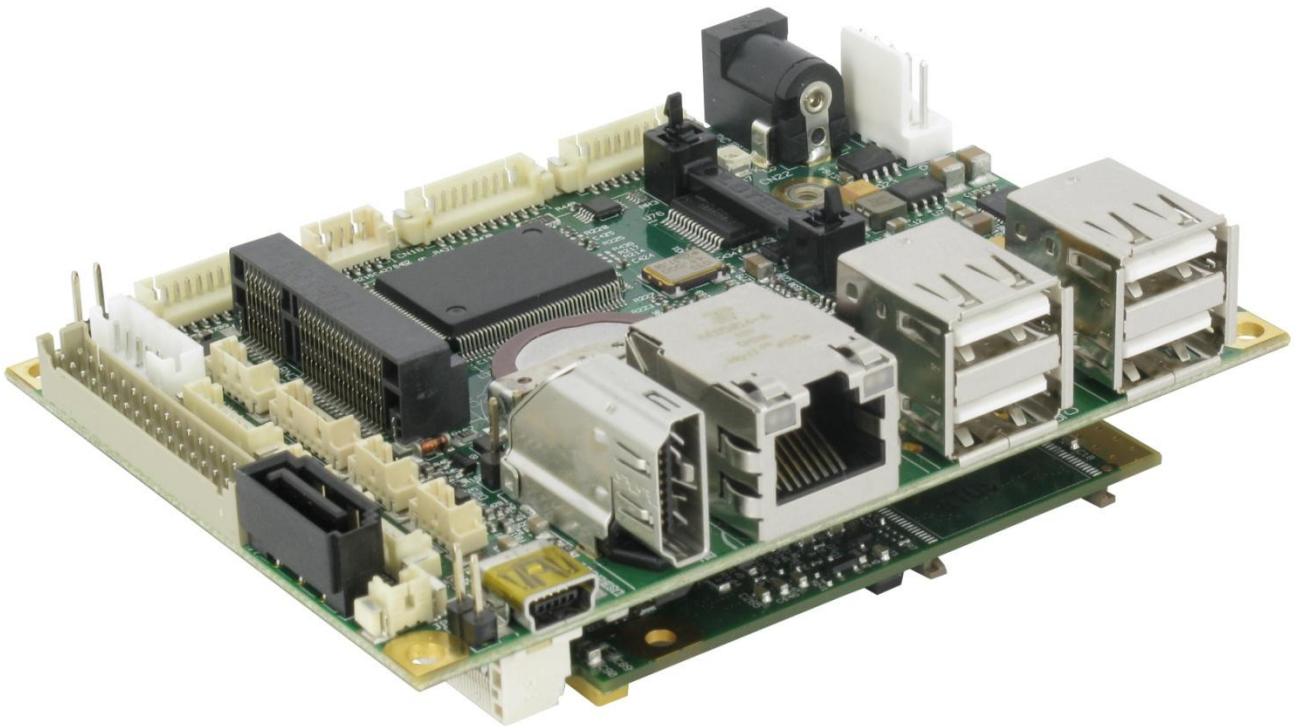


SECOCQ7-pITX-XBoard

Carrier Board for Qseven® Quadmo747 modules on Pico ITX form factor



User Manual



SECOCQ7-pITX/Xboard

REVISION HISTORY

Revision	Date	Note	Rif.
1.0	8 th March 2012	First version	SB

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Our team will be pleased and ready to assist you.

SECO Srl - Via Calamandrei 91
52100 Arezzo – ITALY
Ph: +39 0575 26979 - Fax: +39 0575 350210
<http://www.seco.com>
<http://www.secoqseven.com>

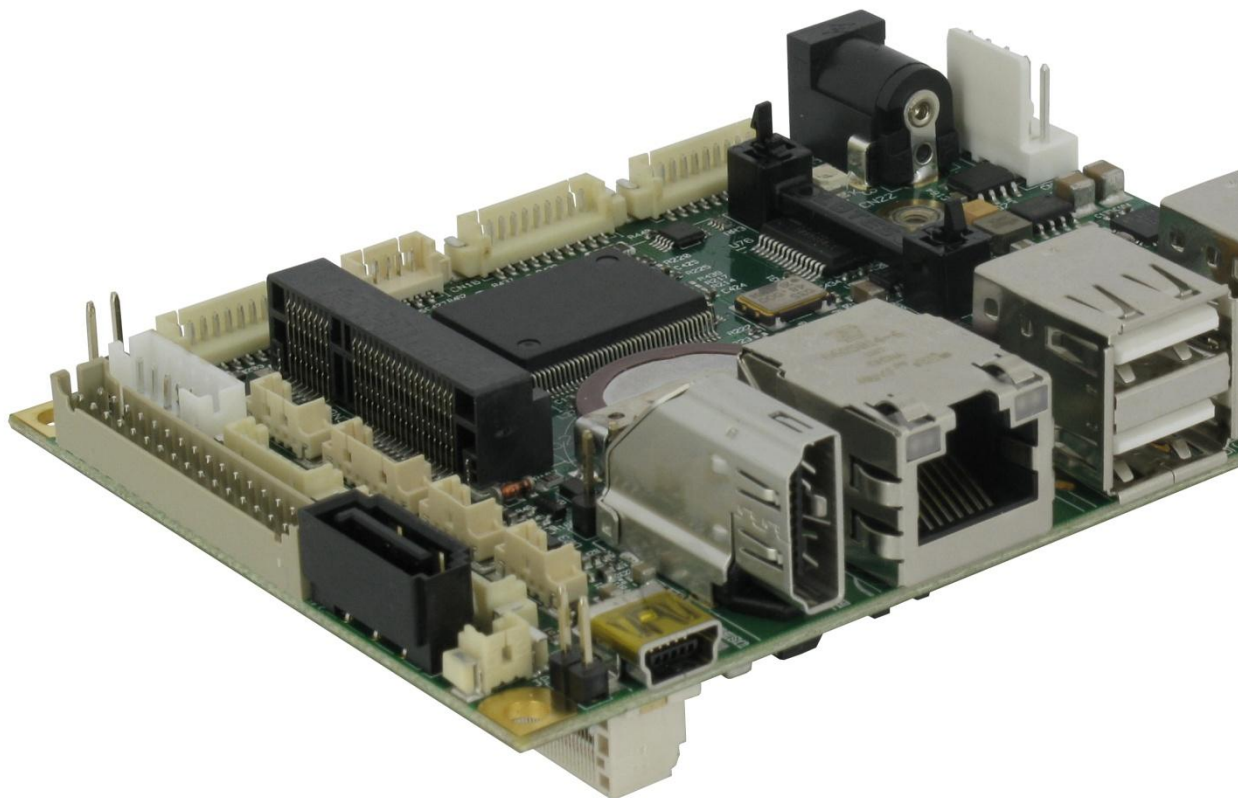


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Chapter 1 INTRODUCTION

- **Warranty**
- **Information and assistance**
- **RMA number request**
- **Safety**
- **Electrostatic Discharges**
- **RoHS compliance**



1.1 Warranty

This product is subject to Italian law D. Lgs 24/2002, acting European Directive 1999/44/CE on arguments of sale and warranties to consumer.

The warranty for this product lasts 1 year

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

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

Items cannot be returned unless formerly authorised by the supplier.

The authorisation is released after compiling the specific form available on the web-site <http://www.seco.com> (RMA Online). Authorisation number for returning the item must be put both on the packaging and on the documents brought with the items, which have to be not damaged, not tampered, with all accessories in their original packaging.

Error analysis form identifying the fault type has to be compiled by the customer and has to be sent in the packaging of the returned item.

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

The supplier, after a technical analysis, will verify if all the requirements for warranty service are met. If warranty cannot be applied, he calculates the minimum cost of this initial analysis on the item and the repairing costs. Costs for replaced components will be calculated aside.

Warning!



All changes or modifications to the equipment not clearly approved by SECO S.r.l. could impair equipment's functionality and lead to the expire of the warranty

1.2 Information and assistance

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

SECO S.r.l. offers the following services:

- **SECO website:** visit <http://www.secoqseven.com> to receive the last information on the product. In most of the cases you can find useful information to resolve your problem.
- **SECO reseller:** the reseller or agent can help you in determining the exact cause of the problem and search the best solution for it.
- **SECO Help-Desk:** contact SECO Technical Assistance.

A technician is at your disposal to understand the exact origin of the problem and suggest the right solution.

E-mail: technical.service@seco.com

Fax (+39) 0575 340434

- **Repairing centre:** it is possible to send the faulty product to SECO Repairing Centre. In this case, follow this procedure:
 - Returned items have to be provided with RMA Number. Items sent without RMA number will be not accepted.
 - Returned items have to be packed in the appropriate manner. SECO is not responsible for damages caused by accidental drop, improper usage, or customer neglects.

Note: We ask to prepare 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 (operative system, version, application software, etc.);
- A complete description of the problem;
- The exact words of every kind of error message received

1.3 RMA number request

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

You will receive an RMA Number within 1 working day (only for on-line RMA request).

1.4 Safety

SECOCQ7-pITX/Xboard module uses only extremely-low voltages.

While handling the board, it is necessary to be careful in order 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.

Don't use metallic components, like paper clips, screws and similar, near the board, when this is supplied, to avoid short circuits due to unwanted contacts with other components of the board.

Never connect the board to an external power supply unit or battery, if the board has become wet.

Make sure that all cables are correctly connected and are not damaged.

1.5 Electrostatic Discharges

SECOCQ7-pITX/Xboard, like any other electronic product, is an electrostatic sensitive device and some device on-board could be damaged by high voltages caused by static electricity.

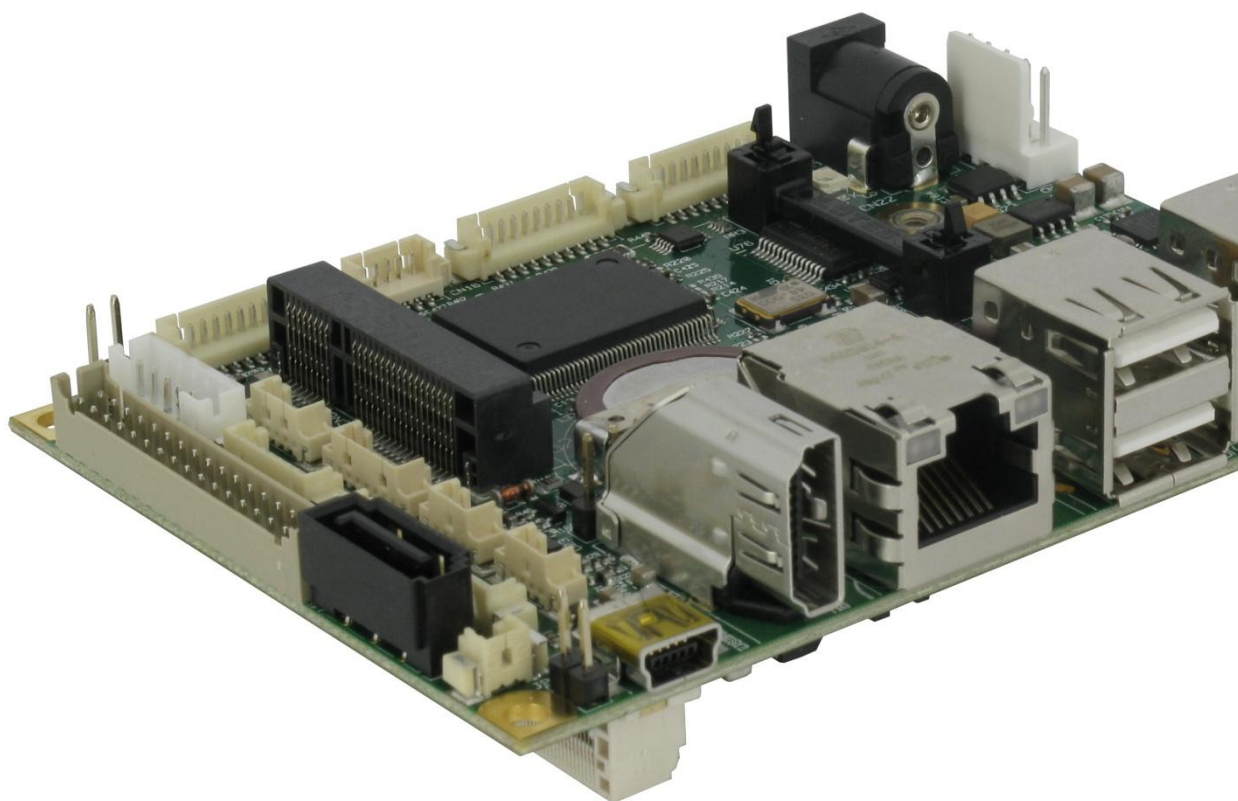
So whenever handling a SECOCQ7-pITX/Xboard, take care to ground yourself through an anti-static wrist strap. Placement of the board on an anti-static surface is also highly recommended.

1.6 RoHS compliance

SECOCQ7-pITX/Xboard is designed using RoHS compliant components and is manufactured on a lead-free production line. It is therefore fully RoHS compliant.

Chapter 2 OVERVIEW

- **Introduction**
- **Technical Specifications**
- **Mechanical specifications**
- **Electrical specifications**



2.1 Introduction

SECOCQ7-pITX/Xboard is a carrier board, designed in picolTX form factor, intended for the use with any Qseven[®] CPU module.

Qseven[®] is a new form factor, designed to minimise space consumption, since it integrates in only 70x70mm of space all core components of a common PC (CPU, RAM, Graphic, audio, etc...). All the functionalities are made available through a standardised card edge connector, from which all signals can be taken and carried to the appropriate external connector in the carrier board and/or to other internal component, to implement more functionalities other than included in the standard Qseven[®] bus interface.

The connection to the Qseven[®] board is implemented through a standardised MXM connector, which is a proven high speed signal interface connector.

All the features implemented on SECOCQ7-pITX/Xboard are implemented according to Qseven[®] standard bus interface, so the board can be used with any Qseven[®] module without incompatibilities and/or loss of functionalities.

The board has been specifically designed for taking advantage of all possible features that can be offered by x86 and/or ARM architectures on Qseven[®] modules.

SECOCQ7-pITX-Xboard is specially designed for being both an advanced development board, for skilled users who want to design their own carrier boards, and a good solution for mass production, for customers whose needing are satisfied by this compact and versatile Carrier Board.

It is also available in EXTREME version, with all the components mounted onboard certified for industrial temperature range.

To learn more about Qseven[®] standard: <http://www.qseven-standard.org>

2.2 Technical Specifications

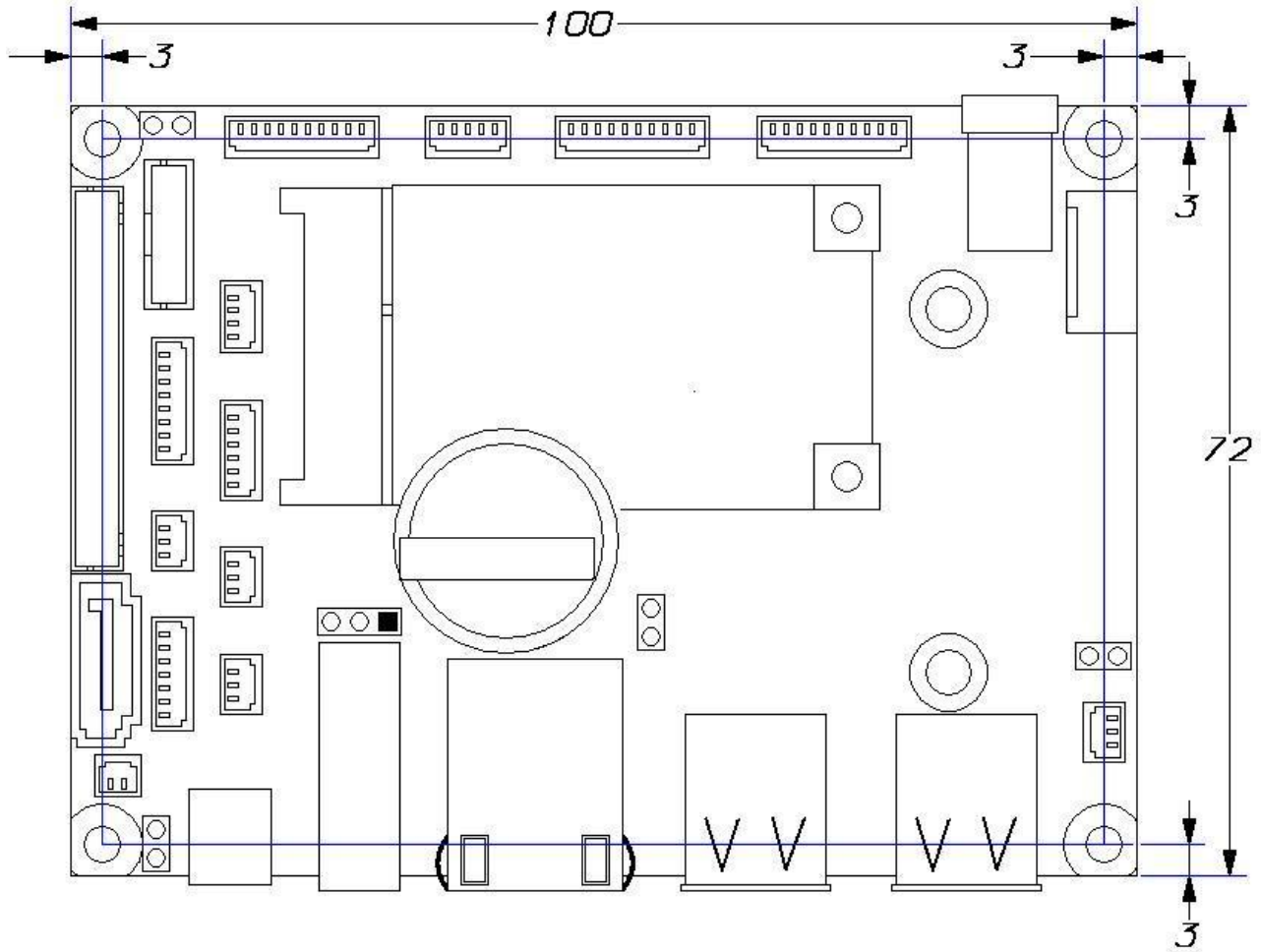
- ◆ Standard MXM connector for use of QSeven® boards
- ◆ USB Client connector
- ◆ Up to 4 x USB 2.0 standard “A” connector
- ◆ 2 x USB 2.0 ports internal connector
- ◆ 1 x S-ATA connectors
- ◆ Hard Disk Power Connector
- ◆ Gigabit Ethernet Connector
- ◆ Fast Ethernet Connector (optional to second USB 2.0 connector)
- ◆ Combo µSD + SIM slot
- ◆ MiniPCI-express slot
- ◆ HD Audio Codec
- ◆ AC'97 Audio Codec
- ◆ Audio LineIn, MicIn, Earphone internal connectors
- ◆ LVDS and Backlight connection
- ◆ HDMI video interface
- ◆ 4-Wire SPI Touch Screen controller integrated
- ◆ 1 x RS-232/RS-422/RS-485 configurable Serial ports
- ◆ 1 x TTL Serial Port
- ◆ 1 x CAN interface
- ◆ 8 x GPIO on internal Pin Header
- ◆ SM Bus Pin Header
- ◆ SPI + I²C Bus internal connector
- ◆ Internal connector for Power, Lid, Sleep and Reset buttons
- ◆ On board rechargeable Lithium battery for CMOS Backup and RTC
- ◆ Input Voltage: +12V_{DC}
- ◆ Total power consumption depends on Qseven® module installed
- ◆ Temperature Range: 0 to 60° C (Commercial version)
-40°C ÷ +85°C (Extreme version)
- ◆ Dimensions: 72 x 100 mm (4.528” x 6.496”)
- ◆ Compliant to Qseven® rel.1.20 specifications

2.3 Mechanical specifications

According to PicoITX form factor, board dimensions are: 72 x 100 mm (4.528" x 6.496").

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

For the correct fixing of Qseven® modules to the carrier board, two metallic spacers of the correct height are directly soldered on board.



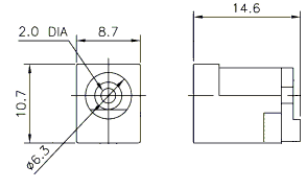
2.4 Electrical specifications

SECOCQ7-pITX/Xboard needs to be supplied only with an external $12V_{DC} \pm 5\%$ power supply.

This voltage can be supplied through a standard 6.3mm (internal pin, diameter 2 mm) Power Jack.

Internal pin is V_{IN} power line.

An SMT Green Led (D47) is present near the Power Jack to indicate the presence of the external Power Supply or not.



2.4.1 RTC Battery

For the occurrences when the system (Carrier Board + Qseven[®] module) is not powered with an external power supply, nor with an internal Smart Battery, on board there is a coin to supply, with a 3V voltage, the Real Time Clock and CMOS memory mounted on your Qseven[®] module.

For commercial version of the board, battery is rechargeable type, with a nominal capacity of 20mAh, type VL2020.

For Extreme (industrial temperature range) version of the board, battery is not rechargeable, with a nominal capacity of 120mAh, type BR-1632A.

Current-limiting devices have been implemented to fulfill EN60950 requirements.

They 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.

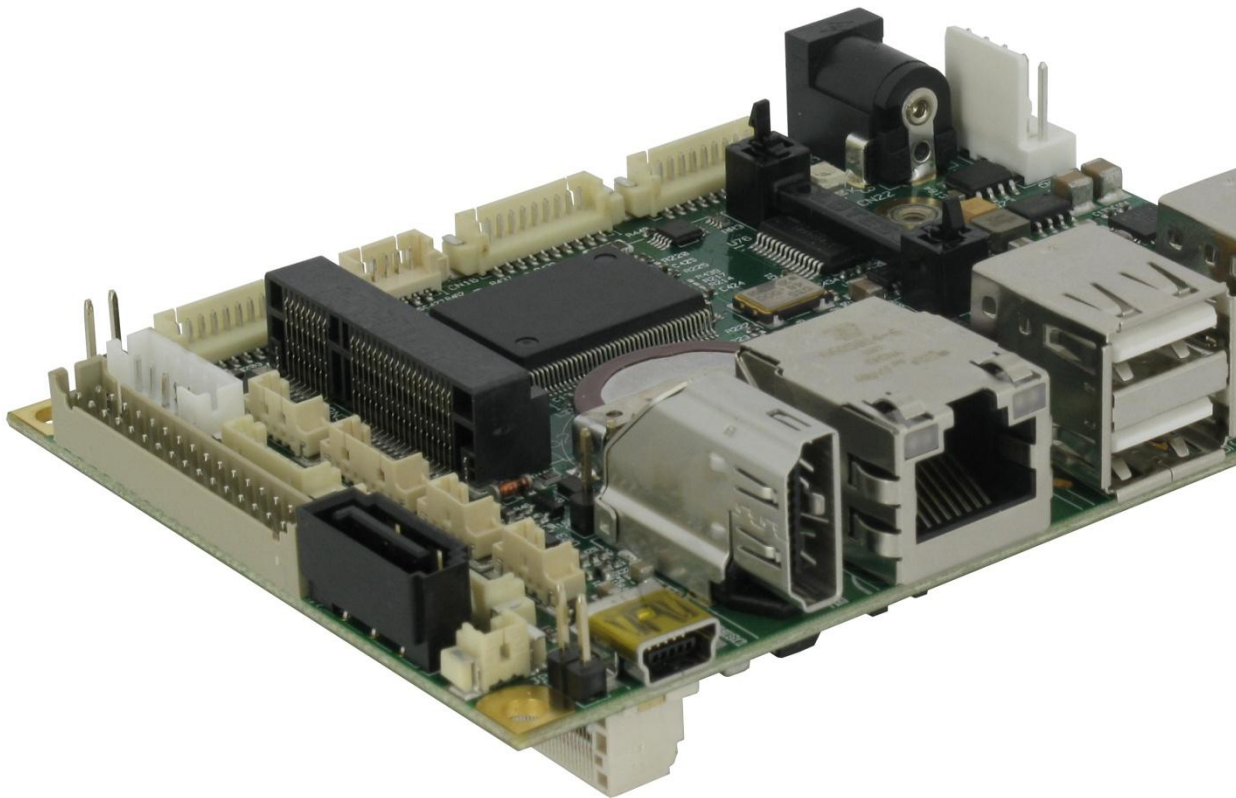
Never allow the batteries to become short-circuited during handling.

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

Batteries supplied with SECOCQ7-pITX/Xboard are compliant to requirements of European Directive 2006/66/EC regarding batteries and accumulators. When putting out of order SECOCQ7-pITX/Xboard, 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 has to be made according to these requirements.

Chapter 3 CONNECTORS

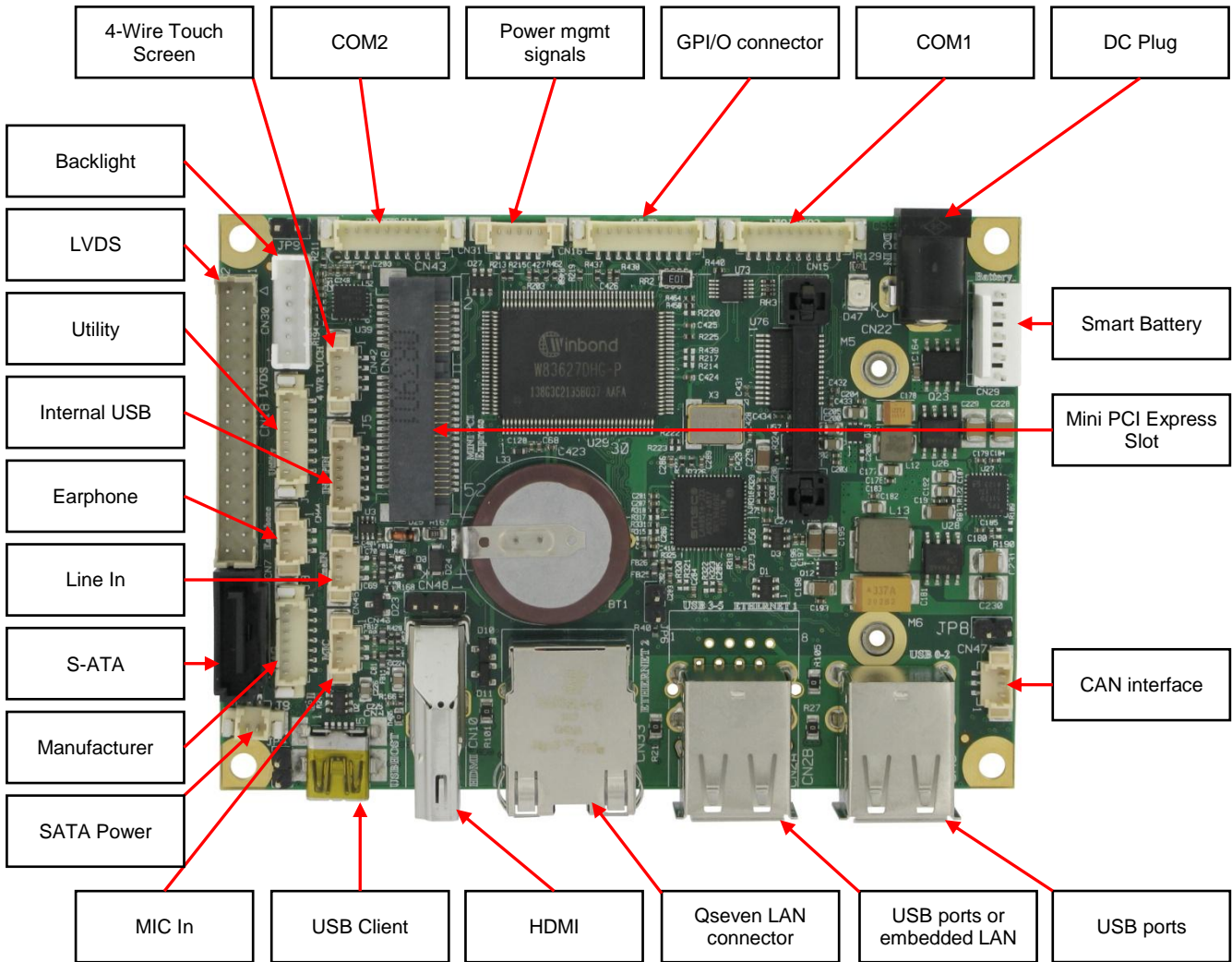
- **Connectors placement - Overview**
- **Upper side connectors**
- **Lower Side connectors**



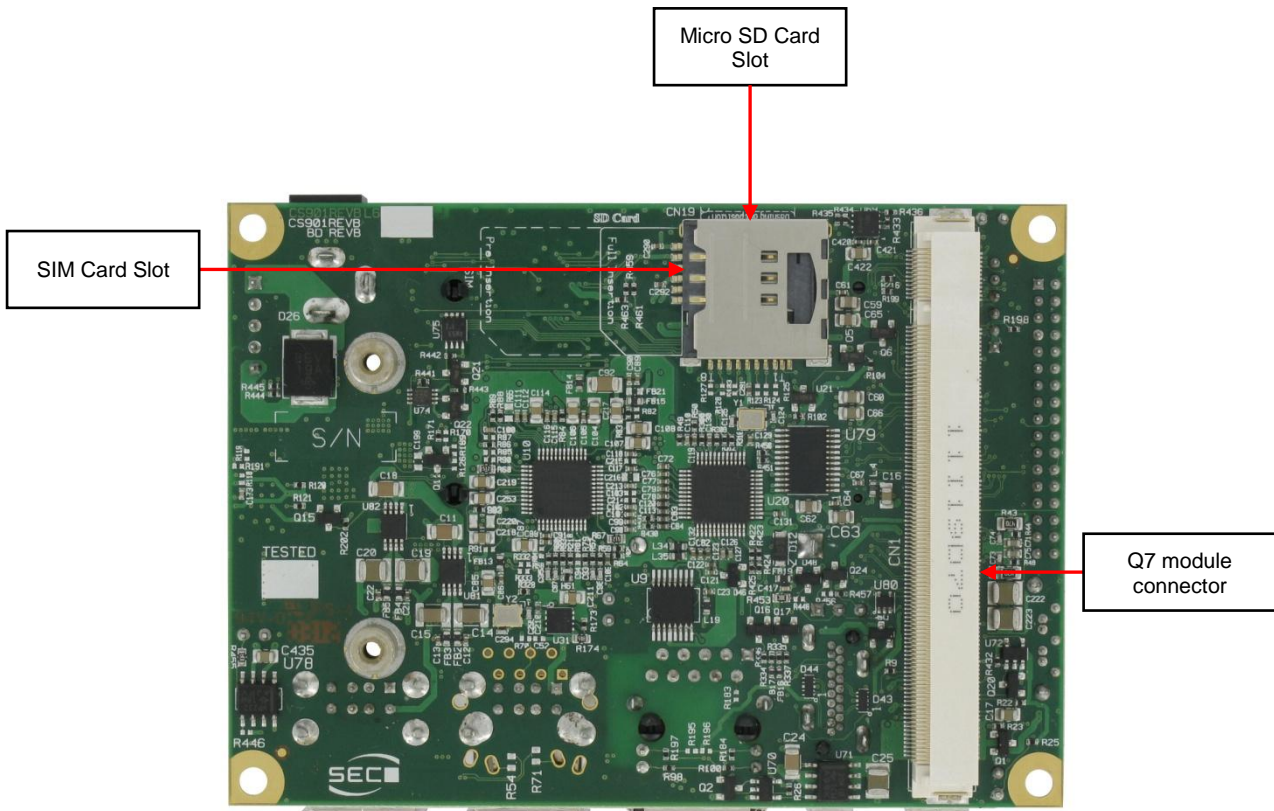
3.1 Connectors placement - Overview

On SECOCQ7-pITX/Xboard carrier board, there are several connectors located on the upper and lower planes. Some of them are standard connectors, like USB, miniUSB client, Ethernet and HDMI connectors, and are placed on the same side of the board, so that they can be placed on a panel of an eventual containing box.

Upper side connectors



Lower side connectors



3.2 Upper side connectors

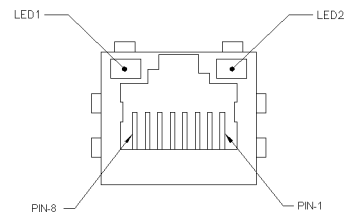
3.2.1 Ethernet connectors

On board, there can be up to two Ethernet RJ-45 connectors, for the use of up to two different LANs.

First connector is type LINK-PP p/n LPJG16314A4NL or equivalent, with 2kV decoupling capacitor, 100 Ohm impedance. It is referred as CN33 on the board.

CN33 provide direct access to the Gigabit Ethernet signals directly managed by the Qseven[®] modules.

Gigabit LAN connector –CN33			
Pin	Signal	Pin	Signal
1	GBE_MDI0+	5	GBE_MDI2-
2	GBE_MDI0-	6	GBE_MDI1-
3	GBE_MDI1+	7	GBE_MDI3+
4	GBE_MDI2+	8	GBE_MDI3-

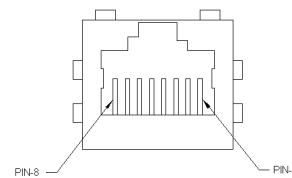


On the connector there are also two bicolour Green/Yellow LEDs: LED1 (Left LED) shows 10/100 or 1000 connection. LED2 (Right LED) shows LINK and ACTIVITY presence.

A second FastEthernet connector, CN2B, accesses to the embedded USB 2.0 Hub and FastEthernet Controller, which is always present onboard. Due to the limited space available on the Carrier board, and to keep low the global height of the module, this second Fast Ethernet connector is alternative to USB connector CN2A, only one at a time can be present.

FastEthernet connector is type HALO p/n HFJ11-2450E-L12RL or equivalent.

FastEthernet LAN connector –CN2B			
Pin	Signal	Pin	Signal
1	Tx+	5	C.T.
2	Tx-	6	Rx-
3	Rx+	7	N.C.
4	C.T.	8	GND-



3.2.2 USB 2.0 Connectors

Lined to the ETHERNET connector, there can be up to two double USB connectors, CN2A and CN5, which are standard USB sockets, shielded.

USB ports are supplied with +5V_{SB} voltage, so they continue to be supplied even when the OS is in Soft-Off state, and they can be used to implement the “Wake-Up on USB” functionality, if the Qseven[®] module you use does implement this feature.

USB connector – CN2A				USB connector – CN5			
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	Vcc_USB	5	Vcc_USB	1	Vcc_USB	5	Vcc_USB
2	USB_P3-	6	USB_H5-	2	USB_H2-	6	USB_P2-
3	USB_P3+	7	USB_H5+	3	USB_H2+	7	USB_P2+
4	GND	8	GND	4	GND	8	GND



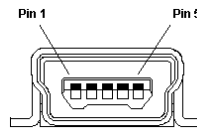
NB: signals noted as USB_Hxx are coming out from embedded USB 2.0 Hub, which has been placed on the carrier board to increase the number of USB ports available also for those Qseven[®] CPU modules that can offer only a few USB ports (the Hub uses USB Port 0 of Qseven[®] connector).

As already stated in previous paragraph, due to reduced space on the Carrier board, the connector CN2A is alternative to FastEthernet connector CN2B, only one at a time can be present.

3.2.3 USB Client connector

Another connector placed on the “front” side, which can be placed on a panel of an eventual enclosure, is a mini-USB connector, type “B”, which can be used as an USB client.

MiniUSB connector – CN4	
Pin	Signal
1	+3.3V _{DC}
2	USB_Client -
3	USB_Client +
4	N.C.
5	GND



According to Qseven Specifications rel. 1.20, USB port #1 can be set to work as a standard USB Host or as USB client. The selection can be made using jumper JP4, which is a standard pin header, P2.54mm.

JP4	USB Client	USB port #1 Host
Inserted	Disabled	Enabled
Not inserted	Enabled	Disabled

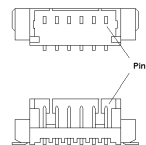


3.2.4 Internal USB strip

Internally to the board, there is an additional 6-pin connector, type MOLEX 53398-0671 or equivalent, carrying out the signals of an additional USB 2.0 port.

Differently from external USB ports, this port carries out internally generated +5V_{DC}, that is not present when the system is in Soft Off State. This port is therefore not supplied in this state, and cannot be used for the Wake-Up on USB functionality (in case your Qseven[®] module does support this feature).

USB Connector – J5	
Pin	Signal
1	+5V _{DC}
2	USB_H4-
3	USB_H4+
4	USB_P4-
5	USB_P4+
6	GND

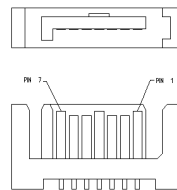


3.2.5 S-ATA connector

For the connection of external Mass Storage Devices, there is a standard S-ATA connector.

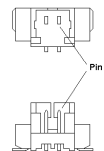
Please notice that S-ATA connector will work only in case your Qseven® module supports all S-ATA signals on MXM connector (pins 29,31,35 and 37). In case you use a Qseven® module that doesn't have these signals connected, then this connector will not be usable.

S-ATA connector – CN7	
Pin	Signal
1	GND
2	SATA0_Tx+
3	SATA0_Tx-
4	GND
5	SATA0_Rx-
6	SATA0_Rx+
7	GND



It is also present a 2-pin male connector, type MOLEX 53398-0271 or equivalent, for giving directly power supply to the SATA Disk.

SATA Power Connector – J9	
Pin	Signal
1	Vcc
2	GND



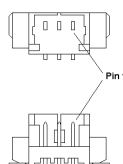
3.2.6 CAN Interface

With release 1.20 of Qseven® specifications, it has been introduced the possibility to have directly a CAN interface on golden finger connector, to take advantage of architectures that offers this interface natively

In latest Qseven® specifications rel.1.20, CAN interface has been introduced on the golden edge finger connector. To use it, therefore, on SECOCQ7-pITX/Xboard there is a CAN transceiver.

CAN interface is available through a 3-pin connector type MOLEX p/n 53398-0371 or equivalent, with following pinout.

CAN Interface – CN44	
Pin	Signal
1	CAN_H
2	GND
3	CAN_L



CAN interface can optionally be terminated with a 124Ω Resistor, in case SECOCQ7-pITX/Xboard carrier is at one of the end of CAN line. To enable this termination, is necessary to use jumper JP7.

JP7	124Ω CAN Termination
Inserted	Termination present
Not inserted	Termination disconnected



3.2.7 LVDS Connector

SECOCQ7-pITX/Xboard can be interfaced to LCD displays using its LVDS interface, which allows the connection of displays with a colour depth of 18 or 24 bit, single or dual channel.

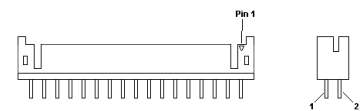
Please notice that the effective support of this kind of displays depends only by the Qseven[®] module used with the carrier board, it is not a feature dependent from the carrier board itself. The pin-out of this connector is given according to Qseven[®] specifications, so that the carrier board is ready for the use of any Qseven[®] module that follows those specifications. Please refer to your CPU Module User manual for the details regarding the panel supported.

For the connection, a connector type JST B34B-PHDSS or equivalent (2 x 17p, male, straight, P2, low profile, polarised) is provided, with the following pin-out.

NOTE: signal indicated as LVDS_A are the connection for the primary channel of dual channel displays, LVDS_B are the connections for the secondary channel of dual channel displays.

Display Data Channel signals are also provided, in case your Qseven[®] module supports them.

LVDS Connector - CN18			
Pin	Signal	Pin	Signal
1	LVDS_DID_CLK	2	LVDS_DID_DAT
3	+3.3V _{DC}	4	+3.3V _{DC}
5	LVDS_A0-	6	GND
7	LVDS_PPEN	8	LVDS_A0+
9	LVDS_A1+	10	LVDS_A1-
11	LVDS_A2+	12	LVDS_BLEN
13	GND	14	LVDS_A2-
15	LVDS_A_CLK+	16	LVDS_A_CLK-
17	LVDS_A3+	18	LVDS_BLT_CTRL
19	GND	20	LVDS_A3-
21	LVDS_B0+	22	LVDS_B0-
23	LVDS_B1-	24	GND
25	GND	26	LVDS_B1-
27	LVDS_B2+	28	LVDS_B2-
29	LVDS_B_CLK+	30	GND
31	GND	32	LVDS_B_CLK-
33	LVDS_B3-	34	LVDS_B3+



3.2.8 Backlight connector

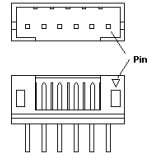
If desired, onboard there is a small connector intended for taking out power supplies, for an eventual panel backlight module.

While +5V_{DC} power supply is realised internally in the SECOCQ7-pITX/Xboard, the power lane indicated as +12V_{DC} is taken directly from the external DC adapter or from the Smart Battery. This means, first of all, that the value of this voltage is not factory defined, since it depends on the voltage of the external DC adapter used. Furthermore, voltage +12V_{DC} taken on pin 1-2 of this connector, can be inaccurate, mainly in case of voltage taken from the optional Smart Battery, whose charge level is constantly decreasing during the use, when the external DC Power Adapter is not present.

The final consideration that has to be made, is that +12V_{DC} is always present. To avoid that the backlight, when supplied with this voltage, will be always active, it is better to choose backlight modules with power enabling, to be driven using signals present on LVDS connector CN18. This way, it will be possible to disable the backlight, when not necessary (i.e, when the system is in Soft-Off State, and there is the DC adapter and/or the external SMART Battery).

Backlight connector CN30 is a single row, 6 pin, p2mm connector, type MOLEX 89400-0620 or equivalent.

Backlight connector – CN30	
Pin	Signal
1	+12V _{DC}
2	+12V _{DC}
3	GND
4	GND
5	+5V _{DC}
6	+5V _{DC}

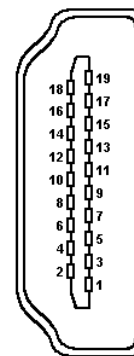


3.2.9 HDMI Connector

SECOCQ7-pITX/Xboard offers the possibility to connect directly one HDMI displays, using the HDMI interface coming out from Qseven[®] CPU module. Please notice that, according to Qseven[®] Specifications Rel. 1.20, HDMI video output is alternative to Display Port / SDVO / DVI interfaces, therefore not all Qseven[®] modules can support this video output.

External connector is a standard certified HDMI connector, type A, model TYCO Electronics p/n 2007435-1, with the following pinout (it is HDMI standard pinout):

HDMI Connector – CN10			
Pin	Signal	Pin	Signal
1	TMDS_LANE2+	2	GND
3	TMDS_LANE2-	4	TMDS_LANE1+
5	GND	6	TMDS_LANE1-
7	TMDS_LANE0+	8	GND
9	TMDS_LANE0-	10	TMDS_CLK+
11	GND	12	TMDS_CLK-
13	---	14	---
15	HDMI_CTRL_CLK_L	16	HDMI_CTRL_DAT_L
17	GND	18	+5V _{HDMI}
19	HPD		



It is possible to choose the polarity of signal Hot Plug Detect by using Jumper CN48, which is a standard 3-way jumper.

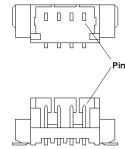
CN48 Position	Hot Plug Detect Polarity
1-2	Active High
2-3	Active Low

3.2.10 Touch Screen Interface

SECOCQ7-pITX/Xboard mounts an SPI Touch Screen controller, for direct connection of common 4-Wire resistive Touch Screens to the system, without the needing of additional external Hardware.

T/S controller is Texas Instruments® TSC2006, is placed on SPI bus, and its external interface is available on connector CN42, that is another 4-pin single row connector, type MOLEX p/n 53398-0471 or equivalent, with following pinout:

4-Wire Touch Screen Interface – CN42	
Pin	Signal
1	X_Right
2	Y_Top
3	X_Left
4	Y_Bottom



3.2.11 Audio Connectors

Qseven® specifications Rel. 1.20 contemplate the possibility of having indifferently AC'97 or HD audio interface on the module, signals carried on golden finger connector are the same.

For this reason, SECOCQ7-pITX/Xboard integrates both an High Definition Audio Codec, VIA VT1708B, and an AC'97 Audio Codec, VIA VT1613 (Cirrus Logic CS4207 and Wolfson WM9707 codecs for industrial temperature range).

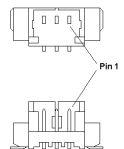
Audio signals are carried on three different internal connectors, one for the earphone, one for LineIn and the other for Mic.

All connectors are type MOLEX p/n 53398-0371, or equivalent, with the pin-out reported in the following tables.

Earphone Connector – CN44	
Pin	Signal
1	OUT_R
2	AUDIO_GND
3	OUT_L

Line IN Connector – CN45	
Pin	Signal
1	LINEIN_R
2	AUDIO_GND
3	LINEIN_L

MIC IN Connector – CN46	
Pin	Signal
1	MICIN_R
2	AUDIO_GND
3	MICIN_L



Selection between AC'97 and HD Audio Codec is made using jumper JP6, which is another standard pin header, P2.54mm, 1x2 pin.

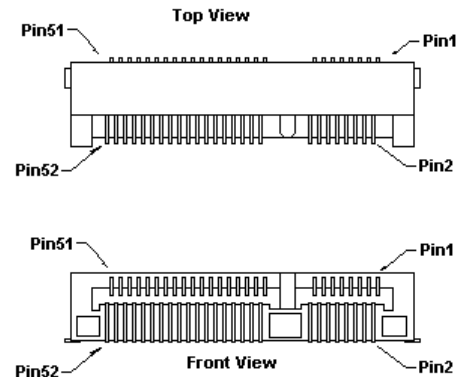
JP6	Audio Codec enabled
Inserted	HD Audio Codec
Not inserted	AC'97 Audio Codec



3.2.12 Mini PCI Express connector

To add communications functionality, or other features not already implemented in the carrier board SECOCQ7-pITX, is it possible to use mini-PCI Express cards, using the dedicate connector, CN8, which is a standard 52pin miniPCI Express connector, type LOTES AAA-PCI-047-K01, H=9mm, with the following pinout:

Mini PCI Express Connector - CN8			
Pin	Signal	Pin	Signal
1	PCIE_WAKE#	2	+3.3V _{SB}
3	N.C.	4	GND
5	N.C.	6	+1.5V _{DC}
7	N.C.	8	SIM_PWR
9	GND	10	IO_SIM
11	PCIE_CLK_REF-	12	CLK_SIM
13	PCIE_CLK_REF+	14	RST_SIM
15	GND	16	SIM_VPP
17	N.C.	18	GND
19	N.C.	20	IRQ_WIFI
21	GND	22	PCIE_RST#
23	PCIE0_RX-	24	+3.3V _{SB}
25	PCIE0_RX+	26	GND
27	GND	28	+1.5V _{DC}
29	GND	30	SMB_CLK
31	PCIE0_TX-	32	SMB_DAT
33	PCIE0_TX+	34	GND
35	GND	36	USB_H3-
37	GND	38	USB_H3+
39	+3.3V _{SB}	40	GND
41	+3.3V _{SB}	42	N.C.
43	GND	44	N.C.
45	N.C.	46	N.C.
47	N.C.	48	+1.5V _{DC}
49	N.C.	50	GND
51	N.C.	52	+3.3V _{SB}



On Mini PCI Express Card Slot are also carried signals for interfacing to SIM cards, so that it is possible to use miniPCI Express modems.

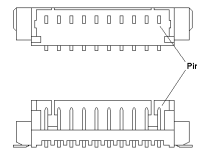
Please notice that for WiFi Card management on this connector has been introduced an additional signal, IRQ_WiFi, for cards using IRQ dedicated lines. This signal is carried directly to Qseven[®] CPU module through golden edge finger connector, on pin 124, which is defined as "Reserved" by Qseven[®] specifications rel. 1.20.

3.2.13 Serial ports

Interfacing to LPC bus, on SECOCQ7-pITX/Xboard carrier board it has been placed a SuperI/O controller (Nuvoton W83627DHG-P), for the implementation of two serial ports, that are carried out on two connectors MOLEX type 53398-1071 or equivalent.

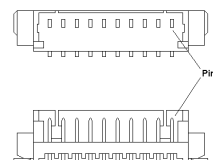
First serial port, COM1, is fully RS-232 compliant. It can also be configured to work in RS-422 or RS-485 mode.

COM1 Connector – CN15			
Pin	Signal RS-232 mode	Signal RS-422 mode	Signal RS-485 mode
1	DCD_1	TX-	TX-/RX-
2	DSR_1	TX+	TX+/RX+
3	RX_1	---	---
4	RTS_1	---	---
5	TX_1	---	---
6	CTS_1	RX+	---
7	DTR_1	---	---
8	RI_1	RX-	---
9	GND	GND	GND
10	GND	GND	GND



Second serial port, COM2, carries out serial port signals at a TTL/CMOS level.

COM2 Connector – CN43	
Pin	Signal
1	DCD_2
2	DSR_2
3	RX_2
4	RTS_2
5	TX_2
6	CTS_2
7	DTR_2
8	RI_2
9	GND
10	GND

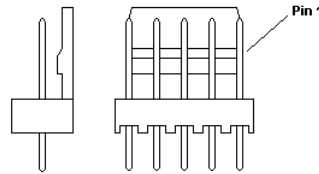


3.2.14 SMART Battery connector

SECOCQ7-pITX/Xboard can optionally mount a battery charger, so that is possible to connect the board to a Smart Battery, like typical batteries for notebooks, so that the system (Carrier board + Qseven® module) can operate even in absence of direct connection to voltage lines.

Smart battery management is made through SMBus, and related signals are carried on a 5pin, p2.54mm, single row connector, type MOLEX 22-27-2051 or equivalent.

Smart Battery Connector – CN23	
Pin	Signal
1	V_Battery
2	SMB_CLK
3	SMB_DAT
4	SMB_ALERT#
5	GND

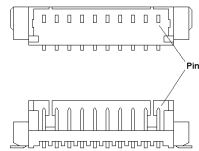


3.2.15 GPIO Connector

Due to the presence of the Super I/O controller (Nuvoton W83627DHG-P), that implements the two serial ports, on SECOCQ7-pITX/Xboard carrier board there is also the possibility of using up to nine General Purpose Input Outputs, with onboard pull-up of 10Kohm to 3.3V

Connector used for these GPIO is a 1.27mm pitch, 10 pin SMT connector, type MOLEX 53398-1071 or equivalent.

GPIO Connector – CN16	
Pin	Signal
1	+3.3VDC
2	GPIO_0
3	GPIO_1
4	GPIO_2
5	GPIO_3
6	GPIO_4
7	GPIO_5
8	GPIO_6
9	GPIO_7
10	GND



Signals reported on the table above correspond to GPI/O Port 2 of Nuvoton LPC Super I/O W83627DHG-P chip. For use of this port, please refer to your Qseven® module's resource assignment to determine the base Address of Super I/O chip. Please also refer to W83627DHG-P Datasheet for proper programming of the GPIO's.

Correspondence between pin, ports and bits, is the following:

PIN CN16	Signal	Port	Bit
2	GPIO_0	2	0
3	GPIO_1	2	1
4	GPIO_2	2	2
5	GPIO_3	2	3
6	GPIO_4	2	4
7	GPIO_5	2	5
8	GPIO_6	2	6
9	GPIO_7	2	7

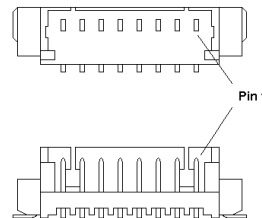
3.2.16 Utility Connector

SPI signals, coming out from QSeven[®] CPU module, are used internally to the carrier board only for the connection of one Touch Screen controller, as described in par. 3.2.10.

These signals, however, are also externally carried out, along with I2C bus signals, to allow external expandability of the system using these common interfaces.

Connector is type AMTEK 1250MS-08TW-U or equivalent, with following pinout

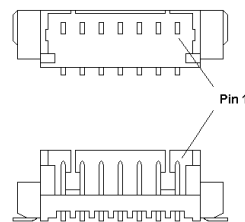
Utility connector – J4	
Pin	Signal
1	+3.3V _{DC}
2	SPI_MOSI
3	SPI_MISO
4	SPI_SCK
5	SPI_CS1#
6	I2C_CLK
7	I2C_DAT
8	GND



3.2.17 Manufacturer Connector

According to Qseven[®] rel. 1.20 specifications, on golden edge finger connector there are some pins reserved for manufacturer purposes. On SECOCQ7-pITX/Xboard, they are carried out through a dedicated 7 pin connector, type MOLEX p/n 53398-0771 or equivalent, with following pinout.

Manufacturer connector – J8	
Pin	Signal
1	MFG_NC0
2	MFG_NC1
3	MUX_SEL_FS
4	MFG_NC4
5	MFG_NC2
6	MFG_NC3
7	GND



3.2.18 Power Management signals Connector

Qseven[®] specifications refer to ACPI specifications for Power Management.

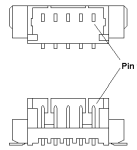
SECOCQ7-pITX/Xboard module, therefore, includes the signals necessary for ACPI Power Management.

More exactly, on board there is a connector carrying signals for the Power Button (to be used to put the system in a Soft Off State, or awake from it), for the Sleep Button (to be used to put the system in Sleep Mode, or awake from it) and for a LID switch (again, this can be used to put the system in sleep mode or awake from it. Typical use of a LID switch is to detect if a notebook is open or closed, in order to switch power state to Sleep or Operating). There is also the signal for Reset Button.

User Manual - Rev. First Edition: 1.0 - Last Edition: 1.0 - Author: S.B. - Reviewed by G.M.

All signals are active low, and are carried on a 5 pin, p1,25 mm, single Row connector, type MOLEX 53398-0571 or equivalent.

Power Button Connector – CN31	
Pin	Signal
1	PWRBTN#
2	LID_BTN#
3	SLP_BTN#
4	RSTBTN#
5	GND



3.3 Lower Side connectors

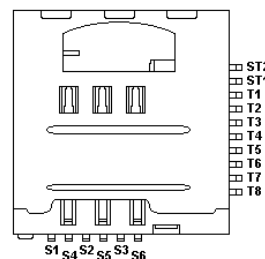
3.3.1 SD/MMC Card + SIM combo connector

Since Qseven[®] standard contemplates signals for Secure Digital Input/Output and MultiMedia Cards, on SECOCQ7-pITX/Xboard there is also a socket, for the use of standard SD or MMC cards, to be used as Mass Storage Device and/or Boot Device (if the Qseven[®] module you are using with this carrier board implements this functionality). Please refer to your Qseven[®] module for information about Card types supported by the chipset.

Moreover, as already stated in par. 3.2.12, SECOCQ7-pITX/Xboard is designed to accept also SIM cards, for use of miniPCI Express modems. SIM card can be inserted in this combo connector

The connector is a combo SD/MMC + SIM connector, push-push type, 2.7 mm global height, type AVX p/n 009162006501150 or equivalent. Pinout here reported is related only to signal routing on specific connector, internally the pin-out is the same of any standard SD/MMC 4.0 and SIM card.

SD/MMC + SIM Combo Connector – CN19	
Pin	Signal
S1	SIM_PWR
S2	RST_SIM
S3	CLK_SIM
S4	GND
S5	SIM_VPP
S6	IO_SIM
T1	SDIO_DAT2
T2	SDIO_DAT3
T3	SDIO_CMD
T4	SDIO_PWR#
T5	SDIO_CLK
T6	GND
T7	SDIO_DAT0
T8	SDIO_DAT1
ST1	SDIO_CD#
ST2	GND



3.3.2 Qseven[®] Connector

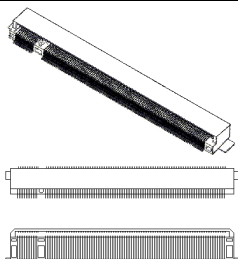
According to Qseven[®] specifications, for the insertion of your CPU module there is a standard MXM connector, height 7.8mm, type LOTES SP-AAA-MXM-001.

Not all signals contemplated in Qseven[®] standard are implemented on MXM connector, due to the functionalities used in SECOCQ7-pITX/Xboard. Therefore, please refer to the following table for a list of effective signals reported on MXM connector.

PIN	Signal	Description	PIN	Signal	Description
1	GND	Power Ground	2	GND	Power Ground
3	GBE_MDI3-	GbEthernet differential pair 3-	4	GBE_MDI2-	GbEthernet differential pair 2-
5	GBE_MDI3+	GbEthernet differential pair 3+	6	GBE_MDI2+	GbEthernet differential pair 2+
7	GBE_LINK100#	Ethernet 100Mb/s link indicator	8	GBE_LINK1000#	Ethernet 1000Mb/s link indicator
9	GBE_MDI1-	Ethernet differential pair 1-	10	GBE_MDI0-	Ethernet differential pair 0-
11	GBE_MDI1+	Ethernet differential pair 1+	12	GBE_MDI0+	Ethernet differential pair 0+
13	GBE_LINK#	Not Connected	14	GBE_ACT#	Ethernet Activity indicator
15	GBE_CTREF	Ethernet Reference Voltage	16	SUS_S5#	Soft Off (S5) Signal
17	N.C.	Not Connected	18	SUS_S3#	Suspend to RAM (S3) signal
19	N.C.	Not Connected	20	PWR_BTN#	Power Button Input
21	SLP_BTN#	Sleep Button	22	LID_BTN#	LID Button Input
23	GND	Power Ground	24	GND	Power Ground
25	GND	Power Ground	26	PWGIN	QSeven [®] module Power Good In
27	N.C.	Not Connected	28	RSTBTN#	Reset Button Input
29	SATA0_TX+	Serial ATA Channel 0 Transmit +	30	N.C.	Not Connected
31	SATA0_TX-	Serial ATA Channel 0 Transmit -	32	N.C.	Not Connected
33	N.C.	Not Connected	34	GND	Power Ground
35	SATA0_RX+	Serial ATA Channel 0 Receive +	36	N.C.	Not Connected
37	SATA0_RX-	Serial ATA Channel 0 Receive -	38	N.C.	Not Connected
39	GND	Power Ground	40	GND	Power Ground
41	BIOS_DISABLE# / BOOT_ALT# (*)	Module BIOS disable / BOOT alternate Firmware	42	SDIO_CLK#	SDIO Clock
43	SDIO_CD#	SDIO Card Detect	44	N.C.	Not Connected
45	SDIO_CMD	SDIO Command/Response	46	N.C.	Not Connected
47	SDIO_PWR#	SDIO Power Enable	48	SDIO_DAT1	SDIO Data Line 1
49	SDIO_DAT0	SDIO Data Line 0	50	SDIO_DAT3	SDIO Data Line 3
51	SDIO_DAT2	SDIO Data Line 2	52	N.C.	Not Connected
53	N.C.	Not Connected	54	N.C.	Not Connected
55	N.C.	Not Connected	56	N.C.	Not Connected
57	GND	Power Ground	58	GND	Power Ground
59	HDA_SYNC	HDAudio/AC'97 Sync signal	60	SMB_CLK	System Management Bus Clock
61	HDA_RST#	HDAudio/AC'97 Codec Reset	62	SMB_DAT	System Management Bus Data
63	HDA_BITCLK	HDAudio/AC'97 Bit Clock	64	SMB_ALERT#	System Management Bus Alert
65	HDA_SDI	HDAudio/AC'97 Serial Data Input	66	I2C_CLK	I ² C Bus Clock Line
67	HDA_SDO	HDAudio/AC'97 Serial Data Out	68	I2C_DAT	I ² C Bus Data Line
69	N.C.	Not Connected	70	N.C.	Not Connected
71	N.C.	Not Connected	72	N.C.	Not Connected

73	GND	Power Ground	74	GND	Power Ground
75	N.C.	Not Connected	76	N.C.	Not Connected
77	N.C.	Not Connected	78	N.C.	Not Connected
79	N.C.	Not Connected	80	N.C.	Not Connected
81	N.C.	Not Connected	82	USBP4-	USB Data Port 4 -
83	N.C.	Not Connected	84	USBP4+	USB Data Port 4 +
85	USB_2_3_OC#	USB ports 2/3 overcurrent detect	86	USB_0_1_OC#	USB ports 0/1 overcurrent detect
87	USBP3-	USB Data Port 3 -	88	USBP2-	USB Data Port 2 -
89	USBP3+	USB Data Port 3 +	90	USBP2+	USB Data Port 2 +
91	USB_CC	USB Client Connect	92	USB_ID	USB Port 1 mode configuration
93	USBP1-	USB Data Port 1 -	94	USBP0-	USB Data Port 0 -
95	USBP1+	USB Data Port 1 +	96	USBP0+	USB Data Port 0 +
97	GND	Power Ground	98	GND	Power Ground
99	LVDS_A0+	LVDS channel A pair 0 +	100	LVDS_B0+	LVDS channel B pair 0 +
101	LVDS_A0-	LVDS channel A pair 0 -	102	LVDS_B0-	LVDS channel B pair 0 -
103	LVDS_A1+	LVDS channel A pair 1 +	104	LVDS_B1+	LVDS channel B pair 1 +
105	LVDS_A1-	LVDS channel A pair 1 -	106	LVDS_B1-	LVDS channel B pair 1 -
107	LVDS_A2+	LVDS channel A pair 2 +	108	LVDS_B2+	LVDS channel B pair 2 +
109	LVDS_A2-	LVDS channel A pair 2 -	110	LVDS_B2-	LVDS channel B pair 2 -
111	LVDS_PPEN	LCD Panel Power Enable	112	LVDS_BLEN	LCD Panel Backlight Enable
113	LVDS_A3+	LVDS channel A pair 3 +	114	LVDS_B3+	LVDS channel B pair 3 +
115	LVDS_A3-	LVDS channel A pair 3 -	116	LVDS_B3-	LVDS channel B pair 3 -
117	GND	Power Ground	118	GND	Power Ground
119	LVDS_A_CLK+	LVDS Channel A Clock +	120	LVDS_B_CLK+	LVDS channel B Clock +
121	LVDS_A_CLK-	LVDS Channel A Clock -	122	LVDS_B_CLK-	LVDS channel B Clock -
123	LVDS_BLT_CTRL	LCD Panel brightness control	124	IRQ_WIFI	WiFi Card IRQ line
125	LVDS_DID_DAT	LVDS DisplayID (I ² C) Data	126	N.C.	Not Connected
127	LVDS_DID_CLK	LVDS DisplayID (I ² C) Clock	128	N.C.	Not Connected
129	CAN_TX	CAN Port TX output	130	CAN_RX	CAN Port RX input
131	TMDS_CLK+	TMDS (HDMI) Clock +	132	N.C.	Not Connected
133	TMDS_CLK-	TMDS (HDMI) Clock -	134	N.C.	Not Connected
135	GND	Power Ground	136	GND	Power Ground
137	TMDS_LANE1+	TMDS (HDMI) Data Line 1+	138	N.C.	Not Connected
139	TMDS_LANE1-	TMDS (HDMI) Data Line 1-	140	N.C.	Not Connected
141	GND	Power Ground	142	GND	Power Ground
143	TMDS_LANE0+	TMDS (HDMI) Data Line 0+	144	N.C.	Not Connected
145	TMDS_LANE0-	TMDS (HDMI) Data Line 0-	146	N.C.	Not Connected
147	GND	Power Ground	148	GND	Power Ground
149	TMDS_LANE2+	TMDS (HDMI) Data Line 2+	150	HDMI_CTRL_DAT	HDMI I ² C Control Data Line
151	TMDS_LANE2-	TMDS (HDMI) Data Line 2-	152	HDMI_CTRL_CLK	HDMI I ² C Control Clock Line
153	HDMI_HPD#	HDMI Hot Plug Detect	154	N.C.	Not Connected
155	PCIE_CLK_REF+	PCI-E Reference Clock +	156	PCIE_WAKE#	Wake signal from ext. devices
157	PCIE_CLK_REF-	PCI-E Reference Clock -	158	PCIE_RST#	Reset signal to external devices

159	GND	Power Ground	160	GND	Power Ground
161	N.C.	Not Connected	162	N.C.	Not Connected
163	N.C.	Not Connected	164	N.C.	Not Connected
165	GND	Power Ground	166	GND	Power Ground
167	N.C.	Not Connected	168	N.C.	Not Connected
169	N.C.	Not Connected	170	N.C.	Not Connected
171	N.C.	Not Connected	172	N.C.	Not Connected
173	N.C.	Not Connected	174	N.C.	Not Connected
175	N.C.	Not Connected	176	N.C.	Not Connected
177	N.C.	Not Connected	178	N.C.	Not Connected
179	PCIE0_TX+	PCI-E Channel 0 Transmit +	180	PCIE0_RX+	PCI-E Channel 0 Receive +
181	PCIE0_TX-	PCI-E Channel 0 Transmit -	182	PCIE0_RX-	PCI-E Channel 0 Receive -
183	GND	Power Ground	184	GND	Power Ground
185	LPC_AD0	LPC Bus Address/Data 0	186	LPC_AD1	LPC Bus Address/Data 1
187	LPC_AD2	LPC Bus Address/Data 2	188	LPC_AD3	LPC Bus Address/Data 3
189	LPC_CLK	LPC Bus Clock	190	LPC_FRAME#	LPC Bus Frame signal
191	SERIRQ	Serialised Interrupt	192	N.C.	Not Connected
193	VCC_RTC	Battery Power Line for RTC	194	SPKR	Speaker signal
195	FAN_TACHOIN	Fan Tachometer Input	196	N.C.	Not Connected
197	GND	Power Ground	198	GND	Power Ground
199	SPI_MOSI	SPI Master Serial Output / Slave Serial Input	200	SPI_CS0#	SPI Chip Select 0
201	SPI_MISO	SPI Master Serial Input / Slave Serial Output	202	SPI_CS1#	SPI Chip Select 1
203	SPI_SCK	SPI Clock	204	MFG_NC4	Manufacturer Reserved Pin
205	+5V _{SB}	Standby Power Supply Line	206	+5V _{SB}	Standby Power Supply Line
207	MFG_NC0	Manufacturer Reserved Pin	208	MFG_NC2	Manufacturer Reserved Pin
209	MFG_NC1	Manufacturer Reserved Pin	210	MFG_NC3	Manufacturer Reserved Pin
211	MUX_SEL_FS	MFG Pin selection signal	212	+5V _{DC}	Sectioned Power Supply Line
213	+5V _{DC}	Sectioned Power Supply Line	214	+5V _{DC}	Sectioned Power Supply Line
215	+5V _{DC}	Sectioned Power Supply Line	216	+5V _{DC}	Sectioned Power Supply Line
217	+5V _{DC}	Sectioned Power Supply Line	218	+5V _{DC}	Sectioned Power Supply Line
219	+5V _{DC}	Sectioned Power Supply Line	220	+5V _{DC}	Sectioned Power Supply Line
221	+5V _{DC}	Sectioned Power Supply Line	222	+5V _{DC}	Sectioned Power Supply Line
223	+5V _{DC}	Sectioned Power Supply Line	224	+5V _{DC}	Sectioned Power Supply Line
225	+5V _{DC}	Sectioned Power Supply Line	226	+5V _{DC}	Sectioned Power Supply Line
227	+5V _{DC}	Sectioned Power Supply Line	228	+5V _{DC}	Sectioned Power Supply Line
229	+5V _{DC}	Sectioned Power Supply Line	230	+5V _{DC}	Sectioned Power Supply Line



(* BIOS_DISABLE# / BOOT_ALTERNATE# Signal can be driven using jumper JP9, which is another standard pin header, P2.54mm, 1x2 pin.

JP9	BIOS_DISABLE# / BOOT_ALTERNATE# level
Inserted	Low
Not inserted	Floating



