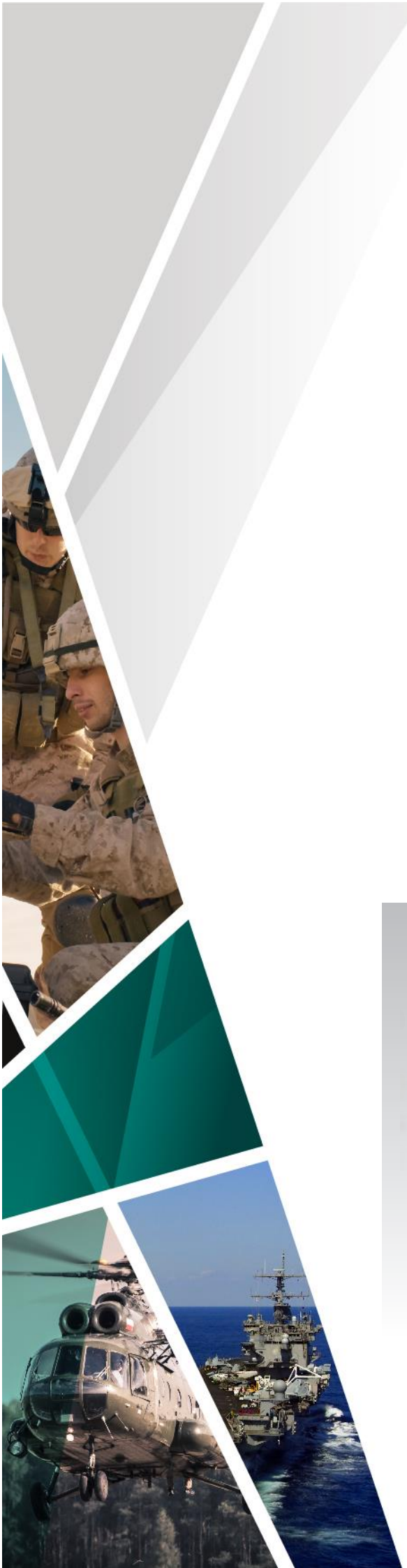


INS8346B

Mini ITX Industrial Motherboard
User's Manual

Safety Information

1. Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area.
- If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your local distributor.

2. Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter any technical problems with the product, contact your local distributor

Statement

- All product specifications are subject to change without prior notice

Revision History

Revision	Date (yyyy.mm.dd)	Changes
Version 1.0	2014.10.14	Initial release

Packing list

- ☐ INS8346B Mini-ITX Industrial MB
- ☐ 1 x I/O shield
- ☐ 1 x SATA cable
- ☐ 2 x COM cables with bracket
- ☐ 1 x USB cable
- ☐ CD (Driver+ user's manual)

Optional Accessories

- Cable Kit: Audio cable, PS/2 cable
- Thermal Kit: CPU cooler
- Processor:
  - ☐ Intel® Core™ i7-3770 (8M Cache, 3.40 GHz), 77W
  - ☐ Intel® Core™ i5-3550S (6M Cache, up to 3.70 GHz), 65W
  - ☐ Intel® Core™ i3-3220 (3M Cache, 3.30 GHz), 55W
  - ☐ Intel® Pentium® G2120 (3M Cache, 3.10 GHz), 55W
  - ☐ Intel® Core™ i7-2600 (8M Cache, 3.40 GHz), 95W
  - ☐ Intel® Core™ i5-2400 (6M Cache, 3.10 GHz), 95W
  - ☐ Intel® Core™ i3-2120 (3M Cache, 3.30 GHz), 65W
  - ☐ Intel® Pentium® G850 (3M Cache, 2.90 GHz), 65W
  - ☐ Intel® Celeron® G540 (2M Cache, 2.50 GHz), 65W

If any of the above items is damaged or missing, please contact your local distributor.

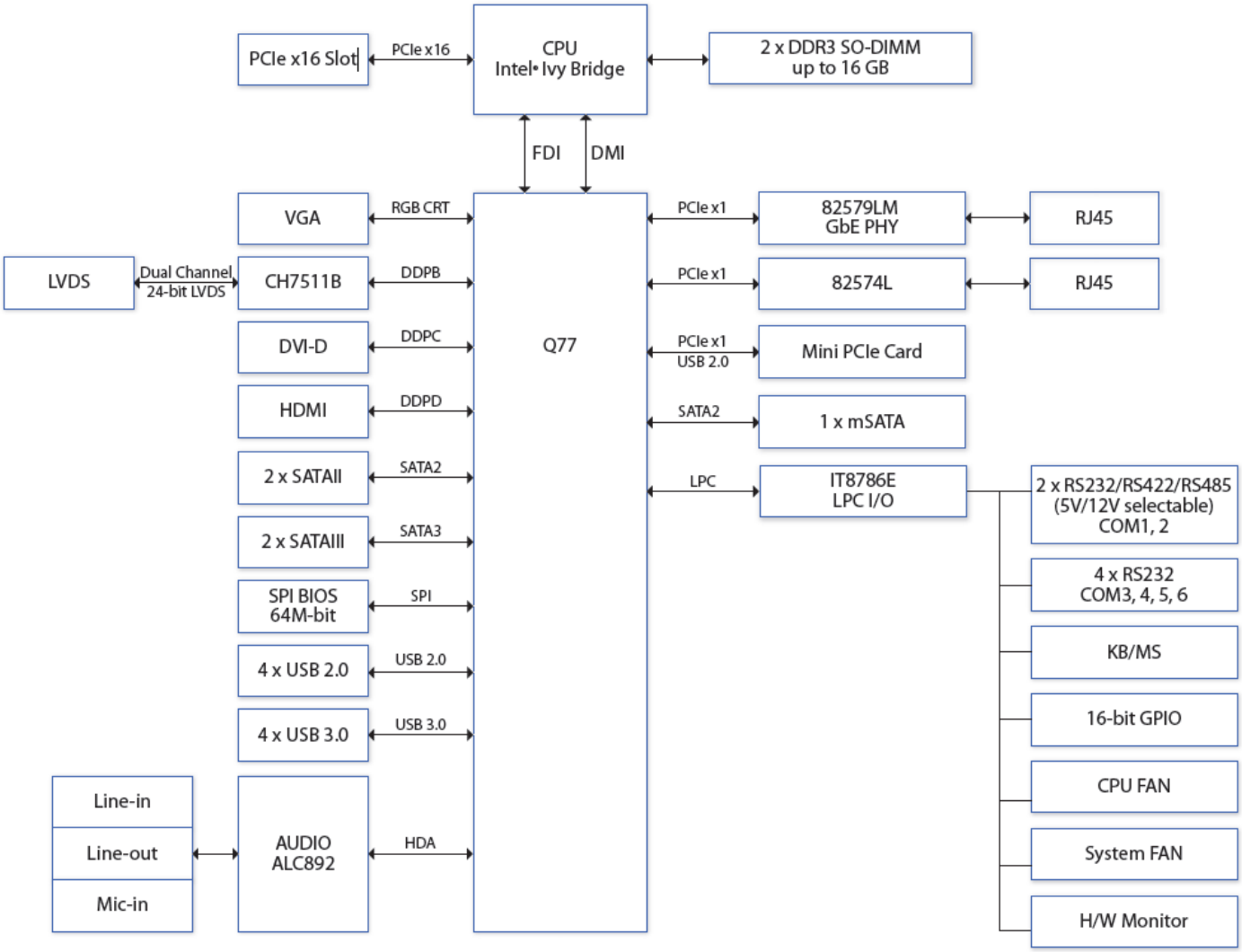
Ordering Information

Part Number	Description
INS8346B-ET	Intel® Ivy Bridge Q77 Mini-ITX Industrial MB, -20 to 70°C
INS8346B-UT	Intel® Ivy Bridge Q77 Mini-ITX Industrial MB, -40 to 85°C

Table of Contents

Chapter 1: Product Information

1.1 Block Diagram



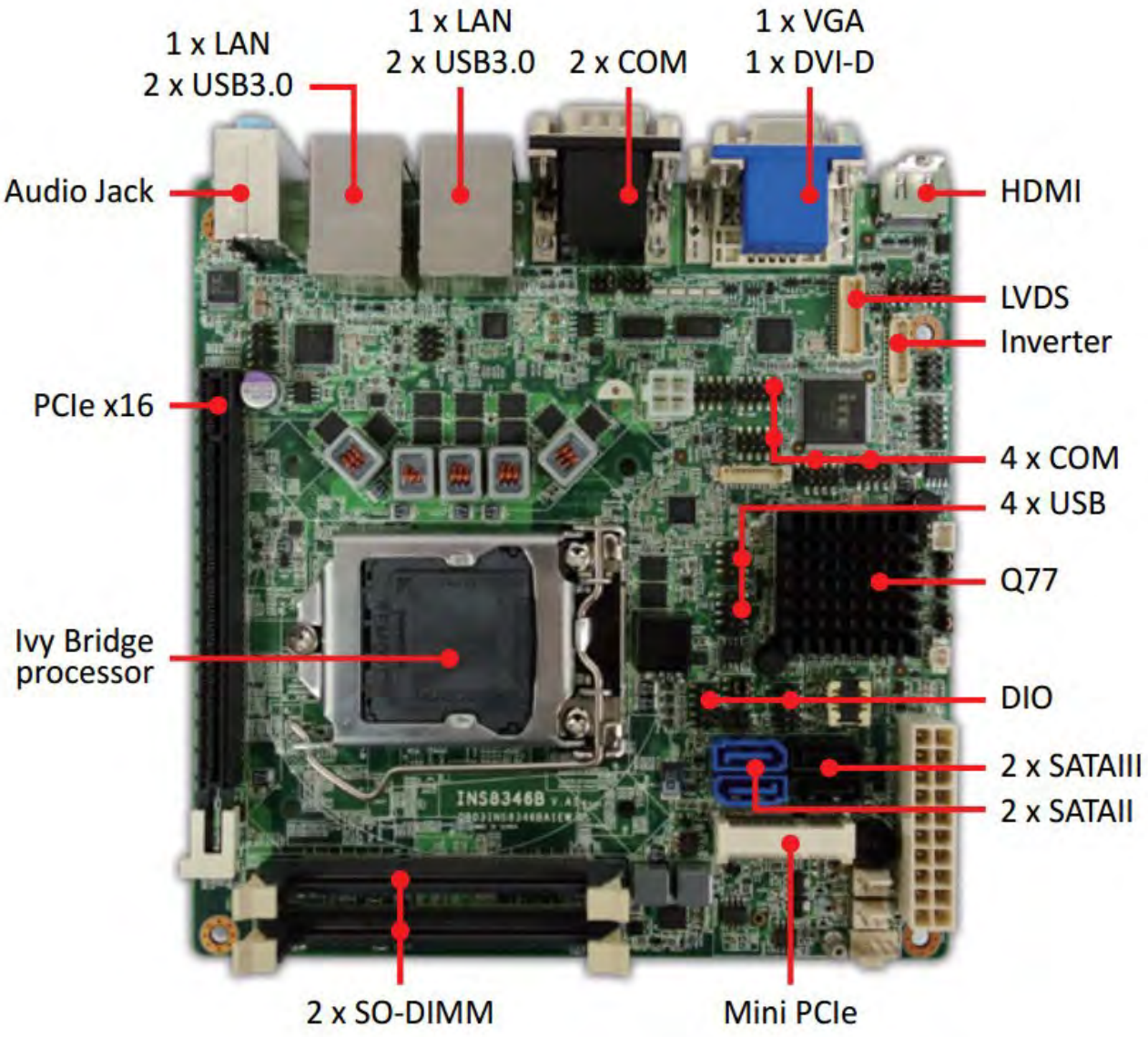
1.2 Key Features

System	
CPU Type	Intel® LGA1155 Core™ i7/i5/i3 Processor Core™ i7-3770 3.4 GHz (8M Cache, 95W) Core™ i5-3550S 3.0 GHz (6M Cache, 65W) Core™ i3-3220 3.3 GHz (3M Cache, 65W) Pentium® G2120 3.1 GHz (3M Cache, 55W)
Chipset	Intel® Q77
Memory Type	2 x 204-pin SO-DIMM DDR3 1333/1600 MHz up to 16 GB
BIOS	AMI® UEFI BIOS
Supoer I/O	ITE8786E
iAMT	Support iAMT 8.0
Watchdog	1-255 sec. or 1-255 min. software programmable, can generate system reset
Expansion Slot	1 x PCIe x16 Gen.2 1 x mPCIe 1 x mSATA
Display	
Chipset	Intel® HD Grapics 4000 Integrated Graphics Engine
LVDS	Dual channel 24-bit LVDS
Display Type	VGA, LVDS, DVI, HDMI
Audio	
Codec	Realtek ALC892 High Definition Audio Codec
Ethernet	
Chipset	Intel® 82579LM & 82574L GbE
WOL	Yes
Boot from LAN	Yes for PXE
Rear I/O	
VGA	1
DVI-D	1
HDMI	1
Ethernet	2 x RJ45
Audio	Mic-in, Line-in, Line-out
COM Port	2 x RS232/422/485 with 5V/12V selectable
USB	4 x USB 3.0
Internal I/O	
SATA	2 x SATAIII (6 Gb/s) 2 x SATAII (3 Gb/s)
USB	4 x USB 2.0 ports by pin header
COM	4 x RS232 ports: COM3~6 support RS232 by pin header
DIO	16-bit (8 in/8 out)
LVDS	1
PS/2	1
Fan	1 x CPU fan 2 x System fan connector

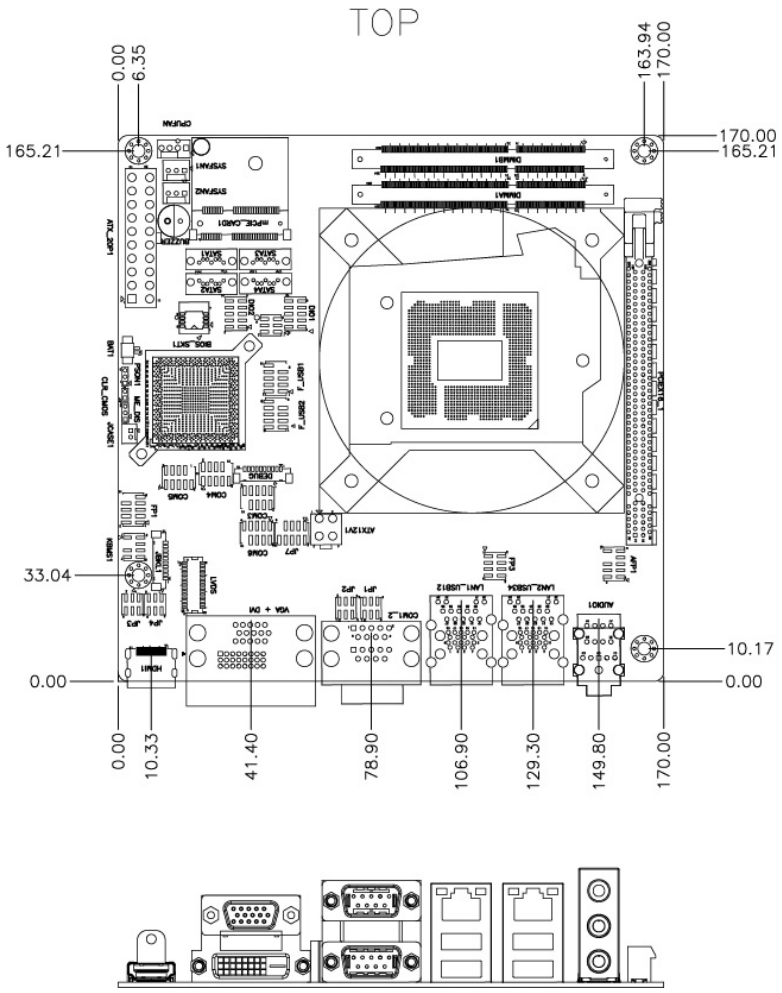
Mechanical and Environment	
Form Factor	Mini-ITX Industrial MB
Power Type	ATX (20-pin + 4-pin)
Dimension	170 x 170 mm (6.7” x 6.7”)
Operating Temp.	-40 to 85°C
Relative Humidity	10% to 90%, non-condensing

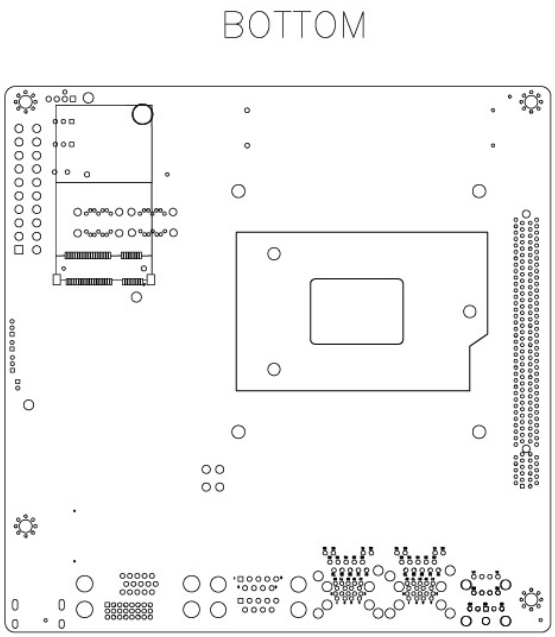
*All specifications and photos are subject to change without notice.

1.3 Board Placement



1.4 Mechanical Drawing





Chapter 2: Jumpers and Connectors

2.1 Jumpers and connectors list

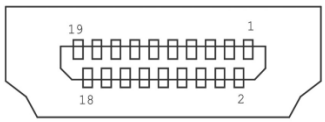
Jumper	Connector	Description		
		Type	Function	Others
CLR_CMOS		Pin Header		
ME_DIS		Pin Header		
PSON1		Pin Header		
	ATX12V1		Power	
	ATX_20P		Power	
	CPU1	Socket	CPU	
	DIMMA1	Slot	DIMM	
	DIMMB1			
	PCIEX16_1	Slot	PCIE	
	SATA1		SATA 3	
	SATA2			
	SATA3		SATA 2	
	SATA4			
	VGA+DVI1		VGA	15Pin D-SUB VGA
			DVI	
	HDMI		HDMI	
	JCASE1			
JP6	DIO1	Pin Header	DIO	DIO Port 0~3
	DIO2			DIO Port 4~7
	KB_MS	Pin Header		P/S2 Key Board
				P/S2 Mouse
	FP1	Pin Header	Front Panel	Front Panel
	F_USB1	Pin Header	USB 2.0	Front Panel 1st. USB 2.0
	F_USB2			Front Panel 2nd. USB 2.0
	CPUFAN		FAN	4Pin CPU FAN
	SYSFAN1			3Pin System FAN
	SYSFAN2			
	AUDIO1		Audio	

Jumper	Connector	Description		
		Type	Function	Other
	AFP1	Pin Header	Audio	Front Panel Audio
JP1	COM1_2		COM	RS232/422/485
JP2				
	COM3	Pin Header		RS232
	COM4			
	COM5			
	COM6			
	mPCIE_CARD1			
	mSATA_CARD1			
JP3	JBKL1		LVDS	LVDS Back Light
JP4	LVDS			LVDS Panel
JP7				
	LAN1_USB12		USB 3.0	1st. USB 3.0
			USB 3.0	2nd. USB 3.0
			Giga LAN	1st. Giga LAN
	FP3	Pin Header	Front Panel	Front Panel LAN1~2 LED
	LAN2_USB34		Giga LAN	2nd. Giga LAN
			USB 3.0	3rd. USB 3.0
			USB 3.0	4th. USB 3.0
	DEBUG		Debug	RD Debug Only

2.2 Jumper Settings

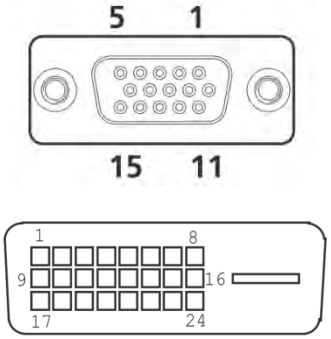
HDMI: HDMI Connector

PIN	DEFINITION	PIN	DEFINITION
1	HDMI_2P	11	GND
2	GND	12	HDMI_CLKN
3	HDMI_2N	13	NC
4	HDMI_1P	14	NC
5	GND	15	HDMI_CLK
6	HDMI_1N	16	HDMI_DAT
7	HDMI_0P	17	GND
8	GND	18	+5V
9	HDMI_0N	19	HDMI_DET
10	HDMI_CLKP		



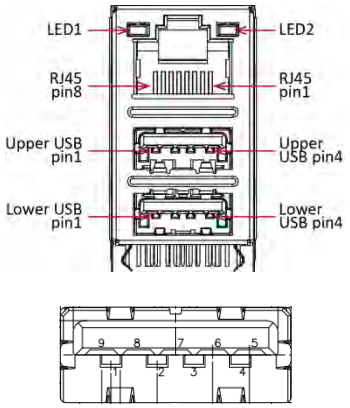
VGA+DVI1: VGA Connector + DVI-D Connector

VGA				DVI			
PIN	DEFINITION	PIN	DEFINITION	PIN	DEFINITION	PIN	DEFINITION
1	RED	9	+5V	1	TMDS2-	13	NC
2	GREEN	10	GND	2	TMDS2+	14	+5V
3	BLUE	11	NC	3	GND	15	GND
4	NC	12	DDC DATA	4	NC	16	HOTPLUG_DETECT
5	GND	13	HSYNC	5	NC	17	TMDS0-
6	GND	14	VSYNC	6	DDC_CLK	18	TMDS0+
7	GND	15	DDC CLOCK	7	DDC_DATA	19	GND
8	GND			8	NC	20	NC
				9	TMDS1-	21	NC
				10	TMDS1+	22	GND
				11	GND	23	TMDSCLK+
				12	NC	24	TMDSCLK-



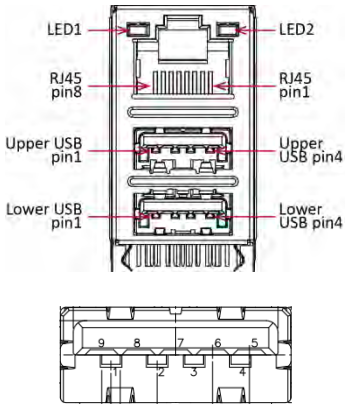
LAN1_USB12: LAN & USB3.0 Port Connector

UPPER USB		LOWER USB		LAN	
PIN	DEFINITION	PIN	DEFINITION	PIN	DEFINITION
1	USB3_VCC1	1	USB3_VCC2	1	LAN1_MDI0+
2	USBD0-	2	USBD1-	2	LAN1_MDI0-
3	USBD0+	3	USBD1+	3	LAN1_MDI1+
4	GND	4	GND	4	LAN1_MDI1-
5	USB3RN1	5	USB3RN2	5	LAN1_MDI2+
6	USB3RP1	6	USB3RP2	6	LAN1_MDI2-
7	GND	7	GND	7	LAN1_MDI3+
8	USB3TN1	8	USB3TN2	8	LAN1_MDI3-
9	USB3TP1	9	USB3TP2		

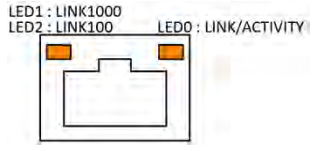


LAN2_USB34: LAN & USB3.0 Port Connector

UPPER USB		LOWER USB		LAN	
PIN	DEFINITION	PIN	DEFINITION	PIN	DEFINITION
1	USB3_VCC3	1	USB3_VCC4	1	LAN2_MDI0+
2	USBD2-	2	USBD3-	2	LAN2_MDI0-
3	USBD2+	3	USBD3+	3	LAN2_MDI1+
4	GND	4	GND	4	LAN2_MDI1-
5	USB3RN3	5	USB3RN4	5	LAN2_MDI2+
6	USB3RP3	6	USB3RP4	6	LAN2_MDI2-
7	GND	7	GND	7	LAN2_MDI3+
8	USB3TN3	8	USB3TN4	8	LAN2_MDI3-
9	USB3TP3	9	USB3TP4		

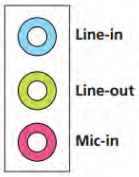


SPEED LED: (Lift)	ACTIVE LED: (Right)
GREEN: 1000Mbps	ORANGE (BLINKING): ACTIVITY
ORANGE: 100Mbps	No Light: NOT LINK
No Light: 10Mbps	ORANGE (NO BLINKING): LINK



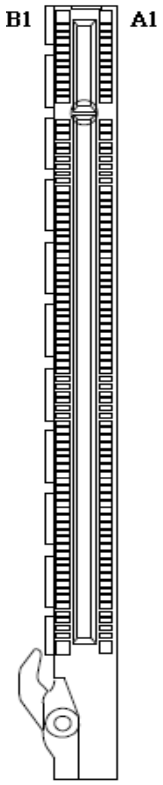
AUDIO1: 3 Stack-up HD Audio Phone Jack

PIN	DEFINITION
1	LINE-IN
2	LINE-OUT
3	MIC-IN



PCIEX16_1: Standard PCI Express x16 Slot

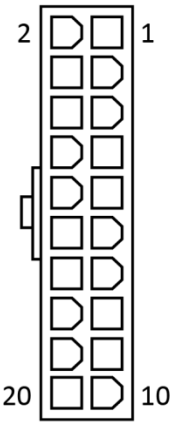
PIN	SIDE B	SIDE A
1	+12V	PRSNT#(B)
2	+12V	+12V
3	+12V	+12V
4	Ground	Ground
5	SMCLK	JTAG2
6	SMDAT	JTAG3
7	Ground	JTAG4
8	+3.3V	JTAG5
9	JTAG1	+3.3V
10	+3VSB	+3.3V
11	WAKE#	PWRGD
12	Reserved	Ground
13	Ground	REFCLK+
14	HSOP0	REFCLK-
15	HSON0	Ground
16	Ground	HSIP0
17	PRSNT#1	HSIP0
18	Ground	Ground
19	HSOP1	Reserved
20	HSON1	Ground
21	Ground	HSIP1
22	Ground	HSIP1
23	HSOP2	Ground
24	HSON2	Ground
25	Ground	HSIP2
26	Ground	HSIP2
27	HSOP3	Ground
28	HSON3	Ground
29	Ground	HSIP3
30	Reserved	HSIP3
31	PRSNT#2	Ground
32	Ground	Reserved
33	HSOP4	Reserved
34	HSON4	Ground



PIN	SIDE B	SIDE A
35	Ground	HSIP4
36	Ground	HSIP4
37	HSOP5	Ground
38	HSON5	Ground
39	Ground	HSIP5
40	Ground	HSIP5
41	HSOP6	Ground
42	HSON6	Ground
43	Ground	HSIP6
44	Ground	HSIP6
45	HSOP7	Ground
46	HSON7	Ground
47	Ground	HSIP7
48	PRSNT#3	HSIP7
49	Ground	Ground
50	HSOP8	Reserved
51	HSON8	Ground
52	Ground	HSIP8
53	Ground	HSIP8
54	HSOP9	Ground
55	HSON9	Ground
56	Ground	HSIP9
57	Ground	HSIP9
58	HSOP10	Ground
59	HSON10	Ground
60	Ground	HSIP10
61	Ground	HSIP10
62	HSOP11	Ground
63	HSON11	Ground
64	Ground	HSIP11
65	Ground	HSIP11
66	HSOP12	Ground
67	HSON12	Ground
68	Ground	HSIP12
69	Ground	HSIP12

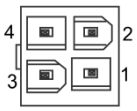
ATX_20P: 20 pin ATX Power Input Connector

PIN	DEFINITION	PIN	DEFINITION
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	POWER OK	18	N/C
9	+5VSB	19	5V
10	+12V	20	5V



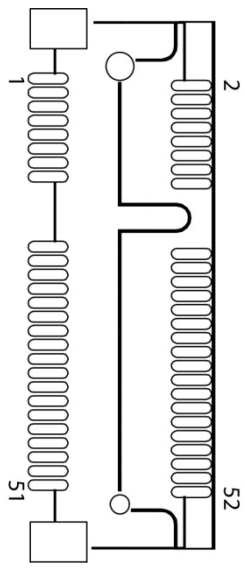
ATX12V1: 4 pin ATX Power Input Connector

PIN	DEFINITION	PIN	DEFINITION
1	GND	3	+12V
2	GND	4	+12V



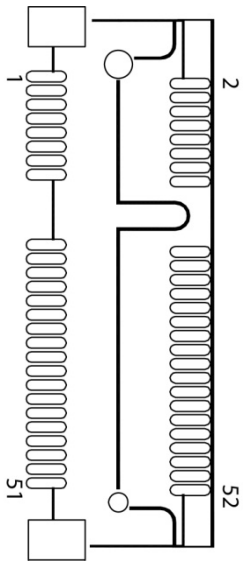
MPCIE_CARD1: Mini PCIE connector

PIN	DEFINITION	PIN	DEFINITION
1	-PCIE_WAKE	2	3.3VAUX
3	NC	4	GND
5	NC	6	1.5V
7	mPCIE_REQ#	8	NC
9	GND	10	NC
11	CLK_mPCIE_DN	12	NC
13	CLK_mPCIE_DP	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	-MCARD_DISABLE
21	GND	22	-RST_DB_MINI
23	mPCIE_RXN	24	3.3Vaux
25	mPCIE_RXP	26	GND
27	GND	28	1.5V
29	GND	30	SMB_CLK
31	mPCIE_TXN	32	SMB_DATA
33	mPCIE_TXP	34	GND
35	GND	36	-USB_MINI
37	GND	38	+USB_MINI
39	+3.3VAUX	40	GND
41	+3.3VAUX	42	NC
43	GND	44	NC
45	CL_CLK	46	NC
47	CL_DATA	48	1.5V
49	-CL_RST	50	GND
51	-MCARD_DISABLE	52	3.3VAUX



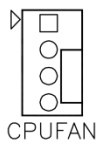
MSATA_CARD1: MSATA CARD connector

PIN	DEFINITION	PIN	DEFINITION
1	NC	2	3.3VAUX
3	NC	4	GND
5	NC	6	+1.5V
7	NC	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
KEY			
17	NC	18	GND
19	NC	20	NC
21	GND	22	NC
23	MSATA_RXP_C	24	3.3VAUX
25	MSATA_RXN_C	26	GND
27	GND	28	1.5V
29	GND	30	NC
31	MSATA_TXN_C	32	NC
33	MSATA_TXP_C	34	GND
35	GND	36	NC
37	GND	38	NC
39	+3.3VAUX	40	GND
41	+3.3VAUX	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	1.5V
49	NC	50	GND
51	NC	52	3.3VAUX



CPUFAN: CPU FAN Wafer

PIN	DEFINITION
1	PWM_CPUFAN
2	TACH_CPUFAN
3	CPUFAN_VCC
4	GND



SYSFAN1: System FAN Wafer

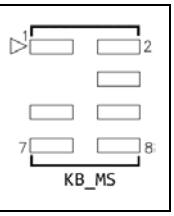
PIN	DEFINITION
1	TACH_SYSFAN1
2	SYSFAN1_VCC
3	GND

SYSFAN2: System FAN Wafer

PIN	DEFINITION
1	TACH_SYSFAN2
2	SYSFAN2_VCC
3	GND

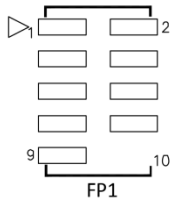
KB_MS: PS2 KB/MS

PIN	DEFINITION	PIN	DEFINITION
1	+5VAUX	2	GND
3		4	GND
5	MS DATA	6	KB DATA
7	MS CLOCK	8	KB CLOCK



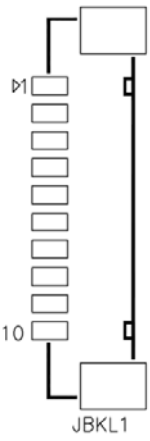
FP1: Front Panel 1

PIN	DEFINITION	PIN	DEFINITION
1	HDLED+	2	PLED+
3	-SATALED	4	PLED-
5	GND	6	-PWRBTN
7	-SYS_RST	8	GND
9	NC		

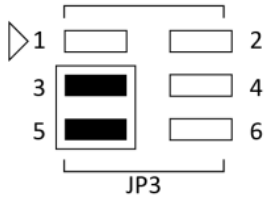
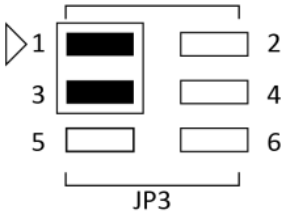


JBKL1: Inverter connector

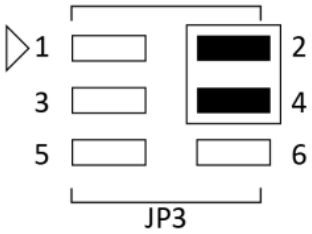
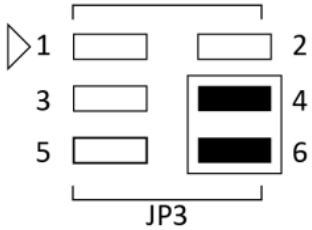
PIN	DEFINITION
1	Backlight power (+12V)
2	Backlight power (+12V)
3	Backlight power (+12V)
4	+5V
5	+5V
6	GND
7	GND
8	Backlight_EN (Voltage level Select by JP3)
9	Backlight_ADJ (Voltage level Select by JP3)
10	GND



JP3: BL_EN Level SELECT

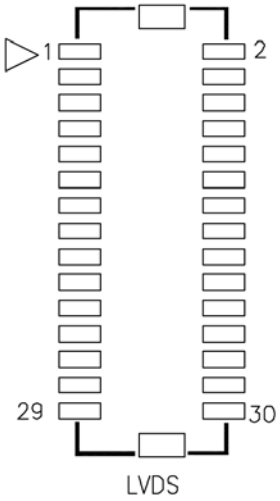
JUMPER	FUNCTION DESCRIPTION	SETTING
5-3	5V	
1-3	3.3V	
Default setting is 1-3		

JP3: BL_ADJ MODE SELECT

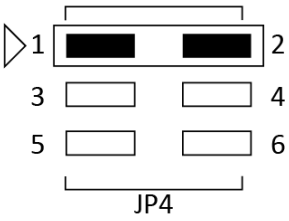
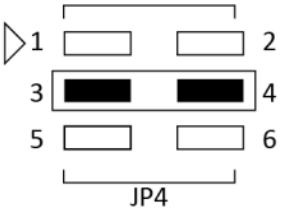
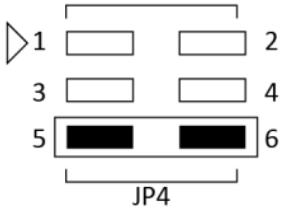
JUMPER	FUNCTION DESCRIPTION	SETTING
2-4	PWM mode	
6-4	DAC mode	
Default setting is 2-4		

LVDS: LVDS connector

PIN	DEFINITION	PIN	DEFINITION
1	LVDS1_CLK+	2	GND
3	LVDS1_CLK-	4	LVDS0_D3+
5	GND	6	LVDS0_D3-
7	LVDS1_D3+	8	GND
9	LVDS1_D3-	10	LVDS0_CLK+
11	LVDS1_D2+	12	LVDS0_CLK-
13	LVDS1_D2-	14	GND
15	LVDS1_D1+	16	LVDS0_D2+
17	LVDS1_D1-	18	LVDS0_D2-
19	LVDS1_D0+	20	LVDS0_D1+
21	LVDS1_D0-	22	LVDS0_D1-
23	GND	24	LVDS0_D0+
25	LVDS0_DDC_SC	26	LVDS0_D0-
27	LVDS0_DDC_SD	28	GND
29	+VDD_LVDS (Define by JP4)	30	+VDD_LVDS (Define by JP4)

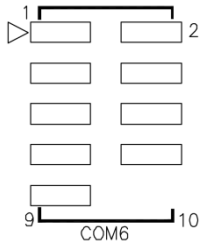


JP4: LVDS_VDD power select

Jumper	Function description	Setting
1-2	+5V	
3-4	+3.3V	
5-6	+12V	
Default setting is 1-2		

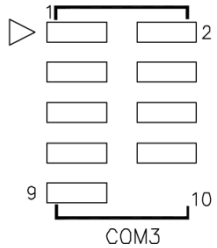
COM6: RS232

Pin	Definition	Pin	Definition
1	COM6_DCD-	2	COM6_RXD
3	COM6_TXD	4	COM6_DTR-
5	GND	6	COM6_DSR-
7	COM6_RTS-	8	COM6_CTS-
9	COM6RI-		



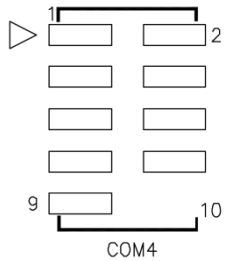
COM3: RS232

Pin	Definition	Pin	Definition
1	COM3_DCD-	2	COM3_RXD
3	COM3_TXD	4	COM3_DTR-
5	GND	6	COM3_DSR-
7	COM3_RTS-	8	COM3_CTS-
9	COM3_RI-		



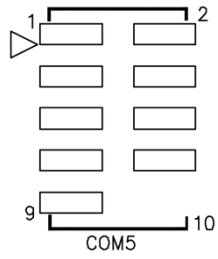
COM4: RS232

Pin	Definition	Pin	Definition
1	COM4_DCD-	2	COM4_RXD
3	COM4_TXD	4	COM4_DTR-
5	GND	6	COM4_DSR-
7	COM4_RTS-	8	COM4_CTS-
9	COM4_RI-		



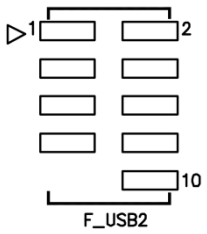
COM5: RS232

Pin	Definition	Pin	Definition
1	COM5_DCD-	2	COM5_RXD
3	COM5_TXD	4	COM5_DTR-
5	GND	6	COM5_DSR-
7	COM5_RTS-	8	COM5_CTS-
9	COM5_RI-		



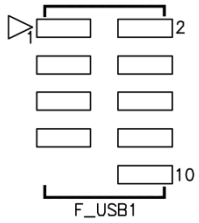
F_USB2: USB2.0 port 2,3 pin header

Pin	Definition	Pin	Definition
1	+5VDUAL	2	+5VDUAL
3	-FUSBP9	4	-FUSBP8
5	+FUSBP9	6	+FUSBP8
7	GND	8	GND
9		10	GND



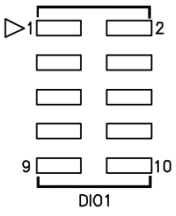
F_USB1: USB2.0 port 0,1 pin header

Pin	Definition	Pin	Definition
1	+5VDUAL	2	+5VDUAL
3	-FUSBP5	4	-FUSBP4
5	+FUSBP5	6	+FUSBP4
7	GND	8	GND
9		10	GND

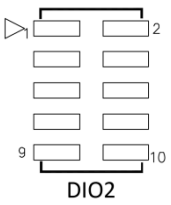


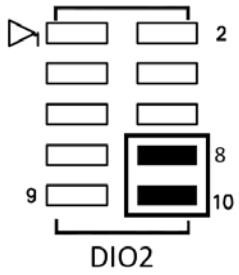
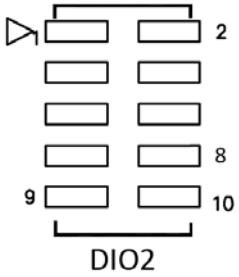
DIO1: Digital input/output pin header

Pin	Definition	PCH	Pin	Definition	PCH
1	SBDO0	GPIO21	2	SBDI0	GPIO6
3	SBDO1	GPIO38	4	SBDI1	GPIO7
5	SBDO2	GPIO36	6	SBDI2	GPIO68
7	SBDO3	GPIO37	8	SBDI3	GPIO69
9	+5V		10	GND	

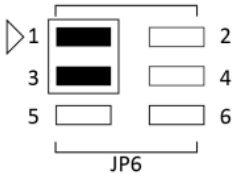
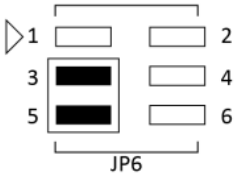


DIO2: Digital input/output pin header

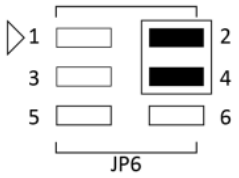
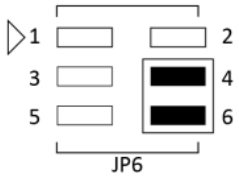
Pin	Definition	PCH	Pin	Definition	PCH	
1	SBDO4	GPIO16	2	SBDI4	GPIO70	
3	SBDO5	GPIO49	4	SBDI5	GPIO71	
5	SBDO6	GPIO17	6	SBDI6	GPIO22	
7	SBDO7	GPIO1	8	SBDI7	GPIO35	
9	+5V		10	GND		

**the alternative DVI-D/LVDS display is by short PIN8-10 (jumper*4pcs are enclosed in the package)	
Short: LVDS 	Open: DVI-D (Default setting) 

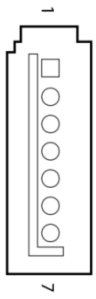
JP6: DIO1_PWR Level SELECT

Jumper	Function description	Setting
3-1	3.3V	
3-5	5V	
Default setting is 3-1		

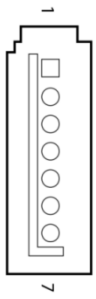
JP6: DIO2_PWR Level SELECT

Jumper	Function description	Setting
4-2	3.3V	
4-6	5V	
Default setting is 4-2		

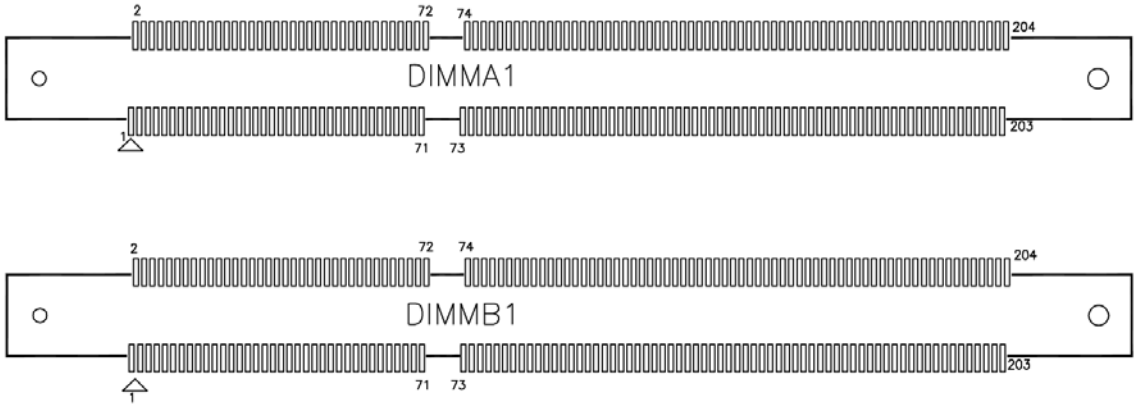
SATA1, SATA2: Serial ATA 3.0 Connector

Pin	Definition	
1	GND	
2	TXP	
3	TXN	
4	GND	
5	RXN	
6	RXP	
7	GND	

SATA3, SATA4: Serial ATA 2.0 Connector

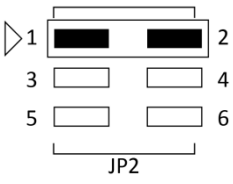
Pin	Definition	
1	GND	
2	TXP	
3	TXN	
4	GND	
5	RXN	
6	RXP	
7	GND	

DIMMA1, DIMMB1: DDR3 SO-DIMM connector



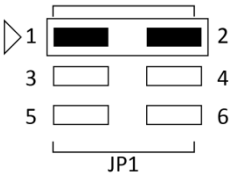
JP2: COM2 +12V/+5V selection

Pin	Definition	Pin	Definition
1	COM2_RI-	2	COM2P9SEL
3	+5V	4	COM2P9SEL
5	+12V	6	COM2P9SEL



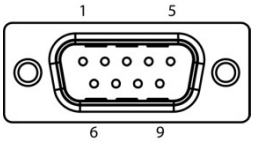
JP1: COM1 +12V/+5V selection

Pin	Definition	Pin	Definition
1	COM1_RI-	2	COM1P9SEL
3	+5V	4	COM1P9SEL
5	+12V	6	COM1P9SEL



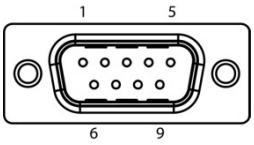
COM1: RS232/422/485 with +12V/+5V selection

Pin	RS-232	RS-422	Half Duplex RS-485
1	COM1_DCD-	TX-	DATA-
2	COM1_SIN	RX+	NA
3	COM1_SOUT	TX+	DATA+
4	COM1_DTR-	RX-	NA
5	GND	GND	GND
6	COM1_DSR-	NA	NA
7	COM1_RTS-	NA	NA
8	COM1_CTS-	NA	NA
9	COM1P9SEL (Define by JP1)	COM1P9SEL (Define by JP1)	COM1P9SEL (Define by JP1)



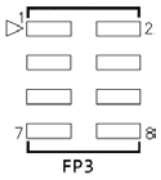
COM2: RS232/422/485 with +12V/+5V selection

Pin	RS-232	RS-422	Half Duplex RS-485
1	COM2_DCD-	TX-	DATA-
2	COM2_SIN	RX+	NA
3	COM2_SOUT	TX+	DATA+
4	COM2_DTR-	RX-	NA
5	GND	GND	GND
6	COM2_DSR-	NA	NA
7	COM2_RTS-	NA	NA
8	COM2_CTS-	NA	NA
9	COM2P9SEL (Define by JP2)	COM2P9SEL (Define by JP2)	COM2P9SEL (Define by JP2)



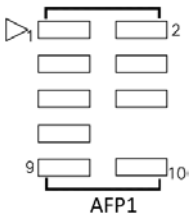
FP3: FRONT LAN LED

Pin	Definition	Pin	Definition
1	VCC3_DSW	2	+V3.3M_LAN2
3	-LAN1_ACT_F	4	-LAN2_ACT_F
5	-LAN1_LINK1000_F	6	-LAN2_LINK1000_F
7	-LAN1_LINK100_F	8	-LAN2_LINK100_F



AFP1: LINE-OUT/MIC-IN

Pin	Definition	Pin	Definition
1	MIC2_L	2	AGND
3	MIC2_R	4	A_GPIO
5	LIN2_R	6	SRTN1
7	SENSE_B	8	
9	LIN2_L	10	SRTN2

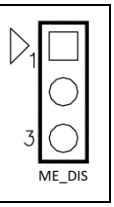


JCASE1: Case Open Warning

Pin	Definition
1	-INTRUDER
2	GND

ME_DIS: Flash Descriptor Security Overide/ Intel ME Debug Mode

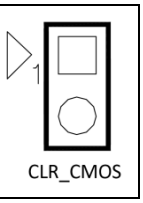
Pin	Definition
1	NC
2	HDA_SDOUT
3	VCC3_DSW



Flash Descriptor Security Overide/Intel ME Debug Mode	
HDA_SDOUT	Low = Default
	High = Enable

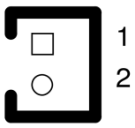
CLR_CMOS: RTC Reset

Pin	Definition
1	-RTCRST
2	GND

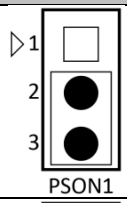
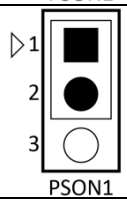


BAT1: RTC battery connector

Pin	Definition
1	GND
2	+3.3V

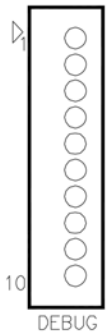


PSON1: ATX/AT mode

Jumper	Function description	Setting
2 - 3	ATX Mode	
1 - 2	AT Mode	
Default setting is 1-2		

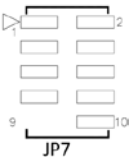
DEBUG: Debug card connector

PIN	DEFINITION
1	DB_CLK33
2	-RST_DB
3	-LFRAME
4	LAD3
5	LAD2
6	LAD1
7	LAD0
8	+3.3V
9	GND
10	GND

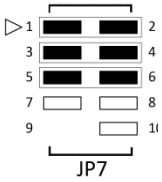
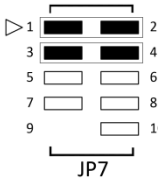
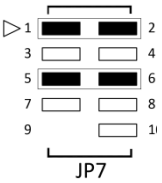
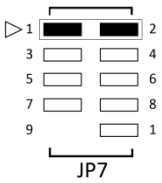
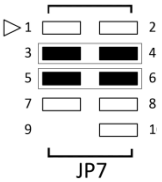
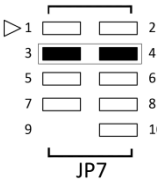
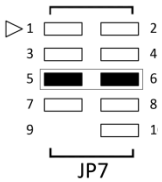
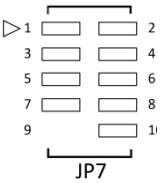


JP7: LVDS Panel selection

PIN	DEFINITION	PIN	DEFINITION
1	7511_GPIO2	2	GND
3	7511_GPIO1	4	GND
5	7511_GPIO0	6	GND
7	BLUP_R	8	BLDN_R
9		10	GND



JP7: LVDS Panel selection jumper setting

Jumper	Resolution		Setting
1-2 3-4 5-6	800x600	18-bit	
1-2 3-4	1024x768	18-bit	
1-2 5-6	1024x768	24-bit	
1-2	1280x800	18-bit	
3-4 5-6	1280x1024	24-bit	
3-4	1366x768	24-bit	
5-6	1440x900	24-bit	
	1920x1080	24-bit	
Default: 1920x1080			

Chapter 3: AMI BIOS UTILITY

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMI BIOS setup utility.

3.1 Starting

To enter the setup screens, perform the following steps:

- Turn on the computer and press the <Del> key immediately.
- After the <Del> key is pressed, the main BIOS setup menu displays. Other setup screens can be accessed from the main BIOS setup menu, such as the Chipset and Power menus.

3.2 Navigation Keys

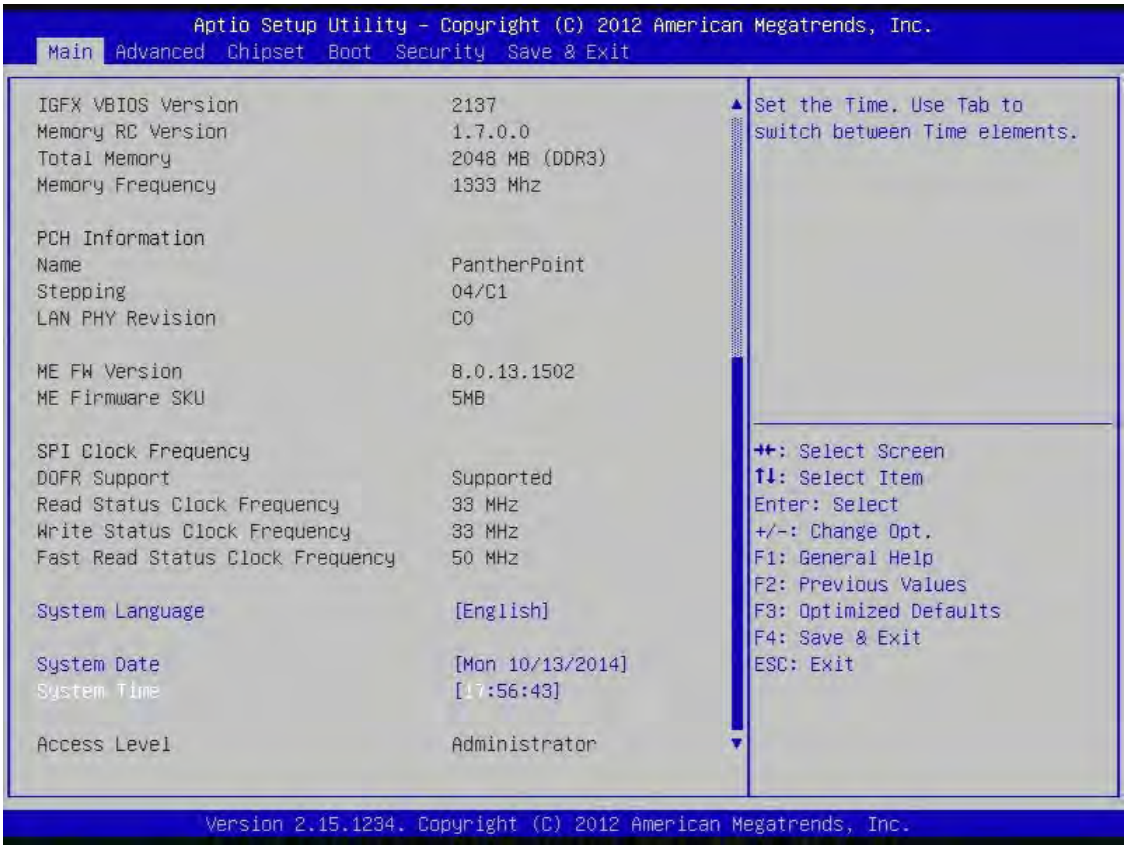
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.
Some of the hot keys are <F1>, <F10>, <Enter>, <ESC>, and <Arrow> keys.

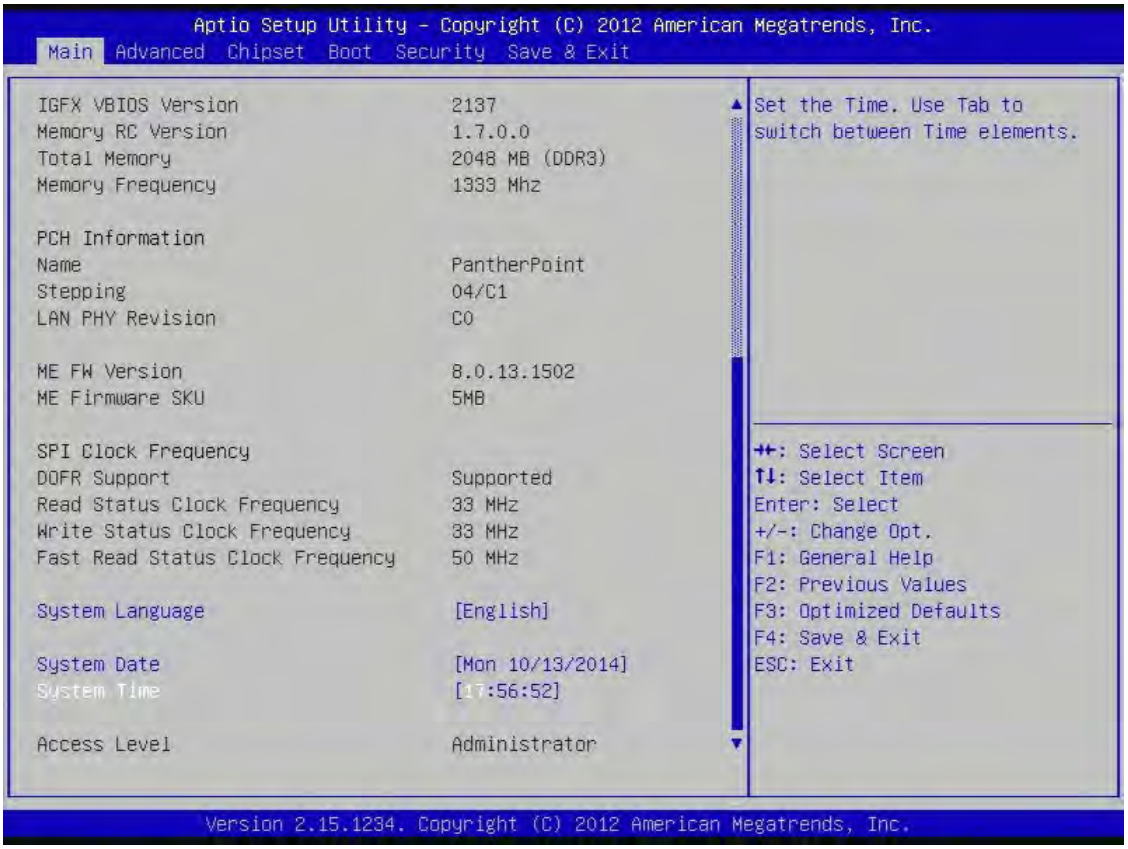
Some of the navigation keys may differ from one screen to another.

Left/Right	The Left and Right <Arrow> keys moves the cursor to select a menu.
Up/Down	The Up and Down <Arrow> keys moves the cursor to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys changes the field value of a particular setup setting.
Tab	The <Tab> key selects the setup fields.
F1	The <F1> key displays the General Help screen.
F10	The <F10> key saves any changes made and exits the BIOS setup utility.
Esc	The <Esc> key discards any changes made and exits the BIOS setup utility.
Enter	The <Enter> key displays a sub-screen or changes a selected or highlighted option in each menu.

3.3 Main Menu

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.





System Language

Use this function to select the system language.

System Date

Use this function to change the system date.

Select System Date using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

The date setting must be entered in MM/DD/YY format.

System Time

Use this function to change the system time.

Select System Time using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

The time setting is entered in HH:MM:SS format.

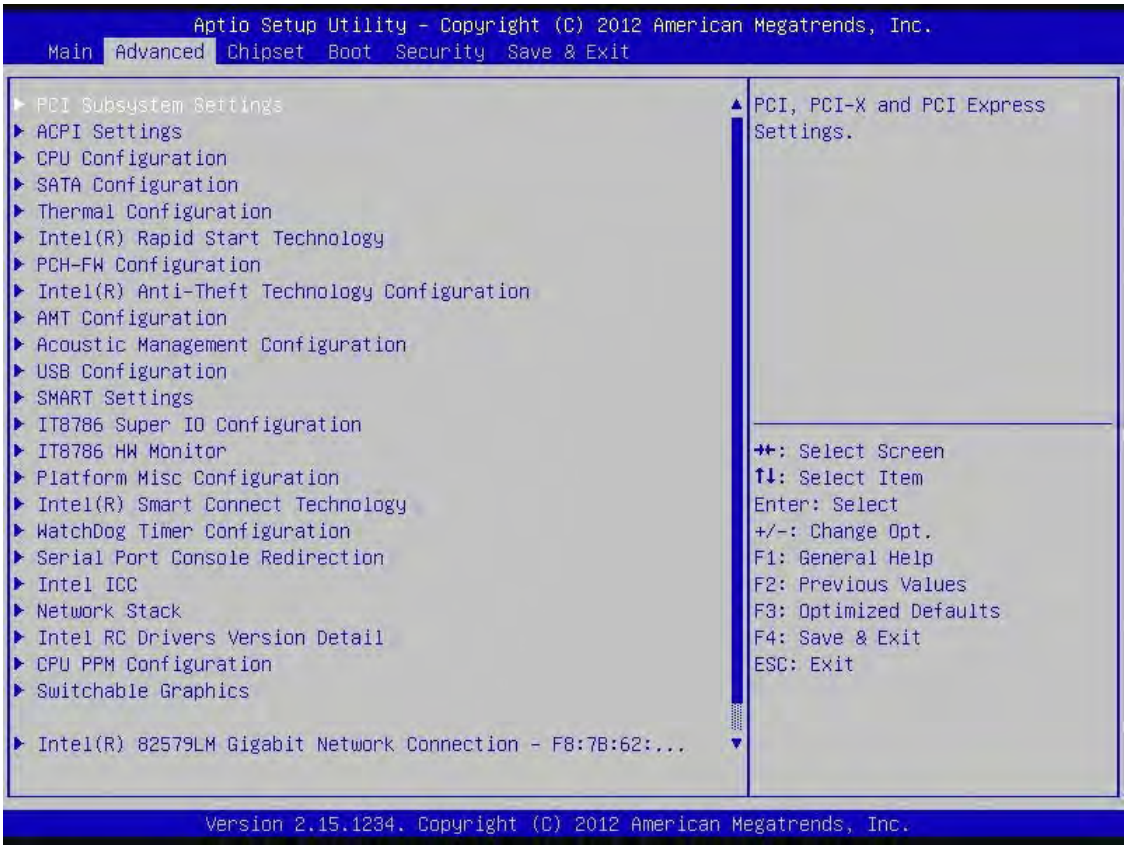
Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

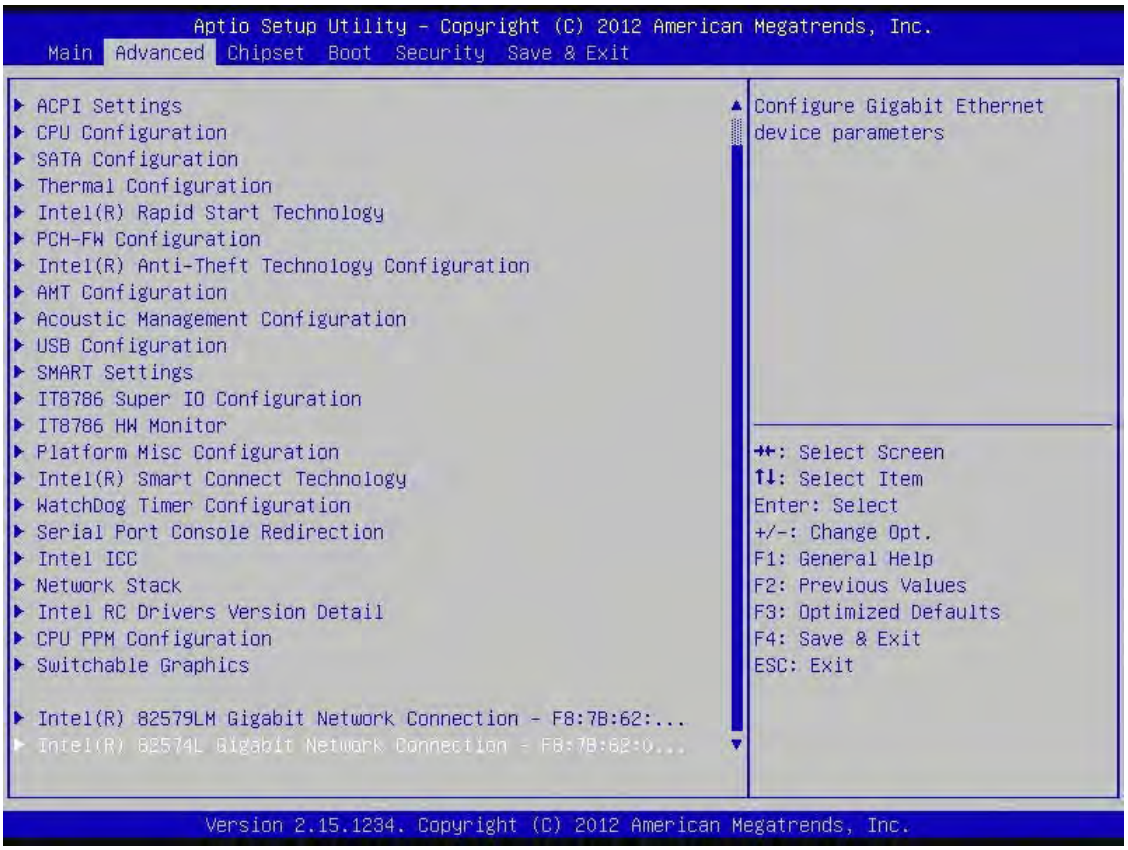
Access Level

Displays the access level of the current user in the BIOS.

3.4 Advanced Menu

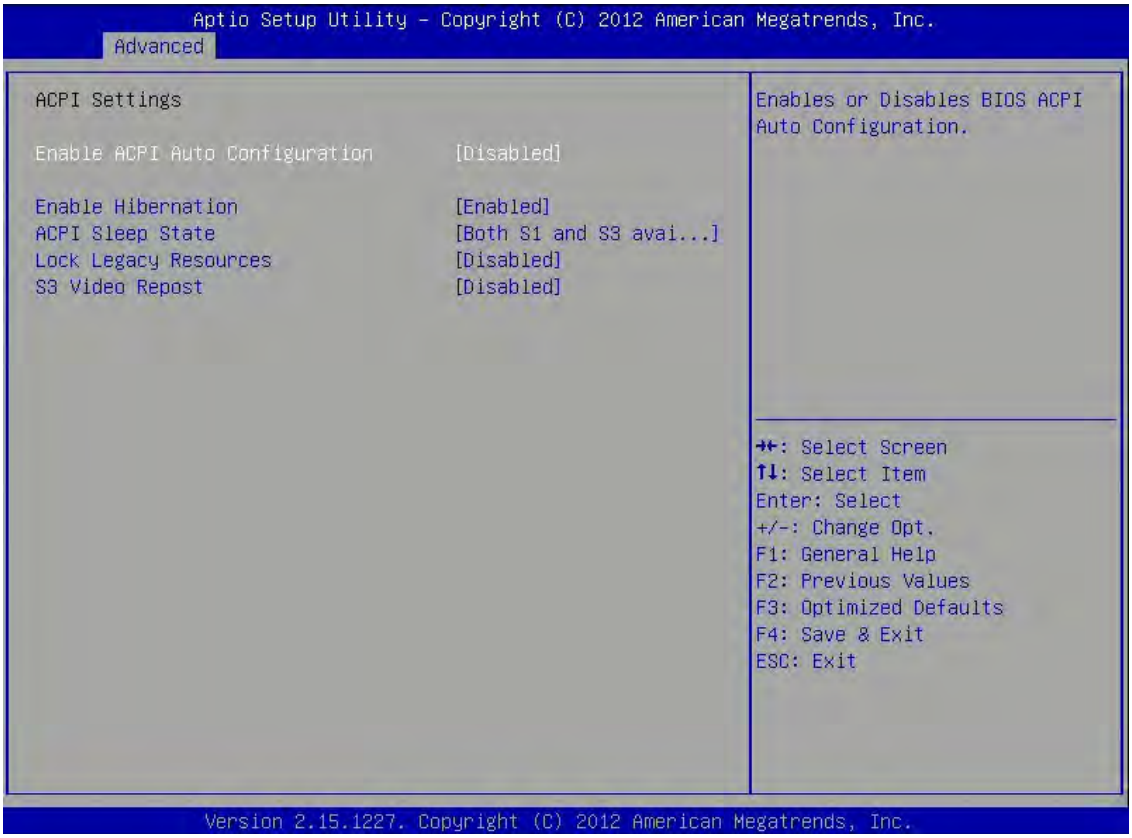
The Advanced Menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference. ***Setting incorrect field values may cause the system to malfunction.***





3.4.1 ACPI Settings

System ACPI parameters



Enable ACPI Auto Configuration

Enables or disables BIOS ACPI auto configuration. The options are disabled, enabled.

Enable Hibernation

Enables or disables system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some OS. The options are disabled, enabled.

ACPI Sleep State

Select the ACPI sleep state the system will enter when the suspend button is pressed. The options are suspend disabled, S1 only (CPU stop clock), S3 only (suspend to RMA), Both S1 and S3 available for OS to choose from.

Lock Legacy Resources

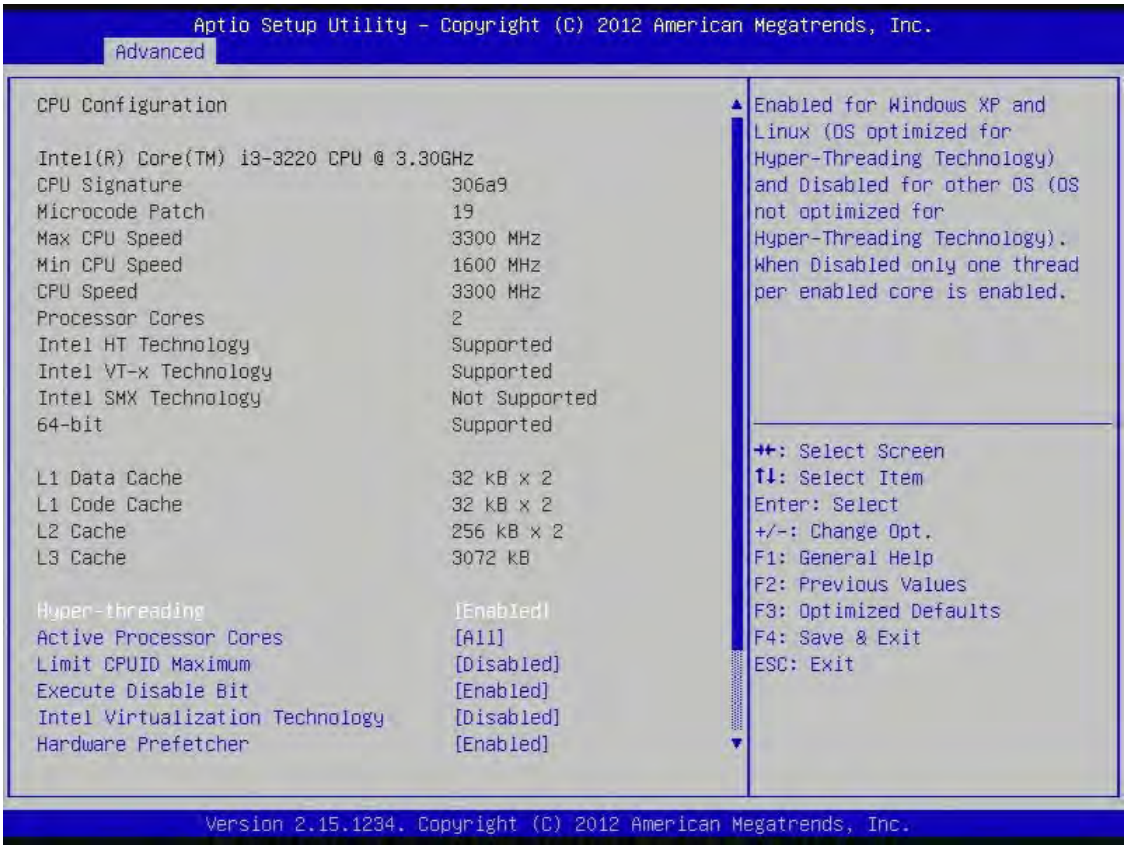
Enables or Disables System Lock of Legacy Resources. The options are disabled, enabled.

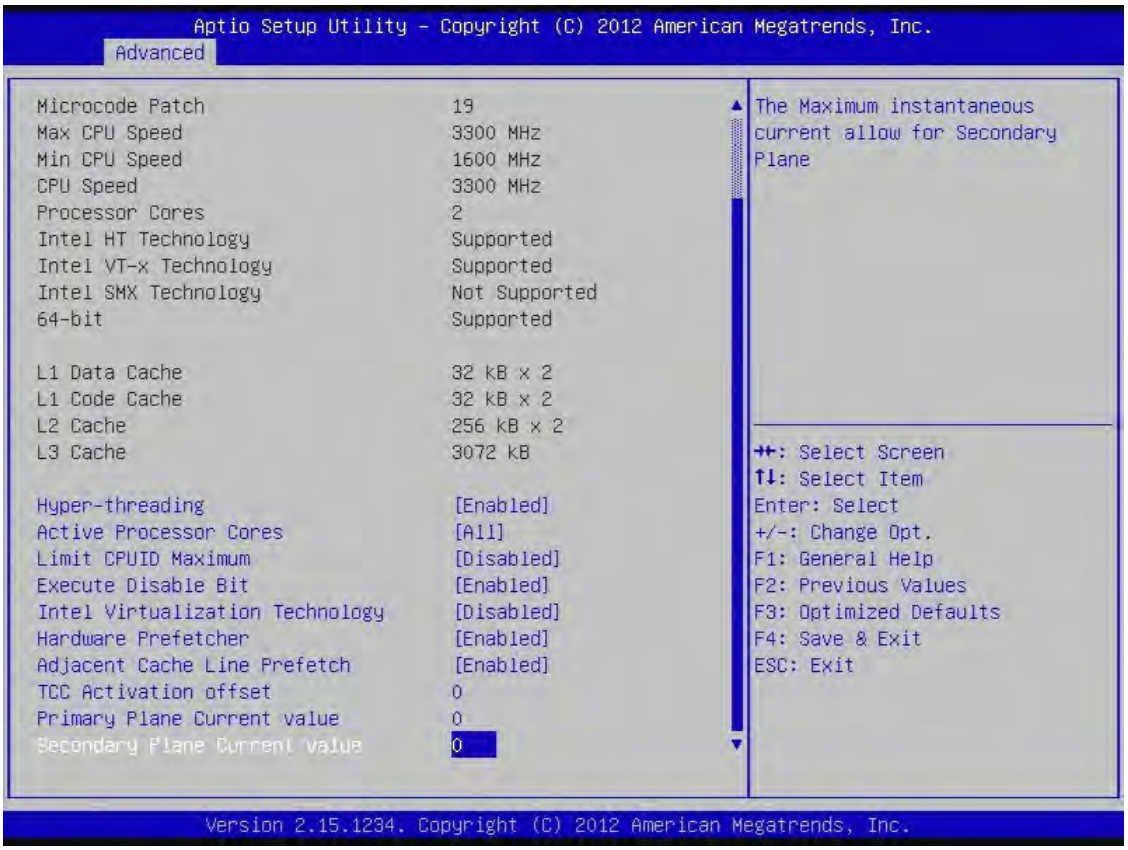
S3 Video Repost

Enable or disable S3 Video Repost. The options are disabled, enabled.

3.4.2 CPU Configuration

CPU configuration parameters





Hyper-threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When disabled only one thread per enabled core is enabled.

Active Processor Cores

Number of cores to enable in each processor package.

Limit CPUID Maximum

Disabled for Windows XP.

Execute Disable Bit

XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Sever 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.). The options are disabled, enabled.

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hardware Prefetcher

To turn on/off the Mid Level Cache (L2) streamer prefectcher

Adjacent Cache Line Prefetche

To turn on/off prefectching of adjacent cache lines

TCC Activation Offset

Offset from the factory TCC activation temperature

Primary Plane Current Value

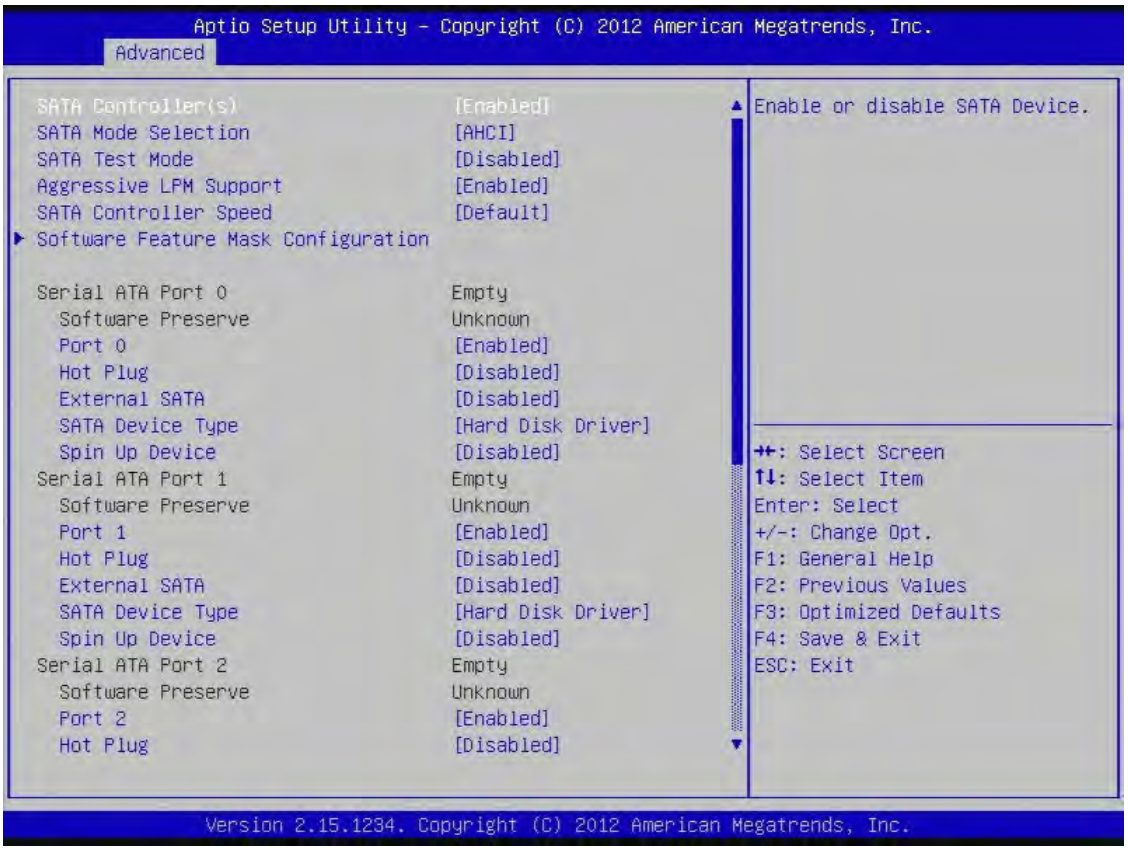
The Maximum instantaneous current allow for primary plane

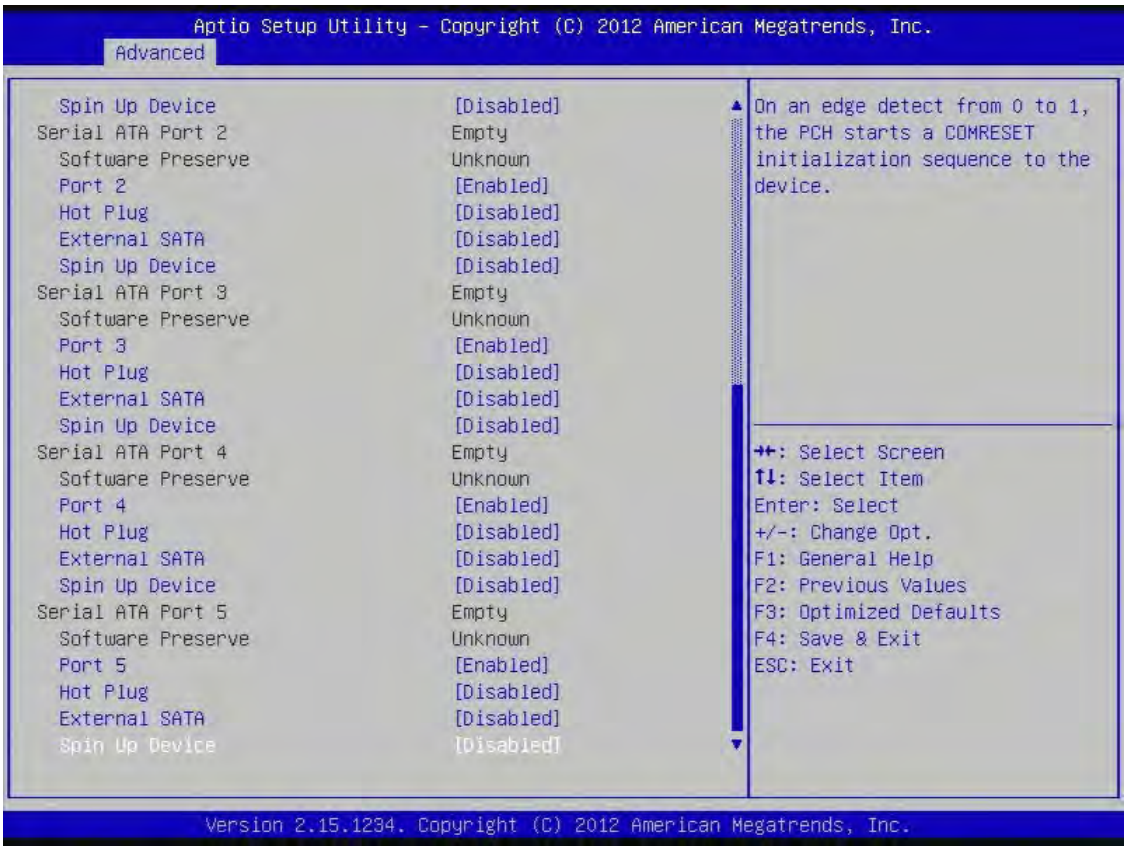
Secondary Plane Current Value

The Maximum instantaneous current allow for secondary plane

3.4.3 SATA Configuration

SATA device option settings





SATA Controller(s)

Enable or disable SATA device.

SATA Mode Selection

Determines how SATA controller(s) operate.

SATA Test Mode

Enable or Disable Test Mode.

Aggressive LPM Support

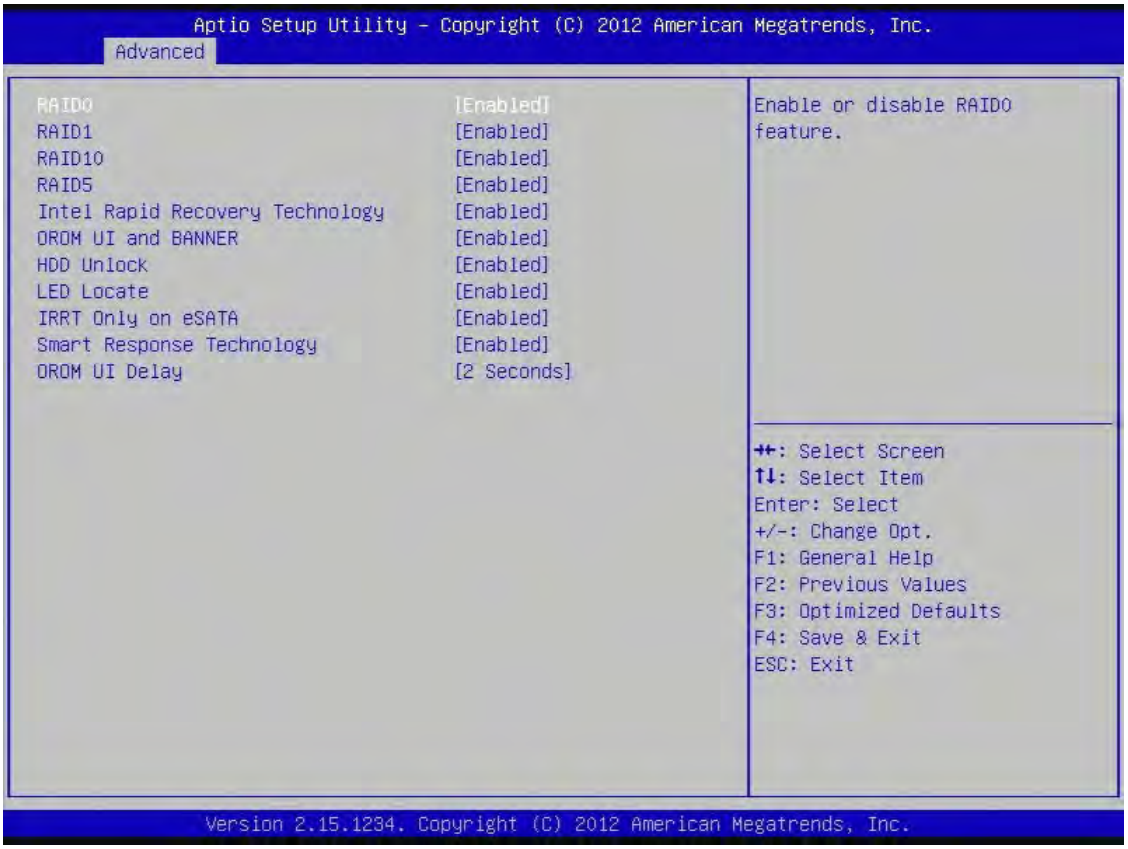
Enable PCH to aggressively enter link power state.

SATA Controller Speed

Indicates the maximum speed the SATA controller can support.

Software Feature Mask Configuration

RAID OROM/RST driver will refer to the SWFM configuration to enable or disable the storage features.



RAID0,1,10,5: enable or disable RAID0,1,10,5 feature

Intel Rapid Recovery Technology: enable or disable Intel Rapid Recovery technology.

OROM UI and BANNER: if enabled, the OROM UI is shown. Otherwise, no OROM banner or information will be displayed if all disks and RAID0 volumes are normal

HDD unlock: if enabled, indicates that the HDD password unlock in the OS is enabled.

LED Locate: If enabled, indicates that the LED/SGPIO hardware is attached and ping to locate feature is enabled on the OS.

IRRT Only on eSATA: if enabled, then only IRRT volumes can span internal and eSATA drivers. If disabled, then any RAID volume can span internal and eSATA drivers

SMART Response Technology: enable or disable Smart response technology

OROM UI Delay: If enabled, indicates the delay of the OROM UI Splash Screen in a normal status

Serial ATA Port 0

Port0: Enable or Disable SATA port

Hot Plug: Designates this port as Hot Pluggable.

External SATA: External SATA Support.

SATA Device Type: Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

Spin Up Device: On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

Serial ATA Port 1

Port1: Enable or Disable SATA port

Hot Plug: Designates this port as Hot Pluggable.

External SATA: External SATA Support.

SATA Device Type: Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

Spin Up Device: On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

Serial ATA Port 2

Port2: Enable or Disable SATA port

Hot Plug: Designates this port as Hot Pluggable.

External SATA: External SATA Support.

SATA Device Type: Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

Spin Up Device: On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

Serial ATA Port 3

Port3: Enable or Disable SATA port

Hot Plug: Designates this port as Hot Pluggable.

External SATA: External SATA Support.

SATA Device Type: Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

Spin Up Device: On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

Serial ATA Port 4

Port4: Enable or Disable SATA port

Hot Plug: Designates this port as Hot Pluggable.

External SATA: External SATA Support.

SATA Device Type: Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

Spin Up Device: On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

Serial ATA Port 5

Port5: Enable or Disable SATA port

Hot Plug: Designates this port as Hot Pluggable.

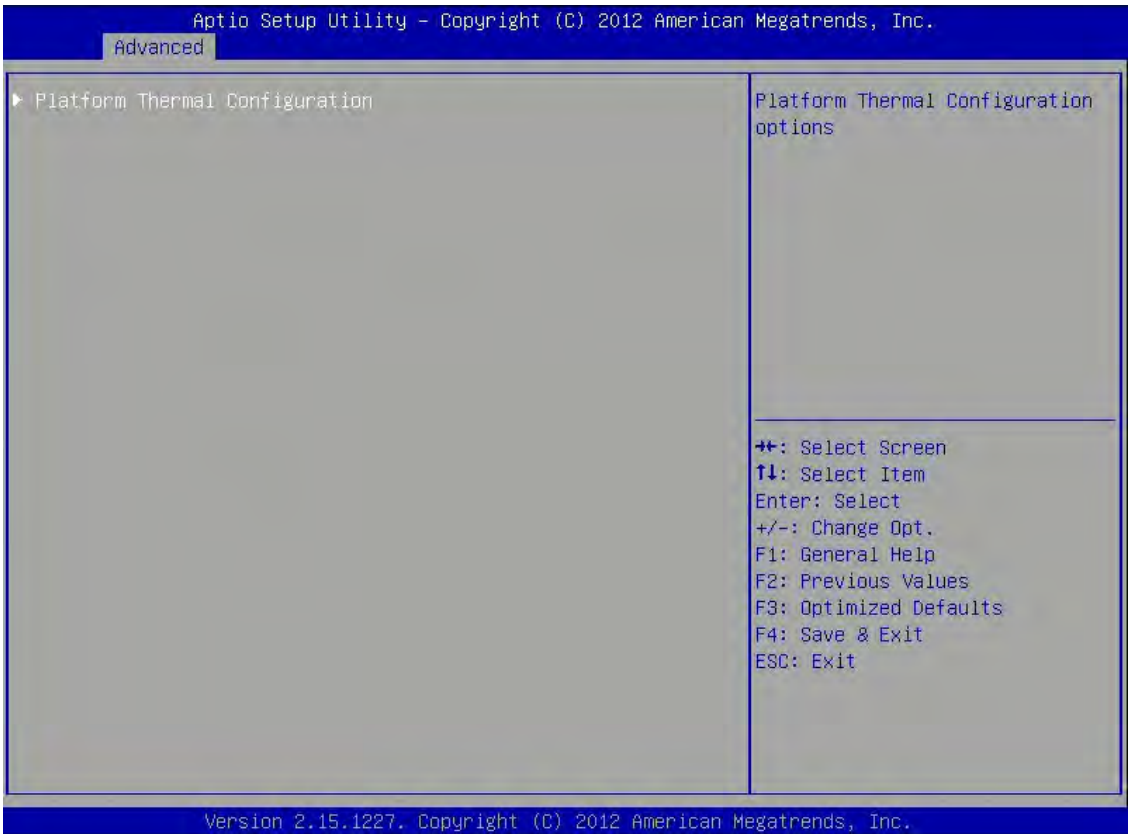
External SATA: External SATA Support.

SATA Device Type: Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

Spin Up Device: On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

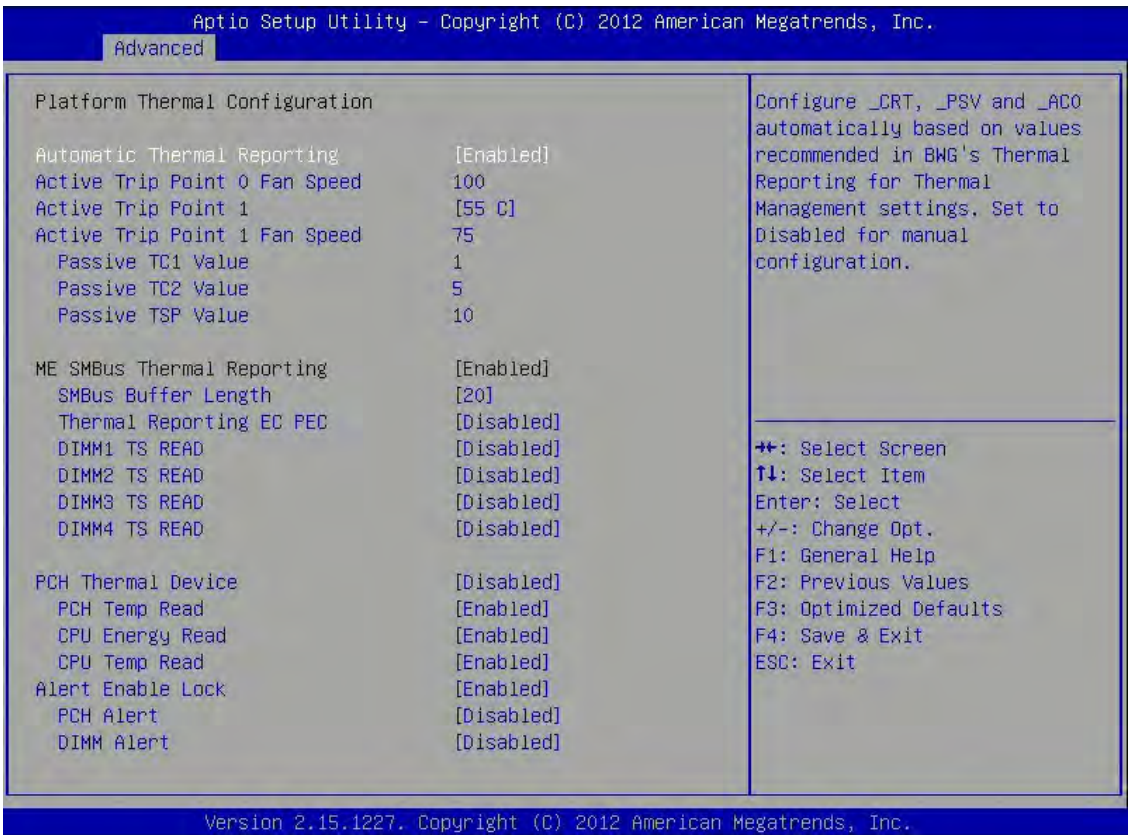
3.4.4 Thermal Configuration

Thermal configuration parameters



Platform Thermal Configuration

Platform thermal configuration option



Platform Thermal Configuration

Automatic Thermal Reporting: Configure _CRT, _PSV and _AC0 automatically based on values recommended in BWG's Thermal Reporting for Thermal Management settings. Set to Disabled for manual configuration.

Active Trip Point 0 Fan Speed: Active Trip Point 0 Fan Speed in percentage. Value must between 0 (Fan off) – 100 (Max fan speed). This is the speed at which fan will run when Active Trip Point 0 is crossed.

Active Trip Point 1: This value controls the temperature of the ACPI Active Trip Point 1 – the point in which the OS will turn the processor fan on Active Trip Point 1 Fan Speed.

Active Trip Point 1 Fan Speed: Active Trip Point 1 Fan Speed in Percentage. Value must between 0 (Fan off) – 100 (Max fan speed). This value must be less than Active Trip Point 0 Fan speed. This is the speed at which fan will run when Active Trip 1 is crossed.

Passive TC1 Value: This value sets the TC1 value for the ACPI Passive Cooling Formula. Range 1 - 16.

Passive TC2 Value: This value sets the TC2 value for the ACPI Passive Cooling Formula. Range 1 - 16.

Passive TSP Value: This item sets the TSP value for the ACPI Passive Cooling Formula. It represents in tenths of a second how often the OS will read the temperature when passive cooling is enabled. Range 2 – 32.

ME SMBus Thermal Reporting

SMBus Buffer Length: SMBus Block Read message length for EC.

Thermal Reporting EC PEC: Enable Packet Error Checking(PEC) for SMBus Block Read.

DIMM1 TS READ: DIMM1 Thermal Sensor Read Enable.

DIMM2 TS READ: DIMM2 Thermal Sensor Read Enable.

DIMM3 TS READ: DIMM3 Thermal Sensor Read Enable.

DIMM4 TS READ: DIMM4 Thermal Sensor Read Enable.

PCH Thermal Device: Enable or Disable PCH Thermal Device (D31:F6).

PCH Temp Read: PCH Temperature Read Enable.

CPU Energy Read: CPU Energy Read Enable.

CPU Temp Read: CPU Temperature Read Enable.

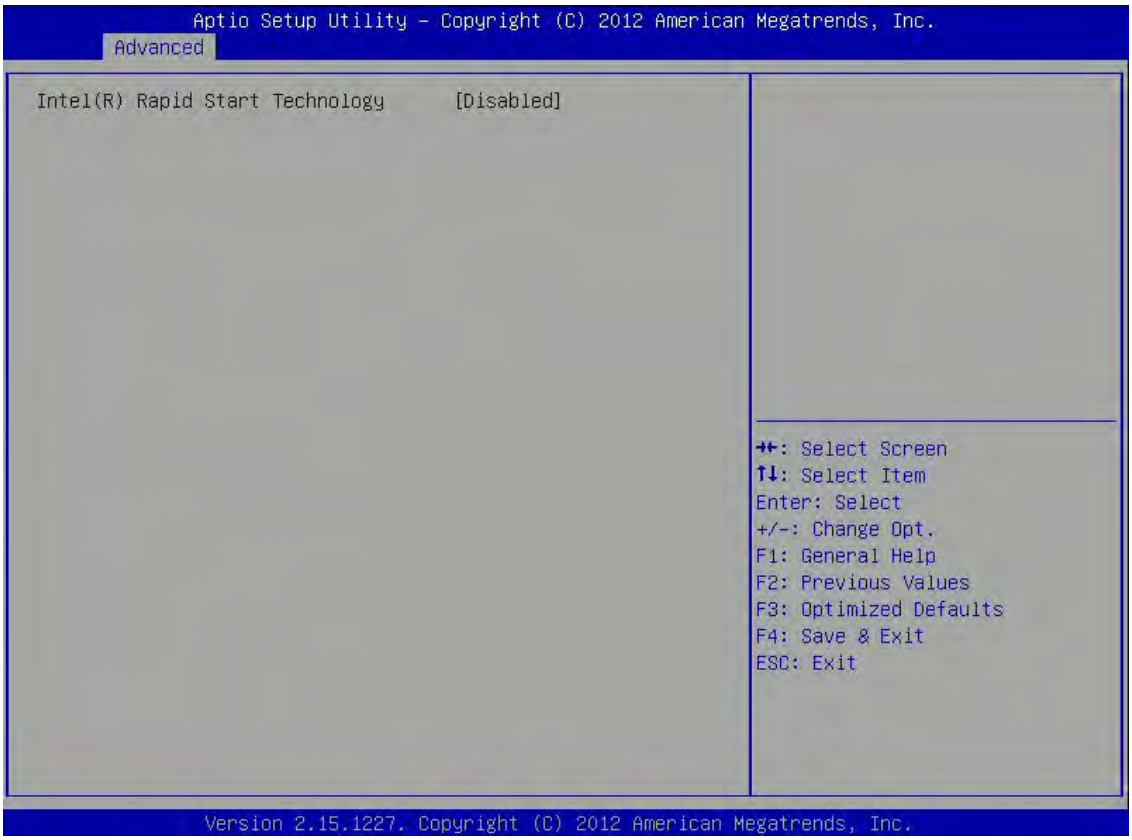
Alert Enable Lock: Lock all Alert Enable setting.

PCH Alert: PCH Alert pin enable.

DIMM Alert: DIMM Alert pin enable.

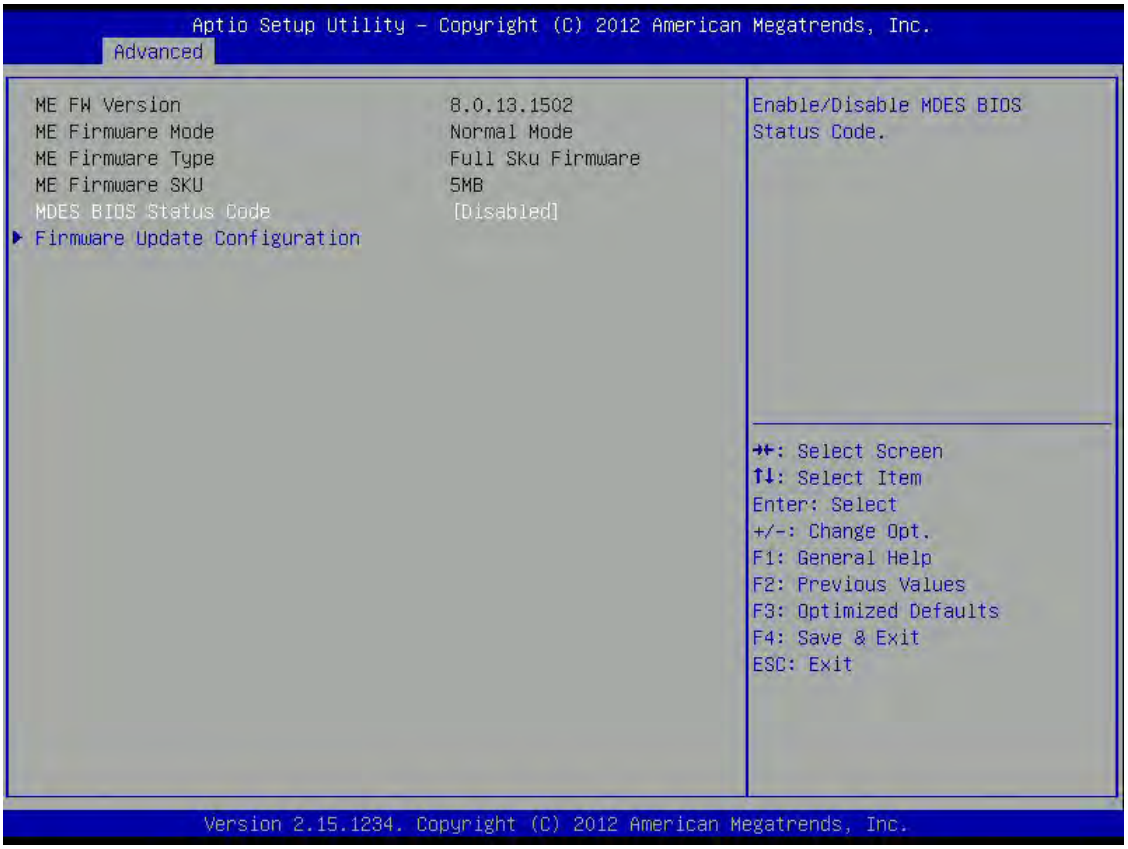
3.4.5 Intel Rapid Start Technology

Enable or disable Intel(R) Rapid Start Technology.



3.4.6 PCH-FW Configuration

Configure management engine technology parameters

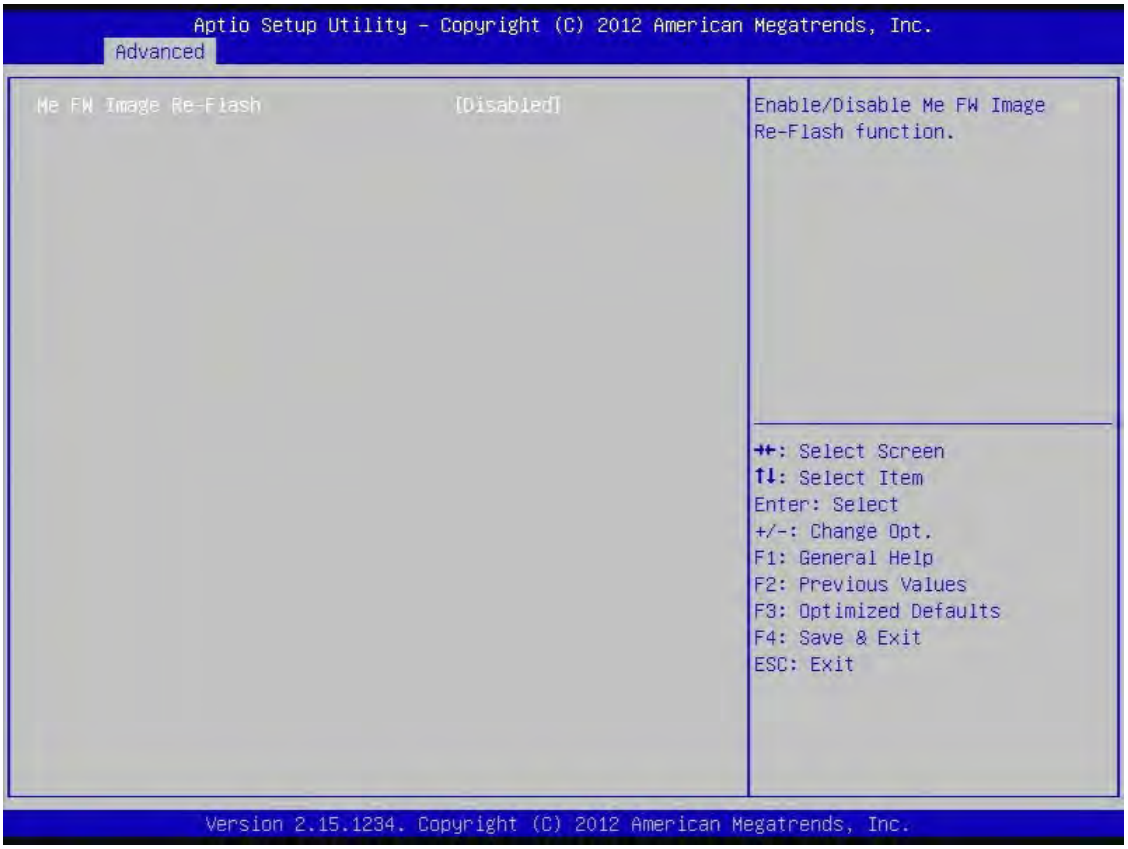


MDES BIOS Status Code

Enable/Disable MDES BIOS Status Code.

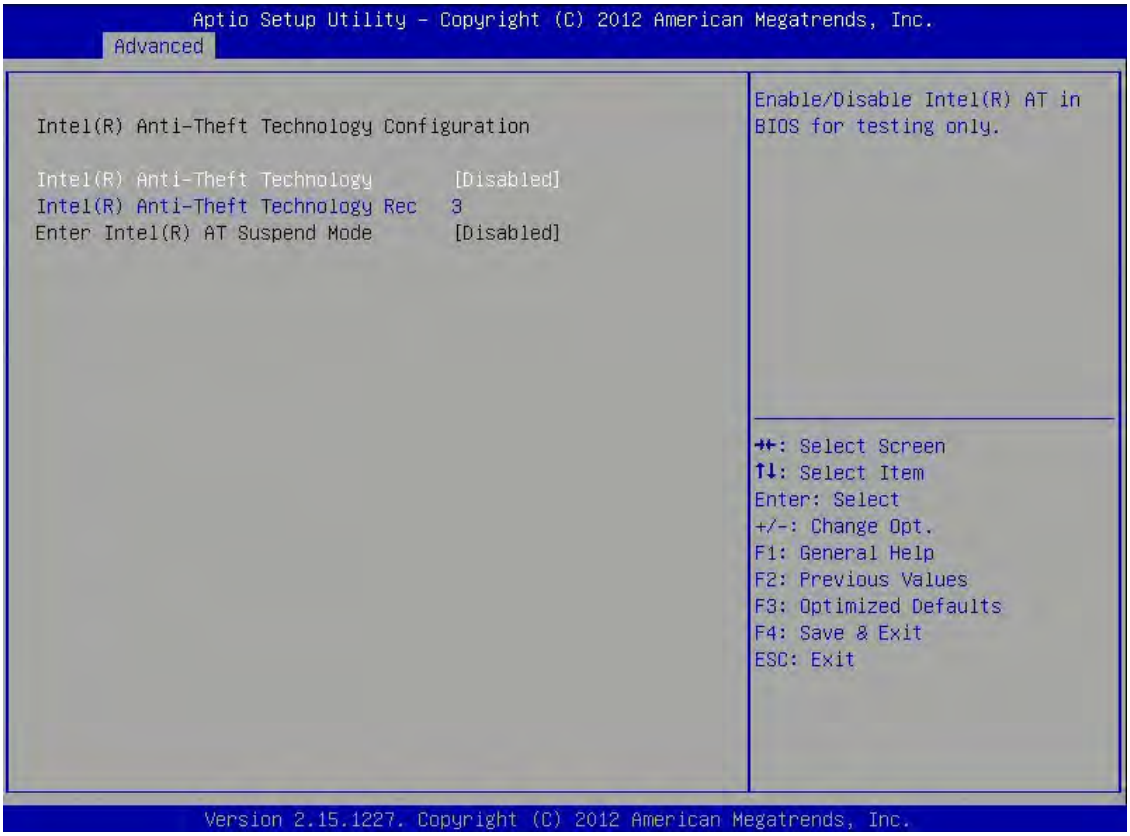
Firmware Update Configuration

ME FW Image Re-Flash: enable/disable ME FW image re-flash function



3.4.7 Intel Anti-Theft Technology Configuration

Disabling Intel AT allow user to login platform. This is strictly for testing only. This does not disable Intel AT services in ME.



Intel(R) Anti-Theft Technology

Enable or Disable Intel AT in BIOS for testing only

Intel(R) Anti-Theft Technology Rec

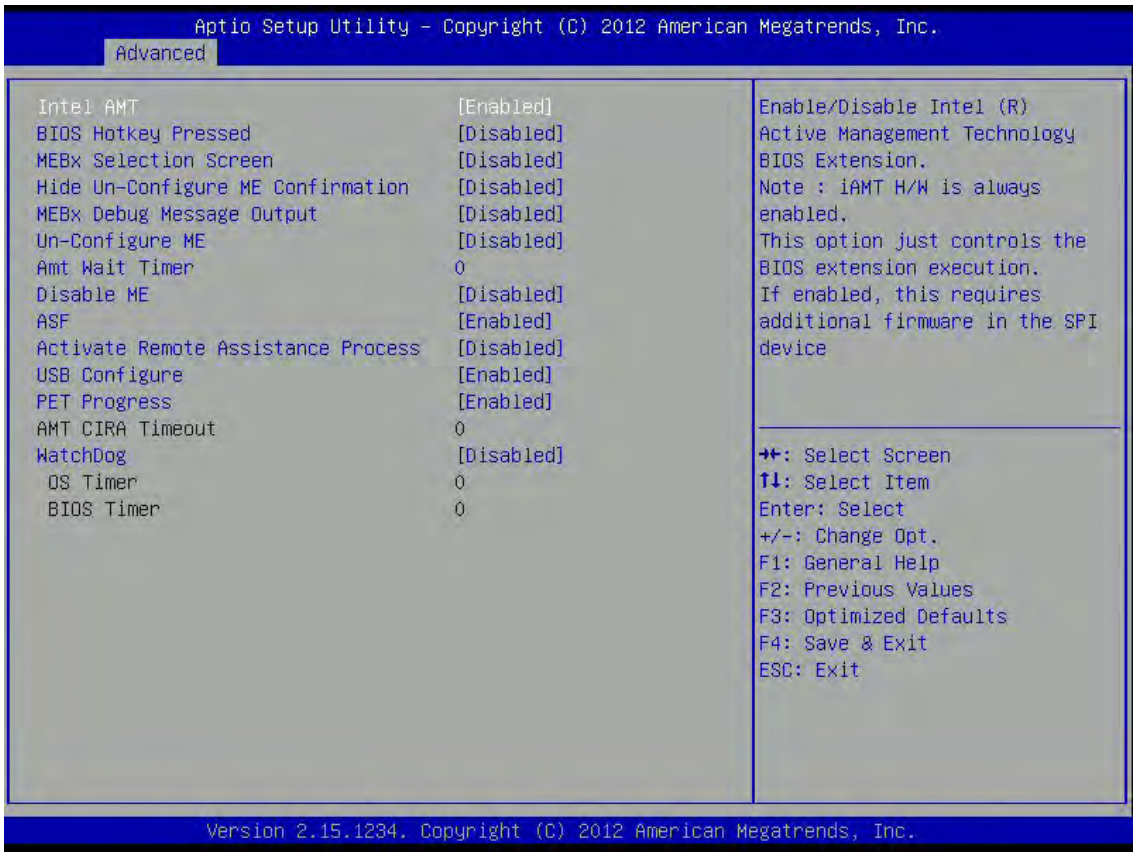
Set the number of times Recovery attemped will be allowed.

Enter Intel (R) AT Suspend Mode

Only disabled.

3.4.8 AMT Configuration

Configure active management technology parameters



Intel AMT

Enable/Disable Intel (R) Active Management Technology BIOS Extension.

Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.

BIOS Hotkey Pressed

OEMFlag Bit 1:

Enable/Disable BIOS hotkey press.

MEBx Selection Screen

OEMFlag Bit 2:

Enable/Disable MEBx selection screen.

Hide Un-configure ME Confirmation

OEMFlag Bit 6:

Hide Un-configure ME without password Confirmation Prompt.

MEBx Debug Message Output

OEMFlag Bit 14:

Enable MEBx debug message output.

Un-Configure ME

OEMFlag Bit 15:

Un-Configure ME without password.

AMT Wait Timer

Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

Disable ME

Set ME to Soft Temporary Disable.

ASF

Enable/Disable Alert Specification Format.

Activate Remote Assistance Process

Trigger CIRA boot.

USB Configure

Enable/Disable USB Configure function.

PET Progress

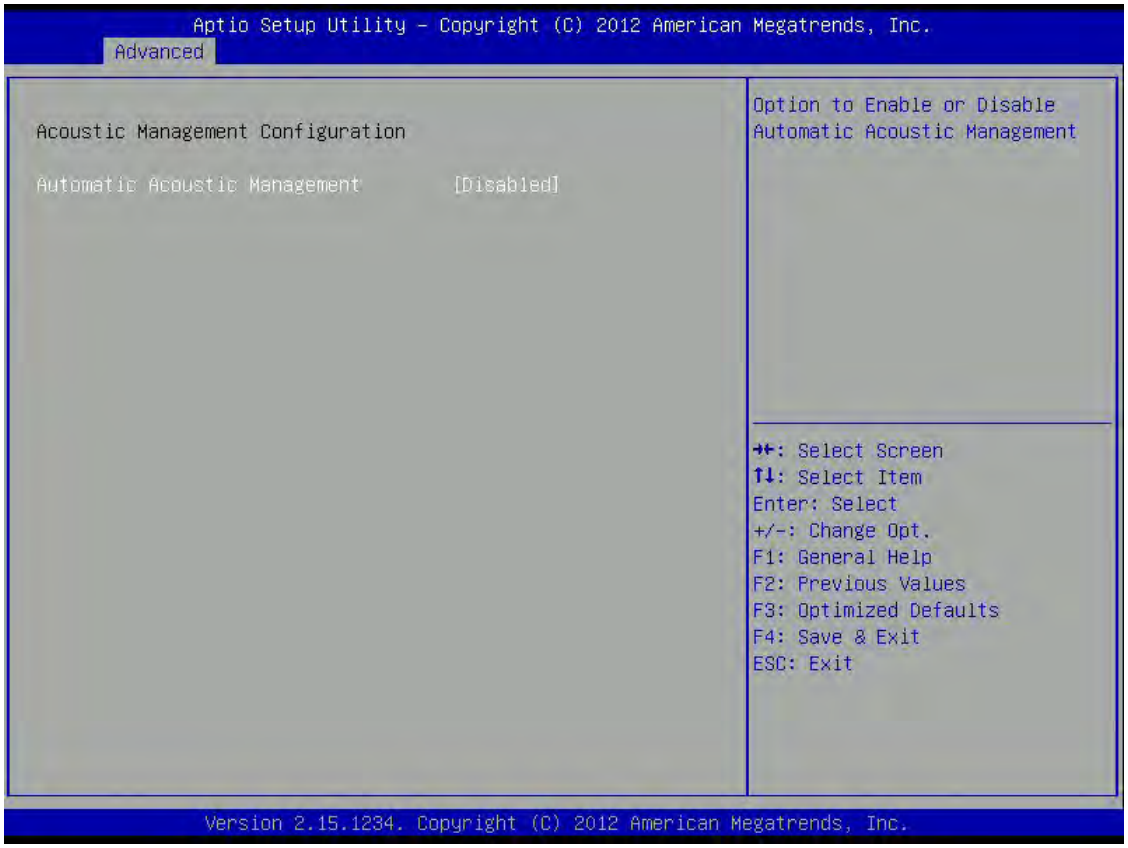
User can Enable/Disable PET Events progress to receive PET events or not.

WatchDog

Enable/Disable WatchDog Timer.

3.4.9 Acoustic Management Configuration

Menu for configuring automatic acoustic management

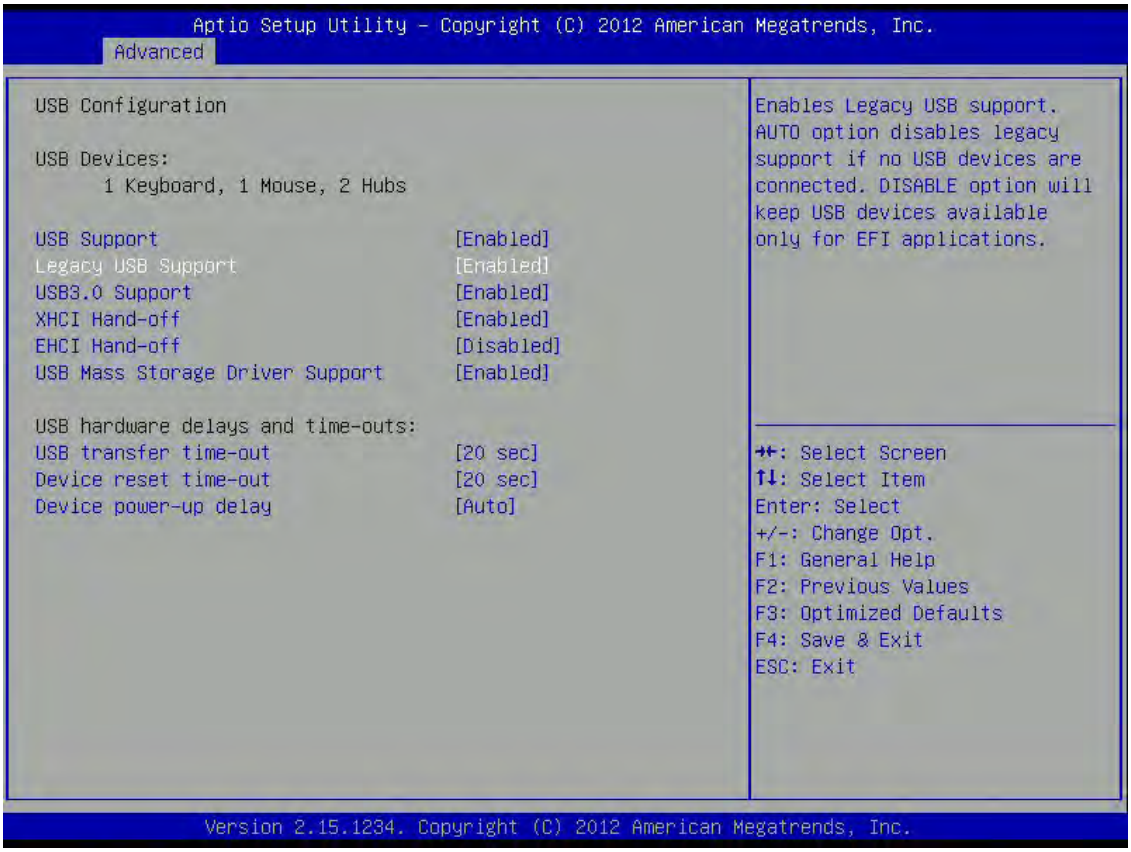


Automatic Acoustic Management

Option to Enable or Disable Automatic Acoustic Management.

3.4.10 USB Configuration

This section is used to configure the USB



USB configuration

USB Support: USB Support Parameters.

Legacy USB Support: Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

USB3.0 Support: Enable/Disable USB3.0 (XHCI) Controller support.

XHCI Hand-off: This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

EHCI Hand-off: This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

USB Mass Storage Driver Support: Enable/Disable USB Mass Storage Driver Support.

USB hardware delays and time-outs:

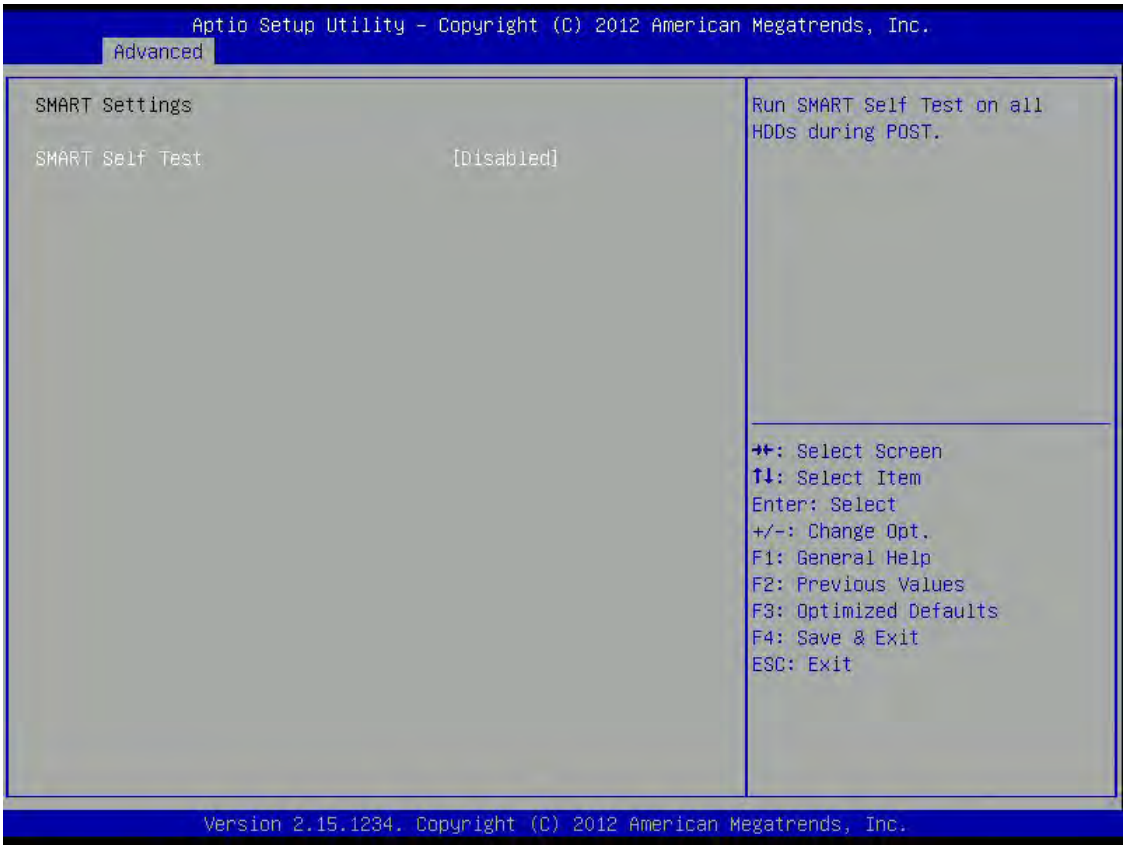
USB Transfer time-out: The time-out value for Control, Bulk, and Interrupt transfers.

Device reset time-out: USB mass Storage device start Unit command time-out.

Device power-up delay: Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

3.4.11 SMART Settings

System SMART settings

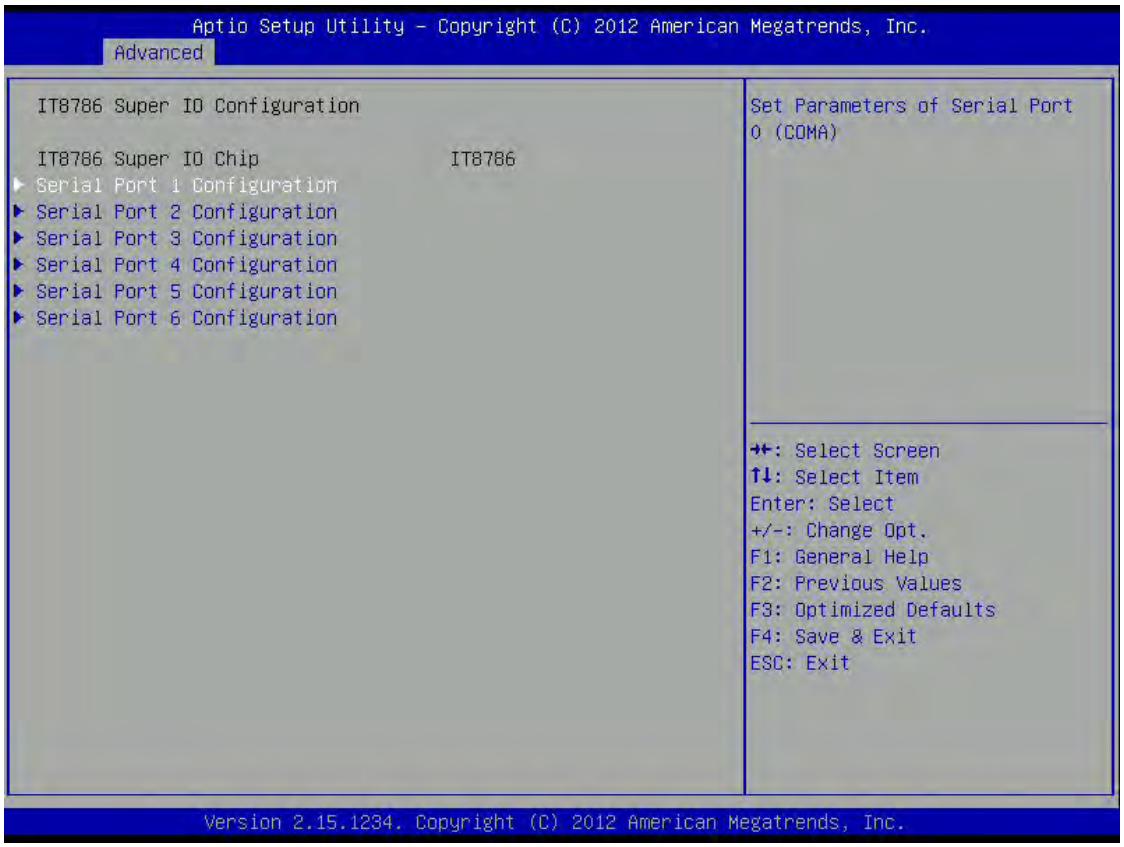


SMART Self Test

Run SMART Self Test on all HDDs during POST.

3.4.12 IT8786 Super IO Configuration

System super IO chip parameters



Serial Port 1 Configuration

Serial Port: Enable or Disable Serial Port (COM).

Change Settings: Select an optimal setting for super IO device.

Serial Port Type: Select one of the type of RS232/RS422/RS485 for COM PORT.

Serial Port 2 Configuration

Serial Port: Enable or Disable Serial Port (COM).

Change Settings: Select an optimal setting for super IO device.

Serial Port Type: Select one of the type of RS232/RS422/RS485 for COM PORT.

Serial Port 3 Configuration

Serial Port: Enable or Disable Serial Port (COM).

Change Settings: Select an optimal setting for super IO device.

Serial Port Type: Select one of the type of RS232/RS422/RS485 for COM PORT.

Serial Port 4 Configuration

Serial Port: Enable or Disable Serial Port (COM).

Change Settings: Select an optimal setting for super IO device.

Serial Port Type: Select one of the type of RS232/RS422/RS485 for COM PORT.

Serial Port 5 Configuration

Serial Port: Enable or Disable Serial Port (COM).

Change Settings: Select an optimal setting for super IO device.

Serial Port Type: Select one of the type of RS232/RS422/RS485 for COM PORT.

Serial Port 6 Configuration

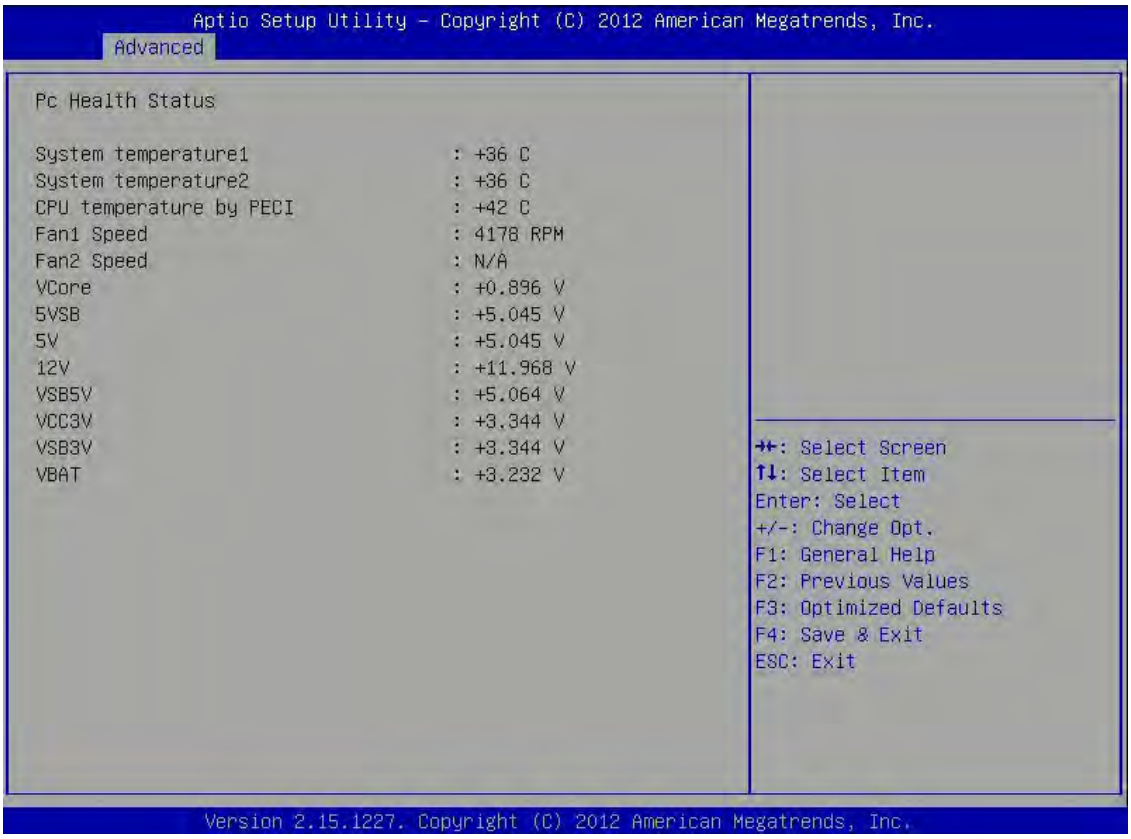
Serial Port: Enable or Disable Serial Port (COM).

Change Settings: Select an optimal setting for super IO device.

Serial Port Type: Select one of the type of RS232/RS422/RS485 for COM PORT.

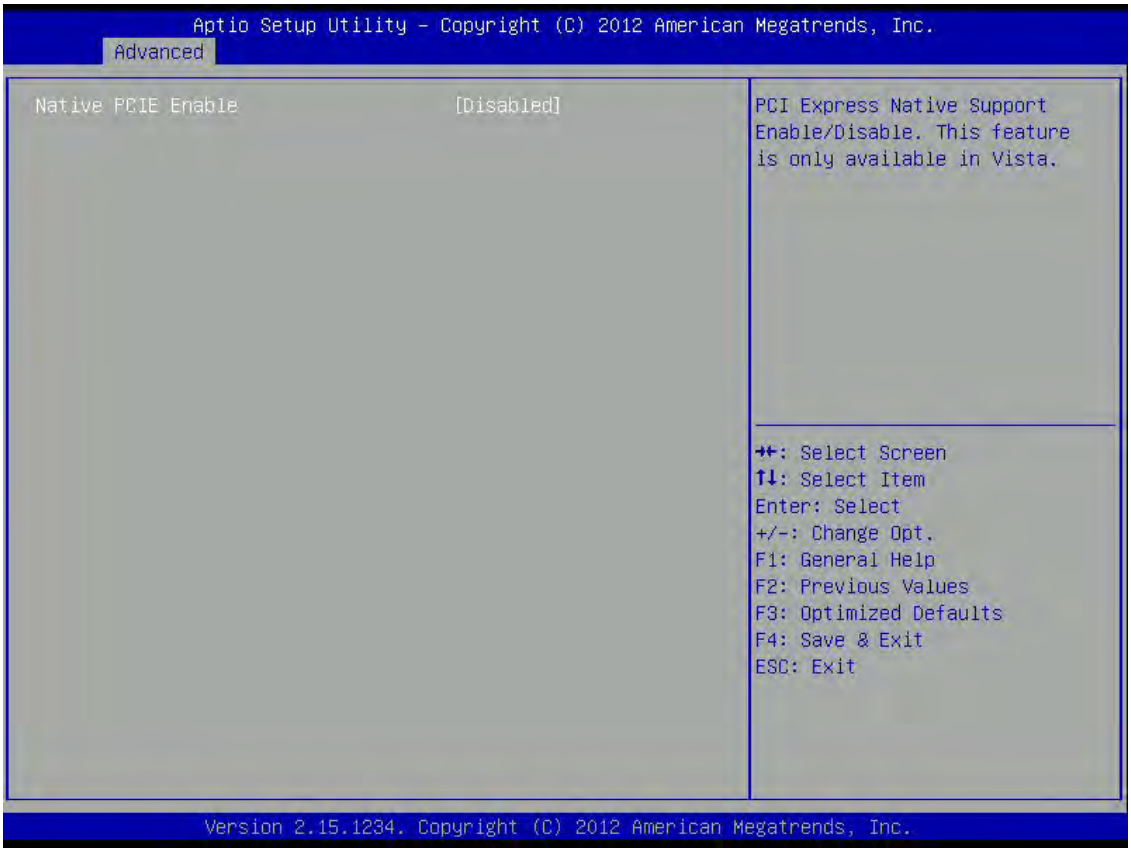
3.4.13 IT8786 H/W Monitor

This section is used to monitor hardware status such as temperature, fan speed and voltages.



3.4.14 Platform Misc Configuration

Platform Misc configuration

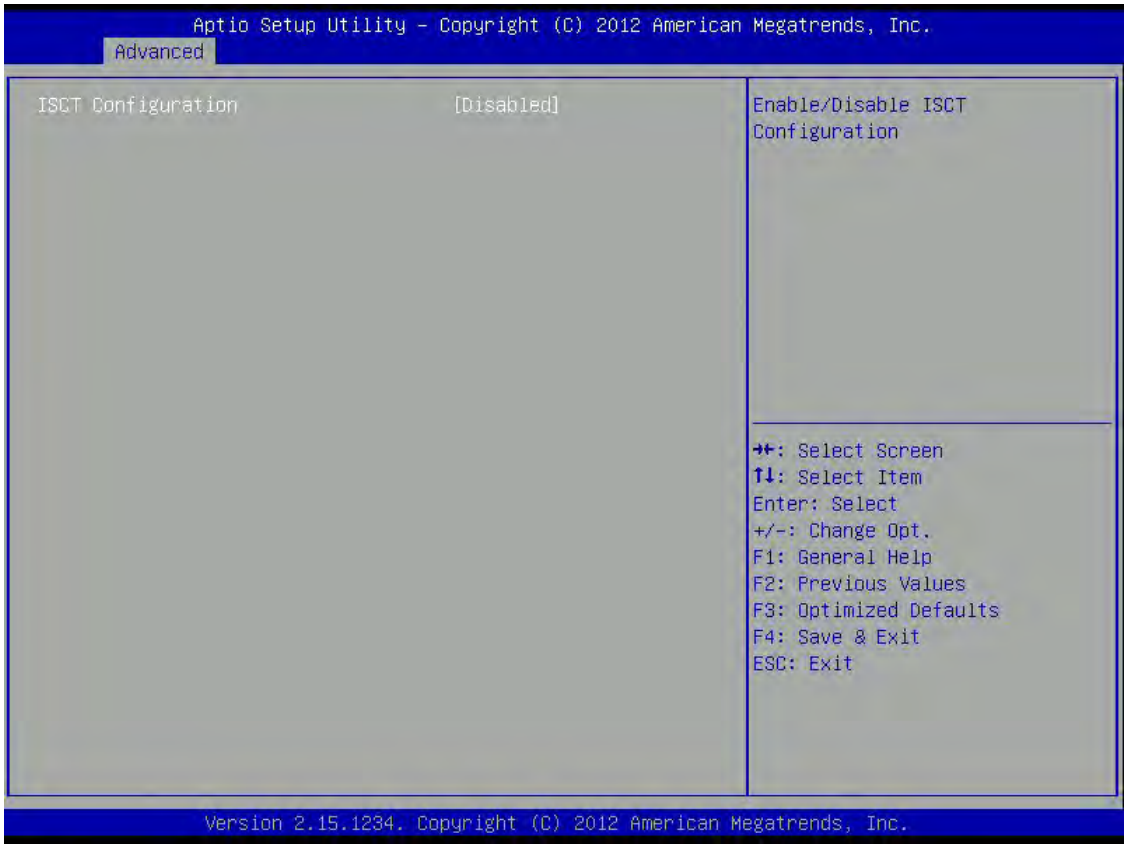


Native PCIE Enable

PCI Express Native Support Enable/Disable. This feature in only available in Vista.

3.4.15 Intel SMART Connect Technology

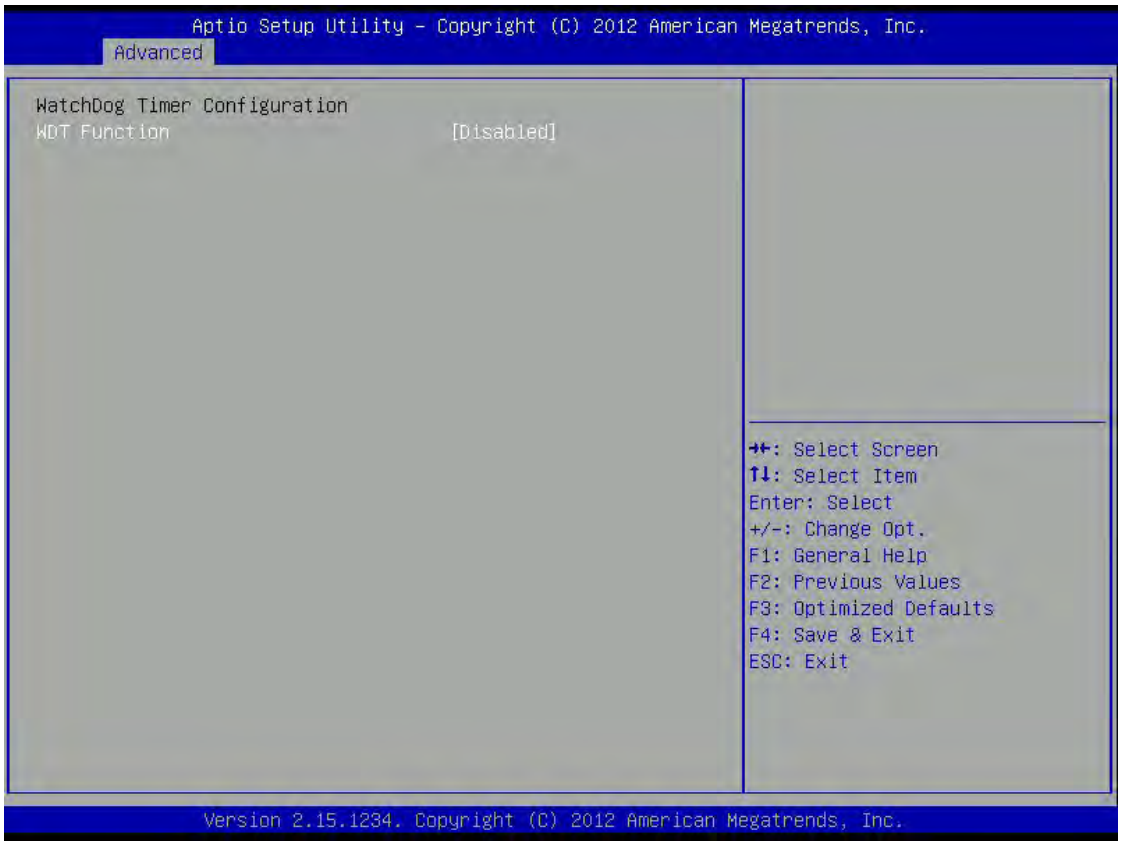
Intel SMART connect technology settings



ISCT Configuration

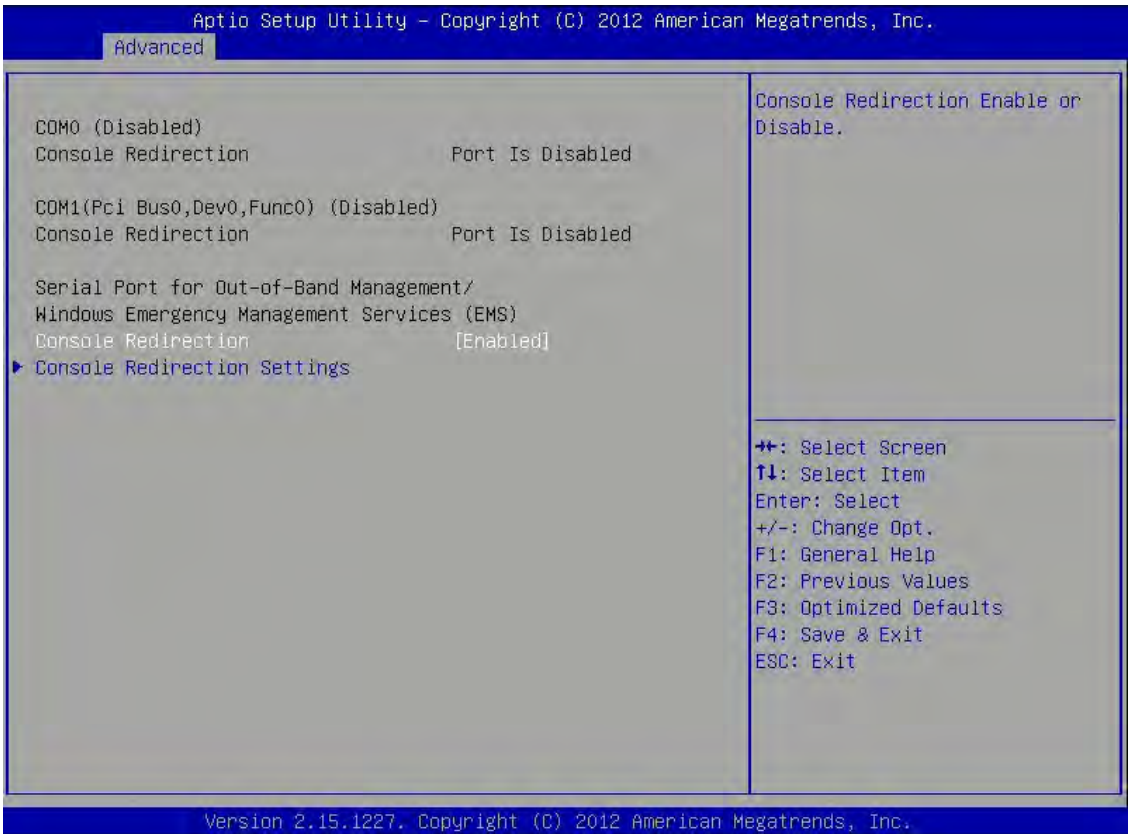
Enable/Disable ISCT Configuration.

3.4.16 WatchDog Timer Configuration



3.4.17 Serial Port Console Redirection

This screen provides information about functions for specifying the Serial Port Console Redirection configuration settings. Console redirection can be used to remotely operate system settings and the EFI console.

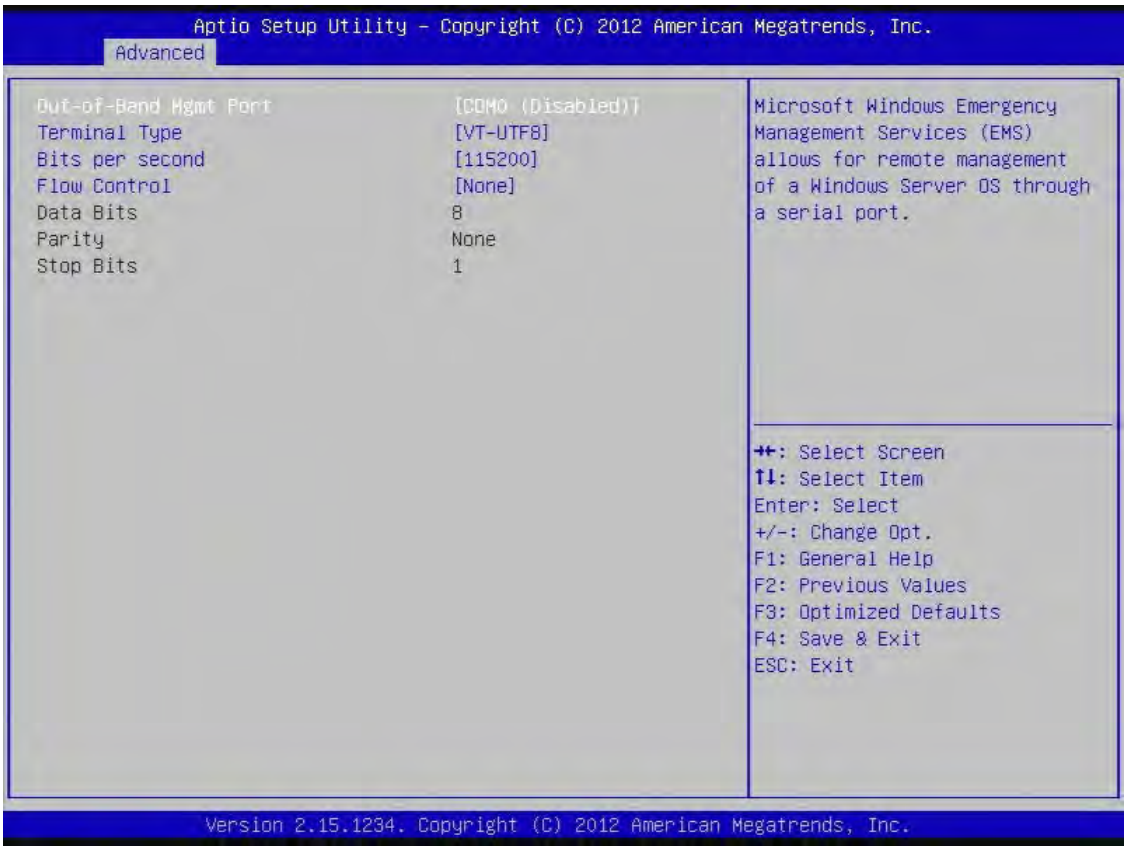


Console Redirection

Console Redirection Enable or Disable.

Console Redirection Settings

The setting specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.



Out-of-Band Mgmt Port: Microsoft Windows Emergency Management Service allows for remote management of a Windows Server OS through a serial port. The options are COM0 (Disabled), COM1(Pci Bus0, Dev0, Func0) (Disabled)

Terminal Type: VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation. The options are VT100, VT100+, VT-UTF8, ANSI.

Bits per second: selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds. The options are 9600, 19200, 57600, 115200.

Flow Control: Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. Once the buffers are empty, a “star” signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals. The options are None, Hardware RTS/CTS, Software Xon/xoff

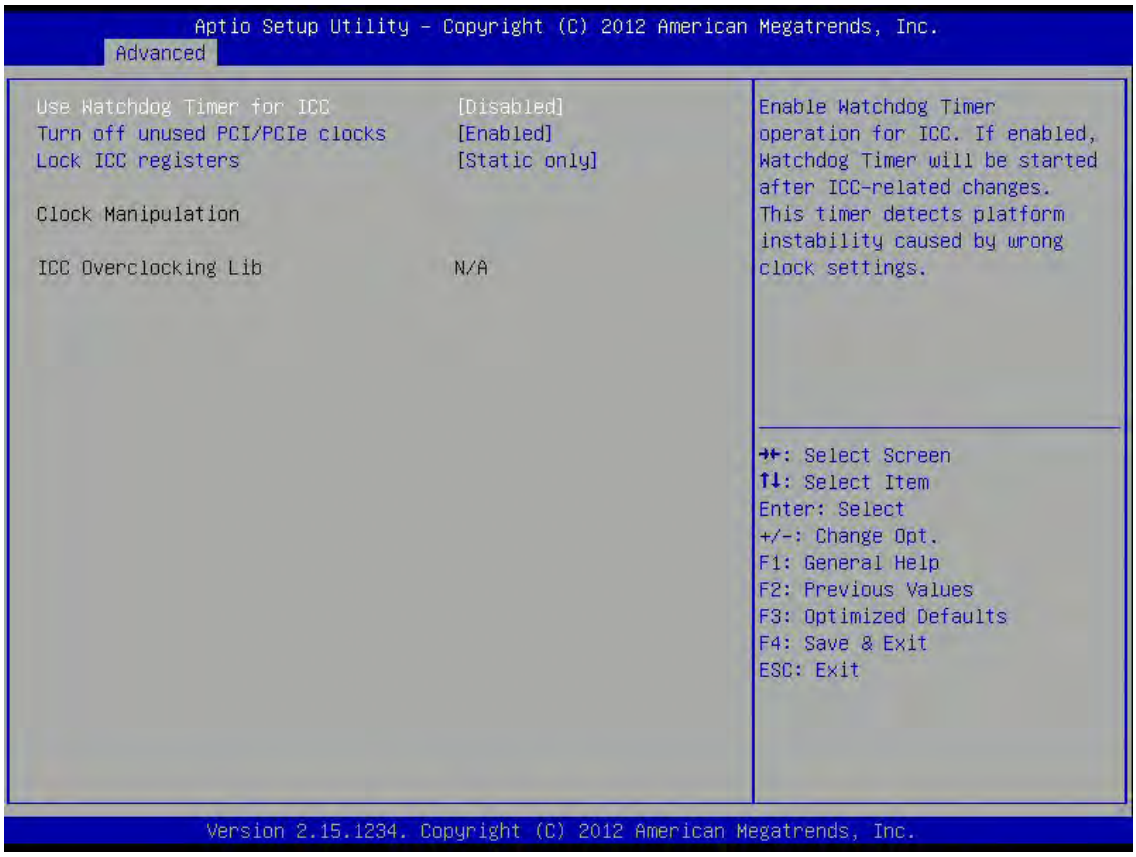
Data bits: 8

Parity: None

Stop bits: 1

3.4.18 Intel ICC

Integrated Clock Control options.



Use Watchdog Timer for ICC

Enable Watchdog Timer operation for ICC. If enabled, Watchdog Timer will be staryed after ICC-related changes. This timer detects platform instability caused by wrong clock settings.

Turn off unused PCI/PCIe clocks

Disabled: all clocks turned on. Enabled:clocks for empty PCI/PCIe slots will be turned off to save power. Platform must be powered off for changes to take effect.

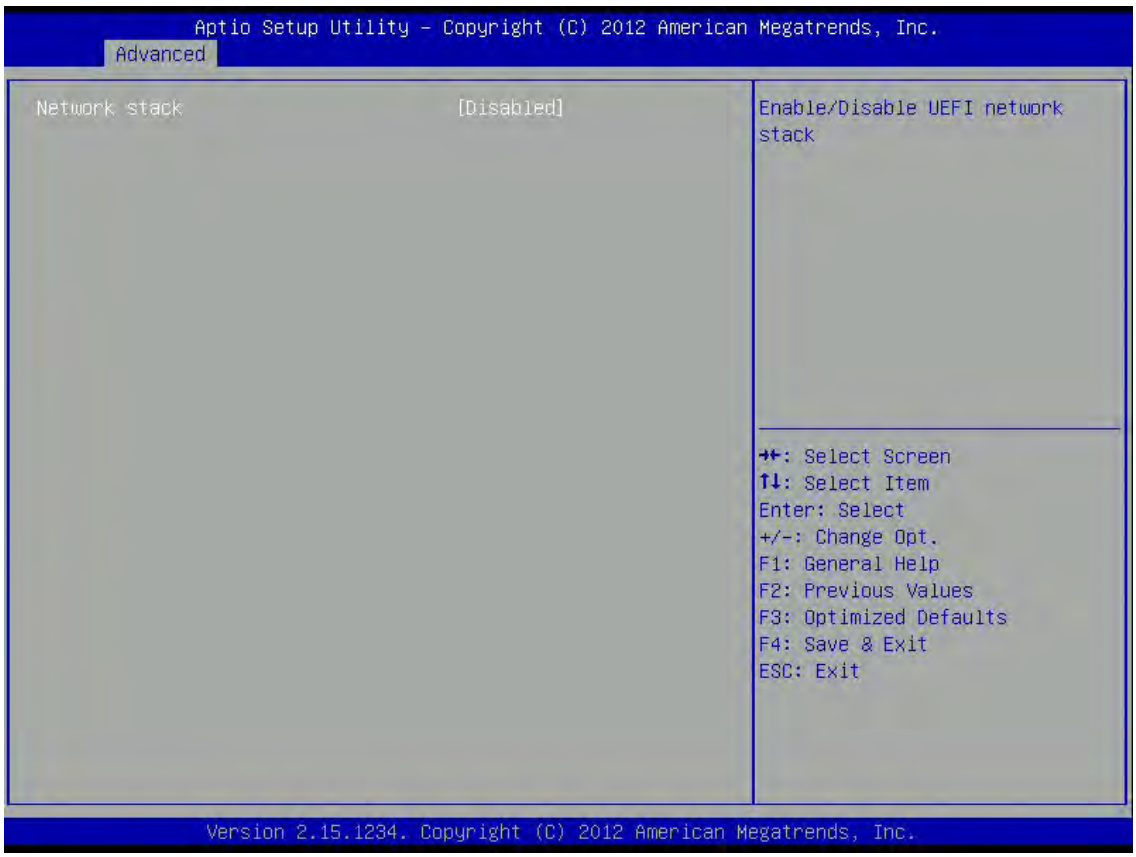
Lock ICC registers

All registers: All ICC registers will be locked.

Static only – only static ICC registers will be locked.

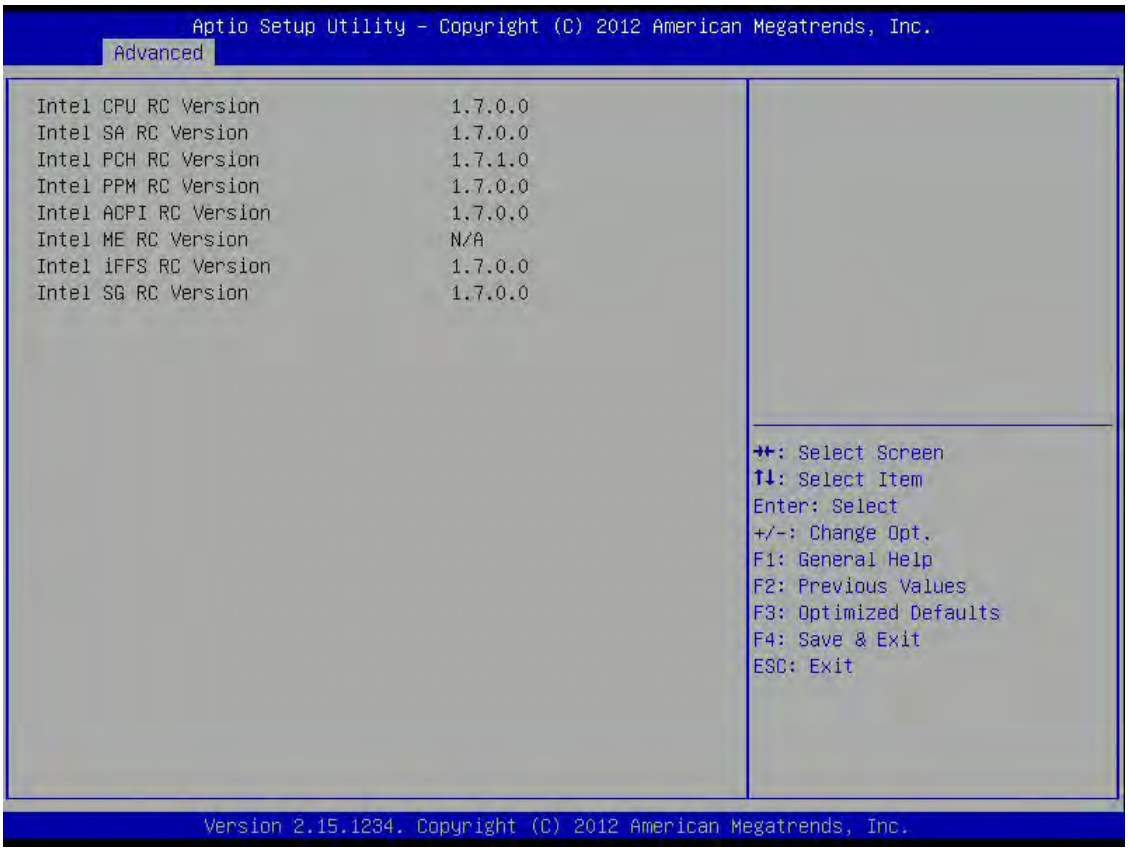
3.4.19 Network Stack

Enable/Disable UEFI network stack.



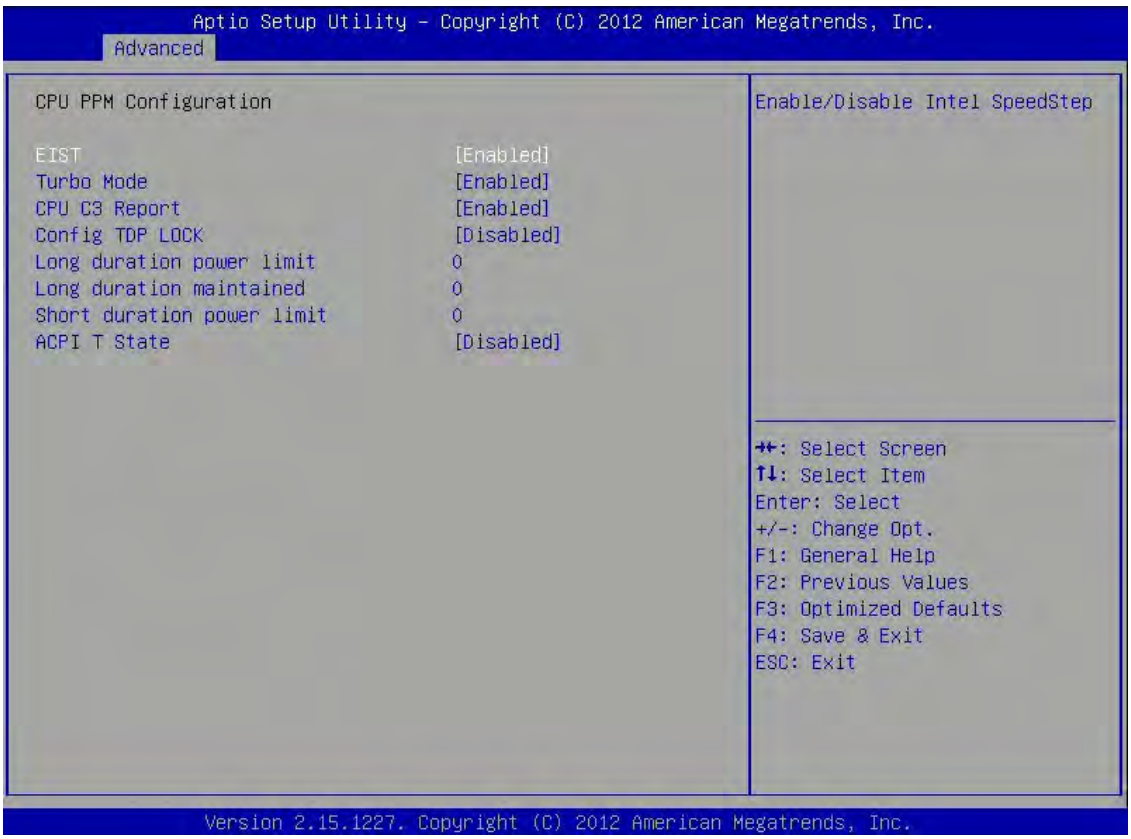
3.4.20 Intel RC Drivers Version Detail

Displays version string for drivers.



3.4.21 CPU PPM configuration

CPU PPM configuration parameters



EIST

Enables or disables Intel SpeedStep.

CPU C3 Report

Enable or disable CPU C3 (ACPI C2) report to OS.

Config TDP LOCK

Lock the Config TDP control register.

Long duration power limit

Long duration power limit in Watts, 0 means use factory default.

Long duration maintained

Time window which the long duration power is maintained.

Short duration power limit

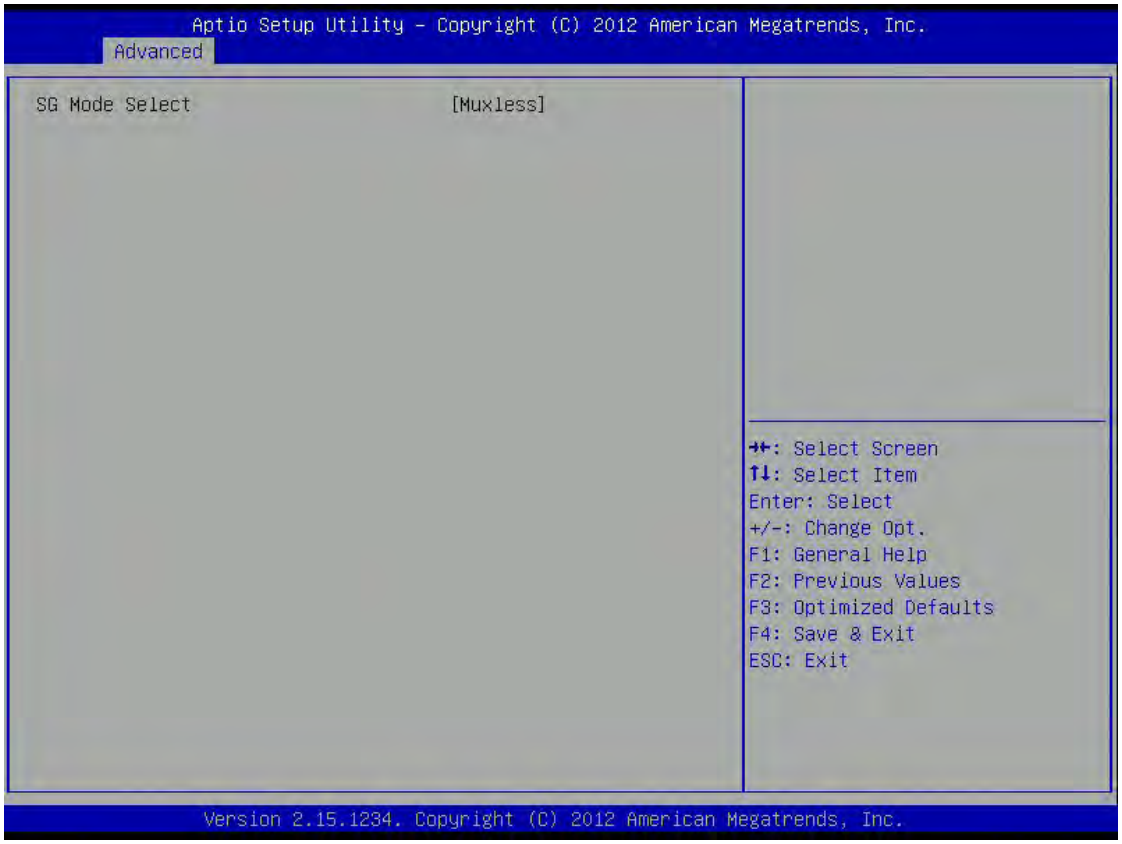
Short duration power limit in Watts, 0 means use factory default.

ACPI T State

Enable or disable ACPI state support.

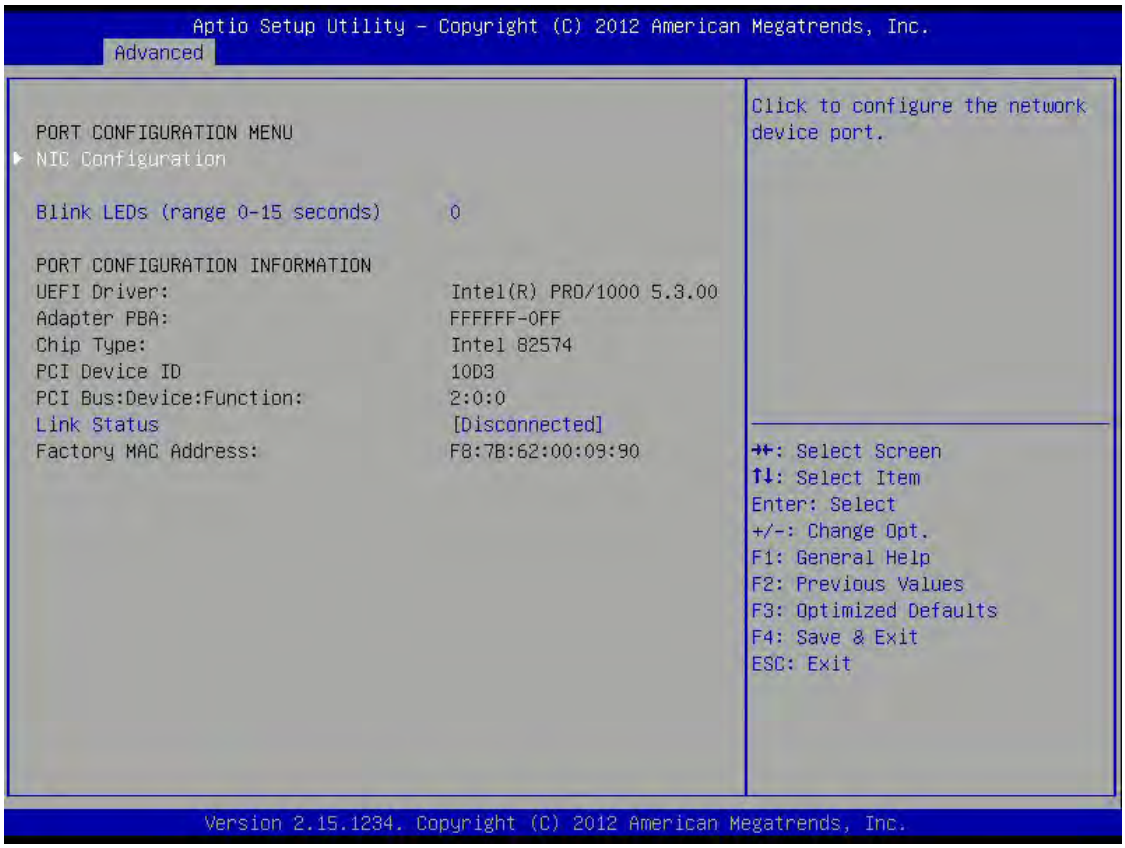
3.4.22 Switchable Graphics

Switchable Graphics selections.



3.4.23 Intel(R) 82579LM Gigabit Network Connection

Configure Gigabit Ethernet device parameter



NIC Configuration

Click to configure the network device port.

Blink LEDs (range 0 – 15 seconds)

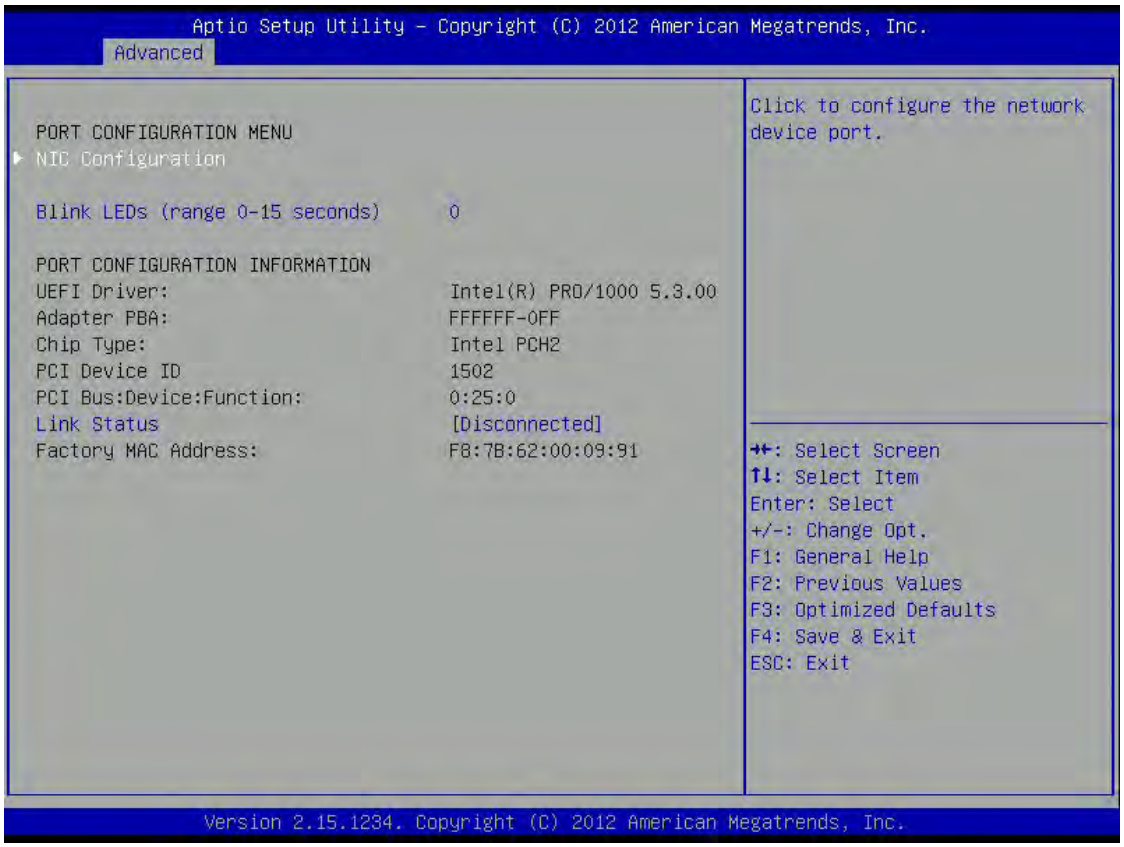
Blink LEDs for the specified duration (up to 15 seconds).

Link Status

Link Status.

3.4.24 Intel(R) 82574L Gigabit Network Connection

Configure Gigabit Ethernet device parameters



NIC Configuration

Click to configure the network device port.

Blink LEDs (range 0 – 15 seconds)

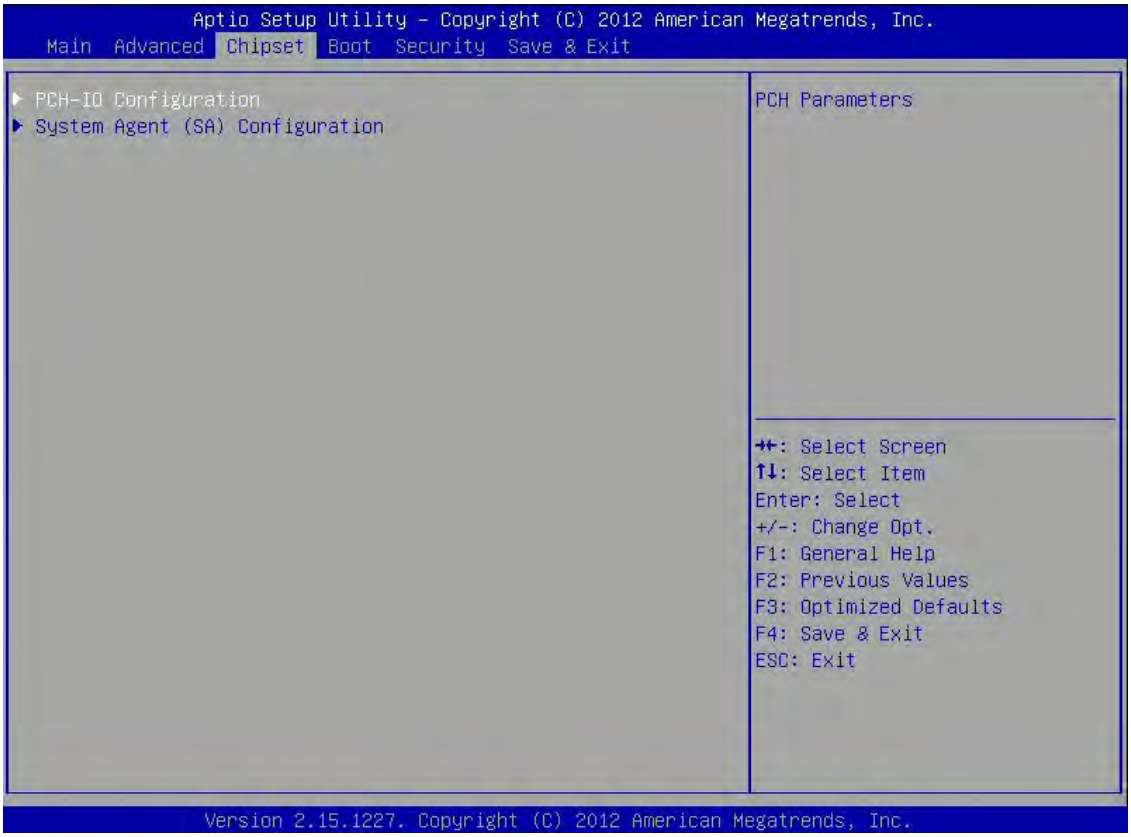
Blink LEDs for the specified duration (up to 15 seconds).

Link Status

Link Status.

3.5 Chipset

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.



3.5.1 PCH-IO Configuration

This section allows you to configure the North Bridge Chipset.

PCI Express Configuration

PCI Express Configuration settings.

USB Configuration

USB configurarion settings

PCH Azalia Configuration

PCH Azalia configuration settings

BIOS Security Configuration

BIOS security configuration settings

LAN 82579

Enable or disable 82579.

Wake on Ring

Ring Wake Up Function select.

DeepSx Power Policies

Configure the DeepSx Mode Configuration.

Display Logic

Enable or disable the PCH Display Logic.

CLKRUN# Logic

Enable the CLKRUN# logic to stop the PCI clocks.

SB CRID

Enable or disable the SB Compatible Revision ID.

High Precision Event Timer Configuration

High Precision Timer: Enable or Disable the High Precision Event Timer.

SLP_S4 Assertion Width

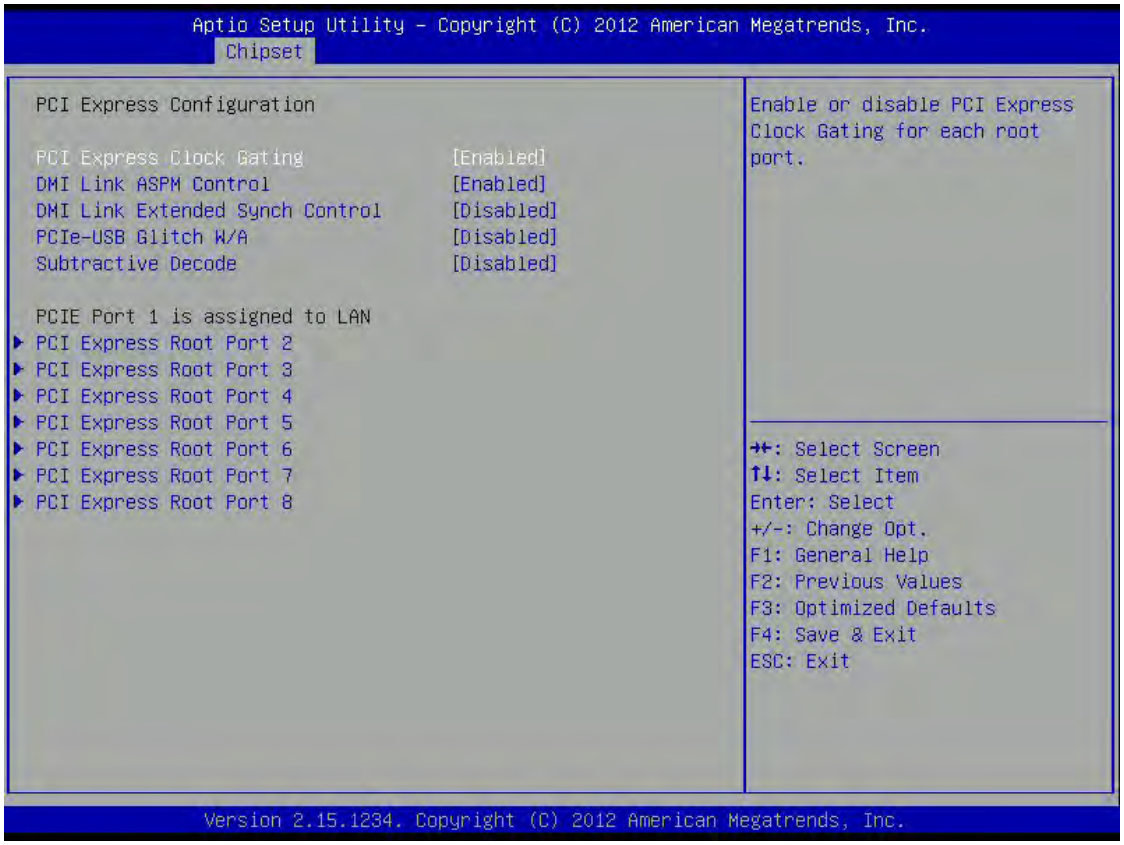
Select a minimum assertion width of the SLP_S4# signal.

Restore AC Power Loss

Select AC power state when power is re-applied after a power failure.

3.5.1.1 PCI Express Configuration

PCI Express Configuration settings.



PCI Express Clock Gating

Enable or disable PCI Express Clock Gating for each root port.

DMI Link ASPM Control

The Control of Active State Power Management on both NB side and SB side of the DMI Link.

DMI Link Extended Synch Control

The control of Extended Synch on SB side of the DMI Link.

PCIe-USB Glitch W/A

PCIe-USB Glitch W/A for bad USB device(s) connected behind PCIE/PEG Port.

Subtractive Decode

Enable or disable PCI Express Subtractive Decode.

PCIE Port 1 is assigned to LAN

PCI Express Root Port 2: PCI Express Root Port 2 Setting.

PCI Express Root Port2: Control the PCI Express Root Port.

ASPM Support: Set the ASPM Level: Force L0s – Force all links to L0s State; AUTO – BIOS auto configure; DISABLE – Disables ASPM.

URR: Enable or disable PCI Express Unsupported Request Reporting.

FER: Enable or disable PCI Express Device Fetal Error Reporting.

NFER: Enable or disable PCI Express Device Non-Fetal Error Reporting.

CER: Enable or disable PCI Express Device Correctable Error Reporting.

CTO: Enable or disable PCI Express Completion Timer TO.

SEFE: Enable or disable Root PCI Express System Error on Fetal Error.

SENFE: Enable or disable Root PCI Express System Error on Non-Fetal Error.

SECE: Enable or disable Root PCI Express System Error on Correctable Error.

PME SCI: Enable or disable PCI Express PME SCI.

Hot Plug: Enable or disable PCI Express Hot Plug.

PCIe Speed: Select PCI Express port speed.

Detect Non-Compliance Device: Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

Extra Bus Reserved: Extra Bus Reserved for bridges behind this Root Bridge.

Reserved Memory: Reserved Memory Range for this Root Bridge.

Prefetchable Memory: Prefetchable Memory Range for this Root Bridge.

Reserved I/O: Reserved I/O(4K/8K/12K/16K/20K) Range for this Root Bridge.

PCI Express Root Port 3: PCI Express Root Port 3 Setting.

PCI Express Root Port3: Control the PCI Express Root Port.

ASPM Support:Set the ASPM Level: Force L0s – Force all links to L0s State; AUTO – BIOS auto configure; DISABLE – Disables ASPM.

URR: Enable or disable PCI Express Unsupported Request Reporting.

FER: Enable or disable PCI Express Device Fetal Error Reporting.

NFER: Enable or disable PCI Express Device Non-Fetal Error Reporting.

CER: Enable or disable PCI Express Device Correctable Error Reporting.

CTO: Enable or disable PCI Express Completion Timer TO.

SEFE: Enable or disable Root PCI Express System Error on Fetal Error.

SENFE: Enable or disable Root PCI Express System Error on Non-Fetal Error.

SECE: Enable or disable Root PCI Express System Error on Correctable Error.

PME SCI: Enable or disable PCI Express PME SCI.

Hot Plug: Enable or disable PCI Express Hot Plug.

PCIe Speed: Select PCI Express port speed.

Detect Non-Compliance Device: Detect Non-Compliance PCI Express Device. If enable, it will take more

time at POST time.

Extra Bus Reserved: Extra Bus Reserved for bridges behind this Root Bridge.

Reserved Memory: Reserved Memory Range for this Root Bridge.

Prefetchable Memory: Prefetchable Memory Range for this Root Bridge.

Reserved I/O: Reserved I/O(4K/8K/12K/16K/20K) Range for this Root Bridge.

PCI Express Root Port 4: PCI Express Root Port 4 Setting.

PCI Express Root Port4: Control the PCI Express Root Port.

ASPM Support: Set the ASPM Level: Force L0s – Force all links to L0s State; AUTO – BIOS auto configure; DISABLE – Disables ASPM.

URR: Enable or disable PCI Express Unsupported Request Reporting.

FER: Enable or disable PCI Express Device Fetal Error Reporting.

NFER: Enable or disable PCI Express Device Non-Fetal Error Reporting.

CER: Enable or disable PCI Express Device Correctable Error Reporting.

CTO: Enable or disable PCI Express Completion Timer TO.

SEFE: Enable or disable Root PCI Express System Error on Fetal Error.

SENFE: Enable or disable Root PCI Express System Error on Non-Fetal Error.

SECE: Enable or disable Root PCI Express System Error on Correctable Error.

PME SCI: Enable or disable PCI Express PME SCI.

Hot Plug: Enable or disable PCI Express Hot Plug.

PCIe Speed: Select PCI Express port speed.

Detect Non-Compliance Device: Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

Extra Bus Reserved: Extra Bus Reserved for bridges behind this Root Bridge.

Reserved Memory: Reserved Memory Range for this Root Bridge.

Prefetchable Memory: Prefetchable Memory Range for this Root Bridge.

Reserved I/O: Reserved I/O(4K/8K/12K/16K/20K) Range for this Root Bridge.

PCI Express Root Port 5: PCI Express Root Port 5 Setting.

PCI Express Root Port5: Control the PCI Express Root Port.

ASPM Support: Set the ASPM Level: Force L0s – Force all links to L0s State; AUTO – BIOS auto configure; DISABLE – Disables ASPM.

URR: Enable or disable PCI Express Unsupported Request Reporting.

FER: Enable or disable PCI Express Device Fetal Error Reporting.

NFER: Enable or disable PCI Express Device Non-Fetal Error Reporting.

CER: Enable or disable PCI Express Device Correctable Error Reporting.

CTO: Enable or disable PCI Express Completion Timer TO.

SEFE: Enable or disable Root PCI Express System Error on Fetal Error.

SENFE: Enable or disable Root PCI Express System Error on Non-Fetal Error.

SECE: Enable or disable Root PCI Express System Error on Correctable Error.

PME SCI: Enable or disable PCI Express PME SCI.

Hot Plug: Enable or disable PCI Express Hot Plug.

PCIe Speed: Select PCI Express port speed.

Detect Non-Compliance Device: Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

Extra Bus Reserved: Extra Bus Reserved for bridges behind this Root Bridge.

Reserved Memory: Reserved Memory Range for this Root Bridge.

Prefetchable Memory: Prefetchable Memory Range for this Root Bridge.

Reserved I/O: Reserved I/O(4K/8K/12K/16K/20K) Range for this Root Bridge.

PCI Express Root Port 6: PCI Express Root Port 6 Setting.

PCI Express Root Port6: Control the PCI Express Root Port.

ASPM Support: Set the ASPM Level: Force L0s – Force all links to L0s State; AUTO – BIOS auto configure; DISABLE – Disables ASPM.

URR: Enable or disable PCI Express Unsupported Request Reporting.

FER: Enable or disable PCI Express Device Fetal Error Reporting.

NFER: Enable or disable PCI Express Device Non-Fetal Error Reporting.

CER: Enable or disable PCI Express Device Correctable Error Reporting.

CTO: Enable or disable PCI Express Completion Timer TO.

SEFE: Enable or disable Root PCI Express System Error on Fetal Error.

SENFE: Enable or disable Root PCI Express System Error on Non-Fetal Error.

SECE: Enable or disable Root PCI Express System Error on Correctable Error.

PME SCI: Enable or disable PCI Express PME SCI.

Hot Plug: Enable or disable PCI Express Hot Plug.

PCIe Speed: Select PCI Express port speed.

Detect Non-Compliance Device: Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

Extra Bus Reserved: Extra Bus Reserved for bridges behind this Root Bridge.

Reserved Memory: Reserved Memory Range for this Root Bridge.

Prefetchable Memory: Prefetchable Memory Range for this Root Bridge.

Reserved I/O: Reserved I/O(4K/8K/12K/16K/20K) Range for this Root Bridge.

PCI Express Root Port 7: PCI Express Root Port 7 Setting.

PCI Express Root Port7: Control the PCI Express Root Port.

ASPM Support: Set the ASPM Level: Force L0s – Force all links to L0s State; AUTO – BIOS auto configure; DISABLE – Disables ASPM.

URR: Enable or disable PCI Express Unsupported Request Reporting.

FER: Enable or disable PCI Express Device Fetal Error Reporting.

NFER: Enable or disable PCI Express Device Non-Fetal Error Reporting.

CER: Enable or disable PCI Express Device Correctable Error Reporting.

CTO: Enable or disable PCI Express Completion Timer TO.

SEFE:Enable or disable Root PCI Express System Error on Fetal Error.

SENFE: Enable or disable Root PCI Express System Error on Non-Fetal Error.

SECE: Enable or disable Root PCI Express System Error on Correctable Error.

PME SCI: Enable or disable PCI Express PME SCI.

Hot Plug: Enable or disable PCI Express Hot Plug.

PCIe Speed: Select PCI Express port speed.

Detect Non-Compliance Device: Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

Extra Bus Reserved: Extra Bus Reserved for bridges behind this Root Bridge.

Reserved Memory: Reserved Memory Range for this Root Bridge.

Prefetchable Memory: Prefetchable Memory Range for this Root Bridge.

Reserved I/O: Reserved I/O(4K/8K/12K/16K/20K) Range for this Root Bridge.

PCI Express Root Port 8: PCI Express Root Port 8 Setting.

PCI Express Root Port8: Control the PCI Express Root Port.

ASPM Support: Set the ASPM Level: Force L0s – Force all links to L0s State; AUTO – BIOS auto configure; DISABLE – Disables ASPM.

URR: Enable or disable PCI Express Unsupported Request Reporting.

FER: Enable or disable PCI Express Device Fetal Error Reporting.

NFER: Enable or disable PCI Express Device Non-Fetal Error Reporting.

CER: Enable or disable PCI Express Device Correctable Error Reporting.

CTO: Enable or disable PCI Express Completion Timer TO.

SEFE: Enable or disable Root PCI Express System Error on Fetal Error.

SENFE: Enable or disable Root PCI Express System Error on Non-Fetal Error.

SECE: Enable or disable Root PCI Express System Error on Correctable Error.

PME SCI: Enable or disable PCI Express PME SCI.

Hot Plug: Enable or disable PCI Express Hot Plug.

PCIe Speed: Select PCI Express port speed.

Detect Non-Compliance Device: Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

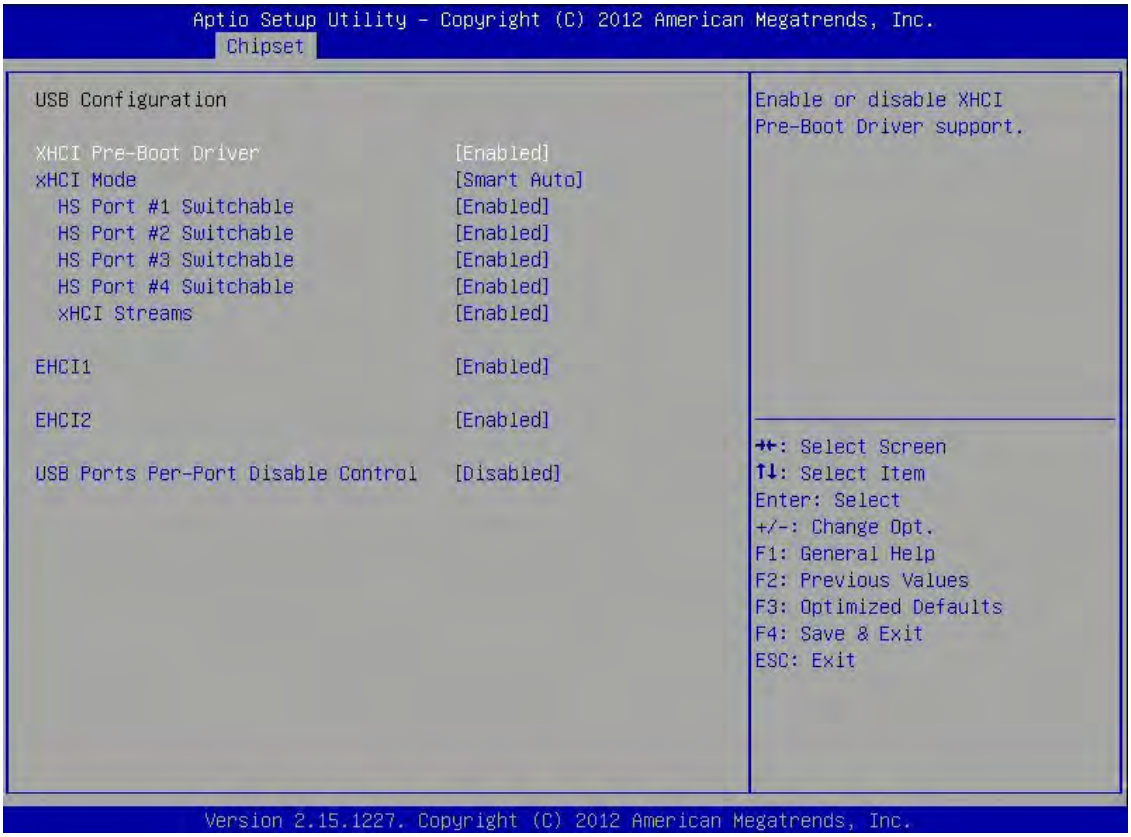
Extra Bus Reserved: Extra Bus Reserved for bridges behind this Root Bridge.

Reserved Memory: Reserved Memory Range for this Root Bridge.

Prefetchable Memory: Prefetchable Memory Range for this Root Bridge.

Reserved I/O: Reserved I/O(4K/8K/12K/16K/20K) Range for this Root Bridge.

3.5.1.2 USB Configuration



XHCI Pre-Boot Driver

Enable or disable XHCI Pre-Boot driver support.

XHCI Mode

Mode of operation of XHCI controller

HS Port #1/2/3/4 Switchable: Allows for HS port switching between xHCI and EHCI. If disabled, port is routed to EHCI. If HS port is routed to xHCI, the corresponding SS port is enabled.

xHCI Streams: Enable or disable xHCI Maximum Primary Stream Array Size.

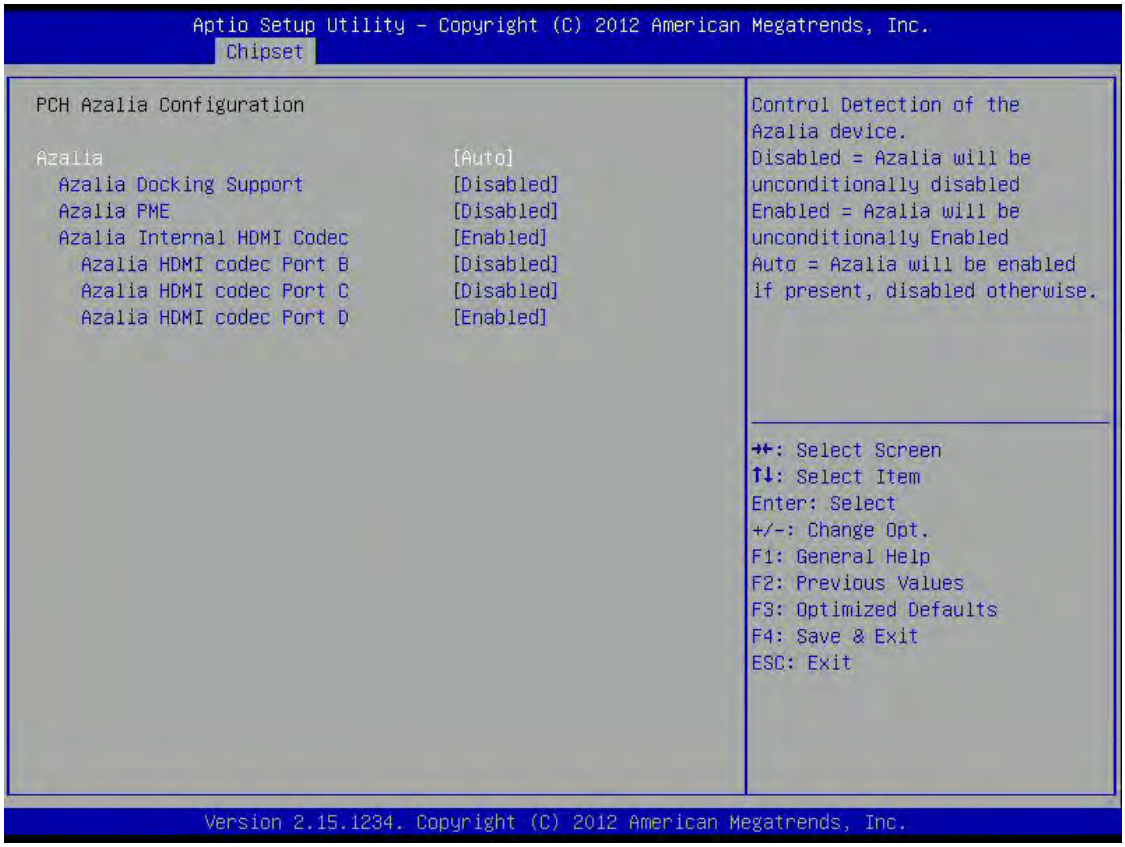
EHCI1/2

Control the USAB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.

USB Ports Per-Port Disable Control

Control each of the USB ports (0~13) disabling.

3.5.1.3 PCH Azalia Configuration



Azalia

Control Detection of the Azalia device.

Disabled=Azalia will unconditionally disabled.

Enabled=Azalia will be unconditionally enabled.

Auto=Azalia will enabled if present, disabled otherwise.

Azalia Docking Support: Enable or disable Azalia Docking Support of Audio Controller.

Azalia PME: Enable or disable Power Management capability of audio controller.

Azalia Internal HDMI codec: Enable or disable internal HDMI codec for Azalia.

Azalia HDMI codec Port B: Enable or disable internal HDMI codec Port for Azalia.

Azalia HDMI codec Port C: Enable or disable internal HDMI codec Port for Azalia.

Azalia HDMI codec Port D: Enable or disable internal HDMI codec Port for Azalia.

3.5.1.4 BIOS Security Configuration

SMI Lock

Enable or disable SMI lockdown.

BIOS Lock

Enable or disable BIOS lock enable (BLE) bit.

GPIO Lock

Enable or disable GPIO lockdown.

BIOS Interface Lock

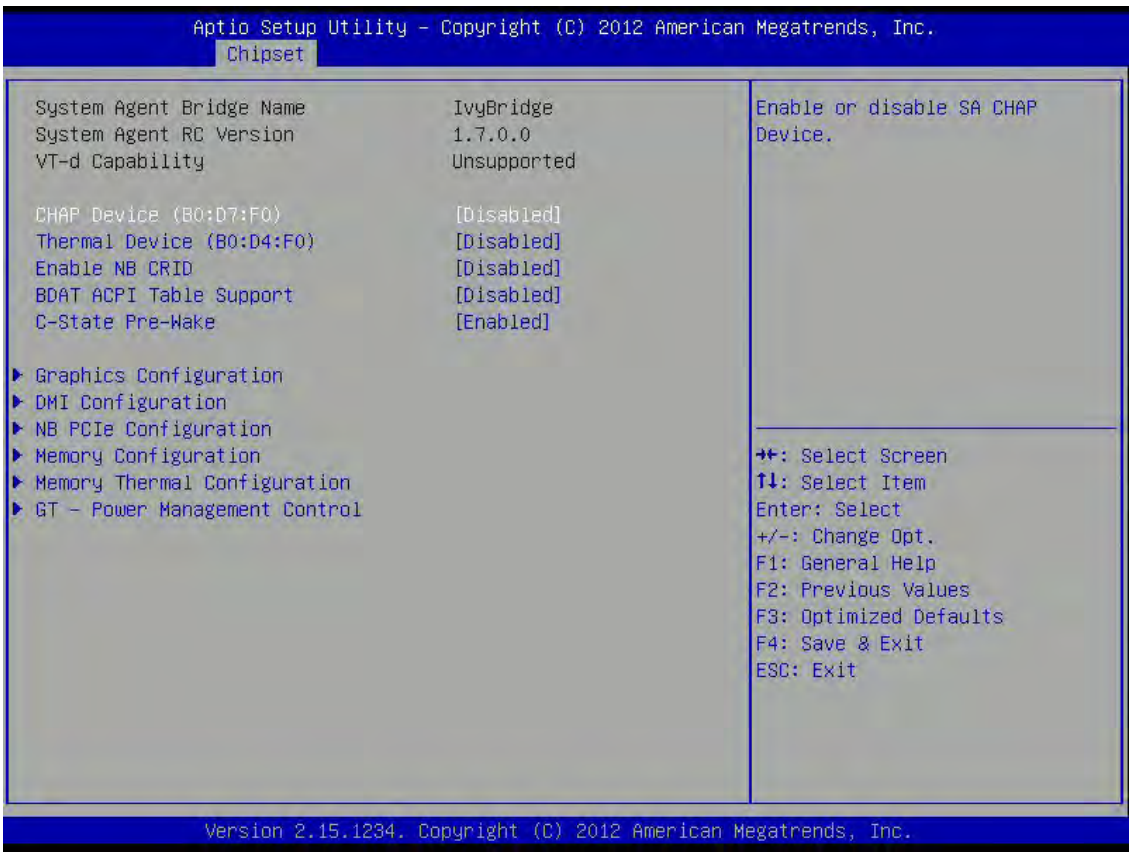
Enable or disable BIOS interface lockdown.

RTC RAM Lock

Enable or disable bytes 38h-3Fh in the upper and lower 128-byte bank of RTC RAM lockdown.

3.5.2 System Agent (SA) Configuration

This section is used to configure the System Agent (SA) configuration.



CHAP Device (B0:D7:F0)

Enable or disable SA CHAP Device.

Thermal Device (B0:D4:F0)

Enable or disable SA Thermal Device.

Enable NB CRID

Enable or disable NB CRID WorkAround.

BDAT ACPI Table Support

Enables support for the BDAT ACPI table.

C-State Pre-Wake

Controls C-State Pre-Wake feature for ARAT, in SSKPD [57].

3.5.2.1 Graphics Configuration: Config Graghics Settings.

Graphics Turbo IMON Current

Graphics turbo IMON current values supported.(14 - 31)

Primary Display

Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.

Internal Graphics

Keep IGD enabled based on the setup options.

GTT Size

Select the GTT Size.

Aperture Size

Select the Aperture Size.

DVMT Pre-Allocated

Select the DVMT 5.0 Pre-Allocated(Fixed) Graphics Memory size used by the Internal Graphics Device.

DVMT Total Gfx Mem

Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

Gfx Low Power mode

This option is applicable for SFF only.

Graphics Performance Analyzers

Enable or disable Intel Graphics Performance Analyzers Counters.

LCD Controls: Enable or disable Intel Graphics Performance Analyzers Counters.

Primary IGFX Boot Display: Select the Video Device which will be activated during POST.This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.

Secondary IGFX Boot Display: select secondary display device

LCD Panel Type: Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.

SDVO-LFP Panel Type: Select SVDO Panel used by Internal Graphics Device by selecting the appropriate setup item.

Panel Scaling: Select the LCD panel scaling option used by the Internal Graphics Device.

Backlight Controller: Back Light Control Setting.
BIA:
>>Auto: GMCH Use VBT Default;
>>Level n: Enabled with Selected Aggressiveness Level.

Spread Spectrum clock Chip:
>>Hardware: Spread is controlled by chip;
>>Software: Spread is controlled by BIOS.

TV1 Standard: Select the ability to configure a TV Format.

TV2 Standard: Select the ability to configure a TV Minor Format.

ALS Support: Valid only for ACPI.
Legacy = ALS Support through the IGD INT10 function.
ACPI = ALS support through an ACPI ALS driver.

Active LFP: Select the Active LFP Configuration.
No LVDS:VBIOS does not enable LVDS.
Int-LVDS:VBIOS enables LVDS driver by Integrated encoder.
SDVO LVDS:VBIOS enables LVDS driver by SDVO encoder.
eDP Port-A:LFP Driven by Int-DisplayPort encoder from Port-A.

Panel Color Depth: Select the LFP Panel Color Depth.

3.5.2.2 DMI Configuration

DMI Vc1 Control

Enable or disable DMI Vc1.

DMI Vcp Control

Enable or disable DMI Vcp.

DMI Vcm Control

Enable or disable DMI Vcm.

DMI Link ASPM Control

Enable or disable the control of Active State Power Management on SA Side of the DMI Link.

DMI Extended Synch Control

Enable DMI Extended Synchronization.

DMI GEN2

Enable or disable DMI GEN2/nAuto means Disabled for IVB A0 MB/DT and IVB B0 MB, Enabled for other CPUs.

3.5.2.3 NB PCIe Configuration

PEG0 – Gen X

Configure PEG0 B0:D1:F0 Gen1-Gen3.

PEG0 ASPM

Control ASPM support for the PEG; Device 1 Function 0. This has no effect if PEG is not the currently active device.

Enable PEG

To enable or disable the PEG.

Detect Non-Compliance Device

Detect Non-Compliance PCI Express Device in PEG.

De-emphasis Control

Configure the De-emphasis control on PEG.

PEG Sampler Calibrate

Enable or disable PEG Sampler Calibrate.

Auto means Disabled for SNB MB/DT, Enabled for IVB A0 B0.

Swing Control

Perform PEG Swing Control, on IVB C0 and Later.

Gen3 Equalization

Perform PEG Gen3 Equalization steps.

Gen3 Eq Phase 2: Perform PEG Gen3 Equalization phase 2.

PEG Gen3 Root Port Present Value for each Lane: Root Port Present Value Per lane for Gen3 Equalization.

Lane 0~15: Value for Lane 0~15

PEG Gen3 Endpoint Present Value each lane: Endpoint Present Value Per lane for Gen3 Equalization.

Lane 0~15: Value for Lane 0~15.

PEG Gen3 Endpoint Hint Value each Lane: Endpoint Hint Value Per lane for Gen3 Equalization.

L ane 0~15: Value for Lane 0~15.

Gen3 Eq Present Search

Perform PEG Gen3 Preset Search algorithm, on IVB C0 and Later.

PEG Link Disabled

Enable or disable PCIe link disable mechanism for additional power saving.

Fast PEG Init

Enable or disable Fast PEG Init. Some optimization if no PEG devices present in cold boot.

RxCEM Loop back

Enable or disable RxCEM Loop back.

PCIe Gen3 RxCTLEp Setting

The range of the setting for perbundle is (0~15) This setting has to be specified basing on platform design and following the guideline.

PCIe Gen3 RxCTLEp Setting 0: The Range of the setting is (0~15) This setting has to be specified basing on platform design and following the guideline.

PCIe Gen3 RxCTLEp Setting 1: The Range of the setting is (0~15) This setting has to be specified basing on platform design and following the guideline.

PCIe Gen3 RxCTLEp Setting 2: The Range of the setting is (0~15) This setting has to be specified basing on platform design and following the guideline.

PCIe Gen3 RxCTLEp Setting 3: The Range of the setting is (0~15) This setting has to be specified basing on platform design and following the guideline.

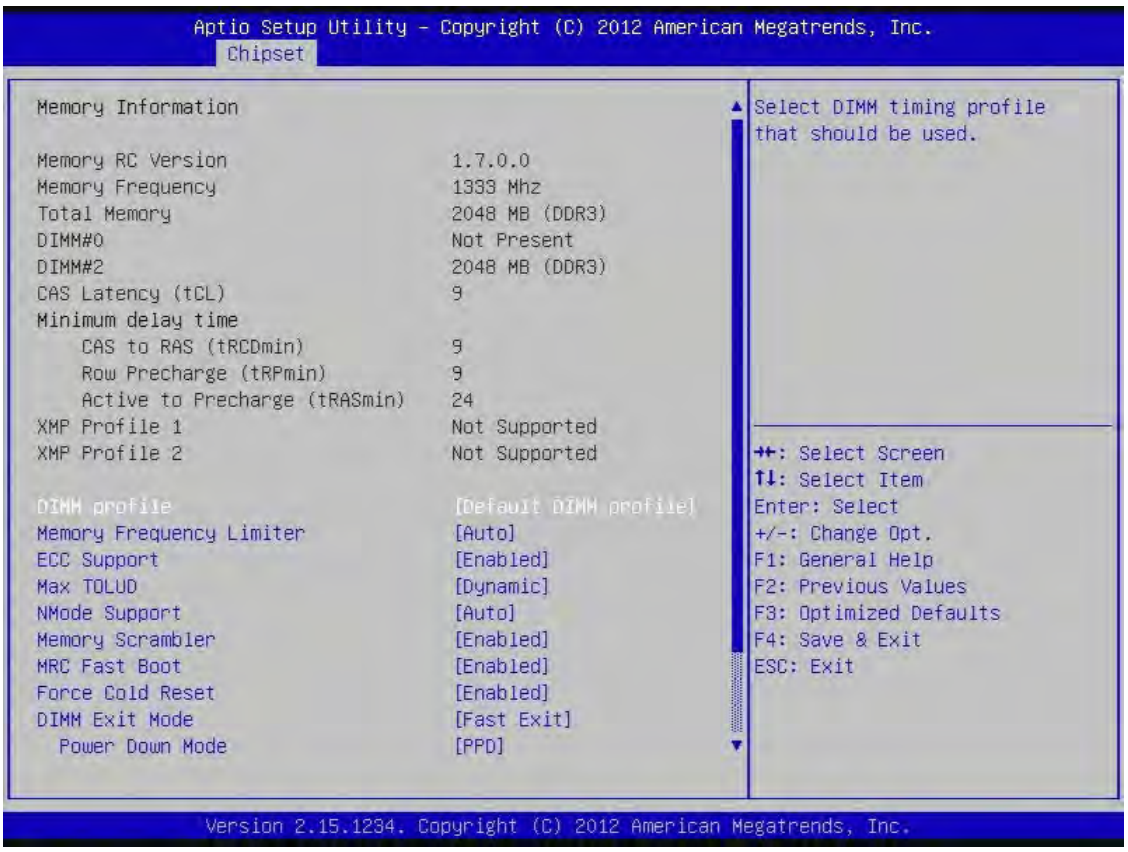
PCIe Gen3 RxCTLEp Setting 4: The Range of the setting is (0~15) This setting has to be specified basing on platform design and following the guideline.

PCIe Gen3 RxCTLEp Setting 5: The Range of the setting is (0~15) This setting has to be specified basing on platform design and following the guideline.

PCIe Gen3 RxCTLEp Setting 6: The Range of the setting is (0~15) This setting has to be specified basing on platform design and following the guideline.

PCIe Gen3 RxCTLEp Setting 7: The Range of the setting is (0~15) This setting has to be specified basing on platform design and following the guideline.

3.5.2.4 Memory Configuration



DIMM profile

Select DIMM timing profile that should be used.

Memory Frequency Limiter

Maximum Memory Frequency Selections in Mhz.

ECC Support

Enable or disable DDR ECC support.

Max TOLUD

Maximum value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.

NMode Support

NMode Support Option.

Memory Scrambler

Enable or disable memory scrambler support.

MRC Fast Boot

Enable or disable MRC Fast Boot.

Force Cold Reset

Force cold reset or choose MRCm cold reset mode, when cold boot is required during MRC execution. Note: If ME 5.0 MB is present, force cold reset is required.

DIMM Exit Mode

DIMM Exit Mode Control.

Power Down Mode: Power Down Mode Control.

Scrambler Seed Generation Off

Control Memory Scrambler Seed Generation. Enable - do not generation scrambler seed. Disable – Generation Scrambler Seed always.

Memory Remap

Enable or disable memory remap above 4G.

Memory Alias Check

Enable or disable memory alias check.

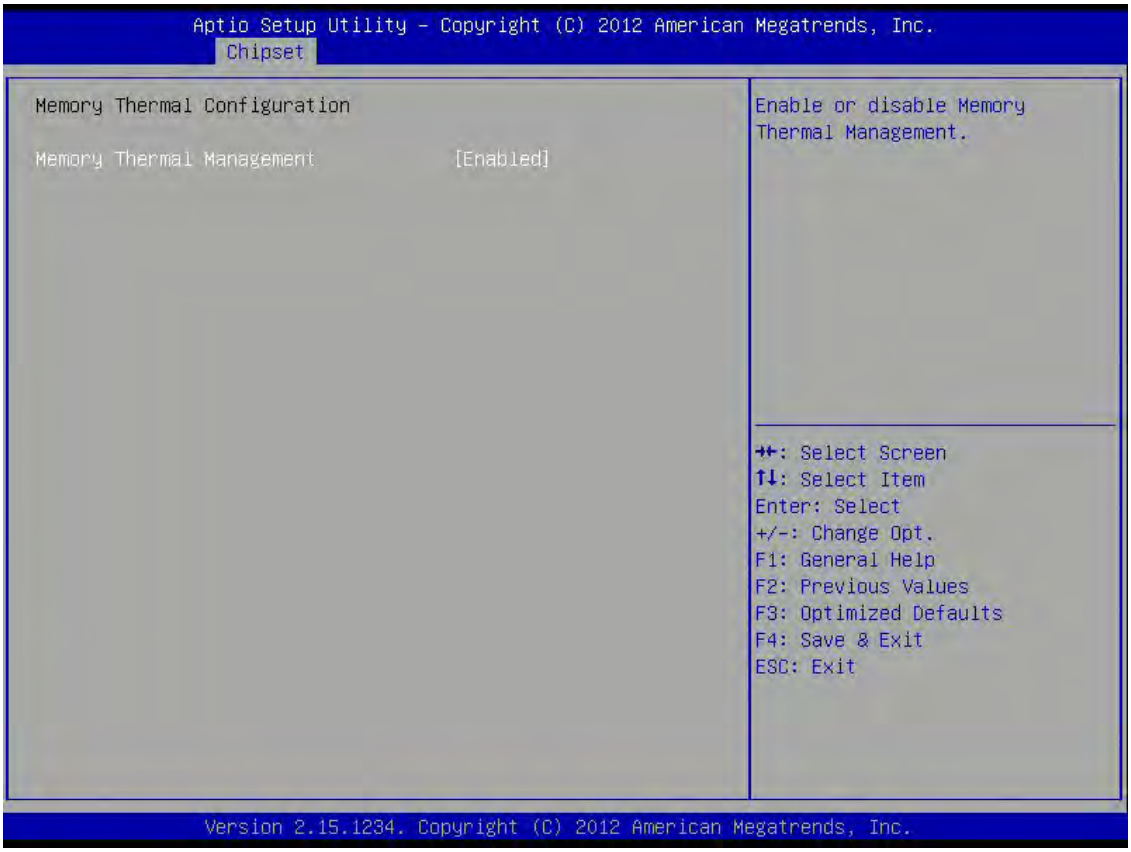
Channel A DIMM control

Enable or disable DIMM on channel A.

Channel B DIMM control

Enable or disable DIMM on channel B.

3.5.2.5 Memory Thermal Configuration



Memory thermal management

Enable or disable memory thermal management.

3.5.2.6 GT-Power Management Control

RC6(Render Stanby)

Check to enable render standby support.

RC6+(Deep RC6)

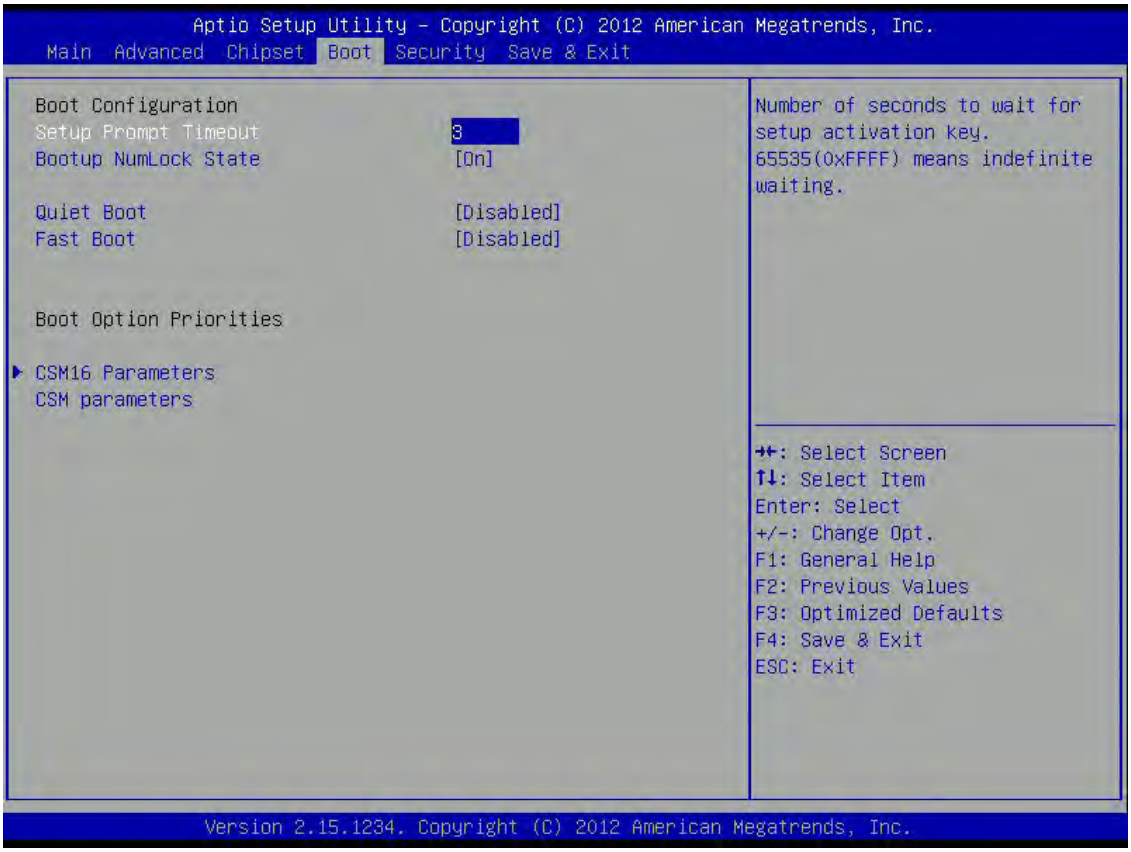
Check to enable Deep RC6(RC6+) support.

GT OverClocking Support

Enable or disable GT OverClocking support.

3.6 Boot

This section is used to configure the boot features.



Setup Prompt Timeout

Number of seconds to wait for setup activation key.

65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or Disables Quiet Boot option.

Fast Boot

Enables or Disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

CSM16 Parameters

GateA20 Active

UPON REQUEST – GA20 can be disabled using BIOS services.

ALWAYS – do not allow disabling GA20; this option is useful when any

RT code is executed above 1MB.

Option ROM Messages

Set display mode for Option ROM.

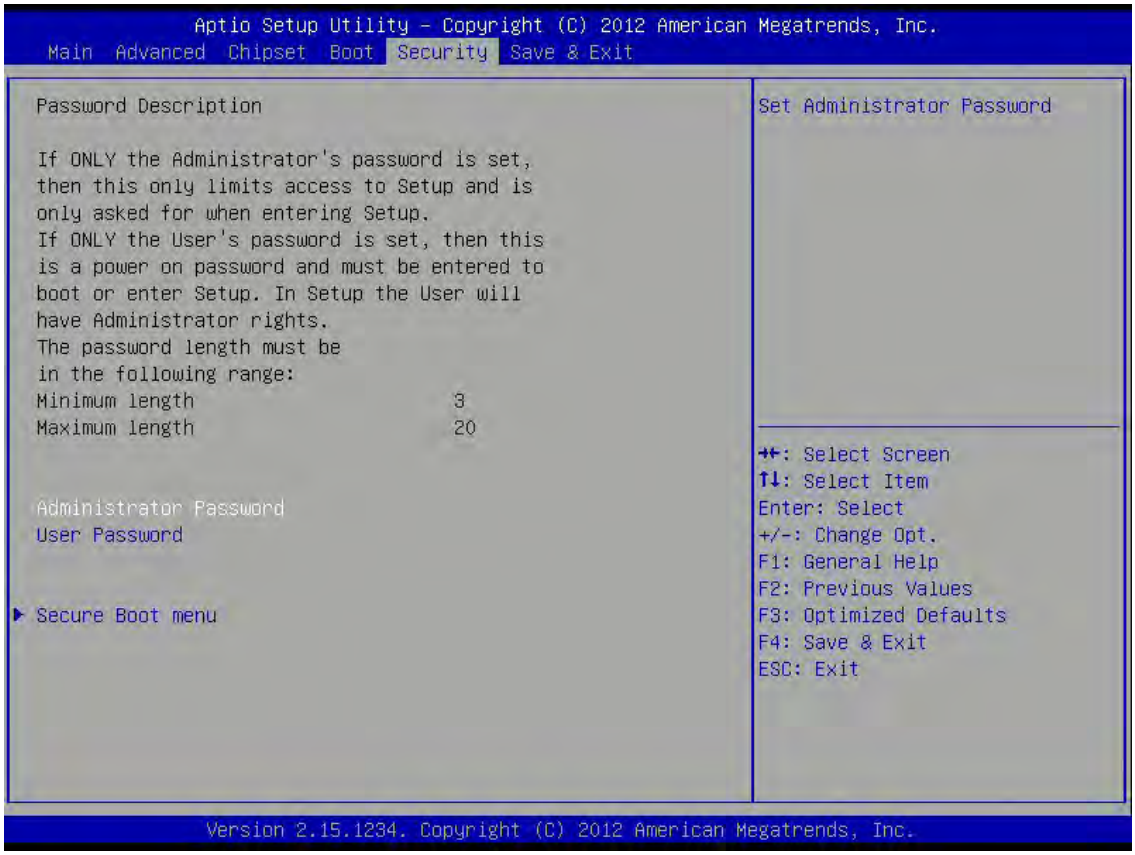
INT19 Trap Response

BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE – execute the trap right away;

POSTPONED – execute the trap during legacy boot.

3.7 Security

Use the Security Menu to establish system passwords



Administrator Password

Set administrator password.

User Password

Set User Password.

Secure Boot menu

Customizable Secure Boot Setting.

Secure Boot Control

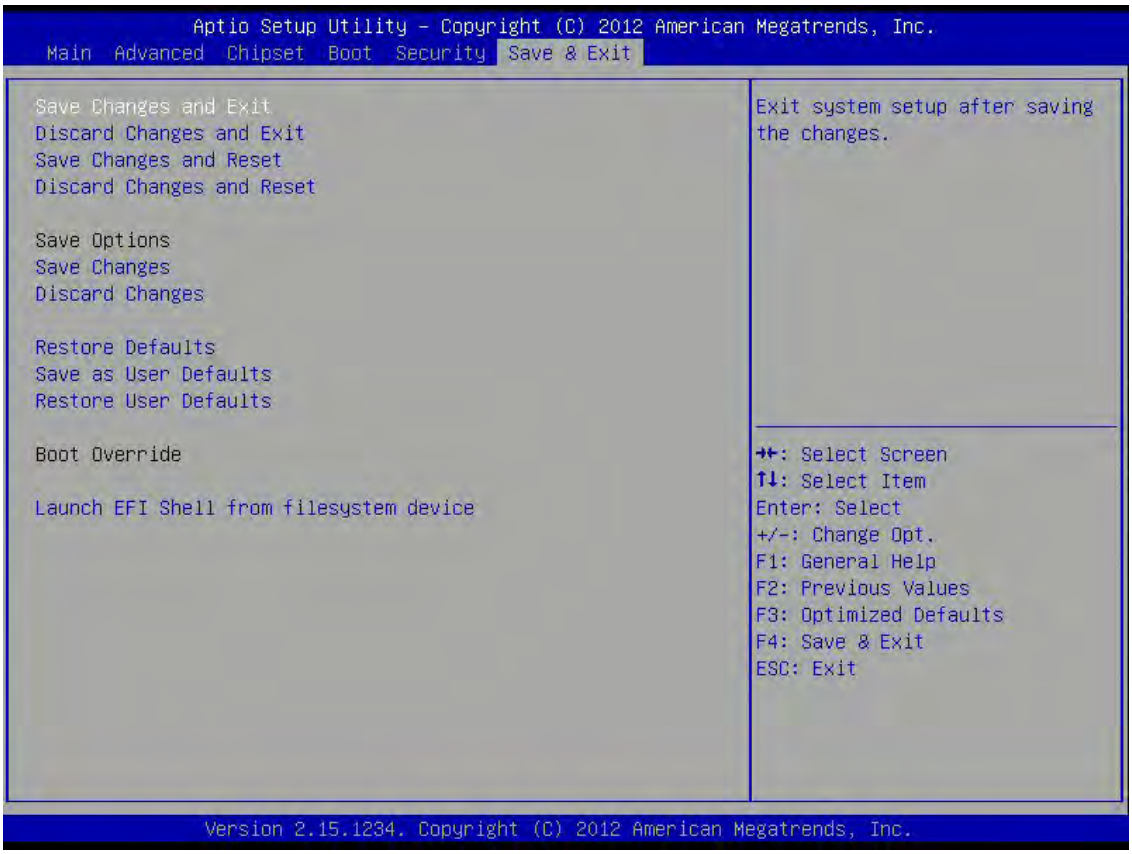
Secure Boot flow control. Secure Boot can be enabled only when platform Key(PK) is enrolled and Platform is operating in user mode.

Secure Boot Mode

Secure boot mode selector. “Custom” mode allows for more flexibility changing image execution policy and secure boot key management.

3.8 Save and exit

This screen provides functions for handling changes made to the BIOS settings and the exiting of the Setup program.



Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save changes and reset

Reset the system after saving the changes.

Discard Changes

Reset System setup without saving any changes.

Save changes

Save changes done so far to any of the setup options.

Discard changes

Discard changes done so far to any of the setup options.

Restore Defaults

Restore or Load Defaults values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the user Defaults to all the setup options.

Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available file system device.