Overview

HP ProBook 470 G5 Notebook PC

Front

1. Microphones (2)
2. Webcam
3. Webcam light
4. Fingerprint reader
5. Clickpad
6. Hard drive LED
7. SD Card reader

8. Headphone/microphone combo jack
9. USB 2.0 (power port)
10. Power button
11. Security lock slot (Lock sold separately.)

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 1

Overview

Rear

1. Power connector
2. Ethernet port (RJ-R45)
3. External VGA monitor port

4. HDMI port (Cable not included.)
5. USB 3.1 Gen 1 (2)
6. USB Type-C™ port

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 2

QuickSpecs

Overview

At a Glance

1. Preinstalled with Windows 10 versions or FreeDOS 2.0

2. Choice of Intel® Core™ processors

3. HP Premium Keyboard, full-sized, spill resistant with numeric keypad and optional backlit

4. Function keys provide control of features including: standby mode, display brightness, external display, microphone mute, volume down, volume up, and backlight toggle for backlit keyboard (Select models only.)

5. Large Clickpad with gestures support

6. Enhanced security features with preinstalled software and hardware options

7. Optional HD webcam with dual-microphone array for video conferencing [1]

8. HDMI port for connecting to high-resolution displays

9. Choice of displays

   o 43.9 cm (17.3") diagonal FHD UWVA anti-glare LED-backlit non-touch; 220 cd/m²; 45% sRGB (1920 x 1080)

   o 43.9 cm (17.3") diagonal HD+ anti-glare LED-backlit non-touch; 220 cd/m²; 45% sRGB (1600 x 900)

10. Flexible wireless connectivity options

11. Battery life up to 14 hours 15 mins (i3, HD with SSD)

12. HP 3-cell, 48 WHr Li-ion battery

13. Pending MIL-STD testing [2]

1. Sold separately or as an optional feature.
2. MIL-STD-810G testing is pending and is conducted on select HP products. Testing is not intended to demonstrate fitness of U.S. Department of Defense (DoD) 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.

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

QuickSpecs

Features

PRODUCT NAMES

HP ProBook 470 G5 Notebook PC

OPERATING SYSTEMS

Preinstalled
Windows 10 Pro 64 – HP recommends Windows 10 Pro [1]
Windows 10 Pro 64 (National Academic License) [1,2]
Windows 10 Home 64 [1]
Windows 10 Home Single Language 64 [1]
Windows 10 Home 64 (National Academic License) [1,2]
FreeDOS 2.0

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. **Note:** 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™ i7-8550U Intel® UHD graphics 620 (1.8 GHz, up to 3.7 GHz with Intel® Turbo Boost Technology 2.0, 8 MB cache, 4 cores) [3,4,5]
Intel® Core™ i5-8250U Intel® UHD Graphics 620 (1.6 GHz, up to 3.4 GHz with Intel® Turbo Boost Technology 2.0, 6 MB cache, 4 cores) [3,4,5]
Intel® Core™ i3-7100U with Intel® HD Graphics 620 (2.4 GHz, 3 MB cache, 2 cores) [3,4,5]

Processors Family
8th Generation Intel® Core™ i7 processor (i7-8550U model) [5]
8th Generation Intel® Core™ i5 processor (i5-8250U model) [5]
7th Generation Intel® Core™ i3 processor (i3-7100U model) [5]

3. Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering is not a measurement of higher performance.
4. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
5. **NOTE:** 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.

CHIPSET

Features

Integrated with processor

GRAPHICS

Integrated
Intel® UHD graphics 620 [6]
Intel® HD graphics 620 [6]

NOTE: View processor section for details.

Discrete
NVIDIA® GeForce® 930MX (2 GB DDR3 dedicated, switchable) [7]

Supports
Support HD decode, DX12, HDMI 1.4b

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

DISPLAYS

Internal

eDP FHD Flat
43.9 cm (17.3") diagonal FHD UWVA anti-glare LED-backlit, 220 cd/m², 45% sRGB (1920 x 1080) [6,8]

eDP HD Flat
43.9 cm (17.3") diagonal HD+ anti-glare LED-backlit, 220 cd/m², 45% sRGB (1600 x 900) [6,8]

Display Size
17.3"
43.9 cm (17.3")

6. HD content required to view HD images.
8. Resolutions are dependent upon monitor capability, and resolution and color depth settings.

STORAGE AND DRIVES

Hard Drives
500 GB SATA (7200 rpm) [9]
500 GB (8 GB cache) SATA SSHD (5400 rpm) [9]
1 TB SATA (5400 rpm) [9]

Primary M.2 Storage
128 GB M.2 SATA TLC SSD [9]
256 GB M.2 PCIe NVMe Value SSD [9]

Features

512 GB M.2 PCIe NVMe TLC SSD [9]

9. 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

Standard
16 GB DDR4-2400 SDRAM (1 x 16 GB) [10]
16 GB DDR4-2400 SDRAM (2 x 8 GB) [10]
12 GB DDR4-2400 SDRAM (4 and 8 GB) [10]
8 GB DDR4-2400 SDRAM (1 x 8 GB) [10]
8 GB DDR4-2400 SDRAM (2 x 4 GB) [10]
4 GB DDR4-2400 SDRAM (1 x 4 GB) [10]

Maximum
32 GB DDR4-2400 SDRAM [10]

2 SODIMM
Both slots are customer accessible / upgradeable
DDR4 PC4 SODIMMS, system runs at 2133 (Intel 8th Gen CPU runs at 2400)
Supports Dual Channel Memory

10. Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

NETWORKING/COMMUNICATIONS

Wireless LAN (WLAN)
Realtek 802.11ac (1x1) WiFi® and Bluetooth® 4.2 Combo [11]
Realtek 802.11ac (2x2) WiFi® and Bluetooth® 4.2 Combo [11]
Intel® Dual Band Wireless-AC 3168 802.11 a/b/g/n/ac (1x1) WiFi® and Bluetooth® 4.2 Combo (non-vPro™) [11]
Intel® Dual Band Wireless-AC 8265 802.11a/b/g/n/ac (2x2) WiFi® and Bluetooth® 4.2 Combo (non-vPro™) [11]

Ethernet
Realtek RTL8111HSH Gigabit Ethernet

11. 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.

AUDIO/MULTIMEDIA

Audio
2 Integrated stereo speakers
Integrated dual array microphone

Features

Webcam
HD webcam [6,12]

6. HD content required to view HD images.
12. Internet access required.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

HP Premium Keyboard, full-sized, spill resistant with numeric keypad and optional backlit

Pointing Device
Clickpad with multi-touch gesture support image sensor, taps enabled as default

Buttons and Function Keys
Separate launch buttons provide easy access to wireless on/off and speaker mute. Function keys provide control of features including: standby mode, display brightness, external display, microphone mute, volume down, volume up, and backlight toggle for backlit keyboard (select models only).

Function Keys
ESC: system information
F1 - Display Switching
F2 - Blank
F3 - Brightness Down
F4 - Brightness Up
F5 - Speaker Mute
F6 - Volume Down
F7 – Volume Up
F8 - Mic Mute
F9 - Backlight Toggle (for backlit keyboard) or Blank
F10 - Blank
F11 - Wifi Toggle
F12 - Sleep

Hidden Fuctions
Fn+R = Break
Fn+S = Sys Rq
Fn+C = Scroll Lock

Gestures
Enabled by default Win 10
2 Finger Scrolling
2 Finger Zoom (Pinch)
OSD (enable/disable)
3 finger tap = Cortana
3 finger flick = App switch
4 finger tap = Action Center

Disabled by default Win 10
3 Finger Flick
2 Finger Rotate

Features

Momentum Motion
1 Finger Vertical Scroll

SOFTWARE AND SECURITY

BIOS

HP BIOSphere Gen4 [13]
HP DriveLock & Automatic DriveLock
BIOS Update via Network
Master Boot Record Security
Power On Authentication
Secure Erase [14]
Absolute Persistence Module [15]
Pre-boot Authentication

Software

HP Native Miracast Support [16]
HP LAN-Wireless Protection
HP Wireless Wakeup
HP Connection Optimizer
HP Velocity
HP 3D DriveGuard 6
HP ePrint + JetAdvantage [17]
HP Hotkey Support
HP Recovery Manager
HP Jumpstart
HP Support Assistant [18]
HP Noise Cancellation Software
Buy Office
Bing Search

Manageability Features

HP Driver Packs [19]
HP System Software Manager
HP BIOS Config Utility (BCU)
HP Client Catalog
HP Management Integration Kit for Microsoft System Center Configuration Manager [20]
LANDESK Management [21]

Client Security Software

HP Client Security Suite Gen3 [22] including:
HP Security Manager (including Credential Manager and Password Manager
HP DriveLock
HP Fingerprint Sensor
HP Password Manager [23]
Microsoft Defender [24]

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 8

Features

13. HP BIOSphere Gen4 requires Intel® 7th or 8th Generation processors.
14. Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88. Supported on Elite platforms with BIOS version F.03 or higher.
15. 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.
16. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming media players that also support Miracast. You can use Miracast to share what you're doing on your PC and present a slide show. For more information: http://windows.microsoft.com/en-us/windows-8/project-wireless-screen-miracast.
17. HP ePrint Drive requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see www.hp.com/go/eprintcenter). Print times and connection speeds may vary.
18. HP Support Assistant requires Windows and Internet access.
19. HP Driver Packs not preinstalled, however available for download at http://www.hp.com/go/clientmanagement.
20. HP Management Integration Kit can be downloaded from http://www8.hp.com/us/en/ads/clientmanagement/overview.html.
21. LANDESK Management subscription required.
22. HP Client Security Suite Gen3 requires Windows and Intel® or AMD 7th or 8th Generation processors.
23. HP Password Manager requires Internet Explorer or Chrome or FireFox. Some websites and applications may not be supported. User may need to enable or allow the add-on / extension in the internet browser.
24. Microsoft Defender Opt in and internet connection required for updates.

POWER

Power Supply

65 W HP Smart AC adapter [25]
65 W EM Smart AC adapter [25]

Battery

3-cell, 48 Wh Long Life Li-ion [26]

Power Cord

3-wire plug - 1m
3-wire plug - 1.8m

Battery life

Up to 14 hours and 15 mins (i3, HD with SSD) [27]
Up to 13 hours and 45 mins (i5 quad core, HD with SSD) [27]

25. Availability may vary by country.
26. Battery is internal and not replaceable by customer. Serviceable by warranty.
27. 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.

Features

WEIGHTS & DIMENSIONS

Weight
Starting at 5.5 lb [28]
Starting at 2.5 kg [28]

Dimensions (w x d x h)
14.8 x 10.4 x 0.82 in
41.38 x 27.6 x 2.25 cm

28. Weight will vary by configuration.

PORTS/SLOTS

Ports
1 USB 3.1 Type-C™
1 USB 2.0 (powered port)
2 USB 3.1 Gen 1
1 HDMI 1.4b [29]
1 RJ-45
1 VGA
1 AC power
1 headphone/microphone combo jack

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

29. HDMI cable sold separately.

SERVICE AND SUPPORT

Warranty
3 year and 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. 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 [30]

30. 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 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.

CERTIFICATION AND COMPLIANCE

Features

ENERGY STAR® certified
EPEAT® Gold [31]
Low halogen [32]

31. EPEAT® registered where applicable. EPEAT registration varies by country. 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.

32. External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)

Nominal Operating Voltage

19V

Average Operating Power

Win 10

Integrated graphics N/A

Discrete Graphics

8.89W

Max Operating Power	Discrete < 65W

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 6.0®	Selected models [33]
EPEAT	Registered Gold in United States [31]
ICES	Yes
Australia /	Yes
NZ A-Tick Compliance	Yes
CCC	Yes
Japan VCCI Compliance	
	Yes

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 12

Technical Specifications

KC	Yes
BSMI	Yes
CE Marking Compliance	
	Yes
BNCI or BELUS	Yes
CIT	Yes
GOST	Yes
Saudi Arabian Compliance (ICCP)	
	Yes
SABS	Yes
UKRSERTCOMPUTER	Yes

31. EPEAT® registered where applicable. EPEAT registration varies by country. 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 www.hp.com/go/options.

33. Configurations of the HP ProBook 470 G4 is ENERGY STAR® qualified are identified as HP ProBook 470 G4 ENERGY STAR on HP websites and on http://www.energystar.gov.

DISPLAYS

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

17.3" diagonal FHD UWVA anti-glare LED-backlit non-touch; 220 cd/m2; 45% sRGB (1920 x 1080)		
	Outline Dimensions (W x H x D)	400 x 233.3 (mm) max
	Active Area	381.89 x 214.81 (mm)
	Weight	550 g max
	Diagonal Size	17.3 (inch)
	Thickness	4.0 (mm) max
	Interface	eDP 1.3
	LCD Mode	IPS
	PPI	
	Surface Treatment	Anti-Glare (AG)
	Touch Enabled	None
	Contrast Ratio	600:1 (typical)
	Refresh Rate	60 Hz
	Brightness	300 nits
	Pixel Resolution	1920 x 1080 (FHD)
	Format	RGB
	Backlight	LED
	Color Gamut Coverage	72%
	Color Depth	6 bits + Hi FRC
	Viewing Angle	UWVA 85/85/85/85

Outline Dimensions (W x H x D)	398.6 x 251 (mm) max

Technical Specifications

17.3" diagonal HD+ anti-glare LED-backlit non-touch; 220 cd/m2; 45% sRGB (1600 x 900)		
Active Area	382.08 x 214.92 (mm)	
Weight	550 g max	
Diagonal Size	17.3 (inch)	
Thickness	4.0 (mm) max	
Interface	eDP 1.3	
LCD Mode	TN	
PPI		
Surface Treatment	Anti-Glare (AG)	
Touch Enabled	None	
Contrast Ratio	300:1 (typical)	
Refresh Rate	60 Hz	
Brightness	220 nits	
Pixel Resolution	1600 x 900 (HD+)	
Format	RGB	
Backlight	LED	
Color Gamut Coverage	60%	

STORAGE AND DRIVES

HARD DRIVES

500 GB 7200 rpm SATA Hard Drive			
Drive Weight	0.20 lbs (92 g) ~ 0.21 lbs (95 g)		
Rotation Speed	7200 rpm		
Cache Buffer	Up to 32 MB		
NAND Type/Size	N/A		
Height	0.28 in (7 mm)		
Width	2.75 in (69.85 mm)		
Interface	ATA-8, SATA 3.0		
Interface Transfer Rate	600 MB/s		
Seek Time	**Single Track**	2 ~ 1.5 ms	
	Average	11 ~ 13 ms	
	Maximum	18 ~ 22 ms	
Logical Blocks	976,773,168		
Operating Temperature	32° to 140° F (0° to 60° C) [top cover temp]		
Security Features	ATA Security		
Other Features	S.M.A.R.T., NCQ, Ultra DMA		

500 GB 5400 rpm SMART SATA Hybrid HDD/SSHD	
Drive Weight	0.20 lbs (92 g) ~ 0.21 lbs (95 g)
Rotation Speed	5400 rpm
Cache Buffer	64 MB
NAND Type/Size	TLC/8GB
Height	0.28 in (7 mm)

Technical Specifications

Width	2.75 in (69.85 mm)	
Interface	ATA-8, SATA 3.0	
Interface Transfer Rate	600 MB/s	
Seek Time	**Single Track**	2 ms
	Average	12 ms
	Maximum	22 ms
Logical Blocks	976,773,168	
Operating Temperature	32° to 140° F (0° to 60° C) [top cover temp]	
Security Features	ATA Security	
Other Features	S.M.A.R.T., NCQ, Ultra DMA	

1TB 5400 rpm SATA Hard Drive

Drive Weight	0.21 lbs (94 g)	
Rotation Speed	5400 rpm	
Cache Buffer	Up to 32 MB	
NAND Type/Size	N/A	
Height	0.28 in (7.2 mm)	
Width	2.75 in (69.85 mm)	
Interface	ATA-8, SATA 3.0	
Interface Transfer Rate	600 MB/s	
Seek Time	**Single Track**	2 ms
	Average	12 ~ 13 ms
	Maximum	18 ~ 22 ms
Logical Blocks	1,953,525,168	
Operating Temperature	32° to 140° F (0° to 60° C) [top cover temp]	
Security Features	ATA Security	
Other Features	S.M.A.R.T., NCQ, Ultra DMA	

SOLID STATE DRIVES

128GB 2280 M2 SATA-3 TLC Solid State Drive

Form Factor	M.2 2280
Capacity	127 GB
NAND Type	TLC
Height	0.09 in (2.3 mm)
Width	0.87 in (22 mm)
Weight	0.01 lb (6 g) ~ 0.02 lb (10 g)
Interface	ATA-8, SATA 3.0
Maximum Sequential Read	Up To 535 MB/s
Maximum Sequential Write	Up To 515 MB/s
Logical Blocks	250,069,680
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
Features	DIPM; TRIM; DEVSLP

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 15

Technical Specifications

256GB 2280 PCIe NVMe Value Solid State Drive	Form Factor	M.2 2280
	Capacity	256 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	Up To 1700 MB/s
	Maximum Sequential Write	Up To 600 MB/s
	Logical Blocks	500,118,192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	TRIM; L1.2

512GB 2280 M2 PCIe NVMe TLC Solid State Drive	Form Factor	M.2 2280
	Capacity	512 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	Up To 2600 MB/s
	Maximum Sequential Write	Up To 1400 MB/s
	Logical Blocks	1,000,215,216
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	TRIM; L1.2

NETWORKING/COMMUNICATIONS

WLAN

Intel 802.11 a/b/g/n/AC (2x2) WiFi and Bluetooth® Combo	**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

802.11b/g/n
- 2.402 – 2.482 GHz

802.11a/n
- 4.9 – 4.95 GHz (Japan)
- 5.15 – 5.25 GHz

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 16

Technical Specifications

	• 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 ~ MCS7, (1SS) (20MHz, 40MHz, and 80MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[1]	• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only
	• AES-CCMP: 128 bit in hardware
	• 802.1x authentication
	• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.
	• WPA2 certification
	• IEEE 802.11i
	• Cisco Certified Extensions, all versions through CCX4 and CCX Lite
	• WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 802.11b : +16dBm minimum
	• 802.11g : +14dBm minimum
	• 802.11a : +14dBm minimum
	• 802.11n HT20(2.4GHz) : +14dBm minimum
	• 802.11n HT40(2.4GHz) : +12dBm minimum
	• 802.11n HT20(5GHz) : +14dBm minimum
	• 802.11n HT40(5GHz) : +12dBm minimum
	• 802.11ac 80MHz(5GHz) : +11dBm minimum
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connect Standby: 10 mW (WLAN+BT) Radio disabled: 5 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display

Technical Specifications

	enclosure	
	Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230 : 2.8g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating	14° to 158° F (–10° to 70° C)
	Non-operating	–40° to 176° F (–40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED White – Radio ON	

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

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

Bluetooth Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	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
Electrical Interface	USB 2.0 compliant
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	ETS 300 328, ETS 300 826
Certifications	Low Voltage Directive IEC950
	UL, CSA, and CE Mark

Technical Specifications

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)	

Intel 802.11 a/b/g/n/AC (1x1) WiFi and Bluetooth® Combo[1]	**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 ~ MCS7, (1SS) (20MHz, 40MHz, and 80MHz)

Modulation

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

Security[3]

- IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only
- AES-CCMP: 128 bit in hardware
- 802.1x authentication
- WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.
- WPA2 certification
- IEEE 802.11i
- Cisco Certified Extensions, all versions through CCX4 and CCX Lite

Technical Specifications

	• WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 802.11b : +14dBm minimum • 802.11g : +12dBm minimum • 802.11a : +12dBm minimum • 802.11n HT20(2.4GHz) : +12dBm minimum • 802.11n HT40(2.4GHz) : +12dBm minimum • 802.11n HT20(5GHz) : +10dBm minimum • 802.11n HT40(5GHz) : +10dBm minimum • 802.11ac VHT80(5GHz) : +10dBm minimum
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connect Standby: 10 mW (WLAN+BT) Radio disabled: 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm
Weight	Type 2230 : 2.8g
Operating Voltage	3.3v +/- 9%
Temperature	Operating 14° to 158° F (−10° to 70° C) Non-operating −40° to 176° F (−40° to 80° C)
Humidity	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
Altitude	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED White – Radio ON

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

Technical Specifications

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

Bluetooth Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	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
Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported **Link Topology**	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	ETS 300 328, ETS 300 826
Certifications	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)

Wireless LAN Standards	IEEE 802.11a IEEE 802.11b

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 21

Technical Specifications

Realtek 802.11a/b/g/n/AC (2x2) WiFi and Bluetooth® 4.2 Combo [1]		IEEE 802.11g IEEE 802.11n IEEE 802.11ac
	Interoperability	Wi-Fi certified
	Frequency Band	802.11b/g/n

802.11b/g/n

- 2.402– 2.482 GHz

802.11a/n

- 5.15 – 4.95 GHz (Japan)
- 5.15 – 5.25 GHz
- 5.25 – 5.35 GHz
- 5.47 – 5.725 GHz
- 5.825 – 5.850 GHz

Data Rates
802.11b: 1, 2, 5.5, 11 Mbps
802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)
802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)

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

Security[1]
- IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only
- AES-CCMP: 128 bit in hardware
- 802.1x authentication
- WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.
- WPA2 certification
- IEEE 802.11i
- Cisco Certified Extensions, all versions through CCX4 and CCX Lite
- WAPI

Network Architecture Models
Ad-hoc (Peer to Peer)
Infrastructure (Access Point Required)

Roaming
IEEE 802.11 compliant roaming between access points

Output Power[2]
- 802.11b : +16dBm minimum
- 802.11g : +14dBm minimum
- 802.11a : +14dBm minimum
- 802.11n HT20(2.4GHz) : +13dBm minimum
- 802.11n HT40(2.4GHz) : +13dBm minimum
- 802.11n HT20(5GHz) : +12dBm minimum
- 802.11n HT40(5GHz) : +12dBm 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

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 22

Technical Specifications

Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm maximum 802.11a, 6Mbps : -86dBm maximum 802.11a, 54Mbps : -72dBm maximum 802.11n, MCS07 : -69dBm maximum 802.11n, MCS15 : -66dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded 2.4 GHz antennas are provided to the card to support WLAN and Bluetooth communications (Support Dual antenna or Single antenna, depend on platform requirement)
Form Factor	PCI-Express M.2 MiniCard
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm
Weight	Type 2230 : 2.8g
Operating Voltage	3.3v +/- 9%

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

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

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

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

Technical Specifications

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
Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported **Link Topology**	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	ETS 300 328, ETS 300 826
Certifications	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)

Realtek 802.11a/b/g/n/ac (1x1) WiFi and Bluetooth® 4.2 Combo [1]	**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

- 5.15 – 4.95 GHz (Japan)
- 5.15 – 5.25 GHz
- 5.25 – 5.35 GHz
- 5.47 – 5.725 GHz
- 5.825 – 5.850 GHz

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 24

Technical Specifications

Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM,
Security[1]	• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 802.11b : +14dBm minimum • 802.11g : +12dBm minimum • 802.11a : +12dBm minimum • 802.11n HT20(2.4GHz) : +12dBm minimum • 802.11n HT40(2.4GHz) : +12dBm minimum • 802.11n HT20(5GHz) : +10dBm minimum • 802.11n HT40(5GHz) : +10dBm minimum • 802.11ac VHT80(5GHz) : +10dBm minimum
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 and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure

Technical Specifications

		Two embedded 2.4 GHz antennas are provided to the card to support WLAN and Bluetooth communications (Support Dual antenna or Single antenna, depend on platform requirement)
Form Factor		PCI-Express M.2 MiniCard
Dimensions		Type 2230 : 2.3 x 22.0 x 30.0 mm
Weight		Type 2230 : 2.8g
Operating Voltage		3.3v +/- 9%
Temperature	**Operating**	14° to 158° F (−10° to 70° C)
	Non-operating	−40° to 176° F (−40° to 80° C)
Humidity	**Operating**	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	**Operating**	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity		LED Amber – Radio OFF; LED White – Radio ON

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

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

Bluetooth Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	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
Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported Link Topology	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	ETS 300 328, ETS 300 826

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 26

Technical Specifications

Certifications	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)

POWER

HP 65W AC Adapter, nPFC 3Pin RC 4.5mm	**Dimensions**	4.25 x 1.85 x 1.47 in (10.8 x 4.7 x 3.74 cm)	
	Weight	1.81 lb (250g) max	
	Input	100 to 240 VAC	
		Input Efficiency	88% min at 115 VAC and 89% min at 230 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC
	Output	**Output power**	65W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
	Connector	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords	
	Environmental Design	**Operating temperature**	32° to 104° F (0° to 40° C)
		Non-operating (storage) temperature	-4° to 149° F (-20° to 65° C)
		Altitude	0 to 10,000 ft (0 to 3,048 m)
		Humidity	20% to 80%
		Storage Humidity	10% to 90%
		*CE Mark - full compliance with LVD and EMC directives	

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 27

Technical Specifications

	EMI and Safety Certifications	* 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.	

65W 3-prong AC Adapter (EM Model)	**Dimensions**	102x55x30mm	
	Weight	270g +/- 10g	
	Input	Input Efficiency	87% min at 115V/230V
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC and maximum load
	Output	DC output	65W(19.5V/3.33A)
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
	Connector	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords	
	Environmental Design	**Operating temperature**	0° to 35° C
		Non-operating (storage) temperature	-20° to 85° C
		Altitude	0 to 5,000 m
		Humidity	0% to 95%
		Storage Humidity	0% to 95%
	Safety Certifications	CE Mark - 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; Reliability - failure rate of less than 0.1% annually within the first three years of operation.	

HP 3-cell, Long Life 48 WHr Li-ion	**Dimensions** (H x W x L)	7.0. x180.48x88.95 mm (0.273 x 7.09 x 3.49 inch)	
	Weight	0.22 kg (0.48lb)	
	Cells/Type	3cell Lithium-Ion	
	Energy	**Voltage**	11.4V/ 10.95V
		Amp-hour capacity	4.212Ah /4.385Ah
		Watt-hour capacity	48Wh
	Temperature	**Operating (Charging)**	32˚ to 113˚ F (0˚ to 45˚ C)
		Operating (Discharging)	14˚ to 122˚ F (-10˚ to 60˚ C)
		Non-operating	-4˚ to 122˚ F (-20˚ to 60˚ C)
	Battery Re-Charge Time	**System in OFF or Standby Mode**	<3 hours

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 28

Technical Specifications

Fuel Gauge LED	No
Warranty	1-year*
Optional Travel Battery Available	No

*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.

Country of Origin

China

Not all configuration components are available in all regions/countries.
c05572890 — DA 16006– Worldwide — Version 3 — September 7, 2017

Page 29

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

Type	Description	Part Number
Docking	HP Essential Backpack	H1D24AA
	HP Essential Messenger Case	H1D25AA
	HP 3005pr USB3 Port Replicator	Y4H06AA
	HP Thunderbolt Dock 120W G2	TBD
	HP USB-C Travel Dock	T0K29AA
	HP USB Travel Dock	T0K30AA
	HP Elite USB-C Docking Station	X7W54AA
	HP Elite USB-C Dock	Z9R42AA
	HP Elite USB-C Dock G3	2DW60AA
	HP USB-C Mini Dock	1PM64AA
	HP USB-C Universal Dock	1MK33AA
Input/Output	HP Slim USB Keyboard and Mouse	T6T83AA
	HP Slim Wireless Keyboard and Mouse	T6L04AA
	HP Ultra Mobile Wireless Mouse	H6F25AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP 3-Button USB Laser Mouse	H4B81AA
	HP USB Travel Mouse	G1K28AA
	HP HDMI to DVI Adapter	F5A28AA
	HP USB-C to DP	N9K78AA
	HP USB-C to USB-A Hub	Z6A00AA
	HP Stereo 3.5mm Headset	T1A66AA
	HP Stereo USB Headset	T1A67AA
Memory	HP 4GB 2400MHz DDR4 Memory	Z4Y84AA
	HP 8GB 2400MHz DDR4 Memory	Z4Y85AA
	HP 16GB 2400MHz DDR4 Memory	Z4Y86AA
Power	HP 45W Smart AC Adapter 4.5mm	H6Y88AA
	HP 65W Smart AC Adapter	H6Y89AA
	HP 65W Slim AC Adapter	H6Y82AA
	HP 45W USB-C Power Adapter	1HE07AA
	HP 65W USB-C Power Adapter	1HE08AA
	HP Notebook Power Bank	N9F71AA
	HP USB-C Notebook Power Bank	1TZ86AA
Storage	HP External USB Optical Drive	F2B56AA
	HP 500GB 7200rpm HDD	F3B97AA
	HP External Portable USB3.0 HDD	K6A93AA
	HP 256GB Value 2280 M.2 SATA-3 SSD	1DE47AA
	HP 512GB TLC PCI-e 3x4 NVME 2280 M.2 SSD	1FU88AA
Security	HP Essential Combination Lock	T0Y16AA
	HP Combination Lock	T0Y15AA
	HP Keyed Cable lock	T0Y14AA
	HP Keyed Cable Lock 10mm	T1A62AA

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

	HP Conferencing Keyboard	K8P74AA
	HP USB Collaboration Keyboard	Z9N38AA
	HP Wireless Collaboration Keyboard	Z9N39AA
UCC	HP UC Wireless Mono Headset	W3K08AA
	HP UC Wireless Duo Headset	W3K09AA
	HP UC Speaker Phone	K7V16AA
	HP UC Wired Headset	K7V17AA
Displays	HP EliteDisplay S140u USB Portable Monitor	G8R65AA
	HP ProDisplay P240VA 23.8-inch Monitor	N3H14AA
	HP ProDisplay P232 23-inch Monitor	K7X31AA
	HP ProDisplay P223 21.5-inch Monitor	X7R61AA
	HP EliteDisplay E230t 23-inch Touch Monitor	W2Z50AA
	HP EliteDisplay E240c 23.8-inch Collaboration Monitor	M1P00A8

Summary of Changes

Date of change:	Version History:		Description of change:
August 22, 2017	From V1 to V2	Update	Change battery life information TBD
September 7, 2017	From V2 to V3	Update	Change battery life information to current