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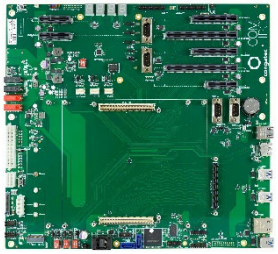
# Manual

# Congatec

## conga-HPC/EVAL-Server

**Evaluation Carrier Board for COM-HPC Server Type Modules**



# conga-HPC/EVAL-Server

Detailed description of the congatec COM-HPC® evaluation carrier board for server modules

***User's Guide***

Revision 1.00

# Revision History

| Revision | Date (yyyy-mm-dd) | Author | Changes |
|---|---|---|---|
| 1.00 | 2022-10-26 | AEM | • Official release |

# Preface

This user's guide provides information about the components, features and connectors available on the congatec COM-HPC® carrier board.

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**Note**

*Notes call attention to important information that should be observed.*

**Connector Type**

*Describes the mating connector for the congatec COM-HPC® carrier board connectors.*

**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 |
|---|---|
| BMC | Board Management Controller |
| CSME | Converged Security and Management Engine |
| DT | Descriptor Table |
| GbE | Gigabit Ethernet |
| HDA | High Definition Audio |
| IPMI | Intelligent Platform Management interface |
| I²C Bus | Inter-Integrated Circuit Bus |
| KCS | Keyboard Controller Style |
| KVM | Keyboard, Video and Mouse |
| MAC | Media Access Control |
| N.A | Not available |
| N.C | Not connected |
| NCSI | Network Controller Sideband Interface |
| PCIe | Peripheral Component Interface Express (PCI Express) |
| SATA | Serial AT Attachment |
| SFP+ | Enhanced Small Form-factor Pluggable |
| SNMP | Simple Network Management Protocol |
| SM Bus | System Management Bus |
| SoL | Serial Over LAN |
| T.B.D | To be determined |
| USB | Universal Serial Bus |

# Contents

# List of Tables

# 1 Introduction

## 1.1 COM-HPC® Concept

COM-HPC® is an open industry standard defined specifically for high performance COMs (computer on modules) for embedded systems. The defined module types are client module with fixed input voltage, client module with variable input voltage and server module with fixed input voltage.

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-HPC® modules have standardized form factors and specified pinouts on the two system connectors that remain the same regardless of the vendor. The COM-HPC® module reflects the functional requirements for a wide range of embedded applications. These functions include, but are not limited to PCI Express, graphics, high definition audio, SATA, gigabit Ethernet and USB ports. Two ruggedized, shielded connectors provide the carrier board interface and carry all the I/O signals to and from the COM-HPC® 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. The result is a more reliable product with simplified system integration.

Most importantly, COM-HPC® modules are scalable. Once an application has been created, the product range can be diversified by using different performance class or form factor size modules. Simply unplug one module and replace it with another; no redesign is necessary.

## 1.2 conga-HPC/EVAL-Server

The conga-HPC/EVAL-Server carrier board design is based on COM-HPC® server pinout definition and it complies with COM-HPC® Specification 1.0. The carrier board supports all congatec size-D and size-E COM-HPC® server modules.

The conga-HPC/EVAL-Server provides most of the functional requirements for server application. These functions include, but are not limited to a rich complement of contemporary high bandwidth interfaces such as PCI Express, Serial ATA, USB 3.0/2.0, and 10 Gb SFP+.

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

## 1.2.1 Order Information

The tables below shows the part numbers and descriptions of the carrier board and its accessories.

Table 1 Order Description

| Part Number | Product Name | Description |
|---|---|---|
| 065500 | conga-HPC/EVAL-Server | Evaluation carrier board for COM-HPC® Server modules (size D and E) |

Table 2 Optional Accessories

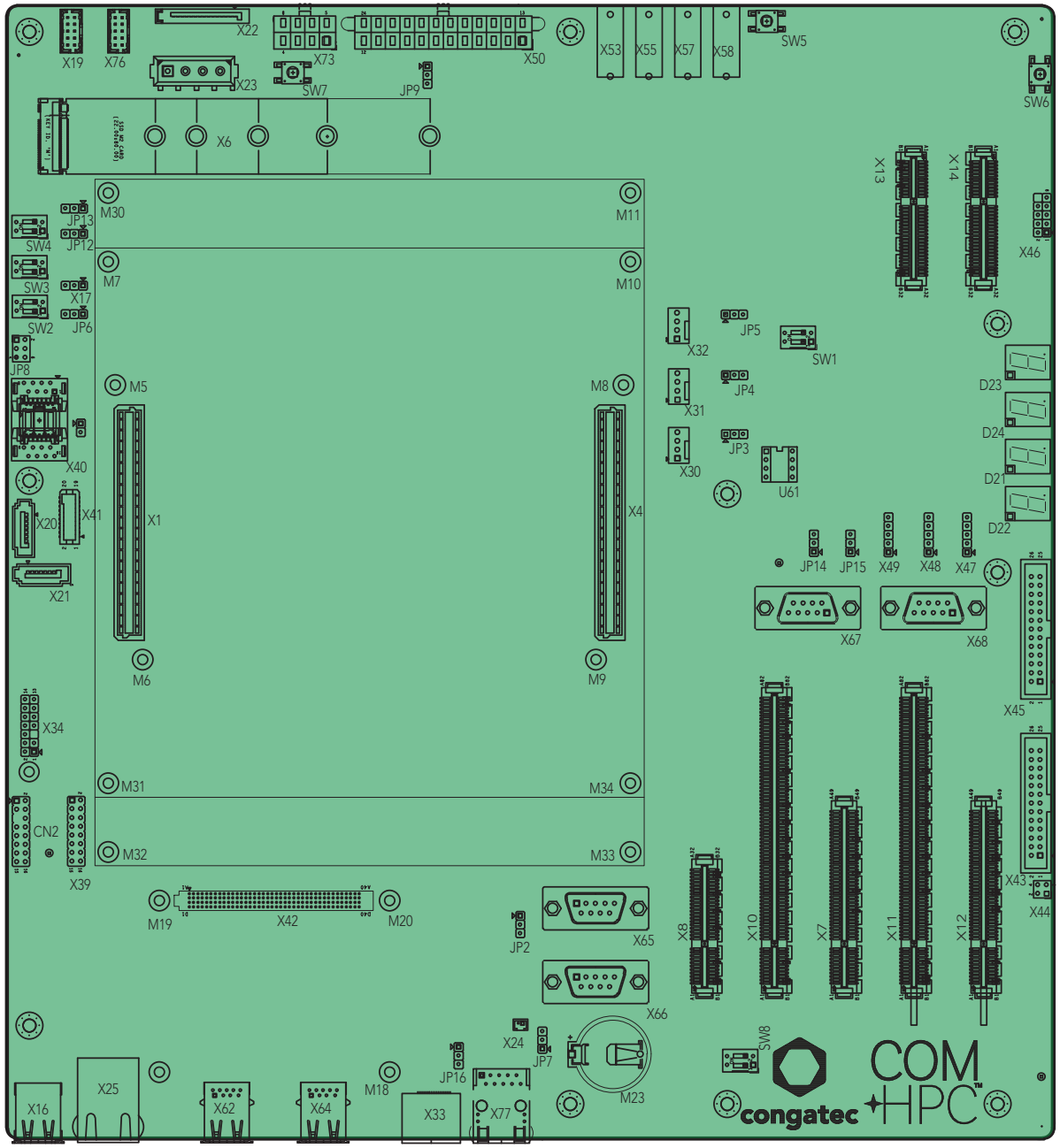
| Part Number | Product Name | Description |
|---|---|---|
| **065505** | conga-HPC/LEK-C827-IM 4SFP28 | COM-HPC® Mezzanine card with Intel C827-IM (4xSFP28) |
| **065506** | conga-HPC/LEK-XL827-AM 8SFP+ | COM-HPC® Mezzanine card with 2x Intel XL827-AM (8xSFP+) |
| **065507** | conga-HPC/LEK-QSFP | COM-HPC® Mezzanine card with direct connection adapter (4x SFP28 and 1x QSFP) |
| **065508** | conga-HPC/LEK-C827-IM 2QSFP28 | COM-HPC® Mezzanine card with Intel C827-IM (2xQSFP28) |
| **065550** | conga-HPC/HEVA LEK1 1 IO Shield | IO Shield for conga-HPC/LEK-C827-IM 4SFP28 (LEK1) |
| **065551** | conga-HPC/HEVA LEK1 2 IO Shield | IO Shield for conga-HPC/LEK-XL827-AM 8SFP+ (LEK1) |
| **065552** | conga-HPC/HEVA LEK2 IO Shield | IO Shield for conga-HPC/LEK-QSFP (LEK2) |
| **065553** | conga-HPC/HEVA LEK3 IO Shield | IO Shield for conga-HPC/LEK-C827-IM 2QSFP28 (LEK3) |

# 2 Connector Layout

The connector layout picture shows each connector and its designator.

Hover over any component. When the mouse icon changes, click on the link to go 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.



# 3 Specifications

## 3.1 Feature List

Table 3 Feature Summary

| | | |
|---|---|---|
| Form Factor | Extended ATX (305 mm by 330 mm) | |
| Supported Modules | congatec COM-HPC® size D and size E server modules | |
| Operating Temperature Range | -40°C to 85°C | |
| BMC | ASPEED AST2600 (IPMI 2.0) | |
| Internal Connectors | 1x ATX 12 V standard power connector<br>1x EPS 12 V<br>3x PCIe x4<br>2x PCIe x8<br>2x PCIe x16<br>1x M.2 Key M, socket 3 (2230/2242/2260/2280/22110)<br>1x KR connector for Ethernet Mezzanine cards<br>2x SATA<br>1x SATA power<br>2x Dual USB 2.0 header (USB ports 4-7)<br>1x eSPI header<br>1x General Purpose SPI header<br>2x Module UART | 2x BMC UART<br>2x System fan (BMC)<br>1x System fan (module)<br>1x I2C0 header<br>1x 12C1 header<br>1x I2C0 I/O expander header<br>1x Intel ISP adapter header<br>1x SMB header<br>1x GPIO header<br>1x Front panel header<br>1x Feature header<br>2x COM-HPC® connectors |
| External Connectors | 1x Dual USB 3.1 (USB ports 2-3)<br>1x 10 GbE RJ45<br>2x USB 3.1 (Port 0 &1) | 1x DisplayPort (BMC)<br>1x 1 GbE RJ45 (BMC Management) [1] |
| Software | AMI Megarc SPX BMC firmware<br>ASPEED Video BIOS | |
| Other Features | Thermal and voltage monitoring<br>CMOS Battery<br>Boot from external BIOS flash | |

**Note**

1. *The 1 GbE port X77 supports only BMC management (no support for network connectivity)*

## 3.2 Mechanical Dimensions

The conga-HPC/EVAL-Server has the following dimensions:

- lenght of 304.8 ± 0.1 mm
- width of 330.2 ± 0.1 mm
- height of 21.6 ± 0.1 mm mm (17 mm top-side, 1.6 mm PCB and 3 mm bottom-side)

## 3.3 Supply Voltage Power

- 12 V DC ± 5 %

## 3.4 Environmental Specifications

| | | |
|---|---|---|
| Temperature | Operation: -40°C to 85°C | Storage: -40° to +85°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 Description

Table 4 Primary Connector X1 Pinout (J1)

| Pin | Row A | Pin | Row B | Pin | Row C | Pin | Row D |
|---|---|---|---|---|---|---|---|
| A01 | VCC | B01 | VCC | C01 | VCC | D01 | VCC |
| A02 | VCC | B02 | PWRBTN# | C02 | RSTBTN# | D02 | VCC |
| A03 | VCC | B03 | VCC | C03 | VCC | D03 | VCC |
| A04 | VCC | B04 | THERMTRIP# | C04 | CARRIER_HOT# | D04 | VCC |
| A05 | VCC | B05 | VCC | C05 | VCC | D05 | VCC |
| A06 | VCC | B06 | TAMPER# | C06 | VIN_PWROK | D06 | VCC |
| A07 | VCC | B07 | VCC | C07 | VCC | D07 | VCC |
| A08 | VCC | B08 | SUS_S3# | C08 | SUS_S4_S5# | D08 | VCC |
| A09 | VCC | B09 | VCC | C09 | VCC | D09 | VCC |
| A10 | GND | B10 | WD_STROBE# | C10 | GND | D10 | WAKE0# |
| A11 | BATLOW# | B11 | WD_OUT | C11 | FAN_PWMOUT | D11 | WAKE1# |
| A12 | PLTRST# | B12 | GND | C12 | FAN_TACHIN | D12 | GND |
| A13 | GND | B13 | USB5- | C13 | GND | D13 | USB1- |
| A14 | USB7- | B14 | USB5+ | C14 | USB3- | D14 | USB1+ |
| A15 | USB7+ | B15 | GND | C15 | USB3+ | D15 | GND |
| A16 | GND | B16 | USB4- | C16 | GND | D16 | USB0- |
| A17 | USB6- | B17 | USB4+ | C17 | USB2- | D17 | USB0+ |
| A18 | USB6+ | B18 | GND | C18 | USB2+ | D18 | GND |
| A19 | GND | B19 | RSVD [1] | C19 | GND | D19 | ETH0_RX- |
| A20 | ETH4_RX- | B20 | RSVD [1] | C20 | ETH0_TX- | D20 | ETH0_RX+ |
| A21 | ETH4_RX+ | B21 | RSVD [1] | C21 | ETH0_TX+ | D21 | GND |
| A22 | GND | B22 | RSVD [1] | C22 | GND | D22 | ETH1_RX- |
| A23 | ETH5_RX- | B23 | RSVD [1] | C23 | ETH1_TX- | D23 | ETH1_RX+ |
| A24 | ETH5_RX+ | B24 | VCC_5V_SBY | C24 | ETH1_TX+ | D24 | GND |
| A25 | GND | B25 | USB67_OC# | C25 | GND | D25 | ETH2_RX- |
| A26 | ETH6_RX- | B26 | USB45_OC# | C26 | ETH2_TX- | D26 | ETH2_RX+ |
| A27 | ETH6_RX+ | B27 | USB23_OC# | C27 | ETH2_TX+ | D27 | GND |
| A28 | GND | B28 | USB01_OC# | C28 | GND | D28 | ETH3_RX- |
| A29 | ETH7_RX- | B29 | SML1_CLK | C29 | ETH3_TX- | D29 | ETH3_RX+ |
| A30 | ETH7_RX+ | B30 | SML1_DAT | C30 | ETH3_TX+ | D30 | GND |
| A31 | GND | B31 | PMCALERT# | C31 | GND | D31 | USB3_SSTX- |
| A32 | RSVD [1] | B32 | SML0_CLK | C32 | USB3_SSRX- | D32 | USB3_SSTX+ |
| A33 | RSVD [1] | B33 | SML0_DAT | C33 | USB3_SSRX+ | D33 | GND |
| A34 | GND | B34 | USB_PD_ALERT# [2] | C34 | GND | D34 | USB2_SSTX- |
| A35 | ETH4_TX- | B35 | USB_PD_I2C_CLK | C35 | USB2_SSRX- | D35 | USB2_SSTX+ |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A36 | ETH4_TX+ | B36 | USB_PD_I2C_DAT | C36 | USB2_SSRX+ | D36 | GND |
| A37 | GND | B37 | USB_RT_ENA [2] | C37 | GND | D37 | USB1_SSTX0- |
| A38 | ETH5_TX- | B38 | USB1_LSRX | C38 | USB1_SSRX0- | D38 | USB1_SSTX0+ |
| A39 | ETH5_TX+ | B39 | USB1_LSTX | C39 | USB1_SSRX0+ | D39 | GND |
| A40 | GND | B40 | USB0_LSRX | C40 | GND | D40 | USB1_SSTX1- |
| A41 | ETH6_TX- | B41 | USB0_LSTX | C41 | USB1_SSRX1- | D41 | USB1_SSTX1+ |
| A42 | ETH6_TX+ | B42 | GND | C42 | USB1_SSRX1+ | D42 | GND |
| A43 | GND | B43 | USB0_AUX- | C43 | GND | D43 | USB0_SSTX0- |
| A44 | ETH7_TX- | B44 | USB0_AUX+ | C44 | USB0_SSRX0- | D44 | USB0_SSTX0+ |
| A45 | ETH7_TX+ | B45 | RSVD [1] | C45 | USB0_SSRX0+ | D45 | GND |
| A46 | GND | B46 | RSVD [1] | C46 | GND | D46 | USB0_SSTX1- |
| A47 | USB1_AUX- | B47 | VCC_BOOT_SPI | C47 | USB0_SSRX1- | D47 | USB0_SSTX1+ |
| A48 | USB1_AUX+ | B48 | BOOT_SPI_CS# | C48 | USB0_SSRX1+ | D48 | GND |
| A49 | GND | B49 | BSEL0 | C49 | GND | D49 | SATA0_RX- |
| A50 | eSPI_IO0 | B50 | BSEL1 | C50 | BOOT_SPI_IO0 | D50 | SATA0_RX+ |
| A51 | eSPI_IO1 | B51 | BSEL2 | C51 | BOOT_SPI_IO1 | D51 | GND |
| A52 | eSPI_IO2 | B52 | eSPI_ALERT0# | C52 | BOOT_SPI_IO2 | D52 | SATA0_TX- |
| A53 | eSPI_IO3 | B53 | eSPI_ALERT1# | C53 | BOOT_SPI_IO3 | D53 | SATA0_TX+ |
| A54 | eSPI_CLK | B54 | eSPI_CS0# | C54 | BOOT_SPI_CLK | D54 | GND |
| A55 | GND | B55 | eSPI_CS1# | C55 | GND | D55 | SATA1_RX- |
| A56 | PCIe_CLKREQ0_LO# | B56 | eSPI_RST# | C56 | PCIe_REFCLK0_HI- | D56 | SATA1_RX+ |
| A57 | PCIe_CLKREQ0_HI# | B57 | GND | C57 | PCIe_REFCLK0_HI+ | D57 | GND |
| A58 | GND | B58 | PCIe_BMC_RX- | C58 | GND | D58 | SATA1_TX- |
| A59 | PCIe_BMC_TX- | B59 | PCIe_BMC_RX+ | C59 | PCIe_REFCLK0_LO- | D59 | SATA1_TX+ |
| A60 | PCIe_BMC_TX+ | B60 | GND | C60 | PCIe_REFCLK0_LO+ | D60 | GND |
| A61 | GND | B61 | PCIe08_RX- | C61 | GND | D61 | PCIe00_TX- |
| A62 | PCIe08_TX- | B62 | PCIe08_RX+ | C62 | PCIe00_RX- | D62 | PCIe00_TX+ |
| A63 | PCIe08_TX+ | B63 | GND | C63 | PCIe00_RX+ | D63 | GND |
| A64 | GND | B64 | PCIe09_RX- | C64 | GND | D64 | PCIe01_TX- |
| A65 | PCIe09_TX- | B65 | PCIe09_RX+ | C65 | PCIe01_RX- | D65 | PCIe01_TX+ |
| A66 | PCIe09_TX+ | B66 | GND | C66 | PCIe01_RX+ | D66 | GND |
| A67 | GND | B67 | PCIe10_RX- | C67 | GND | D67 | PCIe02_TX- |
| A68 | PCIe10_TX- | B68 | PCIe10_RX+ | C68 | PCIe02_RX- | D68 | PCIe02_TX+ |
| A69 | PCIe10_TX+ | B69 | GND | C69 | PCIe02_RX+ | D69 | GND |
| A70 | GND | B70 | PCIe11_RX- | C70 | GND | D70 | PCIe03_TX- |
| A71 | PCIe11_TX- | B71 | PCIe11_RX+ | C71 | PCIe03_RX- | D71 | PCIe03_TX+ |
| A72 | PCIe11_TX+ | B72 | GND | C72 | PCIe03_RX+ | D72 | GND |
| A73 | GND | B73 | PCIe12_RX- | C73 | GND | D73 | PCIe04_TX- |
| A74 | PCIe12_TX- | B74 | PCIe12_RX+ | C74 | PCIe04_RX- | D74 | PCIe04_TX+ |
| A75 | PCIe12_TX+ | B75 | GND | C75 | PCIe04_RX+ | D75 | GND |
| A76 | GND | B76 | PCIe13_RX- | C76 | GND | D76 | PCIe05_TX- |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A77 | PCIe13_TX- | B77 | PCIe13_RX+ | C77 | PCIe05_RX- | D77 | PCIe05_TX+ |
| A78 | PCIe13_TX+ | B78 | GND | C78 | PCIe05_RX+ | D78 | GND |
| A79 | GND | B79 | PCIe14_RX- | C79 | GND | D79 | PCIe06_TX- |
| A80 | PCIe14_TX- | B80 | PCIe14_RX+ | C80 | PCIe06_RX- | D80 | PCIe06_TX+ |
| A81 | PCIe14_TX+ | B81 | GND | C81 | PCIe06_RX+ | D81 | GND |
| A82 | GND | B82 | PCIe15_RX- | C82 | GND | D82 | PCIe07_TX- |
| A83 | PCIe15_TX- | B83 | PCIe15_RX+ | C83 | PCIe07_RX- | D83 | PCIe07_TX+ |
| A84 | PCIe15_TX+ | B84 | GND | C84 | PCIe07_RX+ | D84 | GND |
| A85 | GND | B85 | RSVD | C85 | GND | D85 | NBASET0_MDI0- |
| A86 | VCC_RTC | B86 | RSMRST_OUT# | C86 | SMB_CLK | D86 | NBASET0_MDI0+ |
| A87 | SUS_CLK | B87 | UART1_TX | C87 | SMB_DAT | D87 | GND |
| A88 | GPIO_00 | B88 | UART1_RX | C88 | SMB_ALERT# | D88 | NBASET0_MDI1- |
| A89 | GPIO_01 | B89 | UART1_RTS# | C89 | UART0_TX | D89 | NBASET0_MDI1+ |
| A90 | GPIO_02 | B90 | UART1_CTS# | C90 | UART0_RX | D90 | GND |
| A91 | GPIO_03 | B91 | IPMB_CLK | C91 | UART0_RTS# | D91 | NBASET0_MDI2- |
| A92 | GPIO_04 | B92 | IPMB_DAT | C92 | UART0_CTS# | D92 | NBASET0_MDI2+ |
| A93 | GPIO_05 | B93 | GP_SPI_MOSI | C93 | I2C0_CLK | D93 | GND |
| A94 | GPIO_06 | B94 | GP_SPI_MISO | C94 | I2C0_DAT | D94 | NBASET0_MDI3- |
| A95 | GPIO_07 | B95 | GP_SPI_CS0# | C95 | I2C0_ALERT# | D95 | NBASET0_MDI3+ |
| A96 | GPIO_08 | B96 | GP_SPI_CS1# | C96 | I2C1_CLK | D96 | GND |
| A97 | GPIO_09 | B97 | GP_SPI_CS2# | C97 | I2C1_DAT | D97 | NBASET0_LINK_MAX# |
| A98 | GPIO_10 | B98 | GP_SPI_CS3# | C98 | NBASET0_SDP | D98 | NBASET0_LINK_MID# |
| A99 | GPIO_11 | B99 | GP_SPI_CLK | C99 | NBASET0_CTREF | D99 | NBASET0_LINK_ACT# |
| A100 | TYPE0 | B100 | GP_SPI_ALERT# | C100 | TYPE1 | D100 | TYPE2 |

**Note**

1. *Not connected*
2. *Not supported*

Table 5 Secondary Connector X4 Pinout (J2)

| Pin | Row E | Pin | Row F | Pin | Row G | Pin | Row H |
|---|---|---|---|---|---|---|---|
| E1 | RAPID_SHUTDOWN | F1 | ETH2_SDP | G1 | RSVD [1] | H1 | RSVD [1] |
| E2 | GND | F2 | ETH3_SDP | G2 | RSVD [1] | H2 | RSVD [1] |
| E3 | RSVD [1] | F3 | ETH4_SDP | G3 | RSVD [1] | H3 | RSVD [1] |
| E4 | RSVD [1] | F4 | ETH5_SDP | G4 | RSVD [1] | H4 | RSVD [1] |
| E5 | GND | F5 | ETH6_SDP | G5 | RSVD [1] | H5 | RSVD [1] |
| E6 | RSVD [1] | F6 | ETH7_SDP | G6 | RSVD [1] | H6 | RSVD [1] |
| E7 | RSVD [1] | F7 | ETH4-7_I2C_CLK | G7 | RSVD [1] | H7 | RSVD [1] |
| E8 | GND | F8 | ETH4-7_I2C_DAT | G8 | RSVD [1] | H8 | RSVD [1] |
| E9 | RSVD [1] | F9 | ETH4-7_INT# | G9 | RSVD [1] | H9 | RSVD [1] |
| E10 | RSVD [1] | F10 | ETH4-7_MDIO_CLK | G10 | RSVD [1] | H10 | RSVD [1] |
| E11 | GND | F11 | ETH4-7_MDIO_DAT | G11 | RSVD [1] | H11 | RSVD [1] |
| E12 | RSVD [1] | F12 | ETH4-7_PHY_INT# | G12 | RSVD [1] | H12 | RSVD [1] |
| E13 | RSVD [1] | F13 | ETH4-7_PHY_RST# | G13 | RSVD [1] | H13 | RSVD [1] |
| E14 | GND | F14 | ETH4-7_PRSNT# | G14 | GND | H14 | RSVD [1] |
| E15 | RSVD [1] | F15 | RSVD [1] | G15 | RSVD [1] | H15 | RSVD [1] |
| E16 | RSVD [1] | F16 | RSVD [1] | G16 | RSVD [1] | H16 | RSVD [1] |
| E17 | GND | F17 | RSVD [1] | G17 | RSVD [1] | H17 | RSVD [1] |
| E18 | RSVD [1] | F18 | RSVD [1] | G18 | RSVD [1] | H18 | RSVD [1] |
| E19 | RSVD [1] | F19 | GND | G19 | RSVD [1] | H19 | GND |
| E20 | GND | F20 | PCIe32_RX- | G20 | GND | H20 | PCIe40_TX- |
| E21 | PCIe32_TX- | F21 | PCIe32_RX+ | G21 | PCIe40_RX- | H21 | PCIe40_TX+ |
| E22 | PCIe32_TX+ | F22 | GND | G22 | PCIe40_RX+ | H22 | GND |
| E23 | GND | F23 | PCIe33_RX- | G23 | GND | H23 | PCIe41_TX- |
| E24 | PCIe33_TX- | F24 | PCIe33_RX+ | G24 | PCIe41_RX- | H24 | PCIe41_TX+ |
| E25 | PCIe33_TX+ | F25 | GND | G25 | PCIe41_RX+ | H25 | GND |
| E26 | GND | F26 | PCIe34_RX- | G26 | GND | H26 | PCIe42_TX- |
| E27 | PCIe34_TX- | F27 | PCIe34_RX+ | G27 | PCIe42_RX- | H27 | PCIe42_TX+ |
| E28 | PCIe34_TX+ | F28 | GND | G28 | PCIe42_RX+ | H28 | GND |
| E29 | GND | F29 | PCIe35_RX- | G29 | GND | H29 | PCIe43_TX- |
| E30 | PCIe35_TX- | F30 | PCIe35_RX+ | G30 | PCIe43_RX- | H30 | PCIe43_TX+ |
| E31 | PCIe35_TX+ | F31 | GND | G31 | PCIe43_RX+ | H31 | GND |
| E32 | GND | F32 | PCIe36_RX- | G32 | GND | H32 | PCIe44_TX- |
| E33 | PCIe36_TX- | F33 | PCIe36_RX+ | G33 | PCIe44_RX- | H33 | PCIe44_TX+ |
| E34 | PCIe36_TX+ | F34 | GND | G34 | PCIe44_RX+ | H34 | GND |
| E35 | GND | F35 | PCIe37_RX- | G35 | GND | H35 | PCIe45_TX- |
| E36 | PCIe37_TX- | F36 | PCIe37_RX+ | G36 | PCIe45_RX- | H36 | PCIe45_TX+ |
| E37 | PCIe37_TX+ | F37 | GND | G37 | PCIe45_RX+ | H37 | GND |
| E38 | GND | F38 | PCIe38_RX- | G38 | GND | H38 | PCIe46_TX- |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| E39 | PCIe38_TX- | F39 | PCIe38_RX+ | G39 | PCIe46_RX- | H39 | PCIe46_TX+ |
| E40 | PCIe38_TX+ | F40 | GND | G40 | PCIe46_RX+ | H40 | GND |
| E41 | GND | F41 | PCIe39_RX- | G41 | GND | H41 | PCIe47_TX- |
| E42 | PCIe39_TX- | F42 | PCIe39_RX+ | G42 | PCIe47_RX- | H42 | PCIe47_TX+ |
| E43 | PCIe39_TX+ | F43 | GND | G43 | PCIe47_RX+ | H43 | GND |
| E44 | GND | F44 | PCIe16_RX- | G44 | GND | H44 | PCIe24_TX- |
| E45 | PCIe16_TX- | F45 | PCIe16_RX+ | G45 | PCIe24_RX- | H45 | PCIe24_TX+ |
| E46 | PCIe16_TX+ | F46 | GND | G46 | PCIe24_RX+ | H46 | GND |
| E47 | GND | F47 | PCIe17_RX- | G47 | GND | H47 | PCIe25_TX- |
| E48 | PCIe17_TX- | F48 | PCIe17_RX+ | G48 | PCIe25_RX- | H48 | PCIe25_TX+ |
| E49 | PCIe17_TX+ | F49 | GND | G49 | PCIe25_RX+ | H49 | GND |
| E50 | GND | F50 | PCIe18_RX- | G50 | GND | H50 | PCIe26_TX- |
| E51 | PCIe18_TX- | F51 | PCIe18_RX+ | G51 | PCIe26_RX- | H51 | PCIe26_TX+ |
| E52 | PCIe18_TX+ | F52 | GND | G52 | PCIe26_RX+ | H52 | GND |
| E53 | GND | F53 | PCIe19_RX- | G53 | GND | H53 | PCIe27_TX- |
| E54 | PCIe19_TX- | F54 | PCIe19_RX+ | G54 | PCIe27_RX- | H54 | PCIe27_TX+ |
| E55 | PCIe19_TX+ | F55 | GND | G55 | PCIe27_RX+ | H55 | GND |
| E56 | GND | F56 | PCIe20_RX- | G56 | GND | H56 | PCIe28_TX- |
| E57 | PCIe20_TX- | F57 | PCIe20_RX+ | G57 | PCIe28_RX- | H57 | PCIe28_TX+ |
| E58 | PCIe20_TX+ | F58 | GND | G58 | PCIe28_RX+ | H58 | GND |
| E59 | GND | F59 | PCIe21_RX- | G59 | GND | H59 | PCIe29_TX- |
| E60 | PCIe21_TX- | F60 | PCIe21_RX+ | G60 | PCIe29_RX- | H60 | PCIe29_TX+ |
| E61 | PCIe21_TX+ | F61 | GND | G61 | PCIe29_RX+ | H61 | GND |
| E62 | GND | F62 | PCIe22_RX- | G62 | GND | H62 | PCIe30_TX- |
| E63 | PCIe22_TX- | F63 | PCIe22_RX+ | G63 | PCIe30_RX- | H63 | PCIe30_TX+ |
| E64 | PCIe22_TX+ | F64 | GND | G64 | PCIe30_RX+ | H64 | GND |
| E65 | GND | F65 | PCIe23_RX- | G65 | GND | H65 | PCIe31_TX- |
| E66 | PCIe23_TX- | F66 | PCIe23_RX+ | G66 | PCIe31_RX- | H66 | PCIe31_TX+ |
| E67 | PCIe23_TX+ | F67 | GND | G67 | PCIe31_RX+ | H67 | GND |
| E68 | GND | F68 | PCIe48_RX- | G68 | GND | H68 | PCIe56_TX- |
| E69 | PCIe48_TX- | F69 | PCIe48_RX+ | G69 | PCIe56_RX- | H69 | PCIe56_TX+ |
| E70 | PCIe48_TX+ | F70 | GND | G70 | PCIe56_RX+ | H70 | GND |
| E71 | GND | F71 | PCIe49_RX- | G71 | GND | H71 | PCIe57_TX- |
| E72 | PCIe49_TX- | F72 | PCIe49_RX+ | G72 | PCIe57_RX- | H72 | PCIe57_TX+ |
| E73 | PCIe49_TX+ | F73 | GND | G73 | PCIe57_RX+ | H73 | GND |
| E74 | GND | F74 | PCIe50_RX- | G74 | GND | H74 | PCIe58_TX- |
| E75 | PCIe50_TX- | F75 | PCIe50_RX+ | G75 | PCIe58_RX- | H75 | PCIe58_TX+ |
| E76 | PCIe50_TX+ | F76 | GND | G76 | PCIe58_RX+ | H76 | GND |
| E77 | GND | F77 | PCIe51_RX- | G77 | GND | H77 | PCIe59_TX- |
| E78 | PCIe51_TX- | F78 | PCIe51_RX+ | G78 | PCIe59_RX- | H78 | PCIe59_TX+ |
| E79 | PCIe51_TX+ | F79 | GND | G79 | PCIe59_RX+ | H79 | GND |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| E80 | GND | F80 | PCIe52_RX- | G80 | GND | H80 | PCIe60_TX- |
| E81 | PCIe52_TX- | F81 | PCIe52_RX+ | G81 | PCIe60_RX- | H81 | PCIe60_TX+ |
| E82 | PCIe52_TX+ | F82 | GND | G82 | PCIe60_RX+ | H82 | GND |
| E83 | GND | F83 | PCIe53_RX- | G83 | GND | H83 | PCIe61_TX- |
| E84 | PCIe53_TX- | F84 | PCIe53_RX+ | G84 | PCIe61_RX- | H84 | PCIe61_TX+ |
| E85 | PCIe53_TX+ | F85 | GND | G85 | PCIe61_RX+ | H85 | GND |
| E86 | GND | F86 | PCIe54_RX- | G86 | GND | H86 | PCIe62_TX- |
| E87 | PCIe54_TX- | F87 | PCIe54_RX+ | G87 | PCIe62_RX- | H87 | PCIe62_TX+ |
| E88 | PCIe54_TX+ | F88 | GND | G88 | PCIe62_RX+ | H88 | GND |
| E89 | GND | F89 | PCIe55_RX- | G89 | GND | H89 | PCIe63_TX- |
| E90 | PCIe55_TX- | F90 | PCIe55_RX+ | G90 | PCIe63_RX- | H90 | PCIe63_TX+ |
| E91 | PCIe55_TX+ | F91 | GND | G91 | PCIe63_RX+ | H91 | GND |
| E92 | GND | F92 | PCIe_REFCLK2- | G92 | GND | H92 | PCIe_REFCLKIN0- |
| E93 | PCIe_REFCLK1- | F93 | PCIe_REFCLK2+ | G93 | PCIe_REFCLK3- | H93 | PCIe_REFCLKIN0+ |
| E94 | PCIe_REFCLK1+ | F94 | GND | G94 | PCIe_REFCLK3+ | H94 | GND |
| E95 | GND | F95 | PCIe_CLKREQ3# | G95 | GND | H95 | PCIe_REFCLKIN1- |
| E96 | PCIe_CLKREQ1# | F96 | ETH0-3_PRSNT# | G96 | ETH0-3_I2C_CLK | H96 | PCIe_REFCLKIN1+ |
| E97 | PCIe_CLKREQ2# | F97 | ETH0-3_PHY_RST# | G97 | ETH0-3_I2C_DAT | H97 | GND |
| E98 | PCIe_CLKREQ_OUT0# | F98 | ETH0_SDP | G98 | ETH0-3_PHY_INT# | H98 | ETH0-3_MDIO_CLK |
| E99 | PCIe_CLKREQ_OUT1# | F99 | ETH1_SDP | G99 | ETH0-3_INT# | H99 | ETH0-3_MDIO_DAT |
| E100 | PCIe_PERST_IN0# | F100 | PCIe_PERST_IN1# | G100 | PCIe_WAKE_OUT0# | H100 | PCIe_WAKE_OUT1# |

**Note**

1. *Not connected*

## 4.1 Power Supply Connectors

The conga-HPC/EVAL-Server provides the following power supply connectors:

- standard 24-pin ATX power connector (X50)
- standard 8-pin EPS power connector (X73)
- DC banana jacks (X53, X55, X57 and X58)

**Note**

1. *Do not supply power via the DC banana jacks and the ATX connectors at the same time.*
2. *In ATX mode, the 3.3 V, 5 V, and 12 V are derived from the ATX power supply. If power is supplied via the DC banana jacks, the onboard DC/DC regulators generate the 3.3 V and 5 V.*

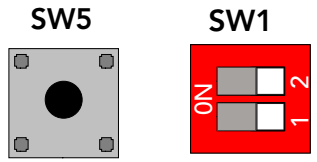
### 4.1.1 ATX Power Connector

The conga-HPC/EVAL-Server provides a standard 24-pin connector X50 for ATX power supply. With an ATX power supply, the COM-HPC® module starts after you press the power-on button SW5 (ATX mode).

To operate the power supply in AT mode, set DIP SW1.2 to ON and jumper JP9 to pin 2-3 . In this mode, the module starts after the power switch on the power supply is turned on.

Table 6 SW1.2 - ATX PSU Control

| Setting | Configuration |
|---|---|
| OFF | ATX mode (default) |
| ON | AT mode |




**Note**

1. *For high-TDP modules, you must supply power to both the ATX connector X50 and EPS connector X74.*
2. *The carrier board supports only 24-pin ATX power supply*
3. *The -12 V power output of the ATX power supply is not used.*

To disconnect the 5 V standby voltage from the whole system, use jumper JP9.

Table 7 JP9 - ATX 5V Standby Connection

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

JP9

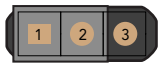
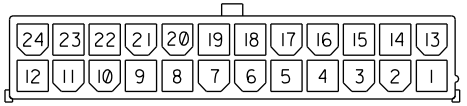



Table 8 X50 - ATX Power Pinout

| Pin | Signal | Description | Pin | Signal | Description |
|---|---|---|---|---|---|
| 1 | +3.3V | Power supply +3.3 VDC | 13 | +3.3V | Power supply +3.3 VDC |
| 2 | +3.3V | Power supply +3.3 VDC | 14 | -12V | Power supply -12 VDC |
| 3 | GND | Power ground | 15 | GND | Power ground |
| 4 | +5V | Power supply +5 VDC | 16 | PS_ON# | Power Supply On (active low). Short this pin to GND to switch power supply ON; 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 | |
| 9 | 5V_SB | Standby power supply +5 VDC | 21 | +5V | Power supply +5 VDC |
| 10 | +12V | Power supply +12 VDC | 22 | +5V | Power supply +5 VDC |
| 11 | +12V | Power supply +12 VDC | 23 | +5V | Power supply +5 VDC |
| 12 | +3.3V | Power supply +3.3 VDC | 24 | GND | Power ground |

X50




## Connector Type

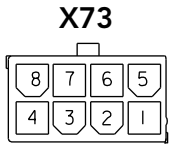
X50: Standard 24-pin ATX connector
JP9: 2.54 mm, 2-pin jumper

## 4.1.2 EPS Power Connector

The conga-HPC/EVAL-Server provides a standard 8-pin EPS connector X73 for additional 12 V power supply to the module. With an ATX power supply, the COM-HPC® module starts after you press the power-on button SW5 (ATX mode).

**Note**

*For high-TDP modules, you must supply power to both the ATX connector X50 and EPS connector X73.*




**Connector Type**

X73: Standard 8-pin EPS connector

## 4.1.3 DC Banana Jack

The conga-HPC/EVAL-Server provides four banana jacks (X53, X55, X57 and X58) for DC power supply to both the module and the voltage regulators on the carrier board. Each banana jack has a maximum power rating of 16 A.

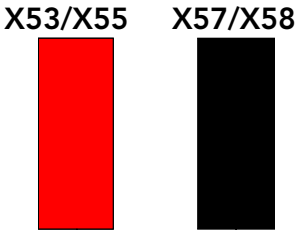
Depending on the power requirements of the system, use one or two pairs of banana jacks to power the system.

**Caution**

*Do not exceed the voltage rating of the COM-HPC® module. Doing so will damage the module.*

Table 9 X53/X55 and X57/X58 - DC Banana Jacks

| Connector | Description |
|---|---|
| X53/X55 | Input voltage for module and carrier board (+12 V) |
| X57/X58 | Ground |




**Connector Type**

X53, X55, X57, X58: 4 mm diameter banana plug (maximum 16 A)

### 4.1.4 Status LEDs

The table below describes the conga-HPC/EVAL-Server status LEDs.

Table 10 Status LED Description

| | LED | Color | Status | Description |
|---|---|---|---|---|
| Power | All | | Off | No power applied to board and BMC |
| M.2 | D4 | Red | On | Activity detected |
| BMC Heatbeat | D17 | Green | On (blinking) | BMC activity is detected.<br>Normal operation: LED blinks at ON/OFF interval of 0.5s and 1s (0.5s ON, 0.5s OFF and 1s ON, 1s OFF)<br>Abnormal operation: LED blinks once at ON/OFF interval of 2.5s and then four times at ON/OFF interval of 0.1s (Once for 2.5s ON, 2.5s OFF and then four times for 0.1s ON, 0.1s OFF) |
| | | | Off | BMC is not active |
| Power rail | D28 | Green | On | Indicates the status of SUS_S4# |
| | D29 | Green | On | Indicates the status of SUS_S3# |
| | D31 | Yellow | On | Indicates that 5 V standby power is applied to the COM-HPC®/EVAL-Server. If only D31 lights, it indicates that the ATX power supply is mechanically switched on and only 5 V standby power is applied to the carrier board |
| | D32 | Yellow | On | Indicates that the onboard 3.3 V standby power is present |
| | D33 | Green | On | Indicates that the onboard 12 V main power is present |
| | D34 | Green | On | Indicates that the onboard 5 V main power is present |
| | D35 | Green | On | Indicates that the onboard 3.3 V main power is present |
| LAN 1 (1 GbE) | Left | Off<br>Orange/Green | Off<br>On (orange/green) | 10 Mb link speed<br>100 Mb/1 Gb link speed |
| | Right | Off<br>Green | Off<br>On (steady/blicking) | No link established<br>Link without activity/ Link established, activity detected |
| LAN 2 (10 GbE) | Left | Off<br>Orange/Green | Off<br>On (green/orange) | Below half link speed<br>Half speed/full link speed(module specific) |
| | Right | Off<br>Green | Off<br>On (steady/blinking) | No link established<br>Link without activity/ Link established, activity detected |

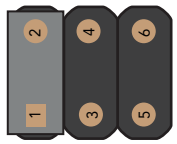
### 4.1.5 VIN_PWR_OK Signal

The VIN_PWR_OK signal is a high-active input from the main power supply to the module. The signal indicates whether the power is good. Use jumper JP8 to configure the module's VIN_PWR_OK signal.

Table 11 JP8 - VIN_PWR_OK Signal Settings

| Pin | Description |
|---|---|
| 1 - 2 | Pull-up the VIN_PWR_OK signal to 3.3 V with a 1 K resistor for debug purposes (default) |
| 3 - 4 | Connect VIN_PWR_OK signal from ATX power supply |
| 5 - 6 | Connect VIN_PWR_OK signal from onboard DC/DC regulator (only in single 12 V mode) |

JP8




**Connector Type**

JP8: 2.54 mm, 2-pin jumper

### 4.1.6 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 chipset of the module to deassert the 'SUS_S3#' signal. With the deassertion, the system transitions to Full-On state (S0).

### 4.1.7 Module Type Detection

The signals TYPE0, TYPE1, and TYPE2 indicate the pinout type of the module connected to the carrier board. These pins are either open (NC) or strapped to ground (GND) by the module as shown in the table below.

Table 12 Module Type Detection Pinout Description

| TYPE2 | TYPE1 | TYPE0 | Meaning |
|---|---|---|---|
| N.C | N.C | N.C | Reserved |
| N.C | N.C | GND | Reserved |
| N.C | GND | N.C | Reserved |
| N.C | GND | GND | Server module - fixed 12 V input |

| | | | |
|---|---|---|---|
| GND | N.C | N.C | Reserved |
| GND | N.C | GND | Reserved |
| GND | GND | N.C | Client module - wide range 8 V to 20 V input |
| GND | GND | GND | Client module - fixed 12 V input |

**Note**

*If the conga-HPC/EVAL-Server detects an incompatible module pinout, an onboard logic prevents the board from powering up the whole system by controlling the 'PS_ON#' signal of the ATX power supply. This feature works only in ATX mode.*

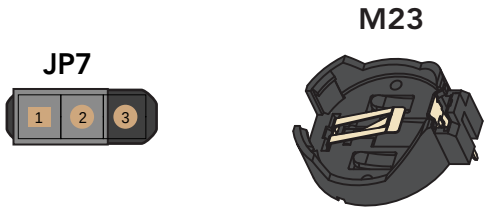
### 4.1.8 CMOS Battery Connector

The conga-HPC/EVAL-Server provides battery holder M23 for BR2032 CMOS battery. The battery supplies power for CMOS settings and real time clock.

To disconnect the CMOS battery, set jumper JP7 to position 2-3.

Table 13 JP7 Pinout Description

| Pin | Description |
|---|---|
| 1-2 | Connect battery (default) |
| 2-3 | Disconnect battery |




**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.*

**Connector Type**

M23: BR2032 battery

JP7: 2.54 mm, 2-pin jumper

## 4.2 Extension Slots

The conga-HPC/EVAL-Server provides the following extension slots:

- eight PCIe slots
  - two PCIe x16 slots (lanes 16-31 on X10 and lanes 32-47 on X11)
  - two PCIe x8 slots (lanes 0-7 on X7 and lanes 48-55 on X12)
  - three PCIe x4 slots (lanes 12-15 on X8, lanes 56-59 on X13 and lanes 60-63 on X14)
  - one M.2 key M, socket 3, type 2230/2242/2260/2280/22110 (PCIe lanes 8-11 on X6)
- one KR connector for Ethernet Mezzanine cards

### Jumpers for PCIe Clock Requests

To permanently enable the clock request for the PCIe slots, use the jumpers described in the table below.

Table 14 JP12 - PCIe Clock Request Configuration

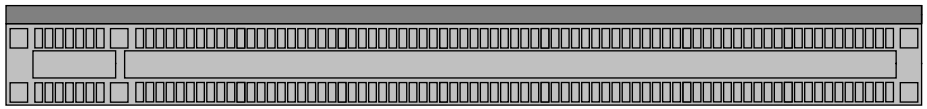
| Jumper | Connector | Socket |
|---|---|---|
| JP12 | X7 | PCIe x8 |
| JP13 | X8 | PCIe x4 |
| JP13 | X6 | M.2 |
| JP14 | X13 | PCIe x4 |
| JP14 | X14 | PCIe x4 |
| JP14 | X12 | PCIe x8 |

### 4.2.1 PCIe x16 Slot

The conga-HPC/EVAL-Server provides two standard PCIe x16 slots:

- PCIe lanes 16-31 on connector X10
- PCIe lanes 32-47 on connector X11

**X10, X11**



**Connector Type**

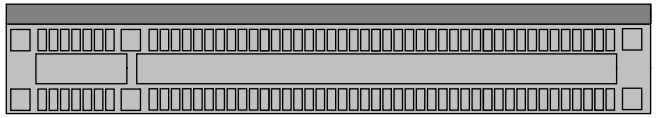
X10, X11: PCIe x16 card

### 4.2.2 PCIe x8 Slot

The conga-HPC/EVAL-Server provides two standard PCIe x8 slots:

- PCIe lanes 00-07 on connector X7
- PCIe lanes 48-55 on connector X12

**X7, X12**

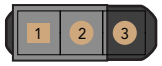


With jumper JP12, you can permanently enable the clock request (PCIe_CLKREQ0_LO#) for connector X7. For connector X12, use jumper JP14 to permanently enable its clock request (PCIe_CLKREQ3#).

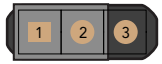
Table 15 JP12/JP14 - PCIe Clock Request Configuration

| Pin | Signal |
|---|---|
| 1-2 | Enable clock request permanently |
| 2-3 | Enable (default) |

**JP12**




**JP14**




**Connector Type**

X7, X12: PCIe x8 card

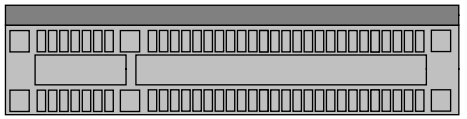
JP12, JP14: 2.54 mm, 2-pin jumper

## 4.2.3 PCIe x4 Slot

The conga-HPC/EVAL-Server provides three standard PCIe x4 slots:

- PCIe lanes 12-15 on connector X8
- PCIe lanes 56-59 on connector X13
- PCIe lanes 60-63 on connector X14

X8, X13, X14



With jumper JP14, you can permanently enable the clock request (PCIe_CLKREQ3#) for connectors X13 and X14. For connector X8, use jumper JP13 to permanently enable its clock request (PCIe_CLKREQ0_HI#).

Table 16 JP13/JP14 - PCIe Clock Request Configuration

| Pin | Signal |
|---|---|
| 1-2 | Enable clock request permanently |
| 2-3 | Enable (default) |

JP13 JP14


**Connector Type**

X8, X13, X14: PCIe x4 card

JP13, JP14: 2.54 mm, 2-pin jumper

## 4.2.4 M.2 Key M Socket

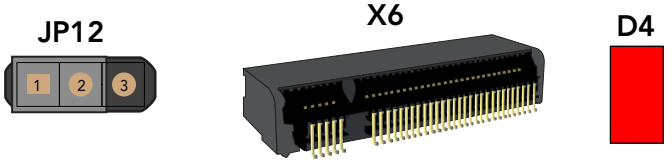
The conga-HPC/EVAL-Server provides a standard M.2 key M, socket X6. The socket is routed to the module's PCIe lanes 8-11 and it supports 2230, 2243, 2260, 2280 and 22110 M.2 card sizes. The red LED D4 lights when there is an activity on this socket.

With jumper JP12, you can permanently enable the socket's clock request signal (PCIe_CLKREQ3#).

Table 17 JP12 - PCIe Clock Request Configuration

| Pin | Signal |
|---|---|
| 1-2 | Enable clocl request permanently |
| 2-3 | Enable (default) |

JP12 X6 D4




**Connector Type**

X6: PCIe M.2 key M card

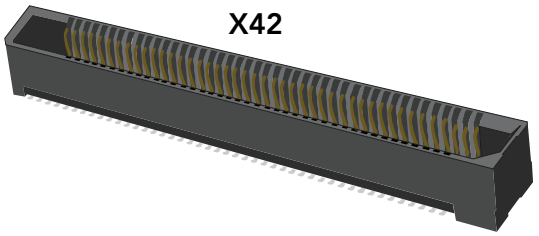
JP12: 2.54 mm, 2-pin jumper

## 4.2.5 Board to Board Connector

The conga-HPC/EVAL-Server provides a board to board connector X42 for connecting congatec KR Ethernet adapters (LEK1, LEK2 and LEK3). For more information about the congatec KR Ethernet adapters, see the congatec LEK Quick Start Guide.

Table 18 X42 - Ethernet Mezzanine Card Connector Pinout

| Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal |
|---|---|---|---|---|---|---|---|
| A1 | GND | B1 | ETH0_RX+ | C1 | GND | D1 | GND |
| A2 | GND | B2 | ETH0_RX- | C2 | GND | D2 | ETH0_SDP |
| A3 | ETH0_TX+ | B3 | GND | C3 | NC | D3 | GND |
| A4 | ETH0_TX- | B4 | GND | C4 | NC | D4 | ETH0-3_INT |
| A5 | GND | B5 | ETH1_RX+ | C5 | GND | D5 | GND |
| A6 | GND | B6 | ETH1_RX- | C6 | GND | D6 | ETH1_SDP |
| A7 | ETH1_TX+ | B7 | GND | C7 | NC | D7 | GND |
| A8 | ETH1_TX- | B8 | GND | C8 | NC | D8 | ETH0-3_I2C_DAT |
| A9 | GND | B9 | ETH2_RX+ | C9 | GND | D9 | ETH0-3_I2C_CLK |
| A10 | GND | B10 | ETH2_RX- | C10 | GND | D10 | ETH2_SDP |
| A11 | ETH2_TX+ | B11 | GND | C11 | NC | D11 | GND |
| A12 | ETH2_TX- | B12 | GND | C12 | NC | D12 | ETH0-3_MDIO_DAT |
| A13 | GND | B13 | ETH3_RX+ | C13 | GND | D13 | ETH0-3_MDIO_CLK |
| A14 | GND | B14 | ETH3_RX- | C14 | GND | D14 | ETH3_SDP |
| A15 | ETH3_TX+ | B15 | GND | C15 | NC | D15 | ETH0-3_PHY_INT# |
| A16 | ETH3_TX- | B16 | GND | C16 | NC | D16 | ETH0-3_PHY_RST# |
| A17 | GND | B17 | ETH4_RX+ | C17 | GND | D17 | ETH0-3_PRSNT# |
| A18 | GND | B18 | ETH4_RX- | C18 | GND | D18 | ETH4_SDP |
| A19 | ETH4_TX+ | B19 | GND | C19 | NC | D19 | GND |
| A20 | ETH4_TX- | B20 | GND | C20 | NC | D20 | ETH4-7_INT# |
| A21 | GND | B21 | ETH5_RX+ | C21 | GND | D21 | GND |
| A22 | GND | B22 | ETH5_RX- | C22 | GND | D22 | ETH5_SDP |
| A23 | ETH5_TX+ | B23 | GND | C23 | NC | D23 | GND |
| A24 | ETH5_TX- | B24 | GND | C24 | NC | D24 | ETH4-7_I2C_DAT |
| A25 | GND | B25 | ETH6_RX+ | C25 | GND | D25 | ETH4-7_I2C_CLK |
| A26 | GND | B26 | ETH6_RX- | C26 | GND | D26 | ETH6_SDP |
| A27 | ETH6_TX+ | B27 | GND | C27 | NC | D27 | GND |



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A28 | ETH6_TX- | B28 | GND | C28 | NC | D28 | ETH4-7_MDIO_DAT |
| A29 | GND | B29 | ETH7_RX+ | C29 | GND | D29 | ETH4-7_MDIO_CLK |
| A30 | GND | B30 | ETH7_RX- | C30 | GND | D30 | ETH7_SDP |
| A31 | ETH7_TX+ | B31 | GND | C31 | NC | D31 | ETH4-7_PHY_INT# |
| A32 | ETH7_TX- | B32 | GND | C32 | NC | D32 | ETH4-7_PHY_RST# |
| A33 | GND | B33 | NC | C33 | NC | D33 | GND |
| A34 | GND | B34 | NC | C34 | NC | D34 | ETH4-7_PRSNT# |
| A35 | GND | B35 | GND | C35 | GND | D35 | GND |
| A36 | GND | B36 | GND | C36 | GND | D36 | GND |
| A37 | GND | B37 | GND | C37 | GND | D37 | GND |
| A38 | +V12S | B38 | +V12S | C38 | +V12S | D38 | +V12S |
| A39 | +V12S | B39 | +V12S | C39 | +V12S | D39 | +V12S |
| A40 | +V12S | B40 | +V12S | C40 | +V12S | D40 | +V12S |

**Connector Type**

X42: congatec Ethernet Mezzanine Card

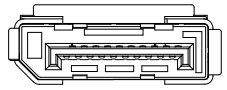
## 4.3 DisplayPort

The conga-HPC/EVAL-Server provides a DisplayPort connector (X33) via the BMC—providing display capability without an additional cost for DP add-on-card. The BMC controls the graphic output via PCIe_BMC_TX and PCIe_BMC_RX pins.

The DisplayPort supports:

- VESA DisplayPort specification version 1.1a
- data rate of 2.7 or 1.62 Gbps per lane
- AUX channel transceiver
- video compression of high graphics display resolution modes up to 1920x1200x32bpp
- maximum display resolution of 1920x1200 at 60 Hz and 32 bpp

**X33**



**Note**

*DisplayPort++ is not supported.*

**Connector Type**

X33: Standard DP plug

## 4.4 UART

The conga-HPC/EVAL-Server provides four UART ports:

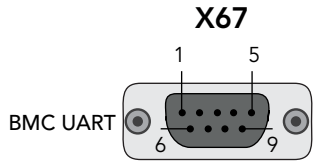
- two BMC UARTs (X67 and X68)
- two module UARTs (X65 and X66)

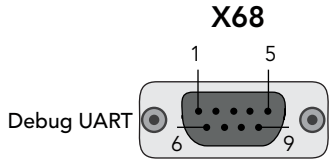
### 4.4.1 BMC UART

The conga-HPC/EVAL-Server provides two RS232 compliant UARTs on D-SUB9 connectors X67 and X68 from the BMC. Connector X67 supports full flow control and functions as a BMC UART port while connector X68 functions as a BMC debug console port.

Table 19 X67/X68 Pinout Description

| X67 | | X68 | | Description |
|---|---|---|---|---|
| Pin | Signals | Pin | Signals | |
| 1 | COM1_DCD1# | 1 | N.C | Data Carrier Detect/Not connected |
| 2 | COM1_RXD1 | 2 | COM5_RXD5 | Receive Data |
| 3 | COM1_TXD1 | 3 | COM5RXD5 | Transmit Data |
| 4 | COM1_DTR1# | 4 | N.C | Data Terminal Ready/Not connected |
| 5 | GND | 5 | GND | Ground |
| 6 | COM1_DSR1 | 6 | N.C | Data Set Ready/Not connected |
| 7 | COM1_RTS1# | 7 | N.C | Request to Send/Not connected |
| 8 | COM1_CTS1# | 8 | N.C | Clear to Send/Not connected |
| 9 | RI1# | 9 | N.C | Ring Indicator/Not connected |




**Connector Type**

X67, X68: D-SUB9 plug

## 4.4.2 Module UART

The conga-HPC/EVAL-Server provides two RS232 UARTs (UART0 and UART1) via the COM-HPC® module. The UART0 is on D-SUB9 connector X65 while the UART1 is on D-SUB9 connector X66. The transmit and receive signals of both UARTs are also routed to the feature connector X43 (pins19-22).

Use switch SW8 to enable or disable the UART ports from the COM-HPC® module. To set the power rail of the module UART0, use jumper JP2. For module UART1, use jumper JP16 to set the power rail.

Table 20 X65/X66 Pinout Description

| X65 | | X66 | | Description |
|---|---|---|---|---|
| Pin | Signals | Pin | Signals | |
| 1 | N.C | 1 | N.C | Not connected |
| 2 | COM0_RXD0 | 2 | COM1_RXD1 | Receive Data |
| 3 | COM0_TXD0 | 3 | COM1_RXD1 | Transmit Data |
| 4 | N.C | 4 | N.C | Not connected |
| 5 | GND | 5 | GND | Ground |
| 6 | N.C | 6 | N.C | Not connected |
| 7 | COM0_RTS0# | 7 | COM1_RTS1# | Request to Send |
| 8 | COM0_CTS0# | 8 | COM1_CTS1# | Clear to Send |
| 9 | N.C | 9 | N.C | Not connected |

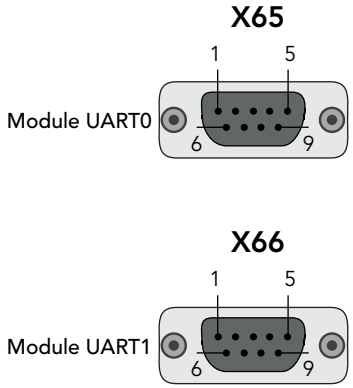



Table 21 SW8 Pinout Description

| Switch | Configuration | Description |
|---|---|---|
| SW8, switch 1 (for X65) | ON | Disable UART0 on X65 |
| | OFF | Enable UART0 on X65 (default) |
| SW8, switch 2 (for X66) | ON | Disable UART 1 on X66 |
| | OFF | Enable UART 1 on X66 (default) |

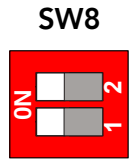


Table 22 JP2 - UART0 Power Rail Configuration

| Pin | Signal |
|---|---|
| 1-2 | UART0 is powered by 3.3 V in S0 mode (default) |
| 2-3 | UART0 is powered by 3.3 V in standby mode |

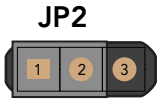
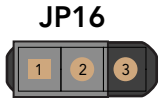



Table 23 JP16 - UART1 Power Rail Configuration

| Pin | Signal |
|---|---|
| 1-2 | UART1 is powered by 3.3 V in S0 mode (default) |
| 2-3 | UART1 is powered by 3.3 V in standby mode |




## Connector Type

X65, X66: D-SUB9 plug

JP2, JP16: 2.54 mm, 2-pin jumper

## 4.5 USB Connectors

The conga-HPC/EVAL-Server provides the following USB connectors:

- two USB 3.1 Type-A
  - port 0 on connector X62
  - port 1 on connector X64
- one dual-stacked USB 3.1 Type-A (ports 2 and 3 on connector X16)
- two USB 2.0 headers
  - ports 4 and 5 on header X76
  - ports 6 and 7 on header X19

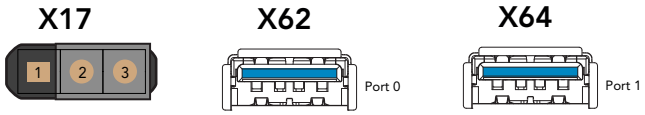
### 4.5.1 USB 3.1 Type-A

The conga-HPC/EVAL-Server provides two USB 3.1 Type-A connectors X62 (USB port 0) and X64 (USB port 1). Each USB port supports a maximum current of 1 A.

Connector X62 shares its USB 2.0 port differential pairs with the BMC via a multiplexer. Use jumper X17 to route the module's USB 2.0 port 0 differential pairs

Table 24 X17 - USB 2.0 Port 0 Routing

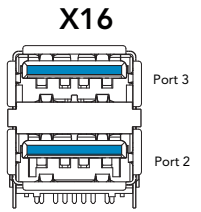
| Pin | Signal |
|---|---|
| 1-2 | Route differential pairs to BMC |
| 2-3 | Route differential pairs to X62 (default) |




**Connector Type**

X62, X64: USB Type-A plug
X17: 2.54, 2-pin jumper

## 4.5.2 Dual-stacked USB 3.1 Type-A




The conga-HPC/EVAL-Server provides two USB 3.1 ports—port 2 on the lower slot and port 3 on the upper slot via a dual-stacked USB Type-A connector X16. Each port supports a maximum current of 1 A.

### Connector Type

X16: USB Type-A plug

## 4.5.3 USB 2.0 Headers

The conga-HPC/EVAL-Server provides two USB 2.0 headers (X76 and X19). USB ports 4 and 5 are provided via connector X76 while USB ports 6 and 7 are provided via header X19.

Table 25 X76 Pinout Description

| USB Port 4 | | | USB Port 5 | | |
|---|---|---|---|---|---|
| Pin | Signal | Description | Pin | Signal | Description |
| 1 | +5V | +5V supply | 2 | +5V | +5V supply |
| 3 | USB4- | USB Port 4, Data- | 4 | USB5- | USB Port 5, Data- |
| 5 | USB4+ | USB Port 4, Data+ | 6 | USB5+ | USB Port 5, Data+ |
| 7 | GND | Ground | 8 | GND | Ground |
| 9 | SHLD | Cable shield | 10 | SHLD | Cable shield |

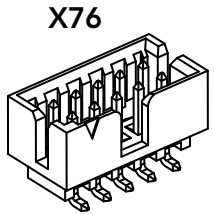
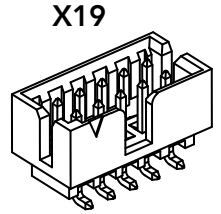



Table 26 X19 Pinout Description

| USB Port 6 | | | USB Port 7 | | |
|---|---|---|---|---|---|
| Pin | Signal | Description | Pin | Signal | Description |
| 1 | +5V | +5V supply | 2 | +5V | +5V supply |
| 3 | USB6- | USB Port 6, Data- | 4 | USB7- | USB Port 7, Data- |
| 5 | USB6+ | USB Port 6, Data+ | 6 | USB7+ | USB Port 7, Data+ |
| 7 | GND | Ground | 8 | GND | Ground |
| 9 | SHLD | Cable shield | 10 | SHLD | Cable shield |




### Connector Type

X76, X19: 2 mm pitch, 2 x 5-pin connector

Possible Mating Connector: Molex 511101051

## 4.6 SATA

The conga-HPC/EVAL-Server provides two standard SATA connectors—port 0 via connector X20 and port 1 via connector X21.


**Connector Type**

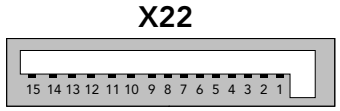
X20, X21: Standard SATA plug

### 4.6.1 SATA Power

The conga-HPC/EVAL-Server provides a standard 15-pin SATA power connector (X22). This connector supplies 3.3 V, 5 V and 12 V.

Table 27 X22 - SATA Power Pinout Description

| Pin | Signal | Pin | Signal | Pin | Signal |
|---|---|---|---|---|---|
| 1 | 3.3 V | 6 | GND | 11 | GND |
| 2 | 3.3 V | 7 | 5 V | 12 | GND |
| 3 | 3.3 V | 8 | 5 V | 13 | 12 V |
| 4 | GND | 9 | 5 V | 14 | 12 V |
| 5 | GND | 10 | GND | 15 | 12 V |




**Connector Type**

X22: Standard 15-pin SATA power connector

### 4.6.2 Disk Drive Power Connector

The conga-HPC/EVAL-Server provides connector X23, a 4-pin connector for powering disk drives.

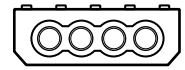
**Caution**

*Do not connect more than one peripheral device to connector X23. The peripherals may damage if you do so.*

Table 28 X23 - Disk Drive Power Pinout

| Pin | Description |
|---|---|
| 1 | 12 V (1.5 A resettable fuse; shared with X22) |
| 2 | GND |
| 3 | GND |
| 4 | 5 V (2 A resettable fuse; shared with X22) |

X23



**Connector Type**

X23: Standard 4-pin disk drive power plug

## 4.7 Ethernet Connectors

The conga-HPC/EVAL-Server provides the following Ethernet connectors:

- two RJ45 Ethernet connector
  - a 1 Gb BMC management interface (X77)
  - up to 10 Gb standard NBASE-T network interface from COM-HPC® module (X25)
- Mezannine card connector for congatec Ethernet adapters (LEK1, LEK2 and LEK3)

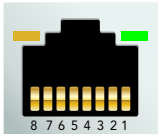
### 4.7.1 RJ45-BMC Management Interface

The conga-HPC/EVAL-Server provides a 1 Gb BMC management interface on standard RJ45 connector (X77). The BMC management interface does not support network connectivity.

Table 29 X77 Status LED Description

| LED Left Side | Description | LED Right Side | Description |
|---|---|---|---|
| Off | 10 Mbps link speed | Off | No link |
| Green | 100 Mbps link speed | Steady On | Link established, no activity detected |
| Orange | 1000 Mbps link speed | Blinking | Link established, activity detected |

X77




**Connector Type**

X77: 8-pin RJ45 plug

## 4.7.2 RJ45 (10 Gb NBASE-T)

The conga-HPC/EVAL-Server provides a standard NBASE-T network interface (up to 10 Gb) from the COM-HPC® module on standard RJ45 connector (X25). The module's NBASET0_SDP pin is provided on header X24.

Table 30 X24 Pinout Description

| Pin | Signal |
|---|---|
| 1 | NBASET0_SDP signal |
| 2 | Ground |

X24

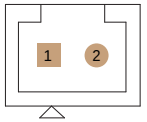
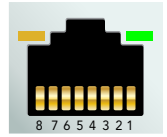



Table 31 X25 Status LED Description

| LED Left Side | Description | LED Right Side | Description |
|---|---|---|---|
| Off | Below half link speed | Off | No link |
| Green | Half link speed (module specific) | Steady On | Link established, no activity detected |
| Orange | Full link speed (module specific) | Blinking | Link established, activity detected |

X25




**Connector Type**

X24: 1.25 mm, 2-pin female connector

X25: 8-pin RJ45 plug

## 4.7.3 Mezzaline Card Connector

The conga-HPC/EVAL-Server provides a board to board connector X42 for connecting congatec KR Ethernet adapters (LEK1, LEK2 and LEK3). For pinout description, see section 4.2.5 "Board to Board Connector".

## 4.8 System Fan Headers

The conga-HPC/EVAL-Server provides the following headers for connecting a 3-pin or 4-pin fan:

- two system fan headers via the BMC (X30 and X31)
- one system fan header via the module (X32)

### 4.8.1 BMC System Fan

The conga-HPC/EVAL-Server provides two 4-pin system fan headers (X30/X31) via the BMC. The BMC controls the speed of the system fans. Use jumper:

- JP3 to set the fan's supply voltage on header X30
- JP4 to set the fan's supply voltage on header X31

Table 32 JP3/JP4 - BMC Fan Voltage Configuration

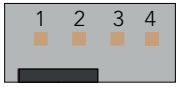
| Pin | Signal |
|---|---|
| 1-2 | 12 V supply voltage (default) |
| 2-3 | 5 V supply voltage |

**JP3/JP4**


Table 33 X30/X31 Pinout Description

| Pin | Signal |
|---|---|
| 1 | GND |
| 2 | +12 VDC |
| 3 | FAN_TACHOIN |
| 4 | FAN_CTRL |

**X30/X31**




**Note**

1. *The connector and pinout complies with 4-Wire Pulse PWM Controlled Fans Specification, Revision 1.3*
2. *FAN_TACHOIN fan output shall provide two pulses per revolution.*
3. *The fan must pull up the FAN_CTRL signal to high logic level.*
4. *Recommended maximum power rating for the fan is 9 W*

**Connector Type**

JP3, JP4: 2.54 mm, 2-pin jumper
X36, X38: 2.54 mm, 4-pin grid fan connector

## 4.8.2 Module System Fan

The conga-HPC/EVAL-Server provides a 4-pin system fan header (X32) via the module. The COM-HPC® module controls the speed of the fan. Use jumper JP5 to set the fan's supply voltage level on header X32.

Table 34 JP5 - Module Fan Voltage Configuration

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

JP5

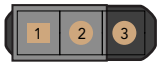
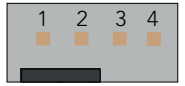



Table 35 X32 Pinout Description

| Pin | Signal |
|---|---|
| 1 | GND |
| 2 | +12 VDC |
| 3 | FAN_TACHOIN |
| 4 | FAN_CTRL |

X32




**Note**

1. *The connector and pinout complies with 4-Wire Pulse PWM Controlled Fans Specification, Revision 1.3*
2. *FAN_TACHOIN fan output shall provide two pulses per revolution.*
3. *The fan must pull up the FAN_CTRL signal to high logic level*
4. *Recommended maximum power rating for the fan is 9 W*

**Connector Type**

JP5: 2.54 mm, 2-pin jumper
X32: 2.54 mm, 4-pin grid fan connector

## 4.9 eSPI Header

On the conga-HPC/EVAL-Server, the eSPI signals of the COM-HPC® module are routed to the BMC and header X34. Use DIP switch 2.1 to select the eSPI alert and chip select signals for the BMC.

Table 36 SW2.1 Pinout Description

| Switch | Configuration | Description |
|---|---|---|
| SW1 | ON | Enable ESPI_CS0# and ESPI_ALERT0# for the BMC (default) |
| | OFF | Enable ESPI_CS1# and ESPI_ALERT1# for the BMC |
| SW2 | N.A | Not used |
| | N.A | Not used |

**SW2.1**

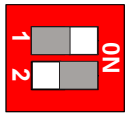
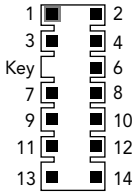



Table 37 X34 - eSPI Header Pinout

| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1 | GND | 2 | ESPI_CS0# |
| 3 | ESPI_CLK | 4 | ESPI_IO3 |
| 5 | KEY | 6 | ESPI_IO2 |
| 7 | PLTRST# | 8 | ESPI_IO1 |
| 9 | +V3.3S | 10 | ESPI_IO0 |
| 11 | ESPI_RST# | 12 | ESPI_CS1# |
| 13 | +V3.3A | 14 | ESPI_ALERT0# |

**X34**




### Connector Type

X34: 2.54 mm, 2x7-pin female connector

## 4.10 I2C Header

The conga-HPC/EVAL-Server provides the following general purpose I2C ports:

- I2C0 on I2C header X47
- I2C0 on I/O expander header X39
- I2C1 on header X48

### 4.10.1 I2C0 Header

The conga-HPC/EVAL-Server features ATMEL AT24C32E—a 2-wire serial EEPROM with I2C device address 0xAE via I2C0 bus. You can access the EEPROM by using the I²C control commands implemented in the congatec CGOS API driver. Refer to the user's guide of the COM-HPC® module and the congatec CGOS manual for more information.

The conga-HPC/EVAL-Server also provides I2C0 signals on header X47. I2C0 operates with 3.3 V.

Table 38 X47 - I2C0 Pinout Description

| Pin | Signal |
|---|---|
| 1 | +V3.3 standby (0.75 A fuse) |
| 2 | I2C0_DAT |
| 3 | I2C0_CLK |
| 4 | I2C0_ALERT# |
| 5 | GND |


**Connector Type**

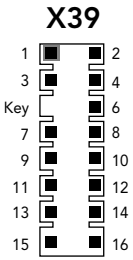
X47: 2.54 mm, 5-pin female connector

## 4.10.2 I2C0 I/O Expander Header

The conga-HPC/EVAL-Server provides eight I2C0 signals on header X39 via an I/O expander (TI PCA9554). The I2C address of the I/O Expander is 0x48.

Table 39 X39 - I2C0 Expander Pinout Description

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | I2C0_IO0 | 2 | GND |
| 3 | I2C0_IO1 | 4 | GND |
| 5 | I2C0_IO2 | 6 | GND |
| 7 | I2C0_IO3 | 8 | GND |
| 9 | I2C0_IO4 | 10 | GND |
| 11 | I2C0_IO5 | 12 | GND |
| 13 | I2C0_IO6 | 14 | GND |
| 15 | I2C0_IO7 | 16 | GND |




**Connector Type**

X39: 2.54 mm, 2x8-pin female connector

## 4.10.3 I2C1 Pin Header

The conga-HPC/EVAL-Server provides I2C1 signals on header X48. I2C1 operates with 1.8 V.

Table 40 X48 - I2C1 Pinout Description

| Pin | Signal |
|---|---|
| 1 | +V1.8 standby (0.75 A fuse) |
| 2 | I2C1_DAT |
| 3 | I2C1_CLK |
| 4 | Pull-up to +V1.8 standby |
| 5 | GND |


**Connector Type**

X48: 2.54 mm, 5-pin female connector

## 4.11 SMBus Header

The conga-HPC/EVAL-Server provides SMBus signals on header X49.

Table 41 X49 - SMBus Pinout Description

| Pin | Signal |
|---|---|
| 1 | +V3.3 standby (0.75 A fuse) |
| 2 | SMB_DAT |
| 3 | SMB_CLK |
| 4 | SMB_ALERT# |
| 5 | GND |


### Connector Type

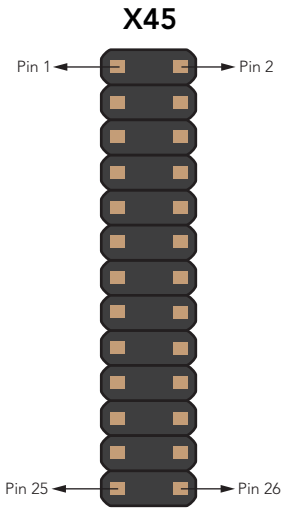
X49: 2.54 mm, 5-pin female connector

## 4.12 GPIO Header

The conga-HPC/EVAL-Server provides 12 GPIOs on header X45.

Table 42 X45 - GPIO Pinout Description

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | +V3.3 standby (0.75 A fuse) | 2 | +V3.3 main (0.75 A fuse) |
| 3 | GPIO_00 | 4 | GND |
| 5 | GPIO_01 | 6 | GND |
| 7 | GPIO_02 | 8 | GND |
| 9 | GPIO_03 | 10 | GND |
| 11 | GPIO_04 | 12 | GND |
| 13 | GPIO_05 | 14 | GND |
| 15 | GPIO_06 | 16 | GND |
| 17 | GPIO_07 | 18 | GND |
| 19 | GPIO_08 | 20 | GND |
| 21 | GPIO_09 | 22 | GND |
| 23 | GPIO_10 | 24 | GND |
| 25 | GPIO_11 | 26 | GND |




### Connector Type

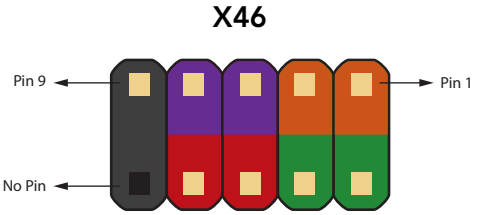
X45: 2.54 mm, 2x13-pin female connector

## 4.13 Front Panel Header

The conga-HPC/EVAL-Server provides power button and reset button for front panels on pin header X46.

Table 43 X46 - Front Panel Pinout Description

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | N.C | 2 | 5 V supply |
| 3 | N.C | 4 | GND |
| 5 | GND | 6 | PWRBTN# |
| 7 | RSTBTN# | 8 | GND |
| 9 | N.C | 10 | No pin |




**Connector Type**

X46: 2.54 mm, 2x5-pin female connector

## 4.14 Intel ISP Adaptor-C2 Connector

The conga-HPC/EVAL-Server provides connector X41 for attaching Intel ISP Adaptor-C2. Use jumper JP6 to select the reset trigger signal (RESET_TRIGGER#) for X41.

Table 44 X41 - Intel ISP Adaptor-C2 Pinout

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | Key | 2 | BOOT_SPI_CS# |
| 3 | RESET_TRIGGER# | 4 | NC |
| 5 | GND | 6 | VCC_BOOT_SPI |
| 7 | BOOT_SPI_CLK | 8 | BOOT_SPI_IO2 |
| 9 | BOOT_SPI_IO3 | 10 | BOOT_SPI_IO1 |
| 11 | NC | 12 | BOOT_SPI_IO0 |
| 13 | NC | 14 | NC |
| 15 | NC | 16 | NC |
| 17 | NC | 18 | NC |
| 19 | PLTRST# | 20 | NC |

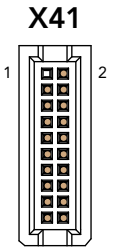
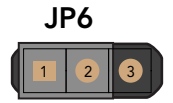


Table 45 JP6 - X41 Reset Trigger Signal

| Pin | Description |
|---|---|
| 1-2 | RSTBTN# triggers reset (default) |
| 2-3 | VIN_PWROK triggers reset |




### Connector Type

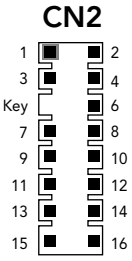
X41: 1.27 mm, 2x10-pin female connector
Possible mating connector: Samtec ASP-159358-02, TFM-110-02-S-D-A
JP6: 2.54 mm grid jumper

## 4.15 General Purpose SPI Header

The conga-HPC/EVAL-Server provides header CN2 for general purpose SPI.

Table 46 CN2 - General Purpose SPI Port Pinout

| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1 | GND | 2 | GP_SPI_CS0# |
| 3 | GP_SPI_CLK | 4 | NC |
| 5 | KEY | 6 | NC |
| 7 | PLTRST# | 8 | GP_SPI_MISO |
| 9 | +V3.3S | 10 | GP_SPI_MOSI |
| 11 | PLTRST# | 12 | GP_SPI_CS1# |
| 13 | +V3.3A | 14 | GP_SPI_ALERT# |
| 15 | GP_SPI_CS2# | 16 | GP_SPI_CS3# |




### Connector Type

CN2: 2.54 mm, 2x8-pin female connector

## 4.16 SPI Flash Socket

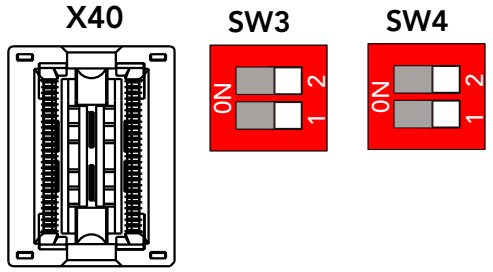
With conga-HPC/EVAL-Server, you can boot the COM-HPC® module from either the module's onboard BIOS or from an external BIOS. The option to boot from an external BIOS is useful for evaluating a customized BIOS.

The conga-HPC/EVAL-Server provides a 16-pin SOIC16 socket (X40) for an SPI flash. Boot select pins BSEL0 and BSEL1 are routed to DIP switch SW3 while boot select pin BSEL2 is routed to DIP switch SW4.

Use DIP switch SW3 and SW4 to select the flash boot device. The table below shows the available configurations.

Table 47 BIOS Select Configurations

| | DIP Switch SW4 | | DIP Switch SW3 | | Description |
|---|---|---|---|---|---|
| BSEL [2:0] | SW 1 (BSEL2) | SW2 | SW 2 (BSEL1) | SW 1 (BSEL0) | |
| 111 | OFF | - | OFF | OFF | Boot from on-module firmware (default) |
| 110 | OFF | - | OFF | ON | Boot from carrier board SPI flash |
| 101 | OFF | - | ON | OFF | CSME/DT on chipset SPI0 device on module.<br>BIOS on SPI0 on module or on SPI1 on carrier |
| 011 | ON | - | OFF | OFF | CSME/DT on chipset SPI0 device on module.<br>BIOS on SPI0 or SPI1 on module |
| 010 | ON | - | OFF | ON | Not supported |
| 001 | OFF | - | OFF | ON | Not supported |




**Note**

*"OFF" = Logic 1; "ON" = Logic 0*

**Connector Type**

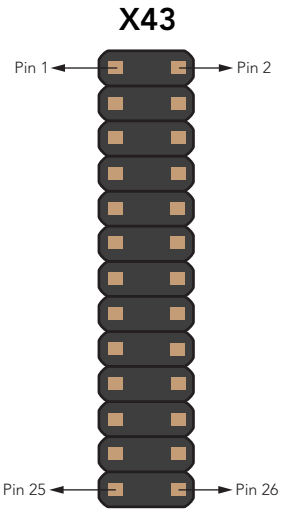
*X40: SPI flash in 16-pin SOIC package*

## 4.17 Feature Connector

The conga-HPC/EVAL-Server provides feature connector X43. The pinout is described below:

Table 48 X43 Pinout Description

| Pin | Signal | Description | Pin | Signal | Description |
|---|---|---|---|---|---|
| 1 | +V5S | 5V main supply (0.75 A fuse) | 2 | +V5A | 5V standby supply (0.75 A fuse) |
| 3 | SUS_CLK | Clock used by carrier board peripherals such as M.2 cards in their low power modes. | 4 | RAPID_ SHUTDOWN | Trigger for rapid shutdown. Must be driven to 5V through a <=50 ohm source impedance for ≥ 20 µs. Pull-down or disable on module if pin is not asserted. |
| 5 | TAMPER# | Tamper or intrusion detection line on VCC_RTC power well. Carrier hardware pulls this low on a Tamper event. | 6 | SUS_S4_S5# | Active low output that indicates the system is in Suspend to Disk (S4) or Soft Off (S5) state. |
| 7 | PS_ON# | ATX power supply on (active low) | 8 | CARRIER_HOT# | Input from off-module temperature sensor indicating an over-temperature situation. |
| 9 | SUS_S3# | Suspend to RAM state (active low output) | 10 | N.C | Not connected |
| 11 | THERMTRIP# | Active low output indicating that the CPU has entered thermal shutdown. | 12 | WAKE1# | General purpose wake up signal. It may be used to implement wake-up on PS2 keyboard or mouse activity. |
| 13 | WD_OUT | Output indicating that a watchdog time-out event has occurred. | 14 | N.C | Not connected |
| 15 | WD_STROBE# | Strobe input to watchdog timer. | 16 | VIN_PWROK | Power OK from main power supply. A high value indicates that the power is good. |
| 17 | BATLOW# | Indicates that external battery is low. | 18 | N.C | Not connected |
| 19 | UART0_TX | COM module's serial port 0 transmit line | 20 | UART1_TX | COM module's serial port 1 transmit line |
| 21 | UART0_RX | COM module's serial port 0 receive line. | 22 | UART1_RX | COM module's serial port 1 receive line |
| 23 | TEST# | Module input for vendor-specific module test mode(s). | 24 | N.C | Not connected |
| 25 | GND | Power ground | 26 | GND | Power ground |




### Connector Type

X43: 2 mm, 2 x 25-pin header

# 5 BMC Overview

BMCs are used in servers for remote administration, thereby reducing the need for onsite administration of the servers. Some of the more common use cases are:

- power cycling a server
- monitoring fan speeds and component temperatures
- monitoring hardware failures

The BMC (Aspeed AST2600) on the conga-HPC/EVAL-Server is for proof of concept only. Carrier board designers can use it as a hardware design guide or to test the physical interfaces of system firmware (BIOS) or remote system management software. The BMC functionality is application-specific and not part of the COM-HPC® specification

The conga-HPC/EVAL-Server supports HTML5-based browsers for remote monitoring.

## 5.1 Firmware

Some of the features the BMC firmware support are:

- KVM/media redirection support via BMC's video and USB
  - redirection with H5View
- media redirection
  - CD redirection
  - secure authentication and encryption for remote KVM or H5Viewer
- remote server power control
  - server's power status report
  - support for server power-up, power-down, power cycle, reset and ACPI shutdown
- IPMI message interface support via communication interfaces such as:
  - Keyboard Controller Style (KCS)
  - LAN (IPMI over LAN)
  - serial interface (access through a serial port. Supports basic and terminal connection modes)
- IPMI event log and alerting

  - event logs reading
  - sensor readings (5 VSB, 12 V, RTC and thermal sensors)
  - LAN
- Web-based configuration
  - full configuration using GUI
  - fail-safe BMC firmware upgrade
- SSH-based Serial Over LAN (SoL) [1]
  - power control of the server
  - complete command support
  - firmware update
  - role-based authentication and authorization
- dedicated gigabit network controller
- remote BIOS update of the SPI flash on the carrier board

**Note**

1. *Requires correct SoL settings in the BIOS setup menu*

# 6 Additional Features

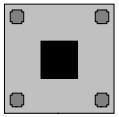
## 6.1 Buttons

The conga-HPC/EVAL-Server features two push buttons—power and reset buttons.

### 6.1.1 Power

When using an ATX power supply, the COM-HPC® module starts after the power-on button SW5 is pressed.

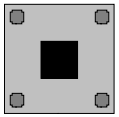
**SW5**



### 6.1.2 Reset

The COM-HPC® module and all connected components will perform a hard reset when this button is pressed. The reset button SW6 is connected to the COM-HPC® module's RSTBTN# signal.

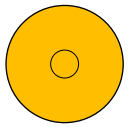
**SW6**



## 6.2 Ground Test Points

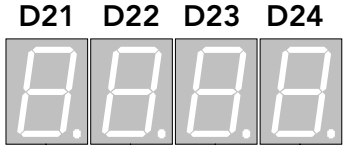
The conga-HPC/EVAL-Server provides four test points (M1-M4). These test points make it easier to connect oscilloscope probes or multimeter to ground during measurements on the COM-HPC® module.

**M1-M4**

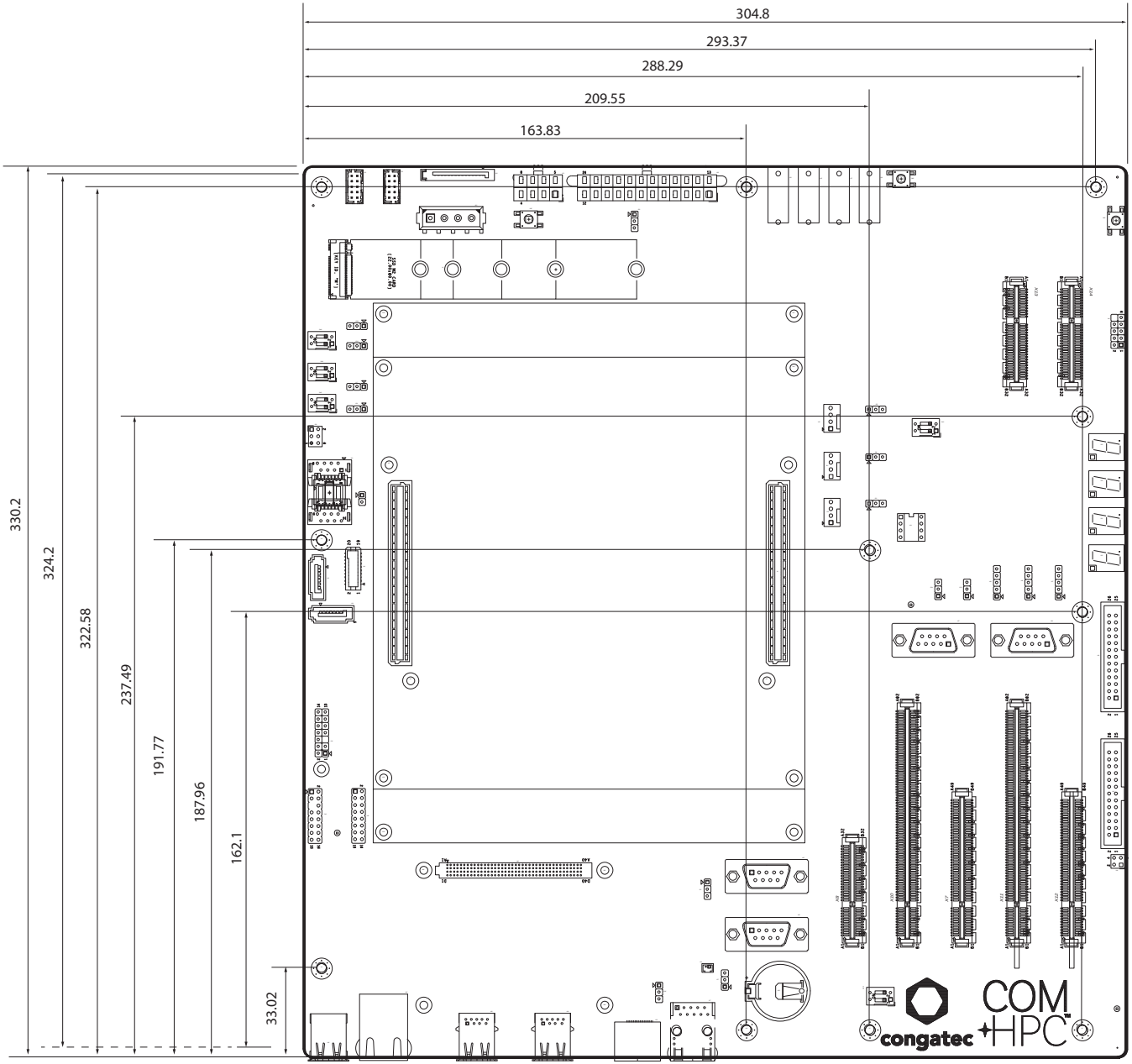


## 6.3 Debug Display

The conga-HPC/EVAL-Server provides four 14-segment displays (D21-D24) for post code or debug information. A list of the BIOS POST codes and associated POST test and initialization routines for congatec COM-HPC® modules is available at www.congatec.com.



# 7 Mechanical Dimensions



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