MacBook Pro (16-inch, 2019) - Technical Specifications





Finish

- Silver
- Space Gray

Display

- Retina display
- 16-inch (diagonal) LED-backlit display with IPS technology; 3072-by-1920 native resolution at 226 pixels per inch with support for millions of colors
- Supported scaled resolutions:
  - 2048 x 1280
  - 1792 x 1120
  - 1344 x 840
  - 1152 x 720
- 500 nits brightness
- Wide color (P3)
- True Tone technology
- Refresh rates: 47.95Hz, 48.00Hz, 50.00Hz, 59.94Hz, 60.00Hz

Processor

- **2.6GHz**
  2.6GHz 6-core Intel Core i7, Turbo Boost up to 4.5GHz, with 12MB shared L3 cache
  Configurable to 2.4GHz 8-core Intel Core i9, Turbo Boost up to 5.0GHz, with 16MB shared L3 cache
- **2.3GHz**
  2.3GHz 8-core Intel Core i9, Turbo Boost up to 4.8GHz, with 16MB shared L3 cache
  Configurable to 2.4GHz 8-core Intel Core i9, Turbo Boost up to 5.0GHz, with 16MB shared L3 cache

Storage[1]

- **2.6GHz**
  512GB SSD
  Configurable to 1TB, 2TB, 4TB, or 8TB SSD
- **2.3GHz**
  1TB SSD
  Configurable to 2TB, 4TB, or 8TB SSD

Memory

- 16GB of 2666MHz DDR4 onboard memory
  Configurable to 32GB or 64GB of memory

Graphics

- **2.6GHz**
  AMD Radeon Pro 5300M with 4GB of GDDR6 memory and automatic graphics switching
  Intel UHD Graphics 630
  Configurable to AMD Radeon Pro 5500M with 4GB of GDDR6 memory, AMD Radeon Pro 5500M with 8GB of GDDR6 memory or AMD Radeon Pro 5600M with 8GB of HBM2 memory
- **2.3GHz**
  AMD Radeon Pro 5500M with 4GB of GDDR6 memory and automatic graphics switching
  Intel UHD Graphics 630
  Configurable to AMD Radeon Pro 5500M with 8GB of GDDR6 memory or AMD Radeon Pro 5600M with 8GB of HBM2 memory

Charging and Expansion
Four Thunderbolt 3 (USB-C) ports with support for:

- Charging
- DisplayPort
- Thunderbolt (up to 40Gb/s)

- USB 3.1 Gen 2 (up to 10Gb/s)

Keyboard and Trackpad

- **Backlit Magic Keyboard with:**
  - 65 (U.S.) or 66 (ISO) keys including 4 arrow keys in an inverted-T arrangement
  - Touch Bar
  - Touch ID sensor
  - Ambient light sensor
  - Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

Wireless

- **Wi-Fi**
  802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**
  Bluetooth 5.0 wireless technology

Camera

- 720p FaceTime HD camera

Video Support
Simultaneously supports full native resolution on the built-in display at millions of colors and:

- Up to two displays with 6016-by-3384 resolution at 60Hz at over a billion colors
- Up to four displays with 4096-by-2304 resolution at 60Hz at over a billion colors

Thunderbolt 3 digital video output

- Native DisplayPort output over USB-C
- VGA, HDMI, DVI, and Thunderbolt 2 output supported using adapters (sold separately)

Audio

- High-fidelity six-speaker system with force-cancelling woofers
- Wide stereo sound
- Support for Dolby Atmos playback
- Studio-quality three-mic array with high signal-to-noise ratio and directional beamforming
- 3.5 mm headphone jack

Battery and Power[2]

- Up to 11 hours wireless web
- Up to 11 hours Apple TV app movie playback
- Up to 30 days of standby time
- Built-in 100-watt-hour lithium-polymer battery[2]
- 96W USB-C Power Adapter

Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

Size and Weight

- Height: 0.64 inch (1.62 cm)
- Width: 14.09 inches (35.79 cm)
- Depth: 9.68 inches (24.59 cm)
- Weight: 4.3 pounds (2.0 kg)[3]

Operating System
macOS
macOS is the most advanced desktop operating system in the world. macOS Big Sur introduces a bold new design and major updates to apps — taking macOS to a new level of power and beauty.
Learn more about latest operating system

Accessibility
Accessibility features help people with disabilities get the most out of their new MacBook Pro. With built-in support for vision, hearing, mobility, and learning, you can create and do amazing things.
Learn more about Accessibility

Features include:

- Voice Control

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

Built-in Apps[4]

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- News
- Stocks
- Home
- Voice Memos
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- Music
- Podcasts
- TV
- Books
- App Store
- Time Machine
- Find My
- QuickTime Player

In the Box

- 16-inch MacBook Pro
- 96W USB-C Power Adapter
- USB-C Charge Cable (2 m)

Configure to Order
Configure your MacBook Pro with these options, only at apple.com:

- 2.4GHz 8-core Intel Core i9, Turbo Boost up to 5.0GHz, with 16MB shared L3 cache
- 32GB or 64GB of 2666MHz DDR4 memory
- AMD Radeon Pro 5500M with 4GB of GDDR6 memory
- AMD Radeon Pro 5500M with 8GB of GDDR6 memory
- AMD Radeon Pro 5600M with 8GB of HBM2 memory
- 1TB, 2TB, 4TB, or 8TB SSD

MacBook Pro and the Environment
Apple takes a complete product life cycle approach to determining our environmental impact.Learn more about MacBook Pro and the Environment

MacBook Pro is designed with the following features to reduce its environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free[5]
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR requirements
- Rated EPEAT Gold[6]

Apple and the Environment
Read our Product Environmental Reports for detailed information on the environmental performance of every Apple product.

Acoustic Performance
Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	**Sound Pressure Level Operator Position $L_{pA,m}$ (dB)**
Idle	1.5 (K_V = 0.3)	9
Wireless web	1.5 (K_V = 0.3)	9

1. $L_{WA,m}$ is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2. $L_{pA,m}$ is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)
4. K_V is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity, $L_{WA,c}$ (formerly called L_{WAd}) may be computed from the sum of $L_{WA,m}$ and K_V.
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 2.3GHz 8-core Intel Core i9 processor, 16GB memory, 1TB storage, Radeon Pro 5500M with 4GB of GDDR6 memory and automatic graphics switching Intel UHD Graphics 630.

1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
2. Actual rating of 99.8 watt-hours. Testing conducted by Apple in October 2019 using preproduction 2.3GHz 8-core Intel Core i9-based 16-inch MacBook Pro systems with 16GB of RAM and 1TB SSD. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The Apple TV app movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See apple.com/batteries for more information.
3. Weight varies by configuration and manufacturing process.
4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
5. PVC-free AC power cord available in all regions except India and South Korea.
6. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

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