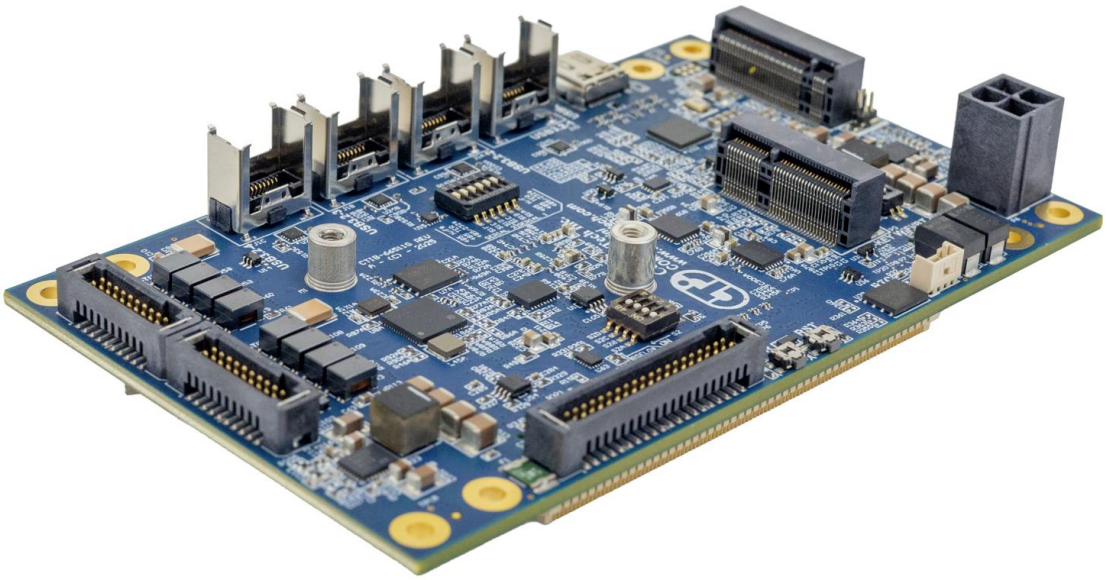
Connect Tech Inc.

Embedded Computing Experts

# USERS GUIDE



# COM-HPC® Mini Carrier Board

CTIM-00136 Revision 0.04

intel partner alliance

CONNECT TECH

www.connecttech.com

support@connecttech.com

# TABLE OF CONTENTS

# PREFACE

## Disclaimer

The information contained within this user's guide, including but not limited to any product specification, is subject to change without notice.

Connect Tech assumes no liability for any damages incurred directly or indirectly from any technical or typographical errors or omissions contained herein or for discrepancies between the product and the user's guide.

## Customer Support Overview

If you experience difficulties after reading the manual and/or using the product, contact the Connect Tech reseller from which you purchased the product. In most cases the reseller can help you with product installation and difficulties.

In the event that the reseller is unable to resolve your problem, our highly qualified support staff can assist you. Support resources are available 24 hours a day, 7 days a week on our website at: https://connecttech.com/support/resource-center/. See the contact information section below for more information on how to contact us directly. Our technical support is always free.

## Contact Information

| Contact Information | |
|---|---|
| **Mail/Courier** | Connect Tech Inc.<br>Technical Support<br>489 Clair Rd. W.<br>Guelph, Ontario<br>Canada N1L 0H7 |
| **Contact Information** | sales@connecttech.com<br>support@connecttech.com<br>www.connecttech.com<br><br>Toll-Free: 800-426-8979 (North America only)<br>Telephone: +1-519-836-1291<br>Facsimile: 519-836-4878 (on-line 24 hours) |
| **Support** | Please go to the Connect Tech Resource Center for product manuals, installation guides, device drivers, BSPs and technical tips.<br><br>Submit your technical support questions to our support engineers. Technical Support representatives are available Monday through Friday, from 8:30 a.m. to 5:00 p.m. Eastern Standard Time. |

## Limited Product Warranty

Connect Tech Inc. provides a 1-year Warranty for the COM-HPC® Mini Carrier Board. Should this product, in Connect Tech Inc.'s opinion, fail to be in good working order during the warranty period, Connect Tech Inc. will, at its option, repair or replace this product at no charge, provided that the product has not been subjected to abuse, misuse, accident, disaster or non-Connect Tech Inc. authorized modification or repair.

You may obtain warranty service by delivering this product to an authorized Connect Tech Inc. business partner or to Connect Tech Inc. along with proof of purchase. Product returned to Connect Tech Inc. must be pre-authorized by Connect Tech Inc. with an RMA (Return Material Authorization) number marked on the outside of the package and sent prepaid, insured, and packaged for safe shipment. Connect Tech Inc. will return this product by prepaid ground shipment service.

The Connect Tech Inc. Limited Warranty is only valid over the serviceable life of the product. This is defined as the period during which all components are available. Should the product prove to be irreparable, Connect Tech Inc. reserves the right to substitute an equivalent product if available or to retract the Warranty if no replacement is available.

The above warranty is the only warranty authorized by Connect Tech Inc. Under no circumstances will Connect Tech Inc. be liable in any way for any damages, including any lost profits, lost savings or other incidental or consequential damages arising out of the use of, or inability to use, such product.

## Copyright Notice

The information contained in this document is subject to change without notice. Connect Tech Inc. shall not be liable for errors contained herein or for incidental consequential damages in connection with the furnishing, performance, or use of this material. This document contains proprietary information that is protected by copyright. All rights are reserved. No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of Connect Tech, Inc.



## Trademark Acknowledgment

Connect Tech, Inc. acknowledges all trademarks, registered trademarks and/or copyrights referred to in this document as the property of their respective owners. Not listing all possible trademarks or copyright acknowledgments does not constitute a lack of acknowledgment to the rightful owners of the trademarks and copyrights mentioned in this document.

## ESD Warning

Electronic components and circuits are sensitive to ElectroStatic Discharge (ESD). When handling any circuit board assemblies including Connect Tech COM-HPC® carrier assemblies, it is recommended that ESD safety precautions be observed. ESD safe best practices include, but are not limited to:

- Leaving circuit boards in their antistatic packaging until they are ready to be installed.
- Using a grounded wrist strap when handling circuit boards, at a minimum you should touch a grounded metal object to dissipate any static charge that may be present on you.
- Only handling circuit boards in ESD safe areas, which may include ESD floor and table mats, wrist strap stations and ESD safe lab coats.
- Avoiding handling circuit boards in carpeted areas.
- Try to handle the board by the edges, avoiding contact with components.

# REVISION HISTORY

| Revision | Date | Changes |
|---|---|---|
| 0.00 | 2025-08-12 | Preliminary Release |
| 0.01 | 2026-01-12 | Updated cabling details |
| 0.02 | 2026-01-26 | Updated HPC002 supported modules |
| 0.03 | 2026-03-26 | Update XBG026 breakout part number to XBG038 |
| 0.04 | 2026-04-14 | Updated Mechanical drawings and models |

# INTRODUCTION

The COM-HPC® Mini Carrier Board is the first of its kind for Connect Tech. This small form factor carrier board features high-speed PC style connectors. The COM-HPC® Mini Carrier Board is an integral addition to Connect Tech's product line, supporting the latest COM-HPC® specification. Improve speed, reduce cost, support research and innovation with the COM-HPC® Mini Carrier Board. It enables scientists and engineers to focus on solving problems instead of managing computer systems.

## Product Features and Specifications

| Specifications | |
|---|---|
| Compatibility | • COM-HPC® Mini Modules (Server Modules not supported)<br>• PICMG COM-HPC® Mini Module Base Specification R1.20 |
| Network | 4x 2.5GBase-T |
| Memory Expansion | 1x 2280 M.2 M-Key Socket (PCIe x4, NVMe) |
| Display | External DisplayPort Breakout board available (XBG033) |
| Expansion Ports | 1x 2230 M.2 E-Key (WiFi/BT) |
| USB | • 4x USB 3.2 Ports (10Gbps Capable)<br>• Rugged Locking High-Speed Samtec ARF6 Connector |
| USB4 | USB Type-C Connector (*Display supported if available on module) |
| Serial | • 2x UART/CONSOLE 3.3V TTL<br>• 2x RS-232/RS-485<br>• 1x I2C Channel @ 3.3V IO<br>• 1x SPI Channel @ 3.3V IO<br>• 1x CAN 2.0B (non-isolated) |
| GPIO | • GPIOs 3.3V Input/Output Capable pins<br>• 1x 3.3V Power Pin at 1A |
| Misc | 1x Power/Reset buttons |
| Power | • +12V DC (Molex Mini-Fit Jr 2X2 Header)<br>• RTC Battery Connector |
| Dimensions | 115mm x 70mm |
| Weight | TBD |
| Operating Temperature | -40°C to 85°C (-40°F to 185°F) |

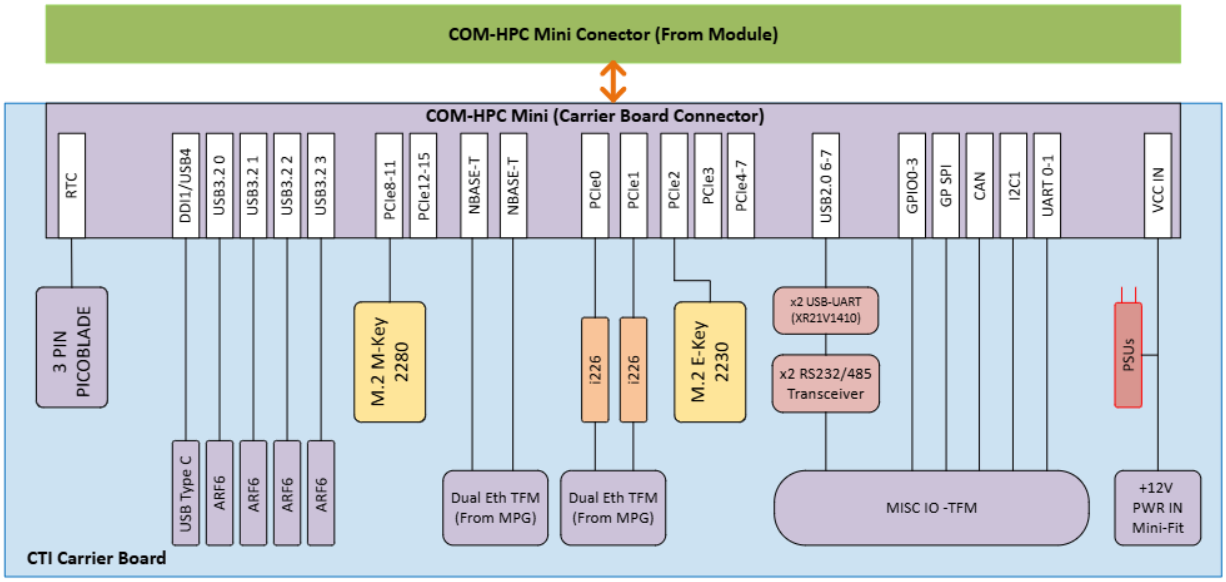
8*Interfaces are sourced from HPC module, so interface configuration and speed are module dependent

# Part Numbers / Ordering Information

| Part Number | |
|---|---|
| **HPC002** | COM-HPC® Mini Carrier Board |
| **HPC002-XXX** | Pre-Integrated Products ask sales@connecttech.com for options.<br><br>Integration options can include:<br>• COM-HPC Mini Module<br>• WiFi/BT Modules<br>• NVMe Modules |
| **XBG038** | Rugged IP67 USB Type C Connector Breakout Board for HPC |
| **XBG033** | Rugged DisplayPort Connector Breakout Board |
| **CKG068** | Cable Kit:<br>• 1x CBG765 (Power)<br>• 2x CBG763 (Ethernet)<br>• 4x CBG762 (USB)<br>• 1x CBG764 (Misc)<br>• 1x CBG797 (DP) |
| **CKG069** | Cable Kit:<br>• 1x CBG762 (USB)<br>• 1x CBG797 (DP) |
| **CBG762** | Rugged High-speed Samtec ARC6<br>(For use with USB breakout boards, XBG038) |
| **CBG765** | Input Power Cable (Discrete Wire) |
| **CBG763** | Dual RJ45F to ISDF-10-D-M Ethernet Cable |
| **CBG764** | Miscellaneous I/O Breakout Cable (Flying Leads) |
| **CBG797** | DisplayPort Breakout Cable<br>(For use with DisplayPort breakout boards, XBG033) |

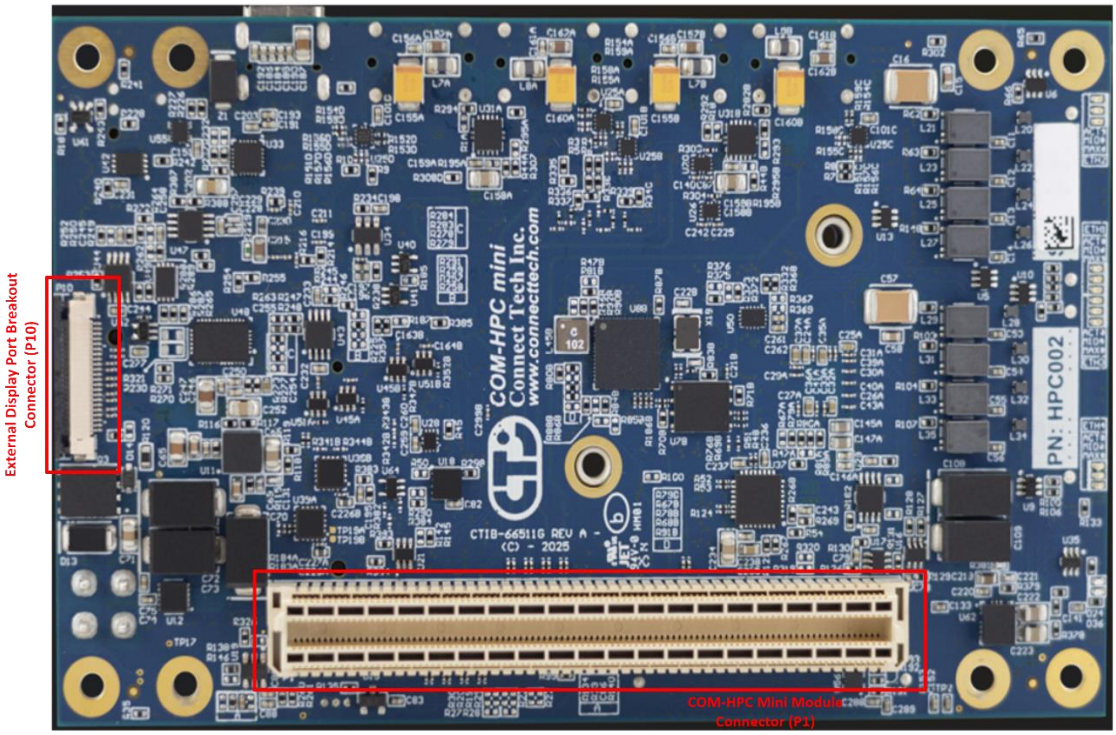
# PRODUCT OVERVIEW

## Block Diagram

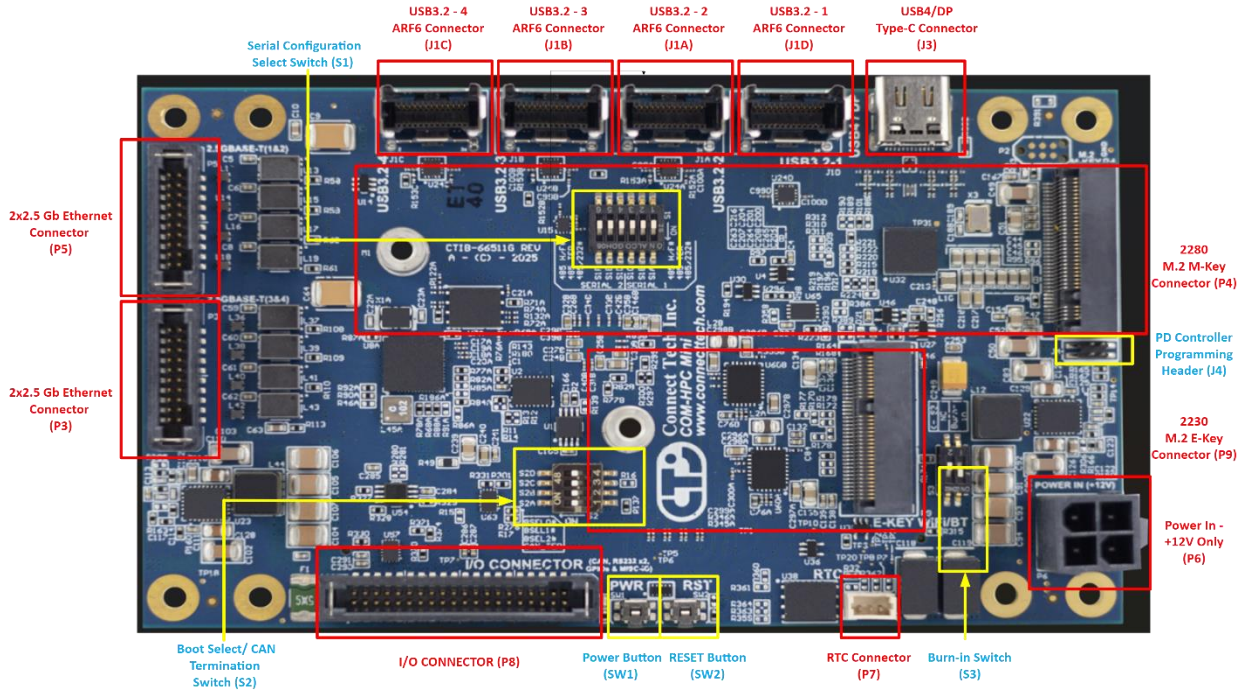



## Connector Summary & Locations

**Top View**



**Bottom View**




| Designator | Description |
|---|---|
| P1 | COM-HPC® Mini Module Connector |
| P3, P5 | 2x2.5 Gb Ethernet Connector |
| P4 | M.2 M-Key for 2280Connector (PCIex4, NVMe) |
| P6 | Power In Connector (Molex Mini-Fit Jr 2X2 Header) |
| P7 | RTC Connector |
| P8 | I/O Connector |
| P9 | M.2 E-Key 2230 for WiFi/BlueTooth Module |
| P10 | External Display Port Breakout Connector |
| J1A, J1B, J1C, J1D | USB3.2 ARF6 Connector |
| J3 | USB4/DP Type-C Connector |
| J4 | PD Controller 2x2 Programming Header |
| SW1 | Power Button |
| SW2 | Reset Button |
| S1 | Serial Configuration Select 6-Pos Dip switch |
| S2 | Boot Select/ CAN Termination 4-Pos Dip switch |
| S3 | Burn-In 2-Pos Dip Switch |

# DETAILED FEATURE DESCRIPTION

## COM-HPC® Mini Module Connectors

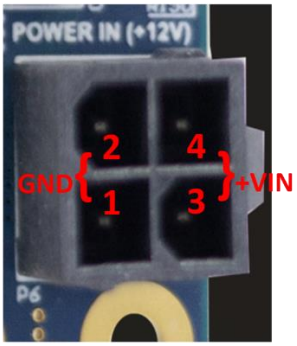
The processor and chipset are implemented on the COM-HPC® Mini Module. While all of the endpoint connectors exist on the HPC002 COM-HPC® Mini Carrier Board, the functionality of each port is dependent on the routing and capabilities from the in-use COM-HPC® Mini Module. The connections of interfaces on the HPC002 COM-HPC® Mini Carrier Board were made in accordance to the PICMG COM-HPC® specification, however some connections may not be present, or be present in a different configuration or capability on the COM-HPC® Mini Module.

| Function | COM-HPC® Mini Module Connectors | |
|---|---|---|
| Location | P1 |  |
| Type | COM-HPC® Connector | |
| Connector | Part Number: ASP-209948-01<br>Manufacturer: Samtec | |
| Mating Connector | COM-HPC® Mini Module | |
| Pinout | Refer to PICMG COM-HPC® Mini Module Base Specification Mini Module Pinout | |

## Power Connector

Power Input: +12V Only.
Fits standard ATX 4 pin Motherboard/GPU power connector.

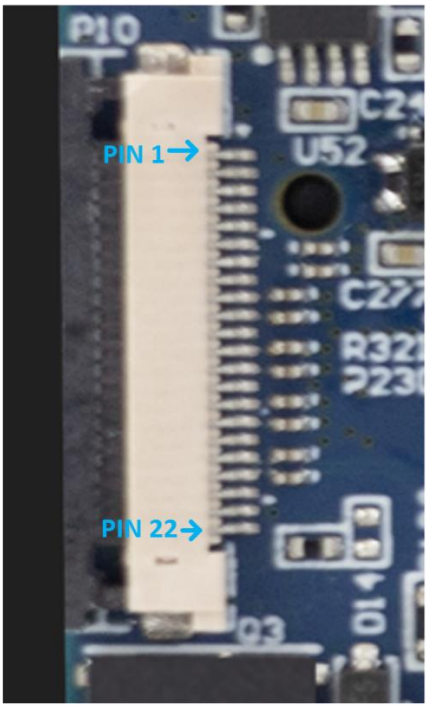
| Function | Power Supply Connector | |
|---|---|---|
| Location | P6 | |
| Type | Mini Fit Jr 2x2 Vertical | |
| Connector | Part Number: 35317-0420<br>Manufacturer: Molex | |
| Mating Connector | Receptacle Housing 5557 series Cable Assembly 45135 series | |
| Pinout | Pin | Description |
| | 4,3 | +VIN |
| | 1,2 | GND |



## Display

FPC Connector for external display breakout

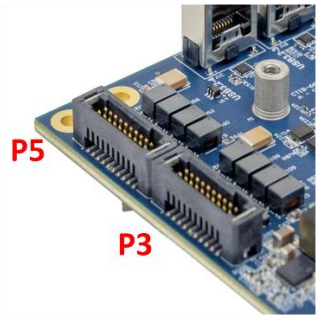
| Function | External DisplayPort Breakout Connectors | |
|---|---|---|
| Location | P10 | |
| Type | 22 Position FFC, FPC Connector | |
| Connector | Part Number: 0545482271<br>Manufacturer: Molex | |
| Mating Breakout | XBG033: HPC-mini DP Breakout Board<br>Mating cable: 686722100001 | |
| Pinout | Pin | Description |
| | 1 | DP0_CEC (1M Pull down on carrier) |
| | 3, 4 | +3.3V |
| | 6 | DP0_TX3+ |
| | 7 | DP0_TX3- |
| | 9 | DP0_TX2+ |
| | 10 | DP0_TX2- |
| | 12 | DP0_TX1+ |
| | 13 | DP0_TX1_ |
| | 15 | DP0_TX0+ |
| | 16 | DP0_TX0- |
| | 18 | DP0_AUX+ |
| | 19 | DP0_AUX- |
| | 21 | DP0_HPD |
| | 22 | DP0_AUX_SEL (1M Pull down on Carrier) |
| | 2, 5, 8, 11, 14, 17, 20 | GND |



## Network

The COM-HPC Mini Carrier features four 2.5G Ethernet ports. Two of these ports are NBASE-T Ethernet ports, sourced directly from the COM-HPC® Mini Module, and are designed for 2.5G operation. However, their performance is dependent on the Ethernet controller within the COM-HPC® Mini Module. The remaining two Ethernet ports, which are also 2.5G capable, are designed using a PCI to Ethernet controller.

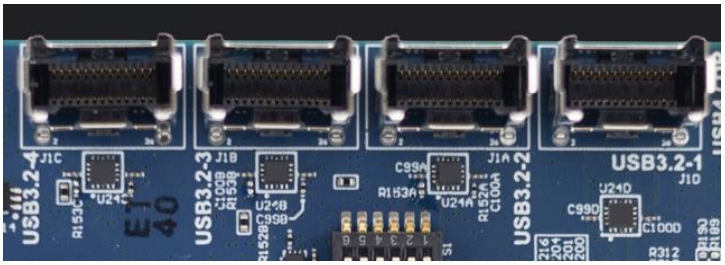
| Function | Ethernet Ports |
|---|---|
| Location | P3, P5 |
| Type | TFM Connector |
| Connector | Part Number: TFM-110-02-L-D-WT<br>Manufacturer: Samtec |
| Mating Breakout | CBG763 / CTIC-00906<br>Dual RJ45F to ISDF-10-D-M |
| Pinout | Refer to CBG763 / CTIC-00906 Specification |




## USB 3.2

x4 USB 3.2 ARF6 Connectors.

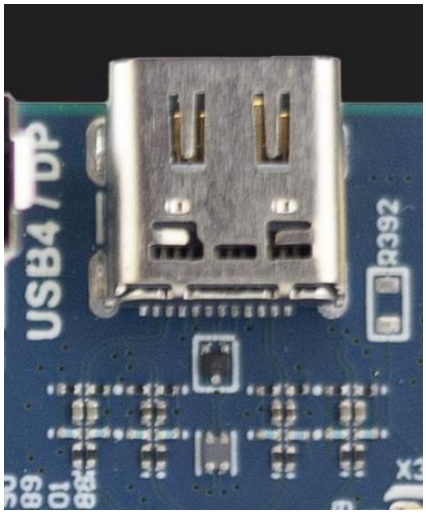
| Function | USB 3.2 |
|---|---|
| Location | J1A, J1B, J1C, J1D |
| Type | USB Type A |
| Connector | Part Number: ARF6-08-S-D-A-K-TR<br>Manufacturer: Samtec |
| Mating Breakout | XBG038: USB Breakout Board<br>Mating Cable: ARC6-08-03.0-LULD21 |
| Pinout | Refer to XBG038 Specification |



## USB4/DP

x1 USB4/ DP Type-C Connector (*Display supported if available on module)

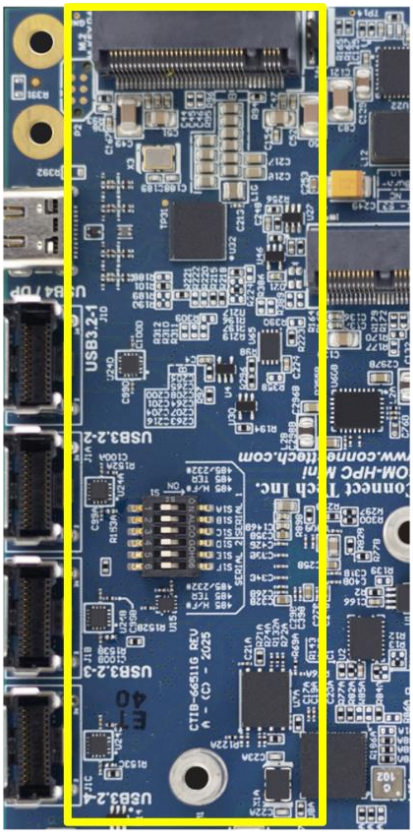
| Function | USB4/DP |
|---|---|
| Location | J3 |
| Type | Type-C Connector |
| Connector | Part Number: DX07S024JAAR1100<br>Manufacturer: JAE |
| Mating Connector | USB4 mating cables |
| Pinout | Refer to USB4 Specification. |




## M.2 M-Key 2280 Expansion

1x 2280 size M.2 M-Key x4 PCIe slots for NVMe usage or other x4 PCIe M-Key devices.

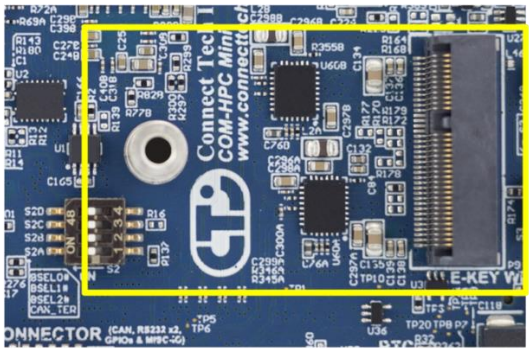
| Function | M.2 M-Key |
|---|---|
| Location | P4 |
| Type | M.2 M-Key 2280 Size |
| Connector | Part Number: 10131758-001RLF<br>Manufacturer: Amphenol |
| Mating Connector | Any M.2 M-Key compatible module |
| Pinout | Refer to M.2 M-key specification |



## M.2 E-Key 2230 Expansion Slot

2230 size M.2 E-Key USB/PCIe slots for WiFi/Bluetooth usage or other E-Key devices.

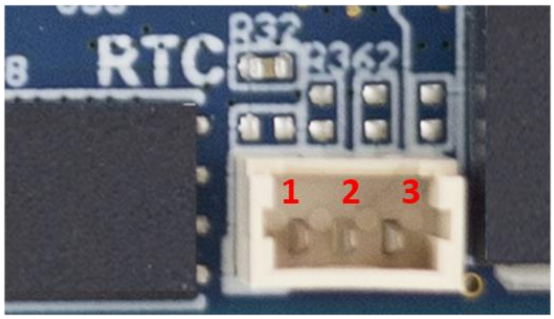
| Function | M.2 E-Key |
|---|---|
| Location | P9 |
| Type | M.2 E-Key 2230 Size |
| Connector | Part Number: 10128797-004RLF<br>Manufacturer: Amphenol |
| Mating Connector | Any M.2 E-Key compatible module |
| Pinout | Refer to M.2 E-key specification |



## RTC Battery Connector

1x3 Molex Picoblade connector for RTC Battery

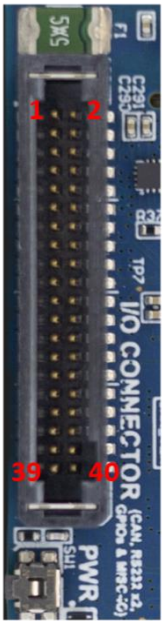
| Function | System I/O | |
|---|---|---|
| Location | P7 | |
| Type | 1x3 TH 1.25mm (Molex-PicoBlade) | |
| Connector | Part Number: 53047-0310<br>Manufacturer: Molex | |
| Mating Connector | Part Number: 0510210300<br>Manufacturer: Molex | |
| Pinout | Pin | Description |
| | 1 | +3.0V |
| | 2 | NC |
| | 3 | GND |

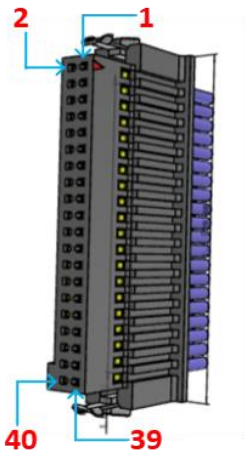


# I/O Connector

IO header for miscellaneous I/O signals.

| Function | General Purpose I/O | | | |
|---|---|---|---|---|
| Location | P8 | | | |
| Type | 40 pin General Purpose 3.3V I/O Connector | | | |
| Connector | Part Number: TFM-120-02-L-D-WT<br>Manufacturer: Samtec | | | |
| Mating Connector | Part Number: SFSD-20-28-G-XX.XX-SR<br>Manufacturer: Samtec | | | |
| Pinout | Pin | Description | Description | Pin |
| | 1 | +3.3V | +3.3V | 2 |
| | 3 | +3.3V | +3.3V | 4 |
| | 5 | SPI_CLK | SPI_MOSI | 6 |
| | 7 | SPI_CS0# | SPI_MISO | 8 |
| | 9 | GND | GND | 10 |
| | 11 | GND | GND | 12 |
| | 13 | UART0_TX | UART1_CTS | 14 |
| | 15 | UART0_RX | UART1_RTS | 16 |
| | 17 | UART0_RTS | UART1_RX | 18 |
| | 19 | UART0_CTS | UART1_TX | 20 |
| | 21 | GND | GND | 22 |
| | 23 | I2C1_CLK | GPIO0 | 24 |
| | 25 | I2C1_DAT | GPIO1 | 26 |
| | 27 | GND | GPIO2 | 28 |
| | 29 | GPIO3 | GND | 30 |
| | 31 | SERIAL1_TX- | SERIAL2_TX- | 32 |
| | 33 | SERIAL1_TX+ | SERIAL2_TX+ | 34 |
| | 35 | SERIAL1_RX- | SERIAL2_RX- | 36 |
| | 37 | SERIAL1_RX+ | SERIAL2_RX+ | 38 |
| | 39 | CAN_L | CAN_H | 40 |



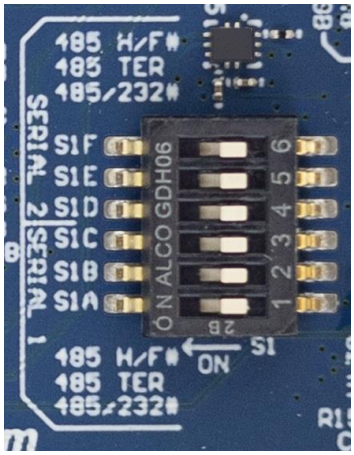




*All I/O is 3.3V CMOS unless otherwise stated

## Serial Configuration Select

6 Position SPST DIP switch to select between different modes of RS232/485

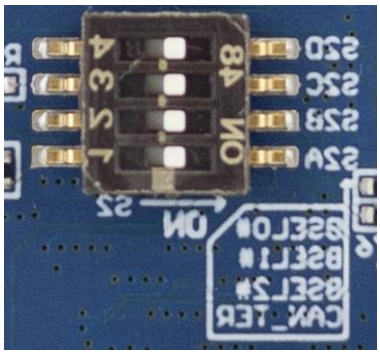
| Function | Description | | |
|---|---|---|---|
| Location | S1 | | |
| Type | 6 Position SPST DIP switch | | |
| Connector | Part Number: 1571983-8<br>Manufacturer: TE Connectivity | | |
| Pinout | Switch | Description | |
| | S1A | Serial 1 | RS485/RS232# |
| | S1B | | RS485 TERMINATION ENABLE |
| | S1C | | H/F# |
| | S1D | Serial 2 | RS485/RS232# |
| | S1E | | RS485 TERMINATION ENABLE |
| | S1F | | H/F# |




## Boot/ CAN Termination Select

4 Position SPST DIP switch to select between different Boot modes and CAN termination.

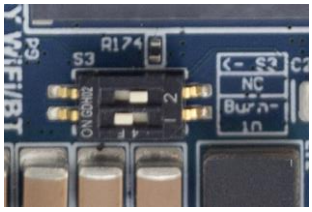
| Function | Description | |
|---|---|---|
| Location | S2 | |
| Type | 4 Position SPST DIP switch | |
| Connector | Part Number: 1571983-4<br>Manufacturer: TE Connectivity | |
| Pinout | Switch | Description |
| | S2A | BSEL0# |
| | S2B | BSEL1# |
| | S2C | BSEL3# |
| | S2D | CAN Termination select |



## Burn-in mode Select

2 Position SPST DIP switch to enable Burn-in mode.

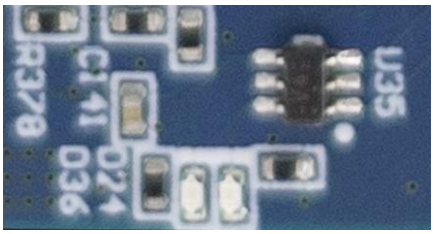
| Function | Description | |
|---|---|---|
| Location | S3 | |
| Type | 2 Position SPST DIP switch | |
| Connector | Part Number: 1571983-4<br>Manufacturer: TE Connectivity | |
| Pinout | Switch | Description |
| | S3A | Burn-in |
| | S3B | NC |

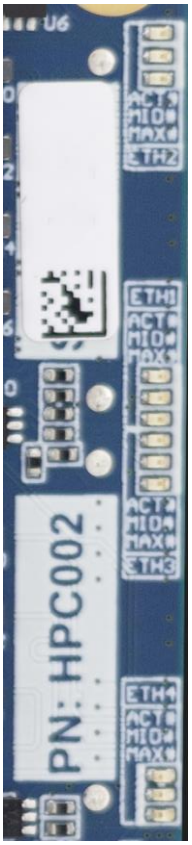
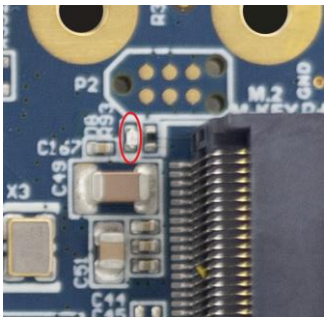



## LED Indicators

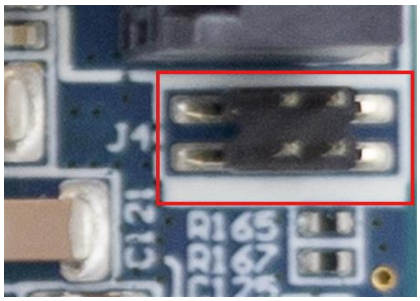
The COM-HPC mini Carrier implements two LED's (D24, D36) for power status, twelve LEDs for Ethernet status and one LED for M.2 M-Key status indication as follows:

| Function | Description |
|---|---|
| Power status LEDs | |
| Location | D24, D36 |
| Type | Blue LED |
| Connector | Part Number: EAST10052BA0<br>Manufacturer: Everlight Electronics |
| LED | Function |
| D24 | RESET_3V3# (Derived from PG_ALL) |
| D36 | PGOOD_+12V |
| Ethernet Status LEDS | |
| Location | D4, D5, D6, D7, D9, D10, D11, D12 - Yellow<br>D2, D3, D16, D17 - Green |
| Type | Yellow/ Green LED |
| Connector | Yellow:<br>Part Number: APHHS1005SYCK<br>Manufacturer: Kingbright<br><br>Green:<br>Part Number: APHHS1005CGCK<br>Manufacturer: Kingbright |
| LED | Function |
| D2, D3, D16, D17 | MAX#<br>(Indicator signal for a 2500 Mbps (Gigabit) |



| | | |
|---|---|---|
| | Ethernet link) |  |
| D5, D7, D10, D12 | MID# (Indicator signal for a 1000 Mbps (Gigabit) Ethernet link) | |
| D4, D6, D9, D11 | ACT# (Activity Indicator transmission activity on the Ethernet link) | |
| M.2 M-Key Status LED | |  |
| Location | D8 | |
| Type | Blue LED | |
| Connector | Part Number: EAST10052BA0<br>Manufacturer: Everlight Electronics | |
| LED | Function | |
| D8 | Status LED for M.2 M-key | |

## Programming Header

| Function | System I/O | |
|---|---|---|
| Location | J4 |  |
| Type | 1.27mm 2x2 Jumper Header | |
| Connector | Part Number: GRPB022VWQS-RC<br>Manufacturer: Sullins Connector | |
| Pinout | **Do not Connect (Left floating)** | |

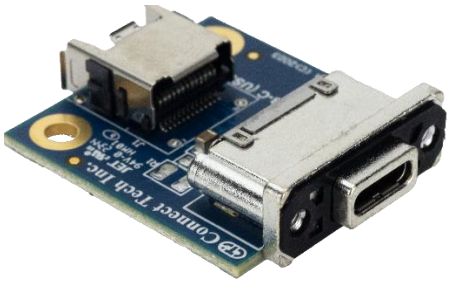
# BREAKOUT BOARD DETAILS

The HPC002 employs Samtec ARF6 Rugged Latching High-Speed connectors for the USB 3.2. These ports utilize Samtec (ARC6) AcceleRate® Slim Cable Assemblies to route out to customer defined IO Panels (MIL Circular, M12, Other) or to Connect Tech breakout boards.

| Part Number | Description |
|---|---|
| **XBG038** | Rugged IP67 USB Type C Connector Breakout Board for HPC |
| **XBG033** | Rugged DisplayPort Connector Breakout Board |
| **CBG762** | Rugged High-speed Samtec ARC6 Cable<br>(For use with USB breakout boards, XBG038) |
| **CBG797** | 22pos FFC/FPC Cable<br>(For use with DisplayPort breakout boards, XBG033) |

XBG038 Breakout Board for USB 3.2 Gen2 (10Gbps)

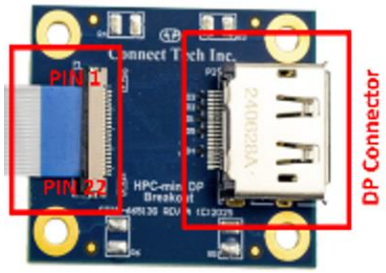
| Function | USB 3.2 Gen2 Data Port | |
|---|---|---|
| Location | J1 **(XBG038 USB Breakout Board)** | |
| Type | Breakout board / USB adapter | |
| HPC002 Facing Connector J1 | Part Number: ARC6-08-03.0-LULD21<br>Manufacturer: Samtec | |
| Pinout for J1 on XBG038 | **Pin Number** | **Function** |
| | Pin 1 | GND |
| | Pin 2 | GND |
| | Pin 3 | USB3_B_RX_P |
| | Pin 4 | +5 volt |
| | Pin 5 | USB3_B_RX_N |
| | Pin 6 | +5 volt |
| | Pin 7 | GND |
| | Pin 8 | GND |
| | Pin 9 | USB3_B_TX_P |
| | Pin 10 | +5 volt |
| | Pin 11 | USB3_B_TX_N |
| | Pin 12 | +5 volt |
| | Pin 13 | GND |
| | Pin 14 | GND |



| | | | |
|---|---|---|---|
| | Pin 15 | USB3_A_RX_P | |
| | Pin 16 | USB2_D_P | |
| | Pin 17 | USB3_A_RX_N | |
| | Pin 18 | USB2_D_N | |
| | Pin 19 | GND | |
| | Pin 20 | GND | |
| | Pin 21 | USB3_A_TX_P | |
| | Pin 22 | CC1 | |
| | Pin 23 | USB3_A_TX_N | |
| | Pin 24 | CC2 | |
| | Pin 25 | GND | |
| | Pin 26 | GND | |
| Notes | Please see Appendix 2. | | |

## XBG033 Breakout Board for DisplayPort

| **Function** | **USB 3.2 Gen2 Data Port** | |
|---|---|---|
| Location | P1 **(XBG033 DisplayPort Breakout Board)** | |
| Type | Breakout board / DisplayPort | |
| HPC002 Facing Connector P1 | Part Number: 54548-2271<br>Manufacturer: Molex | |
| Pinout for P1 on XBG033 | **Pin Number** | **Function** |
| | Pin 1 | DP0 CEC |
| | Pin 2 | GND |
| | Pin 3 | +3.3V |
| | Pin 4 | +3.3V |
| | Pin 5 | GND |
| | Pin 6 | DP0 TX3 P |
| | Pin 7 | DP0 TX3 N |
| | Pin 8 | GND |
| | Pin 9 | DP0 TX2 P |
| | Pin 10 | DP0 TX2 N |
| | Pin 11 | GND |



| | | | |
|---|---|---|---|
| | Pin 12 | DP0 TX1 P | |
| | Pin 13 | DP0 TX1 N | |
| | Pin 14 | GND | |
| | Pin 15 | DP0 TX0 P | |
| | Pin 16 | DP0 TX0 N | |
| | Pin 17 | GND | |
| | Pin 18 | DP0 AUX P | |
| | Pin 19 | DP0 AUX N | |
| | Pin 20 | GND | |
| | Pin 21 | DP HPD | |
| | Pin 22 | DP AUX SEL | |
| Notes | Please see Appendix 1. | | |

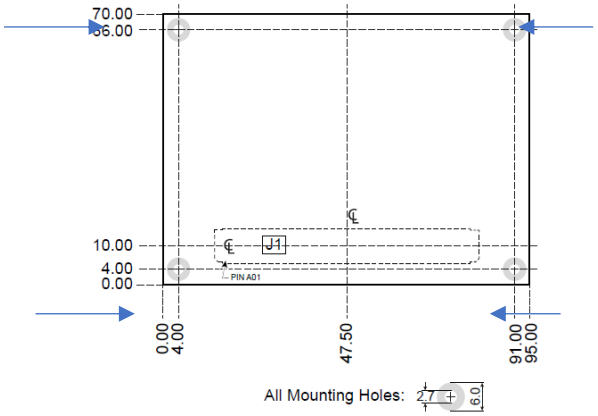
# TYPICAL INSTALLATION

The COM-HPC® Mini Carrier Board was designed based on the PICMG COM-HPC® Mini Module Base Specification to maximize compatibility with as many COM-HPC® Mini Modules as possible. Unfortunately, COM-HPC® Mini Modules always use a subset of its maximum capabilities so it is important to understand the functionality of the COM-HPC® Mini Module and it's compatibility with the HPC002 Carrier before purchasing.

The basic install and power-up conditions are as follows:

Ensure all external system power supplies are off.

1. Procure the COM-HPC® Mini Module and HPC002 Carrier and prepare to integrate them.
    a. If your system is already integrated together, then skip to the next step.
    b. For the COM-HPC® Mini Module:
        i. Ensure the module has the appropriate RAM installed. Sometimes the RAM slot is between the heatsink and the module so you should inspect for RAM before installing the heatsink.
        ii. Install the Heatsink using appropriate screws and mounting kit
    c. For the HPC002 Carrier:
        i. Identify the COM-HPC® Connector, and identify the mounting hole and connector key orientation.
2. Integrate the COM-HPC® Mini Module and Carrier.
    a. The COM-HPC® Mini Module Mounting holes are symmetrical such that they will align when the COM-HPC® Mini Module is in the proper orientation. The Connectors have an angled key such that the connector cannot be mated in the incorrect orientation.



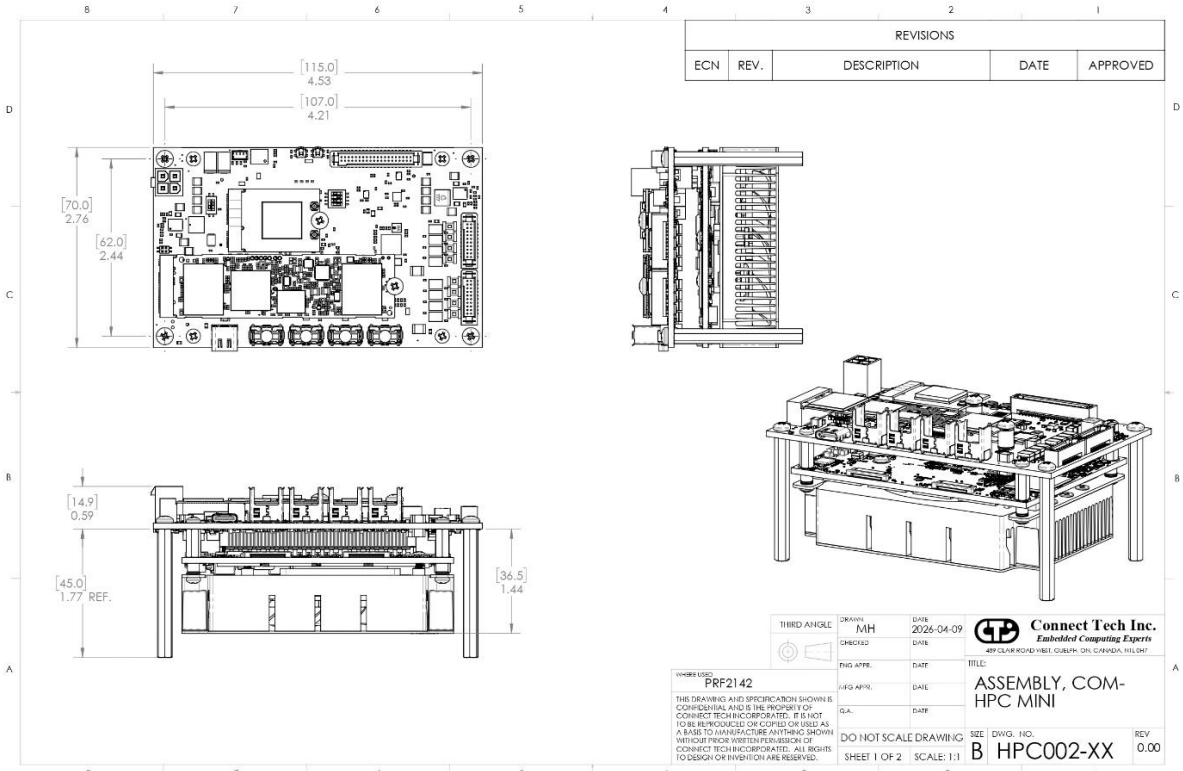

   b. Align the mounting holes from the module and carrier, then firmly press down directly above the two connectors simultaneously.

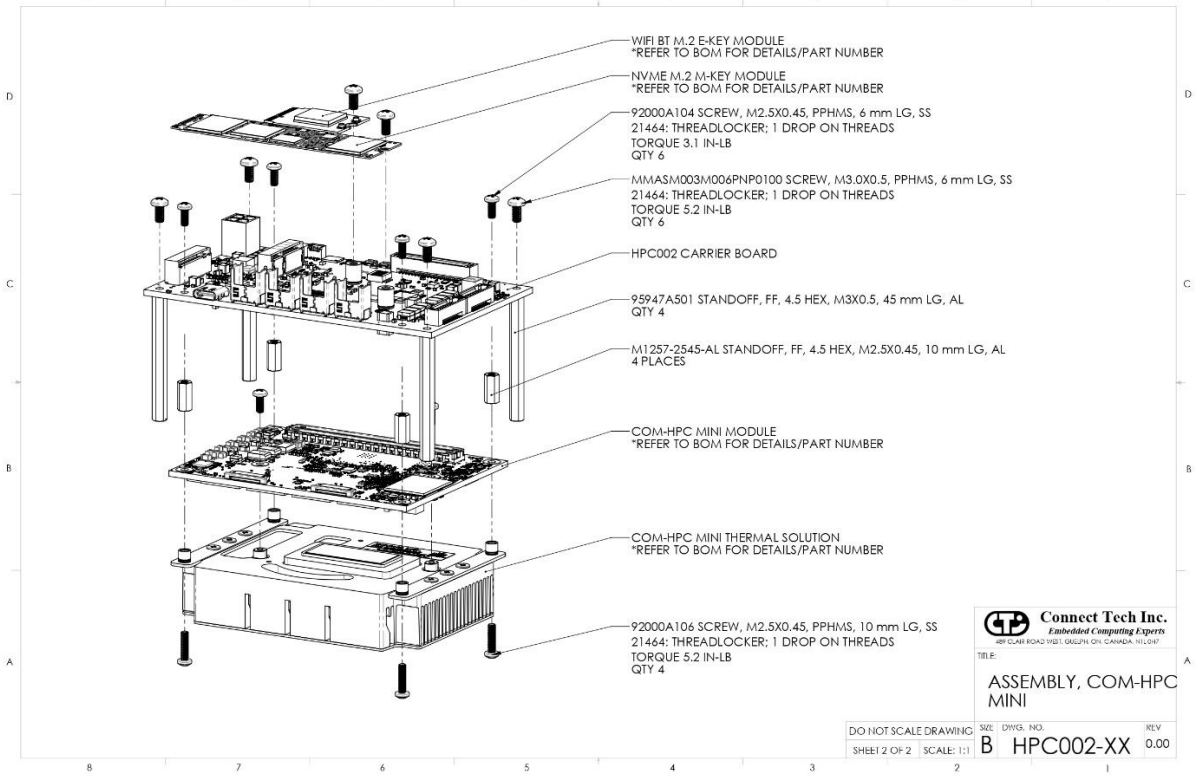
3. Install power cable and basic peripherals.
   a. Power Cable
   b. Display (refer to Appendix 1)
   c. USB Keyboard and Mouse (refer to Appendix 2)
   d. Storage media for operating system (USB, or NVMe)
4. Ensure the power supply is set to appropriate +12V input, then turn on power.
5. Depending on the COM-HPC® Mini Module, a power button press may be required.
6. Configure the system:
   a. It is recommended to use a bootable USB (OS installation media), and an NVMe (OS installation destination) if you are building your own operating system.
   b. BIOS
      i. To enter the BIOS, you must continually hit the correct key (usually delete, or F12), otherwise, if there is no boot media, it will usually automatically enter the BIOS.
      ii. First, you should attempt to configure the boot process so you can use the appropriate media to boot from. (Ensure boot from USB and boot from NVMe are enabled)
      iii. Once you can boot properly into the operating system, then configure any other BIOS settings such as PCIe configurations (links and speeds), serial console redirect, GPIOs, power up mode, etc.
   c. Operating System
      i. Once you have configured the BIOS so you can boot into the desired bootable media, you will likely have to find the appropriate drivers for all of the interfaces to work properly.
      ii. It is highly recommended to build the operating system on this system with internet connection so it will automatically find and download all appropriate drivers it can.
      iii. Common symptoms of incorrect drivers are: bad display resolution, no internet, storage drives found but not usable, etc.

# POWER CONSUMPTION & THERMALS

| Description | Processor | Value | Units | Temperature |
|---|---|---|---|---|
| COM-HPC mini-Module, Passive Cooling, Idle, Ethernet, Mouse and Keyboard plugged in | Intel® Core™ i7-1365URE | TBD | W | 25°C (typ.) |
| | Intel® Core™ i5-1345URE | TBD | W | 25°C (typ.) |
| | Intel® Core™ i3-1315URE | TBD | W | 25°C (typ.) |
| | Intel® Core™ i7-1370PRE | TBD | W | 25°C (typ.) |
| | Intel® Core™ i5-1350PRE | TBD | W | 25°C (typ.) |
| | Intel® Core™ i3-1320PRE | TBD | W | 25°C (typ.) |
| COM-HPC mini-Module (Turbo Power Mode), Passive Cooling, Idle, Ethernet, Mouse and Keyboard plugged in | Intel® Core™ i7-1365URE | TBD | W | 25°C (typ.) |
| | Intel® Core™ i5-1345URE | TBD | W | 25°C (typ.) |
| | Intel® Core™ i3-1315URE | TBD | W | 25°C (typ.) |
| | Intel® Core™ i7-1370PRE | TBD | W | 25°C (typ.) |
| | Intel® Core™ i5-1350PRE | TBD | W | 25°C (typ.) |
| | Intel® Core™ i3-1320PRE | TBD | W | 25°C (typ.) |

# MECHANICAL DRAWINGS & MODELS



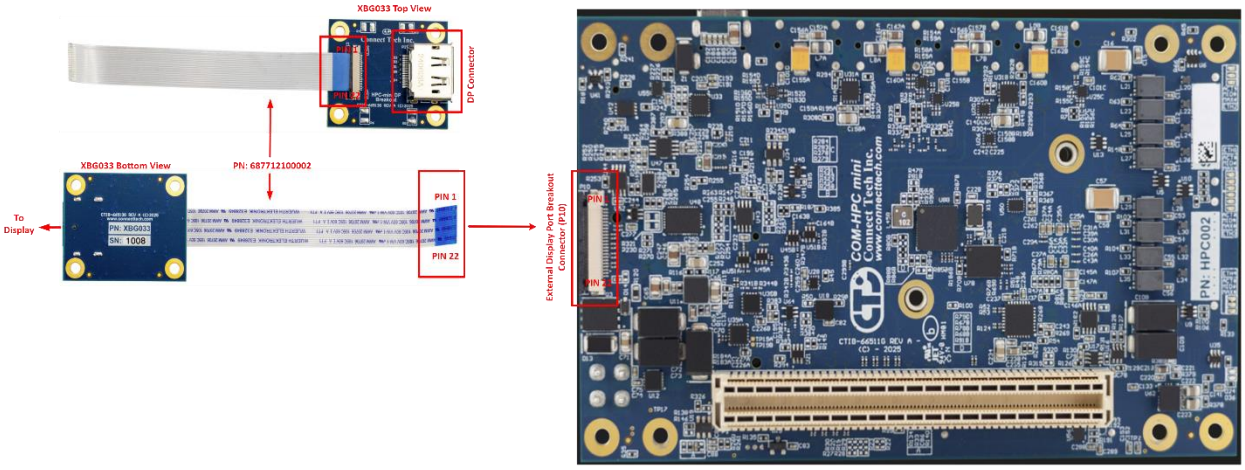
# CABLES (NOT INCLUDED)

| Description | Part Number | Qty |
|---|---|---|
| Power Input Cable | CBG765 | 1 |
| Ethernet Cable | CBG763 | 2 |
| USB Breakout Cable | CBG762 | 4 |
| Mics. I/O Cable | CBG764 | 1 |
| RTC cable | CBG136 | 1 |
| DisplayPort Breakout cable | CBG797 | 1 |

# ACCESSORIES (NOT INCLUDED)

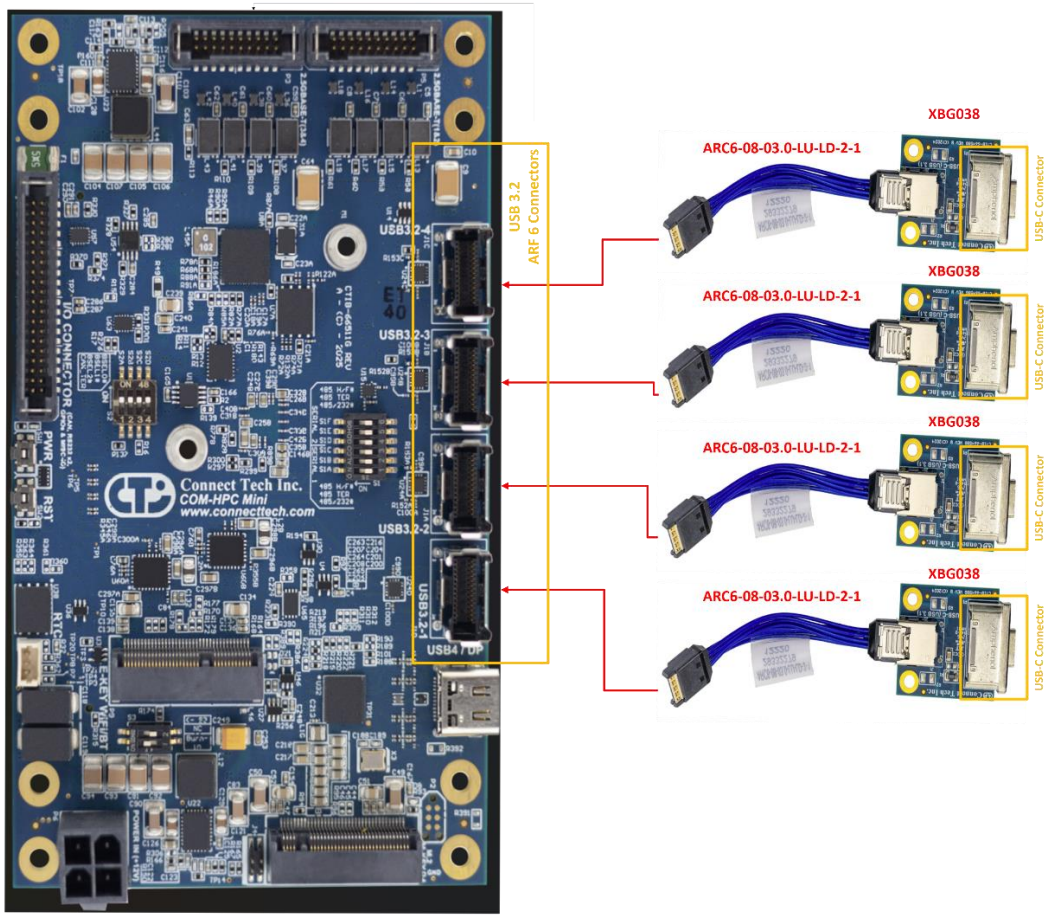
| Description | Part Number |
|---|---|
| ARF6 to USB Breakout | XBG038 |
| Display Breakout Board | XBG033 |

# APPENDIX 1: COM-HPC MINI BOARD AND DISPLAY BREAKOUT INTEGRATION



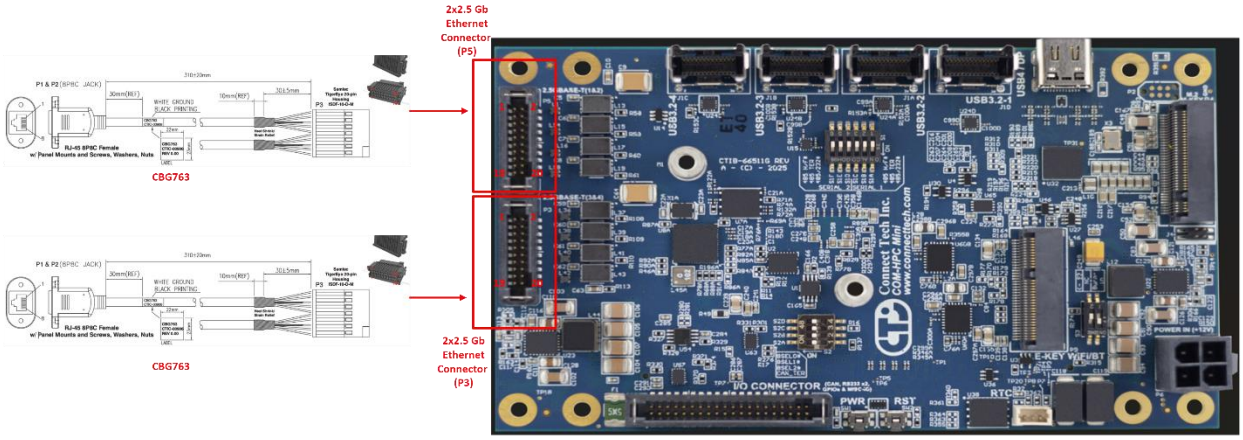

| COM-HPC mini Board Location | Cable Part Number | Breakout Board (XBG033) Location |
|---|---|---|
| P10 | 687712100002 | P1 |

# APPENDIX 2: COM-HPC MINI BOARD AND USB BREAKOUT INTEGRATION




| COM-HPC mini Board Location | Cable Part Number | Breakout Board (XBG038) Location |
|---|---|---|
| J1A<br>J1B<br>J1C<br>J1D | ARC6-08-03.0-LU-LD-2-1 | J1 |

# APPENDIX 3: COM-HPC MINI BOARD AND ETHERNET CABLE ASSEMBLY INTEGRATION




| COM-HPC mini Board Location | Cable Part Number |
|---|---|
| P5, P3 | CBG763 / CTIC-00906 |

# APPENDIX 4: HPC002 SUPPORTED MODULES

| S No | Manufacturer | Description | MFG. Part Number | Tested BIOS Version for USB4/DP |
|---|---|---|---|---|
| 1 | Congatec | conga-HPC/mRLP-i7-1365URE-32G NVMe128 | 045600 | BIOS version: FRLPR022<br>BC Firmware version: 041 |
| 2 | Congatec | conga-HPC/mRLP-i5-1345URE-16G NVMe128 | 045601 | |
| 3 | Congatec | conga-HPC/mRLP-i3-1315URE-16G NVMe128 | 045602 | |
| 4 | Congatec | conga-HPC/mRLP-U300E-16G NVMe128 | 045603 | |
| 5 | Congatec | conga-HPC/mRLP-i7-1370PRE-32G NVMe128 | 045604 | |
| 6 | Congatec | conga-HPC/mRLP-i5-1350PRE-16G NVMe128 | 045605 | |
| 7 | Congatec | conga-HPC/mRLP-i3-1320PRE-16G NVMe128 | 045606 | |
| 8 | TQ | Intel® Core™ Ultra 7 155H (6P+8E, 8Xe, 24 MB, 28 W TDP), 32 GB LPDDR5, TPM 2.0, C-Temp | TQMxCU1-HPCM-AB | TQMxCU1-HpcM_05.54.15.28.05_ConnectTec h.bin<br><br>Note: It's a Connect Tech Custom UEFI for TQMxCU1-HPCM |
| 9 | TQ | Intel® Core™ Ultra 5 125H (4P+8E, 7Xe, 18 MB, 28 W TDP), 16 GB LPDDR5, TPM 2.0, C-Temp | TQMxCU1-HPCM-AD | |
| 10 | TQ | Intel® Core™ Ultra 7 155U (2P+8E, 4Xe, 12 MB, 15 W TDP), 16 GB LPDDR5, TPM 2.0, C-Temp | TQMxCU1-HPCM-AF | |
| 11 | TQ | Intel® Core™ Ultra 5 125U (2P+8E, 4Xe, 12 MB, 15 W TDP), 16 GB LPDDR5, TPM 2.0, C-Temp | TQMxCU1-HPCM-AH | |