QuantaGrid Series

S51G-1UL

Ultra Density for Data Storage Intensive Application

User's Guide

Quanta

Version: 1.1

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Revision History

Refer to the table below for the updates made to this technical guide.

DATE	CHAPTER	UPDATES

Copyright

Version 1.1 / August 26, 2014

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For the latest information and updates please see www.QuantaQCT.com

All the illustrations in this guide are for reference only and are subject to change without prior notice.

About the Book

This guide is written for users who want to know the system featuers.

For the latest version of this guide, see www.QuantaQCT.com.

Intended Application Uses

This product was evaluated as Information Technology Equipment (ITE), which may be installed in offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other product categories and environments (such as medical, industrial, residential, alarm systems, and test equipment), other than an ITE application, may require further evaluation.

Conventions

Several different typographic conventions are used throughout this manual. Refer to the following examples for common usage.

Bold type face denotes menu items, buttons and application names.

Italic type face denotes references to other sections, and the names of the folders, menus, programs, and files.

<**Enter**> type face denotes keyboard keys.

WARNING!

Warning information appears before the text it references and should not be ignored as the content may prevent damage to the device.

CAUTION!

CAUTIONS APPEAR BEFORE THE TEXT IT REFERENCES, SIMILAR TO NOTES AND WARNINGS. CAUTIONS, HOWEVER, APPEAR IN CAPITAL LETTERS AND CONTAIN VITAL HEALTH AND SAFETY INFORMATION.

Note:

Highlights general or useful information and tips.

Structure of this guide

- Chapter 1: About the System

  "This section introduces the system, its different configuration(s) and the main features."

- Chapter 2: Regulatory and Compliance Information

  "This section provides regulatory and compliance information applicable to this system."

About the System

Chapter 1

This section introduces the system, its different configuration(s) and the main features.

1.1 Introduction

QuantaGrid S51G-1UL is an ultra-dense 1U storage server specially tailored to meet the scale-out storage needs of diverse datacenters. It features large storage capacity of up to twelve 3.5" storage drive devices in compact 1U size, cost effective onboard design, and Intel's high performance & efficient power processor. The S51G-1UL is a great choice for applications such as highly scalable and high-throughput object storage and distributed file system in cloud datacenters.

Provide Extremely Large Storage in 1U Space

Big Data is getting particularly much attention today because of the growth predictions for data. QuantaGrid S51G-1UL is a standard 1U rackmount system. It amazingly supports up to twelve 2.5" or 3.5" fixed HDD/SSD bays and one optional SATADOM. It provides unprecedented storage combinations and capacity in a 1U chassis for diverse datacenters. Moreover, the system eliminates unnecessary features and positioned itself as a pure storage server, powered by Intel® Xeon® processor E5-2600 v2 family and supporting eight DDR3 RDIMM/LRDIMM/UDIMM slots.

Bring You the Most Efficiency with Onboard Design

QuantaGrid S51G-1UL not only lowers the cost, but also highly increases the efficiency because of its built-on-board design. All key functions are built on the motherboard, including two 1GbE RJ45 ports for accessing or managing the server from multiple networks, one dedicated RJ45 management port, one 10G SFP+ port for high speed data access, and onboard SATA ports plus LSI 2308 SAS controller for various storage devices. The exceptional design makes all components work smoothly together. Plus two redundant 450W 80plus gold power supply modules, the QuantaGrid S51G-1UL can be ranked as one of the most efficient server ever.

Specifications

Table 1.1: System Specifications

SPECIFICATIONS	DESCRIPTION
Form factor	1U rack mount
Dimensions (W x H x D)	16.9 x 1.7 x 32.0 inches 430 x 43.2 x 812.8 mm
Processor	**Processor type:** Intel® Xeon® processor E5-2600 v2 product family **Max. TDP support:** 95W **Number of processors:** 1 **Internal Interconnect:** 6.4 / 7.2 / 8.0 GT/s **L3 cache:** Up to 30 MB
Chipset	Intel® C602

Table 1.1: System Specifications (Continued)

SPECIFICATIONS	DESCRIPTION
Memory	**Total slots:** 8 **Capacity:** up to 256 GB LRDIMM **Memory type:** 1866/1600/1333 MHz DDR3 RDIMM/LRDIMM/UDIMM **Memory size:** 32GB, 16GB, 8GB, 4GB
Storage controller	**Onboard (Intel® C602):** 4x SATA 3Gb/s ports 2x SATA 6Gb/s ports **Onboard (LSI 2308):** 8x SATA/SAS 6Gb/s ports
Networking	**LOM:** One Intel® I350 dual-port 1 GbE One Intel® 82599 10G single port SFP+ Dedicated 10/100/1000 management port **Optional NIC:** Quanta Intel® i350 dual-port OCP mezzanine Quanta Intel® 82599ES dual-port 10G SFP+ OCP mezzanine
Expansion slots	One x16 PCIe G3 slot (full height)
Storage	12x 3.5" or 2.5" fixed SATA/SAS HDD/SSD
Video	Integrated AST2300 with 8MB DDR3 video memory (optional)
Front I/O	LEDs: LAN/Power/HDD activity/Status/BMC/ID Buttons: Reset/ID/Power
Rear I/O	4x USB 2.0 ports 1x VGA port 1x RS232 serial port 2x GbE RJ45 ports 1x 10/100/1000 RJ45 management port 1x 10G SFP+ onboard port 1x ID button with LED 1x Power button with LED
TPM	Yes (option)
Power supply	2x High efficiency 450W Redundant PSUs, 80plus gold
Fan	5x systems fans + 2x Power Distribution Board fans
System management	IPMI v2.0 Compliant, on board "KVM over IP" support
Operating environment	Operating temperature: 10°C to 35°C (50°F to 95°F) Non-operating temperature: -40°C to 70°C (-40°F to 158°F) Operating relative humidity: 50% to 90%RH Non-operating relative humidity: 20% to 95%RH

1.2 Package Contents

- (1) S51G-1UL system
- (1) processor heat sink
- (1) power supply unit
- (1) power cord (optional)
- (1) utility CD (This Guide included)
- (1) rail kit

Note:

Note: For exact shipping contents, contact your Quanta sales representative.

1.3 A Tour of the System

System Overview

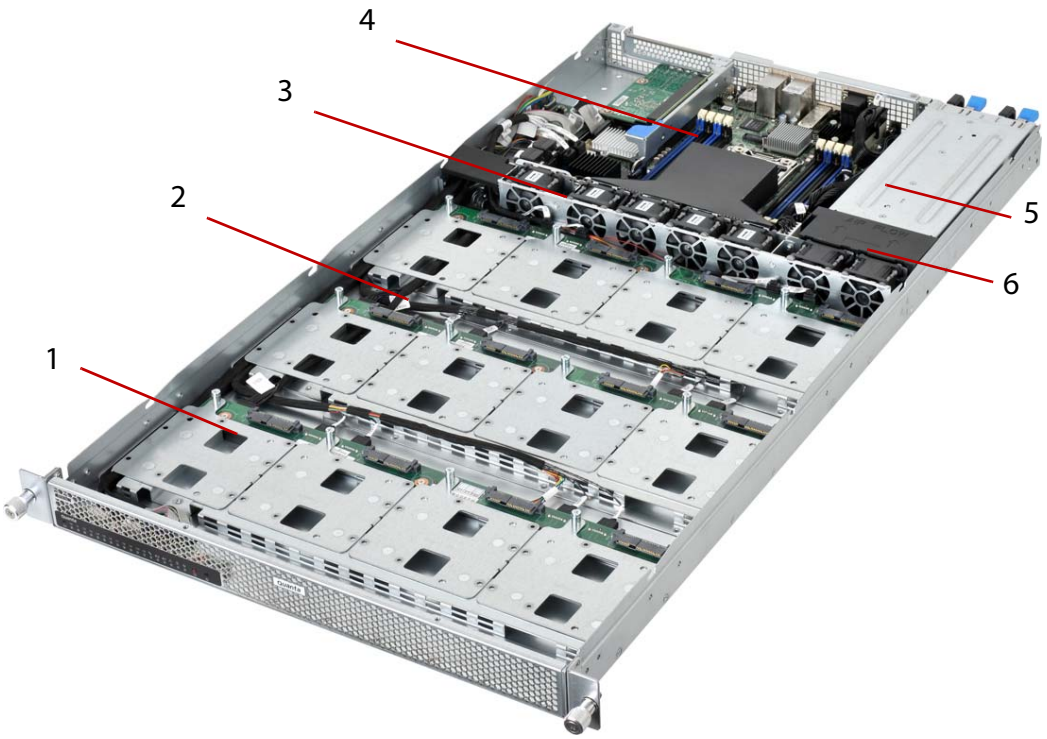


Figure 1-1. System Component Overview

Table 1.2: Component Overview

NO.	ITEM	DESCRIPTION
1	Storage drive bay	Support storage drive: 3.5” / 2.5” ; SAS / SATA; hard disk drive (HDD) / solid state drive (SSD)
2	Storage drive board	Connect to storage drive
3	Fans	(x7) Fan modules (x5 System Fans / x2 Power Distribution Board Fans)
4	Mainboard	Provide all the basic function and information for system operation.
5	Power Supply Unit	Redundant Power Supply Unit (PSU). 450W high efficiency redundant PSU, 100-127V/200-240Vac, 6.5A/3A, 47-63Hz
6	Air Duct	Air Duct for Power Disbribution Board and Power Supply

System Front View

Figure 1-2. System Front View

Table 1.3: Front Control Panel View

NO.	NAME	DESCRIPTION
1	Control Panel	Control system and status display.

Front Control Panel

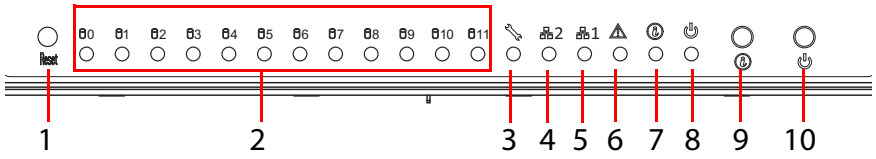


Figure 1-3. Front Control Panel View

Table 1.4: Front Control Panel View

NO.	ICON	NAME	DESCRIPTION
1		Reset Button	Base system On Push button to Reset system
2		HDD Activity LED	Blue Blinking, HDD access OFF, no access Amber Blinking, HDD fail
3		BMC LED	Blue On, link Blinking, LAN access
4		LAN 2 LED	Blue On, link Blinking, LAN access
5		LAN 1 LED	Blue On, link Blinking, LAN access
6		Status LED	Off, Normal Amber Blinking, Critical error.
7		ID LED	Blue ON, selected unit ID OFF, no ID requested

Table 1.4: Front Control Panel View (Continued)

8		Power LED	Blue ON, S0 SYSTEM POWER ON OFF, S4/S5 SYSTEM POWER OFF Blinking, S1 Standby/Sleep
9		ID Button	Push button to light up / off the ID LED.
10		Power Button	Push button to power the system on /off. Press more than 4 sec. to shut down the system.

System Rear View

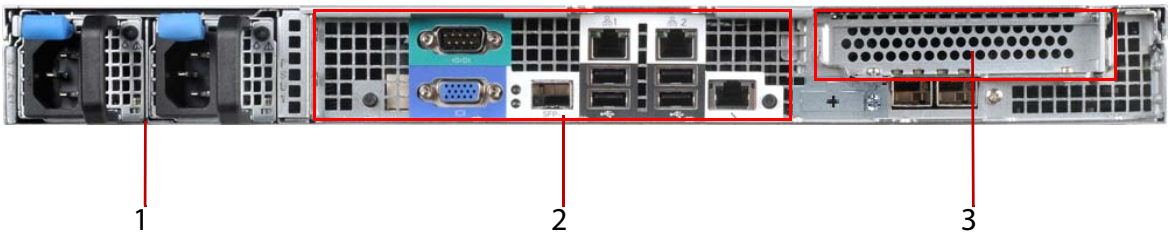


Figure 1-4. System Rear View

Table 1.5: Rear Panel View

NO.	NAME	DESCRIPTION
1	PSU	Redundant Power Supply Unit
2	System Rear I/O	Mainboard (MB) I/O features
3	Expansion Card	(1) PCIe Gen3 x16 card

Rear I/O

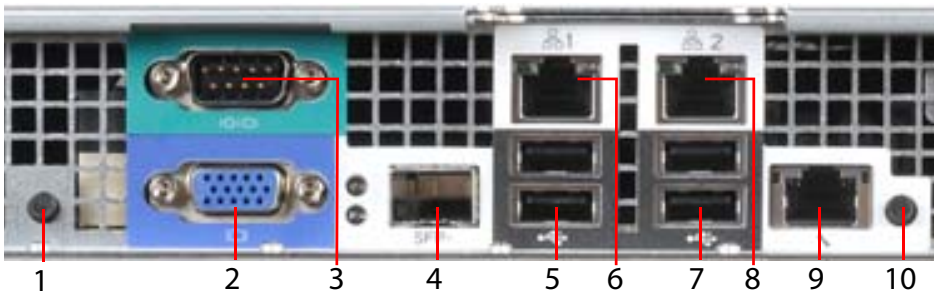


Figure 1-5. Rea i/O View

Table 1.6: Rear Panel View

NO.	ICON	NAME	DESCRIPTION

Table 1.6: Rear Panel View (Continued)

1		Power Button with LED	Green ON, S0 SYSTEM POWER ON OFF, S4/S5 SYSTEM POWER OFF Blinking, S1 Standby/Sleep
2		VGA port	Connects to a monitor
3		COM port	Connects to a serial device
4		SFP+ port	10G SFP+ port
5		USB ports	2 USB ports
6		LAN 1 port	1G BASE-T RJ45 port
7		USB ports	2 USB ports
8		LAN 2 port	1G BASE-T RJ45 port
9		Management port	Dedicated Management LAN port
10		ID Button with LED	Push button to light up / off the ID LED.

PSU View

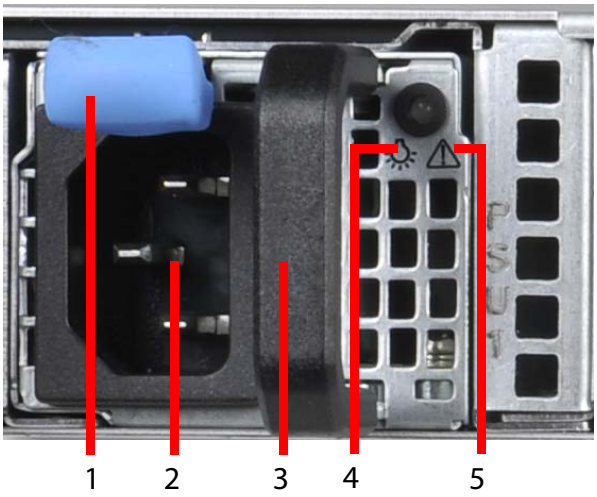


Figure 1-6. PSU View

Table 1.7: PSU View

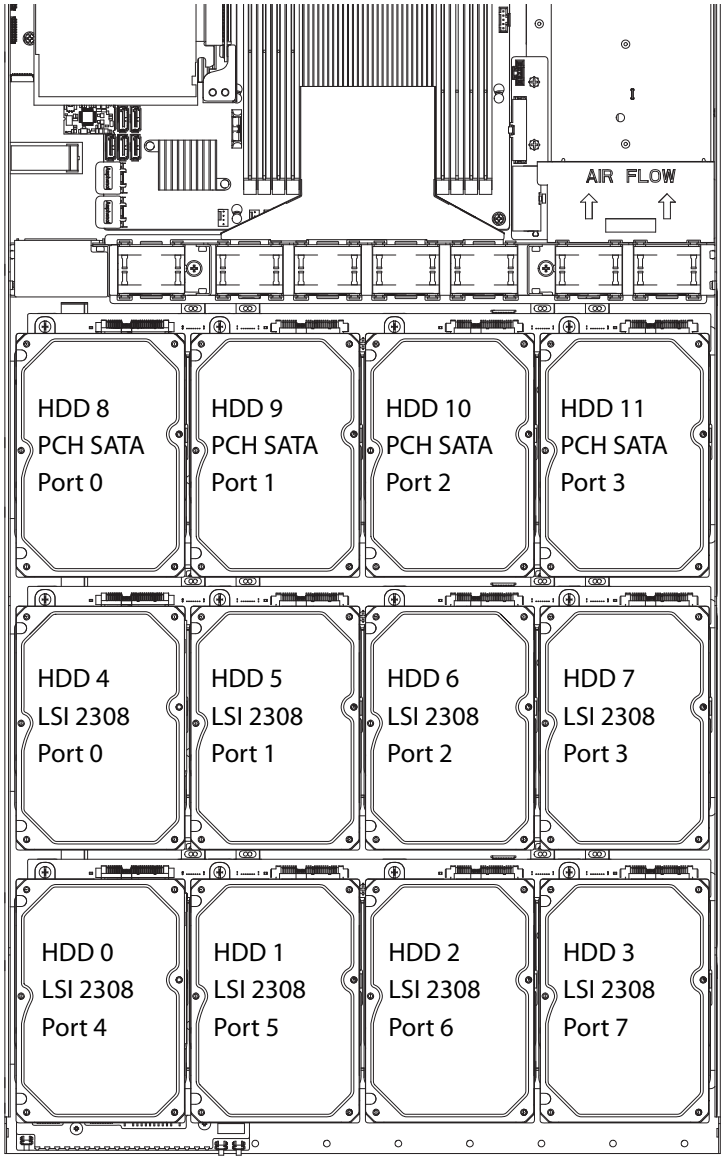
NO.	NAME	DESCRIPTION
1	Release latch	Press and hold to unlock PSU from chassis bay.

Table 1.7: PSU View (Continued)

2	AC input power connector	Connect power plug.
3	Handle	Hold to remove the PSU from the chassis bay.
4	PSU power LED	Green ON: Output ON and OK Blinking: AC present /
5	PSU status LED	Amber ON: AC core unplugged or AC power lost; with a second power supply in parallel still with AC input power; Power supply critical event causing shutdown Blinking: Power supply warning events where the power supply continues to operate; high temp, high power, high current, slow fan

Storage Drive Numbers

Your system features up to twelve 3.5" drive, supported by PCH SATA and LSI 2308, the numbering is as below:



LED Definitions

Front Panel LED Definition

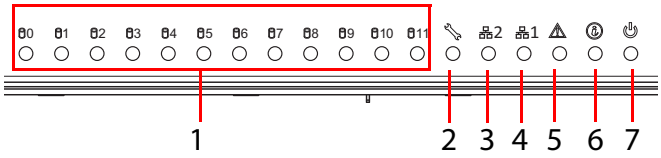


Figure 1-7. Fornt Control Panel LEDs

Table 1.8: Operator Panel LED Definition

NO.	NAME	STATE	DESCRIPTION
1	HDD LED	OFF|OFF	Slot Empty
		Blue Blinking when activity | OFF	Drive Online
		Blue Blinking when activity | OFF	Drive Rebuilding
		Amber OFF | ON / OFF	Drive Failed
2	Mangement LED	Solid Blue	LAN Link to Management NIC
		Blinking	LAN Link to Management NIC active
		Off	Management NIC does not function
3	LAN2 LED	Solid Blue	LAN Link to System NIC i350 Port1
		Blinking	LAN Link to System NIC i350 Port1 active
		Off	System NIC i350 Port1 does not function
4	LAN1 LED	Solid Blue	LAN Link to System NIC i350 Port0
		Blinking	LAN Link to System NIC i350 Port0 active
		Off	System NIC i350 Port0 does not function
5	Status LED	Blinking Amber	Indicating a critical error.
		Off	Non-critical alarm.
6	ID LED	Solid Blue	Identification activity detected.
		Off	No Identification activity initiated.
7	Power LED	Solid Blue	S0 System is powered on.
		Blinking	S1 Standby / Sleep.
		Off	S4/S5 System is powered off.

LAN Port LED

The system mainboard has two i350 Ethernet controller and one 82599EN 10 G ports.

Each RJ45 connector has two built-in LEDs. See the following illustration and table for details.

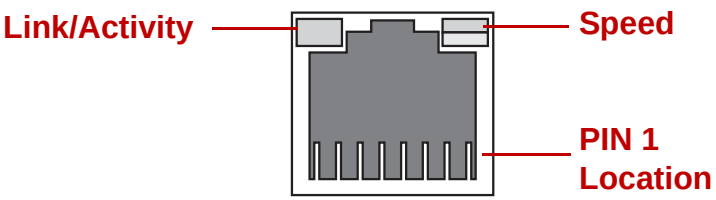


Figure 1-8. RJ45 LAN Connector

Table 1.9: RJ45 LED Description

STATUS	LINK / ACTIVITY LED	SPEED LED
Unplug	Off	Off
1G Link with Active	Green blinking	Amber On
100M Link with Active	Green blinking	Green On
10M Link with Active	Green blinking	Off

10G SFP+

Figure 1-9. 82599 10G SFP+

Table 1.10: SFP+ LED Description

STATUS	SPEED LED	LINK / ACTIVITY LED
Unplug	Dark	Dark
Plug in no Access	Dark	Green
10G Link with Active	Blue	Green blinking
1G Link with Active	Amber	Green blinking

BMC Management Port LED

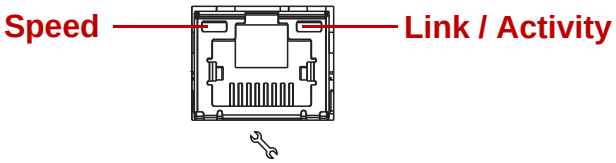


Figure 1-10. Management Port LED

Table 1.11: Management Port LED Behavior

STATUS	SPEED LED	LINK / ACTIVITY LED
Unplug	Off	Off
Plug in no access	Off	Green: on
1G Link +Active	Amber: on	Green: blinking
100M Link + Active	Green: on	Green: blinking
10M Link + Active	Off	Green: blinking

Regulatory and Compliance Information

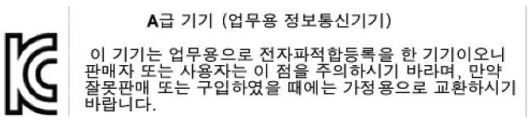
Chapter 2

This section provides regulatory and compliance information applicable to this system.

Product Regulatory Compliance Markings

This product is marked with the following Product Certification Markings:

Product Regulatory Compliance Markings

Regulatory Compliance	Region	Marking
cULus Listing Mark	USA / Canada	
CE Mark	Europe	
FCC Marking (Class A)	USA	This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.
ICES	Canada	CAN ICES-3 (A)/NMB-3(A)
VCCI Marking (Class A)	Japan	この装置は、クラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A
BSMI Certification Number & Class A Warning	Taiwan	 警告使用者： 此為甲類資訊技術設備，於居住環境使用中時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。
EAC Marking	Russia	
CCC	China	 此为 A 级产品,在生活环境中,该产品可能会造成无线电干扰。在这种情况下,可能需要用户对其干扰采取切实可行的措施。
Recycling Package Mark	Other than China	
MSIP	Korea	 A급 기기 (업무용 정보통신기기) 이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Electromagnetic Compatibility Notices

FCC Verification Statement (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) 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 his own expense.

Europe (CE Declaration of Conformity)

This product has been tested in accordance too, and complies with the Low voltage Directive(2006/95/EC) and EMC Directive (2004/108/EC). The product has been marked with the CE Mark to illustrate its compliance.

VCCI (Japan)

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A

English translation of the notice above:

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

BSMI (Taiwan)

The BSMI Certification Marking and EMC warning is located on the outside rear area of the

警告使用者：
此為甲類資訊技術設備，於居住環境使用中時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。

MSIP (Korea)

Ministry of Science, ICT & Future Planning (MSIP) Class A Statement:

A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Regulated Specified Components

To maintain the UL listing and compliance to other regulatory certifications and/or declarations, the following regulated components must be used and conditions adhered to. Interchanging or use of other component will void the UL listing and other product certifications and approvals.

Updated product information for configurations can be found on the site at the following URL:

www.QuantaQCT.com

If you do not have access to the Web address, please contact your local representative.

- **Add-in cards:** must have a printed wiring board flammability rating of minimum UL94V-1. Add-in cards containing external power connectors and/or lithium batteries must be UL recognized or UL listed. Any add-in card containing modem telecommunication circuitry must be UL listed. In addition, the modem must have the appropriate telecommunications, safety, and EMC approvals for the region in which it is sold.
- **Peripheral Storage Devices:** must be UL recognized or UL listed accessory and TUV or VDE licensed. Maximum power rating of any one device is 19 watts. Total server configuration is not to exceed the maximum loading conditions of the power supply.

Restriction of Hazardous Substances (RoHS) Compliance

Quanta® Computer Inc. has a system in place to restrict the use of banned substances in accordance with the European Directive 2011/65/EU. Compliance is based on declaration that materials banned in the RoHS Directive are either (1) below all applicable threshold limits or (2) an approved / pending RoHS exemption applies.

RoHS implementation details are not fully defined and may change.

Threshold limits and banned substances are noted below:

- Quantity limit of 0.1% by mass (1000 PPM) for:

— Lead

— Mercury

— Hexavalent Chromium

— Polybrominated Diphenyl Ethers (PBDE)

- Quantity limit of 0.01% by mass (100 PPM) for:

— Cadmium

End of Life / Product Recycling

Product recycling and end-of-life take-back systems and requirements vary by country. Contact the retailer or distributor of this product for information about product recycling and / or take-back.