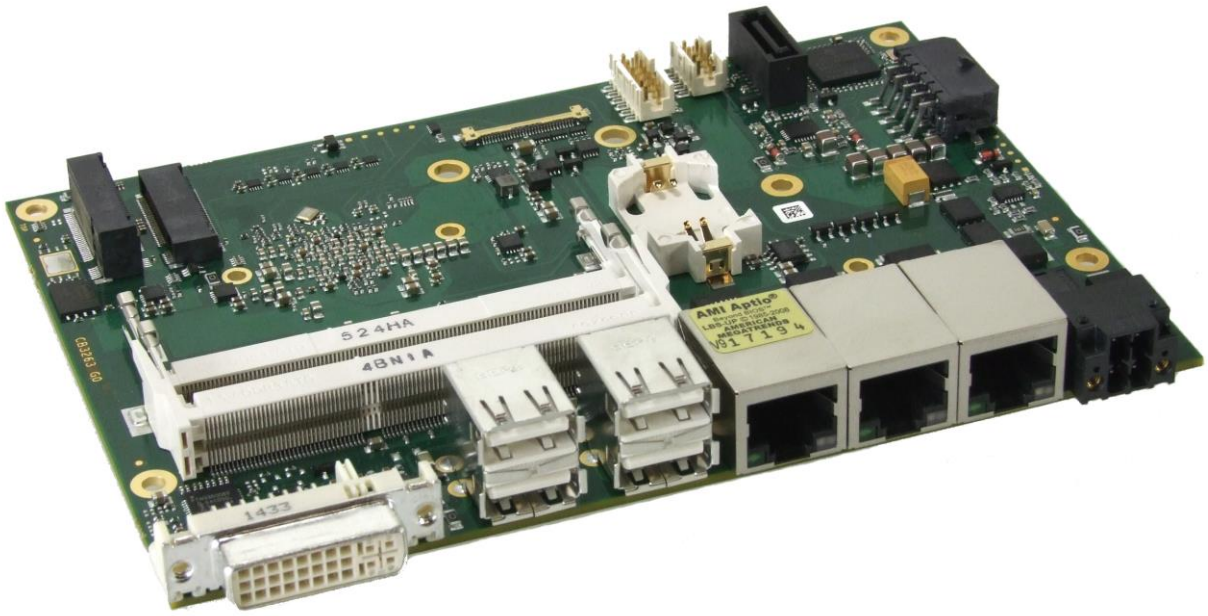
BECKHOFF

CB3263-xxxx

Manual

rev. 0.4



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Contents

0 Document History

Version	Changes
0.1	first pre-release
0.2	updated BIOS chapter
0.3	added chapter LEDs corrected I-PEX connector pinout
0.4	changed M.2 description corrected power supply connector pinout updated M.2 pinouts for M.2 2280 and M.2 2242

1 Introduction

1.1 Notes on the Documentation

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards. It is essential that the following notes and explanations are followed when installing and commissioning these components.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

1.1.1 Disclaimer

The documentation has been prepared with care. The products described are, however, constantly under development.

For that reason the documentation is not in every case checked for consistency with performance data, standards or other characteristics.

None of the statements of this manual represents a guarantee (Garantie) in the meaning of § 443 BGB of the German Civil Code or a statement about the contractually expected fitness for a particular purpose in the meaning of § 434 par. 1 sentence 1 BGB.

In the event that it contains technical or editorial errors, we retain the right to make alterations at any time and without warning.

No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

1.1.2 Copyright

1.2 Safety Instructions

Consider the following safety instructions and descriptions!

Product specific safety instructions are to be found on the following pages or in the areas mounting, wiring, commissioning etc.

1.2.1 Disclaimer

All the components are supplied in particular hardware and software configurations appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH & Co. KG.

1.2.2 Description of Safety Symbols

The following safety symbols are used in this documentation. You have to read the safety symbols carefully and adhere them strictly!

 **DANGER**	**Acute risk of injury!** If you do not adhere the safety advise adjoining this symbol, there is immediate danger to life and health of individuals!
 **WARNING**	**Risk of injury!** If you do not adhere the safety advise adjoining this symbol, there is danger to life and health of individuals!
 **CAUTION**	**Hazard to devices and environment** If you do not adhere the safety advise adjoining this symbol, there is obvious hazard to individuals!
 **Attention**	**Hazard to devices and environment** If you do not adhere the notice adjoining this symbol, there is obvious hazard to materials and environment.
 **Notice**	**Note or pointer** This symbol indicates information that contributes to better understanding.

1.3 FCC Approvals for the United States of America

FCC: Federal Communications Commission Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

1.4 FCC Approval for Canada

FCC: Canadian Notice

This equipment does not exceed the Class A limits for radiated emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.

1.5 Essential Safety Measures

1.5.1 Operator's Obligation to Exercise Diligence

The operator must ensure that

- the product is only used for its intended purpose
- the product is only operated in sound condition and in working order
- the instruction manual is in good condition and complete, and always available for reference at the location where the products are used
- the product is only used by suitably qualified and authorised personnel
- the personnel is instructed regularly about relevant occupational safety and environmental protection aspects
- the operating personnel is familiar with the operating manual and in particular the safety notes contained herein

1.5.2 National Regulations Depending on the Machine Type

Depending on the type of machine and plant in which the product is used, national regulations governing the controllers of such machines will apply, and must be observed by the operator. These regulations cover, amongst other things, the intervals between inspections of the controller. The operator must initiate such inspections in good time.

1.5.3 Operator Requirements

- Read the operating instructions

All users of the product must have read the operating instructions for the system they work with.

- System know-how

All users must be familiar with all accessible functions of the product.

1.6 Functional Range

The descriptions contained in the present documentation represent a detailed and extensive product description. As far as the described motherboard was acquired as an integral component of an Industrial PC from Beckhoff Automation GmbH & Co. KG, this product description shall be applied only in limited scope. Only the contractually agreed specifications of the corresponding Industrial PC from Beckhoff Automation GmbH & Co. KG shall be relevant. Due to several models of Industrial PCs, variations in the component placement of the motherboards are possible. Support and service benefits for the built-in motherboard will be rendered by Beckhoff Automation GmbH & Co. KG exclusively as specified in the product description (inclusive operation system) of the particular Industrial PC.

2 Overview

2.1 Features

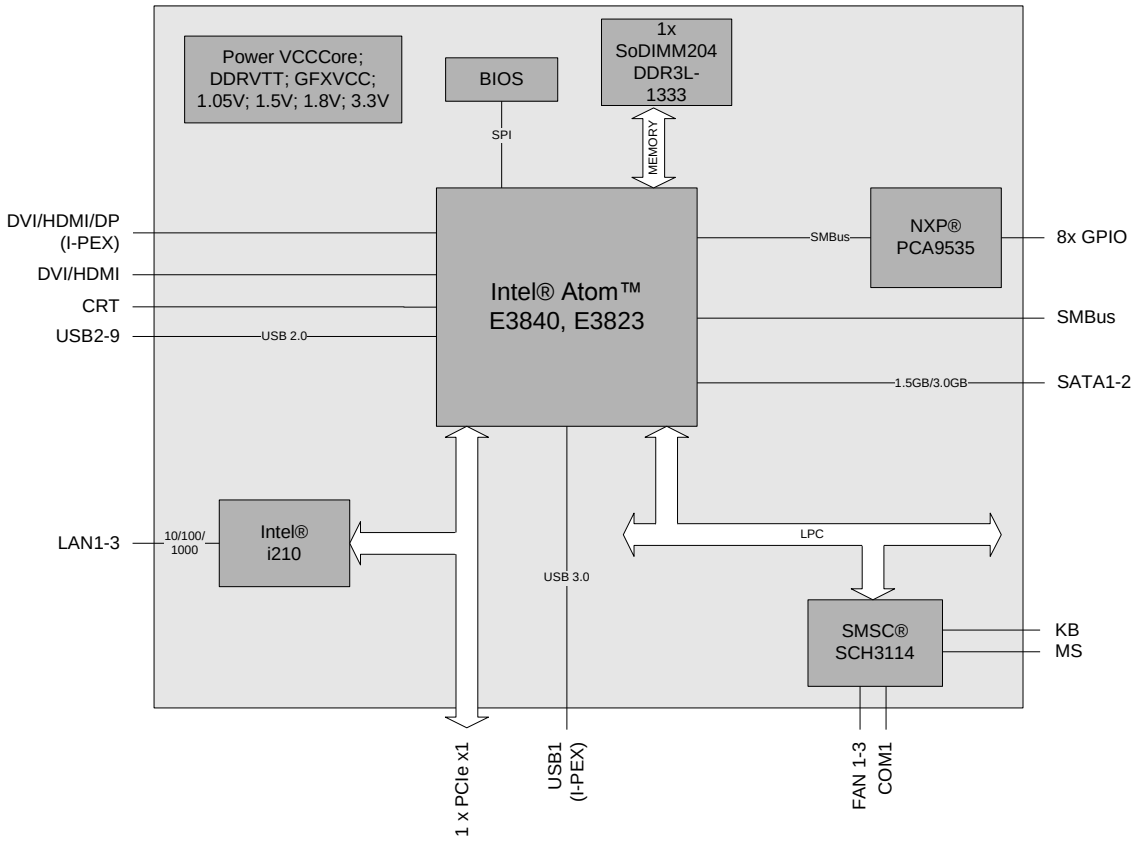
The CB3263 is a highly complex 3,5-inch board which incorporates complete motherboard functionality. It's based on a System-On-Chip (SoC) of Intel®'s Atom E3800 product family. Modern low voltage DDR3L technology provides top-notch memory performance, accomodating up to 16 GByte of RAM (DDR3L-1333) via SO-DIMM204.

The frontpanel provides standard interfaces, such as a DVI/HDMI/DisplayPort connector, 3 Gigabit LAN interfaces and 4 USB2.0 interfaces.

The CB3263 also provides internal interfaces, such as an 30pin I-PEX connector, which makes DVI/HDMI/DP signals and a USB3.0 interface available, a SATA connector and two M.2(B) sockets, which make PCI Express (1 x PCIe x1) and SATA signals available.

The power supply is realized via a 4pin connector. For connected peripherals, such as a display or a SSD, the CB3263 provides two additional power supplies via internal FCI connectors.

Input voltage is 24V.



2.2 Feature List

CB3263	3,5"-Board
CPU	Atom™ E3845 (QC, 2M, 1.91 GHz), TDP 10W
	Atom™ E3827 (DC, 1M, 1.75 GHz), TDP 8W
	Atom™ E3826 (DC, 1M, 1.46 GHz), TDP 7W
	Atom™ E3825 (DC, 1M, 1.33 GHz), TDP 6W
	Atom™ E3815 (SC, 1M, 1.46 GHz), TDP 5W
Memory	Variants with Intel® Atom™ E3815 oder E3825: 1 socket with DDR3L@1066/1333MHz à 8GB
	Variants with Intel® Atom™ E3826, E3827 or E3845: 2 sockets, each with 1x DDR3L @ 1066/1333MHz à 8GB (up to 16GB total memory)
I/O	1 x SATA 2.0
	1 x I-PEX
	1 x M.2(B) Typ 2242 for SSD connection (SATA)
	1 x M.2(B) Typ 2280 for PCIe connection
	4 x USB 2.0
	3 x GBit-LAN, Intel® i210
	1 x DVI-I (DVI / HDMI / DP)
Graphics	HDMI / DVI: 1920 x 1200 (at 16:10), 1920 x 1600 (at 16:9)
	DP / eDP: 2560 x 1600 (at 16:10), 2560 x 1440 (at 16:9)
RTC	changeable horizontal onboard battery
BIOS	AMI® Aptio V
Power Supply	16V - 36V input voltage range
	Over- and undervoltage protection
	S-UPS connection
	Reverse voltage protection
	not galvanically isolated
Format	102 mm x 147 mm

2.3 Specifications and Documents

In making this manual and for further reading of technical documentation, the following documents, specifications and web-pages were used and are recommended.

- PCI specification
  Version 2.3 bzw. 3.0
  www.pcisig.com
- PCI Express® Base specification
  Version 2.0
  www.pcisig.com
- ACPI specification
  Version 3.0
  www.acpi.info
- ATA/ATAPI specification
  Version 7 Rev. 1
  www.t13.org
- USB specifications
  www.usb.org
- SM-Bus specification
  Version 2.0
  www.smbus.org
- Intel® Chip Description
  Intel® Atom™ Processor E3800 Product Family datasheet
  www.intel.com
- Intel® Chip Description
  i210 Datasheet
  www.intel.com
- SMSC® Chip Description
  SCH3114 Datasheet
  www.smsc.com
  (NDA required)
- American Megatrends®
  Aptio™ Text Setup Environment (TSE) User Manual
  www.ami.com
- American Megatrends®
  Aptio™ 4.x Status Codes
  www.ami.com

3 Detailed Description

3.1 Power Supply / UPS

The CB3263 needs an external power supply of 24V (will tolerate 20V-30V). It is also used for charging any UPS device that may be present. This UPS device is either capacitor-based or connected externally as a Pb-battery pack. With a UPS installed and charged, the module can stay operational even when a power failure occurs. A capacitor-based UPS can keep the board alive only for a few seconds while a Pb-battery typically allows for several minutes of continued operation. The exact amount of time is hard to predict as it also depends on factors such as the UPS' charge level at the time of the power failure, CPU/chipset power consumption etc. Generally, a Pb-battery needs a much longer time to reach full charge level compared to a capacitor-based UPS.

3.2 SUPS

Optionally the CB3263 can be equipped with a plug-in SUPS, which can keep the board alive over a short period of time in case of power failure or voltage fluctuation. The exact amount of time is hard to predict as it also depends on factors such as the SUPS' capacitors and the boards' power consumption etc. The capacitors size is only limited by the required space.

3.3 CPU

The motherboard employs an Intel® Atom™ processor of the E3800 family, which is a system-on-chip (SoC) being optimized for low power consumption, while at the same time providing state-of-the-art computing performance.
The processors include a second level cache of 512 KByte. They also offer many features known from the desktop range such as MMX2, serial number, loadable microcode etc.
The Atom™ CPU operates in an extended range of thermal conditions and therefore is capable for use in industrial systems.

3.4 Memory

The CB3263 is equipped with two SO-DIMM204 sockets for DDR3L-1333-RAM. For technical and mechanical reasons it is possible that particular memory modules cannot be employed. Please ask your distributor for recommended memory modules.
With currently available SO-DIMM204 modules a memory extension up to 16 GByte is possible - depending on the variants components. Product variants with Intel® Atom processors E3815 or E3825 provide only one memory socket. Therefore with those variants a memory extension is possible only up to 8 GByte.
If both memory sockets are in use, notice that you must use identical memory modules.
Please notice, that if only one memory socket shall be used, this one must be the memory socket U500 (which is the lower one).

3.5 M.2

Depending on the type of card, add-in cards, which comply with the M.2 specification, come in a very small format and with flexible dimensions. Different key IDs support different interfaces, as there are up to four PCI Express lanes, SATA and/or USB3.0 (see table below).

M.2 cards can be easily inserted: just plug them into the slot and fix it with a fixing screw.

Cards of different types have different keyings. Depending on the supported type, one port can receive add-in cards of one ore various types.

Key ID	Available Interfaces
A	PCIe x2, USB 2.0, I²C and DP
B*	PCIe x2, SATA, USB 2.0/3.0 Audio, UIM, HSIC, SSIC, I²C, SMBus
C, D	Reserved
E	PCIe x2, USB2.0, I²C, SDIO, UART, PCM
F	Future Memory Interface (FMI)
G, H, J, K, L	Reserved
M	PCIe x4, SATA and SMBus

* With its M.2 socket the CB3263 supports keying B M.2 modules.

Notice

Driver Compatibility

For optimal driver compatibility we recommend the use of a Microsoft® Windows® 8 operating system.

If you use an add-in card, which is not or not fully supported, the BIOS will display an error message.

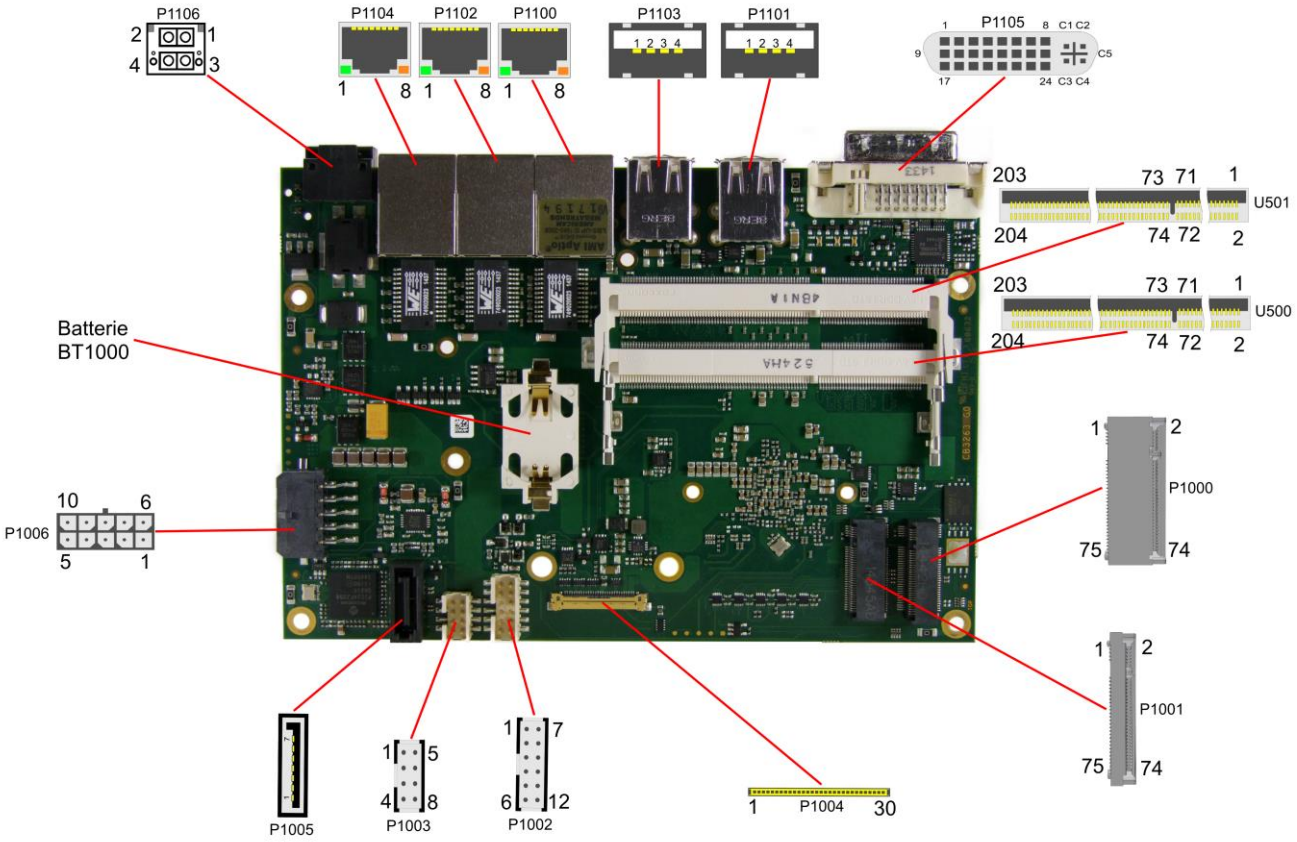
4 Connectors

This section describes all the connectors found on the CB3263.

Notice	**Please consider the requirements on the cabling!** For most interfaces, the cables must meet certain requirements. For instance, USB 2.0 requires twisted and shielded cables to reliably maintain full speed data rates. Restrictions on maximum cable length are also in place for many high speed interfaces and for power supply. Please refer to the respective specifications and use suitable cables at all times.

4.1 Connector Map

Please use the connector map below for quick reference. Only connectors on the component side are shown. For more information on each connector refer to the table below.



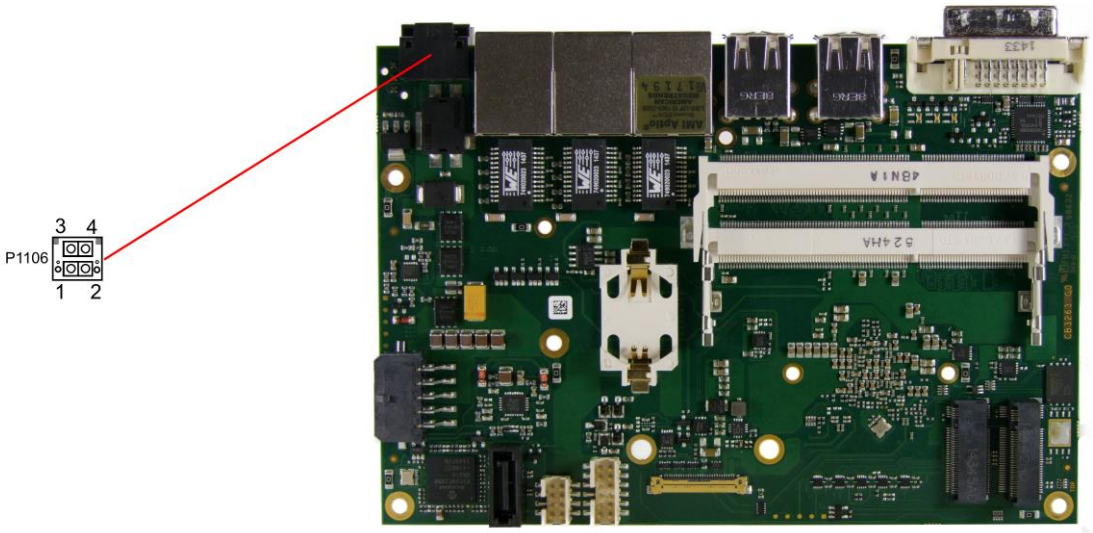
Ref.-No.	Function	Page
U500/501	"Memory"	p. 28
P1000	"M.2 2280 (Keying B)"	p. 31
P1001	"M.2 2242 (Keying B)"	p. 33
P1002	"Power Supply for Peripherals (I-PEX)"	p. 20
P1003	"Power Supply for Peripherals (SATA)"	p. 21
P1004	"DVI/HDMI/DisplayPort and USB3.0"	p. 35
P1005	"SATA Interface"	p. 37
P1006	"S-UPS"	p. 22
P1100/2/4	"LAN"	p. 27
P1101/3	"USB"	p. 26
P1105	"DVI / HDMI / VGA"	p. 24
P1106	"Mainboard Power Supply"	p. 19

4.2 Power Supply

4.2.1 Mainboard Power Supply

The power supply of the CB3263 is realized via a 2x2pin connector (P20THR-1787014). The main 24V power lines are assigned to pin 3.
If a UPS is present you need to have a possibility to shut down the board in a regular way without activating the UPS, thereby preventing premature aging of UPS components. That's what pin 1 (PC_START) is for. When pulled high (24V) a regular shutdown without UPS activity is triggered. As a part of this regular shutdown pin 2 (PC_AKTIV) is pulled from 24V to 0V.

Manufacturer	Description	Mating Connector
Phoenix	P20THR-1787014	DFMC 1,5/ 2-ST-3,5-LR- 1790292



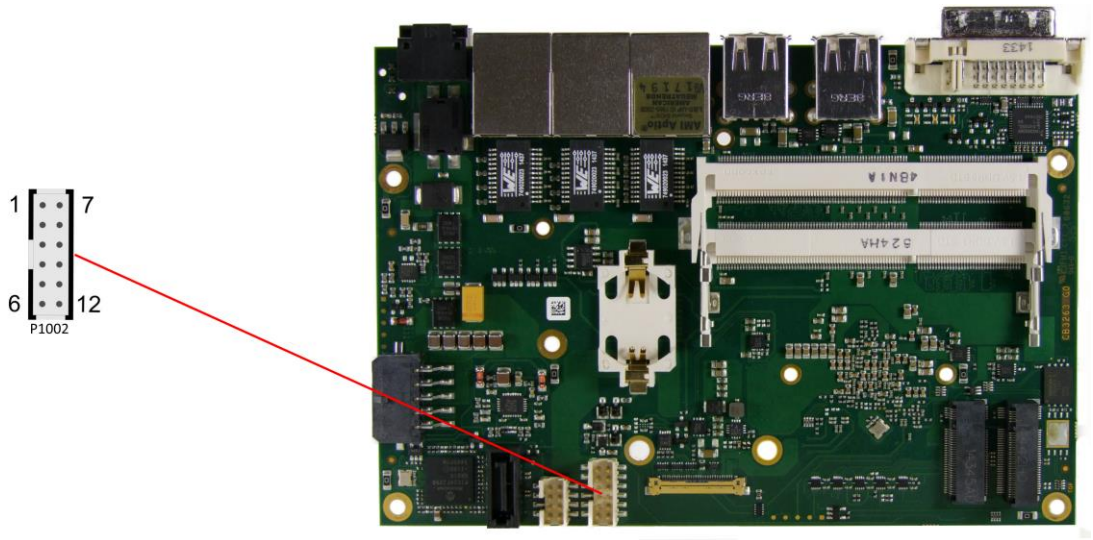
Description	Name	Pin		Name	Description
PC Start	PC_START	1	2	PC_AKTIV	PC Status
Power Supply 24V	Vin	3	4	GND	Ground

4.2.2 Power Supply for Peripherals (I-PEX)

The CB3263 has a 2x6pin connector, which provides the power supply for displays, which are connected via I-PEX.

Maximum current is 6 amperes for VCC combined (2A per contact), and also 6 amperes for 12V (2A per contact).

Manufacturer	Description	Mating Connector
FCI	FCI 98424-G52-12LF	FCI 90311-012LF



Pinout power connector 2x6:

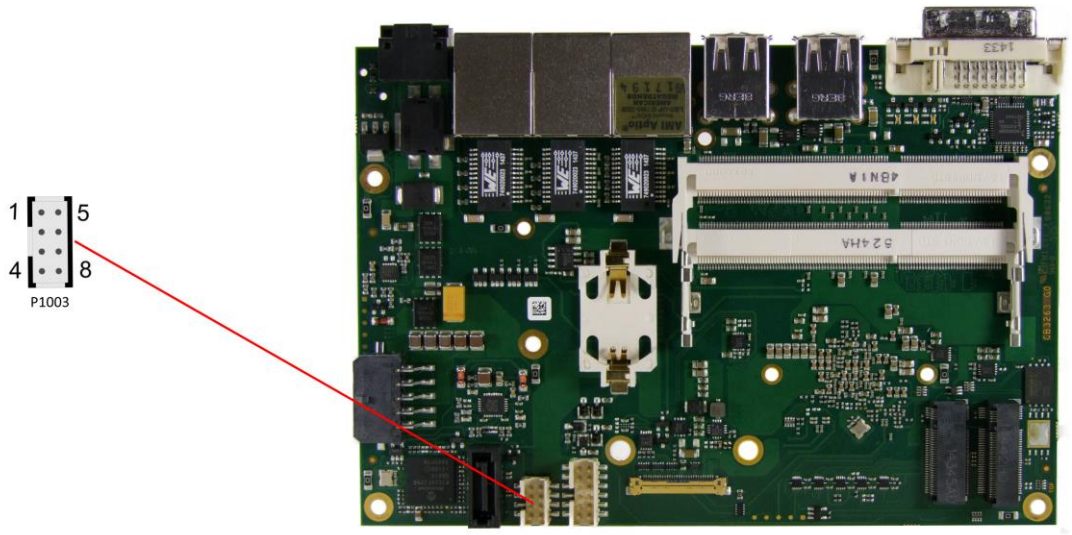
Description	Name	Pin		Name	Description
power supply 5V	VCC	1	7	VCC	power supply 5V
power supply 5V	VCC	2	8	GND	ground
ground	GND	3	9	GND	ground
ground	GND	4	10	GND	ground
power supply 12V	12V	5	11	GND	ground
power supply 12V	12V	6	12	12V	power supply 12V

4.2.3 Power Supply for Peripherals (SATA)

The CB3263 has a 2x4pin connector, which provides the power supply for devices, which are connected via SATA.

Maximum current is 2 amperes for VCC combined (2A per contact), and also 2 amperes for 12V and 3,3V (2A per contact).

Manufacturer	Description	Mating Connector
FCI	98424-G52-08LF	90311-008LF



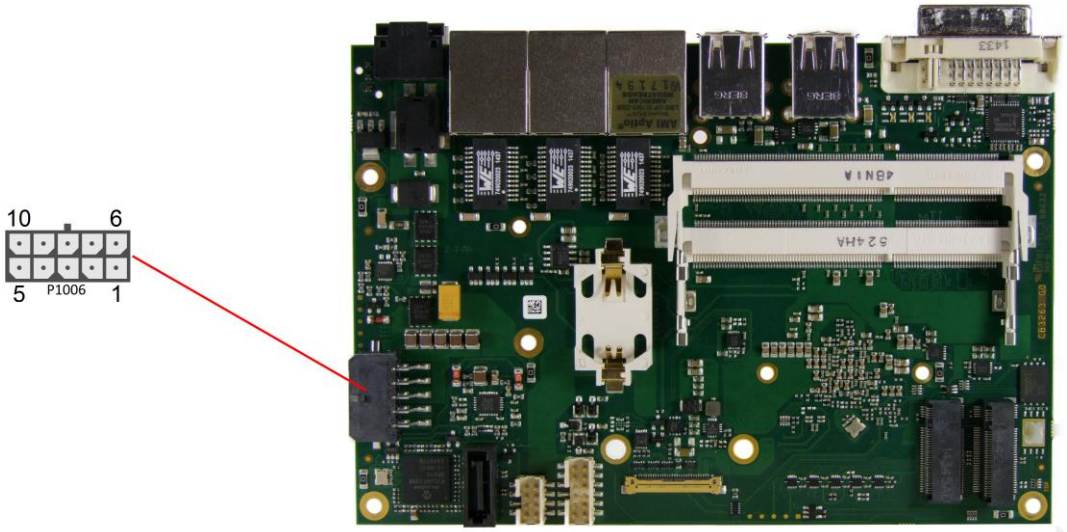
Pinout power connector 2x4:

Description	Name	Pin		Name	Description
battery (Input)	BATT_E	1	5	GND	ground
power supply 3,3V	3,3V	2	6	GND	ground
power supply	VCC	3	7	GND	ground
power supply	12V	4	8	GND	ground

4.2.4 S-UPS

A S-UPS module can be connected to the CB3263 via a 2x5pin connector. The S-UPS is able to maintain the power supply for the CB3263 for a few seconds, depending on the capacity and power consumption.

Manufacturer	Description	Mating Connector
Molex	43045-1009	Molex 43025-1009

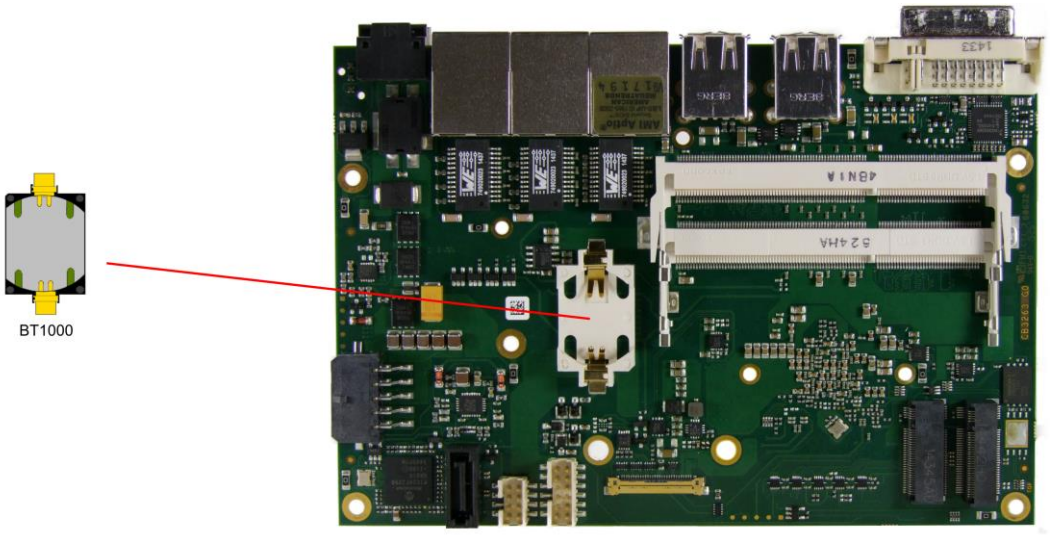


Pinout Molex 2x5:

Description	Name	Pin		Name	Description
output voltage	Voutreg	1	6	Voutreg	output voltage
output voltage	Vout	2	7	Vout	output voltage
ground	GND	3	8	GND	ground
SUSV	SUSV	4	9	SMBALERT#	SMB alert
SMB data	SMB-DAT	5	10	SMB-CLK	SMB clock

4.2.5 External CMOS Battery

The board ships with a CR2032 battery holder (Renata VBH2032-1) and 3V battery.



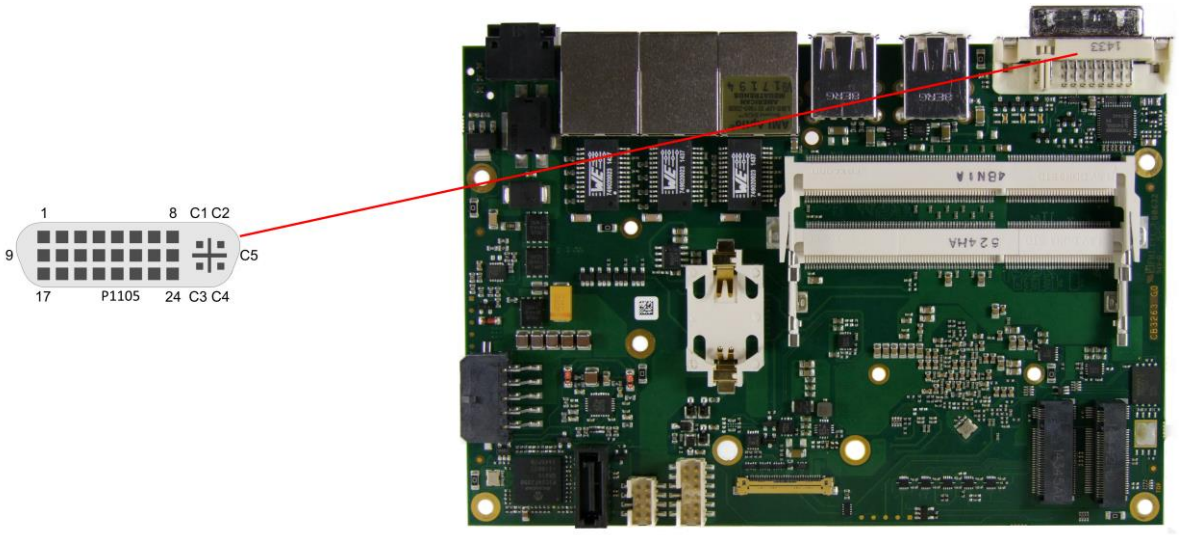
4.3 Front Panel Connectors

A range of standard connectors are available: You can connect displays, USB, LAN etc. The following connectors are located on the front panel of the CB3263.

4.3.1 DVI / HDMI / VGA

The CB3263 is connected to an external display via a DVI-I connector, which supports analog and digital displays. A HDMI display can be connected.

Manufacturer	Description	Mating Connector
Molex	74320-9010	standard DVI connector



Pinout DVI-I:

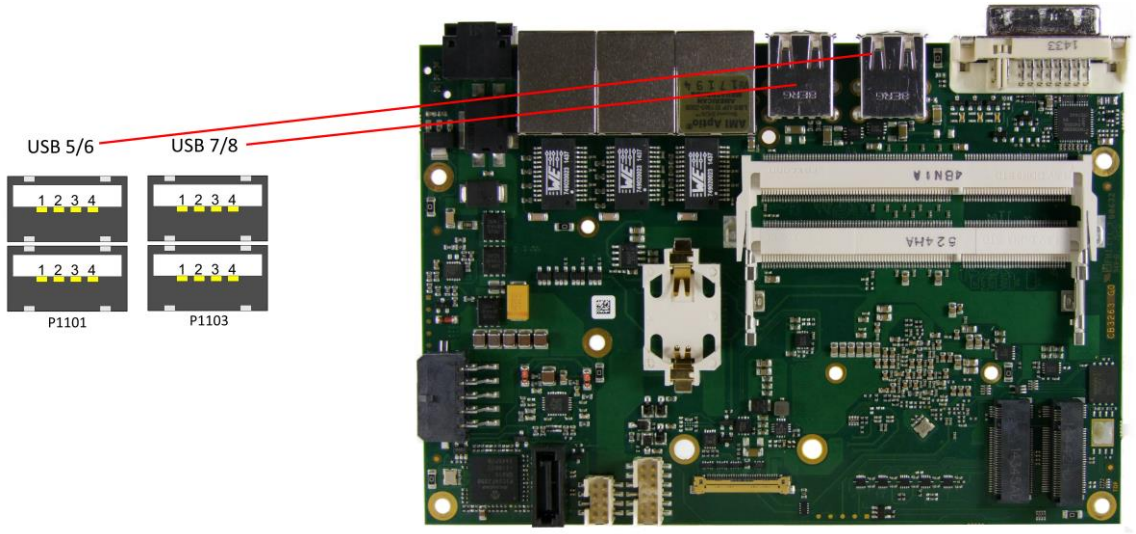
Pin	Name	Description
1	TMDSDAT2#	DVI data 2 -
2	TMDSDAT2	DVI data 2 +
3	GND	ground
4	N/C	reserved
5	N/C	reserved
6	DDC CLK	DDC clock (DVI/VGA)
7	DDC DAT	DDC data (DVI/VGA)
8	VSYNC	VGA vertical synchronization
9	TMDSDAT1#	DVI data 1 -
10	TMDSDAT1	DVI data 1 +
11	GND	ground
12	N/C	reserved
13	N/C	reserved
14	VCC	5 volt supply
15	GND	ground
16	HP_DETECT	hot plug detect
17	TMDSDAT0#	DVI data 0 -
18	TMDSDAT0	DVI data 0 +
19	GND	ground
20	N/C	reserved
21	N/C	reserved
22	GND	ground

Pin	Name	Description
23	TMDS CLK	DVI clock
24	TMDS CLK#	DVI clock
C1	C_RED	VGA red
C2	C_GREEN	VGA green
C3	C_BLUE	VGA blue
C4	C_HSYNC	VGA horizontal synchronization
C5	GND	ground

4.3.2 USB

USB channels 5 to 8 are provided via two standard USB connectors.
The USB channels support USB 2.0. You may note that the setting of USB keyboard or USB mouse support in the BIOS-setup is only necessary and advisable, if the OS offers no USB-support. BIOS-setup can be changed with a USB keyboard without enabling USB keyboard support. Running Windows with these features enabled may lead to significant performance or functionality limitations.
Every USB interface provides up to 500 mA current and is protected by an electronically resettable fuse.
In ACPI state S5 via USB connected devices will not be energized.

Manufacturer	Description	Mating Connectors
Foxconn	UB11121C-8D1-4F	(standard connector)



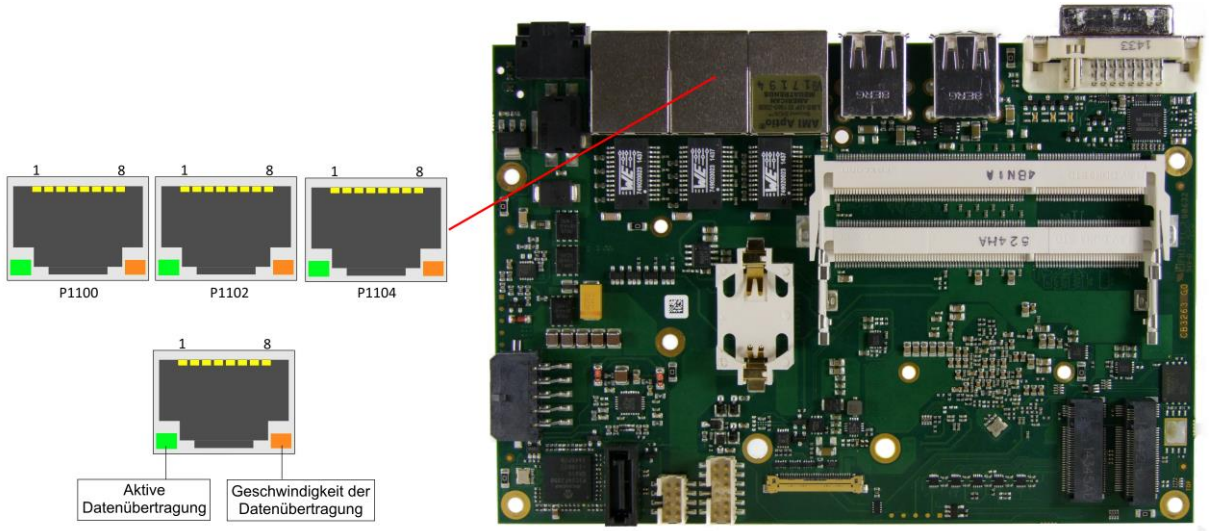
Pinout USB2.0 connector for channel X:

Pin	Name	Description
1	VCC	5 volt for USBX
2	USBX#	minus channel USBX
3	USBX	plus channel USBX
4	GND	ground

4.3.3 LAN

The module has three LAN interfaces of which all three support 10BaseT, 100BaseT, and 1000BaseT compatible net components with automatic bandwidth selection. Controller chip is Intel® i210. Auto-cross and auto-negotiate functionality is available as is PXE and WOL.

Manufacturer	Description	Mating Connector
Assmann	AMJ-188-0101-C5-GO-A	(standard connector)



Pinout LAN 10/100/1000:

Pin	Name	Description
1	LAN-0	LAN channel 0 plus
2	LAN-0#	AN channel 0 minus
3	LAN-1	LAN channel 1 plus
4	LAN-2	LAN channel 2 plus
5	LAN-2#	LAN channel 2 minus
6	LAN-1#	LAN channel 1 minus
7	LAN-3	LAN channel 3 plus
8	LAN-3#	LAN channel 3 minus

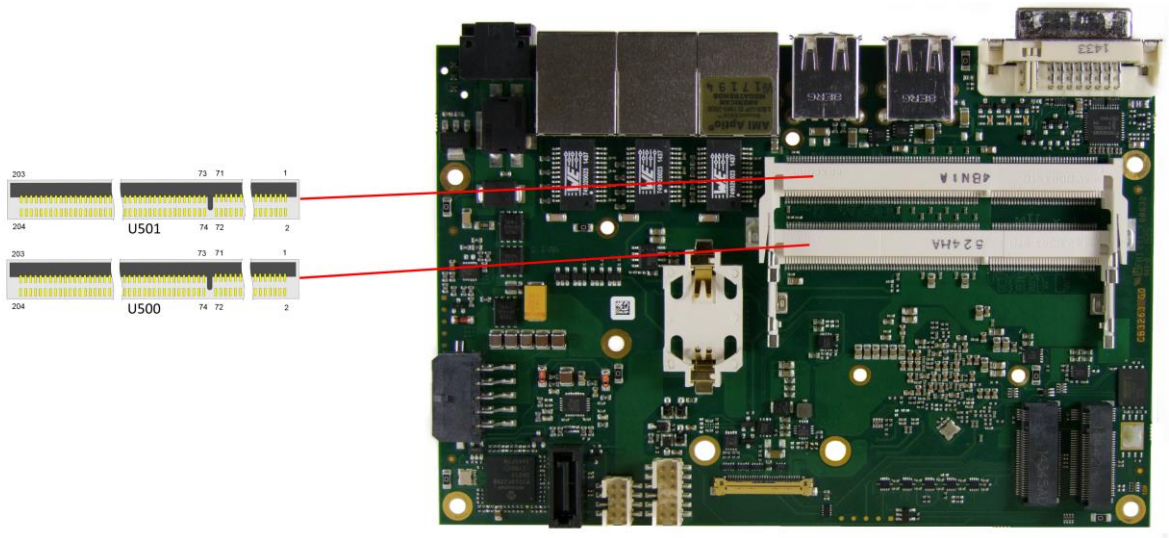
The LEDs show activity and speed of data transfer:

Mbit/s	flashing at data transfer	permanent
1000	green	green
100	green	orange
10	green	-

4.4 Internal Connectors

4.4.1 Memory

Conventional SO-DIMM204 memory modules, as familiar from notebook computers, are used to equip the board with memory. For technical and mechanical reasons it is possible that particular memory modules cannot be employed. Please ask your distributor for recommended memory modules.
With currently available SO-DIMM204 modules a memory extension up to 16 GByte is possible (DDR3L-1333) - depending on the variants components. Product variants with Intel® Atom processors E3815 or E3825 provide only one memory socket. Therefore with those variants a memory extension is possible only up to 8 GByte.
If both memory sockets are in use, notice that you must use identical memory modules.
All timing parameters for different memory modules are automatically set by BIOS.



Pinout SO-DIMM204:

Description	Name	Pin		Name	Description
memory reference current	REF-DQ	1	2	GND	ground
ground	GND	3	4	DQ4	data 4
data 0	DQ0	5	6	DQ5	data 5
data 1	DQ1	7	8	GND	ground
ground	GND	9	10	DQS0#	data strobe 0 -
data mask 0	DM0	11	12	DQS0	data strobe 0 +
ground	GND	13	14	GND	ground
data 2	DQ2	15	16	DQ6	data 6
data 3	DQ3	17	18	DQ7	data 7
ground	GND	19	20	GND	ground
data 8	DQ8	21	22	DQ12	data 12
data 9	DQ9	23	24	DQ13	data 13
ground	GND	25	26	GND	ground
data strobe 1 -	DQS1#	27	28	DM1	data mask 1
data strobe 1 +	DQS1	29	30	RESET#	Reset
ground	GND	31	32	GND	ground
data 10	DQ10	33	34	DQ14	data 14
data 11	DQ11	35	36	DQ15	data 15
ground	GND	37	38	GND	ground
data 16	DQ16	39	40	DQ20	data 20

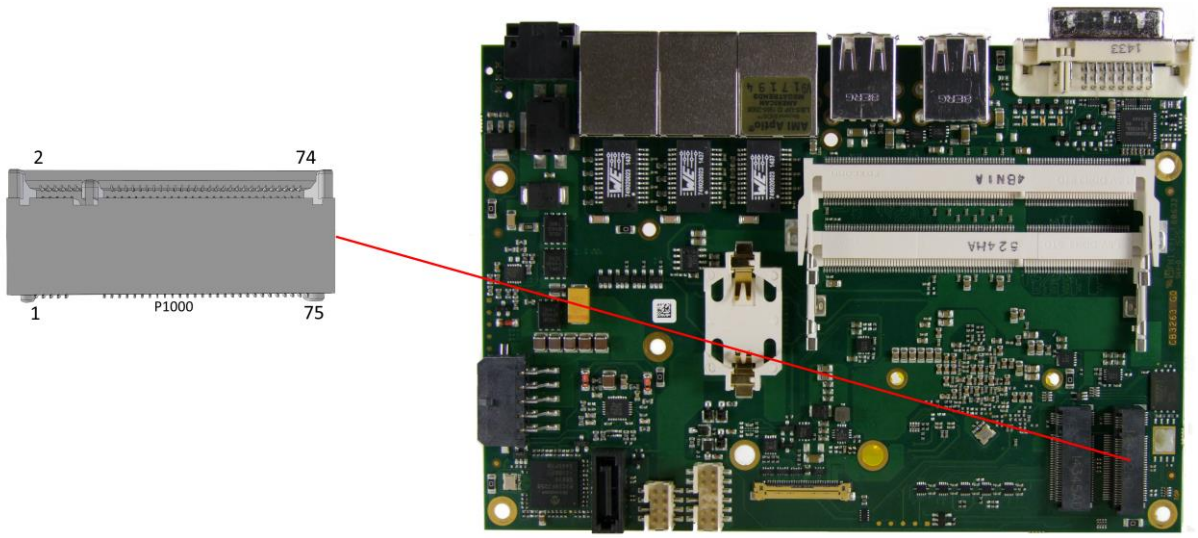
Description	Name	Pin		Name	Description
data 17	DQ17	41	42	DQ21	data 21
ground	GND	43	44	GND	ground
data strobe 2 -	DQS2#	45	46	DM2	data mask 2
data strobe 2 +	DQS2	47	48	GND	ground
ground	GND	49	50	DQ22	data 22
data 18	DQ18	51	52	DQ23	data 23
data 19	DQ19	53	54	GND	ground
ground	GND	55	56	DQ28	data 28
data 24	DQ24	57	58	DQ29	data 29
data 25	DQ25	59	60	GND	ground
ground	GND	61	62	DQS3#	data strobe 3 -
data mask 3	DQM3	63	64	DQS3	data strobe 3 +
ground	GND	65	66	GND	ground
data 26	DQ26	67	68	DQ30	data 30
data 27	DQ27	69	70	DQ31	data 31
ground	GND	71	72	GND	ground
clock enables 0	CKE0	73	74	CKE1	clock enables 1
1.5 volt supply	1.5V	75	76	1.5V	1.5 volt supply
reserved	N/C	77	78	(A15)	reserved
SDRAM bank 2	BA2	79	80	A14	address 14
1.5 volt supply	1.5V	81	82	1.5V	1.5 volt supply
address 12 (burst chop)	A12/BC#	83	84	A11	address 11
address 9	A9	85	86	A7	address 7
1.5 volt supply	1.5V	87	88	1.5V	1.5 volt supply
address 8	A8	89	90	A6	address 6
address 5	A5	91	92	A4	address 4
1.5 volt supply	1.5V	93	94	1.5V	1.5 volt supply
address 3	A3	95	96	A2	address 2
address 1	A1	97	98	A0	address 0
1.5 volt supply	1.5V	99	100	1.5V	1.5 volt supply
Clock 0 +	CK0	101	102	CK1	clock 1 +
Clock 0 -	CK0#	103	104	CK1#	clock 1 -
1.5 volt supply	1.5V	105	106	1.5V	1.5 volt supply
address 10 (auto precharge)	A10/AP	107	108	BA1	SDRAM bank 1
SDRAM Bank 0	BA0	109	110	RAS#	row address strobe
1.5 volt supply	1.5V	111	112	1.5V	1.5 volt supply
write enable	WE#	113	114	S0#	chip select 0
column address strobe	CAS#	115	116	ODT0	on die termination 0
1.5 volt supply	1.5V	117	118	1.5V	1.5 volt supply
address 13	A13	119	120	ODT1	on die termination 1
Chip Select 1	S1#	121	122	N/C	reserved
1.5 volt supply	1.5V	123	124	1.5V	1.5 volt supply
reserved	(TEST)	125	126	REF-CA	reference current
ground	GND	127	128	GND	ground
data 32	DQ32	129	130	DQ36	data 36
data 33	DQ33	131	132	DQ37	data 37
ground	GND	133	134	GND	ground
data strobe 4 -	DQS4#	135	136	DQM4	data mask 4
data strobe 4 +	DQS4	137	138	GND	ground
ground	GND	139	140	DQ38	data 38
data 34	DQ34	141	142	DQ39	data 39
data 35	DQ35	143	144	GND	ground
ground	GND	145	146	DQ44	data 44
data 40	DQ40	147	148	DQ45	data 45
data 41	DQ41	149	150	GND	ground

Description	Name	Pin		Name	Description
ground	GND	151	152	DQS5#	data strobe 5 -
data mask 5	DQM5	153	154	DQS5	data strobe 5 +
ground	GND	155	156	GND	ground
data 42	DQ42	157	158	DQ46	data 46
data 43	DQ43	159	160	DQ47	data 47
ground	GND	161	162	GND	ground
data 48	DQ48	163	164	DQ52	data 52
data 49	DQ49	165	166	DQ53	data 53
ground	GND	167	168	GND	ground
data strobe 6 -	DQS6#	169	170	DQM6	data mask 6
data strobe 6	DQS6	171	172	GND	ground
ground	GND	173	174	DQ54	data 54
data 50	DQ50	175	176	DQ55	data 55
data 51	DQ51	177	178	GND	ground
ground	GND	179	180	DQ60	data 60
data 56	DQ56	181	182	DQ61	data 61
data 57	DQ57	183	184	GND	ground
ground	GND	185	186	DQS7#	data strobe 7 -
data mask 7	DQM7	187	188	DQS7	data strobe 7 +
ground	GND	189	190	GND	ground
data 58	DQ58	191	192	DQ62	data 62
data 59	DQ59	193	194	DQ63	data 63
ground	GND	195	196	GND	ground
SPD address 0	SA0	197	198	EVENT#	Event
3.3 volt supply	3.3V	199	200	SDA	SMBus data
SPD address 1	SA1	201	202	SCL	SMBus clock
termination current	VTT	203	204	VTT	termination current

4.4.2 M.2 2280 (Keying B)

The CB3263 is equipped with an M.2 socket, in which M.2-2280 cards (keying B) can be inserted. The socket leads PCIe signals (1x PCIe x1) through. Adaptor cards with standard PCIe sockets are available, please contact your distributor.

Manufacturer	Description	Mating connector
FCI	10128796-004RLF	(card)



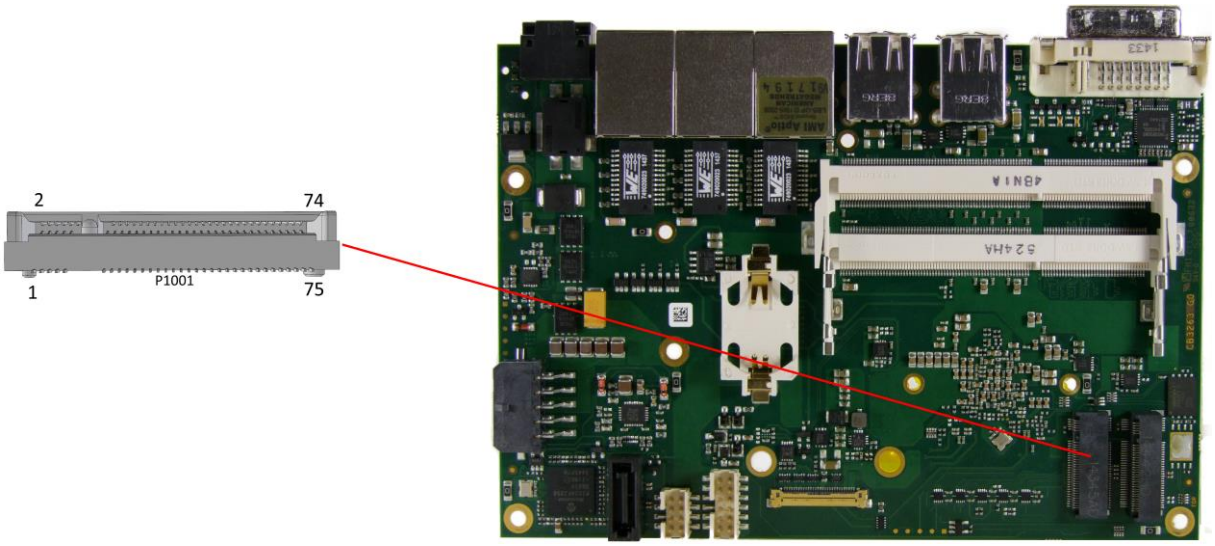
Description	Name	Pin		Name	Description
configuration pin	CONFIG_3	1	2	3.3V1	Standby power supply S3,3V
ground	GND1	3	4	3.3V2	Standby power supply S3,3V
ground	GND2	5	6	FCPWROFF#	Full Card Power OFF active low
USB channel 2 data +	USB_D+	7	8	WDISABLE#	*(not available)*
USB channel 2 data -	USB_D-	9	10	GPIO9 DAS DDS LED1	*(not available)*
ground	GND3	11	12	connector key	
connector key		13	14		
		15	16		
		17	18		
		19	20	GPIO5	*(not available)*
configuration pin	CONFIG_0	21	22	GPIO6	*(not available)*
(not available)	GPIO11	23	24	GPIO7	*(not available)*
(not available)	DPR	25	26	GPIO10	*(not available)*
ground	GND4	27	28	GPIO8	*(not available)*
(not available)	PER1# USB3RX# SSICRX#	29	30	UIM_RST	*(not available)*
(not available)	PER1 USB3RX	31	32	UIM_CLK	*(not available)*

Description	Name	Pin		Name	Description
	SSICRX				
ground	GND5	33	34	UIM_DATA	*(not available)*
(not available)	PET1# USB3TX# SSICTX#	35	36	UIM_PWR	*(not available)*
(not available)	PET1 USB3TX SSICTX	37	38	DEVSLP	*(not available)*
ground	GND6	39	40	GPIO0	*(not available)*
PCIe lane 1 receive -	PER0# SATAB	41	42	GPIO1	*(not available)*
PCIe lane 1 receive +	PER0 SATAB#	43	44	GPIO2	*(not available)*
ground	GND7	45	46	GPIO3	*(not available)*
PCIe lane 1 transmit -	PET0# SATAA#	47	48	GPIO4	*(not available)*
PCIe lane 1 transmit +	PET0 SATAA	49	50	PRST#	PCIe Reset active low
ground	GND8	51	52	CLKREQ#	PCIe clock enable active low
PCIe lane 1 reference clock-	REFCLK#	53	54	PEWAKE#	Link reactivation active low
PCIe lane 1 reference clock +	REFCLK	55	56	N/C	*(not available)*
ground	GND9	57	58	N/C	*(not available)*
(not available)	ANTCTL0	59	60	COEX3	*(not available)*
(not available)	ANTCTL1	61	62	COEX2	*(not available)*
(not available)	ANTCTL2	63	64	COEX1	*(not available)*
(not available)	ANTCTL3	65	66	SIM_DETECT	*(not available)*
Powergood	RESET#	67	68	SUSCLK	system clock
configuration pin	CFG1	69	70	3.3V3	Standby power supply S3,3V
ground	GND10	71	72	3.3V4	Standby power supply S3,3V
ground	GND11	73	74	3.3V5	Standby power supply S3,3V
configuration pin	CFG2	75			

4.4.3 M.2 2242 (Keying B)

The CB3263 is equipped with a further M.2 socket, in which M.2-2242 cards (keying B) can be inserted. The socket leads SATA signals (up to 6 Gb/s) through, and therefore enables the use of an SSD card.

Manufacturer	Description	Mating connector
FCI	10128793-004RLF	(card)



Description	Name	Pin		Name	Description
Configuration pin	CONFIG_3	1	2	3.3V1	Standby power supply S3,3V
ground	GND1	3	4	3.3V2	Standby power supply S3,3V
ground	GND2	5	6	FCPWROFF#	Full Card Power OFF active low
USB channel 3 data +	USB_D+	7	8	WDISABLE#	*(not available)*
USB channel 3 data -	USB_D-	9	10	GPIO9 DAS DDS LED1	*(not available)*
ground	GND3	11	12	connector key	
connector key		13	14		
		15	16		
		17	18		
		19	20	GPIO5	*(not available)*
Configuration pin	CONFIG_0	21	22	GPIO6	*(not available)*
(not available)	GPIO11	23	24	GPIO7	*(not available)*
(not available)	DPR	25	26	GPIO10	*(not available)*
ground	GND4	27	28	GPIO8	*(not available)*
(not available)	PER1# USB3RX# SSICRX#	29	30	UIM_RST	*(not available)*
(not available)	PER1 USB3RX SSICRX	31	32	UIM_CLK	*(not available)*

Description	Name	Pin		Name	Description
ground	GND5	33	34	UIM_DATA	*(not available)*
(not available)	PET1# USB3TX# SSICTX#	35	36	UIM_PWR	*(not available)*
(not available)	PET1 USB3TX SSICTX	37	38	DEVSLP	*(not available)*
ground	GND6	39	40	GPIO0	*(not available)*
SATA lane 2 receive +	PER0# SATAB	41	42	GPIO1	*(not available)*
SATA lane 2 receive -	PER0 SATAB#	43	44	GPIO2	*(not available)*
ground	GND7	45	46	GPIO3	*(not available)*
SATA lane 2 transmit +	PET0# SATAA#	47	48	GPIO4	*(not available)*
SATA lane 2 transmit -	PET0 SATAA	49	50	PRST#	PCIe Reset active low
ground	GND8	51	52	CLKREQ#	*(not available)*
(not available)	REFCLK#	53	54	PEWAKE#	*(not available)*
(not available)	REFCLK	55	56	N/C	*(not available)*
ground	GND9	57	58	N/C	*(not available)*
(not available)	ANTCTL0	59	60	COEX3	*(not available)*
(not available)	ANTCTL1	61	62	COEX2	*(not available)*
(not available)	ANTCTL2	63	64	COEX1	*(not available)*
(not available)	ANTCTL3	65	66	SIM_DETECT	*(not available)*
Powergood	RESET#	67	68	SUSCLK	system clock
Configuration pin	CFG1	69	70	3.3V3	Standby power supply S3,3V
ground	GND10	71	72	3.3V4	Standby power supply S3,3V
ground	GND11	73	74	3.3V5	Standby power supply S3,3V
configuration pin	CFG2	75			

4.4.4 DVI/HDMI/DisplayPort and USB3.0

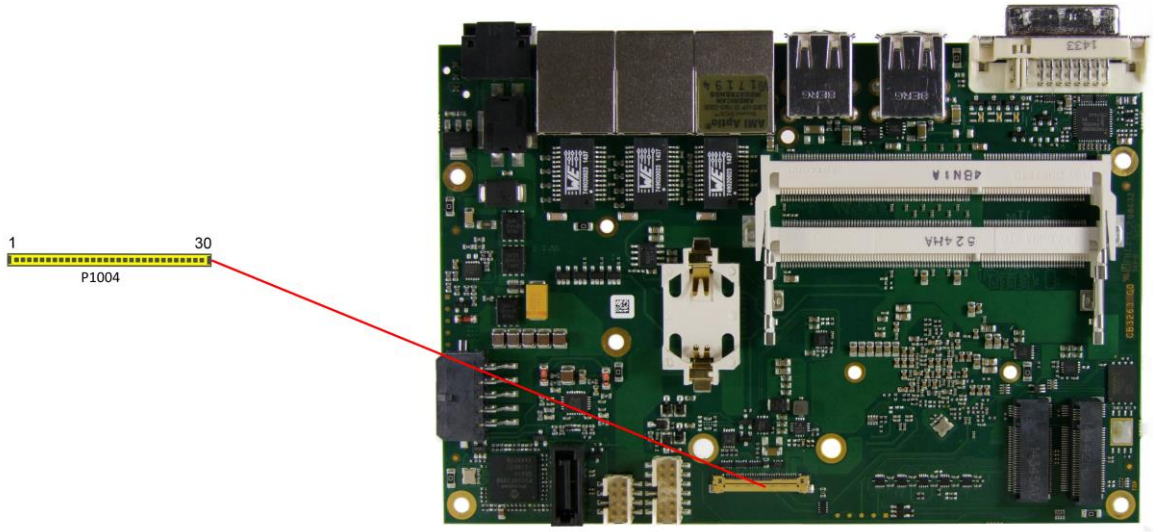
The CB3263 provides a second DVI interface which is realized as a 30pin flat cable header (I-PEX Cabline-VS 20455-030E-12). Analog VGA is not available on this connector. However, an HDMI device or DisplayPort device can be connected.
This custom connector also carries an additional USB interface. The USB channel support USB 3.0. The USB interface provides up to 900 mA current and is protected by an electronically resettable fuse. In ACPI state S5 via USB connected devices will not be energized.

When cabling, please make sure that receive lines are always connected to the transmit lines and vice versa.

Maximum current is 2 amperes for VCC combined (0.5A per contact), and 1 ampere for 3.3V (0.5A per contact).

Please note that a custom cable design is required.

Manufacturer	Description	Mating Connector
I-PEX	20455-030E-12	custom design



Pinout 30pin connector DVI/HDMI/DisplayPort:

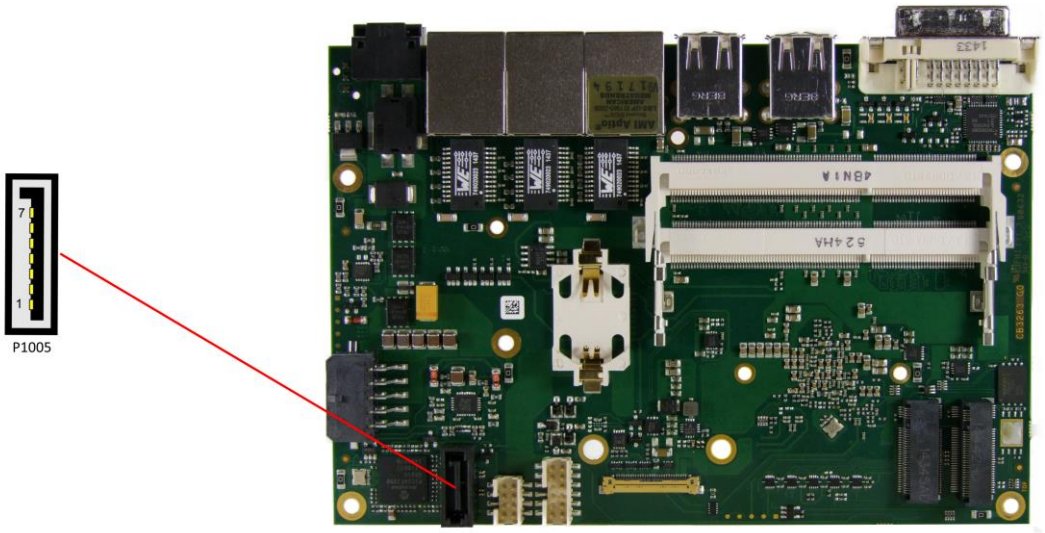
Pin	Name	Description
1	TMDS0#/DP2#	DVI Data 0 - / DP Lane 2 -
2	TMDS0/DP2	DVI Data 0 + / DP Lane 2 +
3	TMDS1#/DP1#	DVI Data 1 - / DP Lane 1 -
4	TMDS1/DP1	DVI Data 1 + / DP Lane 1 +
5	TMDS2#/DP0#	DVI Data 2 - / DP Lane 0 -
6	TMDS2/DP0	DVI Data 2 + / DP Lane 0 +
7	TMDSCLK#/DP3#	DVI Clock - / DP Lane 3 -
8	TMDSCLK/DP3	DVI Clock + / DP Lane 3 +
9	N/C	reserved
10	SEL_DVI/DP#	DVI-DisplayPort Select
11	DDCK/DPAUX	EDID Clock / DP Aux +
12	DDDA/DPAUX#	EDID Data / DP Aux -
13	VCC	5V supply
14	GND	ground
15	HPD	hot plug detect
16	USBVCC	5V supply for USB

Pin	Name	Description
17	USBVCC	5V supply for USB
18	N/C	reserved
19	N/C	reserved
20	SSRX#	Super Speed receiver -
21	SSRX	Super Speed receiver +
22	USB#	USB -
23	USB	USB +
24	SSTX#	Super Speed transmitter -
25	SSTX	Super Speed transmitter
26	3.3V	3.3V supply
27	3.3V	3.3V supply
28	VCC	5V supply
29	VCC	5V supply
30	VCC	5V supply

4.4.5 SATA Interface

The CB3263 provides one SATA interfaces which allows transfer rates of up to 3 Gb/s. The interface is made available via a standard SATA connector. The required settings are made in the BIOS setup.

Manufacturer	Description	Mating Connector
Amphenol	SATA-001-22223-CTR	(standard connector)



Pinout SATA:

Pin	Name	Description
1	GND	ground
2	SATATX	SATA transmit +
3	SATATX#	SATA transmit -
4	GND	ground
5	SATARX	SATA receive -
6	SATARX#	SATA receive +
7	GND	ground

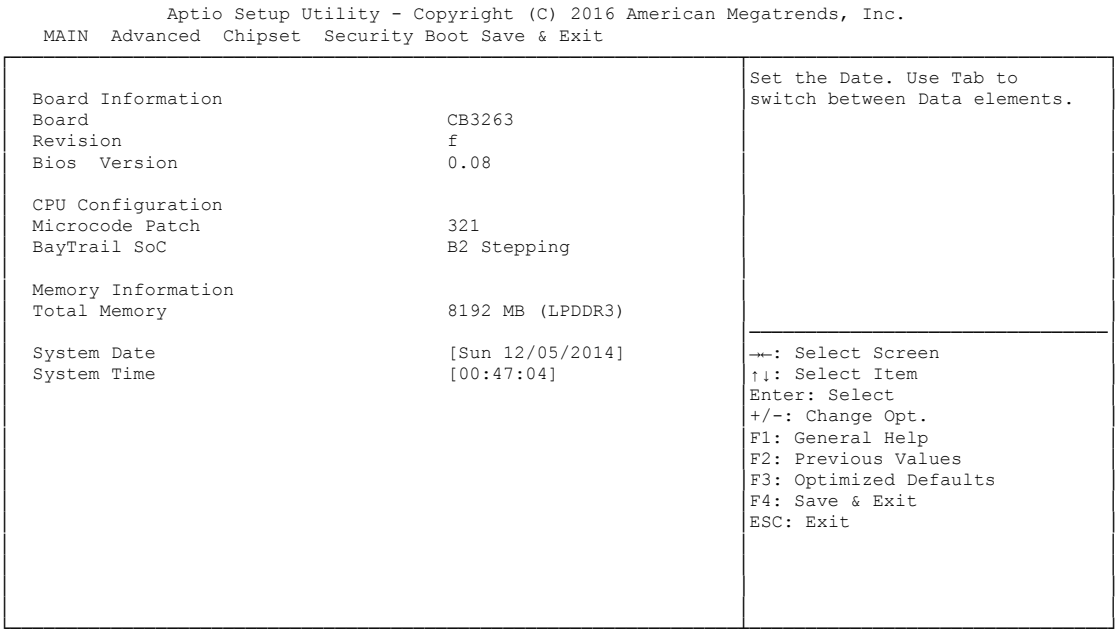
5 BIOS Settings

5.1 General Remarks

In each setup page, standard values for all setup entries can be loaded. Previously saved settings are loaded by pressing F2 and factory defaults are loaded with F3. Both F2 and F3, and also F4 ("Save & Exit") always affect the whole set of setup entries.
Setup entries starting with a „►" sign represent submenus. Navigation between entries is done using the arrow keys on the keyboard, with the <Enter> key being used to select an entry, which either opens up a dialog box or opens a whole new submenu of setup entries.
Each setup entry has a short help text associated with it. This is displayed in the upper right hand corner of the screen.

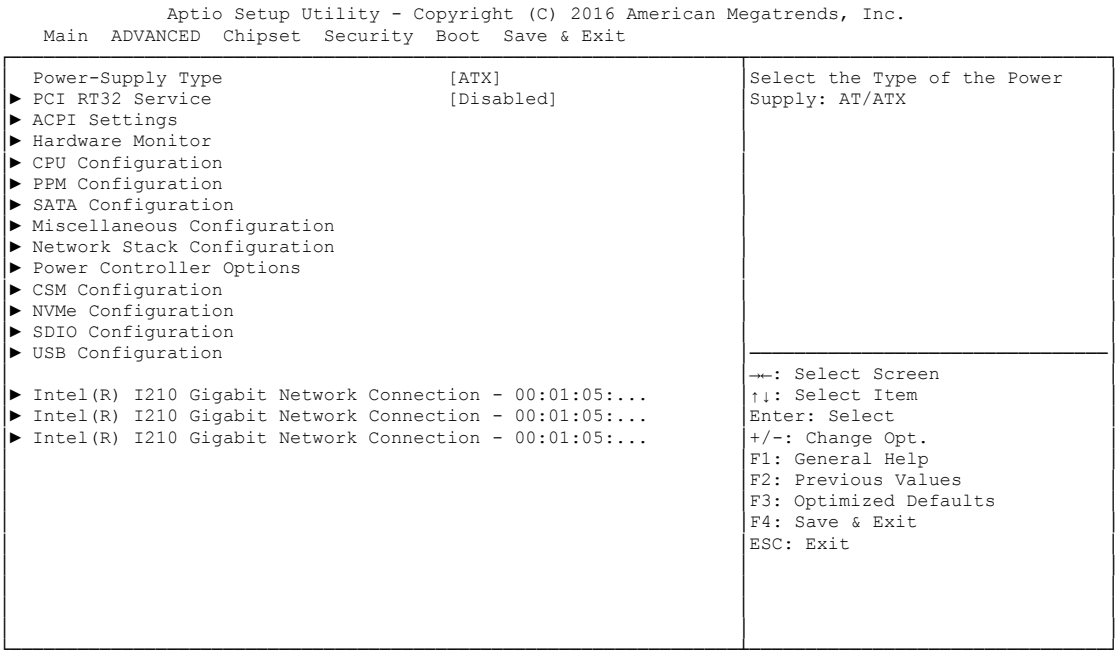
 **Notice**	BIOS features and setup options are subject to change without notice. The settings displayed in the screenshots on the following pages are meant to be examples only. They do not represent the recommended settings or the default settings. Determination of the appropriate settings is dependent upon the particular application scenario in which the board is used.

5.2 Main



- ✓ **Board**
  Options: none
- ✓ **Revision**
  Options: none
- ✓ **Bios Version**
  Options: none
- ✓ **Microcode Patch**
  Options: none
- ✓ **BayTrail SoC**
  Options: none
- ✓ **Total Memory**
  Options: none
- ✓ **System Date**
  Options: The system date can be adjusted here.
- ✓ **System Time**
  Options: The system time can be adjusted here.

5.3 Advanced



- ✓ **Power-Supply Type**
  Options: ATX / AT

- ✓ **PCI RT32 Service**
  Options: Enabled / Disabled

- ✓ **ACPI Settings**
  Sub menu: see "ACPI Settings" (page 42)

- ✓ **H/W Monitor**
  Sub menu: see "H/W Monitor" (page 43)

- ✓ **CPU Configuration**
  Sub menu: see "CPU Configuration" (page 44)

- ✓ **PPM Configuration**
  Sub menu: see "PPM Configuration" (page 47)

- ✓ **SATA Configuration**
  Sub menu: see "SATA Configuration" (page 48)

- ✓ **Miscellaneous Configuration**
  Sub menu: see "Miscellaneous Configuration" (page 49)

- ✓ **Network Stack**
  Sub menu: see "Network Stack" (page 50)

- ✓ **Power Controller Options**
  Sub menu: see "Power Controller Options" (page 51)

- ✓ **CSM Configuration**
  Sub menu: see "CSM Configuration" (page 52)

- ✓ **NVMe Configuration**
  Sub menu: see "Advanced-Menü-NVMe Configuration" (page 53)

- ✓ **SDIO Configuration**
  Sub menu: see "SDIO Configuration" (page 54)

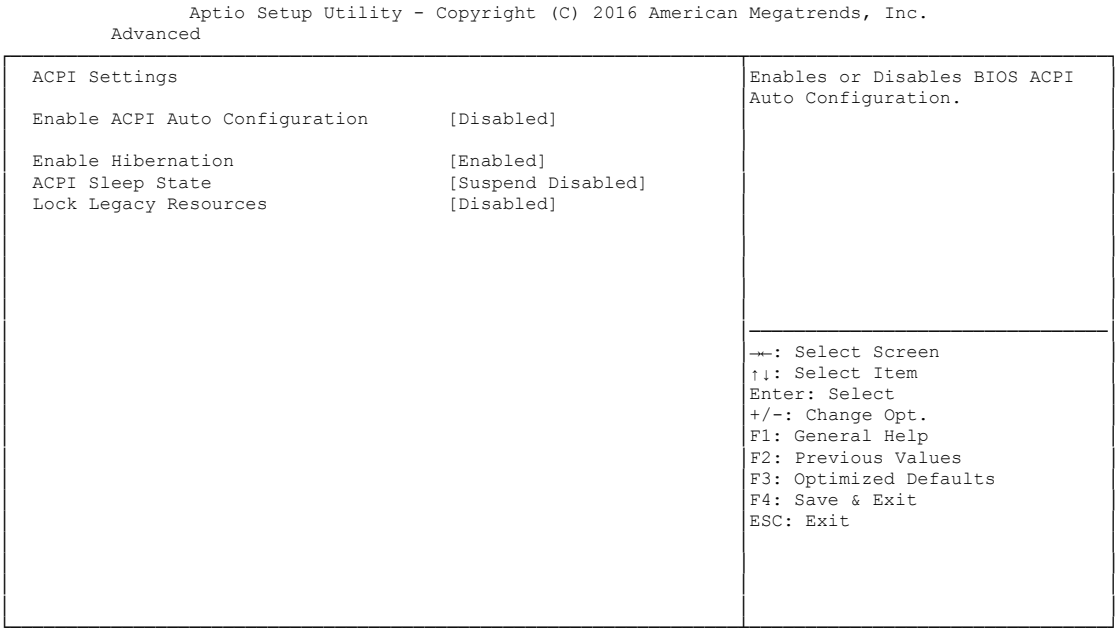
- ✓ **USB Configuration**
  Sub menu: see "USB Configuration" (page 55)

- ✓ **Security Configuration**
  Sub menu: see "Security Configuration" (page 56)

- ✓ **Intel(R) Gigabit Network Connection**
  Sub menu: see "Intel(R) I210 Gigabit Network Connection" (page 57)

- ✓ **Driver Health**
  Sub menu: see "Driver Health" (page 59)

5.3.1 ACPI Settings



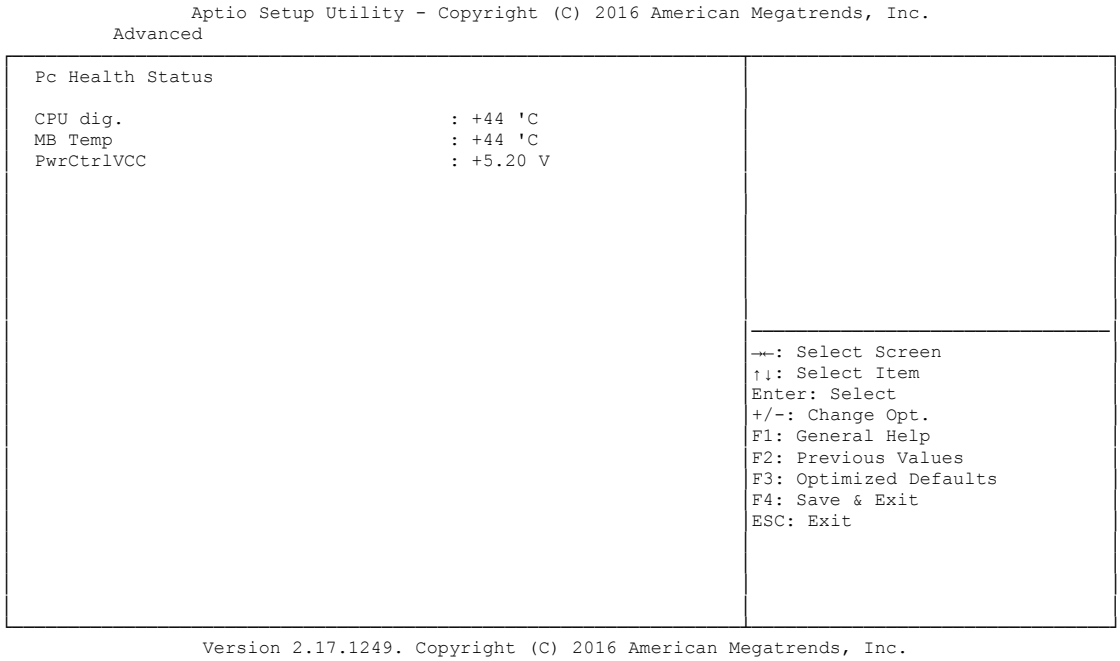
- ✓ **Enable ACPI Auto Configuration**
  Options: Enabled / Disabled

- ✓ **Enable Hibernation**
  Options: Enabled / Disabled

- ✓ **ACPI Sleep State**
  Options: Suspend Disabled / S1 (CPU Stop Clock)

- ✓ **Lock Legacy Resources**
  Options: Enabled / Disabled

5.3.2 H/W Monitor

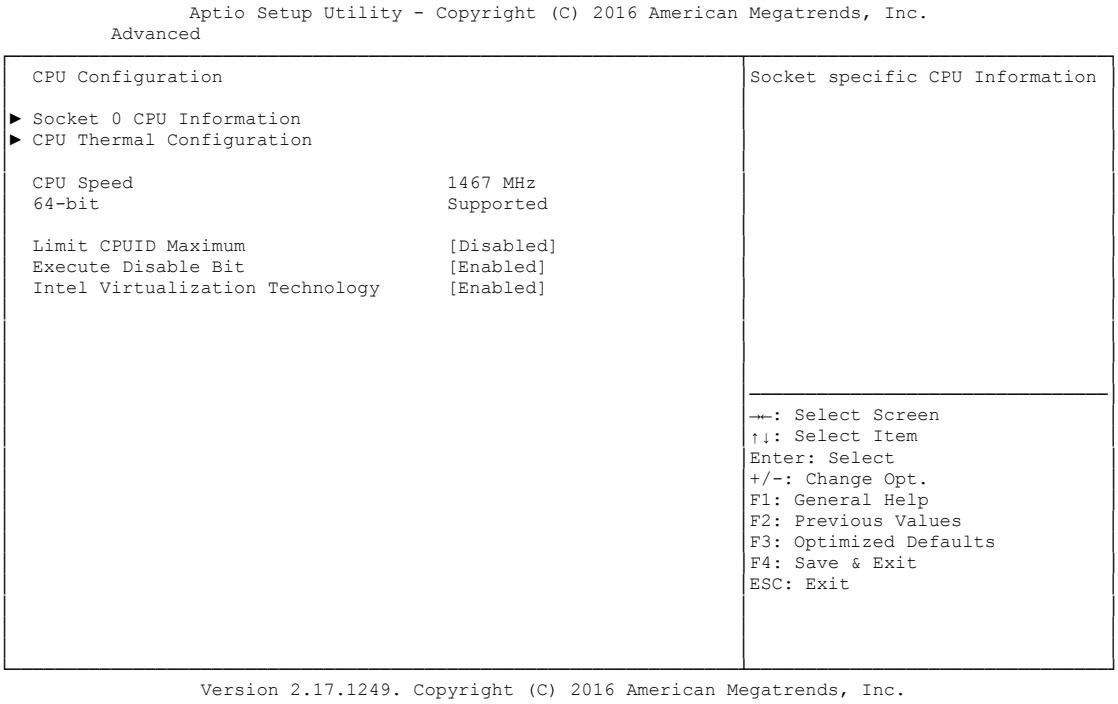


- ✓ **CPU dig.**
  Options: none

- ✓ **MB Temp**
  Options: none

- ✓ **PwrCtrlVCC**
  Options: none

5.3.3 CPU Configuration



- ✓ **Socket 0 CPU Information**
  Sub menu: see "Socket CPU Information" (page 45)

- ✓ **CPU Thermal Configuration**
  Sub menu: see "CPU Thermal Configuration" (page 46)

- ✓ **CPU Speed**
  Options: none

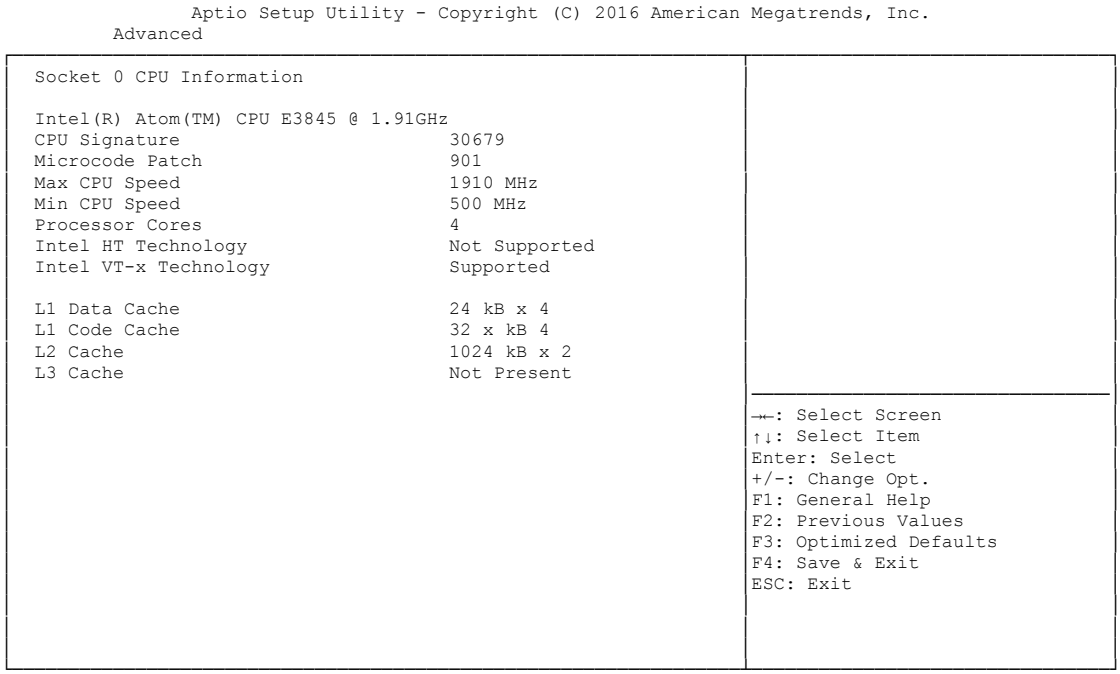
- ✓ **64-bit**
  Options: none

- ✓ **Limit CPUID Maximum**
  Options: Enabled / Disabled

- ✓ **Execute Disable Bit**
  Options: Enabled / Disabled

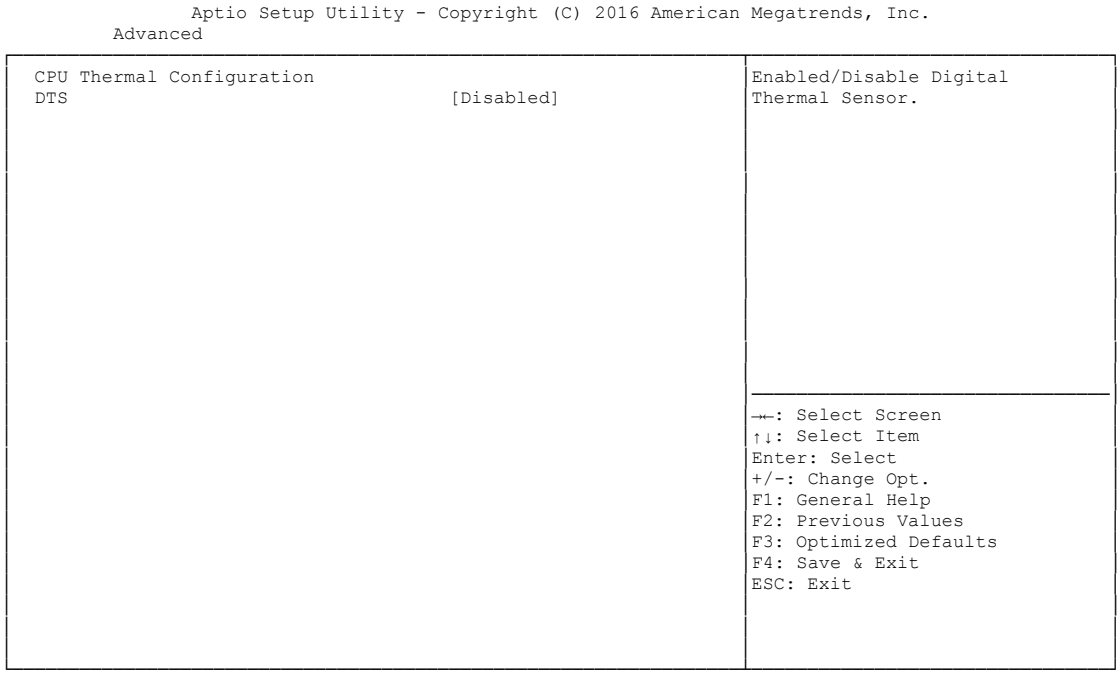
- ✓ **Intel Virtualization Technology**
  Options: Enabled / Disabled

5.3.3.1 Socket CPU Information



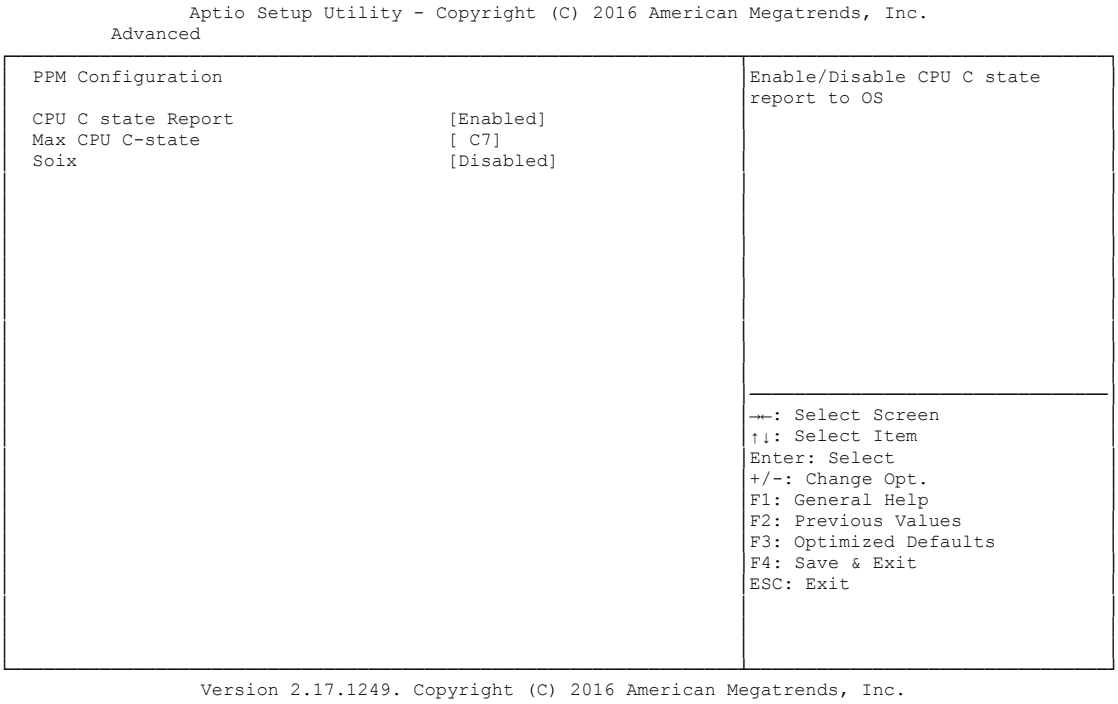
- ✓ **CPU Signature**
  Options: none
- ✓ **Microcode Patch**
  Options: none
- ✓ **Max CPU Speed**
  Options: none
- ✓ **Min CPU Speed**
  Options: none
- ✓ **Processor Cores**
  Options: none
- ✓ **Intel HT Technology**
  Options: none
- ✓ **Intel VT-x Technology**
  Options: none
- ✓ **L1 Data Cache**
  Options: none
- ✓ **L1 Code Cache**
  Options: none
- ✓ **L2 Cache**
  Options: none
- ✓ **L3 Cache**
  Options: none

5.3.3.2 CPU Thermal Configuration



✓ **DTS**
Options: Enabled / Disabled

5.3.4 PPM Configuration

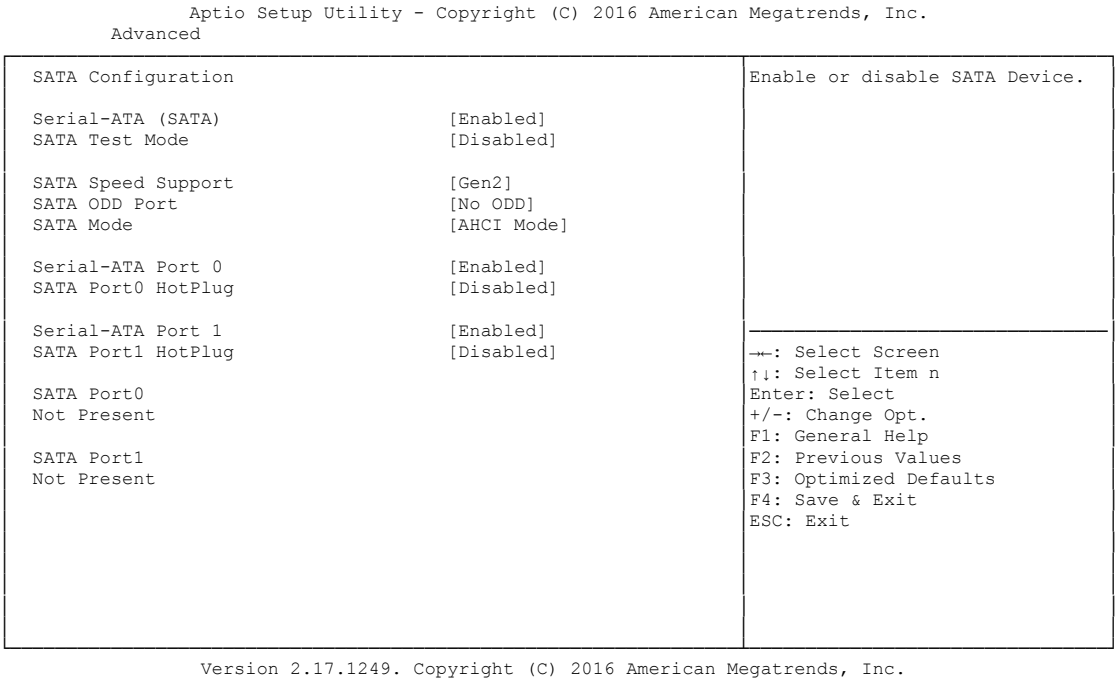


- ✓ **CPU C state Report**
  Options: Disabled / Enabled

- ✓ **Max CPU C-state**
  Options: C7 / C6 / C1

- ✓ **S0ix**
  Options: Disabled / Enabled

5.3.5 SATA Configuration



- ✓ **Serial-ATA (SATA)**
  Options: Enabled / Disabled

- ✓ **SATA Test Mode**
  Options: Enabled / Disabled

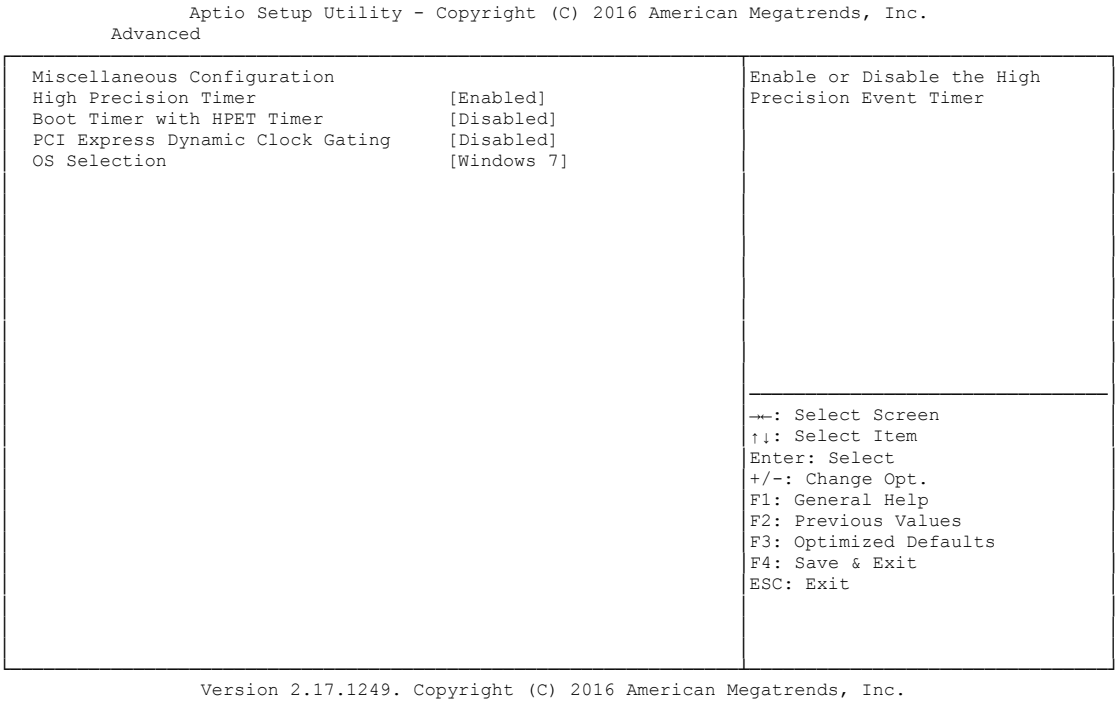
- ✓ **SATA Speed Support**
  Options: Gen1 / Gen2

- ✓ **SATA ODD Port**
  Options: Port0 ODD / Port1 ODD / No ODD

- ✓ **SATA Mode**
  Options: IDE Mode / AHCI Mode

- ✓ **Serial-ATA Port X**
  Options: Enabled / Disabled

5.3.6 Miscellaneous Configuration



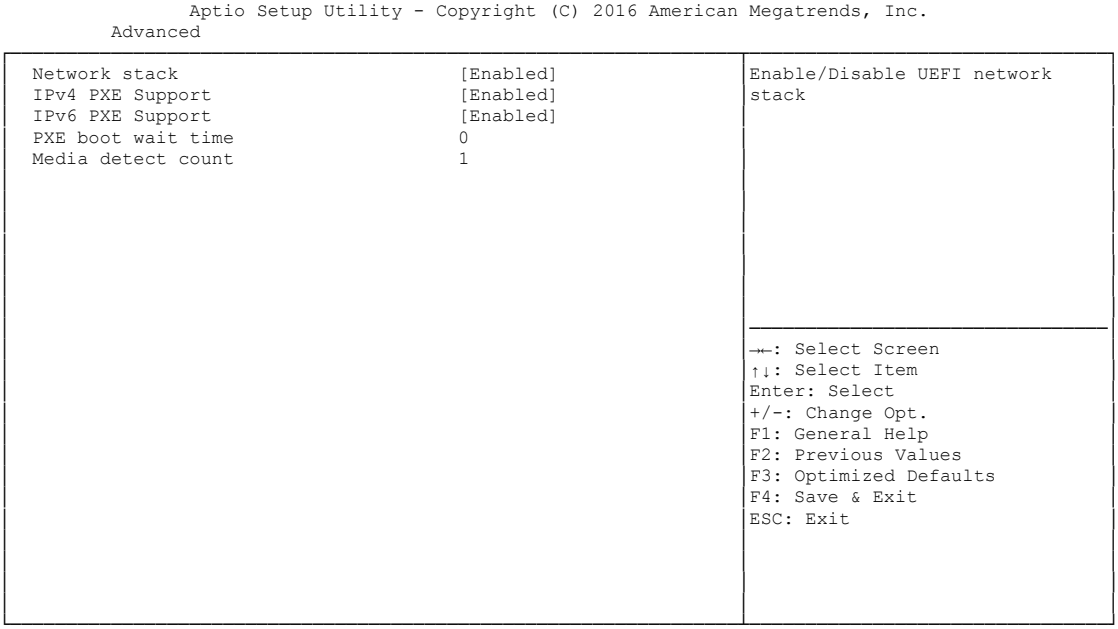
- ✓ **High Precision Timer**
  Options: Disabled / Enabled

- ✓ **Boot Timer with HPET Timer**
  Options: Enabled / Disabled

- ✓ **PCI Express Dynamic Clock Gating**
  Options: Enabled / Disabled

- ✓ **OS Selection**
  Options: Windows 8.X / Windows 7

5.3.7 Network Stack



- ✓ **Network stack**
  Options: Disabled / Enabled

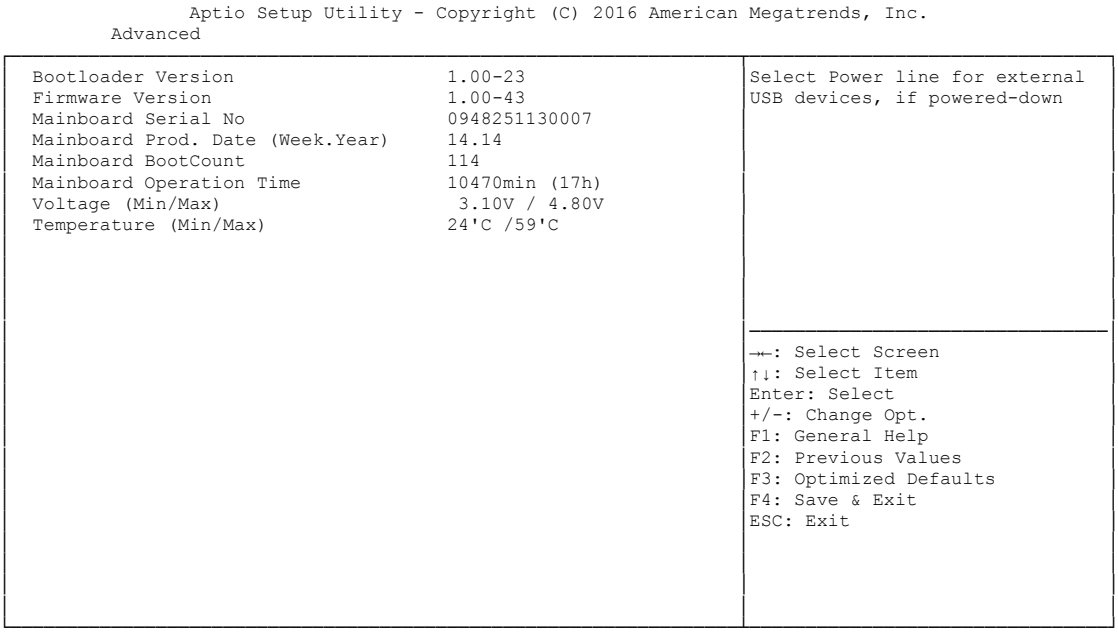
- ✓ **IPv4 PXE Support**
  Options: Disabled / Enabled

- ✓ **IPv6 PXE Support**
  Options: Disabled / Enabled

- ✓ **PXE boot wait time**
  Options: 0..5

- ✓ **Media detect count**
  Options: none

5.3.8 Power Controller Options



- ✓ **Bootloader Version**
  Options: none

- ✓ **Firmware Version**
  Options: none

- ✓ **Mainboard Serial No**
  Options: none

- ✓ **Mainboard Prod. Date (Week.Year)**
  Options: none

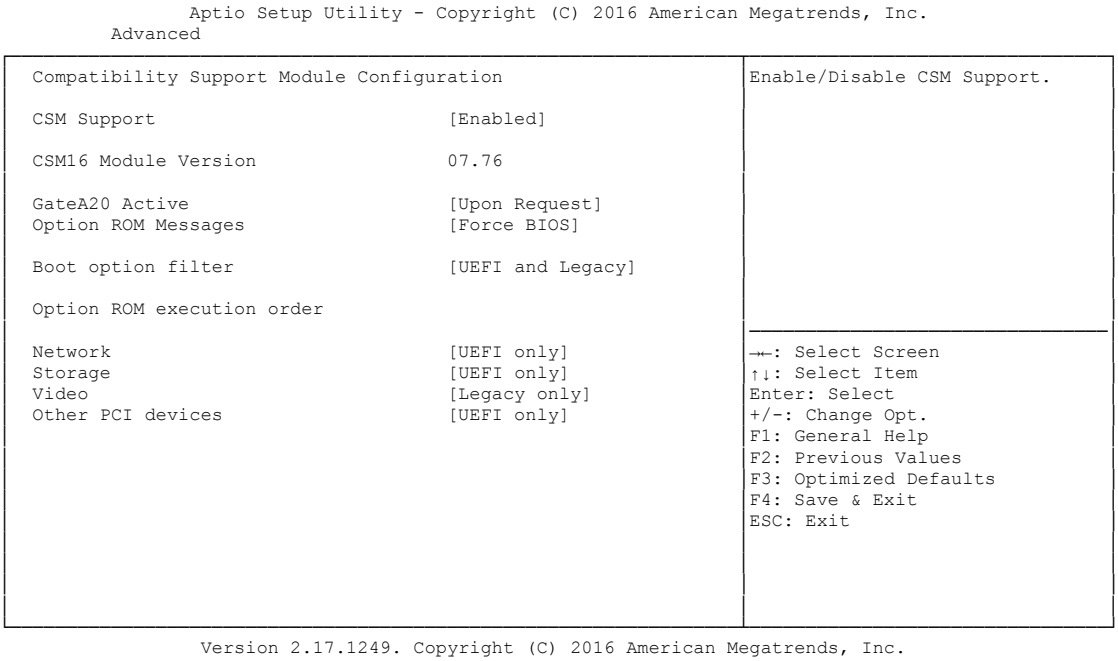
- ✓ **Mainboard Boot Count**
  Options: none

- ✓ **Mainboard Operation Time**
  Options: none

- ✓ **Voltage (Min/Max)**
  Options: none

- ✓ **Temperature (Min/Max)**
  Options: none

5.3.9 CSM Configuration



- ✓ **CSM Support**
  Options: Disabled / Enabled

- ✓ **CSM16 Module Version**
  Options: none

- ✓ **GateA20 Active**
  Options: Upon Request / Always

- ✓ **Option ROM Messages**
  Options: Force BIOS / Keep Current

- ✓ **Boot option filter**
  Options: UEFI and Legacy / Legacy only / UEFI only

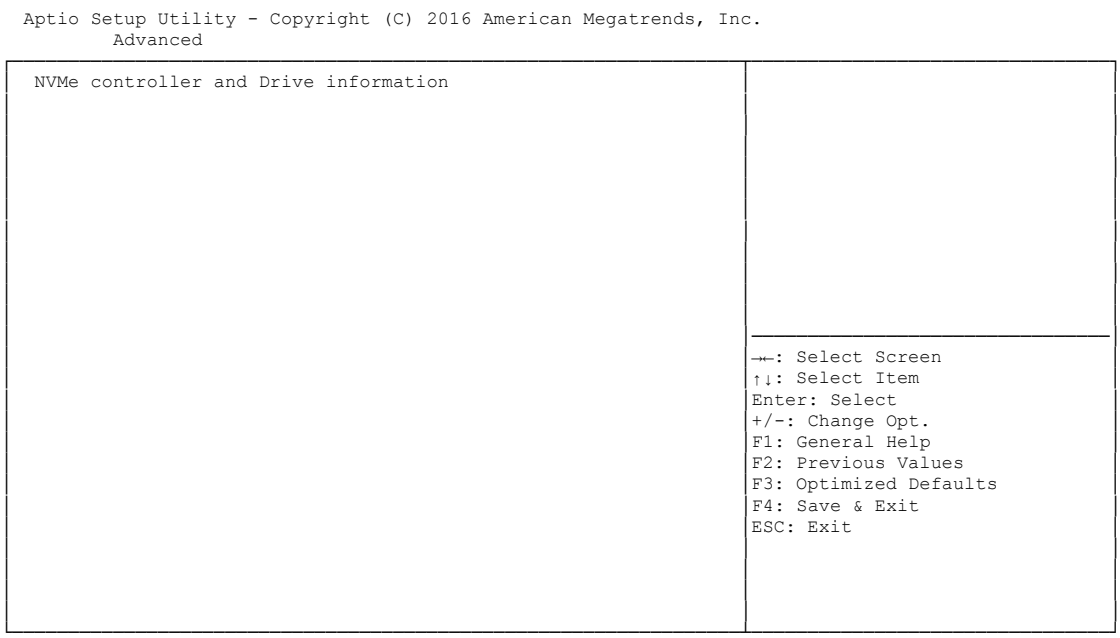
- ✓ **Network**
  Options: Do not launch / UEFI only / Legacy only

- ✓ **Storage**
  Options: Do not launch / UEFI only / Legacy only

- ✓ **Video**
  Options: Do not launch / UEFI only / Legacy only

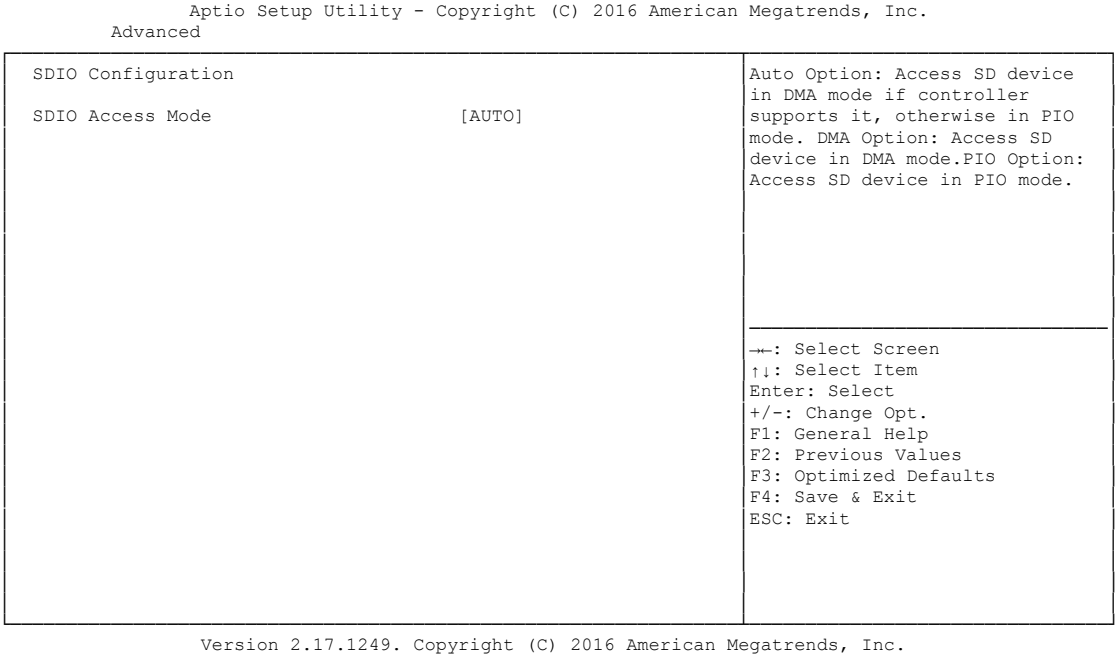
- ✓ **Other PCI devices**
  Options: UEFI only / Legacy only

5.3.10 Advanced-Menü-NVMe Configuration



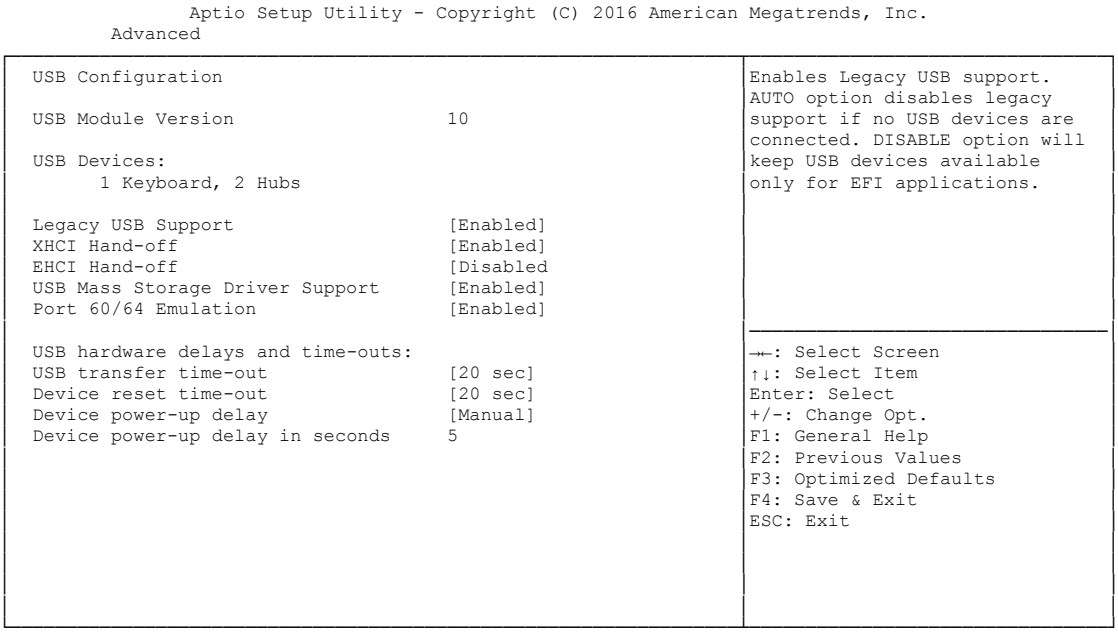
✓ **NVMe controller and Drive information**
Options: none

5.3.11 SDIO Configuration



✓ **SDIO Access Mode**
Options: Auto / DMA / PIO

5.3.12 USB Configuration



- ✓ **USB Devices**
  Options: none

- ✓ **Legacy USB Support**
  Options: Enabled / Disabled / Auto

- ✓ **XHCI Hand-off**
  Options: Enabled / Disabled

- ✓ **EHCI Hand-off**
  Options: Enabled / Disabled

- ✓ **Mass Storage Driver Support**
  Options: Disabled / Enabled

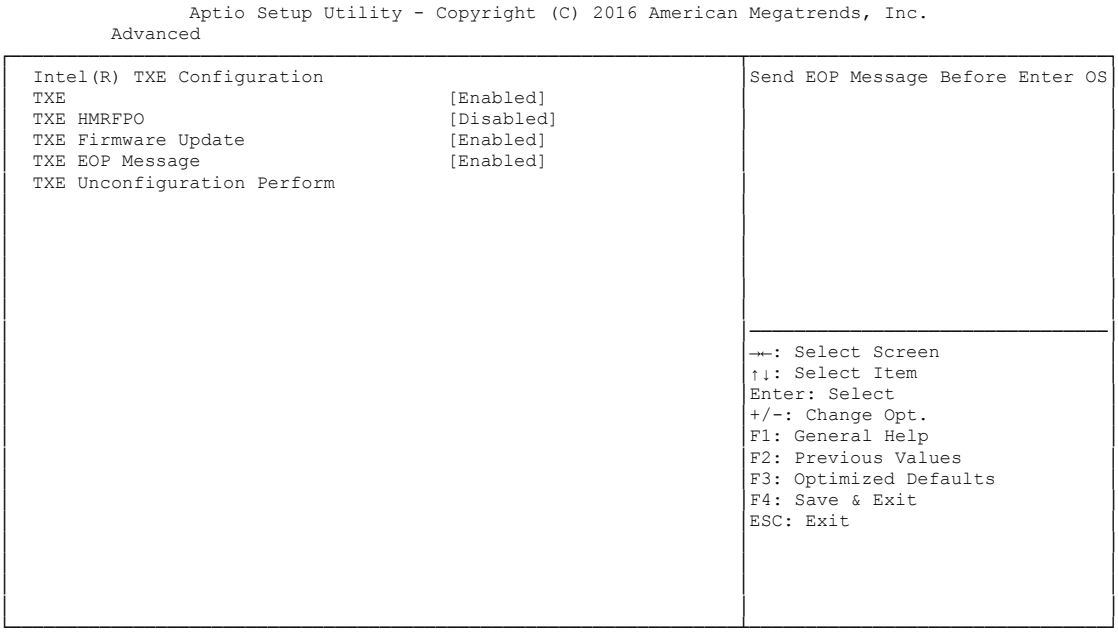
- ✓ **USB transfer time-out**
  Options: 5 sec / 10 sec / 20 sec

- ✓ **Device reset time-out**
  Options: 10 sec / 20 sec / 30 sec / 40 sec

- ✓ **Device power-up delay**
  Options: Auto / Manual

- ✓ **Device power-up delay in seconds**
  Options: 1..40

5.3.13 Security Configuration



- ✓ **TXE**
  Options: Enabled / Disabled

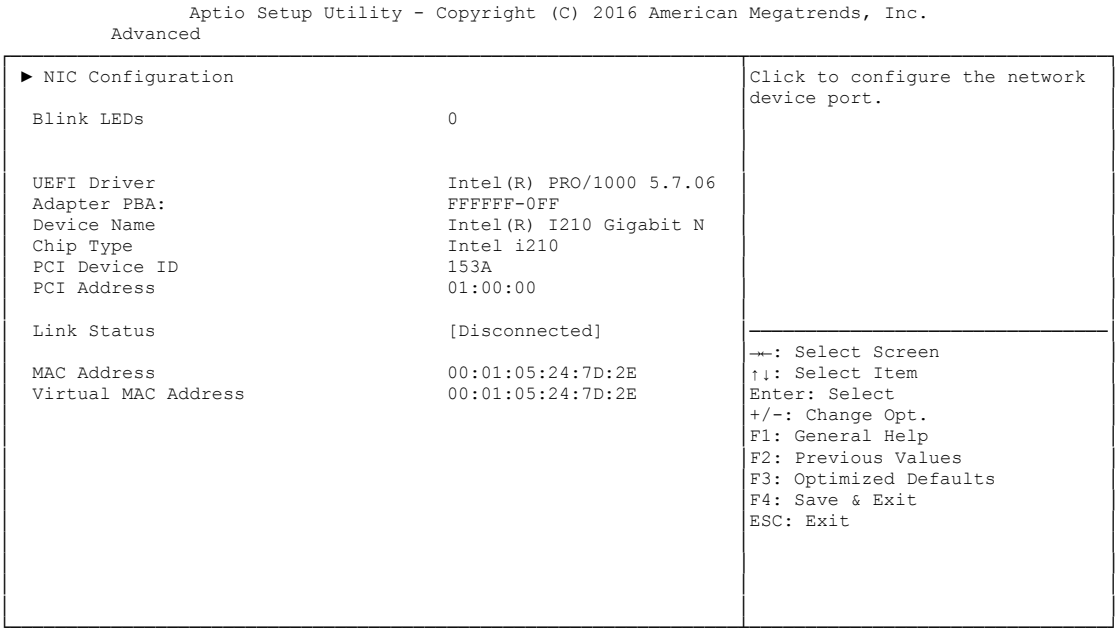
- ✓ **TXE HMRFPO**
  Options: Enabled / Disabled

- ✓ **TXE Firmware Update**
  Options: Enabled / Disabled

- ✓ **TXE EOP Message**
  Options: Enabled / Disabled

- ✓ **TXE Unconfiguration Perform**
  Options: none

5.3.14 Intel(R) I210 Gigabit Network Connection



- ✓ **NIC Configuration**
  Sub menu: see "NIC Configuration" (page 58)

- ✓ **Blink LEDs**
  Options: none

- ✓ **UEFI Driver**
  Options: none

- ✓ **Adapter PBA**
  Options: none

- ✓ **Device Name**
  Options: none

- ✓ **Chip Type**
  Options: none

- ✓ **PCI Device ID**
  Options: none

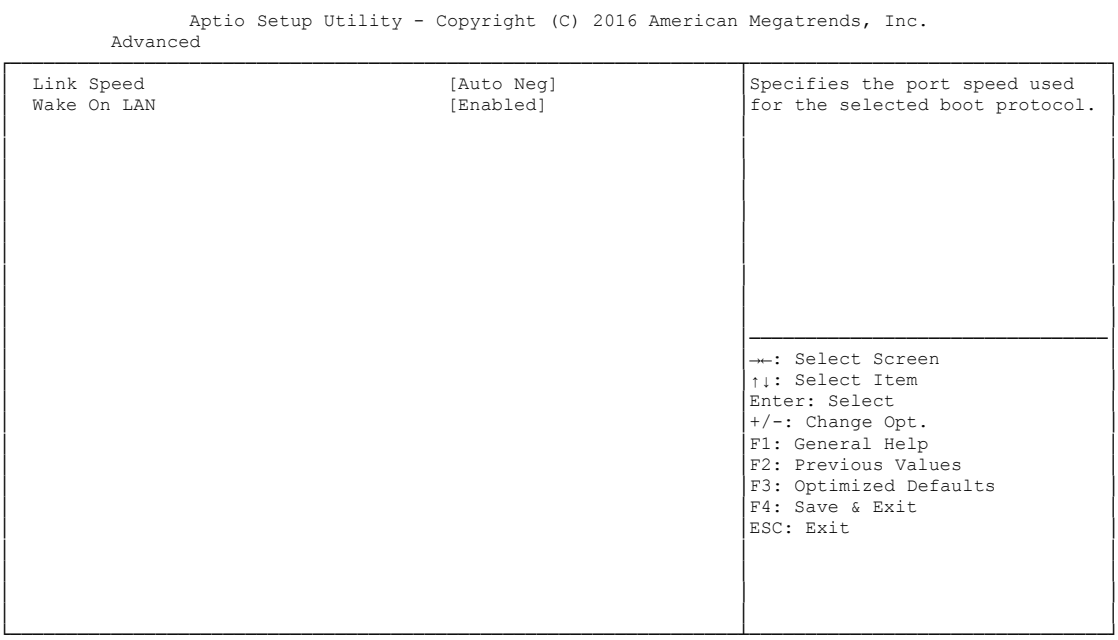
- ✓ **PCI Address**
  Options: none

- ✓ **Link Status**
  Options: none

- ✓ **MAC Address**
  Options: none

- ✓ **Virtual MAC Address**
  Options: none

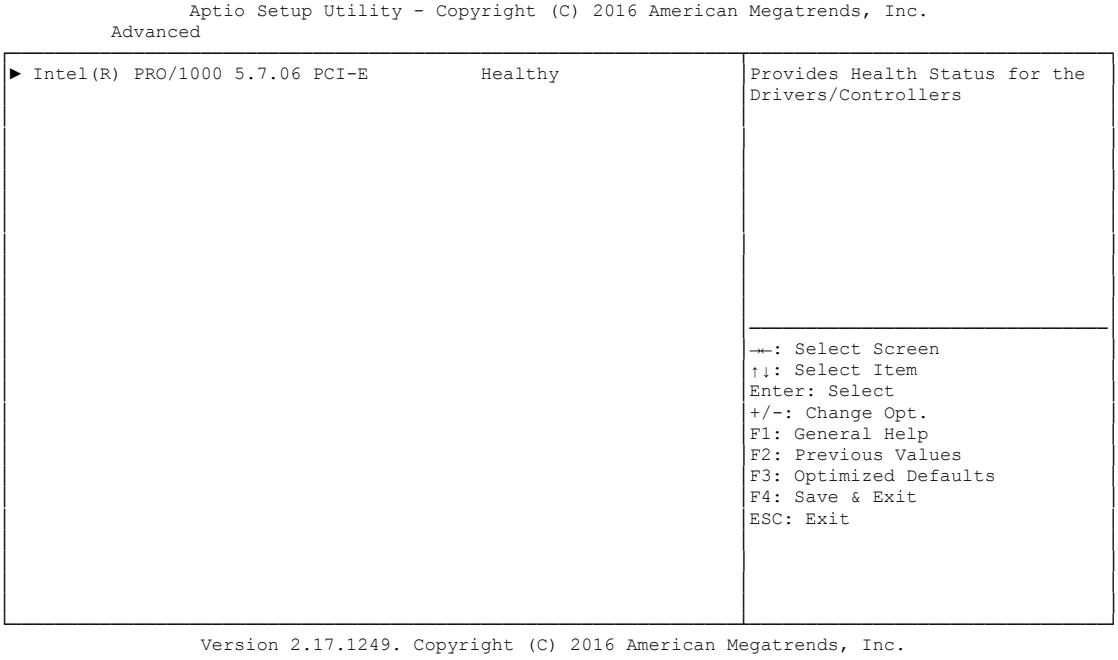
5.3.14.1 NIC Configuration



- ✓ **Link Speed**
  Options: Auto Negotiated / 10Mbps Half / 10Mbps full / 100Mbps Half / 100Mbps Full

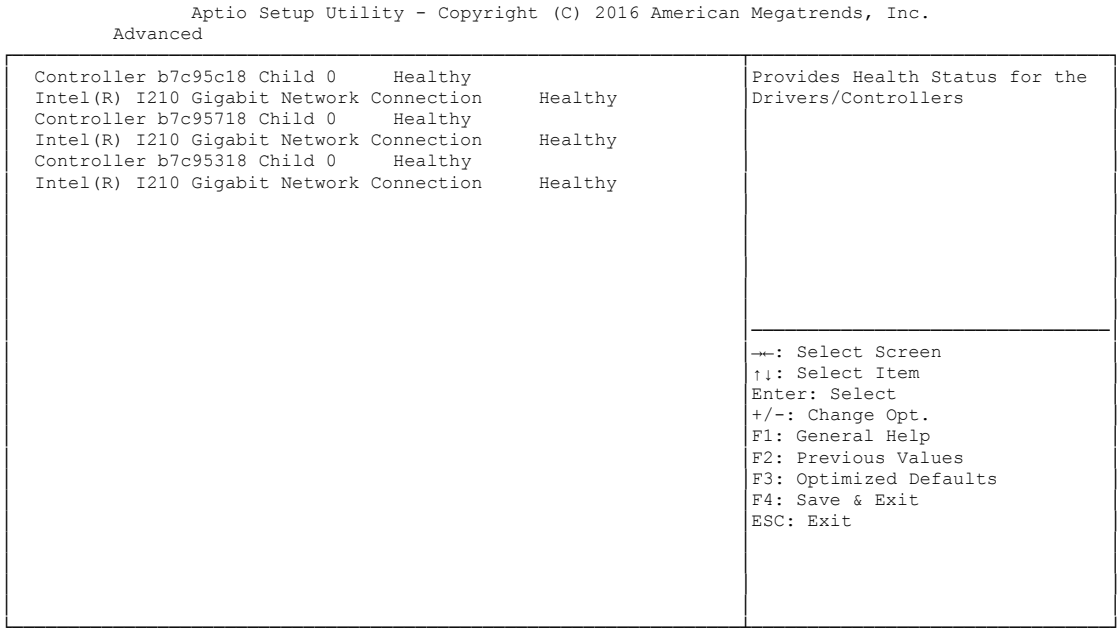
- ✓ **Wake On LAN**
  Options: Enabled / Disabled

5.3.15 Driver Health



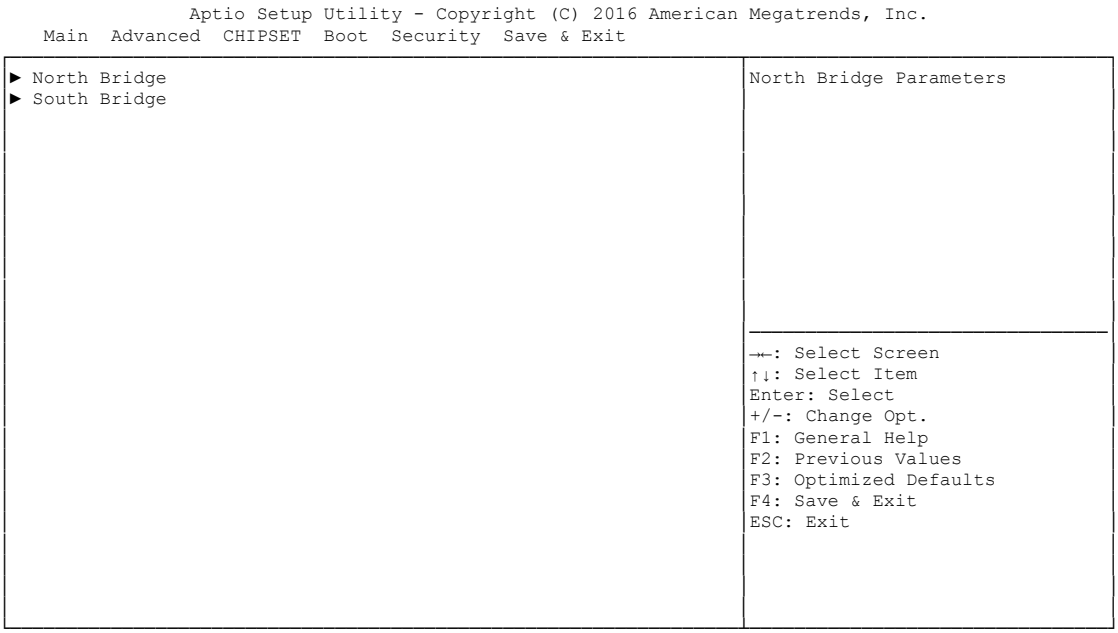
✓ **Intel(R) PRO/1000 5.7.06 PCI-E**
Sub menu: see "Intel(R) PRO/1000 PCI-E" (page 60)

5.3.15.1 Intel(R) PRO/1000 PCI-E



✓ **Controller x Child n**
Options: none

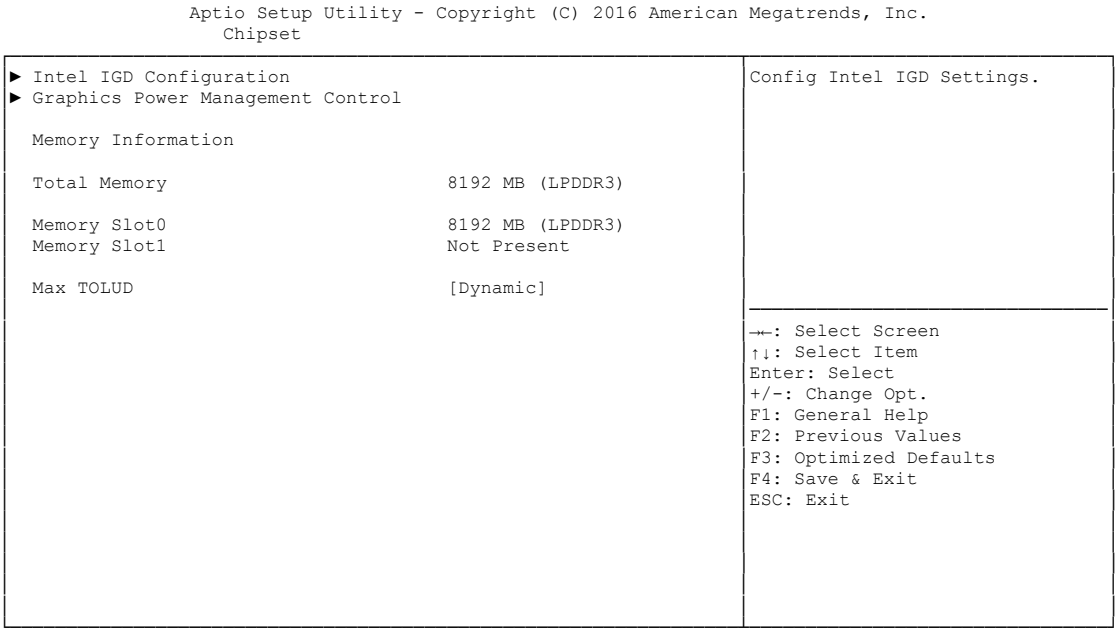
5.4 Chipset



- ✓ **North Bridge**
  Sub menu: see "North Bridge" (page 62)

- ✓ **South Bridge**
  Sub menu: see "South Bridge" (page 66)

5.4.1 North Bridge



- ✓ **Intel IGD Configuration**
  Sub menu: see "Intel IGD Configuration" (page 63)

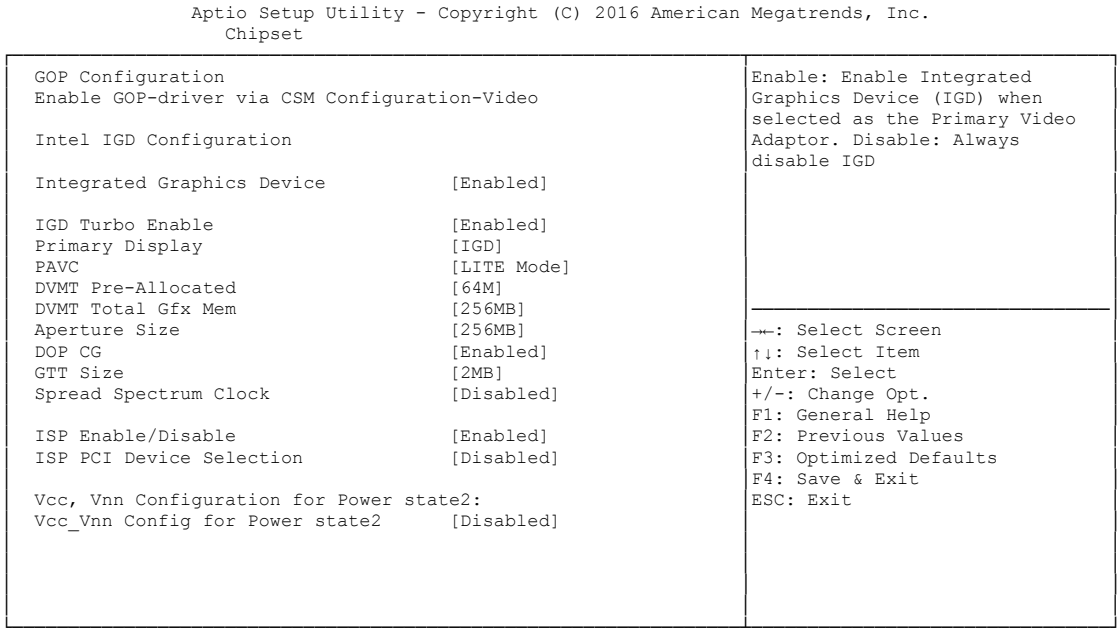
- ✓ **Graphics Power Management Control**
  Sub menu: see "Graphics Power Management Control" (page 65)

- ✓ **Total Memory**
  Options: none

- ✓ **Memory SlotX**
  Options: none

- ✓ **Max TOLUD**
  Options: Dynamic / 1GB / 1.25GB / .. / 3GB

5.4.1.1 Intel IGD Configuration



- ✓ **Integrated Graphics Device**
  Options: Enabled / Disabled

- ✓ **IGD Turbo Enable**
  Options: Enabled / Disabled

- ✓ **Primary Display**
  Options: IGD / PCI

- ✓ **PAVC**
  Options: Disabled / LITE Mode / SERPENT Mode

- ✓ **DVMT Pre-Allocated**
  Options: 32M / 64M ... 480M / 512M

- ✓ **DVMT Total Gfx Mem**
  Options: 128M / 256M / MAX

- ✓ **Aperture Size**
  Options: 128MB / 256MB / 512MB

- ✓ **DOP CG**
  Options: Enabled / Disabled

- ✓ **GTT Size**
  Options: 1MB / 2MB

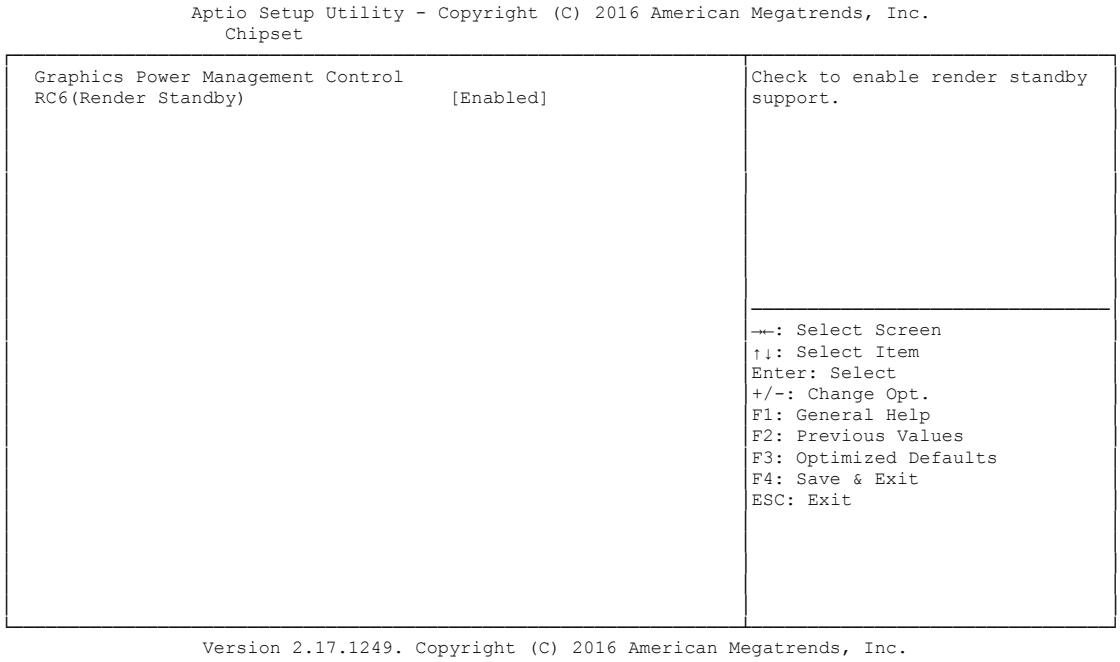
- ✓ **Spread Spectrum clock**
  Options: Enabled / Disabled

- ✓ **ISP Enable/ Disable**
  Options: Enabled / Disabled

- ✓ **ISP PCI Device Selection**
  Options: Disabled / ISP PCI Device as B0D2F0 / ISP PCI Device as B0D3F0

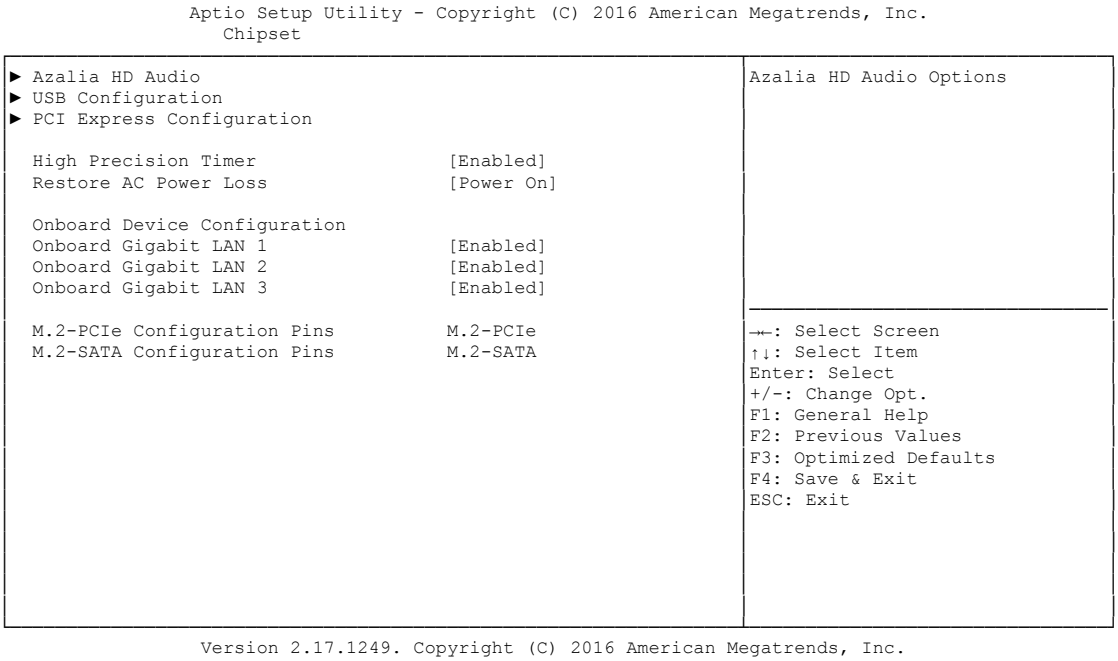
- ✓ **Vcc_Vnn Config for Power state2**
  Options: Enabled / Disabled

5.4.1.2 Graphics Power Management Control



✓ **RC6 (Render Standby)**
Options: Enabled / Disabled

5.4.2 South Bridge



- ✓ **Azalia HD Audio**
  Sub menu: see "Azalia HD Audio" (page 67)

- ✓ **USB Configuration**
  Sub menu: see "USB Configuration" (page 68)

- ✓ **PCI Express Configuration**
  Sub menu: see "PCI Express Configuration" (page 69)

- ✓ **High Precision Timer**
  Options: Disabled / Enabled

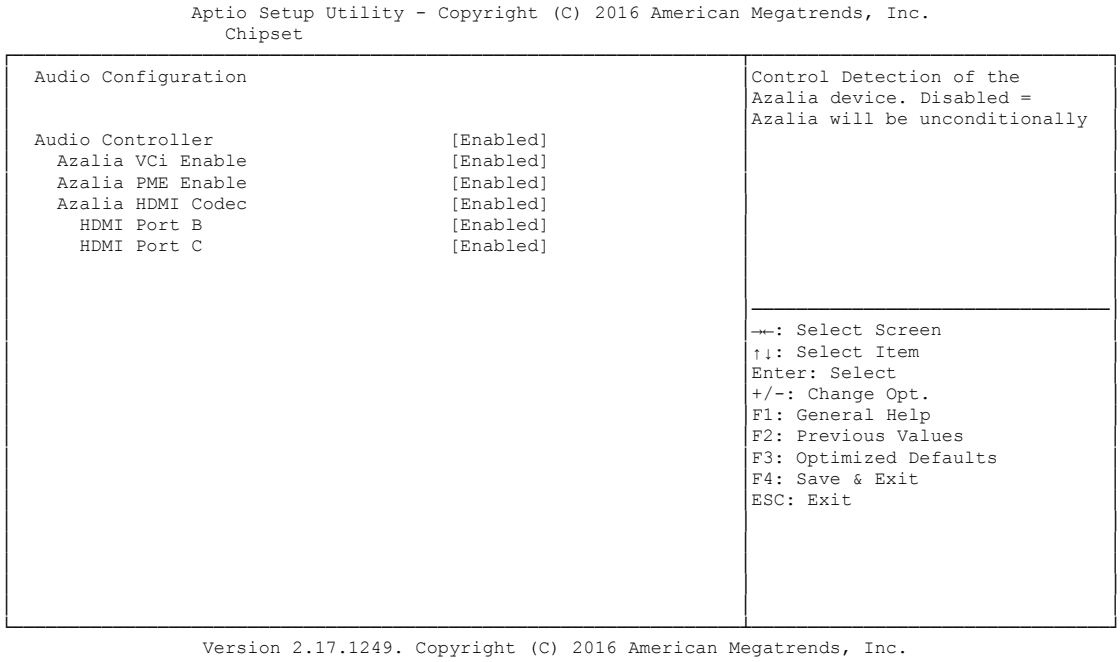
- ✓ **Restore AC Power Loss**
  Options: Power Off / Power On / Last State

- ✓ **Onboard Gigabit LAN X**
  Options: Enabled / Disabled

- ✓ **M.2-PCIe Configuration Pins**
  Options: none

- ✓ **M.2-SATA Configuration Pins**
  Options: none

5.4.2.1 Azalia HD Audio



- ✓ **Audio Controller**
  Options: Disabled / Enabled

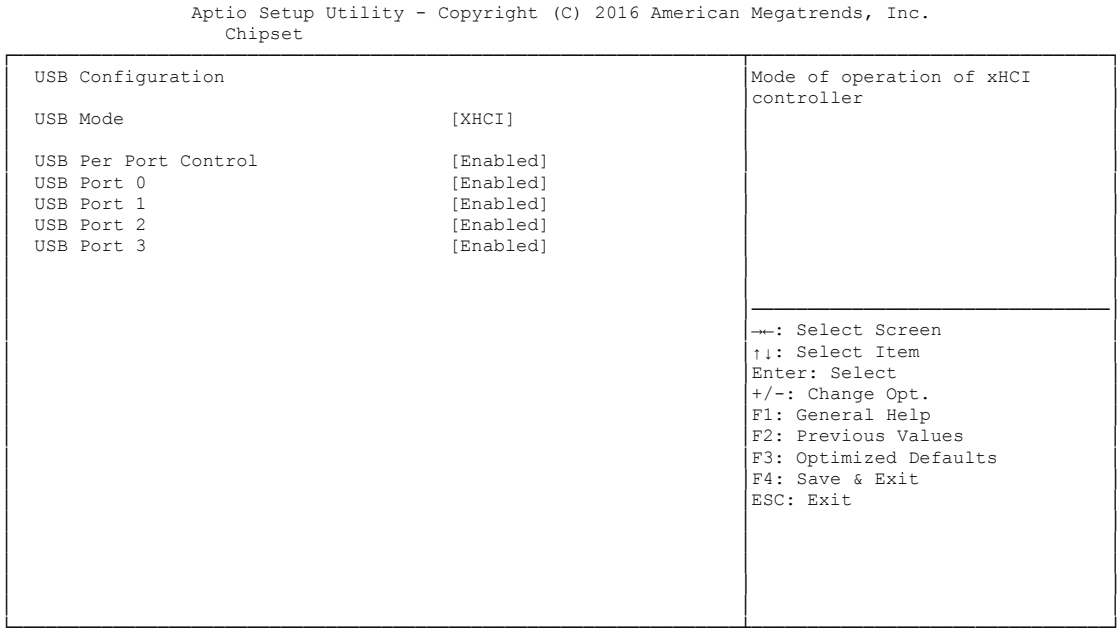
- ✓ **Azalia VCi Enable**
  Options: Disabled / Enabled

- ✓ **Azalia PME Enable**
  Options: Disabled / Enabled

- ✓ **Azalia HDMI Codec**
  Options: Disabled / Enabled

- ✓ **HDMI Port X**
  Options: Disabled / Enabled

5.4.2.2 USB Configuration

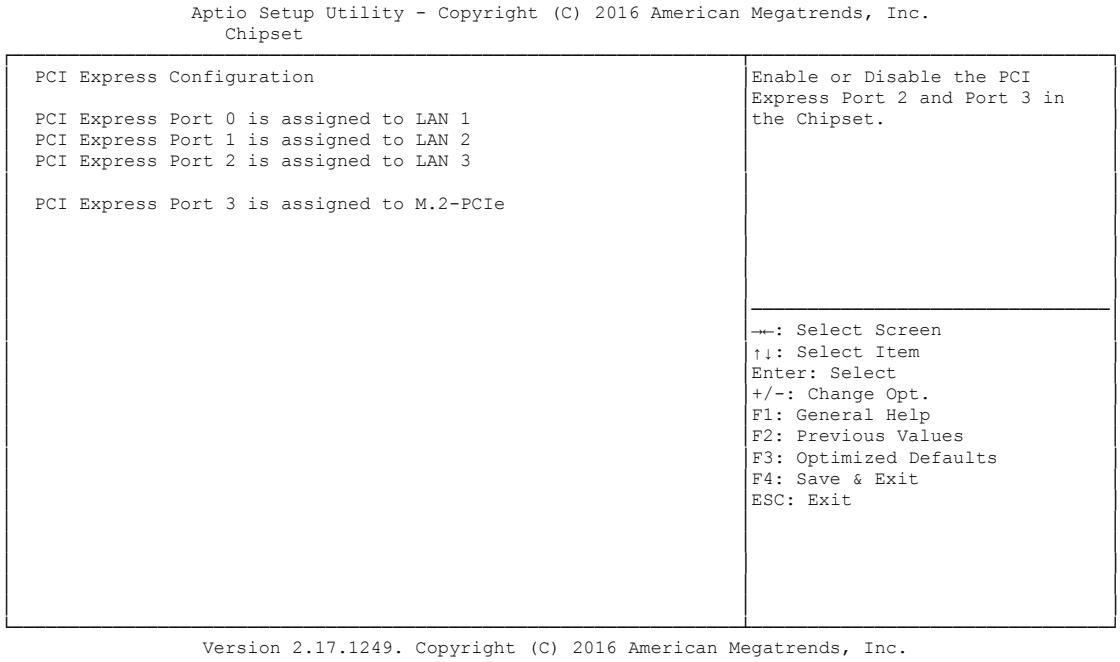


- ✓ **USB Mode**
  Options: EHCI / XHCI

- ✓ **USB Per Port Control**
  Options: Enabled / Disabled

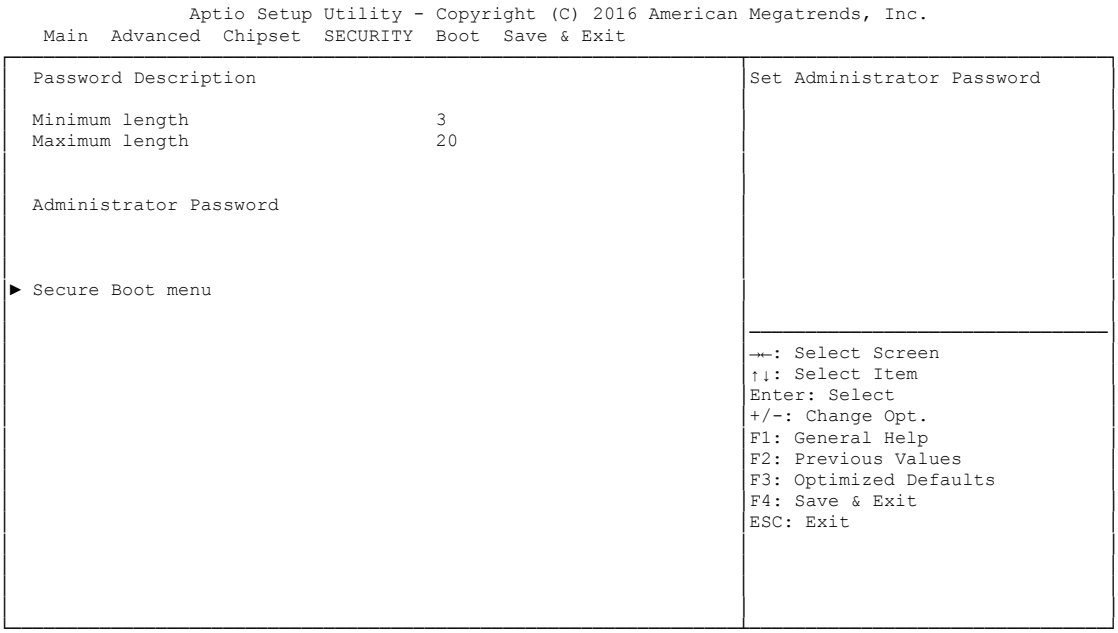
- ✓ **USB Port x**
  Options: Disabled / Enabled

5.4.2.3 PCI Express Configuration



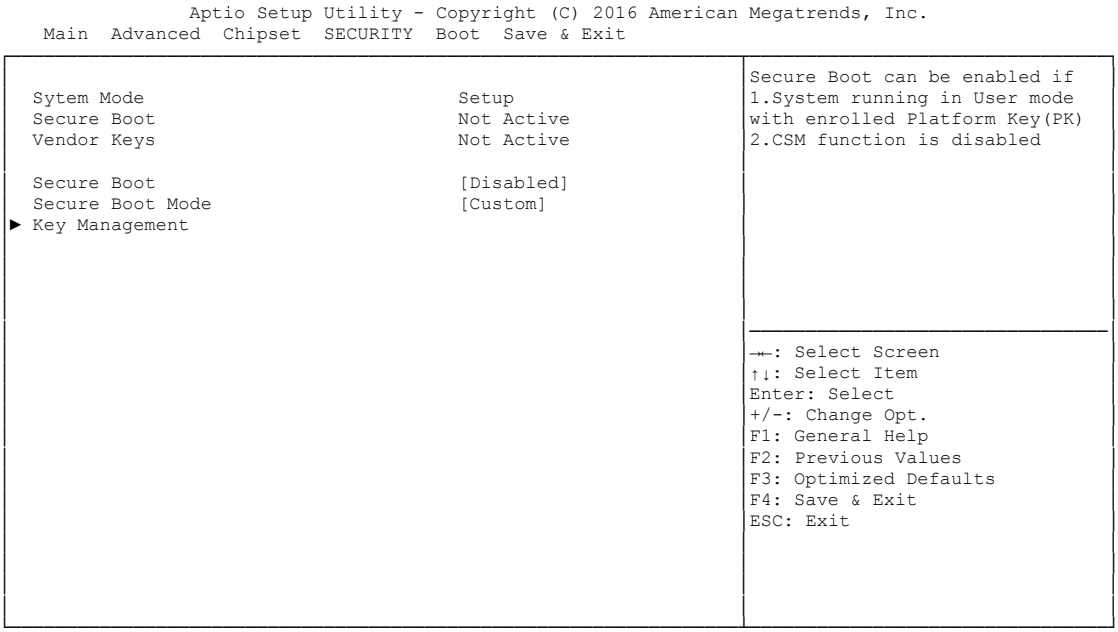
✓ **PCIe Port x is assigned to**
Options: none

5.5 Security



✓ **Secure Boot menu**
Sub menu: see "Secure Boot menu" (page 71)

5.5.1 Secure Boot menu



- ✓ **System Mode**
  Options: none

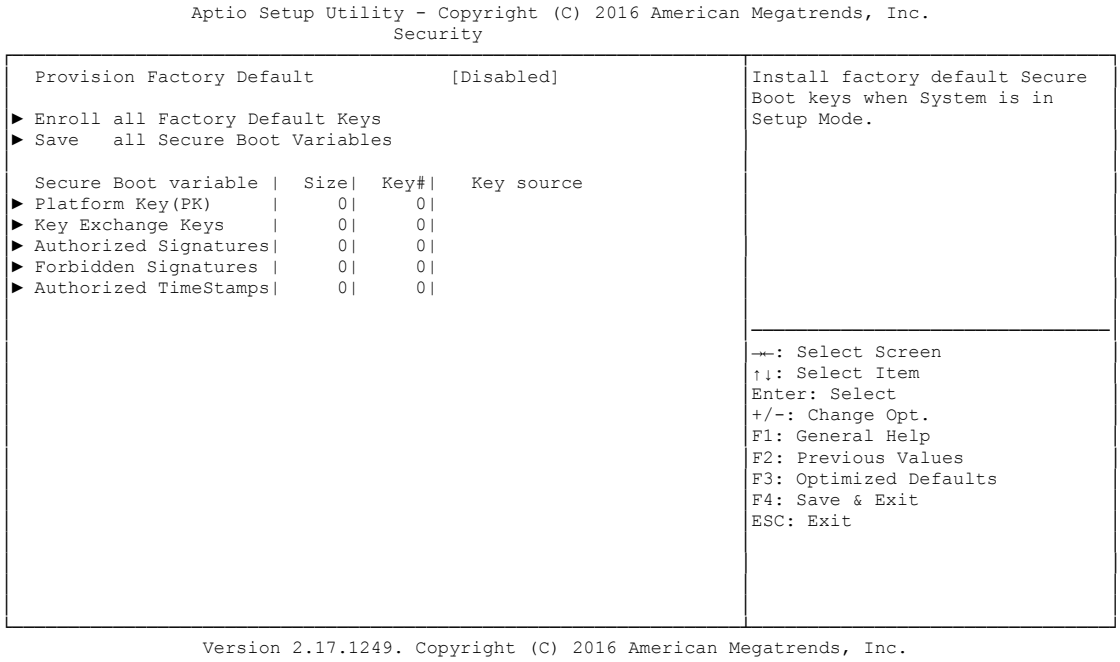
- ✓ **Secure Boot**
  Options: none

- ✓ **Vendor Keys**
  Options: none

- ✓ **Secure Boot Mode**
  Options: Standard / Custom

- ✓ **Key Management**
  Sub menu: see "Key Management" (page 72)

5.5.1.1 Key Management



- ✓ **Provision Factory Default keys**
  Options: Enabled / Disabled

- ✓ **Enroll All Factory Default Keys**
  Options: Press [Enter]

- ✓ **Save All Secure Boot Variables**
  Options: Press [Enter]

- ✓ **Platform Key(PK)**
  Options: Set New Key

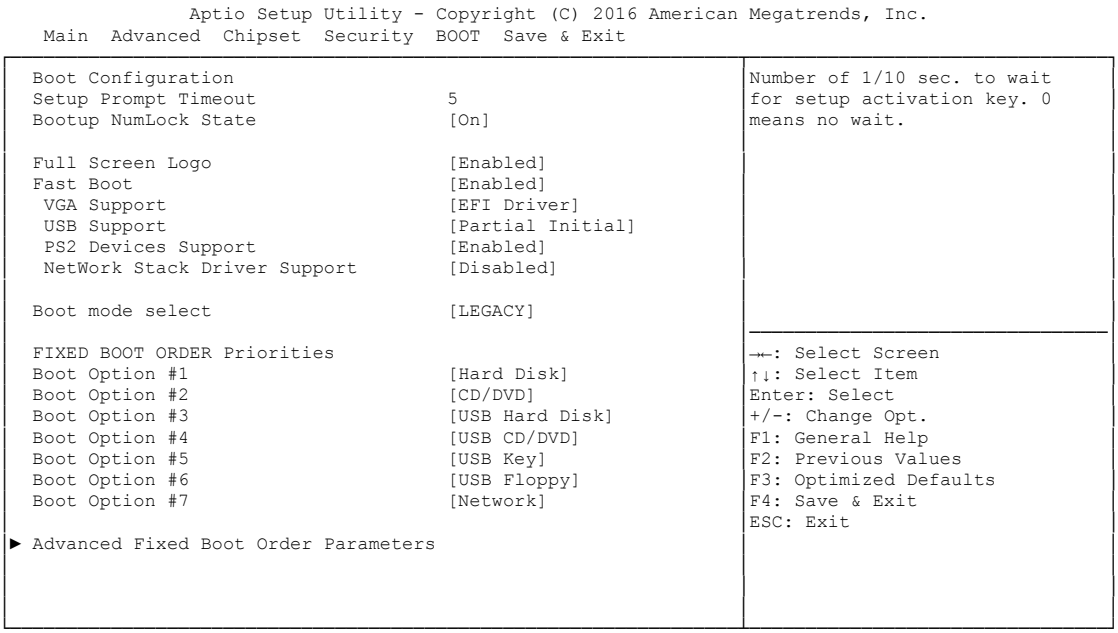
- ✓ **Key Exchange Keys**
  Options: Set New Key / Append Key

- ✓ **Authorized Signatures**
  Options: Set New Key / Append Key

- ✓ **Forbidden Signatures**
  Options: Set New Key / Append Key

- ✓ **Authorized TimeStamps**
  Options: Set New Key / Append Key

5.6 Boot



- ✓ **Setup Prompt Timeout**
  Options: 0...65535 [x 1/10 sec.]

- ✓ **Bootup NumLock State**
  Options: On / Off

- ✓ **Full Screen Logo**
  Options: Disabled / Enabled

- ✓ **Fast Boot**
  Options: Disabled / Enabled

- ✓ **VGA Support**
  Options: Auto / EFI Driver

- ✓ **USB Support**
  Options: Disabled / Full Initial / Partial Initial

- ✓ **PS2 Devices Support**
  Options: Disabled / Enabled

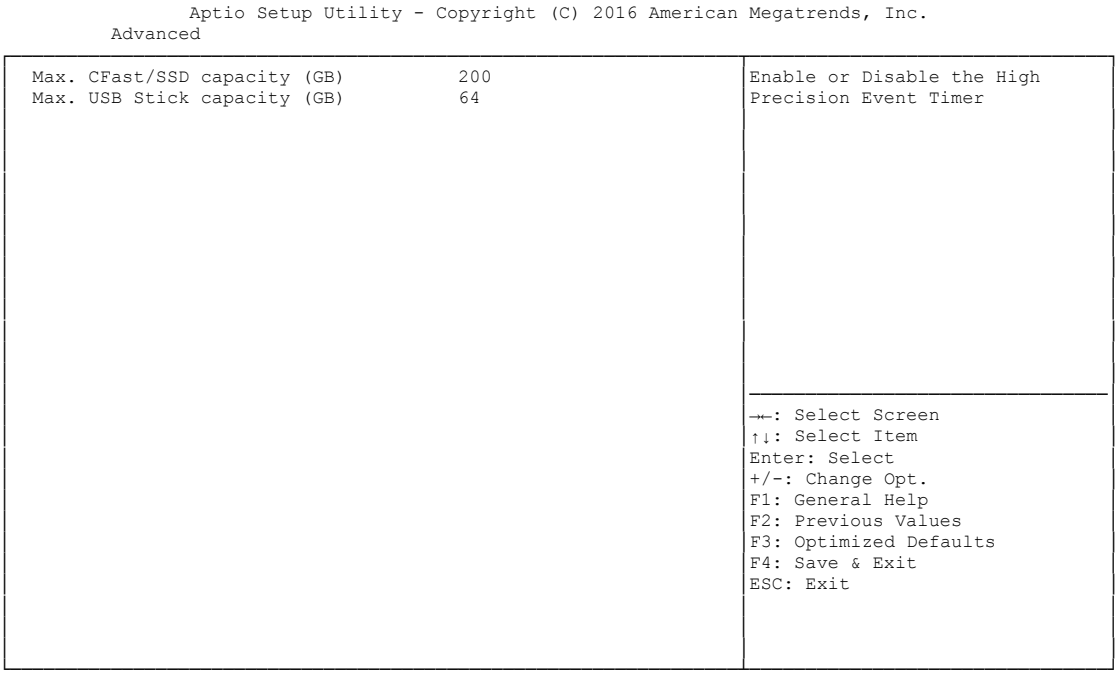
- ✓ **NetWork Stack Driver Support**
  Options: Disabled / Enabled

- ✓ **Boot mode select**
  Options: Legacy / UEFI / DUAL

- ✓ **Fixed Boot Order Priorities**
  Options: Review or change the sequence of available boot devices

- ✓ **Advanced Fixed Boot Order Parameters**
  Sub menu: see "Advanced Fixed Boot Order Parameters" (page 74)

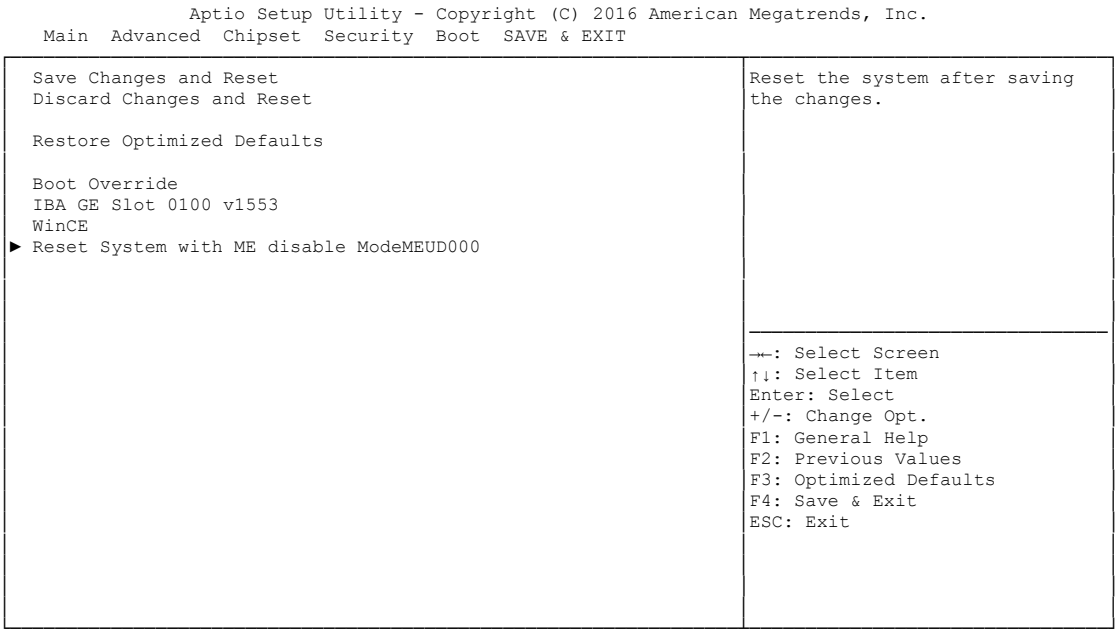
5.6.1 Advanced Fixed Boot Order Parameters



✓ **Max. CFast/SSD capacity (GB)**
Options: none

✓ **Max USB Stick capacity (GB)**
Options: none

5.7 Save & Exit



- ✓ **Save Changes and Reset**
  Options: Press [Enter]

- ✓ **Discard Changes and Reset**
  Options: Press [Enter]

- ✓ **Restore Defaults**
  Options: Press [Enter]

- ✓ **Reset System with ME disable ModeMEUD000**
  Options: Press [Enter]

5.8 BIOS-Update

If a BIOS update needs to be done, the program “DecdFlash” as well as a bootable medium which contains the newest BIOS version is used for this. It is important, that the program is started from a DOS environment without a virtual memory manager, for example “EMM386.EXE”. In case such a memory manager is loaded, the program will stop with an error message.

DescdFlash is a program which provides automatic BIOS updates on any AMI-BIOS boards. All files need to be copied from the .zip-file in another directory.
The system may not be interrupted during the flash process, otherwise the update is stopped and the BIOS is destroyed afterwards.
The program should be started as follows:

```
DecdFlsh BIOS-Filename
```

After checking the name of the BIOS file and its length the BIOS will be programmed.
The flashing takes nearly 75 seconds. The firmware will get updated automatically.

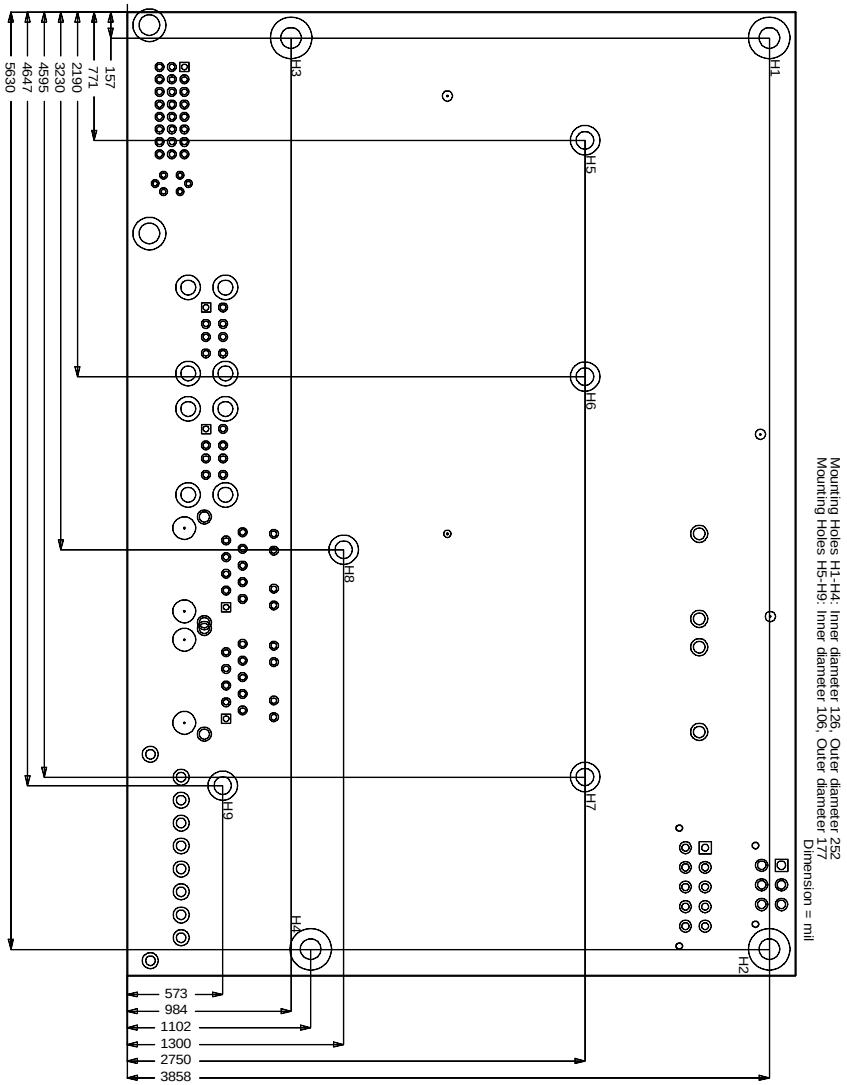
 **Attention**	**A faulty BIOS update process may cause damages on the board!** Updating the BIOS in an improper way can render the board unusable. Therefore, you should only update the BIOS if you really need the changes/corrections which come with the new BIOS version. Before you proceed to update the BIOS you need to make absolutely sure that you have the right BIOS file which was issued for the exact board and exact board revision that you wish to update. If you try to update the BIOS using the wrong file the board will not start up again.

6 Mechanical Drawings

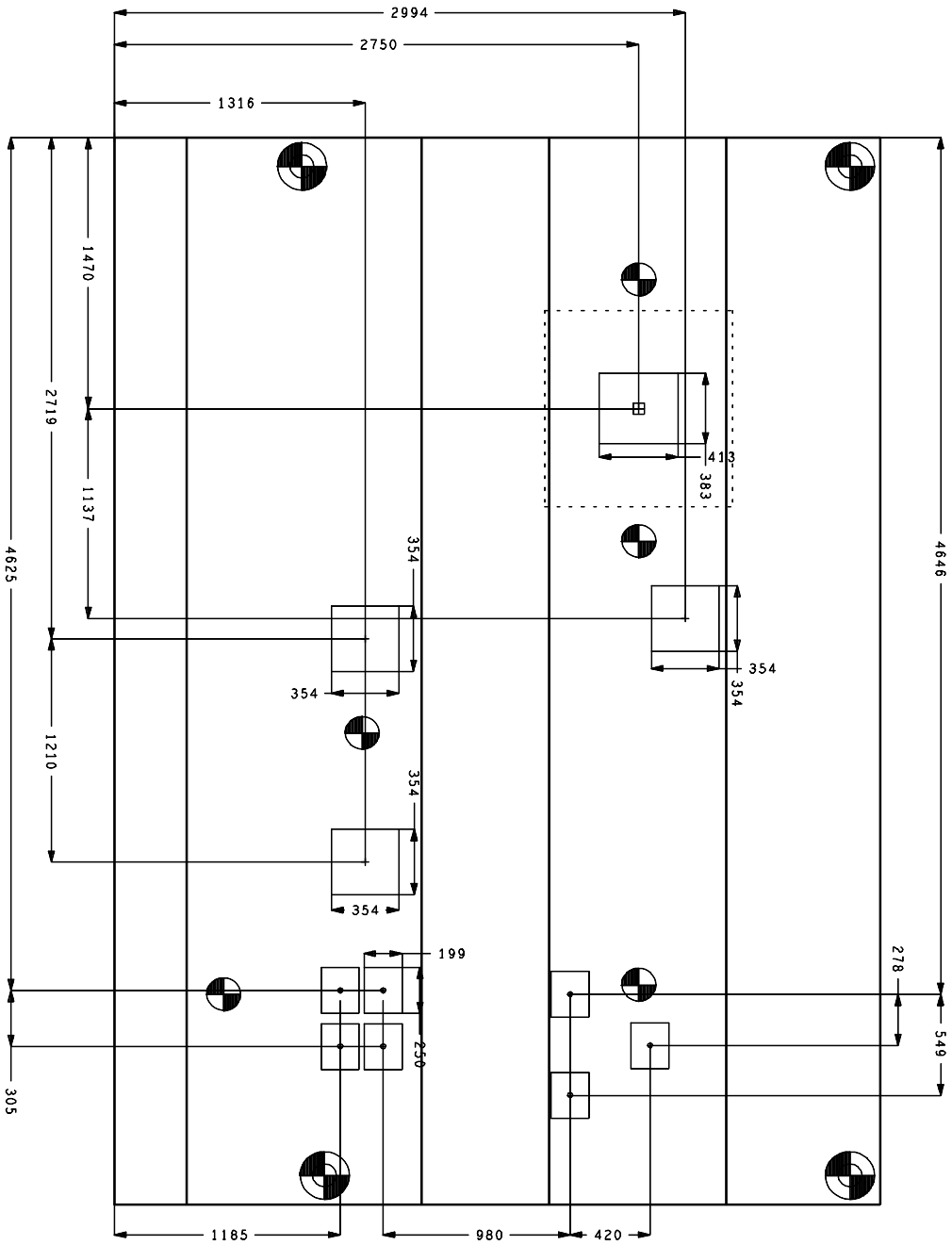
Notice	All dimensions are in mil (1 mil = 0,0254 mm).

6.1 PCB: Mounting Holes

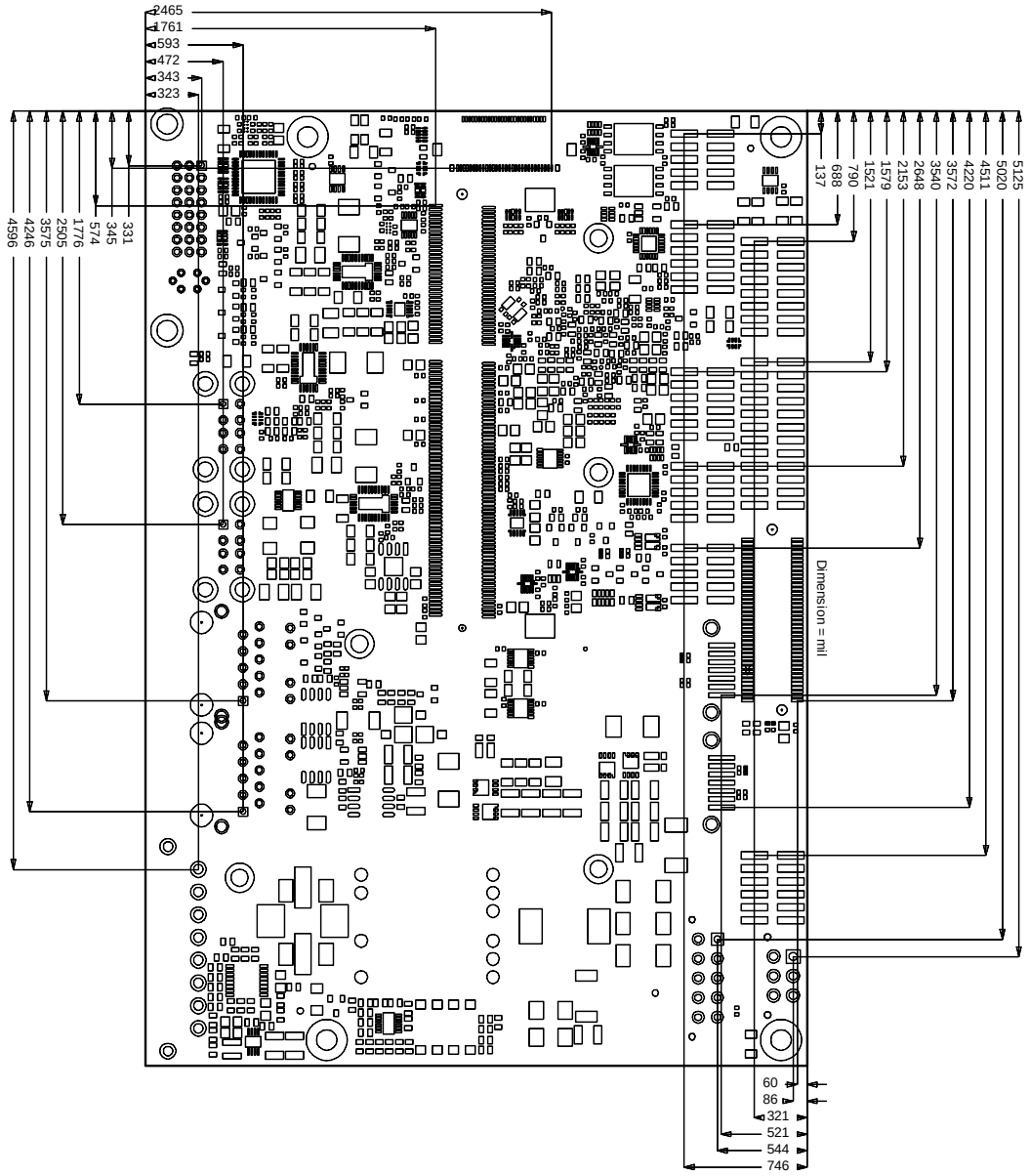
A true dimensioned drawing can be found in the PC/104 specification.



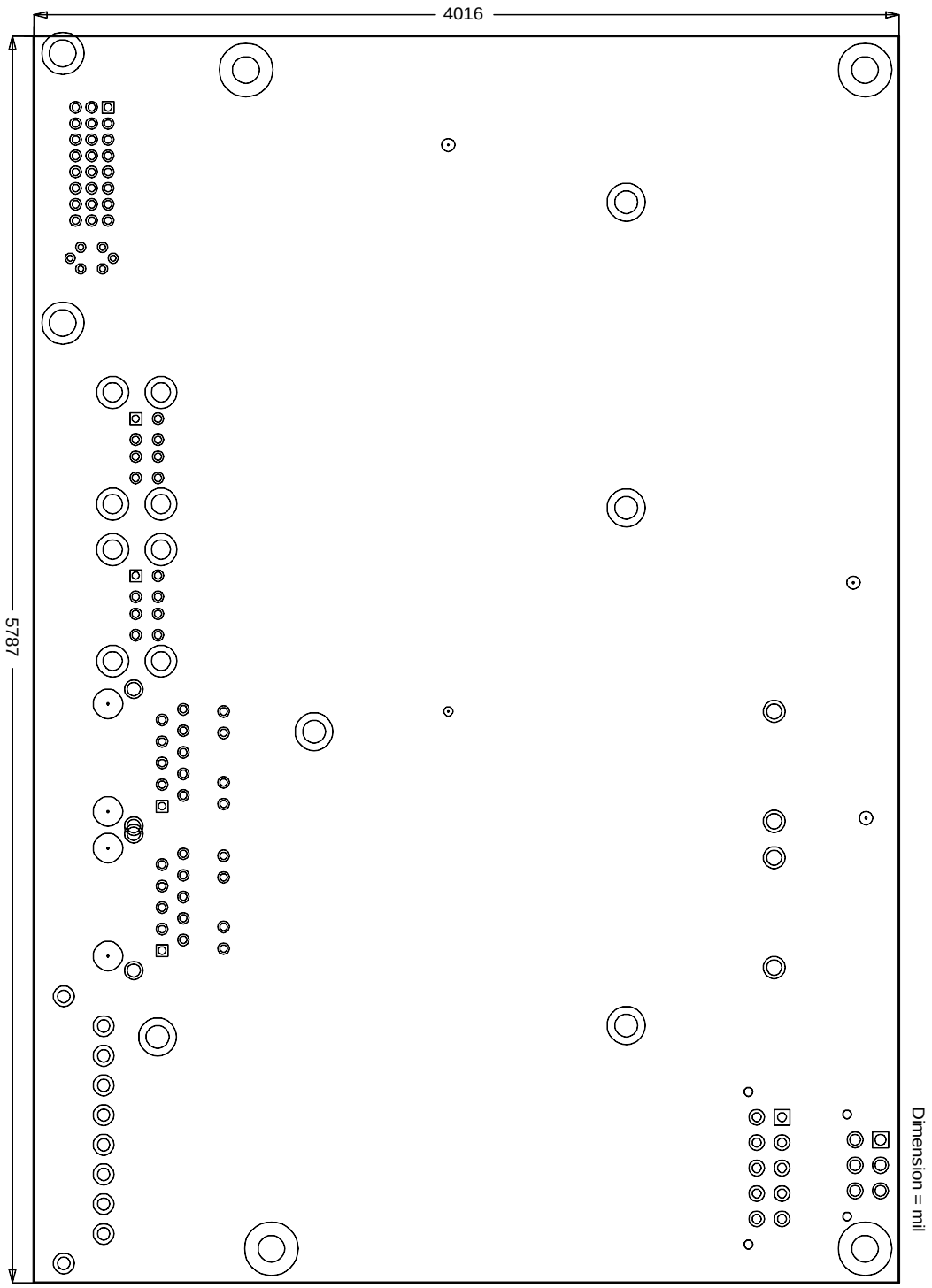
6.2 PCB: Die Center



6.3 PCB: Pin 1 Dimensions



6.4 PCB: Outlines



7 Technical Data

7.1 Electrical Data

Power Supply:

Board:	5 Volt +/- 5% (5 Volt Suspend / 12 Volt Fan)
RTC:	>= 3 Volt

Electric Power Consumption:

RTC:	<= 10µA

7.2 Environmental Conditions

Temperature Range:

Operating:	0°C to +60°C (extended temperature on request)
Storage:	-25°C up to +85°C
Shipping:	-25°C up to +85°C, for packaged boards

Temperature Changes:

Operating:	0.5°C per minute, 7.5°C per 30 minutes
Storage:	1.0°C per minute
Shipping:	1.0°C per minute, for packaged boards

Relative Humidity:

Operating:	5% up to 85% (non condensing)
Storage:	5% up to 95% (non condensing)
Shipping:	5% up to 100% (non condensing), for packaged boards

Shock:

Operating:	150m/s^2, 6ms
Storage:	400m/s^2, 6ms
Shipping:	400m/s^2, 6ms, for packaged boards

Vibration:

Operating:	10 up to 58Hz, 0.075mm amplitude
	58 up to 500Hz, 10m/s^2
Storage:	5 up to 9Hz, 3.5mm amplitude
	9 up to 500Hz, 10m/s^2
Shipping:	5 up to 9Hz, 3.5mm amplitude
	9 up to 500Hz, 10m/s^2, for packaged boards

Notice	**Shock and vibration** Shock and vibration figures pertain to the motherboard alone and do not include additional components such as heat sinks, memory modules, cables etc.

7.3 Thermal Specifications

The board is specified to operate in an environmental temperature range from 0°C to +60°C (extended temperature on request). Maximum die temperature is 100°C. To keep the processor under this threshold an appropriate cooling solution needs to be applied. This solution has to take typical and maximum power consumption into account. The maximum power consumption may be twice as high and should be used as a basis for the cooling concept. Additional controllers may also affect the cooling concept. The power consumption of such components may be comparable to the consumption of the processor.
The board design includes thermal solution mounting points that will provide the best possible thermal interface between die and solution. Since we take thermal solutions seriously we have several advanced, aggressive cooling solutions in our product portfolio. Please contact your sales representative to order or discuss your thermal solution needs.

 **CAUTION**	**Do not exceed the maximum Die temperature!** The end customer has the responsibility to ensure that the die temperature of the processor does not exceed 100°C. Permanent overheating may destroy the board! In case the temperature exceeds 100°C the environmental temperature must be reduced. Under certain circumstances sufficient air circulation must be provided.

8 Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

8.1 Beckhoff's Branch Offices and Representatives

Please contact your Beckhoff branch office or representative for local support and service on Beckhoff products.
The addresses of Beckhoff's branch offices and representatives around the world can be found on her internet pages: http://www.beckhoff.com
You will also find further documentation for Beckhoff components there.

8.2 Beckhoff Support

Support offers you comprehensive technical assistance, helping you not only with the application of individual Beckhoff products, but also with other, wide-ranging services:

- support
- design, programming and commissioning of complex automation systems
- and extensive training programs for Beckhoff system components

hotline:	+49(0)5246/963-157
fax:	+49(0)5246/963-9157
e-mail:	support@beckhoff.com

8.3 Beckhoff Service

The Beckhoff Service Center supports you in all matters of after-sales service:

- on-site service
- repair service
- spare parts service
- hotline service

hotline:	+49(0)5246/963-460
fax:	+49(0)5246/963-479
e-mail:	service@beckhoff.com

8.4 Beckhoff Headquarters

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e-mail:	info@beckhoff.com
web:	www.beckhoff.com

I Annex: Post-Codes

During boot, the BIOS generates a sequence of status codes (so-called "POST codes"), which can be viewed using a special output device (POST code card). The meaning of these codes is described in the document "Aptio™ 4.x Status Codes" by American Megatrends®, which can be downloaded from their website http://www.ami.com. The following additional OEM POST codes are generated:

Code	Description
87h	BIOS-API started
88h	PCA9535 started
89h	PWRCTRL-Firmware started

II Annex: Resources

IO Range

The used resources depend on setup settings.
The given values are ranges, which are fixed by AT compatibility. Other IO ranges are used, which are dynamically adjusted by Plug & Play BIOS while booting.

Adress	Function
0-FF	Reserved IO area of the board
170-17F	
1F0-1F7	
278-27F	
2E8-2EF	
2F8-2FF	COM2
370-377	
378-37F	
3BC-3BF	
3E8-3EF	
3F0-3F7	
3F8-3FF	COM1

Memory

The used resources depend on setup settings.
If the entire range is clogged through option ROMs, these functions do not work anymore.

Adress	Function
A0000-BFFFF	VGA-RAM
90927000-909277FF	AHCI BIOS / RAID / PXE (if available)
FF000000-FFFFFFFF	Intel(R) 82802 Firmwarehub

Interrupt

The used resources depend on setup settings.
The listed interrupts and their use are given through AT compatibility.
If interrupts must exclusively be available on the ISA side, they have to be reserved through the BIOS setup. The exclusivity is not given and not possible on the PCI side.

Adress	Function
IRQ0	Timer
IRQ1	PS/2 Keyboard
IRQ2 (8)	
IRQ3	COM2
IRQ4	COM1
IRQ5	
IRQ6	
IRQ7	
IRQ8	RTC
IRQ9	
IRQ10	
IRQ11	
IRQ12	
IRQ13	

Adress	Function
IRQ14	
IRQ15	

PCI Devices

All listed PCI devices exist on the board. Some PCI devices or functions of devices may be disabled in the BIOS setup. Once a device is disabled other devices may get PCI bus numbers different from the ones listed in the table.

AD	INTA	REQ	Bus	Dev.	Fkt.	Kontroller / Slot
	-	-	0	0	0	Host Bridge ID0F00h
	A	-	0	2	0	VGA Graphics ID0F31h
	A	-	0	18	0	SD Host Control (DMA) ID0F16h
	A	-	0	19	0	SATA (AHCI 1.0) ID0F23h
	A	-	0	20	0	XHCI Controller ID0F35h
	A	-	0	27	0	HD Audio ID0F04h
	A	-	0	28	0	PCI Express Port 1 ID0F48h
	B	-	0	28	1	PCI Express Port 2 ID0F4Ah
	C	-	0	28	2	PCI Express Port 3 ID0F4Ch
	D	-	0	28	3	PCI Express Port 4 ID0F4Eh
	-	-	0	31	0	ISA Bridge ID0F1Ch
	B	-	0	31	3	SMBus Interface ID0F12h
	A	-	1	0	0	Ethernet Controller x1 ID1533h
	A	-	2	0	0	Ethernet Controller x1 ID1533h
	A	-	3	0	0	Ethernet Controller x1 ID1533h

SMB Devices

The following table contains all reserved SM-Bus device addresses in 8-bit notation. Note that external devices must not use any of these addresses even if the component mentioned in the table is not present on the motherboard.

Address	Function
10-11	Standard slave address
40-41	GPIO
60-61	BIOS internal
70-73	POST code output
88-89	BIOS-defined slave address
A0-A1	DIMM 1
A2-A3	DIMM 2
A4-AF	BIOS internal
B0-BF	BIOS internal
D2-D3	Clock