Digital Signage OPS Module User's Manual

The digital signage display Optional Pluggable Specification (OPS) which enables a standard and easier integration of a digital signage computing system or a pluggable module into the display panel.

User Guide Version 1.0

WinMate Communication INC.



Revision History

Version	Date	Note	Author
1.0	2011.08.26		Henry Hsu

Package List

Before using this Digital Signage Evaluation Kit, please make sure that all the items listed below

are present in your package

- 1. Box (Packaging)
- 2. 1 x Pluggable Module
- 3. 1 x User's Manual & Driver DVD

Make sure that all of the items listed above are present. Do not attempt to apply power to the system if there is damage to any of its components.

FCC Statement



This device complies with part 15 FCC rules. Operation is subject to the following two conditions :

- This device may not cause harmful interference.
- This device must accept any interference received including interference that may cause undesired operation.

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

Copyright Notice

ALL RIGHTS RESERVED. No part of this document may be reproduced, copied, translated, or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the prior written permission of the original manufacturer.

Trademark Acknowledgement

Brand and product names are trademarks or registered trademarks of their respective owners.

Disclaimer

We reserve the right to make changes, without notice, to any product, including circuits and/or software described or contained in this manual in order to improve design and/or performance. We assume no responsibility or liability for the use of the described product(s), conveys no license or title under any patent, copyright, or masks work rights to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described in this manual are for illustration purposes only. We Communication Inc. make no representation or warranty that such application will be suitable for the specified use without further testing or modification.

Warranty

We warrant that each of its products will be free from material and workmanship defects for a period of one year from the invoice date. If the customer discovers a defect, We will, at its option, repair or replace the defective product at no charge to the customer, provided it is returned during the warranty period of one year, with transportation charges prepaid. The returned product must be properly packaged in it's original packaging to obtain warranty service.

If the serial number and the product shipping data differ by over 30 days, the in-warranty service will be made according to the shipping date. In the serial numbers the third and fourth two digits give the year of manufacture, and the fifth digit means the month (e.g., with A for October, B for November and C for December).

For example, the serial number 1W11Axxxxxx means October of year 2011.

Customer Service

We provide service guide for any problem as follow steps : First, contact with your distributor, sales representative, or our customer service center for technical support if you need additional assistance. You may have the following information ready before you call :

- Product serial number
- Peripheral attachments
- Software (OS, version, application software, etc.)
- Description of complete problem
- The exact wording of any error messages

In addition, free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Please do not hesitate to call or e-mail us.

Safety Precautions

Warning!



Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the Player chassis.

Caution!



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

Safety and Warranty

- 1. Please disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
- 2. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
- 3. Keep this equipment away from humidity.
- 4. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
- 5. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
- 6. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- 7. All cautions and warnings on the equipment should be noted.
- 8. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
- 9. Never pour any liquid into an opening. This could cause fire or electrical shock.
- 10. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
- 11. If any of the following situations arises, get the equipment checked by service personnel:
 - A. Liquid has penetrated into the equipment.
 - B. The equipment has been exposed to moisture.
 - C. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - D. The equipment has been dropped and damaged.
 - E. The equipment has obvious signs of breakage.
- 12. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -20° C (-4°F) or above 60° C (140° F). It may damage the equipment.

Table of Contents

1. Introduction
1.1 Reference Solution Lineup with Intel Platform8
1.2 Reference Documents
1.3Terms and Abbreviation9
2. Mechanical Assembly10
2.1 Package Information10
2.2 The Pluggable Module10
2.3 Mechanical Specifications12
3. Thermal Specifications
3.1 Thermal Management for the Pluggable Module19
3.2 Thermal Management in the Reference Display Panel System
4. Mechanical Design
4.1 The Prototype
5. BIOS Setting
5.1 Advanced Setting
5.3 Boot
5.4 Security
5.5 Save & Exit

1. Introduction

1.1 Reference Solution Lineup with Intel Platform

The purpose of this document is to describe the thermal design requirements of the Digital Signage Pluggable Module. This module is based on the Intel[®] Core[™] i5-2515E processor with Mobile Intel[®] 6 Series Express Chipset (QM67) platform and also future products. The Pluggable Module is targeted to provide an interchangeable solution to the digital signage media players with compatible connector. This document provides the module form factor, connector specification, reference thermal solution, and boundary conditions in order to ensure the functionally of the module in all compatible display panel system.

The Digital Signage Pluggable Module platform has two reference solutions, as listed in the table below:

Digital Signage Pluggable Module	Intel [®] Core [™] Processor	CPU TDP(W)	Thermal Solution	System Dimension (mm)
Type 1	i5-2515E	35W	Active	200x119x30

1.2 Reference Documents

Document	Document No./Location
Digital Signage Open Pluggable Specification	324427
JAE TX24/TX25 connector product brief	http://jae-connectors.com/en/pdf/2008-40- TX24TX25.pdf
JAE plug connector details and drawing	http://jae- connectors.com/en/product_en.cfm?l_code=EN&s eries_code=TX24/TX25&product_number=TX25- 80P-LT-H1E
JAE receptacle connector details and drawing	<u>http://jae-</u> connectors.com/en/product_en.cfm?l_code=EN&s eries_code=TX24/TX25&product_number=TX24- 80R-LT-H1E

1.3 Terms and Abbreviation

Term	Description
DIMM	Dual In-line Memory Module
EPIC	Embedded Platform for Industrial Computing form factor 165 mm x 115 mm
FAR	Free Area Ratio
OPS	Open Pluggable Specification
SATA	Serial ATA
SSD	Solid State Drive
USB	Universal Serial Bus
VESA	Video Electronics Standards Association
Wifi	Wireless IEEE 802.11 technology
Wimax	Worldwide Interoperability for Microwave Access

2. Mechanical Assembly

2.1 Package Information

The Intel[®] CoreTM i5-2515E processor come in BGA packaging with package size 34x28 mm. The QM67 chipset is a Platform Controller Hub (PCH) that comes in an FCBGA package, which consists of a silicon die mounted face down on an organic substrate populated with solder balls on the bottom side. The package size of the PCH is 25x27 mm.

2.2 The Pluggable Module

Figure 1_shows the features overview of the Pluggable Module. The module front panel consists of the antenna slots, power/reset buttons, audio jacks, RJ45 connector, a DSP port, and 2xUSB ports. The sides of the module consist of 4 guide holes which, when come into contact with the locking pins on the guide rail, lock the module during docking/undocking.

Figure 2 shows the dimensions of the Pluggable Module. The overall dimension of the module including the mounting frame is 200mm x 119mm x 30mm. Figure 2 also shows the location of the front panel screw holes as well as the security lock.

Figure 1. The Pluggable Module







2.3 Mechanical Specifications

Figure 3 shows the Pluggable Module docked at a display panel system. In this reference design, the module is docked and undocked in vertical direction. There are two system fans that drive room temperature air to enter the system through the vent holes at the back cover. Notice that in Figure the system fans are inclined at an angle to the vertical direction in order to align with the shape of the back cover.





Figure 4 illustrates the airflow path to the Pluggable Module. Air at room temperature enters the system through the back vent holes and exit at the top through the extraction fans. In the passive heatsink module, air flows through the heatsink fins and carries away the heat. In the active heatsink module, air is forced through the fins by the fan so that higher cooling rate is achieved.

The details inside the Pluggable Module are shown in **Figure 5**. The top side of the PCB resides the CPU and the chipset. The heatsink comes into contact with these components so that heat is conducted to the heatsink and cooled by air movement through the fins. The WiFi card and memory module are located at the bottom of the PCB.



Figure 4. Airflow to the Pluggable Module



Figure 5. Exploded View of the Pluggable Module



Figure 6. The Guide Rail Mechanism for the Pluggable Module

The Pluggable Module relies on a pair of guide rails for docking and undocking so that the plug connector at the back of the module can mate seamlessly with the receptacle on the docking board. **Figure** 6 shows the docking process as the module slides through the guide rails. There are two lock pins on each side of the guide rail which serve as the locking mechanism to the module when they come into contact with the lock holes on the Pluggable Module. **Figure 7** shows the location of the lock holes on the module dimensions of one of the guide rails.



Figure 7. Location of Lock Hole on the Pluggable Module

Figure 8. Dimensions of the Guide Rail



Figure9 shows the cross-section of a display panel system when the Pluggable Module is plugged in. Noticing that in this reference design there is 10.4 mm clearance between the Pluggable Module and the display panel in order to avoid heating from the panel.





Figure 10 shows the full platform dimension of the Digital Signage Pluggable Module display system. **Figure** 11 shows the dimension of the docking board in the system as well as the VESA mounting holes.



Figure 10. Platform Dimension for a Reference Display Panel System

Figure 11. Location of the VESA Mount on the Display Panel



3. Thermal Specifications

3.1 Thermal Management for the Pluggable Module

This section describes a wind tunnel test to quantify the thermal performance of the Pluggable Module. **Figure 12** shows a thermal model of an arbitrary wind tunnel, where the Pluggable Module is situated at the front of the tunnel. Air flows in from the top grille with specified Free Area Ratio (FAR) so that air at room temperature enters the heatsink of the module. In this test, the FAR is set at 0.6 for reference. The outflow is controlled to obtain the desired airflow flowing through the module. It is required that module be designed to pass all component thermal specifications in this test setup with ambient temperature at **54°C** and airflow speed of **0.7m/s** immediately downstream of the module. All Pluggable Modules must be designed to pass this temperature and airflow requirement to ensure the module ingredients comply with thermal specification. **Figure 3** shows the top view of the wind tunnel test and the location of the imaginary plane 3 mm downstream from the module outlet.



Figure 12. Wind Tunnel Test for the Pluggable Module



Figure 3. Airflow Speed Requirement Downstream of the Pluggable Module in Wind Tunnel Test

3.2 Thermal Management in the Reference Display Panel System

The Pluggable Module relies on airflow from the system fans to achieve its cooling target. **Figure 4** shows that in this reference design there are two 70x70 mm fans at the back panel to extract hot air from the system. There is also a 50x50 mm fan at the front panel to provide fresh air to the internal components such as power supply unit. The back cover of the display panel should have vent holes with FAR > 0.6 to provide sufficient airflow to the module.



Figure 4. System Fans and Ventilation Grille on the Display Back Panel

On the Pluggable Module, it is recommended that some vent holes be opened at the back so that hot air can escape more easily from the module. **Figure 15** shows that the FAR in on both sides of the module back panel should be greater than 0.25.



Figure 15. Vent Holes at the Pluggable Module Back Panel

4. Mechanical Design

4.1 The Prototype

The digital signage OPS prototype is based on a 32" display panel with the functional blocks illustrated in **Figure 16.** It is mainly a 3-board partitioning design consisting of the pluggable module, docking board and the panel control board.





4.2 Pluggable Board Reference Design Features

In this reference design, the pluggable prototype board is based on the $Intel^{\circ}$ Core^m i7 Mobile processor and Mobile Intel^{\circ} QM57 Express chipset platform.

OMIS-OPS (S	andy Bridge Platfo	rm - Optional Pluggable Specification) SPEC.	Remark
MB Form Fac	tor	EPIC(165mm x 115mm)	
	Socket	Intel® i7/i5 processor (Sandy Bridge Core)	
CPU	Туре	BGA	
0.0	CPU Power	i5-2515E (35W)	
	Consumption		
Chipset	PCH	Intel 6 series Chipset (QM67)	
Graphic	GPU Core	Integrated Gfx Gen 6, supports DirectX 10.1 and OpenGL 3.0	
	Channel	Dual-Channel Mode	
Momony	Туре	1 x DDR3 SO-DIMM Socket	
wemory	DDR	1066/1333MHz	
	Max Memory	4GB	
Audio	chipset	Realtek RTL886	
	Display Out	1 x HDMI (by HDMI connector)	
	VGA/COM Port	1 x Dual RS-232 (by Display port connector)	
	USB Port	2 x USB2.0 Port	
External 1/0	Ethernet Port	1x RJ-45 LAN Port Gigabit Ethernet	LAN chipset: Intel 82579LM
External I/O	Audio	1x Line-In, 1x Line-Out	
	Button	1 x Power On 1 x Reset button	
	Antenna	Antenna x 2	
	VGA	1 x VGA (2x4-pin) 2.0mm pitch wafer-header	
Internal I/O	Fan	1 x Fan (1x3-pin), one fan (1x3-pin) reserve	Molex-53398-0310
	SIM card	1 x SIM card slot (for mini PCIe 3G module)	
Internal	Storage	1 x SATA Ports (option of 2.5" HDD or SSD mounting)	
teatures	WiFi Module	1 x Mini PCIe slot (for wireless module)	
	Display Interfaces	HDMI/DVI	
	UART	1set RX/TX signals driven at 3.3V	
	Audio	1 channel audio out L/R	
Dhuggabla	USB	3 x USB2.0 + 2 USB3.0 (reserve)	
Pluggable Connector Interface	Power	DC IN +12V~+19V at recommended 4A max current rating	Recommended 500mA for each pin, total 8pins,
	Control signals	*Pluggable board Power Status indicator *Display panel IR remote control power button *Pluggable board detect *HDMI CEC	
Mechanical	PCB placement	Follow IQWB-OPS	

Table 1. Reference Design Board Features

5. BIOS Setting

Your computer comes with a hardware configuration program which called BIOS Setup that allows you to view and set up the system parameters.

The BIOS (Basic Input / Output System) is a layer of the software called 'firmware' which translates instructions from software (such as the operating system) into instructions that allow the computer hardware to understand the software programs. The BIOS settings also identify installed devices and establish many special features.

ENTERING BIOS SETUP

You can access the BIOS program just after you turn on your computer. Just press the "DEL" key when the following prompt appears:

Press to enter Setup.

When you press to enter the BIOS Setup image, the system interrupts the Power-On Self-Test (POST).

When you first enter the BIOS Setup Utility, you will enter the Main setup image. You can always return to the Main setup image by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup image is shown as below.

Aptio Setup Utility Main Advanced Chipse	7 - Copyright (C) 2010 Ameri et Boot Security Save & E	can Megatrends, Inc. xit
BIOS Information BIOS Vendor Core Version Compliency Project Version Build Date and Time System Language	American Megatrends 4.6.4.0 UEFI 2.1 OMIS 003 x64 08/22/2011 16:06:07 [English]	Choose the system default language
System Date System Time Access Level	[Tue 08/23/2011] [09:12:14] Administrator	<pre>>: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.10.1208	. Copyright (C) 2010 America	n Megatrends, Inc. AB

The Main BIOS setup image has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. On the contrary, options in blue can be configured. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

5.1 Advanced Setting

Aptio Setup Utility - Copyright (C) 2010 Amer.	ican Megatrends, Inc.
Main Advanced Chipset Boot Security Save & 1	Exit
Legacy OpROM Support	Enable or Disable Boot
Launch PXE OpROM [Enabled]	Option for Legacy
Launch Storage OpROM [Disabled]	Network Devices.
PCI Subsystem Settings ACPI Settings Trusted Computing CPU Configuration	
Thermal Configuration Thermal Configuration Intel TXT(LT) Configuration PCH-FW Configuration Intel Anti-Theft Technology Configuration AMT Configuration USB Configuration F81216 Secondary Super IO Configuration Serial Port Console Redirection Intel ICC	<pre>X: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Legacy OpROM

SETTING	DESCRIPTION
Disabled	Use this setting to ignore all PXE Option ROMs.
Enabled	Use this setting to load PXE Option ROMs. To limit the PXE support to particular devices, use the function Use device for PXE.

Default: Disabled

Launch Storage OpROM

SETTING	DESCRIPTION
Disabled	Use this setting to ignore all PXE Option ROMs.
Enabled	Use this setting to specify that legacy PCI option ROMs for PCI storage devices are to be loaded and executed, if found. Typical examples of PCI storage devices include SCSI or similar devices.

Default: Enabled

AB

> PCI ROM Priority

Aptio Setup Utility Advanced	7 - Copyright (C) 2010 Amer	hican Megatrends, Inc.
PCI Bus Driver Versio PCI ROM Priority	V 2.03.00 [EFI Compatible ROM]	In case of multiple Option ROMs (Legacy and EFI Compatible),
PCI Common Settings Set PCI Latency Timer VGA Palette Snoop DEPP# Composition	tings [32 PCI Bus Clocks] [Disabled] [Disabled]	specifies what PCI Option ROM to launch.
SERR# Generation PCI Express Device Sett	[Disabled] [Disabled]	
Relaxed Ordering Extended Tag No Snoop	[Disabled] [Disabled] [Enabled]	×: Select Screen ↑↓: Select Item Enter: Select
Maximum Payload Maximum Read Request	[Auto] [Auto]	+/-: Change Opt. F1: General Help F2: Previous Values
PCI Express Link Settir ASPM Support WARNING: Enabling ASPM	ngs [Disabled] may cause some	F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.10.1208.	Copyright (C) 2010 Americ	an Megatrends, Inc. AB

Selects the PCI Option ROM to launch in case Multiple Option ROMs (Legacy ROM and EFI Compatible ROM) are present.

PCI Latency Timer

Use this function to select the number of PCI bus clocks to be used for the PCI latency timer.



SETTING	DESCRIPTION
32 PCI Bus Clocks	Use this setting to program the PCI latency timer to 32 PCI bus clocks.
64 PCI Bus Clocks	Use this setting to program the PCI latency timer to 64 PCI bus clocks.
96 PCI Bus Clocks	Use this setting to program the PCI latency timer to 96 PCI bus clocks.
128 PCI Bus Clocks	Use this setting to program the PCI latency timer to 128 PCI bus clocks.
160 PCI Bus Clocks	Use this setting to program the PCI latency timer to 160 PCI bus clocks.
192 PCI Bus Clocks	Use this setting to program the PCI latency timer to 192 PCI bus clocks.
224 PCI Bus Clocks	Use this setting to program the PCI latency timer to 224 PCI bus clocks.
248 PCI Bus Clocks	Use this setting to program the PCI latency timer to 248 PCI bus clocks.

Default: 32 PCI Bus Clocks

> VGA Palette Snoop

This filed controls the ability of a primary PCI VGA controller to share a common palette (when a snoop write cycles) with an ISA video card.



Enables or Disables VGA Palette Registers Snooping.

Default: Disabled

> PERR# Generation

Enables or Disables PCI Device to Generate PERR#.

Default: Disabled

SERR# Generation

Enables or Disables PCI Device to Generate SERR#.

Default: Disabled

> Relaxed Ordering

Aptio Setup Utility Advanced	/ - Copyright (C) 2010 Amer:	ican Megatrends, Inc.
PCI Bus Driver Versio	V 2.03.00	Enables or Disables PCI
FCI ROM FILOLICY	[EFT COMPACIDIE ROM]	Ordering.
PCI Common Settings Set	tings	
PCI Latency Timer	[32 PCI Bus Clocks]	
VGA Palette Snoop	[Disabled]	
PERR# Generation	[Disabled]	
SERR# Generation	Relaxed Ordering	
DCI Exproga Doutigo Cott	Disabled Enchlod	
Relayed Ordering		<. Select Screen
Extended Tag		: Select Item
No Snoop	[Enabled]	Enter: Select
Maximum Payload	[Auto]	+/-: Change Opt.
Maximum Read Request	[Auto]	F1: General Help
		F2: Previous Values
PCI Express Link Settir	1gs	F3: Optimized Defaults
ASPM Support	[Disabled]	F4: Save & Exit
WARNING: Enabling ASPM	may cause some	ESC: EXIT
Version 2.10.1208	Convright (C) 2010 Americ	an Megatrends, Inc.
VCLDIMI 2.10.1200.	- oopjiigne (o) zoio nikiito	AB

Enables or Disables PCI Express Device Relaxed Ordering.

Default: Disabled

Extended Tag

SETTING	DESCRIPTION
Disabled	Doesn't allow the system to use 8-bit TAG filed as a requester.
Enabled	Allow the system to use 8-bit TAG filed as a requester.

Default: Disabled

No Snoop

Enable or Disable PCI Express Device No Snoop option.

Default: Enabled

Maximum Payload

Set Maximum Payload of Pci Express Device or allows System BIOS toselect the value.

SETTING	DESCRIPTION
Auto	Auto detect Maximum Payload
128 Bytes	Maximum Payload 128 Bytes.
256 Bytes	Maximum Payload 256 Bytes.
512 Bytes	Maximum Payload 512 Bytes.
1024 Bytes	Maximum Payload 1024 Bytes.
2048 Bytes	Maximum Payload 2048 Bytes.
4096 Bytes	Maximum Payload 4096 Bytes.

Default: Auto

Maximum Read Request Size

Set Maximum Read Request Size of PCI Express Devi ce or allows System BIOS to select the value.



Default: Auto

> ASPM Support

Set the ASPM configuration for the PCI Express devices before the operating system boots. This function is for OS which does not support ASPM.

Aptio Setup Utility Advanced	- Copyright (C) 2010 Ameri	can Megatrends, Inc.
PCI Common Settings Sett PCI Latency Timer VGA Palette Snoop PERR# Generation SERR# Generation	ings [32 PCI Bus Clocks] [Disabled] [Disabled] [Disabled]	Set the ASPM Level: Force LO - Force all links to LO State : AUTO - BIOS auto configure : DISABLE - Disables ASPM
PCI Express Device Setti Relaxed Ordering Extended Tag No Snoop Maximum Payload Maximum Read Request	ASPM Support	×: Select Screen ↑↓: Select Item Enter: Select +/-: Charge Opt
PCI Express Link Setting ASPM Support WARNING: Enabling ASPM m PCI-E devices t Extended Synch	ps [Disabled] may cause some to fail [Disabled]	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.10.1208.	Copyright (C) 2010 America	n Megatrends, Inc. AB

SETTING	DESCRIPTION
Disabled	Disables ASPM
Auto	BIOS auto configure
Force LOs	Force all links to L0 State

Default: Disabled

> Extended Synch

If this item is enabled, it will allow generation of Extended Synchronization patterns.

Default: Disable

- > ACPI Settings
- **Enable ACPI Auto Configuration**

Enables or Disables BIOS ACPI Auto Configuration

Aptio Setup Utility Advanced	y - Copyright (C) 2010 Ame	rican Megatrends, Inc.
ACPI Settings		Enables or Disables
Enable ACPI Auto Conf		Configuration.
Enable Hibernation ACPI Sleep State Lock Legacy Resources	[Enabled] [S3 (Suspend to RAM)] [Disabled]	
Disal Enab	Enable ACPI Auto Configura oled led	tion ct Screen ct Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.10.1208	. Copyright (C) 2010 Ameri	can Megatrends, Inc. AB

Default: Disabled

Enable Hibernation

Enables or Disables System ability to Hibernate. This option may be not effective with some OS.

\geq	ACPI	Sleep	State
·		Ciccp	orare

SETTING	DESCRIPTION
Suspend Disable	System ability to Hibernate (OS/S3 Sleep State)
S1	CPU Stop Clock
S3	Suspend to RAM

Default: S3 (Suspend to RAM)

Lock Legacy Resources

Enables or Disable Lock of Legacy Resource.

Default: Disable

> TPM SUPPORT

Aptio Setup Utili Advanced	ty - Copyright (C) 2.	010 American Megatrends, Inc.
TPM Configuration TPM SUPPORT	[Disable]	Enables or Disables TFM support. O.S. will not show TFM. Reset of platform is required.
Current TPM Status Ir TPM SUPPORT OFF	nformation	
	TPM SUPPO Disable Enable	<pre>RT >: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
version 2.10.120	o. Copyright (C) 201	o American Megatrenos, inc. AB

Default: Disable

> CPU Configuration

Aptio Setup Utility Advanced	r - Copyright (C) 2010 Ame	erican Megatrends, Inc.
CPU Configuration		Disabled for Windows XP
Intel(R) Core(TM) i5-25 Processor Stepping Microcode Revision Max Processor Speed Min Processor Speed	515E CPU @ 2.50GHz 206a7 12 2500 MHz 800 MHz	
Processor Speed Processor Cores Intel HT Technology EMT64	1200 MHz 2 Supported Supported	×: Select Screen ↓: Select Item
Limit CPUID Maximum Execute Disable Bit Hardware Prefetcher Adjacent Cache Line P	[Disabled] [Enabled] [Enabled] [Enabled]	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values
Intel Virtualization Local x2APIC Factory long duration	[Disabled] [Disabled] 35 Watts	F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.10.1208.	Copyright (C) 2010 Amer:	ican Megatrends, Inc. AB

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 Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.)

> Hardware Prefetcher

To turn on/off the MLC streamer prefetcher.

> Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

> Intel Virtualization Technology

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

Local x2APIC

Enable Local x2APIC. Some OSes do not support this.

> SATA Configuration

SATA Device Options Settings

Aptio Setup Utility Advanced	7 - Copyright (C) 2010 Amer	ican Megatrends, Inc.
SATA Controller(s) SATA Mode Selection SATA Test Mode Aggressive LPM Suppor Software Feature Mask C	[Enabled] [AHCI] [Disabled] [Enabled] Configuration	Enable or disable SATA Device.
Serial ATA Port O Software Preserve Port O Hot Plug External SATA SATA Device Type Spin Up Device	TOSHIBA MK1665 (160.0GB SUPPORTED [Enabled] [Disabled] [Hard Disk Driver] [Disabled]	<pre>><: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.10.1208.	Copyright (C) 2010 Americ	an Megatrends, Inc. AB

> SATA Mode

Determines how SATA controllers(s) operate. The options are IDE, AHCI and RAID.

> Aggressive LPM Suppor

Enables PCH to aggressively enter link power state. The options are Enabled and Disabled.

Software Feature Mask Configuration

Enable or disable RAIDO \sim 1 \sim 2 \sim 5 \sim 10 \sim Intel Rapid Recovery \sim OROM UI and BANNER \sim HDD Unlock \sim LED Locate \sim IRRT Only on eSATA

Aptio Setup Utilit Advanced	y - Copyright (C) 2010 American Megatrends, Inc.
RAIDO RAIDI RAIDIO RAID5 Intel Rapid Recovery OROM UI and BANNER HDD Unlock LED Locate IRRT Only on eSATA	[Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled]	Enable or disable RAIDO feature.
		<pre>>: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.10.1208	.Copyright (C) :	2010 American Megatrends, Inc. AB

Aptio Setup Utility Advanced	/ - Copyright (C) 2010 Ameri	can Megatrends, Inc.
Platform Thermal Config	guration	This value controls the
Critical Trip Point	[POR]	Critical Trip Point -
Active Trip Point Hi Active Trip Point O F	[71 C] 100	the point in which the OS will shut the system
Active Trip Point Lo	[55 C] 75	off.
Passive Trip Point	[95 C]	Of Record (POR) for all
Passive TCl Value Passive TC2 Value	1 5	Intel mobile processors.
Passive TSP Value	10	×: Select Screen
ME SMBus Thermal Repo	[Disabled]	Enter: Select
PCH Thermal Device	[Disabled]	F1: General Help
MCH Temp Read PCH Temp Read	[Enabled] [Enabled]	F2: Previous Values F3: Optimized Defaults
CPU Energy Read	[Enabled]	F4: Save & Exit
CPU Temp Read	[FU9DTed]	ESC: EXIT
Version 2.10.1208	. Copyright (C) 2010 America	n Megatrends, Inc. AB

> Critical Trip Point

This value controls the temperature of the ACPI critical Trip point—the point in which the OS will shut the system off.

- > Active Trip Point Hi
- Active Trip Point 0 F
- > Active Trip Point LO
- Active Trip Point 1 F
- Passive Trip Point
- ME SMBus Thermal Reporting

Enable/Disable ME SMBus Thermal Reporting Configuration.

- **PCH Thermal Device**
- MCH Temp Read
- **PCH Temp Read**
- > CPU Energy Read
- > CPU Temp Read

Enable/Disable PCH Thermal Device 、 MCH Temp Read 、 PCH Temp Read 、 CPU Energy Read 、 CPU Temp Read

Intel Anti-Theft Technology Configuration



Intel Anti-Theft Tech

Enable/Disable Intel AT in BIOS for testing only

Intel AMT Intel AMT Setup Promp BIOS Hotkey Pressed MEBx Selection Screen Verbose Mebx Output Hide Un-Configure ME MEBx Debug Message Ou Un-Configure ME Intel AMT Password Wr Amt Wait Timer ASF Activate Remote Assis USB Configure PET Progress	[Enabled] [Enabled] [Disabled] [Disabled] [Enabled] [Disabled] [Disabled] [Disabled] [Enabled] [Disabled] [Enabled] [Enabled] [Enabled]	Enable/Disable Intel (R) Active Management Technology BIOS Extension. Note : iAMT H/W is always enabled. This option just controls the BIOS extension execution. : Select Screen ti: Select Item Enter: Select +/-: Change Opt.
Intel AMT SPI Protect AMT CIRA Timeout	[Disabled] 0	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Intel AMT

Enable/Disable Intel[®] Active Management Technology BIOS Extenstion.

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.

> Intel AMT Setup Prompt

OEMFLag Bit 0: Enable/Disable Intel AMT Setup Prompt to wait for hot-key to enter setup.

BIOS Hotkey Pressed

OEMFLag Bit 1: Enable/Disable BIOS hotkey press.

MeBx Selection Screen

OEMFLag Bit 2: Enable/Disable MEBx selection screen.

> Verbose Mebx Output

OEMFLag Bit 3: Enable/Disable Verbose Mebx Output.

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.

> Intel AMT Password Write Enabled

Enable/Disable Intel AMT Password Write. Password is writeable when set Enable.

> Amt Wait Timer

Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

> 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 received PET events or not.

Intel Amt SPI Protected

Enable/Disable Intel AMT SPI write protect.

USB Configuration

Aptio Setup Utility Advanced	v - Copyright (C) 2010 Am	erican Megatrends, Inc.
USB Configuration		Enables Legacy USB
USB Devices: 1 Keyboard, 1 Mou	use, 3 Hubs	disables legacy support if no USB devices are connected. DISABLE
Legacy USB Support EHCI Hand-off	[Enabled] [Disabled]	option will keep USB devices available only for EFI applications.
USB hardware delays a USB transfer time-out Device reset time-out Device power-up delay	[20 sec] [20 sec] [Auto]	<pre>>: Select Screen ti Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.10.1208.	. Copyright (C) 2010 Amer	ican Megatrends, Inc. AB

Legacy USB support

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

ECHI Hand-off

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

Default: Disabled

USB transfer time-out

The time-out value for control, bulk, and Interrupt transfers.

Default: 20 sec

Aptio Setup Utility - Copyright (C) 2010 A Advanced	merican Megatrends, Inc.
USB Configuration USB Devices: 1 Keyboard, 1 Mouse, 3 Hubs	The time-out value for Control, Bulk, and Interrupt transfers.
Legacy USB Support [Enabled] EHCI Hand-off USB transfer time-ou USB hardware delays a USB transfer time-out Device reset time-out Device power-up delay	t Select Screen Select Item r: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.10.1208. Copyright (C) 2010 Ame	rican Megatrends, Inc. AB

Devices reset time-out

USB mass storage device Start Unit command time-out.

Default: 20 sec

Devices 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 100 ms, for a Hub port the delay is taken from Hub descriptor.



Default: Auto

F81216 Secondary Super IO Configuration

System Super IO Chip Parameters.

Aptio Setup Utility Advanced	y - Copyright (C) 2010 Amer:	ican Megatrends, Inc.
F81216 Secondary Super Super IO Chip F81216 Serial Port 0 Co F81216 Serial Port 1 Co F81216 Serial Port 2 Co	IO Configuration Fintek F81216 onfiguration onfiguration onfiguration	Set Parameters of Serial Port O (COMA)
		<pre>>: Select Screen il: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.10.1208	. Copyright (C) 2010 America	an Megatrends, Inc. AB
F81216 Serial Port O Con Aptio Setup Utility	n <mark>figuration</mark> y - Copyright (C) 2010 Amer	ican Megatrends, Inc.
Advanced		
F81216 Serial Port O Co	onfiguration	Enable or Disable
Serial Port Device Settings	[Enabled] IO=3F8h; IRQ=4;	Serial Fort (COM)
Change Settings Device Mode	[IO=3F8h; IRQ=4;] [Serial Port Functi]	
		×: Select Screen ↑↓: Select Item Enter: Select
		+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Set Parameters of Serial Ports. User can Enable/Disable the serial port and Select an optimal settings for the Super IO Device. Enable or Disable Serial Port (COM)

Default: Enable

 \geq

Serial Port Console Redirection

Aptio Setup Utility	- Copyright (C) 2010 Ameri	.can Megatrends, Inc.
COMO (Disabled) Console Redirection	Port Is Disabled	Console Redirection Enable or Disable.
COM1 (Disabled) Console Redirection	Port Is Disabled	
COM2 (Disabled) Console Redirection	Port Is Disabled	
COM4(Pci Dev22,Func3) Console Redirection Console Redirection Set	[Enabled] tings	×: Select Screen ↑↓: Select Item Enter: Select
Serial Port for Out-of- Windows Emergency Manag Console Redirection Out-of-Band Mgmt Port Data Bits	Band Management/ ement Services (EMS) [Enabled] [COMO (Disabled)] 8	+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.10.1208.	Copyright (C) 2010 America	an Megatrends, Inc. AB

Console Redirection

Console Redirection Enable/Disable.

Out-of-Band Mgmt Port

Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server

OS through a serial port.

Terminal Type

VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100.



> Sandybridge DTS Configuration



CPU DTS

Disabled: ACPI thermal management uses EC reported temperature values.

Enabled: ACPI thermal management uses DTS SMM mechanism to obtain CPU temperature values.

> Sandybridge PPM Configuration

Aptio Setup Utility Advanced	r - Copyright (C)	2010 American Megatrends, Inc.
Sandybridge PPM Configu EIST Turbo Mode CPU C3 Report CPU C6 report	ration [Enabled] [Enabled] [Enabled] [Enabled]	Enable/Disable Intel SpeedStep
CPU C7 report Long duration power l Long duration maintai Short duration power	[Enabled] 0 28 0	
TCC active offset	0	<pre>>: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.10.1208.	Copyright (C) 20)10 American Megatrends, Inc. AB

EIST

Enable/Disble Intel SpeedStep.

Turbo Mode

Turbo Mode.

CPU C3 Report

Enable/Disable CPU C3(ACPI C2) report to OS.

CPU C6 Report

Enable/Disable CPU C6(ACPI C3) report to OS.

CPU C7 Report

Enable/Disable CPU C7(ACPI C3) report to OS.

Chipset Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Aptio Setup Utility - Copyright (C) 2	2010 American Megatrends, Inc.
Main Advanced <mark>Chipset</mark> Boot Security	Save & Exit
System Agent (SA) Configuration	System Agent (SA)
PCH-IO Configuration	Parameters
	<pre>><: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.10.1208. Copyright (C) 201	.0 American Megatrends, Inc. AB

System Agent (SA) Configuration

Aptio Setup Utility Chipse	r - Copyright (C) 20. t	LO American Megatrends, Inc.
System Agent RC Versi VT-d Capability	1.1.1.1 Supported	Check to enable VT-d function on MCH.
VT-d CHAP Device (B0:D7:F0 Thermal Device (B0:D4 Enable NB CRID	[Enabled] [Disabled] [Disabled] [Disabled]	
Graphics Configuration DMI Configuration NB PCIE Configuration Memory Configuration Memory Thermal Configur GT - Power Management C	ation Control	<pre>>: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.10.1208.	Copyright (C) 2010	American Megatrends, Inc. AB

≻ VT-d

Check to enable VT-d function on MCH.

> Enable NB CRID

Enable or disable NB CRID WorkAround.

Aptio Setup Utility Chipse	- Copyright (C) t) 2010 American Megatrends, Inc.
Graphics Configuration IGFX VBIOS Version IGfx Frequency Graphics Turbo IMON C	2098 650 MHz <mark>31</mark>	Graphics turbo IMON current values supported (14-31)
Primary Display Internal Graphics GTT Size Aperture Size DVMT Pre-Allocated DVMT Total Gfx Mem Gfx Low Power Mode	[Auto] [Auto] [2MB] [256MB] [64M] [256M] [Enabled]	<pre>>: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.10.1208.	Copyright (C) 2	2010 American Megatrends, Inc. AB

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: 1MB, 2MB.

> Aperture Size

Select the Aperture Size: 128MB, 256MB, 512MB.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device: 0M~512M.

DVMT Total Gfx Mem

Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device: 128M, 256M, MAX.

Gfx Low Power Mode

This option is applicable for SFF only.

DMI Configuration

Aptio Setup Utility Chipse	r - Copyright (C) 2010 Amer: t	ican Megatrends, Inc.
DMI Configuration		Enable or disable DMI
DMI	X4 Gen2	
DMI Vcl Control DMI Vcp Control DMI Vcm Control DMI Link ASPM Control DMI Extended Synch Co DMI Gen 2	[Enabled] [Enabled] [LOsL1] [Disabled] [Enabled]	<pre>>: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

AB

NB PCIe Configuration

Aptio Setup Utility Chipse	7 - Copyright (C) 2010 Ameri ^I t	.can Megatrends, Inc.
NB PCIe Configuration PEGO PEGO - Gen X PEG1 PEG1 - Gen X PEG2 PEG2 - Gen X PEG3 PEG3 - Gen X	Not Present [Auto] Not Present [Auto] Not Present [Auto] Not Present [Auto]	Configure PEGO B0:D1:F0 Gen1-Gen2
Always Enable PEG PEG ASPM ASPM LOs De-emphasis Control	[Disabled] [ASPM LOsL1] [Both Root and Endp] [-3.5 dB]	<pre>>: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.10.1208.	Copyright (C) 2010 America	n Megatrends, Inc. AB

Memory Configuration

Aptio Setup Utility Chipse	'- Copyright (C) 2010 Ameri t	can Megatrends, Inc.
Memory Information		Select DIMM timing profile that should be
Memory RC Version	1.1.1.0	used.
Memory Frequency	1333 Mhz	
Total Memory	2048 MB (DDR3)	
CAS Latonar (tCL)	2048 MB (DDR3)	
Minimum delay time		
CAS to RAS (tRCDm	9	
Row Precharge (tR	9	
Active to Prechar	24	\succ : Select Screen
		↑↓: Select Item
DIMM profile	[Default DIMM profile]	Enter: Select
Memory Frequency	[Auto]	+/-: Change Opt.
Max TOLUD	[Dynamic]	Fl: General Help
NMode Support	[Auto]	F2: Previous Values
Memory Scrambler	[Enabled]	F3: Optimized Defaults
RMT Crosser Support	[Disabled]	F4: Save & Exit
MRC Fast Boot	[Enabled]	ESC: Exit

Version 2.10.1208. Copyright (C) 2010 American Megatrends, I:

AB

Memory Thermal Manage



GT – Power Management Control

Aptio Setup Utility Chipse	r - Copyright (C t	C) 2010 Americ	can Megatrends, Inc.
GT - Power Management C GT Info	Control GT2 (Ox116)		Check to enable render standby support.
RC6(Render Standby) GT OverClocking Suppo	[Enabled] [Disabled]		
			↑↓: Select Item Enter: Select +/-: Change Opt.
			F1: General Help F2: Previous Values F3: Optimized Defaults
			F4: Save & Exit ESC: Exit
Version 2.10.1208.	Copyright (C)	2010 American	n Megatrends, Inc. AB

> PCI Express Configuration

Aptio Setup Utility Chipse	/ - Copyright (C) 2010 Amer. et	ican Megatrends, Inc.
Intel PCH RC Version Intel PCH SKU Name	1.1.2.0 QM67	Enable or disable onboard NIC.
PCH LAN Controller Wake on LAN Board Capability EC Turbo Control Mode Azalia Azalia Docking Supp Azalia PME	[Enabled] [Enabled] [SUS_PWR_DN_ACK] [Disabled] — PCH LAN Controller — Enabled Disabled	
Azalia Internal HDM Azalia HDMI codec Azalia HDMI codec Azalia HDMI codec Display Logic CLKRUN# Logic SB CRID	[Enabled] [Enabled] [Enabled] [Enabled] [Disabled]	: Select Screen : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults E4: Care 6 Emit
BIOS Security Configura	ation	ESC: Exit
Version 2.10.1208.	. Copyright (C) 2010 America	an Megatrends, Inc. AB

> Azalia

Control Detectin 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.

Set NAND Management Override

Option to Override NAND Management to allow driver or 3rd parties software to configure the NAND module after POST.

Aptio Setup Utility Chipse	y - Copyright (C) et	2010 American Megatrends, Inc.
Azalia HDMI codec Display Logic CLKRUN# Logic SB CRID	[Enabled] [Enabled] [Enabled] [Disabled]	Option to Override NAND Management to allow driver or 3rd parties software to configure the NAND module after
BIOS Security Configura SMI Lock	ation [Disabled]	POST.
BIOS Lock GPIO Lock Disa Enat	Set NAND Manageme abled pled	ent Override —
High Precision Ev High Precision Time		ect Screen ect Item
SLP_S4 Assertion Widt Restore AC Power Loss Set NAND Management O	[4-5 Seconds] [Power Off] [Enabled]	+/-: Change Opt. F1: General Help F2: Previous Values
USB Configuration PCI Express Configurati	.on	F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.10.1208.	Copyright (C) 20	010 American Megatrends, Inc. AB

USB Configuration

EHCI1

Control the USB EHCI (USB2.0) functions. One EHCI controller must always be enabled.



PCI Express Configuration

Aptio Setup Utility - Copyright (Chipset	C) 2010 American Megatrends, Inc.
PCI Express Clock Gat[Enabled]DMI Link ASPM Control[L0sL1]DMI Link Extended Syn[Disabled]Subtractive Decode[Disabled]	Enable or disable PCI Express Clock Gating for each root port.
PCI Express Root Port 1 PCIE Port 6 is assign	
	<pre>>: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.10.1208. Copyright (C)	2010 American Megatrends, Inc. AB

> DMI Clink 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.

5.3 Boot

Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

Default: 1

Aptio Setup Utility Main Advanced Chipse	y - Copyright (C) 2010 Amer et Boot Security Save &	ican Megatrends, Inc. Exit
Boot Configuration Setup Prompt Timeout Bootup NumLock State	L [On]	Number of seconds to wait for setup activation key.
Quiet Boot	[Disabled]	indefinite waiting.
CSM16 Module Verison	07.64	
GateA20 Active Option ROM Messages Interrupt 19 Capture	[Upon Request] [Force BIOS] [Disabled]	×: Select Screen
Boot Option Priorities Boot Option #1 Boot Option #2	[PO: TOSHIBA MK1665] [IBA GE Slot 00C8 v]	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values
Hard Drive BBS Priorities Network Device BBS Priorities		F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.10.1208	. Copyright (C) 2010 Americ	an Megatrends, Inc. AB

Bootup NumLock State

Select the keyboard NumberLock State

Default: On

> Quiet Boot

Enable or Disable Quiet Boot Option.

Default: Disable

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. Options are Force BIOS and Keep Current.

Interrupt 19 Canture

Enable: Allows Option ROMs to trap Int 19.

Boot Option Priorities

Sets the system boot order.

5.4 Security

Administrator Password

This section allows you to configure and improve your system and allows you to set up some system

features according to your preference.



Administrator Password

Set Setup Administrator Password.

User Password

Set User Password.

AB

5.5 Save & Exit

Exit system setup after saving the change

Aptio Setup Utility - Co Main Advanced Chipset Bo	yright (C) 2010 American Megatrends, Inc. t Security Save & Exit
Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset	Exit system setup after saving the changes.
Save Options Save Changes Discard Changes	
Restore Defaults	
Save as User Defaults	×: Select Screen
Restore User Defaults	↑↓: Select Item Enter: Select
Boot Override	+/-: Change Opt.
PO: TOSHIBA MK1665GSX	F1: General Help
IBA GE Slot 00C8 v1365	F2: Previous Values F3: Optimized Defaults
Launch EFI Shell from filesy:	tem device F4: Save & Exit ESC: Exit
Version 2.10.1208. Copy:	right (C) 2010 American Megatrends, Inc.

Save Changes and Exit

Exit system setup after saving the changes.

Disacard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

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.

AD

Restore Defaults

Restore/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.

Boot Override

Pressing ENTER causes the system to enter the OS.

> Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.