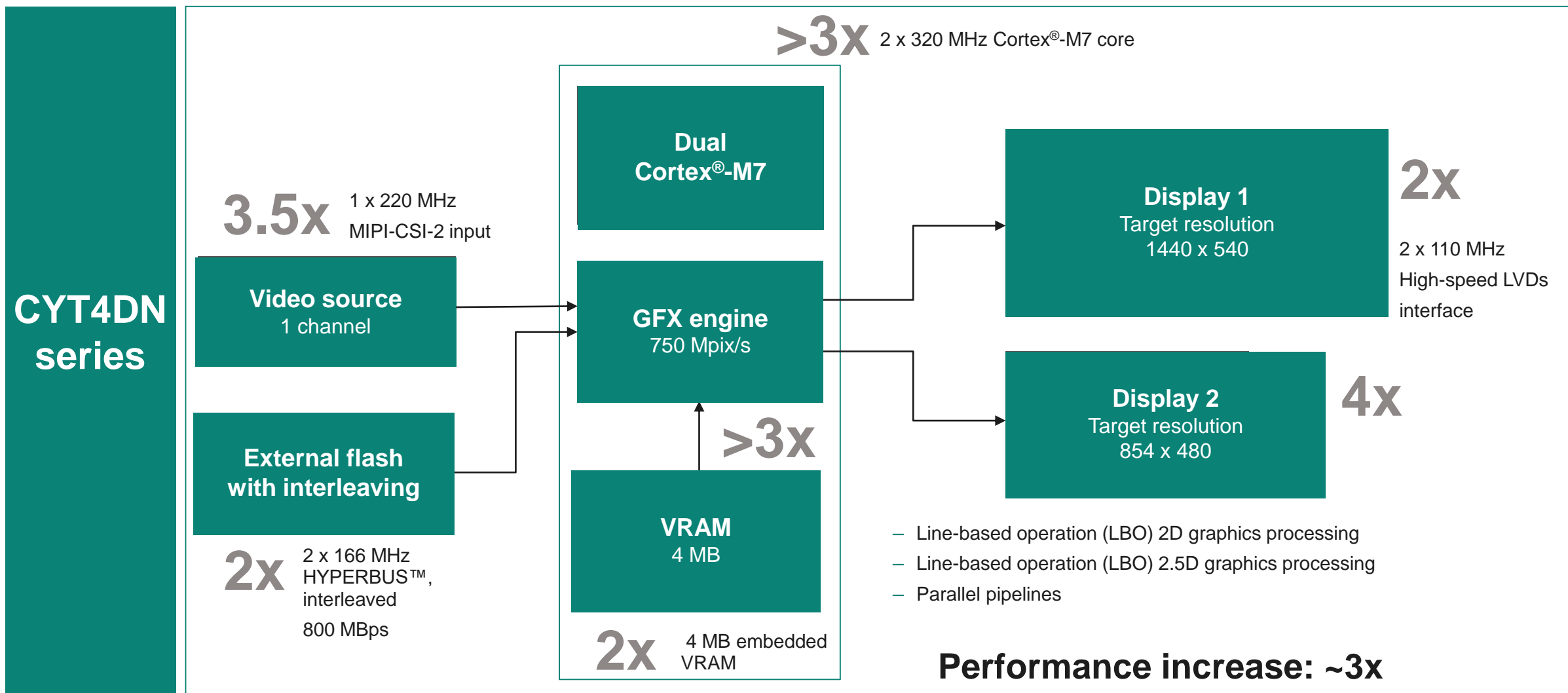


# TRAVEO™ T2G HSM for security

- Root-of-trust boot ROM and chain-of-trust boot firmware
  - Ensure establishment of hardware isolation between secure and non-secure applications
  - Enable fast authentication of ECU software during secure boot
- Flexible configuration of secure domain for efficient resource utilization
- Generation and storage of device-unique secret AES keys



# TRAVEO™ T2G graphic performance vs. TRAVEO™ T1G



# TRAVEO™ T2G product lineup



**Performance** 

	Concept	Development	Sampling	Production
Automotive				
Availability			QYYY	QYYY



# TRAVEO™ T2G Cluster portfolio scalability

Family	Flash memory Size	Pin count					
		LQFP/TQFP			BGA		
		144-lead	176-lead	216-lead	272-ball	327-ball	500-ball
CYT4EN	6 MB DDR	High-end with graphics					640 KB*
CYT4DN	6 MB				640 KB* 4 MB**		
CYT3DL	4 MB			384 KB* 2 MB**	384 KB* 2 MB**		
CYT2CL	4 MB	512 KB* -	512 KB* -	Entry			

Legend: \* RAM  
\*\* VRAM

Common SW

## Software offering

- MCAL<sup>1</sup>
- STL<sup>2</sup>
- FEE<sup>3</sup>

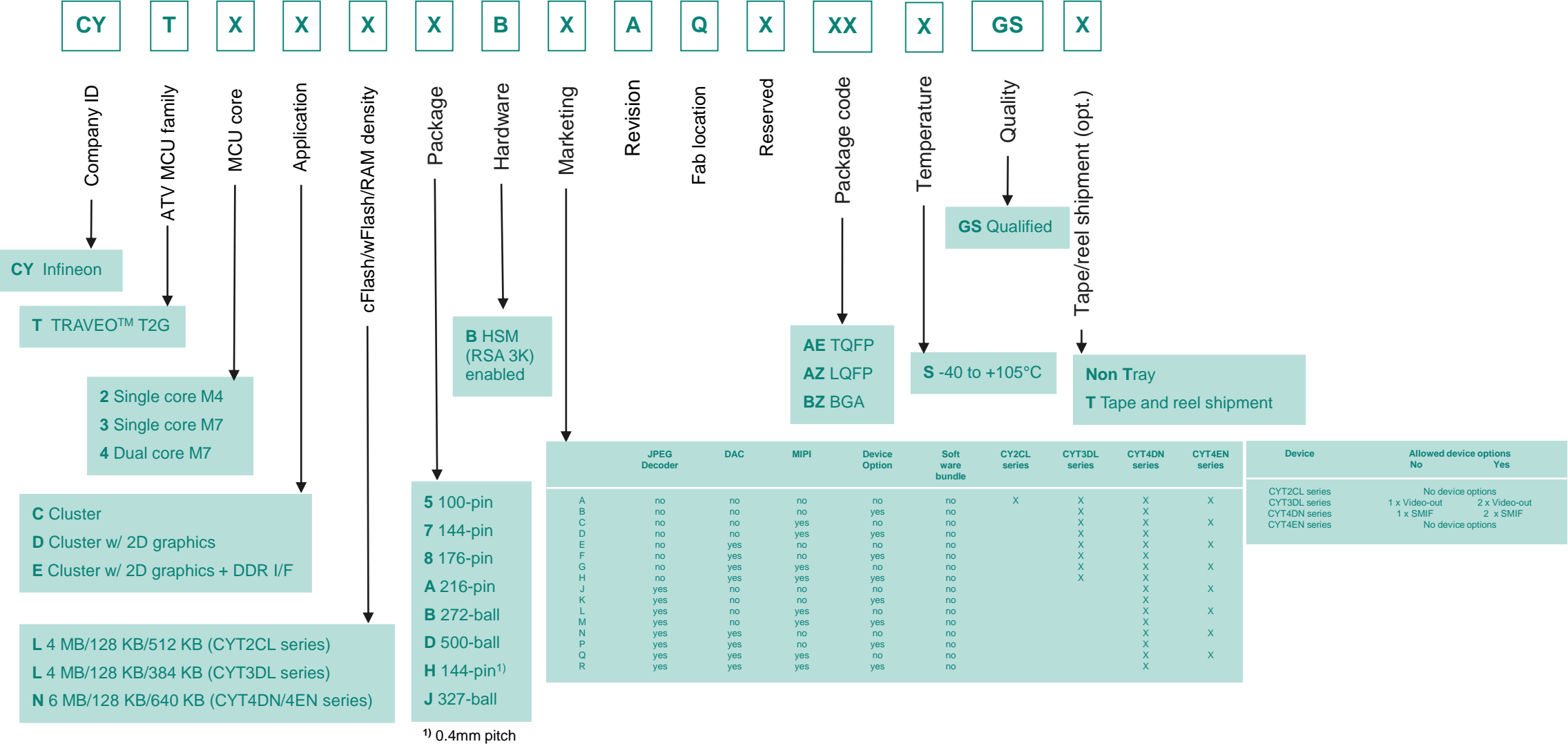
**Additional:**  
Graphics driver

- <sup>1</sup> MCAL: microcontroller abstraction layer  
<sup>2</sup> STL: Self-test library  
<sup>3</sup> FEE: Flash EEPROM emulation

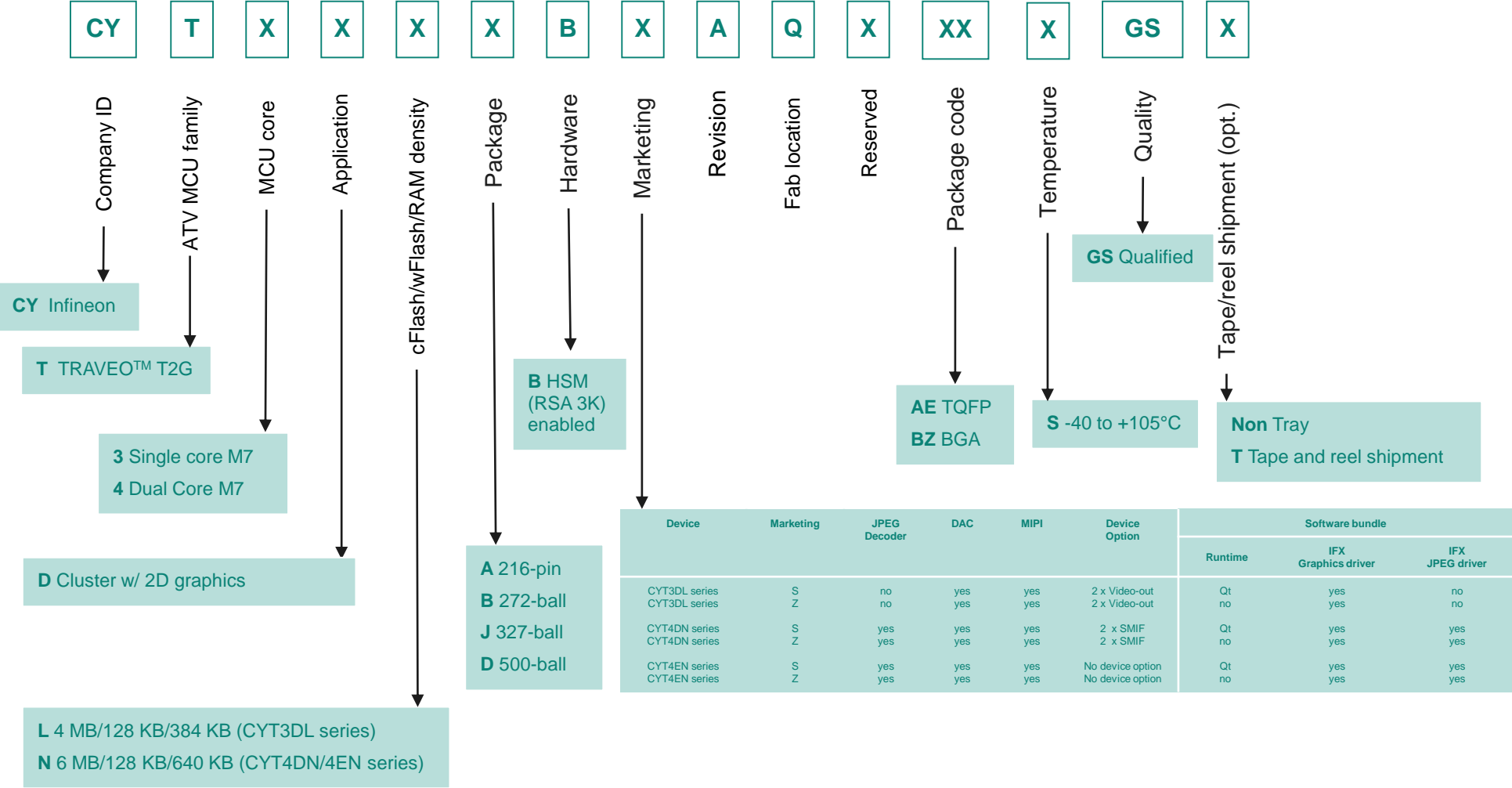
TRAVEO™ T2G on-the-fly and line-based graphics reduces memory footprint



# TRAVEO™ T2G Cluster MCU ordering code decoder



# TRAVEO™ T2G Cluster MCU ordering code decoder (Software bundle)



# TRAVEO™ T2G ecosystem



# Comprehensive tools, kits, and software

## Software

- Header files and sample driver libraries (SDL)
- AUTOSAR MCAL 4.2.x
- Self test libraries

## Third-party software IDEs

- Green Hills Multi and IAR Embedded Workbench
- iSYSTEM debug and test environment und DTS development environment

## Third-party debug hardware

- Green Hills and SuperTrace probe
- IAR I-jet debugging for Arm® Cortex®-M
- Lauterbach

## Hardware

- Evaluation board
- Lite KIT

## Functional safety

- Safety manual
- FMEDAs

- Third-party HMI tools
- Third-party HSM software

## Other support from Infineon

- SPICE-verified software services and JTAG flash programming
- Auto Flash Utility



Evaluation board

**Extensive Infineon and partner development resources simplify system integration**

# TRAVEO™ extensive Kit ecosystem

## Something for every design adventure and budget!



### TRAVEO™ T2G Cluster Entry



- Develop and test the key functionalities provided by TRAVEO™ T2G Cluster entry such as User **Switch**, User **LED**, and **UART** communication

— CYTVII-C-E-4M-176-CPU

### TRAVEO™ T2G Cluster High



- Design and debug easily the T2G-C 2D devices
- **Graphics** driver
- **MJPEG**, **Ethernet**, **Audio** interface, **Display** interface, **HYPERFLASH™**/HYPERRAM™
- Purchasable as **SET** or independently

— CYTVII-C-2D-4M-216-CPU  
— CYTVII-C-2D-4M-216-SET  
— CYTVII-C-2D-6M-327-CPU  
— CYTVII-C-2D-6M-327-SET  
— CYTVII-C-2D-6M-DDR-CPU  
— CYTVII-C-2D-6M-DDR-SET

### TRAVEO™ T2G Cluster Low cost kits



- **Low-cost**
- **Easy to use** evaluation board based on the TRAVEO™ T2G body **Entry/High** families **Ethernet**, **Arduino**, **mikroBUS**
- Supported by our **Certified HMI tool partners** (only for the High)

— KIT\_T2G\_C-2D-4M\_LITE **new**  
— KIT\_T2G\_C-2D-6M\_LITE **new**

# TRAVEO™ T2G Lite kits supported by ModusToolbox™

TRAVEO™ T2G Lite kits

[KIT\\_T2G-B-E\\_LITE](#)

Fully supported by [ModusToolbox™](#)

[KIT\\_T2G-B-H\\_LITE](#)

Fully supported by [ModusToolbox™](#)

ModusToolbox™

ModusToolbox™ Software is a modern, extensible development ecosystem supporting a wide range of Infineon microcontroller devices, including [PSOC™ Arm® Cortex® microcontrollers](#), [TRAVEO™ T2G Arm® Cortex® microcontroller](#). Provided as a collection of development tools, libraries, and embedded runtime assets, ModusToolbox™ Software is architected to provide a flexible and comprehensive development experience

[User manual](#)

[Getting started](#)

[ModusToolbox™ product presentation](#)

[GitHub](#)

[Community support](#)

# TRAVEO™ T2G Preferred Design Houses

## TRAVEO™ T2G preferred design houses

Our TRAVEO™ T2G preferred design houses is a trusted partners' ecosystem that extends the support force by tailoring their know-how to meet your specific needs.

By partnering with one of our qualified preferred design houses, you can be assured that you'll receive expert advice and customized support to help you achieve your goals. Our team of professionals brings added value to customer service, working together to optimize your design and help you succeed in your business objectives.

We understand that every customer is unique, which is why we offer tailored solutions to meet your specific needs. From product-specific support to application-specific advice, our preferred design house is fully trained to use TRAVEO™ T2G and provides a wealth of knowledge and expertise to help you succeed.

Together with our partners, we offer optimized customer support for systems using our products. Our preferred design houses are committed to delivering exceptional service and support to ensure your success

PDH	Supported Products		Supported Region(s)					
	TRAVEO™ Body	TRAVEO™ Cluster	Global	EMEA	AMR	JP	GC	AP
Altia	-	X	X	-	-	-	-	-
Avin Systems	-	X	-	X	-	-	-	X
Candera	-	X	X	-	-	-	-	-
Embedded Office	X	X	-	X	-	-	-	-
Embien Technologies	-	X	-	-	-	-	-	X
Elektrobit Automotive GmbH	X	X	X	-	-	-	-	-
G-pulse	-	-	-	-	-	-	X	-
Hightec	X	X	X	X	-	-	-	-
Hitex	X	X	X	X	-	-	-	-
L4B software	-	X	-	X	-	-	-	-
Macnica	X	X	-	-	-	X	-	-
Neutron Controls	X	X	-	-	X	-	-	-
QT	-	X	X	-	-	-	-	-
Revotech	X	X	-	-	-	-	-	X
Sili Auto	-	X	-	X	-	-	-	-
Techrein	X	X	-	-	-	-	-	X
Tekall	-	-	-	-	-	-	X	-

# TRAVEO™ T2G software offering overview

## AUTOSAR 4.2.2 SW (ASIL-B)

- MCAL<sup>1</sup>: MCU<sup>2</sup>, ADC<sup>3</sup>, ICU<sup>4</sup>, GPT<sup>5</sup>, PWM<sup>6</sup>, WDG<sup>7</sup>, OCU<sup>8</sup>, CAN<sup>9</sup>, LIN<sup>10</sup>, SPI<sup>11</sup>, FLS<sup>12</sup>, DIO<sup>13</sup>, and PORT
- STL (Self-test libraries): core test, flash test, and RAM test
- FEE (EEPROM emulation)
- Complex device drivers for I<sup>2</sup>C, UART, program flash
- Multi-core extension for MCAL, offering ASR 4.4 type II multi-core support for selected modules

## Software services/customization

- Infineon SW teams have leading expertise in the fields: AUTOSAR, graphics, functional safety, and security
- Customized SW modules available upon request

## SDL (sample driver library)

<sup>1</sup> MCAL: Microcontroller abstraction layer

<sup>2</sup> MCU: Microcontroller

<sup>3</sup> ADC: Analog digital converter

<sup>4</sup> ICU: Input capture unit

<sup>5</sup> GPT: General purpose timer

<sup>6</sup> PWM: Pulse width modulation

<sup>7</sup> WDG: Watchdog

<sup>8</sup> OCU: Output compare unit

<sup>9</sup> CAN: Controller area network

<sup>10</sup> LIN: Local interconnected network

<sup>11</sup> SPI: Serial peripheral interface

<sup>12</sup> FLS: flash

<sup>13</sup> DIO: Digital input/output



# Compiler/programmer/debugger/probes for TRAVEO™ T2G

Vendor	SW tool	Compiler	Programmer	Debugger	ETM trace via SWD/JTAG <sup>1)</sup>	Trace via TPIU (4 pins)	Debugger I/F
<a href="#">IAR</a>	IAR Embedded Workbench	Yes	I-jet			No	SWD/JTAG
<a href="#">IAR</a>	IAR Embedded Workbench	Yes	I-jet trace				SWD/JTAG/TPIU
<a href="#">Lauterbach</a>	PowerView	No <sup>2</sup>	µTrace				SWD/JTAG/TPIU
<a href="#">Lauterbach</a>	PowerView	No <sup>2</sup>	PowerDebug USB 3 + Cortex®-M debug cable PowerDebug Pro + Cortex®-M debug cable			combined with CombiProbe	SWD/JTAG/TPIU
<a href="#">Green Hills Software</a>	Multi	Yes	Green Hills Probe			No	SWD/JTAG
<a href="#">Green Hills Software</a>	Multi	Yes	Green Hills SuperTrace Probe				SWD/JTAG/TPIU
<a href="#">iSYSTEM</a>	WinIDEA	No <sup>2</sup>	iC5000 / iC5700				SWD/JTAG/TPIU
<a href="#">Dts Insight</a>	microVIEW-PLUS	Arm® DS MDK-ARM	adviceXross NETIMPRES	adviceXross			SWD/JTAG/TPIU
<a href="#">PLS</a>	UDE	No <sup>2</sup>	PLS-MemTool	UAD2pro/UAD2next/ UAD3+	UAD2next/UAD3+		SWD/JTAG/TPIU

<sup>1</sup> Check with the tool vendor for the exact trace support feature and the latest status of handling of TVT2G MCUs

<sup>2</sup> Vendor does not offer own compiler

# Infineon's HMI tool certification program

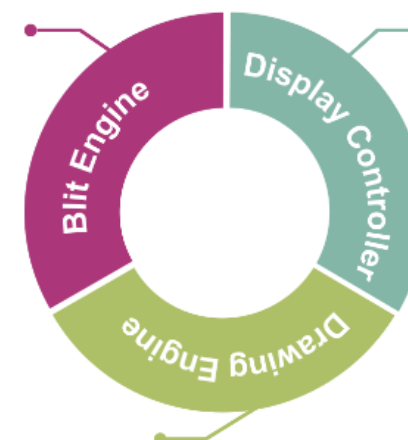
- Infineon defined a list of key features the tool partner must support within its HMI tool. The requirements demand hardware-based rendering – software-based rendering does not take place
- By implementing the reference HMI, our partners have shown that they support the hardware capabilities of our MCU in their HMI tool in the best possible way
- The program requires the implementation of two demos. A full virtual dashboard demo (1920 x 720) and a dual-display head-up solution demo (2x 800 x 480)

OTF: "On-the-fly" (Line-based operation to display)



## Line & Frame based rendering

- Blending
- Rotation
- Blitting
- Scaling
- Decompression
- Warping



## Text rendering

## Vector rendering

## Dual display support

- Warping (HUD)

## Layer composition

- OTF rendering
- Decompression
- Warping

## Scaling

# myInfineon collaboration platform for TRAVEO™ T2G



## Access to additional technical documentation

By registering in the myInfineon collaboration platform (MyICP), you can get access to add-on technical documentation, trainings, tools, and much more for all TRAVEO™ T2G devices.

## How to get access

If not already available, please create a myInfineon account on [www.infineon.com](https://www.infineon.com). Please contact [traveo@infineon.com](mailto:traveo@infineon.com) and request access to TRAVEO™ T2G myICP.

[Link to TRAVEO™ T2G MyICP](#)

