Overview

HP Chromebook 11 G8 EE

1. Webcam LED
2. Webcam
3. Internal Microphone
4. Touchpad

Left

5. USB 3.1 Type-A™ Gen 1 Port
6. USB 3.1 Type-C™ Gen 1 Port
   (Support charging, Power delivery, Video, Data)
7. Nano Security Lock Slot

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 (optional)
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 G 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[1]
- 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[2]
- 180 degree hinge and optional HD IPS anti-glare touchscreen for collaboration[3]
- Enjoy Android™ Apps* on Chrome OS™[3]
- 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)[1,2]
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)[1,2]
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)[1,2]
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)[1,2]

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[3]

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)[3,4,5]
29.46 cm (11.6") diagonal HD IPS anti-glare WLED-backlit, 220 nits, 50% NTSC (1366 x 768)[3,4,5]

Touch
29.46 cm (11.6") diagonal HD IPS anti-glare WLED-backlit touch screen, 220 nits, 50% NTSC (1366 x 768)[3,4,5]

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[6]
32 GB eMMC 5.0[6]
64 GB eMMC 5.0[6]

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™[7]
Realtek 802.11ac (2x2) WLAN and Bluetooth® 5 Combo[7]
MU-MIMO supported
HP Extended Range Wireless Lan supported

Chromecast
Chromecast Support[8]

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 2W stereo speakers
Integrated dual array microphone

Camera
720p HD camera[3]

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
HP Classroom Manager[9]

Manageability Features
Chrome Enterprise Upgrade[10, 11]
Chrome Education Upgrade[10, 11]

Security Management
Titan C
Nano Security lock slot[10]

9. HP Classroom Manager is sold separately. Control and device locking from the teacher's desktop requires purchase of HP Classroom Manager.
10. Sold separately.
11. 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[12]
HP Fast Charge Technology (90% in 90 minutes)[13]

Power Cord
3-wire plug - 1m

Battery life
Up to 13 hours and 30 minutes[14]

12. Battery is internal and not replaceable by customer. Serviceable by warranty.
13. 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.
14. 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.

WEIGHTS & DIMENSIONS

Product Weight
Starting at 2.91 lb[15]
Starting at 1.32 kg[15]

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.

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 (optional)
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.[16]

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.

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	USB-C 45 W adapter	
	Nominal Operating Voltage	15 V
	Average Operating Power	<4.0 W with PLT test
	Integrated Graphics	HD Graphics 600 12EUs
	Max Operating Power	< 45 W
Temperature	**Operating**	41° to 95° F (5° to 35° C)
	Non-operating	-4° to 140° F (-20° to 60° C)
Relative Humidity	**Operating**	10% to 90%
	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**	-50 to 10,000 ft (-15 to 3,048 m)
	Non-operating	-50 to 40,000 ft (-15 to 12,192 m)
Planned Industry Standard Certifications	**UL**	Yes
	FCC Compliance	Yes
	ENERGY STAR®	Yes[17]
	EPEAT® 2019	Yes, Silver in U.S.[18]
	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

17. 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.
18. 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.

Technical Specifications

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

Technical Specifications

11.6 inch diagonal HD (1366 x 768) Anti-Glare WLED UWVA 50% NTSC 220 nits eDP slim	**Outline Dimensions** (W x H x D)	278 x 168(mm) max
	Active Area	256.125 × 144.0 (mm)
	Weight	200 g max.
	Diagonal Size	11.6 (inch)
	Thickness	3.0 (mm) max
	Interface	eDP 1.2
	Surface Treatment	Anti-glare (AG)
	Touch enabled	Yes
	Contrast Ratio	800:1 (typical)
	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	50% of NTSC
	Color Depth	6 bit
	Viewing Angle	UWVA 85/85/85/85

Technical Specifications

STORAGE AND DRIVES*

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

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

Technical Specifications

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

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

Technical Specifications

NETWORKING/COMMUNICATIONS

Intel® 9560 802.11a/b/g/n/ac (2 x 2) Wi-Fi® and Bluetooth® 5.0 Combo[1] non-vPro"	**Wireless LAN Standards**	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
	Interoperability	Wi-Fi certified
	Frequency Band	•802.11b/g/n 2.402 – 2.482 GHz •802.11a/n/ac 4.9 – 4.95 GHz (Japan) 5.15 – 5.25 GHz 5.25 – 5.35 GHz 5.47 – 5.725 GHz 5.825 – 5.850 GHz
	Data Rates	•802.11b: 1, 2, 5.5, 11 Mbps •802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps •802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps •802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) •802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz & 80MHz)
	Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	Security[3]	•IEEE 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[2]	• 802.11b: +18.5dBm minimum

	• 802.11g: +17.5dBm minimum • 802.11a: +18.5dBm minimum • 802.11n HT20(2.4GHz): +15.5dBm minimum • 802.11n HT40(2.4GHz): +14.5dBm minimum • 802.11n HT20(5GHz): +15.5dBm minimum • 802.11n HT40(5GHz): +14.5dBm minimum • 802.11ac VHT80(5GHz): +11.5dBm minimum • 802.11ac VHT160(5GHz): +11.5dBm minimum
Power Consumption	•Transmit mode: 2.0 W •Receive mode: 1.6 W •Idle mode (PSP) 180 mW (WLAN Associated) •Idle mode: 50 mW (WLAN unassociated) •Connected Standby/Modern Standby: 10 mW •Radio disabled: 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity [3]	802.11b, 1Mbps: -93.5dBm maximum 802.11b, 11Mbps: -84dBm maximum 802.11a/g, 6Mbps: -86dBm maximum 802.11a/g, 54Mbps: -72dBm maximum 802.11n, MCS07: -67dBm maximum 802.11n, MCS15: -64dBm maximum 802.11ac, MCS0: -84dBm maximum 802.11ac, MCS9: -59dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard with CNVi Interface
Dimensions	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
Weight	1. Type 2230: 2.8 g 2. Type 126: 1.3 g
Operating Voltage	3.3 v +/- 5%
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)

Technical Specifications

LED Activity	LED Amber – Radio OFF LED OFF – Radio ON
HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0 Wireless Technology	
Bluetooth Specification	4.0/4.1/4.2/5.0 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps signaling data rate[1] 2.17 Mbps BLE: 1 Mbps signaling data rate 0.2 Mbps 1. Actual throughput may vary. Legacy: Synchronous Connection Oriented links, 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.
Power Consumption	Peak (Tx): 330 mW Peak (Rx): 230 mW Selective Suspend: 17 mW
Bluetooth Software Supported Link Topology	Linux kernel version
Power Management	Intel CNVi/BRI HW power management
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension

FAX Profile (FAX)
Basic Imaging Profile (BIP)2
Headset Profile (HSP)
Hands Free Profile (HFP)
Advanced Audio Distribution Profile (A2DP)

1. Wireless access point and Internet service 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

Realtek RTL8822CE 802.11ac 2x2 Wi-Fi® + Bluetooth® 5[1]	**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 & 80MHz)
	Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	Security[3]	•IEEE and Wi-Fi certified 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[2]	• 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

Technical Specifications

	• 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 •Idle mode (PSP) 180 mW (WLAN Associated) •Idle mode50 mW (WLAN unassociated) •Connected Standby/Modern Standby: 10mW •Radio disabled 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[4]	•802.11b, 1Mbps : -93.5dBm maximum •802.11b, 11Mbps : -84dBm maximum •802.11a/g, 6Mbps : -86dBm maximum •802.11a/g, 54Mbps : -72dBm maximum •802.11n, MCS07 : -67dBm maximum •802.11n, MCS15 : -64dBm maximum •802.11ac, MCS0 : -84dBm maximum •802.11ac, MCS9 : -59dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
Weight	1. Type 2230 : 2.8g 2. Type 126: 1.3g
Operating Voltage	3.3v +/- 9%
Temperature	**Operating** 14° to 158° F (–10° to 70° C) **Non-operating** –40° to 176° F (–40° to 80° C)
Humidity	**Operating** 10% to 90% (non-condensing) **Non-operating** 5% to 95% (non-condensing)
Altitude	**Operating** 0 to 10,000 ft (3,048 m) **Non-operating** 0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED OFF – Radio ON

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

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

Technical Specifications

Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps BLE : 1 Mbps data rate; throughput up to 0.2 Mbps Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.

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. 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

45 W PD AC adapter	**Dimensions** (H x W x D)	95 mm x 43 mm x 27.5 mm	
	Weight	200 g +/-10% Not including power cord. Power cord varies by country	
	Input	100 to 240 VAC	
		Input Efficiency	Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec: 5V: 81.5% 9V: 86.7% 12V: 87.41% 15V: 87.8%
		Input frequency range	47 ~ 63Hz
		Input AC current	Max. 1.4 A at 90 Vac
	Output	**Output power**	5V/15W 9V/27W 12V/36W 15V/45W
		DC output	5V/9V/12V/15V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<5.0A by each outputs
	Connector	USB Type-C™	
	Environmental Design	**Operating temperature**	32°F to 95°F (0°C to 35°C)
		Non-operating (storage) temperature	-4°F to 185°F (-20°C to 85°C)
		Altitude	0 to 16,400 ft (0 to 5000m)
		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 2-cell Long Life Li-Ion (47 Whr)	**Dimensions** (H x W x L)	5.2 x 240.8 x 76.4 mm (0.204 x 9.48 x 3 inch)
	Weight	0.19 kg (0.418 lb)
	Cells/Type	2cell Lithium-Ion Polymer cell / 4473A9
	Voltage	7.7 V
	Amp-hour capacity	6.15 Ah
	Watt-hour capacity	47.3 Wh
	Operating (Charging)	32˚ to 113˚ F (0˚ to 45˚ C)

Technical Specifications

Operating (Discharging)	14˚ to 122˚ F (-10˚ to 60˚ C)
Warranty	1-year
Optional Travel Battery Available	No

Technical Specifications

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)	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 60Hz**
Normal Operation (Sort idle)	2.940 W	3.108 W	2.916 W
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

Technical Specifications

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

Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.

Batteries

This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:
Mercury greater the1ppm by weight
Cadmium greater than 20ppm by weight

Battery size: CR2032 (coin cell)
Battery type: LithiuM

Additional Information

- 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			
	External:	PAPER/Corrugated	226 g
	Internal:	PLASTIC/Polyethylene low density - LDPE	7 g

Technical Specifications

	PAPER/Molded Pulp	121g

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)"

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.

Technical Specifications

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.
Hewlett-Packard Corporate Environmental Information	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 and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf

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

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

Summary of Changes

Date of change:	Version History:		Description of change:
January 22, 2020	V1 to V2	Added	Environmental Tab
February 21, 2020	V2 to V3	Updated	Docking Section
March 17, 2020	V3 to V4	Updated	Accessories Section
April 20, 2020	V4 to V5	Added	At a Glance feature
May 23, 2020	V5 to V6	Updated	Military Standards Information
September 14, 2020	V6 to v7	Updated	Audio Section
December 21, 2020	V7 to V8	Updated	Software and Security
February 22, 2021	V8 to V9	Added	New WLAN in Networking Section
March 22, 2021	V9 to V10	Updated	Micro SD card reader in Overview and Port section
	V10 to V11		