**SMARC**

**MSC SM2S-IMX8**

**NXPTM i.MX8 ARM® Cortex™-A72/A53**

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**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).

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**Highlights**

- Single/Dual core ARM Cortex-A72 Application Processor
- Quad core ARM Cortex-A53 Application Processor
- Dual core ARM CortexM4F Real Time Processor
- Vivante GC7000Lite 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 interface with up to 4k (optional)
- Dual Independent Display support
- Dual MIPI CSI-2 Camera Interface
- 2x PCI Express x1 Gen. 3
- 2x USB 2.0 Host interface
- 2x 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

<table>
<thead>
<tr>
<th>Technology</th>
<th>ARM</th>
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<tr>
<td>Formfactor</td>
<td>SMARC Short Size</td>
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</tbody>
</table>
| CPU              | NXP i.MX8 ARM Cortex™-A72 / A53  
                     - i.MX 8QuadMax, 2x A72 (1.8GHz) + 4xA53 (1.2GHz)  
                     - i.MX 8QuadPlus, 1x A72 (1.8GHz) + 4xA53 (1.2GHz)  
                     - i.MX 8Quad, 4xA53 (1.2GHz)  
                     Dual 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 4.2 / NFC support, soldered (optional) |
| Audio Interface  | 2x I2S Audio |
| **Security Device** | Advanced Security, Safety, and Reliability integrated in the SOC  
Infineon Trusted Platform Module (TPM) 2.0 (optional) |
|---------------------|---------------------------------------------------------------|
| **Miscellaneous**   | Watchdog Timer for system reset (programmable, 1s … 600s)  
12x GPIO, configurable as input or output  
2kbit 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 TBD typ. (depending on CPU and optional features) |
| **Environment**     | 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) |
| **Dimensions**      | 82 x 50 mm |
| **Certificates**    | UL / CE |
| **Cooling**         | Heatspreader |
| **Carrier**         | MSC SM2-MB-EP1 |
# Order Reference - MSC SM2S-IMX8

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Description</th>
<th>Reference</th>
<th>Cat</th>
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</thead>
<tbody>
<tr>
<td>76685</td>
<td>SMARC module based on NXP i.MX 8QuadMax processor with 2x Cortex-A72 and 4x Cortex-A53, 4GB LPDDR4, 16GB eMMC Flash, SATA, 2x GbE LAN, 2x PCIe, 2x USB3.0 Host, 2x USB2.0 Host, 1x USB2.0 Host/Device, 2x CAN, 4x UART, TPM, BT/WLAN, LVDS, HDMI/DP, MIPI CSI-2 Camera input (Engineering Sample, get in touch with your sales representative)</td>
<td>MSC SM2S-IMX8QM-001 ES1 PCBES</td>
<td>OR</td>
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## Accessories

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Description</th>
<th>Reference</th>
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<tbody>
<tr>
<td><strong>Carrier Options</strong></td>
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<tr>
<td>68488</td>
<td>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 DVI 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</td>
<td>MSC SM2-MB-EP1-001 PCBFTX</td>
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<tr>
<td><strong>Other Accessories</strong></td>
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<td>40402</td>
<td>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</td>
<td>MSC Debug Console Adapter</td>
</tr>
<tr>
<td>68948</td>
<td>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</td>
<td>MSC JTAG Adapter FFC 10-pin</td>
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<td><strong>Starter Kits</strong></td>
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<tr>
<td>74008</td>
<td>Starter Kit for MSC SM2S-IMX8M modules. Includes MSC SM2-MB-EP1 Baseboard, Heatspreader, SD Card with USB Card Reader, Power Supply and suitable cable kit. The StarterKit does not include the MSC SM2S-IMX8M module. Please order your choice of MSC SM2S-IMX8M-xyz module separately.</td>
<td>MSC SM2-SK-IMX8-EP1-KIT001 SETPAC</td>
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MSC Technologies GmbH

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