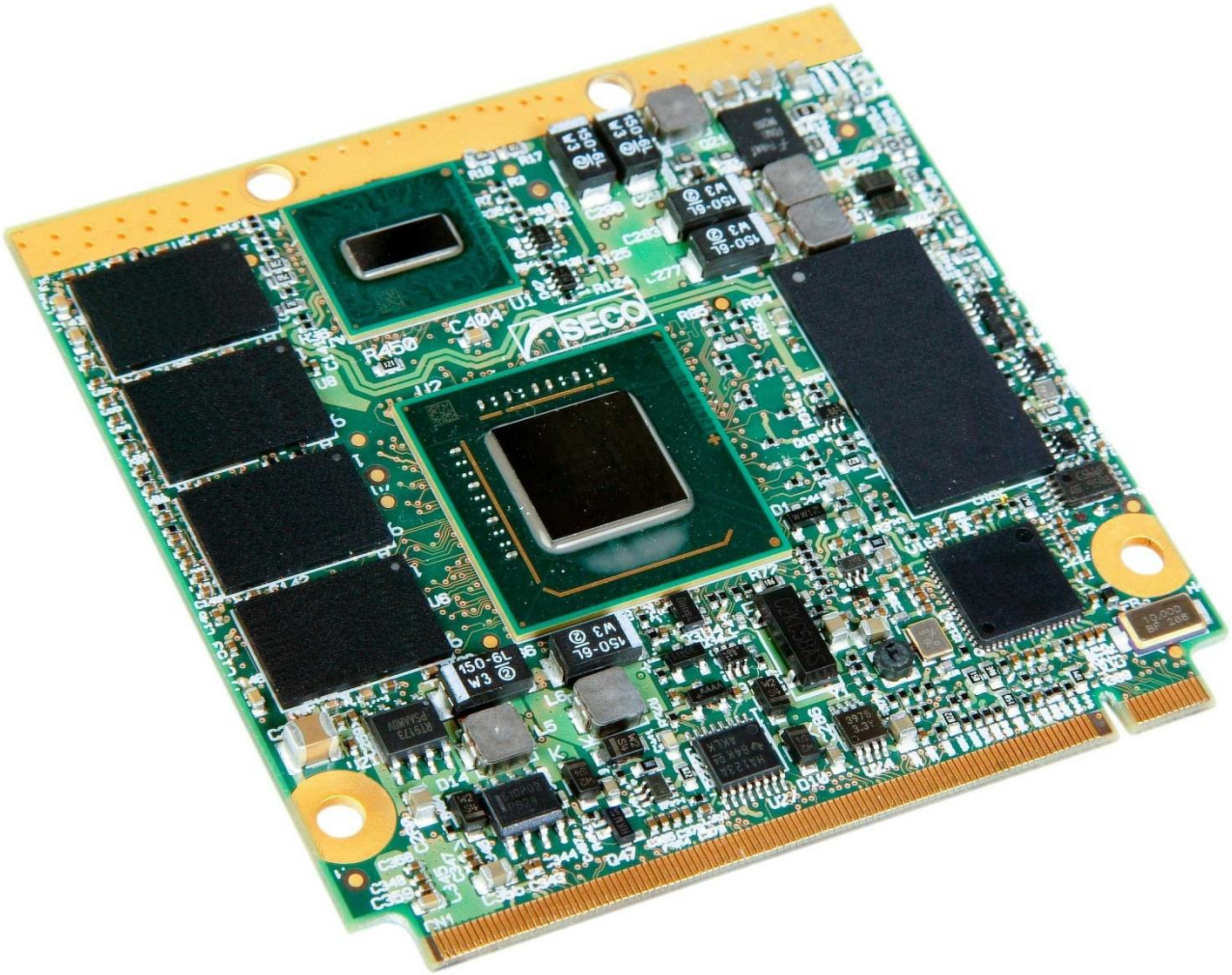
QUADMO747

Qseven™ Module based on Intel® Atom™ platform



User Manual

SECO

QUADMO747

REVISION HISTORY

Revision	Date	Note	Rif.
0.1	29/05/2009	First release	SB
0.2	11/06/2009	Par. 2.3.1 corrected	SB
0.3	13/07/2009	Par. 2.1 and 2.2 corrected	SB
1.0	31/07/2009	Added Bios Chapter and Thermal Design Appendix	SB
1.1	06/08/2009	Bios Chapter Updated	SB
1.2	28/08/2009	Bios Chapter Updated	SB
1.3	02/10/2009	Added “Internal video driver” BIOS menu item Updated “internal Flat Panel Type” menu item (par. 4.4.11)	SB
1.4	09/11/2009	Updated BIOS menu section	SB
1.5	25/11/2009	Corrected IRQ assignment possibilities (par. 4.4.1, 4.4.2, 4.4.3, 4.4.4) USB Menu items updated (par. 4.4.17 and 4.4.18) Added ISA I/O and IRQ mapping	SB
1.6	03/02/2010	Updated LVDS resolutions specifications	SB
1.7	05/05/2010	Introduction and Technical Specifications Updated (par. 2.1, 2.2) Updated BIOS section	SB
1.8	07/06/2010	BIOS Power Management section updated BIOS update procedure added BIOS warnings added in paragraphs 4.3.13 and 4.4.8	SB
1.9	06/09/2010	BIOS section updated BIOS update procedure updated	SB
1.10	21/02/2011	BIOS section updated BIOS update procedure updated	SB
1.11	26/04/2011	BIOS section updated BIOS update procedure updated	SB
1.12	22/09/2011	Added Watchdog Timer section in BIOS. Par. 4.3.6 updated BIOS update procedure updated	SB

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

For further information as regards this module or other SECO products please visit our websites at http://www.seco.com and http://www.secoqseven.com.

Moreover in order to have the proper assistance for any possible issue please complete your registration online on our specific website for QSeven modules (http://www.secoqseven.com).

Our team will be pleased and ready to assist you.

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Chapter 1. INTRODUCTION

- **Warranty**
- **Information and assistance**
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- **Safety**
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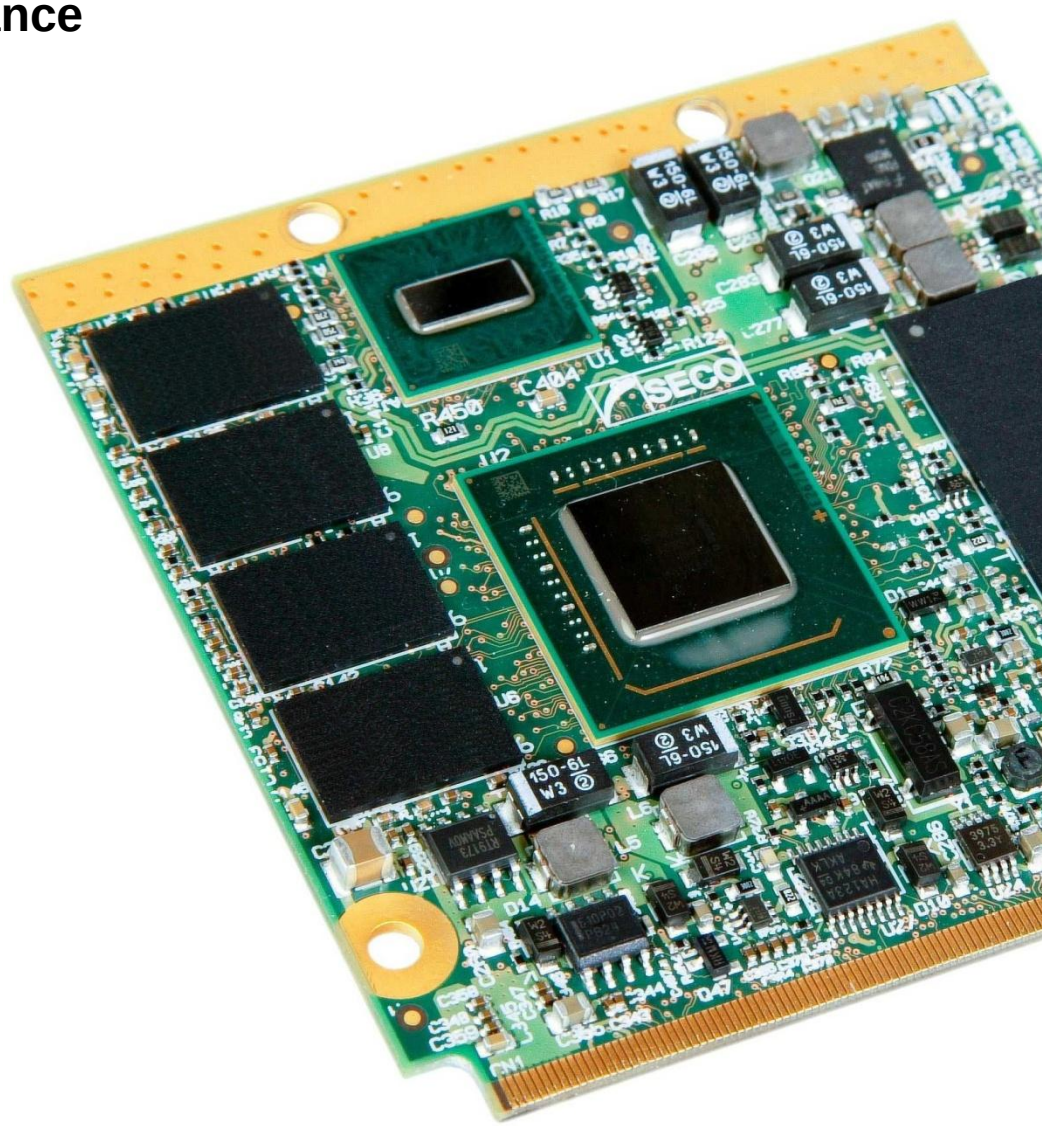


1.1 Warranty

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 from 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 can not 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 by phone the SECO Technical Assistance.
- 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 "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

Quadmo747 module only uses 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

Quadmo747, 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 Quadmo747 board, 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

Quadmo747 board 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**
- **Electrical specifications**
- **Mechanical specifications**
- **Block diagram**

2.1 Introduction

Quadmo747 is a CPU module, in new QSeven™ format, based on Intel® Atom™ (Z5xx series) CPU interfaced to Intel® US15W System Control Hub, a single chip solution that replace previous solutions based on Northbridge + Southbridge chipsets.

This high level of integration allows an extremely reduced consumption of spaces, that is essential for boards with sizes so reduced as for QSeven™ boards, which offers all functionalities of standard PC boards in just 70x70mm.

CPU's available for Quadmo 747 module are Intel ® Atom™ Z510 at 1.1 GHz (400MHz FSB), that represents the low end solution, or Intel® Atom™ Z530 at 1.6 GHz (533 MHz FSB), with higher performances and Hyper Threading (HT)capabilities.

Both CPU's have a 512KB L2 cache, and a TDP (Thermal Dissipation Power) of 2W (2.2W for Intel® Atom™ Z530 , when HT is active), so that global power consumption of the board is <5W.

The System Controller Hub, US15W, includes an advanced 2D and 3D graphic accelerator, Intel® GMA500, the memory controller and I/O controller. Therefore, this chip can offer advanced 3D graphics, hardware video decode acceleration, LVDS and SDVO interface, HD Audio, 2 PCI Express ports, 8 USB 2.0 ports (one of them also configurable to work as USB client), and other features.

The board is completed with up to 1GB DDR2 directly soldered on board, and one Flash Disk, directly accessible like any standard Hard Disk, with up to 8GB of capacity.

One micro-SD slot is present on the board to increment the storage possibilities of the board.

For compliance to QSeven™ specifications, onboard there can optionally be a Gigabit Ethernet Controller and a Parallel-ATA to Serial-ATA Bridge, so that the board can offer also a S-ATA channel.

Interfacing to the board comes through a single card edge connector, as defined by QSeven™ specifications: on this connector, signals are available for Gigabit Ethernet, one additional SD/MMC Card, PCI Express x1, 1 S-ATA channel (optional), 8 USB 2.0 ports (USB ports #0-5 able tow work also in USB1.1mode, USB ports #6 and #7 working only in USB 2.0 mode) 18 or 24-bit Single Channel LVDS, SDVO interface, HD Audio interface, I2C, LPC and SM buses, and other features.

For external interfacing to standard devices, a carrier board with a 230-pin MXM connector is needed. This board will implement all the routing of the interface signals to external standard connectors, as well as integration of other peripherals/devices not already included in Quadmo747 CPU module.

For thermal dissipation of the board, according to QSeven™ specifications, it is contemplated the use of an application specific heatspreader, that is fixed to the board and get in touch with surfaces at higher temperature, like CPU core. For better thermal distribution, on top and bottom side of Quadmo747 module there is a metallized strip free of components, opposite to card edge, that goes in direct contact with the heatspreader, to increment the surface used for thermal exchange. Standard heatspreaders/heatsinks for Quadmo747 module are available from SECO, however, thermal dissipation need to be specifically studied within the whole system.

To learn more about QSeven™ standard: http://www.qseven-standard.org.

2.2 Technical Specifications

- **CPU:** Intel® Atom™ Z510 @ 1.1 GHz, 512KB L2 Cache
  Intel® Atom™ Z530 @ 1.6 GHz, 512KB L2 Cache
- **Chipset:** Intel® System Controller Hub US15W
- **DRAM:** Up to 1GB DDR2 400/533 MHz
- **Graphic Interface:** Intel® GMA 500
- **LVDS:** Single channel LVDS interface, at 18 or 24 bit (resolutions of 640x480, 800x480, 800x600 and 1024x600 are managed with a 18-bit interface, while resolutions of 1024x768, 1280x768, 1280x600 and 1366x768 are on a 24-bit interface)
- **SDVO interface**
- **PCI Express:** one port x1 (optionally two)
- **USB:** 8x USB 2.0 or (2x USB 2.0 only + 6 x USB 2.0 / 1.1)
- **Ethernet:** 1x Gigabit Ethernet controller, Realtek RTL8111C (optional)
- **SDIO:** One micro-SD Card slot onboard
- **One additional SD/MMC Card interface**
- **IDE:** On board flash disk up to 8GB
- **S-ATA:** Single channel interface (optional)
- **AUDIO:** HD interface
- **I2C Bus**
- **LPC Bus**
- **SMBus**
- **FAN Management**
- **Power Management Signals**
- **Power supply voltage:** 5V +/-5%
- **TDP:** Typical <5 W with Intel® Atom™ Z510
- **Dimensions:** 70 x 70 mm (2.756 x 2.756)

2.3 Electrical specifications

Quadmo747 board needs to be supplied only with an external +5V_{DC} power supply. For working in ATX mode, also voltage +5V_{SB} need to be supplied. For Real Time Clock working and CMOS memory data retention, it is also needed a backup battery voltage. All these voltages are supplied directly through card edge fingers (see connectors' pinout).

All remaining voltages needed for board's working are generated internally from +5V_{DC} power rail.

2.3.1 Power Consumption

Quamdo747 module, like all QSeven™ modules, needs a carrier board for its normal working. All connections with the external world come through this carrier board, which provides also the required voltage to the board, deriving it from its power supply source.

Therefore, power consumption of the board is measured using a SECO's SECOCQ7-pITX carrier board, with +12V_{DC} power supply. Test setup includes a VGA connection to a standard CRT monitor, PS/2 mouse and keyboard, and two 8-Ohm speakers.

Using this setup, following consumptions have been measured:

Intel® Atom™ Z530 @ 1,6GHz, with 1GB DDR2 memory, 8GB Flash Disk, Ethernet Controller

O.S.: Windows XP SP2

Idle status, power consumption: 500mA @ +12V_{DC}

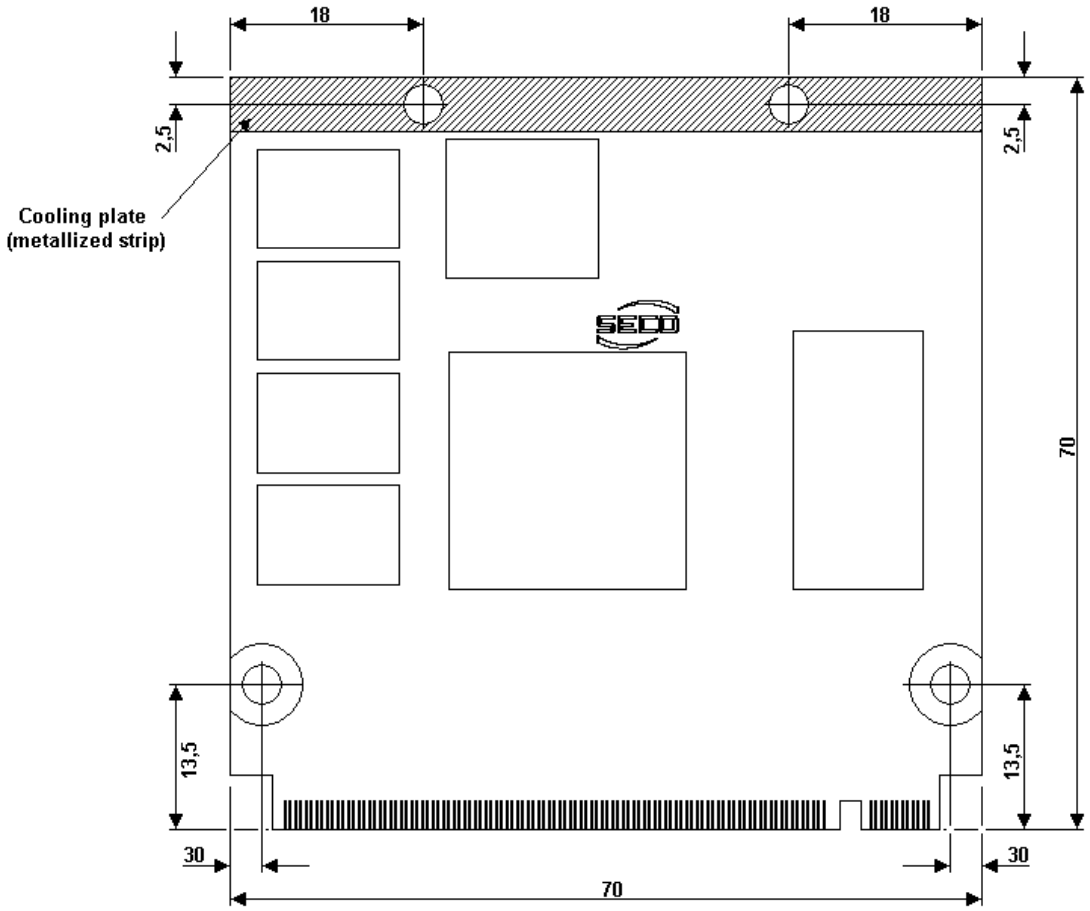
Active status, audio disabled, full work load, power consumption: 750mA @ +12V_{DC}

Active status, audio at maximum volume, full work load, power consumption: 1A @ +12V_{DC}

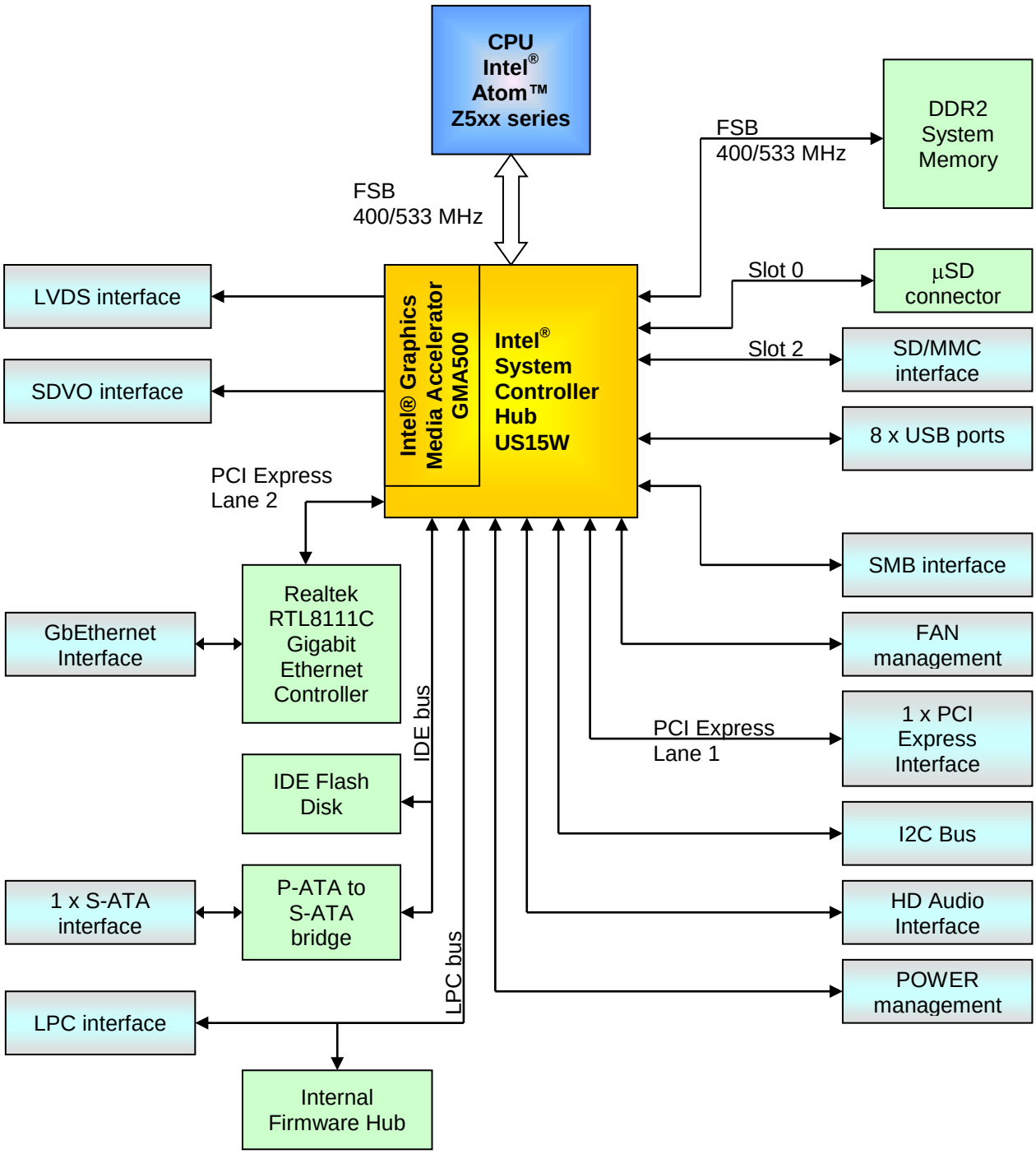
2.4 Mechanical specifications

According to QSeven™ specifications, board dimensions are: 70 x 70 mm (2.756” x 2.756”).

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



2.5 Block diagram



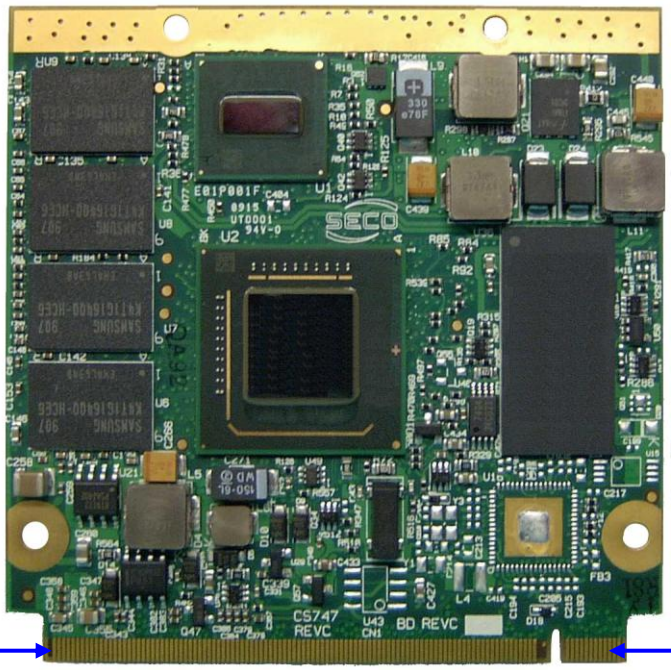
Chapter 3. CONNECTORS

- **Connectors overview**
- **Connectors description**

3.1 Connectors overview

According to QSeven™ specifications, all interfaces to the board are available through a single card edge connector. In addition, a microSD card slot is present to increase mass storage capabilities of the board.

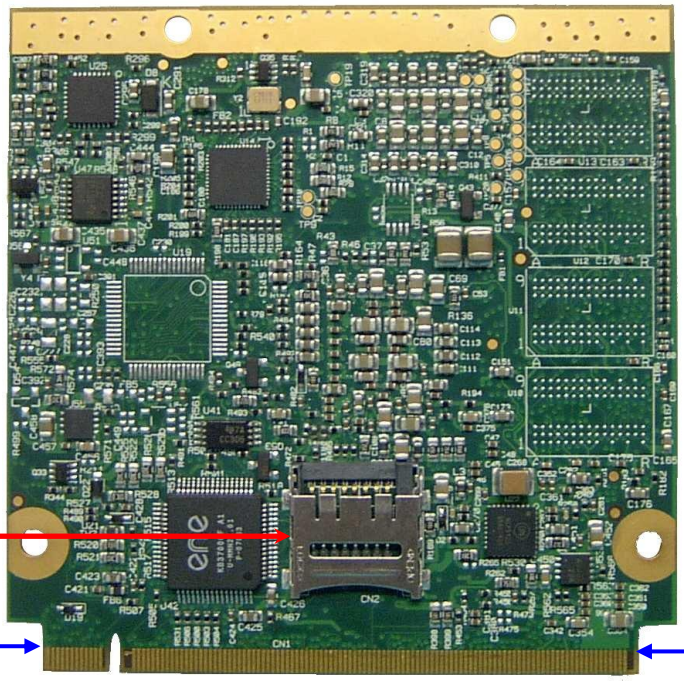
Top side



Card edge golden fingers, pin 229

Card edge golden fingers, pin 1

Bottom side



MicroSD slot

Card edge golden fingers, pin 2

Card edge golden fingers, pin 230

3.2 Connectors description

3.2.1 SD/MMC Card connector

Intel® System Controller Hub US15W offers three SD/IO ports, for interfacing to SD and MMC cards.

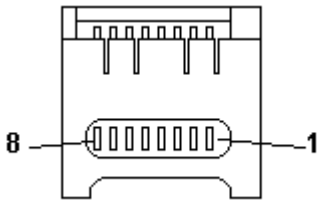
One of these ports is carried out on card edge interface.

Another port is carried to a microSD card slot, which is soldered on board, on bottom side.

The connector is a standard push-push microSD slot, type TOWNES TKS0192003 or equivalent.

Pinout is standard for microSD, however it is here reported for completeness of documentation.

SD/MMC Card Connector – CN25	
Pin	**Signal**
1	SD_DATA_2
2	SD_DATA_3
3	SD_Command / SD_DATA_4
4	SD_Power(+3.3V, software enabled)
5	SD_Clock
6	GND
7	SD_DATA_0
8	SD_DATA_1



3.2.2 QSeven™ Connector

According to QSeven™ specifications, all interface signals are reported on the card edge connector, which is a 230-pin Card Edge that can be inserted into standard MXM connectors, as described in QSeven™ specifications

Not all signals contemplated in QSeven™ standard are implemented on MXM connector, due to the functionalities really implemented on Quadmo747 CPU module. Therefore, please refer to the following table for a list of effective signals reported on MXM connector.

For accurate signals description, please consult QSeven™ specifications.

Some signals are optional, depending on Quadmo747 module configuration. See the description at the end of this document for the list of signals that are not always present (they are also highlighted in light blue in the following table, however). Please check QSeven™ specifications for further details and explanations on these signals.

NOTE: Even pins are available on bottom side of CPU board; odd pins are available on top side of CPU board. Please refer to board photos

Card Edge Golden Fingers - CN1			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	GND
3	GBEthernet_TD3-	4	GBEthernet_TD2-
5	GBEthernet_TD3+	6	GBEthernet_TD2+
7	GBEthernet_LINK100#	8	GBEthernet_LINK1000#
9	GBEthernet_TD1-	10	GBEthernet_TD0-
11	GBEthernet_TD1+	12	GBEthernet_TD0+
13	GBEthernet_LINK#	14	GBEthernet_ACT_LED
15	GBEthernet_CTREF	16	SUS_S5#
17	WAKE#	18	SUS_S3#
19	SUS_STAT#	20	POWER_BUTTON#
21	SLEEP_BUTTON#	22	LID_BUTTON#
23	GND	24	GND
25	GND	26	POWER_GOOD
27	Battery_Low#	28	RESET_IN#
29	SATA_Tx+	30	---
31	SATA_Tx-	32	---
33	SATA_LED#	34	GND
35	SATA_Rx+	36	---
37	SATA_Rx-	38	---
39	GND	40	GND
41	BIOS_DISABLE#	42	SDIO_Clock
43	SDIO_CardDetect#	44	SDIO_LED
45	SDIO_Command	46	SDIO_WriteProtect
47	SDIO_Power#	48	SD_DATA_1
49	SD_DATA_0	50	SD_DATA_3

51	SD_DATA_2	52	SD_DATA_5
53	SD_DATA_4	54	SD_DATA_7
55	SD_DATA_6	56	---
57	GND	58	GND
59	HDA_SYNC	60	SMB_Clock
61	HDA_Reset#	62	SMB_Data
63	HDA_BitClock	64	SMB_Alert#
65	HDA_SerialDataIN	66	I2C_Clock
67	HDA_SerialDataOUT	68	I2C_Data
69	Thermal_Alarm#	70	Watchdog_TRIG#
71	Thermal_Trip#	72	Watchdog_OUT
73	GND	74	GND
75	USB_P7-	76	USB_P6-
77	USB_P7+	78	USB_P6+
79	USB_6-7_OverCurrent#	80	USB_4-5_OverCurrent#
81	USB_P5-	82	USB_P4-
83	USB_P5+	84	USB_P4+
85	USB_2-3_OverCurrent#	86	USB_0-1_OverCurrent#
87	USB_P3-	88	USB_P2-
89	USB_P3+	90	USB_P2+
91	USB_Host_Detect#	92	USB_Host_Control_Select
93	USB_P1-	94	USB_P0-
95	USB_P1+	96	USB_P0+
97	GND	98	GND
99	LVDS_A_0+	100	---
101	LVDS_A_0-	102	---
103	LVDS_A_1+	104	---
105	LVDS_A_1-	106	---
107	LVDS_A_2+	108	---
109	LVDS_A_2-	110	---
111	LCD_POWER_ENABLE	112	LCD_Backlight_Enable
113	LVDS_A_3+	114	---
115	LVDS_A_3-	116	---
117	GND	118	GND
119	LVDS_CLK_A+	120	---
121	LVDS_CLK_A-	122	---
123	LCD_Brightness_Control	124	---
125	LVDS_DisplayID_Data	126	LVDS_BLC_Data
127	LVDS_DisplayID_Clock	128	LVDS_BLC_Clock
129	---	130	---
131	SDVO_Clock+	132	SDVO_INT+

133	SDVO_Clock-	134	SDVO_INT-
135	GND	136	GND
137	SDVO_Green+	138	SDVO_FIELD_STALL+
139	SDVO_Green-	140	SDVO_FIELD_STALL-
141	GND	142	GND
143	SDVO_Blue+	144	SDVO_TV_Clock_IN+
145	SDVO_Blue-	146	SDVO_TV_Clock_IN-
147	GND	148	GND
149	SDVO_Red+	150	SDVO_Control_Data
151	SDVO_Red-	152	SDVO_Control_Clock
153	---	154	---
155	PCIE_Clock_Ref+	156	PCIE_WAKE#
157	PCIE_Clock_Ref-	158	PCIE_RESET#
159	GND	160	GND
161	---	162	---
163	---	164	---
165	GND	166	GND
167	---	168	---
169	---	170	---
171	EXCD0_PERST#	172	EXCD1_PERST#
173	PCIE_TX2+	174	PCIE_RX2+
175	PCIE_TX2-	176	PCIE_RX2-
177	EXCD0_CPPE#	178	EXCD1_CPPE#
179	PCIE_TX1+	180	PCIE_RX1+
181	PCIE_TX1-	182	PCIE_RX1-
183	GND	184	GND
185	LPC_AD0	186	LPC_AD1
187	LPC_AD2	188	LPC_AD3
189	LPC_Clock	190	LPC_FRAME#
191	SERIRQ	192	---
193	Vcc_RTC	194	Speaker
195	FAN_Tachometer_Input	196	FAN_PWM_Out
197	GND	198	GND
199	---	200	---
201	---	202	---
203	---	204	MFG_NC4
205	$+5V_{SB}$	206	$+5V_{SB}$
207	MFG_NC0	208	MFG_NC2
209	MFG_NC1	210	MFG_NC3
211	$+5V_{DC}$	212	$+5V_{DC}$

213	$+5V_{DC}$	214	$+5V_{DC}$
215	$+5V_{DC}$	216	$+5V_{DC}$
217	$+5V_{DC}$	218	$+5V_{DC}$
219	$+5V_{DC}$	220	$+5V_{DC}$
221	$+5V_{DC}$	222	$+5V_{DC}$
223	$+5V_{DC}$	224	$+5V_{DC}$
225	$+5V_{DC}$	226	$+5V_{DC}$
227	$+5V_{DC}$	228	$+5V_{DC}$
229	$+5V_{DC}$	230	$+5V_{DC}$

3.2.3 Optional signals

Depending on your Quadmo747 module, some of the signals indicated on the above table can be absent on the connector.

The following signals will be present only in case your Quadmo747 Module has the internal Gigabit Ethernet controller mounted:

Gigabit Ethernet Signals

Pin 3-6, 9÷12: GBEthernet_TDx+/-: Gigabit Ethernet Transmit/Receive Differential lines
Pin 7: GBEthernet_LINK100#: Ethernet Controller 100Mbit/s link indicator, active low
Pin 8: GBEthernet_LINK1000#: Ethernet Controller 1Gbit/s link indicator, active low
Pin 13: GBEthernet_LINK#: Ethernet controller link indicator, active low
Pin 14: GBEthernet_ACT_LED: Ethernet controller activity indicator, active low

In case the Gigabit Ethernet Controller is not present, and only in this case, a second PCI Express Lane will be present on the connector:

PCI Express Lane 2 Signals

Pin 173/175: PCIE_Tx2+/-: PCI Express Lane 2 Transmit Differential Pair
Pin 174/176: PCIE_Rx2+/-: PCI Express Lane 2 Receive Differential Pair

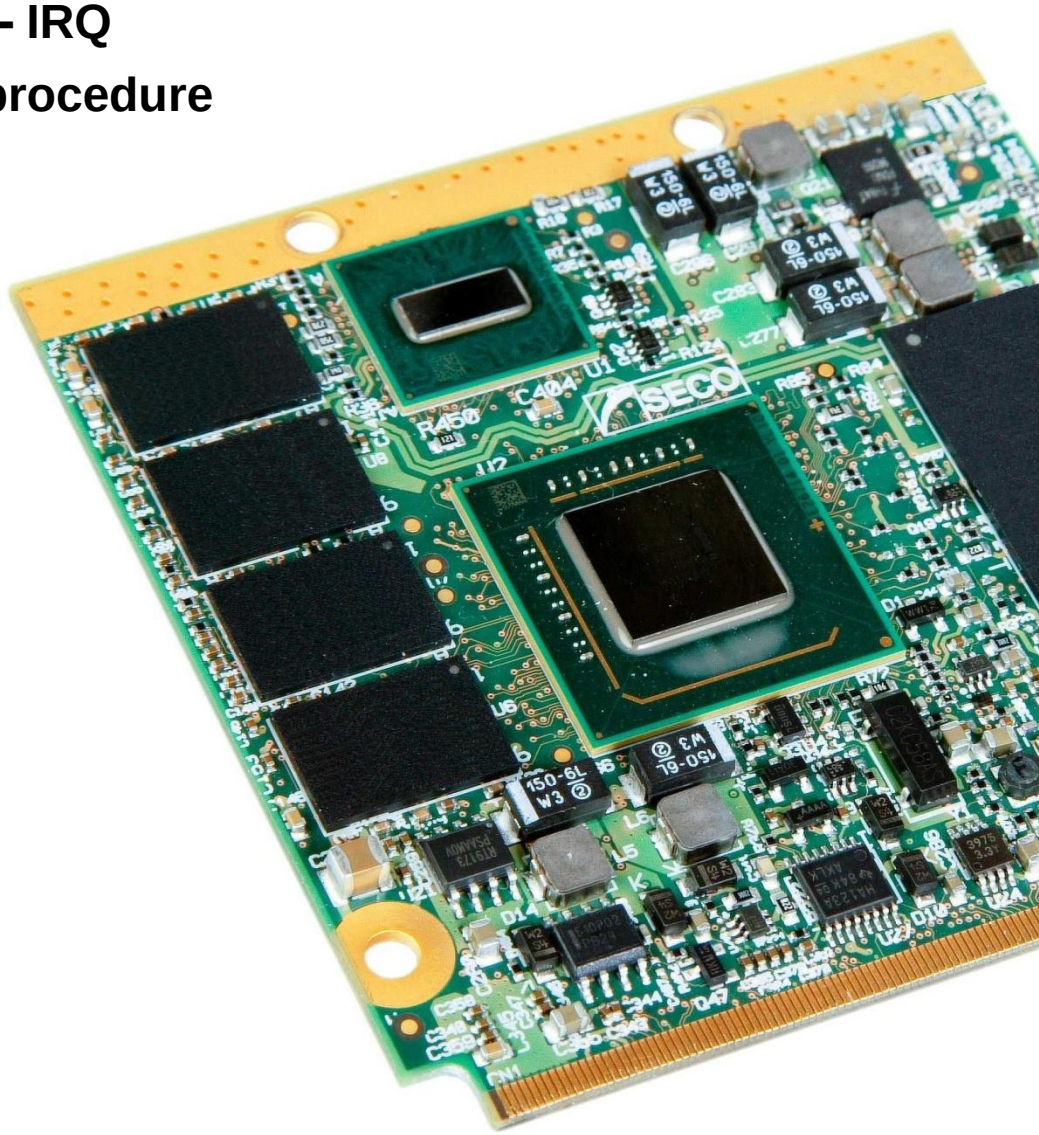
Finally, if the P-ATA to S-ATA bridge is not mounted on the boards, all signals related to S-ATA Channel 0 will be absent:

S-ATA Signals

Pin 29-31: SATA_TX+/-: S-ATA Transmit Differential Pair
Pin 35-37: SATA_RX+/-: S-ATA Receive Differential Pair
Pin 33: SATA_LED#: S-ATA Activity LED indicator

Chapter 4. BIOS SETUP

- **Introduction**
- **Basic CMOS Configuration**
- **Advanced CMOS Configuration**
- **Chipset Configuration**
- **POWER MANAGEMENT**
- **I/O MAPPING – IRQ**
- **BIOS Update procedure**



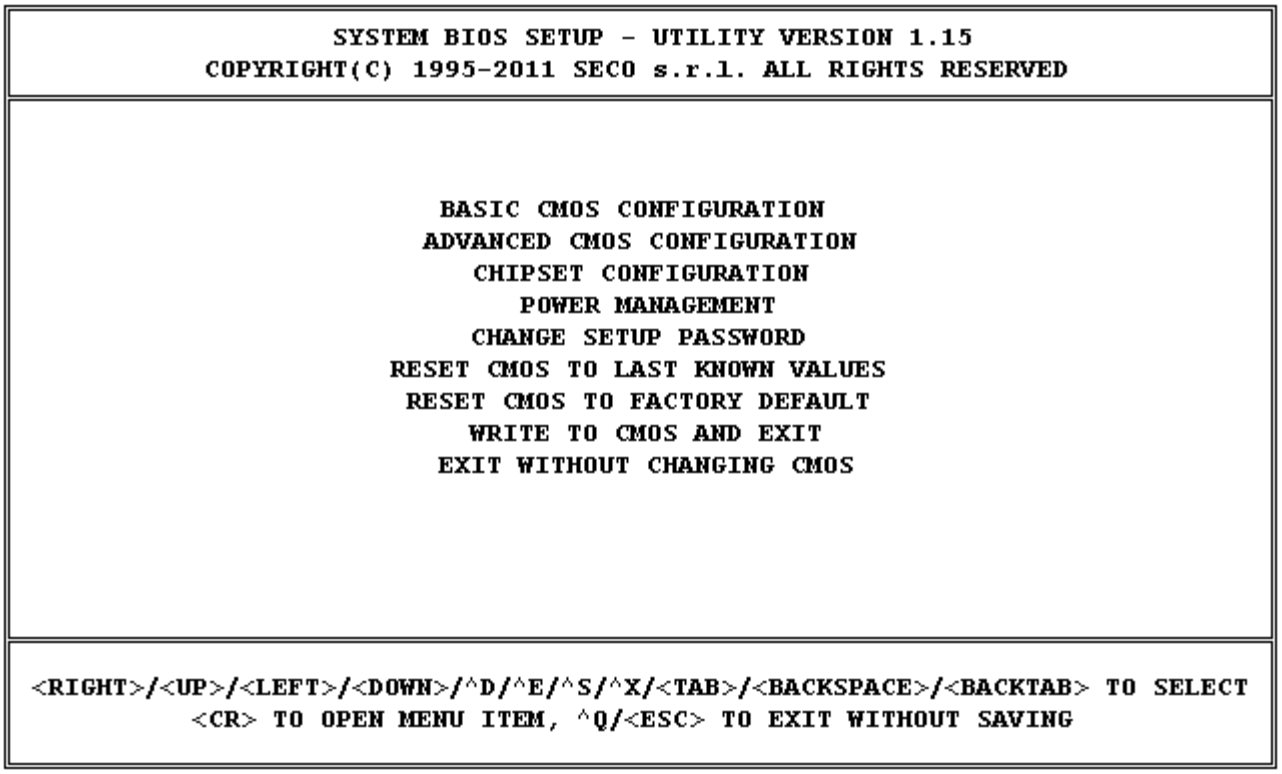
4.1 Introduction

There are some Quadmo747 parameters that are important to set after a first board optimisation, until a new change of hardware configuration.

It is possible to get this one using a user-friendly set-up that stores all parameters in an EEPROM: these data are retained also after the board power off.

The access to Setup can be obtained before the bootstrap by pressing *CTRL+ALT+ESC* or *DEL* keys.

Following this operation, it will appear the menu below:



Selecting a menu item, it is necessary to use the up and down arrows, while to execute them user must press Enter. The same effect of selecting the last item can be obtained by pressing *ESC*.

First four items allow modifying setup parameters. They will be discussed more exhaustively in the following paragraphs.

Fifth item is used to change the password required to enter into the setup menu (factory default is a blank password, and it can be changed by the final user, in order to prevent unauthorised accesses to this part of the system).

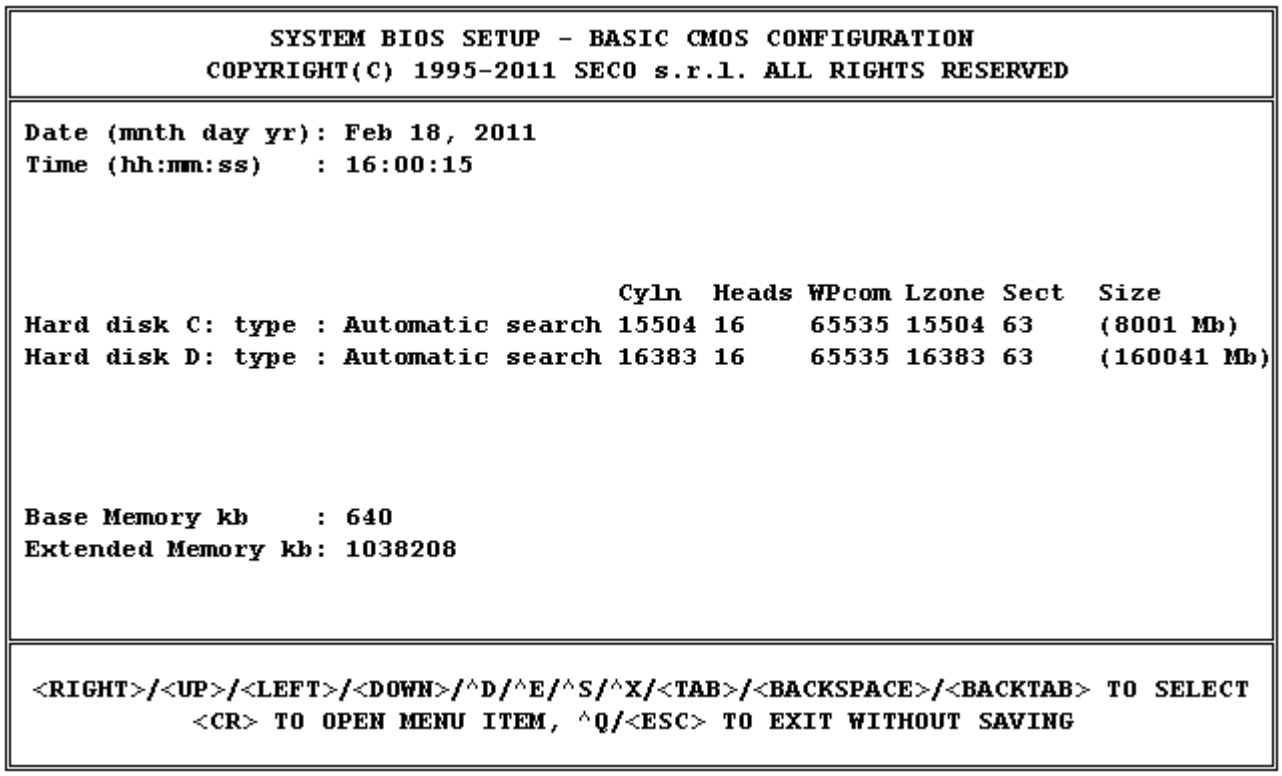
Sixth item restores CMOS situation to last known good values before any parameter modification.

Seventh item resets CMOS parameters to standard values (factory default) that can be adjusted to most probable configuration in order to facilitate the system start in the case of unknown optimised parameters.

The last two items allow exiting from setup respectively updating or not updating the C-MOS RAM. It is important to remember that setup data are stored not only in a C-MOS, but also in an EEPROM.

4.2 Basic CMOS Configuration

Selecting this item, it appears a standard setup screen:



All fields shown, except for the "*Base Memory*" and "*Extended Memory*", can be modified choosing the right field with arrows keys, selecting the field with *Enter* or *Tab* and modifying the value with *PgUp*, *PgDn*, + and -.

"*Hard Disk*" field offers the following choices:

- Not installed;
- Automatic search.

It visualises also six fields:

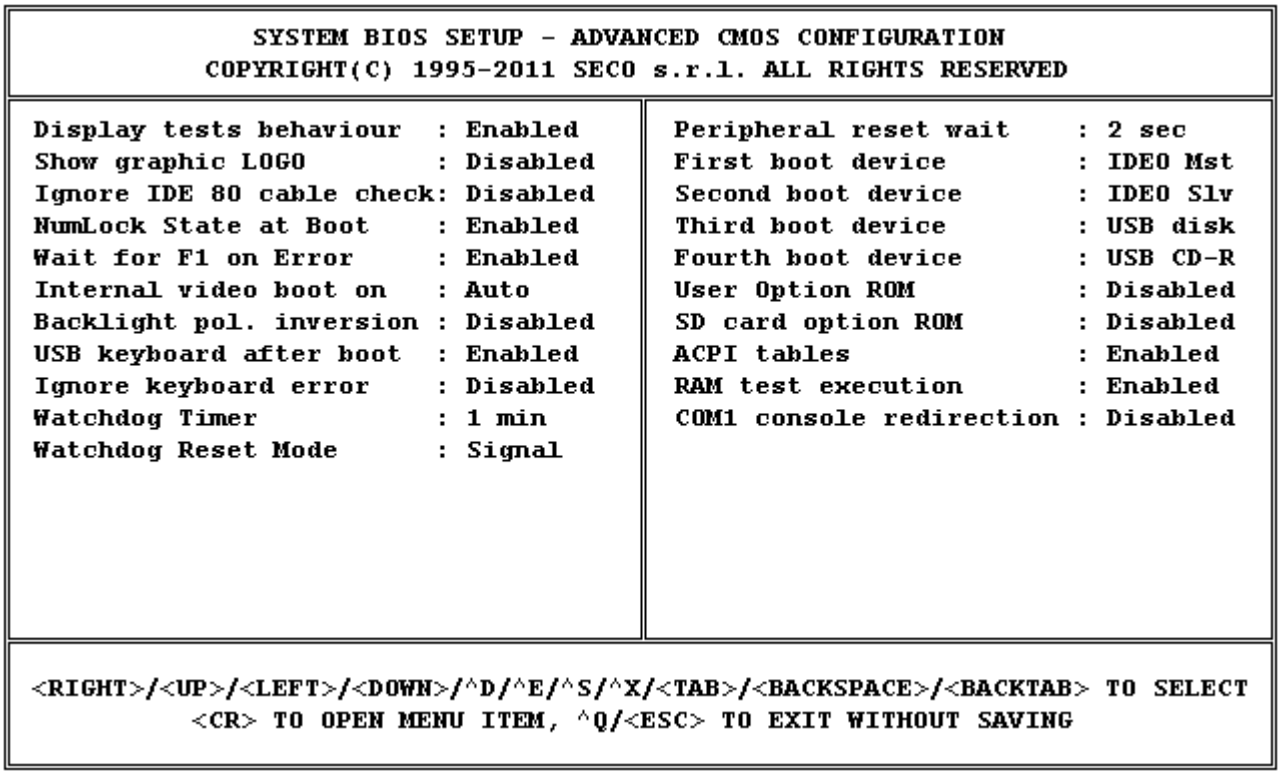
- Cyln;
- Heads;
- Wpcom;
- Lzone;
- Sect;
- Size.

that correspond respectively to: cylinders, heads, write pre-compensation, landing zone, sectors per tracks and dimensions (in MB)

"*Automatic search*" enables the BIOS to check automatically if a hard disk is actually installed and to know its specifications, while *"Not installed* "selection is used to speed up the boot in the case of not used Hard Disk, eliminating the time to check its presence.

4.3 Advanced CMOS Configuration

After the selection of this choice, it will appear the following table:



The selections above mentioned are just as an example, they can be different from default values.

Most fields allow two selections:

Disabled / Enabled

i.e., there is only the chance of enable or disable corresponding operations during the system boot.

4.3.1 Display tests behaviour

When "*Disabled*", it eliminates the message visualisation during initial test.

4.3.2 Show Graphic Logo

This option allows you to enable the visualisation of the graphic logo (a bitmap image 640x480 pixel in 16 colours) during the first steps of boot-up sequence. This image can be customised.

4.3.3 Ignore IDE 80 cable check

When this option is enabled, the system will not perform check of 80-poles cable for IDE Ultra-ATA 133 performances.

4.3.4 NumLock State at Boot

This option allows you to define the *NUMLOCK* state at Boot, delineating working mode of numeric keypad.

4.3.5 Wait for F1 on error

When "*Enabled*", in case of error during the boot phase, the system halts with the request to press F1 to continue.

4.3.6 Internal video boot on

This option allows you to choose which the default video output at system boot is. Possible choices are:

- Auto;
- Int. LVDS;
- Ext. DVI-DMI;
- External TV;
- Ext. CRT;
- Ext. LVDS

Note: Quadmo747 board, like all standard QSeven™ boards, has only two graphical interfaces: LVDS and SDVO. SDVO signals can be converted, in the external graphic card connected to the carrier board, into LVDS, TV, DVI or CRT format. It is important to set this menu item according to the interface used on the carrier board / on the graphical card.

Please also be careful, in case of using an LVDS interface, to differentiate between the internal LVDS controller, coming directly from QSeven™ module, and the external LVDS controller, placed on the SDVO graphical card.

IMPORTANT NOTICE FOR WINDOWS XP FIRST INSTALLATION: Please consider that using GMA video BIOS with Windows XP, after first installation of the system only LVDS output is enabled. Therefore, if you are using external video outputs derived from SDVO interface, you could not see anything at first reboot. To solve this problem, when the video disappear, please wait for about ten second, to allow the O.S. to boot completely, then press the hotkey “CTRL+ALT+F1” to enable immediately the video Output on External interfaces.

4.3.7 Backlight pol. inversion

Enable this feature if you want to switch logical levels of LCD_Backlight_Enable signal (Pin 112 or Quadmo747 Golden finger).

When this item is set to disabled, that signal is driven high to enable the external backlight.

When this item is set to enabled, that signal is driven low to enable the external backlight.

4.3.8 USB Keyboard after boot

During the boot, USB keyboard is always enabled. After this phase, the status of USB keyboard will depend from the settings of this menu item.

4.3.9 Ignore keyboard error

When “*Enabled*”, in case of keyboard error during the boot phase, the system proceeds with the normal boot sequence.

4.3.10 Watchdog Timer

This option allows disabling Watchdog Timer, or enabling it with a Timer value that can be set to be 1 minute, 2 minutes, 4 minutes, 8 minutes, 16 minutes, 32 minutes or 64 minutes.

4.3.11 Watchdog Reset Mode

This option is used to decide the behaviour of the system when the Watchdog timer triggers (in case is not disabled, see previous paragraph).

Signal: The watchdog timer just trigger a warning on Watchdog_OUT signal.

Warm Reset: the watchdog provides to reset the CPU.

Cold Reset: the watchdog let the system perform all the path from S0 (normal working mode) to S4 (Soft Off), then start up again until S0 state.

Reboot: in addition to the behaviour described for Cold reset, the embedded microcontroller that manage the watchdog provide to reset itself, too.

4.3.12 Peripheral reset wait

This option is very useful for the use of some peripherals, which requires more time after the start-up before that they can grant the access. With this option it is possible to specify how much time must the system wait before to attempt an access to external peripherals, in order to allow their complete reset (possible choices are 0, 2, 4 or 8 seconds).

4.3.13 First / Second / Third / Fourth boot device

This option allows you to choose in which order the mass storage devices (or an external LAN server) have to be searched for a valid O.S. for performing the system start-up. Possible choices for each entry are:

- NONE;
- IDE0 Master ;
- IDE0 Slave;
- CD-ROM;
- SD Card
- USB CD-R;
- USB disk.
- Int. LAN

4.3.14 User Option ROM

This option allows you to enable or disable any additional BIOS customised by the user, which allows additional features that wouldn't otherwise be implemented in Quadmo747 module.

4.3.15 SD card Option ROM

This option has been included in BIOS setup to enable or disable the additional BIOS that allows the boot from SD card.

4.3.16 ACPI tables

This option allows you to enable or disable ACPI tables, used in power management from the Operative System to administrate different power states.

4.3.17 RAM test execution

This option allows you to disable RAM test execution during boot phase, in order to allow a faster boot up of the system.

4.3.18 COM1 console redirection

When this option is enabled, all video output is redirected on an eventual serial port COM1 present on the Carrier Board. To work, this serial port must be set at standard address 3F8, IRQ4.

This video output can be read using programs like HyperTerminal or Putty, by setting the communication serial port with the following parameters:

115200bps, 8bit, No Parity, 1 bit stop, No Flow Control.

In case the character set is not visualised correctly, it is necessary:

- on HyperTerminal, in ASCII setup tab, please deselect "Wrap Lines that exceed terminal width" option
- on Putty, set the "Character set translation on received data" to CP437

4.4 Chipset Configuration

After the selection of this submenu, it will appear the following table:

```
          SYSTEM BIOS SETUP - CHIPSET CMOS CONFIGURATION
       COPYRIGHT(C) 1995-2011 SECO s.r.l. ALL RIGHTS RESERVED

PCI Express Slot 1       : Auto      PCI INTA,other device IRQ: 10
PCI Express Slot 2       : Auto      PCI INTB,USB2-3,Slot2 IRQ: 10
Internal SD card (SDI)   : Enabled   PCI INTC, USB4-5, SDE IRQ: 5
External SD card (SDE)   : Enabled   PCI INTD, USB 2.0 IRQ    : 15
Maximum UDMA mode        : 5 (ATA100) Internal EHCI USB        : Enabled
NAND drive               : Enabled   Internal UHCI USB ports  : 6
SATA drive               : Enabled   Internal USB client      : Auto
Internal video memory Mb : 8         Internal LAN             : Enabled
Internal Flat Panel type : 640x480   Internal Audio           : Enabled
Internal LVDS Signal     : 18bit     Default Therm. Management: TM2
External TV format       : Unspecified Default CPU frequency MHz: 1100
Internal F.P. DPST level : Default   HyperThreading Technology: Enabled
Internal F.P. fitting    : Stretching

<RIGHT>/<UP>/<LEFT>/<DOWN>/^D/^E/^S/^X/<TAB>/<BACKSPACE>/<BACKTAB> TO SELECT
          <CR> TO OPEN MENU ITEM, ^Q/<ESC> TO EXIT WITHOUT SAVING
```

The selections above shown are an example and they can be different from the default values.

4.4.1 PCI Express Slot 1 / 2

This option allows you to enable or disable single slots of PCI Express Bus. Auto option will allow automatic enabling of PCI Express slots in case PCI-e peripherals are found.

4.4.2 Internal SD card (SDI)

SDI is the SD card slot directly available on QSeven™ module. Its controller can be directly Enabled or Disabled using this menu item.

4.4.3 External SD card (SDE)

On QSeven™ golden finger there are some signals that can be used for the implementation of an additional SD/MMC card slot. This additional SD slot has an internal controller that can be individually enabled or disabled, using this menu item.

4.4.4 Maximum UDMA mode

It allows you to choose which Ultra-DMA Mode has to be set for EIDE section. Possible choices are: 2 (ATA 33), 3 (ATA50), 4 (ATA66), 5 (ATA100) and None.

4.4.5 NAND drive

Chipset US15W manage directly only one parallel-ATA channel. On this channel, the NAND Flash Disk integrated on board is configured to be the IDE master.

Using this menu item is possible to enable or disable separately the IDE master (the NAND Flash Disk), leaving the P-ATA Channel active for the Slave Disk.

WARNING: under Windows XP and Windows Server 2003, when IDE Master is not enabled, or there isn't the NAND Flash disk on the board, the system will not resume from standby power status. This is a Microsoft known issue (http://support.microsoft.com/default.aspx?scid=kb;en-us;330100).

4.4.6 SATA drive

Since Chipset US15W doesn't manage directly Serial-ATA devices, that are however foreseen in QSeven™ specifications, on the parallel-ATA channel there is a P-ATA to S-ATA Bridge, that is set to work as a slave device. This bridge can be enabled or disabled separately using this menu item, therefore leaving the P-ATA channel active for the Master Disk.

4.4.7 Internal Video Memory Mb

This option allows to choose the memory window size reserved for internal graphic controller (possible choices are *OFF, 1, 4, 8*). If there is installed in the system an additional graphic board, it is necessary to set this value to *OFF*.

4.4.8 Internal Flat Panel Type

This option allows you to define the resolution of video output for the connection of LCD displays (LFP). Possible choices are:

- 640 x 480
- 800 x 480
- 800 x 600
- 1024 x 600
- 1024 x 768
- 1280 x 768
- 1366 x 768
- Custom

Custom resolution is a panel resolution that can be customised in Video BIOS. If not changed, this value corresponds to 1280x800 resolution.

4.4.9 Internal LVDS signal

This item has to be used to set the LVDS bit depth for each panel resolution above described: 18 bit or 24 bit are the possibilities.

4.4.10 External TV format

In case the SDVO external graphic card uses a TV decoder, is it possible to specify, via this menu item, the standard TV format that is desired for output. There are many possibilities, here not listed, ranging form Unspecified TV out to NTSC TV, from PAL to SECAM, in the various broadcast system. HD video formats are also supported, both in CEA and SMPTE standards.

4.4.11 Internal F.P. DPST level

This option allows you to set the Intel Display Power-Saving Technology level, which reduces backlight luminosity depending on the image displayed on the screen, balancing image quality with power consumption. This allows minor power consumption, while keeping a good quality of the video.

Possible values are Default, Off, 1, 2, 3, 4 or 5.

4.4.12 Internal F.P. fitting

When using a Flat Panel connected to internal LVDS interface, it is possible to use this option to determine how the image has to be managed in case of image size different than display size.

Possible options are Disabled, Centering or Stretching.

4.4.13 PCI INTA, other device IRQ

This option allows to choose which IRQ has to be assigned to PCI INTA# line (possibilities are IRQ 3, 4, 5, 6, 7, 10, 11, 12, 15 or NO), which is shared with other internal devices (USB 0÷1 ports, PCIe port 1…)

4.4.14 PCI INTB,USB2-3,Slot2 IRQ

This option allows to choose which IRQ assign to PCI INTB# (possibilities are IRQ 3, 4, 5, 6, 7, 10, 11, 12, 15 or NO), which is shared with USB ports 2÷3 and internal SD slot.

4.4.15 PCI INTC, USB4-5, SDE IRQ

This option allows to choose which IRQ assign to PCI INTC line (possibilities are IRQ 3, 4, 5, 6, 7, 10, 11, 12, 15 or NO), which is shared with USB ports 4÷5 and external SD slot.

4.4.16 PCI INTD, USB 2.0 IRQ

This option allows to choose which IRQ assign to PCI INTD# line (possibilities are IRQ 3, 4, 5, 6, 7, 10, 11, 12, 15 or NO), which is shared with USB 2.0 ports.

4.4.17 Internal EHCI USB

Internal EHCI controller allows you to use all USB ports enabled also in high speed-mode. If enabled, EHCI controller takes control of all eight USB ports, which can now work both in USB 1.1 and USB 2.0 mode. Please notice, however, that USB ports #6 and #7 can work exclusively in USB 2.0 mode, i.e. devices working in USB 1.1. mode will not work when connected to these ports. Please also consider that if Internal UHCI USB ports are set to 0, the EHCI USB controller will be always disabled.

4.4.18 Internal UHCI USB ports

This option allows you to choose how many internal USB ports are enabled, for working in USB 1.1 mode. Possible choices are: 0, 2, 4, 6. Only USB ports from 0 to 5 can be set to work in 1.1 mode, ports #6 and #7 can work exclusively in USB 2.0 mode, when Internal EHCI USB is enabled (devices working in USB 1.1 mode will not work, therefore, if connected to one of these two ports). ***WARNING:*** if Internal UHCI USB ports is set to 0, the Internal EHCI Controller will not work, so there will not be any USB port at all. Please also consider that Quadmo747 board doesn't have support for PS/2 devices, so you can use only USB keyboards and mice, disabling all USB ports will result in the impossibility of interacting with the O.S.

Total number of USB ports will depend, therefore, on the number of UHCI USB ports enabled.

4.4.19 Internal USB client

USB port#1 can be configured to work in USB client mode. USB client needs a dedicate controller, internal to US15W chipset, that can be enabled or disabled using this menu item. When enabled, port 1 (pins 93 and 95 on QSeven™ golden finger) can be used only in USB client mode. Using "Auto" option, the port will be able to acknowledge automatically if must work in Host or in Client mode, depending on the device connected to the port.

4.4.20 Internal LAN

This menu item enables or disables internal Ethernet controller.

4.4.21 Internal Audio

This option allows you to enable or disable select the audio interface coming out from Chipset.

4.4.22 Default Therm. Management

This option describes the kind of behaviour that the board must observe in case of processor overheating. Two different types of thermal management are possible, TM1 and TM2, as described in specifications of Intel® Atom™ processors.

4.4.23 Default CPU frequency MHz

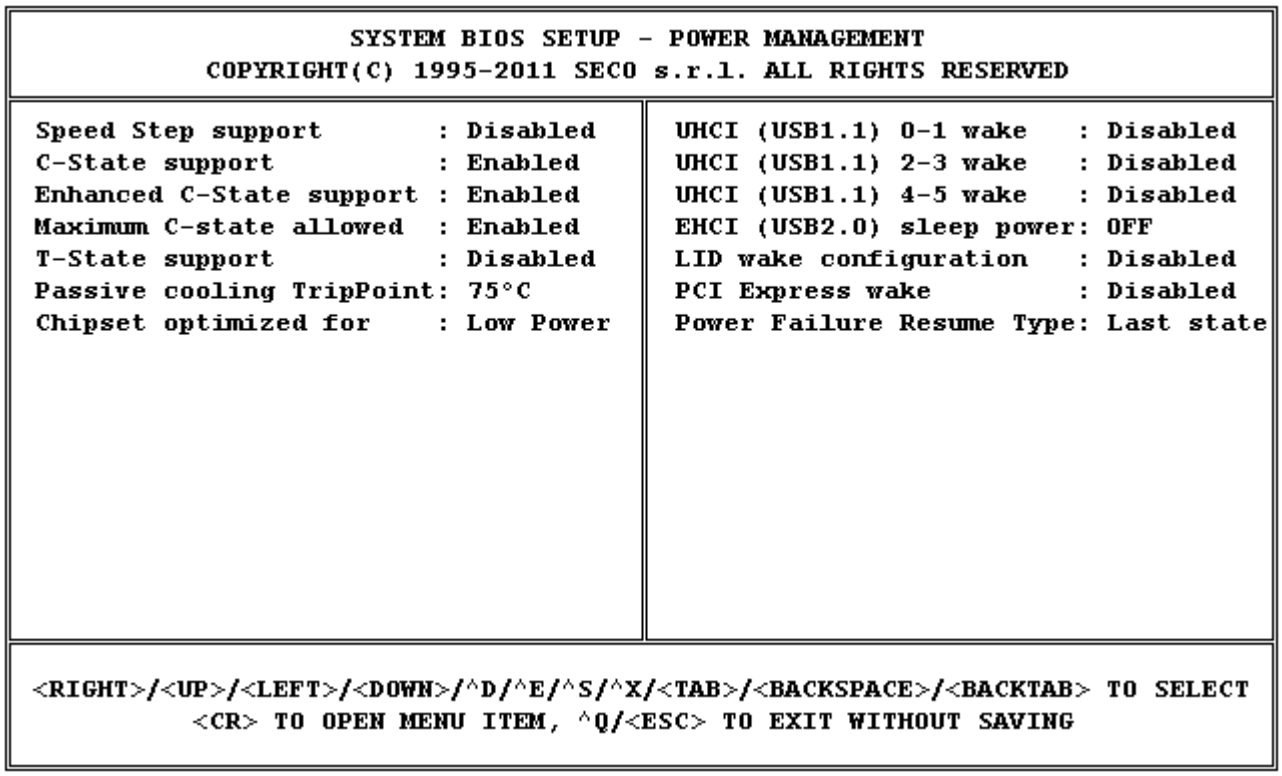
It allows the selection of default operative frequency (MHz) to be used for the CPU. Since the frequency depends on the processor installed, it is not possible to state here the values that will be offered. CPU frequency, like Thermal management mode, can be varied even by the O.S., according to ACPI tables, CPU C-States and Speed Step management

4.4.24 HyperThreading Technology

This feature has to be used to enable or disable HyperThreading capabilities of your module's CPU (this feature is available only on modules with Intel® Atom™ Z530 @ 1.6GHz).

4.5 POWER MANAGEMENT

After the selection of this submenu, it will appear the following table:



The selections above shown are an example and they can be different from the default values.

4.5.1 Speed Step support

This option allows you to enable or disable Speed Step functionality, i.e. the possibility for the board to vary CPU operative frequency, according to augmented or reduced workload, in order to decrease power consumption when the CPU is not idle.

4.5.2 C-State support

This option allows you to enable or disable CPU's C-State management, i.e. the possibility to define different idle states for the CPU, from the lightest to the deepest sleep status. Increasing in sleep status deepness, more and more zones of the CPU are disabled, so that power consumption decrease significantly when CPU is not busy.

4.5.3 Enhanced C-State support

Enhanced C-States are idle states for the CPU, in which more parts of the CPU are temporarily disabled than in normal C-State. This way, these enhanced C-states allow a more significant reduction of power consumption.

4.5.4 Maximum C-State allowed

This option allows you to select which is the deepest sleep state (C-State) that the CPU can reach. Possible values are C1, C2, C3, C4 or C6.

4.5.5 T-State support

This option allows you to enable or disable CPU's Intel T-States management.

4.5.6 Passive cooling TripPoint

With this option, it is possible to set the threshold CPU's temperature value above which ACPI-supporting Operative Systems will begin to throttle the CPU frequency, to try to reduce the global temperature. Possible values are 60°C, 75°C, 90°C, Disabled.

4.5.7 Chipset optimized for

Using this option, it is possible to select if the Chipset has to be optimized for Low Power Consumption or for best Performance.

4.5.8 UHCI (USB1.1) 0-1 wake

Using this option, it is possible to enable or disable USB ports 0 and 1, that are USB1.1 controlled by a single UHCI controller, for waking up the system from S3 (Suspend-To-RAM) state.

4.5.9 UHCI (USB1.1) 2-3 wake

Using this option, it is possible to enable or disable USB ports 2 and 3, that are USB1.1 controlled by a single UHCI controller, for waking up the system from S3 (Suspend-To-RAM) state.

4.5.10 UHCI (USB1.1) 4-5 wake

Using this option, it is possible to enable or disable USB ports 4 and 5, that are USB1.1 controlled by a single UHCI controller, for waking up the system from S3 (Suspend-To-RAM) state.

4.5.11 EHCI (USB2.0) sleep power

Depending on the Hardware connected to the USB ports and on the O.S. you are using, there could be some malfunctioning with Resume from S3 state using GMA video drivers. Malfunctions could especially occur when using USB1.1 devices connected to HUBs…

Using Windows XP with GMA drivers, this menu item allows to manage correctly these situations, and works jointly with “UHCI (USB1.1) x-y wake” selection, according to the following table:

“EHCI (USB2.0) sleep power” Setting	“UHCI (USB1.1) x-y wake” Setting	Behaviour
OFF	Disabled	The System will never resume from S3 State on USB 1.1. or USB2.0
OFF	Enabled	The System will resume from S3 State immediately, even if the Hardware could manage S3 state correctly
ON	Disabled	USB1.1 devices connected to USB Hubs can still wake the system from S3
ON	Enabled	If the Hardware is able to manage S3 correctly, all works fine, otherwise the System will wake up immediately

Using Windows 7, all works fine, even in the second situation the system will wake only from USB1.1 devices connected directly to the ports, not passing through USB HUBs.

4.5.12 LID wake configuration

On notebook systems, it is typical that when the notebook is closed, the display is shut down and the system is in a Suspend state. By correctly setting this option, it is possible to specify if the system has to detect a closure event when Lid signal is at High or Low level.

4.5.13 PCI Express wake

Using this menu item, it is possible to enable or disable the possibility of waking the board using signals coming from PCI Express devices (for example, to enable a Wake on LAN feature).

4.5.14 Power Failure Resume Type

This option allows you to determine how the board must act after a power failure event: in case the option is “Always ON”, the board will start every time the power supply is present; when the option is “Always OFF”, the board will not start automatically when the power supply returns.

Finally, with Last State option, the board will remember its state before power failure event. In this way, when power supply returns, the board will start automatically if it was turned on, and will remain off if it was turned off.

4.6 I/O MAPPING – IRQ

4.6.1 ISA Addressing

On conventional ISA bus, addressing space ranges from 00 Hex to 3FF Hex: some of these I/O addresses are occupied by system resources, therefore they can not be used for direct I/O access.

Please notice, however, that free I/O addresses can change, since PCI dynamical allocation can occupy some of the spaces that are left from BIOS settings. Disabling, via BIOS, some resources can also free some I/O addresses. Finally, additional I/O addresses can be occupied by non-standard devices placed on the Carrier Board of Quadmo747 module.

Therefore, for an exhaustive list of I/O addresses used, it is better to look into your O.S. Device Manager, to see what addresses are effectively free

Here following, however, there is a list of addresses usually occupied for system resources.

Device	Range	Note
	0x00-0xFF	RESERVED FOR MOTHERBOARD PRIMARY RESOURCES
IDE1	0x170-0x177	
IDE0	0x1F0-0x1F7	
IDE1	0x376-0x377	
COM4	0x2E8-02xEF	Available in case the Carrier Board doesn't have SMSC SCH3114 Super I/O controller, able to manage 4 Serial Ports
COM2	0x2F8-02xFF	Available in case there isn't any Super I/O controller on the Baseboard
IDE0	0x3F6-0x3F7	
VGA standard	0x3B0-0x3DF	
COM3	0x3E8-0x3EF	Available in case the Carrier Board doesn't have SMSC SCH3114 Super I/O controller, able to manage 4 Serial Ports
IDE0	0x3F6-0x3F7	
COM1	0x3F8-0x3FF	Available in case there isn't any Super I/O controller on the Baseboard
	0x400-0x47F	RESERVED FOR MOTHERBOARD PRIMARY RESOURCES
	0x4D0-0x4D1	RESERVED FOR MOTHERBOARD PRIMARY RESOURCES
	0x800-0x80F	RESERVED FOR MOTHERBOARD PRIMARY RESOURCES
PCI / PCIe	0xCF8-0xCFF	PCI configuration register
PCI / PCIe Devices	0x1000-0xEFFF	PCIO BIOS starts to assign I/O resources from 0xFFF0 downwards
	0xF000-0xFFFF	RESERVED FOR MOTHERBOARD PRIMARY RESOURCES

4.6.2 IRQ Mapping

IRQ	Device	Note
0	Timer Tick	Timer tick
1	Keyboard Controller	Do not reassign this IRQ to prevent malfunctioning
2	RESERVED	
3	COM2	Available in case there isn't any Super I/O controller on the baseboard
4	COM1	Available in case there isn't any Super I/O controller on the baseboard
5	Available	
6	COM3	Available in case the Carrier Board doesn't have SMSC SCH3114 Super I/O controller , able to manage 4 Serial Ports
7	COM4	
8	Real Time Clock	
9	RESERVED	
10	Available	
11	Available	
12	Available	
13	Math Coprocessor	
14	IDE0	
15	Available	

4.7 BIOS Update procedure

To update the BIOS to the latest release available, you can use Q7P009.COM utility. Both this utility and the latest BIOS release can be downloaded for free from Secoqseven web-site for registered users.

Q7P009.COM is a utility that works exclusively under DOS O.S., therefore it is necessary to have a DOS bootable disk (for example an USB Flash disk). It is also very important that in the disk there aren't CONFIG.SYS and AUTOEXEC.BAT files, so that you can perform a "clean" boot.

Copy on this disk both Q7P009 file and the latest BIOS release, and then start the system connecting this disk.

After the boot, you can perform dumping, erasing, whole BIOS and single flash blocks programming (LOGO, additional BIOS, redundant EEPROM, video BIOS, User String).

4.7.1 Options

The program accepts via the command line these following options:

-l *<file name>*	Logo Programming.
-cl	Clear the logo flash area.
-sl	Skip logo programming.
-c *<file name>*	Custom BIOS Programming.
-cc	Clear the custom BIOS.
-sc	Skip custom BIOS flash area while programming.
-dc *<file name>*	Dump custom BIOS to file.
-o *<file name>*	Program setup options.
-co	Clear setup options in the EEPROM.
-do *<file name>*	Dump setup options to file.
-so	Skip setup options while programming.
-n *<file name>*	Program NVS data.
-cn	Clear NVS data area
-dn *<file name>*	Dump NVS data to file.
-sn	Skip NVS area while programming
-v *<file name>*	Program custom video BIOS
-dv *<file name>*	Dump custom video BIOS to file.
-sv	Skip video BIOS area while programming
-u *<file name>*	Program user string from plain ASCII file
-cu	Clear the User string
-du *<file name>*	Dump User String to file.
-t *<file name>*	Program Custom Data Table
-ct	Clear Custom Data Table
-st	Skip Custom Data Table while programming.
-dt *<file name>*	Dumps Custom Data Table to file.
-f	Program current setup options as Factory Defaults.
-cf	Restore Real Factory Defaults
-b *<file name>*	Program only the BIOS.
-ab *<file name>*	Program all the flash with a new BIOS file.

-db <*file name*> Dump all BIOS to file.

-fw Forces SPI Flash programming

-nr No reboot. Wait for power off.

If no selection has been placed in the command line, the software will return the previous command line list.

Example: ***Q7P009 -so -ab 0747000.115***

With this syntax, the Flash will be programmed entirely (*-ab) with BIOS release contained in file <07470000.115>, but the setup options area will be skipped (*-so), so old setup option will be maintained

WARNING: if your Quadmo747 board has been programmed with a BIOS release 1.15 or higher, whenever you want to change the BIOS, by upgrading OR DOWNGRADING it, you always must use BIOS programmer Q7P009, never use older releases (like Q7P008, Q7P007 or older).

Always use Q7P009 (or higher) for flash programming of BIOS release 1.15 or higher.

4.7.2 Command line options

4.7.2.1 *-l <file name>

This option will save the logo contained in <*file name*> inside the flash.

The logo needs to follow these respective requirements:

- 16 colour bitmap
- It needs to be at least 1 pixel
- the resolution must be no more than 640X480

(NB to make the logo visible you need to set the related option in the BIOS setup)

4.7.2.2 * -cl

This option will erase all the flash data dedicated for the logo.

4.7.2.3 * -sl

During the whole Flash programming (option “-ab), this option indicates to skip the area dedicated to the logo.

4.7.2.4 * -c <file name>

This option will flash an additional BIOS contained in <*file name*> (User Option ROM) inside the BIOS EEPROM.

This additional BIOS must follow these rules:

- valid signature: the first two byte must be 0x55, 0xAA
- 2KB as a minimum size
- 64KB as maximum size
- valid checksum

(NB to run the additional BIOS, you need to enable the related option in the BIOS setup)

4.7.2.5 * -cc

This option will erase the flash data dedicated to the additional BIOS.

4.7.2.6 * -sc

During the whole Flash programming (option “-ab), this option indicates to skip the area dedicated to the additional BIOS.

4.7.2.7 * -dc <file name>

This option will perform the dumping of the flash data dedicated to the additional BIOS on the file <file name>.

4.7.2.8 * -o <file name>

This option will program the setup options contained in <*file name*> inside the flash. This part is used as redundant EEPROM.

The file <*file name*> needs to respect the following requirements

Minimum size 30B

Maximum size 4KB

The fist 30B must have the two valid checksums

If binary input file is a valid one, not only redundant EEPROM will be programmed, but also CMOS.

4.7.2.9 * -co

This option will erase the flash data dedicated to the CMOS redundant copy.

4.7.2.10 * -do <file name>

This option will perform the dumping of the flash area dedicated to the CMOS redundant copy on the file <file name>.

4.7.2.11 * -so

When programming BIOS with options “b” and “-ab”, using this option the programmer will skip the area that is used as redundant EEPROM.

4.7.2.12 * -n <file name>

This option will flash the content of <file name> inside EEPROM’s Non Volatile Storage (NVS) Area.

The binary file needs to be 4096Byte (4KB) size.

4.7.2.13 * -cn

This option will erase the data contained in NVS area

4.7.2.14 * -dn <file name>

This option will perform the dumping of the Non Volatile Storage Area on the file <*file name*>

4.7.2.15 * -sn

With BIOS programming options “-ab”, using this option the programmer will skip the NVS area.

4.7.2.16 * -v <file name>

This option will flash the content of <*file name*> on video BIOS area, overwriting original video BIOS.

Input binary file needs to be a valid video BIOS.

4.7.2.17 * -dv <file name>

This option will perform the dumping of actual video BIOS area on the file <*file name*>.

4.7.2.18 * -sv

With BIOS programming options “-b” and “-ab”, this option will allow to skip the flash programming of video BIOS area.

4.7.2.19 * -u <file name>

This option will program the User String Area with the content of <*file name*>.

<*filename*> must be a plain ASCII text, with max length of 82 characters.

4.7.2.20 * -cu

This option will erase the User String Area.

4.7.2.21 * -du <file name>

This option will perform the dumping of the User String Area on the file <*file name*>.

4.7.2.22 * -t <file name>

This option will program a User Data Table for SuperI/O customisation inside the BIOS flash.

4.7.2.23 * -ct

This option will erase the flash data dedicated to the User Data Table.

4.7.2.24 * -st

During the whole flash programming (options “-b” and “-ab”), this option indicates to skip the area dedicated to the User Data Table.

4.7.2.25 * -dt <file name>

This option will perform the dumping of the flash data dedicated to the User Data Table on the file <*file name*>.

4.7.2.26 * -f

This option uses the current setup values, and save them as factory default.

These settings are saved in Custom Data Area. If in this Area is present some table, different from factory default, that table is kept unchanged. In case in Custom Data Area is already present a table with Factory Defaults, this table will be overwritten.

When this option is used along with “-ab” option, unless options “-ct” or “-st” are used, all the data contained in the Custom Data Area are erased by “-ab” option programming, and then overwritten with the single Factory Default table.

4.7.2.27 * -cf

This option removes Custom Factory Defaults, replacing them with BIOS original factory default. Removal will be made only in case in Custom Data Area is effectively present a Custom factory Default table.

4.7.2.28 * -b <file name>

This option will flash the BIOS contained in <*file name*> inside EEPROM

The programming does not overwrite/erase the flash area dedicated to NVS, to the logo, to the additional BIOS and to the custom data area.

The binary file needs to follow these requirements:

- the size needs to be 1MB
- It needs to be a SECO's BIOS
- It needs to have a valid checksum
- It needs to be made for the board at issue

Unless otherwise stated (options “-so”, “-st” and “-sv”) the dedicated area for redundant EEPROM, User Data Table and video BIOS will be overwritten.

If BIOS image contained in <filename> has valid data for EEPROM area, then also CMOS is reprogrammed with these data; otherwise, EEPROM is cleared and CMOS is not modified.

4.7.2.29 * - ab <file name>

This option will program the entire flash data with the source binary file <file name>.

All areas of BIOS will be overwritten (unless otherwise stated with options “-sl”, “-sc”, “-sn”, “-sv”, “-st” and/or “-so”) will be erased.

If BIOS image contained in *<filename>* has valid data for EEPROM area, then also CMOS is reprogrammed with these data; otherwise, EEPROM is cleared and CMOS is not modified.

NB the requirements of the input binary file are exactly like those indicated for options “-b”.

4.7.2.30 * -db <file name>

This option will perform the entire dumping of the flash data on the file <file name>.

4.7.2.31 * -fw

This option forces SPI Flash writing, even in case that SPI sector’s contents are identical to what we would like to program inside.

This is particularly useful during recovery situations, like, for example, when reprogramming the Flash BIOS by booting from an external Firmware Hub.

4.7.2.32 * -nr

Using this option, in case at least one of the programming or erasing actions have been performed, the automatic reboot will be skipped.

To reboot the system it will be then necessary to power off the system.

4.7.3 Warnings

In order to avoid the failure of the board, it is strongly suggested to follow the precautions here reported.

Please do not reset, tun off, unplug the ac power cord, touch or remove any drive used to updating the bios.

If at least one of the programming or erasing actions has been made the system will be rebooted at end of the action, unless the option “-nr” has been used.

After updating BIOS to a new release, it is strongly recommended that you enter the BIOS and check carefully every option. Particularly, it is recommended to check video BIOS settings, in special mode if you are using internal LVDS interface.

In case you should experience any problem with Q7P009 utility, please contact hardware@seco.com with a detailed description of problems encountered.

Appendix A Thermal Design

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

Highly integrated modules, like Quadmo747 module, allow to achieve very good performances in a very small space, therefore allowing systems minimisation. On the counterpart, minimisation of IC's and the rise of operative frequencies of CPU's generate a big amount of heat, that need to be dissipated to prevent system hang-off or faults.

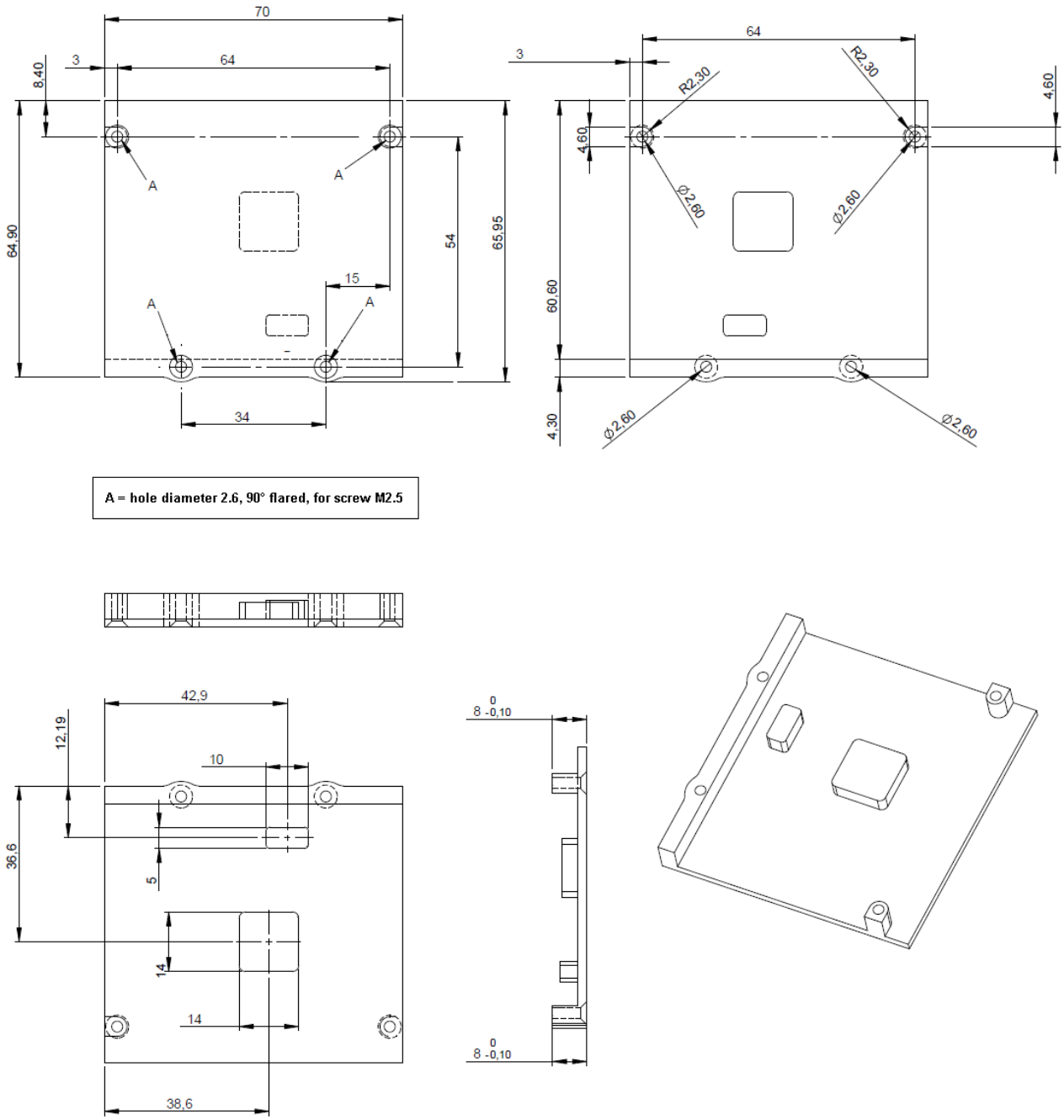
Therefore, it is necessary to study correctly the heat dissipation in your system.

To optimise the dissipation using a board like Quadmo747, it is a good idea to use a metallic heatspreader, which contacts directly heat-generating surfaces like the CPU core and the chipset core. Quadmo747 module, according to QSeven™ specifications, has also a metalled strip free of components both on top and bottom side of the module, opposite to card edge golden finger, that should goe in direct contact with the heatspreader, to increment the surface used for thermal exchange.

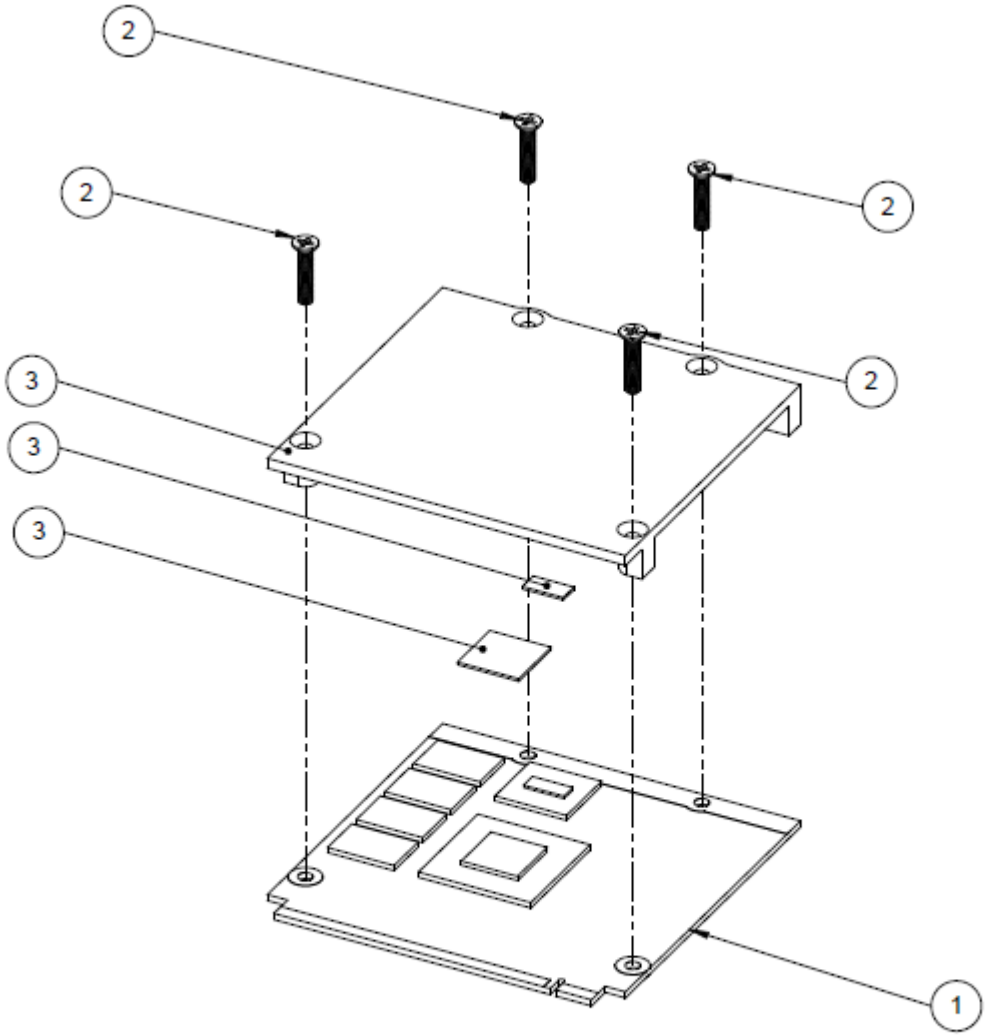
The heatspreader needs to be thermally coupled to the heat generating surfaces using a thermal gap, that will optimise the heat exchange between the device and the heatspreader.

The heatspreader, however, acts only a surface that distributes uniformly the heat generated on the board, and could be not sufficient to cool enough the system. Therefore, it is necessary to study carefully the thermal dissipation of your system, and use, if necessary, other additional thermal solutions, like heatsinks, fans, heatpipes…

SECO can provide for standard heatspreaders to use in conjunction to Quadmo747 module. Please remember, however, that these heatspreaders could not represent the complete thermal dissipation solution for your system.



Heatspreader dimensions and standoff



Item nr	Quantity	Description
1	1	Quadmo747 QSeven Module
2	4	Screw, M2.5, cylindrical head, crosshead, L=12mm, Inox A-2
3	1	Heatspreader + Gap Pad Filler assembly

Heatspreader + Quadmo747 module assembly

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