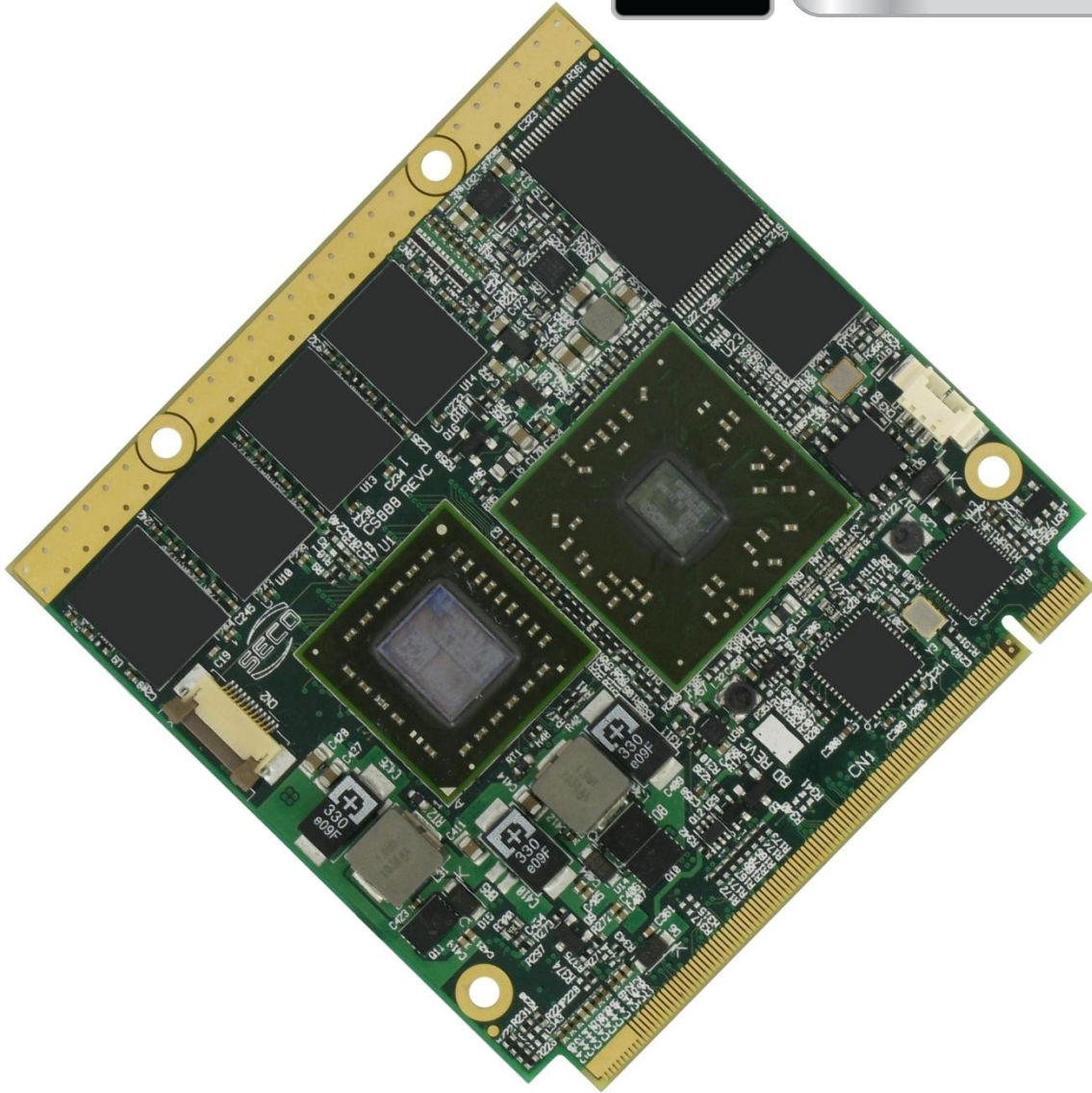


QUADMO747-GSeries

Qseven® Rel. 1.20 Compliant Module with AMD Embedded G-Series APU



AMD Fusion
FAMILY OF APUs
EMBEDDED TECHNOLOGY



User Manual



QUADMO747-GSeries

REVISION HISTORY

Revision	Date	Note	Rif.
1.0	7 th Dec 2011	First official release	SB
1.1	17 th Jan 2012	Operating temperature updated	SB
1.2	20 th Sep 2012	Technical specifications updated Power consumption added Qseven connector pinout updated according to newest PCB releases (see par. 3.2.1.2) BIOS section updated	SB

All rights reserved. All information contained in this manual is proprietary and confidential material of SECO S.r.l.

Unauthorised use, duplication, modification or disclosure of the information to a third-party by any means without prior consent of SECO S.r.l. is prohibited.

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.

Some of the information found in BIOS SETUP Chapter has been extracted from the following copyrighted Insyde Software Corp. documents:

- InsydeH2O™ Setup Utility – User Reference Guide

The above mentioned documents are copyright© 2008 Insyde Software Corp. All rights reserved.

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.

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



INDEX

CHAPTER 1. INTRODUCTION 4

1.1 WARRANTY..... 5

1.2 INFORMATION AND ASSISTANCE 6

1.3 RMA NUMBER REQUEST 6

1.4 SAFETY 7

1.5 ELECTROSTATIC DISCHARGES 7

1.6 ROHS COMPLIANCE 7

CHAPTER 2. OVERVIEW 8

2.1 INTRODUCTION..... 9

2.2 TECHNICAL SPECIFICATIONS..... 10

2.3 ELECTRICAL SPECIFICATIONS..... 11

2.4 MECHANICAL SPECIFICATIONS 12

2.5 BLOCK DIAGRAM 13

CHAPTER 3. CONNECTORS 14

3.1 CONNECTORS OVERVIEW 15

3.2 CONNECTORS DESCRIPTION 16

 3.2.1 Qseven® Connector 16

 3.2.2 VGA Connector..... 19

 3.2.3 FAN Connector 20

CHAPTER 4. BIOS SETUP 21

4.1 INSYDEH2O SETUP UTILITY 22

4.2 MAIN SETUP MENU..... 22

 4.2.1 Language..... 22

 4.2.2 System Time/System Date 22

4.3 ADVANCED MENU 23

 4.3.1 Boot Configuration Submenu..... 23

 4.3.2 Peripheral Configuration Submenu..... 23

 4.3.3 IDE Configuration Submenu 24

 4.3.4 Video Configuration Submenu..... 24

 4.3.5 USB Configuration Submenu..... 25

 4.3.6 Chipset Configuration Submenu..... 25

 4.3.7 ACPI Table/features Submenu 25

 4.3.8 CPU Related setting Submenu..... 26

4.4 SECURITY MENU 27

4.5 POWER MENU 28

 4.5.1 Advanced CPU Control Submenu 29

4.6 BOOT MENU 29

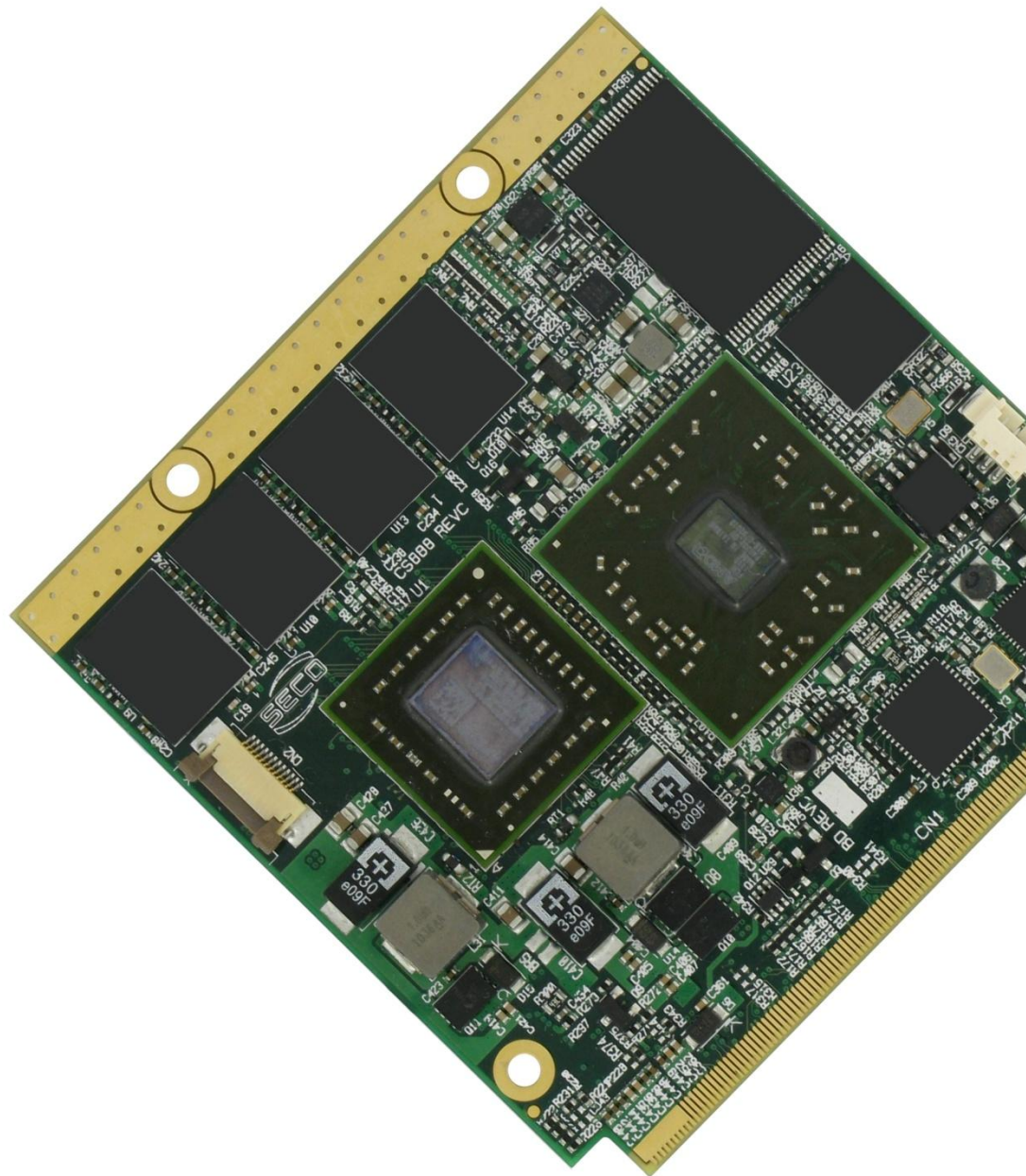
 4.6.1 Legacy Submenu..... 30

4.7 EXIT MENU..... 31

APPENDIX A THERMAL DESIGN 32

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 "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-GSeries modules only use 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-GSeries, like any other electronic product, are electrostatic sensitive devices and some device on-board could be damaged by high voltages caused by static electricity.

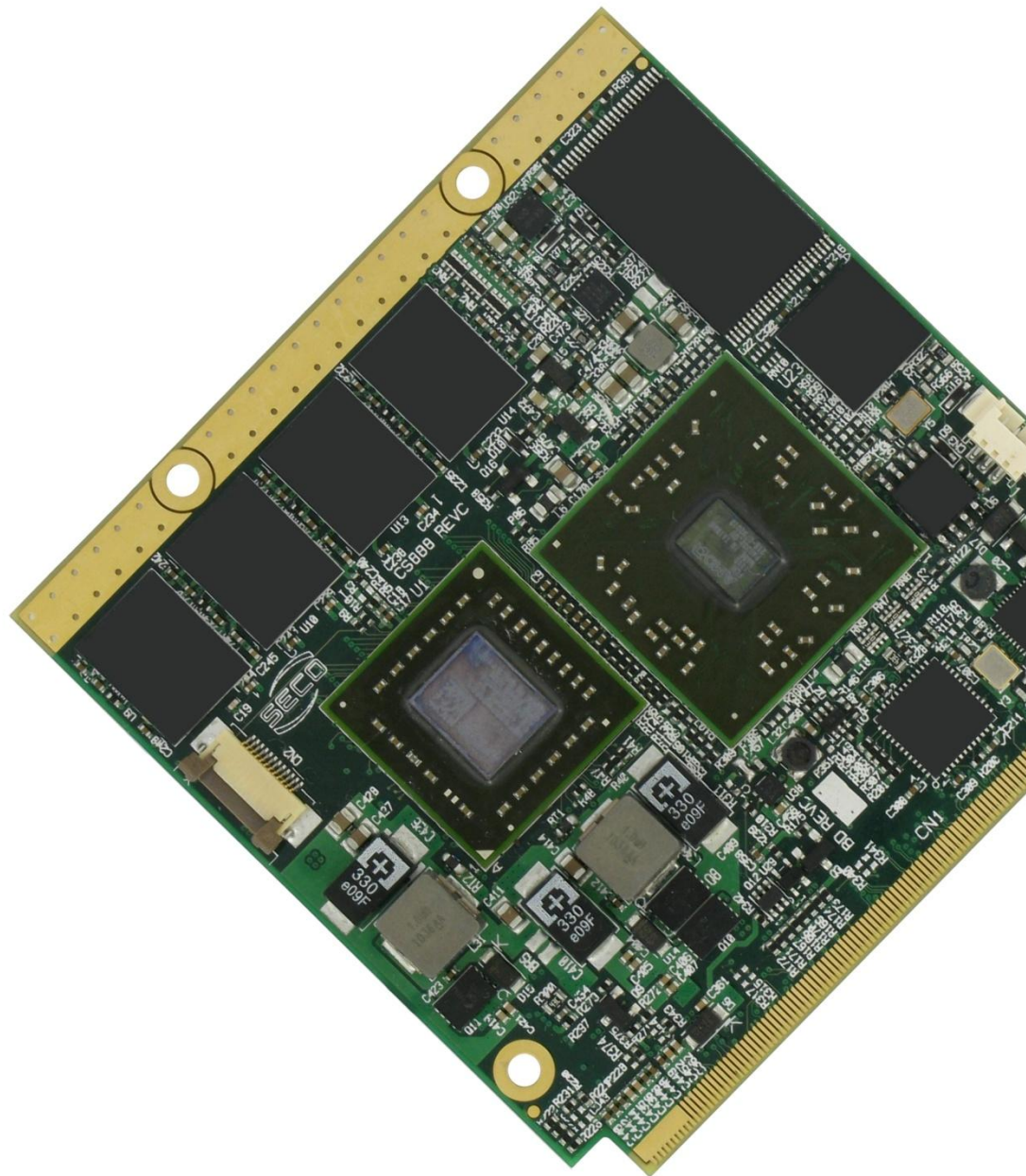
So whenever handling a Quadmo747-GSeries board, take care to ground yourself through an anti-static wrist strap. Placement of the board on an anti-static surface is also highly recommended.

1.6 RoHS compliance

Quadmo747-GSeries boards are designed using RoHS compliant components and are manufactured on a lead-free production line. They are therefore fully RoHS compliant.

Chapter 2. OVERVIEW

- Introduction
- Technical Specifications
- Electrical specifications
- Mechanical specifications
- Block diagram



2.1 Introduction

Quadmo747-GSeries is a CPU module, in Qseven[®] format, based on AMD Embedded G-Series Platform, made by an integrated APU (Accelerated Processing Unit) interfaced to AMD A55E Fusion Control Hub (FCH).

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.

Many APUs are available for Quadmo747-GSeries module, ranging from 1.0GHz to 1.65GHz. Single and Dual Core APUs are available, all with 512KB L2 cache per core.

AMD G-Series APUs include on a single die one or two standard general purpose x86 CPU core (64-bit architecture), a powerful Graphics Processing Unit (GPU), the Memory Controller and a PCI Express controller, able to offer 4 x PCI-e x 1 lanes.

From APU's integrated GPU, the first Display Port / HDMI native interface is directly carried out to the golden finger card edge connector. Second Display Port native interface is onboard converted to an LVDS interface, also this is carried out to the golden finger connector. Third native video interface, VGA, is directly carried out to a dedicated connector on the PCB.

The integrated GPU supports DirectX[®] 11 libraries, as well as OpenGL 4.0 and OpenCL[™] 1.1.

Communications between APU and FCH comes through a dedicated Hi-Speed interface, named Unified Media Interface (UMI).

The Fusion Controller Hub AMD A55E completes the already rich list of features offered by the APU, making available three SATA channels, ten USB 2.0 Host ports, HD Audio interface, I2C Bus, SM Bus and Low Pin Count Interface (LPC). Most of these interfaces are carried out directly on the Qseven[®] golden finger connector; the others are used to implement some additional feature, like the SDI/O interface (using and USB SD Card reader IC) and the Watchdog interface.

The board is completed with up to 2GB DDR3 directly soldered on board, and one SATA Flash Disk, directly accessible like any standard Hard Disk, with up to 32GB of capacity.

Moreover, interfaced to FCH's PCI Express lane #3, there is a Realtek RTL8111E Gigabit Ethernet Controller used to implement also an Ethernet Network interface.

Interfacing to the board comes through a single card edge connector, as defined by Qseven[®] specifications, where are carried out all interfaces previously described. For external interfacing to standard devices, a carrier board with a 230-pin MXM connector is needed. The carrier board will then 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-GSeries 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-GSeries modules there is a metallised strip free of components, opposite to card edge, which goes in direct contact with the heatspreader, to increment the surface used for thermal exchange.

The most powerful AMD T56N APU, however, requires the use of a finned heatsink with FAN (fan connector is integrated on Quadmo747-Gseries module).

Standard heatspreaders/heatsinks for Quadmo747-GSeries 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>.

More information about SECO Qseven products is available at <http://www.secoqseven.com>.

2.2 Technical Specifications

- **APU:** AMD T56N, Dual Core @ 1.65GHz, 18W TDP
AMD T40N, Dual Core @ 1.0GHz, 9W TDP
AMD T44R, Single Core @ 1.2GHz, 9W TDP
AMD T40E, Dual Core @ 1.0GHz, 6.4W TDP
AMD T40R, Single Core @ 1.0GHz, 5.5W TDP
- **Controller Hub:** AMD A55E Fusion Controller Hub
- **Memory:** Up to 2GB DDR3 / LVDDR3-1066 MHz onboard
- **Graphic controller:** integrated AMD GPU Radeon™:
HD6320 for AMD T56N
HD6290 for AMD T40N
HD6250 for AMD T44R, T40E and T40R
Dual independent display support
DirectX®11, OpenGL 4.0, OpenCL™ 1.1 supported
- **Graphic Interface:** Single/Dual Channel LVDS interface, at 18 or 24 bit
HDMI or Display Port Interface
Additional VGA interface
Maximum resolution:
LVDS and HDMI interface up to 1920x1200
Display Port, up to 1920 x 1200 (up to 2560 x 1600 with T56N)
VGA, up to 1920 x 1200 (up to 2048 x 1536 with T56N)
- **Mass Storage:** 2 x External S-ATA Channels
Optional onboard SATA Flash Disk up to 32 GB *
2 x Express Card interface
SD/MMC/SDIO interface
- **PCI Express:** 4 x PCI-e x1 lanes
- **USB:** 8 x USB 2.0 Host ports
- **Ethernet:** Realtek RTL8111E Gigabit Ethernet controller
- **Audio:** HD Audio interface
- **I2C Bus**
- **LPC Bus**
- **SM Bus**
- **FAN and Power Management Signals**
- **Power supply voltage:** +5V_{DC} ± 5%
- **Operating temperature:** 0°C ÷ +60°C **
- **Dimensions:** 70 x 70 mm (2.756 x 2.756)

* Please consider that for HDD and Flash Disk manufacturers, 1GB = 10⁹ Byte. Some OS (like, for example, Windows) intends 1GB = 1024³ byte, so global capacity shown for Disk Properties will be less than expected. Please also consider that a portion of disk capacity will be used by internal Flash Controller for Disk management, so final capacity will be lower.

** Temperature indicated is the maximum temperature that the heatspreader can reach in any of its parts. This means that it is customer's responsibility to connect the standard heatspreader to an application-dependent cooling system, capable to ensure that the heatspreader temperature remains in the range indicated. In case the customer don't uses standard heatspreaders supplied

by SECO, it is his own and sole responsibility to check that and module's section remain in the allowed range for the components.

2.3 Electrical specifications

Quadmo747-GSeries boards need to be supplied only with an external +5V_{DC} power supply.

For working in ATX mode, also +5V_{SB} voltage needs 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 connector's pinout).

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

2.3.1 Power Consumption

Quadmo747- GSeries 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 provide also the required voltage to the board, deriving it from its power supply source.

Anyway, power consumption has been measured on +5V_{DC} power rail that supplies the board. For this reason, the values indicated in the table below are real power consumptions of the board, and are independent from those of the peripherals connected to the Carrier Board.

All measurements have been made on modules with Windows XP SP3 installed, Power management mode set to "Portable/laptop"

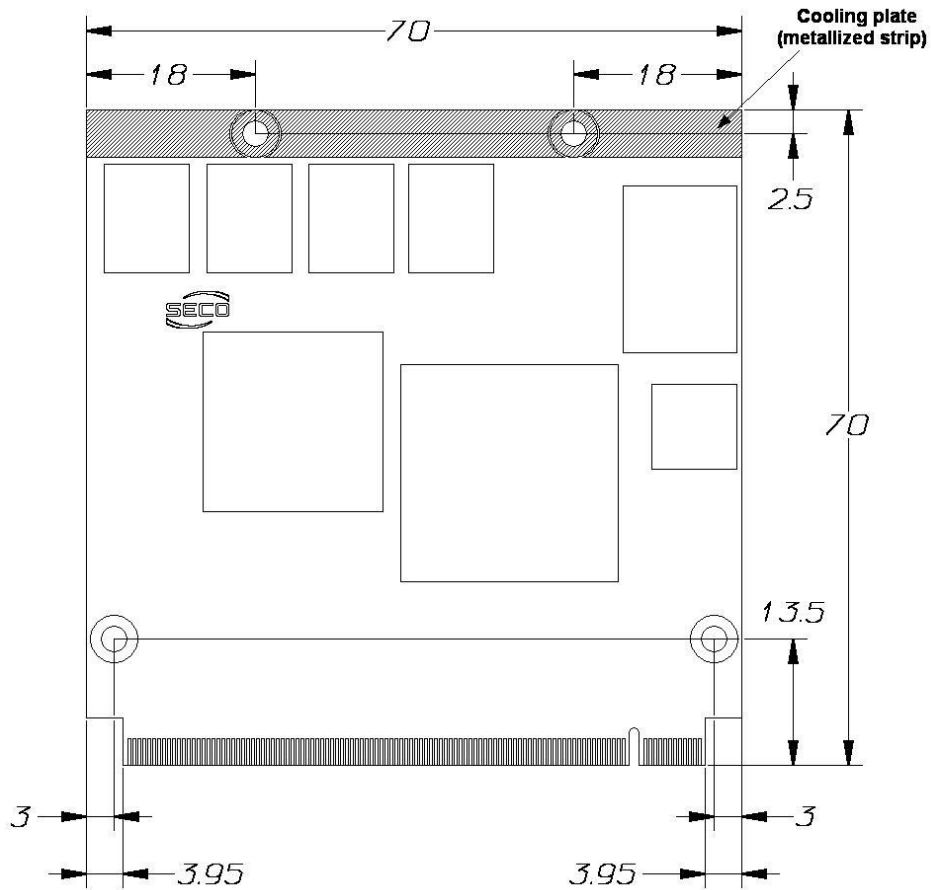
Following consumptions have been measured:

APU	Status / power consumption's measurements			
	Idle (average)	3DMARK 2005 benchmark running (peak)	HD Video 720P playing (peak)	O.S. Boot (peak)
T40R	730 mA	1900 mA	1350 mA	1400 mA
T40E	735 mA	1900 mA	1250 mA	1700 mA
T44R	830 mA	2350 mA	1680 mA	1950 mA
T40N	875 mA	2300 mA	1450 mA	2200 mA
T56N	890 mA	3000 mA	1600 mA	3000 mA

2.4 Mechanical specifications

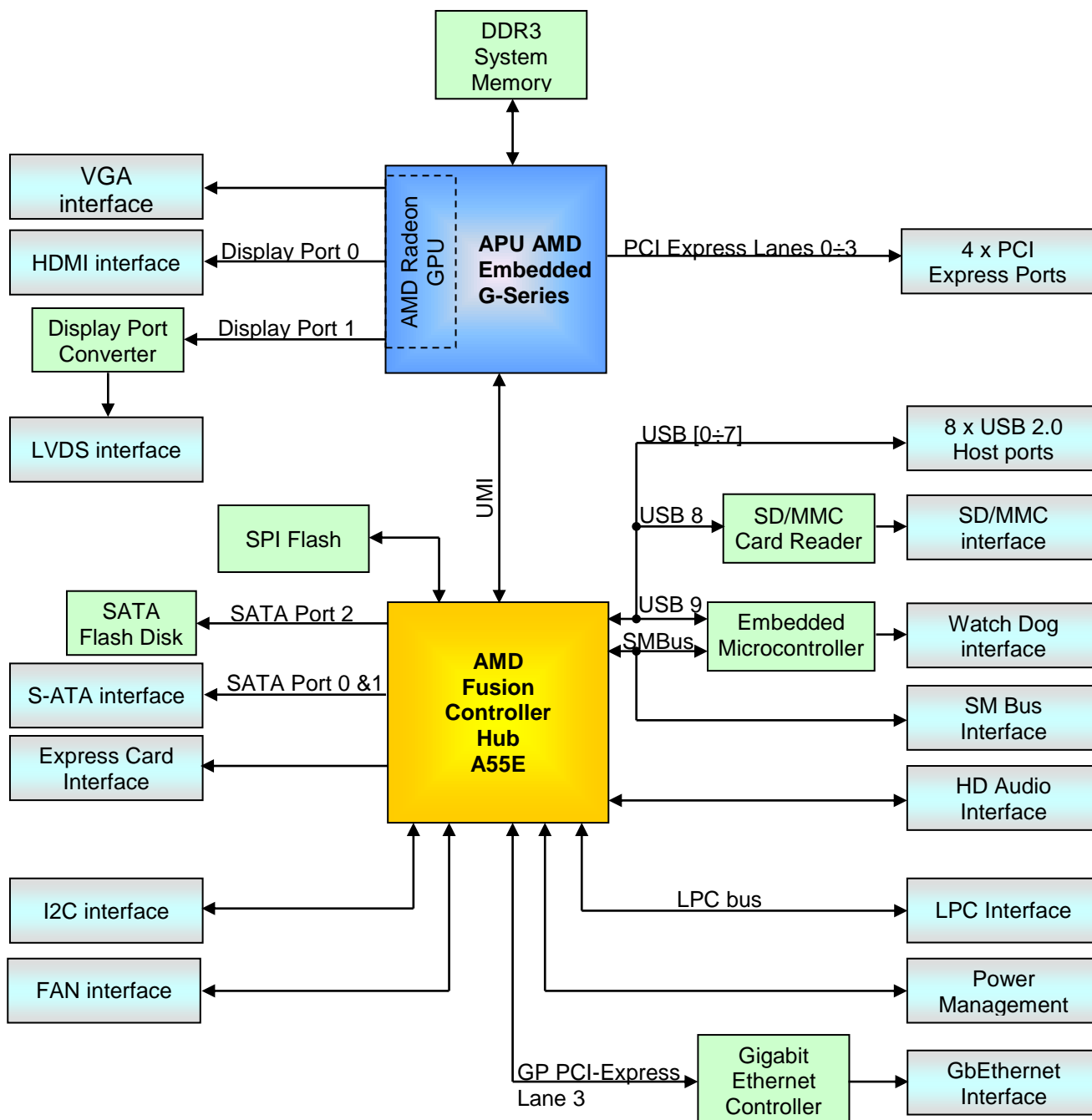
According to Qseven[®] specifications, board dimensions are: 70 x 70 mm (2.756" x 2.756").

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



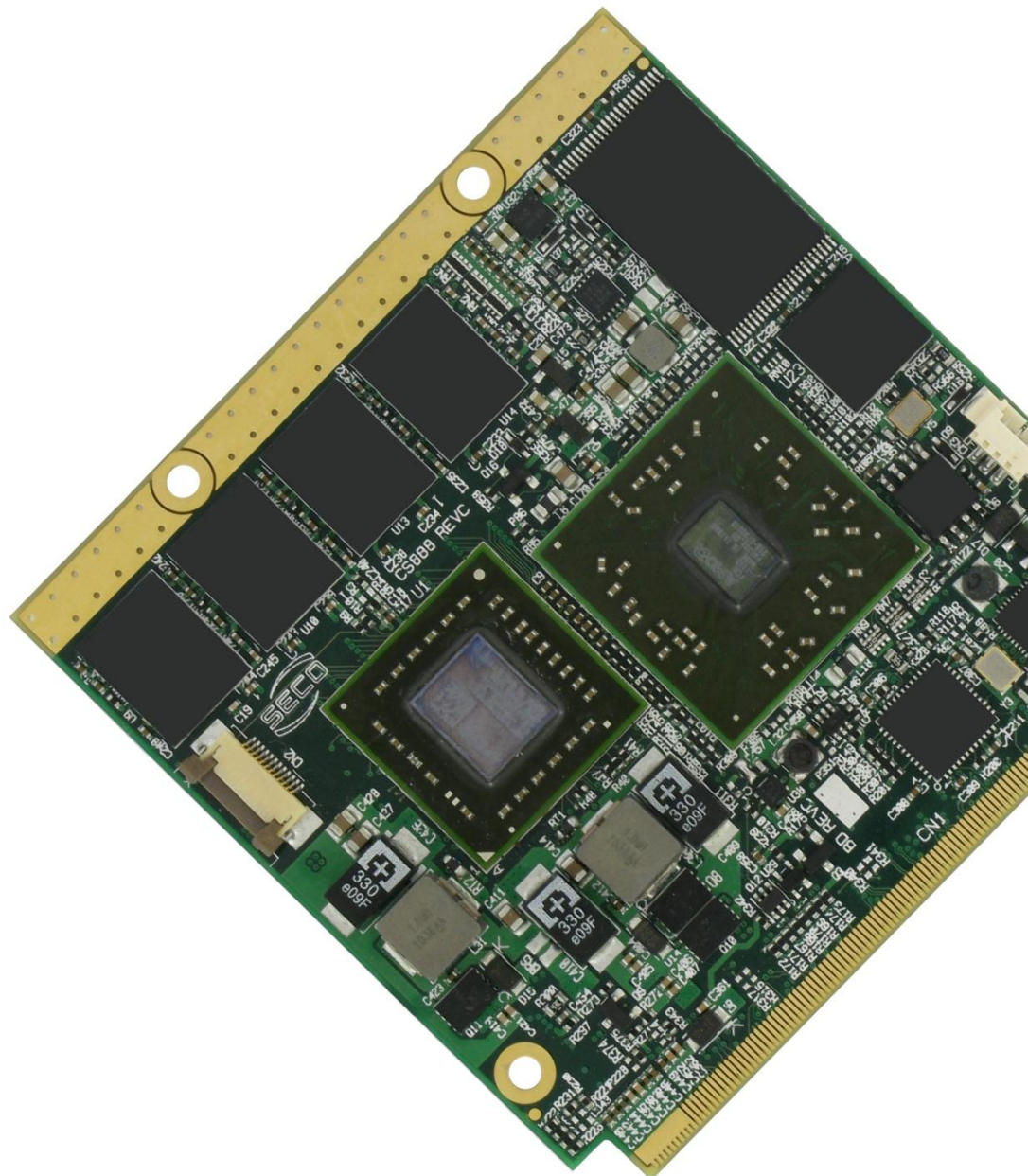
2.5 Block diagram

The following block diagram is related to PCB Rel. E or higher



Chapter 3. CONNECTORS

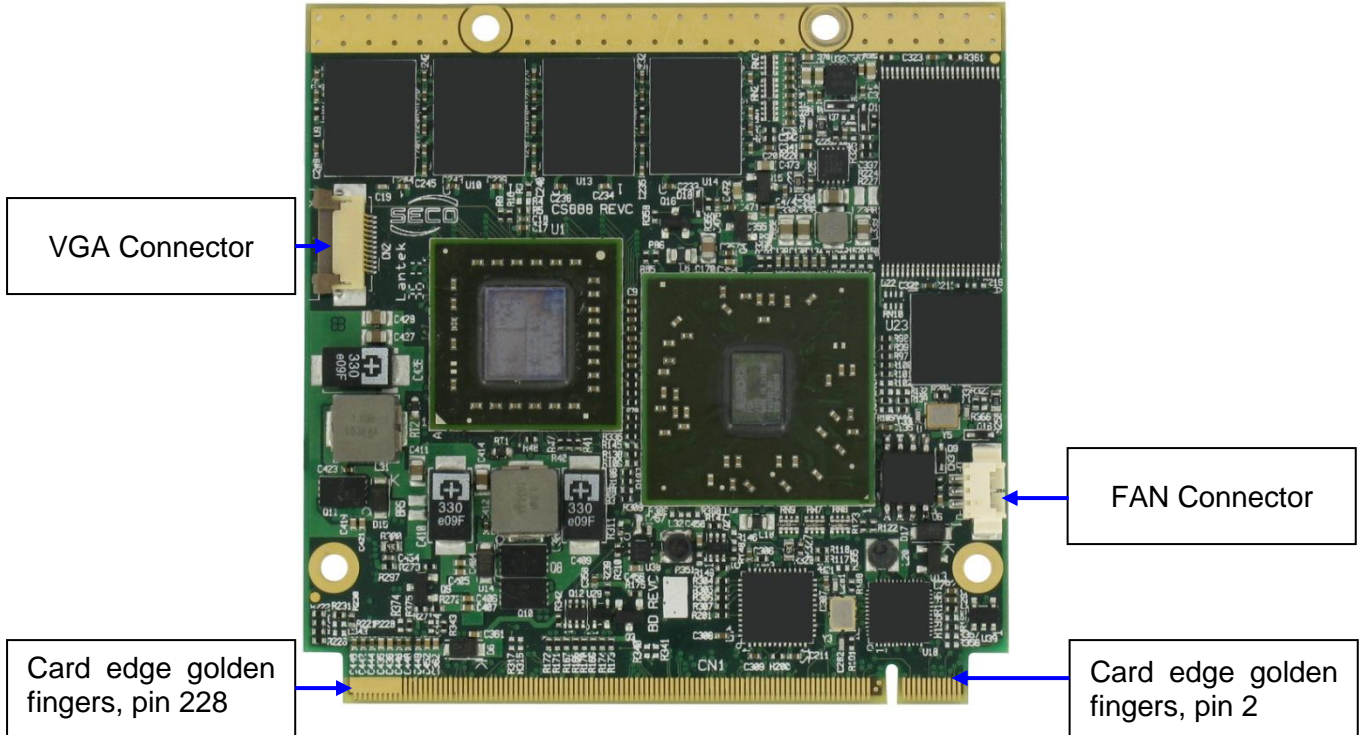
- Connectors overview
- Connectors description



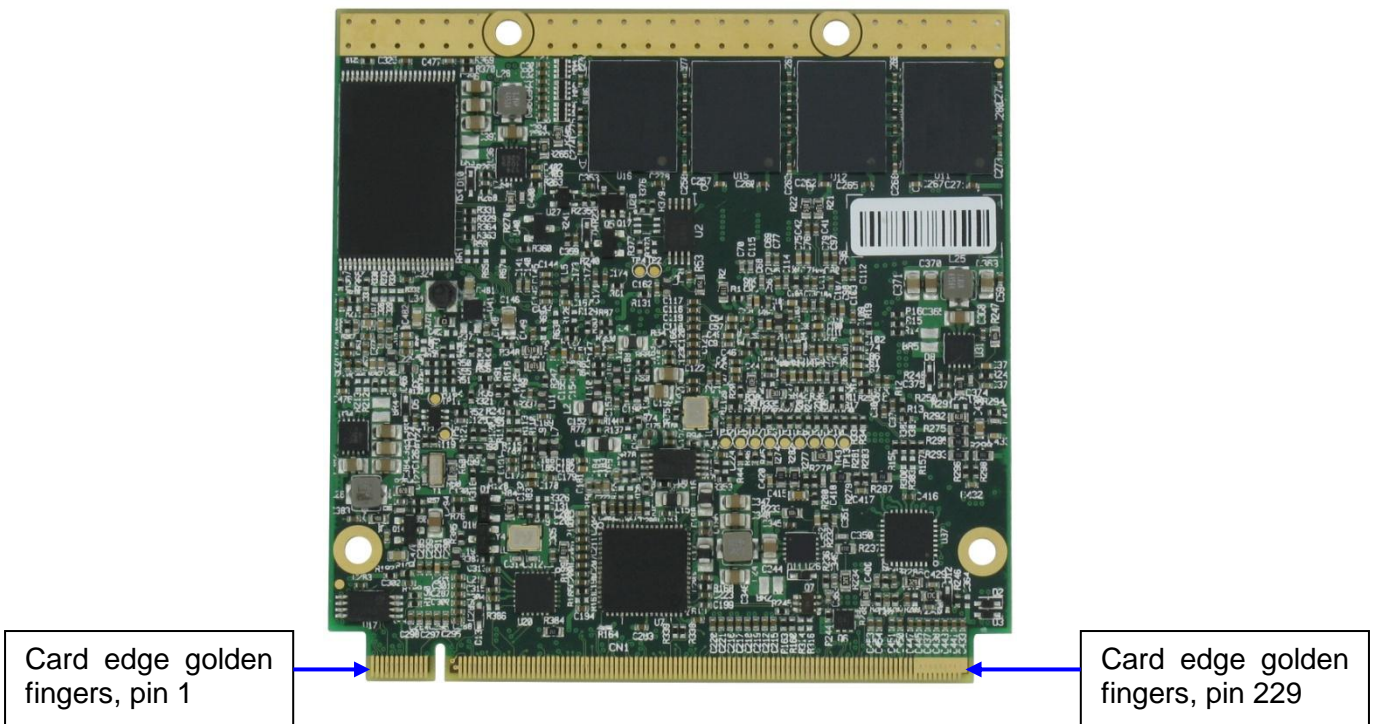
3.1 Connectors overview

According to Qseven[®] specifications, all interfaces to the board are available through a single card edge connector.

Top side



Bottom side



3.2 Connectors description

3.2.1 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-GSeries 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 Rel. 1.20.

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

Card Edge Golden Fingers - CN1			
Pin	Signal	Pin	Signal
1	GND	2	GND
3	GBE_MDI3-	4	GBE_MDI2-
5	GBE_MDI3+	6	GBE_MDI2+
7	GBE_LINK100#	8	GBE_LINK1000#
9	GBE_MDI1-	10	GBE_MDI0-
11	GBE_MDI1+	12	GBE_MDI0+
13	GBE_LINK#	14	GBE_ACT#
15	---	16	SUS_S5#
17	WAKE#	18	SUS_S3#
19	SUS_STAT#	20	PWRBTN#
21	SLP_BTN#	22	LID_BTN#
23	GND	24	GND
25	GND	26	PWGIN
27	BAT_LOW#	28	RSTBTN#
29	SATA0_TX+	30	SATA1_TX+
31	SATA0_TX-	32	SATA1_TX-
33	SATA_ACT#	34	GND
35	SATA0_RX+	36	SATA1_RX+
37	SATA0_RX-	38	SATA1_RX-
39	GND	40	GND
41	BOOT_ALT#	42	SDIO_CLK#
43	SDIO_CD#	44	SDIO_LED
45	SDIO_CMD	46	SDIO_WP
47	SDIO_PWR#	48	SDIO_DAT1
49	SDIO_DAT0	50	SDIO_DAT3
51	SDIO_DAT2	52	---
53	---	54	---

55	---	56	HDA_SDI1
57	GND	58	GND
59	HDA_SYNC	60	SMB_CLK
61	HDA_RST#	62	SMB_DAT
63	HDA_BITCLK	64	SMB_ALERT#
65	HDA_SDI	66	I2C_CLK
67	HDA_SDO	68	I2C_DAT
69	THRM#	70	WDTRIG#
71	THRMTRIP#	72	WDOUT
73	GND	74	GND
75	USB_P7-	76	USP_P6-
77	USB_P7+	78	USP_P6+
79	USB_6_7_OC#	80	USB_4_5_OC#
81	USB_P5-	82	USB_P4-
83	USB_P5+	84	USB_P4+
85	USB_2_3_OC#	86	USB_0_1_OC#
87	USB_P3-	88	USB_P2-
89	USB_P3+	90	USB_P2+
91	---	92	---
93	USB_P1-	94	USB_P0-
95	USB_P1+	96	USB_P0+
97	GND	98	GND
99	LVDS_A0+	100	LVDS_B0+
101	LVDS_A0-	102	LVDS_B0-
103	LVDS_A1+	104	LVDS_B1+
105	LVDS_A1-	106	LVDS_B1-
107	LVDS_A2+	108	LVDS_B2+
109	LVDS_A2-	110	LVDS_B2-
111	LVDS_PPEN	112	LVDS_BLEN
113	LVDS_A3+	114	LVDS_B3+
115	LVDS_A3-	116	LVDS_B3-
117	GND	118	GND
119	LVDS_A_CLK +	120	LVDS_B_CLK +
121	LVDS_A_CLK -	122	LVDS_B_CLK -
123	LVDS_BLT_CTRL	124	---
125	LVDS_DID_DAT	126	---
127	LVDS_DID_CLK	128	---
129	---	130	---
131	HDMI_CLK+	132	---
133	HDMI_CLK-	134	---
135	GND	136	GND

137	HDMI_TX1+	138	---
139	HDMI_TX1-	140	---
141	GND	142	GND
143	HDMI_TX0+	144	---
145	HDMI_TX0-	146	---
147	GND	148	GND
149	HDMI_TX2+	150	HDMI_CTRL_DAT
151	HDMI_TX2-	152	HDMI_CTRL_CLK
153	HDMI_HPD#	154	DP_HPD#
155	PCIE_CLK_REF+	156	PCIE_WAKE#
157	PCIE_CLK_REF-	158	PCIE_RST#
159	GND	160	GND
161	PCIE3_TX+	162	PCIE3_RX+
163	PCIE3_TX-	164	PCIE3_RX-
165	GND	166	GND
167	PCIE2_TX+	168	PCIE2_RX+
169	PCIE2_TX-	170	PCIE2_RX-
171	EXCD0_PERST#	172	EXCD1_PERST#
173	PCIE1_TX+	174	PCIE1_RX+
175	PCIE1_TX-	176	PCIE1_RX-
177	EXCD0_CPPE#	178	EXCD1_CPPE#
179	PCIE0_TX+	180	PCIE0_RX+
181	PCIE0_TX-	182	PCIE0_RX-
183	GND	184	GND
185	LPC_AD0	186	LPC_AD1
187	LPC_AD2	188	LPC_AD3
189	LPC_CLK	190	LPC_FRAME#
191	SERIRQ	192	LPC_LDRQ#
193	Vcc_RTC	194	SPKR
195	FAN_TACHOIN	196	FAN_PWM_OUT
197	GND	198	GND
199	---	200	---
201	---	202	---
203	---	204	MFG_NC4 (MFG_RST)
205	+5V _{SB}	206	+5V _{SB}
207	MFG_NC0 (MFG_TCK)	208	MFG_NC2 (MFG_TDI)
209	MFG_NC1 (MFG_TDO)	210	MFG_NC3 (MFG_TMS)
211	+Vcc	212	+Vcc
213	+Vcc	214	+Vcc
215	+Vcc	216	+Vcc
217	+Vcc	218	+Vcc

219	+Vcc	220	+Vcc
221	+Vcc	222	+Vcc
223	+Vcc	224	+Vcc
225	+Vcc	226	+Vcc
227	+Vcc	228	+Vcc
229	+Vcc	230	+Vcc

3.2.1.1 Specific signals

On Quadmo747-GSeries finger connector there are some signals that are not implemented in Qseven® Specifications rel.1.20, but that don't interfere with standard Carrier Boards.

The following signals differ from the standard:

HD Audio Serial Data In 1 signal

Pin 56: HDA_SD11: HD Audio Serial Data In 1 signal

AMD G-series platform can offer more serial data inputs, while Qseven® specifications contemplate only one SDI signal.

For this reason, in order to have a second Serial Data Input (managed by the Fusion Controller Hub), related signal has been carried out on pin 56, that for Qseven® Specifications is define as a Reserved Pin.

Standard Carrier Boards that leave pin 56 not connected, can be used without problem also with Quadmo747-GSeries board.

3.2.1.2 PCB revision related signals

Some of the signals carried on the finger connector have been implemented only with latest PCB release.

More exactly:

Signals introduced with PCB Release D

Pin 154: DP_HPDP#: Display Port Hot Plug Detection signal

Signals introduced with PCB Release E

Pin 161/163: PCIE3_TX+/- PCI Express Lane 3 Transmit Output Differential Pair

Pin 162/164: PCIE3_RX+/- PCI Express Lane 3 Receive Input Differential Pair

3.2.2 VGA Connector

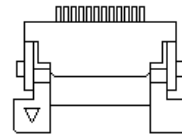
Qseven[®] specifications Rel. 1.20 define an area, on the PCB, that can be used to place optional I/O connectors of any kind.

For this reason, on Quadmo747-GSeries board, there is an additional connector, which carries out VGA interface coming out from G-Series APU.

Considering that G-Series APU is able to manage up to two independent displays, it is possible this way to have many possible combinations of display, using this VGA connector and LVDS and HDMI interfaces present on Qseven[®] golden finger.

VGA connector is an FFC/FPC connector, top contacts, type HIROSE FH12A-12S-0.5SH(55), with following pinout:

VGA CONNECTOR – CN2			
Pin	Signal	Pin	Signal
1	CRT_RED	7	CRT_HSYNC
2	GND	8	CRT_VSYNC
3	CRT_GREEN	9	+5V_S
4	GND	10	CRT_DDC_CLK
5	CRT_BLUE	11	CRT_DDC_DATA
6	GND	12	GND



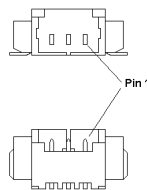
Optionally, Quadmo747-GSeries module can be supplied with a dedicated VGA adapter, able to carry out the signals coming out from VGA connector CN2 to a standard DB-15 HD CRT connector.

3.2.3 FAN Connector

Since Quadmo747-GSeries module can be equipped with a powerful Dual Core APU, like T56N, which has a TDP of 18W, onboard there is also a connector for a dedicated FAN, to be integrated on the dedicated heatsink.

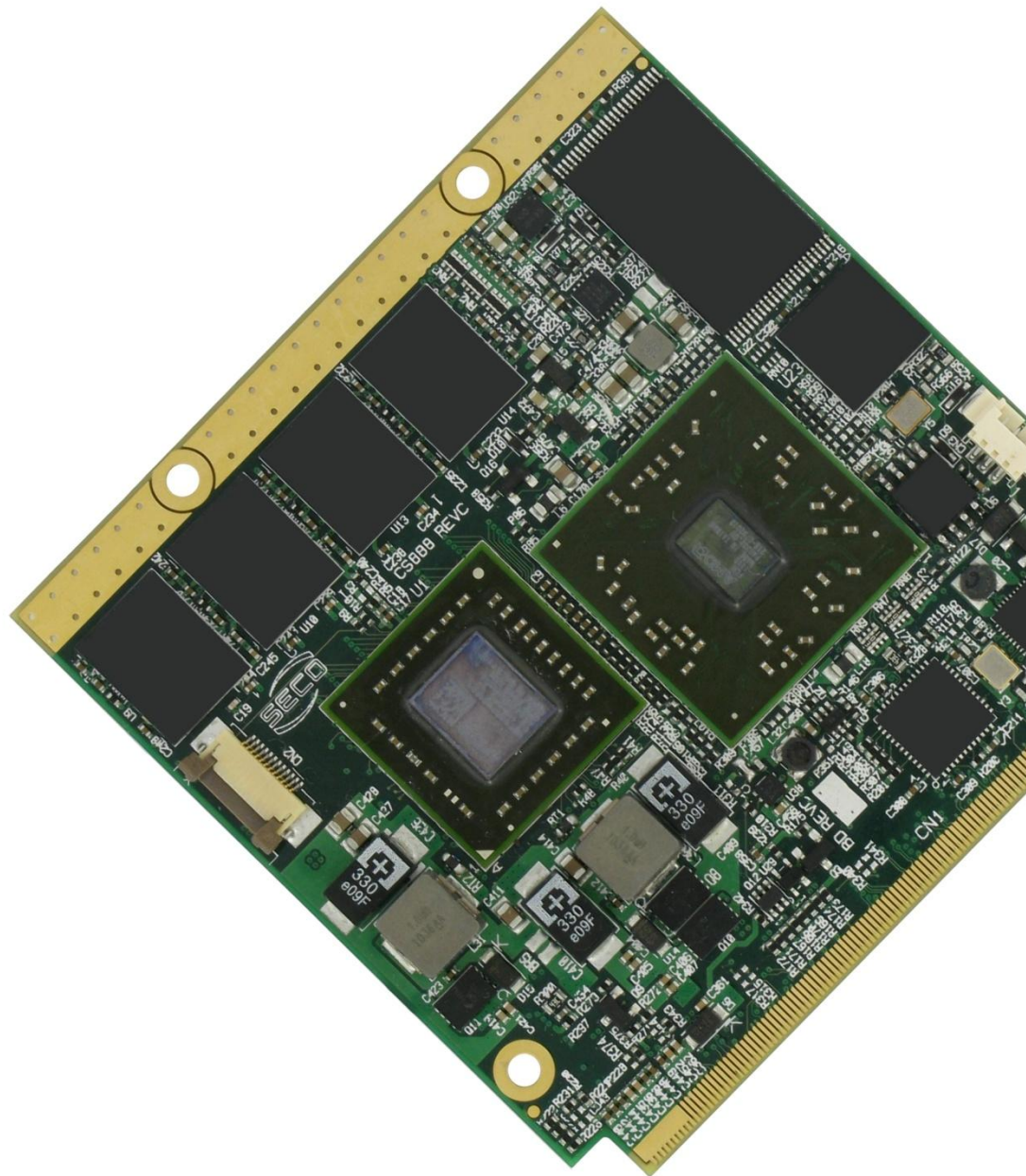
FAN Connector is a 3-pin single line SMT connector, type MOLEX 53261-0371 or equivalent, with following pinout:

FAN CONNECTOR – CN3	
Pin	Signal
1	GND
2	FAN_+5V_S
3	FAN_TACHO



Chapter 4. BIOS SETUP

- **INSYDEH2O SETUP UTILITY**
- **MAIN SETUP MENU**
- **ADVANCED MENU**
- **SECURITY MENU**
- **POWER MENU**
- **BOOT MENU**
- **EXIT MENU**



4.1 INSYDEH2O SETUP UTILITY

Basic Setup of the board can be done using Insyde Software Corp. "InsydeH2O Setup Utility", that is stored inside an onboard Serial Flash.

It is possible to access to InsydeH2O Setup Utility by pressing the <F2> key after System power up, during POST phase.

On each menu page, on left frame are shown all the options that can be configured.

Grayed-out options are only for information and cannot be configured.

Only options written in blue can be configured. Selected options are highlighted in white.

Right frame shows the key legend.

KEY LEGEND:

← / → Navigate between various setup screens (Main, Advanced, Security, Power, Boot...)

↑ / ↓ Select a setup item or a submenu

<F5> / <F6> <F5> and <F6> keys allows to change the field value of highlighted menu item

<F1> The <F1> key allows you to display the *General Help* screen.

<F9> <F9> key allows to load Setup Defaults for the board. After pressing <F9> BIOS Setup utility will request for a confirmation, before saving and exiting. By pressing <ESC> key, this function will be aborted

<F10> <F10> key allows save any changes made and exit Setup. After pressing <F10> key, BIOS Setup utility will request for a confirmation, before saving and exiting. By pressing <ESC> key, this function will be aborted

<ESC> <Esc> key allows you to discard any changes made and exit the Setup. After pressing <ESC> key, BIOS Setup utility will request for a confirmation, before discarding the changes. By pressing <Cancel> key, this function will be aborted

<ENTER> <Enter> key allows to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.

4.2 MAIN SETUP MENU

When entering the Setup Utility, the first screen shown is the Main setup screen. It is always possible to return to the Main setup screen by selecting the *Main* tab.

In this screen, are shown details regarding BIOS version, Processor type, Bus Speed and memory configuration.

Only three options can be configured:

4.2.1 Language

Use this option to select the language that the Setup utility must use. Possible options are English, French

4.2.2 System Time/System Date

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the <Arrow> keys. Enter new values directly through the keyboard, or using + / - keys to increase / reduce displayed values. Press the <Enter> key to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

The system date is in the format mm/dd/yyyy.

4.3 ADVANCED MENU

MENU ITEM	Options	Description
Boot Configuration	See submenu	Configures settings for Boot Phase
Peripheral Configuration	See submenu	Configures the peripherals
IDE configuration	See submenu	Select the IDE controller and hard disk drive type installed in the system
Video Configuration	See submenu	Configures the options for video section
USB Configuration	See submenu	Configures USB Section
Chipset Configuration	See submenu	Configure Chipset's parameters
ACPI Table / Features Control	See submenu	Configures the parameters for ACPI management
CPU Related settings	See submenu	Configures CPU related parameters

4.3.1 Boot Configuration Submenu

MENU ITEM	Options	Description
Numlock	On Off	Allows to choose whether NumLock Key at system boot must be turned On or Off

4.3.2 Peripheral Configuration Submenu

MENU ITEM	Options	Description
EHCI 0	Disabled Auto	Auto: Auto-detects the EHCI controller 0 (for USB High-Speed functionalities), which manages USB ports 0÷4 Disabled: Disable the EHCI Controller 0
EHCI 1	Disabled Auto	Auto: Auto-detects the EHCI controller 1 (for USB High-Speed functionalities), which manages USB ports 5÷9 Disabled: Disable the EHCI Controller 1 **
Azalia	Disabled Auto	Auto: Auto-detects the HD Audio Codec Disabled: Disable the internal HD Audio Controller
SATA	Disabled Auto	Auto: Auto- detects the SATA controller. Disabled: Disable the SATA controller
SATA Port0 Power On	Disabled Enabled	Menu item available only when "SATA" is set to Auto. Enabled: Turn on SATA Port 0 Disabled: Turn off SATA Port 0
SATA Port1 Power On	Disabled Enabled	Menu item available only when "SATA" is set to Auto. Enabled: Turn on SATA Port 1 Disabled: Turn off SATA Port 1
SATA Port2 Power On	Disabled Enabled	Menu item available only when "SATA" is set to Auto. Enabled: Turn on SATA Port 2 (internal Flash Disk) Disabled: Turn off SATA Port 2 (internal Flash Disk)

4.3.3 IDE Configuration Submenu

MENU ITEM	Options	Description
SATA Configure As	IDE LEGAY IDE RAID AHCI IDE→AHCI AMDAHCI IDE→AMDAHCI	<p>Set SATA Configuration type</p> <p>With AHCI, is not possible to install/boot UEFI O.S., only Legacy OS can be installed (a simpler driver is required).</p> <p>LEGACY IDE uses the addresses and IRQs (IRQ14 and IRQ15) defined by old IDE standard, so it can be used for compatibility issues with old software.</p> <p>Setting to IDE, the controller is managed as a PCI device, so addresses reallocation and INT line sharing is possible.</p> <p>With IDE→AHCI, it is possible to install both UEFI and Legacy OS, it uses IDE to avoid the need for an UEFI driver.</p> <p>With AMDAHCI, AHCI ID will be 7804 (not 7801) so that Windows7 will install an AMD AHCI specific driver instead of default AHCI driver</p> <p>Using IDE→AMDAHCI, the behavior will be similar to IDE→AHCI, but will use AHCI ID 7804 like described for AMDAHCI</p>
Force RAID Mode	Disabled Enabled	<p>This menu item is available only when “SATA Configure As” is set to RAID.</p> <p>Force Working to Raid Mode</p>
Serial ATA Port 0 / 1 / 2		Shows information related to eventual devices connected to SATA ports 0, 1 or 2 (internal Flash Disk).

4.3.4 Video Configuration Submenu

MENU ITEM	Options	Description
Primary Video Adaptor	Int Graphics (IGD) Ext Graphics (PEG)	Select Internal/External Graphics
UMA Sharing Memory Size	Auto / 32 MB / 64 MB / 128 MB / 256 MB / 512 MB	Set UMA Sharing Memory Size
Edid Support	Disabled External EDID 640 x 480 / 800x480 / 800x600 / 1024x600 / 1024x768 / 1280x720 / 1280x800 / 1280x1024 / 1366x768 / 1440x900 / 1600x900 / 1680x1050 / 1920x1080	<p>Select LVDS Interface's display resolution</p> <p>Using External EDID, LVDS display resolution is taken by external EDID interface</p>
LVDS Panel Mode	LDI FDPI	<p>Select LVDS Panel mode for 24 bit LVDS interface:</p> <p>FPDI will use Non-Conventional color-mapping, compatible with 18-bit display interface;</p> <p>LDI will use Conventional color-mapping, not compatible with 18-bit display interface;</p>
LVDS Low/Up Link	Not Swapped Swapped	Allows to swap most significant differential pair of LVDS interface with less significant one, for compatibility with some LVDS Display
LVDS Color Mode	18 bit 24 bit	Select 18 or 24 bit per color.
LVDS BackLight Polarity	Not Inv. (Act. High) Inv. (Act. Low)	Configure the LVDS BackLight Polarity

4.3.5 USB Configuration Submenu

MENU ITEM	Options	Description
USB2.0	Enabled /Disabled	Enable/Disable internal USB 2.0 controller.
USB Legacy	Enabled / Disabled	Enable/Disable USB devices boot and access in DOS

4.3.6 Chipset Configuration Submenu

MENU ITEM	Options	Description
NorthBridge/GNB options	See submenu	
SouthBridge/GPP options	See submenu	
PCI Latency timer	32 / 64 / 96 / 128 / 160 / 192 / 224 / 248	Set this value to allow the PCI Latency Timer to be adjusted. This option sets the latency of all PCI devices on the PCI bus. Values are in units of PCI clocks.

4.3.6.1 NorthBridge/GND options Submenu

MENU ITEM	Options	Description
PCI Express Configurations	See following options	PCI Express Configurations
PCIe Speed Power Policy (PSPP)	Disabled PSPP Performance PSPP BalanceHigh PSPP BalanceLow PSPP PowerSaving	The processor can dynamically support the changing to the link frequency due to changes in system configuration and power policy.
APU GPP #0 / #1 / #2 / #3 Features	See following options	These menu are to be used to set single PCI express ports features, see the following two menu items
Speed Mode	Auto Gen1 Gen2	Set PCI-e ports link speed/capability
Link ASPM	Disabled L0s L1 L0s & L1	Manages PCI Express L0s and L1 power states, for OS able to handle Active State Power Management (ASPM)

4.3.6.2 SouthBridge/GPP options Submenu

MENU ITEM	Options	Description
PCI Express Configurations	See following options	PCI Express Configurations
PCIe Port #0 / #1 / #2 / #3 Features	See following options	These menu are to be used to set single PCI express ports features, see the following two menu items
Link ASPM	Disabled L0s L1 L0s & L1	Manages PCI Express L0s and L1 power states, for OS able to handle Active State Power Management (ASPM)

4.3.7 ACPI Table/features Submenu

MENU ITEM	Options	Description
FACP – C2 Latency Value	Enabled Disabled	Allows definition of C2 latency value to be defined in FACP Table. Values smaller than 100 mean C2 Enabled, values larger than 100 mean C2 Disabled
FACP – C3 Latency Value	Enabled Disabled	Allows definition of C3 latency value to be defined in FACP Table. Values smaller than 1000 mean C3 Enabled, values larger than 1000 mean C3 Disabled
FACP – RTC S4 wakeup	Disabled Enabled	Enable or disable FACP support for S4 wakeup from RTC
APIC – IO APIC Mode	Disabled Enabled	This item is valid only for WIN2k and WINXP. Also, a fresh install of the OS must occur when APIC Mode is desired. Test the IO ACPI by setting item to Enable. The APIC Table will then be pointed to by the RSDT, the Local APIC will be initialized, and the proper enable bits will be set in ICH4M
HPET – HPET Support	Disabled Enabled	High Precision Event Timer is supported in Windows Vista or above. HPET controller should not be seen in Windows XP, no matter if enabled/disabled in SCU. If this feature is enabled, the HPET table will be added into ACPI Tables.
_OSC Support	Disabled Enabled	Enable or Disable ACPI Operating System Capabilities (_OSC) Method to communicate to the O. S. which features available in the system can be controlled by the operating system
Fusion Utility	Disabled Enabled	Enable/Disable AMD Fusion Utility Support

4.3.8 CPU Related setting Submenu

MENU ITEM	Options	Description
CPU P-State Setting	Auto Lowest Speed	Sets the CPU P-States behavior, if AUTOMATIC or fixed at lowest speed
SVM support	Enabled Disabled	Enable or Disable Secure Virtual Machine Mode (SVM) support, for users who require to use Virtual Machines

4.4 SECURITY MENU

MENU ITEM	Options	Description
Set Supervisor Password		Install or Change the password for supervisor. Length of password must be greater than one character.
Set User Password		Install or Change the standard User password. Length of password must be greater than one character.
Power on Password	Disabled Enabled	Available only when Supervisor Password has been set. Enabled: System will ask to input a password (Supervisor or User) during P.O.S.T. phase. Disabled: system will ask to input a password only for entering Setup utility
User Access Level	View only Limited Full	Available only when Supervisor Password has been set. Limited: User has access only to limited SETUP menu items. View Only: User can view SETUP menu items but cannot change any item. Full: User has full access to SETUP menu and can change all items, except the Supervisor Password
Clear User Password		Selecting this option will clear the User password without having to type the current password. A supervisor can use this to clear a user password without knowing it.

4.5 POWER MENU

MENU ITEM	Options	Description
Advanced CPU Control	See submenu	These items control various CPU parameters
FAN Configuration Control	See submenu	Change supported FAN settings.
ACPI S3	Enabled Disabled	Enable or Disable ACPI S3 Sleep State
Wake on PME	Enabled Disabled	Determines whether the system must wake up or not when the system power is off and occurs a PCI Power Management Enable wake-up event.
Auto Wake on S5	Disabled By Every Day By Day of Month	Auto wake up from S5 state, it can be set to happen "By Day of month" or at a "Fixed time of every day".
Wake on S5 time	[hh:mm:ss]	This menu item is available only when "Auto Wake on S5" is not set to Disabled. Set time of the day when the board must wake up automatically
Day of month	1 ÷ 31	This menu item is available only when "Auto Wake on S5" is set to "By Day of Month" This is the help for the day field. Valid range is from 1 to 31. Error checking will be done against month/day/year combinations that are not supported. Use + / - to Increase / reduce
USB Wake	Enabled Disabled	Enable or Disable wake from USB peripherals
Always On Patch	Enabled Disabled	Set this item to Enabled if on the Carrier board is not available a battery for CMOS data retention
Power Fail Resume Type	Always OFF Last State Always ON	Determine the System Behavior 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, if this option is set to "Last State", the board will remember the state it had when the power supply went down: so, if the board was on, it will start again when the power returns, and will remain off if the board was in this state when the power went down.
Watchdog Timer	Disabled 1min. 2min. 4 min. 8 min. 16 min. 32 min. 64 min.	Enable the watchdog timer during the board bootup

4.5.1 Advanced CPU Control Submenu

MENU ITEM	Options	Description
Cool N' Quiet Support	Enabled Disabled	Enable or Disable "Cool 'N Quiet" power saving and speed throttling technology for CPU idle states.
Hardware Thermal Control	Auto Enabled	Hardware Thermal Control (HTC) enable CPU thermal monitor feature, to prevent CPU overheating
HTC Temperature Limit		This submenu is available only when "Hardware Thermal Control" is set to Enabled. Set HTC temperature limit (53~115°C)
HTC Hysteresis Value	0.0°C ÷ 0.5°C ÷ 1.0°C ÷ 1.5°C ÷ 2.0°C ÷ 2.5°C ÷ 3.0°C ÷ 3.5°C ÷ 4.0°C ÷ 4.5°C ÷ 5.0°C ÷ 5.5°C ÷ 6.0°C ÷ 6.5°C ÷ 7.0 °C ÷7.5°C	This submenu is available only when "Hardware Thermal Control" is set to Enabled. Set HTC Hysteresis Value

4.5.2 FAN Configuration Submenu

MENU ITEM	Options	Description
Onboard FAN	Enabled Disabled	Enable or Disable Onboard FAN
Low Threshold (°C)	0 °C ÷ 115 °C	This submenu is available only when "Onboard FAN" is set to Enabled. Select the lowest temperature under which the onboard FAN must be Off
High Threshold (°C)	0 °C ÷ 115 °C	This submenu is available only when "Onboard FAN" is set to Enabled. Select the highest temperature above which the onboard FAN must work always at Full Speed
Mid Duty Cycle	0 ÷ 255	This submenu is available only when "Onboard FAN" is set to Enabled. Use this item to set the Duty Cycle for the FAN when the APU temperature is between Low and High threshold. Values that can be accepted are between 0 and 255, where 0 = 0% (OFF), 128 = 50%, 255 = 100% (Full Speed)
External FAN Duty Cycle	0 ÷ 255	Use this item to set the Duty Cycle for the external FAN. Values that can be accepted are between 0 and 255, where 0 = 0% (OFF), 128 = 50%, 255 = 100% (Full Speed)

4.6 BOOT MENU

MENU ITEM	Options	Description
UEFI Boot	Enabled Disabled	Enable or Disable UEFI Boot Support
Quick Boot	Enabled Disabled	Skip certain tests while booting. This will decrease the time needed to boot the system.
Quiet Boot	Enabled Disabled	Disables or enables booting in Text Mode.
PXE Boot to LAN	Enabled Disabled	Disables or enables PXE boot to LAN.
ACPI Selection	Acpi1.0B Acpi3.0 Acpi4.0	Using this menu item is possible to select to which specifications release the ACPI tables must be compliant.
USB Boot	Enabled Disabled	Disables or enables booting from USB boot devices.
EFI Device First	Enabled Disabled	Determine if boot must happen first through EFI devices or through legacy devices. When enabled, it will happen first from EFI devices. When disabled, it will happen first from Legacy devices.
EFI	See Submenu	This submenu is available only when "UEFI Boot" is enabled. Entering the submenu, will show a list of EFI boot devices. Use F5 and F6 key to change order for boot priority.
Legacy	See Submenu	Legacy Boot Order Settings

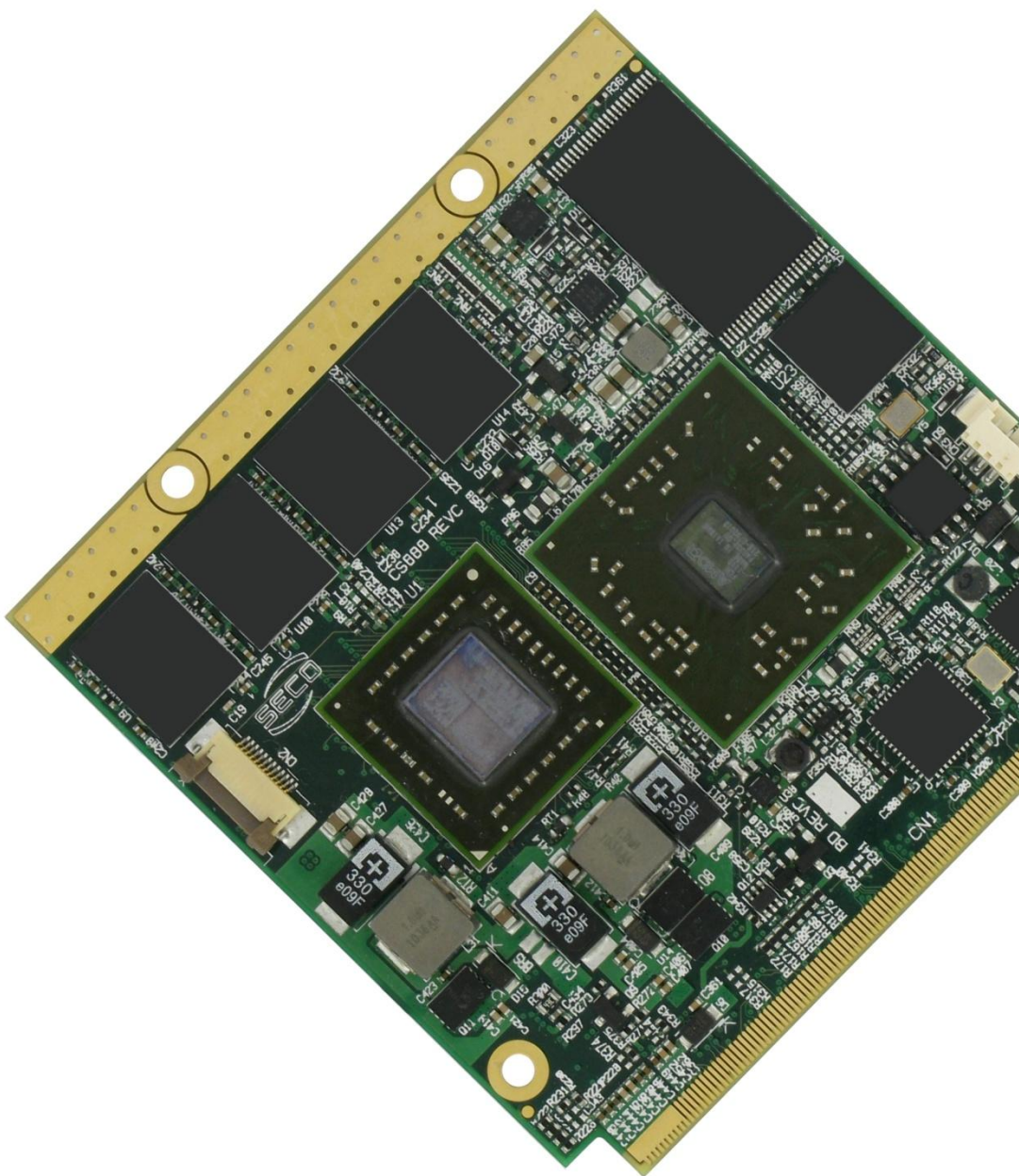
4.6.1 Legacy Submenu

MENU ITEM	Options	Description
Normal Boot Menu	Normal Advanced	Select Normal or Advanced Mode for Boot Device list. When in Advanced mode, only bootable devices connected to the system will be shown, in that case use F5/F6 keys to change their boot order.
Boot Type Order	Floppy Drive Hard Disk Drive CD/DVD-ROM Drive USB Others	This submenu is available only when "Normal Boot Menu" is set to Normal. Use F5/F6 keys to change order between boot device types
Hard Disk Drive		This submenu is available only when "Normal Boot Menu" is set to Normal. Use F5/F6 keys to change order between bootable Hard Disk Drives found to be connected to the system

4.7 EXIT MENU

MENU ITEM	Options	Description
Exit Saving Changes		Exit system setup after saving the changes. F10 key can be used for this operation.
Save Change Without Exit		Save all changes made, but doesn't exit from setup utility.
Exit Discarding Changes		Exit system setup without saving any changes. ESC key can be used for this operation.
Load Optimal Defaults		Load Optimal Default values for all the setup items. F9 key can be used for this operation.
Load Custom Defaults		Load Custom Default values for all the setup items.
Save Custom Defaults		Save Custom Default values for all the setup items.
Discard Changes		Discard changes done so far to any of the setup items.

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-GSeries module, allow the user 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.

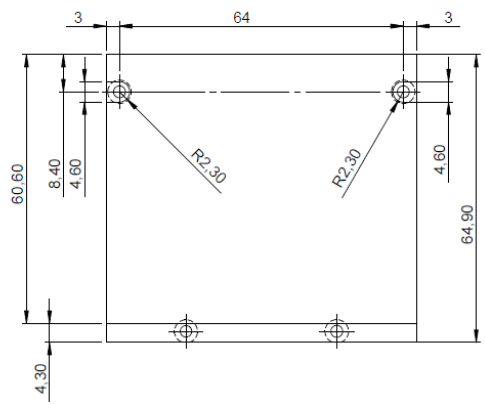
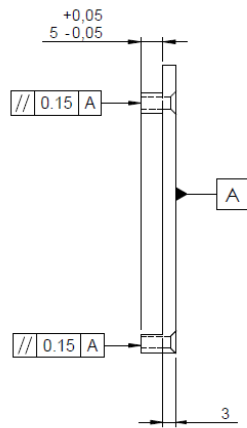
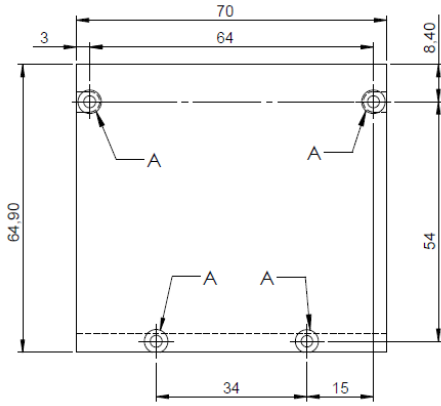
To optimise the dissipation using a board like Quadmo747-GSeries, it is a good idea to use a metallic heatspreader, which contacts directly heat-generating surfaces like the CPU core and the chipset core. Quadmo747-GSeries module, according to Qseven[®] specifications, have also a metallized strip free of components both on top and bottom side of the module, opposite to card edge golden finger, that should go 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 pad, which will optimise the heat exchange between the device and the heatspreader.

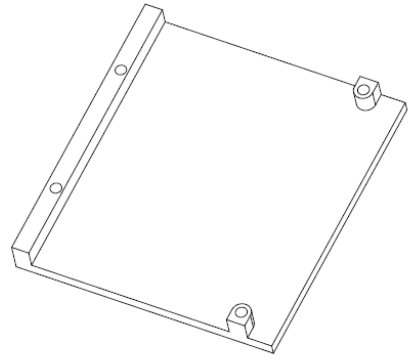
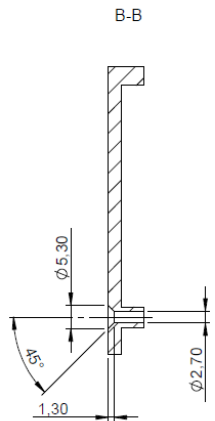
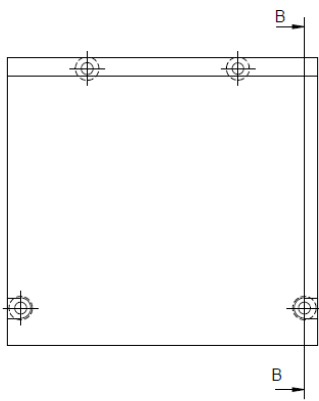
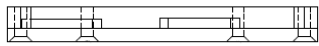
The heatspreader, however, acts only a surface that distributes uniformly the heat generated on the board, and could be not sufficient to cool enough the system. Therefore, it is necessary to study carefully the thermal dissipation of your system, and use, if necessary, other additional thermal solutions,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

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

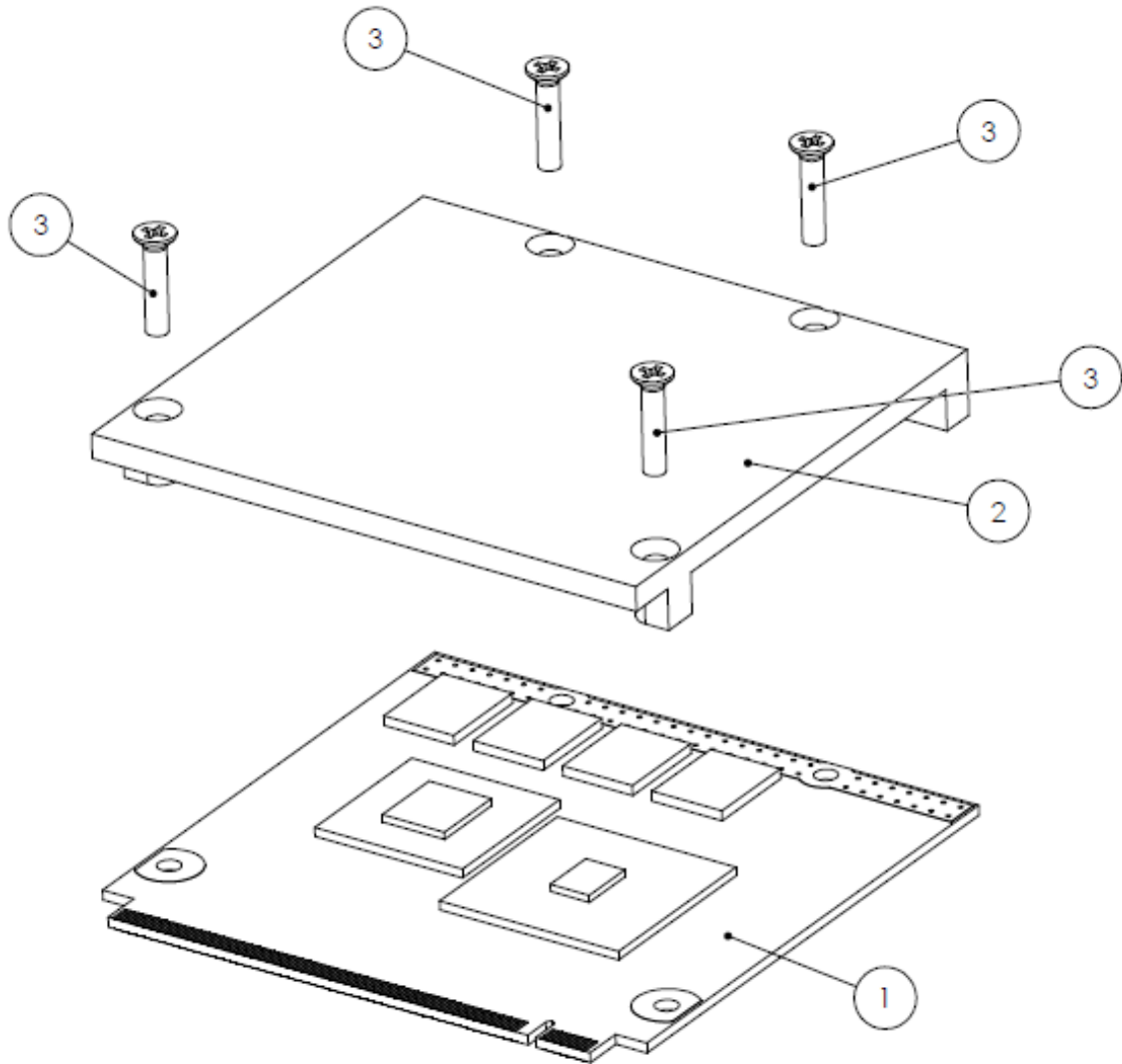
If your Quadmo747-GSeries is equipped with the most powerful AMD T56N APU, then a finned heatsink with integrated FAN is highly recommended.



A = hole diameter 2.7 90° flared, for screw M2.5

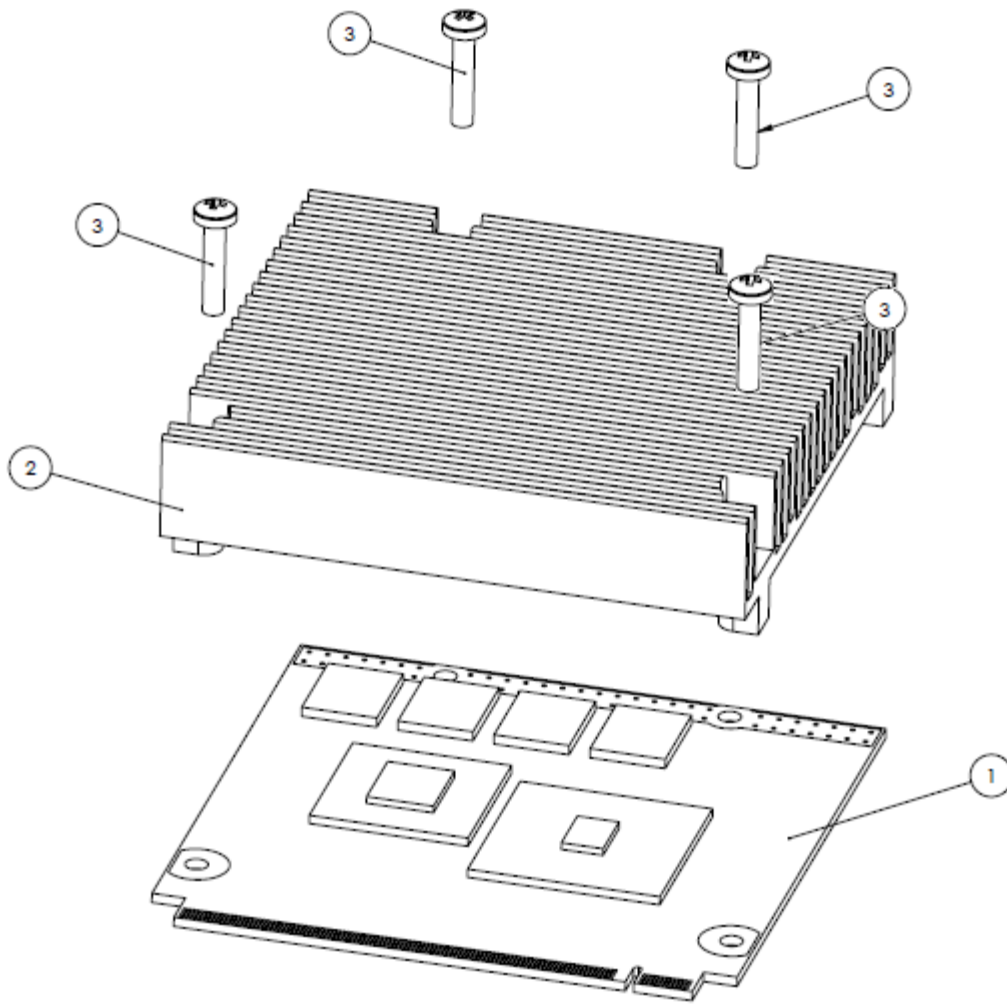


Standard heatspreader dimensions and standoff



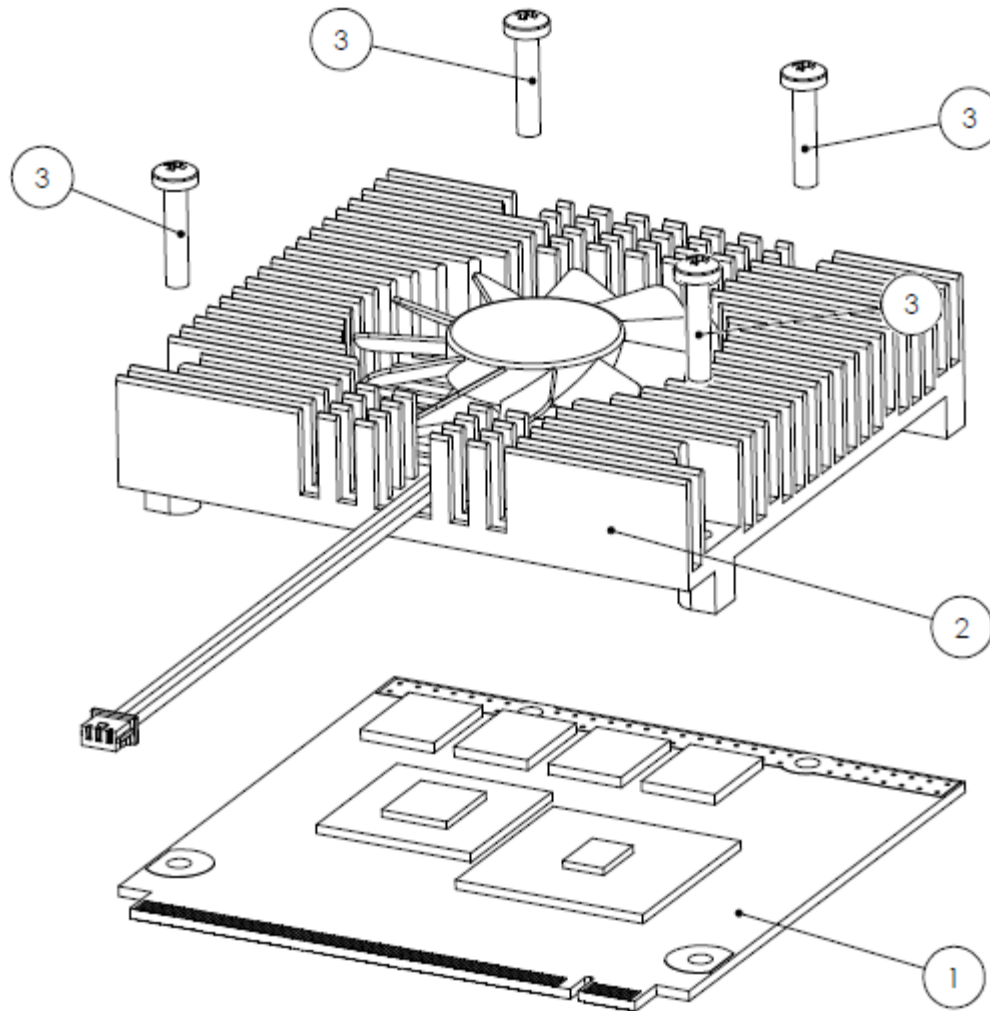
Item nr	Quantity	Description
1	1	Quadmo747-GSeries Qseven module
2	1	Heatspreader + Gap Pad Filler assembled
3	4	Screw, M2.5, cylindrical head, crosshead, L=12mm, Inox A-2

Heatspreader + Quadmo747-GSeries module assembly



Item nr	Quantity	Description
1	1	Quadmo747-GSeries Qseven module
2	1	Heatsink + Gap Pad Filler assembled
3	4	Screw, M2.5, cylindrical head, crosshead, L=12mm, Inox A-2

Heatsink + Quadmo747-GSeries module assembly



Item nr	Quantity	Description
1	1	Quadmo747-GSeries Qseven module
2	1	Heatsink with FAN + Gap Pad Filler assembled
3	4	Screw, M2.5, cylindrical head, crosshead, L=12mm, Inox A-2

Heatsink with FAN + Quadmo747-GSeries module assembly

