Affordable 1-litre Slim PC for powerful Coffee Lake processors

The Shuttle XPC slim Barebone DH310S is a robust 1.3l Barebone PC with H310 chipset for Intel LGA1151v2 desktop processors, code-named "Coffee Lake". It allows for two digital displays to be operated at the same time and supports up to 32 GB DDR4 SO-DIMM memory. Its slim metal chassis provides versatile connectivity and reliable operation in environments with ambient temperatures of up to 50 °C. This platform is targeted at applications such as office, healthcare, Digital Signage, POS, and industry.

XPC slim Barebone
DH 310 S

Images for illustration only.
Processor, memory, storage and operating system not included.

Feature Highlights

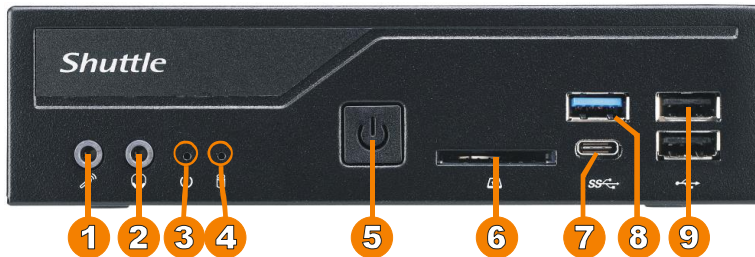|	
Slim Design	• Slim 1.3-litre metal chassis, black • 190 x 165 x 43 mm (LWH) • Operating temperature: 0~50 °C
Operating System	• The operating system is not included • Supports Windows 10 and Linux (64-bit)
Processor	• Supports LGA 1151v2 "Coffee Lake" processors up to a max. TDP of 65 W • Supports Core i7/i5/i3, Pentium Gold, Celeron • Heatpipe cooling system with two fans
Chipset	• Intel H310 Chipset
Memory	• 2x 260-pin SO-DIMM slot • Supports DDR4-2400/2666, max. 2x 16 GB
Graphics	• Integrated Intel HD graphics, 4K support (features depend on processor) • Supports two independent displays
Storage	• 1x 2.5" bay for SATA hard disk or SSD
M.2 slots	• 1x M.2 2280M slot (PCIe x4, SATA) • 1x M.2 2230E for optional WLAN (WLN-M)
Connectors	• HDMI 1.4b, DisplayPort 1.2, optional VGA • SD card reader, 2x audio (line out, mic) • 4x USB 3.0 (1x Type C), 4x USB 2.0 • Gigabit LAN (RJ45) • Connector for external power button • "Always on" Jumper
Power Supply	• External 90W / 19V power adapter
Optional Accessories	• WLAN Module (WLN-M), Vertical Stand (PS02) • VGA Port (PVG01), Rackmount kit (PRM01) • Cable for external power button (CXP01) • VESA mount (PV04)

intel CORE i3 inside — intel CORE i5 inside — intel CORE i7 inside

50 °C / 0

nonstop 24/7

4K 2160p
ULTRA HD
3840 x 2160

Dual Monitor Support

8 887993 00170 8

Shuttle XPC slim Barebone DH310S – Front and Back Panel

Front view

Rear view

Right side

Left side

1 Microphone input
2 Headphones output
3 Power LED
4 Hard disk LED
5 Power Button
6 SD Card Reader
7 USB 3.1 Gen 1 Type C
8 USB 3.1 Gen 1
9 2x USB 2.0
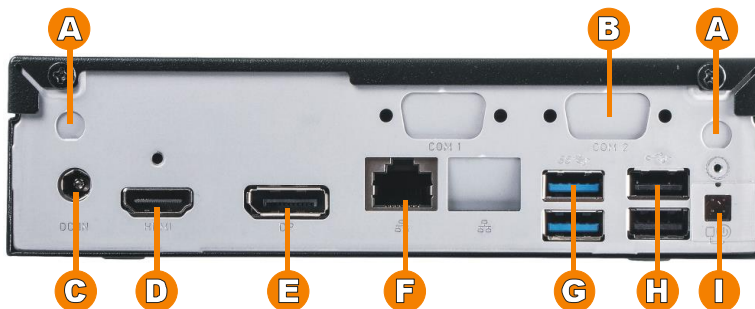
A 2x WLAN perforation
B Optional D-Sub/VGA port (accessory PVG01)
C DC power input
D HDMI 1.4b video output
E DisplayPort (DP 1.2) video output
F 2x RJ45 Gigabit LAN
G 2x USB 3.0 (USB 3.1 Gen 1)
H 2x USB 2.0
I Connector for external power button, Clear CMOS and 5 V DC voltage (4-pin, 2.54 mm pitch)
J 2x hole for Kensington Lock
K Threaded holes for optional VESA mount (accessory PV04)

Shuttle XPC slim Barebone DH310S – Required Components

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

LGA1151v2 processor "Coffee Lake" TDP max. 65 W Core i7 / i5 / i3, Pentium or Celeron
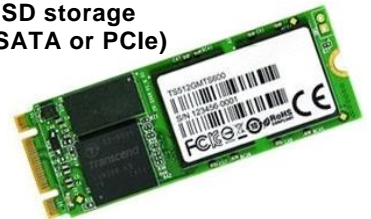
2.5" SATA hard disk or Solid State Disk (SSD) (max. height: 12.5 mm)

Windows 10 / Linux Operating System

Optional: M.2 2280/2260/2242 SSD storage (SATA or PCIe)

Up to two DDR4-2400/2666 SO-DIMM memory modules max. 16 GB each

Optional Accessories

WLAN-Accessory WLN-M M.2-2230 card supports IEEE 802.11 b/g/n/ac including 2 antennas

VGA port Accessory PVG01 Note that only two displays can be operated at the same time.

Vertical Stand PS02 for vertical operation

VESA mounting kit PV04

Rack Mount Kit PRM01 2U front plate to install two 1.3L Shuttle XPCs in a 19" cabinet.

**Cable for external push button switch CXP01** (without button)

Shuttle XPC slim Barebone DH310S – Product Features

1.3 L

19 cm

4.3 cm

16.5 cm

Robust, stylish and particularly small

You should have held it in your own hands to see how small it actually is. At barely a volume of 1.35 litres, its steel chassis gives it the appropriate stability required for professional applications in digital signage. Despite its dimensions of 19 x 16.5 x 4.3 cm (LWH), the overall system performance is very high thanks to support of Intel Core desktop processors of the Coffee Lake generation. The interior of the DH310S is very tidy too so that it won't take long to set up. Its sleek and stylish looks let it easily find a place in both home and office environments.
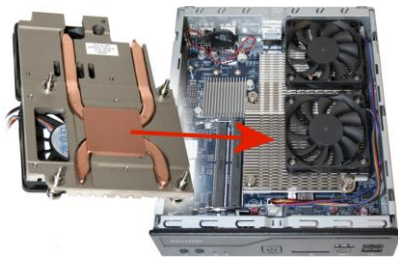
Low noise thanks to heatpipe cooling system

An active dual-fan heatpipe cooling system ensures whisper-quiet operation and system stability.

Extended temperature range and reliability

The DH310S is outstandingly robust thanks to its rugged chassis. With an ambient temperature range from 0-50 °C it is suitable for use in the most demanding environments. Solely designed with all solid capacitors, the DH310S is guaranteed to deliver maximum stability, reliability and longer system lifetime for long-term applications like digital signage.
**Caution:** For high ambient temperatures over 40 °C we strongly recommend to use SSDs instead of hard disks (supporting at least 70 °C).

Dual Display with HDMI and DisplayPort (optional VGA)

The DH310S features two digital video outputs: HDMI 1.4b and DisplayPort (DP). Dual View technology offers multiple display support on up to two separate monitors. This helps improve on productivity by allowing for spreading multiple windows across two monitors while working with them simultaneously.
Furthermore, the DH310S supports an optional D-Sub/VGA port.
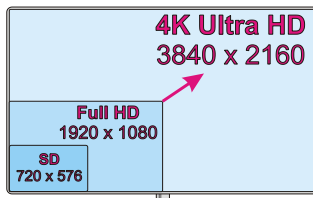
Supports 4K Ultra HD at 60 Hz

Supports 4K Ultra HD at 60 Hz
The DH310S supports displays running at 4K (3840 x 2160 / 2160p) high resolution at 60 Hz frames per second when connected to its DisplayPort video outputs. Being the successor to the Full HD standard, Ultra HD delivers a four times higher resolution with a wider colour space and colour depth.

4K Ultra HD 3840 x 2160
Full HD 1920 x 1080
SD 720 x 576

One M.2-2280M-Slot for SSD card

The M.2-2280M slot supports one M.2 SSD storage card with NVMe PCIe or SATA interface.
Type 2280 means, it supports the usual M.2 cards with a width of 22 mm and a length of 80 mm, but also 2242 and 2260 standard cards are supported.

2242 **M.2**
2260
2280

M.2-2230E-Slot for optional WLAN

The M.2-2230E slot is intended for Wireless LAN (Wifi), Bluetooth, GSM/UMTS cards and others.
Shuttle offers the optional accessory „WLN-M" (see picture), which provides WLAN 802.11ac and Bluetooth 4.0 functionality.

VESA mount (optional)

The optional 75/100mm VESA mount allows for installation on to walls or monitors which is particularly interesting for the industry segment, company buildings and public institutions. Other than this, the chassis bears numerous threaded holes (M3) enabling it to be fitted almost anywhere.

Kensington Lock

This is a small, metal-reinforced hole as part of an anti-theft system. The DH310S provides an appropriate hole on both sides of its chassis. The lock and cable are not included.

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 DH310S (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 |

Power on after Power fail

The BIOS setup provides a "Power-On after Power Fail" function that can be found under "Power Management Configuration". As the name indicates, this function determines the PC's behaviour after power failure: (1) unconditional power on, (2) restore former status (3) keep system turned off (4) Power-On by LAN or (5) Power-On by Real-Time-Clock. As a matter of the nature of this function, it may fail after short power failures. This is why the DH310S also comes with a hardware-based solution. By removing Jumper JP2 (see image) the system will start unconditionally once power is applied.

- Front Panel -

Product Comparison

	DH110SE	DH110	DH170 [1]	DH310S	DH310	DH370
Processor support	Socket LGA1151, TDP max. 65 W			Socket LGA1151v2, TDP max. 65 W		
	"Skylake" (Gen. 6) or "Kaby Lake" (Gen. 7)			"Coffee Lake" (Gen. 8)		
Chipset	Intel H110	Intel H110	Intel H170 [1]	Intel H310	Intel H310	Intel H370
Operation system support	Windows 10 and Linux			Windows 10 and Linux		
	Windows 7/8.1 with Skylake only [2]					
Multi-display	max. 2	max. 2	**max. 3**	max. 2	max. 2	**max. 3**
Max. memory (SO-DIMM)	2x 16 GB DDR4-2400	2x 16 GB DDR3L-1600		2x 16 GB **DDR4-2400/2666**		
2.5" bay	1x 2.5" SATA drive bay (max. height: 12.5 mm)					
M.2 SSD slot	M.2-2260M [3]	M.2-2260M		M.2-2280M		
WLAN slot	M.2-2230AE	Mini-PCIe Half-Size		M.2-2230E		
Buttons / LEDs	Power Button, 2x LED (Power, HDD)			Power Button, 2x LED (Power, HDD)		
SD card reader	Yes			Yes		
Graphics-ports	HDMI 1.4b DP 1.2	HDMI 1.4b DP 1.2	HDMI 1.4b **2x DP 1.2**	HDMI 1.4b DP 1.2	**HDMI 2.0a** DP 1.2	**HDMI 2.0a** **2x DP 1.2**
USB 3.1 Gen. 2	–	–	–	–	–	**4**
USB 3.1 Gen. 1	2	4		4 [5]	4	**4**
USB 2.0	6	3 [4]		4	4	–
PS/2 combo	–	1	–	–	–	–
COM ports	–	2	2	–	2	2
Gigabit network	Single LAN Realtek 8111G	**Dual LAN** Intel 211/219LM		Single LAN Realtek 8111H	**Dual LAN** 2x Intel 211	
Audio	Realtek ALC662, Mic-Input, Line-Out			Realtek ALC662, Mic-Input, Line-Out		
Optional Accessories [6]	WLAN: **WLN-M** Stand: **PS02** Rack: **PRM01** Cable: **CXP01** VESA: **PV04**	WLAN: **WLN-P** Stand: **PS02** Rack: **PRM01** VGA: **PVG01** Cable: **CXP01**	WLAN: **WLN-P** Stand: **PS02** Rack: **PRM01** VGA: **PVG01** Cable: **CXP01**	WLAN: **WLN-M** Stand: **PS02** Rack: **PRM01** VGA: **PVG01** Cable: **CXP01** VESA: **PV04**	WLAN: **WLN-M** Stand: **PS02** Rack: **PRM01** VGA: **PVG01** Cable: **CXP01**	WLAN: **WLN-M** Stand: **PS02** Rack: **PRM01** VGA: **PVG01** Cable: **CXP01**
VESA mount	optional	supplied	supplied	optional	supplied	supplied
19 V power adp.	90 W / 19 V			90 W / 19 V		
12 V support?	No	Yes	No	No	Yes	No

[1] Another product **DQ170** is similar to DH170, but features Q170 chipset, Hardware TPM and vPro support

[2] Windows 7 and 8.1 is only supported in combination with the 6th generation Intel Core processors "Skylake".

[3] This M.2 slot supports SATA interface but no PCI-Express

[4] One USB 2.0 port is designed as eSATA/USB combo port

[5] One USB 3.1 Gen. 1 port at the front panel is implemented as "type-C"

[6] **WLAN**: WLAN card with two external antenna, **Stand**: two feet for vertical operation, **Rack**: 2U rack mount kit to install two Slim-PCs in a 19" server rack, **Cable**: 2-meter cable to connect an external power button, **VESA**: VESA mounting kit, **VGA**: D-sub adapter to connect an analog VGA monitor

DH310S	DH310	DH370

Shuttle XPC cube slim DH310S - Specifications

Chassis	Slim PC with black chassis made of metal Dimensions: 190 x 165 x 43 mm (LWH) = 1.35-litre Weight: 1.3 kg net and 2.1 kg gross Two holes for Kensington Locks and numerous threaded holes (M3) at both sides of the chassis
Power Adapter	External 90 W power adapter (fanless) Input: 100~240 V AC, 50/60 Hz Output: 19 V DC, 4.74 A, max. 90 W DC Connector: 5.5/2.5 mm (outer/inner diameter)
Operation System	This system comes without operating system. It is compatible with Windows 10 and Linux (64-bit)
Processor Support	Processor Socket LGA 1151v2 Supports Intel Core i7 / i5 / i3, Pentium Gold and Celeron processors Supports the 8th generation Intel Core processors, codename "Coffee Lake-S" in 14++ nm process technology Maximum supported processor power consumption (TDP) = 65 W Up to 6 CPU cores, 12 threads and 12 MB of L3 cache Does not support the unlock-function of Intel K-Series processors. Not compatible with older Socket LGA 1151 processors (6th Gen. "Skylake" and 7th Gen. "Kaby Lake"). 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	Heatpipe processor cooling with two 60 mm fans on the upper side of the chassis
Mainboard & Chipset	Shuttle mainboard FS310S, Shuttle form factor, proprietary design for XPC DH310S Chipset/Southbridge: Intel® H310 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
BIOS	AMI BIOS, SPI Interface, 16 MB Flash-EPROOM Supports Hardware Monitoring and watch dog functionality Supports Firmware-TPM (fTPM) v2.0 Supports boot up from external USB flash memory Supports Unified Extensible Firmware Interface (UEFI) Supports power on after power failure [4]

Memory Support	2x SO-DIMM slot with 260 pins Supports DDR4-2400/2666 (PC4-19200/21300) SDRAM at 1.2 V Supports Dual Channel mode Supports a maximum of 16 GB per DIMM, maximum total size: 32 GB Supports two unbuffered DIMM modules (no ECC or registered)
Integrated graphics	The features of the integrated Intel UHD graphics function depend on the processor type used. Supports DirectX 12, OpenGL 4.5 The PC features two digital video outputs: - 1x HDMI v1.4b supports 1080p/60 and 2160p/30 - 1x DisplayPort v1.2 supports 1080p/60 and 2160p/60 Supports displays with 4K Ultra HD resolution at 3840 x 2160 Supports two independent displays with the integrated graphics function Supports Blu-ray (BD) playback with HDCP content protection Hardware video decoding/encoding: H.264, H. 265 (8- and 10-bit, encoding via QuickSync), VP9 (10-bit VP9 can only be decoded) DisplayPort and HDMI support multi-channel digital audio over the same cable. Shared Memory max. 512 MB Optional analog D-Sub/VGA video output (Accessory PVG01)
Storage Bay	1x 6.35 cm / 2.5" storage bay supports one hard disk or SSD drive with SATA connector Device height: 12.5 mm (max.)
SATA Connector	1x Serial-ATA III, 6 Gb/s (600 MB/s) bandwidth With Serial-ATA power connector (onboard)
M.2-2280M SSD Slot	The M.2 2280M slot provides the following interfaces: - PCI-Express Gen. 2.0 X4, supports NVMe - SATA v3.0 (max. 6 Gbps) It supports M.2 cards with a width of 22 mm and a length of 42, 60 or 80 mm (type 2242, 2260, 2280). Supports M.2 SSDs with SATA or PCI-Express interface
M.2-2230E Slot	M.2-2230E slot for WLAN cards Interfaces: PCI-Express Gen. 2.0 X1 und USB 2.0 Supports M.2 cards with a width of 22 mm and a length of 30 mm (type 2230) Supports WLAN extension cards (optional Shuttle accessory: WLN-M)
Audio	Audio Realtek ALC 662 5.1 channel High-Definition Audio Two analog audio connectors (3.5 mm) at the front panel: 1) 2-channel line-out (headphones) 2) microphone input Digital multi-channel audio output: by HDMI and DisplayPort
Gigabit-LAN Controller	Realtek 8111H Ethernet network controller (Gigabit) Supports 10 / 100 / 1.000 MBit/s operation Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE)

Card Reader	Integrated card reader Supports SD, SDHC and SDXC up to v3.01 memory flash cards UHS-I interface supports up to 104 MB/s (SDR104) transfer speed Realtek RTS5227S chip with PCIe chipset interface Supports boot up from SD card
Front panel Connectors and Buttons	Microphone input Audio Line-out (headphones) 1x USB 3.1 Gen 1 1x USB 3.1 Gen 1 Type C 2x USB 2.0 SD card reader Power button Power LED (blue) HDD LED (yellow)
Back Panel Connectors	1x HDMI 1.4b connector [1] 1x DisplayPort 1.2 connector (DP) [2] Optional: 1x D-Sub VGA connector (Accessory PVG01) 2x USB 3.1 Gen 1 2x USB 2.0 1x Gigabit LAN (RJ45) 1x DC-input connector for external power adapter 1x 4-pin connector (2.54 mm pitch) supports: - external power on button - Clear CMOS function - +5V DC voltage for external components 2x Perforation for optional Wireless LAN antennas 2x hole for Kensington Locks
Other Connectors (onboard)	1x jumper JP2 for power-on-after-power-fail (hardware solution) [4] 1x analog VGA graphics output CN6 (2x 1-pin, 1 mm pitch) 1x USB 2.0 (4-pin) 1x fan connector (4-pin) occupied by the cooling system 1x connector for CMOS battery (occupied)
Supplied Accessories	Multi-language user guide (EN, DE, FR, ES, JP, KR, SC, TC) Four screws M3 x 4 mm (to mount a 2.5" storage device into the bay) Two screws M3 x 5 mm (silver colour, to mount two M.2 cards) Driver DVD (Windows 64-bit) Serial ATA cable for 2.5" drive including power cable External 90 W power adapter with power cord Protection cap for CPU socket (do not use if heatpipe or fan is mounted) Heatsink compound

Optional Accessories	- **PVG01:** optional D-Sub VGA video output [4] - **WLN-M.** WLAN module in M.2-2230 format with two external antennas supports IEEE 802.11ac and Bluetooth 4.0 - **PS02:** Stand for vertical operation - **CXP01:** adapter cable for external power button - **PRM01:** 2U rack mount front plate for two Shuttle XPC slim PCs - **PV04:** VESA mounting kit
Environmental Spec	Operating temperature range: 0~50 °C [3] Relative humidity, non-condensing: 10~90 %
Certifications Compliance	EMI: FCC, CE, BSMI, RCM, VCCI Safety: ETL, CB, BSMI Other: RoHS, Energy Star, ErP
Conformity	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] HDMI output supports DVI-D with optional adapter

[2] How to convert DisplayPort into 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 through 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] Operating temperature
For high ambient temperatures over 40 °C we strongly recommend to use SSDs (supporting at least 70 °C) and rugged SO-DIMM memory modules with a temperature range of up to 95 °C.

[4] Power on after power fail
The BIOS setup provides a "Power-On after Power Fail" function that can be found under "Power Management Configuration". As the name indicates, this function determines the PC's behaviour after power failure: (1) unconditional power on, (2) restore former status or (3) keep system turned off. As a matter of the nature of this function, it may fail after short power failures. This is why the DH310 also comes with a hardware-based solution. By removing Jumper JP2 (on the mainboard behind the power button) the system will start unconditionally once power is supplied.

8th Generation Intel Core Desktop Processor Family

Socket LGA1151v2 14 nm++ "Coffee Lake S" processor overview (Date: Jan 2019)
Processors with a TDP>65W are <u>not</u> supported (marked in red)

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

K = unlocked, **T** = Power optimized lifestyle, **TDP** = Thermal Design Power (max. Power Consumption).
Note: The Shuttle XPC slim Barebone DH310S does not support the Unlock-function of Intel K-Series processors.
Please refer to the support list for detailed processor support information at global.shuttle.com.