

## BAREBONE XPC cube SH610R4

### ENTRY-LEVEL PLATFORM FOR INTEL'S 12<sup>TH</sup>/13<sup>TH</sup>-GEN. CPUs

The Shuttle XPC cube Barebone SH610R4 supports the 12<sup>th</sup> and 13<sup>th</sup> generation of Intel Core desktop processors for socket LGA1700, up to 64 GB DDR4-3200 memory, three 4K displays at 60 Hz via 2x DisplayPort and HDMI 2.0, high-performance M.2 SSDs and up to four USB 3.2 devices. The SH610R4 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 SH610R4 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.



INTEL GEN 12  
CPU SUPPORT



HEAT-PIPE  
COOLING



2x 32 GB  
SUPPORT



HDMI 2.0  
PORT



2x DISPLAY-  
PORT 1.4



TRIPLE DISPLAY  
SUPPORT



SUPPORTS  
GRAPHICS Cards



2x 3.5" HDD  
SUPPORT



COM PORT  
OPTIONAL



WLAN  
OPTIONAL



Max.  
40 °C



24/7  
SUPPORT

### CUBE DESIGN

■ Black aluminium chassis ■ Dimensions: 32.9 x 21.6 x 19 cm (LWH), ca. 13.4-litre ■ Operating temperature: 0~40 °C (non-condensing)

### OPERATING SYSTEM

■ An operating system is not included  
■ Supports Windows 10/11 and Linux (64-bit)

### PROCESSOR SUPPORT

■ Socket LGA1700 supports Intel Core i9/i7/i5/i3, Pentium Gold and Celeron processors of Gen. 12 "Alder Lake-S" and Gen. 13 "Raptor Lake-S" in Intel 7 process (10 nm) ■ Maximum supported TDP: 125W TDP  
■ Includes heatpipe cooling system

### CHIPSET & GRAPHICS

■ Intel H610 Chipset  
■ Integrated Intel UHD graphics with Triple 4K display support (features depend on processor, "F"-series CPUs lack the integrated graphics)

### MEMORY SUPPORT

■ Two 288-pin DIMM slots ■ Supports up to 64 GB capacity in total (max. 32 GB each module) ■ Supports DDR4-3200

### PCI-EXPRESS SLOTS

■ 1x PCIe X16 v5 slot supports dual-slot graphics cards up to ca. 28 x 12 x 4 cm (LWH), with 6-pin power connector  
■ 1x PCIe X1 v3 slot (not usable with dual-slot graphics card)

### STORAGE - SATA / M.2

■ Bays: 1x 5.25" and 2x 3.5" (internal), 3x SATA ports  
■ 1x M.2-2280M slot (supports PCIe x4 v4 NVMe or SATA)  
■ 1x M.2-2230E for optional WLAN (accessory: WLN-M/M1)

### CONNECTORS

■ HDMI 2.0b ■ 2x DisplayPort 1.4 ■ D-Sub/VGA ■ 4x USB 3.2 Gen1 ■ 4x USB 2.0 ■ 1x internal USB 2.0 ■ Intel Gigabit LAN (Intel i219) ■ 5x Audio I/O (2x front, 3x rear) ■ Connector for external power button

### POWER SUPPLY

■ Internal 300W power supply, 80Plus Bronze

### OPTIONAL ACCESSORIES

■ WLAN Module (WLN-M (ac)/WLN-M1 (ax)) ■ RS232 COM Port (PCP11)  
■ Adapter for two 2.5" drives (PHD3) ■ Cable for external power button (CXP01)

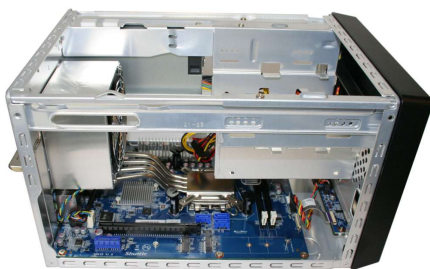
Note: this product features four integrated graphics ports for displays, but only three of them can be used simultaneously. Intel Core processors with F-suffix do not include internal graphics. In this case a PCIe graphics card is required.



## REQUIRED COMPONENTS

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

### Shuttle XPC Cube Barebone SH610R4 (Photo without chassis cover)



#### LGA1700 Processor

Intel Core Gen 12 "Alder Lake-S" or Gen 13 "Raptor Lake-S"  
Core i9 / i7 / i5 / i3, Pentium Gold or Celeron  
TDP max. 125 W



#### Memory Modules

Up to two 288-pin DIMM memory modules, max. 32 GB each  
Supports a total capacity of 64 GB DDR4-3200 memory.



#### SATA Storage Drives

The drive rack supports three drives:

- 1) 5.25" for an optical drive (SATA)
- 2) 3.5" for a hard disk drive (SATA)
- 3) 3.5" for a hard disk drive (SATA)

Note: use accessory PHD3 to install two 2.5" drives (Hard disks or SSDs) in a 3.5" bay. The mainboard features three SATA ports and one USB 2.0 onboard header.



#### M.2 SSD (optional)

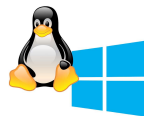
Supports M.2-2280/2260/2242 formats  
Supports SATA or PCIe/NVMe interfaces



#### PCI-EXPRESS CARDS (optional)

- 1) PCI-E X16 slot (e.g. Single-Slot graphics card)
- 2) PCI-E X1 slot (e.g. network card, I/O card, etc.)

The power consumption of the graphics card must not exceed 150 watts. Max. length is 273 mm. If a dual-slot (double-width) graphics cards is used the second PCI-Express slot will be occupied.



#### Operating System

Windows 10/11 or Linux (64-bit only)

## OPTIONAL ACCESSORIES FROM SHUTTLE



#### WLAN-Accessory

**WLN-M** (802.11ac / Wifi 5)  
**WLN-M1** (802.11ax / Wifi 6)  
M.2-2230 card supports  
WLAN and Bluetooth  
including 2 antennas



#### COM Port Adapter

##### PCP11

The H-RS232 allows for installation of one serial COM port (RS232) in the back panel.



#### Adapter for 2.5" drives

##### PHD3

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



#### Cable CXP01

Cable for external push button switch (without button)



#### PSU Upgrade PC850

850W power supply upgrade kit with 80 PLUS® Platinum efficiency

## PRODUCT FEATURES



### The R4 chassis design: a clean and modern look

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.



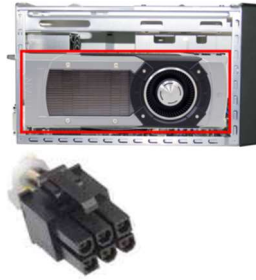
### Integrated Cooling Engine

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



### What is a Barebone?

The Shuttle XPC cube Barebone SH610R4 consists of a stylish 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, a processor, memory, mass storage and operating system need to be added. Shuttle XPC cube Barebones are completely customisable meaning users can pick certain components on their own to ideally match their individual needs.



### Ample space for demanding dual-slot graphics cards

Despite the small housing, the SH610R4 is capable of running dual-slot (double-height) high-performance PCI Express graphics cards. The system provides additional 6-pin power connectors for more power-hungry graphics cards. The maximum size acceptable for graphics cards is 273 mm x 98 mm x 38 mm. Please refer to the support list for detailed support information at [global.shuttle.com](http://global.shuttle.com).



### Triple UHD display support and more

The integrated graphics supports up to three independent monitors at Ultra-HD resolution if not an F-type CPU is used. The traditional VGA port is also available. This XPC supports even more displays in combination with a discrete PCI-Express graphics card, based on the Switchable Graphics feature. Expand your Windows desktop across many monitors, but note it does not support a 2x2 configuration or clone mode with the monitors connected.



### External power button by separate remote line

If, because of space constraints (e.g. in case of fixed installation), the machine cannot be switched on by pressing the front power button, it can be powered on by a separate remote line. You will find an appropriate four-pin connector at the back panel of the SH610R4 (pitch 2.54 mm). Furthermore, this connector provides a Clear CMOS function and +5V DC voltage supply for external devices.

+5V voltage (2)  (4) Power Button  
Clear CMOS (1)  (3) Ground

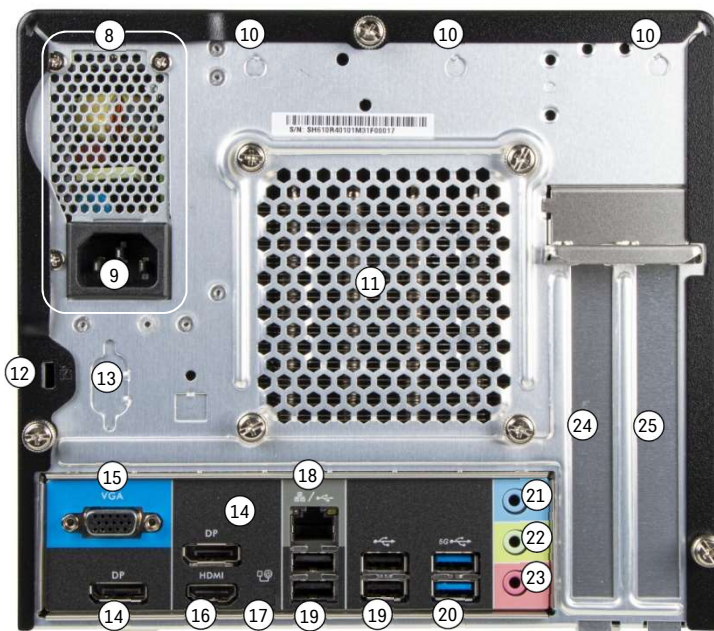
## Front and Back Panel

Front panel



1. 5.25" bay for an optical drive
2. Hard disk LED indicator
3. Power button with Power LED indicator
4. Removable acrylic plate
5. 2x USB 3.2 Gen 1 Type-A port (5 Gbps)
6. Microphone input
7. Headphones output

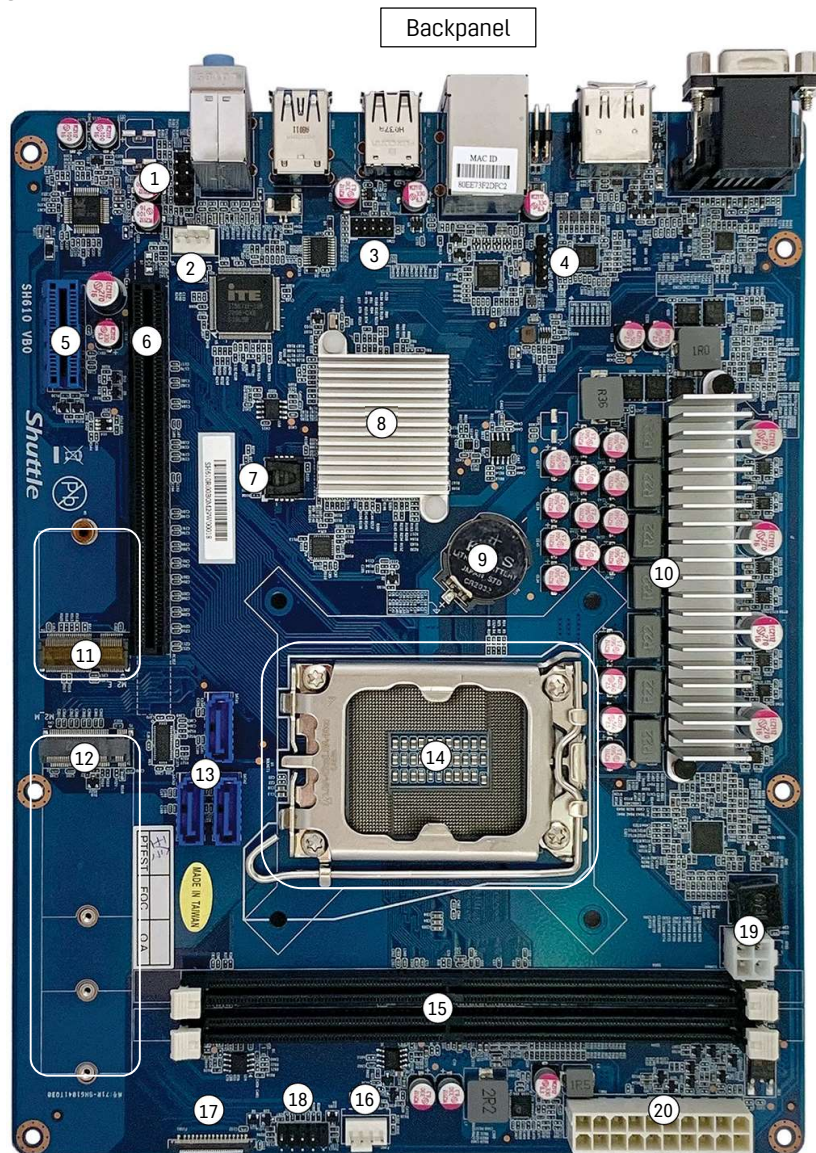
Back panel



8. Internal power supply unit (PSU)
9. AC power connector
10. 3x perforation for optional WLAN antenna
11. Heat-pipe cooling system
12. Hole for Kensington Lock
13. Perforation for optional COM port
14. 2x DisplayPort 1.4
15. D-Sub/VGA
16. HDMI 2.0b
17. 4-pin connector (2.54 mm pitch) for external power button, Clear CMOS button and 5V DC voltage
18. RJ45 Gigabit LAN port
19. 4x USB 2.0 port
20. 2x USB 3.2 Gen 1 Type-A port (5 Gbps)
21. Audio Line-in
22. Audio Line-out
23. Microphone input
24. PCI-Express X16 expansion slot
25. PCI-Express X1 expansion slot



## Mainboard



- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Front audio header</li> <li>2. Connector for cooling fan (4-pin)</li> <li>3. Onboard RS232 COM port header (2x5-pin)</li> <li>4. Onboard USB 2.0 connector (5-pin)</li> <li>5. PCI-Express X1 expansion slot</li> <li>6. PCI-Express X16 expansion slot</li> <li>7. Flash EEPROM (firmware memory)</li> <li>8. Intel H610 chipset with heat sink</li> <li>9. CMOS battery</li> <li>10. CPU voltage regulator area</li> <li>11. M2-2230E slot for WLAN card</li> </ol> | <ol style="list-style-type: none"> <li>12. M.2-2280M slot for SSD card</li> <li>13. 3x SATA v3.0 connector</li> <li>14. LGA1700 processor socket</li> <li>15. 2x DIMM memory slot</li> <li>16. Connector for cooling fan (4-pin)</li> <li>17. Front USB 3.2 header</li> <li>18. Front buttons / LEDs header</li> <li>19. ATX power connector (4-pin)</li> <li>20. ATX power connector (20-pin)</li> </ol> |
|---|---|

## Shuttle Product Comparison: SH610R4 versus SH5xx Series

MODEL	SH610R4	SH510R4	SH570R6 PLUS	SH570R8	SW580R8
CHASSIS	<b>R4</b> chassis customisable front plate	<b>R4</b> chassis customisable front plate	<b>R6</b> chassis with front doors for I/O ports	<b>R8</b> chassis supports four 3.5" hard disks	<b>R8</b> chassis supports four 3.5" hard disks
PROCESSOR SUPPORT	Socket LGA1700, max. 125 W Intel Core Gen 12/13 "Alder/Raptor Lake-S" 10 nm	Socket LGA1200, TDP max. 125 W Intel Core Gen 10/11, code name "Comet/Rocket Lake-S" 14 nm Supports Celeron, Pentium Gold, Core i3 / i5 / i7 / i9			
XEON SUPPORT	—	—	—	—	Xeon W-Series
CPU COOLING	4 heat-pipes	4 heat-pipes	4 heat-pipes	4 heat-pipes	4 heat-pipes
CHIPSET	Intel H610	Intel H510	Intel H570	Intel H570	Intel W580
Intel vPRO/AMT	—	—	—	—	Supported
TPM 2.0	Firmware	Firmware	Firmware	Firmware	Hardware-Chip
OS SUPPORT	Win 10/11, Linux (64-bit)	Windows 10/11 and Linux (64-bit)			
DRIVE BAYS	1x 5.25" 2x 3.5"	1x 5.25" 2x 3.5"	1x 5.25" 2x 3.5" (1x open)	4x 3.5"	4x 3.5"
SATA PORTS	3	3	4	4	4
PCI-E SLOTS	PCIe X16 v5.0 PCIe X1 V3.0	PCIe X16 v4.0 PCIe X1 V3.0	PCIe X16 v4.0 PCIe X4 V3.0	PCIe X16 v4.0 PCIe X4 V3.0	PCIe X16 v4.0 PCIe X4 V3.0
MAX. RAM SUPPORT	2x 32 GB DDR4-3200	2x 32 GB DDR4-3200 [*]	4x 32 GB DDR4-3200 [*]	4x 32 GB DDR4-3200 [*]	4x 32 GB DDR4-3200 [*] Supports ECC
GRAPHICS PORTS	HDMI 2.0b 2x DP 1.4, VGA	HDMI 2.0b [*] DP 1.4, VGA	HDMI 2.0b [*] 2x DP 1.4	HDMI 2.0b [*] 2x DP 1.4	HDMI 2.0b [*] 2x DP 1.4
M.2 SSD SLOT	1	1	1	1	2
WLAN SLOT	M.2-2230E	M.2-2230E			
BUTTONS / LEDS	Power-Btn, Power+HDD LED	Power-Button, Power LED, HDD LED			
USB 3.2 GEN 2	—	—	4	4	4
USB 3.2 GEN 1	4	4	4 (1x Type-C)	4 (1x Type-C)	4 (1x Type-C)
USB 2.0	4	4	4	4	4
USB 2.0 onboard	1	1	1	1	1
1G NETWORK	1x Intel i219	1x Intel i219LM	1x Intel i211 1x Intel i219LM	1x Intel i211 1x Intel i219LM	1x Intel i211 1x Intel i219LM
2.5G NETWORK	—	—	—	—	2x RTL 8125b
AUDIO	Mic-Input, Headphone Output and 6-channel Line-Out	Mic-Input, Headphone Output and 6-channel Line-Out			
OPTIONAL ACCESSORIES	WLAN Kit: <b>WLN-M/M1</b> (ac/ax) COM-Port: <b>PCP11</b> 3.5"/2.5" Adapter: <b>PHD3</b> Cable ext. power btn: <b>CXP01</b> 850W-power supply: <b>PC850</b>	WLAN Kit: <b>WLN-M</b> (ac) / <b>WLN-M1</b> (ax) COM-Port: <b>H-RS232</b> 3.5"/2.5" Adapter: <b>PHD3</b> Cable for ext. power button: <b>CXP01</b> 850W-power supply: <b>PC850</b>			
POWER SUPPLY	300W 80+ Bronze	300W 80+ Bronze	300W <b>Plus:</b> 500W	500 W 80+ Gold	500 W 80+ Gold

[\*] Note: SH5xx-Series supports PCIe X16 V4 slot, DDR4-3200 and HDMI 2.0b with Gen. 11 Processors "Rocket Lake", but only PCIe X16 V3 slot, DDR4-2666/2933 and HDMI 1.4b with Gen. 10 Processors "Comet Lake".

## SHUTTLE XPC CUBE BAREBONE SH610R4 – SPECIFICATIONS

<b>CHASSIS</b>	<p>Black aluminium chassis with acrylic front plate          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.          Storage bays: 1 x 5.25" (external), 2 x 3.5" (internal)          Dimensions: 32.9 x 21,6 x 19.0 cm (LWH without feet) = 13.4 litres          Height with rubber feet: 19.7 cm          Weight: 3.4 kg net / 4.5 kg gross</p>
<b>MAINBOARD / CHIPSET</b>	<p>Mainboard with Shuttle form factor 275x195 mm, proprietary design for XPC SH610R4          Chipset/Southbridge: Intel® H610          Passive chipset cooling with heat sink          The Northbridge is integrated in the processor.          Solid Capacitors for sensitive areas provide excellent heat resistance for enhanced system durability</p>
<b>BIOS</b>	<p>AMI BIOS, SPI Interface, 32 MB Flash-EEPROM          Supports Hardware Monitoring, Watch Dog          Supports Power Fail Resume          Supports Firmware-TPM (fTPM) v2.0          Supports boot up from external USB flash memory          Supports Unified Extensible Firmware Interface (UEFI)</p>
<b>POWER SUPPLY</b>	<p>Built-in 300 Watt mini switching power supply <b>[1]</b>          AC input voltage: 100~240V, 50~60 Hz          80 PLUS Bronze compliant: The PSU provides at least 82/85/82% of efficiency at 20/50/100% of load.          Active PFC circuit (Power Factor Correction)          ATX main power connectors: 2x10 and 2x2-pin          Graphics power connector: 6-pin          Other connectors: 4x SATA, 2x Molex</p>
<b>OPERATING SYSTEM</b>	<p>This system comes without operating system.          It is compatible with Windows 10/11 (64-bit) and Linux (64-bit)</p>
<b>PROCESSOR SUPPORT</b>	<p>Processor Socket LGA1700          Supports Intel Core i9 / i7 / i5 / i3, Pentium Gold and Celeron processors          Supports 12th and 13th generation Intel Core processors, codename "Alder Lake-S" and "Raptor Lake-S" in "Intel 7" process technology (previously Intel 10 nm Enhanced SuperFin)          Maximum supported processor power consumption (TDP) = 125 W          Does not support the unlock-function of Intel K-Series processors.          The processor integrates PCI-Express, memory controller and the graphics engine on the same die.          However, processors with "F" identifier do not support integrated graphics <b>[3]</b> (performance features depending on processor type)          Please refer to the support list for detailed processor support information at <a href="http://global.shuttle.com">global.shuttle.com</a>.</p>
<b>HEAT-PIPE COOLING</b>	<p>Shuttle I.C.E. (Integrated Cooling Engine)          advanced I.C.E. heatpipe technology, linear-controlled 92mm fan          SilentX cooling and noise reduction technology with Active Airflow</p>
<b>MEMORY SUPPORT</b>	<p>2x 288-pin slot          Supports DDR4-3200/2933/2666 (PC4-25600/23466/21300) SDRAM at 1.2 V          Supports Dual Channel mode          Supports a maximum of 32 GB per DIMM, maximum total size: 64 GB          Supports two unbuffered DIMM modules (no ECC or registered)</p>
<b>PCI-E EXPANSION SLOTS</b>	<p>1x PCI-Express x16 v5.0 slot          1x PCI-Express x1 v3.0 slot, open-ended          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.          Graphics power connector: 6 pins <b>[1]</b>          Please refer to the support list for detailed support information at <a href="http://global.shuttle.com">global.shuttle.com</a>.</p>

<b>INTEGRATED GRAPHICS</b> (OPTIONAL [3])	<p>The features of the integrated Intel UHD graphics function depend on the processor type used.          Certain processor models do not support integrated graphics [3]          The PC features four video outputs          (three of them can be used at the same time):</p> <ul style="list-style-type: none"> <li>- 1x HDMI v2.0b</li> <li>- 2x DisplayPort v1.4</li> <li>- 1x D-Sub/VGA</li> </ul> <p>HDMI 2.0b and DisplayPort support displays with 4K Ultra HD resolution at 3840 x 2160 at 60 Hz refresh rate (2160p/60)          Supports three independent displays with the integrated graphics function          Supports more displays in combination with a discrete graphics card          DisplayPort and HDMI support multi-channel digital audio over the same cable</p>
<b>DRIVE BAYS</b>	<p>Storage bays: 1 x 5.25" (external), 2 x 3.5" (internal)          Using the optional accessory PHD3          two 2.5" drives can be installed into one 3.5" bay.</p>
<b>SATA CONNECTORS</b>	<p>3x Serial ATA 6G connector onboard (rev. 3.0, max. 6 Gbit/s)</p>
<b>M.2-2280M</b> <b>SSD SLOT</b>	<p>The M.2 2280M slot provides the following interfaces:</p> <ul style="list-style-type: none"> <li>- PCI-Express Gen. 4.0 X4, supports NVMe</li> <li>- SATA v3.0 (max. 6 Gbps)</li> </ul> <p>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 or PCI-Express interface          A self-adhesive thermal pad (65 x 15 x 7 mm) is included and has to be stuck between the SSD card and the mainboard.</p>
<b>M.2-2230E SLOT FOR</b> <b>WLAN CARDS</b>	<p>Interfaces: PCI-Express Gen. 3.0 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 extension cards (optional Shuttle accessory: WLN-M / WLN-M1)</p>
<b>HD AUDIO</b>	<p>Audio Codec: Realtek ALC888 / ALC662 / ALC897, 5.1 channel          Three analog audio connectors (3.5mm) at the backpanel:          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 head-phones output (line-out)          DisplayPort and HDMI support multi-channel digital audio over the same cable</p>
<b>GIGABIT LAN</b>	<p>Intel i219 Ethernet Controller          Supports 10 / 100 / 1.000 MBit/s operation          Supports WAKE ON LAN (WOL)          Supports network boot by Preboot eXecution Environment (PXE)</p>
<b>FRONT PANEL</b> <b>CONNECTORS</b>	<p>Microphone input (3.5 mm)          Headphone output (3.5 mm)          2x USB 3.2 Gen 1 (max. 5 Gbps), blue          Power button          Power indicator (Blue LED)          Hard disk drive indicator (Yellow LED)</p>
<b>BACK PANEL</b> <b>CONNECTORS</b>	<p>1x HDMI 2.0b          2x DisplayPort 1.4 [2]          1x D-Sub VGA (analog)          2x USB 3.2 Gen 1 (max. 5 Gbps), blue          4x USB 2.0 (black)          1x Gigabit LAN (RJ45)          1x Audio Line-out (3.5 mm)          1x Audio Line-in (3.5 mm)          1x Microphone Input (3.5 mm)          1x 4-pin connector (2.54 mm pitch) supports:</p> <ul style="list-style-type: none"> <li>- external power on button</li> <li>- Clear CMOS function</li> <li>- 5V DC voltage for external components</li> </ul> <p>Optional: Serial RS232 port (Accessory: "PCP11")          3x perforation for optional WLAN antennas (Accessory: "WLN-M/M1")</p>
<b>OTHER ONBOARD</b> <b>CONNECTORS</b>	<p>Occupied front panel connectors for USB, audio, buttons, LEDs          1x RS232 serial interface (2x5 pin header, 2.0mm pitch)          2x fan connectors (4-pin header)          1x USB 2.0 (4-pin header)</p>



<b>SUPPLIED ACCESSORIES</b>	Multi-language XPC Installation Guide (EN, DE, FR, ES, JP, KR, SC, TC) Windows 64-bit driver disk 2x Serial ATA cables Thermal pad for one M.2-2280 SSD card AC Power Cord (with protective-earth contacts) Heatsink Compound Protector cap for the CPU socket (do not use if heatpipe or fan is mounted) Bag with screws
<b>OPTIONAL ACCESSORIES</b>	Back panel adapter for serial RS232 port ( <b>PCP11</b> ) WLAN kit supports WLAN+BT with two external antennas ( <b>WLN-M</b> (802.11ac) and <b>WLN-M1</b> (802.11ax)) Adapter for 2.5" drives such as SSDs ( <b>PHD3</b> ) Adapter cable for external power button ( <b>CXP01</b> ) 850W Power Supply ( <b>PC850</b> )
<b>ENVIRONMENTAL SPECIFICATIONS</b>	Permissible ambient temperature during operation: 0~40 °C Relative humidity: 10~90 %.
<b>CERTIFICATIONS / COMPLIANCE</b>	EMI: FCC, CE, BSMI, C-Tick Safety: CB 60950/62368, cTUVus, 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) 2014/30/EU relating to electromagnetic compatibility (EMC), (2) 2014/35/EU 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] Online Power Calculator

The PCI Express x16 slot provides a maximum of 75 Watts to the graphics card, plus 75 Watts from the 6-pin connector of the power supply - so the power consumption of the graphics card must not exceed 150 watts. The processor may have a maximum TDP of 125 Watts. If powerful PC components are used, then check with the "Power Supply Calculator" whether the built-in 300 Watt power supply supports this configuration, see: <http://global.shuttle.com/support/power>. Please also refer to the support list for detailed processor and graphics cards support information at <http://global.shuttle.com>

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

One DisplayPort output can be converted to HDMI or DVI by an additional, passive adapter cable. For example:

DELOCK 82590: 1 m, DisplayPort (male, 20p) to HDMI-A (male, 19p)

DELOCK 82435: 5 m, 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.

### [3] Integrated graphics is optional

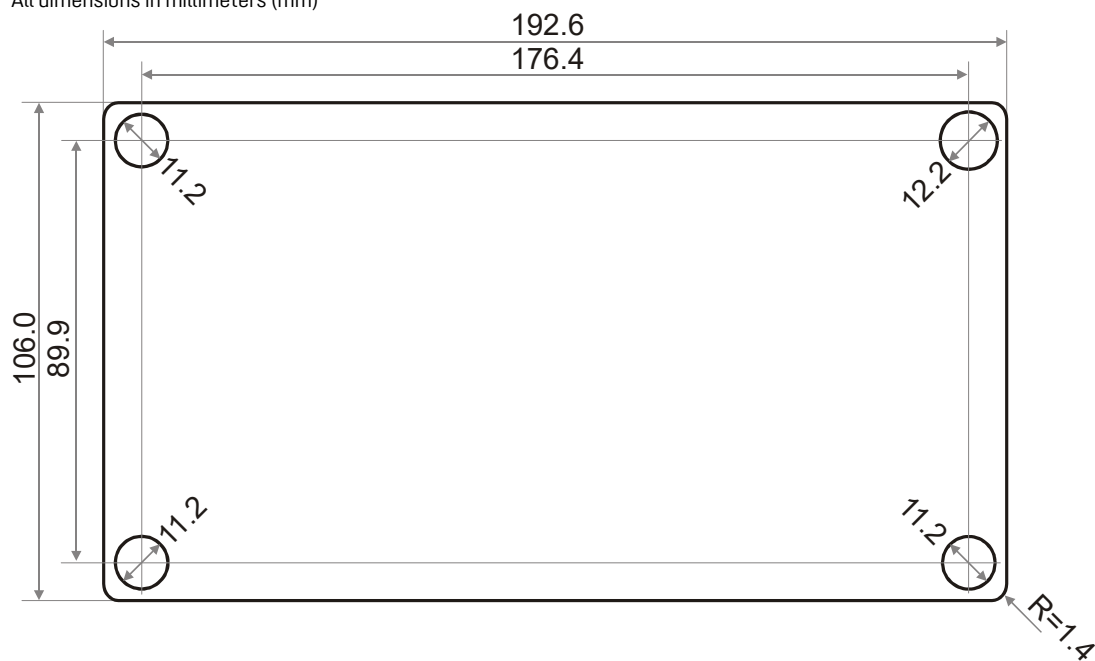
Processors with model numbers ending with "F" (z.B. Intel Core i5-12600F) do not support integrated graphics, so that the graphics outputs of the Shuttle XPC have no function. In this case, an additional discrete PCIe graphics card is mandatory.

### Shuttle XPC cube Barebone SH610R4 – 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)



Design example:



## 12<sup>TH</sup> GENERATION INTEL CORE DESKTOP PROCESSOR FAMILY

Socket LGA1700, Intel 7 process (10 nm) "Alder Lake S" processor overview (Date: October 2022)

Processors with a TDP of more than 125W are **not supported (marked in red)**.

PROCESSOR	MODEL	P-CORES/ THREADS	P-CORES CLOCK/Turbo	E-CORES	E-CORES CLOCK/Turbo	SMART CACHE	BASE TDP	MEMORY SUPPORT	GRAPHICS ENGINE (MAX. CLOCK)
Core™ i9	<b>12900KS</b>	8 / 16	3.4 – 5.2 GHz	8	2.5 – 4.0 GHz	30 MB	<b>150 W</b>	DDR4-3200	UHD 770 (1.55 GHz)
	<b>12900K</b>	8 / 16	3.2 – 5.1 GHz	8	2.4 – 3.9 GHz	30 MB	<b>125 W</b>	DDR4-3200	UHD 770 (1.55 GHz)
	<b>12900KF</b>	8 / 16	3.2 – 5.1 GHz	8	2.4 – 3.9 GHz	30 MB	<b>125 W</b>	DDR4-3200	None
	<b>12900</b>	8 / 16	2.4 – 5.0 GHz	8	1.8 – 3.8 GHz	30 MB	65 W	DDR4-3200	UHD 770 (1.55 GHz)
	<b>12900F</b>	8 / 16	2.4 – 5.0 GHz	8	1.8 – 3.8 GHz	30 MB	65 W	DDR4-3200	None
	<b>12900T</b>	8 / 16	1.4 – 4.8 GHz	8	1.0 – 3.6 GHz	30 MB	35 W	DDR4-3200	UHD 770 (1.55 GHz)
Core™ i7	<b>12700K</b>	8 / 16	3.6 – 4.9 GHz	4	2.7 – 3.8 GHz	25 MB	<b>125 W</b>	DDR4-3200	UHD 770 (1.50 GHz)
	<b>12700KF</b>	8 / 16	3.6 – 4.9 GHz	4	2.7 – 3.8 GHz	25 MB	<b>125 W</b>	DDR4-3200	None
	<b>12700</b>	8 / 16	2.1 – 4.9 GHz	4	1.6 – 3.6 GHz	25 MB	65 W	DDR4-3200	UHD 770 (1.50 GHz)
	<b>12700F</b>	8 / 16	2.1 – 4.9 GHz	4	1.6 – 3.6 GHz	25 MB	65 W	DDR4-3200	None
	<b>12700T</b>	8 / 16	1.4 – 4.6 GHz	4	1.0 – 3.4 GHz	25 MB	35 W	DDR4-3200	UHD 770 (1.50 GHz)
Core™ i5	<b>12600K</b>	6 / 12	3.7 – 4.9 GHz	4	2.8 – 3.6 GHz	20 MB	<b>125 W</b>	DDR4-3200	UHD 770 (1.45 GHz)
	<b>12600KF</b>	6 / 12	3.7 – 4.9 GHz	4	2.8 – 3.6 GHz	20 MB	<b>125 W</b>	DDR4-3200	None
	<b>12600</b>	6 / 12	3.3 – 4.8 GHz	-	-	18 MB	65 W	DDR4-3200	UHD 770 (1.45 GHz)
	<b>12600T</b>	6 / 12	2.1 – 4.6 GHz	-	-	18 MB	35 W	DDR4-3200	UHD 770 (1.45 GHz)
	<b>12500</b>	6 / 12	3.0 – 4.6 GHz	-	-	18 MB	65 W	DDR4-3200	UHD 770 (1.45 GHz)
	<b>12500T</b>	6 / 12	2.0 – 4.4 GHz	-	-	18 MB	35 W	DDR4-3200	UHD 770 (1.45 GHz)
	<b>12490F</b>	6 / 12	3.0 – 4.6 GHz	-	-	20 MB	65 W	DDR4-3200	None
	<b>12400</b>	6 / 12	2.5 – 4.4 GHz	-	-	18 MB	65 W	DDR4-3200	UHD 730 (1.45 GHz)
	<b>12400F</b>	6 / 12	2.5 – 4.4 GHz	-	-	18 MB	65 W	DDR4-3200	None
	<b>12400T</b>	6 / 12	1.8 – 4.2 GHz	-	-	18 MB	35 W	DDR4-3200	UHD 730 (1.45 GHz)
Core™ i3	<b>12300</b>	4 / 8	3.5 – 4.4 GHz	-	-	12 MB	60 W	DDR4-3200	UHD 730 (1.45 GHz)
	<b>12300T</b>	4 / 8	2.3 – 4.2 GHz	-	-	12 MB	35 W	DDR4-3200	UHD 730 (1.45 GHz)
	<b>12100</b>	4 / 8	3.3 – 4.3 GHz	-	-	12 MB	60 W	DDR4-3200	UHD 730 (1.45 GHz)
	<b>12100F</b>	4 / 8	3.3 – 4.3 GHz	-	-	12 MB	58 W	DDR4-3200	None
	<b>12100T</b>	4 / 8	2.2 – 4.1 GHz	-	-	12 MB	35 W	DDR4-3200	UHD 730 (1.40 GHz)
Pentium® Gold	<b>G7400</b>	2 / 4	3.7 GHz	-	-	6 MB	46 W	DDR4-3200	UHD 710 (1.35 GHz)
	<b>G7400T</b>	2 / 4	3.1 GHz	-	-	6 MB	35 W	DDR4-3200	UHD 710 (1.35 GHz)
Celeron®	<b>G6900</b>	2 / 2	3.4 GHz	-	-	4 MB	46 W	DDR4-3200	UHD 710 (1.30 GHz)
	<b>G6900T</b>	2 / 2	2.8 GHz	-	-	4 MB	35 W	DDR4-3200	UHD 710 (1.30 GHz)

**K** = unlocked, **T** = Power optimized lifestyle, **F** = without integrated graphics, **Base TDP** = Base Thermal Design Power (max. Base Power Consumption).

Note: The Shuttle XPC cube Barebone SH610R4 does not support the Unlock-function of Intel K-Series processors.

Intel processors without integrated graphics can be identified by their model name ending on "F". When using this CPU, a graphics card is required.

P-Cores: Performance-Cores, E-Cores: Efficient-Cores

Core Clock: the listed core frequency ranges from Base Frequency to Turbo Frequency (Turbo Boost 3.0 Frequency is not mentioned here)

Base TDF: Processor Base Power dissipation that the processor is validated to not exceed at Base Frequency (Max. Turbo Power is not mentioned here)

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

## 13<sup>TH</sup> GENERATION INTEL CORE DESKTOP PROCESSOR FAMILY

Socket LGA1700, Intel 7 / 10 nm, "Raptor Lake S" processor overview (Date: January 2023)

Processors with a TDP of more than 125W are **not supported (marked in red)**.

PROCESSOR	MODEL	P-CORES/ THREADS	P-CORES CLOCK/Turbo	E-CORES	E-CORES CLOCK/Turbo	SMART CACHE	BASE TDP	MEMORY SUPPORT	GRAPHICS ENGINE (MAX. CLOCK)
Core™ i9	<b>13900KS</b>	8 / 16	3.2 – 6.0 GHz	16	2.4 – 4.3 GHz	36 MB	<b>150 W</b>	DDR4-3200	UHD 770 (1.65 GHz)
	<b>13900K</b>	8 / 16	3.0 – 5.8 GHz	16	2.0 – 4.3 GHz	36 MB	<b>125 W</b>	DDR4-3200	UHD 770 (1.65 GHz)
	<b>13900KF</b>	8 / 16	3.0 – 5.8 GHz	16	2.0 – 4.3 GHz	36 MB	<b>125 W</b>	DDR4-3200	None
	<b>13900</b>	8 / 16	2.0 – 5.2 GHz	16	1.5 – 4.2 GHz	36 MB	65 W	DDR4-3200	UHD 770 (1.65 GHz)
	<b>13900F</b>	8 / 16	2.0 – 5.2 GHz	16	1.5 – 4.2 GHz	36 MB	65 W	DDR4-3200	None
	<b>13900T</b>	8 / 16	1.1 – 5.1 GHz	16	0.8 – 3.9 GHz	36 MB	35 W	DDR4-3200	UHD 770 (1.65 GHz)
Core™ i7	<b>13700K</b>	8 / 16	3.4 – 5.4 GHz	8	2.5 – 4.2 GHz	30 MB	<b>125 W</b>	DDR4-3200	UHD 770 (1.60 GHz)
	<b>13700KF</b>	8 / 16	3.4 – 5.4 GHz	8	2.5 – 4.2 GHz	30 MB	<b>125 W</b>	DDR4-3200	None
	<b>13700</b>	8 / 16	2.1 – 5.1 GHz	8	1.5 – 4.1 GHz	30 MB	65 W	DDR4-3200	UHD 770 (1.60 GHz)
	<b>13700F</b>	8 / 16	2.1 – 5.1 GHz	8	1.5 – 4.1 GHz	30 MB	65 W	DDR4-3200	None
	<b>13700T</b>	8 / 16	1.4 – 4.8 GHz	8	1.0 – 3.6 GHz	30 MB	35 W	DDR4-3200	UHD 770 (1.60 GHz)
Core™ i5	<b>13600K</b>	6 / 12	3.5 – 5.1 GHz	8	2.6 – 3.9 GHz	20 MB	<b>125 W</b>	DDR4-3200	UHD 770 (1.50 GHz)
	<b>13600KF</b>	6 / 12	3.5 – 5.1 GHz	8	2.6 – 3.9 GHz	20 MB	<b>125 W</b>	DDR4-3200	None
	<b>13600</b>	6 / 12	2.7 – 5.0 GHz	8	2.0 – 3.7 GHz	24 MB	65 W	DDR4-3200	UHD 770 (1.55 GHz)
	<b>13600T</b>	6 / 12	1.8 – 4.8 GHz	8	1.3 – 3.4 GHz	24 MB	35 W	DDR4-3200	UHD 770 (1.55 GHz)
	<b>13500</b>	6 / 12	2.5 – 4.8 GHz	8	1.8 – 3.5 GHz	24 MB	65 W	DDR4-3200	UHD 770 (1.55 GHz)
	<b>13500T</b>	6 / 12	1.6 – 4.6 GHz	8	1.2 – 3.2 GHz	24 MB	35 W	DDR4-3200	UHD 770 (1.55 GHz)
	<b>13400</b>	6 / 12	2.5 – 4.6 GHz	4	1.8 – 3.3 GHz	20 MB	65 W	DDR4-3200	UHD 730 (1.55 GHz)
	<b>13400F</b>	6 / 12	2.5 – 4.6 GHz	4	1.8 – 3.3 GHz	20 MB	65 W	DDR4-3200	None
	<b>13400T</b>	6 / 12	1.3 – 4.4 GHz	4	1.0 – 3.0 GHz	20 MB	35 W	DDR4-3200	UHD 730 (1.55 GHz)
Core™ i3	<b>13100</b>	4 / 8	3.4 – 4.5 GHz	-	-	12 MB	60 W	DDR4-3200	UHD 730 (1.50 GHz)
	<b>13100F</b>	4 / 8	3.4 – 4.5 GHz	-	-	12 MB	58 W	DDR4-3200	None
	<b>13100T</b>	4 / 8	2.5 – 4.2 GHz	-	-	12 MB	35 W	DDR4-3200	UHD 730 (1.50 GHz)

**K** = unlocked, **T** = Power optimized lifestyle, **F** = without integrated graphics, **Base TDP** = Base Thermal Design Power (max. Base Power Consumption).

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Intel processors without integrated graphics can be identified by their model name ending on "F". When using this CPU, a graphics card is required.

P-Cores: Performance-Cores, E-Cores: Efficient-Cores

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