

## Overview

### HP Chromebook 11 G8 EE



- |                        |  |
|------------------------|--|
| 1. Webcam LED          | 5. USB 3.1 Type-A™ Gen 1 Port  |
| 2. Webcam              | 6. USB 3.1 Type-C™ Gen 1 Port<br>(Support charging, Power delivery, Video, Data) |
| 3. Internal Microphone | 7. Nano Security Lock Slot   |
| 4. Touchpad            |  |

*Left*

## Overview



### *Right*

1. **Power Button**
2. **USB Type-C™ 3.1 Gen1 Port**  
(support charging, Power delivery, Video, Data)
3. **USB 3.1 Type-A™ Gen 1 Port**
4. **MicroSD™ Memory Card Reader**
5. **Stereo Headphone / Microphone Combo Jack**

## Overview

### AT A GLANCE

- <19 mm thin and rugged design for durability
- Enjoy affordable, convenient mobile productivity with Latest Intel® Celeron® N4020 and N4120 processors
- Designed to pass MIL STD 810 H tests, 76 cm drop on concrete and 122 cm drop on plywood, and enhanced USB-C™ connectors to stand against daily uses of plug and unplug<sup>1</sup>
- 2 USB-C™ ports (Supports Power Delivery, DisplayPort™ and data)
- Choice of up to 8 GB memory or 64 GB eMMC storage
- Spill and pick resistant keyboard with HP Improved Anchored Key Design
- Battery life up to 13 hours and 30 minutes\* and spend less time charging with HP Fast Charge technology<sup>2</sup>
- 180 degree hinge and optional HD IPS anti-glare touchscreen for collaboration<sup>3</sup>
- Enjoy Android™ Apps\* on Chrome OS™<sup>3</sup>
- Your Chromebook boots up within 10 seconds and you can be browsing online and working in Google Apps just moments later
- Intel® 2x2 AC WLAN with MU-MIMO and HP Extended Range Wireless Lan for stable connection in dense environment
- Keyboard that can be repeatedly wiped down with common household cleaning wipes
- Easy for small hands to grip and handle with unique textured surface
- Degrees of IP41 certified to against access to hazardous/solid foreign objects and ingress of water

1. MIL-STD-810H 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.
2. Recharges up to 90% within 90 minutes when the system is off or in standby mode when used with the power adapter provided with the notebook. After charging has reached 90% capacity, charging speed will return to normal. Charging time may vary +/-10% due to System tolerance.
3. Sold separately or as an optional feature.

\* Testing conducted by HP using Google Chrome OS power\_LoadTest. Battery life will vary and the maximum capacity of the battery will naturally decrease with time and usage. See <http://www.chromium.org/chromium-os/testing/power-testing> for test details. Full charge battery life will decrease after Adaptive Battery Optimizer activation.

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

## Technical Specifications

### PRODUCT NAME

HP Chromebook 11 G8 EE

### OPERATING SYSTEM

Preinstalled **Chrome OS™**

### PROCESSOR

Intel® Celeron® N4020 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.8 GHz boost frequency, 4 MB cache, 2 cores)<sup>1,2</sup>

Intel® Celeron® N4120 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.6 GHz boost frequency, 4 MB cache, 4 cores)<sup>1,2</sup>

Intel® Celeron® N4000 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.6 GHz boost frequency, 4 MB cache, 2 cores)<sup>1,2</sup>

Intel® Celeron® N4100 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.4 GHz boost frequency, 4 MB cache, 4 cores)<sup>1,2</sup>

*Processor Family*

Intel® Celeron® processor (N4020, N4120, N4000, N4100)

**1. 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.**

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

### CHIPSET

Chipset is integrated with processor

### GRAPHICS

*Integrated*

Intel® UHD Graphics 600<sup>3</sup>

*Supports*

Support HD Decode, DX12, and HDMI 1.4b

**3. HD content required to view HD images.**

## Technical Specifications

### DISPLAY

#### Non-Touch

**29.46 cm (11.6") diagonal HD SVA anti-glare WLED-backlit, 220 nits, 45% NTSC (1366 x 768)<sup>3,4,5</sup>**  
**29.46 cm (11.6") diagonal HD IPS anti-glare WLED-backlit, 220 nits, 50% NTSC (1366 x 768)<sup>3,4,5</sup>**

#### Touch

**29.46 cm (11.6") diagonal HD IPS anti-glare WLED-backlit touch screen, 220 nits, 50% NTSC (1366 x 768)<sup>3,4,5</sup>**

- 3. HD content required to view HD images.**
- 4. Sold separately or as an optional feature.**
- 5. Resolutions are dependent upon monitor capability, and resolution and color depth settings.**

### STORAGE AND DRIVES

#### Primary Storage

**16 GB eMMC 5.0<sup>6</sup>**  
**32 GB eMMC 5.0<sup>6</sup>**  
**64 GB eMMC 5.0<sup>6</sup>**

- 6. For storage drives, GB = 1 billion bytes. Actual formatted capacity is less. Up to 8.1 GB is not user available**

### MEMORY

#### Maximum Memory

**8 GB LPDDR4-2400 SDRAM**

#### Memory

**4 GB LPDDR4-2400 SDRAM**  
**8 GB LPDDR4-2400 SDRAM**

### NETWORKING/COMMUNICATIONS

#### WLAN

**Intel® Dual Band Wireless-AC 9560 802.11 ac (2x2) Wi-Fi® and Bluetooth® 5.0 Combo, non-vPro™<sup>7</sup>**  
**MU-MIMO supported**  
**HP Extended Range Wireless Lan supported**

#### Chromecast

**Chromecast Support<sup>8</sup>**

- 7. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited.**
- 8. Chromecast must be purchased separately.**

## Technical Specifications

### AUDIO/MULTIMEDIA

#### Audio

**HD audio**

**Dual stereo speakers**

**Integrated dual array microphone**

#### Camera

**720p HD camera<sup>3</sup>**

**3. HD content required to view HD images.**

### KEYBOARD / POINTING DEVICES

#### Keyboard

**Full-size textured island-style keyboard, spill-resistant with HP Improved Anchored Key Design**

#### Pointing Device

**Touchpad with multi-touch gesture support. Taps enabled as default**

### SOFTWARE AND SECURITY

#### Preinstalled Software

**Store up to 100 GB with Google Drive (2-year subscription included)<sup>9</sup>**

**HP Classroom Manager<sup>10</sup>**

#### Manageability Features

**Chrome Enterprise Upgrade<sup>11, 12</sup>**

**Chrome Education Upgrade<sup>11, 12</sup>**

#### Security Management

**Google H1 Security Chip**

**Nano Security lock slot<sup>11</sup>**

**9. Google Drive offer is tied to this device and is non-transferable. If this device is returned, the extra storage will be revoked. In order to redeem this offer, you will need to be on Chrome OS™ 23 or later. Internet access is required and not included. Additional information about storage plan refunds, renewals, cancellations and expiration is available at the Google website: <https://support.google.com/chromebook/answer/2703646?hl=en>.**

**10. HP Classroom Manager is sold separately. Control and device locking from the teacher's desktop requires purchase of HP Classroom Manager.**

**11. Sold separately.**

**12. Requires one-time setup, subscription, Google Admin Console, and your organization's domain. Please see <https://support.google.com/a/answer/60216>.**

## Technical Specifications

### POWER

#### Power Supply

**HP Smart 45 W Type-C™ AC power adapter**

#### Primary Battery

**HP Long Life 2-cell, 47.36 Wh Li-ion polymer<sup>13</sup>**

**HP Fast Charge Technology (90% in 90 minutes)<sup>14</sup>**

#### Power Cord

**3-wire plug - 1 m**

#### Battery life

**Up to 13 hours and 30 minutes\***

**13. Battery is internal and not replaceable by customer. Serviceable by warranty.**

**14. Recharges up to 90% within 90 minutes when the system is off or in standby mode when used with the power adapter provided with the notebook. After charging has reached 90% capacity, charging speed will return to normal. Charging time may vary +/-10% due to System tolerance.**

**\* Testing conducted by HP using Google Chrome OS power\_LoadTest. Battery life will vary and the maximum capacity of the battery will naturally decrease with time and usage. See <http://www.chromium.org/chromium-os/testing/power-testing> for test details. Full charge battery life will decrease after Adaptive Battery Optimizer activation.**

### ENVIRONMENTAL

#### Eco-Label Certifications & declarations

**This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:**

• IT ECO declaration

• US ENERGY STAR®

• EPEAT® Silver registered in the United States. Based on US EPEAT registration according to IEEE 1680.1-2018 EPEAT. Status varies by country. See <http://www.epeat.net> for more information.

#### System Configuration

**The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.**

#### Energy Consumption (in accordance with US ENERGY STAR® test method)

#### Normal Operation (Sort idle)

115VAC, 60Hz

230VAC, 50Hz

100VAC, 60Hz

**2.940 W**

**3.108 W**

**2.916 W**

## Technical Specifications

Normal Operation (Long idle)	0.804 W	0.888 W	0.780 W
Sleep	0.360 W	0.420 W	0.360 W
Off	0.348 W	0.408 W	0.348 W

Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 60Hz
Normal Operation (Short idle)	10 BTU/hr	11 BTU/hr	10 BTU/hr
Normal Operation (Long idle)	3 BTU/hr	3 BTU/hr	3 BTU/hr
Sleep	1 BTU/hr	1 BTU/hr	1 BTU/hr
Off	1 BTU/hr	1 BTU/hr	1 BTU/hr

**NOTE:** Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power ( $L_{WAd}$ , bels)	Sound Pressure ( $L_{pAm}$ , decibels)
Typically Configured – Idle	2.4	24
Fixed Disk – Random writes	2.2	22

**Longevity and Upgrading** This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:

- 3 USB ports
- 1 PC card slot (type I/II)
- 1 ExpressCard/54 slot
- 1 IEEE 1394 Port
- 2 SODIMM memory slots
- Optional expansion base docking station
- 1 multi-bay II storage port
- Interchangeable HDD

**Batteries** Spare parts are available throughout the warranty period and or for up to “5” years after the end of production. This battery(s) in this product comply with EU Directive 2006/66/EC

**Batteries used in the product do not contain:**



## Technical Specifications

Mercury greater than 1ppm by weight  
Cadmium greater than 20ppm by weight

### Additional Information

- Battery size:** CR2032 (coin cell)  
**Battery type:** Lithium
- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.
  - This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
  - This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
  - This product is in compliance with the IEEE 1680.1 (EPEAT) standard at the <Silver> level, see <http://www.epeat.net>
  - Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
  - This product contains 2.48% post-consumer recycled plastic (by wt.)
  - This product is 96.9% recycle-able when properly disposed of at end of life.

### Packaging Materials

<i>External:</i>	<b>PAPER/Corrugated</b>	<b>226 g</b>
<i>Internal:</i>	<b>PLASTIC/Polyethylene low density - LDPE</b>	<b>7 g</b>
	<b>PAPER/Molded Pulp</b>	<b>121g</b>

### Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at <http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf>):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)"

## Technical Specifications

### Packaging Usage

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

### End-of-life Management and Recycling

HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <http://www.hp.com/go/reuse-recycle> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at:

<http://www.hp.com/go/recyclers>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

For more information about HP's commitment to the environment:

#### Global Citizenship Report

<http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html>

#### Eco-label certifications

<http://www8.hp.com/us/en/hp-information/environment/ecolabels.html>

#### ISO 14001 certificates:

[http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC\\_GBU\\_Product\\_Design\\_ISO\\_14K\\_Certificate.pdf](http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf)

and <http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf>

### Hewlett-Packard Corporate Environmental Information

## WEIGHTS & DIMENSIONS

### Product Weight

**Starting at 2.91 lb<sup>15</sup>**

**Starting at 1.32 kg<sup>15</sup>**

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

**11.61 x 8.08 x 0.74 in**

**29.5 x 20.53 x 1.88 cm**

**15. Weight will vary by configuration.**

## Technical Specifications

### PORTS/SLOTS

#### Ports

- 2 USB 3.1 Type-C™ Gen 1 (Supports Power Delivery, Display Port™ and data)**
- 2 USB 3.1 Gen 1**
- 1 Stereo headphone/microphone combo jack**

#### Expansion Slots

- 1 Micro SD multi-format digital media reader**
- Supports SD, SDHC, SDXC**

### SERVICE AND SUPPORT

HP Services offers 1-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year limited warranty as the platform. Refer to <http://www.hp.com/support/batterywarranty/> for additional battery information. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc>.<sup>16</sup>

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

### SYSTEM UNIT

<i>Stand-Alone Power Requirements (AC Power)</i>	<b>USB-C 45 W adapter</b>	
	<i>Nominal Operating Voltage</i>	<b>15 V</b>
	<i>Average Operating Power</i>	<b>&lt;4.0 W with PLT test</b>
<i>Temperature</i>	<i>Integrated Graphics</i>	<b>HD Graphics 600 12EUs</b>
	<i>Max Operating Power</i>	<b>&lt; 45 W</b>
	<i>Operating</i>	<b>41° to 95° F (5° to 35° C)</b>
<i>Relative Humidity</i>	<i>Non-operating</i>	<b>-4° to 140° F (-20° to 60° C)</b>
	<i>Operating</i>	<b>10% to 90%</b>
<i>Shock</i>	<i>Non-operating</i>	<b>5% to 95%</b>
	<i>Operating</i>	<b>40 G, 2 ms, half-sine</b>
<i>Random Vibration</i>	<i>Non-operating</i>	<b>240 G, 2 ms, half-sine</b>
	<i>Operating</i>	<b>1.043 grms</b>
<i>Altitude (unpressurized)</i>	<i>Non-operating</i>	<b>3.5 grms</b>
	<i>Operating</i>	<b>-50 to 10,000 ft (-15 to 3,048 m)</b>
<i>Planned Industry Standard Certifications</i>	<i>Non-operating</i>	<b>-50 to 40,000 ft (-15 to 12,192 m)</b>
	<i>UL</i>	<b>Yes</b>
	<i>FCC Compliance</i>	<b>Yes</b>
	<i>ENERGY STAR®</i>	<b>Yes<sup>19</sup></b>

## Technical Specifications

EPEAT® 2019	Yes, Silver in U.S. <sup>20</sup>
ICES	Yes
Australia /	Yes
NZ RCM Compliance	Yes
CCC	Yes
KC	Yes
BSMI	Yes
CE Marking Compliance	Yes
EAC	Yes
Saudi Arabian Compliance (ICCP)	Yes
SABS	Yes

19. Configurations of the HP ChromeBook 11 G8 EE that are ENERGY STAR® qualified are identified as HP ChromeBook 11 G8 EE ENERGY STAR on HP websites and on <http://www.energystar.gov>.

20. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. EPEAT® status varies by country. Visit <http://www.epeat.net> for more information.

## DISPLAYS

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

11.6 inch diagonal HD (1366 x 768) Anti-Glare WLED SVA 45% NTSC 220 nits eDP slim	Outline Dimensions (W x H x D)	268.5 x 168.54 (mm) max.
	Active Area	256.125 x 144.0 (mm)
	Weight	210 g max.
	Diagonal Size	11.6 inch
	Thickness	3.0 (mm) max
	Interface	eDP 1.2
	Surface Treatment	Anti-glare (AG)
	Contrast Ratio	400:1 (typ) - AG
	Refresh Rate	60 Hz
	Brightness	220 nit typical (Panel Only)
	Pixel Resolution	1366 x 768 (HD)
	Format of LCD Pixel Arrangement	RGB
	Backlight	LED
	Color Gamut Coverage	45% of NTSC
Color Depth	6-bit	
Viewing Angle	SVA 40/40/15/30	

11.6 inch diagonal HD (1366 x 768) Anti-Glare WLED UWVA 50% NTSC	Outline Dimensions (W x H x D)	278.5 x 168.52 (mm) max
	Active Area	256.125 x 144 (mm)
	Weight	200 g max

## Technical Specifications

<i>220 nits eDP 1.2 w/o PSR slim Touch on Panel</i>	<i>Diagonal Size</i>	<b>11.6 (inch)</b>
	<i>Thickness</i>	<b>3.20 (mm) max</b>
	<i>Interface</i>	<b>eDP 1.2</b>
	<i>Surface Treatment</i>	<b>Anti-glare (AG)</b>
	<i>Touch Enabled</i>	<b>yes</b>
	<i>Contrast Ratio</i>	<b>1000:1 (typical)</b>
	<i>Refresh Rate</i>	<b>60 Hz</b>
	<i>Brightness</i>	<b>220 nit typical (Panel Only)</b>
	<i>Pixel Resolution</i>	<b>1366x768 (HD)</b>
	<i>Format of LCD Pixel Arrangement</i>	<b>RGB</b>
	<i>Backlight</i>	<b>LED</b>
	<i>Color Gamut Coverage</i>	<b>50% of NTSC</b>
	<i>Color Depth</i>	<b>6 bit</b>
<i>Viewing Angle</i>	<b>UWVA 85/85/85/85</b>	

<i>11.6 inch diagonal HD (1366 x 768) Anti-Glare WLED UWVA 50% NTSC 220 nits eDP slim</i>	<i>Outline Dimensions (W x H x D)</i>	<b>278 x 168(mm) max</b>
	<i>Active Area</i>	<b>256.125 x 144.0 (mm)</b>
	<i>Weight</i>	<b>200 g max.</b>
	<i>Diagonal Size</i>	<b>11.6 (inch)</b>
	<i>Thickness</i>	<b>3.0 (mm) max</b>
	<i>Interface</i>	<b>eDP 1.2</b>
	<i>Surface Treatment</i>	<b>Anti-glare (AG)</b>
	<i>Touch enabled</i>	<b>Yes</b>
	<i>Contrast Ratio</i>	<b>800:1 (typical)</b>
	<i>Refresh Rate</i>	<b>60 HZ</b>
	<i>Brightness</i>	<b>220 nit typical (Panel Only)</b>
	<i>Pixel Resolution</i>	<b>1366 x 768 (HD)</b>
	<i>Format of LCD Pixel Arrangement</i>	<b>RGB</b>
<i>Backlight</i>	<b>LED</b>	
<i>Color Gamut Coverage</i>	<b>50% of NTSC</b>	
<i>Color Depth</i>	<b>6 bit</b>	
<i>Viewing Angle</i>	<b>UWVA 85/85/85/85</b>	

## Technical Specifications

### STORAGE AND DRIVES\*

<b>16 G eMMC</b>	<i>Drive Weight</i>	<b>0.2 g</b>
	<i>Rotation speed</i>	<b>16 GB / 32 GB / 64 GB</b>
	<i>Cache Buffer</i>	<b>1.4 mm</b>
	<i>Height</i>	<b>11.5 x 13 mm</b>
	<i>Width</i>	<b>MMC protocol</b>
	<i>Transfer Rate</i>	<b>Up to 250 MB/s</b>
	<i>Seek Time</i>	<b>Up to 70 MB/s</b>
	<i>Logical Blocks</i>	<b>16GB (15,758,000,128 Bytes) / 32 GB (31,268,536,320 Bytes) / 64 GB (62,537,072,640 Bytes)</b>
	<i>Operating Temperature</i>	<b>0 to 70</b>
	<i>Security Features</i>	<b>HS400</b>

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<b>32 G eMMC</b>	<i>Drive Weight</i>	<b>0.2 g</b>
	<i>Rotation speed</i>	<b>16 GB / 32 GB / 64 GB</b>
	<i>Cache Buffer</i>	<b>1.4 mm</b>
	<i>Height</i>	<b>11.5 x 13 mm</b>
	<i>Width</i>	<b>MMC protocol</b>
	<i>Transfer Rate</i>	<b>Up to 250 MB/s</b>
	<i>Seek Time</i>	<b>Up to 70 MB/s</b>
	<i>Logical Blocks</i>	<b>16 GB (15,758,000,128 Bytes) / 32 GB (31,268,536,320 Bytes) / 64 GB (62,537,072,640 Bytes)</b>
	<i>Operating Temperature</i>	<b>0 to 70</b>
	<i>Security Features</i>	<b>HS400</b>

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## Technical Specifications

<i>64 G eMMC</i>	<i>Drive Weight</i>	<b>0.2 g</b>
	<i>Rotation speed</i>	<b>16 GB / 32 GB / 64 GB</b>
	<i>Cache Buffer</i>	<b>1.4 mm</b>
	<i>NAND Type/Size</i>	<b>11.5 x 13 mm</b>
	<i>Height</i>	<b>MMC protocol</b>
	<i>Interface</i>	<b>Up to 250 MB/s</b>
	<i>Transfer Rate</i>	<b>Up to 70 MB/s</b>
	<i>Seek Time</i>	<b>16 GB (15,758,000,128 Bytes) / 32 GB (31,268,536,320 Bytes) / 64 GB (62,537,072,640 Bytes)</b>
	<i>Logical Blocks</i>	<b>0 to 70</b>
	<i>Operating Temperature</i>	<b>HS400</b>

**For storage drives, GB = 1 billion bytes. Actual formatted capacity is less. Up to 8.1 GB is not user available**

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## Technical Specifications

### NETWORKING/COMMUNICATIONS

<p>Intel® 9560 802.11a/b/g/n/ac (2 x 2) Wi-Fi® and Bluetooth® 5.0 Combo<sup>1</sup> non-vPro™</p>	<p>Wireless LAN Standards</p>	<p><b>IEEE 802.11a</b> <b>IEEE 802.11b</b> <b>IEEE 802.11g</b> <b>IEEE 802.11n</b> <b>IEEE 802.11ac</b> <b>IEEE 802.11d</b> <b>IEEE 802.11e</b> <b>IEEE 802.11h</b> <b>IEEE 802.11i</b> <b>IEEE 802.11k</b> <b>IEEE 802.11r</b> <b>IEEE 802.11v</b></p>
	<p>Interoperability</p>	<p><b>Wi-Fi certified</b></p>
	<p>Frequency Band</p>	<ul style="list-style-type: none"> <li>•<b>802.11b/g/n</b> <b>2.402 – 2.482 GHz</b></li> <li>•<b>802.11a/n/ac</b> <b>4.9 – 4.95 GHz (Japan)</b> <b>5.15 – 5.25 GHz</b> <b>5.25 – 5.35 GHz</b> <b>5.47 – 5.725 GHz</b> <b>5.825 – 5.850 GHz</b></li> </ul>
	<p>Data Rates</p>	<ul style="list-style-type: none"> <li>•<b>802.11b: 1, 2, 5.5, 11 Mbps</b></li> <li>•<b>802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</b></li> <li>•<b>802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</b></li> <li>•<b>802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</b></li> <li>•<b>802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz &amp; 80MHz)</b></li> </ul>
	<p>Modulation</p>	<p><b>Direct Sequence Spread Spectrum</b> <b>BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM</b></p>
	<p>Security<sup>3</sup></p>	<ul style="list-style-type: none"> <li>•<b>IEEE compliant 64 / 128 bit WEP encryption for a/b/g mode only</b></li> <li>•<b>AES-CCMP: 128 bit in hardware</b></li> <li>•<b>802.1x authentication</b></li> <li>•<b>WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.</b></li> <li>•<b>WPA2 certification</b></li> <li>•<b>IEEE 802.11i</b></li> <li>•<b>WAPI</b></li> </ul>
	<p>Network Architecture Models</p>	<p><b>Ad-hoc (Peer to Peer)</b> <b>Infrastructure (Access Point Required)</b></p>
	<p>Roaming</p>	<p><b>IEEE 802.11 compliant roaming between access points</b></p>
	<p>Output Power<sup>2</sup></p>	<ul style="list-style-type: none"> <li>• <b>802.11b: +18.5dBm minimum</b></li> <li>• <b>802.11g: +17.5dBm minimum</b></li> <li>• <b>802.11a: +18.5dBm minimum</b></li> <li>• <b>802.11n HT20(2.4GHz): +15.5dBm minimum</b></li> <li>• <b>802.11n HT40(2.4GHz): +14.5dBm minimum</b></li> <li>• <b>802.11n HT20(5GHz): +15.5dBm minimum</b></li> </ul>

## Technical Specifications

<i>Power Consumption</i>	<ul style="list-style-type: none"> <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>• 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: 10 mW</li> <li>• Radio disabled: 8 mW</li> </ul>
<i>Power Management</i>	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
<i>Receiver Sensitivity</i> <sup>3</sup>	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
<i>Antenna type</i>	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
<i>Form Factor</i>	PCI-Express M.2 MiniCard with CNVi Interface
<i>Dimensions</i>	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
<i>Weight</i>	1. Type 2230: 2.8 g 2. Type 1216: 1.3 g
<i>Operating Voltage</i>	3.3 v +/- 5%
<i>Temperature</i>	Operating: 14° to 158° F (-10° to 70° C) Non-operating: -40° to 176° F (-40° to 80° C)
<i>Humidity</i>	Operating: 10% to 90% (non-condensing) Non-operating: 5% to 95% (non-condensing)
<i>Altitude</i>	Operating: 0 to 10,000 ft (3,048 m) Non-operating: 0 to 50,000 ft (15,240 m)
<i>LED Activity</i>	LED Amber – Radio OFF LED OFF – Radio ON
<i>HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0 Wireless Technology</i>	
<i>Bluetooth Specification</i>	4.0/4.1/4.2/5.0 Compliant
<i>Frequency Band</i>	2402 to 2480 MHz
<i>Number of Available Channels</i>	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
<i>Signaling Data Rate</i>	Legacy: 3 Mbps signaling data rate <sup>1</sup> 2.17 Mbps BLE: 1 Mbps signaling data rate 0.2 Mbps

## Technical Specifications

### 1. Actual throughput may vary.

<i>Transmit Power</i>	<b>Legacy: Synchronous Connection Oriented links, 3, 64 kbps, voice channels</b> <b>Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)</b> <b>The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.</b>
<i>Power Consumption</i>	<b>Peak (Tx): 330 mW</b> <b>Peak (Rx): 230 mW</b> <b>Selective Suspend: 17 mW</b>
<i>Bluetooth Software Supported</i>	<b>Linux kernel version</b>
<i>Link Topology</i>	
<i>Power Management</i>	<b>Intel CNVi/BRI HW power management</b>
<i>Certifications</i>	<b>FCC (47 CFR) Part 15C, Section 15.247 &amp; 15.249</b>
<i>Power Management Certifications</i>	<b>ETS 300 328, ETS 300 826</b> <b>Low Voltage Directive IEC950</b> <b>UL, CSA, and CE Mark</b>
<i>Bluetooth Profiles Supported</i>	<b>BT4.1-ESR 5/6/7 Compliance</b> <b>LE Link Layer Ping</b> <b>LE Dual Mode</b> <b>LE Link Layer</b> <b>LE Low Duty Cycle Directed Advertising</b> <b>LE L2CAP Connection Oriented Channels</b> <b>Train Nudging &amp; Interlaced Scan</b> <b>BT4.2 ESR08 Compliance</b> <b>LE Secure Connection- Basic/Full</b> <b>LE Privacy 1.2 –Link Layer Privacy</b> <b>LE Privacy 1.2 –Extended Scanner Filter Policies</b> <b>LE Data Packet Length Extension</b> <b>FAX Profile (FAX)</b> <b>Basic Imaging Profile (BIP)2</b> <b>Headset Profile (HSP)</b> <b>Hands Free Profile (HFP)</b> <b>Advanced Audio Distribution Profile (A2DP)</b>

1. **Wireless access point and Internet service is required. Availability of public wireless access point is limited.**
2. **The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.**
3. **Check latest software/driver release for updates on supported security features.**
4. **Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).**

## Technical Specifications

### POWER

<i>45 W PD AC adapter</i>	<i>Dimensions (H x W x D)</i>	<b>95 mm x 43 mm x 27.5 mm</b>	
	<i>Weight</i>	<b>200 g +/-10%</b> <b>Not including power cord. Power cord varies by country</b>	
	<i>Input</i>	<b>100 to 240 VAC</b>	
	<i>Input Efficiency</i>	<b>Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec:</b> <b>5V: 81.5%</b> <b>9V: 86.7%</b> <b>12V: 87.41%</b> <b>15V: 87.8%</b>	
	<i>Input frequency range</i>	<b>47 ~ 63Hz</b>	
	<i>Input AC current</i>	<b>Max. 1.4 A at 90 Vac</b>	
	<i>Output</i>	<i>Output power</i>	<b>5V/15W</b> <b>9V/27W</b> <b>12V/36W</b> <b>15V/45W</b>
		<i>DC output</i>	<b>5V/9V/12V/15V</b>
		<i>Hold-up time</i>	<b>5ms at 115 Vac input</b>
	<i>Connector</i>	<i>Output current limit</i>	<b>&lt;5.0A by each outputs</b>
		<b>USB Type-C™</b>	
<i>Environmental Design</i>	<i>Operating temperature</i>	<b>32°F to 95°F (0°C to 35°C)</b>	
	<i>Non-operating (storage) temperature</i>	<b>-4°F to 185°F (-20°C to 85°C)</b>	
	<i>Altitude</i>	<b>0 to 16,400 ft (0 to 5000m)</b>	
	<i>Humidity</i>	<b>20% to 95%</b>	
	<i>Storage Humidity</i>	<b>10% to 95%</b>	
<i>EMI and Safety Certifications</i>	<b>CE Mark - full compliance with LVD and EMC directives</b> <b>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.</b> <b>MTBF - over 200,000 hours at 25°C ambient condition.</b>		

<i>HP 2-cell Long Life Li-Ion (47 Whr)</i>	<i>Dimensions (H x W x L)</i>	<b>5.2 x 240.8 x 76.4 mm (0.204 x 9.48 x 3 inch)</b>
	<i>Weight</i>	<b>0.19 kg (0.418 lb)</b>
	<i>Cells/Type</i>	<b>2cell Lithium-Ion Polymer cell / 4473A9</b>
	<i>Voltage</i>	<b>7.7 V</b>
	<i>Amp-hour capacity</i>	<b>6.15 Ah</b>
	<i>Watt-hour capacity</i>	<b>47.3 Wh</b>
	<i>Operating (Charging)</i>	<b>32° to 113° F (0° to 45° C)</b>
	<i>Operating (Discharging)</i>	<b>14° to 122° F (-10° to 60° C)</b>
	<i>Warranty</i>	<b>1-year</b>
	<i>Optional Travel Battery Available</i>	<b>No</b>

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

<i>Category</i>	<i>Description</i>	<i>Part Number</i>
<i>Cases</i>	<b>HP Essential Backpack (up to 15.6")</b>	<b>H1D24AA</b>
	<b>HP Reversible 11.6" Sleeve</b>	<b>7ZE81AA</b>
<i>Docking</i>	<b>HP USB-C Travel Dock G2</b>	<b>7PJ38AA</b>
	<b>HP E24d G4 Advanced Docking monitor</b>	<b>6PA50AA</b>
	<b>HP E27d G4 Advanced Docking monitor</b>	<b>6PA56AA</b>
<i>Input/output</i>	<b>HP 3-Button Laser Mouse</b>	<b>H4B81AA</b>
	<b>HP Ultra Mobile Wireless Mouse</b>	<b>H6F25AA</b>
	<b>HP USB Optical Travel mouse</b>	<b>G1K28AA</b>
	<b>HP Essential USB Mouse</b>	<b>2TK37AA</b>
	<b>HP Slim Bluetooth Mouse</b>	<b>F3J92AA</b>
	<b>HP Slim USB KB &amp; Mouse</b>	<b>T6T83AA</b>
	<b>HP USB-C to HDMI 2.0 Adapter</b>	<b>1WC36AA</b>
	<b>HP USB-C to DisplayPort Adapter</b>	<b>N9K78AA</b>
	<b>HP USB-C to USB 3.0 Adapter</b>	<b>N2Z63AAA</b>
	<b>HP USB-C to RJ45 Adapter</b>	<b>V7W66AA</b>
<b>HP USB-C to VGA Adapter</b>	<b>N9K76AA</b>	
<i>Power</i>	<b>HP 45W Type -C Straight Type</b>	<b>1MZ01AA</b>
<i>Security</i>	<b>HP Nano Keyed Cable Lock</b>	<b>1AJ39AA</b>
	<b>HP Sure Key Cable lock</b>	<b>6UW42AA</b>

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

## Summary of Changes

<i>Date of change:</i>	<i>Version History:</i>		<i>Description of change:</i>
<b>January 22, 2020</b>	<b>V1 to V2</b>	<b>Added</b>	<b>Environmental Tab</b>
<b>February 21, 2020</b>	<b>V2 to V3</b>	<b>Updated</b>	<b>Docking Section</b>
<b>March 17, 2020</b>	<b>V3 to V4</b>	<b>Updated</b>	<b>Accessories Section</b>
<b>April 20, 2020</b>	<b>V4 to V5</b>	<b>Updated</b>	<b>Military Standards Information</b>
<b>May 23, 2020</b>	<b>V5 to V6</b>	<b>Updated</b>	<b>Military Standards Information</b>

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