Committed to excellence

RUTRONIK
ELECTRONICS WORLDWIDE

Intel® Product Range

V4.0

intel®

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Our Product Portfolio

- Semiconductors
- Passive Components
- Electromechanical Components
- Displays & Monitors
- Boards & Systems
- Storage Technologies
- Wireless Technologies

Our Initiatives

RUTRONIK AUTOMOTIVE | RUTRONIK EMBEDDED | RUTRONIK POWER | RUTRONIK SMART

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Committed to Excellence

Consult – Know-how. Built-in.

The Technical Competence from Rutronik

Worldwide and individual consulting on the spot: by competent sales staff, application engineers and product specialists.

Components – Variety. Built-in.

The Product Portfolio from Rutronik

Wide product range of semiconductors, passive and electro-mechanical components, displays & monitors, boards & systems, storage and wireless technologies for optimum coverage of your needs.

Logistics – Reliability. Built-in.

The Delivery Service from Rutronik

Innovative and flexible solutions: from supply chain management to individual logistics systems.

Quality – Security. Built-in.

Quality Management without Compromise

The integrated management system (IMS) encompasses quality control, information security, environmental protection, occupational health and safety.

From the Edge of IoT to Cloud – Possible with Intel® Technologies

Rutronik is proud to present you the second edition of our comprehensive overview of the latest, mostly embedded products from Intel.

With a strong reputation earned after supplying leading-edge silicon for nearly half a century, Intel is a dedicated partner to the industrial industry underlining this focus to the embedded marked additionally with the announcement of extending longevity of the newest embedded processors and chipsets to 15 years.

This acknowledges a long lasting wish and requirement of the industrial/embedded industry to be able to build stable products for years without frequent re-qualifications.

Intel offers the quality products, reliability, proven innovation to assist developers who are responding to demanding customer requirements and deadlines. Pre-integrated and pre-validated, Intel system solutions save developers time and costs, bringing industrial solutions to market faster and more affordably.

Many customers are faced with increasing design requirements as more devices become connected in the factory through the Internet of Things (IoT). Many want more affordable products and are looking for new technologies that enable them to differentiate themselves in the marketplace.

With the number of Internet-enabled devices growing, solution providers are focused on processing power, greater networking intelligence, system security and manageability and extracting the value locked within data to drive quality and faster time to market.

Intel hardware and software excel in these areas, offering

- Scalable computing performance
- Security, manageability and connectivity
- Deterministic real-time performance
- Scalable, flexible and compatible software
- Faster time to market
- Standards-based platforms

Rutronik as an Intel authorised distributor is able to offer the whole Intel product protfolio. Furthermore Rutronik complements the Intel portfolio with a number of Intel based embedded boards and system suppliers. This one stop shopping is back by trained BDM's and FAE's throughout EMEA and dedicated product and line managers.

This brochure can help you select the right Intel embedded platforms and products for your applications. If you still have questions please do not hesitate to contact one of our sales offices in EMEA for support.

Intel® Atom® Processor C3000 Series

Formerly Denverton

Intel Atom® C3000 processor series, formerly Denverton, is Intel's third generation system-on-a-chip (SoC)-based CPU manufactured on Intel's optimized 14 nm process technology. The platform extends industry-leading performance per watt, low thermal design power (TDP) and unprecedented levels of configurable high-speed I/O for accelerated innovation across networking, storage, Internet of Things (IoT) and scalable solutions. It also offers extensive software integration functionality, including Intel® QuickAssist Technology (Intel® QAT) to accelerate and compress cryptographic workloads.

Performance for High-Density, Low-Power Designs

Performance improvements over previous generations with an integrated/high-density design and low TDP.

Server-Grade Capabilities

Integration with Intel® QAT for compression and cryptography acceleration and new reliability, availability and serviceability (RAS) functionality.

Multi-Core Scalability

Multiple product configuration options from 2–16 processing cores to scale one design across many use cases.

Long Life and Extended Temperature for Demanding IoT Designs

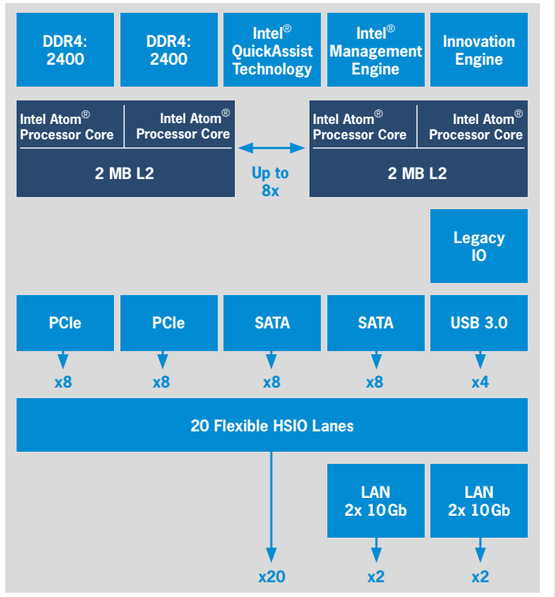
Select processors offer 15 year availability and 10 year product reliability with extended temperature ranges from -40 up to +85°C.

High-Speed I/O Configurability

Faster transmission of large data files with 10 Gb Ethernet and configurable I/O lanes using PCIe gen 3, SATA and USB 3.0.

Innovation Engine

Enables next-generation systems to customize solution firmware to drive greater operational efficiency, security and predictive maintenance.



	Intel Atom® Processor C3308 (4M Cache, → 2.1 GHz)	Intel Atom® Processor C3338 (4M Cache, → 2.2 GHz)	Intel Atom® Processor C3508 (8M Cache, → 1.6 GHz)	Intel Atom® Processor C3538 (8M Cache, → 2.1 GHz)	Intel Atom® Processor C3558 (8M Cache, → 2.2 GHz)	Intel Atom® Processor C3708 (16M Cache, → 1.7 GHz)	Intel Atom® Processor C3758 (16M Cache, → 2.2 GHz)	Intel Atom® Processor C3808 (12M Cache, → 2.0 GHz)	Intel Atom® Processor C3858 (12M Cache, → 2.0 GHz)	Intel Atom® Processor C3958 (16M Cache, → 2.0 GHz)
Code Name	Denverton	Denverton	Denverton	Denverton	Denverton	Denverton	Denverton	Denverton	Denverton	Denverton
Essentials										
Processor Number	C3308	C3338	C3508	C3538	C3558	C3708	C3758	C3808	C3858	C3958
Launch Date	Q3'17	Q1'17	Q3'17	Q3'17	Q3'17	Q3'17	Q3'17	Q3'17	Q3'17	Q3'17
Lithography	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm
Performance										
# of Cores	2	2	4	4	4	8	8	12	12	16
# of Threads	2	2	4	4	4	8	8	12	12	16
Processor Base Frequency	1.60 GHz	1.50 GHz	1.60 GHz	2.10 GHz	2.20 GHz	1.70 GHz	2.20 GHz	2.00 GHz	2.00 GHz	2.00 GHz
Max Turbo Frequency	2.10 GHz	2.20 GHz	1.60 GHz	2.10 GHz	2.20 GHz	1.70 GHz	2.20 GHz	2.00 GHz	2.00 GHz	2.00 GHz
Cache	4 MB	4 MB	8 MB	8 MB	8 MB	16 MB	16 MB	12 MB	12 MB	16 MB
TDP	9.5 W	9 W	11.5 W	15 W	16 W	17 W	25 W	25 W	25 W	31 W
Supplemental Information										
Embedded Options Available	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Memory Specifications										
Max Memory Size (dep. on memory type)	128 GB	128 GB	256 GB	256 GB	256 GB	256 GB	256 GB	256 GB	256 GB	256 GB
Memory Types	DDR4: 1866	DDR4: 1866	DDR4: 1866	DDR4: 2133	DDR4: 2133	DDR4: 2133	DDR4: 2400	DDR4: 2133	DDR4: 2400	DDR4: 2400
Max # of Memory Channels	1	1	2	2	2	2	2	2	2	2
ECC Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Expansion Options										
PCI Express Revision	3	3	3	3	3	3	3	3	3	3
PCI Express Configurations	x2, x4	x2, x4, x8	x2, x4, x8	x2, x4, x8	x2, x4, x8	x2, x4, x8	x2, x4, x8	x2, x4, x8	x2, x4, x8	x2, x4, x8
Max # of PCI Express Lanes	6	10	8	12	12	16	16	16	16	16
I/O Specifications										
# of USB Ports	8	8	8	8	8	8	8	8	8	8
USB Revision	3	3	3	3	3	3	3	3	3	3
Total # of SATA Ports	6	10	8	12	12	16	16	16	16	16
Integrated LAN	4x2.5/1 GbE	4x2.5/1 GbE	4x2.5/1 GbE	2x10/2.5/1GbE + 2x2.5/1GbE	2x10/2.5/1GbE + 2x2.5/1GbE	4x10/2.5/1 GbE	4x10/2.5/1 GbE	4x10/2.5/1 GbE	4x10/2.5/1 GbE	4x10/2.5/1 GbE
Max # of SATA 6 Gb/s Ports	6	10	8	12	12	16	16	16	16	16
Package Specifications										
Sockets Supported	FCBGA1310	FCBGA1310	FCBGA1310	FCBGA1310	FCBGA1310	FCBGA1310	FCBGA1310	FCBGA1310	FCBGA1310	FCBGA1310
Max CPU Configuration	1	1	1	1	1	1	1	1	1	1
T Junction	100°C	100°C	100°C	100°C	100°C	100°C	100°C	100°C	100°C	100°C
Package Size (mm)	34 x 28 mm	34 x 28 mm	34 x 28 mm	34 x 28 mm	34 x 28 mm	34 x 28 mm	34 x 28 mm	34 x 28 mm	34 x 28 mm	34 x 28 mm
Advanced Technologies										
Intel® Turbo Boost Technology	2.0	2.0	No	No	No	No	No	No	No	No
Secure Boot	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Hyper-Threading Technology	No	No	No	No	No	No	No	No	No	No
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® VT-x with Extended Page Tables (EPT)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Integrated Intel® QuickAssist Technology	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Security & Reliability										
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Secure Key	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Software Guard Extensions (Intel® SGX)	No	No	No	No	No	No	No	No	No	No
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® OS Guard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Boot Guard	No	No	No	No	No	No	No	No	No	No

Intel® Pentium® Gold and Celeron® Processors

Formerly Coffe Lake & Comet Lake

Impressive performance for work and play. The new Pentium® Gold processor provides great value and the performance to do daily activities plus the next level of power to do beginning photo and video editing and seamlessly multitask. Enjoy quick processing and vivid graphics from a new computer with an Intel® Pentium® Gold processor. The processors are ideal for everyday computing like basic productivity, browsing visually stunning webpages and editing photos. Whether it's a notebook, convertible, Chromebook, All-in-One, mini PC or desktop PC, Intel® Pentium® Gold and Intel® Celeron® processor-based PCs offer reliable performance at an affordable price for value-oriented buyers.

Intel® Pentium® Gold and Celeron® Mobile Processors

Now you can enjoy the experiences you've wanted from your entry devices notebook, convertible and other innovative form factor PCs with the security and connectivity options you need for a protected lifestyle - whether you're a Chromebook, Windows or Linux user. Intel® Pentium® Gold and Celeron® processors support up to three external monitors and deliver more processor and graphics performance and great battery life in your choice of platform and OS, all at a price point for casual users who still want rich experiences.

Enjoy more computing and greater graphics longer

The latest Pentium® Gold and Celeron® processors give your platform the computing and visual power you've wanted.

Chromebook users can also expect better performance on devices to enjoy more apps and rich online experiences. Whether you're a Windows or Chromebook user, you can now multitask i.e., watch movies/ games and Skype at the same time and still have power for your other activities.

Intel® Processor Graphics Gen9 makes casual game play snappy, enables smooth video streaming for all your online entertainment and gives you enhanced video chatting for more personal online interactions with friends and family.

Besides a new level of performance, more power efficiency and energy-saving standby give you great battery life. Binge watch your movies, chat and be productive.

Intel® Pentium® Gold and Celeron® Desktop Processors

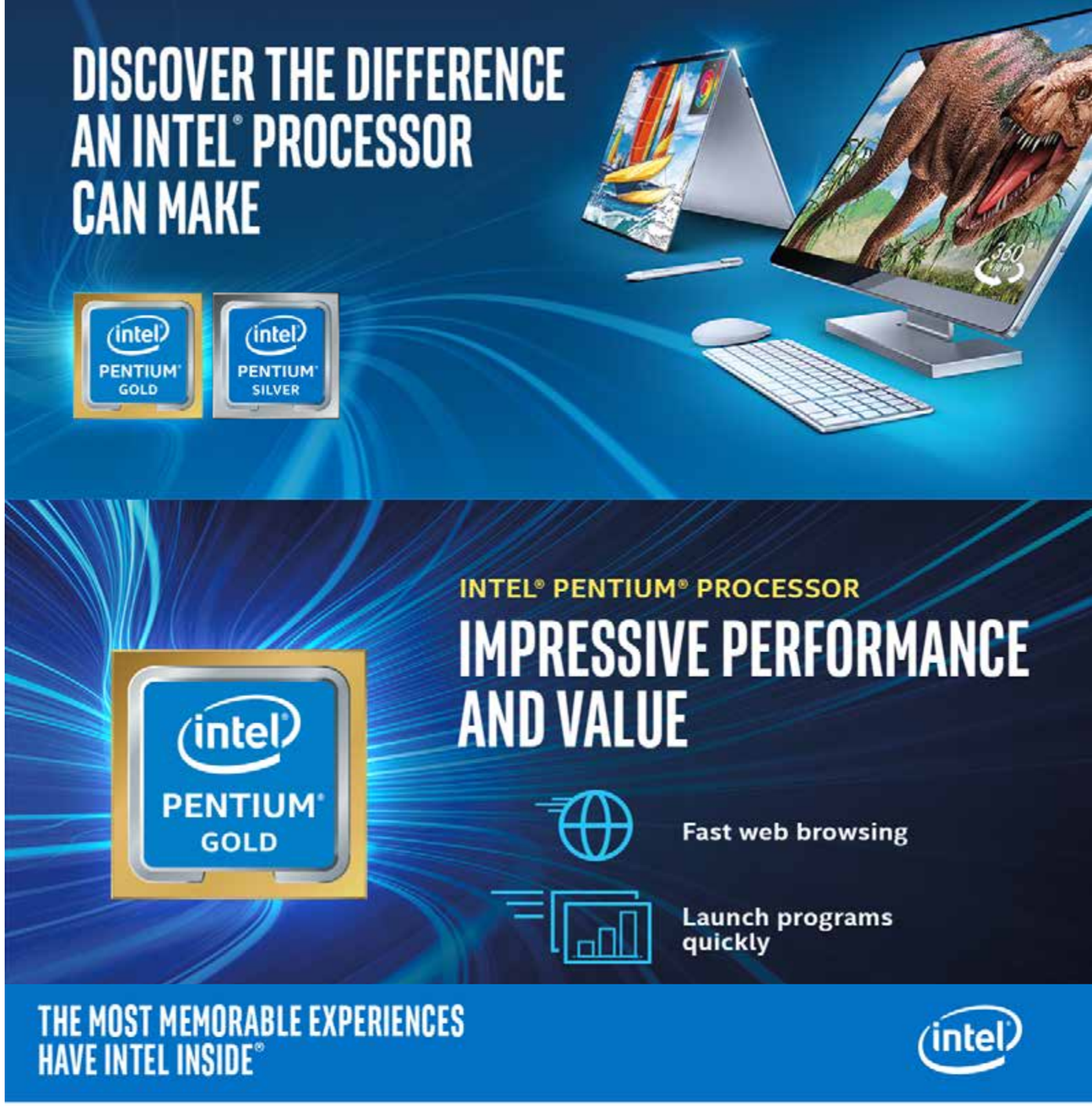
The new Intel® Pentium® Gold processor provides great value and the performance to do daily activities plus the next level of power to do beginning photo and video editing, seamlessly multitask and even run 4K media. Enjoy quick processing and vivid graphics from a new computer with an Intel® Pentium® Gold processor. The new Intel Pentium® Gold and Celeron® processor-based PC offers solid performance to run applications such as web browsing, HD video steaming and productivity software simultaneously and efficiently.

PCs based on the new Intel Pentium® Gold and Celeron® processors are well suited to the home/ voffice. With improved performance and power efficiency, PCs based on the new Intel Pentium® and Celeron® processors are an excellent choice for small businesses and education.

Product Performance

The new Intel Pentium® Gold and Celeron® processors offer great performance that end users can experience and appreciate. With the power and features of the Intel® 300 Series chipset, this platform provides high bandwidth I/O interfaces with great flexibility, including support for the latest DDR4 memory technology and premium 4K content. Intel® Hyper-Threading Technology (Intel® HT Technology) is now available on the new Intel® Pentium® Gold processors. Thanks to Intel HT Technology, your PCs can improve productivity by doing more simultaneously without slowing down.

Intel® HD Graphics makes casual game play snappy, enables smooth video streaming for all your online entertainment and gives you enhanced video chatting for more personal online interactions with friends and family.



CHOOSE THE RIGHT LEVEL OF PROCESSOR FOR YOU	PERFORMANCE AND VALUE	POWER AND PERFORMANCE ↑		
	Intel Pentium Gold	Intel Core i3	Intel Core i5	Intel Core i7
Use the Internet, email & chat	✔	✔	✔	✔
Simple office tasks	✔	✔	✔	✔
Run multiple programs at once		✔	✔	✔
Enjoy 4K videos and HD photos		✔	✔	✔
Edit and create content in full HD resolution			✔	✔
Power for the most demanding apps and games				✔

Intel® Pentium® Gold and Celeron® Processors

	Intel® Celeron® Processor G4930E	Intel® Celeron® Processor G4932E	Intel® Celeron® Processor G4900	Intel® Celeron® Processor G4900T	Intel® Pentium® Gold Processor G5400	Intel® Pentium® Gold Processor G5400T	Intel® Celeron® Processor G5900E	Intel® Celeron® Processor G5900TE	Intel® Pentium® Gold Processor G6400E	Intel® Pentium® Gold Processor G6400TE
Product Collection		Intel® Celeron® Processor G Series			Intel® Pentium® Gold Processor Series		Intel® Celeron® Processor G Series		Intel® Pentium® Gold Processor Series	
Processor Number	G4930E	G4932E	G4900	G4900T	G5400	G5400T	G5900E	G5900TE	G6400E	G6400TE
Lithography	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm
Performance Specifications										
# of Cores	2	2	2	2	2	2	2	2	2	2
# of Threads	2	2	2	2	4	4	2	2	4	4
Processor Base Frequency	2.40 GHz	1.90 GHz	3.10 GHz	2.90 GHz	3.70 GHz	3.10 GHz	3.20 GHz	3.00 GHz	3.80 GHz	3.20 GHz
Max. Turbo Frequency	2.40 GHz	1.90 GHz								
Cache	2 MB	2 MB	2 MB Intel® Smart Cache	2 MB Intel® Smart Cache	4 MB Intel® Smart Cache	4 MB Intel® Smart Cache	2 MB Intel® Smart Cache	2 MB Intel® Smart Cache	4 MB Intel® Smart Cache	4 MB Intel® Smart Cache
Bus Speed	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s
TDP	35 W	25 W	54 W	35 W	58 W	35 W	58 W	35 W	58 W	35 W
Configurable TDP-down Frequency				1.80 GHz		2.10 GHz				
Configurable TDP-down				25 W		25 W				
Memory Specifications										
Max. Memory Size*	64 GB	64 GB	64 GB	64 GB	64 GB	64 GB	128 GB	128 GB	128 GB	128 GB
Memory Types	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400
Max. # of Memory Channels	2	2	2	2	2	2	2	2	2	2
ECC Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Max Memory Bandwidth			37.5 GB/s	37.5 GB/s	37.5 GB/s	37.5 GB/s	37.5 GB/s	37.5 GB/s	37.5 GB/s	37.5 GB/s
Processor Graphics										
Processor Graphics	Intel® UHD Graphics 610	Intel® UHD Graphics 610	Intel® UHD Graphics 610	Intel® UHD Graphics 610	Intel® UHD Graphics 610	Intel® UHD Graphics 610	Intel® UHD Graphics 610	Intel® UHD Graphics 610	Intel® UHD Graphics 610	Intel® UHD Graphics 610
Graphics Base Frequency	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz
Graphics Max Dynamic Frequency	1.05 GHz	1.05 GHz	1.05 GHz	1.00 GHz	1.05 GHz	1.05 GHz	1.00 GHz	1.00 GHz	1.05 GHz	1.05 GHz
Graphics Video Max Memory	64 GB	64 GB	64 GB	64 GB	64 GB	64 GB	64 GB	64 GB	64 GB	64 GB
Graphics Output	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI								
4K Support	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz
Max Resolution (VGA)	N/A	N/A								
Intel® Quick Sync Video	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® InTru™ 3D Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Clear Video HD Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Clear Video Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of Displays Supported	3	3	3	3	3	3	3	3	3	3
Expansion Options										
PCI Express Revision	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
PCI Express Configurations	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4
Max # of PCI Express Lanes	16	16	16	16	16	16	16	16	16	16
Package Specifications										
Sockets Supported	FCBGA1440	FCBGA1440	FCLGA1151	FCLGA1151	FCLGA1151	FCLGA1151	FCLGA1200	FCLGA1200	FCLGA1200	FCLGA1200
Max CPU Configuration	1	1	1	1	1	1	1	1	1	1
TJUNCTION	100 °C	100 °C	100 °C	88 °C	100 °C	100/88 °C	100 °C	100 °C	100 °C	100 °C
Package Size (mm)	42 x 28 mm	42 x 28 mm	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm
Thermal Solution Specification			PCG 2015C (65 W)	PCG 2015A (35 W)	PCG 2015C (65 W)	PCG 2015A (35 W)	PCG2015C	PCG2015B	PCG2015C	PCG2015B
Advanced Technologies										
Intel® Optane™ Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes				
Intel® Turbo Boost Technology	No	No	No	No	No	No	No	No	No	No
Intel vPro® Platform Eligibility	No	No	No	No	No	No	No	No	No	No
Intel® Hyper-Threading Technology	No	No	No	No	Yes	Yes	No	No	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® VT-x with Extended Page Tables (EPT)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Transactional Synchronization Extensions	No	No	No	No	No	No				
Intel® 64	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Instruction Set Extensions	Intel® SSE4.1, Intel® SSE4.2	Intel® SSE4.1, Intel® SSE4.2	Intel® SSE4.1, Intel® SSE4.2	Intel® SSE4.1, Intel® SSE4.2	Intel® SSE4.1, Intel® SSE4.2	Intel® SSE4.1, Intel® SSE4.2	Intel® SSE4.1, Intel® SSE4.2	Intel® SSE4.1, Intel® SSE4.2	Intel® SSE4.1, Intel® SSE4.2	Intel® SSE4.1, Intel® SSE4.2
Idle States	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Intel SpeedStep® Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thermal Monitoring Technologies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Identity Protection Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Stable Image Platform Program (SIPP)	No	No	No	No	No	No	No	No	No	No
Security & Reliability										
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Secure Key	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Software Guard Extensions (Intel® SGX)	Yes with Intel® ME	Yes with Intel® ME	Yes with Intel® ME	Yes with Intel® ME	Yes with Intel® ME	Yes with Intel® ME	Yes with Intel® ME	Yes with Intel® ME	Yes with Intel® ME	Yes with Intel® ME
Intel® Memory Protection Extensions (Intel® MPX)	Yes	Yes	Yes	Yes	Yes	Yes				
Intel® OS Guard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Technology	No	No	No	No	No	No	No	No	No	No
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Boot Guard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Dependent on Memory Type

9th Gen Intel® Core™ Desktop Processor

Formerly Coffee Lake

Whether you are a gamer looking for a fantastic in-game experience with the performance headroom for smooth live streaming and seamless highlights recording or you are a creator that is ready to do more creating and sharing, less time waiting, this new generation of processors is ready to take you to that new level.

Top Level of Performance

The 9th Gen Intel® Core™ processor takes mainstream desktop PC performance to a whole new level. At the top of the stack, our mainstream flagship, the new i9-9900K. The first Intel® Core™ i9 desktop processor for the mainstream users. Best in class, the i9-9900K with 16MB of cache and Intel® Turbo Boost 2.0 technology cranks maximum turbo frequency up to blazing 5.0 GHz. Throw in high performing 16-way multitasking support powered by 8 cores with Intel® Hyper-Threading Technology (Intel® HT Technology) to conquer the most demanding workloads. Want to reach for even greater levels of performance? Overclock confidently with new and enhanced features like Solder Thermal Interface Material (STIM) and improved overclocking customizations to tweak the processor performance to its unleashed potential.

The Top 9th Generation of Intel® Core™ Desktop Processor Delivers:

- A range of processors including the first unlocked Intel® Core™ i9 mainstream desktop processor
- Data acceleration when paired with Intel® Optane™ memory to retrieve data you use the most for fast system responsiveness
- DDR4 RAM memory technology support, which allows systems to have up to 64 GB of memory and up to 2666 MT/s memory transfer speeds
- Intel® Z390 chipset support which includes unprecedented connectivity to all of your devices with integrated USB 3.1 Gen 2, Intel® Wireless-AC and support for Gigabit Wi-Fi speed
- Compatible with Intel® 300 series chipset

Create Without Limits

Unlock your creative potential with the power you need to create, edit and share. Let your creativity flow as the 9th Generation Intel® Core™ processor renders and encodes in the background so you don't miss a beat. Minimize the wait time between inspiration and creation with Intel® Optane™ memory accelerating the loading of your most used applications.

Hardware Based Security

9th Generation Intel® Core™ processors integrate hardware level technologies that help strengthen the protection of your enabled security software. Hardware-based security helps you experience online and offline activities with added peace of mind, enabled by features that include:

- Intel® Software Guard Extensions (Intel® SGX) to help applications protect your system and your data
- Intel® BIOS Guard and Intel® Boot Guard to help protect your system during startup

Step Up to the Next Level with 9th Gen Intel® Core™ Desktop Processors

9th gen is the most powerful generation of Intel® Core™ desktop processors, with features and enhancements to evoke excitement in what you love to do. Step up to a 9th Gen Intel® Core™ processor-powered PC and experience the difference.

Content

	Intel® Core™ i3-9100E Processor	Intel® Core™ i3-9100TE Processor	Intel® Core™ i5-9500E Processor	Intel® Core™ i5-9500TE Processor	Intel® Core™ i7-9700E Processor	Intel® Core™ i7-9700TE Processor
Product Collection	9th Generation Intel® Core™ i3 Processors	9th Generation Intel® Core™ i3 Processors	9th Generation Intel® Core™ i5 Processors	9th Generation Intel® Core™ i5 Processors	9th Generation Intel® Core™ i7 Processors	9th Generation Intel® Core™ i7 Processors
Processor Number	i3-9100E	i3-9100TE	i5-9500E	i5-9500TE	i7-9700E	i7-9700TE
Launch Date	Q2'19	Q2'19	Q2'19	Q2'19	Q2'19	Q2'19
Lithography	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm
Performance Specifications						
# of Cores	4	4	6	6	8	8
# of Threads	4	4	6	6	8	8
Processor Base Frequency	3.10 GHz	2.20 GHz	3.00 GHz	2.20 GHz	2.60 GHz	1.80 GHz
Cache	6 MB	6 MB	9 MB	9 MB	12 MB	12 MB
Bus Speed	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s
TDP	65 W	35 W	65 W	35 W	65 W	35 W
Max Turbo Frequency	3.70 GHz	3.20 GHz	4.20 GHz	3.60 GHz	4.40 GHz	3.80 GHz
Intel® Turbo Boost Techn. 2.0 Freq.	3.70 GHz	3.20 GHz	4.20 GHz	3.60 GHz	4.40 GHz	3.80 GHz
Memory Specifications						
Max Memory Size (dep. on mem. type)	64 GB	64 GB	128 GB	128 GB	128 GB	128 GB
Memory Types	DDR-2400	DDR-2400	DDR4-2666	DDR4-2666	DDR4-2666	DDR4-2666
Max # of Memory Channels	2	2	2	2	2	2
Max Memory Bandwidth	37.5 GB/s	37.5 GB/s	41.6 GB/s	41.6 GB/s	41.6 GB/s	41.6 GB/s
ECC Memory Supported	Yes	Yes	No	No	No	No
Processor Graphics						
Processor Graphics	Intel® UHD Graphics 630	Intel® UHD Graphics 630	Intel® UHD Graphics 630	Intel® UHD Graphics 630	Intel® UHD Graphics 630	Intel® UHD Graphics 630
Graphics Base Frequency	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz
Graphics Max Dynamic Frequency	1.05 GHz	1.05 GHz	1.10 GHz	1.10 GHz	1.15 GHz	1.15 GHz
Graphics Video Max Memory	64 GB	64 GB	128 GB	128 GB	128 GB	128 GB
4K Support	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz
Intel® Quick Sync Video	Yes	Yes	Yes	Yes	Yes	Yes
Intel® InTru™ 3D Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Clear Video HD Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Clear Video Technology	Yes	Yes	Yes	Yes	Yes	Yes
# of Displays Supported	3	3	3	3	3	3
Graphics Output	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI
Expansion Options						
PCI Express Revision	3.0	3.0	3.0	3.0	3.0	3.0
PCI Express Configurations	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4
Max # of PCI Express Lanes	16	16	16	16	16	16
Package Specifications						
Sockets Supported	FCLGA1151	FCLGA1151	FCLGA1151	FCLGA1151	FCLGA1151	FCLGA1151
TJunction	100°C	100°C	100°C	100°C	100°C	100°C
Package Size (mm)	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm
Advanced Technologies						
Intel® Optane™ Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Turbo Boost Technology	2.0	2.0	2.0	2.0	2.0	2.0
Intel vPro® Platform Eligibility	No	No	Yes	Yes	Yes	Yes
Intel® Hyper-Threading Technology	No	No	No	No	No	No
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes
Intel® VT-x with Ext. Page Tables (EPT)	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Transactional Synch. Extensions	No	No	Yes	Yes	Yes	Yes
Intel® 64	Yes	Yes	Yes	Yes	Yes	Yes
Instruction Set Extensions	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2
Idle States	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Intel SpeedStep® Technology	Yes	Yes	Yes	Yes	Yes	Yes
Thermal Monitoring Technologies	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Identity Protection Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Stable Image Platform Program (SIPP)	No	No	Yes	Yes	Yes	Yes
Security & Reliability						
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes
Secure Key	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Software Guard Extensions (Intel® SGX)	Yes with Intel® ME	Yes with Intel® ME	Yes with Intel® ME	Yes with Intel® ME	Yes with Intel® ME	Yes with Intel® ME
Intel® Memory Protection Extensions (Intel® MPX)	Yes	Yes	Yes	Yes	Yes	Yes
Intel® OS Guard	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Technology	No	No	Yes	Yes	Yes	Yes
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Boot Guard	Yes	Yes	Yes	Yes	Yes	Yes

Content

10th Gen Intel® Core™ Desktop Processor

Formerly Comet Lake

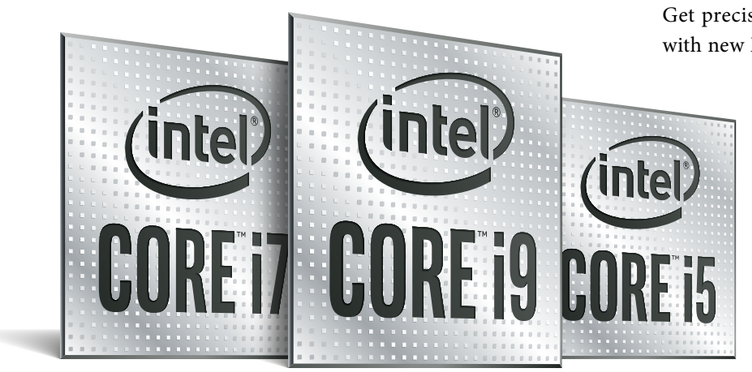
With an optimal balance of frequency, cores and threads, advanced tuning support and blazing connectivity, new 10th Generation Intel® Core™ processors help supercharge desktop PCs and enable incredible experiences and productivity for gamers, content creators and mainstream users. Shatter the performance barrier and enter the realm of immersive 4K entertainment experiences and play the latest gaming titles like never before. Or simply get work done in less time by supercharging the latest business productivity applications for a higher level of collaboration and productivity. Whether you're seeking great performance out of the box, or just want to take advantage of overclocking, there's a new 10th Generation Intel® Core™ processor for you.

Elite Performance

We are introducing Intel's fastest gaming processor with the 10th Gen Intel® Core™ i9-10900k processor and you can gain a competitive edge in both work and play. Prepare to unleash your ideas like never before, enjoy and share incredible PC gaming or get work done in less time.

When it comes to your desktop PC, you can't have too much speed. Whether enjoying the latest games or getting more done with the latest productivity apps, processor speed matters. That's why Intel engineers developed Intel® Thermal Velocity Boost (Intel® TVB). By enabling processor speeds of up to 5.3 GHz right out of the box, you're free to enjoy fast performance - whatever you're looking to accomplish.

Sometimes you need your PC to bring an extra boost - whether it's transcoding that 4K video edit or launching that new game you just installed. Now, with Intel® Turbo Boost Max Technology 3.0, you can experience an automatic performance boost when running lightly threaded applications. And with Intel® Hyper-Threading Technology (Intel® HT Technology) now available across the entire 10th Gen Intel® Core™ processor family, you can multitask with confidence and do more simultaneously, no matter which Intel® Core™ processor you choose.



Seamless Connectivity & Stunning Visual Experiences

Unleash the flexibility to do more with best-in-class connectivity, immersive entertainment and enhanced streaming.

Enjoy fast transfers of large files with greater than 2X the network speeds of 1GB Ethernet - no new cabling required. New 10th Gen Intel® Core™ processor-based desktop PCs support the new Intel® Ethernet Connection I225. Or cut the cord and take things wireless with Intel® Wi-Fi 6 AX201.

You'll be able to experience more responsive online experiences and file transfers, nearly 3X faster downloads and more reliable connections with support for the latest generation of gigabit Wi-Fi. Who wouldn't appreciate the freedom and flexibility to connect anywhere throughout the home or office?

Advanced Tuning Support

Gain ultimate control when overclocking your processor and key system components with features enabled by new unlocked and overclockable 10th Gen Intel® Core™ processors. For those looking to push the limits of performance when gaming or running demanding productivity applications, overclocking is your path to a higher level of experience. Precisely tune and get even more performance from unlocked 10th Gen Intel® Core™ processors with new precision overclocking controls designed for gamers, content creators and overclocking enthusiasts.

Get precise control when pushing the limits of performance with new Enhanced Voltage Frequency Control. You'll be able to dial in your processor's GHz when setting the speed of your processor above the factory default settings.

If you're ready to take advantage of advanced tuning support to overclock, look for the letter "K" in a processor number - this is your sign that it's unlocked and overclockable.

	Intel® Core™ i3-10100E Processor	Intel® Core™ i3-10100TE Processor	Intel® Core™ i5-10500E Processor	Intel® Core™ i5-10500TE Processor	Intel® Core™ i7-10700E Processor	Intel® Core™ i7-10700TE Processor	Intel® Core™ i9-10900E Processor	Intel® Core™ i9-10900TE Processor
Product Collection	10th Generation Intel® Core™ i3 Processors	10th Generation Intel® Core™ i3 Processors	10th Generation Intel® Core™ i5 Processors	10th Generation Intel® Core™ i5 Processors	10th Generation Intel® Core™ i7 Processors	10th Generation Intel® Core™ i7 Processors	10th Generation Intel® Core™ i9 Processors	10th Generation Intel® Core™ i9 Processors
Vertical Segment	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded
Processor Number	i3-10100E	i3-10100TE	i5-10500E	i5-10500TE	i7-10700E	i7-10700TE	i9-10900E	i9-10900TE
Launch Date	Q2'20	Q2'20	Q2'20	Q2'20	Q2'20	Q2'20	Q2'20	Q2'20
Lithography	14nm	14nm	14nm	14nm	14nm	14nm	14nm	14nm
Performance Specifications								
# of Cores	4	4	6	6	8	8	10	10
# of Threads	8	8	12	12	16	16	20	20
Processor Base Frequency	3.20GHz	2.30GHz	3.10GHz	2.30GHz	2.90GHz	2.00GHz	2.80GHz	1.80GHz
Cache	6MB Intel® Smart Cache	6MB Intel® Smart Cache	12MB Intel® Smart Cache	12MB Intel® Smart Cache	16MB Intel® Smart Cache	16MB Intel® Smart Cache	20MB Intel® Smart Cache	20MB Intel® Smart Cache
Bus Speed	8GT/s	8GT/s	8GT/s	8GT/s	8GT/s	8GT/s	8GT/s	8GT/s
TDP	65W	35W	65W	35W	65W	35W	65W	35W
Max Turbo Frequency	3.80GHz	3.60GHz	4.20GHz	3.70GHz	4.50GHz	4.40GHz	4.70GHz	4.50GHz
Intel® Turbo Boost Technology 2.0 Frequency	3.80GHz	3.60GHz	4.20GHz	3.70GHz				
Intel® Turbo Boost Max Technology 3.0 Frequency					4.50GHz	4.40GHz	4.70GHz	4.50GHz
Intel® Thermal Velocity Boost Freq.							4.70GHz	
Memory Specifications								
Max Memory Size	128GB	128GB	128GB	128GB	128GB	128GB	128GB	128GB
Memory Types	DDR4-2666	DDR4-2666	DDR4-2666	DDR4-2666	DDR4-2933	DDR4-2933	DDR4-2933	DDR4-2933
Max # of Memory Channels	2	2	2	2	2	2	2	2
Max Memory Bandwidth	41.6GB/s	41.6GB/s	41.6GB/s	41.6GB/s	45.8GB/s	45.8GB/s	45.8GB/s	45.8GB/s
ECC Memory Supported	Yes	Yes	No	No	No	No	No	No
Processor Graphics								
Processor Graphics	Intel® UHD Graphics 630							
Graphics Base Frequency	350MHz	350MHz	350MHz	350MHz	350MHz	350MHz	350MHz	350MHz
Graphics Max Dynamic Frequency	1.10GHz	1.10GHz	1.15GHz	1.15GHz	1.15GHz	1.15GHz	1.20GHz	1.20GHz
Graphics Video Max Memory	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB
4K Support	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz
Intel® Quick Sync Video	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® InTru™ 3D Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Clear Video HD Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of Displays Supported	3	3	3	3	3	3	3	3
Graphics Output	eDP/DP/HDMI/DVI							
Expansion Options								
PCI Express Revision	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
PCI Express Configurations	Up to 1x16, 2x8, 1x8+2x4							
Max # of PCI Express Lanes	16	16	16	16	16	16	16	16
Package Specifications								
Sockets Supported	FCLGA1200	FCLGA1200	FCLGA1200	FCLGA1200	FCLGA1200	FCLGA1200	FCLGA1200	FCLGA1200
Thermal Solution Specification	PCG2015C	PCG2015B	PCG2015C	PCG2015B	PCG 2015C	PCG 2015B	PCG 2015C	PCG 2015B
TJUNCTION	100°C	100°C	100°C	100°C	100°C	100°C	100°C	100°C
Package Size (mm)	37.5 x 37.5mm							
Advanced Technologies								
Intel® Turbo Boost Technology	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Intel vPro® Platform Eligibility	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualiz. Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® VT-xW. Extended Page Tables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® 64	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Instruction Set Extensions	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2							
Idle States	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Intel SpeedStep® Techn.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thermal Monitoring Technologies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Identity Protection Techn.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Stable Image Platform Program	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Turbo Boost Max Techn. 3.0					Yes	Yes	Yes	Yes
Intel® Thermal Velocity Boost							Yes	
Security & Reliability								
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Secure Key	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Software Guard Extensions	Yes With Intel® ME							
Intel® OS Guard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Techn.	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Boot Guard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Intel® Xeon® Processor D-2100

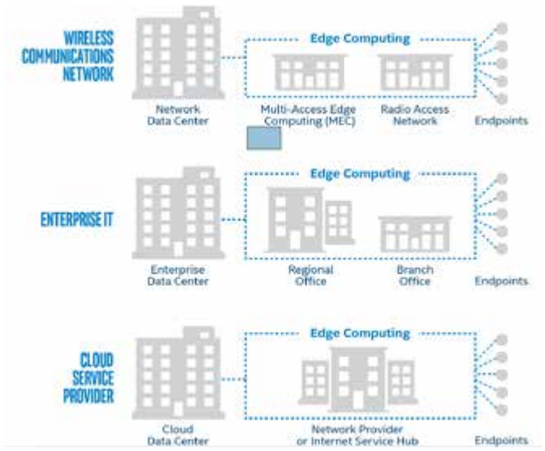
Formerly Skylake

The Intel® Xeon® D-2100 processor delivers Intel's most transformative and ground-breaking data center processor architecture in a form factor optimized for flexible, scalable, high-density network, storage and cloud edge solutions. It brings the architectural innovations of the Intel® Xeon® Scalable platform to a system-on-a-chip (SoC) processor for lower-power, high-density solutions, integrating essential network, security and acceleration capabilities. A software-programmable platform featuring robust virtualization support, with low latency, high-bandwidth capabilities through a flexible design, for a variety of solution and service deployments in space and power constrained environments. Design innovation delivers seamless solution scalability from the data center to the network edge.

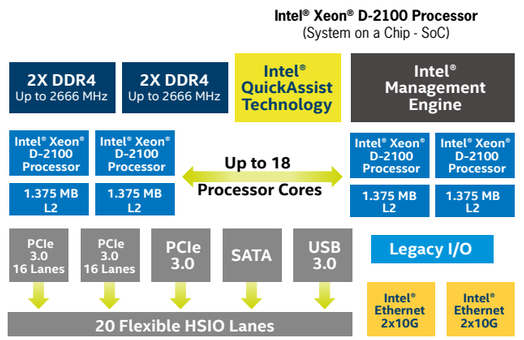
With a range of 4 to 18 cores, up-to 512 GB of addressable memory, this system-on-a-chip (SoC) has an integrated Platform Controller Hub (PCH), integrated high-speed I/O, up-to four integrated 10 Gigabit Intel® Ethernet ports and a thermal design power (TDP) of 60 to 110 Watts. It can run the same instruction set as more robust Intel Xeon Scalable processors to provide software consistency and scale from the data center to the edge. It also provides advanced server-class capabilities, including:

- New Intel® Advanced Vector Extensions 512 (Intel® AVX-512) delivers workload-optimized performance and throughput increases for advanced analytics, compute-intensive applications, cryptography and data compression
- Enhanced Intel® QuickAssist Technology (Intel® QAT), available as an integrated option, delivers chipset-based hardware acceleration, up-to 100 Gb/s, for growing cryptography, encryption and decryption workloads for greater efficiency while delivering enhanced transport and protection across server, storage and network infrastructure
- Built-In Hardware Virtualization using Intel® Virtualization Technology (Intel® VT) to enable dynamic provisioning of services as communication service providers extend network functions virtualization (NFV) to the network edge
- Intel x86 64-bit Software Support for scalable performance and broad application compatibility
- Enhanced Reliability, Availability and Serviceability (RAS) features, including support for error-correcting code (ECC) memory and platform-level error management
- Intel® Platform Storage Extensions to enable smarter and more cost-effective storage solutions through integrated technologies that accelerate data movement, protect data and simplify data management
- Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI) accelerates data encryption and decryption for secure websites

Industries and Customers Use the Edge Differently



Intel® Xeon® D-2100 Processor Design Flexibility



Diagrams are provided for illustration purposes only. Diagrams (above) and table (right) are not a comprehensive list of product features or capabilities. Product details and features are subject to change without notice.

	Intel® Xeon® D-2142IT Processor (11M Cache, 1.90 GHz)	Intel® Xeon® D-2143IT Processor (11M Cache, 2.20 GHz)	Intel® Xeon® D-2145NT Processor (11M Cache, 1.90 GHz)	Intel® Xeon® D-2146NT Processor (11M Cache, 2.30 GHz)	Intel® Xeon® D-2163IT Processor (16.5M Cache, 2.10 GHz)	Intel® Xeon® D-2166NT Processor (16.5M Cache, 2.00 GHz)	Intel® Xeon® D-2173IT Processor (19.25M Cache, 1.70 GHz)	Intel® Xeon® D-2177NT Processor (19.25M Cache, 1.90 GHz)	Intel® Xeon® D-2183IT Processor (22M Cache, 2.20 GHz)	Intel® Xeon® D-2187NT Processor (22M Cache, 2.00 GHz)
Code Name	Skylake	Skylake	Skylake	Skylake	Skylake	Skylake	Skylake	Skylake	Skylake	Skylake
Essentials										
Processor Number	D-2142IT	D-2143IT	D-2145NT	D-2146NT	D-2163IT	D-2166NT	D-2173IT	D-2177NT	D-2183IT	D-2187NT
Launch Date	Q1'18	Q1'18	Q1'18	Q1'18	Q1'18	Q1'18	Q1'18	Q1'18	Q1'18	Q1'18
Lithography	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm
Performance										
# of Cores	8	8	8	8	12	12	14	14	16	16
# of Threads	16	16	16	16	24	24	28	28	32	32
Processor Base Frequency	1.90 GHz	2.20 GHz	1.90 GHz	2.30 GHz	2.10 GHz	2.00 GHz	1.70 GHz	1.90 GHz	2.20 GHz	2.00 GHz
Max Turbo Frequency	3.00 GHz	3.00 GHz	3.00 GHz	3.00 GHz	3.00 GHz	3.00 GHz	3.00 GHz	3.00 GHz	3.00 GHz	3.00 GHz
Cache	11 MB	11 MB	11 MB	11 MB	17 MB	17 MB	19 MB	19 MB	22 MB	22 MB
# of UPI Links	0	0	0	0	0	0	0	0	0	0
TDP	65 W	65 W	65 W	80 W	75 W	85 W	70 W	105 W	100 W	110 W
Supplemental Information										
Embedded Options Available	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Memory Specifications										
Max Memory Size (dependent on memory type)	512 GB	512 GB	512 GB	512 GB	512 GB	512 GB	512 GB	512 GB	512 GB	512 GB
Memory Types	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4
Maximum Memory Speed	2133 MHz	2133 MHz	2133 MHz	2133 MHz	2133 MHz	2133 MHz	2133 MHz	2667 MHz	2400 MHz	2667 MHz
Max # of Memory Channels	4	4	4	4	4	4	4	4	4	4
ECC Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Expansion Options										
Scalability	1S Only	1S Only	1S Only	1S Only	1S Only	1S Only	1S Only	1S Only	1S Only	1S Only
PCI Express Revision	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Max # of PCI Express Lanes	32	32	32	32	32	32	32	32	32	32
Package Specifications										
Sockets Supported	FCBGA2518	FCBGA2518	FCBGA2518	FCBGA2518	FCBGA2518	FCBGA2518	FCBGA2518	FCBGA2518	FCBGA2518	FCBGA2518
Advanced Technologies										
Intel® Turbo Boost Technology	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® VT-x With Extended Page Tables (EPT)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® TSX-NI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® 64	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Instruction Set Extensions	Intel® AVX2	Intel® AVX2	Intel® AVX2	Intel® AVX2	Intel® AVX2	Intel® AVX2	Intel® AVX2	Intel® AVX2	Intel® AVX2	Intel® AVX2
# of AVX-512 FMA Units	1	1	1	1	1	1	1	1	1	1
Idle States	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Intel SpeedStep® Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thermal Monitoring Technologies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Integrated Intel® QuickAssist Technology	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes
Intel® Volume Management Device (VMD)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Security & Reliability										
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Secure Key	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Memory Protection Extensions (Intel® MPX)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® OS Guard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Boot Guard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Intel® Xeon® E-2200 Processor

Formerly Coffee Lake

Performance and Security, Intelligently Designed for Growth

Business computing needs are growing in sophistication and complexity. Servers that are just a few years old are no longer sufficient to support the demands of today's workloads, which are increasing in capabilities to deliver business intelligence, acceleration and agility. New business opportunities, customers and workloads drive a need for tools and technology that will help you win and stay ahead of the competition. With a wide-range of solutions in the marketplace, it can be difficult to identify the right solution for your needs of today and prepare for a winning future.

At Intel, we appreciate these challenges and have worked to understand your needs and demands. We have partnered with industry leaders and solution providers to deliver you a professional-grade solution built from the ground-up with your needs in mind. Intel® Xeon® processors deliver trusted performance and proven innovation, starting with our entry Intel Xeon E processor family. As your business grows and demands increase, so does the Intel Xeon processor portfolio with performance scale and capabilities that extend to our Intel Xeon Scalable processors. Entry servers and secure cloud services built on the Intel Xeon E processor offer a foundation of capabilities that support your growing and changing demands.

Entry Server Solutions for Small Business

Small businesses are looking for server solutions that deliver productivity, reliability and hardware-enhanced security and complement other IT investment options such as cloud-based services. An on-premise server can help address a number of challenges, including the uncertainty for setup and ongoing cost of cloud services, support for legacy applications, regulatory compliance and the need to protect sensitive customer data. A mix of cloud services and in-house solutions provides the flexibility to choose and mix the correct balance for your business needs.

An entry server built with the Intel Xeon E processor is a smart investment positioning you for growth while providing a reliable, always available solution to protect your data and host critical business software solutions. No matter the size of your business, the value of your data is enormous. Keep it accessible and better protected at all times with an affordable Intel Xeon E processor-based server.

Advanced Security for Cloud Services

Intel Xeon E processors feature an advanced security technology, known as Intel® Software Guard Extensions (Intel® SGX). Software enhanced with Intel SGX helps protect application code and data from disclosure or modification, enhancing the security of cloud service workloads and applications. Developers can use Intel SGX to partition their application into protected areas of execution in memory known as processor-hardened enclaves to enhance security even on a platform that becomes compromised. Intel Xeon E processors with Intel SGX can be used in concert with existing data center infrastructure, to protect the most sensitive portions of an application or data being used in a workload or service. Businesses and cloud service providers use Intel Xeon E processors with Intel SGX to protect a variety of applications and data.

Introducing the new Intel Xeon E-2200 processor

Featuring improvements in processor speeds, higher core count options, expanded enclave capacities and more, Intel Xeon E-2200 processors deliver a significant impact, especially compared with hardware that is just a few years old. With up to a 2X overall erformance increase, compared to 2015 Intel Xeon E3-1200v5 processors, Intel Xeon E-2200 processors deliver performance to manage today's most demanding entry server workloads and offer significant advantages over much of the existing installed base.

Even compared to the prior generation of Intel Xeon E-2100 processors, Intel Xeon E-2200 processors deliver up to a 1.2X increase in performance. And both of these latest generations are pin compatible and use the same Intel® 240 Series chipsets.

	Intel® Xeon® E-2226GE Processor	Intel® Xeon® E-2254ME Processor	Intel® Xeon® E-2254ML Processor	Intel® Xeon® E-2276ME Processor	Intel® Xeon® E-2276ML Processor	Intel® Xeon® E-2278GE Processor	Intel® Xeon® E-2278GEL Processor
Product Collection	Intel® Xeon® E Processor	Intel® Xeon® E Processor	Intel® Xeon® E Processor	Intel® Xeon® E Processor	Intel® Xeon® E Processor	Intel® Xeon® E Processor	Intel® Xeon® E Processor
Processor Number	E-2226GE	E-2254ME	E-2254ML	E-2276ME	E-2276ML	E-2278GE	E-2278GEL
Launch Date	Q2'19	Q2'19	Q2'19	Q2'19	Q2'19	Q2'19	Q2'19
Lithography	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm
Performance Specifications							
# of Cores	6	4	4	6	6	8	8
# of Threads	6	8	8	12	12	16	16
Processor Base Frequency	3.40 GHz	2.60 GHz	1.70 GHz	2.80 GHz	2.00 GHz	3.30 GHz	2.00 GHz
Max Turbo Frequency	4.60 GHz	3.80 GHz	3.50 GHz	4.50 GHz	4.20 GHz	4.70 GHz	3.90 GHz
Cache	12 MB Intel® Smart Cache	8 MB	8 MB	12 MB	12 MB	16 MB	16 MB
Bus Speed	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s
Intel® Turbo Boost Technology 2.0 Freq.	4.60 GHz	3.80 GHz	3.50 GHz	4.50 GHz	4.20 GHz	4.70 GHz	3.90 GHz
TDP	80 W	45 W	25 W	45 W	25 W	80 W	35 W
Configurable TDP-down		35 W		35 W			
Memory Specifications							
Max Memory Size (dep. on memory type)	128 GB	64 GB	64 GB	64 GB	64 GB	128 GB	128 GB
Memory Types	DDR4-2666	DDR4-2666	DDR4-2666	DDR4-2666	DDR4-2666	DDR4-2666	DDR4-2666
Max # of Memory Channels	2	2	2	2	2	2	2
Max Memory Bandwidth	41.6 GB/s					41.6 GB/s	41.6 GB/s
ECC Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Processor Graphics							
Processor Graphics	Intel® UHD Graphics 630	Intel® UHD Graphics P630	Intel® UHD Graphics P630	Intel® UHD Graphics P630	Intel® UHD Graphics P630	Intel® UHD Graphics 630	Intel® UHD Graphics 630
Graphics Base Frequency	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz
Graphics Max Dynamic Frequency	1.20 GHz	1.10 GHz	1.10 GHz	1.15 GHz	1.15 GHz	1.20 GHz	1.20 GHz
Graphics Video Max Memory	128 GB	64 GB	64 GB	64 GB	64 GB	128 GB	128 GB
Graphics Output	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI
4K Support	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz	Yes, at 60 Hz
Intel® Quick Sync Video	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® InTru™ 3D Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Clear Video HD Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Clear Video Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of Displays Supported	3	3	3	3	3	3	3
Expansion Options							
PCI Express Revision	3.0	3.0	3.0	3.0	3.0	3.0	3.0
PCI Express Configurations	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4
Max # of PCI Express Lanes	16	16	16	16	16	16	16
Package Specifications							
Sockets Supported	FCLGA1151	FCBGA1440	FCBGA1440	FCBGA1440	FCBGA1440	FCLGA1151	FCLGA1151
Max CPU Configuration	1	1	1	1	1	1	1
TJUNCTION		100	100	100	100		
Package Size (mm)	37.5 x 37.5 mm	42 x 28 mm	42 x 28 mm	42 x 28 mm	42 x 28 mm	37.5 x 37.5 mm	37.5 x 37.5 mm
Advanced Technologies							
Intel® Optane™ Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Turbo Boost Technology	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Intel vPro® Platform Eligibility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Hyper-Threading Technology	No	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® VT-x With Extended Page Tables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Transactional Sync. Extensions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Instruction Set Extensions	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2						
Idle States	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Intel SpeedStep® Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thermal Monitoring Technologies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Speed Shift Technology		Yes	Yes	Yes	Yes		
Intel® MyWiFi Technology		Yes	Yes	Yes	Yes		
Intel® Flex Memory Access		Yes	Yes	Yes	Yes		
Intel® Identity Protection Technology		Yes	Yes	Yes	Yes		
Intel® Stable Image Platform Program		Yes	Yes	Yes	Yes		
Security & Reliability							
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Secure Key	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Software Guard Extensions	Yes With Intel® ME	Yes With Intel® ME	Yes With Intel® ME	Yes With Intel® ME	Yes With Intel® ME	Yes With both Intel® SPS and Intel® ME	
Intel® Memory Protection Extensions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® OS Guard	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Boot Guard	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Intel® Xeon® W-1200 Processor

Formerly Comet Lake

Professional Performance

Intel® Xeon® W-1200 processors (succeeding the Intel® Xeon® E-2200 processors) deliver great performance for entry workstation users with integrated processor graphics alongside the added reliability and confidence of ECC memory. Get outstanding performance plus best-in-class manageability features and support for ground-breaking technologies that enable you to visualize, simulate, research and work with greater accuracy than ever before.

A New Level of Performance:

Designed to deliver an entry-level platform for professionals requiring a true workstation, Intel® Xeon® W-1200 processors are specially optimized for a wide range of workflows and industries including health and life sciences, financial services, architecture, engineering and construction (AEC).

Enterprise-Grade Reliability

When it comes to business, data integrity and system up-time is a priority for workstation users. That's why Intel® Xeon® W-1200 processors feature Intel vPro™ manageability and support for fast ECC memory so your critical data is protected from random soft- memory bit-errors and IT can easily manage the system.

Advanced Connectivity & Visual Support

Unleash the flexibility to do more with best-in-class connectivity and integrated graphics enabling advanced visual support.

- GET BEST-IN-CLASS CONNECTIVITY with 2.5G Intel® Ethernet Connection I2254, Thunderbolt™ 3 & integrated Intel® Wi-Fi 6 AX201 Module
- ENABLE MODERN VISUAL EXPERIENCES with decode and encode support for 4K, HDR, Wide Color Gamut, HDCP 2 and HEVC 10b
- DELIVER FLEXIBLE SYSTEM DESIGNS with integrated Intel® UHD Graphics P630
- OPTIMIZE VISUAL COMPUTE WORKFLOWS with Intel® Quick Sync Video's support for hardware acceleration across the latest video codecs

Featured Technologies

- Intel® Hyper-Threading Technology (Intel® HT Technology)
- Up to 40 processor PCIe lanes
- Error-correcting code (ECC) memory support
- Thunderbolt™ 3 support
- Intel® Optane™ technology support
- Intel vPro® platform support

Enterprise-Grade Security & Reliability

Keep your systems up and running with built-in features that reduce errors, help enhance security and improve manageability.

- **Help protect your system from potential crashes and changes in data** with Error Correcting Code (ECC) memory
- **Get additional peace of mind** with hardware-enhanced security features and identity protection technologies, via the Intel vPro® platform
- **Manageability** for organizations with managed IT. When Intel vPro® is enabled on Intel® Xeon® W-1200 processor-based systems, IT gains a full set of capabilities available for system management

Take Performance to Another Level

Designed for workstation professionals, Intel® Xeon® W-1200 processors are specially optimized for a wide range of workflows, including content creation, engineering and modelling with greater accuracy than ever before.

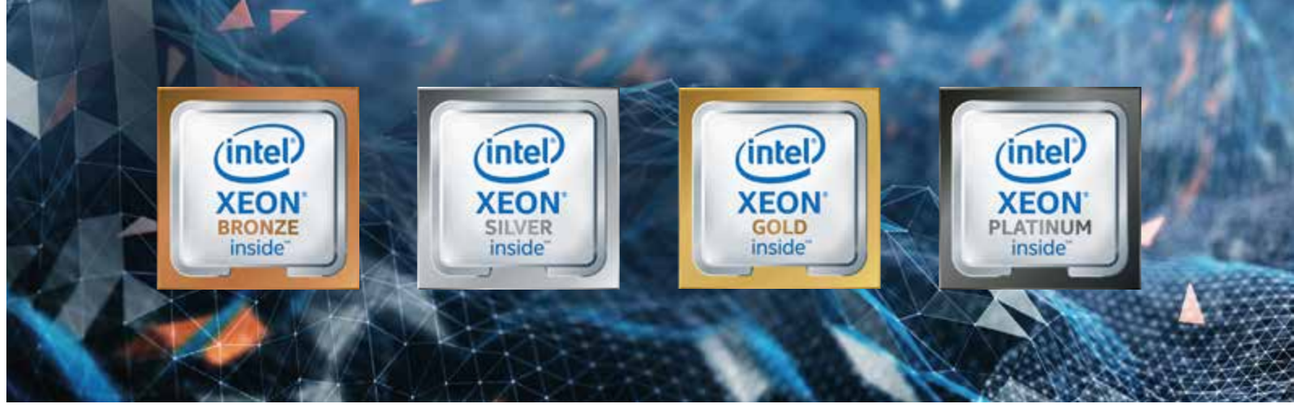
Enhanced Reliability

Help protect workstations from potential crashes and changes in data due to single-bit errors. Error-correcting code (ECC) memory is a platform technology that automatically detects & repairs single-bit memory errors on-the-fly resulting in enhanced reliability.

	Intel® Xeon® W-1250E Processor	Intel® Xeon® W-1250TE Processor	Intel® Xeon® W-1270E Processor	Intel® Xeon® W-1270TE Processor	Intel® Xeon® W-1290E Processor	Intel® Xeon® W-1290TE Processor
Product Collection	Intel® Xeon® W Processor	Intel® Xeon® W Processor	Intel® Xeon® W Processor	Intel® Xeon® W Processor	Intel® Xeon® W Processor	Intel® Xeon® W Processor
Processor Number	W-1250E	W-1250TE	W-1270E	W-1270TE	W-1290E	W-1290TE
Launch Date	Q2'20	Q2'20	Q2'20	Q2'20	Q2'20	Q2'20
Lithography	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm
Performance Specifications						
# of Cores	6	6	8	8	10	10
# of Threads	12	12	16	16	20	20
Processor Base Frequency	3.50 GHz	2.40 GHz	3.40 GHz	2.00 GHz	3.50 GHz	1.80 GHz
Max Turbo Frequency	4.70 GHz	3.80 GHz	4.80 GHz	4.40 GHz	4.80 GHz	4.50 GHz
Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	16 MB Intel® Smart Cache	16 MB Intel® Smart Cache	20 MB Intel® Smart Cache	20 MB Intel® Smart Cache
Bus Speed	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s
Intel® Turbo Boost Technology 2.0 Frequency	4.70 GHz	3.80 GHz				
TDP	80 W	35 W	80 W	35 W	95 W	35 W
Intel® Turbo Boost Max Technology 3.0 Freq.			4.80 GHz	4.40 GHz	4.80 GHz	4.50 GHz
Memory Specifications						
Max Memory Size (dependent on memory type)	128 GB	128 GB	128 GB	128 GB	128 GB	128 GB
Memory Types	DDR4-2666	DDR4-2666	DDR4-2933	DDR4-2933	DDR4-2933	DDR4-2933
Max # of Memory Channels	2	2	2	2	2	2
Max Memory Bandwidth	41.6 GB/s	41.6 GB/s	45.8 GB/s	45.8 GB/s	45.8 GB/s	45.8 GB/s
ECC Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes
Processor Graphics						
Processor Graphics	Intel® UHD Graphics 630					
Graphics Base Frequency	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz
Graphics Max Dynamic Frequency	1.20 GHz	1.15 GHz	1.20 GHz	1.15 GHz	1.20 GHz	1.20 GHz
Graphics Video Max Memory	64 GB	64 GB	64 GB	64 GB	64 GB	64 GB
Graphics Output	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI	eDP/DP/HDMI/DVI
4K Support	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz
Intel® Quick Sync Video	Yes	Yes	Yes	Yes	Yes	Yes
Intel® InTru™ 3D Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Clear Video HD Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Clear Video Technology	Yes	Yes	Yes	Yes	Yes	Yes
# of Displays Supported	3	3	3	3	3	3
Expansion Options						
PCI Express Revision	3.0	3.0	3.0	3.0	3.0	3.0
PCI Express Configurations	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4	Up to 1x16, 2x8, 1x8+2x4
Max # of PCI Express Lanes	16	16	16	16	16	16
Package Specifications						
Sockets Supported	FCLGA1200	FCLGA1200	FCLGA1200	FCLGA1200	FCLGA1200	FCLGA1200
Thermal Solution Specification	PCG 2015W	PCG 2015B	PCG 2015W	PCG 2015B	PCG 2015W	PCG 2015B
TJUNCTION	100°C	100°C	100°C	100°C	100°C	100°C
Package Size (mm)	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm	37.5 x 37.5 mm
Advanced Technologies						
Intel® Turbo Boost Technology	2.0	2.0	2.0	2.0	2.0	2.0
Intel vPro® Platform Eligibility	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes
Intel® VT-x With Extended Page Tables (EPT)	Yes	Yes	Yes	Yes	Yes	Yes
Intel® 64	Yes	Yes	Yes	Yes	Yes	Yes
Instruction Set Extensions	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2
Idle States	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Intel SpeedStep® Technology	Yes	Yes	Yes	Yes	Yes	Yes
Thermal Monitoring Technologies	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Identity Protection Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Turbo Boost Max Technology 3.0			Yes	Yes	Yes	Yes
Intel® Thermal Velocity Boost					Yes	
Security & Reliability						
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes
Secure Key	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Software Guard Extensions (Intel® SGX)	Yes With Intel® ME					
Intel® OS Guard	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Technology	Yes	Yes	Yes	Yes	Yes	Yes
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Boot Guard	Yes	Yes	Yes	Yes	Yes	Yes

2nd Gen Intel® Xeon® Scalable Processor

Formerly Cascade Lake



The Intel® Xeon® Scalable processor family provides the foundation for a powerful data center platform that creates an evolutionary leap in agility and scalability. Disruptive by design, this innovative processor sets a new level of platform convergence and capabilities across compute, storage, memory, network and security. Enterprises and cloud and communications service providers can now drive forward their most ambitious digital initiatives with a feature-rich, highly versatile platform.

Enabling Greater Efficiencies and Lower TCO

Across infrastructures, from enterprise to technical computing applications, the Intel® Xeon® Scalable processor family is designed for data center modernization to drive operational efficiencies that lead to improved total cost of ownership (TCO) and higher productivity for users. Systems built on the Intel® Xeon® Scalable processor family are designed to deliver agile services with enhanced performance and groundbreaking capabilities, compared to the prior generation.

Performance to Propel Insights

Intel's industry-leading, workload-optimized platform with built-in AI acceleration, provides the seamless performance foundation for the data-centric era from the multicloud to intelligent edge and back, the Intel® Xeon® Scalable processor family with 2nd Gen Intel® Xeon® Scalable processors enables a new level of consistent, pervasive and breakthrough performance.

Foundational Enhancements

- **Higher Per-Core Performance**
  Up to 56 cores (9200 series) + up to 28 cores (8200 series), delivering high-performance and scalability for compute-intensive workloads across computer, storage and network usages

- **Greater Memory Bandwidth/Capacity**
  Support for Intel® Optane™ persistent memory, supporting up to 36 TB of system-level memory capacity when combine with traditional DRAM. 50 percent increased memory bandwidth and capacity. Support for six memory channels and up-to 4 TB of DDR4 memory, per socket, with speeds up-to 2933 MT/s (1 DPC)

- **Expanded I/O:** 48 lanes of PCIe 3.0 bandwidth and throughput for demanding I/O-intensive workloads

- **Intel® Ultra Path Interconnect (Intel® UPI)**
  Four Intel® Ultra Path Interconnect (Intel® UPI) (9200 series) and up to three Intel® Ultra Path Interconnect (Intel® UPI) (8200 series) channels increase scalability of the platform to as many as two sockets (9200 series) and up to eight sockets (8200 series). Intel® Ultra Path Interconnect (Intel® UPI) offers the perfect balance between improved throughput and energy efficiency.

- **Intel® Deep Learning Boost (Intel® DL Boost) with VNNI**
  New Intel® Deep Learning Boost (Intel® DL Boost) with Vector Neural Network Instruction (VNNI) bring enhanced artificial intelligence inference performance, with up to 30X performance improvement over the previous generation4, 2nd Gen Intel® Xeon® Scalable processors help to deliver AI readiness across the data center, to the edge and back.

- **Intel® Infrastructure Management Technologies (Intel® IMT)**
  A framework for resource management, Intel® Infrastructure Management Technologies (Intel® IMT), combines multiple Intel capabilities that support platform-level detection, reporting and configuration. This hardware-enhanced monitoring, management and control of resources can help enable greater data center resource efficiency and utilization.

- **Intel® Security Libraries for Data Center (Intel® SecL - DC)**
  A set of software libraries and components, Intel® SecL-DC enables Intel hardware-based security features. The open-source libraries are modular and have a consistent interface. They can be used by customers and software developers to more easily develop solutions that help secure platforms and help protect data using Intel hardware-enhanced security features at cloud scale.

- **Intel® Advanced Vector Extensions 512 (Intel® AVX-512)**
  With double the FLOPS per clock cycle compared to previous generation Intel® Advanced Vector Extensions 2 (Intel® AVX2), Intel® AVX-512 boosts performance and throughput for the most demanding computational tasks in applications, such as modeling and simulation, data analytics and machine learning, data compression, visualization and digital content creation.

- **Security without compromise**
  Limiting encryption overhead and performance on all secure data transactions

Faster Time to Value with Intel® Select Solutions

In today's complex data center, hardware and software infrastructure is not "one size fits all". Intel® Select Solutions eliminates guesswork with rigorously benchmark tested and verified solutions optimized for real-world performance. These solutions accelerate infrastructure deployment on Intel® Xeon® processors for today's critical workloads in advanced analytics, hybrid cloud, storage and networking.

Enterprise and Government - Primed for Business

For enterprise data centers modernizing to take advantage of the era of advanced analytics, the hybrid cloud and future-ready storage, Intel® Select Solutions can speed up your data-fueled, IT-driven business transformation.

Communications Service Providers - Tuned Network Enhancements

For Communication Service Providers transforming their network for a 5G enabled future, Intel® Select Solutions offer a faster and more efficient deployment path of tested, reliable infrastructure with verified configurations that take full advantage of virtual network enhancements that support new and emerging customer workload demands.

High Performance Computing - Accelerated Time to Insight

For research in academia & government as well as the enterprises, high performance computing (HPC) capabilities with Intel® Select Solutions help push the limits of mainstream data today with deeper insights and more complex problem solving.

SKU Numbering

Processor numbers for the Intel® Xeon® Scalable processor family use an alphanumeric scheme based on performance, features, processor generation and any options, following the brand and its class.

Intel® Xeon® Platinum	9	2	#	#	α	α	processor
Intel® Xeon® Platinum	8	2	#	#	α	α	processor
Intel® Xeon® Gold	6	2	#	#	α	α	processor
Intel® Xeon® Gold	5	2	#	#	α	α	processor
Intel® Xeon® Silver	4	2	#	#	α	α	processor
Intel® Xeon® Bronze	3	2	#	#	α	α	processor

Processor Level
9 = Platinum
8 = Platinum
6 = Gold
5 = Gold
4 = Silver
3 = Bronze

Processor Generation
2 = 2nd Gen
1 = 1st Gen

Processor SKU
E.G. 20, 34, ...

Processor Options
L = Large DDR Memory Tier Support (uo to 4.5 TB)
N = Networking/Network Function Virtualization
R = Refresh
S = Search
T = Thermal
V = VM Density Value
Y = Intel® Speed Select Technology

2nd Gen Intel® Xeon® Scalable Processor

Formerly Cascade Lake

	Intel® Xeon® Silver 4209T Processor	Intel® Xeon® Silver 4210 Processor	Intel® Xeon® Silver 4210R Processor	Intel® Xeon® Silver 4210T Processor	Intel® Xeon® Silver 4214 Processor	Intel® Xeon® Silver 4214R Processor	Intel® Xeon® Silver 4215 Processor	Intel® Xeon® Silver 4215R Processor	Intel® Xeon® Silver 4216 Processor	Intel® Xeon® Gold 5215 Processor	Intel® Xeon® Gold 5218N Processor	Intel® Xeon® Gold 5218T Processor	Intel® Xeon® Gold 5220T Processor	Intel® Xeon® Gold 6208U Processor	Intel® Xeon® Gold 6226 Processor	Intel® Xeon® Gold 6226R Processor	Intel® Xeon® Gold 6230 Processor	Intel® Xeon® Gold 6230R Processor	Intel® Xeon® Gold 6230N Processor	Intel® Xeon® Gold 6230T Processor	Intel® Xeon® Gold 6238T Processor	Intel® Xeon® Gold 6252N Processor
Product Collection	2nd Generation Intel® Xeon® Scalable Processors										2nd Generation Intel® Xeon® Scalable Processors											
Vertical Segment	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server	Server
Processor Number	4209T	4210	4210R	4210T	4214	4214R	4215	4215R	4216	5215	5218N	5218T	5220T	6208U	6226	6226R	6230	6230R	6230N	6230T	6238T	6252N
Launch Date	Q2'19	Q2'19	Q1'20	Q1'20	Q2'19	Q1'20	Q2'19	Q1'20	Q2'19	Q2'19	Q2'19	Q2'19	Q2'19	Q1'20	Q2'19	Q1'20	Q2'19	Q1'20	Q2'19	Q2'19	Q2'19	Q2'19
Lithography	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm
Performance Specifications																						
# of Cores	8	10	10	10	12	12	8	8	16	10	16	16	18	16	12	16	20	26	20	20	22	24
# of Threads	16	20	20	20	24	24	16	16	32	20	32	32	36	32	24	32	40	52	40	40	44	48
Processor Base Frequency	2.20 GHz	2.20 GHz	2.40 GHz	2.30 GHz	2.20 GHz	2.40 GHz	2.50 GHz	3.20 GHz	2.10 GHz	2.50 GHz	2.30 GHz	2.10 GHz	1.90 GHz	2.90 GHz	2.70 GHz	2.90 GHz	2.10 GHz	2.10 GHz	2.30 GHz	2.10 GHz	1.90 GHz	2.30 GHz
Max Turbo Frequency	3.20 GHz	3.20 GHz	3.20 GHz	3.20 GHz	3.20 GHz	3.50 GHz	3.50 GHz	4.00 GHz	3.20 GHz	3.40 GHz	3.70 GHz	3.80 GHz	3.90 GHz	3.90 GHz	3.70 GHz	3.90 GHz	3.90 GHz	4.00 GHz	3.50 GHz	3.90 GHz	3.70 GHz	3.60 GHz
Cache	11 MB	13.75 MB	13.75 MB	13.75 MB	16.5 MB	16.5 MB	11 MB	11 MB	22 MB	13.75 MB	22 MB	22 MB	24.75 MB	22 MB	19.25 MB	22 MB	27.5 MB	35.75 MB	27.5 MB	27.5 MB	30.25 MB	35.75 MB
# of UPI Links	2	2	2	2	2	2	2	2	2	2	2	2	2	0	3	2	3	2	3	3	3	3
TDP	70 W	85 W	100 W	95 W	85 W	100 W	85 W	130 W	100 W	85 W	110 W	105 W	105 W	150 W	125 W	150 W	125 W	150 W	125 W	125 W	125 W	150 W
Memory Specifications																						
Max Memory Size (dependent on memory type)	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB
Memory Types	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2667	DDR4-2667	DDR4-2667	DDR4-2667	DDR4-2933	DDR4-2933	DDR4-2933	DDR4-2933	DDR4-2933	DDR4-2933	DDR4-2933	DDR4-2933	DDR4-2933
Maximum Memory Speed	2400 MHz	2400 MHz	2400 MHz	2400 MHz	2400 MHz	2400 MHz	2400 MHz	2400 MHz	2400 MHz	2667 MHz	2667 MHz	2667 MHz	2667 MHz	2933 MHz	2933 MHz	2933 MHz	2933 MHz	2933 MHz	2933 MHz	2933 MHz	2933 MHz	2933 MHz
Max # of Memory Channels	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
ECC Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Optane™ DC Persistent Memory Supported	No	No	No	No	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Expansion Options																						
Scalability	2S	2S	2S	2S	2S	2S	2S	2S	2S	4S	4S	4S	4S	1S Only	4S	2S	4S	2S	4S	4S	4S	4S
PCI Express Revision	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Max # of PCI Express Lanes	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
Package Specifications																						
Sockets Supported	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647	FCLGA3647
TCASE	91 °C	78 °C	84 °C	91 °C	77 °C	79 °C	77 °C	79 °C	79 °C	77 °C	81 °C	93 °C	93 °C	85 °C	86 °C	85 °C	87 °C	85 °C	78 °C	92 °C	90 °C	74 °C
Package Size (mm)	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5	76.0 x 56.5
Advanced Technologies																						
Intel® Deep Learning Boost (Intel® DL Boost)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Speed Select Technology Performance Profile	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Intel® Speed Select Technology Base Frequency	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	Yes	No	No	Yes
Intel® Resource Director Technology (Intel® RDT)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Speed Shift Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Turbo Boost Max Technology 3.0	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Intel® Turbo Boost Technology	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Intel vPro® Platform Eligibility	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® VT-x With Extended Page Tables (EPT)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Transactional Synchronization Extensions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® 64	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Instruction Set Extensions	Intel® SSE4.2, Intel® AVX, Intel® AVX2, Intel® AVX-512										Intel® SSE4.2, Intel® AVX, Intel® AVX2, Intel® AVX-512											
# of AVX-512 FMA Units	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
Enhanced Intel SpeedStep® Techn.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Volume Management Device	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Security & Reliability																						
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Run Sure Technology	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mode-based Execute Control (MBE)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Intel® Wireless-AC and Wireless-AX Products

Intel® Wireless-AC Solutions

Devices with Intel® Wireless-AC-technology inside (802.11ac) offer up to three times higher data rates, a better network coverage and the possibility to connect more devices to one network, compared to previous WiFi standards:

- **More Speed**
  Up to six times faster than single spatial stream (150 Mbps) 802.11n WiFi solutions, speedy enough to stream multiple Blu-Ray quality videos, Netflix movies and YouTube videos simultaneously
- **More Capacity**
  Up to three times the capacity than single spatial stream (150 Mbps) 802.11n WiFi solutions, so your WiFi can handle more users, more devices, more high-quality video streaming and bigger downloads
- **More Coverage**
  Better speeds and reliability at greater distances from your WiFi Access Point than single spatial stream (150 Mbps) 802.11n WiFi solutions, so you stay connected in more places
- **More Battery Life**
  Transfers data more quickly than single spatial stream (150 Mbps) 802.11n WiFi solutions, so your devices use less power and last longer between charges

Application Fields

- Consumer
- PCs / Laptops
- Medical applications
- POS / Kiosk
- Transportation / Surveillance
- Logistics
- Digital signage

Intel® Wirless-AX Solution

With the new WiFi standard IEEE 802.11 ax* (WiFi 6) even higher data rates, lower latency and longer battery lifetime are possible. Intel offers WiFi 6 in their Wireless-AX solutions.

Benefits

- Increased capacity
- Faster speed
- Better coverage
- Extended battery life
- 802.11 ax dual band 2x2 160MHz
- Improved security

Application Fields

- Indoor and outdoor deployments
- Heavily loaded networks
- IoT use cases
- Immersive gaming
- Hard-real-time control

Intel® WiFi 6 (Gig+) Desktop Kit

If you want to free your desktop, ditch the Ethernet cable to connect your Desktop wirelessly and experience gigabit + speeds from anywhere in your home, the Intel WiFi 6 (Gig+) Desktop Kit is the perfect choice: Whether at work or play - reduce costs, increase performance and improve security. It even automatically detects the country you're in and complies with its valid WiFi regulations. Connect your PCs to a WiFi 6 (Gig+) router powered by Intel technology to get fast and responsive connections.

The Kit contains the Intel® WiFi 6 AX200 module, 2 optimized external antenna, one standard size mounting bracket with RF cables installed, a low profile mounting bracket, the Quick Start Guide and safety and regulatory information.

The Kit requires a motherboard with available M.2 connector key E for wireless.

Here you can find the Intergration Guide:

*up to 3x faster than 802.11 ac 2x2 80 MHz => 2402 Mbit/s, theoretically

	Intel WiFi 6 AX200	Intel WiFi 6 AX201	Intel Dual Band Wireless AC 8265	Intel Dual Band Wireless AC 9560	Intel Dual Band Wireless AC 9260	Intel Dual Band Wireless AC 8260	Intel Dual Band Wireless AC 7265	Intel Dual Band Wireless AC 9462	Intel Dual Band Wireless AC 9461	Intel Dual Band Wireless AC 3168	Intel Dual Band Wireless AC 3165
Code Name	Cyclone Peal 2	Harrison Peak 2	Windstorm Peak	Jefferson Peak 2	Thunder Peak 2	Snowfield Peak	Stone Peak	Jefferson Peak 1	Jefferson Peak 1	Sandy Peak	Stone Peak 1
Est. support until	Q4 2025	Q4 2025	Q4 2022	Q4 2024	Q4 2024	Q4 2022	Q4 2022	Q4 2024	Q4 2024	Q4 2022	Q4 2022
Essentials											
Board Form Factor	M.2 2230 M.2 1216 (SMD)	M.2 2230 M.2 1216 (SMD)	M.2 2230 M.2 1216 (SMD)	M.2 2230 M.2 1216 (SMD)	M.2 2230	M.2 2230 M.2 1216 (SMD)	M.2 2230 M.2 1216 (SMD)	M.2 2230 M.2 1216 (SMD)	M.2 2230 M.2 1216 (SMD)	M.2 2230	M.2 2230 M.2 1216 (SMD)
Operating Temperature Range	0 to +80°C	0 to +80°C	0 to +70°C	0 to +70°C	0 to +70°C	0 to +70°C	0 to +70°C	0 to +70°C	0 to +70°C	0 to +70°C	0 to +70°C
Supported Operating Systems	Microsoft Windows 10, 64-bit, Google Chrome OS, Linux	Microsoft Windows 10, 64-bit, Google Chrome OS, Linux	Microsoft Windows 7, 8.1, 10, Linux (limited feature sup-port) android	Microsoft Windows 10, Linux, Chrome	Microsoft Windows 10, Linux, Chrome	Microsoft Windows 7, 8.1, 10, Linux (limited feature support)	Microsoft Windows 7, 8, Linux	Microsoft Windows 10, Linux, Chrome	Microsoft Windows 10, Linux, Chrome	Microsoft Windows 7, 8.1, 10, Linux (most features not available on Linux)	Microsoft Windows 7, 8, 10, Linux (limited features)
Networking Specifications											
WiFi Standard	802.11ax	802.11ax	802.11 a/b/g/n/ac	802.11 a/b/g/n/ac	802.11 a/b/g/n/ac	802.11 a/b/g/n/ac	802.11 a/b/g/n/ac	802.11 a/b/g/n/ac	802.11 a/b/g/n/ac	802.11 a/b/g/n/ac	802.11 a/b/g/n/ac
TX/RX Streams	2x2	2x2	2x2	2x2	2x2	2x2	2x2	1x1	1x1	1x1	1x1
Bands	2.4 GHz, 5 GHz, 160 MHz	2.4 GHz, 5 GHz, 160 MHz	2.4 GHz, 5 GHz	2.4 GHz, 5 GHz, 160 MHz	2.4 GHz, 5 GHz, 160 MHz	2.4 GHz, 5 GHz	2.4 GHz, 5 GHz	2.4 GHz, 5 GHz	2.4 GHz, 5 GHz	2.4 GHz, 5 GHz	2.4 GHz, 5 GHz
Max Speed	2.4 Gbps	2.4 Gbps	867 Mbps	1.73 Gbps	1.73 Gbps	867 Mbps	867 Mbps	433 Mbps	433 Mbps	433 Mbps	433 Mbps
Integrated Bluetooth	V5	V5	V4.2	V5	V5	V4.2	V4.2	V5	V5	V4.2	V4.2
System Interface Type	PCIe (WiFi), USB (BT)	CNVio2	PCIe, USB,	CNVio, GPIO	PCIe, USB	PCIe, USB	PCIe, USB	CNVio, GPIO	CNVio, GPIO	PCIe, USB	PCIe, USB
Package Specifications											
Package Size (mm)	22x30x2.4 12x16x1.8	22x30x2.4 12x16x1.8	22x30x2.4 12x16x1.8	22x30x2.4 12x16x1.57	22x30x2.4	22x30x2.4 12x16x1.8	22x30x2.4 12x16x1.8	22x30x2.4 12x16x1.57	22x30x2.4	22x30x2.4	22x30x2.4 22x26x2.4
Advanced Technologies											
Intel Wireless Display	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel vPro sku available	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No

Intel® Mobile Modem Solutions

Intel® mobile modem solutions deliver the speed and agility to keep you intelligently connected, across town and around the world. Designed for smartphones, tablets, PCs and Internet of Things (IoT) devices, Intel's low-power modems and system on chips (SoCs) are among the industry's most compact and cost-effective mobile solutions.

Rutronik can offer all the 2G, 3G and 4G SoC based products through our 3rd Party Module Maker Telit®.

Have a look in the Wireless Catalogue on chapter "Cellular Modules", all product groups except C1 and G1 are Intel based:

Intel® Solid-State Drive Product Families

Solid-State Drives - Client

Flash memory has been a disruptive technology from its industrial inception in the early '90s and innovation is still ongoing after more than 25 years. Today the most advanced storage products use NAND flash and Intel® Optane™ with 3D-XPoint technology. Thanks to the technologies storage density, NAND and 3D-XPoint has changed our lives. Through continuous development, investment and improvement by Intel®, 3D NAND and Intel® Optane™ deliver outstanding value and capabilities to consumers and businesses alike.

Key Advantages

- Boost your PC performance by replacing your HDD or SATA with an Intel® PCIe SSD
- Reliable Quality - Every Intel® SSD is subject to rigorous testing standards above and beyond the standard quality requirements
- Easy Upgrade or Install - With Intel® Data Migration Software, you can conveniently copy data form your old drive to a new SSD
- Industry leading innovation - the 665p features 96-Layer 3D NAND technology
- Intel® quality and reliability - backed by 5 years warranty

Target Applications

- High-end computing
- Performance gaming
- Workstation
- Digital content creation
- Engineering: FEA, fluid dynamics, CAD
- Mobile computing
- Digital signage
- POS, Kiosk, Vending machines

M.2

2,5"

U.2

AIC

Series	660p	665p	905p	900p	800p	Intel Optane Memory M10	Intel Optane Memory H10 with Solid State Storage
Interface	PCIe 3.0x4	PCIe 3.0 x4	PCIe 3.0 x4	PCIe 3.0 x4	PCIe 3.0 x2	PCIe 3.0 x2	PCIe 3.0 x4
Technology	3D NAND QLC 64-Layer	3D NAND QLC 96-Layer	3D X-Point	3D X-Point	3D X-Point	3D X-Point	3D X-Point
Form Factor	M.2 x 80 mm	M.2 x 80 mm	U.2 x 15 mm AIC M.2 x 110 mm	U.2 x 15 mm AIC	M.2 x 80 mm	M.2 x 42 mm M.2 x 80 mm	M.2 x 80 mm
Capacity	512 GB, 1 TB, 2 TB	1 TB, 2 TB	380 GB, 480 GB, 960 GB, 1.5 TB	280 GB, 480 GB	58 GB, 118 GB	16 GB, 32 GB, 64 GB	16 GB + 256 GB, 32 GB + 512 GB, 32 GB + 1024 GB

Intel® Solid-State Drive Product Families

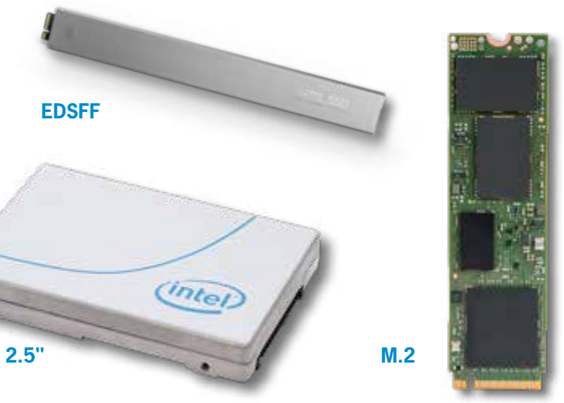
Solid-State Drives – Data Center

Key Advantages

- High capacity per drive, server and rack
- Improved manageability and serviceability
- Efficient thermal design
- Reduced maintenance cost and total cost of ownership
- High throughput (IOPS/s)
- Ultra-low latency
- Excellent quality of service
- Ultra-high endurance

Target Applications

- Cloud storage
- Scale out storage
- Hard drive replacement
- Virtualization
- In-memory database



Applications connected to the Internet already generate vast amount of hot and cold data and require a storage medium to save and access the data. Intel® provides future proof solutions for enterprise infrastructure with extraordinary performance, reliability and endurance. Intel® SSDs enable you to keep up with the ever-increasing demands of the data center with products that provide drive reliability, uncompromised data integrity and consistent performance in critical working environments.

Series	DC P4800X	DC P4800X with IMDT	DC P4801X	DC P4801X with IMDT	DC P4618	DC P4610	DC P4511	DC P4510	DC P4420	DC P4326	DC P4320	DC S4610	DC S4510	DC D4800X
Interface	PCIe 3.0 x4	PCIe 3.0 x4	PCIe 3.0 x4	PCIe 3.0 x4	PCIe 3.1 x8	PCIe 3.1 x4	PCIe 3.1 x4	PCIe 3.1 x4	PCIe 3.1 x4	PCIe 3.1 x4	PCIe 3.1 x4	SATA 3.0 6 GB/s	SATA 3.0 6 GB/s	PCIe 3.0 x2 x2
Technology	3D-Xpoint	3D-Xpoint	3D-Xpoint	3D-Xpoint	3D NAND TLC 64-Layers	3D NAND TLC 64-Layers	3D NAND TLC 64-Layers	3D NAND TLC 64-Layers	3D NAND QLC 64-Layer	3D NAND QLC 64-Layer	3D NAND QLC 64-Layer	3D NAND TLC 64-Layers	3D NAND TLC 64-Layers	3D-Xpoint
Form Factor	AIC U.2 x 15 mm	AIC U.2 x 15 mm	M.2 110 mm U.2 x 15 mm	M.2 110 mm U.2 x 15 mm	AIC	U.2 x 15 mm	M.2 110 mm E1.S 5.9 mm	U.2 x 15 mm E1.L 9.5 mm	U.2 x 15 mm	U.2 x 15 mm E1.L 18 mm E1.L 9.5 mm	U.2 x 15 mm	2.5" x 7 mm	2.5" x 7 mm M.2 x 80 mm	U.2 x 15 mm
Capacity	375 GB, 750 GB 1.5 TB	375 GB, 750 GB 1.5 TB	100 GB, 200 GB 375 GB	100 GB, 200 GB 375 GB	6.4 TB	1.6 TB, 3.2 TB 6.4 TB, 7.68 TB	1 TB, 2 TB, 4 TB	1 TB, 2 TB, 4 TB 8 TB, 15.36 TB	7.68 TB	15.36 TB	7.68 TB	240 GB, 480 GB 960 GB, 1.92 TB 3.84 TB, 7.68 TB	240 GB, 480 GB 960 GB, 1.92 TB 3.84 TB, 7.68 TB	375 GB, 750 GB 1.5 TB

Intel® NUC Kits and Boards

High-End Computing, Low-Profile Style

Ultra Small Form Factor | Space Saving | Versatile Usage | Performance | Stunning Visuals | Low Power Usage

Pint-sized Power

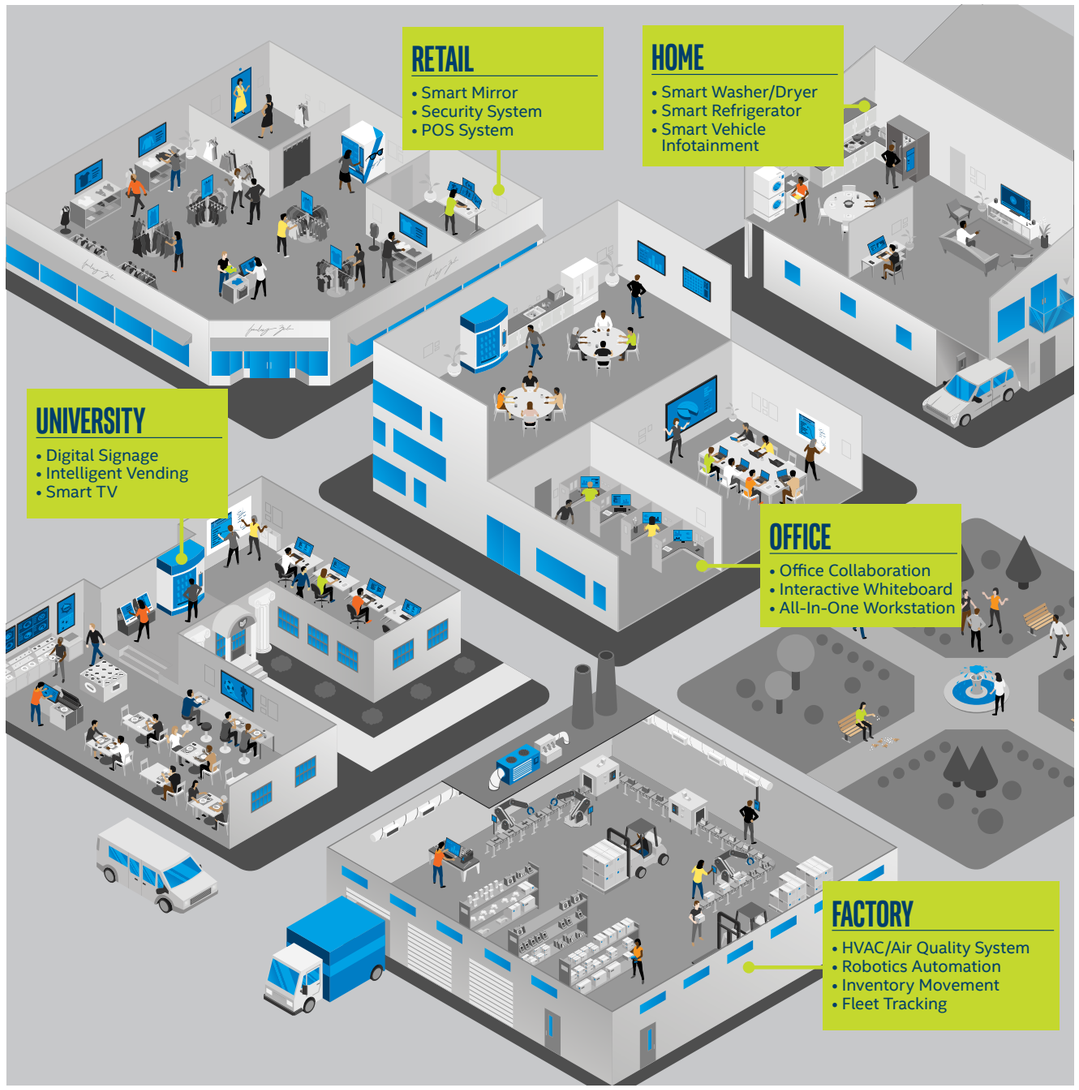
The Intel® NUC is a mini PC with the power of a desktop, packing features for entertainment, gaming and productivity in a 4x4 form factor.

Energy Optimized, Media Savvy

With Intel® NUC, you get an immersive media experience and responsive interaction while consuming a small amount of power relative to a full-sized PC.

Flexibility for Future Growth

Due to its portable size and ease of installation, the Intel® NUC makes it easy to add devices and scale up rapidly based on changing productivity needs.



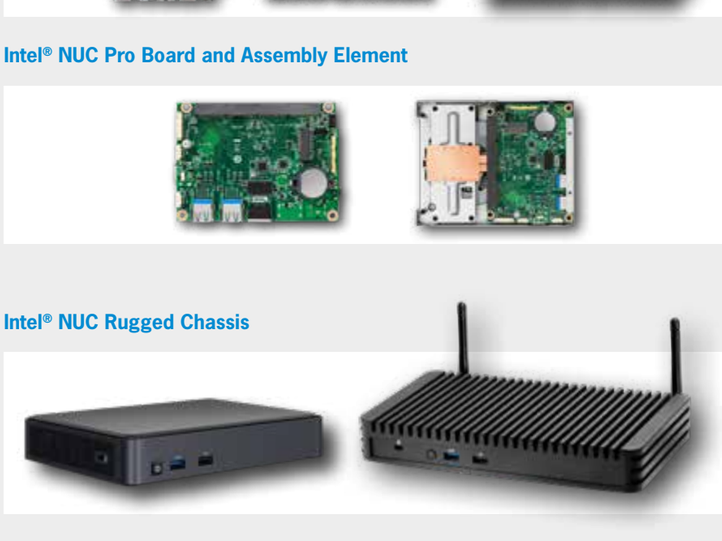
Intel® NUC Elements

Intel® NUC Elements High-Performance, Modular Elements for a Range of Verticals

Start with an Intel NUC Compute Element with the exact processor you need and plug it into an Intel NUC Board Element, your own board, or another third-party board, then embed it into your solution to create unique solutions for your customers' needs. From embedded deployments to rugged systems in unique environments, to full systems in a business or vertical environment, the Intel NUC Elements let you deliver custom solutions with minimal R&D time.

Intel® NUC Compute Elements

Intel® NUC NUC Rugged Board Elements



Intel® NUC Pro Board and Assembly Element

Intel® NUC Rugged Chassis

Intel® NUC Kits – Ghost / Quartz Canyon

	Intel® NUC 9 Pro Kit - NUC9VXQNX	Intel® NUC 9 Pro Kit - NUC9V7QNX	Intel® NUC 9 Extreme Kit - NUC9i9QNX	Intel® NUC 9 Extreme Kit - NUC9i7QNX	Intel® NUC 9 Extreme Kit - NUC9i5QNX
Supported Operating Systems	Windows 10, 64-bit, Windows Server 2019, Linux	Windows 10, 64-bit, Linux	Windows 10, 64-bit, Linux	Windows 10, 64-bit, Linux	Windows 10, 64-bit, Linux
Board Number	NUC9VXQNB	NUC9V7QNB	NUC9i9QNB	NUC9i7QNB	NUC9i5QNB
Board Form Factor	PCIe	PCIe	PCIe	PCIe	PCIe
Internal Drive Form Factor	M.2 SSD	M.2 SSD	M.2 SSD	M.2 SSD	M.2 SSD
# of Internal Drives Supported	3	3	3	3	3
Board Chipset	Mobile Intel® CM246 Chipset	Mobile Intel® CM246 Chipset	Mobile Intel® CM246 Chipset	Mobile Intel® CM246 Chipset	Mobile Intel® CM246 Chipset
Processor Included	Intel® Xeon® E-2286M Processor (16M Cache, 2.40 GHz)	Intel® Core™ i7-9850H Processor (12M Cache, up to 4.60 GHz)	Intel® Core™ i9-9980HK Processor (16M Cache, up to 5.00 GHz)	Intel® Core™ i7-9750H Processor (12M Cache, up to 4.50 GHz)	Intel® Core™ i5-9300H Processor (8M Cache, up to 4.10 GHz)
Intel vPro® Platform Eligibility	Yes	Yes	No	No	No
# of Cores	8	6	8	6	4
# of Threads	16	12	16	12	8
Processor Base Frequency	2.40 GHz	2.60 GHz	2.40 GHz	2.60 GHz	2.40 GHz
Max Turbo Frequency	5.00 GHz	4.60 GHz	5.00 GHz	4.50 GHz	4.10 GHz
Supplemental Information					
Embedded Options Available	No	No	No	No	No
Memory & Storage					
Max Memory Size (dep. on memory type)	64 GB	64 GB	64 GB	64 GB	64 GB
Memory Types	DDR4-2666	DDR4-2666	DDR4-2666	DDR4-2666	DDR4-2666
Max # of Memory Channels	2	2	2	2	2
Max Memory Bandwidth	42.6 GB/s	42.6 GB/s	42.6 GB/s	42.6 GB/s	42.6 GB/s
Max # of DIMMs	2	2	2	2	2
ECC Memory Supported	Yes	No	No	No	No
Processor Graphics					
Processor Graphics	Intel® UHD Graphics P630	Intel® UHD Graphics 630	Intel® UHD Graphics 630	Intel® UHD Graphics 630	Intel® UHD Graphics 630
Integrated Graphics	Yes	Yes	Yes	Yes	Yes
Graphics Output	2x Thunderbolt 3, HDMI 2.0a	2x Thunderbolt 3, HDMI 2.0a	2x Thunderbolt 3, HDMI 2.0a	2x Thunderbolt 3, HDMI 2.0a	2x Thunderbolt 3, HDMI 2.0a
# of Displays Supported	3	3	3	3	3
Discrete Graphics	Via PCIe add-in card(s)	Via PCIe add-in card(s)	Via PCIe add-in card(s)	Via PCIe add-in card(s)	Via PCIe add-in card(s)
Expansion Options					
PCI Express Revision	Gen3	Gen3	Gen3	Gen3	Gen3
PCI Express Configurations	2x M.2 PCIe X4 slots (PCH), 1x M.2 PCIe X4 slot (CPU) Double-wide PCIe X16 (CPU) slot shared with PCIe X4 (CPU) slot, 8" max card length	2x M.2 PCIe X4 slots (PCH), 1x M.2 PCIe X4 slot (CPU) Double-wide PCIe X16 (CPU) slot shared with PCIe X4 (CPU) slot, 8" max card length	2x M.2 PCIe X4 slots (PCH), 1x M.2 PCIe X4 slot (CPU) Double-wide PCIe X16 (CPU) slot shared with PCIe X4 (CPU) slot, 8" max card length	2x M.2 PCIe X4 slots (PCH), 1x M.2 PCIe X4 slot (CPU) Double-wide PCIe X16 (CPU) slot shared with PCIe X4 (CPU) slot, 8" max card length	2x M.2 PCIe X4 slots (PCH), 1x M.2 PCIe X4 slot (CPU) Double-wide PCIe X16 (CPU) slot shared with PCIe X4 (CPU) slot, 8" max card length
PCIe x4 Gen 3	1	1	1	1	1
PCIe x16 Gen 3	1	1	1	1	1
Removable Memory Card Slot	SDXC with UHS-II support	SDXC with UHS-II support	SDXC with UHS-II support	SDXC with UHS-II support	SDXC with UHS-II support
M.2 Card Slot (storage)	2x via PCH + 1x via CPU (NVMe)	2x via PCH + 1x via CPU (NVMe)	2x via PCH + 1x via CPU (NVMe)	2x via PCH + 1x via CPU (NVMe)	2x via PCH + 1x via CPU (NVMe)
I/O Specifications					
# of USB Ports	11	11	11	11	11
USB Configuration	4x rear USB 3.1g2, 2x Thunderbolt 3 (USB 3.1g2), 2x front USB 3.1g2, 2x USB 2.0 via internal headers, 1x USB 2.0 internal	4x rear USB 3.1g2, 2x Thunderbolt 3 (USB 3.1g2), 2x front USB 3.1g2, 2x USB 2.0 via internal headers, 1x USB 2.0 internal	4x rear USB 3.1g2, 2x Thunderbolt 3 (USB 3.1g2), 2x front USB 3.1g2, 2x USB 2.0 via internal headers, 1x USB 2.0 internal	4x rear USB 3.1g2, 2x Thunderbolt 3 (USB 3.1g2), 2x front USB 3.1g2, 2x USB 2.0 via internal headers, 1x USB 2.0 internal	4x rear USB 3.1g2, 2x Thunderbolt 3 (USB 3.1g2), 2x front USB 3.1g2, 2x USB 2.0 via internal headers, 1x USB 2.0 internal
USB Revision	3.1 Gen2, 2.0	3.1 Gen2, 2.0	3.1 Gen2, 2.0	3.1 Gen2, 2.0	3.1 Gen2, 2.0
USB 2.0 Config. (External + Internal)	3x int.	3x int.	3x int.	3x int.	3x int.
Total # of SATA Ports	3	3	3	3	3
Max # of SATA 6.0 GB/s Ports	3	3	3	3	3
RAID Configuration	2x M.2 SATA/PCIe SSD, SATA header (RAID-0 RAID-1)	2x M.2 SATA/PCIe SSD, SATA header (RAID-0 RAID-1)	2x M.2 SATA/PCIe SSD, SATA header (RAID-0 RAID-1)	2x M.2 SATA/PCIe SSD, SATA header (RAID-0 RAID-1)	2x M.2 SATA/PCIe SSD, SATA header (RAID-0 RAID-1)
Audio (back channel + front channel)	7.1 digital; L+R+mic (F); L+R+TOSLINK (R)	7.1 digital; L+R+mic (F); L+R+TOSLINK (R)	7.1 digital; L+R+mic (F); L+R+TOSLINK (R)	7.1 digital; L+R+mic (F); L+R+TOSLINK (R)	7.1 digital; L+R+mic (F); L+R+TOSLINK (R)
Integrated LAN	Intel® Ethernet Connection i219-LM and i210-AT	Intel® Ethernet Connection i219-LM and i210-AT	Intel® Ethernet Connection i219-LM and i210-AT	Intel® Ethernet Connection i219-LM and i210-AT	Intel® Ethernet Connection i219-LM and i210-AT
Integrated Wireless	Intel® Wi-Fi 6 AX200	Intel® Wi-Fi 6 AX200	Intel® Wi-Fi 6 AX200	Intel® Wi-Fi 6 AX200	Intel® Wi-Fi 6 AX200
Integrated Bluetooth	Yes	Yes	Yes	Yes	Yes
S/PDIF Out Connector	TOSLINK	TOSLINK	TOSLINK	TOSLINK	TOSLINK
Additional Headers	CEC, 2x USB2.0, Front Panel	CEC, 2x USB2.0, Front Panel	CEC, 2x USB2.0, Front Panel	CEC, 2x USB2.0, Front Panel	CEC, 2x USB2.0, Front Panel
# of Thunderbolt™ 3 Ports	2	2	2	2	2
Advanced Technologies					
Intel® Optane™ Memory Supported	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes
Intel vPro® Platform Eligibility	Yes	Yes	No	No	No
TPM	Yes	Yes	Yes	Yes	Yes
TPM Version	Discrete 2.0	Discrete 2.0			
Intel® Rapid Storage Technology	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes
Intel® Platform Trust Techn. (Intel® PTT)	Yes	Yes	Yes	Yes	Yes
Security & Reliability					
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Technology	Yes	Yes			

Intel® NUC Kits – Frost Canyon

	Intel® NUC 10 - NUC10i7FNH	Intel® NUC 10 - NUC10i7FNK	Intel® NUC 10 - NUC10i5FNH	Intel® NUC 10 - NUC10i5FNK	Intel® NUC 10 - NUC10i3FNH	Intel® NUC 10 - NUC10i3FNK
Board Number	NUC10i7FNB	NUC10i7FNB	NUC10i5FNB	NUC10i5FNB	NUC10i3FNB	NUC10i3FNB
Board Form Factor	UCFF (4" x 4")	UCFF (4" x 4")	UCFF (4" x 4")	UCFF (4" x 4")	UCFF (4" x 4")	UCFF (4" x 4")
Socket	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA
Internal Drive Form Factor	M.2 and 2.5" Drive	M.2 SSD	M.2 and 2.5" Drive	M.2 SSD	M.2 and 2.5" Drive	M.2 SSD
# of Internal Drives Supported	2	1	2	1	2	1
Lithography	14 nm	14 nm	14 nm	14 nm	14 nm	14 nm
TDP	25 W	25 W	25 W	25 W	25 W	25 W
DC Input Voltage Supported	$19V_{DC}$	$19V_{DC}$	$19V_{DC}$	$19V_{DC}$	$19V_{DC}$	$19V_{DC}$
Processor Included	Intel® Core™ i7-10710U Processor (12 M Cache, up to 4.70 GHz)	Intel® Core™ i7-10710U Processor (12 M Cache, up to 4.70 GHz)	Intel® Core™ i5-10210U Processor (6 M Cache, up to 4.20 GHz)	Intel® Core™ i5-10210U Processor (6 M Cache, up to 4.20 GHz)	Intel® Core™ i3-10110U Processor (4 M Cache, up to 4.10 GHz)	Intel® Core™ i3-10110U Processor (4 M Cache, up to 4.10 GHz)
Intel vPro® Platform Eligibility	No	No	No	No	No	No
# of Cores	6	6	4	4	2	2
# of Threads	12	12	8	8	4	4
Processor Base Frequency	1.10 GHz	1.10 GHz	1.60 GHz	1.60 GHz	2.10 GHz	2.10 GHz
Max. Turbo Frequency	4.70 GHz	4.70 GHz	4.20 GHz	4.20 GHz	4.10 GHz	4.10 GHz
Supplemental Information						
Embedded Options Available	No	No	No	No	No	No
Description	Other features: Includes far-field quad array microphones		Other features: Includes far-field quad array microphones			
Memory & Storage						
Max. Memory Size (Dependent on Memory Type)	64 GB	64 GB	64 GB	64 GB	64 GB	64 GB
Memory Types	DDR4-2666 1.2V SO-DIMM	DDR4-2666 1.2V SO-DIMM	DDR4-2666 1.2V SO-DIMM	DDR4-2666 1.2V SO-DIMM	DDR4-2666 1.2V SO-DIMM	DDR4-2666 1.2V SO-DIMM
Max. # of Memory Channels	2	2	2	2	2	2
Max. Memory Bandwidth	42.6 GB/s	42.6 GB/s	42.6 GB/s	42.6 GB/s	42.6 GB/s	42.6 GB/s
Max. # of DIMMs	2	2	2	2	2	2
ECC Memory Supported	No	No	No	No	No	No
Processor Graphics						
Processor Graphics	Intel® UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics
Integrated Graphics	Yes	Yes	Yes	Yes	Yes	Yes
Graphics Output	HDMI 2.0a; USB-C (DP1.2)	HDMI 2.0a; USB-C (DP1.2)	HDMI 2.0a; USB-C (DP1.2)	HDMI 2.0a; USB-C (DP1.2)	HDMI 2.0a; USB-C (DP1.2)	HDMI 2.0a; USB-C (DP1.2)
# of Displays Supported	3	3	3	3	3	3
Expansion Options						
PCI Express Revision	Gen3	Gen3	Gen3	Gen3	Gen3	Gen3
PCI Express Configurations	M.2 slot with PCIe X4 lanes	M.2 slot with PCIe X4 lanes	M.2 slot with PCIe X4 lanes	M.2 slot with PCIe X4 lanes	M.2 slot with PCIe X4 lanes	M.2 slot with PCIe X4 lanes
Removable Memory Card Slot	SDXC with UHS-II support	SDXC with UHS-II support	SDXC with UHS-II support	SDXC with UHS-II support	SDXC with UHS-II support	SDXC with UHS-II support
M.2 Card Slot (Storage)	22x42/80	22x42/80	22x42/80	22x42/80	22x42/80	22x42/80
I/O Specifications						
# of USB Ports	7	7	7	7	7	7
USB Configuration	2x front (Type-A, Type-C) and 3x rear USB 3.1 Gen2 (2x Type-A, Type-C); 2x USB 2.0 via internal headers	2x front (Type-A, Type-C) and 3x rear USB 3.1 Gen2 (2x Type-A, Type-C); 2x USB 2.0 via internal headers	2x front (Type-A, Type-C) and 3x rear USB 3.1 Gen2 (2x Type-A, Type-C); 2x USB 2.0 via internal headers	2x front (Type-A, Type-C) and 3x rear USB 3.1 Gen2 (2x Type-A, Type-C); 2x USB 2.0 via internal headers	2x front (Type-A, Type-C) and 3x rear USB 3.1 Gen2 (2x Type-A, Type-C); 2x USB 2.0 via internal headers	2x front (Type-A, Type-C) and 3x rear USB 3.1 Gen2 (2x Type-A, Type-C); 2x USB 2.0 via internal headers
USB Revision	2.0, 3.1 Gen2	2.0, 3.1 Gen2	2.0, 3.1 Gen2	2.0, 3.1 Gen2	2.0, 3.1 Gen2	2.0, 3.1 Gen2
USB 2.0 Configuration (External + Internal)	0 + 2	0 + 2	0 + 2	0 + 2	0 + 2	0 + 2
USB 3.0 Configuration (External + Internal)	2B 2F + 0	2B 2F + 0	2B 2F + 0	2B 2F + 0	2B 2F + 0	2B 2F + 0
Total # of SATA Ports	2	2	2	2	2	2
Max. # of SATA 6.0 GB/s Ports	2	2	2	2	2	2
RAID Configuration	2.5" HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)		2.5" HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)		2.5" HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)	
Audio (Back Channel + Front Channel)	7.1 digital (HDMI mDP); L+R mic (F)	7.1 digital (HDMI mDP); L+R mic (F)	7.1 digital (HDMI mDP); L+R mic (F)	7.1 digital (HDMI mDP); L+R mic (F)	7.1 digital (HDMI mDP); L+R mic (F)	7.1 digital (HDMI mDP); L+R mic (F)
Integrated LAN	Intel® Ethernet Connection I219-V	Intel® Ethernet Connection I219-V	Intel® Ethernet Connection I219-V	Intel® Ethernet Connection I219-V	Intel® Ethernet Connection I219-V	Intel® Ethernet Connection I219-V
Integrated Wireless	Intel® Wi-Fi 6 AX201	Intel® Wi-Fi 6 AX201	Intel® Wi-Fi 6 AX201	Intel® Wi-Fi 6 AX201	Intel® Wi-Fi 6 AX201	Intel® Wi-Fi 6 AX201
Integrated Bluetooth	Yes	Yes	Yes	Yes	Yes	Yes
Consumer Infrared Rx Sensor	Yes	Yes	Yes	Yes	Yes	Yes
Additional Headers	CEC, 2x USB2.0, FRONT_PANEL	CEC, 2x USB2.0, FRONT_PANEL	CEC, 2x USB2.0, FRONT_PANEL	CEC, 2x USB2.0, FRONT_PANEL	CEC, 2x USB2.0, FRONT_PANEL	CEC, 2x USB2.0, FRONT_PANEL
# of Thunderbolt™ 3 Ports	1	1	1	1	1	1
Advanced Technologies						
Intel® Optane™ Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes
Intel vPro® Platform Eligibility	No	No	No	No	No	No
TPM	No	No	No	No	No	No
Intel® HD Audio Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Rapid Storage Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Platform Trust Technology (Intel® PTT)	Yes	Yes	Yes	Yes	Yes	Yes
Security & Reliability						
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes

Intel® NUC Kits – Provo Canyon

	Intel® NUC 8 Pro Kit NUC8v7PNH	Intel® NUC 8 Pro Kit NUC8v7PNK	Intel® NUC 8 Pro Kit NUC8v5PNH	Intel® NUC 8 Pro Kit NUC8v5PNK	Intel® NUC 8 Pro Kit NUC8i3PNH	Intel® NUC 8 Pro Kit NUC8i3PNK
Board Number	NUC8v7PNB	NUC8v7PNB	NUC8v5PNB	NUC8v5PNB	NUC8i3PNB	NUC8i3PNB
Board Form Factor	UCFF (4“ x 4“)	UCFF (4“ x 4“)	UCFF (4“ x 4“)	UCFF (4“ x 4“)	UCFF (4“ x 4“)	UCFF (4“ x 4“)
Socket	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA
Internal Drive Form Factor	M.2 and 2.5“ Drive	M.2 SSD	M.2 and 2.5“ Drive	M.2 SSD	M.2 and 2.5“ Drive	M.2 SSD
# of Internal Drives Supported	2	1	2	1	2	1
DC Input Voltage Supported	12-24 V_{DC}	12-24 V_{DC}	12-24 V_{DC}	12-24 V_{DC}	12-24 V_{DC}	12-24 V_{DC}
Processor Included	Intel® Core™ i7-8665U Processor (8M Cache, up to 4.80 GHz)	Intel® Core™ i7-8665U Processor (8M Cache, up to 4.80 GHz)	Intel® Core™ i5-8365U Processor (6M Cache, up to 4.10 GHz)	Intel® Core™ i5-8365U Processor (6M Cache, up to 4.10 GHz)	Intel® Core™ i3-8145U Processor (4M Cache, up to 3.90 GHz)	Intel® Core™ i3-8145U Processor (4M Cache, up to 3.90 GHz)
Intel vPro® Platform Eligibility	Yes	Yes	Yes	Yes	No	No
# of Cores	4	4	4	4	2	2
# of Threads	8	8	8	8	4	4
Processor Base Frequency	1.90 GHz	1.90 GHz	1.60 GHz	1.60 GHz	2.10 GHz	2.10 GHz
Max. Turbo Frequency	4.80 GHz	4.80 GHz	4.10 GHz	4.10 GHz	3.90 GHz	3.90 GHz
Supplemental Information						
Description	Intel® NUC 8 Pro Kit	Intel® NUC 8 Pro Kit	Intel® NUC 8 Pro Kit	Intel® NUC 8 Pro Kit	Intel® NUC 8 Pro Kit	Intel® NUC 8 Pro Kit
Memory & Storage						
Max. Memory Size (Dep. on Memory Type)	64 GB	64 GB	64 GB	64 GB	64 GB	64 GB
Memory Types	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM
Max. # of Memory Channels	2	2	2	2	2	2
Max. # of DIMMs	2	2	2	2	2	2
ECC Memory Supported	No	No	No	No	No	No
Processor Graphics						
Processor Graphics	Intel® UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics
Integrated Graphics	Yes	Yes	Yes	Yes	Yes	Yes
Graphics Output	Dual HDMI 2.0a, DP 1.2 via Type C, 4-lane eDP 1.4	Dual HDMI 2.0a, DP 1.2 via Type C, 4-lane eDP 1.4	Dual HDMI 2.0a, DP 1.2 via Type C, 4-lane eDP 1.4	Dual HDMI 2.0a, DP 1.2 via Type C, 4-lane eDP 1.4	Dual HDMI 2.0a, DP 1.2 via Type C, 4-lane eDP 1.4	Dual HDMI 2.0a, DP 1.2 via Type C, 4-lane eDP 1.4
# of Displays Supported	3	3	3	3	3	3
Expansion Options						
PCI Express Revision	Gen 3	Gen 3	Gen 3	Gen 3	Gen 3	Gen 3
PCI Express Configurations	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot
M.2 Card Slot (Wireless)	22x30 (key E) slot	22x30 (key E) slot	22x30 (key E) slot	22x30 (key E) slot	22 x 30 (key E) slot	22x30 (key E) slot
M.2 Card Slot (Storage)	22x80 (key M) slot	22x80 (key M) slot	22x80 (key M) slot	22x80 (key M) slot	22x80 (key M) slot	22x80 (key M) slot
I/O Specifications						
# of USB Ports	4	4	4	4	4	4
USB Configuration	USB 3.1 (C): 1 rear; USB 3.1 (A): 2 front, 1 rear; USB 3.0: 1 header; USB 2.0: 1 rear, 2 headers	USB 3.1 (C): 1 rear; USB 3.1 (A): 2 front, 1 rear; USB 3.0: 1 header; USB 2.0: 1 rear, 2 headers	USB 3.1 (C): 1 rear; USB 3.1 (A): 2 front, 1 rear; USB 3.0: 1 header; USB 2.0: 1 rear, 2 headers	USB 3.1 (C): 1 rear; USB 3.1 (A): 2 front, 1 rear; USB 3.0: 1 header; USB 2.0: 1 rear, 2 headers	USB 3.1 (C): 1 rear; USB 3.1 (A): 2 front, 1 rear USB 3.0: 1 header; USB 2.0: 1 rear, 2 headers	USB 3.1 (C): 1 rear; USB 3.1 (A): 2 front, 1 rear USB 3.0: 1 header; USB 2.0: 1 rear, 2 headers
Serial Port via Internal Header	Yes	Yes	Yes	Yes	Yes	Yes
Integrated LAN	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet
Integrated Wireless	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0
Integrated Bluetooth	Yes	Yes	Yes	Yes	Yes	Yes
Additional Headers	Front panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector	Front panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector	Front panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector	Front panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector	Front panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector	Front panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector
# of Thunderbolt™ 3 Ports	1 (Type C)	1 (Type C)	1 (Type C)	1 (Type C)	1 (Type C)	1 (Type C)
Total # of SATA Ports	1		1		1	
RAID Configuration	2.5“ HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)		2.5“ HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)		2.5“ HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)	
Advanced Technologies						
Intel® Optane™ Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes
Intel vPro® Platform Eligibility	Yes	Yes	Yes	Yes	No	No
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Platform Trust Technology (Intel® PTT)					Yes	Yes
TPM	Yes	Yes	Yes	Yes		
TPM Version	2.0	2.0	2.0	2.0		
Security & Reliability						
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Technology	Yes	Yes	Yes	Yes	No	No

Intel® NUC Kits – Bean Canyon

	Intel® NUC Kit NUC8i5BEH	Intel® NUC Kit NUC8i5BEHS	Intel® NUC Kit NUC8i5BEK	Intel® NUC Kit NUC8i3BEH	Intel® NUC Kit NUC8i3BEHS	Intel® NUC Kit NUC8i3BEK
Board Number	NUC8BEB	NUC8BEB	NUC8BEB	NUC8BEB	NUC8BEB	NUC8BEB
Board Form Factor	UCFF (4" x 4")	UCFF (4" x 4")	UCFF (4" x 4")	UCFF (4" x 4")	UCFF (4" x 4")	UCFF (4" x 4")
Socket	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA
Internal Drive Form Factor	M.2 and 2.5" Drive	M.2 and 2.5" Drive	M.2 SSD	M.2 and 2.5" Drive	M.2 and 2.5" Drive	M.2 SSD
# of Internal Drives Supported	2	2	1	2	2	1
Lithography	14nm	14nm	14nm	14nm	14nm	14nm
TDP	28W	15W	28W	28W	15W	28W
DC Input Voltage Supported	12-19V_{DC}	12-19V_{DC}	12-19V_{DC}	12-19V_{DC}	12-19V_{DC}	12-19V_{DC}
Processor Included	Intel® Core™ i5-8259U Processor (6M Cache, up to 3.80GHz)	Intel® Core™ i5-8260U Processor (6M Cache, up to 3.90GHz)	Intel® Core™ i5-8259U Processor (6M Cache, up to 3.80GHz)	Intel® Core™ i3-8109U Processor (4M Cache, up to 3.60GHz)	Intel® Core™ i3-8140U Processor (4M Cache, up to 3.90GHz)	Intel® Core™ i3-8109U Processor (4M Cache, up to 3.60GHz)
Intel vPro® Platform Eligibility	No	No	No	No	No	No
# of Cores	4	4	4	2	2	2
# of Threads	8	8	8	4	4	4
Processor Base Frequency	2.30GHz	1.60GHz	2.30GHz	3.00GHz	2.10GHz	3.00GHz
Max Turbo Frequency	3.80GHz	3.90GHz	3.80GHz	3.60GHz	3.90GHz	3.60GHz
Supplemental Information						
Embedded Options Available	No	No	No	No	No	No
Description	Other features: Includes Thunderbolt 3 (40Gbps) USB 3.1 Gen 2 (10Gbps) and DP 1.2 via USB-C; also includes microSDXC card slot, dual microphones			Other features: Includes Thunderbolt 3 (40Gbps) USB 3.1 Gen 2 (10Gbps) and DP 1.2 via USB-C; also includes microSDXC card slot, dual microphones		
Memory & Storage						
Max Memory Size (dependent on memory type)	32GB	64GB	32GB	32GB	64GB	32GB
Memory Types	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM
Max # of Memory Channels	2	2	2	2	2	2
Max Memory Bandwidth	38.4GB/s	38.4GB/s	38.4GB/s	38.4GB/s	38.4GB/s	38.4GB/s
Max # of DIMMs	2	2	2	2	2	2
ECC Memory Supported	No	No	No	No	No	No
Processor Graphics						
Processor Graphics	Intel® Iris® Plus Graphics 655	Intel® UHD Graphics 620	Intel® Iris® Plus Graphics 655	Intel® Iris® Plus Graphics 655	Intel® UHD Graphics 620	Intel® Iris® Plus Graphics 655
Integrated Graphics	Yes	Yes	Yes	Yes	Yes	Yes
Graphics Output	HDMI 2.0a; USB-C (DP1.2)	HDMI 2.0a; USB-C (DP1.2)	HDMI 2.0a; USB-C (DP1.2)	HDMI 2.0a; USB-C (DP1.2)	HDMI 2.0a; USB-C (DP1.2)	HDMI 2.0a; USB-C (DP1.2)
# of Displays Supported	3	3	3	3	3	3
Expansion Options						
PCI Express Revision	Gen3	Gen3	Gen3	Gen3	Gen3	Gen3
PCI Express Configurations	M.2 slot with PCIe X4 lanes	M.2 slot with PCIe X4 lanes	M.2 slot with PCIe X4 lanes	M.2 slot with PCIe X4 lanes	M.2 slot with PCIe X4 lanes	M.2 slot with PCIe X4 lanes
Removable Memory Card Slot	microSDXC with UHS-I support	microSDXC with UHS-I support	microSDXC with UHS-I support	microSDXC with UHS-I support	microSDXC with UHS-I support	microSDXC with UHS-I support
M.2 Card Slot (storage)	22x42/80	22x42/80	22x42/80	22x42/80	22x42/80	22x42/80
I/O Specifications						
# of USB Ports	6	6	6	6	6	6
USB Configuration	2x front and 3x rear USB 3.1 Gen2; 2x USB 2.0 via internal headers	2x front and 3x rear USB 3.1 Gen2; 2x USB 2.0 via internal headers	2x front and 3x rear USB 3.1 Gen2; 2x USB 2.0 via internal headers			
USB Revision	2.0, 3.1 Gen2	2.0, 3.1 Gen2	2.0, 3.1 Gen2	2.0, 3.1 Gen2	2.0, 3.1 Gen2	2.0, 3.1 Gen2
USB 2.0 Configuration (External + Internal)	0 + 2	0 + 2	0 + 2	0 + 2	0 + 2	0 + 2
USB 3.0 Configuration (External + Internal)	2B 2F + 0	2B 2F + 0	2B 2F + 0	2B 2F + 0	2B 2F + 0	2B 2F + 0
Total # of SATA Ports	2	2	2	2	2	2
Max # of SATA 6.0GB/s Ports	2	2	2	2	2	2
RAID Configuration	2.5" HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)	2.5" HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)		2.5" HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)	2.5" HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)	
Audio (back channel + front channel)	7.1 digital (HDMI mDP); L+R mic (F)	7.1 digital (HDMI mDP); L+R mic (F)	7.1 digital (HDMI mDP); L+R mic (F)	7.1 digital (HDMI mDP); L+R mic (F)	7.1 digital (HDMI mDP); L+R mic (F)	7.1 digital (HDMI mDP); L+R mic (F)
Integrated LAN	Intel® Ethernet Connection I219-V	Intel® Ethernet Connection I219-V	Intel® Ethernet Connection I219-V	Intel® Ethernet Connection I219-V	Intel® Ethernet Connection I219-V	Intel® Ethernet Connection I219-V
Integrated Wireless	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0
Integrated Bluetooth	Yes	Yes	Yes	Yes	Yes	Yes
Consumer Infrared Rx Sensor	Yes	Yes	Yes	Yes	Yes	Yes
Additional Headers	CEC, 2x USB2.0, Front Panel	CEC, 2x USB2.0, Front Panel	CEC, 2x USB2.0, Front Panel	CEC, 2x USB2.0, Front Panel	CEC, 2x USB2.0, Front Panel	CEC, 2x USB2.0, Front Panel
# of Thunderbolt™ 3 Ports	1	1	1	1	1	1
Advanced Technologies						
Intel® Optane™ Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes
Intel vPro® Platform Eligibility	No	No	No	No	No	No
TPM	No	No	No	No	No	No
Intel® HD Audio Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Rapid Storage Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Platform Trust Technology (Intel® PTT)	Yes	Yes	Yes	Yes	Yes	Yes
Security & Reliability						
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes

Intel® NUC Kits – Dawson Canyon

	Intel® NUC Kit NUC7i7DNHE	Intel® NUC Kit NUC7i7DNKE	Intel® NUC Kit NUC7i5DNHE	Intel® NUC Kit NUC7i5DNKE	Intel® NUC Kit NUC7i3DNHE	Intel® NUC Kit NUC7i3DNKE
Board Number	NUC7i7DNB	NUC7i7DNB	NUC7i5DNB	NUC7i5DNB	NUC7i3DNB	NUC7i3DNB
Board Form Factor	UCFF (4“ x 4“)	UCFF (4“ x 4“)	UCFF (4“ x 4“)	UCFF (4“ x 4“)	UCFF (4“ x 4“)	UCFF (4“ x 4“)
Socket	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA
Internal Drive Form Factor	M.2 and 2.5“ Drive	M.2 SSD	M.2 and 2.5“ Drive	M.2 SSD	M.2 and 2.5“ Drive	M.2 SSD
# of Internal Drives Supported	2	1	2	1	2	1
TDP	15W	15W	15W	15W	15W	15W
DC Input Voltage Supported	12 - 24 V_{DC}	12-24 V_{DC}	12-24 V_{DC}	12-24 V_{DC}	12-24 V_{DC}	12-24 V_{DC}
Processor Included	Intel® Core™ i7-8650U Processor (8M Cache, up to 4.20 GHz)	Intel® Core™ i7-8650U Processor (8M Cache, up to 4.20 GHz)	Intel® Core™ i5-7300U Processor (3M Cache, up to 3.50 GHz)	Intel® Core™ i5-7300U Processor (3M Cache, up to 3.50 GHz)	Intel® Core™ i3-7100U Processor (3M Cache, 2.40 GHz)	Intel® Core™ i3-7100U Processor (3M Cache, 2.40 GHz)
Intel vPro® Platform Eligibility	Yes	Yes	Yes	Yes	No	No
# of Cores	4	4	2	2	2	2
# of Threads	8	8	4	4	4	4
Processor Base Frequency	1.90 GHz	1.90 GHz	2.60 GHz	2.60 GHz	2.40 GHz	2.40 GHz
Warranty Period	3 yrs	3 yrs	3 yrs	3 yrs	3 yrs	3 yrs
Max. Turbo Frequency	4.20 GHz	4.20 GHz	3.50 GHz	3.50 GHz		
Supplemental Information						
Embedded Options Available	Yes	Yes	Yes	Yes	Yes	Yes
Description	8th Gen Commercial Intel® NUC	8th Gen Commercial Intel® NUC	7th Gen Commercial Intel® NUC	7th Gen Commercial Intel® NUC	7th Gen Commercial Intel® NUC	7th Gen Commercial Intel® NUC
Memory & Storage						
Max. Memory Size (dependent on memory type)	32 GB	32 GB	32 GB	32 GB	32 GB	32 GB
Memory Types	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM	DDR4-2133 1.2V SO-DIMM	DDR4-2133 1.2V SO-DIMM	DDR4-2133 1.2V SO-DIMM	DDR4-2133 1.2V SO-DIMM
Max. # of Memory Channels	2	2	2	2	2	2
Max. # of DIMMs	2	2	2	2	2	2
ECC Memory Supported	No	No	No	No	No	No
Processor Graphics						
Processor Graphics	Intel® UHD Graphics 620	Intel® UHD Graphics 620	Intel® HD Graphics 620	Intel® HD Graphics 620	Intel® HD Graphics 620	Intel® HD Graphics 620
Integrated Graphics	Yes	Yes	Yes	Yes	Yes	Yes
Graphics Output	Dual HDMI 2.0a, 4-lane eDP 1.4	Dual HDMI 2.0a, 4-lane eDP 1.4	Dual HDMI 2.0a, 4-lane eDP 1.4	Dual HDMI 2.0a, 4-lane eDP 1.4	Dual HDMI 2.0a, 4-lane eDP 1.4	Dual HDMI 2.0a, 4-lane eDP 1.4
# of Displays Supported	2	2	2	2	2	2
Expansion Options						
PCI Express Revision	Gen 3	Gen 3	Gen 3	Gen 3	Gen 3	Gen 3
PCI Express Configurations	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot
M.2 Card Slot (Wireless)	22x30 (key E) slot	22x30 (key E) slot	22x30 (key E) slot	22x30 (key E) slot	22x30 (key E) slot	22x30 (key E) slot
M.2 Card Slot (Storage)	22x80 (key M) slot	22x80 (key M) slot	22x80 (key M) slot	22x80 (key M) slot	22x80 (key M) slot	22x80 (key M) slot
I/O Specifications						
# of USB Ports	4	4	4	4	4	4
USB Configuration	2x front and 2x rear USB 3.0; 1x USB 3.0 and 2x USB 2.0 via internal headers			2x front and 2x rear USB 3.0; 1x USB 3.0 and 2x USB 2.0 via internal headers		
USB Revision	2.0, 3.0	2.0, 3.0	2.0, 3.0	2.0, 3.0	2.0, 3.0	2.0, 3.0
USB 2.0 Configuration (External + Internal)	0 + 2	0 + 2	0 + 2	0 + 2	0 + 2	0 + 2
USB 3.0 Configuration (External + Internal)	2B 2F +1	2B 2F +1	2B 2F +1	2B 2F +1	2B 2F +1	2B 2F +1
Total # of SATA Ports	2	2	2	2	2	2
Max # of SATA 6.0 GB/s Ports	2	2	2	2	2	2
RAID Configuration	2.5“ HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)	N/A	2.5“ HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)	N/A	2.5“ HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)	N/A
Serial Port via Internal Header	Yes	Yes	Yes	Yes	Yes	Yes
Integrated LAN	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet
Integrated Wireless	Intel® Wireless-AC 8265 vPro (IEEE 802.11ac 2x2)			Intel® Wireless-AC 8265 vPro (IEEE 802.11ac 2x2)	Intel® Wireless-AC 8265 (IEEE 802.11ac 2x2)	Intel® Wireless-AC 8265 (IEEE 802.11ac 2x2)
Integrated Bluetooth	Yes	Yes	Yes	Yes	Yes	Yes
Additional Headers	Front Panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); HDMI_CEC; Internal 2x2 power connector			Front Panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); HDMI_CEC; Internal 2x2 power connector		
Advanced Technologies						
Intel® Virtualiz. Techn. for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes
Intel vPro® Platform Eligibility	Yes	Yes	Yes	Yes	No	No
Intel® ME Firmware Version	v11.8	v11.8	v11.7	v11.7	v11.7	v11.7
TPM	Yes	Yes	Yes	Yes	No	No
Intel® Rapid Storage Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Platform Trust Technology (Intel® PTT)	No	No	No	No	Yes	Yes
Intel® Optane™ Memory Supported	Yes		Yes		Yes	
TPM Version	2.0	2.0	2.0	2.0		
Security & Reliability						
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Technology	Yes	Yes	Yes	Yes	No	No

Intel® NUC Kits – June Canyon

	Intel® NUC Kit NUC7PJYH	Intel® NUC Kit NUC7CJYH
Board Number	NUC7JYB	NUC7JYB
Board Form Factor	UCFF (4“ x 4“)	UCFF (4“ x 4“)
Socket	Soldered-down BGA	Soldered-down BGA
Internal Drive Form Factor	2.5“ Drive	2.5“ Drive
# of Internal Drives Supported	1	1
Lithography	14 nm	14 nm
TDP	10 W	10 W
DC Input Voltage Supported	12-19 V_{DC}	12-19 V_{DC}
Processor Included	Intel® Pentium® Silver J5005 Processor (4M Cache, up to 2.8 GHz)	Intel® Celeron® J4005 Processor (4M Cache, up to 2.7 GHz)
Intel vPro® Platform Eligibility	No	No
# of Cores	4	2
# of Threads	4	2
Processor Base Frequency	1.50 GHz	2.00 GHz
Supplemental Information		
Embedded Options Available	No	No
Description	Other features: Includes SDXC card slot, dual microphones	Other features: Includes SDXC card slot, dual microphones
Memory & Storage		
Max. Memory Size (Dependent on Memory Type)	8 GB	8 GB
Memory Types	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM
Max. # of Memory Channels	2	2
Max. Memory Bandwidth	38.4 GB/s	38.4 GB/s
Max. # of DIMMs	2	2
ECC Memory Supported	No	No
Processor Graphics		
Integrated Graphics	Intel® UHD Graphics 605	Intel® UHD Graphics 600
Graphics Output	Yes	Yes
# of Displays Supported	2x HDMI 2.0a	2x HDMI 2.0a
Expansion Options	2	2
Removable Memory Card Slot	SDXC with UHS-I support	SDXC with UHS-I support
I/O Specifications		
# of USB Ports	6	6
USB Configuration	2x front and 2x rear USB 3.0; 2x USB 2.0 via internal headers	2x front and 2x rear USB 3.0; 2x USB 2.0 via internal headers
USB Revision	2.0, 3.0	2.0, 3.0
USB 2.0 Configuration (External + Internal)	0 + 2	0 + 2
USB 3.0 Configuration (External + Internal)	2B 2F + 0	2B 2F + 0
Total # of SATA Ports	1	1
Max. # of SATA 6.0 Gb/s Ports	1	1
RAID Configuration	N/A	N/A
Audio (back channel + front channel)	7.1 digital; L+R+mic (F); L+R+TOSLINK (R)	7.1 digital; L+R+mic (F); L+R+TOSLINK (R)
Integrated LAN	Realtek 8111H-CG	Realtek 8111H-CG
Integrated Wireless	Intel® Wireless-AC 9462 + Bluetooth 5.0	Intel® Wireless-AC 9462 + Bluetooth 5.0
Integrated Bluetooth	Yes	Yes
Consumer Infrared Rx Sensor	Yes	Yes
S/PDIF Out Connector	TOSLINK	TOSLINK
Additional Headers	CEC, 2x USB2.0, AUX_PWR, FRONT_PANEL	CEC, 2x USB2.0, AUX_PWR, FRONT_PANEL
Advanced Technologies		
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes
Intel vPro® Platform Eligibility	No	No
TPM	No	No
Intel® HD Audio Technology	Yes	Yes
Intel® Virtualization Technology (VT-x)		Yes
Intel® Platform Trust Technology (Intel® PTT)	Yes	Yes
Security & Reliability		
Intel® AES New Instructions	Yes	Yes

Intel® NUC Kits – Arches / Chaco Canyon

	Intel® NUC Kit NUC6CAYH
Board Number	NUC6CAYB
Board Form Factor	UCFF (4“ x 4“)
Socket	Soldered-down BGA
Internal Drive Form Factor	2.5“ Drive
# of Internal Drives Supported	1
Lithography	14 nm
TDP	10 W
DC Input Voltage Supported	12-19 V_{DC}
Processor Included	Intel® Celeron® Processor J3455 (2M Cache, up to 2.3 GHz)
Intel vPro® Platform Eligibility	No
# of Cores	4
# of Threads	4
Processor Base Frequency	1.50 GHz
Supplemental Information	
Embedded Options Available	No
Memory & Storage	
Max Memory Size (dependent on memory type)	8 GB
Memory Types	DDR3L-1600/1866 1.35V SO-DIMM
Max # of Memory Channels	2
Max Memory Bandwidth	14.9 GB/s
Max # of DIMMs	2
ECC Memory Supported	No
Processor Graphics	
Processor Graphics	Intel® HD Graphics 500
Integrated Graphics	Yes
Graphics Output	VGA (HDB15); HDMI 2.0
# of Displays Supported	2
Expansion Options	
PCI Express Revision	Gen2
PCI Express Configurations	M.2 slot with PCIe x1 lane
Removable Memory Card Slot	SDXC with UHS-I support
M.2 Card Slot (wireless)	22x30
I/O Specifications	
# of USB Ports	6
USB Configuration	2x front and 2x rear USB 3.0; 2x USB 2.0 via internal headers
USB Revision	2.0, 3.0
USB 2.0 Configuration (External + Internal)	0 + 2
USB 3.0 Configuration (External + Internal)	2B 2F + 0
Total # of SATA Ports	1
Max # of SATA 6.0 Gb/s Ports	1
RAID Configuration	N/A
Audio (back channel + front channel)	7.1 digital; L+R+mic (F); L+R+TOSLINK (R)
Integrated LAN	Realtek 8111HN
Integrated Wireless	Intel® Wireless-AC 3168 + Bluetooth 4.2
Integrated Bluetooth	Yes
Consumer Infrared Rx Sensor	Yes
S/PDIF Out Connector	TOSLINK
Additional Headers	CEC, 2x USB2.0, AUX_PWR, Front Panel
Advanced Technologies	
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes
Intel vPro® Platform Eligibility	No
TPM	No
Intel® HD Audio Technology	Yes
Intel® Virtualization Technology (VT-x)	Yes
Intel® Platform Trust Technology (Intel® PTT)	Yes
Security & Reliability	
Intel® AES New Instructions	Yes

	Intel® NUC Kit NUC6CAYH
Board Number	NUC8CCHB
Board Form Factor	3.5" SBC (146mm x 101.6mm)
Internal Drive Form Factor	M.2 SSD
Embedded Storage	64 GB
DC Input Voltage Supported	12V - 24V
Processor Included	Intel® Celeron® Processor N3350 (2M Cache, up to 2.4 GHz)
# of Cores	2
# of Threads	2
Processor Base Frequency	1.10 GHz
Supplemental Information	
Embedded Options Available	No
Memory & Storage	
Included Storage	64GB eMMC
Included Memory	4GB LPDDR3 (dual-channel, soldered-down)
ECC Memory Supported	No
Processor Graphics	
Processor Graphics	Intel® HD Graphics 500
Graphics Output	HDMI 2.0, HDMI 1.4, 4-lane eDP 1.4
# of Displays Supported	2
Expansion Options	
PCI Express Revision	Gen 2
M.2 Card Slot (wireless)	22x30 slot (key E)
M.2 Card Slot (storage)	22x80 slot (key M; NVMe/SATA)
I/O Specifications	
# of USB Ports	4
USB Configuration	1x front and 1x rear USB 3.0; 2x rear USB 2.0; 1x USB 3.0 and 2x USB 2.0 via internal headers
Serial Port via Internal Header	Yes
Audio (back channel + front channel)	1/8" line out
Integrated LAN	Intel® i211-AT (10/100/1000 Mbps)
Integrated Wireless	Intel® Dual Band Wireless-AC 3168
Integrated Bluetooth	Yes
Additional Headers	Front_panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector
Package Specifications	
Chassis Dimensions	154 x 108 x 32 mm
Advanced Technologies	
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes
TPM	No
Intel® HD Audio Technology	Yes
Intel® Virtualization Technology (VT-x)	Yes
Intel® Platform Trust Technology (Intel® PTT)	Yes
Security & Reliability	
Intel® AES New Instructions	Yes
Intel® Trusted Execution Technology	No

Intel® NUC Boards – Provo Canyon

	Intel® NUC 8 Pro Board NUC8v7PNB	Intel® NUC 8 Pro Board NUC8v5PNB	Intel® NUC 8 Pro Board NUC8i3PNB
Board Number	NUC8v7PNB	NUC8v5PNB	NUC8i3PNB
Board Form Factor	UCFF (4" x 4")	UCFF (4" x 4")	UCFF (4" x 4")
Socket	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA
Internal Drive Form Factor	M.2 and 2.5" Drive	M.2 and 2.5" Drive	M.2 and 2.5" Drive
# of Internal Drives Supported	2	2	2
DC Input Voltage Supported	12-24 VDC	12-24 VDC	12-24 VDC
Processor Included	Intel® Core™ i7-8665U Processor (8M Cache, up to 4.80 GHz)	Intel® Core™ i5-8365U Processor (6M Cache, up to 4.10 GHz)	Intel® Core™ i3-8145U Processor (4M Cache, up to 3.90 GHz)
Intel vPro® Platform Eligibility	Yes	Yes	No
# of Cores	4	4	2
# of Threads	8	8	4
Processor Base Frequency	1.90 GHz	1.60 GHz	2.10 GHz
Max Turbo Frequency	4.80 GHz	4.10 GHz	3.90 GHz
Warranty Period	3 yrs	3 yrs	3 yrs
Supplemental Information			
Description	Intel® NUC 8 Pro Board	Intel® NUC 8 Pro Board	Intel® NUC 8 Pro Board
Memory & Storage			
Max Memory Size (dependent on memory type)	64 GB	64 GB	64 GB
Memory Types	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM	DDR4-2400 1.2V SO-DIMM
Max # of Memory Channels	2	2	2
Max # of DIMMs	2	2	2
ECC Memory Supported	No	No	No
Processor Graphics			
Processor Graphics	Intel® UHD Graphics for 10th Gen Intel® Processors	Intel® UHD Graphics for 10th Gen Intel® Processors	Intel® UHD Graphics for 10th Gen Intel® Processors
Integrated Graphics	Yes	Yes	Yes
Graphics Output	Dual HDMI 2.0a, DP 1.2 via Type C, 4-lane eDP 1.4	Dual HDMI 2.0a, DP 1.2 via Type C, 4-lane eDP 1.4	Dual HDMI 2.0a, DP 1.2 via Type C, 4-lane eDP 1.4
# of Displays Supported	3	3	3
Expansion Options			
PCI Express Revision	Gen 3	Gen 3	Gen 3
PCI Express Configurations	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot
M.2 Card Slot (wireless)	22x30 (key E) slot	22x30 (key E) slot	22x30 (key E) slot
M.2 Card Slot (storage)	22x80 (key M) slot	22x80 (key M) slot	22x80 (key M) slot
I/O Specifications			
# of USB Ports	4	4	4
USB Configuration	USB 3.1 (type C): 1 rear USB 3.1 (type A): 2 front, 1 rear USB 3.0: 1 header USB 2.0: 1 rear, 2 headers	USB 3.1 (type C): 1 rear USB 3.1 (type A): 2 front, 1 rear USB 3.0: 1 header USB 2.0: 1 rear, 2 headers	USB 3.1 (type C): 1 rear USB 3.1 (type A): 2 front, 1 rear USB 3.0: 1 header USB 2.0: 1 rear, 2 headers
RAID Configuration	2.5" HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)	2.5" HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)	2.5" HDD/SSD + M.2 SATA SSD (RAID-0 RAID-1)
Serial Port via Internal Header	Yes	Yes	Yes
Integrated LAN	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet
Additional Headers	Front_panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector	Front_panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector	Front_panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector
# of Thunderbolt™ 3 Ports	1 (Type C)	1 (Type C)	1 (Type C)
Advanced Technologies			
Intel® Optane™ Memory Supported	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes
Intel vPro® Platform Eligibility	Yes	Yes	No
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes
Intel® Platform Trust Technology (Intel® PTT)			Yes
TPM	Yes	Yes	
TPM Version	2.0	2.0	
Security & Reliability			
Intel® AES New Instructions	Yes	Yes	Yes
Intel® Trusted Execution Technology	Yes	Yes	No

Intel® NUC Boards – Dawson Canyon

	Intel® NUC Board NUC7i7DNBE	Intel® NUC Board NUC7i5DNBE	Intel® NUC Board NUC7i3DNBE
Board Number	NUC7i7DNB	NUC7i5DNB	NUC7i3DNB
Board Form Factor	UCFF (4" x 4")	UCFF (4" x 4")	UCFF (4" x 4")
Socket	Soldered-down BGA	Soldered-down BGA	Soldered-down BGA
Internal Drive Form Factor	M.2 and 2.5" Drive	M.2 and 2.5" Drive	M.2 and 2.5" Drive
# of Internal Drives Supported	2	2	2
TDP	15 W	15 W	15 W
DC Input Voltage Supported	12-24 V_{DC}	12-24 V_{DC}	12-24 V_{DC}
Processor Included	Intel® Core™ i7-8650U Processor (8M Cache, up to 4.20 GHz)	Intel® Core™ i5-7300U Processor (3M Cache, up to 3.50 GHz)	Intel® Core™ i3-7100U Processor (3M Cache, 2.40 GHz)
Intel vPro® Platform Eligibility	Yes	Yes	No
# of Cores	4	2	2
# of Threads	8	4	4
Processor Base Frequency	1.90 GHz	2.60 GHz	2.40 GHz
Warranty Period	3 yrs	3 yrs	3 yrs
Max Turbo Frequency	4.20 GHz	3.50 GHz	
Supplemental Information			
Embedded Options Available	Yes	Yes	Yes
Description	8th Gen Commercial Intel® NUC	7th Gen Commercial Intel® NUC	7th Gen Commercial Intel® NUC
Memory & Storage			
Max Memory Size (Dependent on Memory Type)	32 GB	32 GB	32 GB
Memory Types	DDR4-2400 1.2V SO-DIMM	DDR4-2133 1.2V SO-DIMM	DDR4-2133 1.2V SO-DIMM
Max # of Memory Channels	2	2	2
Max # of DIMMs	2	2	2
ECC Memory Supported	No	No	No
Processor Graphics			
Processor Graphics	Intel® UHD Graphics 620	Intel® HD Graphics 620	Intel® HD Graphics 620
Integrated Graphics	Yes	Yes	Yes
Graphics Output	Dual HDMI 2.0a, 4-lane eDP 1.4	Dual HDMI 2.0a, 4-lane eDP 1.4	Dual HDMI 2.0a, 4-lane eDP 1.4
# of Displays Supported	3	3	3
Expansion Options			
PCI Express Revision	Gen 3	Gen 3	Gen 3
PCI Express Configurations	PCIe x4: M.2 22x80 (key M) slot PCIe x1: M.2 22x30 (key E) slot		
M.2 Card Slot (wireless)	22x30 (key E) slot	22x30 (key E) slot	22x30 (key E) slot
M.2 Card Slot (storage)	22x80 (key M) slot	22x80 (key M) slot	22x80 (key M) slot
I/O Specifications			
# of USB Ports	4	4	4
USB Configuration	2x front and 2x rear USB 3.0; 1x USB 3.0 and 2x USB 2.0 via internal headers		
USB Revision	2.0, 3.0	2.0, 3.0	2.0, 3.0
USB 2.0 Config. (External + Internal)	0 + 2	0 + 2	0 + 2
USB 3.0 Config.(External + Internal)	2B 2F +1	2B 2F +1	2B 2F +1
Total # of SATA Ports	2	2	2
Max # of SATA 6.0 Gb/s Ports	2	2	2
RAID Configuration	2.5" HDD/SSD + M.2 SATA/PCIe SSD (RAID-0 RAID-1)	2.5" HDD/SSD + M.2 SATA/PCIe SSD (RAID-0 RAID-1)	2.5" HDD/SSD + M.2 SATA/PCIe SSD (RAID-0 RAID-1)
Serial Port via Internal Header	Yes	Yes	Yes
Integrated LAN	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet	Intel® i219-LM 10/100/1000 Mbps Ethernet
Additional Headers	Front_panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); HDMI_CEC; Internal 2x2 power connector	Front_panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); HDMI_CEC; Internal 2x2 power connector	Front_panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); HDMI_CEC; Internal 2x2 power connector
Advanced Technologies			
Intel® Optane™ Memory Supported	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes
Intel vPro® Platform Eligibility	Yes	Yes	No
Intel® ME Firmware Version	v11.8	v11.7	v11.7
TPM	Yes	Yes	No
Intel® Rapid Storage Technology	Yes	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes
Intel® Platform Trust Technology	No	No	Yes
TPM Version	2.0	2.0	
Security & Reliability			
Intel® AES New Instructions	Yes	Yes	Yes
Intel® Trusted Execution Technology	Yes	Yes	No

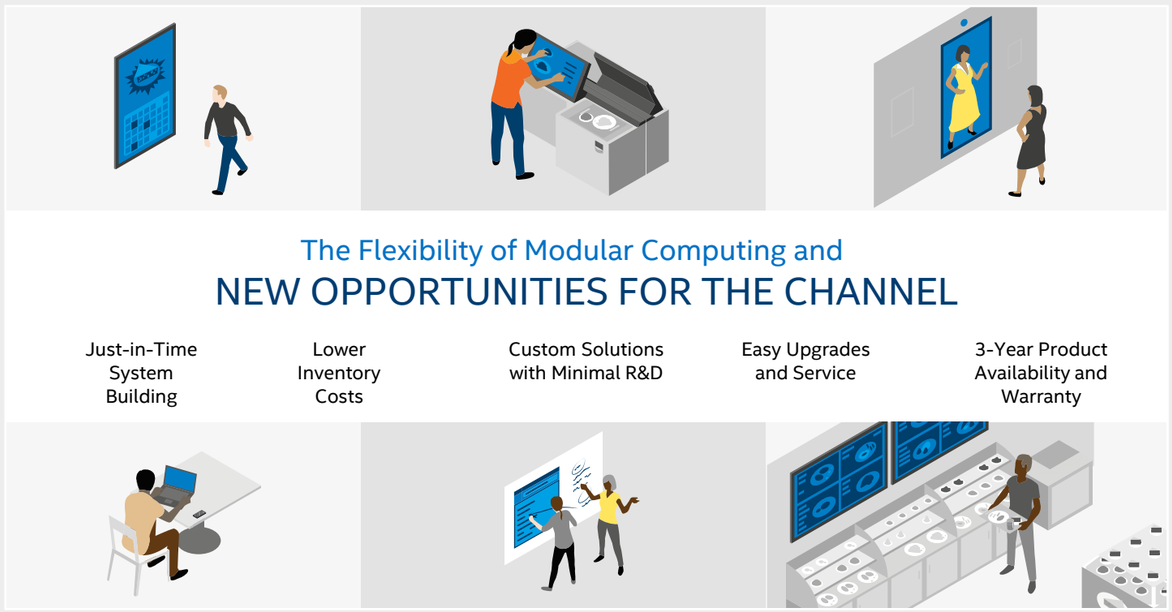
Intel® NUC Boards – Chaco Canyon

	Intel® NUC Board NUC8CCHB
Board Number	NUC8CCHB
Board Form Factor	3.5" SBC (146 x 101.6 mm)
Internal Drive Form Factor	M.2 SSD
Embedded Storage	64 GB
DC Input Voltage Supported	12 - 24 V
Processor Included	Intel® Celeron® Processor N3350 (2M Cache, up to 2.4 GHz)
# of Cores	2
# of Threads	2
Processor Base Frequency	1.10 GHz
Supplemental Information	
Embedded Options Available	No
Memory & Storage	
Included Storage	64 GB eMMC
Included Memory	4 GB LPDDR3 (dual-channel, soldered-down)
ECC Memory Supported	No
Processor Graphics	
Processor Graphics	Intel® HD Graphics 500
Graphics Output	HDMI 2.0, HDMI 1.4, 4-lane eDP 1.4
# of Displays Supported	2
Expansion Options	
PCI Express Revision	Gen 2
M.2 Card Slot (wireless)	22x30 slot (key E)
M.2 Card Slot (storage)	22x80 slot (key M; NVMe/SATA)
I/O Specifications	
# of USB Ports	4
USB Configuration	1x front and 1x rear USB 3.0; 2x rear USB 2.0; 1x USB 3.0 and 2x USB 2.0 via internal headers
Serial Port via Internal Header	Yes
Audio (back channel + front channel)	1/8" line out
Integrated LAN	Intel® i211-AT (10/100/1000 Mbps)
Additional Headers	Front_panel (PWR, RST, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector
Advanced Technologies	
Intel® Virtualization Techn. for Directed I/O (VT-d)	Yes
TPM	No
Intel® HD Audio Technology	Yes
Intel® Virtualization Technology (VT-x)	Yes
Intel® Platform Trust Technology (Intel® PTT)	Yes
Security & Reliability	
Intel® AES New Instructions	Yes
Intel® Trusted Execution Technology	No

with Heatsink

Intel® NUC Rugged Board Elements – Carrier Boards

	Intel® NUC Rugged Board Element CMB1ABA	Intel® NUC Rugged Board Element CMB1ABB	Intel® NUC Rugged Board Element CMB1ABC
Board Form Factor	U-series Element Carrier Board	U-series Element Carrier Board	U-series Element Carrier Board
Internal Drive Form Factor	M.2 SSD	M.2 SSD	M.2 SSD
# of Internal Drives Supported	2	2	2
TDP	15 W	15 W	15 W
DC Input Voltage Supported	12V~24V	12V~24V	12V~24V
Supplemental Information			
Description	The modular Intel® NUC Rugged Board designed for the Intel® NUC Rugged Chassis Element or for use in a third-party chassis and/or embedded solutions. The expandable board – with two headers and serial DV9 - is designed for edge analytics.	The modular Intel® NUC Rugged Board designed for the Intel® NUC Rugged Chassis Element or for use in a third-party chassis and/or embedded solutions. The Dual LAN board – designed for IoT deployments – offers design flexibility.	The modular Intel® NUC Rugged Board designed for the Intel® NUC Rugged Chassis Element or for use in a third-party chassis and/or embedded solutions. The Six HDMI* ports are designed for digital signage and ideal for the QSR market or display walls.
Processor Graphics			
Graphics Output	Dual HDMI, eDP	Dual HDMI, eDP	Six HDMI, eDP
# of Displays Supported	3	3	6
Expansion Options			
M.2 Card Slot (storage)	2280, 2242/80 (M-key)	2280, 2242/80 (M-key)	2280, 2242/80 (M-key)
I/O Specifications			
USB Configuration	USB 3.2g2: 1x front, 2x rear ports USB 3.1g1: 1x header USB 2.0: 1x front port, 2x headers	USB 3.2g2: 1x front, 2x rear ports USB 3.1g1: 1x header USB 2.0: 1x front, 2x rear ports	USB 3.2g2: 1x front, 2x rear ports USB 3.1g1: 1x header USB 2.0: 1x front port, 2x headers
# of Serial Ports	2	2	2
Serial Port via Internal Header	Yes	Yes	Yes
Integrated LAN	Intel® i219-LM GbE	Intel® i219-LM & i211-AT GbE	Intel® i219-LM GbE
Additional Headers	Front panel (PWR_SW, PWR_LED, RST, HDD_Act, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector	Front panel (PWR_SW, PWR_LED, RST, HDD_Act, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector	Front panel (PWR_SW, PWR_LED, RST, HDD_Act, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector
Package Specifications			
Chassis Dimensions	170 x 136.4 mm	170 x 136.4 mm	200 x 136.4 mm



Intel® NUC Boards – Chandler Bay

	Intel® NUC 8 Compute Element CM8v7CB	Intel® NUC 8 Compute Element CM8i7CB	Intel® NUC 8 Compute Element CM8v5CB	Intel® NUC 8 Compute Element CM8i5CB	Intel® NUC 8 Compute Element CM8i3CB	Intel® NUC 8 Compute Element CM8PCB	Intel® NUC 8 Compute Element CM8CCB
Board Form Factor	U-Series Compute Element (95 x 65 x 6 mm)	U-Series Compute Element (95 x 65 x 6 mm)	U-Series Compute Element (95 x 65 x 6 mm)	U-Series Compute Element (95 x 65 x 6 mm)	U-Series Compute Element (95 x 65 x 6 mm)	U-Series Compute Element (95 x 65 x 6 mm)	U-Series Compute Element (95 x 65 x 6 mm)
Processor Included	Intel® Core™ i7-8665U Processor (8M Cache, up to 4.80 GHz)	Intel® Core™ i7-8565U Processor (8M Cache, up to 4.60 GHz)	Intel® Core™ i5-8365U Processor (6M Cache, up to 4.10 GHz)	Intel® Core™ i5-8265U Processor (6M Cache, up to 3.90 GHz)	Intel® Core™ i3-8145U Processor (4M Cache, up to 3.90 GHz)	Intel® Pentium® Gold 5405U Processor (2M Cache, 2.30 GHz)	Intel® Celeron® Processor 4305U (2M Cache, 2.20 GHz)
Intel vPro® Platform Eligibility	Yes	No	Yes	No	No	No	No
# of Cores	4	4	4	4	2	2	2
# of Threads	8	8	8	8	4	4	2
Processor Base Frequency	1.90 GHz	1.80 GHz	1.60 GHz	1.60 GHz	2.10 GHz	2.30 GHz	2.20 GHz
Max Turbo Frequency	4.80 GHz	4.60 GHz	4.10 GHz	3.90 GHz	3.90 GHz		
Supplemental Information							
Description	Intel® NUC Compute Element with 8th gen Intel® Core™ processors give the performance you demand in a manageable, flexible form factor. Plugs into Intel® NUC Board Elements so you can integrate compute and connectivity to quickly develop custom solutions.	Intel® NUC Compute Element with 8th gen Intel® Core™ processors give the performance you demand in a manageable, flexible form factor. Plugs into Intel® NUC Board Elements so you can integrate compute and connectivity to quickly develop custom solutions.	Intel® NUC Compute Element with 8th gen Intel® Core™ processors give the performance you demand in a manageable, flexible form factor. Plugs into Intel® NUC Board Elements so you can integrate compute and connectivity to quickly develop custom solutions.	Intel® NUC Compute Element with 8th gen Intel® Core™ processors give the performance you demand in a manageable, flexible form factor. Plugs into Intel® NUC Board Elements so you can integrate compute and connectivity to quickly develop custom solutions.	Intel® NUC Compute Element with 8th gen Intel® Core™ processors give the performance you demand in a manageable, flexible form factor. Plugs into Intel® NUC Board Elements so you can integrate compute and connectivity to quickly develop custom solutions.	Intel® NUC Compute Element with Intel® Pentium® Gold processors gives you the choice and cost-effectiveness of a general-purpose system. Built-in and accessible I/O makes integration and customization easy.	Intel® NUC Compute Element with Intel® Celeron® processors gives you the choice and cost-effectiveness of a general-purpose system. Built-in and accessible I/O makes integration and customization easy.
Memory & Storage							
Included Memory	8GB	8GB	8GB	8GB	4GB	4GB	4GB
Memory Types	LPDDR3-2133	LPDDR3-2133	LPDDR3-2133	LPDDR3-2133	LPDDR3-2133	LPDDR3-1866	LPDDR3-1866
Max # of Memory Channels	2	2	2	2	2	2	2
ECC Memory Supported	No	No	No	No	No	No	No
Included Storage						64GB eMMC	64GB eMMC
Processor Graphics							
Processor Graphics	Intel® UHD Graphics for 10th Gen Intel® Processors	Intel® UHD Graphics for 10th Gen Intel® Processors	Intel® UHD Graphics for 10th Gen Intel® Processors	Intel® UHD Graphics for 10th Gen Intel® Processors	Intel® UHD Graphics for 10th Gen Intel® Processors	Intel® UHD Graphics for 10th Gen Intel® Processors	Intel® UHD Graphics for 10th Gen Intel® Processors
Integrated Graphics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Graphics Output	2x DDI (configurable as DP/HDMI), 1x eDP	2x DDI (configurable as DP/HDMI), 1x eDP	2x DDI (configurable as DP/HDMI), 1x eDP	2x DDI (configurable as DP/HDMI), 1x eDP	2x DDI (configurable as DP/HDMI), 1x eDP	2x DDI (configurable as DP/HDMI), 1x eDP	2x DDI (configurable as DP/HDMI), 1x eDP
# of Displays Supported	3	3	3	3	3	3	3
Expansion Options							
PCI Express Configurations	1x PCIe x4 Gen 3 (NVMe/SATA) 1x PCIe x4 Gen 3 (NVMe) 1x PCIe x1 Gen 3	1x PCIe x4 Gen 3 (NVMe/SATA) 1x PCIe x4 Gen 3 (NVMe) 1x PCIe x1 Gen 3	1x PCIe x4 Gen 3 (NVMe/SATA) 1x PCIe x4 Gen 3 (NVMe) 1x PCIe x1 Gen 3	1x PCIe x4 Gen 3 (NVMe/SATA) 1x PCIe x4 Gen 3 (NVMe) 1x PCIe x1 Gen 3	1x PCIe x4 Gen 3 (NVMe/SATA) 1x PCIe x4 Gen 3 (NVMe) 1x PCIe x1 Gen 3	1x PCIe x4 Gen 3 (NVMe/SATA) 1x PCIe x4 Gen 3 (NVMe) 1x PCIe x1 Gen 3	1x PCIe x4 Gen 3 (NVMe/SATA) 1x PCIe x4 Gen 3 (NVMe) 1x PCIe x1 Gen 3
I/O Specifications							
USB Configuration	4x USB 3.2 Gen 2 3x USB 2.0	4x USB 3.2 Gen 2 3x USB 2.0	4x USB 3.2 Gen 2 3x USB 2.0	4x USB 3.2 Gen 2 3x USB 2.0	4x USB 3.2 Gen 2 3x USB 2.0	4x USB 3.2 Gen 2 3x USB 2.0	4x USB 3.2 Gen 2 3x USB 2.0
Integrated LAN	Built-in GbE MAC (for i219 PHY)	Built-in GbE MAC (for i219 PHY)	Built-in GbE MAC (for i219 PHY)	Built-in GbE MAC (for i219 PHY)	Built-in GbE MAC (for i219 PHY)	Built-in GbE MAC (for i219 PHY)	Built-in GbE MAC (for i219 PHY)
Integrated Wireless	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0	Intel® Wireless-AC 9560 + Bluetooth 5.0
Integrated Bluetooth	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional Headers	HD Audio, DMIC, eSPI	HD Audio, DMIC, eSPI	HD Audio, DMIC, eSPI	HD Audio, DMIC, eSPI	HD Audio, DMIC, eSPI	HD Audio, DMIC, eSPI	HD Audio, DMIC, eSPI
Advanced Technologies							
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel vPro® Platform Eligibility	Yes	No	Yes	No	No	No	No
TPM	Yes		Yes				
TPM Version	2.0		2.0				
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Platform Trust Technology (Intel® PTT)		Yes		Yes	Yes	Yes	Yes
Security & Reliability							
Intel® AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Technology	Yes	No	Yes	No	No	No	No

Intel® NUC Compute Elements

Intel® NUC Rugged Chassis Elements

	Intel® NUC Rugged Chassis Element CMCR1ABA	Intel® NUC Rugged Chassis Element CMCR1ABB	Intel® NUC Rugged Chassis Element CMCR1ABC
Board Form Factor	U-series Element Carrier Board	U-series Element Carrier Board	U-series Element Carrier Board
Internal Drive Form Factor	M.2 SSD	M.2 SSD	M.2 SSD
# of Internal Drives Supported	2	2	2
TDP	15 W	15 W	15 W
DC Input Voltage Supported	12V~24V	12V~24V	12V~24V
Supplemental Information			
Description	The expandable Intel® NUC Rugged Chassis + Board Element designed for harsh and extreme environments. The expandable board – with two headers and serial DV9 - is designed for edge analytics and offers design flexibility.	The Dual LAN Intel® NUC Rugged Chassis + Board Element designed for harsh and extreme environments. The Dual LAN board – designed for IoT deployments – offers design flexibility.	The multi-HDMI Intel® NUC Rugged Chassis + Board Element designed for harsh and extreme environments The Six HDMI* ports - designed for digital signage - are ideal for the QSR market or display walls.
Processor Graphics			
Graphics Output	Dual HDMI	Dual HDMI	Six HDMI
# of Displays Supported ‡	2	2	6
Expansion Options			
M.2 Card Slot (storage)	2280, 2242/80 (M-key)	2280, 2242/80 (M-key)	2280, 2242/80 (M-key)
I/O Specifications			
USB Configuration	USB 3.2g2: 1x front, 2x rear ports USB 3.1g1: 1x header USB 2.0: 1x front port, 2x headers	USB 3.2g2: 1x front, 2x rear ports USB 3.1g1: 1x header USB 2.0: 1x front, 2x rear ports	USB 3.2g2: 1x front, 2x rear ports USB 3.1g1: 1x header USB 2.0: 1x front port, 2x headers
# of Serial Ports	2	2	2
Serial Port via Internal Header	Yes	Yes	Yes
Integrated LAN	Intel® i219-LM GbE	Intel® i219-LM GbE and Intel® i211-AT GbE	Intel® i219-LM GbE
Additional Headers	Front panel (PWR_SW, PWR_LED, RST, HDD_Act, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector	Front panel (PWR_SW, PWR_LED, RST, HDD_Act, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector	Front panel (PWR_SW, PWR_LED, RST, HDD_Act, 5V, 5Vsby, 3.3Vsby); Internal 2x2 power connector
Package Specifications			
Chassis Dimensions	254 x 152.4 x 36 mm (plus 4.8mm for rubber feet)	254 x 152.4 x 36 mm (plus 4.8mm for rubber feet)	254 x 152.4 x 36 mm (plus 4.8mm for rubber feet)

Intel® NUC Pro Chassis Elements

	Intel® NUC Pro Chassis Element CMCM2FB	Intel® NUC Pro Chassis Element CMCM2FBAV
Board Form Factor	U-series Element Carrier Board	U-series Element Carrier Board
Internal Drive Form Factor	M.2 SSD	M.2 SSD
# of Internal Drives Supported	2	2
DC Input Voltage Supported	12V~24V	12V~24V
Processor Graphics		
Graphics Output	Dual HDMI Out	Dual HDMI Out
# of Displays Supported ‡	2	2
Expansion Options		
M.2 Card Slot (storage)	2280, 2242/80 M-key	2280, 2242/80 M-key
I/O Specifications		
# of USB Ports	6	6
USB Configuration	USB3.1g2: 1 front, 2 rear ports USB2.0: 1 front port & 2 rear ports	USB3.1g2: 1 front, 2 rear ports USB2.0: 1 front port & 2 rear ports
Integrated LAN	Intel® i219-LM GbE and Intel® i211-AT GbE	Intel® i219-LM GbE and Intel® i211-AT GbE
Additional Headers		CMCM2FBAV adds HDMI Capture with HDMI Passthrough
Package Specifications		
Chassis Dimensions	200 x 150 x 35mm (w/ rubber feet)	200 x 150 x 35mm (w/ rubber feet)

Intel® NUC Pro Element – Assembly Element

	Intel® NUC Pro Assembly Element
Board Form Factor	U-series Element Carrier Board
Internal Drive Form Factor	M.2 SSD
# of Internal Drives Supported	1
TDP	15W
DC Input Voltage Supported	12 ~ 24V
Processor Graphics	
Graphics Output	HDMI, eDP
Expansion Options	
M.2 Card Slot (storage)	2280 M-key (NVMe/SATA)
I/O Specifications	
# of USB Ports	4
USB Configuration	4x rear USB 3.0 1x USB 3.0 and 2x USB 2.0 via internal headers
Integrated LAN	Intel® i219-LM GbE
Additional Headers	Front panel (PWR_SW, PWR_LED, RST, HDD_Act, 5V)

Intel® RealSense™

Intel® RealSense™ offers multiple products based on technologies like LiDAR, Stereo and Coded Light to experience and measure the world.

LiDAR

The Intel® RealSense™ LiDAR Camera L515 is the world's smallest and most power efficient hi-res LiDAR, capturing millions of depth points per second. The L515 features a lightweight form factor that delivers consistent high depth accuracy throughout the entire supported range of the camera, which starts at 25 centimeters and goes up to 9 meters.

Depth

Stereo depth works both indoors and outdoors in a wide variety of lighting conditions and can also be used in multiple camera configurations without the need for custom calibration. The onboard Intel® RealSense™ Vision Processor D4 performs all the depth calculations on the camera, allowing for low power, platform agnostic devices.

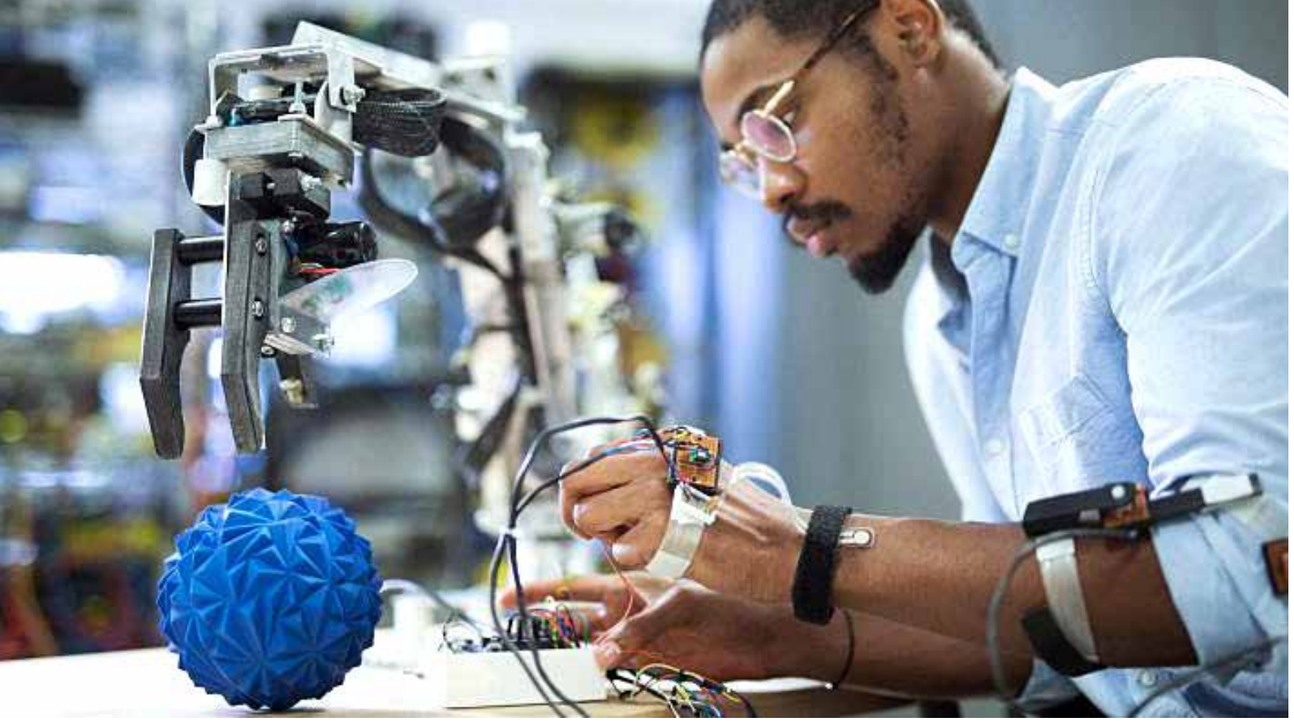
Tracking

With its small form factor and low power consumption, Intel® RealSense™ Tracking Camera T265 has been designed to give you the tracking performance you want straight off-the-shelf. Cross-platform, developer friendly simultaneous localization and mapping for all your robotics, drone and augmented reality rapid prototyping needs.

Product Comparison

Technology	LiDAR	Depth				Tracking
Model	**L515**	**D455**	**D435i**	**D435**	**D415**	**T265**
Depth Technology	LiDAR	Active IR Stereo	Active IR Stereo	Active IR Stereo	Active IR Stereo	—
Technology	Laser Scanning RGB Camera (Rolling Shutter)	Global Shutter, 3µm x 3µm pixel size	Global Shutter, 3µm x 3µm pixel size	Global Shutter, 3µm x 3µm pixel size	Rolling Shutter, 1.4µm x 1.4µm pixel size	Tracking Fisheye (Global Shutter)
Depth FOV (H × V)	70° × 55° (±2°)	87° (±3°) × 58° (±3°)	87° (±3°) × 58° (±1°)	87° (±3°) × 58° (±1°)	65° (±2°) × 40° (±1°)	—
Depth Resolution	Up to 1024 × 768	Up to 1280 × 720	Up to 1280 × 720	Up to 1280 × 720	Up to 1280 × 720	—
Depth Frame Rate	30 fps	Up to 90 fps	Up to 90 fps	Up to 90 fps	Up to 90 fps	—
Resolution and Frame Rate	1920 × 1080 at 30 fps (RGB)	1280 × 800 at 30 fps (RGB)	1920 × 1080 at 30 fps (RGB)	1920 × 1080 at 30 fps (RGB)	1920 × 1080 at 30 fps (RGB)	Up to 848 x 800 at 30 fps (Monochrome)
RGB Sensor FOV (H × V)	69° (±1°) × 42° (±1°)	87° (±3°) × 58° (±1°)	69° (±1°) × 42° (±1°)	69° (±1°) × 42° (±1°)	69° (±1°) × 42° (±1°)	2x 173° (Fisheye)
Inertial Measurement Unit	Yes	Yes	Yes/—	—	—	Yes
Min. Depth Distance (Min-Z)	0.25 m	0.4 m	0.105 m	0.105 m	0.16 m	—
Maximum range	Approx. 9 m[1]	Approx. 20 m[1]	Approx. 10 m[1]	Approx. 10 m[1]	Approx. 10 m[1]	—
Main components	Intel® RealSense™ Vision ASIC MEMS Mirror	Intel® RealSense™ Vision Processor D4 Intel® RealSense™ Depth module D450	Intel® RealSense™ Vision Processor D4 Intel® RealSense™ Depth module D430	Intel® RealSense™ Vision Processor D4 Intel® RealSense™ Depth module D430	Intel® RealSense™ Vision Processor D4 Intel® RealSense™ Depth module D415	Movidius Myriad 2 ASIC Intel® RealSense™ Tracking Module T261
Dimensions (mm)	61 × 26 mm (Diameter × H)	124 × 26 × 29 mm (L × D × H)	90 × 25 × 25 mm (L × D × H)	90 × 25 × 25 mm (L × D × H)	99 × 20 × 23 mm (L × D × H)	108 x 12.5 x 24.5 mm (L x D x H)
Connectors	USB-C 3.1 Gen 1	USB-C* 3.1 Gen 1*	USB-C* 3.1 Gen 1*	USB-C* 3.1 Gen 1*	USB-C* 3.1 Gen 1*	USB-C* 3.1 Gen 1*
Mounting Mechanism	– One 1/4-20 UNC thread mounting point – Two M3 thread mounting points – Tripod	– One 1/4-20 UNC thread mounting point – Two M3 thread mounting points – Tripod	– One 1/4-20 UNC thread mounting point – Two M3 thread mounting points – Tripod	– One 1/4-20 UNC thread mounting point – Two M3 thread mounting points – Tripod	– One 1/4-20 UNC thread mounting point – Two M3 thread mounting points – Tripod	– One 1/4-20 UNC thread mounting point – Two M3 thread mounting points – Tripod
Use Environment	Indoor	Indoor/Outdoor	Indoor/Outdoor	Indoor/Outdoor	Indoor/Outdoor	Indoor/Outdoor

1 Accuracy varies depending on calibration, scene and lighting condition.



Intel® RealSense™ Depth Camera

D400-Series

Module D450

Module Features
Use Environment
Depth Technology
Depth FOV (HxVxD)*
Max. Depth Resolution & Frame Rate*
Min. Depth Distance (Min-Z)*
Maximum Range
Max. RGB Resolution & Frame Rate

Physical
Form Factor
Interface
Product Dimension (LxDxH)

Recommended Accessories
Intel® RealSenseTM Vision Processor D4 (MM#957646)
Intel® RealSenseTM Vision Processor D4 Card (MM#952019)
Intel® RealSenseTM D400 Interposer (MM#956827)

Available in Q4/2020

Module D430

Module Features	
Use Environment	Indoor/Outdoor
Depth Technology	Active IR Stereo (Global Shutter)
Depth FOV (HxVxD)*	91.2 x 65.5 x 100.6
Max. Depth Resolution & Frame Rate*	Up to 1280x720 - Up to 90fps
Min. Depth Distance (Min-Z)*	0.2m
Max. Range (Varies depending on performance accuracy, scene and light conditions)	10m+
Max. RGB Resolution & Frame Rate	No RGB sensor

Physical	
Form Factor	Camera Module
Interface	50-pin Board-to-Board connector
Product Dimension (LxDxH)	70.70 x 14.00 x 10.53 mm

Recommended Accessories	
Intel® RealSense™ Vision Processor D4 (MM#957646)	Vision processing ASIC (for custom integration)
Intel® RealSense™ Vision Processor D4 Card (MM#952019)	Vision processing ASIC integrated onto PCB with USB Type C for connection to host
Intel® RealSense™ D400 Interposer (MM#956827)	Enable connection between module and vision processor card (needed if using D4 card)

*Depth features enabled with Vision Processor D4

Module D420

Module Features	
Use Environment	Indoor/Outdoor
Depth Technology	Stereo (Global Shutter)
Depth FOV (HxVxD)*	91.2 x 65.5 x 100.6
Max. Depth Resolution & Frame Rate*	Up to 1280x720 - Up to 90fps
Min. Depth Distance (Min-Z)*	0.2m
Max. Range (Varies depending on performance accuracy, scene and light conditions)	10m+
Max. RGB Resolution & Frame Rate	No RGB sensor

Physical	
Form Factor	Camera Module
Interface	50-pin Board-to-Board connector
Product Dimension (LxDxH)	70.70 x 14.00 x 10.53 mm

Recommended Accessories	
Intel® RealSense™ Vision Processor D4 (MM#957646)	Vision processing ASIC (for custom integration)
Intel® RealSense™ Vision Processor D4 Card (MM#952019)	Vision processing ASIC integrated onto PCB with USB Type C for connection to host
Intel® RealSense™ D400 Interposer (MM#956827)	Enable connection between module and vision processor card (needed if using D4 card)

*Depth features enabled with Vision Processor D4

Module D415

Module Features	
Use Environment	Indoor/Outdoor
Depth Technology	Active IR Stereo (Rolling Shutter)
Depth FOV (HxVxD)*	69.4 x 42.5 x 77.0
Max. Depth Resolution & Frame Rate*	Up to 1280x720 - Up to 90fps
Min. Depth Distance (Min-Z)*	0.3m
Max. Range (Varies depending on performance accuracy, scene and light conditions)	10m+
Max. RGB Resolution & Frame Rate	Up to 1920x1080 - Up to 60fps

Physical	
Form Factor	Camera Module
Interface	50-pin Board-to-Board connector
Product Dimension (LxDxH)	83.7 x 10.0 x 4.7 mm

Recommended Accessories	
Intel® RealSense™ Vision Processor D4 (MM#957646)	Vision processing ASIC (for custom integration)
Intel® RealSense™ Vision Processor D4 Card (MM#952019)	Vision processing ASIC integrated onto PCB with USB Type C for connection to host
Intel® RealSense™ D400 Interposer (MM#956827)	Enable connection between module and vision processor card (needed if using D4 card)

*Depth features enabled with Vision Processor D4

Module D410

Module Features	
Use Environment	Indoor/Outdoor
Depth Technology	Active IR Stereo (Rolling Shutter)
Depth FOV (HxVxD)*	69.4 x 42.5 x 77.0
Max. Depth Resolution & Frame Rate*	Up to 1280x720 - Up to 90fps
Min. Depth Distance (Min-Z)*	0.3m
Max. Range (Varies depending on performance accuracy, scene and light conditions)	10m+
Max. RGB Resolution & Frame Rate	No RGB Sensor

Physical	
Form Factor	Camera Module
Interface	50-pin Board-to-Board connector
Product Dimension (LxDxH)	74.7 x 10.0 x 4.7 mm

Recommended Accessories	
Intel® RealSense™ Vision Processor D4 (MM#957646)	Vision processing ASIC (for custom integration)
Intel® RealSense™ Vision Processor D4 Card (MM#952019)	Vision processing ASIC integrated onto PCB with USB Type C for connection to host
Intel® RealSense™ D400 Interposer (MM#956827)	Enable connection between module and vision processor card (needed if using D4 card)

*Depth features enabled with Vision Processor D4

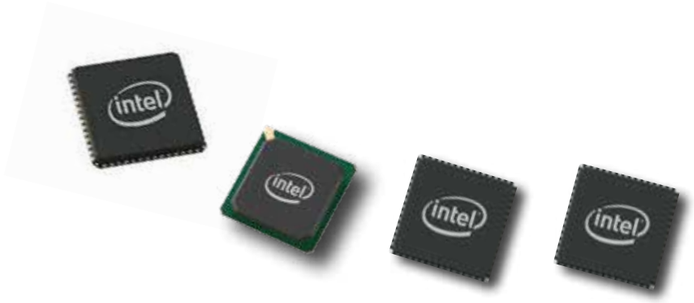
Module D400

Module Features	
Use Environment	Indoor/Outdoor
Depth Technology	Stereo (Rolling Shutter)
Depth FOV (HxVxD)*	69.4 x 42.5 x 77.0
Max. Depth Resolution & Frame Rate*	Up to 1280x720 - Up to 90fps
Min. Depth Distance (Min-Z)*	0.3m
Max. Range (Varies depending on performance accuracy, scene and light conditions)	10m+
Max. RGB Resolution & Frame Rate	No RGB Sensor

Physical	
Form Factor	Camera Module
Interface	50-pin Board-to-Board connector
Product Dimension (LxDxH)	74.7 x 10.0 x 4.7 mm

Recommended Accessories	
Intel® RealSense™ Vision Processor D4 (MM#957646)	Vision processing ASIC (for custom integration)
Intel® RealSense™ Vision Processor D4 Card (MM#952019)	Vision processing ASIC integrated onto PCB with USB Type C for connection to host
Intel® RealSense™ D400 Interposer (MM#956827)	Enable connection between module and vision processor card (needed if using D4 card)

*Depth features enabled with Vision Processor D4



Intel® Ethernet Controllers

Whether you are looking for single, dual or quad port Ethernet-Controller, Intel is committed to solving your Industrial-Ethernet needs by providing solutions in various temperature range and package options.

Gigabit Ethernet Controllers

I210 Family

The Intel® Ethernet Controller I210 provides an ideal solution for customers looking for a full-featured Gigabit Ethernet Media Access Control (MAC) and Physical Layer (PHY) for Desktop, Server and Embedded Applications.

I211-AT

The compact (9 mm x 9 mm 64-pin QFN) Intel® Ethernet Controller I211-AT offers a full-featured GbE Media Access Control (MAC) and Physical Layer (PHY) solution. With support for advanced features, the Intel® I211-AT Ethernet Controller provides an ideal GbE solution for Desktop, Consumer Electronics and other small form-factor Embedded Applications.

I350 Family

The Intel® Ethernet Controller I350 family builds on Intel's history of delivering Ethernet products with flexible design and in-box driver support. Run up to four 1 Gb ports with enhanced power-saving and market-leading flexible I/O virtualization including VMDq and SR-IOV. Intel's software drivers and support are unmatched for virtual or non-virtualized environments.

I225 Family

The Intel Ethernet Controller I225 is designed for use on any mobile, desktop, workstation, value-sever, or industrial design that have critical space constraints. The highlight of the Intel Ethernet Controller I255 is that TSN (Time Sensitive Networking) function has been supported. This feature supports advanced time critical and synchronized application. Prevalent in audio / video, embedded and industrial application. The low transmission latency, real time and high availability can be realized with this part. Besides, I225 provides compact, single-port integrated multi-gigabit (up to 2.5G) – MDI(Copper) standard IEEE802.3 Ethernet interface for 25000BASE-, 1000BASE-T, 100BASE-TX , 10BASE-TE connections.

Key Features

- Time Sensitive Networking capability support
- PCIe 3.1 (5GT/s) x 1 host interface
- MDI (Copper) Standard IEEE 802.3 Ethernet Interface up to 2.5Gb/s
- Innovative power management features
- Support for Intel Active Management Technology on systems enabled with Intel vPRo Technology

	Intel® Ethernet Controller I210-AT	Intel® Ethernet Controller I210-IS	Intel® Ethernet Controller I210-IT	Intel® Ethernet Controller I211-AT	Intel® Ethernet Controller I225-LM	Intel® Ethernet Controller I350-AM2	Intel® Ethernet Controller I350-AM4
Essentials							
Status	Launched	Launched	Launched	Launched	Launched	Launched	Launched
Launch Date	Q4'12	Q4'12	Q4'12	Q4'12	Q4'19	Q2'11	Q2'11
Expected Discontinuance	1H'29	1H'29	1H'29	1H'29		1H'29	1H'29
Operating Temperature Range	0 to +70°C	-40 to +85°C	-40 to +85°C	0 to +70°C	0 to +70°C	-10 to +55°C	-10 to +55°C
Networking Specifications							
Port Configuration	Single	Single	Single	Single	Single	Dual	Quad
Data Rate Per Port	1 GbE	1 GbE SerDes/SGMII	1 GbE	1 GbE	2.5G	1 GbE	1 GbE
System Interface Type	PCIe v2.1 (2.5 GT/s)	PCIe v2.1 (2.5 GT/s)	PCIe v2.1 (2.5 GT/s)	PCIe v2.1 (2.5 GT/s)	PCIe	PCIe v2.0 (5.0 GT/s)	PCIe v2.0 (5.0 GT/s)
NC Sideband Interface	Yes	Yes	Yes	No	No	Yes	Yes
Jumbo Frames Supported	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interfaces Supported	1000Base-T	SGMII, SERDES	1000Base-T	1000Base-T	NBASE-T	1000Base-T, SGMII, SERDES	1000Base-T, SGMII, SERDES
Package Specifications							
Package Size	9 x 9mm	9 x 9mm	9 x 9mm	9 x 9mm	7 x 7mm	17 x 17mm	17 x 17mm
Intel® Virtualization Technology for Connectivity							
On-chip QoS and Traffic Management					Yes	Yes	Yes
Virtual Machine Device Queues (VMDq)						Yes	Yes
PCI-SIG* SR-IOV Capable						Yes	Yes
Advanced Technologies							
Intel® Virtualization Technology for Connectivity (VT-c)						Intel® VT-c	Intel® VT-c
IEEE 1588	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Data Direct I/O Technology						Yes	Yes

Intel® Ethernet Controllers

10/25/40/100 Gigabit Ethernet Controllers

FM10000 Family

The Intel® FM10000 family combines industry proven Intel® Ethernet controller technology with advanced switch resources in a multi-host controller device that is an ideal solution for high-density rack scale server platforms and high-performance communications infrastructure applications.

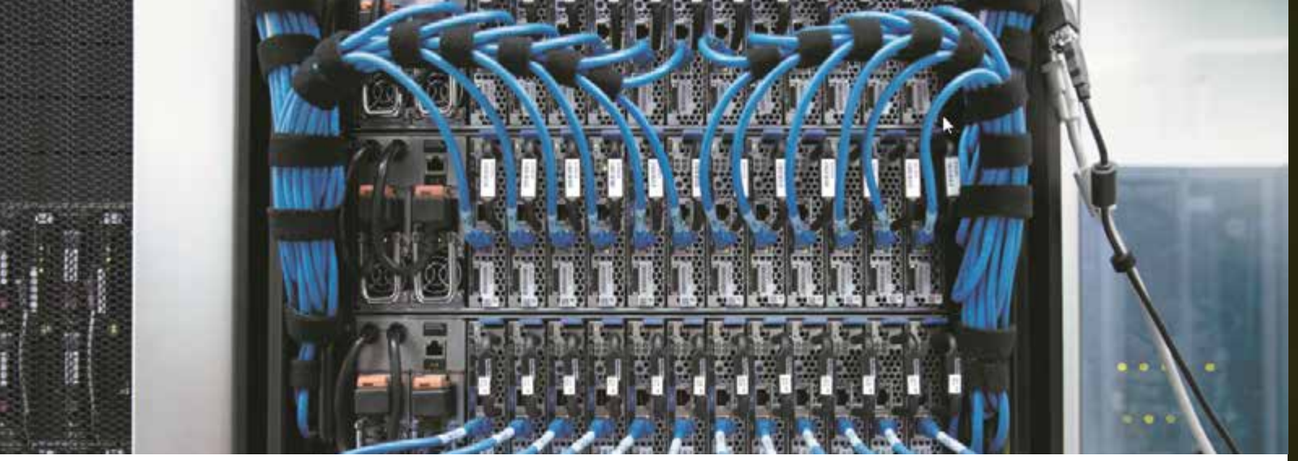
XXV710 Family

Single and dual port Gigabit Ethernet controller with Intel® Virtualization Technology for Cloud and Enterprise data centers.

X550 Family

Integrated Single Chip 10GBASE-T Controller simplifies 10 Gigabit Ethernet (GbE) Server LOM, Converged Network Adapter and Network Add-in Card Designs

	Intel® Ethernet Multi-host Controller FM10420	Intel® Ethernet Multi-host Controller FM10840	Intel® Ethernet Controller XXV710-AM1	Intel® Ethernet Controller XXV710-AM2	Intel® Ethernet Controller XL710-BM1	Intel® Ethernet Controller XL710-BM2	Intel® Ethernet Controller X710-BM2	Intel® Ethernet Controller X550-BT2	Intel® Ethernet Controller X550-AT2	Intel® Ethernet Controller X550-AT
Code Name	Red Rock Canyon	Red Rock Canyon	Fortville	Fortville	Fortville	Fortville	Fortville	Sageville	Sageville	Sageville
Essentials										
Status	Launched	Launched	Launched	Launched	Launched	Launched	Launched	Launched	Launched	Launched
Launch Date	Q4'15	Q4'15	Q3'17	Q3'17	Q4'15	Q4'15	Q4'15	Q4'15	Q4'15	Q1'16
Expected Discontinuance	1H'28	1H'28	1H'31	1H'31	1H'29	1H'29	1H'29	1H'29	1H'29	1H'29
Lithography	28nm	28nm	28nm	28nm	28nm	28nm	28nm	28nm	28nm	28nm
TDP	17.5W	40W			7W	7W	7W	11W	11W	8W
Supported Operational Systems	Linux	Linux						FreeBSD 10.2, Linux RHEL 6.7, Linux RHEL 7.1, Linux SLES 11 SP4, Linux SLES 11 SP4-IA64, Linux SLES 12, Linux Stable Kernel version 2.6/3.x, Linux Stable Kernel version 4.x, UEFI 2.1, UEFI 2.3, UEFI 2.4, VMware ESXi 5.5/6.0, Windows 7 SP1, Windows 8, Windows 8.1, Windows 10, Windows Server 2008 R2, Windows Server 2008 R2 Core, Windows Server 2008 R2 Hyper-V, Windows Server 2012, Windows Server 2012 Core, Windows Server 2012 Hyper-V, Windows Server 2012 R2, Windows Server 2012 R2 Core, Windows Server 2012 R2 Hyper-V, WinPE 3.0 (2008 R2 PE), WinPE 4.0 (2012 PE), WinPE 5.0 (2012 R2 PE)		
Operating Temp. Range	+5 to +85°C	+5 to 85°C	0 to +50°C	0 to +50°C	-10 to +55°C	-10 to +55°C	-10 to +55°C	0 to +55°C	0 to +55°C	0 to +55°C
Supplemental Information										
Description	Intel Ethernet Multi-host Controller supporting up to 2x 100GbE, 2x 40GbE, 8x 25GbE or 8x 10GbE ports plus up to four PCIe host interfaces	Intel Ethernet Multi-host Controller supporting up to 6x 100GbE, 9x 40GbE, 24x 25GbE or 36x 10GbE ports plus up to eight PCIe host interfaces	Single Port 25GbE or 2X25GbE Ethernet Controller	Dual Port 25GbE or 2x25GbE Ethernet Controller	Dual Port 40GbE or 4x10GbE Ethernet Controller	Dual Port 40GbE or 4x10GbE Ethernet Controller	Dual Port 10GbE Ethernet Controller	Fully integrated 10GBASE-T controller designed for LAN-on-Motherboard (LOM) & Converged Network Adapters (CNA)		
Networking Specifications										
Data Rate Per Port	100/25/10/1GbE	100/25/10/1GbE	25/10/1GbE	25/10/1GbE	40/10/1GbE	40/10/1GbE	10/1GbE	10/5/2.5/1GbE (NBASE-T in Linux Only)	10/5/2.5/1GbE (NBASE-T in Linux Only)	10/5/2.5/1GbE (NBASE-T in Linux Only)
System Interface Type	PCIe Gen3	PCIe Gen3	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v2.1 (5.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)
NC Sideband Interface	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Jumbo Frames Supported	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Speed & Slot Width	2x8-lane or 4x4-lane	4x8-lane or 8x4-lane								
Interfaces Supported	SFI, KR, KR4, KX, SGMII, SERDES	SFI, KR, KR4, KX, SGMII, SERDES	SFI, KR, KR4, XAUI, KX, KX4, SGMII	SFI, KR, KR4, XAUI, KX, KX4, SGMII	SFI, KR, KR4, XAUI, KX, KX4, SGMII	SFI, KR, KR4, XAUI, KX, KX4, SGMII	SFI, KR, XAUI, KX, KX4, SGMII	100Base-T, 1000Base-T, 10GBase-T	100Base-T, 1000Base-T, 10GBase-T	100Base-T, 1000Base-T, 10GBase-T
Port Configuration			Single	Dual	Single	Dual	Dual	Dual	Dual	Single
Controller				FTXXV710-AM2						
Package Specifications										
Package Size	37.5 x 37.5mm	37.5 x 37.5mm	25 x 25mm, FC-BGA	25 x 25mm	25 x 25mm	25 x 25mm	25 x 25mm	25 x 25mm	17 x 17mm	17 x 17mm
Intel® Virtualization Technology for Connectivity										
On-chip QoS and Traffic Management	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Flexible Port Partitioning			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virtual Machine Device Queues (VMDq)			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PCI-SIG SR-IOV Capable			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Advanced Technologies										
Fiber Channel over Ethernet								Yes	Yes	Yes
IEEE 1588	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intelligent Offloads	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Storage Over Ethernet	DCB Features	DCB Features	iSCSI, NFS	iSCSI, NFS	iSCSI, NFS	iSCSI, NFS	iSCSI, NFS	iSCSI, FCoE, NFS	iSCSI, FCoE, NFS	iSCSI, FCoE, NFS
Intel® Ethernet Power Management			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Data Direct I/O Technology			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Connectivity (VT-c)								VMDq, SR-IOV	VMDq, SR-IOV	VMDq, SR-IOV



GbE Intel® Ethernet Network Adapters

Our customers say, "It Just Works," here's why: extensive compatibility, broad product selection, performance and acceleration, easy installation and reliability, worldwide availability and world-class support.

	Intel® Ethernet Server Adapter I210-T1	Intel® Ethernet Server Adapter I350-T4V2	Intel® Ethernet Server Adapter I350-T2V2	Intel® Ethernet Server Adapter I350-F4	Intel® Ethernet Server Adapter I350-F2	Intel® Gigabit CT Desktop Adapter	Intel® Gigabit ET Dual Port Server Adapter	Intel® Gigabit ET2 Quad Port Server Adapter	Intel® PRO/1000 GT Desktop Adapter
Essentials									
Vertical Segment	Server	Server	Server	Server	Server	Desktop	Server	Server	Desktop
Cable Medium	Copper	Copper	Copper	Fiber	Fiber	Copper	Copper	Copper	Copper
Cabling Type	RJ-45 Category-5, up to 100 m	Cat 5 up to 100 m	Cat 5 up to 100 m	MMF 50um up to 550 m; MMF 62.5um up to 275 m	MMF 50um up to 550 m; MMF 62.5um up to 275 m	Category-5 up to 100 m	Category-5 up to 100 m	Category-5 up to 100 m	Category-5 up to 100 m
Bracket Height	Low Profile and Full Height	Low Profile and Full Height	Low Profile and Full Height	Full height	Low profile and full height	Low Profile & Full Height	Low Profile & Full Height	Low Profile and Full Height	Full Height or Low Profile, not interchangeable
TDP	1 W	5 W	4.4 W	6 W	5.5 W	1.9 W	2.9 W	8.4 W	
Networking Specifications									
Port Configuration	Single	Quad	Dual	Quad	Dual	Single	Dual	Quad	Single
Speed & Slot Width	2.5 GT/s, x1 Lane	5 GT/s, x4 Lane	5 GT/s x 4 Lane	5 GT/s, x4 Lane	5 GT/s, x4 Lane	2.5 GT/s, x1 Lane	2.5 GT/s, x4 Lane	2.5 GT/s, x4 Lane	
Controller	Intel I210	Intel I350	Intel I350	Intel I350	Intel I350	Intel 82574L	Intel 82576	Intel 82576	Intel 82541
Intel® Virtualization Technology for Connectivity (VT-c)		Yes	Yes	Yes	Yes		VMDq, VMDc	Yes	
Package Specifications									
System Interface Type	PCIe v2.1 (2.5 GT/s)	PCIe v2.1 (5.0 GT/s)	PCIe v2.1 (5.0 GT/s)	PCIe v2.1 (5.0 GT/s)	PCIe v2.1 (5.0 GT/s)	PCIe v1.1 (2.5 GT/s)	PCIe v2.0 (2.5 GT/s)	PCIe v2.0 (2.5 GT/s)	PCI
Intel® Virtualization Technology for Connectivity									
On-chip QoS and Traffic Management	No	Yes	Yes	Yes	Yes		Yes	Yes	
Flexible Port Partitioning	No	Yes	Yes	Yes	Yes		Yes	Yes	
Virtual Machine Device Queues (VMDq)	No	Yes	Yes	Yes	Yes		Yes	Yes	
PCI-SIG SR-IOV Capable	No	Yes	Yes	Yes	Yes		Yes	Yes	
Advanced Technologies									
iWARP/RDMA	No	No	No	No	No			No	
Intel® Ethernet Power Management	Yes	Yes	Yes	Yes	Yes		No	No	
Intel® Data Direct I/O Technology	No								
Intelligent Offloads	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Storage Over Ethernet		iSCSI, NFS	iSCSI, NFS	iSCSI, NFS	iSCSI, NFS		iSCSI, NFS	iSCSI, NFS	

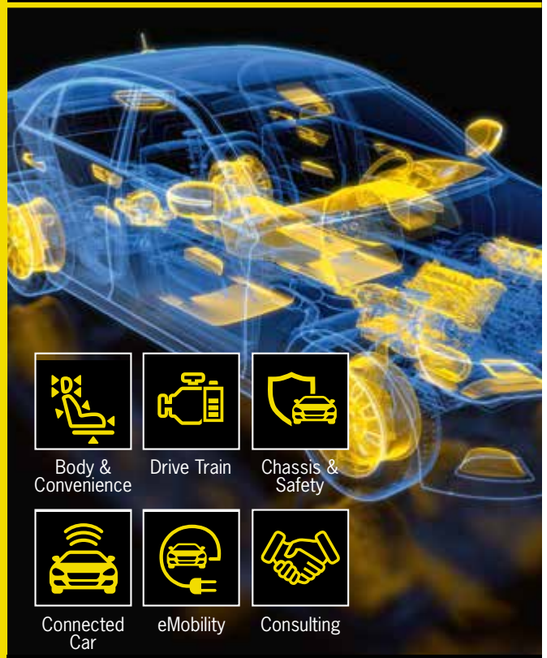
10/25/40 GbE
Intel® Ethernet Network Adapters

Our customers say, "It Just Works," here's why: extensive compatibility, broad product selection, performance and acceleration, easy installation and reliability, worldwide availability and world-class support.

	Intel® Ethernet Network Adapter X722-DA2	Intel® Ethernet Network Adapter X722-DA4	Intel® Ethernet Network Adapter XXV710-DA1	Intel® Ethernet Network Adapter XXV710-DA2	Intel® Ethernet Converged Network Adapter XL710-QDA1	Intel® Ethernet Converged Network Adapter XL710-QDA2	Intel® Ethernet Converged Network Adapter X710-DA2	Intel® Ethernet Converged Network Adapter X710-DA4	Intel® Ethernet Converged Network Adapter X710-T4	Intel® Ethernet Converged Network Adapter X550-T2	Intel® Ethernet Converged Network Adapter X550-T1	Intel® Ethernet Converged Network Adapter X520-DA2
Essentials												
Vertical Segment			Server	Server	Server	Server	Server	Server	Server	Server	Server	Server
Cable Medium			Copper	Copper	Copper	Copper	Copper	Copper	Copper	Copper	Copper	Copper
Cabling Type			SFP28 Direct Attach twinaxial cabling up to 5m / SFP28 SR and LR Optics also supported	SFP28 Direct Attach twinaxial cabling up to 5m / SFP28 SR & LR Optics also supported	QSFP+ Direct Attach Twinaxial Cabling up to 10m	QSFP+ Direct Attach Cabling up to 10m	SFP+ Direct Attached Twinaxial Cabling up to 10m	SFP+ Direct Attached Twin Axial Cabling up to 10m	RJ-45 Category-6 up to 55m; Category-6A up to 100m	RJ-45 Category-6 up to 55m; Category-6A up to 100m	RJ-45 Category-6 up to 55m; Category-6A up to 100m	SFP+ Direct Attached Twin Axial Cabling up to 10m
Bracket Height			Low Profile and Full Height	Low Profile and Full Height	Low Profile and Full Height	Low Profile and Full Height	Low Profile and Full Height	Full Height	Low Profile and Full Height	Low Profile and Full Height	Low Profile and Full Height	Low Profile & Full Height
Networking Specifications												
Port Configuration	Dual	Quad	Single	Dual	Single	Dual	Dual	Quad	Quad	Dual	Single	Dual
Data Rate Per Port	10 GbE	10 GbE	25/10/1 GbE	25/10/1 GbE	40/10 GbE	40/10 GbE	10/1 GbE	10/1 GbE	10 GbE/1 GbE/100 Mb	10 GbE/5 GbE/2.5 GbE/ 1 GbE/100 Mb	10 GbE/5 GbE/2.5 GbE/ 1 GbE/100 Mb	10/1 GbE
System Interface Type	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)										
Speed & Slot Width	8.0 GT/s, x8 lanes	8.0 GT/s, x8 lanes	8.0 GT/s, x8 lanes	8.0 GT/s, x8 lanes	8.0 GT/s, x8 lanes	8.0 GT/s, x 8 Lane	8.0 GT/s, x8 lanes	8.0 GT/s, x 8 Lane	8.0 GT/s, x 8 lane	8.0 GT/s, x 4 Lane	8.0 GT/s, x4 Lane	5.0 GT/s, x8 Lane
Intel® Virtualization Technology for Connectivity (VT-c)			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controller	Intel® C628 Chipset	Intel® C628 Chipset	Intel® Ethernet Controller XL710-BM2	Intel® Ethernet Controller XL710-BM2	Intel® Ethernet Controller XL710	Intel® Ethernet Controller XL710	Intel® Ethernet Controller X710	Intel® Ethernet Controller X710	Intel® Ethernet Controller X710	Intel® Ethernet Controller X550	Intel® Ethernet Controller X550	Intel® 82599 10 Gigabit Ethernet Controller
Intel® Virtualization Technology for Connectivity												
On-chip QoS and Traffic Management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Flexible Port Partitioning	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virtual Machine Device Queues (VMDq)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PCI-SIG SR-IOV Capable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Advanced Technologies												
Intel® Virtualization Technology for Connectivity (VT-c)	Yes	Yes										
iWARP/RDMA	Yes	Yes	No	No	No	No	No	No	No	No	No	No
Intel® Ethernet Power Management	Yes	Yes					Yes	Yes				Yes
Intel® Data Direct I/O Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intelligent Offloads	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Storage Over Ethernet	iSCSI, NFS	iSCSI, NFS	iSCSI, NFS	iSCSI, NFS	iSCSI, NFS	iSCSI, NFS	iSCSI, NFS	iSCSI NFS	iSCSI, NFS	iSCSI, FCoE, NFS	iSCSI, FCoE, NFS	iSCSI, FCoE, NFS
Package Specifications												
System Interface Type	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v3.0 (8.0 GT/s)	PCIe v2.0 (5.0 GT/s)

RUTRONIK
ELECTRONICS WORLDWIDE

RUTRONIK AUTOMOTIVE



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Realize EMBEDDED Designs

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- Industrial Control
- Medical
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Design your Ideas

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More information:
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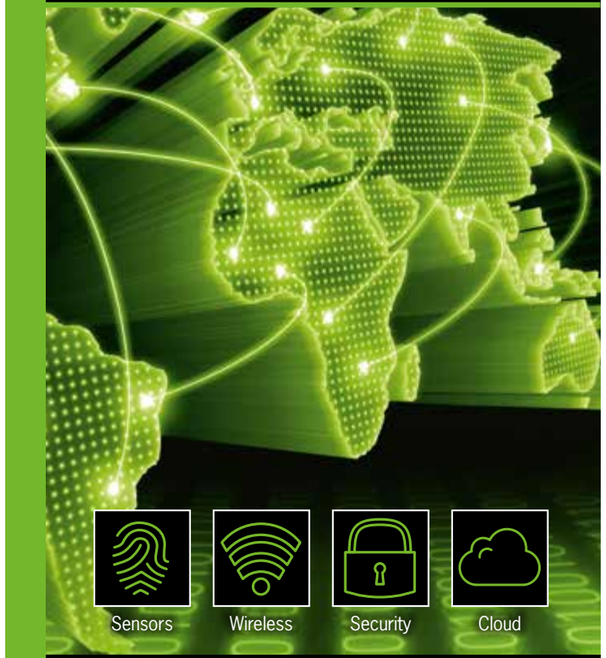

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