Unleash the Power of AI at the Edge
RZ/G3E DX-M1 SOM

Experience a new level of intelligent performance with our new System-on-Module, seamlessly integrating the versatile power of the Renesas RZ/G3E application processor with the groundbreaking DEEPX DX-M1 AI Booster. This powerful combination delivers exceptional processing capabilities and unprecedented AI performance!
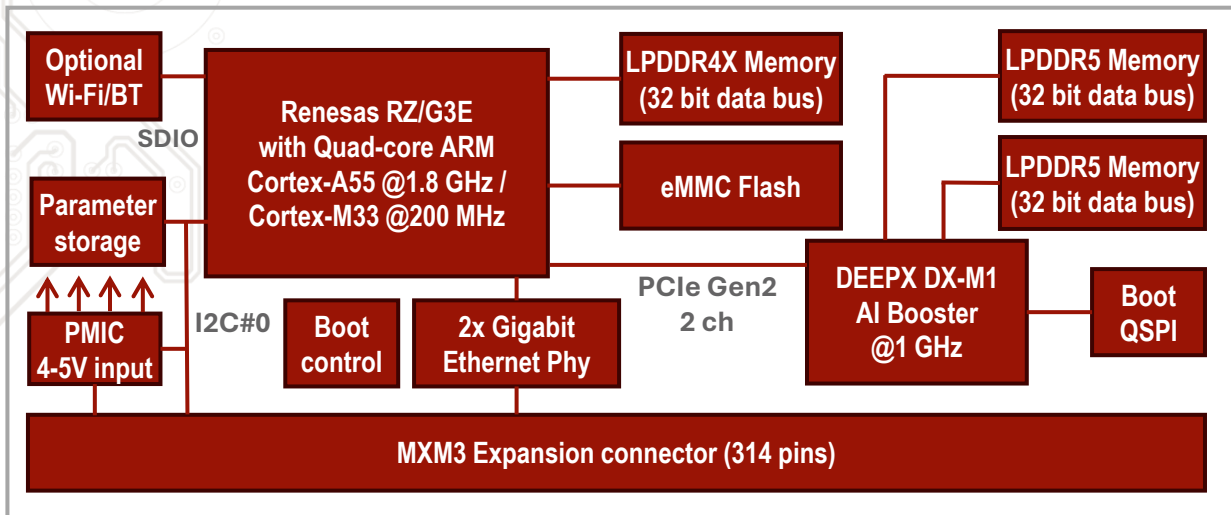
The Renesas RZ/G3E provides a robust foundation, offering high-end graphics with both 3D and 2D engines, plus hardware accelerator for smooth 1080p video. This multimedia capability is perfectly complemented by the revolutionary AI acceleration of the DX-M1.

The DEEPX DX-M1 redefines the landscape of edge AI, achieving unparalleled cost-efficiency (inference/$), power-efficiency (TOPS/W), and performance efficiency (FPS/TOPS). Delivering 25 TOPS at just 5 Watts, it's ideal for diverse applications from smart factory robotics and vision to edge computing and smart mobility. Unlock the full potential of AI at the edge with our new SOM!

Specification

Processor	Cores	Renesas RZ/G3E Quad-core ARM Cortex-A55 and Cortex-M33 (R9A09G047E57GBG)
	Frequency	1.8 GHz on Cortex-A55, 200 MHz on Cortex-M33
Memory	SDRAM	4 GByte LPDDR4X 3200 MT/s, 32-bit/2ch databus
	NAND FLASH	64 GByte eMMC NAND Flash for OS and bootloader
Graphics output	MIPI-DSI	4 lanes with resolution up to 1920x1080 at 60 Hz (1080p60), max 1920x1200 at 60 Hz
	LVDS	2 ch., single link: WXGA up to 1366x768/1280x800 60Hz, dual link: up to 1920x1200 60Hz
	Parallel RGB	18/24 bit up to WXGA, 1280x800 at 60 Hz (720/800p60)
	Video Engine	Decode/Encode H.264/H.265: 1080p60/2160p30
	3D Graphics Engine	Mali-G52 @630 MHz supporting Vulkan 1.2, OpenGL ES 1.1/2.0/3.2 and OpenCL 2.0 full
Graphics input	Camera interface	1x MIPI-CSI2, 4 lanes, max 2.1Gbps per lane
On-chip AI	NPU	Ethos-U55 @ 1GHz, 256MAC, 0.5 TOPS
Communication	Ethernet	2x Gigabit Ethernet interface with on-board Ethernet PHYs
	Wi-Fi/BT	Optional Murata LBEE5HY2FY (2FY), 802.11a/b/g/n/ac/ax SISO, Wi-Fi 6E and 5.4 BR/EDR/BLE, SDIO interface, based on Infineon chipset CYW55513
AI Booster	NPU	DEEPX DX-M1 AI Booster, up to 25TOPS. Frequency up to 1 GHz
	SDRAM	4GByte LPDDR5 5600MT/s, 64-bit/4ch databus
Power	Supply voltage	4-5V
	Power Consumption	7-8 Watts peak (TBD)
Mechanical	Dimensions (W x H x D)	82 x 50 x 5 mm, EACOM form factor
Expansion		MXM3 format, 314 positions

Block Diagram

Optional Wi-Fi/BT

Renesas RZ/G3E with Quad-core ARM Cortex-A55 @1.8 GHz / Cortex-M33 @200 MHz

LPDDR4X Memory (32 bit data bus)

LPDDR5 Memory (32 bit data bus)

SDIO

Parameter storage

eMMC Flash

LPDDR5 Memory (32 bit data bus)

PMIC 4-5V input

I2C#0

Boot control

2x Gigabit Ethernet Phy

PCIe Gen2 2 ch

DEEPX DX-M1 AI Booster @1 GHz

Boot QSPI

MXM3 Expansion connector (314 pins)

Ordering Information

Part No.[1]	CPU	SDRAM/ eMMC	NPU RAM	Wi-Fi/BT	Operating Temperature
EAC00529	R9A09G047E57GBG	4/64 GByte	4 GByte	No	0 - 70° C
EAC00530	R9A09G047E57GBG	4/64 GByte	4 GByte	No	-40 - 85° C

[1] Standard configuration listed. Wi-Fi/BT, other memory configurations and temperature ranges on request

Support and Customization

Embedded Artists is a reliable and competent development partner - we help you become successful!

- Professional and responsive support
- Pre-designed standard Carrier boards for integration
- Custom Carrier board design
- Customization
  - Different form factor, different pinning, supply voltage, memory sizes, etc.
  - Single Board Computer (SBC) solutions
- Display solutions
- Mechanical solutions
- Schematic review of customer carrier board designs
- Driver and application development

Development Kit

The **RZ/G3E DX-M1 SOM** is supported by the **RZ/G3E AI Kit** that provides a quick path to get started with development and integration work.

The kit provides reference implementations of key interfaces. Ordering part No. with DX-M1: **EAK00535**