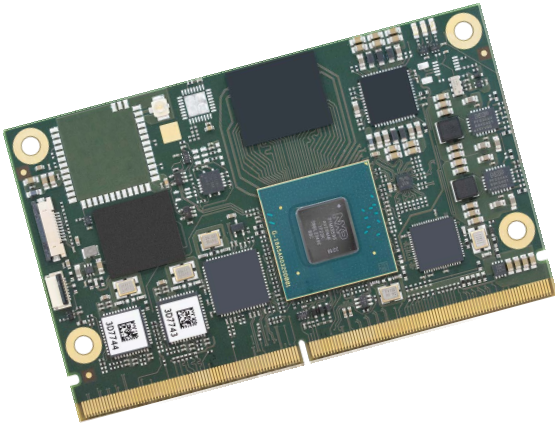




MSC SM2S-IMX95

NXP[®] i.MX 95 Arm[®]
Cortex[®]-A55 / M7 / M33



 82 x 50 mm

 8-10 W

 -40 +85



Description

The MSC SM2S-IMX95 SMARC module family is powered by the latest i.MX 95 Applications Processors, manufactured by NXP. The processors integrates up to six Arm Cortex-A55 cores, dedicated Arm Cortex-M7 and M33 Real-Time Processors, immersive Arm Mali™ GPU, 4K capable VPU combined with Edgelock® secure enclave security. The i.MX 95 family is the first i.MX applications processor family to integrate NXP's eIQ® Neutron neural processing unit (NPU) and a new image signal processor (ISP) developed by NXP, helping developers to build powerful, next-generation edge platforms.

MSC SM2S-IMX95 provides fast LPDDR5 memory technology with inline ECC support, combined with up to 256GB eMMC Flash memory and high speed interfaces such as 10 Gigabit Ethernet, Dual Gigabit Ethernet, USB 3.0 and PCI Express Gen. 3. Various standard interfaces for embedded applications such as CAN-FD, dual-channel LVDS or MIPI DSI, HDMI and MIPI CSI for connecting a camera are available. An on-board Wireless Module is provided as assembly option.

The module is compliant with the new SMARC 2.1.1 standard, allowing easy integration with SMARC baseboards. For evaluation and design-in of the SM2S-IMX95 module, Avnet Embedded provides a development platform and a starter kit. Support for Linux is available (Android support available on request).

Highlights

- Hexa core Arm Cortex-A55 up to 2.0GHz
- Arm Cortex-M7 Real Time Processor at 800MHz
- Arm Cortex-M33 Real Time Processor at 333MHz
- NXP eIQ Neutron Neural Processing Unit
- NXP Image Signal Processor
- Arm Mali Graphics Processing Unit
- Video Processing Unit up to 4k decode/encode
- Up to 16GB LPDDR5 SDRAM with inline ECC
- Up to 256GB eMMC Flash
- Dual-channel LVDS / MIPI-DSI x4
- HDMI interface
- Dual MIPI CSI-2 Camera interface
- 2x PCI Express x1 Gen. 3
- 2x USB 3.0 Host interface
- 2x USB 2.0 Host interface
- 1x USB 2.0 Host/Device interface
- 2x Gigabit Ethernet
- 10 Gigabit Ethernet
- Wireless Module
- 1x MMC/SD/SDIO interface
- 2x CAN-FD Interface
- 2x I2S Audio Interface
- 14x GPIO
- UART, SPI, I2C
- SMARC 2.1.1 Compliant
- Features are dependent on processor SKU and module variant selection

Technical Data - MSC SM2S-IMX95

Technology	Arm
Formfactor	SMARC Short Size
CPU	<p>NXP i.MX 95 Arm Cortex-A55 Applications Processor</p> <ul style="list-style-type: none"> - 6/4 cores, 1.8 - 2.0 GHz, Full-featured - 6/4 cores, 1.8 - 2.0 GHz, no ISP, no 10G - 6/4 cores, 1.8 - 2.0 GHz, no NPU, no 10G - 4/2 cores, 1.8 - 2.0 GHz, no GPU, no 10G <p>Arm Cortex-M7 Real Time Processor at 800MHz Arm Cortex-M33 Real Time Processor at 333MHz</p> <p>NXP eIQ Neutron Neural Processing Unit (processor SKU dependent)</p> <p>NXP Image Signal Processor (processor SKU dependent)</p>
Chipset	SOC
RAM	Up to 16GB 6400MT/s LPDDR5 SDRAM, soldered, inline ECC support
Flash	Up to 256GB eMMC Flash
Storage Interfaces	1x MMC/SD/SDIO
USB	1x USB 2.0 Host/Client, 2x USB 2.0 Host, 2x USB 3.0 Host or 1x USB 2.0 Host/Client, 1x USB 3.0 Host (optional)
Serial Interfaces	2x UART with 2-wire hand shake 2x UART w/o hand shake
Bus Interfaces	<p>2x PCI Express x1 Gen. 3 (optional)</p> <p>5x I2C up to 400 Kbit/s</p> <p>2x CAN-FD / CAN 2.0B</p> <p>2x SPI (with two chip selects)</p> <p>*SPI1 only for memory devices</p>
Display Controller	<p>Arm Mali Graphics Processing Unit (processor SKU dependent)</p> <p>Video Processing Unit up to 4k decode/encode (processor SKU dependent)</p>
Display Interfaces	<p>Dual-channel 18/24 bit LVDS interface, up to 1080p60</p> <p>Also usable as two single independent LVDS channels, up to 720p60</p> <p>or</p> <p>Single-channel LVDS interface (up to 720p60) and MIPI-DSI Display Interface, 4 lanes, up to 3840x1440p60</p> <p>HDMI interface, up to 3840x2160 @ 30fps (optional)</p>
Network Interface	<p>2x 10/100/1000BASE-T Ethernet (one interface with TSN support)</p> <p>10 Gigabit Ethernet SerDes Interface (processor SKU dependent)</p> <p>HD Wireless SPB611 (dual band 2.4/5GHz, full support for 802.11a/b/g/n/ac/ax, industrial temperature, Bluetooth 5.2, soldered (optional)</p>

Audio Interface	2x I2S Audio
Security Device	<p>Advanced Security, Safety, and Reliability integrated in the SOC</p> <p>Integrated EdgeLock secure enclave to simplify implementation of security critical functions like secure boot, cryptography, trust provisioning, run-time attestation, key management services, provision for secure remote management, secure over-the-air updates (OTA) and dedicated cryptographic engine.</p> <p>Trusted Platform Module (TPM) 2.0 (optional)</p>
Miscellaneous	<p>Watchdog Timer for system reset (programmable, 1s ... 600s)</p> <p>RTC / temperature compensated (optional)</p> <p>12x GPIO, configurable as input or output, interrupt capable (14 GPIO optional)</p> <p>64kbit ID EEPROM on I2C bus</p> <p>MIPI CSI-2 camera interface (CSI1, 4-lane)</p> <p>MIPI CSI-2 camera interface (CSI0, 2-lane), mutual exclusive with DSI/HDMI (optional)</p>
Feature Highlights	SMARC 2.1.1 compliant
Firmware	uboot
OS Support	<p>Linux Board Support Package</p> <p>Android Board Support Package (on request)</p>
Power Requirement	<p>Power Supply +5V +/-5%, 5V Standby</p> <p>Power Consumption 8-10W typ. (depending on CPU and optional features)</p>
Environment	<p>Temperature Range:</p> <p>Commercial: 0° ... 70°C (operating) -20° ... 85°C (storage)</p> <p>Extended: -25° ... 85°C (operating) -40° ... 85°C (storage)</p> <p>Industrial: -40° ... 85°C (operating) -40° ... 85°C (storage)</p> <p>Humidity:</p> <p>5 ... 95% (operating, non-condensing)</p> <p>5 ... 95% (storage, non-condensing)</p>
Dimensions	82 x 50 mm
Certificates	UL / CE
Cooling	<p>Heatspreader</p> <p>Heatsink</p>
Carrier	<p>MSC SM2-MB-EP1</p> <p>MSC SM2-MB-EP5</p>

Order Reference - MSC SM2S-IMX95

Order Number	Description	Reference	Cat*
112723	SMARC module based on NXP i.MX 9596, Hexa Core Cortex-A55 processor at 2.0GHz, NPU, ISP, 8GB LPDDR5, 32GB eMMC Flash, 2x GbE, 10GbE, PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, BT/WLAN, TPM, LVDS0/1, HDMI, MIPI CSI-2 Camera input (CSI1); industrial temperature -40...+85°C (Engineering Sample - get in touch with your sales representative)	MSC SM2S-IMX95-HC9-35N06C1I ES1 PCBES	OR

*COM products are divided in two categories, „PV“ (preferred variant) and „OR“ (on request).

Accessories

Order Number	Description	Reference
Carrier Options		
68488	SMARC 2.0 Embedded Platform with PCI Express x4 slot, GbE, SATA, USB 3.0, USB 2.0, USB 2.0 OTG, RS232, CAN, SPI, eSPI, SMBus, I2C and GPIO interface, LVDS/eDP, DisplayPort and HDMI display interface, regulated backlight supply, HD/I2S audio interface, MIPI CSI-2 camera interface, mini PCI Express card slot, SD card slot, fan connector, CMOS battery, Mini-ITX form factor (170 x 170 mm), ATX power connector and single 12V/24V power jack, commercial temperature range 0..+70°C	MSC SM2-MB-EP1-001 PCBFTX
83977	SMARC 2.x compatible embedded platform (146 x 80mm), 10-36V input voltage, 3x RS232, 2x CAN, dual RJ45 LAN with LED (1 x LAN i210) , 1x M.2 2280 Key M slot, mPCIe slot, 1x USB 3.0 Type A, 1x USB 2.0 Type A, 1x USB 2.0 internal, 1x USB 2.0 Host/Device, 2x SPI, I ² C, 8 GPIO on FC, 1x HDMI, LVDS/eDP/DSI on JILI30 connector, SD Card Slot, regulated backlight supply, I2S Audio, 1W Mono, camera connector, RTC battery. Industrial temperature range -40..+85°C, ARM full version	MSC SM2S-MB-EP5-002 PCBFTX
83981	SMARC 2.x compatible embedded platform (146 x 80mm), 10-36V input voltage, 2x UART, 1x RS232, 2x CAN, 1x RJ45 LAN with LED, 1x USB 2.0 Type A, 1x USB3.0 Type A, 1x USB 2.0 internal, 1x USB 2.0 Host/Device, 2x SPI, 12 GPIO on FC, 1x HDMI , SD Card Slot, LVDS/eDP/DSI on JILI30 connector, regulated backlight supply, RTC battery. Industrial temperature range -40..+85°C, ARM slim version	MSC SM2S-MB-EP5-004 PCBFTX
Other Accessories		
82479	Debug Console (UART) Adapter for i.MX6-based Qseven and nanoRISC modules, with 8-pin FFC cable to connect COM module to 9-pin D-Sub connector	MSC Debug Console Adapter
68948	Debug Adapter for i.MX6-based Qseven, SMARC and nanoRISC modules, with 10-pin FFC cable to connect to COM module, adapter provides headers for JTAG connection to Lauterbach and/or Goepel debuggers	MSC JTAG Adapter FFC 10-pin
Starter Kits		
97502	SMARC 2.0 Starterkit for NXP i.MX 9 based Modules. Includes MSC SM2-MB-EP1 Baseboard, Heatspreader/Heatsink, SD Card with USB Card Reader, Power Supply and suitable cable kit. The StarterKit does not include the MSC SM2S-IMX93 or SM2S-IMX91 module. Please order your choice of module separately.	MSC SM2-SK-IMX9-EP1-KIT001 BRDFTX

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