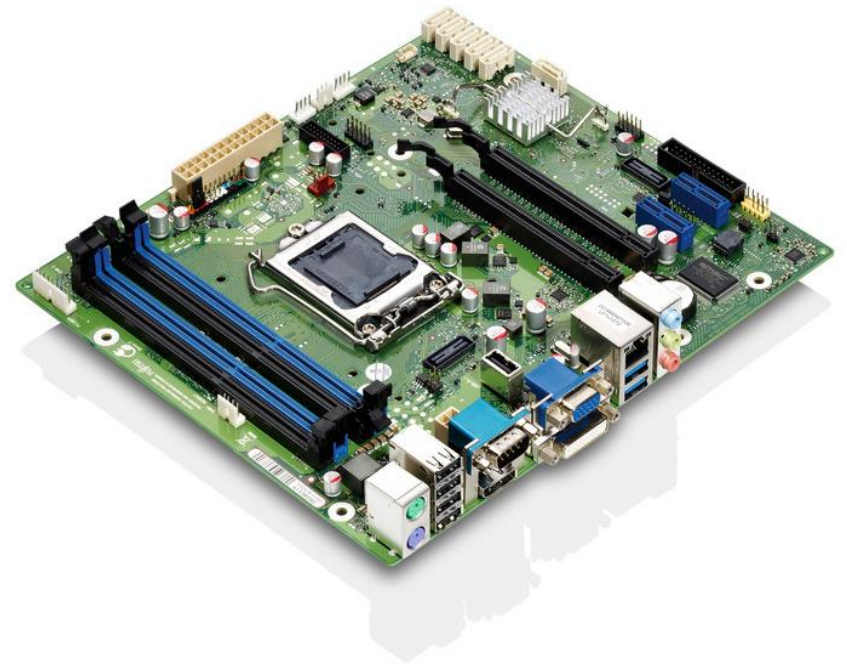


TechNotes V1.2

Extended Lifecycle Mainboard

D3222-B



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1 Safety Instructions

Do not connect or disconnect any cables or modules to or from any onboard connectors (except for the rear I/O connectors) until the mainboard is completely powered down.

Any damage caused to the mainboard by misuse of the onboard connectors is excluded from the standard warranty. Fujitsu Technology Solutions cannot be held liable for any damage that results from incorrect use of any onboard connectors.

The system integrator is fully responsible for the usage of appropriate connectors and cables in order to fulfill the technical requirements (electrical contact, durability, power/current levels, signal integrity etc.)

2 Feature Overview D3222-B

- Based on latest Intel *Lynxpoint* single-chip technology (iQ87)
- Support for full range of latest LGA1150 *Haswell* processors (Intel Core™-i Gen 4; up to 95W TDP)
 - Intel® Core™ i7 – 4xxx processor series
 - Intel® Core™ i5 – 4xxx processor series
 - Future Intel® Core™ i3 – 4xxx processor series
 - Future Intel® Pentium® *Haswell* processor series
 - Future Intel® Celeron® *Haswell* processor series
- **iAMT 9.0 / VPro 2013 Manageability Support**
 Note: Available feature set depends on installed processor
- **Four memory sockets DDR3-1333/1600 supporting up to 32GB**
- **Intel Gbit LAN i217LM ("Clarkville") onboard**
 - iAMT support



Feature Overview D3222-B

- **Trusted Platform Module TPM V1.2 (Infineon) onboard**
- **Latest Intel® HD Graphics (integrated in processor)**
 - Simultaneous use of integrated graphics and PCIe graphics possible
 - Option for up to three digital displays (1 x DVI / 2 x DisplayPort V1.2)
- **PCI Express Gen3**
- **Internal Socket for USB stick / Dongle onboard**
- **USB 3.0 onboard**
- **5.1 multichannel audio onboard**
- **4-Layer PCB**



Feature Overview D3222-B



Designed & approved for 24/7 continuous operation

High Efficiency core voltage regulator design (80-85%)



Extended lifecycle up to 3 years

Hardware Watchdog

→ Easy SW integration via Windows API & Linux Driver

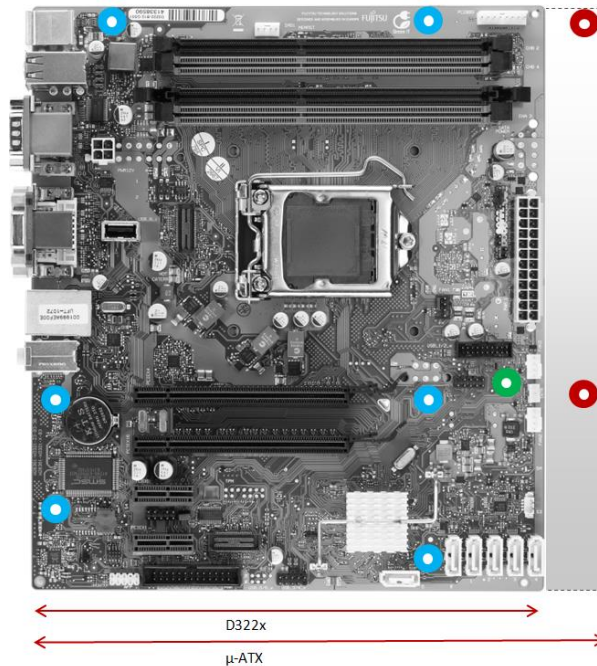


UL/CSA 60950-1 certification

Feature Overview D3222-B

2.1 Mechanical Note / Reduced PCB Size

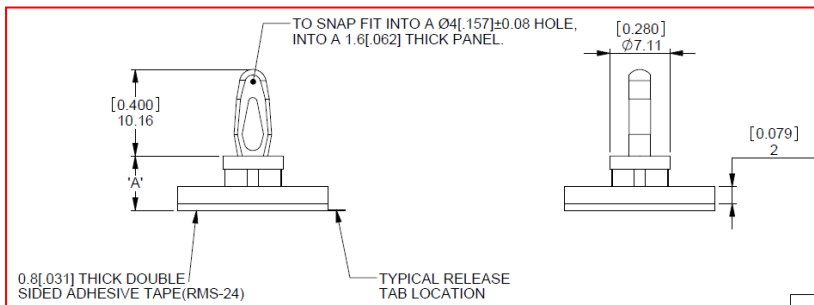
The PCB (Printed Circuit Board) of D322x has been reduced compared to a standard μ ATX PCB (see picture below). Accordingly the two (red) mounting holes of a μ ATX PCB are not available on D322x. In order to improve the mechanical stability (e.g. for installing the ATX power connector), there is an additional mounting hole (4mm diameter; marked "green" in the picture below). This mounting hole can be used for an optional nylon spacer to retain the mainboard.



Feature Overview D3222-B

Mechanical Note / Reduced PCB Size

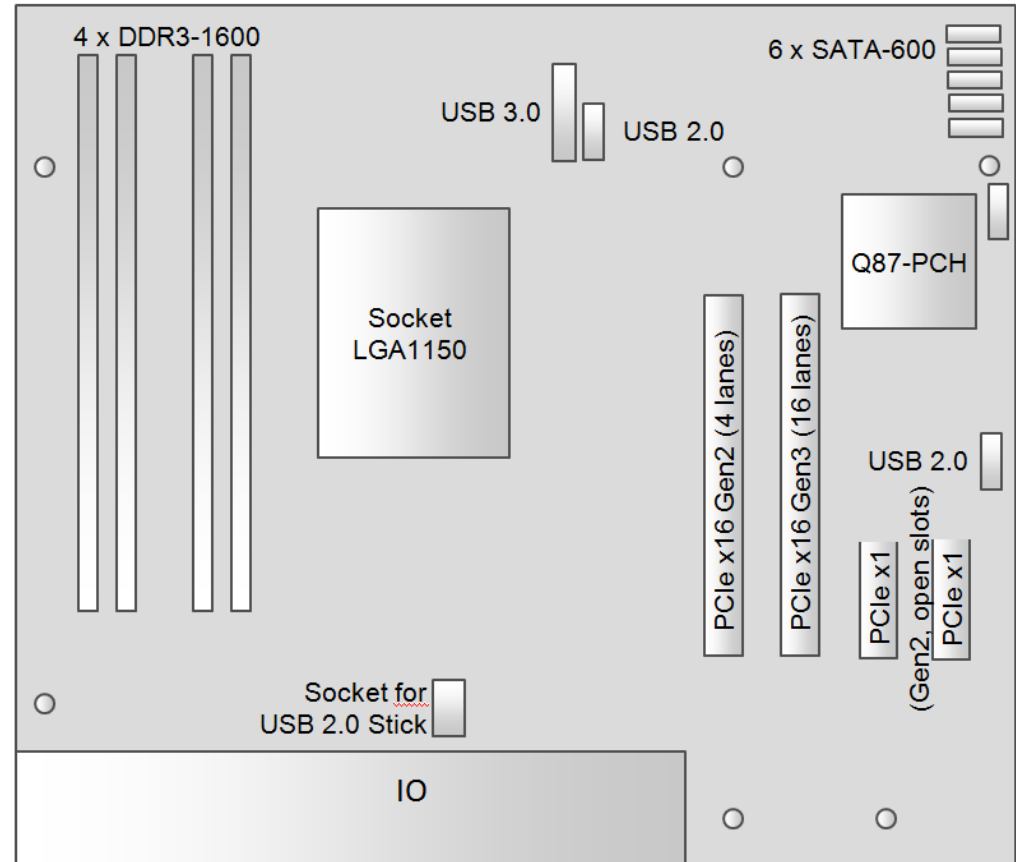
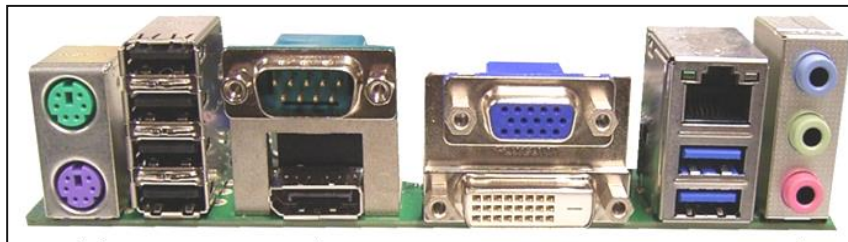
Recommended spacer (optional):
 Richco CBSB-4-01A2-RT / CBSB-4-19A2-RT (dimension "A" = 6.4mm)



Note. As the spacer height depends on the customer chassis, there is no spacer included in the mainboard delivery!

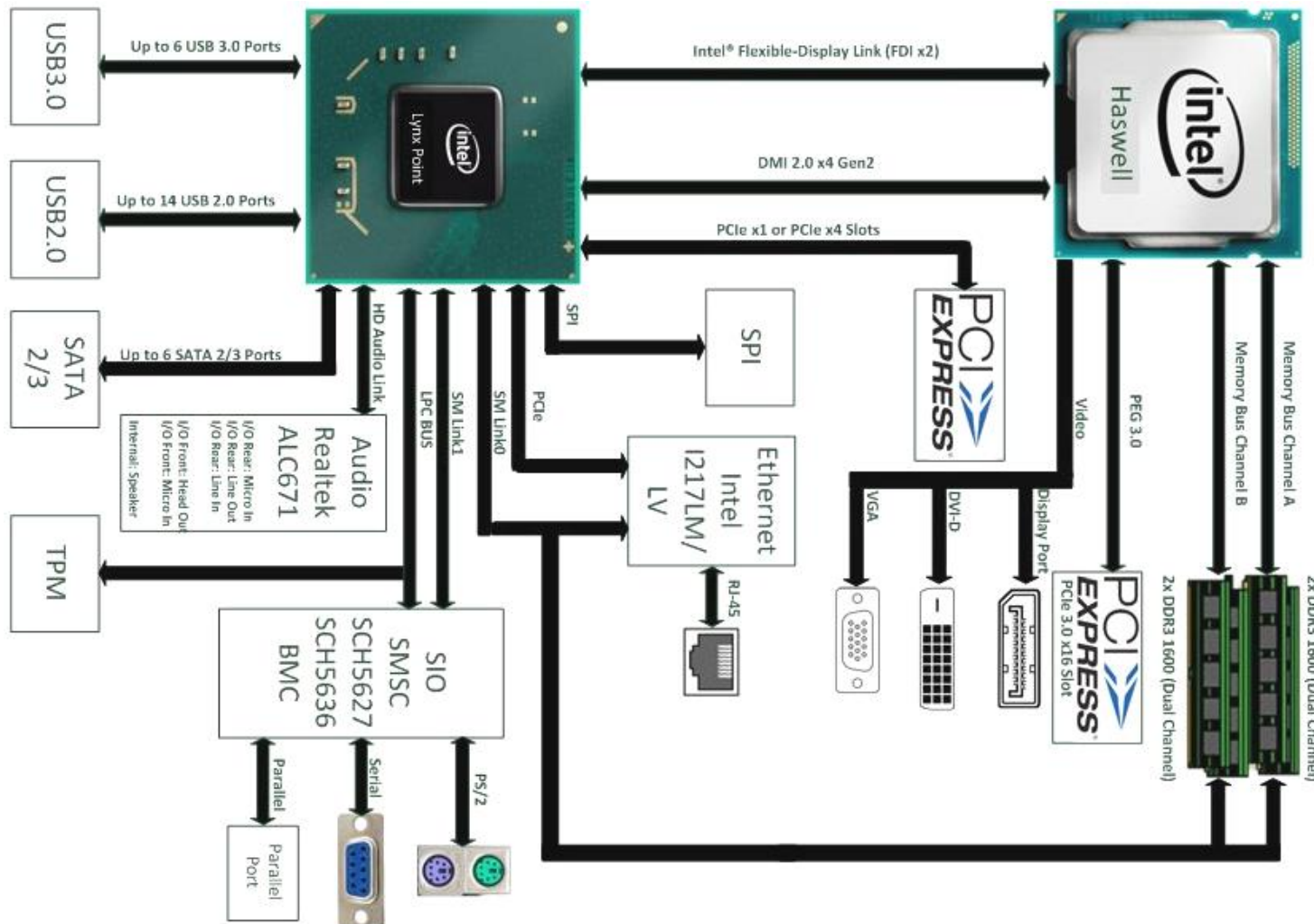
Feature Overview D3222-B

2.2 Basic Layout



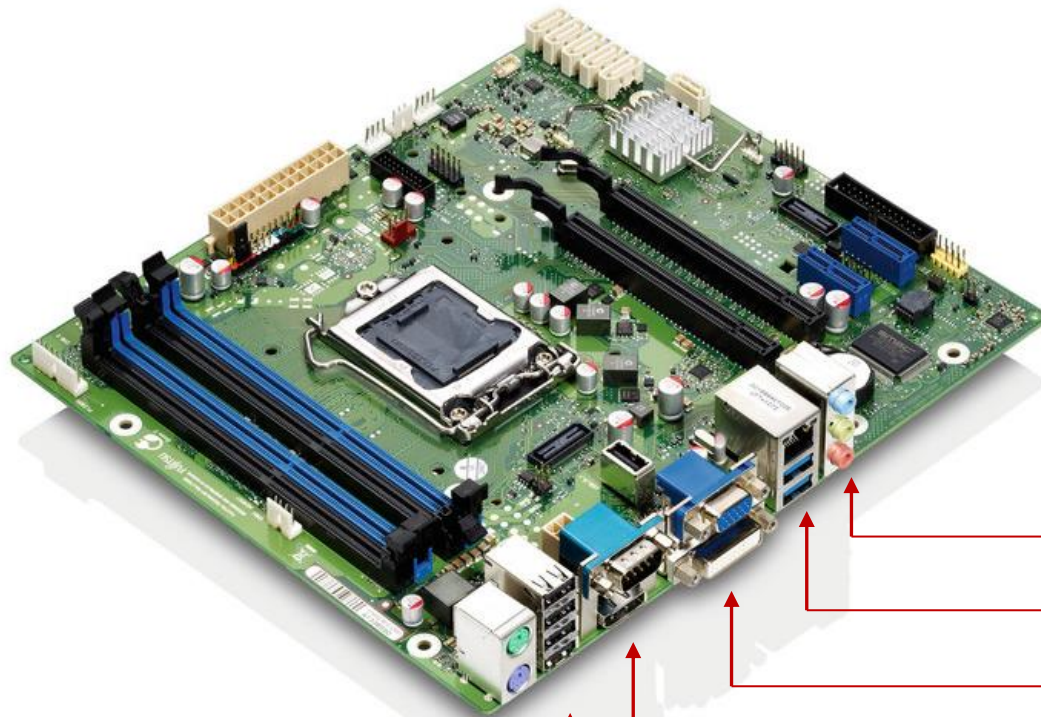
Feature Overview D3222-B

2.3 Block Diagram



Feature Overview D3222-B

2.4 External Connectors D3222-B



Audio

LAN; 2 x USB 3.0

VGA; DVI-D

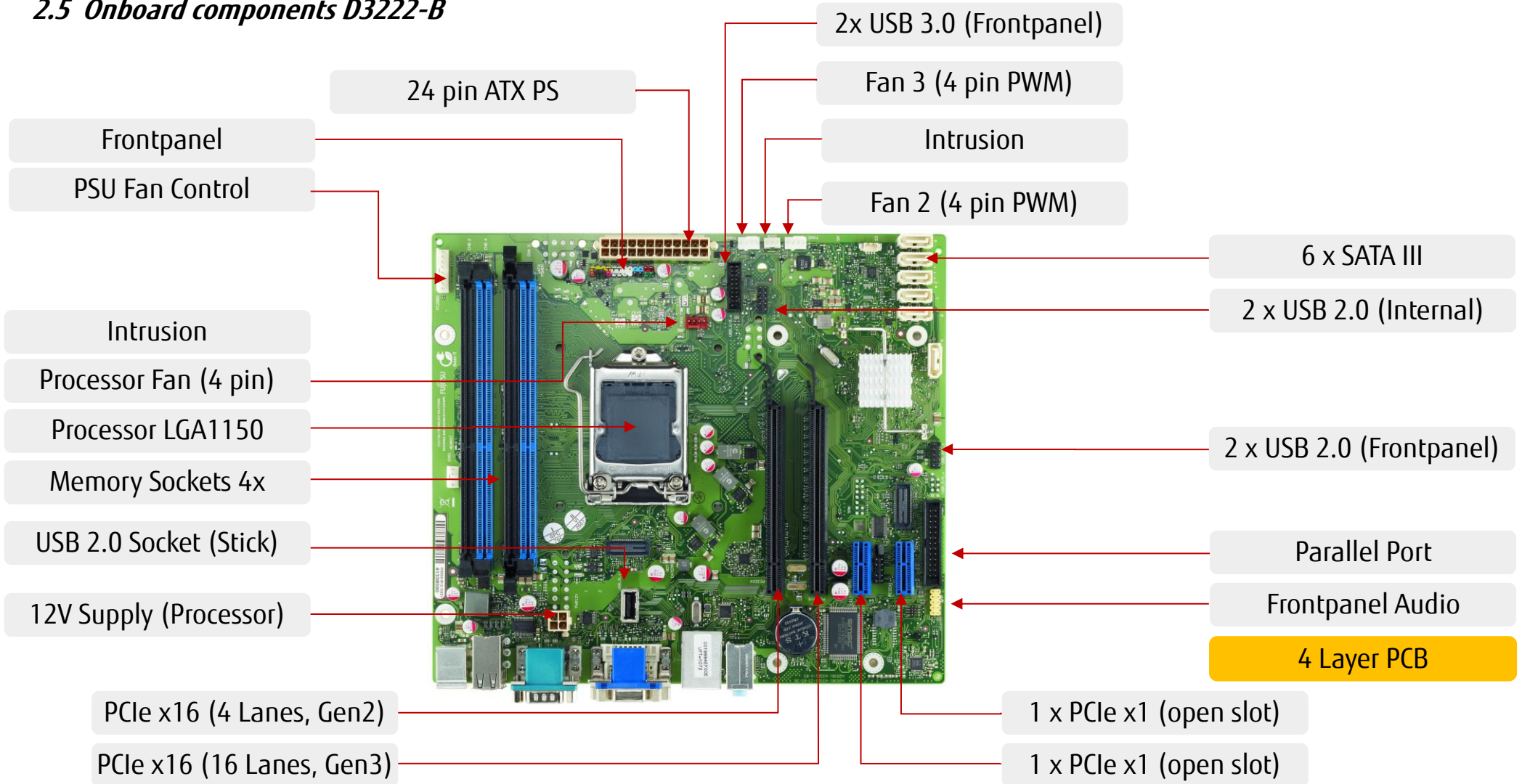
COM; DisplayPort V1.2

4 x USB 2.0

PS/2 Kbd / Mouse

Feature Overview D3222-B

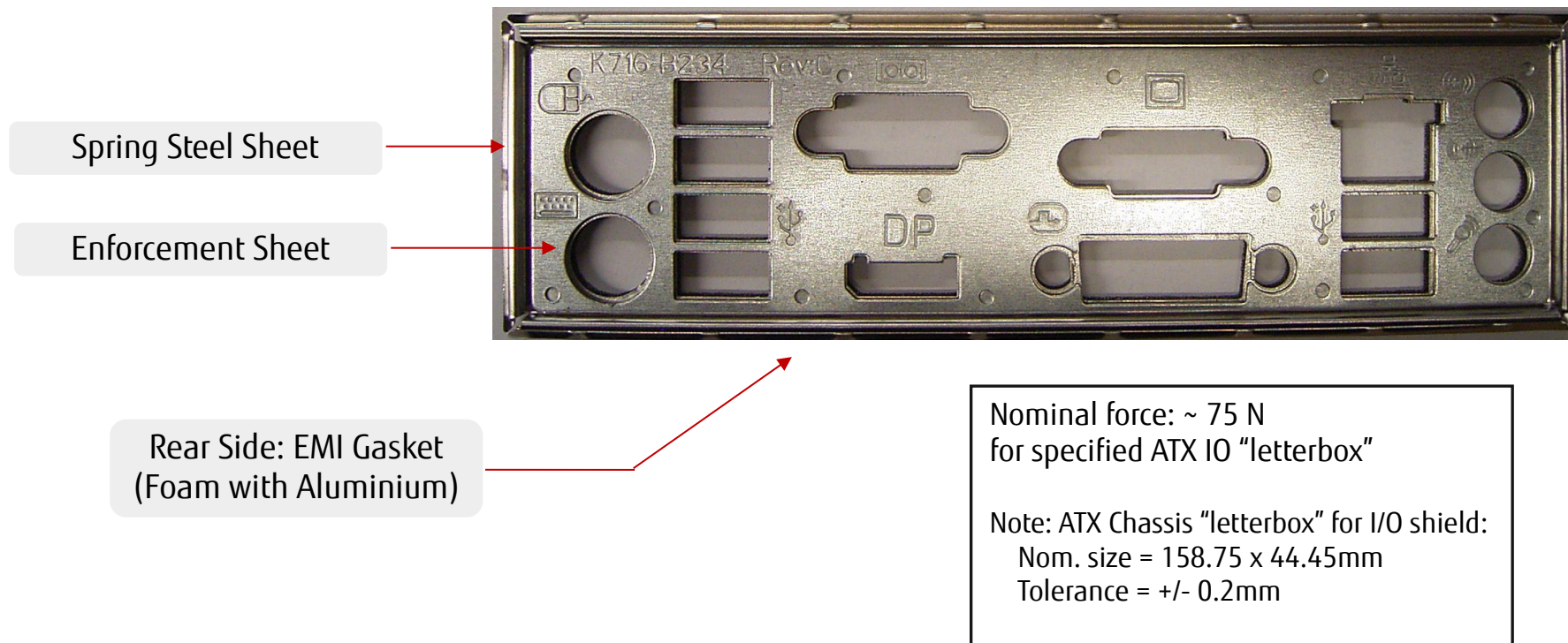
2.5 Onboard components D3222-B



Feature Overview

2.6 I/O-Shield

(front view)



Nominal force: ~ 75 N
for specified ATX IO "letterbox"

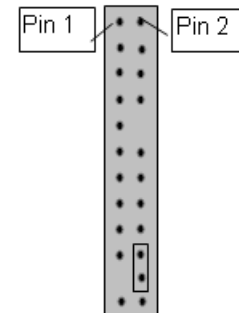
Note: ATX Chassis "letterbox" for I/O shield:
Nom. size = 158.75 x 44.45mm
Tolerance = +/- 0.2mm

3 Interfaces & Connectors

3.1 Frontpanel Connector

Pin	Signal
1	HD-LED +
3	HD-LED -
5	GND
7	Reset_L
9	reserved
11	reserved
13	reserved
15	reserved
17	Speaker +
19	GND
21	Key
23	Speaker -

Pin	Signal
2	Power LED +
4	Power LED -
6	Power Button
8	GND
10	Key
12	GND
14	reserved
16	reserved
18	Password Skip
20	GND (0.1 K)
22	GND (0.1 K)
24	Bios Recovery



Power LED:

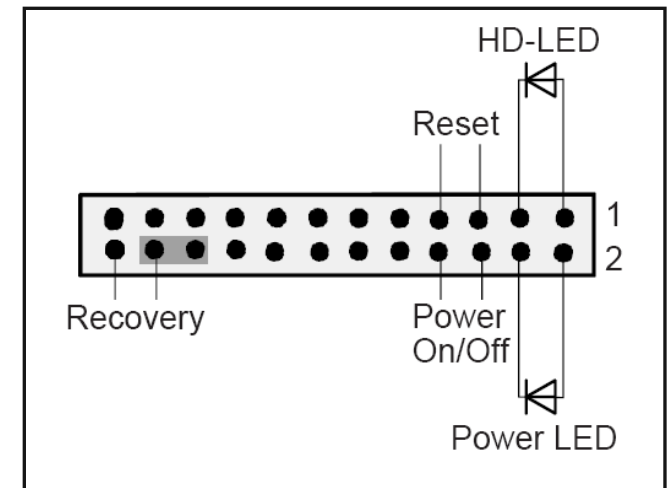
Anode: Pin 2 – current source 12mA up to 4V
 Cathode: Pin 4 (suitable for various LED colors)

HDD LED:

Anode: Pin 1 – current source 6mA up to 4V
 Cathode: Pin 3 (suitable for various LED colors)

Speaker Output:

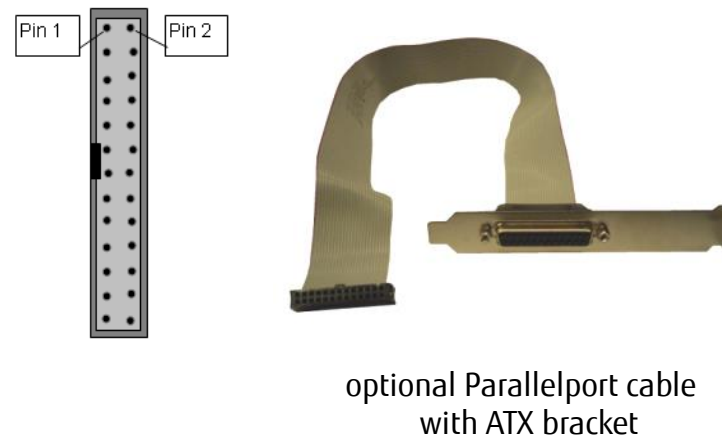
Differential audio signal; max. 2W RMS / 40hm



Interfaces & Connectors

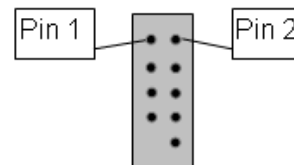
3.2 Internal Parallel Port Connector

Pin	Signal	Pin	Signal
1	Strobe	2	AutoFD
3	Data0	4	Error
5	Data1	6	Init
7	Data2	8	Sel_L
9	Data3	10	GND
11	Data4	12	GND
13	Data5	14	GND
15	Data6	16	GND
17	Data7	18	GND
19	ACK	20	GND
21	Busy	22	GND
23	Empty	24	GND
25	Select	26	GND



3.3 Internal USB2.0 Connector (2 x 2 Ports)

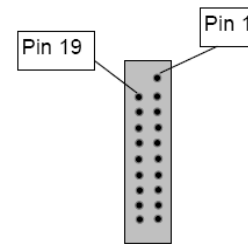
Pin	Signal	Pin	Signal
1	VCC AUX	1	VCC AUX
3	Data negative Port X	3	Data negative Port X
5	Data positive Port X	5	Data positive Port X
7	GND	7	GND
9	Key	9	Key



Interfaces & Connectors

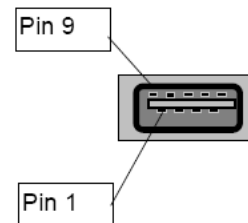
3.4 Internal USB3.0 Connector (1 x 2 Ports)

Pin	Signal	Pin	Signal
1	VCC AUX	2	USB3_RX negative (P2)
3	USB3_RX positive (P2)	4	GND
5	USB3_TX negative (P2)	6	USB3_TX positive (P2)
7	GND	8	Data negative (P2)
9	Data positive (P2)	10	FP Detect
11	Data positive (P3)	12	Data negative (P3)
13	GND	14	USB3_TX positive (P3)
15	USB3_TX negative (P3)	16	GND
17	USB3_RX positive (P3)	18	USB3_RX negative (P3)
19	VCC AUX		



3.5 External USB3.0 Connector

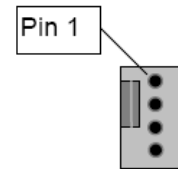
Pin	Signal
1	VCC auxiliary (polyswitch fused and power supervision with over current detection)
2	Data negative
3	Data positive
4	GND
5	USB3_RX negative
6	USB3_RX positive
7	GND
8	USB3_TX negative
9	USB3_TX positive



Interfaces & Connectors

3.6 Fan Connector

Pin	Signal
1	GND
2	12V
3	FAN Sense
4	FAN PWM

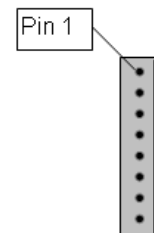


Fan speed control is only supported for 4 pin (PWM) fans.
 3-pin fans (voltage controlled) can be connected, but they will always operate at full speed resp. 12V supply voltage!
 Fan current: max. 1A continuous (CPU Fan: max. 2A continuous)

Note:
Fans must never be attached or removed while the system is powered. Mainboard may be damaged!

3.7 Power Supply Fan Connector

Pin	Signal
1	Not connected
2	PS Fan PWM
3	Not connected
4	PS FAN Sense
5	Not connected
6	Not connected
7	Not connected
8	GND



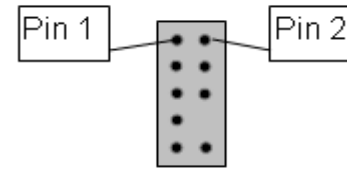
Note: This feature is not supported by standard ATX power supplies!

Interfaces & Connectors

3.8 High Definition Frontpanel Audio Connector (HD Audio) **[Updated]**

Pin	Signal
1	HDA Port 1 Left
3	HDA Port 1 Right
5	HDA Port 2 Left Right
7	Jack Sense common
9	HAD Port 2 Right Left

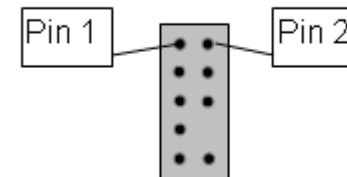
Pin	Signal
2	Analog GND
4	FP Presence Detect
6	Jack Sense Port 1
8	Key
10	Jack Sense Port 2



3.9 AC97 Frontpanel Audio Connector (Legacy Audio)

Pin	Signal
1	Mic Left
3	Mic Right
5	Headphone our Right
7	Analog GND
9	Headphone out Left

Pin	Signal
2	Analog GND
4	reserved
6	reserved
8	Key
10	reserved



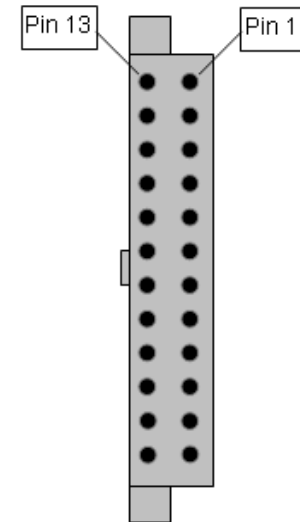
Note: In case of using this connector in AC97 = Legacy mode (BIOS Setting) take care for pin 7. This pin is tied to GND. HP_ON# signaling on this pin is not supported.

Interfaces & Connectors

3.10 Power Supply Connector

Pin	Signal
13	+3.3V (P3V3P)
14	-12V (P12VN)
15	GND
16	PS on (low asserted)
17	GND
18	GND
19	GND
20	NC
21	+5V (VCC)
22	+5V (VCC)
23	+5V (VCC)
24	GND

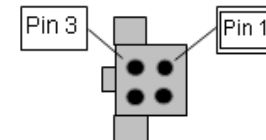
Pin	Signal
1	+3.3V (P3V3P)
2	+3.3V (P3V3P)
3	GND
4	+5V (VCC)
5	GND
6	+5V (VCC)
7	GND
8	Powergood (high asserted)
9	+5V Auxiliary (VCC Aux)
10	+12V (P12VP)
11	+12V (P12VP)
12	+3.3V (P3V3P)



3.11 Additional Power Supply Connector

Pin	Signal
3	+12V
4	+12V

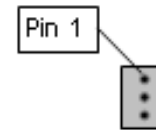
Pin	Signal
1	GND
2	GND



Interfaces & Connectors

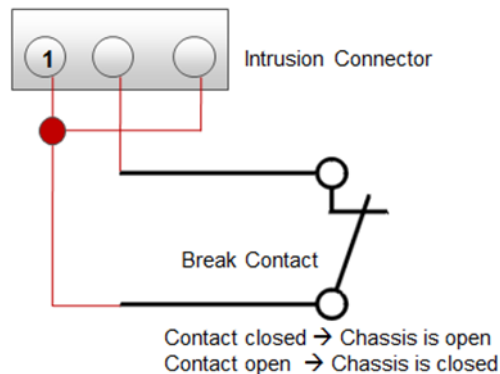
3.12 Chassis Intrusion

Pin	Signal
1	GND
2	Case open (low asserted)
3	Intrusion switch present (low asserted)



Note:

The intrusion supervision feature needs to be enabled in BIOS Setup first (Menu „Security“ → „Cabinet Monitoring“).
This BIOS option is only available if pin 3 („Intrusion Switch Present“) is connected to GND!



Note:

Chassis intrusion is active even if the system is switched off (S5 state) or disconnected from mains power.
The intrusion event is monitored by the chipset (PCH) and stored in the BIOS Eventlog during the next Boot.
A timestamp (Boot date/time) will be added then.
Note: This timestamp does not represent date/time of the intrusion event!
If a Supervisor Password is enabled in BIOS Setup, the system will stop during BIOS POST if an intrusion event has been detected. In order to continue, the Supervisor Password must be entered to confirm the intrusion event.

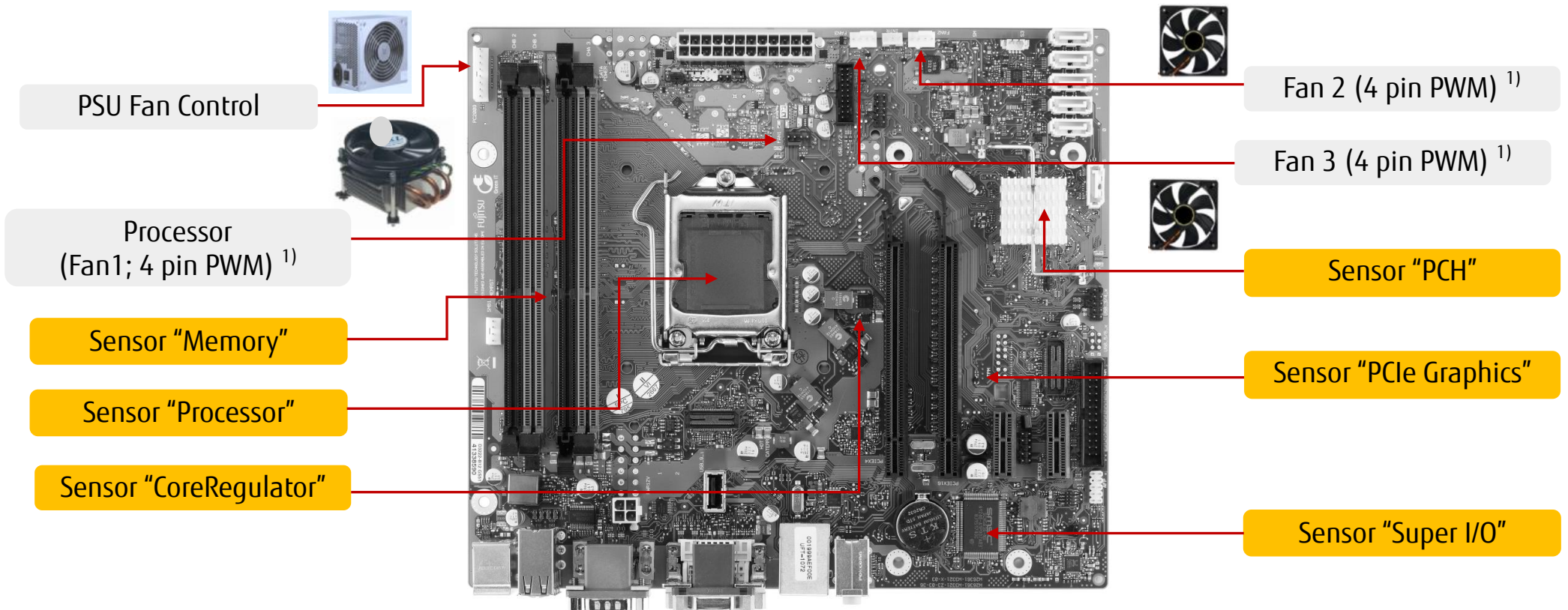
The intrusion status can be easily monitored by using the BMC API (Windows)

4 System Monitoring

- Temperature Sensors and Fans
- SystemGuard: Fan / Temperature Monitor
- SilentFanConfig-Manager
- Temperature Reference Points

System Monitoring

4.1 D3222-B: Temperature Sensors and Fan Connectors



1) 0.3A continuous / 0.6A peak current
(Updated)

**Note: Do not attach more than one fan per connector!
Remove or connect fans only when unit is powered off!**

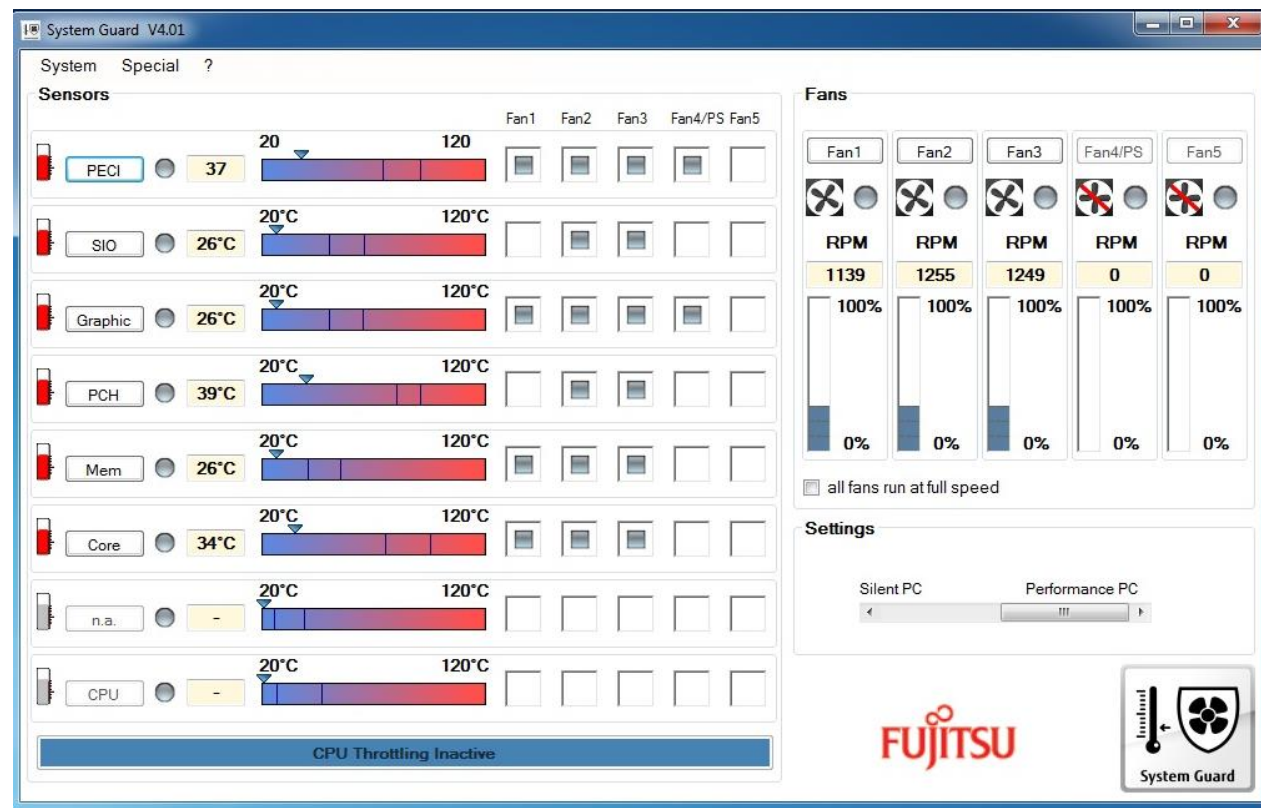
System Monitoring

4.2 D3222-B: SystemGuard

System Monitoring Tool:

- Visualize processor and sensor temperature data
- Display current speed for all attached fans
- User can configure fan aging control (menu "Special")
- User can configure system watchdog (menu "Special")

User can adjust system behaviour via "Silent PC / Performance PC" slider by forced processor throttling



System Monitoring

4.3 D3222-B: SystemGuard - Details

Temperature Sensors

Processor Sensor ¹⁾

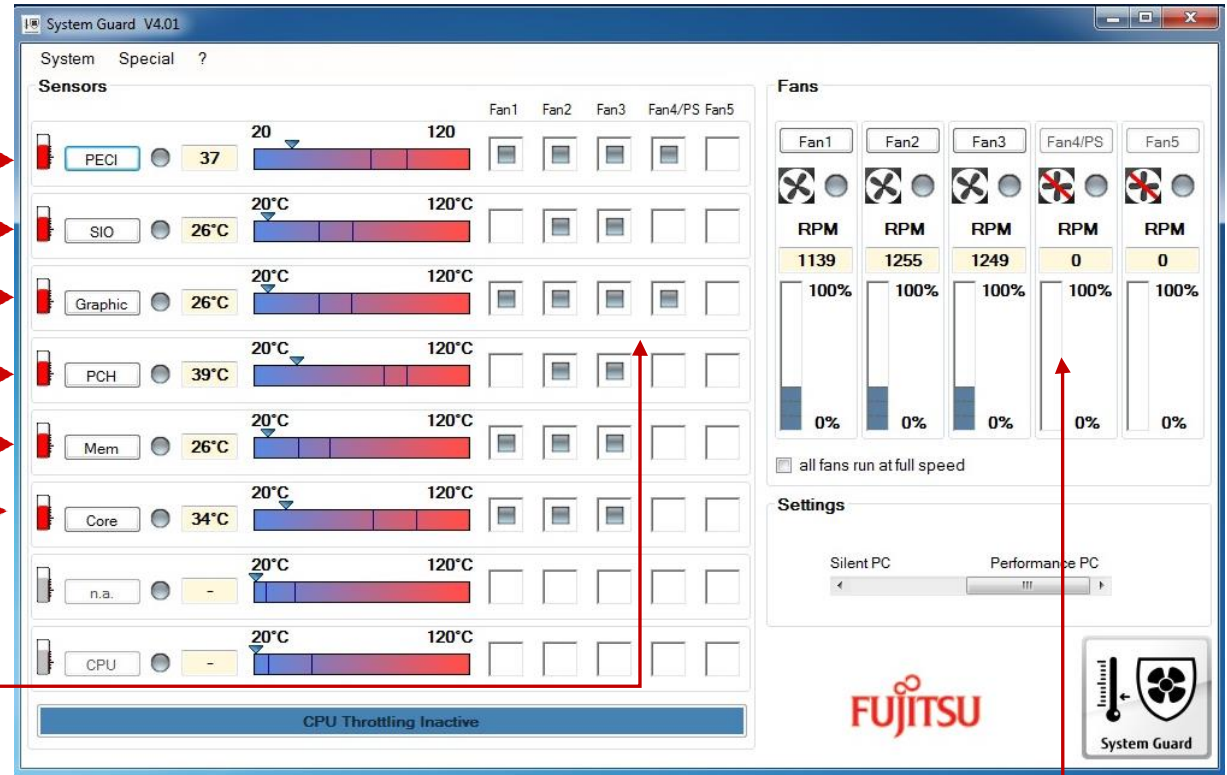
Super I/O Sensor

Sensor PCIe Graphics

PCH Sensor

Memory Sensor

Core Voltage Regulator Sensor



Sensor / Fan Matrix

→ Indicates which sensor influences the specific fan speed
 → Note: Characteristics for FAN1 is always dependent on the CPU temperature – fully controlled by the system BIOS.
 Due to safety reasons the influence of the CPU sensor for FAN1 cannot be disabled!

Fan4/PS

→ Displays the fan speed of the optional power supply fan (specific PSU option)

1) Note: The temperature value shown for the processor (digital „PECI“ measurement =Platform Environment Control Interface) does NOT provide the absolute processor temperature, but it is a calculated value based on the relative PECTI data.

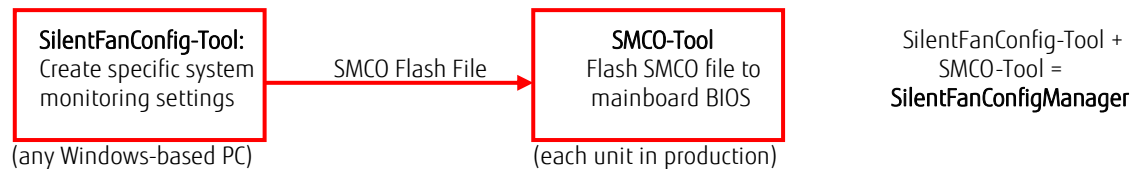
System Monitoring

4.4 SilentFanConfigManager – Customize System Monitoring Settings

Windows-based System Management Configuration Tool

<ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D3222-B/IndustrialTools/SilentFanConfig-Manager/>

1. Windows-based configuration tool (SilentFanConfig) to create customized system monitoring settings like minimum fan speed and temperature sensor influence. These customized settings are stored in a specific “SMCO” flash file.
2. DOS-based tool “SMCO” to flash the customized system monitoring settings (SMCO file) to the system BIOS of the target unit.



Note: New settings are written permanently to system BIOS.
Any BIOS update will not reset the new settings

SilentFanConfig **V1.70.1** or higher required for D3222-B

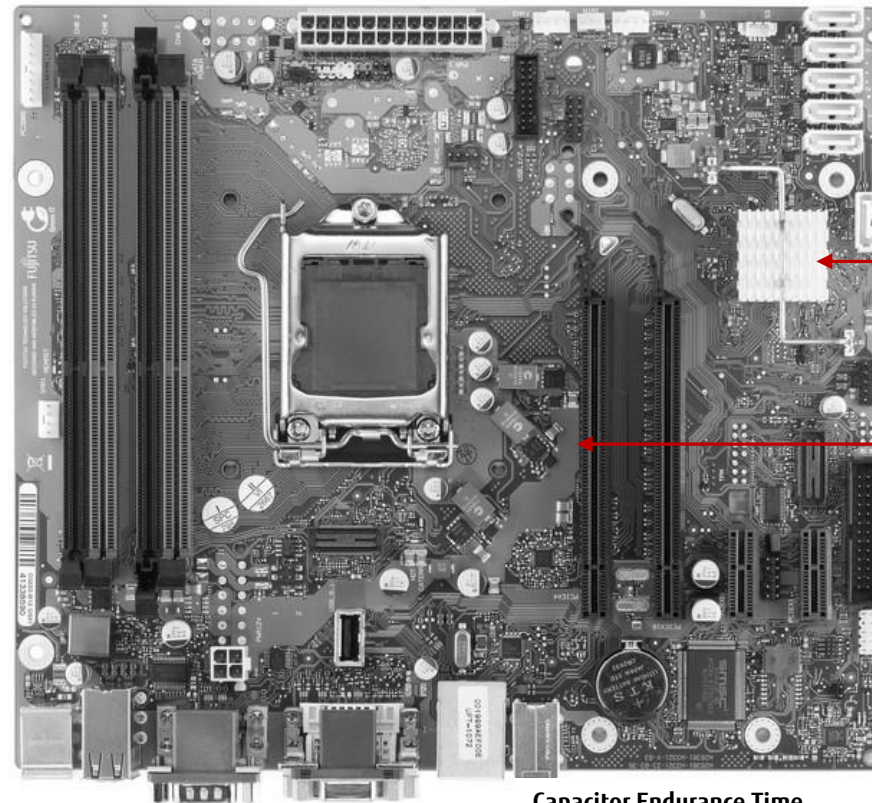
Please see documentation in ZIP file (link below) for further details.

System Monitoring

4.5 Components for continuous 24/7 operation @ +50°C

Operating Conditions:
 Circulating air
 (mainboard) max. 50°C
 Usage 24h / 7 days

All onboard electrolyte capacitors: Polymer type only (= solid electrolyte)



Extra Heatsink on PCH (Q87)

High Efficiency Processor Core Voltage Regulator for reduced thermal dissipation loss

Note: Power Consumption
 PCH → P max ~ 4.1W
 → P idle ~ 0.7W

Capacitor Endurance Time

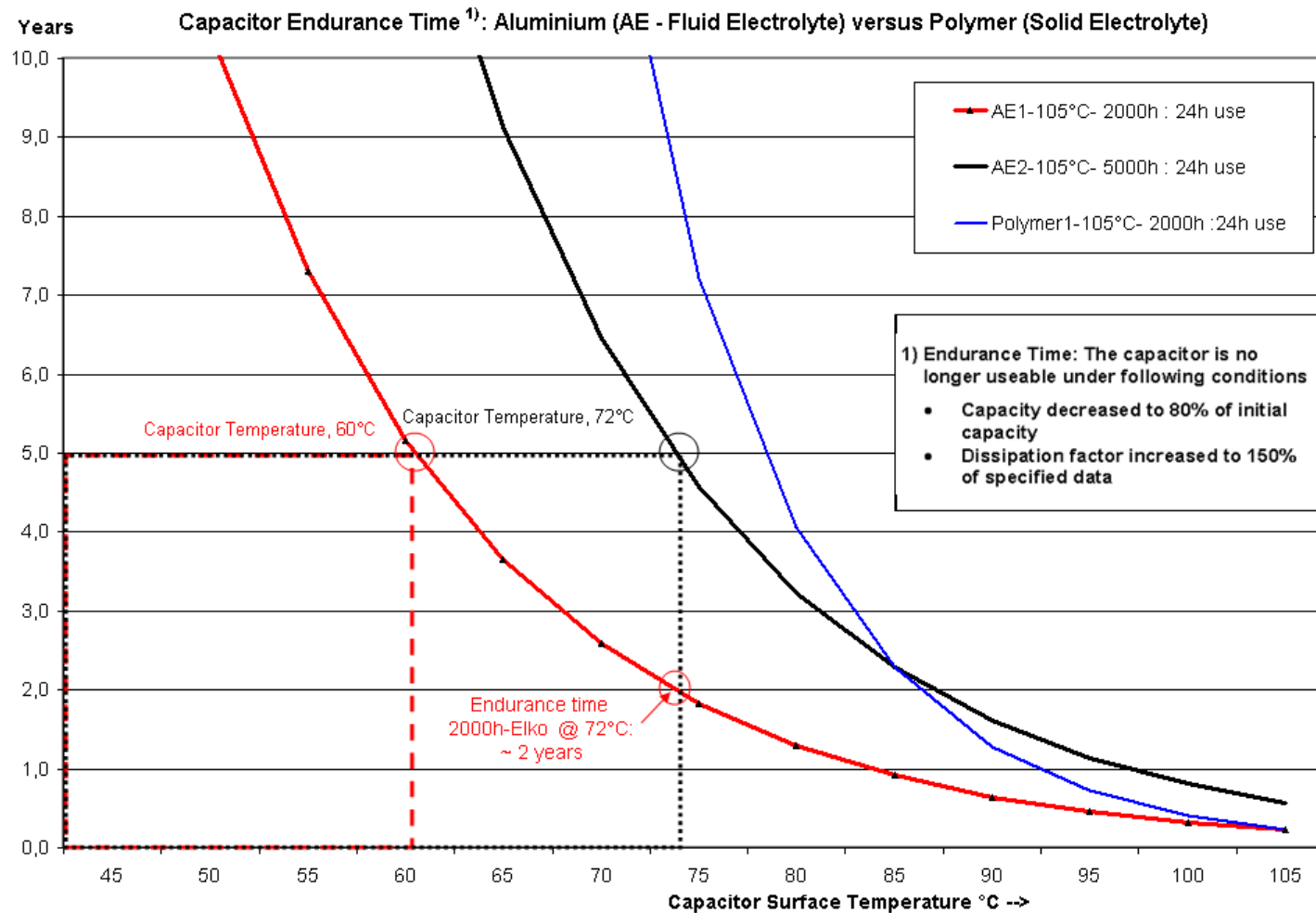
Solid Electrolyte: $L_x = L_o * 10^{\left(\frac{t_o - t_x}{20}\right)}$

Fluid Electrolyte: $L_x = L_o * 2^{\left(\frac{t_o - t_x}{10}\right)}$

Lx = effective endurance time
 Lo = endurance time @ 105°C (e.g. 2.000hrs)
 to = 105°C
 tx = capacitor surface temperature (e.g. 75°C)

System Monitoring

4.6 Capacitor Endurance Time Comparison



System Monitoring

4.7 Temperature Reference Points D3222-B

Operating Conditions:
 Circulating air
 (mainboard) max. 50°C
 Usage 24h / 7 days

All capacitors max. 60°C

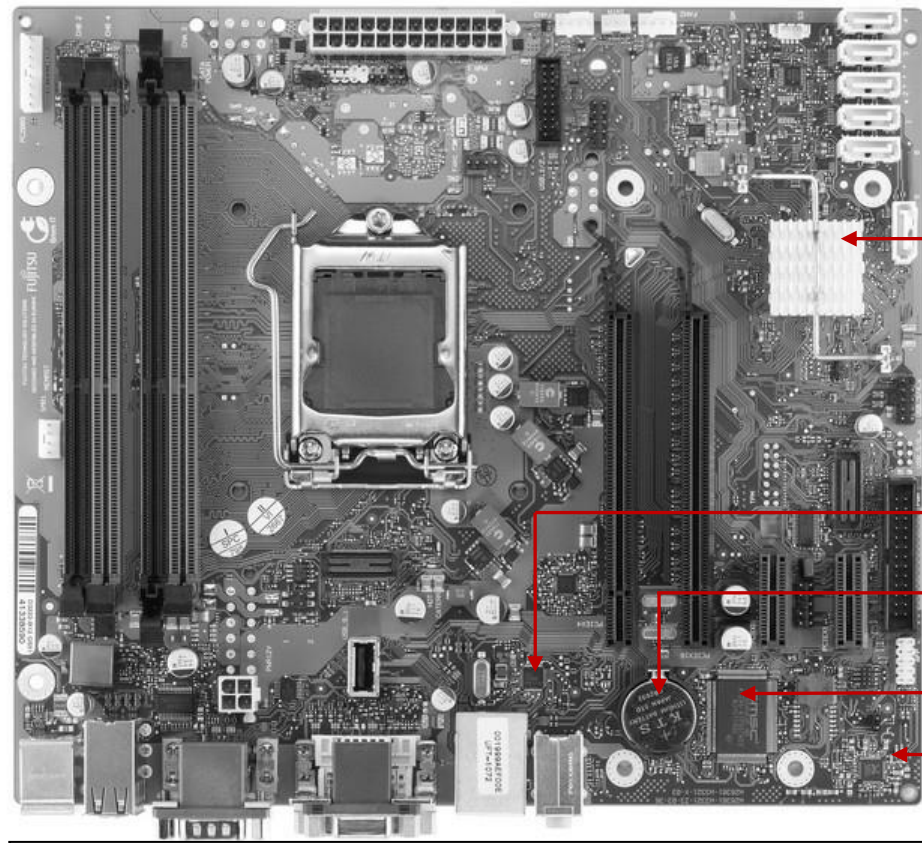
Power MOS-FETs / MOS-FET Drivers max. 90°C

Quartz max. 70°C

Inductors max. 90°C

1) Note: Battery operation is specified in temperature range up to 60°C. Operation between 60°C and 70°C may result in:

- Higher self discharge rate
- Decline of specified characteristics
- Danger of leakage increases



PCH max. 75°C
 (chip surface)

LAN max. 75°C

Battery max. 60/70°C ¹⁾

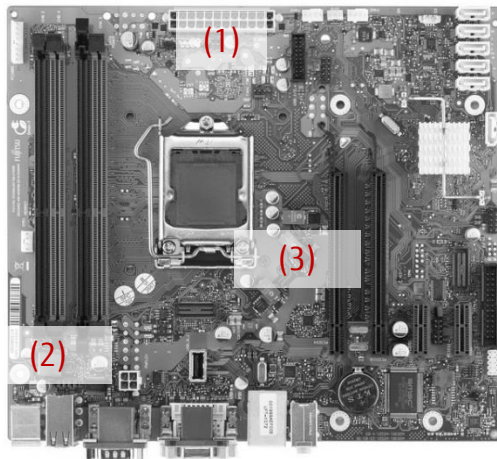
Super I/O max. 70°C

Audio Codec max. 70°C

Reference Point Limit Temperatures (Component Surface) must not be exceeded!

Power Supply

4.8 ATX Power Supply **[Updated]**



Connectors for ATX Power Supply

- (1) 24 pin connector (ATX layout)
- (2) 4 pin connector (+12V, GND)

Note: The +12V supply (up to 12A) for processor and chipset is provided via the 4 pin connector! Onboard voltage regulators convert the +12V input power to the appropriate processor / chipset supply voltages.

- (3) Processor Core Voltage Regulator: High Efficiency design for enhanced power saving and less thermal dissipation loss.

Requirements for ATX Power Supply **[Updated]**

for onboard components (worst case incl. processor, memory, USB devices; w/o PCIe cards, w/o SATA drives)

Source	Voltage	Min. PS Load	Max. Voltage Tolerance	Mainboard Capacitive Load	Max. Mainboard Current
Main Power Supply	+ 12V	0.05A	± 5 %	3.000µF	14A/18A ¹⁾
	- 12V	0A	± 10 %	470µF	0.3A
	+ 5V	0.2A	± 5 %	3.000µF	10A
	+ 3.3V	0A	± 5 %	3.000µF	2A
Aux. Power	+ 5Vaux	0A	+5 % / -3%	3.000µF	2.5A

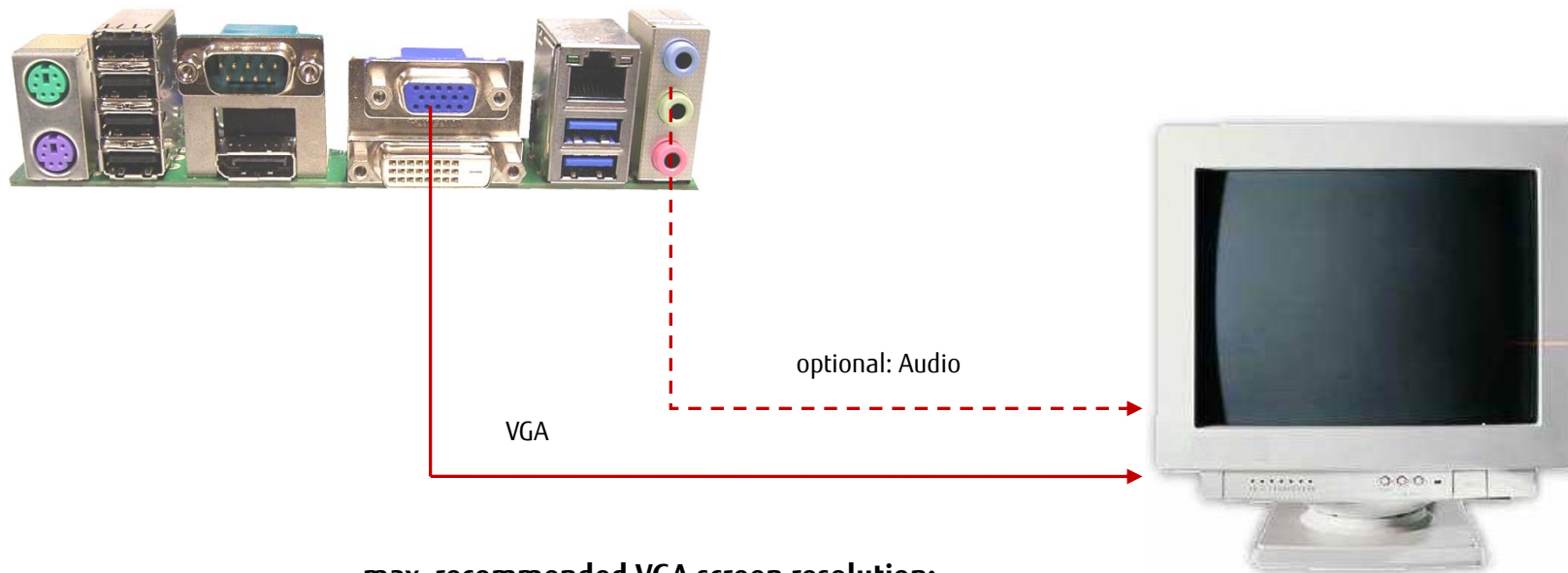
1) 18A = Surge Current for 20 sec!



The ATX power supply must support the minimum load conditions as mentioned in the left chart.

5 Display Options

5.1 VGA Output



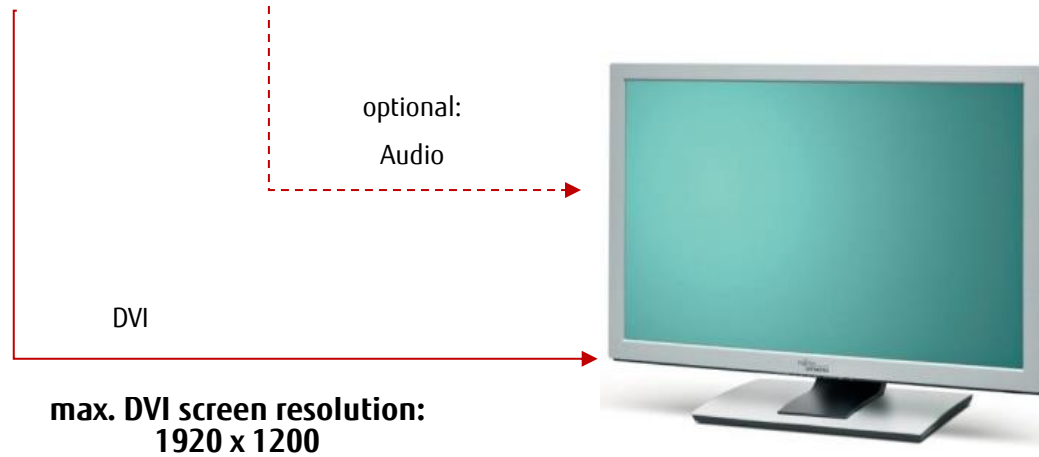
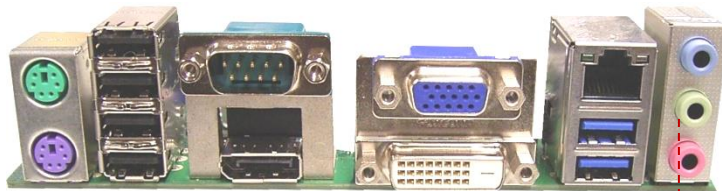
**max. recommended VGA screen resolution:
1920 x 1200**

Note: Intel supports "VGA" up to 2048x1536 @75Hz, but signal quality may be limited!

Analog (VGA) Monitor

Display Options

5.2 DVI Output



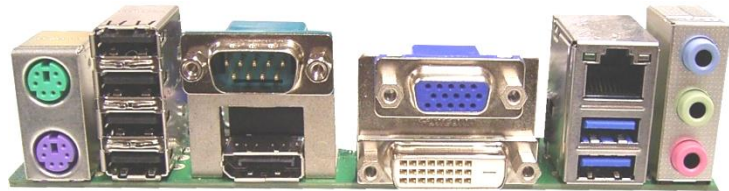
**max. DVI screen resolution:
1920 x 1200**

Note: DVI supports Single Link only!

Digital (DVI) Monitor

Display Options

5.3 HDMI Output



DVI-HDMI Interface Connector



HDMI

**max. HDMI screen resolution:
1920 x 1200 (Full HD)**
HDMI transfers Video & Audio

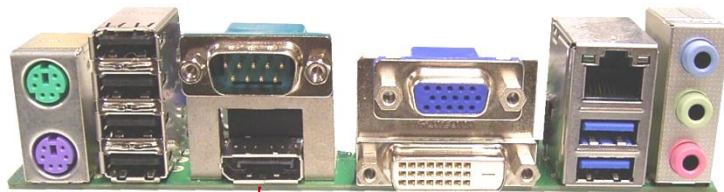


Digital (HDMI) Monitor

Note: HDMI Audio Device needs to be enabled via Control Panel!

Display Options

5.4 DisplayPort Output



Display Port V1.2

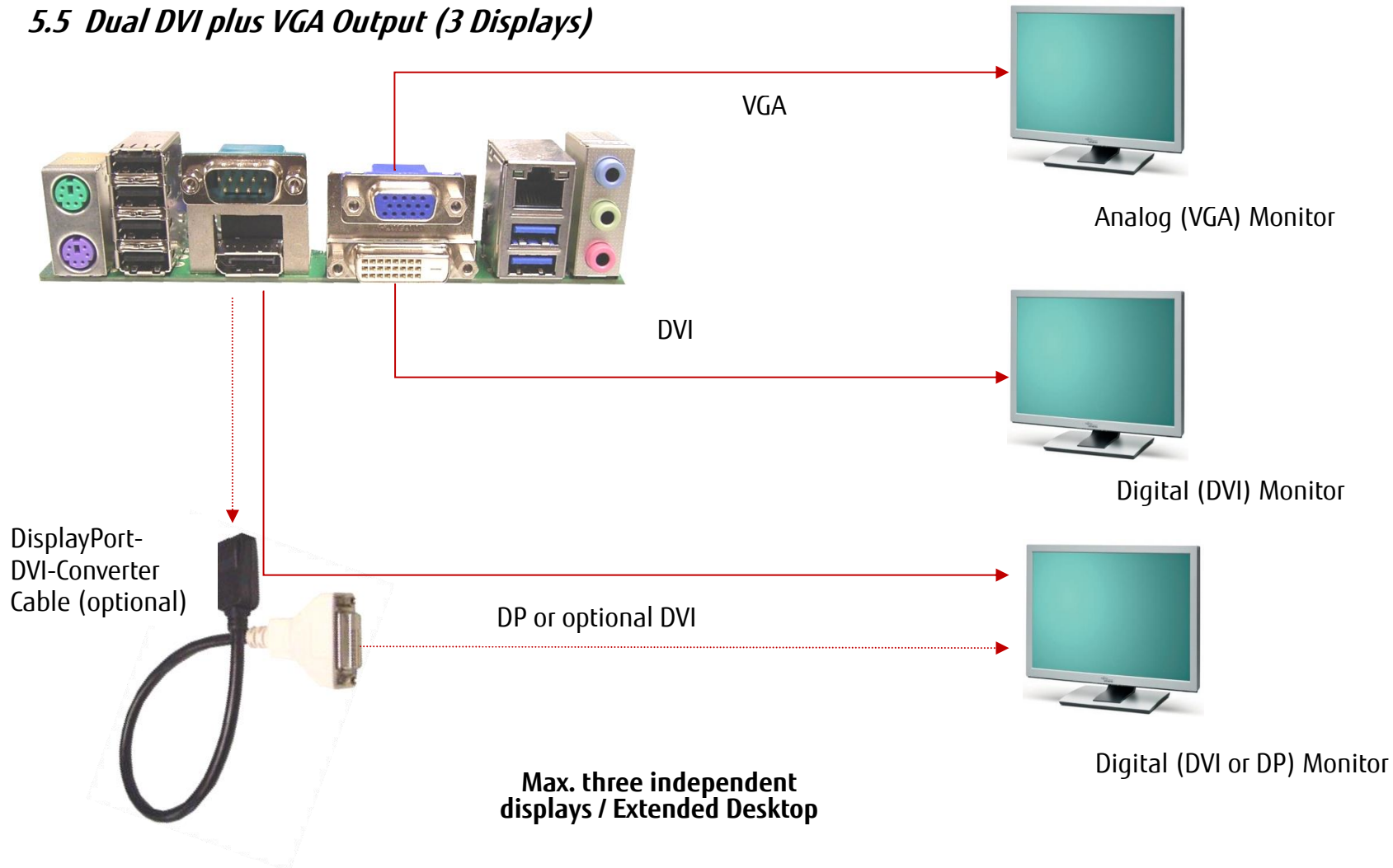
**max. DP screen resolution:
3840 x 2160 @60Hz**



Digital (DisplayPort) Monitor

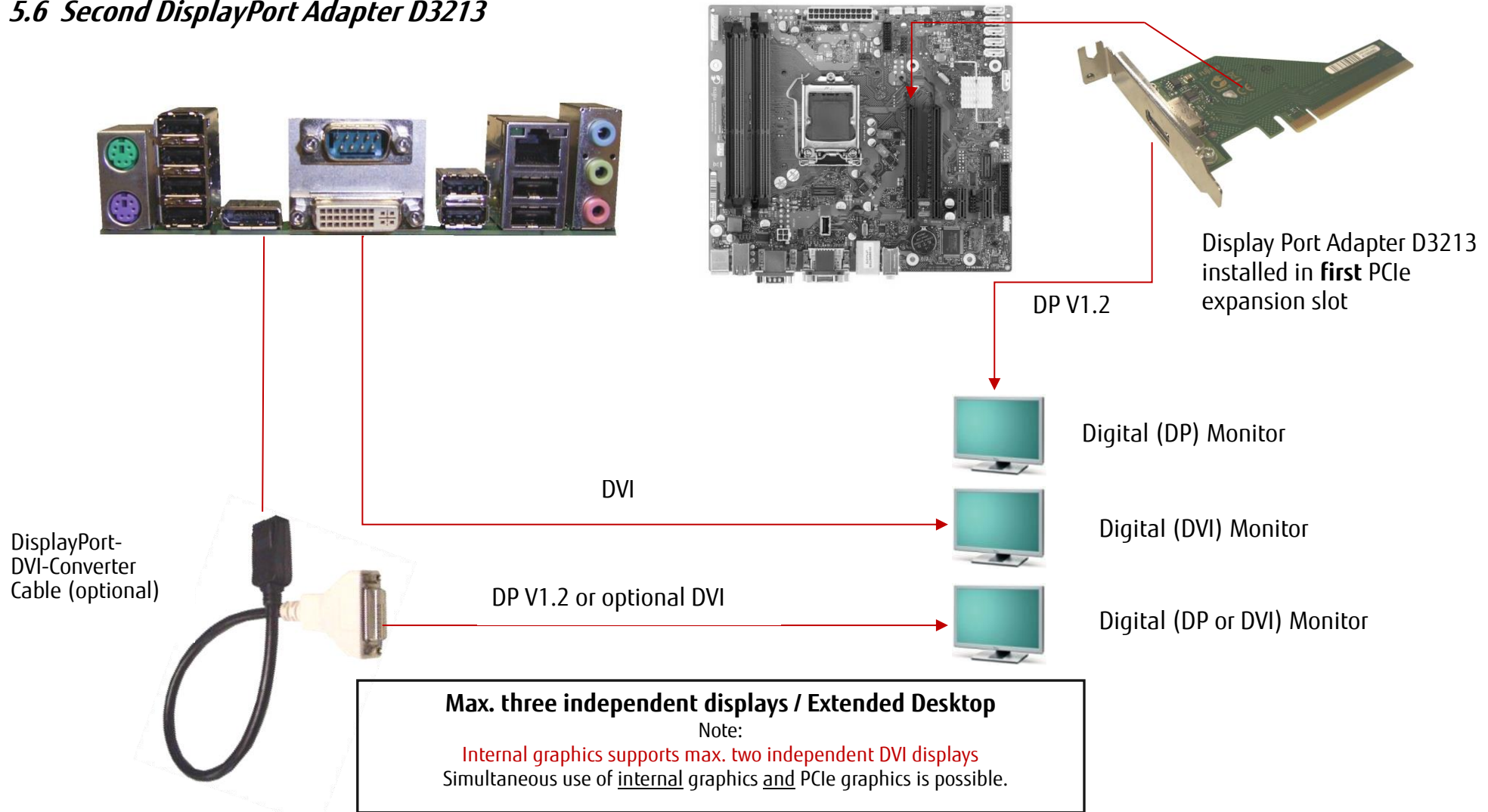
Display Options

5.5 Dual DVI plus VGA Output (3 Displays)



Display Options

5.6 Second DisplayPort Adapter D3213



Display Options

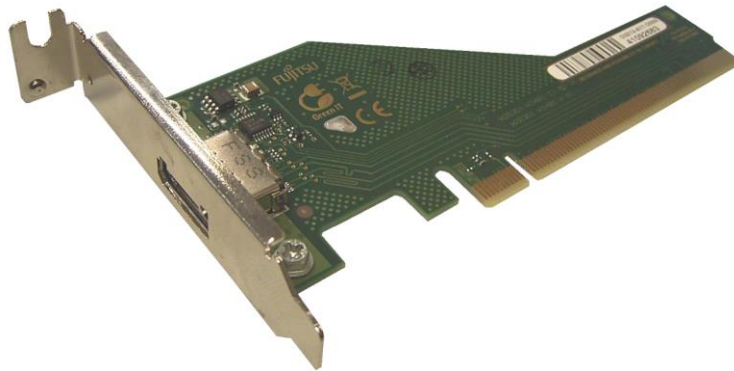
Second DisplayPort Adapter D3213

This adapter allows to connect a second DisplayPort monitor to D322x.

Please note that the DP adapter must be installed in the PCIe x16 slot with 4lanes, which is located close to the processor.

Related FTP link for further details:

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Accessories/Graphics/DisplayPort_D3213_F5000-G001/



6 Operating System Support

- Windows® 7
- Windows® 8

Operating System Support

6.1 Support for Windows 7 / Windows 8

- **Mainboard D3222-B is designed according to the Microsoft Guidelines for Windows 7 and Windows 8**
- **MS certified drivers are available via OEM DU-DVD and OEM FTP Server**



<ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D3222-B/Drivers/>

Note: Intel may provide limited driver support for Windows 8 / 32Bit!

7 Mainboard Tools

Common Mainboard Tools

Note: Make sure not to use any DOS memory manager like *himem.sys* oder *emm386!*



7.1 BIOS Boot Logo Tool

- Tool to integrate a customized boot logo

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Services/Software&Tools/Common-Mainboard-Tools/BootLogo_4_UEFI/

7.2 EditCMOS

- DOS-based production tool to change BIOS settings
and freeze customized BIOS settings (= customized default settings)

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Services/Software&Tools/Common-Mainboard-Tools/EditCMOS_UEFI/

7.3 OEMIDENT

- DOS-based production tool to add MS OEM licence data (SLP1 for Windows XP and SLP2.x for Windows Vista & Windows 7)
- Add an individual customer serial no / add a chassis asset tag
- Disable and hide TPM feature in BIOS Setup

Link to DOS-based tool and 32Bit version (Win PE):

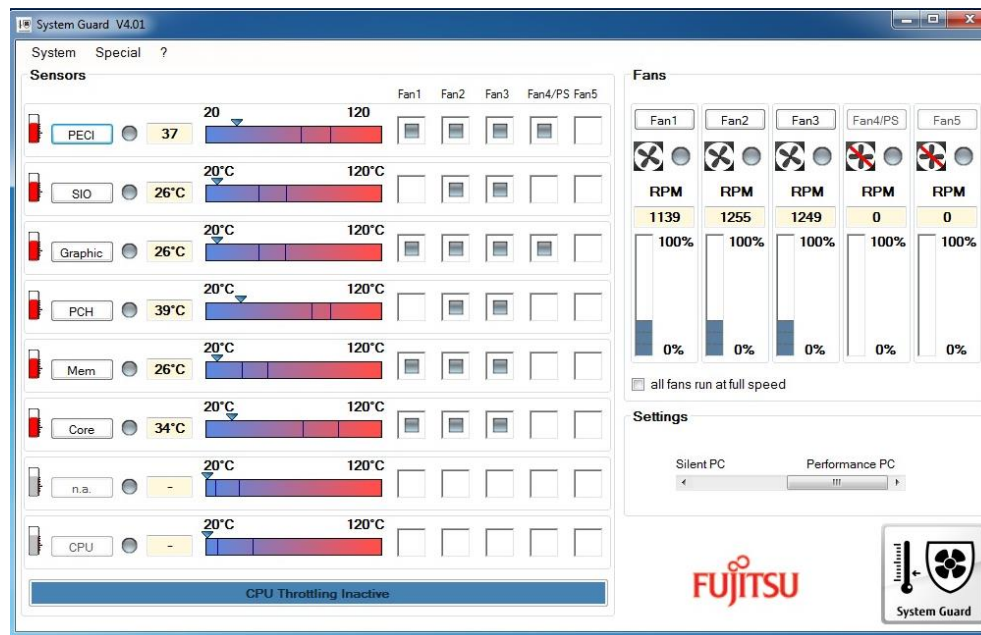
<ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Services/Software&Tools/Common-Mainboard-Tools/OEM-Ident/>

Mainboard Tools

7.4 SystemGuard

- Windows-based tool to monitor temperatures and fan speed of FTS mainboards
- Option to configure automatic fan ageing supervision
- Provides access to the System Watchdog

<ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Services/Software&Tools/Common-Mainboard-Tools/SystemGuard/>



Note: SystemGuard V4.1 (or higher) recommended for D3222-B!

8 Known Issues & Important Notes

8.1 Driver support for MS Windows XP / MS Win8

For the Q87 chipset there are following restrictions (Intel):

- no driver support for Windows XP
- limited driver support for Windows 8 / 32Bit

8.2 Memory Issue

The 2GB module Samsung M378B5773CH0-CK0 may show sporadic issues with D322x (in particular when 4 modules are installed). These modules should not be used!

Recommended alternative:

Samsung M378B5773DH0-CK0 (= new stepping)

8.3 Possible Power Supply Issue

Please note that the requirements regarding minimum ATX PSU load have been update by Intel due to enhanced sleep states of the Haswell processors. Please make sure to use only power supplies qualified by Intel or models that comply with the updated specification (main change: min. load @ 12V reduced to 0.05A – current PSUs may become instable with this low load).

D3222-B provides some additional resistors @+5V and +12V ("dummy load") in order to facilitate the use of previous PSU models.

Known Issues & Important Notes

8.4 SATA Interface (Intel chipset limitation)

D322x may show compatibility issues with SATA-II harddisk drives. Intel strongly recommends to use SATA-III HDDs only. D322x may show compatibility issues with SATA optical drives (older models). Please make sure to use latest revision of optical drives and related firmware only.

8.5 iAMT / vPRO verification test fails

The first released BIOS versions have an issue with the Intel vPro verification test. Issue is solved with BIOS R1.5.0 or higher.

8.6 Graphics driver issue with future Core-i3 / Pentium-G processor

Please note that the early released Intel graphics driver does not support above mentioned processor graphics cores. Graphics driver 9.18.10.3220 or higher required for above mentioned processors.

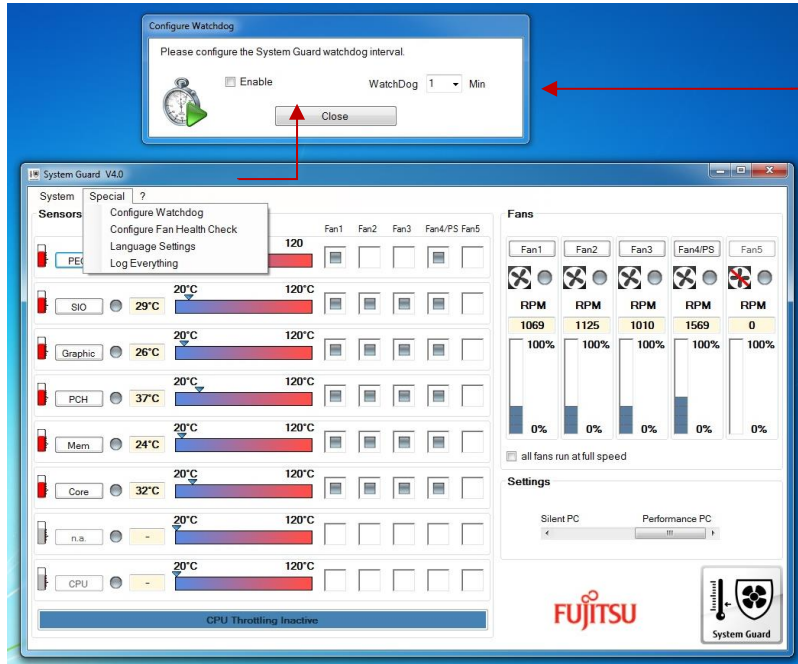
FTP download: <ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D3222-B/Drivers/>

9 Miscellaneous

9.1 System Watchdog (WD)

D3222-B provides a HW Watchdog for Operating System Runtime supervision.

- Use “WD software agent” to start, stop or retrigger the watchdog during OS runtime
 Note: This “agent” needs to be provided by the customer, dependent on his needs.
 For easy access to the watchdog functions, the Windows API (BMC-API) or the related Linux driver (lm-sensors) can be used:
<http://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D3222-B/IndustrialTools/>
- For easy testing, the SystemGuard tool provides access to the OS Watchdog. After enabling the Watchdog, SystemGuard retriggers the WD continuously. In case the system freezes, SystemGuard does no longer provide the retrigger signal and the watchdog resets the system after the timeout.
 Note: When SystemGuard is closed, the WD is stopped in order to avoid an unwanted system reset!



Menu “Special”:
 --> Enable WD
 --> Set timeout to 1 – 8 minutes

Miscellaneous

9.2 BIOS Update / BIOS Recovery

BIOS update options

Link to related BIOS files (OEM FTP Server):

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D3222-B/BIOS_D3222-B/

DOS-based BIOS update (DOS-bootable USB stick)

Required BIOS files:

- EfiFlash.exe (DOS flash tool)
- DosFlash.bat (batch file)
- D3222-B.upd (flash file)

Copy unzipped files to a DOS-bootable USB stick, boot system from stick and run *DosFlash.bat*

Note: In order to easily create a Free-DOS bootable stick, the Fujitsu *BootStick* tool can be used:

[ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D3222-B/BIOS_D3222-B/FTS_Basic-BootStick.\\$XE](ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D3222-B/BIOS_D3222-B/FTS_Basic-BootStick.$XE)

Miscellaneous

BIOS Update / BIOS Recovery

Windows-based BIOS update (Deskflash tool)

Required BIOS file:

- D3222-Bx.R1.x.y.**DFI.exe** (Windows executable flash tool)

Copy file from FTP (link see above), rename *filename.\$xx* to *filename.exe* and copy to target system (e.g. Windows desktop).
 Doubleclick to start BIOS update and follow instructions on the screen.

DOS-based BIOS Recovery (DOS-bootable USB stick)

Required BIOS files:

- EfiFlash.exe (DOS flash tool)
- DosFlash.bat (batch file)
- D3222-B1.upd (flash file)
- D3222-B1.rom / D3222-B1.1xx --> **Important: These files must be located in the root directory of the USB stick!**

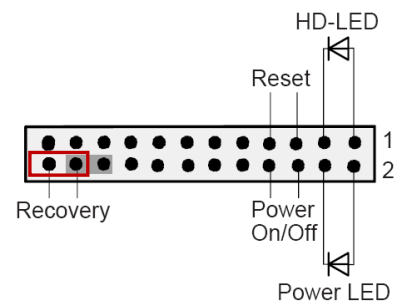
Set onboard jumper to Recovery Mode

Copy unzipped files to a DOS-bootable USB stick,
 boot system from stick and run *DosFlash.bat*

Follow instructions on the screen and set jumper to default position

Note:

BIOS Recovery should only be used to repair a corrupted BIOS.
 All customized data except for OEM SLP data will be reset.



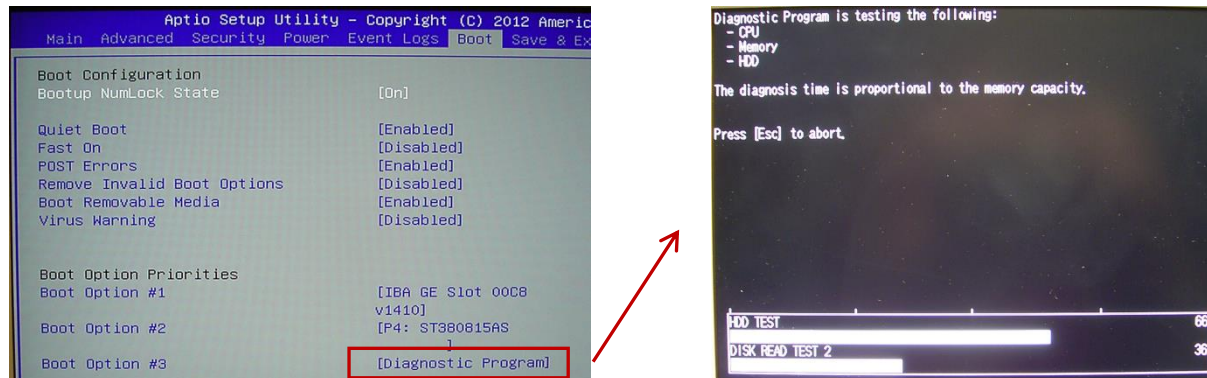
BIOS/CMOS Reset:

In order to reset the CMOS settings: Power off system, set Jumper to "Recovery", power on system and wait until picture appears on screen.
 Power off again and set jumper to original position. CMOS settings should now be reset to default mode. (For this procedure no BIOS update is required!).

Miscellaneous

9.3 BIOS integrated HW Diagnostic Tool

Starting with the D322x mainboards, there is a hardware test module integrated in the system BIOS. In order to run the tool, please select "Diagnostic Program" as boot device and follow the instructions on the screen. This test module analyzes CPU, Memory and HDD.



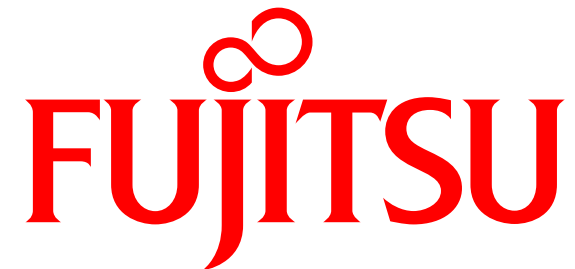
9.4 BIOS integrated Erase Disk Tool

With the previous mainboard generations Fujitsu introduced the integrated BIOS tool *Erase Disk*, a feature for secure deletion of any data on a harddisk drive.

Please note that this tool will no longer be implemented free of charge in D322x mainboards, but it can be ordered as an optional feature. For ordering details please see pricelist.

Detailed information about Erase Disk is available here:

http://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D3222-B/Documentation/PF_EraseDisk_e.pdf



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