ADLINK
LEADING EDGE AI COMPUTING

LEC-IMX952

SMARC 2.2 Short-Size Module with
NXP i.MX952 Series

Preliminary

Features

- NXP i.MX952 series with quad-core Arm Cortex-A55
- 1× Arm Cortex-M7 core (Flex domain) and 1× Cortex-M33 core (low-power real-time domain)
- Integrated NPU delivering up to 2 eTOPS
- SMARC revision 2.2 compliant
- LVDS, DSI, and HDMI graphics output interfaces (BOM option)
- Rugged operating temperature option: -40°C to 85°C (standard SKU: consumer temperature)
- 15-year product availability
- Dual CAN bus
- USB 2.0 interfaces
- Dual Gigabit Ethernet ports with TSN
- I2S audio codec interface

Specifications

Core System	SoC	NXP i.MX952 series with quad-core ARM Cortex-A55 • 1x ARM Cortex-M7 core (flex domain) • 1x ARM Cortex-M33 (low power real-time domain) • TrustZone technology support with ARMv8 Cryptography Extensions • Edgelock secure enclave • Neural Processing Unit (2 TOPS)
	Memory	4, 8, and 16 GB LPDDR5
	L2 Cache	Per core: >32 KB I-cache, 32 KB D-cache, 64 KB L2 cache Unified: > 512 KB L3 cache
	Security	Cryptographic Services • Multiple key stores and multiple users supported • Key types: AES-128/192/256, ECC 256/384 • Key import, creation, derivation, update, and deletion • SCA-hardened asymmetric public-key cryptography: - RSA up to 4096 bits - Elliptic Curve up to P-512 (NIST curves) - Brainpool P-384 / P-512 • SCA-hardened symmetric cryptography: - AES 128/192/256 - Modes: GCM, ECB, CBC, CTR, CCM, XCBC-MAC, KTS (256)

The terms HDMI, HDMI High-Definition Multimedia Interface, HDMI trade dress and the HDMI Logos are trademarks or registered trademarks of HDMI Licensing Administrator, Inc.

Note: “Build option””indicates an alternative BOM configuration to support additional or alternative functions that are not available on the standard product. Be aware that these “build option” part numbers will need to be newly created and this will result in production lead times.

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Specifications

Video	GPU Core	Arm® Mali™ G310
	GPU Feature Support	Arm Mali-G310 GPU • 3D GPU supporting 64 GFLOPs • OpenGL® ES 3.2 • Vulkan ® 1.3 • OpenCL 3.0
	VPU Feature Support	4Kp30 H.264 encode and 4Kp60 H.265 and H.264 decode 1× JPEG encoder 1× JPEG decoder
	HDMI	HDMI 2.0a (bom option)
	MIPI DSI	1x 350 MHz MIPI-DSI, 4Kp30 (1 x4 lanes, or 2 x2 lanes, 2.5 Gbps per lane)
	LVDS	2× 1080p60 LVDS TX (2×4 lanes or 1×8 lanes)
	Camera	MIPI CSI RX Interface • Compatible with the MIPI Alliance interface specification v1.0 • Up to 4 data lanes, 1.0 Gbps maximum data rate per lane • Supports MIPI-HS and MIPI-LP modes
System Storage	SDIO	1× SDIO (4-bit), compatible with SD/SDIO standards up to version 3.0
	eMMC	32, 64, or 128GB (build option) Compatible with eMMC specifications 4.41, 4.51, 5.0, and 5.1
TPM	Chipset	Infineon
	Type	TPM 2.0 (SPI based)
Debug Header		30-pin multipurpose flat cable connector for use with optional DB-30 debug module • Provides JTAG, UART, and power test points • Includes diagnostic LEDs, power, reset, and boot configuration
Audio	Audio Codec	I²S audio codec (located on the carrier)
Audio	Primary LAN Secondary LAN	MAC 10/100/1000 Ethernet port with Time Sensitive Networking MAC 10/100/1000 Ethernet port with Time Sensitive Networking
Wireless Communication	Wi-Fi Bluetooth	IEEE 802.11 2×2 MIMO Wi-Fi (AX/AC/A/B/G/N) (BOM option) Bluetooth 5.3 compliant
Extension Busses	USB	6x USB 2.0 (1x OTG)
Environmental	UART	4 UART interfaces SER1 , 2 (CTS/RTS) / SER0,3 (TX/RX/CTS/RTS)
	CAN	2x CAN 2.0B only, or mixed CAN 2.0B and up to 2x CAN-FD mode, with a data bit rate of up to 8Mbps
	SPI	2x SPI
	I²S	I2S interfaces with audio resolution from 16-bit to 32-bit and sample rate up to 192 kHz (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
	PCIe	1x PCIe single lane Gen3

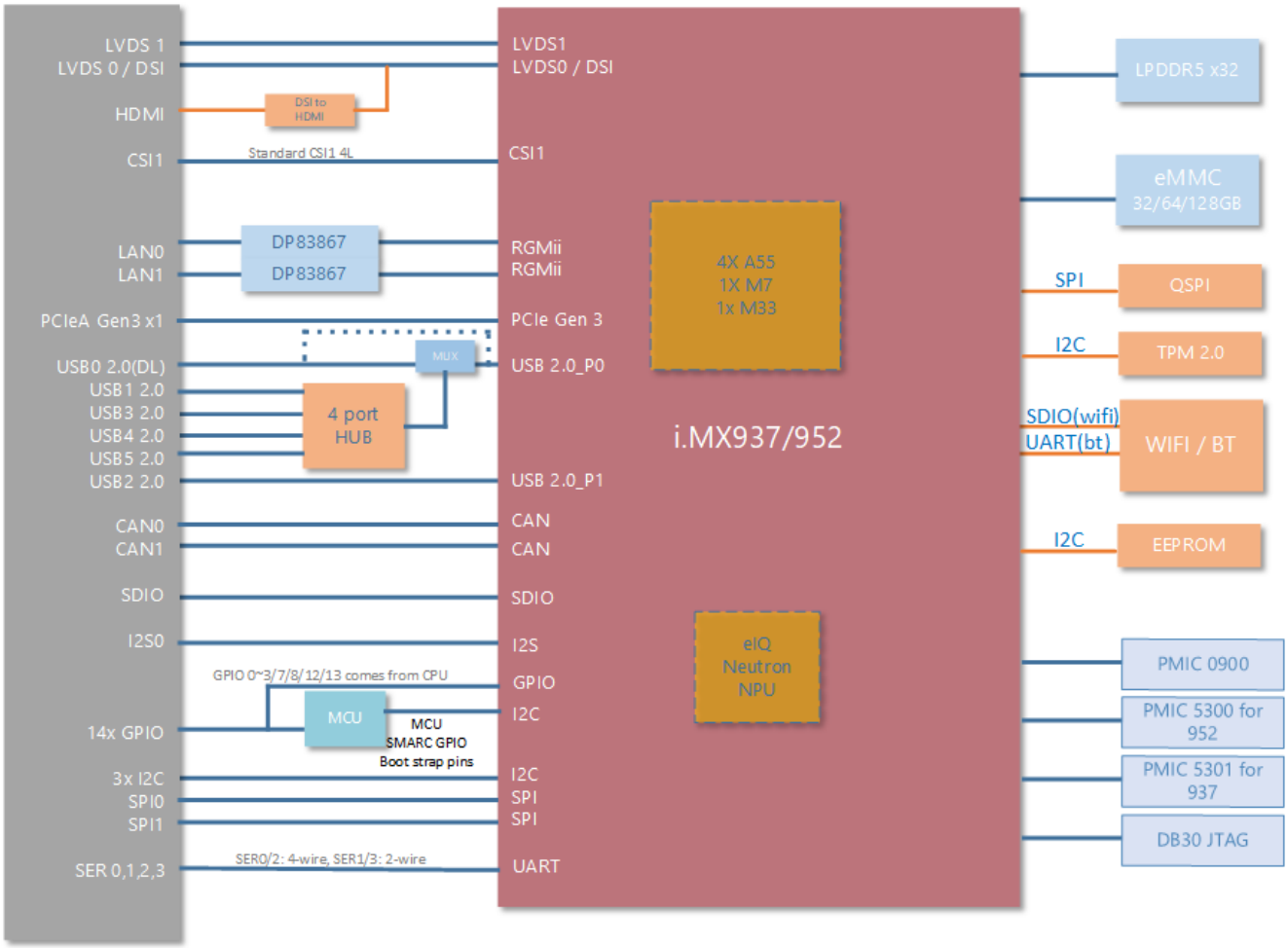
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Specifications

Power	Input	5Vdc +/- 5%
Mechanical and Environmental	Form Factor	SGET SMARC Specifications 2.2
	Dimension	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	Standard Support	Yocto Linux BSP, Android (project based)
	Extended Support (BSP)	Vxworks

Block diagram



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Ordering Information

Module	Description / Configuration
LEC-IMX952-4G-32G-CT	SMARC 2.2 short size module with quad-core NXP i.MX952, 4 GB LPDDR5, 32 GB eMMC, 0°C to 60°C
LEC-IMX952-4G-32G-ER	SMARC 2.2 short size module with quad-core NXP i.MX952, 4 GB LPDDR5, 32 GB eMMC, -40°C to 85°C

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