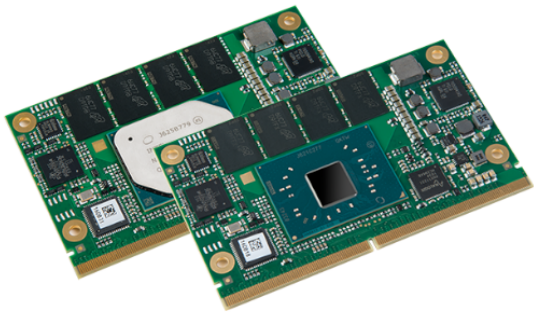
TRIA SM2S-AL

Intel® Atom™ E3900 / Pentium® / Celeron® SOC



82 x 50 mm

7 / 14 W

-40 +85 °C

Highlights

- Intel Atom x7-E3950 quad-core 1.6/2.0GHz, 12W
- Intel Atom x5-E3940 quad-core 1.6/1.8GHz, 9.5W
- Intel Atom x5-E3930 dual-core 1.3/1.8GHz, 6.5W
- Intel Pentium N4200 quad-core 1.1/2.5GHz, 6W
- Intel Celeron N3350 dual-core 1.1/2.4GHz, 6W
- Integrated Intel Gen. 9 HD Graphics
- Up to 8GB LPDDR4 SDRAM, up to 64GB eMMC Flash (optional)
- SATA-III interface (6Gbps)
- Dual DisplayPort++ interface
- LVDS / Embedded DisplayPort and MIPI-DSI
- Triple Independent Display support
- DirectX 12, OpenGL 4.3, OpenCL 2.0
- Dual MIPI CSI-2 Camera Interface
- Up to 4x PCI Express x1 Gen. 2
- 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device interface
- Up to 2x Gigabit Ethernet
- UART, LPC, SPI, I2C, SMBus, HD/I2S Audio, SD Card interface
- Trusted Platform Module (optional)
- UEFI Firmware

Technical Data

Technology	x86
Formfactor	SMARC Short Size
CPU	Intel Atom x7-E3950 Processor, quad-core, 1.6/2.0GHz, 18 EU GFX, 12W Intel Atom x5-E3940 Processor, quad-core, 1.6/1.8GHz, 12 EU GFX, 9.5W Intel Atom x5-E3930 Processor, dual-core, 1.3/1.8GHz, 12 EU GFX, 6.5W Intel Pentium Processor N4200, quad-core, 1.1/2.5GHz, 18 EU GFX, 6W Intel Celeron Processor N3350, dual-core, 1.1/2.4GHz, 12 EU GFX, 6W Intel® Technologies: Enhanced Intel® SpeedStep® Technology Intel® Virtualization Technology (VT-x) Intel® Virtualization Technology for Directed I/O (VT-d) Intel® Trusted Execution Engine (TXE) 3.0 Precision Time Management
Chipset	Integrated in SOC
RAM	Up to 8GB 2400MT/s LPDDR4 SDRAM, quad-channel, soldered
Flash	Up to 64GB eMMC V5.x Flash, soldered (optional)
Storage Interfaces	1x SATA-III 6Gbps 1x SD 3.01
USB	5x USB 2.0 Host interfaces 1x USB 2.0 Host/Device interface 2x USB 3.0 Host interfaces (consumes 2x USB 2.0 if used)
Serial Interfaces	4x UART (two with handshake)
Bus Interfaces	Up to 4x PCI-Express x1 Gen. 2 lanes 1x I2C Bus 2x SPI Bus (Boot/SIO) 1x SMBus
Display Controller	Integrated Intel HD Graphics Gen. 9 Up to 18 execution units (EU) 3D Acceleration: DirectX 12.0, OpenGL 4.3, OpenCL 2.0 Full Profile Video Decode: MPEG2, H.264 (L5.2), VC-1, WMV9, VP8, JPEG/MJPEG, H.265 (HEVC), VP9, MVC
Display Memory	DISPLAY MEMORY DATA HERE
Display Interfaces	Three independent displays supported 2x DisplayPort++ (DisplayPort 1.2a up to 4096 x 2160 @ 60Hz, HDMI 1.4b up to 3840 x 2160 @ 30Hz) Dual-Channel LVDS 24/18 bit up to 1920 x 1200 @ 60Hz or Embedded DisplayPort 1.3 up to 4096 x 2160 @ 60Hz and MIPI-DSI x4 Interface up to 2560 x 1600 @ 60Hz (optional)
Network Interface	Up to 2x 10/100/1000Base-T (Intel i210)
Audio Interface	High Definition Audio I2S Audio
Security Device	Infineon Trusted Platform Module 2.0 (optional)

Miscellaneous	Watchdog Timer: Initiates system reset, (programmable, 1s ... 255h) Fan Supply: PWM Speed Control for system fan on carrier board RTC battery: external System Monitoring: Voltage, Temperature, CPU Fan, System Fan Camera Interface: 2x MIPI CSI-2 camera interface (4-lane / 2 lane)
Feature Highlights	SMARC 2.0 compliant
Firmware	AMI Aptio UEFI
OS Support	Windows 10 (embedded) BSP for Linux on request EAPI (HW Programming Interface)
Power Requirement	+5V +/-5% +5V Standby
Environment	Temperature Range: 0° ... 60°C (operating) -25° ... 85°C (storage) -40° ... 85°C (operating industrial) Humidity: 5 ... 95% (operating, non-condensing) 5 ... 95% (storage, non-condensing)
Dimensions	82 x 50 mm
Certificates	UL / CE
Cooling	Heatspreader Heatsink
Carrier	TRIA SM2-MB-EP1

Technical Data for TRIA SM2S-AL

Order Reference

Order No.	Description	Reference	Status*
70609	SMARC 2.0 short size module with Intel Atom E3950 processor (1.6/2.0GHz), Quad-Core, 12W, 8GB 2400MT/s LPDDR4, 32GB eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics, industrial temperature -40...+85°C (recommended for 24/7 use cases)	MSC SM2S-AL-E3950-35N0201I PCBFTX	PV
78145	SMARC 2.0 short size module with Intel Atom E3950 processor (1.6/2.0GHz), Quad-Core, 12W, 8GB 2400MT/s LPDDR4, no eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics, industrial temperature -40...+85°C (recommended for 24/7 use cases)	MSC SM2S-AL-E3950-3NN0201I PCBFTX	PV
70605	SMARC 2.0 short size module with Intel Atom E3940 processor (1.6/1.8GHz), Quad-Core, 9.5W, 4GB 2133MT/s LPDDR4, 16GB eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics, industrial temperature -40...+85°C (recommended for 24/7 use cases)	MSC SM2S-AL-E3940-24N0201I PCBFTX	PV
78147	SMARC 2.0 short size module with Intel Atom E3940 processor (1.6/1.8GHz), Quad-Core, 9.5W, 4GB 2133MT/s LPDDR4, no eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics, industrial temperature -40...+85°C (recommended for 24/7 use cases)	MSC SM2S-AL-E3940-2NN0201I PCBFTX	PV
70601	SMARC 2.0 short size module with Intel Atom E3930 processor (1.3/1.8GHz), Dual-Core, 6.5W, 2GB 2133MT/s LPDDR4, 16GB eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics, industrial temperature -40...+85°C (recommended for 24/7 use cases)	MSC SM2S-AL-E3930-14N0201I PCBFTX	PV
78151	SMARC 2.0 short size module with Intel Atom E3930 processor (1.3/1.8GHz), Dual-Core, 6.5W, 2GB 2133MT/s LPDDR4, no eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics, industrial temperature -40...+85°C (recommended for 24/7 use cases)	MSC SM2S-AL-E3930-1NN0201I PCBFTX	PV
78149	SMARC 2.0 short size module with Intel Atom E3930 processor (1.3/1.8GHz), Dual-Core, 6.5W, 2GB 2133MT/s LPDDR4, no eMMC, Dual GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics, industrial temperature -40...+85°C (recommended for 24/7 use cases)	MSC SM2S-AL-E3930-1NN0281I PCBFTX	PV
78153	SMARC 2.0 short size module with Intel Atom E3930 processor (1.3/1.8GHz), Dual-Core, 6.5W, 2GB 2133MT/s LPDDR4, 8GB eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, DP, eDP, industrial temperature -40...+85°C (recommended for 24/7 use cases; limited to -25°C if eMMC is used)	MSC SM2S-AL-E3930-13N0100I PCBFTX	PV
81505	SMARC 2.0 short size module with Intel Atom E3950 processor (1.6/2.0GHz), Quad-Core, 12W, 8GB 2400MT/s LPDDR4, 32GB eMMC, Dual GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, eDP, industrial temperature -40...+85°C (recommended for 24/7 use cases)	MSC SM2S-AL-E3950-35N0181I PCBFTX	PV
82559	SMARC 2.0 short size module with Intel Atom E3950 processor (1.6/2.0GHz), Quad-Core, 12W, 8GB 2400MT/s LPDDR4, 32GB eMMC, Dual GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics, industrial temperature -40...+85°C (recommended for 24/7 use cases)	MSC SM2S-AL-E3950-35N0281I PCBFTX	PV
83194	SMARC 2.0 short size module with Intel Atom E3930 processor (1.3/1.8GHz), Dual-Core, 6.5W, 4GB 2133MT/s LPDDR4, no eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics, industrial temperature -40...+85°C (recommended for 24/7 use cases)	MSC SM2S-AL-E3930-2NN0201I PCBFTX	PV

Order No.	Description	Reference	Status*
83196	SMARC 2.0 short size module with Intel Atom E3930 processor (1.3/1.8GHz), Dual-Core, 6.5W, 8GB 2133MT/s LPDDR4, no eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics, industrial temperature -40...+85°C (recommended for 24/7 use cases)	MSC SM2S-AL-E3930-3NN0201I PCBFTX	PV
70607	SMARC 2.0 short size module with Intel Atom E3950 processor (1.6/2.0GHz), Quad-Core, 12W, 8GB 2400MT/s LPDDR4, 32GB eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics	MSC SM2S-AL-E3950-35N0201C PCBFTX	OR
70603	SMARC 2.0 short size module with Intel Atom E3940 processor (1.6/1.8GHz), Quad-Core, 9.5W, 4GB 2133MT/s LPDDR4, 16GB eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics	MSC SM2S-AL-E3940-24N0201C PCBFTX	OR
70599	SMARC 2.0 short size module with Intel Atom E3930 processor (1.3/1.8GHz), Dual-Core, 6.5W, 2GB 2133MT/s LPDDR4, 16GB eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics	MSC SM2S-AL-E3930-14N0201C PCBFTX	OR
70613	SMARC 2.0 short size module with Intel Pentium N4200 processor (1.5/2.5GHz), Quad-Core, 6W, 8GB 2400MT/s LPDDR4, 32GB eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics	MSC SM2S-AL-N4200-35N0201C PCBFTX	OR
70611	SMARC 2.0 short size module with Intel Celeron N3350 processor (1.1/2.3GHz), Dual-Core, 6W, 4GB 2400MT/s LPDDR4, 16GB eMMC, GbE LAN, 2x USB 3.0 Host, 5x USB 2.0 Host, 1x USB 2.0 Host/Device, TPM, DP, LVDS Graphics	MSC SM2S-AL-N3350-24N0201C PCBFTX	OR

Ordering Information for TRIA SM2S-AL

*PV = Preferred variant; OR = on Request (in OEM quantities only)

Accessories

Carrier Options

Order No.	Description	Reference
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
85087	SMARC 2.x compatible embedded platform (146 x 80mm), 10-36V input voltage, 3x RS232, 1x RS485, 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 3.0/ DisplayPort Type C , 1x USB 2.0 Type A, 1x USB 2.0 internal, 1x µUSB 2.0 Host/Device, 2x SPI, I²C, 12 GPIO on FC, 1x DisplayPort++ , LVDS/ eDP/DSI on JILI30 connector, µSD Card Slot, regulated backlight supply, HD Audio with amplifier, system fan connector, camera connector, RTC battery. Industrial temperature range -40..+85°C, x86 full version	MSC SM2S-MB-EP5-001 PCBFTX
83979	SMARC 2.x compatible embedded platform (146 x 80mm), 12V input voltage, 3x RS232, 1x RS485, dual RJ45 LAN with LED, 1x M.2 2280 Key M slot , 1x USB 2.0 Type A, 1x USB3.0 Type A, 1x USB 2.0 internal, 1x µUSB 2.0 Host/Device, 2x SPI, 12 GPIO on FC, 1x DisplayPort++ , LVDS/eDP/DSI on JILI30 connector, regulated backlight supply, RTC battery, Industrial temperature range -40..+85°C, x86 slim version	MSC SM2S-MB-EP5-003 PCBFTX

Carrier Options TRIA SM2S-ASL/ALN/EL/AL/RYZ

Cooling Options

Order No.	Description	Reference
1137475	Passive Heatsink for SM2S-AL variants with Atom processor, consisting of a single-piece aluminium pin cooler and thermal pad for contact to the processor, with 2.7mm through-hole standoffs	MSC SM2S-AL-01 HSI-001
1137476	Heatspreader for SM2S-AL variants with Atom processor, consisting of a single-piece aluminium plane and thermal pad for contact to the processor, with 2.7mm through-hole standoffs	MSC SM2S-AL-01 HSP-001
1137477	Passive Heatsink for SM2S-AL variants with Pentium/Celeron processor, consisting of a single-piece aluminium pin cooler and thermal pad for contact to the processor, with 2.7mm through-hole standoffs	MSC SM2S-AL-02 HSI-001
1137478	Heatspreader for SM2S-AL variants with Pentium/Celeron processor, consisting of a single-piece aluminium plane and thermal pad for contact to the processor, with 2.7mm through-hole standoffs	MSC SM2S-AL-02 HSP-001

Cooling Options TRIA SM2S-AL

Starter Kits

Order No.	Description	Reference
70253	Starter Kit for SMARC Short Size modules with Intel Atom E39xx (Apollo Lake) processor. Includes TRIA SM2-MB-EP1 Baseboard, Heatsinks and Power Supply. The StarterKit does not include the SMARC module. Please order your choice of TRIA SM2S-AL module separately.	MSC SM2S-SK-AL-EP1-KIT001 BRDFTX

Starter Kits TRIA SM2S-AL

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