E3640 High-Reliable MCU
Product Brief

Preliminary

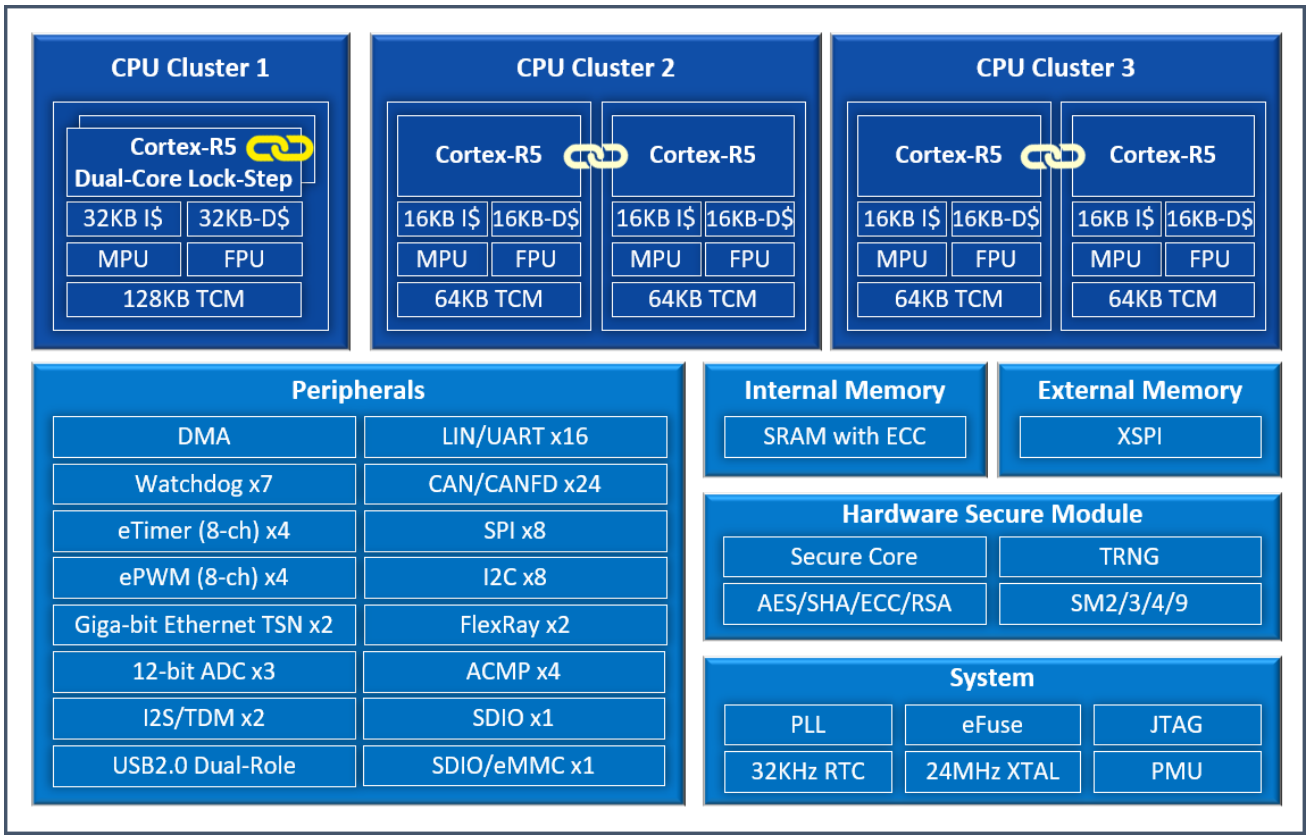
Subject to change without notice

Confidential and Proprietary - Beijing SemiDrive Technology Corporation
Room 505,5/F, Building 5, Courtyard 2, Ronghua South Road, Beijing Economic and Technological Development Zone, Beijing, China

E3640

High-Reliable Automotive MCU

E3640 High-Reliable MCU is the next-generation high-performance MCU designed for safety-critical automotive applications. It integrates 3-pairs of ARM Cortex-R5 lock-step CPU cores and 4MB SRAM to support the increasing demands on computing and program/data storage. It is also equipped with rich communication interfaces such as CANFD, LIN, FlexRay, USB, Giga-bit Ethernet for seamless integration into automotive system at minimal BOM cost. Its internal HSM supports true random number generator and high-performance crypto engines for AES, RSA, ECC, SHA as well as SM2/3/4/9 standards. It is designed to meet the security requirement on secure boot, secure communication, OTA etc.



Automotive Qualification

- AEC-Q100 Grade 1
- ISO 26262 compliance to support safety requirements up to ASIL D

Key Features

CPU Cluster 0

- 600MHz Dual-Core ARM Cortex-R5F
- Fixed Lock-Step Operation
- 32KB I-Cache, 32KB D-Cache
- 128KB TCM
- With FPU & MPU

CPU Cluster 1

- 600MHz Dual-Core ARM Cortex-R5F
- Configurable Lock-Step / Split Operation
- 16KB I-Cache, 16KB D-Cache
- 64KB TCM
- With FPU & MPU

CPU Cluster 2

- 600MHz Dual-Core ARM Cortex-R5F
- Configurable Lock-Step / Split Operation
- 16KB I-Cache, 16KB D-Cache
- 64KB TCM
- With FPU & MPU

ADC

- 3x 12-bit SAR ADC
- 48 shared analog input channels
- Support single-end / differential mode
- Support 0~5V input range

ACMP

- 4x Analog comparator
- 48 shared analog input channels
- Support single-end / differential mode
- Support 0~5V input range

Storage

- 1x SD3.0
- 1x eMMC5.1

Internal Memory

- 4MB SRAM
- ECC protection enabled

XSPI Memory Interface

- Support 16-bit/8-bit/4-bit mode
- Support Octal-SPI / Qual-SPI FLASH
- Support HyperFLASH / HyperRAM

Peripherals

- 24x CAN/CANFD
- 16x LIN/UART
- 2x FlexRay
- 2x Gigabit Ethernet TSN
- 1x USB2.0 Host/Device
- 2x I2S/TDM
- 8x I2C
- 8x SPI
- 4x ePWM, 8-ch per ePWM
- 4x eTimer, 8-ch per eTimer

Hardware Secure Module (HSM)

- High-performance Secure Core
- TRNG
- AES/SHA/RSA/ECC
- SM2/3/4/9

Power Management

- Full PMU integration
- Temperature Sensor
- Voltage detector

Enablement

Software

- AUTOSAR MCAL
- Power-On Self Test Program

Tools

- IAR Workbench

Parameter Table

Family		E3
Series		E3600
Part Number		E3640-AGKAA
Automotive Safety Integrity Level		ASIL D
CPU Cluster 0		600MHz Cortex-R5 Dual-Core Lock-Step
CPU Cluster 1		600MHz Cortex-R5 Dual-Core Split/Lock
CPU Cluster 2		600MHz Cortex-R5 Dual-Core Split/Lock
Internal Memory		4MB with ECC
HSM/Crypto		AES/SHA/ECC/RSA, SM2/3/4/9
XSPI Memory Interface		2x Octal-SPI/Quad-SPI FLASH/HyperFLASH/HyperRAM
Interfaces	**USB2.0**	1
	CANFD	24
	FlexRay	2
	SD/SDIO	1
	eMMC	1
	I2S	2
	1G Ethernet TSN	2
	LIN/UART	16
	SPI	8
	I2C	8
Timer	**ePWM**	4
	eTimer	4
	Watchdog Timer	7
Analog	**ADC**	3
	ACMP	4
	Analog Input Channel	48
Power Management	**External Power Supply**	3.3V
	PMU	Integrated DCDC & LDO
	Temperature Sensor	Integrated Temperature Sensor
	Voltage Detector	Integrated HV/LV Detector
RTC		32KHz RTC
Package		BGA324, 15mm x 15mm, 0.8mm pitch
AEC-Q100		Grade-1
Temperature Range (T_j)		-40 ~ 150