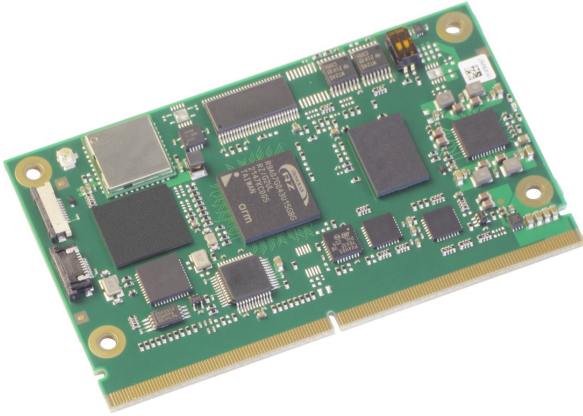


MSC SM2S-G2UL

Renesas RZ/G2UL Arm[®]
Cortex[®]-A55/M33



82 x 50 mm

3-4 W

-40 +85



Description

The new MSC SM2S-G2UL SMARC 2.1.1 module family is equipped with cost-effective and power-efficient RZ/G2UL Arm Cortex-A55 processors, manufactured by Renesas. The module integrates a single-core Arm Cortex-A55 processor running at 1.0 GHz, an Arm Cortex-M33 real-time processor and an Image Processing Unit to support entry level HMI applications. The typical design power ranges from 3 to 4 W.

The MSC SM2S-G2UL offers cost-effective DDR4 memory technology, combined with up to 256GB eMMC Flash memory. Various interfaces for embedded applications such as Gigabit Ethernet, USB 2.0, dual CAN-FD, dual-channel LVDS and MIPI CSI-2 for connecting a camera are available. An on-board Wireless Module is provided as assembly options.

The module is compliant with the new SMARC 2.1.1 standard, allowing easy integration with SMARC baseboards. For evaluation and design-in of the MSC SM2S-G2UL module, Avnet Embedded provides a development platform and a starter kit. Support for Linux is available (Android support on request).

Highlights

- ARM Cortex-A55 Microprocessor at 1.0GHz
- ARM Cortex-M33 Real Time Processor at 200MHz
- Image Processing Unit
- Up to 2GB DDR4 SDRAM with inline ECC
- Up to 256GB eMMC Flash
- Dual-channel LVDS
- MIPI CSI-2 Camera interface
- Up to 4x USB 2.0 Host interfaces
- 1x USB 2.0 Host/Device interface
- Gigabit Ethernet
- Wireless Module (optional)
- MMC/SD/SDIO interface (optional)
- Up to 2x CAN-FD interfaces
- Up to 2x I2S Audio interfaces
- 14x GPIO
- UART, SPI, I2C
- SMARC 2.1.1 Compliant
- Entry level HMI and Vision applications

Technical Data - MSC SM2S-G2UL

Technology	Arm
Formfactor	SMARC Short Size
CPU	<p>Renesas RZ/G2UL family</p> <ul style="list-style-type: none"> - Single Core ARM Cortex-A55 at 1.0GHz, secure - Single Core ARM Cortex-A55 at 1.0GHz, non-secure <p>Arm Cortex-M33 Real Time Processor at 200MHz</p>
Chipset	SOC
RAM	Up to 2GB 1600MT/s DDR4 SDRAM, soldered, inline ECC support
Flash	Up to 256GB eMMC Flash
Storage Interfaces	1x MMC/SD/SDIO (optional, SDIO and WIFI/BT are mutual exclusive)
USB	1x USB 2.0 Host/Client, 4x USB 2.0 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	<p>4x I2C up to 400 Kbit/s 2x SPI (with two chip selects)</p> <p>1x CAN-FD or 2x CAN-FD (optional, LVDS and 2x CAN are mutual exclusive)</p>
Display Controller	Image Processing Unit to support simple HMI graphics (i.e. blending, dither processing, clipping, gamma correction)
Display Interfaces	Dual-channel LVDS interface, 18 or 24 bit (up to 1920x1080); also usable as one single-channel LVDS interface (up to 1366x768)
Network Interface	<p>1x 10/100/1000BASE-T Ethernet</p> <p>Wireless Module with 802.11b/g/n and Bluetooth 5.0, single band 2.4GHz, soldered (optional, SDIO and WIFI/BT are mutual exclusive)</p>
Audio Interface	1x I2S Audio or 2x I2S Audio (optional, LVDS and 2x I2S are mutual exclusive)
Security Device	<p>Advanced Security, Safety, and Reliability integrated in the SOC</p> <p>Trusted Platform Module (TPM) 2.0 (optional)</p>

Miscellaneous	Watchdog Timer for system reset (programmable, 1s ... 600s) RTC / temperature compensated (optional) 14x GPIO, configurable as input or output, interrupt capable 64kbit ID EEPROM on I2C bus MIPI CSI-2 camera interface (CSI0, 2 lane) or MIPI CSI-2 camera interface (CSI1, 4-lane)
Feature Highlights	SMARC 2.1.1 compatible
Firmware	uboot
OS Support	Linux Board Support Package Android Board Support Package (on request)
Power Requirement	Power Supply +5V +/-5%, 5V Standby Power Consumption 1-2 W typ. (depending on CPU and optional features)
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	82 x 50 mm
Certificates	UL / CE
Cooling	Heatspreader
Carrier	MSC SM2-MB-EP1 MSC SM2-MB-EP5

Order Reference - MSC SM2S-G2UL

Order Number	Description	Reference	Cat*
115147	SMARC module based on Renesas RZ/G2UL Single-Core Cortex-A55 processor at 1.0GHz, 2GB DDR4, 16GB eMMC Flash, 1x GbE LAN, 4x USB2.0 Host, 1x USB2.0 Host/Device, 1x I2S, 1x CAN, no SDIO, BT/WLAN, TPM, LVDS, MIPI CSI-2 Camera input (CSI1, 4 lane); industrial temperature -40...+85°C	MSC SM2S-G2UL-SC-14N02C1I PCBFTX	PV
115149	SMARC module based on Renesas RZ/G2UL Single-Core Cortex-A55 processor at 1.0GHz, 1GB DDR4, 8GB eMMC Flash, 1x GbE LAN, 4x USB2.0 Host, 1x USB2.0 Host/Device, 1x I2S, 1x CAN, 1x SDIO, LVDS, MIPI CSI-2 Camera input (CSI0, 2 lane); industrial temperature -40...+85°C	MSC SM2S-G2UL-SC-03N0260I PCBFTX	PV
115145	SMARC module based on Renesas RZ/G2UL Single-Core Cortex-A55 processor at 1.0GHz, 512MB DDR4, 4GB eMMC Flash, 1x GbE LAN, 1x USB2.0 Host, 1x USB2.0 Host/Device, 2x I2S, 2x CAN, 1x SDIO, no DISPLAY, MIPI CSI-2 Camera input (CSI0, 2 lane); extended temperature -25...+85°C	MSC SM2S-G2UL-SC-92N0N70E PCBFTX	PV

*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		
98418	Heatspreader for SM2S-G2UL module, consisting of a single-piece aluminum plane and thermal pad for contact to the processor, with 2.7mm through-hole standoffs	MSC SM2S-G2UL-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