

Hardware Specifications

You can enjoy and utilize the Z93E series Notebook more effectively with a better comprehension of detailed hardware specifications of the notebook.

This chapter lists the detailed specifications of the notebook's main system and modules. Please refer to this section when you need to find out specific technical data about the notebook.

This chapter contains the following information:

- ◆ **System Specifications**
- ◆ **Chipset Specifications**
- ◆ **Key Parts List**
- ◆ **System Resource**
- ◆ **Module Specification**

1. MARKETING SPECIFICATION

Processor & Sockets	<ul style="list-style-type: none"> ■ Mobile Intel® Pentium®- M & Intel Celeron M ■ μPGA Package with Socket-478 ■ 0.13μ/0.09μ Processor <ul style="list-style-type: none"> ◆ Intel Pentium-M, 533 MHz FSB, 2MB L2 Cache, up to 780 processor, 2.13GHz ◆ Dothan Celeron M, 400MHz FSB, 1MB L2 Cache, up to 390 processor, 1.7GHz
BIOS	<ul style="list-style-type: none"> ■ AMI BIOS code ■ 4MB Flash EPROM ■ PMU, Plug & Play
Chipset	■ Intel 915GM + ICH6M
Main Memory	<ul style="list-style-type: none"> ■ Two SO-DIMM socket for expansion up to 2048MB ■ DDR
Display	<ul style="list-style-type: none"> ■ 15.4" active matrix color TFT ■ 15.4" WXGA; 15.4"WSXGA+
Graphics & Video Module	■ Intel 915GM+ ICH6M
CRT Display Modes	<ul style="list-style-type: none"> ■ VGA 640 x 480, 256/32K/64K/16.7M colors ■ SVGA 800 x 600 256/32K/64K/16.7M colors ■ XGA 1024 x 768 256/32K/64K/16.7M colors ■ SXGA 1280 x 1024 256/32K/64K/16.7M colors ■ UXGA 1600x1200 256/32K/64K/16.7M colors
PC Card Slot	<ul style="list-style-type: none"> ■ PCMCIA 2.1 compliant ■ One Type II ■ Non-ZV port
Multi-Card Reader	<ul style="list-style-type: none"> ■ One built-in card reader support <ul style="list-style-type: none"> ◆ MMC/ SD ◆ Memory Stick/ MS Pro ◆ xD (we won't claim xD support to enduser)
Hard Disk Drive	<ul style="list-style-type: none"> ■ 2.5" 9.5 mm IDE HDD with Ultra DMA100 supported ■ 40 /60 / 80GB; support 4200/ 5400 RPM ■ Fixed type, easy for BTO
Modem/FAX & LAN	<ul style="list-style-type: none"> ■ 10/100 BaseT LAN on board ■ Azalia MDC ■ Worldwide regulation, CTR21, JATE, FCC,DGT,A-Tick, 中國入網許可 (Regulation in China).etc passed (TW/PRC/EU/US)
Optical Storage Device	<ul style="list-style-type: none"> ■ 5.25" 12.7mm 8X/ 24X (max.) DVD combo drive ■ 8X DVD-Dual ■ Fixed Type, 2-screw design for BTO
Wireless LAN & Bluetooth	<ul style="list-style-type: none"> ■ Built-in WLAN antenna ■ MiniPCI options of <ul style="list-style-type: none"> ◆ Intel Wireless Pro module supports Calexico 2(BTO option), 802.11 a/b/g compliant ■ 11Mb/54Mb data transfer rate ■ USB option for bluetooth
IrDA-	■ SIR 115.2Kbps supported
On-screen-Display	<ul style="list-style-type: none"> ■ Brightness ■ Display selection LCD/Ext. Monitor//TV-out ■ LCD on/off ■ AC adapter plug in/ Battery in use ■ Volume On/Off ■ Volume Up/Down ■ Power4-Gear indicator
LED Status Indicator	<ul style="list-style-type: none"> ■ Power-on/Suspend ■ Bat. Charging/full ■ Storage device access ■ Cap. Lock ■ Scroll Lock ■ Num Lock ■ E-mail in box

	<ul style="list-style-type: none"> ■ Wireless indicator
Keyboard	<ul style="list-style-type: none"> ■ 19 mm full size 88key with MS-Windows function keys ■ 2.5mm travel
Audio	<ul style="list-style-type: none"> ■ Built-in Azalia compliant audio chip, with 3D effect & full duplex ■ Built-in stereo speakers.
Interface	<ul style="list-style-type: none"> ■ PortBar III 68-pin Connector ■ One Headphone-out jack / SPDIF ■ One Microphone-in jack, fixed. ■ One Lin-in Jack ■ One VGA port/Mini D-sub 15-pin for external DDC monitor ■ One RJ11 Modem jack for phone line ■ One RJ45 LAN Jack for LAN insert ■ 3 USB 2.0 ports ■ One IEEE 1394 port ■ One TV-out
Power Management	<ul style="list-style-type: none"> ■ Full feature ACPI power management, supports Stand-by, Suspend to Disk, and Suspend to RAM ■ MDP 2003 compatible ■ ASUS P4 Gear+ support
Battery Pack& Life	<ul style="list-style-type: none"> ■ 8 cells & 4cells, 2400mAh, 65Whrs ■ Smart battery, charging time, 4hrs/2.5hrs (System On/ Off) to 95%.
AC adapter	<ul style="list-style-type: none"> ■ Output: 19V DC, 3.42A, 65W ■ Input: 100~240V AC, 50/60Hz universal
Pointing Device	<ul style="list-style-type: none"> ■ Built-in Touch pad pointing device ■ 2 click buttons.
Thermal Solution	<ul style="list-style-type: none"> ■ ADTD (Developed by Asus) to handle 27W CPU thermal envelope. Keep discrete Gfx solution, GPU+ memory total 15W.
Support OS	<ul style="list-style-type: none"> ■ Windows XP ,XP SP11 ■ Driver support XP
Security	<ul style="list-style-type: none"> ■ Pre-OS Authentication by programmable key code ■ BIOS Booting User Password Protection ■ HDD User Password Protection and Security Lock ■ Kensington Lock hole provided
Dimensions	<ul style="list-style-type: none"> ■ 369 x269x 34.8mm (W x D x H, typical)
Weight	<ul style="list-style-type: none"> ■ 2.8 kg (w/ 15.4" WLCD, 9.5mm HDD, 12.7" ODD and 4 cells Li-Ion battery pack) ■ 3.0kg (<3.1kg) (w/ 15.4"W LCD, 9.5mm HDD, 12.7" ODD, and 8 cells Li-Ion battery pack)
LED Status Indicator	<ul style="list-style-type: none"> ■ Power-on/Suspend ■ Bat. Charging/full ■ Storage device access ■ Cap. Lock ■ Scroll Lock ■ Num Lock ■ E-mail in box ■ Wireless indicator
Microsoft MDA2003 requirement	<ul style="list-style-type: none"> ■ Boot up within 40 sec ■ Resume from S4 within 25 sec ■ Resume from S3 within 5 sec
Macrovision Support	<ul style="list-style-type: none"> ■ Meet Macrovision Requirement for DVD-ROM model ■ Meet Macrovision 525p requirement

Factory Option

CMOS Camera	<ul style="list-style-type: none"> ■ 1.3Million pixels CMOS Camera (Factory option)
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Accessory Option

PortBar III (option)	Feature <ul style="list-style-type: none"> ■ One 100/10 MHz RJ-45 LAN port ■ One EPP/ECP Parallel port/D-sub 25-pin ■ Four USB 2.0 ports ■ One VGA port / D-sub 15-pin for external monitor ■ 65W DC-in jacks and power supply to main unit through a cable interface ■ Dimension: 200 x 160 x 37mm (max)
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Additional Spec

S/W Utility	<ul style="list-style-type: none"> ■ Asus Winflash for BIOS and Driver live Update ■ Power4Gear: Pre defined power saving theme ■ HotKey: support instant key function defined ■ Asus PC Probe ■ ASUSDVD 2000 XP/Cyberlink PowerDVD (w/ DVD model) w/ latest qualified version ■ Asus Screen Saver ■ Asus Active Update Shipment bundle S/W: <ul style="list-style-type: none"> ■ Trend PC-Cillin® 2004 ■ Adobe Acrobat Reader 5.1 ■ Nero v6.0 lite (w/ combo, DVD-RW SKU)
Regulation	<ul style="list-style-type: none"> ■ EMI: USA(FCC-B), JAP(VCCI-B), BSMI, CCC ■ Safety: CE, CB, TUV, cUL, CCC, ■ Modem: Universal PPT including US(FCC-B), TWN(DGT), PRC (FCC68), JPN(JATE), EURO(CTR21)
Windows Certification	<ul style="list-style-type: none"> ■ Compatibility: HCT V11.1a (Window XP) ■ Language: US Int'l, JAP, TWN ■ Supported OS: Windows XP, MCE
Keyboard Language	<ul style="list-style-type: none"> ■ US, JAP, TWN before M/P ■ France, GR, CR, DN, CZ, IT, BL, NW, PO, SF, SP, SW, SC, FR, JP, RU, UK, Spain, AR, TU, Brazil when M/P

PortBar III

Interface	<ul style="list-style-type: none"> ■ One 100/10 MHz RJ-45 LAN port ■ One EPP/ECP Parallel port/D-sub 25-pin ■ 4 USB 2.0 ports ■ One VGA port / D-sub 15-pin for external monitor ■ Separately 65W DC-in jack and Power Supply to main unit through a cable interface
Support Model	■ NB S1N/M2N/M3N model
Dimension	■ 200 x 160 x 37mm(max.)
Windows Certification	<ul style="list-style-type: none"> ■ Compatibility: HCT V10.0 (Window XP and ME), ■ Supported OS: Windows XP/ME/2K/98SE,

Additional Spec

Regulation	<ul style="list-style-type: none"> ■ EMI: USA(FCC-B), TWN(檢磁), CCIB ■ Safety: CE, CB, TUV, cUL, CCIB,
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Table 1.0.0 Marketing Specification List

2. CHIPSET LIST

Chipset	Description	HW ACPI/PC99
CPU	Intel Pentium M & Celeron M (Dothan)	Not required
SRAM (L2 Cache)	2Mbyte (Pentium M), 512Kbyte (Celeron M)	Not required
NORTH BRIDGE	Intel 915GM	YES
SOUTH BRIDGE	Intel ICH6-M	YES
SpeedStep Controller	Intel ICH6-M	YES
MEMORY	DDR SDRAM	Not required
BIOS ROM	SST 49LF004B (4Mbit)	Not required
SUPER I/O	ITE IT8705F	YES
PCI-Cardbus / IEEE1394 /SD Card /Memory Stick /XD Controller	RICOH R5C841	YES
AUDIO	Azalia CODEC software Audio	YES
AUDIO AMPLIFIER	TI TPA0212 ; TI TPA0211	Not required
KB CONTROLLER	MITSUBISHI M38857	YES
PIC (uP)	PIC16C54C	Not required
IrDA	VISHAY TFDU4100-TR3	Not required
SUPER I/O	ITE8705F	YES
LAN	REALTEK RTL8100CL	YES
MODEM	CONEXANT MDC Modem (HDA)	YES
CLOCK Generator	ICS954213	YES

Table 2.0.0 Chipset List

2.1. CPU

- Processor Type: Intel Pentium M
- Processor Frequency: 400 MHz FSB: 1.4 ~ 2.1 GHz
533 MHz FSB: 1.6 ~ 2.26 GHz
- Construction Method: 478 pin Micro-FCPGA Package
- Supply Voltage: 0.988 ~ 1.356 V
- Function Features:
- Support Intel Architecture with Dynamic Execution
 - On-die, primary 32-KB instruction cache and 32-KB write-back data
 - On-die, 2MB second level cache with Advanced Transfer Cache Architecture
 - Data Pre-fetch Logic
 - Streaming SIMD Extension 2 (SEE2)
 - 400 MHz & 533 MHz, Source-Synchronous FSB
 - Advanced Power Management features including Enhanced Intel SpeedStep technology

2.2. NORTH BRIDGE

Function Features: The GMCH provides high-performance, integrated graphics and manages the flow of information.

- System Memory Interface
 - ◆ Support DDR & DDRII
- PCI Express Based Graphics (discrete graphics devices)
- Integrated Display Interface support
 - ◆ Analog CRT DAC interface
 - ◆ Digital LVDS interface support
 - ◆ Timings must match for both display
 - ◆ SSC must be disabled for LVDS port and CRT DAC single pipe simultaneous display mode
 - ◆ Panel Fitting, Panning, and Center mode supported
 - ◆ Spread spectrum clocking (SSC) supported
 - ◆ Panel Power Sequencing support
 - ◆ Integrated PWM interface for LCD Backlight Inverter Control
 - ◆ Analog TV-Out Interface support
 - ◆ Integrated TV-out device supported on Display pipe A and pipe B
 - ◆ Multiplexed Output interface
 - ◆ Macro-vision support
 - ◆ Over-scan Scaling Support
 - ◆ Serial Digital Video Output (SDVO) support
- Internal Graphics Features
 - ◆ DVMT 3.0 support
 - ◆ Intel Dual-Frequency Graphics Technology
 - ◆ Intel Smart 2D Display Technology
 - ◆ Asynchronous Display core and Render core clocks supported
 - ◆ Dual Independent display pipes
 - ◆ 32 bit Hardware cursor supported
 - ◆ 2D graphics engine
 - ◆ High Quality 3D Setup and Render Engine
 - ◆ High Quality Texture Engine
 - ◆ 3D Graphics Rendering Enchantments
 - ◆ Video DVD/ PC-VCR support
 - ◆ Video Overlay
- Power Management
 - ◆ Enhanced Cx state support using GMCH HCPUSLP#
 - ◆ Direct Media Interface (DMI)

Vendor: INTEL
Parts Number: NQ82915GM
Package: 1257-ball Micro-FCBGA (40x37.5 mm)

2.3. SOUTH BRIDGE

Function Features:

- **Direct Media Interface**
 - ◆ 10 Gb/s each direction, full duplex
 - ◆ Transparent to software
- **PCI Express**
 - ◆ 4 PCI Express root ports
 - ◆ Fully PCI Express 1.0a compliant
 - ◆ Can be statically configured as 4x1, or 1x4
 - ◆ Two virtual channel support for full isochronous data transfers
 - ◆ Support for full 2.5 Gb/s bandwidth in each direction per x1 lane
 - ◆ Module based Hot-Plug supported
- **PCI Bus Interface**
 - ◆ Support PCI Rev 2.3 Specification at 33 MHz
 - ◆ Seven available PCI REQ/GNT pairs
 - ◆ Support for 64-bit addressing on PCI using DAC protocol
- **Integrated Serial ATA Host Controller**
 - ◆ Two ports
 - ◆ Data transfer rates up to 1.5 Gb/s
 - ◆ Integrated AHCI controller
- **Integrate IDE Controller**
 - ◆ Independent timing of up to two drives
 - ◆ Ultra ATA/100/66/33, BMIDE and PIO modes
 - ◆ Tri-state modes to enable swap bay
- **Intel High Definition Audio Interface**
 - ◆ PCI Express endpoint
 - ◆ Independent Bus Master logic for eight general purpose streams
 - ◆ Support three external Codecs
 - ◆ Supports variable length stream slots
 - ◆ Supports multi-channel, 32-bit sample depth 192 KHz sample rate output
 - ◆ Provides mic array support
 - ◆ Supports memory-based command/response transport
 - ◆ Allows for non-48 KHz sampling output
 - ◆ Support for ACPI Device States
- **AC-Link for Audio and Telephony CODECs**
 - ◆ Support for three AC '97 2.3 codecs
 - ◆ Independent bus master logic for 8 channels
 - ◆ Support for up to six channels of PCM audio output
 - ◆ Supports wake-up events
- **USB2.0**
 - ◆ Includes four UHCI Host Controllers, supporting eight external ports
 - ◆ Includes one EHCI Host Controller that supports all eight ports
 - ◆ Includes one USB 2.0 High-speed Debug Port
 - ◆ Supports wake-up from sleeping states S1-S5
 - ◆ Supports legacy Keyboard/Mouse software

- Integrated LAN Controller
 - ◆ Integrated ASF Management Controller
 - ◆ WfM 2.0 and IEEE 802.3 Compliant
 - ◆ LAN Connect Interface (LCI)
 - ◆ 10/100 Mb/s Ethernet Support
- Power Management Logic
 - ◆ ACPI 2.0 compliant
 - ◆ ACPI-defined power states
 - ◆ ACPI Power Management Timer
 - ◆ Support “Intel SpeedStep technology” processor power control and “Deeper Sleep” power state
 - ◆ PCI CLKRUN# and PME# support
 - ◆ SMI# generation
 - ◆ All registers readable/restorable for proper resume from 0V suspend states
 - ◆ Support for APM-based legacy power management for non-ACPI Mobile implementations
- External Glue Integration
 - ◆ Integrated Pull-up, Pull-down and Series Termination resistors on IDE, Processor I/F
 - ◆ Integrated Pull-down and Series resistors on USB
- Enhanced DMA Controller
 - ◆ Two cascaded 8237 DMA controllers
 - ◆ Supports LPC DMA

Vendor: INTEL
 Parts Number: FW82801FBM
 Package: 609-ball BGA (31x31 mm)

2.4. DRAM MEMORY

2.4.1. EXPANSION MEMORY

Number of Sockets: Two 200 pin DDR SO-DIMM sockets
 Bus: 64-bit data path
 Refresh Rate: 8K refresh cycles/ 64ms
 Supply Voltage: 2.5V
 Functional Features:

- Double-Data-Rate architecture, 2 data transfers per clock cycle
- Bi-directional data strobe (DQS)
- Differential clock inputs
- DLL aligns DQ and DQS transition with CK transition
- Auto refresh and self refresh
- Programmable Mode Register

 Hardware Features: Easy removable and exchangeable for user
 Only support 333 MHz DDR SO-DIMM

2.5. BIOS ROM

ROM Type:	4Mbit CMOS Flash Memory
Package:	PLCC 32-Lead
Supply voltage:	3.3V
Erase/program:	100,000 erase/program cycles minimum
Serviceability:	End user refreshable design (software re-flash)

2.6. CARDBUS/IEEE 1394/SD/MS CONTROLLER

Function Features	<ul style="list-style-type: none"> ■ PC98/99/2001 Compliant <ul style="list-style-type: none"> ◆ PC2001 Design Guide compliant (Subsystem ID, Subsystem Vendor ID) ◆ Compliant with ACPI and PCI Bus Power Management 1.1 ◆ Supports Global Reset ■ Low Power Consumption <ul style="list-style-type: none"> ◆ Low operating power consumption due to the improvement of Power management ◆ Software Suspend mode compliant with ACPI ◆ Hardware Suspend ◆ CLKRUN#, CCLKRUN# support ◆ The core logic – powered at 1.8V/2.5V, the others – powered at 3.3V ■ PCI-CardBus/1394 Bridge/SD Card/Memory Stick/xD Picture Card/Express Card Interface <ul style="list-style-type: none"> ◆ slot PC Card ◆ 2 ports of IEEE 1394 ◆ MDIOxx pins shared by SD card, Memory Stick and xD Picture Card <ul style="list-style-type: none"> ➢ Providing Ricoh's proprietary driver for Memory Stick and xD Picture Card/Express Card ◆ Express Card (USB Interface Type) supported by the PC Card passive adapter ■ PCI Bus Interface <ul style="list-style-type: none"> ◆ Compliant with PCI Local Bus Specification 2.3 ◆ The maximum frequency 33 MHz ◆ PCI Master/Target protocol support ◆ Separated PCI configuration space per each function ◆ 3.3V interface (5V tolerant) ■ CardBus PC Card Bridge <ul style="list-style-type: none"> ◆ Compliant with PC Card Standard Release 8.0 Specification ◆ The maximum frequency 33 MHz ◆ Supports CardBus Master/Target protocol ◆ Supports Memory Write Posting/ Read Pre-fetching ◆ Transfer transactions <ul style="list-style-type: none"> ➢ All memory read/write transaction (bi-direction) ➢ I/O read/write transaction (bi-direction) ➢ Configuration read/write transaction (PCI→Card) ➢ 2 programmable memory windows
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- 2 programmable I/O windows
- PC Card-16 Bridge
 - ◆ Compliant with PC Card Standard Release 8.1 16-bit Specification
 - ◆ 5 programmable memory windows
 - ◆ 2 programmable I/O windows
 - ◆ Compliant with i82365SL compatible register set/ExCA
 - ◆ Supports Legacy 16-bit mode (3E0, 3E2 I/O ports)
- IEEE 1394 Interface
 - ◆ Compliant with IEEE 1394-1995 Standard Specification and IEEE 1394-2000 Standard Specification
 - ◆ Compliant with 1394OHCI Release 1.1/1.0 Standard Specification
 - ◆ Supports Cycle Master
 - ◆ Provides the Asynchronous receive/transmit FIFO and isochronous receive/transmit FIFO
 - ◆ Supports Self-ID, physical DMA
 - ◆ Data transmission rate of 100, 200 and 400 Mbps
 - ◆ 2 ports of 1394 Cable interface
 - ◆ 24.576 MHz crystal oscillator and Internal 393.216 MHz PLL
 - ◆ Supports cable power monitoring (CPS)
 - ◆ Set Initial values of Power Class and CMC by PCI Configuration registers
- Small Card Interface
 - ◆ SD Memory Card
 - Compliant with SD memory Card Specification Version 1.01
 - Compliant with SD Input/Output (SDIO) Card Specification Version 1.0
 - Compliant with SD Host Controller Standard Specification Version 1.0
 - ◆ Memory Stick
 - Compliant with Memory Stick Standard Format Specification Version 1.4
 - Compliant with Memory Stick PRO Format Specification Version 1.00
 - ◆ xD Picture Card
 - Compliant with xD Picture Card Specification Version 1.00
 - Compliant with xD Picture Card Host Guideline Version 1.00
 - Backward compatible with the Smart Media
- Express Card Interface
 - ◆ Compliant with EXPRESS CARD STANDARD Draft Release 1.0
 - ◆ Pass USB signals from a USB-HOST to a Card Slot
- System Interrupt
 - ◆ Supports INTA#, INTB#, INTC# and INTD# for PC system interrupt (Each unit is programmable)
 - ◆ IRQx support for ISA system interrupt (Non shared IRQx pins: PC Card only)

- ◆ Supports Serialized IRQ
- ◆ Supports Remote Wake Up by CSTSCHG
- Support an internal regulator to convert from 3.3V power to 2.5V power for core logic
- Supports Zoomed Video Port
- Supports PC Card LED, 1394 LED, SD LED, Memory Stick LED and xD Picture Card LED

Vendor: RICOH
 Parts Number: R5C841
 Package: 208-ball CSP (16 x 16 mm, pitch = 0.8 mm)

2.7. EMBEDDED/KEYBOARD CONTROLLER

- Function Features
- Basic Machine-Language Instructions: 71
 - Minimum Instruction Execution time: 0.5 μ s
 - Memory Size
 - ◆ ROM 32K bytes
 - ◆ RAM 1024 bytes
 - Programmable Input/Output Ports: 72
 - Software pull-up Transistors: 8
 - Interrupts: 22 sources, 16 vectors
 - Timers: 8-bit x 4
 - Watchdog Timer: 16-bit x 1
 - PWM Output: 14-bit x 2
 - Serial I/O: 8-bit x 1
 - Multi-master I²C Bus Interface: 1 channel
 - LPC Interface: 2 decordl
 - Serialized IRQ: 3 factor
 - A-D Converter: 10-bit x 8 channels
 - D-A Converter: 8-bit x 2 channels
 - Comparator Circuit: 8 channels
 - Clock Generating Circuit: Built-in 2 circuits
 - Power Source Voltage: 3.0 to 3.6 V

Vendor: MITSUBISHI ELECTRIC
 Parts Number: M38857M8-A02HP
 Package: 80P6Q-A (14 x 14 mm)

2.8. ETHERNET

Function Features

- Integrated Fast Ethernet MAC, Physical chip, and transceiver in one chip
- 10 Mbps and 100 Mbps operation
- Supports 10 Mbps and 100 Mbps NWay auto-negotiation
- PCI Local bus single-chip Fast Ethernet controller
 - ◆ Complies with PCI Revision 2.2
 - ◆ Supports PCI Clock 16.75 MHz – 40 MHz
 - ◆ Supports PCI target fast back-to-back transaction
 - ◆ Provides PCI bus master data transfers and PCI memory space or I/O space mapped data transfers of the RTL8100's operational registers
 - ◆ Support PCI VPD (Vital Product Data)
 - ◆ Supports ACPI, PCI power management
- Supports 25 MHz crystal or 25 MHz OSC as the internal clock source.
- Complies with the PC99/PC2001 standard
- Supports Wake-On-LAN and remote wake-up
- Supports 4 Wake-On-LAN (WOL) signals (active high, active low, positive pulse, and negative pulse)
- Supports auxiliary power-on internal reset, to be ready for remote wake-up when main power remains off
- Support auxiliary power auto-detect, and sets the related capability of power management registers in PCI configuration space
- Includes programmable PCI burst size and early Tx/Rx threshold
- Support a 32-bit general-purpose timer, with the external PCI clock as clock source, for generating timer-interrupts
- Contains two (2Kbyte) independent receive and transmit FIFOs
- Advanced power saving mode when LAN and wakeup function are not used
- Uses 93C46 (64x16-bit EEPROM) to store resource configuration, ID parameter, and VPD data
- Supports LED pins for various network activity indications
- Support loopback capability
- Half/Full duplex capability
- Supports Full Duplex Flow Control
- 2.5/3.3V power supply with 5V tolerant I/Os

Vendor: REALTEK
Parts Number: RTL8100CL
Package: 128-pin LQFP (16 x 22 mm)

2.9. SUPER I/O

Function Features:	<ul style="list-style-type: none">■ Full ACPI 1.0 and PC98/99 compliant■ Support 10 IRQ channel options■ Integrated PC/AT Floppy Disk Controller■ Support 5.25"/3.5"/2.5" FDD■ Support 3-mode FDD■ Integrated Serial Port RS-232C Controller■ Integrated Infrared Controller■ Support IrDA 1.0■ Integrated Parallel Port Controller■ Support Standard, bi-directional, ECP, EPP mode■ Support 2 general purpose pins for game port control■ Support voltage 5V
Vendor:	ITE (INTEGRATED TECHNOLOGY EXPRESS)
Parts Number:	ITE8705F
Package:	128-pin PQFP

2.10. AUDIO CODEC HIGHT DEFINITION AUDIO (HDA)

Function Features:	<ul style="list-style-type: none">■ High performance DACs with 95dB S/N ratio■ ADCs with S/N ratio greater than 85 dB■ Meets performance requirements for audio on PC2001 systems■ 8 DAC channels support 16/20/24-bit PCM format for 7.1 audio solution■ 3 stereo ADCs support 16/20-bit PCM format, two for microphone array, one for legacy mixer recording■ Supports 44.1K/48K/96K/192K Hz DAC sample rate■ All ADCs support 44.1K/48K/9K sample rate■ Applicable for 4-channel/192KHz and 6-channel/96KHz DVD-Audio solutions■ Up to four channels of microphone input are supported for AEC/BF application■ High-quality differential CD input■ Supports Power Off CD function■ Supports external PCBEEP input and built-in BEEP generator■ PCBEEP Pass-Through when link is in RESET state■ Software selectable 2.5V/3.75V VREFOUT■ Six VREFOUTs are supported■ Two GPI jack detection pins■ 16/20/24-bit S/PDIF-OUT supports 44.1K/48K/96KHz sample rate
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- 16/20/24-bit S/PDIF-IN supports 44.1K/48K/96KHz sample rate
- Optional EAPD supported
- Power management and enhanced power saving features
- Compatible with AC'97
- Reserve analog mixer architecture for backward compatibility with AC '97
- -64dB ~ +30dB with 1dB resolution of mixer gain to achieve finer volume control
- Impedance sensing capability for each re-tasking jack
- All analog jacks are stereo input and output re-tasking for analog plug & play
- Built-in headphone amplifier for each re-tasking jack
- Support external volume knob control
- Supports 2 GPIOs
- Hardware de-scrambling for DVD-Audio Content protection
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- EAX 1.0 & 2.0 compatible
- Direct Sound 3D compatible
- A3D Compatible
- I3DL2 compatible
- HRTF 3D Positional Audio
- Emulation of 26 sound environments to enhance gaming experience
- 10 Software Equalizer Bands
- Voice Cancellation and Key Shifting in Karaoke mode
- Realtek Media Player
- Enhanced Configuration Panel and device sensing wizard to improve user experience
- Microphone Acoustic Echo Cancellation (AEC) and Beam Forming (BF) technology for voice application
- Mono/Stereo Microphone noise suppression

Vendor: REALTEK
Parts Number: ALC880
Package: 48-pin LQFP (9 x 9 mm)

2.11. AUDIO AMPLIFIER

Function	<ul style="list-style-type: none">■ Compatible With PC 99 Desktop Line-Out into 10-K Ω Load■ Internal Gain Control, Which Eliminates External Gain-Setting Resistors■ 2-W/Ch Output Power into 3- Ω Load■ Input MUX Select Terminal■ PC-Beep Input■ Depop Circuitry■ Stereo Input MUX■ Fully Differential Input■ Low Supply Current and Shutdown Current
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Vendor:	TI
Parts Number:	TPA0212PWP
Package:	24-pin TSSOP-P (7.9 x 6.6 mm)

Function	<ul style="list-style-type: none">■ 2W into 4 Ohm from 5-V supply■ 0.6W into 4 Ohm from 3-V supply■ Wide Power Supply Compatibility 3V to 5V■ Low Supply Current – 4mA Typical at 5V (3V)■ Shutdown Control 1uA Typical■ Shutdown Pin Is TLL Compatible■ -40~ -80 degree C Operating Temperature Range■ Space-saving, Thermally-Enhanced MSOP Packaging
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Vendor:	TI
Parts Number:	TPA0211DGN
Package:	8-pin MSOP

3. KEY PARTS LIST

Priority	Usage		Vendor	Model Name	Part Number	Schedule		Comments	Remark	
	1	2				ER	PR			CS
CPU										
1			v	Intel	Pentium M 1.60 GHz (730)	D1-010470214		Now	27W, FSB 533MHz, Dolhan, 90nm, 2M L2 Cache	
1				Intel	Pentium M 1.73 GHz (740)	D1-010470013		Now	27W, FSB 533MHz, Dolhan, 90nm, 2M L2 Cache	
1				Intel	Pentium M 1.87 GHz (750)	D1-010480013		Now	27W, FSB 533MHz, Dolhan, 90nm, 2M L2 Cache	
1			v	Intel	Pentium M 2.00 GHz (760)	D1-010470420		Now	27W, FSB 533MHz, Dolhan, 90nm, 2M L2 Cache	
1			v v	Intel	Pentium M 2.13 GHz (770)	D1-010470514		Now	27W, FSB 533MHz, Dolhan, 90nm, 2M L2 Cache	
1				Intel	Pentium M 2.26 GHz (780)	D1-011230000		Jul.	27W, FSB 533MHz, Dolhan, 90nm, 2M L2 Cache	
1				Intel	Celeron M 1.3 G (350J)	D1-010560012		Now	21W, FSB 400MHz, Dolhan, 90nm, 1M L2 Cache, C-0 Step	
1				Intel	Celeron M 1.4 G (360J)	D1-010560113		Now	21W, FSB 400MHz, Dolhan, 90nm, 1M L2 Cache, C-0 Step	
1			v v	Intel	Celeron M 1.5 G (370)	D1-010620011		Now	21W, FSB 400MHz, Dolhan, 90nm, 1M L2 Cache, C-0 Step	
1				Intel	Celeron M 1.6 G (380)	D1-010630011		Jul.	21W, FSB 400MHz, Dolhan, 90nm, 1M L2 Cache, C-0 Step	
15.4" WXGA (1280 x 800)										
1			v v	LPL	LP154W01-TLA1	18-241546150		May	344.0 x 222.0 x 6.5max, 575g Max, 170 nit, RoHS	
1			v v	CPT	CLAA154WA05	18-241546320		Now	344.0 x 222.0 x 6.2max, 600g Max, 170 nit	
1			v	CPT	CLAA154WA05A	18-241546321		Now	344.0 x 222.0 x 6.2max, 600g Max, 170 nit, Glare	
1			v v	CPT	CLAA154WA01	18-241546330EP		Now	344.0 x 222.0 x 6.5max, 600g Typ., 185 nit	for EPSON
1			v v	Hitaohi	TX39D80VC1GAA	18-241546500		Now	344.0 x 225.0 x 7.0max, 670g Typ., 450 nit, Dual Lamp, Glare	
15.4" WSXGA+ (1680 x 1050)										
1			v v	Samsung	LTN154P1-L02	18-241546210		Now	344.0 x 222.0 x 6.5max, 610g Max, 185 nit	
2			v v	LPL	LP154W02-B1K1	18-241546130		Mar.	344.0 x 222.0 x 6.5max, 560g Max, 185 nit	
24X CD-ROM										
1			v v	Teac	CD-224E-C20	17-030717252		Now	24X CD-ROM, FW: 1.9A, CSEL+	for EPSON
24X Combo										
1			v v	TSST	TS-L462A	17-112150527		Now	Generic Bezel, CSEL+, RoHS, FW: A330, HW: U01	EOL In Jun/E
1			v	TSST	TS-L462C	17-112151102		Jun.	Generic Bezel, CSEL+, RoHS, FW: A302, HW: B	
2			v v	PCC	UJDA770AU1-A	17-112151201	Mar.	Apr.	Generic Bezel, CSEL+, RoHS	
DVD-Dual / DVD-SuperMulti										
1			v v	TSST	TS-L532A	17-121140002		Now	Generic Bezel, CSEL+, DL, RoHS, Dual, FW: T151	
1			v v	PCC	UJ-840BAL3-A	17-121149001		Now	Generic Bezel, CSEL+, DL, Dual, FW: 1.00(=1005)	
1			v v	PCC	UJ-840BAL-A	17-141109010		Now	Generic Bezel, CSEL+, DL, SuperMulti, FW: 1.50(=1008)	
CMOS Camera Module										
1			v v	Sertek	BN2A-OV9650-D-501H	04-370011320		Now	1.3M Pixels, USB 2.0	
MiniPCI TV Tuner Card										
1			v v	AVerMedia	M103	04-250026000	Apr.	May	Hybrid, S/W Encoder	
1			v v	AVerMedia	M104	04-250027000	Apr.	May	Analog, H/W Encoder	
1				AVerMedia	M108J	N/A		Mar.	Hardware Encoder, for EPSON	for EPSON
Bluetooth Module										
1			v v	ASUS	BT-183	80-161002-01P		Apr.	CSR BC04-EXT, Class 2, Bluetooth 2.0, EDR, Chlp Antenna	
FM Tuner Module										
1			v v	MAOTEK	JFR-600	04-670000200		Now	USB FM Radio Module	
MDC										
1			v v	ASUS	AFM5012NAC	04G132052200		Mar.	RD02-D110, MODEM 56K Azalia MDC 1.5, Green Parts	
1			v v	ASUS	90-BMM010-00BNZ	04-132051900		Now	MODEM 56K Azalia MDC 1.5, Non-Green	
RC Receiver Control Board										
1			v v	TopSeed	PCB22005	04-550024000		Now	for EPSON Remote Controller	for EPSON

Priority	Usage		Vendor	Model Name	Part Number	Schedule		Comments	Remark
	1	2				ER	PR		
2.5" SATA100 HDD (9.5mm)									
1		v	v	HGST	HTS424040M9AT00	17-013130709	Now	40GB, 40G/platter, 4200 rpm, Moraga Plus-A (4K40), DA1091	
1				HGST	IC25N060ATMR04	17-013131701	Now	60GB, 40G/platter, 4200 rpm, Moraga 60GN	
1		v	v	HGST	IC25N080ATMR04	17-013132703	Now	80GB, 40G/platter, 4200 rpm, Moraga 80GN	
1				Fujitsu	MHV-2100AT	17-013134113	Now	100GB, 60G/platter, 4200 rpm, V60 Series	
	2			HGST	HTS541060G9AT00	17-013131706	Now	60GB, 40G/platter, 5400 rpm, Moraga Plus-B (5K100)	
	2	v	v	HGST	HTS541080G9AT00	17-013132707	Now	80GB, 40G/platter, 5400 rpm, Moraga Plus-B (5K100)	
	2			Fujitsu	MHV2100AH	17-013134112	Now	100GB, 60G/platter, 5400 rpm, Z60 Series	
MiniPCI WLAN									
1		v	v	Intel	PRO/Wireless 2915ABG (EU)	04-033020014	Now	802.11 a/b/g, Type IIIB, Channel 1~13	
1				Intel	PRO/Wireless 2915ABG (RW)	04-033020015	Now	802.11 a/b/g, Type IIIB, Channel 1~13	
1		v	v	Intel	PRO/Wireless 2915ABG (JP)	04-033020016	Now	802.11 a/b/g, Type IIIB, Channel 1~14	
1				Intel	PRO/Wireless 2915ABG (NA)	04-033020017	Now	802.11 a/b/g, Type IIIB, Channel 1~11	
1		v	v	Intel	PRO/Wireless 2200BG	04-033020011	Now	802.11 b/g, Type IIIB, Channel 1~11	
1		v	v	Intel	PRO/Wireless 2200BG	04-033020012	Now	802.11 b/g, Type IIIB, Channel 1~14, FCN 104511 & 104577	
1		v	v	ASUS	WL-120G V2	80-I7N3E3-01P	May	802.11 b/g, Type IIIB	
Port-Bar									
1				ASUS	PORT-BAR III/GRAY	80-N6W1P1000	Now	ASUS/20 In 1	for A5Lp
TouchPad									
1		v		Synaptics	TM61PDE8307	04-110001700	Now	Normal Type, for ASUS ID	
1		v	v	Synaptics	TM51PUZ378	04-110101400	Now	Hidden Type, for EPSON/WB ID	
Keyboard									
1		v	v	Darton	KEYBOARD A5 (US) R1.0	04-NC50KUS00	Now		
1		v	v	Darton	KEYBOARD A5 (UK) R1.0	04-NC50KUK00	Now		
1		v	v	Sunrex	KEYBOARD A5 (JP) R3.0	04-NC50KJP02-1	Now		
Battery Cell									
1		v	v	Samsung	ICR18650-24A/4S1P	07-016FY1865	Now	3.7V, 2400mAh, 4S1P, 4 cell, A-Type	
1		v	v	Samsung	ICR18650-24A/4S2P	07-016G01865	Now	3.7V, 2400mAh*2, 4S2P, 8 cell, A-Type	
65W AC Adapter (19V/3.42A)									
1				Delta	SADP-65KB-BFJ	04-266003160	Now	3-pin, Cost Down Model, Lead-Free	
	2			Liteon	PA-1650-02AS	04-266004701	Now	3-pin	
	2			Delta	SADP-65KB-ABH	04-266003180	Now	2-pin, Cost Down Model, Lead-Free, for EPSON	
1				Delta	ADP-65DB-AF	04-266001032	Now	2-pin	
	2			Liteon	PA-1650-01AS	04-266004810	Now	2-pin	
256MB PC2700 DDR333 SO-DIMM									
1		v	v	Nanya	NT256D64SH8CDGM-6K	04-00161465D	Now	16Mx16, Nanya Chip, 0.11um	
1		v	v	Unifosa	U30256AAHY1652LUD0	04-0016146F1	Now	16Mx16, Hynix Chip	
1				Unifosa	W30256AAIFI652LWC3	60-N005D5100	Now	16Mx16, Infineon Chip (New Test Program)	
512MB PC2700 DDR333 SO-DIMM									
1		v	v	Unifosa	U30512AAHYQ652LMAJ	04-001616671	Now	32Mx16, Hynix Chip, TSOP	
	2			Samsung	M470L6423END-CB3	04-001616603	Now	32Mx8, Samsung E-Die, TSOP	

Table 3.0.0 Key Parts List

3.1. LCD PANNEL

Option: **15.4" WXGA + TFT LCD Panel**
 Technology: Active color (TFT: Thin Film Transistor)
 Physical Size: 344.0(W) x 225.0(H) x 6.5~7.0(D) Typ. (mm)
 Display Area: 331.2(H) x 207.0(V) (mm)
 Number of Pixel: 1280 x 800 (pixels)
 Pixel Pitch: 0.25875 x 0.25875 (mm)
 Display Color: Native 262K colors (RGB 6-bit data driver)
 Back-light Two Code Cathode Fluorescent Lamp
 Vendor: Hitachi
 Parts Number: HTC 15.4" WXGA TX39D80VC1GAA (DL)

Option: **15.4" WXGA + TFT LCD Panel**
 Technology: Active color (TFT: Thin Film Transistor)
 Physical Size: 344.0(W) x 222.0(H) x 6.0(D) Typ. (mm)
 Display Area: 331.2(H) x 207.0(V) (mm)
 Number of Pixel: 1280 x 800 (pixels)
 Pixel Pitch: 0.25875 x 0.25875 (mm)
 Display Color: Native 262K colors (RGB 6-bit data driver)
 185 nit
 Vendor: CPT
 Parts Number: CPT 15.4" WXGA CLAA154WA01

Option: **15.4" WXGA + TFT LCD Panel**
 Technology: Active color (TFT: Thin Film Transistor)
 Physical Size: 344.5(W) x 222.5(H) x 6.2(D) Typ. (mm)
 Display Area: 331.2(H) x 207.0(V) (mm)
 Number of Pixel: 1280 x 800 (pixels)
 Pixel Pitch: 0.25875 x 0.25875 (mm)
 Display Color: Native 262K colors (RGB 6-bit data driver)
 170 nit
 Vendor: CPT
 Parts Number: CPT 15.4" WXGA CLAA154WA05

Option: **15.4" WXGA + TFT LCD Panel**
 Technology: Active color (TFT: Thin Film Transistor)
 Physical Size: 344.5(W) x 222.5(H) x 6.2(D) Typ. (mm)
 Display Area: 331.2(H) x 207.0(V) (mm)
 Number of Pixel: 1280 x 800 (pixels)
 Pixel Pitch: 0.25875 x 0.25875 (mm)
 Display Color: Native 262K colors (RGB 6-bit data driver)
 170 nit Glare
 Vendor: CPT
 Parts Number: CPT 15.4" WXGA CLAA154WA05A

Option: **15.4" WXGA + TFT LCD Panel**
 Technology: Active color (TFT: Thin Film Transistor)
 Physical Size: 344.0(W) x 222.0(H) x 6.5(D) Typ. (mm)
 Display Area: ----- (mm)
 Number of Pixel: 1280 x 800 (pixels)
 Pixel Pitch: 0.25875 x 0.25875 (mm)
 Display Color: Native 262K colors (RGB 6-bit data driver)

Vendor: LG
 Parts Number: LPL 15.4" WXGA LP154W01-TLA1

Option: **15.4" WSXGA+ + TFT LCD Panel**
 Technology: Active color (TFT: Thin Film Transistor)
 Physical Size: 344.0(W) x 222.0(H) x 6.5(D) Typ. (mm)
 Display Area: 331.38(H) x 207.1125(V) (mm)
 Number of Pixel: 1680 x 1050 (pixels)
 Pixel Pitch: 0.19725 x 0.19725 (mm)
 Display Color: Native 262K colors (RGB 6-bit data driver)

Vendor: Samsung
 Parts Number: Samsung 15.4" WSXGA+ LTN154P1-L02

Option: **15.4" WSXGA+ + TFT LCD Panel**
 Technology: Active color (TFT: Thin Film Transistor)
 Physical Size: 344.0(W) x 222.0(H) x 6.5(D) Typ. (mm)
 Display Area: -----(mm)
 Number of Pixel: 1680 x 1050 (pixels)
 Pixel Pitch: 0.19725 x 0.19725 (mm)
 Display Color: Native 262K colors (RGB 6-bit data driver)

Vendor: LG
 Parts Number: LPL 15.4" WSXGA+ LP154W02-B1K1

3.2. HARD DISK DRIVE

Form Factor: 2.5 inch
 Capacity: HGST 40/60/80 Gigabyte 4200rpm ; 80 Gigabyte 5400rpm
 Fujitsu 100 Gigabyte 4200rpm ; 100 Gigabyte 5400rpm
 Height: 9.5 mm
 Interface: Enhanced IDE conforming to ATA-5
 Function Features: Power Management APM 1.1 and 1.2 (Standby/ suspend)
 Hardware Features: LBA-modes
 Standard I/O addresses: 1F0h and 3F4h
 Support of minimum IRQ 14
 Support of at least 3 DMA channels, if DMA is supported
 Easily removable and exchangeable for user's future upgradeable

Vendor: HGST 40/60/80 Gigabyte 4200rpm

Parts Number: HTS424040M9AT00 /IC25N060ATMR04/IC25N080ATMR04

HGST 80 Gigabyte 5400rpm
HTS541080G9AT0

Fujitsu 100 Gigabyte 4200rpm
MHV-2100AT

Fujitsu 100 Gigabyte 4200rpm ; 100 Gigabyte 5400rpm
MHV2100AH

3.3. CD-ROM DRIVE

Function	Fast 110 ms Random Access time Fast 100 ms Random Seek time Support CD-DA, CD-ROM (Mode1,Mode2),CD-ROM XA M0de2 (Form1,Form2), Photo CD (single/multi-session),Enhanced CD Low power consumption Software Volume Control
Form Factor:	5.25 Inch
Speed:	Max. 24X(CD)
Height:	12.7 mm
Interface:	IDE (ATAPI)
Vendor:	Teac
Parts Number:	CD-224E-C20

3.4. DVD-RW DRIVE

Write Format:	DVD-/+R Disc at once, Incremental write		
	DVD-/+RW Disc at once, Incremental write, restricted overwrite		
	CD-R/RW Disc at once, Track at once, Session at once, Packet write		
Write Disc	DVD-R and DVD+R (Signal & Double Layer)		
	DVD-/+RW		
	CD-R/RW		
Read Disc	DVD DVD-ROM, DVD-/+R, DVD-/+RW & DVD-RAM		
	CD		
Random Access Time	DVD-ROM: 120 ms (3.3-8X)		
	CD-ROM: 105 ms (10.3-24X)		
	DVD-RAM: 250 ms (4.7GB 2X)		
Random Seek Time	DVD-ROM: 105 ms (3.3-8X)		
	CD-ROM: 100 ms (10.3-24X)		
	DVD-RAM: 220 ms (4.7GB 2X)		
Full Stroke Access Time	DVD-ROM: 210 ms (3.3-8X)		
	CD-ROM: 190 ms (10.3-24X)		
	DVD-RAM: 700 ms (4.7GB 2X)		
Spin up Time	DVD-ROM: 3.0 s (3.3-8X)		
	CD-ROM: 3.0 s (10.3-24X)		
	DVD-RAM: 3.0 s (4.7GB 2X)		
Form Factor	5.25 Inch		
Height	12.7 mm		
Interface	IDE (ATAPI)		
Data Buffer Capacity	2 MByte		
Vendor:	TSST	PCC	PCC
Parts Number:	TS-L532A	UJ-840BAL3-A	UJ-840BAL-A

3.5. COMBO DRIVE

DVD Formats (Read)	DVD-ROM Multi-Border DVD-R/DVD-RW Multi-Session DVD+R DVD+RW DVD-RAM		
CD Formats (Read)	CD-ROM CD-R CD-RW		
CD Formats (Write)	CD-R CD-RW		
Random Access Time	DVD-ROM: 130 ms CD-ROM: 130 ms		
Full Stroke Access Time	DVD-ROM: 250 ms CD-ROM: 250 ms		
Form Factor	5.25 Inch		
Speed	24X Read(CD)/ 8X Read(DVD)/ 24X Write(CD-R/RW)		
Height	12.7 mm		
Interface	IDE (ATAPI)		
Data Buffer Capacity	2 MByte		
Vendor:	TSST	TSST	PCC
Parts Number:	TS-L462A	TS-L462C	UJDA770AU1-A

3.6. TOUCH PAD

Function:	Accurate positioning Low fatigue pointing action Low power consumption Software configurable Scanner function for signature Low profile, compact size and low weight No moving parts, high reliability
Dimensions:	77.24 (W) x 40.13 (H) x 0.987 (T) (Unit: mm)
Sensor Effective Areas:	70.24 (W) x 35.63 (H) (Unit: mm)
Interface:	PS/2
X/Y Position Resolution:	40 points / mm (graphics mode)
Customizing:	Custom color can be printed on the sensor pad
Vendor:	Synaptics
Parts Number:	TM51P-378

Functional features:	Accurate positioning Low fatigue pointing action Low power consumption Software configurable Scanner function for signature Low profile, compact size and low weight
Dimensions:	79.7 mm (W) x 47.7 mm (H) x 1.07 mm (T)
Sensor effective areas:	76.9 mm (W) x 44.6 mm (H)
Interface:	PS/2
X/Y position resolution:	40 points / mm (graphics mode)
Customizing:	Custom color can be printed on the sensor pad.
Vendor :	Synaptics:
Parts Number :	TM61P307-307

3.7. KEYBOARD

Compatibility:	MS-Windows 2000/XP
Functional features:	Standard Notebook-KeyBoard MF2-Layout
Hardware feature:	Simultaneously use of internal and external keyboard Easily to assemble or disassemble
Dimensions:	(H) 300mm x (V) 116.5 mm
Type:	Key switch Membrane
Total travel:	3.0 ± 0.3 mm
Key top:	ABS material, TANPO printing with UV hardening English,
Language versions:	Japanese, Chinese, Korean and European etc.,
Vendor/ Model	InnovACE/K000962, Chicony/MP-0411

3.8. BATTERY

3.8.1. MAIN BATTERY

Purpose:	Main power supply battery
Gas-gauge:	SM Bus interface
Chemistry:	Li-ion rechargeable battery
Voltage:	Nominal 14.8V (=3.7V cell 4pcs in serial, 2 pcs in parallel)
Capacity:	Typical 2400 mAH (Single-cell)
Power:	71.04 W-Hrs
Vendor:	Samsung
Duration:	About 1.5 hours (Depend on system configuration)
Charge Method:	Fast Charge: 2.5 hours (while System off) –85% up
Charging Source:	AC adapter
Gas-gauge:	BENCHMARQ bg2060

3.8.2. RTC BACKUP BATTERY

Purpose:	Backup the RTC/ CMOS data While AC adapter off & Main Battery removed
Chemistry:	Coin cell Li-ion battery
Voltage:	Nominal 3V
Capacity:	200 mAH
Vendor:	Maxell

3.9. AC/DC ADAPTER

The notebook can be powered either by an external AC adapter or by an internal battery pack. The AC adapter is used as power source for the DC/DC converter and as constant current source for the battery pack.

Input Requirements

AC Line Voltage:	100V to 240V AC, Full Range
AC Line Current:	≤ 1.5 A
AC Line Frequency:	50Hz to 60Hz
Efficiency:	$\geq 85\%$

Output Requirements

Output Voltage:	+19V DC(+/-5%)
Output Current:	3.42 A
Ripple Voltage:	≤ 350 mV _{p-p}

*Performed by 20M Hz bandwidth in oscilloscope.

*Applied with 0.1uF ceramic capacitor and 10uF tantalum capacitor across output connector terminals.

Power Cord:	Plug to the adapter
DC Cable Length:	1800 +/- 50 (Unit: mm)

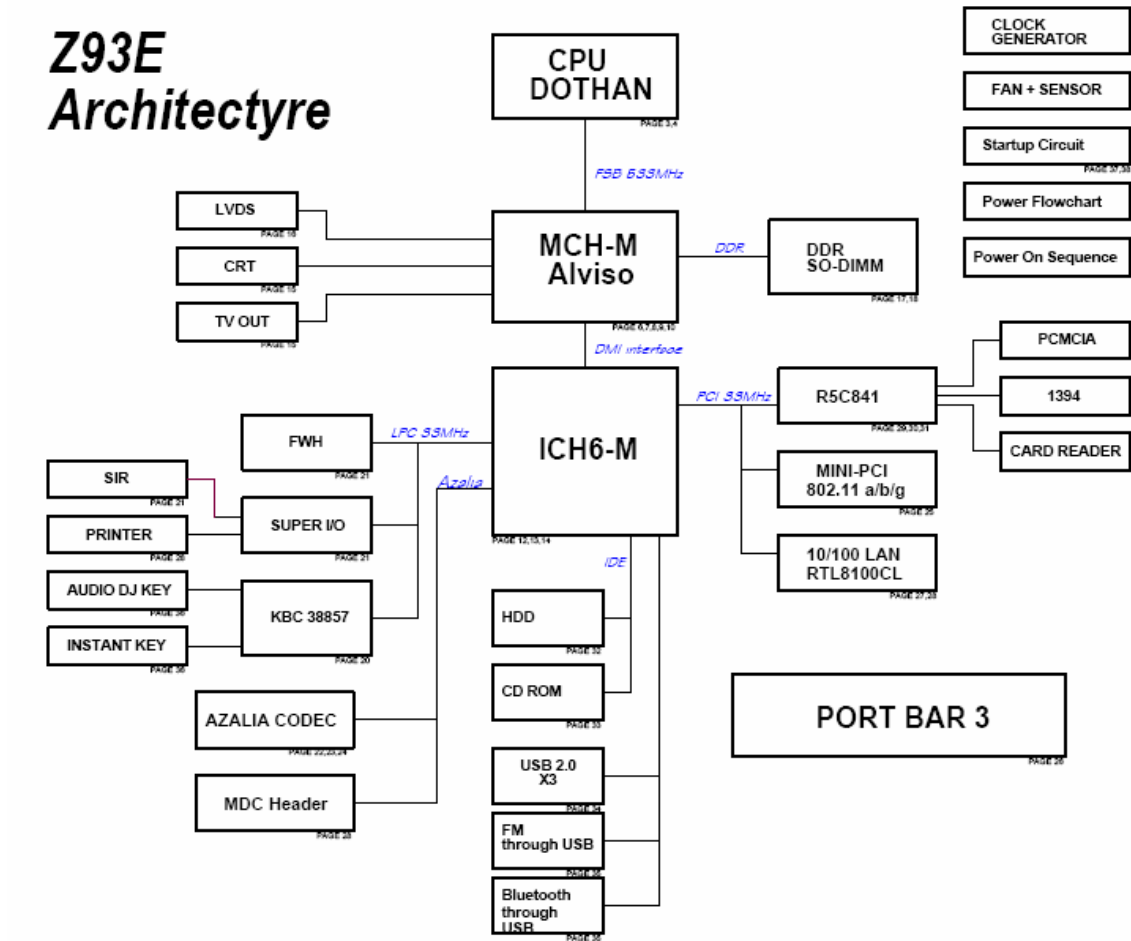
Regulatory

EMI:	CISPR 22: 1993/ EN55022(1994): CLASS B
------	--

Dimension:	(L) 108.5 x (W) 46 x (H) 29.5 mm
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4. SYSTEM

4.1. MAIN COMPONENTS BLOCK DIAGRAMS



PortBar III

TOP VIEW

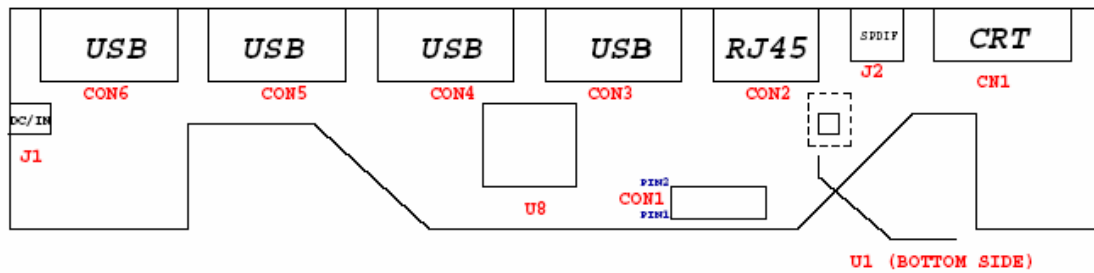


Figure 4.1.0 Block Diagram

4.2. SYSTEM RESOURCE

4.2.1. IRQ MAP

IRQ #	Description
IRQ 0	System Timer
IRQ 1	Keyboard
IRQ 3	IR
IRQ 8	RTC Alarm
IRQ 9	ACPI Compliant System
IRQ12	PS/2 Touch Pad
IRQ13	Numeric Data Processor
IRQ14	Primary IDE
IRQ15	Second IDE
IRQ16	Intel ICH6-M USB Universal Host Controller – 256B
IRQ16	Intel Mobile 915GM Express Chipset Family
IRQ17	Ricoh R5C841 CarBus Controller
IRQ18	Intel ICH6-M USB Universal Host Controller – 256A
IRQ18	OHCI Compliant IEEE 1394 Host Controller
IRQ19	ICH6-M USB Universal Host Controller – 2659
IRQ19	Ricoh Memory Stick Bus Host Adapter
IRQ19	Ricoh SD Bus Host Adapter
IRQ20	Realtek RTL8100cl Fast Ethernet NIC
IRQ22	Intel Pro/Wireless Network Connection
IRQ23	Intel Pro/Wireless Network Connection
IRQ23	Intel ICH6-M USB Universal Host Controller – 2658
IRQ23	Intel ICH6-M USB2 Enhanced Host Controller – 265C

Table 4.2.1 IRQ Map

4.2.2. PCI INT MAP

INT	Description
INTB	Ricoh R5C841 Card Bus interface
INTC	Ricoh R5C841 IEEE 1394 interface
INTD	Ricoh R5C841 MS/SD Card-Reader interface
INTE	Realtek RTL8100 Ethernet Controller interface
INTG	Mini-PCI Intel Wireless LAN Card
INTH	Mini-PCI Intel Wireless LAN Card

Table 4.2.2 PCI INT Map

4.2.3. PCI BUS MASTER MAP

REQ	Description
REQ1	Ricoh R5C841 (1394/PC Card/MS/SD)
REQ2	Realtek RTL8100 (Ethernet Controller)
REQ3	Mini-PCI (Intel Wireless LAN Card)

Table 4.2.3 PCI Bus Master Map

4.2.4. IDSEL & PCI DEVICES

IDSEL	CHIPSET
AD16	Realtek RTL8100 (Ethernet Controller)
AD17	Ricoh R5C841 (1394/PC Card/MS/SD)
AD19	Mini-PCI (Intel Wireless LAN Card)

Table 4.2.4-1 IDSEL List

Device	Chipset	Bus #	Device #	Function #
PCI-to-PCI Bridge	ICH6-M	0	30	0
LPC Controller	ICH6-M	0	31	0
IDE Controller	ICH6-M	0	31	1
SMBus Controller	ICH6-M	0	31	3
USB UHCI Controller #0	ICH6-M	0	29	0
USB UHCI Controller #1	ICH6-M	0	29	1
USB UHCI Controller #2	ICH6-M	0	29	2
USB UHCI Controller #3	ICH6-M	0	29	3
USB 2.0 EHCI Controller	ICH6-M	0	29	7
Intel HDA Controller	ICH6-M	0	27	0
LAN Controller	ICH6-M	0	8	0
Intel Host Bridge	Intel	0	0	0
VGA	Intel	0	2	0
Ethernet Controller	Realtek RTL8100	1	4	0
Card Bus Bridge	Ricoh R5C841	1	1	0
IEEE 1394	Ricoh R5C841	1	1	1
SD Bus Adapter	Ricoh R5C841	1	1	2
Memory Stick Bus Adapter	Ricoh R5C841	1	1	3
Modem	Conexant	X	X	x
Wireless LAN Controller	Intel	1	5	0

Table 4.2.4-2 PCI Device List

5. I/O PORT PIN ASSIGNMENT

No	FUNCTION	DESCRIPTION
1	CRT	Display (Analog)

2	USB	Universal Serial Bus (UHCI)
3	IR	SIR (115Kb)
4	DCIN	Adapter Input
5	LAN/MODEM	(10/100 Mb Ethernet and K56flex modem)
6	MIC	MIC In or Center/Bass Out
7	SPDIF	SPDIF Output
8	IEEE 1394	IEEE 1394 port
9	S-Video out	TV out (Y/C , Comp)
10	Line In	Line In or Rear Out
11	Headphone	STEREO Headphone Out
12	PORT Bar 3	CRT & USB*4 & Printer Port & RJ45

 Table 5.0.0 **I/O Port** Connector List

5.1. CRT PIN ASSIGNMENT

No	PIN ASSIGNMENT	DESCRIPTION
1	ROUT	Red DAC analog output
2	GOUT	Green DAC analog output
3	BOUT	Blue DAC analog output
4	NC	
5	GROUND	Ground
6	RED Return (ground)	Ground
7	GREEN Return (ground)	Ground
8	BLUE Return (ground)	Ground
9	NC	
10	SYNC Return (ground)	Ground
11	NC	
12	DDC_DAT_OUT	DDC monitor data
13	HSYNC_OUT	CRT Horizontal Sync for the CRT monitor.
14	VSYNC_OUT	CRT Vertical Sync for the CRT Monitor.
15	DDC_CLK_OUT	DDC monitor clock

 Table 5.1.0 **CRT Connector** Pin Assignment

5.2. HARD DISK CONNECTOR PIN ASSIGNMENT

No.	Signal	Description	Type
1	IDR_RST#	HDD reset	I
2	GND	Ground	G
3	IDE_PDD7	Primary disk data 7	I/O
4	IDE_PDD8	Primary disk data 8	I/O
5	IDE_PDD6	Primary disk data 6	I/O
6	IDE_PDD9	Primary disk data 9	I/O
7	IDE_PDD5	Primary disk data 5	I/O
8	IDE_PDD10	Primary disk data 10	I/O
9	IDE_PDD4	Primary disk data 4	I/O
10	IDE_PDD11	Primary disk data 11	I/O
11	IDE_PDD3	Primary disk data 3	I/O
12	IDE_PDD12	Primary disk data 12	I/O
13	IDE_PDD2	Primary disk data 2	I/O
14	IDE_PDD13	Primary disk data 13	I/O
15	IDE_PDD1	Primary disk data 1	I/O
16	IDE_PDD14	Primary disk data 14	I/O
17	IDE_PDD0	Primary disk data 0	I/O
18	IDE_PDD15	Primary disk data 15	I/O
19	GND	Ground	G
20	NC		
21	IDE_PREQ	Primary DMA request	O
22	GND	Ground	G
23	IDE_PIOW#	Primary disk IO write	I
24	GND	Ground	G
25	IDE_PIOR#	Primary disk IO read	I
26	GND	Ground	G
27	IDE_PIORDY	Primary disk IO channel ready	O
28	IDE_PCSEL	Cable Select	I
29	IDE_PDACK#	Primary DMA acknowledge	I
30	GND	Ground	G
31	IRQ14	Primary disk interrupt	O
32	IDE_PIOCS16#	16-bit data bus transfer	O
33	IDE_PDA1	Primary disk address 1	I
34	IDE_PDIAG	Diagnostics status	I/O
35	IDE_PDA0	Primary disk address 0	I
36	IDE_PDA2	Primary disk address 2	I
37	IDE_PDCS1#	Primary disk chip select for 100 range	I
38	IDE_PDCS3#	Primary disk chip select for 300 range	I
39	IDE_PDASP#	IDE Primary Active / Secondary Present	I/O
40	GND	Ground	G
41	+5VS	+5V power supply	PWR
42	+5VS	+5V power supply	PWR
43	GND	Ground	G
44	NC		

Table 5.2.0 HDD Connector Pin Assignment

5.3. LCD CONNECTOR PIN ASSIGNMENT

No.	Signal	Description	Type
1	LA_DATAN0	Channel A differential data output - negative	O
2	Ground	Ground	G
3	LA_DATAP0	Channel A differential data output - positive	O
4	LB_CLKP	Channel B differential clock output - positive	O
5	Ground	Ground	G
6	LB_CLKN	Channel B differential clock output - negative	O
7	LA_DATAN1	Channel A differential data output - negative	O
8	Ground	Ground	G
9	LA_DATAP1	Channel A differential data output - positive	O
10	LA_DATAP1	Channel B differential data output - positive	O
11	Ground	Ground	G
12	LA_DATAN1	Channel B differential data output - negative	O
13	LA_DATAN2	Channel A differential data output - negative	O
14	Ground	Ground	G
15	LA_DATAP2	Channel A differential data output - positive	O
16	LA_DATAP2	Channel B differential data output - positive	O
17	Ground	Ground	G
18	LA_DATAN2	Channel B differential data output - negative	O
19	LA_CLKN	Channel A differential clock output - negative	O
20	Ground	Ground	G
21	LA_CLKP	Channel A differential clock output - positive	O
22	LA_DATAP0	Channel B differential data output - positive	O
23	Ground	Ground	G
24	LA_DATAN0	Channel B differential data output - negative	O
25	EDID_CLK	SMBus EDID Clock	I
26	Ground	Ground	G
27	EDID_DAT	SMBus EDID Data	I/O
28	+3VS	Panel EDID Power	I
29	+3VS_LCD	3.3V power for LCD panel	I
30	+3VS_LCD	3.3V power for LCD panel	I

Table 5.3.0-1 LCD Panel Connector Pin Assignment

No.	Signal	Description	Type
1	INTMIC_A	INTMIC	I
2	Ground	Ground	G
3	Ground	Ground MIC	G
4	Ground	Ground	G
5	+5V_USB_CCD	USB Power	O
6	+5V_USB_CCD	USB Power	O
7	USB_PP1	USB POSITIVE	I/O
8	PANEL_ID0	PANEL ID	O
9	USB_PN1	USB NEGATIVE	I/O
10	+3VA	+3V always power	I
11	Ground	Ground	G
12	BL_EN_CON	LCD Backlight Enable	I
13	+VIN_INV	Inverter input power	I
14	LID_SW#	Lid open/close indicate signal	I
15	+VIN_INV	Inverter input power	I
16	Ground	Ground	G
17	NC		
18	L_BKTCTL_V	Back light control voltage level	I
19	NC		
20	PANEL_ID1	PANEL ID	O

Table 5.3.0-2 Inverter, MIC & Camera Connector Pin Assignment

5.4. INTERNAL KEYBOARD PIN ASSIGNMENT

No	Signal	Description	Type
1	KSO7	Keyboard matrix OUT7	OUT
2	KSO0	Keyboard matrix OUT0	OUT
3	KSI1	Keyboard matrix IN1	OUT
4	KSI7	Keyboard matrix IN7	OUT
5	KSIO9	Keyboard matrix OUT9	OUT
6	KSI6	Keyboard matrix IN6	OUT
7	KSI5	Keyboard matrix IN5	OUT
8	KSO3	Keyboard matrix OUT3	OUT
9	KSI4	Keyboard matrix IN4	OUT
10	KSI2	Keyboard matrix IN2	OUT
11	KSO1	Keyboard matrix OUT1	OUT
12	KSI3	Keyboard matrix IN3	OUT
13	KSI0	Keyboard matrix IN0	OUT
14	KSO13	Keyboard matrix OUT13	OUT
15	KSO5	Keyboard matrix OUT5	OUT
16	KSO2	Keyboard matrix OUT2	OUT
17	KSO4	Keyboard matrix OUT4	IN
18	KSO8	Keyboard matrix OUT8	IN
19	KSO6	Keyboard matrix OUT6	IN
20	KSO11	Keyboard matrix OUT11	IN
21	KSO10	Keyboard matrix OUT10	IN
22	KSO12	Keyboard matrix OUT12	IN
23	KSO14	Keyboard matrix OUT14	IN
24	KSO15	Keyboard matrix OUT15	IN
25	X	X	X
26	KID1	Keyboard type detect ID1	OUT
27	GND	Ground	
28	KID2	Keyboard type detect ID2	OUT
29	GND	Ground	
30	GND	Ground	

Table 5.4.0 **Keyboard Connector** Pin Assignment

5.5. TOUCH PAD PIN ASSIGNMENT

No	Signal	Description	Type
1	+V5S_TP	Touch Pad Power	Power
2	+V5S_TP	Touch Pad Power	Power
3	TPAD_DAT_CON	DATA	I/O
4	TPAD_CLK_CON	CLOCK	I/O
5	GND	Ground	GND
6	KSI3	AUDIO DJ "PLAY"	I
7	DJ_SCAN	AUDIO DJ SCAN CODE	I
8	KSI5	AUDIO DJ "STOP"	I
9	KSI2	AUDIO DJ "FORWARD"	I
10	KSI4	AUDIO DJ "BACKWARD"	I
11	BT_LED#	BT_LED#	I
12	+5VS	For Wireless LED Power	Power
13	+5V	For E-mail LED Power	Power
14	EMAIL_LED#_R	E-mail LED	O
15	802_LED_EN#_R	Wireless LED	O
16	+5VLCM	For Battery Charge LED	Power
17	CHG_LED#_R	Battery Charge LED	O
18	+5VSUS	For Power & E-mail LED Power	Power
19	PWR_LED#_R	System Power LED	O
20	DJ_LED_R	AUDIO DJ Power LED	O
21	DJ_SW#	AUDIO DJ Power switch	I
22	GND	Ground	GND

Table 5.5.0 Touch Pad Connector Pin Assignment

5.6. BATTERY PIN ASSIGNMENT

No	Signal	Description	Type
1	GND	Ground	GND
2	GND	Ground	GND
3	TS#	Battery input sense	I
4	SMCLK_BAT1	SMBUS CLOCK	I
5	SMDATA_BAT1	SMBUS DATA	I/O
6	NC		
7	BAT	Battery input/output voltage	Power
8	BAT	Battery input/output voltage	Power

Table 5.6.0 Battery Connector Pin Assignment

5.7. DC IN JACK PIN ASSIGNMENT

No	Signal	Description	Type
1	++AC_IN	Adapter input voltage	Power
2	GND	Ground	GND
3	GND	Ground	GND
4	GND	Ground	GND
5	GND	Ground	GND
6	GND	Ground	GND

Table 5.7.0 DC In Connector Pin Assignment

5.8. AUDIO JACK

No	Signal	Description	Type
1	FRONT_R	Headphone Output Right Channel	O
4	FRONT_L	Headphone Output Left Channel	O
5	EAR_SW	Headphone Insert Detection	I
6	OPTIC_HP	S/PDIF Power Detect	I
7	FM_ANT_GND	FN Signal	O
A	GND	Ground Audio	GND
B	OPTIC_VCC	S/PDIF Power	Power
C	S/PDIF_O	S/PDIF signal out	OUT
9	NC		
10	GND	Ground Audio	GND

Table 5.8.0-1 Audio Jack & S/PDIF Connector Pin Assignment

No	Signal	Description	Type
1	GND	Ground AUDIO	GND
2	MIC_IN_L	External MIC Input Left Channel	I
3	MIC_IN_R	External MIC Input Right Channel	I
4	GND	Ground AUDIO	GND
5	NC		
6	INTMIC_A	Internal MIC Input	I

Table 5.8.0-2 MIC Phone Jack Connector Pin Assignment

No	Signal	Description	Type
1	GND	Ground AUDIO	GND
2	LINE_L	External MIC Input Left Channel	I
3	LINE_R	External MIC Input Right Channel	I
4	GND	Ground AUDIO	GND
5	NC		
6	NC	Internal MIC Input	I

 Table 5.8.0-3 **LINE-IN Jack** Connector Pin Assignment

5.9. Internal Speaker Jack

No	Signal	Description	Type
1	SPKR+	Speaker Right Channel	O
2	SPKR-	Speaker Right Channel	O
3	SPKL+	Speaker Left Channel	O
4	SPKL-	Speaker Left Channel	O

 Table 5.9.0-1 **Speaker Jack** Connector Pin Assignment

No	Signal	Description	Type
1	NC		
2	WOFSPK+	Speaker Right Channel	O
3	WOFSPK-	Woofer Left Channel	O
4	NC		

 Table 5.9.0-2 **Woofer Jack** Connector Pin Assignment

5.10. LAN/MODEM CONNECTOR PIN ASSIGNMENT

No	Signal	No	Signal
1	NC	7	LAN_RXP
2	RJ11_RING	8	LAN_CON8/9 (GND)
3	RJ11_TIP	9	LAN_CON8/9 (GND)
4	NC	10	LAN_RXN
5	LAN_TXP	11	LAN_CON5/6 (GND)
6	LAN_TXN	12	LAN_CON5/6 (GND)

 Table 5.11.0 **LAN/Modem Connector** Pin Assignment

5.11. MDC CONNECTOR PIN ASSIGNMENT

No	Signal	No	Signal
1	GND	11	ACZ_RST#
2	NC	12	ACZ_BCLK
3	ACZ_SDOUT	13	GND
4	NC	14	GND
5	GND	15	GND
6	+3V	16	GND
7	ACZ_SYNC	17	GND
8	GND	18	GND
9	ACZ_SDIN1	19	NC
10	GND	20	NC

Table 5.12.0 MDC Connector Pin Assignment

5.12. 1394 JACK PIN ASSIGNMENT

No	Signal	Description	Type
1	LTPB0-	LTPB0-	O
2	LTPB0+	LTPB0+	O
3	LTPA0-	LTPA0-	O
4	LTPA0+	LTPA0+	O
5	GND	Ground	GND
6	GND	Ground	GND

Table 5.13.0 1394 Connector Pin Assignment

5.13. USB CONNECTOR PIN ASSIGNMENT

No	Signal	Description	Type
1	+5V_USB	USB 5V power	P
2	LP0-_B	USB port 0 negative signal	I/O
3	LP0+_B	USB port 0 positive signal	I/O
4	GND	USB 5V ground	P
5	+5V_USB	USB 5V power	P
6	LP5-_B	USB port 5 negative signal	I/O
7	LP5+_B	USB port 5 positive signal	I/O
8	GND	USB 5V ground	P

Table 5.14.0 USB Connector Pin Assignment

No	Signal	Description	Type
1	+5V_USB	USB 5V power	P
2	LP4-_B	USB port 4 negative signal	I/O
3	LP4+_B	USB port4 positive signal	I/O
4	GND	USB 5V ground	P

Table 5.14.1 USB Connector Pin Assignment

5.14. FAN CONNECTOR PIN ASSIGNMENT

No	Signal	Description	Type
1	+5VS_FAN	Power	P
2	FANSP1	FAN Speed	O
3	GND	Ground	GND

Table 5.15.0 FAN Connector Pin Assignment

5.15. Port Bar 3 CONNECTOR PIN ASSIGNMENT

No.	Signal	Description	Type
1	NC	---	----
2	DAC_G_PB_Q	Green DAC analog output	O
3	DDC_DAT_5V	POWER	P
4	CRT_VSYNC	CRT Vertical Sync for the CRT Monitor.	O
5	PR_IN#_Q	Port Bar 3 insert detect	O
6	SLCT_BUSY	SLCT_BUSY	O
7	LPT_PD7	Port data 7	I/O
8	LPT_PD5	Port data 5	I/O
9	LPT_PD3	Port data 3	I/O
10	LPT_PD2	Port data 2	I/O
11	LPT_PD1	Port data 1	I/O
12	LPT_PD0	Port data 0 signal	I/O
13	SLCT_STB#	SLCT_STB#	O
14	NC	---	----
15	L_RDN_PB	Transmit data negative signal	O
16	L_RDP_PB	Transmit data positive signal	O
17	L_TDN_PB	Receive data negative signal	I
18	L_TDP_PB	Receive data positive signal	I
19	GND	Ground	GND

20	NC	---	----
21	NC	---	----
22	NC	---	----
23	NC	---	----
24	USB_PN3_B	USB port 3 negative signal	I/O
25	USB_PP3_B	USB port 3 positive signal	I/O
26	NC	---	----
27	NC	---	----
28	NC	---	----
29	NC	---	----
30	NC	---	----
31	GND	Ground	GND
32	GND	Ground	GND
33	A/D_DOCK_PR	Port Bar 3 Power	P
34	A/D_DOCK_PR	Port Bar 3 Power	P
35	GND	Ground	GND
36	DAC_R_PB_Q	Red DAC analog output	O
37	DAC_B_PB_Q	Blue DAC analog output	O
38	CRT_HSYNC_PB	CRT Horizontal Sync for the CRT Monitor.	O
39	DDC_CLK_5V	DDC monitor clock	O
40	GND	Ground	GND
41	+5V	Port Bar 3 USB Power	P
42	+5V	Port Bar 3 USB Power	P
43	LPT_SLCT	LPT_SLCT	O
44	+12V	Port Bar 3 Power	P
45	SLCT_AFD#	SLCT_AFD#	O
46	SLCT_ERROR#	SLCT_ERROR#	O
47	SLCT_INIT#	SLCT_INIT#	O
48	SLCT_SLIN#	SLCT_SLIN#	O
49	LPT_PD4	Port data 4	I/O
50	LPT_PD6	Port data 6	I/O
51	SLCT_ACK#	SLCT_ACK#	O
52	SLCT_PE	SLCT_PE	O
53	NC	---	----
54	NC	---	----

55	NC	---	----
56	NC	---	----
57	+5VS	Port Bar 3 USB Power	P
58	+5VS	Port Bar 3 USB Power	P
59	+5VS	Port Bar 3 USB Power	P
60	NC	---	----
61	NC	---	----
62	NC	---	----
63	NC	---	----
64	NC	---	----
65	GND	Ground	GND
66	GND	Ground	GND
67	A/D_DOCK_PR	Port Bar 3 Power	P
68	A/D_DOCK_PR	Port Bar 3 Power	P

 Table 5.15.0 **FAN Connector** Pin Assignment

6. POWER MANAGEMENT

6.1. SYSTEM POWER PLANE

Power Group	Power Control By	Controlled Devices
+VCC_RTC	RTC Battery	South Bridge
+5VA	TPS5130	Power
+3VA	TPS5130	Power
+3VLCM	MIC5235	PIC16C54C
+5VO	LTC3728	MAX1987
+3VO	LTC3728	SI4480DY
+5VSUS	LTC3728	South Bridge, CIR Module
+3VSUS	LTC3728	South Bridge and LAN Chip,
+12VO	L78L12ACUTR	UMC4N
+12V	UMC4N	Control pin
+12VS	UMC4N	Control pin
+5V	SI4800BDY	R5531, SI9183DT
+3V	SI4800BDY	R5531, DDR SO-DIMM, KBC, Mini-PCI, MDC, PC Card Controller and SI2301DS
+2.5V	TPS5130	North Bridge, DDR SO-DIMM and RT9173ACL5
+VCCPB	R5531	PC Card
+VCCCB	R5531	PC Card
+5VS	SI4800BDY	SI2301DS, South Bridge, MAX8863, Audio AMP, Mini-PCI, HDD and ODD
+5V_AUDIO	MAX8863	HDA Codec
+V5S_FAN	SI2301DS	System Fan
+V5S_TP	MMBT2907	Touch Pad
+3VS	SI4800BDY	South Bridge, SI3456DV, Clock Generator, Super I/O, IrDA, BIOS, Audio Codec, Mini-PCI, PC Card Controller and SI9183DT
+3VS_DAC	SI9183DT	North Bridge
+3VS_LCD	SI3456DV	LCD Panel
+MC_VCC	SI2301DS	Card Reader
+2.5VS	PMN45EN	North Bridge and South Bridge,
+1.5VS	TPS5130	North Bridge and South Bridge
+VCC_GMCH_CORE	TPS5130	North Bridge
+1.25VS	RT9173ACL5	DDR
+VCCP	TPS5130	CPU, North Bridge and South Bridge
CPU_VCCA0	TPS5130	CPU
CPU_VCCA123	TPS5130	CPU
+VCORE	MAX1987	CPU

Table 6.1.0 System Power Plane

6.2. POWER MANAGEMENT MODE

6.2.1. FULL ON MODE

All system devices are not power managed and the system can respond to applications with maximum performance.

6.2.2. DOZE MODE

The CPU clock is slow down but all other devices are full on.

6.2.3. STAND BY MODE

A suspend state where all motherboard components are still powered-on except for the system clock generator device. The PCI and CPU buses are driven to the inactive idle state. The system memory is powered and refreshed by the memory bridge, and the graphics frame buffer is powered and refreshed by the graphic chip. The system provides a 32 KHz clock (SUSCLK) in this suspend mode to support refresh of these memory subsystems. Only an enabled “resume event” can bring the system out of the stand by state. The south bridge also provides a resume timer that allows the system to resume after a programmed time has elapsed.

6.2.4. SUSPEND TO RAM MODE (STR)

A suspend state where all motherboard components are powered-off. The CPU/L2 and PCI busses are powered off. All devices connected to the CPU/L2 and PCI busses must either be powered-off or isolate their bus interfaces. The system memory is powered and refreshed by the memory bridge, and the graphics frame buffer is powered and refreshed by the graphics chip. The system provides a 32 KHz clock (SUSCLK) in this suspend mode to support refresh of these memory subsystems. Only an enabled “resume event” can bring the platform out of suspend to RAM (STR) state.

6.2.5. SUSPEND TO DISK MODE (STD)

A suspend state where the context of the entire system is saved to disk, all motherboard components are powered-off, and all clocks are stopped. Any enabled “resume event”, such as Power BTN or RTC, can bring the platform out of suspend to disk (STD) state.

6.2.6. MECHANICAL OFF MODE (MOFF)

All power except the RTC has been removed from the system.

6.3. PMU MODE TRANSITION EVENT

The following table summarizes these entry events and wake-up events of each power management mode.

Power State	Entry Event	Wake up Event
Doze	Doze Time out	Predefined Memory/IO range access Ring Indicator Keystroke Mouse movement IRQ 1-15
Stand by	Stand by Time out	Predefined Memory/IO range access Battery Warning Battery Low Ring Indicator Keystroke (Int. Keyboard or USB Keyboard) Mouse movement Schedule Alarm
STR	Suspend Time out STR hot key pressed Lid close	Ring Indicator Keystroke (Int. Keyboard) Schedule Alarm
STD	Suspend Time out STD hot key pressed Battery Low Lid close	Power Button Ring Indicator (internal Modem) Schedule Alarm LAN Wake Up* (internal LAN)

***Only support in AC mode!**

Table 6.3.0 These Entry Events and Wake-up Events of Each Power Management Mode

6.3.1. LID SWITCH

Display mode	State	Lid close	Lid open
LCD	Full on	LCD OFF	No action
	Stand by	LCD OFF	No action
	STR/STD	LCD OFF	No action
CRT	Full on	No action	No action
	Stand by	No action	No action
	STR/STD	No action	No action
SIMUL	Full on	CRT	No action
	Stand by	No action	No action
	STR/STD	No action	No action

Table 6.3.1 LID Switch Status of Different Display Mode

LCD display will be shut down while closing LCD.

6.3.2. POWER BUTTON

Power button can power on/off the system.

6.4. DEVICE POWER MANAGEMENT

Power State Component	Doze	Stand By	STR	STD
CPU	Stop Grant	Stop Clock	Power Off	Power Off
GMCH	ON	Stop Clock	Power Off (except VCCP)	Power Off
South Bridge	ON	ON	Power Down (Except +VCC_RTC, +3VSUS & +5VSUSUS)	Power Down (Except +VCC_RTC, +3VSUS & +5VSUSUS)
DRAM	ON	Self Refresh	Self Refresh	Power Off
ODD	ON	On	Power Off	Power Off
HDD	ON	On	Power Off	Power Off
KBC	ON	On	On	Power Off
PCMCIA	ON	On	Power Off	Power Off
LCD Backlight	ON	On	Power Off	Power Off
SIR Module	ON	On	Power Off	Power Off
LAN	ON	On	On	Power Off
Modem	ON	On	On	Power Off

RC Receiver Control Board	ON	On	On (Except Battery)	On (Except Battery)
TV Module	ON	On	Power Off	Power Off
Parallel	ON	Power Down	Power Off	Power Off
Serial	N/A	N/A	N/A	N/A
USB	ON	Power Down	Power Down	Power Off
1394A	ON	Power Down	Power Down	Power Off

Table 6.4.0 Power State of Local Devices

ON: Normal Operation.

Self Refresh: Stop I/O Operation but Retain data inside.

Power Down: Stop Operation but Power existence.

Power Off: No Operation and No Power.

6.4.1. DEVICE PM COTROL DURING STR MODE

Device	Power Down Controlled by	Description
CPU	Software Register/ Signal	Controlled by STPCLK#
HDD	Software Register	HDD support power down command
CD-ROM	Software Register	CD-ROM support power down
PCMCIA Controller	Software Register	Enter PCI PM D3Hot state
Super I/O Controller	Software Register/ Signal	Controlled by SUS_STAT#
LCD Panel Back light	Software Register/ Signal	Power Off, L_BKLTEN
Keyboard Controller	Working	M38858 support power down
Internal Modem	Software Register	Enter PCI PM D3Hot state
LAN	Software Register	Enter PCI PM D3Hot state
Clock ICS 954213	Register/Signal	Controlled by CLK_PWR_GD#
TV Module	Hardware	Power Off
SIR Module	Hardware	Power Off
Keyboard Controller	Working	M38858 support power down command
RC Receiver Control Board	Working	
Micro-Processor (PIC16C54C)	Working	

Table 6.4.1 Device PM Control During STR Mode

6.4.2. DEVICE PM CONTROL DURING STD MODE

Device	Power Down Controlled by	Description
CPU	Hardware	Power off
HDD	Hardware	Power off
CD-ROM	Hardware	Power off
PCMCIA Controller	Hardware	Power off
Super I/O Controller	Hardware	Power off
TV Module	Hardware	Power off
SIR Module	Hardware	Power Off
RC Receiver Control Board	Working (Except Battery)	Working (Except Battery)
LCD Panel Back light	Hardware	Power off
Keyboard Controller	Hardware	Power off
Audio AMP	Hardware	Power off
Internal Modem	Hardware	Power off
LAN	Hardware	Power off
Clock ICS 954213	Hardware	Power off
Micro-Processor (PIC16C54C)	Hardware	Power off

Table 6.4.2 Device PM Control During STD Mode

7. MODULE SPECIFICATION

7.1. OVERALL SYSTEM

The notebook system consists of the following PCB assembly and modules.

7.1.1. BOARD ASSEMBLY

Main Board	Main System, DC/DC and Charger
Inverter Board	Voltage transformer for LCD panel
Gauge Board	Battery status
CIR Board	CIR Receiver
RC Receiver Control /FM Board	CIR/FM Module
MDC Modem	MDC Modem
Touch Pad & LED Board	Touch Pad Membrane, 5 LED Indicators, 2 Touch Pad Button, 5 Audio DJ button

7.1.2. MODULES

1. Hard Disk Drive (40 /80 GB)
2. DDR SO-DIMM Module
3. Li-ion Battery Pack
4. Mini-PCI Module (TV Tuner Module)
5. Mini-PCI Module (Wireless)
6. ODD (CD-ROM/ Combo/ DVD-Super Multi DL)
7. Battery (4S1P/4S2P)
8. LCD Panel (WXGA/WSXGA+)

7.2. MAIN BOARD

7.2.1. MAIN SYSTEM MODULE SPECIFICATION

Feature	
	◆ CPU socket, Intel Graphic-Memory Control Hub, Intel I/O Control Hub,
	◆ Clock generator,
	◆ SDRAM & its expansion sockets,
	◆ PC/AT compatible system (RTC, DMA, INT, Timer, ... etc)
	◆ IDE controller with PIO Mode 4 & Ultra-33/66/100,
	◆ PCMCIA /Cardbus controller & their sockets
	◆ I/O peripheral controller (IR, LPT, ...etc)
	◆ Audio CODEC,
	◆ Audio amplifier,
	◆ CPU thermal sensor,
	◆ I/O connectors,
	◆ Power management control circuit,
	◆ Internal Graphic/Display controller,
	◆ Keyboard Controller,
	◆ Audio analog signal,
	◆ Power control, DC/DC,
	◆ IR transmit & receive signal
	◆ Battery power
	◆ Regulated power
	◆ SM bus for Battery
	◆ Indication Charger LED

7.2.2. DC/DC SPECIFICATION

- Controller: MAX1987ETM, LTC3728LX, TPS5130, RT9173, SI9183DT, MAX1909, MIC5233BM5,
- Input Voltage: 11 ~ 20 V

Output voltage/current:

Voltage	Current	Ripple	Regulation
+5V	3A	70mV	+5%
+5VS	3A	70mV	+5%
+3V	1A	50mV	+5%
+3VS	4A	50mV	+5%
+12V	10mA	50mV	+5%
+12VS	10mA	100mV	+5%
+3VALWAYS	50mA	50mV	+5%
+5VALWAYS	50mA	70mV	+5%
+5VSUS	100mA	70mV	+5%
+3VSUS	1A	70mV	+5%
+VCCP	1A	50mV	+5%
+1.25VS	1A	30mV	+5%
+1.5VS	6A	70mV	+5%
+2.5V	5A	70mV	+5%
+2.5VS	200mA	70mV	+5%
+VCORE	27A	50mV	+3%
+VCC_GMCH_CORE	4A	50mV	+5%

Table 7.2.2 Output Voltage & Current

- Support OVP
- Support OCP
- Frequency: 80~600KHz

7.2.3. CHARGER SPECIFICATION

- Controller: MAX1909
- Input voltage: 19.0~20V
- Charger Method: CV.CC
- Li-Ion Battery:
- Full charger sense I min.: 300mA
- Max. charge voltage : 4.20V/cell
- Charger Voltage: 16.6~17.0V
- Charger current:

Input: Adapter			
Contain	Min.	Typical	Max.
Charge current (4S2P)	2.4A	2.5A	2.6A
Charge current (4S1P)	1.15A	1.25A	1.35A
Ripple & Noise	~ 500 mV		
Efficiency	~ 90 %		

Table 7.2.3 Charger Current

7.3. INVERTER BOARD SPECIFICATION

- Input voltage: 12~20V
- Output current: 6.5mA(max)
- Start voltage: 1500Vrms(min)
- Efficiency: 80%(min)
- Brightness adjusted by input voltage.
- Support output short protection
- Frequency: 45~60KHz
- Output connector for CCFT:

Pin No.	I/O	Description
1	Input/ Output	Return
2	Input/ Output	High voltage

Table 7.3.0 Output Connector Pin Assignment

7.4. ADAPTER SPECIFICATION

7.4.1. INPUT

- Input voltage: 90~264VAC, Full range
- Input frequency: 47~63Hz
- Input current: 1.5A(max)/100VAC
- Inrush current: No damage
- Efficiency: 85%(min)

7.4.2. OUTPUT

- 65W power output
- Output Voltage/Current: 18.05~19.95V/3.42A
- Ripple: $\leq 350 \text{ mV}_{p-p}$

*Performed by 20M Hz bandwidth in oscilloscope.

*Applied with 0.1uF ceramic capacitor and 10uF tantalum capacitor across output connector terminals.

7.4.3. PROTECTION

- OVP: 29V(max)
- SCP: Yes
- OCP: 5.0A(max)

7.5. BATTERY SPECIFICATION

- Battery warning and low percentage (Li-Ion):
 Battery low = 10%
 Battery low low= 5 %
- Gauge controller (BQ2060H) setting:
 Charging voltage: 16.8V
 Charging efficiency: 90%
 Low temperature capacity: 70%

	Vendor	Cells	Voltage	Capacity	Watts
Li-Ion	Samsung	8	14.8V	4800mAh	71.04W
Li-Ion	Samsung	4	14.8V	2400mAh	35.52W

Table 7.5.0 Battery Pack Capacity

8. Miscellaneous

8.1. Indicators

Power & DJ LED

Feature:	Show System power status
Type:	2.0x1.5x1.1mm
Color:	Blue
Indication:	On: System in ON Mode Flash (0.3Hz): System in SUSPEND Mode Off: System in OFF Mode
Location:	LED Board (in top of system)

Charge LED

Feature:	Show Battery status
Type:	2.0x1.5x1.1mm
Color:	Orange
Indication:	On: Battery in Charging Flash (0.5Hz): Battery Low Off: Battery is fully charged or absent
Location:	LED Board (in top of System)

Email LED

Feature:	Show Receive mail status
Type:	2.0x1.5x1.1mm
Color:	Blue
Indication:	On: Receive mail Off: No mail status
Location:	LED Board (in top of System)

WLAN & BT LED

Feature:	Show Receive mail status
Type:	2.0x1.5x1.1mm
Color:	Yellow
Indication:	On: RF on Off: No status
Location:	LED Board (in top of System)

Hard Disk Drive LED

Feature:	On: While HDD Read/Write access
Type:	2.0x1.5x1.1mm
Color:	Green
Location:	LED Board (in top of System)

Caps LOCK LED

Feature:	On: While CAP Lock activate
Type:	2.0x1.5x1.1mm
Color:	Green
Location:	LED Board (in top of System)

Num LOCK LED

Feature:	On: While Num Lock activate
Type:	2.0x1.5x1.1mm
Color:	Green
Location:	LED Board (in top of System)

8.2. Power cord list

Where	Description	Vendor
US	P-CORD 1.8m 125V 7A UL 2-PIN WS-027-T	Well shin
UK	P-CORD 1.8m 250V 2.5A UK 2-PIN WS-027-T	Well shin
Japan	P-CORD 1.8m 125V 7A T-MARK 2-PIN WS-027-T	Well shin
Europe	P-CORD 1.8m 250V 2.5A EUR 2-PIN WS-027-T	Well shin
Austria	P-CORD 1.8m 250V 2.5A AUS 2-PIN WS-027-T	Well shin
South Asia	P-CORD 1.8m 125V 7A WS016+WS027 WS-027-T	Well shin

8.3. Safety/ EMI Appliance (TBD):

EMI	Europe (CE),USA (FCC Class B),Canada (ICES-003), Japan (VCCI), Taiwan (BSMI), Australia (C-Tick), China (CCC), Singapore (IDA)
Safety	Europe (CE), USA and Canada (UL / CUL), Europe (TUV), Taiwan (BSMI), China (CCC), Universal (CB)
Telecomm	FCC Part 68 (USA), DOC (Canada), JATE (Japan)