Powerful 3-litre PC with a PCIe X16 slot

The Shuttle XPC slim Barebone XH110G is Shuttle's first 3-litre PC to even house one single-slot expansion card. Together with an LGA 1151 Intel Core desktop processor of the Kaby Lake range, this platform is perfectly suited for many professional applications where performance, flexibility and a compact form factor matter. If a multi-port video card or video grabber card is installed, the XH110G is suitable for diverse applications such as video wall presentations, graphics workstations, media capturing, surveillance, POS, POI and many network and industial tasks. Even mid-range gaming is possible.

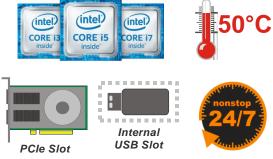
XPC slim Barebone **XH110G**







Images for illustration purposes only.







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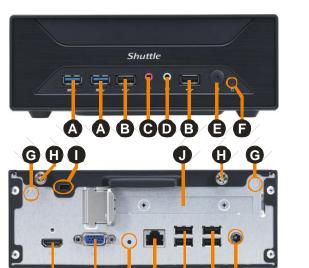
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Feature Highlights

Slim-Design	 Slim steel chassis, black Dimensions: 25 x 20 x 7.85 cm (L/W/H) Max. operating temperature: 0~50 °C Includes VESA mount
PCIe-Slot	 1x PCI-Express X16 v3.0 single-width slot Max. 208.5 x 120 x 30 mm, max. 75 W
Processor	 Supports LGA 1151 Skylake or Kaby Lake processors up to a max. TDP of 65 W Supports Core i7 / i5 / i3, Pentium, Celeron Includes heatpipe cooling system
Operating System	 This system comes without operating system. Supports Windows 7 / 8.1 / 10, Linux (64-bit) Win. 7/8.1 not supported w/ Kaby Lake CPU
Chipset	Intel H110 Chipset
Memory	 2x 260-pin SO-DIMM slot Supports DDR4-2133/2400, max. 2x 16 GB
Storage Bay	 One 2.5" bay with SATA interface supports one 2.5" hard disk or SSD (max. 9.5 mm)
Connectors	 HDMI 1.4 and VGA/D-Sub graphics ports 2x USB 3.0, 6x USB 2.0, 1x Gigabit LAN Microphone and headphones ports Internal Type-A USB slot
Mini-Slots	 M.2 2280 BM Slot (supports SATA/PCIe SSDs) M.2 2230 AE Slot (supports WLAN-cards)
Optional Accessories	Vertical stand (PS01)WLAN kit (WLN-M)
Power Supply	• 180 W / 19 V external power adapter

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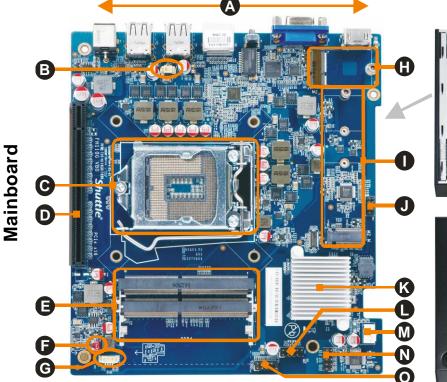
Connectors and Slots

Front Panel

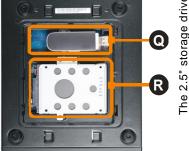
- A 2x USB 3.0 port
- B 2x USB 2.0 port
- C Microphone input
- D Headphones output
- E Power on button with LED
- F LED indicator for hard disk activity

Back Panel

- G 2x perforation for optional WLAN antenna
- H 2x thumbscrew
- I Hole for Kensington Lock
- J PCI Express X16 expansion slot
- K HDMI Video/Audio output
- L VGA/D-Sub Video output
- M Clear CMOS button
- N Gigabit network (RJ45)
- **O** 4x USB 2.0
- P DC-in Connector for power adapter



storage drive and USB stick are not included



- A Back panel connectors
- B Connector for the CMOS Battery
- **C** Processor socket (LGA 1151)
- D PCI Express X16 Expansion Slot
- E 2x SO-DIMM slot for DDR4 RAM
- F Always-On-Jumper
- G USB 2.0 header
- H M.2 2230 AE slot for an optional WLAN card
- I M.2 2280 M slot for an SSD card

- J Debug Header
- K Intel H110 Chipset
- L Front connector for Audio/USB
- M Connector for the CPU cooling fan
- N Front connector for Audio/USB
- O Front connector for Power-Button/LEDs
- P Installed heatpipe cooling system
- Q Internal USB 2.0 slot
- **R** Storage bay for 2.5" drive with SATA port

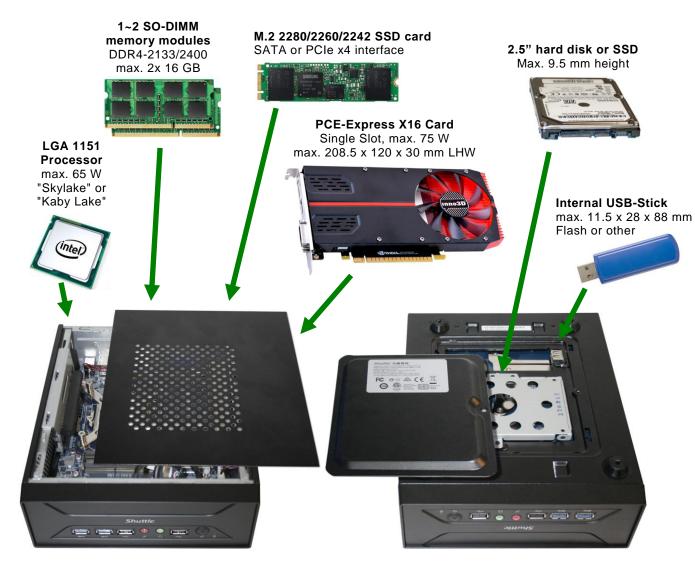
the delivery of the XH110G.

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Appropriate Components

The Shuttle XPC slim Barebone XH110G consists of a stylish case with pre-installed mainboard, cooling system and external power adapter. Despite its small form factor, it offers outstanding connectivity, functionality and performance. For a complete Mini-PC system, a few components still need to be added:



Optional Accessories

Vertical Stand: PS01

WLAN Kit: WLN-M



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Shuttle

Examples for Applications with Expansion Card

Despite the small dimensions of the chassis, the Shuttle XPC slim Barebone XH110G sports a full PCI-Express X16 slot for a single-slot expansion card measuring up to 208.5 mm in length, 120 mm in height and 30 mm in width. The barebone also supports powerful components such as an Intel Core i7 processor or 32 GB RAM. This allows it to be used for numerous applications that required a much bigger PC in the past.



Image: Shuttle XPC slim Barebone XH110G with built-in AMD FirePro W600 graphics card

Expansion Card	Possible Applications			
Gaming Graphics Card e.g. INNO3D GeForce GTX 1050 Ti Compact Single Slot, 4096 MB GDDR5	Gaming PC3D Workstation			
Multi-port Graphics Card e.g. AMD FirePro W600 or Matrox C680 with 6x Mini-DisplayPort	 Visualisation for Control Rooms Surveillance and Security Digital Signage with Video Wall Information Display (POI) 			
CAD Graphics Card e.g. NVIDIA Quadro P2000	CAD ApplicationsContent Creation3D Workstation			
Video Capture Card e.g. with 4x SDI/BNC	Multi-channel Capture System			
Special Network Card e.g. Multiport or 10 Gbps	 Proxy and Firewall Applications Intranet Server			
Fieldbus Card e.g. EtherCAT, Profibus, CAN, Modbus, etc.	Industry AutomationConveyor TechnologyBuilding Automation			
Multi I/O Card e.g. 8x COM-Port, DA/AD converter, general-purpose input/output (GPIO)	 Point of Sales (POS) Vending Machine Automation / Control System 			
Receiver Card e.g. for SAT, DVB-T2, Cable	Home Entertainment			

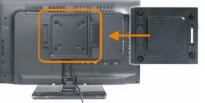
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More Product Features

20 cm 4 25 cm in cm

Shuttle has always placed great emphasis on the interior and exterior aesthetics of their Mini-PCs with the belief that a good blend of style and form factor allows the Mini-PC to be attractive, versatile and work well in almost any environment. And the XH110G was designed just like that and shines in a clean and modern appearance. The front panel connectors are easy to access in daily use and this tiny tot barely stands at 7.85 cm in height.

The slim chassis - a clean and modern look











VESA mount included

With the supplied VESA mount you can easily attach the XH110G to the backside of an appropriate display, to a VESA arm or just to the wall. It is compatible with 75x75 mm and 100x100 mm VESA standards.

Low noise thanks to heatpipe cooling system

An active dual-fan heatpipe cooling system ensures whisper-quiet operation and system stability. A heatpipe is a hollow tube containing a liquid to transfer heat. As the liquid evaporates, it carries heat to the cool end, where it condenses and then runs back to the hot end. Heatpipes thus have a much higher effective thermal conductivity than solid materials. Please keep the vent holes clear.

Extended temperature range and reliability

The Shuttle XPC slim Barebone XH110G is outstandingly robust thanks to its alu chassis. With an operating temperature range of 0-50 °C it is suitable for use in rough environments. Built around entirely all solid capacitors, the XH110G is guaranteed to deliver maximum stability, reliability and longer system life for long-term applications like digital signage.

Notice: For high ambient temperatures over 40 °C we recommend use of Solid State Disks (SSDs) instead of Hard Disk Drives (HDDs).

M.2-2280-Slot for SSD cards

The M.2-2280 BM slot supports M.2 SSD storage cards with SATA or with the modern PCIe 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.

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 Shuttle XPC slim Barebone XH110G also comes with a hardware-based solution. By removing the appropriate Jumper (see image) the system will start unconditionally once power is applied.

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Shuttle XPC slim Barebone XH110G - Specifications

Chassis	Slim X-type chassis, colour: black Dimensions: 250 x 200 x 78.5 mm (LWH) Weight: 1.9 kg net, 3.0 kg gross Open front – no concealed front panel connectors Hole for Kensington Lock at the back panel
Operation Position	 (1) horizontal on its feed (2) vertical with the optional stand (Accessory PS01) (3) vertical with the supplied VESA mount bracket
Operation System	This system comes without operating system. It is compatible with Windows 10 / 8.1 / 7 and Linux (64-bit). Important note: Windows 7 and 8.1 is only supported in combination with the 6th generation Intel Core processors "Skylake".
Mainboard, Chipset and BIOS	Mainboard FH110G, form factor 17 x 19 cm Chipset: Intel® H110 Chipset (Intel® GL82H110 PCH, Codename "Sunrise Point") AMI BIOS in 8 MB 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-fail [1]
Power Adapter	External 180 W power adapter (fanless) Input: 100~240 V AC, 50~60 Hz, max. 2.5 A Output: 19.5 V DC, max. 9.23 A, max. 180 W output wattage AC Connector with protective-earth contacts, cable length: 1.7 m DC Connector: 5.5 / 2.5mm (outer/inner diameter) Dimensions: ca. 167 x 82 x 25.5 mm = 350 ml
Processor Support	Socket LGA 1151 (H4) supports Intel Core i7 / i5 / i3, Pentium and Celeron processors - 6th generation, code name "Skylake" (6000 series) - 7th generation, code name "Kaby Lake" (7000 series) 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 LGA1151 and processors with the older Socket LGA 1150. 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.
Heatpipe Cooling	Processor cooling with heatpipe technology and two fans (60 mm)

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Memory Support	2x 260-pin SO-DIMM slot Supports DDR4-2133/2400 (PC4-17000/19200) SDRAM at 1.2 V Supports Dual Channel mode Supports a maximum of 16 GB per DIMM, Maximum total capacity: 32 GB Supports two unbuffered DIMM modules (no ECC or registered)
PCIe Expansion Slot	1x PCI-Express X16 v3.0 slot with installed 90° Riser Card The used expansion card must meet the following conditions: - Maximum dimensions: 208.5 mm x 120 mm x 30 mm (Single Slot) - Maximum power consumption: 75 W
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 the following video outputs: (1) HDMI 1.4 (supports 1080p/60 and 2160p/30) (2) VGA / 15-pin D-Sub (supports analog video) Supports two independent displays simultaneously HDMI supports 7.1 multi-channel digital audio over the same cable Maximum shared memory of 1760 MB
Audio	Audio Realtek® ALC 662 High-Definition Audio Two analog audio connectors (3.5 mm) at the front panel: (1) Microphone input (2) Headphones output (Line out) Digital 7.1 audio output: is possible via the HDMI port
Gigabit LAN Controller	Intel i211 network controller Supports 10 / 100 / 1.000 MBit/s operation Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE)
2.5" Storage Bay	This system features one 2.5" drive bay which is accessible from the bottom of the housing. It supports one 2.5" / 6.35 cm hard disk or SSD with max. 9.5 mm height. The system includes a pre-installed data/power cable [3]. The connector supports SATA III with max. 6 Gbps.
M.2-2280 Slot	The M.2 2280 M slot provides the following interfaces: - PCI-Express v2.0 X4 - SATA v3.0 (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) and M.2 SSDs with SATA or PCIe interface.

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M.2-2230 Slot	The M.2 2230 AE slot has the following interfaces: - PCI-Express v2.0 X1 - USB 2.0 It supports M.2 cards with a width of 22 mm and a length of 30 mm. This slot is intended for Wireless LAN (Wifi), Bluetooth, GSM/UMTS cards and other. A SATA interface for SSD cards is not available here.
Internal USB Port	This system features one internal USB port which is located behind the bottom cover of this PC. Connector: USB 2.0 Type A Maximum permitted size of the USB stick: 11.5 mm x 28 mm x 88 mm
Front Panel Connectors	1x Microphone input (3.5 mm) 1x Headphones output (3.5 mm, line out) 2x USB 3.0 2x USB 2.0 1x Power button with Power LED (blue) 1x HDD LED (yellow)
Back Panel Connectors	1x HDMI 1.4 digital audio/video output, supports screw lock 1x VGA / D-Sub analog video output 4x USB 2.0 1x GigaBit LAN (RJ45) 1x Clear CMOS Button 2x Perforation for Wireless LAN antennas 1x Hole for Kensington Lock
Other Onboard Connectors	Power-on-after-power-fail (hardware solution by jumper) [1] 4x front connector for power button, LEDs, USBs, audio ports 4-pin fan connectors (occupied by the CPU cooling system) 4-pin USB 2.0 connector (occupied by the internal USB port) 2-pin connector for the CMOS/RTC battery (occupied) 2x 5-pin debug port
Supplied Accessories	Multi-language installation guide (EN, DE, FR, ES, JP, KR, SC, TC) Driver DVD Bracket for one 2.5" drive with screws External power adapter with 1.7 m power cord VESA mount bracket (metal) supports 75x75 and 100x100 mm standard with four screws M4x10 Protector cap for the CPU socket (do not use if heatpipe or fan is mounted) CPU heatpipe cooling system with heatsink compound
Optional Accessories	(1) Vertical stand (PSO1) (2) WLAN module (WLN-M) [4]
Environmental Specifications	Operating temperature range: 0~50 °C [2] Relative humidity range: 10~90 % (non-condensing)

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Conformity and Certifications	 EMI: FCC, CE, BSMI, C-Tick Safety: ETL, CB, BSMI Other: RoHS, Energy Star 5.0, ErP This device is classed as a technical information equipment (ITE) in class B and is intended for use in living room and office. The CE-mark approves the conformity by the EU directives: (1) 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)
	(3) 2009/125/EC relating to ecodesign requirements for energy-related products (ErP)

Notes:

[1] 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 this PC also comes with a hardware-based solution. By removing the appropriate jumper J1, the system will start unconditionally once power is supplied.

[2] High ambient temperature

For high ambient temperature over 40 °C we strongly recommend to use SSDs instead of hard disk drives.

[3] Power connector for SATA drives

The supplied power cable for a SATA drive provides a voltage of 5 V. In very rare cases a 2.5" hard disk also requires a 12 V line, which is not supported.

[4] Optional Wireless LAN module

Shuttle offers the optional accessory "WLN-M" which adds WLAN IEEE 802.11 ac and Bluetooth 4.0 functionality. This kit consists of an M.2 expansion card and two external antennas with appropriate cables.

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6th Generation Intel Core Desktop Processor Family

Socket LGA 1151 14 nm "Skylake-S" processor overview (Date: July 2017) Processors with TDP>65 W are <u>not</u> supported (marked in red)

Name	Model	Cores/ Threads	CPU Clock	Turbo Clock	Cache	TDP	Graphics Engine	Graphics Clock
Core i7	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
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	51 W	HD 530	350~1150 MHz
	6300	2/4	3.8 GHz	_	4 MB	51 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	51 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	350~1050 MHz
	G4500	2/2	3.5 GHz	-	3 MB	51 W	HD 530	350~1050 MHz
Pentium	G4500T	2/2	3.0 GHz	-	3 MB	35 W	HD 530	350~950 MHz
	G4400	2/2	3.3 GHz	-	3 MB	54 W	HD 510	350~1050 MHz
	G4400T	2/2	2.9 GHz	-	3 MB	35 W	HD 510	350~950 MHz
	G3920	2/2	2.9 GHz	-	2 MB	47 W	HD 510	350~950 MHz
Celeron	G3900	2/2	2.8 GHz	_	2 MB	47 W	HD 510	350~950 MHz
	G3900T	2/2	2.6 GHz	_	2 MB	35 W	HD 510	350~950 MHz

K = unlocked, S = Performance optimized lifestyle, TDP = Thermal Power Design – max. power consumption
 Note: The Shuttle XPC slim Barebone XH110G 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*.

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7th Generation Intel Core Desktop Processor Family

Socket LGA 1151 14 nm "Kaby Lake-S" processor overview (Date: July 2017) Processors with a TDP>65 W are <u>not</u> supported (marked in red)

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
COLE 13	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, T = Power optimized lifestyle, TDP = Thermal Power Design – max. power consumption Note: The Shuttle XPC slim Barebone XH110G 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.

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