

DDR2 Memory

DDR2 is the next-generation evolution of DDR memory technology. DDR2 memory features faster speeds, higher data bandwidths, lower power consumption, and enhanced thermal performance. Starting in 2004, DDR2 was launched for use in desktops, servers, notebooks, telecommunications/networking and other platforms in the following form-factors:

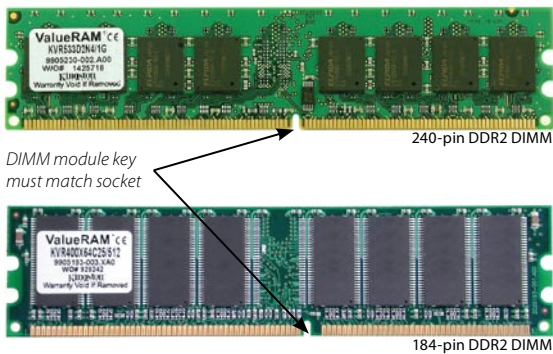
- Unbuffered DIMMs, ECC or non-ECC
- Registered ECC DIMMs
- Fully Buffered DIMMs
- SODIMMs
- MicroDIMMs
- Mini Registered DIMMs
- Custom Modules

Naming conventions

DDR2 memory was developed by JEDEC, the memory industry's standards organization of which Kingston® is a member company. DDR2 memory chips and modules use a naming convention similar to that used for the current DDR memory:

Memory Speed	Memory Chip Classification	Module Classification	Module Bandwidth	Dual-Channel DDR2 System Bandwidth
400MHz	DDR2-400	PC2-3200	3.2GB/sec	6.4GB/sec
533MHz	DDR2-533	PC2-4200	4.3GB/sec	8.6GB/sec
667MHz	DDR2-667	PC2-5300	5.3GB/sec	10.6GB/sec
800MHz	DDR2-800	PC2-6400	6.4GB/sec	12.8GB/sec

Memory modules

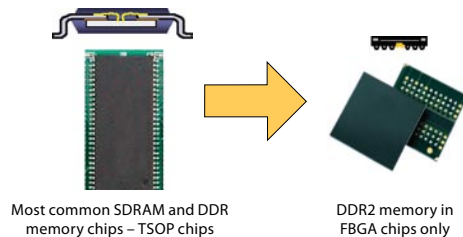


DDR2 memory modules share the same module dimensions as equivalent DDR memory modules, but are not backward-compatible due to incompatible module connections (number of pins), voltage, and DRAM technology. DDR2 memory modules have a different key or notch than same-sized DDR modules to prevent their insertion into an incompatible memory socket.

	DDR2	DDR
Unbuffered DIMMs	240-pin 1.8 V	184-pin 2.5 V
Registered DIMMs	240-pin 1.8 V	184-pin 2.5 V
Fully Buffered DIMMs	240-pin 1.8 V	—
SODIMMs	200-pin 1.8 V	200-pin 2.5 V
Mini Registered DIMMs	244-pin 1.8 V	—
MicroDIMMs	214-pin 1.8 V	172-pin 2.5 V

Memory chips

DDR2 memory chips are made with the familiar black resin Thin Small Outline Package (TSOP) as well as other chip types. DDR2 memory can no longer be manufactured into TSOP chips, and are only specified to be FBGA (Fine-pitch Ball Grid Array) chips. TSOP and FBGA chips are shown below:



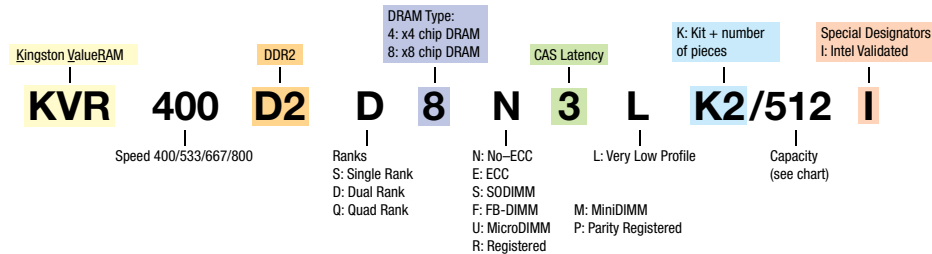
DDR2 chips are also internally different from DDR memory chips. For example, DDR2 memory chips feature:

- 1.8-V operation, delivering over 50 percent less power usage as well as generating less heat compared to DDR
- Memory signal termination inside the memory chip ("On-Die Termination") to prevent reflected signal transmission errors
- Operational enhancements to increase memory performance, efficiency, and timing margins
- DDR2 CAS Latencies: 3, 4, and 5

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This reference guide is designed to help you identify our new ValueRAM® DDR2 memory modules by specification. While this is a representation of a majority of our generic DDR2 modules, naming conventions may vary as necessary. For a complete list, including Intel-validated parts, registered and ECC memory, please visit valueram.com

DDR2 for Notebooks, Desktops, and Servers (PC2-3200, PC2-4200, PC2-5300, PC2-6400)



800MHz DDR2 PC2-6400, DIMM, 240-pin, 1.8v

512MB	KVR800D2N5/512	800MHz 64M x 64 Non-ECC CL5
1GB	KVR800D2N5/1G	800MHz 128M x 64 Non-ECC CL5
	KVR800D2N5K2/1G	800MHz 64M x 64 Non-ECC CL5 (Kit of 2)
2GB	KVR800D2N5K2/2G	800MHz 128M x 64 Non-ECC CL5 (Kit of 2)

800MHz DDR2 PC2-6400, SODIMM, 240-pin, 1.8v

512MB	KVR800D2S5/512	800MHz 64M x 64 Non-ECC CL5
1GB	KVR800D2S5/1G	800MHz 128M x 64 Non-ECC CL5

667MHz DDR2 PC2-5300, DIMM, 240-Pin, 1.8v

256MB	KVR667D2N5/256	667MHz 32M x 64 Non-ECC CL5
	KVR667D2N5/512	667MHz 64M x 64 Non-ECC CL5
512MB	KVR667D2N5K2/512	667MHz 32M x 64 Non-ECC CL5 (Kit of 2)
	KVR667D2U5/512	667MHz 64M x 64 Non-ECC CL5 MicroDIMM
1GB	KVR667D2N5/1G	667MHz 128M x 64 Non-ECC CL5
	KVR667D2N5K2/1G	667MHz 64M x 64 Non-ECC CL5 (Kit of 2)
	KVR667D2U5/1G	667MHz 64M x 64 Non-ECC CL5 MicroDIMM
	KVR667D2S8F5K2/1G	667MHz 64M x 72 ECC Fully Buffered CL5 Single Rank, x8 (Kit of 2)
	KVR667D2D8F5/1G	667MHz 128M x 72 ECC Fully Buffered CL5 Dual Rank, x8
2GB	KVR667D2N5/2G	667MHz 256M x 64 Non-ECC CL5
	KVR667D2N5K2/2G	667MHz 128M x 64 Non-ECC CL5 (Kit of 2)
	KVR667D2D8F5K2/2G	667MHz 128M x 72 ECC Fully Buffered CL5 Dual Rank, x8 (Kit of 2)
	KVR667D2D4F5/2G	667MHz 256M x 72 ECC Fully Buffered CL5 Dual Rank, x4
	KVR667D2D8F5/2G	667MHz 256M x 72 ECC Fully Buffered CL5 Dual Rank, x8
	KVR667D2S4F5/2G	667MHz 256M x 72 ECC Fully Buffered CL5 Single Rank, x4
4GB	KVR667D2N5K2/4G	667MHz 256M x 64 Non-ECC CL5 (Kit of 2)
	KVR667D2D4F5K2/4G	667MHz 256M x 72 ECC Fully Buffered CL5 Dual Rank, x4 (Kit of 2)
	KVR667D2D8F5K2/4G	667MHz 256M x 72 ECC Fully Buffered CL5 Dual Rank, x8 (Kit of 2)
	KVR667D2S4F5K2/4G	667MHz 256M x 72 ECC Fully Buffered CL5 Single Rank, x4 (Kit of 2)
	KVR667D2D4F5/4G	667MHz 256M x 72 ECC Fully Buffered CL5 Dual Rank, x4
8GB	KVR667D2D4F5K2/8G	667MHz 512M x 72 ECC Fully Buffered CL5 Dual Rank, x4 (Kit of 2)

667MHz DDR2 PC2-5300, SODIMM, 240-Pin, 1.8v

256MB	KVR667D2S5/256	667MHz 32M x 64 Non-ECC CL5
512MB	KVR667D2S5/512	667MHz 64M x 64 Non-ECC CL5
1G	KVR667D2S5/1G	667MHz 128M x 64 Non-ECC CL5
2G	KVR667D2S5/2G	667MHz 256M x 64 Non-ECC CL5

533MHz DDR2, PC2-4200 DIMM, 240-Pin, 1.8v

256MB	KVR533D2N4/256	533MHz 32M x 64 Non-ECC CL4
	KVR533D2U4/256	533MHz 32M x 64 Non-ECC CL4 MicroDIMM
512MB	KVR533D2N4/512	533MHz 64M x 64 Non-ECC CL4
	KVR533D2N4K2/512	533MHz 32M x 64 Non-ECC CL4 (Kit of 2)
	KVR533D2U4/512	533MHz 64M x 64 Non-ECC CL4 MicroDIMM
1GB	KVR533D2N4/1G	533MHz 128M x 64 Non-ECC CL4
	KVR533D2N4K2/1G	533MHz 64M x 64 Non-ECC CL4 (Kit of 2)
	KVR533D2U4/1G	533MHz 128M x 64 Non-ECC CL4 MicroDIMM
	KVR533D2S8F4K2/1G	533MHz 64M x 72 ECC Fully Buffered CL4 Single Rank, x8 (Kit of 2)
	KVR533D2D8F4/1G	533MHz 128M x 72 ECC Fully Buffered CL4 Dual Rank, x8
2GB	KVR533D2N4/2G	533MHz 256M x 64 Non-ECC CL4
	KVR533D2N4K2/2G	533MHz 128M x 64 Non-ECC CL4 (Kit of 2)
	KVR533D2D8F4K2/2G	533MHz 128M x 72 ECC Fully Buffered CL4 Dual Rank, x8 (Kit of 2)
	KVR533D2D4F4/2G	533MHz 256M x 72 ECC Fully Buffered CL4 Dual Rank, x4
	KVR533D2D8F4/2G	533MHz 256M x 72 ECC Fully Buffered CL4 Dual Rank, x8
4GB	KVR533D2N4K2/4G	533MHz 256M x 64 Non-ECC CL4 (Kit of 2)
	KVR533D2D4F4K2/4G	533MHz 256M x 72 ECC Fully Buffered CL4 Dual Rank, x4 (Kit of 2)
	KVR533D2D8F4K2/4G	533MHz 256M x 72 ECC Fully Buffered CL4 Dual Rank, x8 (Kit of 2)
	KVR533D2D4F4/4G	533MHz 512M x 72 ECC Fully Buffered CL4 Dual Rank, x4
8GB	KVR533D2D4F4K2/8G	533MHz 512M x 72 ECC Fully Buffered CL4 Dual Rank, x4 (Kit of 2)

533MHz DDR2 PC2-4200, SODIMM, 240-Pin, 1.8v

256MB	KVR533D2S4/256	533MHz 32M x 64 Non-ECC CL4
512MB	KVR533D2S4/512	533MHz 64M x 64 Non-ECC CL4
1GB	KVR533D2S4/1G	533MHz 128M x 64 Non-ECC CL4
2GB	KVR533D2S4/2G	533MHz 256M x 64 Non-ECC CL4

400MHz DDR2 PC2-4200, DIMM, 240-Pin, 1.8v

256MB	KVR400D2N3/256	400MHz 32M x 64 Non-ECC CL3
512MB	KVR400D2N3/512	400MHz 64M x 64 Non-ECC CL3
	KVR400D2N3K2/512	400MHz 32M x 64 Non-ECC CL3 (Kit of 2)
1GB	KVR400D2N3/1G	400MHz 128M x 64 Non-ECC CL3
	KVR400D2N3K2/1G	400MHz 64M x 64 Non-ECC CL3 (Kit of 2)
2GB	KVR400D2N3/2G	400MHz 256M x 64 Non-ECC CL3
	KVR400D2N3K2/2G	400MHz 128M x 64 Non-ECC CL3 (Kit of 2)
4GB	KVR400D2N3K2/4G	400MHz 256M x 64 Non-ECC CL3 (Kit of 2)

400MHz DDR2 PC2-4200, SODIMM, 240-Pin, 1.8v

256MB	KVR400D2S3/256	400MHz 32M x 64 Non-ECC CL3
512MB	KVR400D2S3/512	400MHz 64M x 64 Non-ECC CL3
1GB	KVR400D2S3/1G	400MHz 128M x 64 Non-ECC CL3

