

M57 family has strong AI and vision processing capabilities that targets the Intelligent Front View (IFV), Domain Controller, DMS&OMS markets. It integrates four ARM Cortex-A55 processors, high efficient NPU, excellent ISP that provides superior image quality, and safety Island with lock-step ARM Cortex-R5F that support Autosar CP ecosystem. All these functionalities are optimized to achieve extreme low thermal power dissipation.

M57 family



Key Specifications

Neutron NPU

- Mainstream CNN/Transformer model support, rich operator set
- Mixed precision design (INT4/INT8/INT16)
- Pipeline level optimization
- Full function toolchain, high precision PTQ

Multi-Core System

- Quad-Core Arm® Cortex®-A55

Safety Island

- Arm® Cortex®-R5F x 2 with Lock/Split configuration
- FCU fault control unit
- Support AUTOSAR CP

Low Power

- TDP <3.5w@Tj=125 °C

Proton ISP & CV engine

- NR/HDR/Demosaic
- RGGB/RCCB/RGB-IR
- CV accelerator with rich feature

Video Encoder (VPU)

- H.264、JPEG 8MP@30fps

Key Interfaces

- 2x 4-lane MIPI Rx
- 1x 4-lane MIPI-CSI Tx
- Up to 1G ETH
- CAN/CAN-FD

Certification

- AEC-Q100 Grade 2
- ISO26262 ASIL-B
- ISO21434



Applications

Intelligent Front View System

- Optimize corner cases with ISP
- Close-loop data capturing system with hardware masking
- High performance, mixed precision NPU
- Ultra low power design
- Complete reference design

Domain Controller System

- Driving & Parking in single chip
- Complete reference design

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Product Description

CPU:

- Quad-Core Arm® Cortex®-A55@up to 1.4GHz
- 32KB I-Cache/D-cache
- Advanced SIMD and floating-point extension(Arm® Neon™)

NPU:

- Support mainstream deep learning frameworks
- Support batch acceleration
- Support mixed precision
- Mature tool chain, high-precision PTQ, rich operator set

ISP:

- Maximum performance 8M@30fps
- Support RAW8/10/12/14/16 and YUV8
- Support CFA Patterns-Bayer, RGB-IR, Optimized for RCCB/RCCG
- Raw Local Tone Mapping with multi-scale Contrast Enhancement
- Multi-Scale Noise Reduction
- Demosaic
- 3A (AF, AWB, AE) support

Video and Image Processing:

- Support rich CV functions, such as rotation, resize, dewarp, crop, LK optical flow, 3D-LoU,etc
- Support SFM operators

Video Encoder (VPU) :

- H.264、JPEG encoding
- Maximum performance: 4K@30fps

Main Interfaces

Video Interfaces:

Video Input

- 2 x 4-lane MIPI-CSI2 Rx

Video output

- 1 x 4-lane MIPI-CSI2 Tx

Peripherals :

Ethernet

- 1xRGMII/RMII

Others

- PWM, I2C, SPI, UART, CAN, USB, GPIO, etc

Memory Interfaces:

DDR

- 32-bit LPDDR4/LPDDR4x

eMMC

- eMMC v5.1

OSPI

- Up to Octal-SPI NOR and NAND

SD card

- SD3.0

Safety Island

- 2 x R5F@1GHz with Lock-step/Split
- 5 x CAN, 1 x ETH, 1 x QSPI, 1x 16-ch ADC
- Support AUTOSAR CP
- HSM

- Secure boot
- Memory access protection
- Symmetric algorithms: AES/DES/TDES、
- Hash algorithms: SHA-1/SHA-224/SHA-256/SHA-384/SHA-512
- Public key encryption: RSA、ECDSA
- True random number generation



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Part number

- M57LAANNAP
 - 15KDMIPS
 - 10eTOPS
 - Up to 4xCamera per each MIPI CSI2-Rx
 - Up to 8M resolution
- M57LBANNAP
 - 11KDMIPS
 - 8eTOPS
 - Up to 1xCamera per each MIPI CSI2-Rx
 - Up to 5M resolution



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Physical Spec.

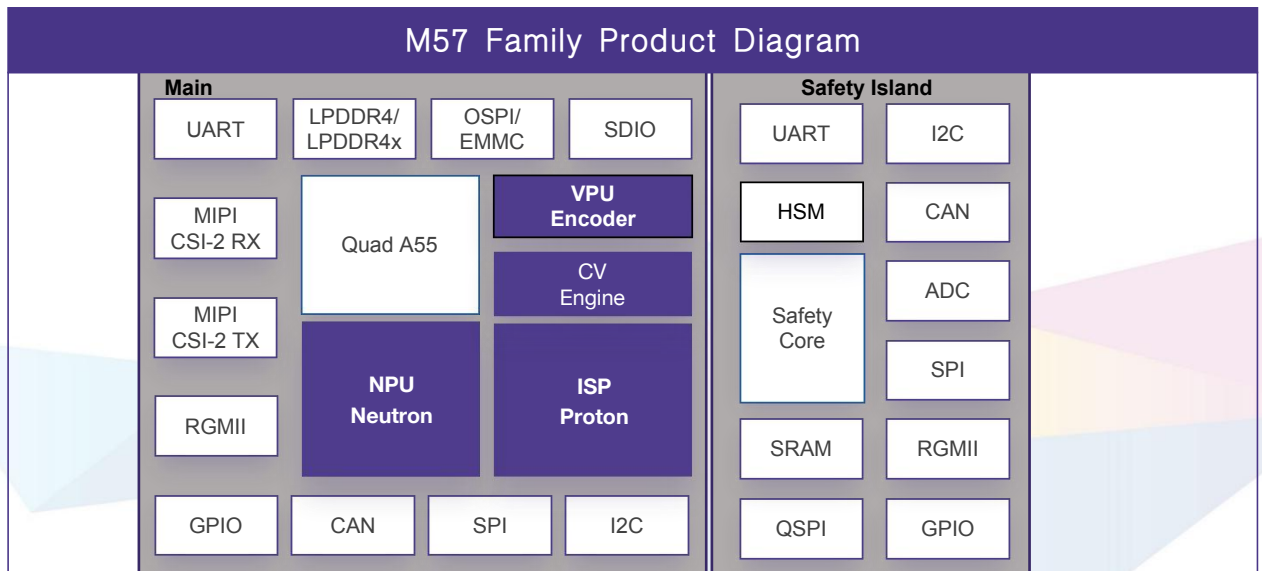
Operating temperature range:

- -40°C ~ 105°C (Ambient)

Certification:

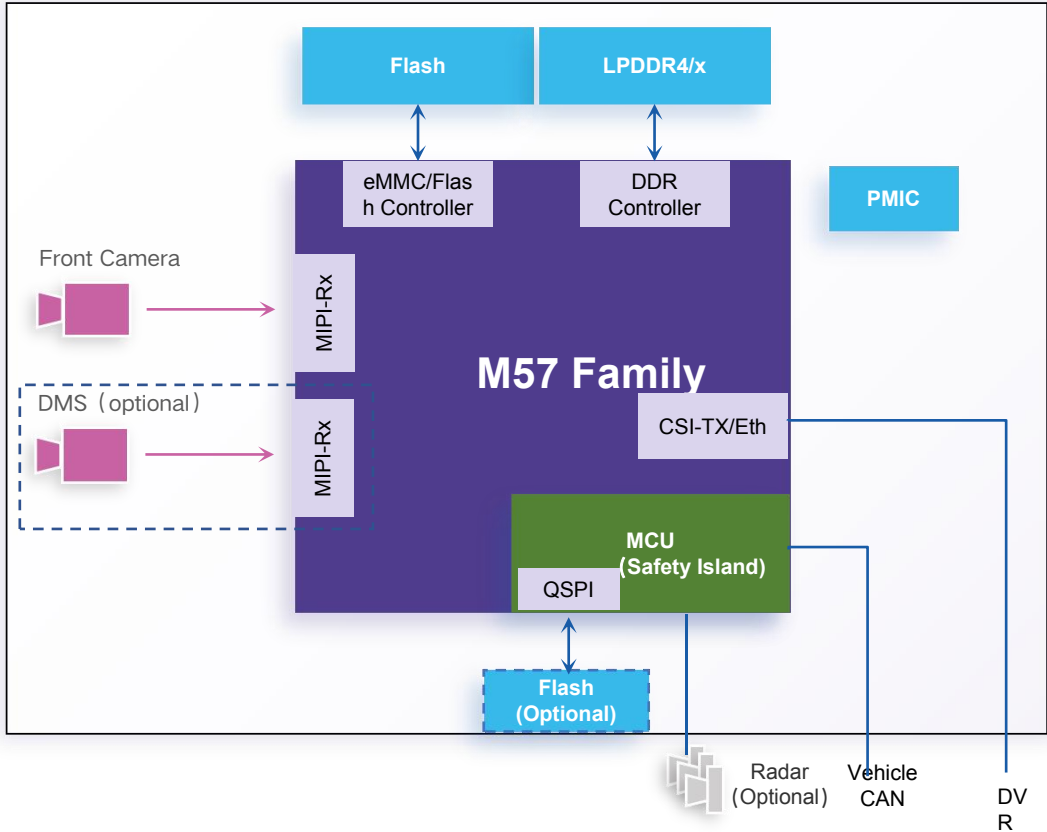
- AEC-Q100 Grade 2
- ISO26262 ASIL-B
- ISO21434

M57 Family Product Diagram



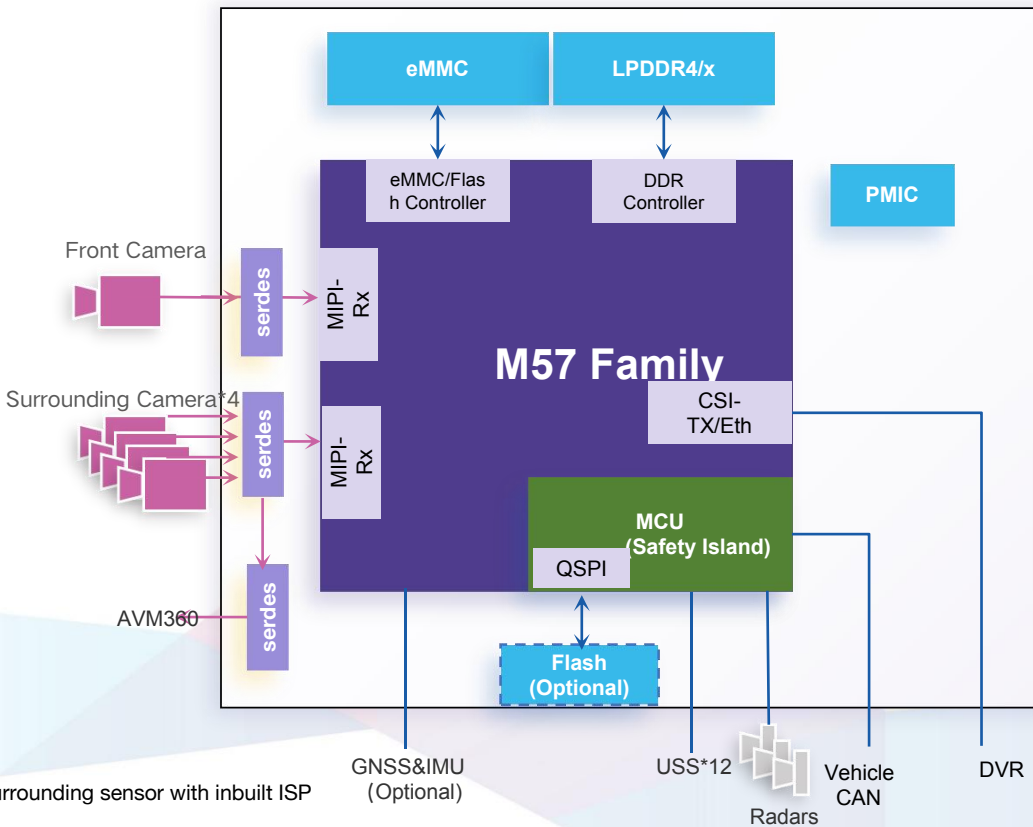
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IFC(Intelligent Front Camera) Solution



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Domain Controller Solution



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*Surrounding sensor with inbuilt ISP

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