/ MAAXBOARD RT

⊿VNET®

MaaXBoard RT is a dual-purpose SBC board based on NXP's i.MX RT1176 processor. Optimized for use as low-cost development board and to embed in OEM products, it provides advanced security, high-performance low-latency real-time operation, with a versatile set of peripheral interfaces ideal for implementation of eg. industrial automation and power-efficient audio/visual AI-enabled applications.

i.MX RT1170 series cross-over processors are based on Arm® Cortex®-M7 and Cortex-M4 cores for real-time industrial performance and microcontroller usability at a cost-effective price.

Software enablement includes a comprehensive NXP RT1170 SDK that accelerates application development with drivers, middleware, code snippets and FreeRTOS based examples (AzureRTOS support will follow soon). Out-of-box Avnet example reference designs are also provided to jump-start development.

Hardware components include SDRAM and HyperFlash high-speed 256 Mb memories, two Ethernet ports, USB 2.0 host and device ports, MIPI-DSI display interface and MIPI-CSI camera interface, Wi-Fi 5 and Bluetooth 5.1 wireless, an audio subsystem that supports Bluetooth PCM audio, onboard PDM microphones (4) plus stereo codec with an audio jack. Expansion 40 pin (Pi HAT-compatible) and 18 pin headers pin-out peripheral interfaces such as UART, SPI, I2C, CAN bus, and GPIO for further system expansion, making this versatile platform ideal for prototyping and deployment of realtime AI and industrial applications.

MaaXBoard RT also has advanced security features to protect your application. (eg. Crypto engine, key protection, random number generation, secure storage, bus encryption, tamper protection, secure boot and more) to secure mission critical applications (eg. electrical grid control and medical applications).

MaaXBoard RT ships with a quick start guide to ensure that hardware and software application development can commence efficiently. The user is responsible for providing an SWD/JTAG debug probe (inexpensive NXP MCU-LINK or equivalent) as well as a suitable 5V/3A USB power adapter with USB-C connector.
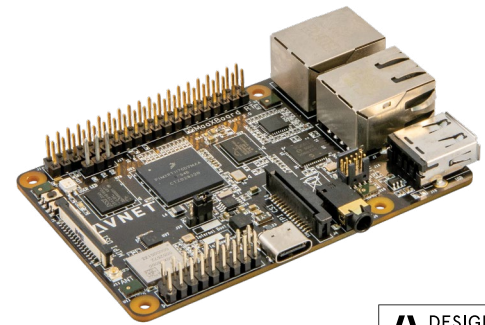
Kit includes

- MaaXBoard RT
- IPEX Antenna
- Quick start guide

Target apps

- Smart home
- Consumer audio
- Emerging consumer & retail
- Factory automation
- Power and energy

⊿ DESIGNED BY AVNET

Features

- NXP i.MX RT1176 Processor
  - Arm Cortex-M7 @1GHz, 32KB/32KB L1 Cache
  - Arm Cortex-M4F @400MHz, 16KB/16KB L1 Cache
  - Fast Real-time, low-latency response (12ns)
  - 2D GPU and Graphics Accelerator
  - Advanced Security
  - 2MB of Fast On-Chip SRAM (includes 512KB of A7 TCM and 256KB M4 TCM)
- 256 Mb Onboard SDRAM
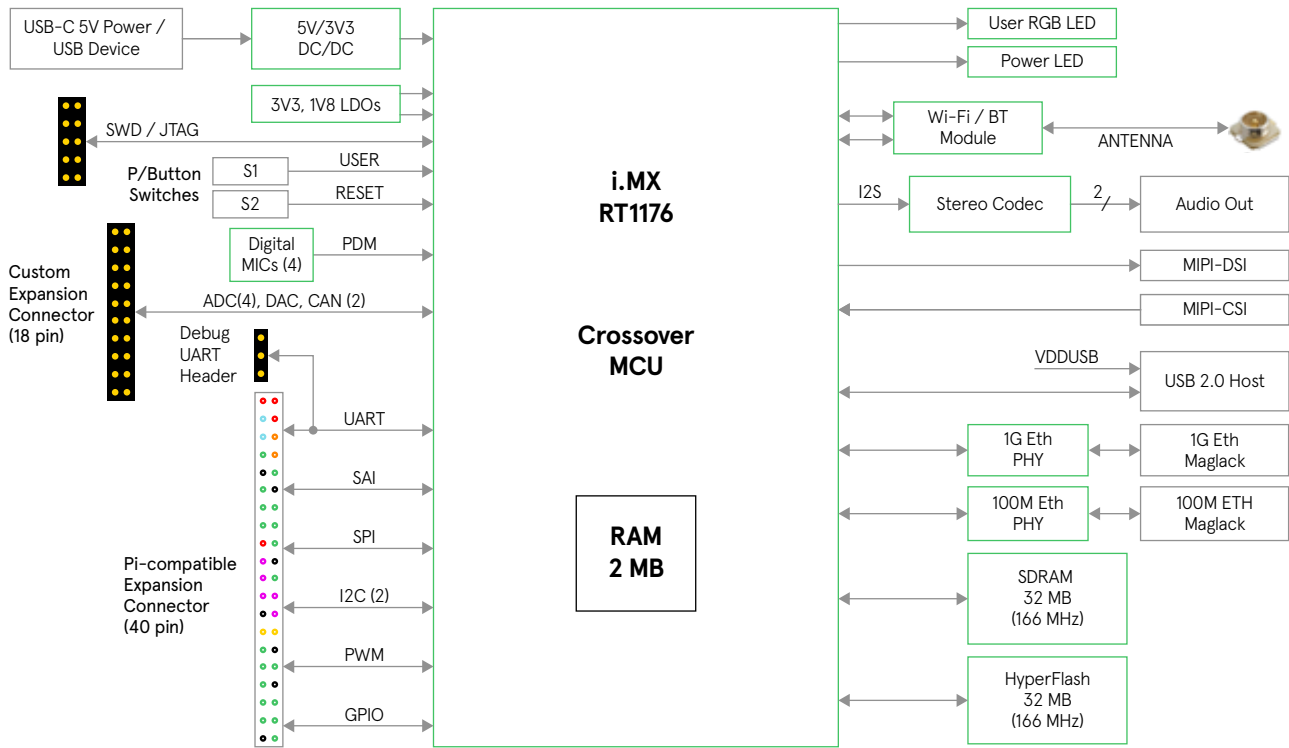- 256 Mb Onboard HyperFlash

Interfaces and connectivity

- 10/100 Mbps Ethernet (IEEE 1588 Time Sync.)
- 10/100/1000 Mbps Ethernet (TSN Time Sync.)
- USB 2.0 Host (type-A connector)
- USB 2.0 Device (type-C connector)
- MIPI-DSI Display (2-Lane, 1280x800, 60fps)
- MIPI-CSI Camera (2-Lane)
- Wi-Fi 5 (802.11 b/g/n/ac)
- Bluetooth 5
- External Antenna (U.FL connector)
- Four Onboard Digital Microphones
- Stereo Codec with on-board Audio Jack
- 10 Pin SWD/JTAG Debugger Header
- Boot Mode Selection Header

Expansion, power and mechanical

- 40 Pin Pi HAT Compatible Header
- 18 Pin Custom Expansion Header
- User/Reset Button and RGB LED
- Efficient DC/DC Voltage Regulator
- USB Type-C Power Input (Rated for 5V/3A)
- Operating Temperature: 0~70°C
- Raspberry-Pi Form-Factor (85mm x 56mm)

For more information visit: avnet.me/maaxboard-rt
For custom features, email customize@avnet.com

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Block diagram

USB-C 5V Power / USB Device → 5V/3V3 DC/DC

3V3, 1V8 LDOs

SWD / JTAG

P/Button Switches — S1 — USER

S2 — RESET

Digital MICs (4) — PDM

Custom Expansion Connector (18 pin)

ADC(4), DAC, CAN (2)

Debug UART Header

UART

SAI

SPI

Pi-compatible Expansion Connector (40 pin)

I2C (2)

PWM

GPIO

i.MX RT1176

Crossover MCU

RAM 2 MB

User RGB LED

Power LED

Wi-Fi / BT Module — ANTENNA

I2S → Stereo Codec → 2 → Audio Out

MIPI-DSI

MIPI-CSI

VDDUSB → USB 2.0 Host

1G Eth PHY → 1G Eth Maglack

100M Eth PHY → 100M ETH Maglack

SDRAM 32 MB (166 MHz)

HyperFlash 32 MB (166 MHz)

Featured manufacturers

NXP MARVELL MICROCHIP Infineon MPS Power Solutions Experts ISSI

EVERLIGHT ONSEMI molex DIODES INCORPORATED RENESAS TDK

YAGEO muRata SAMSUNG

Parts

Part number	Description	Price
AES-MC-SBC-IMXRT1176-G	The MaaXBoard RT is a low-cost, NXP i.MX RT1176 based single board computer	avnet.me/maaxboard-rt-pdp

Related parts

Part number	Description	Price
MCU-LINK	JTAG/SWD Debug Probe	avnet.me/mcu-link
AES-ACC-MAAX-DISP1	MIPI-DSI LCD Touch Display (800 x 1280)	avnet.me/maax-disp1-buy
AES-ACC-MAAX-CAM1	MIPI-CSI Camera (5 Mpixel OV5640 image sensor)	avnet.me/maax-cam1-nxp
AES-ACC-MAAX-PWRUL	UL Certified 5V/3A USB Type-C Power Supply	avnet.me/maax-pwrul-buy

Countries available for purchase: Americas, EMEA

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