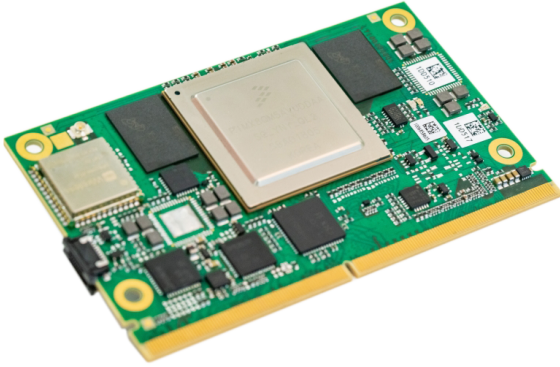




MSC SM2S-IMX8

NXP[®] i.MX8 Arm[®]
Cortex[®]-A72/A53



 82 x 50 mm

 7-14 W

 -40 +85



Description

The new MSC SM2S-IMX8 module offers a quantum leap in terms of computing and graphics performance. It integrates the currently most powerful i.MX8 processor family from NXP™ based on the Arm Cortex-A72/A53 architecture with real hardware virtualization. This enables asymmetric multiprocessing for the most demanding applications like industrial automation and visualization systems, robotics, infotainment systems and building automation.

The 64-bit i.MX8 SoC integrated on the module contains up to eight cores: two Arm Cortex-A72 cores, four Arm Cortex-A53 cores and two Cortex-M4F real-time cores in combination with high-end Vivante GC7000 multimedia 2D/3D GPU.

The module provides up to 8GB LPDDR4 SDRAM, up to 64GB eMMC Flash memory, Dual Gigabit Ethernet, PCI Express Gen.3, SATA III, USB 3.0, an on-board Wireless Module as well as an extensive set of interfaces for embedded applications. The processor module is designed for operation in the full industrial temperature range from -40°C to +85°C.

MSC SM2S-IMX8 is compliant with the new SMARC™ 2.0 standard, allowing easy integration with SMARC baseboards. For evaluation and design-in of the SM2S-IMX8 module, MSC provides a development platform and a starter kit. Support for Linux is available (Android support on request).

Highlights

- Single or Dual core Arm Cortex-A72 Applications Processor
- Quad core Arm Cortex-A53 Applications Processor
- Dual core ARM Cortex-M4F Real Time Processor
- Vivante GC7000 2D/3D Graphics Processor
- 4K H.265 decode, HD H.264 encode
- Up to 8GB LPDDR4 SDRAM
- Up to 64GB eMMC Flash
- SATA-III interface (6Gbps)
- Dual-channel LVDS / Dual MIPI-DSI x4 (optional)
- HDMI 2.0 / DisplayPort with up to 4k (optional)
- Triple Independent Display support
- 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
- Dual Gigabit Ethernet
- Wireless Module (optional)
- MMC/SD/SDIO interface
- 2x CAN interface
- 2x I2S Audio Interface
- UART, SPI, I2C
- SMARC 2.0 Compliant

Technical Data - MSC SM2S-IMX8

Technology	Arm
Formfactor	SMARC Short Size
CPU	NXP i.MX 8QuadMax Applications Processor (2x A72, 4x A53, 2x M4F) NXP i.MX 8QuadPlus Applications Processor (1x A72, 4x A53, 2x M4F) Arm Cortex-A72 with 1.3GHz (Industrial) or 1.6GHz (Automotive) Arm Cortex-A53 with 1.1GHz (Industrial) or 1.2GHz (Automotive) Arm Cortex-M4F Real Time Processor at 266MHz
Chipset	SOC
RAM	Up to 8GB 3200MT/s LPDDR4 SDRAM, soldered
Flash	Up to 64GB eMMC Flash QSPI NOR Flash (optional)
Storage Interfaces	1x SATA-III 6Gbps 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 2.0 Host (optional)
Serial Interfaces	2x UART with 2-wire hand shake 2x UART w/o hand shake
Bus Interfaces	2x PCI Express x1 Gen.3 lanes 2x CAN 2.0B 2x SPI (with two chip selects) 6x I2C up to 400 Kbit/s
Display Controller	Dual GC7000Lite/XSVX 3D Graphics Processing Unit (GPU) Multicore 3D Graphics Acceleration, 128GFLOPS Dual independent 8-Vec4 shader or combined 16-Vec4 shader OpenGL 3.0, OpenGL ES 3.2, OpenCL 2.0, Open VG 1.1 and Vulkan support Video Processing Unit (VPU) with hardware support for 4K H.256 decode & 1080p H.264 encoded/decode
Display Interfaces	Dual-channel LVDS interface, 18 or 24 bit (up to 1920x1080); also usable as 2x single-channel LVDS interface (up to 1366x768) or Dual MIPI-DSI Display Interface, 4 lanes, up to 1920x1080 @ 60fps (optional) HDMI 2.0a interface, up to 4096x2160 @ 60fps or DisplayPort 1.3 interface, up to 4096x2160 @ 60fps (SW selectable)
Network Interface	2x 10/100/1000BASE-T Ethernet HD Wireless Module SPB209A with 802.11ac / Bluetooth 5.0, soldered (optional)
Audio Interface	2x I2S Audio

Security Device	Advanced Security, Safety, and Reliability integrated in the SOC Trusted Platform Module (TPM) 2.0 (optional)
Miscellaneous	Watchdog Timer for system reset (programmable, 1s ... 600s) High accuracy RTC Temperature compensated RTC (optional) 14x GPIO, configurable as input or output 64kbit ID EEPROM on I2C bus 2x MIPI CSI-2 camera interface (4-lane / 2 lane)
OS Support	Linux Board Support Package Android Board Support Package (on request)
Power Requirement	Power Supply +5V +/-5%, 5V Standby Power Consumption 7-14 W typ. (depending on CPU and optional features)
Environment	Temperature Range: 0°C ... +70°C operating commercial -25°C ... +85°C operating extended -40°C ... +85°C operating industrial -40°C ... +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	MSC SM2-MB-EP1

Order Reference - MSC SM2S-IMX8

Order Number	Description	Reference	Cat*
97032	SMARC module based on NXP i.MX 8QuadMax processor with 2x Cortex-A72 and 4x Cortex-A53, 4GB LPDDR4, 32GB eMMC Flash, 8MB QSPI NOR, SATA, 2x GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 2x CAN, WLAN/BT, TPM, MIPI-DSI, HDMI/DP, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8-QCM-25N0CE1I PCBFTX	PV
82087	SMARC module based on NXP i.MX 8QuadMax processor with 2x Cortex-A72 and 4x Cortex-A53, 4GB LPDDR4, 16GB eMMC Flash, 8MB QSPI NOR, SATA, 2x GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 2x CAN, WLAN/BT, TPM, MIPI-DSI, HDMI/DP, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8-QCM-24N0CE1I PCBFTX	PV
93930	SMARC module based on NXP i.MX 8QuadMax processor with 2x Cortex-A72 and 4x Cortex-A53, 4GB LPDDR4, 16GB eMMC Flash, 8MB QSPI NOR, SATA, 2x GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 2x CAN, WLAN/BT, LVDS, HDMI/DP, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8-QCM-24N06E0I PCBFTX	PV
92366	SMARC module based on NXP i.MX 8QuadMax processor (Automotive AEC Qualification Tier) with 2x Cortex-A72 and 4x Cortex-A53, 4GB LPDDR4, 16GB eMMC Flash, 8MB QSPI NOR, SATA, 2x GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 2x CAN, LVDS, HDMI/DP, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8-QCM-24N06A0A PCBFTX	PV
82089	SMARC module based on NXP i.MX 8QuadMax processor with 2x Cortex-A72 and 4x Cortex-A53, 4GB LPDDR4, 16GB eMMC Flash, 8MB QSPI NOR, SATA, 2x GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 2x CAN, LVDS, HDMI/DP, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8-QCM-24N06A0I PCBFTX	PV
82085	SMARC module based on NXP i.MX 8QuadMax processor with 2x Cortex-A72 and 4x Cortex-A53, 2GB LPDDR4, 16GB eMMC Flash, 8MB QSPI NOR, SATA, 2x GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 2x CAN, LVDS, HDMI/DP, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8-QCM-14N06A0I PCBFTX	PV
82091	SMARC module based on NXP i.MX 8QuadPlus processor with 1x Cortex-A72 and 4x Cortex-A53, 4GB LPDDR4, 16GB eMMC Flash, 8MB QSPI NOR, SATA, 2x GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 2x CAN, LVDS, HDMI/DP, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8-QCP-24N06A0I PCBFTX	OR
82104	SMARC module based on NXP i.MX 8QuadPlus processor with 1x Cortex-A72 and 4x Cortex-A53, 2GB LPDDR4, 16GB eMMC Flash, 8MB QSPI NOR, SATA, 2x GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 2x CAN, LVDS, HDMI/DP, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8-QCP-14N06A0I PCBFTX	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
Cooling Options		
81889	Passive Heatsink for SM2S-IMX8 module, consisting of a single-piece aluminum pin cooler and thermal pad for contact to the processor, with 2.7mm through-hole standoffs	MSC SM2S-IMX8-01 HSI-001
81888	Heatspreader for SM2S-IMX8 module, consisting of a single-piece aluminum plane and thermal pad for contact to the processor, with 2.7mm through-hole standoffs	MSC SM2S-IMX8-01 HSP-001
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		
74008	Starter Kit for MSC SMARC i.MX 8 Series 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-IMX8 / 8M / 8MINI / 8NANO / 8PLUS module. Please order your choice of module separately.	MSC SM2-SK-IMX8-EP1-KIT001 SETPAC

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