

☐ Product System (PS)

Subject:	C2-201 Product Internal Engineering Spec.	Part No.:	99.K4501.000	Rev.:	0
		Doc. No.	99.K4501.000-C2-201-001		
Project Code:	99.K4501.001	Component Part.	NA	Page	1 of 28
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Model Name:	DHS5				

Joybook [DHS52](#) Product Engineering Specification

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1. Introduction

1.1 Scope

This document define the **DHS52** (project name **Aphid**) engineering specification in EE/SW/ME and reliability definition.

1.2 Product Objective

DHS52 (project name **Aphid**) is the BenQ Joybook series model and its target market is on the **consumer** field. And the major EE/ME/SW feature are leveraged **Quincy ED2 model** to meet short schedule and variable market environment.

1.3 Function

DHS52 is designed with **2 spindles** system. There are HDD, ODD devices in one system. These devices **can not be removed** by end user but could be easy to maintain. The **DHS52** system supports **13"**, **WXGA 1280X768** LCD panel.

Feature Summary	
Processor	Intel u-FCPGA Dothan 90nm 2M L2, 533MHz FSB
Chipset	Intel 915GM North Bridge ICH6-m South Bridge
Memory	2-slots, DDR 333 SDRAM
Display	13" WXGA TFT LCD
Video	UMA graphic integrated by Intel 915 GM Shared system memory for 64MB dynamic VRAM
1	HDD: 4200RPM/40GB; 5400RPM/40/60/80GB ODD: DVD ROM/Combo /DVD Dual / DVD super Multi
Card Reader	4 in 1 card reader MS,SD,MMC and XD card
KB/IO Controller	NS PC97551
1394	TI IEEE1394 PCI7411
USB	2 ports USB 2.0 function integrated by ICH6-m

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LOM	Realtec RTL 8100CL
Audio	Conexant SmartAMC 20551-27P2
Pointing Device	Touch Pad with two buttons
MODEM	Conexant Modem solution on board
K/B	Internal K/B
Wireless	Mini-PCI 802.11b+g/802.11 a+b+g ** Option module
Power	65 Watt AC Adapter
Battery battery	6 Cell Li-Ion main Battery Pack
IO port	VGA
	RJ45
	RJ11
	PCMCIA typeII *1
	1394
	FIR
	USB2.0 *2
	Headphone out,Mic jack
	DC jack
	*Port Replicator
	--PS2/DC jack/VGA/RS-232/Printer Port/USB*2/RJ45/Ear Phone

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2. Applicable Documents

2.1 BenQ Documents

WI of BenQ Std. of Notebook Reliability design guideline
Joybook ME standard test plan & Procedure
BenQ appearance specification

2.2 Other Documents

ACPI 1.0b or higher
PCI v2.2
Microsoft MDA 2003
AGP V3.0
PnP BIOS 1.0a
PXE 2.0
Window Logo program 2.1a

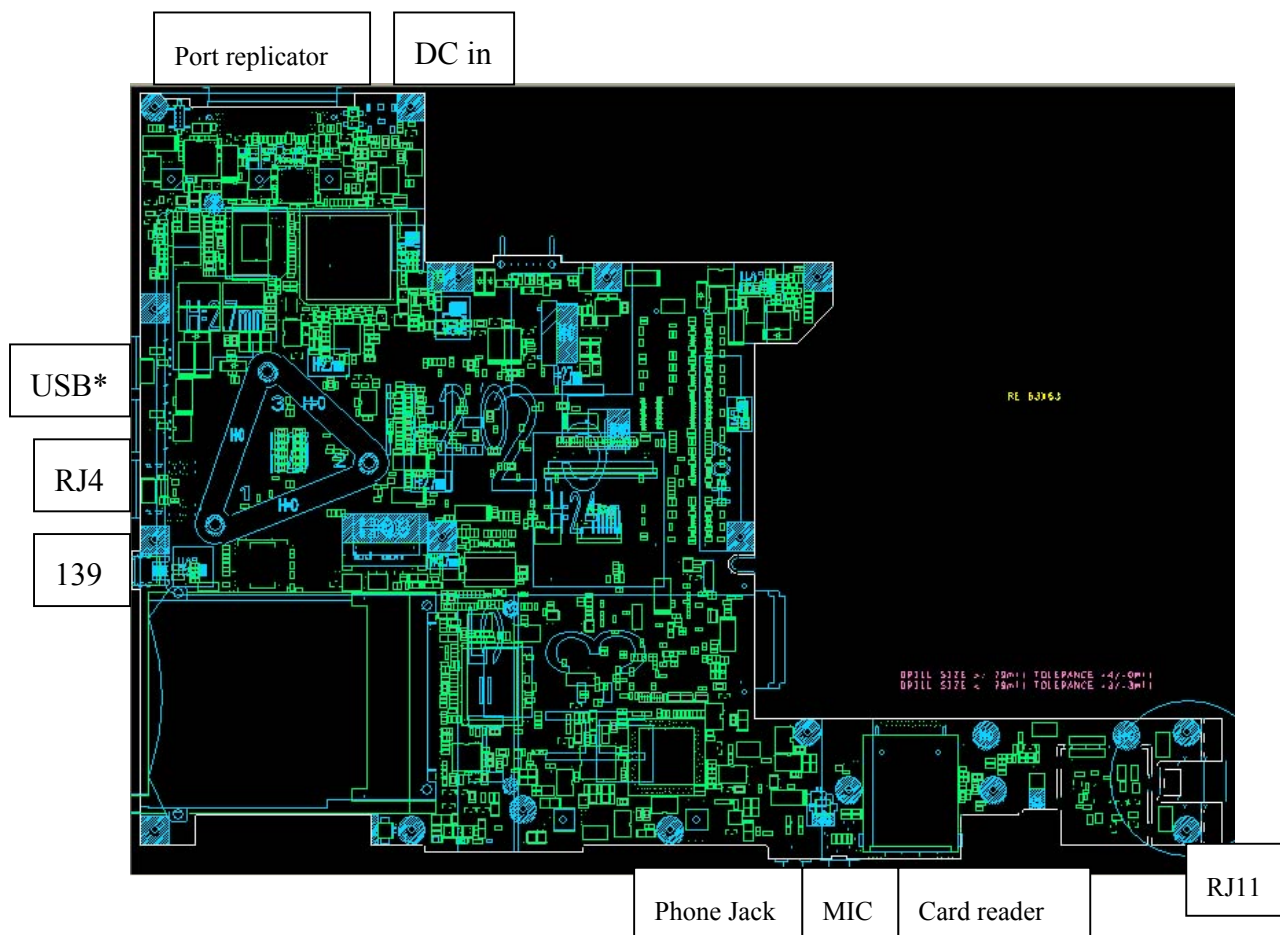
3. Requirement

3.1 HW requirement

The picture shows the Joybook DHS52 I/O ports and main board architecture

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CPU (Intel Pentium M Processor)

Functions	Description	Remark
Package	Micro - FCPGA; 90nm	
Features	<ul style="list-style-type: none"> * On die 32KB instruction cache * On die 32KB write-back data cache * On die L2 2MB cache * Advanced GTL+ bus driver technology * Support streaming SIMD extensions 2(SSEE2) * Dynamic power down of data bus buffers * Support host bus dynamic bus inversion(DINV) 	1.6GHz, 1.73GHz, 1.56GHz, 2.0GHz, 2.13GHz
Voltage	Core = 1.34V to 0.94V VCCA = 1.8V VCCP = 1.05V	

North Bridge (Alviso - Intel 915GM)

Functions	Description	Remark
Package	Micro – FCBGA	37.5mm X 40mm
Voltage	<ul style="list-style-type: none"> * VCC = 1.05 V (Core power) * VCCADAC = 1.5 V (DAC Power) * VCCDVO = 1.5 V (DVO power) * VCCDLVDS = 1.5 V (LVDS Power) * VCCGPIO = 1.5 V (GPIO Power) * VCCHL= 1.5V (Hub Interface Power) * VCCQSM= 2.5V (System Memory Clock power) * VCCSM= 2.5V (Memory IO Power) * VCCTXLVDS= 2.5V (LVDS Data/Clk TX Power) 	
Features	<ul style="list-style-type: none"> * support processor host bus at 400/533Mhz * support 32-bit AGTL+ host bus addressing * support up to two DDR/DDR2 channels (64-bits) * support 128MB(Min.)/2GB(Max.) * support DDR 333 and DDR2 400/533 devices * Integrated one x16 PCI Express Interface * Support traditional PCI/AGP style traffic 	

South Bridge (ICH4-M - Intel 82801DBM)

Functions	Description	Remark
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Package	BGA	31mm X 31mm
Voltage	<ul style="list-style-type: none"> * Main logic voltage = 1.5V * VCCSUS1_5 = 1.5V (resume logic voltage) * VCCLAN1_5 = 1.5V (LAN logic voltage) * VCC3_3 = 3.3 V (main I/O) * VCCSUS3_3 = 3.3 V (resume I/O voltage) * VCCLAN3_3 = 3.3 V (LAN I/O voltage) * V5REF = 5 V * V5REF_SUS = 5V * VCCRTC = 3.3 V * VCCHI = 1.5 V * VCCP = 1.05 V 	
Features	<ul style="list-style-type: none"> * PCI one x4 Express Interface * PCI 2.3 (7PCI bus masters supported) * Serial ATA(SATA) Controller (two port) * Bus Master IDE (PATA) Controller (two devices) * USB 1.1 and 2.0 host controllers * LAN controller via LAN connect interface * System management bus (SMBus) 2.0 controller * AC 97 2.3/Azalia link controller (up to 6channels) * LPC / FWH interface * Advance programmable interrupt controller (APIC) support * Build in Real time clock (RTC) * IRQ Controller 	

Clock Generator (ICS ICS954206)

Functions	Description	Remark
Package	56-pin TSSOP	
Frequency	<ul style="list-style-type: none"> *100Mhz~400Mhz for CPU and North Bridge *100Mhz for North Bridge, South Bridge, SATA, all of PCI Express Devices *96Mhz for DOT *48Mhz for ICH6 USB, 4in1 card reader of PCI7411 *33Mhz for all of PCI devices *14.318Mhz for South Bridge, Audio AC97,Super I/O 	
Features	*Support spread spectrum modulation, down spread 0 to -0.5%. (CPU, 3V66, PCI)	

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	*Efficient power management scheme through PD#, CPU_STOP# and PCI_STOP#	
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System Memory

DHS52 supports **DDR333** SDRAM two 200 pin SO-DIMM socket for expansion with 128MB, 256MB, 512MB, 1GB DDR SDRAM Module. It can achieve total 128MB/2GB system memory. VGA shares memory with system memory. Minimum from 8MB and maximum up to 64MB

Display Subsystem (QDI QD13WL01)

DHS52 supports **QDI QD13WL01 13"** wide color TFT LCD. The screen format is intended to support the WXGA [**1280(H)x768(V)**] screen and 262k colors (RGB 6-bits data driver). All input signals are LVDS interface compatible.

Brightness Requirement:

Min.	30 nits
Max.	Depend on LCD 150~200 nits
Default:	Max.
Auto Dim:	-1 step

CardBus/IEEE-1394/Media card reader controller (TI PCI7411)

Functions	Description	Remark
Package	288-terminal MicroStar BGA	
Voltage	Powered at 1.8V/2.5V for core logic, and 3.3V for other	
Features	*PCI bus, bus master support. *Support serial IRQ interrupt. *Support the four widely used small form factor flash media formats. *Physical and Link Function *Implements PCI Burst Transfers and Deep FIFOs to Tolerate Large Host Latency *Supports Serial Bus Data Rates of 100, 200 and 400 Mbits/second	

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PC card power controller chip (TI TPS2220)

Functions	Description	Remark
Package	SSOP-24 pin package	
Voltage	3.3V, 5.0V, 12V	
Features	Support 3V, 5V, 12V to PCMCIA socket	

LAN (Reltec RTL8100CL)

Functions	Description	Remark
Package	128 pins LQFP	
Power	2.5V, 3.3V	
Features	10/100Mbps Ethernet	
RJ45 LED indicator	<ul style="list-style-type: none"> • Green On: When plug Ethernet cable into this LAN module. • Green Off: When take off Ethernet cable from this LAN module. • Green Blinking: When data TX/RX data transfer to other one Ethernet module. • Orange On: When working on 100M speed. • Orange Off: When working on 10M speed. 	

Bluetooth (Wistron 92035 USB)

Functions	Description	Remark
Package	Mini USB Embedded Blue tooth module	
Frequency range	2.402– 2.480 GHz	
Power	3.3V	
Features	<ul style="list-style-type: none"> *Blue tooth 1.1 qualified Embedded USB Module *Upgradeable to Blue tooth 1.2 when SIG specification is ratified *Extremely small size (26mm X 14mm) *Class 2 specification RF output power (max +4 dBm) *Full Blue tooth data rate (723 kb/s) *USB 2.0 compliant interface *LED indicator built-in Label 	

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Modem (Conexant Standard MDC modem module)

Functions	Description	Remark
Package	28 pins QFN on board	
Power	3.3V	
Features	*Support V.92/V.90 analog receive data up to 56kbps with V.44 data compression *Fax modem with send and receive rate up to 14.4kbps *Data compression and error correction *telephony / Voice / TAM Data / Fax / Voice call discrimination *Worldwide operation including U.S / Japan / Canada	

Power Controller and Keyboard controller (NS PC97551)

Functions	Description	Remark
Package	176 pins TQFP	
Power	3.3V operation with 5V tolerant buffers	
Features	*16-bit embedded RISC processor *Host bus interface (KBC, PM) *PS/2 interface *Hold function *Shared BIOS memory *Fully ACPI compliant	

Super I/O controller (SMSC LPC47N217)

Functions	Description	Remark
Package	64 pins TQFP	
Power	3.3V operation with 5V tolerant buffers	
Features	*LPC bus interface:	

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	<p>Synchronous cycles, up to 33Mhz bus clock</p> <p>8-bits I/O cycles</p> <p>Up to four 8-bits DMA channels</p> <p>*PC2001 and ACPI Compliant:</p> <p>PnP configuration register structure</p> <p>15 IRQ routing options</p> <p>*Parallel interface support:</p> <p>An Enhanced Parallel Port (EPP) compatible with EPP 1.9 also supports version EPP1.7 of the Xircom specification</p> <p>An Extended Capabilities port (ECP)that is IEEE 1284 compliant .</p> <p>*UART serial port interface:</p> <p>High speed UART with send/receive 16 byte FIFOs.</p> <p>Support data rate up to 1.5M baud</p> <p>*Fast Infrared support:</p> <p>IrDA 1.1 compliant, HP-SIR, ASK-IR, Consumer IR Support</p>	
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BIOS ROM (SST SST39VF080)

One 40-pins SSOP package 8Mbits FLASH ROM SST39VF080 is used for BIOS, keyboard encoder and power controller codes. It occupies system memory area E0000-FFFF. After posting system, the shadow RAM function will be enabled.

Functions	Description	Remark
Package	SSOP 40-Lead	
Voltage	3.3V	
Features	<p>*1024KX8 CMOS Boot Block Flash Memory</p> <p>*256 bytes per block</p> <p>*Supply current Icc =30mA (Max)</p> <p> Iccsb=5uA (Max)</p>	

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Audio CODEC ([Conexant CX20551](#))

Functions	Description	Remark
Package	48 pin TQFP	
Voltage	3.3V digital and 5V analog	
Features	<ul style="list-style-type: none"> *AC '97 Revision 2.3-compliant audio/modem codec using SmartDAA technolog *3.3 V analog and I/O operation; uses Vaux for power management modes *Sony Philips Digital Interface (S/PDIF) output *Meets performance requirements for audio on PC2001 systems *Choice of 3 DAC channels for 2.1 audio configuration support or 6 DAC channels for 5.1 audio configuration support *One ADC supports stereo microphone recording *Supports audio formats ranging from 16-bit, 48 kHz to 24-bit, 192 kHz 	

Audio Amplifier ([Maxim 9755ETI+](#))

Functions	Description	Remark
Package	24-Pins Thin-QFN	
Voltage	2V~5.5V	
Features	<ul style="list-style-type: none"> *PC2001 Compliant *High 90 dB PSRR *Selectable Gain settings *Thermal shutdown protection circuitry 	
Power Output	2.6 W(typical) for stereo BTL Speaker amplifiers	

Speaker ([YUNGTECH 2514CP-5](#))

Functions	Description	Remark
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Dimension	25.0*14.0*6.0 mm	
Magnet	Materials Rare Earth, Size, $\Phi 7.5 \times 1.0\text{mm}$	
Impedance	$4\Omega \pm 15\%$ at 1000Hz	
Frequency Range	550Hz ~ 18 KHz Average SPL -10dB	
Lowest resonant frequency	600 Hz + 20%	
Power Rating	Normal 1500mW; Maximum 2000mW	
Output sound pressure level (S.P.L)	$78 \pm 3\text{dB} / 1.0 \text{ Watt} \cdot 1\text{Meter}$	

Thermal Sensor ([Maxim 6657](#))

Functions	Description	Remark
Part name	Maxim 6657	
Package	SOIC 8 pins	
Interface	SMBus / I2C bus	
Function	Thermal sensor with over temperature indication	

AC Adapter:

[Delta SADP-65KB BFB](#)

[Lite-On PA-1650-02BQ](#)

65W or above universal AC adapter 90-264V AC, 47-63HZ

3-wire power cord and DC output cable

L connector to system box

Over-voltage protection: Trip point 24V (max.) shutdown.

Over-current protection: Output shorted without damage

Wire from adaptor to system should be at least 1.6m; from AC to adaptor at least 1.6m

Input characteristics:

Functions	Description
Input voltage	100 ~ 240V AC
Input frequency range	50 ~ 60 Hz
Maximum input AC current	1.6A
Inrush current	50A@115VAC 100A@230VAC

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Efficiency	83% min. @115VAC input full load
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Output characteristics:

Output Voltage	Load range		Regulation	Ripple & Noise
	Minimum	Maximum		
+19V	0A	3.42A	+5%	400mVp-p

RTC battery:**Specification :** [Maxell ML1220](#) Rechargeable LiIon battery**Normal capacity** [14](#) mAhr**Normal voltage** 3.0 V

3.2 SW requirement

(The detail description should refer to SW spec. directly and this one should focus on the SW marketing spec. for example, OS edition/Language, bounlded AP,LED/Hot-key definition, specification etc.)

Target Operating Systems

BenQ will offer support for the following operating systems:

- Require Windows XP (Home Edition)
- Require Windows XP (Professional Edition)

System Management BIOS (SMBIOS)

DHS52 BIOS must support the SMBIOS BIOS Specification version 2.3 (formerly DMI BIOS). Customer requires only the subset of SMBIOS functions and structures that are listed as required in the SMBIOS specification, and as required by the PC2001 specification.

SMBIOS specification.

Note SMBIOS in DHS52 must provide 32-bit entry table in F000 Segment to be PC99+ compliant, also this is the preferred method, since Plug and Play interface will eventually go away and new OS do not handle 16-bit interfaces well.

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Type 0: BIOS Information

Field	
BIOS Version	The BIOS version is defined in the “BIOS Version Numbers” section of this document

Type 1: System Information SMBIOS

Field	
Manufacturer	BenQ
Product Name	Joybook S52
Version	TBD
Serial Number	24 bytes
UUID	16 bytes

Type 2: Base Board Information SMBIOS

Field	
Manufacturer	BENQ
Product Name	Joybook DHS52
Version	
Serial Number	N/A

Security

Security features protect the data of machine from unveiled publicly and unauthorized access. BenQ will provide the security features outlined in this section.

BenQ provides a two-level password security scheme stored in a non-volatile storage device (EEPROM).

- Supervisor password.
- User Password.

The password, if set, is required to gain access to the Setup utility, and to boot the system.

The difference between the two password levels only exists when executing the Setup utility.

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Using the administration password to enter the Setup utility allows the user to access all the configurable fields. Whereas using the user password only allows the user to configure a limited number of fields.

DHS52 also provides a H/W solution to reset or bypass password.

Secured data is kept in a non-volatile storage device (EEPROM). The entire data structure of secured data in the non-volatile storage must be verified with a checksum calculation.

Others follow Third party BIOS's Security specification.

Serial Number (S/N)

The Serial Number string will be stored in the secured data area. The S/N will not be displayed in BIOS SETUP menu. The S/N is an alphanumeric string of 24 bytes in length. The rule of S/N is: P/N (10 bytes) + Year (1 bytes) + Week (2 bytes) + series No (5 bytes) + model (6 bytes). The following is an example of the string representation of S/N: 99K0502T0131500001DHS52.

Model ID String (for SLP)

On BenQ System has a specific text string embedded in BIOS ROM F000:FFB0h. It will be identified the model and BIOS version by diagnostic program and flash utility. The format is as below:

B0 B1 B2 B3 B4 B5 B6 B7 B8 B9 BA BB BC BD BE BF
B e n Q H u b

System Meter

DHS52 should provide 3 bytes in CMOS and the default value is 0. It will auto count the hour of usage when boot to OS. The format is Hour(2 bytes): Min(1 byte)
System cannot reset its value.

Debugging

Basic unit problem analysis will be provided through the use of POST and runtime checkpoint codes output to I/O port 378h.

Auto Dim

The system will support an automatic dimming of the LCD backlight when the AC power source is NOT available (running on battery power).

The user may always manually increase or decrease the brightness, including to full maximum setting.

The current user setting of brightness (along with current power source) will be saved, and the brightness setting will be restored to the user's set level at the next boot or resume.

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Under Ac mode, if user plugs out AC, it will decrease one step automatic. After user plugs in the AC, it will increase one step. There are two special cases that KBC should take care.

- **DC mode and set maximum of brightness**
Don't change the brightness level when AC in. It shouldn't decrease when user plugs AC out.
- **AC mode and set the minimum of brightness**
Don't change the brightness when AC out. It shouldn't increase one step when user plugs AC in again.

Boot Block

DHS52 BIOS provided Crisis mode to support Boot Block function provides a safe solution to recover system BIOS in case of BIOS code in flash memory is corrupted. There are two ways to enter Crisis Mode:

- BIOS corrupted, Boot Block function will enter Crisis mode automatically
- Plug Bootblock board into print port to force Boot Block function to enter Crisis mode.

POST

POST Logo

The logo should be displayed on the screen during POST. It is a colored bitmap (800*600*256 color) and the background should be black. When there is an error occurred, BIOS closes the logo and switches to text mode to display the error message.

BIOS support ESC key for Popup Boot Menu during POST.

POST Error

If the CMOS checksum is bad, the BIOS should load the default values.

Fast POST

BenQ will comply with the *Microsoft Simple Boot Flag Specification v1.0/v2.0*. In that document, two types of boot sequences are defined.

Boot Device Sequence

BIOS will provide the user with the ability to select the devices for attempting to boot an OS. The user will be able to specify which system device will be attempted 1st, 2nd, and so on. During Post, user can also use the "ESC" to select the boot device, and user press the "F10" to enter recovery partition and run recovery program.

The list of possible boot devices sequence will include:

- USB Floppy
- Primary Hard Drive (built-in)
- CD-ROM Drive
- Network (PXE) for built-in LAN

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Boot From LAN

The systems of BenQ has the internal LAN card, booting the system from the network could be done by:

- Specify the network as the first boot device.
- At post, user could change the system boot from network. It depends on Third party BIOS's design.

SVID and SSID of PCI device

BIOS should program the Subsystem Vendor ID and Subsystem ID into the PCI configuration space for each PCI device. The Subsystem Vendor ID will be 17ffh for all devices. The Subsystem ID will be 058bh.

Keyboard Hot Keys

A Message(BenQ Hotkey Manager) will be show when the hot key is activated (as noted in the below table), to indicate to the user that the selected action has been performed.

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**Table1.
Definition**

Function	Hot Key
Function	Hot Key
Hotkey Help	Fn+F1
Sleep	Fn+F2
LCD/CRT switch	Fn+F3
Brightness Down	Fn+F4
Brightness Up	Fn+F5
TouchPad ON TouchPad OFF	Fn+F6
Speaker ON/OFF	Fn+F7
Volume Down	Fn+F8
Volume Up	Fn+F9
QPower switch	Fn+F10
Bluetooth and Wireless on/off	Fn+F12

Hot Key

In spite of those hot keys printed on keyboard, there are some special buttons in system of BenQ. Following is the description.

Hotkey Function	Make/Break	
	Ps2 Set1	Ps2 Set2
IE (Internet/QMedia XS)	E0 32/ E0 B2	E0 3A/ E0 F0 3A
Email (E-mail)	E0 6C/ E0 EC	E0 48/ E0 F0 48

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Table2. Special Key Definition

There are 2 buttons for user easy to launch the Windows application. They will not support user define.

Power-on Button

Power-on button on system, when Power-on button is press, system will enter Windows environment or turn off windows when system is in windows mode.

Indicator at the upper side of keyboard

Following table is the descriptions of the detail behavior of the LED indicator at the upper side of keyboard:

Power On/Off/Standby	
Color: Blue + Amber Dual color LED	Description: Blue LED on = System fully on Amber LED on = System in Standby mode
HDD access	
Color: Blue	Description: Flash when access
ODD access	
Color: Blue	Description: Flash when access
Num Lock	
Color: Blue	Description: On when enabled
Caps Lock	
Color: Blue	Description: On when enabled
Scroll Lock	
Color: Blue	Description: On when enabled

Table5. LCD Indicator at the upper side of keyboard

Indicator at the bottom edge

Battery Charging (turn off in S3/S4 DC only mode)	
Color: Blue + Amber Dual color LED	Description: Blue LED on = When battery is in use for system on Blue LED blinking = When in low battery

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	Amber LED on = When battery charging Amber LED blinking = When battery is abnormal Both LED off = When battery is fully charged
Memory Card reader access	
Color: Blue	Description: Flash when access
Kill switch RF LED (Wireless LAN/Bluetooth)	
Color: Blue + Amber Dual color LED	Description: Blue LED on = Wireless LAN enable Blue LED off = Wireless LAN disable Amber LED on = Bluetooth enable Amber LED off = Bluetooth disable

Table6. LCD Indicator at the bottom edge

Power Management

Power management is controlled by an ACPI capable operating system.

ACPI Mode

In the ACPI system, ACPI OS take care all the Power states of the Device and system.
BenQ required power states:

- Working (S0)
- Standby (S3)
- Hibernate (S4)
- Soft Off (S5)

Definition of these states is provided in the *Advanced Configuration and Power Interface Specification, ACPI Ver1.0b or ACPI Ver 2.0*.

Event	Comments		
	S3	S4/S5	

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RTC Alarm	Yes	Yes	
Power on Button	Yes	Yes	
Lid open	Yes	No	

WOL	Yes	No	This Event is implemented via PME# Support WOL under battery and Adaptor
Onboard Modem Ring	Yes	No	This Event is implemented via PME# Support WOR under battery and adaptor
PCMCIA Modem Ring	No	No	
USB	No	No	
Battery Critical	Yes	No	This event should wake the system to Full ON then notify the OS of the Battery Critical event
TouchPad	No	No	
Keyboard any key	Yes	No	

Table7. ACPI Wake up Event

The following ACPI power management events will be recognized by the unit and the event must be reported to the OS:

- **Battery Critical**
- **Lid Open**
- **Lid Close**
- **Power Button**
- **Sleep Button**
- **AC/DC Change**
- **Battery inserted/removed**
- **Critical thermal threshold crossing (up or down)**

Following event will let system enter either Standby or Hibernation mode, depend on other setting:

- **Power Button (Either S3 or S4, depend on user's setting)**
- **Sleep Button (Either S3 or S4, depend on user's setting)**
- **Standby Timer**

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- **Hibernation Timer**
- **Standby/Hibernation entry in Start / Shut down**

Thermal Management

DHS52 BIOS will support ACPI Thermal management, the Thermal Zone and Cooling control is defined as following table. Note the ACPI BIOS should support a thermal control method as the following:

Object	Description
_CRT	Returns critical trip point in tenths Kelvin
_PSL	List of pointers to passive cooling device objects
_PSV	Returns Passive trip point in tenths Kelvin
_TC1	Thermal constant for Passive cooling
_TC2	Thermal constant for Passive cooling
_TMP	Returns current temperature in tenths Kelvin
_TSP	Thermal sampling period for Passive cooling in tenths of seconds

Table8. Thermal Control Methods

The following table is recommended for ACPI thermal management:

FanControl -		
temp raise	temp fall	
	< 40	Fan off
48-> 55	46 -> 41	Low Speed 3.2V
56 -> 63	54 -> 47	Mid Speed 3.6V

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> 64		High Speed 4.2V
< 74		Normal
> 74		Throttling by OS
> 95		OS shutdown
> 105		EC shutdown
> 110		Thermal shutdown

Table9. Thermal table

The CPU temperature over thermal threshold, EC will generate a thermal SCI and control methods should take the right actions.

Legacy Devices and Standards

Flash Update

The BIOS provide diskette-based BIOS update utility, include Boot Block with Crisis detect and recovery. The BIOS update utility must be executed from the diskette. When booting to the diskette, the BIOS update utility must automatically execute.

The BIOS update utility must contain an identification mechanism that will identify the correct machine for which it is intended and execute only on that machine. The BIOS update utility must not execute on any other machine.

- The utility need to check model ID to decide to update BIOS or not.
- The utility can run under Windows 2000 and Windows XP.

Additional BIOS Requirement

CMOS/ECMOS Map: The BIOS supply a document that contains definitions for all of the CMOS/ECMOS addresses that are used by the BIOS. The BIOS also supply a list of default values for the CMOS/ECMOS variables.

EEPROM programming tool

For use in service centers, UUID and MAC address programming tools should be provided.

3.3 ME requirement

(The detail decription should follow ME document and focus on the marketing spec.)

DHS52 should follow ME “BenQ appearance specification”, “BenQ accoustic test plan” and “BenQ ME test plan” document

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Dimension : 324(mm) x 227.6(mm) x24.9~34.6(mm)
Weight:2.25Kg

Acoustic Noise:

Please follow ME Acoustic noise test plan and spec.

Condition	Declared Sound Power Level , bels	Average Sound Pressure Level , dBA
Idle: Fan off and HDD spinning	3.5	28
Operation: Fan off and HDD random seeks	3.8	31
Idle with Battery Charging: Fan on and HDD spinning	3.9	32
Typical User Running Prime95 Software: Fan on and HDD spinning	4.2	35
Operation: File copy from FDD to HDD	4.7	40
Operation: CD-ROM perform RANDOM ACCESS (average time: 32 sec) operation and the other storage equipment standing by.	4.7	40
Operation: CD-ROM perform RANDOM ACCESS (average time: 32 sec) operation and the other storage equipment standing by.	4.7	40

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4. Document & Change

When any of the above documents are revised the vendor will provide the detail update documents to BENQ and BENQ will have the right to copy any of the above documents.

5. Acceptance Criteria

Any vendor supplying subsystem units should satisfy BENQ “Joybook OQC Checklist” & meet “MIL-STD-105E” requirement.

6. Regulatory

EMC: CE,BSMI, C-Tick

Safety: CCC, CB, SASO

RF: DGT, SRRC, iDA_SIRIM, C_Tick, follow R & TTE

ESD (Basic spec. IEC61000-4-2):(Base on the supplier)

■ Air discharge

+/- 4KV: No error

+/- 8KV: No restart error and damage error

+/- 15KV: No damage error

■ Contact discharge

+/- 4KV: No error

+/- 6KV: No restart error and damage error

+/- 8KV: No damage error

7. Reliability, Maintainability & Quality

7.1 Reliability

MTBF meantime between failures (or meantime to failure)

Expected mean power-on time is 200 hours per month.

The subject products must have a minimum MTBF of **25,000** hours, for the standard configuration.

7.2 Maintainability

Any faulty system, system element or system element subassembly should be replaceable.

Replacement of electronic components is not a field procedure, though it may be used at a manufacturing plant or repair facility.

7.3 Quality

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The product quality must meet the requirements of BenQ's Joybook reliability test requirements.

8. Environmental requirements

(Refer to the requirement of "BenQ ME Standard Test Plan and Procedure")

9. Performance

Battery life

BatteryMark4.0.1 test :

6-cell Battery

Above 4 hrs (Dothan 1.73GHz)

3DMark2001SE test: (CPU Dothan 1.73GHz)

Above 3808score

3Dmark2003 test: (CPU Dothan 1.73GHz)

Above 863 score

Business winstone2004 test : (CPU Dothan 1.73GHz)

Above 22.3 score

MCC Winstone 2004 test : (CPU Dothan 1.73GHz)

Above 23.8 score

10. Compatibility

The **DHS52** must be compatible with the IBM PC/AT computer system. It must be able to run **MS-DOS6.22, Win ME and Win XP SP2**. And Apply MS combined logo.

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