

Overview

HP EliteBook 835 G7 Notebook PC



Left

- | | |
|------------------------------------|--|
| 1. Ambient Light Sensor (Optional) | 7. Glass Clickpad |
| 2. Internal microphones (2) | 8. Smartcard Reader (Optional) |
| 3. Webcam LED (Optional) | 9. Audio Combo Jack |
| 4. Camera Shutter | 10. USB 3.1 Gen 1 Port |
| 5. HD and IR Camera (Optional) | 11. USB 3.1 Gen 1 Port Charging Port |
| 6. IR Camera LEDs (Optional) | 12. Nano Security Lock Slot (Lock sold separately) |

Overview



Right

- | | |
|-----------------------------------|--|
| 1. Power Button Key | 5. USB-C® (Alt Mode, 3.1 Gen2) |
| 2. Power Connector | 6. Nano Sim |
| 3. HDMI port (Cable not included) | 7. HP Fingerprint Sensor (select models) |
| 4. USB-C® (Alt Mode, 3.1 Gen2) | |

1. All units have a SIM card stray but units that do not support WWAN are shipped with a non-removable SIM slot plug

Overview

AT A GLANCE

- Preinstall Windows 10, FreeDOS 3.0
- AMD® Ryzen Pro 4000 processors
- Display include your choice of 33.8cm (13") diagonal IPS Wide viewing Angle, FHD or UHD, Touch or Non-Touch
- AMD Radeon™ Graphics
- Enterprise grade security with HP Sure Sense⁴, HP SureStart Gen6, HP Privacy Camera, HP Sure View Reflect¹, HP Sure Run Gen3 HP Sure Recover Gen3, HP Sure Click, SmartCard Reader² and Touch Fingerprint reader⁵ (select models)
- Tested for 19 MIL-STD 810H tests³
- Weight starting at 2.78 lb (1.26 kg)
- Battery life up to 24 and 15 minutes hours
- Supports wireless LAN and wireless WAN options for connectivity on the go
- Up to 1 TB Solid State Drives
- Up to 32 GB total system memory
- 720p HD webcam, IR camera for face authentication with Windows Hello
- Full size, backlit, Keyboard and Clickpad with image sensor and glass surface, multi-touch gestures enabled, taps enabled as default
- Designed to support USB-C® and Thunderbolt HP docking options including the HP Universal Dock G5²
- Enables AMD Memory Guard to help defend against cold boot attacks with real-time encryption and decryption of system's memory
- Support HP Sure View Reflect with Optional 1000 nit Anti-Glare Privacy Screen which prevents visual hacking

1. HP Sure View Reflect 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. MIL-STD 810H is not intended to demonstrate fitness of 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.

4. HP Sure Sense requires Windows 10. See product specifications for availability.

5. HP Fingerprint Sensor is an optional feature and requires configuration at purchase

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

Technical Specifications

PRODUCT NAME

HP EliteBook 835 G7 Notebook PC

OPERATING SYSTEM

Preinstalled Windows 10 Pro 64 – HP recommends Windows 10 Pro for business¹
Windows 10 Pro 64 (National Academic only)²
Windows 10 Home 64¹
Windows 10 Home Single Language 64¹
Windows 10 Pro (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.

Note: Your product does not support Windows 8 or Windows 7. 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>. A full list of HP products and the Windows 10 versions tested is available on the HP support website <https://support.hp.com/us-en/document/c05195282>.

HP tested Windows 10, version 1809 on this platform For testing information on newer versions of Windows 10, please see: <https://support.hp.com/document/c05195282>.

FreeDOS planned to be available September 2020

PROCESSORS

AMD Ryzen™ 3 PRO 4450U APU with Radeon™ Graphics (2.5 GHz base clock, up to 3.8 GHz max boost clock, 4 MB L3 cache, 4 cores)^{3,4,5}

AMD Ryzen™ 5 PRO 4650U APU with Radeon™ Graphics (2.1 GHz base clock, up to 4 GHz max boost clock, 8 MB L3 cache, 6 cores)^{3,4,5}

AMD Ryzen™ 7 PRO 4750U APU with Radeon™ Graphics (1.7 GHz base clock, up to 4.1 GHz max boost clock, 8 MB L3 cache, 8 cores)^{3,4,5}

Processor Family

2nd Gen AMD® Ryzen™ PRO processor

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. AMD's numbering is not a measurement of clock speed.

4. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

5. In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on

Technical Specifications

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>.

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated

AMD Radeon™ Graphics⁶

Supports

Support HD decode, DX12, HDMI2.0

6. HD content required to view HD images.

DISPLAY

Non-Touch

33.8 cm (13.3") diagonal FHD IPS eDP anti-glare WLED-backlit bent, 250 nits, 45% NTSC (1920 x 1080)^{6,7,8}

33.8 cm (13.3") diagonal FHD IPS eDP anti-glare WLED-backlit bent, 250 nits, 45% NTSC for HD camera (1920 x 1080)^{6,7,8}

33.8 cm (13.3") diagonal FHD IPS eDP anti-glare WLED-backlit bent, 250 nits, 45% NTSC for HD + IR camera (1920 x 1080)^{6,7,8}

33.8 cm (13.3") diagonal FHD IPS eDP anti-glare WLED-backlit bent, 250 nits, 45% NTSC for WWAN (1920 x 1080)^{6,7,8}

33.8 cm (13.3") diagonal FHD IPS eDP anti-glare WLED-backlit bent, 250 nits, 45% NTSC for HD camera for WWAN (1920 x 1080)^{6,7,8}

33.8 cm (13.3") diagonal FHD IPS eDP anti-glare WLED-backlit bent, 250 nits, 45% NTSC for HD + IR camera for WWAN (1920 x 1080)^{6,7,8}

33.8 cm (13.3") diagonal FHD IPS eDP + PSR anti-glare WLED-backlit bent, 1000 nits with HP Sure View Integrated Privacy Screen, 72% NTSC with Ambient Light Sensor and HD + IR camera (1920 x 1080)^{6,7,8}

33.8 cm (13.3") diagonal FHD IPS eDP + PSR anti-glare WLED-backlit bent, 1000 nits with HP Sure View Integrated Privacy Screen, 72% NTSC with Ambient Light Sensor and HD + IR camera for WWAN (1920 x 1080)^{6,7,8,9}

33.8 cm (13.3") diagonal FHD IPS eDP + PSR anti-glare WLED-backlit bent, 400 nits, low power, 72% NTSC with Ambient Light Sensor and HD + IR camera (1920 x 1080)^{6,7,8,9}

33.8 cm (13.3") diagonal FHD IPS eDP + PSR anti-glare WLED-backlit bent, 400 nits, low power, 72% NTSC with Ambient Light Sensor and HD + IR camera for WWAN (1920 x 1080)^{6,7,8,9}

Touch

33.8 cm (13.3") diagonal FHD IPS eDP anti-glare On-Cell WLED-backlit bent touch screen, 250 nits, 45% NTSC with HD+IR camera (1920 x 1080)^{6,7,8}

Technical Specifications

33.8 cm (13.3") diagonal FHD IPS eDP anti-glare On-Cell WLED-backlit bent touch screen, 250 nits, 45% NTSC, for HD+IR camera for WWAN (1920 x 1080)^{6,7,8}

HDMI 2.0

Support resolution up to 4K @60 Hz

6. HD content required to view HD images.

7. Sold separately or as an optional feature.

8. Resolutions are dependent upon monitor capability, and resolution and color depth settings.

9. HP Sure View integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.

Docking station model	Total number of supported displays (incl. the notebook display)	Max. resolutions supported	Dock Connectors	Technical limitations
HP Thunderbolt Dock G2	3	Dual 4K @ 60Hz	2xDP, 1xVGA, 1xUSB-C alt-mode	Dual 4k (4096 x 2160) only with: <ul style="list-style-type: none"> • 1 DP + TB port or • USB-C alt mode + Dual 4K (3840 x 2160) with any of the DP or USB-C alt mode video ports
HP Elite USB-C Dock G5	3	Three 1680x1050 @ 60 Hz Dual 2K @ 60Hz Single 4K @ 60Hz (3840 x 1440)	1xHDMI, 2xDP	
HP USB-C Universal Dock G2	3	Dual 4K @ 60Hz Single 5K @ 60Hz	1xHDMI, 2xDP	
HP USB-C Travel Dock	2	Single 2K @ 60Hz	1xHDMI, 1xVGA	Single external display Only HDMI or VGA at the time

STORAGE AND DRIVES

Primary M.2 Storage

128 GB M.2 SATA-3 TLC¹⁰

Technical Specifications

256 GB PCIe® Gen3x4 NVMe™ TLC Opal 2¹⁰
256 GB PCIe® Gen3x4 NVMe™ SS TLC¹⁰
512 GB PCIe® Gen3x4 NVMe™ M.2 SS TLC¹⁰
1 TB PCIe® Gen3 x4 NVMe™ SS TLC¹⁰
256 GB PCIe® NVMe™ Value¹⁰
512 GB PCIe® NVMe™ Value¹⁰
512 GB PCIe® Gen3x4 NVMe™ TLC Opal 2¹⁰

10. 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.

MEMORY

Maximum Memory

32 GB DDR4-3200 SDRAM

Memory

32 GB DDR4-3200 SDRAM (2 x 16 GB)¹¹
16 GB DDR4-3200 SDRAM (1 x 16 GB)¹¹
16 GB DDR4-3200 SDRAM (2 x 8 GB)¹¹
8 GB DDR4-3200 SDRAM (1 x 8 GB)¹¹
8 GB DDR4-3200 SDRAM (2 x 4 GB)¹¹
4 GB DDR4-3200 SDRAM (1 x 4 GB)¹¹

Memory Slots

2 SODIMM

Both slots are customer accessible / upgradeable

DDR4 SODIMMS, system runs at 3200

Supports Dual Channel Memory

11. 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

Technical Specifications

WLAN

Intel® AX200 Wi-Fi 6 (2x2) and Bluetooth® 5 Combo, non-vPro™ (supporting gigabit file transfer speeds)¹²
Realtek RTL8822BE 802.11ac (2x2) and Bluetooth® 5 Combo¹²

WWAN

Intel® XMM™ 7360 LTE-Advanced Cat 9¹³

NFC

NXP NPC300 Near Field Communication Module

Miracast

Native Miracast Support¹⁴

12. 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.

13. 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.

14. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.

AUDIO/MULTIMEDIA

Audio

Audio by Bang & Olufsen

2 Integrated Stereo Speakers

Integrated 3 Multi Array Microphone

Camera

720p HD camera^{6,7}

720p HD+IR camera^{6,7,15}

Sensors

Ambient light sensor (select models only)

Hall Sensor

6. HD content required to view HD images.

7. Sold separately or as an optional feature.

15. Internet access required.

Technical Specifications

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Premium Keyboard, spill resistant with drain
Backlit keyboard and DuraKeys 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 (with LED)
F3 - Brightness Down
F4 - Brightness Up
F5 - Audio Mute
F6 - Volume Down
F7 - Volume Up
F8 - Mic Mute
F9 - Blank or Backlit Toggle
F10 - Insert
F11 - Airplane Mode
F12 - HP Programmable Key
Print Screen
Power Button (with LED)

Hidden Function Keys

Fn+R - Break
Fn+S - Sys Rq
Fn+C - Scroll Lock

SOFTWARE AND SECURITY

Preinstalled Software

BIOS

HP BIOSphere Gen5¹⁶
HP Drive Lock & Automatic Drive Lock

Technical Specifications

BIOS Update via Network
Power On Authentication
HP Secure Erase¹⁷
Absolute Persistence Module¹⁸
Pre-boot Authentication

Software

HP Connection Optimizer
HP Hotkey Support
HP JumpStarts
HP Support Assistant¹⁹
HP Noise Cancellation Software
Buy Office (sold separately)

Manageability Features

HP Driver Packs (download)²⁰
HP System Software Manager (SSM) (download)
HP BIOS Config Utility (BCU) (download)
HP Client Catalog (download)
HP Manageability Integration Kit Gen4 (download)²¹
HP Image Assistant (download)
HP Client Management Script Library (download)
Ivanti Management Suite (download)

Client Security Software

HP Client Security Manager Gen6²²
HP Fingerprint Sensor²³
Windows Defender²⁴

Security Management

Pre-boot Authentication
TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)²⁵
USB enable/disable (via BIOS)
Power-on password (via BIOS)
Setup password (via BIOS)
Support for chassis padlocks and cable lock devices
HP Sure Click²⁶
HP Sure Start Gen6²⁷
HP Sure Run Gen3²⁸
HP Sure Recover Gen3²⁹
HP Sure Sense³⁰

16. HP BIOSphere Gen5 is available on select HP Pro and Elite PCs. Features may vary depending on the platform and configurations.

17. HP Secure Erase 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™.

18. 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

Technical Specifications

Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit:

<https://www.absolute.com/about/legal/agreements/absolute/>

19. HP Support Assistant requires Windows and Internet access.

20. HP Driver Packs not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.

21. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.

22. HP Client Security Manager Gen6 requires Windows and is available on the select HP Elite and Pro PCs.

23. HP Fingerprint sensor is an optional feature that must be configured at purchase.

24. Windows Defender Opt in and internet connection required for updates.

25. Firmware TPM is version 2.0

26. HP Sure Click requires Windows 10 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.

27. HP Sure Start Gen6 is available on select HP PCs.

28. HP Sure Run Gen3 is available on select Windows 10 based HP Pro, Elite and Workstation PCs with select Intel® or AMD processors.

29. HP Sure Recover Gen3 is available on select HP PCs and requires an open 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.

30. HP Sure Sense requires Windows 10.

POWER

Power Supply

HP Smart 45 W External AC power adapter³¹

HP Smart 45 W External AC power adapter, 2-prong (Japan only)³¹

HP Smart 65 W External AC power adapter³¹

HP Smart 65 W EM External AC power adapter³¹

65 Watt nPFC Slim USB-C Straight AC Adapter³¹

65 W USB Type-C® adapter³¹

Primary Battery

HP Long Life 3-cell, 53 Wh Li-ion^{32,33}

Support HP Fast Charge (Up to 50% in 30 minutes with 65W AC Adapter)^{34,35}

Battery Life

Up to 24 hours and 15 minutes³⁵

Power Cord

2-wire plug - 1.0m³¹

3-wire plug - 1.0m³¹

31. Availability may vary by country.

33. Battery is internal and not replaceable by customer. Serviceable by warranty.

34. Supports HP Fast Charge with 65W AC Adapter. 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.

35. 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 www.bapco.com for additional details.

Technical Specifications

WEIGHTS & DIMENSIONS

Product Weight

Non-touch

Starting at 2.78 lb³⁶

Starting at 1.26 kg³⁶

Touch

Starting at 3.02 lb³⁶

Starting at 1.37 kg³⁶

Non-Touch, WLAN only

12.12 x 8.05 x 0.71 in

30.78 x 20.46 x 1.79 cm

Touch, WLAN only

12.12 x 8.05 x 0.75 in

30.78 x 20.46 x 1.90 cm

WWAN

12.12 x 8.05 x 0.75 in

30.78 x 20.46 x 1.91 cm

[36. Weight will vary by configuration.](#)

PORTS/SLOTS

Ports

2 USB Type-C® 3.1 Gen2 (Alt mode)

1 USB 3.1 Gen 1 port

1 USB 3.1 Gen 1 (1 charging)

1 HDMI 2.0⁶

1 headphone/microphone combo

1 AC power

1 SIM card slot³⁷

1 Smartcard reader

[6. HD content required to view HD images.](#)

[37. SIM slot is not user accessible without WWAN configuration.](#)

SERVICE AND SUPPORT

Technical Specifications

HP Services offers 1-year or 3-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>.³⁸

38. 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.

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	19 V
	Average Operating Power	2.82 W
	Integrated Graphics	6.78 W
	Max Operating Power	Discrete < 65W UMA < 45W
Temperature	Operating	32° to 95° F (0° to 35° C) (not writing optical)
	Non-operating	41° to 95° F (5° to 35° C) (writing optical)
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 ³⁹
	EPEAT®	EPEAT® 2019 Gold in United States ⁴⁰
	ICES	Yes
	Australia / NZ A-Tick Compliance	Yes
	CCC	Yes

Technical Specifications

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

39. Configurations of the HP ProBook 650 G7 that are ENERGY STAR® qualified are identified as HP ProBook 650 G7 ENERGY STAR® on HP websites and on <http://www.energystar.gov>.

40. 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

Panel LCD 13.3 inch FHD (1920x1080) Anti-Glare WLED UWVA 45% NTSC 250 nits eDP 1.2 w/o PSR bent NWBZ	Outline Dimensions (W x H x D)	300.56 x 177.77 mm (max) (FPC folding included)
	Active Area	293.76 x 165.24 mm (typ.)
	Weight	260 g (max)
	Diagonal Size	13.3 inch
	Thickness	3.0 mm/ 5.0 mm (PCB) (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	RGB Stripe
	Backlight	LED
	Color Gamut Coverage	NTSC 45%
	Color Depth	6 bits
Viewing Angle	UWVA 85/85/85/85	

Panel LCD 13.3 inch FHD (1920x1080) Anti-Glare WLED UWVA 45% NTSC 250 nits eDP	Outline Dimensions (W x H x D)	300.56 x 177.77 mm (max)
	Active Area	293.76 x 165.24 mm (typ.)
	Weight	260 g (max)

Technical Specifications

1.2 w/o PSR bent Touch on Panel NWBZ	Diagonal Size	13.3 inch
	Thickness	3.0 mm / 5.0 mm (PCB) (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	RGB Stripe
	Backlight	LED
	Color Gamut Coverage	NTSC 45%
	Color Depth	6 bits (Hi FRC supportive w/ condition to enable)
Viewing Angle	UWVA 85/85/85/85	

Panel LCD 13.3 inch FHD (1920x1080) Anti-Glare WLED UWVA sRGB 100% NTSC 400 nits eDP 1.4+PSR2 bent LP NB2Y	Outline Dimensions (W x H x D)	299.06 x 176.54 mm (max) (FPC folding included)
	Active Area	293.76 x 165.24 mm (typ.)
	Weight	175 g (max)
	Diagonal Size	13.3 inch
	Thickness	2.0 mm / 3.8 mm (PCB) (max)
	Interface	eDP 1.4 w/ PSR II (2 lane)
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	1500:1 (typ)
	Refresh Rate	60 Hz
	Brightness	400 nits
	Pixel Resolution	1920 x 1080 (FHD)
	Format	RGB Stripe
Backlight	LED	
Color Gamut Coverage	sRGB 100% (NTSC 72%)	
Color Depth	8 bits	
Viewing Angle	UWVA 85/85/85/85	

Panel LCD 13.3-in diagonal FHD (1920 x 1080) Anti-Glare WLED UWVA 72% NTSC 1000 nits eDP 1.4+PSR Sure View Reflect	Outline Dimensions (W x H x D)	299.06 x 176.54 mm (max) (FPC folding included)
	Active Area	293.76 x 165.24 mm (typ.)
	Weight	220 g (max)
	Diagonal Size	13.3 inch
	Thickness	3.9 mm (max)

Technical Specifications

Interface	eDP 1.4 + PSR (4 lane)
Surface Treatment	Anti-Glare (AG)
Touch Enabled	No
Contrast Ratio	1500:1 (typ)
Refresh Rate	60 Hz
Brightness	1000 nits
Pixel Resolution	1920 x 1080 (FHD)
Format	RGB
Backlight	LED
Color Gamut Coverage	72% of NTSC
Color Depth	8 bits
Viewing Angle	UWVA 85/85/85/85

STORAGE

SSD 128GB 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 (10g)
Interface	ATA-8, SATA 3.0
Maximum Sequential Read	550 ~ 560 MB/s
Maximum Sequential Write	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 1TB 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 (10g)
Interface	PCIe NVMe Gen3X4
Maximum Sequential Read	3100 ~ 3500 MB/s
Maximum Sequential Write	2770 ~ 3037 MB/s
Logical Blocks	2,000,409,264

Technical Specifications

Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	ATA Security; TRIM; L1.2

SSD 256GB 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 (10g)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	2800 ~ 3500 MB/s
	Maximum Sequential Write	1400 ~ 2200 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

SSD 256GB 2280 PCIe NVMe Value	Form Factor	M.2 2280
	Capacity	256 GB
	NAND Type	Value
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10g)
	Interface	PCIe NVMe Gen3
	Maximum Sequential Read	2100 ~ 2200 MB/s
	Maximum Sequential Write	900 ~ 1400 MB/s
	Logical Blocks	500, 118, 192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security (optional); TRIM; L1.2

SSD 256GB 2280 PCIe-3x4 NVMe 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)

Technical Specifications

Weight	0.02 lb (10g)
Interface	PCIe NVMe Gen3X4
Maximum Sequential Read	2800 ~ 3500 MB/s
Maximum Sequential Write	1663 ~ 2200 MB/s
Logical Blocks	500,118,192
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	ATA Security (Option); TCG Opal 2.0; TRIM; L1.2

SSD 512GB 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 (10g)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	3100 ~ 3500 MB/s
	Maximum Sequential Write	2400 ~ 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 512GB 2280 PCIe NVMe Value	Form Factor	M.2 2280
	Capacity	512 GB
	NAND Type	Value
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10g)
	Interface	PCIe NVMe Gen3
	Maximum Sequential Read	2200 ~ 2300 MB/s
	Maximum Sequential Write	1000 ~ 1600 MB/s
	Logical Blocks	1,000,215,215
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security (optional); TRIM; L1.2

Form Factor	M.2 2280
Capacity	512 GB

Technical Specifications

SSD 512GB 2280 PCIe-3x4 NVMe Self Encrypted OPAL2 Three Layer	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10g)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	3100 ~ 3500 MB/s
	Maximum Sequential Write	2400 ~ 2956 MB/s
	Logical Blocks	1,000,215,215
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security (Option); TCG Opal 2.0; TRIM; L1.2

NOTE: 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.

Technical Specifications

NETWORKING

Intel® Wi-Fi 6¹ AX200 and Bluetooth® 5.0 802.11 ax (2x2) non-vPro, supporting gigabit file transfer speeds) non-vPro

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

Security³

- IEEE and Wi-Fi 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
- WAPI

Network Architecture Models

Ad-hoc (Peer to Peer)
Infrastructure (Access Point Required)

Roaming

IEEE 802.11 compliant roaming between access points

Output Power²

- 802.11b: +18.5dBm minimum
- 802.11g: +17.5dBm minimum

Technical Specifications

	<ul style="list-style-type: none"> • 802.11 a: +18.5dBm minimum • 802.11 n HT20(2.4GHz): +15.5dBm minimum • 802.11 n HT40(2.4GHz): +14.5dBm minimum • 802.11 n HT20(5GHz): +15.5dBm minimum • 802.11 n HT40(5GHz): +14.5dBm minimum • 802.11 ac VHT80(5GHz): +11.5dBm minimum • 802.11 ac VHT160(5GHz): +11.5dBm minimum • 802.11 ax HT40(2.4GHz): +10dBm minimum • 802.11 ax VHT160(5GHz): +10dBm minimum
Power Consumption	<ul style="list-style-type: none"> • 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 10 mW • Radio disabled 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity⁴	<ul style="list-style-type: none"> • 802.11 b, 1Mbps: -93.5dBm maximum • 802.11 b, 11Mbps: -84dBm maximum • 802.11 a/g, 6Mbps: -86dBm maximum • 802.11 a/g, 54Mbps: -72dBm maximum • 802.11 n, MCS07: -67dBm maximum • 802.11 n, MCS15: -64dBm maximum • 802.11 ac, MCS0: -84dBm maximum • 802.11 ac, MCS9: -59dBm maximum • 802.11 ax, MCS11(HT40): -59dBm maximum • 802.11 ax, 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 M.2 MiniCard
Dimensions	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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)
LED Activity	LED Amber Radio Off LED Off Radio On

Technical Specifications

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	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps BLE: 1 Mbps data rate; throughput 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 + 9.5 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
Link Topology	
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 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

Technical Specifications

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. Only available in countries where 802.11ax is supported.

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).

Realtek RTL8822CE

802.11ac 2x2 Wi-Fi and Bluetooth® 5.0

Wireless LAN Standards

IEEE 802.11a
IEEE 802.11b
IEEE 802.11g
IEEE 802.11n
IEEE 802.11ac
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
2.402 – 2.482 GHz
- 802.11a/n/ac
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: MCS 0 ~ MCS 9, (1SS, and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)

Modulation

Direct Sequence Spread Spectrum
OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM

Security³

- IEEE and Wi-Fi 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

Technical Specifications

	<ul style="list-style-type: none"> • IEEE 802.11i • WAPI 				
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)				
Roaming	IEEE 802.11 compliant roaming between access points				
Output Power²	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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/Modern Standby 10 mW • Radio disabled 8 mW 				
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode				
Receiver Sensitivity⁴	<ul style="list-style-type: none"> • 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Type 2230: 2.8g 2. Type 126: 1.3g 				
Operating Voltage	3.3v +/- 9%				
Temperature	<table> <tbody> <tr> <td>Operating</td> <td>14° to 158° F (-10° to 70° C)</td> </tr> <tr> <td>Non-operating</td> <td>-40° to 176° F (-40° to 80° C)</td> </tr> </tbody> </table>	Operating	14° to 158° F (-10° to 70° C)	Non-operating	-40° to 176° F (-40° to 80° C)
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Altitude	<table> <tbody> <tr> <td>Operating</td> <td>0 to 10,000 ft (3,048 m)</td> </tr> <tr> <td>Non-operating</td> <td>0 to 50,000 ft (15,240 m)</td> </tr> </tbody> </table>	Operating	0 to 10,000 ft (3,048 m)	Non-operating	0 to 50,000 ft (15,240 m)
Operating	0 to 10,000 ft (3,048 m)				
Non-operating	0 to 50,000 ft (15,240 m)				

Technical Specifications

LED Activity	LED Amber LED Off	Radio Off Radio On
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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)
Signaling Data Rate	Legacy: 3 Mbps data rate; throughput up to 2.17 Mbps BLE: 1 Mbps data rate; throughput 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.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Link Topology	
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
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Technical Specifications

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Intel® XMM™ 7360 LTE-Advanced CAT9¹	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
	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)
	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.

Near Field Communications Controller (optional)	Dimensions (L x W x H)	Module 25 mm by 10 mm by 2.0 mm
	Chipset	NPC100
	System interface	I2C
	NFC RF standards	ISO/IEC 14443 A ISO/IEC 14443 B 1.8ISO/IEC 15693

Technical Specifications

	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	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	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	0°C to 70°C
Storage temperature	-20°C to 125°C
Humidity	10-90% operating 5-95% non-operating
Supply Operating voltage	4.35 to 5.25 Volts
I/O Voltage	1.8V or 3.3V
Power Consumption (Booster enable, VBAT= 3.3V, VCC_BOOST = 5V)	
Mode	Power Consumption, Typical
Polling	7.3 mA
Detected Test Tag Type 1	Total 283.8 mA Net Module 236.8 mA
Detected Test Tag Type 2	Total 288.8 mA Net Module 241.8 mA
Detected Test Tag Type 3	Total 287.7 mA Net Module 240.7 mA
Detected Test Tag Type 4	Total 282.3 mA Net Module 235.3 mA
Antenna	Antenna connector, 0.5mm pitch, 7 connector FPC. Antenna matching is external to module

Technical Specifications

POWER

AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m	Dimensions	95 x 45 x 26.8 mm
	Weight	unit: 200g +/- 10g
	Input	Input Efficiency 87.74 % at 115 Vac and 88.4 % at 230 Vac
		Input frequency range 47 ~ 63 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 <8.0A
	Connector	Connector 4.5 mm Barrel Type
	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	Eg: *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 x 45 x 26.8 mm
	Weight	unit: 200g +/- 10g
	Input	Input Efficiency 87.74 % at 115 Vac and 88.4 % at 230 Vac
		Input frequency range 47 ~ 63 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 <8.0A
	Connector	Connector 4.5 mm Barrel Type
	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	Eg: *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 Slim USB Type-C® Straight 1.8m	Dimensions	88 x 53.5 x 21 mm	
	Weight	unit: 220g +/- 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 @ 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	1.6 A at 90 VAC and maximum load
	Output	Output power	65W
		DC output	5V/9V/12V/15V/20V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<8.0A
	Connector	Connector	USB Type C®
	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	Eg: *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 nPFC Slim USB Type-C® Straight 1.8m	Dimensions	90.0 x 51 x 28.5 mm	
	Weight	unit: 250g +/- 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 @ 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	1.6 A at 90 VAC and maximum load
	Output	Output power	65W
		DC output	5V/9V/12V/15V/20V
		Hold-up time	5ms at 115 Vac input
		Output current limit	8.0A
	Connector	Connector	USB Type C®
	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)

Technical Specifications

AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm New EM	Dimensions	102 x 55 x 30 mm
	Weight	unit: 220g +/- 10g
	Input	Input Efficiency 88.0 % at 115 Vac and 89.0 % at 230 Vac
		Input frequency range 47 ~ 63 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 <11.0A
	Connector	Connector 4.5 mm Barrel Type
	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	Eg: *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 65 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m	Dimensions	90 x 51 x 28.5 mm
	Weight	unit: 230g +/- 10g
	Input	Input Efficiency 88.0 % at 115 Vac and 89.0 % at 230 Vac
		Input frequency range 47 ~ 63 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 <11.0A
	Connector	Connector 4.5 mm Barrel Type
	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	Eg: *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

Battery CC 3 Cell WHr 53 Long Life -PL Fast Charge	Dimensions (H x W x L)	7.3 x 52.9 x 267.11 mm 0.287 x 2.082 x 10.516 inch
	Weight	205 g 0.45 lb
	Cells/Type	3cell Lithium-Ion Polymer cell / 645180
Energy	Voltage	11.55V
	Amp-hour capacity	4.59Ah
	Watt-hour capacity	53Wh
Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
	Operating (Discharging)	14° to 122° F (-10° to 60° C)
Warranty	Depends on system offering	
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 #
Type Cases	Description	Part Number
	HP Business Backpack (up to 17.3")	2SC67AA
	HP Business Case(up to 15.6")	2SC66AA
	HP Business Slim Top Load (up to 14.1" x .75" thick)	2SC65AA
	HP Essential Top Load Case (up to 15.6")	H2W17AA
Docking Input/Output	HP Thunderbolt Dock 120W G2	2UK37AA
	HP Thunderbolt Dock 230W G2	2UK38AA
	HP Thunderbolt Dock 120W G2 TAA	2UK37AA
	HP TB Dock Audio Module	3AQ21AA
	HP TB Dock 120W G2 cable	3XB94AA
	HP TB Dock G2 combo cable	3XB96AA
	HP USB-C Mini Dock	1PM64AA
	HP USB-C Dock G5	5TW10AA
	HP USB-C/A Universal Dock G2	5TW13AA
	HP Slim Wireless Keyboard and Mouse	T6L04AA
	HP Slim USB Keyboard and Mouse	T6T83AA
	HP Wireless (Link-5) Keyboard	T6U20AA
	HP USB Essential Keyboard and Mouse	H6L29AA
	HP USB Collaboration Keyboard	Z9N38AA
HP Wireless Collaboration Keyboard	Z9N39AA	
HP Comfort Grip Wireless Mouse	H2L63AA	
HP X4000b Bluetooth Mouse	H3T50AA	
HP 3-Button USB Laser Mouse	H4B81AA	
HP USB Travel Mouse	G1K28AA	
Power	HP Ultra Mobile Wireless Mouse	H6F25AA
	HP Wireless Premium Mouse	1JR31AA
	HP USB Premium Mouse	1JR32AA
	HP Essential USB Mouse	2TX37AA
	HP Elite Presenter Mouse	2CE30AA
Storage	HP Bluetooth Travel Mouse	6SP30AA
	HP Stereo 3.5mm Headset	T1A66AA
	HP Stereo USB Headset	T1A67AA
Security	HP UC Wireless Mono Headset	W3K08AA
	HP UC Wireless Duo Headset	W3K09AA
	HP USB-C to USB-A Hub	Z6A00AA
	HP USB-C to DP	N9K78AA

Summary of Changes

Date of change:	Version History:	Updated	Description of change:
	V1 to V2		

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