Sam460ex

power for your embedded ideas

End User Manual

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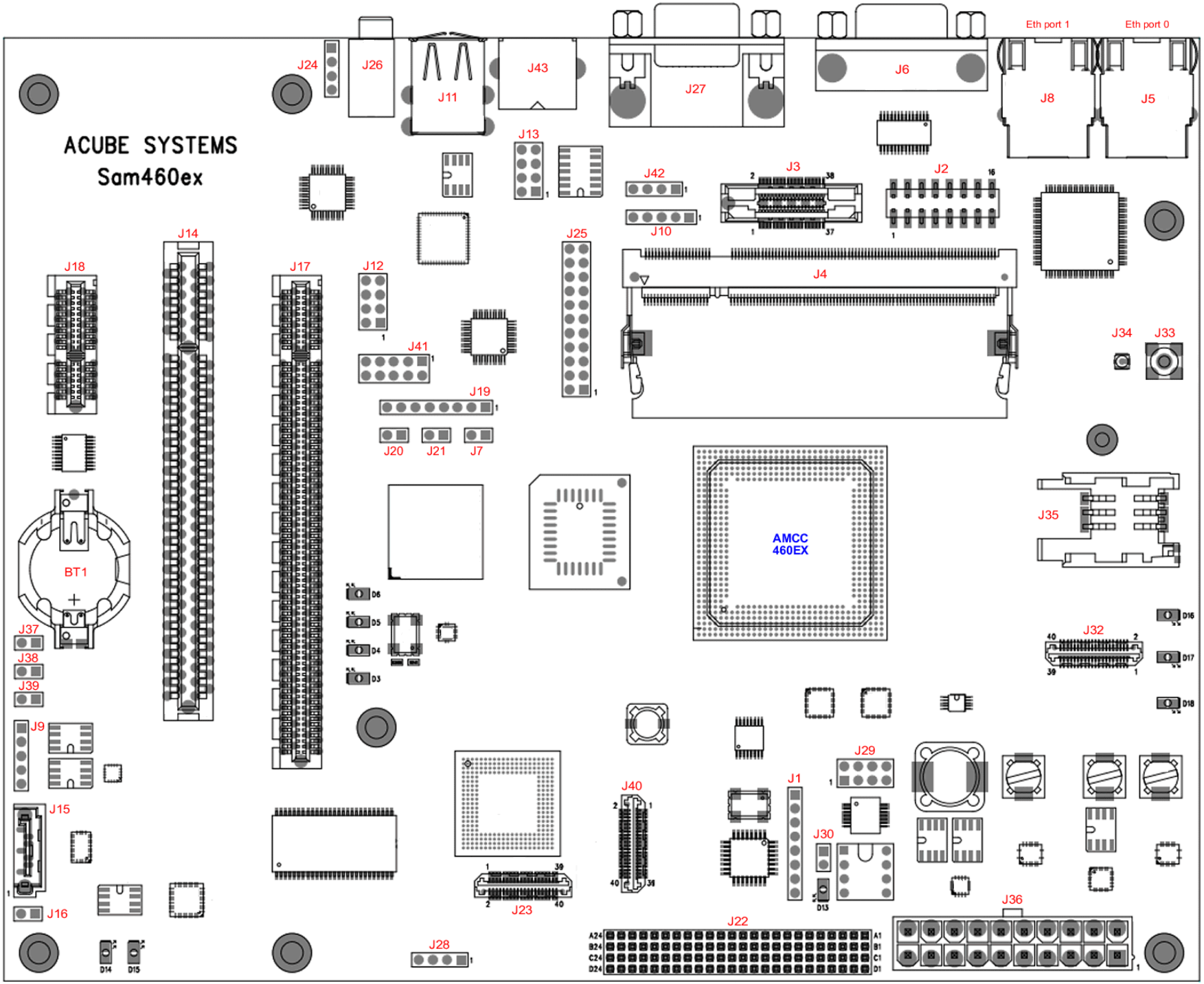
Please check you local regulations for disposal of electronic devices


ACUBE SYSTEMS
Sam460ex
Eth port 1
Eth port 0
J24
J26
J11
J43
J27
J6
J8
J5
J13
J42
J3
J2
J10
J4
J25
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J18
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J20
J21
J7
J34
J33
J35
BT1
AMCC
460EX
J37
J38
J39
J9
J15
J16
J32
D16
D17
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D6
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J29
J1
J40
J30
D13
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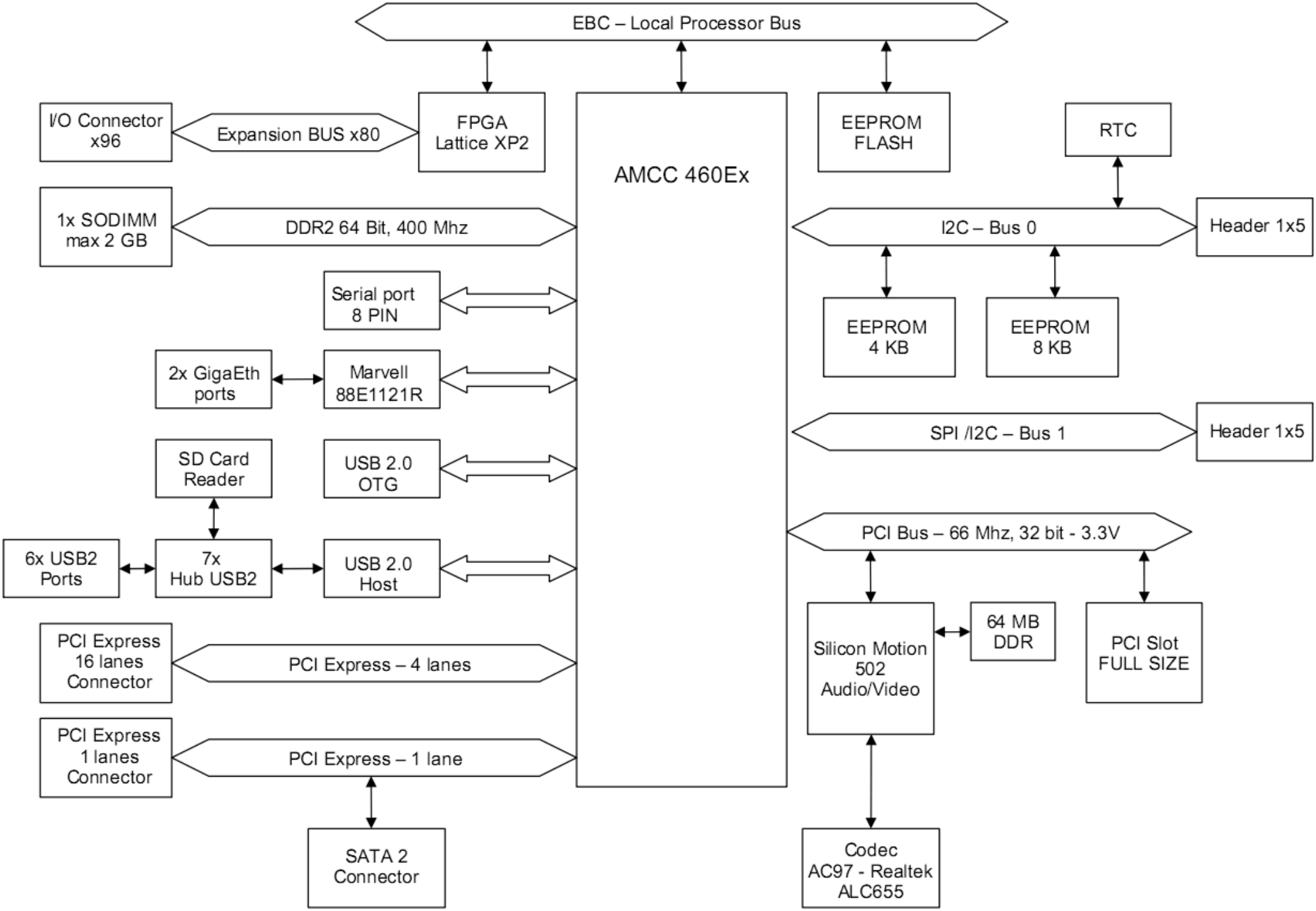

EBC – Local Processor Bus
I/O Connector x96
Expansion BUS x80
FPGA Lattice XP2
AMCC 460Ex
EEPROM FLASH
RTC
1x SODIMM max 2 GB
DDR2 64 Bit, 400 Mhz
I2C – Bus 0
Header 1x5
Serial port 8 PIN
EEPROM 4 KB
EEPROM 8 KB
2x GigaEth ports
Marvell 88E1121R
SPI /I2C – Bus 1
Header 1x5
SD Card Reader
USB 2.0 OTG
PCI Bus – 66 Mhz, 32 bit - 3.3V
6x USB2 Ports
7x Hub USB2
USB 2.0 Host
Silicon Motion 502 Audio/Video
64 MB DDR
PCI Slot FULL SIZE
PCI Express 16 lanes Connector
PCI Express – 4 lanes
PCI Express 1 lanes Connector
PCI Express – 1 lane
SATA 2 Connector
Codec AC97 - Realtek ALC655

Your Sam460ex board is ready to go.

Just connect a hard drive, monitor, mouse and a keyboard, and switch it on!
It could be housed into a flex-ATX, micro-ATX and full ATX computer case.

Sam460ex Hardware specifications:

- flex-ATX form factor (21.6 x 17 cm)
- 8 layers PCB
- AMCC 460ex SoC – upto 1.066 Ghz
- max 2 GB DDR2 Ram – 200-pin SODIMM up to 533 Mhz
- Silicon Motion SM502 embedded MoC (audio/video) max 64Mb gfx Ram
- Audio 5.1 Realtek ALC655 codec
- PCI-express 4x lanes slot (16x mechanical connector)
- PCI-express 1x lane slot (* check notes)
- PCI slot, 32 bit, 66/33 Mhz, 3.3V
- 1x SATA2 port (* check notes)
- 6x USB2 EHCI/OHCI ports
- 2x 10/100/1000 Ethernet ports
- Lattice XP2 FPGA with 80 I/O pins expansion connector (optional)
- UMTS/GSM module (optional requires add-on card)
- 512 MB NAND Flash (optional)
- integrated SD card reader
- RTC clock
- Serial port, 8-wires
- I2C and SPI/I2C buses
- passive cooling
- U-Boot 2009.08

Case panel connector: **J29** (near the ATX connector)

1-2 HD led
3-4 Power led
5-6 Power Switch
7-8 Reset Switch

RAM: **J4** (DDR2 – 200-pin SODIMM) max 2 GB

USB

External USB ports: **J11** (EHCI/OHCI)
Internal USB ports: **J12, J13** (EHCI/OHCI) and **J28** (OHCI only)

J12a (port 3)	1 – VCC	J13a (port 5)	1 – VCC	J28 (port 7)	1 – VCC
	3 – D-		3 – D-		2 – D-
	5 – D+		5 – D+		3 – D+
	7 – GND		7 – GND		4 – GND
J12b (port 4)	2 – VCC	J13b (port 6)	2 – VCC		
	4 – D-		4 – D-		
	6 – D+		6 – D+		
	8 – GND		8 – GND		

Video

VGA: **J27**
SVideo in-out: **J43** (requires add-on card)
LVDS: **J23**
ZV: **J40**
add-on card: **J42**

Audio

Audio out: **J26** (jack stereo)
Audio in: **J24** (DVD/CD)
Audio Expansion port: **J25**
Audio front panel AC97: **J41**

Ethernet

Dual 10/100/100 Ethernet ports: **J5, J8**

Misc

ATX Power connector: **J36**

SATA2 port: **J15**
SATA2 or PCI-e 1x selector: **J16**

Serial port: **J6** 8-wires

SD card: **J31** (solder side)

CPU JTAG: **J2**
CPU Trace: **J3**

Lattice XP2 FPGA JTAG: **J19**
Lattice XP2 FPGA expansion connector: **J22** (80 I/O pins available)

I2C bus port: **J9**

1 – SCLK
2 – 3.3V
3 – SDATA
4 – GND
5 – NC

SPI/I2C bus port: **J10**

1 – I2C SCLK / SPI SCL
2 – 3.3V
3 – I2C SDATA / SPI SDA
4 – GND
5 – SPI SDO

Boot

The current U-Boot version support booting from the following devices:

- SATA2 hard disk connected on the onboard controller port J15 (* check notes)
- SATA hard disk and/or DVD connected to a Silicon Image 3112 controller on PCI slot
- SATA hard disk and/or DVD connected to a Silicon Image 3114 controller on PCI slot
- USB mass storage
- internal SD card reader J31
- Network

Video output

The current U-Boot version support video output from:

- onboard SM502 VGA port
- Radeon card on PCI slot

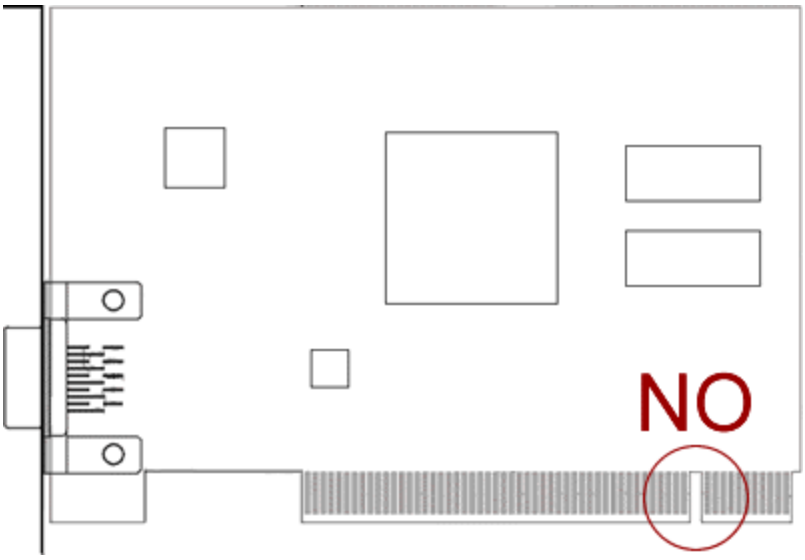
To select the preferred video output, select it from the “Video Option” U-Boot menu.
Video output from a Radeon card in the PCI-Express slot is not current fully supported, U-boot will POST the card (to be initialized later from the Operating System) but video output is not enabled.

Notes: the SATA2 port and the PCI-e 1x slot are mutually exclusive, only one of them can be used at time:

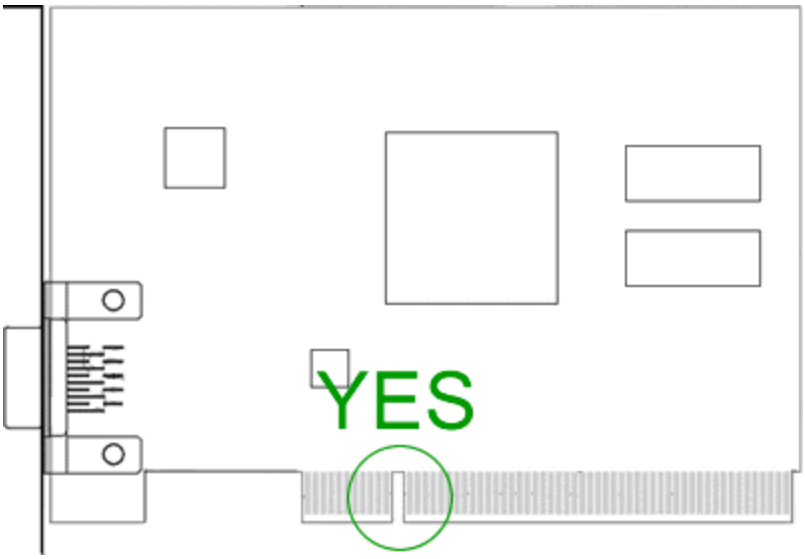
- to use the SATA2 port, close **J16** with a jumper, and select the corresponding entry in the “PCI-E 1x / SATA-2” U-Boot menu.
- to use the PCI-e 1x slot, remove the **J16** jumper, and select the corresponding entry in the “PCI-E 1x / SATA-2” U-Boot menu.

A reboot is required.

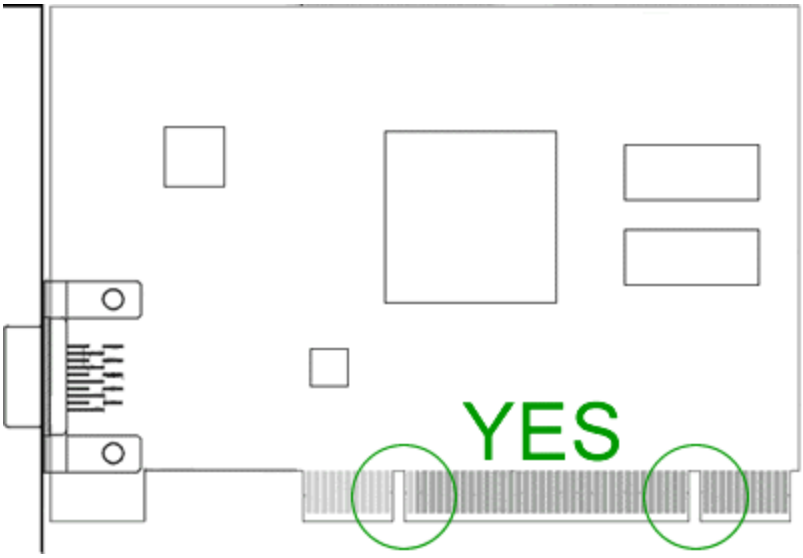
Warning: the PCI slot is compatible with 3.3V PCI card **only**. Inserting a 5.0V PCI card will damage the Sam460ex board !!
Do not try to reverse a 5.0V PCI board to fit it into the 3.3V PCI slot, it will damage your board !!



5V compatible PCI card – DON'T use it



3,3V compatible PCI card – OK



3,3V and 5V compatible PCI card – OK