Cost-effective and reliable Digital Signage communication platform

Shuttle's DS61 V1.1 is a slim, but powerful x86-based Digital Signage Platform offering the best quality, performance and connectivity to meet the requirements of processing high quality digital media. DS61 V1.1 helps you build an affordable media player to spice up your marketing and merchandising effectiveness at exhibitions, hotels, office lobbies, customer waiting areas, shopping malls and retail outlets - the possibilities are highly versatile. With its robust metal chassis and outstanding temperature range the DS61 V1.1 is an industrial-grade signage platform designed for long-term, smooth and reliable operation.

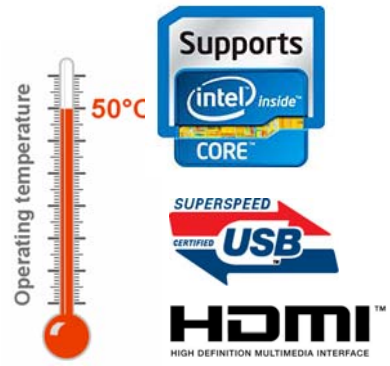
1.3L Slim PC Barebone

DS61 v1.1

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

Feature Highlights

Slim Design	• Slim 1.3 litre metal chassis, black • 190 x 165 x 43 mm (LWH) • Operating temperature: 0~50°C • Including VESA mount (75/100 mm)
Operating system	• The operating system is not included • Compatible w. Windows XP/Vista/7/8, Linux
Processor	• Supports Socket 1155 CPUs, max. 65W TDP • Supports Core i7 / i5 / i3, Pentium, Celeron • Supports 32nm and 22nm processors • Including cooling system with 2 fans
Chipset	• Intel H61 Express Chipset
Memory	• 2x 204 pin SO-DIMM slots • Supports DDR3-1333/1600, max. 2x 8 GB
Graphics	• Integrated Intel HD graphics (features depends on processor) • Video-outputs: HDMI and DVI-I
Storage Bays	• Bays: 1x 6.35cm/2.5" for hard disk or SSD • Slot: Full-Size Mini-PCIe slot supports mSATA
Other Connectors	• 2x Audio (Line out and microphone) • 2x USB 3.0 rear, 4x USB 2.0 front • SD card reader • Dual Gigabit LAN (RJ45), supports WOL, PXE • 2x COM ports (RS232 + RS232/RS422/RS485) • Connector for external power button
Power Supply	• External 90W fanless power adapter
Application	• Digital Signage, POS, control device, etc.



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Shuttle Slim-PC Barebone DS61 V1.1 – Product Features

Robust, stylish and particularly small

You should have held it in your own hands to see how small it actually is. Barely measuring a volume of 1.35 litre, 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. The interior of the DS61 V1.1 is very tidy too so that it won't take long to set it up. Its sleek and stylish looks lets it easily find a place in both home and office environments.

What does Barebone mean?

The Shuttle Slim-PC Barebone DS61 V1.1 consists of a stylish metal 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. The Mini-PC is customisable and takes socket 1155 processors (max. 65W TDP), DDR3 SO-DIMM memories and a 2.5" storage drive (hard disk or SSD). Once the desired operation system is installed, the DS61 V1.1 is ready to use. Moreover, the system features pre-routed cables that are tied down from factory to reduce clutter, increase airflow and ease component installation.

Supports LGA1155 processors and up to 16 GB DDR3

A wide range of socket 1155 Intel processors is available starting from Celeron up to Core processors with a maximum TDP of 65W. Plus, the system memory can be installed according to individual needs up to a maximum capacity of 16 GB DDR3 memory.

Low noise thanks to heat-pipe cooling system

An active dual-fan heatpipe cooling system ensures whisper-quiet operation and system stability. The following results have been measured in combination with an Intel Core i5-3450S processor:
1) Idle mode: 24.5 dBA, fan: 1912 RPM
2) 3DMark06: 27.1 dBA, fan: 2250 RPM
(front side sound pressure in 0,5 meter distance at 25°C ambient temperature)

Extended temperature range and reliability

The DS61 V1.1 is outstandingly robust thanks to its tough chassis, and with an operating temperature range of 0-50 °C it is suitable for use in the most demanding environments. Designed entirely using all solid capacitors, DS61 V1.1 is guaranteed to deliver maximum stability, reliability and longer system lifetime for long-term applications like digital signage.
Caution: for high ambient temperature over 40°C we strongly recommend to use SSDs (supporting at least 70°C) and rugged SODIMM memory with wide temperature range (up to 95°C).

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Energy-saving

The power consumption mainly depends on the processor in use and its load. Using an Intel Pentium G860 processor, the system consumes about 23W in idle mode (27W with Intel Core i7-2600S). Under full load, the power consumption is 52W (94W respectively).
Note: the maximum output wattage of the power adapter is specified with 90W. Assuming, the adapter's efficiency is 90%, the input wattage can be up to 100W.

Great Connectivity

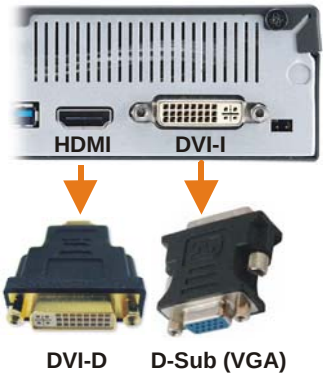
Despite its small size, DS61 V1.1 sports a wide range of I/O connectors. Beside the SD card reader, it features each a couple of USB 3.0, USB 2.0, Gigabit LAN, digital video, audio and serial ports.

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 DS61 V1.1 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.

Dual View Technology with HDMI and DVI

DS61 V1.1 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.



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.

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. DS61 V1.1 features two serial RS-232 ports which also support both 5 or 12V auxiliary voltage. The left COM port also supports the RS422 and RS485 standard.

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Expansion slot for Mini-PCI-Express cards

The Mini-PCIe expansion slot can be used either for a half size or a full size card. It provides not only PCIe and USB 2.0 but also supports mSATA (Mini Serial ATA), which is the new generation of Solid State Drives (SSD) in a compact Mini PCIe card form factor.
Photos: half size Mini-PCIe WLAN card (left) and mSATA SSD card (right).

VESA mount

The supplied 75/100mm VESA mount allows it to install DS61 V1.1 on to walls or just affixed on the rear side of a monitor which is particularly interesting for the industry segment, company buildings and public institutions. Beside this, the chassis of DS61 V1.1 provides 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. DS61 V1.1 provides an appropriate hole on both side 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 the 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 two-pin-connector at the back panel of DS61 V1.1 (pitch 2.54 mm).

DS61

DS61 v1.1

Comparison: DS61 versus DS61 v1.1

Version 1.1 features two additional USB 2.0 connectors at the front panel..

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Connectivity / Applications

The DS61 V1.1's great connectivity makes it well-suited for a wide field of applications and external devices.

The DS61 V1.1 is your powerful 1.3-litre Slim-PC solution for high performance driven applications, e.g.:

- Digital Signage
- In-store Audio/Video entertainment
- Gambling
- Home-Media
- Office
- Call Center
- Education
- Kiosk
- Point of Sales (POS)
- Medical
- Automation
- Small server

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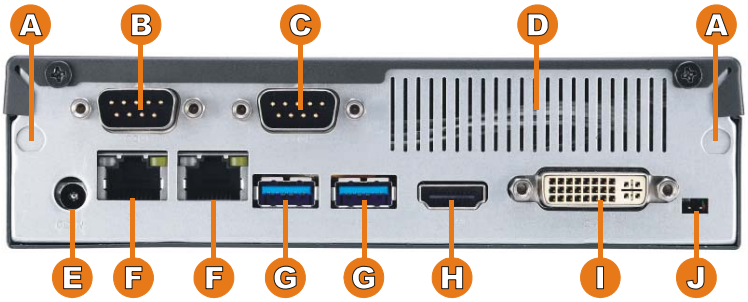
Shuttle DS61 V1.1 – Front and Back Panel

Front view

1 SD Card Reader
2 Power LED
3 Hard disk LED
4 Power Button
5 4x USB 2.0
6 Microphone input
7 Headphone output

Rear view



A 2x WLAN perforation
B RS232/RS422/RS485
C RS232
D Ventilation grille
E DC power input
F 2x RJ45 Gigabit LAN
G 2x USB 3.0
H HDMI video port
I DVI-I video port
J Connector for external power button (two pins, 2.54 mm pitch)
K 2x holes for Kensigton Lock
L VESA mount (two parts)

Right side

Left side

COM port Pin 9 Configuration
Pin 9 is a multi-functional signal. 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).

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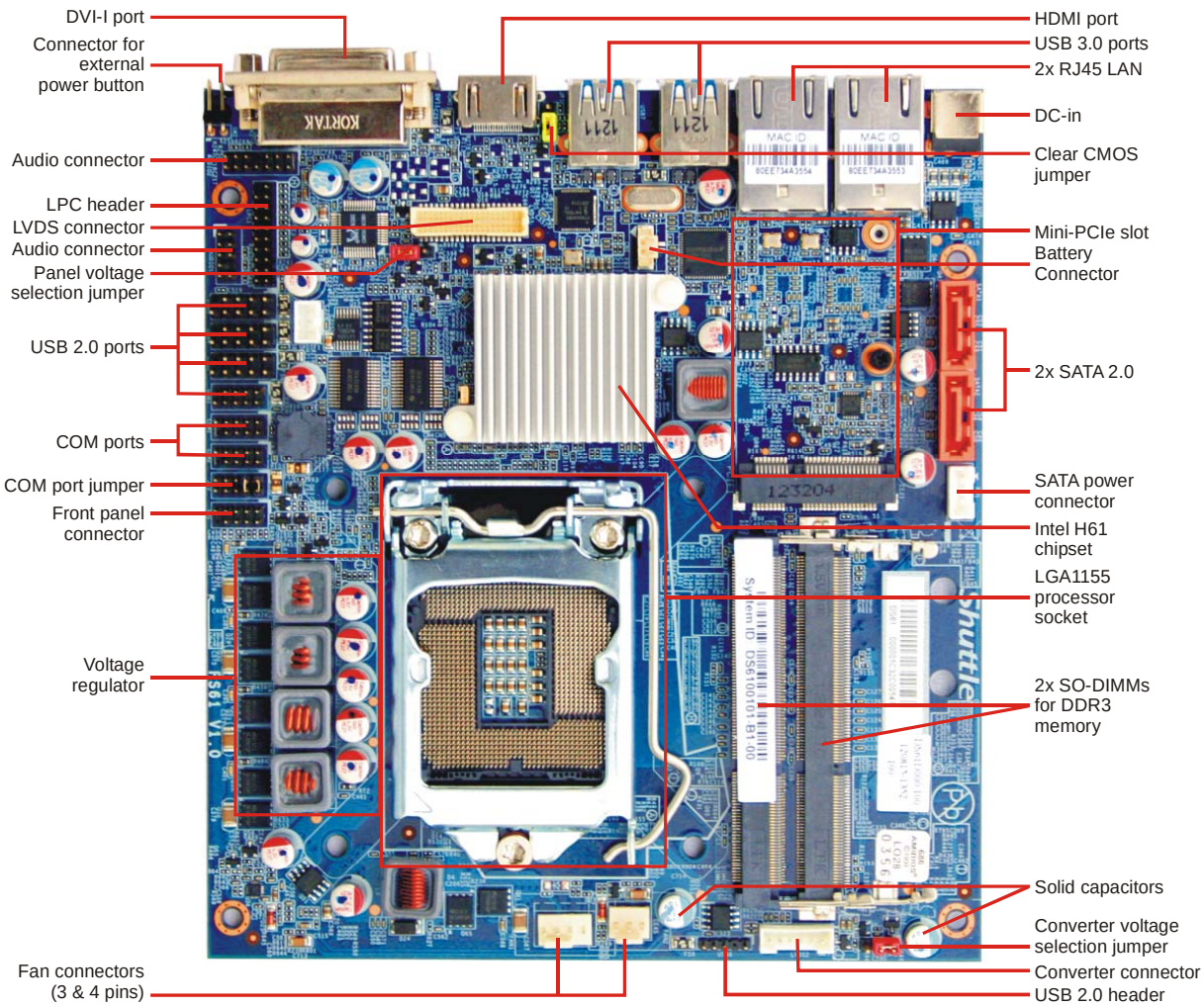
Shuttle DS61 V1.1 – Mainboard



Shuttle DS61 V1.1 – Required Components

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

LGA1155 processor
TDP max. 65W (22 or 32nm)
Core i7 / i5 / i3, Pentium
or Celeron

2.5” SATA hard disk
or Solid State Disk (SSD)
(max. 12.7 mm height)

Windows / Linux
Operating System

Up to two DDR3-1333/1600
SO-DIMM memory modules
max. 8GB each

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Shuttle DS61 V1.1 Specifications

Chassis	Nettop PC with black chassis made of metal Dimensions: 190 x 165 x 43 mm (LWH) = 1.35 litresStorage bays 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
Storage Bay	1x 6.35cm / 2.5" storage bay supports one hard disk or SSD drive Device height: 9.5 or 12.7mm (max.)
Operation System	This system comes without operating system. It is compatible with Windows 8, Windows 7, Windows Vista, Windows XP and Linux (tested with OpenSUSE 12.2, Ubuntu 12.10 and Fedora 17)
Mainboard Chipset BIOS	Chipset: Intel® H61 Express Chipset AMI BIOS in 8Mbit EEPROM with SPI interface All capacitors are high quality solid capacitors Supports hardware monitoring and watch dog functionality Supports Unified Extensible Firmware Interface (UEFI) [2] Supports resume after power failure
Power Adapter	External 90W power adapter (fanless) Input: 100~240V AC, 50/60 Hz Output: 19V DC, 4.74A, max. 90W DC Connector: 5.5/2.5mm (outer/inner diameter)
Processor Support	Socket 1155 (LGA 1155) supports the second and third generation of Intel Core i3 / i5 / i7 / Pentium / Celeron processors with a power consumption of up to 65W TDP - Codename "Sandy Bridge", 32nm process technology and - Codename "Ivy Bridge", 22nm process technology Not compatible with older Socket-1156 processors. The Processor integrates PCI-Express, memory controller and the graphics engine on the same die (depends on processor type) Please refer to the support list for detailed processor support information.
Processor Cooling	Processor cooling with and two 60mm fans on the upper side of the chassis
Memory Support	2x SO-DIMM slots with 204 pins Supports DDR3-1066/1333/1600 SDRAM memory (PC3-8500/10600/12800) The maximum memory clock rate depends on the processor type. Supports Dual Channel mode Supports max. 8 GB per DIMM, maximum total size of 16 GB Supports two unbuffered DIMM modules of 1.5V

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Integrated Graphics	The features of the integrated graphics function [3] depend on the used processor type. "Sandy Bridge" processor: Intel® HD Graphics 2000/3000, DirectX 10.1 "Ivy Bridge" processor: Intel® HD Graphics 2500/4000, DirectX 11 Maximum shared memory size: 1692MB Supports HDMI, max. resolution up to 1920x1200 @ 60Hz Supports DVI, max. resolution up to 1920x1200 @ 60Hz Supports D-Sub, max. resolution up to 2048x1536 @ 75Hz (optional VGA-to-DVI-adapter required) Supports Blu-ray Stereoscopic 3D with HDMI 1.4a [1] Supports HDCP function with DVI and HDMI ports Supports Full HD 1080p Blu-ray (BD) / HD-DVD playback with DVI and HDMI ports Supports Dual-Independent-Display via HDMI and DVI-I port HDMI supports HD video plus multi-channel digital audio via a single cable
Mini-PCIe slots	1x Mini PCI Express expansion slot, full size supports PCIe 2.0, SATA 3G and USB 2.0 e.g. for Mini SATA (mSATA) flash memory cards [6]
Audio	Realtek® ALC 662 High-Definition Audio (5.1 channel) Two analog audio connectors (3.5mm) at the front panel: 1) 2 channel line out (head phone) 2) microphone input Digital multi-channel audio output: via HDMI
Dual Gigabit LAN Controller	Dual Realtek 8111E Ethernet network controller (Gigabit) Supports 10 / 100 / 1.000 MBit/s operation With two RJ45 ports (dual network) supports Teaming [4] Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE)
Drive Connectors	2x Serial-ATA II, 3 Gb/s (300 MB/s) bandwidth Supports Unified Extensible Firmware Interface (UEFI) [2] Note: This barebone system comes with one pre-installed SATA cable
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 (headphone) 4x USB 2.0 SD card reader Power button Power LED (blue) HDD LED (yellow)

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Back Panel Connectors	HDMI connector [1] (supports DVI-D with optional adapter) DVI-I connector (supports VGA with optional adapter) 2x USB 3.0 2x GigaBit LAN (RJ45) 2x RS232 serial ports (5V/12V, 1x switchable to RS422 / RS485) DC-input connector for external power adapter 2 pin connector for power on button (2.54 mm pitch) Perforation for Wireless LAN antennas (2 holes)
Other Onboard Connectors	4x USB 2.0 (two 2x5 pin headers) 4x USB 2.0 (two 2x5 pin, occupied by the front panel) 2x fan connectors (3pin and 4 pin) for the system fans Clear CMOS jumper (2 pins) Digital audio: S/PDIF output (3 pins) Connector for CMOS battery (with battery) 2x10 pins LPC interface (2 mm pitch size) 2x front panel connectors (for audio) Power connector for SATA drives (4 pins) LVDS and converter conntector Jumpers for panel voltage and converter voltage select
Scope of delivery	Multi-language user guide 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) Four screws M3 x 4 mm (to mount a 2.5" storage into the bay) Driver DVD (Windows 7 32/64 bit, Windows Vista 32/64 bit, Windows XP 32 bit) 1x SATA cable (preinstalled for 2.5 HDD/SSD drive) 1x 4 pin to SATA power cable External power adapter with power cord Screws and heatsink compound
Environmental Specifications	Operating temperature range: 0~50°C [7] Relative humidity, non-condensing: 10~90%
Conformity Certifications	EMI: FCC, CE, BSMI, C-Tick Safety: CB, BSMI, ETL 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

[1] HDMI version supported
HDMI 1.4 is not supported by all LGA1155 processors. Some models support HDMI 1.3 only.
[2] Unified Extensible Firmware Interface (UEFI)
required when booting from hard disks larger than 2.2 TB under Windows 64 bit operating systems such as Windows 7, Windows Vista SP1 and Windows Server 2008/2003 SP1.
[3] Integrated video outputs (HDMI and DVI-I)
Not all LGA1155 Intel processors support integrated graphics. Please check the specification of the used processor. If you want to use the video outputs, then please make sure, that the used processor provides integrated graphics.
[4] Teaming Mode

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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.

[5] Optional Wireless LAN module:

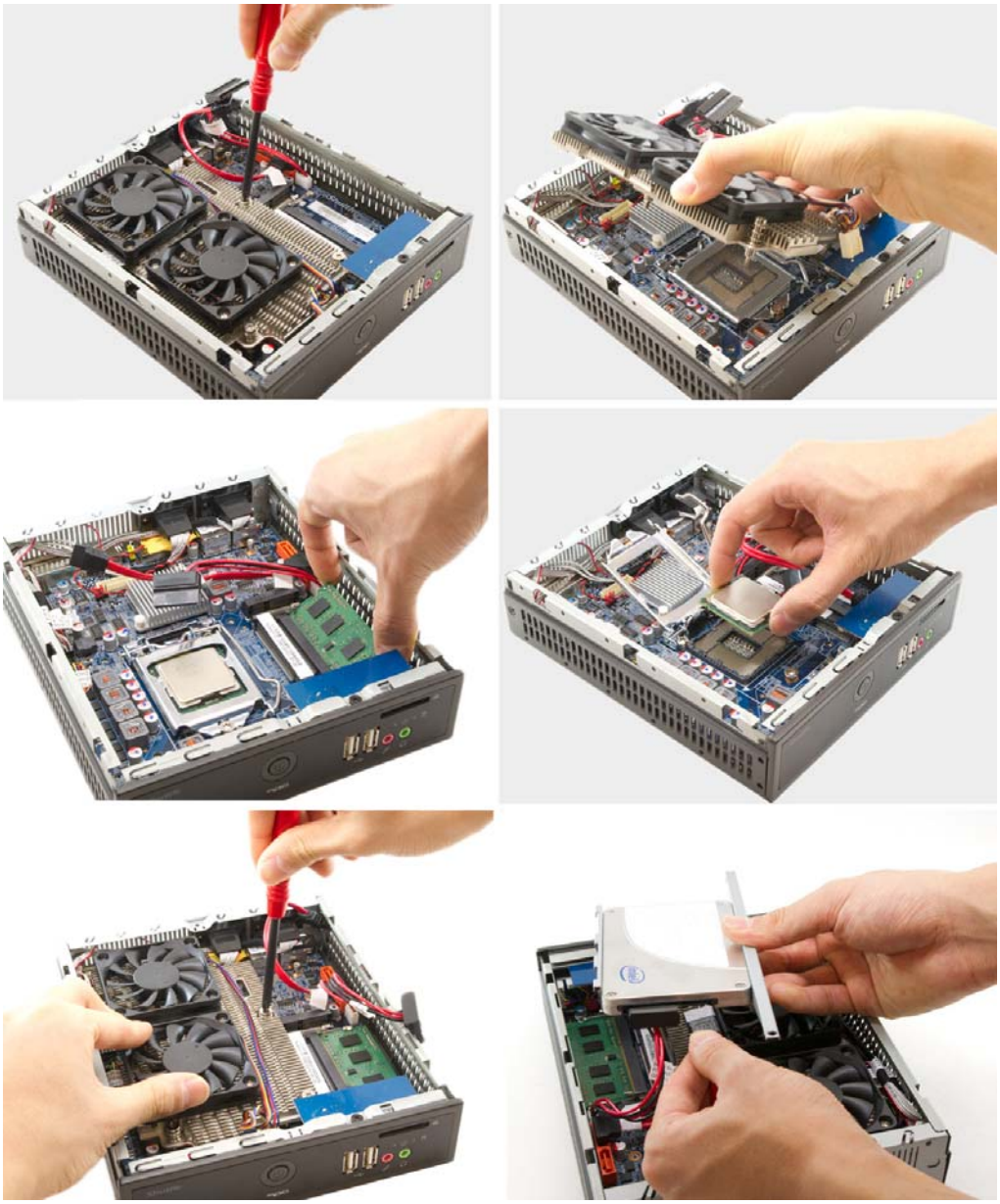
this Slim PC supports an optional WLAN module, which consists of a half-size Mini-PCIe card with IEEE 802.11n functionality and an external antenna with appropriate antenna cable.

[6] 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.

[7] Caution: for high ambient temperature over 40°C we strongly recommend to use SSDs (supporting at least 70°C) and rugged SODIMM memory with wide temperature range (up to 95°C).

Shuttle DS61 V1.1 – Installation



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2rd Generation Intel Core Processor Family (max. 65W)

LGA1155 socket "32nm Sandy Bridge" processor overview (Date: April 2013)

Name	Model	Cores	HT	Clock	Turbo	Cache	TDP	Graphics	Graphics clock
Celeron	G440	1	-	1.6 GHz	-	1 MB	35 W	HD	650~1000 MHz
	G460	1	Yes	1.8 GHz	-	1.5 MB	35 W	HD	650~1000 MHz
	G465	1	Yes	1.9 GHz	-	1.5 MB	35 W	HD	650~1000 MHz
	G530	2	-	2.4 GHz	-	2 MB	65 W	HD	850~1000 MHz
	G530T	2	-	2.0 GHz	-	2 MB	35 W	HD	650~1100 MHz
	G540	2	-	2.5 GHz	-	2 MB	65 W	HD	850~1000 MHz
	G540T	2	-	2.1 GHz	-	2 MB	35 W	HD	650~1000 MHz
	G550	2	-	2.6 GHz	-	2 MB	65 W	HD	850~1000 MHz
	G550T	2	-	2.2 GHz	-	2 MB	35 W	HD	850~1000 MHz
	G555	2	-	2.7 GHz	-	2 MB	65 W	HD	850~1000 MHz
Pentium	G620T	2	-	2.2 GHz	-	3 MB	35 W	HD	650~1100 MHz
	G620	2	-	2.6 GHz	-	3 MB	65 W	HD	850~1100 MHz
	G622	2	-	2.6 GHz	-	3 MB	65 W	HD	850~1100 MHz
	G630	2	-	2.7 GHz	-	3 MB	65 W	HD	850~1100 MHz
	G630T	2	-	2.3 GHz	-	3 MB	35 W	HD	650~1100 MHz
	G632	2	-	2.7 GHz	-	3 MB	65 W	HD	850~1100 MHz
	G640	2	-	2.8 GHz	-	3 MB	65 W	HD	850~1100 MHz
	G640T	2	-	2.4 GHz	-	3 MB	35 W	HD	650~1100 MHz
	G645	2	-	2.9 GHz	-	3 MB	65 W	HD	850~1100 MHz
	G645T	2	-	2.5 GHz	-	3 MB	35 W	HD	650~1100 MHz
	G840	2	-	2.8 GHz	-	3 MB	65 W	HD	850~1100 MHz
	G850	2	-	2.9 GHz	-	3 MB	65 W	HD	850~1100 MHz
	G860	2	-	3.0 GHz	-	3 MB	65 W	HD	850~1100 MHz
	G860T	2	-	2.6 GHz	-	3 MB	35 W	HD	650~1100 MHz
	G870	2	-	3.1 GHz	-	3 MB	65 W	HD	850~1100 MHz
Core i3	2100T	2	Yes	2.5 GHz	-	3 MB	35 W	HD 2000	650~1100 MHz
	2100	2	Yes	3.1 GHz	-	3 MB	45 W	HD 2000	850~1100 MHz
	2102	2	Yes	3.1 GHz	-	3 MB	65 W	HD 2000	850~1100 MHz
	2105	2	Yes	3.1 GHz	-	3 MB	65 W	HD 3000	850~1100 MHz
	2120	2	Yes	3.3 GHz	-	3 MB	45 W	HD 2000	850~1100 MHz
	2120T	2	Yes	2.6 GHz	-	3 MB	35 W	HD 2000	650~1100 MHz
	2125	2	Yes	3.3 GHz	-	3 MB	65 W	HD 3000	850~1100 MHz
	2130	2	Yes	3.4 GHz	-	3 MB	65 W	HD 2000	850~1100 MHz
Core i5	2390T	2	Yes	2.7 GHz	3.5 GHz	3 MB	35 W	HD 2000	650~1100 MHz
	2400S	4	-	2.5 GHz	3.3 GHz	6 MB	65 W	HD 2000	850~1100 MHz
	2405S	4	-	2.5 GHz	3.3 GHz	6 MB	65 W	HD 3000	850~1100 MHz
	2500T	4	-	2.3 GHz	3.3 GHz	6 MB	45 W	HD 2000	650~1250 MHz
	2500S	4	-	2.7 GHz	3.7 GHz	6 MB	65 W	HD 2000	850~1100 MHz
Core i7	2600S	4	Yes	2.8 GHz	3.8 GHz	8 MB	65 W	HD 2000	850~1100 MHz

K = unlocked, S = Performance optimized lifestyle, T = Power optimized lifestyle, HT = Hyper Threading (SMT).
Intel HD graphics HD 3000/2000 supports 12/6 Execution Units (Shader-Quads) and DirectX 10.1.
Certain processor models do not include integrated graphics.
Please refer to the support list for detailed processor support information at global.shuttle.com.

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3rd Generation Intel Core Processor Family (max. 65W)

LGA1155 socket "22nm Ivy Bridge" processor overview (Date: April 2013)

Name	Model	Cores	HT	Clock	Turbo	Cache	TDP	Graphics	Graphics clock
Celeron	G1610	2	-	2.6 GHz	-	2 MB	55 W	HD	650~1050 MHz
	G1610T	2	-	2.3 GHz	-	2 MB	35 W	HD	650~1050 MHz
	G1620	2	-	2.7 GHz	-	2 MB	55 W	HD	650~1050 MHz
Pentium	G2010	2	-	2.8 GHz	-	3 MB	55 W	HD	650~1050 MHz
	G2020T	2	-	2.5 GHz	-	3 MB	35 W	HD	650~1050 MHz
	G2020	2	-	2.9 GHz	-	3 MB	55 W	HD	650~1050 MHz
	G2100T	2	-	2.6 GHz	-	3 MB	35 W	HD	650~1050 MHz
	G2120	2	-	3.1 GHz	-	3 MB	55 W	HD	650~1050 MHz
	G2130	2	-	3.2 GHz	-	3 MB	55 W	HD	650~1050 MHz
Core i3	3210	2	Yes	3.2 GHz	-	3 MB	55 W	HD 2500	650~1050 MHz
	3220T	2	Yes	2.8 GHz	-	3 MB	35 W	HD 2500	650~1050 MHz
	3220	2	Yes	3.3 GHz	-	3 MB	55 W	HD 2500	650~1050 MHz
	3225	2	Yes	3.3 GHz	-	3 MB	55 W	HD 4000	650~1050 MHz
	3240	2	Yes	3.4 GHz	-	3 MB	55 W	HD 2500	650~1050 MHz
	3240T	2	Yes	2.9 GHz	-	3 MB	35 W	HD 2500	650~1050 MHz
Core i5	3330S	4	-	2.7 GHz	3.2 GHz	6 MB	65 W	HD 2500	650~1100 MHz
	3350P	4	-	3.1 GHz	3.3 GHz	6 MB	69 W	-	-
	3450S	4	-	2.8 GHz	3.5 GHz	6 MB	65 W	HD 2500	650~1100 MHz
	3470T	4	-	2.9 GHz	3.6 GHz	3 MB	35 W	HD 2500	650~1100 MHz
	3470S	4	-	2.9 GHz	3.6 GHz	6 MB	65 W	HD 2500	650~1100 MHz
	3475S	4	-	2.9 GHz	3.6 GHz	6 MB	65 W	HD 4000	650~1100 MHz
	3550S	4	-	3.0 GHz	3.7 GHz	6 MB	65 W	HD 2500	650~1150 MHz
	3570S	4	-	3.1 GHz	3.8 GHz	6 MB	65 W	HD 2500	650~1150 MHz
	3570T	4	-	2.3 GHz	3.3 GHz	6 MB	45 W	HD 2500	650~1150 MHz
Core i7	3770T	4	Yes	2.5 GHz	3.7 GHz	8 MB	45 W	HD 4000	650~1150 MHz
	3770S	4	Yes	3.1 GHz	3.9 GHz	8 MB	65 W	HD 4000	650~1150 MHz

K = unlocked, S = Performance optimized lifestyle, T = Power optimized lifestyle, HT = Hyper Threading (SMT).
Intel HD graphics HD 4000/2500 features 16/6 Execution Units (Shader-Quads) and supports DirectX 11/OpenGL 3.1.
Certain processor models do not include integrated graphics.
Please refer to the support list for detailed processor support information at global.shuttle.com.

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