Purpose and Agreement

- This DRAM list for RZ MPUs is intended to **help RZ customers to choose an appropriate DRAM from among the many products**. We have **defined four levels of "Option" on the DRAM list. The DRAM listed with Option-1, Option-2, and Option-3 has been verified on different types of real board (see the table below). Option-4 is used to classify devices that have been briefly verified with simulation to provide a wider selection to save on costs and TAT for memory selection**.
- Please use this information for your reference and confirm whether it works with your design through SI/PI verification as your responsibility. Please understand that Renesas will not guarantee that those DRAMs can work with custom boards. Whether it works with your design through signal integrity (SI) and power integrity (PI) verification as.

Definition of Verification Levels

Table A.1 Definition of Verification Levels

Verification Level	Overview	Deliverables	Notes
Option-1	DRAM operation and characteristics are verified with an EVK by Renesas.	PCB reference design data, PCB design guide	Deliverables can be downloaded from each product page on the Renesas website.
Option-2	DRAM operation and characteristics are verified with an internal board by Renesas.	None	Deliverables are not for disclosure due to the use of a Renesas-internal board.
Option-3	DRAM operation and characteristics are verified with a physical board by a 3rd party.	Verification report	Contact the listed 3rd party for details.
Option-4	SI and/or PI is simulated without a physical board by a 3rd party.	None	Contact the listed 3rd party for details.

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1. DRAM List

Note

Micron DRAM devices may have different rank configurations even when they share the same part number, depending on the revision. When using Micron DRAM, be sure to verify the number of ranks.

1.1 RZ/G2 Group

The table describes information on DRAM for use with devices of the RZ/G2 group.

You can also refer to the RZ/G series web page for more information on included products and related Evaluation Kits (EVKs).

Table 1.1 RZ/G2 Group

Product Group	Memory Type	Density	Bus Size	Rank	Maker	Memory Part Number	Validated by	Options
RZ/G2L 15x15mm 21x21mm LFBGA	DDR4	16 Gb	16 bits	1 rank	Micron	MT40A1G16KD-062E:E	Renesas Electronics	Option-1
	DDR4	8 Gb	16 bits	1 rank	Nanya	NT5AD512M16C4-JRI	Renesas Electronics	Option-1
	DDR4	8 Gb	16 bits	1 rank	Winbond	W668GG6TB-06	Winbond	Option-3
	DDR4	16 Gb	16 bits	1 rank	Samsung	K4AAG165WA-BCTD	Aurora Systems	Option-4
	DDR4	16 Gb	16 bits	1 rank	Alliance	AS4C1G16D4	Aurora Systems	Option-4
	DDR4	8 Gb	16 bits	1 rank	ISSI	IS43/46QR16512A	Aurora Systems	Option-4
RZ/G2LC 13x13mm LFBGA	DDR4	8 Gb	16 bits	1 rank	Micron	MT40A512M16LY-062EIT:E	Renesas Electronics	Option-1
	DDR3L	4 Gb	16 bits	1 rank	Micron	MT41K256M16TW-107 XIT:P	Renesas Electronics	Option-2
RZ/G2UL 13x13mm LFBGA	DDR4	8 Gb	16 bits	1 rank	Micron	MT40A512M16LY-062EIT:E	Renesas Electronics	Option-1
	DDR3L	4 Gb	16 bits	1 rank	Micron	MT41K256M16TW-107 IT	Renesas Electronics	Option-2
RZ/G2H 29x29mm FCBGA	LPDDR4	16 Gb	32 bits	1 rank	Samsung	K4F6E3S4HM-MGCJ	Renesas Electronics	Option-1
RZ/G2M 29x29mm FCBGA	LPDDR4	16 Gb	32 bits	1 rank	Samsung	K4F6E3S4HM-MGCJ	Renesas Electronics	Option-1
RZ/G2N 29x29mm FCBGA	LPDDR4	16 Gb	32 bits	1 rank	Samsung	K4F6E3S4HM-MGCJ	Renesas Electronics	Option-1
RZ/G2E 29x29mm FCBGA	DDR3L	4 Gb	32 bits	1 rank	Winbond	W634GU8NB11I	Renesas Electronics	Option-1

1.2 RZ/Five Group

The table describes information on DRAM for use with devices of the RZ/Five group.

You can also refer to the RZ/G series web page for more information on included products and related Evaluation Kits (EVKs).

Table 1.2 RZ/Five Group

Product Group	Memory Type	Density	Bus Size	Rank	Maker	Memory Part Number	Validated by	Options
RZ/Five 11x11mm	DDR4	8 Gb	16 bits	1 rank	Micron	MT40A512M16LY-062EIT:E	Renesas Electronics	Option-1
13x13mm LFBGA	DDR3L	4 Gb	16 bits	1 rank	Micron	MT41K256M16TW-107 IT	Renesas Electronics	Option-1

1.3 RZ/G3 Group

The table describes information on DRAM for use with devices of the RZ/G3 group.

You can also refer to the RZ/G series web page for more information on included products and related Evaluation Kits (EVKs).

Table 1.3 RZ/G3 Group

Product Group	Memory Type	Density	Bus Size	Rank	Maker	Memory Part Number	Validated by	Options
RZ/G3S 13x13mm 14x14mm LFBGA	LPDDR4	8 Gb	16 bits	1 rank	Micron	MT53E512M16D1FW-046WT	Renesas Electronics	Option-1
	DDR4	16 Gb	16 bits	1 rank	Micron	MT40A2G16TBB-062E:F	Renesas Electronics	Option-2
	LPDDR4	8 Gb	16 bits	1 rank	Nanya	NT6AN512M16AV-J1I	Renesas Electronics	Option-1
	LPDDR4	4 Gb	16 bits	1 rank	Winbond	W66CP6RBQAFJ	Memory Manufacturer	Option-3
	LPDDR4	8 Gb	16 bits	1 rank	ISSI	IS43/46LQ16512B	Aurora Systems	Option-4
RZ/G3E 15x15mm 21x21mm FCBGA	LPDDR4X	32 Gb	32 bits	1 rank	Micron	MT53E1G32D2FW-046 WT:C	Renesas Electronics	Option-1
	LPDDR4	64 Gb	32 bits	2 ranks	Micron	MT53E2G32D4DE-046 AIT:C	Renesas Electronics	Option-2
	LPDDR4	32 Gb	32 bits	1 rank	Micron	MT53E1G32D2FW	Renesas Electronics	Option-2
	LPDDR4X	32 Gb	32 bits	1 rank	ISSI	IS43/46LQ32K01B	Aurora Systems	Option-4
	LPDDR4X	32 Gb	32 bits	1 rank	Biwin	BWCGBX32N2A-32G-X BWMZCX32H2A-32G-X	Aurora Systems	Option-4
RZ/G3L 14x14mm 17x17mm LFBGA	LPDDR4	16Gb	16 bits	1 rank	Micron	MT53E1G16D1ZW-046WT	Renesas Electronics	Option-1
	DDR4	32Gb	16 bits	1 rank	Micron	MT40A2G16TBB-062E IT:F	Renesas Electronics	Option-2
	DDR4	32Gb	16 bits	1 rank	Alliance	AS4C2G16D4-62BCN	Aurora Systems	Option-4
	LPDDR4	16Gb	16 bits	1 rank	ISSI	IS43/46LQ16K01B	Aurora Systems	Option-4
RZ/G3SE 14x14mm 17x17mm LFBGA	LPDDR4	16Gb	16 bits	1 rank	Micron	MT53E1G16D1ZW-046WT	Renesas Electronics	Option-1
	DDR4	32Gb	16 bits	1 rank	Micron	MT40A2G16TBB-062E IT:F	Renesas Electronics	Option-2
	DDR4	32Gb	16 bits	1 rank	Alliance	AS4C2G16D4-62BCN	Aurora Systems	Option-4
	LPDDR4	16Gb	16 bits	1 rank	ISSI	IS43/46LQ16K01B	Aurora Systems	Option-4

1.4 RZ/V2 Group

The table describes information on DRAM for use with devices of the RZ/V2 group.

You can also refer to the RZ/V series web page for more information on included products and related Evaluation Kits (EVKs).

Table 1.4 RZ/V2 Group

Product Group	Memory Type	Density	Bus Size	Rank	Maker	Memory Part Number	Validated by	Options
RZ/V2L 15x15mm 21x21mm LFBGA	DDR4	16 Gb	16 bits	1 rank	Micron	MT40A1G16KD-062E:E	Renesas Electronics	Option-1
	DDR4	8 Gb	16 bits	1 rank	Micron	MT53D512M16D1DS-046	Renesas Electronics	Option-1
	DDR4	16 Gb	16 bits	1 rank	Samsung	K4AAG165WA-BCTD	Aurora Systems	Option-4
	DDR4	16 Gb	16 bits	1 rank	Alliance	AS4C1G16D4	Aurora Systems	Option-4
RZ/V2M/MA 15x15mm FCBGA	LPDDR4	64 Gb	32 bits	1 rank	Micron	MT53E1024M32D4DT-053 AIT:D	Renesas Electronics	Option-1
	LPDDR4	64 Gb	32 bits	1 rank	Micron	MT53E1G32D2NP-046 WT:B	Renesas Electronics	Option-1
RZ/V2H 19x19mm FCBGA	LPDDR4X	64 Gb	32 bits	2 ranks	Micron	MT53E2G32D4DE-046 AIT:C	Renesas Electronics	Option-1
	LPDDR4X	64 Gb	32 bits	2 ranks	Micron	MT53E2G32D4DE-046 WT:C	Aurora Systems	Option-4
	LPDDR4X	32 Gb	32 bits	2 ranks	Micron	MT53E1G32D2FW-046	Aurora Systems	Option-4
	LPDDR4X	32 Gb	32 bits	2 ranks	Nanya	NT6AP1024F32BV-J1	Aurora Systems	Option-4
	LPDDR4X	32 Gb	32 bits	2 ranks	Alliance	AS4C1G32MD4V-046BIN	Aurora Systems	Option-4
	LPDDR4X	32 Gb	32 bits	1 rank	ISSI	IS43/46LQ32K01B	Aurora Systems*1	Option-4
	LPDDR4	32 Gb	32 bits	1 rank	Longsys	FLXC2004G-N1	Aurora Systems	Option-4
	LPDDR4X	64 Gb	32 bits	2 ranks	Biwin	BWCGBX32N2A-64G-X BWMZCX32H2A-64G-X	Aurora Systems	Option-4
	LPDDR4X	32 Gb	32 bits	1 rank	Biwin	BWCGBX32N2A-32G-X BWMZCX32H2A-32G-X	Aurora Systems	Option-4
RZ/V2N 15x15mm FCBGA	LPDDR4X	64 Gb	32 bits	2 ranks	Micron	MT53E2G32D4DE-046 AIT:C	Renesas Electronics	Option-1
	LPDDR4X	64 Gb	32 bits	2 ranks	Micron	MT53E2G32D4DE-046 WT:C	Renesas Electronics	Option-1
	LPDDR4X	32 Gb	32 bits	2 ranks	Nanya	NT6AP1024F32BL-J1	Renesas Electronics	Option-2
	LPDDR4X	32 Gb	32 bits	1 rank	ISSI	IS43/46LQ32K01B	Aurora Systems*1	Option-4
	LPDDR4X	64 Gb	32 bits	2 ranks	Biwin	BWCGBX32N2A-64G-X BWMZCX32H2A-64G-X	Aurora Systems	Option-4
	LPDDR4X	32 Gb	32 bits	1 rank	Biwin	BWCGBX32N2A-32G-X BWMZCX32H2A-32G-X	Aurora Systems	Option-4

Note 1. You will need to use SI simulation to adjust your layout. A few items for verification were subject to failure on RZ/V2H or RZ/V2N EVKs.

1.5 RZ/T2 Group

The table describes information on DRAM for use with devices of the RZ/T2 group.

You can also refer to the RZ/T series web page for more information on included products and related Evaluation Kits (EVKs).

Table 1.5 RZ/T2 Group

Product Group	Memory Type	Density	Bus Size	Rank	Maker	Memory Part Number	Validated by	Options
RZ/T2H 23x23mm FCBGA	LPDDR4	64 Gb	32 bits	2 ranks	Micron	MT53E2G32D4DE-046 WT:C	Renesas Electronics	Option-1
	LPDDR4	32 Gb	32 bits	2 ranks	Nanya	NT6AN1024F32AV-J2I	Aurora Systems*1	Option-4
	LPDDR4	32 Gb	32 bits	2 ranks	ISSI	IS43LQ32K01B	Aurora Systems*1, 2	Option-4
	LPDDR4	32 Gb	32 bits	1 rank	Biwin	BWCGBX32N2A-32G-X BWMZCX32H2A-32G-X	Aurora Systems*1	Option-4
	LPDDR4	8 Gb	32 bits	1 rank	Alliance	AS4C256M32MD4-062BAN AS4C256M32MD4A-046BIN	Aurora Systems*1	Option-4
	LPDDR4	32 Gb	32 bits	1 rank	Longsys	FLXC2004G-N1	Aurora Systems*1	Option-4
RZ/T2N 21x21mm LFBGA	LPDDR4	16 Gb	16 bits	1 rank	Micron	MT53E1G16D1ZW-046 AIT:C	Renesas Electronics	Option-1
	LPDDR4	8 Gb	16 bits	1 rank	Nanya	NT6AN512M16AV-J1I	Renesas Electronics	Option-2
	LPDDR4	8 Gb	16 bits	1 rank	Nanya	NT6AN512M16AV-J2I	Aurora Systems	Option-4
	LPDDR4	8 Gb	16 bits	1 rank	ISSI	IS43LQ16K01B	Aurora Systems*3	Option-4
	LPDDR4	2 Gb	16 bits	1 rank	Winbond	W66BP6RBQAFJ	Memory Manufacturer	Option-3

Note 1. Validated by SI simulation using the reference design layout included in the RZ/T2H Group DDR design contents

Note 2. Adjustment of the CKE signal damping resistor is required.

Note 3. Changing IO drive strength of SoC CA/CS/CKE/RESET from 80/40 Ohm to 96/48 Ohm (pull-up/pull-down) is required.

1.6 RZ/N2 Group

The table describes information on DRAM for use with devices of the RZ/N2 group.

You can also refer to the RZ/N series web page for more information on included products and related Evaluation Kits (EVKs).

Table 1.6 RZ/N2 Group

Product Group	Memory Type	Density	Bus Size	Rank	Maker	Memory Part Number	Validated by	Options
RZ/N2H 21x21mm FCBGA	LPDDR4	64 Gb	32 bits	2 ranks	Micron	MT53E2G32D4DE-046 WT:C	Renesas Electronics	Option-1
	LPDDR4	32 Gb	32 bits	2 ranks	Nanya	NT6AN1024F32AV-J2I	Aurora Systems*1	Option-4
	LPDDR4	32 Gb	32 bits	2 ranks	ISSI	IS43LQ32K01B	Aurora Systems*1, 2	Option-4

Note 1. Validated by SI simulation using the reference design layout included in the RZ/N2H Group DDR design contents

Note 2. Adjustment of the CKE signal damping resistor is required.

1.7 RZ/A Group

The table describes information on DRAM for use with devices of the RZ/A group.

You can also refer to the RZ/A series web page for more information on included products and related Evaluation Kits (EVKs).

Table 1.7 RZ/A Group

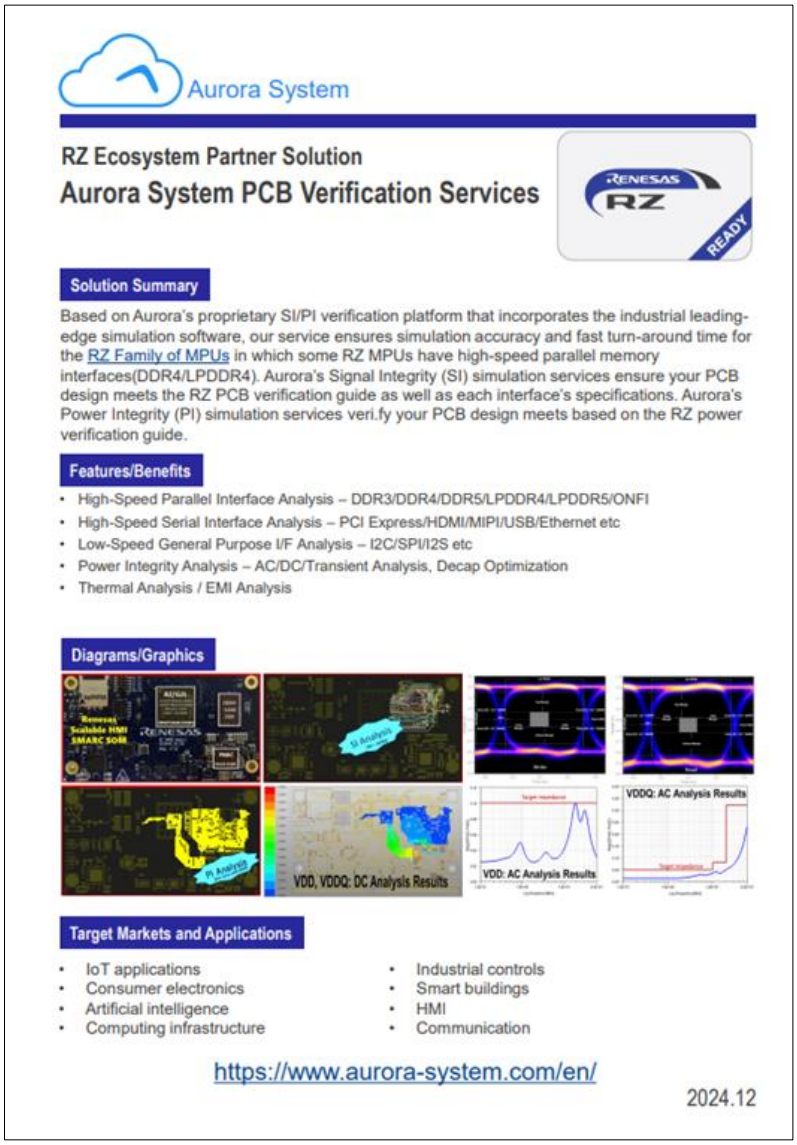
Product Group	Memory Type	Density	Bus Size	Rank	Maker	Memory Part Number	Validated by	Options
RZ/A3UL 13x13mm LFBGA	DDR4	8 Gb	16 bits	1 ranks	Micron	MT40A512M16LY-062EIT:E	Renesas Electronics	Option-1
	DDR3L	4 Gb	16 bits	1 ranks	Micron	MT41K256M16TW-107 IT	Renesas Electronics	Option-2

2. SI/PI Simulation Partner

Renesas recommends that you rely on a PCB verification service vendor for SI/PI simulation if you have no experience in SI/PI or if you encounter any problems in SI/PI simulation etc.

■ Aurora System PCB Verification Services | Renesas

- Is a partner within the Renesas Ready Partner Network.
- Executed SI/PI simulation of the combination of RZ and DDR memory devices defined with “Option-4” as the recommendation level.
- Can provide the simulation report.
- **Their experience can help by offering a smooth SI/PI simulation service for RZ family devices within shorter TATs.**



REVISION HISTORY	RZ Family DRAM List Application Note

Rev.	Date	Description	
		Page	Summary
1.00	Sep 1, 2025	—	First edition issued
1.01	Sep 17, 2025	3	Typo RZ/G2L DDR4[1GByte] → DDR4[2GByte]
1.02	Feb 10, 2026	1	Redefined options
		3	Added Winbond product to the DRAM list for RZ/G2L
		3 to 6	Renewed format of the DRAM list by adding “rank” information
1.03	Feb 24, 2026	1	Redefined options
		3	Deleted several DRAMs from the list because their verification had not been completed.
1.04	Mar 24, 2026	3 to 6	Added ISSI product to the DRAM lists for RZ/G2L, RZ/G3S, RZ/G3E, RZ/V2H and RZ/V2N
		6	Added RZ/A3UL
1.05	Jun 29, 2026	3	Note, added
		4	Added Winbond product to the DRAM list for RZ/G3S
		5	Part numbers of ISSI DRAM device, modified
		6	Added Nanya and ISSI product to the DRAM list for RZ/T2H and RZ/N2H
1.06	Sep 10, 2026	5	The new product groups, RZ/G3L and RZ/G3SE, added
			The options of Micron DDR4 for RZ/G3S, modified
			Nanya and Alliance products for RZ/G3E, deleted
		6	Added Longsys DRAM to the list for RZ/V2H
			Added Nanya and Biwin DRAMs to the list for RZ/V2N
		7	Added Biwin DRAMs to the list for RZ/T2H
1.07	Nov 5, 2026	5	Added the Biwin product to the DRAM list for RZ/G3E
		6	Added the Biwin product to the DRAM list for RZ/V2H and RZ/V2N
		7	Added Alliance and Longsys products to the DRAM list for RZ/T2H
			The new product group, RZ/T2N, added

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)
   A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.
2. Processing at power-on
   The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.
3. Input of signal during power-off state
   Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.
4. Handling of unused pins
   Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.
5. Clock signals
   After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.
6. Voltage application waveform at input pin
   Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).
7. Prohibition of access to reserved addresses
   Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.
8. Differences between products
   Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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