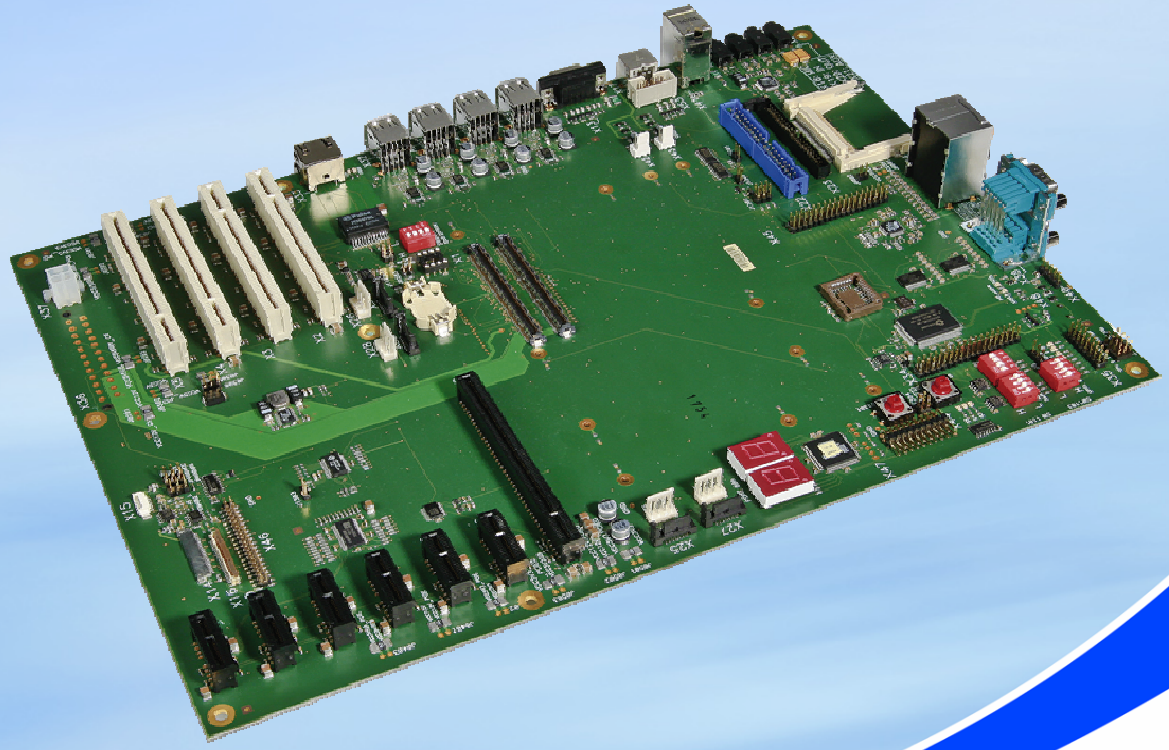
User's Manual



CX-MB-EVA2

MSC COM Express™ Evaluation Board

Rev. 1.0
January 14 , 2009

MICROCOMPUTERS · SYSTEMS · COMPONENTS · VERTRIEBS GMBH

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Preface

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1 General Information

1.1 Revisions and Modifications

Revision	Date	Comment
1.0	January 14, 2009	First release

1.2 Reference Documents

[1] COM Express Module Base Specification
COM Express Revision 1.0
Last update: July 10th, 2005
[2] ATX Specification
atx2_21.pdf
Version 2.2
http://www.formfactors.org
[3] PCI Local Bus Specification Rev. 2.1
PCI21.PDF
Last update: June 1st, 1995
http://www.pcisig.com
[4] JILI Specification
Jilim120.pdf
Last update: April 7th, 2003
http://www.jumptec.de/product/data/jili/index.html
[5] Digital Video Interface DVI
dvi_10.pdf
Rev. 1.0 April 2nd, 1999
http://www.ddwg.org/
[6] ATA/ATAPI-6 Specification
d1410r3b.pdf
http://www.t13.org/
[7] CF+ & CF Specification Rev. 3.0
cfspc3_0.pdf
http://www.compactflash.org/
[8] Serial ATA Specification
Serial ATA 1.0 gold.pdf
Last update: August 29th, 2002 Rev.1.0
http://www.sata-io.org/
[9] IEEE Std. 802.3-2002
802.3-2002.pdf
http://www.ieee.org
[10] Universal Bus Specification
usb_20.pdf
Last update: April 27th, 2000
http://www.usb.org

1.3 Definitions and Abbreviations

COM	Computer-On-Module
RTC	Real Time Clock
ATX	Advanced Technology Extended
PCI	Peripheral Component Interconnect
IDE	Integrated Drive Electronics
EIDE	Enhanced Integrated Drive Electronics
CF	Compact Flash
ATA	Advanced Technology Attachment
ATAPI	Advanced Technology Attachment with Packet Interface
SATA	Serial Advanced Technology Attachment
USB	Universal Serial Bus
PEG	PCI express Graphics
GPIO	General Purpose Input / Output
LVDS	Low Voltage Differential Signaling
JILI	JUMPtec Intelligent LVDS Interface
LAN	Local Area Network
VGA	Video Graphics Array
LPC	Low Pin Count
POST	Power on self test
SMBus	System Management Bus
MDI	Medium Dependent Interface

2 Introduction

2.1 Product Description

COM Express modules are compact, highly integrated Single Board Computers.

Typically a COM Express module consists of CPU, chipset, memory, video controller, Ethernet controller, BIOS flash and EIDE-, SATA- and USB controller. Interface controllers (e.g. for PCMCIA) or connectors (e.g. RJ45) are implemented on the base board on to which the COM Express module can be mounted via one or two 220-pin SMD-connectors. Beside the power supply also signals for PCIe- and PCI-bus, EIDE, 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 five 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 a 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 the COM Express modules.

2.2 Features

- Interface for COM Express module type 2 up to extended form factor
- PCI slots 32Bit v2.1
- 6 PCIe slots
- PCIe x16 graphics / SDVO
- VGA interface
- LVDS interface
- Standard JILI / JILI40
- TV-Out
- AC'97-Link
  - LineIn
  - LineOut
  - Headphone
  - Microphone
- High Definition Audio
  - LineIn
  - LineOut
  - Microphone
  - Center / LFE
  - Surround
  - Side

- 40 pin IDE interface Ultra ATA-100/66/33
- 44 pin IDE interface Ultra ATA-100/66/33
- Compact flash interface Spec. v3.0
- SATA channels up to 150MB/s
- 8 USB2.0 root hub interfaces
- LAN interface max. 1GBit
- LPC slot
- Pin header for GPIOs
- SuperIO W83627THF
    - 2x PS/2
    - 2x COM
    - 1x IrDA
    - fan interfaces
- Hardware monitoring
- Power supply via ATX connector
- POST display on LPC
- Serial EEPROM on I²C-Bus
- Serial EEPROM on SMBus
- On-board BIOS Flash
- Beeper

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.

2.3 Block Diagram

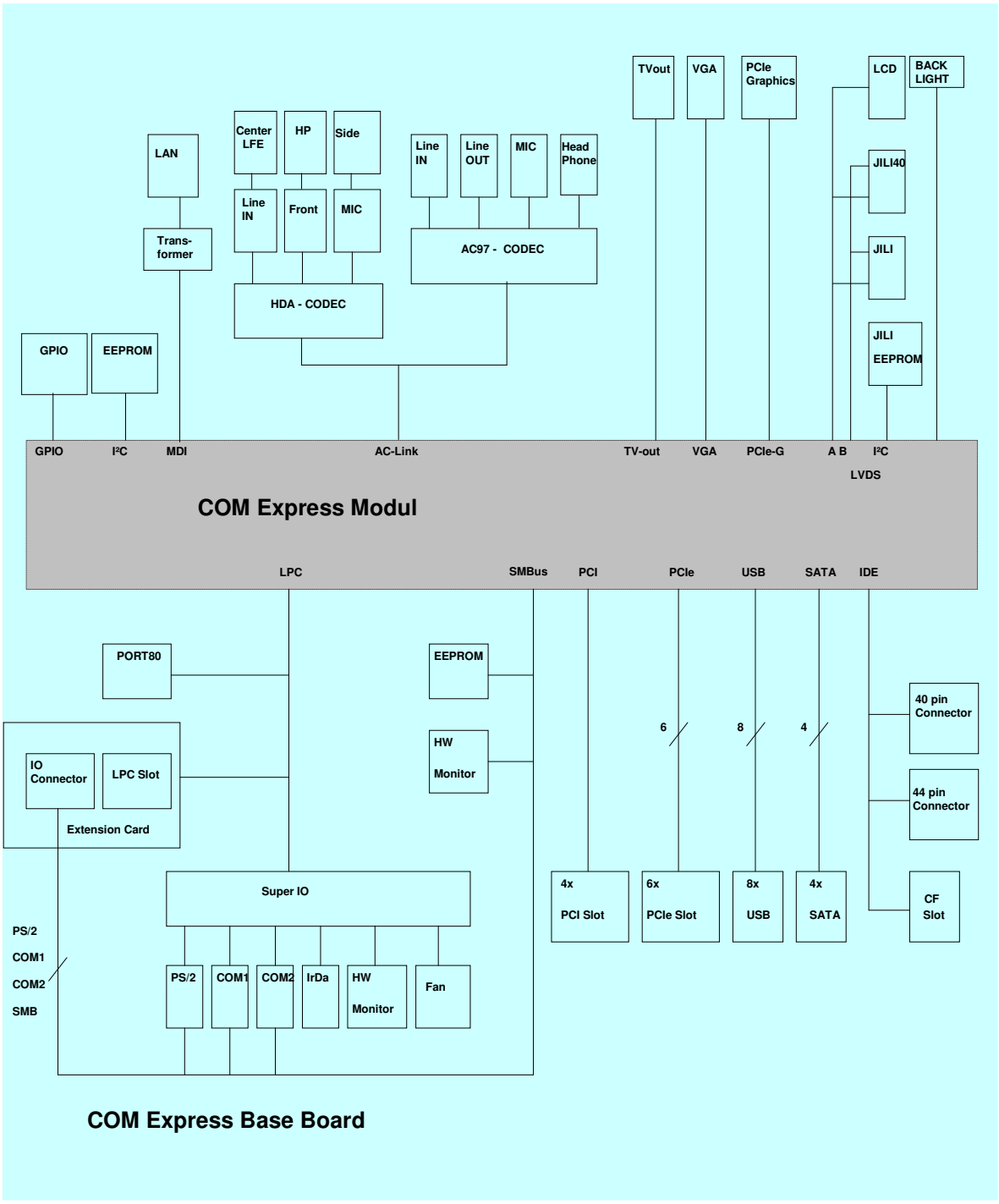

Illustration 1 Block Diagram Base Board

2.4 Positioning of the Connectors

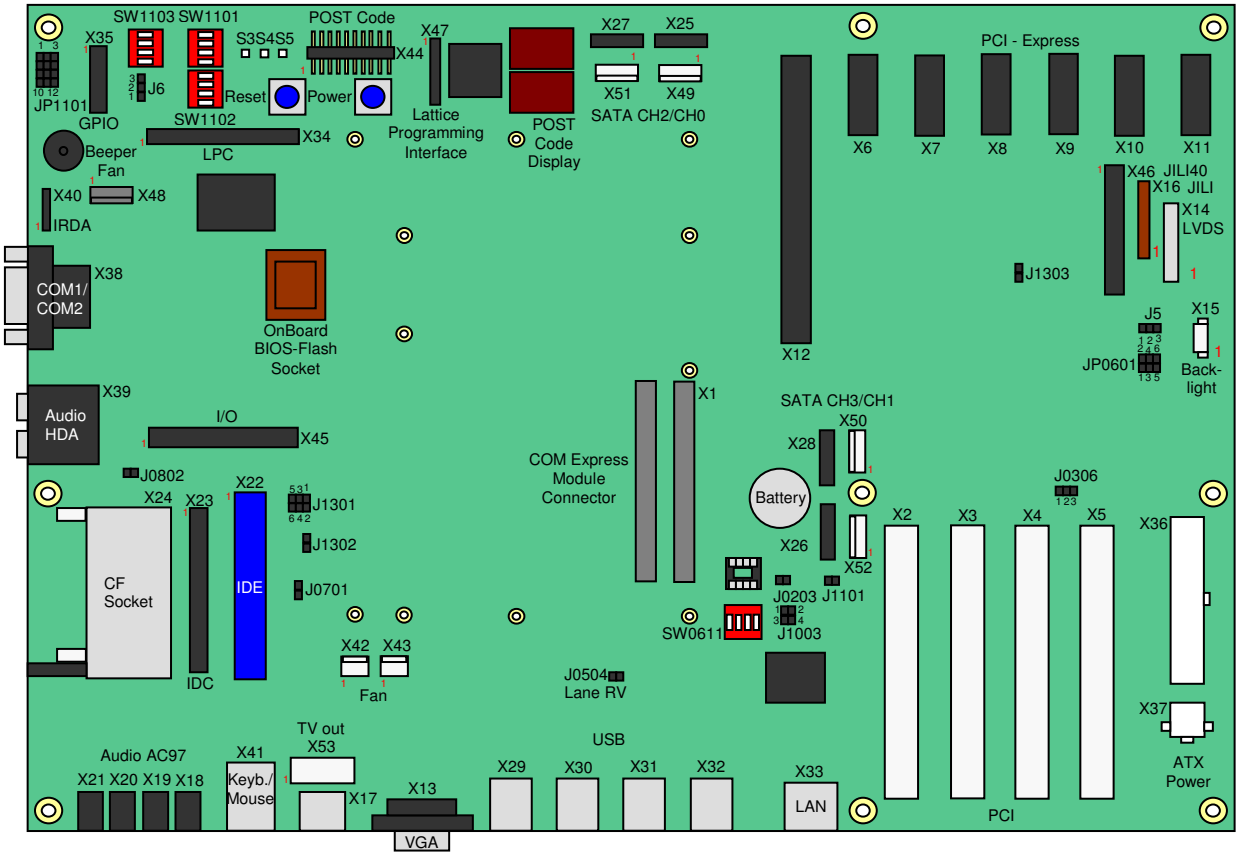

Illustration 2 Positioning of the Connectors

3 Mechanics

3.1 Dimensions

Dimension:	254.5 mm x 36.8 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

CXC:	4x	M2.5 x 5mm bolt
CXB:	5x	M2.5 x 5mm bolt
CXE:	7x	M2.5 x 5mm bolt

4 Hardware

4.1 Plug-in Position of the COM Express module

Sockets for a COM Express type 2 module is available on the base board.

Following form factors are supported:

- Compact module (Industry Consortium form-factor)
- Basic module
- Extended module

Specification:

- Reference: X1
- Connector: AMP / Tyco 3-1827233-6
  0.5 mm pitch free height 440 pin 5H plug (combination of two 220pin plugs)
- Pinout: Refer to COM Express specification for type 2 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_SDIN2
A29	AC_SYNC	B29	AC_SDIN1

A30	AC_RST#	B30	AC_SDIN0
A31	GND	B31	GND
A31	GND	B31	GND
A32	AC_BITCLK	B32	SPKR
A33	AC_SDOUT	B33	I2C_CK
A34	BIOS_DISABLE#	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	KBD_RST#	B86	VCC_5V_SBY
A87	KBD_A20GATE	B87	VCC_5V_SBY
A88	PCIE0_CK_REF+	B88	RSVD
A89	PCIE0_CK_REF-	B89	VGA_RED
A90	GND	B90	GND
A91	RSVD	B91	VGA_GRN
A92	RSVD	B92	VGA_BLU
A93	GPO0	B93	VGA_HSYNC
A94	RSVD	B94	VGA_VSYNC
A95	RSVD	B95	VGA_I2C_CK
A96	GND	B96	VGA_I2C_DAT
A97	VCC_12V	B97	TV_DAC_A
A98	VCC_12V	B98	TV_DAC_B
A99	VCC_12V	B99	TV_DAC_C
A100	GND	B100	GND
A101	VCC_12V	B101	VCC_12V
A102	VCC_12V	B102	VCC_12V
A103	VCC_12V	B103	VCC_12V
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	IDE_D7	D2	IDE_D5
C3	IDE_D6	D3	IDE_D10
C4	IDE_D3	D4	IDE_D11
C5	IDE_D15	D5	IDE_D12
C6	IDE_D8	D6	IDE_D4
C7	IDE_D9	D7	IDE_D0
C8	IDE_D2	D8	IDE_REQ
C9	IDE_D13	D9	IDE_IOW#
C10	IDE_D1	D10	IDE_ACK#
C11	GND	D11	GND
C12	IDE_D14	D12	IDE_IRQ
C13	IDE_IORDY	D13	IDE_A0
C14	IDE_IOR#	D14	IDE_A1
C15	PCI_PME#	D15	IDE_A2
C16	PCI_GNT2#	D16	IDE_CS1#
C17	PCI_REQ2#	D17	IDE_CS3#
C18	PCI_GNT1#	D18	IDE_RESET#
C19	PCI_REQ1#	D19	PCI_GNT3#
C20	PCI_GNT0#	D20	PCI_REQ3#
C21	GND	D21	GND
C22	PCI_REQ0#	D22	PCI_AD1

C23	PCI_RESET#	D23	PCI_AD3
C24	PCI_AD0	D24	PCI_AD5
C25	PCI_AD2	D25	PCI_AD7
C26	PCI_AD4	D26	PCI_C/BE0#
C27	PCI_AD6	D27	PCI_AD9
C28	PCI_AD8	D28	PCI_AD11
C29	PCI_AD10	D29	PCI_AD13
C30	PCI_AD12	D30	PCI_AD15
C31	GND	D31	GND
C31	GND	D31	GND
C32	PCI_AD14	D32	PCI_PAR
C33	PCI_C/BE1#	D33	PCI_SERR#
C34	PCI_PERR#	D34	PCI_STOP#
C35	PCI_LOCK#	D35	PCI_TRDY#
C36	PCI_DEVSEL#	D36	PCI_FRAME#
C37	PCI_IRDY#	D37	PCI_AD16
C38	PCI_C/BE2#	D38	PCI_AD18
C39	PCI_AD17	D39	PCI_AD20
C40	PCI_AD19	D40	PCI_AD22
C41	GND	D41	GND
C42	PCI_AD21	D42	PCI_AD24
C43	PCI_AD23	D43	PCI_AD26
C44	PCI_C/BE3#	D44	PCI_AD28
C45	PCI_AD25	D45	PCI_AD30
C46	PCI_AD27	D46	PCI_IRQC#
C47	PCI_AD29	D47	PCI_IRQD#
C48	PCI_AD31	D48	PCI_CLKRUN#
C49	PCI_IRQA#	D49	PCI_M66EN
C50	PCI_IRQB#	D50	PCI_CLK
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	SDVO_DATA	D73	SDVO_CLK
C74	PEG_RX7+	D74	PEG_TX7+
C75	PEG_RX7-	D75	PEG_TX7-

C76	GND	D76	GND
C77	RSVD	D77	IDE_CBLID#
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 Slots

Four 32-bit PCI slots are provided according to PCI specification v2.1.

The signal assignment for slot 0, slot 1, slot 2 and slot 3 is defined in the COM Express specification.

- INTA#, INTB#, INTC# and INTD#
- REQ[0..3]#
- GNT[0..3]#
- IDSEL

PCI Slot	Reference
PCI Slot 0	X2
PCI Slot 1	X3
PCI Slot 2	X4
PCI Slot 3	X5

Table 3 Assignment PCI slot to connector reference

Specification:

- References: X2 - X5
- Connector: AMP / Tyco 5145154-4
- Pinout: Refer to PCI specification V2.1 [3]

Pin	Signal	Pin	Signal
A1	TRST#	B1	-12V
A2	12V	B2	TCK
A3	TMS	B3	GND
A4	TDI	B4	TDO
A5	5V	B5	5V
A6	INTA#	B6	5V
A7	INTC#	B7	INTB#
A8	5V	B8	INTD#
A9	RSVD	B9	PRSNT1#
A10	5V	B10	RSVD
A11	RSVD	B11	PRSNT2#
A12	GND	B12	GND
A13	GND	B13	GND
A14	3V3	B14	RSVD
A15	RST#	B15	GND
A16	5V	B16	CLK
A17	GNT#	B17	GND
A18	GND	B18	REQ#
A19	PME#	B19	5V
A20	AD30	B20	AD31
A21	3V3	B21	AD29

A22	AD28	B22	GND
A23	AD26	B23	AD27
A24	GND	B24	AD25
A25	AD24	B25	3V3
A26	IDSEL	B26	C/BE3#
A27	3V3	B27	AD23
A28	AD22	B28	GND
A29	AD20	B29	AD21
A30	GND	B30	AD19
A31	AD18	B31	3V3
A32	AD16	B32	AD17
A33	3V3	B33	C/BE2#
A34	FRAME#	B34	GND
A35	GND	B35	IRDY#
A36	TRDY#	B36	3V3
A37	GND	B37	DEVSEL#
A38	STOP#	B38	GND
A39	3V3	B39	LOCK#
A40	SMBCLK	B40	PERR#
A41	SMBDAT	B41	3V3
A42	GND	B42	SERR#
A43	PAR	B43	3V3
A44	AD15	B44	C/BE1#
A45	3V3	B45	AD14
A46	AD13	B46	GND
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD09	B49	GND
Key			
A52	C/BE0#	B52	AD08
A53	3V3	B53	AD07
A54	AD06	B54	3V3
A55	AD04	B55	AD05
A56	GND	B56	AD03
A57	AD02	B57	GND
A58	AD00	B58	AD01
A59	5V	B59	5V
A60	REQ64#	B60	ACK64#
A61	5V	B61	5V
A62	5V	B62	5V

Table 4 Pin out PCI

4.3 PCI Express x1 Slots

One PCIe x1 slot is assigned to each of the 6 PCIe lanes of the COM Express module.

Note: The order of the connectors has changed on the new layout. Now X6 is near PEG slot.

Note : The number of PCIe lanes available will depend on the COM Express module used – not all modules can support 6 PCIe lanes.

PCIe Lane	References
PCIe Lane 0	X6
PCIe Lane 1	X7
PCIe Lane 2	X8
PCIe Lane 3	X9
PCIe Lane 4	X10
PCIe Lane 5	X11

Table 5 Assignment PCIe Lane to connector reference

Specification:

- References: X6 - X11
- Connector: AMP / Tyco 4-1612163-1
- Pinout: 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+	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

4.4 PCI Express x16 Graphics Slot

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

Depending on the chipset the PCIe signals are multiplexed with SDVO signals, thus SDVO modules can be run in this slot as well. SDVO or PCIe graphics will be activated automatically via PullUps of the SDVO I²C interface on the SDVO module.

Specification:

- References: X12
- Connector: AMP / Tyco 4-1612163-4
- Pinout: 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+	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 [1]
A34	GND	B34	PET_n4 [1]
A35	PER_p4 [1]	B35	GND

A36	PER_n4 [1]	B36	GND
A37	GND	B37	PET_p5 [1]
A38	GND	B38	PET_n5 [1]
A39	PER_p5 [1]	B39	GND
A40	PER_n5 [1]	B40	GND
A41	GND	B41	PET_p6 [1]
A42	GND	B42	PET_n6 [1]
A43	PER_p6 [1]	B43	GND
A44	PER_n6 [1]	B44	GND
A45	GND	B45	PET_p7 [1]
A46	GND	B46	PET_n7 [1]
A47	PER_p7 [1]	B47	GND
A48	PER_n7 [1]	B48	PRSNT2#
A49	GND	B49	GND
A50	RSVD	B50	PET_p8 [1]
A51	GND	B51	PET_n8 [1]
A52	PER_p8 [1]	B52	GND
A53	PER_n8 [1]	B53	GND
A54	GND	B54	PET_p9 [1]
A55	GND	B55	PET_n9 [1]
A56	PER_p9 [1]	B56	GND
A57	PER_n9 [1]	B57	GND
A58	GND	B58	PET_p10 [1]
A59	GND	B59	PET_n10 [1]
A60	PER_p10 [1]	B60	GND
A61	PER_n10 [1]	B61	GND
A62	GND	B62	PET_p11 [1]
A63	GND	B63	PET_n11 [1]
A64	PER_p11 [1]	B64	GND
A65	PER_n11 [1]	B65	GND
A66	GND	B66	PET_p12 [1]
A67	GND	B67	PET_n12 [1]
A68	PER_p12 [1]	B68	GND
A69	PER_n12 [1]	B69	GND
A70	GND	B70	PET_p13 [1]
A71	GND	B71	PET_n13 [1]
A72	PER_p13 [1]	B72	GND
A73	PER_n13 [1]	B73	GND
A74	GND	B74	PET_p14 [1]
A75	GND	B75	PET_n14 [1]
A76	PER_p14 [1]	B76	GND
A77	PER_n14 [1]	B77	GND
A78	GND	B78	PET_p15 [1]
A79	GND	B79	PET_n15 [1]
A80	PER_p15 [1]	B80	GND
A81	PER_n15 [1]	B81	PRSNT2#
A82	GND	B82	RSVD

Table 7 Pin out PCI Express x16 Graphics Slot

4.5 VGA Interface

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

Specification:

- References: X13
- Connector: Suyin 7507S-15G5T-A
- Pinout: Refer to Table 3

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 8 Pinout VGA Interface

4.6 LVDS-Interface

LCDs can be connected via a single channel LVDS interface:

Specification:

- References: X14
- Connector: Hirose DF19G-20P-1H
- Pinout: Refer to Table 4

Pin 20 can be configured via 0 Ohm resistors to “OPEN” or “GND”

Pin	Signal name	Function
1	VDD	Power Supply: +3.3V
2	VDD	Power Supply: +3.3V
3	VSS	Ground
4	VSS	Ground
5	LVDS_A0-	LVDS Negative data signal (-)
6	LVDS_A0+	LVDS Positive data signal (+)
7	VSS	Ground
8	LVDS_A1-	LVDS Negative data signal (-)
9	LVDS_A1+	LVDS Positive data signal (+)
10	VSS	Ground
11	LVDS_A2-	LVDS Negative data signal (-)
12	LVDS_A2+	LVDS Positive data signal (+)
13	VSS	Ground
14	LVDS_A_CK-	LVDS Negative clock signal (-)
15	LVDS_A_CK+	LVDS Positive clock signal (+)
16	VSS	Ground
17	LVDS_A3-	LVDS Negative data signal (-)
18	LVDS_A3+	LVDS Positive data signal (+)
19	VSS	Ground
20	NC / VSS	Reserved / Ground

Table 9 Pinout Single Channel LVDS-Interface

4.6.1 LVDS EEPROM

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

To avoid conflicts with configuration EEPROMs connected via the JILI connector, this EEPROM can be assembled optionally.

4.6.2 Backlight Inverter Interface

The supply voltage of the backlight can be adjusted with jumper JP0601. The according position is printed on the PCB.

Jumper J5 should be set according to the backlight inverter used.

If the inverter needs a low active start signal, jumper J5 has to be set to L (pin1 connected to pin2).

If the inverter needs a high active start signal, jumper J5 has to be set to H (pin2 connected to pin3).

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. This signal is integrated and then limited to the maximum allowable voltage of the backlight inverter via a voltage divider.

Control voltage: 0...3V

A value of 0V corresponds to maximum brightness.

Specification:

- References: X15
- Connector: Molex (53047-0510) 53261-0590
- Pinout: Refer to Table 5

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

Table 10 Pinout Backlight

4.7 JILI Interface

4.7.1 Standard JILI Connector

A standard JILI connector can be used alternatively for connection of LCDs.

Both, single and dual channel LCDs, can be connected to the base board via small adaptor boards.

Specification:

- References: X16
- Connector: Hirose FH12-40S-0.5SV
- Pinout: "standard JILI" according to JILI specification [4]

4.7.2 JILI40 Connector

Any LCD display can be connected via an adaptor board to the JILI40 connector.

Two 24 bit LVDS channels are available on this 40-pin header

Specification:

- References: X46
- Connector: Samtec TMM-120-01-LM-D-SM-P
- Pinout: "JILI40" according to JILI specification [4]

4.8 TV Out

A TV-OUT connector is implemented for displaying the video signal on a TV set (or the like). The base board supports the following video signals

- Composite Video
- Component Video (YPbPr)
- S-Video

The type of the video signal is defined by the graphics controller on the COM Express module.

Specification:

- References: X17
- Connector: AMP 5786766-1
- Pinout: Refer to Table 6

Pin	Signal name	Composite	Component	S-Video
1	TV_IRTN_B	Ground	Ground	Ground
2	TV_IRTN_C	Ground	Ground	Ground
3	TV_DACB	not used	Luminance (Y)	Luminance
4	TV_DACC	not used	Chrominance (Pr)	Chrominance
5	TV_DACA	CVBS	Chrominance (Pb)	not used
6	TV_IRTNA	Ground	Ground	Ground
7	RSVD	reserved	reserved	reserved

Table 11 Pinout TV-Out

The signals can be adapted to a different interface with a 10-pin header.

Specification:

- References: X53
- Connector: IDC-M 10pol. THT RM2.54
- Pinout: Refer to Table 7

Pin	Signal	Pin	Signal
1	GND	2	TV_DACA
3	GND	4	TV_DACB
5	GND	6	TV_DACC
7	GND	8	GND
9	GND	10	GND

Table 12 Pinout TV-Out Pin header

4.9 Audio

An AC'97 codec V2.2 is connected to the AC link of the COM Express module. Footprint and circuit are compatible to following AC'97 codecs:

- VIA VT1612A
- Realtek ALC650

Following LF signals are provided by the AC'97 codec:

- Mono Microphone
- Stereo LineIn
- Stereo LineOut
- Stereo Headphone

Alternatively a VIA VT1708 HDA codec can be connected to the AC link of the COM Express module. The audio interface can be selected with Jumper J0701.

Following LF signals are provided by the HDA codec:

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

4.9.1 AC'97 codec

4.9.1.1 Mono-Microphone

Bias voltage for capacitor microphones is provided.

Specification:

- References: X18
- Connector: Kycon ST-3000Mono-Microphone
- Pinout: Refer to Table 8

Pin	Signal name	Function
1	GND	Ground
2	MIC_BIAS	Bias initial load (ring)
3	MIC	NF signal (tip)

Table 13 Pinout Microphone

4.9.1.2 Stereo LineIn

Specification:

- References: X19
- Connector: Kycon ST-3000
- Pinout: Refer to Table 9**Table 14**

Pin	Signal name	Function
1	GND	Ground
2	LINEIN_R	NF signal right (ring)
3	LINEIN_L	NF signal left (tip)

Table 14 Pinout LineIn

4.9.1.3 Stereo LineOut

Specification:

- References: X20
- Connector: Kycon ST-3000
- Pinout: Refer to Table 10

Pin	Signal name	Function
1	GND	Ground
2	LINEOUT_R	NF signal right (ring)
3	LINEOUT_L	NF signal left (tip)

Table 15 Pinout LineOut

4.9.1.4 Stereo Headphone

Specification:

- References: X21
- Connector: Kycon ST-3000
- Pinout: Refer to Table 11

Pin	Signal name	Function
1	GND	Ground
2	HPOUT_R	NF signal right (ring)
3	HPOUT_L	NF signal left (tip)

Table 16 Pinout Headphone

4.9.2 HDA codec

Specification:

- References: X39
- Connector: Foxconn JAS331-H1G2-4F
- Pinout: Refer to Table 12

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

Table 17 Pinout LineOut

4.10 IDE Interface

A standard IDE interface is provided according to ATA/ATAPI, with the controller supporting at least Ultra-ATA100 with 100 MB/sec data rate. The transfer mode that can be selected depends on the cable used and which modes are supported by the drives.

Using a ATA100 cable on X22, avoid a master slave combination with X23 or X24.

4.10.1 Primary IDE Channel

4.10.1.1.1 40-pin IDE interface

A 40-pin IDC connector is provided at the primary IDE channel for standard IDE drives.

Specification:

- References: X22
- Connector: FCI 75869-118
- Pinout: Refer to Specification ATA/ATAPI-6 [6, page 400, Table A3]

4.10.1.1.2 44-pin IDE Interface

For connection of 2.5” hard disks, a 44-pin IDC connector is provided at the primary IDE channel.

Specification:

- References: X23
- Connector: Yamaichi ZP7-44-S-G
- Pinout: Refer to Specification ATA/ATAPI-6 [6, page 412, Table A16]

4.10.1.1.3 Compact Flash Interface

A socket for compact flash cards, type I/II, is provided at the primary IDE channel.

The compact flash interface supports True IDE mode according to compact flash specification rev. 3.0.

Inter alia the compact flash specification rev. 3.0 supports the UDMA mode.

Specification:

- References: X24
- Connector: Yamaichi CF050P2-003-10-D2
- Pinout: Refer to specification "CF+ & CF specification rev. 3.0" [7, page 24, table 4]

4.11 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.

Every SATA signal connector has its own power supply connector.

SATA Channel	References
SATA 0	X25
SATA 1	X26
SATA 2	X27
SATA 3	X28

Table 18 Assignment SATA Channel to Connector Reference

Specification SATA signal connector:

- References: X25 - X28
- Connector: Molex 87713 series
- Pinout: Refer to Specification SATA [8, page 46, table 3]

Specification Power Supply:

- References: X49 - X52
- Connector: AMP 171825-4
- Pinout: Refer to ATX specification V2.2 [2, "Floppy Drive Power Connector"]

4.12 USB Topology

Eight USB ports are provided by the COM Express module.

The exact assignment of each port is defined in the following table:

USB-Port	References	Beschreibung
USB0	X29	External dual connector 1
USB1	X29	External dual connector 1
USB2	X30	External dual connector 2
USB3	X30	External dual connector 2
USB4	X31	External dual connector 3
USB5	X31	External dual connector 3
USB6	X32	External dual connector 4
USB7	X32	External dual connector 4

Table 19 Assignment USB Ports

4.12.1 USB Power Supply

The power supplies are protected by USB power switches. In addition the input voltages of the USB power switches are protected by resettable fuses.

The USB power switches have the following functions:

- The output current is limited to 500mA per port
- A signal to detect overcurrent is generated for each two ports
- USB0 and USB1 have one common signal to detect overcurrent
- USB2 and USB3 have one common signal to detect overcurrent
- USB4 and USB5 have one common signal to detect overcurrent
- USB6 and USB7 have one common signal to detect overcurrent

Specification:

- References: X29 - X32
- Connector: AMP 787617-2 (Dual USB connector type A)
- Pinout: according to USB specification 2.0 [10]

4.13 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 PULSE H 5004 not only supports 10BaseT and 100BaseTX but also 1Gbit.

Specification:

- References: X33
- Connector: AMP 2-406549
- Pinout: Refer to IEEE Std. 802.3 [9, section three, page 225]

4.14 LPC Slot

An LPC slot is available for insertion of LPC expansion boards.

Specification:

- References: X34
- Connector: 36-pin header, 2.54mm
- Pinout: Refer to Table 15

Pin	Signal	Pin	Signal
1	VCC5V	2	VCC5V
3	NC	4	VCC3V3
5	VCC3V3	6	NC
7	VCC3V3_SBY	8	GND
9	GND	10	LPC_RST#
11	GND	12	LPC_LAD0
13	LPC_LAD1	14	LPC_LAD2
15	LPC_LAD3	16	LPC_FRAME#
17	GND	18	LPC_DRQ0
19	GND	20	LPC_CLK
21	GND	22	LPC_PWRDWN
23	GND	24	PME#
25	GND	26	LPC_SMI#
27	GND	28	SERIRQ
29	GND	30	PCI_CLKRUN#
31	GND	32	LPC_DRQ1#
33	GND	34	CPU_RST#
35	GND	36	GND

Table 20 Pinout LPC-Slot

4.15 I/O Connector

An alternative SuperIO controller can be integrated via a 36-pin connector. In this case the onboard chip is not populated and a piggy back board with the SuperIO chip is plugged into the I/O and into the LPC connector.

Specification:

- References: X45
- Connector: CAB 1002-161-036
- Pinout: Refer to Table 16

Pin	Signal	Pin	Signal
1	SMB_CLK	2	SLP_S3#
3	SMB_DAT	4	SLP_S4#
5	KBDAT	6	SLP_S5#
7	KBCLK	8	EXT_THRM#
9	MSDAT	10	SMBALERT#
11	MSCLK	12	NC
13	NC	14	THRMTRIP#
15	NC	16	BATLOW#
17	NC	18	NC
19	NC	20	NC
21	COM1_DCD#	22	COM2_DCD#
23	COM1_RXD	24	COM2_RXD
25	COM1_TXD	26	COM2_TXD
27	COM1_DTR#	28	COM2_DTR#
29	COM1_DSR#	30	COM2_DSR#
31	COM1_RTS#	32	COM2_RTS#
33	COM1_CTS#	34	COM2_CTS#
35	COM1_RI#	36	COM2_RI#

Table 21 Pinout I/O-Connector

4.16 GPIO

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

The GPIs have PullUp resistors and are routed to a dip switch (SW1103). With the dip switch the GPIs can be connected to ground. The assignment GPI – switch – level is printed on the PCB.

If the PullUp resistors are not populated, you can switch LPC_SMI# or HWM_SMI# to GPI0, GPI1, GPI2 or GPI3 with jumper JP1101.

The GPOs are connected to LEDs for optically status display.

Specification:

- References: X35
- Connector: CAB 1002-161-036
- Pinout: Refer to Table 17

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 22 Pinout GPIO connector

4.17 ATX Connector

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

Specification ATX connector:

- References: X36
- Connector: Molex 44206-0007
- Pinout: Refer to ATX specification V2.2 [2]

Specification ATX12V connector:

- References: X37
- Connector: Molex 39-29-9042
- Pinout: Refer to ATX specification V2.2 [2]

4.18 SuperIO

The Winbond SuperIO W83627THF is integrated on the base board.

Interfaces used by the SuperIO

- 2 RS232 interface (function of COM port shared with IrDA interface)
- 1 IrDA interface (function shared with COM port)
- PS/2 interface for keyboard and mouse
- 2 fan interfaces
- Voltage control
- 1 temperature control

4.18.1 COM Ports

Characteristics of the COM ports:

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

Specification:

- References: X38
- Connector: Foxconn DM10151-P71
- Pinout: Refer to Table 18
  (COM1: lower Jack, COM2 upper Jack)

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

Table 23 Pinout COM Ports

4.18.2 IrDA

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

Specification:

- References: X40
- Connector: CAB 1001-161-005
- Pinout: Refer to Table 19**Table 24**

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

Table 24 Pinout IrDA

4.18.3 PS/2

There is a dual PS/2 connector for PS/2 keyboards and PS/2 mice. The upper jack only supports PS/2 mice. The pins of the lower jack provide both, signals for PS/2 keyboards and for PS/2 mice. Keyboards can be connected directly, mice can only be operated using an according Y-adapter.

Specification:

- References: X41
- Connector: Tyco 84376-1
- Pinout: Refer to Tables 20 and 21

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

Table 25 Pinout Upper PS/2 Jack

Pin	Signal name	Function
1	KBDAT	Keyboard Data
2	MSDAT	Mouse Data
3	GND	Ground
4	+5V	VCC
5	KBCLK	Keyboard Clock
6	MSCLK	Mouse Clock

Table 26 Pinout Lower PS/2 Jack

4.18.4 Fan interface

Two PWM controlled fan interfaces are integrated on the base board. They are located near the COM Express modul.

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

Specification:

- References: X42 - X43
- Connector: Molex 22-04-1031

Pinout: Refer to Table **27**

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

Table 27 Pinout Fan Interface

4.18.5 Intel Fan interface

A PWM controlled intel fan interface is shared with X43. Don't use both at the same time.

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

Specification:

- References: X48
- Connector: Molex 47053-1000
- Pinout: Refer to Table 23

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

Table 28 Pinout Fan Interface

4.18.6 SuperIO Hardware Monitor

You can check different voltages and temperatures using the hardware monitor that is integrated in the SuperIO.

Monitored voltages

- VBAT
- 3.3V
- 12V

- 5V

Measured temperatures

- Ambient temperature
  The temperature is measured with a thermistor.

4.19 SMB Hardware Monitor

In addition to the SuperIO hardware monitor you can also connect a SMBus hardware monitor. This chip enables you to control different voltages, temperatures and rotation speeds in legacy-free-designs where the SuperIO is not supported.

Hardware monitor:

- Winbond W83L786R

Controlled voltages

- VBAT
- 3.3V
- 12V
- 5V

Measured temperatures

- Ambient temperature
  The temperature is measured with a thermistor.

Fan interface

For evaluation and control of the revolution speeds please refer to chapter 4.18.4.

4.20 Serial EEPROM on SMBus

For testing purposes a serial EEPROM (4kBit) is connected to the SMBus. To avoid address conflicts, the address can be selected with dip switch SW1101.

4.21 Serial EEPROM on I2C-Bus

For testing purposes a serial EEPROM (4kBit) is connected to the I2C bus. To avoid address conflicts, the address can be selected with dip switch SW1102.

4.22 OnBoard BIOS-Flash

There is a PLCC32 socket on the mother board, where an additional firmware hub can be inserted. To boot from this firmware hub, the firmware hub on the COM Express module has to be disabled with J0203.

4.23 POST-Code Display

For debugging purposes a POST code display is implemented on the base board, thus enabling the display of BIOS outputs on IO-port 80h and/or Port 90h.

In addition, these signals are output on a pin header. For protocolling purposes a logic analyser can be connected here.

The pinout of the output connector X44 corresponds to the pinout of the Hewlett Packard HP-PODs.

Specification:

- References: X44
- Connector: 20-pin header 2.54mm

Pinout: Refer to Table **29**

Pin	HP-POD	Function	Pin	HP-POD	Function
1	+5V	not used	2	CLK2	LPC_CLK
3	CLK1	not used	4	D15	not used
5	D14	not used	6	D13	Test signal 3
7	D12	Test signal 2	8	D11	Test signal 1
9	D10	Test signal 0	10	D9	not used
11	D8	Strobe	12	D7	Data 7
13	D6	Data 6	14	D5	Data 5
15	D4	Data 4	16	D3	Data 3
17	D2	Data 2	18	D1	Data 1
19	D0	Data 0	20	GND	Ground

Table 29 Pinout POST Display (HP-POD)

4.23.1 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: X47
- Connector: CAB 714-91-164-31-007 (socket)
- Pinout: Refer to Table 30

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	Keypin
6	MODE_TMS	Programming Mode
7	GND	Ground
8	SCLK_TCK	Serial Clock

Table 30 Pinout Lattice Programming Interface

4.24 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 jumper J1101.

Type of battery: 2032

Battery socket: Renata SMTU2032-1

4.25 Beeper

A piezo signal generator is implemented for acoustic signals.

Type: Digisound F/DGX05P

4.26 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.

Type: C&K JTP-1230F

4.27 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.

Type: C&K JTP-1230F

4.28 Miscellaneous

4.28.1 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.

4.28.2 Ground Pins

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

4.28.3 Sleep State LED Display

The MSC CX-MB EVA2 has 3 LEDs to display the SleepStates.

LED1201 displays status S3.

LED1202 displays status S4.

LED1203 displays status S5.

4.29 Jumper settings

4.29.1 BIOS-Flash Jumper J0203

To boot from the firmware hub in the PLCC32 socket on the mother board, install J0203. The firmware hub on the COM Express module will be automatically disabled.

Function	J0203
COM Express module flash	removed (BIOS disable LED off)
Flash in PLCC32	installed (BIOS disable LED on)

4.29.2 PCI I/O voltage Jumper J0306

PCI VCCIO	Pins to close
+3,3 V	2-3
+5,0 V	1-2

If no Jumper is closed, the VCCIO plane is powered by 3V over a diode.

4.29.3 Backlight power Jumpers JP0601

Voltage	Pins to close
+12,0 V	5-6
+5,0 V	3-4
+3,3 V	1-2

4.29.4 Backlight polarity Jumper J5

Function	Pins to close
LVDS_BKLT_EN	2-3
LVDS_BKLT_EN#	1-2

4.29.5 AC'97 / HDA select Jumper J0701

Function	J0701
AC'97 codec	removed
HDA codec	installed

4.29.6 Compact Flash Master Jumper J0802

Function	J0802
Master	removed
Slave	installed

4.29.7 LAN speed mode Jumper J1003

Function	J1003
10 / 100 Mbit	all removed
Gigabit	1-2 and 3-4 installed

4.29.8 Battery Jumper J1101

Function	J1101
Battery on	installed

4.29.9 Super I/O disable Jumper J6

Function	J6
Super I/O enabled	1-2
Super I/O disabled	2-3

4.29.10 SMBus Hardware monitor address Jumper J1303

SMBus Address	J1303
0101 1110	removed
0101 1100	installed

4.29.11 ATX Funktion Jumper J1301

PS_ON# from	close
PM_SLPS3#	1-2
PM_SLPS4#	3-4
PM_SLPS5#	5-6

4.29.12 No ATX Jumper J1302

Function	J1302
no ATX	installed

4.29.13 GPI SMI Jumper JP1101

COMX_GPI	LPC_SMI#	HWM_SMI#
GPI0	1-2	2-3
GPI1	4-5	5-6
GPI2	7-8	8-9
GPI3	10-11	11-12

4.29.14 GPI GPO Jumper X35

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

4.29.15 Lane RV Jumper J0504

Function	J0504
PEG Lane reverse	installed

DIP-switch settings

4.29.16 LCD EEPROM SW0611

Switch on	Address
1	A0 high
2	A1 high
3	A2 high
4	-

4.29.17 SMB EEPROM SW1101

Switch on	Address
1	A0 high
2	A1 high
3	A2 high
4	-

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

4.29.18 I²C EEPROM SW1102

Switch on	Address
1	A0 high
2	A1 high
3	A2 high
4	-

4.29.19 GPI-switch SW1103

COMX_GPO	GND
GPI0	1
GPI1	2
GPI2	3
GPI3	4