Fanless Slim PC DS437T - more comfort and efficiency at work

Never underestimate the power of small. The Shuttle Slim-PC DS437T packs dual-core power for multitasking in a compact 1.3L size, providing sufficient power for your daily work and high definition video playback. It comes with numerous USB3.0/2.0 ports for external peripherals and also supports dual-display output. Thanks to its fanless cooling architecture, the system is virtually noiseless when using with a SSD drive. It is big on performance yet extremely energy-efficient, consuming only 11 Watts in idle mode. The robust metal chassis with user friendly bay covers makes mastering the mini-PC quick and easy. If you need a silent, reliable Mini-PC in your office or living room then DS437T is your perfect choice.

1.3L Slim PC Barebone

DS437T

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

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 1037U, Dual Core, 1.8 GHz • Integrated Intel HD graphics • Fanless heat-pipe cooling
Memory Slots	• 2x SO-DIMM slots, max 2x 8GB DDR3-1333
Storage Bay	• Bay: 6.35cm/2.5" for hard disk or SSD
Connectors	• HDMI 1.3, DVI-I (supports Dual Monitoing) • 4x USB 3.0, 4x USB 2.0 • SD card reader , 2x Audio (Line out + mic) • Gigabit LAN (RJ45), WLAN 802.11n (Wifi) • Internal slot for optional TPM module • Connector for external power button
Power Supply	• External 65 W fanless power adapter
Applications	• Office, Home, Digital Signage, etc. • Approved for 24/7 permanent operation

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Shuttle Order No: PIB-DS437T01

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Shuttle Slim-PC Barebone DS437T – 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 DS437T is sufficient to meet the needs of the most demanding multimedia and computational workloads. The well-designed interior of the DS437T 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 DS437T 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 TPM module (optional)
- keyboard, mouse and operating system

Once the operation system is installed, the DS437T is ready to use.

Ease of installation thanks to bay covers

DS437T 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.

Intel Core Processor Architecture

The Shuttle Slim PC DS437T is equipped with an Intel® Celeron™ 1037U 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 third-generation Intel Core processor family (Codename: "Ivy Bridge") with which performance and architecture is fundamentally superior to Atom D2700/D2550 processors. The Celeron 1037U is originally intended for mobile solutions and features 2 MB Cache, dual channel memory interface and a powerful Intel HD graphics chip which is capable of decoding Full HD video.

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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

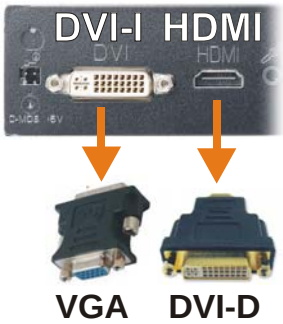
Power consumption mainly depends on system load. Equipped with a 2.5" hard disk, the system consumes about 11W in idle mode and max. 33W under full load. Running the device 5 days a week for eight hours a day, the annual consumption would amount to less than 23 kWh which would mean just 6 Euros on the power bill (25 Euro ct/kWh) - way less than a conventional desktop PC draws.

Great Connectivity

Despite its small size, DS437T sports a wide range of I/O connectors. Besides an SD card reader, it sports 4x USB 3.0, 4x USB 2.0, 2x digital video, 2x audio, 2x serial ports and one Gigabit LAN connector.

Dual View Technology with HDMI and DVI

DS437T 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.

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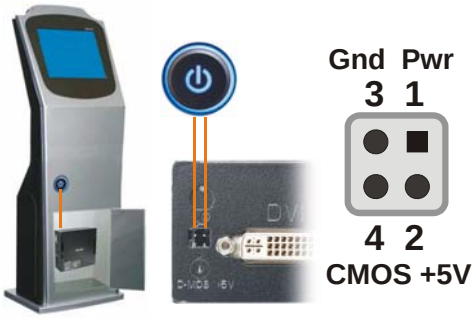
VESA mount

The supplied 75/100mm VESA mount allows DS437T 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 DS437T provides numerous threaded holes (M3) enabling it to be fitted almost anywhere.

SD Card Reader

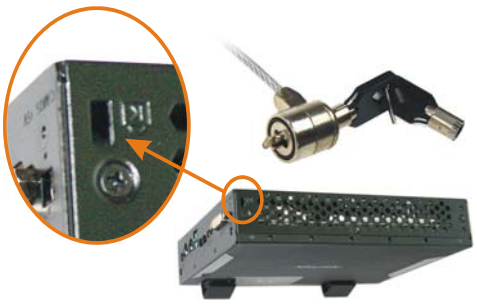
The built-in SD card reader at the front side makes it easy to transfer files from your camera so you can share videos and photos on your DS437T with ease. It supports SD, SDHC and SDXC memory flash cards and also supports boot up from bootable SD cards.



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 DS437T (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. DS437T provides an appropriate hole on both side of its chassis. The lock-and-cable is not included.

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

Shuttle DS437T 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].

TPM expansion slot

Shuttle DS437T can be equipped with an optional Trusted Platform Module (TPM), which offers facilities for the secure generation of cryptographic keys, and limitation of their use, in addition to a random number generator. And it includes capabilities such as remote attestation and sealed storage. The TPM expansion slot is easy accessable behind a chassis cover.

DS437T supports the following TPM 1.2 modules:

- Asus TPM Trusted Platform Module TPM/FW3.19
- GIGABYTE TPM-Module GCTPMR-00-GI

Operating Position

The passive cooling system of DS437T 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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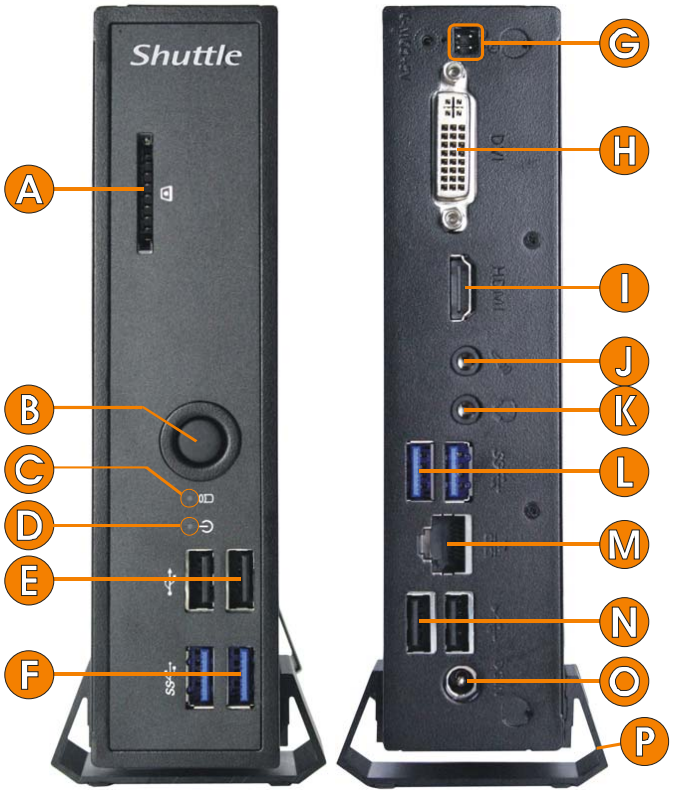
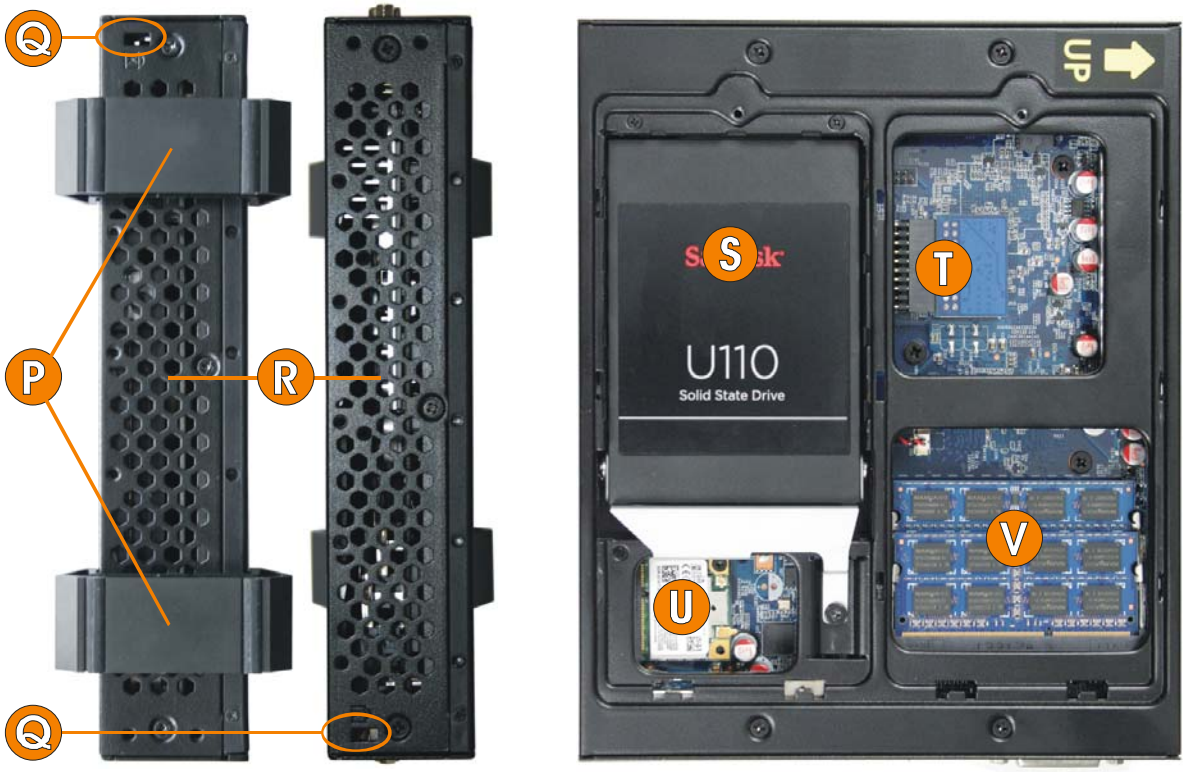
Shuttle DS437T – Product Views



- **A** SD card reader
- **B** On/Off power button
- **C** Hard disk LED indicator
- **D** Power LED indicator
- **E** 2x USB 2.0
- **F** 2x USB 3.0
- **G** Pin connector for external power or CMOS button or 5V DC voltage supply
- **H** DVI-I Video Port
- **I** HDMI Video Port
- **J** Microphone input
- **K** Head phone output
- **L** 2x USB 3.0
- **M** RJ45 Gigabit LAN
- **N** 2x USB 2.0
- **O** DC connector for external power adapter
- **P** Stand
- **Q** Hole for the Kensington lock
- **R** Ventilation holes
- **S** Bay for 2.5“ storage (HDD or SSD) *)
- **T** LPC-Slot for TPM module *)
- **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 expansion cards or TPM modules are not.

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Shuttle DS437T 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 1037U (ULV) Code name: Ivy Bridge (3rd Gen. Core) Cores / Threads: 2 / 2 Clock rate: 1.8 GHz L1/L2/L3 cache: 128 kB / 512 kB / 2048 kB Memory controller: DDR3-1333/1600 Dual Channel TDP wattage: 17 W maximum Manufacturing process: 22 nm Socket: FCBGA1023 Enhanced SpeedStep technology Maximum Tjunction Temperature: 105°C Integrated Intel HD graphics engine Supports 64 Bit, VT-x with EPT, Enhanced SpeedStep, NX bit, SSE4

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Integrated graphics	Intel HD graphics Clock rate: 350~100 MHz Maximum resolution: 1920x1200 (analog or digital) Execution Units (EU): 6 Supports two independent screens Supports DirectX 11.1, OpenGL 4.0 Supports full AVC/VC1/MPEG2 hardware decoding 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 DDR3-1333 (PC3-10600) and DDR3-1600 (PC3-12800) SDRAM 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 slot	Half size Mini PCI Express expansion slots (occupied with a WLAN module)
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
Gigabit LAN Controller	Realtek 8111G Ethernet network controller (Gigabit) Supports 10 / 100 / 1.000 MBit/s operation Supports WAKE ON LAN (WOL) Supports network boot by Preboot eXecution Environment (PXE)
Wireless Network (WLAN)	Built-in Mini-PCIe WLAN card (half size) and internal antenna Single-Chip 1T1R WLAN Controller Realtek RTL8188CE Supports IEEE 802.11b/g/n, max. 150 Mbps up-/downstream Security: WPA/WPA2(-PSK), WEP 64/128bit, IEEE 802.11x/i

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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	2x USB 3.0 2x USB 2.0 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 USB 2.0 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	LPC port (low pin count), 2x 10 pins for optional TPM module [2] Connector for CMOS battery (with battery) Fan connector (4 pins) not occupied
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] LPC port

This expansion slot is compatible with the following TPM 1.2 modules:

- Asus TPM Trusted Platform Module TPM/FW3.19
- GIGABYTE TPM-Module GCTPMR-00-GI

[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?iald=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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Shuttle DS4x Series – Comparison

	DS47	DS437	DS437T
Processor	**Intel Celeron 847** Dual Core 1.1 GHz 32nm „Sandy Bridge“	**Intel Celeron 1037U** Dual Core 1.8 GHz 22nm „Ivy Bridge“	
Integrated graphics	350~800 MHz DirectX 10.1	350~1000 MHz DirectX 11.1	
SO-DIMM Memory	max. 2x 8 GB DDR3-1066/1333	max. 2x 8 GB DDR3-1333/1600	
Front Panel	Card reader 4x USB 2.0 **2x COM (RS232 + RS232/422/485)**		Card reader 2x USB 2.0 **2x USB 3.0**
Back Panel	DVI + HDMI 2x Audio 2x USB 3.0 **2x Gigabit LAN**		DVI + HDMI 2x Audio 2x USB 3.0 **2x USB 2.0** 1x Gigabit LAN
Internal expansion	Full-size Mini-PCIe Slot with **mSATA** support		Internal LPC port supports **TPM module**
Front/Back view			

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