∧VNET EMBEDDED

MSC SM2S-V2L

Renesas RZ/V2L Arm®
Cortex®-A55/M33

⊠	82 x 50 mm
♨	4-6 W
🌡	-40 +85
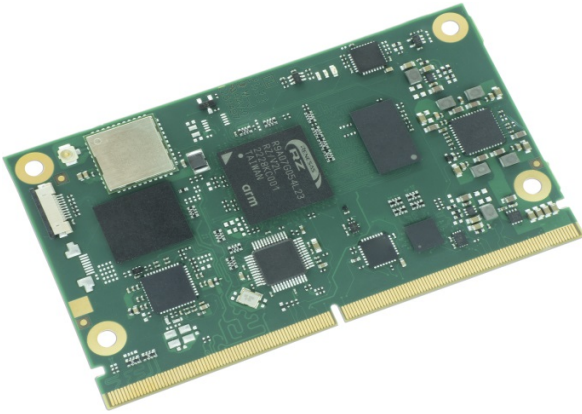
SMARC module RENESAS

Description

The new MSC SM2S-V2L SMARC 2.1.1 module family is equipped with cost-effective and power-efficient RZ/V2L Arm Cortex-A55 processors, manufactured by Renesas. The module integrates a single- or dual-core Arm Cortex-A55 processor running at 1.2 GHz, an Arm Cortex-M33 real-time processor and an efficient multimedia 2D/3D graphics and video processing unit (GPU and VPU). An additional DRP-AI (Dedicated AI-Accelerator) is also provided by RZ/V2L processors. The typical design power ranges from 4 to 6 W.

The MSC SM2S-V2L offers cost-effective DDR4 memory technology, combined with up to 256GB eMMC Flash memory. Various interfaces for embedded applications such as Dual 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-V2L module, Avnet Embedded provides a development platform and a starter kit. Support for Linux is available (Android support on request).

Highlights

- Single or Dual core Arm Cortex-A55 Microprocessor at 1.2GHz
- Arm Cortex-M33 Real Time Processor at 200MHz
- Arm Mali-G31 multimedia 2D/3D Graphics Processing Unit (GPU)
- H.264 Video Encoding and Decoding (VPU)
- DRP-AI (Dedicated AI-Accelerator)
- 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
- Dual Gigabit Ethernet
- Wireless Module (optional)
- MMC/SD/SDIO interface (optional)

- 2x CAN-FD interfaces
- 2x I2S Audio interfaces
- 14x GPIO
- UART, SPI, I2C
- SMARC 2.1.1 Compliant

Technical Data - MSC SM2S-V2L

Technology	Arm
Formfactor	SMARC Short Size
CPU	Renesas RZ/V2L family - Single Core Arm Cortex-A55 at 1.2GHz, secure - Single Core Arm Cortex-A55 at 1.2GHz, non-secure - Dual Core Arm Cortex-A55 at 1.2GHz, secure - Dual Core Arm Cortex-A55 at 1.2GHz, non-secure Arm Cortex-M33 Real Time Processor at 200MHz Embedded DRP-AI (Dedicated AI-Accelerator)
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 TxD, RxD, RTS, CTS 2x UART with TxD, RxD only
Bus Interfaces	4x I2C up to 400 Kbit/s 2x SPI (with two chip selects) 2x CAN-FD
Display Controller	Arm Mali-G31 multimedia 2D/3D Graphics Processing Unit (GPU) OpenGL ES1.1, 2.0, 3.0, 3.1 and 3.2 support OpenCL 2.0 Full Profile support Video Codec Processor with H.264 support
Display Interfaces	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)
Network Interface	2x 10/100/1000BASE-T Ethernet Wireless Module with 802.11b/g/n and Bluetooth 5.0, single band 2.4GHz, soldered (optional, SDIO and WIFI/BT are mutual exclusive)
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)
	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 Main: +5V +/-5% Power Standby: +5V +/-5% Power Consumption 4-6 W typ. (depending on CPU and optional features)
Environment	Temperature Range: Commercial: 0°C … 70°C (operating) -20°C … 85°C (storage) Extended: -25°C … 85°C (operating) -40°C … 85°C (storage) Industrial: -40°C … 85°C (operating) -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 MSC SM2-MB-EP5

Order Reference - MSC SM2S-V2L

Order Number	Description	Reference	Cat*
98241	SMARC module based on Renesas RZ/V2L Dual-Core Cortex-A55 processor at 1.2GHz (integrated DRP-AI), 2GB DDR4, 16GB eMMC Flash, 2x GbE LAN, 4x USB2.0 Host, 1x USB2.0 Host/Device, 2x CAN, no SDIO, BT/WLAN, TPM, LVDS, MIPI CSI-2 Camera input (CSI1, 4 lane); industrial temperature -40...+85°C (Engineering Sample - get in touch with your sales representative)	MSC SM2S-V2L-DC-14N02E1I ES1 PCBES	OR

*COM products are divided in two categories, „PV" (preferred variant) and „OR" (on request).

SMARC

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, I²C, 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
	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