

System board D2179 for Econel 100

Technical manual

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1 Introduction

This technical manual describes the system board D2179, which can be equipped with one Intel® processor.

Further information about drivers is provided in the readme files on the hard disk, on the supplied “ServerSupport” or “ServerStart” CDs.

You will find further information in the BIOS description.

Notational conventions

The meanings of the symbols and fonts used in this manual are as follows:

<i>italics</i>	indicates commands, menu items, file and path names or software programs
fixed font	indicate system output on the monitor
semi-bold fixed font	indicates values to be entered through the keyboard
Key symbol	indicates keys according to their representation on the keyboard If capital letters are to be entered explicitly, then the Shift key is shown, e.g. SHIFT - A for A. If two keys need to be pressed at the same time, then this is shown by placing a hyphen between the two key symbols.
“quotation marks”	indicates names and terms that are being emphasized.
▶	indicates an operation that to be performed
 CAUTION!	indicates warnings, which, if ignored, will endanger your health, destroy the system or lead to the loss of data.
	indicates additional information, notes and tips

Table 1: Notational conventions

2 Important notes

In this chapter you will find essential information regarding safety when working with your server.



CAUTION!

With the system board installed you must open the system to access the system board. How to dismantle and reassemble the system is described in the Options Guide accompanying your system.

2.1 Notes on safety



CAUTION!

- The actions described in these instructions should only be performed by authorized, qualified personnel. Equipment repairs should only be performed by qualified staff. Any failure to observe the guidelines in this manual, and any unauthorized openings and improper repairs could expose the user to risks (electric shock, fire hazards) and could also damage the equipment. Please note that any unauthorized openings of the device will result in the invalidation of the warranty and exclusion from all liability.
- Transport the device only in the antistatic original packaging or in packaging that protects it from knocks and jolts.
- Only install expansions that are allowed for the system board. If you install other expansions, you may damage the requirements and rules governing safety and electromagnetic compatibility or your system. Information on which system expansions are suitable can be obtained from the customer service centre or your sales outlet.
- The warranty expires if the device is damaged during the installation or replacement of system expansions.



- Components can become very hot during operation. Ensure you do not touch components when making extensions to the system board. There is a danger of burns!
- Transmission lines to peripheral devices must be adequately shielded.
- To the LAN wiring the requirements apply in accordance with the standards EN 50173 and EN 50174-1/2. As minimum requirement the use of a protected LAN line of category 5 for 10/100 MBps Ethernet, and/or of category 5e for Gigabit Ethernet is considered. The requirements of the specification ISO/IEC 11801 are to be considered.
- Never connect or disconnect data transmission lines during a storm (lightning hazard).

Batteries



CAUTION!

- Incorrect replacement of lithium battery may lead to a risk of explosion. The batteries may only be replaced with identical batteries or with a type recommended by the manufacturer.

It is essential to observe the instructions on page [25](#).

Modules with electrostatic-sensitive components

Systems and components that might be damaged by electrostatic discharge (ESD) are marked with the following label:

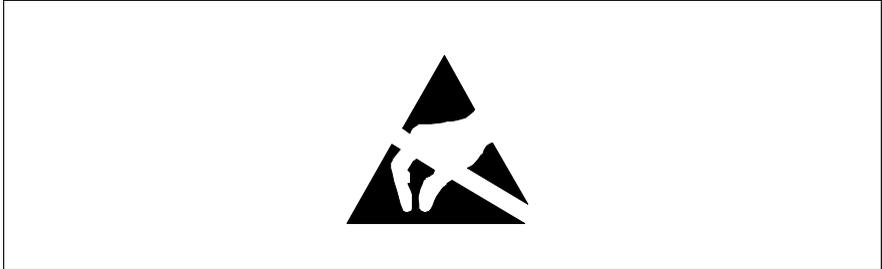


Figure 1: ESD label

When you handle components fitted with ESDs, you must observe the following points under all circumstances:

- You must always discharge yourself of static charges (e.g. by touching a grounded object) before working.
- The equipment and tools you use must be free of static charges.
- Remove the power plug from the power socket before inserting or removing boards containing ESDs.
- Always hold boards with ESDs by their edges.
- Never touch pins or conductors on boards fitted with ESDs.
- Use a grounding cable designed for this purpose to connect yourself to the system unit as you install/deinstall the board.
- Place all components on a static-safe base.



You will find a detailed description for handling ESD components in the relevant European or international standards (EN 61340-5-1, ANSI/ESD S20.20).

Notes about boards

- During installation/deinstallation of the system board, observe the specific instructions described in the service manual for the server.
- Remove the plug from the mains outlet so that system and system board are totally disconnected from the mains voltage.
- To prevent damage to the system board, the components and conductors on it, please take great care when you insert or remove boards. Take great care to ensure that extension boards are slotted in straight, without damaging components or conductors on the system board, or any other components, for example EMI spring contacts
- Be careful with the locking mechanisms (catches, centring pins etc.) when you replace the system board or components on it, for example memory modules or processors.
- Never use sharp objects (screwdrivers) for leverage.

2.2 CE certificate



The shipped version of this board complies with the requirements of the EEC directive 89/336/EEC “Electromagnetic compatibility”.

Compliance was tested in a typical PRIMERGY configuration.

2.3 Environment protection

Environmentally-friendly product design and development

This product has been designed in accordance with the Fujitsu Siemens Computers standard for “environmentally friendly product design and development”. This means that key factors such as durability, selection and labeling of materials, emissions, packaging, ease of disassembly and recycling have been taken into account.

This saves resources and thus reduces the harm done to the environment.

Notes on saving energy

Devices that do not have to be on permanently should not be switched on until they need to be used and should be switched off during long breaks and on completion of work

Notes on packaging

Please do not throw away the packaging. You may need it later for transporting your system unit. If possible, the device should only be transported in its original packaging.

Notes on dealing with consumables

Please dispose of printer consumables and batteries in accordance with local government regulations.

Do not throw batteries and accumulators into the household waste. They must be disposed of in accordance with local regulations concerning special waste.

All batteries containing pollutants are marked with a symbol (a crossed-out rubbish bin on wheels). In addition, the marking is provided with the chemical symbol of the heavy metal decisive for the classification as a pollutant:

Cd Cadmium

Hg Mercury

Pb Lead

Notes on labeling plastic housing parts

Please avoid attaching your own labels to plastic housing parts wherever possible, since this makes it difficult to recycle them.

Returning, recycling and disposal



The device may not be disposed of with household rubbish. This appliance is labelled in accordance with European Directive 2002/96/EC concerning used electrical and electronic appliances (waste electrical and electronic equipment - WEEE).

The guideline determines the framework for the return and recycling of used appliances as applicable throughout the EU. To return your used device, please use the return and collection systems available to you. You will find further information on this at www.fujitsu-siemens.com/recycling.

For details on take-back and reuse of devices and consumables within Europe, see the manual "Returning used devices" or contact your Fujitsu Siemens Computers branch office/subsidiary or our recycling center in Paderborn:

Fujitsu Siemens Computers
Recycling Center
D-33106 Paderborn
Germany

Tel. +49 5251 8 18010

Fax +49 5251 8 18015

Internet: www.fujitsu-siemens.com/recycling

3 Features

3.1 Overview

Processor

- 1 x Intel® Celeron, Pentium D or Pentium 4 processor
- 1 x processor slot with LGA775 socket for processors with 533 or 800 MHz Front Side Bus

Main memory

- 4 slots for main memory PC2-4200 DDR2 533 MHz (unbuffered), DIMM memory modules with 512 MB, 1Gbyte and 2Gbyte
- maximum 8 Gbyte of memory
- minimum 512 MB of memory
- ECC multiple bit error detection

Chips on the system board

- Intel® E7230 Northbridge
- Intel® ICH7 Southbridge
- GBit LAN controller (Broadcom BCM5751)
- VGA controller (ATI-VGA) onboard
- Super I/O controller (SMSC DME1737)
- thermal and system management controller (BMC Heimdall)

Internal connectors

- floppy disk drive
- IDE primary
- main power connector (ATX 24 pin)
- main power connector (ATX 4 pin)
- system fan
- rear fan
- USB front
- intrusion
- 4 x SATA hard disk drive
- front panel
- battery holder

External connectors

- serial port (COM1)
- 2 x PS/2 interfaces for keyboard and mouse
- 4 x USB 2.0 ports (rear)
- 2 x USB 2.0 ports (front)
- VGA port
- RJ45 LAN port
- parallel port

PCI slots

- 4 x PCI-X (32 Bit / 33 MHz) slots
- PCI-Express x1 slot
- PCI-Express x4/x8 slot
- PCI-Express x8/x16 slot

BIOS features

- Phoenix BIOS
- Power on self-test
- system boot possible from:
 - CD/DVD-ROM
 - USB
 - LAN
 - hard disk
 - floppy disk drive
- IPMI V1.5 support

Environmental protection

Battery in holder

Form factor

ATX format 12" x 9,6"

3.2 Main memory

The system board supports up to 8 Gbyte main memory. 4 slots are available for the main memory. Each slot can be populated with 512 Mbyte, 1 Gbyte or 2 Gbyte PC2-4200 DDR2 533 MHz (unbuffered) DIMM memory modules.

i You will find the descriptions how to install memory modules in the Options Guide of your server.

3.3 PCI bus

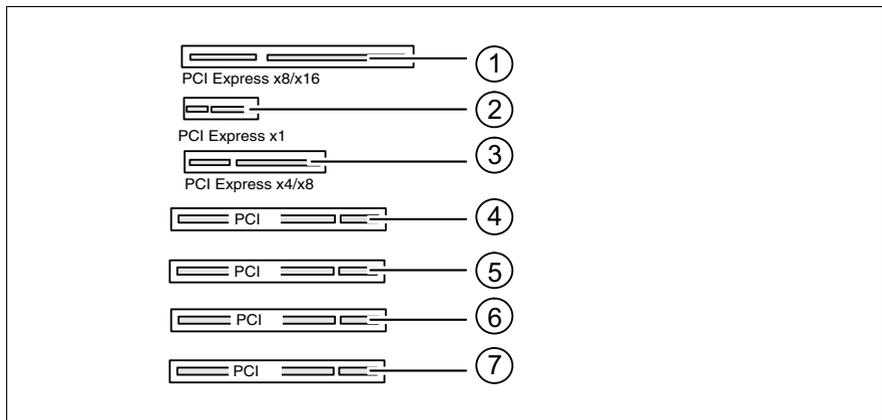


Figure 2: PCI slots

PCI slots

The following table shows an overview of the PCI slots:

No.	PCI slot	64Bit/ 32Bit	Frequenc y in MHz	Description
1	PCIe x16			PCI-Express x16 slot
2	PCIe x1			PCI-Express x1 slot
3	PCI ex8			PCI-Express x8 slot
4	PCI	32 Bit	33	32 Bit PCI-X bus slot
5	PCI	32 Bit	33	32 Bit PCI-X bus slot

No.	PCI slot	64Bit/ 32Bit	Frequenc y in MHz	Description
6	PCI	32 Bit	33	32 Bit PCI-X bus slot
7	PCI	32 Bit	33	32 Bit PCI-X bus slot

PCI IRQ Line x - Assignment of the PCI interrupts

PCI IRQ Line x defines which ISA interrupts are used for the separate PCI slots.

If you select Auto in the BIOS setup, the interrupts are assigned automatically and no further settings are required.

Multifunctional PCI boards or boards with an integrated PCI-to-PCI bridge can use several PCI interrupts (INTA#, INTB#, INTC#, INTD#). Mono functional PCI boards (default) only use one PCI interrupt (INTA#) per PCI slot.

The PCI interrupts INTA#, INTB#, INTC# and INTD# are available for each PCI slot.

The same interrupt can be assigned simultaneously to several PCI boards. You should avoid this condition due to reduced performance.

If you use a setting other than Auto, the Plug&Play functionality of the system BIOS for the corresponding PCI boards is deactivated.

Auto The PCI interrupts are assigned automatically in accordance with the Plug&Play guidelines.

Disabled No ISA interrupt is assigned to the PCI interrupt.

3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15

The selected ISA interrupt is assigned to the PCI interrupt. You may not select an ISA interrupt that is used by a component on the system board (e.g. controller) or an ISA board.

PCI INT LINE	Controller oder slot NT													
	Onboard controller							Slot						
	USB 1.1				USB 2.0	SMB us	ATA - VGA	LAN	PCIe			PCI		
1st	2nd	3rd	4th	x16					x1	x4	1	2	3	4
1 (A)							x	A	D	B				
2 (B)							x	B	A	C				
3 (C)									B	D	D	C	A	D
4 (D)					x				C	A	C	D	B	A
5 (E)				x										
6 (F)			x									B	A	C
7 (G)		x										A	B	D
8 (H)	x				x									

3.4 Screen resolution

Depending on the operating system used the screen resolutions in the following table refer to the screen controller on the system board. If you are using an external screen controller, you will find details of supported screen resolutions in the operating manual or technical manual supplied with the controller.

Screen resolution	Refresh rate (Hz)	Max. number of colors
640x480	200	16.7 Mio.
800x600	200	16.7 Mio.
1024x768	150	16.7 Mio.
1152x864	120	16.7 Mio.
1280x1024	100	16.7 Mio.

3.5 Temperature / system monitoring

Temperature and system monitoring aim to reliably protect the computer hardware against damage caused by overheating. In addition, any unnecessary noise is also prevented by reducing the fan speed, and information is provided about the system status.

The temperature and system monitoring are controlled by an onboard controller.

The following functions are supported:

Temperature monitoring

Measurement of the processor temperature, measurement of the inside temperature by a temperature sensor on the system board.

Fan monitoring

Fans that are no longer available, blocked or sticky fans are detected.

Fan control

The fans are regulated according to temperature.

Sensor monitoring

A fault in a temperature sensor is detected. Should this happen all fans monitored by this sensor run at maximum speed, to achieve the greatest possible protection of the hardware.

Voltage monitoring

When voltage exceeds warning level high or falls below warning level low an alert will be generated.

Cover monitoring

Unauthorized opening of the cover is detected, even when the system is switched off. However, this will only be indicated when the system is switched on again

System Event Log (SEL)

All monitored events of the system board are recorded in the System Event Log. They could be retrieved after a system reboot via ServerView.

3.6 Connectors and jumpers

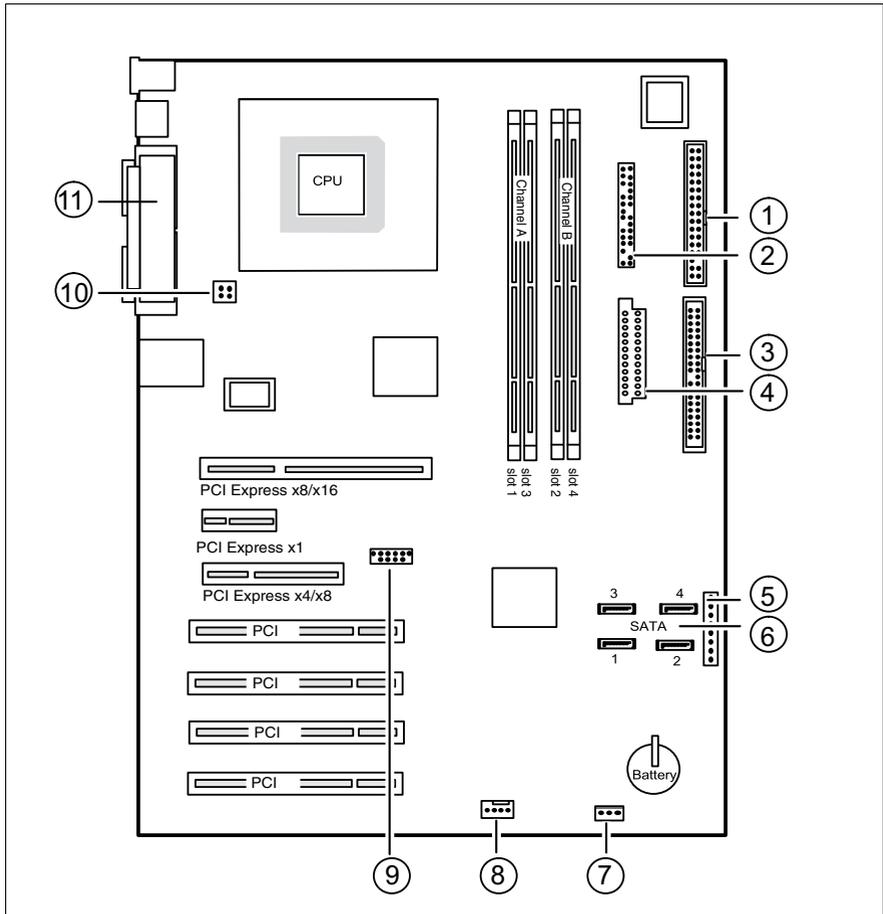


Figure 3: Schematic overview of the system board D2179

- | | |
|----------------------------|----------------------------|
| 1 = Floppy disk drive | 7 = Intrusion |
| 2 = Front panel (+ jumper) | 8 = Fan (F2) |
| 3 = IDE primary | 9 = USB Front |
| 4 = ATX power 24pin (PWR1) | 10 = ATX power 4pin (PWR2) |
| 5 = Power control (PC2004) | 11 = External connectors |
| 6 = Serial ATA 1 - 4 | |

Settings inside front panel connector

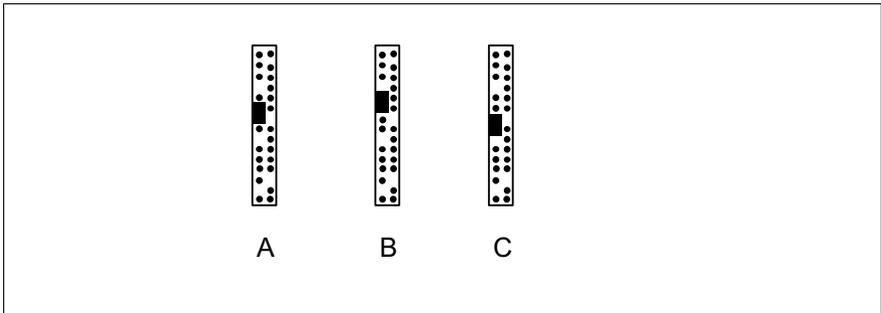


Figure 4: Jumper settings



CAUTION!

Please pay attention to the exact position of the jumpers!

A	inserted	factory setting
B	inserted	The System BIOS executes from floppy drive A: and the inserted “Flash-BIOS-Diskette” restores the System BIOS on the system board.
	not inserted	Normal operation (default setting).
C	inserted	System and BIOS Setup password are skipped when the device is switched on and may be changed.
	not inserted	System and BIOS Setup password must be entered when the device is switched on.

3.6.1 External connectors

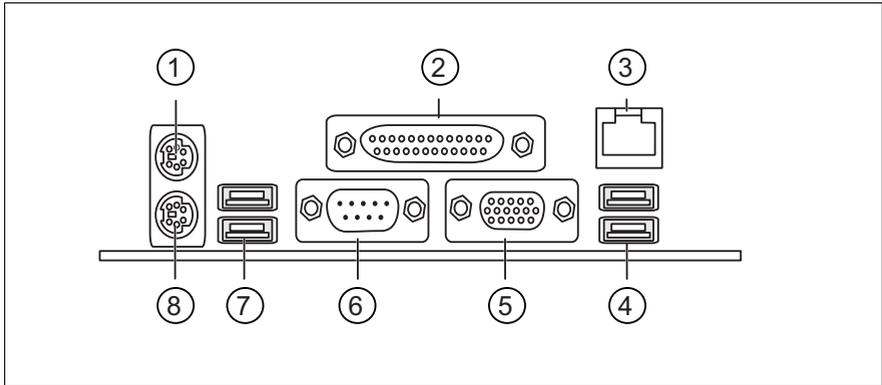


Figure 5: External connectors of the system board D2179

1 = PS/2 mouse port

5 = VGA port

2 = Parallel port/printer

6 = Serial port COM1

3 = LAN port

7 = USB1 port

4 = USB0 port

8 = PS/2 keyboard port

LAN connector

On this system board you will find one Broadcom LAN controller BCM5751. This LAN controller supports the transfer rates of 10 Mbit/s, 100 Mbit/s and 1 Gbit/s. The LAN controller supports WOL function through Magic Packet™.

It is also possible to boot a device without its own boot hard disk via LAN. Here Intel PXE is supported.

The LAN port serves as management interface and is prepared for RemoteView.

The LAN controller connector is equipped with two LEDs (light emitting diode) indicating the transfer rate and the activity.

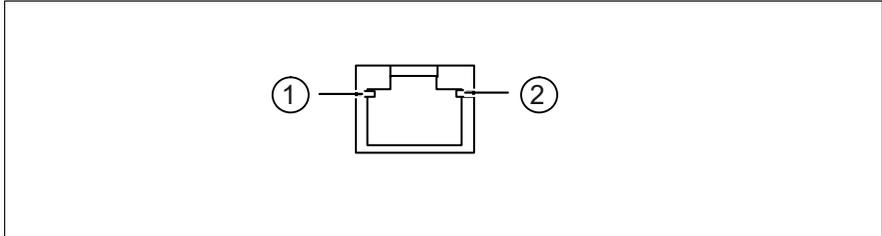


Figure 6: LAN connector

1	LAN link/activity	green	on	LAN connection
			off	no LAN connection
			flashing	LAN transfer
2	LAN transfer rate	green + yellow	off	transfer rate 10 Mbit/s (or no connection)
			green	transfer rate 100 Mbit/s
			yellow	transfer rate 1000 Mbit/s

4 Replacing the lithium battery

In order to save the system information permanently, a lithium battery is installed to provide the CMOS-memory with a current. When the charge is too low or the battery is empty, a corresponding error message is provided. The lithium battery must then be replaced.



CAUTION!

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2032).

Do not throw lithium batteries into the trashcan. It must be disposed of in accordance with local regulations concerning special waste.

Make sure that you insert the battery the right way round. The plus pole must be on the top!

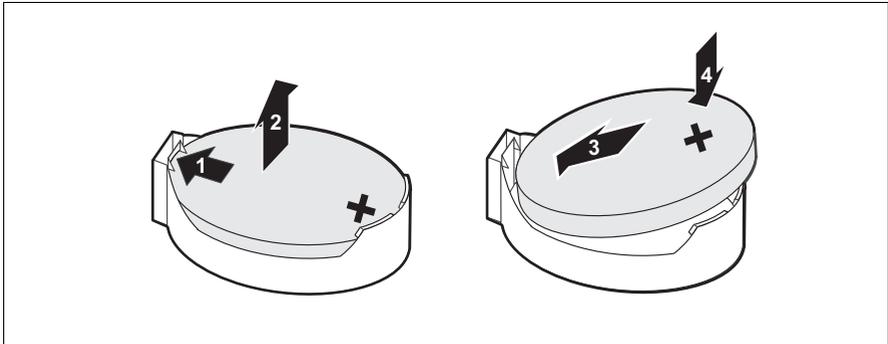


Figure 7: Replacing the lithium battery

- ▶ Press the locking spring into direction of the arrow (1), so that the lithium-battery jumps out of its socket.
- ▶ Remove the battery (2).
- ▶ Insert a new lithium battery of the same type into the socket (3) and (4).

Abbreviations

The technical terms and abbreviations given below represent only a selection of the full list of common technical terms and abbreviations.

Not all technical terms and abbreviations listed here are valid for the described system board.

ACPI

Advanced Configuration and Power management Interface

ASSR

Automatic Server Recovery and Restart

ATA

Advanced Technology Attachment

BBU

Battery Backup Unit

BIOS

Basic Input Output System

BMC

Baseboard Management Controller

CMOS

Complementary Metal Oxide Semiconductor

COM

COMmunication port

CPU

Central Processing Unit

DDR

Double Data Rate

DIMM

Dual In-line Memory Module

Abbreviations

DIP

Dual In-line Package

DMI

Desktop Management Interface

DRAM

Dynamic Random Access Memory

ECC

Error Correction Code

EEPROM

Electrical Erasable Programmable Read Only Memory

EPROM

Erasable Programmable Read Only Memory

EMRL

Embedded RAID Logic

EVRD

Enterprise VRD

HPC

Hot-plug Controller

ICE

In Circuit Emulation

IDE

Integrated (intelligent) Drive Electronics

IME

Integrated Mirror Enhanced

IOOP

Intelligent Organisation Of PCI

IPMB

Intelligent Platform Management Bus

IPMI	Intelligent Platform Management Interface
LAN	Local Area Network
LED	Light Emitting Diode
MPS	Multi Processor Specification
NMI	Non Maskable Interrupt
OEM	Original Equipment Manufacturer
OHCI	Open Host Controller Interface
OS	Operating System
PCI	Peripheral Components Interconnect
PDA	Prefailure Detection and Analyzing
PIO	Programmed Input Output
PLD	Programmable Logic Device
PS(U)	Power Supply (Unit)
PWM	Puls Wide Modulation

Abbreviations

PXE

Preboot eXecution Environment

RAID

Redundant Array if Inexpensive Disks

RSB

Remote Service Board

RST

ReSeT

RTC

Real Time Clock

SCSI

Small Computer Systems Interface

SDDC

Single Device Data Correction

SDRAM

Synchronous Dynamic Random Access Memory

SHDG

Server Hardware Design Guide

SMB

System Management Bus

SMM

Server Management Mode

SMP

Symmetrically Multi Processing

UHCI

Unified Host Controller Interface

USB

Universal Serial Bus

VGA	Video Graphics Adapter
VRD	Voltage Regulator Down
VRM	Voltage Regulator Module
WfM	Wired for Management
WOL	Wake up On LAN

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