# Shuttle®

# BAREBONE
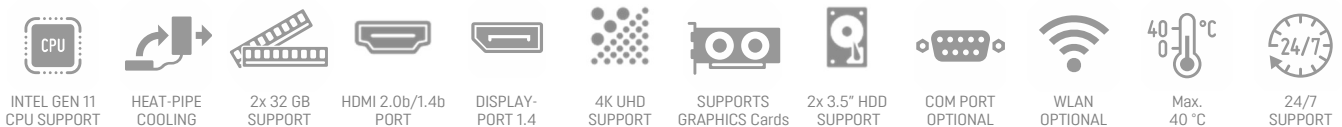## XPC cube
# SH510R4

## ENTRY-LEVEL PLATFORM FOR INTEL's 10ᵀᴴ /11ᵀᴴ-GEN. CPUs

The Shuttle XPC cube Barebone SH510R4 supports the 10th and 11th generation of Intel Core desktop processors for socket LGA1200, up to 64 GB DDR4-3200 memory, two 4K displays at 60 Hz via DisplayPort and HDMI 2.0, high-performance M.2 SSDs and up to four USB 3.2 devices. The SH510R4 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 SH510R4 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 11 CPU SUPPORT | HEAT-PIPE COOLING | 2x 32 GB SUPPORT | HDMI 2.0b/1.4b PORT | DISPLAY-PORT 1.4 | 4K UHD 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 LGA1200 supports Intel Core i9/i7/i5/i3, Pentium Gold and Celeron processors of Gen. 10 "Comet Lake-S" and Gen. 11 "Rocket Lake-S" with up to 125W TDP ■ Includes heatpipe cooling system

## CHIPSET & GRAPHICS
■ Intel H510 Chipset
■ Integrated Intel UHD graphics with dual 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 DDR4-2666/2933/3200

## PCI-EXPRESS SLOTS
■ 1x PCIe X16 v3/v4 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 v3 NVMe or SATA)
■ 1x M.2-2230E for optional WLAN (accessory: WLN-M)

## CONNECTORS
■ HDMI 1.4b/2.0b ■ DisplayPort 1.4 ■ D-Sub/VGA ■ 4x USB 3.2 Gen1
■ 4x USB 2.0 ■ 1x internal USB 2.0 ■ Intel Gigabit LAN (Intel i219LM)
■ 5x Audio I/O (2x front, 3x rear) ■ Connector for external power button

## POWER SUPPLY
■ Internal 300W power supply, 80Plus Bronze

## OPTIONAL ACCESSORIES
■ WLAN Kit (WLN-M (ac)/WLN-M1 (ax)) ■ RS232 COM Port (H-RS232)
■ Adapter for two 2.5" drives (PHD3) ■ 850W Power Supply (PC850)
■ Cable for external power button (CXP01)

**Note:** Some features market in red color are only supported in combination with Gen 11 "Rocket Lake-S" processors.

## Shuttle XPC cubes with Intel 5xx series chipset

| Product | CPU Socket | Chip | Chassis | Drive Bays | LAN | vPro | Power Supply | UPC Code |
|---|---|---|---|---|---|---|---|---|
| SH510R4 | LGA 1200 | H510 | R4 | 5.25" + 2x 3.5" | 1x | — | 300 W, 80+ Bronze | 887993003948 |
| SH570R6 | LGA 1200 | H570 | R6 | 5.25" + 2x 3.5" | 2x | — | 300 W, 80+ Bronze | 887993003498 |
| SH570R6 Plus | LGA 1200 | H570 | R6 | 5.25" + 2x 3.5" | 2x | — | 500 W, 80+ Gold | 887993003870 |
| SH570R8 | LGA 1200 | H570 | R8 | 4x 3.5" | 2x | — | 500 W, 80+ Gold | 887993003504 |
| SW580R8 | LGA 1200 | W580 | R8 | 4x 3.5" | 4x (2x 2.5G) | Yes | 500 W, 80+ Gold | 887993004174 |

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## REQUIRED COMPONENTS

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

**Shuttle XPC Cube Barebone**
**SH510R4**
(Photo without chassis cover)
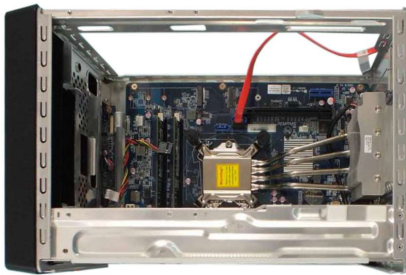
### LGA1200 Processor

Intel Core Gen 10 "Comet Lake-S" or Gen 11 "Rocket 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 DDR4-3200 clock rate with Gen 11 CPUs
Supports DDR4-2933 clock rate with Core i7/i9 Gen 10 CPUs
Supports DDR4-2666 clock rate with other Gen 10 CPUs

### SATA Storage Drives

The drive rack supports three drives:
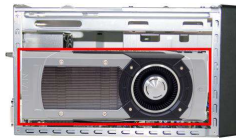1) 5.25" for an optical drive (SATA)
2) 3.5" for a hard disk drive (SATA)
3) 3.5" for a hard disk drive (SATA)
Note: use accessory PHD3 to install two 2.5" drives (Hard disks or SSDs) in a 3.5" bay. The mainboard features three SATA ports and one USB 2.0 onboard header.

### 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 **[5]**. Max. length is 273 mm. If a dual-slot (double-width) graphics cards is used the second PCI-Express slot will be occupied.
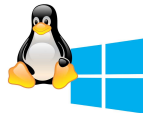
### Operating System

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)
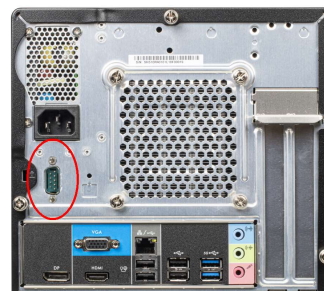M.2-2230 card supports WLAN and Bluetooth including 2 antennas

### 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.

### PSU Upgrade **PC850**

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

### COM Port Adapter

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

### Cable **CXP01**

Cable for external push button switch (without button)

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## 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 acylic 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 SH510R4 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 SH510R4 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.

### Dual UHD display support and more

The integrated graphics supports up to two independent monitors at Ultra-HD resolution if not an F-type CPU is used.

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 SH510R4 (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
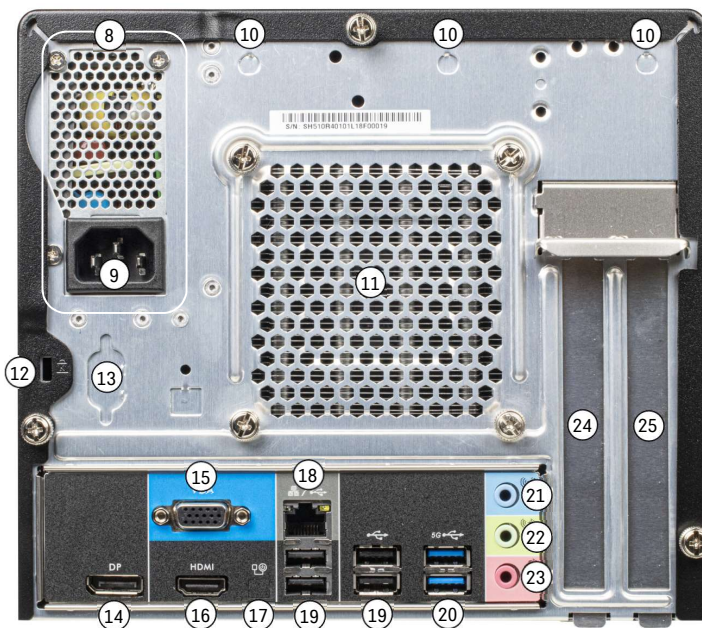Clear CMOS (1)  (3) Ground
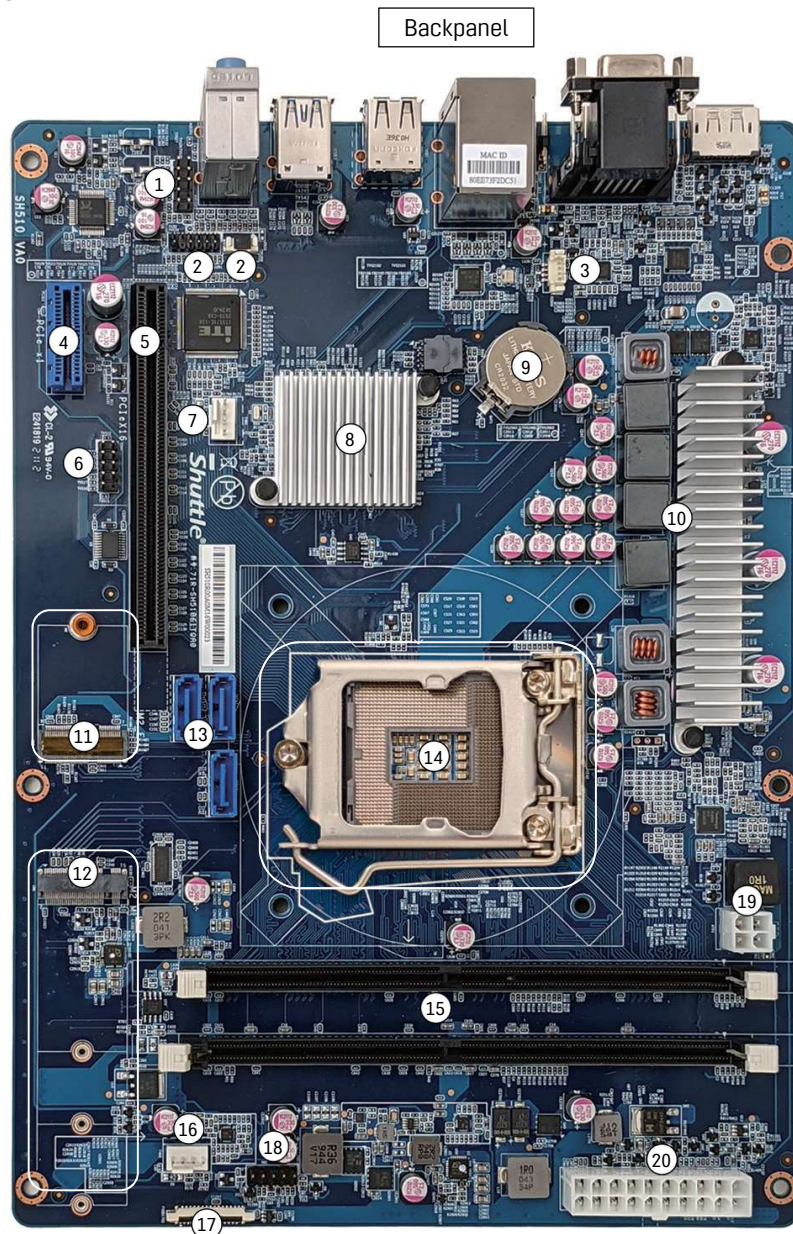
## Front and Back Panel

Front panel



1. 5.25" bay for an optical drive
2. Hard disk LED indicator
3. Power button with Power LED indicator
4. Removable acryllic 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. DisplayPort 1.4
15. D-Sub/VGA
16. HDMI 2.0b/1.4b
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

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## Mainboard

Backpanel



1. Front audio header
2. Debug header (reserved)
3. Onboard USB 2.0 connector (4-pin)
4. PCI-Express X1 expansion slot
5. PCI-Express X16 expansion slot
6. Onboard RS232 COM port header (2x5-pin)
7. Connector for cooling fan (4-pin)
8. Intel H510 chipset with heat sink
9. CMOS battery
10. CPU voltage regulator area
11. M2-2230E slot for WLAN card

12. M.2-2280M slot for SSD card
13. 3x SATA v3.0 connector
14. LGA1200 processor socket
15. 2x DIMM memory slot
16. Connector for cooling fan (4-pin)
17. Front USB 3.2 header
18. Front buttons / LEDs header
19. ATX power connector (20-pin)
20. ATX power connector (4-pin)

## Shuttle Product Comparison: SH3xx versus SH5xx

The differences in the newer SH5xx series are marked in red.

| MODEL | SH310R4V2 | SH370R6V2 PLUS | SH370R8 | SH510R4 | SH570R6 PLUS | SH570R8 | SW580R8 |
|---|---|---|---|---|---|---|---|
| CHASSIS | R4 chassis customisable front plate | R6 chassis with front doors for I/O ports | R8 chassis supports four 3.5" hard disks | R4 chassis customisable front plate | R6 chassis with front doors for I/O ports | R8 chassis supports four 3.5" hard disks | R8 chassis supports four 3.5" hard disks |
| PROCESSOR SUPPORT | Socket LGA1151v2, TDP max. 95 W Code name "Coffee Lake-S" 14 nm – Gen 8 and 9 Supports Celeron, Pentium Gold, Core i3 / i5 / i7 / i9 | | | Socket LGA1200, TDP max. 125 W Code name "Comet/Rocket Lake-S" 14 nm – Gen 10/11 Supports Celeron, Pentium Gold, Core i3 / i5 / i7 / i9 | | | |
| XEON SUPPORT | — | — | — | — | — | — | Xeon W-Series |
| CPU COOLING | 3 heat-pipes | 3 heat-pipes | 3 heat-pipes | 4 heat-pipes | 4 heat-pipes | 4 heat-pipes | 4 heat-pipes |
| CHIPSET | Intel H310 | Intel H370 | Intel H370 | Intel H510 | Intel H570 | Intel H570 | Intel W580 |
| Intel vPRO/AMT | — | — | — | — | — | — | Supported |
| TPM 2.0 | Firmware | Firmware | Firmware | Firmware | Firmware | Firmware | Hardware-Chip |
| OS SUPPORT | Windows 10/11 and 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 open) | 4x 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 | 4 | 4 | 3 | 4 | 4 | 4 |
| PCI-E SLOTS | PCIe X16 v3.0 PCIe X1 V2.0 | PCIe X16 v3.0 PCIe X4 V3.0 | PCIe X16 v3.0 PCIe X4 V3.0 | PCIe X16 v4.0 PCIe X1 V2.0 | 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 16 GB DDR4-2933 | 4x 32 GB DDR4-2933 | 4x 32 GB DDR4-2933 | 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 2.0a DP 1.2, VGA | HDMI 2.0a 2x DP 1.2 | HDMI 2.0a 2x DP 1.2 | 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 | 1 | 1 | 2 |
| WLAN SLOT | M.2-2230E | | | M.2-2230E | | | |
| BUTTONS / LEDS | Power-Button, Power LED, HDD LED | | | Power-Button, Power LED, HDD LED | | | |
| USB 3.2 GEN 2 | — | 4 | 4 | — | 4 | 4 | 4 |
| USB 3.2 GEN 1 | 4 | 4 | 4 | 4 | 4 (1x Type-C) | 4 (1x Type-C) | 4 (1x Type-C) |
| USB 2.0 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| USB 2.0 onboard | 1 | 2 | 2 | 1 | 1 | 1 | 1 |
| 1G NETWORK | 1x Intel i219LM | 2x Intel 211 | 2x Intel 211 | 1x Intel i219LM | 1x Intel i210AT 1x Intel i219LM | 1x Intel i210AT 1x Intel i219LM | 1x Intel i210AT 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: WLN-M (ac) /WLN-M1 (ax) COM-Port: H-RS232 3.5"/2.5" Adapter: PHD3 | | | WLAN Kit: WLN-M (ac) /WLN-M1 (ax) COM-Port: H-RS232 3.5"/2.5" Adapter: PHD3 Cable for ext. power button: CXP01 850W-power supply: PC850 | | | |
| POWER SUPPLY | 300W 80+ Bronze | 300W Plus: 500W | 500 W 80+ Gold | 300W 80+ Bronze | 300W Plus: 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 SH510R4 — SPECIFICATIONS

| | |
|---|---|
| **CHASSIS** | Black aluminium chassis with acrylic front plate<br>Customisable front panel design: simply change the mylar and add a personal design<br>such as a photo, graphics or a logo to the front panel.<br>Storage bays: 1 x 5.25" (external), 2 x 3.5" (internal)<br>Dimensions: 32.9 x 21,6 x 19.0 cm (LWH without feet) = 13.4 litres<br>Height with rubber feet: 19.7 cm<br>Weight: 3.4 kg net / 4.5 kg gross |
| **MAINBOARD / CHIPSET** | Mainboard with Shuttle form factor, proprietary design for XPC SH510R4<br>Chipset/Southbridge: Intel® H510<br>Passive chipset cooling with heat sink<br>The Northbridge is integrated in the processor.<br>Solid Capacitors for sensitive areas provide excellent heat resistance for enhanced system durability |
| **BIOS** | AMI BIOS, SPI Interface, 16 MB Flash-EEPROM<br>Supports Hardware Monitoring, Watch Dog<br>Supports Power Fail Resume<br>Supports Firmware-TPM (fTPM) v2.0<br>Supports boot up from external USB flash memory<br>Supports Unified Extensible Firmware Interface (UEFI) |
| **POWER SUPPLY** | Built-in 300 Watt mini switching power supply [1]<br>AC input voltage: 100~240V, 50~60 Hz<br>80 PLUS Bronze compliant: The PSU provides at least<br>82/85/82% of efficiency at 20/50/100% of load.<br>Active PFC circuit (Power Factor Correction)<br>ATX main power connectors: 2x10 and 2x2-pin<br>Graphics power connector: 6-pin<br>Other connectors: 4x SATA, 2x Molex |
| **OPERATING SYSTEM** | This system comes without operating system.<br>It is compatible with Windows 10/11 and Linux (64-bit) |
| **PROCESSOR SUPPORT** | Processor Socket LGA 1200<br>Supports Intel Core i9 / i7 / i5 / i3, Pentium Gold and Celeron processors<br>Supports the 10th and 11th generation Intel Core processors, code name "Comet Lake-S" and "Rocket Lake-S" in 14++ nm process technology<br>Maximum supported processor power consumption (TDP) = 125 W<br>Up to 10 CPU cores, 20 threads and 20 MB of L3 cache<br>Does not support the unlock-function of Intel K-Series processors.<br>The processor integrates PCI-Express, memory controller and the graphics engine on the same die.<br>However, processors with "F" identifier do not support integrated graphics [3]<br>(performance features depending on processor type)<br>Please refer to the support list for detailed processor support information at global.shuttle.com. |
| **HEAT-PIPE COOLING** | Shuttle I.C.E. (Integrated Cooling Engine)<br>advanced I.C.E. heatpipe technology, linear-controlled 92mm fan<br>SilentX cooling and noise reduction technology with Active Airflow |
| **MEMORY SUPPORT** | 2x 288-pin slot<br>Supports DDR4 memory at 1.2V<br>Supports Dual Channel mode<br>Supports max. 32 GB per DIMM, maximum total size of 64 GB<br>The maximum DDR4 clock frequency depends on the processor type used:<br>- Gen. 11 "Rocket Lake" supports DDR4-3200 (PC4-25600U)<br>- Gen. 10 "Comet Lake" Core i7/i9 supports DDR4-2933 (PC4-23433U)<br>- other "Comet Lake" support DDR4-2666 (PC4-21300U) |
| **PCI-E EXPANSION SLOTS** | 1x PCI-Express x16 v4.0 slot<br>(supports PCI-Express v3.0 with Gen. 10 "Comet Lake" processors)<br>1x PCI-Express x1 v3.0 slot, open-ended<br>Supports dual-slot (double-width) graphics cards (occupies the second PCI-Express slot)<br>The maximum size acceptable for display cards is 273 x 98 x 38 mm.<br>Graphics power connector: 6 pins [1]<br>Please refer to the support list for detailed support information at global.shuttle.com. |

| | |
|---|---|
| **INTEGRATED GRAPHICS** (OPTIONAL **[3]**) | The features of the integrated Intel UHD graphics function depend on the processor type used. <br> Certain processor models do not support integrated graphics **[3]** <br> The PC features three video outputs: <br> - 1x HDMI v2.0b (only HDMI v1.4b with Gen. 10 "Comet Lake" Prozessoren) <br> - 1x DisplayPort v1.4 <br> - 1x D-Sub/VGA <br> HDMI 2.0b and DisplayPort support displays with 4K Ultra HD resolution at 3840 x 2160 at 60 Hz refresh rate (2160p/60) <br> HDMI 1.4b supports Ultra HD resolution at 30 Hz. <br> Supports two independent displays with the integrated graphics function <br> Supports more displays in combination with a discrete graphics card <br> Hardware video decoding/encoding <br> DisplayPort and HDMI support multi-channel digital audio over the same cable |
| **DRIVE BAYS** | Storage bays: 1 x 5.25" (external), 2 x 3.5" (internal) <br> Using the optional accessory PHD3 <br> two 2.5" drives can be installed into one 3.5" bay. |
| **SATA CONNECTORS** | 3x Serial ATA 6G connector onboard (rev. 3.0, max. 6 Gbit/s) |
| **M.2-2280M SSD SLOT** | The M.2 2280M slot provides the following interfaces: <br> - PCI-Express Gen. 3.0 X4, supports NVMe <br> - SATA v3.0 (max. 6 Gbps) <br> It supports M.2 cards with a width of 22 mm <br> and a length of 42, 60 or 80 mm (type 2242, 2260, 2280). <br> Supports M.2 SSDs with SATA or PCI-Express interface |
| **M.2-2230E SLOT FOR WLAN CARDS** | Interfaces: PCI-Express Gen. 3.0 X1 und USB 2.0 <br> Supports M.2 cards with a width of 22 mm and a length of 30 mm (type 2230) <br> Supports WLAN extension cards (optional Shuttle accessory: WLN-M) |
| **HD AUDIO** | Audio Codec: Realtek ALC662/ALC897/ALC888S, 5.1 channel <br> Three analog audio connectors (3.5mm) at the backpanel: <br> Line-in (blue), line-out (green) and microphone input (pink) <br> shared with 5.1 channel line-out (front, rear, center/bass) <br> Front panel: microphone input and head-phones output (line-out) <br> DisplayPort and HDMI support multi-channel digital audio over the same cable |
| **GIGABIT LAN** | Intel i219LM PHY connected to the MAC of the processor <br> Supports 10 / 100 / 1.000 MBit/s operation <br> Supports WAKE ON LAN (WOL) <br> Supports network boot by Preboot eXecution Environment (PXE) |
| **FRONT PANEL CONNECTORS** | Microphone input (3.5 mm) <br> Headphone output (3.5 mm) <br> 2x USB 3.2 Gen 1 (max. 5 Gbps), blue <br> Power button <br> Power indicator (Blue LED) <br> Hard disk drive indicator (Yellow LED) |
| **BACK PANEL CONNECTORS** | 1x HDMI 2.0b (HDMI 1.4b with Gen. 10 "Comet Lake" processor) <br> 1x DisplayPort 1.4 [2] <br> 1x D-Sub VGA (analog) <br> 2x USB 3.2 Gen 1 (max. 5 Gbps), blue <br> 4x USB 2.0 (black) <br> 1x Gigabit LAN (RJ45) <br> 1x Audio Line-out (3.5 mm) <br> 1x Audio Line-in (3.5 mm) <br> 1x Microphone Input (3.5 mm) <br> 1x 4-pin connector (2.54 mm pitch) supports: <br> - external power on button <br> - Clear CMOS function <br> - 5V DC voltage for external components <br> Optional: Serial RS232 port (Accessory: "H-RS232") <br> 3x perforation for optional WLAN antennas (Accessory: "WLN-M") |
| **OTHER ONBOARD CONNECTORS** | Occupied front panel connectors for USB, audio, buttons, LEDs <br> 1x RS232 serial interface (2x5 pin header) <br> 2x fan connectors (4-pin header) <br> 1x USB 2.0 (4-pin header) |

| | |
|---|---|
| **SUPPLIED ACCESSORIES** | Multi-language XPC Installation Guide (EN, DE, FR, ES, JP, KR, SC, TC)<br>Windows 64-bit driver disk<br>2x Serial ATA cables<br>AC Power Cord (with protective-earth contacts)<br>Heatsink Compound<br>Protector cap for the CPU socket (do not use if heatpipe or fan is mounted)<br>Bag with screws |
| **OPTIONAL ACCESSORIES** | Back panel adapter for serial RS232 port **(H-RS232)**<br>WLAN kit supports WLAN and Bluetooth with two external antennas (**WLN-M** (802.11ac) and **WLN-M1** (802.11ax))<br>Adapter for 2.5" drives such as SSDs **(PHD3)**<br>Adapter cable for external power button **(CXP01)**<br>850W power supply **(PC850)** |
| **ENVIRONMENTAL SPECIFICATIONS** | Permissible ambient temperature during operation: 0~40 °C<br>Relative humidity: 10~90 %. |
| **CERTIFICATIONS / COMPLIANCE** | EMI: FCC, CE, BSMI, C-Tick<br>Safety: ETL, CB, BSMI<br>Other: RoHS, Energy Star 5.0, ErP<br>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:<br>(1) 2014/30/EU relating to electromagnetic compatibility (EMC),<br>(2) 2014/35/EU relating to Electrical Equipment designed for use within certain voltage limits (LVD),<br>(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**
The 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 i5-11600F) 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.

## 10TH GENERATION INTEL CORE DESKTOP PROCESSOR FAMILY

**Socket LGA1200 14 nm "Comet Lake S" and "Comet Lake Refresh" processor overview (Date: August 2021)**

| PROCESSOR | MODEL | CORES/ THREADS | CPU CLOCK | TURBO BOOST CLOCK (2.0) | SMART CACHE | TDP | MEMORY SUPPORT | GRAPHICS ENGINE |
|---|---|---|---|---|---|---|---|---|
| Core™ i9 | 10900K | 10/20 | 3.7 GHz | 5.1 GHz | 20 MB | **125 W** | DDR4-2933 | UHD 630 (1.2 GHz) |
| | 10900KF | 10/20 | 3.7 GHz | 5.1 GHz | 20 MB | **125 W** | DDR4-2933 | **None** |
| | 10900 | 10/20 | 2.8 GHz | 5.0 GHz | 20 MB | 65 W | DDR4-2933 | UHD 630 (1.2 GHz) |
| | 10900F | 10/20 | 2.8 GHz | 5.0 GHz | 20 MB | 65 W | DDR4-2933 | **None** |
| | 10900T | 10/20 | 1.9 GHz | 4.5 GHz | 20 MB | 35 W | DDR4-2933 | UHD 630 (1.2 GHz) |
| | 10850K | 10/20 | 3.6 GHz | 5.0 GHz | 20 MB | **125 W** | DDR4-2933 | UHD 630 (1.2 GHz) |
| Core™ i7 | 10700K | 8/16 | 3.8 GHz | 5.0 GHz | 16 MB | **125 W** | DDR4-2933 | UHD 630 (1.2 GHz) |
| | 10700KF | 8/16 | 3.8 GHz | 5.0 GHz | 16 MB | **125 W** | DDR4-2933 | **None** |
| | 10700 | 8/16 | 2.9 GHz | 4.7 GHz | 16 MB | 65 W | DDR4-2933 | UHD 630 (1.2 GHz) |
| | 10700F | 8/16 | 2.9 GHz | 4.7 GHz | 16 MB | 65 W | DDR4-2933 | **None** |
| | 10700T | 8/16 | 2.0 GHz | 4.4 GHz | 16 MB | 35 W | DDR4-2933 | UHD 630 (1.2 GHz) |
| Core™ i5 | 10600K | 6/12 | 4.1 GHz | 4.8 GHz | 12 MB | **125 W** | DDR4-2666 | UHD 630 (1.2 GHz) |
| | 10600KF | 6/12 | 4.1 GHz | 4.8 GHz | 12 MB | **125 W** | DDR4-2666 | **None** |
| | 10600 | 6/12 | 3.3 GHz | 4.8 GHz | 12 MB | 65 W | DDR4-2666 | UHD 630 (1.2 GHz) |
| | 10600T | 6/12 | 2.4 GHz | 4.0 GHz | 12 MB | 35 W | DDR4-2666 | UHD 630 (1.2 GHz) |
| | 10500 | 6/12 | 3.1 GHz | 4.5 GHz | 12 MB | 65 W | DDR4-2666 | UHD 630 (1.15 GHz) |
| | 10500T | 6/12 | 2.3 GHz | 3.8 GHz | 12 MB | 35 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| | 10400 | 6/12 | 2.9 GHz | 4.3 GHz | 12 MB | 65 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| | 10400F | 6/12 | 2.9 GHz | 4.3 GHz | 12 MB | 65 W | DDR4-2666 | **None** |
| | 10400T | 6/12 | 2.0 GHz | 3.6 GHz | 12 MB | 35 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| Core™ i3 | 10325 | 4/8 | 3.9 GHz | 4.7 GHz | 8 MB | 65 W | DDR4-2666 | UHD 630 (1.15 GHz) |
| | 10320 | 4/8 | 3.8 GHz | 4.6 GHz | 8 MB | 65 W | DDR4-2666 | UHD 630 (1.15 GHz) |
| | 10305 | 4/8 | 3.8 GHz | 4.5 GHz | 8 MB | 65 W | DDR4-2666 | UHD 630 (1.15 GHz) |
| | 10305T | 4/8 | 3.8 GHz | 4.5 GHz | 8 MB | 65 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| | 10300 | 4/8 | 3.7 GHz | 4.4 GHz | 8 MB | 65 W | DDR4-2666 | UHD 630 (1.15 GHz) |
| | 10300T | 4/8 | 3.0 GHz | 3.9 GHz | 8 MB | 35 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| | 10105F | 4/8 | 3.7 GHz | 4.4 GHz | 6 MB | 65 W | DDR4-2666 | **None** |
| | 10105 | 4/8 | 3.7 GHz | 4.4 GHz | 6 MB | 65 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| | 10105T | 4/8 | 3.0 GHz | 3.9 GHz | 6 MB | 35 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| | 10100 | 4/8 | 3.6 GHz | 4.3 GHz | 6 MB | 65 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| | 10100F | 4/8 | 3.6 GHz | 4.3 GHz | 6 MB | 65 W | DDR4-2666 | **None** |
| | 10100T | 4/8 | 3.0 GHz | 3.8 GHz | 6 MB | 35 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| Pentium® Gold | G6605 | 2/4 | 4.3 GHz | – | 4 MB | 58 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| | G6600 | 2/4 | 4.2 GHz | – | 4 MB | 58 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| | G6505 | 2/4 | 4.2 GHz | – | 4 MB | 58 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| | G6500 | 2/4 | 4.1 GHz | – | 4 MB | 58 W | DDR4-2666 | UHD 630 (1.1 GHz) |
| | G6500T | 2/4 | 3.5 GHz | – | 4 MB | 35 W | DDR4-2666 | UHD 630 (1.05 GHz) |
| | G6405 | 2/4 | 4.1 GHz | – | 4 MB | 58 W | DDR4-2666 | UHD 610 (1.05 GHz) |
| | G6405T | 2/4 | 3.5 GHz | – | 4 MB | 35 W | DDR4-2666 | UHD 610 (1.05 GHz) |
| | G6400 | 2/4 | 4.0 GHz | – | 4 MB | 58 W | DDR4-2666 | UHD 610 (1.05 GHz) |
| | G6400T | 2/4 | 3.4 GHz | – | 4 MB | 35 W | DDR4-2666 | UHD 610 (1.05 GHz) |

| PROCESSOR | MODEL | CORES/ THREADS | CPU CLOCK | TURBO BOOST CLOCK (2.0) | SMART CACHE | TDP | MEMORY SUPPORT | GRAPHICS ENGINE |
|---|---|---|---|---|---|---|---|---|
| Celeron® | G5925 | 2/2 | 3.6 GHz | – | 4 MB | 58 W | DDR4-2666 | UHD 610 (1.05 GHz) |
| | G5920 | 2/2 | 3.5 GHz | – | 2 MB | 58 W | DDR4-2666 | UHD 610 (1.05 GHz) |
| | G5905 | 2/2 | 3.5 GHz | – | 4 MB | 58 W | DDR4-2666 | UHD 610 (1.05 GHz) |
| | G5905T | 2/2 | 3.3 GHz | – | 4 MB | 35 W | DDR4-2666 | UHD 610 (1.05 GHz) |
| | G5900 | 2/2 | 3.4 GHz | – | 2 MB | 58 W | DDR4-2666 | UHD 610 (1.05 GHz) |
| | G5900T | 2/2 | 3.2 GHz | – | 2 MB | 35 W | DDR4-2666 | UHD 610 (1.05 GHz) |

**K = unlocked, T = Power optimized lifestyle, F = without integrated graphics, TDP = Thermal Design Power (max. Power Consumption).**
Note: The Shuttle XPC cube Barebone SH510R4 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.
Please refer to the support list for detailed processor support information at global.shuttle.com.

## 11TH GENERATION INTEL CORE DESKTOP PROCESSOR FAMILY

**Socket LGA1200 14 nm "Rocket Lake S" processor overview (Date: August 2021)**

| PROCESSOR | MODEL | CORES/ THREADS | CPU CLOCK | TURBO BOOST CLOCK (2.0) | SMART CACHE | TDP | MEMORY SUPPORT | GRAPHICS ENGINE MAX. CLOCK / EUs |
|---|---|---|---|---|---|---|---|---|
| Core™ i9 | 11900K | 8/16 | 3.5 GHz | 5.3 GHz | 16 MB | 125 W | DDR4-3200 | UHD 750 (1.3 GHz, 32 EUs) |
| | 11900KF | 8/16 | 3.5 GHz | 5.3 GHz | 16 MB | 125 W | DDR4-3200 | None |
| | 11900 | 8/16 | 2.5 GHz | 5.2 GHz | 16 MB | 65 W | DDR4-3200 | UHD 750 (1.3 GHz, 32 EUs) |
| | 11900F | 8/16 | 2.5 GHz | 5.2 GHz | 16 MB | 65 W | DDR4-3200 | None |
| | 11900T | 8/16 | 1.5 GHz | 4.9 GHz | 16 MB | 35 W | DDR4-3200 | UHD 750 (1.3 GHz, 32 EUs) |
| Core™ i7 | 11700K | 8/16 | 3.6 GHz | 5.0 GHz | 16 MB | 125 W | DDR4-3200 | UHD 750 (1.3 GHz, 32 EUs) |
| | 11700KF | 8/16 | 3.6 GHz | 5.0 GHz | 16 MB | 125 W | DDR4-3200 | None |
| | 11700 | 8/16 | 2.5 GHz | 4.9 GHz | 16 MB | 65 W | DDR4-3200 | UHD 750 (1.3 GHz, 32 EUs) |
| | 11700F | 8/16 | 2.5 GHz | 4.9 GHz | 16 MB | 65 W | DDR4-3200 | None |
| | 11700T | 8/16 | 1.4 GHz | 4.6 GHz | 16 MB | 35 W | DDR4-3200 | UHD 750 (1.3 GHz, 32 EUs) |
| Core™ i5 | 11600K | 6/12 | 3.9 GHz | 4.9 GHz | 12 MB | 125 W | DDR4-3200 | UHD 750 (1.3 GHz, 32 EUs) |
| | 11600KF | 6/12 | 3.9 GHz | 4.9 GHz | 12 MB | 125 W | DDR4-3200 | None |
| | 11600 | 6/12 | 2.8 GHz | 4.8 GHz | 12 MB | 65 W | DDR4-3200 | UHD 750 (1.3 GHz, 32 EUs) |
| | 11600T | 6/12 | 1.7 GHz | 4.1 GHz | 12 MB | 35 W | DDR4-3200 | UHD 750 (1.3 GHz, 32 EUs) |
| | 11500 | 6/12 | 2.7 GHz | 4.6 GHz | 12 MB | 65 W | DDR4-3200 | UHD 750 (1.3 GHz, 32 EUs) |
| | 11500T | 6/12 | 1.5 GHz | 3.9 GHz | 12 MB | 35 W | DDR4-3200 | UHD 750 (1.2 GHz, 32 EUs) |
| | 11400 | 6/12 | 2.6 GHz | 4.4 GHz | 12 MB | 65 W | DDR4-3200 | UHD 730 (1.3 GHz, 24 EUs) |
| | 11400F | 6/12 | 2.6 GHz | 4.4 GHz | 12 MB | 65 W | DDR4-3200 | None |
| | 11400T | 6/12 | 1.3 GHz | 3.7 GHz | 12 MB | 35 W | DDR4-3200 | UHD 730 (1.2 GHz, 24 EUs) |

**K = unlocked, T = Power optimized lifestyle, F = without integrated graphics, TDP = Thermal Design Power (max. Power Consumption).**
Note: The Shuttle XPC cube Barebone SH510R4 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.
Please refer to the support list for detailed processor support information at global.shuttle.com.