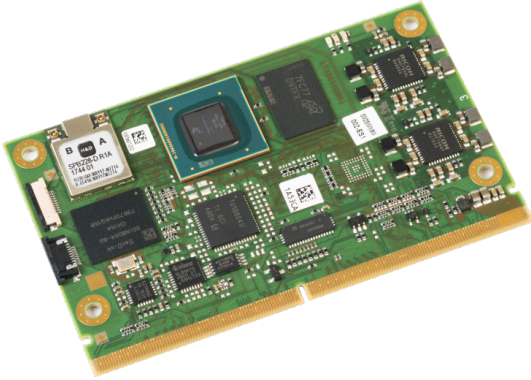


## MSC SM2S-IMX8M

NXP™ i.MX 8M ARM®  
Cortex™-A53



82 x 50 mm

3-6 W

-40 +85



## Description

The new MSC SM2S-IMX8M module features NXP's i.MX 8M processors offering dual- and quad-core ARM Cortex-A53 compute performance at very low power consumption and excellent graphics performance combined with a high degree of functional integration.

Built with best in class audio, voice and video processing technology, the NXP i.MX8M Family of Applications Processors is ideally suited for Media IOT and industrial applications such as Video, Voice and Audio for Connected Devices, Smart Home as well as HMI, Voice and Vision for harsh environments.

MSC SM2S-IMX8M offers dual-core or quad-core ARM Cortex-A53 processors in combination with ARM Cortex-M4 real time processor and Vivante GC7000Lite 3D Graphics GPU. It provides fast LPDDR4 memory, up to 64GB eMMC Flash memory, Gigabit Ethernet, PCI Express, USB 3.0, an on-board Wireless Module as well as an extensive set of interfaces for embedded applications.

The module is compliant with the new SMARC™ 2.0 standard, allowing easy integration with SMARC baseboards. For evaluation and design-in of the SM2S-IMX8M module, MSC provides a development platform and a starter kit. Support for Linux is available (Android support on request).

## Highlights

- Dual or Quad core ARM Cortex-A53 Applications Processor up to 1.5GHz
- ARM Cortex-M4 Real Time Processor at 266MHz
- Vivante GC7000Lite 2D/3D Graphics Processor
- 4Kp60 HEVC/H.265, H.264 and VP9 Video Codec (VPU not available on 8MQuadLite)
- Up to 4GB LPDDR4 SDRAM
- Up to 64GB eMMC Flash
- Dual-channel LVDS / MIPI-DSI x4 (optional)
- HDMI 2.0 with up to 4k
- Dual Independent Display support
- Dual MIPI CSI-2 Camera Interface
- 2x PCI Express x1 Gen. 2
- 2x USB 3.0 Host interface
- 2x USB 2.0 Host interface
- 1x USB 2.0 Host/Device interface
- Gigabit Ethernet
- Wireless Module (optional)
- MMC/SD/SDIO interface
- 2x CAN interface (optional)
- 2x I2S Audio Interface
- UART, SPI, I2C
- SMARC 2.0 Compliant

## Technical Data - MSC SM2S-IMX8M

<b>Technology</b>	ARM
<b>Formfactor</b>	SMARC Short Size
<b>CPU</b>	<p>NXP i.MX 8M ARM Cortex-A53 Applications Processor</p> <ul style="list-style-type: none"> <li>- i.MX 8MQuad, quad-core, 1.3 - 1.5GHz</li> <li>- i.MX 8MDual, dual-core, 1.3 - 1.5GHz</li> <li>- i.MX 8MQuadLite, quad-core, 1.3 - 1.5GHz</li> </ul> <p>ARM Cortex-M4 Real Time Processor at 266MHz</p>
<b>Chipset</b>	SOC
<b>RAM</b>	Up to 4GB 3200MT/s LPDDR4 SDRAM, soldered
<b>Flash</b>	Up to 64GB eMMC Flash QSPI NOR Flash (optional)
<b>Storage Interfaces</b>	1x MMC/SD/SDIO
<b>USB</b>	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, 2x USB 3.0 Host (option with WLAN/BT) or 1x USB 2.0 Host/Client, 1x USB 2.0 Host (option without HUB)
<b>Serial Interfaces</b>	<p>2x UART with 2-wire hand shake + 2x UART w/o hand shake + 1x SPI* or 1x UART with 2-wire hand shake + 2x UART w/o hand shake + 2x SPI* (optional)</p> <p>* CAN and SPI are mutual exclusive</p>
<b>Bus Interfaces</b>	<p>2x PCI Express x1 Gen.2 lanes 6x I2C up to 400 Kbit/s Up to 2x CAN 2.0B (optional)* Up to 2x SPI (with two chip selects)*</p> <p>* CAN and SPI are mutual exclusive</p>
<b>Display Controller</b>	<p>Vivante GC7000Lite 3D Graphics Processing Unit (GPU) Multicore 3D Graphics Acceleration, 4 shaders, 32GFLOPS OpenGL ES 1.0, 2.0, 3.0, 3.1, OpenCL 1.2 and Vulkan support</p> <p>Video Processing Unit (not supported by 8MQuadLite) 4Kp60 Main, Main10 HEVC/H.265 and VP9 decoder 4Kp30 AVC/H.264 decoder 1080p60 MPEG-2, MPEG-4p2, VC-1, VP8, RV9, AVS, MJPEG, H.263 decoder 1080p30 H.264 encoder (SW encode using ARM Cortex Cores)</p>
<b>Display Interfaces</b>	<p>Dual-channel LVDS interface, 18 or 24 bit (up to 1920x1080); also usable as one single-channel LVDS interface (up to 1366x768) or MIPI-DSI Display Interface, 4 lanes, up to 1920x1080 @ 60fps (optional)</p> <p>HDMI 2.0a interface, up to 4096x2160 @ 60fps</p>
<b>Network Interface</b>	<p>1x 10/100/1000BASE-T Ethernet</p> <p>HD Wireless Module SPB228, MU-MIMO 2x2 with 802.11 ac/a/b/g/n and Bluetooth/BLE support, soldered (optional)</p>

<b>Audio Interface</b>	2x I2S Audio
<b>Security Device</b>	Advanced Security, Safety, and Reliability integrated in the SOC Trusted Platform Module (TPM) 2.0 (optional)
<b>Miscellaneous</b>	Watchdog Timer for system reset (programmable, 1s ... 600s) Temperature compensated RTC 12x GPIO, configurable as input or output 64kbit ID EEPROM on I2C bus 2x MIPI CSI-2 camera interface (4-lane / 2 lane)
<b>OS Support</b>	Linux Board Support Package Android Board Support Package (on request)
<b>Power Requirement</b>	Power Supply +5V +/-5%, 5V Standby Power Consumption 3-6 W typ. (depending on CPU and optional features)
<b>Environment</b>	Temperature Range: 0°C ... +70°C operating commercial -40°C ... +85°C operating extended -40°C ... +85°C storage  Humidity: 5 ... 95% (operating, non condensing) 5 ... 95% (storage, non-condensing)
<b>Dimensions</b>	82 x 50 mm
<b>Certificates</b>	UL / CE
<b>Cooling</b>	Heatspreader
<b>Carrier</b>	MSC SM2-MB-EP1

## Order Reference - MSC SM2S-IMX8M

Order Number	Description	Reference	Cat
81568	SMARC module based on NXP i.MX 8MQuad Quad-Core Cortex-A53 processor at 1.3GHz, 2GB LPDDR4, 16GB eMMC Flash, 8MB QSPI NOR, GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 3x UART, no SPI, 2x CAN, WLAN/BT, TPM, MIPI DSI, HDMI, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8M-QC-14N0C61I PCBFTX	PV
73303	SMARC module based on NXP i.MX 8MQuad Quad-Core Cortex-A53 processor at 1.3GHz, 2GB LPDDR4, 8GB eMMC Flash, GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 4x UART, 1x SPI, LVDS, HDMI, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8M-QC-13N0600I PCBFTX	PV
85914	SMARC module based on NXP i.MX 8MQuad Quad-Core Cortex-A53 processor at 1.3GHz, 2GB LPDDR4, 8GB eMMC Flash, GbE LAN, 2x PCIe, 2x USB3.0 Host, 1x USB2.0 Host, 1x USB2.0 Host/Device, 3x UART, 2x SPI, LVDS, HDMI, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8M-QC-13N0680I PCBFTX	PV
73301	SMARC module based on NXP i.MX 8MQuadLite Quad-Core Cortex-A53 processor at 1.3GHz, 2GB LPDDR4, 8GB eMMC Flash, GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 4x UART, 1x SPI, LVDS, HDMI, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8M-QCL-13N0600I PCBFTX	PV
73289	SMARC module based on NXP i.MX 8MDual Dual-Core Cortex-A53 processor at 1.3GHz, 2GB LPDDR4, 8GB eMMC Flash, GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 4x UART, 1x SPI, LVDS, HDMI, MIPI CSI-2 Camera input; industrial temperature -40...+85°C	MSC SM2S-IMX8M-DC-13N0600I PCBFTX	PV

## Accessories

Order Number	Description	Reference
<b>Carrier Options</b>		
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 <sup>2</sup> 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
<b>Cooling Options</b>		
1151449	Passive Heatsink for SM2S-IMX8M 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-IMX8M-01 HSI-001
1144613	Heatspreader for SM2S-IMX8M module, consisting of a single-piece aluminum plane and thermal pad for contact to the processor, with 2.7mm through-hole standoffs	MSC SM2S-IMX8M-01 HSP-001
<b>Other Accessories</b>		
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
<b>Starter Kits</b>		
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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