

AQ7-BT

Intel® Atom™ /Celeron® Processor SoC

Onboard 2GB Memory

SATA x 2

USB 2.0 x 6 USB 3.0 x 1

LVDS, LCD, DP, HD Audio

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Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 AQ7-BT CPU Module
- 1 DVD-ROM for drivers and manual (in PDF format)
- 2 M2.5 Screws

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

China RoHS Requirements
产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。</p>						

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Chapter

1

General Information

1.1 Introduction

Measuring 70mm x 70mm, the AQ7-BT is a Qseven module with Qseven Rev.2.0 specification and equips Intel® Atom™ E3800 Series Processor SoC (and the N2807 Processor) with 2GB of onboard DDR3L memory.

It accommodates PCI-Express[x1] slots, SMBus, I2C bus, and SDIO interface for expansion; 18/24-bit single-channel LVDS and Digital Display Interface which can convert to DP/HDMI or other digital display format (may need certain bridge IC); Intel®'s I211/I210 for Ethernet (depending on SKU); and USB 3.0/2.0, SATA II, and serial ports for I/O

Users may also acquire AAEON's ECB-970 carrier board separately for evaluating and testing the module.

1.2 Features

- Intel® Atom™ E3800 Series Processor SoC, N2807 Processor
- Onboard DDR3L 2GB Memory
- Gigabit Ethernet x 1
- 18/24-bit Single-Channel LVDS, DP/HDMI
- High Definition Audio Interface
- SATA x 2, one share with onboard SATA SSD. (SLC/MLC, up to 32GB)
- USB 3.0 x 1, USB 2.0 x 6
- PCI-Express [x1] x 3
- Qseven Rev. 2.0, 70mm x 70mm

1.3 Specifications

System

Form Factor	Q7
Processor	Intel® Atom™ Processor SoC E3845: 4C/ 1.91GHz/ 10W E3825: 2C/1.33GHz/6W N2807: 2C/1.58GHz
System Memory	Onboard DDR3L 2GB
Chipset	Intel® Atom SoC
Ethernet	Intel® I211/I210 (depending on SKU) for 10/1000/1000Base-TX
BIOS	AMI BIOS, Legacy free BIOS
Wake On LAN	Yes
Watchdog Timer	ITE IT8528VG
H/W Status Monitoring	ITE IT8528VG
Expansion Interface	PCI Express [x1] x3 SMBUS x1 SPI x 1 I2C x1 GPIO: 8-bit SDIO x 1

	UART x 1
Power Requirement	DC 5V
Power Consumption (Typical)	E3845: 2.7A@5V (Whole system under 100% loading)
Board Size	70mm x 70mm (2.75" x 2.75")
Gross Weight	0.2kg (0.44 lbs)
Operating Temperature	0 °C ~ 60 °C (32 °F ~ 140 °F) or -40°C ~ 85°C (-40°F ~ 185°F) (Optional by SKU)
Storage Temperature	-40°C ~ 80°C (-40°F ~ 176°F)
Operation Humidity	0% ~ 90% relative humidity, non-condensing
Display	
Chipset	Intel® Atom™ Processor SoC
Memory	—
Resolution	LCD: Up to 1920 x 1200 DP/HDMI: Up to 1920 x 1080 (Optional)
LCD Interface	Up to 24-bit Dual-Channel LVDS
I/O	
Storage	SATA 2 x 1, onboard 4GB~16GB nanoSSD

(optional by request)

USB

USB 3.0 x 1

USB 2.0 x 6

Serial Port

4-wire UART x 1

Audio

High Definition Audio

Chapter

2

**Quick
Installation
Guide**

2.1 Safety Precautions

Warning!

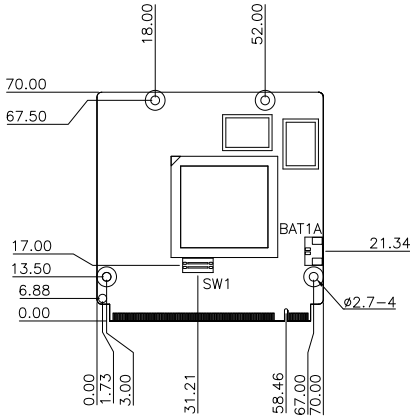
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

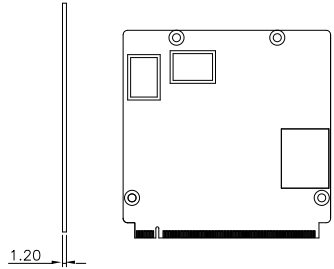
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Mechanical Drawings

Board

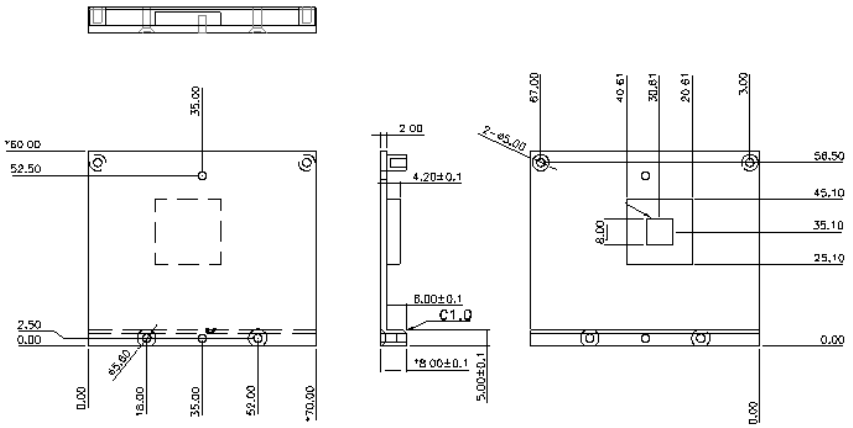


Component Side

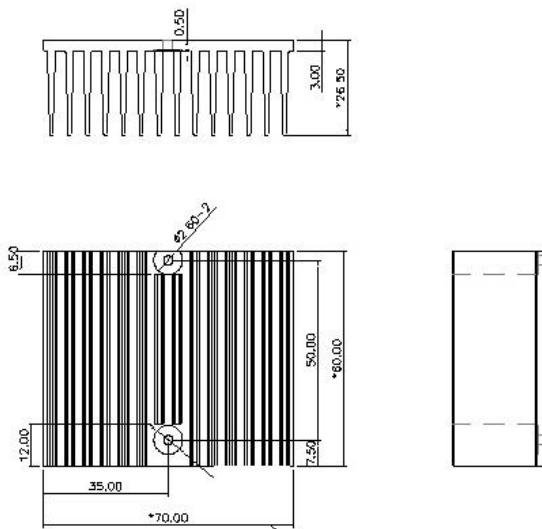


Solder Side

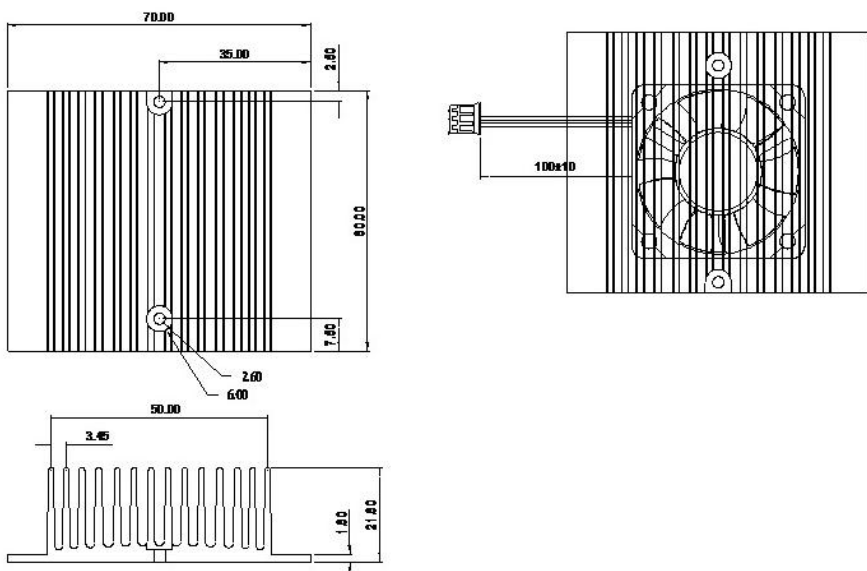
Heat Spreader



Heat Sink



Cooler



2.3 List of Jumpers

The board has a jumper that allows you to configure your system to suit your application.

The table below shows the function of the board's jumper:

Label	Function
SW1	AT/ATX Setting Switch

2.4 AT/ATX Setting Switch (SW1)

Switch	On	Off
1	AT	ATX
2	Factory use only	FW_WP (Default)

* By default, both switches are set to Off

* Switch 2 "On" position is for factory use only. Users are strongly advised not to perform this setting.

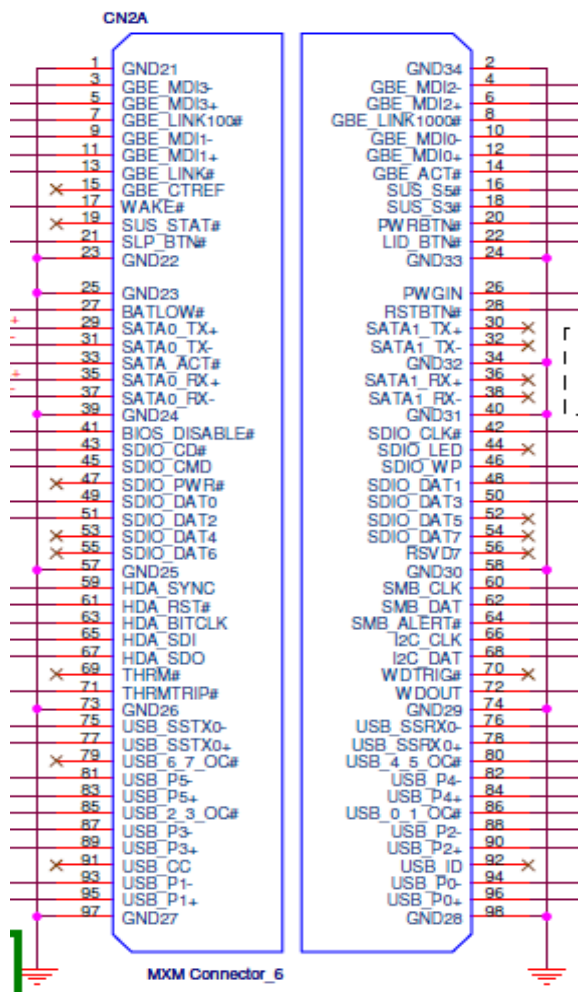
2.5 List of Connectors

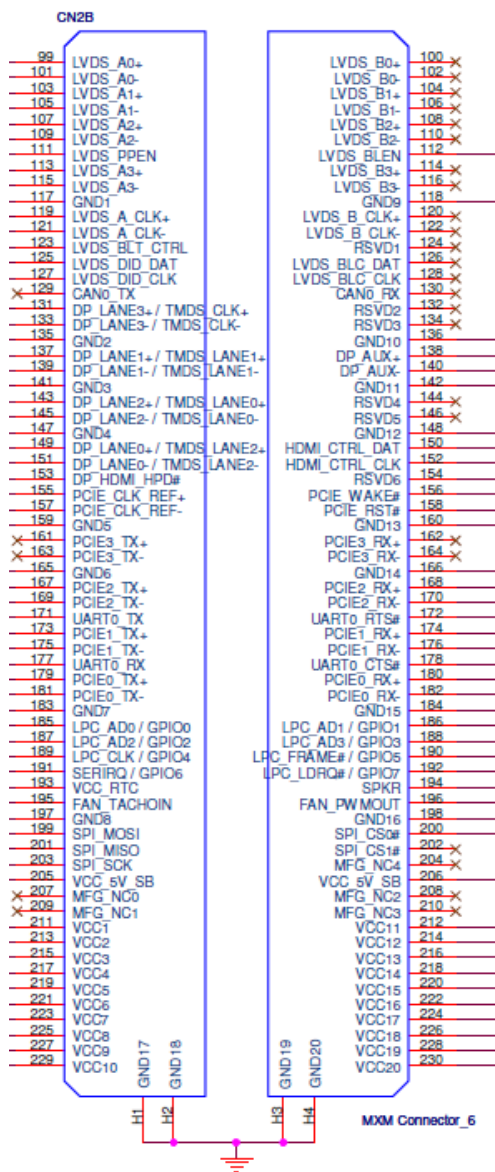
The board has a connector that allows you to configure your system to suit your application.

The table below shows the function of the board's connector:

Label	Function
BAT1A	RTC Battery Connector

2.6 QSeven MXM Pin Definitions





2.7 QSeven MXM Pin Assignments

CN2

Pin	Qseven SPEC Rev. 2.0 Signal	AQ7-BT Signal	Pin	Qseven SPEC Rev. 2.0 Signal	AQ7-BT Signal
1	GND	GND21	2	GND	GND34
3	GBE_MDI3-	LAN1_MDI3N	4	GBE_MDI2-	LAN1_MDI2N
5	GBE_MDI3+	LAN1_MDI3P	6	GBE_MDI2+	LAN1_MDI2P
7	GBE_LINK100#	LAN1_LED_100#	8	GBE_LINK1000#	LAN1_LED_1000#
9	GBE_MDI1-	LAN1_MDI1N	10	GBE_MDI0-	LAN1_MDI0N
11	GBE_MDI1+	LAN1_MDI1P	12	GBE_MDI0+	LAN1_MDI0P
13	GBE_LINK#	LAN1_LED_LNK #_ACT	14	GBE_ACT#	LAN1_LED_LNK#_ ACT
15	GBE_CTREF	No connection	16	SUS_S5#	O_SLP_S4
17	WAKE#	I_Wake1#	18	SUS_S3#	O_SLP_S3
19	SUS_STAT#	No connection	20	PWRBTN#	I_PS_IN#
21	SLP_BTN#	CB_SLEEP#_V3. 3A	22	LID_BTN#	CB_LID#_V3.3A
23	GND	GND22	24	GND	GND33
25	GND	GND23	26	PWGIN	I_PWRGD_CB
27	BATLOW#	I_BATLOW#	28	RSTBTN#	CARRY_SYSRST#
29	SATA0_TX+	SATA_TXP0	30	SATA1_TX+	No connection

31	SATA0_TX-	SATA_TXN0	32	SATA1_TX-	No connection
33	SATA_ACT#	SATA_LED_CB#	34	GND	GND32
35	SATA0_RX+	SATA_RXP0	36	SATA1_RX+	No connection
37	SATA0_RX-	SATA_RXN0	38	SATA1_RX-	No connection
39	GND	GND24	40	GND	GND31
41	BIOS_DISABLE#/ BOOT_ALT#	BIOS_DISABLE#	42	SDIO_CLK#	SDMMC3_CLK
43	SDIO_CD#	SDMMC3_CD#	44	SDIO_LED	No connection
45	SDIO_CMD	SDMMC3_CMD	46	SDIO_WP	SDMMC3_WP
47	SDIO_PWR#	No connection	48	SDIO_DAT1	SDMMC3_D1
49	SDIO_DAT0	SDMMC3_D0	50	SDIO_DAT3	SDMMC3_D3
51	SDIO_DAT2	SDMMC3_D2	52	SDIO_DAT5	No connection
53	SDIO_DAT4	No connection	54	SDIO_DAT7	No connection
55	SDIO_DAT6	No connection	56	RSVD	No connection
57	GND	GND25	58	GND	GND30
59	HDA_SYNC/I2S_ WS	CB_HDA_SYNC	60	SMB_CLK/GPI1_I2 C_CLK	SMB_CLK_3.3S
61	HDA_RST#/I2S_ RST#	CB_HDA_RST#	62	SMB_DAT/GPI1_I2 C_DAT	SMB_DATA_3.3S
63	HDA_BITCLK/I2C _CLK	CB_HDA_CLK	64	SMB_ALERT#	SMB_ALERT#_3.3 S

65	HDA_SDI/I2S_SDI	CB_HDA_SDI0	66	GP0_I2C_CLK	EC_CLK
67	HDA_SDO/I2S_SDO	CB_HDA_SDO	68	GP0_I2C_DAT	EC_DATA
69	THRM#	No connection	70	WDTRIG#	No connection
71	THRMTRIP#	I_THRMTRIP#	72	WDOUT	O_WDT#
73	GND	GND26	74	GND	GND29
75	USB_P7-/USB_SSTX0-	USB_SSTX0-	76	USB_P6-/USB_SSRX0-	USB_SSRX0-
77	USB_P7+/USB_SSTX0+	USB_SSTX0+	78	USB_P6+/USB_SSRX0+	USB_SSRX0+
79	USB_6_7_OC#	No connection	80	USB_4_5_OC#	USB_OC#_4_5
81	USB_P5-/USB_SSTX1-	USB_DN5_CB	82	USB_P4-/USB_SSRX1-	USB_DN4_CB
83	USB_P5+/USB_SSTX1+	USB_DP5_CB	84	USB_P4+/USB_SSRX1+	USB_DP4_CB
85	USB_2_3_OC#	USB_OC#_2_3_3.3S	86	USB_0_1_OC#	USB_OC#_0_1_3.3S
87	USB_P3-	USB_DN3_CB	88	USB_P2-	USB_DN2_CB
89	USB_P3+	USB_DP3_CB	90	USB_P2+	USB_DP2_CB
91	USB_CC	No connection	92	USB_ID	No connection
93	USB_P1-	USB_DN1_CB	94	USB_P0-	USB_DN0_CB

95	USB_P1+	USB_DP1_CB	96	USB_P0+	USB_DP0_CB
97	GND	GND27	98	GND	GND28
99	eDP0_TX0+/LVDS S_A0+	LVDS_A0+	100	eDP1_TX0+/LVDS _B0+	No connection
101	eDP0_TX0-/LVDS _A0-	LVDS_A0-	102	eDP1_TX0-/LVDS B0-	No connection
103	eDP0_TX1+/LVDS S_A1+	LVDS_A1+	104	eDP1_TX1+/LVDS _B1+	No connection
105	eDP0_A1-/LVDS A1-	LVDS_A1-	106	eDP1_TX1-/LVDS B1-	No connection
107	eDP0_TX2+/LVDS S_A2+	LVDS_A2+	108	eDP_TX2+/LVDS_ B2+	No connection
109	eDP0_TX2-/LVDS _A2-	LVDS_A2-	110	eDP_TX2-/LVDS_ B2-	No connection
111	LVDS_PPEN	LVDS_VDD_EN	112	LVDS_BLEN	LVDS_BKLTEN
113	eDP0_TX3+/LVDS S_A3+	LVDS_A3+	114	eDP_TX3+/LVDS_ B3+	No connection
115	eDP0_TX3-/LVDS _A3-	LVDS_A3-	116	eDP_TX3-/LVDS_ B3-	No connection
117	GND	GND1	118	GND	GND9
119	eDP0_AUX+/LVDS S_A_CLK+	LVDS_A_CLK+	120	eDP_AUX+/LVDS_ B_CLK+	No connection

121	eDP0_AUX-/LVDS_S_A_CLK-	LVDS_A_CLK-	122	eDP_AUX-/LVDS_B_CLK-	No connection
123	LVDS_BLT_CTRL/GP_PWM_OUT0	LVDS_BLT_CTRL	124	GP_1-Wire_Bus	No connection
125	GP2_I2C_DAT/LVDS_DID_DAT	LVDS_DID_DAT	126	eDP0_HPD#/LVDS_BLC_DAT	No connection
127	GP2_I2C_CLK/LVDS_DID_CLK	LVDS_DID_CLK	128	eDP1_HPD#/LVDS_BLC_CLK	No connection
129	CAN0_TX	No connection	130	CAN0_RX	No connection
131	DP_LANE3+/TMD_DS_CLK+	HDMI_DP_PAIR3_P	132	RSVD (Diff pair)	No connection
133	DP_LANE3-/TMD_S_CLK-	HDMI_DP_PAIR3_N	134	RSVD (Diff pair)	No connection
135	GND	GND2	136	GND	GND10
137	DP_LANE1+/TMD_DS_LANE1+	HDMI_DP_PAIR1_P	138	DP_AUX+	DDI0_DP_AUXP
139	DP_LANE1-/TMD_S_LANE1-	HDMI_DP_PAIR1_N	140	DP_AUX-	DDI0_DP_AUXN
141	GND	GND3	142	GND	GND11
143	DP_LANE2+/TMD_DS_LANE0+	HDMI_DP_PAIR2_P	144	RSVD (Diff pair)	No connection

145	DP_LANE2-/TMD S_LANE0-	HDMI_DP_PAIR2 _N	146	RSVD (Diff pair)	No connection
147	GND	GND4	148	GND	GND12
149	DP_LANE0+/TM DS_LANE2+	HDMI_DP_PAIR0 _P	150	HDMI_CTRL_DAT	HDMI_DATA
151	DP_LANE0-/TMD S_LANE2-	HDMI_DP_PAIR0 _N	152	HDMI_CTRL_CLK	HDMI_CLK
153	DP_HDMI_HPD#	HDMI_DP_HPD	154	RSVD	HDMI_DP_HPD
155	PCIE_CLK_REF+	CLK_PCIE_1_P	156	PCIE_WAKE#	I_Wake0#
157	PCIE_CLK_REF-	CLK_PCIE_1_N	158	PCIE_RST#	I_LPCRST#
159	GND	GND5	160	GND	GND13
161	PCIE3_TX+	No connection	162	PCIE3_RX+	No connection
163	PCIE3_TX-	No connection	164	PCIE3_RX-	No connection
165	GND	GND6	166	GND	GND14
167	PCIE2_TX+	PCIE_TXP2	168	PCIE2_RX+	PCIE_RXP2
169	PCIE2_TX-	PCIE_TXN2	170	PCIE2_RX-	PCIE_RXN2
171	UART0_TX	TXD	172	UART0_RTS#	UART0_RTS#
173	PCIE1_TX+	PCIE_TXP1	174	PCIE1_RX+	PCIE_RXP1
175	PCIE1_TX-	PCIE_TXN1	176	PCIE1_RX-	PCIE_RXN1
177	UART0_RX	RXD	178	UART0_CTS#	UART0_CTS#
179	PCIE0_TX+	PCIE_TXP0	180	PCIE0_RX+	PCIE_RXP0

181	PCIE0_TX-	PCIE_TXN0	182	PCIE0_RX-	PCIE_RXN0
183	GND	GND7	184	GND	GND15
185	LPC_AD0/GPIO0	LPC_GPIO_AD0	186	LPC_AD1/GPIO1	LPC_GPIO_AD1
187	LPC_AD2/GPIO2	LPC_GPIO_AD2	188	LPC_AD3/GPIO3	LPC_GPIO_AD3
189	LPC_CLK/GPIO4	CLK_LPC_GPIO_	190	LPC_FRAME#/GPI	LPC_GPIO_FRAM
		CON		O5	E#
191	SERIRQ/GPIO6	INT_GPIO_SERI	192	LPC_LDRQ#/GPIO	LPC_GPIO_DRQ#
		RQ		7	
193	VCC_RTC	CB_VRTC	194	SPKR/GP_PWM_	SPKR
				OUT2	
195	FAN_TACHOIN/ GP_TIMER_IN	FAN_TACHOIN	196	FAN_PWMOUT/G	CB_FAN_PWM
				P_PWM_OUT1	
197	GND	GND8	198	GND	GND16
199	SPI_MOSI	SPI_SI_F	200	SPI_CS0#	SPI_CS0#_F
201	SPI_MISO	SPI_SO_F	202	SPI_CS1#	No connection
203	SPI_CLK	SPI_CLK_F	204	MFG_NC4	No connection
205	VCC_5V_SB	VCC_5V_SBY	206	VCC_5V_SB	VCC_5V_SBY
207	MFG_NC0	No connection	208	MFG_NC2	No connection
209	MFG_NC1	No connection	210	MFG_NC3	No connection
211	VCC	V5_MOD_IN	212	VCC	V5_MOD_IN
213	VCC	V5_MOD_IN	214	VCC	V5_MOD_IN

215	VCC	V5_MOD_IN	216	VCC	V5_MOD_IN
217	VCC	V5_MOD_IN	218	VCC	V5_MOD_IN
219	VCC	V5_MOD_IN	220	VCC	V5_MOD_IN
221	VCC	V5_MOD_IN	222	VCC	V5_MOD_IN
223	VCC	V5_MOD_IN	224	VCC	V5_MOD_IN
225	VCC	V5_MOD_IN	226	VCC	V5_MOD_IN
227	VCC	V5_MOD_IN	228	VCC	V5_MOD_IN
229	VCC	V5_MOD_IN	230	VCC	V5_MOD_IN

Chapter

3

**AMI
BIOS Setup**

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The AQ7-BT CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 AMI BIOS Setup

AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press or <F2> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Enable/disable boot option for legacy network devices.

Chipset

Host bridge parameters.

Boot

Enables/disables quiet boot option.

Security

Set setup administrator password.

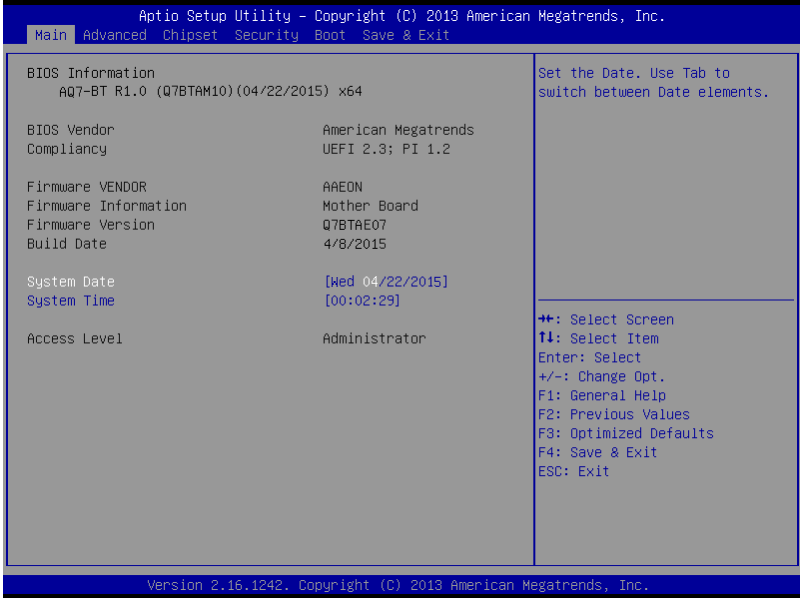
Save&Exit

Exit system setup after saving the changes.

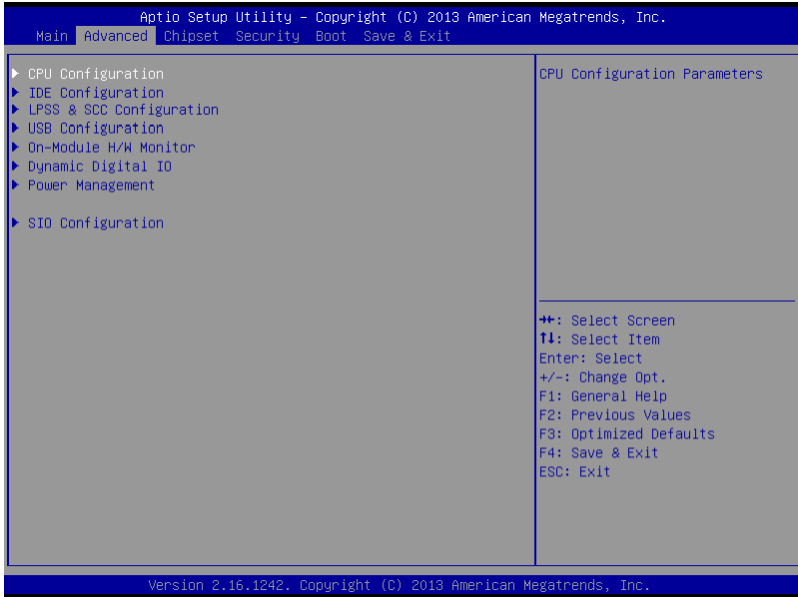
BIOS Setup Menu

Main

Press '*Delete*' Key to enter Setup



Advanced



Advanced -> CPU Configuration

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.

Advanced

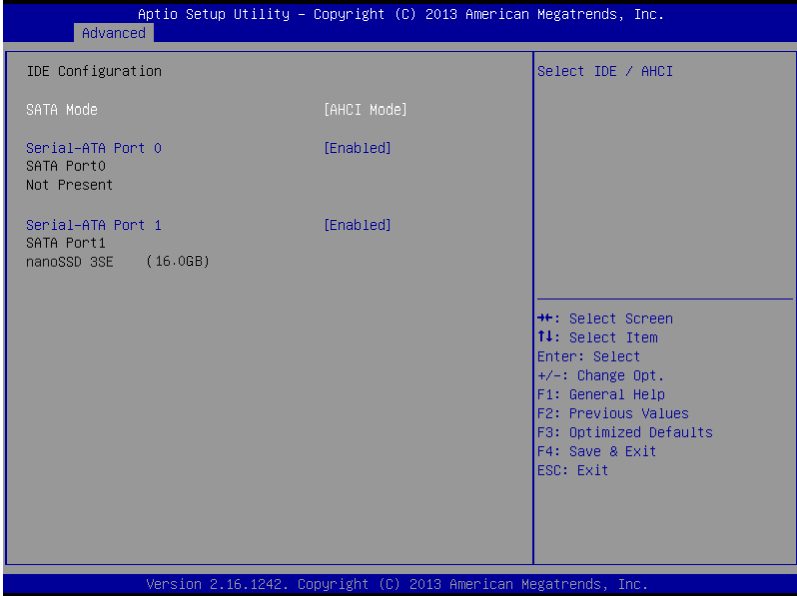
<p>CPU Configuration</p> <pre> Intel(R) Atom(TM) CPU E9845 @ 1.91GHz CPU Signature 30679 Microcode Patch 901 BayTrail SoC D0 Stepping Max CPU Speed 1910 MHz Min CPU Speed 500 MHz Processor Cores 4 Intel HT Technology Not Supported Intel VT-x Technology Supported L1 Data Cache 24 kB x 4 L1 Code Cache 32 kB x 4 L2 Cache 1024 kB x 2 L3 Cache Not Present Intel Virtualization Technology [Enabled] </pre>	<p>When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology</p> <hr/> <p> ++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
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Options summary:

Intel	Disabled	Optimal Default, Failsafe Default
Virtualization Technology	Enabled	
When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology		

Advanced -> IDE Configuration



Options summary:

SATA Mode	IDE	
	AHCI	Default
IDE: Configure SATA controllers as legacy IDE		
AHCI: Configure SATA controllers to operate in AHCI mode		
Serial-ATA Port0/1	Enabled	Default
	Disable	

Advanced -> LPSS & SCC Configuration

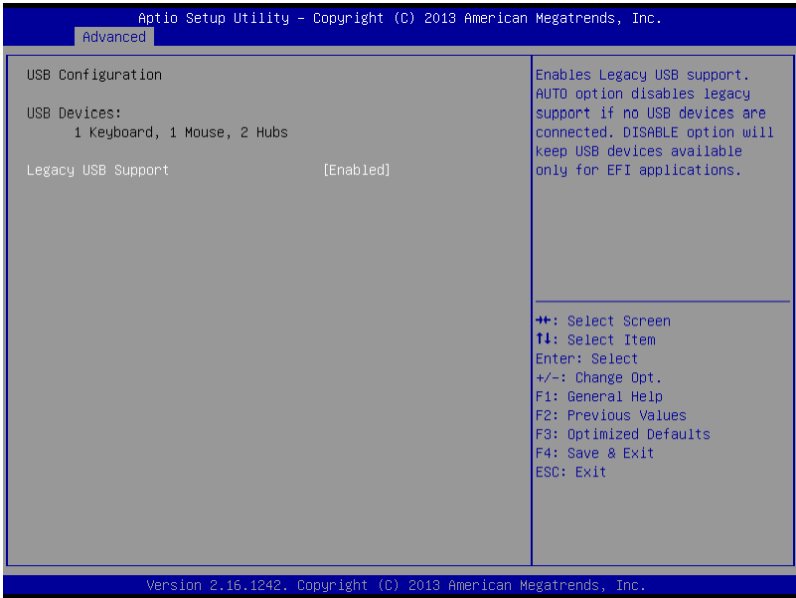


Options summary:

LPSS & SCC Devices Mode	ACPI mode	Default
	PCI mode	
SCC SD Card Support	Enabled	Default
	Disable	
DDR50 Support for SDCard	Enabled	Default
	Disable	

Per chipset spec, there is chance that SD card can't be recognized properly when set to high speed. (DDR50) The issue doesn't occur at low speed setting.

Advanced -> USB Configuration



Options summary:

Legacy USB Support	Enabled	Optimal Default, Failsafe Default
	Disabled	
	Auto	

Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS.

AUTO option disables legacy support if no USB devices are connected

Device Name (Emulation Type)	Auto	Optimal Default, Failsafe Default
	Floppy	
	Forced FDD	
	Hard Disk	
	CDROM	

If Auto. USB devices less than 530MB will be emulated as Floppy and remaining as Floppy and remaining as hard drive. Forced FDD option can be used to force a HDD formatted drive to boot as FDD(Ex. ZIP drive)

Advanced -> On-Module H/W Monitor

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.

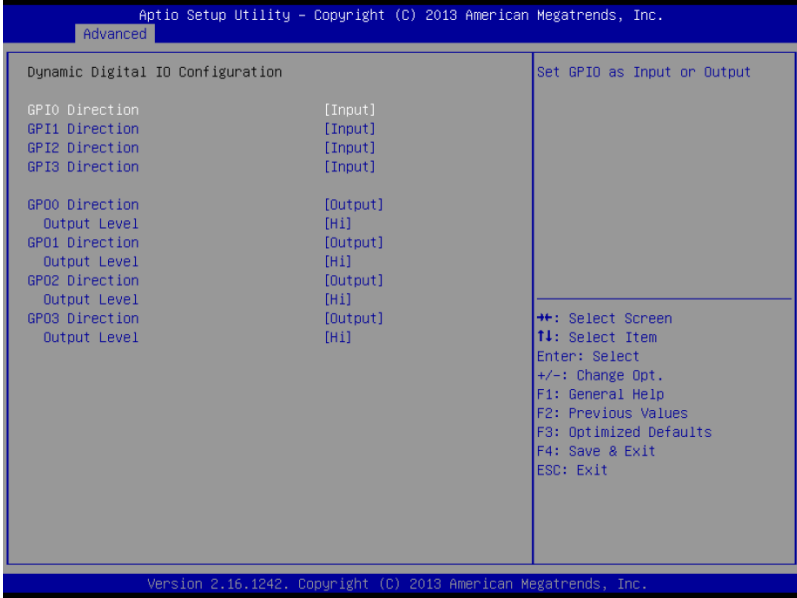
Advanced

Pc Health Status	
CPU Temperature	: +53 ℃
SYS Temperature	: +31 ℃
+3.3V	: +3.296 V
VMEM	: +1.368 V
5VSB	: +5.164 V
VDCORE	: +0.783 V

++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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Advanced -> Dynamic Digital IO

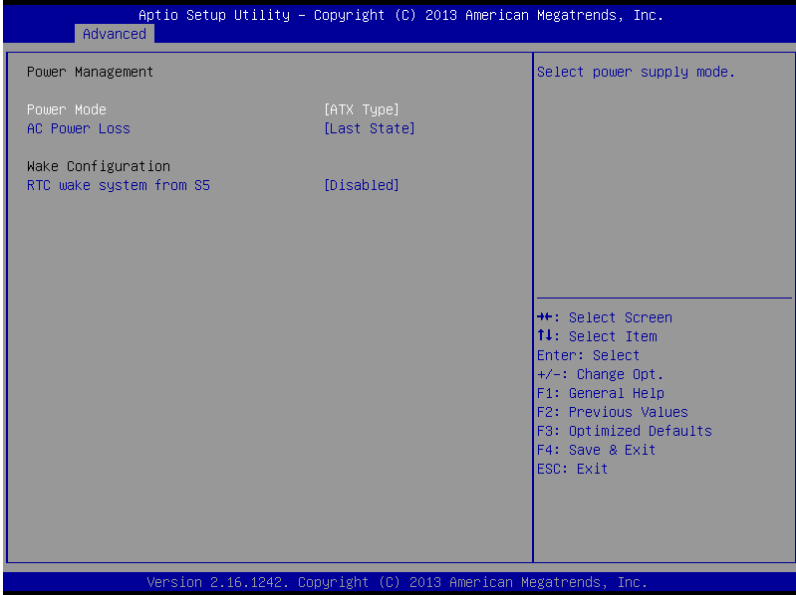


Options summary:

GPI[3:0] Direction	Input	Optimal Default, Failsafe Default
	Output	
Set GPI[3:0] as Input or Output		
GPI[3:0] Output Level	Hi	Optimal Default, Failsafe Default
	Low	
Set GPI[3:0] Output as Hi or Low		
GPO[3:0] Direction	Input	
	Output	Optimal Default, Failsafe Default
Set GPO[3:0] as Input or Output		

GPO[3:0] Output	Input	
Level	Output	Optimal Default, Failsafe Default
Set GPO[3:0] Output as Hi or Low		

Advanced -> Power Management



Options summary:

Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select power supply mode		
Restore AC	Last State	Optimal Default, Failsafe Default
	Power Loss	
	Power On	
	Power Off	
Select AC power state when power is re-applied after a power failure		
RTC wake system	Disable	Optimal Default, Failsafe Default
	Fixed Time	

from S5	Dynamic Time	
Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified		

Advanced -> SIO Configuration

Aprio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.

Advanced

AMI SIO Driver Version : A5.03.03

Super IO Chip Logical Device(s) Configuration

▶ [*Active*] Serial Port

WARNING: Logical Devices state showing at the left side of the controll, reflects current Logical Device state.
Cahnges made during Setup Session will be shown after you restart the system.

View and Set Basic properties of the SIO Logical device.
Like IO Base, IRQ Range, DMA Channel and Device Mode.

++: Select Screen
Tl: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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Advanced -> Serial Port Configuration

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Advanced

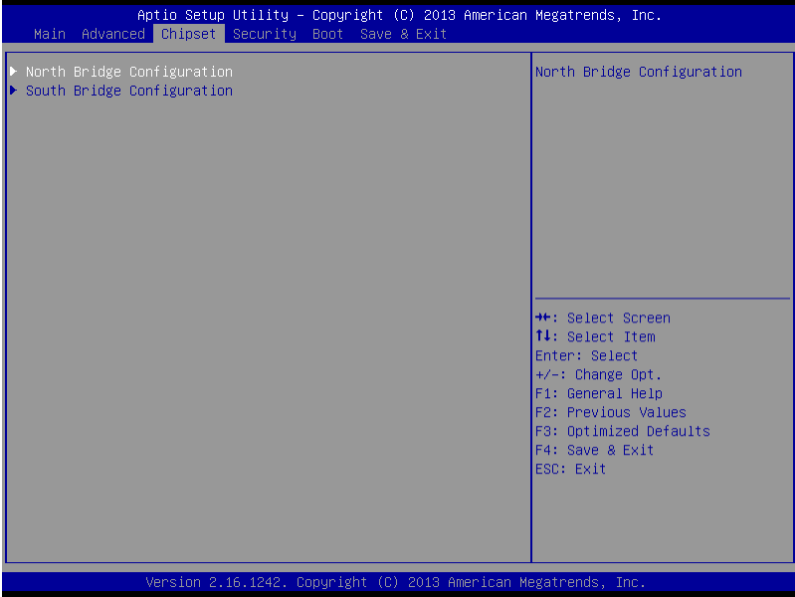
<p>Serial Port Configuration</p> <p>Use This Device [Enabled]</p> <p>Logical Device Settings: Current : IO=2D8h; IRQ=11;</p> <p>Possible: [Use Automatic Settings]</p> <p>WARNING: disabling SIO Logical Devices may have unwanted side effects. PROCEED WITH CAUTION.</p>	<p>Enable or Disable this Logical Device.</p> <hr/> <p> ++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
--	---

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Options summary:

Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2D8; IRQ=11; DMA;	
	IO=2C8; IRQ=11; DMA;	
Select an optimal setting for IO device		

Chipset



Chipset -> North Bridge

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Chipset

North Bridge Configuration	Display Control Configuration
Memory Information	
Total Memory	2048 MB (LPDDR3)
Memory Slot0	2048 MB (LPDDR3)
▶ Display Control Configuration	
	++: Select Screen t1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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Chipset -> North Bridge -> Display Control Configuration

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Chipset

<p>Display Control Configuration</p> <p>DVMT Pre-Allocated [64M] DVMT Total Gfx Mem [256MB]</p> <p>Primary IGFX Boot Display [VBIOS Default] LVDS1 [Enabled] Panel Type [1024x768] Color Depth [18-Bit] Backlight Type [Normal] Backlight Level [80%]</p>	<p>Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.</p> <hr/> <p> ++: Select Screen Tl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
--	---

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Options summary:

DVMT Pre-Allocated	64M	Optimal Default, Failsafe Default
	96M	
	128M	
	160M	
	512M	
DVMT Total Gfx Mem	128MB	
	256MB	Optimal Default, Failsafe Default

	Max	
Primary IGFX Boot Display	VBIOS Default	Optimal Default, Failsafe Default
	LVDS	
	DP/HDMI	
<p>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</p>		
Secondary IGFX Boot Display	Disabled	Optimal Default, Failsafe Default
	LVDS	
	DP/HDMI	
<p>Select Secondary Display Device</p>		
LVDS 1	Disabled	
	Enabled	Optimal Default, Failsafe Default
Panel Type	640x480	
	800x480	
	800x600	
	1024x600	
	1024x768	Optimal Default, Failsafe Default
	1280x768	

	1366x768	
	1440x900	
Select Panel Type 1024x768		
Color Depth	18-Bit	Optimal Default, Failsafe Default
	24-Bit	
Backlight Type	Normal	Optimal Default, Failsafe Default
	Inverted	
Backlight Level	0%	
	10%	
	20%	
	30%	
	40%	
	50%	
	60%	
	70%	
	80%	Optimal Default, Failsafe Default
	90%	
	100%	

Chipset -> South Bridge

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.

Chipset

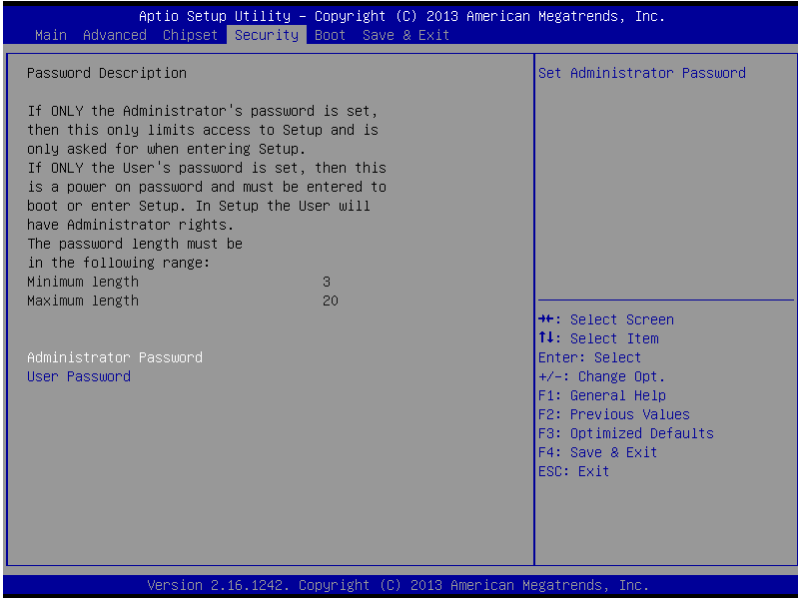
<p>South Bridge Configuration</p> <p>Audio Controller [Enabled]</p> <p>PCI Express Port 0 [Enabled] Hot Plug [Enabled] Speed [Auto]</p> <p>PCI Express Port 1 [Enabled] Hot Plug [Enabled] Speed [Auto]</p> <p>PCI Express Port 2 [Enabled] Hot Plug [Enabled] Speed [Auto]</p> <p>PCI Express Port 3 [Enabled]</p>	<p>Control Detection of the Azalia device. Disabled = Azalia will be unconditionally disabled. Enabled = Azalia will be unconditionally Enabled. Auto = Azalia will be enabled if present disabled otherwise.</p> <hr/> <p> ++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
--	---

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Options summary:

Audio Controller	Enabled	Default
	Disable	
PCI Express Port 0/1/2/3	Enabled	Default
	Disabled	
Hot Plug	Disabled	
	Enabled	Default
Speed	Auto	Default
	Gen 2	
	Gen 1	

Security



Setup submenu: Security

Change User/Supervisor Password

You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

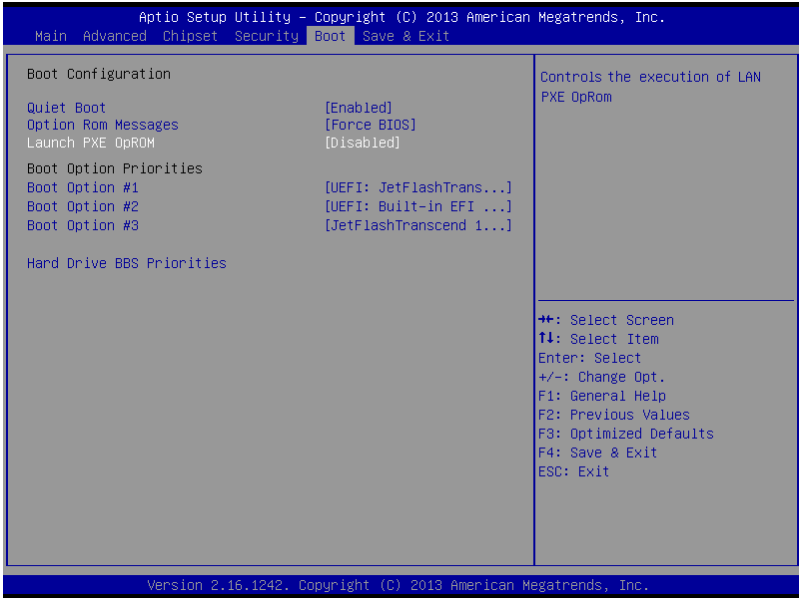
If you highlight these items and press Enter, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for

confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

Removing the Password

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

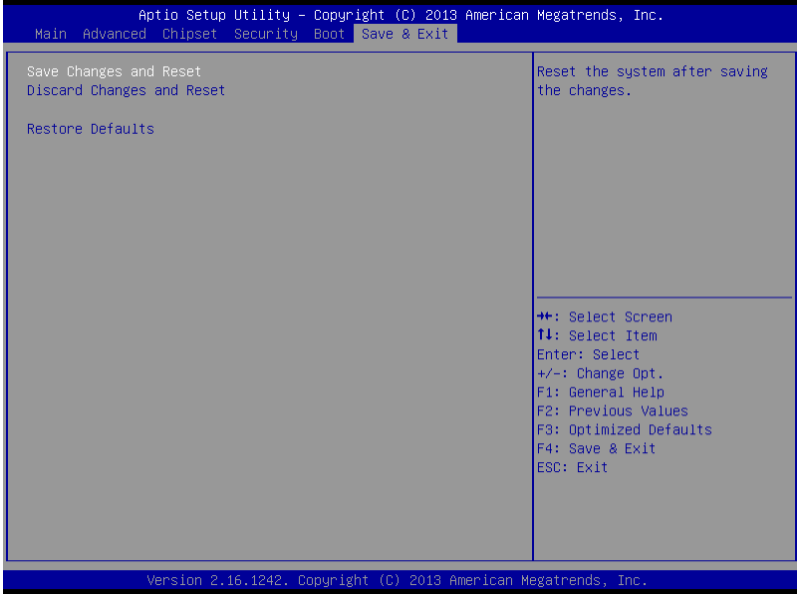
Boot



Options summary:

Quiet Boot	Disabled	
	Enabled	Default
En/Disable showing boot logo.		
Option Rom Message	Force BIOS	Default
	Keep Current	
Launch PXE OpROM	Disabled	Default
	Enabled	
En/Disable PXE boot for LAN		

Exit



Chapter

4

**Driver
Installation**

The AQ7-BT comes with a driver disk that contains all drivers and utilities you need to setup your product.

Insert the disk and the installation guide will start automatically. If it doesn't, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

- Step 1 – Install Chipset Driver
- Step 2 – Install Graphics Driver
- Step 3 – Install LAN Driver
- Step 4 – Install Audio Driver
- Step 5 – Install TXE Driver
- Step 6 – Install USB 3.0 Driver
- Step 7 – Install MBI Driver (Optional)
- Step 8 – Install Atom E3800 I/O Driver

Please read instructions below for further detailed installations.

4.1 Installation

Insert the AQ7-BT driver disk into the disk drive and install the drivers from Step 1 to Step 8 in order.

Step 1 – Install Chipset Driver

1. Open the **STEP1 - CHIPSET** folder followed by **SetupChipset.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 2 – Install Graphics Driver

1. Open the **STEP2 - Graphics** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 3 – Install LAN Driver

1. Open the **STEP3 – LAN** folder and select your OS
2. Open the **Setup.exe** file in the OS folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 4 – Install Audio Driver

1. Open the **STEP4 - LAN** folder followed by **win7_8-32_64_R273.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 5 – Install TXE Driver (Windows 8 only)

1. Open the **STEP5 - TXE** folder followed by **SetupTXE.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 6 – Install USB 3.0 Driver (Windows 7 only)

1. Open the **STEP6 – USB3.0** folder followed by **Setup.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 7 – Install MBI Driver (Optional, Windows 8 only)

1. Open the **STEP7 – MBI (Optional)** folder followed by **Setup.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 8 – Install Atom I/O Driver

1. Open the **STEP8 – Atom_E3800_IO** folder and select your OS

2. Open the *.msi* file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Appendix

A

Programming the Watchdog Timer

A.1 Watchdog Timer Initial Program

Table 1 : Embedded BRAM relative register table

	Default Value	Note
Index	0x284 (Note1)	BRAM Index Register
Data	0x285 (Note2)	BRAM Data Register
Logical Device Number	0xA8 (Note3)	Watch dog Logical Device Number
Function and Device Number	0x00 (Note4)	Watch dog Function/Device Number

Table 2 : Watchdog relative register table

	Option Register	BitNum	Value	Note
Timer Counter	0x00 (Note5)		(Note10)	Time of watchdog timer (0~255)
Counting Unit	0x01 (Note6)	0 (Note7)	0 (Note11)	Select time unit. 0: second 1: minute
Watchdog RST pulse width	0x01 (Note8)	[3:2] (Note9)	0 (Note12)	0: 20ms 1: 60ms 2: 100ms 3: 250ms


```

*****
// Embedded BRAM relative definition (Please reference to Table 1)
#define byte EcBRAMIndex //This parameter is represented from Note1
#define byte EcBRAMData //This parameter is represented from Note2
#define byte BRAMLDNReg //This parameter is represented from Note3
#define byte BRAMFnDataReg //This parameter is represented from Note4
#define void EcBRAMWriteByte(byte Offset, byte Value);
#define byte EcBRAMReadByte(byte Offset);
#define void IOWriteByte(byte Offset, byte Value);
#define byte IOReadByte(byte Offset);
// Watch Dog relative definition (Please reference to Table 2)
#define byte TimerReg //This parameter is represented from Note5
#define byte TimerVal // This parameter is represented from Note10
#define byte UnitReg //This parameter is represented from Note6
#define byte UnitBit //This parameter is represented from Note7
#define byte UnitVal //This parameter is represented from Note11
#define byte RSTReg //This parameter is represented from Note8
#define byte RSTBit //This parameter is represented from Note9
#define byte RSTVal //This parameter is represented from Note12
*****

```

```
*****
VOID Main() {
    // Procedure : AaeonWDTConfig
    // (byte)Timer : Time of WDT timer.(0x00~0xFF)
    // (boolean)Unit : Select time unit(0: second, 1: minute).
    AaeonWDTConfig();

    // Procedure : AaeonWDTEnable
    // This procedure will enable the WDT counting.
    AaeonWDTEnable();
}
*****
```

```

*****
// Procedure : AeonWDTEnable
VOID AeonWDTEnable (){
    WDTEnableDisable(1);
}

// Procedure : AeonWDTConfig
VOID AeonWDTConfig (){
    // Disable WDT counting
    WDTEnableDisable(0);
    // WDT relative parameter setting
    WDTParameterSetting();
}

VOID WDTEnableDisable(byte Value){
    ECBRAMWriteByte(TimerReg , Value);
}

VOID WDTParameterSetting() {
    Byte TempByte;

    // Watchdog Timer counter setting
    ECBRAMWriteByte(TimerReg , TimerVal);
    // WDT counting unit setting
    TempByte = ECBRAMReadByte(UnitReg);
    TempByte |= (UnitVal << UnitBit);
    ECBRAMWriteByte(UnitReg , TempByte);
    // WDT RST pulse width setting
    TempByte = ECBRAMReadByte(RSTReg);
    TempByte |= (RSTVal << RSTBit);
    ECBRAMWriteByte(RSTReg , TempByte);
}
*****

```

```

*****
VOID ECBRAMWriteByte(byte OPReg, byte OPBit, byte Value){
    IOWriteByte(EcBRAMIndex, 0x10);
    IOWriteByte(EcBRAMData, BRAMLDNReg);
    IOWriteByte(EcBRAMIndex, 0x11);
    IOWriteByte(EcBRAMData, BRAMFnDataReg);

    IOWriteByte(EcBRAMIndex, 0x13 + OPReg);
    IOWriteByte(EcBRAMData, Value);

    IOWriteByte(EcBRAMIndex, 0x12);
    IOWriteByte(EcBRAMData, 0x30);           //Write start
}

Byte ECBRAMReadByte(byte OPReg){
    IOWriteByte(EcBRAMIndex, 0x10);
    IOWriteByte(EcBRAMData, BRAMLDNReg);
    IOWriteByte(EcBRAMIndex, 0x11);
    IOWriteByte(EcBRAMData, BRAMFnDataReg);

    IOWriteByte(EcBRAMIndex, 0x12);
    IOWriteByte(EcBRAMData, 0x10);         //Read start

    IOWriteByte(EcBRAMIndex, 0x13 + OPReg);
    Return IOReadByte(EcBRAMData, Value);
}
*****

































```
































Appendix

B

I/O Information
































B.1 I/O Address Map

▲	 aaeon
▲	 Input/output (IO)
	 [00000000 - 0000006F] PCI Express Root Complex
	 [00000020 - 00000021] Programmable interrupt controller
	 [00000024 - 00000025] Programmable interrupt controller
	 [00000028 - 00000029] Programmable interrupt controller
	 [0000002C - 0000002D] Programmable interrupt controller
	 [0000002E - 0000002F] Motherboard resources
	 [00000030 - 00000031] Programmable interrupt controller
	 [00000034 - 00000035] Programmable interrupt controller
	 [00000038 - 00000039] Programmable interrupt controller
	 [0000003C - 0000003D] Programmable interrupt controller
	 [00000040 - 00000043] System timer
	 [0000004E - 0000004F] Motherboard resources
	 [00000050 - 00000053] System timer
	 [00000061 - 00000061] Motherboard resources
	 [00000063 - 00000063] Motherboard resources
	 [00000065 - 00000065] Motherboard resources
	 [00000067 - 00000067] Motherboard resources
	 [00000070 - 00000070] Motherboard resources
	 [00000070 - 00000077] System CMOS/real time clock
	 [00000078 - 0000CF7] PCI Express Root Complex
	 [00000080 - 0000008F] Motherboard resources
	 [00000092 - 00000092] Motherboard resources
	 [000000A0 - 000000A1] Programmable interrupt controller
	 [000000A4 - 000000A5] Programmable interrupt controller
	 [000000A8 - 000000A9] Programmable interrupt controller
	 [000000AC - 000000AD] Programmable interrupt controller
	 [000000B0 - 000000B1] Programmable interrupt controller
	 [000000B2 - 000000B3] Motherboard resources
	 [000000B4 - 000000B5] Programmable interrupt controller
	 [000000B8 - 000000B9] Programmable interrupt controller

	[00000080 - 0000008F] Motherboard resources
	[00000092 - 00000092] Motherboard resources
	[000000A0 - 000000A1] Programmable interrupt controller
	[000000A4 - 000000A5] Programmable interrupt controller
	[000000A8 - 000000A9] Programmable interrupt controller
	[000000AC - 000000AD] Programmable interrupt controller
	[000000B0 - 000000B1] Programmable interrupt controller
	[000000B2 - 000000B3] Motherboard resources
	[000000B4 - 000000B5] Programmable interrupt controller
	[000000B8 - 000000B9] Programmable interrupt controller
	[000000BC - 000000BD] Programmable interrupt controller
	[000002D8 - 000002DF] Communications Port (COM9)
	[000003B0 - 000003BB] Intel(R) HD Graphics
	[000003C0 - 000003DF] Intel(R) HD Graphics
	[00000400 - 0000047F] Motherboard resources
	[000004D0 - 000004D1] Programmable interrupt controller
	[00000500 - 000005FE] Motherboard resources
	[00000600 - 0000061F] Motherboard resources
	[00000680 - 0000069F] Motherboard resources
	[00000D00 - 0000FFFF] PCI Express Root Complex
	[0000D000 - 0000D01F] Ethernet Controller
	[0000D000 - 0000DFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Ro
	[0000E000 - 0000E01F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Contro
	[0000E020 - 0000E03F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[0000E040 - 0000E043] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[0000E050 - 0000E057] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[0000E060 - 0000E063] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[0000E070 - 0000E077] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[0000E080 - 0000E087] Intel(R) HD Graphics
▷ 	Interrupt request (IRQ)
▷ 	Memory

































B.2 Memory Address Map

































▲	aaeon
▶	Input/output (IO)
▶	Interrupt request (IRQ)
▲	Memory
	[000A0000 - 000BFFFF] Intel(R) HD Graphics
	[000A0000 - 000BFFFF] PCI Express Root Complex
	[000C0000 - 000DFFFF] PCI Express Root Complex
	[000E0000 - 000FFFFF] PCI Express Root Complex
	[80000000 - D071AFFE] PCI Express Root Complex
	[C0000000 - CFFFFFFF] Intel(R) HD Graphics
	[D0000000 - D03FFFFF] Intel(R) HD Graphics
	[D0400000 - D04FFFFF] Intel(R) Trusted Execution Engine Interface
	[D0500000 - D05FFFFF] Intel(R) Trusted Execution Engine Interface
	[D0600000 - D061FFFF] Ethernet Controller
	[D0600000 - D061FFFF] Intel(R) I211 Gigabit Network Connection
	[D0600000 - D06FFFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Ro
	[D0620000 - D0623FFF] Ethernet Controller
	[D0620000 - D0623FFF] Intel(R) I211 Gigabit Network Connection
	[D0700000 - D070FFFF] Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
	[D0710000 - D0713FFF] High Definition Audio Controller
	[D0714000 - D071401F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Contr
	[D0717000 - D0717FFF] SDA Standard Compliant SD Host Controller
	[D0718000 - D07187FF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[D0719000 - D0719FFF] SDA Standard Compliant SD Host Controller
	[D071B000 - D071BFFF] Intel SD Host Controller
	[E0000000 - EFFFFFFF] Motherboard resources
	[E00000D0 - E00000DB] Intel(R) Sideband Fabric Device
	[FED00000 - FED003FF] High precision event timer
	[FED01000 - FED01FFF] Motherboard resources
	[FED03000 - FED03FFF] Motherboard resources
	[FED04000 - FED04FFF] Motherboard resources
	[FED08000 - FED08FFF] Motherboard resources

































	[80000000 - D071AFFE] PCI Express Root Complex
	[C0000000 - CFFFFFFF] Intel(R) HD Graphics
	[D0000000 - D03FFFFFFF] Intel(R) HD Graphics
	[D0400000 - D04FFFFFFF] Intel(R) Trusted Execution Engine Interface
	[D0500000 - D05FFFFFFF] Intel(R) Trusted Execution Engine Interface
	[D0600000 - D061FFFF] Ethernet Controller
	[D0600000 - D061FFFF] Intel(R) I211 Gigabit Network Connection
	[D0600000 - D06FFFFFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Ro
	[D0620000 - D0623FFF] Ethernet Controller
	[D0620000 - D0623FFF] Intel(R) I211 Gigabit Network Connection
	[D0700000 - D070FFFF] Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
	[D0710000 - D0713FFF] High Definition Audio Controller
	[D0714000 - D071401F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Contr
	[D0717000 - D0717FFF] SDA Standard Compliant SD Host Controller
	[D0718000 - D07187FF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[D0719000 - D0719FFF] SDA Standard Compliant SD Host Controller
	[D071B000 - D071BFFF] Intel SD Host Controller
	[E0000000 - EFFFFFFF] Motherboard resources
	[E00000D0 - E00000DB] Intel(R) Sideband Fabric Device
	[FED00000 - FED003FF] High precision event timer
	[FED01000 - FED01FFF] Motherboard resources
	[FED03000 - FED03FFF] Motherboard resources
	[FED04000 - FED04FFF] Motherboard resources
	[FED08000 - FED08FFF] Motherboard resources
	[FED0C000 - FED0CFFF] GPIO Controller
	[FED0D000 - FED0DFFF] GPIO Controller
	[FED0E000 - FED0EFFF] GPIO Controller
	[FED1C000 - FED1CFFF] Motherboard resources
	[FEE00000 - FEEFFFFFFF] Motherboard resources
	[FEF00000 - FEFFFFFFFF] Motherboard resources
	[FFF00000 - FFFFFFFF] Intel(R) 82802 Firmware Hub Device

































B.3 IRQ Mapping Chart

































aaeon	
Input/output (IO)	
Interrupt request (IRQ)	
(ISA) 0x00000000 (00)	System timer
(ISA) 0x00000003 (03)	Ethernet Controller
(ISA) 0x00000008 (08)	High precision event timer
(ISA) 0x0000000B (11)	Communications Port (COM9)
(ISA) 0x0000002C (44)	Intel SD Host Controller
(ISA) 0x00000030 (48)	GPIO Controller
(ISA) 0x00000031 (49)	GPIO Controller
(ISA) 0x00000032 (50)	GPIO Controller
(ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
(ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System
(ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System
(ISA) 0x00000054 (84)	Microsoft ACPI-Compliant System
(ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
(ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System
(ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System
(ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System
(ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System
(ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
(ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
(ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
(ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System
(ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
(ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
(ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
(ISA) 0x00000061 (97)	Microsoft ACPI-Compliant System
(ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
(ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System
(ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System

































 (ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
 (ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
 (ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
 (ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
 (ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
 (ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
 (ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
 (ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
 (ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
 (ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
 (ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
 (ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System
 (ISA) 0x00000077 (119)	Microsoft ACPI-Compliant System
 (ISA) 0x00000078 (120)	Microsoft ACPI-Compliant System
 (ISA) 0x00000079 (121)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007A (122)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007B (123)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007C (124)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007D (125)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
 (ISA) 0x00000080 (128)	Microsoft ACPI-Compliant System
 (ISA) 0x00000081 (129)	Microsoft ACPI-Compliant System
 (ISA) 0x00000082 (130)	Microsoft ACPI-Compliant System
 (ISA) 0x00000083 (131)	Microsoft ACPI-Compliant System
 (ISA) 0x00000084 (132)	Microsoft ACPI-Compliant System

































 (ISA) 0x00000083 (131)	Microsoft ACPI-Compliant System
 (ISA) 0x00000084 (132)	Microsoft ACPI-Compliant System
 (ISA) 0x00000085 (133)	Microsoft ACPI-Compliant System
 (ISA) 0x00000086 (134)	Microsoft ACPI-Compliant System
 (ISA) 0x00000087 (135)	Microsoft ACPI-Compliant System
 (ISA) 0x00000088 (136)	Microsoft ACPI-Compliant System
 (ISA) 0x00000089 (137)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008A (138)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008B (139)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008C (140)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008D (141)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008E (142)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008F (143)	Microsoft ACPI-Compliant System
 (ISA) 0x00000090 (144)	Microsoft ACPI-Compliant System
 (ISA) 0x00000091 (145)	Microsoft ACPI-Compliant System
 (ISA) 0x00000092 (146)	Microsoft ACPI-Compliant System
 (ISA) 0x00000093 (147)	Microsoft ACPI-Compliant System
 (ISA) 0x00000094 (148)	Microsoft ACPI-Compliant System
 (ISA) 0x00000095 (149)	Microsoft ACPI-Compliant System
 (ISA) 0x00000096 (150)	Microsoft ACPI-Compliant System
 (ISA) 0x00000097 (151)	Microsoft ACPI-Compliant System
 (ISA) 0x00000098 (152)	Microsoft ACPI-Compliant System
 (ISA) 0x00000099 (153)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009A (154)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009B (155)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009C (156)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009D (157)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009E (158)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009F (159)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A0 (160)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A1 (161)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A2 (162)	Microsoft ACPI-Compliant System

































 (ISA) 0x000000A2 (162)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A3 (163)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A4 (164)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A5 (165)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A6 (166)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A7 (167)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A8 (168)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A9 (169)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AA (170)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AB (171)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AC (172)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AD (173)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AE (174)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AF (175)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B0 (176)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B1 (177)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B2 (178)	Microsoft ACPI-Compliant System
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 (ISA) 0x000000B9 (185)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BA (186)	Microsoft ACPI-Compliant System
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 (ISA) 0x000000BC (188)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BD (189)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BE (190)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BF (191)	Microsoft ACPI-Compliant System
 (ISA) 0x00000100 (256)	Microsoft ACPI-Compliant System
 (ISA) 0x00000101 (257)	Microsoft ACPI-Compliant System

































 (ISA) 0x00000101 (257)	Microsoft ACPI-Compliant System
 (ISA) 0x00000102 (258)	Microsoft ACPI-Compliant System
 (ISA) 0x00000103 (259)	Microsoft ACPI-Compliant System
 (ISA) 0x00000104 (260)	Microsoft ACPI-Compliant System
 (ISA) 0x00000105 (261)	Microsoft ACPI-Compliant System
 (ISA) 0x00000106 (262)	Microsoft ACPI-Compliant System
 (ISA) 0x00000107 (263)	Microsoft ACPI-Compliant System
 (ISA) 0x00000108 (264)	Microsoft ACPI-Compliant System
 (ISA) 0x00000109 (265)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010A (266)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010B (267)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000010D (269)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010E (270)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010F (271)	Microsoft ACPI-Compliant System
 (ISA) 0x00000110 (272)	Microsoft ACPI-Compliant System
 (ISA) 0x00000111 (273)	Microsoft ACPI-Compliant System
 (ISA) 0x00000112 (274)	Microsoft ACPI-Compliant System
 (ISA) 0x00000113 (275)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000011B (283)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011C (284)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011D (285)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011E (286)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011F (287)	Microsoft ACPI-Compliant System
 (ISA) 0x00000120 (288)	Microsoft ACPI-Compliant System

































 (ISA) 0x0000011F (287)	Microsoft ACPI-Compliant System
 (ISA) 0x00000120 (288)	Microsoft ACPI-Compliant System
 (ISA) 0x00000121 (289)	Microsoft ACPI-Compliant System
 (ISA) 0x00000122 (290)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000012D (301)	Microsoft ACPI-Compliant System
 (ISA) 0x0000012E (302)	Microsoft ACPI-Compliant System
 (ISA) 0x0000012F (303)	Microsoft ACPI-Compliant System
 (ISA) 0x00000130 (304)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000013B (315)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013C (316)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013D (317)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013E (318)	Microsoft ACPI-Compliant System

































 (ISA) 0x0000013E (318)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013F (319)	Microsoft ACPI-Compliant System
 (ISA) 0x00000140 (320)	Microsoft ACPI-Compliant System
 (ISA) 0x00000141 (321)	Microsoft ACPI-Compliant System
 (ISA) 0x00000142 (322)	Microsoft ACPI-Compliant System
 (ISA) 0x00000143 (323)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000149 (329)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014A (330)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000014C (332)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014D (333)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014E (334)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014F (335)	Microsoft ACPI-Compliant System
 (ISA) 0x00000150 (336)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000156 (342)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000159 (345)	Microsoft ACPI-Compliant System
 (ISA) 0x0000015A (346)	Microsoft ACPI-Compliant System
 (ISA) 0x0000015B (347)	Microsoft ACPI-Compliant System
 (ISA) 0x0000015C (348)	Microsoft ACPI-Compliant System
 (ISA) 0x0000015D (349)	Microsoft ACPI-Compliant System































 (ISA) 0x0000015D (349)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000015F (351)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000016F (367)	Microsoft ACPI-Compliant System
 (ISA) 0x00000170 (368)	Microsoft ACPI-Compliant System
 (ISA) 0x00000171 (369)	Microsoft ACPI-Compliant System
 (ISA) 0x00000172 (370)	Microsoft ACPI-Compliant System
 (ISA) 0x00000173 (371)	Microsoft ACPI-Compliant System
 (ISA) 0x00000174 (372)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000176 (374)	Microsoft ACPI-Compliant System
 (ISA) 0x00000177 (375)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000017B (379)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017C (380)	Microsoft ACPI-Compliant System


 (ISA) 0x0000017C (380)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000017E (382)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017F (383)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000181 (385)	Microsoft ACPI-Compliant System
 (ISA) 0x00000182 (386)	Microsoft ACPI-Compliant System
 (ISA) 0x00000183 (387)	Microsoft ACPI-Compliant System
 (ISA) 0x00000184 (388)	Microsoft ACPI-Compliant System
 (ISA) 0x00000185 (389)	Microsoft ACPI-Compliant System
 (ISA) 0x00000186 (390)	Microsoft ACPI-Compliant System
 (ISA) 0x00000187 (391)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000018A (394)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000018C (396)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018D (397)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018E (398)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018F (399)	Microsoft ACPI-Compliant System
 (ISA) 0x00000190 (400)	Microsoft ACPI-Compliant System
 (ISA) 0x00000191 (401)	Microsoft ACPI-Compliant System
 (ISA) 0x00000192 (402)	Microsoft ACPI-Compliant System
 (ISA) 0x00000193 (403)	Microsoft ACPI-Compliant System
 (ISA) 0x00000194 (404)	Microsoft ACPI-Compliant System
 (ISA) 0x00000195 (405)	Microsoft ACPI-Compliant System
 (ISA) 0x00000196 (406)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000199 (409)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000019D (413)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019E (414)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019F (415)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A0 (416)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A1 (417)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A2 (418)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A3 (419)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A4 (420)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A5 (421)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A6 (422)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A7 (423)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A8 (424)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A9 (425)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AA (426)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AB (427)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AC (428)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AD (429)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AE (430)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AF (431)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B0 (432)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B1 (433)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001B4 (436)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001B8 (440)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B9 (441)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BA (442)	Microsoft ACPI-Compliant System

 (ISA) 0x000001B9 (441)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BA (442)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BB (443)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BC (444)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BD (445)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BE (446)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BF (447)	Microsoft ACPI-Compliant System
 (ISA) 0x000001C0 (448)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001C8 (456)	Microsoft ACPI-Compliant System
 (ISA) 0x000001C9 (457)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001D9 (473)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001E2 (482)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001E9 (489)	Microsoft ACPI-Compliant System
 (ISA) 0x000001EA (490)	Microsoft ACPI-Compliant System
 (ISA) 0x000001EB (491)	Microsoft ACPI-Compliant System
 (ISA) 0x000001EC (492)	Microsoft ACPI-Compliant System
 (ISA) 0x000001ED (493)	Microsoft ACPI-Compliant System
 (ISA) 0x000001EE (494)	Microsoft ACPI-Compliant System
 (ISA) 0x000001EF (495)	Microsoft ACPI-Compliant System
 (ISA) 0x000001F0 (496)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001F5 (501)	Microsoft ACPI-Compliant System
 (ISA) 0x000001F6 (502)	Microsoft ACPI-Compliant System
 (ISA) 0x000001F7 (503)	Microsoft ACPI-Compliant System

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	(ISA) 0x000001F6 (502)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F7 (503)	Microsoft ACPI-Compliant System
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	(ISA) 0x000001FA (506)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FB (507)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FC (508)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FD (509)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FE (510)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FF (511)	Microsoft ACPI-Compliant System
	(PCI) 0x00000005 (05)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Contr
	(PCI) 0x00000010 (16)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Rc
	(PCI) 0x00000011 (17)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Rc
	(PCI) 0x00000012 (18)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Rc
	(PCI) 0x00000012 (18)	SDA Standard Compliant SD Host Controller
	(PCI) 0x00000013 (19)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	(PCI) 0x00000013 (19)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Rc
	(PCI) 0x00000016 (22)	High Definition Audio Controller
	(PCI) 0xFFFFFFFF6 (-10)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFFF7 (-9)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFFF8 (-8)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFFF9 (-7)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFFFFA (-6)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFFFFB (-5)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFFFFC (-4)	Intel(R) Trusted Execution Engine Interface
	(PCI) 0xFFFFFFFFFD (-3)	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
	(PCI) 0xFFFFFFFFFE (-2)	Intel(R) HD Graphics

▶  Memory

Appendix

C

Programming Digital I/O

C.1 Digital I/O Programming

The AQ7-BT utilizes the ITE8525VG chipset as its Digital I/O controller.

Below are the procedures to complete its configuration which you can develop customized program to fit your application.

C.2 Digital I/O Register

Table 1 : Embedded BRAM relative register table

	Default Value	Note
Index	0x284 ^(Note1)	BRAM Index Register
Data	0x285 ^(Note2)	BRAM Data Register
Logical Device Number	0xA2 ^(Note3)	Watch dog Logical Device Number
Input/Output Function and Device Number	0x00 ^(Note4)	DIO Input/Output Function/Device Number
Output Data Function and Device Number	0x01 ^(Note5)	DIO Output Data Function/Device Number

Table 2 : Digital I/O relative register table

	Register			
	Option Register	BitNum	Value	Note
GPI0 Pin Status	0x00 ^(Note6)	0 ^(Note7)	^(Note15)	GPA2
GPI1 Pin Status	0x00 ^(Note6)	1 ^(Note8)	^(Note16)	GPA3
GPI2 Pin Status	0x00 ^(Note6)	2 ^(Note9)	^(Note17)	GPA4
GPI3 Pin Status	0x00 ^(Note6)	3 ^(Note10)	^(Note18)	GPA5
GPO0 Pin Status	0x00 ^(Note6)	4 ^(Note11)	^(Note19)	GPJ0
GPO1 Pin Status	0x00 ^(Note6)	5 ^(Note12)	^(Note20)	GPJ1
GPO2 Pin Status	0x00 ^(Note6)	6 ^(Note13)	^(Note21)	GPJ2
GPO3 Pin Status	0x00 ^(Note6)	7 ^(Note14)	^(Note22)	GPJ3

C.3 Digital I/O Sample Program

```

*****
// Embedded BRAM relative definition (Please reference to Table 1)
#define byte EcBRAMIndex //This parameter is represented from Note1
#define byte EcBRAMData //This parameter is represented from Note2
#define byte BRAMLDNReg //This parameter is represented from Note3
#define byte BRAMFnData0Reg //This parameter is represented from Note4
#define byte BRAMFnData1Reg //This parameter is represented from Note5
#define void EcBRAMWriteByte(byte Offset, byte Value);
#define byte EcBRAMReadByte(byte Offset);
#define void IOWriteByte(byte Offset, byte Value);
#define byte IOReadByte(byte Offset);
// Digital Input Status relative definition (Please reference to Table 2)
#define byte DIO0ToDIO7Reg // This parameter is represented from Note6
#define byte DIO0Bit // This parameter is represented from Note7
#define byte DIO1Bit // This parameter is represented from Note8
#define byte DIO2Bit // This parameter is represented from Note9
#define byte DIO3Bit // This parameter is represented from Note10
#define byte DIO4Bit // This parameter is represented from Note11
#define byte DIO5Bit // This parameter is represented from Note12
#define byte DIO6Bit // This parameter is represented from Note13
#define byte DIO7Bit // This parameter is represented from Note14
#define byte DIO0Val // This parameter is represented from Note15
#define byte DIO1Val // This parameter is represented from Note16
#define byte DIO2Val // This parameter is represented from Note17
#define byte DIO3Val // This parameter is represented from Note18
#define byte DIO4Val // This parameter is represented from Note19
#define byte DIO5Val // This parameter is represented from Note20
#define byte DIO6Val // This parameter is represented from Note21
#define byte DIO7Val // This parameter is represented from Note22
*****

```

```
*****
```

```
VOID Main(){\n    Boolean PinStatus ;\n\n    // Procedure : AaeonReadPinStatus\n    // Input :\n    //     Example, Read Digital I/O Pin 3 status\n    // Output :\n    //     InputStatus :\n    //         0: Digital I/O Pin level is low\n    //         1: Digital I/O Pin level is High\n    PinStatus = AaeonReadPinStatus(DIO0ToDIO7Reg, DIO3Bit);\n\n    // Procedure : AaeonSetOutputLevel\n    // Input :\n    //     Example, Set Digital I/O Pin 6 level\n    AaeonSetOutputLevel(DIO0ToDIO7Reg, DIO6Bit, DIO6Val);\n}
```

```
*****
```

```
*****
Boolean AaeonReadPinStatus(byte OptionReg, byte BitNum){
    Byte TempByte;

    TempByte = ECBRAMReadByte(BRAMFnData1Reg, OptionReg);
    If (TempByte & BitNum == 0)
        Return 0;
    Return 1;
}
VOID AaeonSetOutputLevel(byte OptionReg, byte BitNum, byte
Value){
    Byte TempByte;

    TempByte = ECBRAMReadByte(BRAMFnData1Reg, OptionReg);
    TempByte |= (Value << BitNum);
    ECBRAMWriteByte(OptionReg, BitNum, Value);
}
*****
```

```

*****
VOID ECBRAMWriteByte(byte OPReg, byte OPBit, byte Value){
    IOWriteByte(EcBRAMIndex, 0x10);
    IOWriteByte(EcBRAMData, BRAMLDNReg);
    IOWriteByte(EcBRAMIndex, 0x11);
    IOWriteByte(EcBRAMData, BRAMFnDataReg);

    IOWriteByte(EcBRAMIndex, 0x13 + OPReg);
    IOWriteByte(EcBRAMData, Value);

    IOWriteByte(EcBRAMIndex, 0x12);
    IOWriteByte(EcBRAMData, 0x30);           //Write start
}

Byte ECBRAMReadByte(byte FnDataReg, byte OPReg){
    IOWriteByte(EcBRAMIndex, 0x10);
    IOWriteByte(EcBRAMData, BRAMLDNReg);
    IOWriteByte(EcBRAMIndex, 0x11);
    IOWriteByte(EcBRAMData, FnDataReg);

    IOWriteByte(EcBRAMIndex, 0x12);
    IOWriteByte(EcBRAMData, 0x10);         //Read start

    IOWriteByte(EcBRAMIndex, 0x13 + OPReg);
    Return IOReadByte(EcBRAMData, Value);
}
*****

```