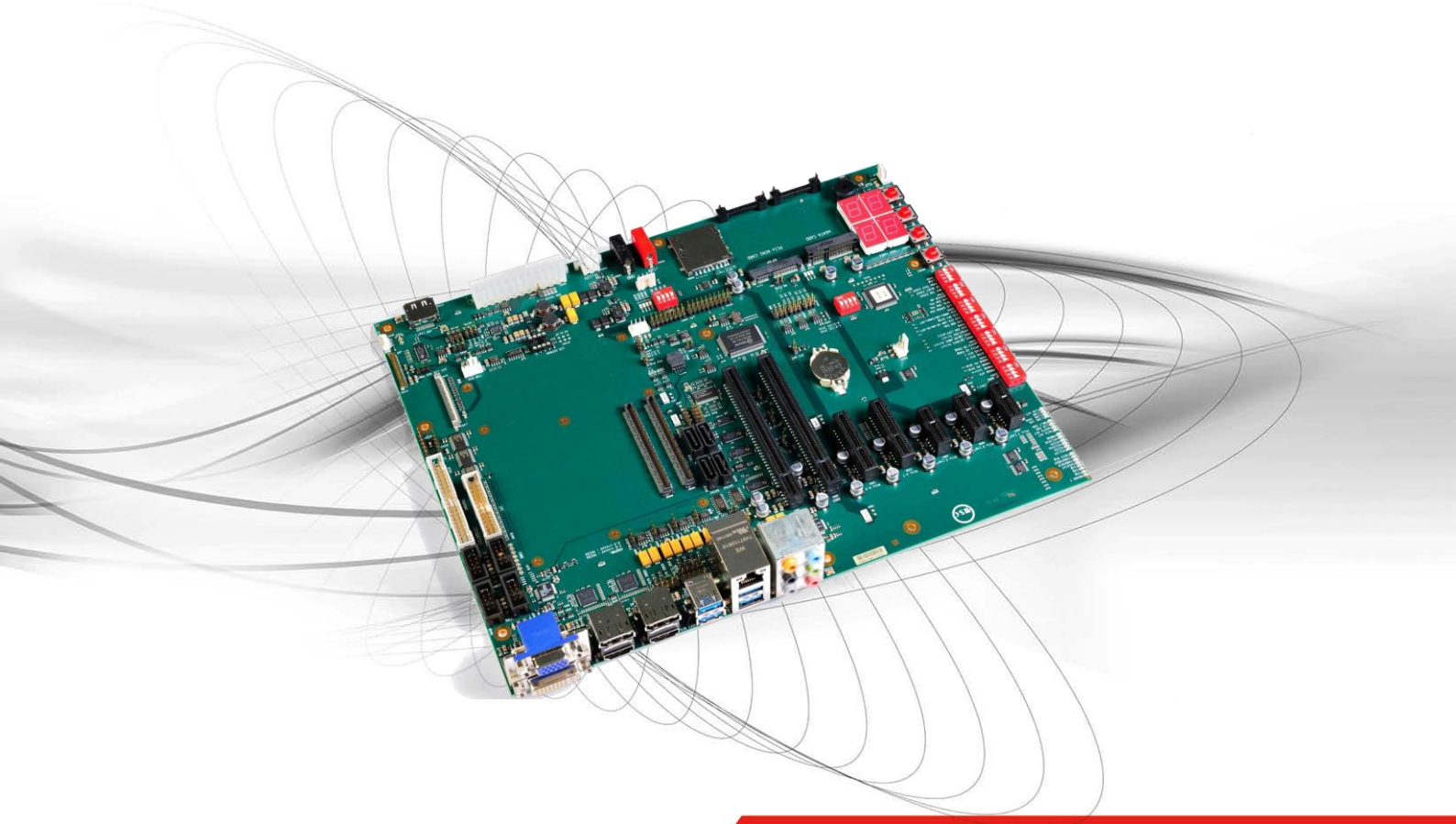
Intelligent Solutions

msc technologies
an Avnet Company



Engineering Leadership

User Manual

COM Express™ Type 6 Carrier
MSC C6-MB-EVA

Evaluation Board
Hardware Rev. 4

Rev. 0.10

2015-02-05

Preface

Copyright Notice

Important Information

This documentation is intended for qualified audience only. The product described herein is not an end user product. It was developed and manufactured for further processing by trained personnel.

Disclaimer

Although this document has been generated with the utmost care no warranty or liability for correctness or suitability for any particular purpose is implied. The information in this document is provided “as is” and is subject to change without notice.

EMC Rules

This unit has to be installed in a shielded housing. If not installed in a properly shielded enclosure, and used in accordance with the instruction manual, this product may cause radio interference in which case the user may be required to take adequate measures at his or her owns expense.

Trademarks

All used product names, logos or trademarks are property of their respective owners.

Certification

MSC Technologies GmbH is certified according to DIN EN ISO 9001:2000 standards.

Life-Cycle-Management

MSC products are developed and manufactured according to high quality standards. Our life-cycle-management assures long term availability through permanent product maintenance. Technically necessary changes and improvements are introduced if applicable. A product-change-notification and end-of-life management process assures early information of our customers.

Product Support

MSC engineers and technicians are committed to provide support to our customers whenever needed.
Before contacting Technical Support of MSC Technologies GmbH, please consult the respective pages on our web site at www.msc-technologies.eu for the latest documentation, drivers and software downloads.
If the information provided there does not solve your problem, please contact our Technical Support:

Email: support@msc-technologies.eu
Phone: +49 8165 906-200

Content

Illustrations

Tables

1 General Information

1.1 Revision History

Rev.	Date	Description
0.1	26.07.2012	Initial Revision
0.2	10.8.2012	Minor changes
0.3	19.09.2012	Due to new board revision: The eDP connector X1501 changed from 40 to 30 pin and the pin assignment at COM ports has changed.
0.4	2012-11-08	Minor changes
0.5	2013-04-15	Adaption to new board revision (LY30E801)
0.6	2013-07-22	SD memory card slot, DIP-switch setting for LY30E801
0.7	2013-11-15	Remarks concerning to LY30E801 added
0.8	2014-03-19	Adaption to new board revision (LY40E801)
0.9	2014-09-05	New covering page
0.10	2015-02-05	Table44 Pin21 corrected

1.2 Reference Documents

[1] COM Express Module Base Specification
COM Express Revision 2.1
Last update: Apr10th, 2012

[2] PCI Local Bus Specification Rev. 2.1
PCI21.PDF
Last update: June 1st, 1995
http://www.pcisig.com

[3] JILI Specification
Jilim120.pdf
Last update: April 7th, 2003
http://www.jumptec.de/product/data/jili/index.html

[4] Serial ATA Specification
Serial ATA 1.0 gold.pdf
Last update: August 29th, 2002 Rev.1.0
http://www.sata-io.org/

[5] IEEE Std. 802.3-2002
802.3-2002.pdf
http://www.ieee.org

[6] Universal Bus Specification
usb_20.pdf
Last update: April 27th, 2000
http://www.usb.org

[7] Digital Video Interface DVI
dvi_10.pdf
Rev. 1.0 April 2nd, 1999
http://www.ddwg.org/

1.3 Introduction

COM Express™, is an open specification from the PICMG (PCI Industrial Computer Manufacturer Group). It is a module concept to bring PCI Express and other new technologies like SATA, USB 3.0 and different display interfaces onto a COM (Computer On Module).

A COM Express™ module is plugged onto an application-specific base board which provides the necessary I/O connectors and may also contain application-specific additional logic circuitry.

Typically a COM Express module consists of CPU, chipset, memory, video controller, Ethernet controller, BIOS Flash, SATA- and USB controller. More I/O controllers and all I/O connectors are implemented on the base board on to which the COM Express module can be plugged via one or two 220-pin SMD-connectors. Beside the power supply also signals for PCIe bus, displays, SATA, USB, LPC etc. are present on these connectors.

The type of interfaces that is led from the COM Express module to the base board depends on the type of module that is used. The COM Express specification defines seven different types which differ in number and pin assignment of the module connectors.

Thanks to the standardized mechanics and interfaces the system can be scaled arbitrarily. In spite of the modular concept the systems design is very flat and compact.

COM Express modules require a base-board for successful operation.

The base board described below acts as an evaluation board for COM Express modules with pin-out Type 6.

2 Technical Description

2.1 Key Features

The MSC C6-MB-EVA COM Express base board is designed as a type 6 carrier board.

Key features include:

- Interface for COM Express module type 6 up to basic form factor
- Dual 220 pin connector (440 pins)
- 1 PCIe x4 slot
- 4 PCIe x1 slots shared with 1 PCIe x4 slot and / or PCIe mini card
- PCIe x16 graphics slot (PEG)
- VGA interface
- LVDS interface (JILI30)
- 3 Digital Display Interfaces /shared with card slot
- 1 DVI connector
- 2 HDMI connectors / 2 DP connectors
- 1 eDP connector (40pin)
- 4 USB3.0 root hub interfaces
- 4 USB2.0 root hub interfaces
- 4 SATA channels up to 300MB/s
- mSATA shared with one standard SATA channel
- High definition digital audio codec ALC888 or pin header
- 6 audio jacks
- SPDIF on pin header
- GBit Ethernet interface
- Feature connector

- LPC header
- Pin header for GPIOs
- SuperIO W83627HG
- PS/2, 2x COM (SIO), LPT, IRDA, fan interfaces
- Power supply via ATX connector or +12V only
- POST display on LPC
- Serial EEPROM on I²C-Bus
- Serial EEPROM on SMBus
- On-board SPI Flash socket
- Beeper
- 2x COM (module)
- 3V battery

Note: Support for all above features will also depend on the COM Express module being used. Not all modules support the maximum number of interfaces.

2.2 Block diagram

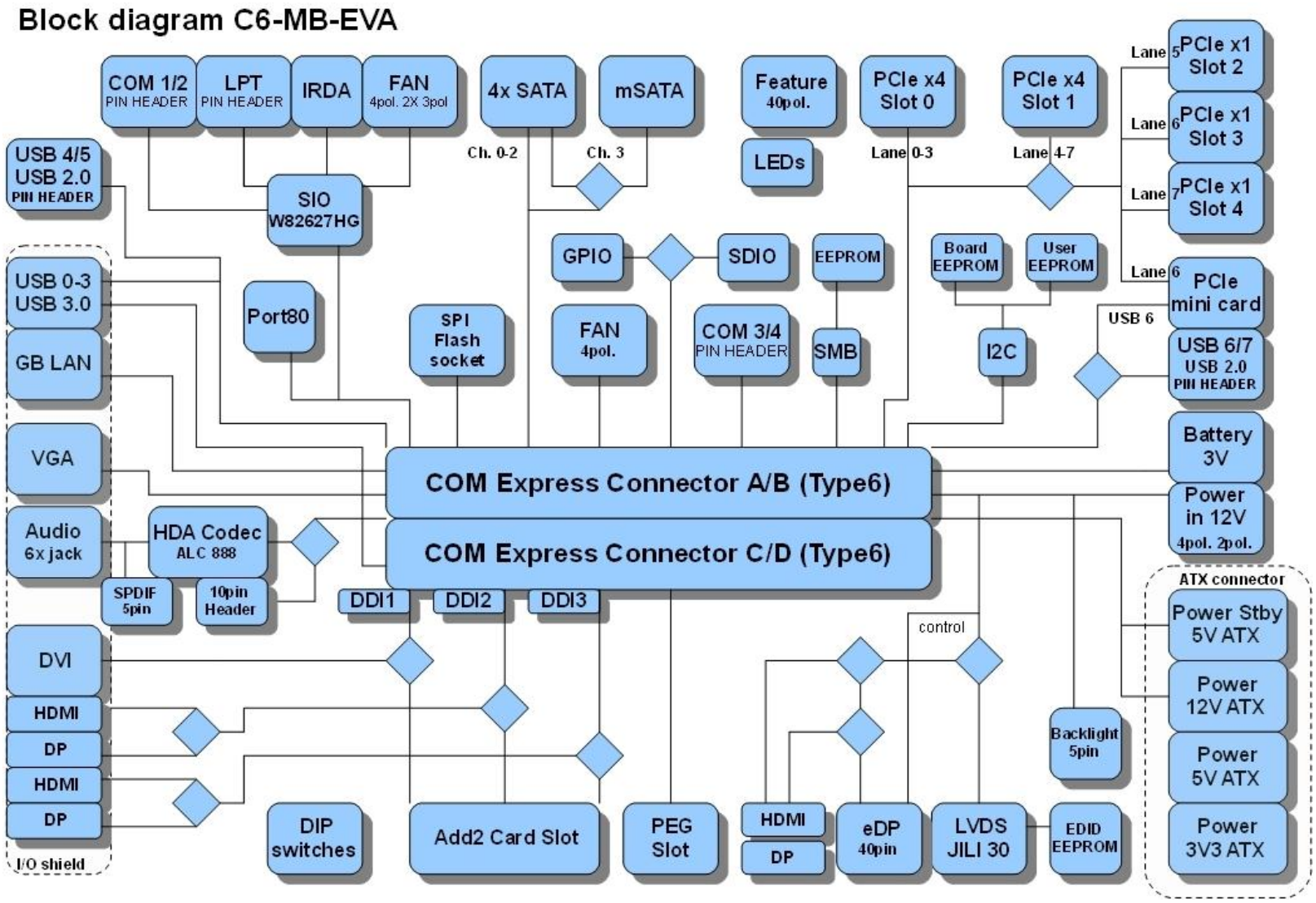


Illustration 1 Block Diagram

2.3 Positioning of the Connectors, Jumpers and Switches

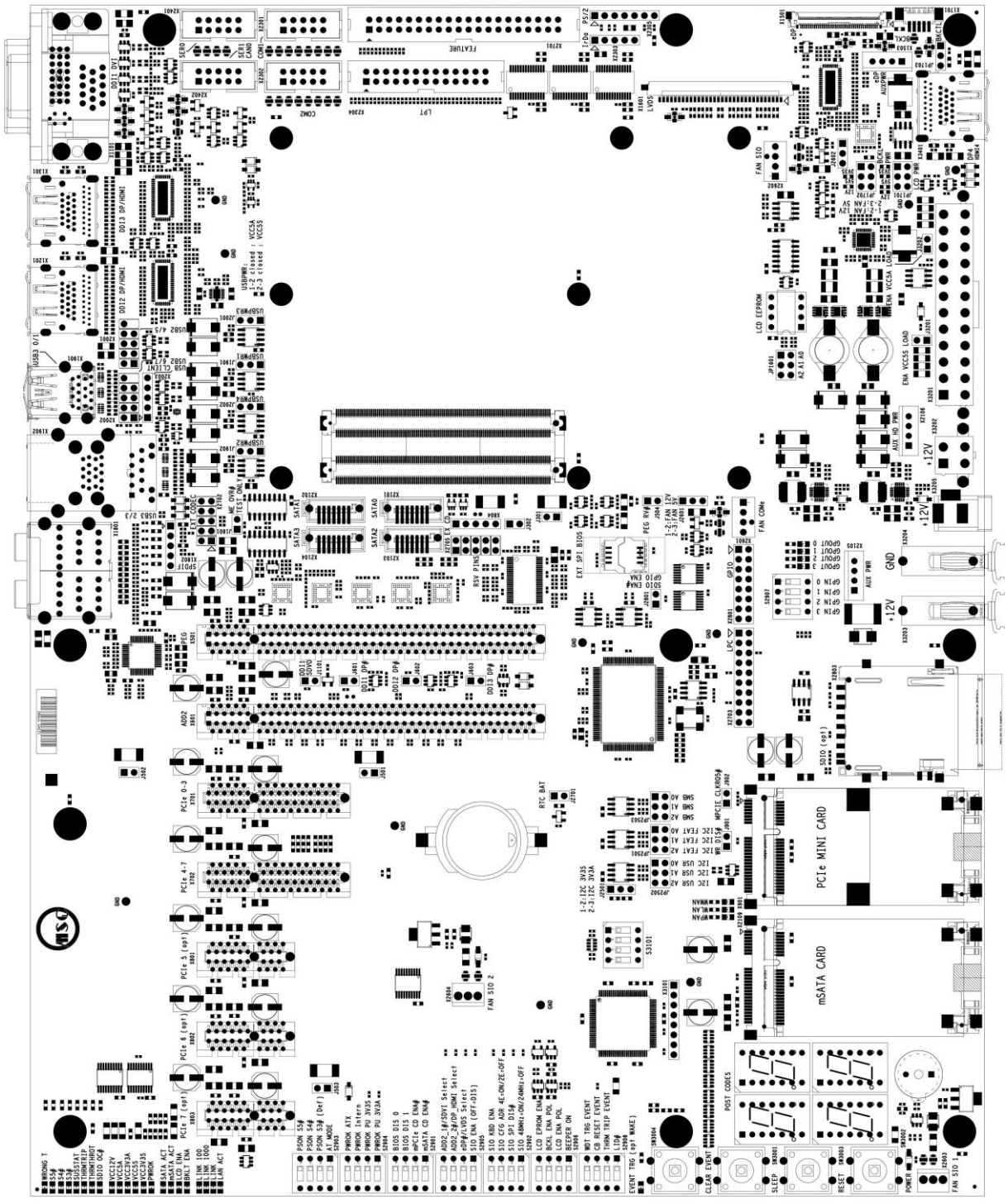


Illustration 2 Connectors overview

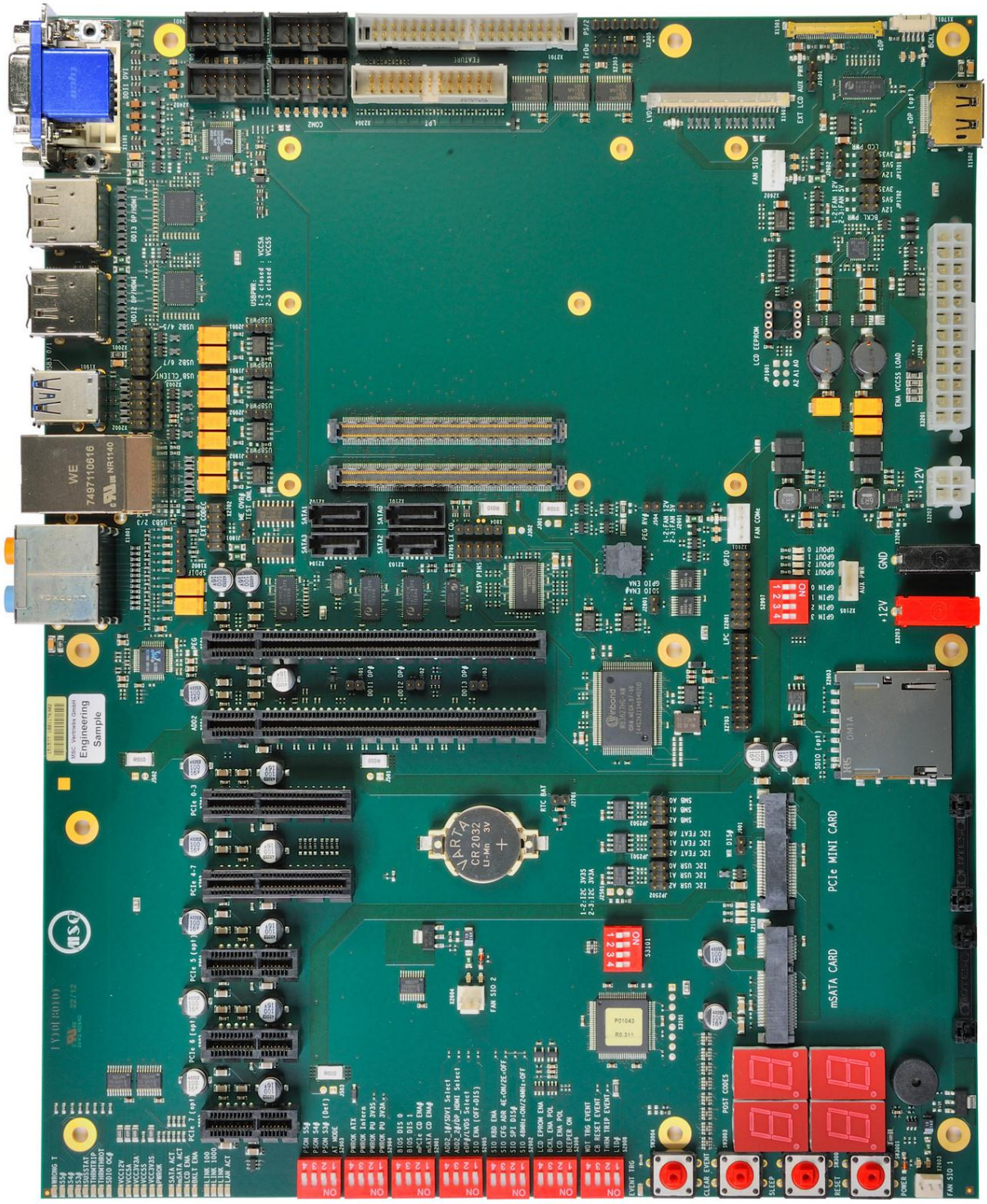
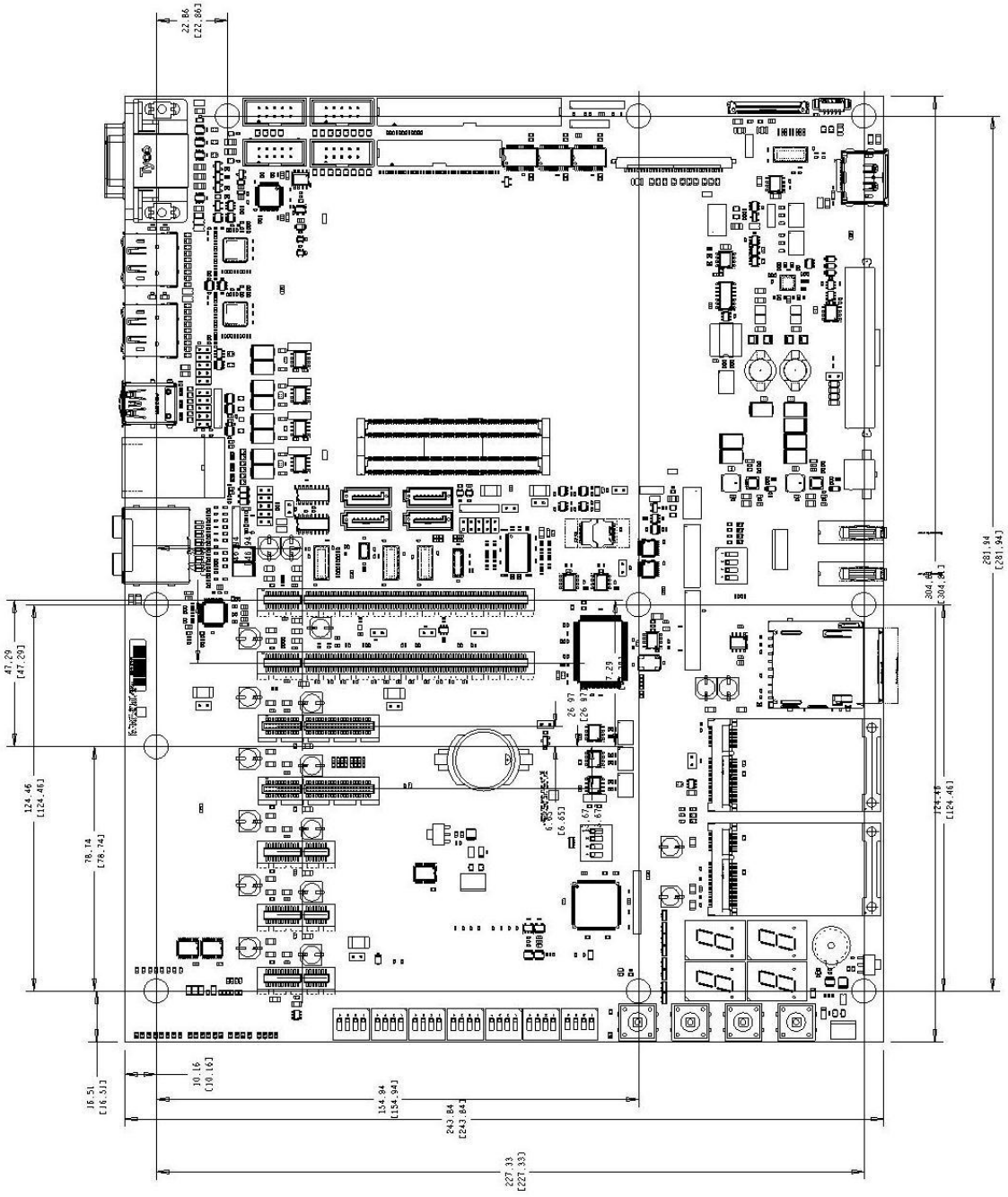


Illustration 3 Picture

3 Mechanics

3.1 Dimensions

Dimension:	243.8 mm x 304.8 mm
Width:	1.6 mm + /-10%
Tolerances of the drill holes:	+/- 0.1mm in X and Y
Tolerances of the diameter:	+ 0.1 mm



3.2 Assembly notes

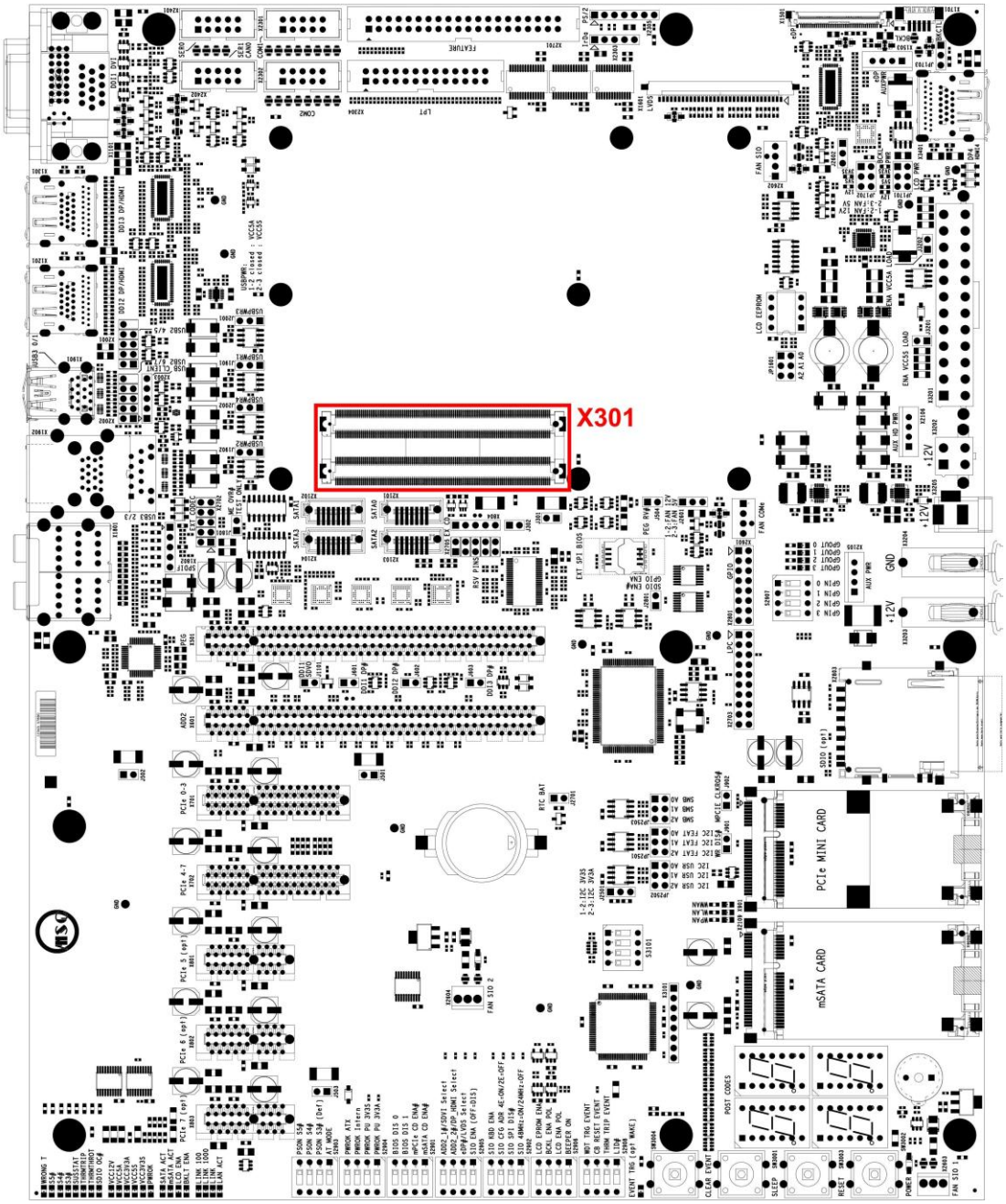
Use these bolts for mounting different form factors:

COM Express Mini:	4x M2.5 x 5mm bolt
COM Express Compact:	4x M2.5 x 5mm bolt
COM Express Basic:	5x M2.5 x 5mm bolt

4 Hardware

4.1 Plug-in Position of the COM Express module

Socket for a COM Express type 6 module is available on the base board.



Following form factors are supported:

- Mini Module
- Compact Module
- Basic Module

Specification:

- Reference: X301
- Connector:AMP / Tyco 3-1827233-6
  0.5 mm pitch free height 440 pin 5H plug (combination of two 220pin plugs)
- Pin-out: Refer to COM Express specification for type 6 module
  [1]

Row A		Row B	
A1	GND	B1	GND
A2	GBE0_MDI3-	B2	GBE0_ACT#
A3	GBE0_MDI3+	B3	LPC_FRAME#
A4	GBE0_LINK100#	B4	LPC_AD0
A5	GBE0_LINK1000#	B5	LPC_AD1
A6	GBE0_MDI2-	B6	LPC_AD2
A7	GBE0_MDI2+	B7	LPC_AD3
A8	GBE0_LINK#	B8	LPC_DRQ0#
A9	GBE0_MDI1-	B9	LPC_DRQ1#
A10	GBE0_MDI1+	B10	LPC_CLK
A11	GND	B11	GND
A12	GBE0_MDI0-	B12	PWRBTN#
A13	GBE0_MDI0+	B13	SMB_CK
A14	GBE0_CTREF	B14	SMB_DAT
A15	SUS_S3#	B15	SMB_ALERT#
A16	SATA0_TX+	B16	SATA1_TX+
A17	SATA0_TX-	B17	SATA1_TX-
A18	SUS_S4#	B18	SUS_STAT#
A19	SATA0_RX+	B19	SATA1_RX+
A20	SATA0_RX-	B20	SATA1_RX-
A21	GND	B21	GND
A22	SATA2_TX+	B22	SATA3_TX+
A23	SATA2_TX-	B23	SATA3_TX-
A24	SUS_S5#	B24	PWR_OK
A25	SATA2_RX+	B25	SATA3_RX+
A26	SATA2_RX-	B26	SATA3_RX-
A27	BATLOW#	B27	WDT
A28	ATA_ACT#	B28	AC/HDA_SDIN2
A29	AC/HDA_SYNC	B29	AC/HDA_SDIN1
A30	AC/HDA_RST#	B30	AC/HDA_SDIN0
A31	GND	B31	GND
A32	AC/HDA_BITCLK	B32	SPKR
A33	AC/HDA_SDOUT	B33	I2C_CK
A34	BIOS_DIS0#	B34	I2C_DAT
A35	THRMTRIP#	B35	THRM#
A36	USB6-	B36	USB7-
A37	USB6+	B37	USB7+
A38	USB_6_7_OC#	B38	USB_4_5_OC#
A39	USB4-	B39	USB5-
A40	USB4+	B40	USB5+
A41	GND	B41	GND
A42	USB2-	B42	USB3-
A43	USB2+	B43	USB3+
A44	USB_2_3_OC#	B44	USB_0_1_OC#
A45	USB0-	B45	USB1-
A46	USB0+	B46	USB1+
A47	VCC_RTC	B47	EXCD1_PERST#
A48	EXCD0_PERST#	B48	EXCD1_CPPE#
A49	EXCD0_CPPE#	B49	SYS_RESET#
A50	LPC_SERIRQ	B50	CB_RESET#
A51	GND	B51	GND
A52	PCIE_TX5+	B52	PCIE_RX5+
A53	PCIE_TX5-	B53	PCIE_RX5-
A54	GPI0	B54	GPO1
A55	PCIE_TX4+	B55	PCIE_RX4+

A56	PCIE_TX4-	B56	PCIE_RX4-
A57	GND	B57	GPO2
A58	PCIE_TX3+	B58	PCIE_RX3+
A59	PCIE_TX3-	B59	PCIE_RX3-
A60	GND	B60	GND
A61	PCIE_TX2+	B61	PCIE_RX2+
A62	PCIE_TX2-	B62	PCIE_RX2-
A63	GPI1	B63	GPO3
A64	PCIE_TX1+	B64	PCIE_RX1+
A65	PCIE_TX1-	B65	PCIE_RX1-
A66	GND	B66	WAKE0#
A67	GPI2	B67	WAKE1#
A68	PCIE_TX0+	B68	PCIE_RX0+
A69	PCIE_TX0-	B69	PCIE_RX0-
A70	GND	B70	GND
A71	LVDS_A0+	B71	LVDS_B0+
A72	LVDS_A0-	B72	LVDS_B0-
A73	LVDS_A1+	B73	LVDS_B1+
A74	LVDS_A1-	B74	LVDS_B1-
A75	LVDS_A2+	B75	LVDS_B2+
A76	LVDS_A2-	B76	LVDS_B2-
A77	LVDS_VDD_EN	B77	LVDS_B3+
A78	LVDS_A3+	B78	LVDS_B3-
A79	LVDS_A3-	B79	LVDS_BKLT_EN
A80	GND	B80	GND
A81	LVDS_A_CK+	B81	LVDS_B_CK+
A82	LVDS_A_CK-	B82	LVDS_B_CK-
A83	LVDS_I2C_CK	B83	LVDS_BKLT_CTRL
A84	LVDS_I2C_DAT	B84	VCC_5V_SBY
A85	GPI3	B85	VCC_5V_SBY
A86	RSVD	B86	VCC_5V_SBY
A87	eDP_HPD	B87	VCC_5V_SBY
A88	PCIE0_CK_REF+	B88	BIOS_DIS1#
A89	PCIE0_CK_REF-	B89	VGA_RED
A90	GND	B90	GND
A91	SPI_POWER	B91	VGA_GRN
A92	SPI_MISO	B92	VGA_BLU
A93	GPO0	B93	VGA_HSYNC
A94	SPI_CLK	B94	VGA_VSYNC
A95	SPI_MOSI	B95	VGA_I2C_CK
A96	TPM_PP	B96	VGA_I2C_DAT
A97	TYPE10#	B97	SPI_CS#
A98	SER0_TX	B98	RSVD
A99	SER0_RX	B99	RSVD
A100	GND	B100	GND
A101	SER1_TX	B101	FAN_PWNOUT
A102	SER1_RX	B102	FAN_TACHIN
A103	LID#	B103	SLEEP#
A104	VCC_12V	B104	VCC_12V
A105	VCC_12V	B105	VCC_12V
A106	VCC_12V	B106	VCC_12V
A107	VCC_12V	B107	VCC_12V
A108	VCC_12V	B108	VCC_12V
A109	VCC_12V	B109	VCC_12V
A110	GND	B110	GND

Table 1 COMExpress Connector Rows A and B

Row C		Row D	
C1	GND	D1	GND
C2	GND	D2	GND
C3	USB_SSRX0-	D3	USB_SSTX0-
C4	USB_SSRX0+	D4	USB_SSTX0+
C5	GND	D5	GND
C6	USB_SSRX1-	D6	USB_SSTX1-
C7	USB_SSRX1+	D7	USB_SSTX1+
C8	GND	D8	GND
C9	USB_SSRX2-	D9	USB_SSTX2-
C10	USB_SSRX2+	D10	USB_SSTX2+
C11	GND	D11	GND
C12	USB_SSRX3-	D12	USB_SSTX3-
C13	USB_SSRX3+	D13	USB_SSTX3+
C14	GND	D14	GND
C15	DDI1_PAIR6+	D15	DDI1_CTRLCLK_AUX+
C16	DDI1_PAIR6-	D16	DDI1_CTRLDATA_AUX-
C17	RSVD	D17	RSVD
C18	RSVD	D18	RSVD
C19	PCIE_RX6+	D19	PCIE_TX6+
C20	PCIE_RX6-	D20	PCIE_TX6-
C21	GND	D21	GND
C22	PCIE_RX7+	D22	PCIE_TX7+
C23	PCIE_RX7-	D23	PCIE_TX7-
C24	DDI1_HPD	D24	RSVD
C25	DDI1_PAIR4+	D25	RSVD
C26	DDI1_PAIR4-	D26	DDI1_PAIR0+
C27	RSVD	D27	DDI1_PAIR0-
C28	RSVD	D28	RSVD
C29	DDI1_PAIR5+	D29	DDI1_PAIR1+
C30	DDI1_PAIR5-	D30	DDI1_PAIR1-
C31	GND	D31	GND
C32	DDI2_CTRLCLK_AUX+	D32	DDI1_PAIR2+
C33	DDI2_CTRLDATA_AUX-	D33	DDI1_PAIR2-
C34	DDI2_DDC_AUX_SEL	D34	DDI1_DDC_AUX_SEL
C35	RSVD	D35	RSVD
C36	DDI3_CTRLCLK_AUX+	D36	DDI1_PAIR3+
C37	DDI3_CTRLDATA_AUX-	D37	DDI1_PAIR3-
C38	DDI3_DDC_AUX_SEL	D38	RSVD
C39	DDI3_PAIR0+	D39	DDI2_PAIR0+
C40	DDI3_PAIR0-	D40	DDI2_PAIR0-
C41	GND	D41	GND
C42	DDI3_PAIR1+	D42	DDI3_PAIR1+
C43	DDI3_PAIR1-	D43	DDI3_PAIR1-
C44	DDI3_HPD	D44	DDI2_HPD
C45	RSVD	D45	RSVD
C46	DDI3_PAIR2+	D46	DDI3_PAIR2+
C47	DDI3_PAIR2-	D47	DDI3_PAIR2-
C48	RSVD	D48	RSVD
C49	DDI3_PAIR3+	D49	DDI3_PAIR3+
C50	DDI3_PAIR3-	D50	DDI3_PAIR3-
C51	GND	D51	GND
C52	PEG_RX0+	D52	PEG_TX0+
C53	PEG_RX0-	D53	PEG_TX0-
C54	TYPE0#	D54	PEG_LANE_RV#
C55	PEG_RX1+	D55	PEG_TX1+

C56	PEG_RX1-	D56	PEG_TX1-
C57	TYPE1#	D57	TYPE2#
C58	PEG_RX2+	D58	PEG_TX2+
C59	PEG_RX2-	D59	PEG_TX2-
C60	GND	D60	GND
C61	PEG_RX3+	D61	PEG_TX3+
C62	PEG_RX3-	D62	PEG_TX3-
C63	RSVD	D63	RSVD
C64	RSVD	D64	RSVD
C65	PEG_RX4+	D65	PEG_TX4+
C66	PEG_RX4-	D66	PEG_TX4-
C67	RSVD	D67	GND
C68	PEG_RX5+	D68	PEG_TX5+
C69	PEG_RX5-	D69	PEG_TX5-
C70	GND	D70	GND
C71	PEG_RX6+	D71	PEG_TX6+
C72	PEG_RX6-	D72	PEG_TX6-
C73	GND	D73	GND
C74	PEG_RX7+	D74	PEG_TX7+
C75	PEG_RX7-	D75	PEG_TX7-
C76	GND	D76	GND
C77	RSVD	D77	RSVD
C78	PEG_RX8+	D78	PEG_TX8+
C79	PEG_RX8-	D79	PEG_TX8-
C80	GND	D80	GND
C81	PEG_RX9+	D81	PEG_TX9+
C82	PEG_RX9-	D82	PEG_TX9-
C83	RSVD	D83	RSVD
C84	GND	D84	GND
C85	PEG_RX10+	D85	PEG_TX10+
C86	PEG_RX10-	D86	PEG_TX10-
C87	GND	D87	GND
C88	PEG_RX11+	D88	PEG_TX11+
C89	PEG_RX11-	D89	PEG_TX11-
C90	GND	D90	GND
C91	PEG_RX12+	D91	PEG_TX12+
C92	PEG_RX12-	D92	PEG_TX12-
C93	GND	D93	GND
C94	PEG_RX13+	D94	PEG_TX13+
C95	PEG_RX13-	D95	PEG_TX13-
C96	GND	D96	GND
C97	RSVD	D97	PEG_ENABLE#
C98	PEG_RX14+	D98	PEG_TX14+
C99	PEG_RX14-	D99	PEG_TX14-
C100	GND	D100	GND
C101	PEG_RX15+	D101	PEG_TX15+
C102	PEG_RX15-	D102	PEG_TX15-
C103	GND	D103	GND
C104	VCC_12V	D104	VCC_12V
C105	VCC_12V	D105	VCC_12V
C106	VCC_12V	D106	VCC_12V
C107	VCC_12V	D107	VCC_12V
C108	VCC_12V	D108	VCC_12V
C109	VCC_12V	D109	VCC_12V
C110	GND	D110	GND

Table 2 COMExpress Connector Rows C and D

4.2 PCI Express Lanes

8 PCIe lanes are defined at the COM Express module.

Some lanes can be routed to various connectors.

Note: The number of PCIe lanes available will depend on the COM Express module used – not all modules can support 8 PCIe lanes.

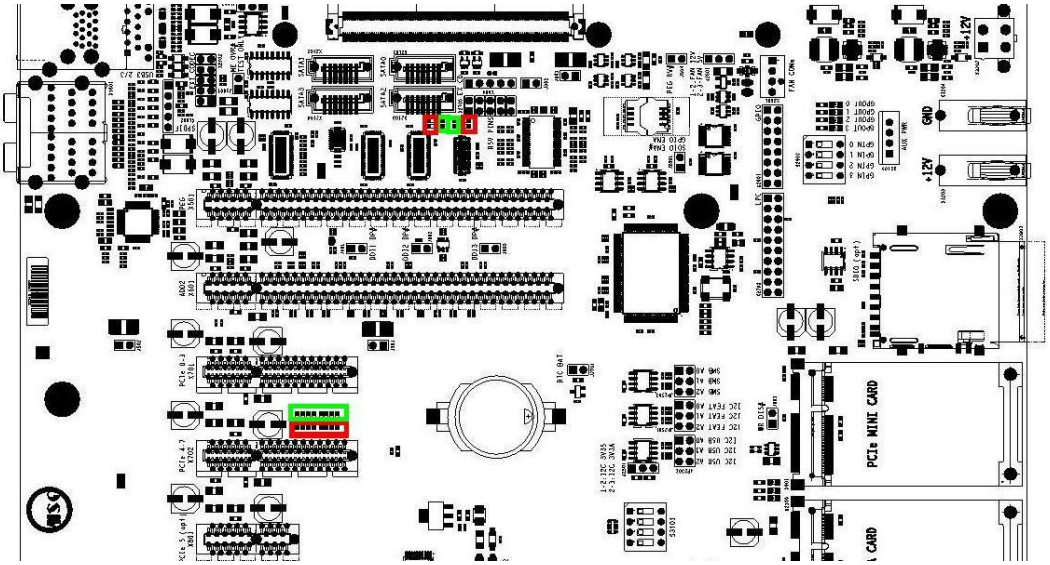
PCIe Lane	References default	References Change via resistors	References Change via switch
PCIe Lane 0	X701 Slot 0		
PCIe Lane 1	X701 Slot 0		
PCIe Lane 2	X701 Slot 0		
PCIe Lane 3	X701 Slot 0		
PCIe Lane 4	X702 Slot 1		
PCIe Lane 5	X801 Slot 2	X702 Slot 1	
PCIe Lane 6	X802 Slot 3	X702 Slot 1	X901 Mini PCIe
PCIe Lane 7	X803 Slot 4	X702 Slot 1	

Table 3 Assignment PCIe Lane to connector reference

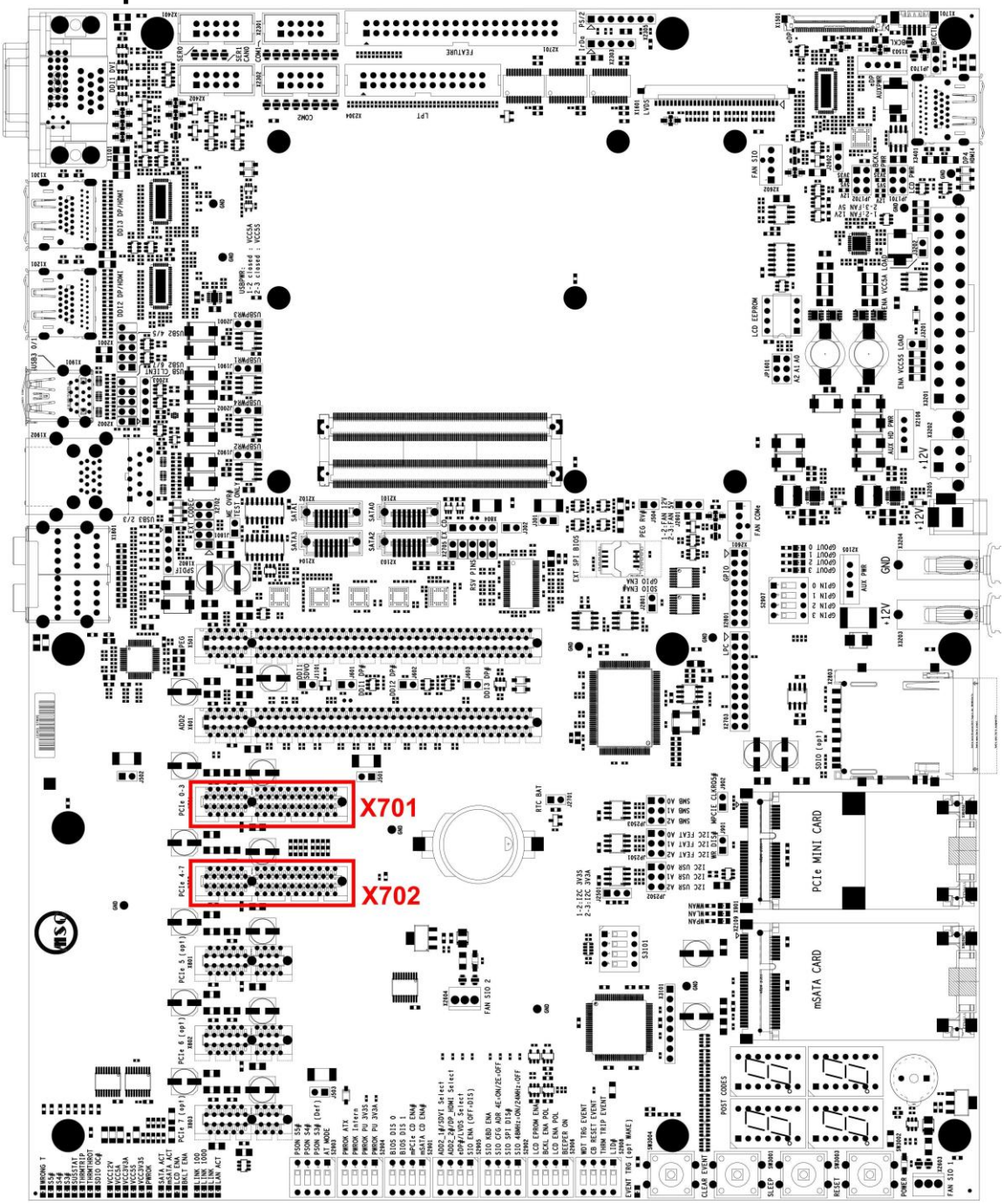
To change PCIe lanes from Slot 1 to Slots 2/3/4 remove resistors and replace them at:

PCIe Lane	Remove (red)	place at (green)	Mini PCIe
PCIe Lane 5	RJ713, RJ714, RJ715, RJ716	RJ701, RJ702, RJ707, RJ708	
PCIe Lane 6	RJ717, RJ718, RJ719, RJ720	RJ703, RJ704, RJ709, RJ710	Don't move resistors. When plugging the device, lane 6 switches automatic.
PCIe Lane 7	RJ721, RJ722, RJ723, RJ724	RJ705, RJ706, RJ711, RJ712	

Table 4 PCIe Lane configuration



4.3 PCI Express x4 Slots



Specification:

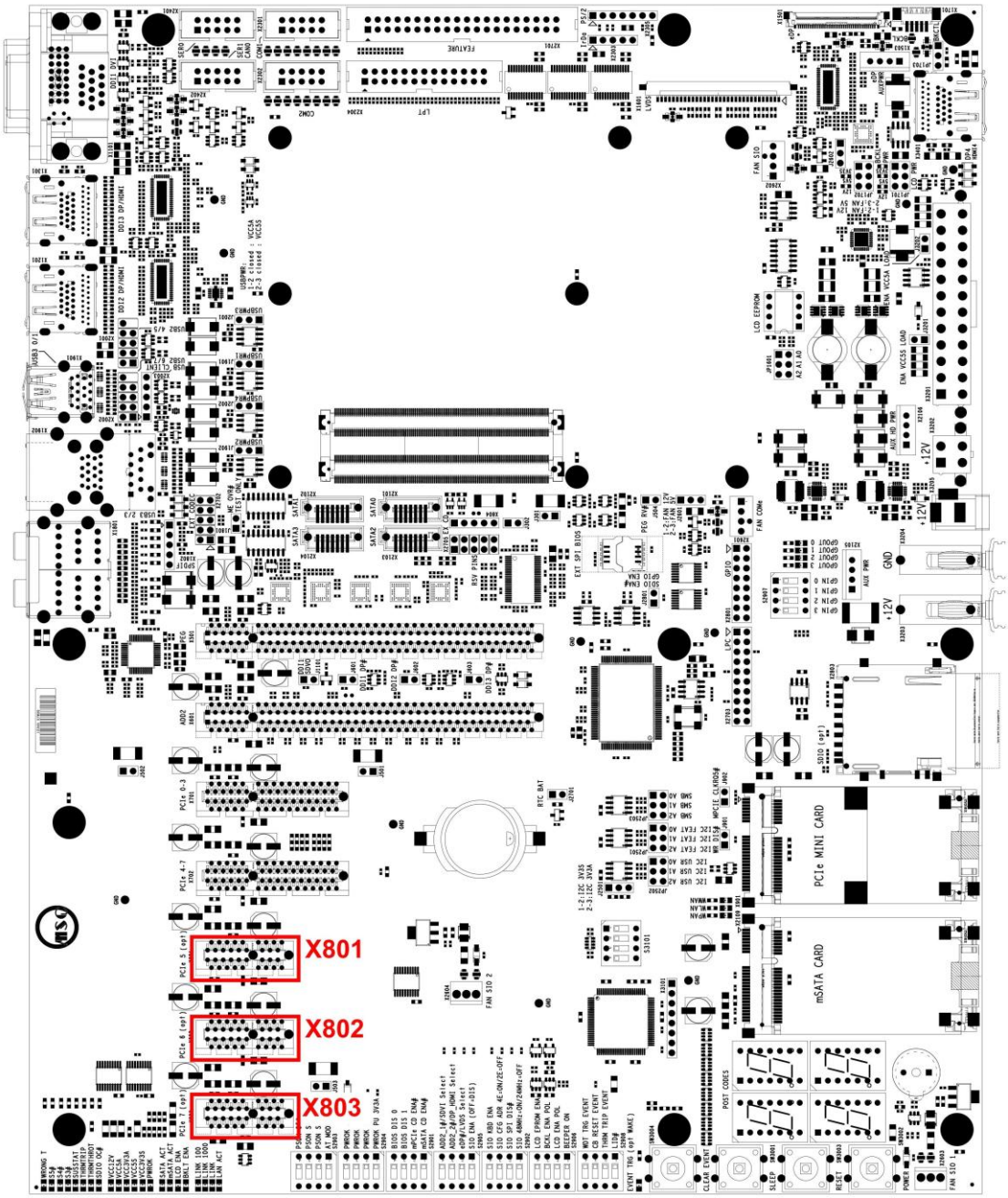
- References: X701, X702
- Connector:FCI 10018784
- Pin-out: Refer to PCI express specification
- PCIe slots are not hot-plug capable

Pin	Signal	Pin	Signal
A1	PRSNT1#	B1	12V
A2	12V	B2	12V
A3	12V	B3	12V
A4	GND	B4	GND
A5	JTAG_TCK	B5	SMB_CLK
A6	JTAG_TDI	B6	SMB_DAT
A7	JTAG_TDO	B7	GND

A8	JTAG_TMS	B8	3V3
A9	3V3	B9	JTAG_RST#
A10	3V3	B10	3V3_AUX
A11	PE_RST#	B11	WAKE#
KEY			
A12	GND	B12	RSVD
A13	REFCLK+	B13	GND
A14	REFCLK-	B14	PET_p0
A15	GND	B15	PET_n0
A16	PER_p0	B16	GND
A17	PER_n0	B17	PRSNT2#
A18	GND	B18	GND
A19	RSVD	B19	PET_p1
A20	GND	B20	PET_n1
A21	PER_p1	B21	GND
A22	PER_n1	B22	PRSNT2#
A23	GND	B23	PET_p2
A24	GND	B24	PET_n2
A25	PER_p2	B25	GND
A26	PER_n2	B26	GND
A27	GND	B27	PET_p3
A28	GND	B28	PET_n3
A29	PER_p3	B29	GND
A30	PER_n3	B30	RSVD
A31	GND	B31	PRSNT2#
A32	RSVD	B32	GND

Table 5 Pin out PCI Express

4.4 PCI Express x1 Slots



Specification:

- References: X801 – X803
- Connector:AMP / Tyco 4-1612163-1
- Pin-out: Refer to PCI express specification
- PCIe slots are not hot-plug capable

Pin	Signal	Pin	Signal
A1	PRSNT1#	B1	12V
A2	12V	B2	12V
A3	12V	B3	12V
A4	GND	B4	GND
A5	JTAG_TCK	B5	SMB_CLK
A6	JTAG_TDI	B6	SMB_DAT
A7	JTAG_TDO	B7	GND
A8	JTAG_TMS	B8	3V3
A9	3V3	B9	JTAG_RST#
A10	3V3	B10	3V3_AUX

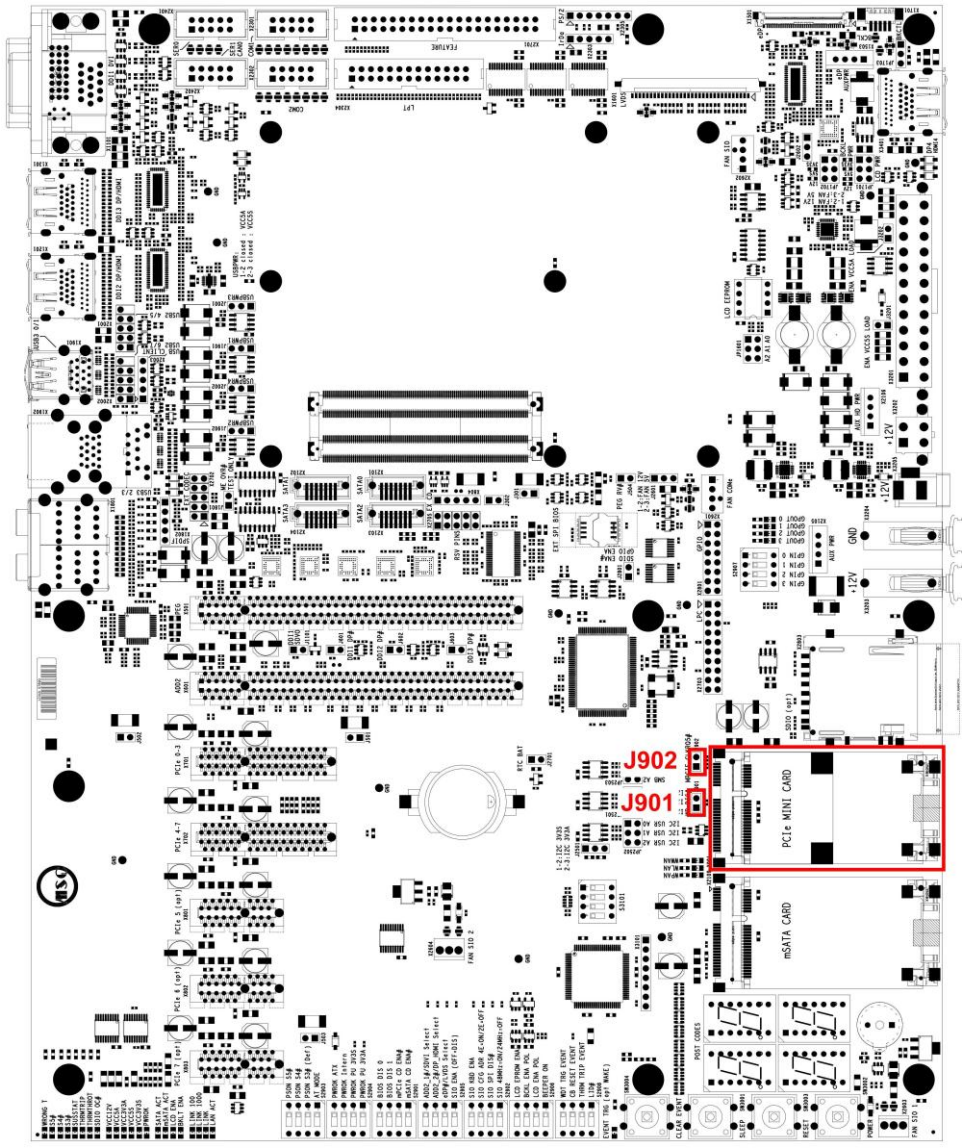
A11	PE_RST#	B11	WAKE#
KEY			
A12	GND	B12	RSVD
A13	REFCLK+	B13	GND
A14	REFCLK-	B14	PET_p0
A15	GND	B15	PET_n0
A16	PER_p0	B16	GND
A17	PER_n0	B17	PRSNT2#
A18	GND	B18	GND

Table 6 Pin out PCI Express

4.5 PCI Express Mini Card

PCIe Lane 6 and the signals from USB port 6 switch automatic to this slot if a card is plugged. It can be selected with DIP switch 2 at S2901. If the Mini Card slot is selected, PCIe-Slot 3 and USB port 6 at X2002 are no longer useable. With the W_DISABLE# jumper J901 the card slot can be set write protected. If the assembled Mini Card do not support CLKREQ# signal, the jumper J902 enables the PCIe-clock signal at the Mini Card slot.

Note: At rev. 3 carrier (LY30E801) the USB port 6 signals are not routed to X901. They are still useable at X2002.

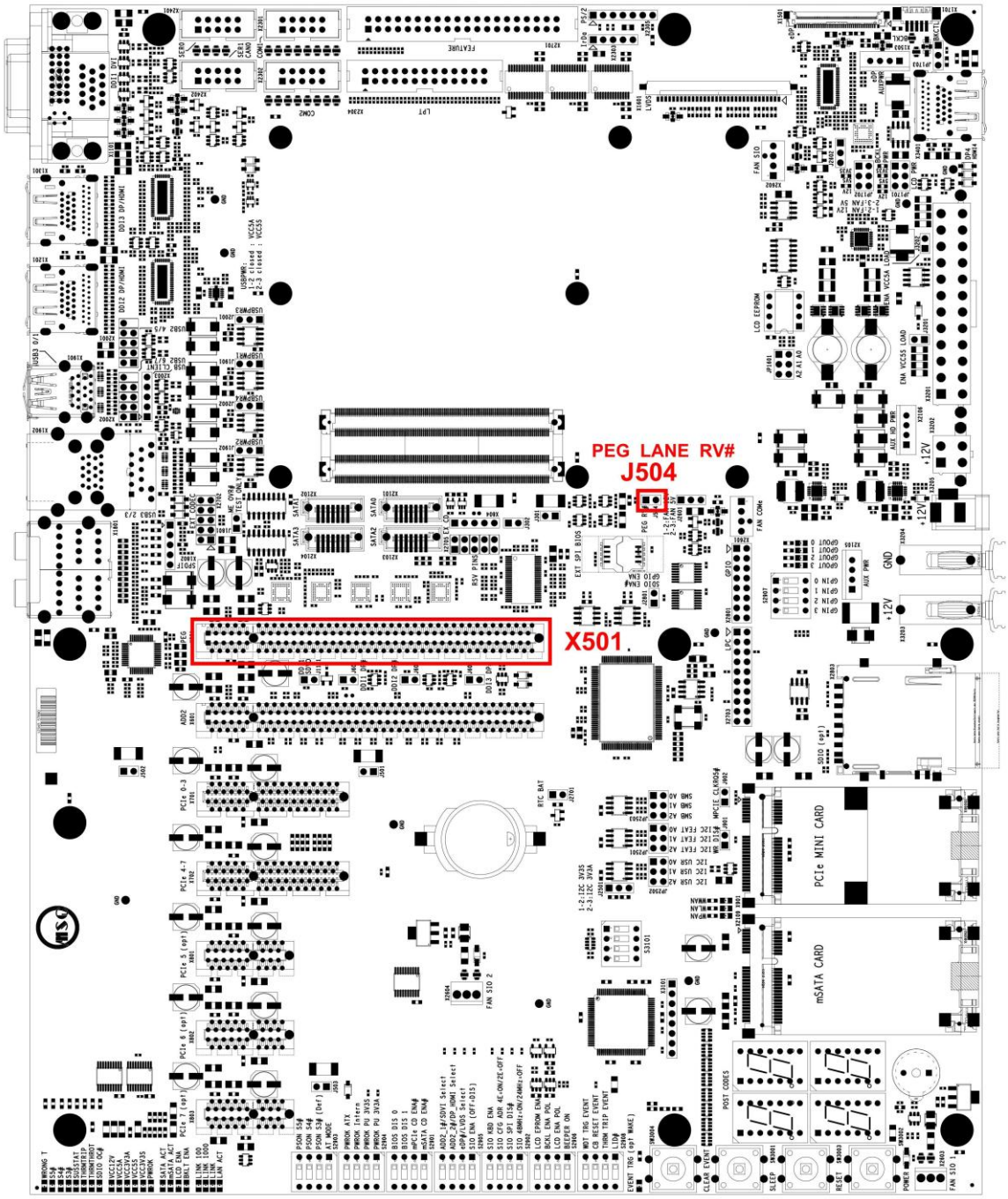


Specification:

- References: X901
- Connector: Molex 67910-9000
- Pin-out: Refer to PCIe Mini Card Specification

4.6 PCI Express x16 Graphics Slot

A PCIe x16 graphics slot is provided for insertion of PEG graphics cards.



Specification:

- References: X501
- Connector:AMP / Tyco 4-1612163-4
- Pin-out: Refer to PCI express specification

Pin D54 can be set to ground with PEG_LANE_RV# jumper J504.

Pin	Signal	Pin	Signal
A1	PRSNT1#	B1	12V
A2	12V	B2	12V
A3	12V	B3	12V
A4	GND	B4	GND
A5	JTAG_TCK	B5	SMB_CLK
A6	JTAG_TDI	B6	SMB_DAT
A7	JTAG_TDO	B7	GND

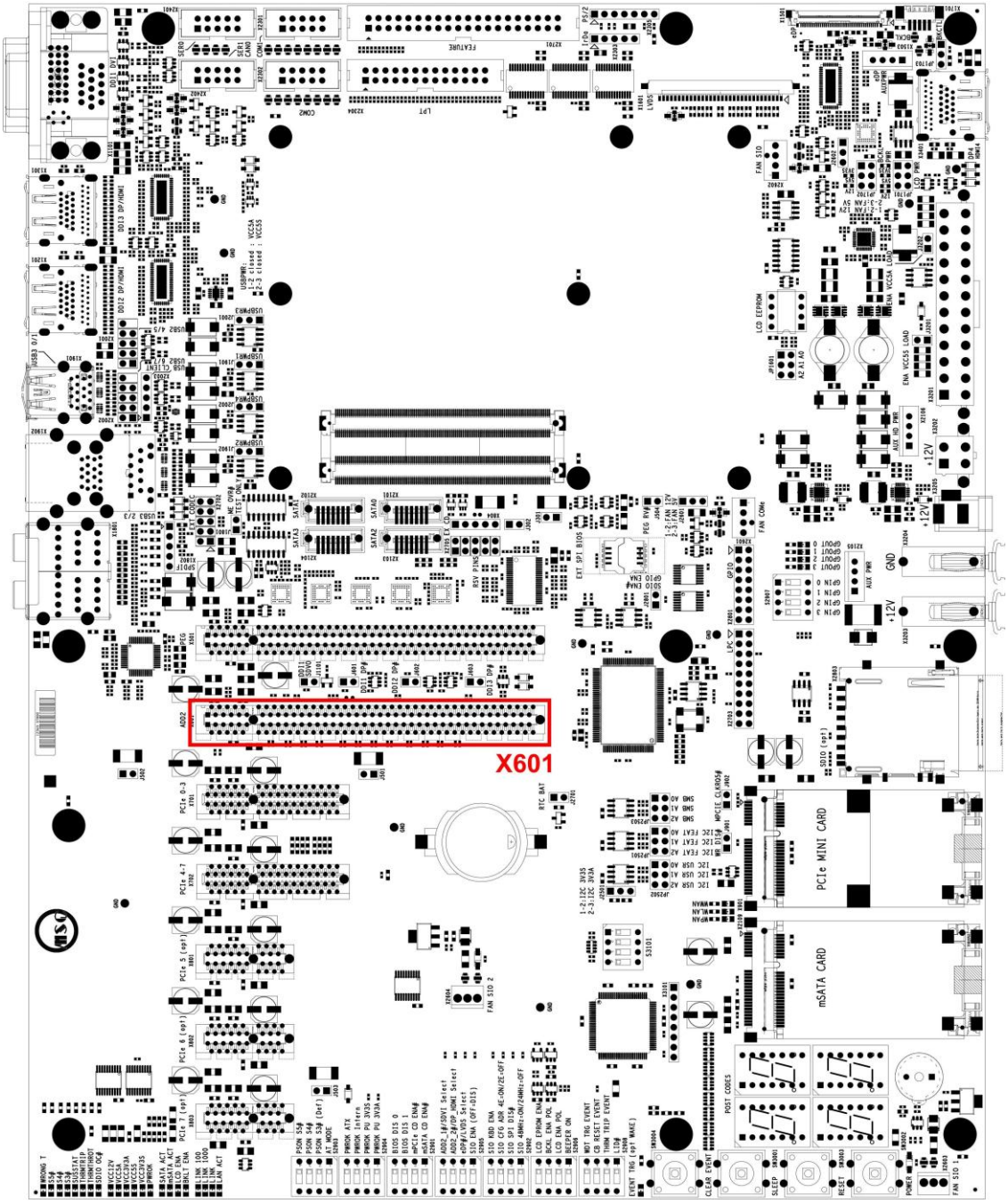
A8	JTAG_TMS	B8	3V3
A9	3V3	B9	JTAG_RST#
A10	3V3	B10	3V3_AUX
A11	PE_RST#	B11	WAKE#
KEY			
A12	GND	B12	RSVD
A13	REFCLK+	B13	GND
A14	REFCLK-	B14	PET_p0
A15	GND	B15	PET_n0
A16	PER_p0	B16	GND
A17	PER_n0	B17	PRSNT2#
A18	GND	B18	GND
A19	RSVD	B19	PET_p1
A20	GND	B20	PET_n1
A21	PER_p1	B21	GND
A22	PER_n1	B22	GND
A23	GND	B23	PET_p2
A24	GND	B24	PET_n2
A25	PER_p2	B25	GND
A26	PER_n2	B26	GND
A27	GND	B27	PET_p3
A28	GND	B28	PET_n3
A29	PER_p3	B29	GND
A30	PER_n3	B30	RSVD
A31	GND	B31	PRSNT2#
A32	RSVD	B32	GND
A33	RSVD	B33	PET_p4
A34	GND	B34	PET_n4
A35	PER_p4	B35	GND
A36	PER_n4	B36	GND
A37	GND	B37	PET_p5
A38	GND	B38	PET_n5
A39	PER_p5	B39	GND
A40	PER_n5	B40	GND
A41	GND	B41	PET_p6
A42	GND	B42	PET_n6
A43	PER_p6	B43	GND
A44	PER_n6	B44	GND
A45	GND	B45	PET_p7
A46	GND	B46	PET_n7
A47	PER_p7	B47	GND
A48	PER_n7	B48	PRSNT2#
A49	GND	B49	GND
A50	RSVD	B50	PET_p8
A51	GND	B51	PET_n8
A52	PER_p8	B52	GND
A53	PER_n8	B53	GND
A54	GND	B54	PET_p9
A55	GND	B55	PET_n9
A56	PER_p9	B56	GND
A57	PER_n9	B57	GND
A58	GND	B58	PET_p10
A59	GND	B59	PET_n10
A60	PER_p10	B60	GND
A61	PER_n10	B61	GND
A62	GND	B62	PET_p11

A63	GND	B63	PET_n11
A64	PER_p11	B64	GND
A65	PER_n11	B65	GND
A66	GND	B66	PET_p12
A67	GND	B67	PET_n12
A68	PER_p12	B68	GND
A69	PER_n12	B69	GND
A70	GND	B70	PET_p13
A71	GND	B71	PET_n13
A72	PER_p13	B72	GND
A73	PER_n13	B73	GND
A74	GND	B74	PET_p14
A75	GND	B75	PET_n14
A76	PER_p14	B76	GND
A77	PER_n14	B77	GND
A78	GND	B78	PET_p15
A79	GND	B79	PET_n15
A80	PER_p15	B80	GND
A81	PER_n15	B81	PRSNT2# (PEG_ENABLE#, D97 at X301)
A82	GND	B82	RSVD

Table 7 Pin out PCI Express x16 Graphics Slot

4.7 ADD2 Card Slot

The digital display interfaces can be switched to the ADD2-N (Advanced Digital Display - Normal) card slot. Refer to chapter 4.42.



Specification:

- References: X601
- Connector:AMP / Tyco 4-1612163-4
- Pin-out: Refer to PCI express specification

Pin	Signal	Pin	Signal
A1	PRSNT1#	B1	12V
A2	12V	B2	12V
A3	12V	B3	12V
A4	GND	B4	GND

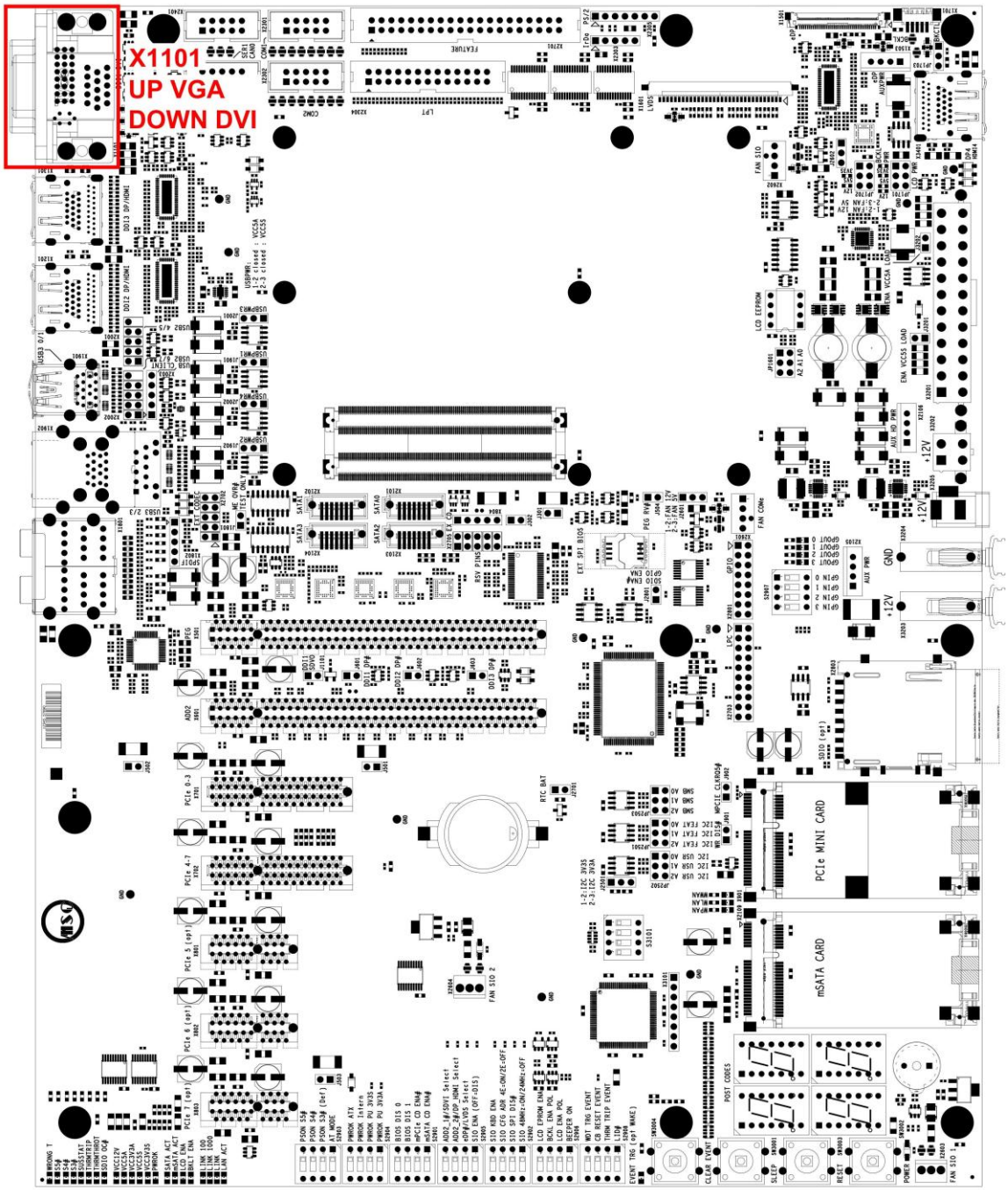
A5	JTAG_TCK	B5	SMB_CLK
A6	JTAG_TDI	B6	SMB_DAT
A7	JTAG_TDO	B7	GND
A8	JTAG_TMS	B8	3V3
A9	3V3	B9	JTAG_RST#
A10	3V3	B10	3V3_AUX
A11	PE_RST#	B11	WAKE#
KEY			
A12	GND	B12	RSVD
A13	REFCLK+ / n.c.	B13	GND
A14	REFCLK- / n.c.	B14	PET_p0 / DDI1 LANE0+
A15	GND	B15	PET_n0 / DDI1 LANE0-
A16	PER_p0 / DDI1 LANE 5+	B16	GND
A17	PER_n0 / DDI1 LANE 5-	B17	PRSNT2# / DDI1 AUX SW+
A18	GND	B18	GND
A19	RSVD	B19	PET_p1 / DDI1 LANE1+
A20	GND	B20	PET_n1 / DDI1 LANE1-
A21	PER_p1 / DDI1 LANE4+	B21	GND
A22	PER_n1 / DDI1 LANE 4-	B22	GND
A23	GND	B23	PET_p2 / DDI1 LANE2+
A24	GND	B24	PET_n2 / DDI1 LANE2-
A25	PER_p2 / DDI1 AUX+	B25	GND
A26	PER_n2 / DDI1 AUX-	B26	GND
A27	GND	B27	PET_p3 / DDI1 LANE3+
A28	GND	B28	PET_n3 / DDI1 LANE3-
A29	PER_p3 / DDI1 HPD	B29	GND
A30	PER_n3 / DDI1 AUX SEL	B30	RSVD
A31	GND	B31	PRSNT2# / DDI1 SW-
A32	RSVD	B32	GND
A33	RSVD	B33	PET_p4 / DDI2 LANE0+
A34	GND	B34	PET_n4 / DDI2 LANE0-
A35	PER_p4 / n.c.	B35	GND
A36	PER_n4 / n.c.	B36	GND
A37	GND	B37	PET_p5 / DDI2 LANE1+
A38	GND	B38	PET_n5 / DDI2 LANE1-
A39	PER_p5 / n.c.	B39	GND
A40	PER_n5 / n.c.	B40	GND
A41	GND	B41	PET_p6 / DDI2 LANE2+
A42	GND	B42	PET_n6 / DDI2 LANE2-
A43	PER_p6 / DDI2 AUX+	B43	GND
A44	PER_n6 / DDI2 AUX-	B44	GND
A45	GND	B45	PET_p7 / DDI2 LANE3+
A46	GND	B46	PET_n7 / DDI2 LANE3-
A47	PER_p7 / DDI2 HPD	B47	GND
A48	PER_n7 / DDI2 AUX SEL	B48	PRSNT2#
A49	GND	B49	GND
A50	RSVD	B50	PET_p8 / DDI3 LANE0+
A51	GND	B51	PET_n8 / DDI3 LANE0-
A52	PER_p8 / n.c.	B52	GND
A53	PER_n8 / n.c.	B53	GND
A54	GND	B54	PET_p9 / DDI3 LANE1+
A55	GND	B55	PET_n9 / DDI3 LANE1-
A56	PER_p9 / n.c.	B56	GND
A57	PER_n9 / n.c.	B57	GND
A58	GND	B58	PET_p10 / DDI3 LANE2+
A59	GND	B59	PET_n10 / DDI3 LANE2-

A60	PER_p10 / DDI3 AUX+	B60	GND
A61	PER_n10 / DDI3 AUX-	B61	GND
A62	GND	B62	PET_p11 / DDI3 LANE3+
A63	GND	B63	PET_n11 / DDI3 LANE3-
A64	PER_p11 / DDI3 HPD	B64	GND
A65	PER_n11 / DDI3 AUX SEL	B65	GND
A66	GND	B66	PET_p12 / n.c.
A67	GND	B67	PET_n12 / n.c.
A68	PER_p12 / n.c.	B68	GND
A69	PER_n12 / n.c.	B69	GND
A70	GND	B70	PET_p13 / n.c.
A71	GND	B71	PET_n13 / n.c.
A72	PER_p13 / n.c.	B72	GND
A73	PER_n13 / n.c.	B73	GND
A74	GND	B74	PET_p14 / n.c.
A75	GND	B75	PET_n14 / n.c.
A76	PER_p14 / n.c.	B76	GND
A77	PER_n14 / n.c.	B77	GND
A78	GND	B78	PET_p15 / n.c.
A79	GND	B79	PET_n15 / n.c.
A80	PER_p15 / n.c.	B80	GND
A81	PER_n15 / n.c.	B81	PRSNT2# / n.c.
A82	GND	B82	RSVD

Table 8 Pin out ADD2 Card Slot

4.8 VGA Interface

An analog display can be connected via a VGA (VESA DDC) interface.



Specification:

- References: X1101
- Pin-out: Refer to Table 8

Pin	Signal name	Function
1	RED	Signal red
2	GREEN	Signal green
3	BLUE	Signal blue
4	RSVD	reserved
5	GND	Ground digital
6	RGND	Ground red
7	GGND	Ground green

8	BGND	Ground blue
9	+5V	+5V VDC
10	SGND	Ground Synchronisation
11	ID0	Monitor ID Bit 0 (optional)
12	SDA	DDC Data
13	HSYNC	Horizontal Sync.
14	VSYNC	Vertical Sync.
15	SCL	DDC Clock

Table 9 Pin-out VGA Interface

4.9 DVI-D Interface

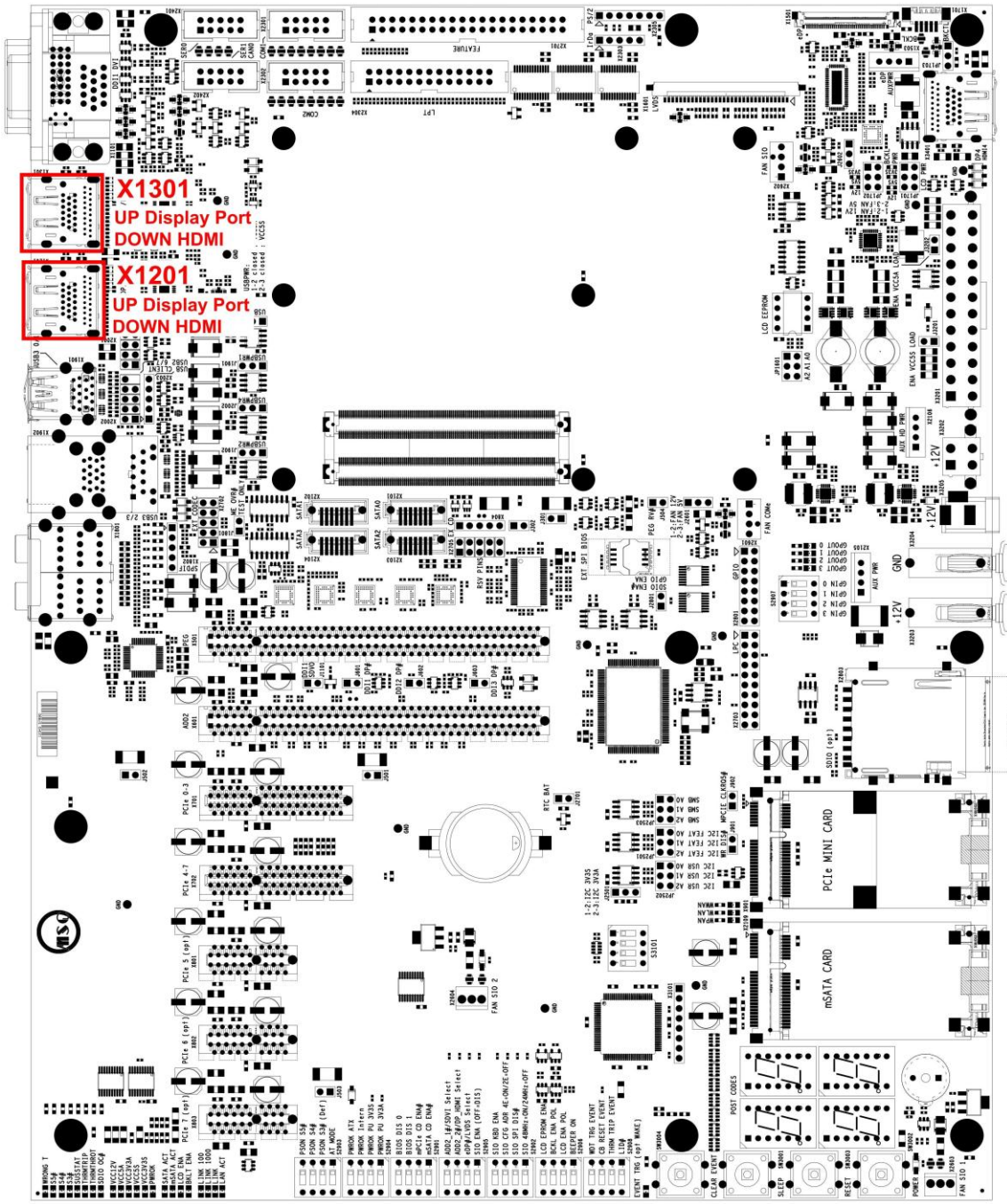
Specification:

- References: X1101
- Pin-out: Refer to Table 9
- Location: Refer to chapter 4.8 VGA Interface

Pin	Signal name	Function
1	TMDS D2-	T.M.D.S. Data channel 2-
2	TMDS D2+	T.M.D.S. Data channel 2+
3	SHIELD 2/4	Shield connected to Ground
4	TMDS D4- n.c.	reserved
5	TMDS D4+ n.c.	reserved
6	DDC CLK	DDC Clock
7	DDC DATA	DDC Data
8	VSYNC n.c.	Analog Vertical Sync.
9	TMDS D1-	T.M.D.S. Data channel 1-
10	TMDS D1+	T.M.D.S. Data channel 1+
11	SHIELD 1/3	Shield connected to Ground
12	TMDS D3- n.c.	reserved
13	TMDS D3+ n.c.	reserved
14	+5V	+5V VDC
15	GND	Ground
16	HPDET	Hot Plug Detect
17	TMDS D0-	T.M.D.S. Data channel 0-
18	TMDS D0+	T.M.D.S. Data channel 0+
19	SHIELD 0/5	Shield connected to Ground
20	TMDS D5- n.c.	reserved
21	TMDS D5+ n.c.	reserved
22	CLK SHIELD	Clock Shield connected to Ground
23	TMDS CLK+	T.M.D.S. Clock channel -
24	TMDS CLK-	T.M.D.S. Clock channel +
C1	RED n.c.	Analog RED
C2	GREEN n.c.	Analog GREEN
C3	BLUE n.c.	Analog BLUE
C4	HSYNC n.c.	Analog Horizontal Sync.
C5	GND	Analog Ground

Table 10 Pin-out DVI-D Interface

4.10 High Definition Multimedia Interface (HDMI)



Specification:

- References: X1201, X1301, X3401
- Pin-out: Refer to Table 11

Pin	Signal name	Function
1	TMDS D2+	T.M.D.S. Data channel 2+
2	SHIELD 2	Shield connected to Ground
3	TMDS D2-	T.M.D.S. Data channel 2-
4	TMDS D1+	T.M.D.S. Data channel 1+
5	SHIELD 1	Shield connected to Ground
6	TMDS D1-	T.M.D.S. Data channel 1-
7	TMDS D0+	T.M.D.S. Data channel 0+
8	SHIELD 0	Shield connected to Ground

9	TMDS D0-	T.M.D.S. Data channel 0-
10	TMDS CLK+	T.M.D.S. Clock channel +
11	CLK SHIELD	Clock Shield connected to Ground
12	TMDS CLK-	T.M.D.S. Clock channel -
13	CEC	n.c. (consumer electronics control)
14	reserved	n.c.
15	DDC CLK	DDC Clock
16	DDC DATA	DDC Data
17	GND	Ground
18	+5V	+5V VDC
19	HPDET	Hot Plug Detect

Table 11 Pin-out HDMI

4.11 Display Port (DP)

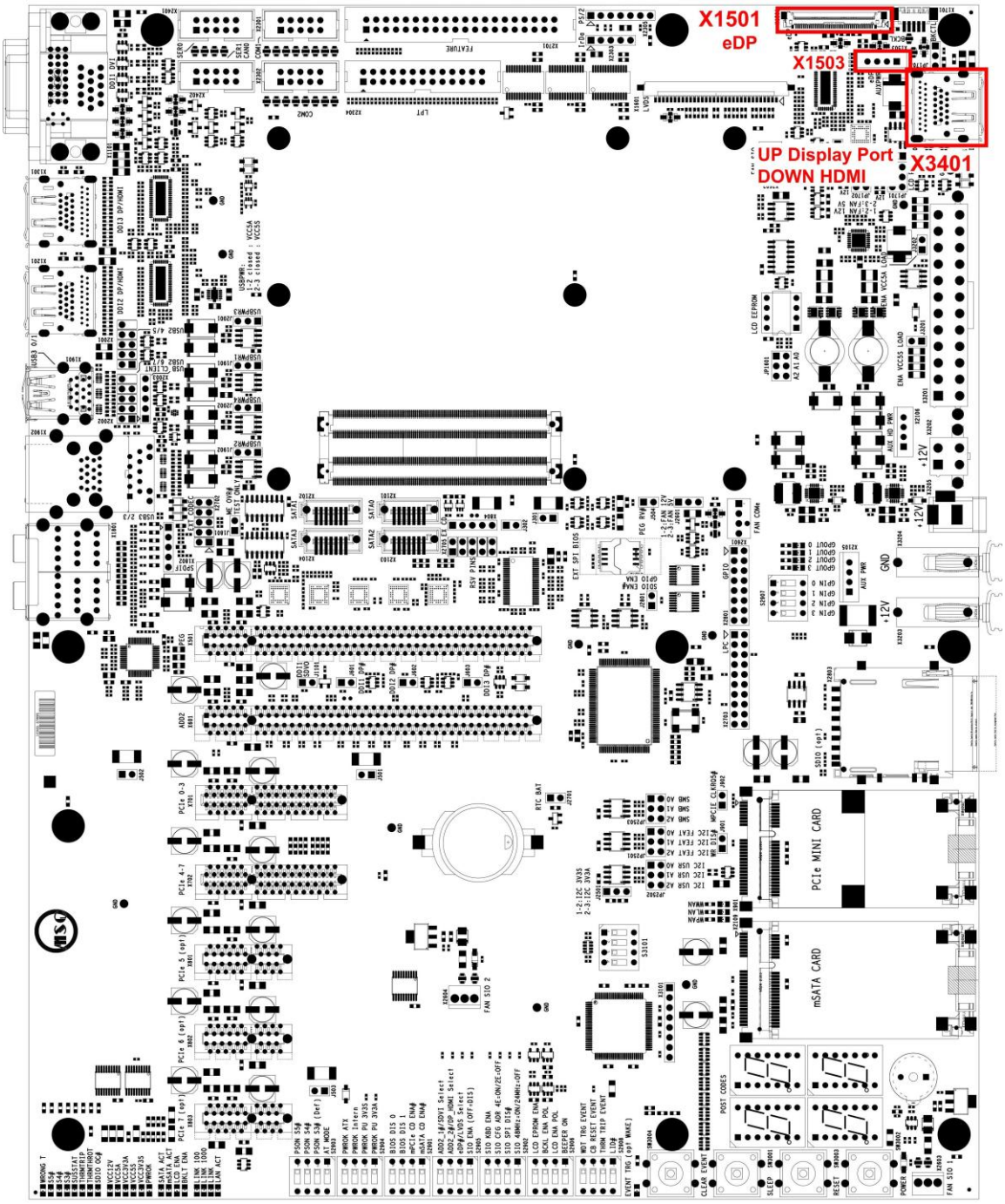
Specification:

- References: X1201, X1301, X3401
- Pin-out: Refer to Table 12
- Location: Refer to chapter 4.10 High Definition Multimedia Interface (HDMI)

Pin	Signal name	Function
1	LANE 0 +	LANE 0 positive data signal
2	GND	Ground
3	LANE 0 -	LANE 0 negative data signal
4	LANE 1 +	LANE 1 positive data signal
5	GND	Ground
6	LANE 1 -	LANE 1 negative data signal
7	LANE 2 +	LANE 2 positive data signal
8	GND	Ground
9	LANE 2 -	LANE 2 negative data signal
10	LANE 3 +	LANE 3 positive data signal
11	GND	Ground
12	LANE 3 -	LANE 3 negative data signal
13	CONFIG1	CA_DET (cable detect)
14	CONFIG2	Ground
15	AUX CH +	Auxiliary Channel positive signal
16	GND	Ground
17	AUX CH -	Auxiliary Channel negative signal
18	HPDET	Hot Plug Detect
19	Return	Ground
20	DP_PWR	+3,3 VDC

Table 12 Pin-out Display Port

4.12 Embedded Display Port (eDP)



Specification:

- References: X1501
- Connector:Tyco 5-2069716-3, I-PEX 20455-040E-02
- Pin-out: Refer to Table 13

Pin	Signal name	Function
1	RSVD	Reserved for LCD manufacturer's use
2	BL_PWR	Backlight power
3	BL_PWR	Backlight power
4	BL_PWR	Backlight power
5	BL_PWR	Backlight power
6	RSVD	SMBDAT

7	RSVD	SMBCLK
8	BL_PWM_DIM or NC	System PWM signal input for dimming (Optional)
9	BL_ENABLE or NC	Backlight On/0ff (Optional)
10	BL_GND	Backlight ground
11	BL_GND	Backlight ground
12	BL_GND	Backlight ground
13	BL_GND	Backlight ground
14	HPD	Hot Plug Detect
15	LCD_GND	LCD logic and driver ground
16	LCD_GND	LCD logic and driver ground
17	LCD_GND	LCD logic and driver ground
18	LCD_GND	LCD logic and driver ground
19	LCD_Self_Test or NC	LCD Panel Self Test Enable n.c.
20	LCD_VCC	LCD logic and driver power
21	LCD_VCC	LCD logic and driver power
22	LCD_VCC	LCD logic and driver power
23	LCD_VCC	LCD logic and driver power
24	H_GND	High Speed Ground
25	AUX_CH_N	Auxiliary Channel negative signal
26	AUX_CH_P	Auxiliary Channel positive signal
27	H_GND	High Speed Ground
28	Lane0_P	LANE 0 positive data signal
29	Lane0_N	LANE 0 negative data signal
30	H_GND	High Speed Ground
31	Lane1_P	LANE 1 positive data signal
32	Lane1_N	LANE 1 negative data signal
33	H_GND	High Speed Ground
34	Lane2_P	LANE 2 positive data signal
35	Lane2_N	LANE 2 negative data signal
36	H_GND	High Speed Ground
37	Lane3_P	LANE 3 positive data signal
38	Lane3_N	LANE 3 negative data signal
39	H_GND	High Speed Ground
40	RSVD	Reserved for LCD manufacturer’s use

Table 13 Pin-out embedded Display Port

The supply voltage of the eDP backlight can be adjusted with jumper JP1702. The according position is printed on the PCB. Refer to chapter 4.14 LVDS-Interface.
Also the voltage can supplied with X1503. If this option is used leave jumper JP1702 open.

Specification eDP Backlight Power Supply:

- References: X1503
- Connector:AMP 171825-4
- Location: Refer to chapter 4.12 Embedded Display Port (eDP)

Pin	Function
1	+12V
2	GND
3	GND
4	PWRBL

Table 14 Pin-out eDP Backlight Power Supply Connector

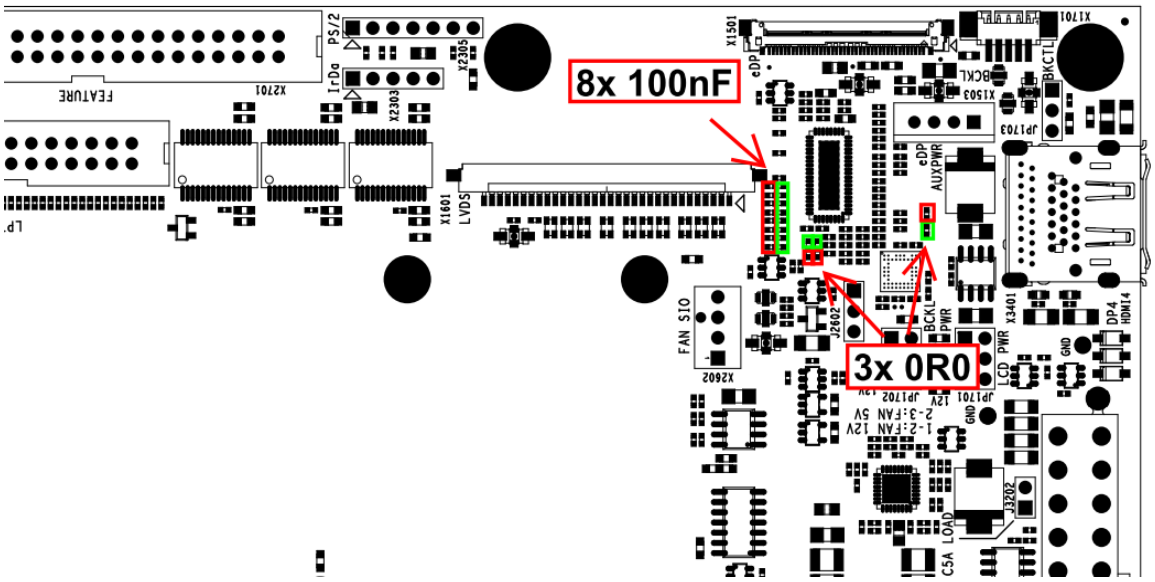
4.13 Alternative Embedded Display Port and HDMI Connector

The selection of these connectors is described in chapter 4.42

Specification:

- References: X3401
- Pin-out: Refer to Table 12 and Table 13
- Location: Refer to chapter 4.12 Embedded Display Port (eDP)

To change DP signals lanes from eDP connector to X3401 remove red parts and replace them at green locations:



4.14 LVDS-Interface

Any LCD display can be connected via a JILI30 connector.

Two 24 bit LVDS channels are present on this 30-pin connector.

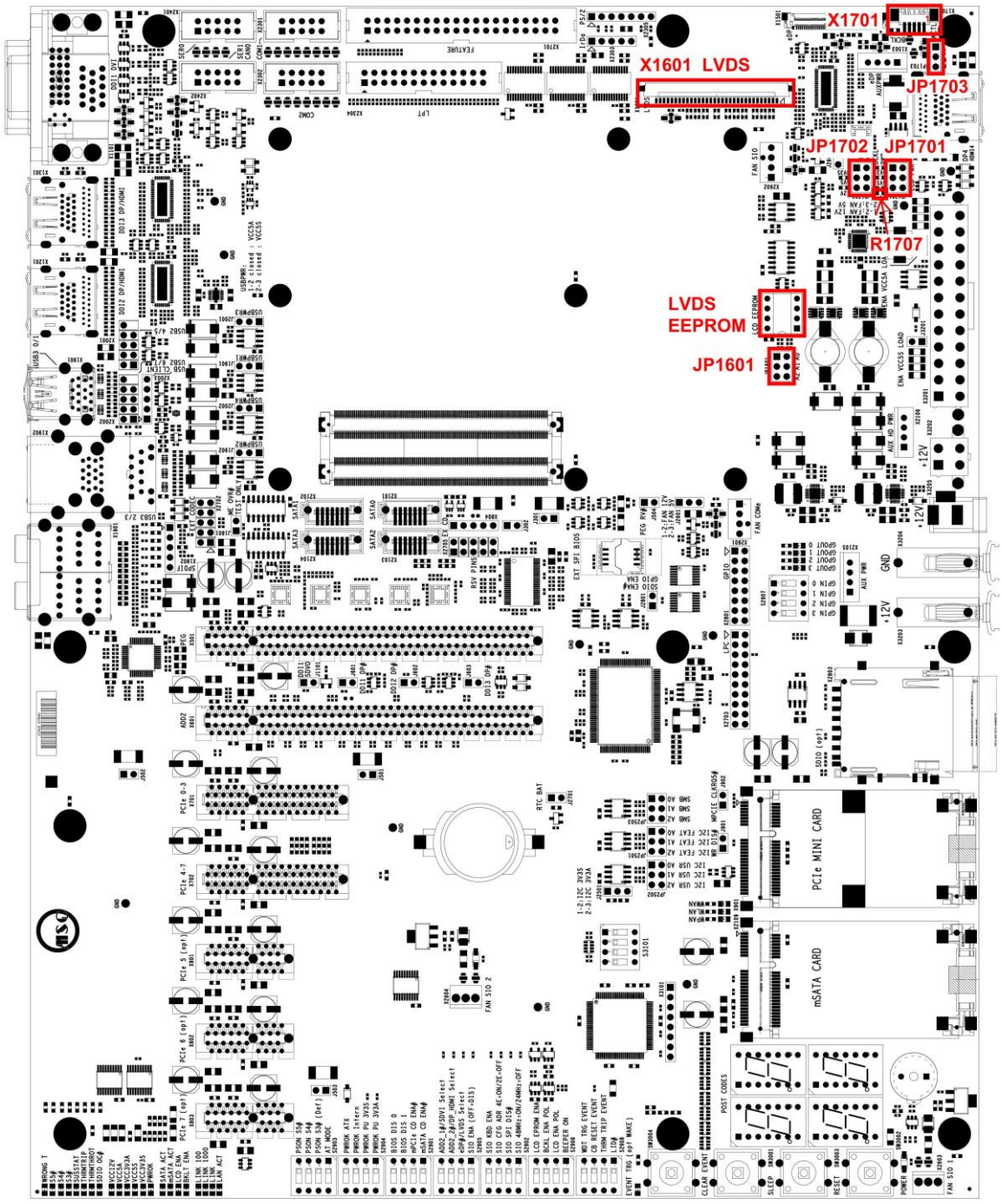
The supply voltage of the display can be adjusted with jumper JP1701. The according position is printed on the PCB. +12V supply voltage is only available with setting R1707 (0R0).

If the display needs a low active start signal VDD_EN, DIP-Switch S2906 #2 has to be set open.

If the display needs a high active start signal VDD_EN, DIP-Switch S2906 #2 has to be set on.

Specification:

- References: X1601
- Connector:JAE FI-X30SSL-HF
- Pin-out: Refer to Table 15 "JILI30" according to JILI specification [4]



Pin	Signal name	Function
1	LVDS_A0-	LVDS Negative data signal (-)
2	LVDS_A0+	LVDS Positive data signal (+)
3	LVDS_A1-	LVDS Negative data signal (-)
4	LVDS_A1+	LVDS Positive data signal (+)
5	LVDS_A2-	LVDS Negative data signal (-)
6	LVDS_A2+	LVDS Positive data signal (+)
7	VSS	Ground
8	LVDS_A_CK-	LVDS Negative clock signal (-)
9	LVDS_A_CK+	LVDS Positive clock signal (+)
10	LVDS_A3-	LVDS Negative data signal (-)
11	LVDS_A3+	LVDS Positive data signal (+)
12	LVDS_B0-	LVDS Negative data signal (-)
13	LVDS_B0+	LVDS Positive data signal (+)
14	VSS	Ground
15	LVDS_B1-	LVDS Negative data signal (-)
16	LVDS_B1+	LVDS Positive data signal (+)
17	VSS	Ground
18	LVDS_B2-	LVDS Negative data signal (-)
19	LVDS_B2+	LVDS Positive data signal (+)
20	LVDS_B_CK-	LVDS Negative clock signal (-)
21	LVDS_B_CK+	LVDS Positive clock signal (+)
22	LVDS_B3-	LVDS Negative data signal (-)
23	LVDS_B3+	LVDS Positive data signal (+)
24	GND	Ground
25	LVDS I2C DAT	I²C Data
26	VDD EN	Display power enable signal
27	LVDS I2C CK	I²C Clock
28	VCC LCDSW	Switched Power Supply (Voltage depend on JP1701)
29	VCC LCDSW	Switched Power Supply (Voltage depend on JP1701)
30	VCC LCDSW	Switched Power Supply (Voltage depend on JP1701)

Table 15 Pin-out JILI30 LVDS-Interface

4.14.1 LVDS EEPROM Socket

A serial EEPROM is connected to the signals LVDS_I2C_CK and LVDS_I2C_DAT to store configuration data of the LCD.

This EEPROM can be assembled optionally or it can be disabled with a closed DIP-Switch S2906 #4 to avoid conflicts with configuration EEPROM connected via the JILI connector.

Specification:

- References: U1601
- Connector: DIP8 socket
- Pin-out: Refer to Table 16
- Location: Refer to chapter 4.14 LVDS-Interface

Pin	Signal name	Function
1	A0	EEPROM Address 0 (PD 10k)
2	A1	EEPROM Address 1 (PD 10k)
3	A2	EEPROM Address 2 (PD 10k)
4	GND	Ground
5	SDA	Serial data
6	SCL	Serial clock
7	WP	Write protection (Ground, disabled)
8	VCC	Power supply 3V3

Table 16 Pin-out LVDS EEPROM Socket

The LVDS EEPROM address can be select with the nearby jumper block JP1601. To use this option, the pull-up resistors must be assembled.

Pin	Signal name	Function
1-2	A0	EEPROM Address 0 connect to GND
3-4	A1	EEPROM Address 1 connect to GND
5-6	A2	EEPROM Address 2 connect to GND

Table 17 EEPROM Address JP1601

4.14.2 Backlight Inverter Interface

The supply voltage of the backlight can be adjusted with jumper JP1702. The according position is printed on the PCB.

DIP switch S2906 #2 should be set according to the backlight inverter used.

If the inverter needs a low active start signal, DIP-Switch S2906 #3 has to be set open.

If the inverter needs a high active start signal, DIP-Switch S2906 #3 has to be set on.

Brightness of the backlight inverter is controlled via the LVDS-BKLT-CTRL signal.

The LVDS-BKLT-CTRL signal of the COM Express module is a PWM signal with current chipsets. If jumper JP1703 is placed between pins 1-2, the signal is integrated and then limited to the maximum allowable voltage of the backlight inverter via a voltage divider. If the jumper JP1703 is closed between pins 2-3, the LVDS-BKLT-CTRL signal of the COM Express module is routed straight to the backlight inverter connector.

Control voltage: 0...3V

A value of 0V corresponds to maximum brightness.

Specification:

- References: X1701
- Connector: Molex (53047-0510) 53261-0590
- Pin-out: Refer to Table 18
- Location: Refer to chapter 4.14 LVDS-Interface

Pin	Signal name	Function
1	VCC	Power supply backlight
2	GND	Ground
3	BLON#	Backlight On
4	VCON	Brightness control
5	GND	Ground

Table 18 Pin-out Backlight

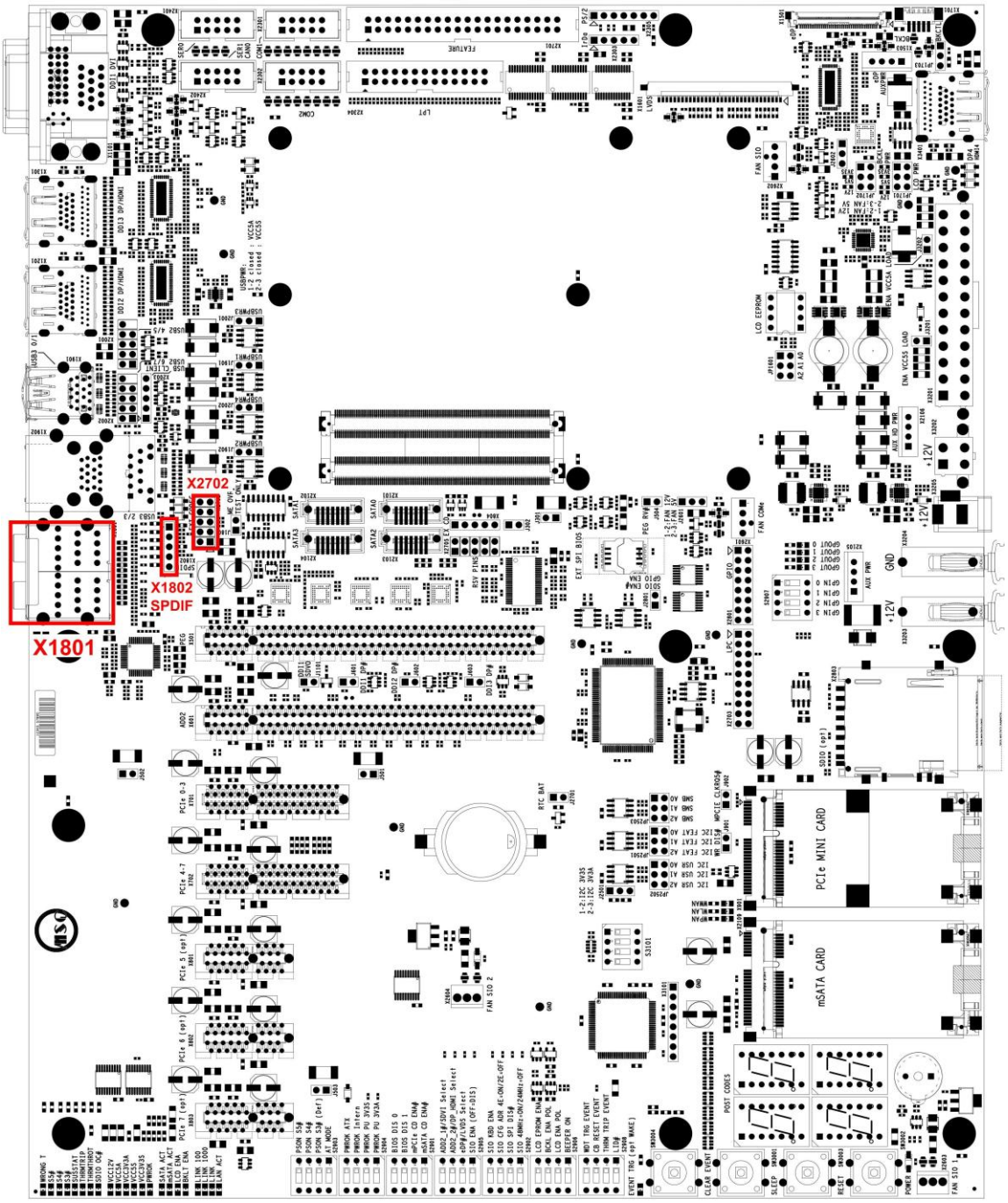
4.15 Audio

A Realtek ALC888 HD audio codec is connected to the AC link of the COM Express module.

Following LF signals are provided by the HDA codec:

- Stereo LineIn
- Stereo LineOut
- Stereo Microfon
- Mono Center / Mono LFE
- Stereo Surround
- Stereo Side

Note: At rev. 3 carrier (LY30E801) some COM Express modules can have problems with the delay of the signal multiplexers U1802 and U1803 (74HCT4053).
A corrective action is to replace the multiplexers by copper wire.



4.15.1 HDA Connector

Specification:

- References: X1801
- Connector: Foxconn JAS331-H1G2-4F
- Pin-out: Refer to Table 19
- Location: Refer to chapter 4.15 Audio

Con	Color	Function
1	light blue	Line In
2	lime	Line Out
3	pink	Mikrofon
4	orange	Center / LFE
5	black	Surround
6	grey	Side

Table 19 Pin-out LineOut

4.15.2 SPDIF

The ALC888 SPDIF signals are routed to a pin header.

Specification:

- References: X1802
- Connector: Pin header (5 pins)
- Pin-out: Refer to Table 20
- Location: Refer to chapter 4.15 Audio

Pin	Signal name	Function
1	VCC	+5V Power Supply
2	SPDIF IN	Signal input
3	SPDIF OUT	Signal output
4	GND	Ground
5	NC	Not connected

Table 20 Pin-out SPDIF

4.15.3 **HDA Codec Adapter** (not available from Rev.4)

The AC link signals can be switched to a 10 pin header.

The SDIN0-2 signals can be select via resistors R2701 (SDIN0, default), R2702 (SDIN1) and R2703 (SDIN2)

A low level at EN_EXT_HDA# switches the signals to the pin header.

Specification:

- References: X2702
- Connector: Pinheader 5x2
- Pin-out: Refer to Table 21
- Location: Refer to chapter 4.15 Audio

Pin	Signal	Signal	Pin
1	+12V	+3,3V	2
3	HAD_SYNC	HAD_RST#	4
5	HAD_SDIN0/1/2	HAD_BIT_CLK	6
7	HAD_SDOUT	EN_EXT_HDA#	8
9	GND	GND	10

Table 21 Pin-out HAD Codec Adapter

4.16 SATA-Interface

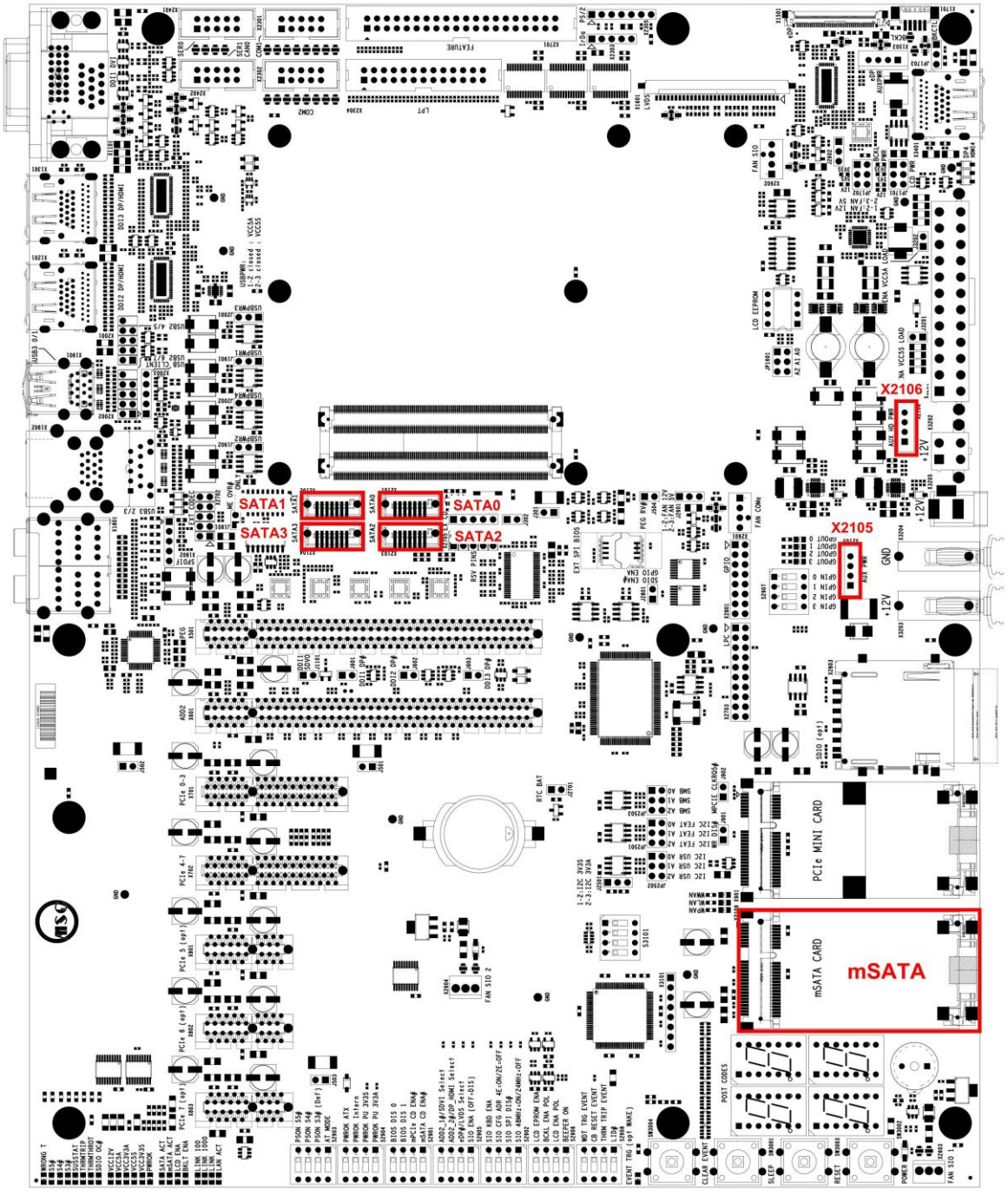
Up to four SATA drives can be connected to the SATA interfaces.

Note: Depending on the COM Express module used, not all SATA ports are available.

For disk drive power there is one power supply connector available.

SATA Channel	References
SATA 0	X2101
SATA 1	X2102
SATA 2	X2103
SATA 3	X2104 (multiplexed with mSATA socket)

Table 22 Assignment SATA Channel to Connector Reference



Specification:

- References: X2101, X2102, X2103, X2104
- Connector:FCI 10035691
- Pin-out: Refer to Specification SATA [8, page 46, table 3]

Specification Power Supply:

- References: X2105, X2106
- Connector:AMP 171825-4
- Pin-out: Refer to ATX specification V2.2 [2, "Floppy Drive Power Connector"]
- Location: Refer to chapter 4.16 SATA-Interface

4.17 mSATA Interface

One mSATA slot is available at the C6-MB-EVA board. The SATA channel is shared with SATA 3 port. It will be automatically switched if an mSATA card is plugged in. It can also be selected with DIP switch 1 at S2901.

Specification:

- References: X2109
- Connector:Molex 67910-9000
- Pin-out: Refer to Table 22
- Location: Refer to chapter 4.16 SATA-Interface

Pin	Signal	Pin	Signal
1	Not connected	2	+3,3V
3	Not connected	4	GND
5	Not connected	6	+1,5V
7	Not connected	8	Not connected
9	GND	10	Not connected
11	Not connected	12	Not connected
13	Not connected	14	Not connected
15	GND	16	Not connected
17	Not connected	18	GND
19	Not connected	20	Not connected
21	GND	22	Not connected
23	mSATA_RX-	24	+3,3V
25	mSATA_RX+	26	GND
27	GND	28	+1,5V
29	GND	30	SMB_CLK
31	mSATA_TX-	32	SMB_DAT
33	mSATA_TX+	34	GND
35	GND	36	Not connected
37	GND	38	Not connected
39	+3,3V	40	GND
41	+3,3V	42	Not connected
43	PD not populated	44	Not connected
45	Not connected	46	Not connected
47	Not connected	48	+1,5V
49	mSATA_ACT#	50	ENAUTO_mSATA#
51	Not connected	52	+3,3V

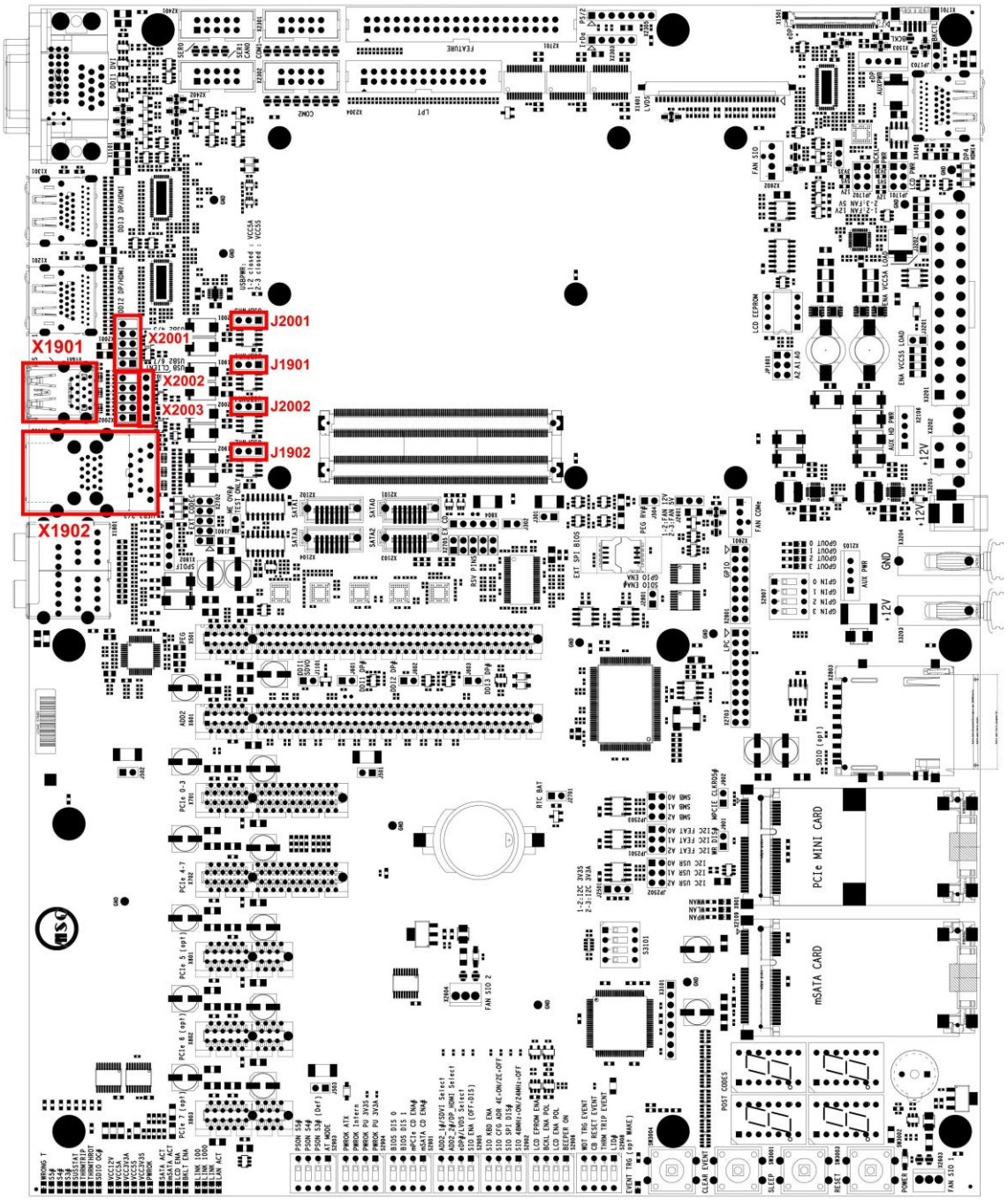
Table 23 Pin-out mSATA socket

4.18 USB Topology

Eight USB ports are normally provided by the COM Express module.
The exact assignment of each port is defined in the following table:

USB-Port	References	Function	Location	Power jumper	Remarks
USB0	X1901	USB 3.0	I/O Shield	J1901	
USB1	X1901	USB 3.0	I/O Shield	J1901	
USB2	X1902	USB 3.0	I/O Shield	J1902	With RJ45
USB3	X1902	USB 3.0	I/O Shield	J1902	With RJ45
USB4	X2001	USB 2.0	Internal header	J2001	
USB5	X2001	USB 2.0	Internal header	J2001	
USB6	X2002	USB 2.0	Internal header	J2002	Shared with PCIe Mini Card
USB7	X2002	USB 2.0	Internal header	J2002	

Table 24 Assignment USB Ports



4.18.1 USB Power Supply

The power supplies are protected by USB power switches. With power jumper setting the USB power can be sourced from standard +5V (2-3) or from suspend +5V (1-2).

The USB power switches have the following functions:

- The output current is limited to 500mA at each USB 2.0 port and 800mA at each USB 3.0 port
- A signal to detect over-current is generated for each two ports
- USB0 and USB1 have one common signal to detect over-current
- USB2 and USB3 have one common signal to detect over-current
- USB4 and USB5 have one common signal to detect over-current
- USB6 and USB7 have one common signal to detect over-current

4.18.2 USB Connectors

Specification:

- References: X1901
- Connector:Foxconn UEA1112C-8HS1-4F (Dual USB 3.0 connector type A)
- Pin-out: according to USB specification 3.0 [10]
- Location: Refer to chapter 4.18 USB Topology

- References: X1902
- Connector:Würth 749110616 (RJ45LAN 10/100/1000 BaseT + USB 3.0)
- Pin-out: according to USB specification 3.0 [10]
- Location: Refer to chapter 4.18 USB Topology

- References: X2001, X2002
- Connector:Pinheader 5x2
- Pin-out: Refer to Table 25 and Table 26
- Location: Refer to chapter 4.18 USB Topology

Pin	Signal	Pin	Signal
1	VCC_USB4	2	VCC_USB5
3	USB_P4_N	4	USB_P5_N
5	USB_P4_P	6	USB_P5_P
7	GND	8	GND
9	Not connected	10	key

Table 25 Pin-out USB 2.0 pin header

Pin	Signal	Pin	Signal
1	VCC_USB6	2	VCC_USB7
3	USB_P6_N	4	USB_P7_N
5	USB_P6_P	6	USB_P7_P
7	GND	8	GND
9	Not connected	10	key

Table 26 Pin-out USB 2.0 pin header

Note: At Rev.1 carrier (LY10E801) the Pin1 at X2001 and pin1 at X2002 are on opposite sides in the layout.

4.18.3 USB Client Connector

The USB Port 7 signals were switched to a 5 pin header, if a USB client is plugged at X2003. The client control signal is routed to an auxiliary header X2705 at pin 2.

Specification:

- References: X2003
- Connector:single row pin header
- Pin-out: Refer to Table 27
- Location: Refer to chapter 4.18 USB Topology

Pin	Signal	Function
1	VCC_IN_CLIENT	Power in
2	USB_P7_N	USB port 7 negative signal
3	USB_P7_P	USB port 7 positive signal
4	GND	Power Ground
5	GND_SHLD	Ground Shield

Table 27 USB Client Connector

4.19 Ethernet

The base board can be connected to a local area network with an Ethernet interface. The COM Express module already provides MDI signals, so that only the transformer on the base board required. The transformer is integrated in X1902.

Specification:

- References: X1902
- Connector:Würth 749110616 (RJ45LAN 10/100/1000 BaseT + USB 3.0)
- Pin-out: Refer to IEEE Std. 802.3 [9, section three, page 225]
- Location: Refer to chapter 4.18 USB Topology

Color	Status	Description
Yellow	Off	No link
Yellow	Blinking	Link established, activity detected
Green/Orange	Off	10 Mbps
Green	On	100 Mbps
Orange	On	1000 Mbps

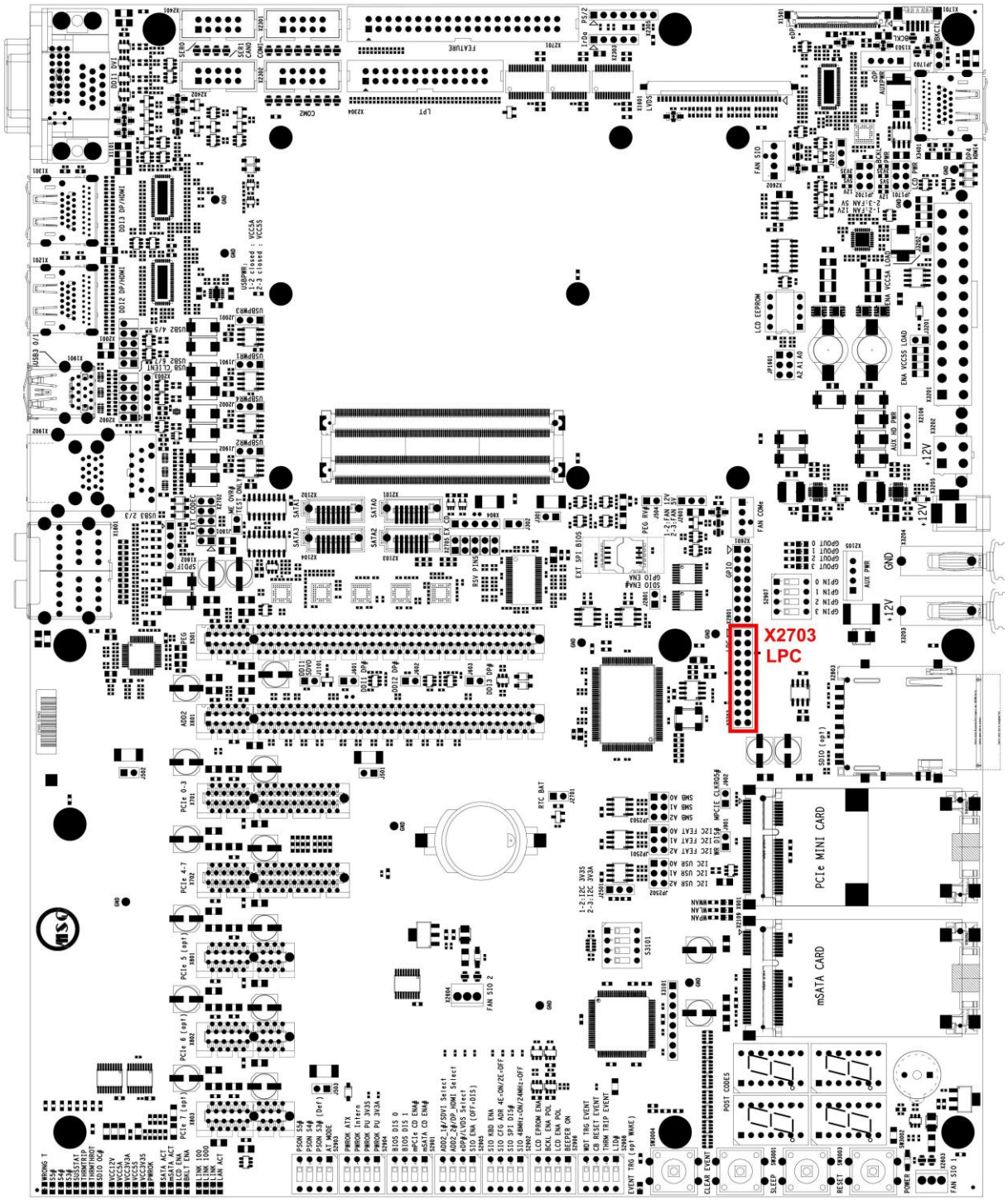
LAN LED Description

4.20 LPC Connector

The LPC signals are available on a pin header.

Specification:

- References: X2703
- Connector:20 pin header, 2.54mm
- Pin-out: Refer to Table 28



Pin	Signal	Pin	Signal
1	LPC_CLK	2	GND
3	LPC_FRAME#	4	NC
5	LPC_RST#	6	VCC5V_SUS
7	LPC_LAD3	8	LPC_LAD2
9	VCC3V3_SBY	10	LPC_LAD1
11	LPC_LAD0	12	GND
13	SMB_CLK	14	SMB_DAT
15	VCC3V3	16	SERIRQ
17	GND	18	NC
19	PM_SUS_STAT#	20	LPC_DRQ1#

Table 28 Pin-out LPC-Slot

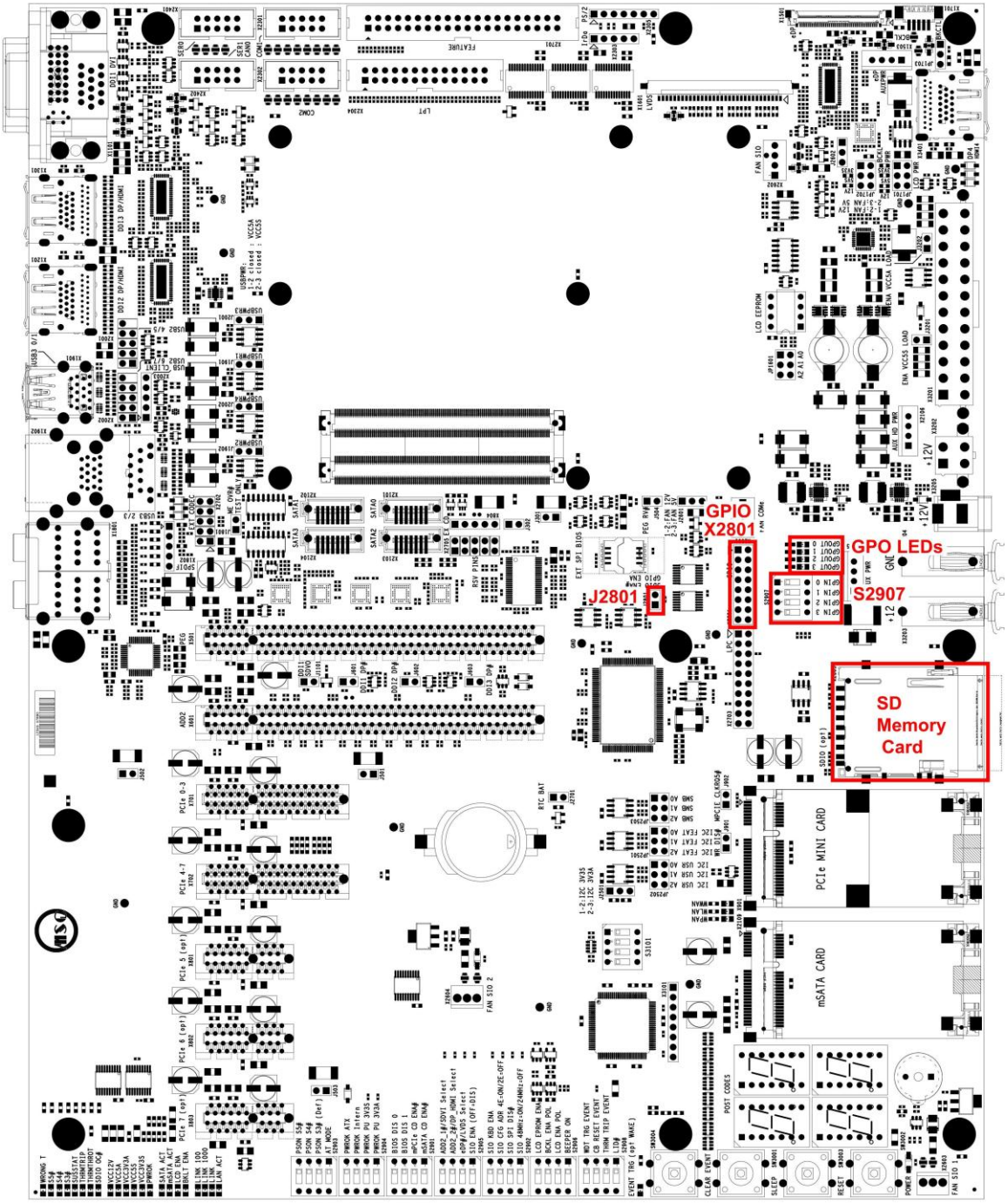
4.21 GPIO

The COM Express module provides four general purpose outputs and four general purpose inputs.

The GPIs have pull-up resistors and are routed to a dip switch (S2907). With the dip switch the GPIs can be connected to ground. The assignment GPI – switch – level is printed on the PCB.

From rev.4 the GPI signals cannot be switched to SD Card port.

The GPOs are connected to LEDs for optically status display.



4.21.1 GPIO Connector

Don't set jumper J2801 to use the GPI signals at X2801. (Default)

Specification:

- References: X2801
- Connector:16 pin header, 2.54mm
- Pin-out: Refer to Table 29

Pin	Signal	Pin	Signal
1	GPI0	2	GND
3	GPI1	4	GND
5	GPI2	6	GND
7	GPI3	8	GND
9	GPO0	10	GND
11	GPO1	12	GND
13	GPO2	14	GND
15	GPO3	16	GND

Table 29 Pin-out GPIO connector

4.21.2 SD Memory Card Connector

An SD memory card connector is available on the board.

Set J2801 to enable the SD memory card slot.

All signals at DIP-switch S2907 must be set off for correct function of the SD memory card slot. This sanction concerns layout revision 3 (LY30E801) and earlier.

Specification:

- References: X2803
- Connector:Hirose DM1AA-SF-PEJ
- Pin-out: Refer to SD Specification [11]

4.22 COM Ports COM3 COM4

Characteristics of the COM ports:

- RS232 standard
- RS232 transceiver ESD protected +/- 15kV
- EMC improved by using EMI filters in the signal lines

Specification:

- References: X2401 (COM3), X2402 (COM4)
- Connector:10 pin IDC-M
- Pin-out: Refer to Table 30
- Location: Refer to chapter 4.23 Super IO

Pin	Signal	Function	Function	Signal	Pin
1	DCD#	n.c.	n.c.	DSR#	2
3	RXD	Receive Data	n.c.	RTS#	4
5	TXD	Transmit Data	n.c.	CTS#	6
7	DTR#	n.c.	n.c.	RI#	8
9	GND	Ground	n.c.	VCC	10

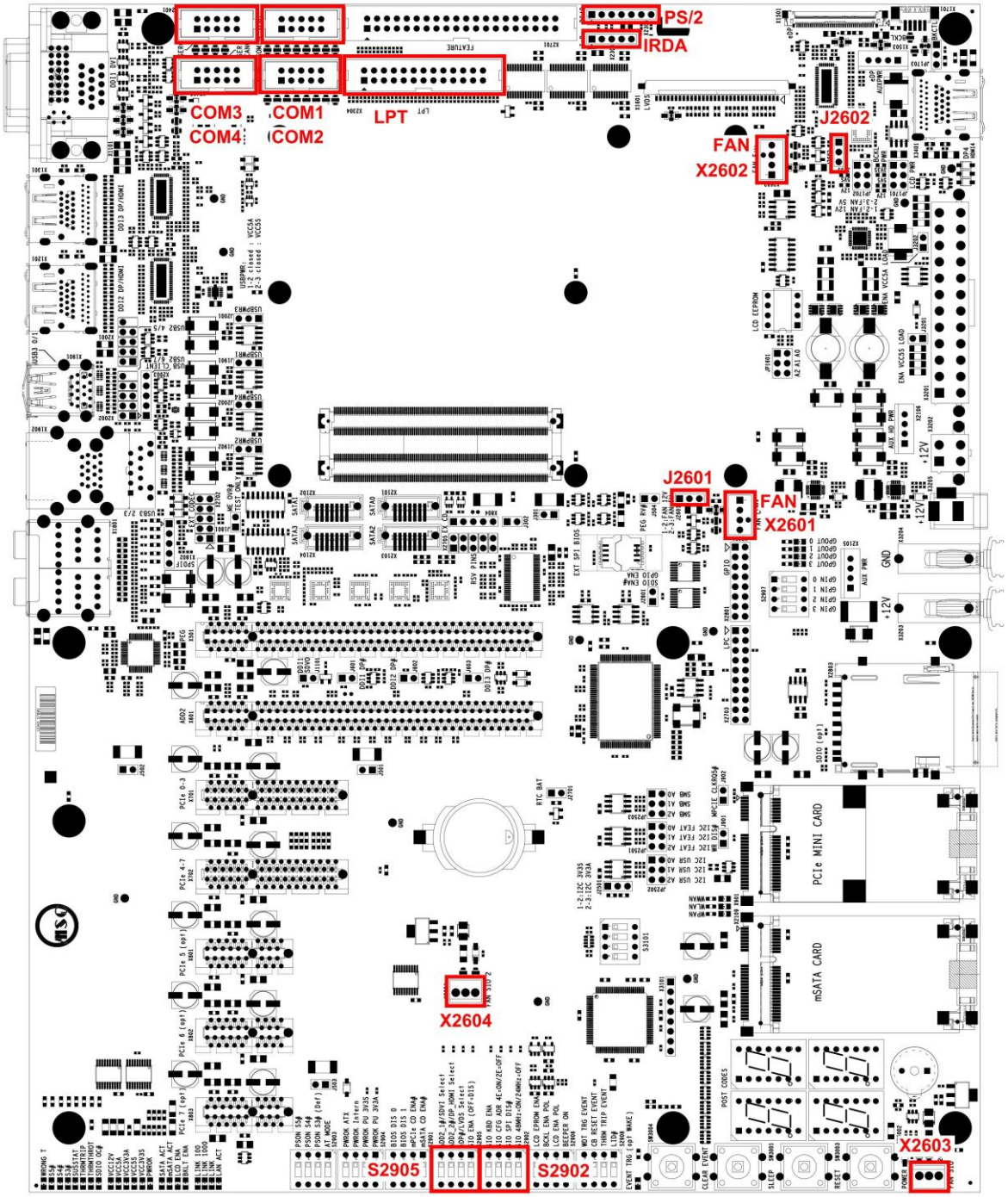
Table 30 Pin-out COM Ports

4.23 Super IO

The Winbond Super IO W83627HG is integrated on the base board.

Interfaces used by the Super IO

- 2 RS232 interface (function of COM port shared with IrDA interface)
- 1 IrDA interface (function shared with COM port)
- 1 LPT interface
- PS/2 interface for keyboard and mouse
- 2 fan interfaces
- 4 voltage monitors
- 2 temperature sensors



4.23.1 SIO Configuration

The SIO strap options can be changed via DIP switches S2902 and S2905.

Switch	Signal name	ON	OFF
S2902 #1	48MHz_EN	Enable 48MHz (default)	Enable 24MHz
S2902 #2	PNP_ADR	Reset FDC UARTs LPT setting	No reset FDC UARTs LPT setting
S2902 #3	4EH_ENA	SIO address 4EH (default)	SIO address 2EH
S2902 #4	KBD_EN	Enable KBC	Disable KBC
S2905 #1	SIO_RST_N	Enable SIO	Disable SIO

Table 31 SIO Configuration

4.23.2 Parallel Port

Specification:

- References: X2304
- Connector:26 pin IDC-M
- Pin-out: Refer to Table 32

Pin	Signal name	Signal name	Pin
1	STB#	AFD#	2
3	PD0	ERR#	4
5	PD1	INIT#	6
7	PD2	SLIN#	8
9	PD3	GND	10
11	PD4	GND	12
13	PD5	GND	14
15	PD6	GND	16
17	PD7	GND	18
19	ACK#	GND	20
21	BUSY	GND	22
23	PE	GND	24
25	SLCT	VCC n.c.	26

Table 32 Pin-out LPT Port

4.23.3 COM Ports COM1 COM2

Characteristics of the COM ports:

- RS232 standard
- RS232 transceiver ESD protected +/- 15kV
- EMC improved by using EMI filters in the signal lines

Specification:

- References: X2301 (COM1), X2302 (COM2)
- Connector:10 pin IDC-M
- Pin-out: Refer to Table 33 Pin-out COM Ports

Pin	Signal name	Function
1	DCD#	Data Carrier Detect
2	DSR#	Data Set Ready
3	RXD	Receive Data
4	RTS#	Request To Send
5	TXD	Transmit Data
6	CTS#	Clear To Send
7	DTR#	Data Terminal Ready
8	RI#	Ring Indicator
9	GND	Ground
10	VCC	n. c.

Table 33 Pin-out COM Ports

4.23.4 IrDA

The connectors of the IrDA interface are designed for commercial IrDA transmitters.

Specification:

- References: X2303
- Connector:CAB 1001-161-005
- Pin-out: Refer to Table 34

Pin	Signal name	Function
1	+5V	Power supply
2	NC	Not connected
3	IRRX	Received data
4	GND	Ground
5	IRTX	Transmission data

Table 34 Pin-out IrDA

4.23.5 PS/2 Connector

The PS/2 signals are routed to a 7pin single row header to connect PS/2 keyboards and PS/2 mice.

Specification:

- References: X2305
- Connector:7 pin single row header 2.54mm
- Pin-out: Refer to Table 35

Pin	Signal name	Function
1	KBDAT	Keyboard Data
2	NC	not connected
3	MSDAT	Mouse Data
4	GND	Ground
5	+5V	VCC
6	KBCLK	Keyboard Clock
7	MSCLK	Mouse Clock

Table 35 Pin-out PS/2 Connector

4.23.6 Super IO Fan interface

Two PWM controlled fan interfaces are integrated on the base board.

Measurement of the tacho signal and control of the rotation speed is done by the Super IO.

Specification:

- References: X2603, X2604
- Connector: Molex 22-04-1031
- Pin-out: Refer to Table 36

Pin	Signal name	Function
1	GND	Ground
2	PWM	PWM signal
3	TACHO	Tacho signal

Table 36 Pin-out SIO Fan Interface

4.23.7 Super IO Hardware Monitor

Various voltages and temperatures can be monitored by hardware integrated in the SuperIO.

Monitored voltages

- 3.3V
- 12V
- Output voltage from CX 12V Vin current sensor (OP)
- Output voltage from CX 5V STBY Vin current sensor (OP)

Measured temperatures

- 2 ambient temperatures
  Temperature is measured with a thermistor.

4.24 Fan Interface

4.24.1 Intel Fan interface

In addition to the two fan interfaces according to Super IO, there is the X2601intel fan connector on the board which is supported from COM Express interface.

The second intel fan interface at X2602 is shared with X2604. Don't use both at the same time.
Measurement of the tacho signal and control of the rotation speed is done by the Super IO.

Specification:

- References: X2601, X2602
- Connector: Molex 47053-1000
- Pin-out: Refer to Table 37
- Location: Refer to chapter 4.23 SuperIO

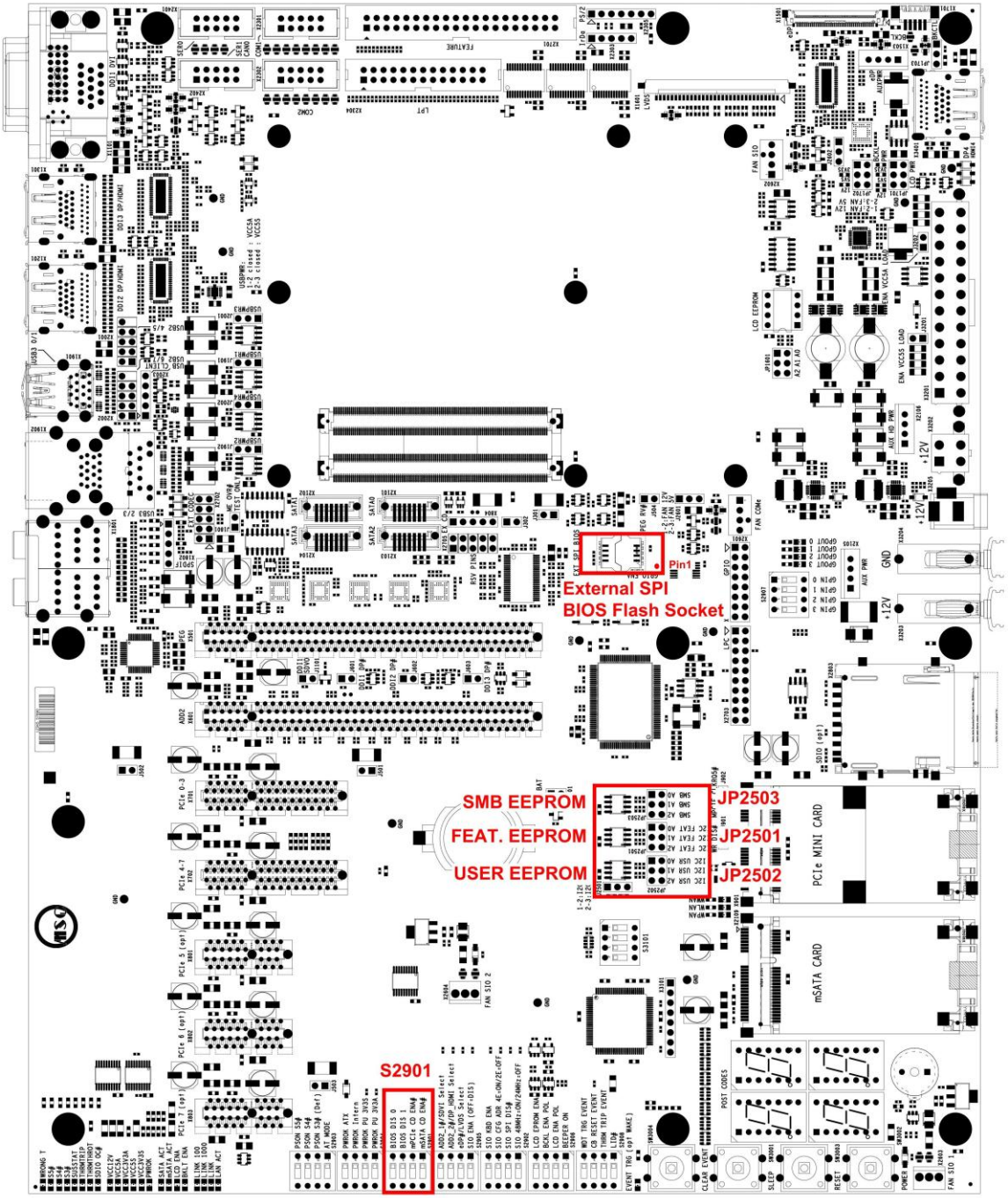
With J2601 and J2602 the supply voltage can be changed from +12V (1-2) to +5V (2-3).

Pin	Signal name	Function
1	GND	Ground
2	+12V	VCC
3	TACHO	Tacho signal
4	PWM	PWM signal

Table 37 Pin-out Fan Interface

4.25 Serial SMB EEPROM

For testing purposes a serial EEPROM (4kBit) is connected to the SMBus. To avoid address conflicts, the address can be selected with jumpers.



JP2503	Signal name	Function	Default resistor setting
1 - 2	A0	A0 low	low
3 - 4	A1	A1 low	low
5 - 6	A2	A2 low	low

Table 38 Jumper SMB EEPROM Address

Do not use address A0 and A4. There can be an address conflict with the spd on the memory slot.

4.26 Serial I2C-Bus EEPROM

For testing purposes two serial EEPROM (4kBit) are connected to the I2C bus. To avoid address conflicts, the address can be selected with jumpers.

4.26.1 Feature I2C EEPROM

JP2501	Signal name	Function	Default resistor setting
1 - 2	A0	A0 low	high
3 - 4	A1	A1 low	high
5 - 6	A2	A2 low	high

Table 39 Jumper Feature I2C EEPROM Address

4.26.2 User I2C EEPROM

JP2502	Signal name	Function	Default resistor setting
1 - 2	A0	A0 low	high
3 - 4	A1	A1 low	high
5 - 6	A2	A2 low	high

Table 40 Jumper User I2C EEPROM Address

Note: The 10k pull up resistor at A2 is missing on rev. 3 carriers (LY30E801).

4.27 External SPI BIOS-Flash

There is a socket on the mother board, where an additional BIOS-Flash can be inserted. The BIOS SPI flash can be selected with DIP switch S2901.

BIOS_DIS1	BIOS_DIS0	BIPOS Entry (SPI_CS#)
OFF	OFF	On module SPI (default)
OFF	ON	Carrier FWH (not supported)
ON	OFF	Carrier SPI
ON	ON	On module SPI, carrier SPI contains management data

Table 41 Jumper BIOS selection

4.28 POST-Code Display

For debugging purposes a POST code display is implemented on the base board. The display of BIOS outputs on IO-port 80h, 84h, 90h or 94h is selected using DIP switch S3101.

SW	Port Address
1 ON	80h (Default)
1 OFF	90h
2 ON	84h (Default)
2 OFF	94h

Table 42 POST-Code Selection

4.28.1 Lattice Programming Interface

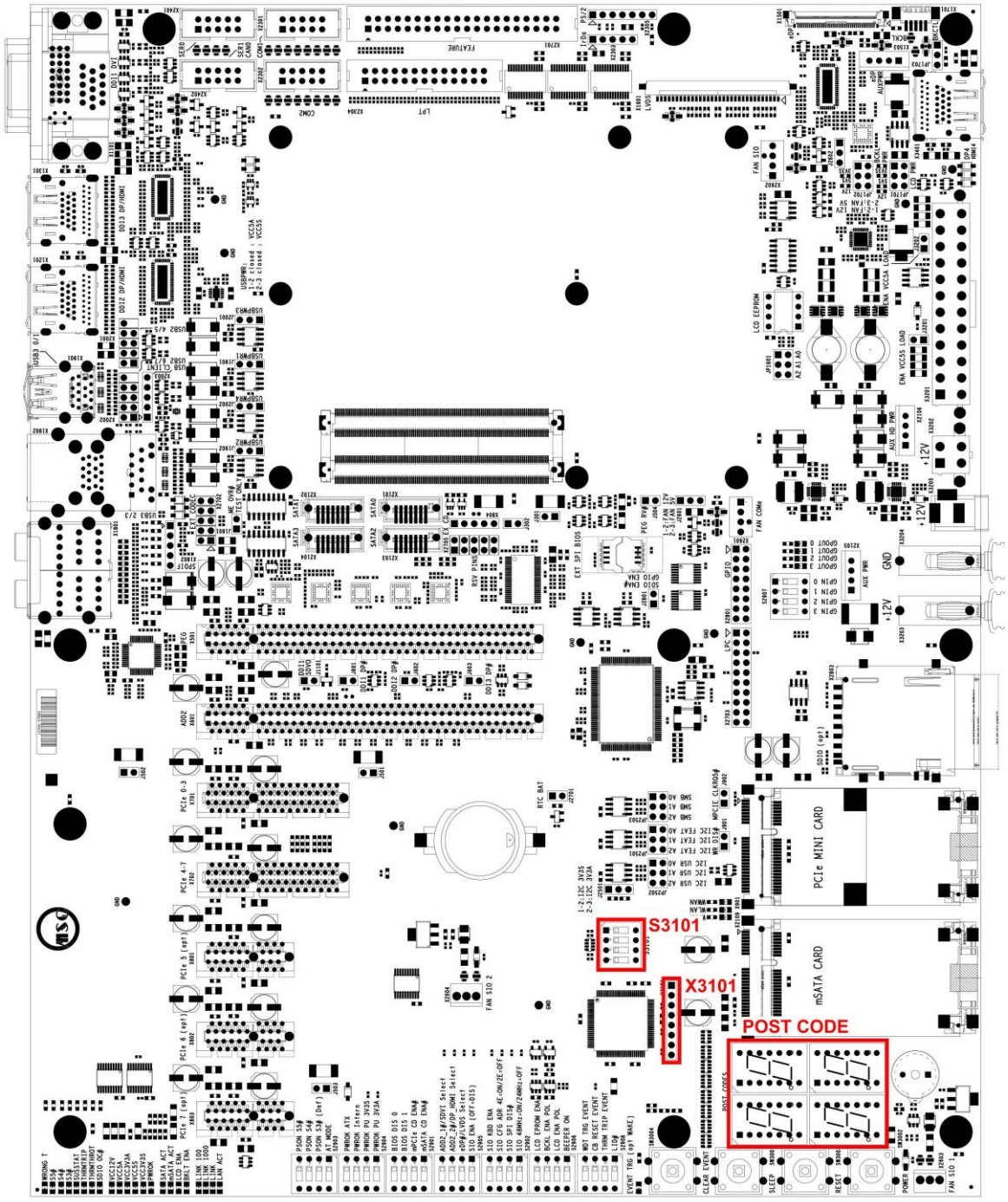
A connector used to program the PLD to decode the POST codes is implemented. To reprogram the PLD a Lattice programming adapter is required.

Specification:

- References: X3101
- Connector:CAB 1001-161-008
- Pin-out: Refer to Table 43

Pin	Signal name	Function
1	VCC	Power Supply
2	SDO_TDO	Serial Data Out
3	SDI_TDI	Serial Data In
4	ISPEN#	Programming Enable
5	KEY	Key-pin
6	MODE_TMS	Programming Mode
7	GND	Ground
8	SCLK_TCK	Serial Clock

Table 43 Pin-out Lattice Programming Interface



4.29 Feature Connector

Many COMExpress signals are not used on this carrier. These signals and some other signals and power planes are available at the Feature connector.

Specification Feature connector:

- References: X2701
- Connector:40 pin IDC-M
- Pin-out: Refer to Table 44
- Location: Refer to Illustration 4 Miscellaneous Parts

Pin	Signal	Pin	Signal
1	VCC5S (5V switched)	2	VCC3V3S (3,3V switched)
3	VCC5A (5V always on)	4	SATA_LED# (incl. 330R serial)
5	I2C_DAT	6	SMB_CLK
7	I2C_CLK	8	SMB_DAT
9	VCC3V3A (always on)	10	LPC_SERIRQ
11	TPM_PP (TPM presence)	12	VCC5S (5V switched)
13	SLP_S5#	14	BEEPER
15	SLP_S3#	16	SER0_TXD
17	SLP_S4#	18	SER0_RXD
19	PS_ON#	20	SMB_ALERT#
21	WAKE1#	22	CAN0_SER1_TXD
23	SUS_STAT#	24	THRM#
25	GND	26	CAN0_SER1_RXD
27	WDT (Watch dog trigger)	28	SLEEP#
29	GND	30	THRMTRIP#
31	BATLOW#	32	PCIE_WAKE#
33	GND	34	EVENT_EDGE
35	LID#	36	RESET#
37	GND	38	GND
39	PWRBTN#	40	PWR_OK

Table 44 Pin-out Feature connector

4.30 Power Supply ATX Connector

An ATX connector with additional ATX12V connector is available to power the system.

Specification ATX connector:

- References: X3201
- Connector:Molex 44206-0007
- Pin-out: Refer to ATX specification V2.2 [2]

Specification ATX12V connector:

- References: X3202
- Connector:Molex 39-29-9042
- Pin-out: Refer to ATX specification V2.2 [2]

Specification 2 pol. Power jack connector:

- References: X3205
- Connector:Kycon KLD(X)-0202-B (6.3mm, 2.5mm)
- Pin-out: Refer Refer to Table 45 GND pin2 --(●-- pin1 +12V

Pin	Signal name	Function
1	+12V	VCC (inner pin 2.5mm diameter)
2	GND	Ground (shell 6.3mm diameter)

Table 45 Pin-out Power IN3 connector

4.31 Power Supply Labor Connector

The carrier can also be powered with +12VDC only.

Specification Labor connector:

- References: X3203, X3204 (Power LAB)
- Connector: Hirschmann PB4, 4mm, 60V, 16A.
- Pin-out: Red: +12V / Black: GND

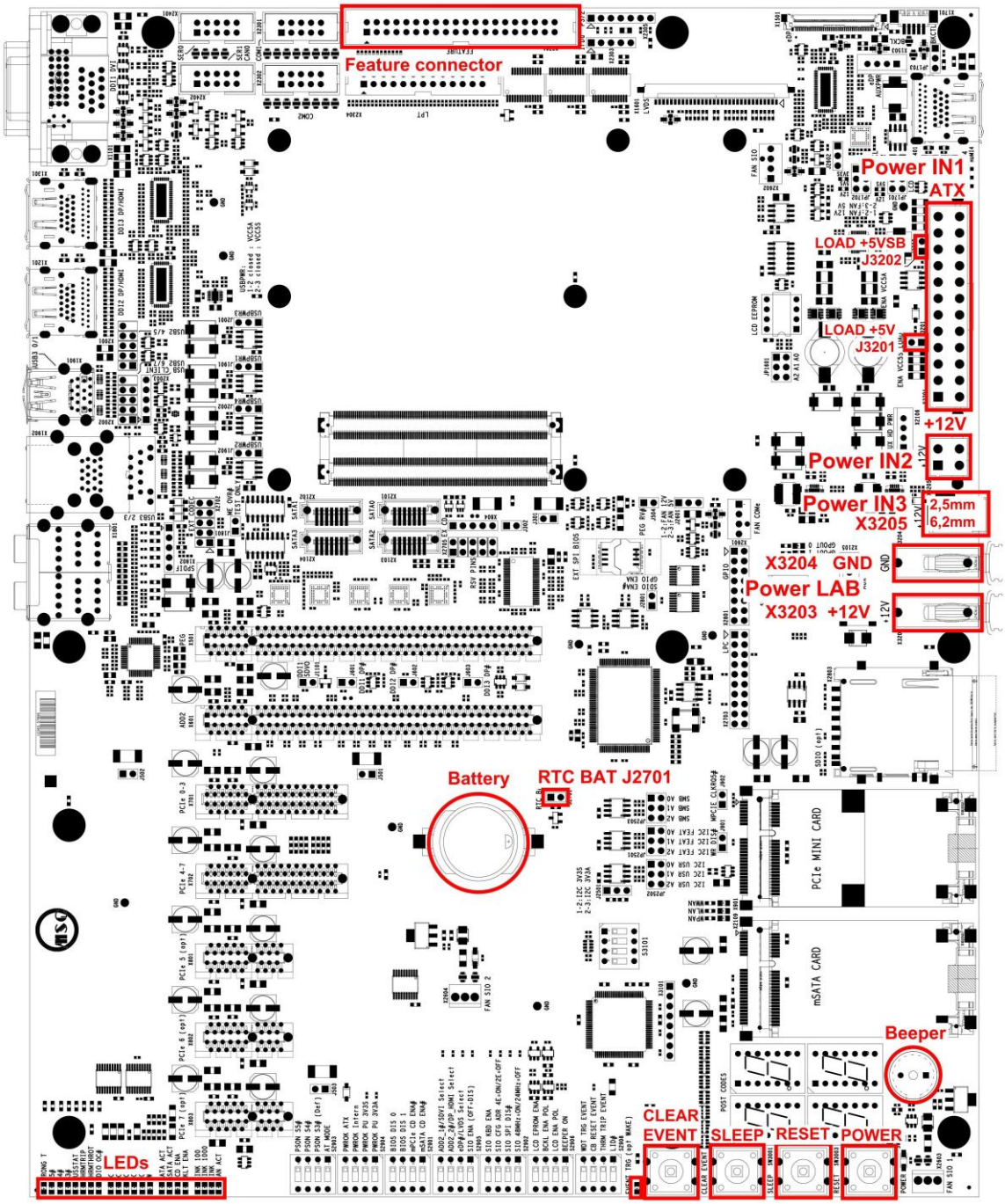


Illustration 4 Miscellaneous Parts

The LOAD jumper J3201 and J3202 adds a 100mA current at 5V ATX plane and 5VSB plane. In some causes this can help the ATX power supply unit to turn on.

4.32 Battery

The RTC on the COM Express module is buffered with a socketed battery on the base board.

In order to clear the CMOS memory, the battery voltage to the COM Express module can be disconnected via nearby RTC BAT jumper J2701.

Type of battery: 2032

- References: BT2701
- Connector: Renata SMTU2032-1
- Location: Refer to Illustration 4 Miscellaneous Parts

4.33 Beeper

A signal generator is implemented for acoustic signals. The beeper can be enabled and disabled with DIP switch 1 at S2906.

Type: Digisound F/DGX05P

- References: LS2701
- Type: Digisound F/DGX05P
- Location: Refer to Illustration 4 Miscellaneous Parts

4.34 Power Button

For switching the system on a power push button has been implemented.

The PWR_BTN# signal is low-active and is connected directly to the corresponding pin of the COM Express module.

- References: SW3001
- Type: ITT PTS125
- Location: Refer to Illustration 4 Miscellaneous Parts

4.35 Reset Button

There is a push button for resetting the system.

The RESET# signal is low-active and is connected to the SYS_RESET#- pin of the COM Express module.

- References: SW3002
- Type: ITT PTS125
- Location: Refer to Illustration 4 Miscellaneous Parts

4.36 Sleep Button

There is a push button for setting the system into sleep state.

- References: SW3003
- Type: ITT PTS125
- Location: Refer to Illustration 4 Miscellaneous Parts

4.37 Clear Event Button

There is a push button to reset the state of the event latch.

- References: SW3004
- Type: ITT PTS125
- Location: Refer to Illustration 4 Miscellaneous Parts

4.38 LEDs

There are many LEDs placed on the edge of the carrier. They indicate power and system states.

- Location: Refer to Illustration 4 Miscellaneous Parts

Color	Function	Description
Red	WRONG T	No type 6 module is plugged at X301.
Red	S5#	Module is in sleep state S5
Red	S4#	Module is in sleep state S4
Red	S3#	Module is in sleep state S3
Red	SUSSTAT	Module is in suspend state
Red	THRMTRIP	CPU has entered thermal shutdown.
Red	THRMTHROT	Over-temp situation has occurred.
Red	SDIO OC#	Over-current at SD Card slot.
Green	VCC12V	12V power supply ok.
Green	VCC5A	5V suspend power ok.
Green	VCC3V3A	3V3 suspend power ok.
Green	VCC5S	5V power supply ok.
Green	VCC3V3S	3V3 power supply ok.
Green	PWROK	PWR_OK signal is applied.
Yellow	SATA ACT	Indicates SATA activity.
Yellow	mSATA ACT	Indicates mSATA activity.
Green	LCD ENA	Display power is switched on.
Green	BKLT ENA	Backlight power is switched on.
Green	LINK 100	Indicates LAN 100Mps activity.
Yellow	LINK 1000	Indicates LAN 100Mps activity.
Green	LINK	Indicates LAN link.
Green	LAN ACT	Indicates LAN activity.

Table 46 LEDs Overview

4.39 WLAN LEDs

There are three yellow LEDs placed near PCIe Mini Card slot. They indicate the card type.

- Wireless Wide Area Network (WWAN).
- Wireless Local Area Network (WLAN).
- Wireless Personal Area Network (WPAN).

4.40 DIP Switches

There is an array of DIP switches at the card edge to configure various functions.

- References: S2901, S2902, S2903, S2904, S2905, S2906, S2908.
- Type: 4pol
- Location: Card edge

Reference	No.	Function	Description
S2903	4	PSON S5#	Selects source for PSON signal.
S2903	3	PSON S4#	Selects source for PSON signal.
S2903	2	PSON S3# (default on)	Selects source for PSON signal.
S2903	1	AT MODE	ATX always on (PSON is set to GND)
S2904	4	PWROK ATX (default on)	PWROK from ATX supply
S2904	3	PWROK Intern	PWROK from DC/DC (12V only mode)
S2904	2	PWROK PU 3V3S	PU 1k2 to 3V3
S2904	1	PWROK PU 3V3A	PU 1k2 to 3V3 SUS
S2901	4	BIOS DIS 0 (default off)	BIOS selection table at chapter 4.27
S2901	3	BIOS DIS 1 (default off)	BIOS selection table at chapter 4.27
S2901	2	mPCIe CD ENA#	On enables mPCIe slot (chap. 4.5)
S2901	1	mSATA CD ENA#	On enables mSATA slot (chap. 4.17)
S2905	4	ADD2_1#/SDVI Select	DDI selection
S2905	3	ADD2_2#/DP_HDMI Select	DDI selection
S2905	2	eDP#/LVDS Select	eDP / LVDS selection
S2905	1	SIO ENA / OFF = DIS	On enables SIO W83627
S2902	4	SIO KBD ENA	SIO keyboard controller enable (on)
S2902	3	SIO CFG ADR 4E=ON/2E=OFF	SIO address selection (default off, 2E)
S2902	2	SIO SPI DIS#	SIO PNP, disables SPI (default off)
S2902	1	SIO 48MHz=ON/24MHz=OFF	SIO PEN48 (default on, 48MHz)
S2906	4	LCD EPROM ENA (default on)	Off enables carrier EDID EEPROM
S2906	3	BCKL ENA POL	Backlight polarity, off = low active
S2906	2	LCD ENA POL	LVDS enable polarity, off = low active
S2906	1	BEEPER ON	On enables beeper
S2908	4	WDT TRG EVENT	Source for trigger event edge
S2908	3	CB RESET EVENT	Source for trigger event edge
S2908	2	THRM TRIP EVENT	Source for trigger event edge
S2908	1	LID#	On = 680R to GND

Table 47 DIP Switch Overview

4.41 Miscellaneous

4.41.1 Resistors for current measuring

Resistors are inserted into the power supply lines of the COM Express module, the PCI express graphics slot as well as into every PCI slot and one PCI express x1 slot. These can be used for current measurement.

In addition to there is one jumper to measure the current using an external wire loop and clamp meter.

4.41.2 Ground Pins

There are several ground pins spread over the base board for connection of measurement equipment.

4.41.3 Power supply current measuring

Since the sense resistors in the power supply lines of the COM Express module are removed in rev.3, the two jumpers J301 and J302 must be set for full ATX function.

J301 can be used for +12V module current measurement.

J302 can be used for +5V Suspend module current measurement.

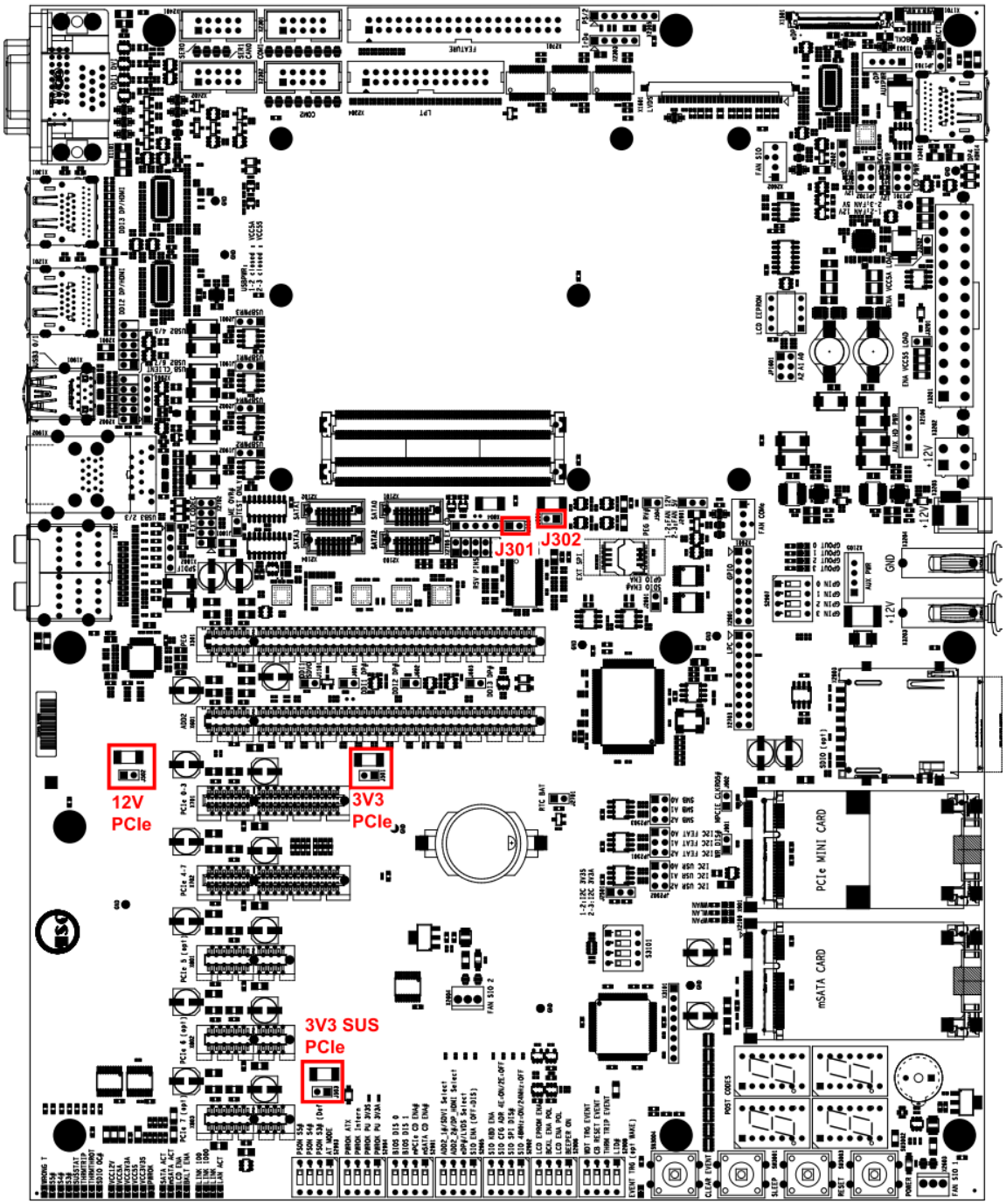


Illustration 5 Current Measurement

4.42 Graphic Port Selection

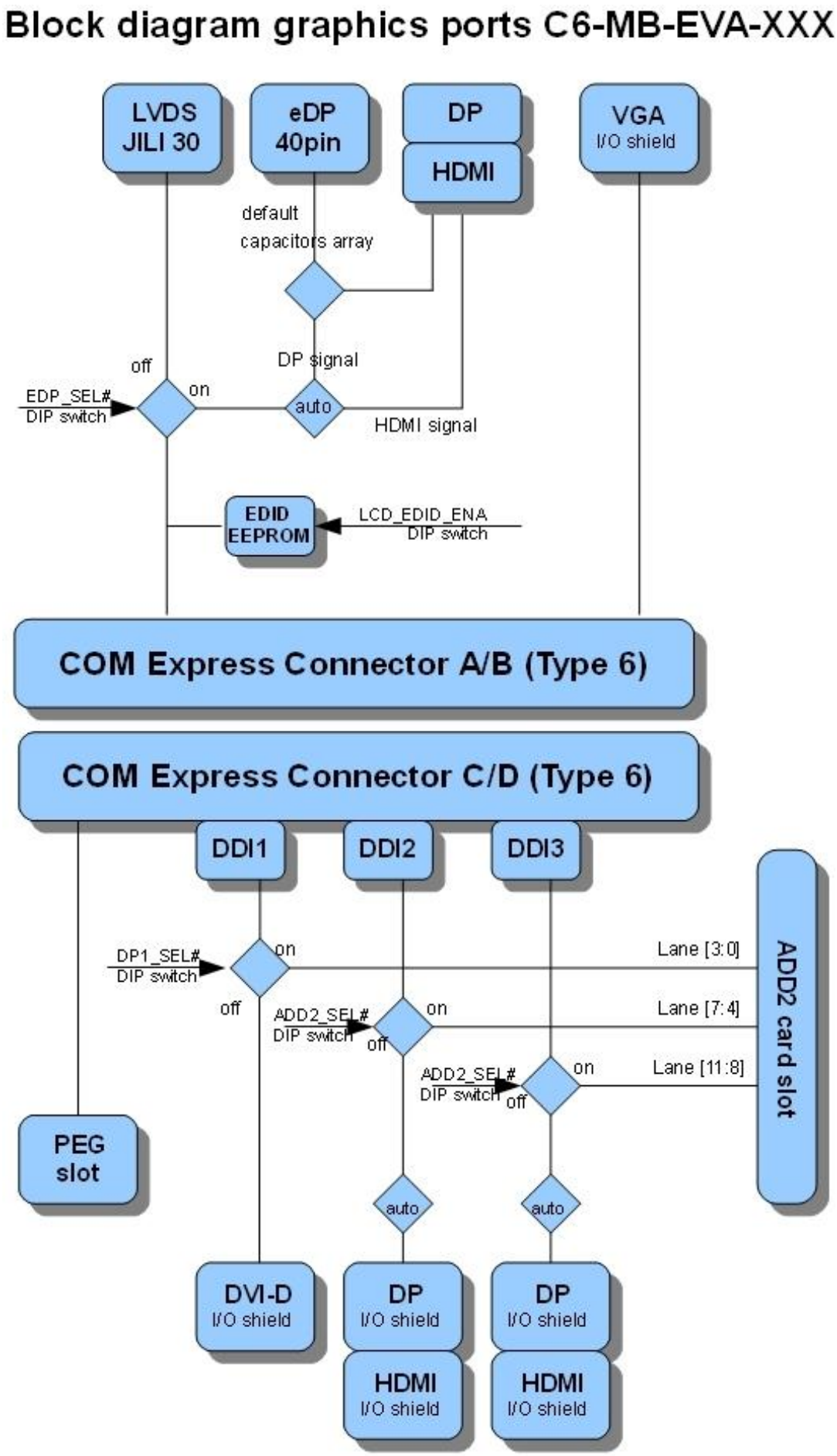


Illustration 6 Block Diagram Graphics Ports

4.42.1 JILI30 / eDP Selection

DIP Switch	No.	Status	Function
S2905	2	OFF	JILI30 (LVDS)
S2905	2	ON	eDP (embedded Display Port 40pin)

Table 48 JILI30 / eDP Selection

4.42.2 DDI Port Selection

Source	Jumper settings		DP jumper	Connector	Interface
DDI1	S2905 /4 OFF	J1101 don't care	J601 open	X1101	DVI
DDI1	S2905 /4 ON	J1101 closed	J601 open	X601 (ADD2)	DVI / HDMI
DDI1	S2905 /4 ON	J1101 closed	J601 closed	X601 (ADD2)	DP
DDI1	S2905 /4 ON	J1101 open	J601 open	X601 (ADD2)	SDVO
DDI2	S2905 /3 OFF		J602 open	X1201	HDMI/ DP
DDI2	S2905 /3 OFF		J602 closed	X601 (ADD2)	DP
DDI2	S2905 /3 ON		J602 open	X601 (ADD2)	DVI / HDMI
DDI3	S2905 /3 OFF		J603 open	X1301	HDMI/ DP
DDI3	S2905 /3 OFF		J603 closed	X601 (ADD2)	DP
DDI3	S2905 /3 ON		J603 open	X601 (ADD2)	DVI / HDMI

Table 49 DDI Port Selection