

## Entry-level platform for Intel's 8<sup>th</sup>/9<sup>th</sup> Gen. "Coffee Lake" processors

The Shuttle XPC cube Barebone SH310R4 supports the 8<sup>th</sup> and 9<sup>th</sup> generation of Intel Core desktop processors ("Coffee Lake") for socket LGA1151v2, up to 64 GB memory, two 4K displays at 60 Hz via DisplayPort and HDMI 2.0, high-performance M.2 SSDs and up to four USB 3.0 devices. The SH310R4 can be expanded with a high-performance graphics card for demanding applications while the second PCIe-X1-slot can be used for other expansion cards. WLAN and COM port can be additionally installed as well. The SH310R4 comes with a built-in 80 PLUS power supply and Shuttle's I.C.E. heatpipe cooling which means it is energy-efficient and ready for long-term operation. For a personal look and feel, the front panel can be customised by adding individual designs.

### Feature Highlights

<b>R4 Chassis</b>	<ul style="list-style-type: none"> <li>Black aluminium chassis</li> <li>Dimensions: 32.9 x 21.5 x 19 cm (13.4 L)</li> <li>Bays: 1x 5.25" external, 2x 3.5" internal</li> </ul>
<b>CPU</b>	<ul style="list-style-type: none"> <li>Sockets LGA 1151v2 supports the 8<sup>th</sup>/9<sup>th</sup> gen. Intel Core CPUs "Coffee Lake" up to 95 W TDP</li> <li>Supports Intel Core i9/i7/i5/i3, Pentium Gold and Celeron</li> <li>Shuttle I.C.E. Heatpipe cooling system</li> </ul>
<b>OS</b>	<ul style="list-style-type: none"> <li>Supports Windows 10 and Linux (64-bit)</li> </ul>
<b>Optional Graphics</b>	<ul style="list-style-type: none"> <li>Optional Intel graphics (depends on CPU [7])</li> <li>Supports two UHD displays at the same time</li> </ul>
<b>Chipset</b>	<ul style="list-style-type: none"> <li>Intel H310 chipset</li> </ul>
<b>Memory</b>	<ul style="list-style-type: none"> <li>Supports up to 2x 32 GB DDR4-2400/2666 DIMM memory modules (total max. 64 GB)</li> </ul>
<b>Expansion Slots:</b>	<ul style="list-style-type: none"> <li>1x PCIe X16 (v3.0) supports dual-slot graphics cards with ≥273 mm length and with 6-pin power connector</li> <li>1x PCIe X1 (v2.0) slot supports PCIe X4 cards</li> <li>1x M.2-2280 (SATA / PCIe X4) supports M.2 SSDs</li> <li>1x M.2-2230 supports WLAN cards</li> </ul>
<b>SATA</b>	<ul style="list-style-type: none"> <li>3x Serial ATA 6Gb/s</li> </ul>
<b>Connectors</b>	<ul style="list-style-type: none"> <li>HDMI 2.0a, DisplayPort 1.2, VGA/D-Sub</li> <li>4x USB 3.1 Gen 1, 4x USB 2.0 (+ 1x onboard)</li> <li>Intel GigaBit LAN, 5x Audio (2x front, 3x rear)</li> </ul>
<b>PSU</b>	<ul style="list-style-type: none"> <li>300 W mini power supply, 80 PLUS Bronze</li> </ul>
<b>Optional Accessories</b>	<ul style="list-style-type: none"> <li>RS232 Serial COM-Port (H-RS232)</li> <li>Wireless LAN 802.11ac + BT module (WLN-M)</li> <li>500 W Power Supply (PC63J)</li> </ul>

## XPC cube Barebone SH310R4



8/9<sup>th</sup> Gen. Intel Core



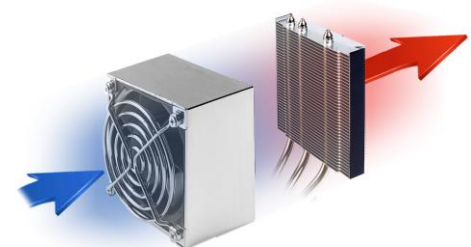
2x DDR4 max. 64GB



M.2 2280 Support



Dual Display

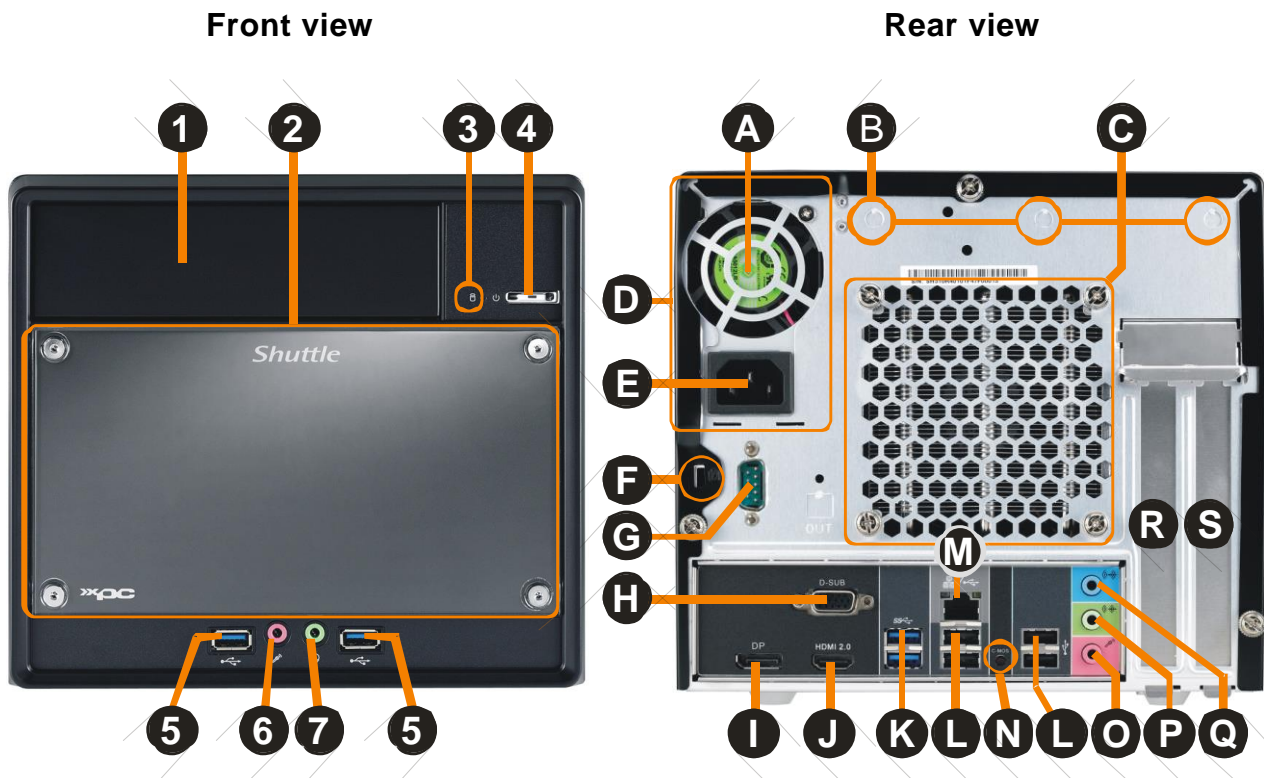


### Shuttle I.C.E. Heatpipe cooling

Images for illustration purposes only



## Shuttle XPC cube Barebone SH310R4 – Connectors



- 1 5.25" optical drive bay
- 2 Removable acrylic plate
- 3 Hard disk LED indicator
- 4 Power switch with LED
- 5 2x USB 3.0 \*)
- 6 Microphone input
- 7 Headphones output

- A Power supply fan
- B Optional WLAN antennas
- C Heatpipe cooling system
- D Power supply
- E AC power connector
- F Hole for Kensington Lock
- G Optional COM port
- H VGA/D-Sub video output \*)
- I DisplayPort video output \*)
- J HDMI 2.0a video output \*)

- K 2x USB 3.0 \*\*)
- L 4x USB 2.0
- M Gigabit LAN (RJ45)
- N Clear-CMOS-Button
- O Microphone input
- P Audio Line-out
- Q Audio Line-in
- R PCI-Express X16 slot
- S PCI-Express X1 slot

\*) **Note:** The graphics outputs (HDMI and DisplayPort) can only be used if the processor supports integrated graphics. [7].

\*\*) **USB 3.0** (max. 5 Gbps) has officially been re-named **USB 3.1 Gen 1** by the USB Implementers Forum, Inc.(USB-IF).

### Shuttle XPC cube Barebone SH310R4 – Required Components

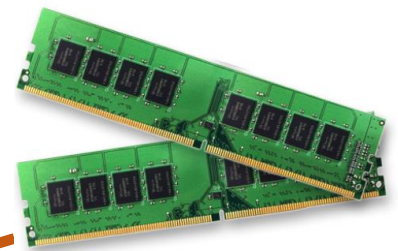
The following components need to be added to make it a fully-configured Mini PC:

**Gen. 8/9 Intel Core processor**  
**Socket LGA 1151v2 „Coffee Lake“**  
**Core i9 / i7 / i5 / i3, Pentium**  
**or Celeron \*)**

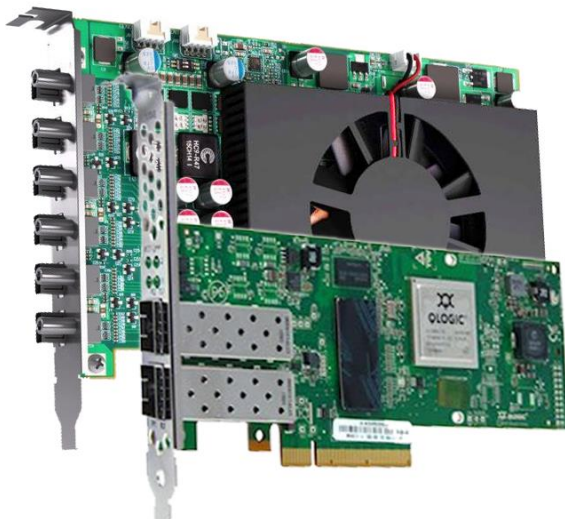


**Three drive bays:**  
**1 x 5.25" and 2 x 3.5" (internal)**  
**(Use accessory PHD3 to install**  
**two 2.5" drives in a 3.5" bay)**

Example configuration (see photo):  
 1x 5.25" Blu-ray drive (SATA)  
 2x 3.5" hard disk (SATA)



**Up to two DDR4-2666/2400**  
**DIMM memory modules**  
**max. 32 GB each**



**M.2 2280/2260/2242**  
**SSD card**  
**(NVMe or SATA)**

**Optional:**  
**2x PCI-Express expansion card (X16 + X4)**

Example configuration (see photo):  
 PCIe X16 slot: multiport graphics card (max. Length: 273 mm)  
 PCIe X4 slot: Dual 10Gb network card  
 Note: If a dual-slot (double-width) graphics cards is used the second PCI-Express slot will be occupied.



## Shuttle XPC cube Barebone SH310R4 – Product Features



### The R4 chassis: a stylish and cleanlook

Shuttle has always placed great emphasis on the interior and exterior aesthetics of the XPC with the belief that a good blend of style and form factor allows the XPC to be attractive, versatile and work well in almost any environment. The construction and cover of the R4 chassis is made of aluminium. This leads to a stylish, but robust appearance which has made the R4 a popular chassis design. The drives and media connectors on the front are easy to access in daily use.



### Customisable

The front of this XPC Barebone can easily be customised by simply changing the mylar behind the acrylic front plate. Add your individual design such as a photo, graphics or a company logo to the front panel in just a few steps.



### Small, but easy to build

Shuttle XPCs offer the performance of a desktop PC at a third of the size while using standard desktop components. Be ready for the future when banking on Shuttle's R4 chassis. The meticulously designed internal layout features pre-routed cables to reduce clutter, increase airflow and make the installation of components easy.



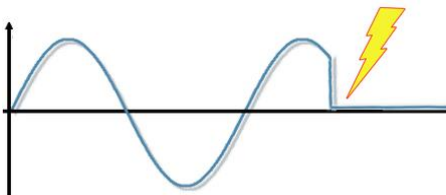
### What does "Barebone" mean?

The Shuttle XPC cube Barebone SH310R4 consists of a compact case with pre-installed mainboard, power supply unit (PSU) and cables. Despite its small form factor, it offers outstanding connectivity, functionality and performance. For a full PC system, components such as a processor, memory, hard disk and operating system need to be added that can be chosen individually to ideally match personal needs. Some XPC models require a graphics card to be added.



### Integrated Cooling Engine (I.C.E.)

In order to ensure proper airflow inside such a small case, more advanced cooling technologies have been developed and implemented in the Shuttle XPC cube. Shuttle's industry-leading I.C.E. heatpipe technology delivers efficient cooling and is exceptionally quiet.



## Supports Intel "Coffee Lake" Processors

"Coffee Lake" is the codename for Intel's 8th and 9th Generation of Intel® Core™ Processors introduced in 2017/2018 along with the 300-Series chipsets. Coffee Lake CPUs are built using the second refinement of Intel's 14nm process (14++) and are a landmark in the number of cores of their mainstream desktop processors. The 8000 series processors feature up to 6 cores and 12 threads and 12 MB of cache memory and the 9000 series up to 8 cores, 16 threads and 16 MB Cache. The Shuttle XPC cube Barebone SH370R6 supports the desktop version "Coffee Lake-S" with socket LGA1151v2, while the previous generations with LGA1151 are not compatible.

## Internal Drives

Up to one optical drive and two hard disks can be fitted in the Shuttle XPC cube Barebone SH310R4. To reduce heat and improve on airflow, the drive rack built into the SH310R4 leaves generous space between the hard disks. Intelligently-engineered airflow mechanics channels cool air to where it is needed the most to protect components and provide optimal performance.

## Supports up to 64 GB DDR4 memory

The Shuttle XPC cube Barebone SH310R4 supports up to 64 GB of DDR4-2400/2666 memory which is ideal for workstations powered by 64-bit operating systems, so users take full advantage of high-performance configurations. Compatible memory comes in 288-pin DIMM modules at 1.2V operating voltage.

## M.2-2280-Slot for SSD cards

The M.2-2280 BM slot supports M.2 SSD storage cards with NVMe interface or SATA.

Type 2280 means, it supports the usual M.2 cards with a width of 22mm and a length of 80mm, but also 2242 and 2260 standard cards are supported.

## M.2-2230-Slot for optional WLAN

The M.2-2230 AE slot is intended for Wireless LAN (Wifi), Bluetooth, GSM/UMTS cards and others.

Shuttle offers the optional accessory „WLN-M“ (see picture on the left), which adds WLAN 802.11ac and Bluetooth 4.0 to your Shuttle XPC cube Barebone SH310R4.

## Power on after Power fail

The BIOS setup provides a "Power-On after Power Fail" function that can be found under "Power Management Configuration". As the name indicates, this function determines the PC's behaviour after power failure: (1) unconditional power on, (2) restore former status or (3) keep system turned off.

## Graphics Features



### Built-in Intel® UHD Graphics Engine (optional [7])

The integrated Intel® UHD Graphics depends on the type of processor used and supports hardware decoding for HEVC (4K/H.265) video, Intel® Quick-Sync video encoding, 2160p high-definition resolution, HDCP, Blu-ray\*) playback, DirectX 12, OpenGL 4.5 and up to 64 GB shared graphics memory. The graphics performance is comparable to entry-level discrete graphics cards.

\*) appropriate software and optical drive required

### Supports 4K Ultra-HD video playback

4K resolution is a technological milestone in high-definition content delivery, utilizing more than four times of 1080p Full HD pixel density. The Shuttle XPC cube Barebone SH310R4 supports 4K Ultra-HD video content at 2160p/60Hz via its DisplayPort 1.2 and HDMI 2.0a video output.

### Video outputs

The PC features three video outputs:

- **HDMI 2.0a** and **DisplayPort 1.2** supports Full-HD and Ultra-HD resolutions with 60 frames per second and multi-channel audio output
- **VGA / 15-pin D-Sub** - supports analog video

Supports two independent displays simultaneously.

### Dual View Technology

Dual View technology offers multiple display support for up to two separate monitors. This helps improve on productivity by allowing to spread multiple windows across two monitors while working with them simultaneously. For this, the Shuttle XPC cube Barebone SH310R4 features two digital video outputs (DisplayPort and HDMI) and an analog VGA port.

### Support of four displays and more

The Shuttle XPC cube Barebone SH310R4 can be connected to even more displays, if a dedicated discrete PCI-Express graphics card is used. This function is based on the "Switchable Graphics" feature, which combines the integrated graphics and the graphics card.

### PCI-Express V3.0 for high-performance graphics cards

Thanks to the optimised internal layout, the XPC cube Barebone SH310R4 even takes large dual-slot graphics cards. The modern PCI Express V3.0 interface makes sure there is no bottleneck when gaming or working with 3D applications. This barebone PC also features an additional 6-pin ATX auxiliary power connector. The maximum size acceptable for display cards is 273 mm x 98 mm x 38 mm.

## Optional Accessories



### WLAN-Kit (WLN-M)

Shuttle offers the optional accessory „WLN-M“, which adds WLAN 802.11ac and Bluetooth 4.0 to your Shuttle XPC cube Barebone SH310R4.



### Serial RS-232 port (H-RS232)

One serial COM port (RS232) can optionally be installed to the back panel. This is particularly relevant for professional applications such as electronic POS, industrial automation systems and scientific analysis.



### 500W Power Supply with 80 PLUS Silver Logo (PC63J)

The PC63J is a high-end power supply with a maximum output wattage of 500W. It features additional 6-pin and 8-pin ATX auxiliary power connectors for high-end graphics cards. Thanks to its 80 PLUS Silver certification for power-efficient devices, this power supply is also suitable for ENERGY STAR® compliant systems.



### Adapter for 2.5" drives (PHD3)

The PHD3 allows for installation of 63.5mm (2.5") hard drives or SSDs into a larger 89 mm (3.5") drive bay.



## Shuttle XPC cube Barebone SH310R4 - Specifications

<i>R4-Chassis</i>	<p>Black aluminium chassis with acrylic front plate</p> <p>Customisable front panel design: simply change the mylar and add a personal design such as a photo, graphics or a logo to the front panel.</p> <p>Storage bays: 1 x 5.25" (external), 2 x 3.5" (internal)</p> <p>Dimensions: 32.9 x 21,5 x 19.0 cm (LWH without feet) = 13.4 litres</p> <p>Height with rubber feet: 19.7 cm</p> <p>Weight: 3.4 kg net / 4.5 kg gross</p>
<i>Mainboard and Chipset</i>	<p>Shuttle mainboard FH310, Shuttle form factor, proprietary design for XPC SH310R4</p> <p>Chipset/Southbridge: Intel® H310</p> <p>Passive chipset cooling with heat sink</p> <p>The Northbridge is integrated in the processor. Solid Capacitors for sensitive areas provide excellent heat resistance for enhanced system durability.</p>
<i>BIOS</i>	<p>AMI BIOS, SPI Interface, 16 MB Flash-EPROM</p> <p>Supports PnP, ACPI 3.0, Hardware Monitoring, Firmware-TPM (fTPM) v2.0</p> <p>Supports boot up from external USB flash memory</p> <p>Supports Unified Extensible Firmware Interface (UEFI)</p>
<i>Power Supply</i>	<p>Built-in 300 Watt mini switching power supply (model PC61J)</p> <p>AC input voltage: 100~240V, 50~60 Hz</p> <p>80 PLUS Bronze compliant: The PSU provides at least 82/85/82% of efficiency at 20/50/100% of load.</p> <p>Active PFC circuit (Power Factor Correction)</p> <p>ATX main power connectors: 2x 10 and 2x 2-pin</p> <p>Graphics power connector: 6-pin</p> <p>Other connectors: 4x SATA, 2x Molex, 1x Floppy</p>
<i>Operation System</i>	<p>This system comes without operating system.</p> <p>It is compatible with Windows 10 and Linux (64-bit).</p>
<i>Processor Support</i>	<p>Processor Socket LGA 1151 v2</p> <p>Supports Intel Core i9 / i7 / i5 / i3, Pentium Gold and Celeron processors</p> <p>Supports the 8th and 9th generation Intel Core processors, code name "Coffee Lake" in 14+ nm process technology</p> <p>Maximum supported processor power consumption (TDP) = 95 W</p> <p>Up to 8 CPU cores, 16 threads and 16 MB of L3 cache</p> <p>Does not support the unlock-function of Intel K-Series processors.</p> <p><u>Not compatible</u> with older Socket LGA 1151 processors (6th Gen. "Skylake" and 7th Gen. "Kaby Lake").</p> <p>The processor integrates PCI-Express, memory controller and the graphics engine on the same die</p> <p>However, processors with "F" identifier do not support integrated graphics [7] (performance features depending on processor type)</p> <p>Please refer to the support list for detailed processor support information at <a href="http://global.shuttle.com">global.shuttle.com</a>.</p>



<i>Heatpipe Processor Cooling</i>	Shuttle I.C.E. (Integrated Cooling Engine) advanced I.C.E. heatpipe technology, linear-controlled 92 mm fan SilentX cooling and noise reduction technology with Active Airflow
<i>Memory Support</i>	2 x 288-pin slot Supports DDR4-2400/2666 memory (PC4-19200/21300) at 1.2 V Supports Dual Channel mode Supports max. 32 GB per DIMM, maximum total size of 64 GB
<i>PCI-e Slots</i>	1x PCI-Express x16 v3.0 slot 1x PCI-Express x1 v2.0 slot, open-end [3] Supports dual-slot (double-width) graphics cards (occupies the second PCI-Express slot) The maximum size acceptable for display cards is 273 x 98 x 38 mm. With 6-pin power connector for graphics card.
<i>M.2-2280M SSD Slot</i>	The M.2 2280M slot provides the following interfaces: - PCI-Express Gen. 3.0 X4, supports NVMe - SATA v3.0 (max. 6 Gbps) It supports M.2 cards with a width of 22 mm and a length of 42, 60 or 80 mm (type 2242, 2260, 2280). Supports M.2 SSDs with SATA and PCI-Express interface
<i>M.2-2230E Slot for WLAN cards</i>	Interfaces: PCI-Express Gen. 2.0 X1 und USB 2.0 Supports M.2 cards with a width of 22 mm and a length of 30 mm (type 2230) Supports WLAN expansion cards (optional Shuttle accessory: WLN-M [4])
<i>Integrated Graphics (optional)</i>	The features of the integrated Intel UHD graphics function depend on the processor type used. Certain processor models do not support integrated graphics [7] Supports DirectX 12, OpenGL 4.4 The PC features three video outputs: - HDMI v2.0a (supports 1080p/60 and 2160p/60) - DisplayPort v1.2 (support 1080p/60 and 2160p/60) - VGA / 15-pin D-Sub (supports analog video in FullHD resolution) Supports displays with 4K Ultra HD resolution at 3840 x 2160 via HDMI or DisplayPort. Supports max. two independent displays with the integrated graphics function Supports more displays in combination with a discrete graphics card [6] Supports Blu-ray (BD) playback with HDCP 2.2 content protection [2] Hardware video decoding/encoding: H.264, H. 265 (8- and 10-bit, encoding via QuickSync), VP9 (10-bit VP9 can only be decoded) DisplayPort and HDMI support multi-channel digital audio over the same cable Maximum shared memory of 1 GB
<i>6-Channel Audio</i>	Audio Codec: Realtek ALC662, 5.1 channel Three analog audio connectors (3.5 mm) at the back panel: Line-in (blue), line-out (green) and microphone input (pink) shared with 5.1 channel line-out (front, rear, center/bass) Front panel: microphone input and headphones output (line-out) DisplayPort and HDMI support multi-channel digital audio over the same cable.

<i>Gigabit-LAN Controller</i>	Intel i219LM PHY connected to the MAC of the processor Supports 10 / 100 / 1.000 MBit/s operation Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE)
<i>Drive Connectors</i>	3x Serial ATA 6G ( rev. 3.0, max. 6 Gbit/s, colour: blue) Storage bays: 1 x 5.25" (external), 2 x 3.5" (internal)
<i>Front Panel Connectors</i>	Microphone input (3.5 mm) Headphone output (3.5 mm) 2x USB 3.0 (USB 3.1 Gen 1) Power button Power indicator (Blue LED) Hard disk drive indicator (Yellow LED)
<i>Back Panel Connectors</i>	HDMI 2.0a (digital video and audio) DisplayPort 1.2 (digital video and audio) D-Sub VGA (analog video) 2x USB 3.0 (USB 3.1 Gen 1) 4x USB 2.0 GigaBit LAN (RJ45) Audio Line-out (3.5 mm) Audio Line-in (3.5 mm) Microphone Input (3.5 mm) Clear CMOS button Optional: Serial RS232 port (Accessory: "H-RS232") Perforations for optional WLAN antennas [4]
<i>Other Connectors (onboard)</i>	Front panel connectors: USB, audio, buttons, LEDs 1x RS232 serial interface (2x 5-pin) 1x USB 2.0 interface (4-pin) 2x fan connector (4-pin) - one is occupied
<i>Included Accessories</i>	Multi-language XPC Installation Guide (EN, DE, FR, ES, JP, KR, SC, TC) 64-bit driver disk 2x Serial ATA cables AC Power Cord (with protective-earth contacts) Heatsink Compound, Bag with screws Protector cap for the CPU socket (do not use if heatpipe or fan is mounted)
<i>Optional Accessories</i>	Back panel adapter for serial RS232 port ( <b>H-RS232</b> ) Wireless LAN 802.11ac and Bluetooth kit with two antennas ( <b>WLN-M</b> ) [4] Adapter for 2.5" drives such as SSDs ( <b>PHD3</b> ) 500 W power supply, 80Plus Silver ( <b>PC63J</b> )
<i>Environmental criteria</i>	Operating temperature: 0~40 °C Humidity: 10~90 %

### Certifications Compliance

EMI: CE, FCC, BSMI, RCM/ C-Tick, VCCI

Safety: CB, ETL, BSMI

Other: RoHS, Energy Star 5.0, ErP

This device is classed as a technical information equipment (ITE) in class B and is intended for use in living room and office. The CE-mark approves the conformity by the EU directives:

(1) 2004/108/EC relating to electromagnetic compatibility (EMC),

(2) 2006/95/EC relating to Electrical Equipment designed for use within certain voltage limits (LVD),

(3) 2009/125/EC relating to ecodesign requirements for energy-related products (ErP)

### [1] Overclocking Notice

Please note there is a certain risk involved with overclocking, including adjusting the BIOS settings or using third-party overclocking tools. Overclocking may affect your system stability or even cause damage of the components and devices of your system. It is done at your own risk and expense. Shuttle cannot be held responsible for possible damage caused thereof.

**[2] For Blu-ray playback** appropriate software and a Blu-ray drive is required (not included).

**[3] Open-end PCI-E slot** - The X1 slot uses an open-end socket to permit physically longer cards (e.g. X4 or X8) while the speed is limited to X1.

**[4] Optional Wireless LAN module (WLN-M):** This XPC Barebone supports the optional Shuttle XPC Accessory WLN-M which consists of a M.2-2230 card with IEEE 802.11ac and BT4.0 functionality and two external antennas with appropriate antenna cables.

### [5] How to convert DisplayPort to HDMI/DVI

The DisplayPort output can be converted to HDMI or DVI by an additional, passive adapter cable. For example: DELOCK 82590: 1m, DisplayPort (male, 20p) to HDMI-A (male, 19p)

DELOCK 82435: 5m, DisplayPort (male, 20p) to DVI-D (male, 24p)

The integrated graphics automatically detects the connected display and puts out the appropriate electric signal - either DisplayPort (without an adapter) or HDMI/DVI (with an adapter).

However, a monitor with a DisplayPort connector cannot be connected to the HDMI port with a simple, passive adapter.

### [6] Supports additional displays in combination with a discrete graphics card

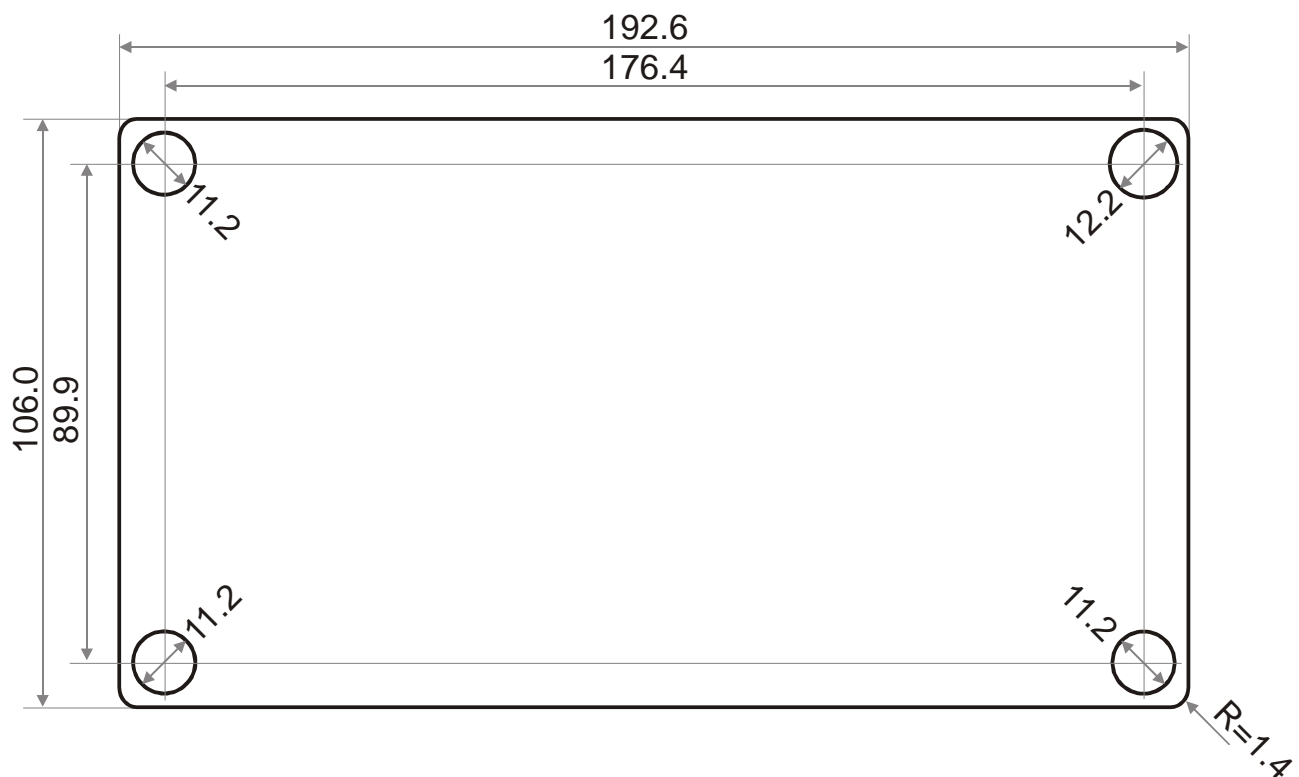
The integrated graphics function already supports two independent displays via its digital video outputs. This PC does even support more displays in combination with a discrete PCI-Express graphics card. This function is based on the Switchable Graphics feature introduced with the 2nd Generation of Intel® Core™ processors. To enable this, please enter the BIOS Setup Utility by pressing the "Delete" key after powering on the PC, then go to the "Advanced" tab and change the "Initiate Graphics Adapter" setting to "Switchable".

### [7] Integrated graphics is optional

Processors with model numbers ending with "F" (z.B. Intel Core i5-9400F) do not support integrated graphics, so that the graphics outputs of the Shuttle XPC have no function. In this case, an additional an additional discrete PCIe graphics card is mandatory.

## Shuttle XPC cube Barebone SH310R4 – Mylar Dimensions

The R4 front panel comes with a removable acrylic plate which allows for creating individual front designs. Simply change the mylar and add your individual design such as a photo, graphics or a company logo to the front panel in just a few steps.



All dimensions in millimeters (mm)





Example



## SH310R4 versus SH110R4

Comparison with the predecessor

Barebone Model	SH310R4	SH110R4
Back Panel		
Intel Processor Support	LGA1151v2, max. 95 W 14nm Coffee Lake (8/9 <sup>th</sup> Gen. Core CPU) Intel Core i9, i7, i5, i3, Pentium, Celeron	LGA1151, max. 95 W 14nm Skylake (6 <sup>th</sup> Gen. Core CPU) 14nm Kaby Lake (7 <sup>th</sup> Gen. Core CPU) Intel Core i7, i5, i3, Pentium, Celeron
Operation System	Windows 10 and Linux (64-bit)	Windows 7, 8.1, 10 and Linux (64-bit) Windows 7+8.1 only with Skylake CPUs
Chipset	Intel H310	Intel H110
Memory	Max. 2x 32 GB DDR4-2400/2666	Max. 2x 32 GB DDR4-2133/2400
PCI-Express Slots	(1x) PCIe X16 v3.0 (1x) PCIe X1 v2.0	(1x) PCIe X16 v3.0 (1x) PCIe X1 v2.0
Mini-Slots	1x M.2-2280BM (PCIe X4, SATA) 1x M.2-2230AE (PCIe X1, USB 2.0)	1x M.2-2280BM (PCIe X4, SATA) 1x M.2-2230AE (PCIe X1, USB 2.0)
Front Panel	Power Button with LED, HDD LED Microphone-in, headphones out 2x USB 3.0	Power Button with LED, HDD LED Microphone-in, headphones out 2x USB 3.0
Back Panel	HDMI 2.0a, DisplayPort 1.2, D-Sub/VGA 4x USB 2.0, 2x USB 3.0, GigaBit LAN (Intel i219-LM) 3x Audio, Clear CMOS Button	HDMI 1.4b, DisplayPort 1.2, D-Sub/VGA 4x USB 2.0, 2x USB 3.0, PS/2 Combo GigaBit LAN (Intel i219-LM) 3x Audio, Clear CMOS Button
Ultra HD Support	HDMI 2.0a: 2160p/60Hz DisplayPort 1.2: 2160p/60Hz	HDMI 1.4b: 2160p/30Hz DisplayPort 1.2: 2160p/60Hz
SATA onboard *)	3x SATA 6G	3x SATA 6G
Power Supply	300 W 80 PLUS Bronze	300 W 80 PLUS Bronze
Optional Accessories	500 W PSU (PC63J) RS232 port (H-RS232) WLAN kit 802.11n/ac+BT (WLN-M) 2.5" drive kit (PHD3)	500 W PSU (PC63J) RS232 port (H-RS232) WLAN kit 802.11n/ac+BT (WLN-M) 2.5" drive kit (PHD3)







\*) Note: The H110 and H310 chipsets both support four SATA devices in total.

Three are available for regular SATA drives and one is being used for the M.2-2280-slot.

\*\*) Note: Processors with model numbers ending with "F" (z.B. Intel Core i5-9400F) do not support integrated graphics, so that the graphics outputs of the Shuttle XPC have no function. In this case, an additional an additional discrete PCIe graphics card is mandatory.

## Shuttle XPC cube series for Intel Core Gen. 8 and 9 processors

## Product comparison

Model	SH310R4	SH370R6 (Plus)	SH370R8
Chassis Type	R4 Chassis Customisable front plate	R6 Chassis Front doors for I/O ports	R8 Chassis Supports four hard disks
Chipset	Intel H310	Intel H370	Intel H370
Drive Bays, SATA Ports	1x 5.25" 2x 3.5" (internal) 3x SATA 3.0 (6G)	1x 5.25" 1x 3.5" (internal) 1x 3.5" (external) 4x SATA 3.0 (6G)	4x 3.5" (internal) 4x SATA 3.0 (6G)
Memory (max.)	2x 32 GB DDR4-2666	4x 32 GB DDR4-2666	4x 32 GB DDR4-2666
PCIe Slots	1x PCIe x16 v3.0 1x PCIe x1 v2.0	1x PCIe x16 v3.0 1x PCIe x4 v3.0	1x PCIe x16 v3.0 1x PCIe x4 v3.0
M.2 Slots	1x M.2-2280M (NVMe) 1x M.2-2230E	1x M.2-2280M (NVMe) 1x M.2-2230E	1x M.2-2280M (NVMe) 1x M.2-2230E
Intel Optane	–	Supported	Supported
Optional Graphics *)	Supports Dual Display 1x HDMI 2.0a 1x DisplayPort 1.2 1x D-Sub/VGA	Supports <b>Triple</b> Display 1x HDMI 2.0a 2x DisplayPort 1.2	Supports <b>Triple</b> Display 1x HDMI 2.0a 2x DisplayPort 1.2
Network	Single Gigabit LAN 1x Intel i219LM	Single Gigabit LAN 1x Intel i211	<b>Dual</b> Gigabit LAN 2x Intel i211
USB	4x USB 3.1 Gen. 1 (5G) 4x USB 2.0 (+ 1x onboard)	4x USB 3.1 Gen. 2 (10G) 4x USB 3.1 Gen. 1 (5G) 4x USB 2.0 (+ 2x onboard)	4x USB 3.1 Gen. 2 (10G) 4x USB 3.1 Gen. 1 (5G) 2x USB 2.0 (+ 2x onboard)
Audio	2x front, 3x rear	2x front, 3x rear	2x front, 3x rear
Power Supply	300 W 80 PLUS Bronze	SH370R6: 300 W SH370R6 Plus: 500 W	500 W 80 PLUS Silver
Front View			
Rear View			

\*) **Note:** Processors with model numbers ending with "**F**" (z.B. *Intel Core i5-9400F*) do not support integrated graphics, so that the graphics outputs of the Shuttle XPC have no function. In this case, an additional an additional discrete PCIe graphics card is mandatory.

8<sup>th</sup> Generation Intel Core Desktop Processor Family

Socket LGA1151v2 14nm++ "Coffee Lake S" processor overview (Date: Jan 2019)

Name	Model	Cores/ Threads	CPU Clock	Turbo Clock	Smart Cache	TDP	Memory Support	Graphics Engine (clock in MHz)
Core i7	8700K	6 / 12	3.7 GHz	4.7 GHz	12 MB	95 W	DDR4-2666	UHD 630, 350~1200 MHz
	8700	6 / 12	3.2 GHz	4.6 GHz	12 MB	65 W	DDR4-2666	UHD 630, 350~1200 MHz
	8700T	6 / 12	2.4 GHz	4.0 GHz	12 MB	35 W	DDR4-2666	UHD 630, 350~1200 MHz
Core i5	8600K	6 / 6	3.6 GHz	4.3 GHz	9 MB	95 W	DDR4-2666	UHD 630, 350~1150 MHz
	8600	6 / 6	3.1 GHz	4.3 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350~1150 MHz
	8600T	6 / 6	2.3 GHz	3.7 GHz	9 MB	35 W	DDR4-2666	UHD 630, 350~1150 MHz
	8500	6 / 6	3.0 GHz	4.1 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350~1100 MHz
	8500T	6 / 6	2.1 GHz	3.5 GHz	9 MB	35 W	DDR4-2666	UHD 630, 350~1100 MHz
	8400	6 / 6	2.8 GHz	4.0 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350~1050 MHz
	8400B	6 / 6	2.8 GHz	4.0 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350~1050 MHz
Core i3	8400T	6 / 6	1.7 GHz	3.3 GHz	9 MB	35 W	DDR4-2666	UHD 630, 350~1050 MHz
	8350K	4 / 4	4.0 GHz	–	8 MB	91 W	DDR4-2400	UHD 630, 350~1150 MHz
	8300	4 / 4	3.7 GHz	–	8 MB	62 W	DDR4-2400	UHD 630, 350~1150 MHz
	8300T	4 / 4	3.2 GHz	–	8 MB	35 W	DDR4-2400	UHD 630, 350~1150 MHz
	8100	4 / 4	3.6 GHz	–	6 MB	65 W	DDR4-2400	UHD 630, 350~1100 MHz
Pentium Gold	8100T	4 / 4	3.1 GHz	–	6 MB	35 W	DDR4-2400	UHD 630, 350~1100 MHz
	G5600	2 / 4	3.9 GHz	–	4 MB	51 W	DDR4-2400	UHD 630, 350~1100 MHz
	G5500	2 / 4	3.8 GHz	–	4 MB	51 W	DDR4-2400	UHD 630, 350~1100 MHz
	G5500T	2 / 4	3.2 GHz	–	4 MB	35 W	DDR4-2400	UHD 630, 350~1100 MHz
	G5400	2 / 4	3.7 GHz	–	4 MB	51 W	DDR4-2400	UHD 630, 350~1050 MHz
Celeron	G5400T	2 / 4	3.1 GHz	–	4 MB	35 W	DDR4-2400	UHD 630, 350~1050 MHz
	G4920	2 / 2	3.2 GHz	–	2 MB	54 W	DDR4-2400	UHD 610, 350~1050 MHz
	G4900	2 / 2	3.1 GHz	–	2 MB	54 W	DDR4-2400	UHD 610, 350~1050 MHz
	G4900T	2 / 2	2.9 GHz	–	2 MB	35 W	DDR4-2400	UHD 610, 350~1050 MHz

K = unlocked, T = Power optimized lifestyle, TDP = Thermal Design Power (max. power consumption).

Note: The Shuttle XPC cube Barebone SH310R4 does not support the unlock-function of Intel K-Series processors.

Please refer to the support list for detailed processor support information at [global.shuttle.com](http://global.shuttle.com).

9<sup>th</sup> Generation Intel Core Desktop Processor Family

Socket LGA1151v2 14nm++ "Coffee Lake Refresh" processor overview (Date: April 2019)

Name	Model	Cores/ Threads	CPU Clock	Turbo Clock	Smart Cache	TDP	Memory Support	Graphics Engine (clock in MHz)
Core i9	9900K	8 / 16	3.6 GHz	5.0 GHz	16 MB	95 W	DDR4-2666	UHD 630, 350-1200 MHz
	9900KF	8 / 16	3.6 GHz	5.0 GHz	16 MB	95 W	DDR4-2666	None
	9900	8 / 16	3.1 GHz	5.0 GHz	16 MB	65 W	DDR4-2666	UHD 630, 350-1200 MHz
	9900T	8 / 16	2.1 GHz	4.4 GHz	16 MB	35 W	DDR4-2666	UHD 630, 350-1200 MHz
Core i7	9700K	8 / 8	3.6 GHz	4.9 GHz	12 MB	95 W	DDR4-2666	UHD 630, 350-1200 MHz
	9700KF	8 / 8	3.6 GHz	4.9 GHz	12 MB	95 W	DDR4-2666	None
	9700	8 / 8	3.0 GHz	4.7 GHz	12 MB	65 W	DDR4-2666	UHD 630, 350-1200 MHz
	9700T	8 / 8	2.0 GHz	4.3 GHz	12 MB	35 W	DDR4-2666	UHD 630, 350-1200 MHz
Core i5	9600K	6 / 6	3.7 GHz	4.6 GHz	9 MB	95 W	DDR4-2666	UHD 630, 350-1150 MHz
	9600KF	6 / 6	3.7 GHz	4.6 GHz	9 MB	95 W	DDR4-2666	None
	9400	6 / 6	2.9 GHz	4.1 GHz	9 MB	65 W	DDR4-2666	UHD 630, 350-1050 MHz
	9400F	6 / 6	2.9 GHz	4.1 GHz	9 MB	65 W	DDR4-2666	None
	9400T	6 / 6	1.8 GHz	3.4 GHz	9 MB	35 W	DDR4-2666	UHD 630, 350-1050 MHz
Core i3	9350K	4 / 4	4.0 GHz	4.6 GHz	8 MB	91 W	DDR4-2400	UHD 630, 350-1150 MHz
	9350KF	4 / 4	4.0 GHz	4.6 GHz	8 MB	91 W	DDR4-2400	None
	9320	4 / 4	3.7 GHz	4.4 GHz	8 MB	62 W	DDR4-2400	UHD 630, 350-1150 MHz
	9300	4 / 4	3.7 GHz	4.3 GHz	8 MB	62 W	DDR4-2400	UHD 630, 350-1150 MHz
	9300T	4 / 4	3.1 GHz	3.7 GHz	6 MB	35 W	DDR4-2400	UHD 630, 350-1100 MHz
	9300TE	4 / 4	2.2 GHz	3.2 GHz	6 MB	35 W	DDR4-2400	UHD 630, 350-1050 MHz
	9100	4 / 4	3.6 GHz	4.2 GHz	6 MB	65 W	DDR4-2400	UHD 630, 350-1100 MHz
	9100F	4 / 4	3.6 GHz	4.2 GHz	6 MB	65 W	DDR4-2400	None
	9100T	4 / 4	3.1 GHz	3.7 GHz	6 MB	35 W	DDR4-2400	UHD 630, 350-1100 MHz
	9100TE	4 / 4	2.2 GHz	3.2 GHz	6 MB	35 W	DDR4-2400	UHD 630, 350-1050 MHz
	9100E	4 / 4	3.1 GHz	3.7 GHz	6 MB	65 W	DDR4-2400	UHD 630, 350-1050 MHz

K = unlocked, T = Power optimized lifestyle, F = without integrated graphics (requires discrete graphics card)

TDP = Thermal Design Power (max. power consumption).

Note: The Shuttle XPC cube Barebone SH310R4 does not support the unlock-function of Intel K-Series processors.

Please refer to the support list for detailed processor support information at [global.shuttle.com](http://global.shuttle.com).