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### First Shuttle XPC slim with HDMI 2.0

The Shuttle XPC slim Barebone DH270 is a robust 1.31 Barebone PC with H270 chipset for Intel LGA1151 desktop processors, codenamed "Skylake" and "Kaby Lake". Three HDMI ports allow for three independent displays to be operated at the same time. One HDMI 2.0 port supports Ultra HD at 60 Hz frame rate. The DH270 also offers Dual Intel LAN, two COM ports and one USB port type C. Its slim metal chassis comes with a VESA mount included, provides versatile connectivity and reliable operation in environments with ambient temperatures of up to 50 °C. This platform is targeted at professional applications such as Digital Signage, POS, POI, gambling machines, office, healthcare and industry.

**Feature Highlights** 

### • Slim 1.3-litre metal chassis, black • 190 x 165 x 43 mm (LWH) Slim Design Operating temperature: 0~50 °C • Including VESA mount (75/100 mm) • The operating system is not included Operating • Supports Windows 10 and Linux (64-bit) System • Windows 7 with Skylake CPUs only • Supports LGA 1151 Skylake or Kaby Lake processors up to a max. TDP of 65 W • Supports Core i7 / i5 / i3, Pentium, Celeron **Processor** Heatpipe cooling system with two fans • Integrated Intel HD graphics supports 4K and can operate three independent displays simultaneously Chipset • Intel H270 Chipset • 2x 260-pin SO-DIMM slots Memory Supports DDR4-2133/2400, max. 2x 16 GB • 1x 2.5" bay for SATA hard disk or SSD Storage • Two Mini expansion slots: Bays/Slots 1x M.2 2280BM, supports PCIe x4 & SATA 1x M.2-2230AE for optional WLAN [WLN-M] • 1x HDMI 2.0, 2x HDMI 1.4b, optional VGA

SD card reader, 2x audio (line out, mic) 3x USB 3.0 (1x Type C), 4x USB 2.0

2x Intel Gigabit LAN (RJ45), supports WOL

"Always on" Jumper onboard

• External 90 W fanless power adapter

2x COM port (RS232 + RS232/RS422/RS485) Connector for external power button

# XPC slim Barebone









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



















1/0

**Connectors** 

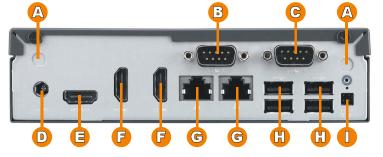
**Power Supply** 

# Shuttle XPC slim Barebone DH270 – Front and Back Panel

## Front view



# Rear view



# Right side







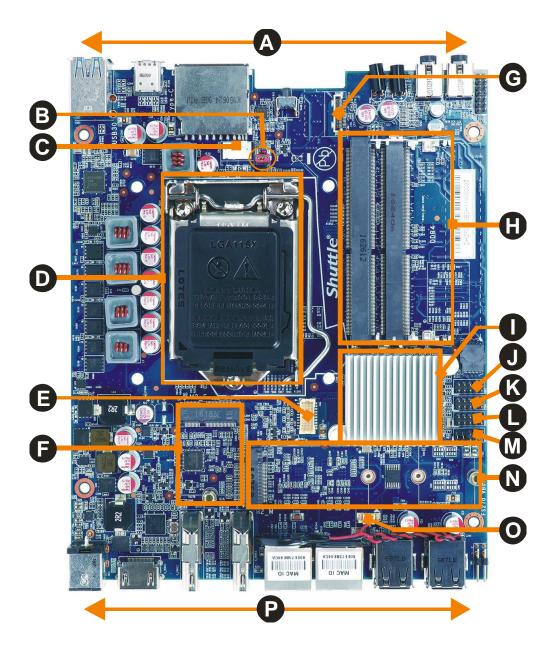
- 1 Microphone input
- 2 Headphones output
- 3 Power LED
- 4 Hard disk LED
- 5 Power Button
- 6 SD Card Reader
- 7 1x USB 3.0 Type C
- 8 2x USB 3.0 Type A
- A 2x WLAN perforation
- **B** COM1 supports RS232 (or optional VGA port for analog displays [5])
- C COM2 supports RS232/RS422/RS485
- D DC power input
- E HDMI 2.0 video output
- F HDMI 1.4b video outputs
- G 2x RJ45 Gigabit LAN
- H 4x USB 2.0
- I Connector for external power button, Clear CMOS and 5 V DC voltage (4 pins, 2.54 mm pitch)
- J 2x hole for Kensington Lock
- K VESA mount (two parts)



### **COM port Pin 9 Configuration**

Pin 9 is a multi-functional signal. Based on jumper JP1 configuration on the mainboard, it can be configured as Ring Indicator (RI) or external power supply with either 5 V or 12 V voltage level (each COM port separately).

# Shuttle XPC slim Barebone DH270 - Mainboard

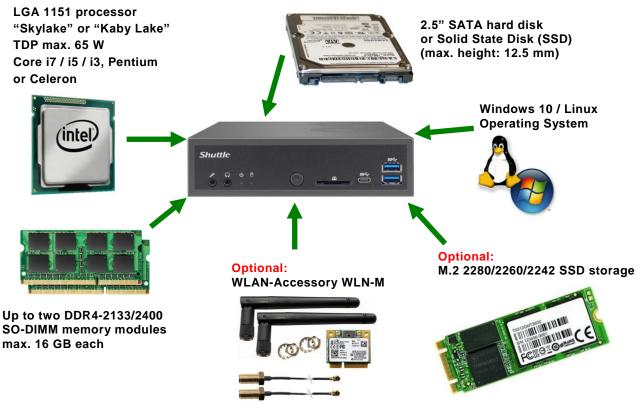


Α	Front Panel
В	Always Power-On Jumper
С	Fan Connector
D	LGA 1151 Processor Socket
E	VGA Connector
F	M.2 2230 Slot (for optional WLAN)
G	SATA 3.0 (6 Gbps) Connector
Н	SO-DIMM Socket for DDR4 Memory

ı	Intel H270 Chipset
J	Debug Interface
K	COM1 serial Port (R\$232,R\$422,R\$485)
L	COM2 serial Port (R\$232)
М	COM1/COM2 Pin 9 Configuration
N	M.2 2280 Slot
0	Battery Connector
Р	Back Panel

# Shuttle XPC slim Barebone DH270 – Required Components

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





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# **Product Comparison**

	DH110SE	DH110	DH170	DQ170	DH270					
Availability	Nov 2016	Jan 2016	Oct 2015	Oct 2016	Q3 2017					
Processor Support	Socket LGA 1151 supports Intel Core i7 / i5 / i3, Pentium, Celeron 6 <sup>th</sup> gen. "Skylake" or 7 <sup>th</sup> gen. "Kaby Lake", TDP max. 65 W									
OS Support	Windows 7, 10 and Linux (64-bit only) Note: Windows 7 is not supported in connection with Kaby Lake processors.									
Chipset	H110	H110	H170	Q170	H270					
TPM-Support	Firmware	Firmware	Firmware	Hardware	Firmware					
Multi-Display	2 Displays	2 Displays	3 Displays	3 Displays	3 Displays					
Memory	2x SO-DIMM max. 2x 16GB DDR4-2133	2x SO-DIMM max. 2x 16GB DDR3L-1600	2x SO-DIMM max. 2x 16GB DDR3L-1600	2x SO-DIMM max. 2x 16GB DDR3L-1600	2x SO-DIMM max. 2x 16GB DDR4-2133/2400					
2.5" drive bay	1x SATA v3.0	1x SATA v3.0	1x SATA v3.0	1x SATA v3.0	1x SATA v3.0					
M.2 SSD slot	M.2-2260 SATA	M.2-2260 SATA/PCIe	M.2-2260 SATA/PCIe NVMe-Support	M.2-2260 SATA/PCIe NVMe-Support	M.2-2280 SATA/PCIe NVMe-Support					
Network Single LAN Dual LAN RTL8111G Intel i211/i219LM		Dual LAN Intel i211/i219LM	Dual LAN Intel i211/i219LM	Dual LAN 2x Intel i211						
Front Panel		2x Audio 2x USB 3.0 2x USB 2.0 Card reader	2x Audio 2x USB 3.0 2x USB 2.0 Card reader	2x Audio 3x USB 3.0 (1x Type C) Card reader						
Back Panel	HDMI 1.4b DP 1.2 4x USB 2.0 1x LAN	HDMI 1.4b DP 1.2 2x USB 3.0 1x USB/eSATA 2x LAN 2x COM	HDMI 1.4b 2x DP 1.2 2x USB 3.0 2x USB 2.0 2x LAN 2x COM	HDMI 1.4b 2x DP 1.2 2x USB 3.0 2x USB 2.0 2x LAN 2x COM	1x HDMI 2.0 2x HDMI 1.4b 4x USB 2.0 2x LAN 2x COM					
Power Adapter	90 W / 19 W	90 W / 19 W *)	90 W / 19 W	90 W / 19 W	90 W / 19 W *)					
VESA mount	Optional	Yes	Yes	Yes	Yes					
Optional WLAN	WLN-M	WLN-M	WLN-P	WLN-P	WLN-M					
Optional VGA	tional VGA - PVG01 PVG01 PVG01 PVG01									

<sup>\*)</sup> DH110 and DH270 support 84 W / 12 V power adapters as well



Shu	uttle XPC slim Barebone DH270 - Specifications
Chassis	Black chassis made of steel Dimensions: $190 \times 165 \times 43$ mm (LWH) = $1.35$ -litre Weight: $1.3$ kg net and $2.04$ kg gross Two holes for Kensington Locks and numerous threaded holes (M3) at both sides of the chassis
Operation System	This system comes without operating system. It is compatible with Windows 10 and Linux (64-bit). Note: Windows 7 is only supported in combination with 6th generation Intel Core processors "Skylake". For an additional note on Windows 7, please see [1]
Mainboard, Chipset, BIOS	Chipset: Intel® H270 Chipset (code name "Union Point") Platform Controller Hub (PCH) as Single-Chip-Solution AMI BIOS in 8 Mbit EEPROM with SPI interface All capacitors are high quality solid capacitors Supports hardware monitoring and watch dog functionality Supports Unified Extensible Firmware Interface (UEFI) Supports power on after power failure [4] Supports Firmware-TPM (fTPM) Version 2.0
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) Remark: The DC-input of the computer supports an external power source with either 12V±5% or 19V±5%.
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) = 65 W  14 nm 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.  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 (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



Memory Support	2x SO-DIMM slot with 260 pins Supports DDR4-2133/2400 (PC4-17066/19200) SDRAM at 1.2 V Supports maximum total size of 32 GB (max. 16 GB per module) Supports Dual Channel mode Supports two unbuffered DIMM modules (no ECC)
Integrated Graphics	The features of the integrated graphics function depend on the processor type used.  Three digital video outputs: 1x HDMI 2.0 und 2x HDMI 1.4b - supports up to three independent displays simultaneously - HDMI 1.4b supports 4K UHD resolution at 30 Hz (2160p/30) - HDMI 2.0 supports 4K UHD resolution at 60 Hz (2160p/60) - supports Blu-ray (BD) playback with HDCP - supports HD video plus multi-channel digital audio via a single cable Optional analog D-Sub/VGA video output [3]
2.5" Storage Bay	1x 6.35 cm / 2.5" storage bay supports one hard disk or SSD drive Device height: 12.5 mm (max.) 1x Serial-ATA III connector, max. 6 Gb/s (600 MB/s) bandwidth With Serial-ATA power connector (onboard)
Two M.2 Slot	This XPC features two M.2 expansion slots: (1) M.2 2280 BM slot - Interfaces: PCI-Express Gen. 2.0 X4 (max. 16 Gbit/s) and SATA v3.0 (max. 6 Gbit/s) - supports M.2 cards with a width of 22 mm and a length of 42, 60 or 80 mm (type 2242, 2260, 2280) - supports SATA SSDs (BM-Key) or PCIe SSDs (M-Key) (2) M.2 2230 AE slot - 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 an optional WLAN card (accessory WLN-M [4])
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.
Dual Gigabit LAN Controller	Dual network with two RJ45 ports Used network chips:  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 [5]
Card Reader	Integrated card reader Supports SD, SDHC and SDXC memory flash cards Supports boot up from SD card



Front Panel Connectors	Microphone input Audio Line-out (headphones) 2x USB 3.0 type A 1x USB 3.0 type C SD card reader Power button Power LED (blue) HDD LED (yellow)
Back Panel Connectors	1x HDMI 2.0 (supports Ultra HD resolution at 60 Hz) 2x HDMI 1.4b Optional 1x D-Sub VGA connector (Accessory PVG01 [3]) 4x USB 2.0 2x Gigabit LAN (RJ45) 2x RS232 serial port, 9-pin D-Sub (5/12 V, 1x RS422/RS485) [6] DC-input connector for external power adapter 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 (at the side)
Other Onboard Connectors	1x jumper JP2 – power-on-after-power-fail (hardware solution) [4] 1x analog VGA graphics output CN6 (2x 10-pin, 1 mm pitch) [3] 2x serial interface (COM) occupied by back panel connectors 1x fan connector (4-pin) occupied by cooling system 1x connector for CMOS battery (occupied) 1x audio connector (line-out/microphone, 2x 7-pin)
Supplied Accessories	Multi-language user guide (EN, DE, FR, ES, JP, KR, SC, TC) VESA mount for 75/100mm standard (two metal brackets) Four thumbscrews M3 x 5 mm (screws together VESA mount and PC) Four screws M4 x 10 mm (to affix VESA mount on the PC) Four screws M3 x 4 mm (to mount a 2.5" drive into the bay) Driver DVD (Windows 10 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 Accessory	(1) WLN-M: Wireless LAN kit consisting of a M.2-2230 WLAN card, two antennas and appropriate cables. Supports IEEE 802.11b/g/n/ac in the 2.4 / 5 GHz band and Bluetooth 4.0. [7] (2) PVG01: optional D-Sub VGA video output [3]
Environmental Specifications	Operating temperature range: $0{\sim}50~^{\circ}C$ [8] Relative humidity, non-condensing: $10{\sim}90~^{\circ}$



Conformity Certifications	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)
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### Footnotes:

### [1] Installation of Windows 7

The Intel® 100/200 chipset series does no longer support the Enhanced Host Controller Interface (EHCI) which is the driver software for USB 2.0. 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 the Windows 7 Installation. As a solution, please add the required USB 3.0 drivers to the Windows 7 installation files - this procedure is explained in the Shuttle FAQ section at <a href="http://go.shuttle.eu/skylakewin7en">http://go.shuttle.eu/skylakewin7en</a>.

Note: Windows 7 is only supported with processors of the 6th generation (Skylake), not with processors of the 7th generation (Kaby Lake).

[2] HDMI output supports DVI-D with optional adapter

### [3] Optional D-Sub/VGA connector

The mainboard features one analog graphics port CN6 on the mainboard. This signal can be lead to the outside as a 15-pin D-Sub VGA connector at the backpanel by using an optional adapter PVG01. However doing so means one serial port (COM) less can be used at the backpanel.

### [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 DH270 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.

### [5] Teaming Mode

The teaming function allows you to group both available network adapters together to function as one single adapter. The benefit of this approach is that it enables load balancing and failover.

Driver download: <a href="https://downloadcenter.intel.com/download/21642">https://downloadcenter.intel.com/download/21642</a>

### [6] Serial Ports

This PC features two serial RS232 ports with 9-pin D-Sub connectors at the back panel. The left COM port (COM1) can also be configured as RS422 and RS485 in the BIOS setup. The COM ports are protected by black plastic caps. Pin 9 of the D-Sub COM-Port is a multi-functional signal. Based on the Jumper JP1 configuration on the mainboard, it can be configured as Ring Indicator (RI) or external power supply with a voltage level of either 5 V or 12 V. Each COM port can be configured separately. The maximum current is 500 mA per connector.

### [7] Optional Wireless LAN module

This Shuttle XPC slim 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.

### [8] Notice - operating temperature

For ambient temperatures over 40  $^{\circ}$ C we strongly recommend to use SSDs (supporting at least 70  $^{\circ}$ C) and rugged SO-DIMM memory modules with a temperature range of up to 95  $^{\circ}$ C.



# 6<sup>th</sup> Generation Intel Core Desktop Processor Family

Socket LGA 1151 14 nm "Skylake-S" processor overview Processors with a TDP>65 W are <u>not</u> supported (<u>marked in red</u>)

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
Core i7	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
Core i5	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
Core i3	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
Pentium	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
Celeron	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 clock multiplier, T = Power optimized lifestyle, TDP = Thermal Design Power (max. power consumption)
 Note: The Shuttle XPC slim Barebone DH270 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.



# 7<sup>th</sup> Generation Intel Core Desktop Processor Family

Socket LGA 1151 14 nm "Kaby Lake-S" processor overview Processors with a TDP>65 W are <u>not</u> supported (<u>marked in red</u>)

Name	Model	Cores/ Threads	CPU Clock	Turbo Clock	Cache	TDP	Graphics Engine	Graphics Clock
Core i7	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
Core i5	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
Core i3	7300T	2/4	3.5 GHz	_	4 MB	35 W	HD 630	350~1100 MHz
Core is	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
Pentium	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
Celeron	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 clock multiplier, T = Power optimized lifestyle, TDP = Thermal Design Power (max. power consumption)
 Note: The Shuttle XPC slim Barebone DH270 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.