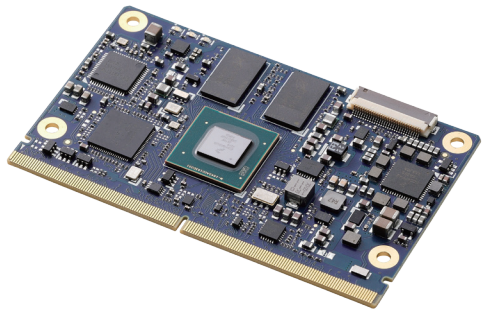
LEC-IMX8M

SMARC Short Size Module with NXP i.MX 8M

Features

- Quad Arm® Cortex®-A53 and Cortex-M4
- Cryptographic co-processor for end-to-end IoT security
- Full 4K UltraHD resolution HDMI 2.0a and dual channel LVDS
- Two MIPI-CSI-2 camera inputs
- 2x GbE LAN (optional TSN support), USB 3.0/2.0 and OTG
- Standard or rugged support: 0°C to +60°C or -40°C to +85°C
- 15 year product availability



Specifications

Core System

SoC

Arm® Quad Cortex®-A53 core up to 1.5 GHz
Arm® Cortex®-M4 core processor is for low-power processing

Memory

1/2/4GB DDR3L memory down

L2 Cache

32 kB I-cache32 kB D-cache (A53) & 16 kB I-cache16 kB D-cache (M4)

IOT security

Cryptographic co-processor with secure hardware-based key storage
Protected storage for up to 16 Keys, certificates or data
ECDH: FIPS SP800-56A Elliptic Curve Diffie-Hellman NIST standard P256 elliptic curve support
SHA-256 & HMAC hash including off-chip context save/restore
AES-128: encrypt/decrypt, Galois field multiply for GCM

Video

Graphics Support

GPU: Vivante GC7000Lite 2D/3D
4 shaders, OpenGL ES 3.1, OpenCL 1.2, OpenGL 3.0, OpenVG and Vulkan
Up to 4Kp60 UHD resolution
VPU: HEVC/H.265, H.264, VP9 Decoder 1080p60 MPEG-2, MPEG-4p2, VC-1, VP8, RV9, AVS, MJPEG, H.263 Decoder
(no VPU support for iMX 8M Quad Lite version)

HDMI

HDMI 2.0a supporting 4K resolution (4096 x 2160 at 60Hz)

LVDS

LVDS single/dual channel 24-bit
MIPI DSI (optional) MIPI DSI 4 lanes at up to 1080p @60fps display output (build option)

Camera

2x MIPI-CSI2 camera inputs: one 4-lane, one 2-lane

Audio

Audio Codec

Supports ES8316 codec for high performance and low power multi-bit delta-sigma audio ADC and DAC (located on carrier)

Dual Ethernet

Primary

GbE Ethernet Controller with IEEE-1588 PTP (Precision Time Protocol)
Supports 10/100/1000-Mbps data transfer rates, both full- and half-duplex

Secondary

Intel® i210 GbE controller with IEEE-1588 PTP (Precision Time Protocol)
Supports 10/100/1000-Mbps data transfer rates, both full- and half-duplex

Expansion Busses

PCIe

2x PCI Express x1 Gen2.1

USB

2x USB 3.0/2.0, 2x USB 2.0 and , 1x USB 2.0 OTG

UART

3x UART interfaces: Tx/Rx/CTS/RTS (SER0) and Tx/Rx (SER1, SER3)
7- or 8-bit data words, 1 or 2 stop bits, programmable parity (even, odd, or none)
Programmable baud rates up to 4 Mbps

CAN

Supports CAN 2.0B only or mixed CAN 2.0B and CAN FB mode, data bit rate up to 8 Mbps

SPI

2x SPI

I²S

2x I²S interfaces with audio resolution from 16-bits to 32-bits, sample rate up to 192KHz (see Audio Codec support)

I²C

6x I²C interface
- Supports 7-bit and 10-bit address mode
- Software programmable clock frequency: 100 kbit/s in Standard-mode, 400 kbit/s in Fast-mode or 1 Mbit/s in Fast-mode Plus

GPIO

12x GPIO with interrupt, one GPIO with PWM

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Specifications

- **System Storage**

  SDIO

  1x SDIO (4-bit) compatible with SD/SDIO standard, up to version 3.0

  eMMC

  32 or 64 GB (build option) eMMC specification 4.41, 4.51, 5.0

- **SEMA Board Controller**

  Voltage/current monitoring, boot configuration, logistics and forensic information, flat panel control, watchdog timer

- **Debug Header**

  30-pin multipurpose flat cable connector for use with optional DB-30 debug module providing JTAG, BMC access, UART, power testpoints, diagnostic LEDs, power, reset, boot configuration

- **Mechanical and Environmental**

  Form Factor

  SGET SMARC Specifications 2.0 (2.1)

  Dimensions

  SMARC short size module, 82 mm x 50 mm

  Operating Temperature

  Standard: 0°C to +60°C
  Rugged: -40°C to +85°C (optional)

  Humidity

  5-90% RH operating, non-condensing
  5-95% RH storage (and operating with conformal coating)

  Shock and Vibration

  IEC 60068-2-64 and IEC-60068-2-27, MIL-STD-202 F, Method 213B, Table 213-I, Condition A and Method 214A, Table 214-I, Condition D

  HALT

  Thermal Stress, Vibration Stress, Thermal Shock and Combined Test

- **Operating Systems**

  Yocto Linux BSP at https://github.com/ADLINK/meta-adlink-nxp
  Ubuntu 18.04 LTS BSP
  Windows 10 IOT Core BSP
  Android 8.1 (by request)

Ordering Information

- **LEC-IMX8M-Q-4G-32G-CT**
  SMARC Short Size Module with Quad Core NXP i.MX8M, 4 GB DDR3L, 32 GB eMMC, 0°C to +60°C
- **LEC-IMX8M-Q-4G-64G-CT**
  SMARC Short Size Module with Quad Core NXP i.MX8M, 4 GB DDR3L, 64 GB eMMC, 0°C to +60°C
- **LEC-IMX8M-Q-4G-32G-ER**
  SMARC Short Size Module with Quad Core NXP i.MX8M, 4 GB DDR3L, 32 GB eMMC, -40°C to +85°C
- **LEC-IMX8M-Q-4G-64G-ER**
  SMARC Short Size Module with Quad Core NXP i.MX8M, 4 GB DDR3L, 64 GB eMMC, -40°C to +85°C

Accessories

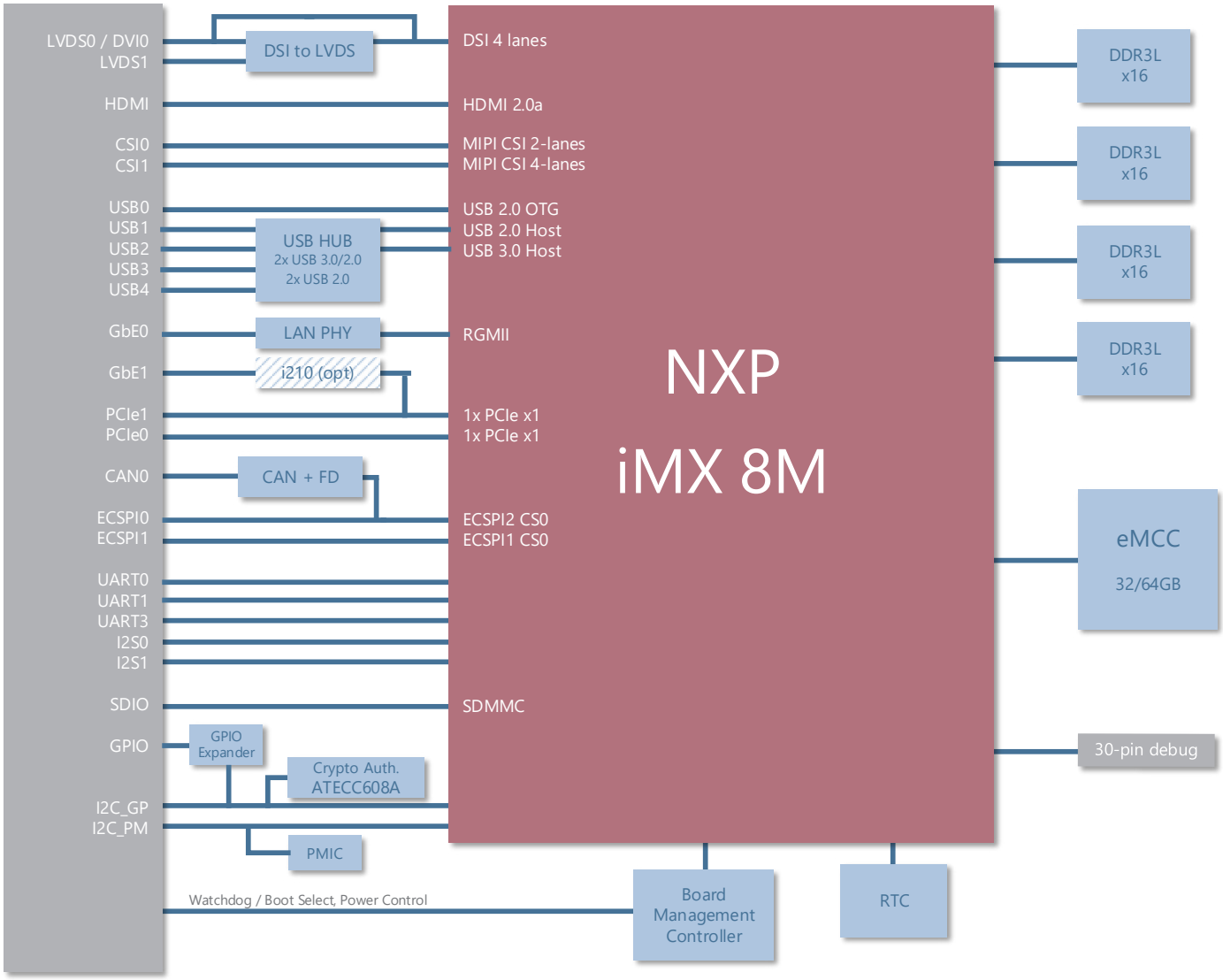
Heat Spreaders

- **HTS-SIMX8M**
  Heat spreader for LEC-IMX8M (standard temperature range)
- **THS-SIMX8M**
  Low profile heatsink for LEC-IMX8M (standard temperature range)

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LEC-IMX8M

Functional Diagram



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