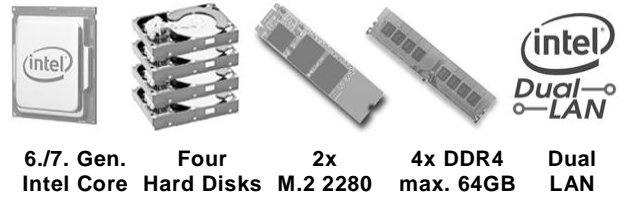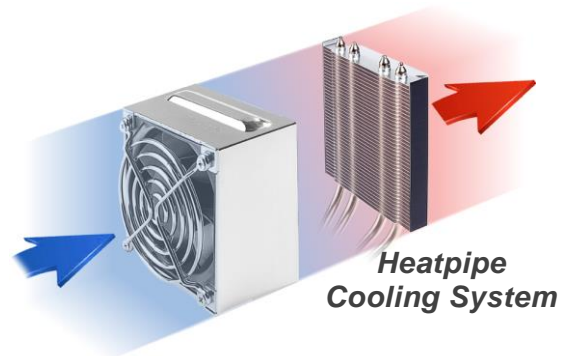## The R8 – fast gets even faster

The Shuttle XPC cube Barebone SZ270R8 is able to accommodate up to four 3.5 inch hard drives which makes an overall maximum capacity of up to 40TB a reality. Ideal for both home and commercial applications. Still, there's much room for expansion in the form of two M.2 SSD for PCI-E which means transfer rates of up to 32 Gbit/s out-shining current SATA-SSDs. The M.2 slot also supports Intel® Optane™ memory for even more acceleration. However, this barebones plat-form is way more than just about storage - the SZ270R8 has enough grunt under its aluminium bonnet to be a high-end gaming PC or a workstation for intensive graphics or even video editing. The main-board sports Intel's high-performance Z270 chipset that is designed for next-gen LGA 1151 "Skylake" and "Kaby Lake" processors up to the top-end Core i7 ones of the K-Series. Additionally, large dual-slot graphics cards and up to 64GB of DDR4 memory can be fitted.

XPC cube Barebone
SZ270R8

| 6./7. Gen. Intel Core | Four Hard Disks | 2x M.2 2280 | 4x DDR4 max. 64GB | Dual LAN |

Feature Highlights

|	
R8 Chassis	• Black aluminium chassis (14.2-litre) • Four internal 3.5" bays for hard disks
CPU	• Supports 6th/7th Gen. Intel® Core™ Processors "Skylake" and "Kaby Lake", Socket LGA 1151 • Supports Core i3, i5, i7, Pentium, Celeron • Shuttle I.C.E. heatpipe cooling system
Operating System	• An operating system is not included • Supports Windows 7/8.1/10, Linux (64-bit) Windows 7/8.1 only supported with a Skylake CPU
Four 3.5" Bays	• 4x 3.5" storage bay • 4x SATA 3.0 (6Gbps) port, supports RAID/RST
Slots	• 1x PCIe x16 (v3.0) supports dual-slot PCI-Express X16 graphics cards • 1x PCIe x4 (v3.0) • 2x M.2 2280 supports PCIe 3.0 x4 & SATA 3 Prepared for Intel® Optane™ Technology • 1x M.2 2230, supports optional WLAN
Chipset	• Intel Z270 PCH
Integrated Graphics	• Supports three Full HD displays • Supports 1x 4K/UHD resolution (2160p/60)
Memory	• Supports 4x DDR4-2133/2400, max. 64 GB
Other Connectors	• HDMI 1.4b, 2x DisplayPort 1.2, HD-Audio • 6x USB 3.0, 4x USB 2.0, 2x Intel GigaBit LAN
Optional	• COM-Port, Wireless LAN and 2.5" bay
PSU	• 500 Watt power supply (80 PLUS Silver)

Heatpipe Cooling System

Images for illustration purposes only.

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Shuttle XPC cube Barebone SZ270R8 – Connectors

Front view

Rear view
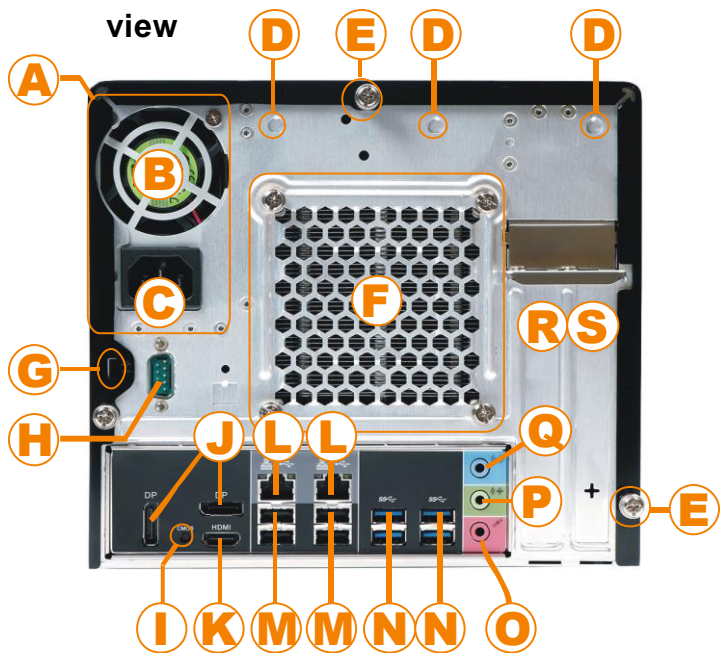
1	Hard disk LED indicator
2	Power button Power LED indicator
3	2x USB 3.0 port
4	Microphone input
5	Headphones output

A	Power supply
B	Power supply fan
C	AC power connector
D	Perforation for optional WLAN module (WLN-M)
E	Three thumbscrews
F	Heatpipe cooling system
G	Hole for Kensington Lock
H	COM / RS232 (optional)
I	Clear-CMOS-Button

J	2x DisplayPort output
K	HDMI output
L	2x Gigabit LAN (RJ45)
M	4x USB 2.0
N	4x USB 3.0
O	Audio Mic-In
P	Audio Line-Out
Q	Audio Line-In
R	PCI-Express X16 slot
S	PCI-Express X4 slot

Interior view
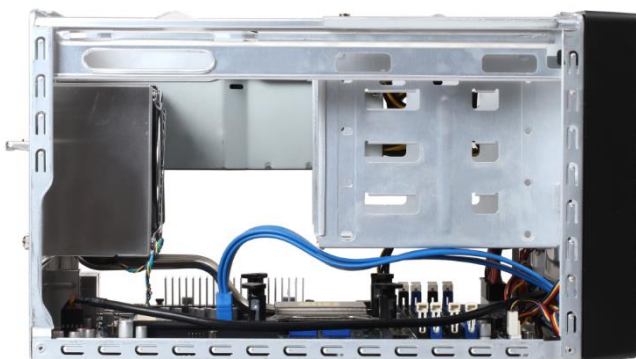
left side
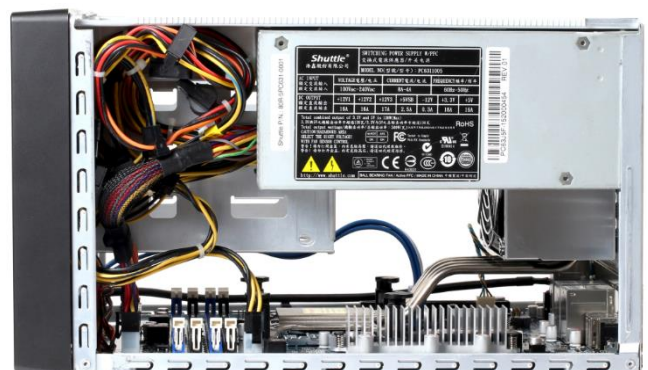
right side

Shuttle XPC cube Barebone SZ270R8 – Mainboard

Back Panel Connectors

Front Audio Header

USB 2.0 Header

FAN1 Connector

Intel Z270 Chipset

PCIe X4 Slot

PCIe X16 Slot

Front USB 3.0 Header

4x Serial-ATA 3.0

M.2-2230 A/E Slot

M.2-2280 M Slot

COM Port (RS232)

M.2-2280 M Slot

Front Button/
LED Header

FAN2 Connector

CMOS Battery

USB 2.0 Header

Solid Capacitors

Power FET
Heatsink

LGA1151
CPU Socket

ATX Power
(4 Pins)

4x DIMM Socket
support DDR4

ATX Power
(20 Pins)
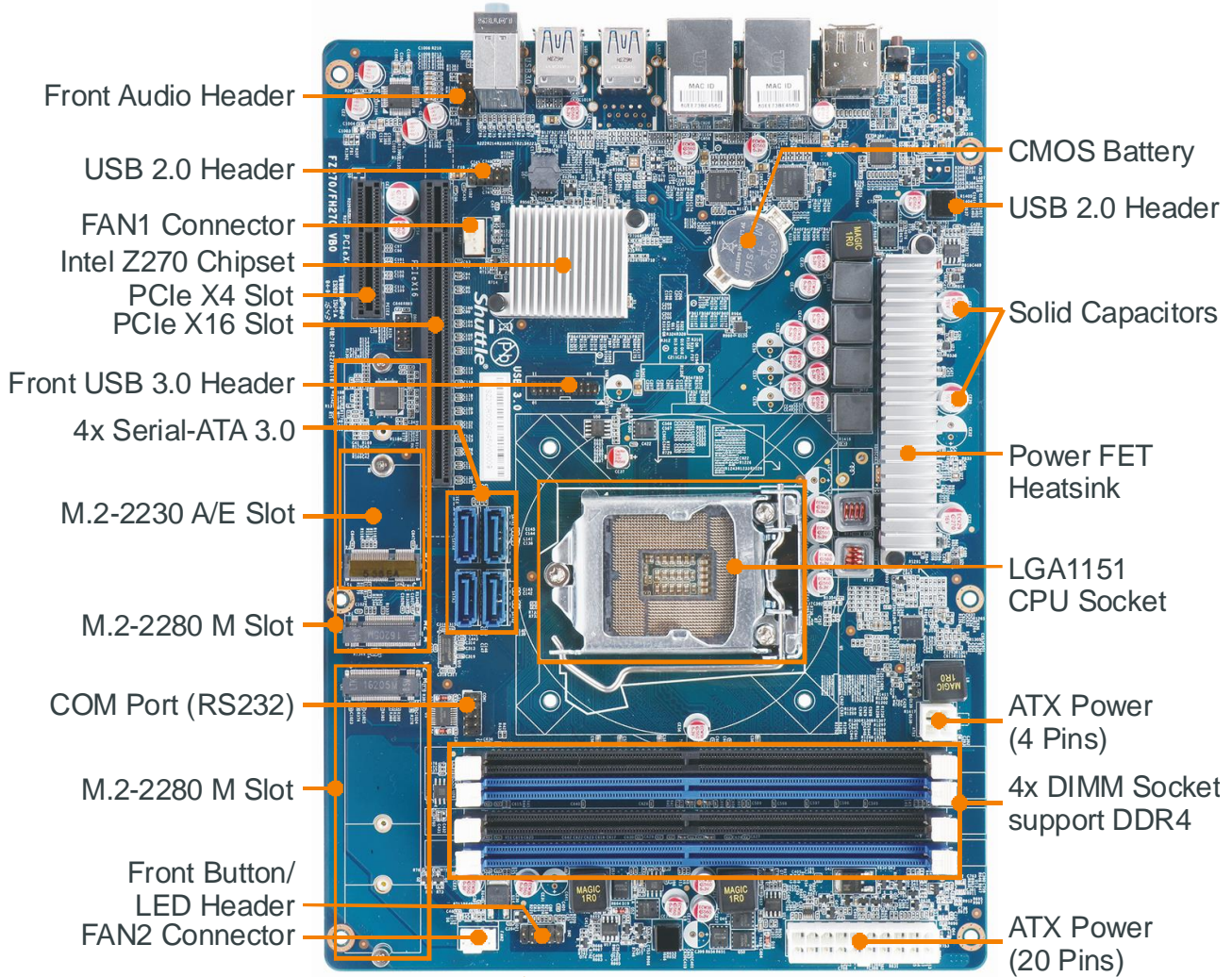
Shuttle XPC cube Barebone SZ270R8 – Product Features

The R8 chassis design: stylish and sophisticated

The R8 is the case design of choice when it comes to flexible storage solutions thanks to its four-hard-drive support. At the same time, it provides even more room for large state-of-the-art graphics cards. With no drive doors on the front, the cas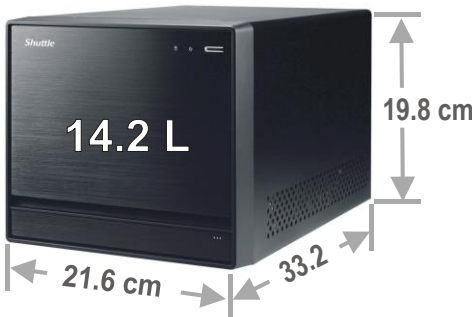e appears uniform and elegant as never before. Its high-quality finish and aesthetics remain untouched - the R8 case uses light aluminium as its stylish base material and the brushed surfaces are truly eye-catching.

14.2 L — 19.8 cm — 21.6 cm — 33.2

Small, but easy to install

Shuttle XPC cubes offer the performance of a desktop PC at a third of the size while using standard desktop components. Shuttle keeps the concept of being futureproof in mind when designing the new R8 chassis. The meticulously designed internal layout already comes with cables fitted to reduce clutter, increase airflow and make the installation of components easy.

What is a Barebone?

The Shuttle XPC cube Barebone SZ270R8 consists of a stylish case with a 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 optional a graphics card 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.

Supports Intel 14nm Skylake and Kaby Lake Processors

Skylake and Kaby Lake are codenames for Intel's 6th/7th Generation of Intel Core Processors socket LGA 1151 introduced along with the 100/200-Series chipsets. The Shuttle XPC cube Barebone SZ270R8 supports the desktop versions of these processors. Thanks to the advanced Z270 chipset, the SZ270R8 also supports Intel's K-series processors with unlocked multiplier settings.

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. Shuttle's industry-leading I.C.E. heatpipe technology delivers efficient cooling and is exceptionally quiet.
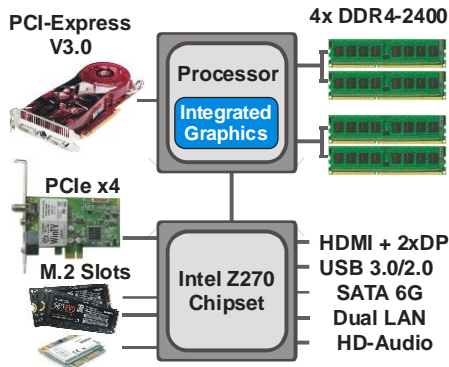
Single-Chip Chipset: Intel Z270

The Shuttle XPC cube Barebone SZ270R8 sports Intel's Z270 Platform Controller Hub (PCH), which is part of the 200 Series "Union Point" chipset. The Z270 chipset consists of a single chip and integrates the hard drive controller, network controller, firmware interface, PCIe links, USB and other connectors.

Supports up to 64 GB DDR4 memory

The Shuttle XPC cube Barebone SZ270R8 supports up to 64 GB of DDR4-2133/2400 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.

Two M.2-2280-Slots for SSD cards

The M.2-2280 BM slots support two M.2 SSD storage cards with SATA or with the more advanced PCIe interface.
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. The SZ270R8 is prepared for the Intel® Optane™ Technology.

Intel® Optane™ Ready

With a 7th Gen Intel® Core™ "Kaby Lake" processor, the SZ270R8 supports the latest Intel® Optane™ memory technology which is able to accelerate your system to deliver amazing speed.

M.2-2230-Slot for optional WLAN

The M.2-2230 AE slot is intended for Wireless LAN (Wifi), Bluetooth, GSM/UMTS cards and other.
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 SZ270R8.

### 500W power supply with 80 Plus Silver efficiency

The Shuttle XPC Barebone SZ270R8 is equipped with a rock-stable 500W power supply which has been tested with some of the latest graphics cards and powerful Core i3/i5/i7 processors. Its 80 Plus Silver logo indicates that it provides more than 85/89/85% of energy efficiency at 20/50/100% of rated load which reduces energy consumption and increases the computer's reliability. In addition, the power supply uses a 50mm cooling fan providing the same airflow, but spins slower than previous 40mm models to make the system run even more quietly.

Additional power plugs for graphics cards with 6 and 6+2 pins

6x USB 3.0

The Shuttle XPC cube Barebone SZ270R8 sports six USB 3.0 ports (2x front, 4x rear) besides four USB 2.0 ports. USB 3.0 achieves a maximum data transfer rate of up to 5.0Gbps (640MBytes/sec) which is ten times faster than USB 2.0. USB 3.0 is fully downward compatible to USB 2.0.

Intel Rapid Storage Technology - RAID support
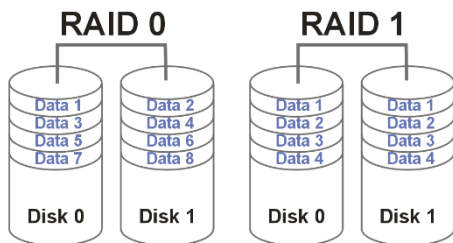
Intel® Rapid Storage Technology offers new levels of protection, performance and expandability for desktop platforms. No matter if one or multiple hard drives are used, users benefit from enhanced performance and lower power consumption. Valuable data is protected from hard drive failures, if the system is configured in any of the following three fault-tolerant RAID configurations: RAID 1, RAID 5, and RAID 10. By seamlessly storing copies of data on one or more hard drives, any hard drive may fail without loss of data or system downtime. Once the defective drive is removed and a replacement hard drive is installed, data security is guaranteed again.

Supports up to four hard disks for storage applications

Users can install up to four 3.5" hard disks (or SSDs) into the XPC cube Barebone SZ270R8. An integrated 80mm fan in front of the hard disk rack ensures low operating temperatures and higher reliability. Thanks to the integrated RAID controller, different configurations are possible. For example, a RAID 10 array with four 8TB hard disks can be used as a network-attached storage server for SMBs.Otherwise an SSD can be installed in the M.2 slot that can be used for the system partition. In conclusion, the SZ270R8 can be turned into a professional storage system at a volume of just 14 litres while it may be a powerful graphics workstation or gaming PC at the same time.

Intel Dual Gigabit LAN with Teaming Support

This Shuttle XPC cube SZ270R8 also features two high-speed Gigabit LAN ports. The teaming function allows for grouping both available network adapters to act as one single adapter - a method to set up a virtual LAN. The benefit of this approach is to enable load balancing and failover.

HD Audio capabilities

The Shuttle XPC cube Barebone SZ270R8 supports multi-channel audio either via three analog stereo audio ports or digitally through the HDMI and DisplayPort connectors that combine high-bandwidth video with digital audio in one single port.

Shuttle XPC cube Barebone SZ270R8 – Graphics Features

PCI-Express v3.0 for high-performance graphics cards

The Shuttle XPC cube Barebone SZ270R8 supports PCI-Express x16 Version 3.0 combined with a 14nm Intel Kaby Lake processor to deliver a bandwidth of up to 16 GB/s. So expect plenty of potential for the newest graphics cards.

Ample space for demanding dual-slot graphics cards

Despite the small housing, the SZ270R8 is capable of running dual-slot (double-height) high-performance PCI Express graphics cards. The system provides additional 6-pin and 8-pin power connectors for more power-hungry graphics cards. Please refer to the support list for detailed support information. The length of the graphics cards can be up to 280 mm (or 273 mm, if the power connectors are on the back side).

Built-in Intel® HD Graphics Engine

The integrated Intel HD Graphics processor has been moved to the same die as the CPU. Some of the graphics features depend on the processor type. It supports 3D stereoscopic playback, video hardware encoding, Blu-ray playback with HDCP, 4K resolution, DirectX 12, OGL 5.x and OCL 2.x. With all these features, this GPU is comparable to entry-level discrete cards.
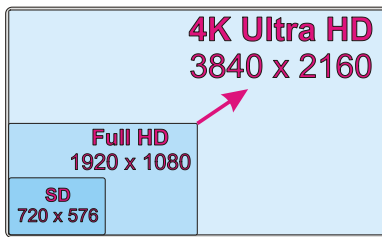
Supports 4K Ultra HD at 60Hz

The Shuttle XPC cube Barebone SZ270R8 supports one 4K display running at 3840 x 2160 @ 60Hz (2160p/60) when connected to one of the barebone's DisplayPort video output. As the successor to the Full HD standard, Ultra HD delivers a four times higher resolution with a wider colour space and colour depth. Dual channel memory (2 or 4 modules) is required for smooth 4K (2160p) video playback.

Triple Display with HDMI and 2x DisplayPort

The Shuttle XPC cube Barebone SZ270R8 features three digital video outputs: 1x HDMI 1.4 and 2x DisplayPort 1.2. Triple View technology brings you multiple display support on up to three separate monitors at Full HD resolution. This helps improve on productivity by allowing for spreading multiple windows across three monitors while working with them simultaneously.

Connect even more displays with a discrete graphics card

The Shuttle XPC cube Barebone SZ270R8 supports even more additional 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.

Shuttle XPC cube Barebone SZ270R8 – Optional Accessories

Wireless LAN (Accessory WLN-M)

The Shuttle Accessory WLN-M is a wireless LAN kit consisting of a M.2-2230 card, two antennas and appropriate cables. Using this, the Shuttle XPC cube Barebone SZ270R8 can be equipped with a wireless LAN module according to IEEE 802.11ac standards. WPA2 with AES encryption is supported, too. WLN-M also supports Bluetooth 4.0.

Serial RS-232 port (Accessory H-RS232)

Add one serial COM port (RS232) to the back panel. While today's consumer PCs rarely have it, as it has been superseded by USB, it is still commonly used for industrial automation systems, scientific analysis and POS systems.

Two 2.5" drives in one 3.5" bay

The optional Shuttle Accessory PHD3 allows for installation of up to two 63.5mm (2.5") hard drives or SSDs into one larger 89 mm (3.5") drive bay. This makes for a more flexible configuration in your drive rack.

The Shuttle XPC cube Barebone SZ270R8 can be installed up to eight 2.5" SATA hard disks (or SSDs) in combination with the Shuttle Accessory PHD3. For more than five SATA hard disks, though, extra SATA cables, power cables and a SATA controller card is required.

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Comparison: Shuttle XPC cube products with socket LGA 1151

Product	SH110R4	SH170R6 SH170R6 Plus	SZ170R8	SZ170R8V2	SZ270R8
Chipset	Intel H110	Intel H170	Intel Z170	Intel Z170	Intel Z270
CPU Support	Socket LGA 1151, TDP max. 95W, code name "Skylake" and "Kaby Lake"				
OS Support	Supports Windows 7, 10 and Linux (64-bit) (Windows 7 with Skylake CPU only)				
K serie CPU Overclocking?	No	No	Yes		
CPU Cooling	Heatpipe with 3 pipes		Heatpipe with 4 pipes		
Storage Bays	1x 5.25" 2x 3.5" (internal)	1x 5.25" 2x 3.5" (1x ext.)	4x 3.5" (internal)		
Max. Memory	2x 16 GB DDR4-2133/2400	4x 16 GB DDR4-2133/2400			4x 16 GB DDR4-2133/2400
Video Outputs	HDMI, DP, VGA Dual Display	HDMI, 2x DisplayPort Triple Display			HDMI, 2x DisplayPort Triple Display
4K-Support	HDMI: 2160p/30 Hz, DP: 2160p/60 Hz				
PCI Express Slots	1x PCIe X16 V3 1x PCIe X1 V2	1x PCIe X16 V3 1x PCIe X4 V3			
M.2 Slot	M.2-2280 slot SATA and PCIe V2 X4	M.2-2280 slot SATA and PCIe V3 X4 (NVMe support)			2x M.2-2280 Slot SATA+PCIe/NVMe Intel® Optane™
Intel® Optane™	No	No	No	No	Yes
Slot for WLAN	M.2 2230 AE	Mini-PCIe, Half-Size		M.2 2230 AE	
Gigabit LAN	Intel i219LM	Intel i218LM		Intel i211 + i219LM	2x Intel i211
Audio	Realtek ALC662	Realtek ALC892			Realtek ALC662
USB	4x USB 3.0 4x USB 2.0	8x USB 3.0 2x USB 2.0	8x USB 3.0		6x USB 3.0 4x USB 2.0
SATA Ports	3x SATA 6G	4x SATA 6G, 1x eSATA 6G		4x SATA 6G	
Power Supply	300W [A]	300W [A] Plus: 500W [B]	500W [B]		
Front Design	R4 chassis customizable	R6 chassis Plastic front	R8 chassis Brushed Alu Look		
Optional Accessories	PHD3: 3.5"/2.5" bay H-RS232: COM port WLN-M: WLAN kit PC63J: 500W PSU	PHD3: 3.5"/2.5" bay H-RS232: COM port WLN-C/P: WLAN kit PC63J: 500W PSU	PHD3: 3.5"/2.5" bay H-RS232: COM port WLN-C/P: WLAN kit		PHD3: 3.5"/2.5" bay H-RS232: COM port WLN-M: WLAN kit
Front Panel					
Rear Panel					

Power Supply A: 300W - 80+ Bronze, with 6-pin power connector for graphics card
Power Supply B: 500W - 80+ Silver, with 6-pin and 8-pin power connector for graphics card

www.shuttle.eu

Shuttle XPC cube Barebone SZ270R8 - Specifications

R8-Chassis	Black aluminium chassis Front panel: brushed aluminium Front doors for USB ports Kensington Security Slot at the back panel (also called K-Slot or Kensington lock) as a part of an anti-theft system Dimensions: 33.2 x 21,6 x 19.8 cm (LWH), 14.2-litre Weight: 3.5 kg net / 5.0 kg gross
Storage Bays	Storage bays: 4 x 3.5" (internal) Using the optional accessory PHD3 two 2.5" drives can be installed into one 3.5" bay.
Mainboard and Chipset	Shuttle Mainboard "FZ270", Shuttle Form Factor proprietary design for XPC cube Barebone SZ270R8 Dimensions: 270 x 195 mm Chipset: Intel® Z270 Chipset, code name "Union Point" Platform Controller Hub (PCH) as Single-Chip-Solution Solid Capacitors for sensitive areas provide excellent heat resistance for enhanced system durability
BIOS	AMI BIOS, SPI Interface, 32 MBit Flash-ROM with SPI interface Supports PnP, ACPI 3.0, Hardware Monitoring Supports Unified Extensible Firmware Interface (UEFI) Supports boot-up from external USB flash memory
Power Supply	Built-in 500 Watt mini switching power supply (PC63J) AC input voltage: supports 100~240V, 50~60 Hz 80 PLUS Silver compliant: the PSU provides at least 85/89/85% 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 and 8-pin Other connectors: 4x SATA, 2x Molex, 1x Floppy
Operation System	This system comes without operating system. It is compatible with Windows 7 / 10 and Linux (64-bit). Note: Windows 7 is only supported in combination with 6th generation Intel Core processors "Skylake". Additional note on Windows 7 see [7]

Processor Support	Socket LGA 1151 (H4) supports Intel Core i7 / i5 / i3, Pentium and Celeron processors - 6th generation, code name "Skylake" - 7th generation, code name "Kaby Lake" Maximum supported processor power consumption (TDP) = 95W 14nm process technology, up to 8 MB of L3 cache Not compatible with Intel Xeon E3 V5 processors for socket LGA 1151 and processors with the older Socket LGA 1150. Supports the unlock function of Intel K-Series processors. The processor integrates PCI-Express, memory controller and the graphics engine on the same die (performance features depending on processor type) Please refer to the support list for detailed processor support information at global.shuttle.com.
Processor Cooling	Shuttle I.C.E. (Integrated Cooling Engine) Advanced I.C.E. Heatpipe technology with 4 pipes Temperature controlled 92 mm fan SilentX cooling and noise reduction technology with Active Airflow
Memory Support	4 x 288-pin slot Supports DDR4-2133/2400 memory (PC4-17066/19200) at 1.2V Supports 2+2 Dual Channel mode Supports max. 16 GB per DIMM, maximum total size of 64 GB
Integrated graphics	The features of the integrated Intel HD graphics function depend on the processor type used. Supports DirectX 12, OGL 5.x, OCL 2.x The PC features three digital video outputs: - HDMI v1.4b (supports 1080p/60 and 2160p/30) - 2x DisplayPort v1.2 (support 1080p/60 and 2160p/60) Supports displays with 4K Ultra HD resolution at 3840 x 2160 [3] Supports three independent Full HD displays with the integrated graphics function Supports more displays in combination with a discrete graphics card [2] Supports Blu-ray (BD) playback with HDCP copy protection Supports multi-channel digital audio over the same cable Maximum shared memory of 512 MB
PCIe-Expansion Slots	1x PCI-Express x16 v3.0 slot (PEG, for graphics cards only) 1x PCI-Express x4 v3.0 slot This XPC supports dual-slot (double-width) graphics cards - in this case the second PCI-Express slot will be occupied. The length of the graphics cards can be up to 280 mm or 273 mm, if the power connectors are on the back side. Graphics power connectors: 6-pin and 8-pin

Two M.2-2280 SSD Slots	The mainboard provides two M.2 2280 slots with the following interfaces: - PCI-Express Gen. 3.0 X4 with up to 32 Gbps Data Transfer Speed - 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 or PCI-Express interface. Prepared for the Intel® Optane™ Technology.
Supports Intel® Optane™	The SZ270R8 supports the Intel® Optane™ Technology which accelerates the speed of one hard disk through data caching. This requires a 7th gen. Intel Core processor ("Kaby Lake") and an Optane-SSD with 3D-Xpoint memory (e.g. in M.2 format).
M.2-2230 WLAN Slot	Interfaces: PCI-Express Gen. 2.0 X1 and 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 [6])
Multi-Channel Audio	High Definition Audio with Realtek ALC662 codec Back panel: three analog audio connectors (3.5mm): 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 7.1 channel Digital Audio: via HDMI and DisplayPort outputs
Dual Gigabit-LAN Controller	Dual network with two RJ45 ports 2x Intel i211 Ethernet Controller with MAC, PHY and PCIe interface Supports 10 / 100 / 1.000 MBit/s operation Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE) Supports Teaming mode [8]
SATA Connectors	The mainboard provides five Serial-ATA 3.0 interfaces, max. 6 Gbps supported 4x Serial ATA connector onboard Supports Intel Rapid Storage Technology (RST, Raid 0/1/5/10, JBOD)
Front Panel Connectors and Buttons	Microphone input Headphones output (line-out) 2x USB 3.0 Power button Power indicator (blue LED) Hard disk drive indicator (yellow LED)

Back Panel Connectors	1x HDMI v1.4b 2x DisplayPort v1.2 [4] 4x USB 3.0 4x USB 2.0 2x Gigabit LAN (RJ45) 3x Audio 3.5 mm (Line-in, Line-out, Microphone-in) Clear CMOS button Optional: 1x Serial port RS-232 (Accessory: H-RS232) 3x perforation for optional WLAN antennas (Accessory: WLN-M)
Other Connectors (onboard)	2x USB 2.0 (2x 5-pin) 1x RS232 (2x 5-pin) for optional accessory H-RS232 2x fan connector (4-pin), one connector is occupied Occupied front connectors: USB 3.0, USB2.0, audio, power buttons, LEDs
Included Accessories	Multi-language XPC Installation Guide (EN, DE, FR, ES, JP, KR, SC, TC) 32/64-bit driver disk for Windows 4x Serial ATA cables 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
Optional Accessories	**PHD3**: 3.5" to 2.5" adapter **H-RS232**: Backpanel COM port adapter for RS232 serial interface **WLN-M**: Wireless LAN 802.11ac + BT4.0 module with two external antennas [6]
Environmental Spec	Operating temperature range: 0~40°C Relative humidity range: 10~90% (non-condensing)
Certifications and Compliance	EMI: FCC, CE, BSMI, C-Tick Safety: ETL, CB, BSMI Other: RoHS, Energy Star, 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)

Notes:

[1] Overclocking Warning

Please note there is a certain risk involved with overclocking, including adjusting the settings in the BIOS 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 by overclocking.

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

The integrated graphics function already supports three independent displays via its digital video outputs. This PC can 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".

[3] 4K Ultra-HD resolution

A 4K-display with Ultra-HD resolution (3840 x 2160) should be connected via DisplayPort, as only this port supports a higher refresh rate of 60Hz. The video playback performance depends on the video format, bitrate and the processor used. Daily office applications usually won't require the system to run under full load, however for smooth 4K (2160p) video playback requirements are different. An Intel Core i3 processor or higher and dual channel memory (2 or 4 modules) is recommended here.

[4] How to convert DisplayPort to HDMI/DVI

The DisplayPort outputs 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.

[5] Three independent displays simultaneously

The Shuttle XPC cube Barebone SZ170R8 supports a maximum of two displays with a DVI or HDMI input. A third digital display, if required, must be connected directly to the DisplayPort output (without an adapter).

[6] Optional Wireless LAN module (WLN-M): This XPC cube 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.

[7] Installation of Windows 7

Intel® 100/200 chipset series has no support for the Enhanced Host Controller Interface (EHCI) which is the driver software for the USB 2.0 ports. The new chipset only supports the updated Extensible Host Controller Interface (xHCI for USB 3.0) which is not supported by the original Windows 7 installation disk. This means, that peripheral devices connected by USB (like keyboard, mouse and external optical drive) will not work during Windows 7 Installation. Please therefore add the required USB 3.0 drivers to the Windows 7 installation files. This is also explained in the Shuttle FAQ section at global.shuttle.com.
Note: Windows 7 is only supported if a 6th generation Intel Core processor ("Skylake") is used.

[8] Teaming Mode

The teaming function allows you to group both available network adapters together to function as a single adapter. The benefit of this approach is that it enables load balancing and failover.
Driver download: https://downloadcenter.intel.com/download/21642

6ᵗʰ Generation Intel Core Desktop Processor Family

Socket LGA 1151 14 nm "Skylake-S" processor overview (Date: July 2017)

Name	Model	Cores/ Threads	CPU Clock	Turbo Clock	Cache	TDP	Graphics Engine	Graphics Clock
	6700K	4 / 8	4.0 GHz	4.2 GHz	8 MB	91 W	HD 530	350~1150 MHz
	6700	4 / 8	3.4 GHz	4.0 GHz	8 MB	65 W	HD 530	350~1150 MHz
	6700T	4 / 8	2.8 GHz	3.6 GHz	8 MB	35 W	HD 530	350~1100 MHz
	6600K	4 / 4	3.5 GHz	3.9 GHz	6 MB	91 W	HD 530	350~1150 MHz
	6600	4 / 4	3.3 GHz	3.9 GHz	6 MB	65 W	HD 530	350~1150 MHz
	6600T	4 / 4	2.7 GHz	3.5 GHz	6 MB	35 W	HD 530	350~1100 MHz
	6500	4 / 4	3.2 GHz	3.6 GHz	6 MB	65 W	HD 530	350~1150 MHz
	6500T	4 / 4	2.5 GHz	3.1 GHz	6 MB	35 W	HD 530	350~1100 MHz
	6400	4 / 4	2.7 GHz	3.3 GHz	6 MB	65 W	HD 530	350~1150 MHz
	6400T	4 / 4	2.2 GHz	2.8 GHz	6 MB	35 W	HD 530	350~1100 MHz
	6320	2 / 4	3.9 GHz	–	4 MB	65 W	HD 530	350~1150 MHz
	6300	2 / 4	3.8 GHz	–	4 MB	65 W	HD 530	350~1150 MHz
	6300T	2 / 4	3.3 GHz	–	4 MB	35 W	HD 530	350~1100 MHz
	6100	2 / 4	3.7 GHz	–	4 MB	65 W	HD 530	350~1150 MHz
	6100T	2 / 4	3.2 GHz	–	4 MB	35 W	HD 530	350~1100 MHz
	G4520	2 / 2	3.6 GHz	–	3 MB	51 W	HD 530	350~1150 MHz
	G4500	2 / 2	3.5 GHz	–	3 MB	51 W	HD 530	350~1150 MHz
	G4500T	2 / 2	3.0 GHz	–	3 MB	35 W	HD 530	350~1100 MHz
	G4400	2 / 2	3.3 GHz	–	3 MB	51 W	HD 530	350~1150 MHz
	G4400T	2 / 2	2.9 GHz	–	3 MB	35 W	HD 530	350~1100 MHz
	G3920	2 / 2	2.9 GHz	–	2 MB	51 W	HD 530	350~1050 MHz
	G3900	2 / 2	2.8 GHz	–	2 MB	51 W	HD 530	350~1050 MHz
	G3900T	2 / 2	2.6 GHz	–	2 MB	35 W	HD 530	350~950 MHz

K = unlocked, **T** = Power optimized lifestyle, **HT** = Hyper Threading (SMT).
Note: The Shuttle XPC cube Barebone SZ270R8 also supports the unlock function of Intel K-Series processors.
Please refer to the support list for detailed processor support information at global.shuttle.com.

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7th Generation Intel Core Desktop Processor Family

Socket LGA 1151 14nm "Kaby Lake-S" processor overview (Date: July 2017)

Name	Model	Cores/Threads	CPU Clock	Turbo Clock	Cache	TDP	Graphics Engine	Graphics Clock
	7700K	4 / 8	4.2 GHz	4.5 GHz	8 MB	91 W	HD 630	350~1150 MHz
	7700	4 / 8	3.6 GHz	4.2 GHz	8 MB	65 W	HD 630	350~1150 MHz
	7700T	4 / 8	2.9 GHz	3.8 GHz	8 MB	35 W	HD 630	350~1150 MHz
	7600K	4 / 4	3.8 GHz	4.2 GHz	6 MB	91 W	HD 630	350~1150 MHz
	7600	4 / 4	3.5 GHz	4.1 GHz	6 MB	65 W	HD 630	350~1150 MHz
	7600T	4 / 4	2.8 GHz	3.7 GHz	6 MB	35 W	HD 630	350~1100 MHz
	7500	4 / 4	3.4 GHz	3.8 GHz	6 MB	65 W	HD 630	350~1100 MHz
	7500T	4 / 4	2.7 GHz	3.3 GHz	6 MB	35 W	HD 630	350~1100 MHz
	7400	4 / 4	3.0 GHz	3.5 GHz	6 MB	65 W	HD 630	350~1000 MHz
	7400T	4 / 4	2.4 GHz	3.0 GHz	6 MB	35 W	HD 630	350~1000 MHz
	7350K	2 / 4	4.2 GHz	–	4 MB	60 W	HD 630	350~1050 MHz
	7320	2 / 4	4.1 GHz	–	4 MB	51 W	HD 630	350~1050 MHz
	7300	2 / 4	4.0 GHz	–	4 MB	51 W	HD 630	350~1050 MHz
	7300T	2 / 4	3.5 GHz	–	4 MB	35 W	HD 630	350~1100 MHz
	7101E	2 / 4	3.9 GHz	–	3 MB	54 W	HD 610	350~1100 MHz
	7101TE	2 / 4	3.4 GHz	–	3 MB	35 W	HD 610	350~1100 MHz
	7100	2 / 4	3.9 GHz	–	3 MB	51 W	HD 630	350~1100 MHz
	7100T	2 / 4	3.4 GHz	–	3 MB	35 W	HD 630	350~1100 MHz
	G4620	2 / 4	3.7 GHz	–	3 MB	51 W	HD 630	350~1100 MHz
	G4600	2 / 4	3.6 GHz	–	3 MB	51 W	HD 630	350~1100 MHz
	G4600T	2 / 4	3.0 GHz	–	3 MB	35 W	HD 630	350~1050 MHz
	G4560	2 / 4	3.5 GHz	–	3 MB	54 W	HD 610	350~1050 MHz
	G4560T	2 / 4	2.9 GHz	–	3 MB	35 W	HD 610	350~1050 MHz
	G3950	2 / 2	3.0 GHz	–	2 MB	51 W	HD 610	350~1050 MHz
	G3930	2 / 2	2.9 GHz	–	2 MB	51 W	HD 610	350~1050 MHz
	G3930T	2 / 2	2.7 GHz	–	2 MB	35 W	HD 610	350~1000 MHz

K = unlocked, **T** = Power optimized lifestyle, **HT** = Hyper Threading (SMT).
Note: The Shuttle XPC cube Barebone SZ270R8 also supports the unlock function of Intel K-Series processors.
Please refer to the support list for detailed processor support information at global.shuttle.com.