Overview

HP EliteBook 850 G6 Notebook PC

Left

1. **HD and IR Camera (Optional)**
2. **Ambient Light Sensor (Optional)**
3. **IR camera LEDs (Optional)**
4. **Internal Microphones**
5. **Camera Shutter**
6. **HD Camera LED**
7. **Pointstick**
8. **Numeric Keypad**
9. **Glass Clickpad**
10. **Smartcard Reader (Optional)**
11. **USB 3.2 Gen 1 Charging Port**
12. **Vents**
13. **Standard Security Lock Slot (Lock sold separately)**
14. **Power Button**

Overview

Right

1. **Power Connector**
2. **USB Type-C™ with Thunderbolt™**
3. **Docking Connector**
4. **Ethernet Port**
5. **HDMI Port (Cable not included)**
6. **USB 3.2 Gen 1 Port**
7. **Audio Combo Jack**
8. **SIM Card Slot**
9. **Touch Fingerprint Sensor (Optional)**

Overview

AT A GLANCE

- **Eye-catching Ultraslim design, premium precision-crafted machined aluminum (CNC) chassis for clean, crisp, premium look and feel**
- **8th Generation Intel® Core™ i5, i7 Processors**
- **Preinstalled with Windows 10 versions or FreeDOS**
- **Designed to support all HP docking options including HP's traditional Ultraslim mechanical dock and all-new Thunderbolt dock[2]**
- **Featuring HP Collaboration Keyboard with Clickpad to manage most commonly used conferencing functions with a single keystroke**
- **Innovative world-facing third mic improves inbound ambient noise cancellation while 360 degree mic pick-up allows everyone to clearly hear and be heard**
- **Optional ultrabright displays with ambient light sensor**
- **Choice of displays:**
  -39.6 cm (15.6") diagonal FHD IPS Anti-Glare LED-backlit, 250 nits, 45% NTSC
  -39.6 cm (15.6") diagonal FHD IPS Anti-Glare LED-backlit non-touch 400 nits, 72% NTSC
  -39.6cm (15.6") diagonal UHD IPS Anti-Glare LED-backlit non-touch, 400 nits, 72% NTSC
  -39.6cm (15.6") diagonal FHD IPS Anti-Glare LED-backlit non-touch, 1000 nits, 72% NTSC with HP Sure View (Available 3Q 2019)*
  -39.6cm (15.6") diagonal FHD IPS Anti-Glare On-Cell LED-backlit touch, 250 nits, 45% NTSC
- **Optional AMD Radeon 550X discrete graphics with 2GB GDDR5 video memory**
- **Enterprise grade security with HP Sure Sense[5], HP SureStart Gen5, HP Privacy Camera, HP Sure View Gen3[1], HP Sure Run Gen2, HP Sure Recover Gen2 with Embedded Reimaging[2], HP Sure Click, SmartCard Reader[2] and Touch Fingerprint reader[2]**
- **Ultimate connectivity with optional CAT16 4G/LTE WWAN, and Thunderbolt™ Docking (dock sold separately)**
- **Supports fast charging (50% in 30 minutes) with no impact on battery recharge cycles[3]**
- **Flexible wireless connectivity options**
- **Choice of solid state drives up to 2 TB and DDR4 memory up to 64 GB**
- **Passed 19 MIL-STD 810G tests[4]**
- **UMA graphics: Up to 15 hours (Intel® 8th generation CPU and 3-cell 56 WHr battery)**
- **Discrete graphics: Up to 14 hours and 45 minutes (Intel® 8th generation CPU and 3-cell 56 WHr battery)**

1. HP Sure View G3 integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.
2. Sold separately or as an optional feature.
3. Recharges your battery up to 50% within 30 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 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.
4. MIL STD 810G testing is not intended to demonstrate fitness for U.S. Department of Defense contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Accidental damage requires an optional HP Accidental Damage Protection Care Pack.
5. HP Sure Sense requires Windows 10. See product specifications for availability.
***Touch-enabled display and Sure View privacy panel will lower actual brightness**

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

Features

PRODUCT NAME

HP EliteBook 850 G6 Notebook PC

OPERATING SYSTEM

Preinstalled

Windows 10 Pro 64 – HP recommends Windows 10 Pro.[1]
Windows 10 Pro 64 (National Academic License)[2]
Windows 10 Home 64[1]
Windows 10 Home Single Language 64[1]
Windows® 10 (Windows 10 Enterprise available with a Volume Licensing Agreement)[1]
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.

PROCESSORS

Intel® Core™ i7-8665U vPro™ with Intel® UHD graphics 620 (1.9 GHz base frequency, up to 4.8 GHz with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores)[3,4,5,6]
Intel® Core™ i7-8565U 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™ i5-8365U vPro™ with Intel® UHD Graphics 620 (1.6 GHz base frequency, up to 4.1 GHz with Intel® Turbo Boost Technology, 6 MB L3 cache, 4 cores)[3,4,5,6]
Intel® Core™ i5-8265U with Intel® UHD Graphics 620 (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]

Processor Family
8th Generation Intel® Core™ i7 processor (i7-8665U and i7-8565U)[6]
8th Generation Intel® Core™ i5 processor (i5-8365U and i5-8265U)[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, branding and/or naming 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.
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.

Features

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated
Intel® UHD Graphics 620[7]

Discrete
AMD Radeon™ 550X (2 GB GDDR5 video memory)[8,9]

Supports
Support HD decode, DX12, HDMI 1.4b[10]

7. HD content required to view HD images.
8. Sold separately or as an optional feature
9. AMD Dynamic Switchable Graphics technology requires an Intel processor, plus an AMD Radeon™ discrete graphics configuration and is not available on FreeDOS and Linux OS. With AMD Dynamic Switchable Graphics 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).
10. HDMI cable sold separately

DISPLAY

Non-Touch
39.6 cm (15.6") diagonal FHD eDP anti-glare WLED-backlit slim, 250 nits, 45% NTSC (1920 x 1080)[7,8,11]
39.6 cm (15.6") diagonal FHD eDP anti-glare WLED-backlit slim, 250 nits, 45% NTSC with HD camera (1920 x 1080)[7,8,11]
39.6 cm (15.6") diagonal FHD eDP anti-glare WLED-backlit slim, 250 nits, 45% NTSC with HD + IR camera (1920 x 1080)[7,8,11]
39.6 cm (15.6") diagonal FHD eDP anti-glare WLED-backlit slim, 250 nits, 45% NTSC for WWAN (1920 x 1080)[7,8,11]
39.6 cm (15.6") diagonal FHD eDP anti-glare WLED-backlit slim, 250 nits, 45% NTSC with HD camera for WWAN (1920 x 1080)[7,8,11]
39.6 cm (15.6") diagonal FHD eDP anti-glare WLED-backlit slim, 250 nits, 45% NTSC with HD + IR camera for WWAN (1920 x 1080)[7,8,11]
39.6 cm (15.6") diagonal FHD eDP + PSR anti-glare WLED-backlit slim, 400 nits, 72% NTSC with Ambient Light Sensor and HD + IR camera (1920 x 1080)[7,8,11]
39.6 cm (15.6") diagonal FHD eDP + PSR anti-glare WLED-backlit slim, 400 nits, 72% NTSC with Ambient Light Sensor and HD + IR camera for WWAN (1920 x 1080) [7,8,11]
39.6 cm (15.6") diagonal FHD eDP + PSR anti-glare WLED-backlit Ultraslim, 400 nits, 72% NTSC with Ambient Light Sensor and HD + IR camera for WWAN (3840 x 2160)[7,8,11]

HP Sure View G3 Integrated Privacy Screen 39.6 cm (15.6") diagonal FHD IPS eDP + PSR anti-glare WLED-backlit flat with Ambient Light Sensor for HD+IR camera and WWAN, 1000 nits, 72% NTSC (1920 x 1080) (Available 3Q 2019)[7,8,11,12*]

Touch
39.6 cm (15.6") diagonal FHD eDP Anti-Glare On-Cell WLED-backlit slim touch screen Corning® 250 nits, 45% NTSC with HD+IR camera (1920 x 1080)[7,8,11]
39.6 cm (15.6") diagonal FHD eDP Anti-Glare On-Cell WLED-backlit slim touch screen Corning® 250 nits, 45% NTSC with HD+IR camera for WWAN (1920 x 1080)[7,8,11]

HDMI 1.4b
Supports resolution up to 4k @ 60Hz via DisplayPort™ and @ 30Hz via HDMI[7]

Features

7. HD content required to view HD images.
8. Sold separately or as an optional feature.
11. Resolutions are dependent upon monitor capability, and resolution and color depth settings.
12. HP Sure View G3 integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.
***Touch-enabled display and Sure View privacy panel will lower actual brightness**

Docking station model	*Total number of supported displays (incl. the notebook display)*	*Max.resolutions supported*	*Dock Connectors*	*Technical limitations*
HP UltraSlim Docking Station	**3**	**Dual 2.5K @ 60Hz**	**2xDP, 1xVGA**	**Dual 2.5k only with both displays into DP**
HP Thunderbolt Dock G2	**3**	**Dual 4K @ 60Hz**	**2xDP, 1xVGA, 1xTB, 1xUSB-C alt-mode**	**Dual 4k only with one display in to DP and + TB port or USB-C alt mode + TB port**
HP Elite USB-C Dock G4	**3**	**Dual 2K @ 60Hz Single 4K @ 60Hz (3840 x 1440)**	**1xHDMI, 2xDP**	
HP USB-C Universal Dock	**3**	**Dual 4K @ 60Hz Single 5K @ 60Hz**	**2xDP**	
HP USB-C Travel Dock	**2**	**Single 2K @ 60Hz**	**1xHDMI, 1xVGA**	**Single external display Only HDMI or VGA at the time**
HP USB-C Mini Dock	**2**	**Single 4K @ 30Hz**	**1xHDMI, 1xVGA**	**Single external display Only HDMI or VGA at the time**

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

Features

STORAGE AND DRIVES

Primary M.2 Storage
128 GB SATA-3 SS TLC[12]
256 GB PCIe® NVMe™ Value SS TLC[12]
256 GB PCIe® Gen3x4 NVMe™ SS TLC[12]
256 GB SATA-3 TLC Opal 2[12]
256 GB Intel® PCIe® NVMe™ QLC M.2 SSD with 16 GB Intel® Optane™ memory H10[12,13,14]
512 GB PCIe® Gen3x4 NVMe™ SS TLC[12]
512 GB PCIe® Gen3x4 NVMe™ SS TLC Opal 2[12]
512 GB SATA-3 SS TLC FIPS-140-2[12]
512 GB PCIe® Value[12]
512 GB Intel® PCIe® NVMe™ QLC M.2 SSD with 32 GB Intel® Optane™ memory H10 (Memory Planned to be available Q3 2019)[12,13,14]
1 TB PCIe® Gen3 x4 NVMe™ SS TLC[12]
2 TB PCIe® Gen3 x4 NVMe™ SS TLC[12]

12. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.
13. Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system. Requires 8th Gen or higher Intel® Core™ processor, BIOS version with Intel® Optane™ supported, Windows 10 64-bit, and an Intel® Rapid Storage Technology (Intel® RST) driver.
14. Intel® Optane™ memory H10 only for Intel® PCIe® NVMe™ QLC M.2 SSD.

MEMORY

Maximum Memory
64 GB DDR4-2400 SDRAM (2 X 32 GB)[15]

Memory
64 GB DDR4-2400 SDRAM (2 X 32 GB)[15]
32 GB DDR4-2400 SDRAM (2 x 16 GB)[15]
16 GB DDR4-2400 SDRAM (1 x 16 GB)[15]
16 GB DDR4-2400 SDRAM (2 x 8 GB)[15]
8 GB DDR4-2400 SDRAM (1 x 8 GB)[15]
8 GB DDR4-2400 SDRAM (2 x 4 GB)[15]
4 GB DDR4-2400 SDRAM (1 x 4 GB)[15]

Memory Slots
2 SODIMM
Both slots are customer accessible / upgradeable
DDR4 SODIMMS, system runs at 2400
Supports Dual Channel Memory

15. 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

Features

WLAN
Intel® Dual Band Wireless-AC 9560 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 5 Combo, vPro™[16]
Intel® Dual Band Wireless-AC 9560 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 5 Combo, non-vPro™[16]
Intel® Wi-Fi 6 AX200 802.11a/b/g/n/ac/ax (2x2) and Bluetooth® 5 Combo, vPro™[17]
Intel® Wi-Fi 6 AX200 802.11a/b/g/n/ac/ax (2x2) Bluetooth® 5 Combo, non-vPro™[17]

WWAN
Intel® XMM™ 7262 LTE-Advanced Cat 6[18]
Intel® XMM™ 7360 LTE-Advanced Cat 9[18]
Intel® XMM™ 7560 LTE-Advanced Pro Cat 16[19]
NFC
NXP NPC300 Near Field Communication Module

Miracast
Native Miracast Support[20]

Ethernet
Intel® I219-LM 10/100/1000 GbE, vPro™[21]
Intel® I219-V 10/100/1000 GbE, non-vPro™[21]

16. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.
17. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices.
18. WWAN module is an optional feature, requires factory configuration and requires separately purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.
19. Gigabit class Category 16 4G LTE module is optional and must be configured at the factory. Module designed for up to 1 Gbps download speeds as carriers deploy 5 carrier aggregation and 100Mhz channel bandwidth, requires activation and separately purchased service contract. Backwards compatible to HSPA 3G technologies. Check with service provider for coverage and availability in your area. Connection, upload and download speeds will vary due to network, location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.
20. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.
21. The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

AUDIO/MULTIMEDIA

Audio
Audio by Bang & Olufsen
Integrated 3 Multi Array Microphone
2 Integrated stereo speakers

Camera
720p HD camera[7,8]
720p HD IR camera[7,8]

Sensors
Ambient light sensor (Select models only)

Features

7. HD content required to view HD images.
8. Sold separately or as an optional feature.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard
HP Premium Collaboration Keyboard with Numeric Keypad, spill resistant with drain
Backlit keyboard available as an option

Pointing Device
Clickpad with multi-touch gestures enabled, taps enabled as default
Microsoft Precision Touchpad Default Gestures Support

Function Keys
F1 - Display Switching
F2 - Blank or Privacy
F3 - Brightness Down
F4 - Brightness Up
F5 - Audio Mute
F6 - Volume Down
F7 - Volume Up
F8 - Mic Mute
F9 - Blank or Backlit Toggle
F10 - numlk
F11 - Wireless
F12 - Calendar
Share/Present
Call Answer
Call End

Hidden Function Keys
Fn+R - Break
Fn+S - Sys Rq
Fn+C - Scroll Lock
Fn+E - Insert
Fn+W - Pause

Features

SOFTWARE AND SECURITY

Preinstalled Software

BIOS

HP BIOSphere Gen5[22]
HP Drive Lock & Automatic Drive Lock[23]
BIOS Update via Network
Master Boot Record Security
Power On Authentication
Secure Erase[24]
Absolute Persistence Module[25]
Pre-boot Authentication

Software

HP Native Miracast Support[26]
HP Connection Optimizer
HP Image Assistant
HP Hotkey Support
HP JumpStart
HP Support Assistant[27]
HP Noise Cancellation Software
Buy Office (sold separately)

Manageability Features

HP Driver Packs[28]
HP System Software Manager (SSM)
HP BIOS Config Utility (BCU)
HP Client Catalog
HP Manageability Integration Kit Gen3[29]
Ivanti Management Suite
HP Cloud Recovery[30]

Client Security Software

HP Client Security Manager Gen5[31]
HP Fingerprint Sensor[32]
HP Power On Authentication
Windows Defender[33]

Security Management

Pre-boot Authentication
TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)
Power-on password (via BIOS)
Setup password (via BIOS)
Support for chassis padlocks and cable lock devices
HP Sure Click[34]
HP Sure Start Gen5[35]
HP Sure Run Gen2[36]
HP Sure Recover Gen2[37]
HP Sure Sense[38]

TPM

Model: Infineon SLB9670
Version: 7.85

Features

Revision: TPM 2.0
FIPS 140-2 Compliant: Yes

Smartcard Reader
Model number: Alcor AU9560
FIPS 201 Compliant: Yes

IPv6 Certification:
Yes

MD5 Hash: **Please follow the instructions below to access MD5 Hash.**

Log-on to http://hp.com/support, enter your product name, select

software and drivers, select OS, select driver. After selecting the driver,

click on "Associated files" and then click on "Download". When opening the file, under "Purpose" you should see the appropriate "SOFTPAQ MD5:" Field

Graphics (Intel Video Driver): TBD
WWAN: TBD
WLAN: TBD

Is the BIOS on this notebook ISO/IEC 19678:2015 (formerly NIST 800-147) compliant?:
Yes
UEFI version: 2.6

22. HP BIOSphere Gen5 is available on select HP Pro and Elite PCs. See product specifications for details. Features may vary depending on the platform and configurations
23. HP Drive Lock & Automatic Drive Lock is not supported on NVMe drives
24. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.
25. Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: http://www.absolute.com/company/legal/agreements/ computrace-agreement. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.
26. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.
27. HP Support Assistant requires Windows and Internet access.
28. HP Driver Packs not preinstalled, however available for download at http://www.hp.com/go/clientmanagement.
29. HP Manageability Integration Kit can be downloaded from http://www.hp.com/go/clientmanagement.
30. HP Cloud Recovery is available for HP Elite and Pro desktops and laptops PCs with Intel® or AMD processors and requires an open, wired network connection. Note: You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Detail please refer to: https://support.hp.com/us-en/document/c05115630
31. HP Client Security Manager Gen5 requires Windows and is available on the select HP Pro and Elite PCs. See product specifications for details.
32. HP Fingerprint Sensor sold separately or as an optional feature.
33. Windows Defender Opt in and internet connection required for updates.
34. HP Sure Click is available on select HP platforms and supports Microsoft Internet Explorer, Google Chrome™, and Chromium™. Supported attachments include Microsoft Office (Word, Excel, PowerPoint) and PDF files in read only mode, when Microsoft Office or Adobe Acrobat are installed.

Features

35. HP Sure Start Gen5 is available on select HP PCs with Intel processors. See product specifications for availability.
36. HP Sure Run Gen2: See product specifications for availability.
37. HP Sure Recover Gen2: See product specifications for availability. Requires an open, wired network connection. Not available on platforms with multiple internal storage drives. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. HP Sure Recover (Gen1) does not support platforms with Intel® Optane™.
38. HP Sure Sense requires Windows 10. See product specifications for availability.

POWER

Power Supply

HP Smart 45 W External AC power adapter[39]
HP Smart 45 W External AC power adapter, 2-prong (Japan only)[39]
HP Smart 65 W External AC power adapter[39]
HP Smart 65 W EM External AC power adapter[39]
45 W USB Type-C™ adapter[39]
65 W USB Type-C™ adapter[39]

Primary Battery

HP Long Life 3-cell, 56 Wh Li-ion[40]
Supports HP Fast Charge (Up to 50% in 30 minutes with 65W AC Adaptor)[41]

Battery Life

UMA graphics: Up to 15 hours (Intel® 8th generation CPU and 3-cell 56 WHr battery)[42]

Power Cord

2-wire plug - 1.0m (Japan only)[39]
3-wire plug - 1.0m[39]
3-wire plug - 1.8m[39]
Duckhead power cord - 1.0m[39]
Duckhead power cord - 1.8m[39]

Battery Weight

0.22 kg (0.48 lb)

39. Availability may vary by country.
40. Battery is internal and not replaceable by customer. Serviceable by warranty.
41. Recharges the battery up to 50% within 30 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 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.
42. 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 3.94 lb (non-touch); Starting at 4.16 lb (touch)[43]
Starting at 1.78 kg (non-touch); Starting at 1.89 kg (touch)[43]

Product Dimensions (w x d x h)

Non-Touch

14.6 x 9.91 x 0.72 in

Features

37 x 25.17 x 1.82 cm
Touch
14.6 x 9.91 x 0.73 in
37 x 25.17 x 1.86 cm

43. Weight will vary by configuration.

PORTS/SLOTS

Ports

1 Thunderbolt™ (USB Type-C™ connector)
2 USB 3.2 Gen 1 (1 charging)
1 HDMI 1.4b[10]
1 RJ-45
1 docking connector
1 headphone/microphone combo
1 AC power
Standard Security Lock Slot (Lock sold separately)

10. 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.[44]

44. 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*	**19V**
	Average Operating Power	**Win 10**
	Integrated Graphics	**6.78W**
	Discrete Graphics	**13 W**
	Max Operating Power	**Discrete < 65W** **UMA < 45W**
Temperature	*Operating*	**32° to 95° F (0° to 35° C)**
	Non-operating	**-4° to 140° F (-20° to 60° C)**
Relative Humidity	*Operating*	**10% to 90%, non-condensing**
	Non-operating	**5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature**
Shock	*Operating*	**40 G, 2 ms, half-sine**
	Non-operating	**200 G, 2 ms, half-sine**
Random Vibration	*Operating*	**0.75 grms**
	Non-operating	**1.50 grms**
Altitude (unpressurized)	*Operating*	**-50 to 10,000 ft (-15.24 to 3,048 m)**
	Non-operating	**-50 to 40,000 ft (-15.24 to 12,192 m)**
Planned Industry Standard Certifications	*UL*	**Yes**
	CSA	**Yes**
	FCC Compliance	**Yes**
	ENERGY STAR®	**Select models[45]**
	EPEAT® 2019	**Yes, Silver in U.S.[46]**
	ICES	**Yes**
	Australia / 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**

45. Configurations of the HP Elitebook 850 G6 that are ENERGY STAR® qualified are identified as HP Elitebook 850 G6 ENERGY STAR on HP websites and on http://www.energystar.gov.
46. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit http://www.epeat.net for more information.

Technical Specifications

ENVIRONMENTAL & INDUSTRY

Eco-Label Certifications & declarations	**This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:** **• IT ECO declaration** **•US ENERGY STAR®** **• EPEAT® Silver registered in the United States. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit http://www.epeat.net for more information.**		
System Configuration	**The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a Typically Configured Notebook.**		
Energy Consumption (in accordance with US ENERGY STAR® test method)	*115VAC, 60Hz*	*230VAC, 50Hz*	*100VAC, 60Hz*
Normal Operation (Short idle)	**7.52 W**	**7.36 W**	**7.56 W**
Normal Operation (Long idle)	**4.20 W**	**4.04 W**	**3.91 W**
Sleep	**0.92 W**	**0.95 W**	**0.94 W**
Off	**0.41 W**	**0.42 W**	**0.42 W**
	NOTE: **Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.**		
*Heat Dissipation**	*115VAC, 60Hz*	*230VAC, 50Hz*	*100VAC, 50Hz*
Normal Operation (Short idle)	**26 BTU/hr**	**25 BTU/hr**	**26 BTU/hr**
Normal Operation (Long idle)	**14 BTU/hr**	**14 BTU/hr**	**13 BTU/hr**
Sleep	**3 BTU/hr**	**3 BTU/hr**	**3 BTU/hr**
Off	**1 BTU/hr**	**1 BTU/hr**	**1 BTU/hr**
	NOTE: **Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.**		

Technical Specifications

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	**Sound Power (L_{WAd}, bels)**		**Sound Pressure (L_{pAm}, decibels)**
Typically Configured – Idle	**2.5**		**14**
Fixed Disk – Random writes	**2.5**		**14**
Longevity and Upgrading	**This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:** **• 3 USB ports** **• 1 PC card slot (type I/II)** **• 1 ExpressCard/54 slot** **• 1 IEEE 1394 Port** **• 2 SODIMM memory slots** **• Optional expansion base docking station** **• 1 multi-bay II storage port** **• Interchangeable HDD** **Spare parts are available throughout the warranty period and or for up to "5" years after the end of production.**		
Batteries	**This battery(s) in this product comply with EU Directive 2006/66/EC** **Batteries used in the product do not contain:** **Mercury greater the1ppm by weight** **Cadmium greater than 20ppm by weight** **Battery size: CR2032 (coin cell)** **Battery type: Lithium**		
Additional Information	**• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.** **• This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.** **• This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).** **• This product is in compliance with the IEEE 1680.1 (EPEAT) standard at the <Silver> level in the U.S. See http://www.epeat.net for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at http://www.hp.com/go/options** **• Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.** **• This product contains 0% post-consumer recycled plastic (by wt.)** **• This product is 95.1% recycle-able when properly disposed of at end of life.**		
Packaging Materials	*External:*	**PAPER/Corrugated**	**345 g**
	Internal:	**PLASTIC/Polypropylene - PP**	**4 g**
		PLASTIC/Polyethylene Expanded - EPE	**76 g**
		PLASTIC/Polyethylene low density - LDPE	**15 g**
Material Usage	**This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf):** **• Asbestos**		

Technical Specifications

	• Certain Azo Colorants • Certain Brominated Flame Retardants – may not be used as flame retardants in plastics • Cadmium • Chlorinated Hydrocarbons • Chlorinated Paraffins • Formaldehyde • Halogenated Diphenyl Methanes • Lead carbonates and sulfates • Lead and Lead compounds • Mercuric Oxide Batteries • Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user. • Ozone Depleting Substances • Polybrominated Biphenyls (PBBs) • Polybrominated Biphenyl Ethers (PBBEs) • Polybrominated Biphenyl Oxides (PBBOs) • Polychlorinated Biphenyl (PCB) • Polychlorinated Terphenyls (PCT) • Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications. • Radioactive Substances • Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)
Packaging Usage	This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf): • Asbestos • Certain Azo Colorants • Certain Brominated Flame Retardants – may not be used as flame retardants in plastics • Cadmium • Chlorinated Hydrocarbons • Chlorinated Paraffins • Formaldehyde • Halogenated Diphenyl Methanes • Lead carbonates and sulfates • Lead and Lead compounds • Mercuric Oxide Batteries • Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user. • Ozone Depleting Substances • Polybrominated Biphenyls (PBBs) • Polybrominated Biphenyl Ethers (PBBEs) • Polybrominated Biphenyl Oxides (PBBOs) • Polychlorinated Biphenyl (PCB) • Polychlorinated Terphenyls (PCT) • Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications. • Radioactive Substances • Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Technical Specifications

End-of-life Management and Recycling	**HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.** **The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.** **Global Citizenship Report** **http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html** **Eco-label certifications** **http://www8.hp.com/us/en/hp-information/environment/ecolabels.html** **ISO 14001 certificates:** **http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf** **and** **http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf**

DISPLAYS

Panel LCD 15.6 inch diagonal FHD (1920 x 1080) Anti-Glare WLED UWVA 45 percent cg 250 nits eDP slim

Outline Dimensions (W x H)	**350.96 x 216.65 mm (max)**
Active Area	**344.16 x 193.59 mm (typ.)**
Weight	**370 g (max)**
Diagonal Size	**15.6 inch**
Thickness	**3.2 mm (max)**
Interface	**eDP 1.2 (2 lane)**
Surface Treatment	**Anti-Glare**
Touch Enabled	**No**
Contrast Ratio	**600:1 (typ.)**
Refresh Rate	**60 Hz**
Brightness	**250 nits**
Pixel Resolution	**1920 x 1080 (FHD)**
Format of LCD Pixel Arrangement	**RGB**
Backlight	**LED**
Color Gamut Coverage	**45% of NTSC**
Color Depth	**6 bits**
Viewing Angle	**UWVA 85/85/85/85**

Technical Specifications

Panel LCD 15.6 inch diagonal FHD (1920 x 1080) Anti-Glare WLED UWVA 45 percent cg 250 nits eDP slim On-cell touch	*Outline Dimensions (W x H)*	**350.96 x 216.75 mm (max)**
	Active Area	**344.16 x 193.59 mm (typ.)**
	Weight	**385 g (max)**
	Diagonal Size	**15.6 inch**
	Thickness	**3.2 mm (panel side) / 3.4 mm (PCBA Side) (max)**
	Interface	**eDP 1.2**
	Surface Treatment	**Anti-Glare On-cell**
	Touch Enabled	**Yes**
	Contrast Ratio	**600:1 (typ.)**
	Refresh Rate	**60 Hz**
	Brightness	**250 nits**
	Pixel Resolution	**1920 x 1080 (FHD)**
	Format of LCD Pixel Arrangement	**RGB**
	Backlight	**LED**
	Color Gamut Coverage	**45% of NTSC**
	Color Depth	**6 bits**
	Viewing Angle	**UWVA 85/85/85/85**
Panel LCD 15.6 inch diagonal FHD (1920 x 1080) Anti-Glare WLED UWVA 72 percent cg 400 nits eDP 1.3 + PSR slim	*Outline Dimensions (W x H)*	**350.96 x 216.75 mm (max)**
	Active Area	**344.16 x 193.59 mm (typ.)**
	Weight	**370 g (max)**
	Diagonal Size	**15.6 inch**
	Thickness	**3.2 mm (max)**
	Interface	**eDP 1.3 + PSR (2 lane)**
	Surface Treatment	**Anti-Glare**
	Touch Enabled	**No**
	Contrast Ratio	**600:1 (typ.)**
	Refresh Rate	**60 Hz**
	Brightness	**400 nits**
	Pixel Resolution	**1920 x 1080 (FHD)**
	Format of LCD Pixel Arrangement	**RGB**
	Backlight	**LED**
	Color Gamut Coverage	**72% of NTSC**
	Color Depth	**6 bits (Hi FRC supportive w/ condition to enable)**
	Viewing Angle	**UWVA 85/85/85/85**
	Outline Dimensions (W x H)	**350.96 x 216.95 mm (max)**

Technical Specifications

Panel LCD 15.6 inch diagonal UHD (3840 x 2160) Anti-Glare WLED UWVA 72 percent cg 400 nits eDP 1.3+PSR Ultraslim	*Active Area*	**344.2176 x 193.6224 mm (typ.)**
	Weight	**320 g (max)**
	Diagonal Size	**15.6 inch**
	Thickness	**2.6 mm (max)**
	Interface	**eDP 1.3 + PSR (4 lane/5.4Gbps), (MBO Support)**
	Surface Treatment	**Anti-Glare**
	Touch Enabled	**No**
	Contrast Ratio	**1200:1 (typ.)**
	Refresh Rate	**60 Hz**
	Brightness	**400 nits**
	Pixel Resolution	**3840 x 2160 (UHD)**
	Format of LCD Pixel Arrangement	**RGB**
	Backlight	**LED**
	Color Gamut Coverage	**72% of NTSC**
	Color Depth	**8 bits (Hi FRC supportive w/ condition to enable)**
	Viewing Angle	**UWVA 85/85/85/85**

Panel LCD 15.6 inch diagonal FHD (1920 x 1080) Anti-Glare WLED UWVA 72 percent cg 1000 nits eDP 1.4+PSR2 flat Privacy	*Outline Dimensions (W x H)*	**349.52 x 204.79 mm (max)**
	Active Area	**344.16 x 193.59 mm (typ.)**
	Weight	**350 g (max)**
	Diagonal Size	**15.6 inch**
	Thickness	**2.6 mm (max)**
	Interface	**eDP 1.4 + PSR2 (4 lane)**
	Surface Treatment	**Anti-Glare**
	Touch Enabled	**No**
	Contrast Ratio	**2000:1 (typ.)**
	Refresh Rate	**60 Hz**
	*Brightness**	**1000 nits**
	Pixel Resolution	**1920 x 1080 (FHD)**
	Format of LCD Pixel Arrangement	**RGB**
	Backlight	**LED**
	Color Gamut Coverage	**72% of NTSC**
	Color Depth	**8 bits**
	Viewing Angle	**UWVA 85/85/85/85**

***Touch-enabled display and Sure View privacy panel will lower actual brightness**

Technical Specifications

STORAGE[1]

SSD 128 GB 2280 M2 SATA-3 TLC	*Form Factor*	**M.2 2280**
	Capacity	**128 GB**
	NAND Type	**TLC**
	Height	**0.09 in (2.3 mm)**
	Width	**0.87 in (22 mm)**
	Weight	**0.02 lb (10 g)**
	Interface	**ATA-8, SATA 3.0**
	Maximum Sequential Read	**Around 540 ~ 560 MB/s**
	Maximum Sequential Write	**Around 380 ~ 530 MB/s**
	Logical Blocks	**250,069,680**
	Operating Temperature	**32° to 158°F (0° to 70°C) [ambient temp]**
	Features	**ATA Security; DIPM; TRIM; DEVSLP**
SSD 1 TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided	*Form Factor*	**M.2 2280**
	Capacity	**1 TB**
	NAND Type	**TLC**
	Height	**0.09 in (2.3 mm)**
	Width	**0.87 in (22 mm)**
	Weight	**0.02 lb (10 g)**
	Interface	**PCIe NVMe Gen3X4**
	Maximum Sequential Read	**Around 3200 ~ 3480 MB/s**
	Maximum Sequential Write	**Around 2400 ~ 3037 MB/s**
	Logical Blocks	**2,000,409,264**
	Operating Temperature	**32° to 158°F (0° to 70°C) [ambient temp]**
	Features	**ATA Security; TRIM; L1.2**
SSD 256 GB 2280 M2 PCIe-3x4 SS NVMe TLC	*Form Factor*	**M.2 2280**
	Capacity	**256 GB**
	NAND Type	**TLC**
	Height	**0.09 in (2.3 mm)**
	Width	**0.87 in (22 mm)**
	Weight	**0.02 lb (10 g)**
	Interface	**PCIe NVMe Gen3X4**
	Maximum Sequential Read	**Around 2900 ~ 3167 MB/s**
	Maximum Sequential Write	**Around 1300 ~ 1663 MB/s**
	Logical Blocks	**500,118,192**
	Operating Temperature	**32° to 158°F (0° to 70°C) [ambient temp]**

Technical Specifications

	Features	**ATA Security; TRIM; L1.2**
SSD 256 GB 2280 M2 SATA-3 Self Encrypted OPAL2 Three Layer Cell	*Form Factor*	**M.2 2280**
	Capacity	**256 GB**
	NAND Type	**TLC**
	Height	**0.09 in (2.3 mm)**
	Width	**0.87 in (22 mm)**
	Weight	**0.02 lb (10 g)**
	Interface	**ATA-8, SATA 3.0**
	Maximum Sequential Read	**Around 530 ~ 560 MB/s**
	Maximum Sequential Write	**Around 500 ~ 530 MB/s**
	Logical Blocks	**500,118,192**
	Operating Temperature	**32° to 158°F (0° to 70°C) [ambient temp]**
	Features	**ATA Security; TCG OPAL 2.0; DIPM; TRIM; DEVSLP**
SSD 256 GB 2280 PCIe NVMe Value	*Form Factor*	**M.2 2280**
	Capacity	**256 GB**
	NAND Type	**TLC**
	Height	**0.09 in (2.3 mm)**
	Width	**0.87 in (22 mm)**
	Weight	**0.02 lb (10 g)**
	Interface	**PCIe NVMe Gen3X4**
	Maximum Sequential Read	**Around 1500 ~ 1700 MB/s**
	Maximum Sequential Write	**Around 780 ~ 1300 MB/s**
	Logical Blocks	**500,118,192**
	Operating Temperature	**32° to 158°F (0° to 70°C) [ambient temp]**
	Features	**ATA Security; TRIM; L1.2**

Technical Specifications

2 TB 2280 PCIe-3x4 NVMe Three Layer Cell single-sided	*Form Factor*	**M.2 2280**
	Capacity	**2 TB**
	NAND Type	**TLC**
	Height	**0.09 in (2.3 mm)**
	Width	**0.87 in (22 mm)**
	Weight	**0.02 lb (10 g)**
	Interface	**PCIe NVMe Gen3X4**
	Maximum Sequential Read	**Around 2900 ~ 3000 MB/s**
	Maximum Sequential Write	**Around 2100 MB/s**
	Logical Blocks	**3,907,029,168**
	Operating Temperature	**32° to 158°F (0° to 70°C) [ambient temp]**
	Features	**ATA Security; TRIM; L1.2**

SSD 512 GB 2280 M2 PCIe-3x4 SS NVMe TLC	*Form Factor*	**M.2 2280**
	Capacity	**512 GB**
	NAND Type	**TLC**
	Height	**0.09 in (2.3 mm)**
	Width	**0.87 in (22 mm)**
	Weight	**0.02 lb (10 g)**
	Interface	**PCIe NVMe Gen3X4**
	Maximum Sequential Read	**Around 2700 ~ 3400 MB/s**
	Maximum Sequential Write	**Around 1390 ~ 2956 MB/s**
	Logical Blocks	**1,000,215,215**
	Operating Temperature	**32° to 158°F (0° to 70°C) [ambient temp]**
	Features	**ATA Security; TRIM; L1.2**

SSD 512 GB 2280 M2 SATA-3 Three Layer Cell Federal Information Processing Standard	*Form Factor*	**M.2 2280**
	Capacity	**512 GB**
	NAND Type	**TLC**
	Height	**2.6 mm Max**
	Width	**0.87 in (22 mm)**
	Weight	**0.02 lb (10 g)**
	Interface	**ACS-3, SATA 3.2**
	Maximum Sequential Read	**Around 530 MB/s**
	Maximum Sequential Write	**Around 400 MB/s**
	Logical Blocks	**1,000,215,216**
	Operating Temperature	**32° to 158°F (0° to 70°C) [ambient temp]**

Technical Specifications

	Features	**ATA Security; TCG Opal 2.0; FIPS; DIPM; TRIM; DEVSLP**
SSD 512 GB 2280 PCIe NVMe Value	*Form Factor*	**M.2 2280**
	Capacity	**512 GB**
	NAND Type	**TLC/QLC**
	Height	**0.09 in (2.3 mm)**
	Width	**0.87 in (22 mm)**
	Weight	**0.02 lb (10 g)**
	Interface	**PCIe NVMe Gen3X4**
	Maximum Sequential Read	**Around 1500 ~ 1700 MB/s**
	Maximum Sequential Write	**Around 860 ~ 1500 MB/s**
	Logical Blocks	**1,000,215,215**
	Operating Temperature	**32° to 158°F (0° to 70°C) [ambient temp]**
	Features	**ATA Security; TRIM; L1.2**
SSD 512 GB 2280 PCIe-3x4 NVMe Self Encrypted OPAL2 Three Layer Cell	*Form Factor*	**M.2 2280**
	Capacity	**512 GB**
	NAND Type	**TLC**
	Height	**0.09 in (2.3 mm)**
	Width	**0.87 in (22 mm)**
	Weight	**0.02 lb (10 g)**
	Interface	**PCIe NVMe Gen3X4**
	Maximum Sequential Read	**Around 2900 ~ 3400 MB/s**
	Maximum Sequential Write	**Around 1000 ~ 2500 MB/s**
	Logical Blocks	**1,000,215,216**
	Operating Temperature	**32° to 158°F (0° to 70°C) [ambient temp]**
	Features	**ATA Security; TCG Opal 2.0; FIPS; DIPM; TRIM; DEVSLP**

Technical Specifications

NETWORKING/COMMUNICATIONS

Intel® 9560 802.11a/b/g/n/ac (2 x 2) Wi-Fi® and Bluetooth® 5.0 Combo[1] vPro™	*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, ,80MHz & 160MHz)**
	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	**Ad-hoc (Peer to Peer)**
	Models	**Infrastructure (Access Point Required)**
	Roaming	**IEEE 802.11 compliant roaming between access points**
	Output Power[2]	**• 802.11b: +18.5dBm minimum** **• 802.11g: +17.5dBm minimum** **• 802.11a: +18.5dBm minimum** **• 802.11n HT20(2.4GHz): +15.5dBm minimum** **• 802.11n HT40(2.4GHz): +14.5dBm minimum** **• 802.11n HT20(5GHz): +15.5dBm minimum** **• 802.11n HT40(5GHz): +14.5dBm minimum** **• 802.11ac VHT80(5GHz): +11.5dBm minimum** **• 802.11ac VHT160(5GHz): +11.5dBm minimum**
	Power Consumption	**• Transmit mode 2.0 W** **• Receive mode 1.6 W**

Technical Specifications

	• Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW	
Power Management	**ACPI 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 Half-MiniCard**	
Dimensions	**Type 2230: 2.3 x 22.0 x 30.0 mm**	
Weight	**Type 2230: 2.8 g**	
Operating Voltage	**3.3v +/- 9%**	
Temperature	*Operating* *Non-operating*	**14° to 158° F (–10° to 70° C)** **–40° to 176° F (–40° to 80° C)**
Humidity	*Operating* *Non-operating*	**10% to 90% (non-condensing)** **5% to 95% (non-condensing)**
Altitude	*Operating* *Non-operating*	**0 to 10,000 ft (3,048 m)** **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 4.0/4.1/4.2/5.0 Wireless Technology

Bluetooth Specification	**4.0/4.1/4.2/5.0 Compliant**
Frequency Band	**2402 to 2480 MHz**
Number of Available Channels	**Legacy: 0~79 (1 MHz/CH)** **BLE: 0~39 (2 MHz/CH)**

Technical Specifications

Signaling Data Rate[1]	**Legacy: 3 Mbps signaling data rate[1] 2.17 Mbps** **BLE: 1 Mbps signaling data rate[1] 0.2 Mbps** **1. Actual throughput may vary.** **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.**
Power Consumption	**Peak (Tx) 330 mW** **Peak (Rx) 230 mW** **Selective Suspend 17 mW**
Bluetooth Software Supported	**Microsoft Windows Bluetooth Software**
Power Management	**Microsoft Windows ACPI, and USB Bus Support**
Certifications	**FCC (47 CFR) Part 15C, Section 15.247 & 15.249**
Power Management Certifications	**ETS 300 328, ETS 300 826** **Low Voltage Directive IEC950** **UL, CSA, and CE Mark**
Bluetooth Profiles Supported	**BT4.1-ESR 5/6/7 Compliance** **LE Link Layer Ping** **LE Dual Mode** **LE Link Layer** **LE Low Duty Cycle Directed Advertising** **LE L2CAP Connection Oriented Channels** **Train Nudging & Interlaced Scan** **BT4.2 ESR08 Compliance** **LE Secure Connection- Basic/Full** **LE Privacy 1.2 –Link Layer Privacy** **LE Privacy 1.2 –Extended Scanner Filter Policies** **LE Data Packet Length Extension** **FAX Profile (FAX)** **Basic Imaging Profile (BIP)2** **Headset Profile (HSP)** **Hands Free Profile (HFP)** **Advanced Audio Distribution Profile (A2DP)**
Security & Manageability	**Intel® vPro™ support with appropriate Intel® chipset components**

1. Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices

Technical Specifications

2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. 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).

Intel® 9560 802.11a/b/g/n/ac (2 x 2) Wi-Fi® and Bluetooth® 5.0 Combo[1] non-vPro™	*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,80MHz & 160MHz)**
	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	**Ad-hoc (Peer to Peer)**
	Models	**Infrastructure (Access Point Required)**
	Roaming	**IEEE 802.11 compliant roaming between access points**
	Output Power[2]	**• 802.11b: +18.5dBm minimum** **• 802.11g: +17.5dBm minimum** **• 802.11a: +18.5dBm minimum** **• 802.11n HT20(2.4GHz): +15.5dBm minimum** **• 802.11n HT40(2.4GHz): +14.5dBm minimum** **• 802.11n HT20(5GHz): +15.5dBm minimum**

Technical Specifications

	• 802.11n HT40(5GHz): +14.5dBm minimum • 802.11ac VHT80(5GHz): +11.5dBm minimum • 802.11ac VHT160(5GHz): +11.5dBm minimum	
Power Consumption	• Transmit mode 2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW	
Power Management	ACPI 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 Half-MiniCard	
Dimensions	Type 2230: 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230: 2.8 g	
Operating Voltage	3.3v +/- 9%	
Temperature	*Operating* *Non-operating*	14° to 158° F (–10° to 70° C) –40° to 176° F (–40° to 80° C)
Humidity	*Operating* *Non-operating*	10% to 90% (non-condensing) 5% to 95% (non-condensing)
Altitude	*Operating* *Non-operating*	0 to 10,000 ft (3,048 m) 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 4.0/4.1/4.2/5.0 Wireless Technology

Bluetooth Specification	4.0/4.1/4.2/5.0 Compliant
Frequency Band	2402 to 2480 MHz

Technical Specifications

Number of Available Channels	**Legacy: 0~79 (1 MHz/CH)** **BLE: 0~39 (2 MHz/CH)**
Signaling Data Rate[1]	**Legacy: 3 Mbps signaling data rate[1] 2.17 Mbps** **BLE: 1 Mbps signaling data rate[1] 0.2 Mbps** **1. Actual throughput may vary.** **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.**
Power Consumption	**Peak (Tx) 330 mW** **Peak (Rx) 230 mW** **Selective Suspend 17 mW**
Bluetooth Software Supported	**Microsoft Windows Bluetooth Software**
Power Management	**Microsoft Windows ACPI, and USB Bus Support**
Certifications	**FCC (47 CFR) Part 15C, Section 15.247 & 15.249**
Power Management Certifications	**ETS 300 328, ETS 300 826** **Low Voltage Directive IEC950** **UL, CSA, and CE Mark**
Bluetooth Profiles Supported	**BT4.1-ESR 5/6/7 Compliance** **LE Link Layer Ping** **LE Dual Mode** **LE Link Layer** **LE Low Duty Cycle Directed Advertising** **LE L2CAP Connection Oriented Channels** **Train Nudging & Interlaced Scan** **BT4.2 ESR08 Compliance** **LE Secure Connection- Basic/Full** **LE Privacy 1.2 –Link Layer Privacy** **LE Privacy 1.2 –Extended Scanner Filter Policies** **LE Data Packet Length Extension** **FAX Profile (FAX)** **Basic Imaging Profile (BIP)2** **Headset Profile (HSP)** **Hands Free Profile (HFP)** **Advanced Audio Distribution Profile (A2DP)**

1. Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.

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4. 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).

Intel Wi-Fi® 6 AX200 + BT5 vPro™	*Wireless LAN Standards*	**IEEE 802.11a** **IEEE 802.11b** **IEEE 802.11g** **IEEE 802.11n** **IEEE 802.11ac** **IEEE 802.11ax** **IEEE 802.11d** **IEEE 802.11e** **IEEE 802.11h** **IEEE 802.11i** **IEEE 802.11k** **IEEE 802.11r** **IEEE 802.11v**
	Interoperability	**Wi-Fi® certified**
	Frequency Band	**• 802.11b/g/n/ax** **2.402 – 2.482 GHz** **• 802.11a/n/ac/ax** **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, ,80MHz & 160MHz)** **• 802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)**
	Modulation	**Direct Sequence Spread Spectrum** **OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM**
	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)**

Technical Specifications

Roaming	**IEEE 802.11 compliant roaming between access points**	
Output Power[2]	**• 802.11b: +18.5dBm minimum** **• 802.11g: +17.5dBm minimum** **• 802.11a: +18.5dBm minimum** **• 802.11n HT20(2.4GHz): +15.5dBm minimum** **• 802.11n HT40(2.4GHz): +14.5dBm minimum** **• 802.11n HT20(5GHz): +15.5dBm minimum** **• 802.11n HT40(5GHz): +14.5dBm minimum** **• 802.11ac VHT80(5GHz): +11.5dBm minimum** **• 802.11ac VHT160(5GHz): +11.5dBm minimum** **• 802.11ax HT40(2.4GHz): +10dBm minimum** **• 802.11ax VHT160(5GHz): +10dBm minimum**	
Power Consumption	**• Transmit mode 2.0 W** **• Receive mode 1.6 W** **• Idle mode (PSP) 180 mW (WLAN Associated)** **• Idle mode 50 mW (WLAN unassociated)** **• Connected Standby 10mW** **• Radio disabled 8 mW**	
Power Management	**ACPI 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** **•802.11ax, MCS11(HT40): -59dBm maximum** **•802.11ax, MCS11(VHT160): -58.5dBm 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 Half-MiniCard**	
Dimensions	**1. Type 2230: 2.3 x 22.0 x 30.0 mm** **2. Type 1216: 1.67 x 12.0 x 16.0 mm**	
Weight	**1. Type 2230: 2.8g** **2. Type 126: 1.3g**	
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)**

Technical Specifications

Altitude	*Operating*	**0 to 10,000 ft (3,048 m)**
	Non-operating	**0 to 50,000 ft (15,240 m)**

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 4.0/4.1/4.2/5.0/5.1 Wireless Technology

Bluetooth Specification	**4.0/4.1/4.2/5.0/5.1 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[1]	**Legacy: 3 Mbps signaling data rate[1] 2.17 Mbps** **BLE: 1 Mbps signaling data rate[1] 0.2 Mbps** **1. Actual throughput may vary.** **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.**
Power Consumption	**Peak (Tx) 330 mW** **Peak (Rx) 230 mW** **Selective Suspend 17 mW**
Bluetooth Software Supported	**Microsoft Windows Bluetooth Software**
Power Management	**Microsoft Windows ACPI, and USB Bus Support**
Certifications	**FCC (47 CFR) Part 15C, Section 15.247 & 15.249**
Power Management Certifications	**ETS 300 328, ETS 300 826** **Low Voltage Directive IEC950** **UL, CSA, and CE Mark**
Bluetooth Profiles Supported	**BT4.1-ESR 5/6/7 Compliance** **LE Link Layer Ping** **LE Dual Mode** **LE Link Layer** **LE Low Duty Cycle Directed Advertising** **LE L2CAP Connection Oriented Channels** **Train Nudging & Interlaced Scan** **BT4.2 ESR08 Compliance** **LE Secure Connection- Basic/Full** **LE Privacy 1.2 –Link Layer Privacy** **LE Privacy 1.2 –Extended Scanner Filter Policies** **LE Data Packet Length Extension** **FAX Profile (FAX)** **Basic Imaging Profile (BIP)2**

Technical Specifications

		Headset Profile (HSP) **Hands Free Profile (HFP)** **Advanced Audio Distribution Profile (A2DP)**
	Security & Manageability	**Intel® vPro™ support with appropriate Intel® chipset components**

1. Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. 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).

Intel Wi-Fi® 6 AX200 + BT5 non-vPro™	*Wireless LAN Standards*	**IEEE 802.11a** **IEEE 802.11b** **IEEE 802.11g** **IEEE 802.11n** **IEEE 802.11ac** **IEEE 802.11ax** **IEEE 802.11d** **IEEE 802.11e** **IEEE 802.11h** **IEEE 802.11i** **IEEE 802.11k** **IEEE 802.11r** **IEEE 802.11v**
	Interoperability	**Wi-Fi® certified**
	Frequency Band	**• 802.11b/g/n/ax** **2.402 – 2.482 GHz** **• 802.11a/n/ac/ax** **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, ,80MHz & 160MHz)** **• 802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)**
	Modulation	**Direct Sequence Spread Spectrum**

Technical Specifications

	OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
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	**Ad-hoc (Peer to Peer)**
Models	**Infrastructure (Access Point Required)**
Roaming	**IEEE 802.11 compliant roaming between access points**
Output Power[2]	**• 802.11b: +18.5dBm minimum** **• 802.11g: +17.5dBm minimum** **• 802.11a: +18.5dBm minimum** **• 802.11n HT20(2.4GHz): +15.5dBm minimum** **• 802.11n HT40(2.4GHz): +14.5dBm minimum** **• 802.11n HT20(5GHz): +15.5dBm minimum** **• 802.11n HT40(5GHz): +14.5dBm minimum** **• 802.11ac VHT80(5GHz): +11.5dBm minimum** **• 802.11ac VHT160(5GHz): +11.5dBm minimum** **• 802.11ax HT40(2.4GHz): +10dBm minimum** **• 802.11ax VHT160(5GHz): +10dBm minimum**
Power Consumption	**• Transmit mode 2.0 W** **• Receive mode 1.6 W** **• Idle mode (PSP) 180 mW (WLAN Associated)** **• Idle mode 50 mW (WLAN unassociated)** **• Connected Standby 10mW** **• Radio disabled 8 mW**
Power Management	**ACPI 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** **•802.11ax, MCS11(HT40): -59dBm maximum** **•802.11ax, MCS11(VHT160): -58.5dBm 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 Half-MiniCard**

Technical Specifications

Dimensions	**1. Type 2230: 2.3 x 22.0 x 30.0 mm** **2. Type 1216: 1.67 x 12.0 x 16.0 mm**	
Weight	**1. Type 2230: 2.8g** **2. Type 126: 1.3g**	
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)**

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 4.0/4.1/4.2/5.0/5.1 Wireless Technology

Bluetooth Specification	**4.0/4.1/4.2/5.0/5.1 Compliant**
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Signaling Data Rate[1]	**Legacy: 3 Mbps signaling data rate[1] 2.17 Mbps** **BLE: 1 Mbps signaling data rate[1] 0.2 Mbps** **1. Actual throughput may vary.** **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.**
Power Consumption	**Peak (Tx) 330 mW** **Peak (Rx) 230 mW** **Selective Suspend 17 mW**
Bluetooth Software Supported	**Microsoft Windows Bluetooth Software**
Power Management	**Microsoft Windows ACPI, and USB Bus Support**
Certifications	**FCC (47 CFR) Part 15C, Section 15.247 & 15.249**
Power Management Certifications	**ETS 300 328, ETS 300 826** **Low Voltage Directive IEC950** **UL, CSA, and CE Mark**
Bluetooth Profiles Supported	**BT4.1-ESR 5/6/7 Compliance** **LE Link Layer Ping** **LE Dual Mode** **LE Link Layer**

Technical Specifications

		LE Low Duty Cycle Directed Advertising **LE L2CAP Connection Oriented Channels** **Train Nudging & Interlaced Scan** **BT4.2 ESR08 Compliance** **LE Secure Connection- Basic/Full** **LE Privacy 1.2 –Link Layer Privacy** **LE Privacy 1.2 –Extended Scanner Filter Policies** **LE Data Packet Length Extension** **FAX Profile (FAX)** **Basic Imaging Profile (BIP)2** **Headset Profile (HSP)** **Hands Free Profile (HFP)** **Advanced Audio Distribution Profile (A2DP)**

1. Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. 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).

Intel® XMM™ 7360 LTE-Advanced CAT9[1]	*Technology/Operating bands*	**FDD LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700/2100 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 1400 (Band 11), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 17 lower), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1400 (Band 21), 850 (Band 26), 700 (Band 28), 700 (Band 29 RX only), 2300 (Band 30), 1700/2100 (Band 66).** **TDD LTE: 2600 (Band 38), 1900 (Band 39), 2400 (Band 40), 2500 (Band 41).** **HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz**
	Wireless protocol standards	**3GPP Release 11 LTE Specification CAT.9, DL 60MHz BW throughput up to 450Mbps; UL 20MHz throughput up to 50Mbps** **WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification**
	GPS	**Standalone, A-GPS (MS-A, MS-B)**
	GPS bands	**1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 MHz**
	Maximum data rates	**LTE: 450 Mbps (Download), 50 Mbps (Upload)** **DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)** **HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)**

Technical Specifications

	Maximum output power	**LTE: 23 dBm** **HSPA+: 23.5 dBm**
	Maximum power consumption	**LTE: 1,200 mA (peak); 900 mA (average)** **HSPA+: 1,100 mA (peak); 800 mA (average)**
	Form Factor	**M.2, 3042-S3 Key B**
	Weight	**5.8 g**
	Dimensions (Length x Width x Thickness)	**42 x 30 x 2.3 mm**

1. Mobile Broadband is an optional feature. Connection requires wireless data service contract, network support, and is not available in all areas. Contact service provider to determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products or in all countries.

Intel ® XMM 7262 LTE-Advanced Cat 6[1]	*Technology/Operating bands*	**FDD LTE: 2100 (Band 1), 1800 (Band 3), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 800 (Band 20), 700 (Band 28),** **HSPA+: 2100 (Band 1), 850 (Band 5), 900 (Band 8)**
	Wireless protocol standards	**3GPP Release 11 LTE Specification CAT.6, DL 40MHz BW throughput up to 300Mbps; UL 20MHz throughput up to 50Mbps** **WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification**
	GPS	**Standalone, A-GPS (MS-A, MS-B and XTRA)**
	GPS bands	**1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz**
	Maximum data rates	**LTE: 300 Mbps (Download), 50 Mbps (Upload)** **DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)** **UMT: 384 kbps (Download), 384 kbps (Upload)**
	Maximum output power	**LTE: 23 dBm** **HSPA+: 23.5 dBm**
	Maximum power consumption	**LTE: 1,200 mA (peak); 900 mA (average)** **HSPA+: 1,100 mA (peak); 800 mA (average)**
	Form Factor	**M.2, 3042-S3 Key B**
	Weight	**6 g**
	Dimensions (Length x Width x Thickness)	**42 x 30 x 2.3 mm**

Technical Specifications

1. Mobile Broadband is an optional feature. Connection requires wireless data service contract, network support, and is not available in all areas. Contact service provider to determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products or in all countries.

Technical Specifications

Intel® XMM™ 7560 LTE-Advanced Pro (CAT16)	*Technology/Operating bands*	**FDD LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700/2100 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 14 upper), 700 (Band 17 lower), 850 (Band 18 lower), 850 (Band 19 upper), 800 (Band 20), 1900 (Band 25), 850 (Band 26), 700 (Band 28), 700 (Band 29 RX only), 2300 (Band 30), 1700/2100 (Band 66).** **TDD LTE: 2600 (Band 38), 1900 (Band 39), 2400 (Band 40), 2500 (Band 41), 3500 (Band 42), 5200 (Band 46 RX only)** **HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MH**
	Wireless protocol standards	**3GPP Release 12 LTE Specification DL-CAT.16, DL 100MHz BW throughput up to 978Mbps; UL-CAT.13 40MHz throughput up to 150Mbps** **WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification**
	GPS	**Standalone, A-GPS (MS-B and LTO)**
	GPS bands	**GPS 1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz, Beidou 1561.098 ± 2.046 MHz**
	Maximum data rates	**LTE: 978 Mbps (Download), 150 Mbps (Upload)** **DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)** **HSPA+: 21Mbps (Download), 5.76 Mbps (Upload)**
	Maximum output power	**LTE: 23 dBm in all bands except B41** **LTE B41 HPUE: 26dBm** **HSPA+: 23.5 dBm**
	Maximum power consumption	**LTE: 1,200 mA (peak); 900 mA (average)** **HSPA+: 1,100 mA (peak); 800 mA (average)**
	Form Factor	**M.2, 3042-S3 Key B**
	Weight	**6 g**
	Dimensions (Length x Width x Thickness)	**42 x 30 x 2.3 mm**

Technical Specifications

Near Field Communications Controller (Mirage)

Dimensions (L x W x H)	**Module 17 mm by 10 mm by 2.0 mm**
Chipset	**NPC300**
System interface	**I2C**
NFC RF standards	**ISO/IEC 14443 A** **ISO/IEC 14443 B** **ISO/IEC 15693** **ISO/IEC 18092** **ECMA-340 NFCIP-1 Target and Initiator** **ECMA-320 NFCIP-2**
NFC Forum Support	**Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2**
Reader (PCD-VCD) Mode(1)	**ISO/IEC 14443 A** **ISO/IEC 14443 B** **ISO/IEC 15693** **MIFARE 1K** **MIFARE 4K** **MIFARE DESFire** **FeliCa** **Jewel and Topaz cards**
Card Emulation (PICC-VICC) Mode(1)	**ISO/IEC 14443 A** **ISO/IEC 14443 B and B'** **MIFARE** **FeliCa**
Frequency	**13.56 MHz**
NFC Modes Supported	**Reader/Writer, Peer-to-Peer**
Raw RF Data Rates	**106, 212, 424, 848 kbps**
Operating temperature	**-25 C to 80°C**
Storage temperature	**-20°C to 125°C**
Humidity	**10-90% operating** **5-95% non-operating**
Supply Operating voltage	**2.7 to 5.5 Volts**
I/O Voltage	**1.8V or 3.3V**

Technical Specifications

Power Consumption
(Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)

Polling	**710.93 mW**
Detected Test Tag Type 1	**152.09 mW**
Detected Test Tag Type 2	**341.26 mW**
Detected Test Tag Type 3	**383.76 mW**
Detected Test Tag Type 4	**312.26 mW**
Antenna	**Antenna connector, 0.3mm pitch, 7 connector FPC. Antenna matching is external to module.**

Intel® i219LM 10/100/1000 Integrated NIC

Connector	**RJ-45**
System Interface	**PCI (Intel proprietary) + SMBus**
Data rates supported	**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 Compliance	**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)**
Performance	**TCP/IP/UDP Checksum Offload (configurable)** **Protocol Offload (ARP & NS)** **Large send offload and Giant send offload** **Receiving Side Scaling** **Jumbo Frame 9K**
Power consumption	**Cable Disconnection: 25mW** **100Mbps Full Run: 450mW** **1000bp Full Run: 1000mW** **WoL Enable(S3/S4/S5): 50mW** **WoL Disable(S3/S4/S5): 25mW**
Power Management	**ACPI compliant – multiple power modes** **Situation-sensitive features reduce power consumption** **Advanced link down power saving for reducing link down power consumption**

Technical Specifications

Management Interface	**Auto MDI/MDIX Crossover cable detection**
IT 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**
Security & Manageability	**Intel® vPro™ support with appropriate Intel® chipset components**

Intel® i219v 10/100/1000 Integrated NIC

Connector	**RJ-45**
System Interface	**PCI (Intel proprietary) + SMBus**
Data rates supported	**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 Compliance	**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)**
Performance	**TCP/IP/UDP Checksum Offload (configurable)** **Protocol Offload (ARP & NS)** **Large send offload and Giant send offload** **Receiving Side Scaling** **Jumbo Frame 9K**
Power consumption	**TCP/IP/UDP Checksum Offload (configurable)** **Protocol Offload (ARP & NS)** **Large send offload and Giant send offload** **Receiving Side Scaling** **Jumbo Frame 9K**
Power Management	**ACPI compliant – multiple power modes** **Situation-sensitive features reduce power consumption**

Technical Specifications

		Advanced link down power saving for reducing link down power consumption
	Management Interface	**Auto MDI/MDIX Crossover cable detection**
	IT 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**

POWER

AC Adapter 45 Watt nPFC Wall Mount USB type C™ Straight 1.8 m C6NS	*Dimensions*	**62.0 x 62.0 x 28.5mm**	
	Weight	**unit: 220g +/- 10g**	
	Input	*Input Efficiency*	**Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec:** **5V: 81.5%** **9V: 86.7%** **10V: 87.5%** **12V: 87.8%** **15V: 87.8%** **20V: 87.8%**
		Input frequency range	**47 ~ 63Hz**
		Input AC current	**Max. 1.4 A at 90 Vac**
	Output	*Output power*	**Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec**
		DC output	**5V: 81.5%**
		Hold-up time	**9V: 86.7%**
		Output current limit	**10V: 87.5%**
	Connector	**Non-Standard C6**	
	Environmental Design	*Operating temperature*	**32°Fto 95°F (0° to 35°C)**
		Non-operating (storage) temperature	**-4°F to 185°F (-20° to 85°C)**
		Altitude	**0 to 16,400 ft (0 to 5000m)**
		Humidity	**20% to 95%**
		Storage Humidity	**10% to 95%**
	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.**	

Technical Specifications

MTBF - over 200,000 hours at 25°C ambient condition.

Technical Specifications

AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m	*Dimensions*	**95.0 x 40.0 x 26.5mm**	
	Weight	**unit: 200g +/- 10g**	
	Input	*Input Efficiency*	**87.74 % at 115 Vac and 88.4 % at 230Vac**
		Input frequency range	**47 ~ 63Hz**
		Input AC current	**Max. 1.4 A at 90 Vac**
	Output	*Output power*	**45 W**
		DC output	**19.5 V**
		Hold-up time	**5ms at 115 Vac input**
		Output current limit	**<8.0 A**
	Connector	**C6**	
	Environmental Design	*Operating temperature*	**32°F to 95°F (0°to 35°C)**
		Non-operating (storage) temperature	**-4°F to 185°F (-20° to 85°C)**
		Altitude	**0 to 16,400 ft (0 to 5000m)**
		Humidity	**20% to 95%**
		Storage Humidity	**10% to 95%**
	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.**	

AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m 2prong	*Dimensions*	**95.0 x 40.0 x 26.5 mm**	
	Weight	**unit: 200g +/- 10g**	
	Input	*Input Efficiency*	**87.74% at 115Vac and 88.4% at 230Vac**
		Input frequency range	**47 ~ 63Hz**
		Input AC current	**Max. 1.4 A at 90 Vac**
	Output	*Output power*	**45 W**
		DC output	**19.5 V**
		Hold-up time	**5 ms at 115 Vac input**
		Output current limit	**<8.0 A**
	Connector	**C8**	
	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	**0 to 16,400 ft (0 to 5000m)**
		Humidity	**20% to 95%**
		Storage Humidity	**10% to 95%**
	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.**	

Technical Specifications

AC Adapter 65 Watt nPFC USB type C Straight 1.8m C6NS	*Dimensions*	**74 x 74 x 28.5 mm**	
	Weight	**unit: 245g +/- 10g**	
	Input	*Input Efficiency*	**81.5% min at 115 Vac/ 230Vac @ 5V/3A 86.7% min at 115 Vac/ 230Vac @ 9V/3A 88% min at 115 Vac/ 230Vac @ 10V/5A 88% min at 115 Vac/ 230Vac @ 12V/5A 89% min at 115 Vac/ 230Vac @ 15V/4.33A 89% min at 115 Vac/ 230Vac @ 20V/3.25A**
		Input frequency range	**47 ~ 63 Hz**
		Input AC current	**Max. 1.7 A at 90 Vac and maximum load**
	Output	*Output power*	**65 W**
		DC output	**5V/9V/10V/12V/15V/20V**
		Hold-up time	**5ms at 115 Vac input**
		Output current limit	**<8.0 A**
	Connector	**Non-Standard C6**	
	Environmental Design	*Operating temperature*	**32°F to 95°F (0°to 35°C)**
		Non-operating (storage) temperature	**-4°F to 185°F (-20° to 85°C)**
		Altitude	**0 to 16,400 ft (0 to 5000m)**
		Humidity	**5% to 95%**
		Storage Humidity	**5% to 95%**
	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 100,000 hours at 25°C ambient condition.**	
AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm New EM	*Dimensions*	**102 x 55 x 30 mm**	
	Weight	**unit: 250g +/- 10g**	
	Input	*Input Efficiency*	**88.0 % at 115 Vac and 89.0 % at 230Vac**
		Input frequency range	**47 to 63 Hz**
		Input AC current	**Max. 1.7 A at 90 Vac**
	Output	*Output Power*	**65 W**
		DC Output	**19.5 V**
		Hold-up Time	**5ms at 115 Vac input**
		Output current limit	**<11.0 A**
	Connector	**C6**	
	Environmental Design	*Operating temperature*	**32°F to 95°F (0° to 35°C)**
		Non-operating (storage) temperature	**-4°F to 185°F (-20°to 85°C)**
		Altitude	**0 to 16,400 ft (0 to 5000m)**
		Humidity	**20% to 95%**
		Storage Humidity	**10% to 95%**
	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,**	

Technical Specifications

		FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	
AC Adapter 65 Watt Smart nPFC Standard Barrel 4.5 mm Right Angle 1.8 m	*Dimensions*	**90.0 x 51 x 28.5 mm**	
	Weight	**unit: 230g +/- 10g**	
	Input	*Input Efficiency*	**88.0 % at 115 Vac and 89.0 % at 230Vac**
		Input frequency range	**47 ~ 63 Hz**
		Input AC current	**Max. 1.7 A at 90 Vac**
	Output	*Output Power*	**65 W**
		DC Output	**19.5 V**
		Hold-up Time	**5ms at 115 Vac input**
		Output current limit	**<11.0 A**
	Connector	**C6**	
	Environmental Design	*Operating temperature*	**32°F to 95°F (0° to 35°C)**
		Non-operating (storage) temperature	**-4°F to 185°F (-20°to 85°C)**
		Altitude	**0 to 16,400 ft (0 to 5000m)**
		Humidity	**20% to 95%**
		Storage Humidity	**10% to 95%**
	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.**	
Battery TT 3 Cell WHr 56 Long Life -PL	*Dimensions* **(H x W x L)**	**L 281.7mm x W 79.65mm x H 7.15mm**	
	Weight	**219 +/- 10g**	
	Cells/Type	**3cell Lithium-Ion Polymer cell / P615383A1**	
	Energy	*Voltage*	**11.55V**
		Amp-hour capacity	**4.610Ah/ 4.850Ah**
		Watt-hour capacity	**56 Wh**
	Temperature	*Operating (Charging)*	**0˚ to 50˚ C**
		Operating (Discharging)	**-10˚ to 60˚ C**
	Fuel Gauge LED	**NA**	
	Optional Travel Battery Available	**No**	

Technical Specifications

COUNTRY OF ORIGIN

China

Options and Accessories (sold separately and availability may vary by country)

Type	Description	Part #
Cases	HP Essential Top Load Case (up to 15.6")	H2W17AA#xxx
	HP Slim Ultrabook Top Load	F3W15AA#xxx
	HP Basic/Essential Backpack	H1D24AA#xxx
	HP Exec Midnight 15.6" Backpack	1KM16AA#xxx
Docking	HP TB Dock G2 w/ Combo Cable	3TR87AA
	HP TB Dock 120W G2 w/ Audio	3YE87AA
	HP UltraSlim Docking Station	D9Y32AA#xxx
	HP UltraSlim Docking Station TAA US	E5C22AV#ABA
	HP Thunderbolt Dock 120W G2	2UK37AA
	HP Thunderbolt Dock 120W G2 TAA	2UK37AA
	HP Thunderbolt Dock 230W G2	2UK38AA
	HP TB Dock Audio Module	3AQ21AA
	HP TB Dock 120W G2 cable	3XB94AA
	HP TB Dock G2 combo cable	3XB96AA
	HP USB-C Universal Dock	1MK33AA#xxx
	HP Elite 90W Thunderbolt 3 Dock	1DT93AA#xxx
	HP USB-C Dock G4	3FF69AA#xxx
	HP USB-C Mini Dock	1PM64AA#xxx
	HP USB-C Travel Dock	T0K29AA#xxx
	HP USB Travel Dock	T0K30AA#xxx
	HP USB-C Universal Dock w/4.5mm Adapter	2UF95AA
	HP USB-C Universal Dock w/4.5mm Adapter - non-flash version	3DV65AA
	HP USB-C Dock G5	5TW10AA#xxx
	HP USB-C/A Universal Dock G2	5TW13AA#xxx
	HP Adjustable Dual Display Stand	AW664AA#xxx
	HP Display and Notebook Stand II	E8G00AA#xxx
Input/Output	HP Slim Wireless Keyboard and Mouse	T6L04AA#xxx
	HP Slim USB Keyboard and Mouse	T6T83AA#xxx
	HP Wireless (Link-5) Keyboard	T6U20AA#xxx
	HP USB Essential Keyboard and Mouse	H6L29AA#xxx
	HP Conferencing Keyboard	K8P74AA#xxx
	HP USB Collaboration Keyboard	Z9N38AA#xxx
	HP Wireless Collaboration Keyboard	Z9N39AA#xxx
	HP Comfort Grip Wireless Mouse	H2L63AA#xxx
	HP X4000b Bluetooth Mouse	H3T50AA#xxx
	HP 3-Button USB Laser Mouse	H4B81AA#xxx
	HP USB Travel Mouse	G1K28AA#xxx
	HP Ultra Mobile Wireless Mouse	H6F25AA#xxx
	HP Slim Bluetooth Mouse to AMO	F3J92AA#xxx
	HP Wireless Premium Mouse	1JR31AA#xxx

Options and Accessories (sold separately and availability may vary by country)

	HP USB Premium Mouse	1JR32AA#xxx
	HP Essential USB Mouse	2TX37AA#xxx
	HP Elite Presenter Mouse	2CE30AA#xxx
	HP USB-C to USB 3.0 Adapter	N2Z63AAA#xxx
	HP USB-C to USB-A Hub	Z6A00AA#xxx
	HP USB-C to DP	N9K78AA#xxx
	HP USB-C to VGA	N9K76AA#xxx
	HP HDMI to DVI	F5A28AA#xxx
	HP HDMI to VGA	H4F02AA#xxx
	HP USB-C to HDMI 2.0 Adapter	1WC36AA#xxx
Power	HP 65W Slim AC Adapter	H6Y82AA#xxx
	HP 90W Slim AC Adapter	H6Y83AA#xxx
	HP 90W Slim Combo AC Adapter w/ USB	H6Y84AA#xxx
	HP 45W Smart AC Adapter	H6Y88AA#xxx
	HP 65W Smart AC Adapter	H6Y89AA#xxx
	HP 90W Smart AC Adapter	H6Y90AA#xxx
	HP 45W 2-prong 4.5 mm DC jack AC Adapter	L6F60AA#ABJ
	HP 45W USB-C Power Adapter	1HE07AA#xxx
	HP 65W USB-C Power Adapter	1HE08AA#xxx
	65W USB-C Slim Power Adapter	3PN48AA
	HP Notebook Power Bank	N9F71AA#xxx
	HP USB-C Notebook Power Bank	1TZ86AA#xxx
Storage	HP USB External DVDRW Drive	F2B56AA#xxx
	HP 256GB M2 PCIe NVME SSD TLC (2280)	1FU87AA#xxx
	HP 512GB M2 PCIe NVME SSD TLC 2280)	1FU88AA#xxx
Memory	HP 4GB 2400MHz DDR4 Memory	Z4Y84AA#xxx
	HP 8GB 2400MHz DDR4 Memory	Z4Y85AA#xxx
	HP 16GB 2400MHz DDR4 Memory	Z4Y86AA#xxx
Security	HP Docking Station Cable Lock	AU656AA#xxx
	HP Essential Combination Lock	T0Y16AA#xxx
	HP Combination Lock	T0Y15AA#xxx
	HP Keyed Cable lock	T0Y14AA#xxx
	HP Keyed Cable Lock 10mm	T1A62AA#xxx
	HP Dual Head Keyed Cable Lock	T1A64AA#xxx
UCC	HP Stereo 3.5mm Headset	T1A66AA#xxx
	HP Stereo USB Headset	T1A67AA#xxx
	HP UC Wireless Mono Headset	W3K08AA#xxx
	HP UC Wireless Duo Headset	W3K09AA#xxx

Options and Accessories (sold separately and availability may vary by country)

Displays	**HP EliteDisplay E243d 23.8-inch Docking Monitor**	**1TJ76AA**
	HP EliteDisplay E243 23.8-inch Monitor	**1FH47AA**
	HP EliteDisplay E273q 27-inch Monitor	**1FH52AA**

Summary of Changes

Date of change:	Version History:		Description of change:
May 30, 2019	V1 to V2	Updated	Lock Slot
June 3, 2019	V2 to V3	Added	Environmental Section
June 10, 2019	V3 to V4	Added	HP Cloud Recovery
July 2, 2019	V4 to V5	Updated	Color Gamut
September 9, 2019	V5 to V6	Updated	Intel® Optane™ and disclaimer for 1000 nit Sure View panel
October 10, 2019	V6 to V7	Updated	Numeric Keyboard
February 21, 2020	V7 to V8	Updated	Memory Section
May 27, 2020	V8 to V9	Updated	Ports section