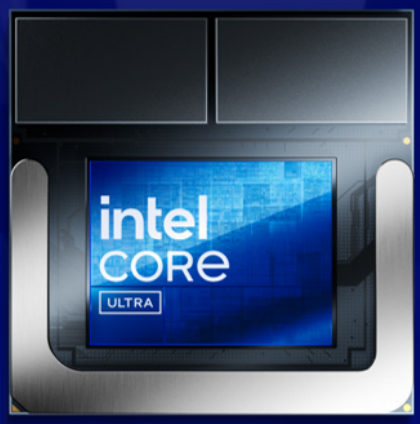


Product Brief

Intel® Core™ Ultra Mobile Processors (Series 2)

Intel® Core™ Ultra mobile processors (Series 2) are high-efficiency processors built to deliver next-gen AI experiences in sleek and slim mobile form factors, featuring the latest generation of P-core and low-power E-core processor architectures, an enhanced NPU 4.0 AI Engine, and available with built-in Intel® Arc™ GPUs[1] driven by new Xe2 architecture.

Breakthrough x86 Power Efficiency

Four next-gen low-power E-cores optimized for tasks requiring less power, along with new power, thermal, and acoustic features, help create powerhouse thin & light systems.

Next-Gen
P-Cores

Rearchitected for efficient performance, featuring AI-based management, an enhanced memory subsystem, PPA optimizations, and up to 12 MB of shared L3 cache.

Next-Gen
E-Cores

Our most efficient performant architecture, with up to 4 MB shared L2 cache and 2x AI throughput from four 128-bit FP & SIMD vector.

Power-Saving Technologies

- Intel® Intelligent Display can automatically adjust brightness, refresh rate, and contrast based on what the user is doing or the content on screen.[2]
- Endurance Gaming Mode automatically adjusts framerates and power consumption to maximize playtime while on battery.
- Intel® Dynamic Tuning Technology uses advanced machine learning algorithms to maximize performance and battery life while minimizing heat and noise. It also allows OEMs to customize and differentiate systems with minimal tuning effort.

Exceptional Core Performance

Intel® Core™ Ultra processors (Series 2) feature 4 P-cores and 4-E-cores built with Intel's latest processor architectures.

4

Next-Gen P-Cores

Up to **5.1 GHz** **Max Turbo Frequency**

Designed for priority tasks and workloads, optimized for power efficiency.

4

Next-Gen E-Cores

Up to **3.7 GHz** **Max Turbo Frequency**

Housed in a dedicated cluster with their own cache, optimized for lower priority tasks requiring less power.

Maximizing Performance, Minimizing Power Use

- **Intel® Turbo Boost Technology 2.0**
  Accelerates processor and graphics performance for peak loads.
- **Intel® Adaptive Boost Technology**
  Intelligently boosts the processor to run faster than its rated frequency.
- **Intel® Speedshift Technology**
  An energy-efficient method of frequency control by the hardware.
- **Intel® Dynamic Tuning Technology**
  Power optimization tools that intelligently adapt power policies.
- **Intel® Deep Learning Boost**
  Significantly accelerates inference performance for deep-learning workloads optimized to use VNNI.
- **Intel® Smart Cache Technology**
  CPU memory caching method for sharing among P-Cores, E-Cores, and processor graphics if applicable.

Massive Leap in Graphics

Intel® Core™ Ultra processors (Series 2) provide discrete-level graphics for thin & light laptops.

- **NEW** Built-in Intel® Arc™ GPU[1] delivers power-efficient DirectX 12 Ultimate performance

8	64	8
Xᵉ-cores	vector engines	MB cache

- The first DirectX 12 Ultimate GPU in the world to leverage LPDDR memory on package
- Intel® XᵉSS (Xᵉ Super Sampling) and Intel® XMX (Xᵉ Matrix eXtensions) AI engines provide AI upscaling and raytracing performance for graphics far beyond what people expect from thin & light systems

Unmatched AI Compute

NEW NPU
(Neural Processing Unit)

Up to
2x Bandwidth
compared to previous generation

Up to
48 TOPS[3]

Intel® Core™ Ultra Processors
The Foundation of the AI PC

GPU
High Throughput

Ideal for AI-accelerated digital content creation.

+

NPU
Low Power

Ideal for sustained AI workloads and AI offload for battery life.

+

CPU
Fast Response

Ideal for low-latency AI workloads.

- **Leadership AI Engines**
  ~4x NPU AI throughput and ~3x GPU AI throughput*
- **Comprehensive AI**
  With more than 300 AI-accelerated ISV features, your customers' favorite AI tools and services run great on Intel® Core™ Ultra processors
- **Intel® XMX**
  (Xe Matrix eXtensions) Enable Intel® Arc™ graphics to accelerate today's increasingly important AI workloads
- **Intel® XeSS**
  (Xe Super Sampling) AI image upscaling to improve performance and graphics
- **Intel® Dynamic Tuning Technology**
  - **Energy Performance Optimizer:** Intelligent, predictive, and efficient system optimization engine for performance and long battery life
  - **Intelligent Thermal Management:** Maximizes performance with runtime thermal monitoring

*vs. MTL U 15W

A Platform for Premium Experiences

Thunderbolt™ 4 Technology

Thunderbolt™ 4 ports and cables support the trifecta of power charging and data transfer with bidirectional movement and video display in one interface. For example, with a Thunderbolt™ technology-enabled laptop, display, and cable, the laptop can pass a video signal to the monitor and the monitor can charge the laptop at the same time.

Thunderbolt™ Share[9]

Offers users an easy, fast, and efficient way to do more with two PCs by sharing screens, keyboard, mouse, storage, and files with the speed of Thunderbolt™ technology.

Intel® Connectivity Performance Suite[10]

Acts as your built-in IT expert by continuously optimizing your Wi-Fi connection and prioritizing your business-critical applications to help enable improved responsiveness, better resolution, and faster speeds.

Intel® Unison™ Software[4]

Seamlessly connects PCs and other devices. Now featuring tablet support, it allows users to transfer files and photos, extend the screen, or share keyboard and mouse controls between a PC and tethered tablet or phone.

Integrated Intel® Wi-Fi 7 (5 Gig)[11] and Bluetooth 5.4 Support

Ensures creators can manage live content and creative files on the go with up to 5.8 Gb/s Wi-Fi speeds.

Intel vPro® Platform Helps Organizations Maximize Value from AI

New commercial devices with Intel® Core™ Ultra processors fuel operational excellence and help organizations achieve better business outcomes.

User Productivity

AI empowers people to achieve new levels of productivity. Visual and audio effects help employees look and sound their best while collaborating remotely, with the top enterprise solutions optimized for Intel® Core™ Ultra processors. Personal assistants and large language models promise to streamline daily workflows, meeting preparation, and project management. Specific Intel® Core™ Ultra mobile processors (Series 2) can power these demanding AI workloads, delivering the responsiveness and lower latency users require. The combined power of the CPU, GPU, and NPU enables higher quality work to be executed faster in the areas of content creation, data visualization, design, research, and similar tasks common to business professionals. Intel® Core™ Ultra processors enable better business outcomes everywhere AI PCs are deployed.

AI for Security, Security for AI

As security threats grow more sophisticated, the need for advanced detection and protection technologies grows as well. Intel® Core™ Ultra processors extend the NPU to third-party security software vendors, enabling applications to become more effective and efficient at detecting and responding to threats. In addition, the Intel vPro® platform provides a more secure computing foundation for AI apps and data with a robust set of security features that PC manufacturers must design into every PC bearing the Intel vPro® badge.

Services-Ready Endpoints

Device management applications rely on endpoint data to make the right configuration, maintenance, and servicing decisions. Intel® Device Discovery provides a method for local and remote applications to obtain greater visibility into endpoints, with a robust data set spanning device profile, history, and capabilities. This includes an inventory of Intel vPro® platform features present and their configuration state. The wealth of data generated by Intel® Device Discovery may be used by applications to generate PC health assessments, determine the security posture of a PC, or learn how to best configure and maintain a device. Greater visibility into endpoints becomes vital as IT operations embrace AI and automation.

Intel® Evo™ Platform

Engineered to do it all.

Intel® Evo™ laptops powered by Intel® Core™ Ultra processors deliver a no-compromise premium mobile experience by verifying that each laptop design meets the premium standards you desire. We are continually adding innovative features that evolve the laptop experience. Intel spent thousands of hours studying the way people use their laptops in real life and then collaborated with leading PC makers to co-engineer, optimize, and verify these laptop designs. To obtain the Intel® Evo™ brand seal of approval, laptop designs must pass rigorous testing around performance, battery life, connectivity, audio & visual quality, size, weight, and more. And to ensure an evolving laptop experience, innovative features are continuously built in and introduced for the first time through Intel® Evo™ laptops. The result is a sleek and stylish premium laptop that delivers cutting-edge innovation and the ideal combination of world-class performance, outstanding graphics, and ultimate mobility with features like fast-charging & long-lasting battery, consistent responsiveness on battery, and instant wake.

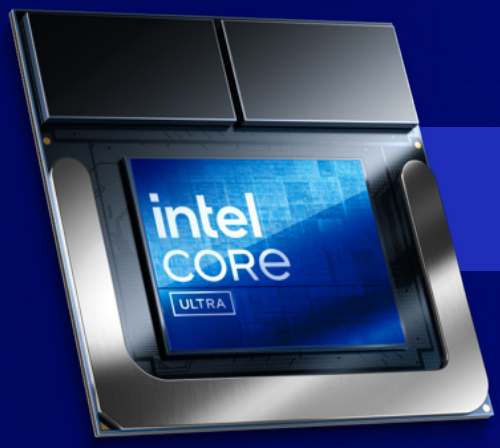
Intel® Unison™ software[4] has an intuitive one-time setup that's fast, easy, and does not require an email or cloud account to set up and use. Intel® Unison™ software is flexible, letting you connect your choice of PC and phone or tablet (Android or iOS) to do file transfers, photo sharing, text messaging, phone calls, and notifications all from your PC without waking up your phone.

Features at a Glance

Feature	Benefit
Power-Efficient Core Architectures	Integrates P-cores and low-power E-cores onto a single chip. Low-power E-cores given separate cluster with dedicated cache optimized for lower priority tasks at reduced power.
NPU	A neural processing unit is a processor built for handling AI & machine learning tasks. Select Intel® Core™ Ultra processors include a CPU, a GPU, and an NPU.
TOPS	Trillions of operations per second. Measures performance of NPUs, much like how GHz measures performance of CPUs.
Built-in Intel® Arc™ GPU,[1] Driven by Xe2 Architecture	Select Intel® Core™ Ultra processors include an Intel® Arc™ GPU,[1] providing discrete-class graphics for mobile form factors. The latest Xe2 architecture provides great performance at lower power, perfect for gaming or AI on-the-go.
Intel® Smart Cache	CPU memory caching method for sharing among P-cores, E-cores, and processor graphics if applicable.
Intel® Deep Learning Boost	Significantly accelerates inference performance for deep-learning workloads optimized on the CPU.
Intel® Turbo Boost Technology 2.0	Accelerates processor and graphics performance for peak loads, automatically allowing processor cores to run faster than the rated operating frequency if they're operating below power, current, and temperature specification limits.
Intel® Adaptive Boost Technology	Opportunistically increases all-core turbo frequency when current, power, and thermal headroom exists. Works below a temperature limit of 100°C.
Intel® Speedshift Technology	An energy-efficient method of frequency control by the hardware rather than relying on OS control.
Intel® Dynamic Tuning Technology	Power optimization tools that intelligently adapt power policies based on usage mode and temperature, with a new policy that determines and directs application resource optimization in real-time.
Intel® XeSS (Xe Super Sampling)	Renders a game at a lower resolution, then upscales the image using AI to a higher resolution with quality similar (or better) to a native render, providing high-quality graphics and stellar performance at the same time.
Intel® Intelligent Display Technology[2]	Automatically adjust brightness, refresh rate, and contrast based on what the user is doing or the content on screen. Ex. Turning down brightness when user looks away, or matching screen refresh rate to video FPS.
Intel® XMX AI Engines (Xe matrix eXtensions)	AI engines integrated into the Xe-cores of Intel® Arc™ GPUs.[1] They enable Intel® Arc™ graphics to accelerate today's increasingly important AI workloads.
Endurance Gaming Mode	Extends playtime on battery by balancing frame rate and power consumption.

SKU Chart

	Intel® Core™ Ultra 9 processor 288V	Intel® Core™ Ultra 7 processor 268V	Intel® Core™ Ultra 7 processor 266V	Intel® Core™ Ultra 7 processor 258V	Intel® Core™ Ultra 7 processor 256V	Intel® Core™ Ultra 5 processor 238V	Intel® Core™ Ultra 5 processor 236V	Intel® Core™ Ultra 5 processor 228V	Intel® Core™ Ultra 5 processor 226V
Processor Cores (P-cores + LP E-cores)[5]	8 (4+4)	8 (4+4)	8 (4+4)	8 (4+4)	8 (4+4)	8 (4+4)	8 (4+4)	8 (4+4)	8 (4+4)
Processor Threads	8	8	8	8	8	8	8	8	8
Intel® Smart Cache (LLC)	12 MB	12 MB	12 MB	12 MB	12 MB	8 MB	8 MB	8 MB	8 MB
P-core Max Turbo Frequency[8]	Up to 5.1 GHz	Up to 5.0 GHz	Up to 5.0 GHz	Up to 4.8 GHz	Up to 4.8 GHz	Up to 4.7 GHz	Up to 4.7 GHz	Up to 4.5 GHz	Up to 4.5 GHz
E-core Max Turbo Frequency[8]	Up to 3.7 GHz	Up to 3.7 GHz	Up to 3.7 GHz	Up to 3.7 GHz	Up to 3.7 GHz	Up to 3.5 GHz	Up to 3.5 GHz	Up to 3.5 GHz	Up to 3.5 GHz
Graphics Max Frequency	Up to 2.05 GHz	Up to 2.0 GHz	Up to 2.0 GHz	Up to 1.95 GHz	Up to 1.95 GHz	Up to 1.85 GHz	Up to 1.85 GHz	Up to 1.85 GHz	Up to 1.85 GHz
Processor Graphics	Intel® Arc™ 140V GPU					Intel® Arc™ 130V GPU			
Total PCIe Lanes, Thunderbolt™ Technology, Wi-Fi	4 PCIe Gen 5 Lanes + 4 PCIe Gen Lanes 3 Integrated Thunderbolt™ 4 Ports Integrated Wi-Fi 7[8]								
Max Memory Speed[7]	LPDDR5X-8533 MT/s								
Maximum Memory Capacity/Rank	32 GB/2R	32 GB/2R	16 GB/1R	32 GB/2R	16 GB/1R	32 GB/2R	16 GB/1R	32 GB/2R	16 GB/1R
Processor Base Power	30 W (Minimum: 17 W)	17 W (Minimum: 8 W)							
Maximum Turbo Power	37 W								



Package Platform

MIPI CSI (IPU 7)

eDP 1.5
HBR3

3 Thunderbolt™ 4 Ports
DP 2.1 HDMI 2.1

ISH

SPI w/THC

Intel® Wi-Fi 7[8] & Bluetooth 5.4

4 P-Cores
+
4 LP E-Cores

8 Xe2 LPG

LP5X 8533 (MOP)

48 TOPS[3] NPU

67 TOPS[3] GPU

PCI EXPRESS

6 USB2
2 USB3

4 PCIe 5.0
4 PCIe 4.0 SSD

GbE LAN (I219-LM) eSPI SPI

Notices & Disclaimers

1. Intel® Arc™ Graphics: Intel® Arc™ graphics only available on select Intel® Core™ Ultra processor (Series 2) powered systems; minimum processor power required. OEM enablement required. Check with OEM or retailer for system configuration.
2. Intel® Intelligent Display: Intel® Core™ Ultra processors enable Intel® Intelligent Display capabilities. System requirements must include compatible TCON and display panel. Check with OEM or retailer for system configuration.
3. TOPS: All TOPS are "up to" and approximate until final IP frequency defined, different SKUs with different frequency & power targets will have different TOPS.
4. Intel® Unison™ Software: Intel® Unison™ solution is currently available for Intel® Evo™ designs on Windows-based PCs powered by 13th Gen or newer Intel® Core™ CPU and only pairs with Android- or iOS-based phones and tablets; all devices must run a supported OS version. See intel.com/performance-evo for details.
5. Core Counts: Processor cores listed first are the total number of cores in the processor. The number of Performance-cores, Efficient-cores, and Low-power E-cores are listed in parentheses (P +LPE).
6. Max Turbo Frequency: The frequency of cores and core types varies by workload, power consumption, and other factors.
7. Max Memory Speed: For latest memory configurations and speeds.
8. Intel® Wi-Fi 7 (5 Gig): While Wi-Fi 7 is backward compatible with previous generations, new Wi-Fi 7 features require PCs configured with Intel® Wi-Fi 7 solutions, PC OEM enabling, operating system support, and use with appropriate Wi-Fi 7 routers/Access Points/ gateways. 6 GHz Wi-Fi 7 may not be available in all regions. Performance varies by use, configuration, and other factors.
9. Thunderbolt™ Share: Thunderbolt™ Share is required to be installed on both PCs. See the release notes via intel.com for supported hardware, what is new, bug fixes, and known issues.
10. Intel® Connectivity Performance Suite: This software only works on specific Intel® Evo™ or Intel vPro® platforms with Intel® Wi-Fi 6/6E (or greater) products.

Performance varies by use, configuration, and other factors.

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See backup for configuration details. No product or component can be absolutely secure.

Your costs and results may vary.

Intel technologies may require enabled hardware, software, or service activation.