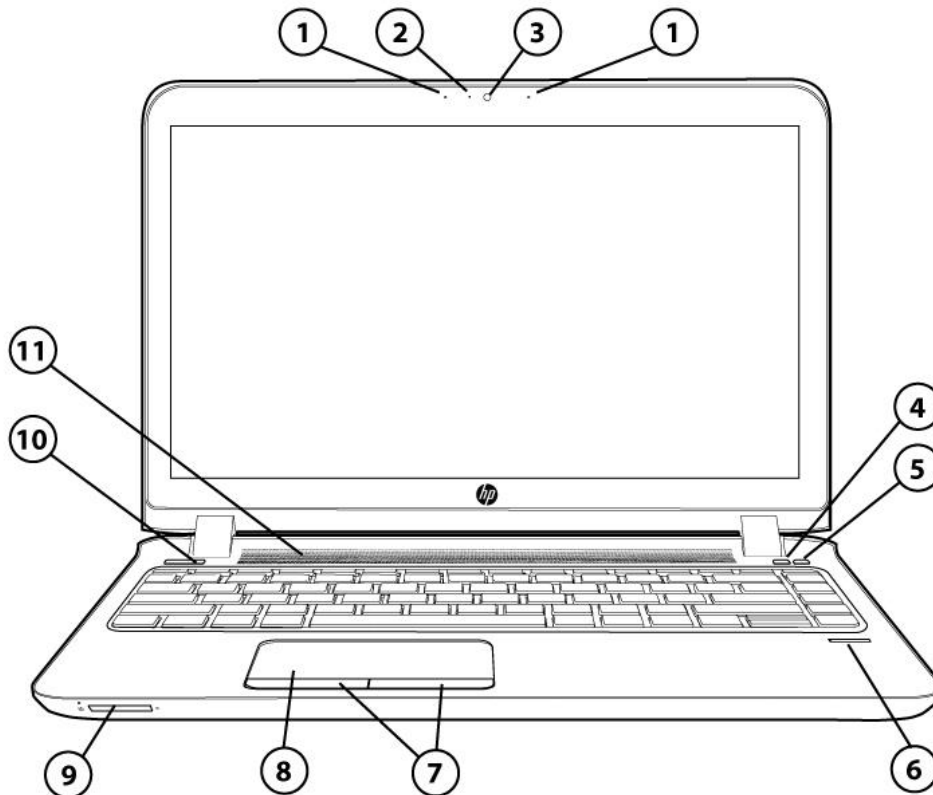


QuickSpecs

Overview

HP ProBook 455 G3 Notebook PC



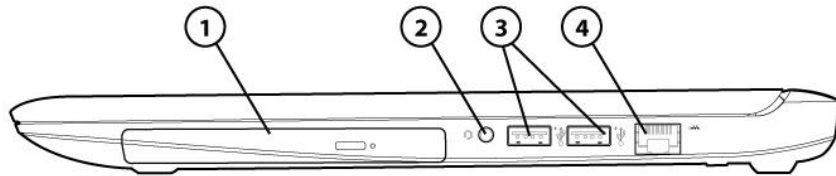
Front

- | | |
|---------------------------|--------------------------|
| 1. Microphones (2) | 7. Touchpad pick buttons |
| 2. Webcam light | 8. Touchpad |
| 3. Webcam | 9. SD Card reader |
| 4. Wireless on/off button | 10. Power button |
| 5. Speaker mute button | 11. Speaker array |
| 6. Fingerprint reader | |



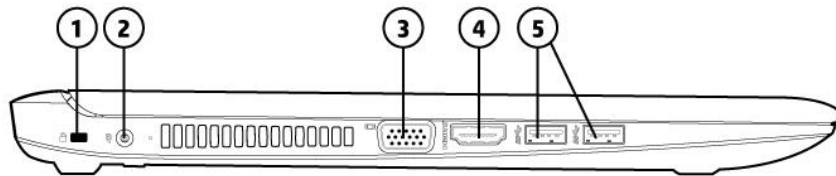
QuickSpecs

Overview



Right

- | | |
|------------------------------------|-------------------------|
| 1. Optical drive | 3. USB 2.0 ports (2) |
| 2. Headphone/Microphone combo jack | 4. RJ-45 /Ethernet port |



Left

- | | |
|------------------------------|----------------------|
| 1. Security lock slot | 4. HDMI port |
| 2. Power connector | 5. USB 3.0 ports (2) |
| 3. External VGA monitor port | |



QuickSpecs

Overview

AT A GLANCE

- Windows 10 versions, Windows 8.1 versions, Windows 7 versions, or FreeDOS 2.0
- Durable multi-layer soft touch painted LCD cover and brushed aluminum keyboard deck that keeps system looking good longer
- Choose from AMD APUs (Accelerated Processing Unit) with Radeon™ Graphics
- Weight starting at 4.74 lbs (2.15 kg)
- 15.6" diagonal HD Anti-glare LED-backlit (1366 x 768) display
- Storage options up to 1 TB Hard Drive
- Memory options up to 16 GB
- Full size HP Premium Keyboard, spill-resistant keyboard with a thin layer of Mylar film to prevent minor spills; full separate numeric keypad
- Larger Touchpad with gestures support, on/off button with LED indicator
- HDMI port for connecting to high-resolution displays on select models
- HP Webcam (front-facing) with integrated speakers
- Enhanced security features including HP TouchPoint Manager, HP Security Manager and optional HP Fingerprint Reader and TPM
- HP 3D DriveGuard helps protect critical information while you're on the move.
- DTS Studio Sound™ optimized for high fidelity audio
- Passed MIL-STD testing¹
- Battery life up to 9 hours and 15 minutes
- Supports a broad range of wireless options:
 - Realtek 802.11 b/g/n (1x1)
 - Broadcom 802.11 b/g/n (1x1) + Bluetooth® Combo
 - Broadcom 802.11 a/b/g/n (2x2) + Bluetooth® Combo

1. MIL STD 810G testing is not intended to demonstrate fitness for U.S. Department of Defense contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Damage under the MIL STD test conditions or any 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.



Features

PRODUCT NAME

HP ProBook 455 G3 Notebook PC

OPERATING SYSTEM

Preinstalled

Windows 10 Pro 64¹
Windows 10 Home 64¹
Windows 8.1 Pro 64¹
Windows 8.1 64¹
Windows 7 Professional 64 (available through downgrade rights from Windows 10 Pro)²
Windows 7 Professional 64 (available through downgrade rights from Windows 8.1 Pro)³
Windows 7 Professional 64¹
FreeDOS 2.0

Web only supported

Windows 7 Professional 32¹
Windows 10 Enterprise 64¹
Windows 8.1 Enterprise 64¹
Windows 7 Enterprise 64¹
Windows 7 Enterprise 32¹

1. Not all features are available in all editions or versions of Windows 10. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows 10 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.microsoft.com>
2. This system is preinstalled with Windows 7 Professional software and also comes with a license and media for Windows 10 Professional software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.
3. This system is preinstalled with Windows 7 Pro software and also comes with a license and media for Windows 8.1 Pro software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data

APUs (ACCELERATED PROCESSING UNIT)

AMD A10-8700P APU with Radeon™ R6 Graphics, Quad Cores, 3.2 GHz/1.8 GHz, 2 MB L2 Cache¹

AMD A8-7410 APU with Radeon™ R5 Graphics, Quad Cores, 2.5 GHz/2.2 GHz, 2 MB L2 Cache²

AMD A4-7210 APU with Radeon™ R3 Graphics, Quad Cores, 2.2 GHz/1.8 GHz, 2 MB L2 Cache³

1. This system requires a separately purchased 64-bit operating system and 64-bit software products to take advantage of the 64-bit processing capabilities of AMD technology. Multi-core processing with AMD technology is designed to improve performance of this system. Given the wide range of SW applications available, performance will vary. AMD's numbering is not a measurement of clock speed.

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

GRAPHICS



Not all configuration components are available in all regions/countries.
Americas – HP ProBook 455 G3 – April 2016 - c04797413

Features

Integrated UMA Graphics

AMD A10-8700P APU with Radeon™ R6 Graphics

AMD A8-7410 APU with Radeon™ R5 Graphics

AMD A4-7210 APU with Radeon™ R3 Graphics

DISPLAY

Internal

15.6" diagonal HD¹ Anti-glare LED-backlit (1366 x 768)

External

Up to 32-bit per pixel color depth

VGA²

Port supports resolutions up to 2048 x 1536 @ 60 Hz

HDMI²

v1.4 (HDMI cable sold separately.)

1. HD content required to view HD images.
2. Available on A4 and A8 APUs only. Supports either VGA or HDMI. Cannot support both VGA and HDMI simultaneously.

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

STORAGE AND DRIVES

Primary Storage Bay

Hard Drives

SATA, 7mm/9.5mm, 2.5" Hard Drives

500 GB - 7200 RPM Hard Drive

1 TB - 5400 RPM Hard Drive

HP 3D DriveGuard (Windows only)

The hard drive is mounted directly to the notebook frame, reducing the transmission of shock to the hard drive

NOTE: For hard drives, GB = 1 billion bytes. Actual formatted capacity is less.

Up to 30 GB (for Windows 10 and Windows 8.1) of system disk is reserved for the system recovery software.

MEMORY

Standard

Two SODIMM slots

Both slots are customer accessible / upgradeable

Supports Single Channel Memory

DDR3L-1600 (Transfer rates up to 1600 MT/s)

4096 MB Total System Memory (4096 MB x 1)

8192 MB Total System Memory (4096 MB x 2) (Single Channel)

8192 MB Total System Memory (8192 MB x 1)

12288 MB Total System Memory (8192 MB + 4096 MB) (Single Channel)

16384 MB Total System Memory (8192 MB x 2) (Single Channel)



Features

Maximum

16384 MB in slots 1 and 2

NOTE: 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

WLAN

Realtek 802.11 b/g/n (1x1)¹

Broadcom 802.11 b/g/n (1x1) + Bluetooth® Combo^{1,2}

Broadcom 802.11 a/b/g/n (2x2) + Bluetooth® Combo^{1,2}

1. Wireless access point and Internet service required and sold separately.

Availability of public wireless access points limited.

2. Sold separately or as an optional feature.

3. Bluetooth® 4.0 is only supported via Combo card.

Communications

Integrated Ethernet 10/100/1000 (Gigabit) NIC

AUDIO/MULTIMEDIA

Audio

HD Audio with DTS Studio Sound™

Integrated microphone (Mono on non-webcam models only)

Integrated microphone (Dual Array on webcam models only)

2 Stereo Speakers

Function keys for microphone mute, volume up, volume down

Stereo Audio-out (headphone)/Audio-in(microphone)

Optional Webcam^{1,2}

HP Camera (720p HD)³

1. Sold separately or as an optional feature.

2. Internet access required.

3. HD content required to view HD images.

KEYBOARDS/POINTING DEVICES

HP Premium Keyboard

The HP spill-resistant keyboard is designed using a thin layer of Mylar film under the keyboard. The 101/102-key compatible keyboard features a full-pitch key layout with desktop keyboard features, such as editing keys, both left and right control and alt keys, and function keys. US and International key layouts are available. Includes a separate numeric keypad. Backlit keyboard available as an option.

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



Features

toggle for backlit keyboard (select models only).

Function Keys

ESC: system information

F1 - Sleep

F2 - Blank

F3 - Backlight Toggle (for backlit keyboard) or Blank

F4 - Display Switching

F5 - brightness down

F6 - brightness up

F7 - Blank

F8 - Volume Down

F9 - Volume Up

F10 - Mic Mute

F11 - Blank

F12 - Blank

Hidden Functions

o Fn+R --> Break

o Fn+S --> Sys Rq

o Fn+C --> Scroll Lock

TouchPad

On/off button (on board)

Taps enabled as default

Gestures

Enabled by default

2 Finger Scrolling

2 Finger Zoom (Pinch)

OSD (enable/disable)

Win 8 2 Finger tap = right click

Win 8 Edge Swipes

Disabled by default

3 Finger Flick

2 Finger Rotate

Momentum Motion

1 Finger Vertical Scroll

SOFTWARE AND SECURITY

Preinstalled Software

BIOS

HP BIOSphere¹

HP DriveLock | HP Automatic DriveLock

HP BIOS Protection²

Master Boot Record Security

Power On Authentication



Features

Pre-Boot Security

Secure Erase³

Hybrid Boot (Windows 8.1 & later)

Measure Boot (Windows 8.1 & later)

Secure Boot (Windows 8.1 & later)

Absolute Persistence Module⁴

Multi Media

Cyberlink Power DVD, BD

Cyberlink Power2Go (Secure Burn)

Cyberlink YouCam BE (Windows 7 only)

Communication

HP GPS and Location (Windows 7 only)⁵

HP Connection Manager with support for HP Mobile Connect (Windows 7 only)⁶

HP Mobile Connect (Windows 8.1 & later)⁶

Native Miracast Support⁸

HP Value Add Software

HP 3D DriveGuard

HP ePrint Driver⁹

HP Hotkey

HP Recovery Manager

HP Recovery Disc Creator

HP Unified Recovery Manager (Windows 8.1 and 10 only)

HP Registration App (Windows 8.1 & later)

HP Support Assistant

HP Noise Reduction Software

HP Pixel Sharp

3rd Party

Foxit PhantomPDF Express for HP

Microsoft Products

Buy Office

Bing Search

Skype¹⁰

Manageability

HP Driver Packs¹¹

HP SoftPaq Download Manager (SDM)

HP System Software Manager (SSM)¹¹



Features

HP BIOS Config Utility (BCU)¹¹
HP Client Catalog¹¹
HP CIK for Microsoft SCCM¹¹
LANDESK Management¹²

For more information on HP Client Management Solutions refer to: <http://www.hp.com/go/clientmanagement>.

Client Security Software

Absolute Persistence Module
HP Drive Encryption¹³
HP Security Manager
Microsoft Security Essentials¹⁴
Microsoft Defender

Security

Pre-boot Authentication
Security lock slot (Lock sold separately.)
Optional¹⁵ Fingerprint Reader
TPM

NOTE: The Absolute Persistence agent is shipped turned off, and must be activated by customers when they purchase a subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S.

For more information on HP Client Security Software Suite, refer to <http://www.hp.com/go/clientsecurity>.

1. Available only on business PCs with HP BIOS.
2. May require a manual recovery step if all copies of BIOS are compromised or deleted.
3. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88.
4. 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.
5. GPS access requires an unobstructed path to multiple satellites. Performance may be affected if/when used inside of buildings, bridges or heavily congested metropolitan areas. Requires separately purchased GPS navigation software available from multiple GPS applications.
- 7 HP Mobile Connect is only available on preconfigured devices with WWAN. For geographic availability refer to www.hp.com/go/mobileconnect
8. 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>
9. 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). Requires optional broadband module. Broadband use requires separately



Features

purchased service contract. Check with service provider for coverage and availability in your area.

Separately purchased data plans or usage fees may apply. Print times and connection speeds may vary.

10. Skype is not offered in China.

11. Not preinstalled, however available on manageability website.

12. Subscription required.

13. Data is protected prior to Drive Encryption login. Turning the PC off or into hibernate logs out of Drive Encryption and prevents data access.

14. Opt in and internet connection required for updates.

15. Sold separately or as an optional feature.

POWER

Power Supply

Models with integrated graphics

HP 45W Smart AC Adapter

Power cord included is 1.8 m (+/- 0.1 m) or 1.0 m (+/- 0.1 m).

Total length including external AC adapter is 12 feet (3.66 meter).

Batteries

HP 4 cell (44 WHr) Lithium-Ion Battery

Optional HP 6 cell (55 WHr) Long Life Lithium-Ion Battery¹

1. Sold separately or as an optional feature.

Battery Life

Memory/OS	Battery	UMA Graphics	Discrete Graphics
DDR3/Windows 8.1	4 cell (44 Whr)	Up to 7 hrs 15 mins ¹	Up to 7 hrs 30 mins ¹
DDR3/Windows 8.1	6 cell (55 Whr)	Up to 9 hrs 15 mins ¹	Up to 9 hrs 15 mins ¹

1. Windows 8.1 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.

System Standby Time

TBD

WEIGHTS & DIMENSIONS

Weight¹

Starting at 4.74 lbs (2.15 kg)

(No-ODD, 4 (44 Whr) cell Battery)

Other Weights¹

4.98lb/2.26kg ODD, 4 cell Battery



Features

5.00lb/2.27kg	No-ODD, 6 cell Battery
5.25lb/2.38kg	ODD, 6 cell Battery

1. Weight varies by configuration and components.

Dimensions (w x d x h)

14.88 x 10.41 x 0.94 in (Front) – 0.98 (at rear)

37.80 x 26.43 x 2.38 cm (Front) – 2.48 (at rear)

NOTE: Height varies depending upon where on the notebook the measurement is made.

PORTS/SLOTS

Ports

2 USB 3.0 Ports

2 USB 2.0 Ports

1 HDMI

1 VGA

1 RJ-45 /Ethernet

1 Headphone/Microphone Combo Jack

1 Power Adapter connector

NOTE: All cables are sold separately.

Media Reader Slot

Support SD/SDHC/SDXC

Push-Push Insertion/Removal

SERVICE AND SUPPORT

Services offers limited 3-year, 1-year and 90-day warranty options depending on country.

1-year limited warranty on primary battery. On-site service and optional extended service contracts are also available.

Optional¹ HP Services² are extended service contracts which go beyond your standard limited warranties. For more details visit: <http://www.hp.com/go/lookuptool>.

1. Sold separately or as an optional feature.
2. 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. 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. 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>.



Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	19.5V
	Average Operating Power	21W
	Max Operating Power	Discrete < 65W UMA < 45W
Temperature	Operating	32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)
	Non-operating	-4° to 140° F (-20° to 60° C)
Relative Humidity	Operating	10% to 90%, non-condensing
	Non-operating	5% to 95%, 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	UL	Yes
Certifications	CSA	Yes
	FCC Compliance	Yes
	ENERGY STAR®	Select models*
	EPEAT®	Registered Gold in United States**
	ICES	Yes
	Australia / NZ A-Tick Compliance	Yes
	CCC	Yes
	Japan VCCI Compliance	Yes



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

* Configurations of the HP ProBook 455 G3 that are ENERGY STAR qualified are identified as HP ProBook 455 G3 ENERGY STAR on HP websites and on www.energystar.gov.

** EPEAT registration varies by country. See www.epeat.net for registration status by country. EPEAT status listed above applies to U.S.

For accessibility information on HP products, please visit: <http://www.hp.com/accessibility>.

DISPLAYS

15.6-inch diagonal LED HD (1366 x 768) anti-glare	Dimensions (W x H)	14.17 x 8.83 in (36.0 x 22.43 cm)		
	Weight	500g max.		
	Diagonal Size	15.6 in (39.6cm)		
	Surface Treatment	Anti-glare		
	Contrast Ratio	400:1 (min)		
	Refresh Rate	60 Hz		
	Brightness	200 nit (typical)		
	Pixel Resolution	Pitch	0.252 mm	
		Format	1366 x 768	
		Configuration	RGB Stripe	
	Backlight	LED		
	PPI	106 ppi		
	Viewing Angle	±30° Horizontal, ±10° Vertical (minimum) 30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)		



Technical Specifications

STORAGE AND DRIVES

500 GB* 7200 rpm SATA Hard Drive	Drive Weight	0.25 lbs (115g)	
	Capacity	500 GB	
	Height	0.276 in (7 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum) 300 MB/s (Drive Capability)	
	Seek Time (typical reads, including settling)	Single Track	1.5 ms
		Average	11 ms
		Maximum	22 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
Features	ATA Security		

1 TB* 5400 rpm SATA Hard Drive	Drive Weight	0.254 lb (115 g)	
	Capacity	1 TB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum) 300 MB/s (Drive Capability)	
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	1,953,525,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
Features	ATA Security		

*For hard drives, GB = 1 billion bytes. Actual formatted capacity is less.

Up to 30 GB (for Windows 10 and Windows 8.1) of system disk is reserved for the system recovery software.

NETWORKING/COMMUNICATIONS

Realtek 802.11 b/g/n (1x1)

Wireless LAN Standards	IEEE 802.11b
	IEEE 802.11g
	IEEE 802.11n



Technical Specifications

Interoperability	Wi-Fi certified
Frequency Band	802.11b/g/n <ul style="list-style-type: none">2.402 – 2.482 GHz <p>Note: 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.</p>
Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: MCS 0 ~ MCS 07, (20MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM,
Security¹	<ul style="list-style-type: none">IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode onlyAES-CCMP: 128 bit in hardware802.1x authenticationWPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.WPA2 certificationIEEE 802.11iCisco Certified Extensions, all versions through CCX4 and CCX LiteWAPI
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 : +16dBm minimum802.11g : +14dBm minimum802.11a : +14dBm minimum802.11n HT20(2.4GHz) : +13dBm minimum802.11n HT40(2.4GHz) : +13dBm minimum802.11n HT20(5GHz) : +12dBm minimum802.11n HT40(5GHz) : +12dBm minimum
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated)



Technical Specifications

	Idle mode: 60 mW (WLAN unassociated)
	Radio disabled: 30 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity³	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 Or Type 1630 : 2.3 x 16.0 x 30.0 mm
Weight	Type 2230 : 2.8g Or Type 1630 : 2g
Operating Voltage	3.3v +/- 9%
Temperature	Operating Non-operating



Technical Specifications

Humidity	Operating Non-operating
Altitude	Operating Non-operating
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).

Broadcom 802.11 b/g/n (1x1) + Bluetooth® Combo

Wireless LAN Standards	IEEE 802.11b IEEE 802.11g IEEE 802.11n
Interoperability	Wi-Fi certified
Frequency Band	802.11b/g/n <ul style="list-style-type: none">• 2.402 – 2.482 GHz <p>Note: 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.</p>
Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: MCS 0 ~ MCS 07, (20MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM,
Security¹	<ul style="list-style-type: none">• 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

Network Architecture Models	<ul style="list-style-type: none"> WAPI 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 : +16dBm minimum 802.11g : +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: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 60 mW (WLAN unassociated) Radio disabled: 30 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity³	802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm 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 antennas for 2.4GHz 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



Technical Specifications

	Or	
	Type 1630 :	2.3 x 16.0 x 30.0 mm
Weight	Type 2230 :	2.8g
	Or	
	Type 1630 :	2g
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+EDR Wireless Technology

Bluetooth Specification	4.0+EDR Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	79 (1 MHz) available channels
Data Rates and Throughput	3 Mbps data rate; throughput up to 2.17 Mbps
	Synchronous Connection Oriented links up to 3, 64 kbps, voice channels
	Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric



Technical Specifications

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.												
Receiver Sensitivity	<table border="1"> <thead> <tr> <th>Modulation</th> <th>0.01% BER</th> <th>0.001% BER</th> </tr> </thead> <tbody> <tr> <td>GFSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> <tr> <td>$\pi/4$-DQPSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> <tr> <td>8DPSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> </tbody> </table>	Modulation	0.01% BER	0.001% BER	GFSK	-80 dBm	-70 dBm	$\pi/4$ -DQPSK	-80 dBm	-70 dBm	8DPSK	-80 dBm	-70 dBm
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8DPSK	-80 dBm	-70 dBm											
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW												
Range	Up to 33 ft (10 m)												
Electrical Interface	USB 2.0 compliant												
Bluetooth Software Supported	Microsoft Windows Bluetooth Software												
Link Topology													
Electrical Interface	Point to Point, Multipoint Pico Nets up to 7 slaves												
Bluetooth Software Supported	Full support of Bluetooth Security Provisions												
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Power Management	Microsoft Windows ACPI, and USB Bus Support												
Power Management	Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff												
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Bluetooth Profiles Supported	Serial Port Profile (SPP) ¹ Service Discovery Application Profile (SDAP)												



Technical Specifications

Dial-Up Networking (DUN)^{1,2}
Generic Object Exchange Profile (GOEP)^{1,2}
Object Push Profile (OPP)^{1,2}
File Transfer Profile (FTP)
Synchronization Profile (SYNC)
Hard Copy Cable Replacement (HCRP)^{1,2}
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Human Interface Device Profile (HID)^{1,2}
FAX Profile (FAX)
Basic Imaging Profile (BIP)²
Headset Profile (HSP)
Hands Free Profile (HFP)
Advanced Audio Distribution Profile (A2DP)

Broadcom 802.11 a/b/g/n (2x2) + Bluetooth® Combo

Wireless LAN Standards

IEEE 802.11a
IEEE 802.11b
IEEE 802.11g
IEEE 802.11n

Interoperability

Wi-Fi certified

Frequency Band

802.11b/g/n

- 2.402 – 2.482 GHz

Note:

The FCC has declared as of January 1, 2015 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.

802.11a

- 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

Note:

Indonesia only supports 5.725 - 5.825 GHz (CH149 - CH161)



Technical Specifications

Antenna Structure	2 transmit; 2 receive (2x2)
Data Rates	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)
Modulation	Direct Sequence Spread Spectrum CCK, BPSK, QPSK, 16-QAM, 64-QAM
Security¹	<ul style="list-style-type: none">• 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
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between band Access Points
Output Power²	<ul style="list-style-type: none">• 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: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 60 mW (WLAN unassociated) Radio disabled: 30 mW



Technical Specifications

Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity³	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 dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO and Bluetooth communications	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm Or Type 1630 : 2.3 x 16.0 x 30.0 mm	
Weight	Type 2230 : 2.8g Or Type 1630 : 2g	
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	

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Technical Specifications

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	Headset Profile (HSP)
	Hands Free Profile (HFP)
	Advanced Audio Distribution Profile (A2DP)

Realtek Ethernet (10/100/1000)

Ethernet Features

10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)
 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)
 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40)
 Auto-Negotiation (Automatic Speed Selection)
 Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s
 IEEE 802.1p QoS (Quality of Service) Support
 IEEE 802.1q VLAN support
 IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable)
 IEEE 802.3az EEE (Energy Efficient Ethernet)
 Jumbo Frame 9K
 Auto MDI/MDIX Crossover cable detection



Technical Specifications

Power Management	ACPI compliant - multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
Performance Features	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling
Manageability	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
Interface	PCI Express 1.1 to fully support ASPM L0s/L1 and CLKREQ
NIC Device Driver Name	Realtek PCIe GBE Ethernet Family Controller

AUDIO/MULTIMEDIA

DTS Studio Sound™

Hardware	Implementation	Conexant
	Function Key Volume Controls	Volume up, volume down, and mute
	Full Duplex	Yes
	Microphone In	Stereo
	Headphone/Line Out	Stereo
	Integrated Microphone	Yes, dual digital microphone array
Audio Output Quality	Frequency Response	20Hz – 20kHz
	Signal to Noise Ratio	106 dB (DAC), 102dB (ADC)
	Total Harmonic Distortion	91dB THD+n on Line Out/HP (0.003%)



Technical Specifications

	Play Sampling Rate(s)	Up to 192kHz
	Record Sampling Rate(s)	Up to 96Khz
	DAC	16, 20 or 24-bit
	ADC	16, 20 or 24-bit
Integrated Stereo Speakers	Power Rating	2 Watts
	Impedance	4 Ohms

SECURITY

HP Validity VFM 495 Fingerprint Reader (optional)

Mobile Voltage Operation	3.0V-3.6V Single Supply
Operating Temperature	32° – 158°F (0° – 70°C)
Current Consumption @ 3.3V	Less than 70 mA peak imaging and scrolling Less than 25 mA hardware finger detection Advanced Power Management
High-Rate Image Capture	Up to 240 image frames /sec
ESD Resistance	IEC 61000-4-2 Level 4 (±15KV)
Detection Matrix	200 pixel wide fingerprint image 16.5 mm x 3 mm sensor area 508 dpi resolution, 256 levels of grayscale

POWER

HP 45W Smart AC Adapter

Dimensions	3.74 x 1.57 x 1.04 in (9.5 x 4.0 x 2.65 cm)
Weight	0.386 lb (175g) max
Input	90 to 265 VAC
	Input Efficiency 87.74% at 115Vac and 88.4% at 230Vac
	Input frequency range 47 to 63 Hz
	Input AC current 1.4 A at 90 VAC
Output	Output power 45W
	DC output 19.5V



Technical Specifications

	Hold-up time	5 msec at 115 VAC input
	Output current limit	<8.0A
	Over voltage protection	< 29V max automatic shutdown
	Over short protection	Auto-recovery and no damage
Connector		3 pin/grounded, mates with interchangeable cords
Environmental Design	Operating temperature	32° to 95° F (0° to 35° C)
	Non-operating (storage) temperature	-4° to 185° F (-20° to 85° C)
	Altitude	0 to 16,400 ft (0 to 5,000 m)
	Humidity	20% to 95%
	Storage Humidity	10% to 95%
EMI and Safety Certifications		*CE Mark - full compliance with LVD and EMC directives * Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. * MTBF - over 200,000 hours at 25°C ambient condition.

HP 4-cell, Long Life 44 WHr Li-ion

Dimensions (H x W x L)	33.40*275.80*20.60 mm (1.32x10.86x0.81 inch)	
Weight	0.3 kg (0.66lb)	
Cells/Type	4cell Lithium-Ion	
Energy	Voltage	14.8V
	Amp-hour capacity	3.0Ah
	Watt-hour capacity	44Wh
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
Fuel Gauge LED	No	
Warranty	1 year	
Optional Travel Battery Available	No	



Technical Specifications

HP 6-cell, Long Life 55 WHr Li-ion	Dimensions (H x W x L)	45.59x275.8x33.89	
	Weight	330g	
	Cells/Type	Cylindrical ICR18650 C4	
	Energy	10.68V	Voltage
		5.15Ah	Amp-hour capacity
		55Wh	Watt-hour capacity
	Temperature	32° to 113° F (0° to 45° C)	Operating (Charging)
		14 to 140° F (-10° to 60° C)	Operating (Discharging)
		-4° to 140° F (-20° to 60° C)	Non-operating
	Battery Re-Charge Time	3 hours	System in OFF or Standby Mode
	3 to 5 hours	System ON	
Fuel Gauge LED	NA		
Warranty	3years or 1000 cycles		
Optional Travel Battery Available	NO		

ENVIRONMENTAL

TBD

COUNTRY OF ORIGIN

China



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

Type	Description	Part number	
Cases	HP Essential Top Load Case	H2W17AA	
	HP Essential Backpack (up to 15.6")	H1D24AA	
	HP Essential Messenger Case (up to 17.3")	H1D25AA	
	HP Business Backpack (up to 17.3")	H5M90AA	
	HP Business Case(up to 15.6")	H5M92AA	
Docking	HP 3001pr USB 3 Port Replicator	F3S42AA	
	HP 3005pr USB 3.0 Port Replicator	H1L08AA	
	HP Display and Notebook Stand	E8G00AA	
Input/Output	HP Stylish Wireless Keyboard and Mouse	H4B79AA	
	HP 2.4 GHz Keyboard and Mouse	G1K29AA	
	HP Ultra Mobile Wireless Mouse	H6F25AA	
	HP X4000b Bluetooth Mouse	H3T50AA	
	HP 3-Button USB Laser Mouse	H4B81AA	
	HP USB Travel Mouse	G1K28AA	
	HP Ultrathin Wireless Mouse	L9V78AA	
	HP Conferencing Keyboard	K8P74AA	
	HP Speaker Phone	K7V16AA	
	HP Wired Headset	K7V17AA	
	HP HDMI to DVI Adapter	F5A28AA	
	HP Wireless Display Adapter	J1V25AA	
	Power	HP 45W Smart AC Adapter 4.5mm	H6Y88AA
		HP 65W Smart AC Adapter	H6Y89AA
HP 65W Slim AC Adapter		H6Y82AA	
HP 90W Slim AC Adapter		H6Y83AA	
HP 90W Slim Combo AC Adapter w/ USB		H6Y84AA	
HP Power Bank		N9F71AA	
Storage	HP External USB Optical Drive	F2B56AA	
	HP 500GB 7200rpm HDD	F3B97AA	
	HP External Portable USB3.0 HDD	K6A93AA	
Security	HP UltraSlim Keyed Cable Lock	H4D73AA	
	HP USB Smart Card Reader	F6V67AA	
Displays	HP ProDisplay P242va 24-inch Monitor	K7X32AA	
	HP EliteDisplay E222 21.5-inch Monitor	M1N96AA	
	HP EliteDisplay E240 23.8-inch Monitor	M1N99AA	
	HP EliteDisplay E240c 23.8-inch Monitor	M1P00AA	
	HP EliteDisplay S270c 27-inch Curved Display	K1M38AA	



Summary of Changes

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