Fanless Slim PC with Skylake-U processor in industrial design

The DS6800BA is a fanless slim PC system with a robust 1.3 litre metal chassis. It is equipped with a Dual Core Celeron ULV processor, 4 GB RAM, 120 GB SSD, Windows 7 Professional operating system and offers exceptional connectivity: HDMI, VGA, Dual Intel LAN, USB 3.0/2.0, serial ports, audio, card reader and W-LAN 802.11n. The integrated HD graphics provides ample performance for playback 1080p content. Thanks to its re-designed passive cooling architecture, the system is virtually noiseless, maintenance-free and is approved for 24/7 nonstop operation. It is big on performance, yet extremely energy-efficient. The Shuttle Slim-PC Barebone DS6800BA is an ideal platform for professional applications such as digital signage, POS, Kiosk, Thin Client, Cloud Computing, Office PC and Multimedia.

1.3L XPC slim System
DS 6800BA
120 GB SSD, 4 GB RAM, Windows 7 Prof.

Feature Highlights

Slim Design	• Slim 1.3 litre metal chassis, black • Dimensions: 20 x 16.5 x 3.95 cm (LWH) • Incl. Stand & VESA mount (75/100 mm)
Operating System	• Windows 7 Professional, 64-bit
Processor	• Intel Celeron 3855U "Skylake-U", 1.6 GHz • Integrated Intel HD 510 graphics, DX12 • Fanless heatpipe cooling
Memory	• 4 GB DDR3L-1600 204 pin SO-DIMM
Storage	• 120 SSD drive (2.5" SATA3) • M.2 2280 B/M slot (supports PCIe and SATA)
Connectors	• HDMI 1.4, VGA (D-Sub) • 2x USB 3.0, 4x USB 2.0 • 2x Intel Gigabit LAN, SD card reader • 2x Audio (Line out + mic) • WLAN 802.11n with internal antenna • 2x COM ports (RS232 + RS232/RS422/RS485) • Connector for external power button
Power Supply	• External 65 W fanless power adapter
Applications	• Digital Signage, POS, control device, etc. • Approved for 24/7 permanent operation

| Product	Processor	Storage	RAM	Operating System
DS68U	Celeron 3855U	–	–	–
DS6800XA	Celeron 3855U	120 GB SSD	4 GB	–
DS6800BA	Celeron 3855U	120 GB SSD	4 GB	Windows 7 Prof. 64 Bit

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Images for illustration purposes only.

Shuttle XPC slim System DS6800BA – Product Views
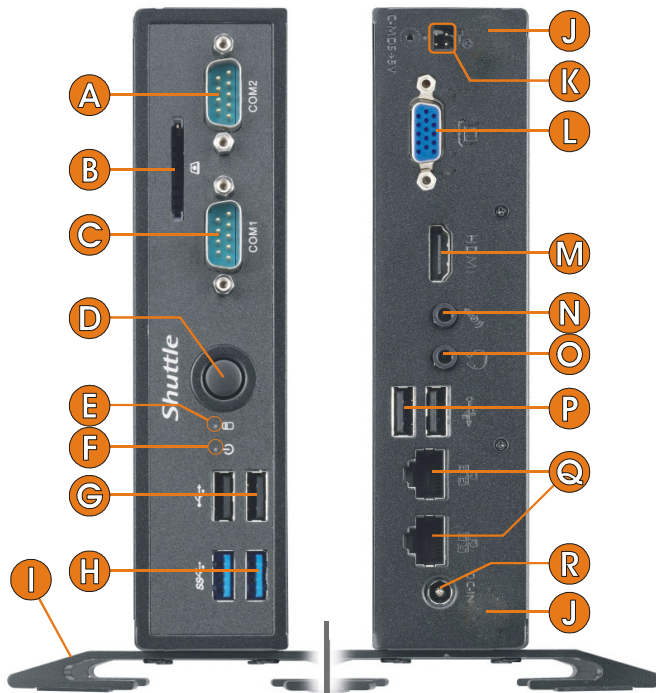
- **A** COM2: RS-232
- **B** SD card reader
- **C** COM1: RS-232/422/485
- **D** On/Off power button
- **E** Hard disk LED indicator
- **F** Power LED indicator
- **G** 2x USB 2.0
- **H** 2x USB 3.0
- **I** Stand with screws
- **J** 2x perforation for optional external antennas
- **K** Pin connector for external power button or CMOS button or 5V DC voltage supply
- **L** VGA D-Sub Video output
- **M** HDMI Audio/Video output
- **N** Microphone input
- **O** Head phone output
- **P** 2x USB 2.0
- **Q** 2x RJ45 Gigabit LAN
- **R** DC connector for external power adapter
- **S** Ventilation holes
- **T** Hole for Kensington lock
- **U** M.2 2280 slot for a SSD card with PCIe or SATA interface *)
- **V** M.2 2230 slot with WLAN card *)
- **W** 2x SO-DIMM slot for DDR3L memory modules at 1.35V *)
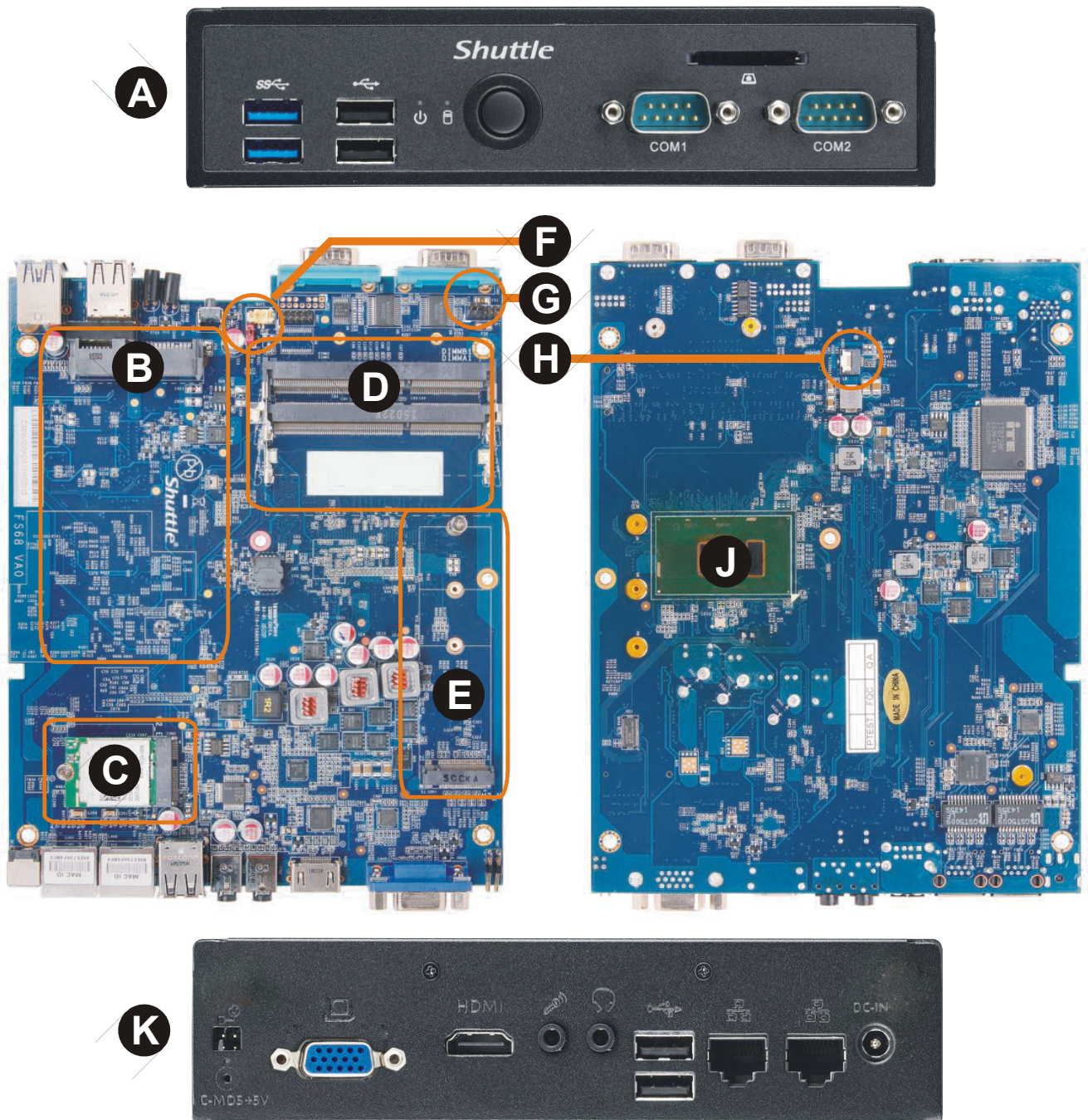- **X** Bay for 2.5" storage (HDD or SSD) *)
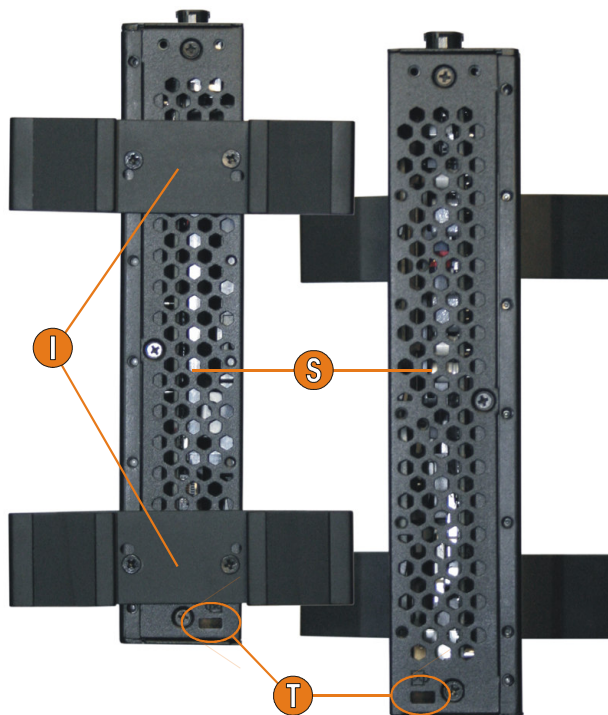
*) The WLAN card and one internal antenna are included.
Images for illustration purposes only. The delivered components are described in the specification.

Shuttle XPC slim System DS6800BA – Mainboard

A Front Panel	**F** Jumper for „Always Power On" setting
B Connector for 2.5" SATA storage	**G** COM port configuration (Pin-9 voltage setting)
C M2-2230 Slot with WLAN module	**H** Cardreader Connector
D 2x SO-DIMM slot for DDR3L memory	**J** Processor (soldered)
E M2-2280 slot for SSD cards	**K** Back Panel

Shuttle XPC slim System DS6800BA – Product Features

20 cm
3.95
1.3 L
16.5 cm
11 cm

Robust, Stylish and Extremely Small

You should have held it in your own hands to experience how small it actually is. Barely 1.35 litre in volume, its rigid steel chassis design meets the high standards towards quality and stability that are essential for professional applications like digital signage. Despite its diminutive size, the processing power inside the DS68U is sufficient to meet the needs of the most demanding multimedia and computational workloads. The well-designed interior of the DS6800BA makes installations and upgrades effortless. Its sleek and stylish look blends seamlessly in both home and office environments.

nonstop 24/7

40°C

24/7 nonstop operation and 0~40°C temperature range

The Shuttle XPC slim System DS6800BA is officially approved for 24/7 permanent operation. Thanks to its low power consumption and completely passive cooling, this PC runs highly reliably making it perfectly suitable for digital signage and POI/POS applications – even at ambient temperatures of up to 40 ° C. [5]

Conditions for permanent use:
- Free circulation of air amongst the PC must be guaranteed
- Ventilation holes must stay clear

No fan noise

A large heatsink is concealed behind a plastic cover and cools down the processor in a passive way without any fan. Using an SSD drive instead of a hard disk makes the system virtually noiseless and hence perfectly suitable for noise-sensitive environments like e.g.a library, living room, music studio or even a bedroom.
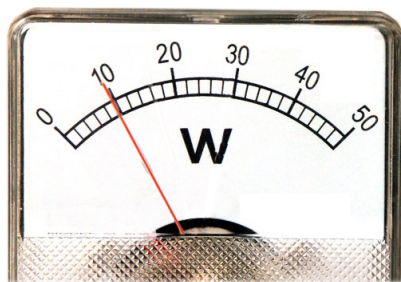
Energy-saving

Power consumption mainly depends on system load. Equipped with a 2.5" hard disk, the system consumes about 10-12 W in idle mode. Running the device 5 days a week for eight hours a day in idle mode, the annual consumption would amount to less than 21~25 kWh which would mean just 6 Euros on the power bill (25 Euro ct/kWh) - way less than a conventional desktop PC draws.

Energy-efficient Intel® Skylake-U Processor

The Shuttle XPC slim System DS6800BA is equipped with an Intel® Dual Core processor of the Skylake-U-Series which is soldered to mainboard and passively cooled by a large heatsink. This ultra low voltage (ULV) processor belongs to Intel's sixth-generation Intel Core processor family (codename: "Skylake") manufactured in a new energy-efficient 14 nm architecture. As a result of further integration, it comes as a system-on-a-chip (SoC) without the need of an extra chipset. The integrated Intel HD-Graphics-510 engine supports DirectX 12 and Ultra HD / 4K resolution via HDMI 1.4a. Mature graphics drivers are available for all major operation systems including Windows 7, Windows 8.1, Windows 10 and Linux.


Great Connectivity

Despite its small size, the Shuttle XPC slim System DS6800BA sports a wide range of I/O connectors. Besides an SD card reader, it comes with a couple of USB 3.0, USB 2.0, Gigabit-LAN, video, audio and serial ports.

Dual View Technology with HDMI and VGA

The Shuttle XPC slim System DS6800BA features two video outputs: one digital HDMI port and one analog D-Sub/VGA port. 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.
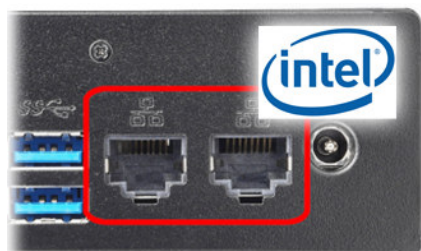
Dual Gigabit Intel LAN Network

Today's media-rich communications across the internet and within enterprises create new demands for clients in Local Area Networks. For that reason, Shuttle applies Gigabit LAN performance to their Mini-PCs and the Shuttle XPC slim System DS6800BA even supports two of them. Intel network adapters are popular for their excellent performance and driver compatibility and are the preferred choice for professional environments.

COM ports with plastic caps

RS-232   **RS-232**
RS-422
RS-485

Two serial ports

Many PCs do not have these legacy ports any longer, since they have been superseded and replaced by USB for most consumer applications, but they are still commonly used for applications such as industrial automation systems, scientific analysis, POS systems and other such fields of application. The Shuttle XPC slim System DS6800BA features two serial RS-232 ports which also support both 5 and 12V auxiliary voltage. The left COM port (COM1) also supports the RS422 and RS485 standard. The COM ports are protected by black plastic caps.

COM port Pin 9 Configuration
Pin 9 of the COM-Port is a multi-functional signal (see red circle on the photo). 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 5V or 12V (each COM port can be configured separately).

USB 3.0

The Shuttle XPC slim System DS6800BA has six USB ports, two of which are USB 3.0. USB 3.0 "SuperSpeed" provides a significant performance increase over previous USB generations making it the ideal interface solution for demanding, external peripherals. USB 3.0 supports up to 5Gb/s full duplex which means an up to 10 times greater performance than USB 2.0.

2242 **M.2**

2260

2280

M.2-2280-Slot for SSD cards

The M.2-2280 BM slot supports 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.

VESA mount

The supplied 75/100mm VESA mount allows the Shuttle XPC slim System DS6800BA to be wall-mounted or just to be affixed on the rear side of a monitor which is particularly interesting for the industry segment, company buildings and public institutions. Besides, the chassis of the Shuttle XPC slim System DS6800BA provides numerous threaded holes (M3) enabling it to be fitted almost anywhere.

SD Card Reader

The built-in SD card reader at the front side makes file transfer from and to a digital camera easy. It takes SD, SDHC and SDXC memory flash cards in standard size format and also supports booting from bootable SD cards.
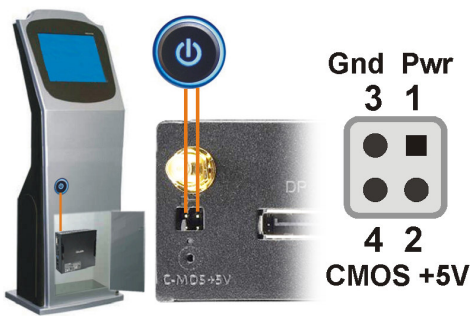
### External power button by separate remote line

If space is an object (e.g. in case of a fixed installation) and the machine cannot be switched on by pressing the front power button, it can be powered on by a separate remote line. An appropriate four-pin-connector "SW2" can be found at the back panel of the Shuttle XPC slim System DS6800BA (pitch 2.54 mm). In addition, this connector also provides the Clear CMOS function and an external 5VDC voltage supply.

Pin 1-3	Connect external power button (use a temporary switch)
Pin 3-4	Close these pins for 3 seconds to perform a Clear CMOS
Pin 2-3	External +5V DC voltage (Pin 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 or (4) PowerOn by LAN. As a matter of the nature of this function, it may fail after short power failures. This is why the DS6800BA also comes with a hardware-based solution. By removing Jumper J9 (see quick guide) the system will start unconditionally once power is applied.

Location of Jumper J9
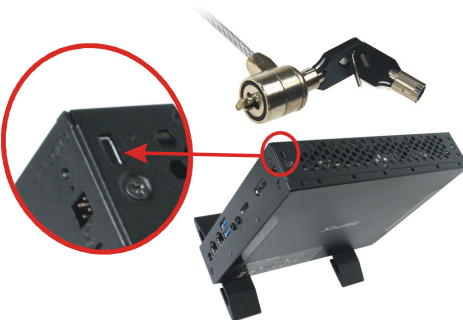
Kensington Lock

This is a small, metal-reinforced hole as part of an anti-theft system. The Shuttle XPC slim System DS6800BA provides an appropriate hole on both sides of its chassis. The lock-and-cable is not included.

Supplied accessory: VESA mount with screws

Shuttle XPC slim System DS6800BA Specifications

Fanless and Silent	Fanless and Silent Passive cooling, no fan noise at all Perfect to be used in noise-sensitive environments Fanless, dust-free and thus virtually maintenance-free
Low Power Consumption	Power consumption in idle mode: 10~12 W Power consumption under full load: 17 W / 25.5 W (CPU / CPU+graphics)
24/7 Nonstop Operation	This device is approved for 24/7 permanent operation. Requirements: - Free circulation of air amongst the PC must be guaranteed. - Ventilation holes must stay clear. - If a hard disk is installed, this must also be approved for permanent operation by its manufacturer
Chassis	Slim-PC (Nettop) with black chassis made of steel Without cooling fan, passive cooling only The bays for memory, 2.5" drive and M.2 card can be easily accessed by removing two cover plates. Dimensions: 200 x 165 x 39.5 mm (LWH) = 1.3 litres Weight: 1.43 kg net and 2.13 kg gross Two holes for Kensington Lock and numerous threaded holes (M3) at both sides of the chassis
Operation Position	1) Vertical: Usually operated in vertical position with the supplied feet (VGA-Port facing up). 2) VESA-mounted: The device can also be mounted behind an appropriate monitor using the supplied VESA mount kit. Note: From a thermal point of view horizontal operation is permitted, however, there are no rubber feet on the device. The maximum operating temperature is 35°C then.
Operation System	Windows 7 Professional – 64-bit

Processor	Model: Intel Celeron 3855U (ULV) System-on-a-chip architecture (SoC): no chipset required BGA1356 package - directly soldered onto the mainboard Code name: Skylake-U (6th Generation Intel Core) Cores / Threads: 2 / 2 Clock rate: 1.6 GHz L1/L2/L3 Cache: 128 kB / 512 kB / 2048 kB Memory controller: DDR3L-1600 Dual Channel (1.35V) TDP wattage: 15 W maximum Manufacturing process: 14 nm Maximum Tjunction Temperature: 100°C Supports 64 Bit, VT-x (EPT), VT-d, Enhanced SpeedStep, NX bit, AES-NI, SSE 4.1/4.2 Integrated graphics engine
Integrated Graphics	Intel HD graphics 510 (Intel HD Gen. 9) Two video ports support two independent screens: 1) HDMI 1.4 supports 4096x2304 @ 24Hz 2) D-Sub/VGA supports 1920x1200 @ 60Hz Supports Ultra HD / 4K resolution GPU clock rate: 300~900 MHz Execution Units (EU): 12 Supports DirectX 12, OpenGL 4.4 Supports full h264, h265 8/10 bit, VP8/9, VC-1, AVC hardware decoding Supports Quick Sync Video and Clear Video HD technology Supports HD video plus multi-channel digital audio via a single cable Dynamic, shared memory: up to 1.7 GB
Mainboard BIOS	Shuttle Mainboard FS67 All capacitors are high quality solid capacitors Supports resume after power failure [6] Supports Wake on LAN (WOL) Supports Power on by RTC Alarm Supports boot from M.2 SSD cards, USB devices and SD card reader AMI BIOS in 8 MByte EEPROM with SPI interface Supports hardware monitoring and watch dog function Supports Unified Extensible Firmware Interface (UEFI) Supports Firmware TPM v2.0 (fTPM) since BIOS version DS68UE00.102
Power Adapter	External 65 W power adapter (fanless) Input: 100~240 V AC, 50/60 Hz, max. 1.6 A Output: 19 V DC, max. 3.42 A, max. 65 W DC Connector: 5.5/2.5mm (outer/inner diameter)
Memory	4 GB DDR3L-1600 (PC3-12800) SDRAM SO-DIMM memory module with 204 pins Supports a maximum of 16 GB per DIMM, maximum total size: 32 GB Supports two unbuffered DIMM modules (no ECC or registered)

Audio	Audio Realtek® ALC 662 High-Definition Audio Two analog audio connectors (3.5mm) at the back panel: 1) 2 channel line out (headphones) 2) microphone input Digital multi-channel audio output: via HDMI port
Dual Gigabit LAN	Dual network with two RJ45 ports Used network chips: 1) Intel i211 Ethernet Controller with MAC, PHY and PCIe interface 2) Intel i219LM PHY connected to the MAC of the processor Supports 10 / 100 / 1.000 MBit/s operation Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE) Supports Teaming mode [3]
Wireless Network (WLAN)	Built-in WLAN card (M.2-2230, AE key) with one internal antenna Single-Chip 1T1R WLAN Controller Realtek RTL8188EE Supports IEEE 802.11b/g/n, max. 150Mbps up-/downstream Security: WPA/WPA2(-PSK), WEP 64/128bit, IEEE 802.11x/i
M.2 Slot for SSDs	The M.2 2280 BM slot provides 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 SATA SSDs (with B+M key) and M.2 PCIe SSDs (with M key)
2.5" SSD Drive	120 GB SSD drive in 6.35cm/2.5" format Supports Serial-ATA III interface with max. 6 Gb/s (600 MB/s) bandwidth
Card Reader	Integrated SD card reader Supports SD, SDHC and SDXC memory flash cards Supports booting from SD card
Front Panel Connectors	2x USB 3.0 2x USB 2.0 2x RS232 serial ports (5V/12V, 1x switchable to RS422 / RS485) [1] covered with black plastic caps SD card reader (supports SD, SDHC, SDXC) Power button Power LED (blue) HDD LED (yellow)

Back Panel Connectors	HDMI 1.4 D-Sub/VGA 2x USB 2.0 2x Gigabit LAN (RJ45) Microphone input Audio Line-out (headphones) DC-input connector for external power adapter 4-pin connector "SW2" (2.54 mm pitch) for power button, Clear CMOS and 5V DC [4] 2x Perforation for optional externe Wireless LAN antennas
Always-On-Jumper	By removing Jumper J9 (please refer to the quick user guide) the system will start unconditionally once power is applied. [6]
Scope of Delivery	Multi-language user guide Two metal feet with four screws M3 x 7 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 fix the VESA mount to the external surface) Rack (to mount a 2.5" storage in the bay) with two screws M3 x 4 mm Driver DVD for Windows 7, 8.1 and 10 (64-bit) External power adapter with power cord
Environmental Specifications	Operating temperature range: 0~40 °C [5] Relative humidity, non-condensing: 10~90%
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), (4) 1999/5/EC related to Radio and Telecommunications Terminal Equipment (R&TTE)

<u>Footnote:</u>

[1] Jumper for COM port configuration

Pin 9 of the 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 5V or 12V. Each COM port can be configured separately.

The operating mode of COM 1 can be set to RS232, RS422 or RS485 in the BIOS. COM 2 supports RS232 mode only.

[2] Supports 64-bit operating systems

<u>For Windows:</u> only 64-bit versions are supported

<u>For Linux:</u> Ubuntu and Fedora support 64-bit only, but OpenSuse can also support 32-bit. (date: Jan'16)

[3] 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

[4] Four-pin header at the back panel

This header allows for connecting an external power button.

It also provides 5V DC voltage for external devices and the Clear CMOS function.

[5] Caution: for high ambient temperatures over 35°C we strongly recommend to use SSDs (supporting at least 70°C).

[6] Power on after power fail:

The BIOS setup provides a "Power-On after Power Fail" function that can be found under "Power Management Configuration". This function determines the PC's behaviour after power failure. As a matter of the nature of this function, it may fail after short power failures. This is why the Shuttle XPC slim System DS6800BA also comes with a hardware-based solution. By removing Jumper J9 (please refer to the quick user guide) the system will start unconditionally once power is applied.

[7] Installation of Windows 7

Intel® Skylake-U processor series has removed their 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) do not work during the Windows 7 Installation. As a solution please add the required USB 3.0 drivers to the Windows 7 installation files (with SP1) - this procedure is explained in the Shuttle FAQ section at www.shuttle.eu.