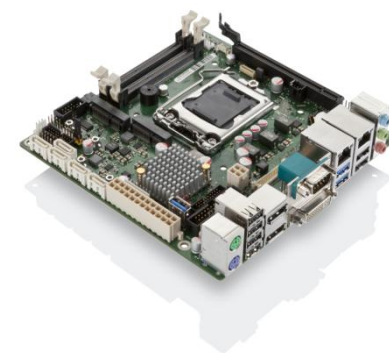


Industrial Mainboard Series

D3243-S



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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.)

Important Note (D3243-S):

If the Power Supply is changed from Multirail to 12V only or vice versa, make sure to disconnect the mainboard D3243-S from any power at least for 10 minutes!

2 Feature Overview

- Based on latest Intel *Lynxpoint* single-chip technology (iQ87 resp. iH81)
- Support for full range of latest LGA1150 *Haswell* and *Haswell Refresh* processors (Intel Core™-i Gen 4; up to 95W TDP)
 - Intel® Core™ i7 / i5 / i3 – 4xxx processor series
 - Intel® Pentium® G3xxx processor series
 - Intel® Celeron® G18xx processor series
 - Intel® "TE" Haswell-based embedded processor series
- **iAMT 9.1 / VPro 2014 Manageability Support**
 Note: Available feature set depends on PCH and installed processor
- Max. four memory sockets DDR3-1333/1600 supporting up to 32GB
- Intel Gbit LAN i217LM ("Clarkville") onboard
 - iAMT support
- Second Intel Gbit LAN i210AT (optional)
 - Teaming support



Feature Overview

- **Trusted Platform Module TPM V1.2 (Infineon) onboard (optional)**
- **Latest Intel® HD Graphics (integrated in processor)**
 - Simultaneous use of integrated graphics and PCIe graphics possible
 - Onboard option for up to three digital displays (1 x DVI / 2 x DisplayPort V1.2) or two digital displays (2 x DisplayPort V1.2) and 1 x VGA (DVI-I via VGA converter)
 - Support of 4k resolutions (3840 x 2160) via DisplayPort V1.2
 - Support of spanned displays (*Collage Mode*)
- **PCI Express Gen3 (Q87) / PCI Express Gen2 (H81)**



Feature Overview

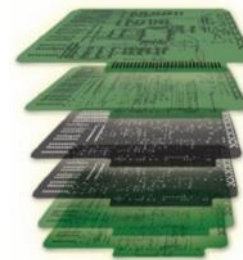
- Internal Socket for USB stick / Dongle onboard (optional)

- USB 3.0 onboard



- Multichannel audio (5.1) incl. S/PDIF onboard

- 6-Layer PCB (D323x-S) resp. 8-Layer PCB (D3243-S)
 - Improved electrical signal quality
 - Improved durability



Feature Overview



Designed & approved for 24/7 continuous operation @ 60°C



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



Extended lifecycle up to 5 years

BIOS-POST/-Boot & OS – HW Watchdog onboard

→ Easy SW integration via Windows API & Linux Driver



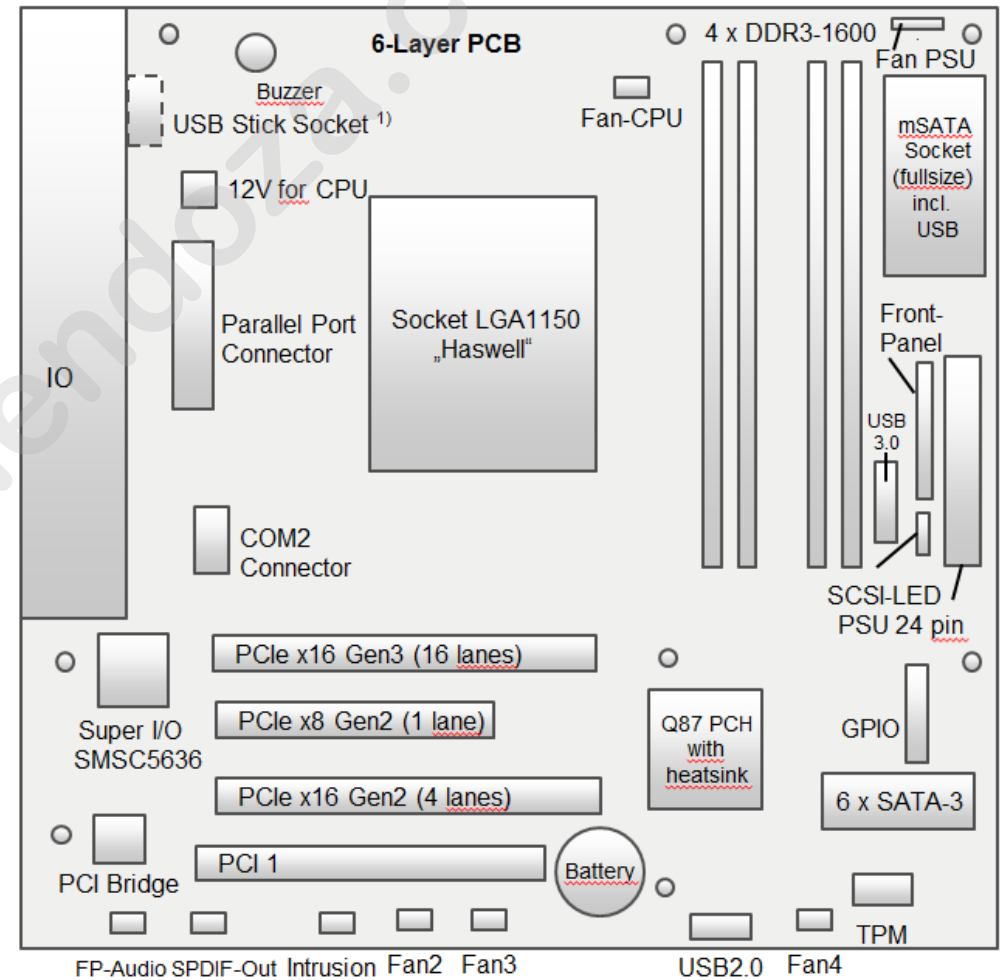
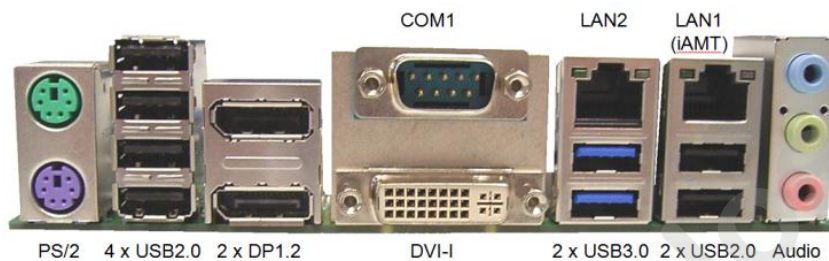
mSATA Socket (D3231-S/D3236-S) resp. mSATA Socket & Mini-PCIe Socket (D3243-S)

→ for OS installation or hddisk caching

→ incl. USB 2.0 interface for USB-based modules

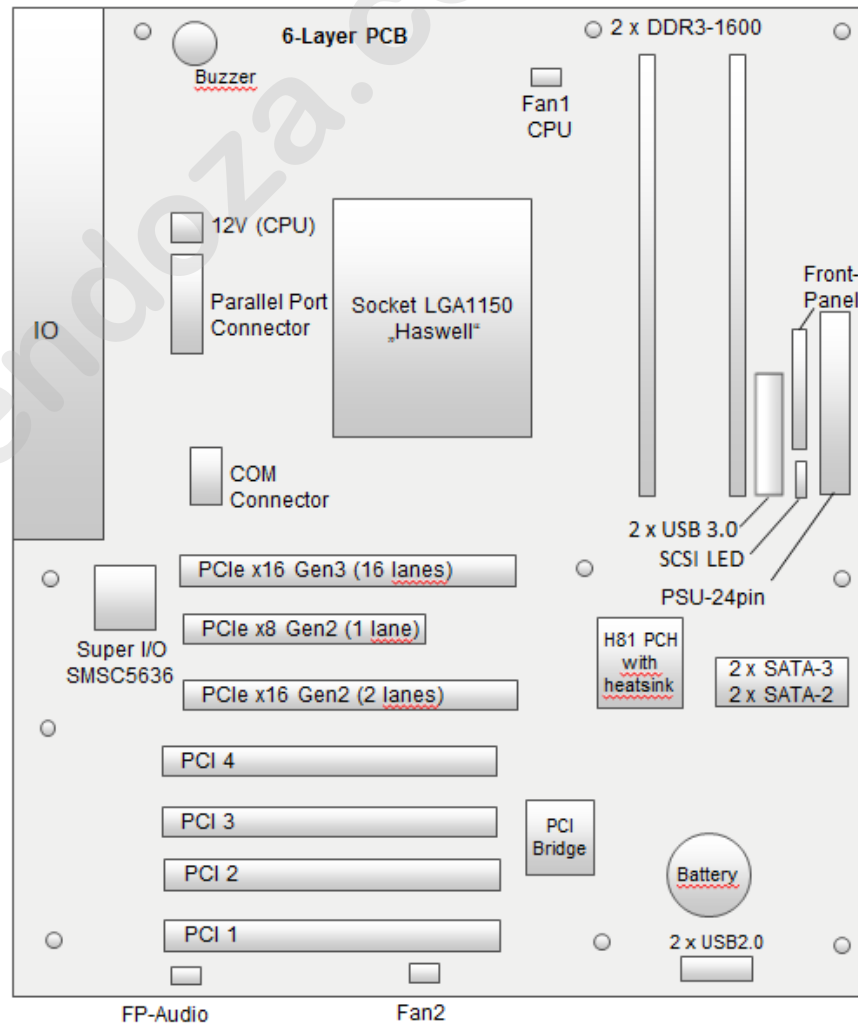
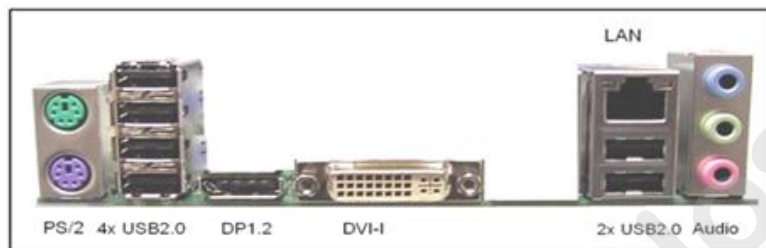
Feature Overview

2.1 Basic Layout D3231-S



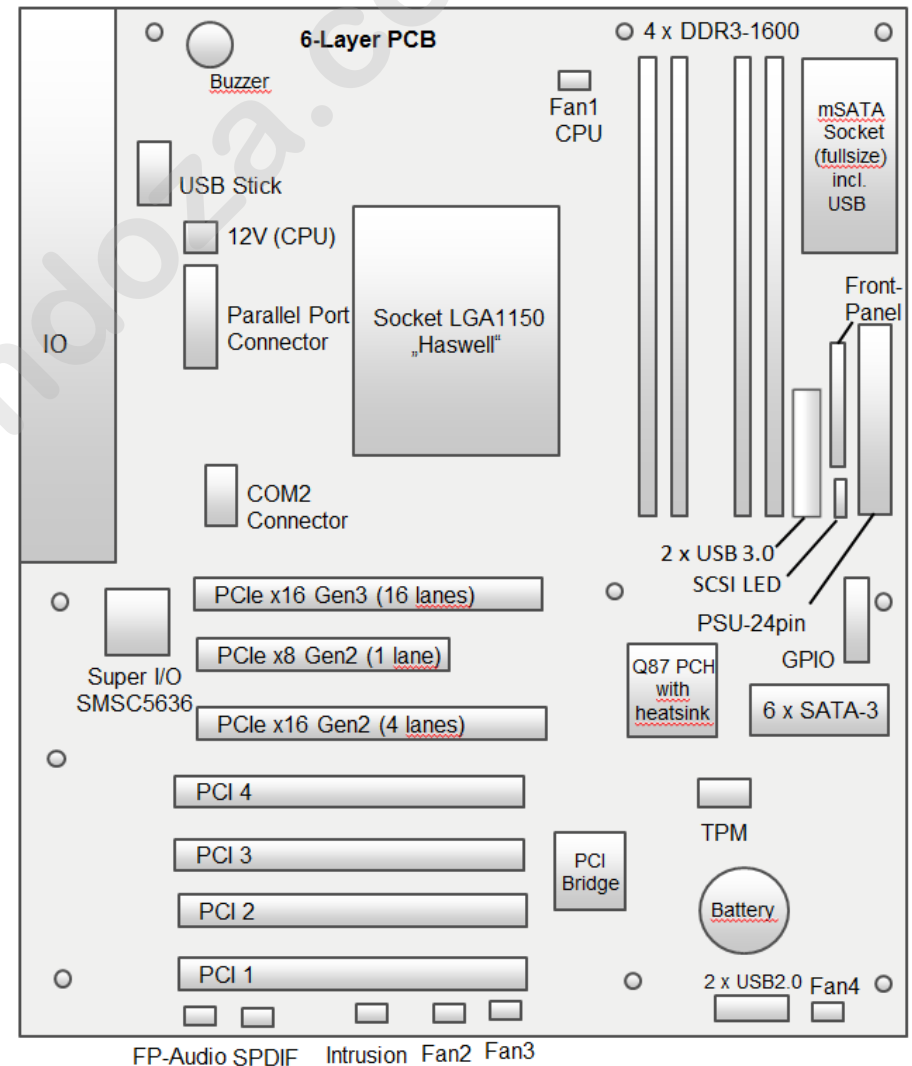
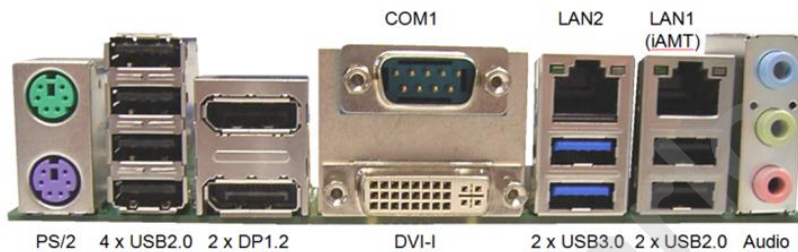
Feature Overview

2.2 Basic Layout D3235-S



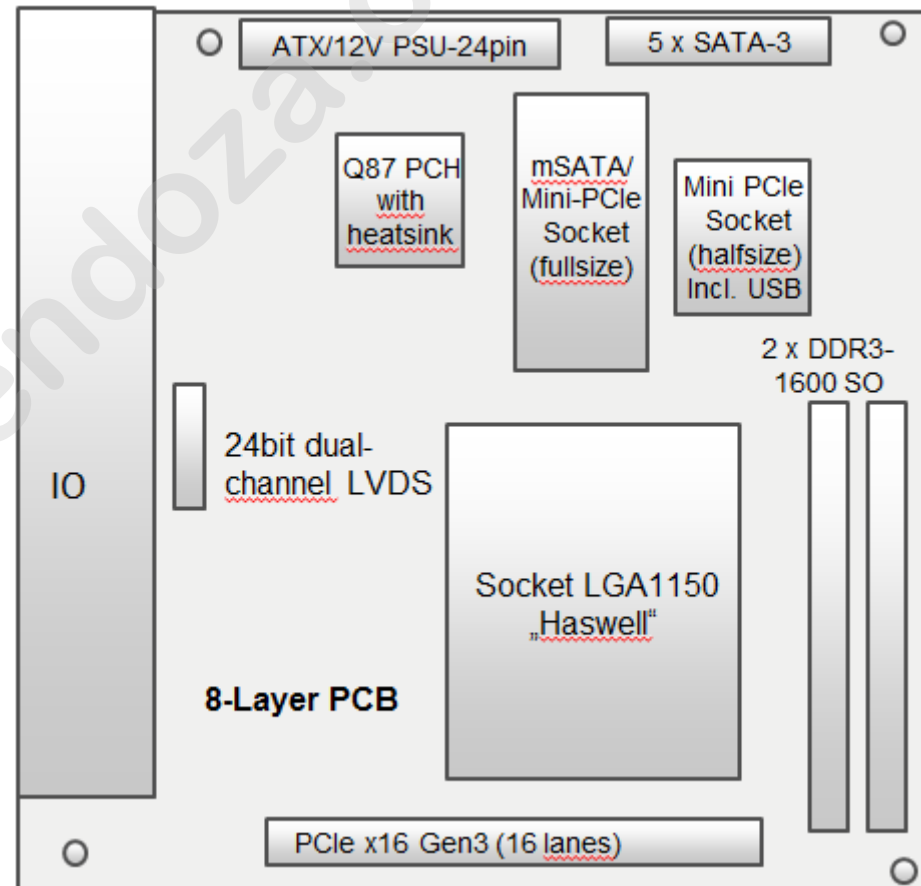
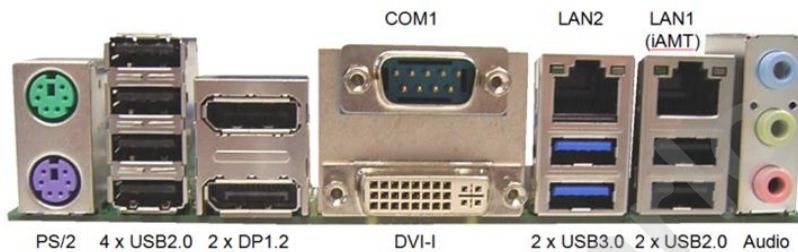
Feature Overview

2.3 Basic Layout D3236-S



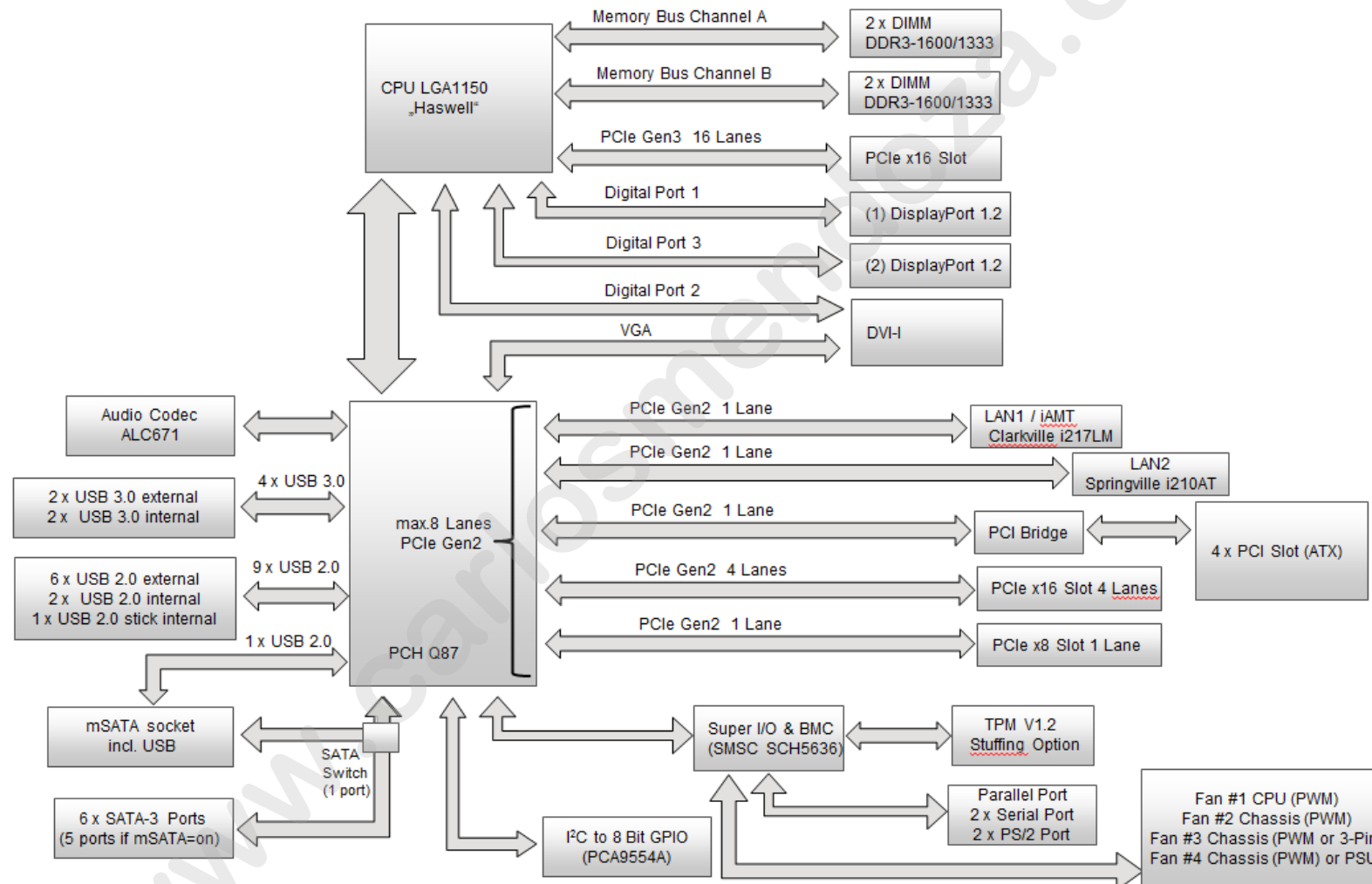
Feature Overview

2.4 Basic Layout D3243-S



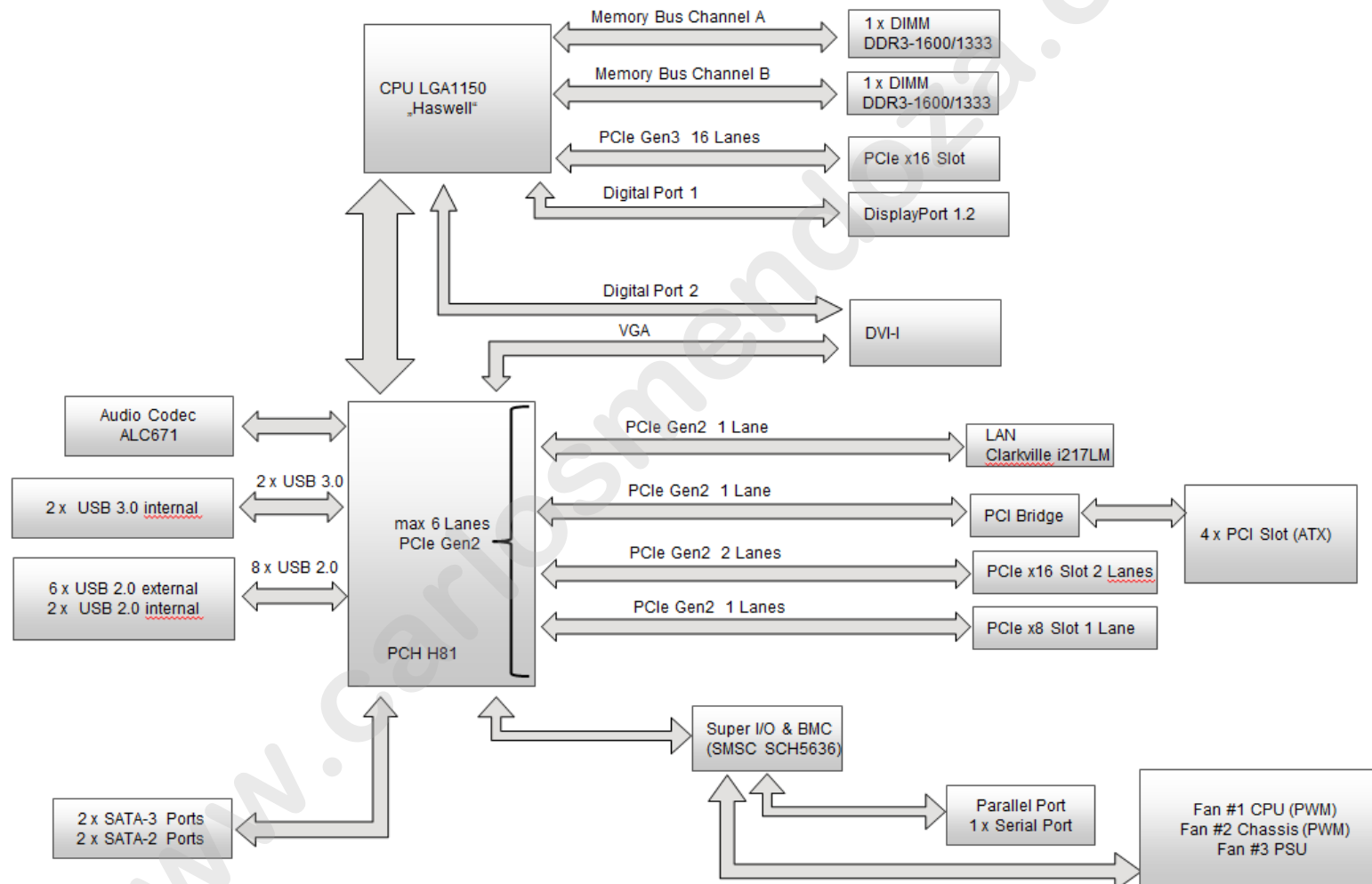
Feature Overview

2.5 Block Diagram D3231-S & D3236-S



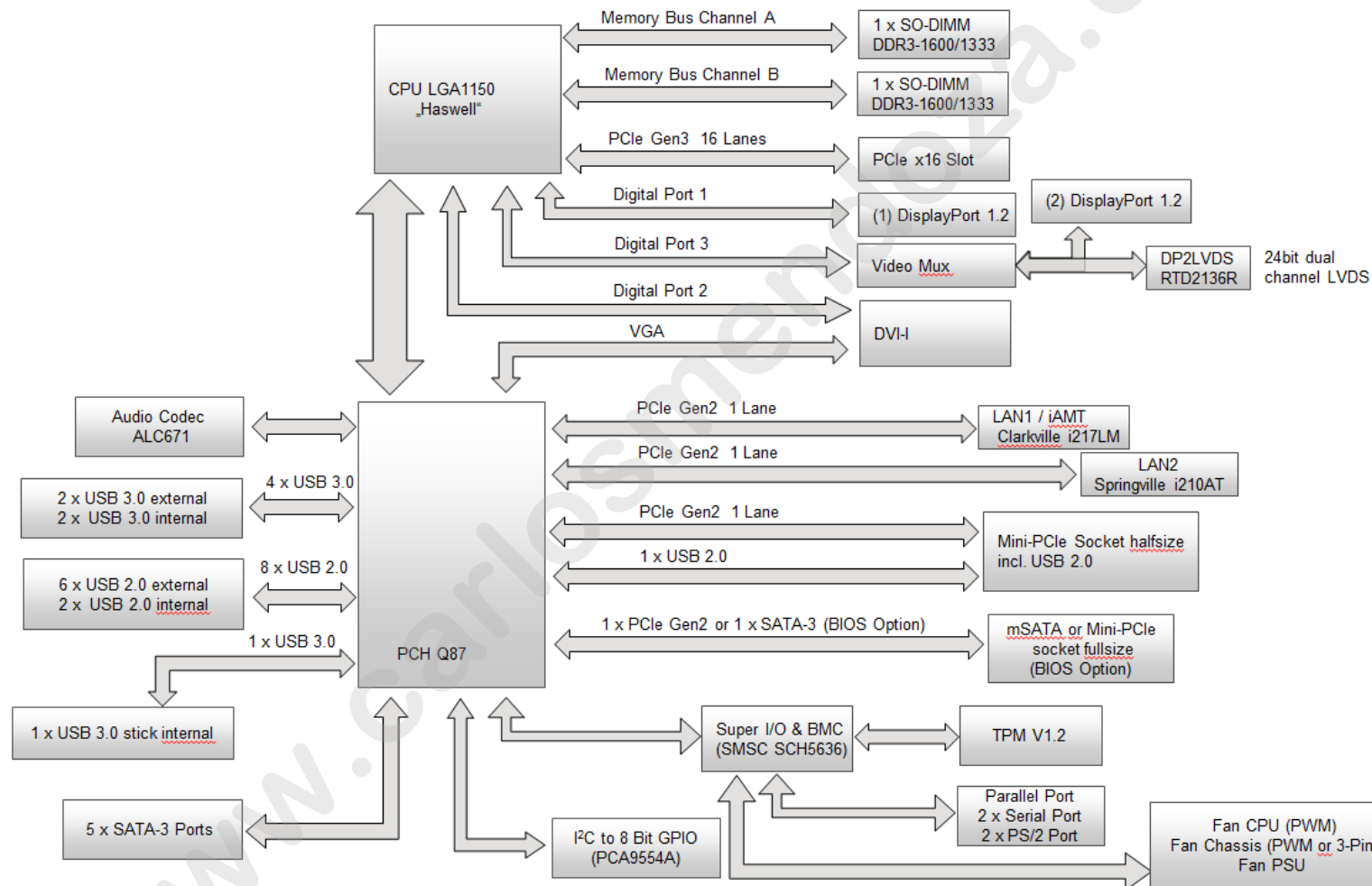
Feature Overview

2.6 Block Diagram D3235-S



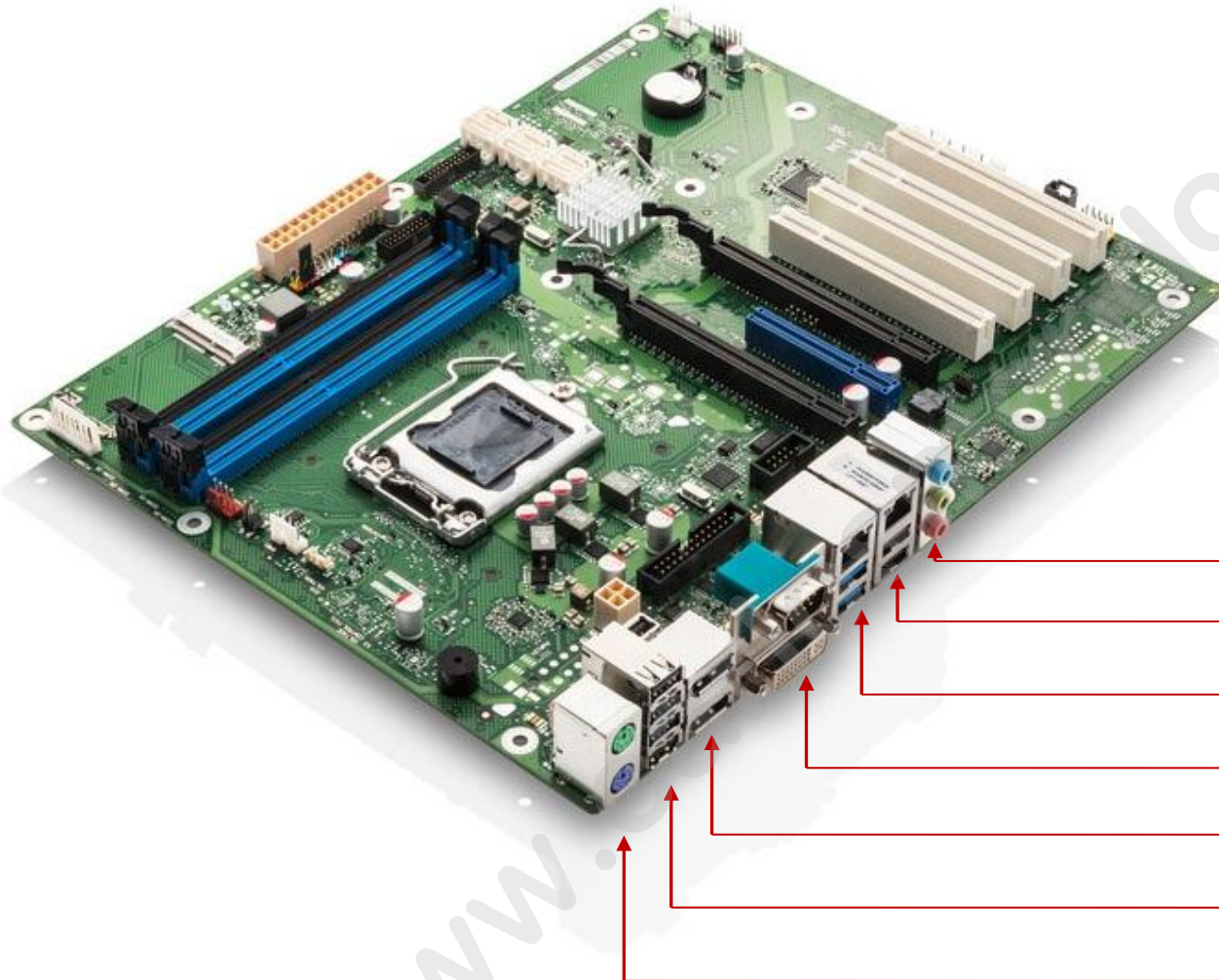
Feature Overview

2.7 Block Diagram D3243-S



Feature Overview

2.8 External Connectors D3231-S / D3236-S & D3243-S



Audio

LAN1 (iAMT) / 2 x USB2.0

LAN2 / 2 x USB 3.0

COM1; DVI-I

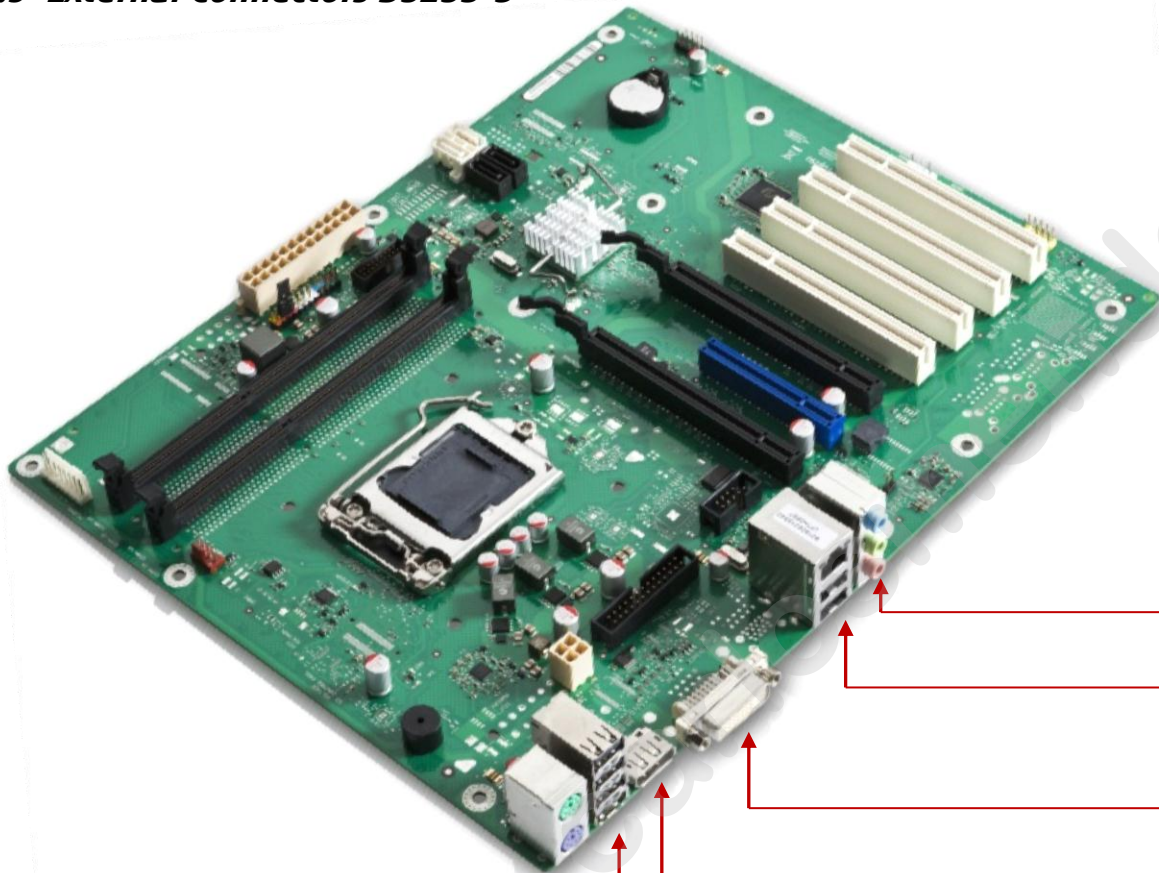
Dual DisplayPort V1.2

4 x USB 2.0

PS/2 Kbd / Mouse

Feature Overview

2.9 External Connectors D3235-S



Audio

LAN1 / 2 x USB2.0

DVI-I

DisplayPort V1.2

4 x USB 2.0

PS/2 Kbd / Mouse

Feature Overview

2.10 Onboard components D323x-S

6 Layer PCB

Frontpanel

mSATA Socket ²⁾

PSU Fan Control ¹⁾

Processor Fan (4 pin)

Processor LGA1150

COM Port

Parallel Port

12V Supply (Processor)

USB 2.0 Socket (Stick) ²⁾

PCIe x16 (16 Lanes, Gen2/3)

PCIe x8 (1 Lane, Gen2, open slot)

SCSI LED

24 pin ATX PS

2x USB 3.0 (Frontpanel)

8 Bit GPIO ²⁾

Up to 6 x SATA III

Fan 4 (4 pin PWM) ¹⁾²⁾

2 x USB 2.0 (Internal)

Fan3 (4 pin PWM / 3 pin) ²⁾

Fan2 (4 pin PWM)

Intrusion ²⁾

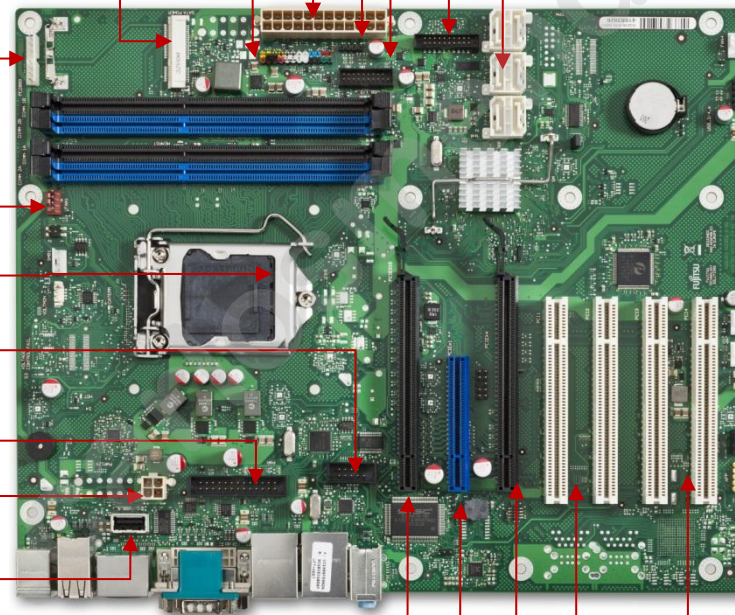
Frontpanel Audio & S/PDIF ²⁾

1) PSU fan and FAN4 shared!
(BIOS Setup Option)

2) Not available on D3235-S

Up to 4 x PCI

1 x PCIe x16 (4 lanes/2lanes, Gen2)



Feature Overview

2.11 Onboard components D3243-S

8 Layer PCB

COM2

Frontpanel

Buzzer

2 x DDR3-1600 SO

Intrusion

5 x SATA-3

2 x USB2.0 / 2 x USB3.0

Mini-PCIe Socket (halfsize)

mSATA / Mini-PCIe Socket

PSU Fan Control

PowerSupply ATX/12V

Processor Fan (4 pin)

USB3 Stick / GPIO-Port

Parallel Port

LVDS Backlight

12V Supply (Processor)

LVDS 24bit dual channel

Fan3 (4 pin PWM / 3 pin)

Mounting Area for
LGA1150Heatsink

PCIe x16 Gen3

S/P-DIF

Frontpanel Audio

Feature Overview

2.12 Summary: Feature Differences D323x-S

Feature	D3231-S	D3236-S	D3235-S	D3243-S
Chipset (PCH)	Q87	Q87	H81	Q87
Memory Sockets / max. RAM	4 / 32GB	4 / 32GB	2 / 16GB	2 / 16GB
PCIe x16 (PEG Slot) [Note: Lane splitting not possible!]	Gen3	Gen3	Gen2	Gen3
PCIe x16- 16 lanes / PCIe x16- 4 lanes/ PCIe x16- 2 lanes / PCIe x8- 1 lane / PCI	1 / 1 / -- / 1 / 1	1 / 1 / -- / 1 / 4	1 / -- / 1 / 1 / 4	1 / -- / -- / -- / --
mSATA Socket / Mini-PCIe Socket / 8 Bit GPIO / TPM V1.2	x / -- / x / x	x / -- / x / x	-- / -- / -- / --	x ³⁾ / x / x / x
USB2.0 Ports internal / external	4 ¹⁾ / 6	4 ¹⁾ / 6	2 / 6	3 ²⁾ / 6
USB3.0 Ports internal / external	2 / 2	2 / 2	2 / --	3 ²⁾ / 2
Supported Fans / PowerSupply Fan Control	4 / x	4 / x	2 / x	2 / x
SATA2 / SATA3	-- / 6	-- / 6	3 / 2	-- / 5
S-PDIF / Intrusion / SCSI LED	x / x / x	x / x / x	-- / -- / x	x / x / --
COM-Port external / COM-Port internal / Parallel Port internal	1 / 1 / 1	1 / 1 / 1	-- / 1 / 1	1 / 1 / 1
DVI-I / DisplayPort 1 / DisplayPort 2 / LVDS	x / x / x / --	x / x / x / --	x / x / -- / --	x / x / x / x
Dual LAN / Intel iAMT 9.1 - vPro 2014 Manageability	x / x	x / x	-- / --	x / x
BIOS-POST / BIOS-Boot / OS – HW Watchdog onboard	x / x / x	x / x / x	x / x / x	x / x / x
EraseDisk (BIOS Feature) included	x	x	x	x

1) Thereof two ports used for USB stick (dongle) and mSATA socket 2) Thereof 1x USB3.0 for USB stick (dongle) and 1 x USB 2.0 for Mini-PCIe

3). Fullsize slot switchable between mSATA or Mini-PCIe (BIOS Option)

Feature Overview

2.13 I/O-Shield



D3235-S



D3231-S
D3236-S
D3243-S

Spring Steel Sheet

Enforcement Sheet

Rear Side: EMI Gasket
(Foam with Copper Nickel
fabric)

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

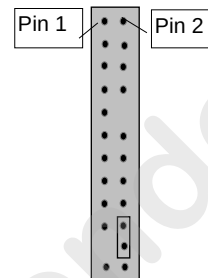
Note: ATX Chassis "letterbox" for I/O shield:
Nom. size = 158.75 x 44.45mm
Tolerance = +/- 0.2mm

3 Interfaces & Connectors

3.1 Frontpanel Connector **[Updated]**

Pin	Signal
1	HD-LED +
3	HD-LED -
5	GND
7	RST_L
9	reserved
11	reserved
13	BMC Alert LED1 +
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	BMC Alert LED1 -
16	reserved
18	BIOS Testmode (reserved)
20	GND (0,1K)
22	GND (0,1K)
24	Recover BIOS



Power LED:

Anode: Pin 2 – current source 3mA up to 4V

Cathode: Pin 4 (suitable for various LED colors)

HDD LED:

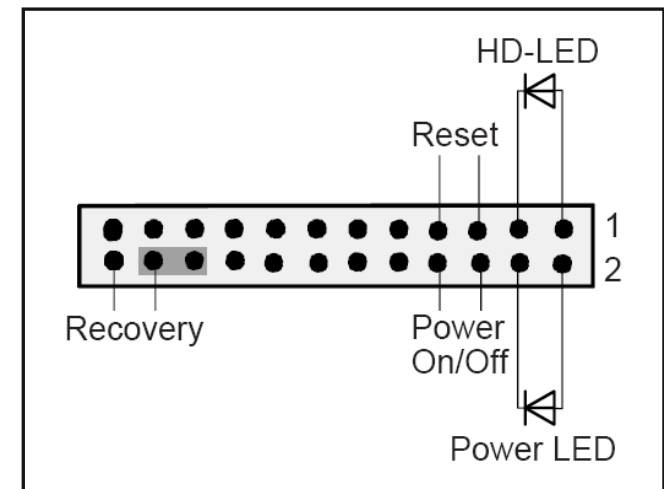
Anode: Pin 1 – current source 3mA up to 4V

Cathode: Pin 3 (suitable for various LED colors)

Internal Speaker Output:

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

Note: System Beeps are audible via the internal speaker output only, even if a device is connected to the external audio ports (rear/front) .

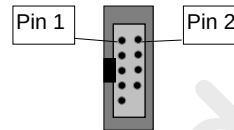


Interfaces & Connectors

3.2 Internal Serial (COM) Port Connector

Pin	Signal
1	DCD 2
3	SIN 2
5	SOUT 2
7	DTR 2
9	GND

Pin	Signal
2	DSR 2
4	RTS 2
6	CTS 2
8	RI 2
10	Key

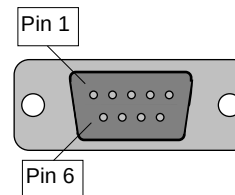


Note: D3235-S: The internal COM-Port is COM1
D3231-S / D3236-S / D3243-S: The internal COM-Port is COM2

3.3 External Serial (COM) Port Connector

Pin	Signal
1	DCD 1
2	SIN 1
3	SOUT 1
4	DTR 1
5	GND

Pin	Signal
6	DSR 1
7	RTS 1
8	CTS 1
9	RI 1

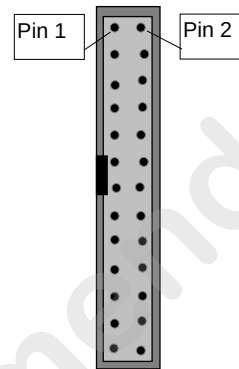


Interfaces & Connectors

3.4 Internal Parallel Port Connector

Pin	Signal
1	Strobe
3	Data0
5	Data1
7	Data2
9	Data3
11	Data4
13	Data5
15	Data6
17	Data7
19	ACK
21	Busy
23	Empty
25	Select

Pin	Signal
2	AutoFD
4	Error
6	Init
8	Sel_L
10	GND
12	GND
14	GND
16	GND
18	GND
20	GND
22	GND
24	GND
26	GND

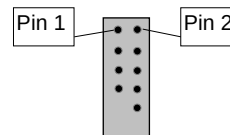


optional Parallelport cable with ATX bracket

3.5 Internal USB2.0 Connector (2 Ports)

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

Pin	Signal
2	VCC AUX
4	Data negative Port Y
6	Data positive Port Y
8	GND
10	Not connected

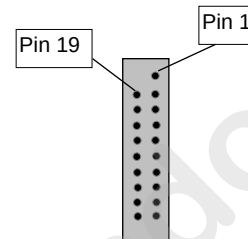


Interfaces & Connectors

3.6 Internal USB3.0 Connector (2 Ports)

Pin	Signal
1	VCC AUX
3	USB3_RX positive (P2)
5	USB3_TX negative (P2)
7	GND
9	Data positive (P2) [USB2.0]
11	Data positive (P3) [USB2.0]
13	GND
15	USB3_TX negative (P3)
17	USB3_RX positive (P3)
19	VCC AUX

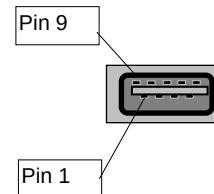
Pin	Signal
2	USB3_RX negative (P2)
4	GND
6	USB3_TX positive (P2)
8	Data negative (P2) [USB2.0]
10	FP Detect
12	Data negative (P3) [USB2.0]
14	USB3_TX positive (P3)
16	GND
18	USB3_RX negative (P3)



Note: All USB3 connectors provide separate signal lines for USB3.0 and USB2.0!

3.7 External USB3.0 Connector

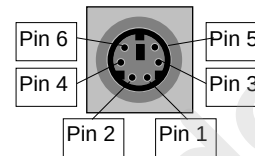
Pin	Signal
1	VCC auxiliary (polyswitch fused and power supervision with over current detection)
2	Data negative [USB2.0]
3	Data positive [USB2.0]
4	GND
5	USB3_RX negative
6	USB3_RX positive
7	GND
8	USB3_TX negative
9	USB3_TX positive



Interfaces & Connectors

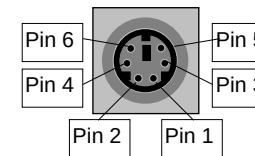
3.8 PS/2 Keyboard Port

Pin	Signal
1	KBD Data
2	Not connected
3	GND
4	VCC (polyswitch fused)
5	KBD CLK
6	Keyboard_On (low asserted pulse)



3.9 PS/2 Mouse Port

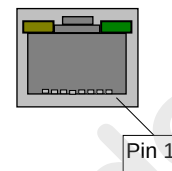
Pin	Signal
1	MOUSE Data
2	Not connected
3	GND
4	VCC (polyswitch fused)
5	MOUSE CLK
6	Not connected



Interfaces & Connectors

3.10 LAN Connector

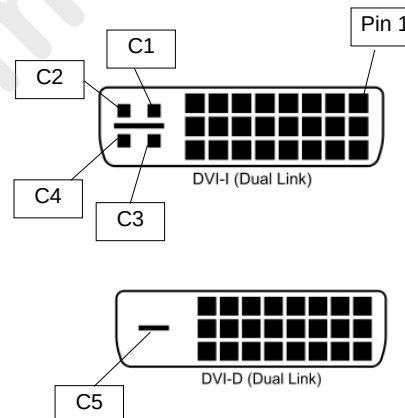
Pin	Signal with 10/100/1000	Signal with 10/100
1	MX1 +	TX +
2	MX1 -	TX -
3	MX2 +	RX +
4	MX3 +	TERMPANE
5	MX3 -	TERMPANE
6	MX2 -	RX -
7	MX4 +	TERMPANE
8	MX4 -	TERMPANE



3.11 DVI-I Connector

Pin	Signal
1	Data2+
2	Data2-
3	GND
4	NC
5	NC
6	DDC_CLK
7	DDC_DAT
8	NC
9	Data1-
10	Data1+
11	GND
12	NC
C5	Masse
C1	Red (DVI-I)
C2	Green (DVI-I)

Pin	Signal
13	NC
14	Vcc (fused)
15	GND
16	Hot_Plug_detect
17	Data0-
18	Data0+
19	GND
20	NC
21	NC
22	GND
23	CLK+
24	CLK-
C3	Blue (DVI-I)
C4	H-Sync (DVI-I)

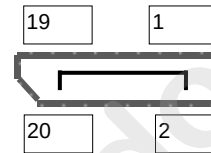


Interfaces & Connectors

3.12 DisplayPort V1.2 Connector

Pin	Signal
1	Link0+
2	Link0-
3	GND
4	Link2+
5	Link2-
6	GND
7	DVI dongle detect / (GND (N/A))
8	AUX+
9	AUX-
10	GND (Return)

Pin	Signal
11	GND
12	Link1+
13	Link1-
14	GND
15	Link3+
16	Link3-
17	GND / (CEC for HDMI (N/A))
18	GND
19	Hotplug detect
20	P3V3P



3.13 Serial ATA Connectors

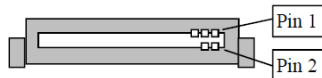
Pin	Signal
1	GND
3	Transmit data negative
5	Receive data negative
7	GND

Pin	Signal
2	Transmit data positive
4	GND
6	Receive data positive



Interfaces & Connectors

3.14 mSATA Pinout / Mini-PCle Pinout [Updated]



1) Fullsize socket can be used for mSATA or Mini-PCle (selectable via BIOS Setup)

2) USB 2.0 for mSATA socket selectable via BIOS Setup.

Note: If USB 2.0 is enabled for the fullsize socket, USB 2.0 is no longer available for the onboard USB 3.0 stick socket!

NC = pin not connected to mainboard

Reserved = pin connected to mainboard

Pin	Signal Assignment	
	mSATA/Mini-PCle 1)	Mini PCle halfsize
1	NC / WAKE#	WAKE#
2	+3.3V / +3.3V STBY	+3.3V STBY
3	NC	
4	GND	
5	NC	
6	+1.5V	
7	NC	
8	NC	
9	GND	
10	NC	
11	Reserved / REFCLK-	REFCLK-
12	NC	
13	Reserved / REFCLK+	REFCLK+
14	NC	
15	GND	
16	Reserved	
17	NC	
18	GND	
19	NC	
20	Reserved / EN_WLAN	EN_WLAN
21	GND	
22	NC / PERST#	PERST#
23	SATA TX+ / PCIe TX-	PCIe TX-
24	+3.3V / +3.3V STBY	+3.3V STBY
25	SATA TX- / PCIe TX+	PCIe TX+
26	GND	

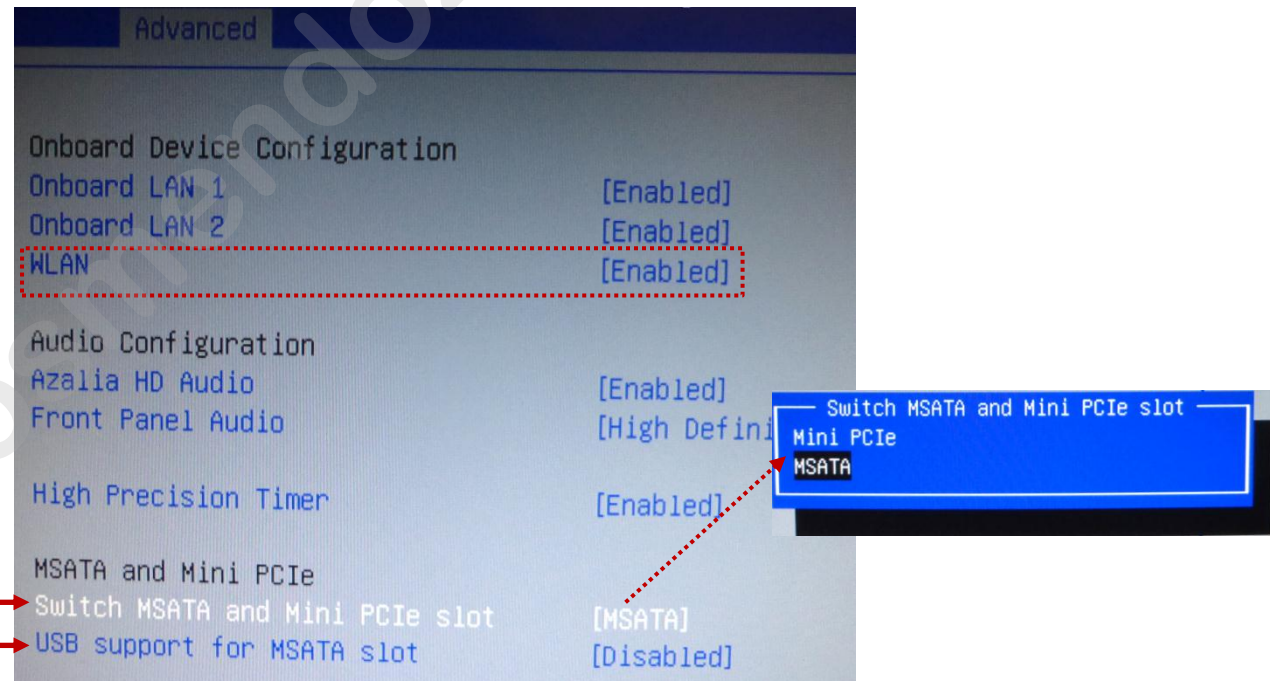
Pin	Signal Assignment	
	mSATA/Mini-PCle 1)	Mini PCle halfsize
27	GND	
28	+1.5V	
29	GND	
30	NC	
31	SATA RX- / PCIe RX-	PCIe RX-
32	NC	
33	SATA RX+ / PCIe RX+	PCIe RX+
34	GND	
35	GND	
36	USB Data - 1)	USB Data -
37	GND	
38	USB Data + 1)	USB Data +
39	+3.3V / +3.3V standby	+3.3V standby
40	GND	
41	+3.3V / +3.3V standby	+3.3V standby
42	NC	
43	GND	
44	NC	
45	NC	
46	NC	
47	NC	
48	+1.5V	
49	NC	
50	GND	
51	MSATA Present low	NC
52	+3.3V / +3.3V standby	+3.3V STBY standby

Interfaces & Connectors

3.15 mSATA / Mini-PCIe BIOS Setup Options **[New]**

- The halfsize socket always supports Mini-PCI Express AND USB 2.0.
It can NOT be used for mSATA modules!
- The fullsize socket can be configured for mSATA modules OR Mini-PCI Express (BIOS Setup option; default = mSATA).
- USB2.0 support for the fullsize socket can be enabled if needed.
(BIOS Setup option, default = disabled).
Note: If USB2.0 is enabled, the onboard USB stick socket supports USB3.0 only, but no longer USB2.0

Mode switch for fullsize socket
USB2.0 switch for fullsize socket

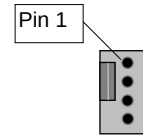


Note: BIOS Setup option **"WLAN"**
→ This option can be used to enable/disable Mini-PCIe WLAN modules of D3243-S.

Interfaces & Connectors

3.16 Fan Connectors

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



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

Fan speed control is supported for 4 pin (PWM) fans.

Fan3 can be changed from 4-pin mode to 3-pin controlled mode via BIOS Setup.

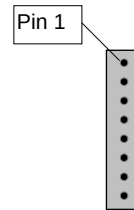
3-pin fans (voltage controlled) connected to Fan1/Fan2/Fan4 connector will always operate at full speed resp. 12V supply voltage!

Fan current: max. 2A continuous / 4A peak (D323x-S)

max. 1.5A continuous / 3A peak (D3243-S)

3.17 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!

The power supply fan connector is shared with FAN4 connector on D3231-S/D3236-S (BIOS Setup option), they must not be used simultaneously!

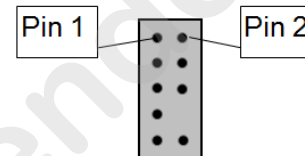
Interfaces & Connectors

3.18 Rear Audio / Frontpanel Audio Connector **[Updated]**

Frontpanel Audio: High Definition Mode

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

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



Frontpanel Audio: Legacy Mode (AC97)

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

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

Note: Front audio operating mode (High Definition Audio or Legacy Audio) selectable in BIOS Setup

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

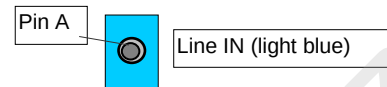
Rear Audio / Frontpanel Audio Connector **[New]**

Rear Audio Connectors

Pin	Signal
A	Line input

Pin	Signal
A	Headphone output

Pin	Signal
A	Microphone input



Electrical input characteristics

Line: Stereo max. 1,2V_{rms} (Gain=0dB) input voltage

Microphone: Supports electret microphones with 1,3V_{rms} (Gain=0dB) or 0,13V_{rms} (Gain=20dB)

Electrical output characteristics

Headphone: Stereo max. 1,2 V_{rms} output voltage at 320hm load

System Speaker (via frontpanel connector): Mono, typ. 2W (RMS) at 40hm load

Mute Topology

When an outPut device (HeadPhone, HifiAmp...) is attached to an output jack, the following mute topology is required:

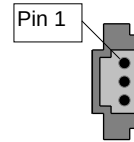
→ FrontOut mutes RearOut and MonoOut → RearOut mutes MonoOut (frontpanel system speaker)

Remark: System beeps are only audible via the internal (frontpanel) system speaker. System beeps are also audible on the internal speaker if an external device is plugged in.

Interfaces & Connectors

3.19 S/PDIF Connector

Pin	Signal
1	VCC
2	SPDIF out
3	GND



Note:

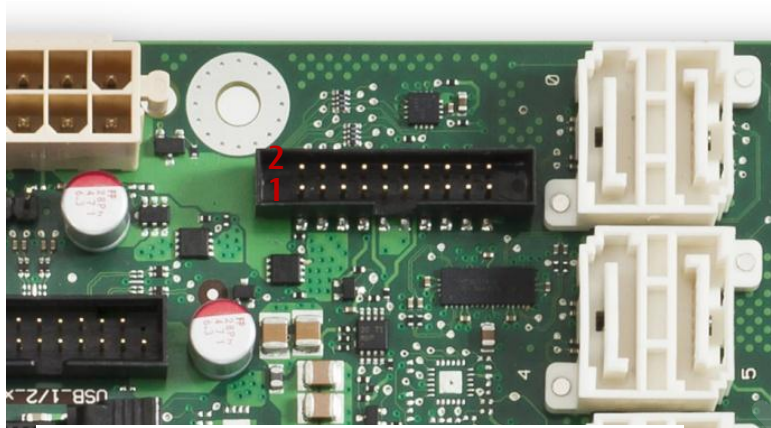
Standard connector bracket should directly connect to SPDIF out and GND pins (no signal converter required)



(Sample S/PDIF connector bracket)

Interfaces & Connectors

3.20 GPIO (Feature Connector)



(Connector location shown for D3231-S/D3236-S)

Parameter	Range
GPI/O Input Low Voltage	-0.5V ... 0.8V
GPI/O Input High Voltage	2V ... 3.3V
GPI/O Output Low Voltage	max. 0.7V
GPI/O Output High Voltage	min. 2.5V
Note: max. load per GPI/O pin: 10mA (overall current for all GPI/O pins must be < 85mA) Each GPI/O pin has an integrated serial resistor of 150 Ohm	

Feature Connector: CompuPack R-DRK2-20-S3-SMT

1	GPI/O_0	GPI/O_1	2
3	GPI/O_2	GPI/O_3	4
5	GPI/O_4	GPI/O_5	6
7	GPI/O_6	GPI/O_7	8
9	VCC_3.3V	GND	10
11	VCC_3.3V	VCC_5Vaux	12
13	reserved	GND	14
15	reserved	GND	16
17	GND	VCC_5V	18
19	VCC_12V	VCC_12V	20

Note: Current max. 1.5 A per power pin!

GPIO access is provided via the SM-Bus controller PCA9554A
ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D323x-S/Documentation/Specifications/GPIO_Chip_PCA9554a.pdf

Note: SM-Bus address: 0x78h (8-bit)

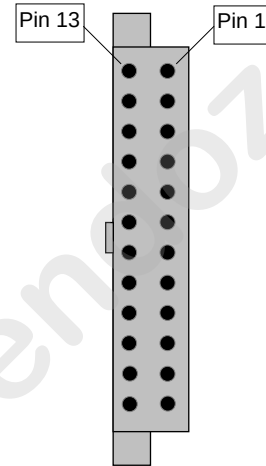
For Windows OS, the FTS BMC API provides easy access to the GPIO:
ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D323x-S/IndustrialTools_D323x-S/BMC_Management-Controller-API/

Interfaces & Connectors

3.21 Power Supply Connector D323x-S (Multirail)

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

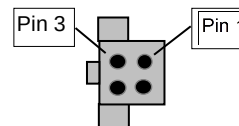
Pin	Signal
1	+ 3.3V (P3V3P)
2	+ 3.3V (P3V3P)
3	GND
4	+ 5V (VCC)
5	GND
6	+ 5V (VCC)
7	GND
8	Powergood (high asserted)
9	+ 5V Auxiliary (VCC Aux)
10	+ 12V (P12VP)
11	+ 12V (P12VP)
12	+ 3.3V (P3V3P)



3.22 Additional Power Supply Connector D323x-S (12V for Processor)

Pin	Signal
3	+ 12V
4	+ 12V

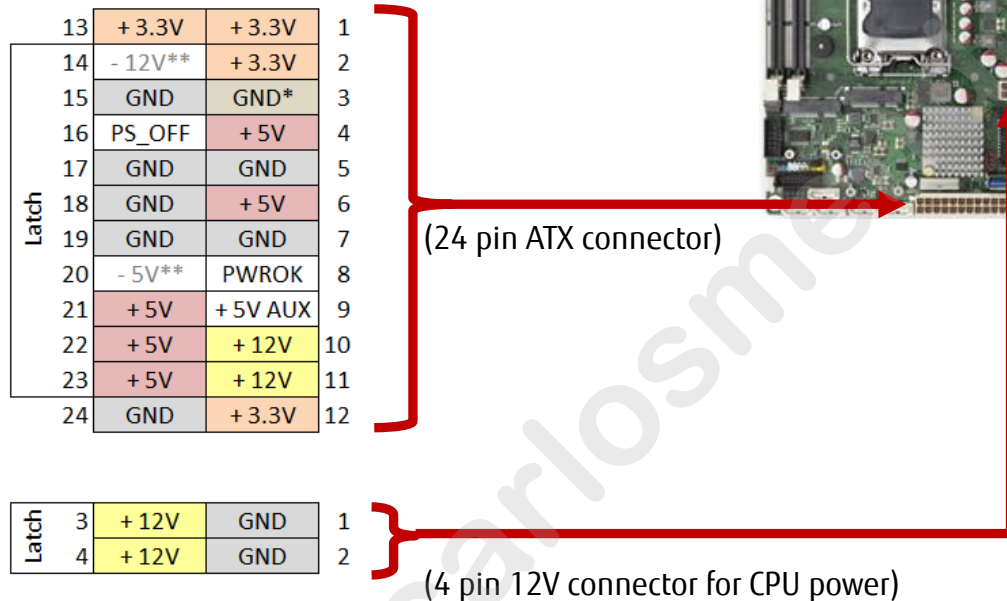
Pin	Signal
1	GND
2	GND



Interfaces & Connectors

3.23 Power Supply Connectors D3243-S (ATX Multirail or Single 12V Operation) **[Updated]**

3.23.1 D3243-S ATX Multirail Operation **[Updated]**



Important Note:

If the Power Supply is changed from Multirail to single 12V or vice versa, make sure to disconnect the mainboard D3243-S from any power at least for 10 minutes!

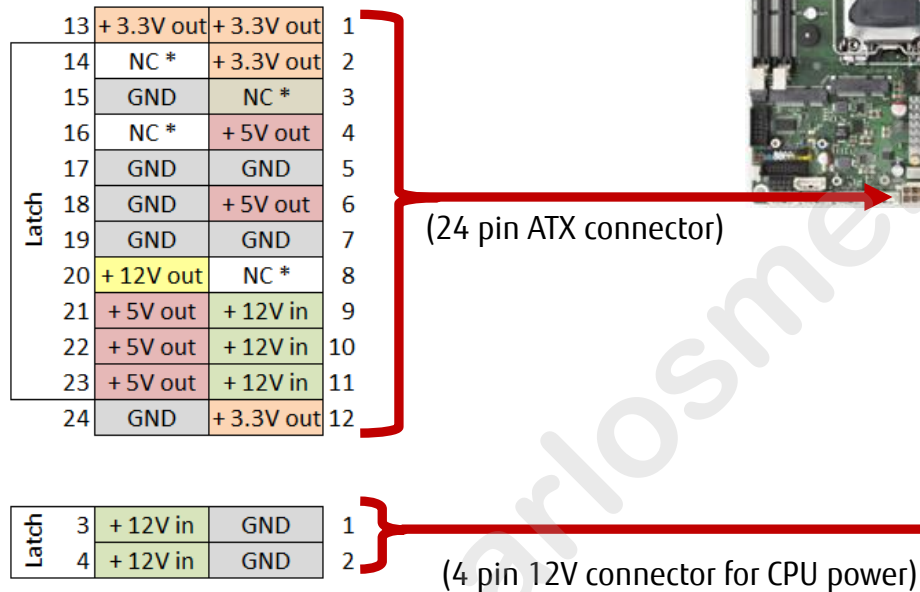
24 pin ATX connector:

* Pin 3 (GND) must be connected (= detection of ATX PSU)

** Pin 14 (-12V) and pin 20 (-5V) are not required for D3243-S

Interfaces & Connectors

3.23.2 D3243-S Single 12V Operation **[Updated]**



Important Note (Single 12V mode):

The "output" pins (3.3V_{out}, 5V_{out}, 12V_{out}) provide power for drives or extra devices.

Maximum "output" power ratings:

- +3.3V_{out}: max. 4A
= combined output current of 3.3V PCIe x16 and 3.3V_{out} pins (1, 2, 12, 13)
- +5V_{out}: max. 9A
= combined output current of all USB ports and +5V_{out} pins (4, 6, 21, 22, 23)
- +12V_{out}: max. 6A
depends on output power of single 12V PSU! (12V_{out} = pin 20)

For single 12V operation **both** connectors 24 pin and 4 pin are required!

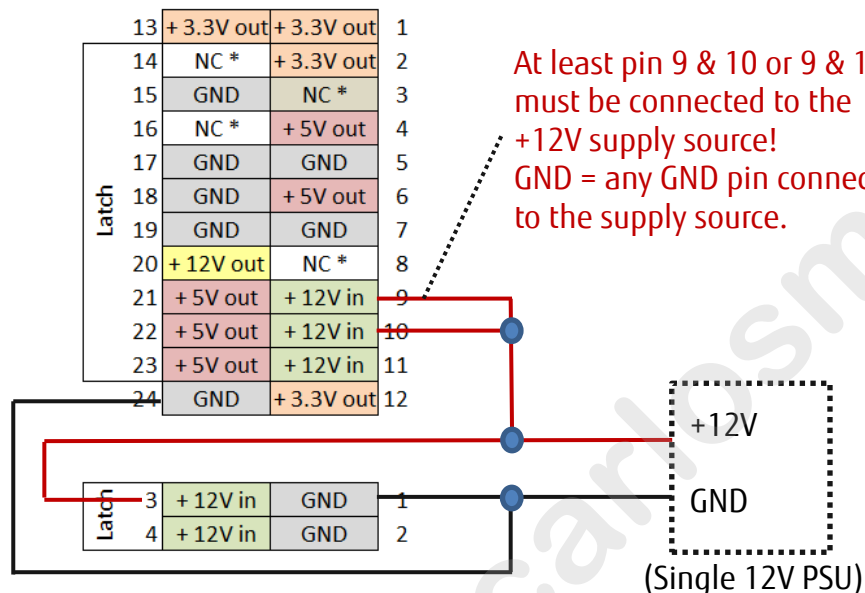
24 pin ATX connector:

* Pin 3, 8, 14, 16 (NC) must NOT be used in single 12V mode!

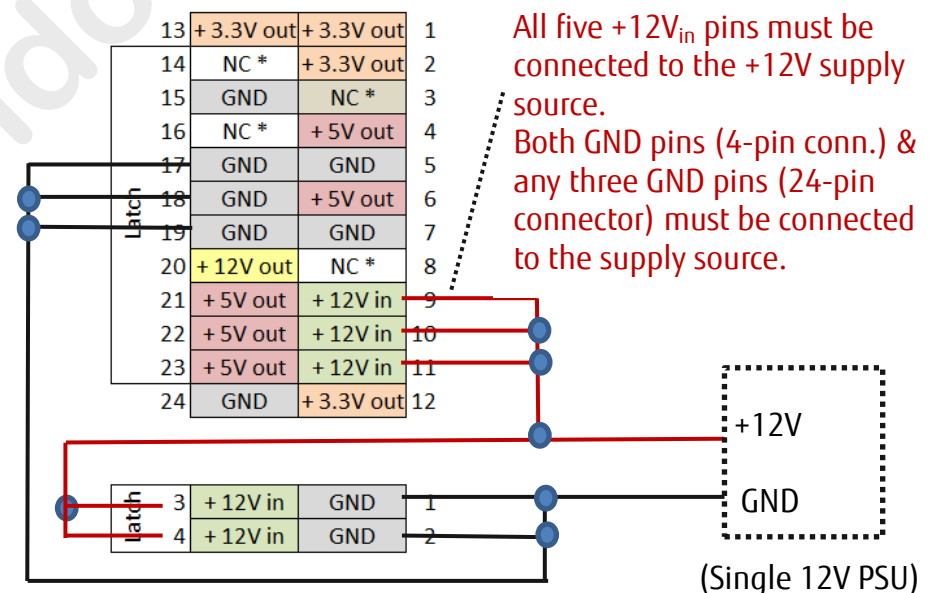
Interfaces & Connectors

3.23.3 D3243-S Single 12V Operation – Min / Max Config **[New]**

Sample supply cabling for minimum single 12V configuration:
e.g. processor up to 45W, no PCIe card installed, no SATA drives



Sample supply cabling for maximum single 12V configuration:
e.g. processor > 45W, additional graphics card, several SATA drives

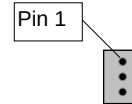


Note: Each single pin of both connectors is capable of max. 8A!
For processor ≥ 65W all pins of the 4-pin connector must be used due to peak current in Turbo Mode.

Interfaces & Connectors

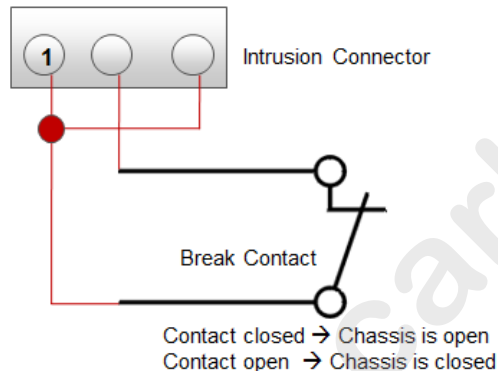
3.24 Chassis Intrusion [Updated]

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):

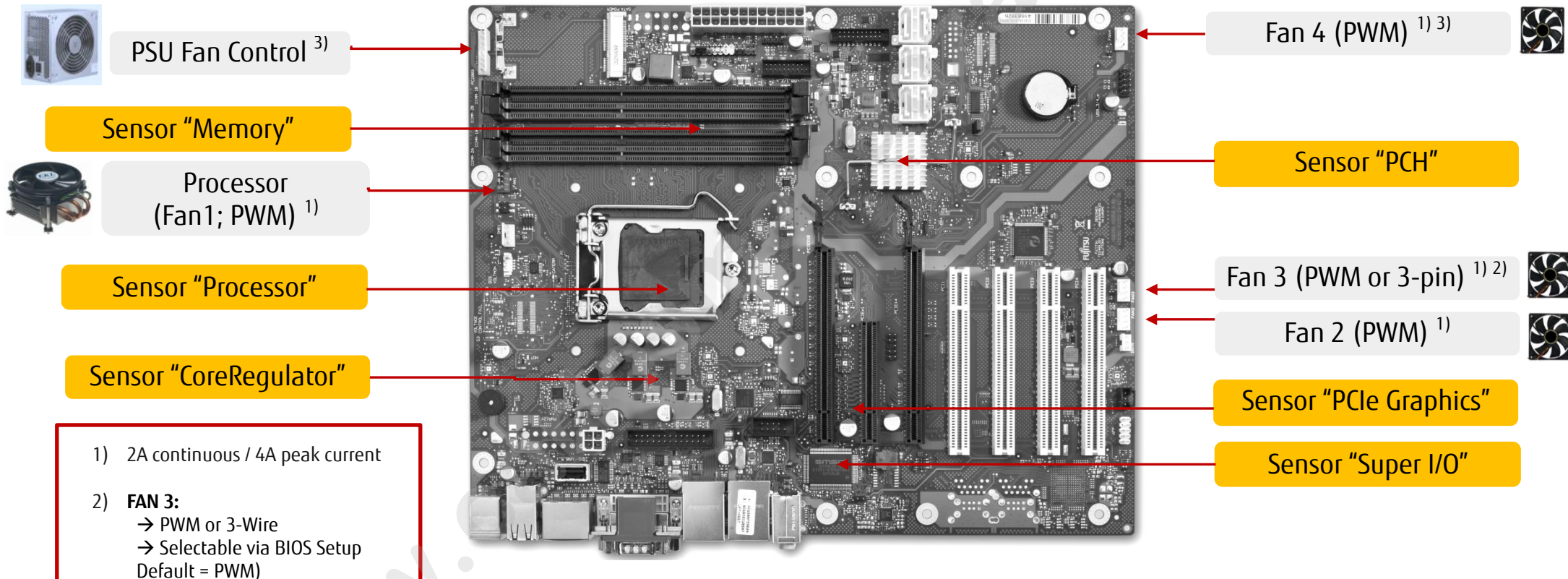
http://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D323x-S/IndustrialTools_D323x-S/BMC_Management-Controller-API/

4 System Monitoring

- Temperature Sensors and Fans
- SystemGuard: Fan / Temperature Monitor
- SilentFanConfig-Manager
- Temperature Reference Points
- BMC – BIOS Default Settings

System Monitoring

4.1 D3236-S / D3231-S: Temperature Sensors and Fan Connectors



- 1) 2A continuous / 4A peak current
- 2) **FAN 3:**
→ PWM or 3-Wire
→ Selectable via BIOS Setup
Default = PWM)
- 3) **FAN 4 / PowerSupply Fan:**
→ Connectors must not be used simultaneously!
→ Selectable via BIOS Setup

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

System Monitoring

4.2 D3243-S: Temperature Sensors and Fan Connectors

Sensor "Super I/O" (SIO)
(rear side below memory)

Sensor "MCard"

PSU Fan Control

Sensor "PCH"

Processor
(Fan1; PWM) ¹⁾

Fan 3 (PWM) ^{1) 2)}

Sensor "PCIe Graphics"

Sensor "Processor" (PEI)

Sensor "Core Regulator"
(VCore)

1) 1.5A continuous / 3A peak current

2) **FAN 3:**
→ PWM or 3-Wire
→ Selectable via BIOS Setup
Default = PWM)

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

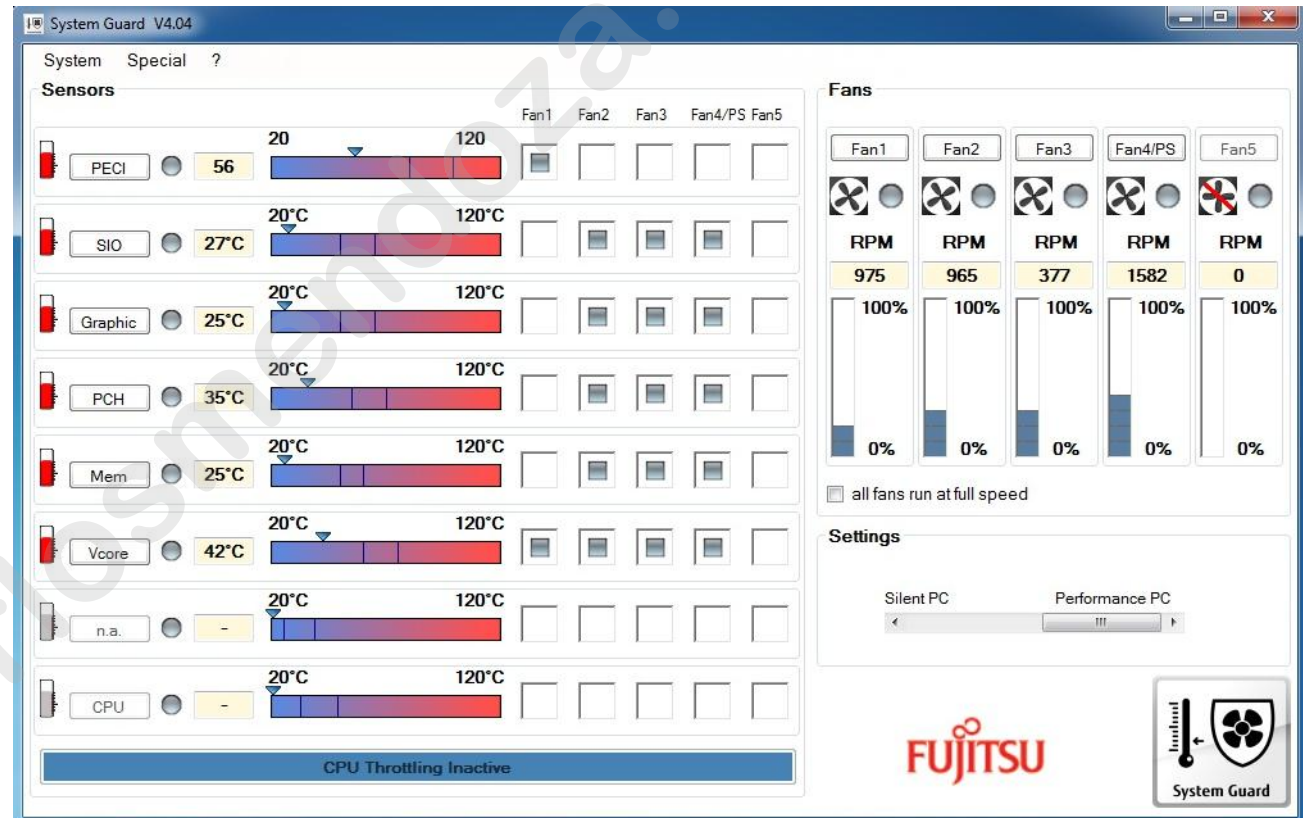
System Monitoring

4.3 D323x-S / D3243-S: 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

4.4 D323x-S: SystemGuard - Details

Temperature Sensors

Processor Sensor ¹⁾

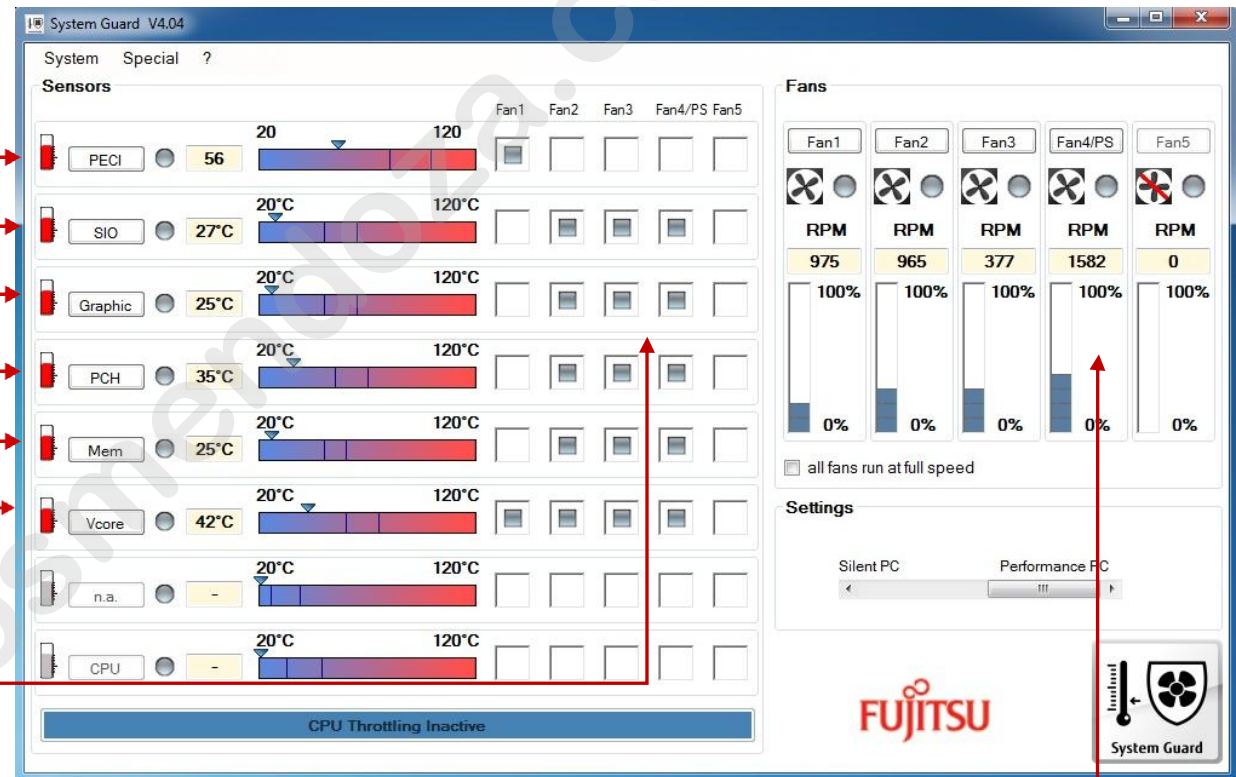
Super I/O Sensor

Sensor PCIe Graphics

PCH Sensor

Memory Sensor

Core Voltage Regulator Sensor



(Note: Sample screenshot only; data may differ for specific mainboard model)

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 „PECT“ measurement =Platform Environment Control Interface) does NOT provide the absolute processor temperature, but it is a calculated value based on the relative PECT data.

System Monitoring

4.5 D3243-S: SystemGuard - Details

Temperature Sensors

Processor Sensor ¹⁾

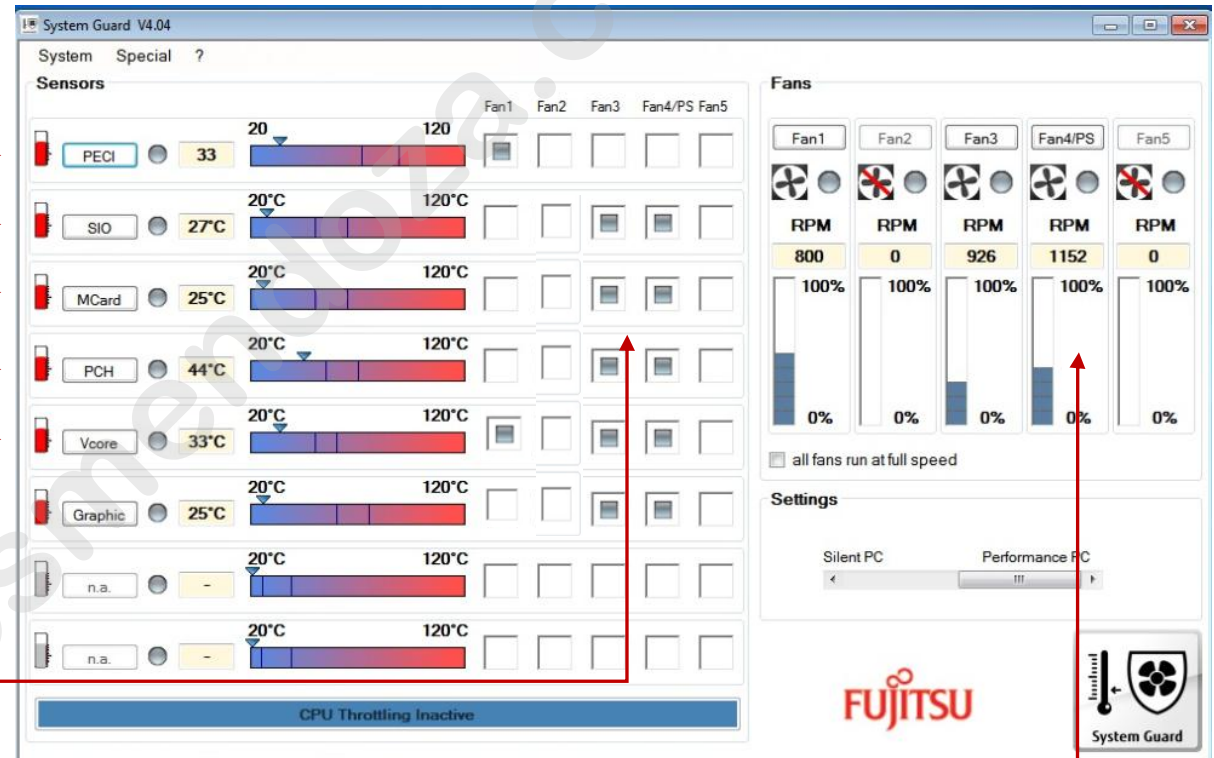
Super I/O Sensor

Sensor below Mini-PCIe

PCH Sensor

Core Voltage Regulator Sensor

PCI Express x16 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!
 Note: Fan2 is not available on D3243-S!

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 PECT data.

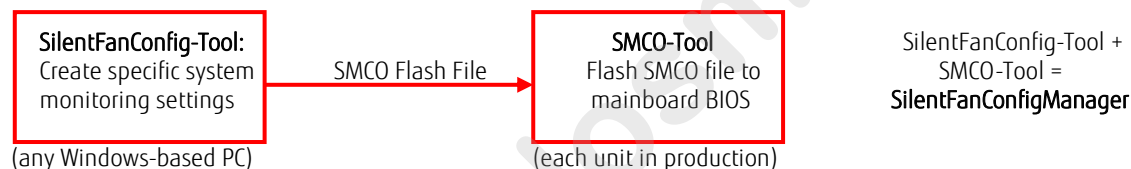
System Monitoring

4.6 SilentFanConfigManager – Customize System Monitoring Settings

Windows-based System Management Configuration Tool

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D323x-S/IndustrialTools_D323x-S/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 D323x-S, V1.71.0 or higher for D3243-S

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

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D323x-S/IndustrialTools_D323x-S/SilentFanConfig-Manager/

System Monitoring

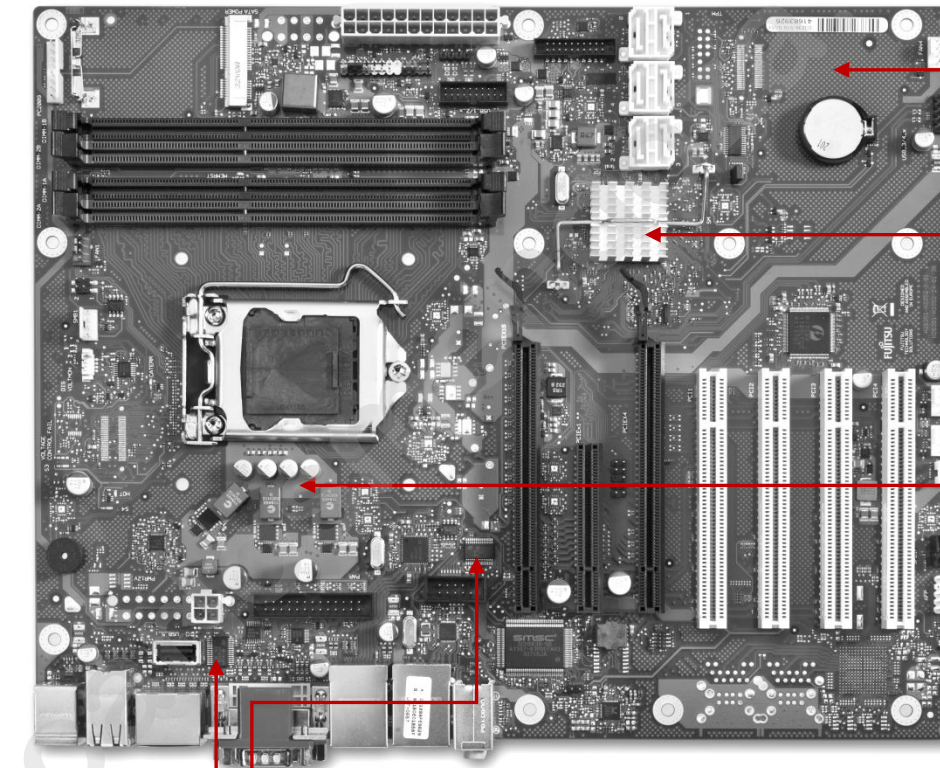
4.7 Components for continuous 24/7 operation @ +60°C

Operating Conditions:
Circulating air
(mainboard) max. 60°C
Usage 24h / 7 days

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

All voltage regulators = switching regulators (high efficiency & stable operation within full temperature range). No linear regulators (low efficiency)

Quartz with enhanced operating temperature range



6-layer PCB for improved signal quality within full operating temperature range

Extra Heatsink on PCH (Q87)

Quartz with enhanced operating temperature range

High Efficiency Processor Core Voltage Regulator for reduced thermal dissipation loss

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

COM Driver with enhanced operating temperature range

Capacitor Endurance Time

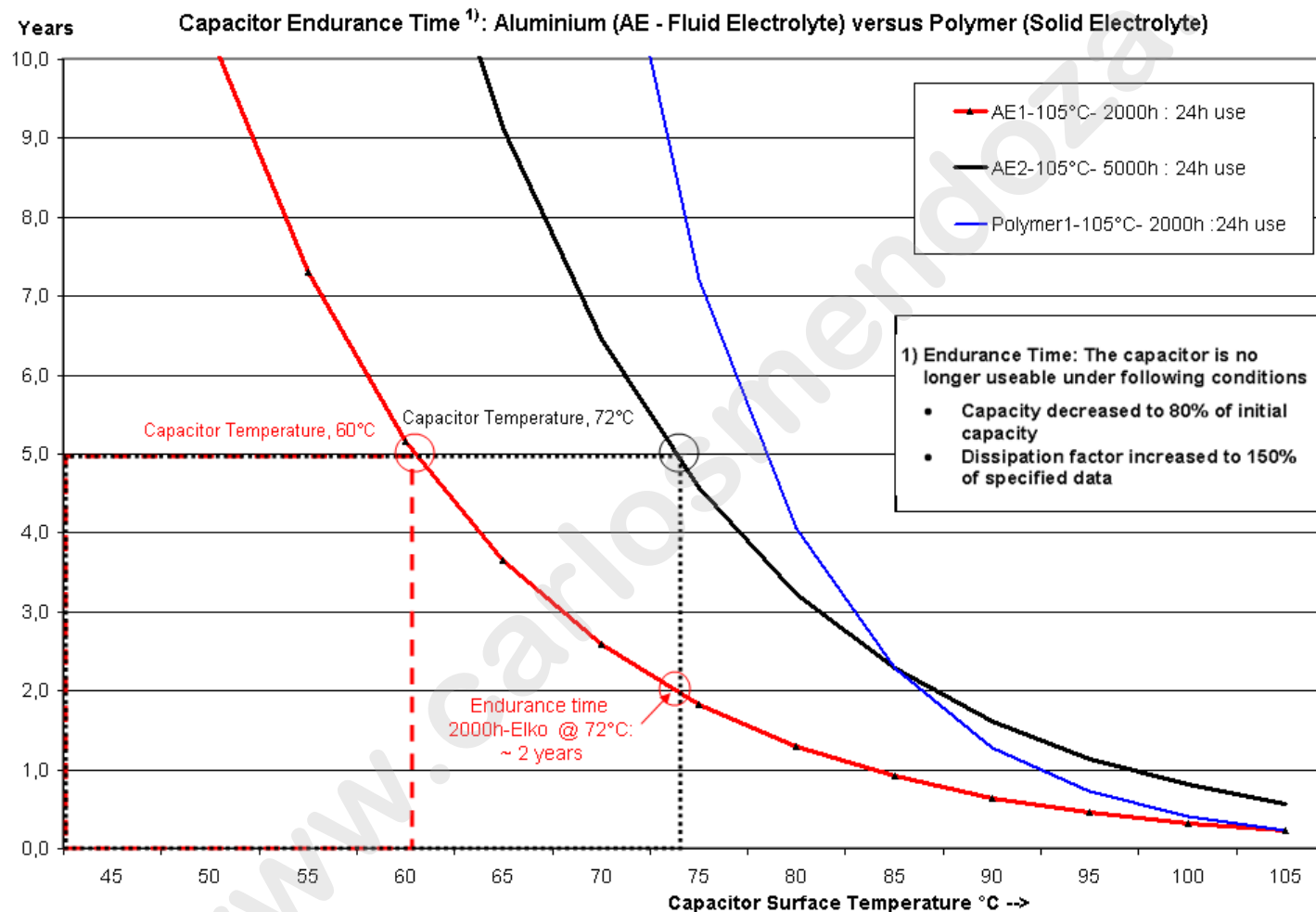
Solid Electrolyte: $L_x = L_o * 10^{\left(\frac{t_o - t_x}{20}\right)}$

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

L_x = effective endurance time
 L_o = endurance time @ 105°C (e.g. 2.000hrs)
 t_o = 105°C
 t_x = capacitor surface temperature (e.g. 68°C)

System Monitoring

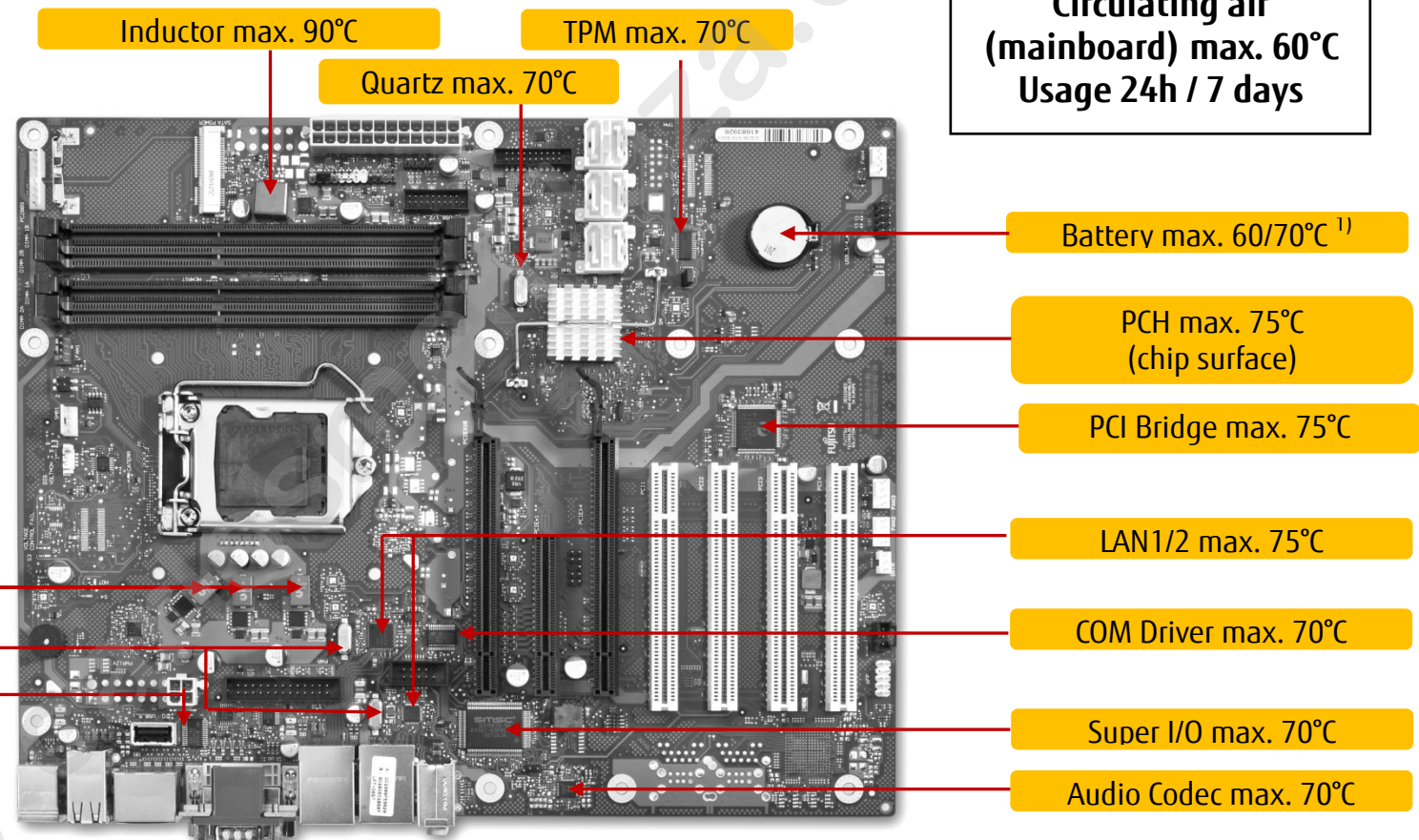
4.8 Capacitor Endurance Time Comparison



System Monitoring

4.9 Temperature Reference Points D323x-S

Operating Conditions:
Circulating air
(mainboard) max. 60°C
Usage 24h / 7 days



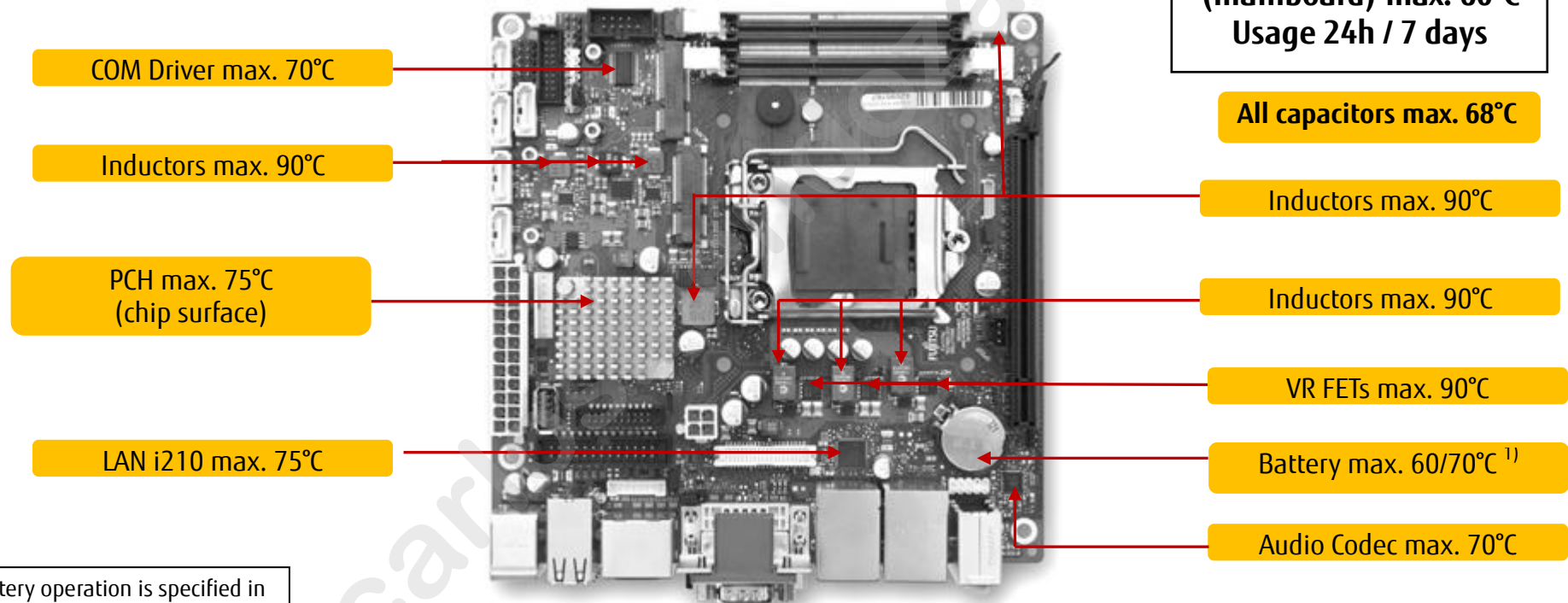
1) Note: Battery operation is specified in temperature range up to 60°C. Operation between 60°C and 70°C may result in:

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

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

System Monitoring

4.10 Temperature Reference Points D3243-S (front)



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

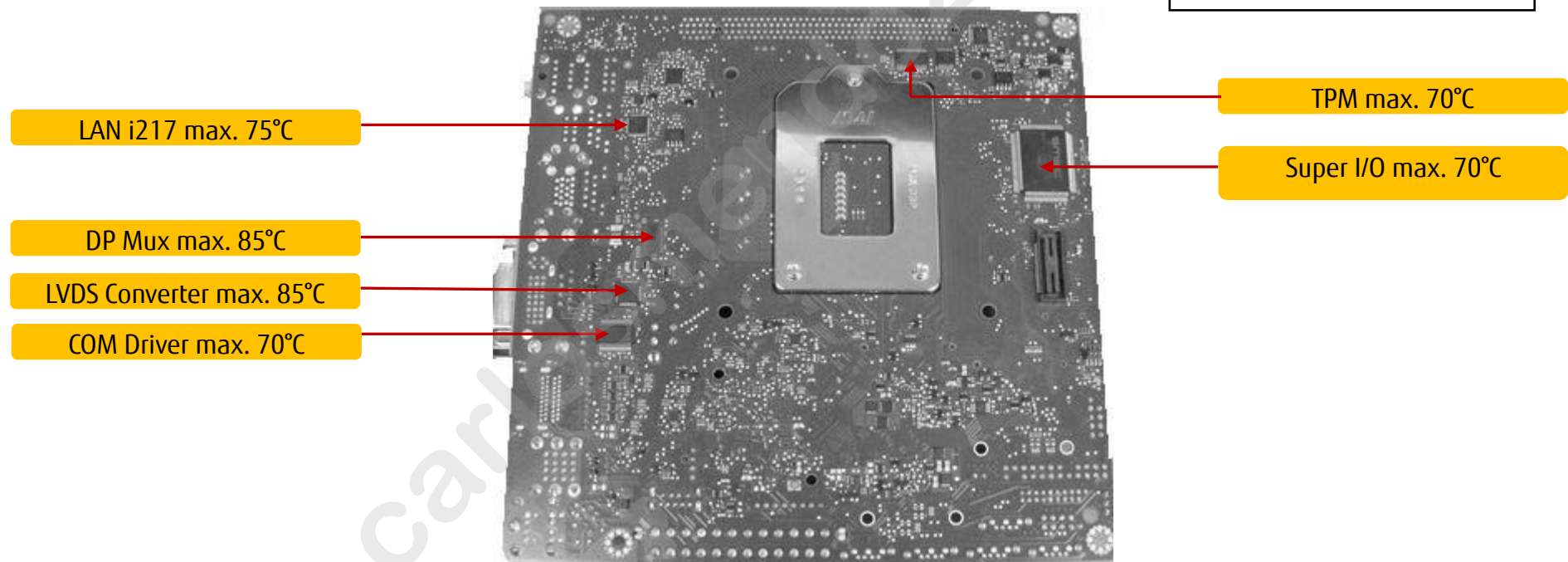
- Higher self discharge rate
- Decline of specified characteristics
- Danger of leakage increases

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

System Monitoring

4.11 Temperature Reference Points D3243x-S (rear)

Operating Conditions:
Circulating air
(mainboard) max. 60°C
Usage 24h / 7 days



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

System Monitoring

4.12 BMC – BIOS Default Settings D323x-S

The default system monitoring settings like fan speed, sensor influence, and Alert temperatures are fixed by the system BIOS. All relevant settings can be customized by system builders via the SilentFanConfig-Manager tool kit.

Sensors →	PECI (Processor)	Super I/O	PCIe Graphics	PCH	Memory	Core Regulator
Fan1 (CPU)	X					X
Fan2		X	X	X	X	X
Fan3		X	X	X	X	X
Fan4/PSU		X	X	X	X	X

"X" indicates that this specific sensor influences the speed of this specific fan

	StartUp ¹⁾	FullSpeed ²⁾	Alert ³⁾	Note
PECI (Processor)	80	99	99	These settings are fixed by the BIOS (depends on the individual installed processor) and cannot be changed via SilentFanConfig-Manager. These settings are implemented for the current BIOS version and may be changed for upcoming BIOS versions! Default minimum fan speed = 30% (all fans).
Super I/O	50°C	65°C	70°C	
PCIe Graphics	50°C	65°C	70°C	
PCH	55°C	70°C	80°C	
Memory	50°C	60°C	65°C	
Core Regulator	60°C	75°C	80°C	

1) If the sensor temperature is below "StartUp" the fan rotates at its defined minimum fan speed

2) Between "StartUp" and "FullSpeed" the fan speed increases linear

3) If the sensor temperature achieves "Alert", the system can provide a warning (e.g. via SystemGuard tool)

System Monitoring

4.13 BMC – BIOS Default Settings D3243-S

The default system monitoring settings like fan speed, sensor influence, and Alert temperatures are fixed by the system BIOS. All relevant settings can be customized by system builders via the SilentFanConfig-Manager tool kit.

Sensors →	PECI (Processor)	Super I/O	MCard	PCH	VCore	Graphics
Fan1 (CPU)	X				X	
Fan2		X	X	X	X	X
Fan3		X	X	X	X	X
Fan4/PSU		X	X	X	X	X

"X" indicates that this specific sensor influences the speed of this specific fan

	StartUp ¹⁾	FullSpeed ²⁾	Alert ³⁾	Note
PECI (Processor)	72	89	89	These settings are fixed by the BIOS (depends on the individual installed processor) and cannot be changed via SilentFanConfig-Manager. These settings are implemented for the current BIOS version and may be changed for upcoming BIOS versions! Default minimum fan speed = 30% (all fans).
Super I/O	50°C	65°C	70°C	
MCard	50°C	65°C	70°C	
PCH	55°C	70°C	80°C	
VCore	60°C	75°C	80°C	
Graphics	50°C	65°C	70°C	

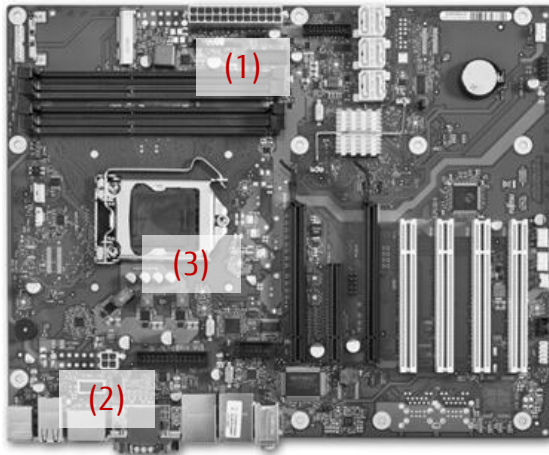
4) If the sensor temperature is below "StartUp" the fan rotates at its defined minimum fan speed

5) Between "StartUp" and "FullSpeed" the fan speed increases linear

6) If the sensor temperature achieves "Alert", the system can provide a warning (e.g. via SystemGuard tool)

5 Power Supply

5.1 ATX Power Supply / Single 12V Supply **[Updated]**



Connectors for ATX (Multirail) Power Supply

See chapter 3.21 – 3.23 for cabling details!

(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

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

Source ¹⁾	Voltage	Min. PS Load	Max.Voltage Tolerance	Mainboard Capacitive Load	Max. Mainboard Current
ATX Power Supply	+ 12V	0.05A	± 5 %	10.000µF	14A/18A ²⁾
	- 12V	0A	± 10 %	500µF	0.3A
	+ 5V	0.2A	± 5 %	10.000µF	10A
	+ 3.3V	0A	± 5 %	6.000µF	2A
	+ 5Vaux	0A	+5 % / -3%	7.000µF	2.5A
12V only PSU	+12V	0A	± 5 %	10.000µF	19A/23A ²⁾



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

→ Single 12V supply only supported by D3243-S!

1) ATX PSU or 12V only DC Supply 2) 18A (23A) = Surge Current for 20 sec!

6 Display Options

6.1 Summary: Video Output Options D323x-S / D3243-S

- Up to three independent displays supported (D3235-S: max. two displays)
- Supports Clone Mode, Extended Desktop and Collage Mode (combine 2 or 3 displays to one screen)
- Support of 4K display technology via DisplayPort output
- Intel Restrictions for simultaneous use of three displays:
 - max. 2 x HDMI (via DVI2HDMI or DP2HDMI converter)
 - max. 2 x DVI (direct or via DP2DVI converter)
 - max. 1 x DVI and 1 x HDMI
 - one VGA (analog)
- D3243-S: Second DisplayPort can be used as DP or LVDS (via onboard DP2LVDS converter)
- D3235-S: Second DisplayPort not available

Display Options

6.2 VGA Output



DVI-I



optional: Audio

VGA via DVI-VGA converter



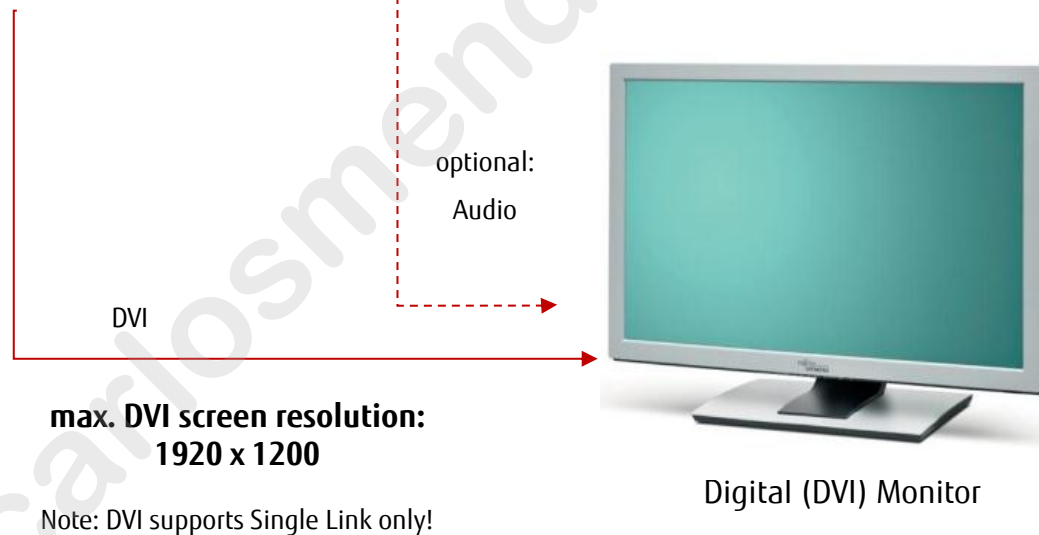
Analog (VGA) Monitor

max. recommended VGA screen resolution:
1920 x 1200

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

Display Options

6.4 DVI Output



Display Options

6.5 HDMI Output



DVI-I

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

6.6 DisplayPort Output **[Updated]**



Digital (DisplayPort) Monitor



Digital (DisplayPort) Monitor



Display Port V1.2

max. DP screen resolution:
3840 x 2160 @60Hz¹⁾
(each port)

DisplayPort transfers Video & Audio

1) Important note:

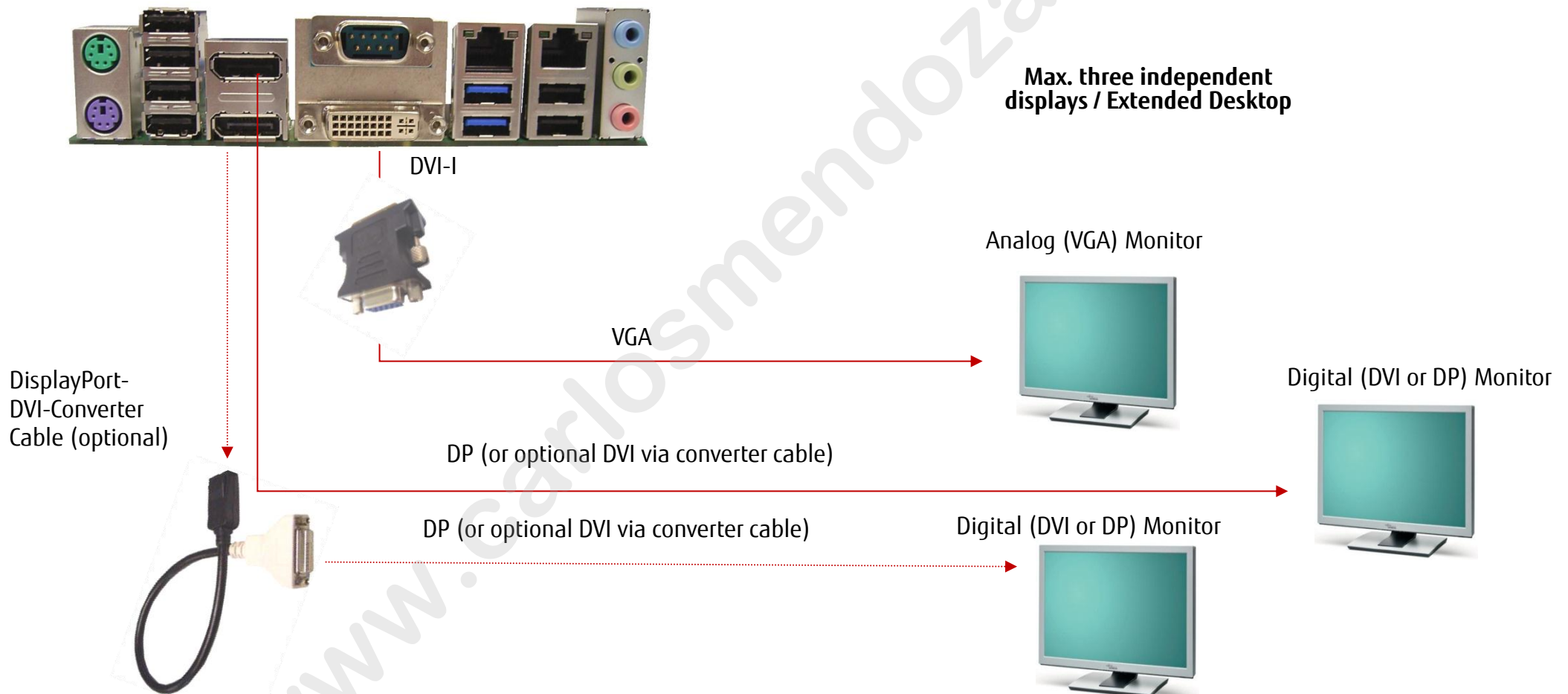
Celeron and Pentium processors support DP resolutions up to 2560 x 1600 @ 60Hz (according DP1.1a).

For resolutions up to 3840 x 2160 @ 60Hz (according to DP1.2) Core i3/i5/i7 processors are required



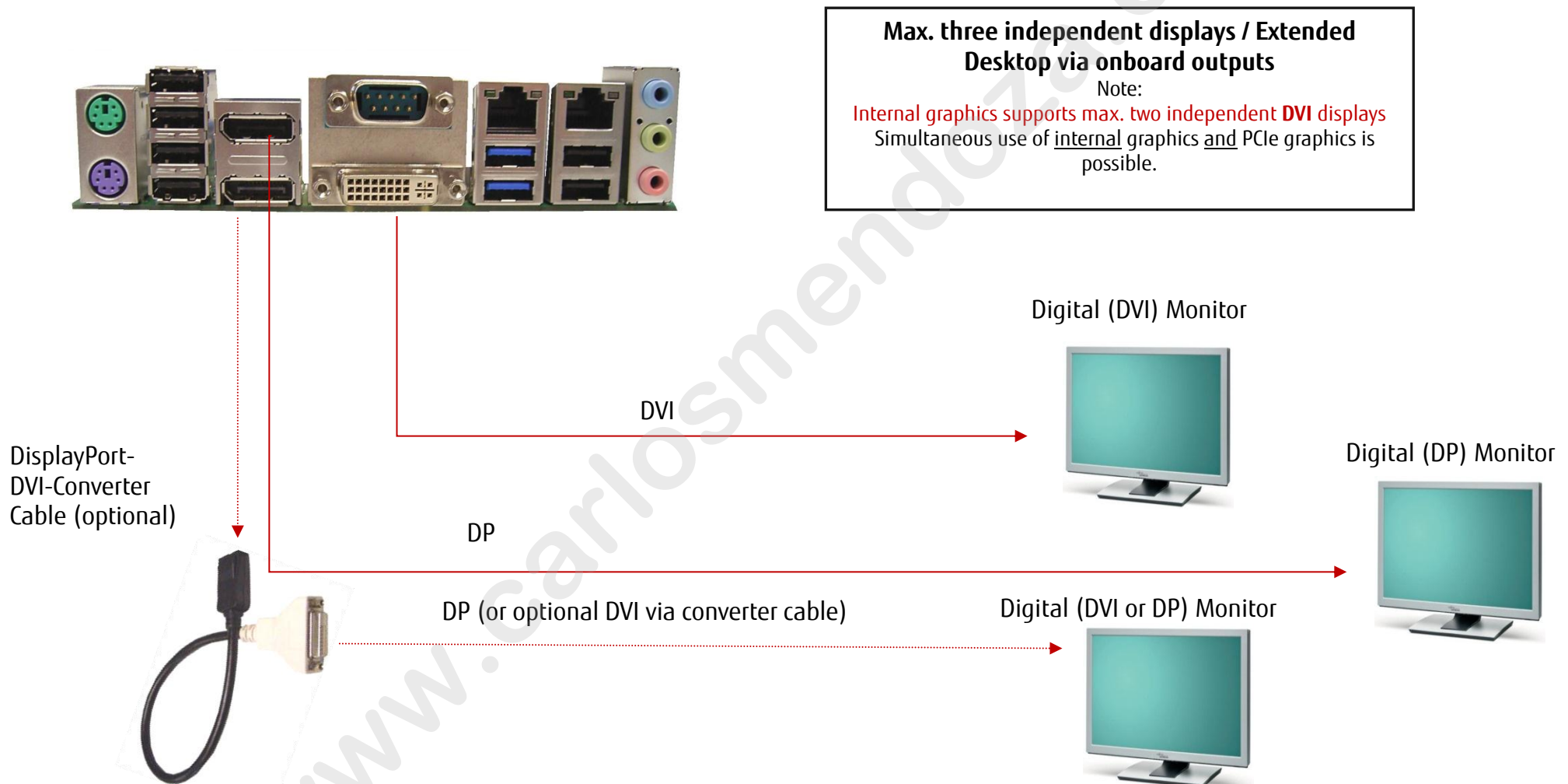
Display Options

6.7 Dual Digital plus VGA Output (3 Displays)



Display Options

6.8 Three Digital Outputs (3 Displays)



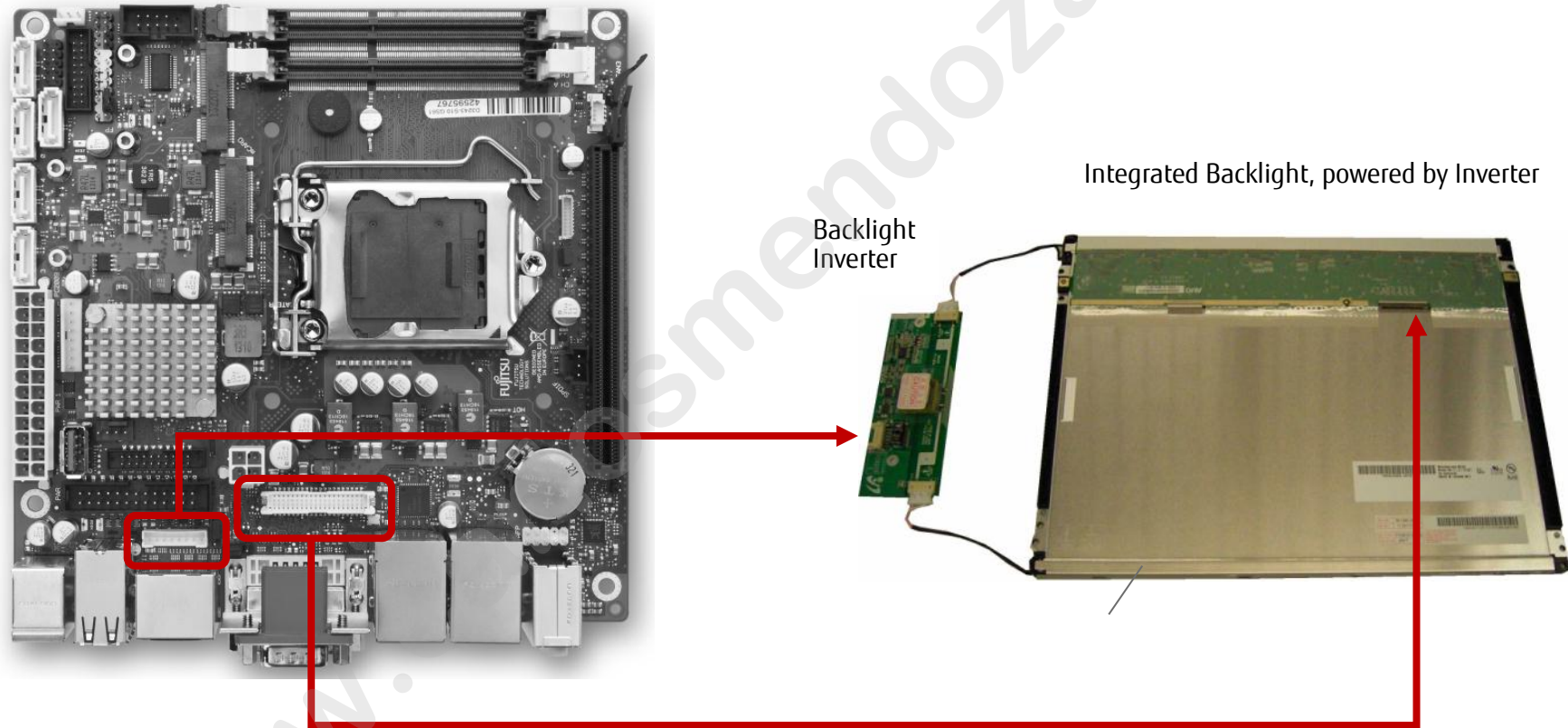
Max. three independent displays / Extended Desktop via onboard outputs

Note:

Internal graphics supports max. two independent **DVI** displays
Simultaneous use of internal graphics and PCIe graphics is possible.

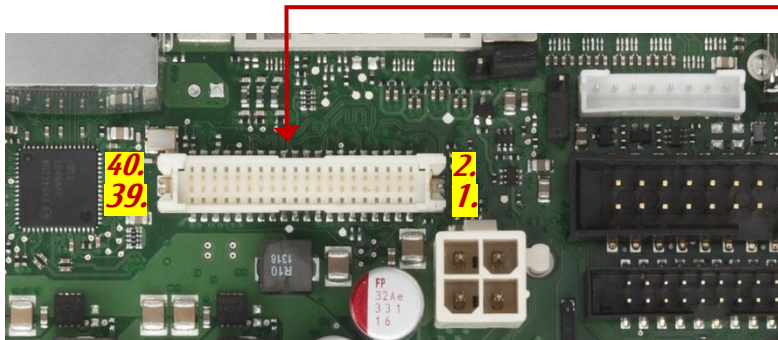
Display Options

6.9 LVDS Display & Backlight Inverter (D3243-S)



Display Options

6.10 LVDS Connector Details (D3243-S)



LVDS Connector: Hirose DF13-40 (or compatible)

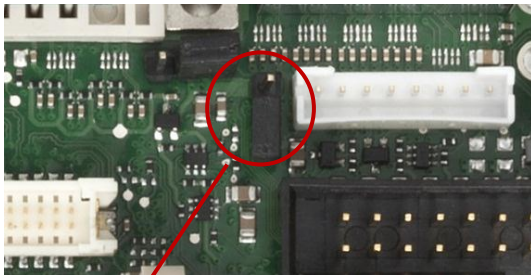
PIN	SIGNAL	SIGNAL	PIN
2	Ground	Ground	1
4	LVDS_H3+ (EVEN_3+)	LVDS_L3+ (ODD_3+)	3
6	LVDS_H3- (EVEN_3-)	LVDS_L3- (ODD_3-)	5
8	Ground	Ground	7
10	LVDS_H2+ (EVEN_2+)	LVDS_L2+ (ODD_2+)	9
12	LVDS_H2- (EVEN_2-)	LVDS_L2- (ODD_2-)	11
14	Ground	Ground	13
16	LVDS_H1+ (EVEN_1+)	LVDS_L1+ (ODD_1+)	15
18	LVDS_H1- (EVEN_1-)	LVDS_L1- (ODD_1-)	17
20	Ground	Ground	19
22	LVDS_H0+ (EVEN_0+)	LVDS_L0+ (ODD_0+)	21
24	LVDS_H0- (EVEN_0-)	LVDS_L0- (ODD_0-)	23
26	Ground	Ground	25
28	LVDS_CLK_H+ (CLK_EVEN+)	LVDS_CLK_L+ (CLK_ODD+)	27
30	LVDS_CLKH- (CLK_EVEN-)	LVDS_CLK_L- (CLK_ODD-)	29
32	Ground	Ground	31
34	DDC-Data	DDC-Clock	33
36	LCD-Power ¹⁾	LCD-Power ¹⁾	35
38	Ground	LCD-Power ¹⁾	37
40	LCD_Power_Enable	Ground	39

1) selectable via Jumper

max. load: 1A per pin!

Note: LVDS pinning is compatible to
D2703-S / D2963-S / D3003-S / D3313-S

LVDS operating voltage selector jumper

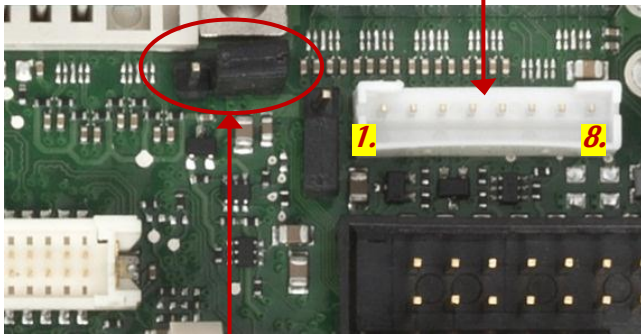


☐ 5V (optional)
☒ 3.3V (default)

Pin	Signal
1	VCC 5V
2	Power LVDS
3	VCC 3.3V

Display Options

6.11 Backlight Inverter Connector Details (D3243-S)



LVDS Backlight Brightness Control Jumper
(Select analog or PWM output)

Backlight Inverter Connector: JST PHR-8

Ground	GND	1
Ground	GND	2
Backlight Brightness CTRL	0-4V or PWM	3
Power 5V	VCC	4
Power 5V	VCC	5
Backlight On/Off Control	BL On/Off	6
Power 12V	+12V	7
Power 12V	+12V	8

Backlight Brightness Control:

Provides a variable DC voltage between 0V and 4V via an RC filter (10kOhm / 20uF; buffered output). Alternatively a PWM control is available, please see related jumper setting. Basically the brightness level can be selected by BIOS Setup, but it is also accessible from Windows OS.

If this control signal is used, the system integrator is responsible for the implementation of a backlight converter that fits to the control output voltage range.

Backlight On/Off Control:

Active High, 3.3V Note: Polarity can be changed via BIOS Setup

1 2 3

Analog (default)
PWM(optional)

Pin	Signal
3	Analog
2	BI Brightn. Contr.
1	PWM

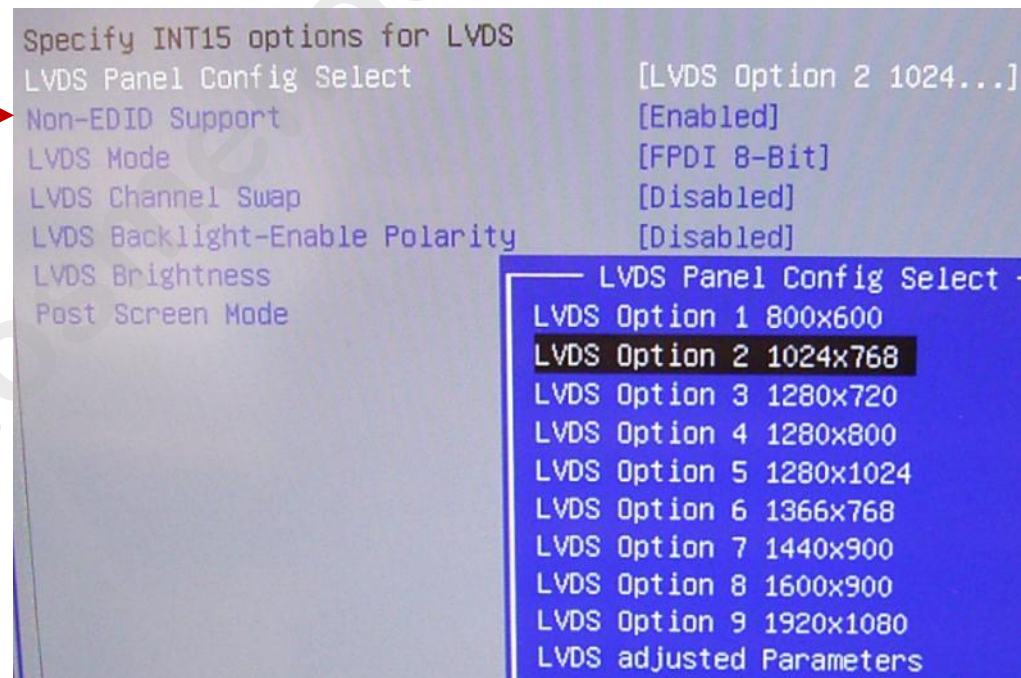
Display Options

6.12 LVDS Timing & Screen Resolution (D3243-S)

There are 9 default LVDS settings available
→ BIOS Setup – Advanced – LVDS Config Select

Note: Option 10 (LVDS adjusted Parameters) becomes visible after running the “LVDS Tool” for implementing customized LVDS settings once.

Important note: “Non-EDID Support” must be set to <Enabled> for standard LVDS displays w/o DDC (EDID) interface!



Display Options

LVDS Timing & Screen Resolution (D3243-S)

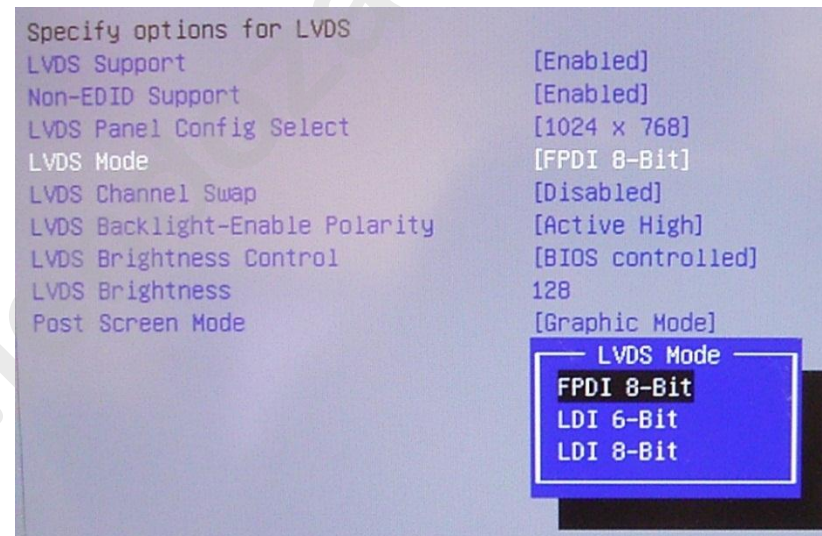
LVDS Mode: _____
The correct mode must be set for the attached LVDS panel.

Note: This setting is also required if customized LVDS timings are implemented (LVDS tool)!

LVDS Brightness: _____
Set the level for the „Backlight Brightness Pin“.
Typical voltage level (analog mode) resp. PWM level:

BIOS-Setting	Voltage Level / PWM Level
0	0.1V / 0.4%
255	4.1V / 100%

The LVDS brightness level can be adjusted in BIOS Setup or via Windows 7 / Windows 8.1 Mobility Center (<Windows key> + <X>)



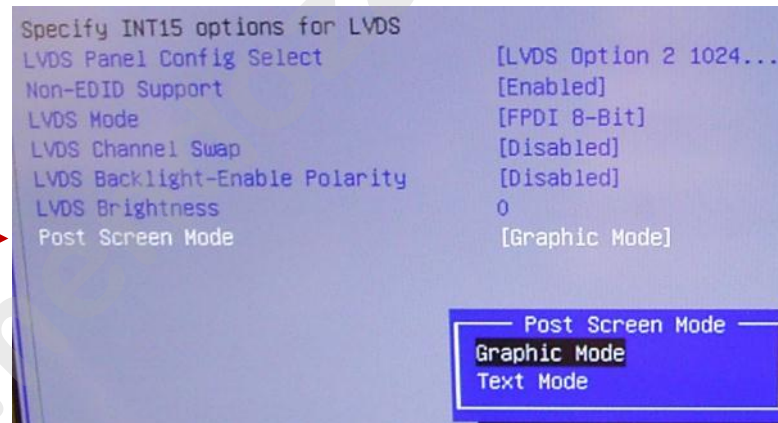
Display Options

LVDS Timing & Screen Resolution (D3243-S)

POST Screen Mode:

Default setting = Graphic Mode (800 x 600).

For panels < 800 x 600 mode could be changed to <Text Mode> in order to enable full BIOS POST screen resp. full BIOS Setup screen (otherwise some portion of the screen may be cut off)



Display Options

6.13 LVDS Tool [Updated]

The LVDS tool (DOS-based) allows to flash specific LVDS settings to the system BIOS of D3243-S.

The LVDS tool needs a panel-specific EDID configuration file based on the spec data of the LVDS panel.

Note: Sample configuration EDID files are available in the LVDS Tool kit.
For adjusting EDID files the "Phoenix EDID tool" is required (see link below).

```

Creating buffer (0x2c bytes) for LVDS data.
Writing LVDS data to buffer.
Dumping raw LVDS payload data.
Buffer at 50C2:331A (Size: 0x2C)
Dump of 0x2C Byte at Offset 0x0
-----
00000000 | 2c 00 01 00 64 19 00 04 40 01 00 03 26 00 18 00
00000010 | 88 00 03 00 06 00 30 01 e4 00 00 00 06 00 00 00
00000020 | 00 00 20 00 f4 01 03 24 5e 3c 01 01

2C 00 01 00 64 19 00 04 40 01 00 03 26 00 18 00  ....d.. .@...&...
88 00 03 00 06 00 30 01 F4 00 00 00 06 00 00 00  ....0 .....
00 00 20 00 F4 01 03 24 5E 3C 01 01  .. .... $^<..

Everything worked well.
Returning 0 (0x00)
  
```

(Sample screen message after running LVDS tool)

Download-Link for LVDS Tool:

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D3243-S/IndustrialTools_D3243/LVDS-Tool/

→ BIOS ≥ R1.20.0.SR2 and LVDS tool ≥ V2.2.1 must be used to implement customized LVDS settings

Note:

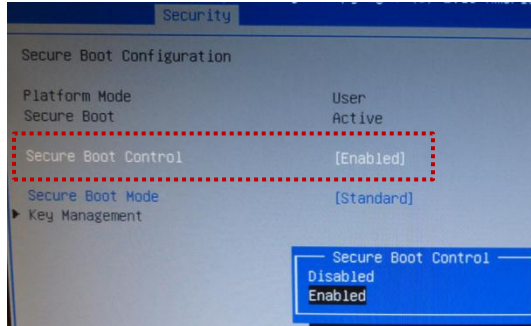
The onboard LVDS converter switches automatically between single channel and dual channel mode.
The reference resolution is 1366 x 800 pixels. If H > 1366 or V > 800, the scaler switches to dual channel mode.
Otherwise, LVDS will operate in single channel mode.
The scaler supports clock rates up to 105Mhz; LVDS displays with clock rates > 105Mhz are not supported

Display Options

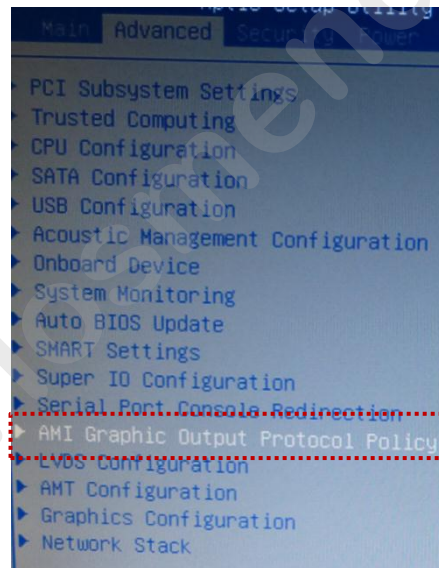
6.14 LVDS – Influence on Graphics Output D3243-S [New]

When LVDS support is enabled in BIOS Setup of D3243-S, this has some effect on the support of the other graphics output ports (DVI-D, VGA via DVI-I, DisplayPort). Furthermore, the setting "Secure Boot" (required for Windows 8.1) also influences the supported graphics output modes.

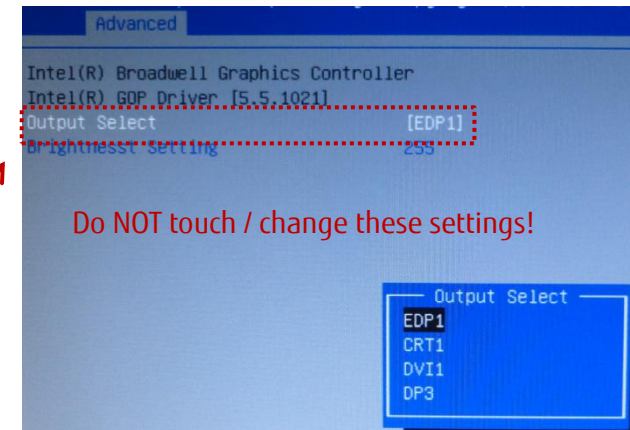
Important note: If Secure Boot is enabled, the System BIOS uses the GOP (Graphics Output Protocol) graphics driver. In addition, there is another BIOS Setup option available (in Secure Boot mode only!): AMI Graphic Output Protocol Policy. The settings in this menu should never be changed, otherwise any video outputs may be inaccurate!



BIOS Setup option to select Secure Boot:
 Disabled for MS Windows 7 (=default)
 Enabled for MS Windows 8.1



Additional BIOS Setup graphics option,
 available in Secure Boot mode only



Display Options

LVDS – Influence on Graphics Output D3243-S [New]

The following table shows the supported video ports for Windows OS, BIOS Setup and DOS mode (e.g. DOS USB Stick; DOS not applicable for Secure Boot mode!).

Windows 7 Mode (BIOS Setup → Secure Boot Disabled)				
Used Video Ports	LVDS	DVI	DP (lower port)	VGA (via DVI dongle)
LVDS & DVI-D	Win7 ✓ BIOS Setup ✓ DOS ✓	Win7 ✓ BIOS Setup ✓ DOS ---		
LVDS & VGA	Win7 ✓ BIOS Setup ✓ DOS ✓			Win7 ✓ BIOS Setup ✓ DOS ---
LVDS & DP	Win7 ✓ BIOS Setup ✓ DOS ✓		Win7 ✓ BIOS Setup ✓ DOS ---	
LVDS & DVI-D & DP	Win7 ✓ BIOS Setup ✓ DOS ✓	Win7 ✓ BIOS Setup ✓ DOS ---	Win7 ✓ BIOS Setup --- DOS ---	
LVDS & DP & VGA	Win7 ✓ BIOS Setup ✓ DOS ✓		Win7 ✓ BIOS Setup ✓ DOS ---	Win7 ✓ BIOS Setup --- DOS ---
Windows 8.1 Mode (BIOS Setup → Secure Boot Enabled)				
Used Video Ports	LVDS	DVI	DP (lower port)	VGA (via DVI dongle)
LVDS & DVI-D	Win8.1 ✓ BIOS Setup ✓	Win8.1 ✓ BIOS Setup ✓		
LVDS & VGA	Win8.1 ✓ BIOS Setup ✓			Win8.1 ✓ BIOS Setup ✓
LVDS & DP	Win8.1 ✓ BIOS Setup ✓		Win8.1 ✓ BIOS Setup ✓	
LVDS & DVI-D & DP	Win8.1 ✓ BIOS Setup ✓	Win8.1 ✓ BIOS Setup ✓	Win8.1 ✓ BIOS Setup ---	
LVDS & DP & VGA	Win8.1 ✓ BIOS Setup ✓		Win8.1 ✓ BIOS Setup ---	Win8.1 ✓ BIOS Setup ✓

Display Options

6.15 LVDS Cabling Reference

Sample cabling diagrams for following LVDS displays & related inverters are available:

Display Size	TFT	Pixel	Inverter
10.4"	NEC NL6448BC33-63D	640 x 480	NEC 104PW201
12.1"	AUO G121SN01-V0	800 x 600	Green-C&C GH093A-ROHS
12.1"	LG-Philips LB121S03-TL01	800 x 600	Green-C&C GH001HB-ROHS
15"	Sharp LQ150X1LW71N	1024 x 768	TDK CXA-0349
15"	AUO G150XG01V0	1024 x 768	Green-C&C GH001A-ROHS
17"	AUO M170EG01-VD	1280 x 1024	Green-C&C GH053A-ROHS
19"	Sharp LQ190E1LW01	1280 x 1024	Power Systems PS-DA0412-05
19"	AUO M190EG01	1280 x 1024	GH053(A1)-ROHS

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D3243-S/Documentation/LVDS_Cabling-Samples/



Display Options

6.16 LVDS Sample Cabling for AuO-G150

FSC D2703-S; Hirose DF13-40, straight, SMT LVDS-Connector			AUD-G150XG01; DF-14H-20P-1.25H (Hirose) or CWY20G-A0D1T (PTWO)	
SIGNAL	SYMBOL	PIN	Pin No.	Symbol
Ground	GND	1		
Ground	GND	2	20	GND
LVDS_Out3+ (ODD 3+)	LO3+	3	18	RxIN3+
LVDS_Out7+ (EVEN 3+)	LO7+	4		
LVDS_Out3- (ODD 3-)	LO3-	5	17	RxIN3-
LVDS_Out7- (EVEN 3-)	LO7-	6		
Ground	GND	7	3	GND
Ground	GND	8	4	GND
LVDS_Out2+ (ODD 2+)	LO2+	9	12	RxIN2+
LVDS_Out6+ (EVEN 2+)	LO6+	10		
LVDS_Out2- (ODD 2-)	LO2-	11	11	RxIN2-
LVDS_Out6- (EVEN 2-)	LO6-	12		
Ground	GND	13		
Ground	GND	14	7	GND
LVDS_Out1+ (ODD 1+)	LO1+	15	9	RxIN1+
LVDS_Out5+ (EVEN 1+)	LO5+	16		
LVDS_Out1- (ODD 1-)	LO1-	17	8	RxIN1-
LVDS_Out5- (EVEN 1-)	LO5-	18		
Ground	GND	19		
Ground	GND	20	10	GND
LVDS_Out0+ (ODD 0+)	LO0+	21	6	RxIN0+
LVDS_Out4+ (EVEN 0+)	LO4+	22		
LVDS_Out0- (ODD 0-)	LO0-	23	5	RxIN0-
LVDS_Out4- (EVEN 0-)	LO4-	24		
Ground	GND	25		
Ground	GND	26	13	GND
LVDS_CLK1+ (CLK ODD+)	CLK1+	27	15	CKIN+
LVDS_CLK2+ (CLK EVEN+)	CLK2+	28		
LVDS_CLK1- (CLK ODD-)	CLK1-	29	14	CKIN-
LVDS_CLK2- (CLK EVEN-)	CLK2-	30		
Ground	GND	31	16	GND
Ground	GND	32	19	GND
DDC-Clock	DDCCLK	33		
DDC-Data	DDCDATA	34		
LCD-Power ¹⁾	+3.3V / +5V	35	1	VDD
LCD-Power ¹⁾	+3.3V / +5V	36	2	VDD
LCD-Power ¹⁾	+3.3V / +5V	37		
Ground	GND	38		
Ground	GND	39		
LCD_PowerOn	LCD_On	40		

1) selectable via Jumper

Cable Length: 500mm

LVDS-Connector AuO_G150 based on Panel Datasheet

DF-14H-20P-1.25H (Hirose) or CWY20G-A0D1T (PTWO)		
Pin No.	Symbol	Description
1	VDD	Power Supply, 3.3V (typical)
2	VDD	Power Supply, 3.3V (typical)
3	VSS	Ground
4	VSS	Ground
5	Rin0-	- LVDS differential data input (R0-R5, G0)
6	Rin0+	+ LVDS differential data input (R0-R5, G0)
7	VSS	Ground
8	Rin1-	- LVDS differential data input (G1-G5, B0-B1)
9	Rin1+	+ LVDS differential data input (G1-G5, B0-B1)
10	VSS	Ground
11	Rin2-	- LVDS differential data input (B2-B5, HS, VS, DE)
12	Rin2+	+ LVDS differential data input (B2-B5, HS, VS, DE)
13	VSS	Ground
14	ClkIN-	- LVDS differential clock input
15	ClkIN+	+ LVDS differential clock input
16	VSS	Ground
17	Rin3-	NC
18	Rin3+	NC
19	VSS	Ground
20	NC	Please "floating" and don't connect to ground.

LVDS-Extension für Philips LM150X08

LCD (CN1):DF14H-20P-1.25H (Hirose)

Pin No	Symbol
1	VLCD
2	VLCD
3	GND
4	GND
5	RXIN0-
6	RXIN0+
7	GND
8	RXIN1-
9	RXIN1+
10	GND
11	RXIN2-
12	RXIN2+
13	GND
14	RXCLK IN-
15	RXCLK IN+
16	GND
17	RXIN3-
18	RXIN3+
19	GND
20	GND

Symbol	Parameter	Min	Typ	Max	Unit	Condition
VDD	LCD Drive Voltage	3.0	3.3	3.6	[V]	
IDD	LCD Drive Current	-	1.0	1.3	[A]	VDD=3.3V, All Black Pattern
PDD	LCD Drive power consumption	-	3.3	4.3	[Watt]	VDD=3.3V, All Black Pattern
VDDns	Allowable LCD Drive Ripple Noise	-	-	100	[mV] P-P	

7 Operating System Support

- Windows® 7
- Windows® 8.1
- Linux

Operating System Support

7.1 Support for Windows 7 / Windows 8.1

- Mainboards D323x-S and D3243-S are designed according to the Microsoft Guidelines for Windows 7 and Windows 8.1
- 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/D323x-S/Drivers_D323x-S/

Note: D323x-S and D3243-S use the same "family drivers"

Operating System Support

7.2 Linux Support **[Updated]**

- Ubuntu Desktop 13.10 ✓
- Ubuntu LTS 12.04.3 ✓
- Fedora 19.1 ✓
- SUSE SLES 11 SP3 64bit ✓
- OpenSUSE 13.1
„flickering screen“ after installation; solved after update
- Debian 7.2.0
Network driver issue → Debian kernel “too old” for LynxPoint system



Note: Hints regarding usage of Watchdog, GPIO, LM-Sensors:

http://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D323x-S/IndustrialTools_D323x-S/Linux_SystemMonitoring&Watchdog&GPIO/

8 Mainboard Tools

Common Mainboard Tools **[Updated]**

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



8.1 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/

8.2 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/

8.3 OEMIDENT

- Production tool to add MS OEM licence data (SLP1 / SLP2.x / OA3.0)
- Add an individual customer serial no / add a chassis asset tag and patch several DMI data
- Disable and hide TPM feature in BIOS Setup

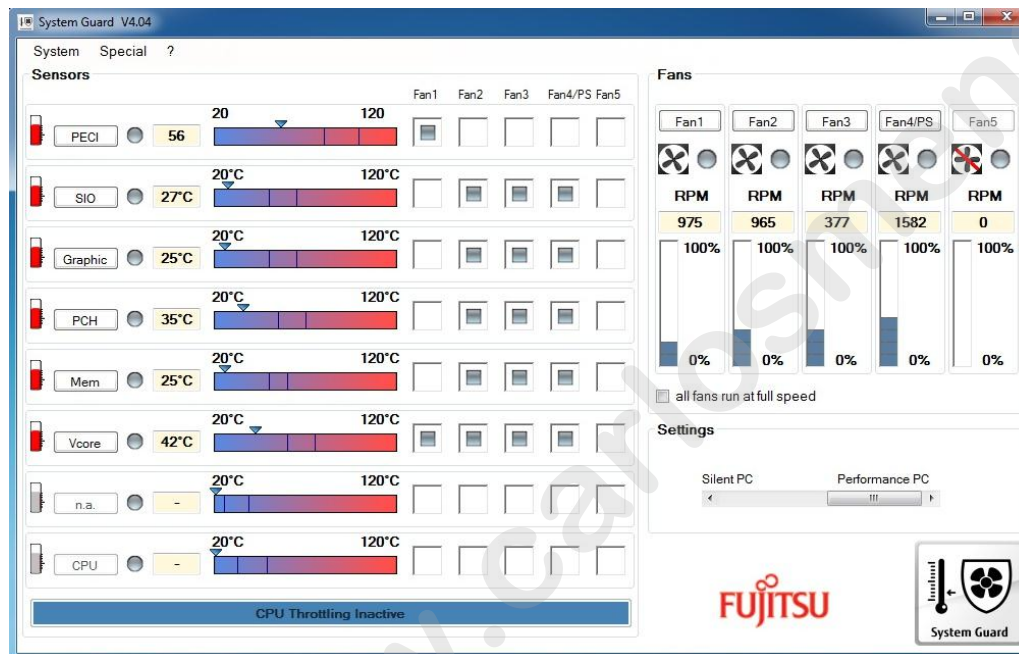
<ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Services/Software&Tools/Common-Mainboard-Tools/OEM-Ident/>

Mainboard Tools

8.4 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 V4.04 (or higher) recommended for D323x-S and D3243-S

Mainboard Tools

Industrial Tools

8.5 SilentFanConfig-Manager

- Windows-based configuration tool to implement customized fan characteristics and temperature parameters. Includes DOS-based tool "SMCO" to flash the configuration file permanently into the system BIOS.

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D323x-S/IndustrialTools_D323x-S/SilentFanConfig-Manager/



8.6 LVDS Tool

- Tool to adjust LVDS-timings for mainboard D3243-S. Adjusted data are flashed into the system BIOS permanently.

Download-Link for LVDS Tool:

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D3243-S/IndustrialTools_D3243/LVDS-Tool/

See chapter 5 (LVDS section) for more details.

Mainboard Tools

8.7 Windows System-Monitoring API (BMC API)

- BMC-Management-Controller to access and adjust System Monitoring parameters like fan speed and temperatures. This API also provides access to the mainboard watchdog, the 8Bit GPIO interface and the intrusion feature of the mainboard.

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D323x-S/IndustrialTools_D323x-S/BMC_Management-Controller-API/

8.8 Linux System-Monitoring Driver ("LM-Sensors")

- BMC-Management-Controller to access and adjust System Monitoring parameters like fan speed and temperatures. This driver also provides access to the mainboard watchdog.

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D323x-S/IndustrialTools_D323x-S/Linux_SystemMonitoring&Watchdog&GPIO/

Note: Further details regarding mainboard tools can be found in the related "Mainboard Tools Datasheet"

[ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Services/Software&Tools/Common-Mainboard-Tools/\\$\\$ DS_UEFI-Tools.pdf](ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Services/Software&Tools/Common-Mainboard-Tools/$$ DS_UEFI-Tools.pdf)

9 Known Issues & Important Notes

9.1 Driver support for MS Windows XP / MS Win8 **[Updated]**

For the Q87/H81 chipset there are following restrictions (Intel):

- No driver support for Windows XP
Note: Limited XP driver support for embedded applications. Currently under investigation
- Limited driver support for Windows 8 / 32Bit

9.2 Memory Issue

The 2GB module Samsung M378B5773**CH0**-CK0 may show sporadic issues with D323x (in particular when 4 modules are installed). These modules should not be used!

Recommended alternative:

Samsung M378B5773**DH0**-CK0 (= new stepping)

9.3 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).

D323x-S and D3243-S provide some additional load ("dynamic load") during power-on in order to facilitate the use of previous PSU models.

Known Issues & Important Notes

9.4 SATA Interface (Intel chipset limitation)

D323x and D3243-S may show compatibility issues with SATA-II harddisk drives. Intel strongly recommends to use SATA-III HDDs only. D323x and D3243-S may show compatibility issues with SATA optical drives (older models). Please make sure to use latest revision of optical drives and related firmware only.

9.5 SATA / eSATA Signal Quality [New]

Please note:

In BIOS Setup, if "eSATA" mode is enabled for any SATA port, the speed for this port is reduced to SATA Gen2. The driver strength is NOT influenced by this setting.

9.6 Graphics driver: Support for Collage Mode

In order to use the new Collage Mode (combine several displays to one display) graphics driver "3355" or higher is required
FTP download: http://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D323x-S/Drivers_D323x-S/

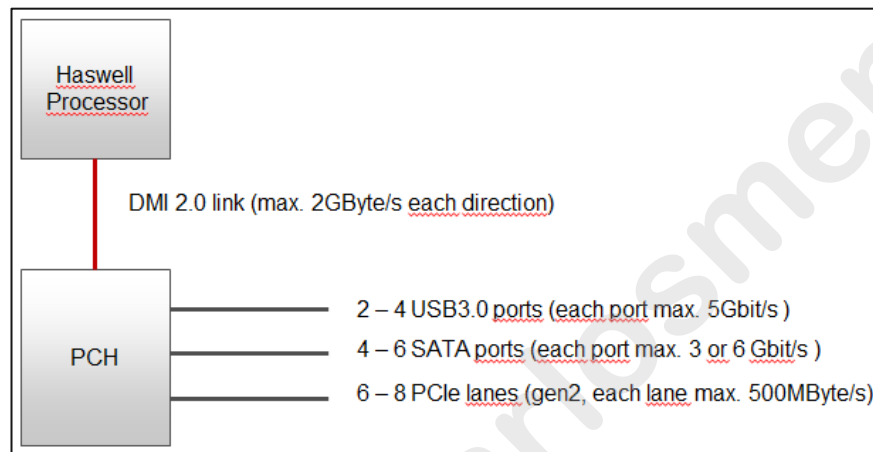
9.7 mSATA support

D3231-S and D3236-S provide an mSATA socket. Please note that one SATA channel (Port 2) and mSATA are shared and cannot be used simultaneously. By default, Port2 is enabled and mSATA disabled. Please select the required option in BIOS Setup accordingly.

Known Issues & Important Notes

9.8 USB3.0 Performance

A single USB3.0 port supports data transfer rates up to 5Gb/s. Please note that there may be a bottleneck between PCH and processor, as the DMI link is shared by all highspeed busses in the system.



Block diagram: High speed busses Q87/H81 system

According to Intel, typically two USB3.0 ports can be used simultaneously (Max. 5Gb/s for each port)

Known Issues & Important Notes

9.9 Support for Haswell Refresh (HR) Processors **[New]**

- **D3243-S:** All mass production mainboards are prepared for HR processors
- **D323x-S:**

For HR processors, both BIOS $\geq$ R1.18.0 and Management Engine (ME) Firmware $\geq$ V9.1.0.1120 are required. With older BIOS or ME-Firmware versions Haswell Refresh processors cannot be used (mainboard will not boot!).

Mainboards D323x-S "**GS2**" and newer are delivered ex factory with BIOS and ME-Firmware ready for HR processors.

For mainboards version D323x-S "**GS1**" with older BIOS or ME-Firmware please follow the steps below, using any older Haswell (not Haswell Refresh) processor:

- First install BIOS R1.18.0 or newer (this prepares the mainboard for the ME firmware update)
- (2) Next install BIOS R1.18.0.SR1 ("Service Release BIOS", this installs the ME firmware update)
Note: BIOS upgrade may take some time before indicating any progress! Please be patient.
- (3) Optional: Now any BIOS version $\geq$ R1.18.0 can be installed

Please make sure that the Haswell Refresh processor is NOT installed before steps (1) and (2) are performed.

Additional note – Possible PCIe x16 issue:

After installing a HR processor in mainboard D323x-S (BIOS $<$ R1.21.0), it may happen that the PCIe x16 slot is corrupted (e.g. PCIe graphics card not working). This behaviour is based on an Intel firmware bug. There is a tool to reset affected mainboards:

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Services/Software&Tools/Common-Mainboard-Tools/HaswellRefresh_PClEX16/

Link to **processor compatibility overview** (provides overview about Haswell / Haswell Refresh processors):

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Services/Compatibility_CPU_x_Board/Compatibility_CPUxBoard.pdf

Known Issues & Important Notes

9.10 PCI Slots D323x-S [New]

Possible issue: PCI slot of D3231-S does not operate as expected → Please install BIOS ≥ R1.18.0

General note: D323x-S support 5V-only and 3.3V/5V universal PCI cards.

Mainboard signal level is 3.3V (=5 V tolerant)

3.3V-only PCI cards can NOT be used (different mechanical connector layout)

Since the current Intel chipsets do not natively support PCI any more, D323x-S use a Pericom PI7C9X118SL PCIe to PCI Bridge which is compliant to PCI Rev. 2.3 (32Bit/33 MHz).

There are several "older" PCI cards that comply to PCI Rev. 2.1 or earlier only. These cards may NOT be supported on D323x-S.

9.11 PCI Express Slots [New]

Possible options to get critical PCIe cards working:

- Reduce PCIe link speed in BIOS Setup
- Use BIOS ≥ R1.20.0
- Change Link State Power Management setting within Windows OS
 → Control Panel / Power Options / Change Plan Settings / Change advanced power settings / PCI Express / Link State Power Management
 Change from "moderate power savings" or "maximum power savings" to "Off".

Note: With BIOS 1.20.0.SR1 and later the PCIe power management settings are changed so that the OS cannot re-enable them even though they are disabled by default in the BIOS.

Known Issues & Important Notes

9.12 Intel iAMT / vPRO Manageability Support [New]

Mainboards D3231-S, D3236-S and D3243-S featuring the iQ87 chipset provide full support for iAMT / vPro.

- ➔ Appropriate Core i5 / Core i7 processors: Full iAMT / vPro feature set supported
- ➔ Some Core i5 / some Core i7 / Core i3 / Pentium: Only "Standard Manageability" supported (e.g. no KVM)
- ➔ Celeron processors: No Manageability supported

Note: KVM support is only possible via the processor-integrated graphics!

10 Miscellaneous

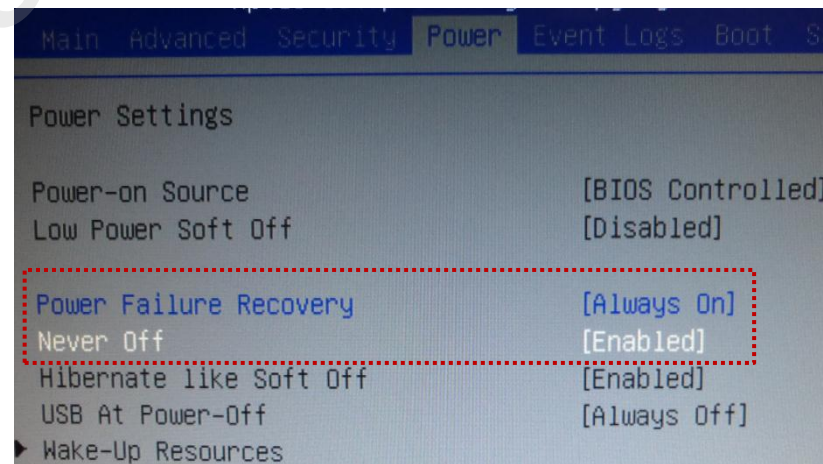
10.1 Specific BIOS Modes “Always On” & “Never Off” (D3243-S) [New]

The BIOS Setup of D3243-S provides two settings for specific operating modes

- **Always On** (Power Failure Recovery)
The system is forced to power up under any condition whenever power is connected to the system.
e.g. when mainboard battery is dead
Default setting: “Power Failure Recovery = Always On”
- **Never Off**
The system cannot be switched off by the mainboard power button or from Windows OS.
If any shutdown (incl. S3 / S4) or power button override is detected, the system is forced to powered up and reboot again.
This feature may be used e.g. for unattended systems that should never be shut down.
Default setting: “Never Off = disabled”

Note: If “Never Off = enabled”, then Power Failure Recovery should be set to “Always On”!

This Never Off-feature is only supported by mass production mainboards D3243-S!



Miscellaneous

10.2 Battery Lifetime **[New]**

The typical battery lifetime is designed for 5 years.

This is based on following usage profile:

- G3 → 28% / two days per week
(System Off, Power disconnected)
- Deep S5/S4/S3 → 48% / 17 hrs per working day
(System Off, Power connected)
- S0 → 24% / 8 hrs per working day
(System Working)

On-Temperature (S0): 70°C

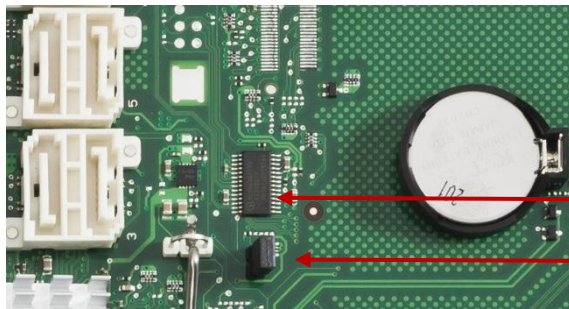
Off-Temperature (G3, S5/S4/S3): 23°C

Note: If the system is never in G3 mode or if the S0 "working" temperature is lower than 70°C, this may result in much higher battery lifetime.

Miscellaneous

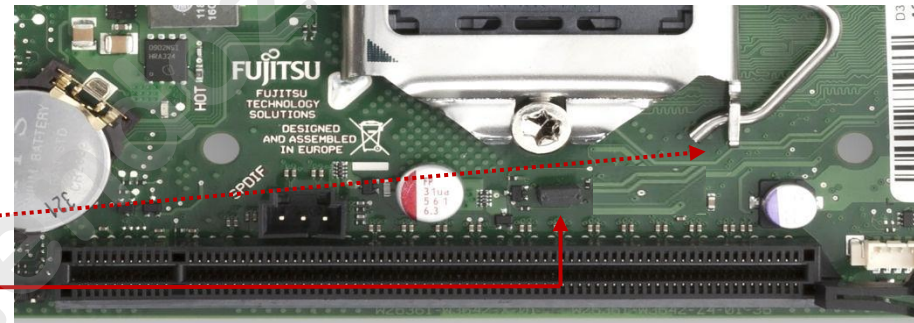
10.3 Trusted Platform Module (TPM) [Updated]

TPM V1.2 controller: Infineon SLB9635 (D3231-S/D3236-S) resp. Infineon SLB9660 (D3243-S)



(D3231-S / D3236-S)

TPM Infineon
TPM Jumper



(D3243-S: TPM located on rear side)

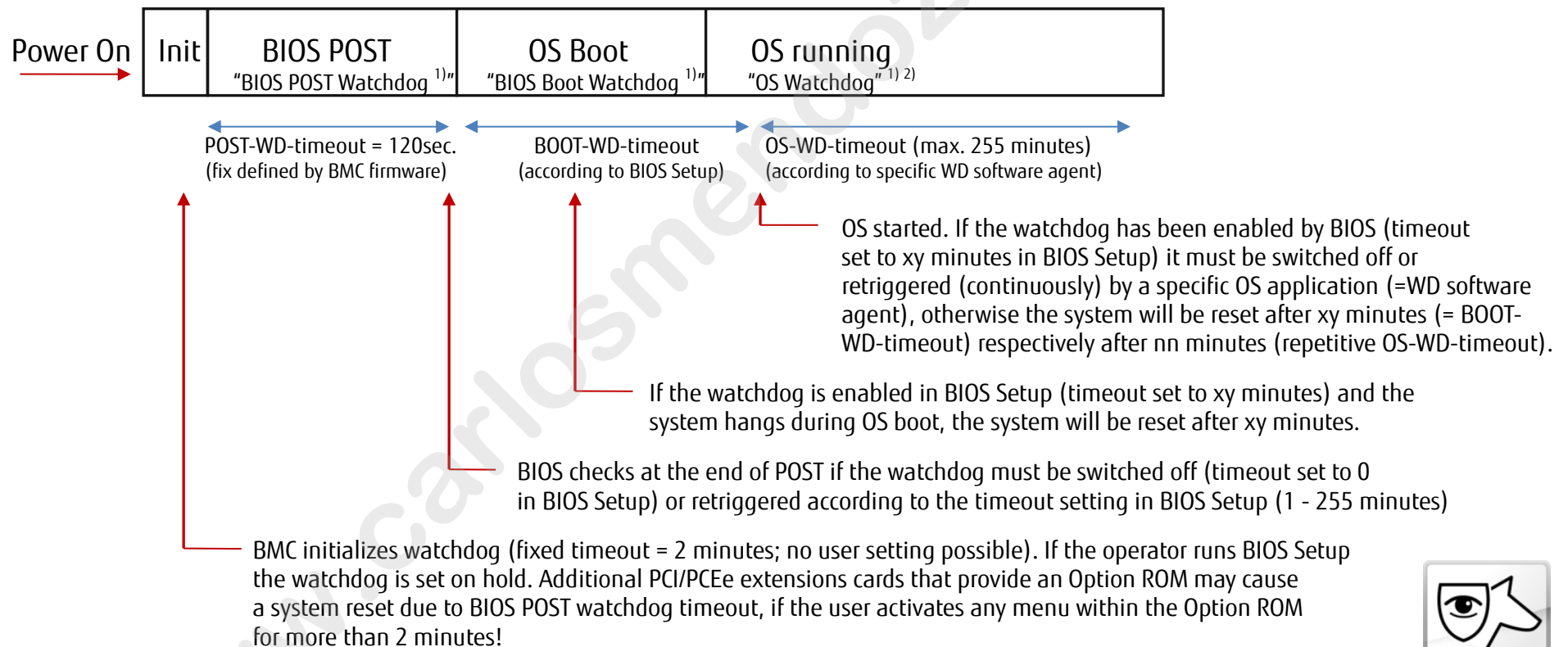
Note:

- TPM Jumper must be installed in order to enable the TPM hardware (installed = default)
- TPM must be enabled in BIOS Setup before its features can be used
- For applications / customers that do not want to use TPM, the full functionality can be disabled and hidden in BIOS Setup by the OEMIDENT tool. See OEMIDENT readme for details.
Once TPM has been disabled by OEMIDENT, it cannot be re-enabled again (only possible by factory RMA)!

Miscellaneous

10.4 System Watchdog (WD)

Mainboards provide full BIOS POST-, Operating System Boot-, and Operating System-Runtime watchdog supervision.



- 1) Note: All three watchdogs are physical identical, but they are handled from different application levels
- 2) As the SystemGuard tool offers access to the watchdog it can be used as "WD software agent" to retrigger the watchdog during OS runtime

Miscellaneous

System Watchdog (WD)

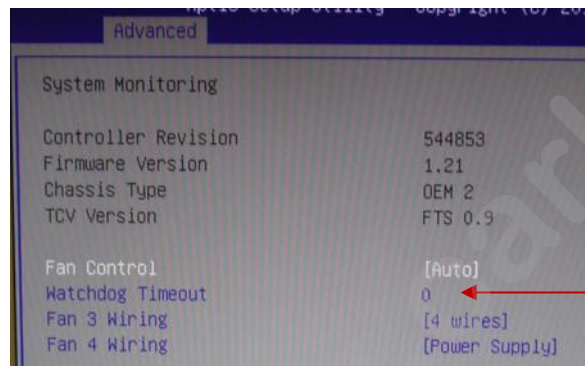
How to handle the different watchdog levels

- **BIOS POST Watchdog**

- No user interaction possible – POST Watchdog is always enabled!

- **BIOS Boot Watchdog**

- Set Watchdog in BIOS Setup



0 = WD disabled

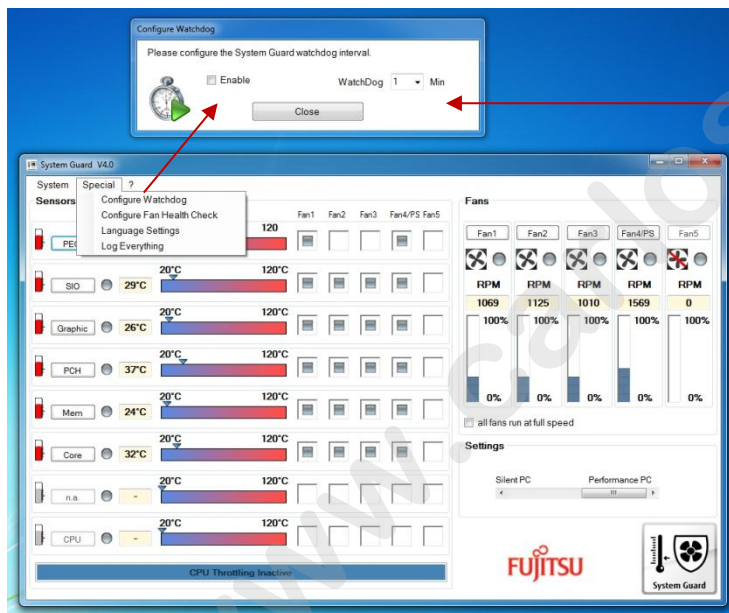
1 – 255 = WD enabled (timeout = 1 – 255 minutes)

Miscellaneous

System Watchdog (WD)

OS Watchdog

- Use "WD software agent" to 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/D323x-S/IndustrialTools_D323x-S/
- 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 a unwanted system reset!



Menu "Special":

--> Enable WD

--> Set timeout to 1 – 8 minutes

Miscellaneous

10.5 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/D323x-S/BIOS_D323x-S/

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D3243-S/BIOS_D3243-S/

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

Required BIOS files:

- EfiFlash.exe (DOS flash tool)
- DosFlash.bat (batch file)
- Dxxx-y.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/D323x-S/BIOS_D323x-S/BIOS_D3236-S/FTS_Basic-BootStick.\\$XE](ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D323x-S/BIOS_D323x-S/BIOS_D3236-S/FTS_Basic-BootStick.$XE)

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

Miscellaneous

BIOS Update / BIOS Recovery

Windows-based BIOS update (Deskflash tool)

Required BIOS file:

- Dxxxx-Sx.R1.x.y.**DFI.exe** (Windows executable flash tool)

Copy file from FTP (link see above), rename *filename.\$x* 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)
- Dxxxx-S1.upd (flash file)
- Dxxxx-S1.rom / Dxxxx-S1.1xx --> Important: These files must be located in the root directory of the USB stick!

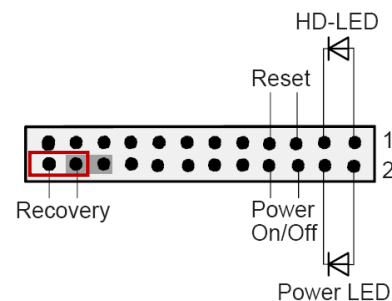
Set onboard jumper to Recovery Mode

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.



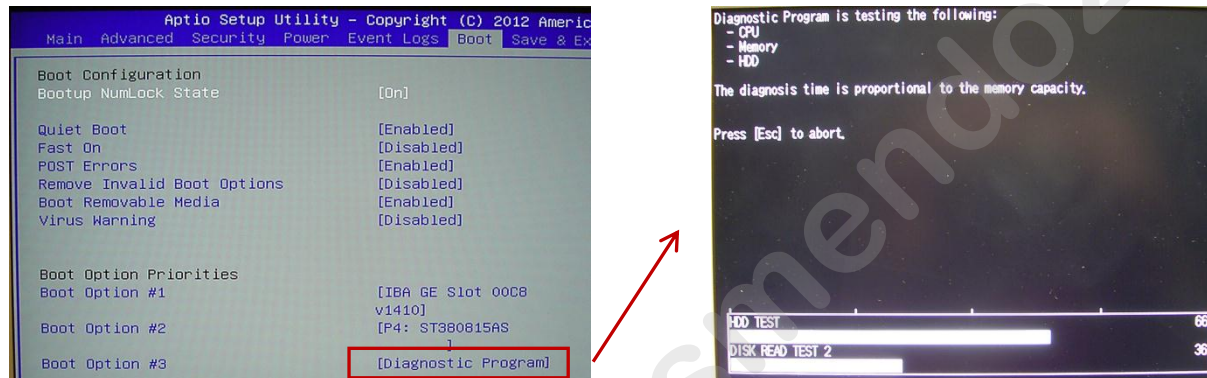
10.6 BIOS/CMOS: Reset Defaults

Set BIOS Setup to Defaults ("Clear CMOS"): Power off system, set Jumper to "Recovery", power on system and wait until picture appears on screen.
Power off again and set jumper to previous position. CMOS settings should now be reset to default mode. (For this procedure no BIOS update/ USB stick is required!).

Miscellaneous

10.7 BIOS integrated HW Diagnostic Tool

Starting with the D323x 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.

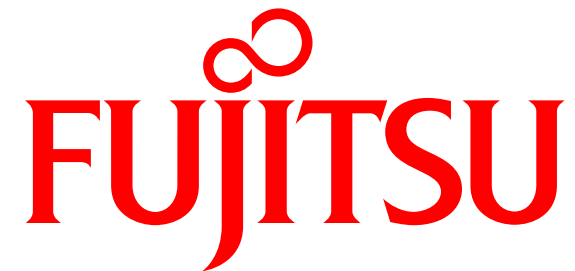


10.8 BIOS integrated Erase Disk Tool

All Industrial Mainboard include the BIOS tool "EraseDisk" for easy and secure deletion of any data on the harddisk

Detailed information about Erase Disk is available here:

ftp://ftp.ts.fujitsu.com/pub/Mainboard-OEM-Sales/Products/Mainboards/Industrial&ExtendedLifetime/D323x-S/Documentation/PF_EraseDisk_e.pdf



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