Fanless Slim PC with Celeron processor for numerous applications

A pioneer in Small Form Factor PC, once again, Shuttle is reshaping the industry by unveiling our newest model: DS47. It is an engineering marvel of integration redesigned in an ultra-small form factor. It is a fanless Slim PC packed into a robust 1.3 litre metal chassis with exceptional connectivity and expansion options: HDMI, DVI, Dual Gigabit LAN, USB 3.0/2.0, serial ports, audio, card reader and plenty of interior space for two memory modules, a 2.5" drive and a mSATA module. The DS47 also comes with a built-in Wireless LAN and Dual Core processor with integrated HD graphics capable of playing 1080p Full HD video flawlessly. Thanks to its redesigned passive cooling architecture, the system is virtually maintenance-free and has been approved for 24/7 nonstop operation. It is big on performance yet extremely energy-efficient, consuming only 11 Watts in idle mode. DS47 closes the gap between lower-performance Atom solutions and high-performance Ivy/Sandy Bridge solutions. It is an ideal platform for professional applications such as digital signage, POS, Kiosk, Thin Client, Cloud Computing, Office PC and Multimedia.

1.3L Slim PC Barebone

DS47

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	• The operating system is not included • Compatible w. Windows XP / 7 / 8, Linux
Processor	• Intel Celeron 847, Dual Core, 1.1 GHz • Integrated Intel HD graphics • Fanless heat-pipe cooling
Memory Slots	• 2x SO-DIMM slots, max 2x 8GB DDR3-1333
Storage Bays	• Bay: 6.35cm/2.5” for hard disk or SSD • Slot: Full-Size Mini-PCIe slot supports mSATA
Connectors	• HDMI 1.3, DVI-I • 2x USB 3.0 rear, 4x USB 2.0 front • SD card reader , 2x Audio (Line out + mic) • Dual Gigabit LAN (RJ45), WLAN 802.11n • 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

Images for illustration purposes only.
This product does not include memory, storage and operating system.

nonstop 24/7

Shuttle Order No: PIB-DS47001

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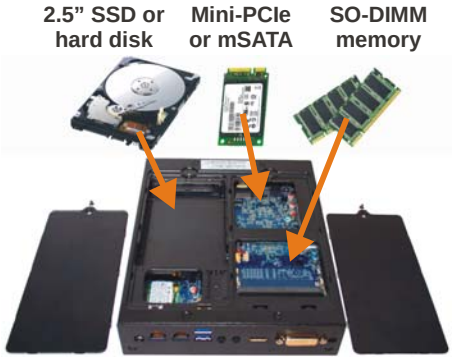
Shuttle Slim-PC Barebone DS47 – Product Features

Robust, Stylish and Extremely Small

You should have held it in your own hands to appreciate how small it actually is. Barely 1.35 litre in volume, its rigid steel chassis design exudes the level of quality and stability that is required for professional digital signage applications. Despite its diminutive size, the processing power inside the DS47 is sufficient to meet the needs of the most demanding multimedia and computational workloads. The well-designed interior of the DS47 makes installations and upgrades effortless. Its sleek and stylish look blends seamlessly in both home and office environments.



What does Barebone mean?

The Shuttle Slim-PC Barebone DS47 consists of a stylish metal case with pre-installed mainboard including processor, 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. The Mini-PC can be custom-built using the following components:

- up to two DDR3 SO-DIMM memory modules (max. 2x 8 GB)
- one 2.5” storage drive (hard disk or SSD)
- a Mini-PCIe card or mSATA module
- keyboard, mouse and operating system

Once the desired operation system is installed, the DS47 is ready to use.

Ease of installation thanks to bay covers

DS47 features two practical bay covers at the bottom of the chassis which makes the installation or upgrade of hardware components a breeze. No cable is required and no cooling system needs to be installed - the system is quickly completed.

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Intel Core Processor Architecture

The Shuttle Slim PC DS47 is equipped with an Intel® Celeron™ 847 processor which is soldered to mainboard and passively cooled by a large heat-sink. Although the Thermal Design Power (TDP) is 17 watts, the average heat dissipation is much lower. The processor belongs to Intel's second-generation Intel Core processor family (Codename: "Sandy Bridge") with which performance and architecture is fundamentally superior to Atom D2700/D2550 processors. The Celeron 847 is originally intended for mobile solutions and features 2 MB Cache, dual channel memory interface and a powerful Intel HD graphics chip. It is capable of decoding Full HD video with driver support for all major operation systems including Windows XP, 7, 8 and Linux.

No fan noise

A large heat sink 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. bedroom, library, living room, music studio etc.

Energy-saving

Power consumption mainly depends on system load. Equipped with a 2.5" hard disk, the system consumes about 11W in idle mode and max. 30W under full load. Running the device 5 days a week for eight hours a day, the annual consumption would amount to less than 23 kWh which would mean just 6 Euros on the power bill (25 Euro ct/kWh) - way less than a conventional desktop PC draws.

Great Connectivity

Despite its small size, DS47 sports a wide range of I/O connectors. Besides an SD card reader, it sports a couple of USB 3.0, USB 2.0, Gigabit-LAN, digital video, audio and serial ports.

Dual View Technology with HDMI and DVI

DS47 features two digital video outputs: HDMI and DVI-I. Dual View technology offers multiple display support on up to two separate monitors. This helps to improve on productivity by allowing for spreading multiple windows across two monitors while working with them simultaneously.

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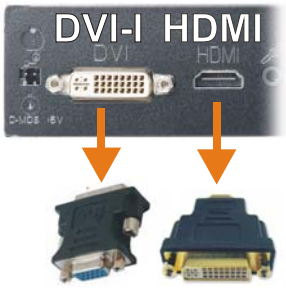
Dual Gigabit LAN Network

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 DS47 even supports two of them. Dual networking allows the computer to connect to a single network using two cables at once with an appropriate switch (teaming mode with load balancing or failover function) or to two different networks depending on the needs of the user.



VGA DVI-D

Video outputs

With optional adapters DVI-D devices can be connected to the HDMI port or VGA devices to the DVI-I port, respectively.

DVI-D means the connector only outputs digital video signals.
DVI-I means digital and analog video signals are put out.
HDMI supports digital video plus multi-channel digital audio output.
D-Sub / VGA means analog video signals are put out.

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 industrial applications. DS47 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 Jumper JP2 configuration on the mainboard, it can be configured as Ring Indicator (RI) or external power supply with either 5V or 12V voltage level (each COM port separately).

WLAN mSATA

Expansion slots for Mini-PCI-Express cards

DS47 features two Mini PCI Expess expansion slots which can easily accessed by removing the appropriate bay cover. One slot supports half size cards and is already occupied with a WLAN card. The other slot also supports full size cards and can be used either for a Mini PCIe card or for a mSATA (Mini Serial ATA) card, which is a Solid State Drive (SSD) in a compact Mini PCIe card form factor.

VESA mount

The supplied 75/100mm VESA mount allows DS47 to be installed on to walls 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 this, the chassis of DS47 provides numerous threaded holes (M3) enabling it to be fitted almost anywhere.

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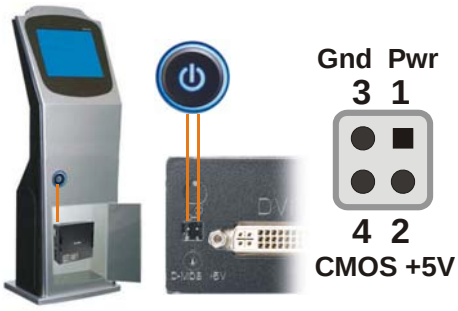
SD Card Reader

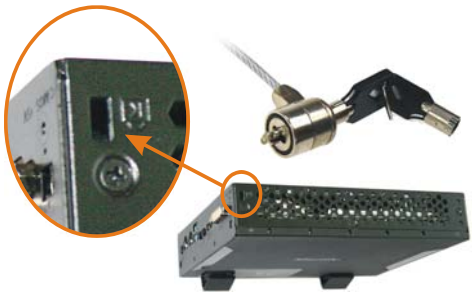
The built-in SD card reader at the front side makes it easy to transfer files from your camera so you can share videos and photos on your DS47 with ease. It supports SD, SDHC and SDXC memory flash cards in standard size format also supports boot up from bootable SD cards.



External power button by separate remote line

If because of space constraints (e.g. in the case of a 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 DS47 (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).



Kensington Lock

This is a small, metal-reinforced hole as part of an anti-theft system. DS47 provides an appropriate hole on both side of its chassis. The lock-and-cable is not included.

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

Shuttle DS47 is officially approved for 24/7 permanent operation. Thanks to its low power consumption and completely passive cooling, this PC runs highly reliable making it perfectly suitable for digital signage and POI/POS applications – even at ambient temperatures up to 40 ° C. [5]

Conditions for permanent use:

- 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 (max. one hard disk)
- for ambient temperature >35°C we strongly recommend to use SSDs (instead HDD) and rugged memory with wide temperature range [5].

Operating Position

The passive cooling system of DS47 uses the convective heat-transfer principle, which requires observing the correct operation position of the device. Please follow these instructions in order to obtain the best possible cooling effect:

1) Device must only be used in vertical position with the DVI port facing up

2) Please make sure to use either the supplied feet or the VESA mount

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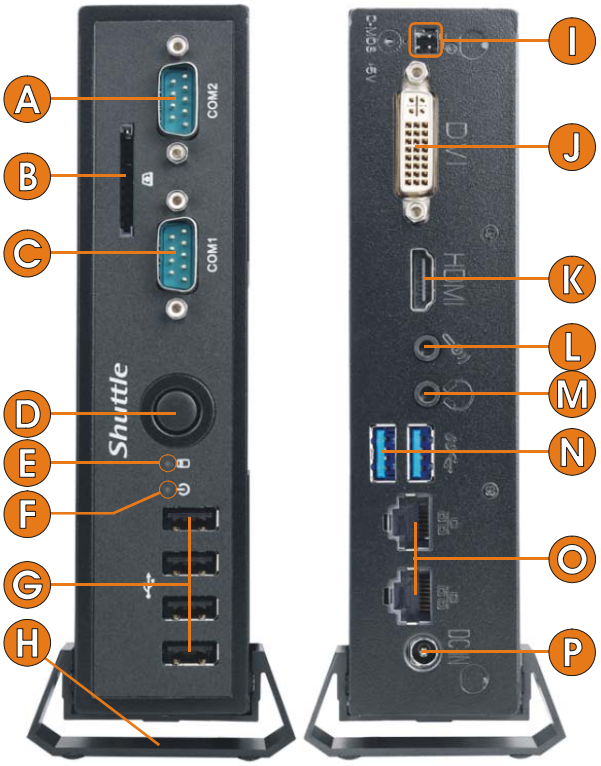
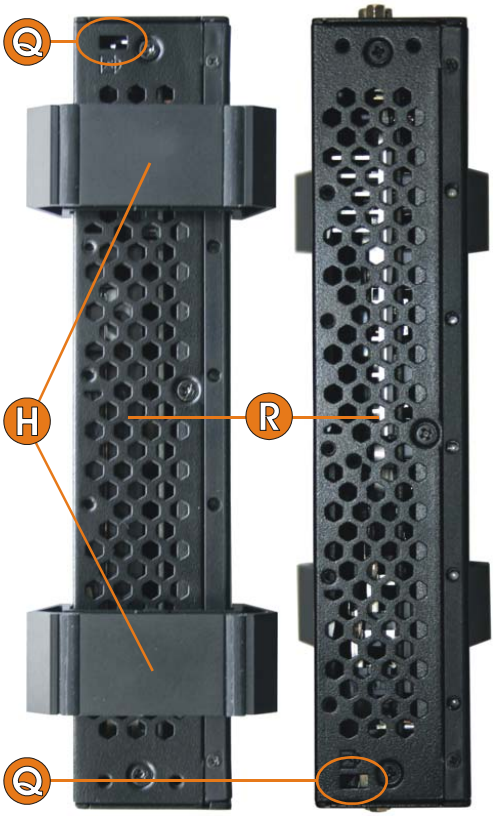
Shuttle DS47 – Product Views



- **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** 4x USB 2.0
- **H** Stand
- **I** Pin connector for external power or CMOS button or 5V DC voltage supply
- **J** DVI-I Video Port
- **K** HDMI Video Port
- **L** Microphone input
- **M** Head phone output
- **N** 2x USB 3.0
- **O** 2x RJ45 Gigabit LAN
- **P** DC connector for external power adapter
- **Q** Hole for the Kensington lock
- **R** Ventilation holes
- **S** Bay for 2.5“ storage (HDD or SSD) *)
- **T** Slot for Mini PCIe card or mSATA module (full size or half size) *)
- **U** Slot for half size WLAN module *)
- **V** 2x SO-DIMM slot for DDR3 memory modules *)



*) The WLAN module is included in the scope of delivery in the form of a Mini-PCIe card. The other components such as hard disk, SSD, memory modules, other Mini-PCIe cards or mSATA modules are not.

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Shuttle DS47 Specifications

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: idle: 10-11W, full load: 22-30W (without/with graphics) (measured with 2x 2GB SO-DIMM, 500 GB 2.5" hard disk)
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" drives and Mini-PCIe cards 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	Operation Position: 1) Device must only be used in vertical position with the DVI port facing up 2) Please make sure to use either the supplied feet or the VESA mount
Operation System	This barebone system comes without operating system. It is compatible with Windows 8, Windows 7, Windows XP and Linux Supports 32 and 64 bit.
Processor	Model: Intel Celeron 847 Code name: Sandy Bridge (2nd Gen. Core) Cores / Threads: 2 / 2 Clock rate: 1.1 GHz L1/L2/L3 cache: 128 kB / 512 kB / 2048 kB Memory controller: DDR3-1066/1333 Dual Channel TDP wattage: 17 W maximum, 13.8W typical Manufacturing process: 32 nm Socket: FCBGA1023 Enhanced SpeedStep technology Maximum Tjunction Temperature: 100°C Integrated Intel HD graphics engine Supports 64 Bit, VT-x with EPT, SpeedStep

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Integrated graphics	Intel HD graphics Clock rate: 350~800 MHz Maximum resolution: 2560 x 1600 (analog), 1920 x 1200 (digital, via DVI-D / HDMI) Execution Units (EU): 6 Supports two independent screens Supports DirectX 10.1, Shader 4.1, OpenGL 3.0 HDMI supports HD video plus multi-channel digital audio via a single cable
Mainboard Chipset BIOS	Shuttle Mainboard FS47 All capacitors are high quality solid capacitors Chipset: Intel® NM70 Express Supports resume after power failure Supports Wake on LAN (WOL) Supports Power on by RTC Alarm Supports boot from USB devices and SD card reader AMI BIOS in 8 Mbit EEPROM with SPI interface Supports hardware monitoring and watch dog functionality Supports Unified Extensible Firmware Interface (UEFI) [1]
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 Support	2x SO-DIMM slots with 204 pins Supports DDR3-1066 (PC3-8500) and DDR3-1333 (PC3-10600) SDRAM DDR3-1600 (PC3-12800) is supported at 1333 MHz clock rate. Supports Dual Channel mode Supports max. 8 GB per DIMM, maximum total size of 16 GB Supports two unbuffered DIMM modules (no ECC)
Mini-PCIe slots	Two Mini PCI Express expansion slots: full size and half size 1) the half size slot is occupied with a WLAN module 2) the full size slot supports PCIe 2.0, SATA 3G and USB 2.0 and can either be used for a Mini-PCIe card or for a Mini SATA (mSATA) flash memory card [3] Please use the "Mini-PCIE / mSATA Select" function in the BIOS setup.
Audio	Audio Realtek® ALC 662 High-Definition Audio (5.1 channel) Two analog audio connectors (3.5mm) at the back panel: 1) 2 channel line out (head phone) 2) microphone input Digital multi-channel audio output: via HDMI
Dual Gigabit LAN Controller	Dual Realtek 8111G Ethernet network controller (Gigabit) Supports 10 / 100 / 1.000 MBit/s operation With two RJ45 ports (dual network) supports Teaming [2] Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE)

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Wireless Network (WLAN)	Built-in Mini-PCIe WLAN card (half size) and internal antenna Supports IEEE 802.11b/g/n, max. 150Mbps up-/downstream Security: WPA/WPA2(-PSK), WEP 64/128bit, IEEE 802.11x/i
2.5" drive bay	Supports one Serial ATA hard disk or one SATA SSD drive in 6.35cm/2.5" format Device height: 9.5 or 12.5 mm (max.) Supports Serial-ATA III, 6 Gb/s (600 MB/s) bandwidth Supports Unified Extensible Firmware Interface (UEFI) [1] Note: no Serial ATA cable is required
Card reader	Integrated USB card reader Supports SD, SDHC and SDXC memory flash cards Supports boot up from SD card
Front Panel Connectors	4x USB 2.0 2x RS232 serial ports (5V/12V, 1x switchable to RS422 / RS485) with black plastic caps SD card reader (supports SD, SDHC, SDXC) Power button Power LED (blue) HDD LED (yellow)
Back Panel Connectors	HDMI 1.3 connector (supports DVI-D with optional adapter) DVI-I connector (supports VGA with optional adapter) 2x USB 3.0 2x Gigabit LAN (RJ45) Microphone input Audio Line-out (headphone) DC-input connector for external power adapter 4 pin connector (2.54 mm pitch) for power button, Clear CMOS and 5V DC [4] Perforation for optional Wireless LAN antennas (2 holes)
Other Onboard Connectors	Connector for CMOS battery (with battery) Fan connector (4 pins) not occupied LVDS connector (50 pins) Jumpers for panel voltage and converter voltage select
Scope of delivery	Multi-language user guide Two metal feet 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 device) Three screws M3 x 4 mm and a rack (to mount a 2.5" storage into the bay) Driver DVD (Windows 8 / 7 / XP) External power adapter with power cord
Environmental Specifications	Operating temperature range: 0~40 °C [5] Relative humidity, non-condensing: 10~90%

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Conformity Certifications	EMI: FCC, CE, BSMI, C-Tick Safety: CB, BSMI, ETL, CCC 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-guidelines: - EMV-guideline 89/336/EWG electromagnetic tolerance - LVD-guideline 73/23/EWG use of electric devices within certain voltage-limits

Footnote:

[1] Unified Extensible Firmware Interface (UEFI) - required when booting from hard disks larger than 2.2 TB

[2] Teaming Mode

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

[3] mini-SATA (mSATA)

not to be confused with the "micro SATA" connector, is a newer industry standard which converts the electrical SATA interface (1.5 or 3.0 Gbit/s) to the pysical "Mini PCI Express" mini card form factor.

[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 temperature over 35°C we strongly recommend to use SSDs (supporting at least 70°C) and rugged SODIMM memory with wide temperature range (up to 95°C).
Suggested vendors for rugged memory modules:
Samsung: http://www.samsung.com/global/business/semiconductor/product/computing-dram/catalogue?iaId=690
Elpida: http://www.elpida.com/en/products/ddr3module.html
Micron: http://www.micron.com/products/dram/ddr3-sdram#fullPart&186=1&219=3,4,5,6&220=3

Supplied accessory: VESA mount with screws

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