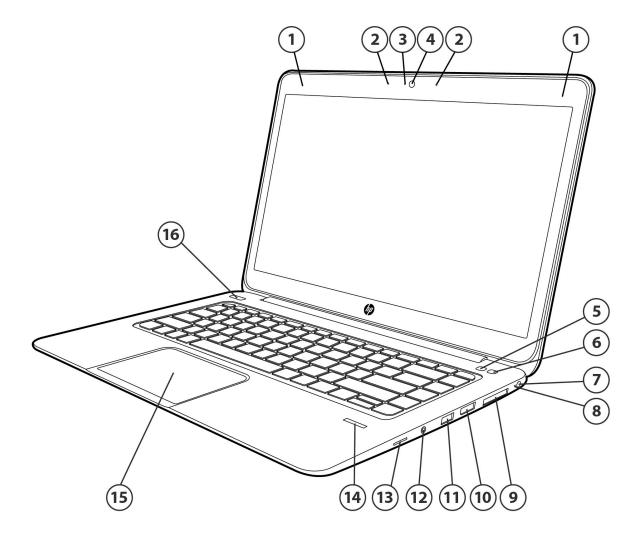
#### Overview

## HP EliteBook Folio 1040 G1 Notebook PC

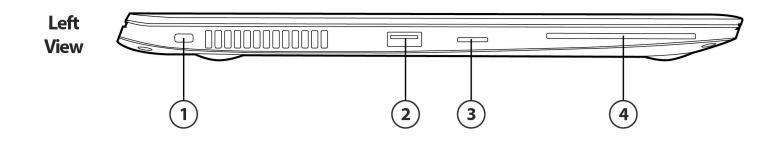


- 1. WLAN antennas (2)
- 2. Dual-microphone array
- 3. Webcam light (only with optional webcam)
- 4. Optional 720p HD webcam
- 5. Wireless on/off button with LED indicator
- 6. Speaker mute button with LED indicator
- 7. Power connector
- 8. Power LED indicator RJ-45/Ethernet port
- 9. Docking connector

- 10. DisplayPort 1.2
- 11. USB 3.0 port
- 12. Headphone/microphone combo
- 13. Micro-SD card reader
- 14. Fingerprint reader (select models only)
- 15 ForcePad<sup>™</sup>
- 16. Power button



### Overview



- 1. Security lock
- 2. USB 3.0 charging port

- 3. TBD
- 4. Smart Card Reader

## At A Glance

- Windows 8.1 Pro, Windows 8, Windows 7 versions or FreeDOS
- Magnesium display enclosure, magnesium-reinforced chassis, wear-resistant platinum-colored HP DuraFinish, HP DisplaySafe frame, HP DuraKeys, precision metal-alloy hinges, aluminum keyboard deck, and a ForcePad that enables multiple gestures and eliminates the need for repetitive motion and makes navigation easier
- Choice of 4<sup>th</sup> Generation Intel<sup>®</sup> Core<sup>™</sup> i7 and i5 with Turbo Boost Technology, as well as 4<sup>th</sup> Generation Intel Core i3 Dual-Core
- Integrated Intel<sup>®</sup> HD Graphics 4000
- 14.0-inch diagonal HD or HD+\* widescreen LED-backlit display
- Choice of 256 GB Solid State Drive, 180 GB Solid State Drive, or 128 GB Solid State Drive
- Optional 32 GB mSATA M.2 Flash Cache module support for Intel Smart Response Technology. (Available only with standard non-SED hard drive).
- Built-in docking for a desktop-like experience
- DisplayPort 1.2 for high resolution support
- HD Audio with DTS Studio Sound<sup>™</sup> optimized for high fidelity audio during video conferencing and web-based training
- 6-cell (42 WHr) HP Long Life battery for battery life up to TBD hours
- ForcePad<sup>™</sup> that enables multiple gestures and eliminates the need for repetitive motion and makes navigation easier
- Integrated Smart Card Reader and optional fingerprint reader for strong security authentication
- HP Premier Image with Microsoft Security Essentials and without trialware
- HP BIOSphere with HP Sure Start
- Flexible wireless connectivity options:
  - Optional integrated wireless mobile broadband 3G and 4G/LTE support (no Win 8 support)
  - Integrated Intel<sup>®</sup> 802.11 a/b/g/n (2x2), Intel<sup>®</sup> 802.11 a/b/g/n (2x2) with Bluetooth<sup>®</sup> v4.0 Combo, or Intel<sup>®</sup> 802.11 a/b/g/n (2x2) AC with Bluetooth<sup>®</sup> v4.0 Combo
- Low halogen, ENERGY STAR qualified (with Microsoft OS) and EPEAT TBD registered in the U.S. (with Microsoft OS). EPEAT status varies by country- please see epeat.net.





**Overview** 

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

### Features

### **PRODUCT NAME**

HP EliteBook Folio 1040 G1 Notebook PC

## **OPERATING SYSTEM**

Preinstalled	Windows 8.1 Pro 64* Windows 8.1 64* Windows 7 Professional (available through downgrade rights from Windows 8.1 Pro)** Windows 7 Professional 32*** Windows 7 Professional 64*** Windows 7 Home Premium 32*** FreeDOS SUSE Linux Enterprise
Supported	Windows 8 Pro* Windows 8 Enterprise* Windows 7 Enterprise 32*** Windows 7 Enterprise 64*** Windows 7 Ultimate 32*** Windows 7 Ultimate 64*** SUSE Linux Enterprise
Certified	SUSE Linux Enterprise Desktop

\* Not all features are available in all editions of Windows 8.1. Systems may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8.1 functionality. See <u>http://www.microsoft.com</u> for details.

\*\* This system is preinstalled with Windows<sup>®</sup> 7 Pro software and also comes with a license and media for Windows 8 Pro software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

\*\*\* Not all features are available in all editions of Windows 7. This system may require upgraded and/or separately purchased hardware to take full advantage of Windows 7 functionality. See <u>http://www.microsoft.com/windows/windows-7/</u> for details.

### PROCESSOR

4th Generation Intel<sup>®</sup> Core™ i7-4600U with Intel HD Graphics 4400 (2.1 GHz, 4 MB cache, 2 cores)\*

Up to 3.3 GHz with Intel Turbo Boost Technology

4th Generation Intel® Core™ i7-4650U with Intel HD Graphics 5000 (1.7 GHz, 4 MB cache, 2 cores)\* Up to 3.3 GHz with Intel Turbo Boost Technology

4th Generation Intel® Core™ i5-4300U with Intel HD Graphics 4400 (1.9 GHz, 3 MB cache, 2 cores)\* Up to 2.9 GHz with Intel Turbo Boost Technology

4th Generation Intel<sup>®</sup> Core™ i5-4200U with Intel HD Graphics 4400 (1.6 GHz, 3 MB cache, 2 cores)\* Up to 2.6 GHz with Intel Turbo Boost Technology

† Not available with vPro

\* Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. 64-bit computing on Intel® architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary



### Features

depending on your hardware and software configurations. Intel's numbering is not a measurement of higher performance. **NOTE:** Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

### CHIPSET

Mobile Intel<sup>®</sup> QM87

## INTEL CORE 15 WITH VPRO/CORE 17 WITH VPRO TECHNOLOGY CAPABLE

Intel Core i5 with vPro and Core i7 with vPro technology is a selectable feature that is available on units configured with select processors, an Intel Centrino<sup>®</sup> Advanced-N or Ultimate-N WLAN module and a preinstalled Windows operating system. It provides advances in remote manageability, security, energy efficient performance, and wireless connectivity. Intel Active Management Technology 9.0 (iAMT) offers built-in manageability and proactive security for networked notebook PCs, even when they are powered off\* or when the operating system is inoperable. It can help identify threats before they reach the network, isolate infected systems, and update PCs regardless of their power state.

\*Requires a Windows operating system, network hardware and software, connection with a power source, and a direct (non-VPN) corporate network connection which is either cable or wireless LAN.

**NOTE:** Some functionality of Intel<sup>®</sup> Core i5 with vPro/Core i7 with vPro technology, such as Intel<sup>®</sup> Active Management technology and Intel<sup>®</sup> Virtualization technology, requires additional third- party software in order to run. Availability of future "virtual appliances" applications for Intel<sup>®</sup> Core i5 with vPro/Core i7 with vPro technology is dependent on third- party software providers. Compatibility with future "virtual appliances" is yet to be determined.

### GRAPHICS

Integrated: Intel® HD Graphics 4400 Intel® HD Graphics 5000

### DISPLAY

#### Internal

14.0" diagonal eDP, slim, LED-backlit HD+\* 16:9 widescreen anti-glare SVA (1600 x 900)

#### External

Up to 32-bit per pixel color depth (250 nits)

#### DisplayPort

Supports resolutions up to 2560 x 1600, 30-bit color depth at 60 Hz, and full HD\* (1920 x 1080) monitors, 24-bit color depth at 120 Hz

#### VGA

Port supports resolutions up to 2048 x 1536 at 75 Hz, and lower resolutions at up to 100 Hz

#### Internal

14.0" diagonal eDP, slim, LED-backlit FHD\* widescreen anti-glare UWVA (1920 x 1080)

#### External

Up to 32-bit per pixel color depth (250 nits)

#### DisplayPort

Supports resolutions up to 2560 x 1600, 30-bit color depth at 60 Hz, and full HD\* (1920 x 1080) monitors, 24-bit color depth



### Features

at 120 Hz

#### VGA

Port supports resolutions up to 2048 x 1536 at 75 Hz, and lower resolutions at up to 100 Hz

\* HD content required to view HD images.

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

### **FLASH CACHE MODULE**

Optional 32 GB mSATA M.2 Flash cache module support for Intel Smart Response Technology. (Available only with standard non-SED hard drive).

### **STORAGE AND DRIVES**

Primary Storage Bay

#### **Solid State Drive**

SATA 6 Gb/s 128 GB\* Solid State SATA 6 Gb/s 180 GB\* Solid State SATA 6 Gb/s 256 GB\* Solid State

\* For hard drives and solid state drives, GB = 1 billion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 7) and up to 36 GB (for Windows 8.1) of system disk is reserved for the system recovery software.

**NOTE:** The EliteBook Folio is available in standard thin and light configurations for customers who value the ultra-thin design but prefer options such as a standalone HDD or require a self-encrypting hard drive. These configurations will not meet Intel's definition of an Ultrabook.

### MEMORY

**Standard** DDR3L SDRAM (1600 MHz, 1.3v) One SODIMM Standard memory up to 8192 MB **Maximum** Upgradeable to 8 GB (4/8 GB Memory Module Upgrade Options)

**NOTE:** Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed. With Windows Starter 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not be available due to system resource requirements.

## **NETWORKING/COMMUNICATIONS**

#### Wireless

Support for a broad range of secure, integrated wireless LAN and wireless WAN options featuring support for the latest industry standards. Broadband Wireless (WWAN) requires a Windows operating system and is available in select countries. Wireless LAN and integrated Bluetooth are also available (both are factory configurable only) and can be combined with any of the supported wireless WAN options.

#### **Broadband Wireless (WWAN)**

HP lt4111 LTE/EV-DO/SHPA+ Mobile Broadband Module \*,\*\*



### Features

HP lt4112 LTE/HSPA+ Mobile Broadband Module (EMEA only) \*,\*\* HP hs3110 HSPA+ Mobile Broadband Module \*

#### **Integrated wireless LAN options**

Intel® 802.11 a/b/g/n (2x2)\*\*\*

Intel<sup>®</sup> 802.11 a/b/g/n (2x2) with Bluetooth<sup>®</sup> v4.0 Combo\*\*\*

Intel®802.11 a/b/g/n (2x2) AC with Bluetooth® v4.0 Combo\*\*\*, \*\*\*\*

\* WWAN is an optional feature sold separately or as an add on feature. WWAN connection requires wireless data service contract, network support, and is not available in all areas. Contact service provider to determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors. \*\* 4G LTE not available on all products, in all regions and requires Windows.

\*\*\*Wireless access point and Internet service is required and is not included. Availability of public wireless access points limited.

\*\*\*\* The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.

#### Communications

Intel® 1218LM Gigabit Network connection\*

\* 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.

## AUDIO/MULTIMEDIA

#### Audio

HD Audio with DTS Studio Sound Integrated stereo speakers Integrated dual-microphone array located in display Button for speaker mute; function keys for volume up and down Headphone/Microphone combo port

Webcam

Optional\* 720p HD\*\* webcam

- HD format (widescreen)
- Supports videoconferencing and still image capture
- High quality fixed focus lens
- Video capture at various resolutions up to 1280x720 resolution (720p) and up to 30fps
- M-JPEG compression supports higher frame rates for video capture and videoconferencing
- Improved low light sensitivity
- Improved dynamic range

\* Sold separately as an optional feature.

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

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

#### Keyboard

The HP spill-resistant, backlit keyboard is designed using a thin layer of Mylar film under the keyboard and a drain system that funnels fluid through a hole in the bottom of the notebook. This minimizes the risk of damage to sensitive components underneath. The 101/102-key compatible keyboard features a full-pitch key layout with desktop keyboard features, such as



### Features

the isolated inverted-T cursor control keys, editing keys, both left and right control and alt keys, 12 function keys, and 19.05 x 19.05 mm key pitch (center-to-center spacing). U.S. and International key layouts are available. Other features include hot keys for instant access to power conservation and brightness.

**Pointing Devices** 

ForcePad™

#### **Buttons and Function Keys**

Discrete buttons provide easy access to the following features: wireless on/off, and speaker mute. Function keys provide control of the following features: sleep mode, external display switching, volume down, volume up, microphone mute, backlit keyboard, and display brightness.

### SOFTWARE AND SECURITY

#### Preinstalled Software with Windows Operating System

HP BIOSphere with HP Sure Start\* Buy Office HP Connection Manager (Win 7) HP Wireless HotSpot\*\* HP Mobile Connect (EMEA only) HP PageLift HP Recovery Manager HP Support Assistant HP ePrint\*\*\* Lync Optimized\*\*\*\*

\* HP Sure Start is only available on the EliteBook 800 series, Workstation ZBook series and HP EliteBook Folio 1040. \*\* The wireless hotspot application requires an active internet connection and separately purchased data plan. While HP wireless hotspot is active, on-device applications will continue to work and will use the same data plan as the wireless hotspot. Wireless hotspot data usage may incur additional charges. Check with your service provider for plan details. Requires Windows 8.

\*\*\* Requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see www.hp.com/go/eprintcenter).Requires optional broadband module. Broadband use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Separately purchased data plans or usage fees may apply. Print times and connection speeds may vary.

\*\*\*\* Lync software is sold separately. Requires internet access.

**NOTE:** HP Recovery Manager enables fast recovery of the factory preinstalled image if the system becomes corrupted or if important system files are accidentally deleted. Up to 30 GB (for Windows 7) and up to 36 GB (for Windows 8.1) of system disk is reserved for the system recovery software.

#### Security

#### Standard

HP Trust Circles Standard (Available in Fall 2013)\* HP Client Security TPM 1.2 Embedded Security Chip Integrated Smart Card Reader HP Fingerprint Sensor (100%) Full Volume Encryption



### Features

Security Lock Slot Microsoft Security Essentials

\* HP Trust Circles Standard, when included, allows up to 5 Trust Circles with up to 5 contacts in each Trust Circle. Optional Trust Circles Professional required for unrestricted number of Trust Circles and members contacts. Trust Circles Reader is available to allow a contact to participate in an invited Trust Circle. Requires Windows.

For more information on HP security solutions refer to: <u>http://www.hp.com/go/security</u>

### POWER

#### **Power Supply**

45W Smart AC Adapter 65W Smart EM AC Adapter 65W Slim Smart AC Adapter Power cord included is TBD-foot (TBD meter). Total length including external AC adapter is TBD feet (TBD meter).

#### **Primary Battery**

HP 6-Cell (42Whr) polymer long life battery

#### **Slice Battery**

HP 6-cell Lithium-Ion Long Life Battery (60 WHr)

Battery Life\* Up to TBD hours

#### System Standby Time

#### Up to TBD weeks

\*Battery life will vary depending on the 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 MobileMark07 battery benchmark <u>http://www.bapco.com/products/mobileMark2007</u> for additional details.

#### **Power Conservation**

Hibernation Standby ACPI compliance

### ENVIRONMENTAL

ENERGY STAR TBD qualified (with Microsoft OS) Low Halogen (does not cover adapters and power cords) IT ECO Declaration EPEAT® TBD in the U.S. See <u>www.epeat.net</u> for registration status by country.

**NOTE:** 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.

## **WEIGHTS & DIMENSIONS**

Weight

Starting at 3.3 lbs (1.49 kg) (Weight will vary by configuration.)



### Features

**Dimensions** (w x d x h) 13.31 x 9.19 x 0.63 in 33.8 x 23.35 x 1.59 cm

**NOTE:** Weight varies by configuration and components. Weight includes 4-cell battery, mSATA solid state drive, and 4 GB memory. Weight varies by configuration and components.

## **PORTS/SLOTS**

#### Ports

DisplayPort – One (v1.2) Headphone/Microphone combo port – One Power Connector – One Docking Connector – One USB 3.0 – One USB 3.0 charging port – One

#### **Digital Media Slots**

Micro-SD card reader supports SD, SDHC, SDXC

### SERVICE AND SUPPORT

Limited 3-year, 1-year and 90-day warranty options available, depending on country, 3-year limited warranty on HP Long Life Battery (only available with 3-year platform warranty). Optional\* HP Care Pack Services\*\* are extended service contracts which go beyond your standard warranties. For more details visit: http://www.hp.com/go/cpc.

\*Sold separately or as an optional feature.

\*\* 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. Consult the HP Customer Support Center for details. http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp

**NOTE**: 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: <u>www.hp.com/go/cpc</u>



## **Technical Specifications**

### **SYSTEM UNIT**

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	18.5 V	
	Average Operating Power	Windows 7 (32-bit)	Windows 7 (64-bit)
		TBD W	TBD W
	Max Operating Power	< 65 W	
Temperature	Operating	32° to 95° F (0° to 35° C) (not writing	optical)
	Non-operating	-4° to 140° F (-20° to 60° C)	
<b>Relative Humidity</b>	Operating	10% to 90%, non-condensing	
	Non-operating	5% to 95%, 101.6° F (38.7° C) maxim	um wet bulb temperature
Shock	Operating	40 G, 2 ms, half-sine	
	Non-operating	200 G, 2 ms, half-sine	
<b>Random Vibration</b>	Operating	0.75 grms	
	Non-operating	1.50 grms	
Altitude (unpressurized)	Operating	-50 to 10,000 ft (-15.24 to 3,048 m)	
	Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)	)
Planned Industry	UL	Yes	
Standard	CSA	Yes	
Certifications	FCC Compliance	Yes	
	ENERGY STAR®	TBD models (Microsoft OS)*	
	EPEAT <sup>®</sup>	Registered TBD in United States**	
	ICES	Yes	
	Australia / NZ A-Tick Compliance	Yes	
	כככ	Yes	
	Japan VCCI Compliance	Yes	
	KC	Yes Yes Yes Yes Yes	
	BSMI		
	CE Marking Compliance		
	BNCI or BELUS		
	СІТ		
	GOST	Yes	
	Saudi Arabian Compliance (ICCP)	Yes	
	SABS	Yes	
	UKRSERTCOMPUTER	Yes	

\* Configurations of the HP EliteBook Folio 1040 G1that are ENERGY STAR qualified are identified as HP EliteBook Folio 1040 G1 ENERGY STAR on HP websites and on www.energystar.gov.

\*\*EPEAT® TBD in the U.S. See www.epeat.net for registration status by country.



## **Technical Specifications**

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



## **Technical Specifications**

## DISPLAYS

14" diagonal LED- backlit HD+ anti-glare	<b>Outline Dimensions</b> (W x H x D)	12.6 x 8.09 x 0.14 in (32.09 x 20.56 x 0.36 cm)	
SVA flat (1600 x 900)	Active Area	12.19 x 6.86 in (30.96 x 17.415 cm)	
	Weight	0.72 lb (325 g) (max)	
	Diagonal Size	14.0 in (35.6cm)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	300:1 (min)	
	Refresh Rate	60 Hz	
	Brightness	250 nit (typical)	
	<b>Pixel Resolution</b>	Format	1600 x 900 (HD+)
		Configuration	RGB Stripe
	Interface	eDP 1.2 (1 lane)	
	LCD Mode	TN	
	PPI	131 ррі	
	Viewing Angle	SVA 40/40/15/30 (Left/Right/Down/Up)	
14" diagonal LED-backlit		12.6 x 8.09 x 0.12 in (32.09 x 20	).56 x 0.3 cm)
FHD anti-glare UWVA sli	<b>n</b> (W x H x D)		
(1920 x 1080)	Active Area	12.18 x 6.85 in (30.93 x 17.4 cm	1)
	Weight	0.75 lb (340 g) (max)	
	Diagonal Size	14.0 in (35.6cm)	
	Touch enabled	Yes	
	Surface Treatment	Anti-glare	
	Contrast Ratio	600:1 (min)	
	Refresh Rate	60 Hz	
	Brightness	300 nit (typical)	
	Pixel Resolution	Format	1920 x 1080 (FHD)
		Configuration	RGB Stripe
	Interface	eDP 1.3+PSR (2 lane)	
	LCD Mode	IPS/FFS/VA	
	PPI	157 ррі	
	Viewing Angle	UWVA 85/85/85/85 (Left/Right,	/Down/Up)

## **STORAGE AND DRIVES**

#### **Internal Storage**

The EliteBook Folio is available in standard thin and light configurations for customers who value the ultra-thin design but prefer options such as a standalone HDD or require a self-encrypting hard drive. These configurations will not meet Intel's definition of an Ultrabook.

128 GB* M.2 Solid State	Drive Weight	10 grams
Drive	Capacity	128 GB
	Height	0.091 in (2.3 mm)



## **Technical Specifications**

Notion Conversion (Conversion) Performance Performance Performance Performance Logical Blocks Coperating Temperature Sign Capacity Capacity Pretures ATA Security; ATA-8; SATA 3.0; DIPM; TRIM Tab GB* M.2 Solid State Drive Drive Weight Capacity 100 GB Capacity Reight Capacity 100 GB 100 G		Width	0.87 in (22 mm)	
Performance         Maximum Sequential Read Up to 500 MB/s         Maximum Sequential Read Up to 500 MB/s           Logical Blocks         250.059,680         3210 159F (0' to 70°C) [case temp] Table Servers         3210 159F (0' to 70°C) [case temp] Table Servers           SB GB* A.2. Solid Stati Prive         Nrive Weight         10 grams         Table Servers           180 GB         Automa Sequential Read Weight         0.091 in (2.3 mm)         Table Servers           Width         0.80 Fin (22 mm)         Watamum Sequential Read Up to 520 MB/s         Maximum Sequential Read Up to 520 MB/s           Digradi Blocks         551,651,888         Watamum Sequential Read Deperating Temperature         210 to 158P (0' to 70°C) [case temp] Features         Table Servers           SS GB* M.2. Solid Stati Drive         Nive Weight         0.091 in (2.3 mm)         Watamus Sequential Read Up to 520 MB/s         Watamus Sequential Read Up to 500 MB/s         Watamus Sequential Read Up to 500 MB/s         Watamus Sequential Read Up to 500 MB/s         Maximus Sequential Re				
Image: Sign Sign Sign Sign Sign Sign Sign Sign				Maximum Coquantial Writa
Logical Blocks       250.059,680         Operating Temperatur       22' to 158°F (0' to 70°C) [case tem]         ATA Security: ATA-8; SATA 3.0; DIPM. TRIM         180 GB* M.2. Solid State       Drive Weight       0.9 grams         Grapecity       180 GB		renormance	-	-
braring Temperatus         24:0 158°F(0*t070°C)Case temperatus           Features         ATA Security: ATA-8; SATA 3.0; DIPW FIN           B30 GB* A.2. Solid State         Iograms           Fraine         00 grams           Capacity         80 GB           Height         0.091 in (2.3 mm)           Width         0.80 (3 mm)           Height         0.97 in (2.8 mm)           Width         0.87 in (2.8 mm)           Performance         Mainum Sequential Read         Maximus Sequential Read           Interface         87.651,888         Up to 490 MB/s           Operating Temperatus         25:05 (0*t0 ro 0*C) (Case tem)         Iot 400 MB/s           Fatures         Capacity         25:05 (0*t0 ro 0*C) (Case tem)         Iot 400 MB/s           Fatures         Operating Temperatus         25:05 (0*t0 ro 0*C) (Case tem)         Iot 400 MB/s           Fatures         Operating Temperatus         25:05 (0*t0 ro 0*C) (Case tem)         Iot 500 MB/s         Iot 500 MB/s           Height         0.91 in (2.3 mm)         Iot 500 MB/s         Iot 500 MB/s         Iot 500 MB/s           Interface         Soli 116 (20 mm)         Iot 500 MB/s         Iot 500 MB/s         Iot 500 MB/s           Fatures         Soli 116 (20 mm)         Iot 500 MB/s		Logical Blocks	-	op to 250 Mb/5
Features       ATA Security; ATA-8; SATA 3.0; DIPM; TRIM         180 GB* M.2 Solid State brive       Drive Weight       10 grams         Capacity       180 GB		-		
Bis GB* M.2. Solid State prive       Drive Weight       10 grams         Height       80 GB				трім
DriveCapacity180 GBHeight0.091 in (2.3 mm)Width0.87 in (22 mm)Width0.87 in (22 mm)InterfaceSATG GB (6 Gb/S)Performance20 to 520 MB/SLogical Blocks51,651,888Operating Temperature22 to 158°F (0° to 70°C) [case temp]FeaturesATA Security: ATA-8, SATA 3.0; DIPN; TEMPriveOperating Temperature256 GBMaximus Geguentia Marite0.091 in (2.3 mm)Width0.87 in (22 mm)Height0.091 in (2.3 mm)Width0.87 in (22 mm)Height0.97 in (22 mm)Mittine0.97 in (22 mm)Mittine0.97 in (22 mm)Height0.91 in (2.3 mm)Width0.87 in (22 mm)Height0.91 in (2.3 mm)Width0.91 in (2.3 mm)Mittine0.91 in (2.3 mm)Mittine0.91 in (2.3 mm)Mittine0.91 in (2.3 mm)Height0.91 in (2.3 mm)Width0.91 in (2.3 mm)Mittine0.91 in (2.3 mm)Mittine0.91 in (2.3 mm)Mittine0.91 in (2.3 mm)Height0.91 in (2.3 mm)Mittine0.91 in (2.3 mm)Height0.91 in (3.9 mm)Height0.91 in (3.9 mm)Height <th></th> <th>reatures</th> <th></th> <th></th>		reatures		
king in a serie in a s	180 GB* M.2 Solid State	Drive Weight	10 grams	
With Interface0.87 in (22 mm)VerticeInterfaceSATA Gen 3 (6 Gb/s)PerformanceWaimun Sequential Read Up to 520 MB/sMaximun Sequential Write Up to 490 MB/sGogical Blocks32 to 158% (0° to 70°C) [case term]Gogerating Temperature32 to 158% (0° to 70°C) [case term]Features10 gramsCapacity256 GBMidth0.91 in (2.3 mm)Width0.91 in (2.3 mm)Height0.91 in (2.3 mm)Midth0.87 in (22 mm)InterfaceSATA Gen 3 (6 Gb/s)PerformanceMaximun Sequential Read Up to 500 MB/sInterfaceS00, 118, 192Operating Temperature2° to 158% (0° to 70°C) [case term]Gogerating Temperature2° to 158% (0° to 70°C) [case term]FyringerMobile Voltage OperationSECURTYSourceFyringer Frint ReaderMobile Voltage Operation(optional)Mobile Voltage OperationMinare Companytion10° to 16° to 1	Drive	Capacity	180 GB	
Interface       AIX Gan 3 (Gan 5)         Performance       Jainam Sequentia Real       Mainum Sequentia Real         Iopi Gal Blocks       31,631,888       3210138° (Gan 5)         Garding Temperate       3210138° (Gan 5)       3210138° (Gan 5)         Prive       Ony Weight       Ong ans       3210138° (Gan 5)         Finance       10 garms       3210138° (Gan 5)       3210138° (Gan 5)         Prive       Ony Weight       Ong ans       3210138° (Gan 5)         Night       0.9101(2.3 mm)       3210138° (Gan 5)         Height       0.9101(2.3 mm)       3210138° (Gan 5)         Night       Ong Can 100 (Gan 5)       3210138° (Gan 5)         Night       Ong Can 100 (Gan 5)       3210138° (Gan 5)         Performance       Mainum Sequentia Read       Mainum Sequentia Read         Notacita Blocks       Ong Can 10,103 (Gan 5)       3210138° (Gan 5)         Fortigeneritie       Mainum Sequentia Read       3210138° (Gan 5)         Fortigeneritie       Stocker 1,103 (Gan 5)       3210138° (Gan 5)		Height	0.091 in (2.3 mm)	
Performance       Maximum Sequential Read       Maximum Sequential Read       Maximum Sequential Read         Logical Blocks       351,551,888       212 to 158°F (0° to 70°C) [Case temp]         Zero Edition       212 to 158°F (0° to 70°C) [Case temp]		Width	0.87 in (22 mm)	
Logical Blocks Operating Temperator Features       51,651,888 21,5158*C0 to 70*01 (case temperator 21,5158*C0 to 70*01 (case temperator 21,51		Interface	SATA Gen 3 (6 Gb/s)	
Logical Blocks       351,513,888         Operating Temperatur       2* to 158°F (0° to 70°C) [case temp]         Features       ATA Security; ATA-8, SATA 3.0; DIPN; TRIM         Z556 GB* M.2 Solid State       Orive Weight       10 grams         Fraperity       256 GB		Performance	Maximum Sequential Read	Maximum Sequential Write
Operating Temperature       32* to 158°F 0°* to 70°C) [case temp]         Features       ATA Security; ATA-8, SATA 3.0; DIPM; TRIM         Z56 G8* M.2 Solid State       Drive Weight       10 grams         Drive       Capacity       256 G8         Height       0.091 in (2.3 mm)			Up to 520 MB/s	Up to 490 MB/s
Features       ATA Security; ATA-8, SATA 3.0; DIPM; TRIM         256 GB* M.2 Solid State Drive       Drive Weight       10 grams         Capacity       256 GB       256 GB         Height       0.091 in (2.3 mm)       Vieta         Width       0.87 in (22 mm)       Vieta         Interface       SATA Gen 3 (6 Gb/s)       Vieta         Performance       Maximun Sequential Read Up to 500 MB/s       Maximun Sequential Write Up to 350 MB/s         Logical Blocks       500,118,192       Up to 350 MB/s         Operating Temperature       32° to 158°F (0° to 70°C) [case tem]       Temperature         Features       30V-3.6V       Vieta Security; ATA-8, SATA 3.0; DIPM; TRIM         SECURITY       Mobile Voltage Operation       3.0V-3.6V       Vieta         (optional)       Goperating Temperature       14° - 167°F (-10° - 75°C)       Vieta         Image       100 Lines/sec       Vieta       Vieta         Image       950 uA       Vieta       Vieta         Image       Singuire Katege       Singuire Katege       Vieta         Image       100 Lines/sec       Vieta       Vieta         Image       Singuire Katege       Singuire Katege       Vieta         Image       Singuire Katege       Singu		Logical Blocks	351,651,888	
256 GB* M.2 Solid State Drive       Drive Weight       10 grams         Capacity       256 GB         Height       0.091 in (2.3 mm)         Width       0.87 in (22 mm)         Interface       SATA Gen 3 (6 Gb/s)         Performance       Maximum Sequential Read       Maximum Sequential Write         Up to 500 MB/s       Up to 350 MB/s       Up to 350 MB/s         Operating Temperature       32° to 158°F (0° to 70°C) [case temp]       Temperature         Features       30° to 158°F (0° to 70°C) [case temp]       Temperature         SECURITY       Mobile Voltage Operation       3.0V-3.6V         Cuprent Gronsumption       3.0V-3.6V       Security: ATA-8, SATA 3.0; DIPM; TRIM         Coptional.)       Operating Temperature       14° - 167°F (-10° - 75°C)       Security: ATA-8, SATA 3.0; DIPM; TRIM         Cuprent Consumption       3.0V-3.6V       Security: ATA-8, SATA 3.0; DIPM; TRIM       Security: ATA-8, SATA 3.0; DIPM; TRIM         Cuprent Consumption       1.0° - 167°F (-10° - 75°C)       Security: ATA-8, SATA 3.0; DIPM; TRIM       Security: ATA-8, SATA 3.0; DIPM; TRIM         Cuprent Consumption       1.0° - 167°F (-10° - 75°C)       Security: ATA-8, SATA 3.0; DIPM; TRIM       Security: ATA-8, SATA 3.0; DIPM; TRIM         Cuprent Consumption       1.0° - 167°F (-10° - 75°C)       Security: ATA-8, SATA 3.0; DIPM;		Operating Temperature	32° to 158°F (0° to 70°C) [case temp]	
DriveCapacity256 GBHeight0.091 in (2.3 mm)Width0.87 in (22 mm)InterfaceSATA Gen 3 (6 Gb/s)PerformanceMaximu Sequential ReadMaximum Sequential WriteUp to 500 MB/sUp to 350 MB/sLogical Blocks500,118,192Operating Temperature32° to 158°F (0° to 70°C) [case tem]Features32° to 158°F (0° to 70°C) [case tem]FeaturesATA Security; ATA-8, SATA 3.0; DIPK; TRIMSECURITYNobile Voltage OperationInterf Consumption10° - 167°F (-10° - 75°C)Current Consumption36 mA peakImageImageLow Latency Wait for Finger950 uACapture Rate ESD ResistanceS00. lines/secESD ResistanceEC 61000-4-24 B (±15KV)Detection Matrix20°1 (plus another secondary line; So dpi		Features	ATA Security; ATA-8, SATA 3.0; DIPM;	TRIM
DriveCapacity256 GBHeight0.091 in (2.3 mm)Width0.87 in (22 mm)InterfaceSATA Gen 3 (6 Gb/s)PerformanceMaximu Sequential ReadMaximum Sequential WriteUp to 500 MB/sUp to 350 MB/sLogical Blocks500,118,192Operating Temperature32° to 158°F (0° to 70°C) [case tem]Features32° to 158°F (0° to 70°C) [case tem]FeaturesATA Security; ATA-8, SATA 3.0; DIPK; TRIMSECURITYNobile Voltage OperationInterf Consumption10° - 167°F (-10° - 75°C)Current Consumption36 mA peakImageImageLow Latency Wait for Finger950 uACapture Rate ESD ResistanceS00. lines/secESD ResistanceEC 61000-4-24 B (±15KV)Detection Matrix20°1 (plus another secondary line; So dpi				
Finder Capacity 258 dB Farger 1, 258 dB Faight 0.091 in (2.3 mm) Width 0.87 in (22 mm) Interface SATA Gen 3 (6 Gb/s) Performance Maximum Sequential Read Up to 350 MB/s Up to 500 MB/s Up to 350 MB/s Cogical Blocks 050,118,192 Operating Temperature 32° to 158°F (0° to 70°C) [case temp] Features ATA Security; ATA-8, SATA 3.0; DIPM; TRIM SECURITY HP Fingerprint Reader (optional) Mobile Voltage Operation 3.0V-3.6V Current Consumption 16° mapeak Low Latency Wait for 950 uA Finger Capture Rate 800 Unines/sec ESD Resistance 16C 1000-4-2 4B (±15KV) Detection Matrix 2001 (plus another secondary line) S0 (1plus another secondary line) S0 (2011)		Drive Weight	10 grams	
Width0.87 in (22 mm)InterfaceSATA Gen 3 (6 Gb/s)PerformanceMaximun Sequential ReadMaximun Sequential WriteUp to 500 MB/sUp to 350 MB/sLogical Blocks500,118,192Operating Temperatue32° to 158°F (0° to 70°C) [case tem]FeaturesATA Security; ATA-8, SATA 3.0; DIPM; TMIMSECURITYMobile Voltage OperationMobile Voltage Operation10°-160°F (-10° - 75°C)Operating Temperatue14° - 167°F (-10° - 75°C)Operating Temperatue16° MA peakImage1600 - 42 B (±15KV)Capture Rate500 - 1600 - 42 B (±15KV)ESD ResistanceEC 1000-4-2 4B (±15KV)Detection Matrix20°1 (plus another secondary line)Sol another secondary line)20°1 (plus another secondary line)Sol another secondary line)20°1 (plus another secondary line)	Drive	Capacity	256 GB	
InterfaceSATA Gen 3 (So		Height	0.091 in (2.3 mm)	
Performance       Maximum Sequential Reade       Maximum Sequential Reade         Logical Blocks       50,118,192       Up to 300 MSC         Operating Temperature       20° to 150° CD (Cost OT 0° C) [Cost OT 0° C) [Cost OT 0° C]       Test Ot 0° COST 0° C)         SECURITY       Mole Votage Operature       30° to 150° CD 0° COST 0° C)       Test Operature         Mole Votage Operature       30° to 160° CD 0° COST 0° C)       Test Operature       Test Operature         Operating Temperature       10° to 10° CD 0° COST 0° C)       Test Operature       Test Operature         Operating Temperature       10° to 10° CD 0° COST 0° C)       Test Operature       Test Operature         Operating Temperature       10° to 10° CD 0° COST 0° C)       Test Operature       Test Operature         Operating Temperature       10° to 10° CD 0° COST 0° C)       Test Operature       Test Operature         Operating Temperature       10° CD 0° COST 0° C)       Test Operature       Test Operature         Operature Cost 0° C		Width	0.87 in (22 mm)	
Up to 500 MB/s       Up to 350 MB/s         Logical Blocks       500,118,192         Operating Temperature       32° to 158°F (0° to 70°C) [case tem]         Features       ATA Security; ATA-8, SATA 3.0; DIPM; TRIM         SECURITY       Mobile Voltage Operation       3.0V-3.6V         Iperating Temperature       1.4° - 167°F (-10° - 75°C)       Security; ATA-8, SATA 3.0; DIPM; TRIM         Coptional)       Operating Temperature       1.4° - 167°F (-10° - 75°C)       Security; ATA-8, SATA 3.0; DIPM; TRIM         Image       Jon Apeak       Jon Apeak       Security; ATA-8, SATA 3.0; DIPM; TRIM         Image       Jon Apeak       Jon Apeak       Jon Apeak         Image       Jon Apeak		Interface	SATA Gen 3 (6 Gb/s)	
Logical Blocks       500,118,192         Operating Temperature       32° to 158°F (0° to 70°C) [case temp]         Features       ATA Security; ATA-8, SATA 3.0; DIPM; TRIM         SECURITY       Mobile Voltage Operatio       3.0V-3.6V         Operating Temperature       14° - 167°F (-10° - 75°C)         Current Consumption Image       36 mA peak         Low Latency Wait for Finger       950 uA         Capture Rate       000.lines/sec         ESD Resistance       IEC 61000-4-2 4B (±15KV)         Detection Matrix       200°1 (plus another secondary line) 508 dpi		Performance	Maximum Sequential Read	Maximum Sequential Write
Operating Temperatur Features32° to 158°F (0° to 70°C) [case temp] ATA Security; ATA-8, SATA 3.0; DIPM; TRIMSECURITYMobile Voltage Operation3.0V-3.6V 0perating TemperatureOperating Temperature (optional)14° - 167°F (-10° - 75°C)Current Consumption Image36 mA peak 950 uALow Latency Wait for Finger950 uACapture Rate ESD Resistance000. lines/secESD Resistance S0 dpiEC 61000-4-2 4B (±15KV)Detection Matrix200° 1 (plus another secondary line) 			Up to 500 MB/s	Up to 350 MB/s
Features       ATA Security; ATA-8, SATA 3.0; DIPM; TRIM         SECURITY       Mobile Voltage Operation       3.0V-3.6V         Image       14° - 167°F (-10° - 75°C)         Current Consumption       36 mA peak         Image       1000 Lines/sec         Expure Rate       0000 Lines/sec         ESD Resistance       EC 61000-4-2 4B (±15KV)         Detection Matrix       200*1 (plus another secondary line)         508 dpi       200*1 (plus another secondary line)		Logical Blocks	500,118,192	
SECURITY         HP Fingerprint Reader (optional)       Mobile Voltage Operatios 3.0V-3.6V         Operating Temperature       14° - 167°F (-10° - 75°C)         Current Consumption Image       36 mA peak         Low Latency Wait for Finger       950 uA         Capture Rate       3000. lines/sec         ESD Resistance       IEC 61000-4-2 4B (±15KV)         Detection Matrix       200*1 (plus another secondary line) 508 dpi		Operating Temperature	32° to 158°F (0° to 70°C) [case temp]	
HP Fingerprint Reader (optional)       Mobile Voltage Operatio       3.0V-3.6V         Operating Temperature       14° - 167°F (-10° - 75°C)         Current Consumption Image       36 mA peak         Low Latency Wait for Finger       950 uA         Capture Rate       3000. lines/sec         ESD Resistance       IEC 61000-4-2 4B (±15KV)         Detection Matrix       203°1 (plus another secondary line) 508 dpi		Features	ATA Security; ATA-8, SATA 3.0; DIPM;	TRIM
(optional)Operating Temperature14° - 167°F (-10° - 75°C)Current Consumption Image36 mA peakLow Latency Wait for Finger950 uACapture Rate3000. lines/secESD ResistanceIEC 61000-4-2 4B (±15KV)Detection Matrix200*1 (plus another secondary line) 508 dpi	SECURITY			
Current Consumption       36 mA peak         Image       Low Latency Wait for         Finger       950 uA         Capture Rate       3000. lines/sec         ESD Resistance       IEC 61000-4-2 4B (±15KV)         Detection Matrix       200*1 (plus another secondary line)         508 dpi	HP Fingerprint Reader	Mobile Voltage Operation	3.0V-3.6V	
Image       Low Latency Wait for       950 uA         Finger       3000. lines/sec         Capture Rate       3000. lines/sec         ESD Resistance       IEC 61000-4-2 4B (±15KV)         Detection Matrix       200*1 (plus another secondary line) 508 dpi	(optional)	Operating Temperature	14° - 167°F (-10° - 75°C)	
Low Latency Wait for Finger950 uACapture Rate3000. lines/secESD ResistanceIEC 61000-4-2 4B (±15KV)Detection Matrix200*1 (plus another secondary line) 508 dpi		•	36 mA peak	
Finger         Capture Rate       3000. lines/sec         ESD Resistance       IEC 61000-4-2 4B (±15KV)         Detection Matrix       200*1 (plus another secondary line)         508 dpi		-		
ESD ResistanceIEC 61000-4-2 4B (±15KV)Detection Matrix200*1 (plus another secondary line)508 dpi		-	950 uA	
Detection Matrix200*1 (plus another secondary line)508 dpi		Capture Rate	3000. lines/sec	
508 dpi		ESD Resistance	IEC 61000-4-2 4B (±15KV)	
		Detection Matrix	508 dpi	



## **Technical Specifications**

Smart Card Reader	Smart card standard	PC/SC 2.0 for Windows smart card standard		
	<b>Dimensions</b> (L x W x H)	0.41x 0.08 x 0.32 in (10.5 x 2 x 8.2 mm)		
	Smart Card support	ISO 7816 Class A and AB		
	Smart Card Interface	Smart Card Interface with T = 0 and T = 1 support Support I2C memory card, SLE4418, SLE4428, SLE4432, SLE4442, SLE4 SLE5536, SLE6636, AT88SC1608, AT45D041 card and AT45DB041 card external EEPROM No driver is required for this device. Native support is provided by the operating system.		
	Operating systems			
	Power	Normal Mode	With card present, before being suspended: 40.9 mA Without card present, before being suspended: 33.16 mA After being suspended with smart card present: 380 µA After being suspended without smart card present: 380 µA	
		Power Saving Mode	With card present, before being suspended: 40.6 mA Without card present: 380 µA After being suspended with smart card present: 380 µA	
		<ul> <li>Support TO, T1</li> <li>Support I2C me SLE4436,</li> <li>SLE5536, SLE66 card via externa</li> <li>Support ISO781</li> <li>Implemented as endpoint, Mass</li> <li>Storage endpoi</li> <li>Built-in PLL for</li> <li>Support EEPRO iManufacturer/i accessing mem</li> <li>EEPROM progra</li> <li>Support softwa</li> <li>Support softwa</li> <li>Support short A</li> <li>Compatible with</li> <li>Support USB se</li> <li>Support Power Normal/PWR Sa</li> </ul>	protocol mory card, SLE4418, SLE4428, SLE4432, SLE4442, 536, AT88SC1608, AT45D041 card and AT45DB041 al EEPROM 6 Class A, B and C (5V/3V/1.8V) card s an USB full speed device with bulk transfer nt USB and Smart Card clocks requirement M for USB descriptors customization (PID/VID/ Product/Serial Number), Direct Web Page Link, and ory card module. mmable via USB interface re update for memory card module Web Page Link via configuration in external PDU and extended APDU n Microsoft USB-CCID driver e wake up through inserting card/removing card lective suspend Saving Mode (Using one pin to select between	



## **Technical Specifications**

- Built in resonator.
- Support USB LPM (Link Power Management) features.
- Embedded clock source.

## **NETWORKING/COMMUNICATIONS**

Intel I218LM Gigabit	Connector	RJ-45		
Network Connection	System Interface	Integrated on PCA		
	Controller	Intel I218LM GbE platform LAN connect networking controller		
	Memory	24 KB FIFO packet buffer memory		
	Data rates supported	10/100/1000 Mbps		
	IEEE Compliance	802.1P 802.1Q 802.2 802.3 802.3ab 802.3az 802.3az		
	Bus architecture	PCI Express and SMBus		
	Data transfer mode	PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx low power state)		
	Power requirement	Requires 3.3V and 0.9V or just 3.3V with integrated regulators Power consumption 0.733 Watts		
	Boot ROM support	Yes		
	Network transfer mode	Full-duplex		
		Half-duplex (not supported for the 1000BASE-T transceiver)		
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps		
		10BASE-T (full-duplex) 20 Mbps		
		100BASE-TX (half-duplex) 100 Mbps		
		100BASE-TX (full-duplex) 200 Mbps		
		1000BASE-T (full-duplex) 2000 Mbps		
	Environmental	Operating Temperature: 0° to 85° C		
		Operating Humidity: 60% RH		
	Management	WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, Advanced cable diagnostic.		
	Alerting	ASF 2.0 support; iAMT 9.0 support		
HP 3110 HSPA+ Mobile Broadband Module*	Technology/Operating Bands	ng CDMA/1xRTT/EvDO: 800MHz (Cell), 1900MHz (PCS) GSM/GPRS/EDGE: 850MHz (Cell), 900MHz (EGSM), 1800MHz (DCS), 1900MHz (PCS) UMTS/WCDMA with receive diversity: 2100MHz (UTRA FDD Band I), 1900MHz (UTRA FDD Band II), 900MHz (UTRA FDD Band VIII), 850 MHz (U FDD Band V) LTE: 700 MHz (Verizon, Band XIII)		
	Mobile Operator	Verizon (US only)		



## **Technical Specifications**

Wireless Protocol	GSM/GPRS/EDGE: Class B, Multi-slot class 10 operation, coding schemes
Standards	CS1 - CS4 and MSC1 - MSC9.
	CDMA: 1xEVDO Release 0 and Release A, IS-95A, IS-95B, IS-856, IS-2000 UMTS/WCDMA: Release 99 and Release 7
	LTE: Power Class III as per 3GPP TS 36.101
Wireless Parametric	Complies with 3GPP specifications Release 8 for LTE
Standards	
Maximum Data Rates	EvDO (Revision A) - 3.1 Mbps (Download), 1.8 Mbps (Upload)
	WCDMA (DC-HSPA+) - 42Mbps (Download) LTE (Category 3) - 100 Mbps (Download ), 50Mbps (Upload)
GPS	Standalone, Assisted, XTRA
GPS Bands	1575.42 MHz (± 1.023 MHz)
Maximum Output Power	GSM/GPRS/EDGE: 32dBm (+/-1)
Maximum Output Fower	WCDMA: 24dBm (+0.7/-2.3)
	LTE: +23 dBm (+2.7 dBm/-1.7 dBm)
	1xRTT/EvDO: +24 dBm (+0.5 dBm/-1.5 dBm)
Maximum Power	2700mA (peak)
Consumption	
Power Consumption, Sleep Mode	10 mA
Power Management	USB selective suspend
-	Integrated notebook wireless button
Antenna Type	Dual high efficiency 6 band antennae with spatial diversity, mounted in the
	display enclosure
Form Factor	PCI-Express MiniCard, USB 2.0 interface
Weight	< 10 g
<b>Dimensions</b> (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (51 x 30 x 4.5 mm)
Voltage, Operating	3.3v +/- 9%
Temperature, Operating	-4° to 149° F (-20° to 65° C)
Temperature, Non-	-40° to 185° F (-40° to 85° C)
operating, 96 hours (from MIL-STD 202 Method 108)	
Humidity, Non-operating	85% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
LED Activity	LED Off - Radio Off;
	Solid LED On - Radio On
requires wireless data ser	optional feature sold separately or as an add on feature. Connection vice contract, network support, and is not available in all areas. Contact nine the coverage area and availability. Connection speeds will vary due
to location, environment,	network conditions, and other factors.
Technology/Operating	LTE EDD all hands with diversity: 1900 MHz (Band II) <sup>1</sup> 1700/2100MHz (Band

HP lt4111 LTE/EV-DO/HSPA+ 4G WWAN\*

to totation, environment, network conditions, and other factors.			
Technology/Operating	LTE FDD all bands with diversity: 1900 MHz (Band II) <sup>1</sup> , 1700/2100MHz (Band		
Bands	IV (AWS), 850 MHz (Band V), 700MHz (Band XIII), 700MHZ (Band XVII),		
	1900MHz G Block (Band XXV)		
	WCDMA/HSDPA/HSUPA/HSPA+: all bands with diversity: 2100 MHz (Band I),		
	1900 MHz (Band II) , AWS 1700/2100MHz (Band IV), 850 MHz (Band V), 800		



## **Technical Specifications**

	MHz (Band VIII) GSM/GPRS/EDGE: 1900 MHz, 1800 MHz , 850 MHz , 900 MHz
	CDMA: Cellular 800MHz (BC0), PCS 1900MHz (BC1)
Wireless Protocol	3GPP Release 8 LTE Specification
Standards	WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification
	EVDO Release 0 and Release A
Wireless Parametric	Complies with 3GPP specifications Release 8 for LTE
Standards	
Maximum Data Rates	LTE (Category 3): 100 Mbps (Download), 50Mbps (Upload)
	DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload)
	HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload)
	EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload)
GPS	Standalone GPS, A-GPS, GPS XTRA
GPS Bands	1575.42 MHz (± 1.023 MHz), GLONASS 1596-1607MHz
	LTE: +23 dBm (+/- 1 dBm)
Maximum Output Power	WCDMA: +23 dBm (+/- 1 dBm)
	GSM850/900, GMSK: +32dBm (+/- 1dBm)
	GSM850/900, 8PSK: +27dBm (+/- 1dBm)
	DCS1800 / PCS 1900, GMSK: +29dBm (+/- 1dBm)
	DCS1800 / PCS 1900, 8PSK: +26dBm (+/- 1dBm)
	CDMA: +24dBm (+/- 1dBm)
Maximum Power	LTE: 1,200 mA (peak); <900 mA (average)
Consumption	WCDMA: 1,100 mA (peak); <800 mA (average) EGPRS: 2,500 mA (peak); <700 mA (average)
Power Consumption,	2 mA
Sleep Mode	
-	
Power Management	USB selective suspend, Integrated notebook wireless button
Power Management Antenna Type	Dual high efficiency multi-band antennae with spatial diversity
-	
Antenna Type Form Factor Weight	Dual high efficiency multi-band antennae with spatial diversity
Antenna Type Form Factor	Dual high efficiency multi-band antennae with spatial diversity M.2, 3042-S3 Key B
Antenna Type Form Factor Weight Dimensions (Length x	Dual high efficiency multi-band antennae with spatial diversity M.2, 3042-S3 Key B 6 g
Antenna Type Form Factor Weight Dimensions (Length x Width x Thickness)	Dual high efficiency multi-band antennae with spatial diversity M.2, 3042-S3 Key B 6 g 42 mm × 30 mm × 2.3 mm
Antenna Type Form Factor Weight Dimensions (Length x Width x Thickness) Voltage, Operating Temperature, operating	Dual high efficiency multi-band antennae with spatial diversity M.2, 3042-S3 Key B 6 g 42 mm × 30 mm × 2.3 mm 3.135 V to 4.4 V (3.3 V +1.1V/-0.165V)
Antenna Type Form Factor Weight Dimensions (Length x Width x Thickness) Voltage, Operating Temperature, operating (from TIA/EIA/IS-98-D)	Dual high efficiency multi-band antennae with spatial diversity M.2, 3042-S3 Key B 6 g 42 mm × 30 mm × 2.3 mm 3.135 V to 4.4 V (3.3 V +1.1V/-0.165V) -13° to 140° F (-25° to 60° C) -40° to 185° F (-40° to 85° C)
Antenna Type Form Factor Weight Dimensions (Length x Width x Thickness) Voltage, Operating Temperature, operating (from TIA/EIA/IS-98-D) Temperature, non- operating, 96 hours (from MIL-STD 202 Method 108)	Dual high efficiency multi-band antennae with spatial diversity M.2, 3042-S3 Key B 6 g 42 mm × 30 mm × 2.3 mm 3.135 V to 4.4 V (3.3 V +1.1V/-0.165V) -13° to 140° F (-25° to 60° C) -40° to 185° F (-40° to 85° C)
Antenna Type Form Factor Weight Dimensions (Length x Width x Thickness) Voltage, Operating Temperature, operating (from TIA/EIA/IS-98-D) Temperature, non- operating, 96 hours (from MIL-STD 202 Method 108)	Dual high efficiency multi-band antennae with spatial diversity M.2, 3042-S3 Key B 6 g 42 mm × 30 mm × 2.3 mm 3.135 V to 4.4 V (3.3 V +1.1V/-0.165V) -13° to 140° F (-25° to 60° C) -40° to 185° F (-40° to 85° C)
Antenna Type Form Factor Weight Dimensions (Length x Width x Thickness) Voltage, Operating Temperature, operating (from TIA/EIA/IS-98-D) Temperature, non- operating, 96 hours (from MIL-STD 202 Method 108) Humidity, Non-operating LED Activity	Dual high efficiency multi-band antennae with spatial diversity M.2, 3042-S3 Key B 6 g 42 mm × 30 mm × 2.3 mm 3.135 V to 4.4 V (3.3 V +1.1V/-0.165V) -13° to 140° F (-25° to 60° C) -40° to 185° F (-40° to 85° C) 95% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
Antenna Type Form Factor Weight Dimensions (Length x Width x Thickness) Voltage, Operating Temperature, operating (from TIA/EIA/IS-98-D) Temperature, non- operating, 96 hours (from MIL-STD 202 Method 108) Humidity, Non-operating LED Activity <sup>1</sup> 1900 MHz (Band II) and 8 firmware update.	Dual high efficiency multi-band antennae with spatial diversity M.2, 3042-S3 Key B 6 g 42 mm × 30 mm × 2.3 mm 3.135 V to 4.4 V (3.3 V +1.1V/-0.165V) -13° to 140° F (-25° to 60° C) -40° to 185° F (-40° to 85° C) 95% relative humidity for 48 hours @ 185° F (85° C) (non-condensing) LED Off - Radio Off; Solid LED On - Radio On

\* 4G LTE not available on all products, in all regions and requires Windows. WWAN use requires separately purchased service contract. Check with service provider for coverage and availability in



## **Technical Specifications**

	your area. Connection spe factors.	eeds will vary due to location, environment, network conditions, and other
HP lt4112 LTE/HSPA+ Gobi 4G Module*	Technology/Operating Bands	LTE FDD all bands with diversity: 2100 MHz (Band I), 1900 MHz (Band II), 1800 MHz (Band III), 850 MHz (Band V), 2600 MHz (Band VII), 900 MHz (Band VIII), 800 MHz (Band XX, DD800) WCDMA/HSDPA/HSUPA/HSPA+ all bands with diversity: 2100 MHz (Band I), 1900 MHz (Band II), 800 MHz (Band V), 900 MHz (Band VIII) GSM/GPRS/EDGE: 1900 MHz (Band II), 1800 MHz (Band III), 850 MHz (Band V), 900 MHz (Band VIII)
	Wireless Protocol Standards	3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification
	Wireless Parametric Standards	Complies with 3GPP specifications Release 8 for LTE
	Maximum Data Rates	LTE (Category 3): 100 Mbps (Download), 50Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload) EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload)
	GPS	Standalone
	GPS Bands	1575.42 MHz (± 1.023 MHz), GLONASS 1596-1607MHz
	Maximum Output Power	LTE: +23 dBm (+/- 2 dBm) WCDMA: +23.5 dBm (+/- 1 dBm) GPRS Band II, III: +29.5 dBm (+/- 1 dBm) GPRS Band V, VIII: +32.5 dBm (+/- 1 dBm) EGPRS Band II, III: +26.5 dBM (+/-1.5 dBm) EGPRS Band V, VIII: +27.5 dBM (+/-1.5 dBm)
	Maximum Power Consumption	LTE: 1,200 mA (peak); <900 mA (average) WCDMA: 1,100 mA (peak); <800 mA (average) EGPRS: 2,800 mA (peak); <700 mA (average)
	Power Consumption, Sleep Mode	3 mA
	Power Management	USB selective suspend, Integrated notebook wireless button
	Antenna Type	Dual high efficiency multi-band antennae with spatial diversity
	Form Factor	M.2, USB 2.0 interface
	Weight	6 g
	<b>Dimensions</b> (Length x Width x Thickness)	42 mm × 30 mm × 2.3 mm
	Voltage, Operating	3.135 V to 4.4 V (3.3 V +1.1V/-0.165V)
	<b>Temperature, operating</b> (from TIA/EIA/IS-98-D)	14° to 131° F (-10° to 55° C)
	<b>Temperature, non-</b> <b>operating, 96 hours</b> (from MIL-STD 202 Method 108)	
	Humidity, Non-operating	95% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
	LED Activity	LED Off - Radio Off; Solid LED On - Radio On



## **Technical Specifications**

\* 4G LTE not available on all products, in all regions and requires Windows. WWAN use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors.

	Power Consumption	• 5G: +12dBm minin Transmit: 2.0 Watts	mum	
	Output Power <sup>2</sup>	<ul> <li>2.4G: +13.5dBm r</li> <li>5G: +12dPm mining</li> </ul>	-	
	Roaming	IEEE 802.11 compliant roa	aming between band Access Points	
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)		
	Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.		
	Modulation Security <sup>1</sup>	<ul> <li>802.116.0, 5, 12, 10, 24, 30, 40, 54 Mbps</li> <li>802.11b: 1, 2, 5.5, 11 Mbps</li> <li>802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>802.11n: card will support rates for NSS=1 and NSS=2 for RX and TX for 20 and 40 MHz channels. Short and long guard interval shall be supported.</li> <li>Direct Sequence Spread Spectrum</li> <li>CCK, BPSK, QPSK, 16-QAM, 64-QAM <ul> <li>IEEE and WiFi 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>Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>WAPI</li> </ul> </li> </ul>		
	Antenna Structure Data Rates	2 transmit; 2 receive (2x2) 802.11a: 6, 9, 12, 18, 24, 3		
		802.11a/n	4.9 - 4.95 GHz (Japan) 5.15 - 5.25 GHz 5.25 - 5.35 GHz 5.47 - 5.725 GHz 5.825 - 5.850 GHz	
	Frequency Band	Cisco Compatible Extensio Windows Vista and XP (det http://www.hp.com/go/nc 802.11b/g/n		
	Interoperability	Wi-Fi certified		
Intel Dual Band Wireless- N 7260NB 802.11 a/b/g/n (2x2) WiFi Adapter*		IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n		

#### **Technical Specifications** Receive: 1.6 Watts Idle mode<sup>3</sup>: 250 mW (WLAN Associated) Idle mode: 100 mW (WLAN unassociated) Radio off: 75 mW **Power Management** ACPI and PCI Express compliant power management 802.11 compliant power saving mode **Receiver Sensitivity**<sup>4</sup> 802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps) 802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps) 802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps) 802.11n:-69 dBm (150 Mbps), -66 dBm (300 Mbps) Antenna Connections 2 U.FL type connectors (output impedance of $50 \pm 2$ ohms) **Form Factor** PCI-Express Half-MiniCard Dimensions 0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm) Weight 3.1q **Operating Voltage** 3.3v +/- 9% Operating 14° to 158° F (-10° to 70° C) Temperature -40° to 176° F (-40° to 80° C) Non-operating Humidity Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing) Altitude Operating 0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m) Non-operating **LED Activity** LED Amber - Radio OFF; Solid LED On - Radio ON 1. Check latest software/driver release for updates on supported security features. 2. Maximum output power may vary by country according to local regulations. 3. In Power Save Polling mode and on battery power. 4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation). 5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista. \* Wireless access point and internet service required. Availability of public wireless access points limitod Intel Dual Band Wireless- Wireless LAN Standards IEEE 802.11a N 7260AN 802.11 a/b/g/n IEEE 802.11b (2 IEEE 802.11q

(2x2) WiFi + Bluetooth 4.0	)
Combo Adaptor*	
	Interoperability

IEEE 802.11n

Wi-Fi certified



#### **Technical Specifications** Cisco Compatible Extensions Program compliant with Microsoft Windows 7, Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN) **Frequency Band** 802.11b/g/n 2.402 - 2.482 GHz 802.11a/n 4.9 - 4.95 GHz (Japan) 5.15 - 5.25 GHz 5.25 - 5.35 GHz 5.47 - 5.725 GHz 5.825 - 5.850 GHz 2 transmit: 2 receive (2x2) Antenna Structure **Data Rates** 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: card will support rates for NSS=1 and NSS=2 for RX and TX for 20 and 40 MHz channels. Short and long guard interval shall be supported. Modulation **Direct Sequence Spread Spectrum** CCK, BPSK, QPSK, 16-QAM, 64-QAM Security<sup>1</sup> IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g • mode only AES-CCMP: 128 bit in hardware ٠ • 802.1x authentication WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. WPA2 certification IEEE 802.11i ٠ Cisco Certified Extensions, all versions through CCX4 and CCX Lite WAPI

Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.		
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)		
Roaming	IEEE 802.11 compliant roaming between band Access Points		
Output Power <sup>2</sup>	<ul> <li>2.4G: +13.5dBm minimum</li> <li>5G: +12dBm minimum</li> </ul>		
Power Consumption	Transmit: 2.0 Watts Receive: 1.6 Watts Idle mode <sup>3</sup> : 250 mW (WLAN Associated) Idle mode: 100 mW (WLAN unassociated) Radio off: 75 mW		
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode		
Receiver Sensitivity <sup>4</sup>	802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps)		



#### **Technical Specifications**

802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps)

802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps)

802.11n:-69 dBm (150 Mbps), -66 dBm (300 Mbps)

Antenna Connections	2 U.FL type connectors (output impedance of 50 $\pm$ 2 ohms)	

Form Factor	PCI-Express Half-MiniCard
Dimensions	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)
Weight	3.1g
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 Non-operating	10% to 90% (non-condensing) 5% to 95% (non-condensing)
Altitude	Operating Non-operating	0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON	

1. Check latest software/driver release for updates on supported security features.

2. Maximum output power may vary by country according to local regulations.

3. In Power Save Polling mode and on battery power.

4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.

HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology

<b>Bluetooth Speci</b>	ification 4.0+	EDR Compliant
		-bit comptionit

•	•
Dimensions	1.18 x 0.26 x 0.13 in (30 x 6.5 x 3.25 mm)
Frequency Band	2402 to 2480 MHz
Number of Available Channels	79 (1 MHz) available channels
Data Rates and	3 Mbps data rate; throughput up to 2.17 Mbps
Throughput	Synchronous Connection Oriented links up to 3, 64 kbps, voice channels
	Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric
Transmit Power	-1.5 dBm to 4 dBm (Bluetooth Class II)
<b>Receiver Sensitivity</b>	Better than -20 dBM at 0.1 % raw bit error rate
Power Consumption	Peak (Tx) 264 mW Peak (Rx) 231 mW Sleep <1 mW



## **Technical Specifications**

	Antenna	Internally integrated within module
	Range	Up to 33 ft (10 m)
	Electrical Interface	USB 2.0 compliant
		Microsoft Windows Plug and Play compliant
	Bluetooth Software	Broadcom Bluetooth for Windows
	Supported	Microsoft Windows Bluetooth Software
	Link Topology	Point to Point, Multipoint Pico Nets up to 7 slaves
	Security	Full support of Bluetooth Security Provisions
	Power Management	Microsoft Windows ACPI, and USB Bus Support
	rowei management	Self configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
	Certifications	All necessary regulatory approvals for supported countries, including:
		FCC (47 CFR) Part 15C, Section 15.247 & 15.249
		ETS 300 328, ETS 300 826
		Low Voltage Directive IEC950
		UL, CSA, and CE Mark
	<b>Bluetooth Profiles</b>	Serial Port Profile (SPP) <sup>1</sup>
	Supported	Service Discovery Application Profile (SDAP)
		Dial-Up Networking (DUN) <sup>1,2</sup>
		Generic Object Exchange Profile (GOEP) <sup>1,2</sup> Object Push Profile (OPP) <sup>1,2</sup>
		File Transfer Profile (FTP)
		Synchronization Profile (SYNC)
		Hard Copy Cable Replacement (HCRP) <sup>1,2</sup>
		Personal Area Networking Profile (PAN) <sup>1,2</sup>
		Human Interface Device Profile (HID) <sup>1,2</sup>
		FAX Profile (FAX)
		Basic Imaging Profile (BIP) <sup>2</sup>
		Headset Profile (HSP) Hands Free Profile (HFP)
		Advanced Audio Distribution Profile (A2DP)
	1. indicates the profile is	supported by Microsoft Windows XP SP2
	2. indicates the profile is	
	-	Id internet service required. Availability of public wireless access points
	limited.	
Intel Dual Band Wireless-	Wireless LAN Standards	IEEE 802.11a
AC 7260 802.11 ac (2x2)		IEEE 802.11b
WiFi + BT 4.0 combo Adaptor*		IEEE 802.11g
Adapter*		IEEE 802.11n IEEE 802.11ac
	Interoperability	Wi-Fi certified
	Frequency Band	802.11b/g/n
	i requeircy ballu	002.110/9/11

• 2.402 - 2.482 GHz



## **Technical Specifications**

802.11a/n

Data Rates	<ul> <li>4.9 - 4.95 GHz (Japan)</li> <li>5.15 - 5.25 GHz</li> <li>5.25 - 5.35 GHz\</li> <li>5.47 - 5.725 GHz</li> <li>5.825 - 5.850 GHz</li> <li>2.402 - 2.482 GHz</li> <li>802.11b: 1, 2, 5.5, 11 Mbps</li> <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>802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>802.11a: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li> <li>802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, and 80MHz)</li> </ul>	
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM	
Security <sup>1</sup>	<ul> <li>IEEE and WiFi 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>Cisco Certified Extensions, all versions through CCX4 and CCX Lite</li> <li>WAPI</li> </ul>	
Network Architecture Models	Network Architecture Models	
Roaming	IEEE 802.11 compliant roaming between access points	
Output Power <sup>2</sup>	<ul> <li>2.4G: +13.5dBm minimum</li> <li>5G: +12dBm minimum</li> <li>Maximum output power must be able to achieve modular regulatory certification with notebooks that have antennas &gt;20cm from the user and peak gain of +3dBi at 2.4GHz and +4dBi at 5GHz</li> </ul>	
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 250 mW (WLAN Associated) Idle mode: 100 mW (WLAN unassociated) Radio disabled: 75 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity <sup>3</sup>	802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps)	



## **Technical Specifications**

	802.11a/g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps)		
	802.11n:-69 dBm (72.2 Mbps), -66 dBm (300 Mbps)		
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	
		nunications and Bluetooth communications	
Form Factor	PCI-Express Half-MiniCard	i	
Dimensions	0.19 x 1.06 x 1.18 in (4.75	5 x 26.8 x 30 mm)	
Weight	3.1g		
Operating Voltage	3.3v +/- 9%		
Temperature	Operating Non-operating	14° to 158° F (-10° to 70° C) -40° to 176° F (-40° to 80° C)	
Humidity	Operating Non-operating	10% to 90% (non-condensing) 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 Off - Radio OFF; Solid	LED On - Radio ON	
<ol> <li>Check latest software/driver release for updates on supported security features.</li> <li>Maximum output power may vary by country according to local regulations.</li> <li>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>			
<b>Bluetooth Specification</b>			
Bluetooth Specification V4.0 High Speed. V2.1+EC	)R. backwards compatible w	ith V1.1. 1.2 and 2.0	
V4.0 High Speed, V2.1+EC	)R, backwards compatible w 79 (1 MHz) available chan		
-	)R, backwards compatible w 79 (1 MHz) available chan		
V4.0 High Speed, V2.1+EC Number of Available	•	nels	
V4.0 High Speed, V2.1+EC Number of Available Channels Data Rates and	79 (1 MHz) available chan 3 Mbps data rate; through	nels	
V4.0 High Speed, V2.1+EC Number of Available Channels Data Rates and	79 (1 MHz) available chan 3 Mbps data rate; through Synchronous Connection	nels aput up to 2.17 Mbps Oriented links up to 3, 64 kbps, voice channels Less links 2178.1 kbps/177.1 kbps asymmetric	
V4.0 High Speed, V2.1+EC Number of Available Channels Data Rates and	79 (1 MHz) available chan 3 Mbps data rate; through Synchronous Connection Asynchronous Connection	nels aput up to 2.17 Mbps Oriented links up to 3, 64 kbps, voice channels Less links 2178.1 kbps/177.1 kbps asymmetric	
V4.0 High Speed, V2.1+ED Number of Available Channels Data Rates and Throughput	79 (1 MHz) available chan 3 Mbps data rate; through Synchronous Connection Asynchronous Connection or 1306.9 kbps symmetrie	nels oput up to 2.17 Mbps Oriented links up to 3, 64 kbps, voice channels Less links 2178.1 kbps/177.1 kbps asymmetric c oth Class II)	
V4.0 High Speed, V2.1+ED Number of Available Channels Data Rates and Throughput	79 (1 MHz) available chan 3 Mbps data rate; through Synchronous Connection Asynchronous Connection or 1306.9 kbps symmetric -6 dBm to 4 dBm (Bluetoc	nels oput up to 2.17 Mbps Oriented links up to 3, 64 kbps, voice channels Less links 2178.1 kbps/177.1 kbps asymmetric c oth Class II)	
V4.0 High Speed, V2.1+ED Number of Available Channels Data Rates and Throughput Transmit Power Receiver Sensitivity	79 (1 MHz) available chan 3 Mbps data rate; through Synchronous Connection or 1306.9 kbps symmetric -6 dBm to 4 dBm (Bluetoc Better than -80 dBM at 0. Peak (Tx) 330 mW Peak (Rx) 230 mW	nels oput up to 2.17 Mbps Oriented links up to 3, 64 kbps, voice channels Less links 2178.1 kbps/177.1 kbps asymmetric oth Class II) 1 % raw bit error rate	
V4.0 High Speed, V2.1+ED Number of Available Channels Data Rates and Throughput Transmit Power Receiver Sensitivity Power Consumption	79 (1 MHz) available chan 3 Mbps data rate; through Synchronous Connection or 1306.9 kbps symmetric -6 dBm to 4 dBm (Bluetoc Better than -80 dBM at 0. Peak (Tx) 330 mW Peak (Rx) 230 mW Sleep <17 mW	nels oput up to 2.17 Mbps Oriented links up to 3, 64 kbps, voice channels Less links 2178.1 kbps/177.1 kbps asymmetric oth Class II) 1 % raw bit error rate	



## **Technical Specifications**

Bluetooth Software	Broadcom Bluetooth for Windows		
Supported	Microsoft Windows Bluetooth Software		
Link Topology	Point to Point, Multipoint Pico Nets up to 7 slaves		
Security	Full support of Bluetooth Security Provisions		
Power Management	Microsoft Windows ACPI, and USB Bus Support Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff		
Certifications	All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249 ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark		
<b>Bluetooth Profiles</b>	Generic Access Profile (GAP)		
Supported	Service Discovery Application Profile (SDAP)		
	Serial Port Profile (SPP)		
	Dial_Up Networking Profile (DUN)		
	Generic Object Exchange Profile (GOEP)		
	Object Push Profile (OPP)		
	File Transfer Profile (FTP)		
	Synchronization Profile (SYNC)		
	Hard Copy Cable Replacement (HCRP)		
	Personal Area Networking Profile (PAN)		
	Human Interface Device Profile (HID)		
	Generic Audio/Video Distribution Profile (GAVDP)		
	Advanced Audio/Video Distribution Profile (A2DP)		
	FAX Profile (FAX)		
	Basic Imaging Profile (BIP)		
	Headset Profile (HSP)		
	Hands Free Profile (HFP)		
	Basic Printing Profile (BPP)		
	VDP (Video Distribution Profile)		
	AVRCP (Audio Video Remote Control Profile)		
* Wirolocc accors point	and internet corvice required. Availability of public wireless access points		

\* Wireless access point and internet service required. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices

### **AUDIO/MULTIMEDIA - DTS SOUND+**

Hardware	Implementation	IDT 92HD91
	Function Key Volume Controls	Volume up, volume down, and mute
	Full Duplex	Yes
	Microphone In	Stereo
	Headphone/Line Out	Stereo
	Integrated Microphone	Yes, dual digital microphone array when equipped with optional webcam
Audio Output Quality	Frequency Response	20 Hz - 20 kHz



## **Technical Specifications**

	Signal to Noise Ratio	>85 dB	
	Total Harmonic Distortion	0.01%	
	Noise Floor	-110 dB	
	Play/Record Sampling Rate(s)	8 kHz - 48kHz	
	DAC	16, 20 or 24-bit	
	ADC	16 or 20-bit	
Integrated Stereo	Power Rating 2 Watts		
Speakers	Impedance	4 Ohms	
POWER			
HP 45W Smart AC Adapte	r Dimensions	3.78 x 1.95 x 0.88 in (9.6 x 4.95 x 2.24 cm)	
	Input	90 to 265 VAC	
		Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.4 A at 90 VAC and maximum load
	Output	Output power	45W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<8A, Over voltage protection- 29V max automatic shutdown
	Connector	3 pin/grounded, mates with interchangeable cords	
	Environmental Design	Operating temperature	32° to 95° F (0° to 35° C)
		Non-operating (storage) -4° to 121° F (-20° to 85° C) temperature	
		Altitude	0 to 16,405 ft (0 to 5,000 m)
		Humidity	0% to 95%
		Storage Humidity	0% 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; Reliability - failure rate of less than 0.1% annually within the first three years of operation.	
HP 65W EM Smart AC	Dimensions	4.98 x 1.97 x 1.18 in (12.65 x 5.0 x 3.0 cm)	
Adapter	Weight	0.62 lb (290 g) max	
	Input	90 to 265 VAC	
		Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC
	Output	Output power	65W



## **Technical Specifications**

		DC output	19.5V	
		Hold-up time	5 msec at 115 VAC input	
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown	
	Connector	3 pin/grounded, mates with interchangeable cords		
	Environmental Design	Operating temperature	32° to 95° F (0° to 35° C)	
		Non-operating (storage) temperature	-4° to 185° F (-20° to 85° C)	
		Altitude	0 to 10,000 ft (0 to 3,048 m)	
		Humidity	20% to 95%	
		Storage Humidity	10% to 95%	
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives; Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; MTBF - over 200,000 hours at 25°C ambient condition.		
HP 65W Smart AC Adapter	Dimensions	4.17 x 1.85 x 1.1 in (10.6 x 4.7 x 2.8 cm)		
	Weight	0.62 lb (280 g)		
	Input	100 to 240 VAC		
		Input Efficiency	87% min at 115 VAC	
		Input frequency range	47 to 63 Hz	
		Input AC current	1.7 A at 90 VAC, 0.85 A at 180 VAC	
	Output	Output power	65W	
		DC output	18.5V	
		Hold-up time	5 msec at 115 VAC input	
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown	
	Connector	3 pin/grounded, mates with interchangeable cords		
	Environmental Design	Operating temperature	32° to 104° F (0° to 40° C)	
		Non-operating (storage) temperature	-4° to 149° F (-20° to 65° C)	
		Altitude	0 to 10,000 ft (0 to 3,048 m)	
		Humidity	20% to 80%	
		Storage Humidity	10% to 90%	
Certificationsstandards - IEC60950, EN6095- C-UL-US, NORDICS, DENAN, E		with LVD and EMC directives; Worldwide safety 50950, UL60950, Class1, SELV; Agency approvals N, EN55022 Class B, FCC Class B, CISPR22 Class B, over 200,000 hours at 25°C ambient condition.		

## **COUNTRY OF ORIGIN**

TBD



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

Туре	Description	Part #
Cases	HP Business Slim Top Load (up to 14.1" x .75" thick)	H2T13AA
	HP Professional Slim Top Load Case	H4J91AA
	HP Professional Series Backpack	H4J93AA
	HP Deluxe 4 Wheel Roller	XW576AA
Docking	HP Display and Notebook Stand	AW662AA
	HP Dual Hinge Notebook Stand	AW661AA
	HP Adjustable Dual Display Stand	AW664AA
	HP UltraSlim Side Docking Station	TBD#xxx
	HP 2005pr USB 2.0 Port Replicator	H1L07AA#xxx
	HP 3005pr USB 3.0 Port Replicator	H1L08AA#xxx
Input/Output – Mice	HP 2.4 GHz Wireless Optical Mobile Mouse	LX732AA
	HP Wireless Mobile Mouse	H2L63AA
	USB Keyboard & Mouse Bundle	RC465AA#xxx
	HP Stylish USB Keyboard and Mouse	H4B80AA
Adapters	HP Smart 65W Travel AC Adapter	AU155AA#xxx
	HP 65W Slim Adapter	AX727AA#xxx
	HP 90W Smart AC/Auto/Air Combo Adapter	AJ652AA#xxx
Storage - External Storage	HP Mobile USB DVDRW	A2U57AA
Batteries	HP BT04XL Long Life Notebook Battery	H4Q47AA
	HP BA06XL Long Life Notebook Battery	H4Q48AA
Health and Education	HP 20-Notebook Managed Charging Cart	QL489AA
	HP 20-Notebook Charging Cart	QL488AA
	HP 30-Notebook Managed Charging Cart	QL490AA
Security	HP UltraSlim Keyed Cable Lock	H4D73AA
Monitors	HP EliteDisplay E231 23-inch LED Monitor	C9V75AA/A8/AS/AT
	HP LA1956x 19-inch LED Monitor	A9S75AA/A8/AS/AT
	HP LA2405x 24-inch LED Monitor	A9P21AA/A8/AT
	HP ProDisplay P221 21.5" LED Monitor	C9E49AA/A8/AS/AT
	HP ProDisplay P201 20" LED Monitor	C9F26AA/A8/AS/AT



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

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