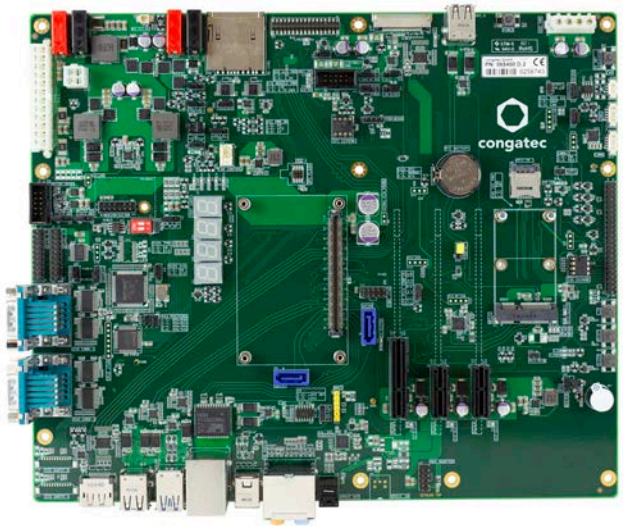

COM Express™ conga-MEVAL

Detailed description of the congatec COM Express™ Type 10 evaluation carrier board

User's Guide (Rev. D or later)

Revision 1.0

congatec

Revision History

Revision	Date (yyyy-mm-dd)	Author	Changes
1.0	2022-03-11	AEM	• Official release

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This user's guide provides information about the components, features and connectors available on the congatec COM Express™ Type 10 evaluation carrier board (revision D or later).

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Note

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Connector Type

Describes the connector that must be used with the conga-MEVAL evaluation 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 conga-MEVAL connector layout diagram.

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Terminology

Term	Description
DAC	Digital Analog Converter
DDC	Display Data Channel
eDP	Embedded DisplayPort
GbE	Gigabit Ethernet
GPIO	General Purpose Input/Output
HBR3	High Bit Rate 3
I²C Bus	Inter-Integrated Circuit Bus
HDA	High Definition Audio
LVDS	Low Voltage Differential Signaling
N.A	Not available
N.C	Not connected
PCIe	Peripheral Component Interface Express (PCI Express)
SIO	Super I/O
SM Bus	System Management Bus
SATA	Serial AT Attachment. A serial-interface standard for hard disks
SDIO	Secure Digital Input Output
T.B.D	To be determined
TPM	Trusted Platform Module
USB	Universal Serial Bus

Contents

List of Tables

1 Introduction

1.1 COM Express™ Concept

COM Express™ is an open industry standard defined specifically for COMs (computer on modules). Its creation makes it possible to smoothly transition from legacy interfaces to the newest technologies available today.

A Computer On Module integrates all the core components and standard I/O interfaces of a common PC onto an application specific carrier board. The key advantage of the COM in the embedded computer industries is that all the highly integrated, high speed components such as CPU, chipsets and memory are combined on a small module form factor for easy adaptation into different applications across multiple market segments.

COM Express™ modules have standardized form factors and specified pinouts on the two system connectors that remain the same regardless of the vendor. The COM Express™ module reflects the functional requirements for a wide range of embedded applications. These functions include, but are not limited to, PCI Express, PCI, Graphics, High Definition Audio, serial ATA, Gigabit Ethernet and USB ports. One ruggedized, shielded connector provide the carrier board interface and carry all the I/O signals to and from the COM Express™ module.

Carrier board designers can use as little or as many of the I/O interfaces as deemed necessary. The carrier board can therefore provide all the interface connectors required to attach the system to the application specific peripherals. This versatility allows the designer to create a dense and optimized package, which results in a more reliable product while simplifying system integration. Most importantly, COM Express™ modules are scalable, which means once an application has been created there is the ability to diversify the product range through the use of different performance class or form factor size modules. Simply unplug one module and replace it with another; no redesign is necessary.

1.2 conga-MEVAL

The conga-MEVAL carrier board is designed based on the Type 10 pinout definition and it complies with COM Express Specification 3.0. The conga-MEVAL provides most of the functional requirements for any embedded PC application. These functions include, but are not limited to a rich complement of contemporary high bandwidth serial interfaces such as PCI Express, Serial ATA, USB 2.0, and Gigabit Ethernet. To ensure stable data throughput, the carrier board is equipped with a high performance connector in accordance with the COM Express specification.

By combining the scalability of COM Express modules, the conga-MEVAL carrier board provides manufacturers and developers with a platform to jump-start the development of systems and applications based on COM Express specification. This helps to reduce product design cycle and encourages rapid innovation in system design, to meet the ever-changing needs of the market.

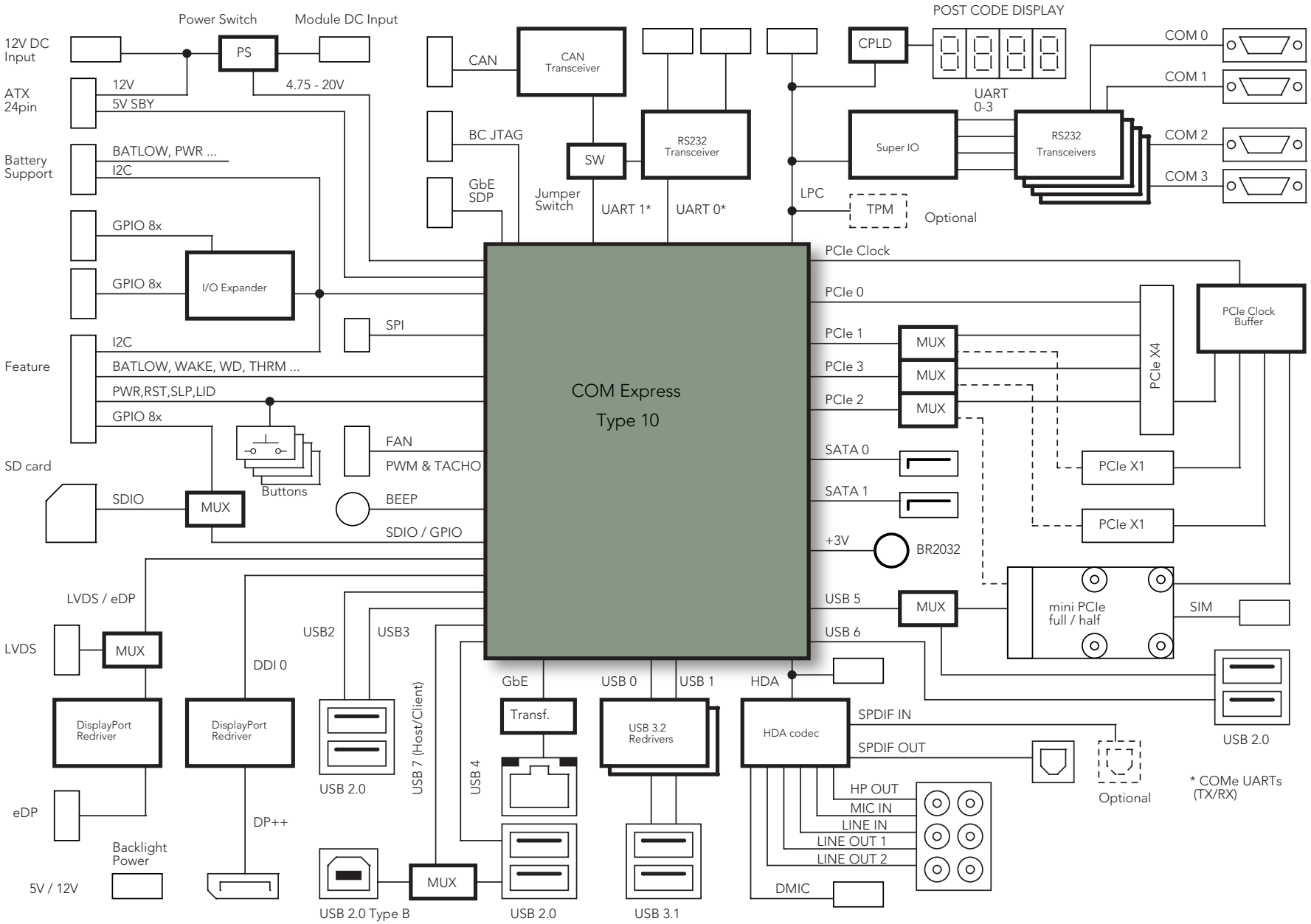
The various features and capabilities offered by the conga-MEVAL makes it ideal for integrating mini form factor modules.

1.3 Order Number

Table 1 Order Description

Part Number	Product Name	Description
065400	conga-MEVAL	Evaluation carrier board for COM Express Type 10 modules, rev. 3.0 (mini form factor)

2 Block Diagram

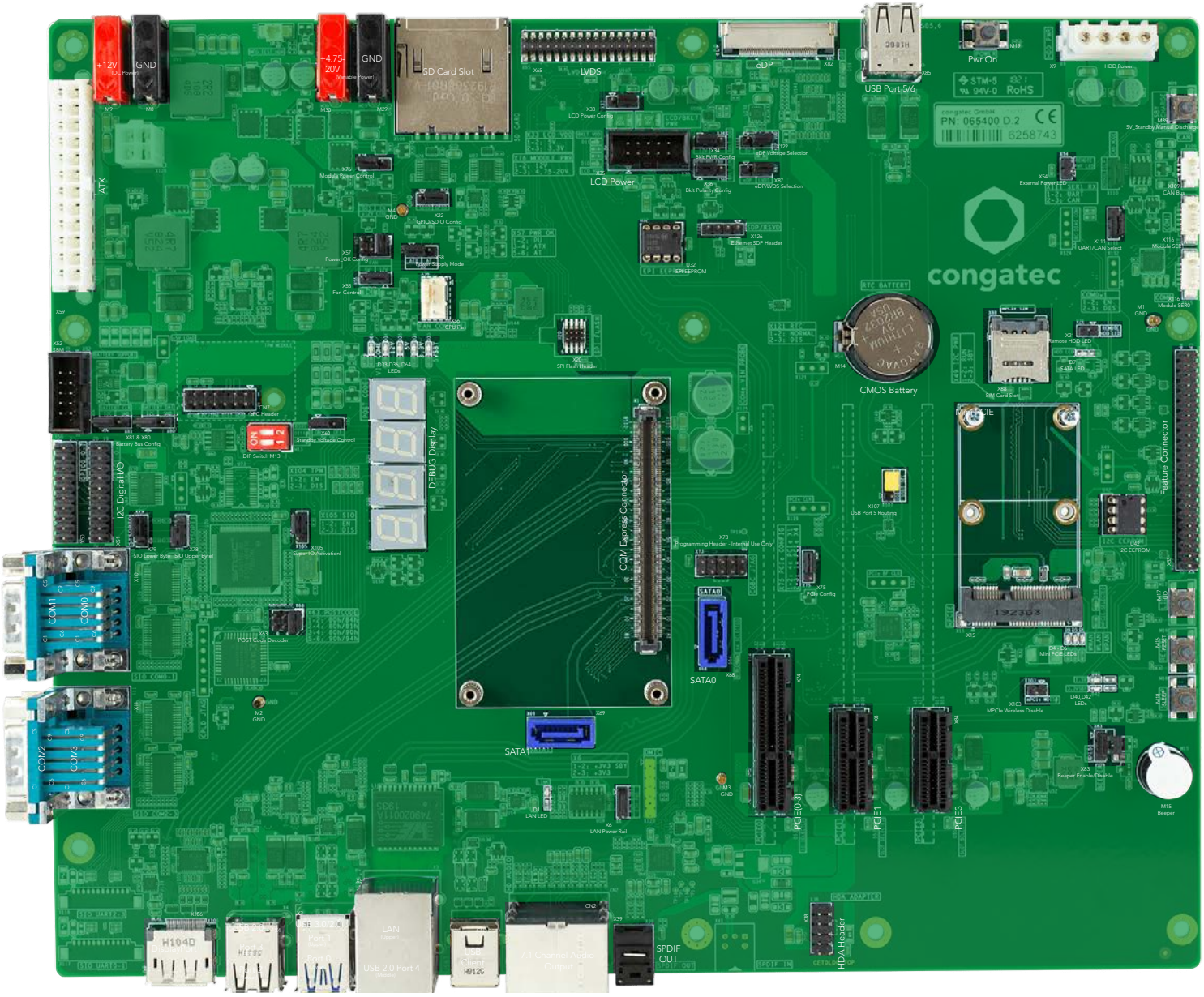


3 Connector Layout

The connector layout picture shows each connector and its name designator. Jumpers 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 that 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 picture.



4 Specifications

4.1 Feature List

Table 2 Feature Summary

Form Factor	Based on COM Express standard pinout Type 10, rev. 3.0	
Supported Modules	COM Express™ Type 10 mini module form factor (55 x 85 mm)	
Power	1x standard 24-pin ATX connector 1x DC power input (4 mm banana connectors) 1x BR2032 CMOS battery	
Back Panel I/O Connectors	1x DP 2x USB 3.1 ports 4x USB 2.0 host ports 1x Gigabit Ethernet RJ45 port 1x USB Type B (USB device functionality)	2x Line-Out jacks 1x Line-In jack 1x Microphone jack 1x Headphone jack 1x Optical S/PDIF-Out
Onboard I/O Connectors	1x PCIe x4 slot 2x PCIe x1 slots 1x mini PCIe socket 1x SIM card socket 1x SD card socket (full-size) 2x LVDS connectors 1x LVDS/Backlight power supply header 2x SATA connectors 1x Disk drive 4-pin connector 1x HDA adapter/debug header 4x COM ports 2x COM port headers (module serial ports)	1x I²C digital IO expansion header 1x CPU fan header 1x SBM header 1x I²C EEPROM socket 1x SPI flash header 1x LPC header 1x EPI EEPROM Socket 1x Feature connector 2x USB 2.0 host ports 1x DMIC header
Other Features	5x Buttons (power, reset, sleep, lid, 5 V standby power discharge) 1x Beeper 4x Debug displays for post code information 4x Ground test points 1x Voltage test point for COM Express module Onboard Super I/O Optional discrete TPM	

Note

The module must also support these features for them to function. Refer to the module's user's guide for information about supported features.

4.2 Mechanical Dimensions

- 294 mm x 244 mm
- Height approximately 36 mm (top side)

4.3 Environmental Specifications

Temperature	Operation: -40° to +85°C	Storage: -40° to +85°C
Humidity	Operation: 10% to 90%	Storage: 5% to 95%

Note

1. *The above operating temperatures must be strictly adhered to at all times. The maximum operating temperature refers to any measurable spot on the carrier board's surface.*

2. *Humidity specifications are for non-condensing conditions.*

5 Connectors and Features

5.1 COM Express A - B Connector

Table 3 Module Type 10 Connector Pinout—Rows A and B

Pin	Row A	Pin	Row B	Pin	Row A	Pin	Row B
A1	GND(FIXED)	B1	GND(FIXED)	A56	RSVD	B56	RSVD
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	eDP_TX2+/LVDS_A0+	B71	DDI0_PAIR0+
A17	SATA0_TX-	B17	SATA1_TX-	A72	eDP_TX2-/LVDS_A0-	B72	DDI0_PAIR0-
A18	SUS_S4#	B18	SUS_STAT#	A73	eDP_TX1+/LVDS_A1+	B73	DDI0_PAIR1+
A19	SATA0_RX+	B19	SATA1_RX+	A74	eDP_TX1-/LVDS_A1-	B74	DDI0_PAIR1-
A20	SATA0_RX-	B20	SATA1_RX-	A75	eDP_TX0+/LVDS_A2+	B75	DDI0_PAIR2+
A21	GND(FIXED)	B21	GND(FIXED)	A76	eDP_TX0-/LVDS_A2-	B76	DDI0_PAIR2-
A22	USB_SSRX0-	B22	USB_SSTX0-	A77	eDP/LVDS_VDD_EN	B77	DDI0_PAIR4+ [1]
A23	USB_SSRX0+	B23	USB_SSTX0+	A78	LVDS_A3+	B78	DDI0_PAIR4- [1]
A24	SUS_S5#	B24	PWR_OK	A79	LVDS_A3-	B79	eDP/LVDS_BKLT_EN
A25	USB_SSRX1-	B25	USB_SSTX1-	A80	GND(FIXED)	B80	GND(FIXED)
A26	USB_SSRX1+	B26	USB_SSTX1+	A81	eDP_TX3+/LVDS_A_CK+	B81	DDI0_PAIR3+
A27	BATLOW#	B27	WDT	A82	eDP_TX3-/LVDS_A_CK-	B82	DDI0_PAIR3-

Pin	Row A	Pin	Row B	Pin	Row A	Pin	Row B
A28	(S)ATA_ACT#	B28	HDA_SDIN2	A83	eDP_AUX+/LVDS_I2C_CK	B83	eDP/LVDS_BKLT_CTRL
A29	HDA_SYNC	B29	HDA_SDIN1 [2]	A84	eDP_AUX-/LVDS_I2C_DAT	B84	VCC_5V_SBY
A30	HDA_RST#	B30	HDA_SDIN0 [2]	A85	GPI3	B85	VCC_5V_SBY
A31	GND(FIXED)	B31	GND(FIXED)	A86	RSVD	B86	VCC_5V_SBY
A32	HDA_BITCLK	B32	SPKR	A87	eDP_HPD	B87	VCC_5V_SBY
A33	HDA_SDOUT	B33	I2C_CK	A88	PCIE_CLK_REF+	B88	BIOS_DIS1#
A34	BIOS_DIS0#	B34	I2C_DAT	A89	PCIE_CLK_REF-	B89	DD0_HPD
A35	THRMTRIP#	B35	THRM#	A90	GND(FIXED)	B90	GND(FIXED)
A36	USB6-	B36	USB7-	A91	SPI_POWER	B91	DDI0_PAIR5+ [1]
A37	USB6+	B37	USB7+	A92	SPI_MISO	B92	DDI0_PAIR5- [1]
A38	USB_6_7_OC#	B38	USB_4_5_OC#	A93	GPO0	B93	DDI0_PAIR6+ [1]
A39	USB4-	B39	USB5-	A94	SPI_CLK	B94	DDI0_PAIR6- [1]
A40	USB4+	B40	USB5+	A95	SPI_MOSI	B95	DDI0_DDC_AUX_SEL
A41	GND(FIXED)	B41	GND(FIXED)	A96	TPM_PP	B96	USB7_HOST_PRSNT
A42	USB2-	B42	USB3-	A97	TYPE10#	B97	SPI_CS#
A43	USB2+	B43	USB3+	A98	SER0_TX	B98	DDI0_CTRLCLK_AUX+
A44	USB_2_3_OC#	B44	USB_0_1_OC#	A99	SER0_RX	B99	DDI0_CTRLDATA_AUX-
A45	USB0-	B45	USB1-	A100	GND(FIXED)	B100	GND(FIXED)
A46	USB0+	B46	USB1+	A101	SER1_TX/CAN_TX	B101	FAN_PWMOUT
A47	VCC_RTC	B47	ESPI_EN#	A102	SER1_RX/CAN_RX	B102	FAN_TACHIN
A48	RSVD	B48	USB0_HOST_PRSNT	A103	LID#	B103	SLEEP#
A49	GBE0_SDP	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	RSVD	B52	RSVD	A107	VCC_12V	B107	VCC_12V
A53	RSVD	B53	RSVD	A108	VCC_12V	B108	VCC_12V
A54	GPI0	B54	GPO1	A109	VCC_12V	B109	VCC_12V
A55	RSVD	B55	RSVD	A110	GND(FIXED)	B110	GND(FIXED)

Note

1. *Not supported*
2. *Assembly option*

5.2 Power Supply Connectors

The conga-MEVAL provides the following connectors for power supply:

- standard 24-pin ATX conector (X59)
- 12 V DC banana jack (M22 and M23)
- optional DC banana jack for supplying power to the module (M29 and M30)

Note

In ATX mode, the +3.3 V, +5 V and +12 V are derived from the ATX power supply. If 12 V DC power is supplied via the DC banana jack, the onboard DC/DC regulators will generate 3.3 V and 5 V.

Caution

1. *Do not exceed the voltage rating of the COM Express module. Doing so will damage the module.*
2. *Do not supply power to both the DC banana jack and the ATX connector at the same time.*

5.2.1 Standard ATX Connector

The conga-MEVAL provides a 24-pin ATX connector (X59). Use jumper X58 to select ATX or AT power supply mode. Use jumper X60 to disconnect the 5 V standby voltage from the whole system.

The conga-MEVAL also provides a 4-pin ATX connector (X128). This connector can be used together with connector X59 if higher current is expected.

Table 4 X58 - ATX PSU Control Description

Pin	Configuration	Description
1-2	ATX mode (default)	Module starts after pressing power-on button M19
2-3	AT mode	Module starts after switching on the power supply

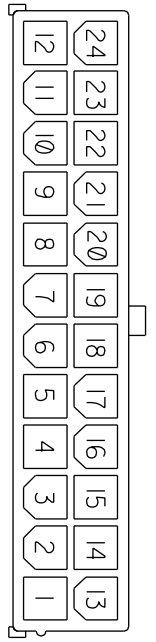
Table 5 X60 - ATX 5V Standby Connection

Pin	Description
1-2	5V standby connected (default)
2-3	5V standby disconnected

Table 6 X59 - ATX Pinout

Pin	Signal	Description	Pin	Signal	
1	+3.3 V	Power supply +3.3 VDC	13	+3.3V	Power supply +3.3 VDC
2	+3.3 V	Power supply +3.3 VDC	14	-12V	Power supply -12 VDC
3	GND	Power ground	15	GND	Power ground
4	+5 V	Power supply +5 VDC	16	PS_ON#	Power supply on (active low). Short this pin to GND to switch on power supply; disconnect from GND to switch off.
5	GND	Power ground	17	GND	Power ground
6	+5V	Power supply +5 VDC	18	GND	Power ground
7	GND	Power ground	19	GND	Power ground
8	PWR_OK	Power Ok	20	N.C	Not connected
9	5V_SB	Standby power supply +5 VDC	21	+5V	Power supply +5 VDC
10	+12 V	Power supply +12 VDC	22	+5V	Power supply +5 VDC
11	+12 V	Power supply +12 VDC	23	+5V	Power supply +5 VDC
12	+3.3 V	Power supply +3.3 VDC	24	GND	Power ground

X59



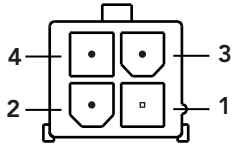
Note

The -12 V power output of the ATX power supply is not used.

Table 7 X128 - ATX (4-pin)

Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	GND	Ground
3	+12 V	Power supply +12 VDC	4	+12 V	Power supply +12 VDC

X128



Connector Type

X58, X60: 2.54 mm grid jumper

X59: 24-pin ATX 2.0 power connector

X128: 4-pin ATX connector

5.2.2 DC Banana Jack

The conga-MEVAL provides M22 and M23 for 12 V DC power supply.

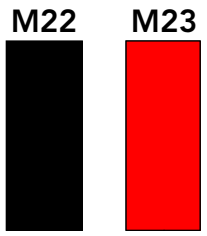


Table 8 M22/M23 - DC Banana Jack

Connector	Description
M22	Ground
M23	+12 VDC (11,4 V – 12,6 V)

Connector Type

M22/M23: 4 mm diameter banana plug

5.2.3 Optional DC Banana Jack

The conga_MEVAL offers M29 and M30 optionally for supplying separate variable power to the module. The input voltage varies between 4.75 V and 20 V.

Jumper X76 controls the source of the COM Express module's input voltage when using the optional DC banana jack.

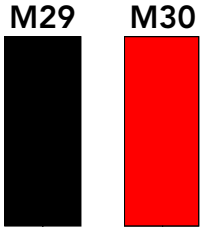


Table 9 M29/M30 - Optional DC Banana Jack

Connector	Description
M29	Ground
M30	+4.75 - 20 V

Table 10 X76 - Voltage Regulator Control

Pin	Description
1-2	Force COM Express module to run on the on-carrier 12 V supply (default)
2-3	Force COM Express module to run on external 4.75 - 20 V supply

Note

1. *With variable power input, you can measure the module power. To enable variable voltage power to the module, the conga-MEVAL power must be on.*

2. *The conga-MEVAL supplies the module with a standby voltage if available.*

Connector Type

X76: 2.54 mm grid jumpet

M29/M30: 4 mm diameter banana plug

5.2.4 Status LEDs

The status LEDs show the different power states of the conga-MEVAL. Refer to the following table for detailed information.

Table 11 Power LEDs Status

LED	Status	Description
All	Off	No power applied.
All	On	ATX power supply is fully switched on, with stable 3.3 V, 5 V and 12 V.
D64	On	The green LED indicates that power is delivered to the COM Express module
D34	On	The green LED indicates that 12 V main power is present
D35	On	The green LED indicates that 5 V main power is present
D36	On	The green LED indicates that the onboard 3.3 V main power is present
D40	On	The green LED indicates that the 1.5 V power is present
D42	On	The yellow LED indicates that the onboard 3.3 V standby power is present
D33	On	The yellow LED indicates that 5V standby power is applied to the conga-MEVAL. If D33 and D42 are lit, it indicates the ATX power supply is mechanically switched on.

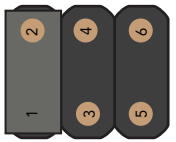
5.2.5 PWR_OK Signal

The PWR_OK signal is a high-active input from the main power supply to the module and it indicates whether the power is good. Use jumper X57 to configure the PWR_OK signal.

Table 12 X57 - Module PWR_OK Signal

Pin	Description
1-2	Add 3.3V pull-up with 1 kΩ to PWR_OK signal (default)
3-4	Connect PWR_OK signal from ATX power supply
5-6	Connect PWR_OK signal from onboard DC/DC regulator (only via DC banana jack)

X57



Connector Type

X57: 2.54 mm, 2-pin jumper

5.2.6 Power-Up Control

The module's SUS_S3# signal controls the ATX power supply control signal (PS_ON#). When the system goes to Suspend to RAM (S3) or Soft Off (S5), the module's chipset asserts the 'SUS_S3#' signal. Through the use of an inverter, the low active 'PS_ON#' signal goes high and switches off the ATX power supply.

When the system is in a power-down system state, any system wake-up event invokes the module's chipset to deassert the 'SUS_S3#' signal. With the deassertion, the system transitions to 'Full-On' state (S0).

5.2.7 Module Type Detection

The signals TYPE0#, TYPE1#, TYPE2# and TYPE10# indicate the pinout type of the module connected to the carrier board. These pins are either open (N.C), strapped to ground (GND) or connected to 12 V by the module as shown below.

Table 13 Module Type Detection Pinout Description

	TYPE0#	TYPE1#	TYPE2#	TYPE10#	Comment
Module Type 1	X (don't care)	X (don't care)	X (don't care)	12 V/NC	COM Express Specification 1.0/2.0
Module Type 10	X (don't care)	X (don't care)	X (don't care)	47k PD	COM Express Specification 2.0
Module Type 2	N.C	N.C	N.C	12 V/N.C	COM Express Specification 1.0/2.0

Module Type 3	N.C	N.C	GND	12 V/N.C	COM Express Specification 1.0/2.0
Module Type 4	N.C	GND	N.C	12 V/N.C	COM Express Specification 1.0/2.0
Module Type 5	N.C	GND	GND	12 V/N.C	COM Express Specification 1.0/2.0
Module Type 6	GND	N.C	N.C	N.C	COM Express Specification 2.0/3.0
Module Type 7	GND	N.C	GND	N.C	COM Express Specification 3.0

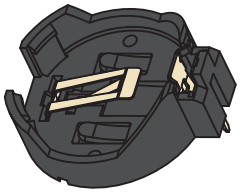
Note

If conga-MEVAL detects an incompatible module pinout, the onboard logic will prevent the board from powering up the whole system by controlling the 'PS_ON#' signal of the ATX power supply.

5.3 CMOS Battery

The conga-MEVAL provides a board-mounted battery holder (M14) for attaching a BR2032 CMOS battery. The battery supplies power to the RTC and CMOS memory.

M14



Note

The conga-MEVAL incorporates two current-limiting devices (resistor and diode) in the battery power supply path in accordance with DIN EN60950 standard.

Warning

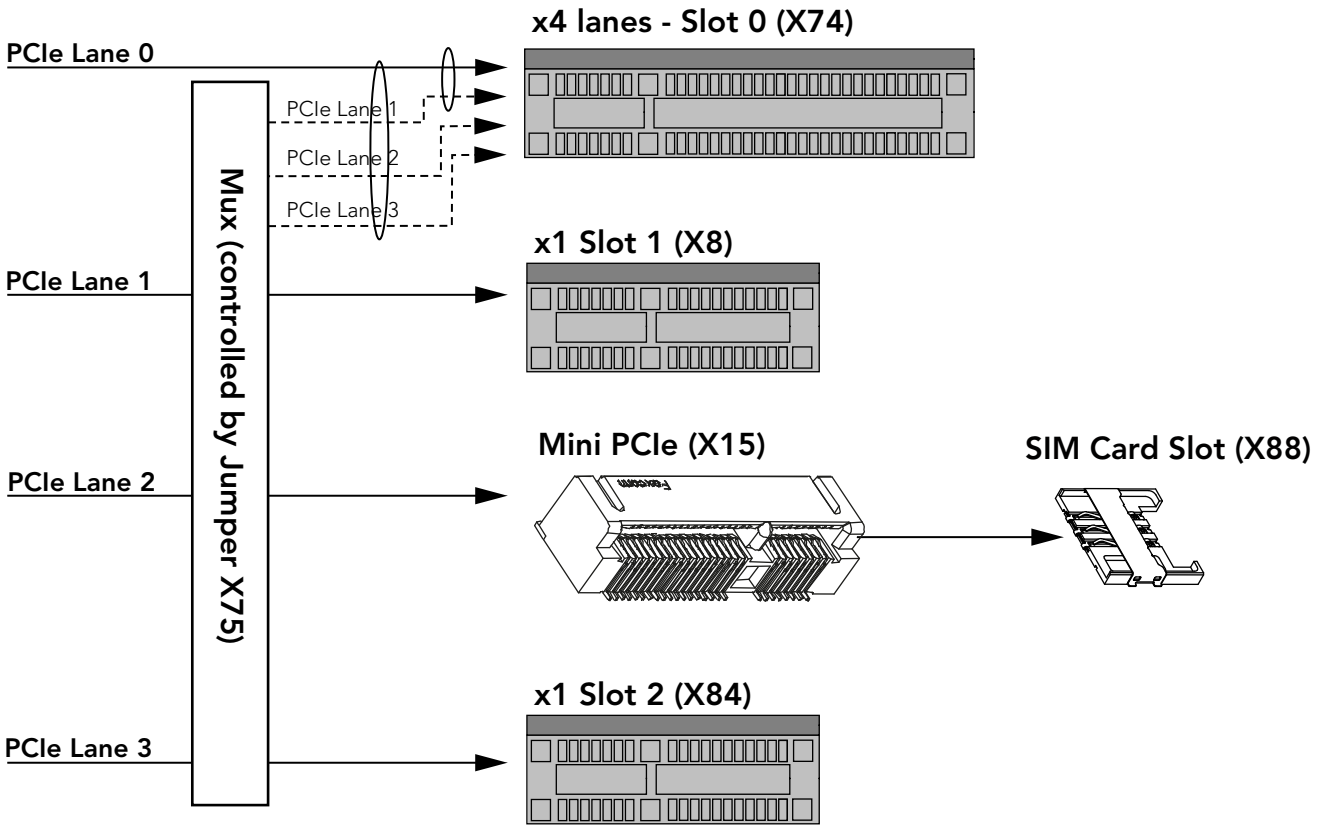
Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

5.4 PCIe Connectors

The conga-MEVAL provides:

- one x4 PCIe slot connector X74 (PCIe lanes 0–3)
- two x1 PCIe slot connectors X8 and X84 (PCIe lanes 1 and 3)
- one mPCIe socket connector X15 (PCIe lane 2)

The pcie lanes are routed as shown below:



5.4.1 PCIe x4 Slot

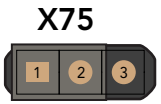
The conga-MEVAL provides a standard PCIe x4 slot connector X74 (Slot 0). This slot, which is routed to the module's PCIe lanes 0–3, shares:

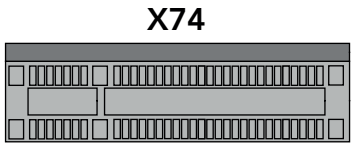
- PCIe lane 1 with connector X8 (Slot 1)
- PCIe lane 2 with connector X15 (mPCIe slot)
- PCIe lane 3 with connector X84 (Slot 2)

PCIe Slot 0 supports one PCIe lane (x1 link) by default. To support x4 link operation, set jumper X75 as described in the table below:

Table 14 X75 - PCIe x4 Slot Configuration

Pin	Description
1-2	x1 PCIe link (default)
2-3	x4 PCIe link





Note

The COM Express module must support the selected PCIe configuration.

Connector Type

X74: PCIe card

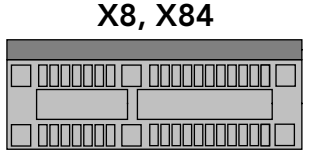
X75: 2.54 mm grid jumper

5.4.2 PCIe x1 Slot

The conga-MEVAL provides two standard PCIe x1 slots. The table below shows how the signals are routed to the connectors:

Table 15 PCIe x1 Lane Routing

Slot Number	PCIe Lane	Connector
Slot 1	PCIe 1	X8
Slot 2	PCIe 3	X84



Connector Type

X8, X84: PCIe x1 card

5.4.3 Mini PCIe Socket

The conga-MEVAL provides a standard mini PCIe socket X15. The module's PCIe lane 2 and USB port 5 signals are routed to this socket. This socket shares the USB port 5 signals with the lower slot of USB connector X85. Use jumper X107 to select how the USB port 5 is routed.

The LEDs D4–D6 indicate activity of the card attached to the socket. The UIM interface of the mini PCIe socket is connected to a micro-SIM card slot (X88).

Table 16 X107 - USB Port 5 Routing

Pin	Description
1-2	USB port 5 auto switching (mPCIe card detection)
2-3	USB port 5 to mPCIe connector (default)

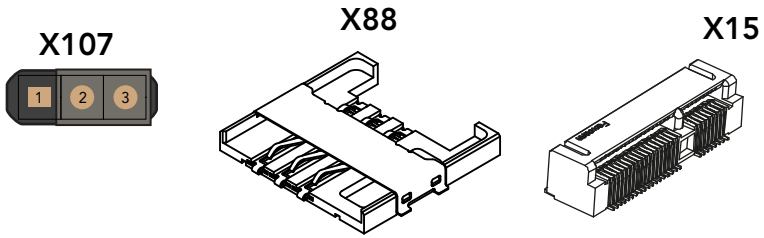


Table 17 D4-D6 - Mini PCIe LEDs Description

LED	Color	Description
D4	Green	Wireless Wide Area Network
D5	Green	Wireless Local Area Network
D6	Green	Wireless Personal Area Network

Note

1. *Set jumper X107 to postion 1-2 to route USB port 5 to USB connector X85.*
2. *X15 supports half and full card sizes*

Connector Type

X15: mPCIe card

X107: 2.54 mm grid jumper

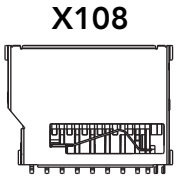
5.5 SD Card Slot

The conga-MEVAL features a full-size SD card slot X108. The slot is routed to the module's SDIO interface, which is multiplexed with GPIO. The shared signals are demultiplexed and routed to either the SD card slot (SDIO mode) or the feature connector X53 (GPIO mode).

Use jumper X22 to select SDIO or GPIO mode.

Table 18 X22 - SDIO/GPIO Connection

Pin	Description
1-2	SDIO mode
2-3	GPIO mode (default)



Connector Type

X22: 2.54 mm grid jumper

X108: SD card

5.6 Display Interfaces

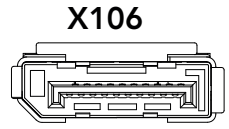
The conga-MEVAL provides the following display interfaces:

- DisplayPort++
- eDP
- LVDS

5.6.1 DP++

The conga-MEVAL provides a DisplayPort interface on connector X106. The DP++ port is routed through DisplayPort re-driver to support HBR3 data rate (up to 12 Gbps).

You can connect a DP++ to HDMI dongle to the DP++ connectors if your module supports it.



Connector Type

X106: Standard DP cable

5.6.2 eDP

The conga-MEVAL provides eDP interface on connector X82. The connector supplies 3.3 V or 5 V to eDP panels. Use jumper X122 to select the eDP panel power.

The connector also supplies 5 V or 12 V to backlight inverter (maximum output current of 1 A). Use jumper X34 to select eDP backlight power. For eDP functionality on X82, set jumper X87 to position 1-2.

Table 19 X82 - eDP Pinout Description

Pin	Signal	Pin	Signal
1	N.C.	21	PANEL_PWR
2	GND	22	N.C.
3	eDP_TX3-	23	GND
4	eDP_TX3+	24	GND
5	GND	25	GND
6	eDP_TX2-	26	GND
7	eDP_TX2+	27	eDP_HPD
8	GND	28	GND
9	eDP_TX1-	29	GND
10	eDP_TX1+	30	GND
11	GND	31	GND
12	eDP_TX0-	32	eDP_LVDS_BKLT_EN
13	eDP_TX0+	33	eDP_LVDS_BKLT_CTRL
14	GND	34	N.C.
15	eDP]_AUX+	35	N.C.
16	eDP_AUX-	36	BKLT_PWR
17	GND	37	BKLT_PWR
18	PANEL_PWR	38	BKLT_PWR
19	PANEL_PWR	39	BKLT_PWR
20	PANEL_PWR	40	N.C.

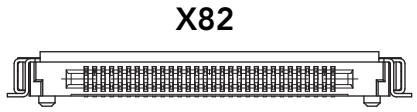


Table 20 X87 - eDP/LVDS Selection

Pin	Configuration
1-2	Select eDP
2-3	Select LVDS (default)

X87

Connector Type

X82: 0.5 mm, 40 Pos. ACES series 50204 connector

X87: 2.54 mm grid jumper

5.6.2.1 Panel Power and Backlight Jumpers

The eDP connector X82 supplies 5 V or 3.3 V to eDP panel and 5 V or 12 V to panel backlight (maximum output current of 1 A). Use jumper X122 to select the eDP panel power and jumper X34 to select the eDP backlight power.

Table 21 X122 - eDP Panel Power

Pin	Configuration
1-2	5 V eDP panel power
2-3	3.3 V eDP panel power (default)

X122

Table 22 X34 - Backlight Voltage Selection

Pin	Configuration
1-2	12 V backlight Power (default)
2-3	5 V backlight Power

X34

Connector Type

X122, X34: 2.54 mm grid jumper

5.6.3 LVDS

The conga-MEVAL provides LVDS connectors CN6 and X65. Connector CN6 supplies 3.3 V or 5 V LVDS panel power. The power/backlight connector X35 supplies 5 V or 12 V backlight power (maximum output current of 1 A) to CN6 and X65, as well as 3.3 V or 5 V panel power to X65.

Use jumper X33 to select the LVDS panel power and jumper X34 to select the LVDS backlight power. For LVDS functionality on CN6 or X65, set jumper X87 to position 2-3.

Table 23 X87 - eDP/LVDS Selection

Pin	Configuration
1-2	Select eDP
2-3	Select LVDS (default)

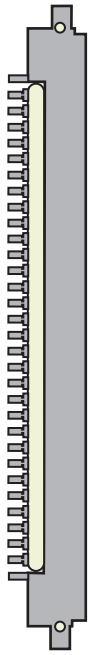
Table 24 X65 - LVDS Connector (Top side)

Pin	Signal	Description	Pin	Signal	Description
1	LVDS_I2C_DAT	I²C data line for LVDS display	2	LVDS_I2C_CK	I²C clock output for LVDS display
3	N.C	Not Connected	4	N.C	Not Connected
5	GND	Power Ground	6	LVDS_A0-	LVDS Channel A differential pairs
7	LVDS_A0+	LVDS Channel A differential pairs	8	LVDS_VDD_EN	LVDS panel power enable
9	LVDS_A1-	LVDS Channel A differential pairs	10	LVDS_A1+	LVDS Channel A differential pairs
11	LVDS_BKLT_EN	LVDS panel backlight enable	12	LVDS_A2+	LVDS Channel A differential pairs
13	LVDS_A2-	LVDS Channel A differential pairs	14	N.C.	Not Connected
15	LVDS_A_CK-	LVDS Channel A differential clock	16	LVDS_A_CK+	LVDS Channel A differential clock
17	N.C	Not Connected	18	LVDS_A3+	LVDS Channel A differential pairs
19	LVDS_A3-	LVDS Channel A differential pairs	20	GND	Ground
21	N.C	Not Connected	22	N.C	Not Connected
23	GND	Power Ground	24	N.C	Not Connected
25	N.C	Not Connected	26	GND	Power Ground
27	N.C	Not Connected	28	N.C	Not Connected
29	GND	Power Ground	30	N.C	Not Connected
31	N.C	Not Connected	32	N.C	Not Connected
33	N.C	Not Connected	34	N.C	Not Connected

Table 25 CN6 - LVDS Connector (Bottom side)

Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	17	N.C	Not connected
2	LVDS_A0-	LVDS Channel A differential data pair 0	18	GND	Ground
3	LVDS_A0+		19	N.C	Not connected
4	LVDS_A1-	LVDS Channel A differential data pair 1	20	N.C	Not connected
5	LVDS_A1+		21	N.C	Not connected
6	LVDS_A2-	LVDS Channel A differential data pair 2	22	N.C	Not connected
7	LVDS_A2+		23	N.C	Not connected
8	GND	Ground	24	N.C	Not connected
9	LVDS_A_CLK-	LVDS Channel A differential clock pair	25	GND	Ground
10	LVDS_A_CLK+		26	LVDS_I2C_DAT	I²C data line for LVDS display
11	LVDS_A3-	LVDS Channel A differential data pair 3	27	LVDS_VDD_EN	LVDS panel power enable
12	LVDS_A3+		28	LVDS_I2C_CLK	I²C clock output for LVDS display
13	N.C	Not connected	29	VDD_LCD	LCD power supply
14	N.C	Not connected	30	VDD_LCD	LCD power supply
15	GND	Ground	31	VDD_LCD	LCD power supply
16	N.C	Not connected	32	GND	Ground

CN6



Connector Type

X87: 2.54 mm grid jumper

X65: 34-pin, 2 mm female grid

CN6: JILI30

5.6.3.1 Panel Power and Backlight Jumpers

The conga-MEVAL supports different voltages for LVDS panel and backlight. Use jumper X33 to select the LVDS panel power and jumper X34 to select the LVDS backlight power.

Table 26 X33 - LVDS Panel Power

Pin	Configuration
1-2	5 V panel power
2-3	3.3 V panel power (default)

X33

Table 27 X34 - Backlight Voltage Selection

Pin	Configuration
1-2	12 V backlight Power (default)
2-3	5 V backlight Power

X34

Connector Type

X33, X34: 2.54 mm grid jumper

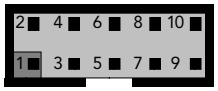
5.6.3.2 Panel and Backlight Power Supply

The power supply for LVDS panel and backlight inverter is available on connector X35.

Table 28 X35 - LVDS Power Pinout Description

Pin	Signal	Pin	Signal
1	VDD_LCD (1.5 A fuse)	2	VDD_BKLT (1.5 A fuse)
3	+5 V (1.5 A fuse)	4	+12 V (1.5 A fuse)
5	LVDS_VDD_EN (3.3 V output)	6	LVDS_BKLT_EN (3.3 V output)
7	LVDS_BKLT_VREF (DAC 5 V analog output)	8	LVDS_BKLT_CTRL (3.3 V output)
9	GND	10	GND

X35



Connector Type

X35: 2.54 mm, 2 x 5-pin female connector

5.6.3.3 Backlight Enable Polarity

Use jumper X36 to set the polarity of the backlight enable signal of connector X65.

Table 29 X36 - Backlight Enable Polarity

Pin	Configuration
1-2	Non-inverted BKLT_EN signal (default)
2-3	Inverted BKLT_EN signal

X36

Note

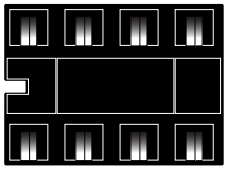
X36: 2.54 mm grid jumper

5.6.3.4 Flat Panel Configuration Data

The flat panel configuration data (EPI extended EDID™ 1.3 file) for most common displays is included in the congatec COM Express™ CPU module's system BIOS.

On the conga-MEVAL, you can store a customized EPI extended EDID™ 1.3 file in a serial EEPROM located on DIL SOIC8 socket U32. The following EEPROMs are supported at address A0h:

U32

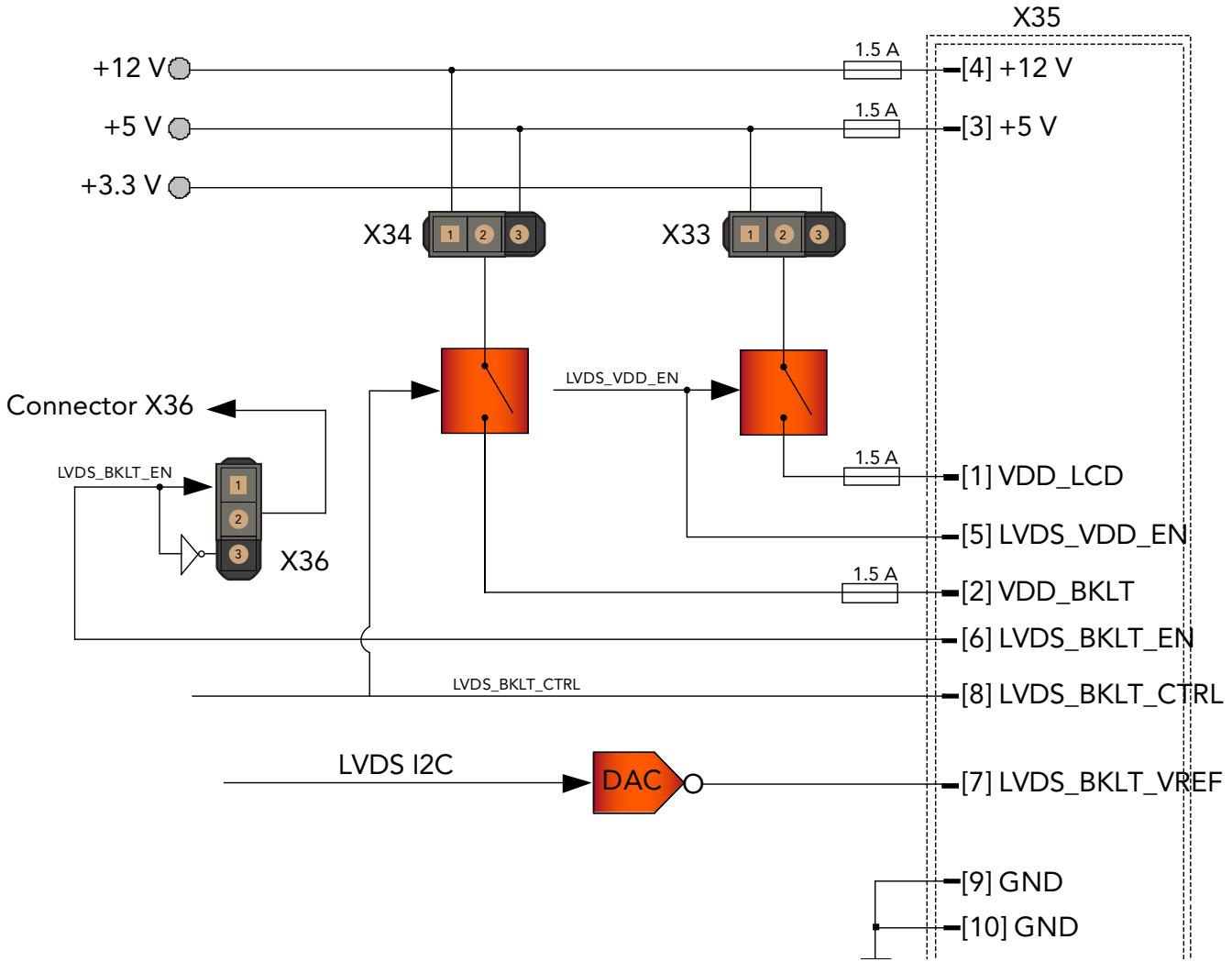


- 24C02
- 24C04
- 24C16

Connector Type

U32: EEPROM in 8-pin DIL package

5.6.3.5 Flat Panel and Backlight Power Supply Connection

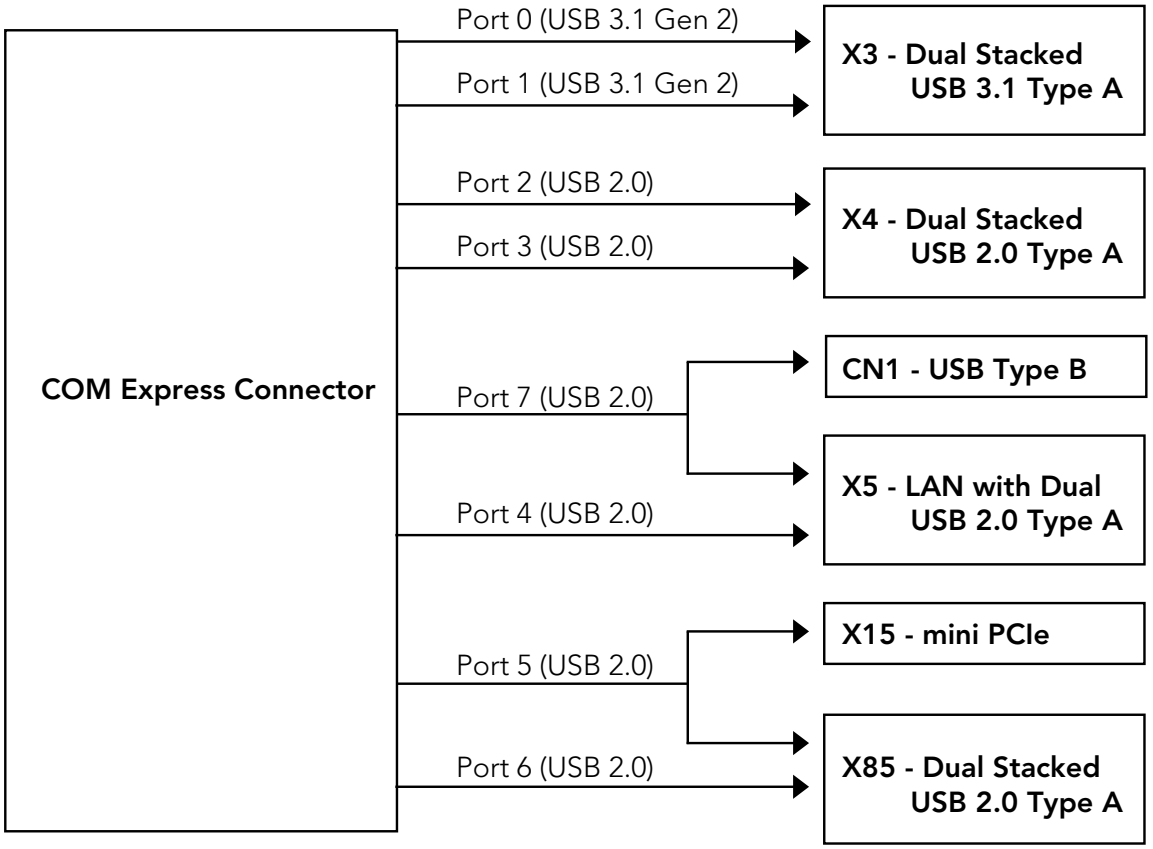


5.7 Universal Serial Bus (USB)

The conga-MEVAL provides the following USB connectors:

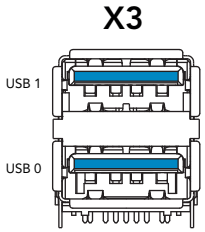
- one dual-stacked USB 3.1 Gen 2, Type-A (X3)
- three dual-stacked USB 2.0, Type-A (X4, X5 and X85)
- one USB Type B (CN1)

The COM Express USB signals are routed to the connectors as shown below:



5.7.1 Dual Stacked USB 3.1 Gen 2 Type-A

The conga-MEVAL provides two USB 3.1 Gen 2 ports (USB 0 and 1) via X3—a dual-stacked USB Type-A connector. Each port provides up to one ampere. The ports do not support Wake-on-USB.



Connector Type

X3: USB Type A plug

5.7.2 Dual Stacked USB 2.0 Type-A

The conga-MEVAL provides up to six USB 2.0 ports via three dual-stacked USB Type A connectors (X4, X5 and X85). The upper slot of connector X5 shares the module's USB port 7 signals with USB client port CN1. The lower slot of connector X85 shares the module's USB port 5 signals with mini PCIe slot X15. Use jumper X107 to select how the USB5 signal is routed.

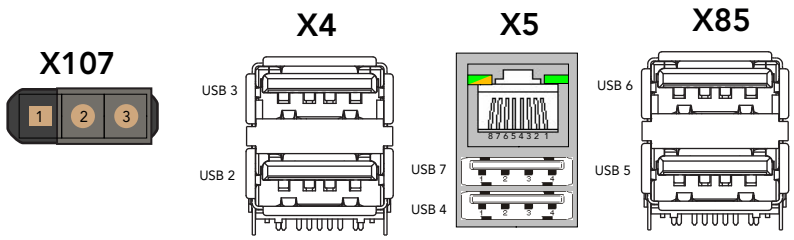
USB 2.0 ports on connector X4 (USB 2-3) provide up to one ampere while USB 2.0 ports on connectors X5 and X85 (USB 4-7) provide up to 0.5 ampere.

Note

1. *The upper slot of connector X5 will not function if a USB host device is connected to CN1.*
2. *The lower slot of USB connector X85 will not function if a mini PCIe card is connected to X15.*
3. *USB ports 4-7 (connector X5 and X85) support Wake-on-USB. USB ports 2-3 (connector X4) do not support Wake-on-USB.*
4. *The mini PCIe pin 43 controls the automatic switching of USB port 5. To route USB port 5 to mini PCIe connector, the mini PCIe card must connect pin 43 to ground.*

Table 30 X107 - USB5 Route Configuration

Pin	Configuration
1-2	USB port 5 auto switching (mPCIe card detection)
2-3	USB5 is routed to mPCIe (default)



Connector Type

X4, X5, X85: USB Type A plug

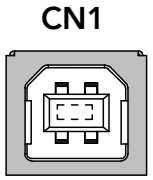
X107: 2.54 mm grid jumper

5.7.3 USB Type-B

The conga-MEVAL provides USB 2.0 Type B connector CN1 for USB device functionality. Its USB signals (USB port 7) are shared with the upper slot of connector X5. The shared USB signals are automatically routed to CN1 when a USB host device is connected.

Note

CN1 will not function if the COM Express module does not support USB device (client) mode.



Connector Type

CN1: USB Type B plug

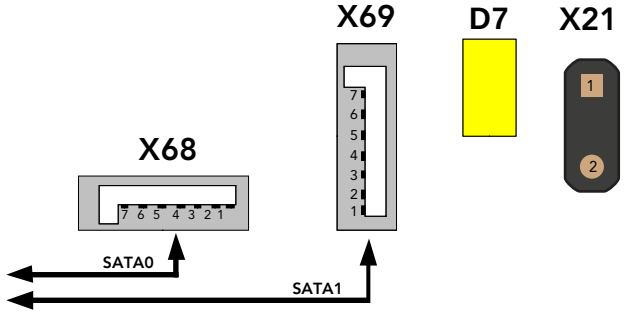
5.8 SATA™

The conga-MEVAL provides two standard SATA connectors (X68 and X69). The SATA activity LED (D7) lights when an activity occurs on any of the SATA interfaces. The pin header X21 provides an option to connect external SATA activity LED.

The header provides 3.3 V with 470 ohm resistor.

Table 31 X21 - External LED Header

Pin	Signal
1	Anode
2	Cathode



Connector Type

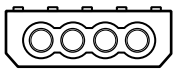
X68, X69: Standard SATA cable

X21: 2.54 mm grid female connector

5.8.1 Disk Drive Power Connector

The conga-MEVAL provides connector X9, a 4-pin connector for powering disk drive.

X9



5.9 Gigabit Ethernet

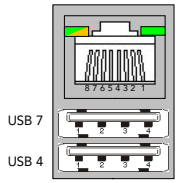
The conga-MEVAL provides a gigabit Ethernet port on a standard RJ45 connector (X5). Use jumper X6 to set the power rail of the status LEDs on connector X5.

The SDP signal output from the module's gigabit Ethernet controller is routed to connector X126. This connector is only available on hardware revision D.x and later.

Table 32 X5 Status LEDs

Left LED	Right LED	Description
Off	Off	No connection
On (steady yellow)	Off	10 Mb link established but no activity
On (blinking yellow)	Off	10 Mb link established with link activity
On (blinking yellow)	On (steady green)	100 Mb link established with link activity
On (blinking yellow)	On (steady orange)	1 Gb link established with link activity

X5



Note

The operation of the status LEDs depends on the COM Express module.

Table 33 D1 - Onboard GbE Link LED

LED	Color	Description
D1	Yellow	Indicates a link is established

Table 34 X6 - Ethernet LEDs Power Configuration

Pin	Configuration
1-2	Status LEDs are powered by standby voltage (default)
2-3	Status LEDs are powered by runtime voltage

X6

X126 - Ethernet SDP

Pin	Configuration
1	3.3 V
2	SDP signal (3.3 V)
3	Ground
4	Not connected

X126

Connector Type

X5: 8-pin RJ45 plug

X126: 2.54 mm grid female connector

X6: 2.54 mm grid jumper

5.10 Audio Interfaces

The conga-MEVAL features the following:

- multi-channel low power HD audio codec (Cirrus CS4207). The codec supports:
  - MIC-In signals on connector CN2 (pink jack by default and optionally on orange jack)
  - Line-In signals (blue jack) and Line-Out signals (black and lime jacks) on CN2
  - Headpone signals on CN2 (grey jack)
  - Optical S/PDIF output signal on connector X39
  - DMIC header X123
- HDA adapter/debug header on connector X38

5.10.1 Audio Jacks

The conga-MEVAL supports the audio outputs described in the table below.

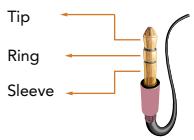
Table 35 CN2 Pinout Description

Jack 1 (Orange) [1]	Signal	Description	Jack 4 (Blue)	Signal	Description
Tip	MIC_L	Microphone - left channel	Tip	LINEIN_L	Line input 1 left
Ring	MIC_Bias	Microphone bias voltage	Ring	LINEIN_R	Line Input 1 right
Sleeve	A_GND	Analog ground	Sleeve	A_GND	Analog ground

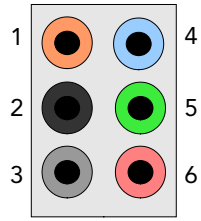
Jack 2 (Black)	Signal	Description	Jack 5 (Lime)	Signal	Description
Tip	LINEOUT_L2	Line output 2 - left channel	Tip	LINEOUT_L1	Line output 1 - left channel
Ring	LINEOUT_R2	Line output 2 - right channel	Ring	LINEOUT_R1	Line output 1 - right channel
Sleeve	A_GND	Analog ground	Sleeve	A_GND	Analog ground

Jack 3 (Grey)	Signal	Description	Jack 6 (Pink) [2]	Signal	Description
Tip	HPOUT_L	Headphone output - left channel	Tip	MIC_L	Microphone - left channel
Ring	HPOUT_R	Headphone utput - right channel	Ring	MIC_R	Microphone - right channel
Sleeve	HPREF	Headphone ground reference	Sleeve	A_GND	Analog ground

Jack Pins



CN2



Note

1. *The optional orange jack is not supported by default (assembly option)*
2. *Hardware revision C.x and earlier do not support microphone input on jack 6 (pink)*

Note

The Windows OS driver is available in the product section (under accessories) of the congatec website at www.congatec.com.

Connector Type

CN2: Six 3-pin, 3.5 mm audio jacks

5.10.2 Optical S/PDIF-Out

The conga-MEVAL provides S/PDIF-OUT signal on connector X39.

X39

Connector Type

X39: TOSLINK Optical cable

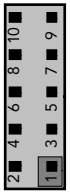
5.10.3 HDA Adapter/Debug Header

The HDA adapter X38 makes it possible to connect other HDA solutions to the conga-MEVAL.

Table 36 X38 Pinout Description

Pin	Signal	Description	Pin	Signal	Description
1	+12V	12 V DC power supply with 500 mA fuse	2	+3.3V	3.3 V DC power suppy with 750 mA fuse
3	HDA_SYNC	48 kHz fixed-rate, sample-synchronization signal to the codec(s)	4	HDA_RST#	Reset output from COM Express module, active low
5	HDA_SDIN2	Serial TDM data input to COM Express module	6	HDA_BITCLK	Up to 24 MHz serial clock generated by HDA controller
7	HDA_SDOUT	Serial TDM data output from COM Express module	8	N.C	Not connected
9	GND	Power ground	10	GND	Power ground

X38



Note

For HD audio support, the COM Express module must support HDA_SIN2 signal. On request, connector X38 can support HDA_SDIN0 or HDA_SDIN1 (assembly option).

Connector Type

X38: 2x 5-pin, 2.54 mm grid female

5.10.4 Digital MIC

The conga-MEVAL provides a digital microphone (DMIC) header X123.

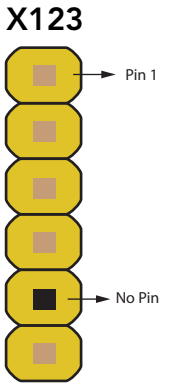


Table 37 X123 Pinout

Pin	Signal	Description
1	+3.3 V	3.3 V power supply for digital MIC
2	DMIC_DAT1	Serial data from digital MIC
3	GND	Ground
4	DMIC_CLK	Clock output from HDA codec to digital MiC
5	KEY	No pin
6	N.C	Not connected

Connector Type

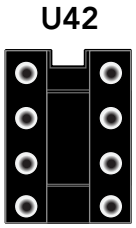
X123: 6x 1-pin, 2.54 mm grid female

5.11 I²C Bus

The I²C signals are available in different locations on the conga-MEVAL, including on the feature connector X53 described in section 5.22 "Feature Connector". The conga-MEVAL includes socket U42 for attaching an I²C EEPROM for test purposes during the system development.

The 8-pin DIL socket supports various 2-wire 3.3 V serial EEPROMs such as 24C04, 24C08 and 24C16. Use the I²C control commands implemented in the congatec CGOS API driver to access the EEPROMs.

For more information, refer to the CGOS manual and the user's guide of the COM Express module.



Connector Type

U42: EEPROM in 8-pin DIL package

5.12 SM Bus

The SM Bus signals are available on the feature connector X53 described in section 5.22 “Feature Connector”. The SM Bus on the module is powered by the standby power rail.

5.12.1 I²C Digital I/O

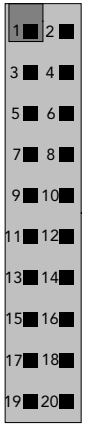
The conga-MEVAL provides two GPIO expansion headers (X50 and X51) for I²C applications. The GPIO signals are provided with 3.3 V power supply via a 16-bit I2C I/O expander (PCA9555).

The I2C device address for the expansion headers is 0x4E (least significant bit is set to a write operation). The table below describes the X50/X51 pinout. For more information, contact the congatec technical support team.

Table 38 X50/X51 Pinout Description

X50						X51					
Pin	Signals	Description	Pin	Signals	Description	Pin	Signals	Description	Pin	Signals	Description
1	GND	Ground	2	IO0_0	Port 0 input/output	1	IO1_0	Port 1 input/output	2	GND	Ground
3	GND		4	IO0_1		3	IO1_1		4	GND	
5	GND		6	IO0_2		5	IO1_2		6	GND	
7	GND		8	IO0_3		7	IO1_3		8	GND	
9	GND		10	IO0_4		9	IO1_4		10	GND	
11	GND		12	IO0_5		11	IO1_5		12	GND	
13	GND		14	IO0_6		13	IO1_6		14	GND	
15	GND		16	IO0_7		15	IO1_7		16	GND	
17	BATLOW#	COM Express BATLOW# signal	18	INT#	Interrupt output	17	INT#	Interrupt output	18	BATLOW#	COM Express BATLOW# signal
19	3.3 V	3.3 V supply	20	3.3 V	3.3 V supply	19	3.3 V	3.3 V supply	20	3.3 V	3.3 V supply

X50, X51



Connector Type

X50, X51: 2x 10-pin, 2.54mm grid female

5.13 SPI Flash Header

The conga-MEVAL provides header X20 for connecting SPI flash by default. An optional 8-pin SOIC socket can be provided by request (BOM option). Use DIP M13 to select the flash device to boot from.

Table 39 X20 - SPI Flash Header

Pin	Signal	Description	Pin	Signal	Description
1	SPI_CS#	SPI Chip select	2	SPI_PWR	SPI power source from COM Express module
3	SPI_MISO	SPI data in from carrier board flash to module	4	SPI_HOLD#	Stops serial communication temporary without device reset
5	SPI_WP	SPI write protect	6	SPI_CLK	SPI clock from module
7	GND	Ground	8	SPI_MOSI	SPI data out from module to carrier board flash

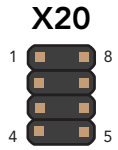
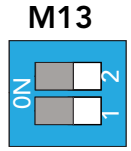


Table 40 SW M13 - BIOS Boot Device Selection

SW1	SW2	Configuration
OFF	OFF	Boot from on-module firmware (default)
OFF	ON	Boot from carrier board SPI Flash (X20)
ON	OFF	Not supported
ON	ON	Not supported



Note

Use SPI flash that supports the module's SPI power.

Connector Type

M13: DIP Switch

X20: 1.27 mm, 2 x 4-pin female header (board to board connection)

5.14 LPC Interfaces

On the conga-MEVAL, the module's LPC interface is routed to:

- LPC header CN7
- Optional discrete TPM chip
- LPC Super I/O controller for serial port support
- Xilinx CPLD for postcode display

Use jumper X104 (optional) to enable or disable the optional onboard LPC TPM module. Use jumper X105 to enable or disable the onboard LPC Super I/O controller.

5.15 LPC Header

The LPC interface from the module is also routed to connector CN7, a 14-pin header. Connector CN7 supports external TPM or Super I/O modules that are compliant with LPC specification.

For external TPM support, disable onboard TPM chip via jumper X104 if available. For external Super I/O support, disable the onboard Super I/O controller via jumper X105.

Table 41 CN7 - LPC Header

Pin	Signals	Pin	Signals
1	GND	2	LPC_FRAME#
3	LPC_CLK	4	LPC_AD3
5	KEY	6	LPC_AD2
7	PLT_RST#	8	LPC_AD1
9	VCC3V3	10	LPC_AD0
11	N.C	12	LPC_SERIRQ
13	VCC3V3_SBY	14	LPC_DRQ#

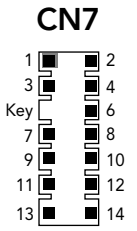


Table 42 X104 - Onboard TPM Activation

Pin	Configuration
1-2	Enable the optional onboard TPM if available (default)
2-3	Disable optional onboard TPM if available

Table 43 X105 - Super I/O Activation

Pin	Configuration
1-2	Enable Super I/O (default)
2-3	Disable Super I/O

X105

Note

For Super I/O or TPM functionality, the COM Express module must support the LPC signals above. Refer to the module's user's guide for information about supported features.

Connector Type

CN7: 2.54 mm, 2 x 7-pin female header (board to board connection)

X104, X105: 2.54 mm grid jumper

5.16 Super I/O Configuration

The conga-MEVAL provides jumpers X78 and X79 for configuring the Super I/O index base address.

Table 44 X78 - SIO Upper Byte

Jumper	Configuration
1-2	Upper byte = 00xx (default)
2-3	Upper byte = 16xx

X78

Table 45 X79 - SIO Lower Byte

Jumper	Configuration
1-2	Lower byte = xx4E
2-3	Lower byte = xx2E (default)

X79

Connector Type

X78, X79: 2.54 mm grid jumper

5.17 Serial Ports

The conga-MEVAL provides up to six serial ports:

- four serial ports via the Super I/O controller
  - COM port 0 and 1 on DSUB9 connector X10
  - COM port 2 and 3 on DSUB9 connector X11
- two serial ports from the COM Express
  - Module serial port 0 (SER0) on pin header X115
  - Module serial port 1 (SER1) on pin header X116

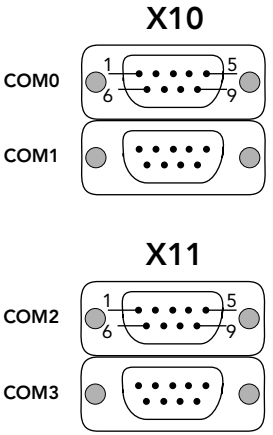
5.17.1 COM Ports 0-3

The conga-MEVAL provides COM ports 0-1 on DSUB9 connector X10 and COM ports 2-3 on DSUB9 connector X11 via the Super I/O controller. The COM ports support only RS-232 interface, with flow control.

Optionally, the serial port signals from the Super I/O can be rerouted to pin headers X117 and X118 (BOM option).

Table 46 X10,X11 - COM Port 0-3 Pinout Description

Pin	Signal	Description
1	DCD#	Carrier detect
2	RXD	Receive data
3	TXD	Trasmit data
4	DTR#	Data terminal ready
5	GND	Signal ground
6	DSR#	Data set ready
7	RTS#	Request to send
8	CTS#	Clear to send
9	RI#	Ring Indicator



Connector Type

X10, X11: 2x 9-pin D-SUB female

5.17.2 Module Serial Port 0-1/CAN Bus

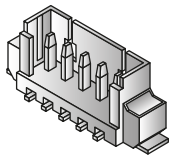
The conga-MEVAL provides the module's serial port 0 (SER0) on pin header X115 and the module's serial port 1 (SER1) on pin header X116 or CAN bus connector X109. The serial ports support only RS-232 signals, without flow control.

Use jumper X111 to route the module's serial port 1 to pin header X116 or to CAN bus connector X109. Use jumper X110 to set the CAN bus mode.

Table 47 X115, X116 - Module Serial Port 0-1

Pin	Signal	Description
1	GND	Ground
2	TXD	Transmit data
3	N.C	Not connected
4	N.C	Not connected
5	RXD	Receive data

X115



X116

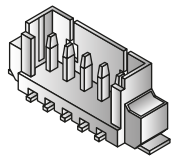


Table 48 X111 - SER1/CAN Bus Selection

Pin	Description
1 - 2	Module's SER1 RX signal to serial port header X116 (default)
2 - 3	Module's SER1 RX signal to CAN connector X109

X111

Table 49 X109 - CAN Bus

Pin	Signal	Description
1	CAN_H	CAN high
2	CAN_L	CAN low
3	GND	Ground

X109

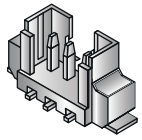


Table 50 X110 - CAN Bus Mode

Pin	Description
1 - 2	Normal operation mode (default)
2 - 3	Sleep mode

X110

Note

The CAN bus does not have resistor termination. For CAN bus termination, use a cable adapter with internal resistor termination.

Connector Type

X115, X116: Molex 51021-0500

X109: Molex 51021-0300

X110, X11: 2.54 mm grid jumper

5.18 CPU Fan Header

The conga-MEVAL provides a 4-pin CPU fan header X56. Use jumper X55 to set the fan's supply voltage.

Table 51 X56 - CPU Fan Header

Pin	Signal
1	GND
2	+VDD (12 V or 5 V)
3	Sense
4	Control

X56

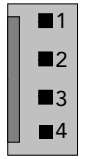


Table 52 X55 - CPU Fan Voltage Selection

Pin	Configuration
1-2	12 V supply voltage (default)
2-3	5 V supply voltage

X55

Connector Type

X56: Standard 4-pin fan connector

X55: 2.54 mm grid jumper

5.19 Smart Battery Header

The conga-MEVAL provides SBM header X52 for attaching smart battery module kits. Use jumpers X80 and X81 to select the communication bus for the smart battery.

Table 53 X52 - SBM Header Pinout

Pin	Signal	Pin	Signal
1	I2C/SMB_CLK	2	I2C/SMB_DAT
3	PWRBTN#	4	BATLOW#
5	PS_ON#	6	SUS_S45# [1]
7	VCC (5V)	8	5V_SB
9	SUS_STAT#	10	GND

X52

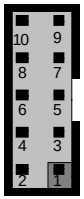


Table 54 X80/X81 - Bus Selection

Pin	X80	X81	Description
1-2	I2C bus data signal	I2C bus clock signal	Select I2C bus for smart battery (default)
2-3	SM bus data signal	SM bus clock signal	Select SM bus for smart battery

X80/X81

Note

[1] The signal "SUS_S45#" represents a "logical ANDing" of signals SUS_S4# and SUS_S5#

Connector Type

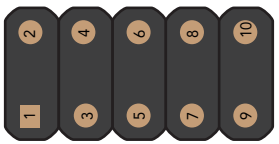
X52: 2.54 mm, 2 x 10-pin grid female

X80, X81: 2.54 mm grid jumper

5.20 Programming Header - Internal Use Only

Connector X73 is for programming the congatec board controller. This connector is designed for internal use only.

X73

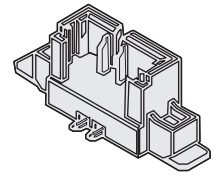


Connector Type

X73: 2.54 mm, 2 x 10-pin female header

5.21 Module Detection - Internal Use Only

X89



Connector X89 is for detecting the COM Express module presence.

Connector Type

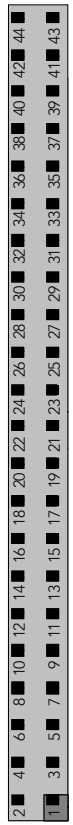
X89: Molex 51021-0200

5.22 Feature Connector

Table 55 X53 - Feature Connector

Pin	Signal	Description	Pin	Signal	Description
1	+5V (500 mA fuse)		2	5V_SB (500 mA fuse)	
3	+5V (470 Ω)	LED anode voltage with 470 Ω resistor	4	Hard Disk Activity	Shows activity on hard disk interface (open-drain output for LED cathode)
5	I2C_DAT	General purpose I²C port data I/O line	6	SMB_CLK	System Management Bus clock line
7	I2C_CLK	General purpose I²C port clock output	8	SMB_DATA	System Management Bus bidirectional data line
9	N.C	Not connected	10	GPO0	General Purpose Output 0
11	N.C	Not connected	12	GPO1	General Purpose Output 1
13	PS_ON#	Power Supply On (active low).	14	GPO2	General Purpose Output 2
15	SUS_S3#	Indicates system is in Suspend to RAM state. Active low output.	16	GPO3	General Purpose Output 3
17	GND	Power Ground	18	GND	Power Ground
19	THRMTRIP#	Active low output indicating that the CPU has entered thermal shutdown	20	SMB_ALERT#	System Management Bus Alert – active low input can be used to generate an SMI# (System Management Interrupt) or to wake the system (connect to open-drain pin)
21	GPI1	General Purpose Input 1	22	SUS_S4#	Indicates systems is in Suspend to Disk state. Active low output.
23	SUS_STAT#	Indicates imminent suspend operation; used to notify LPC devices	24	GPI0	General Purpose Input 0
25	GPI2	General Purpose Input 2	26	SUS_S5#	Indicates systems is in Soft Off state
27	WDT	Watch Dog Timer output	28	THRM#	Input from off-module temp sensor indicating an over-temp situation (connect to open-drain pin)
29	GPI3	General Purpose Input 3	30	LID#	Module input signal, generation a LID close or open event
31	BATLOW#	Indicates that external battery is low (connect to open-drain pin)	32	WAKE1#	General purpose wake up signal. May be used to implement wake-up on PS2 keyboard or mouse activity (connect to open drain pin)

X53



33	TPM_PP	Physical presence pin, indication signal to TPM chip	34	N.C	Not Connected
35	SLEEP#	Sleep signal, to bring system to a predefined sleep state	36	SYS_RESET#	Reset Button Input. Active low input. System is held in hardware reset while this input is low and comes out of reset upon release.
37	GND	Power Ground	38	GND	Power Ground
39	PWBTN#	Power Button to bring system out of S5 (soft off), active on rising edge	40	PWR_OK	Power OK from main power supply. A high value indicates that the power is good. For additional information refer to module PWR_OK config connector X57.
41	N.C	Not Connected	42	N.C	Not Connected
43	N.C	Not Connected	44	N.C	Not Connected

Note

The signals have 3.3 V level.

6 Additional Features

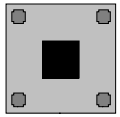
6.1 Buttons

The conga-MEVAL features the power, reset, LID and sleep buttons.

6.1.1 Power

In ATX mode, the COM Express module starts after the power-on button M19 is pressed.

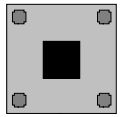
M19



6.1.2 Reset

When you press the reset button M16, it triggers the module's SYS_RESET# signal. The triggered event usually invokes a system warm reset. This behavior however depends on the configuration of the module.

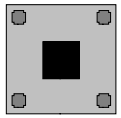
M16



6.1.3 LID

When you press the lid button M17, it triggers the module's LID# signal. The system's behavior depends on the ACPI settings of the operating system.

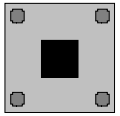
M17



6.1.4 Sleep

When you press the sleep button M18, it triggers the module's SLEEP# signal. The system's behavior depends on the ACPI settings of the operating system.

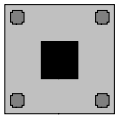
M18



6.1.5 Fast Standby Discharge

Press M39 to quickly discharge the 5 V standby power.

M39



6.2 Beeper

The beeper M15 provides audible error code (beep code) information during POST. The beeper is connected to pin B32 (SPKR signal) on the COM Express™ module.

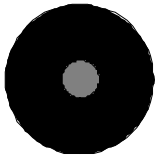
Use jumper X83 to enable or disable the beeper (remove jumper to disable the beeper).

Table 56 X83 - Beeper Configuration

Pin	Configuration
1-2	Enable beeper (default)
2-3	Disable beeper

X83

M15



Connector Type

X83: 2.54 mm grid jumper

6.3 Debug Display

The conga-MEVAL provides four 7-segment displays (D37-D39, D41) for post code or debug information. Use the tables below to configure the post code decoding process.

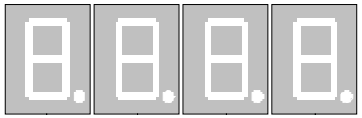
A list of the BIOS POST codes and associated POST test and initialization routines for congatec COM Express™ modules is available at www.congatec.com.

Table 57 X63 - POST Code Decoder

Pins	Configuration
1 - 2	Port 80h and port 84h (default)
2 - 4	Port 80h and port 81h
3 - 4	Port 80h and port 90h
5 - 6	Port 90h and port 94h

X63

D37 D38 D39 D41



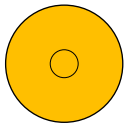
Connector Type

X63: 2.54 mm grid jumper

6.4 Ground Test Points

The conga-MEVAL provides four test points (M1-M4). These test points are connected to ground and they make it easier to connect oscilloscope probes or multimeter lines or both to ground during measurements.

M1-M4



6.5 External Power LED

The conga-MEVAL provides pin header X54 for connecting external power LED.

Table 58 X54 - External Power LED

Pin	Description
1	Anode (+5 V runtime, 470 ohm resistor)
2	Catnode (ground)

X54

Connector Type

X54: 2-pin, 2.54 mm female pin header

6.6 Wireless Disable

The conga-MEVAL provides jumper header X103 for switching the mini PCIe wireless device on or off.

Table 59 X103 - Mini PCIe Wireless Disable Signal

Jumper	Configuration
1-2	Disable mini PCIe wireless communication
N.C	Enable mini PCIe wireless communication (default)

X103

Connector Type

X103: 2.54 mm grid jumper header

7 Mechanical Dimensions