



Intel® Xeon™ Processor 3400 Series

Key Features of the Intel® Xeon™ Processor 3400 Series (codenamed “Lynnfield”)

- **Intel® Core™ Microarchitecture (“Nehalem”)**
These processors offer users the benefits of the latest technology – Nehalem architecture – in a single-processor configuration.
- **Intel® Turbo Boost Technology**
Turbo Boost delivers additional performance automatically when needed by taking advantage of the processor's power and thermal headroom. This enables increased performance of both multi-threaded and single-threaded workloads.
- **Intel® Hyper-Threading Technology**
Hyper-Threading Technology, available with most Xeon 3400 Series processors, allows thread-level parallelism, resulting in more efficient use of processor resources. With higher processing throughput, you enjoy substantially improved performance.
- **Integrated Memory Controller (IMC) with 2 Channels DDR3 Memory**
The move to DDR3 memory offers increased performance due to higher memory speeds, and reduced power consumption compared to FB-DDR2 memory operating at the same speed. The 3400 Series supports up to 4 ECC / Non-ECC UDIMMs or 6 RDIMMs.
- **Integrated PCI Express I/O**
16-lane PCI Express 2 port enables all input/output and manageability functions to be handled by a single chip. Flexible configuration options include 1x16, 2x8, or 4x4.

Dramatically Increased Performance

Dramatically Decreased Energy Consumption

Expert included.



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Product Specifications

TDP	CPU Number	Cores	Cache	Max Memory Speed	Turbo [†]	HT
95W	X3470 (2.93 GHz)	4	8M	1333 MHz	2 / 2 / 4 / 5	✓
95W	X3460 (2.80 GHz)	4	8M	1333 MHz	1 / 1 / 4 / 5	✓
95W	X3450 (2.66 GHz)	4	8M	1333 MHz	1 / 1 / 4 / 4	✓
95W	X3440 (2.53 GHz)	4	8M	1333 MHz	1 / 1 / 2 / 3	✓
95W	X3430 (2.40 GHz)	4	8M	1333 MHz	1 / 1 / 2 / 3	No HT
45W	L3426 (1.86 GHz)	4	8M	1333 MHz	2 / 2 / 9 / 10	✓

Real value as you move up the stack

[†]Turbo Boost frequency based on number of 133-MHz increments above base frequency (+2 = 0.266 GHz, +3 = 0.400 GHz)

Expert included.



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Memory Overview

Platform capability (6 DIMMs):

- Up to 2 channels per CPU
- Up to 3 DIMMs per channel

Memory types supported:

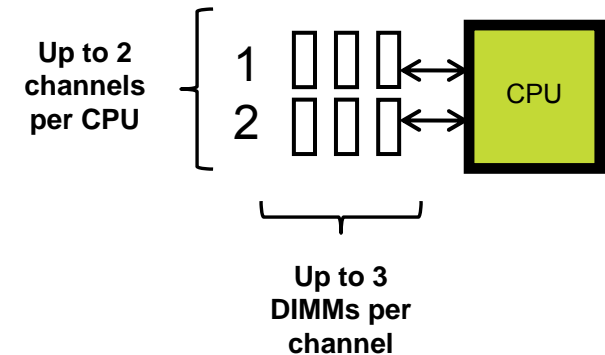
- DDR3 1333, 1066, and 800
- Registered ECC (RDIMM) and Unbuffered ECC (UDIMM)
- Single-rank (SR), dual-rank (DR), quad-rank (QR)

System memory speed (i.e. the speed at which the memory is *actually* running) is set by BIOS depending on:

- CPU capability
- DIMM type(s) used (memory speed, U/RDIMM, SR/DR/QR)
- Number of DIMMs populated per channel

Both channels in a system will run at the fastest *common* frequency:

- Example: If you populate 1 DIMM at 1333 MHz in Channel 1, and 1 DIMM at 1066 MHz in Channel 2, both DIMMs will run at 1066 MHz.



Expert included.



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RDIMM* Support

DIMM Slots per Channel	DIMMs populated per Channel	DIMM Type	POR Speeds	Ranks per DIMM (any combination)
3	1	Registered DDR3 ECC	1066MHz, 1333 MHz	SR, DR
3	1	Registered DDR3 ECC	1066 MHz	QR
3	2	Registered DDR3 ECC	1066MHz, 1333 MHz	SR, DR
3	2	Registered DDR3 ECC	800 MHz**	QR
3	2	Registered DDR3 ECC	800 MHz**	SR, DR

Other Restrictions:

- No support for LV DIMMs
- All channels in a system will run at the fastest common **frequency**
- No mixing of registered and unbuffered DIMMs

Max Memory Possible (x8 devices)	1Gb DRAM Technology	2Gb DRAM Technology
Single Rank RDIMMs	6GB (6x 1GB DIMMs)	12GB (6x 2GB DIMMs)
Dual Rank RDIMMs	12 GB (6x 2GB DIMMs)	24 GB (6x 4GB DIMMs)
Quad Rank RDIMMs	16GB (4x 4GB DIMMs)	32GB (4x 8GB DIMMs)

Cost-effective 4GB/core maintained for Quad-Core with flexibility for upgrades and higher capacities

* RDIMM support on Lynnfield only
 ** 1066 RDIMMs running at 800; BIOS should automatically down shift higher speed DIMMs to 800.

Expert included.



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UDIMM* Support

DIMM Slots per Channel	DIMMs populated per Channel	DIMM Type	POR Speeds	Ranks per DIMM (any combination)
2	1	Unbuffered DDR3 ECC	1066MHz, 1333 MHz	SR, DR
2	2	Unbuffered DDR3 ECC	1066MHz, 1333 MHz	SR, DR

Other Restrictions:

- No support for LV DIMMs
- All channels in a system will run at the fastest common **frequency**
- No mixing of registered and unbuffered DIMMs
- Mixing ECC and non-ECC UDIMMs is not supported

Max Memory Possible** (x8 devices)	1Gb DRAM Technology	2Gb DRAM Technology
Single Rank UDIMMs	4GB (4x 1GB DIMMs)	8GB (4x 2GB DIMMs)
Dual Rank UDIMMs	8 GB (4x 2GB DIMMs)	16 GB (4x 4GB DIMMs)

Enables cost-optimized value platforms with 4GB / core

* UDIMM support on both Clarkdale and Lynnfield
 ** Both configurations are with x8 devices

Expert included.

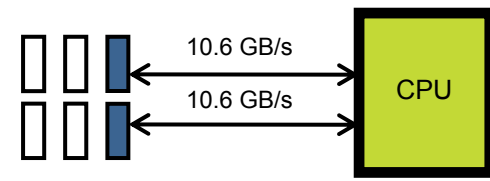


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Memory Population Scenarios

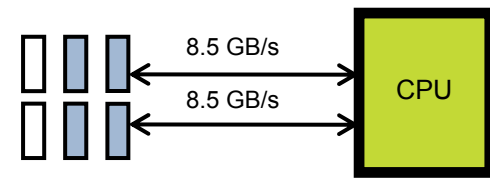
Maximum Bandwidth:

- DDR3 1333 across both channels
- 1 DIMM per channel (2 DIMMs)



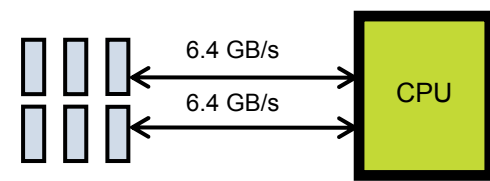
Balanced Performance:

- DDR3 1066 across both channels
- 2 DIMMs per channel (4 DIMMs)



Maximum Capacity:

- DDR3 800 across both channels
- 3 DIMMs per channel (6 DIMMs total) †



For maximum bandwidth, you want to fill only 1 DIMM per channel. Since 1333MHz memory is only supported at up to 1 DIMM per channel, the maximum installation would be 2 DIMMs.

For maximum capacity, you want to be able to install as many DIMMs as possible. Populating 3 DIMMs per channel will result in the memory running at a maximum of 800MHz, meaning you can choose slower DIMMs, but they must be registered memory.

† For systems offering only 4 DIMMs, please contact your Silicon Mechanics sales representative.

Expert included.



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Contact Silicon Mechanics

For answers regarding processor selection, memory matching, or other questions you may have, contact one of the Experts at Silicon Mechanics:

Email: sales@siliconmechanics.com

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www.siliconmechanics.com

Expert included.