



**THE DATASHEET OF  
MIMXRT1176CVM8A**



# i.MX RT1170 CROSSOVER MCUs

## Ushering in the GHZ ERA

i.MX RT1170 crossover MCUs are setting speed records at 1GHz. This ground-breaking family combines superior computing power and multiple media capabilities with ease of use and real-time functionality.

### PRODUCT HIGHLIGHTS

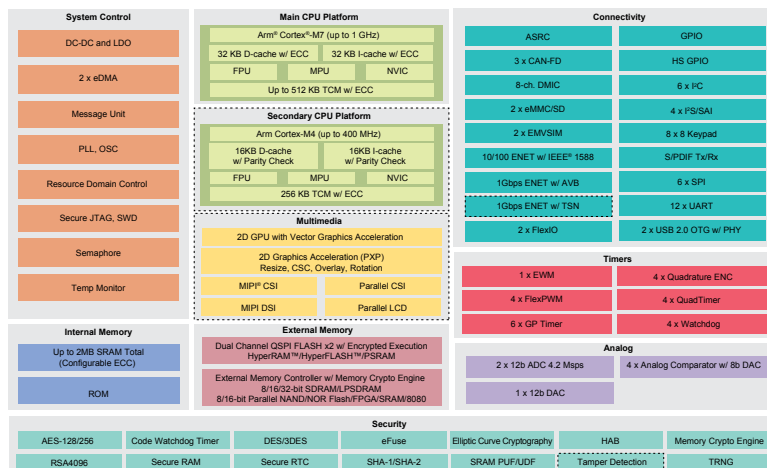
- High-performing Arm® Cortex®-M based device
  - Up to 6468 total CoreMarks® with Cortex-M7 @ 1 GHz + Cortex-M4 @ 400 MHz
- Real-time, low-latency response
  - Up to 2 MB SRAM:
    - 512 KB Cortex-M7 TCM + 128 KB ECC
    - 256 KB Cortex-M4 TCM with ECC
    - 1 MB on-chip RAM + 128 KB ECC
  - Fast real-time response with latency as low as 12 ns
- Low-power operation
  - Low dynamic power with integrated DC-DC converter
  - Low-power run modes at 24 MHz
- Highly integrated
  - Advanced multimedia for GUI and enhanced HMI
    - Multiple display and CMOS sensor interfaces
    - OpenVG™ graphics accelerator running up to 500 MHz

- Extensive memory interface options
  - Quad/Octal SPI and HyperFlash™/HyperRAM™, SDRAM, NAND/NOR Flash, SD/eMMC, PSRAM, LPDDR4
- Security
  - Hardware Elliptic Curve Cryptography
  - Hardware-protected keys for secure boot
  - AES engine for data encryption
  - On-the-fly AES decryption for execute-in-place (NOR) from Quad/Octal SPI/HyperFlash
  - Part of the EdgeLock™ Assurance program, more details available at [nxp.com/EdgeLockAssurance](http://nxp.com/EdgeLockAssurance)

### TARGET APPLICATIONS

- ML-based edge applications
- Industrial computing designs
- Motor control and power conversion
- Personal health and fitness
- Voice-enabled IoT devices

### i.MX RT1170 CROSSOVER MCU FAMILY BLOCK DIAGRAM



Available on certain products within the family

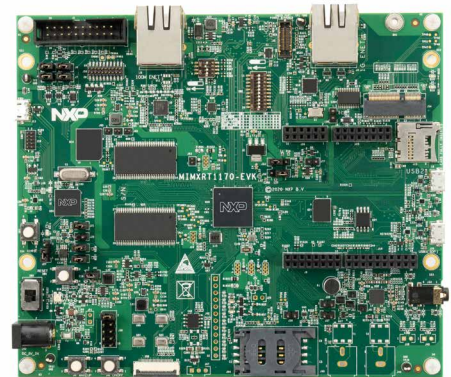
## i.MX RT1170 MCU FAMILY CONFIGURATIONS

Device	i.MX RT1171	i.MX RT1172	i.MX RT1173	i.MX RT1175	i.MX RT1176
Arm® Cortex®-M7	1 GHz/800 MHz*	1 GHz/800 MHz*	800 MHz	1 GHz/800 MHz*	1 GHz/800 MHz*
Cortex-M4	-	-	400 MHz	400 MHz	400 MHz
MIPI CSI / DSI	-	Y	Y	-	Y
OpenVG™ 1.1	-	Y	Y	-	Y
CSI / LCDIF / PXP	-	Y	Y	-	Y
Ethernet	Y	Y	Y	Y	Y
TSN	-	-	-	-	Y
Tamper Protection	-	-	Y	-	-
HAB/AES/DES	Y	Y	Y	Y	Y
Packages	289 MAPBGA	289 MAPBGA	289 MAPBGA	289 MAPBGA	289 MAPBGA
Qualification/ Temperature	Commercial/0-95 °C Industrial/-40 – 105 °C Auto/-40 – 125 °C	Commercial/0 – 95 °C Industrial/-40 – 105 °C Auto/-40 – 125 °C	Industrial/-40 – 105 °C	Commercial/0 – 95 °C Industrial/-40 – 105 °C Auto/-40 – 125 °C	Commercial/0 – 95 °C Industrial/-40 – 105 °C Auto/-40 – 125 °C
Part Numbers	MIMXRT1171DVMAA MIMXRT1171CVM8A MIMXRT1171AVM8A	MIMXRT1172DVMAA MIMXRT1172CVM8A MIMXRT1172AVM8A	MIMXRT1173CVM8A	MIMXRT1175DVMAA MIMXRT1175CVM8A MIMXRT1175AVM8A	MIMXRT1176DVMAA MIMXRT1176CVM8A MIMXRT1176AVM8A

\*First speed listed is speed for commercial-qualified device. Second speed listed is for industrial- and automotive-qualified devices.

## i.MX RT1170 EVK FEATURES

Processor	<ul style="list-style-type: none"> <li>MIMXRT1176DVMAA</li> </ul>
Memory	<ul style="list-style-type: none"> <li>512 Mbit SDRAM memory</li> <li>512 Mbit Octal flash</li> <li>128 Mbit QSPI flash</li> <li>2 Gbit Raw NAND flash</li> <li>64 Mbit LPSPFI flash</li> <li>TF socket for SD card</li> </ul>
Graphics	<ul style="list-style-type: none"> <li>MIPI LCD connector</li> <li>MIPI camera sensor connector</li> </ul>
Audio	<ul style="list-style-type: none"> <li>Audio codec</li> <li>4-pole audio headphone jack</li> <li>External speaker connection</li> <li>Microphone (analog and digital)</li> <li>SPDIF connector</li> </ul>
Connectivity	<ul style="list-style-type: none"> <li>2 x Micro USB OTG connectors</li> <li>Ethernet (10/100/1000M) connector</li> <li>Ethernet (10/100M) connector</li> <li>M.2 connector</li> <li>CAN transceivers</li> <li>Arduino® interface</li> <li>FRDM motor control interface</li> <li>SIM card slot</li> </ul>
Debug	<ul style="list-style-type: none"> <li>JTAG connector</li> <li>Onboard DAP-Link debugger</li> </ul>
Sensor	<ul style="list-style-type: none"> <li>6-Axis ecompass (3-Axis magnetometer, 3-Axis accelerometer) sensor FXOS8700CQ</li> </ul>
Ordering Information	<ul style="list-style-type: none"> <li>MIMXRT1170-EVK</li> <li>RK055HDMI4M (5.5" 720p display)</li> </ul>



### GET STARTED NOW

The i.MX RT1170 evaluation kit (EVK) helps you take your design to the next level by reducing complexity and accelerating time to market.

### SOFTWARE AND TOOLS

NXP's **MCUXpresso software and tools** offer comprehensive development solutions designed to optimize, ease and accelerate embedded system development of applications based on Cortex-M core devices from NXP, including its general purpose, crossover and Bluetooth-enabled MCUs.

[nxp.com/iMXRT1170](http://nxp.com/iMXRT1170)

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Product Longevity

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