

### Overview

### HP 250 G8 Notebook PC



#### Left

- |                        |  |
|------------------------|--|
| 1. Internal microphone | 7. Power indicator LED                       |
| 2. Webcam LED          | 8. Hard drive indicator LED                  |
| 3. Webcam              | 9. USB-C® 3.2 Gen1 port (Data Transfer Only) |
| 4. Touchpad            | 10. HDMI Port (Cable sold separately)        |
| 5. Touchpad buttons    | 11. RJ-45 / Ethernet port                    |
| 6. Audio combo jack    | 12. Power button                             |

### Overview



#### Right

1. Nano Security lock slot (Lock sold separately)
2. USB-A 3.2 Gen 1 port
3. USB-A 3.2 Gen 1 port
4. SD Card slot

### Overview

#### At a Glance

- A new compact narrow bezel design with thinner & lighter chassis
- Preinstall with Windows 10 versions or FreeDOS
- Choice of 11<sup>th</sup> or 10<sup>th</sup> Generation Intel® Core™ i7, i5 and i3 processors and Intel® Pentium®, or Intel® Celeron® processors
- Choice of 39.62 cm (15.6") diagonal HD and FHD SVA Anti-Glare WLED or FHD IPS Anti-Glare WLED
- Optional NVIDIA GeForce MX130/MX330/MX450 discrete graphics with 2 GB GDDR5 video memory
- Security features including Firmware TPM 2.0
- Weight starting at 3.84 lbs (1.74 kgs)
- MM18 Battery life up to 9 Hours 50 mins <sup>1</sup>
- Wireless LAN (WLAN) up to 802.11ac or 802.11ax to keep you connected
- One USB 3.2 Gen 1 Type-C (Data Transfer Only), Two USB 3.2 Gen 1 Type-A
- Choice of Solid State Drives up to 1 TB and Hard Drive up to 2 TB
- Fast and upgradeable dual channel DDR4 SODIMM memory up to 16 GB
- HP webcam with dual digital microphone and HD (supporting WDR- Wide Dynamic Range)

1. Windows 10 MM18 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See <http://www.bapco.com> for additional details.

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

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## Technical Specifications

### PRODUCT NAME

HP 250 G8 Notebook PC

### OPERATING SYSTEMS

#### Preinstalled

Windows 10 Pro 64 – HP recommends Windows 10 Pro<sup>1</sup>  
Windows 10 Pro 64 (National Academic only)<sup>2</sup>  
Windows 10 Home 64<sup>1</sup>  
Windows 10 Home Single Language 64<sup>1</sup>  
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.

#### Supported Version

HP tested Windows 10, version 1809 on this platform For testing information on newer versions of Windows10, please see: <https://support.hp.com/document/c05195282>.

### PROCESSORS

Intel® Core™ i7-1165G7 processor with Intel® Iris® Xe Graphics (2.8 GHz base frequency, up to 4.7 GHz frequency with Intel® Turbo Boost Technology, 12 MB L3 cache, 4 cores)<sup>3,4,5,6</sup>

Intel® Core™ i5-1135G7 processor with Intel® Iris® Xe Graphics (2.4 GHz base frequency, up to 4.2 GHz frequency with Intel® Turbo Boost Technology, 8 MB L3 cache, 4 cores)<sup>3,4,5,6</sup>

Intel® Core™ i3-1115G4 processor with Intel® UHD Graphics ( 3.0 GHz base frequency, up to 4.1 GHz frequency with Intel® Turbo Boost Technology, 6 MB L3 cache, 2 cores)<sup>3,4,5,6</sup>

Intel® Core™ i7-1065G7 with Intel® Iris® Plus graphics (1.3 GHz base frequency, up to 3.9 GHz with Intel® Turbo Boost Technology, 8 MB cache, 4 cores)<sup>3,4,5,6</sup>

Intel® Core™ i5-1035G1 processor with Intel® UHD Graphics (1.0 GHz base frequency, up to 3.6 GHz with Intel® Turbo Boost Technology, 6 MB cache, 4 cores)<sup>3,4,5,6</sup>

Intel® Core™ i3-1005G1 processor with Intel® UHD Graphics (1.2 GHz base frequency, up to 3.4GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores)<sup>3,4,5,6</sup>

Intel® Pentium® Silver N5030 Processor with Intel® UHD Graphics 605 (1.1 GHz base frequency, up to 3.1 GHz burst frequency, 4 MB cache, 4 cores)<sup>3,4,6</sup>

Intel® Celeron® N4020 Processor with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.8 GHz burst frequency, 4 MB cache, 2 cores)<sup>3,4,6</sup>

Intel® Pentium® Gold 7505 Processor with Intel® UHD Graphics (2.0 GHz base frequency, up to 3.5 GHz Standard, 4 MB cache, 2 cores)<sup>3,4,6</sup>

#### Processors Family

11th Generation Intel® Core™ i7 processor (i7-1165G7)<sup>7</sup>

11th Generation Intel® Core™ i5 processor (i5-1135G7)<sup>7</sup>

11th Generation Intel® Core™ i3 processor (i3-1115G4)<sup>7</sup>

10th Generation Intel® Core™ i7 processor (i7-1065G7)<sup>7</sup>

10th Generation Intel® Core™ i5 processor (i5-1035G1)<sup>7</sup>

10th Generation Intel® Core™ i3 processor (i3-1005G1)<sup>7</sup>

Intel® Pentium® Silver Processor (N5030)<sup>7</sup>



### Technical Specifications

Intel® Pentium® Gold Processor (7505) <sup>7</sup>  
Intel® Celeron® processor (N4020) <sup>7</sup>

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

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### CHIPSET

Chipset is integrated with processor

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### GRAPHICS

#### Integrated

Intel® Iris® Xe Graphics  
Intel® Iris® Plus graphics  
Intel® UHD Graphics  
Intel® UHD Graphics 605  
Intel® UHD Graphics 600

#### Discrete

NVIDIA® GeForce® MX130 (2 GB DDR5 dedicated) <sup>9</sup>  
NVIDIA® GeForce® MX330 (2 GB DDR5 dedicated) <sup>9</sup>  
NVIDIA® GeForce® MX350 (2 GB DDR5 dedicated) <sup>9</sup>

#### Supports

Support HD decode, DX12, HDMI 1.4b <sup>8</sup>

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



## Technical Specifications

### DISPLAYS

#### Non-Touch

39.6 cm (15.6") diagonal, HD (1366 x 768), SVA, Anti-Glare WLED, 250nits, eDP micro-edge, 45% NTSC <sup>8,10,11</sup>  
39.6 cm (15.6") diagonal, FHD (1920 x 1080), IPS, Anti-Glare WLED, 250nits eDP micro-edge, 45% NTSC <sup>8,10,11</sup>  
39.6 cm (15.6") diagonal, FHD (1920 x 1080), SVA, Anti-Glare WLED, 250nits eDP micro-edge, 45% NTSC <sup>8,10,11</sup>

#### HDMI

Port supports resolutions up to 1920 x 1080 external resolution @60 Hz

8. HD content required to view HD images.

10. Sold separately or as an optional feature.

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

### STORAGE AND DRIVES

#### Primary Storage

2 TB 5400 rpm SATA <sup>12</sup>

1 TB 5400 rpm SATA <sup>12</sup>

500 GB 7200 rpm SATA <sup>12</sup>

500 GB 5400 rpm SATA <sup>12</sup>

#### Primary M.2 Storage

128 GB M.2 SATA-3 TLC Solid State Drive <sup>12</sup>

256 GB M.2 SATA-3 TLC Solid State Drive <sup>12</sup>

256 GB PCIe® NVMe™ M.2 Value Solid State Drive <sup>12</sup>

512 GB PCIe® NVMe™ M.2 Value Solid State Drive <sup>12</sup>

512 GB PCIe® NVMe™ M.2 TLC Solid State Drive <sup>12</sup>

1 TB PCIe® NVMe™ M.2 Value Solid State Drive <sup>12</sup>

256 GB Intel® PCIe® NVMe™ QLC M.2 SSD with 16 GB Intel® Optane™ memory H10 <sup>12,13,14</sup>

512 GB Intel® PCIe® NVMe™ QLC M.2 SSD with 32 GB Intel® Optane™ memory H10 <sup>12,13,14</sup>

2 TB 5400 rpm SATA with 16 GB Intel® Optane™ memory <sup>12,13</sup>

1 TB 5400 rpm SATA with 16 GB Intel® Optane™ memory <sup>12,13</sup>

#### Dual Storage

128 GB M.2 SATA-3 TLC Solid State Drive + 1 TB 5400rpm SATA <sup>12</sup>

256 GB PCIe® NVMe™ M.2 Value Solid State Drive + 1 TB 5400rpm SATA <sup>12</sup>

12. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.

13. Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system. Requires 8th Gen or higher Intel® Core™ processor, BIOS version with Intel® Optane™ supported, Windows 10 64-bit, and an Intel® Rapid Storage Technology (Intel® RST) driver.

14. Intel® Optane™ memory H10 only for Intel® PCIe® NVMe™ QLC M.2 SSD.



## Technical Specifications

### MEMORY

**Maximum Memory**

16 GB DDR4-2666 SDRAM<sup>15</sup>

**Memory**

16 GB DDR4-2666 SDRAM (2 X 8 GB)<sup>15</sup>

12 GB DDR4-2666 SDRAM (4 GB (1 x 4GB) and 8 GB (1 x 8 GB))<sup>15</sup>

8 GB DDR4-2666 SDRAM (1 x 8 GB)<sup>15</sup>

8 GB DDR4-2400 SDRAM (1 x 8 GB)<sup>15</sup>

8 GB DDR4-2666 SDRAM (2 x 4 GB)<sup>15</sup>

4 GB DDR4-2666 SDRAM (1 x 4 GB)<sup>15</sup>

4 GB DDR4-2400 SDRAM (1 x 4 GB)<sup>15</sup>

**Memory Slots**

2 SODIMM (10th Generation Intel® Core™)

Supports Dual Channel Memory

1 SODIMM (Intel® Pentium®, Celeron® processors)

NOTE: All slots are customer non-accessible / non-upgradeable

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

### NETWORKING/COMMUNICATIONS

**WLAN**

Realtek RTL8822CE 802.11ac 2x2 Wi-Fi® + Bluetooth® 5<sup>16</sup>

Realtek RTL8822CE 802.11a/b/g/n/ac (1x1) Wi-Fi® with Bluetooth® 4.2 Combo<sup>16</sup>

Intel® Dual Band Wi-Fi 6 AX201 802.11a/b/g/n/ac/ax (2x2) WLAN and Bluetooth® 5 Combo, non-vPro®<sup>17</sup>

**Miracast**

Compatible with Miracast-certified devices (For Win10)<sup>18</sup>

**Ethernet**

Realtek 10/100/1000 GbE NIC<sup>19</sup>

16. Wi-Fi supporting gigabit speeds (802.11ac) is achievable when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 160MHz channels.

17. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices.

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

19. The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.



### Technical Specifications

#### AUDIO/MULTIMEDIA

**Audio**

2 Integrated stereo speakers  
Integrated dual digital microphone

**Camera**

HP TrueVision HD Camera <sup>8,10</sup>

**Webcam**<sup>10</sup>

8. HD content required to view HD images.

10. Sold separately or as an optional feature.

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#### KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

**Keyboard**

Full Size Textured island-style Keyboard

**Pointing Device**

Touchpad with multi-touch gesture support (PTP certified)

**Function Keys**

F1 - Open " How to get help in Windows 10" webpage

F2 - Brightness Down

F3 - Brightness Up

F4 - Display Switching

F5 - Blank

F6 - Mute

F7 - Volume Down

F8 -Volume Up

F9 - Previous

F10 - Play/Pause

F11 - Next

F12 - Airplane mode

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#### SOFTWARE AND SECURITY

**Preinstalled Software****Software**

HP Support Assistant <sup>20</sup>

Native Miracast Support <sup>21</sup>

HP documentation

HP Setup Integrated OOBE

HP SSRM

HP Audio Switch

HP JumpStarts

McAfee LiveSafe™ <sup>19</sup>

Xerox® DocuShare® 90 day free trial offer<sup>29</sup>

**Security Management**

### Technical Specifications

Firmware TPM 2.0 <sup>22</sup>

19. 30 days free trial

20. HP Support Assistant requires Windows and Internet access.

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

22. Firmware TPM is version 2.0, which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology (PTT).

32. Firmware TPM is version 2.0.

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### POWER

#### Power Supply

HP Smart 65 W External AC power adapter <sup>23</sup>

HP Smart 65 W EM External AC power adapter <sup>23</sup>

HP Smart 45 W External AC power adapter <sup>23</sup>

#### Primary Battery

HP Long Life 3-cell, 41 Wh Li-ion <sup>24</sup>

#### Power Cord

1M (3.28 feet) length power cord

#### MM18 Battery life

Up to 9 Hours 50 mins <sup>25</sup>

#### Battery Weight

0.19 kg

0.42 lb

23. Availability may vary by country.

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

25. Windows 10 MM18 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](http://www.bapco.com) for additional details.

### WEIGHTS & DIMENSIONS

#### Product Weight <sup>26</sup>

Starting at 3.84 lb

Starting at 1.74 kg

#### Product Dimensions (w x d x h)

14.09 x 9.53 x 0.78 in

35.8 x 24.2 x 1.99 cm

26. Weight will vary by configuration. Does not include power adapter.



### Technical Specifications

#### PORTS/SLOTS

##### Ports

- 2 USB-A 3.2 Gen1
- 1 USB Type-C® 3.2 Gen1 (Data Transfer Only)
- 1 HDMI v1.4b <sup>27</sup>
- 1 RJ-45
- 1 AC Power
- 1 Headphone/microphone combo jack

##### Expansion Slots

- Support SD/SDHC/SDXC
- 1 Multi-format digital media reader

<sup>27</sup>. HDMI cable sold separately.

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#### SERVICE AND SUPPORT

1-year limited warranty and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty. 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>. <sup>28</sup>

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



## Technical Specifications

### SYSTEM UNIT

#### Stand-Alone Power Requirements (AC Power)

Nominal Operating Voltage	19.5 V
Average Operating Power	TBD
Integrated graphics	6.37W
Discrete Graphics	N/A (Switchable graphics design)
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%

#### Shock

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

#### Random Vibration

Operating	1.043 grms
Non-operating	3.5 grms

#### Altitude (unpressurized)

Operating	-15 m to 3048 m (-50 ft to 10000 ft)
Non-operating	-15 m to 12192 m (-50 ft to 40000 ft)

#### Planned Industry Standard Certifications

UL	Yes
CSA	No
FCC Compliance	Yes
ENERGY STAR®	Yes
EPEAT®	Yes
ICES	Yes
Australia /	No
NZ A – Tick Compliance	No
CCC	Yes
Japan VCCI Compliance	No
KC	No
BSMI	Yes
CE Marketing Compliance	Yes
BNCI or BELUS	No
CIT	No
GOST	No
Saudi Arabian Compliance (ICCP)	No



## Technical Specifications

SABS	No
UKRSERTCOMPUTER	No

### DISPLAYS

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

<b>Panel LCD 15.6 inch FHD (1920x1080) Anti-Glare WLED UWVA 45percent cg 250nits eDP 1.2 w/o PSR slim NWBZ</b>	<b>Outline Dimensions (W x H x D)</b>	350.96 x 216.75 (max.) x 3.2 (max.) mm
	<b>Active Area</b>	344.16 x 193.59 mm
	<b>Weight</b>	370g max.
	<b>Diagonal Size</b>	15.6"
	<b>Surface Treatment</b>	AG
	<b>Touch enabled</b>	None
	<b>Contrast Ratio</b>	600:1 (typ.)
	<b>Refresh Rate</b>	60Hz
	<b>Brightness</b>	250nits typ.
	<b>Pixel Resolution</b>	
	<b>Configuration</b>	1920 x 1080 (FHD)
	<b>Interface</b>	eDP 1.2 w/o PSR
	<b>LCD Mode</b>	IPS/PLS/AHVA
	<b>PPI</b>	142
	<b>Viewing Angle</b>	UWVA 85/85/85/85

<b>Panel LCD 15.6-in FHD (1920x1080) Anti-Glare WLED SVA 45percent cg 250nits eDP 1.2 w/o PSR NWBZ ultraslim</b>	<b>Outline Dimensions (W x H x D)</b>	350.96 x 216.75 (max.) x 3.2 (max.) mm
	<b>Active Area</b>	344.16 x 193.59 mm
	<b>Weight</b>	360g max.
	<b>Diagonal Size</b>	15.6"
	<b>Surface Treatment</b>	AG
	<b>Touch enabled</b>	None
	<b>Contrast Ratio</b>	300:1 (typ.)
	<b>Refresh Rate</b>	60Hz
	<b>Brightness</b>	250nits typ.
	<b>Pixel Resolution</b>	
	<b>Configuration</b>	1920 x 1080 (FHD)
	<b>Interface</b>	eDP 1.2 w/o PSR
	<b>LCD Mode</b>	TN
	<b>PPI</b>	142
	<b>Viewing Angle</b>	UWVA 45/45/15/35



### Technical Specifications

<b>Panel LCD 15.6-in HD (1366x768) Anti-Glare WLED SVA 45percent cg 250nits eDP 1.2 w/o PSR NWBZ ultraslim</b>	<b>Outline Dimensions (W x H x D)</b>	351.03 x 216.75 (max.) x 3.2 (max.) mm
	<b>Active Area</b>	344.23 x 193.54 mm
	<b>Weight</b>	360g max.
	<b>Diagonal Size</b>	15.6"
	<b>Surface Treatment</b>	AG
	<b>Touch enabled</b>	None
	<b>Contrast Ratio</b>	300:1 (typ.)
	<b>Refresh Rate</b>	60Hz
	<b>Brightness</b>	250nits typ.
	<b>Pixel Resolution</b>	
	<b>Configuration</b>	1366 x 768 (HD)
	<b>Interface</b>	eDP 1.2 w/o PSR
	<b>LCD Mode</b>	TN
	<b>PPI</b>	101
	<b>Viewing Angle</b>	UWVA 40/40/15/30



## Technical Specifications

### STORAGE AND DRIVES\*

\* 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.

<b>HDD 1TB 5400RPM 7mm SATA (HDD 1TB 5400RPM 2.5in)</b>	<b>Drive Weight</b>	0.21 lbs (95 g)
	<b>Capacity</b>	1TB
	<b>Height</b>	0.28 in (7 mm)
	<b>Width</b>	2.75 in (69.85 mm)
	<b>Interface</b>	ATA-8, SATA 3.0
	<b>Maximum Sequential Read</b>	Up to 100 MB/s
	<b>Maximum Sequential Write</b>	Up to 100 MB/s
	<b>Logical Blocks</b>	1,953,525,168
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]
	<b>Features</b>	S.M.A.R.T., NCQ, Ultra DMA

<b>HDD 2TB 5400RPM 7mm SATA 2.5in (HDD 2TB 5400RPM SATA 2.5in 2nd)</b>	<b>Drive Weight</b>	0.21 lbs (95 g)
	<b>Capacity</b>	2TB
	<b>Height</b>	Up to 128MB
	<b>Width</b>	0.28 in (7 mm)
	<b>Interface</b>	2.75 in (69.85 mm)
	<b>Maximum Sequential Read</b>	Up to 100 MB/s
	<b>Maximum Sequential Write</b>	Up to 100 MB/s
	<b>Logical Blocks</b>	3,907,029,168
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]
	<b>Features</b>	S.M.A.R.T., NCQ, Ultra DMA

<b>HDD 500GB 5400RPM 7mm SATA</b>	<b>Drive Weight</b>	0.21 lbs (95 g)
	<b>Capacity</b>	500GB
	<b>Height</b>	0.28 in (7 mm)
	<b>Width</b>	2.75 in (69.85 mm)
	<b>Interface</b>	ATA-8, SATA 3.0
	<b>Maximum Sequential Read</b>	Up to 100 MB/s
	<b>Maximum Sequential Write</b>	Up to 100 MB/s
	<b>Logical Blocks</b>	976,773,168
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]
	<b>Features</b>	S.M.A.R.T., NCQ, Ultra DMA



## Technical Specifications

<b>HDD 500GB 7200RPM 7mm SATA (HDD 500GB 7200RPM 2.5in)</b>	<b>Drive Weight</b>	0.21 lbs (95 g)
	<b>Capacity</b>	500GB
	<b>Height</b>	0.28 in (7 mm)
	<b>Width</b>	2.75 in (69.85 mm)
	<b>Interface</b>	ATA-8, SATA 3.0
	<b>Maximum Sequential Read</b>	Up to 120 MB/s
	<b>Maximum Sequential Write</b>	Up to 120 MB/s
	<b>Logical Blocks</b>	976,773,168
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]
	<b>Features</b>	S.M.A.R.T., NCQ, Ultra DMA

<b>SSD 128GB 2280 M2 SATA-3 TLC (SSD 128GB 2280 M2 SATA-3 TLC)</b>	<b>Drive Weight</b>	0.01 lb (6 g) ~ 0.02 lb (10 g)
	<b>Capacity</b>	128 GB
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Interface</b>	ATA-8, SATA 3.0
	<b>Maximum Sequential Read</b>	Up to 100MB/s
	<b>Maximum Sequential Write</b>	Up to 400MB/s
	<b>Logical Blocks</b>	250,069,680
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	DIPM; TRIM; DEVSLP

<b>SSD 1TB 2280 PCIe NVMe Value (SSD 1TB 2280 PCIe NVMe Value)</b>	<b>Drive Weight</b>	0.01 lb (6 g) ~ 0.02 lb (10 g)
	<b>Capacity</b>	1TB
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Interface</b>	PCIe NVMe Gen3X2
	<b>Maximum Sequential Read</b>	Up to 1500MB/s
	<b>Maximum Sequential Write</b>	Up to 750MB/s
	<b>Logical Blocks</b>	2,000,409,264
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	L1.2



## Technical Specifications

<b>SSD 16GB 2280 PCIe-3x2 NVMe 3D Xpoint (SSD 16GB 2280 PCIe-3x2 NVMe 3D Xpoint)</b>	<b>Drive Weight</b>	0.01 lb (6 g) ~ 0.02 lb (10 g)
	<b>Capacity</b>	16GB
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Interface</b>	PCIe NVMe Gen3X2
	<b>Maximum Sequential Read</b>	900MB/s
	<b>Maximum Sequential Write</b>	145MB/s
	<b>Logical Blocks</b>	28,181,188
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	TRIM, L1.2

<b>SSD 256GB 2280 M2 SATA-3 TLC (SSD 256GB 2280 M2 SATA-3 Three Layer Cell)</b>	<b>Drive Weight</b>	0.01 lb (6 g) ~ 0.02 lb (10 g)
	<b>Capacity</b>	256GB
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Interface</b>	PCIe NVMe Gen3X2
	<b>Maximum Sequential Read</b>	Up to 2900 MB/s
	<b>Maximum Sequential Write</b>	Up to 1100 MB/s
	<b>Logical Blocks</b>	500,118,191
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	DIPM; TRIM; DEVSLP

<b>SSD 256GB 2280 PCIe NVMe Value ( SSD 256GB 2280 PCIe NVMe Value )</b>	<b>Drive Weight</b>	0.01 lb (6 g) ~ 0.02 lb (10 g)
	<b>Capacity</b>	256GB
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Interface</b>	PCIe NVMe Gen3X2
	<b>Maximum Sequential Read</b>	Up to 1500MB/s
	<b>Maximum Sequential Write</b>	Up to 750MB/s
	<b>Logical Blocks</b>	500,118,192
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	TRIM, L1.2



## Technical Specifications

<b>SSD 256GB 2280 PCIe-3x2x2 NVMe+SSD 16GB 3D Xpoint ( SSD 256GB 2280 PCIe-3x2x2 NVMe +SSD 16GB 3D Xpoint )</b>	<b>Drive Weight</b>	0.01 lb (6 g) ~ 0.02 lb (10 g)
	<b>Capacity</b>	256GB
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Interface</b>	PCIe NVMe Gen3X2
	<b>Maximum Sequential Read</b>	1450MB/s
	<b>Maximum Sequential Write</b>	500MB/s
	<b>Logical Blocks</b>	500,188,192
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	TRIM, L1.2

<b>SSD 512GB 2280 M2 PCIe-3x4 SS NVMe TLC ( SSD 512GB M.2 2280 PCIe NVMe Three Layer Cell w/Caddy 2nd)</b>	<b>Drive Weight</b>	0.01 lb (6 g) ~ 0.02 lb (10 g)
	<b>Capacity</b>	512GB
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Interface</b>	PCIe NVMe Gen3X2
	<b>Maximum Sequential Read</b>	Up to 3000MB/s
	<b>Maximum Sequential Write</b>	Up to 150MB/s
	<b>Logical Blocks</b>	1,000,215,216
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	TRIM, L1.2

<b>SSD 512GB 2280 PCIe NVMe Value (SSD 512GB 2280 PCIe NVMe Value)</b>	<b>Drive Weight</b>	0.01 lb (6 g) ~ 0.02 lb (10 g)
	<b>Capacity</b>	512GB
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Interface</b>	PCIe NVMe Gen3X2
	<b>Maximum Sequential Read</b>	Up to 1500MB/s
	<b>Maximum Sequential Write</b>	Up to 750MB/s
	<b>Logical Blocks</b>	1,000,215,216
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	TRIM, L1.2



### Technical Specifications

<b>SSD 512GB 2280 PCIe NVMe Value (SSD 512GB 2280 PCIe NVMe Value)</b>	<b>Drive Weight</b>	0.01 lb (6 g) ~ 0.02 lb (10 g)
	<b>Capacity</b>	512GB
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Interface</b>	PCIe NVMe Gen3X2
	<b>Maximum Sequential Read</b>	Up to 1500MB/s
	<b>Maximum Sequential Write</b>	Up to 750MB/s
	<b>Logical Blocks</b>	1,000,215,216
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	TRIM, L1.2

<b>SSD 512GB 2280 PCIe-3x2x2 NVMe+SSD 32GB 3D Xpoint ( SSD 512GB 2280 PCIe-3x2x2 NVMe +SSD 32GB 3D Xpoint )</b>	<b>Drive Weight</b>	0.01 lb (6 g) ~ 0.02 lb (10 g)
	<b>Capacity</b>	512GB
	<b>Height</b>	0.09 in (2.3 mm)
	<b>Width</b>	0.87 in (22 mm)
	<b>Interface</b>	PCIe NVMe Gen3X2
	<b>Maximum Sequential Read</b>	2400MB/s
	<b>Maximum Sequential Write</b>	1300MB/s
	<b>Logical Blocks</b>	1,000,215,215
	<b>Operating Temperature</b>	32° to 158°F (0° to 70°C) [ambient temp]
	<b>Features</b>	TRIM, L1.2

### NETWORKING/COMMUNICATIONS

<b>Intel® Wi-Fi 6 AX201 + Bluetooth® 5 (802.11ax 2x2, non-vPro®, supporting gigabit file transfer speeds) non-vPro®<sup>1,2</sup></b>	<b>Wireless LAN Standards</b>	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
	<b>Interoperability</b>	Features Wi-Fi® 6 technology
	<b>Frequency Band</b>	<ul style="list-style-type: none"> <li>• 802.11b/g/n/ax 2.402 – 2.482 GHz</li> <li>• 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</li> </ul>
	<b>Data Rates</b>	<ul style="list-style-type: none"> <li>• 802.11b: 1, 2, 5.5, 11 Mbps</li> </ul>



## Technical Specifications

	<ul style="list-style-type: none"> <li>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li> <li>• 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li> <li>• 802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz &amp; 160MHz)</li> </ul>
<b>Modulation</b>	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
<b>Security<sup>3</sup></b>	<ul style="list-style-type: none"> <li>• IEEE compliant 64 /128 bit WEP encryption for a/b/g mode only</li> <li>• AES-CCMP: 128 bit in hardware</li> <li>• 802.1x authentication</li> <li>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</li> <li>• WPA2 certification</li> <li>• IEEE 802.11i</li> <li>• WAPI</li> </ul>
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
<b>Output Power<sup>4</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b: +18.5dBm minimum</li> <li>• 802.11g: +17.5dBm minimum</li> <li>• 802.11a: +18.5dBm minimum</li> <li>• 802.11n HT20(2.4GHz): +15.5dBm minimum</li> <li>• 802.11n HT40(2.4GHz): +14.5dBm minimum</li> <li>• 802.11n HT20(5GHz): +15.5dBm minimum</li> <li>• 802.11n HT40(5GHz): +14.5dBm minimum</li> <li>• 802.11ac VHT80(5GHz): +11.5dBm minimum</li> <li>• 802.11ac VHT160(5GHz): +11.5dBm minimum</li> <li>• 802.11ax HT40(2.4GHz): +10dBm minimum</li> <li>• 802.11ax VHT160(5GHz): +10dBm minimum</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>• Transmit mode: 2.0 W</li> <li>• Receive mode: 1.6 W</li> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode: 50 mW (WLAN unassociated)</li> <li>• Connected Standby/Modern Standby: 10mW</li> <li>• Radio disabled: 8 mW</li> </ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>5</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b, 1Mbps: -93.5dBm maximum</li> <li>• 802.11b, 11Mbps: -84dBm maximum</li> <li>• 802.11a/g, 6Mbps: -86dBm maximum</li> <li>• 802.11a/g, 54Mbps: -72dBm maximum</li> <li>• 802.11n, MCS07: -67dBm maximum</li> <li>• 802.11n, MCS15: -64dBm maximum</li> <li>• 802.11ac, MCS0: -84dBm maximum</li> <li>• 802.11ac, MCS9: -59dBm maximum</li> <li>• 802.11ax, MCS11(HT40): -59dBm maximum</li> <li>• 802.11ax, MCS11(VHT160): -58.5dBm maximum</li> </ul>
<b>Antenna type</b>	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
<b>Form Factor</b>	PCI-Express M.2 MiniCard with CNVi Interface
<b>Dimensions</b>	1. Type 2230: 2.3 x 22.0 x 30.0 mm



### Technical Specifications

	2. Type 1216: 1.67 x 12.0 x 16.0 mm
<b>Weight</b>	1. Type 2230: 2.8 g 2. Type 126: 1.3 g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	<b>Operating</b> 14° to 158° F (–10° to 70° C) <b>Non-operating</b> –40° to 176° F (–40° to 80° C)
<b>Humidity</b>	<b>Operating</b> 10% to 90% (non-condensing) <b>Non-operating</b> 5% to 95% (non-condensing)
<b>Altitude</b>	<b>Operating</b> 0 to 10,000 ft (3,048 m) <b>Non-operating</b> 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF LED Off – Radio ON
	<ol style="list-style-type: none"> <li>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 Wi-Fi 6 (802.11 ax) 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.</li> <li>2. Wi-Fi supporting gigabit speeds is achievable when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 160MHz channels.</li> <li>3. Check latest software/driver release for updates on supported security features.</li> <li>4. 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.</li> <li>5. 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).</li> </ol>

### HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1 Wireless Technology

<b>Bluetooth Specification</b>	4.0/4.1/4.2/5.0/5.1 Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
<b>Signaling Data Rate</b>	Legacy: 3 Mbps signaling data rate <sup>6</sup> 2.17 Mbps BLE: 1 Mbps signaling data rate <sup>6</sup> 0.2 Mbps <b>6. Actual throughput may vary.</b>
	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)
<b>Transmit Power</b>	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 dBm for BR and EDR.



## Technical Specifications

<b>Realtek 802.11a/b/g/n/ac (1x1) Wi-Fi® and Bluetooth® 4.2 Combo<sup>1</sup></b>	<b>Wireless LAN Standards</b>	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
	<b>Interoperability</b>	Wi-Fi certified modules
	<b>Frequency Band</b>	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
	<b>Data Rates</b>	• 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)
	<b>Modulation</b>	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	<b>Security<sup>2</sup></b>	• 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 • WAPI
	<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
	<b>Output Power<sup>3</sup></b>	• 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
	<b>Power Consumption</b>	• 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: 10mW • Radio disabled: 8 mW
	<b>Power Management</b>	ACPI and PCI Express compliant power management

Not all configuration components are available in all regions/countries.  
 C06913991 — DA16761 - Worldwide — Version 1 — September 15, 2020



## Technical Specifications

<b>Receiver Sensitivity<sup>4</sup></b>	802.11 compliant power saving mode				
	<ul style="list-style-type: none"> <li>• 802.11b, 1Mbps: -93.5dBm maximum</li> <li>• 802.11b, 11Mbps: -84dBm maximum</li> <li>• 802.11a/g, 6Mbps: -86dBm maximum</li> <li>• 802.11a/g, 54Mbps: -72dBm maximum</li> <li>• 802.11n, MCS07: -67dBm maximum</li> <li>• 802.11n, MCS15: -64dBm maximum</li> <li>• 802.11ac, MCS0: -84dBm maximum</li> <li>• 802.11ac, MCS9: -59dBm maximum</li> </ul>				
<b>Antenna type</b>	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				
<b>Form Factor</b>	PCI-Express M.2 MiniCard				
<b>Dimensions</b>	Type 2230 : 2.3 x 22.0 x 30.0 mm				
<b>Weight</b>	Type 2230 : 2.8g				
<b>Operating Voltage</b>	3.3v +/- 9%				
<b>Temperature</b>	<table> <tr> <td><b>Operating</b></td> <td>14° to 158° F (-10° to 70° C)</td> </tr> <tr> <td><b>Non-operating</b></td> <td>-40° to 176° F (-40° to 80° C)</td> </tr> </table>	<b>Operating</b>	14° to 158° F (-10° to 70° C)	<b>Non-operating</b>	-40° to 176° F (-40° to 80° C)
<b>Operating</b>	14° to 158° F (-10° to 70° C)				
<b>Non-operating</b>	-40° to 176° F (-40° to 80° C)				
<b>Humidity</b>	<table> <tr> <td><b>Operating</b></td> <td>10% to 90% (non-condensing)</td> </tr> <tr> <td><b>Non-operating</b></td> <td>5% to 95% (non-condensing)</td> </tr> </table>	<b>Operating</b>	10% to 90% (non-condensing)	<b>Non-operating</b>	5% to 95% (non-condensing)
<b>Operating</b>	10% to 90% (non-condensing)				
<b>Non-operating</b>	5% to 95% (non-condensing)				
<b>Altitude</b>	<table> <tr> <td><b>Operating</b></td> <td>0 to 10,000 ft (3,048 m)</td> </tr> <tr> <td><b>Non-operating</b></td> <td>0 to 50,000 ft (15,240 m)</td> </tr> </table>	<b>Operating</b>	0 to 10,000 ft (3,048 m)	<b>Non-operating</b>	0 to 50,000 ft (15,240 m)
<b>Operating</b>	0 to 10,000 ft (3,048 m)				
<b>Non-operating</b>	0 to 50,000 ft (15,240 m)				
<b>LED Activity</b>	LED Amber – Radio OFF LED Off – Radio ON				

1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 5 (802.11 ac) is backwards compatible with prior 802.11 specs.
2. Check latest software/driver release for updates on supported security features.
3. 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.
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).

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

<b>Bluetooth Specification</b>	4.0/4.1/4.2 Compliant
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
<b>Data Rates and Throughput</b>	<p>Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps BLE : 1 Mbps data rate; throughput up to 0.2 Mbps</p> <p>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)</p>



### 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.

**Realtek RTL8822CE  
802.11ac 2x2 Wi-Fi®+  
Bluetooth® 5<sup>1</sup>**

#### 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 modules

#### 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 : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)

#### Modulation

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

#### Security<sup>2</sup>

- 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
- WAPI

#### Network Architecture Models

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

#### Roaming

IEEE 802.11 compliant roaming between access points

#### Output Power<sup>3</sup>

- 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

#### Power Consumption

- Transmit mode: 2.0 W
- Receive mode:1.6 W



### Technical Specifications

	<ul style="list-style-type: none"> <li>• Idle mode (PSP) 180 mW (WLAN Associated)</li> <li>• Idle mode: 50 mW (WLAN unassociated)</li> <li>• Connected Standby/Modern Standby: 10mW</li> <li>• Radio disabled: 8 mW</li> </ul>
<b>Power Management</b>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b, 1Mbps: -93.5dBm maximum</li> <li>• 802.11b, 11Mbps: -84dBm maximum</li> <li>• 802.11a/g, 6Mbps: -86dBm maximum</li> <li>• 802.11a/g, 54Mbps: -72dBm maximum</li> <li>• 802.11n, MCS07: -67dBm maximum</li> <li>• 802.11n, MCS15: -64dBm maximum</li> <li>• 802.11ac, MCS0: -84dBm maximum</li> <li>• 802.11ac, MCS9: -59dBm maximum</li> </ul>
<b>Antenna type</b>	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
<b>Form Factor</b>	PCI-Express M.2 MiniCard
<b>Dimensions</b>	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
<b>Weight</b>	1. Type 2230 : 2.8g 2. Type 126: 1.3g
<b>Operating Voltage</b>	3.3v +/- 9%
<b>Temperature</b>	<b>Operating</b> 14° to 158° F (-10° to 70° C) <b>Non-operating</b> -40° to 176° F (-40° to 80° C)
<b>Humidity</b>	<b>Operating</b> 10% to 90% (non-condensing) <b>Non-operating</b> 5% to 95% (non-condensing)
<b>Altitude</b>	<b>Operating</b> 0 to 10,000 ft (3,048 m) <b>Non-operating</b> 0 to 50,000 ft (15,240 m)
<b>LED Activity</b>	LED Amber – Radio OFF LED Off – Radio ON

1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 5 (802.11 ac) is backwards compatible with prior 802.11 specs.
2. Check latest software/driver release for updates on supported security features.
3. 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.
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).

#### HP Integrated Module with Bluetooth® 4.0/4.1/4.2/5.0 Wireless Technology

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



### Technical Specifications

<b>Data Rates and Throughput</b>	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)
<b>Transmit Power</b>	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.

### POWER

<b>AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m</b>	<b>Dimensions (H x W x D)</b>	95.0x40.0x26.5mm
	<b>Weight</b>	unit: 200g +/- 10g
	<b>Input</b>	<b>Input Efficiency</b> 87.74 % at 115 Vac and 88.4 % at 230Vac <b>Input frequency range</b> 47 ~ 63 Hz <b>Input AC current</b> Max. 1.4 A at 90 Vac
	<b>Output</b>	<b>Output power</b> 45W <b>DC output</b> 19.5V <b>Hold-up time</b> 5ms at 115 Vac input Output current limit <8.0A
	<b>Connector</b>	C6 (3pin/with grounded, with Smart ID DC connector)
	<b>Environmental Design</b>	<b>Operating temperature</b> 32°F to 95°F (0° to 35°C) <b>Non-operating (storage) temperature</b> -4°F to 185°F (-20° to 85°C) <b>Altitude</b> 0 to 16,400 ft (0 to 5,000 m) <b>Humidity</b> 20% to 95% <b>Storage Humidity</b> 10% to 95%
	<b>EMI and Safety Certifications</b>	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.

<b>AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm New EM</b>	<b>Dimensions</b>	102x55x30mm
	<b>Weight</b>	unit: 250g +/- 10g
	<b>Input</b>	<b>Input Efficiency</b> 88.0 % at 115 Vac and 89.0 % at 230Vac <b>Input frequency range</b> 47 ~ 63 Hz <b>Input AC current</b> Max. 1.7 A at 90 Vac
	<b>Output</b>	<b>Output power</b> 65W <b>DC output</b> 19.5V <b>Hold-up time</b> 5ms at 115 Vac input



### Technical Specifications

<b>Connector</b>	<b>Output current limit</b>	<11.0A
<b>Environmental Design</b>	C6 (3pin/with grounded, with Smart ID DC connector)	
	<b>Operating temperature</b>	32°F to 95°F (0°to 35°C)
	<b>Non-operating (storage) temperature</b>	-4°F to 185°F (-20°to 85°C)
	<b>Altitude</b>	0 to 16,400 ft (0 to 5000m)
	<b>Humidity</b>	20% to 95%
	<b>Storage Humidity</b>	10% to 95%
<b>EMI and Safety Certifications</b>	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.	

<b>AC Adapter 65 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m</b>	<b>Dimensions</b>	90.0x51x28.5mm
	<b>Weight</b>	unit: 230g +/- 10g
	<b>Input</b>	<b>Input Efficiency</b> 88.0 % at 115 Vac and 89.0% at 230Vac
		<b>Input frequency range</b> 47 ~ 63 Hz
		<b>Input AC current</b> Max. 1.7 A at 90 Vac
	<b>Output</b>	<b>Output power</b> 65W
		<b>DC output</b> 19.5V
		<b>Hold-up time</b> 5ms at 115 Vac input
		<b>Output current limit</b> <11.0A
	<b>Connector</b>	C6 (3pin/with grounded, with Smart ID DC connector)
	<b>Environmental Design</b>	<b>Operating temperature</b> 32°F to 95°F (0°to 35°C)
		<b>Non-operating (storage) temperature</b> -4°F to 185°F (-20°to 85°C)
		<b>Altitude</b> 0 to 16,400 ft (0 to 5000m)
		<b>Humidity</b> 20% to 95%
		<b>Storage Humidity</b> 10% to 95%
	<b>EMI and Safety Certifications</b>	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.

<b>Battery HT 3 Cell WHr 41 Long Life -PR+PL Fast Charge ( Battery 3 Cell</b>	<b>Dimensions</b>	6.0mm x 186.85mm x 90.2mm
	<b>Weight</b>	192g
	<b>Cells/Type</b>	3cell Lithium-Ion Prismatic cell / 496080



### Technical Specifications

<b>WHr 41 Long Life -PR+PL Fast</b>	<b>Energy</b>	Voltage	11.55V
		Amp-hour capacity	3615mAh
		Watt-hour capacity	41Wh
	<b>Temperature</b>	Operating (Charging)	0°C ~ 45°C
		Operating (Discharging)	-10°C ~ 60°C
	<b>Fuel Gauge LED</b>	N/A	
	<b>Warranty</b>	1000 cycles > 65% (at 23°C)	
	<b>Optional Travel Battery Available</b>	No	

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### Technical Specifications

#### FINGERPRINT READER

<b>Model</b>	Elan eFSA80ST touch sensor
<b>Mobile Voltage Operation</b>	2.65V to 3.6V
<b>Operating Temperature:</b>	32° to 95° F (0° to 35° C)
<b>Current Consumption Image:</b>	50mA peak
<b>Low Latency Wait For Finger</b>	<900 uA
<b>Capture Rate: Image transmitter output frequency</b>	20cm/sec
<b>ESD Resistance</b>	IEC 61000-4-2 (+15KV)
<b>Detection Matrix</b>	508 dpi / 4x4mm sensor area
<b>FRR (False Reject Rate) / FAR (False Acceptance Rate)</b>	FRR ~ 2% @ 1:50K FAR

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#### Country of Origin

China

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

Type	Description	Part Number
<b>Cases</b>	HP Prelude Pro Top Load	1X645AA
	HP Prelude Pro Backpack	1X644AA
	HP Prelude Top Load 15.6	1E7D7AA
	HP Prelude Backpack 15.6	1E7D6AA
<b>Docking</b>	HP USB-C®/A Universal Dock G2	5TW13AA
	HP 4.5 mm and USB-C® Dock Adapter G2	6LX61AA
<b>Input/Output</b>	HP USB Essential Keyboard/Mouse	H6L29AA
	HP Wired Desktop 320MK Mouse and Keyboard	9SR36AA
	HP Slim Wireless Keyboard & Mouse	T6L04AA
	HP Wired Desktop 320K Keyboard	9SR37AA
	HP Slim Wireless Keyboard (Link-5)	T6U20AA
	HP 3-Button USB Laser Mouse	H4B81AA
	HP Essential USB Mouse	2TX37AA
	HP USB Travel Mouse	G1K28AA
	HP Bluetooth Travel Mouse	6SP30AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP Wired Desktop 320M Mouse	9VA80AA
	HP HDMI to VGA Adapter	H4F02AA
	HP HDMI to DVI	F5A28AA
<b>Power</b>	HP 45W Smart AC Adapter	H6Y88AA
	HP 65W Smart AC Adapter	H6Y89AA
	HP 65W Slim Adapters (w/ detachable DC cable + TIPS)	H6Y82AA
<b>Storage</b>	HP External USB Optical Drive	F2B56AA



### Summary of Changes

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

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