

**Toshiba Personal Computer
Satellite P300
Maintenance Manual**

TOSHIBA CORPORATION

File Number 960-Q08

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Toshiba Personal Computer Washington- Satellite A300 Maintenance Manual

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer Satellite A300 Series.

The procedures described in this manual are intended to help service technicians isolate faulty Field Replaceable Units (FRUs) and replace them in the field.

SAFETY PRECAUTIONS

Four types of messages are used in this manual to bring important information to your attention. Each of these messages will be italicized and identified as shown below.

DANGER: “*Danger*” indicates the existence of a hazard that could result in death or serious bodily injury, if the safety instruction is not observed.

WARNING: “*Warning*” indicates the existence of a hazard that could result in bodily injury, if the safety instruction is not observed.

CAUTION: “*Caution*” indicates the existence of a hazard that could result in property damage, if the safety instruction is not observed.

NOTE: “*Note*” contains general information that relates to your safe maintenance service.

Improper repair of the computer may result in safety hazards. Toshiba requires service technicians and authorized dealers or service providers to ensure the following safety precautions are adhered to strictly.

- ❑ Be sure to fasten screws securely with the right screwdriver. If a screw is not fully fastened, it could come loose, creating a danger of a short circuit, which could cause overheating, smoke or fire.
- ❑ If you replace the battery pack or RTC battery, be sure to use only the same model battery or an equivalent battery recommended by Toshiba. Installation of the wrong battery can cause the battery to explode.

The manual is divided into the following parts:

- Chapter 1 Hardware Overview describes the Satellite A300 system unit and each FRU.
- Chapter 2 Troubleshooting Procedures explains how to diagnose and resolve FRU problems.
- Chapter 3 Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.
- Chapter 4 Replacement Procedures describes the removal and replacement of the FRUs.
- Appendices The appendices describe the following:
 - Handling the LCD Module
 - Board layout
 - Pin assignments
 - Keyboard scan/character codes
 - Key layout
 - Wiring diagrams
 - BIOS Rewrite Procedures
 - EC/KBC Rewrite Procedures
 - Reliability

Conventions

This manual uses the following formats to describe, identify, and highlight terms and operating procedures.

Acronyms

On the first appearance and whenever necessary for clarification acronyms are enclosed in parentheses following their definition. For example:

Read Only Memory (ROM)

Keys

Keys are used in the text to describe many operations. The key top symbol as it appears on the keyboard is printed in **boldface** type.

Key operation

Some operations require you to simultaneously use two or more keys. We identify such operations by the key top symbols separated by a plus (+) sign. For example, **Ctrl + Pause (Break)** means you must hold down **Ctrl** and at the same time press **Pause (Break)**. If three keys are used, hold down the first two and at the same time press the third.

User input

Text that you are instructed to type in is shown in the boldface type below:

DISKCOPY A: B:

The display

Text generated by the computer that appears on its display is presented in the typeface below:

```
Format complete  
System transferred
```

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Hardware Overview

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1.1 Features

The Satellite P300 and Satellite Pro P300 (AMD Platform) features are listed below.

θ Microprocessor

Microprocessor that is used will be different by the model.

It supports processors as follows

AMD Turion64 Dual Core Rev. F

TL58 1.9GHz (TMDTL58HAX5DM)

TL60 2.0GHz (TMDTL60HAX5DM)

TL62 2.1GHz (TMDTL62HAX5DM)

TL64 2.2GHz (TMDTL64HAX5DM)

TL66 2.3GHz (TMDTL66HAX5DM)

TL68 2.4GHz (TMDTL68HAX5DM)

θ Memory

Two DDRII SO-DIMM (667MHz specification compliant) up to 4GB can be upgraded through Memory Module Slot. Maximum upgradeable system memory may depend on the model

θ VRAM

Shared with System RAM for AMD RS690M.

M86 Graphic card:256MB,512MB;

M82XT Graphic card:64MB,128MB,256MB.

θ HDD (First/Second Hard Drive – SATA)

160GB, 200GB, 250GB, 300GB, internal drives. 2.5 inch x 9.5mm height.

θ USB FDD (Option)

Toshiba external USB FDD for option

θ Display

- LCD

17-inch, 1,440 (H) x 900 (V) WXGA+ 262,144 colors + CCFL, High-brightness, amorphous silicon TFT color display.

- CRT

Supported via a RGB connector.

- HDMI

Supported via a HDMI TYPE-A connector

- S-Video

Supported via a 4-pins S-Video connector

θ Keyboard

Toshiba keyboard module has (104/105/109 keys) with three LEDs design, Support Windows keys & Application keys. Multi-langue support.

θ New card slot

ExpressCard/34 and ExpressCard/54 are supported.

θ Optical devices

A DVD Super Multi drive is equipped.

θ Battery

The RTC battery is equipped inside the computer.
It is good with no external power source for 1 month on average.

The main battery is a detachable lithium ion battery.

6 cell Li-Ion 10.8v/4000mAh

9 cell Li-Ion 10.8v/6000mAh

θ USB (Universal Serial Bus)

4 USB ports are provided. The ports comply with the USB2.0 standard, which enables data transfer speeds 40 times faster than USB1.1 standard. USB1.1 is also supported.

θ Sound system

Internal stereo speaker, Internal MIC, external microphone connector, stereo headphone connector (support SPDIF function).

θ Wireless LAN

The wireless LAN is equipped on the mini card slot.

θ LAN/MODEM

Connectors for LAN and Modem are separately mounted.

θ 1394

One 1394 port is equipped.

θ Multiple Digital Media Card Slot

XD/MS/MS pro/SD/MMC are supported

θ Bluetooth

USB Bluetooth Module (BTO) V2.1 & EDR(Enhanced Data Rate) equipped

θ Security

Kensington Lock,

Fingerprint –Enhanced Lock is also equipped.

HDD Password

Front with the display open

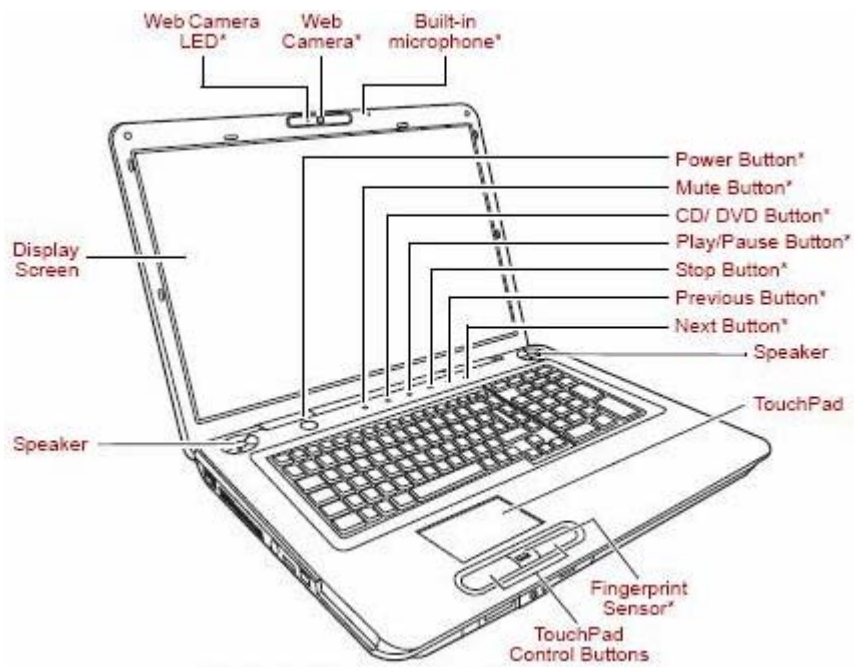


Figure 1-1 Front of the computer

1.2 System Block Diagram

Figure 1-2 shows the system block diagram.

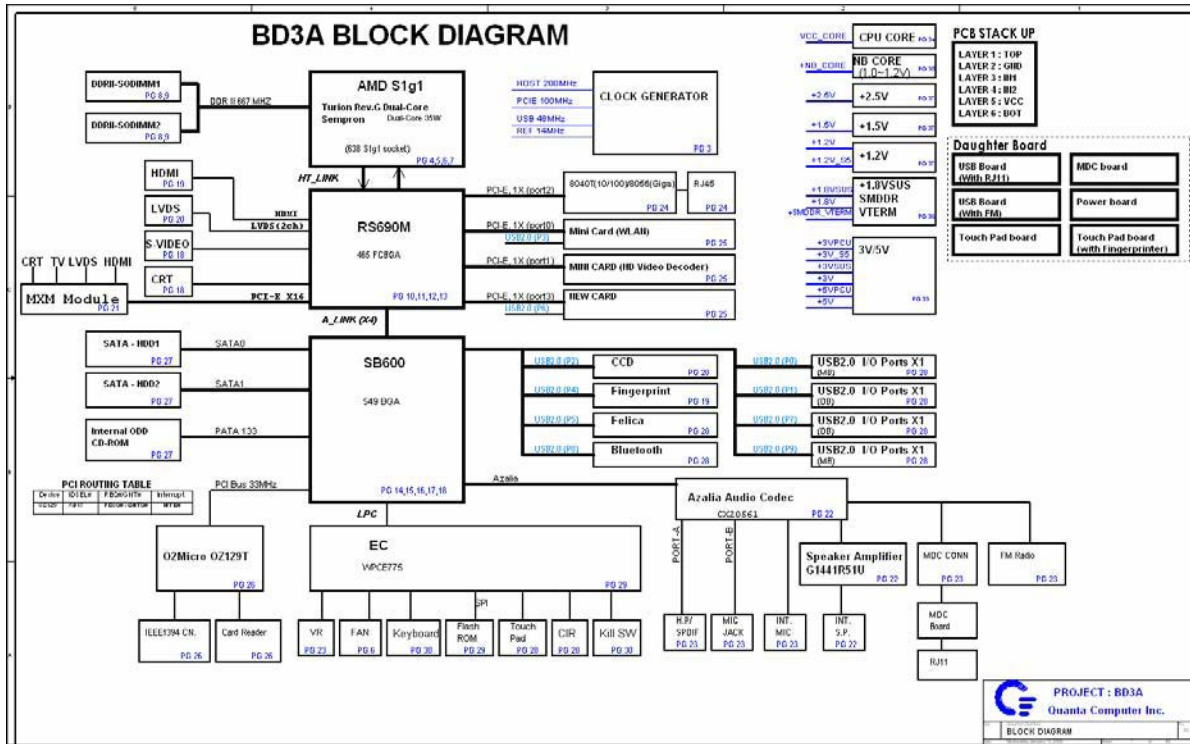


Figure 1-2 System block diagram for AMD Platform

The PC contains the following components.

θ CPU

AMD Turion64 Dual Core Rev. F

TL58 1.9GHz (TMDTL58HAX5DM)

TL60 2.0GHz (TMDTL60HAX5DM)

TL62 2.1GHz (TMDTL62HAX5DM)

TL64 2.2GHz (TMDTL64HAX5DM)

TL66 2.3GHz (TMDTL66HAX5DM)

TL68 2.4GHz (TMDTL68HAX5DM)

θ Memory

Two memory slots capable of accepting DDRII-SDRAM 256MB, 512MB, 1GB or 2GB memory modules for a maximum of 4GB.

- 200-pin SO-DIMM
- 1.8V operation

θ BIOS ROM (Flash memory)

- 8Mbit – SPI interface

θ Chipset (AMD RS690M/SB600 Platform)

This gate array has the following elements and functions.

- North Bridge (AMD RS690M)
 - AMD HyperTransport Interface support
 - PCI Express Interface 1.1a support
 - A-Link Express II Interface
 - 465-ball 21 x 21mm FC-BGA Package
- South Bridge (AMD SB600)
 - A-Link Express II Interface (1/2/4-lane)
 - Serial ATA (SATA) Controller
 - PCI Interface
 - IDE Interface
 - SATA II AHCI Controller

- Low Pin count (LPC) interface
- Serial Peripheral Interface (SPI)
- DMA controller
- USB Controllers(5 OHCI and 1 EHCI to support 10 USB ports)
- RTC
- GPIO
- ACPI Power Management
- SMBus 2.0 Controller
- High Definition Audio Controller
- 549-pin 23mm x 23mm FCBGA Package

θ Other main system chips

- Clock Generator (ICS951462AGLFT)
- EC/KBC (Support CIR : Winbond WPCE775CA0DG)
- EC/KBC (No Support CIR : Winbond WPCE775LA0DG)
- HD Audio (CONEXANT CX20561-12Z)
- Audio AMP (GMT G1441R51U)
- 1394/Card Reader controller (O2 OZ129TN)
- 10/100 LAN controller (Marvell 88E8040T-A0-NNC1C000)
- GIGA LAN controller (Marvell 88E8072-B1-NNC1C000)

θ Mini Card

Wireless LAN card

Conformity with IEEE 802.11b/g and IEEE 802.11a/b/g.

θ MODEM (CONEXANT CX20548-11Z)

The modem supports V.92/V.90 analog receive data up to 56 kbps with V.44 data compression, V.17 analog fax to 14.4 kbps, voice/telephone answering machine (TAM), high quality soft speakerphone.

θ Bluetooth

USB Bluetooth Module. Bluetooth standard V2.1 +EDR conformity.

1.3 2.5-inch Hard Disk Drive

A compact, high-capacity HDD with a height of 9.5mm. Contains a 2.5-inch magnetic disk and magnetic heads.

Figure 1-2 shows a view of the 2.5-inch HDD and Tables 1-1 and 1-2 list the specifications.

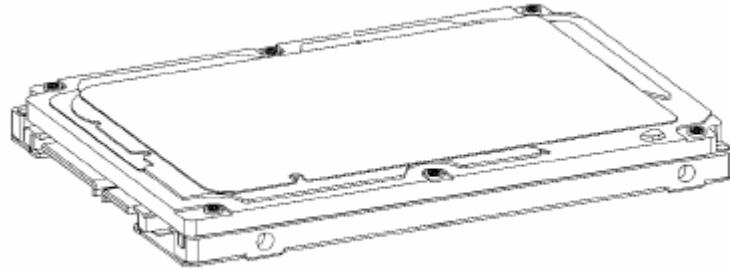


Figure 1-3 2.5-inch HDD

Table 1-1 2.5-inch HDD dimensions

Parameter		Standard value				
		TOSHIBA MK8046GSX	TOSHIBA MK1246GSX	TOSHIBA MK1646GSX	TOSHIBA MK2046GSX	TOSHIBA MK2546GSX
Outline dimensions	Width (mm)	69.85				
	Height (mm)	9.5				
	Depth (mm)	100.0				
	Weight (g)	98	98	102	102	102

Parameter		Standard value				
		FUJITSU MHY2080B H	FUJITSU MHW2120B H	FUJITSU MHW2160B H-PL	FUJITSU MHY2250B H	FUJITSU MHX2300BT
Outline dimensi ons	Width (mm)	70				
	Height (mm)	9.5				
	Depth (mm)	100.0				
	Weight (g)	101(Max)				

Parameter		Standard value				
		HITACHI HTS542580k9 SA00	HITACHI HTS542512 k9SA00	HITACHI HTS542516k9 SA00	HITACHI HTS542520k9 SA00	HITACHI HTS542525k9S A00
Outline dimensi ons	Width (mm)	69.85				
	Height (mm)	9.5				
	Depth (mm)	100.0				
	Weight (g)	102 (max.)				

Table 1-2 2.5-inch HDD specifications

Parameter	Specification				
	TOSHIBA MK8046GSX	TOSHIBA MK1246GSX	TOSHIBA MK1646GSX	TOSHIBA MK2046GSX	TOSHIBA MK2546GSX
Storage size (formatted)	80GB	120GB	160GB	200GB	250 GB
Speed (RPM)	5,400				
Data transfer Rate - Internal Transfer Rate - Host Transfer Rate	370~730(Mbits/Sec). 3Gbps (300MB/s)				
bus transfer rate (MB/s)	Compliant with ATA-8, Serial ATA 2.6				
Average random seek time (read) (ms)	12				
Power-on-to-ready (sec)	3.5(typ)/9.5(Max)				

Parameter	Specification				
	FUJITSU MHY2080BH	FUJITSU MHW2120B H	FUJITSU MHW2160BH- PL	FUJITSU MHY2250BH	FUJITSU MHX2300BT
Storage size (formatted)	80GB	120GB	160GB	250GB	300GB
Speed (RPM)	5,400				
Data transfer Rate - To/From Media - T0/From Host	84.6MB/s Max. 1.5Gbps (150MB/s)				
bus transfer rate (MB/s)	Compliant with ATA-8 ACS AST, Serial ATA Revision 2.5 Gen1i				
Buffer Size	8MB				
Average random seek time (read) (ms)	12				
Power-on-to-ready (sec)	4.0 (typ.)				

Specification					
Parameter	TOSHIBA MK8046GSX	TOSHIBA MK1246GSX	TOSHIBA MK1646GSX	TOSHIBA MK2046GSX	TOSHIBA MK2546GSX
Storage size (formatted)	80GB	120GB	160GB	200GB	250GB
Speed (RPM)	5,400				
Data transfer Rate - To/From Media - T0/From Host	66.25MB/s 1.5Gbps	80.375MB/s 1.5Gbps	77.375MB/s 1.5Gbps	75.5MB/s 1.5Gbps	83.125MB/s 1.5Gbps
bus transfer rate (MB/s)	SATA Interface conforming to Serial ATA/ High Speed Serialized AT Attachment				
Average random seek time (read) (ms)	11				
Power-on-to-ready (sec)	3.5				

1.4 Optical Drive (DVD Super Multi Drive)

The DVD Super Multi drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM, CD-R/RW, DVD±R/±RW and DVD-RAM. It is a high-performance drive that reads DVD-ROM at maximum 8-speed and CD at maximum 24-speed. Write speed of DVD±R/±RW and DVD-RAM is different depending on the drive.

The DVD Super Multi drive is shown in Figure 1-4. The dimensions and specifications of the DVD Super Multi drive are described in Table 1-3, Table 1-4, Table 1-5, Table 1-6, Table 1-7.

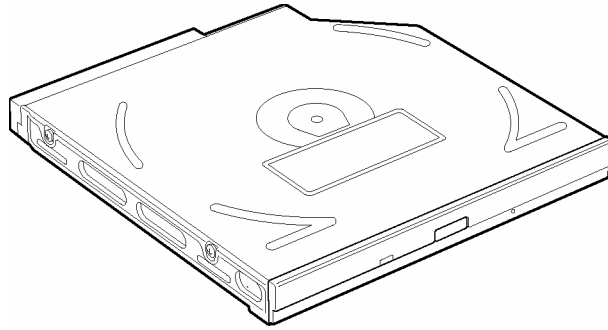


Figure 1-4 DVD Super Multi drive

Table 1-3 DVD Super Multi drive outline dimensions

Parameter		Standard value	
Outline dimensions	Maker	HLDS (GSA-T40N-ATAK7B0)	HLDS (GSA-T40F-ATAK7B0)
	Width (mm)	128	
	Height (mm)	12.7	
	Depth (mm)	127	
	Mass (g)	173	

Parameter		Standard value	
Outline dimensions	Maker	Pioneer (DVR-KD08TBM)	Pioneer (DVR-KD08TBF)
	Width (mm)	128	
	Height (mm)	12.7	
	Depth (mm)	127	
	Mass (g)	170	

Parameter		Standard value	
Outline dimensions	Maker	Panasonic (UJ-870BTJZ-A)	Panasonic (UJ-870FTJZ-A)
	Width (mm)	128	
	Height (mm)	12.7	
	Depth (mm)	129	
	Mass (g)	180	

Parameter		Standard value	
Outline dimensions	Maker	TSST (TS-L632H)	TSST (TS-L632P)
	Width (mm)	128	
	Height (mm)	12.7	
	Depth (mm)	127	
	Mass (g)	165	

Table 1-4 HLDS DVD Super Multi drive specifications

Parameter		HLDS Drive Specification	
		GSA-T40N-ATAK7B0	GSA-T40F-ATAK7B0
Label Flash Function		No support	Support
Data transfer speed	Read	DVD-ROM 8x max. DVD-R(SL/DL) 8x/4x max. DVD+R(SL/DL) 8x/4x max. DVD-RW 8x max. DVD+RW 8x max. DVD-RAM (Ver.1.0) 2x (Ver.2.2) 2x, 3x, 5x DVD-Video 4x max. (Single/Dual layer) CD-R/RW/ROM 24x/24x/24x max. CD-DA (DAE: Ripping/Play) 20x/20x max.	
	Write	DVD-R 2x CLV, 4x ZCLV, 8x CAV DVD-R DL 2x CLV, 4x ZCLV DVD-RW 1x, 2x CLV, 4x, 6x ZCLV DVD-RAM 2x, 3x ZCLV, 5x PCAV(Ver.2.2) (16x Media: Not support) DVD+R 2.4x CLV, 4x ZCLV, 8x CAV DVD+R DL 2.4x CLV, 4x ZCLV DVD+RW .4x, 3.3x CLV, 4x ZCLV, 8x ZCLV (8x Speed disc: 3.3x CLV, 8x ZCLV) CD-R 10x CLV, 16x, 24x ZCLV CD-RW 4x, 10x CLV, 16x ZCLV	
	Burst Transfer mode	PIO mode4/Multi word mode2/Ultra DMA mode2	
Access time (ms) (Random)	CD-ROM	130ms (Typ.)	
	DVD-ROM	135ms (Typ.)	
Buffer memory		2MB	

Table 1-5 Pioneer DVD Super Multi drive specifications

Parameter		Pioneer Drive Specification	
		DVR-KD08TBM	DVR-KD08TBF
Label Flash Function		No support	Support
Data transfer speed	Read	8X CAV at DVD-ROM SL, DVD-R / +R, -RW / +RW, DVD-ROM DL, DVD-R DL / +R DL 5X Zone CLV at DVD-RAM 24X CAV at CD-ROM, CD-R / RW	
	Write	8X Zone CLV at DVD-R / +R, DVD+RW 6X Zone CLV at DVD-RW 5X Zone CLV at DVD-RAM 4X zone CLV at DVD-R DL/+R DL 24X Zone CLV at CD-R 16X Zone CLV at CD- RW	
	Burst Transfer mode	PIO mode4/Multi word mode2/Ultra DMA mode2	
Access time (ms) (Random)	CD-ROM	150ms (Typ.)	
	DVD-ROM	160ms (Typ.)	
Buffer memory		2MB	

Table 1-6 Panasonic DVD Super Multi drive specifications

Parameter		Panasonic Drive Specification	
		UJ-870BTJZ-A	UJ-870FTJZ-A
Label Flash Function		No support	Support
Data transfer speed	Read	DVD-ROM :Max 8X CAV CD-ROM :Max 24X CAV	
	Write	CD-R :Max24X CAV CD-RW :4X CLV High Speed CD-RW :10XCLV Ultra Speed CD-RW :Max 16X Zone CLV DVD-R :Max.8X CAV DVD-R DL :Max.4X Zone CLV DVD-RW :Max.6X Zone CLV DVD+R :Max.8X CAV DVD+R DL :Max.4X Zone CLV DVD+RW :Max.8X Zone CLV DVD-RAM :3-5X ZCLV (4.7GB)	
	Burst Transfer mode	PIO mode4/Multi word mode2/Ultra DMA mode2	
Access time (ms) (Random)	CD-ROM	150ms (Typ.)	
	DVD-ROM	180ms (Typ.)	
Buffer memory		2MB	

Table 1-7 TSST DVD Super Multi drive specifications

Parameter		TSST Drive Specification	
		TS-L632H	TS-L632P
Label Flash Function		No support	Support
Data transfer speed	Read	CD-ROM Max. 24X (3,600 KB/sec) CD-R Max. 24X (3,600 KB/sec) CD-RW Max. 24X (3,600 KB/sec) DVD-ROM(SL) Max 8X (10,800 KB/sec) DVD-ROM(DL) Max 8X (10,800 KB/sec) DVD±R DUAL Max 6X (8,100 KB/sec) DVD-RAM Max. 6,750 KB/sec	
	Write	CD-R Max. 24X (3,600 KB/sec) P MS CD-RW Max. 4X (600 KB/sec) HS CD-RW Max. 10X (1,500 KB/sec) US CD-RW Max. 16X (2,400 KB/sec) DVD+R Max 8X (10,800 KB/sec) DVD-R Max 8X (10,800 KB/sec) DVD+RW Max 8X (10,800 KB/sec) DVD-RW Max 6x (8,100KB/sec) DVD+R DUAL Max 4X (5400 KB/sec) DVD-R DUAL Max 4X (5400 KB/sec) DVD-RAM Max 5x PCAV 5X/ CLV3X/2X	
	Burst Transfer mode	PIO mode4 Multi word mode2 Ultra DMA mode2	
Access time (ms) (Random)	CD-ROM	130ms (Typ.)	
	DVD-ROM	130ms (Typ.)	
Buffer memory		2MB	

1.5 Key board

The Satellite P300 and SatellitePro300 keyboard has three different kinds of placement, one is for US style, one is for UK style and the other is for JP style.

Figure 1-5 is a view of the keyboard for US style



Figure 1-5 Keyboard for US style

Figure 1-6 is a view of the keyboard for UK style



Figure 1-6 Keyboard for UK style

Figure 1-7 is a view of the keyboard for JP style



Figure 1-7 Keyboard for JP style

1.6 TFT Color Display

The Satellite P300 and Satellite Pro300Panel use CCFL to control backlight.

1.6.1 LCD Module with CCFL Backlight

Figure 1-8 ~ 1-11 shows a view of the LCD module and Table 1-8 lists the specifications.

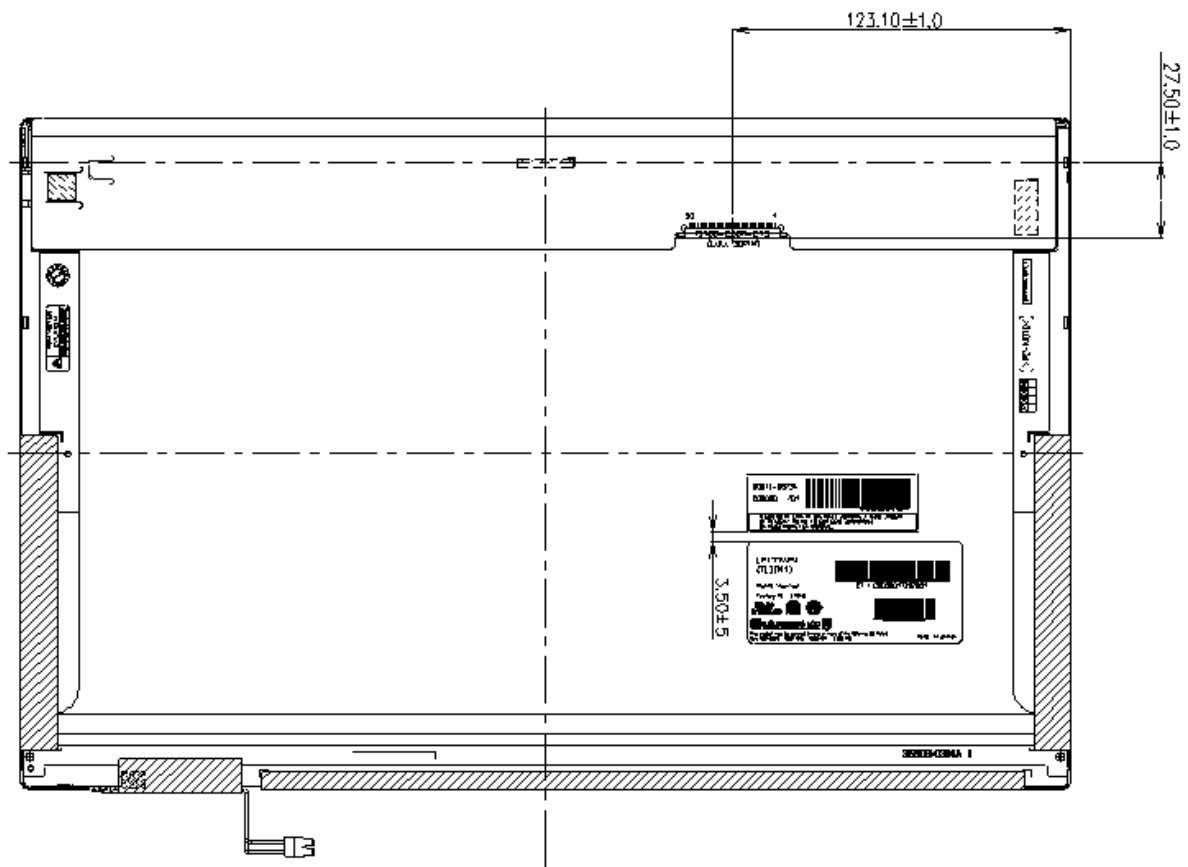


Figure 1-8 LG-Philips LCD Module

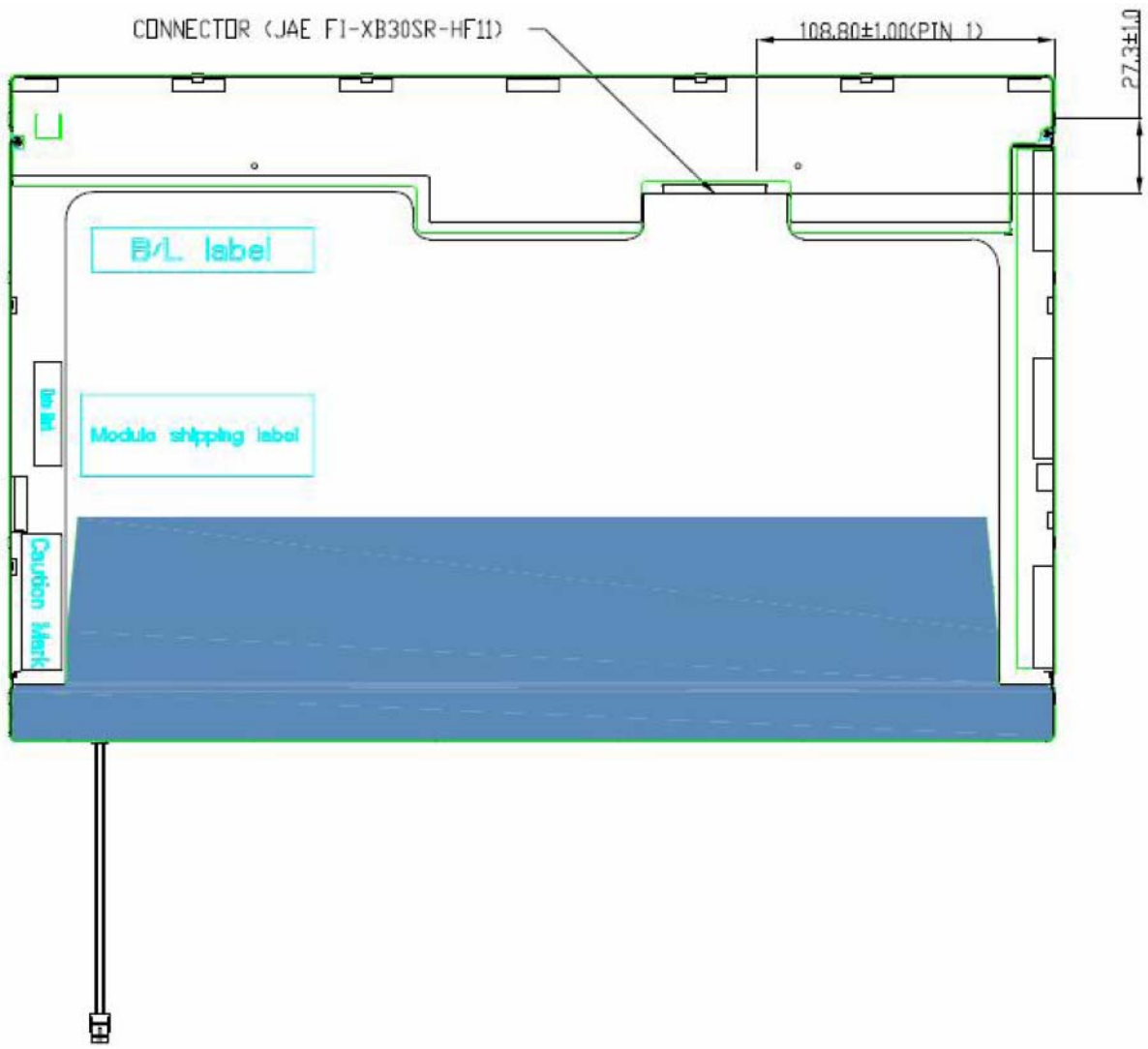


Figure 1-9 AUO LCD Module

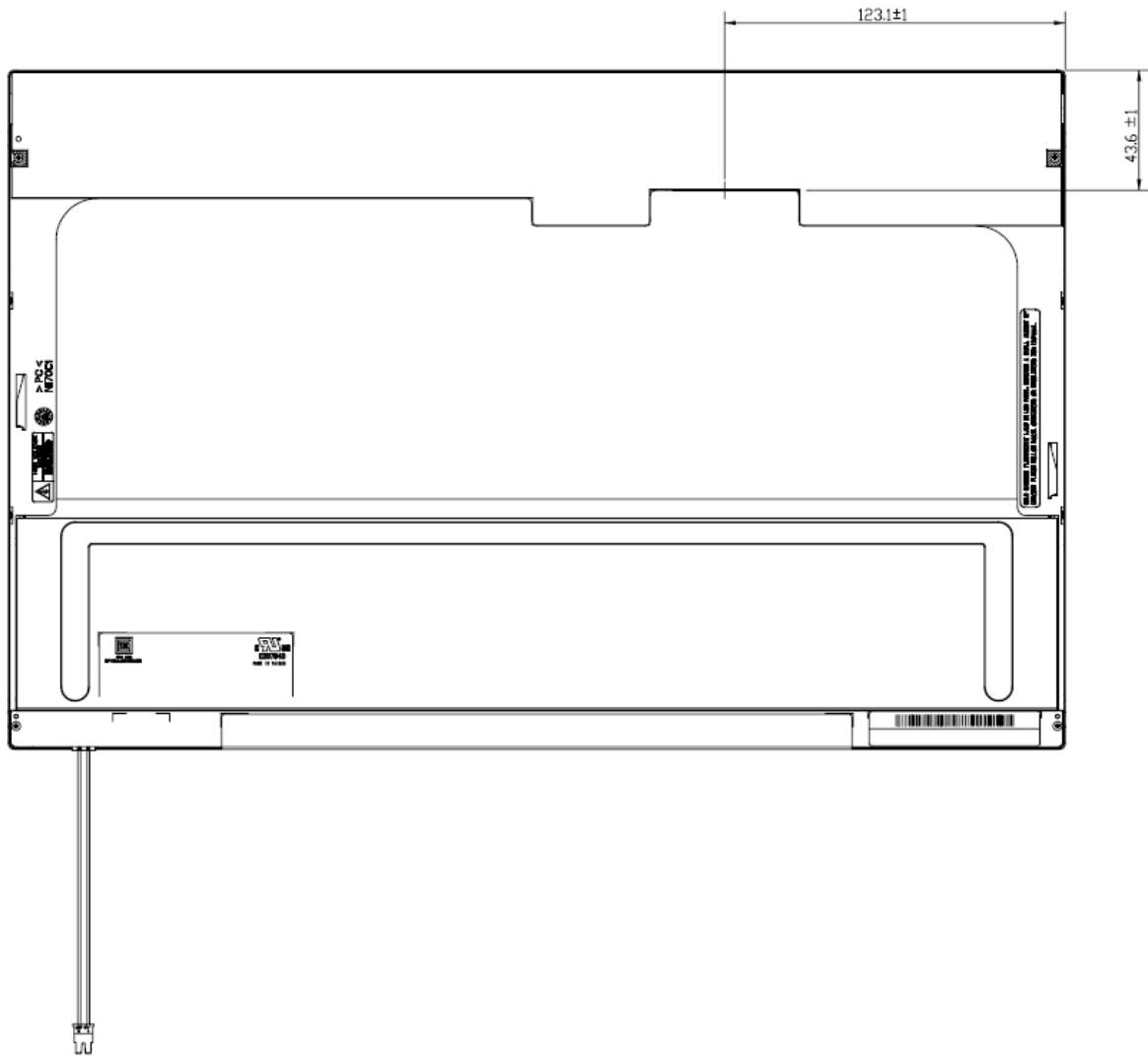


Figure 1-10 CMO LCD Module

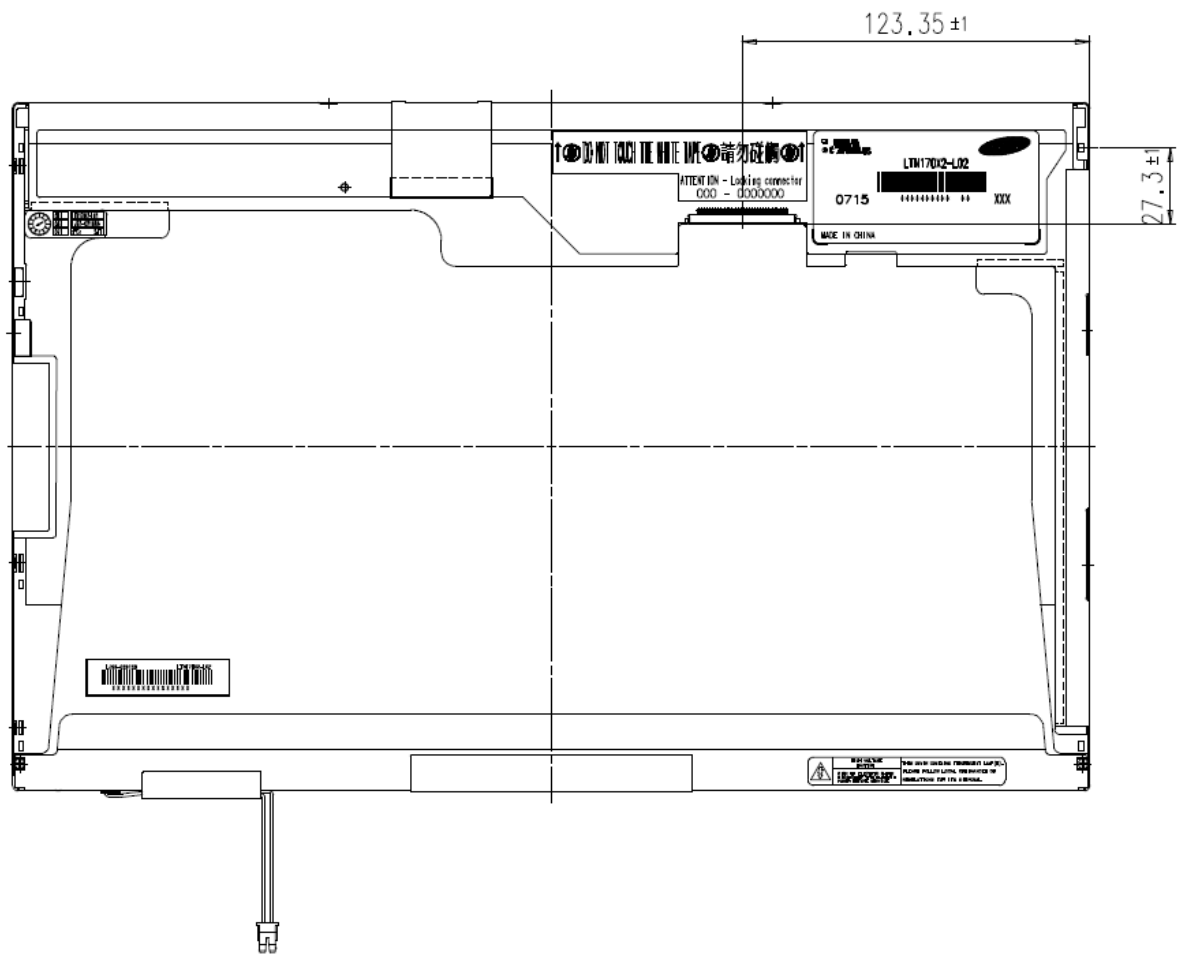


Figure 1-11 SAMSUNG LCD Module

Table 1-8 LCD module specifications

Item	Specifications(WXGA+)			
	LG-Philips LP171WP4-TLN1	AUO B170PW06	CMO N170C2-L02	Samsung LTN170X2-L02-S
Number of Dots	1,440 x 3(R,G,B) x 900			
Dot spacing (mm)	0.255(H)× 0.2555(V)			
Display Colors	262,144 colors			

1.6.2 CCFL Inverter Board

Table 1-9 lists the FL inverter board specifications.

Table 1-9 FL inverter board specifications

Item		Specifications			
		Foxconn T18I095.00	Delta DAC-08N035 AF	SUMIDA TWS-449-308	TDK TBD485NR
Input	Voltage (V)	8~20	8~20	8~20	8~20
	Power (W)	7.5W	7.5W	7.5W	7.5W
Output	Voltage (Vrms)	612~945	612~945	612~945	612~945
	Current (f=55KHz)(mA rms)	2.3±0.4 ~ 6.5±0.3			

1.7 Power Rails

Table 1-10 lists the power rail output specifications of RS690M platform.

Table 1-10 RS690M Power supply output rating

Name	Power supply (Yes/No)			
	Voltage [V]	Power OFF Suspend mode	Power OFF Boot mode	No Battery
+5VPCU	5	Yes	Yes	No
+5V	5	No	No	No
+3VPCU	3.3	Yes	Yes	No
+3V_S5	3.3	Yes	No	No
+3VSUS	3.3	Yes	No	No
+3V	3.3	No	No	No
+2.5V	2.5	No	No	No
+1.8VSUS	1.8	Yes	No	No
+SMDDR_VTERM	1.8	Yes	No	No
+SMDDR_VREF	1.8	Yes	No	No
+1.8V	1.8	No	No	No
+1.5V	1.5	No	No	No
+1.2V	1.25	No	No	No
+1.2V_S5	1.25	No	No	No
+NB_CORE	1.0~1.2	No	No	No
VCC_CORE	0.7~1.2	No	No	No

1.8 Batteries

The PC has the following two batteries.

- θ Main battery
- θ Real time clock (RTC) battery

Table 1-11 lists the specifications for these two batteries.

Table 1-11 Battery specifications

Battery Name		Battery Element	Output Voltage	Capacity
Main battery	Sanyo 6 cell	Lithium ion	10.8v	4000mAh
	Panasonic 6 cell		10.8v	4000mAh
	Sanyo 9 cell		10.8v	6000mAh
Real time clock (RTC) battery	Panasonic ML1220/F1BE- MOLEX-58ZL1	Lithium ion	3V	17mAh

1.8.1 Main Battery

The main battery is the primary power supply for the computer when the AC adapter is not connected. In Standby, the main battery maintains the current status of the computer.

1.8.2 Battery Charging Control

Battery charging is controlled by a power supply microprocessor. The power supply microprocessor controls power supply and detects a full charge when the AC adaptor and battery are connected to the computer.

θ Battery Charge

When the AC adapter is connected, normal charging is used while the system is turned on and quick charge is used while the system is turned off. Refer to the following Table 1-12.

Table 1-12 Time required for charges of main battery

Condition	Charging Time
Power On Charge	About 12 hours-
Power Off Charge	About 4 hours

Charge is stopped in the following cases.

1. The main battery is fully charged
2. The main battery is removed
3. Main battery or AC adapter voltage is abnormal
4. Charging current is abnormal

θ Data preservation time

When turning off the power in being charged fully, the preservation time is as following Table 1-13.

Table 1-13 Data preservation time

Condition		preservation time
Battery Pack	6 cell	Approximately 2 days(sleep mode)
	9 cell	Approximately 3 days(sleep mode)
Battery Pack	6 cell	Approximately 20 days(Hibernate mode)
	9 cell	Approximately 30 days(Hibernate mode)
Battery Pack	6 cell	Approximately 20 days(Shut Down mode)
	9 cell	Approximately 30 days(Shut Down mode)

1.8.3 RTC Battery

The RTC battery provides the power supply to maintain the date, time, and other system information in memory.

Table 1-14 lists the Time required for charges of RTC battery and data preservation time.

Table 1-14 Time required for charges of RTC battery

Condition	Time
Power ON (Lights Power LED)	About 24 hours
Data preservation tome (Full-charged)	About a month

1.9 AC Adapter

The AC adapter is used to charge the battery.

Table 1-15 lists the AC adapter specifications.

Table 1-15 AC adapter specifications

Parameter	Specification		
With Led	DELTA/ LITE-ON	DELTA/ LITE-ON	DELTA/ LITE-ON
Power	75W	90W	120W
Input voltage	AC 100V/240V		
Input frequency	50Hz/60Hz		
Input current	$\leq 1.5A$	$\leq 1.5A$	$\leq 2A$
Output voltage	DC 19V		
Output current	3.95A	4.74A	6.3A

Features

1.1 Features

The Satellite P300 Satellite Pro P300 (Intel Platform) series are 2 spindle PCs running
Intel® Core Duo Processor T8100 (800MHz) or higher
Intel® Core Duo Processor T9300 (800MHz) or higher.
Intel® Pentium Dual Processor T2330 or higher.
Intel® Celeron 540 Processor or higher.
Intel® Core™2 Duo Processor (667MHz) T5450 or higher.

The features are listed below.

θ Microprocessor

Microprocessor that is used will be different by the model.

It supports processors as follows:

Intel Core2 Duo Processor

FSB : 667 MHz	T5550(1.83GHz)
	T5750(2.0GHz)
	T5850(2.16GHz)
FSB : 800MHz	T8100(2.10GHz)
	T8300(2.40GHz)
	T9300(2.5GHz)
	T9500(2.6GHz)

Intel Pentium Dual

FSB :533GHz	T2330(1.6GHz)
	T2370(1.73GHz)
	T2390(1.86GHz)

Intel Celeron

FSB : 533 GHz	540(1.86GHz)
	550(2.0GHz)
	560(2.13GHz)
	570(2.26GHz)

θ Memory

Two DDRII SO-DIMM (667MHz specification compliant) used can be up to 4GB
(but 2GB for GL960) which can be upgraded through Memory Module Slot.

Maximum upgradeable system memory may depend on the model

θ VRAM

Shared with System RAM for Intel GM965, PM965, GL960, GM965 +ATI
M82XT Graphic card: 64MB, 128MB, 256MB.

θ HDD (First/Second Hard Drive – SATA)

160GB, 200GB, 250GB, 300GB, internal drives. 2.5 inch x 9.5mm height.

θ USB FDD (Option)

Toshiba external USB FDD for option

θ Display

LCD

17-inch, 1,440 (H) x 900 (V) WXGA+ 262,144 colors + CCFL, High-brightness, amorphous silicon TFT color display..

CRT

Supported via a RGB connector.

θ Keyboard

Toshiba keyboard module has (104/105/109 keys) with three LEDs design, Support Windows keys & Application keys. Multi-language support.

θ New Dummy card slot

The new card slot (dummy card) accommodates one 5mm Type II card. The slot support 16-bit PC cards.

θ Optical devices

A DVD Super Multi drive is equipped.

θ Battery

The RTC battery is equipped inside the computer.

It is good with no external power source for 1 month on average.

The main battery is a detachable lithium ion battery.

6 cell Li-Ion 10.8v/4000mAh

9 cell Li-Ion 10.8v/6000mAh

θ USB (Universal Serial Bus)

3 USB ports are provided. The ports comply with the USB2.0 standard, which enables data transfer speeds 40 times faster than USB1.1 standard. USB1.1 is also supported.

θ Sound system

Internal stereo speaker, Internal MIC (Option) external monaural microphone connector, stereo headphone connector.

θ Wireless LAN

The wireless LAN is equipped on the mini card slot.

θ LAN/MODEM

Connectors for LAN and Modem are separately mounted.

θ 1394

One 1394 port is equipped.

θ Multiple Digital Media Card Slot

XD/MS/MS pro/SD/MMC are supported

θ Bluetooth

USB Bluetooth Module standard Ver 2.1 & EDR(Enhanced Data Rate) equipped

θ Security

Kensington Lock,

Fingerprint –Enhanced Lock is also equipped.

θ HDD Password

θ 3D Accelerometer for HDD

Front with the display open

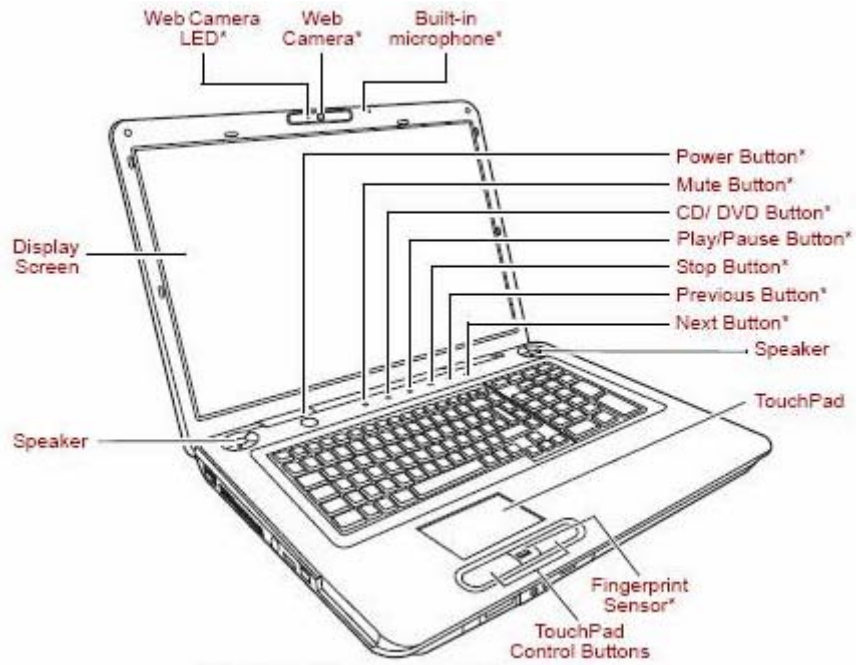


Figure 1-1 Front of the computer

1.2 System Block Diagram

Figure 1-2 shows the system block diagram.

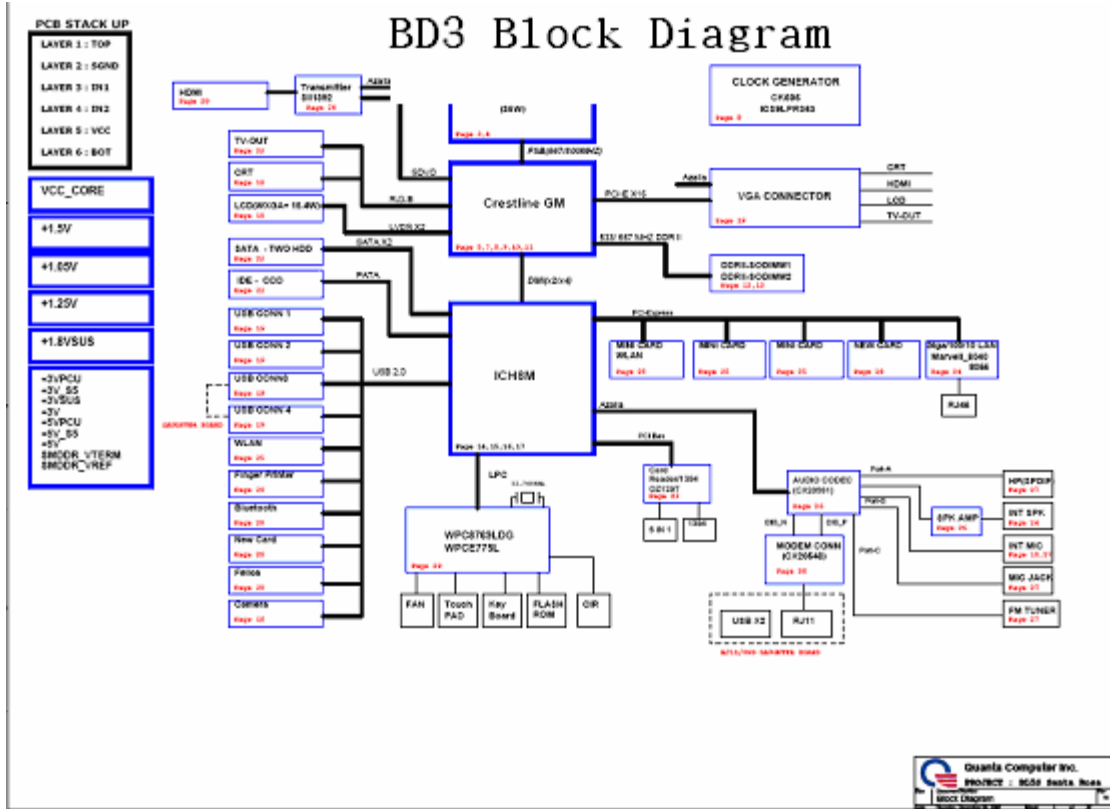


Figure 1-2 System block diagram for Intel Platform

The PC contains the following components.

θ CPU

Intel Core2 Duo Processor

FSB : 667 MHz	T5550(1.83GHz)
	T5750(2.0GHz)
	T5850(2.16GHz)
FSB : 800MHz	T8100(2.10GHz)
	T8300(2.40GHz)
	T9300(2.5GHz)
	T9500(2.6GHz)

Intel Pentium Dual

FSB :533GHz	T2330(1.6GHz)
	T2370(1.73GHz)
	T2390(1.86GHz)

Intel Celeron

FSB : 533 GHz	540(1.86GHz)
	550(2.0GHz)
	560(2.13GHz)
	570(2.26GHz)

θ Memory

Two memory slots capable of accepting DDRII-SDRAM 512MB,1GB or 2GB memory modules for a maximum of 4GB(2GB for GL960).

- 200-pin SO-DIMM
- 1.8V operation

θ BIOS ROM (Flash memory)

- 8Mbit

θ Chipset (Santa Rosa Platform)

This gate array has the following elements and functions.

- North Bridge (Intel PM965,GM965/GL960)
 - Celeron processor System Bus support
 - DRAM Controller : DDRII 533/667/800 support
 - DMI
 - 1299-ball 35 x 35mm Mirco FC-BGA Package

- South Bridge (Intel 82801HBM ICH8-M)
 - Direct Media Interface (DMI)
 - PCI Express
 - Serial ATA (SATA) Controller
 - PCI Interface
 - Low Pin count (LPC) interface
 - Serial Peripheral Interface (SPI)
 - DMA controller
 - Advanced Programmable Interrupt Controller (APIC)
 - USB Controllers
 - Gigabit Ethernet Controller
 - RTC
 - GPIO
 - Enhanced Power Management
 - SMBus 2.0
 - High Definition Audio Controller
 - 676-pin 31mmx31mm mBGA Package

θ Other main system chips

- Clock Generator (ICS951462AGLFT)
- EC/KBC (Support CIR : Winbond WPCE775CA0DG)
- EC/KBC (No Support CIR : Winbond WPCE775LA0DG)
- HD Audio (CONEXANT CX20561-12Z)
- Audio AMP (GMT G1441R51U)
- 1394/Card Reader controller (O2 OZ129TN)
- 10/100 LAN controller (Marvell 88E8040T-A0-NNC1C000)
- GIGA LAN controller (Marvell 88E8072-B1-NNC1C000)

θ Mini Card

Wireless LAN card (BTO)

5.4 GHz DSSS/OFDM LAN card is equipped. Conformity with IEEE 802.11b/g, IEEE 802.11 a/g/n and IEEE 802.11a/b/g..

θ MODEM (Conexant x 1)

Supported by on board Modem + DAA daughter card.

Data and FAX transmission is available.

Supports ITU-TV.90.

The transfer speed of data receiving is 56kbps, of data sending is 33.6kbps and of FAX is 14.4kbps. Actual speed depends on the quality of the line used.

Connected to telephone line through RJ11 MOD

1.3 2.5-inch Hard Disk Drive

A compact, high-capacity HDD with a height of 9.5mm. Contains a 2.5-inch magnetic disk and magnetic heads.

Figure 1-3 shows a view of the 2.5-inch HDD and Tables 1-1 and 1-2 list the specifications.

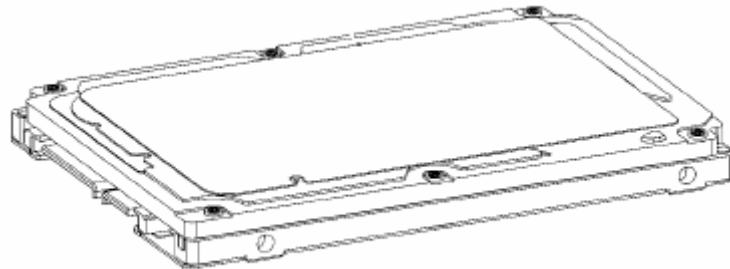


Figure 1-3 2.5-inch HDD

Table 1-1 2.5-inch HDD dimensions

Parameter		Standard value				
		TOSHIBA MK1246GS X	TOSHIBA MK1646GS X	TOSHIBA MK2046GS X	TOSHIBA MK2546GS X	TOSHIBA MK3252GSX
Outline dimens ions	Width (mm)	69.85 +/- 0.25				
	Height (mm)	9.5				
	Depth (mm)	100.2 +/- 0.25				
	Weight (g)	97/98	97/98	101//102	101//102	

Parameter		Standard value			
		FUJITSU MHY2120BH	FUJITSU MHY2160BH	FUJITSU MHY2200BH	FUJITSU MHY2250BH
Outline dimensi ons	Width (mm)	100			
	Height (mm)	9.5			
	Depth (mm)	70			
	Weight (g)	101(Max)			

Parameter		Standard value			
		HITACHI HTS542512k9SA0 0	HITACHI HTS542516k9SA 00	HITACHI HTS542520k9SA 00	HITACHI HTS542525k9S A00
Outline dimen sions	Width (mm)	69.85 +/- 0.25			
	Height (mm)	9.5			
	Depth (mm)	100.2 +/- 0.25			
	Weight (g)	95 (max.)	95 (max.)	102 (max.)	102 (max.)

Table 1-2 2.5-inch HDD dimensions

Parameter		Standard value		
		FUJITSU MHX2250BT	FUJITSU MHX2300BT	FUJITSU MHZ2400BT
Outline dimensi ons	Width (mm)	100		
	Height (mm)	12.5		
	Depth (mm)	70.0		
	Weight (g)	101(Max)		

Table 1-3 2.5-inch HDD specifications

Parameter	Specification				
	TOSHIBA MK1246G SX	TOSHIBA MK1646GS X	TOSHIBA MK2046G SX	TOSHIBA MK2546G SX	TOSHIBA MK3252G SX
Storage size (formatted)	120GB	160GB	200GB	250 GB	320GB
Speed (RPM)	5,400				
Data transfer Rate - To/From Media - T0/From Host	730Mbits Media 300MBytes Host				794Mbits Media 3GBytes Host
bus transfer rate (MB/s)	1.5Gbps(150MB/s)				
Average random seek time (read) (ms)	12				
Power-on-to-ready (sec)	3.5(typ)/9.5(Max)				

Specification				
Parameter	FUJITSU MHY2120BH	FUJITSU MHY2160BH	FUJITSU MHY2200BH	FUJITSU MHY2250BH
Storage size (formatted)	80GB	120GB	200GB	250GB
Speed (RPM)	5,400			
Data transfer Rate - To/From Media - T0/From Host	84.6MB/s Max. 1.5Gbps (150MB/s)			
bus transfer rate (MB/s)	1.5Gbps(150MB/s)			
Average random seek time (read) (ms)	12.0ms/14.0ms			
Power-on-to-ready (sec)	4.0 (typ.)			

Specification				
Parameter	HITACHI HTS542512k9 SA00	HITACHI HTS542516k9S A00	HITACHI HTS542520k9SA 00	HITACHI HTS542525k9SA0 0
Storage size (formatted)	120GB	160GB	200GB	250GB
Speed (RPM)	5,400			
Data transfer Rate - To/From Media - T0/From Host	65.5MB/s 1.5Gbps	65.5MB/s 1.5Gbps	65.5MB/s 1.5Gbps	65.5MB/s 1.5Gbps
bus transfer rate (MB/s)	150 (MB/s)			
Average random seek time (read) (ms)	11			
Power-on-to-ready (sec)	3.5 sec			

Specification			
Parameter	FUJITSU MHX2250BT	FUJITSU MHX2300BT	FUJITSU MHZ2400BT
Storage size (formatted)	250GB	300GB	400GB
Speed (RPM)	4,200		
Data transfer Rate - To/From Media - T0/From Host	60.8MB/s Max. 1.5Gbps (150MB/s)		
bus transfer rate (MB/s)	1.5Gbps (150MB/s)		
Average random seek time (read) (ms)	12.0ms/14.0ms		
Power-on-to-ready (sec)	4.0 (typ)		

1.4 Optical drive (DVD Super Multi Drive)

The DVD Super Multi drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM, CD-R/RW, DVD±R/±RW and DVD-RAM. It is a high-performance drive that reads DVD-ROM at maximum 8-speed and CD at maximum 24-speed. Write speed of DVD±R/±RW and DVD-RAM is different depending on the drive.

The DVD Super Multi drive is shown in Figure 1-4. The dimensions and specifications of the DVD Super Multi drive are described in Table 1-4, Table 1-5.

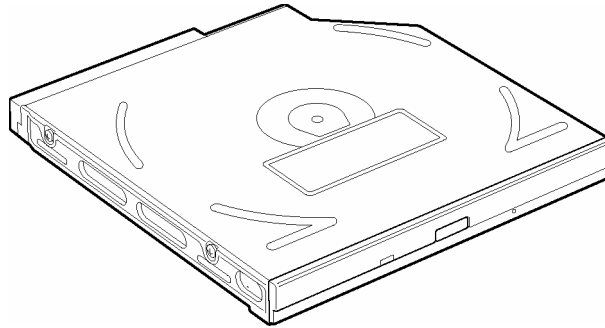


Figure 1-4 DVD Super Multi drive

Table 1-4 DVD Super Multi drive outline dimensions

Parameter		Standard Value			
Outline dimension	Maker	TST TS-L632H	TST TS-L632P	PNR DVR-KD08TBT	PNR DVR-KD08TBL
	Width (mm)	122.4	122.4	128	128
	Height (mm)	12.7	12.7	12.7	12.7
	Depth (mm)	126	126	134	134
	Mass (g)	104	104	176.2	176.2

Table 1-5 DVD Super Multi drive specifications (1/4)

Parameter		Drive Specification			
		TST TS-L632H	TST TS-L632P	PNR DVR-KD08TBT	PNR DVR-KD08TBL
Data transfer speed	Read (KB/s)	CD-ROM 3600 KB/s CD-R 3600 KB/s CD-RW 3600 KB/s DVD-ROM(L) 10800 KB/s DVD+/-R Dual8100KB/s DVD-RAM 6750 KB/s	CD-ROM 3600 KB/s CD-R 3600 KB/s CD-RW 3600 KB/s DVD-ROM(SL) 10800 KB/s DVD+/-R Dual 8100 KB/s DVD-RAM 6750 KB/s	CDInner 1,545 Outer 3,600 (10.3-24XCAV mode over16 Block Transfer)DVD(single Layer)Inner 4,455 Outer 10,800 (3.3X-8X CAV mode Over16 Block Transfer)DVD-RM Inner 4,155 Outer 6,925 (3X-5XZone-CLV mode Over16 Block Transfer)	CDInner 1,545 Outer 3,600 (10.3-24X CAV mode over16 Block Transfer) DVD(single Layer)Inner 4,455 Outer 10,800 (3.3X-8X CAV mode Over16 Block Transfer)DVD-RAM Inner 4,155 Outer 6,925 (3X-5XZone-CLV mode Over16 Block Transfer)
	Write	CD-R 3600 KB/s MS CD-RW 600 KB/s HS CD-RW 1500 KB/s US CD-RW 2400 KB/s US+ CD-RW Not Support DVD+R/-R 10800 KB/s	CD-R 3600 KB/s MS CD-RW 600 KB/s HS CD-RW 1500 KB/s US CD-RW 2400 KB/s US+ CD-RW Not Support DVD+R/-R 10800 KB/s	CDInner 1,500 Outer 3,600 (24x Zone-CLV CD-R write)DVD-RInner 2,700Outer 10,800 (8X Zone-CLV write)DVD+R Inner 3,240Outer 10,800(8X Zone-CLV write)DVD-RAM Inner 4,155Outer 6,925 (3X-5X Zone-CLV write)	CDInner 1,500 Outer 3,600 (24x Zone-CLV CD-R write) DVD-R Inner 2,700 Outer 10,800 (8X Zone-CLV write) DVD+R Inner 3,240 Outer 10,800 (8X Zone-CLV write) DVD-RAM Inner 4,155 Outer 6,925 (3X-5X Zone-CLV write)
	ATAPI interface (MB/s)	MAX 33.2MB/s	MAX 33.2MB/s	16.6(PIO Mode4/MultiwordDM A Mode2) 33.3(UltraDMA Mode2)	16.6(PIO Mode4/MultiwordDMA Mode2) 33.3(UltraDMA Mode2)
Access time (ms) (Random)	CD-ROM	130 ms	130 ms	Ave.140(CD-ROM Mode1Disc is used)	Ave.140(CD-ROM Mode 1 Disc is used)
	DVD-ROM	130 ms	130 ms	Ave.150 (DVD-ROM Single Layer Disc is used)	Ave.150 (DVD-ROM Single Layer Disc is use)

Buffer memory		2 M	2 M	2 Mbytes	2 Mbytes
Supported disk format	CD	650MB CD-ROMR(Rad Only) 80mm CD(Horizontal Mount only) 800/700/650 CD-Recordable (Read & Write) 700/650 MB CD-Rewritable (Read & Write) 700/650MB High Speed CD-Rewritable (Read & Write) 700/650 MB Ultra Speed CD-Rewritable (Read & Write) Ultra+ Speed CD-Rewritable (Read Only)	650MB CD-ROMR(Read Only) 80mm CD(Horizontal Mount only) 800/700/650 CD-Recordable (Read & Write) 700/650 MB CD-Rewritable (Read & Write) 700/650MB High Speed CD-Rewritable (Read & Write) 700/650 MB Ultra Speed CD-Rewritable (Read & Write) Ultra+ Speed CD-Rewritable (Read Only)	CD-ROM Mode1 CD-ROM XA Mode2 (form1, form2) Photo CD (single and multiple session) Video CD CD-DA CD-Extra Mixed-CD CD-Text CD-R CD-RW(Supports AM2) HSCD-RW(Supports AM2) USCD-RW(Supports AM2) US+CD-RW(Supports AM2)(*Read only)	CD-ROM Mode1 CD-ROM XA Mode2 (form1, form2) Photo CD (single and multiple session) Video CD CD-DA CD-Extra Mixed-CD CD-Text CD-R CD-RW(Supports AM2) HSCD-RW(Supports AM2) USCD-RW(Supports AM2) US+CD-RW(Supports AM2)(*Read only)
	DVD	5/9/10/18 G DVD-Single/Dual (PTP, OTP) (Read Only) 4.7G DVD+-R/RW (Read & Write) DVD+-R Dual (Read & Write) DVD-RAM (Read & Write)80mm DVD	5/9/10/18 G DVD-Single/Dual (PTP, OTP) (Read Only) 4.7G DVD+-R/RW (Read & Write) DVD+-R Dual (Read & Write) DVD-RAM (Read & Write) 80mm DVD	DVD (DVD-5; Single layer, Single side 4.7Gbytes) DVD (DVD-9; Dual layer, Single	DVD (DVD-5; Single layer, Single side 4.7Gbytes) DVD (DVD-9; Dual layer, Single

1.5 Keyboard

The Satellite P300 keyboard has two different kinds of placement, one is for JP style and the other is for US/UK style

Figure 1-5 is a view of the keyboard for US style



Figure 1-5 Keyboard for US style

Figure 1-6 is a view of the keyboard for UK style.



Figure 1-6 Keyboard for UK style

Figure 1-7 is a view of the keyboard for JP style.



Figure 1-7 Keyboard for JP style

See Appendix E for details of the keyboard layout.

1.6 TFT Color Display

The SatelliteP300 and Satellite Pro 300 Panel use CCFL to control backlight.

1.6.1 LCD Module with CCFL Backlight

Figure 1-8 ~ 1-11 shows a view of the LCD module and Table 1-8 lists the specifications.

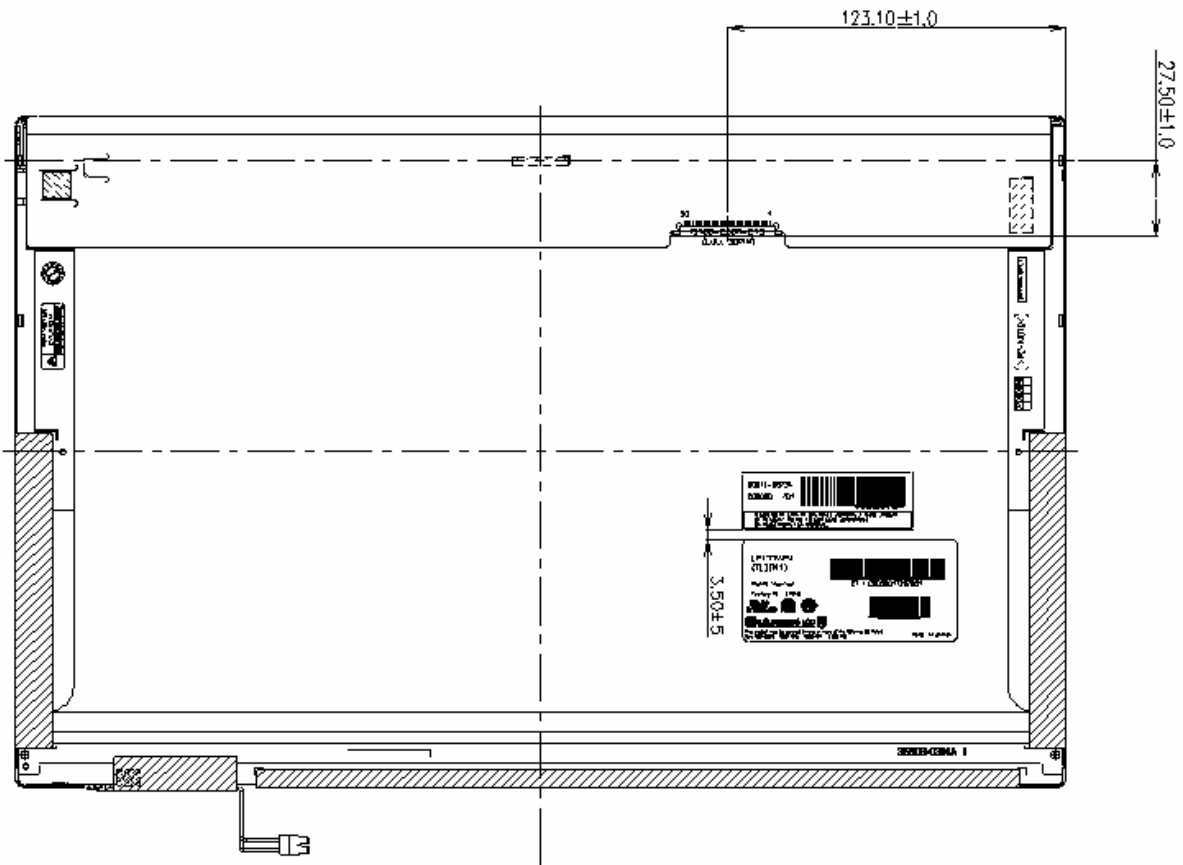


Figure 1-8 LG-Philips LCD Module

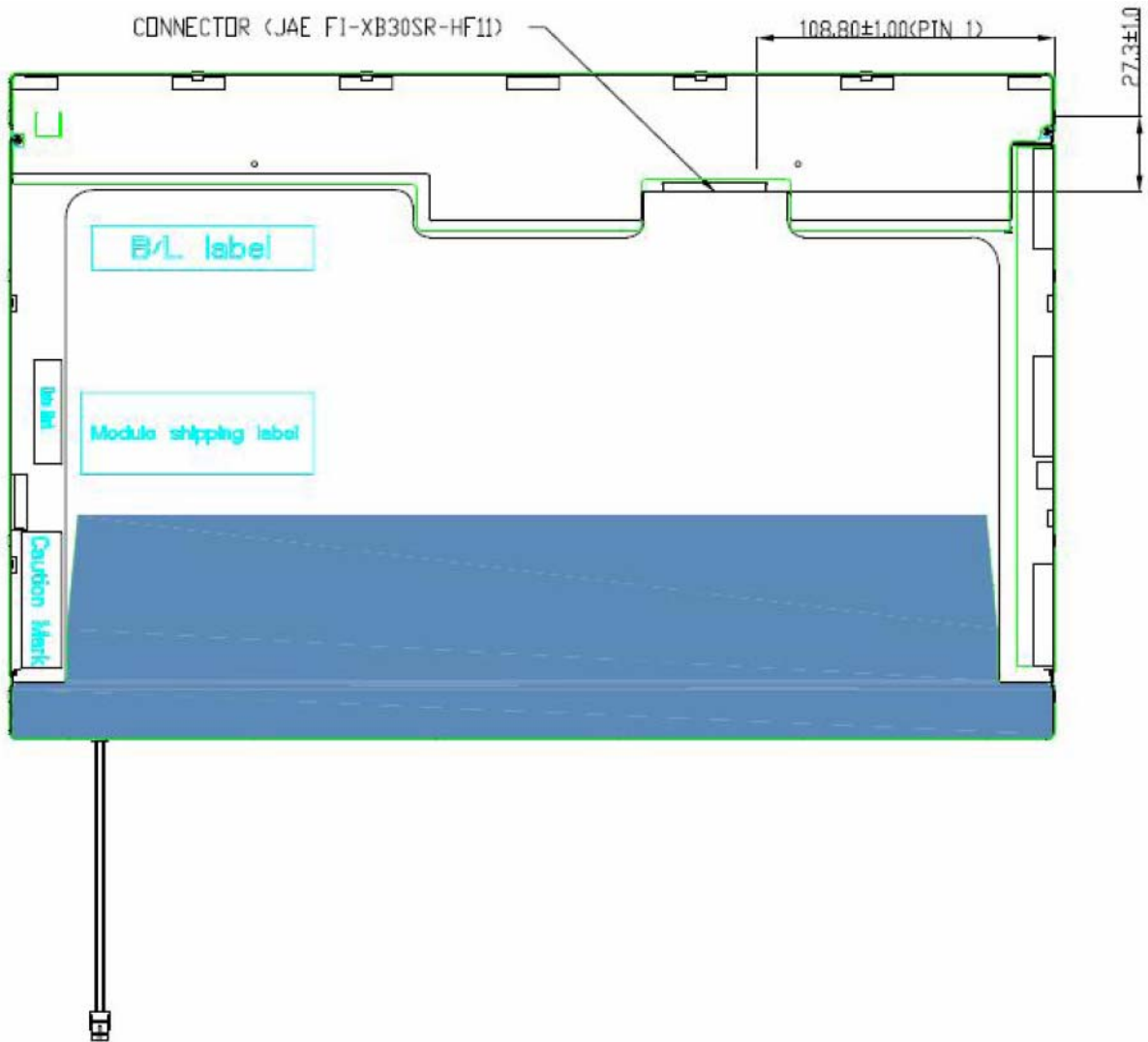


Figure 1-9 AUO LCD Module

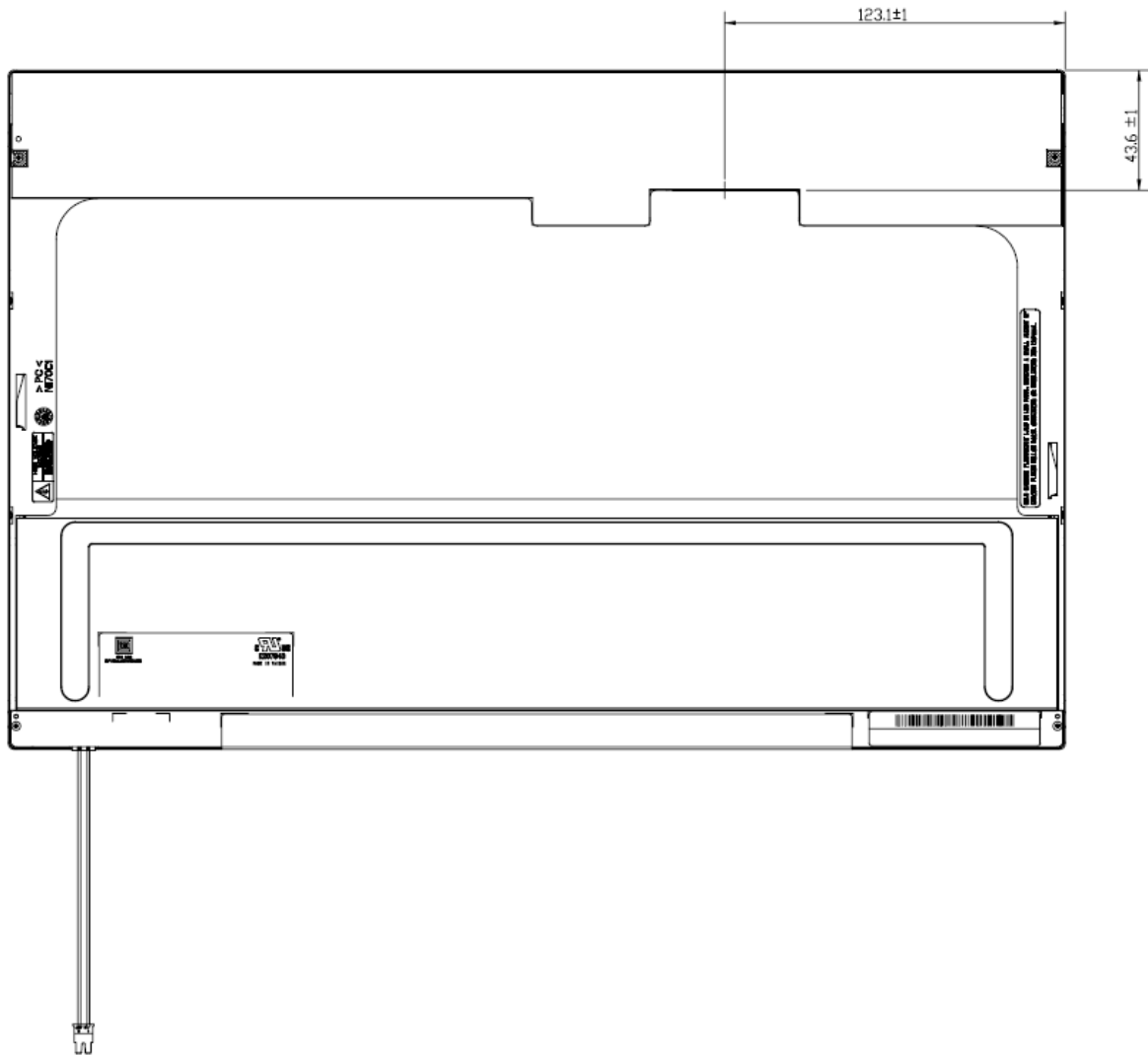


Figure 1-10 CMO LCD Module

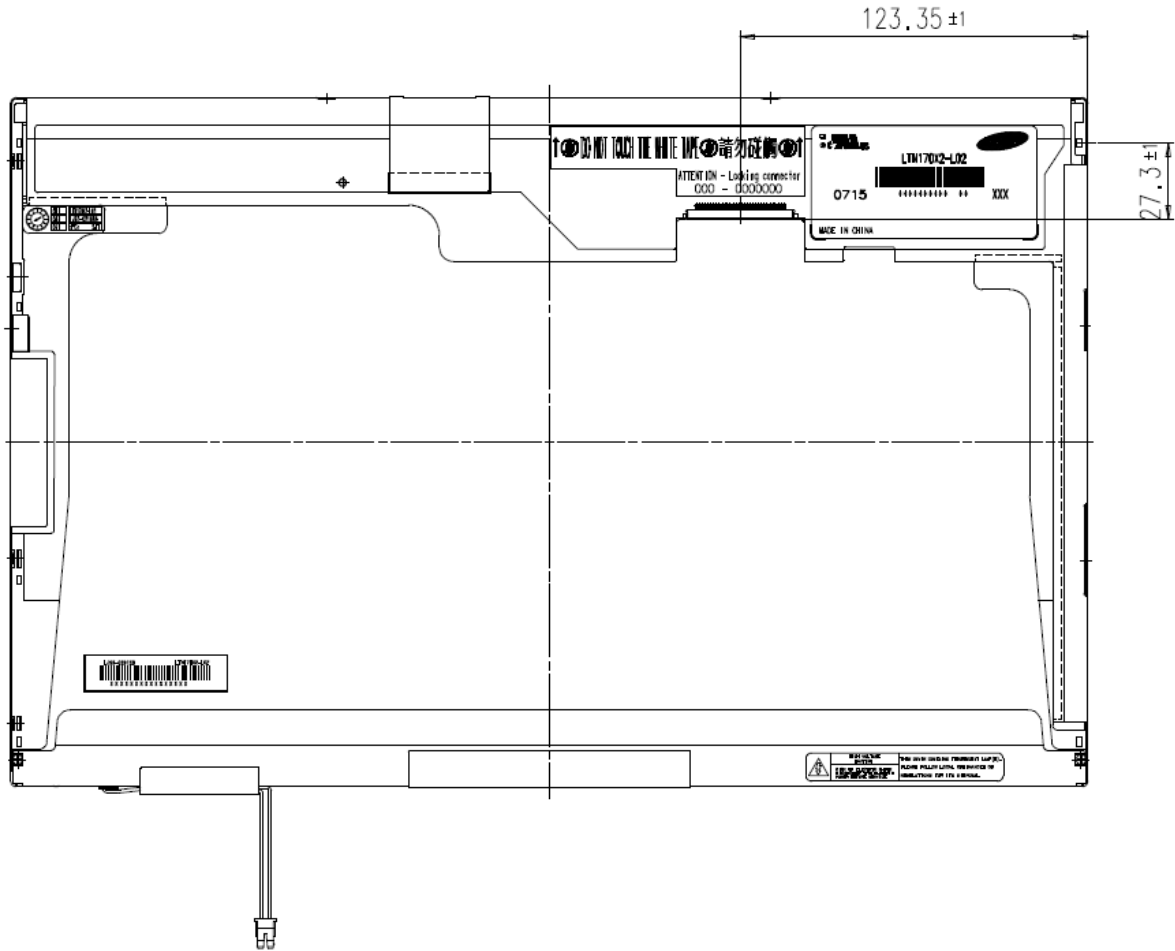


Figure 1-11 SAMSUNG LCD Module

Table 1-6 LCD module specifications

Item	Specifications(WXGA+)			
	LG-Philips LP171WP4-TLN1	AUO B170PW06	CMO N170C2-L02	Samsung LTN170X2-L02-S
Number of Dots	1,440 x 3(R,G,B) x 900			
Dot spacing (mm)	0.255(H)× 0.2555(V)			
Display Colors	262,144 colors			

1.6.2 CCFL Inverter Board

Table 1-7 lists the FL inverter board specifications.

Table 1-7 FL inverter board specifications

Item		Specifications			
		Foxconn T18I095.00	Delta DAC-08N035 AF	SUMIDA TWS-449-308	TDK TBD485NR
Input	Voltage (V)	8~20	8~20	8~20	8~20
	Power (W)	7.5W	7.5W	7.5W	7.5W
Output	Voltage (Vrms)	612~945	612~945	612~945	612~945
	Current (f=55KHz)(mArms)	2.3±0.4 ~ 6.5±0.3			

1.7 Power Rails

Table 1-8 lists the power rail output specifications of Santa Rosa platform.

Table 1-8 Power supply output rating

Name	Power supply (Yes/No)			
	Voltage [V]	Power OFF Suspend mode	Power OFF Boot mode	No Battery
+5VPCU	5	Yes	Yes	No
+5V_S5	5	Yes	No	No
+5V	5	No	No	No
+5VSATA	5	No	No	No
USBPWR1	5	No	No	No
+5V_TP	5	No	No	No
VCCRTC	3.3	Yes	Yes	Yes
TH_FAN_POWER	3.1~5	No	No	No
+3VPCU	3.3	Yes	Yes	No
+3V_S5	3.3	Yes	No	No
+3VSUS	3.3	Yes	No	No
+3V	3.3	No	No	No
CCD_POWER	3.3	No	No	No
VCC_XD	3.3	No	No	No
+1.8VSUS	1.8	Yes	No	No
+1.5V	1.5	No	No	No
+1.25V	1.25	No	No	No
+1.05V	1.05	No	No	No
VCC_CORE	0.55~1.575	No	No	No

1.8 Batteries

The PC has the following two batteries.

- θ Main battery
- θ Real time clock (RTC) battery

Table 1-9 lists the specifications for these two batteries.

Table 1-9 Battery specifications

Battery Name		Battery Element	Output Voltage	Capacity
Main battery	Sanyo 6 cell	Lithium ion	10.8v	4000mAh
	Panasonic 6 cell		10.8v	4000mAh
	Sanyo 9 cell		10.8v	6000mAh
Real time clock (RTC) battery	Panasonic ML1220/F1BE- MOLEX-58ZL1	Lithium ion	3V	17mAh

1.8.1 Main Battery

The main battery is the primary power supply for the computer when the AC adapter is not connected. In Standby, the main battery maintains the current status of the computer.

1.8.2 Battery Charging Control

Battery charging is controlled by a power supply microprocessor. The power supply microprocessor controls power supply and detects a full charge when the AC adaptor and battery are connected to the computer.

θ Battery Charge

When the AC adapter is connected, normal charging is used while the system is turned on and quick charge is used while the system is turned off. Refer to the following Table 1-10.

Table 1-10 Time required for charges of main battery

Condition	Charging Time
Power On Charge	About 12 hours-
Power Off Charge	About 4 hours

Charge is stopped in the following cases.

1. The main battery is fully charged
2. The main battery is removed
3. Main battery or AC adapter voltage is abnormal
4. Charging current is abnormal

θ Data preservation time

When turning off the power in being charged fully, the preservation time is as following Table 1-11.

Table 1-11 Data preservation time

Condition	preservation time	
Standby	About 3 days	
Hibernation	About 1 month	
Battery Pack	3 cell	Approximately 1.5 days(sleep mode)
	6 cell	Approximately 3 days(sleep mode)
	9 cell	Approximately 5 days(sleep mode)
Approximately 1 month(shutdown mode,All type of battery pack)		

1.8.3 RTC Battery

The RTC battery provides the power supply to maintain the date, time, and other system information in memory.

Table 1-12 lists the Time required for charges of RTC battery and data preservation time.

Table 1-12 Time required for charges of RTC battery

Condition	Time
Power ON (Lights Power LED)	About 24 hours
Data preservation tome (Full-charged)	About a month

1.9 AC Adapter

The AC adapter is used to charge the battery.

Table 1-13 lists the AC adapter specifications.

Table 1-13 AC adapter specifications

Parameter	Specification		
With Led	DELTA/ LITE-ON	DELTA/ LITE-ON	DELTA/ LITE-ON
Power	75W	90W	120W
Input voltage	AC 100V/240V		
Input frequency	50Hz/60Hz		
Input current	$\leq 1.5A$		
Output voltage	DC 19V		
Output current	3.95A	4.74A	6.3A

Chapter 4

Replacement Procedures

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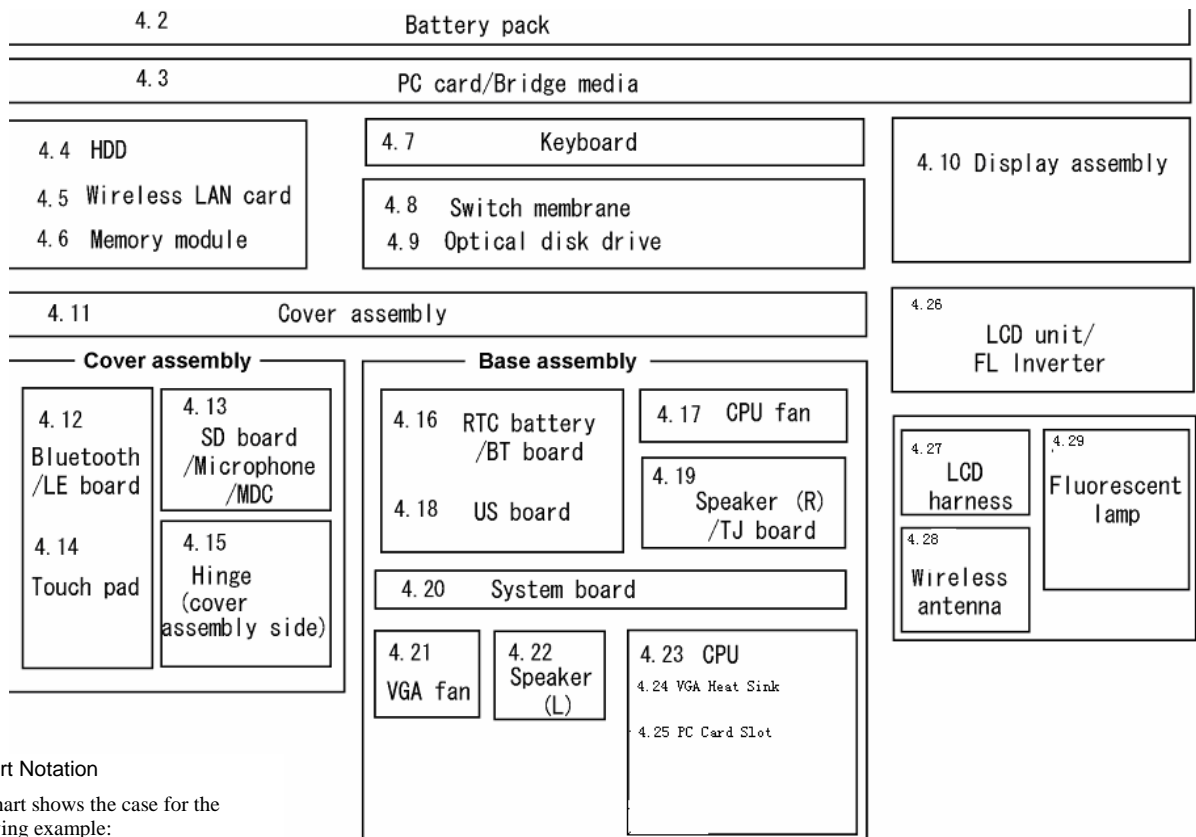
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4.1 Overview

This chapter describes the procedure for removing and replacing the field replaceable units (FRUs) in the PC. It may not be necessary to remove all the FRUs in order to replace one. The chart below provides a guide as to which other FRUs must be removed before a particular FRU can be removed. The numbers in the chart indicate the relevant section numbers in this manual.

In all cases when removing an FRU, the battery pack must also be removed. When repairing an FRU that is the potential cause of a computer fault, use the chart to determine the order in which FRUs need to be removed.

The tilt stand, if it is installed, can be removed without any other FRUs removed.



• Chart Notation

The chart shows the case for the following example:

• Removing a MDC

All FRUs down to the “4.2 Battery pack” to “4.11 Cover assembly” above a SD board/Microphone/MDC must be removed.

Safety Precautions

Please read the following safety instructions before disassembling the computer and always follow the instructions while working on the computer.

DANGER:

- 1. In the case of the battery, always use authentic parts or equivalent parts approved by Toshiba. Other batteries may have different specifications that are incompatible with the computer and may result in fire or explosion.
Due to the risk of alkali fluid leaks, never attempt to heat or disassemble the battery. Similarly, due to the risk of explosion, never expose the battery to flame.*
- 2. Some parts including the power supply and FL inverter generate high voltages. If you need to turn on the power while disassembling the computer, do not touch any connectors or other components due to the risk of electric shock. Also, do not disassemble individual parts when performing routine maintenance.*

WARNING:

- 1. To prevent electric shock, turn off the power unplug the AC adapter from the power source.*
- 2. As the battery installed to the computer is typically already charged, the risk of electric shock remains even when the AC adapter is unplugged from the socket. To prevent electric shock, always take off any metal jewelry or accessories such as necklaces, bracelets or rings before working on the computer. Never work with wet or moist hands.*
- 3. Take care not to injury yourself on any edges or corners.*

CAUTION:

- 1. Confirm that replacement parts have compatible specifications before replacing on the computer. Never use incorrect parts as these may cause faults on the computer.*
- 2. To prevent internal damage such as short circuits or burning, do not allow any screws, paper clips, or other metal objects to fall into the computer. When removing screws, always replace with the same size screws. Ensure that all screws are fully tightened. Loose screws may result in short circuits leading to overheating, smoke or flame.*
- 3. To prevent electric shock, check that you have disconnected all cables from a part before removing the part.*
- 4. When connecting to the AC power supply, use only an AC adapter and cable approved by Toshiba.*
- 5. To prevent electric shock, ensure that all replacement parts are compatible with the computer and that all cables and connectors are securely connected.*

Before You Begin

Take note of the following points before starting work. Always remove the AC adapter and battery pack before commencing any of the procedures. The procedure for removing the battery pack is described in section “4.2.1 Battery Pack”.

1. Do not disassemble the computer unless it is operating abnormally.
2. Use the designated tools.
3. Ensure that the environment for working on and storing parts does not contain any of the following.
 - Dust or dirt
 - Static electricity
 - Extremely hot, cold or humid conditions
4. Perform the diagnostic tests described in Chapter 2 to determine which FRU is the cause of the fault.
5. Do not perform any unnecessary work. Always work in accordance with the disassembly and reassembly procedures in this manual.
6. Keep parts removed from the computer in a safe place away from the computer where they will not be damaged or interfere with your work.
7. Disassembling requires the removal of a large number of screws. Keep removed screws in a safe place such that you can determine which screws belong to which part.
8. When reassembling, ensure that you use the correct screws and fit parts in the correct position. Screw sizes are noted in the text and figures.
9. As all parts have sharp edges and corners, take care not to cut yourself.
10. After replacing an FRU, check that the computer and replaced part operate correctly.

Disassembly Procedure

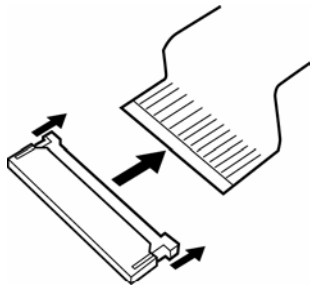
Three main types of cable connector are used.

- Pressure plate connector
- Spring connector
- Normal pin connector

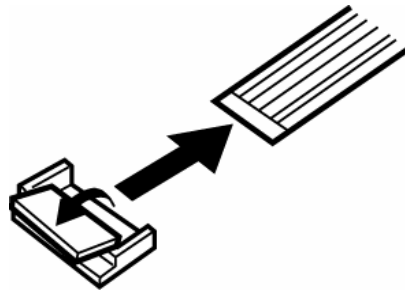
When disconnecting a pressure plate connector, lift up the tag on one side of the plastic pressure plate on the connector and pull the cable out from the connector. When reconnecting a cable to a pressure plate connector, lift up the pressure plate to a suitable height and insert the cable into the connector. Press down on both sides of the pressure plate such that both sides of the plate and connector are at the same height and that the cable is fixed in the correct position. Pull the cable to ensure that it is securely connected. If the cable is disconnected from the connector, reconnect it making sure that you lift the pressure plate high enough to insert fully the cable.

For spring connectors, lifting up the stopper frees the cable and allows it to be pulled out. To reconnect, hold the stopper in the up position and insert the cable, then lower the stopper to secure the cable.

Normal pin connectors are used for all other cables. Simply pull out or push in these connectors to disconnect or reconnect.



Pressure plate connector



Spring connector

Assembly Procedure

After the computer has been disassembled and the part that caused the fault has been repaired or replaced, the computer must be reassembled.

Take note of the following general points when assembling the computer.

- Take your time and follow the instructions carefully. Hurrying the assembly work will only introduce new problems.
- Check that all cables and connectors are securely connected.
- Before fastening FRUs or other parts in place, ensure that no cables are caught on screws or the FRU.
- Check that all latches are securely closed.
- Ensure that you have installed all FRUs correctly and do not have any screws left over. Using an incorrect screw may damage the thread or screw head and result in the FRU not being securely fastened in place.

After installing FRUs, check that the computer operates correctly.

Tools and Equipment

For your safety and the safety of the people around you, it is important that you use Electrostatic Discharge (ESD) equipment. Correctly utilizing of the equipment increases the percentage of successful repairs and saves on the cost of damaged or destroyed parts. The following equipment is required for disassembly and assembly.

- One Philips screwdriver with type 0 bit (for THIN HEAD screws)
- One Philips screwdriver with type 1 bit (for screws other than above)
- Tweezers (for lifting screws)
- ESD mats (lay on work table or floor)
- An ESD wrist strap and heel grounder
- Anti-static carpet or flooring

Screw Tightening Torque

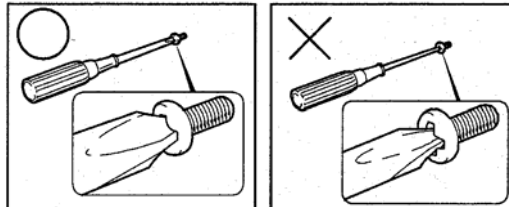
Use the following torque when tightening screws.

CAUTION: *Overtightening may damage screws or parts. Undertightening may allow screws to loosen (and possibly fall out) causing a short circuit or other damage.*

NOTE: *To tighten screws quickly and accurately, an electric screwdriver is recommended.*

- M2 (2mm) 0.167 N·m (1.7 kgf·cm)
- M2.5 (2.5mm) 0.245 N·m(2.5 kgf·cm)
- M2.5 (2.5mm) 0.392 N·m(4.0 kgf·cm) for Hinge support
- M3.0 (3mm) 0.245 N·m (2.5 kgf·cm)

NOTE: *To prevent damage to THIN HEAD screws, press along the axis of the screwdriver while turning the screw. This is because the contact area between the screw and driver is less than for a pan head screw (standard pan-shaped screw head).*



Grip Color

Some screws have a colored grip area to help you determine the length of the screw.

- Even numbered length screws: Brown
- Odd numbered length screws: White
- Special length screw: Blue



“Special length screw” means screws whose length is indicated in an integral number to the first decimal places such as 2.5 mm, 2.8 mm and so on.

Screw Notation

To make maintenance of the computer easier, markings of the kinds of the screws including the types and lengths are indicated on the computer body.

Format:

Screw shape + Screw length (mm)

Screw shape

B: Bind screw

F: Thin head screw

S: Super thin head screw

T: Tapping screw

U: Other screws (Unique screws: pan head, stud, etc.)

Example: B6 ... 6mm bind screw

4.2 Battery pack

Removing the battery pack

The following describes the procedure for removing the battery pack (See Figure 4-1).

CAUTION: Take care not to short circuit the terminals when removing the battery pack. Similarly, do not drop, knock, scratch, disassemble, twist, or bend the battery pack.

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.
3. Turn the computer upside down.
4. Slide and hold the battery release latch (2) to free the battery pack after moving the battery release lock (1) into it unlock position – pick the battery pack out of the computer from fillister.

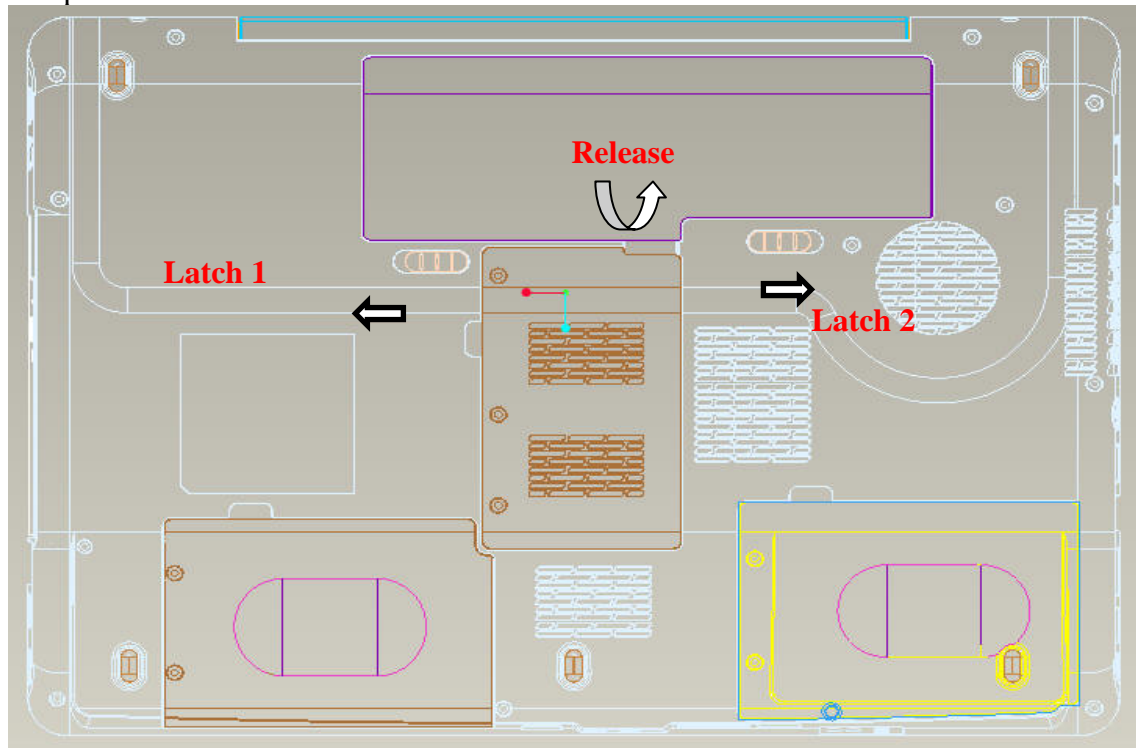


Figure 4-1 Remove the battery pack

NOTE: *Dispose of the used battery pack in accordance with the laws and ordinances of your local authority.*

Installing the battery pack

The following describes the procedure for installing the battery pack (See Figure 4-1).

CAUTION: *There is a danger that the lithium ion battery pack may explode if not fitted, operated, handled, or disposed correctly. Dispose always the used battery pack in accordance with the laws and ordinances of your local authority. Use only the batteries approved by Toshiba.*

NOTE: *Check visually the battery terminals and clean off any dirt with a dry cloth.*

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.
3. Attach the **battery cover** to the **battery pack**.
4. Insert the battery pack
5. Ensure the battery release lock (1) is moved into its locked position

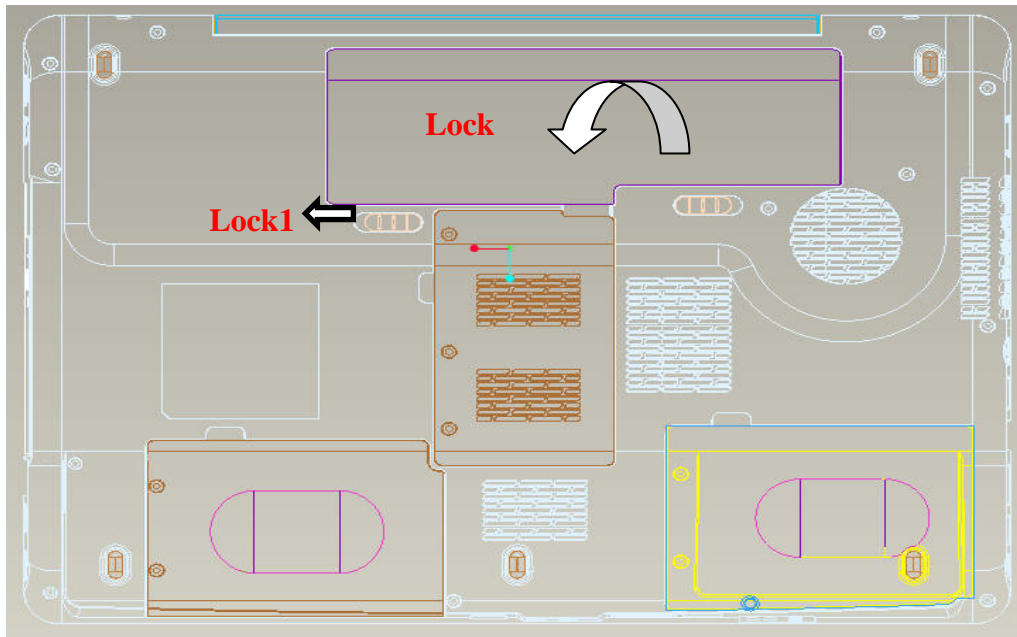


Figure 4-2-1 Install the battery pack

4.3 PC card

Removing a PC card

The following describes the procedure for removing a PC card (See Figure 4-2-1).

CAUTION: Insert or remove a PC card in accordance with any instructions in a PC card manual or the manuals of the computer system you are using.

1. Push the **PC card**. It will pop out PCMCIA Card when you release it. And NEW Card same as PC card. Then press the card once more to eject a card.
2. Grasp one of **PC card** and remove it.

NOTE: If a PC card is not inserted all the way, the eject button may not pop out. Be sure to push a PC card firmly and press the eject button again.

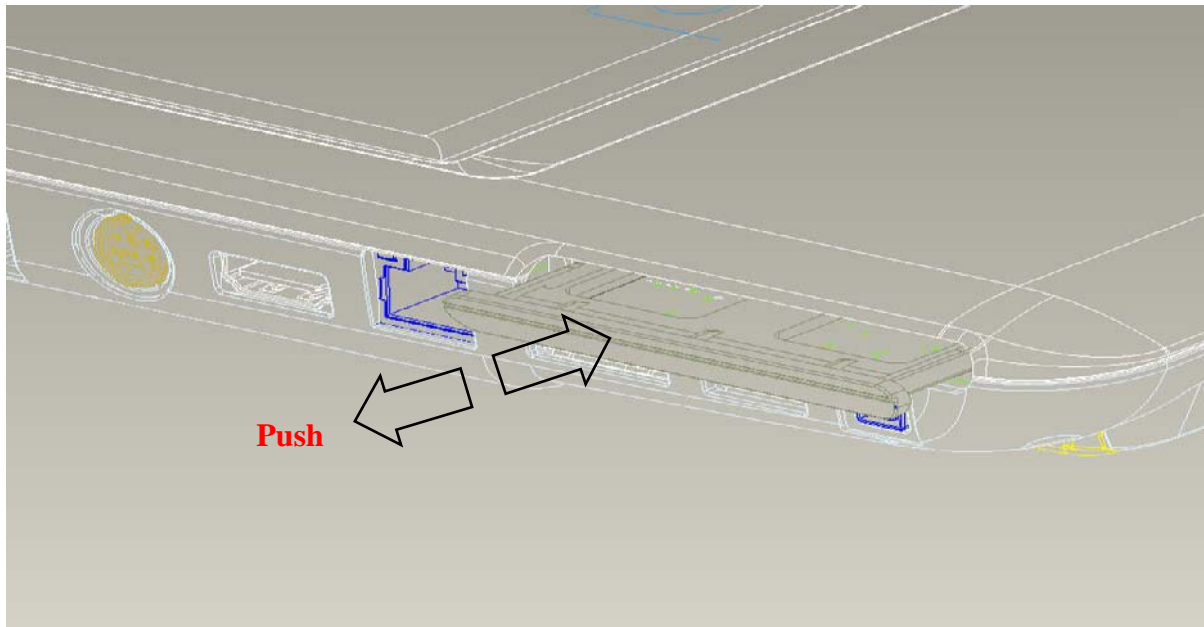


Figure 4-2 Remove a PC card

Installing a PC card

The following describes the procedure for inserting a PC card (See Figure 4-2-2).

1. Make sure the **PC card** does not stick out.
2. Insert a **PC card** and press it until it is securely connected.

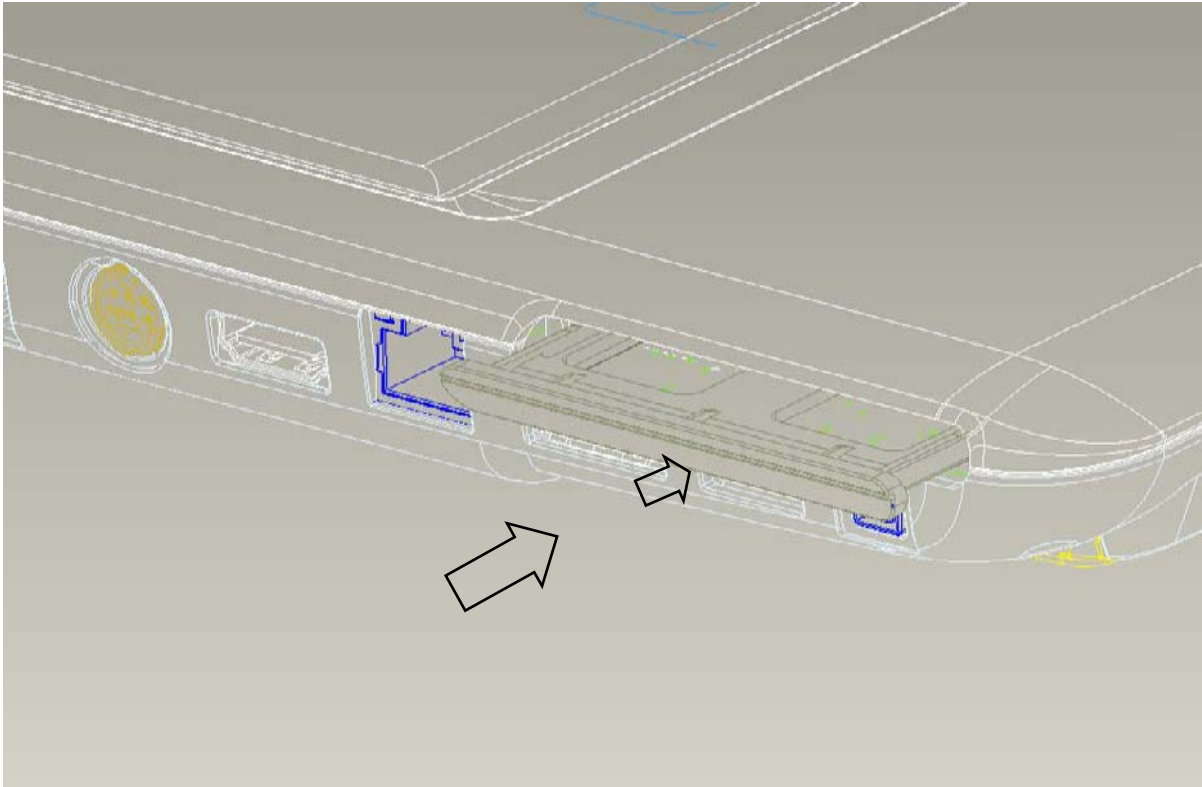


Figure 4-3-1 Insert a PC card

4.4 HDD

Removing a MAIN HDD-H9.5mm / HDD-H12.5mm

The following describes the procedure for removing the main HDD (See Figure 4-3 to 4-4).

CAUTION: *Take care not to press on the top or bottom of a HDD. Pressure may cause data loss or damage to the device.*

1. Turn the computer upside down.
2. Remove the following **screws** securing a HDD slot cover and remove a **HDD slot cover**.
 - M2.5×4.0B FLAT BIND screw x2
3. Remove the following **screws** securing the **HDD assembly**.
 - M2.5×5.0B FLAT BIND screw x2
4. Disconnect the **HDD assembly** from the connector on the system board.

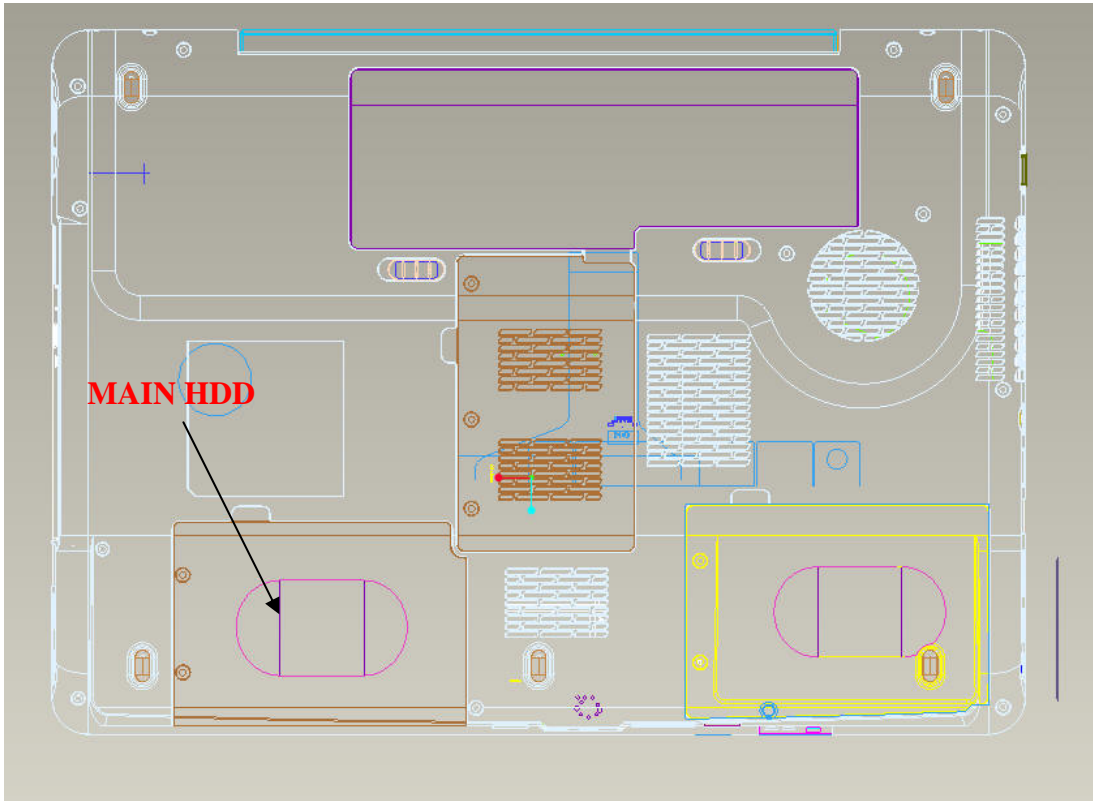


Figure 4-4 Turn the compute upside down

CAUTION: When a HDD is installed, they are installed in the position as the following figure.

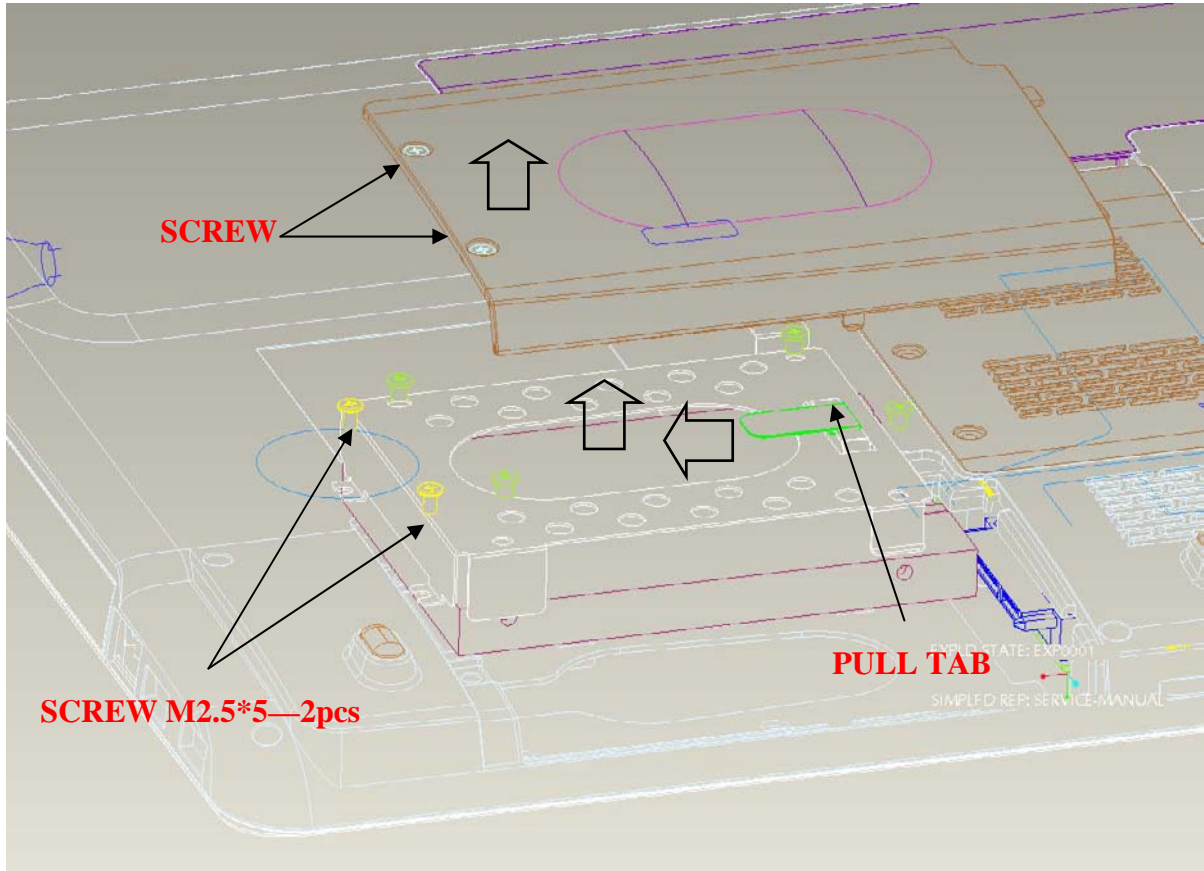


Figure 4-5-1 Remove the MAIN HDD assembly

5. Remove the following **screws** securing the HDD holder and remove the **HDD holder**.

- M3.0×3.0B FLAT BIND screw x4

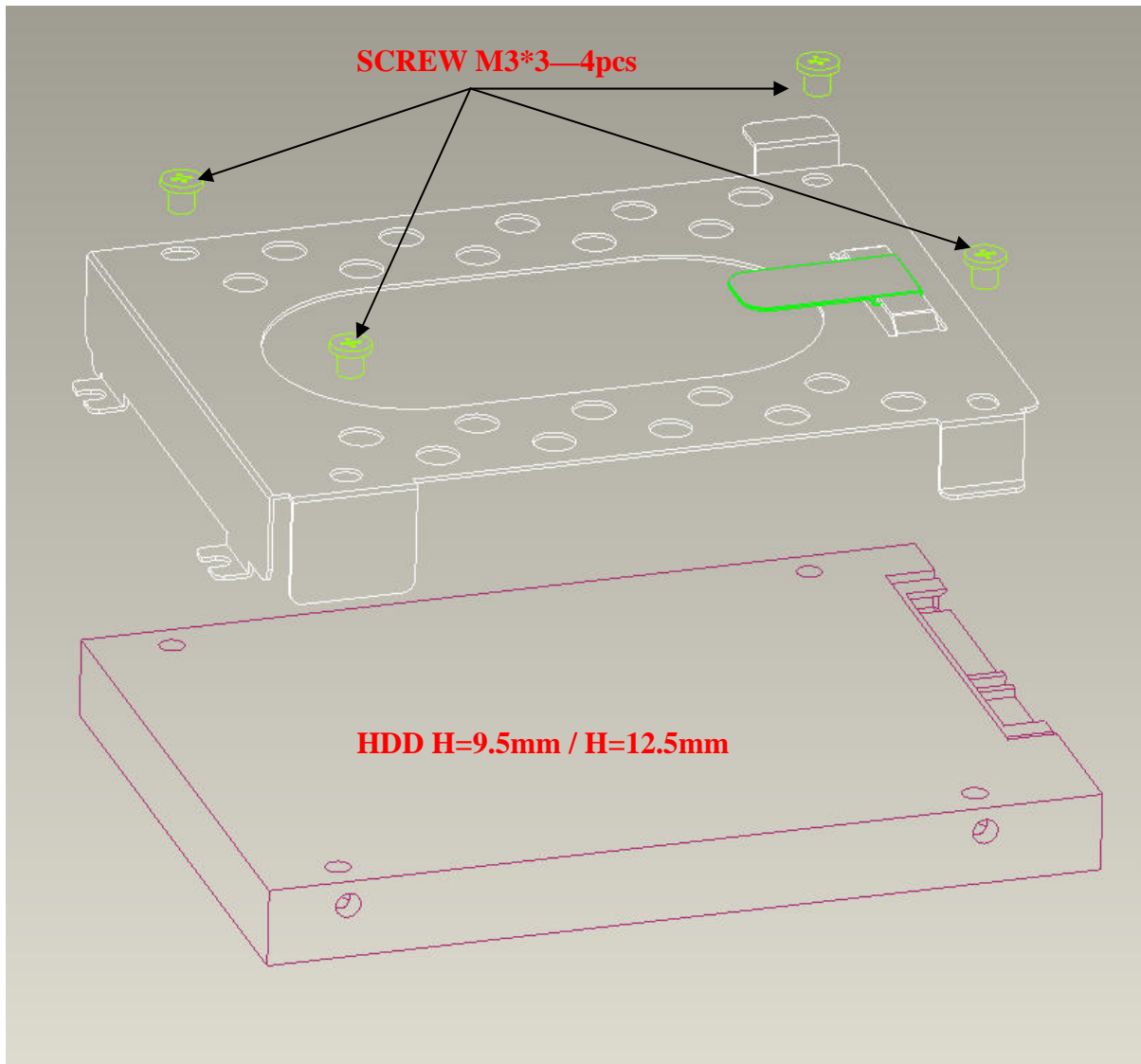


Figure 4-4 Remove MAIN HDD

Installing MAIN HDD-H9.5mm / HDD-H12.5mm

The following describes the procedure for installing the main HDD (See Figure 4-3 to 4-4).

1. Install a HDD to the **HDD holder** and secure it with the following **screws**.

- M3.0×3.5F FLAT BIND screw x4

<p>NOTE: <i>Although they are 3mm head screws, screw torque must be set in 2.5kg-cm for four screws securing the HDD holder.</i></p>

2. Insert the **HDD assembly** into the HDD slot and connect it carefully to the **MAIN HDD** on the system board.
3. Secure the **HDD assembly** with the following **screw**.

- M2.5×4.0B FLAT BIND screw x2

4.5 HDD

Removing second HDD-H9.5mm / HDD-H12.5mm

The following describes the procedure for removing the second HDD (See Figure 4-3 to 4-4).

CAUTION: *Take care not to press on the top or bottom of a HDD. Pressure may cause data loss or damage to the device.*

4. Turn the computer upside down.
5. Remove the following **screws** securing a HDD slot cover and remove a **HDD slot cover**.
 - M2.5×4.0B FLAT BIND screw x2
6. Remove the following **screws** securing the **HDD assembly**.
 - M2.5×5.0B FLAT BIND screw x2
7. Disconnect the **HDD assembly** from the connector on the system board.

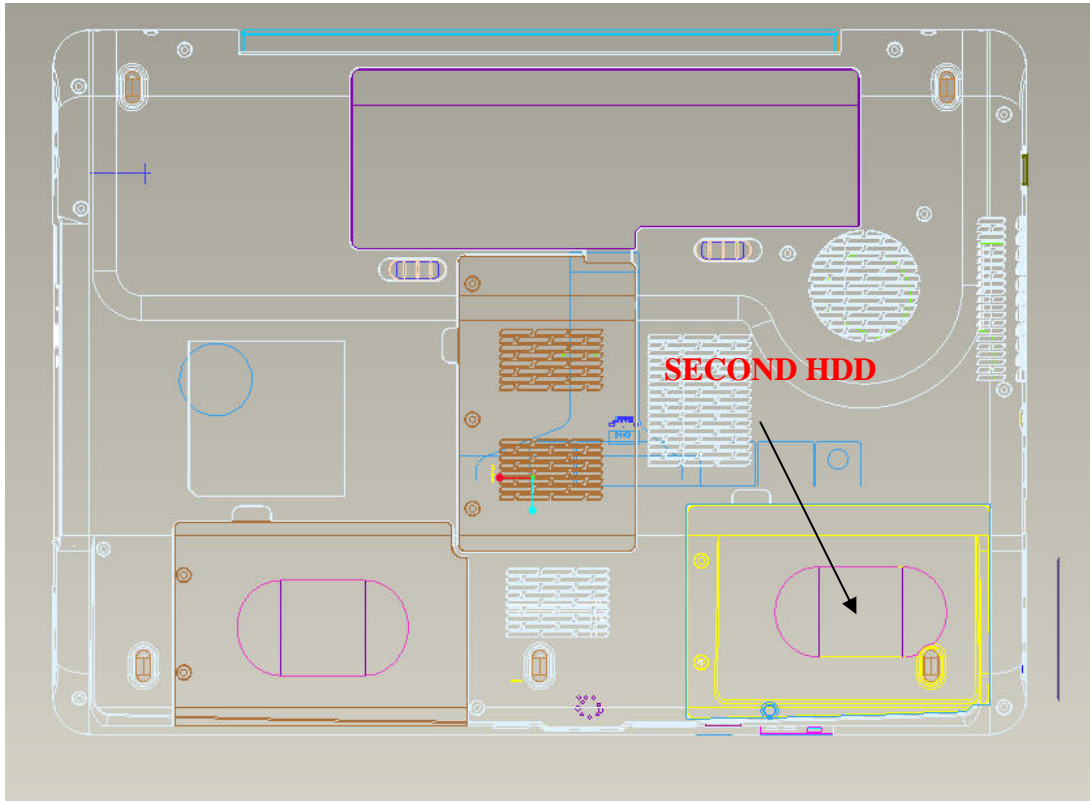


Figure 4-4-1 Turn the computer upside down

CAUTION: When a HDD is installed, they are installed in the position as the following figure.

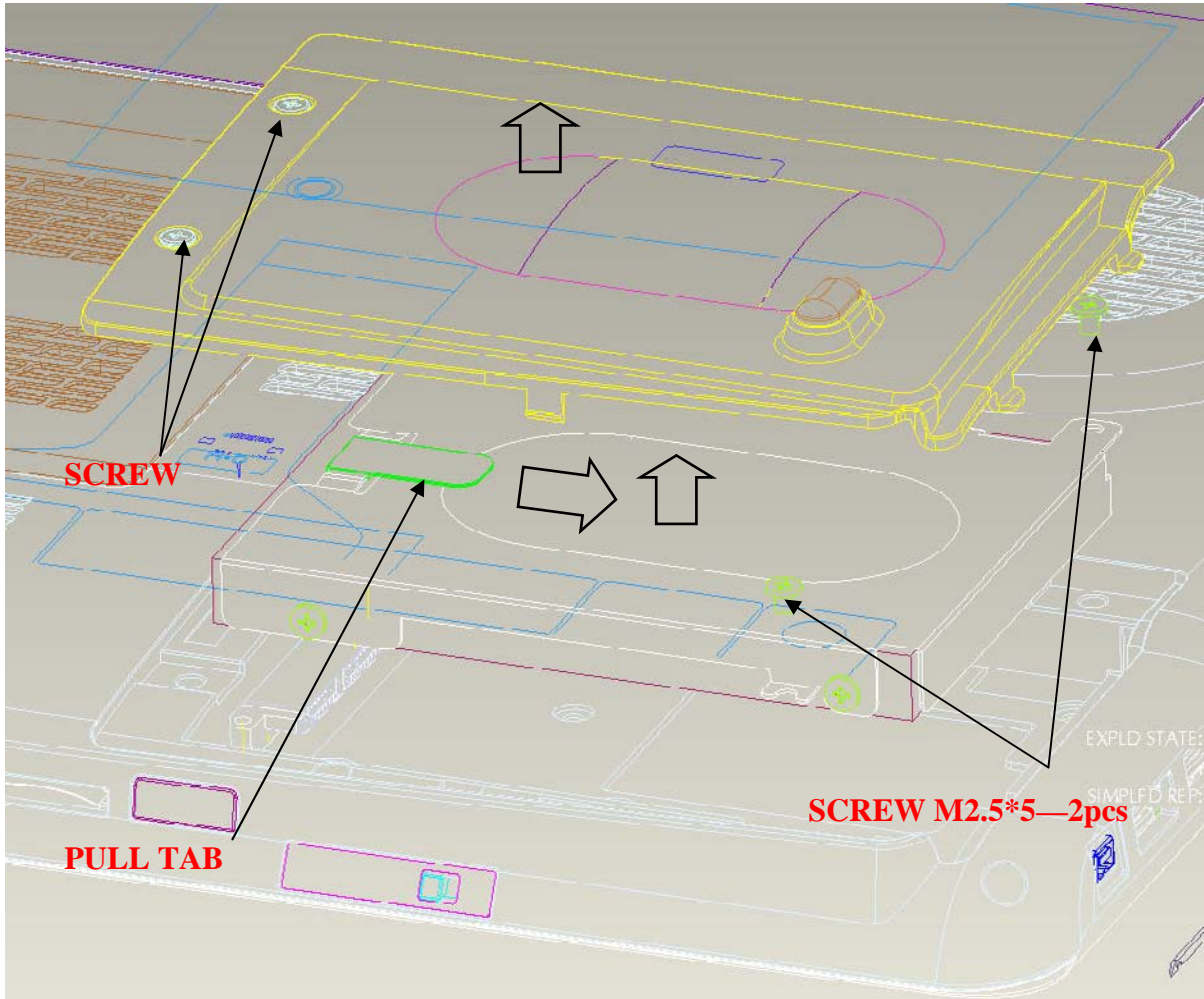


Figure 4-4-2 Remove the SECOND HDD assembly

8. Remove the following **screws** securing the HDD holder and remove the **HDD holder**.

- M3.0×3.0B FLAT BIND screw x4

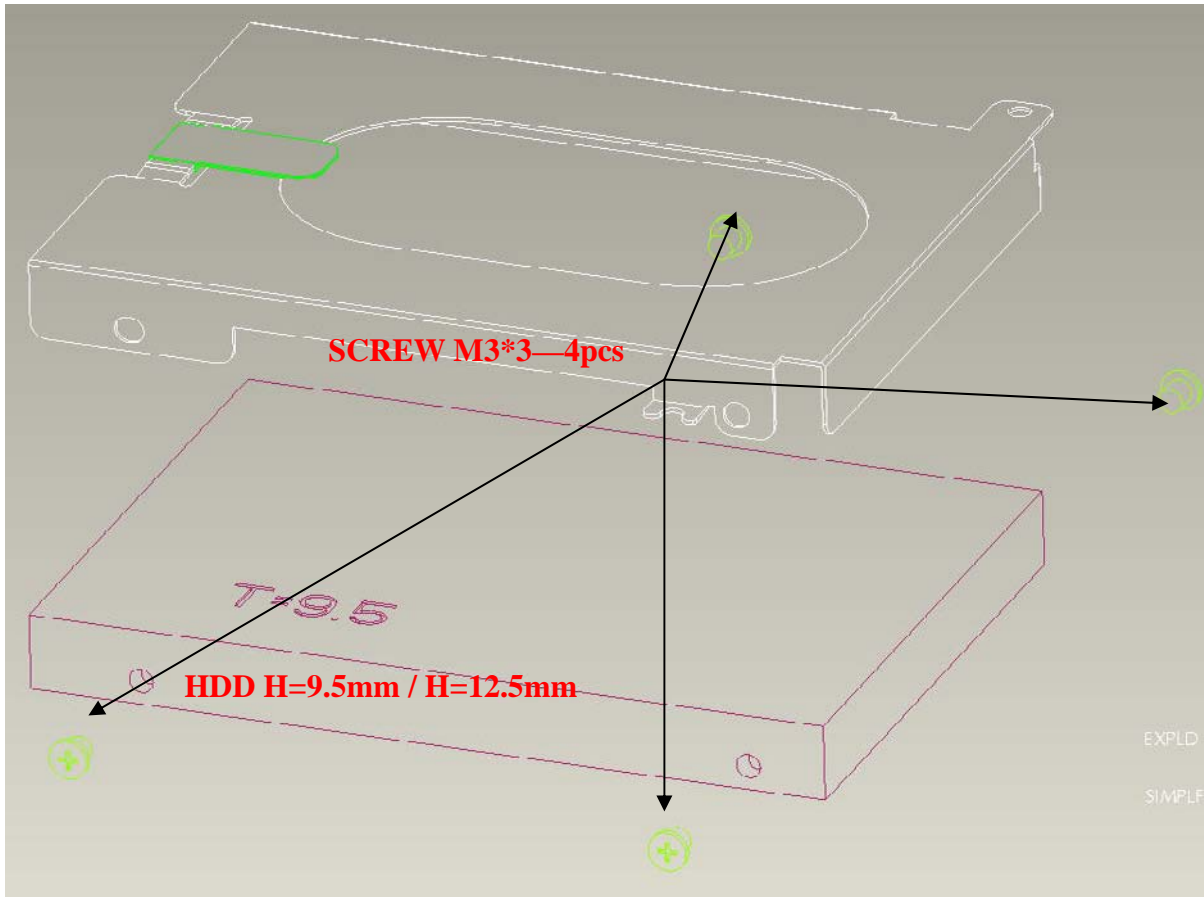


Figure 4-4-3 Remove the screws and HDD holder

Installing Second HDD-H9.5mm / HDD-H12.5mm

The following describes the procedure for installing a HDD (See Figure 4-3 to 4-4).

9. Install a HDD to the **HDD holder** and secure it with the following **screws**.

- M3.0×3.5F FLAT BIND screw x4

NOTE: *Although they are 3mm head screws, screw torque must be set in 2.5kg-cm for four screws securing the HDD holder.*

10. Insert the **HDD assembly** into the HDD slot and connect it carefully to the **MAIN HDD** on the system board.

11. Secure the **HDD assembly** with the following **screw**.

- M2.5×4.0B FLAT BIND screw x2

4.6 Wireless LAN card

Removing a Wireless LAN card

The following describes the procedure for removing a Wireless LAN card (See Figure 4-5).

1. Remove the following **screw** of wireless cover securing **wireless LAN card cover** and remove it. And remove screw of wireless board
 - 2.5.0 x 4.0B BIND screw x3
2. Disconnect the **wireless LAN antenna cable** from the connectors on a wireless LAN card.
3. Open the left and right latches holding a wireless LAN card and remove a **wireless LAN card** from the **connector** on the system board.

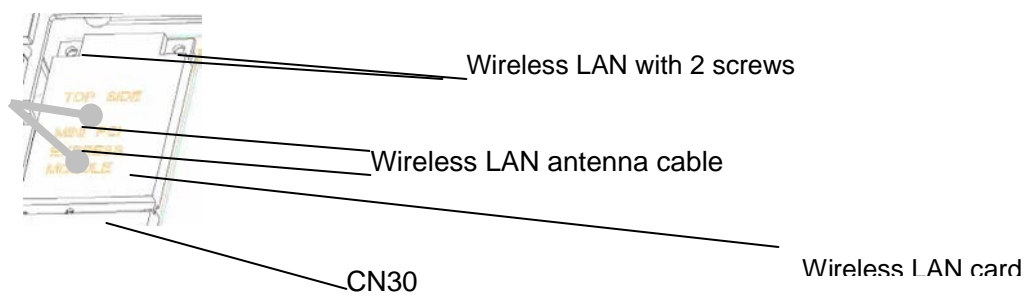
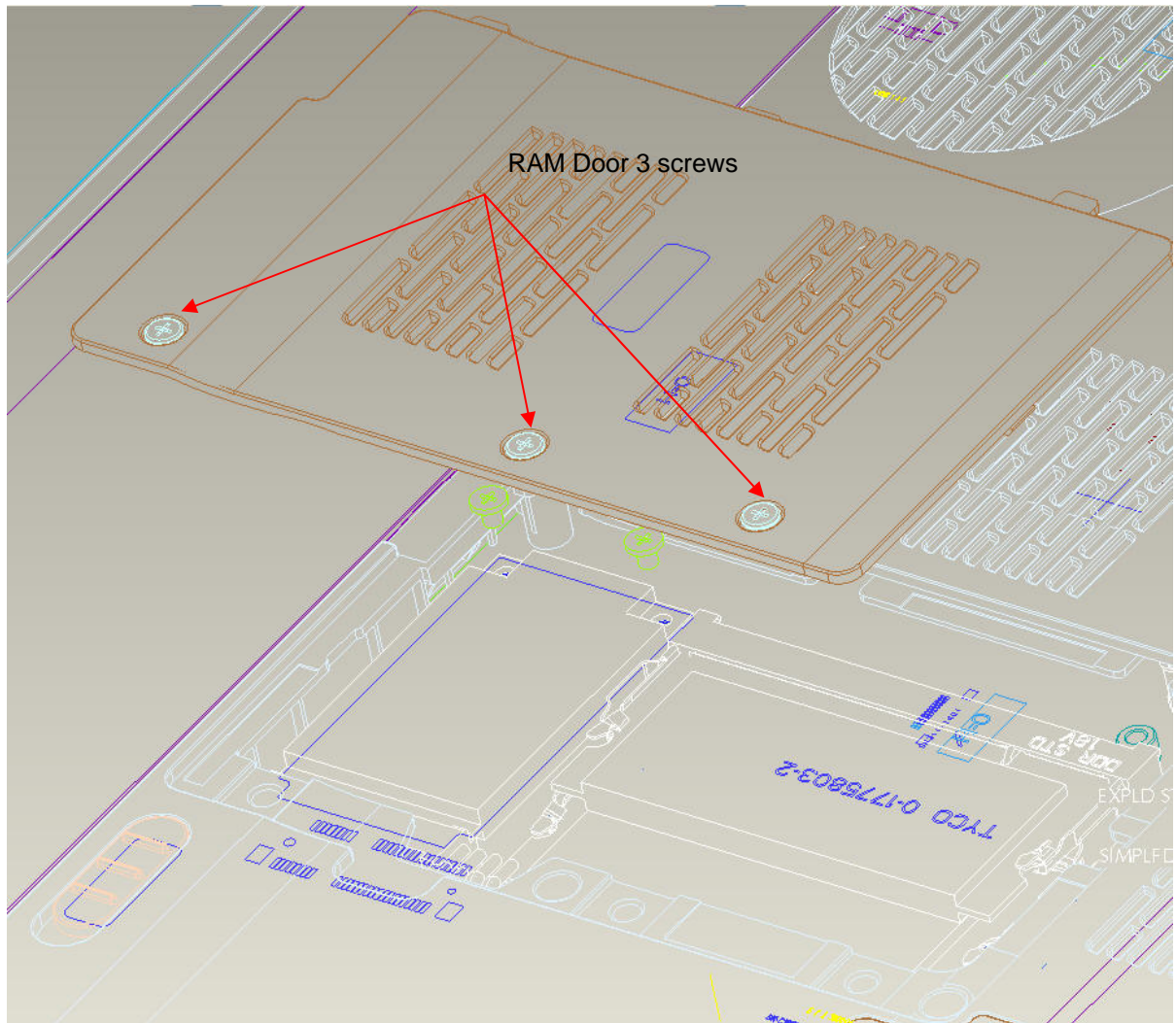


Figure 4-5 Remove a wireless LAN card

Installing a Wireless LAN card

The following describes the procedure for installing a Wireless LAN card (See Figure 4-5).

1. Insert a **wireless LAN card** terminals slantwise into the connector on the computer and press a wireless LAN card and lock the secure screws.
2. Connect the **wireless LAN antenna cables** to the terminals on a wireless LAN card.
3. Install the **wireless LAN card cover** and secure it with the following **screw**.

4.7 Memory module

CAUTION: *The power of the computer must be turned off when you remove a memory module. Removing a memory module with the power on risks damaging the module or the computer itself.*

Do not touch memory module terminals. Any dirt on the terminals may cause memory access problems.

Never press hard or bend a memory module.

Removing a memory module

To remove a memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-6).

1. Loosen the **screw** securing the **memory slot cover**.
2. Remove the **memory slot cover**.
3. Open the left and right **latches** and remove a **memory module**.

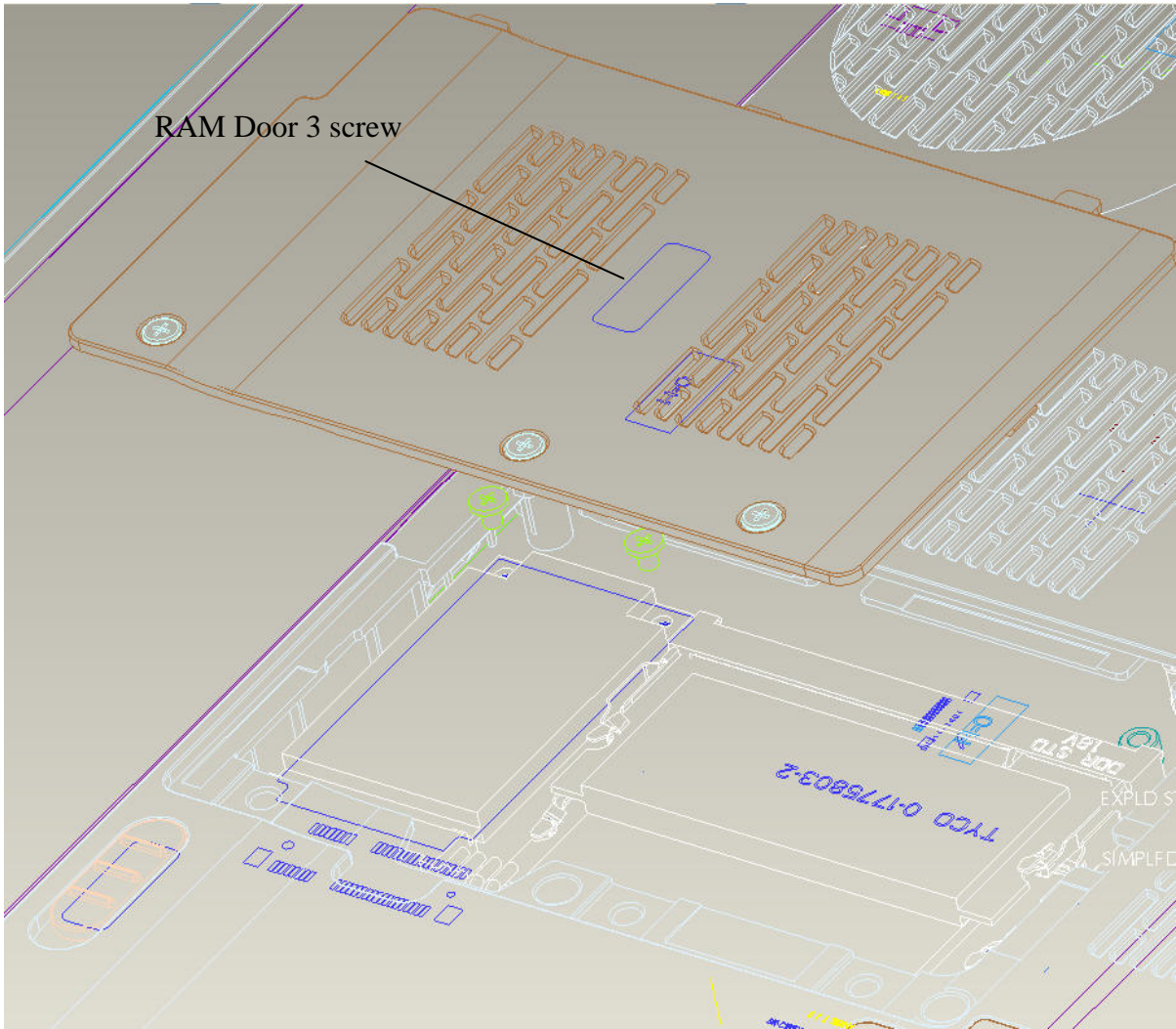


Figure 4-6 Remove memory slot cover

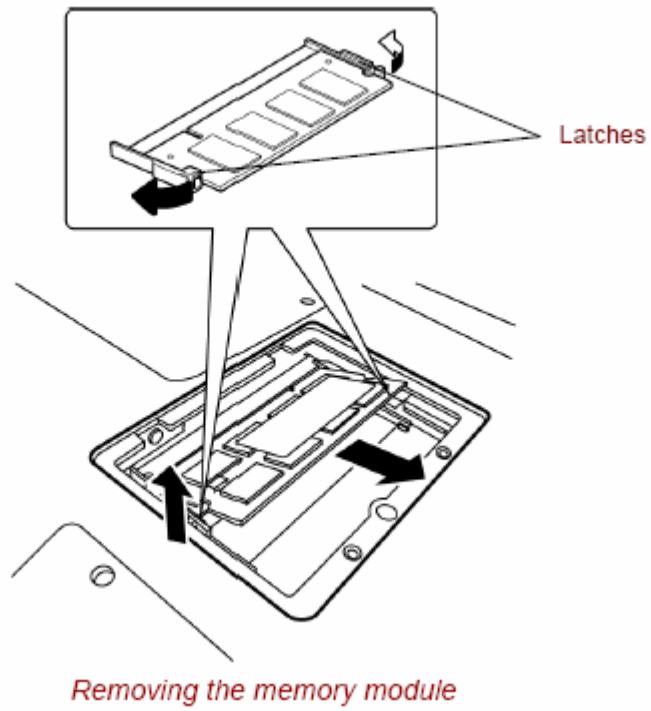


Figure 4-6-1 Remove a memory module

Installing a memory module

To install a memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-7).

1. Insert a **memory module** into the connector of the computer slantwise (terminal side first) and press it to connect firmly.

CAUTION: *The power must be turned off when you insert a memory module. Inserting a memory module with the power on might damage the module or the computer itself.*

Never press hard or bend a memory module.

2. Install the **memory slot cover** and secure it with the **screw**.
3. When the power of the computer is turned on, the computer checks automatically the memory size. Confirm that the new memory is detected correctly.
4. If the memory is not detected, check that it is connected correctly.

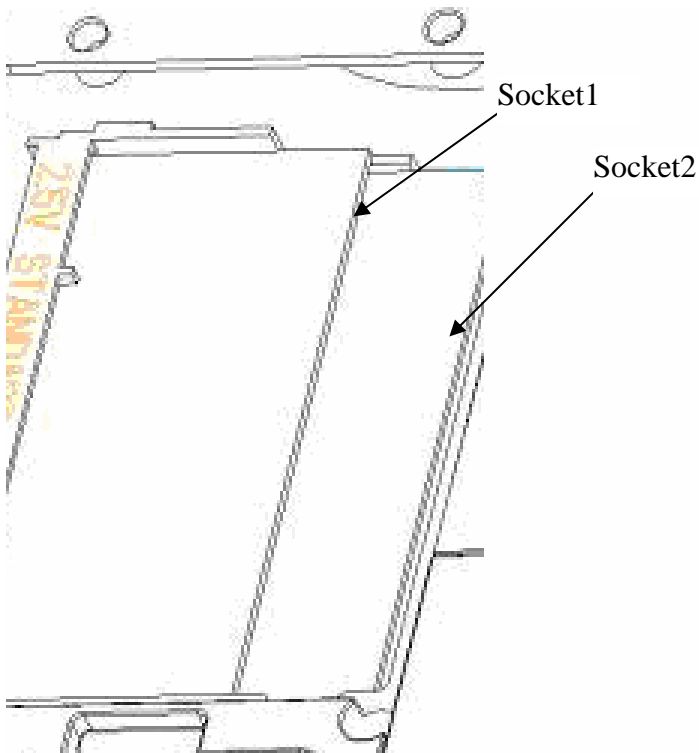


Figure 4-7 Insert a memory module

4.8 Keyboard

Removing the keyboard

The following describes the procedure for removing the keyboard (See Figure 4-8 to 4-9).

CAUTION: *As the keycap may fall out, when handling the keyboard always hold it by the frame and do not touch the keycap.*

1. Turn the computer upside down
2. Loose the **screw** securing KBD Holder.
M2.5x3.0B Flat BIND screws x3
3. Upside down the computer.
4. Open the display.
5. Remove KBD holder. Insert your finger into the slot between the KBD holder and the keyboard. Then, lift up the **keyboard cover** to remove it.
6. Insert your finger into the keyboard slot and keyboard. Then lift up the keyboard to remove it.
7. Disconnect keyboard cable.

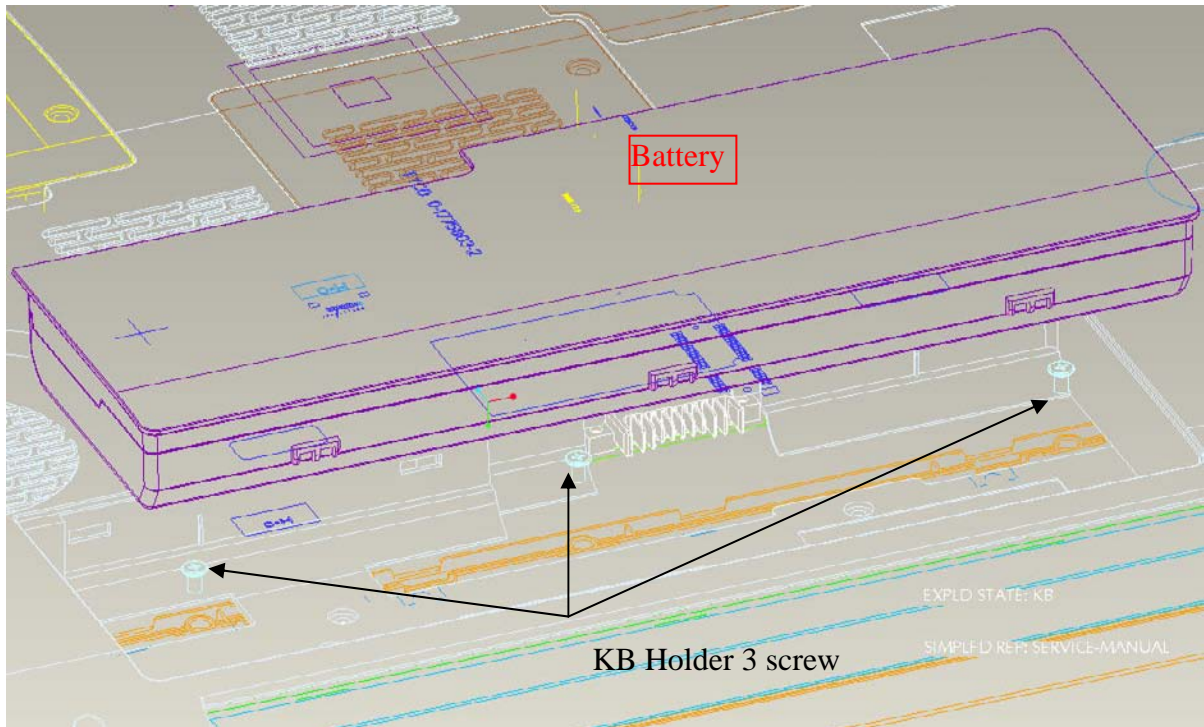


Figure 4-8 Remove screws for KB Holder

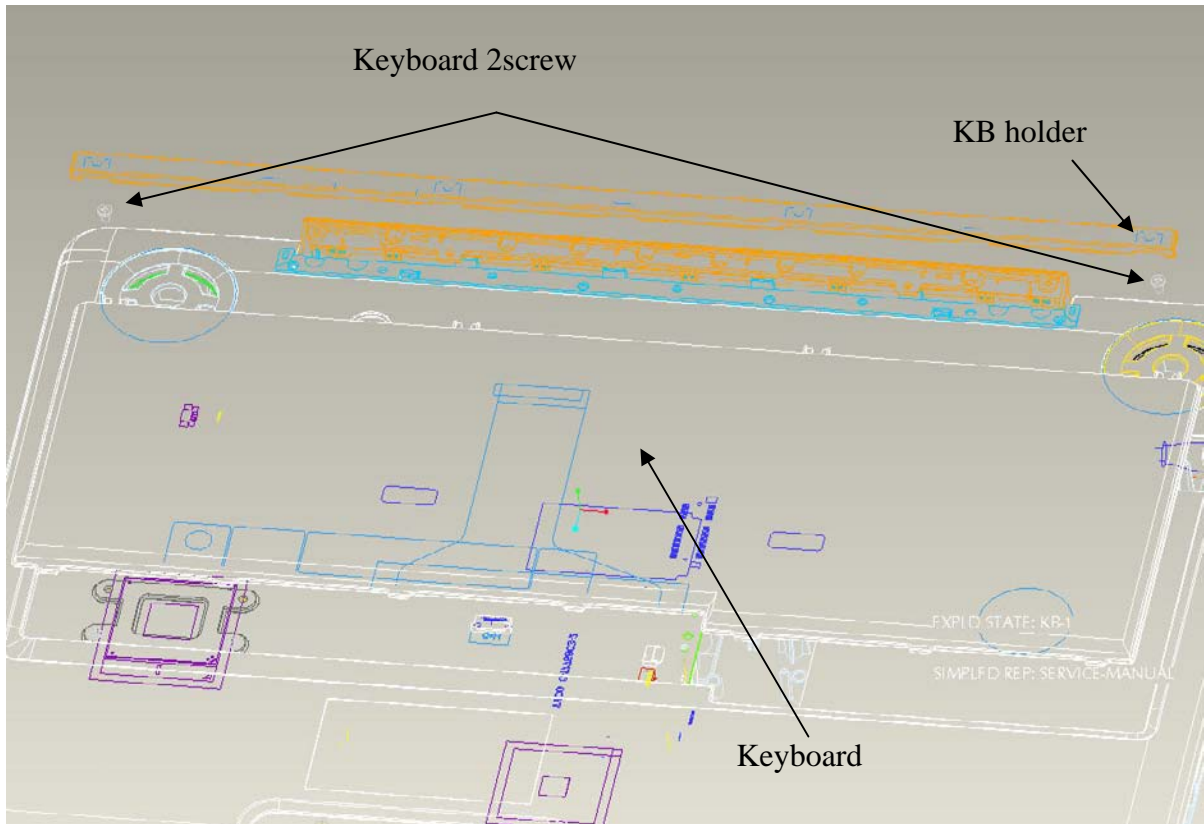


Figure 4-9 Remove the keyboard/KB Holder

Installing the keyboard

The following describes the procedure for installing the keyboard (See Figure 4-8 to 4-9).

1. Turn the **keyboard** upside down and place it on the palm rest as its face down. Connect the **keyboard flexible cable** to the connector on the system board.
2. Slide and set the **speaker cover assembly** and secure it with the following **screw**.
 - M2.5×5.0B FLAT BIND screw x2
3. Install the **keyboard brace** by pressing it from the topside.

4.9 Optical disk drive

NOTE: Do not apply excessive force to the top of an optical disk drive.
Do not touch the shaded portion of the figure below, when the drive is removed or installed.

Removing an optical disk drive

The following describes the procedure for removing an optical disk drive (See Figure 4-11 and 4-12).

1. Remove **Keyboard** and next remove the following **screws** securing an optical disk drive.
 - M2.5×5.0B FLAT BIND screw x1
2. Disconnect an **optical disk drive** toward the arrow direction from the connector **CN26** on the system board.

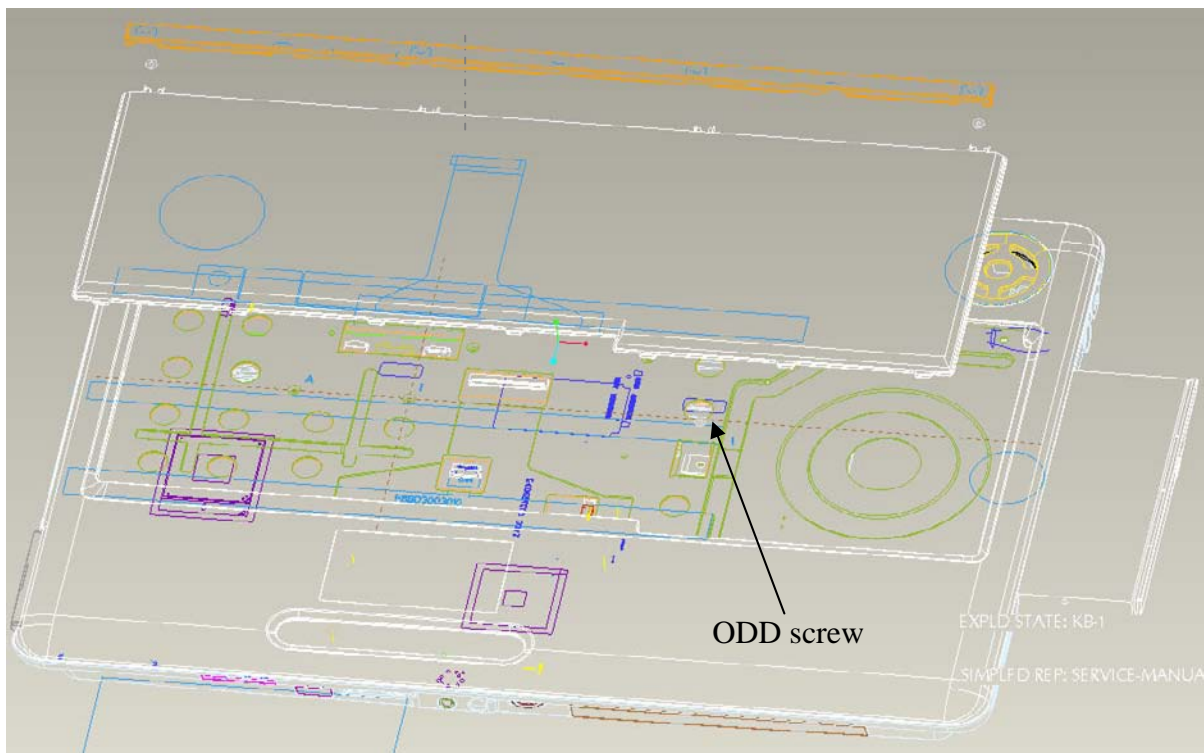


Figure 4-10 Remove an optical disk drive

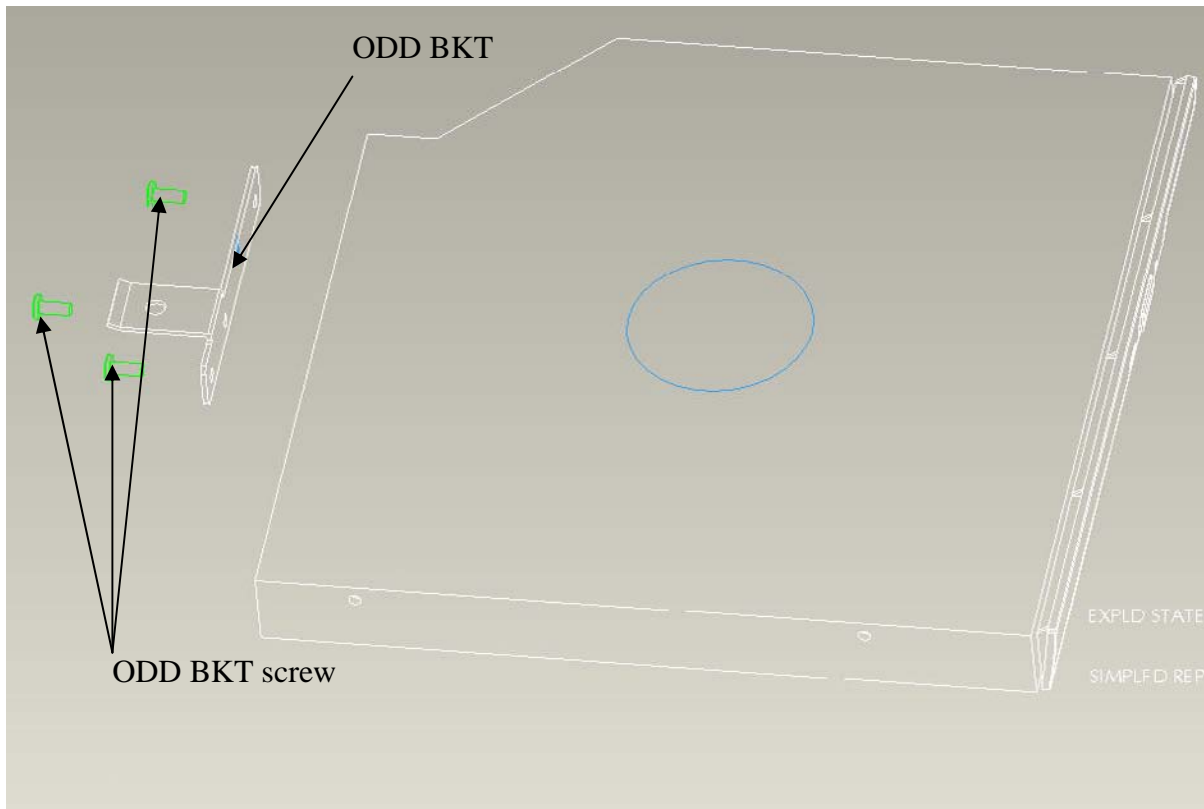


Figure 4-11 Disassemble the side bracket

Installing an optical disk drive

The following describes the procedure for installing an optical disk drive (See Figure 4-11 and 4-12).

1. Attach the **ODD bracket** to an optical disk drive and secure it with the following **screws**.
 - M2.0×3.0 Flat BIND screw x3
2. Insert an optical disk drive assembly into the slot and connect it to the connector **CN26** on the system board.
3. Secure the ODD drive with the following **screw**.

M2.5X5.0 Flat BIND screw X1

4.10 Display assembly

Removing the display assembly

The following describes the procedure for removing the display assembly (See Figure 4-13 to 4-17).

1. Close the display and turn the computer upside down.
2. Open the RAM Door and remove antenna cable Connector.

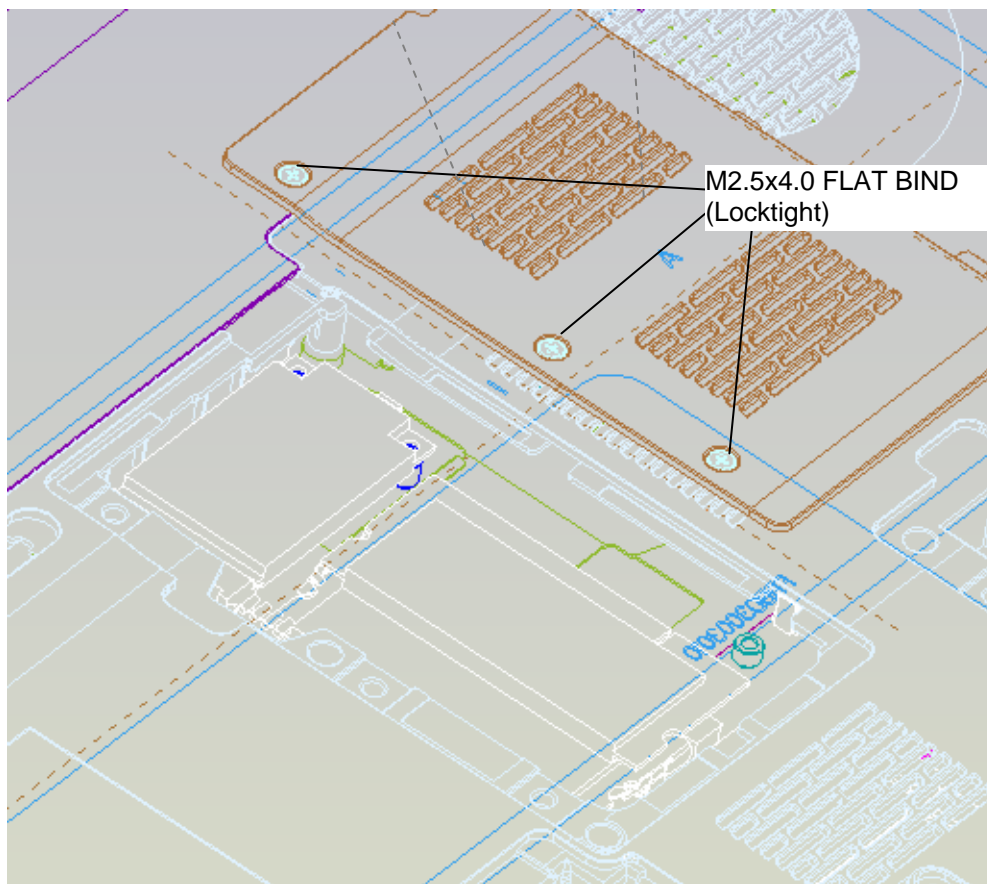


Figure 4-12 Remove the screws (securing display assembly)

3. Remove Battery and disassembly **k/b holder** and **keyboard** screw. (please refer figure 4-8,figure4-9).

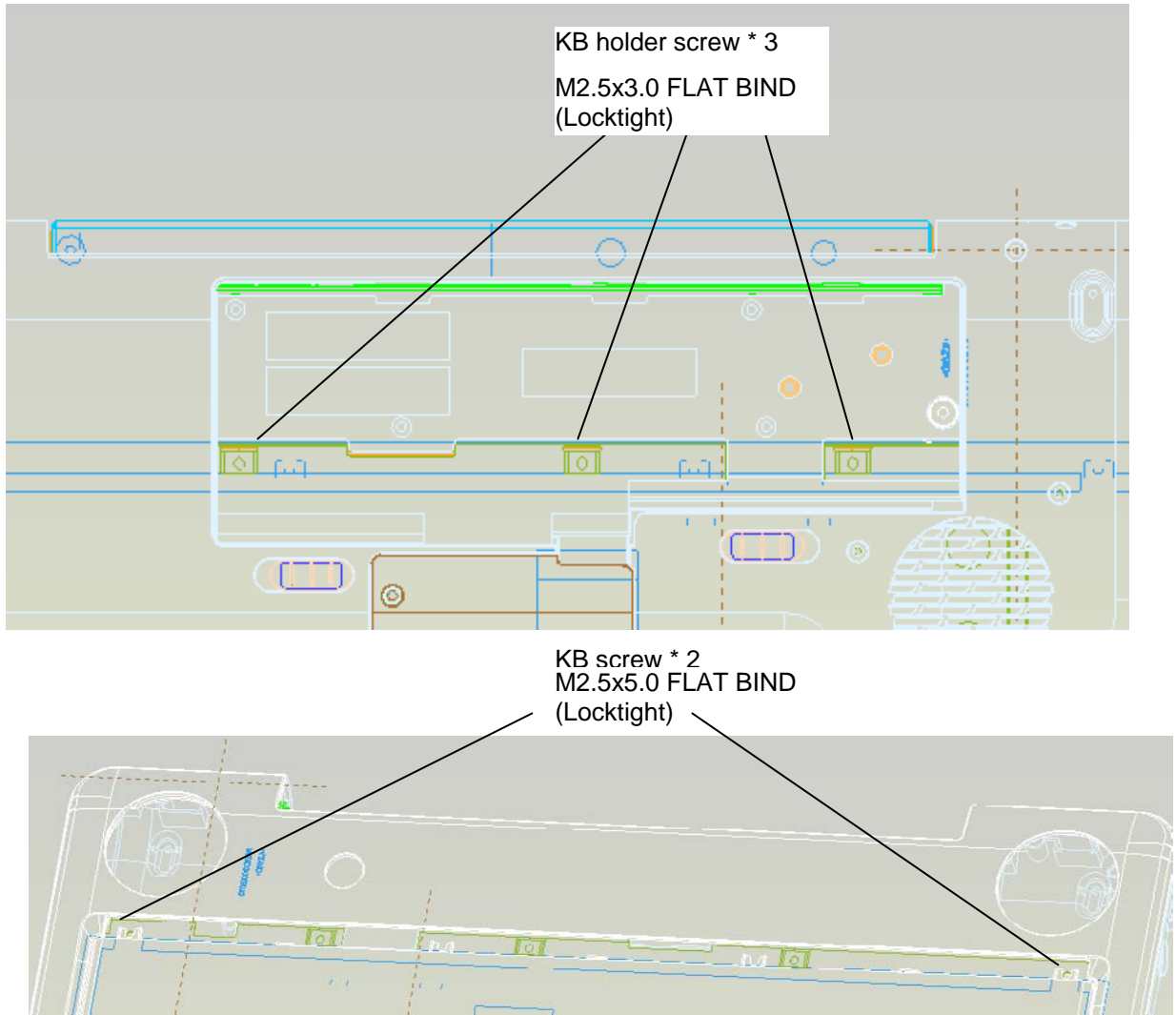


Figure 4-12-1 Remove the KB screws

4. Disassembly TOP ASSY

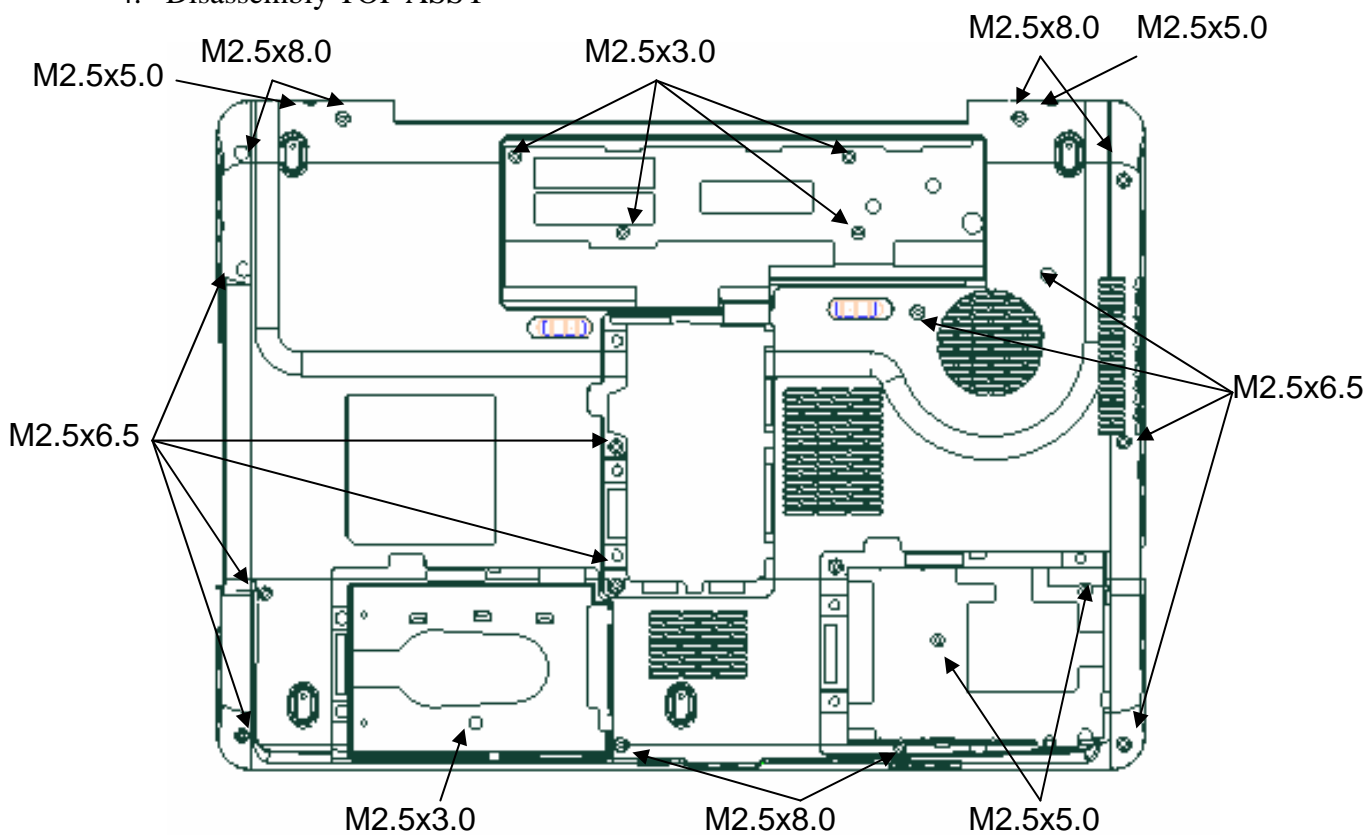


Figure 4-13 Remove the screws (from bottom side)

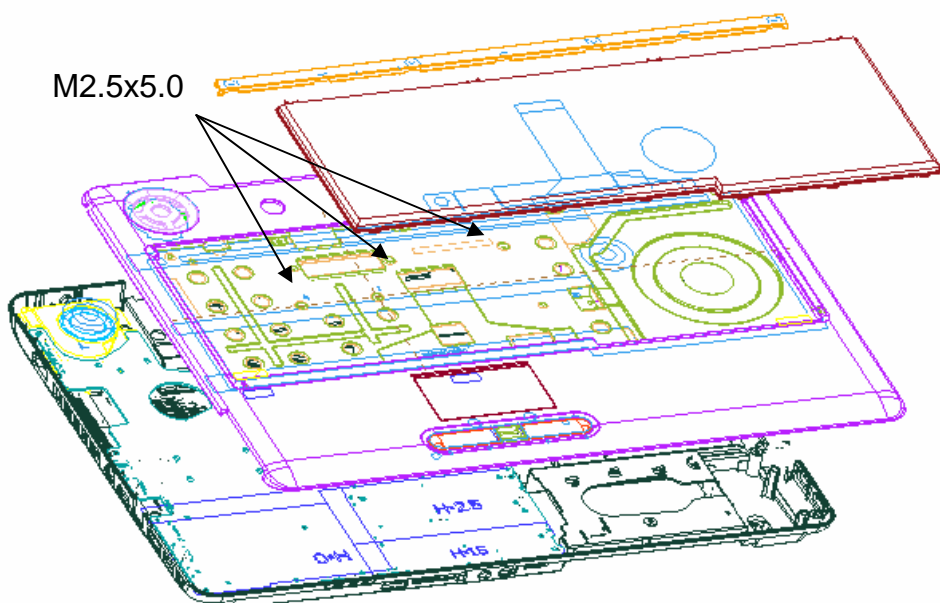


Figure 4-14 Remove the screws (from top side)

5. Pull out the **wireless LAN antenna and LCD cables** from the guide

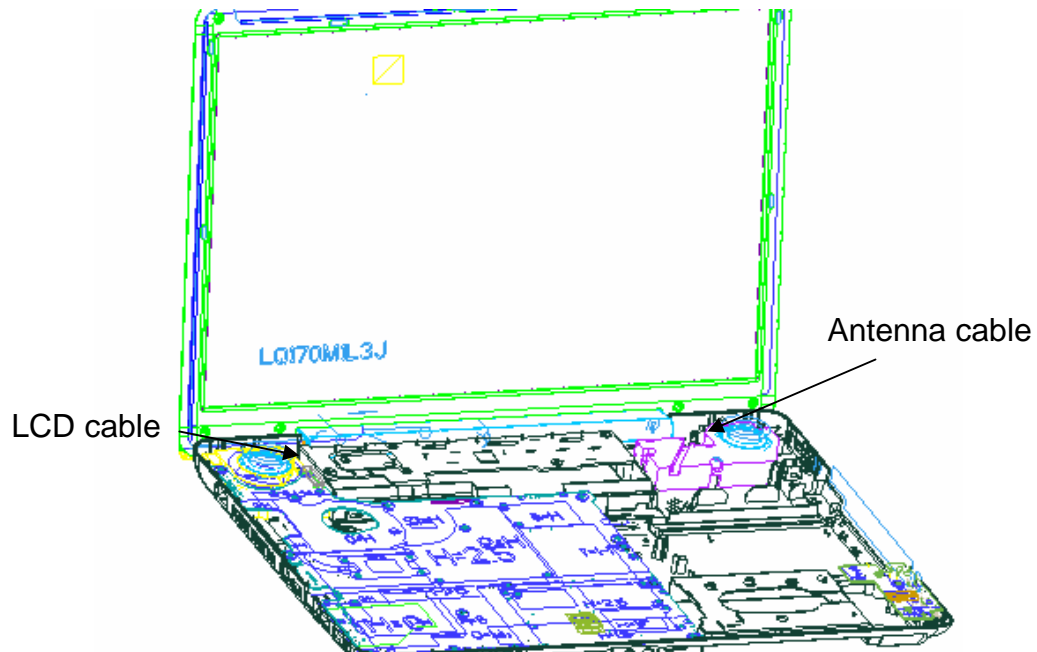


Figure 4-15 Remove the Wireless Antenna and LCD cable

Opening the display to 135degree, and remove the hinge screw.

- M2.5×6.5 FLAT BIND screw x6 (Locktight)

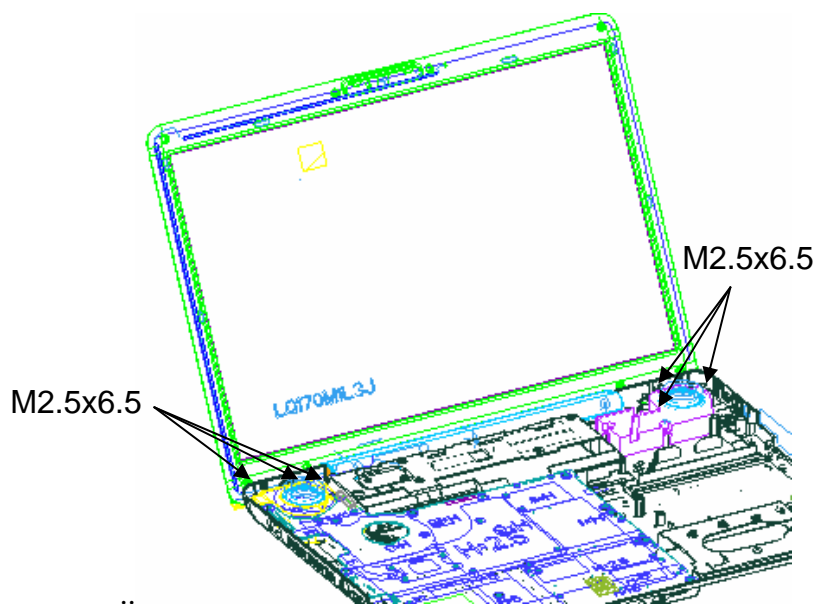


Figure 4-16 Remove the hinge screws

6. Pulling out the **pole of hinge** from the **hole** of hinge assembly, remove the **display assembly** from the base assembly.

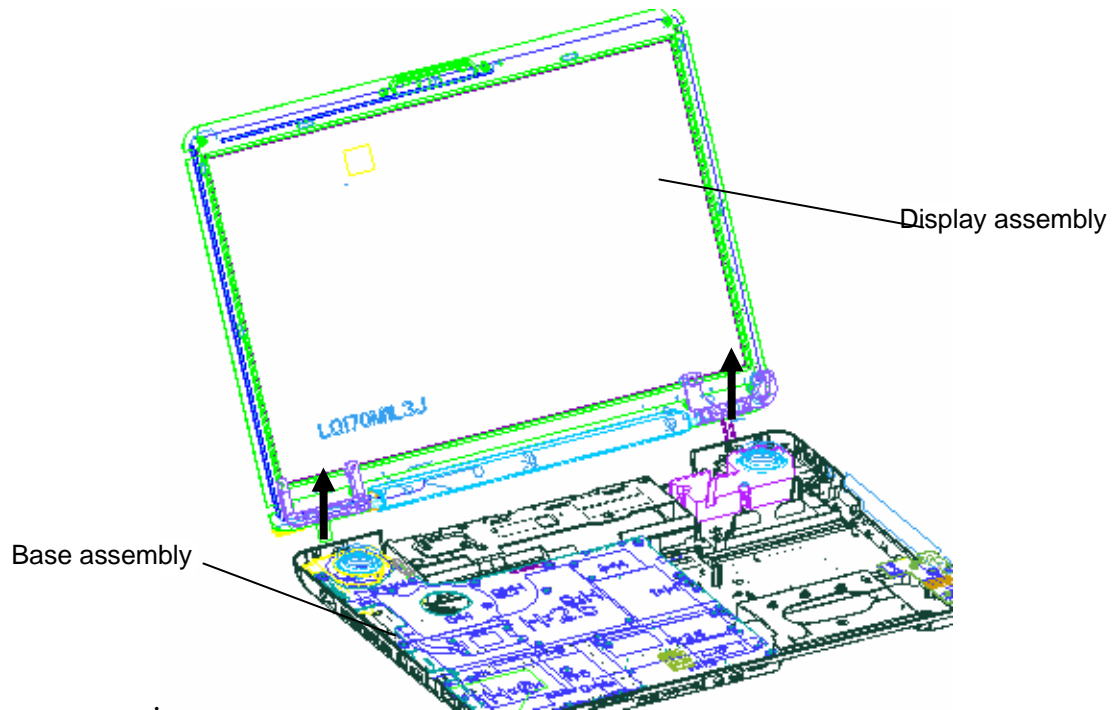


Figure 4-17 Remove the LCD harness and remove display assembly

Installing the display assembly

The following describes the procedure for installing the display assembly (See Figure 4-13 to 4-17).

1. Inserting the **pole of hinge** to the **hole** of hinge assembly, set the **display assembly** on the base assembly.
2. Secure the **hinges** with the following **screws** secure the **display mask** with the following **screws** and stick the **mask seal** on them.

- M2.5×6.5 FLAT BIND screw x6
(Locktight)

<p><i>NOTE: Be sure to apply the locktight to the screws instructed in the figure above.</i></p>

3. Connect the **LCD harness** to the connector on the system board.
4. Arrange the wireless antenna cables along the guide (front) and secure them with **guide**.
5. Pass the cables to the back of computer through the **slot**.
6. Arrange the **wireless LAN antenna** along the guide and contact with the connector.
7. Install the LAN board and cover ASSY of the system.

4.11 Cover assembly

Removing the cover assembly

The following describes the procedure for removing the cover assembly (See Figure 4-19 to 4-21).

1. Turn over the computer.
2. Remove the following **screws** securing the cover assembly from the back and bottom of computer.

- M2.0×5.0 FLAT BIND screw Back x4
- M2.5×6.5 FLAT BIND screw Back x11
- M2.5×8.0 FLAT BIND screw Back x4
- M2.0×3.0 FLAT BIND screw Back x5

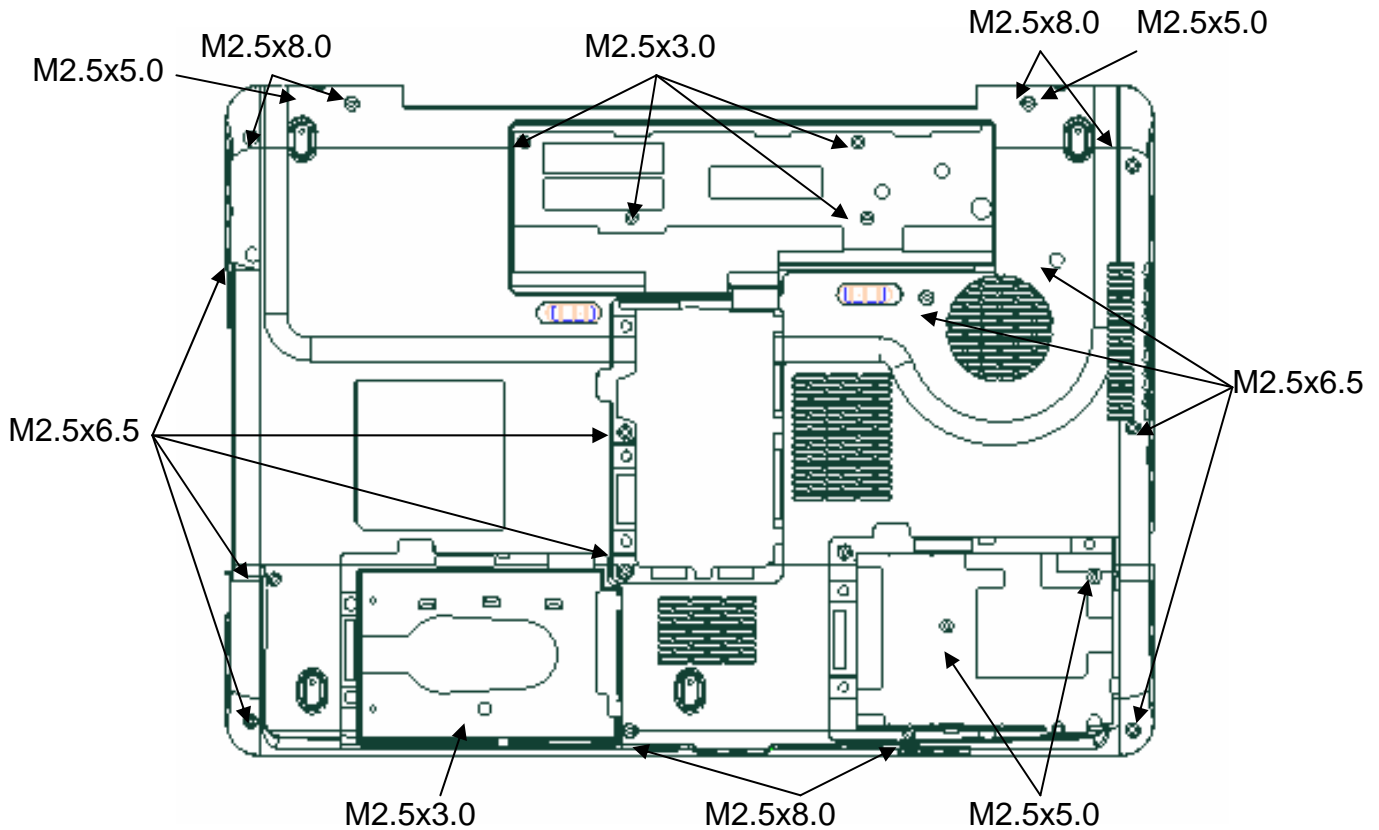


Figure 4-18 remove the screws (back)

3. Disconnect the **touch pad flat cable/Fingerprint cable** from the connector on the system board.

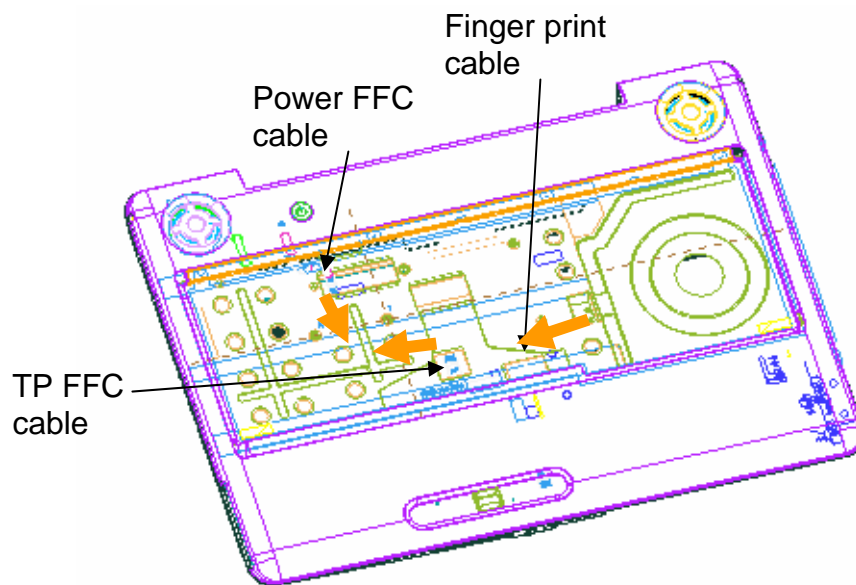


Figure 4-19 Disconnect the touch pad flat cable/Fingerprint cable

4. Remove the following **screws** securing the cover assembly from the front of computer. Pull up and remove the **cover assembly** from the **base assembly**.

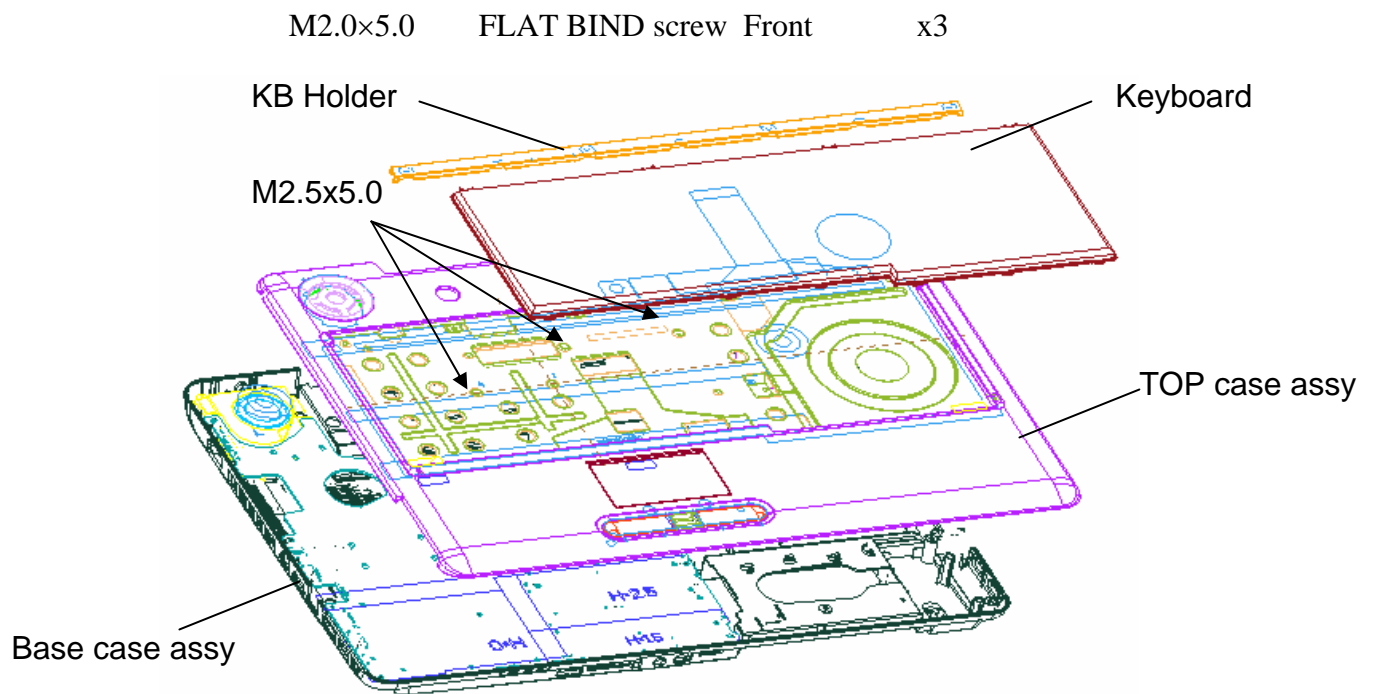


Figure 4-20 Remove the screws (front) and cover assy

Installing the cover assembly

The following describes the procedure for installing the cover assembly (See Figure 4-19 to 4-21).

1. Install the **cover assembly** to the base assembly.

NOTE: *Be careful not to catch the cables between cover assembly and base assembly.*

2. Connect the **touch pad flat cable** to the connector on the system board.
3. Secure the cover assembly with the following **screws** from the back and bottom of computer.

- M2.0×5.0 FLAT BIND screw Back x4
- M2.5×6.5 FLAT BIND screw Back x11
- M2.5×8.0 FLAT BIND screw Back x4
- M2.0×3.0 FLAT BIND screw Back x5

4. Free the cable from cable-drain when through the antenna cable to PCB hole.

4.12 Touch pad

Removing the touch pad

The following describes the procedure for removing the touch pad (See Figure 4-22).

1. Peel off the **glass tape** and disconnect the **touch pad flat cable**, **finger print cable** from the connector on the touch pad.
2. Remove the following **screws** securing the touch pad plate.
 - M2.0×3.0B SUPER THIN HEAD screw x6
3. Remove the **touch pad board and touch pad plate**.
4. Peel off and remove the **touch pad** from the cover assembly.

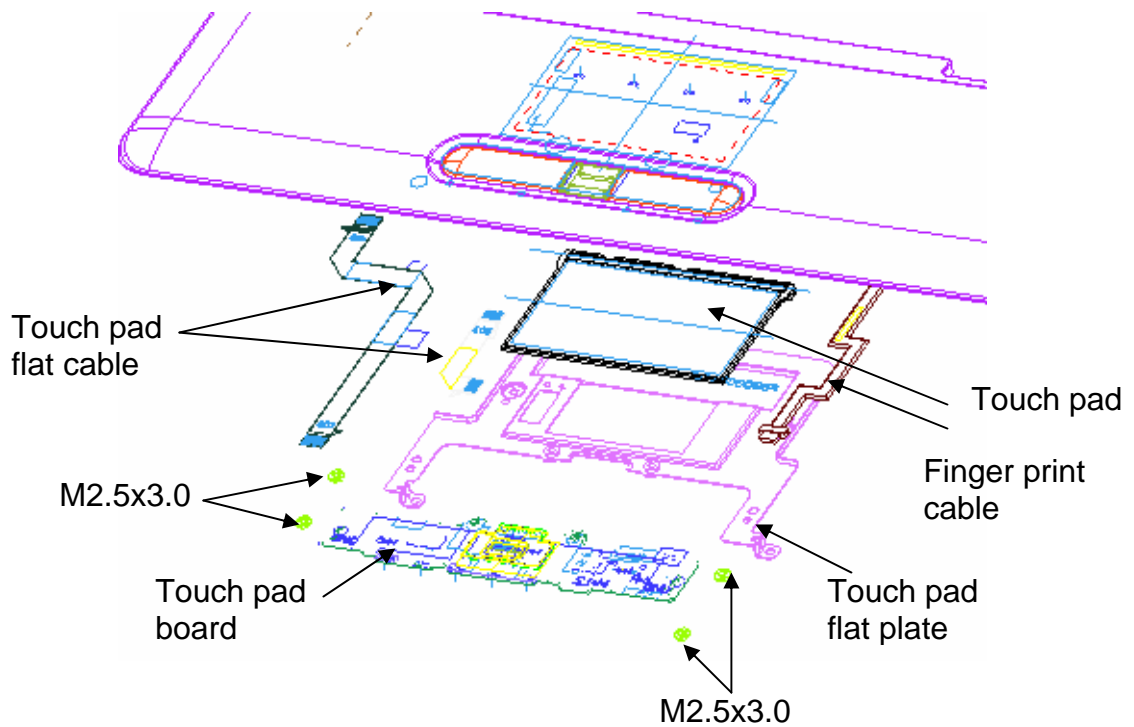


Figure 4-21 Remove the touch pad

Installing the touch pad

The following describes the procedure for installing the touch pad (See Figure 4-22).

1. Peel off the separator covering on the sensor portion of a new touch pad.

NOTE: *Do not reuse the touch pad so that it can not be used after peeling off from the computer. Be sure to stick a new touch pad.*

When sticking the touch pad, be careful not to get the bubbles under the touch pad.

2. Stick and install the **touch pad** on the cover assembly.
3. Install the **touch pad plate** and secure it with the following **screws**.
 - M2.0×3.0 SUPER THIN HEAD screw x7
4. Stick the **insulator** on the touch pad plate.
5. Connect the **touch pad flat cable** to the connector on the touch pad and stick the **glass tape** on the connector.

4.13 USB Board

The following describes for removing the cover assembly (See Figure 4-23).

Removing the USB board

1. Pull out the **USB cable**, **Modem cable**, from USB board connector.
2. Loose the below **screws** and then incline pull out **USB board**.

- M2.0x5.0 FLAT BIND screw x2

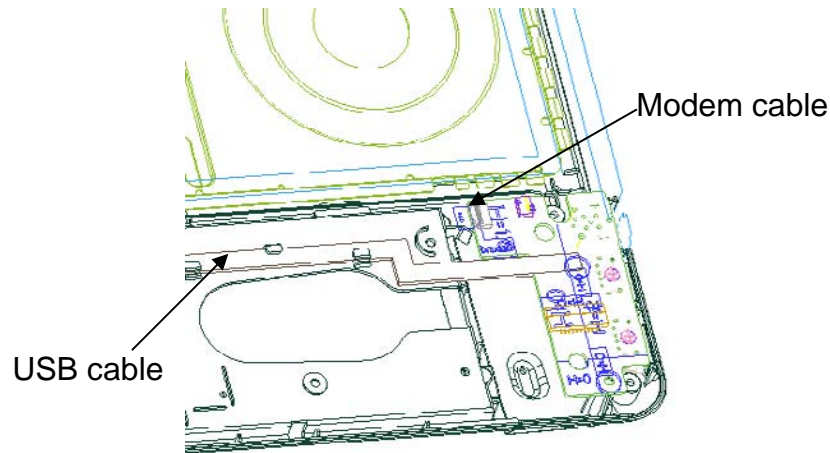


Figure 4-22 Remove the USB Board

Installing the USB board

1. Insert the **usb board** into base case and connect USB board cable, Modem cable
2. Fix the below **screws**

- M2.0x5.0 FLAT BIND screw x2

NOTE: *Be careful not to catch the cables between cover assembly and base assembly.*

4.14 System board

CAUTION: 1. when handling the system board, always hold by the edges. Do not touch the printed circuit face.

2. if replacing with a new system board, execute the substest01 Initial configuration in section 3.3 “Setting of the hardware configuration”. Also update with the latest BIOS as described in Appendix G “BIOS Rewrite Procedures” and with the latest EC/KBC as described in Appendix H “EC/KBC Rewrite Procedures”.

Removing the system board

The following describes the procedure for removing the system board.

1. Disconnect the power cable from the system board (See Figure 4-25)

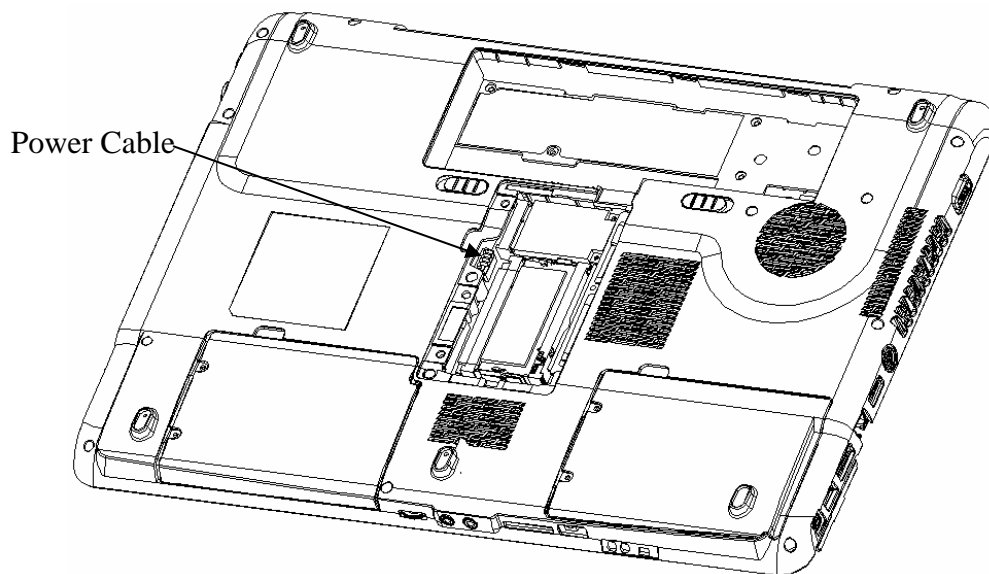


Figure 4-23 Disconnect the power cable

2. Disconnect the **speaker cable**, **USB cable**, **FM CABLE**, **MDC CABLE** and **BLUETOOTH CABLE** from the connector on the system board.

3. Remove the following **screws** securing the system board and remove the **system board**. (See Figure 4-26)

- M2.5×5.0 BIND screw x4

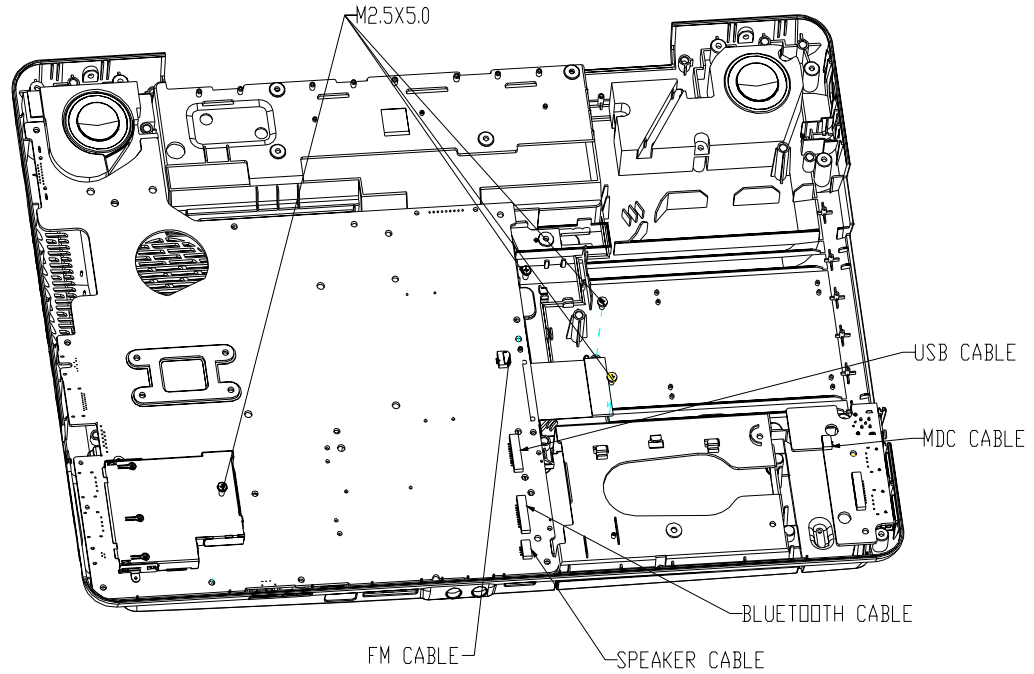


Figure 4-24 Remove the system board

Installing the system board

The following describes the procedure for installing the system board (See Figure 4-26).

1. Secure the system board with the following **screws**.
 - M2.5×5.0 BIND screw x4
2. Connect the **speaker cable, USB cable, FM CABLE, MDC CABLE and BLUETOOTH CABLE** to the connector on the system board.
3. Connect the power cable to the connector on the system board

4.15 CPU

Removing the CPU heat sink

The following describes the procedure for removing the CPU heat sink (See Figure 4-27).

1. Disconnect the **Heat sink cable** from the connector on the system board
2. Remove the following **screws** securing the heat sink holder along 1 to 6.

- M2.5×5.0 BIND screw x8

NOTE: When removing the heat sink holder, be sure to remove the screws in the reverse order of the number marked on the holder.

3. Remove the **CPU heat sink**.

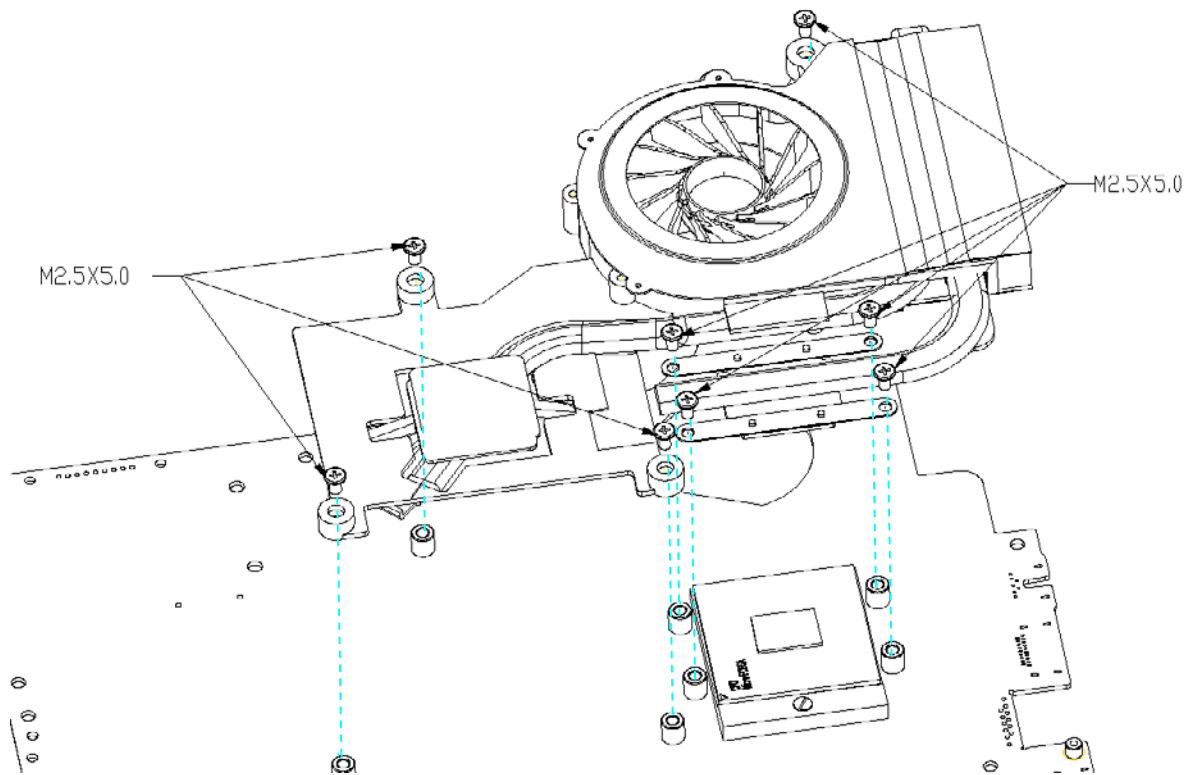


Figure 4-25 Remove the CPU heat sink

4. Unlock the **CPU** by rotating the **cam** on the CPU socket 120 degrees to the counterclockwise with a flat-blade screwdriver.
5. Remove the **CPU**.

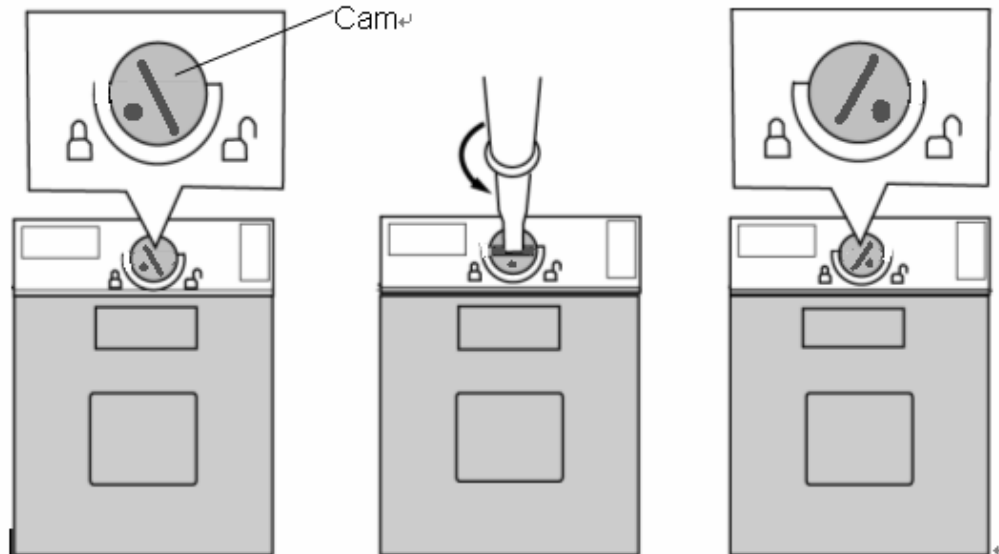


Figure 4-26 Remove the CPU

Installing the CPU

The following describes the procedure for installing the CPU (See Figure 4-27 to 4-28).

1. Check that the mark of cam is in the unlocking position.
2. Attach the **CPU** to the correct position in the **CPU socket**.
3. Fix the **CPU** by rotating the cam 120 degrees to the clockwise with a flat-blade screwdriver.
4. If there is already silicon grease on the CPU, clean it with a cloth.
Using a special applicator, apply silicon grease so that the CPU chip on the CPU is completely covered.
5. Please apply 0.1cc silicon grease (**Shinetsu 7762**) for each repair. And apply

Thermal pad for N-bridge, VGA&V-RAM for each repair

NOTE: Apply the silicon grease enough to cover the chip surface using the special applicator. Thermal pad is fixed for each one, no need special applicator.

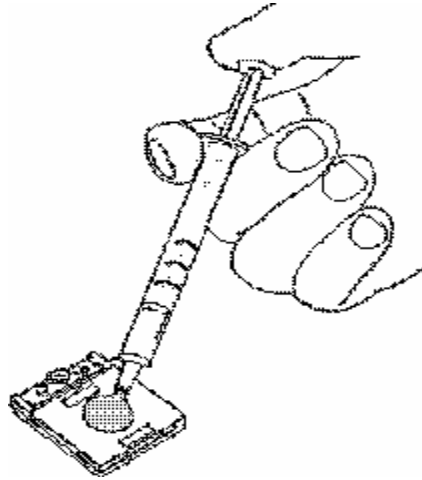


Figure 4-27 Apply silicon grease

6. Install the **CPU heat sink** and **heat sink holder** and secure them with the following **screws** along 1 to 6.

M2.5×5.0BIND screw x8

7. Connect the **Heat sink cable** to the connector on the system board

NOTE: *When securing the heat sink holder, be sure to secure the screws in the order of the number marked on the holder.*

4.16 LCD unit / FL inverter

CAUTION: When replacing a LCD, it is required that SVP parameter is set. Update with the latest EC/KBC as described in Appendix H “EC/KBC Rewrite Procedures”.

Removing the LCD unit / FL inverter

The following describes the procedure for removing the LCD unit and FL inverter (See Figure 4-30 to 4-33)

Remove Screw rubber cover X8

1. Remove the following **screws** securing the display mask

M2.5×5.0 BIND screw X4

M2.5×4.0 BIND screw X4

2. Insert your finger between the edge of the display mask and the **LCD**, and remove the **display mask** while releasing the latches of display mask.

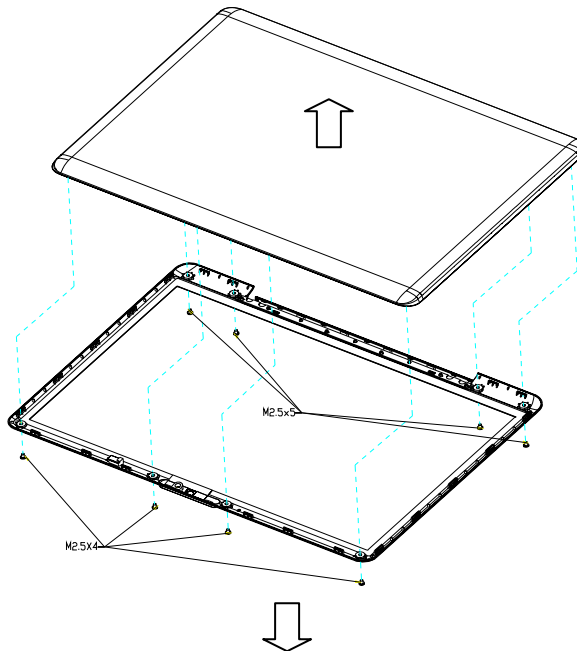


Figure 4-28 Remove the display mask

Replacement Procedures

3. Pull out one **insulator** and peel off the other one adhered to the FL inverter.
4. Disconnect the **LCD harnesses** from the connectors **CN1** on the FL inverter.
5. Disconnect the **HV harnesses** from the connectors **CN2** on the FL inverter.
6. Remove the **FL inverter** while peeling off the **double-sided tape**.

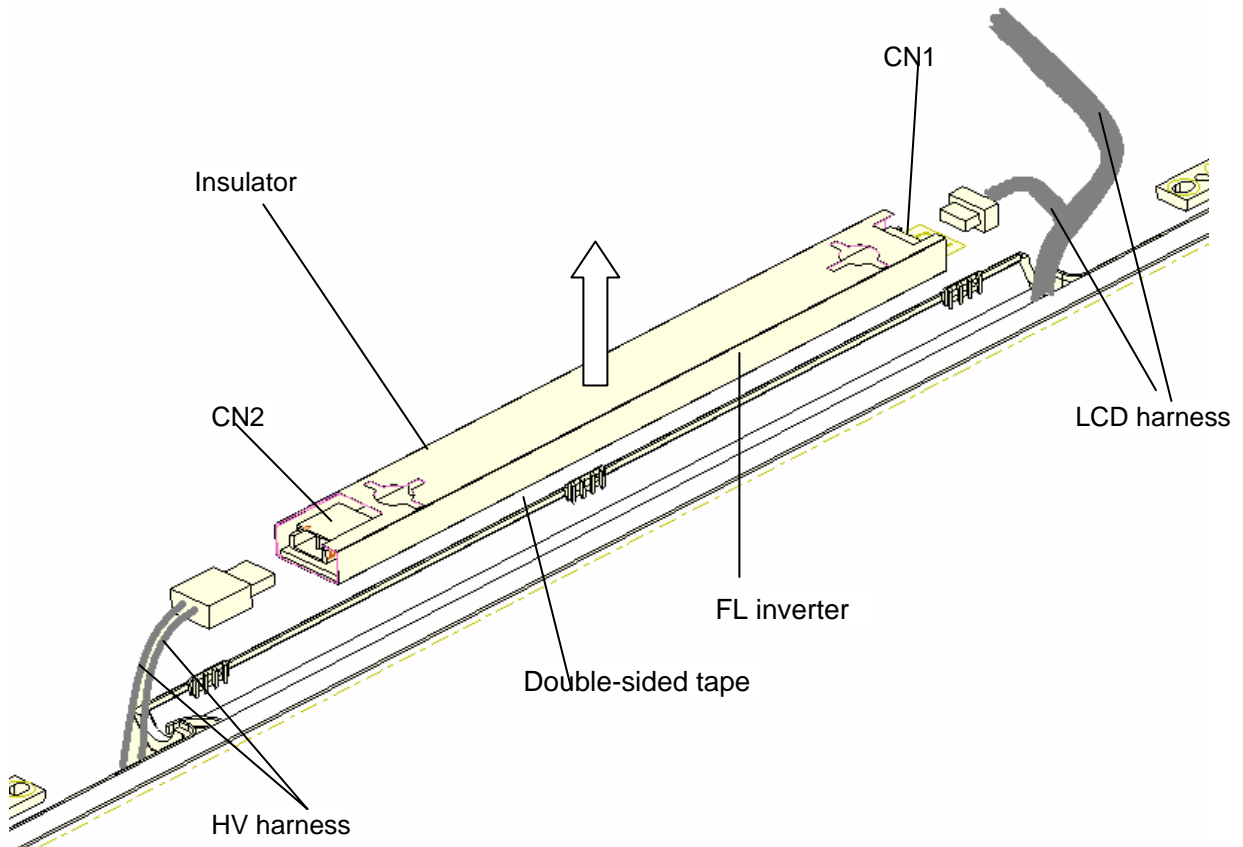


Figure 4-29 Remove the FL inverter

Replacement Procedures

7. Remove the following **screws** securing the LCD unit.
 - M2.5x5.0 BINK HEAD screw x4
8. With the bottom edge of the LCD unit on the display cover, lift only the top edge of the LCD unit. After peeling off the **CONDUTIVE tape**, disconnect the LCD harness from the connector on the back of the LCD.
9. Remove the **LCD unit**.

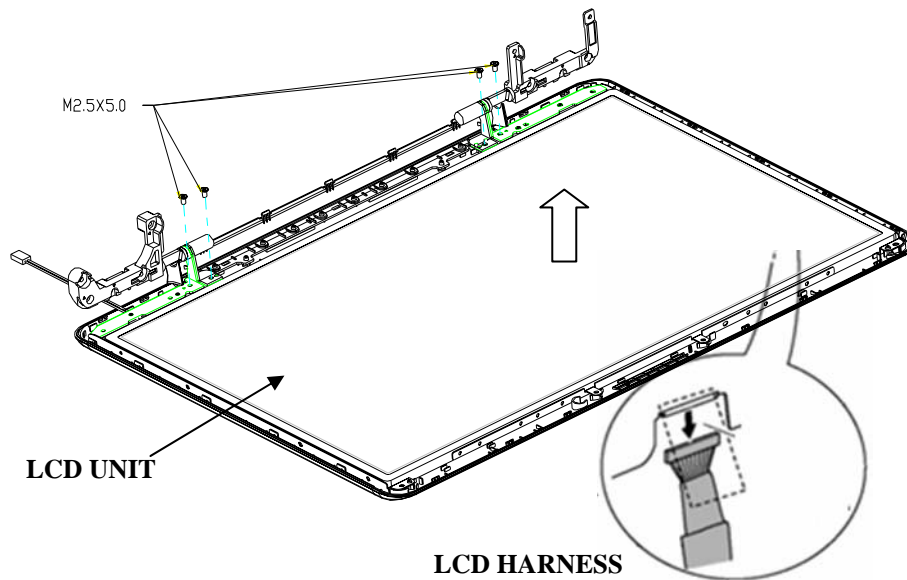


Figure 4-30 Remove the LCD unit

10. Remove the following screws securing the LCD support (LCD unit side) and remove the **LCD supports and LCD top bracket** from the LCD unit.

- M2.0x2.5 BINK screw x6

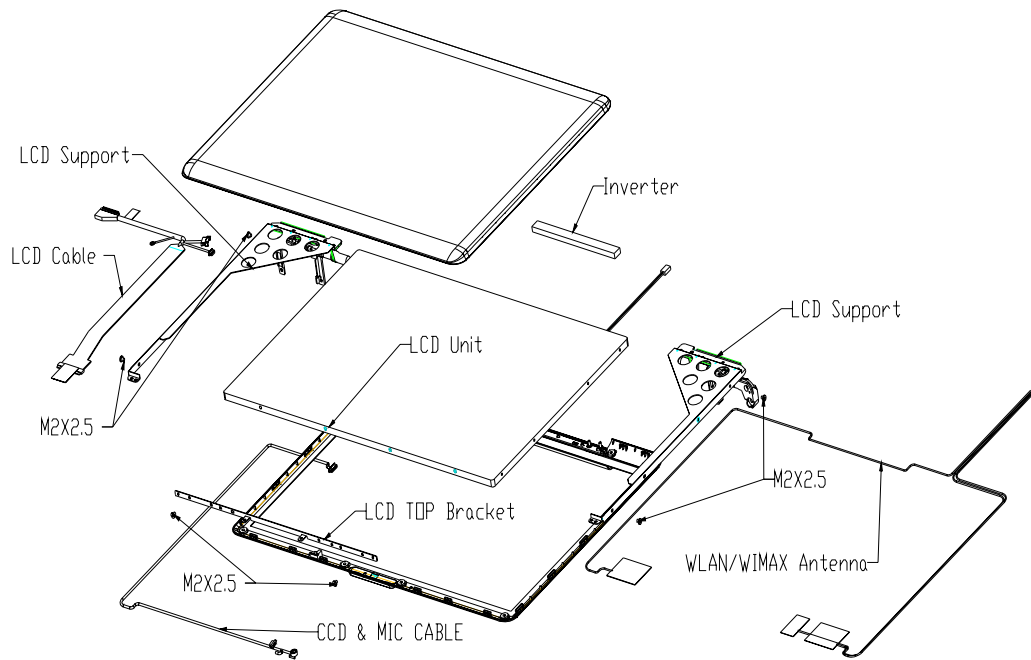


Figure 4-31 Remove the LCD supports

Installing the LCD unit/FL Inverter

The following describes the procedure for installing the LCD unit and FL inverter (See Figure 4-31 to 4-34).

1. Install the LCD supports (LCD unit side) and LCD top bracket to the LCD and secure them with the following **screws**.
 - M2.0×2.5 BINK screw x6
2. Stand the **LCD unit** on the display cover and connect the **LCD harness** to the connector on the back of LCD.
3. Stick the **conductive tape** on the connector of LCD harness.
4. Secure the LCD unit with the following **screws**.
 - M2.5×5.0 BINK screw x4
5. Connect **LCD harnesses** to the connector **CN1** of the FL inverter.

CAUTION: *Be careful not to connect the LCD harnesses to the wrong connectors of FL inverter.*

6. Connect **HV harnesses** to the connector **CN2** of the FL inverter.
7. Install the **display mask** while fitting the latches.
8. Secure the display mask with following **screws**
 - M2.5×5.0 BIND screw X8
9. Cover screws with Screw rubber cover X8

NOTE: *When installing the display mask, make sure there is no gap between the display mask and the display cover.*

4.17 Application for Grease (Denka FCR-AS)/Thermal pad on North Bridge, VGA,V-RAM

I. For Satellite P300, Satellite Pro P300, EQUIUM P300, SATEGO P300(Intel without VGA Board) use Thermal pad on North Bridge

TSB PN	RW PN	Used on
A000032180	JXBL5016010	N-BRIDGE THERMAL PAD BL5(JXBL5016,3A)

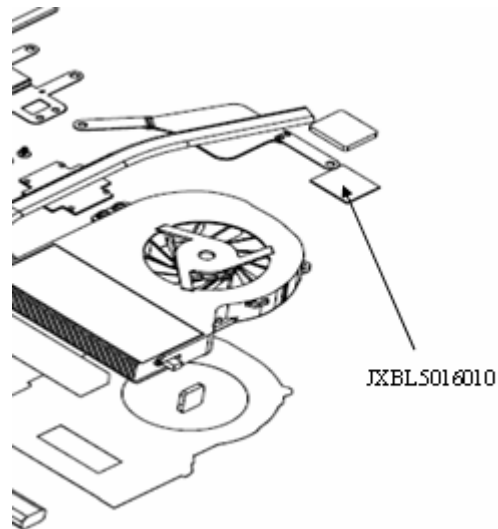


Figure 4-32 Thermal pad on North Bridge

II. For Satellite P300, Satellite Pro P300, EQUIUM P300, SATEGO P300(INT with VGA board) use Denka FCR-AS (A000018310) grease on North Bridge, and used Thermal pad on VGA, VRAM1,VRAM2,VRAM3,VRAM4.

1. Denka FCR-AS: A000018310
2. 0.15cc for one repair
3. one Syringe contains 1cc of Denka FCR-AS grease

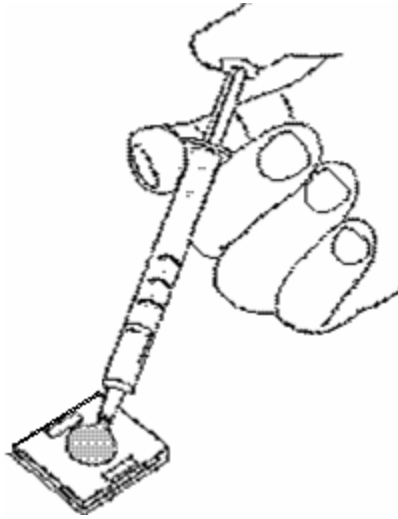


Figure 4-33 Apply silicon grease for North Bridge

4. Thermal pad used on VGA, VRAM1, VRAM2, VRAM3, VRAM4.

TSB PN	RW PN	Used on
A000032190	JXBL5017010	VGA THERMAL PAD BL5(JXBL5017,REV3A)
A000032200	JXBL5018010	VRAM1 THERMAL PAD BL5(JXBL5018,REV3A)
A000032210	JXBL5019010	VRAM2 THERMAL PAD BL5(JXBL5019,REV3A)
A000032220	JXBL5020010	VRAM3 THERMAL PAD BL5(JXBL5020,REV3A)
A000032230	JXBL5021010	VRAM4 THERMAL PAD BL5(JXBL5021,REV3A)

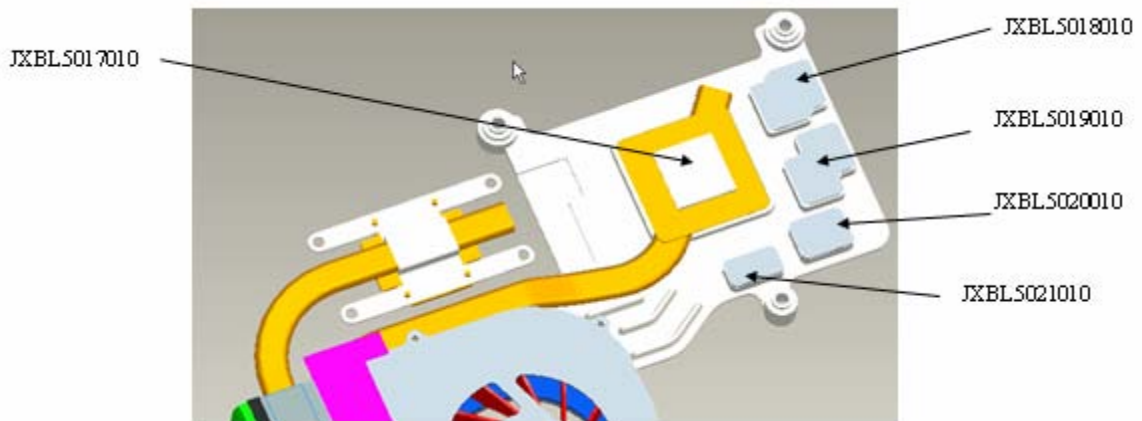


Figure 4-34 Thermal pad & VRAM position

III. For Satellite P300D, Satellite Pro P300D, EQUIUM P300D, SATEGO P300D (AMD without VGA Board) use the thermal pad only on North Bridge.

TSB PN	RW PN	Used on
A000037540	JXBD3027010	UMA NB PAD FSL-BS BD3A(JXBD3027,3A)

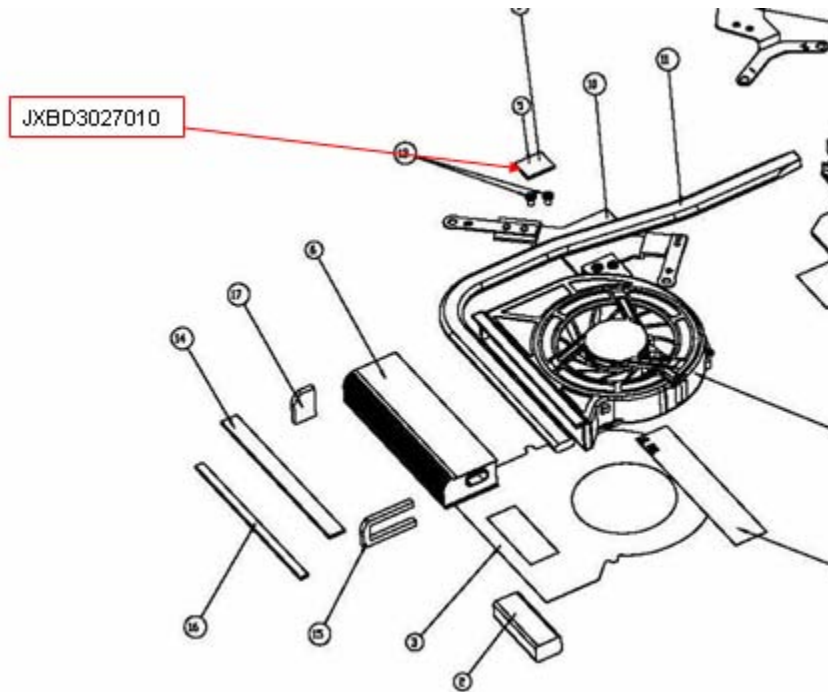


Figure 4-37 Thermal pad position

IV. For Satellite P300D, Satellite Pro P300D, EQUIUM P300D, SATEGO P300D (AMD with VGA board) use the thermal pad on North Bridge, VGA, VRAM1, VRAM2, VRAM3, VRAM4 (part number is under application)

TSB PN	RW PN	Used on
A000037550	JXBD3028010	DIS NB PAD FSL-BS BD3A(JXBD3028,3A)
A000037560	JXBD3029010	DIS VGA PAD 50H BD3A(JXBD3029,3A)
A000037570	JXBD3030010	DIS VRAM PAD1 T-FLEX340BD3A(JXBD3030,3A)
A000037580	JXBD3031010	DIS VRAM PAD2 T-FLEX340BD3A(JXBD3031,3A)
A000037590	JXBD3032010	DIS VRAM PAD3 T-FLEX340BD3A(JXBD3032,3A)
A000037600	JXBD3033010	DIS VRAM PAD4 T-FLEX340BD3A(JXBD3033,3A)

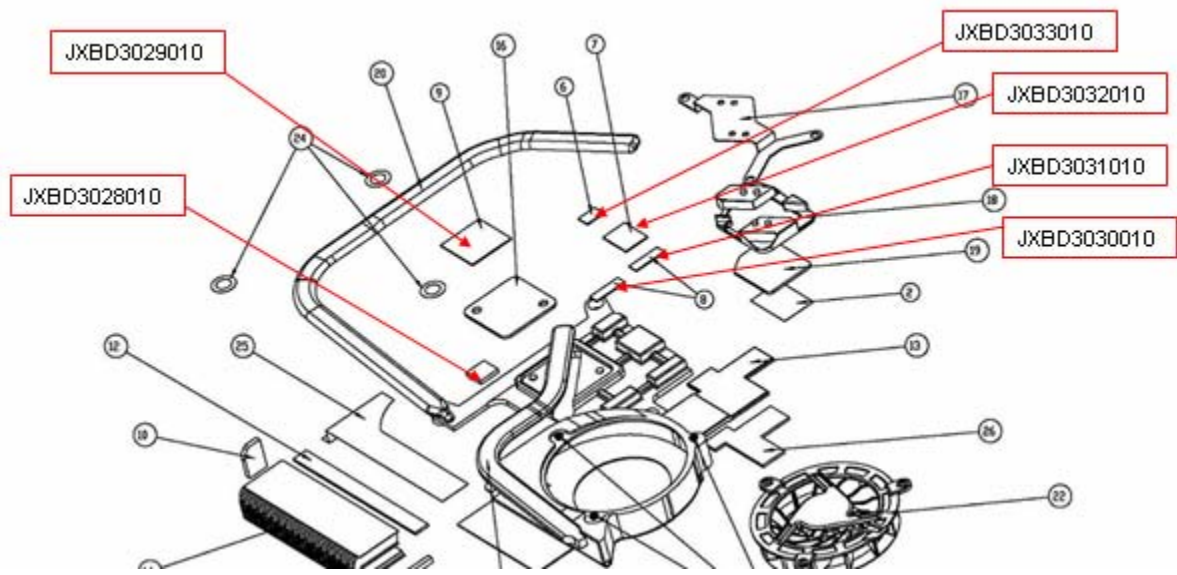


Figure 4-38 Thermal pad & VRAM position

NOTE: When applying for grease on North Bridge, one syringe*1cc can cover about seven repairs. Thermal pad is fixed for each one, no need special applicator and can re-use.

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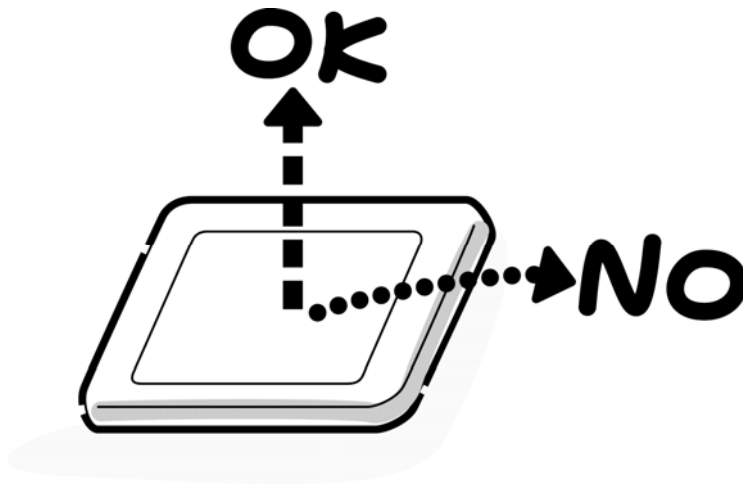
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Appendix A Handling the LCD Module

Precautions for handling the LCD module

The LCD module can be easily damaged during assembly or disassembly. Observe the following precautions when handling the LCD module:

1. When installing the LCD module in the LCD cover, be sure to seat it so that it is properly aligned and maximum visibility of the display is maintained.



2. Be careful to align the holes at the four corners of the LCD module with the corresponding holes in the LCD cover before securing the module with screws. Do not force the module into place, because stress can affect its performance.

Also, the panel's polarized surface is easily scarred, so be careful when handling it.



3. If the panel's surface gets dirty, wipe it with cotton or a soft cloth. If it is still dirty, try breathing on the surface to create a light condensate and wipe it again.

If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.



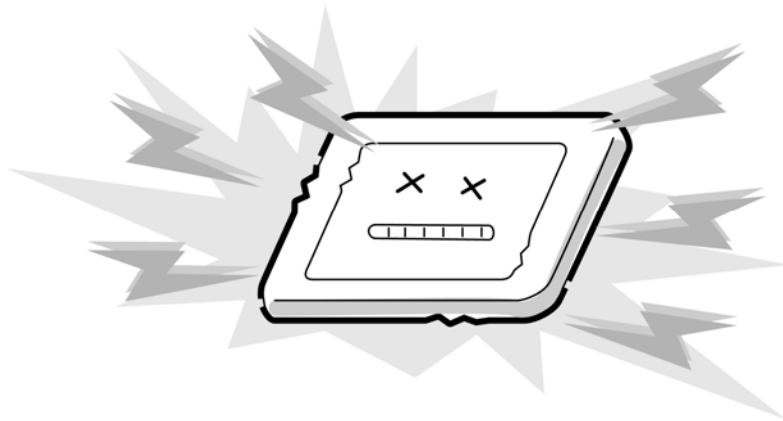
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



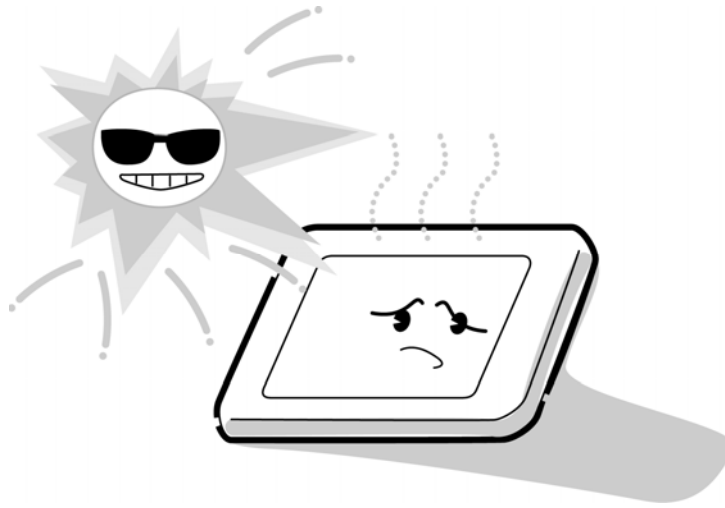
5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.



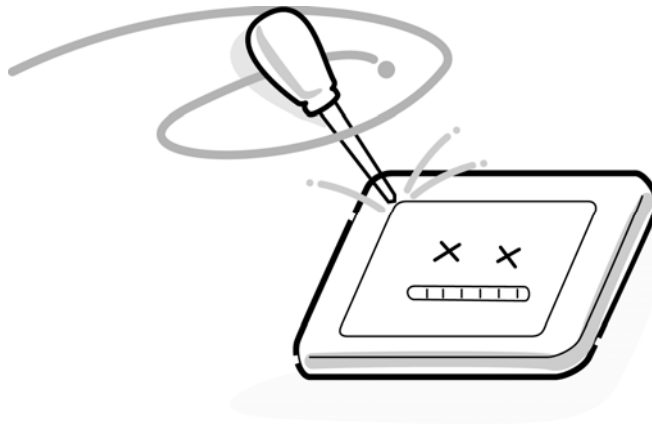
7. Do not expose the module directly to sunlight or strong ultraviolet rays for long periods.



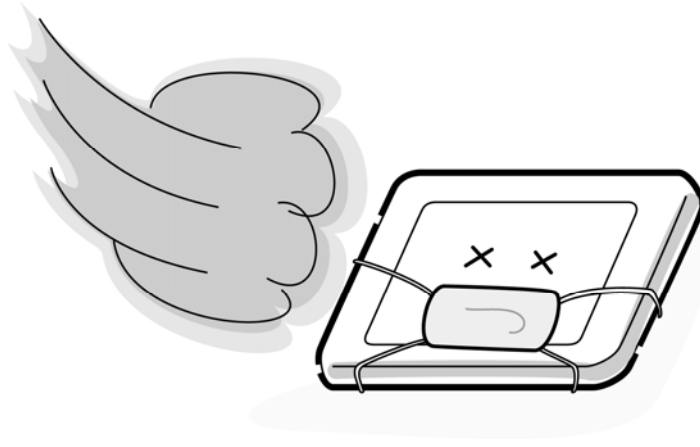
8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



9. Do not disassemble the LCD module. Disassembly can cause malfunctions.



10. If you transport the module, do not use packing material which contains epoxy resin (amine) or silicon glue (alcohol or oxide). These materials can release gas that can damage the panel's polarization.



Appendix B Board Layout

B.1 System Board

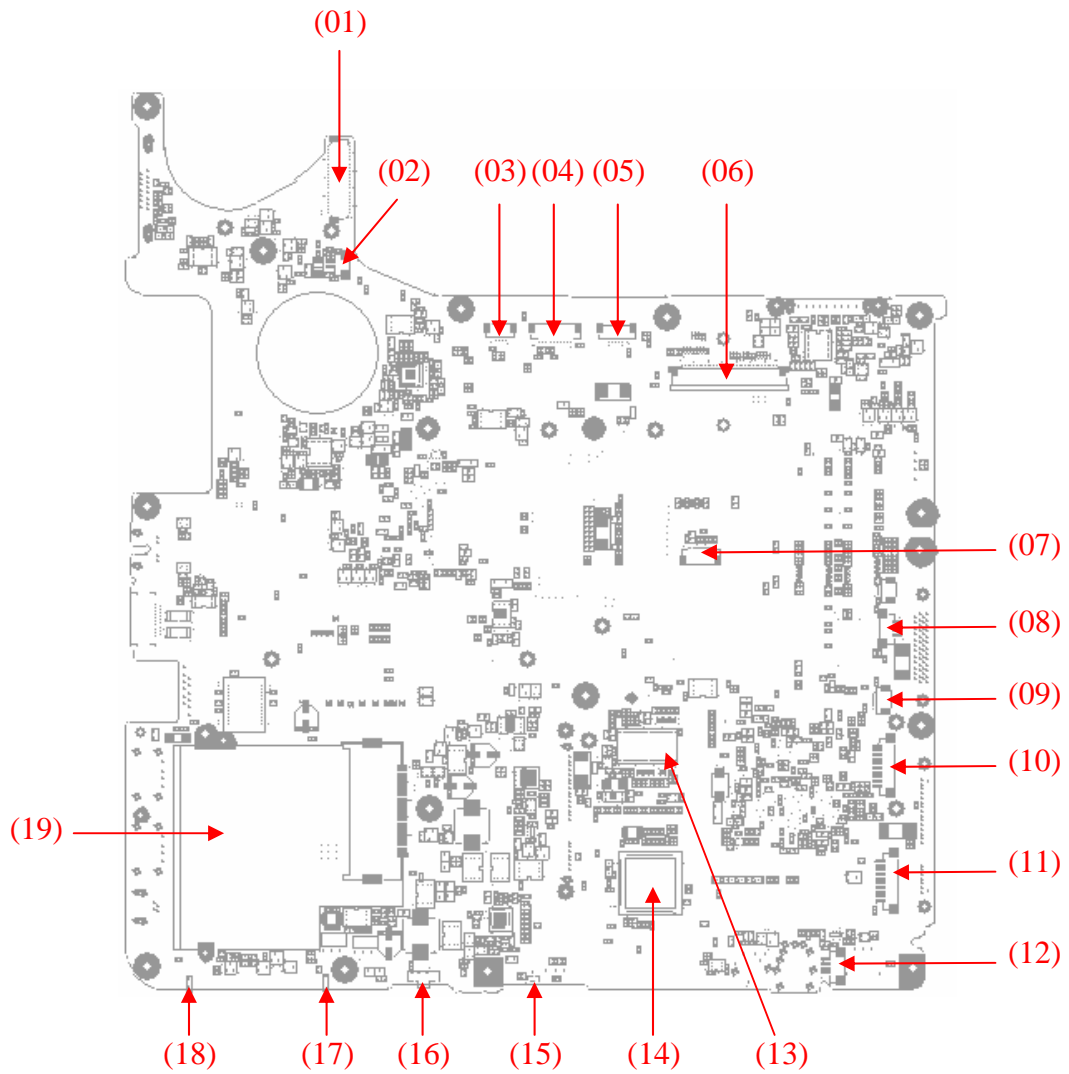


Figure B-1 System board layout (front)

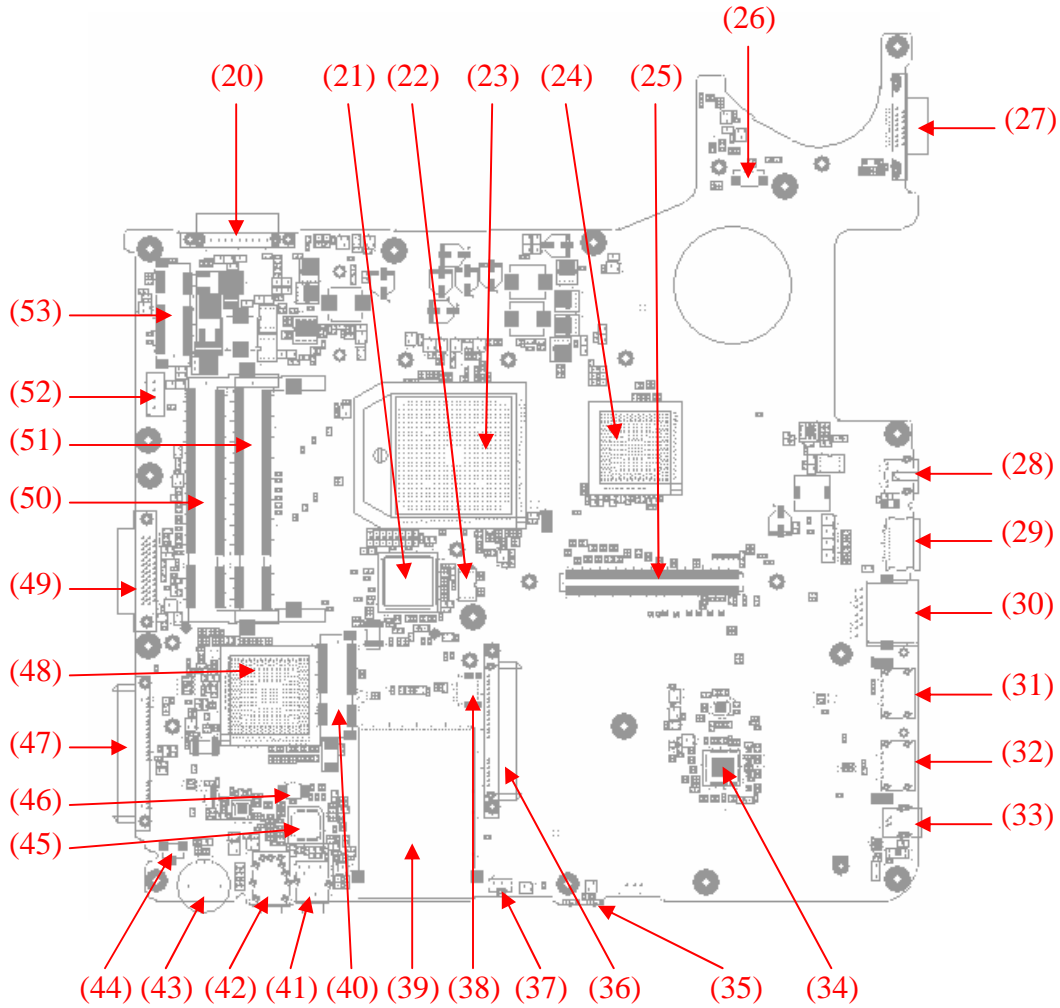


Figure B-2 System board layout (Back)

Table B-1 System board ICs and connectors

	Location	Function
(01)	CN4	M/B to panel connector
(02)	CN5	Internal MIC cable connector
(03)	CN8	M/B to Power Switch Board connector
(04)	CN6	M/B to Low Cost Function Board connector
(05)	CN7	M/B to MMB connector
(06)	CN9/CN10	M/B to Keyboard connector
(07)	CN11	M/B to Touchpad Board connector
(08)	CN13	M/B to Touchpad Board connector
(09)	CN42	M/B to FM connector
(10)	CN16	M/B to USB Board connector
(11)	CN14	M/B to Bluetooth module connector
(12)	CN17	M/B to Speaker connector
(13)	U17	Clock Generator
(14)	U20	Card Reader and 1394 Combo controller IC O ₂ OZ129TN
(15)	MR4	Hall IC
(16)	SW4	Kill Switch
(17)	LED6	Logo LED
(18)	LED5	Logo LED
(19)	CN15	New Card connector
(20)	CN20	Battery connector
(21)	U26	Embedded Controller IC Winbond WPCE775
(22)	U27	BIOS IC
(23)	U25	CPU
(24)	U24	North Bridge
(25)	CN27	M/B to External VGA Board connector
(26)	CN19	FAN connector
(27)	CN18	CRT connector
(28)	CN22	S-Video connector
(29)	CN25	HDMI connector
(30)	CN28	RJ-45 connector
(31)	CN31	USB connector
(32)	CN35	USB connector
(33)	CN38	1394 connector
(34)	U35	LAN controller IC Marvell 88E8040T(10/100) / 88E8072(Giga)
(35)	LED8	WLAN and BT Combo LED
(36)	CN32	2 nd SATA connector
(37)	U41	CIR Sensor
(38)	CN43	M/B to MDC module connector

(39)	CN33	Card Reader connector
(40)	CN30	HD DVD Decoder Module Slot
(41)	CN41	External MIC Jack
(42)	CN40	Headphone and SPDIF Combo Jack
(43)	VR4	Volume Regulator
(44)	CN39	Internal MIC cable connector
(45)	U38	Azalia Audio Codec Conexant CX20561-12Z
(46)	CN37	RTC Battery connector
(47)	CN34	1 st SATA connector
(48)	U32	South Bridge
(49)	CN26	PATA ODD connector
(50)	CN23	DDR SO-DIMM Slot B
(51)	CN24	DDR SO-DIMM Slot A
(52)	PCN4	ACIN cable connector
(53)	CN21	WLAN Module Slot

B.2 MMB board

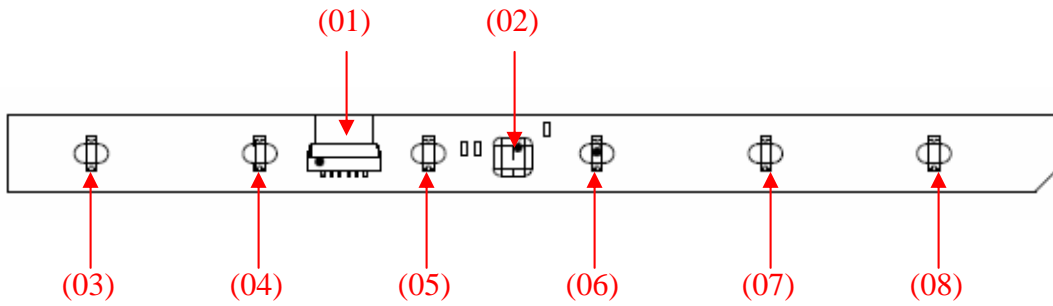


Figure B-3 MMB board layout (back)

Table B-2 MMB board IC and connectors

	Location	Function
(01)	J1	Connect to M/B connector
(02)	U1	Sensor IC Quantum QT1081
(03)	D1	Music Mute Button
(04)	D2	Media Player Button
(05)	D3	Music Play / Pause Button
(06)	D4	Music Stop Button
(07)	D5	Music Backward
(08)	D6	Music Forward

B.3 Low Cost Function board

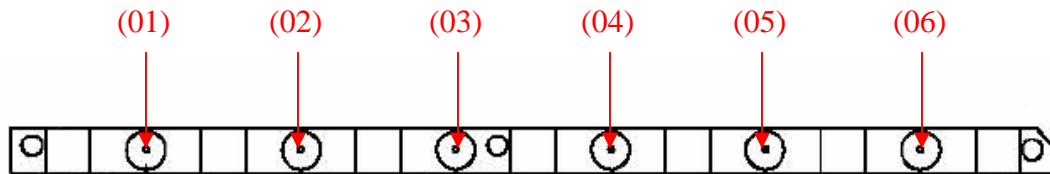


Figure B-4 Low Cost Function board layout (front)

Table B-3 Low Cost Function board connectors

	Location	Function
(01)	SW1	Music Mute Button
(02)	SW2	Media Player Button
(03)	SW3	Music Play / Pause Button
(04)	SW4	Music Stop Button
(05)	SW5	Music Backward
(06)	SW6	Music Forward

B.4 USB with RJ11 board

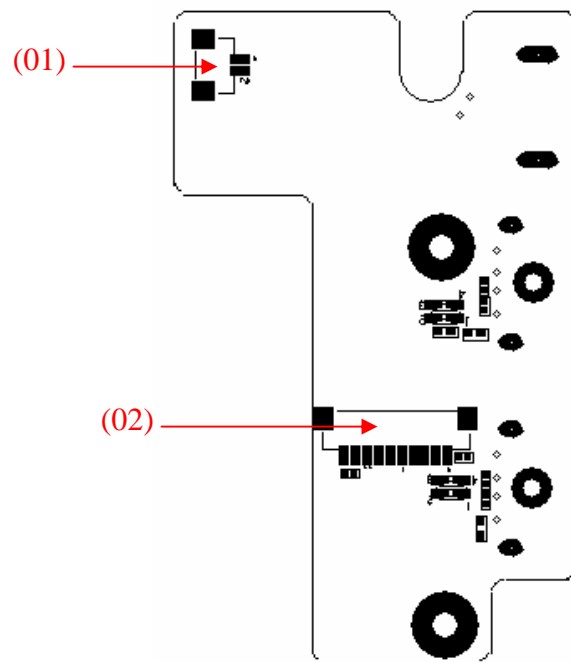


Figure B-5 USB with RJ11 board layout (front)

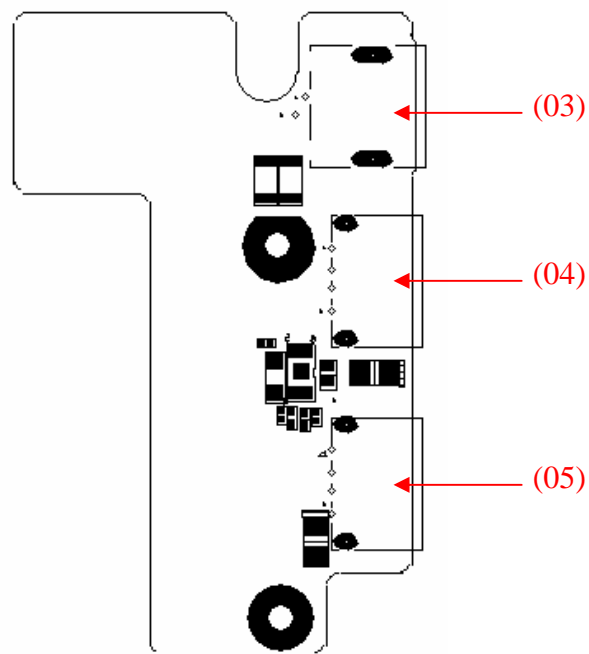


Figure B-6 USB with RJ11 board layout (back)

Table B-4 USB with RJ11 board connectors

	Location	Function
(01)	CN2	Connect to Modem module
(02)	CN3	Connect to M/B USB connector
(03)	CN1	RJ11 connector
(04)	CN4	USB connector
(05)	CN5	USB connector

B.5 USB with FM Board

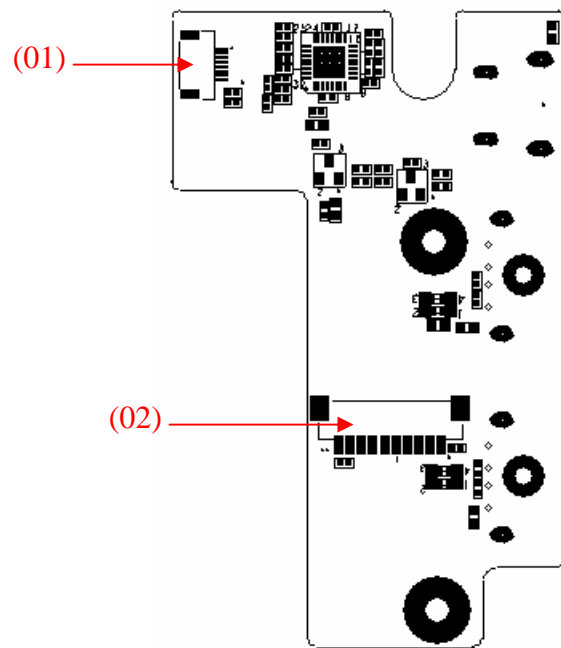


Figure B-7 USB with FM board layout (front)

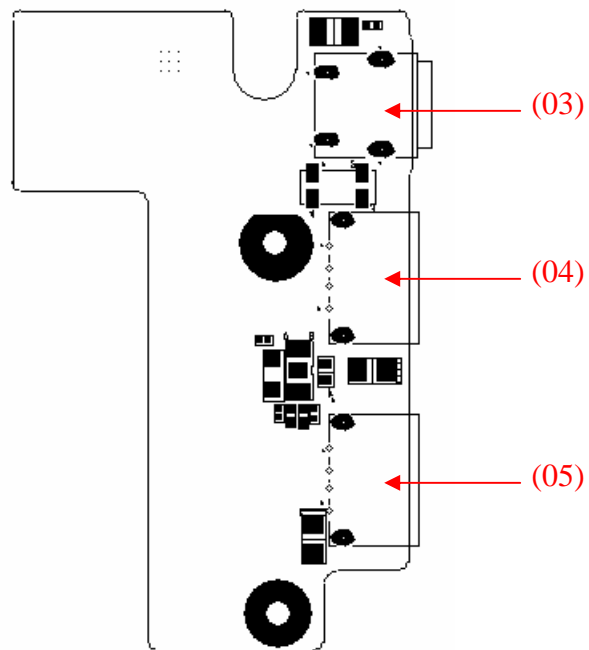


Figure B-8 USB with FM board layout (back)

Table B-5 USB with FM board connectors

	Location	Function
(01)	CN7	Connect to M/B FM connector
(02)	CN3	Connect to M/B USB connector
(03)	CN8	FM Jack
(04)	CN4	USB connector
(05)	CN5	USB connector

B.6 Touch Pad Board

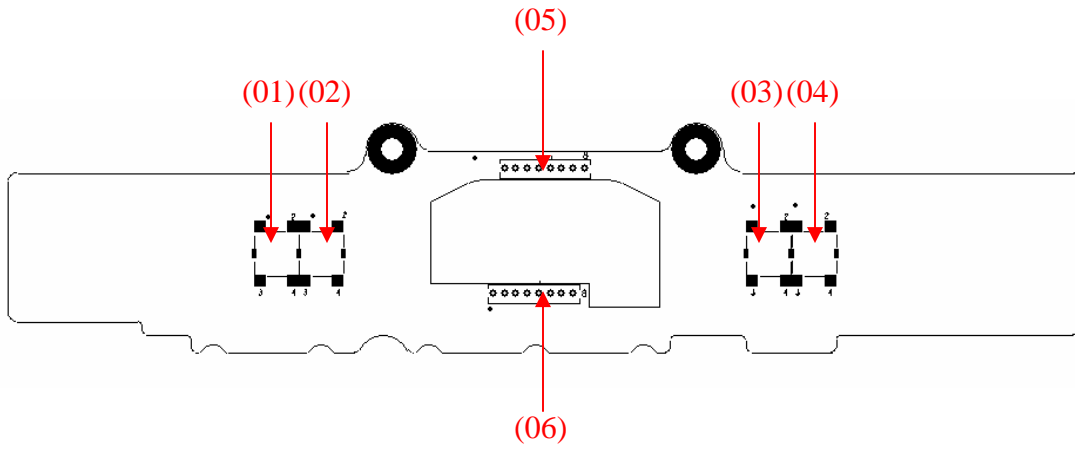


Figure B-9 Touch pad board layout (front)

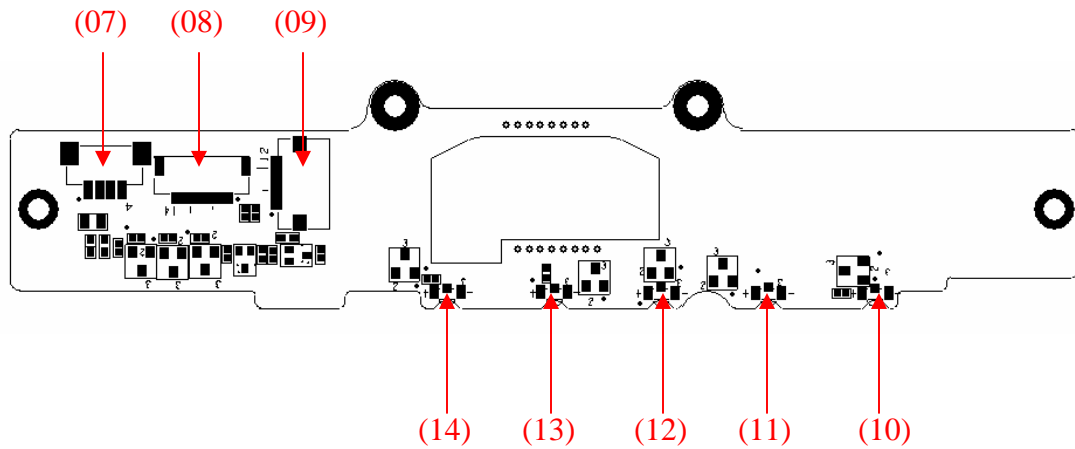


Figure B-10 Touch pad board layout (back)

Table B-6 Touch pad board connectors

	Location	Function
(01)	SW1	Mouse Button Left key
(02)	SW3	Mouse Button Left key
(03)	SW4	Mouse Button Right key
(04)	SW2	Mouse Button Right key
(05)	CN2	TP board to FP board connector
(06)	CN3	TP board to FP board connector
(07)	CN1	TP board to M/B USB signal connector
(08)	CN4	TP board to M/B USB signal connector
(09)	CN5	TP Board to TP module connector
(10)	LED4	ACIN LED
(11)	LED1	Power and Suspend LED
(12)	LED2	Battery Charge LED
(13)	LED3	HDD LED
(14)	LED5	Card Reader LED

B.7 Power Switch Board

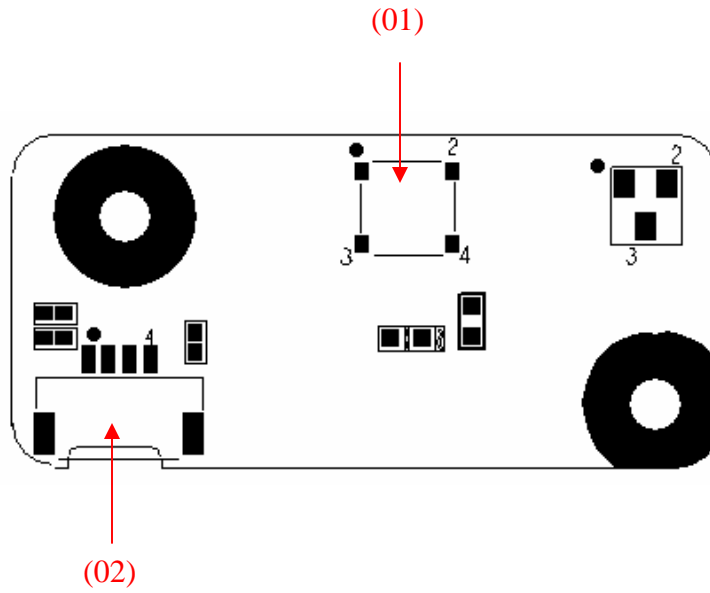


Figure B-11 Power Switch board layout (front)

Table B-7 Power Switch board connectors

	Location	Function
(01)	SW1	Power Button
(02)	CN14	Power Switch Board to M/B connector

B.8 Fingerprint Board

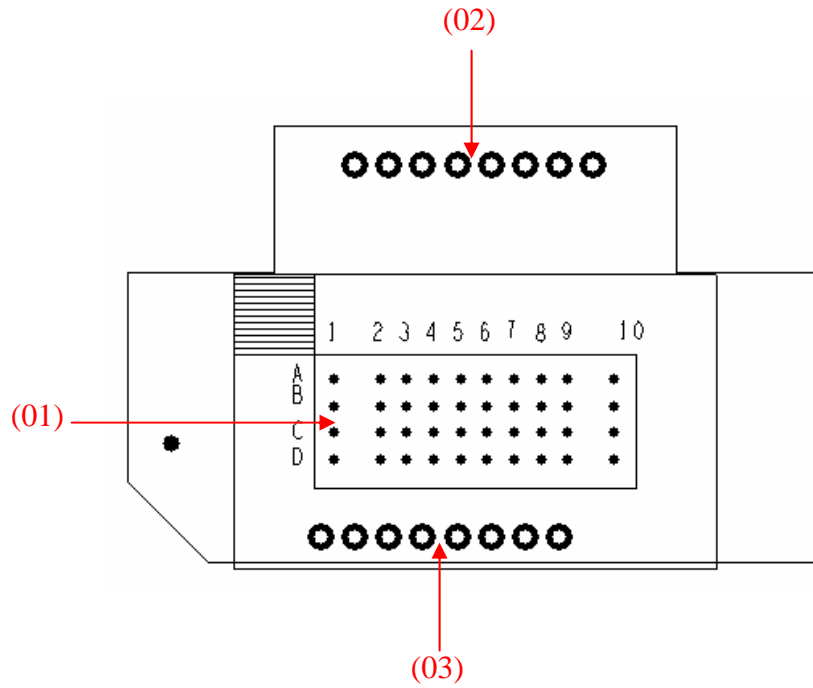


Figure B-12 Fingerprint board layout (front)

Table B-8 Fingerprint board IC and connectors

	Location	Function
(01)	U1	Finger Printer IC Authentec AES1610
(02)	CN2	FP board to TP board connector
(03)	CN3	FP board to TP board connector

B.9 Modem Board

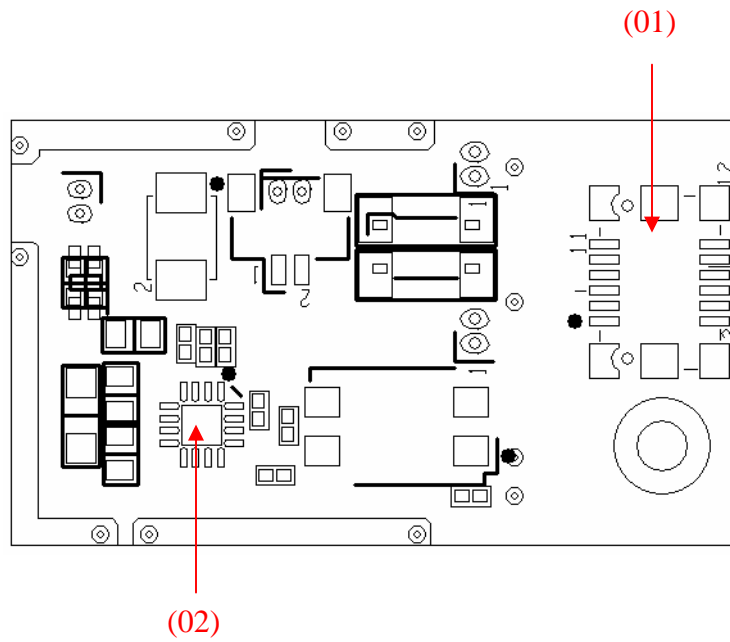


Figure B-13 Modem board layout (front)

Table B-9 Modem board IC and connectors

	Location	Function
(01)	CN1	Modem board to M/B board connector
(02)	MU1	Modem IC Conexant CX20548-11Z

Appendix C Pin Assignment

CN4 LCD TYPE CONNECTOR

CONN SMD WAFER 40P 2R MS(P1.0,H3.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	INVCC0	---	2	LCD_VCC	---
3	INVCC0	---	4	LCD_VCC	---
5	INVCC0	---	6	LCD_EDIDDATA	I/O
7	+3V	---	8	LCD_EDIDCLK	I/O
9	CCD_POWER	---	10	LCD_VADJ	I
11	MIC_GND_R	---	12	GND	---
13	Analog MIC_R	---	14	CCD_USBP2+	I/O
15	DISPON	O	16	CCD_USBP2-	I/O
17	GND	---	18	GND	---
19	TXLCLKOUT+	I/O	20	TXUCLKOUT+	I/O
21	TXLCLKOUT-	I/O	22	TXUCLKOUT-	I/O
23	GND	---	24	GND	---
25	TXLOUT0+	I/O	26	TXUOUT0+	I/O
27	TXLOUT0-	I/O	28	TXUOUT0-	I/O
29	GND	---	30	GND	---
31	TXLOUT1+	I/O	32	TXUOUT1+	I/O
33	TXLOUT1-	I/O	34	TXUOUT1-	I/O
35	GND	---	36	GND	---
37	TXLOUT2+	I/O	38	TXUOUT2+	I/O

39	TXLOUT2-	I/O	40	TXUOUT2-	I/O
41	GND	---	42	GND	---

CN5 INTMIC Connector1

CONN SMD HEADER 2P 1R MR(P1.25,H1.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MIC_GND	---	2	Analog MIC	---

CN6 Low cost MMB Connector

CONN SMD FPC 10P 1R FR(P1.0,H1.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+3VPCU	---	2	MX5	I
3	MX2	I	4	MY1	I
5	GND	---	6	MX3	I
7	LOW_DET	I	8	MX4	I
9	FN0#	I	10	FN1#	I

CN7 Main stream MMB Connector

Pin Assignment

CONN SMD FPC 6P 1R FR(P1.0,H1.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+3VPCU	---	2	+5VPCU	---
3	KEY_INT	I	4	GND	---
5	3ND_MBDATA	I/O	6	3ND_MBCLK	I/O

CN8 Power board Connector

CONN SMD FFC 4P 1R FR (P1.0,H1.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+5VPCU	---	2	NBSWON#	I
3	PWRLED#	I	4	GND	---

CN9 Keyboard Side Connector

CONN SMD FFC 34P,1R,FR(P0.8,H2.0)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	K_LED_P	I	2	MY16	I
3	NC	---	4	MY17	I
5	NC	---	6	K_LED_P	I
7	MY2	I	8	MY1	I
9	MY0	I	10	MY4	I
11	MY3	I	12	MY5	I
13	MY14	I	14	MY6	I

15	MY7	I	16	MY13	I
17	MY8	I	18	MY9	I
19	MY10	I	20	MY11	I
21	MY12	I	22	MY15	I
23	MX7	I	24	MX2	I
25	MX3	I	26	MX4	I
27	MX0	I	28	MX5	I
29	MX6	I	30	MX1	I
31	K_LED_P	I	32	CAPSLED	I
33	FN_F10	I	34	NUMLED	I

CN11 T/P Connector

CONN SMD FFC 14P 1R FR(P0.5,H1.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+5V_TP	---	2	+5VPCU	---
3	TPDATA_1	I/O	4	TPCLK_1	I/O
5	GND	---	6	GND	---
7	TP_LED_ON_C	O	8	BATLED1#	O
9	BATLED0#	O	10	PWRLED#	O
11	SUSLED_EC	O	12	IDE_LED#	O
13	ACIN	O	14	TP_XD_LED	O

CN12 Felica Connector

CONN SMD FPC 6P 1R FR(P0.5,H1.5)

Pin Assignment

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	FELICA_POWER	---	2	USBP5-_C	I/O
3	USBP5+_C	I/O	4	GND	---
5	NC	---	6	FELICA_DE	---

CN13 Finger Printer CONNECTOR

CONN SMD HEADER 4P 1R MR(P1.25,H1.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	FINGER_POWER	---	2	USBP4-_C	I/O
3	USBP4+_C	I/O	4	GND	---

CN14 BLUETOOTH MODULE CONNECTOR

CONN SMD HEADER 10P 1R MR(P1.25,H1.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	BT_USBP8+_C	I/O
3	BT_USBP8-_C	I/O	4	WCS_CLK	O
5	GND	---	6	BT_RESET	I
7	WCS_DAT	I	8	+3V	---
9	USB_DETACH	I	10	GND	---

CN15 New card Connector

CONN SMD HEADER 26P 1R MR (P1.0,H5.4)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	O	2	USBP6-_R	I/O
3	USBP6+_R	I/O	4	CPUSB#	I
5	T84	---	---	T89	---
7	NEW_SMCLK	I/O	8	NEW_SMDATA	I/O
9	+NEW_1.5V	---	10	+NEW_1.5V	---
11	PCIE_WAKE#	O	12	+NEW_3VAUX	---
13	PERST#	O	14	+NEW_3V	---
15	+NEW_3V	---	16	NEW Card_CLKREQ#	O
17	CPPE#	I	18	CLK_PCIE_NEW#	O
19	CLK_PCIE_NEW	O	20	GND	---
21	GPP_RX3N_NEWCARD	I/O	22	GPP_RX3P_NEWCARD	I/O
23	GND	---	24	GPP_TX3N_NEWCARD	I/O
25	GPP_TX3P_NEWCARD	I/O	26	GND	---

CN16 USB(Daughter Board side) Connector

CONN SMD HEADER 10P 1R MR(P1.25,H1.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+5VPCU	---	2	USB_OC2#	I
3	GND	---	4	USBP9+_C	I/O
5	USBP9-_C	I/O	6	USBP1+_C	I/O
7	USBP1-_C	I/O	8	GND	---
9	USB_EN2#	O	10	+5VPCU	---

CN17 INT SPEAKER Connector

CONN SMD HEADER 4P 1R MR(P1.25,H1.9)

Pin Assignment

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	INSPKL-N	---	2	INSPKL+N	---
3	INSPKR-N	---	4	INSPKR+N	---

CN18 CRT PORT Connector

CONN DIP D-SUB 15P 2R FR(H12.5,P0.76)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	CRT_R1	O	2	CRT_G1	O
3	CRT_B1	O	4	NC	---
5	GND	---	6	GND	---
7	GND	---	8	GND	---
9	5V_CRT2	---	10	GND	---
11	T174	---	12	CRTDDAT	I/O
13	CRTHSYNC	O	14	CRTVSYNC	O
15	CRTDCLK	I/O			

CN19 CPU FAN Connector

CONN SMD WAFER,3P,1R,MS(P1.25,H4.7)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	TH_FAN_POWER_R	---	2	GND	---
3	FANSIG	I/O			

CN20 Battery Connector

CONN DIP BATT 9P 1R MR(P2.0,H6.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MBAT+	---	2	MBAT+	---
3	ID_L	O	4	B/I	O
5	TEMP_MBAT	---	6	MBDATA	I/O
7	MBCLK	I/O	8	GND	---
9	GND	---			

CN21 MINI-Card I (WLAN) Connector

CONN SMD HEADER,52P,2R,MS(P0.8,H9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	WLAN_WAKE#	O	2	+3V_WL_VDD	---
3	WCS_DATR	---	4	GND	---
5	WCS_CLKR	---	6	+1.5V	---
7	CLKREQ_WLAN#	O	8	NC	---
9	GND	---	10	NC	---
11	CLK_PCIE_WLAN#	I	12	NC	---
13	CLK_PCIE_WLAN	I	14	NC	---
15	GND	---	16	NC	---
17	NC	---	18	GND	---
19	NC	---	20	RF_EN_WLAN	I
21	GND	---	22	PLTRST#	I
23	GPP_RX1N_WLAN	O	24	+3V_WL_VDD	---
25	GPP_RX1P_WLAN	O	26	GND	---
27	GND	---	28	+1.5V	---

Pin Assignment

29	GND	---	30	WL_SMCLK_WLAN	I/O
31	GPP_TX1N_WLAN	I	32	WL_SMDATA_WLAN	I/O
33	GPP_TX1P_WLAN	I	34	GND	---
35	GND	---	36	USBP3-_C	I/O
37	NC	---	38	USBP3+_C	I/O
39	+3V_WL_VDD	---	40	GND	---
41	+3V_WL_VDD	---	42	WiMAX_LED#_A	---
43	GND	---	44	NC	---
45	NC	---	46	NC	---
47	NC	---	48	+1.5V	---
49	NC	---	50	GND	---
51	NC	O	52	+3V_WL_VDD	---

CN22 TVOUT Connector

CONN DIP MINI-DIN 4P FR(P1.0,H10.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	GND	---
3	TV-LUMA	O	4	TV-CHROMA	O
5	GND	---	6	GND	---

CN23 DDRII SODIMM Connector1

DDR2 SO-DIMM(200P,H10.1,RVS)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MVREF_DIM	---	2	GND	---
3	GND	---	4	M_B_DQ5	I/O
5	M_B_DQ4	I/O	6	M_B_DQ0	I/O
7	M_B_DQ1	I/O	8	GND	---
9	GND	---	10	M_B_DM0	I
11	M_B_DQS#0	I/O	12	GND	---
13	M_B_DQS0	I/O	14	M_B_DQ6	I/O
15	GND	---	16	M_B_DQ7	I/O
17	M_B_DQ2	I/O	18	GND	---
19	M_B_DQ3	I/O	20	M_B_DQ12	I/O
21	GND	---	22	M_B_DQ13	I/O
23	M_B_DQ8	I/O	24	GND	---
25	M_B_DQ9	I/O	26	M_B_DM1	I
27	GND	---	28	GND	---
29	M_B_DQS#1	I/O	30	M_CLKOUT3	I
31	M_B_DQS1	I/O	32	M_CLKOUT3#	I
33	GND	---	34	GND	---
35	M_B_DQ10	I/O	36	M_B_DQ14	I/O
37	M_B_DQ15	I/O	38	M_B_DQ11	I/O
39	GND	---	40	GND	---
41	GND	---	42	GND	---
43	M_B_DQ16	I/O	44	M_B_DQ20	I/O
45	M_B_DQ21	I/O	46	M_B_DQ17	I/O

Pin Assignment

47	GND	---	48	GND	---
49	M_B_DQS#2	I/O	50	T59	---
51	M_B_DQS2	I/O	52	M_B_DM2	I
53	GND	---	54	GND	---
55	M_B_DQ19	I/O	56	M_B_DQ18	I/O
57	M_B_DQ23	I/O	58	M_B_DQ22	I/O
59	GND	---	60	GND	---
61	M_B_DQ29	I/O	62	M_B_DQ24	I/O
63	M_B_DQ28	I/O	64	M_B_DQ25	I/O
65	GND	---	66	GND	---
67	M_B_DM3	I	68	M_B_DQS#3	I/O
69	T57	---	70	M_B_DQS3	I/O
71	GND	---	72	GND	---
73	M_B_DQ26	I/O	74	M_B_DQ30	I/O
75	M_B_DQ27	I/O	76	M_B_DQ31	I/O
77	GND	---	78	GND	---
79	M_CKE2	I	80	M_CKE3	I
81	+1.8VSUS	---	82	+1.8VSUS	---
83	M_B_CS#2	---	84	M_B_A15	---
85	M_B_BS#2	I	86	M_B_A14	---
87	+1.8VSUS	---	88	+1.8VSUS	---
89	M_B_A12	I/O	90	M_B_A11	I/O
91	M_B_A9	I/O	92	M_B_A7	I/O
93	M_B_A8	I/O	94	M_B_A6	I/O

95	+1.8VSUS	---	96	+1.8VSUS	---
97	M_B_A5	I/O	98	M_B_A4	I/O
99	M_B_A3	I/O	100	M_B_A2	I/O
101	M_B_A1	I/O	102	M_B_A0	I/O
103	+1.8VSUS	---	104	+1.8VSUS	---
105	M_B_A10	I/O	106	M_B_BS#1	I
107	M_B_BS#0	I	108	M_B_RAS#	I
109	M_B_WE#	I	110	M_B_CS#0	I
111	+1.8VSUS	---	112	+1.8VSUS	---
113	M_B_CAS#	I	114	M_ODT2	I
115	M_B_CS#1	I	116	M_B_A13	I/O
117	+1.8VSUS	---	118	+1.8VSUS	---
119	M_ODT3	I	120	M_B_CS#3	---
121	GND	---	122	GND	---
123	M_B_DQ32	I/O	124	M_B_DQ33	I/O
125	M_B_DQ36	I/O	126	M_B_DQ37	I/O
127	GND	---	128	GND	---
129	M_B_DQS#4	I/O	130	M_B_DM4	I
131	M_B_DQS4	I/O	132	GND	---
133	GND	---	134	M_B_DQ34	I/O
135	M_B_DQ39	I/O	136	M_B_DQ38	I/O
137	M_B_DQ35	I/O	138	GND	---
139	GND	---	140	M_B_DQ44	I/O
141	M_B_DQ40	I/O	142	M_B_DQ45	I/O

Pin Assignment

143	M_B_DQ41	I/O	144	GND	---
145	GND	---	146	M_B_DQS#5	I/O
147	M_B_DM5	I	148	M_B_DQS5	I/O
149	GND	---	150	GND	---
151	M_B_DQ46	I/O	152	M_B_DQ47	I/O
153	M_B_DQ43	I/O	154	M_B_DQ42	I/O
155	GND	---	156	GND	---
157	M_B_DQ53	I/O	158	M_B_DQ48	I/O
159	M_B_DQ49	I/O	160	M_B_DQ52	I/O
161	GND	---	162	GND	---
163	T29	---	164	M_CLKOUT4	I
165	GND	---	166	M_CLKOUT4#	I
167	M_B_DQS#6	I/O	168	GND	---
169	M_B_DQS6	I/O	170	M_B_DM6	I
171	GND	---	172	GND	---
173	M_B_DQ55	I/O	174	M_B_DQ50	I/O
175	M_B_DQ54	I/O	176	M_B_DQ51	I/O
177	GND	---	178	GND	---
179	M_B_DQ60	I/O	180	M_B_DQ61	I/O
181	M_B_DQ57	I/O	182	M_B_DQ56	I/O
183	GND	---	184	GND	---
185	M_B_DM7	I	186	M_B_DQS#7	I/O
187	GND	---	188	M_B_DQS7	I/O
189	M_B_DQ62	I/O	190	GND	---

191	M_B_DQ59	I/O	192	M_B_DQ63	I/O
193	GND	---	194	M_B_DQ58	I/O
195	DDRDAT_SMB	I/O	196	GND	---
197	DDRCLK_SMB	I/O	198	SA0_B	---
199	+3V	---	200	SA1_B	---

CN24 DDRII SODIMM Connector2

DDR2 SO-DIMM(200P,H5.6,RVS)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MVREF_DIM	---	2	GND	---
3	GND	---	4	M_A_DQ0	I/O
5	M_A_DQ1	I/O	6	M_A_DQ4	I/O
7	M_A_DQ5	I/O	8	GND	---
9	GND	---	10	M_A_DM0	I
11	M_A_DQS#0	I/O	12	GND	---
13	M_A_DQS0	I/O	14	M_A_DQ7	I/O
15	GND	---	16	M_A_DQ6	I/O
17	M_A_DQ2	I/O	18	GND	---
19	M_A_DQ3	I/O	20	M_A_DQ13	I/O
21	GND	---	22	M_A_DQ9	I/O
23	M_A_DQ12	I/O	24	GND	---
25	M_A_DQ8	I/O	26	M_A_DM1	I
27	GND	---	28	GND	---
29	M_A_DQS#1	I/O	30	M_CLKOUT0	I

Pin Assignment

31	M_A_DQS1	I/O	32	M_CLKOUT0#	I
33	GND	---	34	GND	---
35	M_A_DQ10	I/O	36	M_A_DQ15	I/O
37	M_A_DQ14	I/O	38	M_A_DQ11	I/O
39	GND	---	40	GND	---
41	GND	---	42	GND	---
43	M_A_DQ21	I/O	44	M_A_DQ20	I/O
45	M_A_DQ17	I/O	46	M_A_DQ19	I/O
47	GND	---	48	GND	---
49	M_A_DQS#2	I/O	50	T58	---
51	M_A_DQS2	I/O	52	M_A_DM2	I
53	GND	---	54	GND	---
55	M_A_DQ23	I/O	56	M_A_DQ22	I/O
57	M_A_DQ18	I/O	58	M_A_DQ16	I/O
59	GND	---	60	GND	---
61	M_A_DQ29	I/O	62	M_A_DQ25	I/O
63	M_A_DQ28	I/O	64	M_A_DQ24	I/O
65	GND	---	66	GND	---
67	M_A_DM3	I	68	M_A_DQS#3	I/O
69	T137	---	70	M_A_DQS3	I/O
71	GND	---	72	GND	---
73	M_A_DQ31	I/O	74	M_A_DQ27	I/O
75	M_A_DQ26	I/O	76	M_A_DQ30	I/O
77	GND	---	78	GND	---

79	M_CKE0	I	80	M_CKE1	I
81	+1.8VSUS	---	82	+1.8VSUS	---
83	M_A_CS#2	---	84	M_A_A15	---
85	M_A_BS#2	I	86	M_A_A14	---
87	+1.8VSUS	---	88	+1.8VSUS	---
89	M_A_A12	I/O	90	M_A_A11	I/O
91	M_A_A9	I/O	92	M_A_A7	I/O
93	M_A_A8	I/O	94	M_A_A6	I/O
95	+1.8VSUS	---	96	+1.8VSUS	---
97	M_A_A5	I/O	98	M_A_A4	I/O
99	M_A_A3	I/O	100	M_A_A2	I/O
101	M_A_A1	I/O	102	M_A_A0	I/O
103	+1.8VSUS	---	104	+1.8VSUS	---
105	M_A_A10	I/O	106	M_A_BS#1	I
107	M_A_BS#0	I	108	M_A_RAS#	I
109	M_A_WE#	I	110	M_A_CS#0	I
111	+1.8VSUS	---	112	+1.8VSUS	---
113	M_A_CAS#	I	114	M_ODT0	I
115	M_A_CS#1	I	116	M_A_A13	I/O
117	+1.8VSUS	---	118	+1.8VSUS	---
119	M_ODT1	I	120	M_A_CS#3	---
121	GND	---	122	GND	---
123	M_A_DQ32	I/O	124	M_A_DQ33	I/O
125	M_A_DQ36	I/O	126	M_A_DQ38	I/O

Pin Assignment

127	GND	---	128	GND	---
129	M_A_DQS#4	I/O	130	M_A_DM4	I
131	M_A_DQS4	I/O	132	GND	---
133	GND	---	134	M_A_DQ34	I/O
135	M_A_DQ37	I/O	136	M_A_DQ39	I/O
137	M_A_DQ35	I/O	138	GND	---
139	GND	---	140	M_A_DQ44	I/O
141	M_A_DQ40	I/O	142	M_A_DQ45	I/O
143	M_A_DQ41	I/O	144	GND	---
145	GND	---	146	M_A_DQS#5	I/O
147	M_A_DM5	I	148	M_A_DQS5	I/O
149	GND	---	150	GND	---
151	M_A_DQ42	I/O	152	M_A_DQ43	I/O
153	M_A_DQ46	I/O	154	M_A_DQ47	I/O
155	GND	---	156	GND	---
157	M_A_DQ55	I/O	158	M_A_DQ53	I/O
159	M_A_DQ54	I/O	160	M_A_DQ48	I/O
161	GND	---	162	GND	---
163	T130	---	164	M_CLKOUT1	I
165	GND	---	166	M_CLKOUT1#	I
167	M_A_DQS#6	I/O	168	GND	---
169	M_A_DQS6	I/O	170	M_A_DM6	I
171	GND	---	172	GND	---
173	M_A_DQ50	I/O	174	M_A_DQ49	I/O

175	M_A_DQ51	I/O	176	M_A_DQ52	I/O
177	GND	---	178	GND	---
179	M_A_DQ56	I/O	180	M_A_DQ57	I/O
181	M_A_DQ60	I/O	182	M_A_DQ61	I/O
183	GND	---	184	GND	---
185	M_A_DM7	I	186	M_A_DQS#7	I/O
187	GND	---	188	M_A_DQS7	I/O
189	M_A_DQ59	I/O	190	GND	---
191	M_A_DQ58	I/O	192	M_A_DQ63	I/O
193	GND	---	194	M_A_DQ62	I/O
195	DDRDAT_SMB	I/O	196	GND	---
197	DDRCLK_SMB	I/O	198	SA0_A	---
199	+3V	---	200	SA1_A	---

CN25 HDMI Connector

CONN DIP HDMI HOUSING 19P 2R FR(H7.23)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	HDMITX2P_C	O	2	GND	---
3	HDMITX2N_C	O	4	HDMITX1P_C	O
5	GND	---	6	HDMITX1N_C	O

Pin Assignment

7	HDMITX0P_C	O	8	GND	---
9	HDMITX0N_C	O	10	HDMICLK+_C	O
11	GND	---	12	HDMICLK-_C	O
13	CEC	I/O	14	NC	---
15	HDMI_SCL	O	16	HDMI_SDA	O
17	GND	---	18	DDC5V	---
19	HDMI_HPD	I			---

CN26 ODD CONNECTOR

CONN DIP HOUSING 50P 2R FR(P0.8,H4.1)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	NC	---	2	NC	---
3	NC	---	4	GND	---
5	-IDERST	O	6	PDD8	I/O
7	PDD7	I/O	8	PDD9	I/O
9	PDD6	I/O	10	PDD10	I/O
11	PDD5	I/O	12	PDD11	I/O
13	PDD4	I/O	14	PDD12	I/O
15	PDD3	I/O	16	PDD13	I/O
17	PDD2	I/O	18	PDD14	I/O
19	PDD1	I/O	20	PDD15	I/O
21	PDD0	I/O	22	PDDREQ	O
23	GND	---	24	PDIOR#	I

25	PDIOW#	I	26	GND	---
27	PDIORDY	O	28	PDDACK#	I
29	IRQ14	O	30	NC	---
31	PDA1	I/O	32	DIAG#	---
33	PDA0	I/O	34	PDA2	I/O
35	PDCS1#	I	36	PDCS3#	O
37	ODD_LED#	O	38	+5V	---
39	+5V	---	40	+5V	---
41	+5V	---	42	+5V	---
43	GND	---	44	GND	---
45	GND	---	46	GND	---
47	GND	---	48	GND	---
49	NC	---	50	NC	---

CN27 MXM Connector

CONN SMD HOUSING 200P FS(P5.15,H8.65)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	PEG_RXN15	I	2	PEG_TXN15	O
3	PEG_RXP15	I	4	PEG_TXP15	O
5	GND	---	6	GND	---
7	PEG_RXN14	I	8	PEG_TXN14	O

Pin Assignment

9	PEG_RXP14	I	10	PEG_TXP14	O
11	GND	---	12	GND	---
13	PEG_RXN13	I	14	PEG_TXN13	O
15	PEG_RXP13	I	16	PEG_TXP13	O
17	GND	---	18	GND	---
19	PEG_RXN12	I	20	PEG_TXN12	O
21	PEG_RXP12	I	22	PEG_TXP12	O
23	GND	---	24	GND	---
25	PEG_RXN11	I	26	PEG_TXN11	O
27	PEG_RXP11	I	28	PEG_TXP11	O
29	GND	---	30	GND	---
31	PEG_RXN10	I	32	PEG_TXN10	O
33	PEG_RXP10	I	34	PEG_TXP10	O
35	GND	---	36	GND	---
37	PEG_RXN9	I	38	PEG_TXN9	O
39	PEG_RXP9	I	40	PEG_TXP9	O
41	GND	---	42	GND	---
43	PEG_RXN8	I	44	PEG_TXN8	O
45	PEG_RXP8	I	46	PEG_TXP8	O
47	GND	---	48	GND	---
49	PEG_RXN7	I	50	PEG_TXN7	O
51	PEG_RXP7	I	52	PEG_TXP7	O
53	GND	---	54	GND	---
55	PEG_RXN6	I	56	PEG_TXN6	O

57	PEG_RXP6	I	58	PEG_TXP6	O
59	GND	---	60	GND	---
61	PEG_RXN5	I	62	PEG_TXN5	O
63	PEG_RXP5	I	64	PEG_TXP5	O
65	GND	---	66	GND	---
67	PEG_RXN4	I	68	PEG_TXN4	O
69	PEG_RXP4	I	70	PEG_TXP4	O
71	GND	---	72	GND	---
73	PEG_RXN3	I	74	PEG_TXN3	O
75	PEG_RXP3	I	76	PEG_TXP3	O
77	GND	---	78	GND	---
79	PEG_RXN2	I	80	PEG_TXN2	O
81	PEG_RXP2	I	82	PEG_TXP2	O
83	GND	---	84	GND	---
85	PEG_RXN1	I	86	PEG_TXN1	O
87	PEG_RXP1	I	88	PEG_TXP1	O
89	GND	---	90	GND	---
91	PEG_RXN0	I	92	PEG_TXN0	O
93	PEG_RXP0	I	94	PEG_TXP0	O
95	GND	---	96	GND	---
97	MXM_REFCLKN	I	98	EXT_CRT_DDCCLK	I/O
99	MXM_REFCLKP	I	100	EXT_CRT_DDCDAT	I/O
101	GND	---	102	GND	---
103	PLTRST#	I	104	EXT_HDMI_DDCCLK	I/O

Pin Assignment

105	SYSFANON#	O	106	EXT_HDMI_DDCDAT	I/O
107	MAINON	I	108	GND	---
109	GFXPG	O	110	EXT_LVDS_PNLCLK	I/O
111	VGA_MBDATA	I/O	112	EXT_LVDS_PNLDAT	I/O
113	VGA_MBCLK	I/O	114	GND	---
115	EXT_LVDS_BLON	O	116	EXT_VGA_RED	O
117	EXT_DISP_ON	O	118	GND	---
119	DVI_HPD	I	120	EXT_VGA_GRN	O
121	GND	---	122	GND	---
123	EXT_HSYNC	O	124	EXT_VGA_BLU	O
125	EXT_VSYNC	O	126	GND	---
127	GND	---	128	EXT_LVDS_TXL#2	O
129	EXT_LVDS_TXU#2	O	130	EXT_LVDS_TXL2	O
131	EXT_LVDS_TXU2	O	132	GND	---
133	GND	---	134	EXT_LVDS_TXL#1	O
135	EXT_LVDS_TXU#1	O	136	EXT_LVDS_TXL1	O
137	EXT_LVDS_TXU1	O	138	GND	---
139	GND	---	140	EXT_LVDS_TXL#0	O
141	EXT_LVDS_TXU#0	O	142	EXT_LVDS_TXL0	O
143	EXT_LVDS_TXU0	O	144	GND	---
145	GND	---	146	EXT_LVDS_TXLCK#	O
147	EXT_LVDS_TXUCK#	O	148	EXT_LVDS_TXLCK	O
149	EXT_LVDS_TXUCK	O	150	GND	---
151	GND	---	152	EXT_TV_C/R	O

153	GND	---	154	GND	---
155	GND	---	156	EXT_TV_Y/G	O
157	GND	---	158	GND	---
159	GND	---	160	EXT_TV_COMP	O
161	NC	---	162	GND	---
163	+5V	---	164	EXT_HDMICLK-	O
165	+5V	---	166	EXT_HDMICLK+	O
167	NC	---	168	GND	---
169	GND	---	170	EXT_HDMITX2N	O
171	NC	---	172	EXT_HDMITX2P	O
173	+3V	---	174	GND	---
175	+3V	---	176	EXT_HDMITX1N	O
177	+3V	---	178	EXT_HDMITX1P	O
179	+3V	---	180	GND	---
181	+3V	---	182	EXT_HDMITX0N	O
183	NC	---	184	EXT_HDMITX0P	O
185	GND	---	186	GND	---
187	NC	---	188	NC	---
189	VIN	---	190	VIN	---
191	VIN	---	192	VIN	---
193	VIN	---	194	VIN	---
195	VIN	---	196	VIN	---
197	VIN	---	198	VIN	---
199	VIN	---	200	VIN	---

CN28 RJ45 Connector

CONN DIP RJ45 12P 2P FR(H8.0)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	X-TX0P	I/O	2	X-TX0N	I/O
3	X-TX1P	I/O	4	X-TX2P	I/O
5	X-TX2N	I/O	6	X-TX1N	I/O
7	X-TX3P	I/O	8	X-TX3N	I/O
9	LAN_VCC4	---	10	LAN_LINKLED#	---
11	LAN_VCC3	---	12	LAN_ACTLED#	---

CN30 MINI-Card II (HD Decoder) Connector

CONN SMD HEADER 52P 2R MS(P0.8,H8)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	NC	---	2	+3V_HD_VDD	---
3	NC	---	4	GND	---
5	NC	---	6	+1.5V	---
7	NC	---	8	LAD0_PCIE	I/O
9	GND	---	10	LAD1_PCIE	I/O
11	CLK_PCIE_MINICARD#	I	12	LAD2_PCIE	I/O

13	CLK_PCIE_MINICARD	I	14	LAD3_PCIE	I/O
15	GND	---	16	LFRAME#_PCIE	I
17	NC	---	18	GND	---
19	NC	---	20	RF_EN_WLAN	I
21	GND	---	22	PLTRST#	I
23	GPP_RX2N_MINICARD	O	24	+3V_HD_VDD	---
25	GPP_RX2P_MINICARD	O	26	GND	I
27	GND	---	28	+1.5V	---
29	GND	---	30	MINI2_SMCLK	I/O
31	GPP_TX2N_MINICARD	I	32	MINI2_SMDATA	I/O
33	GPP_TX2P_MINICARD	I	34	GND	---
35	GND	---	36	NC	---
37	GND	---	38	NC	---
39	NC	---	40	GND	---
41	NC	---	42	NC	---
43	GND	---	44	NC	---
45	PCLK_DBC_R	---	46	NC	---
47	PCIRST#_R	---	48	+1.5V	---
49	NC	---	50	GND	---
51	NC	---	52	+3V_HD_VDD	---

CN31 USB Connector

CONN DIP USB HOUSING 4P 1R FR(H7.6)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
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Pin Assignment

1	USBPWR0	---	2	BUSBP7-	I/O
3	BUSBP7+	I/O	4	GND	---

CN32 2'nd SATA HDD Connector

CONN DIP HOUSING 22P 1R FR(P1.27,H4.0)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	SATA_TXP1	I
3	SATA_TXN1	I	4	GND	
5	SATA_RXN1_C	O	6	SATA_RXP1_C	O
7	GND	---	8	+3.3VSATA2	---
9	+3.3VSATA2	---	10	+3.3VSATA2	---
11	GND	---	12	GND	---
13	GND	---	14	+5V	---
15	+5V	---	16	+5V	---
17	GND	---	18	NC	---
19	GND	---	20	NC	---
21	NC	---	22	NC	---

CN33 5 IN 1 CARD READER Connector

CONN SMD HOUSING 43P FR(P0.82,H7.05)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	XD_CD#_C	O
3	XD_R/B#_C	I	4	XD_RE#_C	I/O

5	XD_CE#_C	I	6	XD_CLE_C	O
7	XD_ALE_C	I	8	XD_WE#_C	I
9	SD_D2_C	I/O	10	XD_WPO#_C	O
11	GND	---	12	SD_D3_C	I/O
13	VCC_XD	---	14	SD/MS_CLK_C	I/O
15	SD_CMD_C	I	16	MS_D3/XD_D0_C	I/O
17	GND	---	18	MS_CD#_C	I/O
19	GND	---	20	MS_D2/XD_D1_C	I/O
21	VCC_XD	---	22	MS_D0/XD_D2_C	I/O
23	MS_D3/XD_D0_C	I/O	24	MS_D1/XD_D7_C	I/O
25	SD/MS_CLK_C	I/O	26	MS_BS/XD_D3_C	I/O
27	GND	---	28	GND	---
29	MS_D2/XD_D1_C	I/O	30	SD_D0_C	I/O
31	MS_D0/XD_D2_C	I/O	32	SD_D1_C	I/O
33	MS_BS/XD_D3_C	I/O	34	XD_D4_C	I/O
35	XD_D5_C	I/O	36	XD_D6_C	I/O
37	MS_D1/XD_D7_C	I/O	38	VCC_XD	---
39	SD_CD#_C	I/O	40	GND	---
41	SM_WPI#/SD_WP_C	I	42	GND	---
43	GND	---			

CN34 SATA HDD Connector

CONN DIP HOUSING 22P 1R FR(P1.27,H6.7)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
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Pin Assignment

1	GND	---	2	SATA_TXP0	I
3	SATA_TXN0	I	4	GND	---
5	SATA_RXN0_C	O	6	SATA_RXP0_C	O
7	GND	---	8	+3.3VSATA1	---
9	+3.3VSATA1	---	10	+3.3VSATA1	---
11	GND	---	12	GND	---
13	GND	---	14	+5V	---
15	+5V	---	16	+5V	---
17	GND	---	18	NC	---
19	GND	---	20	NC	---
21	NC	---	22	NC	---

CN36 USB Connector

CONN DIP USB HOUSING 4P 1R FR(H7.6)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	USBPWR0	---	2	BUSBP0-	I/O
3	BUSBP0+	I/O	4	GND	---

CN37 RTC Connector

CONN SMD HEADER 2P MR(P1.25)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	VCCRTC	---	2	GND	---

CN38 1394 Port

CONN DIP 1394 4P FR(P0.8,H7.2)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	L1394_TPBO-	I/O	2	L1394_TPBO+	I/O
3	L1394_TPA0-	I/O	4	L1394_TPA0+	I/O

CN39 INT MIC Connector

CONN SMD HEADER 2P 1R MR(P1.25,H1.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	ADOGND	---	2	INT_MIC_R	---

CN40 Headphone Jack

CONN DIP PHONE JACK 8P 1R FR(H6.6)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	ADOGND	---	2	HPR_SYS	O
3	HPL_SYS	O	4	ADOGND	---
5	HP_JD	I	6	GND	---
7	+3V_SPD	---	8	SPDIF_OUT	O
9	GND	---	10	GND	---

CN41 SYSTEM MIC Jack

Pin Assignment

CONN DIP PHONE JACK 6P 1R FR(H6.6)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	ADOGND	---	2	MIC1_L	I
3	MIC1_R	I	4	Port_B#	I
5	ADOGND	---	6	NC	---

CN42 FM Connector

CONN SMD HOUSING 8P 1R FR(P0.5,H1.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+3V	---	2	FM_CLOCK	O
3	FM_DATA	O	4	GND	---
5	FM_LEFT	O	6	FM_RIGHT	O
7	FM_DET	I	8	FM_INTX	I

CN43 MDC Connector

CONN SMD HEADER 12P 2R MR(P0.8,H5.35)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	NC	---	2	NC	---
3	NC	---	4	NC	---
5	NC	---	6	NC	---
7	DIB_P	I/O	8	NC	---
9	DIB_N	I/O	10	NC	---
11	NC	---	12	NC	---

Appendix D Display Codes

D.1 Display Codes

Table D-1 Scan codes (set 1 and set 2) (1/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
01	‘ ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 \$	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*2
09	8 *	09	89	3E	F0	3E	*2
10	9 (0A	8A	46	F0	46	*2
11	0)	0B	8B	45	F0	45	
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*2
24	I	17	97	43	F0	43	*2
25	O	13	98	44	F0	44	*2
26	P	19	99	4D	F0	4D	*2
27	[{	1A	9A	54	F0	54	
28] }	1B	9B	5B	F0	5B	

Table D-1 Scan codes (set 1 and set 2) (2/4)

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
29	\	2B	AB	5D	F0 5D	*5
30	Caps Lock	3A	BA	58	F0 58	
31	A	1E	9E	1C	F0 1C	
32	S	1F	9F	1B	F0 1B	
33	D	20	A0	23	F0 23	
34	F	21	A1	2B	F0 2B	
35	G	22	A2	34	F0 34	
36	H	23	A3	33	F0 33	
37	J	24	A4	3B	F0 3B	*2
38	K	25	A5	42	F0 42	*2
39	L	26	A6	4B	F0 4B	*2
40	; :	27	A7	4C	F0 4C	*2
41	' "	28	A8	52	F0 52	
43	Enter	1C	9C	5A	F0 5A	*3
44	Shift (L)	2A	AA	12	F0 12	
45	No.102 key	56	D6	61	F0 61	
46	Z	2C	AC	1A	F0 1A	
47	X	2D	AD	22	F0 22	
48	C	2E	AE	21	F0 21	
49	V	2F	AF	2A	F0 2A	
50	B	30	B0	32	F0 32	
51	N	31	B1	31	F0 31	
52	M	32	B2	3A	F0 3A	*2
53	, <	33	B3	41	F0 41	*2
54	. >	34	B4	49	F0 49	*2
55	/ ?	35	B5	4A	F0 4A	*2
57	Shift (R)	36	B6	59	F0 59	

Table D-1 Scan codes (set 1 and set 2) (3/4)

Cap No.	Keytop	Code set 1				Code set 2				Note
		Make		Break		Make		Break		
58	Ctrl	1D		9D		14		F0 14		*3
60	Alt (L)	38		B8		11		F0 11		*3
61	Space	39		B9		29		F0 29		
62	ALT (R)	E0	38	E0	B8	E0	11	E0	F0 11	
75	Ins	E0	52	E0	D2	E0	70	E0	F0 70	*1
76	Del	E0	53	E0	D3	E0	71	E0	F0 71	*1
79	←	E0	4B	E0	CB	E0	6B	E0	F0 6B	*1
80	Home	E0	47	E0	C7	E0	6C	E0	F0 6C	*1
81	End	E0	4F	E0	CF	E0	69	E0	F0 69	*1
83	↑	E0	48	E0	C8	E0	75	E0	F0 75	*1
84	↓	E0	50	E0	D0	E0	72	E0	F0 72	*1
85	PgUp	E0	49	E0	C9	E0	7D	E0	F0 7D	*1
86	PgDn	E0	51	E0	D1	E0	7A	E0	F0 7A	*1
89	→	E0	4D	E0	CD	E0	74	E0	F0 74	*1
110	Esc	01		81		76		F0 76		
112	F1	3B		BB		05		F0 05		
113	F2	3C		BC		06		F0 06		
114	F3	3D		BD		04		F0 04		
115	F4	3E		BE		0C		F0 0C		
116	F5	3F		BF		03		F0 03		
117	F6	40		C0		0B		F0 0B		
118	F7	41		C1		83		F0 83		
119	F8	42		C2		0A		F0 0A		
120	F9	43		C3		01		F0 01		
121	F10	44		C4		09		F0 09		*3

Table D-1 Scan codes (set 1 and set 2) (4/4)

Cap No.	Keytop	Code set 1				Code set 2				Note
		Make		Break		Make		Break		
122	F11	57	D7	78	F0	78			*3	
123	F12	58	D8	07	F0	07			*3	
124	PrintSc	*6	*6	*6	*6				*6	
126	Pause	*7	*7	*7	*7				*7	
202	Fn	—	—	—	—				*4	
203	Win	E0	5B	E0	DB	E0	1F	E0	F0	1F
204	App	E0	5D	E0	DD	E0	2F	E0	F0	2F

Notes:

1. * Scan codes differ by mode.
2. * Scan codes differ by overlay function.
3. * Combined with the **Fn** key makes different codes.
4. * **Fn** key does not generate a code by itself.
5. * This key corresponds to key No. 42 in a 102-key model.
6. * Refer to Table D-6, No. 124 key scan code.
7. * Refer to Table D-7, No. 126 key scan code.

Table D-2 Scan codes with left Shift key

Cap No.	Key top	Code set 1				Code set 2			
		Make		Break		Make		Break	
55	/	E0 AA	E0 35	E0 B5	E0 2A	E0 F0	12 E0 4A	E0 F0	4A E0 12
75	INS	E0 AA	E0 52	E0 D2	E0 2A	E0 F0	12 E0 70	E0 F0	70 E0 12
76	DEL	E0 AA	E0 53	E0 D3	E0 2A	E0 F0	12 E0 71	E0 F0	71 E0 12
79	←	E0 AA	E0 4B	E0 CB	E0 2A	E0 F0	12 E0 6B	E0 F0	6B E0 12
80	Home	E0 AA	E0 47	E0 C7	E0 2A	E0 F0	12 E0 6C	E0 F0	6C E0 12
81	End	E0 AA	E0 4F	E0 CF	E0 2A	E0 F0	12 E0 69	E0 F0	69 E0 12
83	↑	E0 AA	E0 48	E0 C8	E0 2A	E0 F0	12 E0 75	E0 F0	75 E0 12
84	↓	E0 AA	E0 50	E0 D0	E0 2A	E0 F0	12 E0 72	E0 F0	72 E0 12
85	PgUp	E0 AA	E0 49	E0 C9	E0 2A	E0 F0	12 E0 7D	E0 F0	7D E0 12
86	PgDn	E0 AA	E0 51	E0 D1	E0 2A	E0 F0	12 E0 7A	E0 F0	7A E0 12
89	→	E0 AA	E0 4D	E0 CD	E0 2A	E0 F0	12 E0 74	E0 F0	74 E0 12
203	Win	E0 AA	E0 5B	E0 DB	E0 2A	E0 F0	12 E0 1F	E0 F0	1F E0 12
204	App	E0 AA	E0 5D	E0 DD	E0 2A	E0 F0	12 E0 2F	E0 F0	2F E0 12

Note : The table above shows scan codes with the left **Shift** key. In combination with the right **Shift** key, scan codes are changed as listed below:

	With left Shift	With right Shift
Set 1	E0 AA _____	E0 B6
	E0 2A _____	E0 36
Set 2	E0 F0 12 _____	E0 F0 59
	E0 12 _____	E0 59

Table D-3 Scan codes in Numlock mode

Cap No.	Key top	Code set 1				Code set 2			
		Make		Break		Make		Break	
75	INS	E0 2A	E0 52	E0 D2	E0 AA	E0 12	E0 70	E0 F0	70 E0 F0 12
76	DEL	E0 2A	E0 53	E0 D3	E0 AA	E0 12	E0 71	E0 F0	71 E0 F0 12
79	←	E0 2A	E0 4B	E0 CB	E0 AA	E0 12	E0 6B	E0 F0	6B E0 F0 12
80	Home	E0 2A	E0 47	E0 C7	E0 AA	E0 12	E0 6C	E0 F0	6C E0 F0 12
81	End	E0 2A	E0 4F	E0 CF	E0 AA	E0 12	E0 69	E0 F0	69 E0 F0 12
83	↑	E0 2A	E0 48	E0 C8	E0 AA	E0 12	E0 75	E0 F0	75 E0 F0 12
84	↓	E0 2A	E0 50	E0 D0	E0 AA	E0 12	E0 72	E0 F0	72 E0 F0 12
85	PgUp	E0 2A	E0 49	E0 C9	E0 AA	E0 12	E0 7D	E0 F0	7D E0 F0 12
86	PgDn	E0 2A	E0 51	E0 D1	E0 AA	E0 12	E0 7A	E0 F0	7A E0 F0 12
89	→	E0 2A	E0 4D	E0 CD	E0 AA	E0 12	E0 74	E0 F0	74 E0 F0 12
203	Win	E0 2A	E0 5B	E0 DB	E0 AA	E0 12	E0 1F	E0 F0	1F E0 F0 12
204	App	E0 2A	E0 5D	E0 DD	E0 AA	E0 12	E0 2F	E0 F0	2F E0 F0 12

Table D-4 Scan codes with Fn key

Cap No.	Keytop	Code set 1		Code set 2	
		Make	Break	Make	Break
43	ENT	E0 1C	E0 9C	E0 5A	E0 F0 5A
58	CTRL	E0 1D	E0 9D	E0 14	E0 F0 14
60	LALT	E0 38	E0 B8	E0 11	E0 F0 11
121	ARROW	45	C5	77	F0 77
122	NUMERIC	45	C5	77	F0 77
123	Scrl	46	C5	7E	F0 7E

Table D-5 Scan codes in overlay mode

Cap No.	Keytop		Code set 1				Code set 2			
			Make		Break		Make		Break	
09	8	(8)	48		C8			75	F0	75
10	9	(9)	49		C9			7D	F0	7D
11	0	(*)	37		B7			7C	F0	7C
23	U	(4)	4B		CB			6B	F0	6B
24	I	(5)	4C		CC			73	F0	73
25	O	(6)	4D		CD			74	F0	74
26	P	(-)	4A		CA			7B	F0	7B
37	J	(1)	4F		CF			69	F0	69
38	K	(2)	50		D0			72	F0	72
39	L	(3)	51		D1			7A	F0	7A
40	;	(+)	4E		CE			79	F0	79
52	M	(0)	52		D2			70	F0	70
54	.	(.)	53		D3			71	F0	71
55	/	(/)	E0 35		E0 B5			40 4A	E0 F0	4A

Table D-6 No.124 key scan code

Key top	Shift	Code set 1				Code set 2			
		Make		Break		Make		Break	
Prt Sc	Common	E0 2A	E0 37	E0 B7	E0 AA	E0 12	E0 7C	E0 F0	7C E0 F0 12
	Ctrl +	E0 37		E0 B7		E0 7C		E0 F0	7C
	Shift +	E0 37		E0 B7		E0 7C		E0 F0	7C
	Alt +		54	D4		84		F0	B4

Table D-7 No.126 key scan code

Key top	Shift	Code set 1						Code set 2							
		Make						Make							
Pause	Common*	E1	1D	45	E1	9D	C5	E1	14	77	E1	F0	14	F0	77
	Ctrl*	E0	46	E0	C6			E0	7E	E0	F0	7E			

*: This key generates only make codes.

Appendix G BIOS Rewrite Procedures

This Appendix explains how to rewrite the system BIOS program when you update the system BIOS.

Tools

To rewrite the BIOS, you need the following tool:

- BIOS/EC/KBC rewriting disk
- USB doggle

Rewriting the BIOS

1. Set the system to shut down mode.
2. Turn off the power to the computer.
3. Remove the external cables and cards.
4. Connect an external FDD and insert the BIOS rewriting disk into the external FDD.
5. Connect the USB doggle special for BIOS rewrite
6. Turn on the power
7. The BIOS rewriting starts.
8. When the process is completed, it beeps and the system automatically reboots.

NOTE:

1. *Connect the AC adaptor to the computer when you rewrite the BIOS.*
2. *Do not turn off the power while you are rewriting the BIOS.*
If the rewriting fails, it might be impossible to start up the computer.
3. *If you fail to rewrite BIOS, then when you next turn on the power, a message may be displayed that the contents of the BIOS have been erased or system can't be booted . In this case, insert the BIOS rewriting disk, and the BIOS will be rewritten.*

Appendix H EC/KBC Rewrite Procedures

Same as BIOS rewrite Procedures, please refer appendix G

Appendix I Reliability

The following table shows MTBF (Mean Time Between Failures) in maximum configuration.

Table I-1 MTBF

Component	Time (hours)
System	6150

