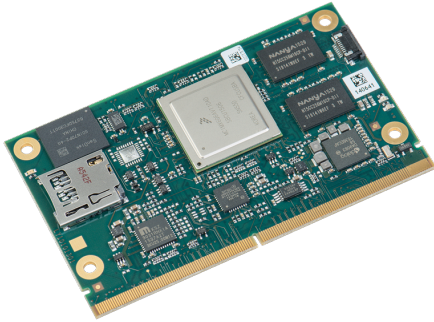


## MSC SM2S-IMX6

NXP™ i.MX6 ARM®  
Cortex™-A9



82 x 50 mm



4-6 W



-40 +85



## Description

The design of the MSC SM2S-IMX6 module is based on NXP's i.MX 6 processors offering quad-, dual- and single-core ARM® Cortex™-A9 compute performance at very low power consumption and excellent graphics performance combined with a high degree of functional integration.

It incorporates the i.MX 6 (Solo, DualLite, Dual or Quad) or the i.MX 6DualPlus or 6QuadPlus processor with up to 1.2 GHz, up to 4GB DDR3L SDRAM and up to 64GB eMMC Flash memory as well as an extensive set of interface controllers. 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-IMX6 module, MSC provides a development platform and a starter kit. Support for Linux and Windows Embedded Compact 7 and 2013 is available (Android on request).

## Highlights

- NXP™ i.MX 6 ARM® Cortex™-A9 Solo, DualLite, Dual, Quad, DualPlus and QuadPlus processor
- MPEG-4 Video Encoding/Decoding 1080p
- HDMI graphics 1920 x 1080 x 30fps
- Dual-channel LVDS 1920 x 1080 x 30fps
- Up to 4GB DDR3L SDRAM
- Up to 64GB eMMC Flash
- Gigabit Ethernet Interface
- 1x PCI Express x1
- 1x SATA-II (3Gbps, quad-/dual-core only)
- 1x USB Device/Host + up to 5x USB 2.0
- 1x MMC/SD/SDIO Interface
- 2x CAN Interface
- I2S Audio Interface
- MIPI CSI-2 Camera Interface
- Micro SD Card Socket
- SMARC™ 2.0 Compliant

## Technical Data - MSC SM2S-IMX6

|                           |  |
|---------------------------|--|
| <b>Technology</b>         | ARM  |
| <b>Formfactor</b>         | SMARC™ Short Size  |
| <b>CPU</b>                | <p>NXP™ i.MX 6 ARM® Cortex™-A9:</p> <ul style="list-style-type: none"> <li>- i.MX 6QuadPlus, quad-core, 800MHz...1.2GHz</li> <li>- i.MX 6Quad, quad-core, 800MHz...1.2GHz</li> <li>- i.MX 6DualPlus, dual-core, 800MHz...1.2GHz</li> <li>- i.MX 6Dual, dual-core, 800MHz...1.2GHz</li> <li>- i.MX 6DualLite, dual-core, 800MHz...1.0GHz</li> <li>- i.MX 6Solo, single-core, 800MHz...1.0GHz</li> </ul> |
| <b>Chipset</b>            | SOC  |
| <b>RAM</b>                | Up to 4GB DDR3L SDRAM (DDR-1066), soldered, non ECC  |
| <b>Flash</b>              | Up to 64GB eMMC Flash  |
| <b>Storage Interfaces</b> | <p>Micro SD Card Socket</p> <p>1x MMC/SD/SDIO</p> <p>1x SATA-II (3Gbps, not supported by Solo/DualLite CPU)</p>  |
| <b>USB</b>                | <p>1x USB 2.0 Host/Client, 4x USB 2.0 Host or</p> <p>1x USB 2.0 Host/Client, 5x USB 2.0 Host (optional) or</p> <p>1x USB 2.0 Host/Client, 1x USB 2.0 Host (optional)</p>   |
| <b>Serial Interfaces</b>  | 4x UART (two with 2-wire hand shake)   |
| <b>Bus Interfaces</b>     | <p>1x PCI Express x1</p> <p>2x CAN 2.0B</p> <p>5x I2C up to 400 Kbit/s</p> <p>2x SPI (with two chip selects)</p> <p>1x SMBus</p>   |
| <b>Display Controller</b> | <p>Video, 2D and 3D Graphics Units integrated in i.MX6 Processor</p> <p>OpenGL® ES 1.1/2.0/Halti, OpenVG™ 1.1, OpenCL™ 1.1 EP</p> <p>Multi-Format Hardware Video Encoder/Decoder</p>   |
| <b>Display Interfaces</b> | <p>Dual-channel LVDS interface, 18 or 24 bit (up to 1920x1080). Also usable as 2x single-channel LVDS interface (up to 1366x768)</p> <p>HDMI V1.4 up to WUXGA (1920x1080) incl. Full-HD @ 30fps</p> <p>MIPI CSI-2 Camera Interface</p>   |
| <b>Network Interface</b>  | 1x 10/100/1000BASE-T Ethernet  |
| <b>Audio Interface</b>    | I2S Audio  |
| <b>Security Device</b>    | Infineon Trusted Platform Module (TPM) 1.2, optional   |
| <b>Miscellaneous</b>      | <p>Watchdog Timer for system reset (programmable, 1s ... 600s)</p> <p>12x GPIO, configurable as input or output</p> <p>2kbit ID EEPROM on I2C bus</p>  |
| <b>OS Support</b>         | <p>Linux Board Support Package</p> <p>Windows Embedded Compact 7 and 2013 Board Support Packages (in preparation)</p> <p>Android Board Support Package (in preparation)</p>  |

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**Power Requirement**      Power Supply +5V +/-5%, 5V Standby  
Power Consumption 4-6 W 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

## Order Reference - MSC SM2S-IMX6

| Order Number | Description   | Reference                   | Cat |
|--------------|---|-----------------------------|-----|
| 68410        | SMARC module based on NXP i.MX 6Solo Single-Core Cortex-A9 processor at 800MHz, 1GB DDR3 soldered, integrated Graphics, HDMI max. 1920x1080, dual-channel LVDS, Ethernet controller (10/100/1000Base-T), 4GB eMMC Flash, micro SD socket, no SATA, 1x PCIe, 4x USB2.0 Host, 1x USB2.0 Host/Client, I2S Audio, MIPI CSI-2 Camera input; industrial temperature -40...+85°C   | MSC SM2S-IMX6-112<br>PCBFTX | PV  |
| 68432        | SMARC module based on NXP i.MX 6Dual Dual-Core Cortex-A9 processor at 800MHz, 2GB DDR3 soldered, integrated Graphics, HDMI max. 1920x1080, dual-channel LVDS, Ethernet controller (10/100/1000Base-T), 8GB eMMC Flash, micro SD socket, 1x SATA, 1x PCIe, 4x USB2.0 Host, 1x USB2.0 Host/Client, I2S Audio, MIPI CSI-2 Camera input; industrial temperature -40...+85°C     | MSC SM2S-IMX6-123<br>PCBFTX | PV  |
| 68434        | SMARC module based on NXP i.MX 6DualLite Dual-Core Cortex-A9 processor at 800MHz, 2GB DDR3 soldered, integrated Graphics, HDMI max. 1920x1080, dual-channel LVDS, Ethernet controller (10/100/1000Base-T), 8GB eMMC Flash, micro SD socket, no SATA, 1x PCIe, 4x USB2.0 Host, 1x USB2.0 Host/Client, I2S Audio, MIPI CSI-2 Camera input; industrial temperature -40...+85°C | MSC SM2S-IMX6-133<br>PCBFTX | PV  |
| 68436        | SMARC module based on NXP i.MX 6Quad Quad-Core Cortex-A9 processor at 800MHz, 2GB DDR3 soldered, integrated Graphics, HDMI max. 1920x1080, dual-channel LVDS, Ethernet controller (10/100/1000Base-T), 8GB eMMC Flash, micro SD socket, 1x SATA, 1x PCIe, 4x USB2.0 Host, 1x USB2.0 Host/Client, I2S Audio, MIPI CSI-2 Camera input; industrial temperature -40...+85°C     | MSC SM2S-IMX6-143<br>PCBFTX | PV  |
| 68438        | SMARC module based on NXP i.MX 6DualPlus Dual-Core Cortex-A9 processor at 800MHz, 2GB DDR3 soldered, integrated Graphics, HDMI max. 1920x1080, dual-channel LVDS, Ethernet controller (10/100/1000Base-T), 4GB eMMC Flash, micro SD socket, 1x SATA, 1x PCIe, 4x USB2.0 Host, 1x USB2.0 Host/Client, I2S Audio, MIPI CSI-2 Camera input; industrial temperature -40...+85°C | MSC SM2S-IMX6-163<br>PCBFTX | OR  |
| 68440        | SMARC module based on NXP i.MX 6QuadPlus Quad-Core Cortex-A9 processor at 800MHz, 2GB DDR3 soldered, integrated Graphics, HDMI max. 1920x1080, dual-channel LVDS, Ethernet controller (10/100/1000Base-T), 8GB eMMC Flash, micro SD socket, 1x SATA, 1x PCIe, 4x USB2.0 Host, 1x USB2.0 Host/Client, I2S Audio, MIPI CSI-2 Camera input; industrial temperature -40...+85°C | MSC SM2S-IMX6-183<br>PCBFTX | OR  |
| 77401        | SMARC module based on NXP i.MX 6Solo Single-Core Cortex-A9 processor at 1GHz, 512MB DDR3 soldered, integrated Graphics, HDMI max. 1920x1080, dual-channel LVDS, Ethernet controller (10/100/1000Base-T), 8GB eMMC Flash, micro SD socket, no SATA, 1x PCIe, 4x USB2.0 Host, 1x USB2.0 Host/Client, I2S Audio, MIPI CSI-2 Camera input; commercial temperature 0...+70°C     | MSC SM2S-IMX6-010<br>PCBFTX | PV  |

## Order Reference - MSC SM2S-IMX6

| Order Number | Description  | Reference                   | Cat |
|--------------|--|-----------------------------|-----|
| 71242        | SMARC module based on NXP i.MX 6DualLite Dual-Core Cortex-A9 processor at 1GHz, 1GB DDR3 soldered, integrated Graphics, HDMI max. 1920x1080, dual-channel LVDS, Ethernet controller (10/100/1000Base-T), 8GB eMMC Flash, micro SD socket, no SATA, 1x PCIe, 1x USB2.0 Host, 1x USB2.0 Host/Client, I2S Audio, MIPI CSI-2 Camera input; commercial temperature 0...+70°C      | MSC SM2S-IMX6-03A<br>PCBFTX | PV  |
| 71668        | SMARC module based on NXP i.MX 6DualLite Dual-Core Cortex-A9 processor at 1GHz, 512MB DDR3 soldered, integrated Graphics, HDMI max. 1920x1080, dual-channel LVDS, Ethernet controller (10/100/1000Base-T), 8GB eMMC Flash, no micro SD socket, no SATA, 1x PCIe, 1x USB2.0 Host, 1x USB2.0 Host/Client, I2S Audio, MIPI CSI-2 Camera input; extended temperature -20...+85°C | MSC SM2S-IMX6-238<br>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 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 | MSC SM2-MB-EP1-001 PCBFTX         |
| <b>Cooling Options</b>   |  |                                   |
| 1133175                  | Heat spreader for SM2S-IMX6 module with flip-chip processor package (all single-core & dual-lite versions, all standard temperature versions)  | MSC SM2S-IMX6-01 HSP-001          |
| 1133176                  | Heat spreader for SM2S-IMX6 module with lidded processor package (extended temperature versions of dual- and quad-core only)   | MSC SM2S-IMX6-02 HSP-001          |
| <b>Other Accessories</b> |  |                                   |
| 40402                    | 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>      |  |                                   |
| 68994                    | Starter Kit for MSC SM2S-IMX6 modules. Includes MSC SM2-MB-EP1 Baseboard, Heatspreader, SD Card with Linux installation and Power Supply. The StarterKit does not include the MSC SM2S-IMX6 module. Please order your choice of MSC SM2S-IMX6-XYZ module separately.   | MSC SM2-SK-IMX6-EP1-KIT001 BRDFTX |