Overview

HP 250 G7 Notebook PC

Left

1. Webcam LED
2. Webcam
3. Internal microphone
4. Touchpad
5. Touchpad button
6. Audio combo jack

7. USB 3.1 Gen 1 port
8. USB 3.1 Gen 1 port
9. HDMI port (Cable not included)
10. RJ-45/Ethernet port
11. AC Smart Pin adapter plug
12. Power button

Overview

Right

1. Security lock slot (Lock sold separately)
2. Optical drive (optional)
3. USB 2.0 port
4. SD Card slot
5. Hard drive indicator LED
6. Power indicator LED

Overview

AT A GLANCE

- Preinstalled with Windows 10 versions or FreeDOS
- Choice of 8th or 7th Generation Intel® Core™ processors
- 15" (39.6 cm) diagonal FHD/HD Anti-Glare Display
- Choice of Integrated Intel® UHD Graphics 620, HD Graphics 620 or Switchable Discrete Graphics NVIDIA Geforce MX110
- Dark Ash Silver or Asteroid Silver color with texture pattern (Color options available in select countries)
- Up to 1 TB Hard Drive or 512 GB M.2 PCIe Value Solid State Drive
- Weight starting at 1.78 Kgs (3.91 lbs)
- Security features including FW TPM 2.0 and security lock slot (Lock not included)
- Keyboard - Full size textured island-style keyboard with numeric pad
- Touchpad with gestures support
- HP webcam with single digital microphone and HD (supporting WDR- Wide Dynamic Range) or VGA camera
- Two USB 3.1 (Gen 1) ports and One USB 2.0 port
- Wireless LAN (WLAN) up to 802.11ac to keep you connected
- Battery Life Up to 12 hours and 30 minutes

NOTE: See important legal disclosures for all listed specs in their respective features sections.

PRODUCT NAME

HP 250 G7 Notebook PC

OPERATING SYSTEM

Preinstalled

Windows 10 Pro 64[1]
Windows 10 Home 64[1]
Windows 10 Home Single Language 64[1]
Windows 10 Pro 64 (National Academic only)[2]
FreeDOS

1. Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See http://www.windows.com/.
2. Some devices for academic use will automatically be updated to Windows 10 Pro Education with the Windows 10 Anniversary Update. Features vary; see https://aka.ms/ProEducation for Windows 10 Pro Education feature information.

PROCESSOR

Intel® Core™ i7-8565U processor with Intel® UHD Graphics 620 (1.8 GHz base frequency, up to 4.6 GHz with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores)[3,4,5,6]
Intel® Core™ i5-8265U with Intel® UHD Graphics 620 Graphics (1.6 GHz base frequency, up to 3.9 GHz with Intel® Turbo Boost Technology, 6 MB L3 cache, 4 cores) [3,4,5,6]
Intel® Core™ i3-7020U with Intel® HD Graphics 620 (2.3 GHz, 3 MB cache, 2 cores)[3,4,6]
Intel® Pentium® Silver Processor N5000 with Intel® UHD Graphics 605 (1.1 GHz base frequency, up to 2.7 GHz burst frequency, 4 MB cache, 4 cores)[3,4,6]
Intel® Celeron® Processor N4000 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.6 GHz burst frequency, 4 MB cache, 2 cores)[3,4,6]
Intel® Core™ i7+ 8565U processor (Core™ i7 and 16 GB Intel® Optane™ memory) with Intel® UHD Graphics 620 (4.1 GHz base frequency, up to 4.6 GHz with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores)[3,4,5,6,7]
Intel® Core™ i5+ 8265U processor (Core™ i5 and 16 GB Intel® Optane™ memory) with Intel® UHD Graphics 620 (3.7 GHz base frequency, up to 3.9 GHz with Intel® Turbo Boost Technology, 6 MB L3 cache, 4 cores)[3,4,5,6,7]
Intel® Celeron® N3060 with Intel® HD Graphics 400 (1.6 GHz base frequency, up to 2.48 GHz burst frequency, 2 MB cache, 2 cores)[3,4,6]
Intel® Pentium® Gold Processor 4417U with Intel® HD Graphics 610 (2.3 GHz base frequency, 2 MB cache, 2 cores)[3,4,6]

Processor Family
8th Generation Intel® Core™ i7 processor (i7-8565U)[6]
8th Generation Intel® Core™ i5 processor (i5-8265U)[6]
7th Generation Intel® Core™ i3 processor (i3-7020U)[6]
Intel® Pentium® processor (N5000, 4417U are Windows 10 only)[6]
Intel® Celeron® processor (N4000, N3060 are Windows 10 only)[6]

3. Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering is not a measurement of higher performance.
4. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
5. Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See http://www.intel.com/technology/turboboost for more information.

Features

6. In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on products configured with Intel and AMD 7th generation and forward processors or provide any Windows 8 or Windows 7 drivers on http://www.support.hp.com.
7. Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system and requires configuration with an optional Intel® Core™ i(5 or 7)+ processor.

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated
Intel® HD Graphics 610[8,9]
Intel® UHD Graphics 620[8,9]
Intel® UHD Graphics 605[8,9]
Intel® UHD Graphics 600[8,9]
Intel® HD Graphics 400[8,9]

Discrete
NVIDIA® GeForce® MX110 (2 GB DDR5 dedicated)[9]

Supports
Support HD decode, DX12, HDMI 1.4b

8. HD content required to view HD images.
9. Integrated graphics depends on processor. NVIDIA® Optimus™ technology requires an Intel processor, plus an NVIDIA® GeForce® discrete graphics configuration and is available on Windows 10 Pro OS. With NVIDIA® Optimus™ technology, full enablement of all discrete graphics video and display features may not be supported on all systems (e.g. OpenGL applications will run on the integrated GPU or the APU as the case may be).

DISPLAY

Internal
Non-Touch
39.6 cm (15.6") diagonal HD SVA eDP anti-glare WLED-backlit slim, 220 cd/m², 67% sRGB (1366 x 768)[8, 10,11]
39.6 cm (15.6") diagonal FHD SVA eDP anti-glare WLED-backlit slim, 220 cd/m², 67% sRGB (1920 x 1080)[8,10,11]

HDMI
Port supports resolutions up to 1920 x 1200 external resolution @60 Hz

8. HD content required to view HD images.
10. Resolutions are dependent upon monitor capability, and resolution and color depth settings.
11. Sold separately or as an optional feature.

Features

STORAGE AND DRIVES

Primary Storage
1 TB 5400 rpm SATA[12]
500 GB 7200 rpm SATA[12]
500 GB 5400 rpm SATA[12]

Primary M.2 Storage
128 GB SATA-3 TLC Solid State Drive[12]
256 GB SATA-3 TLC Solid State Drive[12]
256 GB PCIe Gen3x4 NVMe Value Solid State Drive[12]
512 GB PCIe Gen3x4 NVMe Value Solid State Drive[12]
16 GB Intel® Optane™ Memory Cache[7]

12. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 7. Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system and requires configuration with an optional Intel® Core™ i(5 or 7)+ processor.

MEMORY

Standard
Maximum Memory
16 GB DR4-2400 SDRAM[14]
8 GB DR4-2133 SDRAM[14]
8 GB DR4-1600 SDRAM[14]

Memory
16 GB DDR4-2400 SDRAM (2 X 8 GB) [14]
8 GB DDR4-2400 SDRAM (1 x 8 GB)
8 GB DDR4-2400 SDRAM (2 x 4 GB) [14]
4 GB DDR4-2400 SDRAM (1 x 4 GB)
8 GB DDR4-2133 SDRAM (1 x 8 GB)
8 GB DDR4-2133 SDRAM (2 x 4 GB) [14]
4 GB DDR4-2133 SDRAM (1 x 4 GB)
4 GB DDR3L-1600 SDRAM (1 x 4 GB)
8 GB DDR3L-1600 SDRAM (1 x 8 GB)
4 GB DDR3L-2133 SDRAM (1 x 4 GB)
4 GB DDR3L-2400 SDRAM (1 x 4 GB)

Memory Slots
2 SODIMM (Intel® 8th & 7th Generation Intel® Core™ processor)
DDR4 PC4 SODIMMS, system runs at 2400 (Intel 7th Gen (KBL) runs at 2133)
Supports Dual Channel Memory[13]
Both slots are customer non-accessible / non-upgradeable

Maximum Memory
8 GB DDR4-2400 SDRAM (1 SODIMM Only)

Memory
8 GB DDR4-2400 SDRAM (1 x 8 GB)
4 GB DDR4-2400 SDRAM (1 x 4 GB)
6 GB DDR4-2400 SDRAM (2 GB + 4 GB)[14]
8 GB DDR4-2400 SDRAM (2 x 4 GB)[14]

Features

Memory Slots
1 SODIMM (Intel® N5000, N4000 processor)
Single Channel Memory
Memory slot are customer non-accessible / non-upgradeable

Memory Slots
1 SODIMM (Intel® N3060 processor)
Single Channel Memory
Memory slot are customer non-accessible / non-upgradeable

13.Dual channel memory support only for 8th and 7th Generation Intel® Core™ processors.
14. Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

NETWORKING/COMMUNICATIONS

Wireless LAN (WLAN)
Realtek 802.11ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo (MU-MIMO supported)[15]
Realtek 802.11ac (1x1) and Bluetooth® 4.2 Combo[15]
Realtek 802.11b/g/n (1x1) and Bluetooth® 4.2 Combo[15]

Miracast
Compatible with Miracast-certified devices[16]

Ethernet
Integrated 10/100/1000 GbE NIC

15. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited.
16. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.

AUDIO/MULTIMEDIA

Audio
2 Integrated stereo speakers

Camera
HP TrueVision HD Camera[8,11]

Webcam
VGA webcam[1117]

Optical Drive
Optional DVD-Writer[18,19]

8. HD content required to view HD images.
11. Sold separately or as an optional feature.
17. Internet access required.
18. Unit shipped with either "DVD+/-RW SuperMulti DL" or "DVD Writer Drive." Units undergoing repairs may be returned with a "DVD+/-RW SuperMulti DL."

Features

19. HD-DVD disks cannot be played on this drive. No support for DVDRAM. Actual speeds may vary. Don't copy copyright protected materials. Double Layer discs can store more data than single layer discs; discs burned with this drive may not be compatible with many existing single-layer DVD drives and players.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard
Keyboard - Full size textured island-style keyboard with numeric pad

Pointing Device
Touchpad with multi-touch gesture support

Function Keys
F1 - Open " How to get help in Windows 10" webpage
F2 - Brightness Down
F3 - Brightness Up
F4 - Display Switching
F5 - Blank
F6 - Mute
F7 - Volume Down
F8 -Volume Up
F9 - Previous
F10 - Play/Pause
F11 - Next
F12 - Airplane mode

SOFTWARE AND SECURITY

Preinstalled Software

HP JumpStart
HP Documentation
HP Setup Integrated OOBE
HP SSRM
HP Audio Switch
HP Support Assistant[20]
McAfee LiveSafe™

Security Management
TPM 2.0[21]
Security lock slot (Lock sold separately)

20. HP Support Assistant requires Windows and Internet access.
21. Firmware TPM is version 2.0. Hardware TPM is v1.2, which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology (PTT). TPM is version 2.0. Hardware TPM is v1.2, which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology (PTT).

Features

POWER

Power Supply

HP Smart 65 W External AC power adapter[22, 24]
HP Smart 65 W EM External AC power adapter[22, 24]
HP Smart 45 W External AC power adapter[22]

Primary Battery

HP Long Life 3-cell, 41 Wh Li-ion[23,24]
Support battery fast charging - Approximately 90% in 90 minutes

Power Cord

1M (3.28 feet) length power cord[22]

Battery Life

Up to 12 hours and 30 minutes[25]

Battery Weight

0.18 kg
0.39 lb

22. Availability may vary by country.
23. Battery is internal and not replaceable by customer. Serviceable by warranty.
24. Recharges the battery up to 90% within 90 minutes when the system is off or in standby mode. Power adapter with a minimum capacity of 65 watts is required. After charging has reached 90% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.
25. Windows 10 MM14 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See http://www.bapco.com for additional details.

WEIGHTS & DIMENSIONS

Product Weight

Starting at 3.91 lb[26]
Starting at 1.78 kg[26]

Product Dimensions (w x d x h)

14.8 x 9.68 x 0.89 in
37.6 x 24.6 x 2.25 cm

26. Weight varies by configuration and components.

PORTS/SLOTS

Ports/Slots

2 USB 3.1 Gen 1
1 USB 2.0
1 HDMI v1.4b[27]
1 RJ-45
1 AC power

Features

1 Headphone/microphone combo jack

Expansion Slots
1 multi-format digital media reader
Supports SD, SDHC, SDXC

27. HDMI cable sold separately.

SERVICE AND SUPPORT

HP Services offers 1-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year or 3-year limited warranty as the platform. Refer to http://www.hp.com/support/batterywarranty/ for additional battery information. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: http://www.hp.com/go/cpc .[28]

28. HP Care Packs are sold separately. Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit http://www.hp.com/go/cpc. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)

Nominal Operating Voltage	19.5 V
Average Operating Power	Win 10
Integrated graphics	6.39W
	Discrete < 65W
Max Operating Power	UMA < 45W

Temperature

Operating	32° to 95° F (0° to 35° C) (not writing optical)
	41° to 95° F (5° to 35° C) (writing optical)
Non-operating	-4° to 140° F (-20° to 60° C)

Relative Humidity

Operating	10% to 90%, non-condensing
Non-operating	5% to 95%

Shock

Operating	40 G, 2 ms duration, half-sine
Non-operating	240 G, 2 ms duration, half-sine

Random Vibration

Operating	1.043 grms
Non-operating	3.5 grms

Planned Industry Standard Certifications

UL	Yes
CSA	No
FCC Compliance	Yes
ENERGY STAR®	Yes[29]
EPEAT® 2019	Yes, Silver in U.S.[30]
ICES	Yes
Australia /	Yes
NZ A-Tick Compliance	Yes
CCC	Yes
Japan VCCI Compliance	Yes
KC	Yes
BSMI	Yes
CE Marking Compliance	Yes
BNCI or BELUS	Yes
CIT	Yes
GOST	Yes
Saudi Arabian Compliance (ICCP)	Yes
SABS	Yes

29. Configurations of the HP 250 G7 that are ENERGY STAR® certified are identified as HP 250 G7 ENERGY STAR on HP websites and on http://www.energystar.gov.

QuickSpecs

Technical Specifications

30. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit http://www.epeat.net for more information.

DISPLAYS

Note: All specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary either higher or lower.

15.6" diagonal HD WLED AntiGlare (1366x768) slim-flat (3.2mm) SVA, eDP			
Outline Dimensions (W x H x D)	360.0 x 224.3mm max		
Active Area	344.2 x 193.5		
Weight	420 max.		
Diagonal Size	15.6 (inch)		
Thickness	3.2mm max		
Interface	eDP 1.2 (1 lane)		
Surface Treatment	Anti-glare (AG)		
Touch Enabled	NO		
Contrast Ratio	300:1 (typ)		
Refresh Rate	60Hz		
Brightness	220 nit typ		
Pixel Resolution	Format	1366 x 768 (HD)	
	Configuration	RGB	
Backlight	LED		
Color Gamut Coverage	45%		
Color Depth	6 bits (Hi FRC)		
Viewing Angle	SVA 40/40/15/30		

15.6" diagonal FHD WLED AntiGlare (1920x1080) slim-flat (3.2mm) SVA, eDP			
Outline Dimensions (W x H x D)	360.0 x 224.3mm max		
Active Area	344.16 x 193.59		
Weight	370g max.		
Diagonal Size	15.6 (inch)		
Thickness	3.2mm max		
Interface	eDP 1.2		
Surface Treatment	Anti-glare (AG)		
Touch Enabled	NO		
Contrast Ratio	300:1 (typ)		
Refresh Rate	60Hz		
Brightness	220 nit typ		
Pixel Resolution	Format	1920 x 1080 (FHD)	
	Configuration	RGB	
Backlight	LED		
Color Gamut Coverage	45%		

Technical Specifications

	Color Depth	6 bits + FRC
	Viewing Angle	SVA 45/45/25/35

STORAGE AND DRIVES

500 GB 5400 rpm SATA Dard Drive

Drive Weight	92g(0.20lb)
Rotation speed	5400 rpm
Cache Buffer	Up to 128MB
Height	7.0 +/- 0.2 mm (0.28 +/-.008 in)
Width	69.85 +/- 0.25 mm (2.750 +/- 0.010 in)
Interface	ATA-8, SATA 3.0
Transfer Rate	600 MB/s
Seek Time	Single Track: 2 ~ 1.5 ms Average: 11 ~ 16 ms Maximum: 18 ~ 22 ms
Logical Blocks	976,773,168
Operating Temperature	0° to 60°C
Security Features	ATA Security
Features	S.M.A.R.T., NCQ, Ultra DMA

500 GB 7200 rpm SATA Hard Drive

Drive Weight	92g(0.20lb)
Rotation speed	7200 rpm
Cache Buffer	Up to 128MB
Height	7.0 +/- 0.2 mm (0.28 +/-.008 in)
Width	69.85 +/- 0.25 mm (2.750 +/- 0.010 in)
Interface	ATA-8, SATA 3.0
Transfer Rate	600 MB/s
Seek Time	Single Track: 2 ~ 1.5 ms Average: 11 ~ 13 ms Maximum: 18 ~ 22 ms
Logical Blocks	976,773,168
Operating Temperature	0° to 60°C
Security Features	ATA Security
Features	S.M.A.R.T., NCQ, Ultra DMA

Technical Specifications

1 TB 5400 rpm SATA Hard Drive	Drive Weight	92g(0.20lb)
	Rotation speed	7200 rpm
	Cache Buffer	Up to 128MB
	Height	7.0 +/- 0.2 mm (0.28 +/-.008 in)
	Width	69.85 +/- 0.25 mm (2.750 +/- 0.010 in)
	Interface	ATA-8, SATA 3.0
	Transfer Rate	600 MB/s
	Seek Time	Single Track: 2 ~ 1.5 ms Average: 11 ~ 16 ms Maximum: 18 ~ 22 ms
	Logical Blocks	976,773,168
	Operating Temperature	0° to 60°C
	Security Features	ATA Security
	Features	S.M.A.R.T., NCQ, Ultra DMA

128 GB 2280 M2 SATA-3 TLC Solid State Drive	Drive Weight	0.02 lb (10 g)
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	ATA-8, SATA 3.0
	Transfer Rate	550MB/s
	Logical Blocks	250,069,680
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Security Features	ATA Security
	Features	DIPM; TRIM; DEVSLP

256 GB 2280 M2 SATA-3 TLC Solid State Drive	Drive Weight	0.02 lb (10 g)
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	ATA-8, SATA 3.0
	Transfer Rate	550MB/s
	Logical Blocks	500,118,192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Security Features	ATA Security
	Features	DIPM; TRIM; DEVSLP

256 GB 2280 M2 PCIe NVMe Value Solid State Drive	Form Factor	M.2 2280
	Capacity	256 GB
	NAND Type	TLC

Technical Specifications

	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.01 lb (6 g) ~ 0.02 lb (10 g)
	Interface	PCIe NVMe Gen3x2
	Maximum Sequential Read	Up To 1500 MB/s
	Maximum Sequential Write	Up To 1000 MB/s
	Logical Blocks	500,118,192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	DIPM; TRIM; DEVSLP
512 GB 2280 M2 PCIe NVMe Value Solid State Drive	**Form Factor**	M.2 2280
	Capacity	512 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	PCIe NVMe Gen3x2
	Maximum Sequential Read	Up To 1600 MB/s
	Maximum Sequential Write	Up To 1200 MB/s
	Logical Blocks	1,000,236,384
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	DIPM; TRIM; DEVSLP
16 GB Intel®Optane™ Solution PCIe Gen3x2 M.2 SSD	**Form Factor**	M.2 2280
	Capacity	16 GB
	NAND Type	3D Xpoint
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	PCIe NVMe Gen3x2
	Maximum Sequential Read	1350MB/s
	Maximum Sequential Write	290MB/s
	Logical Blocks	31,257,387
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]

Technical Specifications

NETWORKING/COMMUNICATIONS
WLAN

Realtek RTL8822BE 802.11 ac 2x2 WiFi + Bluetooth®4.2 Combo Adapter (MU-MIMO supported)	**Wireless LAN Standards**	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
	Interoperability	Wi-Fi® certified
	Frequency Band	802.11b/g/n •2.402 – 2.482 GHz 802.11a/n •4.9 – 4.95 GHz (Japan) •5.15 – 5.25 GHz •5.25 – 5.35 GHz •5.47 – 5.725 GHz •5.825 – 5.850 GHz
	Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
	Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	Security[3]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power[2]	• 802.11b: +14dBm minimum • 802.11g: +12dBm minimum • 802.11a: +12dBm minimum • 802.11n HT20(2.4GHz): +12dBm minimum • 802.11n HT40(2.4GHz): +12dBm minimum • 802.11n HT20(5GHz): +10dBm minimum • 802.11n HT40(5GHz): +10dBm minimum • 802.11ac VHT80(5GHz): +10dBm minimum

Technical Specifications

Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connect Standby: 10 mW (WLAN+BT) Radio disabled: 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	802.11b, 1Mbps: -93.5dBm maximum 802.11b, 11Mbps: -84dBm maximum 802.11a/g, 6Mbps: -86dBm maximum 802.11a/g, 54Mbps: -72dBm maximum 802.11n, MCS07: -67dBm maximum 802.11n, MCS15: -64dBm maximum 802.11ac, MCS0: -84dBm maximum 802.11ac, MCS9: -59dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	Type 2230: 2.3 x 22.0 x 30.0 mm
Weight	Type 2230: 2.8g
Operating Voltage	3.3v +/- 9%
Temperature	Operating 14° to 158° F (−10° to 70° C) Non-operating −40° to 176° F (−40° to 80° C)
Humidity	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
Altitude	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED White – Radio ON

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology

Bluetooth Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps signaling data rate[1] up to 2.17 Mbps BLE: 1 Mbps data signaling data rate[1] up to 0.2 Mbps Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice

Technical Specifications

		channels
		Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
	Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.
Realtek RTL8821CE 802.11ac 1x1 WiFi + Bluetooth® 4.2 Combo (MU-MIMO supported)	**Wireless LAN Standards**	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
	Interoperability	Wi-Fi® certified
	Frequency Band	802.11b/g/n •2.402 – 2.482 GHz 802.11a/n •4.9 – 4.95 GHz (Japan) •5.15 – 5.25 GHz •5.25 – 5.35 GHz •5.47 – 5.725 GHz •5.825 – 5.850 GHz
	Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
	Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	Security[3]	• IEEE and WiFi® compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power[2]	• 802.11b: +14dBm minimum • 802.11g: +12dBm minimum

Technical Specifications

- 802.11a: +12dBm minimum
- 802.11n HT20(2.4GHz): +12dBm minimum
- 802.11n HT40(2.4GHz): +12dBm minimum
- 802.11n HT20(5GHz): +10dBm minimum
- 802.11n HT40(5GHz): +10dBm minimum
- 802.11ac VHT80(5GHz): +10dBm minimum"

Power Consumption	Transmit: 2.0 W (max) Receive mode: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connect Standby: 10 mW Radio disabled: 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	802.11b, 1Mbps: -93.5dBm maximum 802.11b, 11Mbps: -84dBm maximum 802.11a/g, 6Mbps: -86dBm maximum 802.11a/g, 54Mbps: -72dBm maximum 802.11n, MCS07: -67dBm maximum 802.11n, MCS15: -64dBm maximum 802.11ac, MCS0: -84dBm maximum 802.11ac, MCS9: -59dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	Type 2230: 2.3 x 22.0 x 30.0 mm
Weight	Type 2230: 2.8g
Operating Voltage	3.3v +/- 9%

Temperature	Operating	14° to 158° F (−10° to 70° C)
	Non-operating	−40° to 176° F (−40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED White – Radio ON	

4. Check latest software/driver release for updates on supported security features.
5. Maximum output power may vary by country according to local regulations.
6. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Technical Specifications

HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology

Bluetooth Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps data signaling data rate[1] up to 2.17 Mbps BLE: 1 Mbps data signaling data rate[1] up to 0.2 Mbps Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.

Realtek Ethernet (10/100/1000)	**Ethernet Features**	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet) Jumbo Frame 9K Auto MDI/MDIX Crossover cable detection
	Power Management	ACPI compliant - multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
	Performance Features	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling
	Manageability	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
	Interface	PCI Express 1.1 to support ASPM L1
	NIC Device Driver Name	Realtek PCIe GBE Ethernet Family Controller

QuickSpecs

Technical Specifications

POWER

HP 65 W Smart AC adapter	**Dimensions** (H x W x D)	108 x 47 x 37.4mm
	Weight	250g
	Input	**Input** — 100 to 240 VAC
		Input Efficiency — 88.0 % at 115 VAC and 89.0 % at 230VAC
		Input frequency range — 50~ 60 Hz
		Input AC current — Max. 1.7 A at 90 VAC
	Output	**Output power** — 65W
		DC output — 19.5V
		Hold-up time — 5ms at 115 Vac input
		Output current limit — The power supply shall limit the maximum steady state output current to an average current of 11 Amperes.
	Connector	4.5mm Barrel Type
	Environmental Design	**Operating temperature** — 32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature — -4° to 185° F (-20° to 85° C)
		Altitude — The power supply can be operated at 5,000 m above sea level
		Humidity — The power supply shall withstand without degradation with 95% relative humidity, non-condensing, both operating and non-operating
	EMI and Safety Certifications	*CE Mark - full compliance with LVD and EMC directives * Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. * MTBF - over 200,000 hours at 25°C ambient condition.
45 W AC adapter	**Dimensions** (H x W x D)	95x40x26.5mm
	Weight	200g
	Input	**Input** — 100 to 240 VAC
		Input Efficiency — 87.8 % at 115 VAC and 88.5 % at 230VAC
		Input frequency range — 50~ 60 Hz
		Input AC current — Max. 1.4 A at 90 VAC
	Output	**Output power** — 45W
		DC output — 19.5V
		Hold-up time — 5ms at 115 Vac input
		Output current limit — The power supply shall limit the maximum steady state output current to an average current of 8 Amperes.
	Connector	4.5mm Barrel Type,
	Environmental Design	**Operating temperature** — 32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature — -4° to 185° F (-20° to 85° C)
		Altitude — The power supply can be operated at 5,000 m above sea level

Technical Specifications

	Humidity	The power supply shall withstand without degradation with 95% relative humidity, non-condensing, both operating and non-operating.
	EMI and Safety Certifications	*CE Mark - full compliance with LVD and EMC directives * Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. * MTBF - over 200,000 hours at 25°C ambient condition.
HP 65W Smart AC adapter (EM)	**Dimensions** (H x W x D)	102x55x30mm
	Weight	270g
	Input	**Input** — 100 to 240 VAC
		Input Efficiency — 88.0 % at 115 VAC and 89.0 % at 230VAC
		Input frequency range — 50~ 60 Hz
		Input AC current — Max. 1.7 A at 90 VAC
	Output	**Output power** — 65W
		DC output — 19.5V
		Hold-up time — 5ms at 115 Vac input
		Output current limit — The power supply shall limit the maximum steady state output current to an average current of 11 Amperes.
	Connector	4.5mm Barrel Type
	Environmental Design	**Operating temperature** — 32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature — -4° to 185° F (-20° to 85° C)
		Altitude — The power supply can be operated at 5,000 m above sea level
		Humidity — The power supply shall withstand without degradation with 95% relative humidity, non-condensing, both operating and non-operating.
	EMI and Safety Certifications	*CE Mark - full compliance with LVD and EMC directives * Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. * MTBF - over 200,000 hours at 25°C ambient condition.
HP 3-cell Li-Ion Long Life - Fast Charge (41 WHr)	**Dimensions** (H x W x L)	6.0 x 186.85 x 90.2 mm (0.236 x 7.35 x 3.55 inch)
	Weight	0.18 kg (0.39 lb)
	Cells/Type	3cell Lithium-Ion Polymer cell / 515974
	Voltage	11.4V
	Amp-hour capacity	3.6Ah
	Watt-hour capacity	41Wh
	Operating (Charging)	32˚ to 113˚ F (0˚ to 45˚ C)
	Operating (Discharging)	14˚ to 122˚ F (-10˚ to 60˚ C)
	Optional Travel Battery Available	No
	Dimensions	6.0 x 186.85 x 90.2 mm (0.236 x 7.35 x 3.55 inch)

QuickSpecs

Technical Specifications

HP 3-cell Li-Ion Long Life - Fast Charge (41 WHr)

Weight	0.19 kg (0.41 lb)
Cells/Type	3cell Lithium-Ion Prismatic cell / 496080
Voltage	11.55V
Amp-hour capacity	3.615Ah/3.63Ah
Watt-hour capacity	41Wh
Operating (Charging)	32˚ to 113˚ F (0˚ to 45˚ C)
Operating (Discharging)	14˚ to 122˚ F (-10˚ to 60˚ C)
Optional Travel Battery Available	No

Technical Specifications

Country of Origin

China

Category	Description	Part Number
Cases	HP Essential Top Load Case	H2W17AA#xxx
	HP Essential Backpack (up to 15.6")	H1D24AA
	HP Essential Messenger Case (up to 17.3")	H1D25AA
Docking	HP 3005PR USB3 Port Replicator	Y4H06AA
	HP USB Travel Dock	T0K30AA
	HP Monitor Stand	M9X76AA
Input / Output	HP Slim USB Keyboard and Mouse	T6T83AA
	HP Slim Wireless Keyboard and Mouse	T6L04AA
	HP 3-Button USB Laser Mouse	H4B81AA
	HP USB Travel Mouse	G1K28AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP Ultra Mobile Wireless Mouse	H6F25AA#xxx
	HP HDMI to DVI Adapter	F5A28AA
	HP Stereo USB Headset	T1A67AA
	HP Stereo 3.5mm Headset	T1A66AA
Power	HP 45W Smart AC Adapter 4.5mm	H6Y88AA#XXX
	HP 65W Smart AC Adapter	H6Y89AA#xxx
	HP 65W Slim AC Adapter	H6Y82AA#xxx
Storage	HP External USB Optical Drive	F2B56AA
Memory	HP 4GB 2666Mhz DDR4	4VN05AA
	HP 8GB 2666Mhz DDR4	4VN06AA
Displays	HP S140u 14-inch Portable Display	G8R65AA
	HP ProDisplay P223 21-5inch Monitor	X7R61AA
	HP ProDisplay P232 23-inch Monitor	K7X31AA
	HP ProDisplay P240va 23.8-inch Monitor	N3H14AA
	HP EliteDisplay S14 14-inch USB-C Portable Monitor	3HX46AA

Summary of Changes

Date of change:	Version History:		Description of change:
March 1, 2019	From v1 to v2	Removed	USB-C Travel Dock
March 4, 2019	From v2 to v3	Removed	Battery Life
March 18, 2019	From v3 to v4	Added	Battery Life
April 9, 2019	From v4 to v5	Update	Memory section
May 17, 2019	From v5 to v6	Update	Memory section
June 13, 2019	From v6 to v7	Updated	EPEAT
July 3, 2019	From v7 to V8	Updated	Processors