

COMe Eval Carrier T7 (A2T7)

Rev 1.4

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▶ COME EVAL CARRIER T7 (A2T7) - USER GUIDE

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▲ CAUTION

Handling and operation of the product is permitted only for trained personnel within a work place that is access controlled. Please follow the **"General Safety Instructions"** supplied with the system.

NOTICE

You find the most recent version of the **"General Safety Instructions"** online in the download area of this product.

Revision History

| Revision | Brief Description of Changes | Date of Issue | Author |
|----------|--|-----------------|--------|
| 1.0 | Initial issue | 2021-October-12 | hjs |
| 1.1 | New Adapter card specified in chapter 9/, new RMA link, | 2022-April-28 | hjs |
| 1.2 | Minor updates | 2022-August-29 | ih |
| 1.3 | Photos updated | 2023-March-10 | ih |
| 1.4 | Additional comment for adapter cards | 2023-March-24 | ih |

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Find Kontron contacts by visiting: <https://www.kontron.de/support-and-services>.

Customer Service

As a trusted technology innovator and global solutions provider, Kontron extends its embedded market strengths into a services portfolio allowing companies to break the barriers of traditional product lifecycles. Proven product expertise coupled with collaborative and highly-experienced support enables Kontron to provide exceptional peace of mind to build and maintain successful products.





For more details on Kontron's service offerings such as: enhanced repair services, extended warranty, Kontron training academy, and more visit <https://www.kontron.de/support-and-services>.

Customer Comments

If you have any difficulties using this user guide, discover an error, or just want to provide some feedback, contact [Kontron support](#). Detail any errors you find. We will correct the errors or problems as soon as possible and post the revised user guide on our website.

Symbols

The following symbols may be used in this manual

| | |
|---|--|
| ⚠ DANGER | DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury. |
| ⚠ WARNING | WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury. |
| NOTICE | NOTICE indicates a property damage message. |
| ⚠ CAUTION | CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury. |
|  | <p>Electric Shock!</p> <p>This symbol and title warn of hazards due to electrical shocks (> 60 V) when touching products or parts of products. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.</p> |
|  | <p>ESD Sensitive Device!</p> <p>This symbol and title inform that the electronic boards and their components are sensitive to static electricity. Care must therefore be taken during all handling operations and inspections of this product in order to ensure product integrity at all times.</p> |
|  | <p>HOT Surface!</p> <p>Do NOT touch! Allow to cool before servicing.</p> |
|  | <p>Laser!</p> |

This symbol inform of the risk of exposure to laser beam and light emitting devices (LEDs) from an electrical device. Eye protection per manufacturer notice shall review before servicing.



This symbol indicates general information about the product and the user guide.

This symbol also indicates detail information about the specific product configuration.



This symbol precedes helpful hints and tips for daily use.

For Your Safety

Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions

As a precaution and in case of danger, the power connector must be easily accessible. The power connector is the product's main disconnect device.

⚠ CAUTION

Warning

All operations on this product must be carried out by sufficiently skilled personnel only.

⚠ CAUTION



Electric Shock!

Before installing a non hot-swappable Kontron product into a system always ensure that your mains power is switched off. This also applies to the installation of piggybacks. Serious electrical shock hazards can exist during all installation, repair, and maintenance operations on this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing any work on this product.

Earth ground connection to vehicle's chassis or a central grounding point shall remain connected. The earth ground cable shall be the last cable to be

disconnected or the first cable to be connected when performing installation or removal procedures on this product.

Special Handling and Unpacking Instruction

NOTICE



ESD Sensitive Device!

Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product in order to ensure product integrity at all times.

Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.

Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory backup, ensure that the product is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits on the product.

Lithium Battery Precautions

If your product is equipped with a lithium battery, take the following precautions when replacing the battery.

CAUTION

Danger of explosion if the battery is replaced incorrectly.

- ▶ Replace only with same or equivalent battery type recommended by the manufacturer.
 - ▶ Dispose of used batteries according to the manufacturer's instructions.
-

General Instructions on Usage

In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the product, that are not explicitly approved by Kontron and described in this user guide or received from Kontron Support as a special handling instruction, will void your warranty.

This product should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This also applies to the operational temperature range of the specific board version that must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

In performing all necessary installation and application operations, only follow the instructions supplied by the present user guide.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the product then re-pack it in the same manner as it was delivered.

Special care is necessary when handling or unpacking the product. See Special Handling and Unpacking Instruction.

Quality and Environmental Management

Kontron aims to deliver reliable high-end products designed and built for quality, and aims to complying with environmental laws, regulations, and other environmentally oriented requirements. For more information regarding Kontron's quality and environmental responsibilities, visit <http://www.kontron.com/about-kontron/corporate-responsibility/quality-management>.

Disposal and Recycling

Kontron's products are manufactured to satisfy environmental protection requirements where possible. Many of the components used are capable of being recycled. Final disposal of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.

WEEE Compliance

The Waste Electrical and Electronic Equipment (WEEE) Directive aims to:

- ▶ Reduce waste arising from electrical and electronic equipment (EEE)
- ▶ Make producers of EEE responsible for the environmental impact of their products, especially when the product become waste
- ▶ Encourage separate collection and subsequent treatment, reuse, recovery, recycling and sound environmental disposal of EEE
- ▶ Improve the environmental performance of all those involved during the lifecycle of EEE



Environmental protection is a high priority with Kontron.
Kontron follows the WEEE directive
You are encouraged to return our products for proper disposal.

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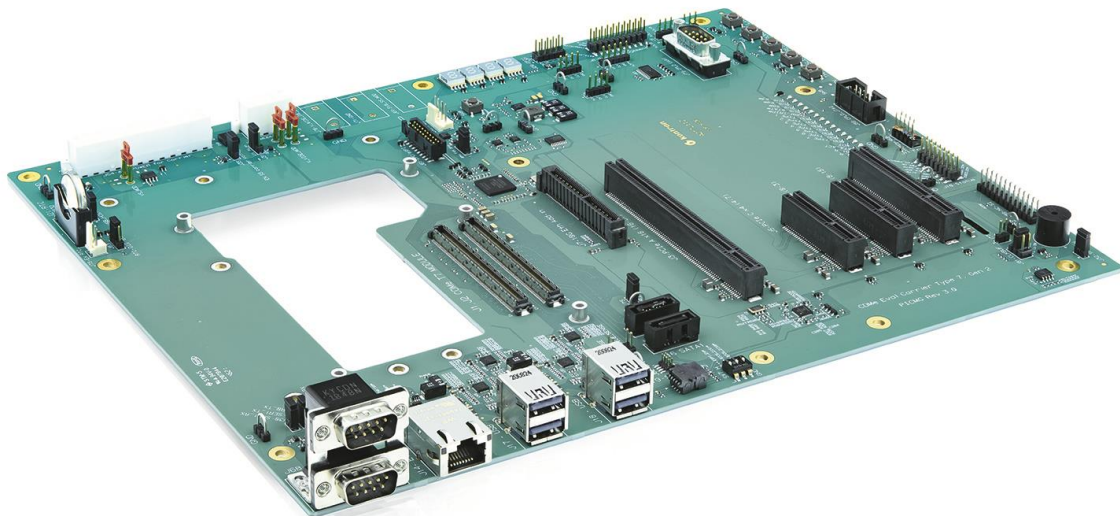
1/ Introduction

1.1. Product Description

The A2T7 is the successor of the already existing ADT7 COM Express Evaluation Carrier Type7. It is an evaluation, testing and validation carrier board (baseboard) for COM Express® Type 7 modules in ATX form factor. The A2T7 will allow more flexibility with respect to the 10 GbE configurations. Main purpose of this carrier board is to bring out all the signals from COM Express® connector of COMe Type7 modules to industry standard interfaces. The key features are:

- ▶ Compliant to PICMG COM Express COM.0 R3.0 and R3.1 – different P/Ns available
- ▶ Support of COM Express® basic and compact modules Pin-out Type 7 compliant with cutout area for 2x SODIMMs on the bottom side of the PCB
- ▶ Support of overall 32x PCIe lanes via different PCIe card slots: 4x PCIe slots (1x16 + 1x8 + 2x4)
- ▶ Support of 2x UART ports via DSUB-9 connector
- ▶ Flexible configuration of 4x 10 GB Eth interfaces from COMe module via pluggable expansion cards
- ▶ 1x 1000Base-T interface, directly from COMe module with basic EMI/ESD protection in RJ-45 integrated magnetic connector
- ▶ 4x USB 3.1 gen2 Interface, directly from COMe module with basic EMI/ESD protection and redrivers
- ▶ 2x SATA standard interface, directly from COMe module
- ▶ External fan connector
- ▶ Coin cell and options for external RTC
- ▶ BIOS POST Code display in the form of 7-Segment display array
- ▶ Pin headers for COM Express® specific signals enabling measurement like GPIOs, I2C, SMBus, Power management, Status signal
- ▶ External BIOS flash socket and header for emulator connection

Figure 1: COMe Eval Carrier T7 (A2T7) with four PCIe slots



1.2. Product Naming Clarification

The product names for Kontron COM Express® Computer-on-Modules consist of a short form of the industry standard (COMe-), the form factor (b=basic, c=compact, m=mini), the capital letters for the CPU and Chipset Codenames (XX) and the pin-out type (#) followed by the CPU Name.

COM Express® defines a Computer-On-Module, or COM, with all components necessary for a bootable host computer, packaged as a super component.

- ▶ COMe-bXX# modules are Kontron's COM Express® modules in basic form factor (125 mm x 95 mm)
- ▶ COMe-cXX# modules are Kontron's COM Express® modules in compact form factor (95 mm x 95 mm)

1.3. Understanding COM Express® Functionality

All Kontron COM Express® extended, basic and compact modules contain two 220pin connectors; each of it has two rows called Row A & B on primary connector and Row C & D on secondary connector. The COM Express® Computer-On-Module (COM) features the following maximum amount of interfaces according to the PCI Industrial Computer Manufacturers Group (PICMG) module Pin-out type.

Table 1: Features

| Feature | COMe Eval Carrier T7 (A2T7) |
|-------------------------|--|
| 10 Gbit Ethernet | 4x |
| SFP+ | 2x or 4x |
| COMe Connec. | COMe Connectors 5mm / 8mm |
| USB | 4x USB double stacked |
| COM | 2x DSUB-9 |
| SATA | 2x standard slots |
| Feature Connector | Various control signals - such as WAKE, THRM, SMB, I2C – similar to COMe Eval Carrier Type 7 68300-0000-00-0 |
| PCIe slots | 1x x16, 1x x8, 2x x4 – supporting up to PCIe Gen4 |
| Ethernet expansion slot | 4x 10G KR signals + Ethernet sideband signals |
| LEDs | SMD LEDs e.g. for carrier activity, board status, LAN and power status (power good) |

| Feature | COMe Eval Carrier T7 (A2T7) |
|--------------|--|
| GPIO | GPIO Header for 8 GPIO signals similar to COMe Eval Carrier Type 7 |
| SMBus header | 5-pin header similar to COMe Eval Carrier Type 7 |
| I2C | 4-pin header similar to COMe Eval Carrier Type 7 |
| Fan | 4-pin fan connector, Voltage can be 5 V or 12 V (default) |
| IPMB support | 4-pin header |

1.4. COM Express® Documentation

The COM Express® Specification defines the COM Express® module form factor, pin-out, and signals. This document is available at the PICMG® website by filling out the order form.

1.5. COM Express® Benefits

COM Express® modules are compact and highly integrated computers. All modules feature a standardized form factor and connector layout which carry a specified set of signals. Each COM is based on the COM Express® specification. This standardization allows designers to create a single-system baseboard that can accept present and future COM Express® modules.

The baseboard designer can optimize exactly how each of these functions implements physically. Designers can place connectors precisely where needed for the application on a baseboard designed to optimally fit a system's packaging.

A single baseboard design can use a range of COM Express® modules with different sizes and pin-outs. This flexibility can differentiate products at various price/performance points. The modularity of a COM Express® solution also ensures against obsolescence when computer technology evolves. A properly designed COM Express® baseboard can work with several successive generations of COM Express® modules.

A COM Express® baseboard design has many advantages of a customized computer-board design and, additionally, delivers better obsolescence protection, heavily reduced engineering effort, and faster time to market.

2/ System specifications

2.1. Component Main Data

The table below summarizes the features of the motherboard.

Table 2: Component Main Data

| COMe Eval Carrier T7 (A2T7) | |
|-----------------------------|---|
| Form factor | Testing Hardware with 244.0 mm x 305.0 mm |
| Compliance | PICMG COM.0 R3.0 and R3.1 |
| Memory | |
| EEPROM System (U17) | PICMG EEPROM |
| I/O | |
| LAN | 1x RJ45 GbE port, expansion slot for 4x 10 GbE adapter cards |
| USB | 4x USB 3.1 double stack |
| COM | 2x DSUB-9 |
| SATA | 2x standard slots |
| Feature Connector | Various control signals - such as WAKE, THRM, SMB, I2C |
| PCIe | 1x x16, 1x x8, 2x x4, supporting up to PCIe Gen4 (depending on module capabilities) |
| LEDs | SMD LEDs e.g. for carrier activity, board status, LAN and power status (power good) |
| GPIO | GPIO Header for 8 GPIO signals |
| SMBus header | 5-pin header |
| I2C | 4-pin header |
| Battery | CR2032 battery holder |
| Fan | 4-pin fan connector, Voltage can be 5 V or 12 V (default) |
| NC-SI | 24-pin Network controller sideband interface |
| Carrier Board Power | |
| Power input | Carrier is powered from standard ATX power supply with ATX 24-pin connector. |
| Single Supply Support | carrier requires ATX power |
| ACPI | ACPI 4.0 |

| | |
|-------------------------------|-------------------------------|
| Single Supply Simulation Mode | yes |
| Misc Power Management | yes |
| Kontron Features | |
| External I2C Bus | Fast I2C, MultiMaster capable |

⚠ CAUTION

Danger of explosion if the lithium 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
-

2.2. Environmental Conditions

Table 3: Environmental Conditions for the evaluation carrier A2T7

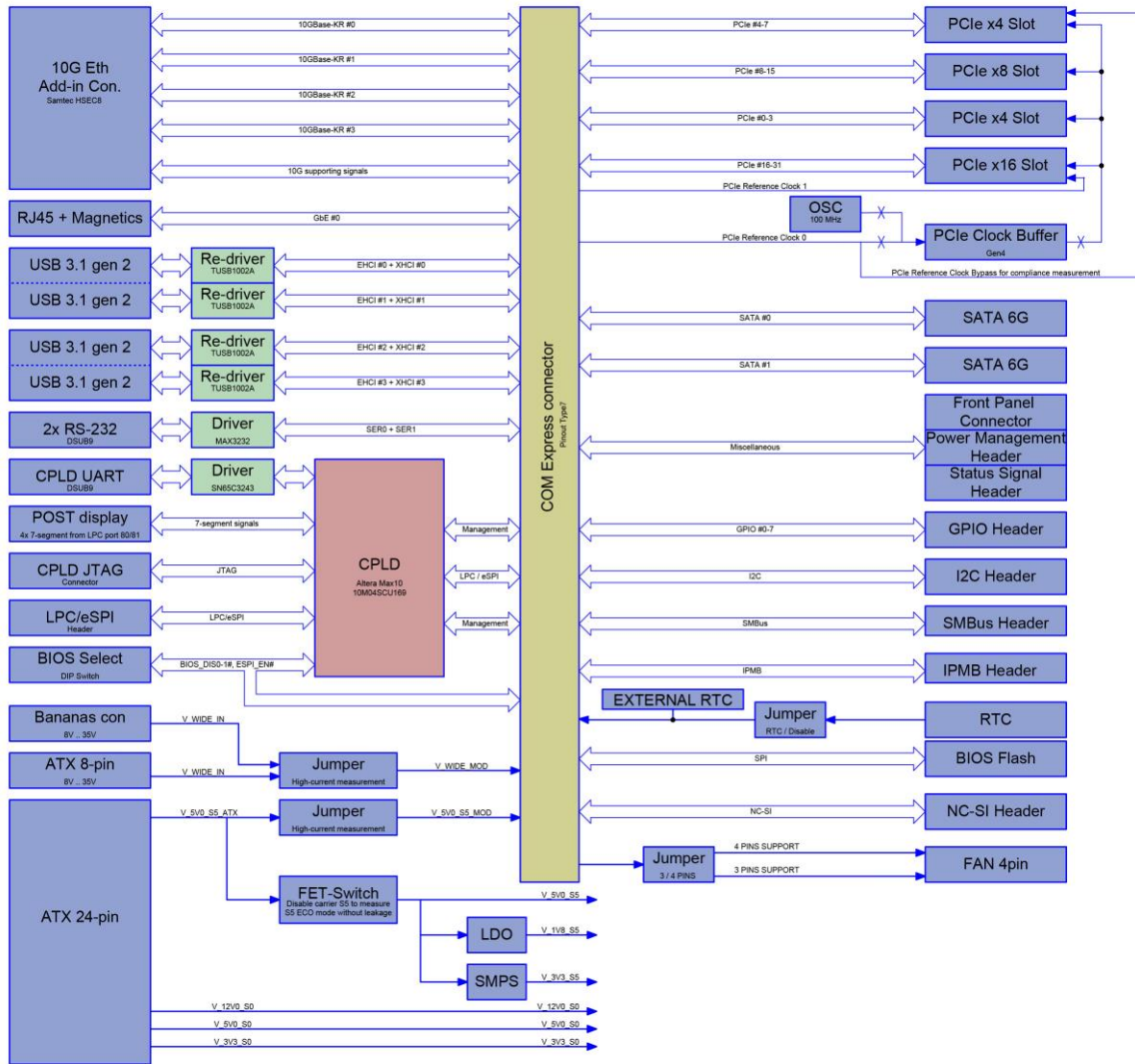
NOTICE

 the adapter cards are intended for laboratory use only

| | |
|--|---|
| Operating | -0°C to +60°C Some connectors and supercap has operating temperature only 0°C to +70°C, relative humidity (non-condensing) 10 % to 93 % at 40°C (acc. to IEC 60068-2-78) |
| Storage | -30°C to +85°C relative humidity (non-condensing) 10 % to 93 % at 40°C (acc. to IEC 60068-2-78) |
| Waste Electrical and Electronic Equipment (WEEE) | Components and materials of the product must not contain lead, mercury, cadmium, hexavalent, chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE). (Directive 2012/19/EU) |
| RoHS II Compliance | The product will comply with the European Council Directive on the approximation of the laws of the member states relating to Directive 2011/65/EU or the last status thereof. |
| MTBF | TBD |
| Compliance | EMC according to EN 55032 Class B, IEC/EN 61000-6-3 and EN 55024, IEC/EN 61000-6-2 Reach compliant (Regulation (EC) No 1907/2006) EN 62368-1:2014 - Safety for audio/video and information technology equipment |

2.3. Block diagram

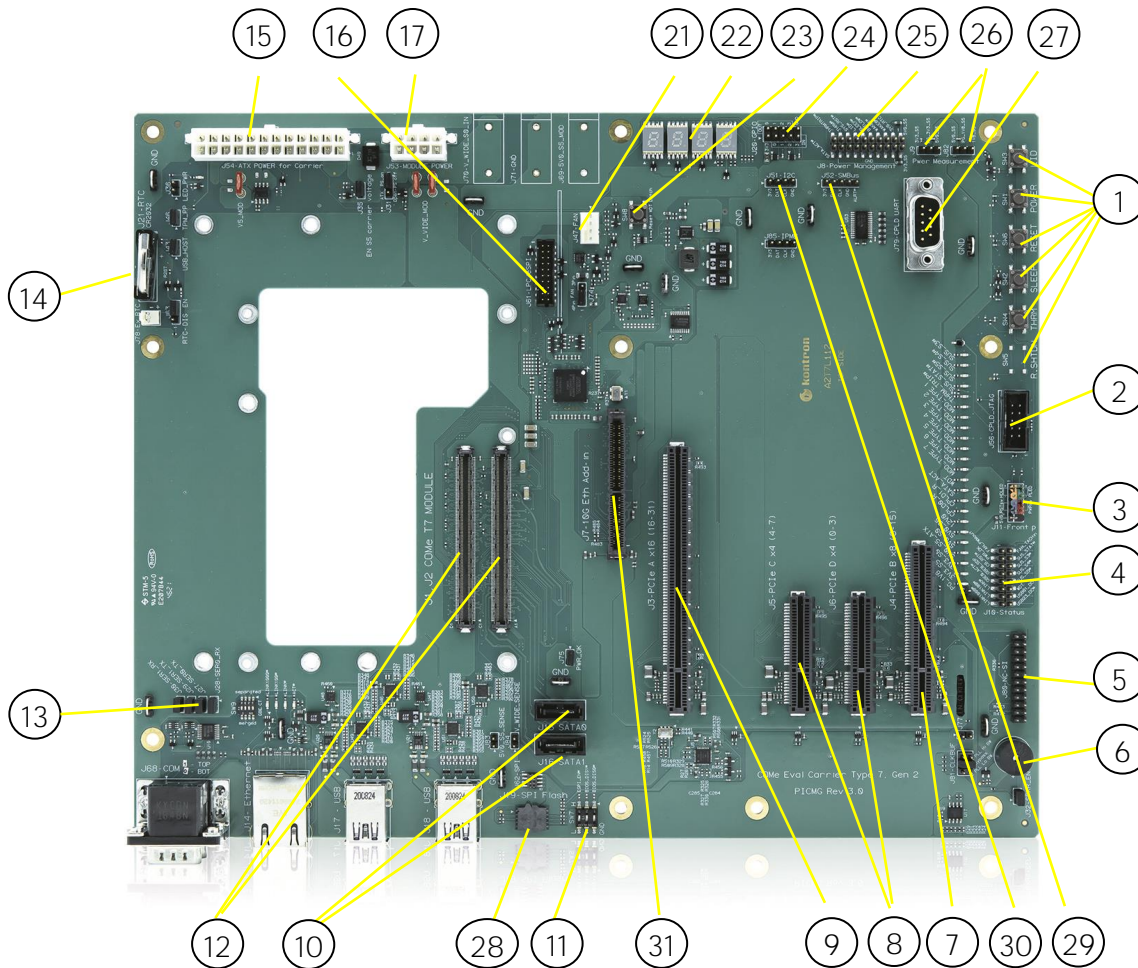
Figure 2: Block Diagram COMe Eval Carrier T7 (A2T7)



3/ Mainboard Views

3.1. Top View

Figure 3: Top View of COMe Eval Carrier T7 (A2T7)

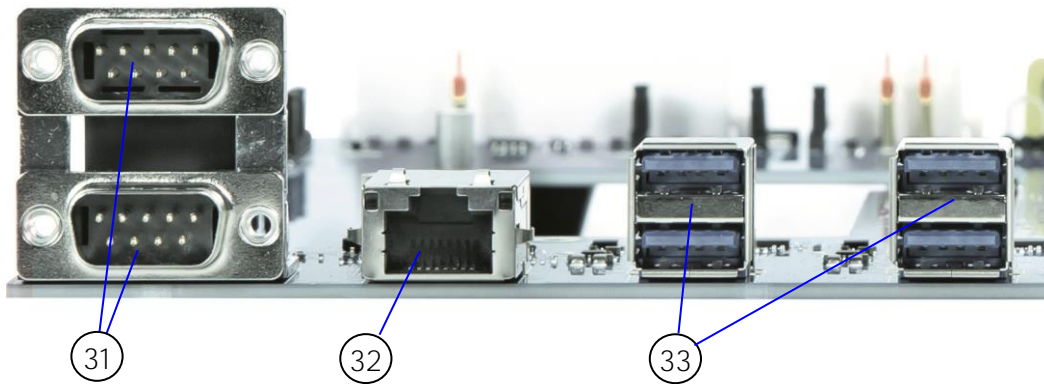


- | | |
|---------------------------------------|--------------------------------------|
| 1. 6x Button Switches (SW1-SW6) | 16. LPC/eSPI (J61) |
| 2. CPLD JTAG (2x5 pins, J56) | 17. ATX power connector 8 pins (J53) |
| 3. Front Panel Connector (J11) | 18. n/a |
| 4. Status Header (J10) | 19. n/a |
| 5. NC-SI (J80) | 20. n/a |
| 6. Speaker Enable/Disable (J32) | 21. Fan (J47) |
| 7. PCIe x8 (J4) | 22. POST Code Display |
| 8. 2x PCIe x4 (J5/J6) | 23. Button Switch Reset WDT (SW8) |
| 9. PCIe x16 (J3) | 24. GPIO (J20) |
| 10. 2x SATA (J15/J16) | 25. Power Management (J8) |
| 11. DIP Switch (SW7) | 26. 2x Power Measurement (J9, J82) |
| 12. 2x COMe interface (J1/J2) | 27. CPLD UART (8 pins, J79) |
| 13. Jumper (J27, J28, J29, J30) | 28. SPI Flash (J19) |
| 14. Battery (J21) | 29. SMBus (J52) |
| 15. ATX power connector 24 pins (J54) | 30. I2C (J51) |

31. 10G Ethernet Extension (J7)

3.2. Front panel

Figure 4: Front Panel



32. 2x UART ports (COM0-Top, COM1-Bot)

33. Ethernet (J14)

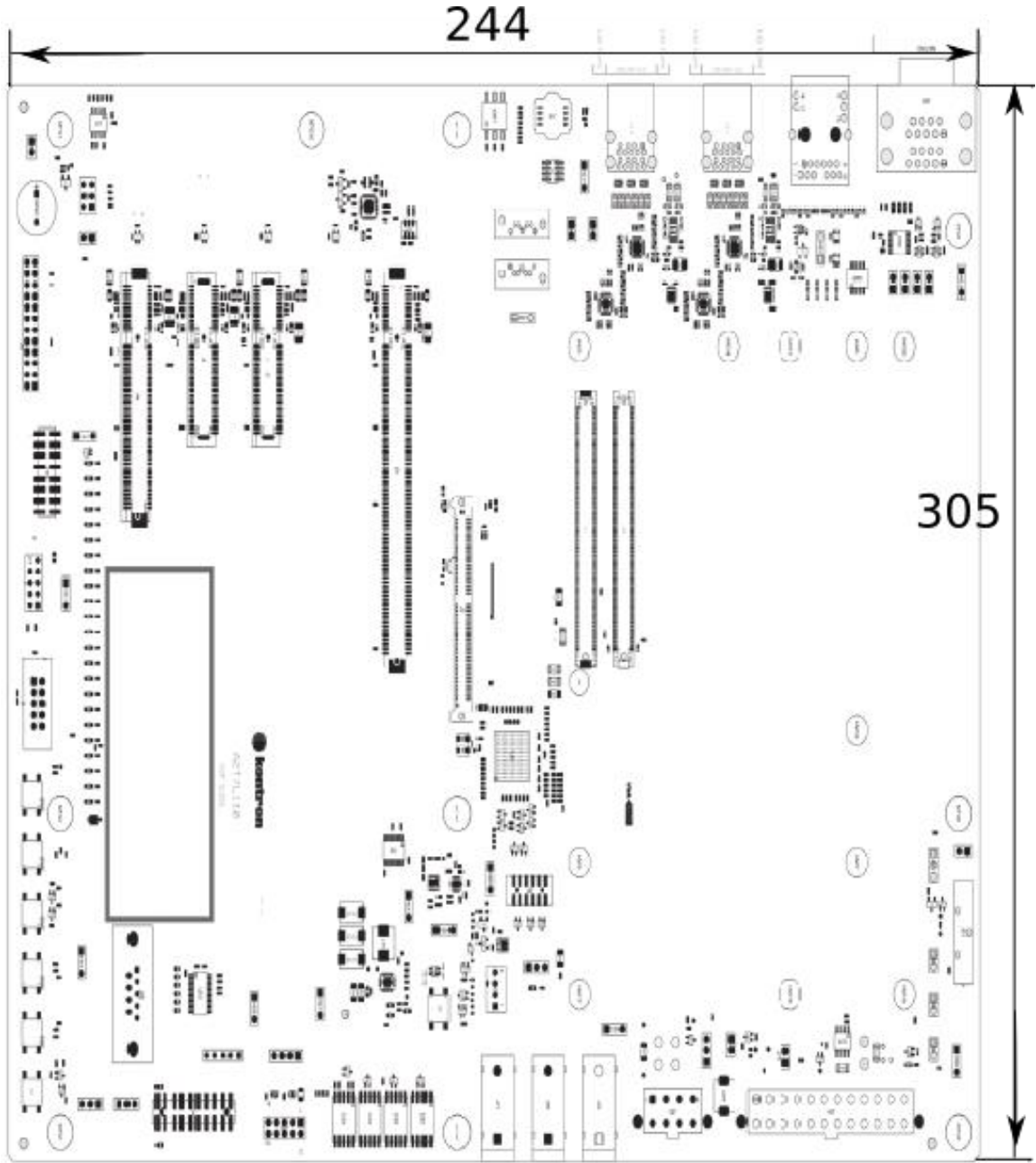
34. 4x USB (J17, J18)

4/ Mechanical Specification

4.1. Dimensions

The dimensions of the carrier board (see Figure 5) are 244.0 mm x 305.0 mm.

Figure 5: Board Dimensions



5/ Interfaces and Connectors

5.1. 1 GB Ethernet Connector (J14)

Figure 6: 1 GB Ethernet Connector

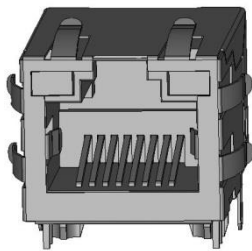


Table 4: 1 GB Ethernet Connector

| Pin | Signal Name |
|-----|-------------------|
| 1 | CT_MDI1 |
| 2 | GBEO_MDI1- |
| 3 | GBEO_MDI1+ |
| 4 | GBEO_MDI2+ |
| 5 | GBEO_MDI2- |
| 6 | CT_MDI2 |
| 7 | CT_MDIO |
| 8 | GBEO_MDIO+ |
| 9 | GBEO_MDIO- |
| 10 | GBEO_MDI3- |
| 11 | GBEO_MDI3+ |
| 12 | CT_MDI3 |
| 13 | GBEO_LED_ACT# |
| 14 | GBEO_LED_ACTPWR |
| 15 | GBEO_LED_R_Y |
| 16 | GBEO_LED_SPEEDPWR |
| 17 | GBEO_LED_R_G |
| S1 | GND |
| S2 | GND |

Table 5: Signals

| LED | Signal |
|-----|-------------------|
| 1 | green, activity |
| 2 | green, 100 MB/s |
| 2 | yellow, 1000 MB/s |

5.2. USB 3.1 Double Connector (J68)

Figure 7: USB 3.1 Double Connector

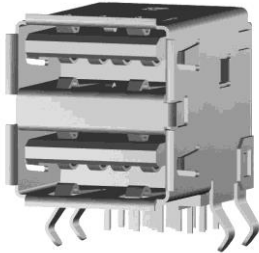


Table 6: USB 3.1 Double Connector

| Pin | Signal Name - J17 | | Signal Name - J18 | |
|-----|-------------------|-------------------|-------------------|-------------|
| 1 | V_5V0_M_USB1_CONN | BOTTOM SLOT | V_5V0_M_USB3_CONN | BOTTOM SLOT |
| 2 | USB20_D1_CONN- | | USB20_D3_CONN- | |
| 3 | USB20_D1_CONN+ | | USB20_D3_CONN+ | |
| 4 | GND | | GND | |
| 5 | USB31_SSRX1_CONN- | | USB31_SSRX3_CONN- | |
| 6 | USB31_SSRX1_CONN+ | | USB31_SSRX3_CONN+ | |
| 7 | GND | | GND | |
| 8 | USB31_SSTX1_CONN- | | USB31_SSTX3_CONN- | |
| 9 | USB31_SSTX1_CONN+ | | USB31_SSTX3_CONN+ | |
| 10 | V_5V0_M_USB0_CONN | TOP SLOT | V_5V0_M_USB2_CONN | TOP SLOT |
| 11 | USB20_D0_CONN- | | USB20_D2_CONN- | |
| 12 | USB20_D0_CONN+ | | USB20_D2_CONN+ | |
| 13 | GND | | GND | |
| 14 | USB31_SSRX0_CONN- | | USB31_SSRX2_CONN- | |
| 15 | USB31_SSRX0_CONN+ | | USB31_SSRX2_CONN+ | |
| 16 | GND | | GND | |
| 17 | USB31_SSTX0_CONN- | | USB31_SSTX2_CONN- | |
| 18 | USB31_SSTX0_CONN+ | USB31_SSTX2_CONN+ | | |
| 19 | GND | | GND | |
| 20 | GND | | GND | |
| 21 | GND | | GND | |
| 22 | GND | | GND | |

5.3. COM Ports (J68)

Figure 8: Double COM Ports



Table 7: Double COM Ports

| Pin | Signal Name | |
|-----|--------------------|-------------|
| 1B | NC | BOTTOM SLOT |
| 2B | SERO_RX_RS M0 | |
| 3B | SERO_TX_RS232_COM0 | |
| 4B | NC | |
| 5B | GND | |
| 6B | NC | |
| 7B | NC | |
| 8B | NC | |
| 9B | NC | |
| S1B | GND | |
| S2B | GND | |
| 1T | NC | |
| 2T | SER1_RX_RS232_COM0 | |
| 3T | SER1_TX_RS232_COM0 | |
| 4T | NC | |
| 5T | GND | |
| 6T | NC | |
| 7T | NC | |
| 8T | NC | |
| 9T | NC | |
| S1T | GND | |
| S2T | GND | |

5.4. CPLD UART (J79)

Figure 9: CPLD UART



Table 8: CPLD UART Connector

| Pin | Signal Name |
|-----|---------------|
| 1 | NC |
| 2 | SN65_UART_RXD |
| 3 | SN65_UART_TXD |
| 4 | SN65_UART_DTR |
| 5 | GND |
| 6 | SN65_UART_DSR |
| 7 | SN65_UART_RTS |
| 8 | SN65_UART_CTS |
| 9 | NC |
| S1 | GND |
| S2 | GND |

5.5. 10 GB Ethernet Add-in Card Connector (J7)

The carrier board contains 10 GB Ethernet connector that supports copper and optical 10 GB interface via extended cards.

Figure 10: 10 GB Ethernet Add-in Card Connector

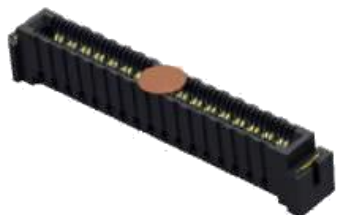


Table 9: Connector Pinning

| Pin | Signal Name | Pin | Signal Name |
|-----|--------------|-----|----------------|
| 1 | V_12V0_S0 | 2 | V_3V3_S5 |
| 3 | V_12V0_S0 | 4 | V_3V3_S5 |
| 5 | V_12V0_S0 | 6 | 10G_PWR_OK |
| 7 | V_3V3_S0 | 8 | GND |
| 9 | V_3V3_S0 | 10 | 10G_WAKE# |
| 11 | SMB_CLK | 12 | 10G_PHY_CAP_01 |
| 13 | GND | 14 | GND |
| 15 | SMB_DAT | 16 | 10G_LED_SDA |
| 17 | 10G_SFP_SDA1 | 18 | 10G_LED_SCL |
| 19 | GND | 20 | GND |
| 21 | 10G_KR_RX1+ | 22 | CB_RESET# |
| 23 | 10G_KR_RX1- | 24 | 10G_SFP_SCL1 |
| 25 | GND | 26 | GND |
| 27 | NC | 28 | 10G_KR_TX1- |
| 29 | 10G_SFP_SDA0 | 30 | 10G_KR_TX1+ |
| 31 | GND | 32 | GND |
| 33 | 10G_KR_RX0+ | 34 | NC |
| 35 | 10G_KR_RX0- | 36 | 10G_SFP_SCL0 |
| 37 | GND | 38 | GND |
| 39 | NC | 40 | 10G_KR_TX0- |
| 41 | 10G_SFP_SDA3 | 42 | 10G_KR_TX0+ |
| 43 | GND | 44 | GND |

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------------|-----|-------------------|
| 45 | GND | 46 | GND |
| 47 | 10G_KR_RX3+ | 48 | NC |
| 49 | 10G_KR_RX3- | 50 | 10G_SFP_SCL3 |
| 51 | GND | 52 | GND |
| 53 | NC | 54 | 10G_KR_TX3- |
| 55 | 10G_SFP_SDA2 | 56 | 10G_KR_TX3+ |
| 57 | GND | 58 | GND |
| 59 | 10G_KR_RX2+ | 60 | NC |
| 61 | 10G_KR_RX2- | 62 | 10G_SFP_SCL2 |
| 63 | GND | 64 | GND |
| 65 | NC | 66 | 10G_KR_TX2- |
| 67 | 10G_PHY_RST_23 | 68 | 10G_KR_TX2+ |
| 69 | GND | 70 | GND |
| 71 | V_5V0_S5 | 72 | V_5V0_S5 |
| 73 | 10G_PHY_RST_01 | 74 | 10G_PHY_CAP_23 |
| 75 | GND | 76 | GND |
| 77 | 10G_INT1 | 78 | 10G_INT3 |
| 79 | 10G_SDP1 | 80 | 10G_SDP3 |
| 81 | GND | 82 | GND |
| 83 | 10G_PHY_MDC_SCL1 | 84 | 10G_PHY_MDC_SCL3 |
| 85 | 10G_PHY_MDIO_SDA1 | 86 | 10G_PHY_MDIO_SDA3 |
| 87 | GND | 88 | GND |
| 89 | 10G_INT0 | 90 | 10G_INT2 |
| 91 | 10G_SDP0 | 92 | 10G_SDP2 |
| 93 | GND | 94 | GND |
| 95 | 10G_PHY_MDC_SCL0 | 96 | 10G_PHY_MDC_SCL2 |
| 97 | 10G_PHY_MDIO_SDA0 | 98 | 10G_PHY_MDIO_SDA2 |
| 99 | GND | 100 | GND |
| M1 | GND | M2 | GND |

5.6. SATA 6 GB (J15, J16)

Figure 11: SATA 6 GB



Table 10: SATA 6 GB Connector

| Pin | Signal Name - J15 | Signal Name – J16 |
|-----|-------------------|-------------------|
| 1 | GND | GND |
| 2 | SATA0_TX+ | SATA1_TX+ |
| 3 | SATA0_TX- | SATA1_TX- |
| 4 | GND | GND |
| 5 | SATA0_RX+ | SATA1_RX+ |
| 6 | SATA0_RX- | SATA1_RX- |
| 7 | GND | GND |
| M1 | GND | GND |
| M2 | GND | GND |

5.7. PCIe Slots (J3 – J6)

Table 11: PCIe Slots

| PCIe Slot | Connector | PCIe Lanes |
|------------|-----------|-----------------------|
| PCIe A x16 | J3 | 16 lanes PCIE[16..31] |
| PCIe B x8 | J4 | 8 lanes PCIE[8..15] |
| PCIe C x4 | J5 | 4 lanes PCIE[4..7] |
| PCIe D x4 | J6 | 4 lanes PCIE[0..3] |

5.8. NC-SI Connector (J80)

Figure 12: NC-SI Connector

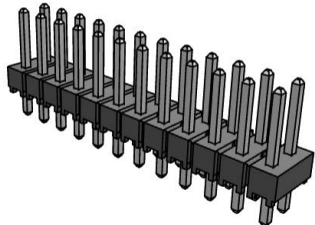


Table 12: NC-SI Connector Pinning

| Pin | Signal Name |
|-----|-----------------------------|
| 1 | V_3V0_RTC |
| 2 | V_3V3_S5 |
| 3 | NCSI_ARB_OUT |
| 4 | V_5V0_S5 |
| 5 | NCSI_RXD1 |
| 6 | V_5V0_S5 |
| 7 | NCSI_RXD0 |
| 8 | NCSI_TXD0 |
| 9 | I2C_CLK |
| 10 | NCSI_TXD1 |
| 11 | I2C_DAT |
| 12 | NCSI_TX_EN |
| 13 | NCSI_CRS_DV |
| 14 | NCSI_CLK_IN |
| 15 | NCSI_RX_ERR |
| 16 | NCSI_ARB_IN |
| 17 | SMB_ALERT# |
| 18 | SYS_RESET# |
| 19 | NCSI_SMB_CLK (build option) |
| 20 | GND |
| 21 | NCSI_SMB_DAT (build option) |
| 22 | GND |
| 23 | GND |
| 24 | GND |

5.9. Fan Connector (J47)

Figure 13: Fan Connector with 4 pins

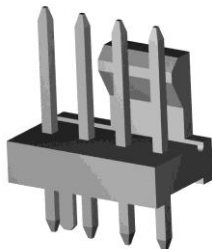


Table 13: Fan Connector

| Pin | Description |
|-----|--------------|
| 1 | GND |
| 2 | V_FAN |
| 3 | FAN_TACH_CON |
| 4 | FAN_PWM_CON |

5.10. BIOS Flash Socket (J19)

Figure 14: BIOS Flash Socket

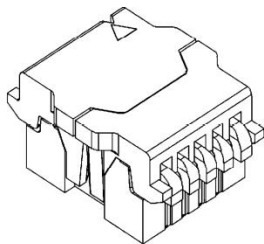


Table 14: BIOS Flash Socket Pinout

| Pin | Signal | Pin | Signal |
|-----|----------|-----|-----------|
| 1 | SPI_CS# | 5 | SPI_MOSI |
| 2 | SPI_MISO | 6 | SPI_CLK |
| 3 | SPI_WP# | 7 | SPI_HOLD# |
| 4 | GND | 8 | SPI_VCC |

5.11. SPI Connector (J62)

Figure 15: SPI Connector with 8 pins



Table 15: SPI Connector

| Pin | Signal Name |
|-----|-------------|
| 1 | SPI_CS# |
| 2 | SPI_VCC |
| 3 | SPI_MISO |
| 4 | SPI_HOLD# |
| 5 | SPI_WP# |
| 6 | SPI_CLK |
| 7 | GND |
| 8 | SPI_MOSI |

5.12. GPIO - General Purpose Input and Output (J20)

Figure 16: GPIO Header with 10 pins



Table 16: GPIO Header with 10 pins

| Pin | Signal Name |
|-----|-------------------|
| 1 | V_3V3_S0_GPI O |
| 2 | GPIO_GPO0 |
| 3 | GPIO_GPI0 |
| 4 | GPIO_GPO1 |
| 5 | GPIO_GPI1 |
| 6 | GPIO_GPO2 |
| 7 | GPIO_GPI2 |
| 8 | GPIO_GPO3 |
| 9 | GPIO_GPI3 |
| 10 | GND |

5.13. IPMB Header (J85)

Figure 17: IPMB Header with 4 pins



Table 17: Pinning IPMB Header

| Pin | Description |
|-----|-------------|
| 1 | V_3V3_S5 |
| 2 | IPMB_DAT |
| 3 | IPMB_CLK |
| 4 | GND |

5.14. Power Management Header (J8)

Figure 18: Power Management Header

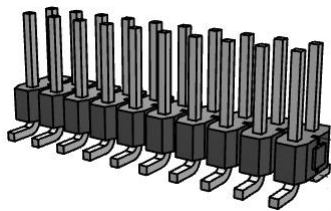


Table 18: Power Management Header

| Pin | Signal Name |
|-----|-------------|
| 1 | V_5V0_S5 |
| 2 | V_3V3_S5 |
| 3 | V_3V0_RTC |
| 4 | GND |
| 5 | WAKE0# |
| 6 | GND |
| 7 | WAKE1# |
| 8 | GND |
| 9 | BATLOW# |
| 10 | GND |
| 11 | SLEEP# |
| 12 | GND |
| 13 | LID# |
| 14 | GND |
| 15 | SYS_RESET# |
| 16 | GND |
| 17 | THRM# |
| 18 | GND |
| 19 | THRMTRIP# |
| 20 | SATA_ACT# |

5.15. Status Signal Header (J10)

Figure 19: Status Signal Header

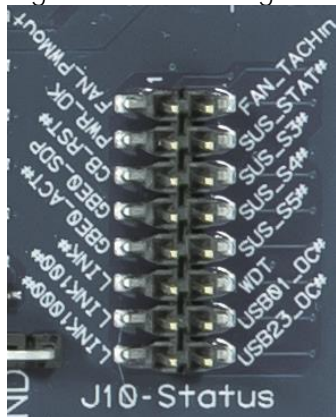


Table 19: Status Signal Header

| Pin | Signal Name |
|-----|---------------------------|
| 1 | FAN_PWMOUT |
| 2 | FAN_TACHIN |
| 3 | PWR_OK |
| 4 | SUS_STAT#_ESPI_RESET # |
| 5 | CB_RESET# |
| 6 | SUS_S3# |
| 7 | GBEO_SDP |
| 8 | SUS_S4# |
| 9 | GBEO_ACT# |
| 10 | SUS_S5# |
| 11 | GBEO_LINK# |
| 12 | WDT |
| 13 | GBEO_LINK100# |
| 14 | USB_0_1_OC# |
| 15 | GBEO_LINK1000# |
| 16 | USB_2_3_OC# |

5.16. Front Panel Connector (J11)

Figure 20: Front Panel Connector



Table 20: Front Panel Connector

| Pin | Signal Name |
|-----|-------------|
| 1 | SATA_LED+ |
| 2 | POWER_LED+ |
| 3 | SATA_ACT# |
| 4 | GND |
| 5 | GND |
| 6 | PWRBTN# |
| 7 | SYS_RESET# |
| 8 | GND |
| 9 | V_5V0_S0 |

5.17. I2C (J51)

The I2C Interface supports clock from 127Hz to 400kHz (limited by on board devices and capacitive loading) and can be configured in Setup.

Figure 21: I2C header with four pins

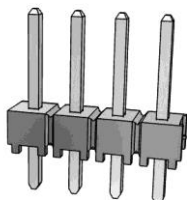


Table 21: I2C Header (J51)

| Pin | Description |
|-----|-------------|
| 1 | V_3V3_S5 |
| 2 | I2C_DAT |
| 3 | I2C_CLK |

| Pin | Description |
|-----|-------------|
| 4 | GND |

5.18. SMBus (J52)

Figure 22: SMBus header with five pins



Table 22: SMBus Header (J52)

| Pin | Description |
|-----|-------------|
| 1 | V_V3V_S5 |
| 2 | SMB_DAT |
| 3 | SMB_CLK |
| 4 | GND |
| 5 | SMB_ALERT# |

5.19. ATX Power connector (J54)

Figure 23: ATX Power connector with 24 pins

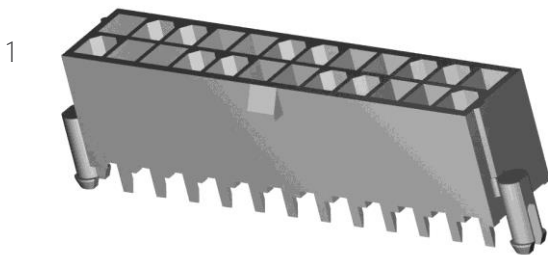


Table 23: ATX Power connector with 24 pins

| Pin | Signal | Cable Colour |
|-----|--------|--------------|
| 1 | 3,3 V | Orange |
| 2 | 3,3 V | Orange |
| 3 | GND | Black |

| Pin | Signal | Cable Colour |
|-----|--------|--------------|
| 4 | 5 V | Red |
| 5 | GND | Black |
| 6 | 5 V | Red |
| 7 | GND | Black |
| 8 | PWR_OK | Grey |
| 9 | 5 VSB | Purple |
| 10 | 12 V | Yellow |
| 11 | 12 V | Yellow |
| 12 | 3,3 V | Orange |
| 13 | 3,3 V | Orange |
| 14 | NC | Blue |
| 15 | GND | Black |
| 16 | PS ON | Green |
| 17 | GND | Black |
| 18 | GND | Black |
| 19 | GND | Black |
| 20 | NC | White |
| 21 | 5 V | Red |
| 22 | 5 V | Red |
| 23 | 5 V | Red |
| 24 | GND | Black |

5.20. ATX Power connector (J53)

Figure 24: ATX Power connector with 8 pins

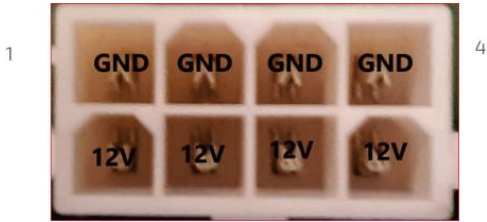


Table 24: ATX Power connector with 8 pins

| Pin | Signal |
|-----|--------|
| 1 | GND |
| 2 | GND |
| 3 | GND |
| 4 | GND |
| 5 | +12 V |
| 6 | +12 V |
| 7 | +12 V |
| 8 | +12 V |

5.21. RTC Socket (J21)

Figure 25: RTC Socket

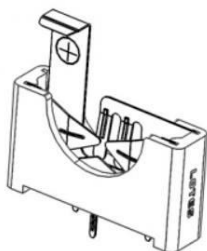


Table 25: RTC Socket

| Pin | Signal Name |
|-----|-------------|
| 1 | V_RTC_BAT |
| 2 | V_RTC_BAT |
| 3 | GND |

5.22. DIP Switch (SW7)

Figure 26: DIP Switch (Default)

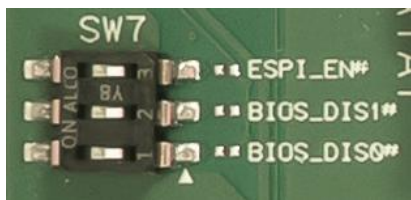


Table 26:Function Table DIP Switch

| ESPI_EN | BIOS_DIS 1# | BIOS_DIS 0# | Boot Bus | BBS | Chipset ESPI CS0# | Chipset SPI CS1# Destinati | Chipset SPI CS0# Destinati | SPI Descript or | Notes |
|---------|----------------|----------------|----------|-----|-------------------------|----------------------------------|----------------------------------|-----------------------|--|
| 1 | 0 | 0 | SPI | 0 | - | Carrier | Module | Module | MAFS on Module LPC bus enabled |
| 1 | 0 | 1 | SPI | 0 | - | Module | Carrier | Carrier | MAFS on Carrier LPC bus enabled |
| 1 | 1 | 0 | - | 0 | - | - | - | - | Not used |
| 1 | 1 | 1 | SPI | 0 | - | Module | Module | Module | MAFS on Module LPC bus enabled (Default) |
| 0 | 0 | 0 | SPI | 0 | - | Module | Module | Module | MAFS on Module ESPI bus enabled |
| 0 | 0 | 1 | SPI | 0 | - | Module | Carrier | Carrier | MAFS on Carrier ESPI bus enabled |
| 0 | 1 | 0 | eSP I | 1 | Module | - | - | Module | SAFS ans BMC on Module ESPI bus enabled |
| 0 | 1 | 1 | eSP I | 1 | Carrier | - | - | Carrier | SAFS ans BMC on Carrier ESPI bus enabled |

5.23. Button Switches

Figure 27: Button Switches



Table 27: LEDs

| Button Switch | Function |
|---------------|--------------------------|
| SW1 | POWER |
| SW2 | SLEEP |
| SW3 | LID (Lid) |
| SW4 | THRM (Thermal) |
| SW5 | R.SHTON (Rapid Shutdown) |
| SW6 | RESET |

NOTICE Rapid shutdown requires disconnecting V_WIDE_S0_MOD and V_5V0_S5_MOD rails externally.

5.24. Jumper

5.24.1. Jumper (J43, J46)

Figure 28: Jumper J43, J46



Table 28: Jumper J43, J46

| Jumper Position (Default) | Function description |
|---------------------------|----------------------|
| J43 (closed) | USB_HOST |
| J46 (closed) | TPM_PP |

NOTICE Module USB client may detect the presence of a USB host on USB0. A high value indicates that a host is present.

NOTICE J46 signal is used to indicate physical presence to the TPM.

5.24.2. Jumper (J27, J28, J29, J30)

Figure 29: Jumper 27 to 30



Table 29: Jumper 27 to 30

| Jumper Position (Default) | Function description |
|---------------------------|----------------------|
| J27 (closed) | SER0_TX |
| J28 (closed) | SER0_RX |
| J29 (closed) | SER1_TX |
| J30 (closed) | SER1_RX |

5.24.3. Connector (J36)

Figure 30: Connector J36



Table 30: Connector J36

| Pin | Signal |
|-----|-----------|
| 1 | LED_PWR_P |
| 2 | LED_PWR_N |

5.24.4. Jumper (V5_MOD, J75, J31, J35, V_WIDE)

Figure 31: Jumper J22-23



Table 31: Jumper J22-23, J24-25, J31, J35, J75

| Jumper Position (Default) | Function description |
|---------------------------|---|
| V_Wide_MOD (both closed) | V_WIDE_S0_IN |
| V5_MOD (closed) | V_WIDE_S0_MOD |
| J75 (closed) | PWR_OK to module |
| J31 (2-3) | 1-2: PS-ON=0=ON => AT-Mode 2-3: PS-ON to ATX power supply (default); DNI (N.C.): OFF |

| Jumper Position (Default) | Function description |
|---------------------------|--|
| J35 (closed) | EN_5V0_S5_CARRIER J35=Closed: ATX S5 enabled (default) J35=DNI: No S5-Voltage (G3) |

NOTICE

J35 - Enable S5 carrier voltage. Open to cut 5V0_S5 from carrier, short for normal operation.

6/ Electrical Specification

6.1. Supply Voltage

- ▶ one ATX Main Power 24pin



Power supply for the module: the ATX_12V P4 connector provides a wide range of input, depending on module specification.

6.2. Power Supply Rise time

- ▶ The input voltages shall rise from $\leq 10\%$ of nominal to within the regulation ranges within 0.1ms to 20ms.
- ▶ There must be a smooth and continuous ramp of each DC input voltage from 10% to 90% of its final set-point following the ATX specification

NOTICE

If any of the supply voltages drops below the allowed operating level longer than the specified hold-up time, all the supply voltages should be shut down and left OFF for a time long enough to allow the internal board voltages to discharge sufficiently.

If the OFF time is not observed, parts of the board or attached peripherals may work incorrectly or even suffer a reduction of MTBF.

The minimum OFF time depends on the implemented PSU model and other electrical factors and needs to be measured individually for each case.

6.3. Supply Voltage Ripple

- ▶ Maximum 100 mV peak to peak 0-20MHz

NOTICE

To protect external power lines of peripheral devices, make sure that the wires have the right diameter to withstand the maximum available current. The enclosure of the peripheral device has to fulfill the fire-protection requirements of IEC/EN62368.

7/ Features

7.1. Rapid Shutdown (SW5)

Kontron has implemented a rapid shutdown function. It works as follows:

1. An active-high shutdown signal is asserted by the COMe Eval Type T7 carrier board through button switch SW5. The characteristics of the shutdown signal are as follows:
 - ▶ Amplitude 5.0V +/- 5%
 - ▶ Source impedance ≤ 50 ohms
 - ▶ Rise time ≤ 1 μ s
 - ▶ Duration ≥ 20 μ s

The assertion of this signal causes all power regulators to be disabled and the internal power supply rails to be discharged by crowbar circuits. The shutdown circuitry provides internal energy storage that maintains crowbar activation for at least 2 ms following the de-assertion of the shutdown signal.

2. Simultaneously with the leading edge of shutdown, the 12 V (main) input power to the module is removed and these input power pins are externally clamped to ground through a crowbar circuit located on the COM Express carrier board. This external clamping circuit must maintain a maximum resistance of approximately 1 ohm and be activated for a minimum of 2 ms.
3. Simultaneously with the leading edge of shutdown, the 5 V (standby) input power to the module is removed, if present. External clamping on these pins is not necessary (but recommended) because it is clamped through the module by the main 12 V rail.

7.2. LEDs and Indicators

Indicators and LEDs indicate only presence of voltage on certain signal, but not necessarily a correct shape and level of the voltage. This is important especially for power supplies – power good signal would provide more accurate indication, but it is not possible to provide this for all signals (for example ATX power signals share one power good).

Table 32: LED Colors

| LED color | Function |
|-----------|---------------------------|
| Green | Power rail |
| Red | Management |
| Yellow | Information/10 G Ethernet |
| | |



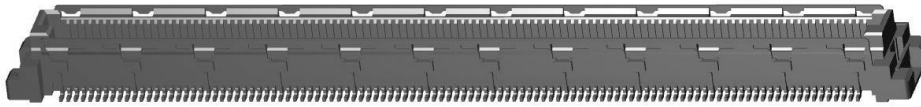
Figure 32: LEDs

Table 33: LEDs

| Reference designator | Indicator | Color A | Color B |
|----------------------|-------------------|-----------------------|----------------------------|
| D20 | ATX 5.0V STBY | [OFF] Rail off | [Green] Rail running |
| D18 | Carrier 5.0V STBY | [OFF] Rail off | [Green] Rail running |
| D17 | Carrier 3.3V STBY | [OFF] Rail off | [Green] Rail running |
| D14 | Carrier 12.0V RUN | [OFF] Rail off | [Green] Rail running |
| D15 | Carrier 5.0V RUN | [OFF] Rail off | [Green] Rail running |
| D19 | Carrier 1.5V RUN | [OFF] Rail off | [Green] Rail running |
| D21 | All RUN PSUs OK | [OFF] Rail off | [Green] Rail running |
| D48 | Carrier 1.8V STBY | [OFF] Rail off | [Green] Rail running |
| D1 | SUS S3# | [OFF] Signal inactive | [Red] Signal active (low) |
| D2 | SUS S4# | [OFF] Signal inactive | [Red] Signal active (low) |
| D3 | SUS S5# | [OFF] Signal inactive | [Red] Signal active (low) |
| D4 | SUS STAT# | [OFF] Signal inactive | [Red] Signal active (low) |
| D51 | THRMTRIP# | [OFF] Signal inactive | [Red] Signal active (low) |
| D5 | WDT | [OFF] Signal inactive | [Red] Signal active (high) |
| D7 | Type 1 | [OFF] Signal inactive | [Red] Module is type 1 |
| D8 | Type 2 | [OFF] Signal inactive | [Red] Module is type 2 |
| D9 | Type 3 | [OFF] Signal inactive | [Red] Module is type 3 |
| D10 | Type 4 | [OFF] Signal inactive | [Red] Module is type 4 |
| D11 | Type 5 | [OFF] Signal inactive | [Red] Module is type 5 |
| D12 | Type 6 | [OFF] Signal inactive | [Red] Module is type 6 |
| D13 | Type 7 | [OFF] Signal inactive | [Red] Module is type 7 |
| D22 | SATA ACT# | [OFF] Signal inactive | [Yellow] SATA Activity |
| D23 | CPLD LED0 | [OFF] Debug inactive | [Yellow] Debug active |
| D24 | CPLD LED1 | [OFF] Debug inactive | [Yellow] Debug active |

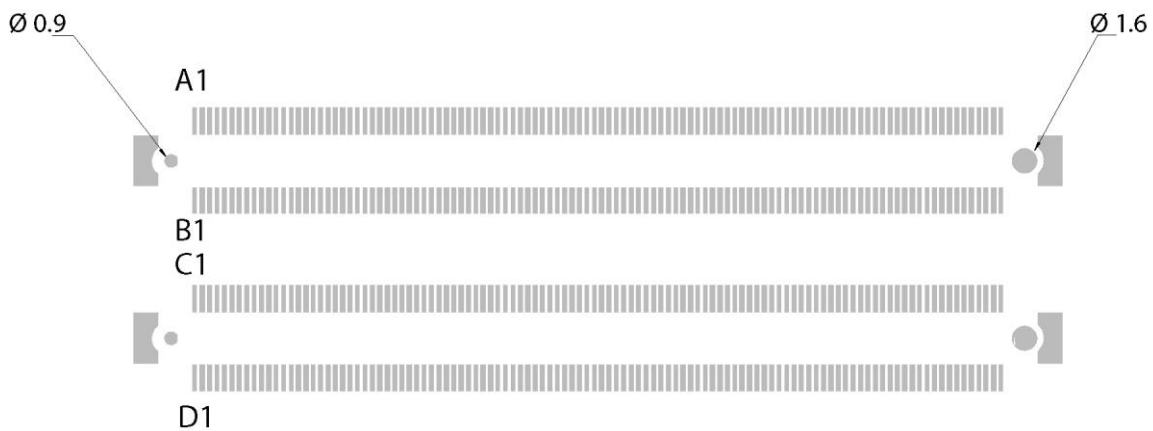
8/ COMe Connector Pin-out List

Figure 33: COMe Connector with 220 pins



This table lists the pins and signals according to the PICMG specification COM.0 Rev 3.0 Type 7 standard.

Figure 34: COMe Connector Pinout



NOTICE To protect external power lines of peripheral devices, make sure that: the wires have the right diameter to withstand the maximum available current the enclosure of the peripheral device fulfills the fire-protection requirements of IEC/EN62368.

Table 34: Pin-out List

| Pin | Signal Name | Pin | Signal Name | Pin | Signal Name | Pin | Signal Name |
|-----|---------------|-----|--------------------------|-----|--------------|-----|--------------|
| A1 | GND | B1 | GND | C1 | GND | D1 | GND |
| A2 | GBE0_MDI3- | B2 | GBE0_ACT# | C2 | GND | D2 | GND |
| A3 | GBE0_MDI3+ | B3 | LPC_FRAME#_ES PI_CS0# | C3 | USB31_SSRX0- | D3 | USB31_SSTX0- |
| A4 | GBE0_LINK100# | B4 | LPC_ADO_ESPI_I O_0 | C4 | USB31_SSRX0+ | D4 | USB31_SSTX0+ |

| Pin | Signal Name | Pin | Signal Name | Pin | Signal Name | Pin | Signal Name |
|-----|--------------------------|-----|----------------------------|-----|---------------------------------------|-----|--|
| A5 | GBEO_LINK1000# | B5 | LPC_AD1_ESPI_I O_1 | C5 | GND | D5 | GND |
| A6 | GBEO_MDI2- | B6 | LPC_AD2_ESPI_I O_2 | C6 | USB31_SSRX1- | D6 | USB31_SSTX1- |
| A7 | GBEO_MDI2+ | B7 | LPC_AD3_ESPI_I O_3 | C7 | USB31_SSRX1+ | D7 | USB31_SSTX1+ |
| A8 | GBEO_LINK# | B8 | LPC_DR00#_ESP I_ALERT0# | C8 | GND | D8 | GND |
| A9 | GBEO_MDI1- | B9 | LPC_DR01#_ESPI _ALERT1# | C9 | USB31_SSRX2- | D9 | USB31_SSTX2- |
| A10 | GBEO_MDI1+ | B10 | LPC_CLK_ESPI_C LK | C10 | USB31_SSRX2+ | D10 | USB31_SSTX2+ |
| A11 | GND | B11 | GND | C11 | GND | D11 | GND |
| A12 | GBEO_MDIO- | B12 | PWRBTN# | C12 | USB31_SSRX3- | D12 | USB31_SSTX3- |
| A13 | GBEO_MDIO+ | B13 | SMB_CLK | C13 | USB31_SSRX3+ | D13 | USB31_SSTX3+ |
| A14 | GBEO_CTREF | B14 | SMB_DAT | C14 | GND | D14 | GND |
| A15 | SUS_S3# | B15 | SMB_ALERT# | C15 | 10G_PHY_MDC _SCL3 | D15 | 10G_PHY_MDIO_ SDA3 |
| A16 | SATAO_TX+ | B16 | SATA1_TX+ | C16 | 10G_PHY_MDC _SCL2 | D16 | 10G_PHY_MDIO_ SDA2 |
| A17 | SATAO_TX- | B17 | SATA1_TX- | C17 | 10G_SDP2 | D17 | 10G_SDP3 |
| A18 | SUS_S4# | B18 | SUS_STAT#_ESP I_RESET# | C18 | GND | D18 | GND |
| A19 | SATAO_RX+ | B19 | SATA1_RX+ | C19 | PCIE_RX6+ | D19 | PCIE_TX6+ |
| A20 | SATAO_RX- | B20 | SATA1_RX- | C20 | PCIE_RX6- | D20 | PCIE_TX6- |
| A21 | GND | B21 | GND | C21 | GND | D21 | GND |
| A22 | PCIE_TX15+ | B22 | PCIE_RX15+ | C22 | PCIE_RX7+ | D22 | PCIE_TX7+ |
| A23 | PCIE_TX15- | B23 | PCIE_RX15- | C23 | PCIE_RX7- | D23 | PCIE_TX7- |
| A24 | SUS_S5# | B24 | PWR_OK | C24 | 10G_INT2 | D24 | 10G_INT3 |
| A25 | PCIE_TX14+ | B25 | PCIE_RX14+ | C25 | GND | D25 | GND |
| A26 | PCIE_TX14- | B26 | PCIE_RX14- | C26 | 10G_KR_RX3+ | D26 | 10G_KR_TX3+ |
| A27 | BATLOW# | B27 | WDT | C27 | 10G_KR_RX3- | D27 | 10G_KR_TX3- |
| A28 | SATA_ACT# | B28 | GND | C28 | GND | D28 | GND |
| A29 | NC | B29 | PCIE_CK_REF1+ | C29 | 10G_KR_RX2+ | D29 | 10G_KR_TX2+ |
| A30 | NC | B30 | PCIE_CK_REF1- | C30 | 10G_KR_RX2- | D30 | 10G_KR_TX2- |
| A31 | GND | B31 | GND | C31 | GND | D31 | GND |
| A32 | IPMB_CLK | B32 | SPKR | C32 | 10G_SFP_SDA3 | D32 | 10G_SFP_SCL3 |
| A33 | IPMB_DAT | B33 | I2C_CLK | C33 | 10G_SFP_SDA2 | D33 | 10G_SFP_SCL2 |
| A34 | BIOS_DIS0#_ESPI _SAFS | B34 | I2C_DAT | C34 | 10G_PHY_RST_ 23 | D34 | 10G_PHY_SEL_23 |
| A35 | THRMTRIP# | B35 | THRM# | C35 | 10G_PHY_RST_ 01 / R3.1 CEI_RST# | D35 | 10G_PHY_SEL_01 / R3.1: CEI_PRSENT# |
| A36 | PCIE_TX13+ | B36 | PCIE_RX13+ | C36 | 10G_LED_SDA | D36 | NC |
| A37 | PCIE_TX13- | B37 | PCIE_RX13- | C37 | 10G_LED_SCL | D37 | NC |
| A38 | GND | B38 | GND | C38 | 10G_SFP_SDA1 | D38 | 10G_SFP_SCL1 |
| A39 | PCIE_TX12+ | B39 | PCIE_RX12+ | C39 | 10G_SFP_SDA0 / R3.1: CEI_SDA | D39 | 10G_SFP_SCL0 / R3.1: CEI_SCL |

| Pin | Signal Name | Pin | Signal Name | Pin | Signal Name | Pin | Signal Name |
|-----|-----------------------|-----|----------------|-----|----------------------------------|-----|------------------------------------|
| A40 | PCIE_TX12- | B40 | PCIE_RX12- | C40 | 10G_SDP0 | D40 | 10G_SDP1 |
| A41 | GND | B41 | GND | C41 | GND | D41 | GND |
| A42 | USB20_D2- | B42 | USB20_D3- | C42 | 10G_KR_RX1+ | D42 | 10G_KR_TX1+ |
| A43 | USB20_D2+ | B43 | USB20_D3+ | C43 | 10G_KR_RX1- | D43 | 10G_KR_TX1- |
| A44 | USB_2_3_OC# | B44 | USB_0_1_OC# | C44 | GND | D44 | GND |
| A45 | USB20_D0- | B45 | USB20_D1- | C45 | 10G_PHY_MDC_SCL1 | D45 | 10G_PHY_MDIO_SDA1 |
| A46 | USB20_D0+ | B46 | USB20_D1+ | C46 | 10G_PHY_MDC_SCLO / R3.1: CEI_MDC | D46 | 10G_PHY_MDIO_SDA0 / R3.1: CEI_MDIO |
| A47 | V_3V0_RTC | B47 | ESPI_EN# | C47 | 10G_INT0 / R3.1: CEI_INT# | D47 | 10G_INT1 / R3.1: ETH_PHY_INT# |
| A48 | NC | B48 | USB_HOST_PRSNT | C48 | GND | D48 | GND |
| A49 | GBE0_SDP | B49 | SYS_RESET# | C49 | 10G_KR_RX0+ | D49 | 10G_KR_TX0+ |
| A50 | LPC_SERIRQ_ESP_I_CS1# | B50 | CB_RESET# | C50 | 10G_KR_RX0- | D50 | 10G_KR_TX0- |
| A51 | GND | B51 | GND | C51 | GND | D51 | GND |
| A52 | PCIE_TX5+ | B52 | PCIE_RX5+ | C52 | PCIE_RX16+ | D52 | PCIE_TX16+ |
| A53 | PCIE_TX5- | B53 | PCIE_RX5- | C53 | PCIE_RX16- | D53 | PCIE_TX16- |
| A54 | GPIO_GPIO | B54 | GPIO_GPO1 | C54 | TYPE0# | D54 | GND |
| A55 | PCIE_TX4+ | B55 | PCIE_RX4+ | C55 | PCIE_RX17+ | D55 | PCIE_TX17+ |
| A56 | PCIE_TX4- | B56 | PCIE_RX4- | C56 | PCIE_RX17- | D56 | PCIE_TX17- |
| A57 | GND | B57 | GPIO_GPO2 | C57 | TYPE1# | D57 | TYPE2# |
| A58 | PCIE_TX3+ | B58 | PCIE_RX3+ | C58 | PCIE_RX18+ | D58 | PCIE_TX18+ |
| A59 | PCIE_TX3- | B59 | PCIE_RX3- | C59 | PCIE_RX18- | D59 | PCIE_TX18- |
| A60 | GND | B60 | GND | C60 | GND | D60 | GND |
| A61 | PCIE_TX2+ | B61 | PCIE_RX2+ | C61 | PCIE_RX19+ | D61 | PCIE_TX19+ |
| A62 | PCIE_TX2- | B62 | PCIE_RX2- | C62 | PCIE_RX19- | D62 | PCIE_TX19- |
| A63 | GPIO_GPI1 | B63 | GPIO_GPO3 | C63 | GND | D63 | GND |
| A64 | PCIE_TX1+ | B64 | PCIE_RX1+ | C64 | GND | D64 | GND |
| A65 | PCIE_TX1- | B65 | PCIE_RX1- | C65 | PCIE_RX20+ | D65 | PCIE_TX20+ |
| A66 | GND | B66 | WAKE0# | C66 | PCIE_RX20- | D66 | PCIE_TX20- |
| A67 | GPIO_GPI2 | B67 | WAKE1# | C67 | RAPID_SHTDN_5V0 | D67 | GND |
| A68 | PCIE_TX0+ | B68 | PCIE_RX0+ | C68 | PCIE_RX21+ | D68 | PCIE_TX21+ |
| A69 | PCIE_TX0- | B69 | PCIE_RX0- | C69 | PCIE_RX21- | D69 | PCIE_TX21- |
| A70 | GND | B70 | GND | C70 | GND | D70 | GND |
| A71 | PCIE_TX8+ | B71 | PCIE_RX8+ | C71 | PCIE_RX22+ | D71 | PCIE_TX22+ |
| A72 | PCIE_TX8- | B72 | PCIE_RX8- | C72 | PCIE_RX22- | D72 | PCIE_TX22- |
| A73 | GND | B73 | GND | C73 | GND | D73 | GND |
| A74 | PCIE_TX9+ | B74 | PCIE_RX9+ | C74 | PCIE_RX23+ | D74 | PCIE_TX23+ |
| A75 | PCIE_TX9- | B75 | PCIE_RX9- | C75 | PCIE_RX23- | D75 | PCIE_TX23- |
| A76 | GND | B76 | GND | C76 | GND | D76 | GND |
| A77 | PCIE_TX10+ | B77 | PCIE_RX10+ | C77 | GND | D77 | GND |
| A78 | PCIE_TX10- | B78 | PCIE_RX10- | C78 | PCIE_RX24+ | D78 | PCIE_TX24+ |
| A79 | GND | B79 | GND | C79 | PCIE_RX24- | D79 | PCIE_TX24- |

| Pin | Signal Name | Pin | Signal Name | Pin | Signal Name | Pin | Signal Name |
|------|-------------------------|------|-------------------|------|-------------------|------|-------------------|
| A80 | GND | B80 | GND | C80 | GND | D80 | GND |
| A81 | PCIE_TX11+ | B81 | PCIE_RX11+ | C81 | PCIE_RX25+ | D81 | PCIE_TX25+ |
| A82 | PCIE_TX11- | B82 | PCIE_RX11- | C82 | PCIE_RX25- | D82 | PCIE_TX25- |
| A83 | GND | B83 | GND | C83 | GND | D83 | GND |
| A84 | NCSI_TX_EN | B84 | V_5V0_S5_MOD | C84 | GND | D84 | GND |
| A85 | GPIO_GPI3 | B85 | V_5V0_S5_MOD | C85 | PCIE_RX26+ | D85 | PCIE_TX26+ |
| A86 | NC | B86 | V_5V0_S5_MOD | C86 | PCIE_RX26- | D86 | PCIE_TX26- |
| A87 | GND | B87 | V_5V0_S5_MOD | C87 | GND | D87 | GND |
| A88 | CLK_100M_PE_R EFCLK+ | B88 | BIOS_DIS1# | C88 | PCIE_RX27+ | D88 | PCIE_TX27+ |
| A89 | CLK_100M_PE_R EFCLK- | B89 | NCSI_RX_ERR | C89 | PCIE_RX27- | D89 | PCIE_TX27- |
| A90 | GND | B90 | GND | C90 | GND | D90 | GND |
| A91 | V_SPI_POWER | B91 | NCSI_CLK_IN | C91 | PCIE_RX28+ | D91 | PCIE_TX28+ |
| A92 | SPI_MISO | B92 | NCSI_RXD1 | C92 | PCIE_RX28- | D92 | PCIE_TX28- |
| A93 | GPIO_GPO0 | B93 | NCSI_RXD0 | C93 | GND | D93 | GND |
| A94 | SPI_CLK | B94 | NCSI_CRD_V | C94 | PCIE_RX29+ | D94 | PCIE_TX29+ |
| A95 | SPI_MOSI | B95 | NCSI_TXD1 | C95 | PCIE_RX29- | D95 | PCIE_TX29- |
| A96 | TPM_PP | B96 | NCSI_TXD0 | C96 | GND | D96 | GND |
| A97 | TYPE10# | B97 | SPI_CS# | C97 | GND | D97 | GND |
| A98 | SERO_TX | B98 | NCSI_ARB_IN | C98 | PCIE_RX30+ | D98 | PCIE_TX30+ |
| A99 | SERO_RX | B99 | NCSI_ARB_OUT | C99 | PCIE_RX30- | D99 | PCIE_TX30- |
| A100 | GND | B100 | GND | C100 | GND | D100 | GND |
| A101 | SER1_TX | B101 | FAN_PWMOUT | C101 | PCIE_RX31+ | D101 | PCIE_TX31+ |
| A102 | SER1_RX | B102 | FAN_TACHIN | C102 | PCIE_RX31- | D102 | PCIE_TX31- |
| A103 | LID# | B103 | SLEEP# | C103 | GND | D103 | GND |
| A104 | V_WIDE_S0_M OD | B104 | V_WIDE_S0_M OD | C104 | V_WIDE_S0_M OD | D104 | V_WIDE_S0_M OD |
| A105 | V_WIDE_S0_M OD | B105 | V_WIDE_S0_M OD | C105 | V_WIDE_S0_M OD | D105 | V_WIDE_S0_M OD |
| A106 | V_WIDE_S0_M OD | B106 | V_WIDE_S0_M OD | C106 | V_WIDE_S0_M OD | D106 | V_WIDE_S0_M OD |
| A107 | V_WIDE_S0_M OD | B107 | V_WIDE_S0_M OD | C107 | V_WIDE_S0_M OD | D107 | V_WIDE_S0_M OD |
| A108 | V_WIDE_S0_M OD | B108 | V_WIDE_S0_M OD | C108 | V_WIDE_S0_M OD | D108 | V_WIDE_S0_M OD |
| A109 | V_WIDE_S0_M OD | B109 | V_WIDE_S0_M OD | C109 | V_WIDE_S0_M OD | D109 | V_WIDE_S0_M OD |
| A110 | GND | B110 | GND | C110 | GND | D110 | |
| MTG1 | GND | | | MTG3 | GND | | |
| MTG2 | GND | | | MTG4 | GND | | |

9/ Variants

Table 35: Variants

| Product Number | Carrier | Description |
|-----------------------|---|--|
| 68301-0000-00-8 | COMe Eval Carrier T7 G2 R3.0 8mm stack-up | COM Express® Eval Carrier Type 7 Gen2 8mm stack-up according to COM.0 R3.0 |
| 68301-0001-00-8 | COMe Eval Carrier T7 G2 R3.1 8mm stack-up | COM Express® Eval Carrier Type 7 Gen2 8mm stack-up according to COM.0 R3.1 |
| Available on request: | | |
| 68301-0000-00-5 | COMe Eval Carrier T7 G2 R3.0 5mm stack-up | COM Express® Eval Carrier Type 7 Gen2 5mm stack-up according to COM.0 R3.0 |
| 68301-0001-00-5 | COMe Eval Carrier T7 G2 R3.1 5mm stack-up | COM Express® Eval Carrier Type 7 Gen2 5mm stack-up according to COM.0 R3.1 |

10/ Adapter Cards

Table 36: Adapter Cards

| Product Number | Adapter Card | Description |
|-----------------|--|---|
| 68301-0000-04-4 | Adapter Card ADA-COMe-T7-G2 4x 10G DAC – DEV-TOOL (A2DC) | Direct connection 10G SFP adapter card for COMe T7 Evaluation Carrier A2T7 |
| 68301-0000-01-4 | Adapter Card ADA-COMe-T7-G2 4x 10G RJ45 – DEV-TOOL (A2X5) | 4x 10GBase-T adapter card COMe T7 Evaluation Carrier A2T7 with 2x Intel PHY X557-AT2 according to PICMG COM-0 R3.0 |
| 68301-0000-03-2 | Adapter Card ADA-COMe-T7-G2 2x 10G SFP+ – DEV-TOOL (A2IN) | 2x 10G SFP+ adapter card for COMe T7 Evaluation Carrier A2T7 with Inphi PHY CS4227 according to PICMG COM-0 R3.0 |
| 68301-0000-03-4 | ADA-COMe-T7-G2 4x 10G SFP+ – DEV-TOOL (A2IN) | 4x 10G SFP+ adapter card for COMe T7 Evaluation Carrier A2T7 with Inphi PHY CS4223 according to PICMG COM-0 R3.0 |
| 68301-0000-05-4 | ADA-COMe-T7-G2 4x10G SFP+ – C827 – DEV-TOOL (A2C8) | 4x 10G SFP+ adapter card for COMe T7 Evaluation Carrier A2T7 with CEI Interface, PHY Intel C827-IM1 according to PICMG COM-0 R3.1 |

CAUTION

The adapter cards are custom built evaluation kits destined for professionals to be used solely at research and development facilities for such purposes

10.1. Adapter Card: ADA-COMe-T7-G2 4X10G DAC - DEV-TOOL (A2DC)

Figure 35: Top View Adapter Card A2DC

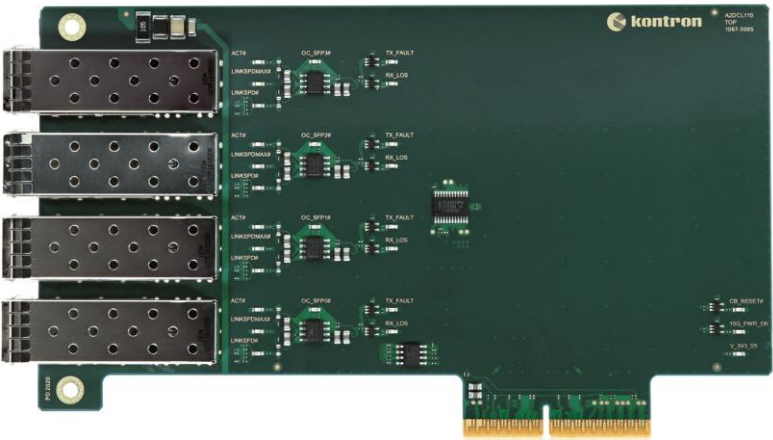


Figure 36: IOs



10.2. Adapter Card ADA-COMe-T7-G2 4x 10G RJ45 - DEV-TOOL (A2X5)

Figure 37: Top View Adapter Card A2X5

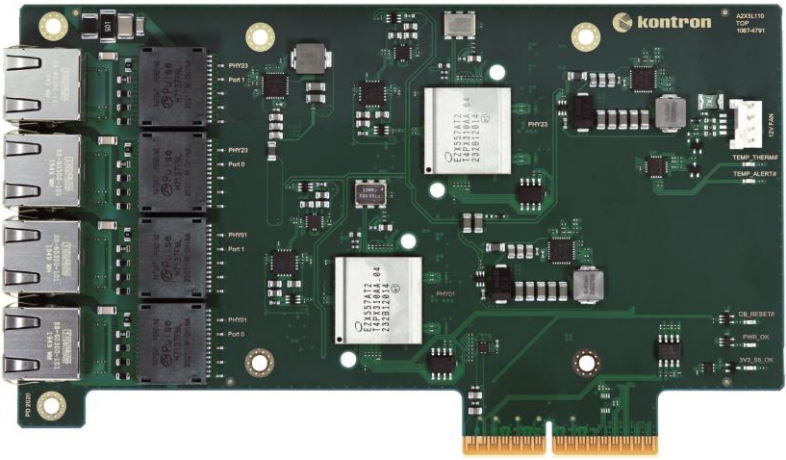


Figure 38: IOs



10.3. Adapter Cards: ADA-COMe-T7-G2 2x 10G SFP+ - DEV-TOOL (A2IN) / ADA-COMe-T7-G2 4x 10G SFP+ - DEV-TOOL (A2IN)

Figure 39: Top View Adapter Card A2IN

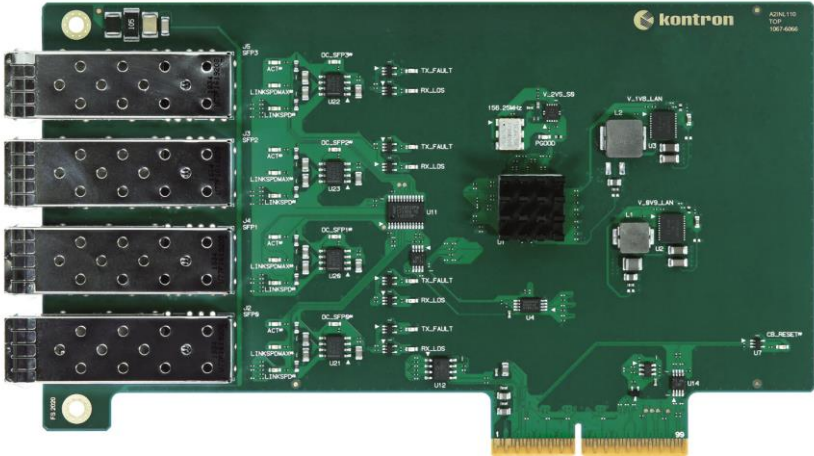


Figure 40: IOs



10.4. Adapter Card: ADA-COMe-T7-G2 4x 10G SFP+ C827 - DEV-TOOL (A2C8)

Figure 41: Top View Adapter Card A2C8



Figure 42: IOs



For more information such as block diagram and schematics see [Kontron's Customer Section](#).

11/ Compatibility Eval-Carrier – Adapter Cards

| COMe Type7 Eval Carrier Gen1 | Description | PHY | Connectivity | COM.O Rev | For |
|------------------------------|----------------------|--------|--------------|-----------|-------------------------------------|
| 68300-0000-00-0 | COMe Eval Carrier T7 | no PHY | 10G-KR - DAC | 3.0 | all COMe Type 7 Modules |
| | | | 10G-SFI | 3.0 | COMe-bDV7 COMe-bID7 COMe-bEP7 |

| COMe Type7 Eval Carrier Gen2 | Description | PHY | Connectivity | COM.O Rev | For |
|---|--|-------------------|----------------|--------------|-------------------------------------|
| 68301-0000-00-5 (av. on request) | COMe Eval Carrier2 T7-G2 5mm stackup PCIe Gen3 only | n/a | | 3.0 | all COMe Type 7 Modules |
| 68301-0000-00-8 | COMe Eval Carrier2 T7-G2 8mm stackup PCIe Gen3 only | n/a | | 3.0 | all COMe Type 7 Modules |
| 68301-0001-00-5 (av. on request) | COMe Eval Carrier2 T7-G2 5mm stackup | n/a | | 3.1 | COMe-bID7 |
| 68301-0001-00-8 | COMe Eval Carrier2 T7-G2 8mm stackup | n/a | | 3.1 | COMe-bID7 |
| Adapter Cards for Type7 Eval Carrier Gen2 | Description | PHY | Connectivity | COM.O Rev | For |
| 68301-0000-04-4 | ADA-COMe-T7-G2 4X 10G DAC - DEV-TOOL | no PHY | 10G-KR – DAC | n/a | all COMe Type 7 Modules |
| | | | 10G-SFI native | 3.0 – Legacy | COMe-bDV7 COMe-bID7 COMe-bEP7 |
| 68301-0000-01-4 | ADA-COMe-T7-G2 4x 10G RJ45 - DEV-TOOL | 2x Intel X557-AT2 | 10G-BASE-T | 3.0 - Legacy | COMe-bDV7 COMe-bBD7 COMe-bID7 |
| 68301-0000-03-2 | ADA-COMe-T7-G2 2x 10G SFP+ - DEV-TOOL | 1x Inphi CS4227 | 10G-SFI | 3.0 - Legacy | COMe-bBD7 |
| 68301-0000-03-4 | ADA-COMe-T7-G2 4x 10G SFP+ - DEV-TOOL | 1x Inphi CS4223 | 10G-SFI | 3.0 - Legacy | COMe-bDV7 |
| 68301-0000-05-4 | ADA-COMe-T7-G2 4x 10G SFP+ - C827-IM1 – DEV-TOOL | 1x Intel C827-IM1 | 10G-SFI | 3.1 - CEI | COMe-bID7 |

12/ Technical Support

For technical support contact our Support department:

E-mail: support@kontron.com

Phone: +49-821-4086-888

Make sure you have the following information available when you call:

Product ID Number (PN),

Serial Number (SN)



The serial **number can be found on the Type Label, located on the product's rear side.**

Be ready to explain the nature of your problem to the service technician.

12.1. Warranty

Due to their limited service life, parts that by their nature are subject to a particularly high degree of wear (wearing parts) are excluded from the warranty beyond that provided by law. This applies to the CMOS battery, for example.



If there is a protection label on your product, then the warranty is lost if the product is opened.

12.2. Returning Defective Merchandise

All equipment returned to Kontron must have a Return of Material Authorization (RMA) number assigned exclusively by Kontron. Kontron cannot be held responsible for any loss or damage caused to the equipment received without an RMA number. The buyer accepts responsibility for all freight charges for the return of goods to Kontron's designated facility. Kontron will pay the return freight charges back to the buyer's location in the event that the equipment is repaired or replaced within the stipulated warranty period. Follow these steps before returning any product to Kontron.

1. Visit the RMA Information website:
<https://www.kontron.com/en/support/rma-information>

Download the RMA Request sheet for Kontron Europe GmbH and fill out the form. Take care to include a short detailed description of the observed problem or failure and to include the product identification Information (Name of product, Product number and Serial number). If a delivery includes more than one product, fill out the above information in the RMA Request form for each product.

2. Send the completed RMA-Request form to the fax or email address given below at Kontron Europe GmbH. Kontron will provide an RMA-Number.

Kontron Europe GmbH
RMA Support
Phone: +49 (0) 821 4086-0
Fax: +49 (0) 821 4086 111
Email: service@kontron.com

3. The goods for repair must be packed properly for shipping, considering shock and ESD protection.



Goods returned to Kontron Europe GmbH in non-proper packaging will be considered as customer caused faults and cannot be accepted as warranty repairs.

4. Include the RMA-Number with the shipping paperwork and send the product to the delivery address provided in the RMA form or received from Kontron RMA Support.

List of Acronyms

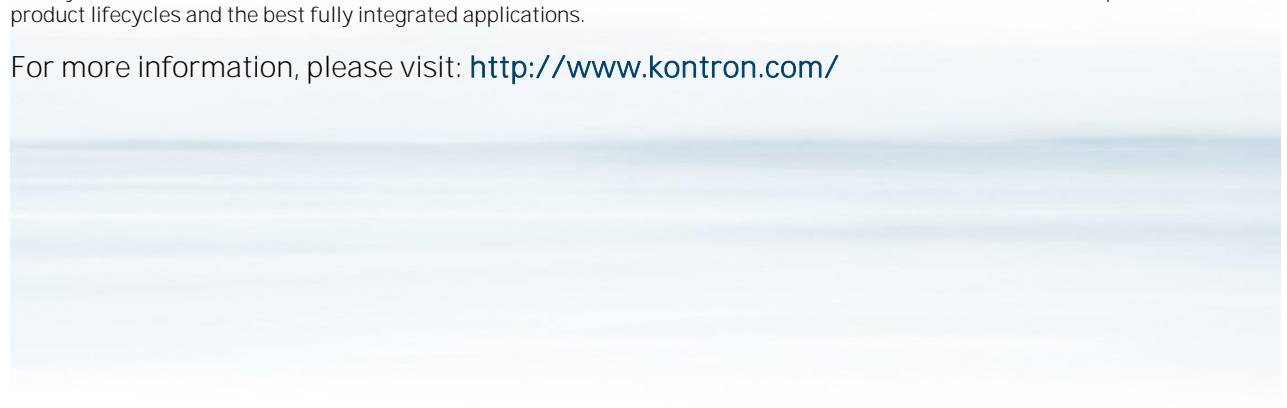
| | |
|--------|--|
| ACPI | Advanced Configuration & Power Interface |
| COMe | COM Express® - Computer on Module Express |
| EMC | ElectroMagnetic Compatibility |
| IPMB | Intelligent Platform Management Bus |
| ME | Management Engine |
| NC-SI | Network controller sideband interface |
| PCIe | PCI-Express |
| PICMG | PCI Industrial Computer Manufacturers Group |
| POR | Power-On Reset |
| PSU | Power Supply Unit |
| RTC | Real Time Clock |
| S0 | ACPI OS System State 0. Indicates fully on operating state. |
| S3 | ACPI OS System State 3. Indicates Suspend to RAM. |
| S5 | ACPI OS System State 5. Indicates Soft Off operating state. |
| SIO | Super I/O |
| SSD | Solid-State Drive |
| SMB | System Management Bus. |
| SMBIOS | System Management BIOS |
| SMI | System Management Interrupt |
| SPD | Serial Presence Detect: A standardized way to automatically access information about a computer memory module. |
| WEEE | Waste Electrical and Electronic Equipment |



About Kontron

Kontron is a global leader in IoT/Embedded Computing Technology (ECT) offering individual solutions in the areas of Internet of Things (IoT) and Industry 4.0 through a combined portfolio of hardware, software and services. With its standard and customized products based on highly reliable state-of-the-art technologies, Kontron provides secure and innovative applications for a wide variety of industries. As a result, customers benefit from accelerated time-to-market, lower total cost of ownership, extended product lifecycles and the best fully integrated applications.

For more information, please visit: <http://www.kontron.com/>



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