

Intel DQ45EK Review

Foreword

On 18.07.2008 Intel celebrated its 40-year existence and instead of having given oneself presents, we got a present from the market leader. We only recently got the multimedia board DG45FC, which overtook other Mini-ITX manufacturers in big steps. A test motherboard **DQ45EK** reached us now, which rather was drawn up for productive or industrial application.

Here the main focus lies in the application security, functionality and performance. Correspondingly the technology of processors **2008 Intel vPro** is set-in, where features like „Trusted Platform Module 1.2“ (TPM), „Trusted Execution Technology“ (TXT) and „Active Management Technology 5.0 (ATM)“ are implemented.



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Specifications

Model	DQ45EK
Type	Mini-ITX motherboard
CPU	Intel Core 2 Duo up to 1333FSB (Socket 775)
Chipset	Intel Q45 (ICH10DO)
GPU	Intel GMA 4500
RAM	2x DDR2 667/800 Dual Channel (4 GB max.)
Display connections	1x DVI-I, 1x DVI-D
PCI	1x PCIe 1x
SATA	4x SATA II (RAID), 1x eSATA
Audio	Intel High Definition Audio, 4 channels
LAN	1x 1000Mbit
USB 2.0	6+4x USB 2.0
External I/O	DVI-I, DVI-D, 6x USB 2.0, 1x eSATA, 1x GigaLAN, Audio
Internal I/O	1x PCIe 1x, 4x USB 2.0, 4x SATA, Serial, Audio

Power Supply	24 Pin ATX, P4-connector
Scope of supply	I/O aperture, 2x SATA data cable, DVI to VGA adapter, quick installation guide
Software	driver CD, RAID drivers FDD
Dimensions (Length x Width)	17cm x 17cm

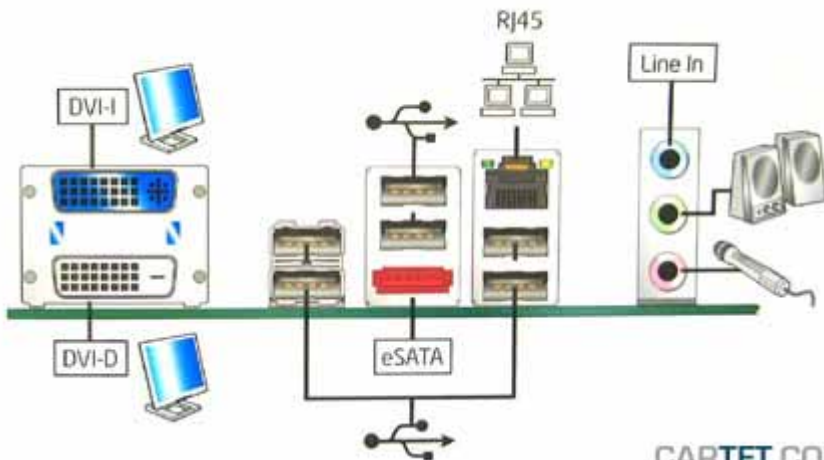
Motherboard and connectivity

The motherboard is equipped with the **Q45 Express Chipset** and with the Southbridge **ICH10DO**, whereon the newest Intel 65W 45nm Core2Duo with 1333MHz FSB can find its place. Up to RAM 4GB Dual Channel DDR2 800/667 MHz is supported. Responsible for the graphical output is the „**GMA 4500 Graphics Media Accelerator**“, which contains DirectX10 like the other variant with HD.

You can see one of the differences between DG45FC and DQ45EK at the I/O ports. Multi channel audio wasn't appreciated here and an HDMI port cannot be found. There is a 2 channel sound chip instead only and for multi monitoring there are 2 DVI outputs (DVI-I and DVI-D). Otherwise nothing has changed.



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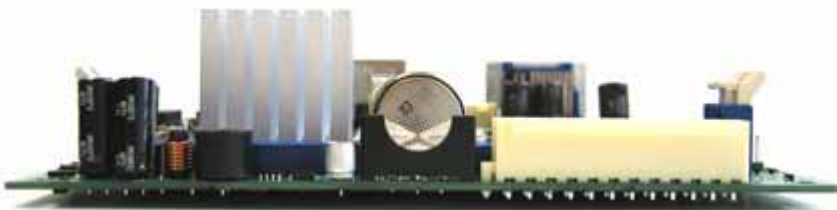
The following external connections are available: One DVI-I and one DVI-D output, six USB 2.0 ports, one eSATA port, one GigaLAN port and the audio connections.

Hardly anything has internally changed also: four USB 2.0 ports, four SATA ports, one PCIe 1x slot, serial and audio for connection to the front panel.

The two DDR2 RAM 800/667 MHz slots can be equipped with two same sized RAM modules and therewith they can run in Dual Channel mode, what contributes to a higher transfer rate.



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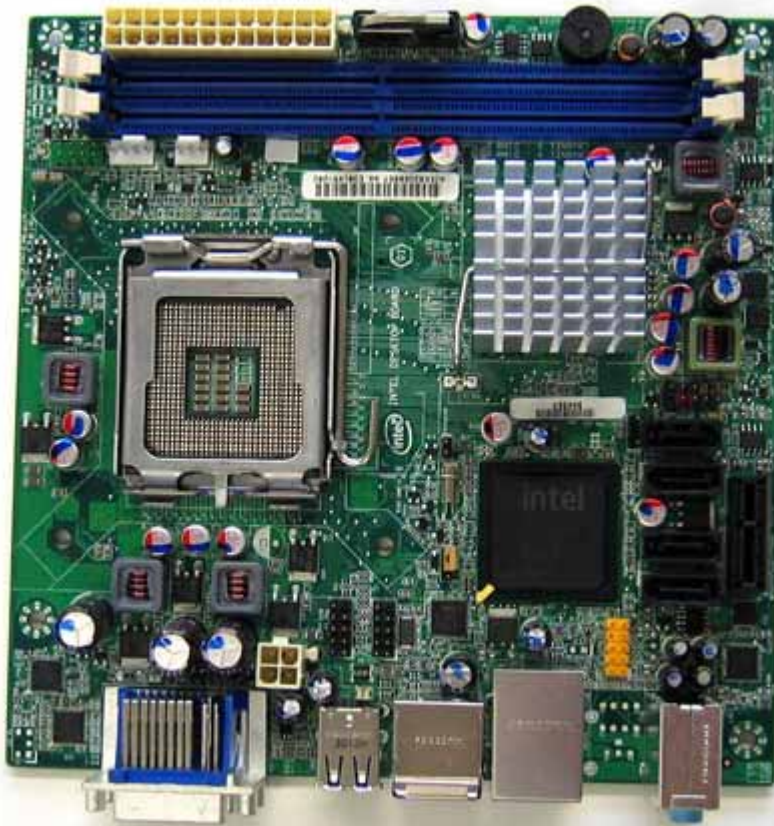


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Because the design of the motherboard has changed hardly in comparison to the DG45FC, also here make sure that a corresponding cooler is going to be used, because of the components in the near of the CPU socket.



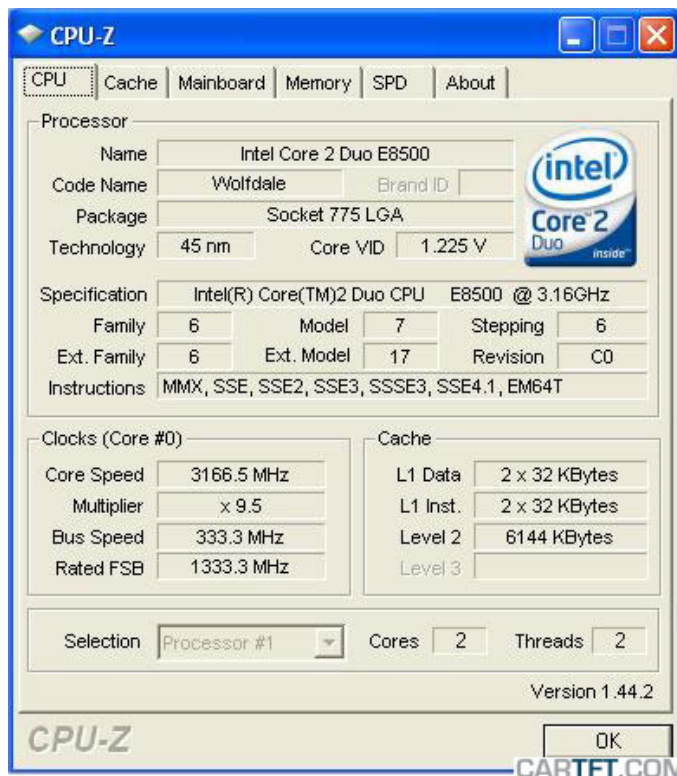
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Following hardware has been used for this test-system:

- Intel DQ45EK with Intel Core 2 Duo E8500
- 2x 1GiB DDR2 800 RAM by Aeon
- HDD 250 GB SATA with 5400rps by WD
- DVD-ROM R/RW by Pioneer
- M2-ATX supplied by a 110W AC adapter



CPU-Z (Version 1.44.2)

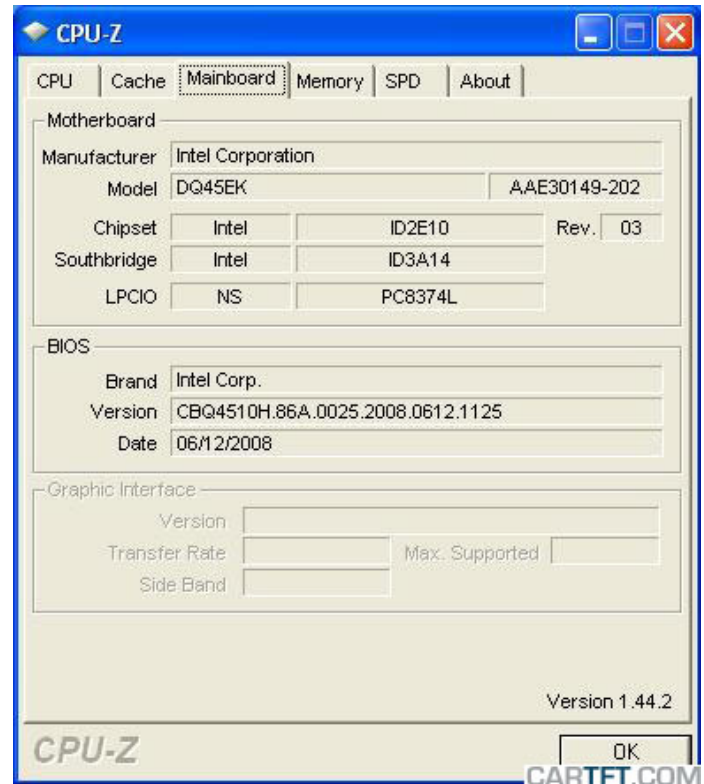
Processor: Intel Core 2 Duo E8500 (Wolfdale, Socket 775 LGA, 45 nm, Core VID 1.225 V)

Specification: Intel(R) Core(TM)2 Duo CPU E8500 @ 3.16GHz

Clocks (Core #0): Core Speed 3166.5 MHz, Multiplier x 9.5, Bus Speed 333.3 MHz, Rated FSB 1333.3 MHz

Cache: L1 Data 2 x 32 KBytes, L1 Inst. 2 x 32 KBytes, Level 2 6144 KBytes, Level 3

Selection: Processor #1, Cores: 2, Threads: 2



CPU-Z (Version 1.44.2)

Motherboard: Intel Corporation, Model DQ45EK, AAE30149-202

Chipset: Intel ID2E10, Rev. 03

Southbridge: Intel ID3A14

LPCIO: NS, PC8374L

BIOS: Brand Intel Corp., Version CBQ4510H.86A.0025.2008.0612.1125, Date 06/12/2008

Graphic Interface: Version, Transfer Rate, Side Band, Max. Supported

For our tests Windows XP Professional and Windows Vista Ultimate 32bit was installed as is usual. The pre-release drivers had to be installed manually yet. But you will find the full automatically routine of installation on the final driver CD again.

A few packages were in a pre-alpha status, wherefore we are not going to go into details for special features. Except the graphic drivers in Windows XP, which is possible to install with the device manager only, every needed hardware driver was recognized. A TPM chip is fixed on the motherboard, identifying the system explicit. The biggest difference to current systems is that people are not bound to certain users but bound to a system.

Addressed initially as TCPA, the controversial organization was renamed later into Trusted Computing Group (TCG) because of its bad reputation. TPM on the one hand contributes to safety reasons, but being ensured that TPM is activated with certain applications. Originally it was planned that software only runs on these systems sometime that has got a certificate from TCG, what many software developers didn't like at all.

However with this method it's guaranteed to create a non-manipulable platform, what benefits the industry due to not leveraged program interfaces by various encoding technologies.

Copy protection, administration of rights, license examination and references are included here. Among other things more information can be found here: http://en.wikipedia.org/wiki/Trusted_Platform_Module

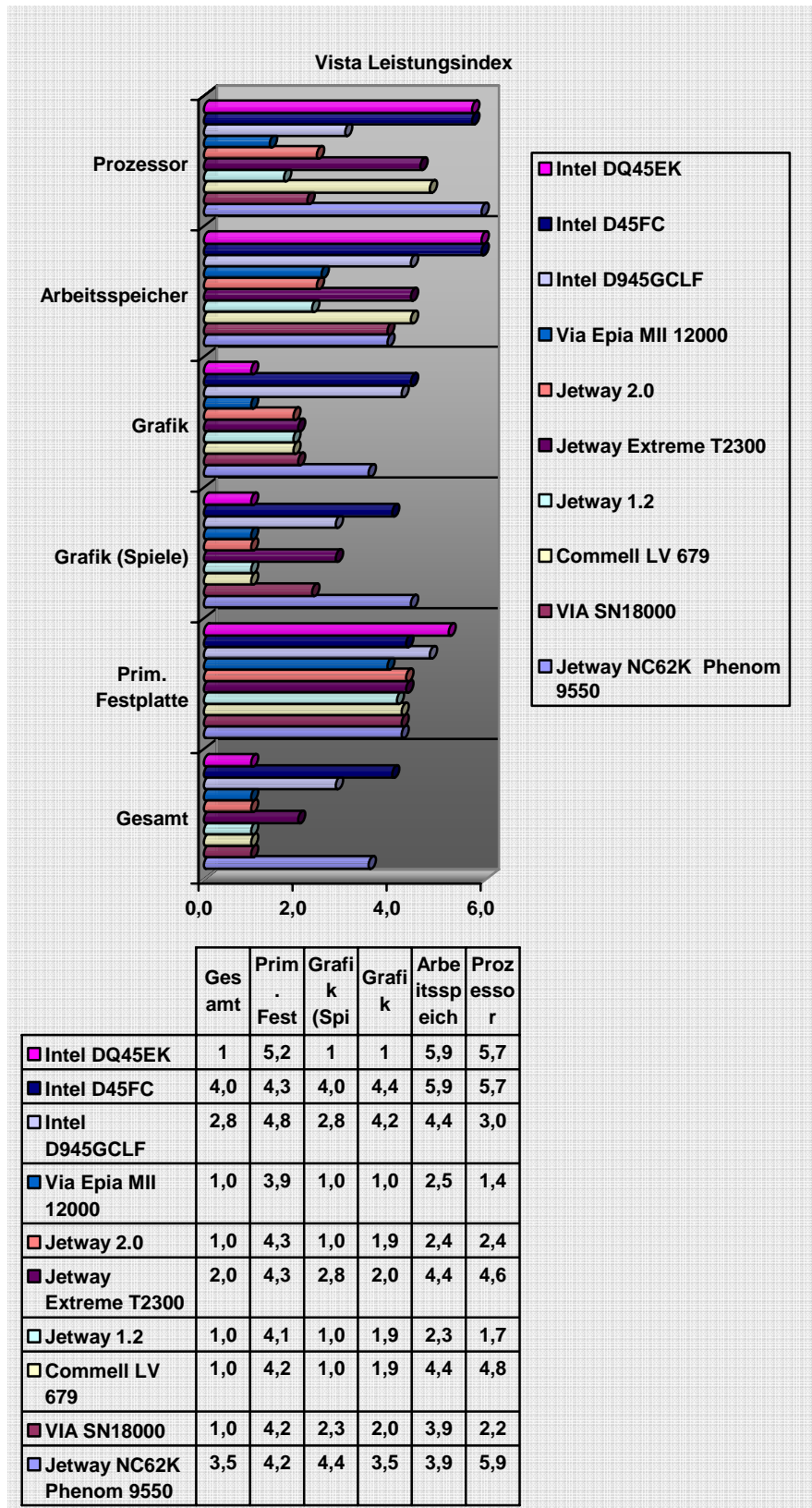
With the ATM technology Intel implement a central function of observation and control to get the possibility to maintain pc-systems or to repair them if necessary. The advantage of an embedded solution is that pc-systems aren't bound to applications and therefore it's guaranteed that offline-PCs or no functional operating systems can be selected. This makes it much easier to do a remote maintenance via remote access or over the network. Active Management Technology version 5.0 is used with this motherboard. Another security mechanism, named „Trusted Execution Technology“ (TXT)“, permits no still so privileged program to get access to data and code.

TXT is an integral part of the CPU and communicates with TPM. Note all security mechanisms are able to be deactivated in the BIOS.

Efficiency, power consumption

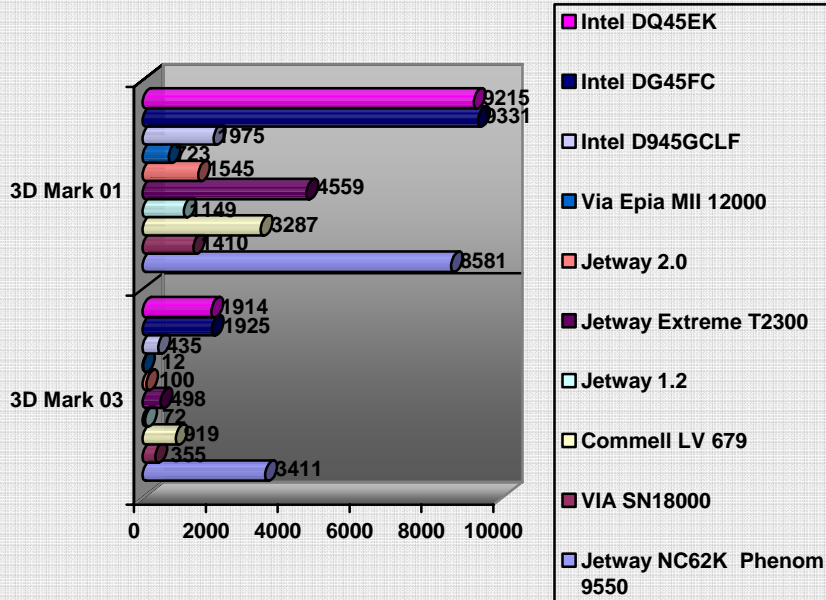
The DG45FC was chosen in our mini-ITX confrontations as a reference. Whereas the architecture of the DQ45EK is very similar, it was clear that the two Intel motherboards don't give themselves much in the efficiency. Therefore value was attached to an almost identical system (see used hardware).

Only the power supply has to be distinguished as a change. This time we decided to use an M2-ATX and a 100W AC power adapter. But the differences were considered and subtracted in the corresponding values.

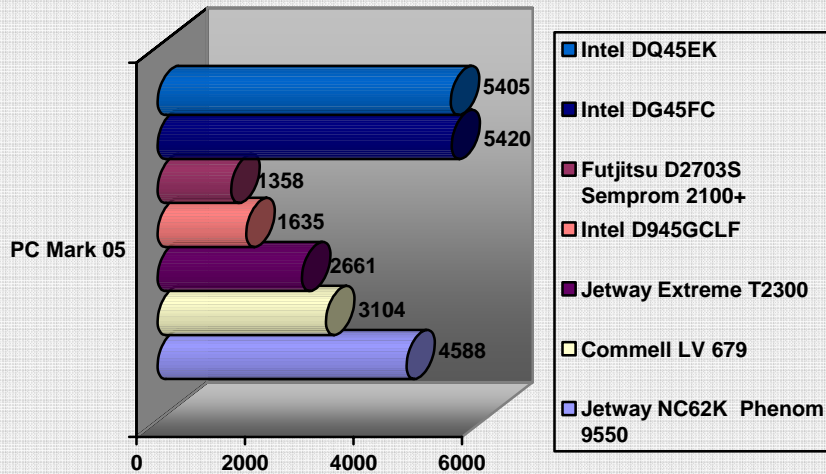


Only the optimized multimedia interface is missing on the onboard graphic chip 4500 in comparison with the HD variant. Almost the performance of the 3D image stays identical.

3D Mark

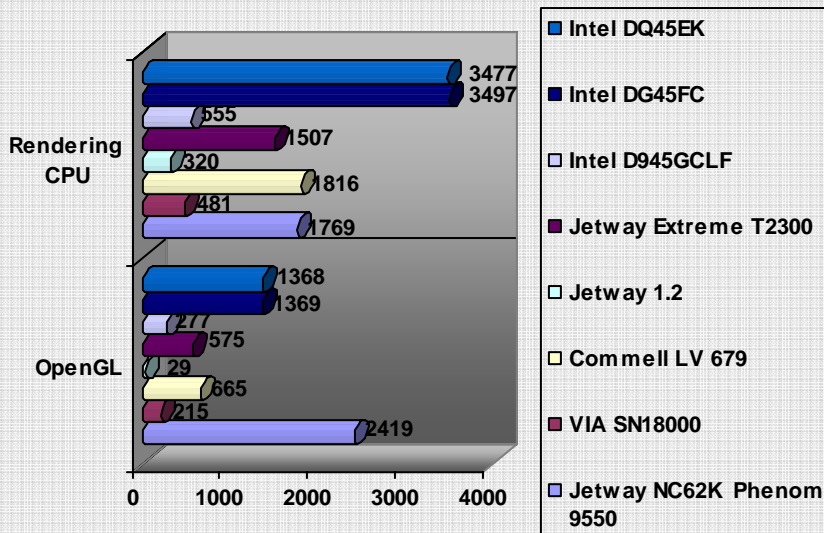


PC Mark 05

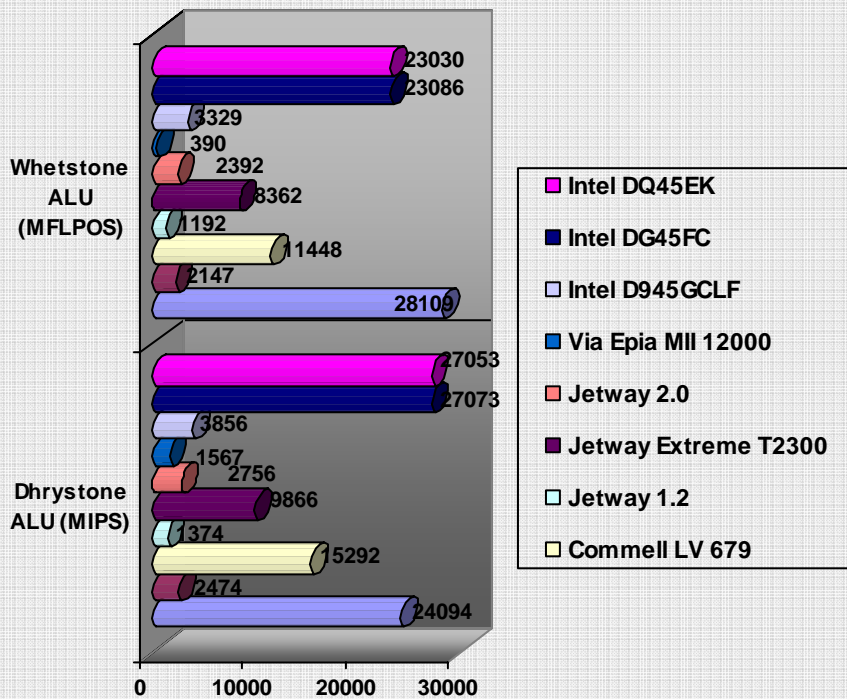




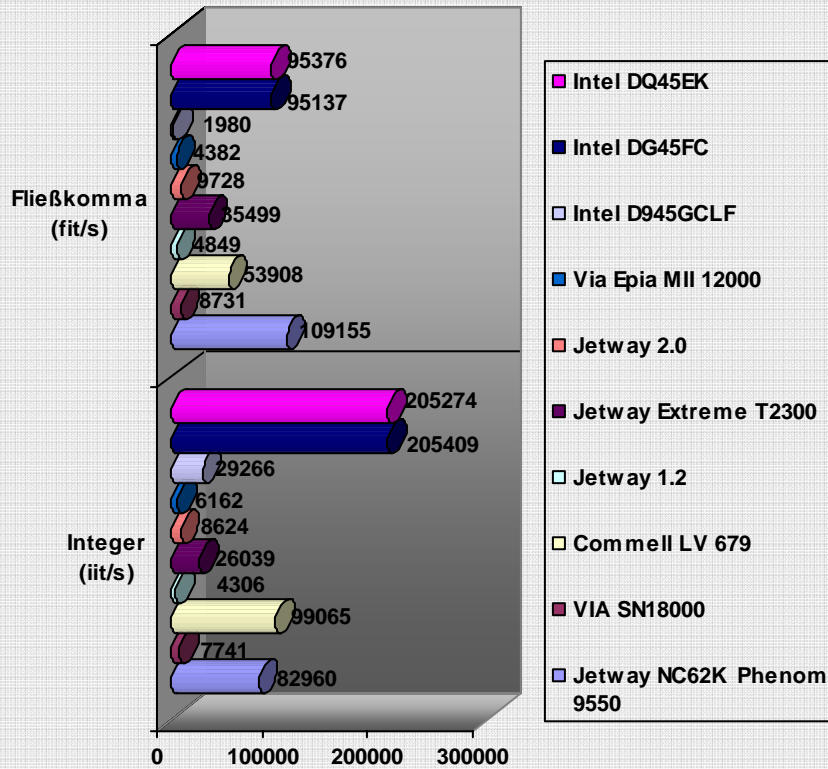
Cinebench R10



SiSoft Sandra CPU Arithmetik

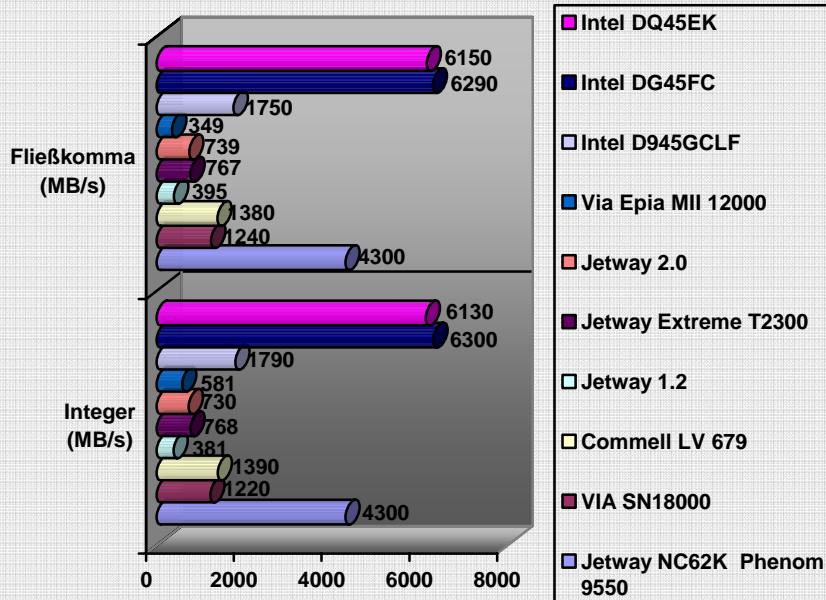


SiSoft Sandra CPU Multimedia



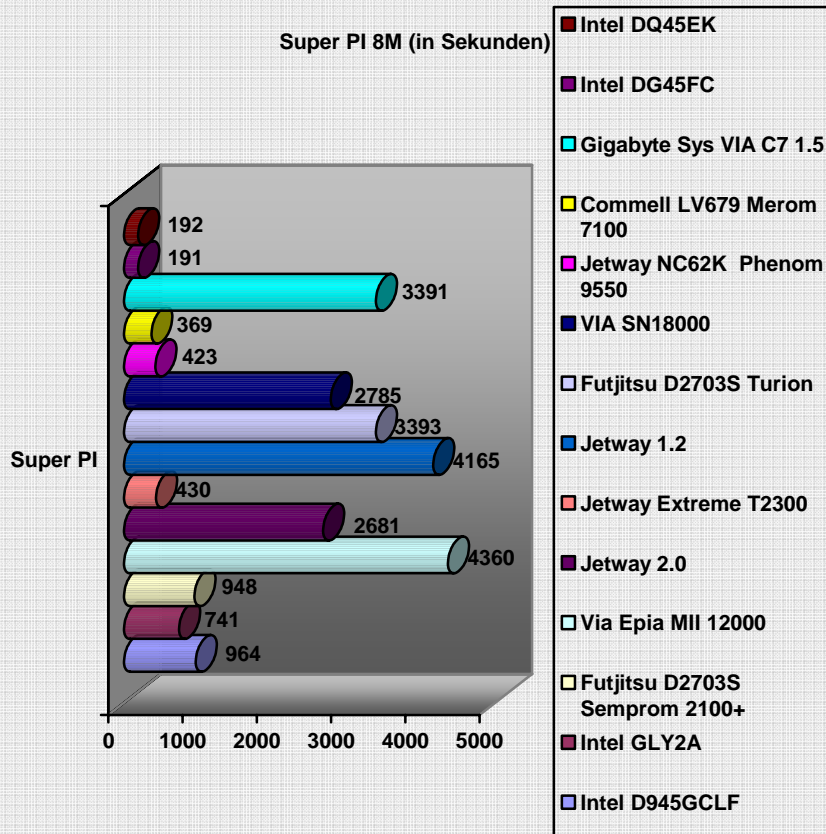


SiSoft Sandra Speicherbandbreite



At the Super PI calculation a definite amount of decimal places of the number “pi” is calculated. The shorter the duration, the better/faster the system is calculating the decimal places. The DQ45EK is beaten by his „multimedia brother“ with one second, only.

Super PI 8M (in Sekunden)



Power consumption

Phase of boot	69W
Idle	42W
Load	64W
CD/DVD Load	50W
DVD	48W

Temperatures, noise level

We decided to choose the boxed version again for the DQ45EK also, because the coolers, which will be used in CarTFT.com pc-systems later, still are in testing phase.

Noise level in common use hence cannot be considered. The temperatures aren't selected in the pre-release version, too. Defaults occurred, so we decided to leave the values out. However, the system was felt in temperature ranges which have to be classified as absolutely quite safe. Perhaps the CPU was working between 35°C and 55°C.

Conclusion

The DQ45EK catches up performance technically with the DG45FC, the application areas of the two motherboards nevertheless cannot be more different.

The system is rather intended for industrial platforms by onset of the processor technology 2008 Intel vPro. Due to current architecture, however, the speed can convince very much. Despite the performance Intel has managed again to create a thrifty working platform which has implemented most current security and management functions.

Therefore the weighting turns out also rather scanty in the area of multimedia and there is only 2 channel sound what can for example be compensated for with a PCIe sound card again, however. The graphic unity works despite missing high-density optimization properly and is enough for the application area of the DQ45EK completely. Photo editing programs like Photoshop, office work, encoding und decoding of tunes, videos and pictures etc. take place quickly. Performance hungry Windows Vista works also this without any speed losses. Unfortunately, it wasn't possible for us at this time yet to exhaust all functions and to test them on heart and kidneys.

A person who attaches importance to a system, which permanently is selected by remote access or network, guesses the safety feature programs of the organization "Trusted Computing Group" pushing themselves on the market slowly, searches performance despite thrifty components and likes it small and handily, is more than used well with this board.

Written by: Timo Decristan (Fluxkompensator)

<http://www.cartft.com>

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Translated by Benjamin Lambert

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