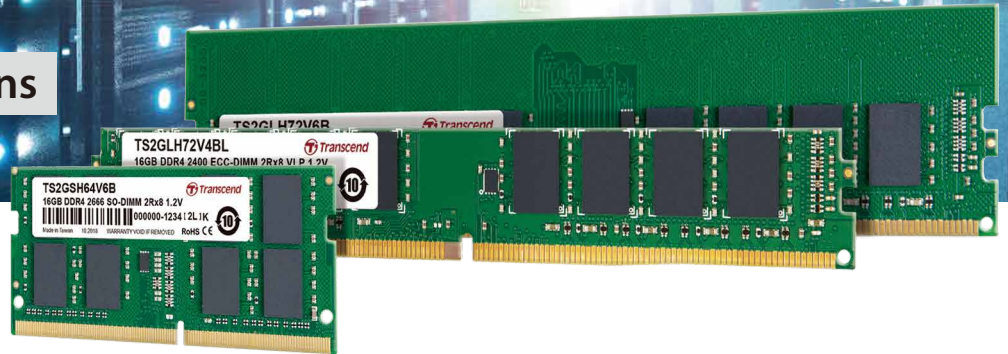


## Embedded Solutions

# DRAM Modules DDR4



Transcend's DDR4 DRAM modules operate at a nominal voltage of just 1.2V, offering higher energy efficiency and exceptional clock speeds to cater to the demands of the embedded industry. The modules are available in multiple form factors and technologies, such as ECC and wide-temperature support. All components are of the highest quality, having been sourced directly from the world's first-tier supplier of DRAM chips and stringently tested for unparalleled compatibility, reliability, and performance.

## Features

- JEDEC standard 1.2V  $\pm$  0.06V power supply
- High energy efficiency
- 8 bit pre-fetch
- Burst Length: 4, 8
- 16 Banks (4 Bank Groups)
- Support DBI mode
- Support Command/Address parity detection
- Support Data Cyclic Redundancy Check (CRC) for improved data reliability
- On-die termination with ODT pin
- Serial presence detect with EEPROM
- 100% tested for stability, compatibility and performance

## Advanced Technologies



Anti-Sulfur  
Technology



Corner Bond &  
Underfill



Conformal  
Coating



Wide  
Temperature



30  $\mu$ m  
Gold Finger

# DDR4 Unbuffered DIMMs



Module Type	DDR4 Long-DIMM	DDR4 SO-DIMM
Standard	JEDEC®	
Speed	3200/2666 MT/s	
Capacity	2GB~32GB	
Voltage	1.2V	
Pin Count	288 pin	260 pin
PCB Height	Standard: 1.23 inches Very Low Profile: 0.74 inches	1.18 inches
PCB Gold Finger Thickness	30μ" (Wide Temp.)	
Anti-Sulfuration	Default (Wide Temp.)	
Operating Temperature	Standard Temperature: 0°C ~ 95°C Wide Temperature: -40°C ~ 95°C	

## DDR4-3200

	Capacity	Component Composition	Rank x Org.	Long-DIMM	SO-DIMM
Standard Temp. (0°C~ 95°C)	4GB	(512Mx16)x4	1Rx16	TS512MLH64V2D	TS512MSH64V2D
		(512Mx16)x4	1Rx16	TS512MLH64V2D3	TS512MSH64V2D3
		(512Mx8)x8	1Rx8	TS512MLH64V2H	TS512MSH64V2H
		(512Mx8)x8	1Rx8	TS512MLH64V2H-G	-
	8GB	(1Gx8)x8	1Rx8	TS1GLH64V2B	TS1GSH64V2B
		(1Gx8)x8	1Rx8	TS1GLH64V2B-G	TS1GSH64V2B-G
		(1Gx8)x8	1Rx8	TS1GLH64V2B3	TS1GSH64V2B3
		(1Gx8)x8	1Rx8	-	TS1GSH64V2B3-G
		(1Gx16)x4	1Rx16	TS1GLH64V2G	TS1GSH64V2G
		(1Gx16)x4	1Rx16	TS1GLH64V2G3	TS1GSH64V2G3
	16GB	(1Gx8)x16	2Rx8	TS2GLH64V2B	TS2GSH64V2B
		(1Gx8)x16	2Rx8	TS2GLH64V2B-G	TS2GSH64V2B-G
		(1Gx8)x16	2Rx8	TS2GLH64V2B3	TS2GSH64V2B3
		(1Gx8)x16	2Rx8	-	TS2GSH64V2B3-G
		(2Gx8)x8	1Rx8	TS2GLH64V2E	TS2GSH64V2E
		(2Gx8)x8	1Rx8	TS2GLH64V2E3	TS2GSH64V2E3
	32GB	(2Gx8)x16	2Rx8	TS4GLH64V2E	TS4GSH64V2E
		(2Gx8)x16	2Rx8	TS4GLH64V2E-G	TS4GSH64V2E-G
		(2Gx8)x16	2Rx8	TS4GLH64V2E3	TS4GSH64V2E3
		(2Gx8)x16	2Rx8	TS4GLH64V2E3	TS4GSH64V2E3
Wide Temp. (-40°C~ 95°C)	4GB	(512Mx16)x4	1Rx16	TS512MLH64V2D-I	TS512MSH64V2D-I
	8GB	(1Gx8)x8	1Rx8	TS1GLH64V2B-I	TS1GSH64V2B-I
		(1Gx16)x4	1Rx16	TS1GLH64V2G-I	TS1GSH64V2G-I
	16GB	(1Gx8)x16	2Rx8	TS2GLH64V2B-I	TS2GSH64V2B-I
		(2Gx8)x8	1Rx8	TS2GLH64V2E-I	TS2GSH64V2E-I
Very Low Profile (0°C~ 95°C)	32GB	(2Gx8)x16	2Rx8	TS4GLH64V2E-I	TS4GSH64V2E-I
	4GB	(512Mx8)x8	1Rx8	TS512MLH64V2HL	-
		(1Gx8)x8	1Rx8	TS1GLH64V2BL	-
		(1Gx8)x8	1Rx8	TS1GLH64V2BL-G	-
		(1Gx8)x16	2Rx8	TS2GLH64V2BL	-
16GB	(1Gx8)x16	2Rx8	TS2GLH64V2BL-G	-	
	(2Gx8)x16	2Rx8	TS4GLH64V2E3L	-	

## DDR4-2666

	Capacity	Component Composition	Rank x Org.	Long-DIMM	SO-DIMM
Standard Temp. (0°C~ 95°C)	2GB	(256Mx16)x4	1Rx16	TS256MLH64V6X	TS256MSH64V6X
		(512Mx16)x4	1Rx16	TS512MLH64V6D	TS512MSH64V6D
	4GB	(512Mx8)x8	1Rx8	TS512MLH64V6H	TS512MSH64V6H
		(512Mx8)x8	1Rx8	TS512MLH64V6H3	TS512MSH64V6H3
		(512Mx8)x8	1Rx8	TS512MLH64V6H-G	-
		(512Mx16)x4	1Rx16	-	TS512MSH64V6D3
	8GB	(512Mx8)x16	2Rx8	-	TS1GSH64V6H
		(1Gx8)x8	1Rx8	TS1GLH64V6B	TS1GSH64V6B
		(1Gx8)x8	1Rx8	TS1GLH64V6B3	TS1GSH64V6B3
		(1Gx8)x8	1Rx8	TS1GLH64V6B-G	-
	16GB	(1Gx8)x16	2Rx8	TS2GLH64V6B	TS2GSH64V6B
		(1Gx8)x16	2Rx8	TS2GLH64V6B-G	-
		(1Gx8)x16	2Rx8	TS2GLH64V6B3	TS2GSH64V6B3
	32GB	(2Gx8)x16	2Rx8	TS4GLH64V6E	TS4GSH64V6E
(2Gx8)x16		2Rx8	TS4GLH64V6EL-G	-	
(2Gx8)x16		2Rx8	-	TS4GSH64V6E3	
Wide Temp. (-40°C~ 95°C)	4GB	(512Mx8)x8	1Rx8	-	TS512MSH64V6H-I
		(512Mx16)x4	1Rx16	-	TS512MSH64V6D-I
	8GB	(1Gx8)x8	1Rx8	-	TS1GSH64V6B-I
	16GB	(1Gx8)x16	2Rx8	TS2GLH64V6B-I	TS2GSH64V6B-I
Very Low Profile (0°C~ 95°C)	32GB	(2Gx8)x16	2Rx8	TS4GLH64V6E-I	TS4GSH64V6E-I
	2GB	(256Mx16)x4	1Rx16	TS256MLH64V6XL	-
	4GB	(512Mx8)x8	1Rx8	TS512MLH64V6HL	-
	8GB	(1Gx8)x8	1Rx8	TS1GLH64V6BL	-
	16GB	(1Gx8)x16	2Rx8	TS2GLH64V6BL	-

## DDR4-2400

	Capacity	Component Composition	Rank x Org.	Long-DIMM	SO-DIMM
Standard Temp. (0°C~ 95°C)	2GB	(256Mx16)x4	1Rx16	-	TS256MSH64V4X
	4GB	(512Mx8)x8	1Rx8	TS512MLH64V4H	TS512MSH64V4H
	8GB	(512Mx8)x16	2Rx8	TS1GLH64V4H	TS1GSH64V4H
		(1Gx8)x8	1Rx8	TS1GLH64V4B	TS1GSH64V4B
16GB	(1Gx8)x16	2Rx8	TS2GLH64V4B	TS2GSH64V4B	
Wide Temp. (-40°C~ 95°C)	4GB	(512Mx8)x8	1Rx8	-	TS512MSH64V4H-I
	8GB	(1Gx8)x8	1Rx8	-	TS1GSH64V4B-I
	16GB	(1Gx8)x16	2Rx8	-	TS2GSH64V4B-I
Very Low Profile (0°C~ 95°C)	4GB	(512Mx8)x8	1Rx8	TS512MLH64V4HL	-

## DDR4-2133

	Capacity	Component Composition	Rank x Org.	Long-DIMM	SO-DIMM
Standard Temp. (0°C~ 95°C)	4GB	(512Mx8)x8	1Rx8	TS512MLH64V1H	TS512MSH64V1H
	8GB	(512Mx8)x16	2Rx8	TS1GLH64V1H	TS1GSH64V1H
	16GB	(1Gx8)x16	2Rx8	TS2GLH64V1B	TS2GSH64V1B
Wide Temp. (-40°C~ 95°C)	4GB	(512Mx8)x8	1Rx8	-	TS512MSH64V1H-I
	8GB	(512Mx8)x16	2Rx8	-	TS1GSH64V1H-I
	16GB	(1Gx8)x16	2Rx8	-	TS2GSH64V1B-I
Very Low Profile (0°C~ 95°C)	8GB	(512Mx8)x16	2Rx8	TS1GLH64V1HL	-

# DDR4 ECC DIMMs



Module Type	DDR4 ECC Long-DIMM	DDR4 ECC SO-DIMM
Standard	JEDEC®	
Speed	3200/2666 MT/s	
Capacity	4GB~32GB	
Voltage	1.2V	
Pin Count	288 pin	260 pin
PCB Height	Standard: 1.23 inches Very Low Profile: 0.74 inches	1.18 inches
PCB Gold Finger Thickness	30μ"	
Anti-Sulfuration	Default	
Operating Temperature	Standard Temperature: 0°C ~ 95°C Wide Temperature: -40°C ~ 95°C	

## DDR4-3200

	Capacity	Component Composition	Rank x Org.	Long-DIMM	SO-DIMM	
Standard Temp. (0°C~ 95°C)	8GB	(512Mx8)x9	1Rx8	-	TS512MSH72V2H	
		(1Gx8)x9	1Rx8	TS1GLH72V2B	TS1GSH72V2B	
		(1Gx8)x9	1Rx8	TS1GLH72V2B3	TS1GSH72V2B3	
		(512Mx8)x18	2Rx8	-	TS1GSH72V2H	
		(1Gx8)x18	2Rx8	TS2GLH72V2B	TS2GSH72V2B	
		(2Gx8)x9	1Rx8	TS2GLH72V2E	TS2GSH72V2E	
	16GB	(2Gx8)x9	1Rx8	TS2GLH72V2E3	TS2GSH72V2E3	
		(2Gx8)x18	2Rx8	TS4GLH72V2E	TS4GSH72V2E	
		(2Gx8)x18	2Rx8	TS4GLH72V2E3	TS4GSH72V2E3	
		8GB	(1Gx8)x9	1Rx8	TS1GLH72V2B-I	TS1GSH72V2B-I
			(1Gx8)x9	1Rx8	-	TS1GSH72V2B3-I
			(512Mx8)x18	2Rx8	-	TS1GSH72V2H-I
(1Gx8)x18	2Rx8		TS2GLH72V2B-I	TS2GSH72V2B-I		
16GB	(2Gx8)x9		1Rx8	-	TS2GSH72V2E3-I	
	(2Gx8)x9		1Rx8	-	TS2GSH72V2E-I	
32GB	(2Gx8)x18	2Rx8	TS4GLH72V2E-I	TS4GSH72V2E-I		
	(2Gx8)x18	2Rx8	-	TS4GSH72V2E3-I		
	8GB	(1Gx8)x9	1Rx8	TS1GLH72V2BL	-	
		(1Gx8)x18	2Rx8	TS2GLH72V2BL	-	
(1Gx8)x18		2Rx8	TS2GLH72V2B3L	-		
32GB		(2Gx8)x18	2Rx8	TS4GLH72V2E3L	-	

## DDR4-2666

	Capacity	Component Composition	Rank x Org.	Long-DIMM	SO-DIMM
Standard Temp. (0°C~ 95°C)	4GB	(512Mx8)x9	1Rx8	TS512MLH72V6H	TS512MSH72V6H
	8GB	(1Gx8)x9	1Rx8	TS1GLH72V6B	TS1GSH72V6B
		(1Gx8)x9	1Rx8	TS1GLH72V6B3	-
	16GB	(1Gx8)x18	2Rx8	TS2GLH72V6B	TS2GSH72V6B
	32GB	(2Gx8)x18	2Rx8	TS4GLH72V6E	TS4GSH72V6E
(2Gx8)x18		2Rx8	TS4GLH72V6E3	-	
Wide Temp. (-40°C~ 95°C)	4GB	(512Mx8)x9	1Rx8	-	TS512MSH72V6H-I
	8GB	(1Gx8)x9	1Rx8	TS1GLH72V6B-I	TS1GSH72V6B-I
	16GB	(1Gx8)x18	2Rx8	-	TS2GSH72V6B-I
	32GB	(2Gx8)x18	2Rx8	-	TS4GSH72V6E-I
Very Low Profile (0°C~ 95°C)	8GB	(1Gx8)x9	1Rx8	TS1GLH72V6BL	-
	16GB	(1Gx8)x18	2Rx8	TS2GLH72V6BL	-

## DDR4-2400

	Capacity	Component Composition	Rank x Org.	Long-DIMM	SO-DIMM
Standard Temp. (0°C~ 95°C)	4GB	(512Mx8)x9	1Rx8	TS512MLH72V4H	TS512MSH72V4H
	8GB	(1Gx8)x9	1Rx8	TS1GLH72V4B	TS1GSH72V4B
	16GB	(1Gx8)x18	2Rx8	TS2GLH72V4B	TS2GSH72V4B
Wide Temp. (-40°C~ 95°C)	16GB	(1Gx8)x18	2Rx8	-	TS2GSH72V4B-I

## DDR4-2133

	Capacity	Component Composition	Rank x Org.	Long-DIMM	SO-DIMM
Standard Temp. (0°C~ 95°C)	4GB	(512Mx8)x9	1Rx8	TS512MLH72V1H	TS512MSH72V1H
	8GB	(512Mx8)x18	2Rx8	TS1GLH72V1H	TS1GSH72V1H
	16GB	(1Gx8)x18	2Rx8	TS2GLH72V1B	TS2GSH72V1B

# DDR4 Registered DIMMs



Module Type	DDR4 R-DIMM
Standard	JEDEC®
Speed	3200/2666 MT/s
Capacity	4GB~32GB
Voltage	1.2V
Pin Count	288 pin
PCB Height	Standard: 1.23 inches Very Low Profile: 0.74 inches
PCB Gold Finger Thickness	30μ"
Anti-Sulfuration	Default
Operating Temperature	Standard Temperature: 0°C ~ 95°C Wide Temperature: -40°C ~ 95°C

## DDR4-3200

	Capacity	Component Composition	Rank x Org.	Long-DIMM
Standard Temp. (0°C~ 95°C)	8GB	(1Gx8)x9	1Rx8	TS1GHR72V2B
		(1Gx8)x9	1Rx8	TS1GHR72V2B3
	16GB	(1Gx8)x18	2Rx8	TS2GHR72V2B
		(2Gx8)x9	1Rx8	TS2GHR72V2E
		(2Gx8)x9	1Rx8	TS2GHR72V2E3
		(1Gx8)x18	2Rx8	TS2GHR72V2B3
	32GB	(2Gx8)x18	2Rx8	TS4GHR72V2E
		(2Gx8)x18	2Rx8	TS4GHR72V2E3
		(2Gx4)x36	2Rx4	TS4GHR72V2C-SAM
64GB	(4Gx4)x36	2Rx4	TS8GHR72V2F-SAM	
Wide Temp. (-40°C~ 95°C)	16GB	(1Gx8)x18	2Rx8	TS2GHR72V2B-I
	32GB	(2Gx8)x18	2Rx8	TS4GHR72V2E-I
		(2Gx8)x18	2Rx8	TS4GHR72V2EL-I
Very Low Profile (0°C~ 95°C)	8GB	(1Gx8)x9	1Rx8	TS1GHR72V2BL
	16GB	(1Gx8)x18	2Rx8	TS2GHR72V2BL
		(2Gx8)x9	1Rx8	TS2GHR72V2EL
	32GB	(2Gx8)x18	2Rx8	TS4GHR72V2EL

## DDR4-2666

	Capacity	Component Composition	Rank x Org.	Long-DIMM
Standard Temp. (0°C~ 95°C)	4GB	(512Mx8)x9	1Rx8	TS512MHR72V6H
	8GB	(512Mx8)x18	2Rx8	TS1GHR72V6H
		(1Gx8)x9	1Rx8	TS1GHR72V6B
Wide Temp. (-40°C~ 95°C)	16GB	(1Gx8)x18	2Rx8	TS2GHR72V6B
	16GB	(1Gx8)x18	2Rx8	TS2GHR72V6B-I
Very Low Profile (0°C~ 95°C)	32GB	(2Gx8)x18	2Rx8	TS4GHR72V6E-I
	16GB	(1Gx8)x18	2Rx8	TS2GHR72V6BL

## DDR4-2400

	Capacity	Component Composition	Rank x Org.	Long-DIMM
Standard Temp. (0°C~ 95°C)	4GB	(512Mx8)x9	1Rx8	TS512MHR72V4H
	8GB	(1Gx8)x9	1Rx8	TS1GHR72V4B
	16GB	(1Gx8)x18	2Rx8	TS2GHR72V4B
Very Low Profile (0°C~ 95°C)	8GB	(512Mx8)x18	2Rx8	TS1GHR72V4HL
	16GB	(2Gx4)x18	1Rx4	TS2GHR72V4CL

## DDR4-2133

	Capacity	Component Composition	Rank x Org.	Long-DIMM
Standard Temp. (0°C~ 95°C)	8GB	(512Mx8)x18	2Rx8	TS1GHR72V1H
	16GB	(1Gx8)x18	2Rx8	TS2GHR72V1B
Very Low Profile (0°C~ 95°C)	8GB	(512Mx8)x18	2Rx8	TS1GHR72V1HL



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