COM Express™ conga-MCB

Short description of the congatec COM Express™ mini carrier board

Short Description

Revision 1.0

Revision History

Revision	Date (dd.mm.yy)	Author	Changes
1.0	21.04.	GDA	Official release

Preface

This short description provides information about the components, features and connectors available on the conga-MCB COM Express™ mini carrier board.

Disclaimer

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Intended Audience

This short description is intended for technically qualified personnel. It is not intended for general audiences.

Lead-Free Designs (RoHS)

All congatec AG products are created from lead-free components and are completely RoHS compliant.

Symbols

The following symbols are used in this short description:

Warning

Warnings indicate conditions that, if not observed, can cause personal injury.

Caution

Cautions warn the user about how to prevent damage to hardware or loss of data.

Note

Notes call attention to important information that should be observed.

Connector Type

Describes the connector that must be used with the COM Express™ mini carrier board, not the connector found on the COM Express™ mini carrier board.

Link to connector layout diagram

This link icon is located in the top left corner of each page. It provides a direct link to the connector layout diagram on page 8 of this document.

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Terminology

Term	Description
PCI Express (PCIe)	Peripheral Component Interface Express – next-generation high speed Serialized I/O bus
PCI Express Lane	One PCI Express Lane is a set of 4 signals that contains two differential lines for Transmitter and two differential lines for Receiver. Clocking information is embedded into the data stream.
x1, x2, x4, x16	x1 refers to one PCI Express Lane of basic bandwidth; x2 to a collection of two PCI Express Lanes; etc.. Also referred to as x1, x2, x4 or x16 link.
ExpressCard	A PCMCIA standard built on the latest USB 2.0 and PCI Express buses.
PCI Express Mini Card	PCI Express Mini Card add-in card is a small size unique form factor optimized for mobile computing platforms.
MMCplus	MMCplus was defined for first time in MMC System Specification v4.0. MMCplus is backward compatible with MMC. MMCplus has 13 pins.
SDIO card	SDIO (Secure Digital Input Output) is a non-volatile memory card format developed for use in portable devices.
USB	Universal Serial Bus
SATA	Serial AT Attachment: serial-interface standard for hard disks
HDA	High Definition Audio
S/PDIF	S/PDIF (Sony/Philips Digital Interconnect Format) specifies a Data Link Layer protocol and choice of Physical Layer specifications for carrying digital audio signals between devices and stereo components.
HDMI	High Definition Multimedia Interface. HDMI supports standard, enhanced, or high-definition video, plus multi-channel digital audio on a single cable.
TMDS	Transition Minimized Differential Signaling. TMDS is a signaling interface defined by Silicon Image that is used for DVI and HDMI.
DVI	Digital Visual Interface is a video interface standard developed by the Digital Display Working Group (DDWG).
LPC	Low Pin-Count: a low speed interface used for peripheral circuits such as Super I/O controllers, which typically combine legacy device support into a single IC.
I²C Bus	Inter-Integrated Circuit Bus: is a simple two-wire bus with a software-defined protocol that was developed to provide the communications link between integrated circuits in a system.
SM Bus	System Management Bus: is a popular derivative of the I²C-bus.
GBE	Gigabit Ethernet
LVDS	Low-Voltage Differential Signaling
SDVO	Serial Digital Video Out is a proprietary technology introduced by Intel® to add additional video signaling interfaces to a system.
DDC	Display Data Channel is an I²C bus interface between a display and a graphics adapter.
N.C.	Not connected
N.A.	Not available
T.B.D.	To be determined

Technical Support

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Electrostatic Sensitive Device

All electronic parts described in this short description are electrostatic sensitive devices and are packaged accordingly. Do not open or handle a carrier board or module except at an electrostatic-free workstation. Additionally, do not ship or store electronic devices near strong electrostatic, electromagnetic, magnetic, or radioactive fields unless the device is contained within its original manufacturer's packaging.

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Certification

congatec AG is certified to DIN EN ISO 9001:2008 standard.

Contents

1   Introduction

The conga-MCB is a COM Express™ Type 2 Compact module mini carrier board. It has an industrial 5 pin power connector and therefore can be used as a stand-alone carrier board for the COM Express™ Compact modules. It's also possible to use the conga-MCB as a small evaluation platform for your battery supported application using COM Express™ Compact modules or it can be directly integrated into an application.

conga-MCB Features
COM Express™ Type 2 compliant
1x PCI Express mini Card socket specification rev. 1.2 (bottom side)
Gigabit Ethernet connector with LEDs on front panel
1x CFast socket (bottom side)
2x vertical SATA connectors + 2x power JST PH headers
1x 4bit SD Card socket (bottom side)
2x USB on front panel, 2x USB on internal 2x5pins 2.54 USB header
1 x Stacked HDMI and DisplayPort connector on front panel
VGA interface provided on internal 6pin 1.25mm box header for debug purposes
LVDS - Single/Dual 18/24bits connector and 4pin Backlight JST PH header
Audio - Two 3.5' Jack on front panel; 2x3pins 2.54 SPDIF I/O internal header;
PC Beep Speaker
APIX2 Extension on 45pins 0.5mm FFC connector as option
FAN - One controlled Standard 3pins FAN connector
5pin power connector for single voltage usage, 8pin control connector from conga battery module
Feature connector for Power and Reset Buttons, LED indicators, mini Card Wifi Radio On/Off

Note

Information about the cables required to operate the conga-MCB COM Express™ mini carrier board can be found in section 6 "Cables" of this document.

2   Connector Layout

The connector layout picture below shows each connector and its name designator. Jumpers and their respective Pin 1 are also shown. Select the Adobe 'Zoom-In-Tool' and zoom in on a given component to see its designator. Hover over the component and the 'Zoom-In-Tool' will change indicating there is a link. Click on the link to navigate to the area in the document where the component is described. Use the mouse icon in the top left hand corner of the destination page to return to the connector layout pictures.
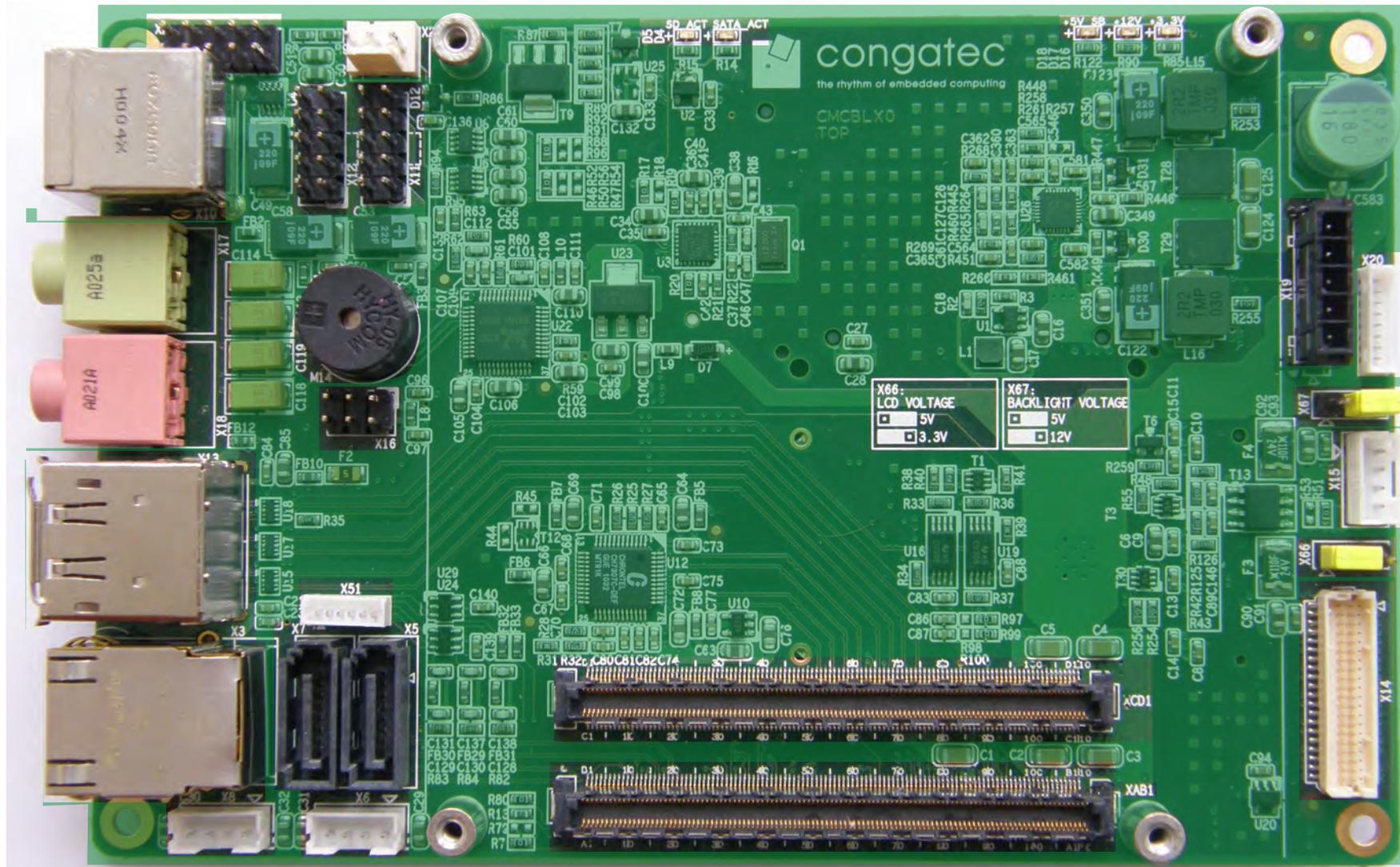
Bottom Side conga-MCB
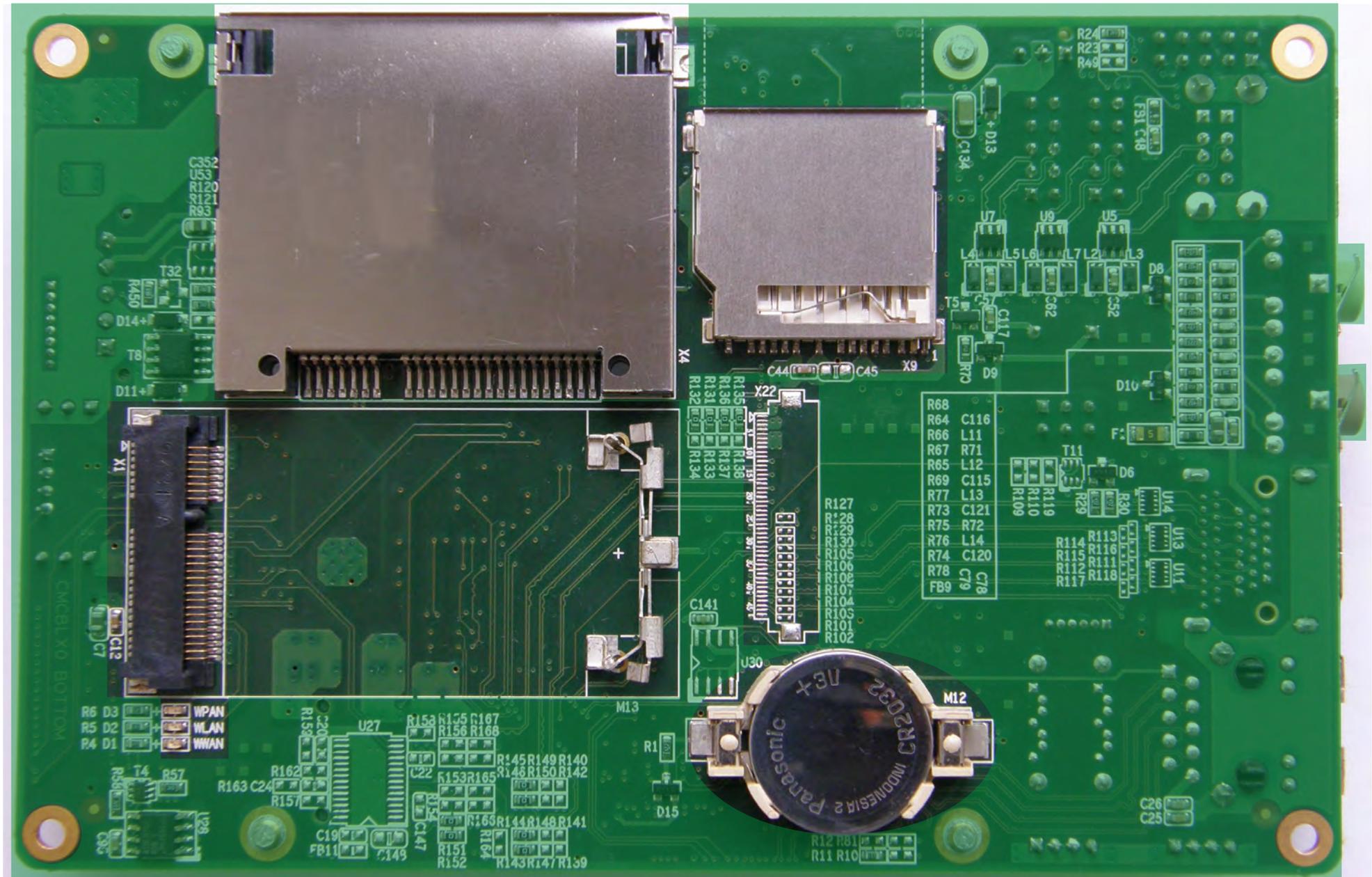
3 Specifications

3.1 Mechanical Dimensions

- 95mm x 145mm
- Height approximately 20mm (top side)
- Height approximately 6mm (bottom side)

3.2 Environmental Specifications

Temperature	Operation: 0° to 60°C	Storage: -20° to +80°C
Humidity	Operation: 10% to 90%	Storage: 5% to 95%

Note

The above operating temperatures must be strictly adhered to at all times. The maximum operating temperature refers to any measurable spot on the modules surface.

Humidity specifications are for non-condensing conditions.

4   Connector Descriptions

The following tables describe the pin assignments for the COM Express™ connectors found on the conga-MCB.

4.1   Connector XAB1 (COM Express™ connector rows A and B)

Pin	Row A	Pin	Row B	Pin	Row A	Pin	Row B
A1	GND (FIXED)	B1	GND (FIXED)	A56	PCIE_TX4-	B56	PCIE_RX4-
A2	GBE0_MDI3-	B2	GBE0_ACT#	A57	GND	B57	GPO2
A3	GBE0_MDI3+	B3	LPC_FRAME#	A58	PCIE_TX3+	B58	PCIE_RX3+
A4	GBE0_LINK100#	B4	LPC_AD0	A59	PCIE_TX3-	B59	PCIE_RX3-
A5	GBE0_LINK1000#	B5	LPC_AD1	A60	GND (FIXED)	B60	GND (FIXED)
A6	GBE0_MDI2-	B6	LPC_AD2	A61	PCIE_TX2+	B61	PCIE_RX2+
A7	GBE0_MDI2+	B7	LPC_AD3	A62	PCIE_TX2-	B62	PCIE_RX2-
A8	GBE0_LINK#	B8	LPC_DRQ0#	A63	GPI1	B63	GPO3
A9	GBE0_MDI1-	B9	LPC_DRQ1#	A64	PCIE_TX1+	B64	PCIE_RX1+
A10	GBE0_MDI1+	B10	LPC_CLK	A65	PCIE_TX1-	B65	PCIE_RX1-
A11	GND (FIXED)	B11	GND (FIXED)	A66	GND	B66	WAKE0#
A12	GBE0_MDI0-	B12	PWRBTN#	A67	GPI2	B67	WAKE1#
A13	GBE0_MDI0+	B13	SMB_CK	A68	PCIE_TX0+	B68	PCIE_RX0+
A14	GBE0_CTREF	B14	SMB_DAT	A69	PCIE_TX0-	B69	PCIE_RX0-
A15	SUS_S3#	B15	SMB_ALERT#	A70	GND (FIXED)	B70	GND (FIXED)
A16	SATA0_TX+	B16	SATA1_TX+	A71	LVDS_A0+	B71	LVDS_B0+
A17	SATA0_TX-	B17	SATA1_TX-	A72	LVDS_A0-	B72	LVDS_B0-
A18	SUS_S4#	B18	SUS_STAT#	A73	LVDS_A1+	B73	LVDS_B1+
A19	SATA0_RX+	B19	SATA1_RX+	A74	LVDS_A1-	B74	LVDS_B1-
A20	SATA0_RX-	B20	SATA1_RX-	A75	LVDS_A2+	B75	LVDS_B2+
A21	GND (FIXED)	B21	GND (FIXED)	A76	LVDS_A2-	B76	LVDS_B2-
A22	SATA2_TX+	B22	SATA3_TX+	A77	LVDS_VDD_EN	B77	LVDS_B3+
A23	SATA2_TX-	B23	SATA3_TX-	A78	LVDS_A3+	B78	LVDS_B3-
A24	SUS_S5#	B24	PWR_OK	A79	LVDS_A3-	B79	LVDS_BKLT_EN
A25	SATA2_RX+	B25	SATA3_RX+	A80	GND (FIXED)	B80	GND (FIXED)
A26	SATA2_RX-	B26	SATA3_RX-	A81	LVDS_A_CK+	B81	LVDS_B_CK+
A27	BATLOW#	B27	WDT	A82	LVDS_A_CK-	B82	LVDS_B_CK-
A28	(S)ATA_ACT#	B28	AC/HDA_SDIN2	A83	LVDS_I2C_CK	B83	LVDS_BKLT_CTRL
A29	AC/HDA_SYNC	B29	AC/HDA_SDIN1	A84	LVDS_I2C_DAT	B84	VCC_5V_SBY
A30	AC/HDA_RST#	B30	AC/HDA_SDIN0	A85	GPI3	B85	VCC_5V_SBY
A31	GND (FIXED)	B31	GND (FIXED)	A86	KBD_RST#	B86	VCC_5V_SBY
A32	AC/HDA_BITCLK	B32	SPKR	A87	KBD_A20GATE	B87	VCC_5V_SBY

Pin	Row A	Pin	Row B	Pin	Row A	Pin	Row B
A33	AC/HDA_SDOUT	B33	I2C_CK	A88	PCIE0_CK_REF+	B88	BIOS_DIS1#
A34	BIOS_DIS0#	B34	I2C_DAT	A89	PCIE0_CK_REF-	B89	VGA_RED
A35	THRMTRIP#	B35	THRM#	A90	GND (FIXED)	B90	GND (FIXED)
A36	USB6-	B36	USB7-	A91	SPI_POWER	B91	VGA_GRN
A37	USB6+	B37	USB7+	A92	SPI_MISO	B92	VGA_BLU
A38	USB_6_7_OC#	B38	USB_4_5_OC#	A93	GPO0	B93	VGA_HSYNC
A39	USB4-	B39	USB5-	A94	SPI_CLK	B94	VGA_VSYNC
A40	USB4+	B40	USB5+	A95	SPI_MOSI	B95	VGA_I2C_CK
A41	GND (FIXED)	B41	GND (FIXED)	A96	GND	B96	VGA_I2C_DAT
A42	USB2-	B42	USB3-	A97	RSVD	B97	SPI_CS#
A43	USB2+	B43	USB3+	A98	RSVD	B98	RSVD
A44	USB_2_3_OC#	B44	USB_0_1_OC#	A99	RSVD	B99	RSVD
A45	USB0-	B45	USB1-	A100	GND (FIXED)	B100	GND (FIXED)
A46	USB0+	B46	USB1+	A101	RSVD	B101	RSVD
A47	VCC_RTC	B47	EXCD1_PERST#	A102	RSVD	B102	RSVD
A48	EXCD0_PERST#	B48	EXCD1_CPPE#	A103	RSVD	B103	RSVD
A49	EXCD0_CPPE#	B49	SYS_RESET#	A104	VCC_12V	B104	VCC_12V
A50	LPC_SERIRQ	B50	CB_RESET#	A105	VCC_12V	B105	VCC_12V
A51	GND (FIXED)	B51	GND (FIXED)	A106	VCC_12V	B106	VCC_12V
A52	PCIE_TX5+	B52	PCIE_RX5+	A107	VCC_12V	B107	VCC_12V
A53	PCIE_TX5-	B53	PCIE_RX5-	A108	VCC_12V	B108	VCC_12V
A54	GPI0	B54	GPO1	A109	VCC_12V	B109	VCC_12V
A55	PCIE_TX4+	B55	PCIE_RX4+	A110	GND (FIXED)	B110	GND (FIXED)

4.2   Connector XCD1 (COM Express™ connector rows C and D)

Pin	Row C	Pin	Row D	Pin	Row C	Pin	Row D
C1	GND (FIXED)	D1	GND (FIXED)	C56	PEG_RX1-	D56	PEG_TX1-
C2	IDE_D7	D2	IDE_D5	C57	TYPE1#	D57	TYPE2#
C3	IDE_D6	D3	IDE_D10	C58	PEG_RX2+	D58	PEG_TX2+
C4	IDE_D3	D4	IDE_D11	C59	PEG_RX2-	D59	PEG_TX2-
C5	IDE_D15	D5	IDE_D12	C60	GND (FIXED)	D60	GND (FIXED)
C6	IDE_D8	D6	IDE_D4	C61	PEG_RX3+	D61	PEG_TX3+
C7	IDE_D9	D7	IDE_D0	C62	PEG_RX3-	D62	PEG_TX3-
C8	IDE_D2	D8	IDE_REQ	C63	RSVD	D63	DDPC_CTRLCLK
C9	IDE_D13	D9	IDE_IOW#	C64	RSVD	D64	DDPC_CTRLDATA
C10	IDE_D1	D10	IDE_ACK#	C65	PEG_RX4+	D65	PEG_TX4+
C11	GND (FIXED)	D11	GND (FIXED)	C66	PEG_RX4-	D66	PEG_TX4-
C12	IDE_D14	D12	IDE_IRQ	C67	FAN_PWMOUT	D67	GND
C13	IDE_IORDY	D13	IDE_A0	C68	PEG_RX5+	D68	PEG_TX5+
C14	IDE_IOR#	D14	IDE_A1	C69	PEG_RX5-	D69	PEG_TX5-
C15	PCI_PME#	D15	IDE_A2	C70	GND (FIXED)	D70	GND (FIXED)
C16	PCI_GNT2#	D16	IDE_CS1#	C71	PEG_RX6+	D71	PEG_TX6+
C17	PCI_REQ2#	D17	IDE_CS3#	C72	PEG_RX6-	D72	PEG_TX6-
C18	PCI_GNT1#	D18	IDE_RESET#	C73	SDVO_DATA	D73	SVDO_CLK
C19	PCI_REQ1#	D19	PCI_GNT3#	C74	PEG_RX7+	D74	PEG_TX7+
C20	PCI_GNT0#	D20	PCI_REQ3#	C75	PEG_RX7-	D75	PEG_TX7-
C21	GND (FIXED)	D21	GND (FIXED)	C76	GND	D76	GND
C22	PCI_REQ0#	D22	PCI_AD1	C77	FAN_TACHOIN	D77	IDE_CBLID#
C23	PCI_RESET#	D23	PCI_AD3	C78	PEG_RX8+	D78	PEG_TX8+
C24	PCI_AD0	D24	PCI_AD5	C79	PEG_RX8-	D79	PEG_TX8-
C25	PCI_AD2	D25	PCI_AD7	C80	GND (FIXED)	D80	GND (FIXED)
C26	PCI_AD4	D26	PCI_C/BE0#	C81	PEG_RX9+	D81	PEG_TX9+
C27	PCI_AD6	D27	PCI_AD9	C82	PEG_RX9-	D82	PEG_TX9-
C28	PCI_AD8	D28	PCI_AD11	C83	PP_TPM	D83	RSVD
C29	PCI_AD10	D29	PCI_AD13	C84	GND	D84	GND
C30	PCI_AD12	D30	PCI_AD15	C85	PEG_RX10+	D85	PEG_TX10+
C31	GND (FIXED)	D31	GND (FIXED)	C86	PEG_RX10-	D86	PEG_TX10-
C32	PCI_AD14	D32	PCI_PAR	C87	GND	D87	GND
C33	PCI_C/BE1#	D33	PCI_SERR#	C88	PEG_RX11+	D88	PEG_TX11+
C34	PCI_PERR#	D34	PCI_STOP#	C89	PEG_RX11-	D89	PEG_TX11-
C35	PCI_LOCK#	D35	PCI_TRDY#	C90	GND (FIXED)	D90	GND (FIXED)
C36	PCI_DEVSEL#	D36	PCI_FRAME#	C91	PEG_RX12+	D91	PEG_TX12+
C37	PCI_IRDY#	D37	PCI_AD16	C92	PEG_RX12-	D92	PEG_TX12-
C38	PCI_C/BE2#	D38	PCI_AD18	C93	GND	D93	GND

Pin	Row C	Pin	Row D	Pin	Row C	Pin	Row D
C39	PCI_AD17	D39	PCI_AD20	C94	PEG_RX13+	D94	PEG_TX13+
C40	PCI_AD19	D40	PCI_AD22	C95	PEG_RX13-	D95	PEG_TX13-
C41	GND (FIXED)	D41	GND (FIXED)	C96	GND	D96	GND
C42	PCI_AD21	D42	PCI_AD24	C97	RSVD	D97	PEG_ENABLE#
C43	PCI_AD23	D43	PCI_AD26	C98	PEG_RX14+	D98	PEG_TX14+
C44	PCI_C/BE3#	D44	PCI_AD28	C99	PEG_RX14-	D99	PEG_TX14-
C45	PCI_AD25	D45	PCI_AD30	C100	GND (FIXED)	D100	GND (FIXED)
C46	PCI_AD27	D46	PCI_IRQC#	C101	PEG_RX15+	D101	PEG_TX15+
C47	PCI_AD29	D47	PCI_IRQD#	C102	PEG_RX15-	D102	PEG_TX15-
C48	PCI_AD31	D48	PCI_CLKRUN#	C103	GND	D103	GND
C49	PCI_IRQA#	D49	PCI_M66EN	C104	VCC_12V	D104	VCC_12V
C50	PCI_IRQB#	D50	PCI_CLK	C105	VCC_12V	D105	VCC_12V
C51	GND (FIXED)	D51	GND (FIXED)	C106	VCC_12V	D106	VCC_12V
C52	PEG_RX0+	D52	PEG_TX0+	C107	VCC_12V	D107	VCC_12V
C53	PEG_RX0-	D53	PEG_TX0-	C108	VCC_12V	D108	VCC_12V
C54	TYPE0#	D54	PEG_LANE_RV#	C109	VCC_12V	D109	VCC_12V
C55	PEG_RX1+	D55	PEG_TX1+	C110	GND (FIXED)	D110	GND (FIXED)

4.3 Interface Connectors

4.3.1 Connector X1 PCIe Mini Card Socket

The conga-MCB is equipped with a PCI Express Mini Card socket. PCI Express Mini Card is a unique small size form factor optimized for mobile computing platforms equipped with communication applications such as Wireless LAN. Connector X1 on the bottom side of the conga-MCB provides an interface to insert a standard PCIe Mini Card. The signal to Enable/Disable Wi-Fi Radio is made available on the X2 feature connector (pin 5) to control Wi-Fi Radio (when Wi-Fi card is inserted into slot X1).
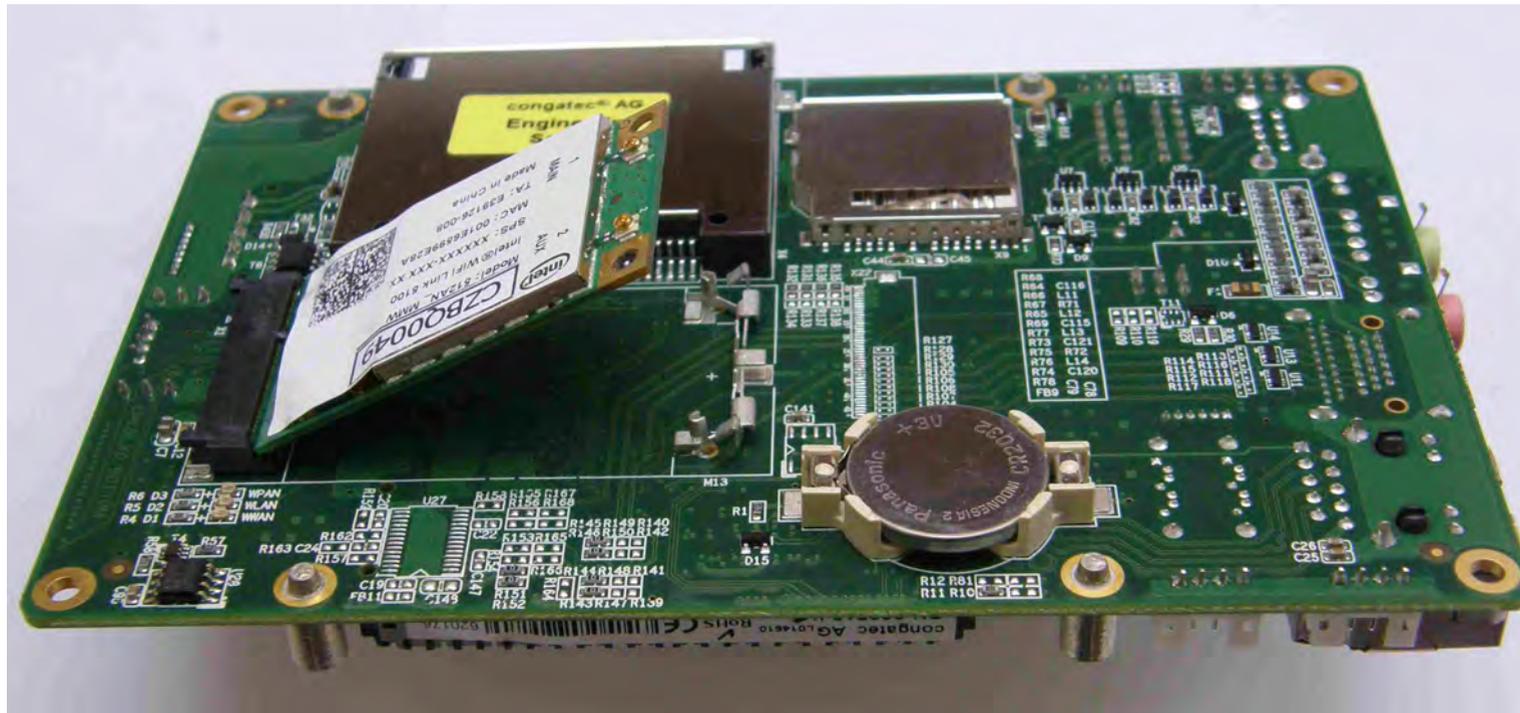
Connector Type

Standard PCIe Mini Card, 52 pos.

4.3.2 Connector X2 Feature Header LEDs/Buttons

Connector X2 provides an interface to connect LED indicators, buttons and a signal to Enable/Disable Wi-Fi Radio (when Wi-Fi card is inserted into slot X1).

Pin	Signal	Pin	Signal
1	GND (PWR_LED Cathode)	2	PWR_LED Anode
3	HDD_LED Cathode	4	HDD_LED Anode
5	PCIe Mini Card WiFi Dis#	6	GND
7	Reset Button	8	GND
9	Power Button	10	GND

Feature Connector (X2)
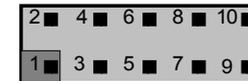
⊞ **Connector Type**

2.54mm Pitch Female Crimp Housing 2 Pos. (female) Harwin P/N: M20-1060200 and jumper (for WiFi Radio disable).

4.3.3 Connector X3 LAN

The conga-MCB is equipped with a RJ45 connector with integrated magnetics to support Gigabit Ethernet on the X3 connector. Additionally, "Link" and "Activity" LED indicators are integrated within the LAN connector.

Pin	Signal
1	GbE MDI0P
2	GbE MDI0N
3	GbE MDI1P
4	GbE MDI2P
5	GbE MDI2N
6	GbE MDI1N
7	GbE MDI3P
8	GbE MDI3N
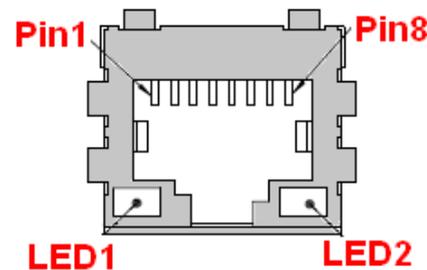
Action	Description
LED 1 Green lit	Link
LED 1 Green blinking	Activity
LED 2 Green lit	Link 100Mbit
LED 2 Yellow lit	Link 1 Gbit

⊞ **Connector Type**

Standard Patch cable with 8pin RJ45 connector (male).

4.3.4   Connector X4 CFast Host Type II Push-Push

A CFast socket Type II is implemented on the bottom side of conga-MCB to provide support for the new media based on Serial ATA interface. It is connected to Serial ATA channel 0 that originates from COM Express Compact module.
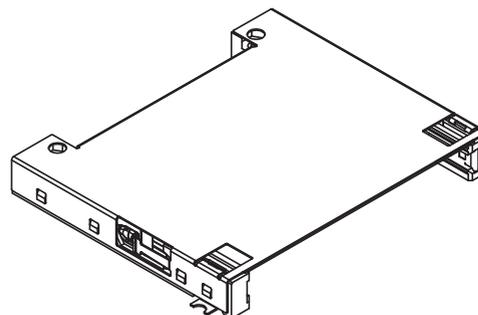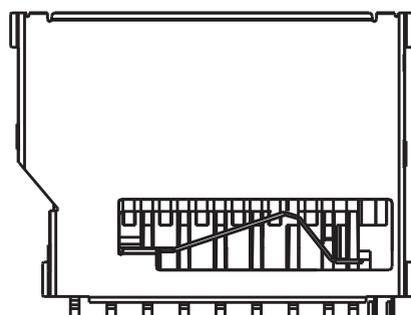

Connector Type

Standard CFast media Type I or Type II.

4.3.5   Connector X9 SD/MMC 4.0 Card Socket

The X9 socket on bottom side of the conga-MCB offers an interface for SD Card, SDHC Card and MMC Plus card media. The SD controller is connected to USB5, which originates from COM Express™ Compact module.

4.3.6 Connector X5 and X7 SATA

The conga-MCB also features two standard SATA connectors X5 (Serial ATA channel 1) and X7 (Serial ATA channel 2), which originate from connector XAB1 on the COM Express™ Compact module.

Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

SATA1 (X5)   SATA0 (X7)

7 6 5 4 3 2 1   7 6 5 4 3 2 1

Serial ATA Channel 1
Serial ATA Channel 2
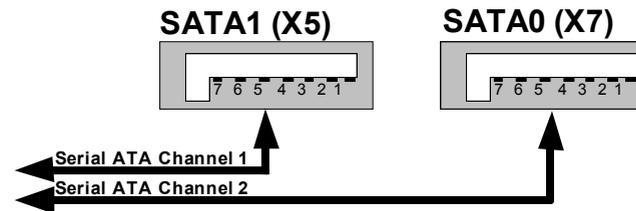
Connector Type

1.27mm Pitch Standard SATA Connector 7 Pos. (plug).

4.3.7 Connector X6 X8 Auxiliary Power

The X6 and X8 connectors are dedicated to supplying main power (for example 2.5' SATA hard disk drives or other external devices requiring 5V and/or 3.3V). 12V is not supported and therefore 3.5' SATA hard drives will not work.

Pin	Signal
1	+3.3V (max 1A)
2	GND
3	GND
4	+5V (max 1A)
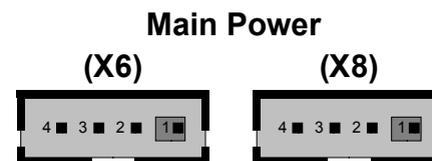
Main Power

(X6)   **(X8)**

4 3 2 1   4 3 2 1

Connector Type

2.00mm Pitch Housing connector 4 Pos. (female) JST P/N: PHR-4.

See section 6 of this document for information about this cable.
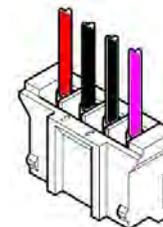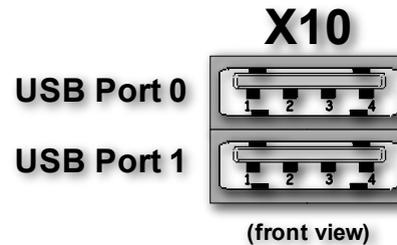
4.3.8 Connector X10 Dual USB 2.0

The conga-MCB features a Dual USB connector (X10) that is connected to USB port 0 and USB port 1, which originate from the COM Express™ Compact module. Support for USB 2.0 and/or 1.1 devices is dependent on the COM Express™ Compact module used.

Pin	Signal
1	+5V
2	DATA-
3	DATA+
4	GND

X10

USB Port 0

USB Port 1

(front view)

4.3.9 Connector X11, X12 USB 2.0 Headers

Additional USB 2.0 ports are available on the conga-MCB via pin header connectors (X11, X12). X11 provides a connection to USB port 2 and 3 while X12 provides a connection to USB port 6 and 7. All of the above mentioned USB ports originate from COM Express™ Compact module. Support for USB 2.0 and/or 1.1 devices is dependent on the COM Express™ Compact module used.

USB 2.0 Pin Header X11

Pin	Signal	Pin	Signal
1	+5V (USB2)	2	+5V (USB3)
3	DATA - (USB2)	4	DATA - (USB3)
5	DATA + (USB2)	6	DATA + (USB3)
7	GND (USB2)	8	GND (USB3)
9	USB CLIENT DETECT	10	NC

USB 2.0 Pin Header X12

Pin	Signal	Pin	Signal
1	+5V (USB6)	2	+5V (USB7)
3	DATA - (USB6)	4	DATA - (USB7)
5	DATA + (USB6)	6	DATA + (USB7)
7	GND (USB6)	8	GND (USB7)
9	NC	10	USB CLIENT DETECT

**USB 2.0
(X11)   (X12)**
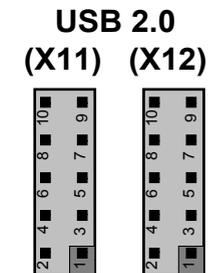
 Connector Type

2.54mm Pitch Housing 5 Pos. (female) Harwin P/N: M20-1060500.

*See section 6 of this document for information about this cable.*

5

1

## 4.3.10 Connector X13 DisplayPort and HDMI Combo

A high resolution monitor can be attached to the conga-MCB through the use of either DisplayPort or HDMI port in connector X13. These connections support DDC detection.

Pin	Signal	Pin	Signal
1	TMDS Data2+	2	TMDS Data2 Shield
3	TMDS Data2-	4	TMDS Data1+
5	TMDS DATA1 Shield	6	TMDS Data1-
7	TMDS DATA0+	8	TMDS Data0 Shield
9	TMDS DATA0-	10	TMDS Clock+
11	TMDS Clock Shield	12	TMDS Clock-
13	CEC (not supported)	14	RESERVED
15	SCL (Serial Clock for DDC)	16	SDA (Serial Data for DDC)
17	DDC/CEC/HEC GND	18	+5V Power (max 50mA)
19	Hot Plug Detect		
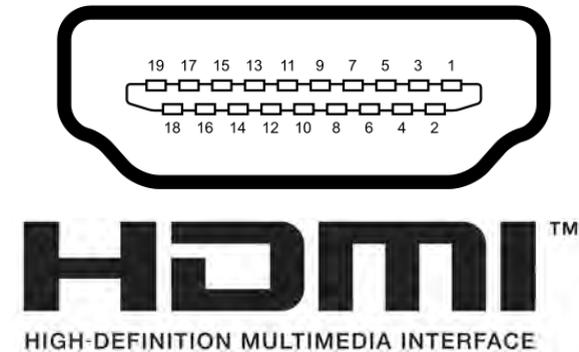
HDMI is supplied by the SDVO interface that originates from the COM Express™ Compact module as SDVO port B over DVI/HDMI Transmitter.

| Pin	Signal	Pin	Signal
1	ML_Lane 0P	2	GND
3	ML_Lane 0N	4	ML_Lane 1P
5	GND	6	ML_Lane 1N
7	ML_Lane 2P	8	GND
9	ML_Lane 2N	10	ML_Lane 3P
11	GND	12	ML_Lane 3N
13	GND	14	GND
15	AUXCH P	16	GND
17	AUXCH N	18	Hot Plug Detect
19	Return for Power	20	+3.3V Power (max 0.5A)
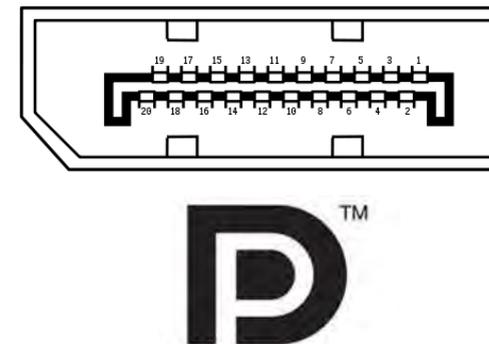
DisplayPort originates from connector XCD1 on the COM Express™ Compact module as DDI port C.

4.3.11   Connector X14 LVDS

A dual LVDS Interface is supported on the conga-MCB via box header X14. DDC detection is included. Supply Voltage for the LCD display can be set to either 5V or 3.3V using jumper X66.

Pin	Signal	Pin	Signal
1	LVDS B TX0N	2	LCD +VDD (+3.3V/+5V, max 1A)
3	LVDS B TX0P	4	LCD +VDD (+3.3V/+5V, max 1A)
5	GND	6	GND
7	LVDS B TX1N	8	GND
9	LVDS B TX1P	10	LVDS A TX0N
11	GND	12	LVDS A TX0P
13	LVDS B TX2N	14	GND
15	LVDS B TX2P	16	LVDS A TX1N
17	GND	18	LVDS A TX1P
19	LVDS B CLKN	20	GND
21	LVDS B CLKP	22	LVDS A TX2N
23	GND	24	LVDS A TX2P
25	LVDS B TX3N	26	GND
27	LVDS B TX3P	28	LVDS A CLKN
29	GND	30	LVDS A CLKP
31	GND	32	GND
33	LVDS VDD ENABLE	34	LVDS A TX3N
35	NC	36	LVDS A TX3P
37	LVDS BKL CTRL	38	LVDS SCL
39	LVDS BKL ENABLE	40	LVDS SDA

Contact No.1
Contact No.2
Contact No.3
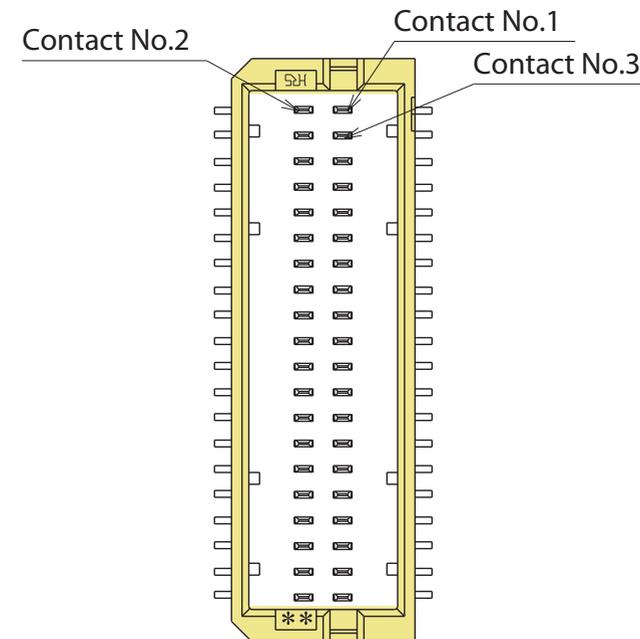
The LCD supply voltage on pins 2 and 4 is adjustable by using jumper X66.

Connector Type

1 mm Pitch Double Row socket 40 Pos. (female) HRS (Hirose), P/N: DF20A-40DS-1C.

See section 6 of this document for information about this cable.

4.3.12   Connector X15 Backlight

Connector X15 on the conga-MCB is a 4 pin box header designated for backlight voltage. Supply Voltage for the backlight converter can be set to 5V or 12V using jumper X67.

Pin	Signal
1	VDD BCKL (+5V/+12V, max 1A)
2	GND
3	BCKL EN (High active)
4	BCKL CTRL*

**Backlight Power
(X15)**

Note

BCKL_CTRL signal is controlled by the I²C bus and originates from COM Express™ Compact module.

Connector Type

2.00mm Pitch Housing connector 4 Pos. (female) JST P/N: PHR-4.

See section 6 of this document for information about this cable.
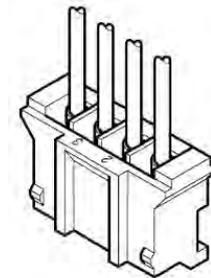
4.3.13   Jumper X66 LCD Supply Voltage Selector

Jumper X66 provides the ability to select the LCD supply voltage for pins 2 and 4 of the LVDS connector X14.

Jumper X66	Signal
1-2	3.3V LCD Voltage
2-3	5V LCD Voltage (default)

Jumper X66

Connector Type

X66: 2.54mm grid jumper

4.3.14 Jumper X67 Backlight Supply Voltage Selector

Jumper X67 provides the ability to select the backlight supply voltage for pin 1 of connector X15.

Jumper X67	Signal
1-2	12V (default)
2-3	+5V

Jumper X67

Connector Type

X67: 2.54mm grid jumper

4.3.15 Connector X16 S/PDIF

The conga-MCB provides a S/PDIF audio interface via a 6 pin header (X16).

Pin	Signal	Pin	Signal
1	+5V	2	+5V S/PDIF (Filtered)
3	S/PDIF OUT	4	S/PDIF IN
5	GND	6	GND

S/PDIF (X16)

Connector Type

2.54mm Pitch Female Crimp Housing 3 Pos. (female) Harwin P/N: M20-1060300.

4.3.16 Connectors X17 Line-Out and X18 Mic-In

Stereo analog audio signals are provided via 3.5mm 2 Audio Jack Connectors. X17 is for Line-Out (lime color) and X18 is for Mic-In (pink color).
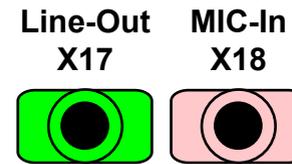
Connector Type

Standard 3.5mm stereo Jack.

4.3.17 Connector X19 Power Supply

The conga-MCB has a 5 pin power connector that provides the ability to connect to a 12V power source. 5V Standby is an optional voltage supported by ATX mode in conjunction with power control connector X20 and the ATX cable adapter (available from congatec, see section 6 of this document for more information). Connector X19 can also be used for a single voltage supply (12V only) thereby allowing the conga-MCB to be a stand-alone carrier board.

Pin	Signal
1	+12V (±5%)
2	+12V (±5%)
3	GND
4	GND
5	+5V STB (±5%)
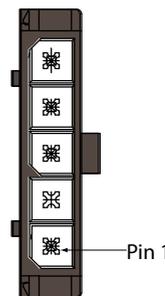
Connector Type

3.00mm Pitch Micro-Fit 3.0™ Receptacle Housing Molex, P/N: 0436450500.

See section 6 of this document for information about this cable.
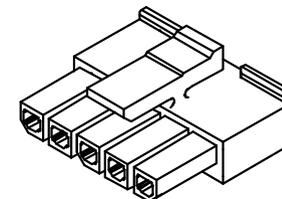
4.3.18   Connector X20 Power Supply Control

The conga-MCB has an 8 pin power control connector (X20) that provides a connection to a battery management module 12V power source. 5V Standby is an optional voltage supported by ATX mode in conjunction with power control connector X20 and the ATX cable adapter (available from congatec, see section 6 of this document for more information). Connector X20 can also be used for a single voltage supply (12V only) thereby allowing the conga-MCB to be a stand-alone carrier board.

Power Connector X20

Pin	Signal	Description
1	GND	Power Button
2	SDA	I2C bus Data
3	SCL	I2C bus Clock
4	BATLOW#	Signal from COM Express™ connector XAB1
5	SUS_STAT#	Signal from COM Express™ connector XAB1
6	SUS_S3#	Signal from COM Express™ connector XAB1
7	SUS_S5#	Signal from COM Express™ connector XAB1
8	PWRBTN#	Power Button
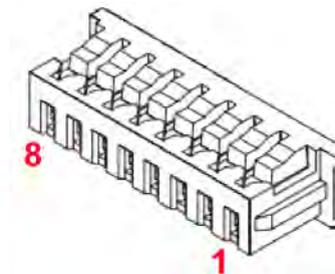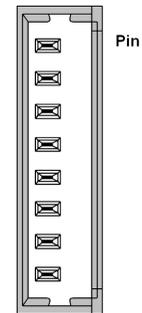
Connector Type

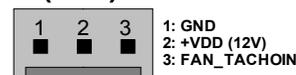*1.25mm Pitch PicoBlade™ Housing Female Molex, P/N: 0510210800.*

See section 6 of this document for information about this cable.

4.3.19   Connector X21 Fan

A standard 3 pin header for Fan is provided on the conga-MCB.

Pin	Signal
1	GND
2	+VDD (12V)
3	FAN_TACHOIN

Fan (X21)

1: GND
2: +VDD (12V)
3: FAN_TACHOIN

Connector Type

2.54mm Standard 3pin Housing for Fan.

4.3.20 Connector X51 VGA

A CRT monitor can be attached to the conga-MCB through the use of connector X51. This connection does not support DDC detection.

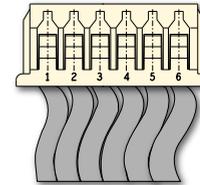| Pin	Signal
1	HSY
2	VSY
3	GND
4	B
5	G
6	R

**VGA
(X51)**

Connector Type

1.25mm Pitch Wire to Board Connector 6 Pos. (female).

See section 6 of this document for information about this cable.

4.3.21 Power and Reset Buttons

The conga-MCB is not equipped with a power button or a reset button due to space limitations but it does have the possibility to connect both buttons using the feature header X2.

Power On   **Reset**
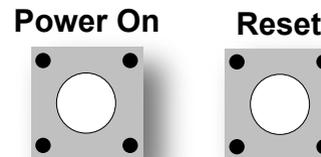
The power button is functional only if the conga-MCB power is being supplied by an ATX power supply (for example when using the congatec ATX cable adapter for conga-MCB, see section 6 of this document for more information). The carrier board must be connected to an ATX power supply for this feature to work. Additionally, the reset button can be used to invoke the hardware reset signal for the system. If the conga-MCB is supplied from a single 12V source, the carrier will start immediately after the supply voltage is connected to power connector X19.

Connector Type

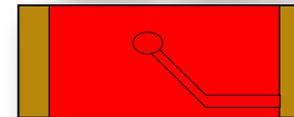*X2: 2.54mm Pitch Female Crimp Housing 2 Pos. (female) Harwin P/N: M20-1060200.*

5   Additional Features

5.1   Red LEDs

There are two red LEDs found on the conga-MCB. A detailed description of them can be found in the table below.

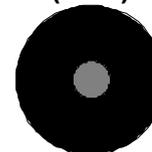| LED	Function When Lit
D4	SATA Active - indicates activity of SATA channel
D5	SD Active - indicates activity of SD Card

Red LEDs

5.2   PC Speaker (Beeper)

The board-mounted speaker provides audible error code (beep code) information during POST. The speaker M14 is connected to the COM Express™ module's SPEAKER signal.
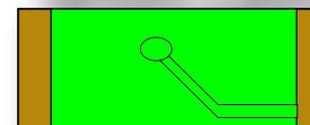
**Speaker
(M14)**

5.3   Power Indication LEDs

There are total of six green LEDs located on the conga-MCB. LEDs D16-D18 indicate the presence of supply voltages on the carrier board. A detailed description of these can be found in the table below.

| LED	Function When Lit
D16	Indicates 3.3V is present
D17	Indicates 12V is present
D18	Indicates 5V STB is present

Green LEDs

5.4   PCI Mini Card Activity LEDs

There are total of six green LEDs located on the conga-MCB. LEDs D1-D3 indicate PCIe Mini Card activity. A detailed description of these LEDs can be found in the table below.

LED	Function When Lit
D1	WWAN - indicates activity of wireless wide area network
D2	WLAN - indicates activity of wireless local area network
D3	WPAN - indicates activity of wireless personal area network

Green LEDs
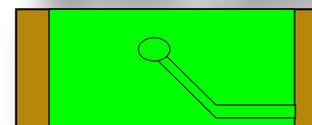
5.5   Connector X22 APIX 2 (Optional)

A 45 pin flat foil connector (X22) can be optionally provided as an assembly option on the conga-MCB. This connector provides the possibility to expand the carrier board features to include the APIX 2 automation interface.

For more information about APIX technology visit http://www.inova-semiconductors.de/

5.6   CMOS Battery

The conga-MCB includes a battery that supplies the RTC and CMOS memory of the COM Express™ CPU module. The battery needs to provide 3V of power. The specified battery type is CR2032.

⚠ **Warning**

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

To fulfill the requirements of the EN60950, the conga-MCB incorporates two current-limiting devices (resistor and diode) in the battery power supply path.

6　Cables

There are several cables that can be utilized with the conga-MCB COM Express™ mini carrier board.

The table below lists their part numbers and describes their functions.

Part Number	Name	Discription
14000040	Cable Kit	Complete cable kit for conga-MCB/COM Express™.
047245	adapVGA	VGA cable for connector X51.
14000027	cab-MCB-Power	Power cable for conga-MCB mini carrier connector X19 with female banana plug.
14000031	cab-MCB-Power-ATX	Power cable for conga-MCB mini carrier connector X20 for ATX Power supply.
14000032	cab-SATA-Power	SATA power cable for 2.5" HDD. Fits connectors X6 and X8. *Note: 3.5" HDD are not supported (no 12V supply).*
14000033	cab-MCB-LVDS	LVDS display data cable for conga-MCB mini carrier connector X14.
14000034	cab-MCB-BKL	Backlight cable for conga-MCB mini carrier connector X15.
14000035	cab-USB-B	USB 2.0 shielded high speed cable (USB B, Client) for conga-MCB mini carrier connectors X11 and X12.
14000038	Dual USB-A cable	Dual USB 2.0 shielded high speed cable (USB A) for conga-MCB mini carrier connectors X11 and X12.

7 Mechanical Drawing
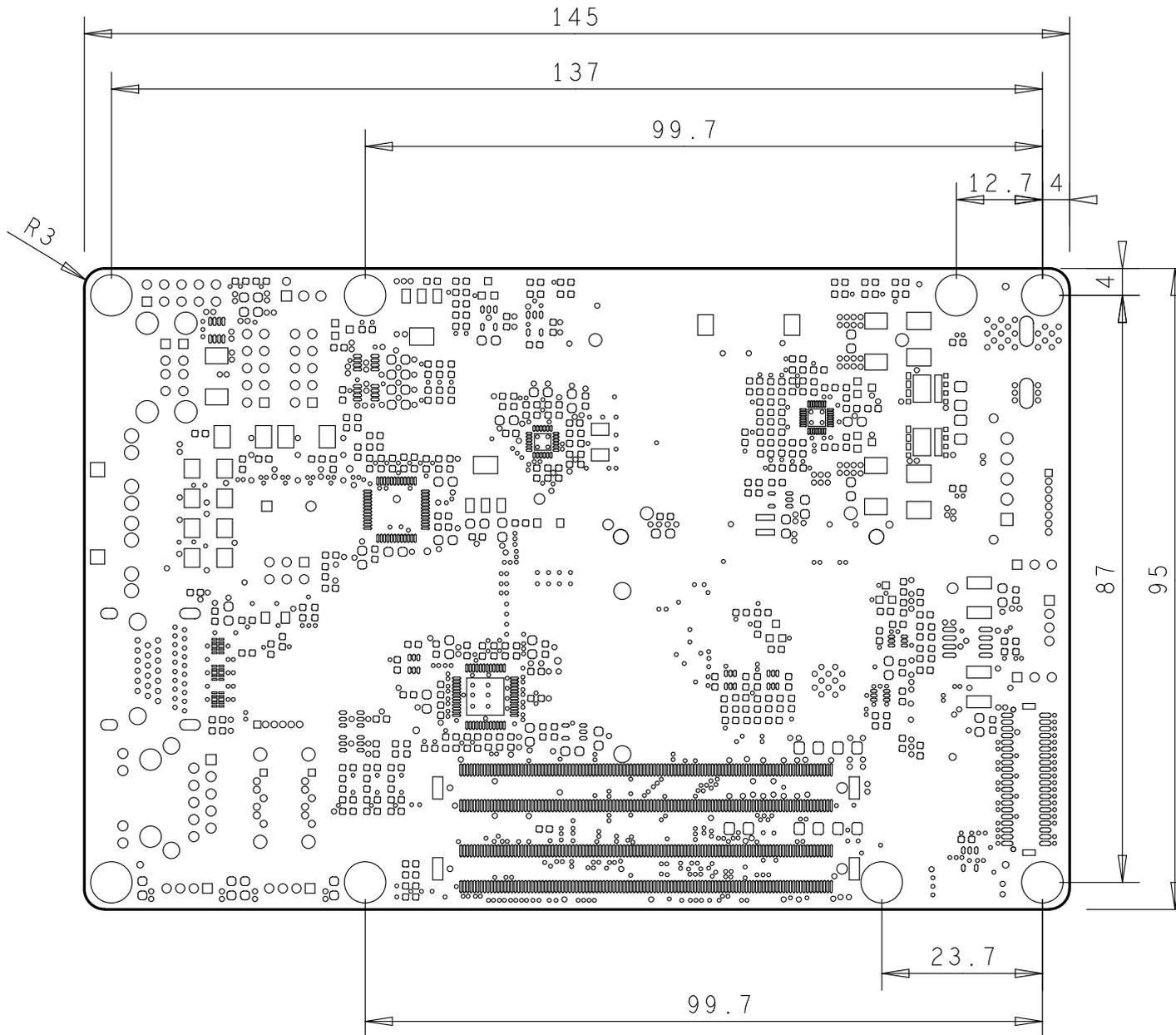
8 Industry Specifications

The list below provides links to industry specifications that to the conga-MCB Compact COM Express™ carrier board.

Specification	Link
PICMG® COM Express™ Module Base Specification	http://www.picmg.org/
COM Express™ Carrier Design Guide	http://www.picmg.org/v2internal/resourcepage2.cfm?id=3
PCI Express Base Specification, Revision 2.0	http://www.pcisig.com/specifications
Universal Serial Bus (USB) Specification, Revision 2.0	http://www.usb.org/home
PCI Specification, Revision 2.2	http://www.pcisig.com/specifications
Serial ATA Specification, Revision 1.0a	http://www.serialata.org
Low Pin Count Interface Specification, Revision 1.0 (LPC)	http://developer.intel.com/design/chipsets/industry/lpc.htm