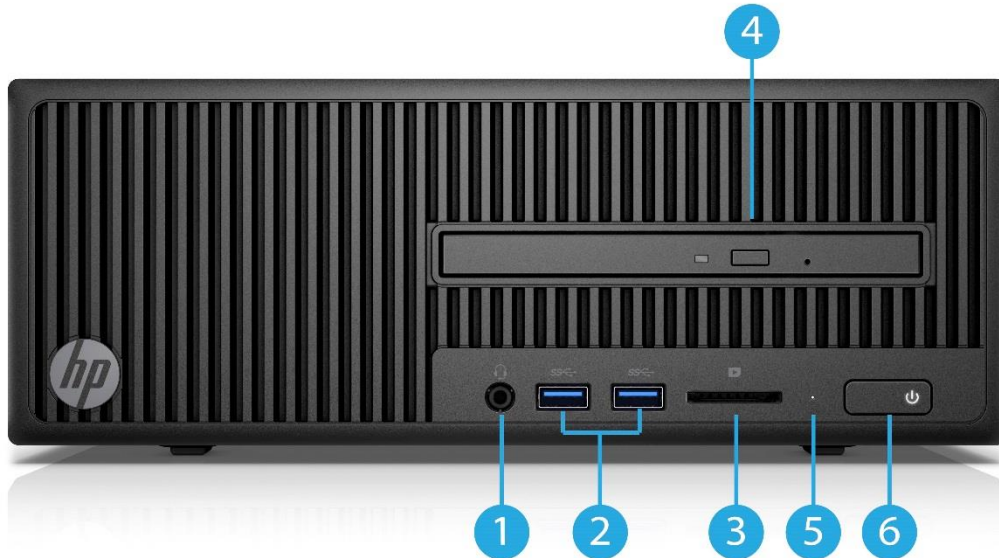


### Overview

### HP 280 G2 Small Form Factor Business PC



#### **Front**

1. Microphone/Headphone Combo Jack
2. (2) USB 3.0 Ports
3. 3-in1 SD Media Card Reader
4. Slim-height Bay - supporting an optical disk drive (optional)
5. PC Status LED
6. Power Button

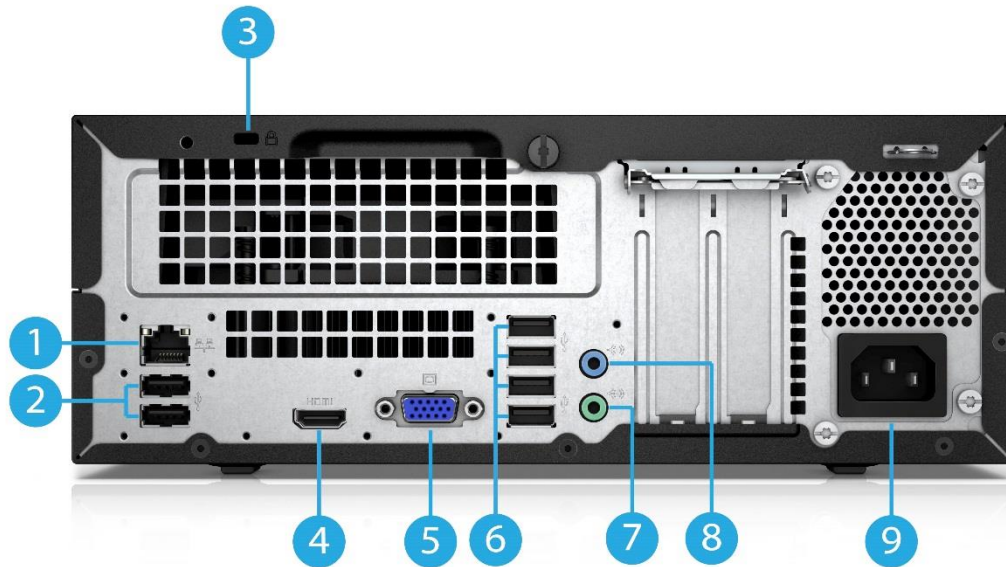
#### **Not Shown**

- Slots (1) PCI Express x16 Graphics Connector  
(1) PCI Express x1 Accessory Connector

- Bays (1) 3.5" internal storage drive bay

### Overview

### HP 280 G2 Small Form Factor Business PC



#### **Back**

- |                            |                         |
|----------------------------|-------------------------|
| 1. RJ-45 Network Connector | 6. (4) USB 2.0 Ports    |
| 2. (2) USB 2.0 Ports       | 7. Audio Line Out       |
| 3. Security Lock Slot      | 8. Audio Line In        |
| 4. HDMI Port               | 9. Power Cord Connector |
| 5. VGA Port                |                         |

### Overview

#### AT A GLANCE

- Windows 10 Pro , Windows 10 Home, NeoKylin Linux (select countries only) or FreeDOS 2.0 operating systems
- Intel® H110 chipset supporting Intel® 7<sup>th</sup> & 6<sup>th</sup> generation Intel® Celeron®, Pentium®, Core™ i3 ,i5, i7 processors featuring Intel® HD Graphics
- Supports an optional discrete graphics card
- Integrated 10/100/1000 Ethernet Controller
- Supports Wake-on-LAN (WOL)
- Up to 32GB DDR4 Unbuffered Memory (UDIMM)
- Supports both Hard Disk and Solid State Drives
- Independent monitor support via VGA video interfaces
- TPM 2.0 support (firmware)
- High definition audio
- 8 USB ports (including 2-USB 3.0 ports)
- 3-in1 SD Media Card Reader
- 180W energy efficient internal power supply
- Security cable lock supported (sold separately)
- Protected by HP Services; terms and conditions vary by country; certain restrictions and exclusions apply

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

### Standard Features and Configurable Modules

#### OPERATING SYSTEMS

##### Preinstalled (Windows)

Windows 10 Pro 64\*  
Windows 10 Home 64\*

##### Pre-installed (Other)

FreeDOS 2.0  
NeoKylin Linux 64-bit Commercial OS (select countries only)

##### Web-supported

Windows 10 Pro 64  
Windows 10 Home 64

\*Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.microsoft.com>.

Your product does not support Windows 8 or Windows 7. In accordance with Microsoft's support policy, HP does not support the Windows® 8 or Windows 7 operating system on this product or provide any Windows® 8 or Windows 7 drivers on <http://www.support.hp.com>.

#### CHIPSET

Intel® H110 Chipset

#### PROCESSOR\*

##### Intel® Celeron®

Intel® Celeron® G3900 with Intel® HD Graphics 510 (2.8 GHz, 2 MB cache, 2 cores)

##### Intel® Celeron®

Intel® Celeron® G3930 with Intel® HD Graphics 610 (2.9 GHz, 2 MB cache, 2 cores)

##### Intel® Pentium®

Intel® Pentium® G4400 with Intel® HD Graphics 510 (3.3 GHz, 3 MB cache, 2 cores)

##### Intel® Pentium®

Intel® Pentium® G4560 with Intel® HD Graphics 610 (3.5 GHz, 3 MB cache, 2 cores)

##### Intel® Core™ i3

Intel® Core™ i3-6100 with Intel® HD Graphics 530 (3.7 GHz, 3 MB cache, 2 cores)

##### Intel® Core™ i3

Intel® Core™ i3-7100 with Intel® HD Graphics 630 (3.9 GHz, 3 MB cache, 2 cores)

##### Intel® Core™ i5

Intel® Core™ i5-6500 with Intel® HD Graphics 530 (3.2 GHz, 6 MB cache, 4 cores)

##### Intel® Core™ i5

### Standard Features and Configurable Modules

Intel® Core™ i5-7500 with Intel® HD Graphics 630 (3.4 GHz, 6 MB cache, 4 cores)

**Intel® Core™ i7**

Intel® Core™ i7-7700 with Intel® HD Graphics 630 (3.6 GHz, 8 MB cache, 4 cores)

\*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 is not a measurement of higher performance.

### Standard Features and Configurable Modules

#### MEMORY\*

Both slots are customer accessible / upgradeable, Supports Dual Channel Memory

| Form Factor       | Type   | Maximum        | # of Slots |
|-------------------|--|----------------|------------|
| Small Form Factor | DDR4-2133 for SkyLake CPUS<br>(Transfer rates up to 2133 MT/s)<br>DDR4-2400 for KabyLake CPUS (Transfer rates up to 2400 MT/s) | 32 GB capacity | 2 DIMM     |

2GB DDR4-2133 DIMM (1x2GB)

4GB DDR4-2133 DIMM (1x4GB)

8GB DDR4-2133 DIMM (1x8GB)

8GB DDR4-2133 DIMM (2x4GB) (Dual Channel)

2GB DDR4-2400 UDIMM (1x2GB)

4GB DDR4-2400 UDIMM (1x4GB)

8GB DDR4-2400 UDIMM (1x8GB)

**\*NOTE:** For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system. Memory modules support data transfer rates up to 2133 MT/s; actual data rate is determined by the system's configured processor. See processor specifications for supported memory data rate.

#### STORAGE\*

##### SATA 3.5" 6Gb/s HDDs\*

500GB 7200 RPM SATA Hard Disk Drive

1TB 7200 RPM SATA Hard Disk Drive

##### Solid State Drives 2.5" \*

128GB SATA Value SSD

##### SD Card Reader\*\*

3-in1 SD Media Card Reader

**\*NOTE:** For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

\*\*Card sold separately

#### OPTICAL DISC DRIVES\*

HP 9.5mm Desktop G2 Slim DVD-ROM Drive

HP 9.5mm Desktop G2 Slim DVD Writer Drive

\*Optical drives are optional or add on features. Duplication of copyrighted material is strictly prohibited. Actual speeds may vary. Double Layer media compatibility will widely vary with some home DVD players and DVD-ROM drives.

### Standard Features and Configurable Modules

#### **GRAPHICS**

**Integrated**

Intel® Integrated HD Graphics Varies by Processor

**Discrete** (optional for selected countries only)

NVIDIA® GeForce® GT 730 2GB PCIe x8

### Standard Features and Configurable Modules

#### AUDIO/MULTIMEDIA

HD audio with Realtek ALC3252 Audio Codec  
Combo Microphone/Headphone Jack  
Line-out and Line-in rear port (3.5mm)

#### NETWORKING

##### Ethernet (RJ-45)

Integrated 10/100/1000M Gigabit Ethernet Controller with Realtek RTL8111HSH –CG

- Supports Wake-on-LAN (WOL)

##### Wireless\*

Intel® 3168 802.11ac with PCIe x1 WLAN/ Bluetooth® Combo\*®  
Intel® 3168 802.11ac with PCIe x1 WLAN/ Bluetooth® Combo\*® Disabled

\* Wireless cards are optional or add-on features and requires separately purchased wireless access point and internet service. Availability of public wireless access points limited.

#### PORTS

##### Front I/O Ports

Two (2) USB 3.0 ports  
One (1) Microphone/Headphone Combo Jack

##### Rear I/O Ports

Six (6) USB 2.0 ports  
One (1) RJ45 network connection  
One (1) Audio Line out  
One (1) Audio Line in  
One (1) VGA  
One (1) HDMI

##### Internal I/O Ports

One (1) PCIe x 16 (3.0)  
One (1) PCIe x 1 (2.0)

#### BAYS

One (1) 1st 3.5" Hard Disc Drive Bay  
One (1) 9.5mm Slim ODD Bay  
One (1) Secure Digital (SD) Reader Bay

#### KEYBOARDS AND POINTING DEVICES\*

##### Keyboards

Business Slim USB Antimicrobial Standalone Wired Keyboard  
HP USB Business Slim Keyboard

##### Mice



### Standard Features and Configurable Modules

HP USB Mouse (China only)

HP USB Mouse

\*Keyboards and mouse are optional or add-on features.

### SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

Preinstalled (varies by country)

#### BIOS

Power On Authentication

#### Multimedia

Cyberlink Power Media Player

Cyberlink Power2Go (Secure Burn)

#### HP Value Add Software

HP ePrint Driver<sup>1</sup>

HP Recovery Manager

HP Support Assistant

Windows 10 Welcome App

#### 3rd Party

Foxit PhantomPDF Express for HP (optional, US only)

#### Microsoft Products

Buy Office

Bing Search

Skype

#### Manageability

Discover HP Touchpoint Manager<sup>2</sup>

### SECURITY FEATURES

Trusted Platform Module (TPM) 2.0 (firmware)

1. TPM feature will not be supported on machines pre-configured with FreeDOS/Linux

2. In selected countries, machines pre-configured with Windows OS will be shipped with TPM disabled.

Security cable slot

### POWER SUPPLY\*

- 180 W, up to 85% efficient

\*Note: All power supplies are not available in every region.

### Standard Features and Configurable Modules

#### DIMENSIONS AND WEIGHT (configured with 1 HDD and 1 ODD)

|                                |  |
|--------------------------------|--|
| <b>Chassis<br/>(D x W x H)</b> | 11.42 x 10.63 x 3.94 in<br>290 x 270 x 100 mm                          |
| <b>System Weight</b>           | 8.88 lbs / 4.03 kg (for 3.5" HDD)<br>8.07 lbs / 3.66 kg (for 2.5" SSD) |

#### PACKAGING DIMENSIONS AND WEIGHT

|                   |   |
|-------------------|---|
| <b>Dimensions</b> | 19.65 x 15.71 x 8.98 in (499 x 399 x 228 mm)                            |
| <b>Weight</b>     | 15.5 lbs / 7.03 kg (for 3.5" HDD)<br>14.68 lbs / 6.66 kg (for 2.5" SSD) |

#### PALLETIZATION AND CONTAINER

|                                       |   |
|---------------------------------------|---|
| <b>Type</b>                           | Normal 40'G container   |
| <b>Pallet Size</b>                    | 47.24 x 39.37 x 4.96 in<br>1200 x 1000 x 126 mm                                     |
| <b>Pallet Profile</b>                 | 1 product/carton<br>6 cartons/layer<br>9 layers/pallet<br>Total = 54 pcs per pallet |
| <b>Pallet Size Loaded</b>             | 47.24 x 39.37 x 86.81 in<br>1200 x 100 x 2205 mm                                    |
| <b>Container Profile</b>              | 21 pallets/40'G container   |
| <b>Product Quantity per Container</b> | 54 x 21 = 1134 pcs  |

#### UNIT ENVIRONMENT AND OPERATING CONDITIONS

##### General Unit Operating Guidelines

- Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range.
- Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow.
- Never restrict airflow into the computer by blocking any vents or air intakes.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.

|   |   |
|---|---|
| <b>Temperature Range</b>                | Operating: 50° to 95° F (10° to 35° C)*<br>Non-operating: -22° to 140° F (-30° to 60° C)                  |
| <b>Relative Humidity</b>                | Operating: 10% to 90% (non-condensing at ambient)<br>Non-operating: 5% to 95% (non-condensing at ambient) |
| <b>Maximum Altitude (unpressurized)</b> | Operating: 10,000 ft (3048 m)<br>Non-operating: 30,000 ft (9144 m)  |

### Standard Features and Configurable Modules

\* Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.

### ENVIRONMENTAL DATA

|   |   |                     |  |
|---|---|---------------------|--|
| <b>Eco-Label Certifications &amp; declarations</b>  | 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: <ul style="list-style-type: none"> <li>• IT ECO declaration</li> <li>• US ENERGY STAR®</li> <li>• EPEAT® &lt;Gold&gt; registered in the United States. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status in your country.</li> </ul>   |                     |  |
| <b>System Configuration</b><br><br><b>Energy Consumption (in accordance with US ENERGY STAR® test method)</b> | The configuration used for the Energy Consumption and Declared Noise Emissions data for the Ultra-slim Desktop model is based on a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.  |                     |  |
|   | <b>115VAC, 60Hz</b>   | <b>230VAC, 50Hz</b> | <b>100VAC, 60Hz</b>                          |
| Normal Operation (Short idle)   | 16.11 W   | 16.06 W             | 16.47 W                                      |
| Normal Operation (Long idle)  | 15.28 W   | 15.16 W             | 15.23 W                                      |
| Sleep   | 1.19 W  | 1.13 W              | 1.06 W                                       |
| Off   | 0.74 W  | 0.74 W              | 0.74 W                                       |
|   | Note:   |                     |  |
|   | 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. |                     |  |
| <b>Heat Dissipation*</b>  | <b>115VAC, 60Hz</b>   | <b>230VAC, 50Hz</b> | <b>100VAC, 60Hz</b>                          |
| Normal Operation (Short idle)   | 55 BTU/hr   | 55 BTU/hr           | 56 BTU/hr                                    |
| Normal Operation (Long idle)  | 52 BTU/hr   | 52 BTU/hr           | 52 BTU/hr                                    |
| Sleep   | 4 BTU/hr  | 4 BTU/hr            | 4 BTU/hr                                     |
| Off   | 3 BTU/hr  | 3 BTU/hr            | 3 BTU/hr                                     |
|   | *NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.   |                     |  |
| <b>Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)</b>                                    | Sound Power (L <sub>WAd</sub> , bels)   |                     | Sound Pressure (L <sub>pAm</sub> , decibels) |
| Typically Configured – Idle   | 3.4   |                     | 25   |
| Fixed Disk – Random writes  | 3.5   |                     | 25   |

### Standard Features and Configurable Modules

|                                   |  |                                    |         |
|-----------------------------------|--|------------------------------------|---------|
| <b>Longevity and Upgrading</b>    | <p>This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:</p> <ul style="list-style-type: none"> <li>• 6 USB ports</li> <li>• 2 memory slots</li> <li>• 1 Mini PCIe half-length slot</li> <li>• 1 MXM 3.0 Type A - 35W slot</li> <li>• 1 mSATA slot</li> <li>• 1 2.5" internal bay supporting up to Two 2.5" hard drives (HDD/SSD/SED/SSHD)</li> <li>• 1 5.25" external supporting optical drive</li> </ul> <p>Spare parts are available throughout the warranty period and or for up to "5" years after the end of production.</p>   |                                    |         |
| <b>Batteries</b>                  | <p>This battery(s) in this product comply with EU Directive 2006/66/EC</p> <p>Batteries used in the product do not contain:<br/>         Mercury greater the 1ppm by weight<br/>         Cadmium greater than 20ppm by weight</p> <p>Battery size: CR2032 (coin cell)<br/>         Battery type: Lithium</p>   |                                    |         |
| <b>Additional Information</b>     | <ul style="list-style-type: none"> <li>• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.</li> <li>• This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.</li> <li>• This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).</li> <li>• This product is in compliance with the IEEE 1680 (EPEAT) standard at the &lt;gold&gt; level, see <a href="http://www.epeat.net">www.epeat.net</a></li> <li>• Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.</li> <li>• This product contains 5.7% post-consumer recycled plastic (by wt.)</li> <li>• This product is 92.2% recycle-able when properly disposed of at end of life.</li> </ul> |                                    |         |
| <b>Packaging Materials</b>        | <b>External:</b>   | PAPER/Corrugated                   | 1300 g  |
|                                   | <b>Internal:</b>   | PLASTIC/EPE-Expanded Polyethylene  | 129.6 g |
|                                   |  | PLASTIC/EPS (Expanded Polystyrene) | 133.6 g |
|                                   |  | PLASTIC/Polyethylene low density   | 21.76 g |
|                                   | The plastic packaging material contains at least 5% recycled content.  |                                    |         |
|                                   | The corrugated paper packaging materials contains at least 30.66% recycled content.  |                                    |         |
| <b>Common to all Form Factors</b> |  |                                    |         |
| <b>Material Usage</b>             | <p>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 <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf</a>):</p> <ul style="list-style-type: none"> <li>• Asbestos</li> <li>• Certain Azo Colorants</li> <li>• Certain Brominated Flame Retardants – may not be used as flame retardants in plastics</li> <li>• Cadmium</li> <li>• Chlorinated Hydrocarbons</li> <li>• Chlorinated Paraffins</li> </ul>   |                                    |         |

### Standard Features and Configurable Modules

|   |  |
|---|--|
|   | <ul style="list-style-type: none"> <li>• Formaldehyde</li> <li>• Halogenated Diphenyl Methanes</li> <li>• Lead carbonates and sulfates</li> <li>• Lead and Lead compounds</li> <li>• Mercuric Oxide Batteries</li> <li>• Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.</li> <li>• Ozone Depleting Substances</li> <li>• Polybrominated Biphenyls (PBBs)</li> <li>• Polybrominated Biphenyl Ethers (PBBEs)</li> <li>• Polybrominated Biphenyl Oxides (PBBOs)</li> <li>• Polychlorinated Biphenyl (PCB)</li> <li>• Polychlorinated Terphenyls (PCT)</li> <li>• Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.</li> <li>• Radioactive Substances</li> <li>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)</li> </ul> |
| <p><b>Packaging Usage</b></p>                                     | <p>HP follows these guidelines to decrease the environmental impact of product packaging:</p> <ul style="list-style-type: none"> <li>• Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.</li> <li>• Eliminate the use of ozone-depleting substances (ODS) in packaging materials.</li> <li>• Design packaging materials for ease of disassembly.</li> <li>• Maximize the use of post-consumer recycled content materials in packaging materials.</li> <li>• Use readily recyclable packaging materials such as paper and corrugated materials.</li> <li>• Reduce size and weight of packages to improve transportation fuel efficiency.</li> <li>• Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.</li> </ul>  |
| <p><b>End-of-life Management and Recycling</b></p>                | <p>Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <a href="http://www.hp.com/go/reuse-recycle">http://www.hp.com/go/reuse-recycle</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>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: <a href="http://www.hp.com/go/recyclers">http://www.hp.com/go/recyclers</a>. 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.</p>                                 |
| <p><b>Hewlett-Packard Corporate Environmental Information</b></p> | <p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report<br/> <a href="http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html">http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html</a></p> <p>Eco-label certifications<br/> <a href="http://www8.hp.com/us/en/hp-information/environment/ecolabels.html">http://www8.hp.com/us/en/hp-information/environment/ecolabels.html</a></p> <p>ISO 14001 certificates:<br/> <a href="http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842">http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842</a><br/> and<br/> <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</a></p>   |

### Standard Features and Configurable Modules

#### CERTIFICATIONS

EPEAT® Silver\*  
CECP  
SEPA  
WEEE (Waste, Electric and electronic equipment)  
ENERGY STAR® 6.1  
CEL  
FCC  
UL  
RoHS

\*EPEAT® registered where applicable/supported. EPEAT registration varies by country. See [www.epeat.net](http://www.epeat.net) for registration status by country.

#### SERVICE AND SUPPORT

On-site Warranty: One-year (1-1-1) or Three-year (3-3-3) limited warranty delivers three years of on-site, next business day<sup>2</sup> service for parts and labor and complimentary limited technical support. One-year/Three-year onsite and labor are not available in all countries. Service offers terms up to 5 years by choosing an optional HP Care Pack.<sup>4</sup> To choose the right level of service for your HP product, visit HP Care Pack Central: [www.hp.com/go/cpc](http://www.hp.com/go/cpc)

NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply. Other warranty variations may be offered in your region.

NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

NOTE 3: Technical support applies only to HP-configured and third-party HP qualified hardware and software.

NOTE 4: 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 [www.hp.com/go/cpc](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 - Graphics

#### GRAPHICS

| <b>Intel® HD Graphics (integrated)</b>   |  |             |                      |
|--|--|-------------|----------------------|
| <b>HDMI</b>  | Multimode capable; supports HDCP, HDMI Audio (2 streams), HBR2 link rates and Multi-Stream Technology for a maximum of 3 displays (including the integrated panel)   |             |                      |
| <b>Maximum Graphics Memory</b>   | Microsoft Windows 7  | Windows 8.1 | Windows 10           |
|  | Up to 1.7GB  | Up to 1.8GB | >4 GB                |
| Note: the actual amount of maximum graphics memory can be less than the amounts listed above depending upon your computer's configuration. |  |             |                      |
| <b>Maximum Color Depth</b>   | 24/30/36   |             |                      |
| <b>Graphics/Video API Support</b>  | 6th Generation Core™ processors: <ul style="list-style-type: none"> <li>• Next Generation Intel® Clear Video Technology HD Support is a collection of video playback and enhancement features that improve the end user's viewing experience               <ul style="list-style-type: none"> <li>○ Encode/transcode HD content</li> <li>○ Playback of high definition content including Blu-ray Disc</li> <li>○ Superior image quality with sharper, more colorful images</li> </ul> </li> <li>• DirectX Video Acceleration (DXVA) support for accelerating video processing               <ul style="list-style-type: none"> <li>○ Full AVC/VC1/MPEG2/HEVC HW Decode</li> </ul> </li> <li>• Advanced Scheduler 2.0, 1.0</li> <li>• Windows 7, Windows 8.1, Windows 10, Linux OS Support</li> <li>• DirectX 12.1</li> <li>• OpenGL 4.4</li> <li>• Open CL 1.2 (Intel® HD Graphics 510)</li> <li>• Open CL 1.2/2.0 (Intel® HD Graphics 530)</li> </ul> |             |                      |
| <b>Supported Display Resolutions and Refresh Rates</b>   |  |             |                      |
| <b>Note:</b> other resolutions may be available but are not recommended as they may not have been tested and qualified by HP               |  |             |                      |
|  | <b>Resolution</b>  |             | <b>Refresh Rates</b> |
|  | 800x600  |             | 60 Hz                |
|  | 1024x768   |             | 60 Hz                |
|  | 1152x864   |             | 60 Hz                |
|  | 1280x600   |             | 60 Hz                |
|  | 1280x720   |             | 60 Hz                |
|  | 1280x800   |             | 60 Hz                |
|  | 1280x960   |             | 60 Hz                |
|  | 1280x1024  |             | 60 Hz                |
|  | 1360x768   |             | 60 Hz                |
|  | 1366x768   |             | 60 Hz                |
|  | 1400x1050  |             | 60 Hz                |
|  | 1440x900   |             | 60 Hz                |
|  | 1600x900   |             | 60 Hz                |
|  | 1600x1200*   |             | 60 Hz                |
|  | 1680x1050  |             | 60 Hz                |
|  | 1920x1080  |             | 60 Hz                |
| * Only supported on displays connected to the external DisplayPort connector.  |  |             |                      |

### Technical Specifications - Graphics

#### NVIDIA® GeForce® GT 730 2GB PCIe x8 Graphics Card

|                               |   |
|-------------------------------|---|
| <b>Introduction</b>           | Get impressive graphics and high resolution dual-display performance in a low profile, PCI Express x8 graphics add-in card based on the NVIDIA® Kepler™ Graphics Processor. Improve your everyday PC, Web conferencing, and video or photo editing. |
| <b>Memory</b>                 | 2GB DDR3 64-bit wide frame buffer operating at 900 MHz  |
| <b>Controller Clock Speed</b> | NVIDIA® Kepler™ GPU operating at 902 MHz  |
| <b>Multi-display Support</b>  | A maximum of 4 displays are supported by the card.  |
| <b>Graphics /API support</b>  | Supports Microsoft DirectX 12, OpenGL 4.4 and OpenCL 2 APIs, Shade Model 5, UVD 4.2, VCE 2.0, and DirectCompute 11  |
| <b>Output Connectors</b>      | 1 x Dual-Link DVI-I, 1x DisplayPort; Includes DVI to VGA adapter<br>Display Port output is multi-mode capable, support Audio, HBR2 and MST  |

#### Supported Display Resolutions and Refresh Rates

**Note:** other resolutions may be available but are not recommended as they may not have been tested and qualified by HP

| Resolution  | Refresh Rate*    | VGA<br>(DVI-VGA<br>adapter) | DVI-D | DisplayPort | Standard                         |
|-------------|------------------|-----------------------------|-------|-------------|----------------------------------|
| 640 x 480   | 60, 75, 85       | X                           | X     | X           | VESA DMT, CVT 0.31M3             |
| 720 x 400   | 70               | X                           | X     | X           | IBM VGA                          |
| 800 x 600   | 60, 75, 85       | X                           | X     | X           | VESA DMT, CVT0.48M3              |
| 1024 x 768  | 60, 75, 85       | X                           | X     | X           | VESA DMT, CVT 0.79M3             |
| 1152 x 864  | 60, 75, 85       | X                           | X     | X           | VESA DMT, CVT 0.83MA             |
| 1280 x 720  | 60, 75, 85       | X                           | X     | X           | VESA DMT, CVT 0.92M9, CEA-770.3  |
| 1280 x 768  | 60, 60RB, 75, 85 | X                           | X     | X           | VESA DMT, CVT 0.98M9/0.98M9-R    |
| 1280 x 800  | 60, 75, 85       | X                           | X     | X           | VESA DMT                         |
| 1280 x 960  | 60, 75, 85       | X                           | X     | X           | VESA DMT                         |
| 1280 x 1024 | 60, 75, 85       | X                           | X     | X           | VESA DMT, CVT 1.31M4             |
| 1366 x 768  | 60, 60RB         | X                           | X     | X           | VESA DMT                         |
| 1440 x 900  | 60, 60RB         | X                           | X     | X           | VESA DMT                         |
| 1600 x 900  | 60, 60RB, 75, 85 | X                           | X     | X           | VESA DMT                         |
| 1680 x 1050 | 60, 60RB, 75     | X                           | X     | X           | VESA DMT, CVT 1.76MA/1.76MA-R    |
| 1920 x 1080 | 60               | X                           | X     | X           | VESA DMT, CVT 2.07M9, SMPTE 274M |
| 1920 x 1200 | 60, 60RB, 75, 85 | X                           | X     | X           | DMT, CVT 2.30MA/2.30MA-R         |
| 1600 x 1200 | 60, 75, 85       | X                           | X     | X           | VESA DMT, 1.92M3                 |



### Technical Specifications - Graphics

|             |            |   |   |   |                                    |
|-------------|------------|---|---|---|------------------------------------|
| 1920 x 1440 | 60, 75, 85 | X | X | X | VESA DMT, CVT 2.76M3               |
| 2048 x 1536 | 60,75      | X | X | X | CVT 3.15M3                         |
| 2560 x 1440 | 59.951     |   | X | X | CVT 3.69M9-R                       |
| 2560 x 1600 | 60, 60RB   |   | X | X | VESA DMT, CVT 4.10MA/4.10MA-R      |
| 3840 x 2160 | 24         |   |   | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 25         |   |   | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 30         |   | X | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 3840 x 2160 | 60         |   |   | X | CVT-RBv1/v2 (8.29M9-R), SMPTE 274M |
| 4096 x 2160 | 24         |   |   | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M  |
| 4096 x 2160 | 25         |   |   | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M  |
| 4096 x 2160 | 30         |   |   | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M  |
| 4096 x 2160 | 60         |   |   | X | CVT-RBv1/v2 (8.85M-R), SMPTE 274M  |
| 1920 x 1080 | 60         |   | X | X | VESA (SMPTE 274M)                  |
| 1920 x 1080 | 50         |   | X | X | SMPTE 274M                         |
| 1920 x 1080 | 30         |   | X | X | SMPTE 274M                         |
| 1920 x 1080 | 24         |   | X | X | SMPTE 274M                         |
| 1280 x 720  | 60         |   | X | X | VESA (CEA-770.3)                   |
| 1280 x 720  | 50         |   | X | X | SMPTE 296M                         |
| 720 x 480   | 60         |   | X | X | MHL (CEA-770.2)                    |
| 720 x 576   | 50         |   | X | X | ITU-R BT.1358                      |
| 640 x 480   | 60         |   | X | X | CEA (VESA DMT)                     |

\* >60 refresh rates only for analog (VGA) signaling

### Technical Specifications – Hard Disk and Solid State Storage

| <b>1TB 7.2K rpm SATA 6.0Gb/s 3.5” Hard Disk Drive</b>   |                                |        |
|---|--------------------------------|--------|
| <b>Capacity</b>   | 1,000,204,886,016 bytes        |        |
| <b>Rotational Speed</b>   | 7,200 rpm                      |        |
| <b>Interface</b>  | Serial ATA 3.0 (6.0 Gb/s)      |        |
| <b>Buffer Size</b>  | 32 MB                          |        |
| <b>Logical Blocks</b>   | 1,953,525,168                  |        |
| <b>Seek Time</b> (typical reads, includes controller overhead, including settling)  | <b>Single Track:</b>           | 2.0 ms |
|   | <b>Average:</b>                | 11 ms  |
|   | <b>Full-Stroke:</b>            | 21 ms  |
| <b>Height</b> (nominal)   | 1 in/2.54 cm                   |        |
| <b>Width</b> (nominal)  | Media diameter: 3.5 in/8.89 cm |        |
|   | Physical size: 4 in/10.2 cm    |        |
| <b>Operating Temperature</b>  | 41° to 131° F (5° to 55° C)    |        |
| <p><b>NOTE:</b> "For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 16 GB (for Windows 7) and 36 GB (for Windows 8.1/10) of system disk is reserved for the system recovery software."</p> |                                |        |

| <b>500GB 7.2K rpm SATA 6.0Gb/s 3.5” Hard Disk Drive</b>                            |                           |        |
|--|---------------------------|--------|
| <b>Capacity</b>  | 500,107,862,016 bytes     |        |
| <b>Rotational Speed</b>  | 7,200 rpm                 |        |
| <b>Interface</b>   | Serial ATA 3.0 (6.0 Gb/s) |        |
| <b>Buffer Size</b>   | 16 MB                     |        |
| <b>Logical Blocks</b>  | 976,773,168               |        |
| <b>Seek Time</b> (typical reads, includes controller overhead, including settling) | <b>Single Track:</b>      | 2.0 ms |
|  | <b>Average:</b>           | 11 ms  |
|  | <b>Full-Stroke:</b>       | 21 ms  |
| <b>Height</b> (nominal)  | 1 in/2.54 cm              |        |

### Technical Specifications – Hard Disk and Solid State Storage

|   |                                |
|---|--------------------------------|
| <b>Width</b> (nominal)  | Media diameter: 3.5 in/8.89 cm |
|   | Physical size: 4 in/10.2 cm    |
| <b>Operating Temperature</b>  | 41° to 131° F (5° to 55° C)    |
| NOTE: "For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 16 GB (for Windows 7) and 36 GB (for Windows 8.1/10) of system disk is reserved for the system recovery software." |                                |

| <b>128GB SATA 2.5" Value (Non-SED) Solid State Drive</b>   |  |                             |
|--|--|-----------------------------|
| <b>Unformatted Capacity</b>  | 128 GB                                   |                             |
| <b>Architecture</b>  | TLC NAND Flash                           |                             |
| <b>Interface</b>   | SATA 3.2 (6.0 Gb/s)                      |                             |
| <b>Form Factor</b>   | 2.5 inch                                 |                             |
| <b>Dimensions (W x H x D)</b>  | 6.98 x 0.7 x 10.05 cm                    |                             |
| <b>Weight</b>  | 31g                                      |                             |
| <b>Bandwidth Performance</b>   | Sustained Sequential Read:               | Up to 510 MB/s              |
|  | Sustained Sequential Write:              | Up to 330 MB/s              |
|  | Random Read:                             | Up to 38K IOPs              |
|  | Random Write:                            | Up to 70K IOPs              |
| <b>Power</b>   | DC power requirement:                    | 5 VDC 5%-100 mV ripple p-p  |
|  | Total power consumption:                 | 50mW (active); 20mW (idle)  |
| <b>Useful Drive Life</b>   | 72TB written, up to 40GB/day for 5 years |                             |
| <b>Environmental</b><br>(all conditions, non-condensing)   | Operating Temperature:                   | 32° to 158° F (0° to 70° C) |
|  | Relative Humidity:                       | 5% to 95%                   |
|  | Shock:                                   | 1,500 G/0.5 ms              |
| NOTE: "For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows10) of system disk is reserved for the system recovery software." |  |                             |

### Technical Specifications - Removable Storage

| <b>HP 9.5mm Desktop G2 Slim DVD Writer Drive</b>                |   |   |
|---|---|---|
| <b>Height</b>   | 9.5 mm height   |   |
| <b>Orientation</b>  | Either horizontal or vertical                           |   |
| <b>Interface type</b>   | SATA/ATAPI  |   |
| <b>Disc recording capacity</b>                                  | Up to 8.5 GB DL or 4.7 GB standard                      |   |
| <b>Dimensions (W x H x D)</b>                                   | 5.04 x 0.37 x 5.0 in (128 x 9.5 x 127 mm) without bezel |   |
| <b>Weight (max)</b>   | 0.31 lb (140 g)   |   |
|   | DVD-R DL  | Up to 6X  |
|   | DVD+R   | Up to 8X  |
|   | DVD+RW  | Up to 8X  |
|   | DVD+R DL  | Up to 6X  |
|   | DVD-R   | Up to 8X  |
|   | DVD-RW  | Up to 6X  |
|   | CD-R  | Up to 24X   |
|   | CD-RW   | Up to 10X   |
|   | DVD-RW, DVD+RW  | Up to 8X  |
|   | DVD-R DL, DVD+R DL                                      | Up to 8X  |
|   | DVD+R, DVD-R  | Up to 8X  |
|   | DVD-ROM DL, DVD-ROM                                     | Up to 8X  |
|   | CD-ROM, CD-R  | Up to 24X   |
|   | CD-RW   | Up to 24X   |
| <b>Access time</b><br>(typical reads, including settling)       | Random  | DVD-ROM: 170 ms (typical), CD-ROM: 170 ms (typical) |
|   | Full Stroke   | DVD-ROM: 320 ms (typical), CD-ROM: 320 ms (typical) |
|   | Stop Time   | 6 seconds (typical)                                 |
| <b>Power</b>  | Source  | Slimline SATA DC power receptacle                   |
|   | DC Power Requirement                                    | 5 VDC ± 5%-100 mV ripple p-p                        |
|   | DC Current  | 5 VDC (< 1000 mA typical, 1600 mA maximum)          |
| <b>Environmental conditions</b><br>(operating - non-condensing) | Temperature   | 41° to 122° F (5° to 50° C)                         |
|   | Relative Humidity                                       | 10% to 80%  |
|   | Maximum Wet Bulb Temperature                            | 84° F (29° C)                                       |
| <b>HP 9.5mm Desktop G2 Slim DVD-ROM Drive</b>                   |   |   |
| <b>Height</b>   | 9.5mm   |   |

### Technical Specifications - Removable Storage

|   |   |   |
|---|---|---|
| <b>Orientation</b>  | Either horizontal or vertical                           |   |
| <b>Interface type</b>                                     | SATA/ATAPI  |   |
| <b>Dimensions (W x H x D)</b>                             | 5.04 x 0.37 x 5.0 in (128 x 9.5 x 127 mm) without bezel |   |
| <b>Weight (max)</b>                                       | Up to 0.31 lb (140g) without bezel                      |   |
| <b>Read speeds</b>  | DVD+R/-R/+RW/<br>-RW/+R DL /-R DL                       | Up to 8X  |
|   | DVD-ROM   | Up to 8X  |
|   | CD-ROM, CD-R  | Up to 24X   |
|   | CD-RW   | Up to 24X   |
| <b>Access time</b><br>(typical reads, including settling) | Random  | DVD-ROM: 170 ms (typical), CD-ROM: 170 ms (typical) |
|   | Full Stroke   | DVD-ROM: 320 ms (typical), CD-ROM: 320 ms (typical) |
| <b>Power</b>  | Source  | Slimline SATA DC power receptacle                   |
|   | DC Power Requirement                                    | 5 VDC ± 5%-100 mV ripple p-p                        |
|   | DC Current  | 5 VDC - <1000 mA typical, < 1600 mA maximum         |
| <b>Environmental</b> (all conditions non-condensing)      | Temperature   | 41° to 122° F (5° to 50° C)                         |
|   | Relative Humidity                                       | 10% to 80%  |
|   | Maximum Wet Bulb Temperature (operating)                | 84° F (29° C)                                       |

### Technical Specifications - Audio

| <b>High Definition Audio</b>      |   |
|-----------------------------------|---|
| <b>Type</b>                       | Integrated  |
| <b>HD Stereo Codec</b>            | Realtek 2.1-channel ALC3252 codec   |
| <b>Audio I/O Ports</b>            | Front Headphone-Out(Gain=0 dB, 1 ohm Input Impedance, function is configurable by audio driver)   |
|                                   | Rear Line-In/Microphone input (Gain=0 dB ,27-K ohm Input Impedance, function is configurable by audio driver)                               |
|                                   | Rear Line-Out*(Gain=0 dB, 200 ohm Input Impedance, function is configurable by audio driver)  |
|                                   | All ports are 3.5mm   |
| <b>Internal Speaker Amplifier</b> | N/A   |
| <b>Multi-streaming Capable</b>    | Multi-streaming can be enabled in the Realtek control panel to allow independent audio streams to be sent to/from the front and rear jacks. |
| <b>Sampling</b>                   | 8 kHz - 192 kHz   |
| <b>Wavetable Syntheses</b>        | Yes – Uses OS soft wavetable  |
| <b>Analog Audio</b>               | Yes   |
| <b># of Channels on Line-Out</b>  | Stereo (Left & Right channels)  |
| <b>Internal Speaker</b>           | No  |
| <b>External Speaker Jack</b>      | Yes   |

### Technical Specifications - Networking/Communication

| <b>Realtek RTL8111HSH -CG GbE</b> |                               |  |
|-----------------------------------|-------------------------------|--|
| <b>10/100/1000 NIC</b>            | <b>Ethernet Features</b>      | 10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)<br>100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)<br>1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40)<br>Auto-Negotiation (Automatic Speed Selection)<br>Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s<br>IEEE 802.1p QoS (Quality of Service) Support<br>IEEE 802.1q VLAN support<br>IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable)<br>IEEE 802.3az EEE (Energy Efficient Ethernet)<br>Jumbo Frame 9K<br>Auto MDI/MDIX Crossover cable detection |
|                                   | <b>Power Management</b>       | ACPI compliant – multiple power modes<br>Situation-sensitive features reduce power consumption<br>Advanced link down power saving for reducing link down power consumption   |
|                                   | <b>Performance Features</b>   | TCP/IP/UDP Checksum Offload (configurable)<br>Protocol Offload (ARP & NS)<br>Large send offload and Giant send offload<br>Receiving Side Scaling   |
|                                   | <b>Manageability</b>          | Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame);<br>Wake-on-LAN from off (Magic Packet only)<br>PXE 2.1 Remote Boot<br>Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30))<br>Comprehensive diagnostic and configuration software suite<br>Virtual Cable Doctor for Ethernet cable status  |
|                                   | <b>Interface</b>              | PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ   |
|                                   | <b>NIC Device Driver Name</b> | PCIe GbE Ethernet Family Controller  |

| <b>Intel® 3168 802.11ac with PCIe x1 WLAN/ Bluetooth® Combo*</b> |   |  |
|--|---|--|
| <b>Wireless LAN Standards</b>                                    | IEEE 802.11a<br>IEEE 802.11b<br>IEEE 802.11g<br>IEEE 802.11n<br>IEEE 802.11ac |  |
| <b>Interoperability</b>  | Wi-Fi certification   |  |
| <b>Frequency Bands</b>   | 802.11b/g/n   | 2.402 – 2.482 GHz<br><br><b>Note:</b><br>The FCC has declared as of January 1, 2015 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels. |

### Technical Specifications - Networking/Communication

|                                    |           |  |
|------------------------------------|-----------|--|
|                                    | 802.11a/n | <p>4.9 – 4.95 GHz (Japan)<br/>                     5.15 – 5.25 GHz<br/>                     5.25 – 5.35 GHz<br/>                     5.47 – 5.725 GHz<br/>                     5.825 – 5.850 GHz</p> <p>Note: Indonesia only supports 5.725 - 5.825 GHz (CH149 - CH161)</p>  |
| <b>Data Rates</b>                  |           | <ul style="list-style-type: none"> <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>802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)</li> <li>802.11ac : MCS0 ~ MCS7, (1SS) (20MHz, 40MHz, and 80MHz)</li> </ul>  |
| <b>Modulation</b>                  |           | <p>Direct Sequence Spread Spectrum</p> <p>BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM</p>   |
| <b>Security<sup>1</sup></b>        |           | <ul style="list-style-type: none"> <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> <p><sup>1</sup> Check latest software/driver release for updates on supported security features.</p> |
| <b>Network Architecture Models</b> |           | <p>Ad-hoc (Peer to Peer)<br/>                     Infrastructure (Access Point Required)</p>   |
| <b>Roaming</b>                     |           | 802.11r Fast Roaming   |
| <b>Output Power<sup>2</sup></b>    |           | <ul style="list-style-type: none"> <li>802.11b : +16dBm minimum</li> <li>802.11g : +14dBm minimum</li> <li>802.11a : +14dBm minimum</li> <li>802.11n HT20(2.4GHz) : +14dBm minimum</li> <li>802.11n HT40(2.4GHz) : +12dBm minimum</li> <li>802.11n HT20(5GHz) : +14dBm minimum</li> <li>802.11n HT40(5GHz) : +12dBm minimum</li> <li>802.11ac 80MHz(5GHz) : +11dBm minimum</li> </ul> <p><sup>2</sup> Maximum output power may vary by country according to local regulations.</p>                             |
| <b>Power Consumption</b>           |           | <p>Transmit: 2.0 W (max)<br/>                     Receive: 1.6 W (max)<br/>                     Idle mode (PSP): 180 mW (WLAN Associated)<br/>                     Idle mode: 50 mW (WLAN unassociated)</p>  |



### Technical Specifications - Networking/Communication

|  |   |                                |
|--|---|--------------------------------|
|  | Connect Standby: 10 mW (WLAN+BT)<br>Radio disabled: 5 mW  |                                |
| <b>Power Management</b>  | ACPI and PCI Express compliant power management<br>802.11 compliant power saving mode   |                                |
| <b>Receiver Sensitivity<sup>3</sup></b>  | 802.11b, 1Mbps : -94dBm maximum<br>802.11b, 11Mbps : -86dBm maximum<br>802.11g, 6Mbps : -88dBm maximum<br>802.11g, 54Mbps : -74dBm maximum<br>802.11a, 6Mbps : -88dBm maximum<br>802.11a, 54Mbps : -74dBm maximum<br>802.11n, MCS07 : -69dBm maximum<br>802.11n, MCS15 : -66dBm maximum<br>802.11ac, 1SS, MCS-0 : -86dBm maximum<br>802.11ac, 1SS, MCS-9 : -61dBm maximum<br>802.11ac, 2SS, MCS-0 : -83dBm maximum<br>802.11ac, 2SS, MCS-9 : -58dBm maximum |                                |
|  | <sup>3</sup> 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).   |                                |
| <b>Antenna type</b>  | High efficiency antenna with spatial diversity, mounted in the display enclosure<br>Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications   |                                |
| <b>Form Factors</b>  | PCI-Express M.2 MiniCard  |                                |
| <b>Dimensions</b>  | Type 2230 : 2.3 x 22.0 x 30.0 mm<br>Or<br>Type 1630 : 2.3 x 16.0 x 30.0 mm  |                                |
| <b>Weight</b>  | Type 2230 : 2.8g<br>Or<br>Type 1630 : 2g  |                                |
| <b>Operating Voltage</b>   | 3.3v +/- 9%   |                                |
| <b>Temperature</b>   | <b>Operating:</b>   | 14° to 158° F (-10° to 70° C)  |
|  | <b>Non-operating:</b>   | -40° to 176° F (-40° to 80° C) |
| <b>Humidity</b>  | <b>Operating:</b>   | 10% to 90% (non-condensing)    |
|  | <b>Non-operating:</b>   | 5% to 95% (non-condensing)     |
| <b>Altitude</b>  | <b>Operating:</b>   | 0 to 10,000 ft (3,048 m)       |
|  | <b>Non-operating:</b>   | 0 to 50,000 ft (15,240 m)      |
| <b>LED Activity</b>  | LED Amber – Radio OFF; LED White – Radio ON   |                                |
| * Wireless access point and Internet service required and not included. Availability of public wireless access points limited. |   |                                |
| <b>HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology</b>   |   |                                |
| <b>Bluetooth Specification</b>   | 4.0/4.1/4.2 Compliant   |                                |

### Technical Specifications - Networking/Communication

| <b>Frequency Band</b>   | 2402 to 2480 MHz  |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
|---|---|------------|--|------------|-----------|------------|------|---------|---------|----------------|---------|---------|-------|---------|---------|
| <b>Number of Available Channels</b>                               | Legacy : 0~79 (1 MHz/CH)<br>BLE : 0~39 (2 MHz/CH)   |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
| <b>Data Rates and Throughput</b>                                  | Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps   |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
|   | BLE : 1 Mbps data rate; throughput up to 0.2 Mbps<br>Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels  |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
|   | Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)   |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
| <b>Transmit Power</b>   | The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.   |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
| <b>Receiver Sensitivity Legacy</b>                                | <table border="1"> <thead> <tr> <th>Modulation</th> <th>0.01% BER</th> <th>0.001% BER</th> </tr> </thead> <tbody> <tr> <td>GFSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> <tr> <td><math>\pi/4</math>-DQPSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> <tr> <td>8DPSK</td> <td>-80 dBm</td> <td>-70 dBm</td> </tr> </tbody> </table> |            |  | Modulation | 0.01% BER | 0.001% BER | GFSK | -80 dBm | -70 dBm | $\pi/4$ -DQPSK | -80 dBm | -70 dBm | 8DPSK | -80 dBm | -70 dBm |
| Modulation  | 0.01% BER   | 0.001% BER |  |            |           |            |      |         |         |                |         |         |       |         |         |
| GFSK  | -80 dBm   | -70 dBm    |  |            |           |            |      |         |         |                |         |         |       |         |         |
| $\pi/4$ -DQPSK  | -80 dBm   | -70 dBm    |  |            |           |            |      |         |         |                |         |         |       |         |         |
| 8DPSK   | -80 dBm   | -70 dBm    |  |            |           |            |      |         |         |                |         |         |       |         |         |
| <b>Power Consumption</b>  | Peak (Tx) 330 mW<br>Peak (Rx) 230 mW<br>Selective Suspend 17 mW   |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
| <b>Range</b>  | Legacy Up to 33 ft (10 m)<br>BLE Up to 99 ft (30 m)   |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
| <b>Electrical Interface</b>                                       | USB 2.0 compliant   |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
| <b>Bluetooth Software Supported Link Topology</b>                 | Microsoft Windows Bluetooth Software  |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
| <b>Electrical Interface Bluetooth Software Supported Security</b> | Point to Point, Multipoint Pico Nets up to 7 slaves   |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
|   | Full support of Bluetooth Security Provisions   |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
| <b>Power Management Certifications</b>                            | Microsoft Windows ACPI, and USB Bus Support   |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
|   | Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff   |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
| <b>Security</b>   | All necessary regulatory approvals for supported countries, including:  |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
| <b>Certifications Bluetooth Profiles Supported</b>                | FCC (47 CFR) Part 15C, Section 15.247 & 15.249  |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
| <b>Power Management Certifications</b>                            | ETS 300 328, ETS 300 826  |            |  |            |           |            |      |         |         |                |         |         |       |         |         |
|   | Low Voltage Directive IEC950  |            |  |            |           |            |      |         |         |                |         |         |       |         |         |

### Technical Specifications - Networking/Communication

|  |  |
|--|--|
| <b>Certifications</b><br><b>Bluetooth Profiles Supported</b> | <ul style="list-style-type: none"> <li>UL, CSA, and CE Mark</li> <li>Serial Port Profile (SPP)<sup>1</sup></li> <li>Service Discovery Application Profile (SDAP)</li> <li>Dial-Up Networking (DUN)<sup>1,2</sup></li> <li>Generic Object Exchange Profile (GOEP)<sup>1,2</sup></li> <li>Object Push Profile (OPP)<sup>1,2</sup></li> <li>Hard Copy Cable Replacement (HCRP)<sup>1,2</sup></li> <li>Personal Area Networking Profile (PAN)<sup>1,2</sup></li> <li>Human Interface Device Profile (HID)<sup>1,2</sup></li> <li>Hands Free Profile (HFP)</li> <li>Advanced Audio Distribution Profile (A2DP)</li> <li>Audio Video Remote Control Profile (AVRCP)</li> </ul> |
| <b>Bluetooth V4.1/V4.2 support feature</b>                   | <ul style="list-style-type: none"> <li>V4.1: ESR5/6/7 compliant</li> <li>V4.2: ESR8 compliant, LE Secure Connection – Basic.</li> </ul>  |

After-Market Options (availability may vary by region)

| <b><u>Type</u></b> | <b><u>Description</u></b>                            | <b><u>Part #</u></b> |
|--------------------|--|----------------------|
| <b>Memory</b>      | HP 4GB DDR4-2133 DIMM                                | P1N51AA              |
|                    | HP 8GB DDR4-2133 DIMM                                | P1N52AA              |
| <b>Storage</b>     | HP 500GB SATA 6.0Gb/s Hard Drive                     | QK554AA              |
| <b>Graphics</b>    | NVIDIA GeForce GT 730 2GB PCIe x8 Card               | N3R90AA              |
| <b>Security</b>    | HP Business PC Security Lock V2 Kit                  | N3R93AA              |
| <b>Multimedia</b>  | HP Business Headset v2                               | N3R89AA              |
|                    | HP USB Business Speakers v2                          | T4E61AA              |
| <b>Input</b>       | HP USB Keyboard                                      | QY776AA              |
|                    | HP Conferencing Keyboard                             | K8P74AA              |
|                    | HP USB Conferencing Keyboard                         | N8N57AA              |
|                    | HP USB Business Slim Keyboard                        | N3R87AA              |
|                    | HP USB Antimicrobial Keyboard and Mouse (China Only) | K7X25AA              |

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### Change Log

| <b>Date of change:</b> | <b>Version History:</b> |        | <b>Description of change:</b>   |
|------------------------|-------------------------|--------|---|
| December 5, 2016       | From v1 to v2           | Update | SuperMulti references deleted   |
| February 1, 2017       | From v2 to v3           | Update | Software Components and Applications with Windows Section updated. HP BIOS Config Utility (BCU) deleted                       |
| April 26, 2017         | From v3 to v4           | Update | Audio Section Updated   |
| August 7, 2017         | From v4 to v5           | Update | At a Glance, Processor & Memory sections updated  |
| August 22, 2017        | From v5 to v6           | Update | Transfer rate fixed on the Memory section   |
| January 18, 2018       | From v6 to v7           | Update | Environmental data added  |
| March 8, 2018          | From v7 to v8           | Update | Couple of notes added to (TPM) 2.0 (firmware) in Security Features section  |
| December 19, 2018      | From v8 to v9           | Update | HP ePrint driver removed from software and HP touchpoint manager from Manageability<br>Typos corrected on Environmental table |