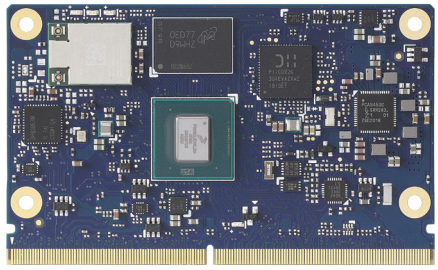
LEC-IMX8MP

SMARC 2.1 Short Size Module with NXP i.MX8M Plus

Features

- NXP i.MX8M Plus with Quad Cortex-A53
- Optional in-SoC 2.3 TOPS NPU
- SMARC revision 2.1 compliant
- LVDS, DSI, HDMI graphic output interfaces
- Dual CAN bus / USB 2.0 / USB 3.0 interfaces
- Dual GbE ports (one TSN capable)
- I^2S audio codec interface
- Rugged operating temperature (optional): -40°C to 85°C
- 15 year product availability



Specifications

Core System

SoC

NXP i.MX8M Plus with Quad core ARM Cortex-A53
TrustZone technology supports ARMv8 Cryptography Extensions
2.3 TOPS Neural Processing Unit (optional)

Memory

2/4/8GB LPDDR4L-4266

L2 Cache

512KB system L2 cache (ECC)

Security

Resource Domain Controller (RDC) supports 4 domains and up to 8 regions of DDR
Arm® TrustZone® (TZ) architecture: Cortex®-A53 MPCore TrustZone® support
On-chip RAM (OCRAM) secure region protection using OCRAM controller
High Assurance Boot (HAB)
Cryptographic Acceleration and Assurance Module (CAAM)
Capable to support Widevine and PlayReady content protection
Public Key Cryptography (PKHA) with RSA and Elliptic Curve (ECC) algorithms
Real-time integrity checker (RTIC)
DRM support for RSA, AES, 3DES, DES
Side channel attack resistance
True random number generation (RNG)
Manufacturing protection support / Secure Non-Volatile Storage (SNVS)

MIPI-DSI

1x MIPI-DSI 4 lanes

Cameras

1x MIPI-CSI dual lane interface
1x MIPI-CSI quad lane interface

Video

GPU Core

Integrated in SoC
- GC7000UL 3D graphics with 2 high performance vec4 shaders
- GC520L 2D graphics
- Supports up to 2x 1080p60 or 1x 4kp30 display resolution
- Up to 3 independent displays
- OpenGL ES 2.0/3.0/3.1, Vulkan, OpenCL 1.2

VPU Feature Support

1080p60 VP9 Profile 0, 2 (10 bit) decoder (Hantro G2), input video stream can be 10-bit, the output decoded video is always 8-bit after post-processing in G2 core
1080p60 HEVC/H.265 decoder (Hantro G2)
1080p60 AVC/H.264 Baseline, Main, High decoder (Hantro G1) 1080p60 VP8 decoder (Hantro G1)
The video encoding features include:
1080p60 AVC/H.264 Encoder
1080p60 HEVC/H.265 Encoder

HDMI

HDMI 2.0a (2160p30)

MIPI-DSI

1x MIPI-DSI 4 lanes

Cameras

MIPI-CSI RX Interface
- Compatible with the MIPI Alliance Interface specification v1.0
- Up to 4 data lanes, 1.0Gbps maximum data rate per lane
- Supports MIPI-HS, MIPI-LP mode

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LEC-IMX8MP

Specifications

- **System Storage**

  SDIO

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

  eMMC

  16, 32, 64 or 128 GB (build option)

  Compatible with eMMC specifications 4.41, 4.51, 5.0 and 5.1

- **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

  Provides JTAG, BMC access; UART, power test points; diagnostic LEDs, Power, Reset, Boot configuration

- **Audio**

  Audio Codec

  I²S audio codec (located on carrier)

- **Dual Ethernet**

  Primary LAN

  MAC 10/100/1000 Ethernet Controller on SoC (TSN capable)

  Secondary LAN

  MAC 10/100/1000 Ethernet Controller on SoC

- **Wireless Communication**

  Wi-Fi

  IEEE 802.11 2X2 MIMO ac/a/b/g/n Wireless LAN

  Bluetooth

  Bluetooth 5.0 complaint with Bluetooth 2.1+Enhanced Data Rate (EDR)

- **Expansion Busses**

  PCIe

  2x PCIe x1 Gen3

  USB

  CT 2x USB 3.0, 3x USB 2.0, 1x USB 2.0 OTG
  ER 1x USB 3.0, 1x USB 2.0/OTG

  UART

  Three UART interfaces SER1 and SER 2 (CTS/RTS) / SER0 (TX/RX/CTS/RTS)

  CAN

  2x CAN2.0B only or mixed CAN2.0B and CAN FD mode, data bit rate up to 8 Mbps

  SPI

  2x SPI

  I²S

  1x I²S interfaces with audio resolution from 16-bits to 32-bits and sample rate up to 192KHz (see Audio Codec support)

  I²C

  Four I²C interfaces

  - Support for 7-bit and 10-bit address mode
  - Software programmable clock frequency of 100 kbit/s in Standard-mode, 400 kbit/s in the Fast-mode or 1 Mbit/s in Fast-mode Plus

  GPIO

  14x GPIO with interrupt, one GPIO with PWM

- **Storage**

  SDIO

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

- **Power**

  Input

  5Vdc +/- 5%

- **Mechanical and Environmental**

  Form Factor

  SGET SMARC Specifications 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

  10-90% 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

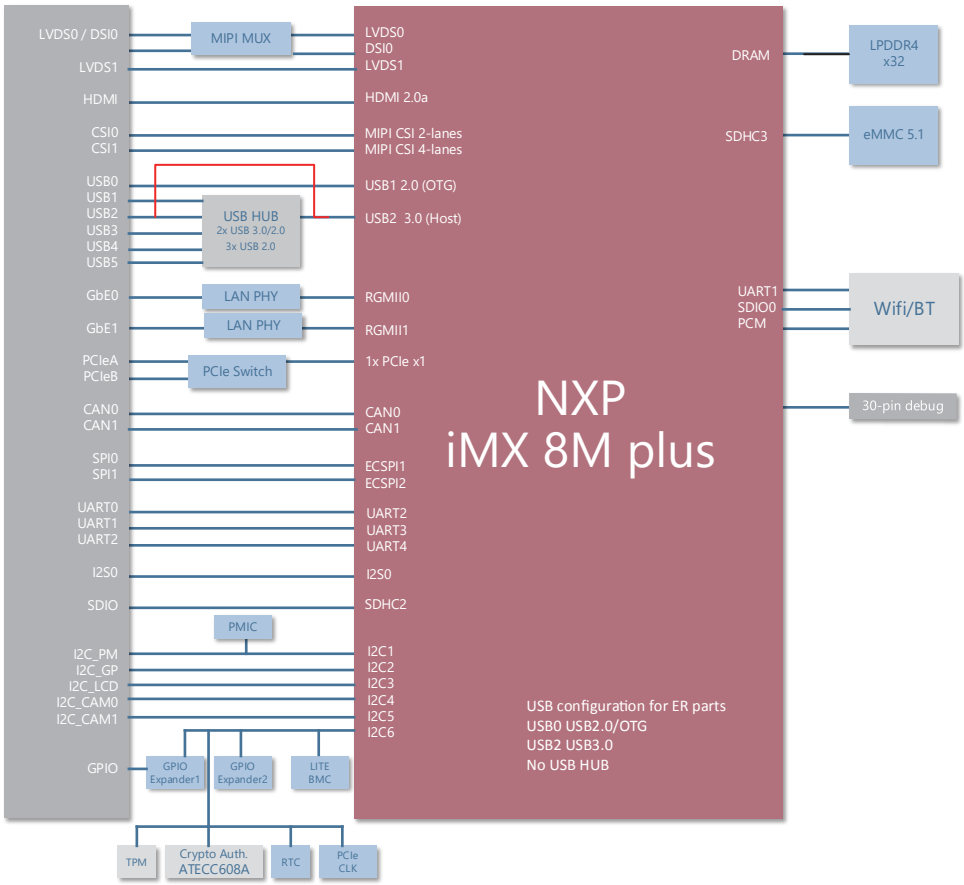
- **Operating Systems**
- **Standard Support**
- Yocto Linux BSP, Android, Windows 10 IoT
- **Extended Support (BSP)**
- VxWorks

LEC-IMX8MP

Ordering Information

- **LEC-IMX8MP-Q-N-2G-32G-CT**
  SMARC 2.1 Short Size Module with Quad Core NXP i.MX8M-PLUS, NPU , 2 GB LPDDR4, 32 GB eMMC, 0°C to 60°C
- **LEC-IMX8MP-Q-N-2G-32G-ER**
  SMARC 2.1 Short Size Module with Quad Core NXP i.MX8M-PLUS, NPU , 2 GB LPDDR4, 32 GB eMMC, -40°C to 85°C
- **LEC-IMX8MP-Q-N-4G-32G-CT**
  SMARC 2.1 Short Size Module with Quad Core NXP i.MX8M-PLUS, NPU, 4 GB LPDDR4 , 32 GB eMMC, 0°C to 60°C
- **LEC-IMX8MP-Q-N-4G-32G-ER**
  SMARC 2.1 Short Size Module with Quad Core NXP i.MX8M-PLUS, NPU, 4 GB LPDDR4 , 32 GB eMMC, -40°C to 85°C
- **LEC-IMX8MP-Q-2G-32G-CT**
  SMARC 2.1 Short Size Module with Quad Core NXP i.MX8M-PLUS, 2 GB LPDDR4, 32 GB eMMC, 0°C to 60°C
- **LEC-IMX8MP-Q-2G-32G-ER**
  SMARC 2.1 Short Size Module with Quad Core NXP i.MX8M-PLUS, 2 GB LPDDR4, 32 GB eMMC, -40°C to 85°C
- **LEC-IMX8MP-Q-4G-32G-CT**
  SMARC 2.1 Short Size Module with Quad Core NXP i.MX8M-PLUS, 4 GB LPDDR4 , 32 GB eMMC, 0°C to 60°C
- **LEC-IMX8MP-Q-4G-32G-ER**
  SMARC 2.1 Short Size Module with Quad Core NXP i.MX8M-PLUS, 4 GB LPDDR4 , 32 GB eMMC, -40°C to 85°C
- **LEC-IMX8MP-QL-2G-16G-CT**
  SMARC 2.1 Short Size Module with Quad Core NXP i.MX8M-PLUS Quadlite, 2GB LPDDR4 , 16 GB eMMC, 0°C to 60°C
- **LEC-IMX8MP-QL-2G-16G-ER**
  SMARC 2.1 Short Size Module with Quad Core NXP i.MX8M-PLUS Quadlite, 2GB LPDDR4 , 16 GB eMMC, -40°C to 85°C
- **LEC-IMX8MP-QL-2G-16G-C**
  SMARC 2.1 Short Size Module with Quad Core NXP i.MX8M-PLUS Quadlite, 2GB LPDDR4 , 16 GB eMMC, 0°C to 60°C
- **LEC-IMX8MP-QL-2G-16G-ER**
  SMARC 2.1 Short Size Module with Quad Core NXP i.MX8M-PLUS Quadlite, 2GB LPDDR4 , 16 GB eMMC, -40°C to 85°C

Block diagram



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