

Foreword

Intel seems to feel very well in the domain of miniITX and brings even more platforms onto the market, which are suitable for differential domains.

Interim a sample of the Multimedia Desktop boards DG45FC, based on the Intel G45 Express Chipset with socket 775 for Intel Core family, arrived.

The board is equipped with the GMA X4500HD graphic chipset, which supports DirectX10 and relieves the CPU at High Definition Video Material appropriately. The HDMI port, Blue-Ray support and HD DVD support, 8 channels Audio or SPDIF are rounding off this multimedia package and they provide the performance necessary for home cinema.

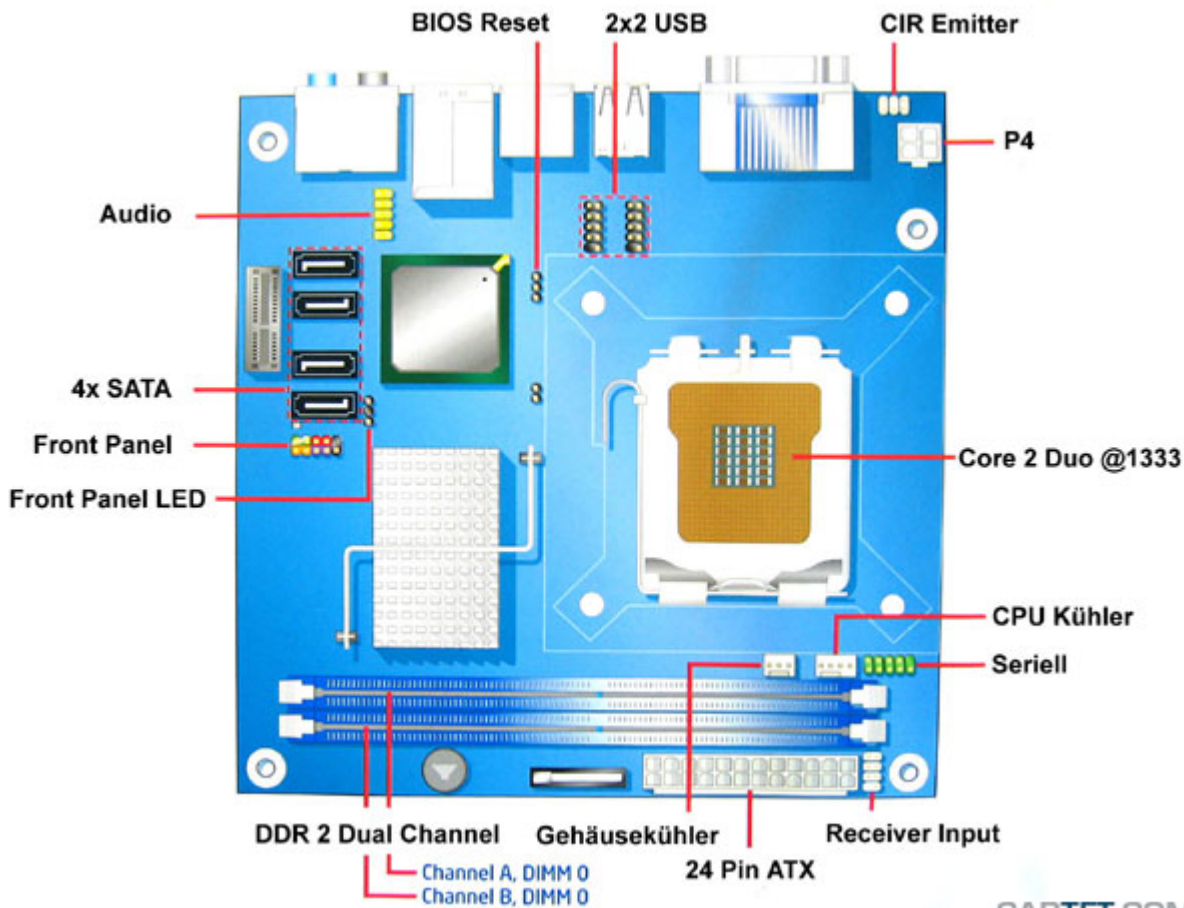
Specifications

Model	DG45FC
Format	Mini-ITX Mainboard
CPU	Intel Core 2 Duo up to 13333FSB (Socket 775)
Chipset	Intel G45 (ICH10)
GPU	Intel GMA X4500HD
RAM	2x DDR2 667/800 Dual Channel (4 GiB max.)
Display ports	1x DVI, 1x HDMI
PCI	1x PCIe 1x
SATA	4x SATA II (RAID), 1x eSATA
Audio	Intel High Definition Audio, 8 channels
LAN	1x 1000Mbit
USB 2.0	6+4x USB 2.0
I/O external	DVI, HDMI, 6x USB 2.0, 1x eSATA, 1x GigaLAN, Audio, SPDIF
I/O internal	1x PCIe 1x, 4x USB 2.0, 4x SATA, Serial, Audio
Power supply	24 Pin ATX, P4-connector
Scope of supply	I/O Blende, 2x SATA Datenkabel, Schnellanleitung
Software	Treiber CD, RAID Treiber FDD
Dimensions	17cm x 17cm

Motherboard and connectors

The DG45FC is a mini-ITX motherboard fit with the G45 ICH10 chipset. An Intel Core 2 Duo CPU with up to 1333FSB can find its place on the socket 775. The X4500HD is responsible for the graphic output.

As mentioned, this motherboard is designed for the multimedia domain and comes along with corresponding equipment. At the connections it immediately stands out that a HDMI output has still found its place directly under the DVI plug-in place.



For external connectivities there is one DVI output, one HDMI, six USB2.0 ports, one eSATA port, one GigaLAN port, the audio-connectors as well as one SPDIF port.

Internal, there are four USB2.0 ports again, four SATA slots, one PCIe 1x slot, serial and audio for the connection of a front panel (not included in the scope of supply).

The two DDR2 RAM slots are good for the efficiency, because they can run "Dual-Channel" mode with two identically modules of RAM. The board gets supplied with a 24 pin ATX connector as well as a P4 connector.

The board layout is built logically and clear. All slots are reachable very good and there are no modifications needed, even if you liked to exhaust all connectivities.



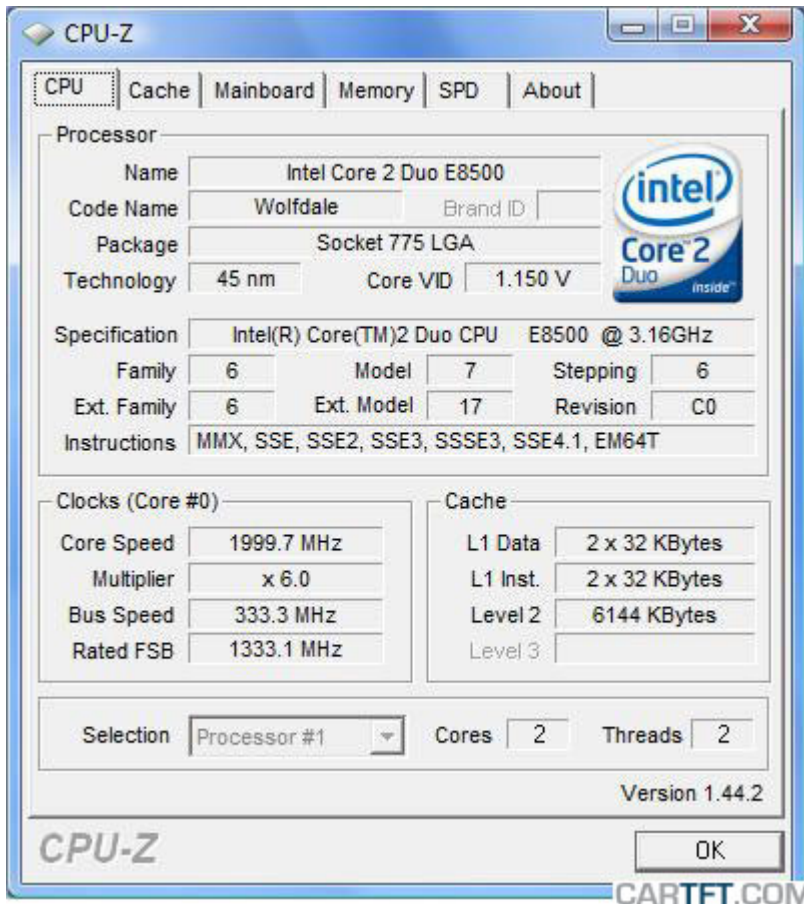
There are some components in the near of the CPU socket, which could be in the way of some coolers, because of their height.

Note: The heat sink has to be suitable for the layout.

Installation, hardware used and operation

The following hardware has been used for the test-system:

- Intel DG45FC with Intel Core 2 Duo E8500
- 2x 1GiB DDR2 800 RAM by Aeon
- 60 GiB SATA HDD with 5400 rpm by WD
- DVD R/RW slim-line by Pioneer
- picoPSU 120W supplied with a 84W AC Adapter



The installation of both operating systems Windows XP Professional and Windows Vista Ultimate 32bit passed without problems with the pre-released drivers. The usual full automatic installation routine wasn't on the CD though. So the drivers had to be installed one by one out of their folders.

Because the motherboard is classified in the multimedia category, the tests were made with different video material and the work load of the CPU was observed.

For High Definition test a Blue-Ray Rip with 1080p was used and AC3 was converted into TS format. The movie was played with VLC Media Player. The work load of the CPU was increasing to max. 25% at 1980x1200 resolution and most of the time it was moving between 14-17%, which on the one side is to owe the enormous system and on the other hand the optimized graphic chip for HD. The work load of the CPU lays at about 5% with a MPEG file, while a *.mov format was at average 4%.

For an on-board solution the audio playback is okay. The sound feels clear and powerful.

But the appearance, the volume and the stereophonic sound cannot keep pace with a PCI sound card.

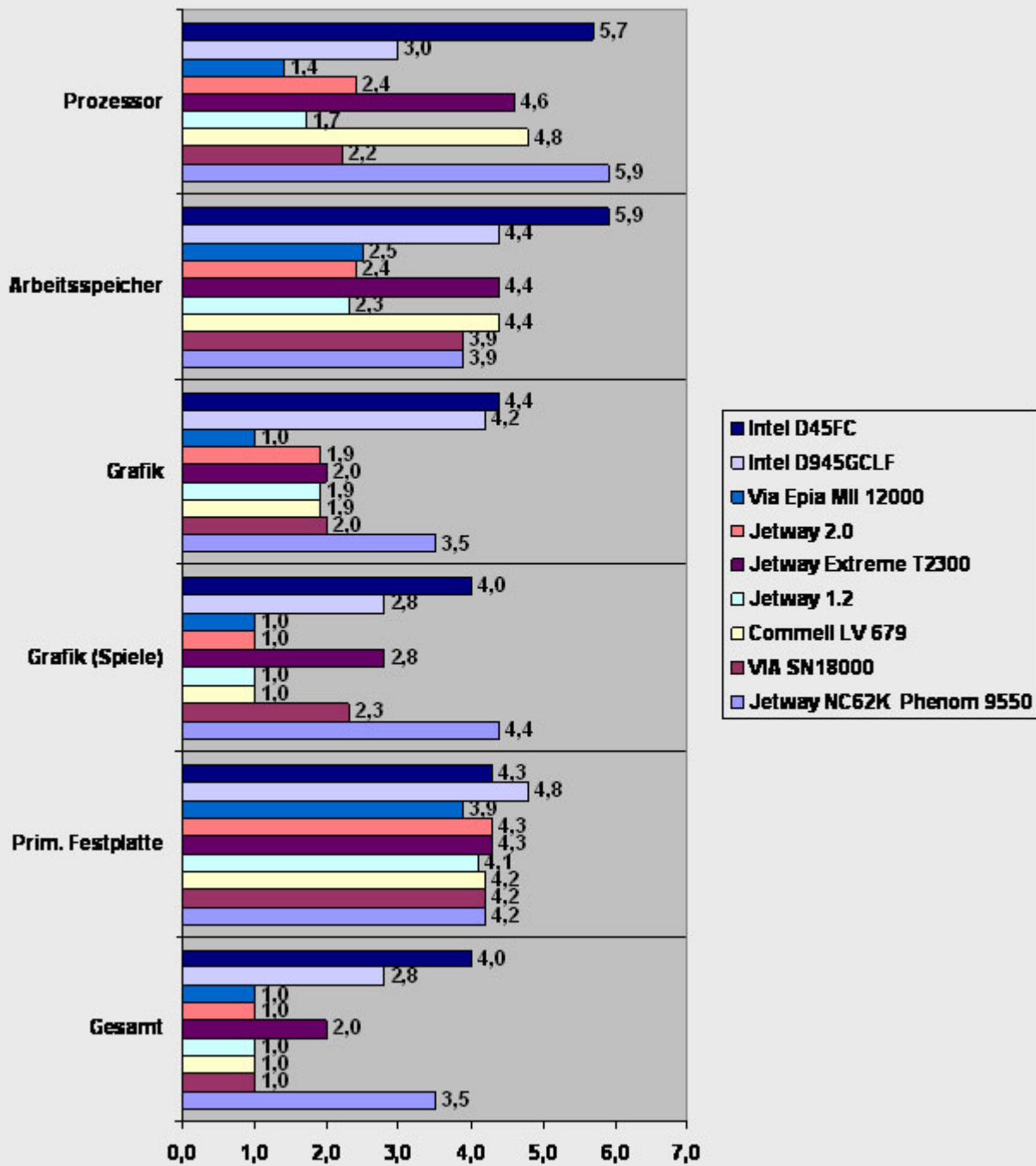
For the game test "Ghost Recon Advance Warfighter" was installed, because it does not have those extreme hardware requirements that current games have. The frame rate was selected by Fraps. The resolution 800x600 with medium details and trilinear texture filter was set. On average 15 frames per second had been measured on Vista. With the same settings 20 frames per second were measured on Windows XP. The results aren't that good, but a game with lower requirements is realizable on this platform, if you can live with some jerking frames.

Both energy saving modes S1 and S3 are working flawless. By setting the pc-system into the stand-by mode, the system is ready to work in about 3-4 seconds after pressing the ON/OFF switch.

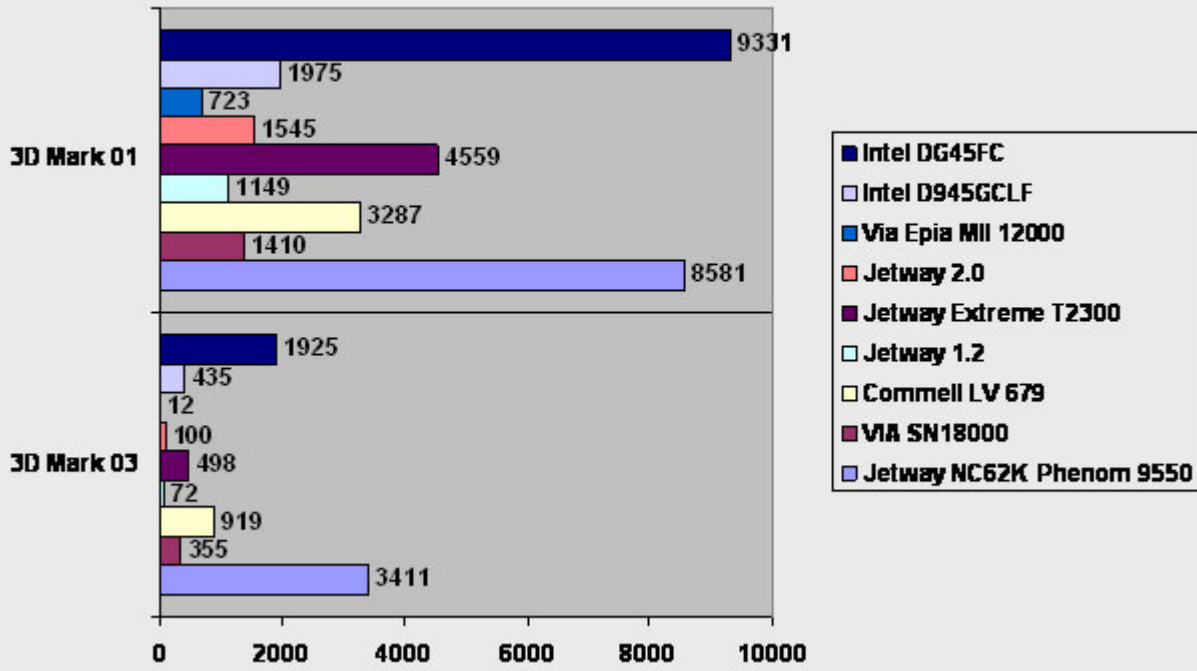
Performance, Power consumption

The DG45FC scales the throne of efficiency in the overall picture seen and is declared as a reference for the moment. Thanks to the G45 chip set, which is used on ATX desktop motherboards also, the Dual Channel RAM slots and the Intel Core 2 Duo CPU of the next generation are forming into a mini-ITX system with enormous performance, which must be compared with ATX format motherboards.

Vista Leistungsindex

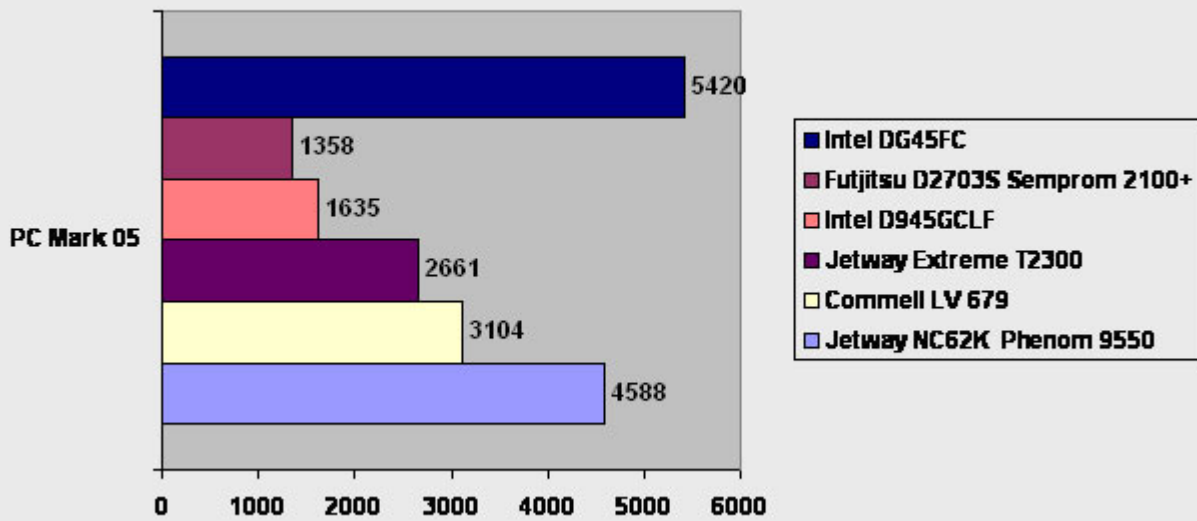


3D Mark

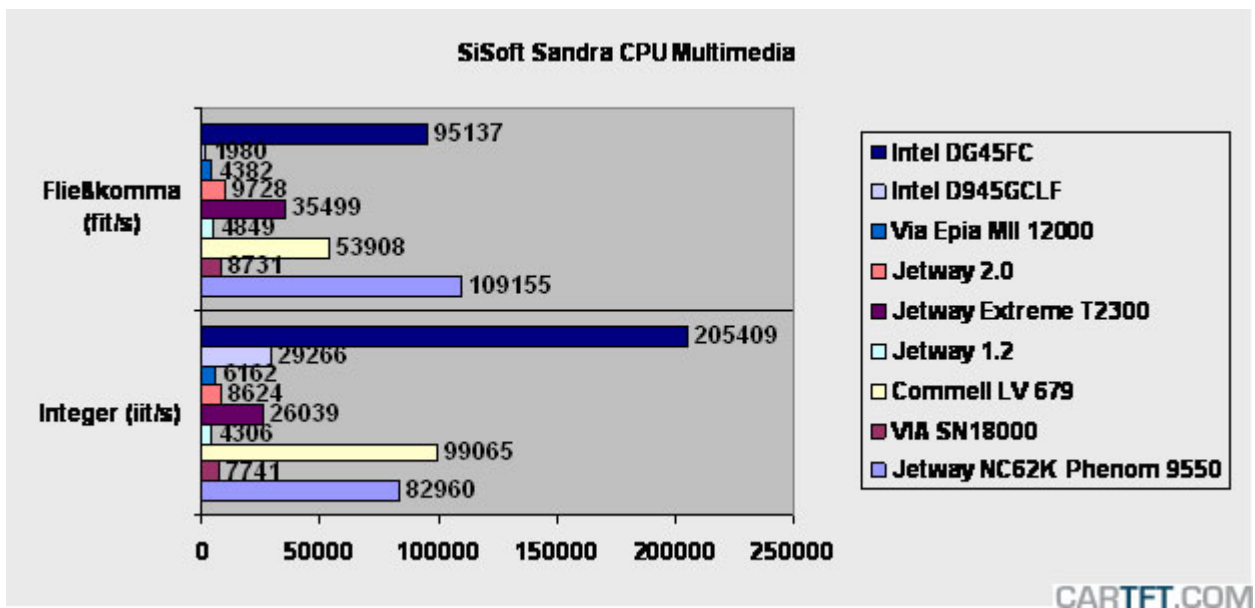
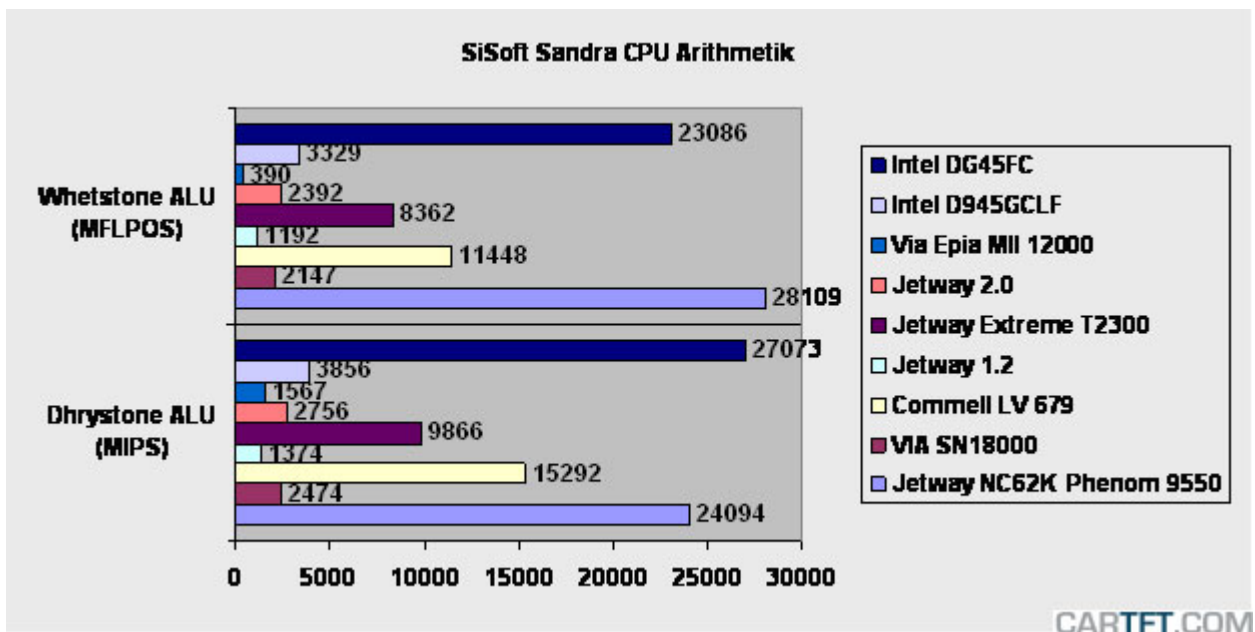
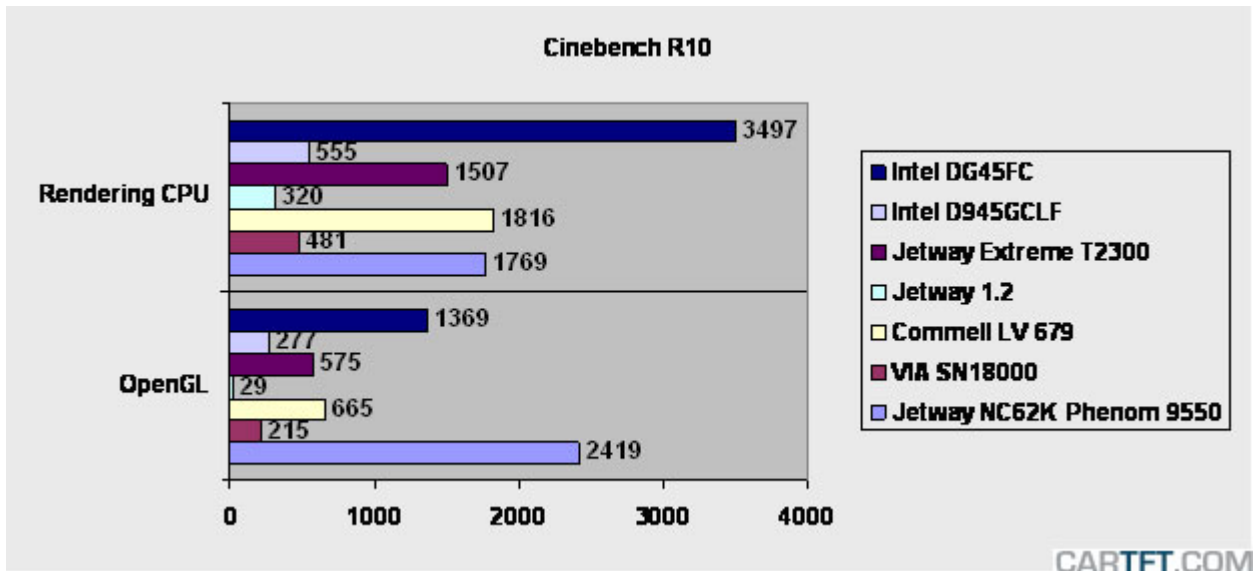


CARTFT.COM

PC Mark 05

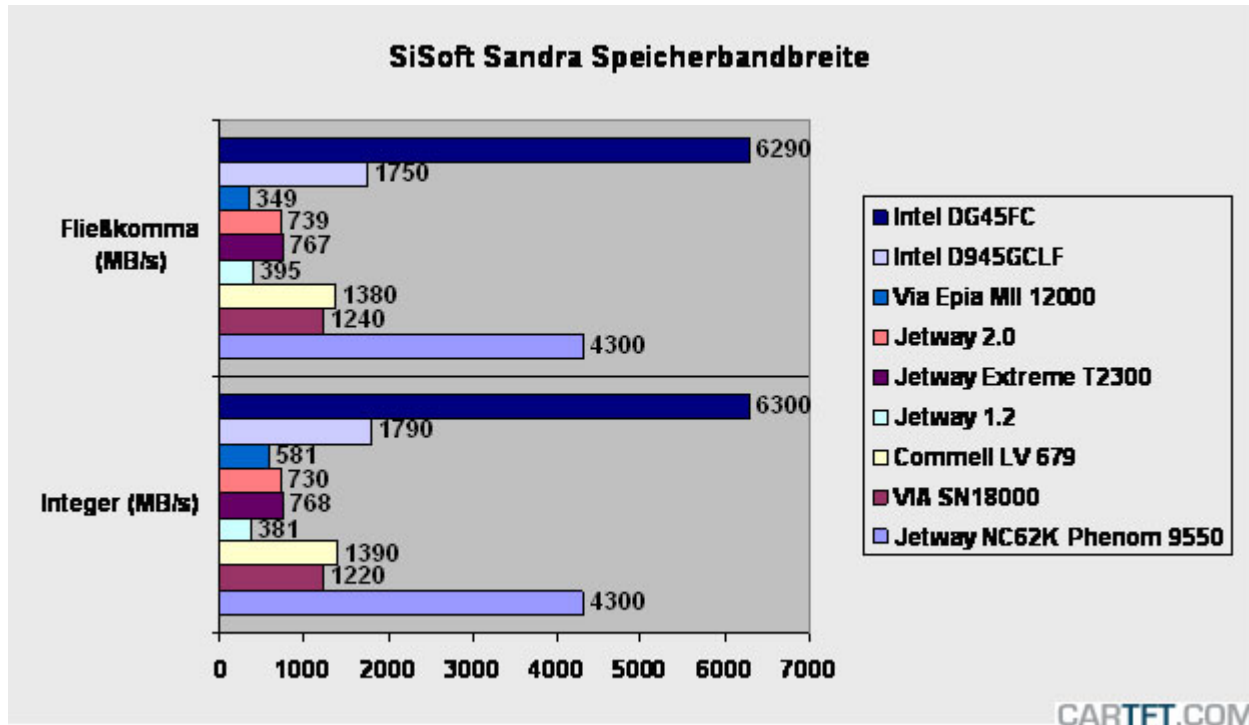


CARTFT.COM



The on-board GPU X4500HD needn't to hide. Also games are possible with some reservations. Due to the fact that Dual Channel is supported by the motherboard, the DG45FC races away in the

memory bandwidth test. The Intel has an increased efficiency of ~32% opposites the old king of performance Jetway NC62K.



Power Consumption

Boot	70W
Idle	38W
Load	70W
CD/DVD Load	49W
DVD	44W

Temperatures, noise level

In this test, the boxed cooler of the Intel Core 2 Duo CPU had to be used. Because of the dimensions of the cooler inclusive 80mm fan, the system was low noise obversely.

With load the fan never turned faster than 1000rpm.

The temperatures could be only partly selected correctly with the sample motherboard, but this will be changed with the release. So the behaviour of the temperatures doesn't get considered.

Conclusion

The Intel DG45FC is designed absolutely for fans of multimedia and for enthusiasts of performance in the mini-ITX domain but yet to acquire relatively on good terms. The competition falls by the wayside with the price-performance ratio. If the DG45FC gets equipped with the Intel E8500, you get a powerful pc-system. You get a good pc-system for about 200 Euro, if a lower Core 2 Duo CPU is planned be used.

The multimedia freak gets everything he needs to build a home cinema PC. Full HD is realizable - thanks to the X4500HD chip and HDMI, Thereby the PC-system doesn't break sweat, in contrast: The boxed cooler was not running faster than 1000rpm while the whole stage test. Audiophile people should purchase a sound card additionally. This shall not mean that the quality of the audio output isn't completely sufficient. But if you have such a motherboard and you are watching videos

in high resolutions, then you shouldn't save money for a sound card (e.g. PCIe or external solutions).

In office operation it's a real blessing to work with this system. Every work is done quickly and even working on videos- as well as pictures is real fun. Playing games is possible with some reservation. Do not expect too much, but older games without current graphic engines can be played.

Fortunately the consumption is okay. It's possible to run a complete system with a M2-ATX in the car for example. For typical CarPC software the load and reaction times are extremely low and the navigation through the programs runs fast and fluent.

Intel leads the way: Gigantically much efficiency and relatively low-priced after all. The competition has to beware for Intel. We want more of that!

Written by: Timo Decristan (Fluxkompensator)

Translated by : Benjamin Lambert

CarTFT.com (<http://www.cartft.com>) , 23.06.2008