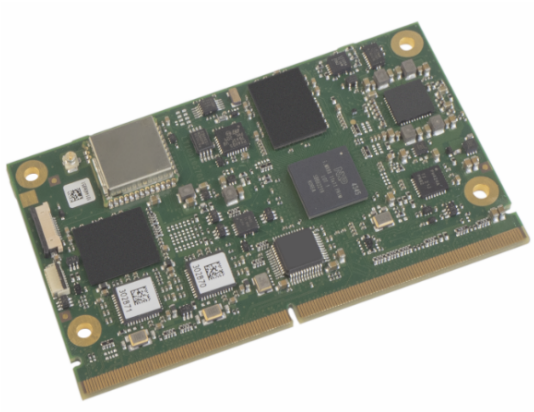
SMARC

TRIA SM2S-IMX93

NXP® i.MX 93 Arm® Cortex®-A55 / M33



82 x 50 mm

2-4 W

-40 +85 °C

Highlights

- Single or Dual core Arm Cortex-A55 Applications Processors up to 1.7GHz
- Arm Cortex-M33 Real Time Processor at 250MHz
- Arm Ethos™-U65 microNPU with 256 MACs/Cycle
- Pixel processing pipeline (PXP) engine
- Up to 2GB LPDDR4 SDRAM with inline ECC
- Up to 256GB eMMC Flash
- Single-channel LVDS / MIPI-DSI x4 (optional)
- MIPI CSI-2 Camera Interface
- 4x USB 2.0 Host interfaces
- 1x USB 2.0 Host/Device interface
- 2x Gigabit Ethernet
- Wireless Module (optional)
- 1x MMC/SD/SDIO interface
- 2x CAN-FD interfaces
- 2x I2S Audio interfaces
- 14x GPIO
- UART, SPI, I2C
- SMARC 2.2 compatible
- Energy Flex Architecture
- Optimized design for low power applications

Technical Data

Technology	Arm
Formfactor	SMARC Short Size
CPU	NXP i.MX 93 Arm Cortex-A55 Applications Processors - i.MX 9352, dual-core, NPU, 1.7GHz - i.MX 9332, dual-core, 1.7GHz - i.MX 9351, single-core, NPU, 1.7GHz - i.MX 9331, single-core, 1.7GHz NXP i.MX 93 Arm Cortex-A55 Applications Processors (slower parts) - i.MX 9302, dual-core, 900MHz - i.MX 9301, single-core, 900MHz Arm Cortex-M33 Real Time Processor at 250MHz Arm Ethos-U65 microNPU with 256 MACs/Cycle
Chipset	SOC
RAM	Up to 2GB 3700MT/s LPDDR4 SDRAM, soldered, inline ECC support
Flash	Up to 256GB eMMC Flash
Storage Interfaces	1x MMC/SD/SDIO
USB	1x USB 2.0 Host/Client, 4x USB 2.0 Host 1x USB 2.0 Host/Client, 1x USB 2.0 Host (optional)
Serial Interfaces	2x UART with 2-wire hand shake 2x UART w/o hand shake
Bus Interfaces	4x I2C up to 400 Kbit/s 2x CAN-FD / CAN 2.0B 2x SPI (with two chip selects)
Display Controller	Pixel processing pipeline (PXP) engine to support 2D image processing (i.e. Blending/Composition, Rotation, Resize, Color Space Conversion) no 3D Graphics Processing Unit (GPU) no Video Processing Unit (VPU)
Display Interfaces	Single-channel LVDS interface, 18 or 24 bit, up to 1366x768 @ 60fps or MIPI-DSI Display Interface, 4 lanes, up to 1920x1080 @ 60fps (optional)
Network Interface	2x 10/100/1000BASE-T Ethernet (one interface with TSN/1588 support) 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)
Audio Interface	1x I2S Audio
Security Device	Advanced Security, Safety, and Reliability integrated in the SOC Integrated EdgeLock secure enclave enables autonomous management of security functions, including runtime attestation, silicon root of trust, reusable certifications, trust provisioning, and fine-grain key management augmented by extensive crypto services for advanced attack resistance Trusted Platform Module (TPM) 2.0 (optional)
Miscellaneous	Watchdog Timer for system reset (programmable, 1s ... 600s) RTC / temperature compensated (optional) 14x GPIO, configurable as input or output, interrupt capable 64kbit ID EEPROM on I2C bus MIPI CSI-2 camera interface (CSI0, 2-lane) or MIPI CSI-2 camera interface (CSI1, 2-lane)

SMARC

Feature Highlights	SMARC 2.2 compatible
Firmware	uboot
OS Support	Linux Board Support Package Android Board Support Package (on request)
Power Requirement	Power Supply +5V +/-5%, 5V Standby Power Consumption 2-4 W typ. (depending on CPU and optional features)
Environment	Temperature Range: Commercial: 0° ... 70°C (operating) -20° ... 85°C (storage) Extended: -25° ... 85°C (operating) -40° ... 85°C (storage) Industrial: -40° ... 85°C (operating) -40° ... 85°C (storage) Humidity: 5 ... 95% (operating, non-condensing) 5 ... 95% (storage, non-condensing)
Dimensions	82 x 50 mm
Certificates	UL / CE
Cooling	Heatspreader
Carrier	TRIA SM2-MB-EP1 TRIA SM2-MB-EP5

Technical Data for TRIA SM2S-IMX93

Order Reference

Order No.	Description	Reference	Status*
111291	SMARC module based on NXP i.MX 9352, Dual Core Cortex-A55 at 1.7GHz, NPU, 2GB LPDDR4, 32GB eMMC Flash, 2x GbE LAN, 4x USB2.0 Host, 1x USB2.0 Host/Device, BT/WLAN, TPM, LVDS, MIPI CSI-2 Camera input (CSI0, 2 lane); industrial temperature -40...+85°C	MSC SM2S-IMX93-DC-15N02E1I PCBFTX	PV
111289	SMARC module based on NXP i.MX 9352, Dual Core Cortex-A55 at 1.7GHz, NPU, 2GB LPDDR4, 16GB eMMC Flash, 2x GbE LAN, 4x USB2.0 Host, 1x USB2.0 Host/Device, MIPI DSI, MIPI CSI-2 Camera input (CSI0, 2 lane); industrial temperature -40...+85°C	MSC SM2S-IMX93-DC-14N08A0I PCBFTX	PV
111365	SMARC module based on NXP i.MX 9332, Dual Core Cortex-A55 at 1.7GHz, no NPU, 2GB LPDDR4, 16GB eMMC Flash, 2x GbE LAN, 4x USB2.0 Host, 1x USB2.0 Host/Device, LVDS, MIPI CSI-2 Camera input (CSI0, 2 lane); industrial temperature -40...+85°C	MSC SM2S-IMX93-DCL-14N02A0I PCBFTX	PV
111363	SMARC module based on NXP i.MX 9332, Dual Core Cortex-A55 at 1.7GHz, no NPU, 1GB LPDDR4, 16GB eMMC Flash, 2x GbE LAN, 1x USB2.0 Host, 1x USB2.0 Host/Device, LVDS, MIPI CSI-2 Camera input (CSI0, 2 lane); extended temperature -25...+85°C	MSC SM2S-IMX93-DCL-04N02B0E PCBFTX	PV
111367	SMARC module based on NXP i.MX 9331, Single Core Cortex-A55 at 1.7 GHz, no NPU, 1GB LPDDR4, 8GB eMMC Flash, 1x GbE LAN, 1x USB2.0 Host, 1x USB2.0 Host/Device, LVDS, MIPI CSI-2 Camera input (CSI0, 2 lane); extended temperature -25...+85°C	MSC SM2S-IMX93-SCL-03N0270E PCBFTX	PV

Ordering Information for TRIA SM2S-IMX93

*PV = Preferred variant; OR = on Request (in OEM quantities only)

Accessories

Carrier Options

Order No.	Description	Reference
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 2.1 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 µUSB 2.0 Host/Device, 2x SPI, I²C, 8 GPIO on FC, 1x HDMI, LVDS/eDP/DSI on JILI30 connector, µSD 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 2.1 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 µUSB 2.0 Host/Device, 2x SPI, 12 GPIO on FC, 1x HDMI , µSD 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

Carrier Options TRIA SM2S-IMX8MLC/IMX95/IMX91/V2L/G2L/IMX93/G2UL/AM62X/IMX8/IMX8M/IMX8PLUS/IMX8MINI/IMX8NANO/ IMX6/IMX6ULL

Cooling Options

Order No.	Description	Reference
97153	Heatspreader for SM2S-IMX93 module, consisting of a single-piece aluminum plane and thermal pad for contact to the processor, with 2.7mm through-hole standoffs	MSC SM2S-IMX93-01 HSP-001

Cooling Options TRIA SM2S-IMX93

Other Accessories

Order No.	Description	Reference
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

Other Accessories TRIA SM2S-IMX8MLC/IMX95/IMX91/V2L/G2L/IMX93/G2UL/AM62X/IMX8/IMX8PLUS

Starter Kits

Order No.	Description	Reference
97502	SMARC 2.0 Starterkit for NXP i.MX 9 based Modules. Includes TRIA SM2-MB-EP1 Baseboard, Heatspreader/Heatsink, SD Card with USB Card Reader, Power Supply and suitable cable kit. The StarterKit does not include the TRIA SM2S-IMX93 or SM2S-IMX91 module. Please order your choice of module separately.	MSC SM2-SK-IMX9-EP1-KIT001 BRDFTX

Starter Kits TRIA SM2S-IMX95/IMX91/IMX93

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