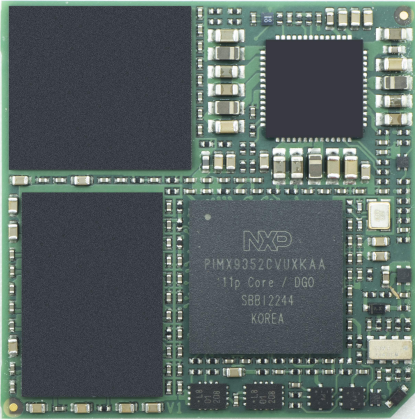


MSC OSM-SF-IMX93

NXP™ i.MX 93 ARM®
Cortex™-A55 / M33



30 x 30 mm



500mW - 2W



-40 +85



OPEN
STANDARD
MODULE™



Description

The MSC OSM-SF-IMX93 is based on the new OSM 1.1 standard (Size-S) "Small" for completely machine processible low-cost embedded computer modules during soldering, assembly and testing.

Highly scalable and equipped with i.MX 93 Applications Processors manufactured by NXP. The processors integrate ARM Cortex-A55 cores, bringing performance and energy efficiency to Linux-based edge applications and the ARM Ethos-U65 microNPU, enabling developers to create more capable, cost-effective and energy-efficient machine learning (ML) applications. The i.MX 93 processors deliver advanced security with integrated EdgeLock secure enclave and an efficient 2D graphics processing unit (GPU).

MSC OSM-SF-IMX93 provides fast and low power LPDDR4 memory technology with inline ECC support, combined with up to 256GB eMMC Flash memory. Various interfaces for embedded applications such as Dual Gigabit Ethernet (RGMII), USB 2.0, 2x CAN-FD, MIPI-DSI and MIPI CSI-2 (2-lane) for connecting a camera are available. The typical design power ranges from 500mW to 2W.

The module is compliant with the new OSM 1.1 standard (OSM-SF). For evaluation and design-in of the new OSM-SF-IMX93 module, MSC provides a development platform and a starter kit. A Yocto based Linux Board Support Package is available (Android support on request).

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
- MIPI-DSI x4, Single-channel LVDS (opt. on RGB)
- MIPI CSI-2 Camera Interface
- 1x USB 2.0 Host interface
- 1x USB 2.0 Host/Device interface
- 2x Gigabit Ethernet (RGMII)
- 2x SD/SDIO interfaces
- 2x CAN-FD interfaces
- 1x I2S Audio interface
- 4x UART, 2x SPI, 4x I2C
- 20x GPIO
- 2x ADC inputs (12-bit)
- Optimized design for low power applications
- OSM 1.1 (SF) Compliant, 322 Pin, RM 1,25 mm

Technical Data - MSC OSM-SF-IMX93

Technology	ARM
Formfactor	OSM-MF, 322 Pin, RM 1,25 mm
CPU	<p>NXP i.MX 93 ARM Cortex-A55 Applications Processors</p> <ul style="list-style-type: none"> - i.MX 9352, dual-core, NPU, 1.7GHz - i.MX 9351, single-core, NPU, 1.7GHz - i.MX 9332, dual-core, 1.7GHz - i.MX 9331, single-core, 1.7GHz - i.MX 9302, dual-core, 900 MHz - i.MX 9301, single-core, 900 MHz <p>ARM Cortex-M33 Real Time Processor at 250MHz ARM Ethos-U65 microNPU with 256 MACs/Cycle</p>
Chipset	SOC
RAM	Up to 2GB 3700MT/s LPDDR4 SDRAM, soldered, inline ECC support
Flash	Up to 256GB eMMC Flash
Storage Interfaces	2x MMC/SD/SDIO
USB	1x USB 2.0 Host/Client, 1x USB 2.0 Host
Serial Interfaces	<p>1x UART Console with Rx, Tx only 1x UART with 2-wire hand shake 2x UART w/o hand shake</p>
Bus Interfaces	<p>2x I2C up to 400 Kbit/s 2x SPI (with two chip selects) 2x CAN-FD /CAN 2.0B</p>
Display Controller	<p>Pixel processing pipeline (PXP) engine to support 2D image processing (i.e. Blending/Composition, Rotation, Resize, Color Space Conversion)</p> <p>no 3D Graphics Processing Unit (GPU) no Video Processing Unit (VPU)</p>
Display Interfaces	<p>MIPI-DSI Display Interface, 4 lanes, up to 1920x1080 @ 60fps Single-channel LVDS interface, 18 or 24 bit, up to 1366x768 @ 60fps (opt. on RGB Pins)</p>
Network Interface	2x Ethernet, (RGMII interface)
Audio Interface	1x I2S Audio
Security Device	<p>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</p>

Miscellaneous	Watchdog Timer for system reset (programmable, 1s ... 600s) RTC 20x GPIO, configurable as input or output, interrupt capable 2x PWM 2x ADC inputs (12-bit) MIPI CSI-2 camera interface (2 lane)
Feature Highlights	OSM, Size-S compatible
Firmware	uboot
OS Support	Linux Board Support Package Android Board Support Package (on request)
Power Requirement	Power Supply +5V +/-5% Power Consumption 500mW-2W typ.
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	30 x 30 mm
Certificates	UL /CE
Carrier	MSC SM2F-OSM-AD-001

Order Reference - MSC OSM-SF-IMX93

Order Number	Description	Reference	Cat*
111852	OSM 1.1 module based on NXP i.MX 9352, Dual Core Cortex-A55 processor at 1.7GHz, NPU, 2GB LPDDR4, 16GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, industrial temperature -40...+85°C	MSC OSM-SF-IMX93-DC-14N0A001 PCBFTX	PV
111801	OSM 1.1 module based on NXP i.MX 9352, Dual Core Cortex-A55 processor at 1.7GHz, NPU, 1GB LPDDR4, 8GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, industrial temperature -40...+85°C	MSC OSM-SF-IMX93-DC-03N0A001 PCBFTX	PV
111853	OSM 1.1 module based on NXP i.MX 9332, Dual Core Cortex-A55 processor at 1.7GHz, no NPU, 1GB LPDDR4, 8GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, extended temperature -25...+85°C	MSC OSM-SF-IMX93-DCL-03N0A00E PCBFTX	PV
111854	OSM 1.1 module based on NXP i.MX 9331, Single Core Cortex-A55 processor at 1.7GHz, no NPU, 512MB LPDDR4, 4GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, extended temperature -25...+85°C	MSC OSM-SF-IMX93-SCL-92N0A00E PCBFTX	PV
98572	OSM 1.1 module based on NXP i.MX 9352, Dual Core Cortex-A55 processor at 1.7GHz, NPU, 1GB LPDDR4, 16GB eMMC Flash, soldered on SM2F-OSM-AD-001	MSC SM2F-OSM-AD-93D1G160-001 ES2 PCBES	OR
98574	OSM 1.1 module based on NXP i.MX 9352, Dual Core Cortex-A55 processor at 1.7GHz, NPU, 512MB LPDDR4, 4GB eMMC Flash, soldered on SM2F-OSM-AD-001	MSC SM2F-OSM-AD-93D05G40-001 ES2 PCBES	OR

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

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