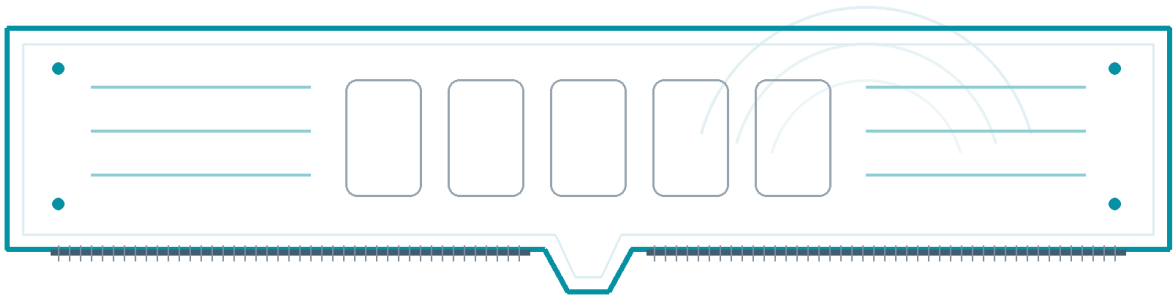
SAMSUNG DDR5 ECC UDIMM

M324R4GA3BB0-CQK

32GB DDR5-4800 ECC UDIMM

TECHNICAL SPECIFICATION



32GB	4800 MT/s	DUAL RANK	1.1V
CAPACITY	DATA RATE	2RX8	NOMINAL VOLTAGE

INDEPENDENT TECHNICAL REFERENCE

SOURCE MEMORY CHIPS

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1. PRODUCT OVERVIEW

M324R4GA3BB0-CQK

32GB DDR5-4800 ECC UDIMM

The Samsung M324R4GA3BB0-CQK is a 32GB DDR5 ECC unbuffered memory module designed for compatible professional computing platforms that require reliable memory operation and system-level error-correction support.

The module operates at a rated data transfer speed of 4800 MT/s through a 288-pin DDR5 UDIMM interface. Its unbuffered architecture maintains a direct command and control signal path between the host memory controller and the module, while ECC capability supports improved data integrity on systems that explicitly enable ECC operation.

M324R4GA3BB0-CQK uses a dual-rank 2Rx8 organization and operates at a nominal voltage of 1.1V. It is intended for supported workstations, ECC-capable professional desktop systems, and entry-level server platforms.

The complete part number should be used during sourcing, qualification, and replacement verification. M324R4GA3BB0-CQK is not interchangeable with DDR5 RDIMM or SODIMM products, even when capacity and transfer rate appear similar.

QUICK SPECIFICATION

PART NUMBER
M324R4GA3BB0-CQK

CAPACITY
32GB

MODULE TYPE
ECC UDIMM

DATA RATE
4800 MT/s

ORGANIZATION
Dual Rank / 2Rx8

INTERFACE
288-pin DDR5 DIMM

VOLTAGE
1.1V nominal

KEY PRODUCT CHARACTERISTICS

- PC5-38400 speed classification
- Samsung K4RAH086VB-BCQK DRAM component
- Professional workstation and entry-level server use
- ECC-supported unbuffered architecture
- Compatible platform must support DDR5 ECC UDIMM
- Not interchangeable with RDIMM or SODIMM

KEY TAKEAWAYS

32GB CAPACITY	ECC UDIMM	PLATFORM MATCH
A single-module capacity intended for compatible professional systems requiring additional memory resources.	Combines ECC capability with the direct signal structure of an unbuffered DDR5 module.	Requires explicit processor, motherboard, BIOS, and capacity support for DDR5 ECC UDIMM operation.

Compatibility note: Actual support depends on the processor memory controller, motherboard design, BIOS configuration, and validated memory capacity of the target system.

2. PRODUCT IDENTIFICATION

M324R4GA3BB0-CQK

ORDERING AND QUALIFICATION IDENTITY

M324R4GA3BB0-CQK is the complete orderable part number for the Samsung 32GB DDR5-4800 ECC UDIMM covered by this technical specification. The complete identifier should remain unchanged in quotations, purchase orders, qualification records, receiving documents, and replacement requests.

For M324R4GA3BB0-CQK, capacity and transfer rate alone do not establish equivalence. Qualification must also match the ECC UDIMM architecture, unbuffered signal path, dual-rank 2Rx8 organization, 288-pin interface, and the target platform's supported memory configuration.

The full part number should therefore be treated as a controlled sourcing and engineering identity rather than as a shortened description such as “Samsung 32GB DDR5 ECC.”

VERIFIED PRODUCT IDENTITY

MANUFACTURER
Samsung

PART NUMBER
M324R4GA3BB0-CQK

MODULE TYPE
DDR5 ECC UDIMM

CAPACITY
32GB

DATA RATE
4800 MT/s

RANK / ORGANIZATION
Dual Rank / 2Rx8

INTERFACE
288-pin DDR5 DIMM

NOMINAL VOLTAGE
1.1V

DRAM COMPONENT
K4RAH086VB-BCQK

IDENTIFICATION CONTROL FOR M324R4GA3BB0-CQK

EXACT PART NUMBER	MODULE ARCHITECTURE	PLATFORM MATCH
Confirm M324R4GA3BB0-CQK on the label, supplier quotation, packing record, and receiving documentation.	Confirm DDR5 ECC UDIMM and unbuffered operation. RDIMM support alone does not qualify this module.	Confirm processor, motherboard, BIOS, 32GB-per-slot, dual-rank, and DDR5-4800 support.

QUALIFICATION CHECKPOINTS

CHECK ITEM	REQUIRED CONDITION FOR M324R4GA3BB0-CQK
Memory generation and interface	DDR5, 288-pin UDIMM slot
ECC and buffer architecture	Processor, motherboard, and BIOS must support ECC UDIMM and unbuffered operation
Capacity and organization	32GB per slot, Dual Rank, 2Rx8 support
Operating speed	DDR5-4800 or a platform-supported compatible operating rate
Validation basis	System-manufacturer QVL, AVL, or documented platform confirmation preferred

REPLACEMENT SCREEN FOR M324R4GA3BB0-CQK

MATCH BEFORE APPROVAL	DO NOT ASSUME EQUIVALENCE
M324R4GA3BB0-CQK, DDR5 ECC UDIMM, 32GB, 4800 MT/s, Dual Rank 2Rx8, 288-pin, and 1.1V nominal.	RDIMM, SODIMM, non-ECC UDIMM, or a module with unmatched rank or organization requires separate platform qualification.
	SOURCING NOTE Use the complete part number M324R4GA3BB0-CQK for controlled sourcing, qualification, and replacement verification. Shortened descriptions do not uniquely identify this module configuration.

3. TECHNICAL SPECIFICATIONS

M324R4GA3BB0-CQK

CONFIRMED MODULE PARAMETERS

M324R4GA3BB0-CQK is a 32GB DDR5-4800 ECC UDIMM configured for platforms that support unbuffered error-correcting memory. Its confirmed module profile combines a 288-pin DDR5 UDIMM interface, dual-rank 2Rx8 organization, and a nominal operating voltage of 1.1V.

The table below includes only parameters that can be supported by the available model-specific sources. Unverified timing, power, temperature, and component-level details are intentionally excluded.

CONFIRMED TECHNICAL SPECIFICATIONS

PARAMETER	SPECIFICATION FOR M324R4GA3BB0-CQK
Manufacturer	Samsung
Complete part number	M324R4GA3BB0-CQK
Module classification	DDR5 ECC UDIMM
Capacity	32GB
Rated data transfer speed	4800 MT/s
Speed classification	PC5-38400
Rank configuration	Dual Rank
Module organization	2Rx8
Buffer architecture	Unbuffered
Error correction	ECC supported
Interface	288-pin DDR5 DIMM
Nominal operating voltage	1.1V
Verified DRAM component	K4RAH086VB-BCQK

M324R4GA3BB0-CQK OPERATING PROFILE

32GB CAPACITY	4800 MT/s	DUAL RANK / 2Rx8
Single-module capacity for a compatible DDR5 ECC UDIMM platform.	Rated transfer speed corresponding to the PC5-38400 classification.	Two logical ranks using x8-organized DRAM devices.

4. MODULE ARCHITECTURE

M324R4GA3BB0-CQK

ECC UDIMM CONFIGURATION AND PLATFORM CONDITIONS

M324R4GA3BB0-CQK combines ECC capability with an unbuffered DDR5 UDIMM architecture. The module must therefore be evaluated as a specific ECC UDIMM configuration rather than as a generic 32GB DDR5 module.

ARCHITECTURE SUMMARY FOR M324R4GA3BB0-CQK

ECC UDIMM	UNBUFFERED SIGNAL PATH	DUAL RANK 2Rx8
Designed for platforms that support system-level error correction with unbuffered memory.	Command and control signals are not handled through the registered architecture used by RDIMM products.	The host memory controller addresses two logical ranks built around x8-organized DRAM devices.

DATA RATE AND VOLTAGE

DDR5-4800 / PC5-38400	1.1V NOMINAL
M324R4GA3BB0-CQK is rated for 4800 MT/s. Actual operation depends on processor, motherboard, BIOS, and installed-memory configuration.	The confirmed nominal module voltage is 1.1V. Platform support must be established through the target system documentation or validation process.

PLATFORM CONDITIONS FOR M324R4GA3BB0-CQK

PLATFORM CHECK	REQUIRED CONDITION
Memory generation and form factor	DDR5 with a 288-pin UDIMM slot
ECC and buffer support	Processor, motherboard, and BIOS must support ECC UDIMM and unbuffered operation
Capacity and rank support	32GB per slot with dual-rank 2Rx8 support
Operating rate	DDR5-4800 or another rate explicitly supported by the platform
Validation basis	System-manufacturer QVL, AVL, or documented platform confirmation preferred

SPECIFICATION BOUNDARY CAS latency, detailed timing values, power consumption, operating-temperature range, mechanical tolerances, PMIC identification, SPD-hub identification, pin-assignment details, and SPD byte data are not stated because they have not been verified from reliable model-specific documentation.

5. ECC SUPPORT AND DATA INTEGRITY

M324R4GA3BB0-CQK

ECC OPERATING CONTEXT AND PLATFORM REQUIREMENTS

M324R4GA3BB0-CQK is a DDR5 ECC UDIMM intended for compatible professional systems that support unbuffered error-correcting memory. Its ECC-capable module configuration contributes to system-level data integrity only when the host platform supports and enables ECC operation.

ECC operation is not determined by M324R4GA3BB0-CQK alone. The processor memory controller, motherboard, BIOS, and system firmware must support the required ECC UDIMM configuration.

ECC SUPPORT CONDITIONS FOR M324R4GA3BB0-CQK

PLATFORM ELEMENT	REQUIREMENT FOR M324R4GA3BB0-CQK
Processor	Must support DDR5 ECC UDIMM operation
Motherboard	Must provide compatible 288-pin DDR5 UDIMM slots
BIOS / firmware	Must support and correctly configure ECC operation
Module architecture	Unbuffered ECC UDIMM
Installed capacity	Platform must support 32GB per module
Rank / organization	Platform must support Dual Rank / 2Rx8
Operating rate	DDR5-4800 or a platform-supported compatible rate

DATA INTEGRITY CONSIDERATIONS

PLATFORM ENABLEMENT	MODULE ROLE	STATUS CONFIRMATION
ECC capability must be enabled and reported by the target processor, motherboard, BIOS, and operating environment.	M324R4GA3BB0-CQK participates in the platform memory-protection mechanism as an ECC-capable unbuffered DDR5 module.	Confirm ECC status through BIOS information, operating-system reporting, management software, or platform diagnostics.

M324R4GA3BB0-CQK QUALIFICATION GUIDANCE

1. Confirm the installed module label matches M324R4GA3BB0-CQK.	**2.** Confirm the system supports DDR5 ECC UDIMM rather than RDIMM-only memory.
3. Confirm support for 32GB Dual Rank 2Rx8 modules.	**4.** Confirm BIOS or firmware recognizes ECC-capable memory.
5. Confirm the expected capacity and ECC status in the operating environment.	**6.** Complete a platform memory diagnostic after installation.

ECC UDIMM BOUNDARY M324R4GA3BB0-CQK is an unbuffered ECC module. It is not an RDIMM, registered server memory, SODIMM, non-ECC UDIMM, or a universal replacement for all 32GB DDR5 modules.

6. SYSTEM COMPATIBILITY AND PLATFORM QUALIFICATION

M324R4GA3BB0-CQK

TARGET SYSTEM REQUIREMENTS AND VALIDATION

M324R4GA3BB0-CQK must be installed in a system that explicitly supports DDR5 ECC UDIMM memory. A 288-pin DDR5 slot alone does not establish compatibility.

The processor memory controller, motherboard, BIOS, supported capacity, rank configuration, and ECC implementation must all match the requirements of this specific module.

REQUIRED COMPATIBILITY CONDITIONS

PLATFORM REQUIREMENT	CONDITION FOR M324R4GA3BB0-CQK
Memory generation	DDR5
Module form factor	288-pin UDIMM
Module architecture	Unbuffered ECC UDIMM
Capacity support	32GB per memory slot
Rank / organization	Dual Rank / 2Rx8
Rated data rate	DDR5-4800
Nominal voltage	1.1V
ECC support	Required at processor, motherboard, and BIOS level
Validation basis	System QVL, AVL, or documented platform qualification

PROCESSOR AND MOTHERBOARD SUPPORT

PROCESSOR / MEMORY CONTROLLER

The installed processor must support DDR5 ECC UDIMM, 32GB per module, Dual Rank operation, 2Rx8 organization, and DDR5-4800 or a supported compatible rate.

MOTHERBOARD / BIOS

The motherboard must provide compatible DDR5 UDIMM slots and enable ECC with unbuffered memory. A current BIOS version is recommended when platform updates are available.

PLATFORM VALIDATION

QVL / AVL VERIFICATION

A listing for the complete part number M324R4GA3BB0-CQK provides platform-specific evidence. A similar Samsung part number does not automatically qualify this module.

POST-INSTALLATION CHECK

Confirm 32GB detection, ECC recognition, the platform-reported operating rate, and successful completion of the system memory diagnostic.

INCOMPATIBLE OR UNQUALIFIED CONFIGURATIONS Do not install M324R4GA3BB0-CQK in RDIMM-only, SODIMM, non-ECC-only, DDR4, or proprietary-memory platforms without separate documented qualification.

7. INSTALLATION, HANDLING, AND VALIDATION

M324R4GA3BB0-CQK

PRE-INSTALLATION CONTROL AND MODULE HANDLING

M324R4GA3BB0-CQK should be installed only in a compatible 288-pin DDR5 ECC UDIMM slot. Before installation, confirm the complete module configuration against the target platform documentation.

Power down the system, disconnect external power, and apply standard electrostatic-discharge precautions before handling or installing the module.

PRE-INSTALLATION CHECK

CHECK ITEM	REQUIREMENT FOR M324R4GA3BB0-CQK
Part number	Confirm M324R4GA3BB0-CQK on the module label
Memory slot	Compatible 288-pin DDR5 UDIMM slot
Memory type	DDR5 ECC UDIMM
Buffer architecture	Unbuffered
Capacity support	32GB per installed slot
Rank / organization	Dual Rank / 2Rx8
Platform documentation	Review the latest QVL, AVL, or system manual
BIOS / firmware	Use a platform-supported firmware version

MODULE HANDLING

HANDLING PRACTICES

- Hold the module by the PCB edges.
- Avoid touching the gold contacts.
- Use a grounded ESD-control method.
- Keep the module in protective packaging until installation.

INSPECTION AND PROTECTION

- Avoid direct contact with mounted components.
- Do not flex or bend the module PCB.
- Do not modify module-mounted components.
- Inspect for visible damage or an unreadable label.

INSTALLATION PROCEDURE

1. Shut down the target system and disconnect external power.	**2.** Open the system using the manufacturer service procedure.
3. Identify a compatible DDR5 ECC UDIMM slot.	**4.** Confirm the required memory-slot population order.
5. Align the module notch with the DDR5 UDIMM socket.	**6.** Insert the module evenly until both retaining clips engage.
7. Confirm the module is level and fully seated.	**8.** Reassemble the system and reconnect external power.

INSTALLATION WARNING M324R4GA3BB0-CQK must not be forced into a DDR4, RDIMM, or SODIMM socket. Physical or electrical incompatibility can damage the module or platform.

7. INSTALLATION, HANDLING, AND VALIDATION (CONTINUED)

M324R4GA3BB0-CQK

POST-INSTALLATION VERIFICATION AND DEPLOYMENT VALIDATION

POST-INSTALLATION VERIFICATION

VERIFICATION ITEM	EXPECTED RESULT
Installed capacity	32GB for each installed M324R4GA3BB0-CQK
Memory generation	DDR5
Module type	ECC-capable UDIMM
Rank configuration	Dual Rank, when reported by the platform
Operating speed	DDR5-4800 or a platform-supported compatible rate
ECC status	Enabled or recognized on a supported platform
System stability	No memory-related startup or diagnostic error

VALIDATION PROCEDURE

1. Confirm full 32GB capacity detection.	**2.** Confirm ECC recognition or ECC-enabled status.
3. Run the system manufacturer memory diagnostic.	**4.** Perform an extended memory test under the intended module population.
5. Review BIOS, operating-system, and management logs for memory errors.	**6.** Verify stable operation during representative workloads.
7. Record the module part number, system model, BIOS version, and result.	**8.** Treat a power-on test as preliminary, not complete production qualification.

MIXED-MEMORY CONFIGURATION

PREFERRED CONFIGURATION	RISKS OF UNMATCHED MODULES
Use identical M324R4GA3BB0-CQK modules where a matched configuration is required, and follow the platform slot-population sequence.	Different capacity, rank, organization, ECC capability, speed, or buffer architecture may reduce speed, disable ECC, cause instability, or prevent startup.

INSTALLATION BOUNDARY M324R4GA3BB0-CQK is intended only for compatible DDR5 ECC UDIMM platforms supporting 32GB Dual Rank 2Rx8 modules. Final approval requires platform documentation and system-level testing.

8. APPLICATIONS AND DEPLOYMENT GUIDANCE

M324R4GA3BB0-CQK

INTENDED PLATFORMS AND DEPLOYMENT SUITABILITY

M324R4GA3BB0-CQK is intended for professional computing platforms that support 32GB DDR5-4800 ECC UDIMM memory. Its configuration is appropriate where improved memory data integrity is required without using registered server memory.

Deployment should proceed only after the complete module profile has been confirmed against the processor, motherboard, BIOS, capacity limits, and platform validation records.

TYPICAL APPLICATION CATEGORIES

PROFESSIONAL WORKSTATIONS	ENTRY-LEVEL SERVERS	PROFESSIONAL DESKTOPS
Compatible systems used for engineering, technical analysis, software development, content creation, data processing, and long-duration professional workloads.	Compatible servers designed for DDR5 ECC UDIMM, including small-business, file, application, development, test, edge, or departmental systems.	ECC-capable desktop systems where the processor, motherboard, and BIOS support 32GB Dual Rank 2Rx8 DDR5 ECC UDIMM operation.

DEPLOYMENT SUITABILITY MATRIX

DEPLOYMENT ENVIRONMENT	SUITABILITY FOR M324R4GA3BB0-CQK
Professional workstation	Suitable when validated
Entry-level server	Suitable when the server uses unbuffered ECC memory
Professional desktop	Conditional on processor, motherboard, and BIOS ECC support
RDIMM-based server	Not suitable without platform redesign
Laptop / mobile workstation	Not suitable; these platforms normally require SODIMM
Non-ECC desktop	Not qualified until ECC UDIMM support is confirmed
DDR4 platform	Not compatible

CAPACITY PLANNING

PER-MODULE CAPACITY	POPULATION EFFECTS
Each M324R4GA3BB0-CQK provides 32GB. Confirm the platform maximum capacity and supported capacity per slot.	The supported operating rate may depend on the number of populated slots, the processor memory controller, and the installed Dual Rank module population.

8. APPLICATIONS AND DEPLOYMENT GUIDANCE (CONTINUED)

M324R4GA3BB0-CQK

DEPLOYMENT CONTROL AND PROCUREMENT PRACTICES

DEPLOYMENT CONFIGURATION

MATCHED CONFIGURATION

- Use identical M324R4GA3BB0-CQK modules where matched memory is required.
- Follow the system manufacturer slot-population sequence.
- Avoid mixing ECC and non-ECC memory.
- Avoid mixing UDIMM and RDIMM.

CONTROLLED DEPLOYMENT

- Avoid mixing capacities, rank structures, or organizations unless validated.
- Record the complete part number for every deployed module.
- Maintain BIOS and validation records with deployment documentation.
- Qualify any mixed configuration separately.

PROCUREMENT AND DEPLOYMENT CONTROL

ORDERING ITEM	REQUIRED INFORMATION
Manufacturer	Samsung
Complete part number	M324R4GA3BB0-CQK
Capacity	32GB
Module type	DDR5 ECC UDIMM
Data rate	4800 MT/s
Rank / organization	Dual Rank / 2Rx8
Interface	288-pin DDR5 DIMM
Nominal voltage	1.1V

DEPLOYMENT RISKS TO AVOID

1. Selecting RDIMM instead of ECC UDIMM.
2. Installing the module in a non-ECC platform.
3. Assuming all 288-pin DDR5 modules are interchangeable.
4. Ignoring Dual Rank or 2Rx8 support requirements.
5. Mixing unmatched memory modules.
6. Using an outdated BIOS.
7. Relying on a shortened supplier description.
8. Skipping system-level memory validation.

DEPLOYMENT RECOMMENDATION M324R4GA3BB0-CQK is best suited to a documented and validated DDR5 ECC UDIMM platform supporting 32GB capacity, Dual Rank 2Rx8 organization, and DDR5-4800 operation.

9. ORDERING INFORMATION, REFERENCES, AND DISCLAIMER

M324R4GA3BB0-CQK

CONTROLLED ORDERING AND RECEIVING INSPECTION

M324R4GA3BB0-CQK should be ordered, quoted, inspected, and recorded using the complete Samsung part number. Shortened descriptions do not uniquely identify the configuration covered by this document.

CONTROLLED ORDERING IDENTIFICATION

ORDERING FIELD	REQUIRED INFORMATION
Manufacturer	Samsung
Complete part number	M324R4GA3BB0-CQK
Product category	DDR5 memory module
Module type	ECC UDIMM
Capacity	32GB
Rated data transfer speed	4800 MT/s
Speed classification	PC5-38400
Rank / organization	Dual Rank / 2Rx8
Buffer architecture	Unbuffered
Interface	288-pin DDR5 DIMM
Nominal voltage	1.1V
Verified DRAM component	K4RAH086VB-BCQK

PURCHASE-ORDER DESCRIPTION Samsung M324R4GA3BB0-CQK, 32GB DDR5-4800 ECC UDIMM, Dual Rank 2Rx8, 288-pin, 1.1V nominal.

RECEIVING INSPECTION

IDENTITY CHECK

- Confirm Samsung identification.
- Confirm M324R4GA3BB0-CQK on the label.
- Confirm 32GB module capacity.
- Confirm DDR5-4800 product description.

CONDITION AND TRACEABILITY

- Confirm ECC UDIMM classification.
- Inspect physical condition and label legibility.
- Record quantity received.
- Record supplier lot, date code, or traceability details when available.

QUALIFICATION RECORD

RECORD ITEM	RECOMMENDED ENTRY
Target platform	System manufacturer and model
Processor	Installed processor and memory-controller configuration
Motherboard / BIOS	Board model, revision, and firmware version
Module population	Number of modules and slot positions
Detected capacity / speed	System-reported capacity and operating rate
ECC status / test result	Platform-reported ECC status and validation outcome

9. ORDERING INFORMATION, REFERENCES, AND DISCLAIMER (CONTINUED)

M324R4GA3BB0-CQK

REFERENCE BASIS, DOCUMENT SCOPE, AND DISCLAIMER

REFERENCE BASIS

This technical specification has been compiled from publicly available information relevant to M324R4GA3BB0-CQK. The reference basis includes Samsung DDR5 ECC UDIMM category information, the ASUS DDR5-4800 ECC Qualified Vendors List, and publicly accessible product information identifying this complete part number.

Model-specific information has been retained only where the available sources were consistent. Information that could not be reliably confirmed for M324R4GA3BB0-CQK has been excluded.

PARAMETERS INTENTIONALLY EXCLUDED

UNVERIFIED OPERATING DATA	UNVERIFIED COMPONENT / LIFECYCLE DATA
• CAS latency	• PMIC part number
• Detailed timing table	• SPD hub part number
• Power-consumption values	• Complete pin-assignment table
• Operating-temperature range	• SPD byte data
• Mechanical tolerances	• Product lifecycle status or manufacturing location

DOCUMENT SCOPE

This document applies only to Samsung M324R4GA3BB0-CQK. Its contents should not be applied automatically to other Samsung M324-series modules, M321 RDIMM products, M425 SODIMM products, other 32GB DDR5-4800 modules, or parts with a different suffix, rank, organization, or architecture.

DISCLAIMER

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FINAL IDENTIFICATION STATEMENT For sourcing, qualification, deployment, and replacement control, use the complete part number M324R4GA3BB0-CQK.