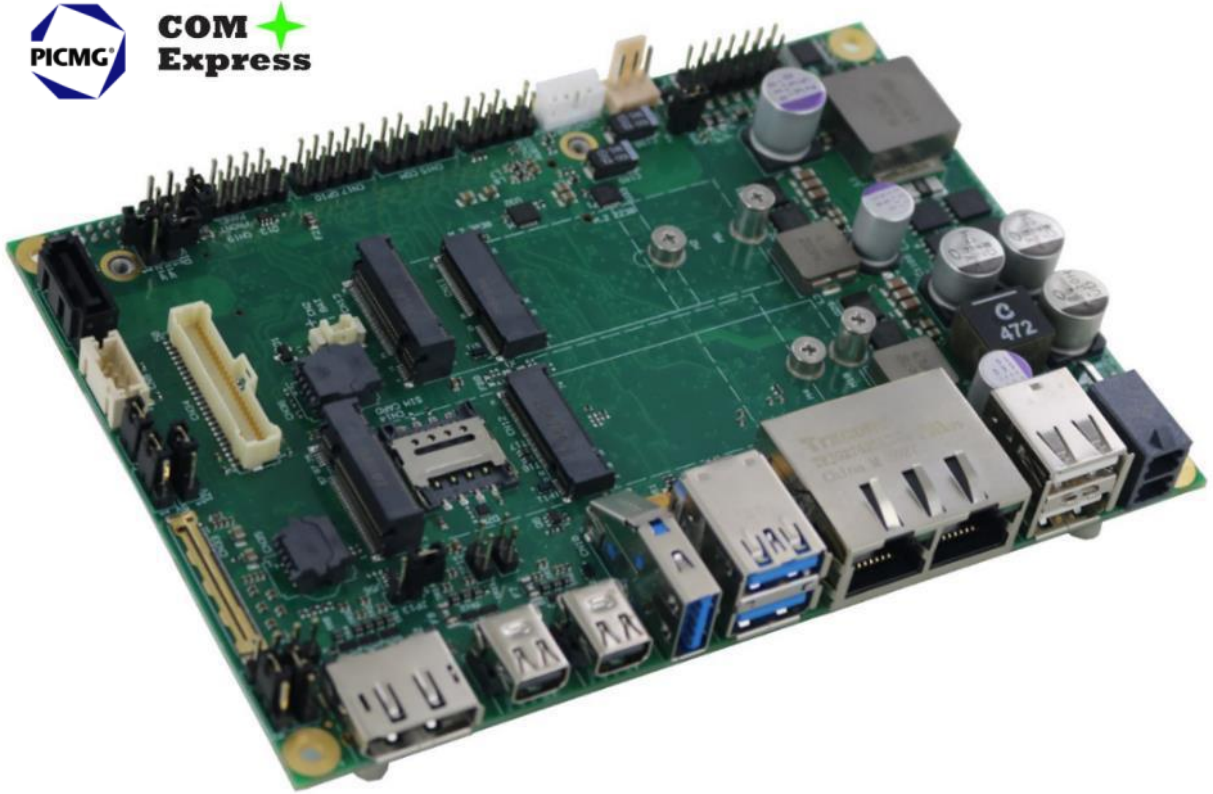
Com express

User Manual



CCOMe-C30

Carrier Board for COM-Express™ Type 6 Module
on 3.5” form factor

www.seco.com

REVISION HISTORY

Revision	Date	Note	Rif
1.0	18 June 2019	First release	SB
1.1	19 August 2019	Electrical specifications updated (par. 2.3) Audio Section updated (par. 3.3.17)	SB
1.2	19 March 2020	Electrical specifications updated (par. 2.3) Block Diagram updated	SB
1.3	15 June 2021	Updated Audio Section description (par. 3.3.17) Updated LVDS Connector CN34 (par. 3.3.12) Removed LCD and backlight control Connector CN25 Added USB_6_7_OC# on COM Express™ Connector Added CABKITC30 accessory (par. 4.2.4) Updated power input voltage range (par. 2.2) Updated Block Diagram Updated pictures to latest board revision	AR
1.4	31 August 2021	Removed support on M.2 SSD slot CN13 for 2242 modules size Added safety policy paragraph (1.7) Updated Block Diagram	AR

Every effort has been made to ensure the accuracy of this manual. However, SECO S.p.A. accepts no responsibility for any inaccuracies, errors or omissions herein. SECO S.p.A. reserves the right to change precise specifications without prior notice to supply the best product possible.

For further information on this module or other SECO products, but also to get the required assistance for any and possible issues, please contact us using the dedicated web form available at https://www.seco.com/ (registration required).

Our team is ready to assist you.

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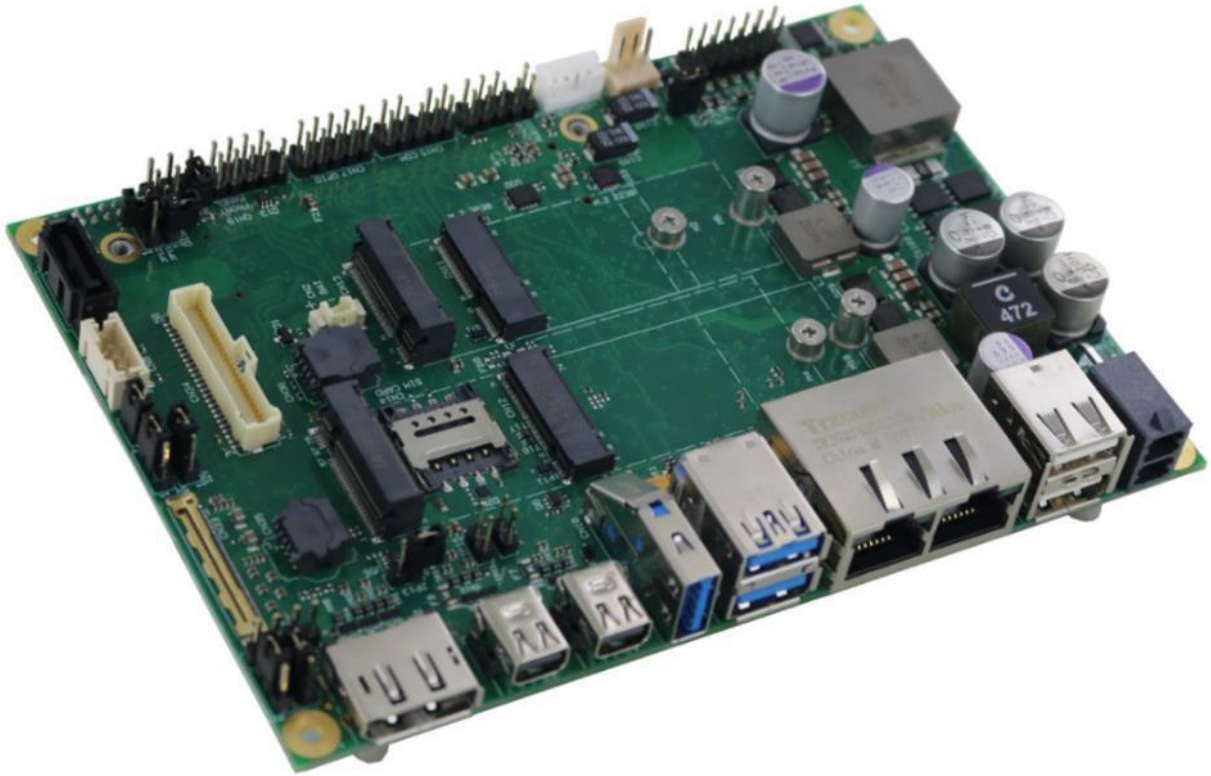
Chapter 1.
INTRODUCTION

- Warranty
- Information and assistance
- RMA number request
- Safety
- Electrostatic Discharges
- RoHS compliance
- Safety Policy
- Terminology and definitions
- Reference specifications



1.1 Warranty

This product is subject to the Italian Law Decree 24/2002, acting European Directive 1999/44/CE on matters of sale and warranties to consumers.

The warranty on this product lasts 1 year.

Under the warranty period, the Supplier guarantees the buyer assistance and service for repairing, replacing or credit of the item, at the Supplier's own discretion.

Shipping costs that apply to non-conforming items or items that need replacement are to be paid by the customer.

Items cannot be returned unless previously authorised by the supplier.

The authorisation is released after completing the specific form available on the web-site https://www.seco.com/eu/support/online-rma.html (Online RMA). The RMA Authorisation number must be put both on the packaging and on the documents shipped with the items, which must include all the accessories in their original packaging, with no signs of damage to, or tampering with, any returned item.

The error analysis form identifying the fault type must be completed by the customer and must accompany the returned item.

If any of the above mentioned requirements for RMA is not satisfied, the item will be shipped back and the customer will have to pay any and all shipping costs.

Following after a technical analysis, the supplier will verify if all the requirements for which a warranty service applies are met. If the warranty cannot be applied, the Supplier will calculate the minimum cost of this initial analysis on the item and the repair costs. Costs for replaced components will be calculated separately.

Warning!
All changes or modifications to the equipment not explicitly approved by SECO S.p.A. could impair the equipment's functionality and could void the warranty.

1.2 Information and assistance

What do I have to do if the product is faulty?

SECO S.p.A. offers the following services:

- SECO website: visit https://www.seco.com to receive the latest information on the product. In most cases it is possible to find useful information to solve the problem.
- SECO Sales Representative: the Sales Rep can help to determine the exact cause of the problem and search for the best solution.
- SECO Help-Desk: contact SECO Technical Assistance. A technician is at disposal to understand the exact origin of the problem and suggest the correct solution.

  E-mail: technical.service@seco.com

  Fax (+39) 0575 340434
- Repair centre: it is possible to send the faulty product to the SECO Repair Centre. In this case, follow this procedure:
  - Returned items must be accompanied by a RMA Number. Items sent without the RMA number will be not accepted.
  - Returned items must be shipped in an appropriate package. SECO is not responsible for damages caused by accidental drop, improper usage, or customer neglect.

Note: Please have the following information before asking for technical assistance:

- Name and serial number of the product;
- Description of Customer's peripheral connections;
- Description of Customer's software (operating system, version, application software, etc.);
- A complete description of the problem;
- The exact words of every kind of error message encountered.

1.3 RMA number request

To request a RMA number, please visit SECO's web-site. On the home page, please select "RMA Online" and follow the procedure described.

A RMA Number will be released within 1 working day (only for on-line RMA requests).

1.4 Safety

The CCOMe-C30 board uses only extremely-low voltages.

While handling the board, please use extreme caution to avoid any kind of risk or damages to electronic components.

Always switch the power off, and unplug the power supply unit, before handling the board and/or connecting cables or other boards.

Avoid using metallic components - like paper clips, screws and similar - near the board when connected to a power supply, to avoid short circuits due to unwanted contacts with other board components.

If the board has become wet, never connect it to any external power supply unit or battery.

Check carefully that all cables are correctly connected and that they are not damaged.

1.5 Electrostatic Discharges

The CCOMe-C30 board, like any other electronic product, is an electrostatic sensitive device: high voltages caused by static electricity could damage some or all the devices and/or components on-board.

Whenever handling a CCOMe-C30 board, ground yourself through an anti-static wrist strap. Placement of the board on an anti-static surface is also highly recommended.

1.6 RoHS compliance

The CCOMe-C30 board is designed using RoHS compliant components and is manufactured on a lead-free production line. It is therefore fully RoHS compliant.

1.7 Safety Policy

In order to meet the safety requirements of EN62368-1:2014 standard for Audio/Video, information and communication technology equipment, the CCOMe-C30 Carrier Board shall be:

- used inside a fire enclosure made of non-combustible material or V-1 material (the fire enclosure is not necessary if the maximum power supplied to the board never exceeds 100 W, even in worst-case fault);
- used inside an enclosure provided with the symbol IEC 60417-5041(element 1a according to clause 9.5.2 of the IEC 62368-1) on the external part;
- installed inside an enclosure compliant with all applicable IEC 62368-1 requirements;

The manufacturer which includes a CCOMe-C30 Carrier Board in his end-user product shall:

- verify the compliance with B.2 and B.3 clauses of the EN62368-1 standard when the module works in its own final operating condition
- prescribe temperature and humidity range for operating, transport and storage conditions;
- prescribe to perform maintenance on the board only when it is off and has already cooled down;
- prescribe that the connections from or to the board have to be compliant to ES1 requirements;
- the board in its enclosure must be evaluated for temperature and airflow considerations.

1.8 Terminology and definitions

ACPI	Advanced Configuration and Power Interface, an open industrial standard for the board's devices configuration and power management
CEC	Consumer Electronics Control, an HDMI feature which allows controlling more devices connected together by using only one remote control
DDC	Display Data Channel, a kind of I2C interface for digital communication between displays and graphics processing units (GPU)
DP	Display Port, a type of digital video display interface
DVI	Digital Visual interface, a type of digital video display interface
eDP	embedded Display Port, a type of digital video display interface developed especially for internal connections between boards and digital displays
GbE	Gigabit Ethernet
Gbps	Gigabits per second
GND	Ground
GPI/O	General purpose Input/Output
HD Audio	High Definition Audio, most recent standard for hardware codecs developed by Intel® in 2004 for higher audio quality
HDMI	High Definition Multimedia Interface, a digital audio and video interface
I2C Bus	Inter-Integrated Circuit Bus, a simple serial bus consisting only of data and clock line, with multi-master capability
LPC Bus	Low Pin Count Bus, a low speed interface based on a very restricted number of signals, deemed to management of legacy peripherals
LVDS	Low Voltage Differential Signalling, a standard for transferring data at very high speed using inexpensive twisted pair copper cables, usually used for video applications
Mbps	Megabits per second
N.A.	Not Applicable
N.C.	Not Connected
OS	Operating System
PCI-e	Peripheral Component Interface Express
PWM	Pulse Width Modulation
PWR	Power
SATA	Serial Advance Technology Attachment, a differential half duplex serial interface for Hard Disks
SD	Secure Digital, a memory card type
SDIO	Secure Digital Input/Output, an evolution of the SD standard that allows use the use of the same SD interface to drive different Input/Output devices, like cameras, GPS, Tuners and so on
SIM	Subscriber Identity Module, a card which stores all data of the owner necessary to allow him accessing to mobile communication networks

SM Bus	System Management Bus, a subset of the I2C bus protocol dedicated to communication with devices for system management, like a smart battery and other power supply-related devices
SPI	Serial Peripheral Interface, a 4-Wire synchronous full-duplex serial interface which is composed of a master and one or more slaves, individually enabled through a Chip Select line
TBM	To be measured
TMDS	Transition-Minimized Differential Signalling, a method for transmitting high speed serial data, normally used on DVI and HDMI interfaces
TTL	Transistor-transistor Logic
UIM	User Identity Module, an extension of SIM modules.
USB	Universal Serial Bus
V_REF	Voltage reference Pin

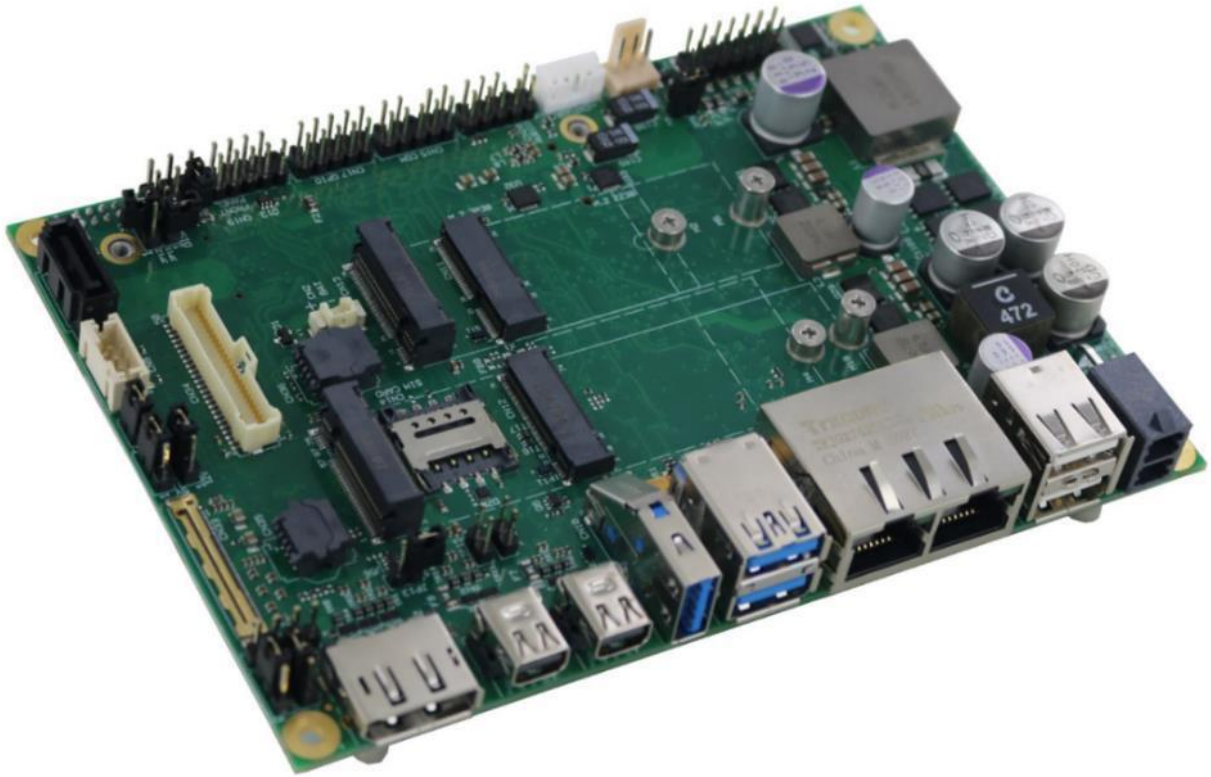
1.9 Reference specifications

Here below it is a list of applicable industry specifications and reference documents.

Reference	Link
ACPI	http://www.acpi.info
Com Express	https://www.picmg.org/openstandards/com-express/
Com Express Carrier Design Guide	https://www.picmg.org/wp-content/uploads/PICMG_COMDG_2.0-RELEASED-2013-12-061.pdf
DDC	https://www.vesa.org/
DP, eDP	https://www.vesa.org/
Ethernet	http://standards.ieee.org/about/get/802/802.3.html
HD Audio	http://www.intel.com/content/dam/www/public/us/en/documents/product-specifications/high-definition-audio-specification.pdf
HDMI	http://www.hdmi.org/index.aspx
I2C	http://www.nxp.com/docs/en/user-guide/UM10204.pdf
Intel® Front Panel I/O connectivity DG	http://www.formfactors.org/developer/specs/A2928604-005.pdf
LPC Bus	http://www.intel.com/design/chipsets/industry/lpc.htm
LVDS	http://www.ti.com/lit/ug/snla187/snla187.pdf
PCI Express	http://www.pcisig.com/specifications/pciexpress
PCI Express M.2	https://members.pcisig.com/wg/PCI-SIG/document/download/10029
SATA	https://www.sata-io.org
SD Card Association	https://www.sdcard.org
SM Bus	http://www.smbus.org/specs
TMDS	http://www.latticesemi.com/view_document?document_id=38351
USB 2.0 and USB OTG	http://www.usb.org/developers/docs/usb20_docs/usb_20_080117.zip
USB 3.0	http://www.usb.org/developers/docs/usb_31_080117.zip

Chapter 2.
OVERVIEW

- Introduction
- Technical Specifications
- Electrical Specifications
- Mechanical Specifications
- Block Diagram



2.1 Introduction

CCOMe-C30 is a carrier board, designed in 3.5" form factor, intended for the use with COM-Express™ Type 6 CPU modules.

COM-Express™ is an open industry standard defined specifically for COMs (computer on modules). Its definition provides the ability to make a smooth transition from legacy parallel interfaces to the newest technologies based on serial buses available today.

COM Express™ CPU modules integrate all the core components of a typical PC-like architecture, and make all interface available through two standardized connectors, so that COM Express™ modules become scalable. This means that once an application has been created, there is the ability to diversify the product range through the use of different performance class or form factor size modules.

Baseboard designers can use just the I/O interfaces that really need, providing, on the carrier board, the routing to the adequate interface connectors.

This versatility allows the designer to create a dense and optimised package, which results in a more reliable product while simplifying system integration.

CCOMe-C30 board can be used both as an evaluation module, to test the functionality of your COM-Express™ module and design an application specific carrier board for it, or as a complete carrier board, already suited for standard purposes, with a small space consumption.

In any case, the solutions so realised is fully scalable, and allows to the user to keep his own-designed system continuously up-to-date, since the system can be updated simply replacing the COM-Express™ module with a newer one, just unplugging the module and replacing it, without the need of redesigning it.

The robust thermal and mechanical concept, combined with extended power-management capabilities, is perfectly suited for all applications.

2.2 Technical Specifications

Supported Modules

- COM Express™ Type 6 compliant modules

Mass Storage interfaces

- SATA 7p M connector
- M.2 Socket 2 2260 Key B slot for SSD
- M.2 Socket 3 2280 Key M for NVMe
- µSD Card slot (interface multiplexed with GPIO header)

Video Interfaces

- 1 x DP++ connector
- 2 x miniDP++ connectors
- LVDS 24-bit Single/Dual Channel Connector
- LVDS External EDID connector
- eDP 4-lanes 40 poles VESA connector

Audio

- On-board HD Audio Codec (Realtek ALC262)
- Mic In + Line Out internal pin header

USB

- 3 x USB 3.0 Host ports on Type-A sockets
- 2 x USB 2.0 Host ports on Type-A sockets
- 1 x USB 2.0 host ports on internal pin header

Networking

- Dual RJ-45 connector (1 port managed by COM Express Gigabit Ethernet interface, 1 port managed by Carrier board's Intel® I210 GbEthernet controller)
- M.2 Socket 2 2242 / 3042 Key B slot for WWAN modules (modem)
- M.2 Socket 1 2230 Key E slot for WiFi / BT modules

Serial Ports

- 2 x RS-232 / RS-422 / RS-485 ports on internal pin header (from carrier board's SuperI/O)
- 2 x RS-232 ports on feature pin header (from module)

Other Interfaces

- microSIM slot for M.2 modem
- 4 x GPI + 4 x GPO pin header (interface multiplexed with µSD slot)
- Button / LEDs front panel header
- 3-pin tachometric FAN connector
- I2C + SM Bus on feature Pin header
- LPC internal header

Power supply: 19÷24 V_{DC}

- Mega-Fit® 2x1 Power Connector
- Cabled Coin-cell connector for RTC

Operating temperature: 0°C ÷ +50°C *

Dimensions: 147 x 101.6 mm (5.79" x 4").

! ** Temperature ranges indicated mean that all components available onboard are certified for working with a Tcase included in these temperature ranges. This means that it is customer's responsibility to ensure that all components' Tcases remain in the range above indicated. Please also check paragraph 4.1.*

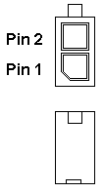
2.3 Electrical Specifications

CCOMe-C30 board can be supplied using any voltage in the range 19-24V_{DC} voltage. All the other voltages necessary for the working of the carrier board, of the COM Express module and of the connected peripherals (including 12V, 5V and 3.3V voltages) are derived from the main V_{IN} power rail.

Please be aware that the carrier board can be used to support modules with a maximum CPU TDP of 45W.

Power Connector - CN4	
Pin	**Signal**
1	GND
2	V_{IN}

Power Connector is type Molex Mega-Fit® connector, p/n 76825-0002, or equivalent, with the pin-out indicated in the table here on the left.



Mating Connector, MOLEX p/n 171692-0102 or equivalent, with female crimp terminal MOLEX series 172063 or 78623.

The use of wires with section 14 AWG is recommended, in order to ensure the proper amperage of the power section.

One pushbutton, SW1, is located on bottom side of the board, on the left of microSD Card Slot, and has to be used to turn/on or off the power of the board.

Another pushbutton, SW2, is located on bottom side of the board, on the right of microSD Card Slot, and can be used to reset the system.

It is also possible to use the pushbuttons available on the front panel module (see par. 4.2.1) to power on/off and reset the system

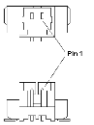
2.3.1 RTC Battery

For the occurrences when the system (Carrier Board + COM Express™ module) is not powered with an external power supply, a cabled coin Lithium Battery to supply, with a 3V voltage, the Real Time Clock eventually available on the COM Express Module.

Battery used is a cabled CR2032HT-LD Lithium coin-cell battery, with a nominal capacity of 220mAh.

Battery connector - CN2	
Pin	**Signal**
1	V_{RTC}
2	GND

The battery is not rechargeable and can be connected to the board using dedicated connector CN2 which is a 2-pin p1.27 mm type MOLEX p/n 53398-0271 or equivalent, with pinout shown in the table on the left.



Mating connector: MOLEX 51021-0200 receptacle with MOLEX 50079-8000 female crimp terminals.

In case of exhaustion, the battery should only be replaced with devices of the same type. Always check the orientation before inserting and make sure that they are aligned correctly and are not damaged or leaking.

Never allow the batteries to become short-circuited during handling.

! CAUTION: handling batteries incorrectly or replacing with not-approved devices may present a risk of fire or explosion.

Batteries supplied with CCOMe-C30 board are compliant to requirements of European Directive 2006/66/EC regarding batteries and accumulators. When putting

out of order CCOMe-C30 board, remove the batteries from the board in order to collect and dispose them according to the requirement of the same European Directive above mentioned. Even when replacing the batteries, the disposal must be made according to these requirements.

2.3.2 Power Rails meanings

In all the tables contained in this manual, Power rails are named with the following meaning:

_S: Switched voltages, i.e. power rails that are active only when the board is in ACPI's S0 (Working) state. Examples: +3.3V_S, +5V_S.

_A: Always-on voltages, i.e. power rails that are active both in ACPI's S0 (Working), S3 (Standby) and S5 (Soft Off) state. Examples: +5V_A, +3.3V_A.

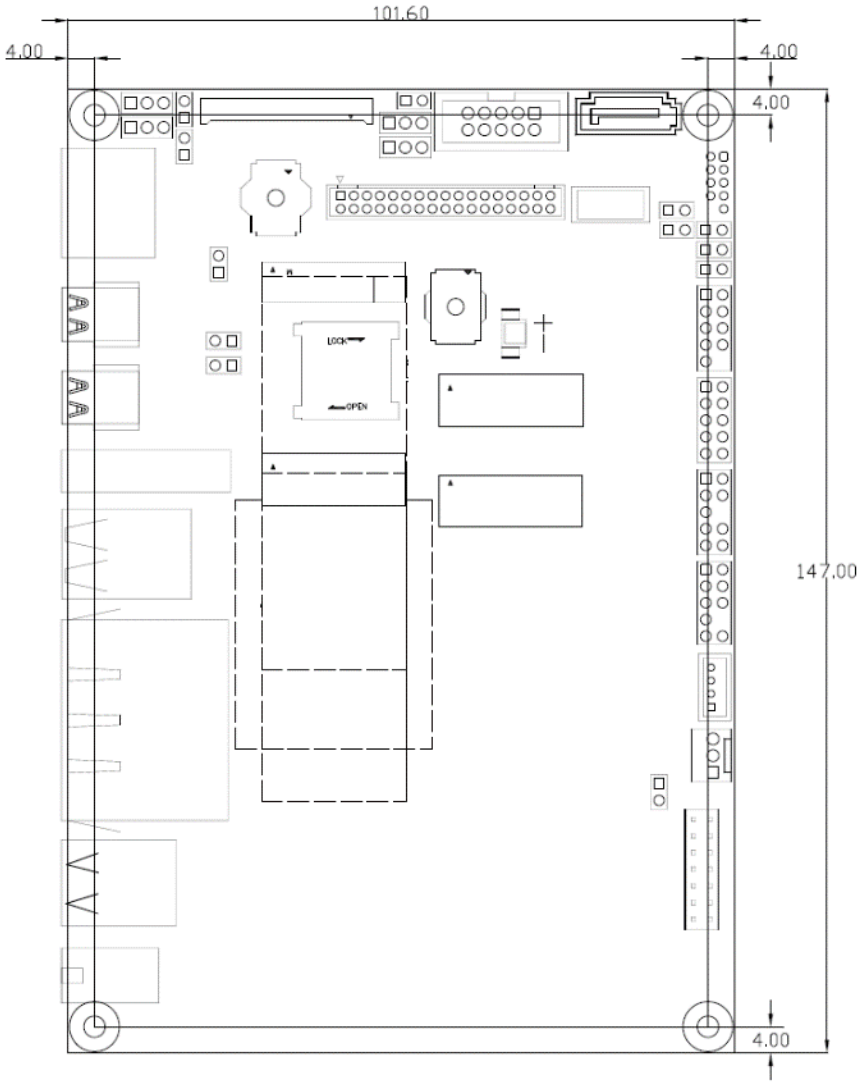
_U: unswitched ACPI S3 voltages, i.e. power rails that are active both in ACPI's S0 (Working) and S3 (Standby) state. Examples: +1.5V_U

2.4 Mechanical Specifications

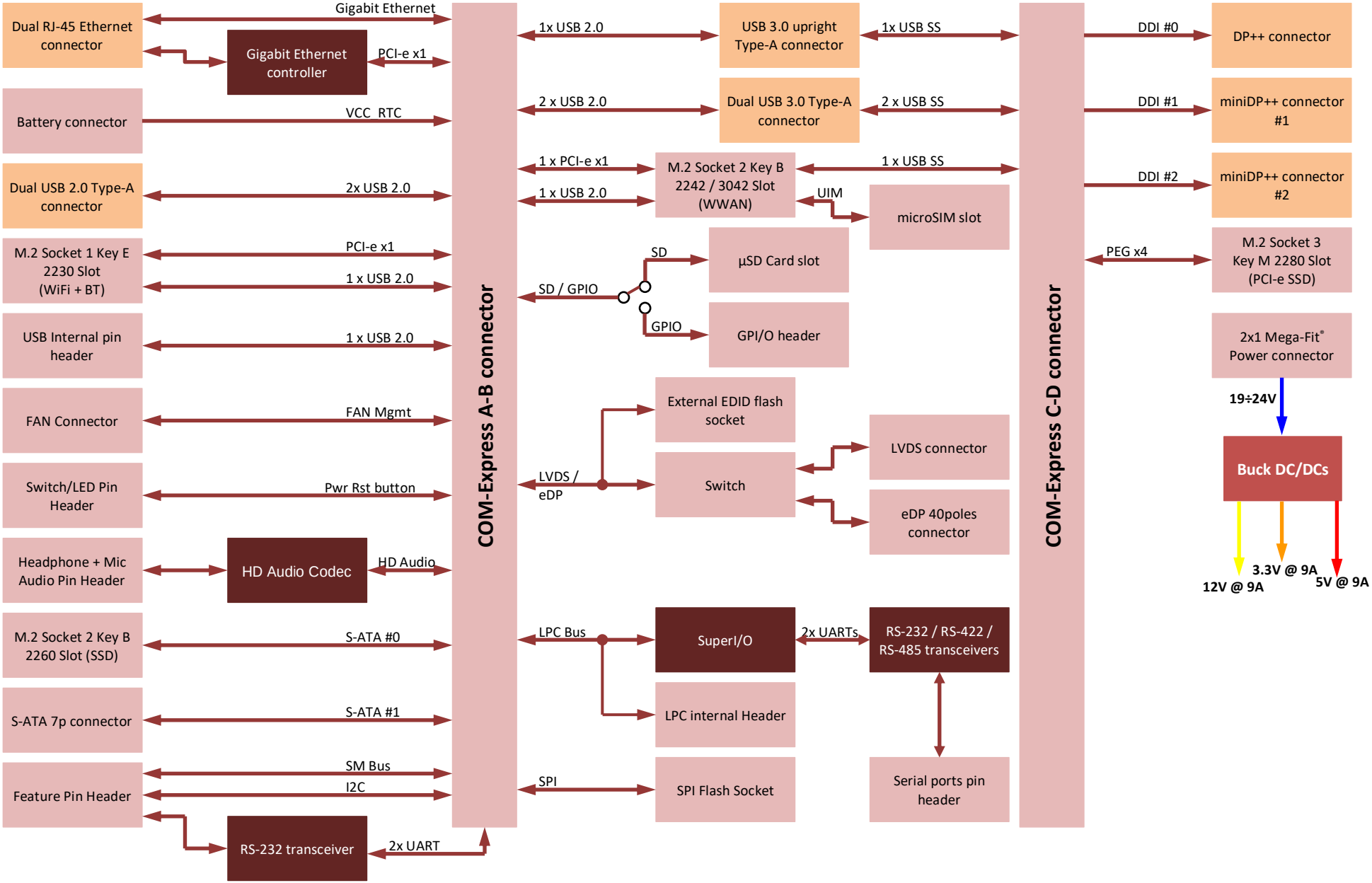
According to 3.5” form factor, board dimensions are 147 x 101.6 mm (5.79” x 4”).

The printed circuit of the board is made of ten layers, some of them are ground planes, for disturbance rejection.

In order to fix the COM Express™ module to the carrier board, on CCOMe-C30 have been soldered six metallic spacers, height 8mm, 2.5mm diameter.

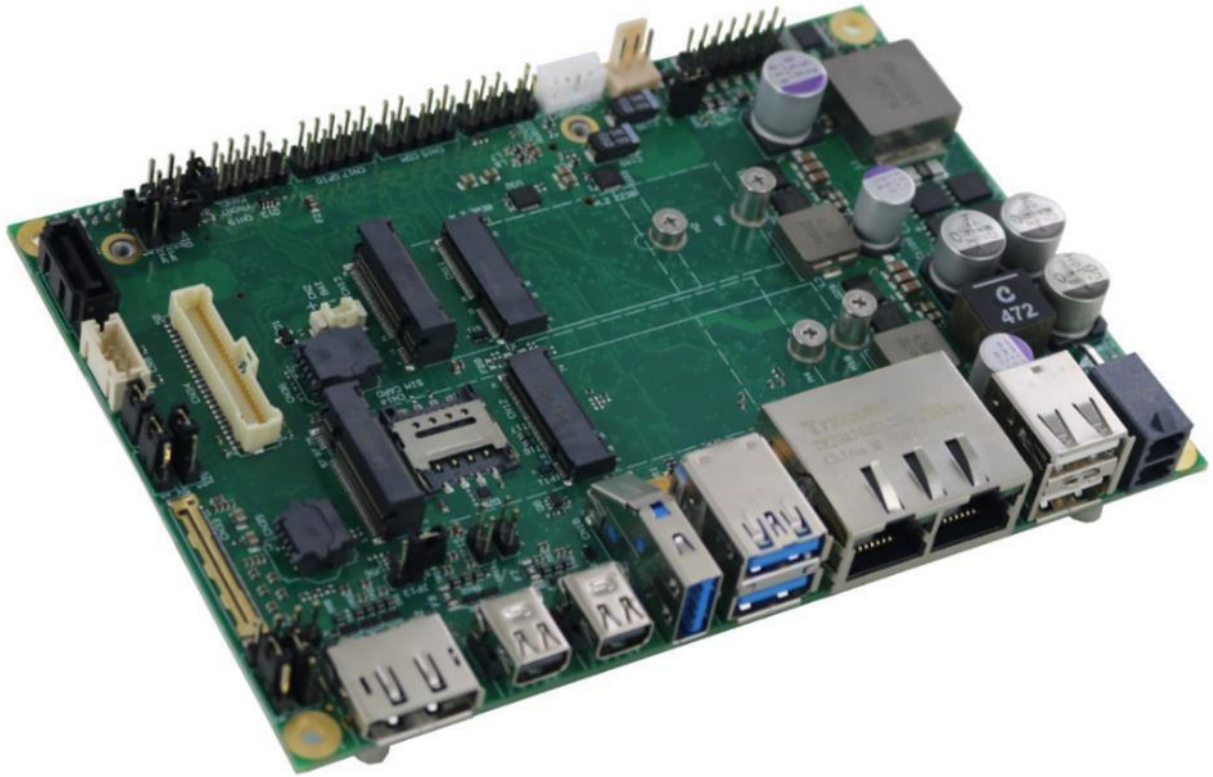


2.5 Block Diagram



Chapter 3. CONNECTORS

- Connectors placement
- Connectors overview
- Connectors description

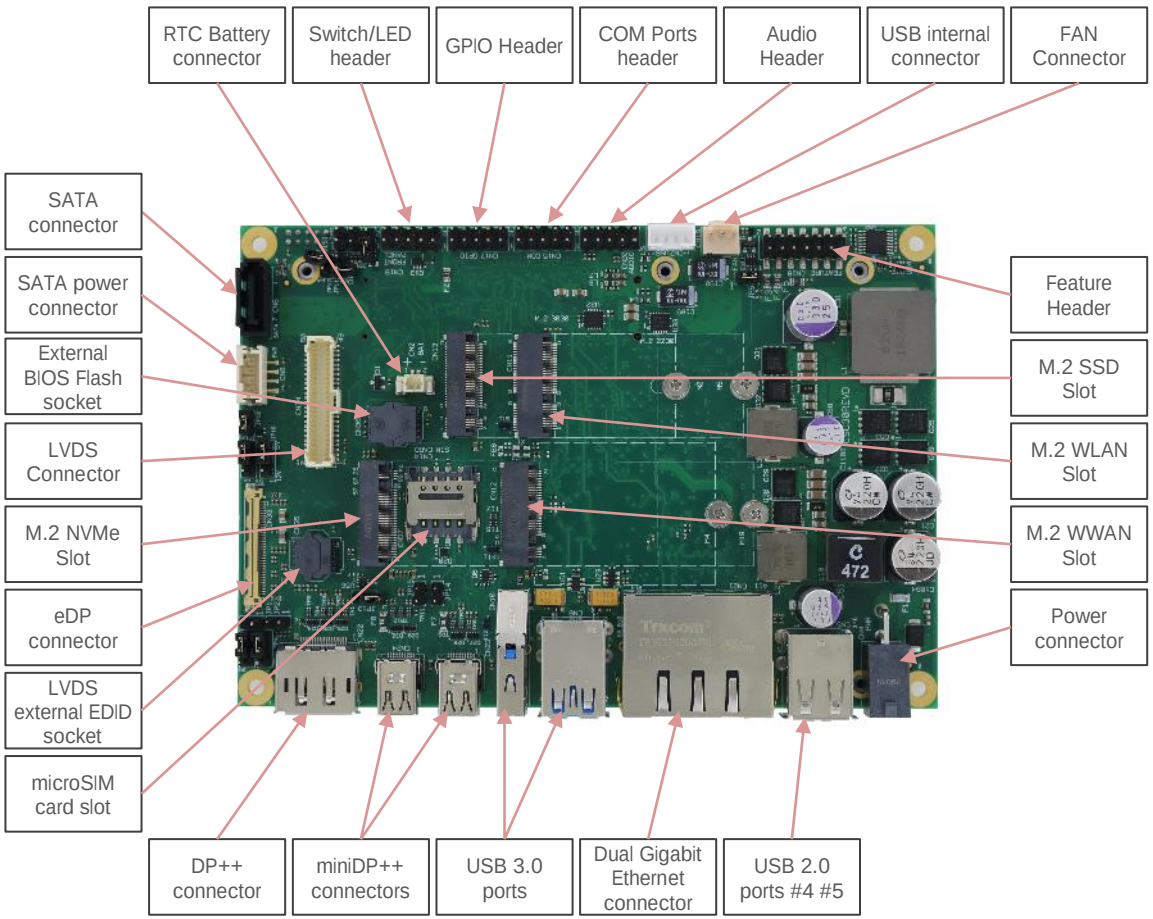


3.1 Connectors placement

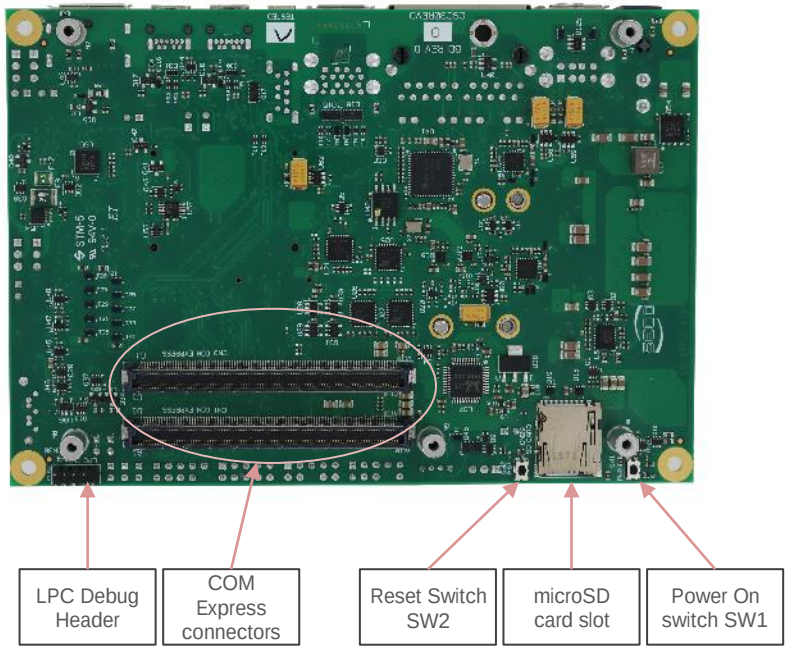
On CCOMe-C30 carrier board, there are several connectors. Some of them are standard connectors, like Display Port, HDMI, Gigabit Ethernet, USB ports, and are placed on the same side of the board, so that they can be placed on a panel of a possible enclosure.

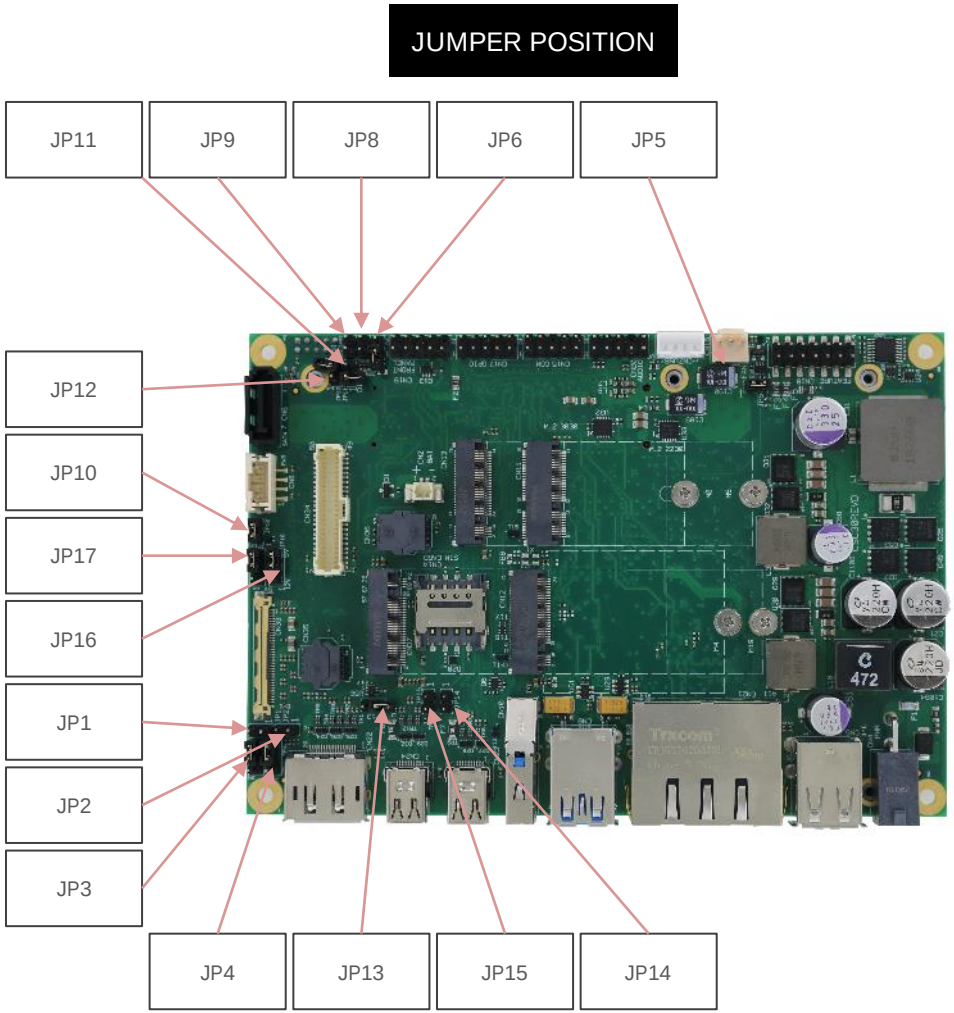
In the following picture it is possible to see the position of each connector.

TOP SIDE



BOTTOM SIDE




JUMPER POSITION
JP11
JP9
JP8
JP6
JP5
JP12
JP10
JP17
JP16
JP1
JP2
JP3
JP4
JP13
JP15
JP14

3.2 Connectors overview

3.2.1 Connectors list

Name	Description	Name	Description
CN1	Com Express, A-B rows connector	CN17	GPIO Pin header
CN2	Cabled RTC Coin Cell Battery connector	CN18	Feature pin header
CN3	Com Express, C-D rows connector	CN19	Switch/LED Header
CN4	Power In connector	CN20	Audio Header
CN5	USB 2.0 ports#4 - #5 connector	CN21	Dual Gigabit Ethernet connector
CN6	SATA M 7-p connector	CN22	DP++ connector
CN7	USB 2.0 port #7 internal header	CN23	miniDP++ #2 connector
CN8	SATA Power connector	CN24	miniDP++ #1 connector
CN9	USB 3.0 ports #0 #1 connector	CN29	microSD Card Slot
CN10	USB 3.0 port #2 connector	CN30	LPC Debug header
CN11	M.2 WLAN Key E Slot	CN33	eDP connector
CN12	M.2 WWAN Key B Slot	CN34	LVDS connector
CN13	M.2 SSD Key B Slot	CN35	LVDS External EDID Flash Socket
CN14	microSIM Card slot	CN36	External BIOS Flash socket
CN15	COM ports Header	CN37	M.2 NVMe KeyM Slot
CN16	FAN Connector		

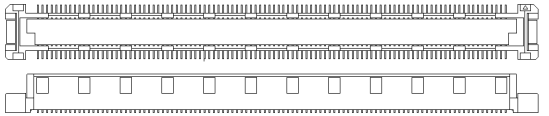
3.2.2 Jumpers list

Name	Description	Name	Description
JP1	WWAN Card Disable #1	JP10	eDP/LVDS interface selector
JP2	WLAN Card Disable #2	JP11	BIOS_Disable signal #0 level selector
JP3	COM Port #1 Mode Select	JP12	BIOS_Disable signal #1 level selector
JP4	COM Port #2 Mode Select	JP13	eDP to LVDS bridge enable
JP5	GPIO/SD interface selector	JP14	WLAN Card Disable #1
JP6	Backlight control signal voltage level selector	JP15	WLAN Card Disable #2
JP8	Backlight enable signal voltage level selector	JP16	Backlight voltage selector
JP9	VDD enable signal voltage level selector	JP17	LVDS panel voltage selector

3.3 Connectors description

3.3.1 COM Express™ module connectors

For the connection of COM Express™ CPU modules, on board there are two connectors, type TYCO 3-6318491-6 (220 pin dual row plug, ultra thin, 0.5mm pitch, h=8mm), as requested by COM Express™ specifications.



The pinout of these connectors will be briefly described in the following paragraphs. Please refer to COM Express™ standard for a better description of each signal.

COM Express™ Connector CN1 - Rows A & B					
Description	**Pin name**	**Pin nr.**	**Pin nr.**	**Pin name**	**Description**
Power Ground	GND	A1	B1	GND	Power Ground
GbEthernet Differential pair 3-	GBE0_MDI3-	A2	B2	GBE0_ACT#	GbEth Activity indicator
GbEthernet Differential pair 3+	GBE0_MDI3+	A3	B3	LPC_FRAME#	LPC Frame Indicator
GbEthernet 100Mb/s link ind.	GBE0_LINK100#	A4	B4	LPC_AD0	LPC Address / Data Bus 0
GbEthernet 1000Mb/s link ind.	GBE0_LINK1000#	A5	B5	LPC_AD1	LPC Address / Data Bus 1
GbEthernet differential pair 2-	GBE0_MDI2-	A6	B6	LPC_AD2	LPC Address / Data Bus 2
GbEthernet Differential pair 2+	GBE0_MDI2+	A7	B7	LPC_AD3	LPC Address / Data Bus 3
Not connected	N.C.	A8	B8	N.C.	Not connected
GbEthernet Differential pair 1-	GBE0_MDI1-	A9	B9	N.C.	Not connected
GbEthernet Differential pair 1+	GBE0_MDI1+	A10	B10	LPC_CLK	LPC Clock Output 33MHz
Power Ground	GND	A11	B11	GND	Power Ground
GbEthernet Differential pair 0-	GBE0_MDI0-	A12	B12	PWRBTN#	Power Button
GbEthernet Differential pair 0+	GBE0_MDI0+	A13	B13	SMB_CK	SM Bus Clock
GbEthernet Reference Voltage	GBE0_CTREF	A14	B14	SMB_DAT	SM Bus Data
Suspend to RAM (S3) signal	SUS_S3#	A15	B15	SMB_ALERT#	SM Bus Alert signal
SATA0 Transmit Data +	SATA0_TX+	A16	B16	SATA1_TX+	SATA1 Transmit Data +
SATA0 Transmit Data -	SATA0_TX-	A17	B17	SATA1_TX-	SATA1 Transmit Data -
Not connected	N.C.	A18	B18	N.C.	Not connected
SATA0 Receive Data +	SATA0_RX+	A19	B19	SATA1_RX+	SATA1 Receive Data +
SATA0 Receive Data -	SATA0_RX-	A20	B20	SATA1_RX-	SATA1 Receive Data -

Power Ground	GND	A21	B21	GND	Power Ground
Not connected	N.C.	A22	B22	N.C.	Not Connected
Not connected	N.C.	A23	B23	N.C.	Not Connected
Soft Off (S5) Signal	SUS_S5#	A24	B24	PWR_OK	Power OK signal
Not connected	N.C.	A25	B25	N.C.	Not Connected
Not connected	N.C.	A26	B26	N.C.	Not Connected
Not connected	N.C.	A27	B27	N.C.	Not connected
SATA LED	SATA_ACT#	A28	B28	N.C.	Not connected
HD Audio Sync signal	AC/HDA_SYNC	A29	B29	N.C.	Not Connected
HD Audio Reset	AC/HDA_RST#	A30	B30	HDA_SDIN0	HD Audio Serial TDM Input 0
Power Ground	GND	A31	B31	GND	Power Ground
HD Audio Bit Clock	AC/HDA_BITCLK	A32	B32	SPKR	Speaker
HD Audio Serial TDM Output	AC/HDA_SDOUT	A33	B33	I2C_CK	I2C Clock
Not connected	N.C.	A34	B34	I2C_DAT	I2C Data
Not connected	N.C.	A35	B35	N.C.	Not connected
USB Data Port 6 -	USB6-	A36	B36	USB7-	USB Data Port 7-
USB Data Port 6 +	USB6+	A37	B37	USB7+	USB Data Port 7+
USB Over Current Ports 6/7	USB_6_7_OC#	A38	B38	USB_4_5_OC#	USB Over Current Ports 4/5
USB Data Port 4 -	USB4-	A39	B39	USB5-	USB Data Port 5-
USB Data Port 4 +	USB4+	A40	B40	USB5+	USB Data Port 5+
Power Ground	GND	A41	B41	GND	Power Ground
USB Data Port 2 -	USB2-	A42	B42	USB3-	USB Data Port 3-
USB Data Port 2 +	USB2+	A43	B43	USB3+	USB Data Port 3+
USB Over Current Ports 2/3	USB_2_3_OC#	A44	B44	USB_0_1_OC#	USB Over Current Ports 0/1
USB Data Port 0 -	USB0-	A45	B45	USB1-	USB Data Port 1-
USB Data Port 0 +	USB0+	A46	B46	USB1+	USB Data Port 1+
Real Time Clock power line	VCC_RTC	A47	B47	N.C.	Not Connected
Not Connected	N.C.	A48	B48	N.C.	Not Connected
Not Connected	N.C.	A49	B49	SYS_RESET#	Reset Button Input
LPC serial interrupt request	LPC_SERIRQ	A50	B50	CB_RESET#	Board Reset Output

Power Ground	GND	A51	B51	GND	Power Ground
Not connected	N.C.	A52	B52	N.C.	Not connected
Not connected	N.C.	A53	B53	N.C.	Not connected
GP Input 0 / SDIO data signal 0	GPI0/SD_DATA0	A54	B54	GPO1/SD_CMD	GP Output 1 / SDIO CMD output
Not connected	N.C.	A55	B55	N.C.	Not connected
Not connected	N.C.	A56	B56	N.C.	Not connected
Power Ground	GND	A57	B57	GPO2/SD_WP	GP Output 2 / SDIO WP input
Not connected	N.C.	A58	B58	N.C.	Not connected
Not connected	N.C.	A59	B59	N.C.	Not connected
Power Ground	GND	A60	B60	GND	Power Ground
PCI-E lane 2 transmit +	PCIE_TX2+	A61	B61	PCIE_RX2+	PCI-E lane 2 receive +
PCI-E lane 2 transmit -	PCIE_TX2-	A62	B62	PCIE_RX2-	PCI-E lane 2 receive -
GP Input 1 / SDIO data signal 1	GPI1/SD_DATA1	A63	B63	GPO3/SD_CD#	GP Output 3 / SDIO CD# input
PCI-E lane 1 transmit +	PCIE_TX1+	A64	B64	PCIE_RX1+	PCI-E lane 1 receive +
PCI-E lane 1 transmit -	PCIE_TX1-	A65	B65	PCIE_RX1-	PCI-E lane 1 receive -
Power Ground	GND	A66	B66	WAKE0#	PCI-express wake up signal
GP Input 2 / SDIO data signal 2	GPI2/SD_DATA2	A67	B67	WAKE1#	General purpose wake up signal
PCI-E lane 0 transmit +	PCIE_TX0+	A68	B68	PCIE_RX0+	PCI-E lane 0 receive +
PCI-E lane 0 transmit -	PCIE_TX0-	A69	B69	PCIE_RX0-	PCI-E lane 0 receive -
Power Ground	GND	A70	B70	GND	Power Ground
LVDS Ch. A Data 0 + / eDP Ch. Data 2+	LVDS_A0+/eDP_TX2+	A71	B71	LVDS_B0+	LVDS Ch. B Data 0 +
LVDS Ch. A Data 0 - / eDP Ch. Data 2-	LVDS_A0-/eDP_TX2-	A72	B72	LVDS_B0-	LVDS Ch. B Data 0 -
LVDS Ch. A Data 1+ / eDP Ch. Data 1+	LVDS_A1+/eDP_TX1+	A73	B73	LVDS_B1+	LVDS Ch. B Data 1 +
LVDS Ch. A Data 1- / eDP Ch. Data 1-	LVDS_A1-/eDP_TX1-	A74	B74	LVDS_B1-	LVDS Ch. B Data 1 -
LVDS Ch. A Data 2+ / eDP Ch. Data 0+	LVDS_A2+/eDP_TX0+	A75	B75	LVDS_B2+	LVDS Ch. B Data 2 +
LVDS Ch. A Data 2- / eDP Ch. Data 0-	LVDS_A2-/eDP_TX0+	A76	B76	LVDS_B2-	LVDS Ch. B Data 2 -
LVDS Panel Power Enable	LVDS_VDD_EN	A77	B77	LVDS_B3+	LVDS Ch. B Data 3 +
LVDS Ch. A Data 3 +	LVDS_A3+	A78	B78	LVDS_B3-	LVDS Ch. B Data 3 -
LVDS Ch. A Data 3 -	LVDS_A3-	A79	B79	LVDS_BKLT_EN	LVDS Panel Backlight ON
Power Ground	GND	A80	B80	GND	Power Ground

LVDS Ch. A Clock + / eDP Ch. Data 3+	LVDS_A_CK+/eDP_TX3+	A81	B81	LVDS_B_CK+	LVDS Ch. B Clock +
LVDS Ch. A Clock - / eDP Ch. Data 3-	LVDS_A_CK-/eDP_TX3-	A82	B82	LVDS_B_CK-	LVDS Ch. B Clock -
LVDS I2C Clock / eDP Ch. Aux +	LVDS_I2C_CK/eDP_AUX+	A83	B83	LVDS_BKLT_CTRL	LVDS Backlight Brightness
LVDS I2C Data / eDP Ch. Aux -	LVDS_I2C_DAT/eDP_AUX-	A84	B84	+5V_A	+5V Standby power line
GP Input 3 / SDIO data signal 3	GPI3/SD_DATA3	A85	B85	+5V_A	+5V Standby power line
Not Connected	RSVD	A86	B86	+5V_A	+5V Standby power line
eDP Hot Plug Detect Signal	eDP_HPD	A87	B87	+5V_A	+5V Standby power line
PCI-E Clock reference +	PCIE_CK_REF+	A88	B88	N.C.	Not connected
PCI-E Clock reference -	PCIE_CK_REF-	A89	B89	N.C.	Not connected
Power Ground	GND	A90	B90	GND	Power Ground
Not connected	N.C.	A91	B91	N.C.	Not connected
Not connected	N.C.	A92	B92	N.C.	Not connected
GP Output 0 / SDIO Clock	GPO0 / SD_CLK	A93	B93	N.C.	Not connected
Not connected	N.C.	A94	B94	N.C.	Not connected
Not connected	N.C.	A95	B95	N.C.	Not connected
Not connected	N.C.	A96	B96	N.C.	Not connected
Type10 signal: Not connected	Type10#	A97	B97	N.C.	Not connected
Module's serial port 0 TX	SER0_TX	A98	B98	RSVD	Not Connected
Module's serial port 0 RX	SER0_RX	A99	B99	RSVD	Not Connected
Power Ground	GND	A100	B100	GND	Power Ground
Module's serial port 1 TX	SER1_TX	A101	B101	FAN_PWMOUT	FAN Speed control
Module's serial port 1 RX	SER1_RX	A102	B102	FAN_TACHIN	FAN tachometer input
Not connected	N.C.	A103	B103	N.C.	Not connected
+12V switched power supply	+12V_S	A104	B104	+12V_S	+12V switched power supply
+12V switched power supply	+12V_S	A105	B105	+12V_S	+12V switched power supply
+12V switched power supply	+12V_S	A106	B106	+12V_S	+12V switched power supply
+12V switched power supply	+12V_S	A107	B107	+12V_S	+12V switched power supply
+12V switched power supply	+12V_S	A108	B108	+12V_S	+12V switched power supply
+12V switched power supply	+12V_S	A109	B109	+12V_S	+12V switched power supply
Power Ground	GND	A110	B110	GND	Power Ground

COM Express™ Connector CN3 - Rows C & D					
Description	**Pin name**	**Pin nr.**	**Pin nr.**	**Pin name**	**Description**
Power Ground	GND	C1	D1	GND	Power Ground
Power Ground	GND	C2	D2	GND	Power Ground
SuperSpeed USB receive pair 0-	USB_SSRX0-	C3	D3	USB_SSTX0-	SuperSpeed USB transmit pair 0-
SuperSpeed USB receive pair 0+	USB_SSRX0+	C4	D4	USB_SSTX0+	SuperSpeed USB transmit pair 0+
Power ground	GND	C5	D5	GND	Power ground
SuperSpeed USB receive pair 1-	USB_SSRX1-	C6	D6	USB_SSTX1-	SuperSpeed USB transmit pair 1-
SuperSpeed USB receive pair 1+	USB_SSRX1+	C7	D7	USB_SSTX1+	SuperSpeed USB transmit pair 1+
Power ground	GND	C8	D8	GND	Power ground
SuperSpeed USB receive pair 2-	USB_SSRX2-	C9	D9	USB_SSTX2-	SuperSpeed USB transmit pair 2-
SuperSpeed USB receive pair 2+	USB_SSRX2+	C10	D10	USB_SSTX2+	SuperSpeed USB transmit pair 2+
Power Ground	GND	C11	D11	GND	Power Ground
SuperSpeed USB receive pair 3-	USB_SSRX3-	C12	D12	USB_SSTX3-	SuperSpeed USB transmit pair 3-
SuperSpeed USB receive pair 3+	USB_SSRX3+	C13	D13	USB_SSTX3+	SuperSpeed USB transmit pair 3+
Power Ground	GND	C14	D14	GND	Power Ground
Not Connected	N.C.	C15	D15	DDI1_CTRLCLK_AUX+	DP1 Aux+ or TMDS1 I2C_CLK
Not Connected	N.C.	C16	D16	DDI1_CTRLDATA_AUX-	DP1 Aux- or TMDS1 I2C_DAT
Not Connected	RSVD	C17	D17	RSVD	Not Connected
Not Connected	RSVD	C18	D18	RSVD	Not Connected
Not Connected	N.C.	C19	D19	N.C.	Not Connected
Not Connected	N.C.	C20	D20	N.C.	Not Connected
Power Ground	GND	C21	D21	GND	Power Ground
Not Connected	N.C.	C22	D22	N.C.	Not Connected
Not Connected	N.C.	C23	D23	N.C.	Not Connected
Digital Display Interface 1 Hot-Plug Detect	DDI1_HPD	C24	D24	RSVD	Not Connected
Not Connected	N.C.	C25	D25	RSVD	Not Connected
Not Connected	N.C.	C26	D26	DDI1_PAIR0+	Digital Display interface 1 pair 0+
Not Connected	RSVD	C27	D27	DDI1_PAIR0-	Digital Display interface 1 pair 0-
Not Connected	RSVD	C28	D28	RSVD	Not Connected

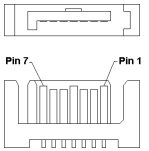
Not Connected	N.C.	C29	D29	DDI1_PAIR1+	Digital Display interface 1 pair 1+
Not Connected	N.C.	C30	D30	DDI1_PAIR1-	Digital Display interface 1 pair 1-
Power Ground	GND	C31	D31	GND	Power Ground
DP2 Aux+ or TMDS2 I2C_CLK	DDI2_CTRLCLK_AUX+	C32	D32	DDI1_PAIR2+	Digital Display interface 1 pair 2+
DP2 Aux- or TMDS2 I2C_DAT	DDI2_CTRLDATA_AUX-	C33	D33	DDI1_PAIR2-	Digital Display interface 1 pair 2-
DP2 or TMDS2 selector	DDI2_DDC_AUX_SEL	C34	D34	DDI1_DDC_AUX_SEL	DP1 or TMDS1 selector
Not Connected	RSVD	C35	D35	RSVD	Not Connected
DP3 Aux+ or TMDS3 I2C_CLK	DDI3_CTRLCLK_AUX+	C36	D36	DDI1_PAIR3+	Digital Display interface 1 pair 3+
DP3 Aux- or TMDS3 I2C_DAT	DDI3_CTRLDATA_AUX-	C37	D37	DDI1_PAIR3-	Digital Display interface 1 pair 3-
DP3 or TMDS3 selector	DDI3_DDC_AUX_SEL	C38	D38	RSVD	Not Connected
Digital Display interface 3 pair 0+	DDI3_PAIR0+	C39	D39	DDI2_PAIR0+	Digital Display interface 2 pair 0+
Digital Display interface 3 pair 0-	DDI3_PAIR0-	C40	D40	DDI2_PAIR0-	Digital Display interface 2 pair 0-
Power Ground	GND	C41	D41	GND	Power Ground
Digital Display interface 3 pair 1+	DDI3_PAIR1+	C42	D42	DDI2_PAIR1+	Digital Display interface 2 pair 1+
Digital Display interface 3 pair 1-	DDI3_PAIR1-	C43	D43	DDI2_PAIR1-	Digital Display interface 2 pair 1-
Digital Display Interface 3Hot-Plug Detect	DDI3_HPD	C44	D44	DDI2_HPD	Digital Display Interface 2 Hot-Plug Detect
Not Connected	RSVD	C45	D45	RSVD	Not Connected
Digital Display interface 3 pair 2+	DDI3_PAIR2+	C46	D46	DDI2_PAIR2+	Digital Display interface 2 pair 2+
Digital Display interface 3 pair 2-	DDI3_PAIR2-	C47	D47	DDI2_PAIR2-	Digital Display interface 2 pair 2-
Not Connected	RSVD	C48	D48	RSVD	Not Connected
Digital Display interface 3 pair 3+	DDI3_PAIR3+	C49	D49	DDI2_PAIR3+	Digital Display interface 2 pair 3+
Digital Display interface 3 pair 3-	DDI3_PAIR3-	C50	D50	DDI2_PAIR3-	Digital Display interface 2 pair 3-
Power Ground	GND	C51	D51	GND	Power Ground
Not Connected	N.C.	C52	D52	N.C.	Not Connected
Not Connected	N.C.	C53	D53	N.C.	Not Connected
Type0 signal: Not Connected	TYPE0#	C54	D54	N.C.	Not Connected
Not Connected	N.C.	C55	D55	N.C.	Not Connected
Not Connected	N.C.	C56	D56	N.C.	Not Connected
Type1 signal: Not Connected	TYPE1#	C57	D57	TYPE2#	Type2 signal: +5V_A
Not Connected	N.C.	C58	D58	N.C.	Not Connected

Not Connected	N.C.	C59	D59	N.C.	Not Connected
Power Ground	GND	C60	D60	GND	Power Ground
Not Connected	N.C.	C61	D61	N.C.	Not Connected
Not Connected	N.C.	C62	D62	N.C.	Not Connected
Not Connected	RSVD	C63	D63	RSVD	Not Connected
Not Connected	RSVD	C64	D64	RSVD	Not Connected
Not Connected	N.C.	C65	D65	N.C.	Not Connected
Not Connected	N.C.	C66	D66	N.C.	Not Connected
Not Connected	RSVD	C67	D67	GND	Power Ground
Not Connected	N.C.	C68	D68	N.C.	Not Connected
Not Connected	N.C.	C69	D69	N.C.	Not Connected
Power Ground	GND	C70	D70	GND	Power Ground
Not Connected	N.C.	C71	D71	N.C.	Not Connected
Not Connected	N.C.	C72	D72	N.C.	Not Connected
Power Ground	GND	C73	D73	GND	Power Ground
Not Connected	N.C.	C74	D74	N.C.	Not Connected
Not Connected	N.C.	C75	D75	N.C.	Not Connected
Power Ground	GND	C76	D76	GND	Power Ground
Not Connected	RSVD	C77	D77	RSVD	Not Connected
Not Connected	N.C.	C78	D78	N.C.	Not Connected
Not Connected	N.C.	C79	D79	N.C.	Not Connected
Power Ground	GND	C80	D80	GND	Power Ground
Not Connected	N.C.	C81	D81	N.C.	Not Connected
Not Connected	N.C.	C82	D82	N.C.	Not Connected
Not Connected	RSVD	C83	D83	RSVD	Not Connected
Power Ground	GND	C84	D84	GND	Power Ground
Not Connected	N.C.	C85	D85	N.C.	Not Connected
Not Connected	N.C.	C86	D86	N.C.	Not Connected
Power Ground	GND	C87	D87	GND	Power Ground
Not Connected	N.C.	C88	D88	N.C.	Not Connected

Not Connected	N.C.	C89	D89	N.C.	Not Connected
Power Ground	GND	C90	D90	GND	Power Ground
Not Connected	N.C.	C91	D91	N.C.	Not Connected
Not Connected	N.C.	C92	D92	N.C.	Not Connected
Power Ground	GND	C93	D93	GND	Power Ground
Not Connected	N.C.	C94	D94	N.C.	Not Connected
Not Connected	N.C.	C95	D95	N.C.	Not Connected
Power Ground	GND	C96	D96	GND	Power Ground
Not Connected	RSVD	C97	D97	RSVD	Not Connected
Not Connected	N.C.	C98	D98	N.C.	Not Connected
Not Connected	N.C.	C99	D99	N.C.	Not Connected
Power Ground	GND	C100	D100	GND	Power Ground
Not Connected	N.C.	C101	D101	N.C.	Not Connected
Not Connected	N.C.	C102	D102	N.C.	Not Connected
Power Ground	GND	C103	D103	GND	Power Ground
+12V switched power supply	+12V_S	C104	D104	+12V_S	+12V switched power supply
+12V switched power supply	+12V_S	C105	D105	+12V_S	+12V switched power supply
+12V switched power supply	+12V_S	C106	D106	+12V_S	+12V switched power supply
+12V switched power supply	+12V_S	C107	D107	+12V_S	+12V switched power supply
+12V switched power supply	+12V_S	C108	D108	+12V_S	+12V switched power supply
+12V switched power supply	+12V_S	C109	D109	+12V_S	+12V switched power supply
Power Ground	GND	C110	D110	GND	Power Ground

3.3.2 SATA connectors

SATA #1 Connector - CN6	
Pin	**Signal**
1	GND
2	SATA1_Tx+
3	SATA1_Tx-
4	GND
5	SATA1_Rx-
6	SATA1_Rx+
7	GND

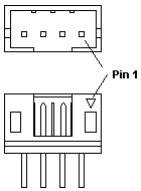


For the connection of external Mass Storage Devices, there is a standard male SATA connector, CN6.

These connectors carry out directly SATA port #1 signals coming from COM Express™ module's connector.

Please notice that each SATA connector will work only in case the COM Express™ module carries out SATA Channel #1 on COM Express™ connector (pins B16, B17, B19 and B20). In case the COM Express™ module used doesn't have these signals connected, then one or both of these connectors will not be usable.

SATA Power Connector - CN8	
Pin	**Signal**
1	+12V_S
2	GND
3	GND
4	+5V_S



A dedicated power connector, CN 8, can be used to give supply to external Hard Disks (or Solid State Disks) connected to the SATA male connector.

The dedicated power connector is a 4-pin male connector, type HR p/n A2001WV-S-04 or equivalent, with pinout shown in the table on the left.

Mating connector: HR A2001H-04P housing with HR A2001 series crimp terminals.

Here following the signals related to SATA interface:

SATA1_TX+/SATA1_TX-: Serial ATA Channel #1 Transmit differential pair.

SATA1_RX+/SATA1_RX-: Serial ATA Channel #1 Receive differential pair.

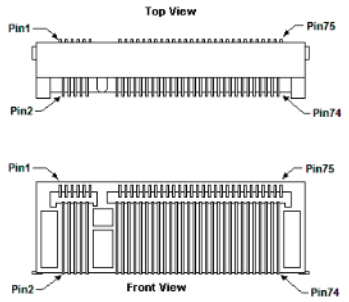
3.3.3 M.2 SSD Slot: Socket 2 Key B Type 2260

M.2 SSD Slot (Socket 2 Key B type 2260) - CN13			
Pin	Signal	Pin	Signal
1	---	2	+3.3V_S
3	GND	4	+3.3V_S
5	GND	6	---
7	---	8	---
9	---	10	---
11	GND		
		20	---
21	---	22	---
23	---	24	---
25	---	26	---
27	GND	28	---
29	---	30	---
31	---	32	---
33	GND	34	---
35	---	36	---
37	---	38	---
39	GND	40	---
41	SATA0_RX+	42	---
43	SATA0_RX-	44	---
45	GND	46	---
47	SATA0_TX-	48	---
49	SATA0_TX+	50	---
51	GND	52	---
53	---	54	---
55	---	56	---
57	GND	58	---

The mass storage capabilities of the CCOME-C30 carrier board are completed by an M.2 SSD Slot, which allow plugging M.2 Socket 2 Key B Solid State Drives.

The connector used for the M.2 SSD slot is CN13, which is a standard 75 pin M.2 Key B connector, type LOTES p/n APCI0087-P001A, H=8.5mm, with the pinout shown in the table on the left.

On the CCOME-C30 carrier board there is also a Threaded Spacer which allows the placement of M.2 Socket 2 Key B SSD modules in 2260 size.



Here following the signals related to this SATA interface:

SATA0_TX+/SATA0_TX-: Serial ATA Channel #0 Transmit differential pair

SATA0_RX+/SATA0_RX-: Serial ATA Channel #0 Receive differential pair

10nF AC series decoupling capacitors are placed on each line of SATA differential pairs

Please be aware that M.2 SSD slot will work only in case the COM Express™ module carries out SATA Channel #0 on COM Express™ connector (pins A16, A17, A19 and A20). In case the COM Express™ module used doesn't have these signals connected, then this slot will not be usable.

59	---	60	---
61	---	62	---
63	---	64	---
65	---	66	---
67	---	68	---
69	---	70	+3.3V_S
71	GND	72	+3.3V_S
73	GND	74	+3.3V_S
75	---		

3.3.4 microSD Card Slot

According to the release 2.0 of COM Express™ specifications, on the same pins are multiplexed the signals necessary for the implementation of 4-bit SD cards with four General Purpose Inputs plus four general Purpose Outputs. Effective support of GPI+GPO signals or SDIO interface depends on the module used. Please refer to the User Manual of the COM Express™ module used for a detail about the interface support.

This SD interface is carried to a standard µSD card slot (CN29), soldered on bottom side of the module, push-push type.

Signals description

SD_CD#: Card Detect Input.

SD_CLK: SD Clock Line (output).

SD_CMD: Command/Response bidirectional line.

SD_WP: SD Write Protect Input line

SDIO_DAT[0÷3]: SD Card data bus. SDIO_DAT0 signal is used for all communication modes. SDIO_DAT[1÷3] signals are required for 4-bit communication mode.

JP5 position	Interface enabled
Inserted	SDIO enabled
Not inserted	GPI/O enabled

The selection between SD Card interface and GPI/O interface is made using jumper JP5, according to the table on the left.

3.3.5 GPIO Pin Header

GPIO pin header - CN17			
Pin	Signal	Pin	Signal
1	GPO0	2	+3.3V_A
3	GPO1	4	GPI0
5	GPO2	6	GPI1
7	GPO3	8	GPI2
9	GND	10	GPI3

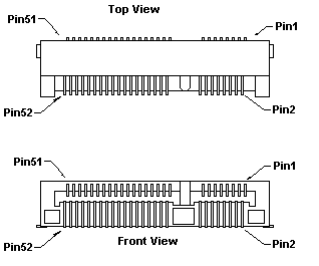
If supported by the COM Express module installed on CCOMe-C30 module, the GPIO interface, is available on CN17, which is a dual row, 10 pin, P2.54mm standard pin header, with the pinout shown in the table on the left.

This interface is available only by removing the jumper JP5 (as described in the previous paragraph)

3.3.6 M.2 WLAN Slot: Socket 1 Key E Type 2230

M.2 WLAN Slot (Socket 1 Key E type 2230) - CN11			
Pin	Signal	Pin	Signal
1	GND	2	+3.3V_A
3	USB6+	4	+3.3V_A
5	USB6-	6	---
7	GND	8	---
9	---	10	---
11	---	12	---
13	---	14	---
15	---	16	---
17	---	18	GND
19	---	20	---
21	---	22	---
23	---	32	---
33	GND	34	---
35	PCIE_Tx1+	36	---
37	PCIE_Tx1-	38	---
39	GND	40	---
41	PCIE_Rx1+	42	---
43	PCIE_Rx1-	44	---
45	GND	46	---
47	PCIE_CLK1+	48	---
49	PCIE_CLK1-	50	---
51	GND	52	WiFi_RST#
53	---	54	W_DISABLE2_E#
55	M.2_WAKE#	56	W_DISABLE1_E#
57	GND	58	---
59	---	60	---
61	---	62	---

To add communications functionality, or other features not available on CCOMe-C30 Carrier board, it is possible to use M.2 Socket 1 Key E connectivity modules (i.e. modules with functionalities like WiFi + Bluetooth).



The connector used for the M.2 WLAN slot is CN11, which is a standard 75 pin M.2 Key E connector, type LOTES p/n APCI0076-P001A, H=4.2mm, with the pinout shown in the table on the left.

On the CCOMe-C30 Carrier board there is also a Threaded Spacer which allows the placement of M.2 Socket 1 Key E WLAN modules in 2230 size.

Signals carried to M.2 WLAN Slot are the following:

PCIE_TX1+/PCIE_TX1-: PCI Express lane #1, Transmitting Output Differential pair.

PCIE_RX1+/PCIE_RX1-: PCI Express lane #1, Receiving Input Differential pair.

PCIE_CLK1+ / PCIE_CLK1-: PCI Express Reference Clock for lane #1, Differential Pair.

USB6+ / USB6-: USB Port #6 differential pair.

M.2_WAKE#: Board's Wake Input, it must be externally driven by the M.2 WLAN module inserted in the slot when it requires waking up the system. This signal is connected to COM Express module's WAKE0# signal.

WiFi_RST#: WLAN specific reset Signal, derived from the CB_RESET signal sent from COM Express™ module to all PCI-e devices available on the board.

PCIE_REQ1#: PCI Express Clock Request Input. This signal shall be driven low by the module inserted in the M.2 WLAN slot, in order to ensure that the PCI-e clock buffer available on the carrier board makes available the reference clock for this slot (i.e. PCIE_CLK1+/PCIE_CLK1-).

W_DISABLE1_E#: this signal can be used to enable/disable the WiFi functionality of a M.2 WLAN module plugged in slot CN11. This signal is directly managed using jumper JP14 as described in the table below.

W_DISABLE2_E#: this signal can be used to enable/disable the BT functionality of a M.2 WLAN module plugged in slot CN11. This signal is directly managed using jumper JP15, as described in the table below.

63	PCIE_REQ1#	64	---
65	---	66	---
67	---	68	---
69	GND	70	---
71	---	72	+3.3V_A
73	---	74	+3.3V_A
75	GND		

JP14 position	M.2 WLAN module
Inserted	Disabled
Not inserted	Enabled

JP15 position	M.2 WLAN module
Inserted	Disabled
Not inserted	Enabled

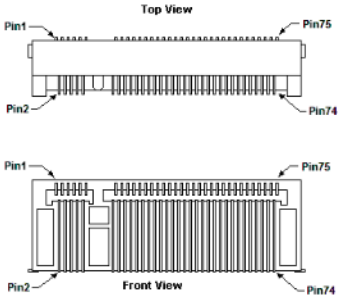
3.3.7 M.2 WWAN Slot: Socket 2 Key B Type 2242 / 3042

M.2 WWAN Slot (Socket 2 Key B type 2242 / 3042) - CN12			
Pin	**Signal**	**Pin**	**Signal**
1	---	2	+3.3V_A
3	GND	4	+3.3V_A
5	GND	6	PWR_OFF#
7	USB3+	8	W_DISABLE1#_B
9	USB3-	10	---
11	GND	20	---
21	---	22	---
23	WAKE_ON_WWAN#	24	---
25	---	26	W_DISABLE2#_B
27	GND	28	---
29	USB_SSRX3-	30	UIM_RST#
31	USB_SSRX3+	32	UIM_CLK
33	GND	34	UIM_DATA
35	USB_SSTX3-	36	UIM_PWR
37	USB_SSTX3+	38	---
39	GND	40	---
41	PCIE_Rx2-	42	---
43	PCIE_Rx2+	44	---
45	GND	46	---

It is possible to increase the networking possibilities of CCOMe-C30 Carrier board by using M.2 Socket 2 Key B WWAN modules (i.e. modem modules).

The connector used for the M.2 WWAN slot is CN12, which is a standard 75 pin M.2 Key B connector, type LOTES p/n APCI0087-P001A, H=8.5mm, with the pinout shown in the table on the left.

On the CCOMe-C30 Carrier board there is also a Threaded Spacer which allows the placement of M.2 Socket 2 Key B WLAN modules in 2242 or 3042 size.



Signals carried to M.2 WLAN Slot are the following:

PCIE_TX2+/PCIE_TX2-: PCI Express lane #2, Transmitting Output Differential pair.

PCIE_RX2+/PCIE_RX2-: PCI Express lane #2, Receiving Input Differential pair.

PCIE_CLK2+ / PCIE_CLK2-: PCI Express Reference Clock for lane #2, Differential Pair.

USB3+ / USB3-: USB Port #3 differential pair.

USB_SSRX3- / USB_SSRX3+: Superspeed USB port #3, receiving differential pair.

USB_SSTX3- / USB_SSTX3+: Superspeed USB port #3, transmitting differential pair.

WAKE_ON_WWAN#: Board's Wake Input, it must be externally driven by the M.2 WWAN module inserted in the slot when it requires waking up the system. This signal is connected to COM Express module's WAKE1# signal.

WWAN_RST#: WLAN specific reset Signal, derived from the CB_RESET signal sent from COM Express™ module to all PCI-e devices available on the board.

47	PCIE_Tx2-	48	---
49	PCIE_Tx2+	50	WWAN_RST#
51	GND	52	---
53	PCIE_CLK2-	54	M.2_WAKE#
55	PCIE_CLK2+	56	---
57	GND	58	---
59	---	60	---
61	---	62	---
63	---	64	---
65	---	66	---
67	---	68	---
69	---	70	+3.3V_A
71	CLK_REQ2#	72	+3.3V_A
73	GND	74	+3.3V_A
75	---		

CLK_REQ2#: PCI Express Clock Request Input. This signal shall be driven low by the module inserted in the M.2 WWAN slot, in order to ensure that the PCI-e clock buffer available on the carrier board makes available the reference clock for this slot (i.e. PCIE_CLK2+/PCIE_CLK2-).

PWR_OFF#: 1kOhm pullup to 3.3V_A

W_DISABLE1#_B: this signal can be used to enable/disable the M.2 WWAN module plugged in slot CN12. This signal is directly managed using jumper JP1, as described in the table below.

W_DISABLE2#_B: this signal can be used to enable/disable the M.2 WWAN module plugged in slot CN12. This signal is directly managed using jumper JP2, as described in the table below.

M.2_WAKE#: Board's Wake Input, it must be externally driven by the M.2 WWAN module inserted in the slot when it requires waking up the system. This signal is connected to COM Express module's WAKE0# signal.

On the WWAN slot are also available the signals for interfacing to microSIM cards (which can be hosted in the microSIM slot CN14), so that it is possible to use M.2 WWAN modems.

UIM_PWR: Power line for UIM module.

UIM_DATA: Bidirectional Data line between M.2 WWAN card and UIM module.

UIM_CLK: Clock line, output from M.2 WWAN card to the UIM module.

UIM_RST#: Reset signal line, sent from M.2 WWAN card to the UIM module.

Please be aware that all signals related to User Identity Modules are managed directly by the M.2 card circuitry, they don't involve neither carrier board's nor COM Express™ module's management.

JP1 position	M.2 WWAN module
Inserted	Disabled
Not inserted	Enabled

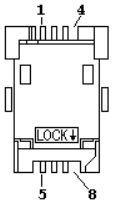
JP2 position	M.2 WWAN module
Inserted	Disabled
Not inserted	Enabled

3.3.8 microSIM Card Slot

microSIM Card Slot - CN14			
Pin	**Signal**	**Pin**	**Signal**
1	UIM_PWR	5	GND
2	UIM_RST#	6	UIM_PWR
3	UIM_CLK	7	UIM_DATA
4	---	8	GND

Interfaced to the M.2 WWAN slot CN12, as already told in previous paragraph, there is a microSIM Card Slot, to be used in conjunction with M.2 Socket 2 Key B modems. Here it is possible to insert the microSIM card provided by any telecommunication operator for the connection to their network.

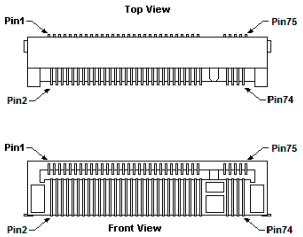
The socket is type Wellco T&C Co. p/n S0HG-150008-10G or equivalent, with the pinout shown in the table on the left.



3.3.9 M.2 NVMe Slot: Socket 3 Key M Type 2280

M.2 NVMe Slot (Socket 3 Key M type 2280) – CN37			
Pin	**Signal**	**Pin**	**Signal**
1	CLK_REQ3	2	+3.3V_S
3	GND	4	+3.3V_S
5	PEG_Rx3-	6	---
7	PEG_Rx3+	8	---
9	GND	10	---
11	PEG_Tx3-	12	+3.3V_S
13	PEG_Tx3+	14	+3.3V_S
15	GND	16	+3.3V_S
17	PEG_Rx2-	18	+3.3V_S
19	PEG_Rx2+	20	---
21	GND	22	---
23	PEG_Tx2-	24	---
25	PEG_Tx2+	26	---
27	GND	28	---
29	PEG_Rx1-	30	---
31	PEG_Rx1+	32	---
33	GND	34	---
35	PEG_Tx1-	36	---
37	PEG_Tx1+	38	---
39	GND	40	---
41	PEG_Rx0-	42	---
43	PEG_Rx0+	44	---
45	GND	46	---
47	PEG_Tx0-	48	---
49	PEG_Tx0+	50	NVME_RST#
51	GND	52	---

Another possibility for connecting mass storage devices is given by the M.2 Key M Slot, which allows the plugging of M.2 High Capacity SSD drives with PCI-e x4 interface



The connector used for the M.2 SSD slot is CN37, which is a standard 75 pin M.2 Key M connector, type LOTES p/n APCI0096-P005H, H=8.5mm, with the pinout shown in the following table.

On the board there are also two Threaded Spacers which allows the placement of M.2 Socket 3 Key M PCI-e SSD modules in 2280 size.

Here following the signals related to this next generation storage interface:

PEG_Tx0+/PEG_Tx0-: PCI-e GFX port x4 lane #0, Transmitting Output Differential pair

PEG_Rx0+/ PEG_Rx0-: PCI-e GFX port x4 lane #0, Receiving Input Differential pair

PEG_Tx1+/GFX_Tx1-: PCI-e GFX port x4 lane #1, Transmitting Output Differential pair

PEG_Rx1+/GFX_Rx1-: PCI-e GFX port x4 lane #1, Receiving Input Differential pair

PEG_Tx2+/ PEG_Tx2-: PCI-e GFX port x4 lane #2, Transmitting Output Differential pair

PEG_Rx2+/ PEG_Rx2-: PCI-e GFX port x4 lane #2, Receiving Input Differential pair

PEG_Tx3+/ PEG_Tx3-: PCI-e GFX port x4 lane #3, Transmitting Output Differential pair

PEG_Rx3+/ PEG_Rx3-: PCI-e GFX port x4 lane #3, Receiving Input Differential pair

NVME_CLK_Clock+ / NVME_Clock-: PCI Express Reference Clock for the PCI Express lanes, Differential Pair

NVME_RST#: Reset Signal.

CLK_REQ3#: PCI Express Clock Request Input, active low signal. This signal shall be driven low by any module inserted in the connectivity slot, in order to ensure that the SoC makes available the reference clock.

M.2_WAKE#: Board's Wake Input, it must be externally driven by the M.2 NVMe module inserted in the slot when it requires waking up the system. This signal is connected to COM Express module's WAKE0# signal.

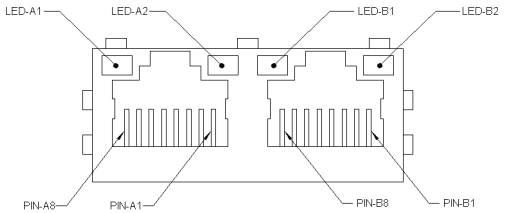
53	NVME_CLK-	54	M.2_WAKE#
55	NVME_CLK+	56	---
57	GND	58	---
67	---	68	---
69	---	70	+3.3V_S
71	GND	72	+3.3V_S
73	GND	74	+3.3V_S
75	GND		

3.3.10 Dual Gigabit Ethernet connector

Gigabit Ethernet Ports #0 #1- CN21			
Pin	**Signal**	**Pin**	**Signal**
A1	GBE0_MDI0+	A5	GBE0_MDI2-
A2	GBE0_MDI0-	A6	GBE0_MDI1-
A3	GBE0_MDI1+	A7	GBE0_MDI3+
A4	GBE0_MDI2+	A8	GBE0_MDI3-
B1	GBE1_MDI0+	B5	GBE1_MDI2-
B2	GBE1_MDI0-	B6	GBE1_MDI1-
B3	GBE1_MDI1+	B7	GBE1_MDI3+
B4	GBE1_MDI2+	B8	GBE1_MDI3-

On board, there are is a dual Gigabit Ethernet RJ-45 connector for the connection to up to two different LAN ports.

The connector is a double port RJ-45 socket type TRXCOM p/n TRJG27420AINL or equivalent, with 2kV decoupling capacitors.



On the connectors there are also two LEDs for each port. Left LED is bicolor (Green /Yellow) and shows 10/100 or 1000 connection: green means 100Mbps connection, yellow means 1000Mpbs connection, when the LED is Off then 10Mpbs or no connection is available. The right LED is Green and shows ACTIVITY presence.

These two interfaces are compatible both with Gigabit Ethernet (1000Mbps) and with Fast Ethernet (10/100Mbps) Networks. They will configure automatically to work with the existing network.

Please be aware that they will work in Gigabit mode only in case that they are connected to Gigabit Ethernet switches/hubs/routers. For the connection, cables category Cat5e or better are required. Cables category Cat6 are recommended for noise reduction and EMC compatibility issues, especially when the length of the cable is significant.

CN21 provide direct access to the Gigabit Ethernet signals directly managed by the COM Express™ modules (indicated as GBE0_xxx), while the second Gigabit Ethernet interface, indicated as GBE1_xxx, is managed by a dedicated Intel® I210AT or equivalent controller, interfaced to PCI-express lane #0, coming out from COM Express™ connector's rows A-B..

GBEx_MDI0+/GBEx_MDI0-: Ethernet Controller #x Media Dependent Interface (MDI) I/O differential pair #0. It is the first differential pair in Gigabit Ethernet mode, and the Transmit differential pair in 10/100 Mbps modes.

GBEx_MDI1+/GBEx_MDI1-: Ethernet Controller #x Media Dependent Interface (MDI) I/O differential pair #1. It is the second differential pair in Gigabit Ethernet mode, and the Receive differential pair in 10/100 Mbps modes.

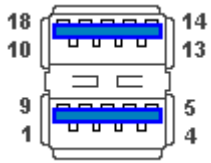
GBEx_MDI2+/GBEx_MDI2-: Ethernet Controller #x Media Dependent Interface (MDI) I/O differential pair #2. It is the third differential pair in Gigabit Ethernet mode; it is not used in 10/100Mbps modes.

GBEx_MDI3+/GBEx_MDI3-: Ethernet Controller #x Media Dependent Interface (MDI) I/O differential pair #3. It is the fourth differential pair in Gigabit Ethernet mode; it is not used in 10/100Mbps modes.

3.3.11 USB connectors

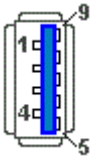
The CCOMe-C30 Carrier board offers the possibility of using all the possible USB ports that are foreseen for COM Express Type 6 modules.

The first two USB 3.0 ports, in a stacked receptacle, of a double type-A USB 3.0 receptacle, type Winning p/n WDU3R-18F1B4PBUW3 or equivalent.



USB 3.0 ports #0 / #1- CN9			
Pin	**Signal**	**Pin**	**Signal**
1	$+5V_{USB0}$	10	$+5V_{USB1}$
2	USB0-	11	USB1-
3	USB0+	12	USB1+
4	GND	13	GND
5	USB_SSRX0-	14	USB_SSRX1-
6	USB_SSRX0+	15	USB_SSRX1+
7	GND	16	GND
8	USB_SSTX0-	17	USB_SSTX1-
9	USB_SSTX0+	18	USB_SSTX1+

The third USB 3.0 port is carried to a single Type-A, upright USB 3.0 receptacle, type LOTES p/n AUSB0043-P005C or equivalent.



USB 3.0 port #2 - CN10			
Pin	**Signal**	**Pin**	**Signal**
1	$+5V_{USB2}$	5	USB_SSRX2-
2	USB2-	6	USB_SSRX2+
3	USB2+	7	GND
4	GND	8	USB_SSTX2-
		9	USB_SSTX2+

Since these connectors are standard type-A receptacles, they can be connected to all types of USB 1.1 / USB 2.0 / USB 3.0 devices using Standard-A USB 3.0 or USB 2.0 plugs.

USB_SSTXx+ / USB_SSTXx+: USB Superspeed port #x transmitting output differential pair

USB_SSRXx+ / USB_SSRXx+: USB Superspeed port #x receiving input differential pair

USBx+ / USBx-: USB 2.0 Port #x differential pair

Common mode chokes are placed on all USB differential pairs for EMI compliance. For ESD protection, on all data and voltage lines are placed clamping diodes for voltage transient suppression.

Since these connectors are standard type receptacles, they can be connected to all types of USB 1.1 / USB 2.0 / USB 3.0 devices using Standard-A USB 3.0 or USB 2.0 plugs.

For USB 3.0 connections it is mandatory the use of SuperSpeed certified cables, whose SuperSpeed differential pairs are individually shielded inside the global cable's external shielding.

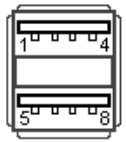
> **!** Please be aware that USB 3.0 connectivity can be obtained only in case that it is supported by the COM Express™ module plugged onto the Carrier Board.
>
> In case the COM Express™ module used doesn't offer one or all USB 3.0 ports, it will be always possible to use the corresponding USB 2.0 ports, simply by plugging an USB 2.0 cable.
>
> Avoid using USB 3.0 cables if the COM Express™ module used doesn't offer such an interface.

USB #4 #5 connector- CN5

Pin	Signal	Pin	Signal
1	$+5V_{USB4}$	5	$+5V_{USB5}$
2	USB4-	6	USB5-
3	USB4+	7	USB5+
4	GND	8	GND

Other than the USB 3.0 ports available through the standard connectors CN9 and CN10, there are other three USB 2.0 ports (#4, #5 and #7) coming out from COM Express™ module that can be used for the connection of external devices.

USB 2.0 ports #4 and #5 are available on a standard double Type-A receptacle.



Since this connector is a standard type receptacle, it can be connected to all types of USB 1.1 / USB 2.0 devices using Standard-A USB 2.0 cables.

USB #7 header- CN7

Pin	Signal
1	$+5V_{USB7}$
2	USB7-
3	USB7+
4	GND

The remaining USB 2.0 port (USB #7) is available on an internal 4-pin standard male pin header (CN7), p 2.54 mm, h= 6mm, with the pinout shown in the table on the left.

For the connection of standard devices to this pin headers, it is needed an adapter cable (common adapter cables for motherboard USB pin headers are suited for this purpose)

USB4+ / USB4-: USB 2.0 Port #4 differential pair.

USB5+ / USB5-: USB 2.0 Port #5 differential pair.

USB7+ / USB7-: USB 2.0 Port #7 differential pair.

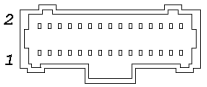
Common mode chokes are placed on all USB differential pairs for EMI compliance. For ESD protection, on all data and voltage lines are placed clamping diodes for voltage transient suppression.

3.3.12 Single/Dual Channel LVDS connector

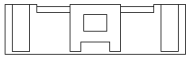
LVDS connector – CN34			
Pin	Signal	Pin	Signal
2	VDD_BKLT	1	VDD_LVDS
4	VDD_BKLT	3	VDD_LVDS
6	VDD_BKLT	5	VDD_LVDS
8	GND	7	3.3V_S
10	LVDS_A0+	9	GND
12	LVDS_A0-	11	LVDS_A1+
14	GND	13	LVDS_A1-
16	LVDS_A2+	15	GND
18	LVDS_A2-	17	LVDS_A3+
20	GND	19	LVDS_A3-
22	LVDS_A_CK+	21	GND
24	LVDS_A_CK-	23	LVDS_B0+
26	GND	25	LVDS_B0-
28	LVDS_B1+	27	GND
30	LVDS_B1-	29	LVDS_B2+
32	GND	31	LVDS_B2-
34	LVDS_B3+	33	GND
36	LVDS_B3-	35	LVDS_B_CLK+
38	GND	37	LVDS_B_CLK-
40	GND	39	GND
42	LVDS_BKLT_CTRL	41	LVDS_BKLT_EN
44	LVDS_VDD_EN	43	LVDS_BKLT_AN_CTRL
46	---	45	---
48	---	47	---
50	LVDS_I2C_CLK	49	LVDS_I2C_DAT

CCOMe-C30 board allows to interface to Single/Dual Channel 18-/24-bit displays, using the LVDS channel coming directly from the COM Express™ module.

The LVDS interface will be available on a connector type HR A1014WV-S-2x25P or equivalent (2 x 25p, male, straight, P1, low profile, polarised), with the pin-out shown in the table on the left.



Mating connector: HR A1014H-2X25P with HR A1014-T female crimp terminals.



Alternative mating connector, MOLEX 501189-5010 with crimp terminals series 501334.

On the same connectors, are also implemented signals for direct driving of display's backlight: voltages (VDD_BKLT and VDD_LCD) and control signals (LCD enable signal, LCD_VDD_EN, Backlight enable signal, LCD_BKLTEN, and Backlight Brightness Control signal, LCD_BKLT_PWM and LCD_BKLT_AN_CTRL).

When building a cable for connection of LVDS displays, please take care of twist as tight as possible differential pairs' signal wires, in order to reduce EMI interferences. Shielded cables are also recommended.

90Ω @ 100MHz common mode chokes are placed on all LVDS differential pairs for EMI reduction.

LVDS_A[0..3]+ / LVDS_A[0..3]-: COM Express Module LVDS Channel A Differential pairs

LVDS_A_CK+ / LVDS_A_CK-: COM Express Module LVDS Channel A Differential clock

LVDS_B[0..3]+ / LVDS_B[0..3]-: COM Express Module LVDS Channel B Differential pairs

LVDS_B_CK+ / LVDS_B_CK-: COM Express Module LVDS Channel B Differential clock

LVDS_I2C_DAT: COM Express Module Display ID Data line for LVDS flat Panel detection.

LVDS_I2C_CLK: COM Express Module Display ID Clock line for LVDS flat Panel detection

LVDS_VDD_EN: LVDS Panel power Enable Signal. Please check par. 3.3.13 for a description

LVDS_BKLT_EN: LVDS Panel's Backlight Enable Signal. Please check par. 3.3.13 for a description

LVDS_BKLT_CTRL: LVDS Panel Backlight Brightness Control, PWM signal. Please check par. 3.3.13 for a description

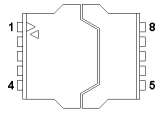
LVDS_BKLT_AN_CTRL: LVDS Panel Backlight Brightness Analog Dimming Control, derived from LVDS_BKLT_CTRL, for direct analogic control of backlights not supporting PWM.

JP10 position	Panel Interface Selector
Inserted	eDP
Not Inserted	LVDS

Since COM Express modules can offer eDP or LVDS interface on the same pins, these require a proper high-speed differential pair switch, which will make available LVDS interface on connector CN34 or eDP interface on connector CN33. Selectin between these two interfaces can be done by using Jumper JP10.

LVDS External EDID Flash Socket – CN35			
Pin	Signal	Pin	Signal
1	+3.3V_S	5	+3.3V_S
2	+3.3V_S	6	+3.3V_S
3	+3.3V_S	7	LVDS_I2C_CLK
4	GND	8	LVDS_I2C_DAT

On the carrier board is also embedded an 8-pin Flash Socket, type LOTES p/n ASPI0001-P001A, for the mounting of I2C EEPROMs in SO-8 format, which can be used to store LVDS DDC Data (to be used when it is not possible directly the DDC Channel available on connector CN34).



3.3.13 LCD Voltages and backlight control signals jumpers

On-board there are five 2-way jumpers used to set voltage level for signals driving LVDS Panel through connector CN34.

JP6 position	LVDS_BKLT_CTRL Voltage Level
Inserted	+5V_S
Not Inserted	+3.3V_S

JP8 position	LVDS_BKLT_EN Voltage Level
Inserted	+5V_S
Not Inserted	+3.3V_S

JP9 position	LVDS_VDD_EN Voltage Level
Inserted	+5V_S
Not Inserted	+3.3V_S

LVDS_VDD_EN and LVDS_BKLT_EN are respectively the LCD panel's and the Backlight's Enabled signals, controlled by the COM Express Modules directly.

LVDS_BKLT_CTRL is the PWM signal that can be used to manage the brightness of the LCD Panel, and is controlled by the COM Express Modules directly.

LVDS_BKLT_AN_CTRL is a +5V signal, derived from the PWM signal LVDS_BKLT_CTRL, for direct analogic control of backlights not supporting PWM.

Backlight PWM Control signal, i.e. signal LVDS_BKLT_CTRL, can also be regulated to be at +5V_S or +3.3V_S voltage level, using jumper JP6.

Similarly, backlight enable signal, LVDS_BKLT_EN, can be regulated to be at +5V_S or +3.3V_S voltage level, using jumper JP8.

In the same way, Panel enable signal, LVDS_VDD_EN, can be regulated to be at +5V_S or +3.3V_S voltage level, using jumper JP9.

JP17 position	VDD_LVDS Voltage Selector
1-2	+5V_S
2-3	+3.3V_S

The LCD panel voltage, i.e. signal VDD_LVDS, can be regulated to be +3.3V_S or +5V_S using jumper JP17.

JP16 position	VDD_BKLT Voltage Selector
1-2	+12V_S
2-3	+5V_S

The LCD backlight voltage, i.e. signal VDD_BKLT, can be regulated to be +12V_S or +5V_S, using jumper JP16.

3.3.14 eDP Connector

eDP connector – CN33			
Pin	**Signal**	**Pin**	**Signal**
1	PTN_PWR	21	VDD_LVDS
2	VDD_BKLT	22	VDD_LVDS
3	VDD_BKLT	23	VDD_LVDS
4	VDD_BKLT	24	GND
5	VDD_BKLT	25	eDP_AUX-
6	PTN_SMB_CLK	26	eDP_AUX+
7	PTN_SMB_DAT	27	GND
8	LVDS_BKLT_CTRL	28	eDP_TX0+
9	LVDS_BKLT_EN	29	eDP_TX0-
10	GND	30	GND
11	GND	31	eDP_TX1+
12	GND	32	eDP_TX1-
13	GND	33	GND
14	eDP_HPD	34	eDP_TX2+
15	GND	35	eDP_TX2-
16	GND	36	GND
17	GND	37	eDP_TX3+
18	GND	38	eDP_TX3-
19	---	39	GND
20	VDD_LVDS	40	---

JP13 position	External eDP-to-LVDS adapter
Inserted	Enabled
Not Inserted	Disabled

As mentioned in paragraph 3.3.12, the CCOMe-C30 carrier board is also able to manage eDP Displays, when jumper JP10 is in position.

For the connection of this kind of displays, on-board there is a VESA® certified connectors for embedded Display Port interface, type STARCONN p/n 300E40-0110RA-G3 or equivalent (microcoaxial cable connector, 0.5mm pitch, 40 positions).

On this connector, VDD_BKLT and VDD_LVDS are the voltage rails that can be used to supply the LCD and related Backlight Unit (please check par. 3.3.13)

Here following the signals involved in eDP management:

eDP_TX0+/eDP_TX0-: embedded DP differential data pair #0.

eDP_TX1+/eDP_TX1-: embedded DP differential data pair #1.

eDP_TX2+/eDP_TX2-: embedded DP differential data pair #2.

eDP_TX3+/eDP_TX3-: embedded DP differential data pair #3.

eDP_AUX+/eDP_AUX-: embedded DP auxiliary channel differential data pair.

eDP_HPD: embedded DP Hot Plug Detect. Active high signal.

LVDS_BKLT_EN: eDP Panel's Backlight Enable Signal. Please check par. 3.3.13 for a description

LVDS_BKLT_CTRL: eDP Panel Backlight Brightness Control, PWM signal. Please check par. 3.3.13 for a description

PTN_PWR: 3.3V_S derived voltage for external eDP-to-LVDS bridge adapter. This power rail will be enabled only in case jumper JP13 is placed, according to the table on the bottom of this page

PTN_SMB_CLK: SM Bus control clock line for external eDP-to-LVDS bridge adapter. Output signal, electrical level PTN_PWR.

PTN_SMB_DAT: SM Bus control data line for external eDP-to-LVDS bridge adapter. Bidirectional signal, electrical level PTN_PWR.

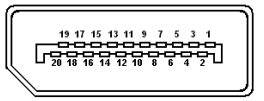
3.3.15 DisplayPort Connectors

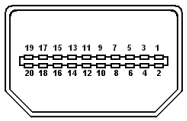
Multimode DP Connector - CN22			
Pin	**Signal**	**Pin**	**Signal**
1	DDI0_PAIR0+	2	GND
3	DDI0_PAIR0-	4	DDI0_PAIR1+
5	GND	6	DDI0_PAIR1-
7	DDI0_PAIR2+	8	GND
9	DDI0_PAIR2-	10	DDI0_PAIR3+
11	GND	12	DDI0_PAIR3-
13	DDI0_DDC_AUX_SEL	14	DDI0_CEC
15	DDI0_CTRLCLK_AUX+	16	GND
17	DDI0_CTRLDATA_AUX-	18	DDI0_HPD
19	GND	20	+3.3V_S

miniDP++ Connector #1- CN24			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	DDI1_HPD
3	DDI1_PAIR0+	4	DDI1_DDC_AUX_SEL
5	DDI1_PAIR0-	6	DDI1_CEC
7	GND	8	GND
9	DDI1_PAIR1+	10	DDI1_PAIR3+
11	DDI1_PAIR1-	12	DDI1_PAIR3-
13	GND	14	GND
15	DDI1_PAIR2+	16	DDI1_CTRLCLK_AUX+
17	DDI1_PAIR2-	18	DDI1_CTRLDATA_AUX-
19	GND	20	+3.3V_S

According to COM Express™ specifications, Type 6 pinout defines three Digital Display interfaces (DDI), that can be used to carry out DisplayPort and TMDS (HDMI/DVI) interface.

The first Digital Display Interface is carried out directly on a standard DisplayPort Connector, CN22, type WINNING p/n WDPE-20F3L1BU3 or equivalent, with the pinout shown in the following table.





The remaining two Digital Display interfaces coming from the COM Express™ module are carried to as many miniDP connectors type Jameco Electronics p/n MDPC-S-RA-KT-TR or equivalent, with the pinout shown in the following tables in this page

All these connectors can be used directly as a Multi-Mode Display Port connector, i.e. they can be used also for HDMI/DVI devices by using passive external adapters.

DDIx_PAIR0+/DDIx_PAIR0-: DDI Interface #x Differential Pair #0. Can be used as Display Port differential pair #0 or TMDS (HDMI) differential pair #2.

DDIx_PAIR1+/DDIx_PAIR1-: DDI Interface #x Differential Pair #1. Can be used as Display Port differential pair #1 or TMDS (HDMI) differential pair #1.

DDIx_PAIR2+/DDIx_PAIR2-: DDI Interface #x Differential Pair #2. Can be used as Display Port differential pair #2 or TMDS (HDMI) differential pair #0.

miniDP++ Connector #2- CN23			
Pin	Signal	Pin	Signal
1	GND	2	DDI2_HPD
3	DDI2_PAIR0+	4	DDI2_DDC_AUX_SEL
5	DDI2_PAIR0-	6	DDI2_CEC
7	GND	8	GND
9	DDI2_PAIR1+	10	DDI2_PAIR3+
11	DDI2_PAIR1-	12	DDI2_PAIR3-
13	GND	14	GND
15	DDI2_PAIR2+	16	DDI2_CTRLCLK_AUX+
17	DDI2_PAIR2-	18	DDI2_CTRLDATA_AUX-
19	GND	20	+3.3V_S

DDIx_PAIR3+/DDIx_PAIR3-: DDI Interface #x Differential Pair #3. Can be used as Display Port differential pair #3 or TMDS (HDMI) Clock differential pair.

DDIx_CTRLCLK_AUX+/DDIx_CTRLDATA_AUX-: DDI Interface #x, Auxiliary channel for Display Port (differential pair) or DDC Clock and Data Line for TMDS.

DDIx_HPD: DDI Interface #x Hot Plug Detect

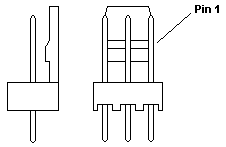
DDIx_DDC_AUX_SEL: DDI Interface #x Cable Adapter Detect signal. When this signal is detected high, then on the connector there is the TMDS interface (it means that a DP-to-HDMI adapter is connected).

DDIx_CEC: this signal is tied to GND through a 5.1MOhm resistor.

3.3.16 FAN Connector

FAN Connector - CN16	
Pin	Signal
1	GND
2	FAN_POWER
3	FAN_TACHO_IN

Depending on the usage model of systems based on CCOMe-C30 carrier board, for critical applications/environments it is available a 3-pin dedicated connector for an external +12V_{DC} FAN.



FAN Connector is a 3-pin single line SMT connector, type MOLEX 22-27-2031 or equivalent, with pinout shown in the table on the left.

Mating connector: MOLEX 22-01-2035 receptacle with MOLEX 2759 or 4809 KK® crimp terminals.

Please be aware that the use of an external fan depends strongly on customer's application/installation. Fan Speed control must be supported by COM Express™ module through signals FAN_TACHIN and FAN_PWMOUT

Please refer to chapter 4.1 for considerations about thermal dissipation.

FAN_POWER: +12V_S derived power rail for FAN, managed by PWM signal FAN_PWMOUT coming from COM Express™ connector.

FAN_TACHO_IN: tachometric input from the fan to the COM Express™ module

3.3.17 Audio Section

CCOMe-C30 integrates a High Definition Audio Codec, Realtek ALC262-VD2-GR, for high quality audio implementation.

HD Audio Front Panel Header – CN20			
Pin	**Signal**	**Pin**	**Signal**
1	Mic_In_L	2	Audio_GND
3	Mic_In_R	4	---
5	Line_Out_R	6	Sense1_Return
7	Audio_GND		
9	Line_Out_L	10	Sense2_Return

In order to give the maximum flexibility to CCOMe-C30 carrier board, it is available a dedicated 9-pin 2.54mm pitch Pin header for external connection of a Line Out output and a Mic In input.

Pinout hereby shown is compliant to "Intel® Front Panel I/O connectivity Design Guide" specifications, par. 2.3.5 Table 7.

Using this dedicated connector, it will be possible to connect any Azalia compliant panel audio jack to remote audio connectors in the preferred position.

Alternatively, it is also possible to buy SECO's dedicated front panel module, which offers two standard audio jacks, two pushbuttons (for reset and power on) and two LEDs, for SATA activity and Power status signalling. Please also check chapter 4.2.1 for further details.

Signals Description:

Mic_In_L: Microphone Left Channel.

Mic_In_R: Microphone Right Channel.

Sense1_return: Microphone Jack detection return signal.

Line_Out_L: Line Out Left Channel.

Line_Out_R: Line Out Right Channel.

Sense2_return: Line Out Jack detection return signal.

3.3.18 COM Ports Pin Header

COM ports pin header - CN15			
Pin	Signal RS-232 mode	Signal RS-422 mode	Signal RS-485 mode
1	COM1_RxD	COM1_Rx+	
2	COM2_RxD	COM2_Rx+	
3	COM1_TxD	COM1_Tx-	COM1_Rx-/COM1_Tx-
4	COM2_TxD	COM2_Tx-	COM2_Rx-/COM2_Tx-
5		GND	
7	COM1_RTS#	COM1_Tx+	COM1_Rx+/COM1_Tx+
8	COM2_RTS#	COM2_Tx+	COM2_Rx+/COM2_Tx+
9	COM1_CTS#	COM1_Rx-	
10	COM2_CTS#	COM2_Rx-	

Interfaced to the LPC Bus coming from the COM Express™ module, on CCOMe-C30 Carrier board there is a Dual LPC UART bridge, which allows the implementation of two legacy COM Ports.

These two COM ports are made externally accessible through two multistandard transceiver, which allows using them in RS-232, RS-422 or RS-485 mode.

These ports are available on dedicated connector CN19, which is an internal 9-pin standard male pin header, p 2.54 mm, 5+4 pin, h= 6mm, type NELTRON p/n 2213S-10G-E06 or equivalent.

Selection of working mode is made using jumpers JP3 and JP4, which are standard pin headers, P2.54mm, 1x3 pin.

According to the working mode selected via jumpers JP3 and JP4, the pinout of the connector (a dual row p.254mm 9-pin header) is as described in the following table.

JP3 position	COM #1 Working Mode
1-2	RS-422
2-3	RS-232
Not Inserted	RS-485

JP4 position	COM #2 Working Mode
1-2	RS-422
2-3	RS-232
Not Inserted	RS-485

3.3.19 LPC Debug header

LPC Pin Header - CN30			
Pin	Signal	Pin	Signal
1	LPC_AD3	2	+3.3V_S
3	LPC_AD2	4	LPC_FRAME#
5	LPC_AD1	6	LPC_RST#
7	LPC_AD0	8	LPC_CLK
9	GND	10	N.C.

The LPC signals coming out from COM Express™ card edge connector are also carried out on a dual row, 10 pin, P2.54mm standard pin header, with the pinout shown in the table on the left.

The signals here available can be used for Debug Purpose, like to connect a POST code display.

3.3.20 Feature internal pin header

Feature internal pin header - CN18			
Pin	Signal	Pin	Signal
1	+3.3V_A	2	+3.3V_S
3	SMB_CK	4	I2C_CK
5	SMB_DAT	6	I2C_DAT
7	GND	8	+5V_S
9	SER1_TX	10	SER0_TX
11	SER1_RX	12	SER0_RX
13	GND	14	GND

For further expandability of the system, on board there is an expansion connector, which carries out the signals related to I2C bus, SM Bus and the two UARTs available on COM Express™ card edge connector. These signals allow implementing, through external expansion modules, further functionalities that are not already realised by the carrier board.

For this purpose, it is available a dual row, 14 pin, P2.54mm standard pin header, with the pinout shown in the table on the left.

All the signals available on this connector come out directly from the COM Express™ connector; please check the related table for a description of the signals.

3.3.21 Switch / LED header interface

Switch / LED Header Interface - CN19			
Pin	Signal	Pin	Signal
1	HD_LED_P	2	FP PWR_P/SLP_N
3	HD_LED_N	4	FP PWR_N/SLP_P
5	RST_SW_N	6	PWR_SW_P
7	RST_SW_P	8	PWR_SW_N
9	+5V_S		

To allow the integration of a CCOMe-C30 based system inside a box PC-like, there is a connector on the carrier board that allows to remote signals for the Power Button (to be used to put the system in a Soft Off State, or awake from it), for the Reset Button, and the signal for optional LED signalling activity on SATA Channel and Power On states.

The pinout of this connector complies with Intel® Front Panel I/O connectivity Design Guide, Switch/LED Front Panel section, chapter 2.2. It is shown in the table on the left.

Connector CN19 is an internal 9-pin standard male pin header, p 2.54 mm, 5+4 pin, h= 6mm, type NELTRON p/n 2213S-10G-E10 or equivalent.

Signals Description:

HD_LED_P: Hard Disk Activity LED signal's pull-up to +5V_S voltage (510Ω pull-up).

HD_LED_N: Hard Disk Activity LED output signal.

RST_SW_N: Reset Switch GND.

RST_SW_P: Reset switch input signal. This signal has to be connected to an external momentary pushbutton (contacts normally open). When the pushbutton is pressed, the pulse of Reset signal will cause the reset of the board.

PWR_SW_P: Power switch input signal, open drain. This signal has to be connected to an external momentary pushbutton (contacts normally open). Upon the pressure of this pushbutton, the pulse of this signal will let the switched voltage rails turn on or off.

PWR_SW_N: Power Switch GND.

FP PWR_P/SLP_N: Power/Sleep messaging LED terminal 1 with 510Ω pull-up resistor to +5V_A voltage. Connect it to an extremity of a dual-colour power LED for power ON/OF, sleep and message waiting signalling. Please refer to Intel® Front Panel I/O connectivity Design Guide, chapter 2.2.4, for LED functionalities and signal meaning.

FP PWR_N/SLP_P: Power/Sleep messaging LED terminal 2 with 510Ω pull-up resistor to +5V_A voltage. Connect it to the other extremity of the dual-colour power LED above mentioned.

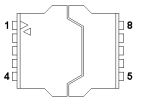
Please be aware that the power switch input signal and the reset switch input signal are also managed directly on the carrier board by the two pushbuttons SW1 and SW2 (respectively), so it is not mandatory to connect them externally using CN19.

As already written in the previous paragraph dedicated to Audio interface, it is also possible to buy SECO's dedicated front panel module, which offers two standard audio jacks, two pushbuttons (for reset and power on) and two LEDs, for SATA activity and Power status signalling. Please also check chapter 4.2.1 for further details.

3.3.22 External BIOS Flash Socket

External BIOS Flash socket - CN36			
Pin	**Signal**	**Pin**	**Signal**
1	SPI_CS#	8	SPI_POWER
2	SPI_MISO	7	SPI_HOLD#
3	SPI_WP#	6	SPI_CLK
4	GND	5	SPI_MOSI

In case that an external Flash is needed, then on the carrier board it is provided an 8-pin SOIC socket for the housing of SPI Flashes.



Socket is type LOTES p/n ACA-SPI-004-K0 or equivalent, p. 1.27mm, with the pinout shown in the table on the left.

Almost all signals on this socket come directly from COM Express™ connector CN1, with the following exceptions:

SPI_WP#: this signal is tied, through a 10kΩ resistor, to SPI_POWER signal. This means that when the Flash is powered, the protection from writing is automatically removed.

SPI_HOLD#: this signal too is tied, through a 10kΩ resistor, to SPI_POWER signal. This means that when the Flash is powered, the Hold condition of serial communication is automatically removed.

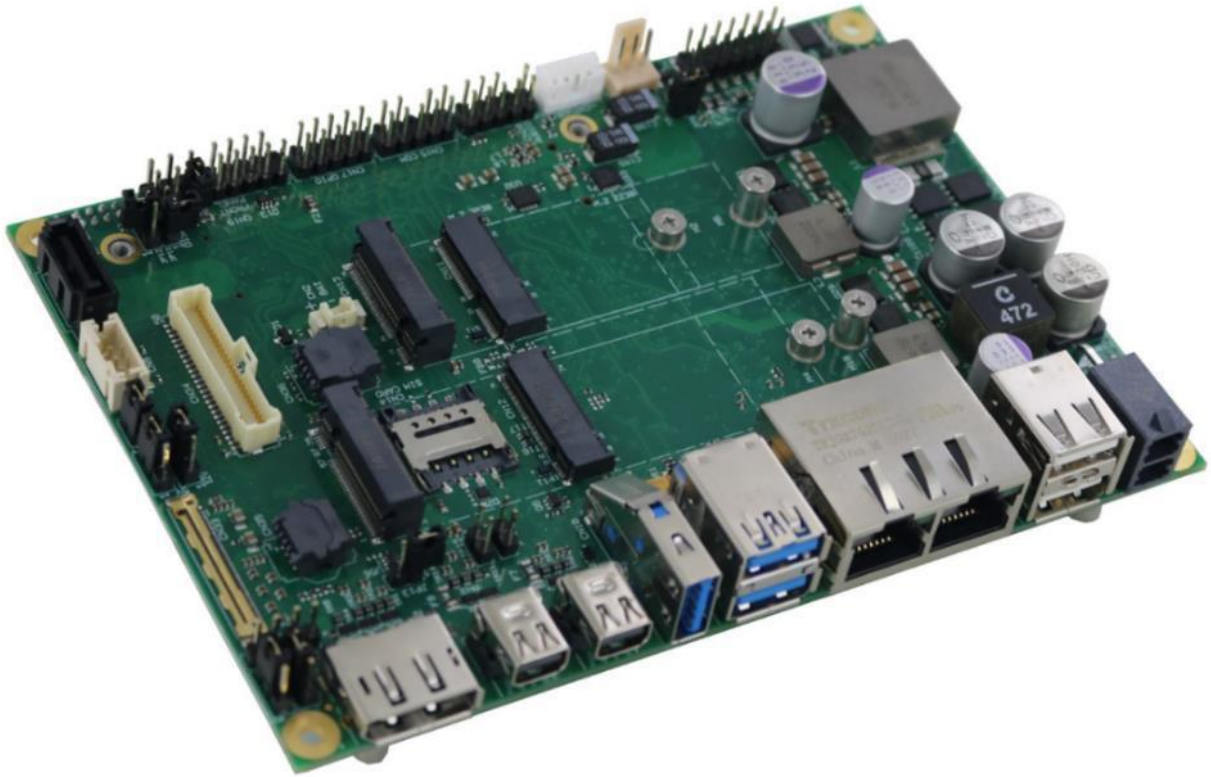
3.3.23 BIOS disable signals

According to COM Express™ specifications, there are two jumpers JP11 and JP12, which allow configuring the BIOS_DIS[0..1]# signals according to the table below.

JP12 position	JP11 position	Chipset SPI CS1# Destination	Chipset SPI CS0# Destination	Carrier SPI_CS#	SPI Descriptor	BIOS Entry
Not inserted	Not inserted	Module	Module	High	Module	SPI0/SPI1
Not inserted	Inserted	---	---	High	---	Not used
Inserted	Not inserted	Module	Carrier	SPI0	Carrier	SPI0/SPI1
Inserted	Inserted	Carrier	Module	SPI1	Module	SPI0/SPI1

Chapter 4.
Appendices

- Thermal Design
- Accessories



4.1 Thermal Design

A parameter that has to be kept in very high consideration is the thermal design of the system.

Highly integrated modules, like COM Express™ modules, offer to the user very good performances in minimal spaces, therefore allowing the systems' minimisation. On the counterpart, the miniaturising of IC's and the rise of operative frequencies of processors lead to the generation of a big amount of heat, that must be dissipated to prevent system hang-off or faults.

COM Express™ specifications take into account the use of a heatspreader, which will act only as thermal coupling device between the COM Express™ module and an external dissipating surface/cooler. The heatspreader also needs to be thermally coupled to all the heat generating surfaces using a thermal gap pad, which will optimise the heat exchange between the module and the heatspreader.

The heatspreader is not intended to be a cooling system by itself, but only as means for transferring heat to another surface/cooler, like heatsinks, fans, heat pipes and so on.

Conversely, heatsinks in some situation can represent a cooling solution. Until the modules are used on a development Carrier board, on free air, just for software development and system tuning, then a finned heatsink with fan could be sufficient for modules' cooling. Anyhow, please remember that all depends also on the workload of the processor. Heavy computational tasks will generate much heat.

Indeed, when using CCOMe-C30 carrier board with any COM Express™ module, it is necessary to consider carefully the global heat generated by the system, and the scenario of utilisation.

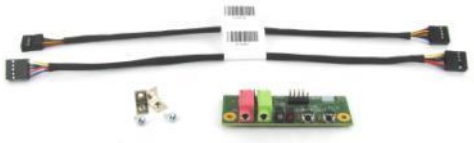
Therefore, it is always necessary that the customer study and develop accurately the cooling solution for his system, by evaluating processor's workload, utilisation scenarios, the enclosures of the system, the air flow and so on. This is particularly needed for industrial grade modules.

SECO can provide COM Express™ modules' specific heatspreaders and heatsinks (active and passive), but please remember that their use must be evaluated accurately inside the final system (electronics + mechanics), and that they should be used only as a part of a more comprehensive ad-hoc cooling solutions, which also keeps the surface temperature of all carrier board's components in the temperature range specified for the specific carrier board configuration (industrial or commercial grade).

4.2 Accessories

SECO can offer the following accessories in completion of CCOMe-C30 functionalities

4.2.1 Front Panel I/O board



As described in paragraphs 3.3.17 and 3.3.21, SECO can provide a specific module, the *Front Panel I/O board* V995, which allows to remote on a panel of an optional enclosure two Audio jacks (Headphone and Mic in), Reset Button, Power button and two LED (for SATA activity and Power Status of the board itself).

For fixing of the front panel I/O board to the external enclosure's panel, the module is equipped with two brackets and screws for the fixing of the brackets to the module.

Please be aware that this module is useful only for remoting the buttons and the audio jacks, but it is not needed for working of CCOMe-C30 board.

Indeed, Power and Reset button functionalities are ensured also by the two pushbuttons SW1 and SW2 embedded on the carrier itself. Only the Audio functionalities are not directly exploitable on the carrier board.

Ordering Code	Description
V995-0000-0000-C0	Front Panel I/O board

4.2.2 USB-to-Serial port converter modules

This optional module can be used to convert the internal USB port available on connector CN7 into a serial port, which can be of RS-232, RS-422 or RS-485 type.

Depending on the type of serial port needed, different module configurations are available; moreover, the output of the module can be available on standard DB-9 male connector or on RJ-45 sockets.

Using these modules, it will be possible to have additional serial ports, other than those available on connector CN27.

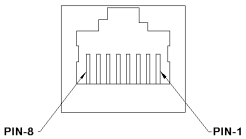
Modules with DB-9 connector			
Pin	Signal RS-232 converter	Signal RS-422 converter	Signal RS-485 converter
1	DCD#	N.C.	N.C.
2	RX	RX-	N.C.
3	TX	TX-	RX- / TX-
4	DTR#	N.C.	N.C.
5	GND	GND	GND
6	DSR#	N.C.	N.C.
7	RTS#	TX+	RX+ / TX+
8	CTS#	RX+	N.C.
9	RI#	N.C	N.C.

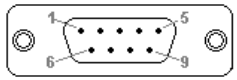
Modules with RJ-45 socket			
Pin	Signal RS-232 converter	Signal RS-422 converter	Signal RS-485 converter
1	DTR#	N.C.	N.C.
2	CTS#	RX+	N.C.
3	N.C.	N.C.	N.C.
4	RX	RX-	N.C.
5	N.C.	N.C.	N.C.
6	TX	TX-	RX- / TX-
7	GND	GND	GND
8	RTS#	TX+	RX+ / TX+

All modules type mounts an FTDI FT232R USB-to-Serial UART interface IC; RS-232 converter module then mounts a Serial Port RS-232 Transceiver with 15kV ESD protection. Instead, the other converters mount an RS-485/RS-422 transceiver.

In the table on the left are shown the pinout of DB-9 connector and of RJ-45 socket for all kind of modules.

120Ω termination resistors on differential pairs are available both on RS-422 and on RS-485 modules.





Ordering Code	Description
VA13-0000-1100-C0	USB to RS232 serial port converter with DB9 connector
VA13-0000-1200-C0	USB to RS422 serial port converter with DB9 connector
VA13-0000-1300-C0	USB to RS485 serial port converter with DB9 connector
VA13-0000-2100-C0	USB to RS232 serial port converter with RJ-45 connector
VA13-0000-2200-C0	USB to RS422 serial port converter with RJ-45 connector
VA13-0000-2300-C0	USB to RS485 serial port converter with RJ-45 connector

4.2.3 eDP-to-LVDS converter

This optional module has been designed to convert the eDP interface available on connector CN33 into a Single or Dual Channel 18- / 24-bit LVDS interface by using an NXP PTN3460I eDP to LVDS bridge.

eDP connector - CN2			
Pin	**Signal**	**Pin**	**Signal**
1	---	21	SW_VDD
2	GND	22	---
3	---	23	GND
4	---	24	GND
5	GND	25	GND
6	---	26	GND
7	---	27	eDP_HPD
8	GND	28	GND
9	eDP_TX1-	29	GND
10	eDP_TX1+	30	GND
11	GND	31	GND
12	eDP_TX0-	32	---
13	eDP_TX0+	33	eDP_BLT_CTRL
14	GND	34	PTN_SMB_DAT
15	eDP_AUX+	35	PTN_SMB_CLK
16	eDP_AUX-	36	SW_BACK
17	GND	37	SW_BACK
18	SW_VDD	38	SW_BACK
19	SW_VDD	39	SW_BACK
20	SW_VDD	40	3.3V_S

The eDP interface of the module is carried to another VESA® certified connectors for embedded Display Port interface, type STARCONN p/n 300E40-0110RA-G3 or equivalent (microcoaxial cable connector, 0.5mm pitch, 40 positions). It is the same identical connector to CCOMe-C30 board's connector CN33. The pinout is shown in the table on the left.

Only 2-lane eDP interface is required for this module.

For signals' description please refer to paragraph 3.3.14

SW_VDD and SW_BACK voltages are used only to drive the display, they are not used for module's working (see further on).

All the signals necessary for working of the eDP to LVDS converter module can be found on connector CN2, which can be paired to CCOMe-C30 board using a 1:1 direct cable connection.

I2C female connector - CN4				I2C male connector - CN5			
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
2	---	1	+3.3V_A	1	---	2	+3.3V_A
4	GP_I2C_CLK	3	---	3	GP_I2C_CLK	4	---
6	GP_I2C_DAT	5	---	5	GP_I2C_DAT	6	---
8	GND	7	GND	7	GND	8	GND
10	---	9	LVDS_RST#	9	---	10	LVDS_RST#
12	---	11	---	11	---	12	---
14	---	13	---	13	---	14	---
16	---	15	---	15	---	16	---

For the occurrences when the module is paired to different boards, or when the SM_Bus is not working / connectable on connector CN2, then the module offers also the possibility of connecting to another board's I2C interface using a dedicated 16-pin connector. Such a connector is available in two factory option, as a male 2x8 pin header p 2.54mm h= 6mm (CN5), or as a female 2x8 pin connector, p2.54mm, h=11.04mm type NELTRON p/n 2214123-16G10-1B-32 (CN4) for piggyback connection

GP_I2C_CLK: General Purpose I2C Clock line

GP_I2C_DAT: General Purpose I2C Data line

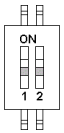
LVDS_RST#: General purpose Input signal. Can be used for LVDS section's reset. 3.3V input signal with 100kΩ pull-up resistor, active low.

The I2C bus available on connectors CN4/CN5 can be used in alternative to SM Bus interface available on connector CN2 to manage the eDP to LVDS bridge.

It is necessary to configure properly the module in order to use the General Purpose I2C bus (CN4/CN5) or SM Bus (CN2). The selection must be made using module's dip switch SW1

SW1 Switch	ON Position	OFF Position
1	SM Bus used	GP_I2C used
2	eDP-to-LVDS bridge acts as I2C bus slave	eDP-to-LVDS bridge acts as I2C bus master, can read from external EEPROM

Setting of these signals can be made according to the table on the left.

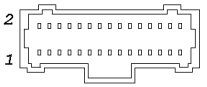


When MC30's jumper JP13 is placed, it is suggested to set both SW1 switches in position ON. The COM express module plugged on MC30 Carrier, however, must be able to support the eDP to LVDS bridge through its SM Bus interface

LVDS connector - CN3			
Pin	Signal	Pin	Signal
1	GND	2	GND
3	LVDS_ODD_TX3+	4	LVDS_EVEN_TX3+
5	LVDS_ODD_TX3-	6	LVDS_EVEN_TX3-
7	LVDS_ODD_TX2+	8	LVDS_EVEN_TX2+
9	LVDS_ODD_TX2-	10	LVDS_EVEN_TX2-
11	LVDS_ODD_TX1+	12	LVDS_EVEN_TX1+
13	LVDS_ODD_TX1-	14	LVDS_EVEN_TX1-
15	LVDS_ODD_TX0+	16	LVDS_EVEN_TX0+
17	LVDS_ODD_TX0-	18	LVDS_EVEN_TX0-
19	GND	20	GND
21	LVDS_ODD_CLK+	22	LVDS_EVEN_CLK+
23	LVDS_ODD_CLK-	24	LVDS_EVEN_CLK-
25	GND	26	GND
27	LVDS_DDC_CLK	28	BKLT_EN
29	LVDS_DDC_DATA	30	eDP_BLT_CTRL
31	+3.3V	32	VDD_ON
33	SW_VDD_LVDS	34	SW_BACK_LVDS
35	SW_VDD_LVDS	36	SW_BACK_LVDS
37	SW_VDD_LVDS	38	SW_BACK_LVDS
39	GND	40	GND
41	GND	42	GND
43	GND	44	GND
45	---	46	---
47	---	48	---
49	+3.3V	50	GND

Modulated (PWM) regulations.

The LVDS interface is available on a connector type HR A1014WVA-S-2x25P or equivalent (2 x 25p, male, straight, P1, low profile, polarised) is provided, with the pin-out indicated in the following table (different configurations are shown).



Mating connector: HR A1014H-2X25P with HR A1014-T female crimp terminals.

Alternative mating connector, MOLEX 501189-5010 with crimp terminals series 501334.

When building a cable for connection of LVDS displays, please take care of twist as tight as possible differential pairs' signal wires, in order to reduce EMI interferences. Shielded cables are also recommended.

Here following the signals related to LVDS management:

LVDS_ODD_TX0+/ LVDS_ODD_TX0-: LVDS Odd Channel differential data pair #0.

LVDS_ODD_TX1+/ LVDS_ODD_TX1-: LVDS Odd Channel differential data pair #1.

LVDS_ODD_TX2+/ LVDS_ODD_TX2-: LVDS Odd Channel differential data pair #2.

LVDS_ODD_TX3+/ LVDS_ODD_TX3-: LVDS Odd Channel differential data pair #3.

LVDS_ODD_CLK+/LVDS_ODD_CLK-: LVDS Odd Channel differential Clock.

LVDS_EVEN_TX0+/ LVDS_EVEN_TX0-: LVDS Even Channel differential data pair #0.

LVDS_EVEN_TX1+/ LVDS_EVEN_TX1-: LVDS Even Channel differential data pair #1.

LVDS_EVEN_TX2+/ LVDS_EVEN_TX2-: LVDS Even Channel differential data pair #2.

LVDS_EVEN_TX3+/ LVDS_EVEN_TX3-: LVDS Even Channel differential data pair #3.

LVDS_EVEN_CLK+/LVDS_EVEN_CLK-: LVDS Even Channel differential Clock.

LVDS_DDC_DAT: DisplayID DDC Data line for LVDS flat Panel detection. Bidirectional signal, electrical level +3.3V_S with a 4k7Ω pull-up resistor.

LVDS_DDC_CLK: DisplayID DDC Clock line for LVDS flat Panel detection. Bidirectional signal, electrical level +3.3V_S with a 4k7Ω pull-up resistor.

BKLT_EN: +3.3V electrical level Output, Backlight Enable signal. It can be used to turn On/Off the backlight's lamps of connected displays.

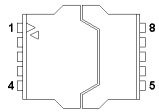
VDD_ON: +3.3V electrical level Output, Panel Power Enable signal. It can be used to turn On/Off the connected display.

eDP_BLT_CTRL: this signal can be used to adjust the backlight brightness in displays supporting Pulse Width

Display supply voltages (SW_VDD_LVDS) and backlight supply voltage (SW_BACK_LVDS) are derived by SW_VDD and SW_BACK voltages, carried to the module through the eDP connector CN2, simply by turning them On and Off using signals LVDS_VDD_ON and LVDS_BKLT_EN managed by the PTN3460IBS eDP to LVDS bridge.

LVDS External EDID Flash Socket – CN6			
Pin	**Signal**	**Pin**	**Signal**
1	GND	5	+3.3V_S
2	GND	6	+3.3V_S
3	GND	7	LVDS_I2C_CLK
4	GND	8	LVDS_I2C_DAT

Finally, on the module is also embedded an 8-pin Flash Socket, type LOTES p/n ASPI0001-P001A, for the mounting of I2C EEPROMs in SO-8 format, which can be used to store LVDS DDC Data (to be used when it is not possible to use directly the DDC Channel available on module's connector CN3. In this case, dip switch #2 on SW1 must be set to OFF).



4.2.4 Accessories kit CABKITC30

This accessories kit includes the following items:

- *Front Panel /I/O board* V995 already described in 4.2.1
- Cables for connection of the *Front Panel /I/O board* to CCOMe-C30 board:
  - Connection cable CV-837/30 is needed for audio functionalities; it has to be connected to CCOMe-C30 board's connector CN20 and to V995 module's connector CN2.
  - Connection cable CV-836/30 is needed for connection of power and reset pushbuttons and SATA / power LEDs; it has to be connected to CCOMe-C30 board's connector CN19 and to V995 module's connector CN1.
- Serial adapter cable CV-904/20REVB. It can be used to carry out the signals of RS-232/RS-422/RS-485 signals available on the connector CN15 to two standard DB-9 male connectors.
- SATA power cable, for connection of power rails of external SATA disks / SSDs to internal SATA power connector CN8
- Cables for connection of power supply:
  - Connection cable CV-1085/150: adapter cable from Molex Mega-Fit 2-pin connector to Molex Mini-Fit 2x2 connector
  - Connection cable CV-1080/300 for connection of power connector CN4 to external PSU with terminal block connection

SECO S.p.A. - Via A. Grandi, 20
52100 Arezzo - ITALY
Ph: +39 0575 26979 - Fax: +39 0575 350210
www.seco.com