Chapter 1
Hardware Overview

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1.1 **Features**

The Toshiba Satellite/Satellite Pro C870/C875/L870/L875 Personal Computer uses extensive Large Scale Integration (LSI), and Complementary Metal-Oxide Semiconductor (CMOS) technology extensively to provide compact size, minimum weight, low power usage and high reliability. This computer incorporates the following features.

Refer to the Parts List for the configuration of each model and the available options.

❑ Microprocessor

The Satellite/Satellite Pro C870/C875/L870/L875 computer is equipped with an Intel®
Sandy Bridge multi-chip package mobile processor or Intel® Ivy Bridge multi-chip
package mobile processor. The processor includes integrated Display Engine, Processor
Graphic and Integrated Memory Controller and is designed for mobile platforms.

❑ Chipset

The Satellite/Satellite Pro C870/C875/L870/L875 is equipped with Mobile Intel HM70
Express Chipset or Mobile Intel HM76 Express Chipset.

❑ GPU (Graphics Processing Unit)

(1) Integrated graphic model: Intel integrated graphics (Mobile Intel HM70 Express
Chipset or Mobile Intel HM76 Express Chipset)

(2) Discrete graphic model: AMD Thames LE (for C870/C875)

Discrete graphic model: AMD Thames XT (for L870/L875).

❑ Memory

The computer comes with two DDR3 SO-DIMM slots. Two memory modules of 1GB
(1,024MB), 2GB (2,048MB) , 4GB (4,096MB)or 8GB (8,192MB)can be installed, and it
can incorporate up to 16GB of main memory.

❑ HDD

(1) HDD: The computer has a 2.5-inch SATA HDD. The following capacities are
available:

- 320/500/640/750/1000 GB

❑ Optical Drive

The computer accommodates a fixed 12.7mm ODD with one of following types:

- Tray Type DVD Super Multi +-R Double Layer drive

- • Tray Type BD-combo
- • Tray Type BD-Writer

❑ Display

The PC comes with 17.3"W HD (1600x900), LED, Bent, CSV or 17.3"W HD(1600x900),LED, Bent, Non-CSV.

❑ Keyboard

A4+10key size 101 keys (US) / 102keys (UK) / 106 keys (JP) keyboard provides a numeric keypad overlay for fast numeric data entry or for cursor and page control. The keyboard also includes two keys that have special functions in Microsoft$^®$ Windows$^®$7 and Microsoft$^®$ Windows$^®$8.

❑ Pointing Device

The touch pad and control buttons enable control of the on-screen pointer and scrolling of windows.

❑ Batteries

The computer has two batteries: a rechargeable Lithium-Ion main battery pack and RTC battery (that backs up the Real Time Clock and CMOS memory).The capacity of the main battery pack can be 2200mAh, 4400mAhor 6000mAh depending on the model of computer.

❑ Universal Serial Bus (USB2.0)

One, Two or Three 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.

❑ Universal Serial Bus (USB3.0)

One or Two USB3.0 ports are provided. USB3.0 has a 5 Gbps signaling rate offering 10x performance increase over USB2.0. The port complies with the USB2.0 standard, which enables data transfer speeds 40 times faster than USB1.1 standard. USB1.1 is also supported.

❑ External monitor (RGB) port

The port enables connection of an external monitor, which is recognized automatically by Video Electronics Standards Association (VESA) Display Data Channel (DDC) compatible functions.

❑ Media Card slot

The Media Card Slot can accommodate types of media (SD/Mini SD (card adapter is needed)/Micro SD (card adapter is needed)/SDHC memory card/MMC/Memory

stick/Memory stick PRO) with various capacities. Media cards let you easily transfer data from devices, such as digital cameras and Personal Digital Assistants, which use Media Card flash-memory.

❑ Sound system

The sound system is equipped with the following features:

- Azalia Link (Intel High Definition Audio I/F) built in the Intel HM76 + Realtek ALC269
- Amplifier: Realtek ALC269 built-in
- Speaker: 1.2W/4ohm speaker

❑ Internal LAN

The computer is equipped with LAN circuits that support Ethernet LAN (10/100Mbps or 10/100/1000 Mbps). It also supports Wakeup on LAN (WOL), Magic Packet.

❑ Wireless LAN /Bluetooth (BTO)

The computer is equipped with PCI-E MiniCard type wireless LAN board that supports 802.11 b/g/n in the PCI-E MiniCard slot or combo with Bluetooth through USB interface. This function can be switched on and off by a keyboard hot-key.

❑ Webcam Module

The computer is equipped with a webcam module which is embeddedto transfer video data– to take stillimage and offer video stream for end user to preview/record motion image through USB2.0 interface.

❑ HDMI port

A HDMI port is provided which complies with the HDMI 1.4a standard.

❑ Headphone Jack

The computer is equipped with aheadphone jack.

❑ Microphone Jack

The computer is equipped with amicrophone jack.
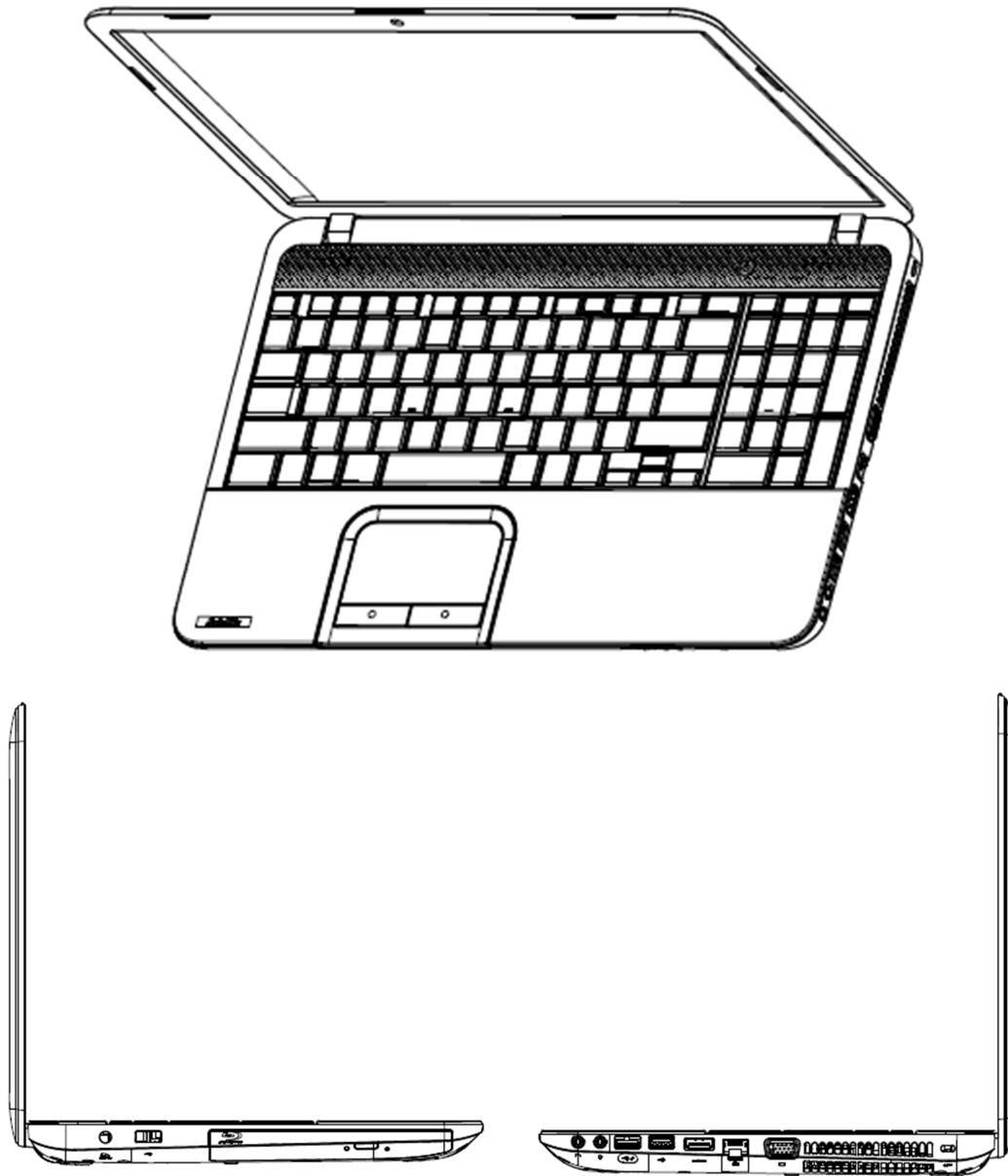
The front of the computer is shown in figure 1-1.

Figure 1-1Thefront, left and right view of the computer

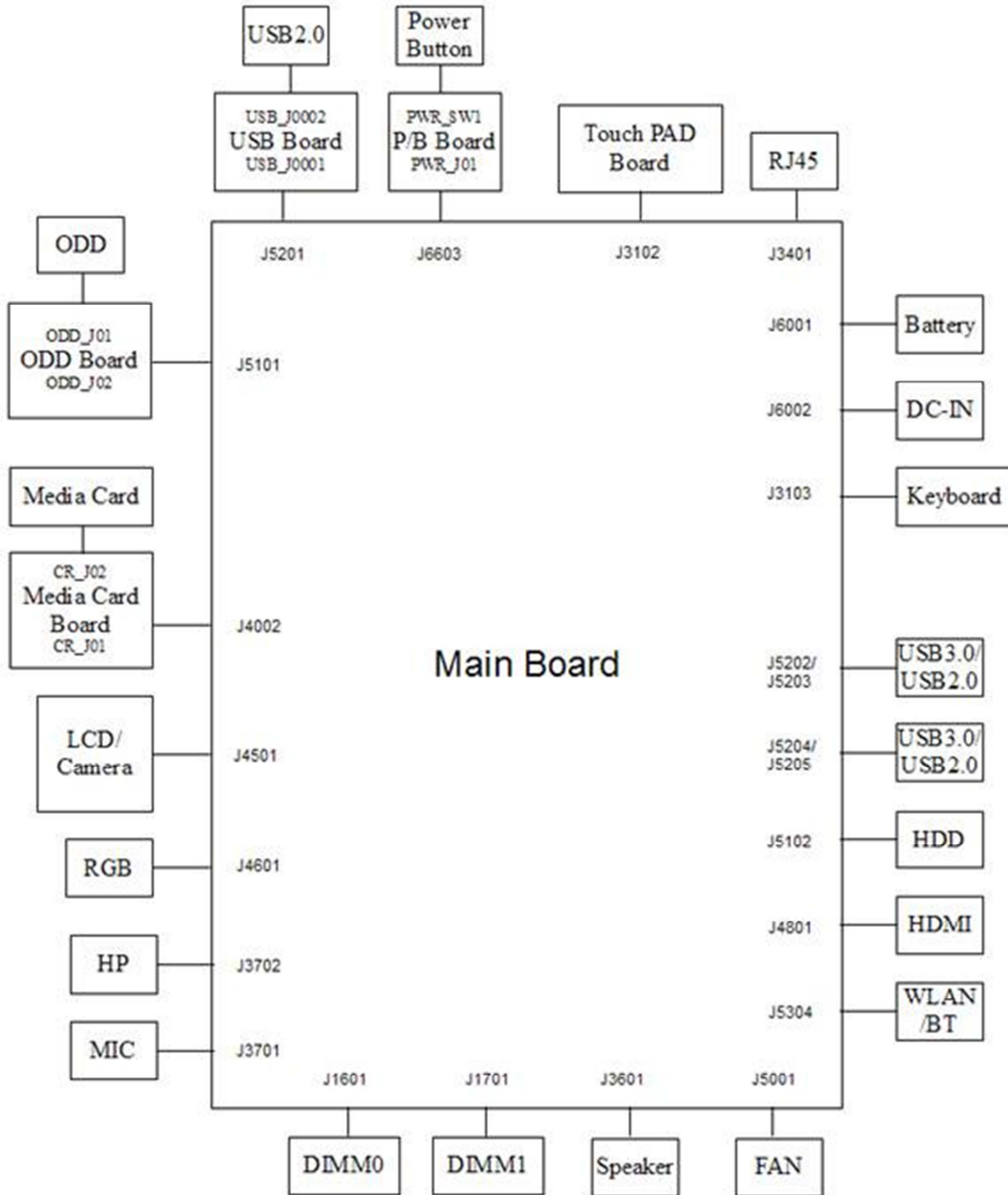The system unit configuration is shown in figure 1-2.

Figure 1-2   System unit configuration

1.2 System Unit Block Diagram

Figure 1-3 is a block diagram of the system unit.

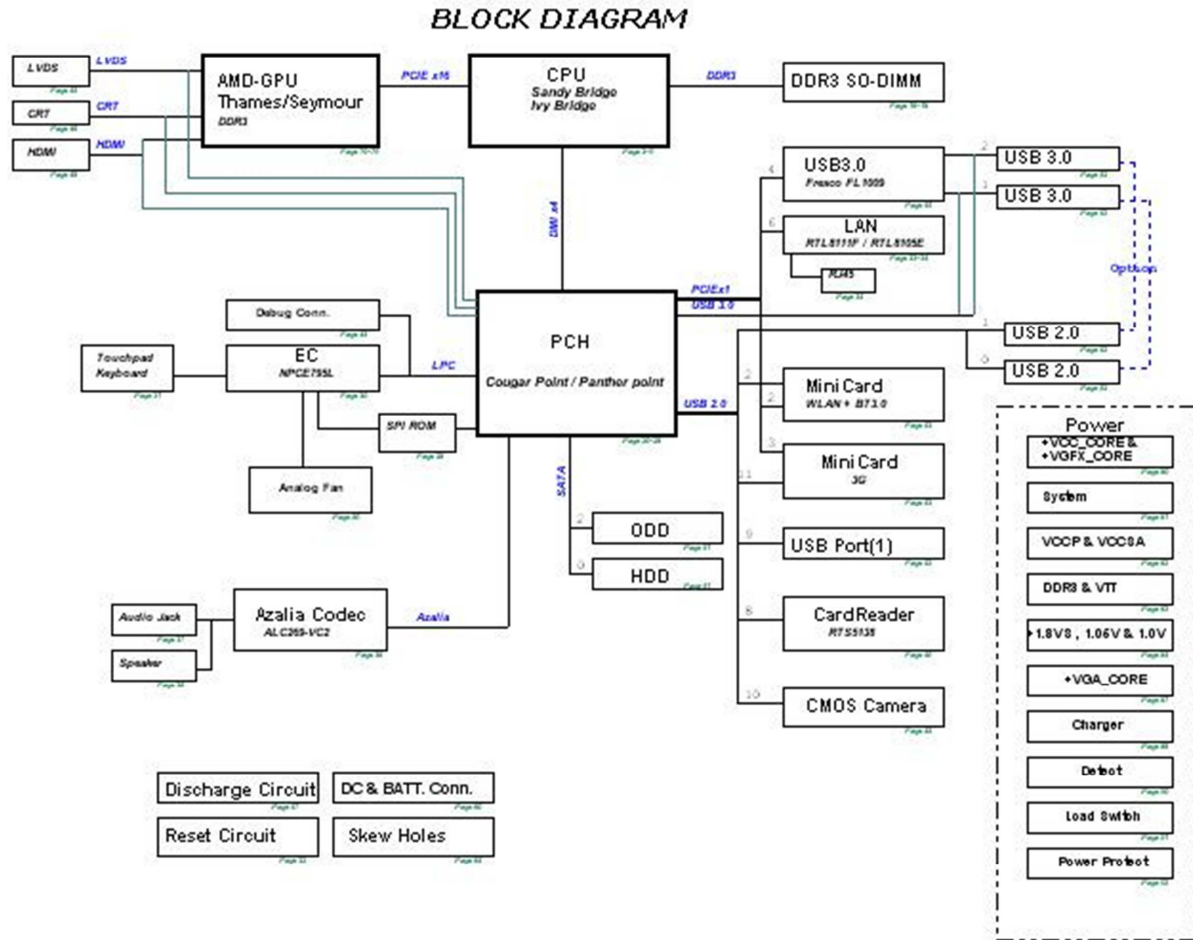*Figure 1-3System unit block diagram*

The system unit is composed of the following major components:

❑ Processor

* Intel®Sandy Bridge multi-chip package mobile processor

* Intel®Ivy Bridge multi-chip package mobile processor

* Core speed:

Intel®Celeron®processor:

B815 (1.6G/2M), B820(1.7G/2M)

Intel®Petium® processor:

B960 (2.2G/2M),B970(2.3G/2M)

Intel® Core™ i3 processors:

i3-2310M (2.1G/3M), i3-2350M (2.3G/3M),i3-2370M(2.4G/3M), i3-3110M (2.4G/3M)

Intel® Core™ i5 processors:

i5-2410M (2.3G/3M), i5-2450M (2.5G/3M), i5-3210M (2.5G/3M)

i5-3320M (2.6G/3M), i5-3360M (2.8G/3M)

Intel® Core™ i7 processors:

i7-2620M (2.7G/4M), i7-3520M (2.9G/4M), i7-3610QM (2.3G/6M)

i7-3612QM (2.1G/6M), i7-3720QM (2.6G/6M), i7-3820QM (2.7G/8M)

* Features:
   – Intel Hyper-Threading Technology (Intel HT Technology)
   – Intel Turbo Boost technology
   – Supports DDR3
   – 8GB maximum memory support
   – PCI Express: 1 16-lane PCI Express port, Supports PCI Express 3.0
   – Internal Graphics Controller: 900MHz core render clock @1.05V core voltage
   – DMI:4GB/s (1GB/s each direction), point-to-point interface to PCH
   – Intel Flexible Display Interface (Intel FDI)
   – 988-pin37.5 mm x 37.5 mmrPGA package (rPGA988B)

❑ BIOS EEPROM

* 32Mbit + 32Mbit(optional)SPI serial flash
* Supply voltage: 2.7~3.6V
* Low power consumption: active read: 10mA (typical); standby: 5uA (typical).

      *   8-lead SOIC package

❑ Memory

Two memory slots are provided. Expansion up to8GB is available.

      *   Memory
         –DDR3-SDRAM
         –1333/1600 MHz
         –1.5 volt operation
         –FBGA
      *   Memory Module
         –204 pin, SO Dual In-line Memory Module (SO-DIMM)
         –PC10600
         –1GB (1,024MB), 2GB (2,048MB), 4GB (4,096MB),8GB(8192MB)

❑ Intel PCH

      *   Intel® 7 Series Chipset Family is used.
      *   Features:
          • PCI Express* Base Specification, Revision 2.0 support for up to eight ports with transfers up to 5 GT/s
          • PCI Local Bus Specification, Revision 2.3 support for 33 MHz PCI operations(supports up to four Req/Gnt pairs)
          • ACPI Power Management Logic Support, Revision 4.0a
          • Enhanced DMA controller, interrupt controller, and timer functions
          • Integrated Serial ATA host controllers with independent DMA operation on up to six ports
          • USB host interface with two EHCI high-speed USB 2.0 Host controllers and two rate matching hubs provide support for up to fourteen USB 2.0 ports and one xHCI provides support for up to four Super Speed USB 3.0 ports.
          • Integrated 10/100/1000 Gigabit Ethernet MAC with System Defense
          • System Management Bus (SMBus) Specification, Version 2.0 with additional support for I2C devices
          • Supports Intel® High Definition Audio (Intel® HD Audio)
          • Supports Intel® Rapid Storage Technology (Intel® RST)
          • Supports Intel® Active Management Technology (Intel® AMT)
          • Supports Intel® Virtualization Technology for Directed I/O (Intel® VT-d)
          • Supports Intel® Trusted Execution Technology (Intel® TXT)
          • Integrated Clock Controller
          • Intel® Flexible Display Interconnect (Intel® FDI)

- Analog and digital display ports
  - — Analog VGA
  - — HDMI
  - — DVI
  - — DisplayPort* 1.1, Embedded DisplayPort
  - — Intel® SDVO
  - — LVDS (Mobile Only)
- Low Pin Count (LPC) interface
- Firmware Hub (FWH) interface support
- Serial Peripheral Interface (SPI) support
- Intel® Anti-Theft Technology (Intel® AT)
- JTAG Boundary Scan support
- 989-ball25×25FCBGAPackage

❑ Card Reader Controller

- RealtekRTS5138 is used
- Futures:
  - – USB 2.0 I/F
  - – Support High-speed (480Mbps) and Full-speed (12Mbps) Data Transfer
  - – SD/MMCCard Controller
  - – 24-pin(4x4) QFN package

❑ Sound Controller

- Realtek ALC269
- Mono Microphone-in and stereo headphone-out.
- Internal digital Microphone
- Volume control: Digital control
- Stereo w/o box, 4 ohm/1.2W.

❑ EC/KBC (Embedded Controller/Keyboard Controller)

- One NUVOTON NPCE885WA0DXchip functions as both EC and KBC.

❑ LAN Controller

- Realtek RTL8105E-VD-CG or RTL8111F-CGis used(depending on model)
- This controller has the following functions:
    - Integrated 10/100/1000 transceiver (depending on model)
    - Auto-Negotiation with Next Page capability
    - Supports PCI Express 1.1
    - Supports pair swap/polarity/skew correction
    - Crossover Detection & Auto-Correction
    - Wake-on-LAN and remote wake-up support
    - Microsoft NDIS5, NDIS6 Checksum Offload (IPv4, IPv6, TCP, UDP) and Segmentation Task-offload (Large send v1 and Large send v2) support
    - Supports EMAC-393 ECMA ProxZzzy Standard for sleeping hosts
    - Supports Full Duplex flow control (IEEE 802.3x)
    - Supports jumbo frame to 9K bytes (depending on model)
    - Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab (depending on model)
    - Supports IEEE 802.1P Layer 2 Priority Encoding
    - Supports IEEE 802.1Q VLAN tagging
    - Supports IEEE 802.3az-2010 (EEE)

❑ Wireless LAN / Bluetooth

- One PCI-E MiniCard is used
- Support 802.11 a/b/g/n or 802.11 b/g/n

1.3 HDD/SSD

1.3.1 2.5-inch Hard Disk Drive

The removable HDD is a random access non-volatile storage device. It has a non-removable 2.5-inch magnetic disk and mini-Winchester type magnetic heads.
The computer supports a320GB, 500G, 640GB,750GB and 1TB.
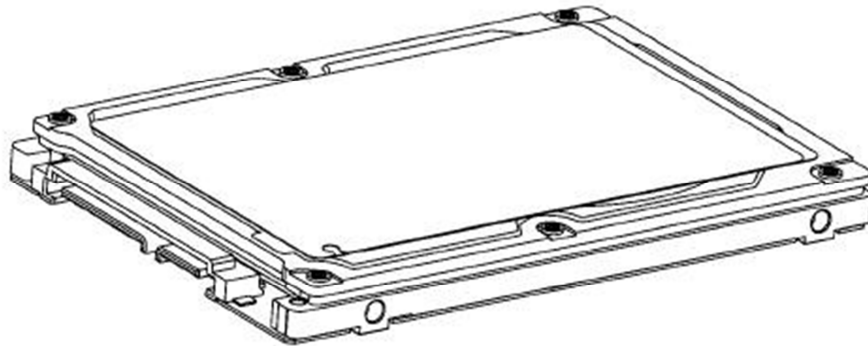The HDD is shown in figure 1-4. Specifications are listed in Table 1-1.

Figure 1-42.5-inch HDD

Table 1-1 2.5-inch HDD specifications (1/1)

Item	Specifications		
Capacity (GB)	320 GB	500 GB	640 GB
Rotational Speed (RPM)	5400 rpm	5400 rpm	5400 rpm
Height	7.0 mm/9.5 mm	7.0mm/9.5 mm	9.5 mm
User Data Sectors	625,142,448	976,773,168	1,250,263,728
Bytes / Sector	512	512	512

Item	Specifications	
Capacity (GB)	750 GB	1000 GB
Rotational Speed (RPM)	5400 rpm	5400 rpm
Height	9.5 mm	9.5 mm
User Data Sectors	1,465,149,168	1,953,525,168
Bytes / Sector	512	512

1.4 DVD Super Multi Drive

This drive is a combination of DVD-ROM,DVD±R/±RW/-RAM, BD-combo and BD-WriterDrive. It is full-size and runs either 12cm (4.72-inch) or 8cm (3.15-inch) DVD/CDs without an adaptor. It reads DVDs at maximum 8x speed and CDs at maximum 24x speed. It also writes CD-R at maximum 24x speed, CD-RW at maximum 4x speed, DVD±R at maximum 8x speed, DVD-RW at maximum 6x speed, DVD+RW at maximum 8x speed, DVD±R DL at maximum 3.3x~6x speed and DVD-RAM at maximum 3-5x speed.

The DVD is shown in figure 1-5.
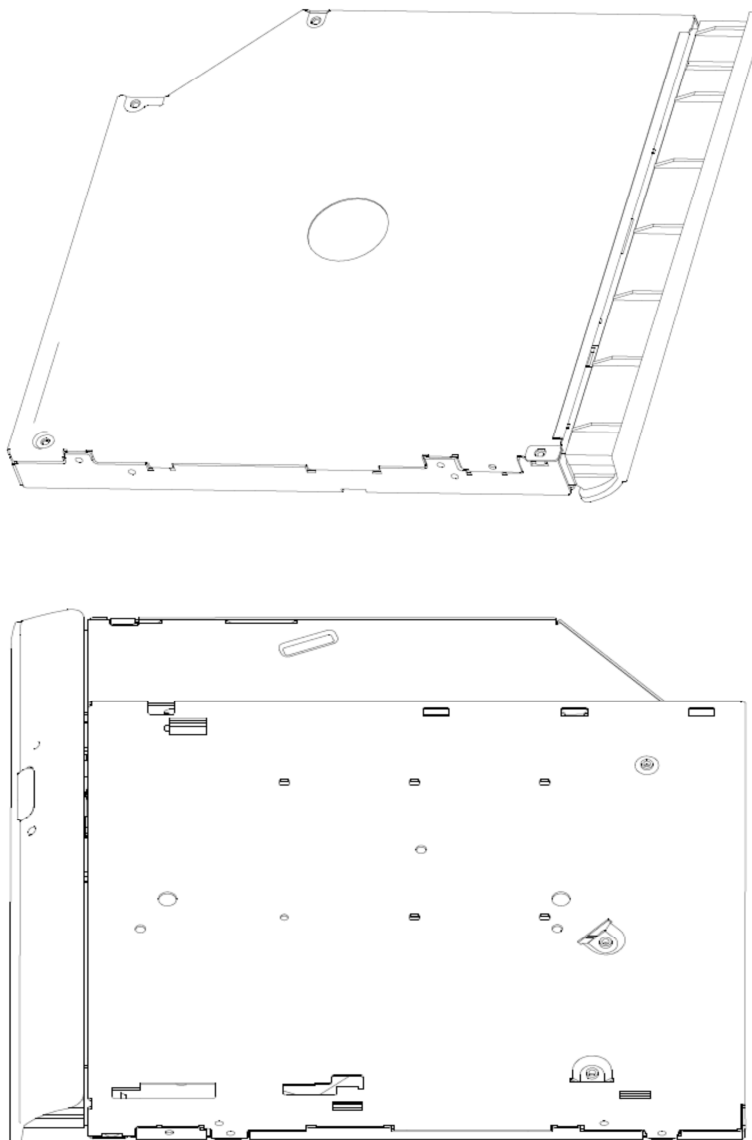
Figure 1-5DVD Super Multi drive

The specifications are listed in Table 1-2.

Table 1-2DVD Super Multi drive specifications (1/1)

Item	Specifications	
	DVD-ROM mode	**CD-ROM mode**
SATA Interface(Mbytes/s)	150 Mbyte/s	
Average access time (ms)	180msTyp.	150msTyp.
Data Buffer Capacity	1MB	
Support Formats	CD-R CD-RW High Speed CD-RW Ultra Speed CD-RW DVD-R DVD-R DL DVD-RW DVD+R DVD+R DL DVD+RW DVD-RAM	

1.5 Keyboard

The keyboardhas 101(US)/102(UK)/106(JP) keys that consist of character keys and control keys, and is in conformity with JIS. The keyboard is connected to a membrane connector on the system board and is controlled by EC.

Figure 1-6 is a view of the keyboard.
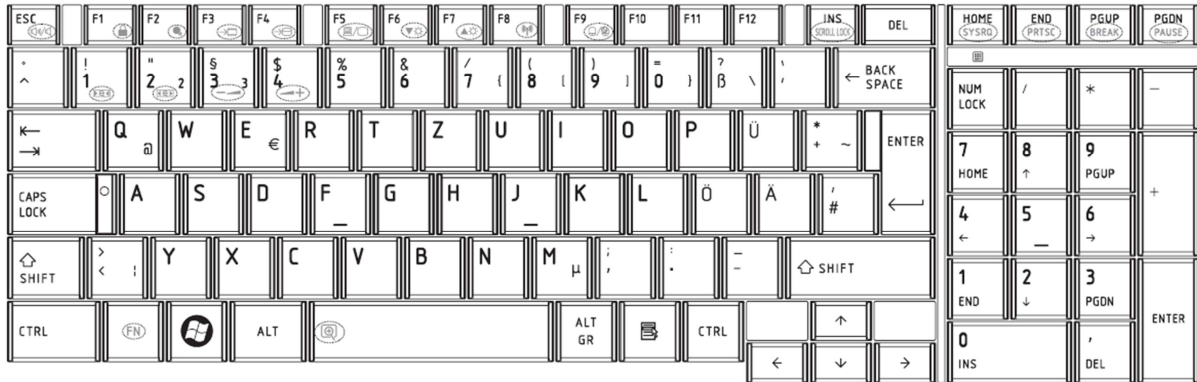
Figure 1-6Keyboard

1.6 TFT Color Display

The TFT color display consists of 17.3-inch LCD module.

The LCD module used for the TFT color display uses a LED backlight as the light source and can display a maximum of 262,144colors with 1600 x 900resolution.

Table 1-3 lists the specifications.

Table 1-3   LCD module specifications (1/1)

Item	Specifications
	17.3"W HD+(1600x 900), **CSV or N0n-CSV type,LED backlight**
Number of Dots	1,600 (W) *900 (H)
Dot spacing (mm)	0.2388 (H) x 0.2388 (V) (TYP.)
Display range (mm)	382.08 (H) x 214.92 (V) (17.3 ”diagonal)

1.7 Power Supply

The power supply provides different voltages to the system board and performs the following functions:

1. Determines that the DC power supply (AC adapter) is connected to the computer.

2. Detects DC output and circuit malfunctions.

3. Controls the battery icon, and DC IN icon.

4. Turns the battery charging system on and off and detects a fully charged battery.

5. Turns the power supply on and off.

6. Provides more accurate detection of a low battery.

7. Calculates the remaining battery capacity.

8. Controls the transmission of the status signal of the main battery.

The power supply output rating is specified in Table 1-4.

Table 1-4Power supply output rating

Name	Voltage (V)	Use
+VCORE	VID (Intel spec)	CPU
+VGFX_CORE	VID(Intel spec)	Integrated graphic (UMA)
+VGA_VCORE	VID(Nvidia spec)	Discrete graphic (DSC)
+VCCP	1.05	CPU, PCH, GPU
+1.5VS	1.5	CPU, Mini Card
+1.5V	1.5	DDR3-SDRAM
+1.8VS	1.8	CPU, PCH
+0.75VS	0.75	DDR3-SDRAM
+3VSUS	3.3	PCH, LAN, SPI ROM
+3V	3.3	Camera, Card Reader
+3VS	3.3	PCH, DDR3-SDRAM,LCD,Codec, EC, HDD, Mini Card
+3VA	3.3V	PCH RTC, EC
+5VA	5	USB S&C
+5VSUS	5	PCH,USB
+5VS	5	PCH, CRT, HDMI, Codec, Touch pad, FAN, HDD, ODD

1.8 Batteries

The computer has two types of batteries as follows:

❑ Main battery pack

❑ RTC battery

The battery specifications are listed in Table 1-5.

Table 1-5Battery specifications

Battery name	Material	Output voltage	Capacity
Main battery(3 cell)	Lithium-Ion	10.8V	2200mAh
Main battery(6 cell)	Lithium-Ion	10.8V	4400mAh
Main battery(6 cell)	Lithium-Ion	11.1V	6000mAh
RTC battery(CR2032)	Lithium	3.0 V	210mAh

1.8.1 Main Battery

The removable main battery pack is the computer's main power source when the AC adaptor is not attached. The main battery maintains the state of the computer when the computer enters intoresume mode.

1.8.2 Battery Charging Control

Battery charging is controlled by anembedded controller (EC). The EC controls whether the charge is on or off and detects a full charge when the AC adaptor and battery are attached to the computer. The system charges the battery.

Battery Charge

When the AC adaptor is attached, there are two types of charge: When the system is powered off and when the system is powered on. Table 1-6 lists the charging time required for charges.

Table 1-6 Time required for charges

Battery type	Power on (hours)	Power off (hours)
1st battery pack (3cell,6cell)	4-10 hours	4hours max

NOTE:The time required when the system is powered on is affected by the amount of power the system is consuming. Use of the fluorescent lamp and frequent disk access diverts power and lengthens the charge time.

If any of the following occurs, the battery charge process stops.

1. The battery becomes fully charged.

2. The AC adaptor or battery is removed.

3. The battery or output voltage is abnormal.

❑ Detection of full charge

A full charge is detected only when the battery is charging at charge. A full charge is detected under any of the following conditions:

1. The current in the battery charging circuit drops under the predetermined limit.

2. The charging time exceeds the fixed limit.

1.8.3 RTC battery

The RTC battery provides power to keep the current date, time and other setup information in memory while the computer is turned off. Table 1-7 lists the data preservation period of the RTC battery.

Table 1-7   RTC battery charging/data preservation time

Status	Time
Data preservation period (full capacity)	3.5 years

1.9 AC Adaptor

The AC adaptor is also used to charge the battery.

Table 1-8, 1-9 and 1-10lists the AC adaptor specifications.

Table 1-8ACadaptor specifications for integrated graphic model

Parameter	Specification	
	2-pin	3-pin
Power	65W	
Input voltage	100V-240V	
Input frequency	50Hz–60Hz	
Input current	1.6A or less (100V-240V)	
Output voltage	19V	
Output current	0A to3.42A (At constant voltage mode)	

Table 1-9ACadaptor specificationsfor discrete graphic model

Parameter	Specification	
	2-pin	3-pin
Power	75W	
Input voltage	100V-240V	
Input frequency	50Hz-60Hz	
Input current	1.5A or less (100V-240V)	
Output voltage	19V	
Output current	0A to3.95A (At constant voltage mode)	

Table 1-10 AC adaptor specificationsfor discrete graphic model

Parameter	Specification	
	2-pin	3-pin
Power	90W	
Input voltage	100V-240V	
Input frequency	50Hz - 60Hz	
Input current	1.4A or less (100V-240V)	
Output voltage	19V	
Output current	0A to4.74A (At constant voltage mode)	

Table 1-11 AC adaptor specificationsfor discrete graphic model

Parameter	Specification	
	2-pin	3-pin
Power	120W	
Input voltage	100V-240V	
Input frequency	50Hz - 60Hz	
Input current	1.8A or less (100V-240V)	
Output voltage	19V	
Output current	0A to6.32A (At constant voltage mode)	

Chapter 2
Troubleshooting Procedures

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Note:

In this document, mark ○,¹ *means this function is for Intel platform only.*

2.1   Troubleshooting

Chapter 2 describes how to determine if a Field Replaceable Unit (FRU) in the computer is causing the computer to malfunction. The FRUs covered are:

1	Power Supply	6	Optical Drive	11	Bluetooth (BTO) ○,ⁱ
2	Main Board	7	LAN	12	Camera (BTO)
3	HDD	8	Wireless(WiDi WiFi) LAN	13	HDMI
4	Keyboard/Touch pad	9	Sound component	14	Touch Pad with gesture
5	Display	10	Card reader	15	Battery, RTC Battery

The Diagnostics optical disk or USB disk operations are described in Chapter 3. Detailed Replacement Procedures are given in Chapter 4, *Replacement Procedures*.
The following tools are necessary for implementing the troubleshooting procedures:

The following tools are necessary for implementing the Diagnostics procedures:
For tools required for executing the Test Program, refer to the Chapter 3. For tools required for disassembling/assembling, refer to Chapter 4.

1. A bootable USB key

2. An external CRT display (for Display troubleshooting)

3. An external HDMI display(for HDMI troubleshooting)

4. A Card reader (for Card reader slot troubleshooting)

5. An external microphone (for Sound troubleshooting)

6. Headphone (for Sound troubleshooting)

2.2 Troubleshooting Flowchart

Use the flowchart in Figure 2-1 as a guide for determining which FRU is malfunctioning. Before going through the flowchart steps, check the following:

❑ Ask the user if a password is registered and, if it is, ask him or her to enter the password.

❑ Make sure that Toshiba Windows 7(TM) is installed on the hard disk. Non-Toshiba operating systems can cause the computer malfunction.

❑ Make sure all optional equipment is removed from the computer.

❑ Make sure the HDD and optical drive bays are empty.

START

↓

Connect the AC adapter to the DC IN socket

↓

Does the DC IN icon glow? — No → Perform the Power Supply Troubleshooting Procedures in section 2.3

Yes ↓

Dose the Battery icon glow? — No → Perform the Power Supply Troubleshooting Procedures in section 2.3

Yes ↓

Turn the Power Switch on.

↓

Does the DC IN icon flash when the power is turned on? — Yes → Perform the Power Supply Troubleshooting Procedures in section 2.3

No ↓

Is an error message displayed? — Yes → Perform the Main board Troubleshooting Procedures in section 2.4

No ↓

Is the "startup" logo message displayed? — No → Perform the Display Troubleshooting Procedures in section 2.7

Yes ↓

If the "Password=" message displays, type the password.

↓

Is Toshiba Window 7 ™ being loaded? — No → Perform the Hard Disk Driver Troubleshooting Procedures in section 2.5

Yes ↓

1

Figure 2-1 Troubleshooting flowchart (1/2)

Figure 2-1 Troubleshooting flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may be intermittent. The **Running Test program** should be executed several times to isolate the problem. Check the **Log Utilities function** to confirm which diagnostic test detected an error, then perform the appropriate troubleshooting procedures as follows:

1. If an error is detected on the system test, memory test, real timer test, perform the Main Board Troubleshooting Procedures in Section 2.4.

2. If an error is detected on the hard disk test, perform the HDD Troubleshooting Procedures in Section 2.5.

3. If an error is detected on the keyboard test, perform the Keyboard and Touch pad Troubleshooting Procedures in Section 2.6.

4. If an error is detected on the display test, perform the Display Troubleshooting Procedures in Section 2.7.

5. If an error is detected on the CD-ROM/DVD-ROM/BluRay test, perform the Optical Drive Troubleshooting Procedures in Section 2.8.

6. If an error is detected on the LAN test, perform the LAN Troubleshooting Procedures in Section 2.9.

7. If an error is detected on the Wireless(WiDi WiFi) LAN test, perform the Wireless(WiDi WiFi) LAN Troubleshooting Procedures in Section 2.10.

8. If an error is detected on the sound test, perform the Sound Troubleshooting Procedures in Section 2.11.

9. If an error is detected on card reader, perform the card reader Slot Troubleshooting Procedures in Section 2.12.

10. If an error is detected on Bluetooth, perform the Bluetooth Troubleshooting Procedures in Section 2.13. ○,I

11. If an error is detected on camera, perform the camera Troubleshooting Procedures in Section 2.14.

2.3   Power Supply Troubleshooting

The power supply controls many functions and components. To determine if the power supply is functioning properly, start with Procedure 1 and continue with the other Procedures as instructed. The procedures described in this section are:

Procedure 1:   Icons in the LCD Check

Procedure 2:   Connection Check

Procedure 3:   Charge Check

Procedure 4:   Replacement Check

Procedure 1   Icons in the LCD Check

The following Icons in the LCD indicate the power supply status:

❑ Battery icon

❑ DC IN icon

The power supply controller displays the power supply status through the Battery icon and the DC IN icon in the LCD as listed in the tables below. To check the power supply status, install a battery pack and connect an AC adaptor.

Table 2-1 Battery icon

Battery icon	Power supply status
Lights orange	Battery has been charging and AC adaptor is connected.
Lights white	Battery is fully charged and AC adaptor is connected.
Flashes orange	Battery charge is low. The AC adaptor must be connected to recharge the battery.
Doesn't light	Any condition other than those above.

Table 2-2 DC IN icon

DC IN icon	Power supply status
Lights white	DC power is being supplied from the AC adaptor.
Doesn't light	Any condition other than those above.

Procedure 2   Connection Check

The power supply wiring diagram is shown below:
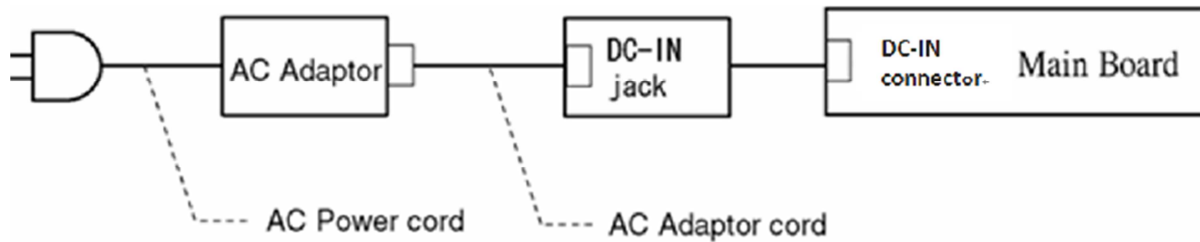
Any of the connectors may be disconnected. Perform Check 1.

Check 1   Disconnect the AC power cord from the wall outlet. Check the power cable for breaks. If the power cord is damaged, connect a new AC power cord. If there is no damage, go to Check 2.

Check 2   Make sure the AC adaptor cord and AC power cord are firmly plugged into the DC-IN jack socket and AC adaptor inlet/wall outlet, respectively. If these cables are connected correctly, go to Check 3.

Check 3   Make sure the DC IN jack is firmly connected to the DC-IN connector on the main board.
- If the DC IN jack is not firmly connected, go to Procedure 5.
- If it is connected, go to Check 4.

Check 4   Use a multimeter to make sure the AC adaptor output voltage is close to 19 V. If the output is several percent lower than 19 V, go to Check 5. If the output is close to 19 V, go to Check 6.

Check 5   Connect a new AC adaptor or AC power cord.
- If the DC IN icon does not light, go to Procedure 5.
- If the battery icon does not light, go to Check 6.

Check 6   Make sure the battery pack is installed in the computer correctly. If the battery is properly installed and the battery icon still does not light, go to Procedure 4.

Procedure 3   Charge Check

The power supply may not charge the battery pack. Perform the following procedures:

1. Reinstall the battery pack.

2. Attach the AC adaptor and turn on the power. If you cannot turn on the power, go to Procedure 5.

Check 1   Make sure the AC adaptor and AC power cord is firmly plugged into the DC IN socket and the wall outlet. If these cables are connected correctly, replace the AC adaptor (and/or AC power cord, if necessary).

Check 2   Make sure the battery is properly installed. If the battery is properly installed, go to Check 3.

Check 3   The battery pack may be completely discharged. Wait a few minutes to charge the battery pack. If the battery pack is still not charged, go to Check 4.

Check 4   The battery's temperature is too hot or cold. Return the temperature to a normal operating condition. If the battery pack still is not charged, go to Check 5.

Check 5   Replace the battery pack with a new one. If the battery pack still is not charged, go to Procedure 5.

Procedure 4   Replacement Check

The main board processor module may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*. Check the connection between the AC adaptor and main board and connection. After checking the connections, perform the following Check 1:

Check 1   Replace the AC adaptor with a new one. If the AC adaptor is still not functioning properly, perform Check 2.

Check 2   Replace the main board with a new one following the steps described in Chapter 4, *Replacement Procedures*.

2.4   Main Board Troubleshooting

This section describes how to determine if the main board and CPU are defective or not functioning properly. Start with Procedure 1 and continue with the other procedures as instructed.

The procedures described in this section are:

           Procedure 1:   Message Check

           Procedure 2:   Diagnostic Test Program Execution Check

           Procedure 3:   Replacement Check

Procedure 1　Message Check

When the power is turned on, the system performs the Power On Self Test (POST) installed in the BIOS ROM. The POST tests each IC on the main board and initializes it.

❑ If an error message is shown on the display, perform Check 1.

❑ If Toshiba **FREE-DOS** or Windows 7(TM) is properly loaded, go to Procedure 2.

Check 1　If one of the following error messages appears on the screen, press **F1** as the message instructs. These errors occur when the system configuration preserved in the RTC memory (CMOS type memory) is not the same as the actual configuration or when the data is lost.

Press **F1** as the message instructs to return all system settings to their default values. Then the system reboots. Press F2 to run setup.

If an error message (a) appears often when the power is turned on, replace the RTC battery. If any other error message displays, perform Check 2.

```
(a)   CMOS Battery Low
      Press F2 to Run Setup, Press F1 to Load Default
Values and Continue.
(b)   RAM READ/WRITE Test Failed
      Press F2 to Run Setup, Press F1 to Load Default
Values and Continue.
(c)   CMOS DATE/TIME Not Set
      Press F2 to Run Setup, Press F1 to Load Default
Values and Continue.
(d)   CMOS Settings Wrong
      Press F2 to Run Setup, Press F1 to Load Default
Values and Continue.
(e)   Primary Master Hard Disk Error
      Press F2 to Run Setup, Press F1 to Load Default
Values and Continue.
```

Check 2   The POST checks the main board. When the POST detects an error, the system
stops or an error message appears.

If one of the following error messages (1) through (3), (5) or (11) appears, go to
Procedure 3.

If the error message (12), (13) appears, go to the Keyboard Troubleshooting
Procedures in Section 2.6.

If the error message (15) appears, go to the HDD Troubleshooting Procedures in
Section 2.5.

```
(1).  Refresh timer test failed
(2).  KBC BAT Test failed
(3).  RAM R/W test failed
(4).  KBC BAT Test failed
(5).  CMOS Battery Low
(6).  CMOS Settings Wrong
(7).  CMOS Date/Time Not Set
(8).  DMA Controller Error
(9).  DMA-1 Error
(10). DMA-2 Error
(11). Timer Error
(12). Keyboard/Interface Error
(13). PS2 Keyboard not found
(14). PS2 Mouse not found
(15). Primary Master Hard Disk Error
```

Procedure 2   Diagnostic Test Program Execution Check

Execute the following tests from the Diagnostic Test Menu. Refer to Chapter 3, *Tests and Diagnostics,* for more information on how to perform these tests.

1. Model, BIOS and CPU Test	**A. LED Test**
2. Check MAC Test	**B. LID switch Test**
3. PAD Test	**C. SD CARD Test**
4. LCDRGB Test	**D. HDD Test**
5. Audio Test	**E. Wireless Test**
6. Keyboard Test	**F. Webcamera Test**
7. Memory Test	**G. Speaker Test**
8. Function Test	**H. R/W DMI**
9. STORE Test[CD/DVD-ROM TEST]	**I. FAN Test**

If an error is detected during these tests, go to Procedure 3.

Procedure 3   Replacement Check

The main board connectors may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform Check 1.

Check 1   Visually check for the following:

        a) Cracked or broken connector housing

        b) Damaged connector pins

        If their connectors are in good condition, but there is still a problem, go to Check 2.

Check 2   The main board may be damaged. Replace the main board with a new one following the steps described in Chapter 4, *Replacement Procedures*.

2.5   HDD Troubleshooting

This section describes how to determine if the HDD is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

> Procedure 1:   Message Check
>
> Procedure 2:   Partition Check
>
> Procedure 3:   Format Check
>
> Procedure 4:   Diagnostic Test Program Execution Check
>
> Procedure 5:   Connector Check and Replacement Check

CAUTION: *The contents of the hard disk will be erased when you execute the HDD troubleshooting procedures. Transfer the contents of the hard disk to other storage media.*

Procedure 1   Message Check

When the computer's HDD does not function properly, some of the following error messages may appear on the display. Start with Check 1 below and perform the other checks as instructed.

Check 1   If either of the following messages appears, go to Procedure 2. If the following messages do not appear, perform Check 2.

```
Insert system disk in drive
Press any key when ready .....
         or
Non-System disk or disk error
Replace and press any key
```

Check 2   Make sure the Hard Disk option is set to not used. If it is set to not used, choose another setting and restart the computer. If the problem still exists, go to Procedure 2.

Procedure 2   Partition Check

Insert the bootable USB key, restart the computer with Esc key pressing down, and choose boot from USB device. Perform the following checks:

Check 1   Type `C:` and press **Enter**. If you cannot change to drive C, go to Check 2. If you can change to drive C, go to Check 3.

Check 2   Type `FDISK` and press **Enter**. Choose Display Partition Information from the FDISK menu. If drive C is listed, go to Check 3. If drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition on drive C. Restart the computer from the Toshiba FREE-DOS system disk. If the problem still exists, go to Procedure 3.

Check 3   If drive C is listed as active in the FDISK menu, go to Check 4. If drive C is not listed as active, return to the FDISK menu and choose the option to set the active partition for drive C. Restart the computer and then go to Procedure 3.

Check 4   Remove the USB key and restart the computer. If the problem still exists, go to Procedure 3.

Check 5   Using the SYS command on the Toshiba FREE-DOS system disk, install system files on the HDD.

If the following message appears on the display, the system files have been transferred to the HDD. Restart the computer. If the problem still exists, go to Procedure 3.

```
System transferred
```

NOTE: *If the computer is running Windows 2000, OSR2 or higher and the hard disk has more than 512 MB capacity, the FDISK program will ask if you need support for a partition larger than 2GB. Select Y for large partition support; however, be sure to read the precaution regarding access by other operating systems.*

Procedure 3   Format Check

The computer's HDD is formatted using the low level format program and the FREE-DOS
FORMAT program. To format the HDD, start with Check 1 below and perform the other
steps as required.

Check 1   Format the HDD and transfer system files using **FORMAT C:/S/U**. If the
            following message appears on the display, the HDD is formatted.

```
            Format complete
```

            If an error message appears on the display, refer to the Toshiba FREE-DOS
            Manual for more information and perform Check 2.

Check 2   Using the Diagnostics Disk, format the HDD with a low level format option.
            Refer to Chapter 3, *Tests and Diagnostics* for more information about the
            diagnostic program.

            If the following message appears on the display, the HDD low level format is
            complete. Partition and format the HDD using the FREE-DOS FORMAT
            command.

```
            Format complete
```

            If you cannot format the HDD using the Tests and Diagnostic program, go to
            Procedure 4.

Procedure 4   Diagnostic Test Program Execution Check

The HDD test program is stored in the Diagnostics Disk. Perform all of the HDD tests in the Hard Disk Drive Test. Refer to Chapter 3, *Tests and Diagnostics,* for more information about the HDD test program.

If the problem still exists, go to Procedure 5.

Procedure 5   Connector Check and Replacement Check

The HDD may be disconnected, or the HDD or the main board may be damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

Check 1   Make sure the HDD is firmly connected to HDD connector on the main board.
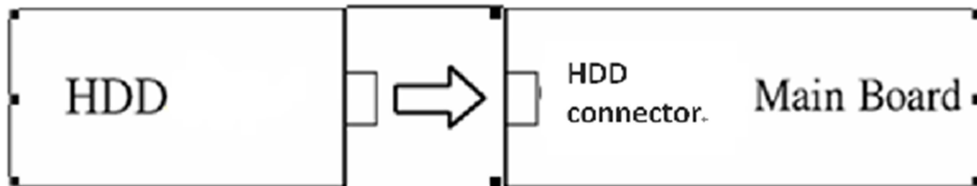
If any of the connections are loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 2.

Check 2   The HDD may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 3.

Check 3   The Main board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.6 Keyboard and Touch pad Troubleshooting

To determine if the computer's keyboard or touch pad is functioning properly, perform the following procedures. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

Execute the Keyboard Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

If an error occurs, go to Procedure 2. If an error does not occur, the keyboard is functioning properly.

Procedure 2 Connector Check and Replacement Check

The keyboard, touch pad or sensor/switch board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

1. If the keyboard or AccuPoint malfunctions, start with Check 1.

2. If the touch pad malfunctions, start with Check 3.

3. If the power switch, InTouch button or Presentation button malfunctions, start with Check 5.

Check 1   Make sure the keyboard cable is securely connected to keyboard connector on the main board.
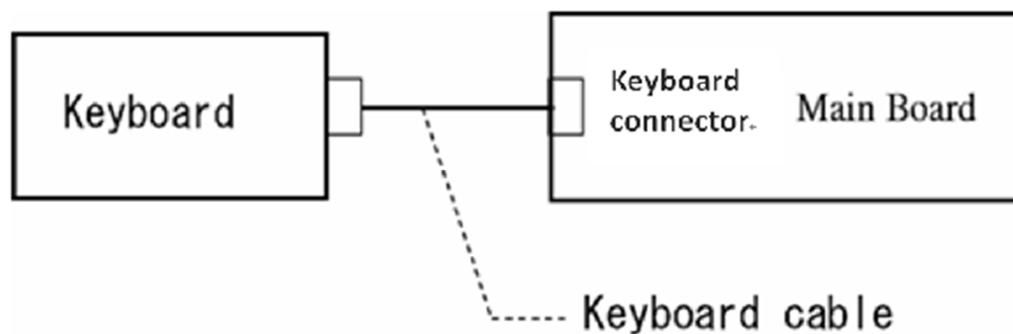
If the connection is loose, reconnect firmly. If there is still an error, go to Check 2.

Check 2   The keyboard or its cable may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 5.

Check 3   Make sure the touch pad cable is firmly connected to A1tp_Con1 on the touch pad board.
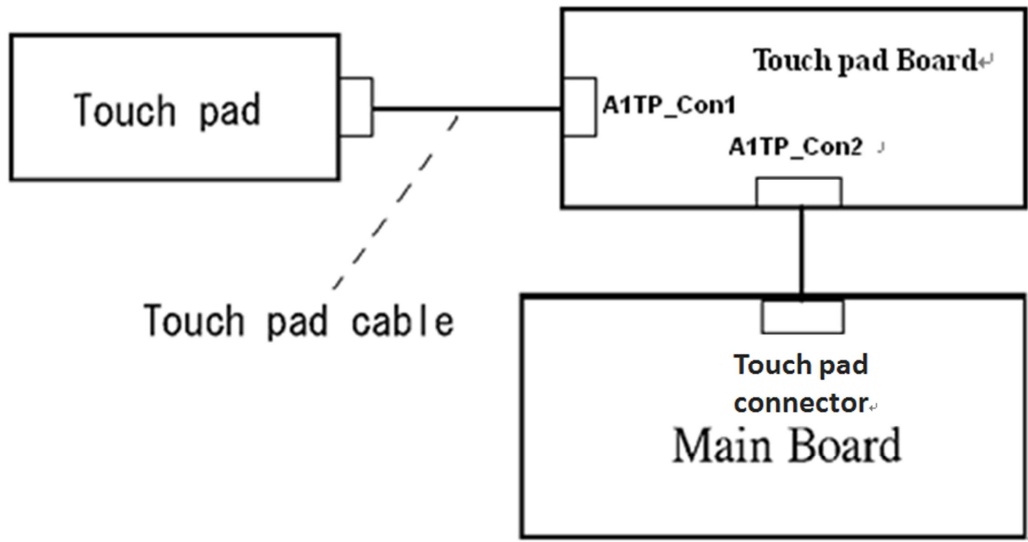
If the connection is loose, reconnect firmly. If there is still an error, go to Check 4.

Check 4   The touch pad or the touch pad cable may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 5.

Check 5   The main board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.7   Display Troubleshooting

This section describes how to determine if the computer's display is functioning properly. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1:   External Monitor Check

Procedure 2:   Diagnostic Test Program Execution Check

Procedure 3:   Connector Check and Cable Check

Procedure 4:   Replacement Check

Procedure 1   External Monitor Check

Connect an external monitor and turn on the computer. If there is no problem on it, the internal LCD may be defective. Go to Procedure 3. If there is any problem on the external monitor, the main board may be defective. Go to Procedure 2.

Procedure 2   Diagnostic Test Program Execution Check

The Display Test program is stored on the computer's Diagnostics disk. This program checks the display controller on the main board. Connect the Diagnostics disk, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details. If an error is detected, go to Procedure 3.

Procedure 3   Connector Check and Cable Check

Check 1   The LCD and Main board are connected by inverter cable, inverter board and LVDS cable. Make sure the LVDS cable is firmly connected to Main board. If the connection is loose, reconnect firmly and restart the computer. If there is still an error, go to Check 2.
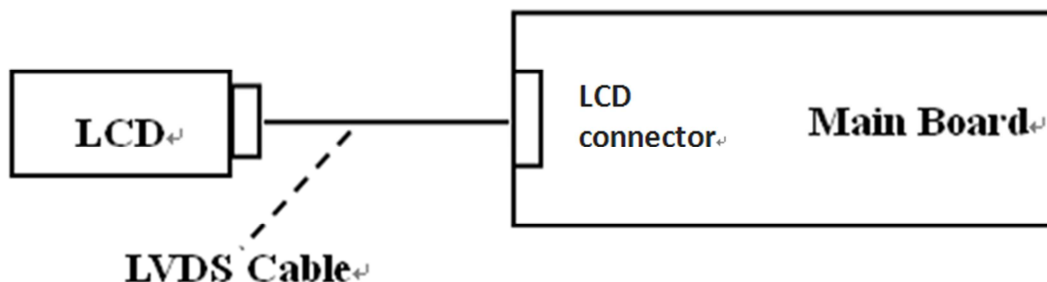
Procedure 4   Replacement Check

LCD module and main board are connected to display circuits through LVDS cable. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks:

Check 1   The LVDS cable or inverter cable may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 2.

Check 3   The Main board or LCD panel may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.8 Optical Drive Troubleshooting

This section describes how to determine if the optical drive (DVD-ROM,DVD±R/±RW/-RAM and BluRay Drive) in the Slim Select Bay is functioning properly. Perform the steps below starting with Procedure 1 and continue with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1   Diagnostic Test Program Execution Check

The DVD-ROM, DVD±R/±RW/-RAM and BluRay Drive test program is stored on the Diagnostics Disk.

For the test, prepare test Media.

Then connect the Diagnostics HDD, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics,* for more information about the diagnostics test procedures.

If any errors occur while executing the DVD-ROM, DVD±R/±RW/-RAM and BluRay Drive test, go to Procedure 2.

Procedure 2   Connector Check and Replacement Check

The optical drive (DVD-ROM, DVD±R/±RW/-RAM and BluRay Drive) is connected to the main board. The connectors may be disconnected from the main board or may be damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

Check 1   Make sure the drive to test is firmly connected to ODD connector on the main board.
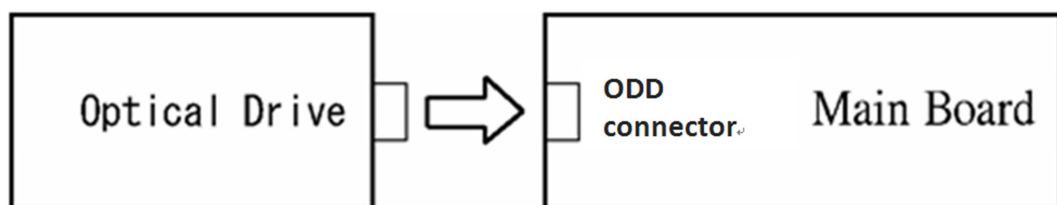
If the connection is loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 2.

Check 2   The drive may be defective or damaged. Replace the drive with a new one. If there is still an error, go to Check 3.

Check 3   Replace the main board with a new one following the steps in Chapter 4,
           Replacement Procedures.

2.9 LAN Troubleshooting

This section describes how to determine if the computer's LAN is functioning properly. Perform the steps below starting with Procedure 1 and continue with the other procedures as required.

Procedure 1:   Diagnostic Test Program Execution Check

Procedure 1   Diagnostic Test Program Execution Check

Execute the LAN test program available as part of the LAN test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

2.10 Wireless(WiDi WiFi) LAN Troubleshooting

This section describes how to determine if the computer's Wireless(WiDi WiFi) LAN is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antenna Connection Check

Procedure 3: Replacement Check

Procedure 1   Transmitting-Receiving Check

Make sure the Wireless(WiDi WiFi) switch of the computer is turned "On." If it is not, please turn it on.

Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

Check 1   Execute test program for the Wireless(WiDi WiFi) LAN function to check the transmitting-receiving function of the Wireless(WiDi WiFi) LAN. You will need a second computer that can communicate by the Wireless(WiDi WiFi) LAN.

If the computer passes the test, the function is correctly working.

If the computer does not pass the test, perform Procedure 2.

Procedure 2   Antenna Connection Check

The Wireless(WiDi WiFi) LAN wiring diagram is shown below:
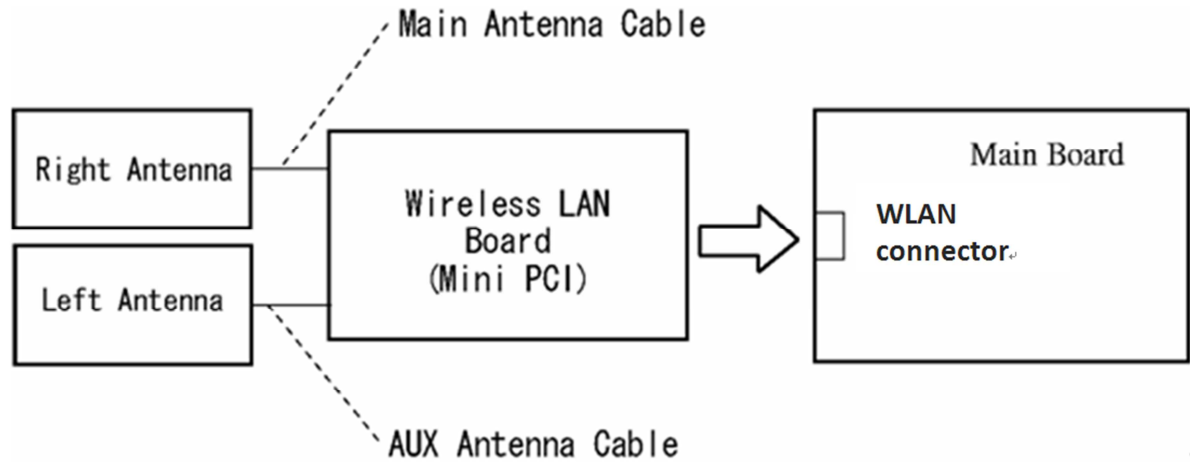
Any of the connections may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1   Make sure the Wireless(WiDi WiFi) LAN board is firmly connected to WLAN connector on the main board.

         If the connector is disconnected, connect it firmly. If the Wireless(WiDi WiFi) LAN board is still not functioning properly, perform Check 2.

Check 2   Make sure the Wireless(WiDi WiFi) LAN antenna cables are firmly connected to the Wireless(WiDi WiFi) LAN board.

         If the Wireless(WiDi WiFi) LAN antenna cables are disconnected, connect them firmly. If the Wireless(WiDi WiFi) LAN board is still not functioning properly, go to Procedure 3.

Procedure 3   Replacement Check

The Wireless(WiDi WiFi) LAN antenna, Wireless(WiDi WiFi) LAN board and the main board are connected to the circuits. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks:

Check 1   The Wireless(WiDi WiFi) LAN board may be defective or damaged. Replace the board with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 2.

Check 2   The Wireless(WiDi WiFi) LAN antenna may be defective or damaged. Replace the antenna with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 3.

Check 3   The main board may be defective or damaged. Replace the board with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again.

2.11 Sound Troubleshooting

This section describes how to determine if the computer's sound functions are functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1:   Diagnostic Test Program Execution Check

Procedure 2:   Connector Check

Procedure 3:   Replacement Check

Procedure 1   Diagnostic Test Program Execution Check

Insert the Sound test program in the USB key, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics*, for details.

If an error is detected, go to Procedure 2.

Procedure 2   Connector Check

The sound function-wiring diagram is shown below:
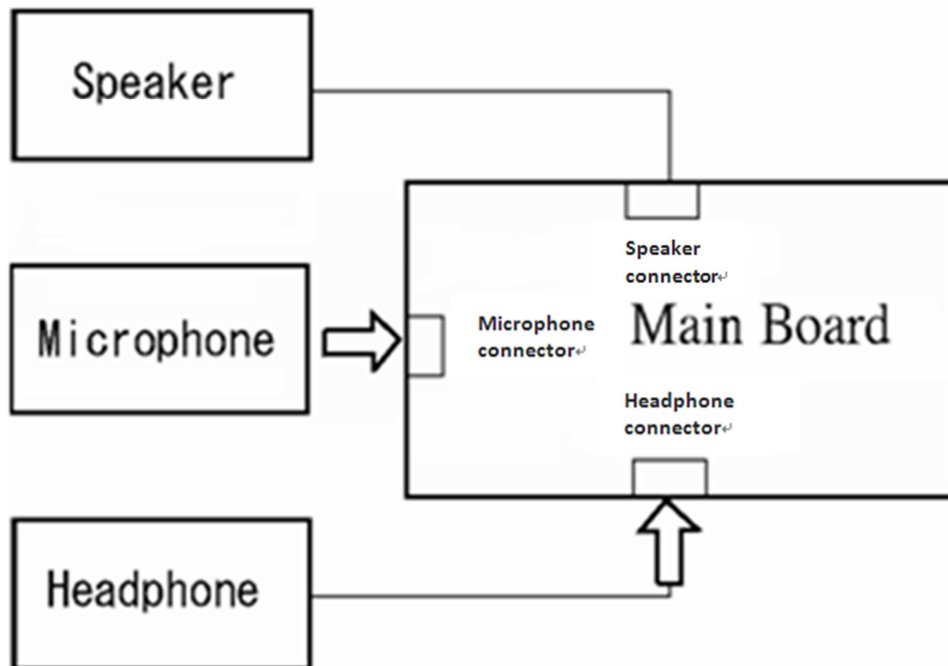
Any of the connections may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

> If the stereo speakers do not work correctly, perform Check 1.
>
> If the headphone does not work correctly, perform Check 2.
>
> If the microphones do not work correctly, perform Check 3.

Check 1   If the stereo speakers do not work properly, the speaker cable may be disconnected. Make sure the speaker cable is firmly connected to speaker connector on the Main board. If the stereo speakers are still not functioning properly, go to procedure 3.

Check 2   If the headphone does not work properly, the headphone cable may be disconnected. Make sure the headphone cable is firmly connected to headphone connector on the Main board. If the sound function still does not work properly, go to procedure 3.

Check 3   If the microphones do not work properly, the external microphone cable may be disconnected. When using the external microphone, make sure the external microphone cable is firmly connected to microphone connector on the Main board. If the microphones are still not functioning properly, go to procedure 3.

Procedure 3   Replacement Check

Check 1   If the stereo speakers do not sound properly, the right or left speaker may be defective or damaged. Replace it with a new one. If the stereo speakers still do not work properly, go to Check 4.

Check 2   If the headphone does not sound properly, the headphone jack may be defective or damaged. Replace it with a new one. If the sound function still does not work properly, go to Check 4.

Check 3   If the microphones do not work properly, the microphone cable may be defective or damaged. Replace it with a new one. If the microphone still does not work properly, go to Check 4.

Check 4   The Main board may be defective or damaged. Replace it with a new one.

2.12 Card Reader Slot Troubleshooting

This section describes how to determine if the computer's card reader functions are functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Check on Windows 7(TM)

Procedure 2: Connector Check and Replacement Check

Procedure 1   Check on Windows 7(TM)

Insert an MMC/SD/MS/MS(PRO) card into the slot. Check if the installed Windows recognizes automatically the MMC/SD/MS/MS(PRO) card and the data in the MMC/SD/MS/MS(PRO) card can be read.

If the card is not recognized or data are not read, go to Procedure 2.

Procedure 2   Connector Check and Replacement Check

The MMC/SD/MS/MS(PRO) card is connected to media card connector on the Main board.
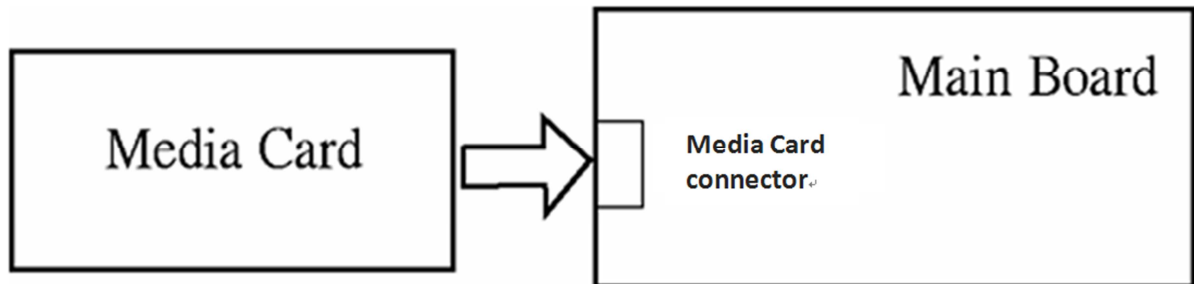
Check 1   The MMC/SD/MS/MS(PRO) card and the Main board may be disconnected. Make sure the MMC/SD/MS/MS(PRO) card is firmly inserted to CON3301 on the Main board. If not, insert it firmly. If the MMC/SD/MS/MS(PRO) card is still not functioning properly, perform Check 2.

Check 2   The MMC/SD/MS/MS(PRO) card may be faulty. Replace it with a new one following the step in Chapter 4 *Replacement Procedures*. If the problem continues, perform Check 3.

Check 3   The Main board may be faulty. Replace it with a new one following the step in Chapter 4 *Replacement Procedures*.

2.13 Bluetooth (BTO) Troubleshooting ○,ı

This section describes how to determine if the computer's Bluetooth is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

>   Procedure 1:   Diagnostic Test Program Execution Check
>
>   Procedure 2:   Connector Check and Replacement Check

Procedure 1   Diagnostic Test Program Execution Check

Insert the Bluetooth test program in the USB key, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics,* for more information about the diagnostics test procedures.

If any errors occur while executing the Bluetooth test, go to Procedure 2.

Procedure 2   Connector Check and Replacement Check

The Bluetooth is installed on the main board by Bluetooth cable. If the Bluetooth malfunctions, there may be a bad connection between the Bluetooth and the main board. Or the Bluetooth, main board or the Bluetooth cable might be damaged.

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

Check 1   Make sure the Bluetooth is firmly connected to Bluetooth connector by Bluetooth cable on the main board and the connector of the Bluetooth.
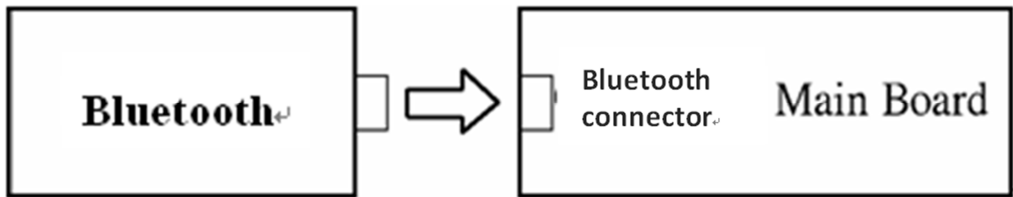
If a connector is disconnected, connect it firmly and repeat Procedure 1. If the Bluetooth is still not functioning properly, perform Check 2.

Check 2   The Bluetooth may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Bluetooth is still not functioning properly, perform Check 3.

Check 3   The Bluetooth cable may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Bluetooth is still not functioning properly, perform Check 4.

Check 4   The main board may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.14 Camera (BTO) Troubleshooting

This section describes how to determine if the computer's camera is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

> Procedure 1:   Diagnostic Test Program Execution Check
>
> Procedure 2:   Connector Check and Replacement Check

Procedure 1   Diagnostic Test Program Execution Check

Insert the camera test program in the USB key, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics,* for more information about the diagnostics test procedures.

If any errors occur while executing the camera test, go to Procedure 2.

Procedure 2   Connector Check and Replacement Check

The camera is installed on the main board by camera cable. If the camera malfunctions, there may be a bad connection between the camera and the main board. Or the camera, main board or the camera cable might be damaged.

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

Check 1   Make sure the camera is firmly connected to camera connector by camera cable on the main board.
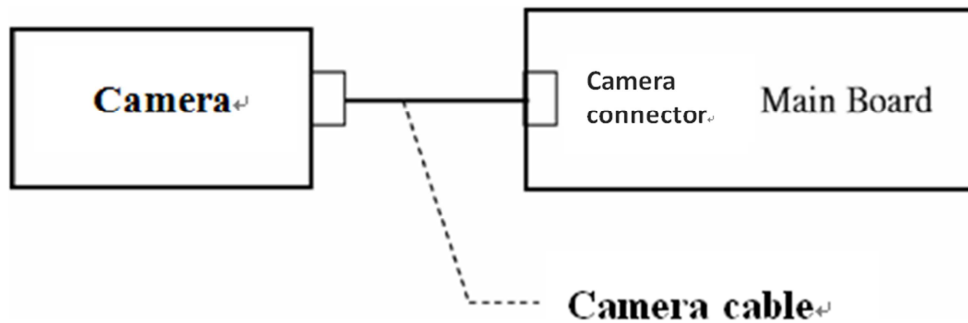
If a connector is disconnected, connect it firmly and repeat Procedure 1. If the camera is still not functioning properly, perform Check 2.

Check 2   The camera may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the camera is still not functioning properly, perform Check 3.

Check 3   The camera cable may be defective or damaged. Replace the LCD cover with a new one following the steps in Chapter 4, *Replacement Procedures*. If the camera is still not functioning properly, perform Check 4.

Check 4   The main board may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.15 HDMI Troubleshooting

This section describes if the computer HDMI functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1:   Check on Windows 7(TM)

Procedure 2:   Connector Check and Replacement Check

Procedure 1   Check on Windows 7(TM)

Switch play device to "high digital output" and if the HDMI output error then go to Procedure 2.

Procedure 2   Connector Check and Replacement Check

The HDMI function is work in main board. If the HDMI display malfunctions, there may be a bad connection between the HDMI displayer and the main board. Or the main board might be damaged.

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

Check 1   Make sure the HDMI displayer is firmly connected to HDMI connector on the main board by HDMI cable.
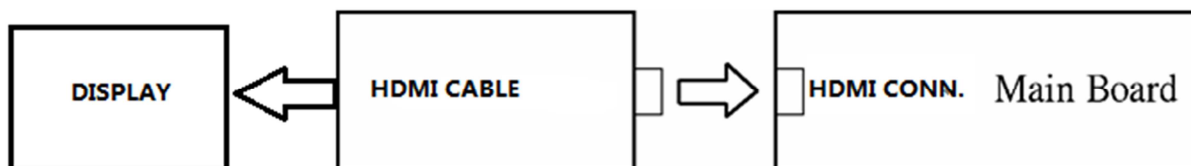
If a connector is disconnected, connect it firmly and repeat Procedure 1. If the output is still not functioning properly, perform Check 2.

Check 2   The main board may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.16 Touch Pad Troubleshooting

This section describes if the computer **Touch Pad with gesture** functioning properly.
Perform the steps below starting with Procedure 1 and continuing with the other procedures
as required.

> Procedure 1:   Open a Photo
>
> Procedure 2:   Test touchpad by Gesture

Procedure 1   Open a Photo

Procedure 2   Test touchpad by Gesture

Follow below can move photo.
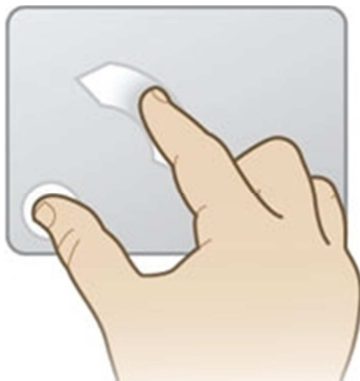
Follow below can change photo dimension
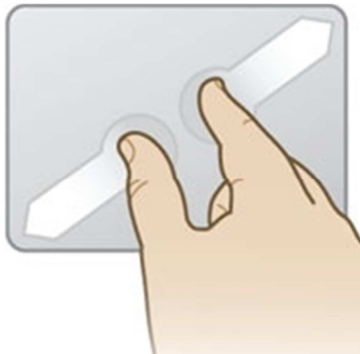
2.17 Battery, RTC Battery Troubleshooting

This section describes if the computer **battery and RTC battery** functioning properly.
Perform the steps below starting with Procedure 1 and continuing with the other procedures
as required.

Procedure 1:   AC in to charge the battery

Procedure 2:   Log in BIOS

Procedure 1   AC in to charge the battery

Make sure AC in for a while, and then remove AC to see if battery has power and it can
support computer on.

Procedure 2   Log in BIOS

Log in BIOS to see if the system current time is the same with nature time.

If not, please correct and check it matched nature time again after a while.

Chapter 3

Tests and Diagnostics

Chapter 3   Contents

Tests and Diagnostics

3.1   Preparation

This chapter explains how to use the Diagnostic Test programs to test the functions of the computer's hardware modules. The test program should be stored on an optical media disk or a USB boot memory.

The test program menu will also consist of some programs which test the hardware function or display the current information of the computer.

To execute the auto run will automatically run all the test programs.

NOTE: Before starting the diagnostics, be sure to follow these steps:

1. Check all cables are connected with Audio jack (Microphone& Headphone) firmly.

2. Exit any application and close Windows and power off.

3. Set SATA Controller Mode to "Compatibility" in BIOS. (Setup Utility)

4. When test web camera/SD Card/ODD device, please use ISO image test program with CD-ROM Media.

To set SATA Controller Mode to "Compatibility", please follow below steps:

1. Turn on the power, under Toshiba Logo screen press F2 to enter "Setup Utility".

2. Press left and move cursor to "Advanced".

3. Press down and move cursor to "System Configuration", then press enter.
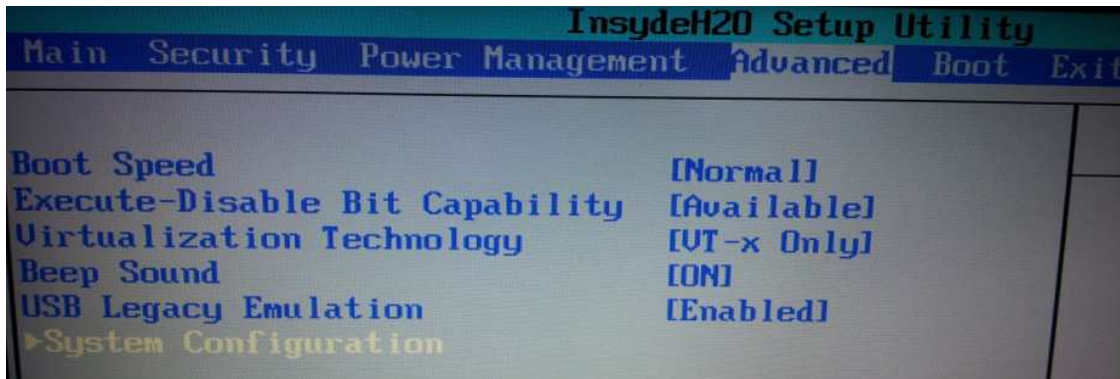
4. Press down and move cursor to "SATA Controller Mode", then press enter.

---

5. Press down and move cursor to "Compatibility", then press enter.
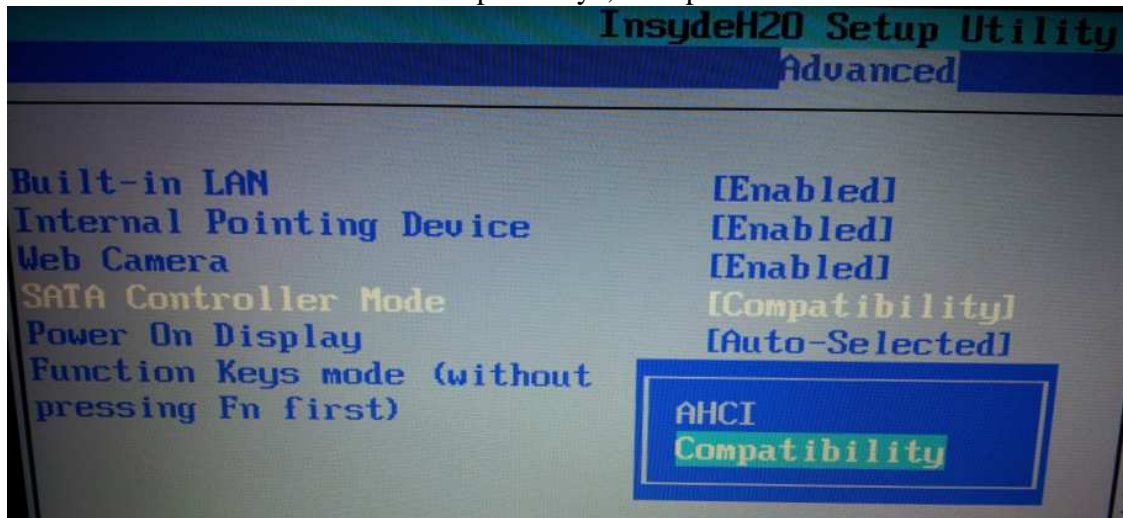
6. Press F10 and enter to restart the PC

The Test MENU consists of the following functions.

USB T&D test menu
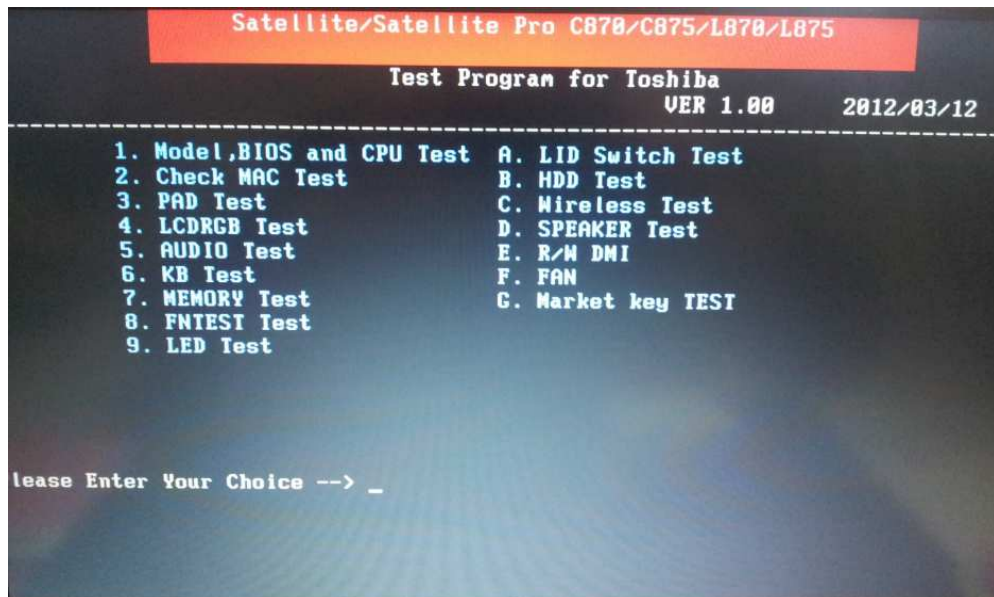
ISO image T&D test menu
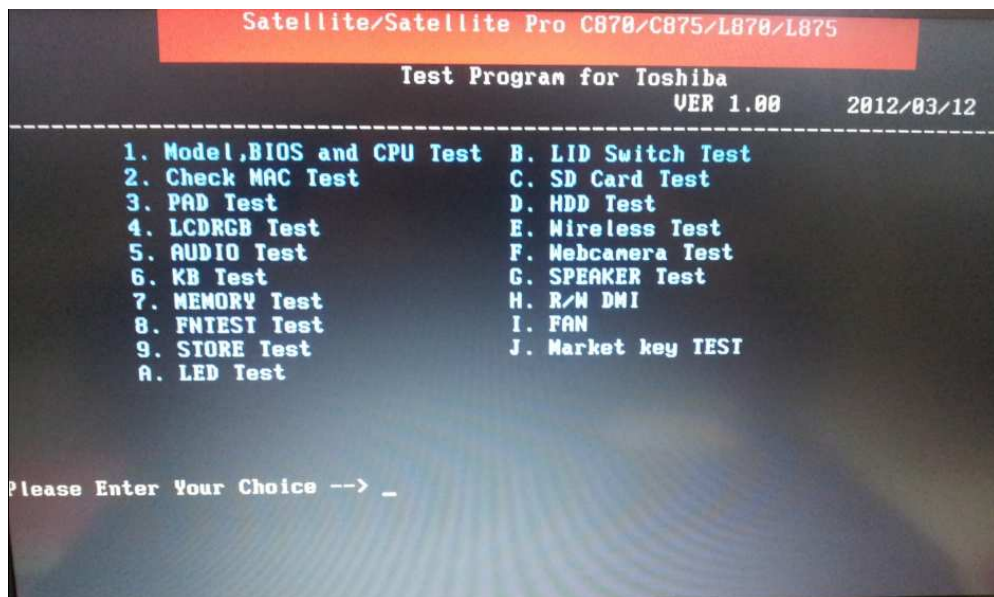
When execute the test item, please key number of testing item.

3.1.1   Executing from ISO image

To start the ISO Image Test PROGRAM from CD-ROM, please follow these steps:

1. Burn ISO image test program into optical media disk.

To burn ISO image, please double click the ISO image in Windows 7, then click burn.
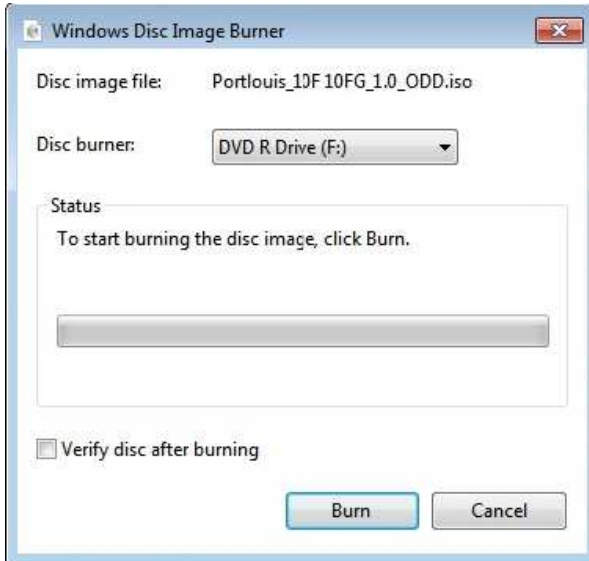
2. Insert the optical media disk (ISO Image test program) into optical device.
3. Turn on the power, under Toshiba Logo screen and press F12.
4. Choose ODD from boot menu.
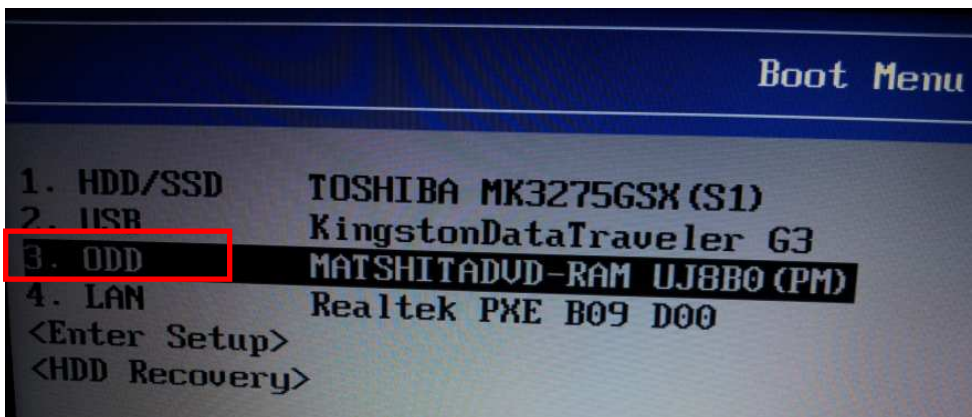
5. System will automatically run the test program and display the test menu.

6. When the test menu displays, please enter the item number to choose and execute the test item.
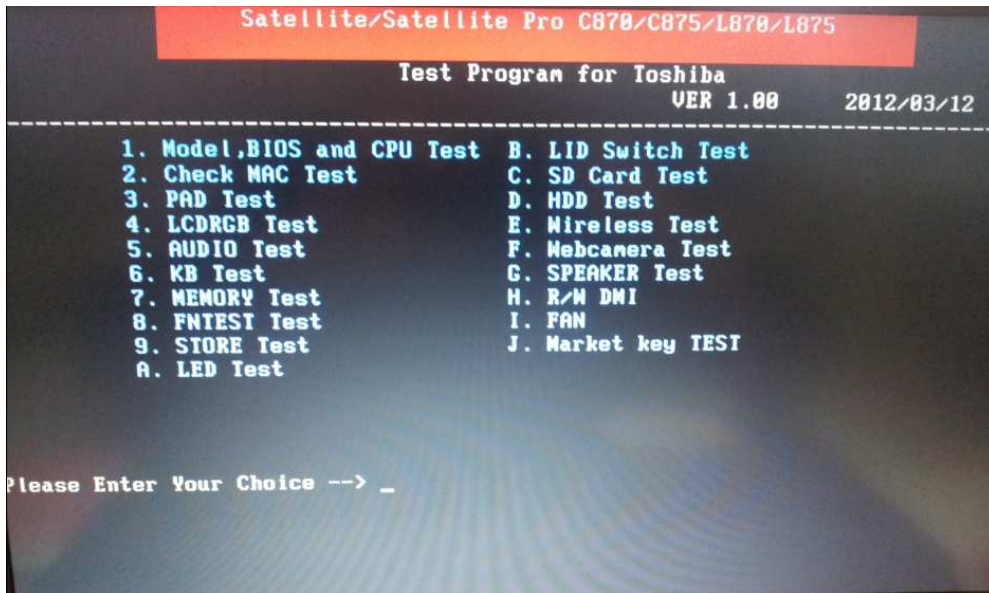
Note:

Before start test, please make sure to set test SATA Controller Mode to "Compatibility" in BIOS

After test, please make sure to set SATA Controller Mode to "ACHI" (default).

If it fails when testing an item, press "Ctrl+C" and "Y" then press "Enter" back to the main menu

Press any key to back to main menu after each test

Please check DMI information correct before test

3 Tests and Diagnostics

3.1.2 Executing from USB device

To start the USB Test PROGRAM from USB device, please follow these steps:

1. Please prepare Toshiba PC of Windows 7 OS.

2. Please copy the file for creating a USB-Bootable memory to Windows 7 PC.

   The filename of five files and one folder to copy is shown as below.

   a) COMMAND.COM
   b) Freedos.bss
   c) FreeDOSMake.exe
   d) KERNEL.SYS
   e) Autoexec.bat
   f) Folder (USBMakingFolder)

COMMAND
MS-DOS Application
65.3 KB

Freedos.bss
BSS File
512 bytes

FreeDOSMake
TODO: <ファイルの説明>
TODO: <会社名>

KERNEL.SYS
System File
44.2 KB

USBMakingFolder
File Folder

autoexec
Windows Batch File
0 bytes

   Make sure to format the USB disk in FAT mode before creating USB-Bootable memory.

   (When you create USB-Bootable disk, please use only one USB-disk.)

3. Run "FreeDOSMake.exe" on the windows 7 PC and there appears the following picture.

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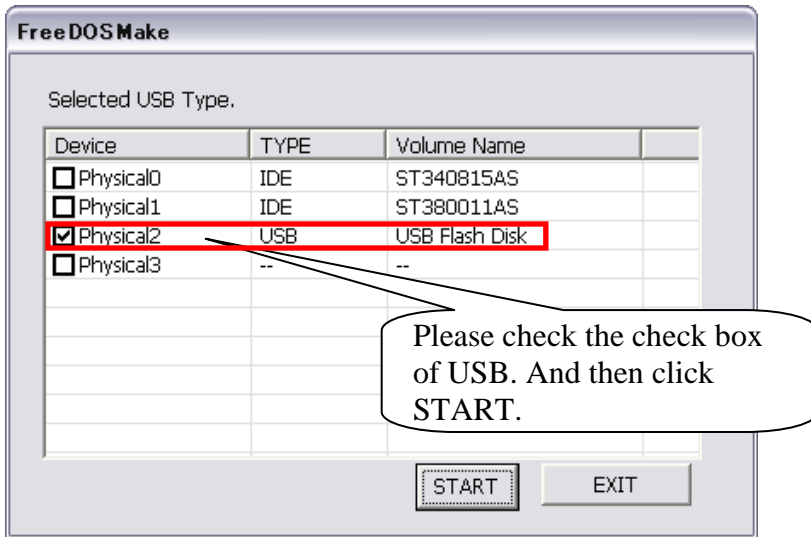
4. Download the compressed file (test program) from the FTP.

5. Unzip it and then copy whole file to USB-disk, overwrite all files.

6. Turn on the power, press F12 when Toshiba Logo appears in the screen.

7. Choose item2 USB from boot menu.
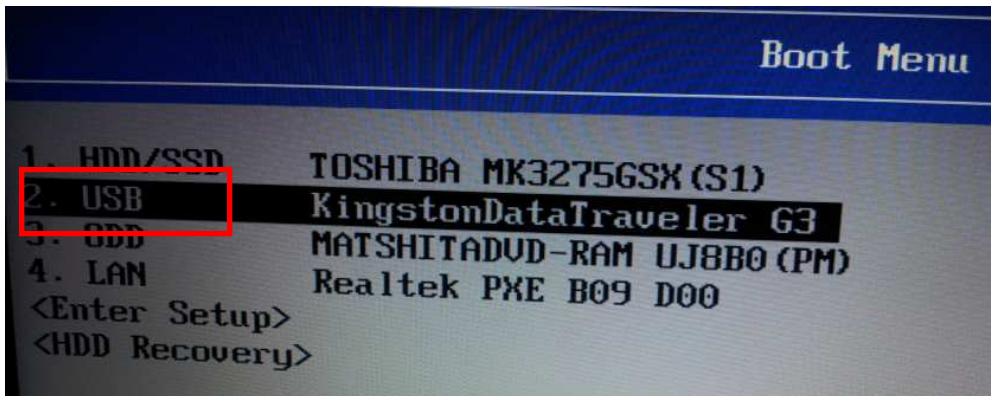
8. System will automatically run the test program and show the test menu.

9. Enter the item number (1~G) to choose and execute the function test.
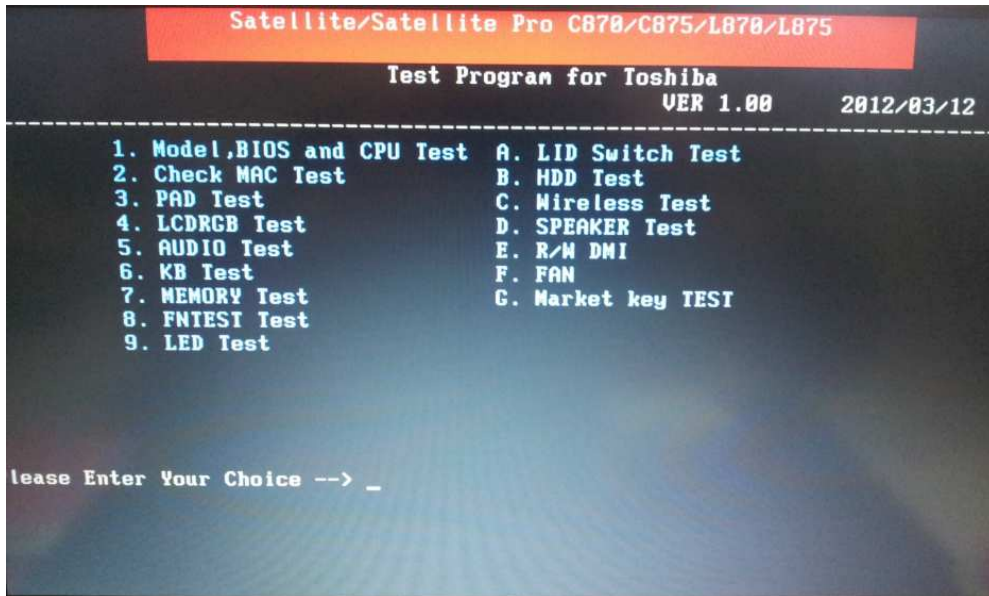
NOTE:

Before starting test, please make sure to set test SATA Controller Mode to "Compatibility" in BIOS

After test, please make sure to set SATA Controller Mode to default "ACHI".

If it fails in a test item, press "Ctrl+C" and "Y" then press "Enter" back to main menu.

Press any key to back to main menu after each test

Please check DMI information correct before test

3.2   Model, BIOS and CPU Test

1. This test displays the two following information.

One is a Model and BIOS information display.

The other one is the information display of CPU and CPU test.

[Model and BIOS information]

```
                        DMI Utility Rev 1.26          Built Date:06/06/2003
---------------------------------------------------------------------------
SMBIOS Structure Table Address:F000:E120
Entry Point:E000:6E50
DMI Revision:2.7
Structure Numbers:60

M/B Manufacturer  : Type2 - Board Vendor Name1
M/B Product       : Type2 - Board Product Name1
M/B Version       : Type2 - Board Version
BIOS Vendor       : Insyde Corp.
BIOS Version      : 0.22                        <--- BIOS information
BIOS Release Date : 02/08/2012
System Manufact.  : TOSHIBA
System Product    : Satellite C850 <---  Model information
System Version    : PSKC8A-01P00S
UUID              : A2BFE5C8-DD22-D9D5-5D03-386077F80FD9


                                          ? Please check the Produce,      ?
                                          ? UUID and BIOS Version.          ?
                                                                       T.C.
                        Return Code = 1
Press any key to continue . . .
```

Press the any key after above "Model and BIOS information" screen display.

Check CPU information of the T&D is the same with your pc configuration.

   [CPU information]

```
SMBIOS Structure Table Address:F000:E120
Entry Point:E000:6E50
DMI Revision:2.7
Structure Numbers:62

Socket Type          : U3E1
Manufacturer         : Intel(R) Corporation
Version              : Intel(R) Core(TM) i3-3110M CPU @ 2.40GHz
Max./Cur./Ext.(MHz) : 4000/2400/100

Current date is Sat 02-18-2012
Current time is  6:10:33.23 pm




                              ┌─────────────────────────────┐
                              │Please confirm the CPU Spec.  ?│
                              │and current date/time.        ?│
                              └──────────────────────T.C.─┘
```

3.3   Check MAC Test

This item is check the LAN controller functions and indicates a LAN controller MAC address of ROM. Please check MAC (LAN ID) address with the label on motherboard.

3.4   PAD Test

Press both the Left and Right Buttons three times then move cursor to 4 corners.
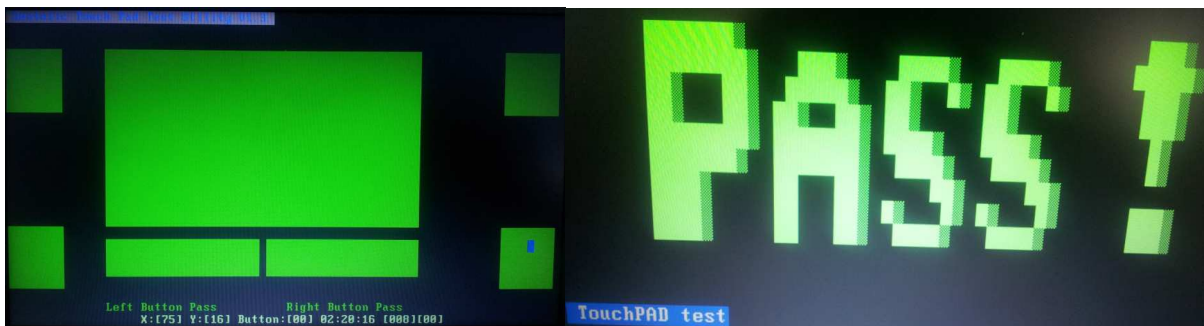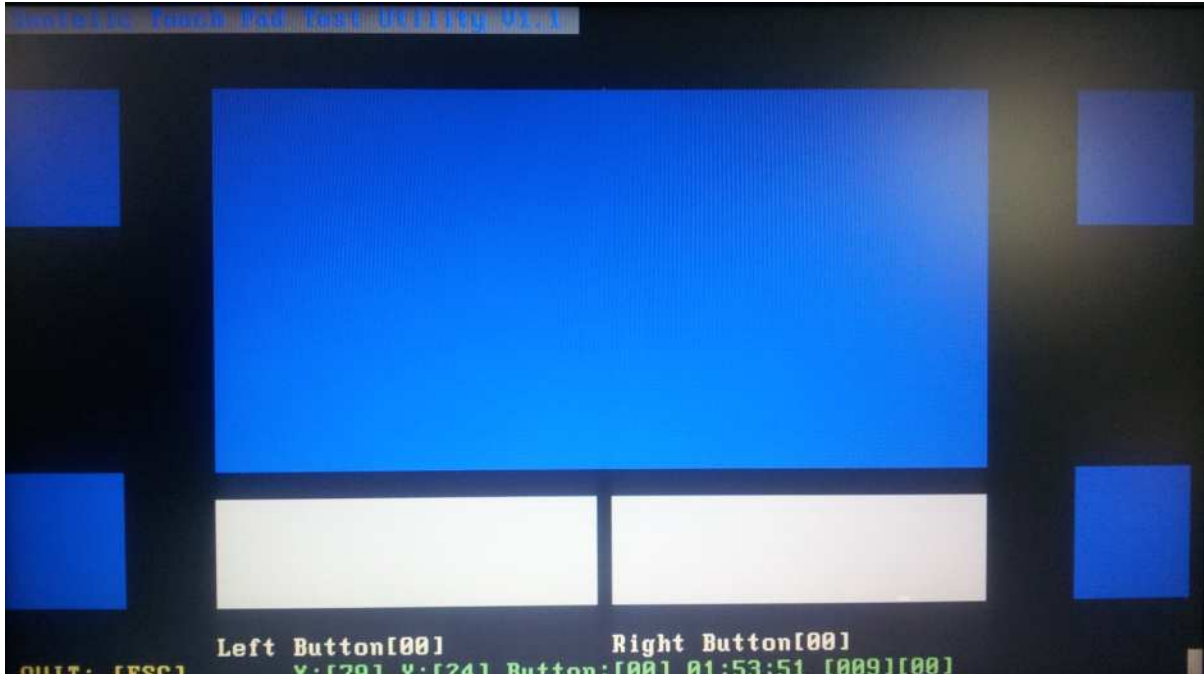
3.5 LCDRGB Test

This subtest displays gradations for following modes. To change the mode, press ***Enter***.

`[Mode VESA 101 - 640*480/256 colors]`
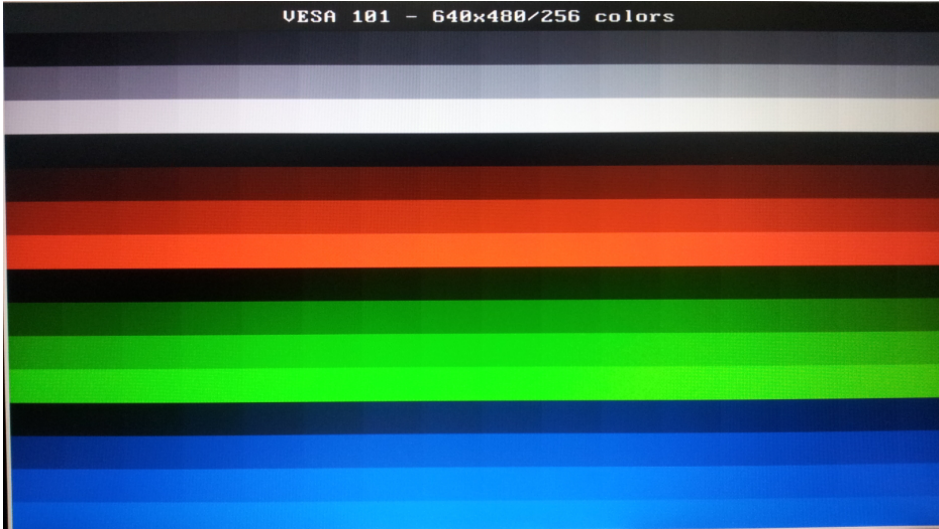
`[Mode VESA 103 800*600/256 colors]`
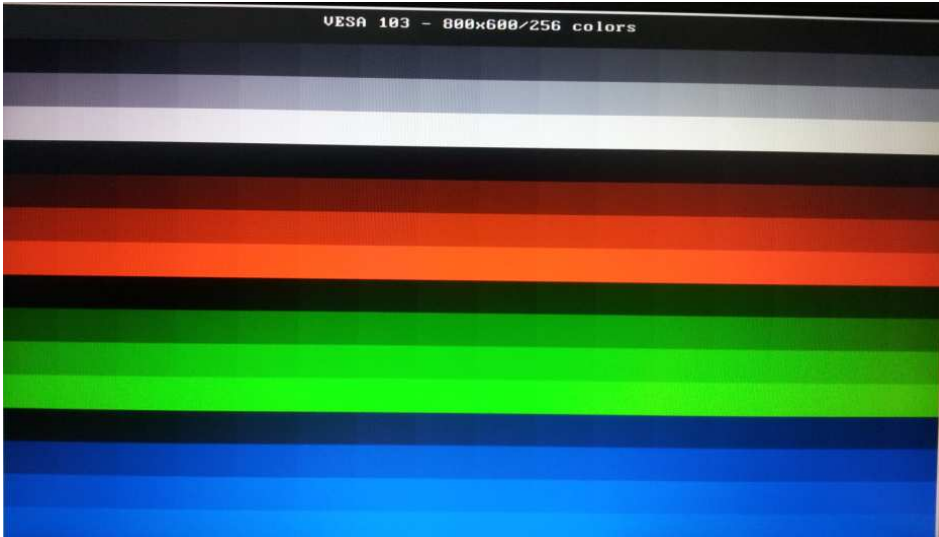
[Mode VESA 105 1024*768/256 colors]
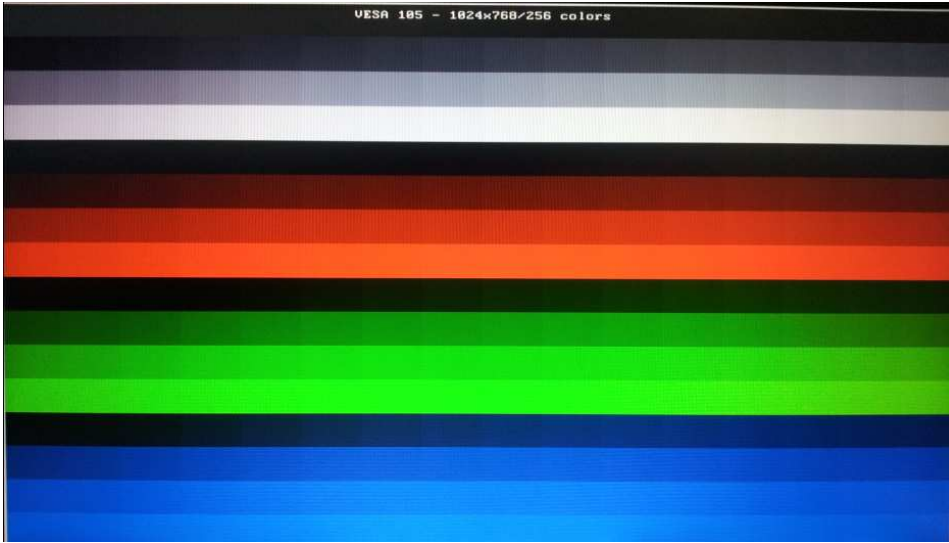
3.6 Audio Test

> *Note: To test the audio device function, you need to plug in the loopback cable.*

If test result is fail, the following screen will be display.

After test complete, press any key to continue.

3.7 Keyboard Test

Please choose the corresponding KB type to test.

```
          1. US type
          2. UK type
          3. Return




Please Enter Your Choice -->
```

For US Keyboard

```
                        Build Date:2011-02-25
Pegatron          KB Utility for Toshiba, Copyright by Pegatron          Diags
================================================================================
                        Detect Key Scan Code...

 Esc   F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12    INS  DEL   HOME END PGUP PGDN

 ~ `  ! 1 @ 2 # 3 $ 4 % 5 ^ 6 & 7 * 8 ( 9 ) 0 _ - + = Back NUM   /   *     -

 Tab  Q   W   E   R   T   Y   U   I   O   P  { [ } ] ¦ \    7   8   9
                                                                        +
 Caps  A   S   D   F   G   H   J   K   L  : ; " ' Ente   4   5   6

 Shift  Z   X   C   V   B   N   M  < , > . ? /  shift    1   2   3
                                                                       ENT
 Ctrl  Fn  LWin Alt    Space    Alt Men  Ctr     ↑      0       .

                                          <-   ↓   ->

       ↑
       └─── Press Fn + INS Key to Test...
Key_Code -> 46 C6
C:\KB>
                        Return_Code=0
```

For UK Keyboard


```
                        Build Date:2011-02-25
Pegatron           KB Utility for Toshiba, Copyright by Pegatron          Diags
================================================================================
                       Detect Key Scan Code...

 Esc   F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12    INS  DEL  HOME END PGUP PGDN

 ⌐|  ! 1 " 2  3 $ 4 % 5 ^ 6 & 7 * 8 ( 9 ) 0 _ - + = Back NUM  /   *      -

 Tab  Q  W  E  R  T  Y  U  I  O  P  { [ } ]  ENT   7   8   9
                                                                           +
 Caps  A  S  D  F  G  H  J  K  L  : ; @ ' ~ # ←┘   4   5   6

 SIF |\ Z  X  C  V  B  N  M < , > . ? /  Shift     1   2   3
                                                                          ENT
 Ctrl  Fn  LWin Alt    Space    Alt Men Ctr     ↑        0       .

                                              <-   ↓   ->

      ↑
      └──  Press Fn + INS Key to Test...
Key_Code -> 46 C6
C:\KB>
                           Return_Code=0
```

Press Fn +INS to end the test

NOTE:

Press the Fn + INS to end the test can only work after pressing all keys on the keyboard.

3.8 Memory Test

This program will test the memory and shows you the total memory size.


```
        1. Memory Size Check
        2. Memory Test
        3. Return
```

```
Please Enter Your Choice -->
```
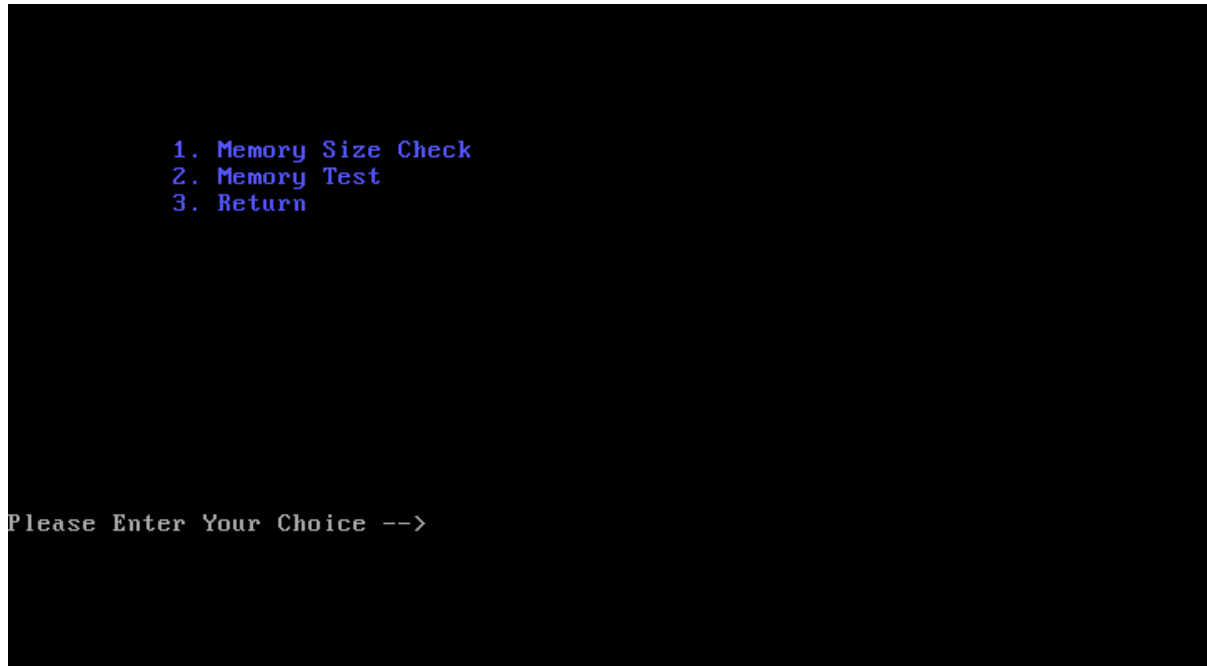
Choose "1" to check a total memory size.


```
                        Build DATE:2007-01-10
ASUS            Memory Utility, Copyright by ASUS Rev1.12            Diags
==============================================================================
Memory Module Information:
        DIMM0 = 2048 MB,
        DIMM1 = 2048 MB,
        Total Memory Size = 4096 MB, Memory working speed = 0 MHz




                    4096
                                    MB


                        ?Please confirm the memsize.  ?
                        ?                              ?
                                                 T.C.
                    Return_Code=-1
```
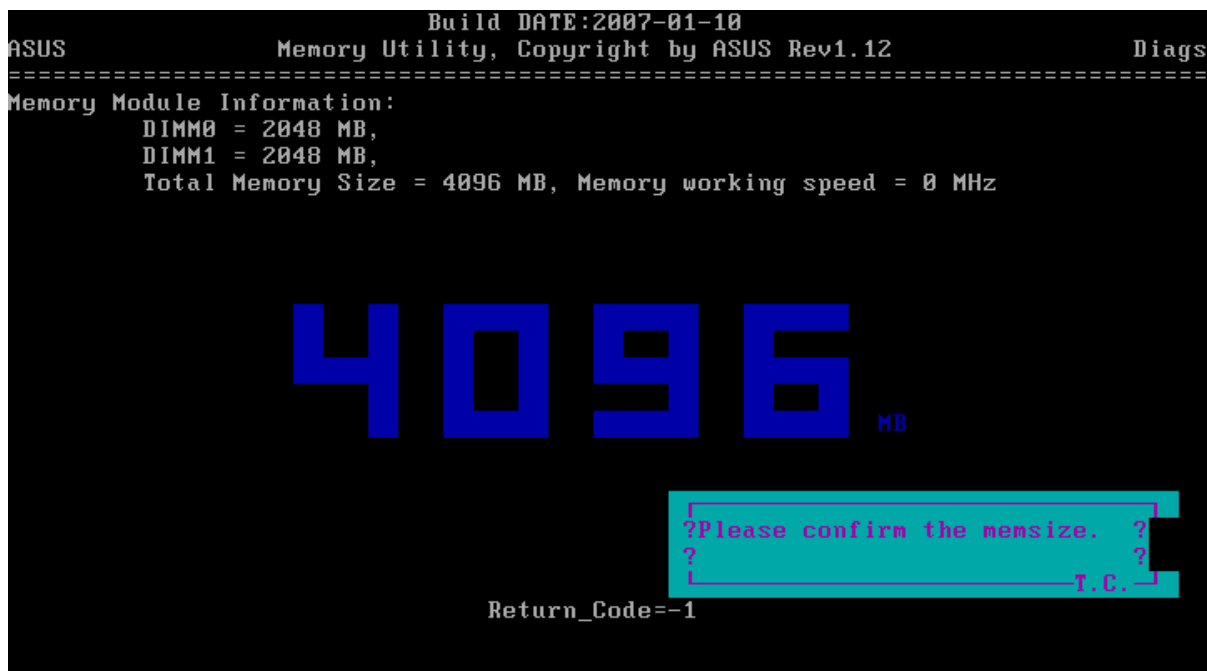
Press any key to back to the memory test interface, choose "2" to test memory.

```
                          Build DATE:2010-10-01
Pegatron      Memory Test Utility, Copyright by Pegatron Rev3.47          Diags
================================================================================
 E820h  No.03  Size:    1GB, 601MB, 932KB   All mem.size:    3GB, 915MB, 196KB

 Field       00000000:40005000h - 00000000:A59EDFFFh      Size ratio      40.78 %
                                                                                  5
 Pattern No: 500        5 &   6 Pattern->22222222:22222222 & DDDDDDDD:DDDDDDDD

                             Target Page Field        St.Time   End Time
                             ——— (2MB) ———
                       00000000:4AE00000h-00000000:4AFFFFFFh  18:17:18    :  :    0


 Moving    :             0   10   20   30   40   50   60   70   80   90  100 %
 Comparing :                                                                      5
 Success   :
 Failure   :
```

If test result is fail, the following screen will be display.

And press any key to continue.

MEMORY TEST FAIL!

3 Tests and Diagnostics

3.9 Function Test

Select the function test. Test program will test several functions and show the test result one by one.

```
                           Build DATE:2008-04-23
Pegatron     IRQ8 Tester using CMOS, Copywrite by Pegatron Rev1.10        Diags
================================================================================
IRQ8 Periodic Interrupt 2 times within 2 ms --> OK
  Now Time: 19:04:04
Alarm Time: 19:04:05
Alarm Interrupt Test OK(0) ...
Start&Update Interrupt Test OK ...992




                                          ?      IRQ8 Test Passed!!       ?
                                          ?      Please check time        ?
                                          └─────────────────────────T.C.─┘

Press any key to continue . . .Return_Code = 0
```

```
                           Build DATE:2008-12-22
Pegatron        FuncTest.exe, Copyright by Pegatron Rev1.06               Diags
================================================================================
  Setting Clock... OK!
  Testing DMA Controller: P8237A-5 #1, P8237A-5 #2, Page Registor OK!
  Testing Interrupt Controller ... OK!
  Testing Protect Mode... OK!
  Testing Coprocessor... OK!
  Testing Clock... OK!
  Testing Calendar... OK!




                                         ? Function Test Passed!!       ?
                                         ?                              ?
                                         └──────────────────────────T.C.─┘

C:\>                           Return_Code=0
```

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3.10   STORE Test [CD/DVD-ROM TEST]

Note: When test ODD device, please use ISO image test program with CD-ROM Media.

This Program will test if the CD/DVD-ROM works properly in the ODD mode, please insert ISO image test program CD before test.

When test passed, the following screen will be displayed.

If test fail, the following screen display.
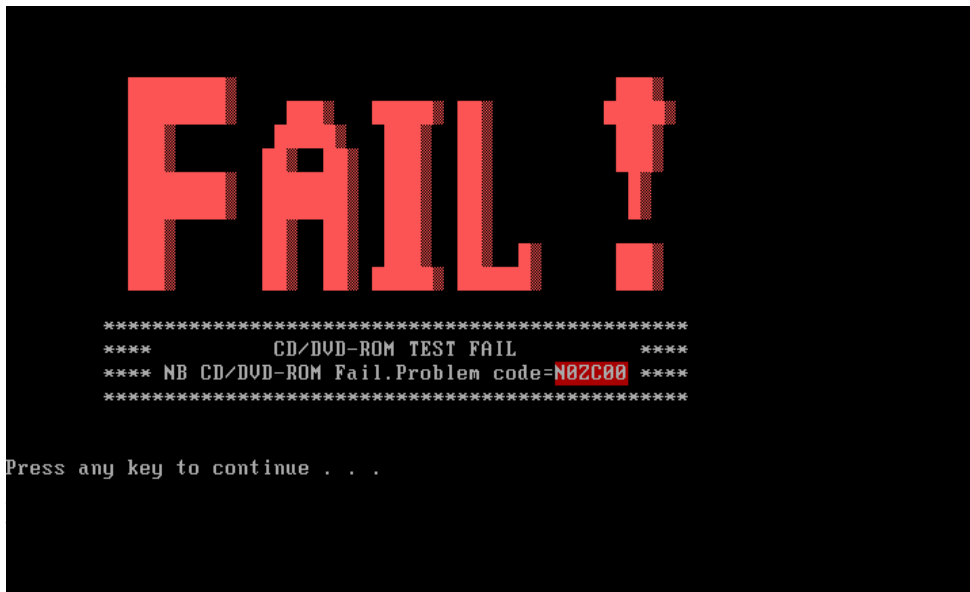
3.11   LED Test

Choose a number of test items as following test items.

```
        1. Caps LED Test
        2. Num Test
        3. BATT LED Test
        4. Power LED Test
        5. DC IN LED Test
        6. WLAN LED Test
        7. Return




Please Enter Your Choice -->
```
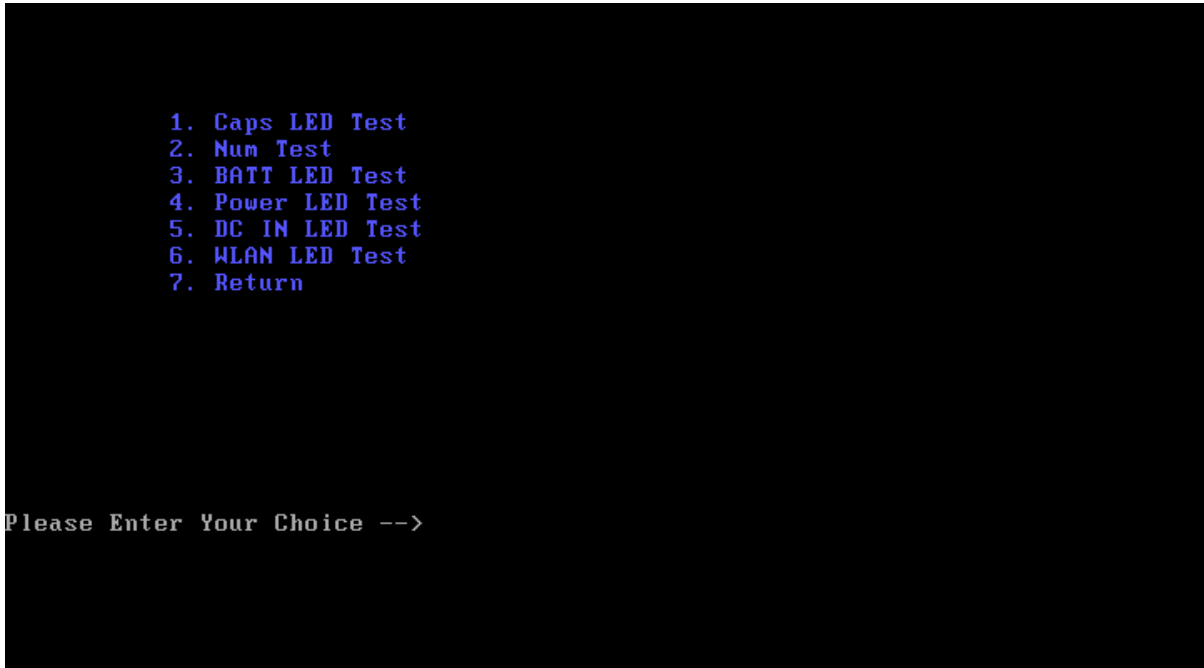
When testing, please check the statues of led marked in below picture is right.

CAPS LOCK
ON: Green

NUM LOCK
ON: Green

WLAN
ON: Red

BATT
ON: Red

DC IN
ON: White

POWER
ON: White

3.12   LID Switch Test

Run the LID Switch test, refer to the instructions as below.

This part shows how to use the Diagnostics to test the LID functions.

After active LID function (close the upper cover to less than 10 degree) please use your finger, then check LCD bright or not.

3.13 SDCARD Test

> *Note:*
>
> *When test SD Card device, please use ISO image test program with CD-ROM Media.*
>
> *And insert the SD card with unlock condition to SD card slot.*

UNLOCK

3.14 HDD TEST

There are three items you can choose to test:

```
        1. HDD Detect
        2. HDD Read Test
        3. HDD R/W Test
        4. Return




Please Enter Your Choice -->
```

1. HDD Detect:

Num	Dev	Device Model	Serial Number	F/W Rev	LBA Size	HDD Size
1		TOSHIBA MK3275GSX	Y1B2C4MTT	GT001M	2542EAB0	320.07GB
3		MATSHITADVD-RAM UJ8D	YH58 393165	1.00		
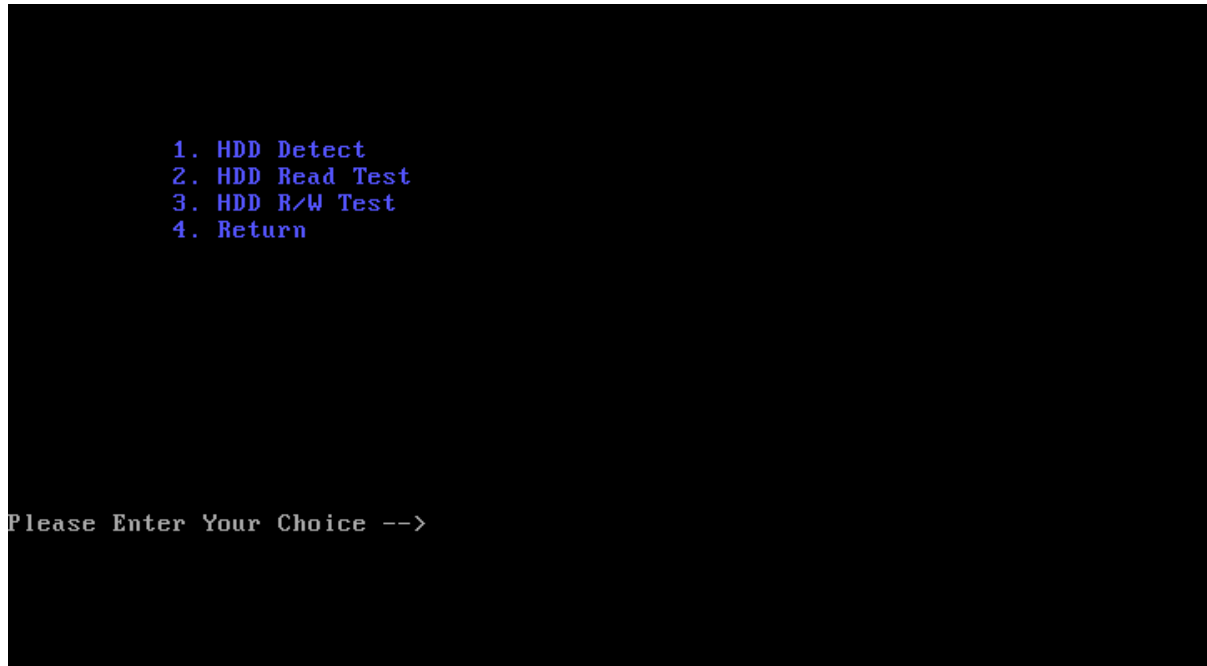
PATA&SATA Utility
Copyright by Pegatron, Build Date:2008-12-01 Rev1.34
... Device Information List ...

If it fails to detect HDD, the location of information marked in picture will be empty

3 Tests and Diagnostics

2. Read HDD:

1. R/W HDD:

Note:
When test the read and write HDD, the password is: hard disk

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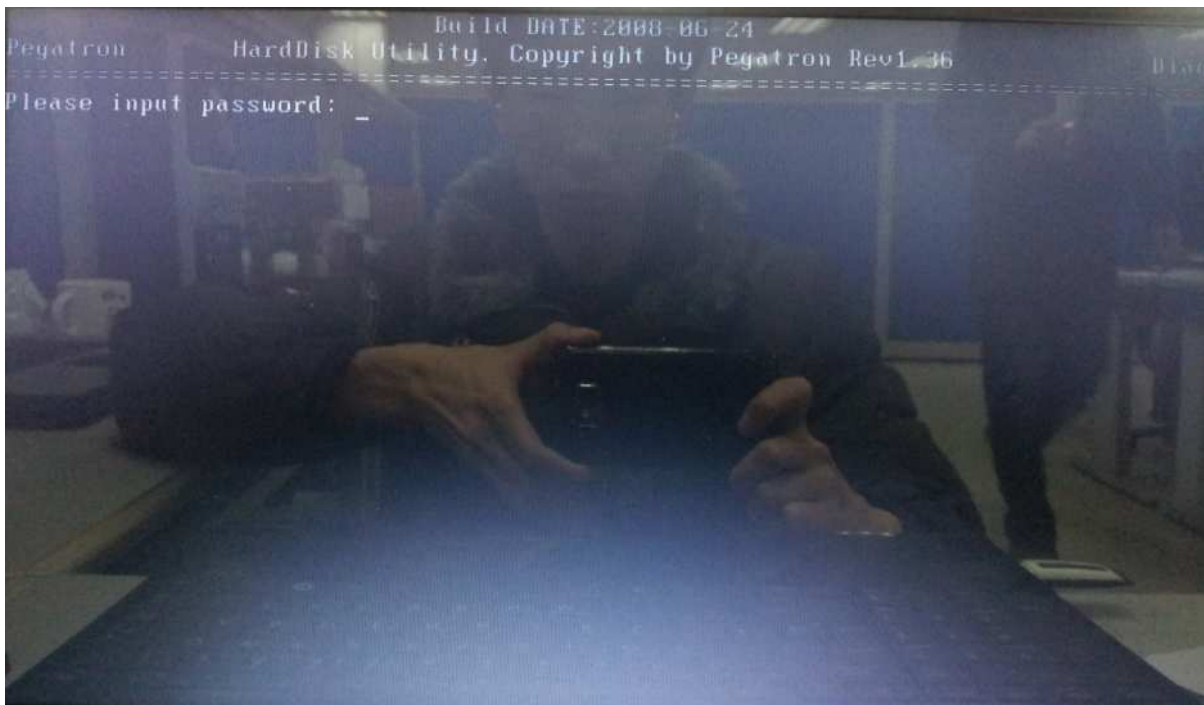
3.15 Wireless Test (Wireless device detective check)

This program is to detective Wireless device.

```
                        Build DATE:2008-10-30
Pegatron          COMMON Tool, Copyright by Pegatron Rev2.26              Diags
================================================================================

Search Data = NETWORK CONTROLLER

The Result Is :
Line 17 =    03     00     00    8086 0885   5F   8086 1305   NETWORK CONTROLLER




                                              WWIRLESS device check PASS!!   ?
                                            ?                                ?
                                                                     T.C.

Press any key to continue . . .

                              Return_Code=0
```

Note:

 This test program tests the WIRELESS device ID pass or fail.

3.16 Web camera Test

This program is to check webcamera ID.

Due to web camera is a USB device for this model, so it can not be test by USB file, please test it by using ISO file.

Note:

When test the Web camera, the program will check the device ID, all of the USB ports will be closed, so you cannot test this one within the USB mode. Please test it in the ODD mode.

3.17   Speaker Test

This program will test left channel, right channel and two wave files to test speaker function.
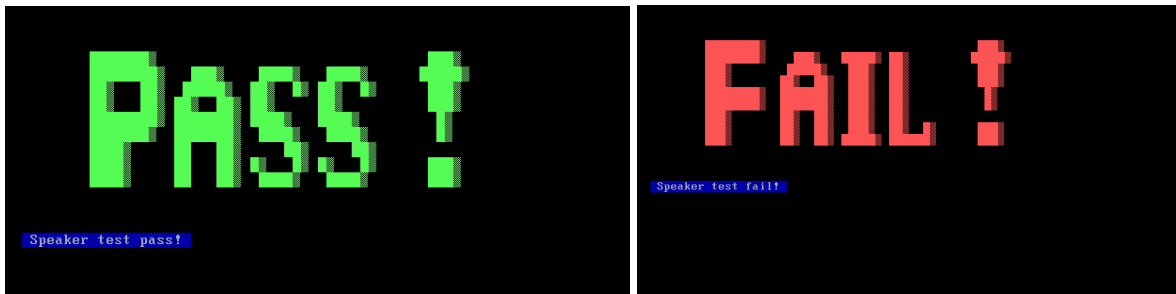
Note:

When you test the speaker, you can hear two piece of music, press "Y" to continue;

If you can't hear music, press "N"

3.18 Read and write DMI Test

This program could read and write below strings from/to DMI block.

1. Manufacture
2. Product Name
3. Pa-Number
4. Serial Number
5. Type 11
6. UUID

```
        1. Read DMI
        2. Write Manufacture
        3. Write Product Name (32 byte)
        4. Write Pa-Number  (32 byte)
        5. Write Serial Number  (32 byte)
        6. Read Type11    (64 byte)
        7. Write Type11   (64 byte)
        8. Write UUID
        9. Return



Please Enter Your Choice -->
```

DMI information: (1. Reader DMI)


```
                             Build DATE:2010-02-22
Pegatron       SMBIOS Utility, Copyright by Pegatron Rev1.30.01          Diags
================================================================================
 System Information(Type 1)
00: Type = 01 , Length = 1B , Handle = 0001
04: Manufacturer = TOSHIBA
05: Product Name = PLCSF
06: Version = 123456-654321
07: Serial Number = 987654321
08: UUID = A2BFE5C8DD22D9D55D03386077F80FD9
18: Wake-up Type = 06
19: SKU Number = 123456-654321
1A: Family = Type1Family

                                 Return_Code=-1
```

Write Manufacture: (2. Write Manufacture)


```
                             Build DATE:2010-02-22
Pegatron       SMBIOS Utility, Copyright by Pegatron Rev1.30.01          Diags
================================================================================
 System Information(Type 1)
00: Type = 01 , Length = 1B , Handle = 0001
04: Manufacturer = TOSHIBA
```

Write Produce Name: (3. Write Produce Name)


```
                             Build DATE:2010-02-22
Pegatron       SMBIOS Utility, Copyright by Pegatron Rev1.30.01          Diags
================================================================================
 System Information(Type 1)
00: Type = 01 , Length = 1B , Handle = 0001
05: Product Name = PLCSF
```

Write Pa-Number: (4. Write Pa-Number)

```
                        Build DATE:2010-02-22
Pegatron        SMBIOS Utility, Copyright by Pegatron Rev1.30.01        Diags
================================================================================
 ┌─System Information(Type 1) ──────────────────────────────────────────────┐
 │00: Type = 01 , Length = 1B , Handle = 0001                                │
 │06: Version = pskc8a-01p00s AA BB                                          │
 └───────────────────────────────────────────────────────────────────────────┘

 Please Input a String:^C
```

Write Serial Number: (5.Write Serial Number)

```
                        Build DATE:2010-02-22
Pegatron        SMBIOS Utility, Copyright by Pegatron Rev1.30.01        Diags
================================================================================
 ┌─System Information(Type 1) ──────────────────────────────────────────────┐
 │00: Type = 01 , Length = 1B , Handle = 0001                                │
 │07: Serial Number = 987654321                                              │
 └───────────────────────────────────────────────────────────────────────────┘

 Please Input a String:^C
```

Read Type 11: (6. Read Type11 64 byte)

```
                        Build DATE:2008-09-03
Pegatron        SMBIOS Utility, Copyright by Pegatron Rev1.26           Diags
================================================================================
 ┌─ OEM Strings(Type 11) ────────────────────────────────────────────────────┐
 │00: Type = 0B , Length = 05 , Handle = 000D                                │
 │04: Count = 05                                                             │
 │01: String: T                                                             │
 │02: String: 6AAtpdr54-EkQ                                                 │
 │03: String: k890VSws+Oa7e                                                 │
 │04: String: ZHO3OYiC9yj2F                                                 │
 │05: String: To Be Filled By O.E.M.                                        │
 └───────────────────────────────────────────────────────────────────────────┘
```

Write Type 11: (7. Write Type11 64 bytes)

```
                        Build DATE:2008-09-03
Pegatron        SMBIOS Utility, Copyright by Pegatron Rev1.26           Diags
================================================================================
 ┌─OEM Strings(Type 11) ─────────────────────────────────────────────────────┐
 │00: Type = 0B , Length = 05 , Handle = 000D                                │
 │01: String: T                                                             │
 └───────────────────────────────────────────────────────────────────────────┘

 Please Input a String:^C
```

Write UUID: (8. Write UUID)

UUID is built by 20 bytes random code and 12 bytes MAC address.
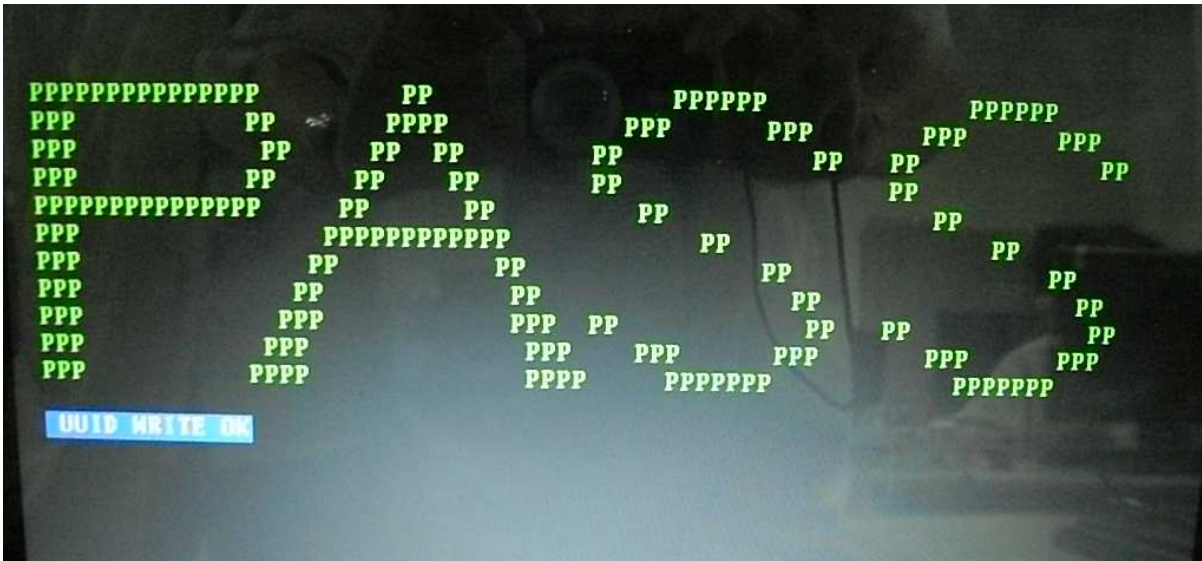
3.19   FAN Test

This program is to test FAN function, change fan speed to see if it is in correct range.
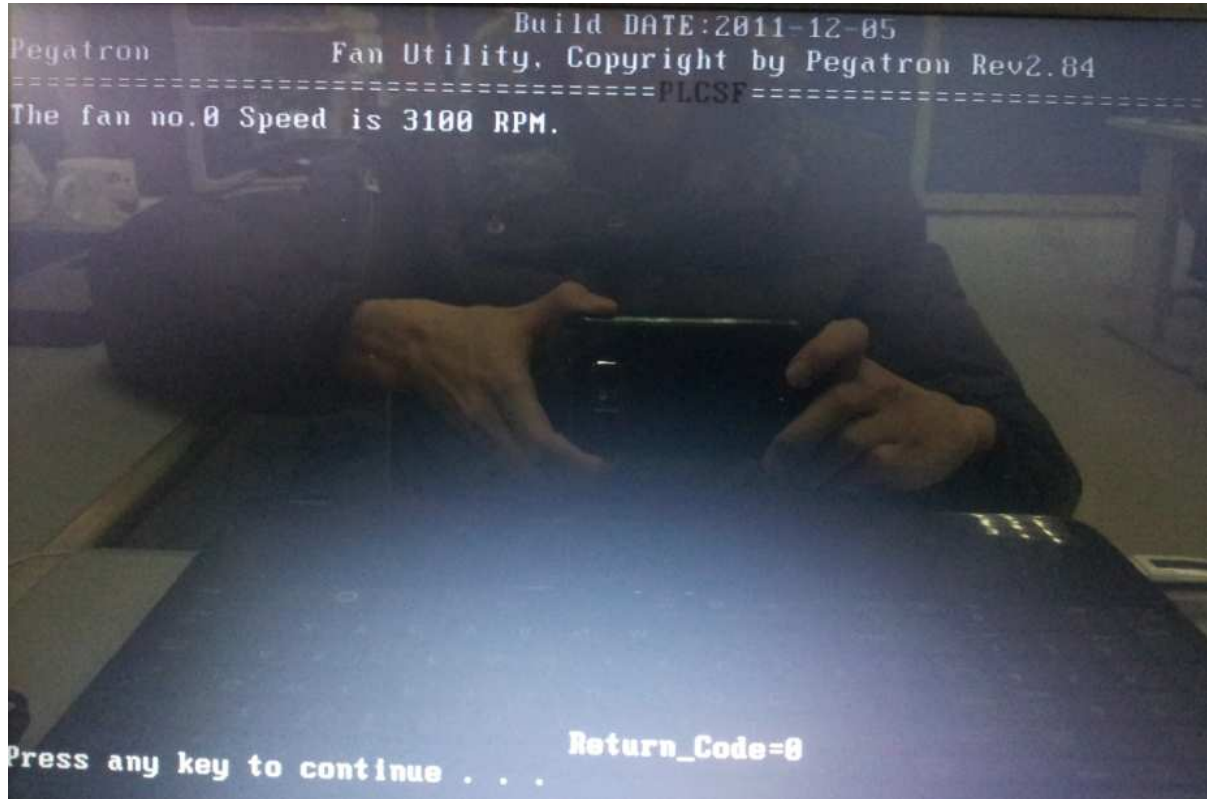
Note:

The items will test the fan function, if it's not among the range of 2500-5500 RPM, it will show fail.

3.20 Write the Market Key

When MB is replaced at a repair station, the data of the market key must be written in EEPROM so that the OS of the system can be active to use normally.

The program will show like below so that the key can be written or delete from the ROM.

Press **W** to write the market key.

Press *D* to delete the market key please.

Chapter 4
Disassembly and Assembly Procedures

Chapter 4   Contents

4.1   Remove the Battery pack

1. Turn off the power of the computer. Disconnect the AC adapter and other external devices from the computer.
2. Turn the computer face down. Release the battery lock. Pull out the battery pack while sliding the battery latch.
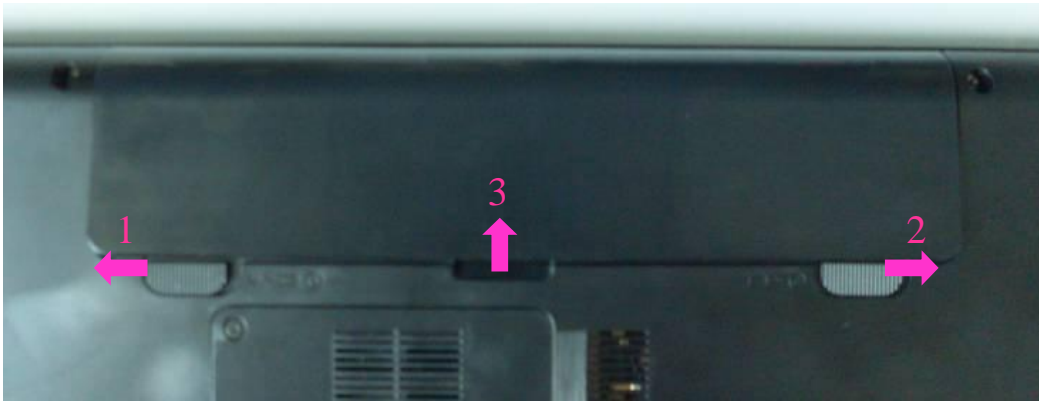
4.2   Remove the Media card

1. Grasp the Media card and pull it out.

4.3 Remove the HDD

1. Turn the computer upside down.
2. Loosen 1 screw (M2*6) and remove the HDD cover.
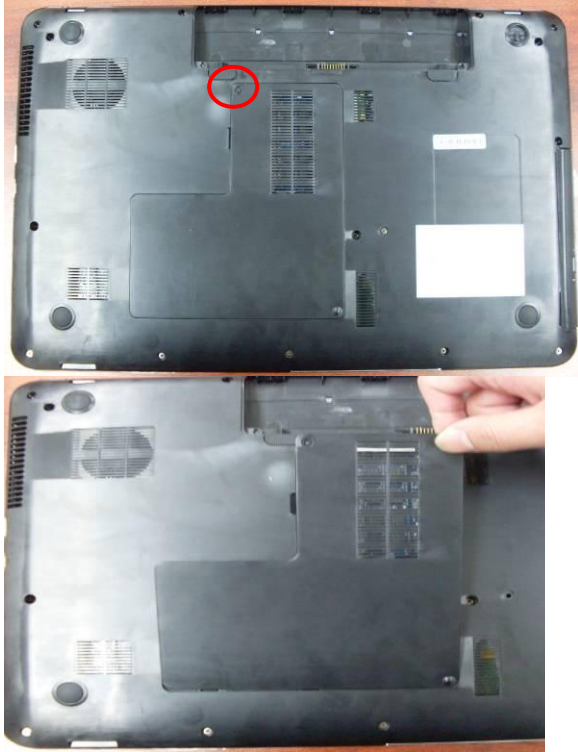
3. Pull the tab of the HDD assembly to remove it from the connector of the HDD cable. Be careful not to damage the connector.

4. Place the HDD assembly on a flat surface, and remove 4 screws (M3*3).

5. Separate the HDD and HDD Mylar.

4.4   Remove the Memory Module

1. Press two latches outward and remove the memory module.
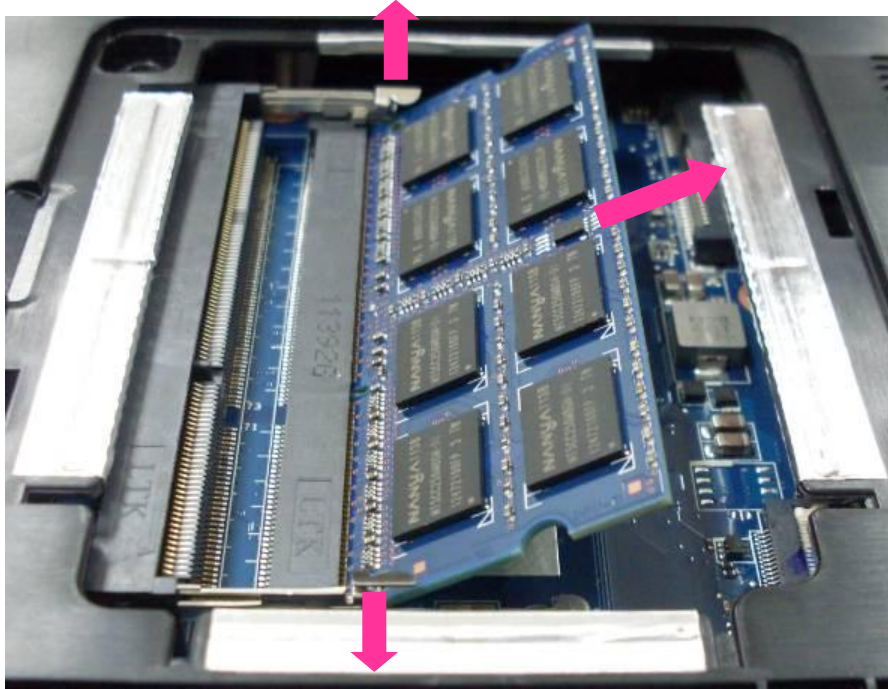
4.5   Remove the Optical Disc Driver Module

1. Remove 1 screw (M2*6) securing the latch of the Optical Disc Drive.
2. While pulling the module towards the direction of the arrow in the figure below, remove the Optical Disc Drive module.
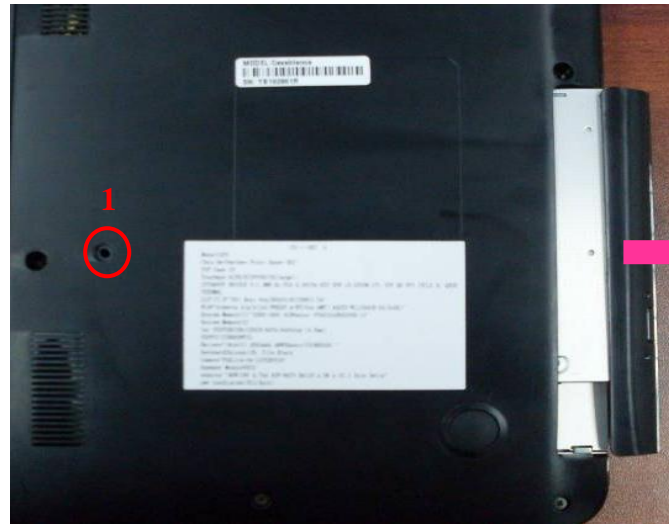
3. Remove ODD bezel ASSY and 2 screws (M2*3) securing the ODD bracket

4.6 Remove the Keyboard

1. Turn the computer over and open the display and remove the keyboard cover.

Tips:
To avoid deforming the edges of keyboard, a plastic pry slice of appropriate size is recommended. Please see the below spec.
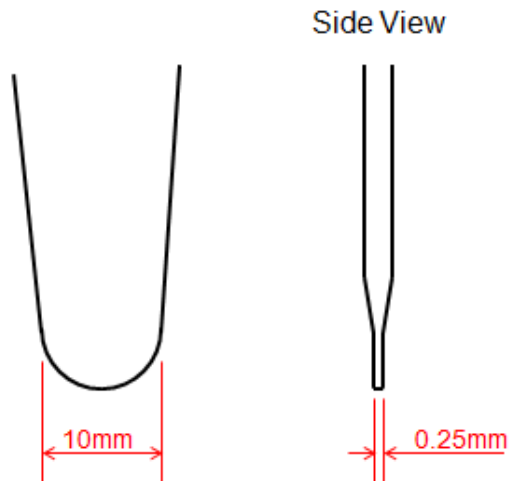
2. Lift the keyboard plate upward a little and turn it face down on the palm rest. Disconnect

the keyboard flexible cable on the main board, and then remove the keyboard.
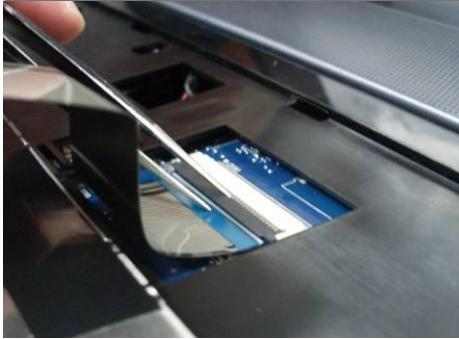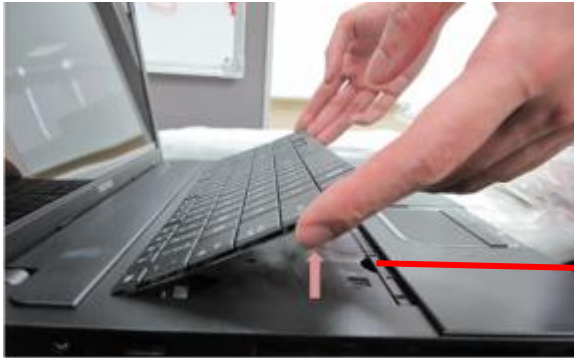
4.7 Remove the Bottom case

1. Turn the bottom case face up, remove 14 screws (M2*6) securing the bottom case.

2. Remove 8 screws (M2*6) securing the Top cover.. Disconnect the Touch pad FFC, power FFC, from the main board.
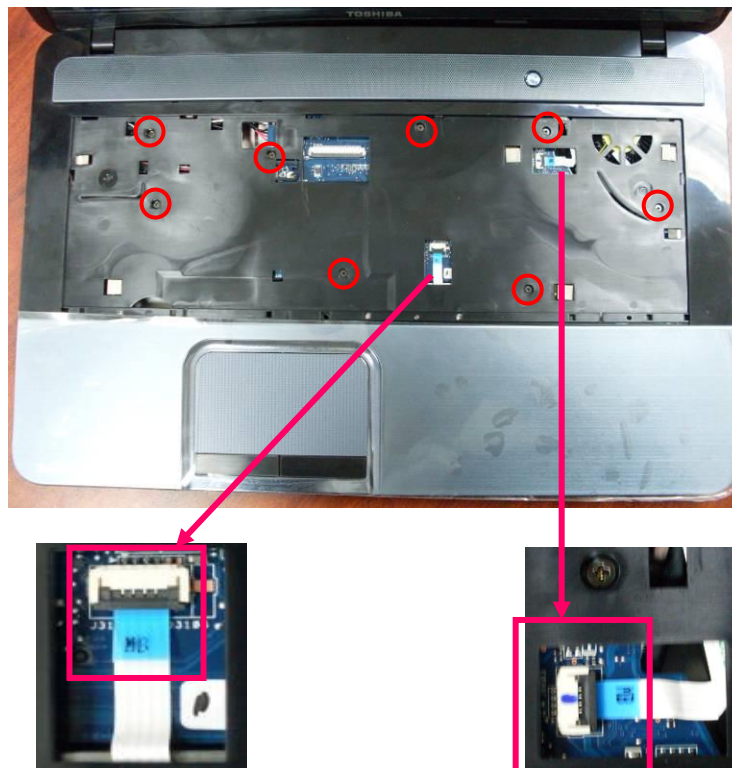
3. Separate the bottom case from the top cover.
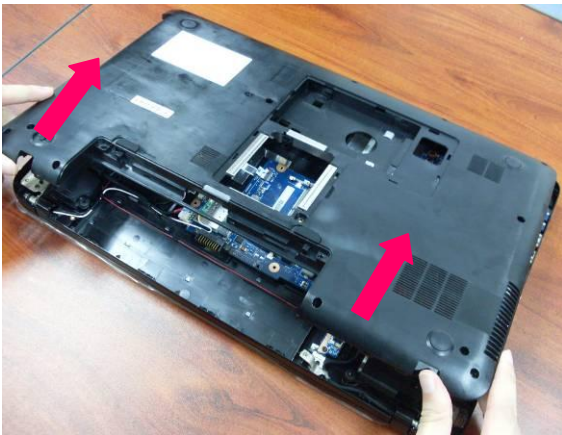
4.8   Remove the Touch pad Board

1. Disconnect the Touch pad board FFC.
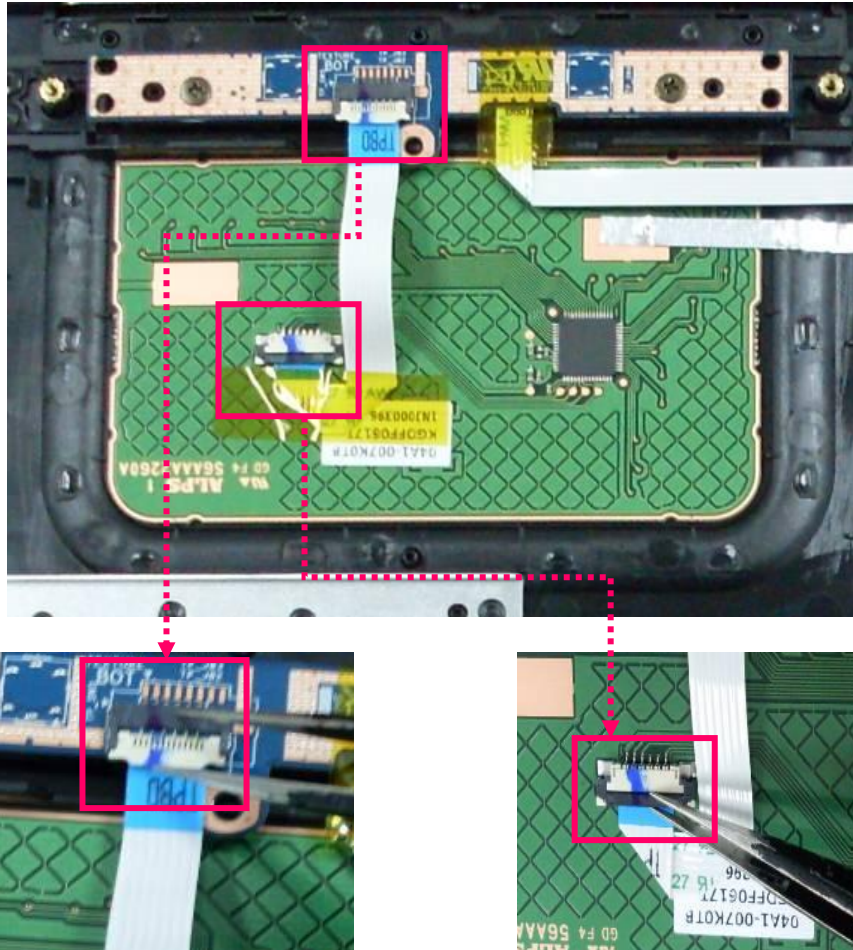
4.9   Remove the Touch pad Button board

1. Remove 2 screws (M2*3) as the following which fix the Touch pad button board, and then take the touch pad button board out of the bottom case.
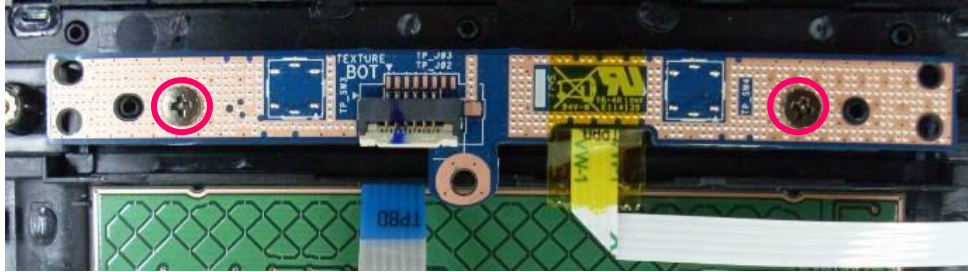
4.10 Remove the Power Board

1. Disconnect the Power FFC from power board.
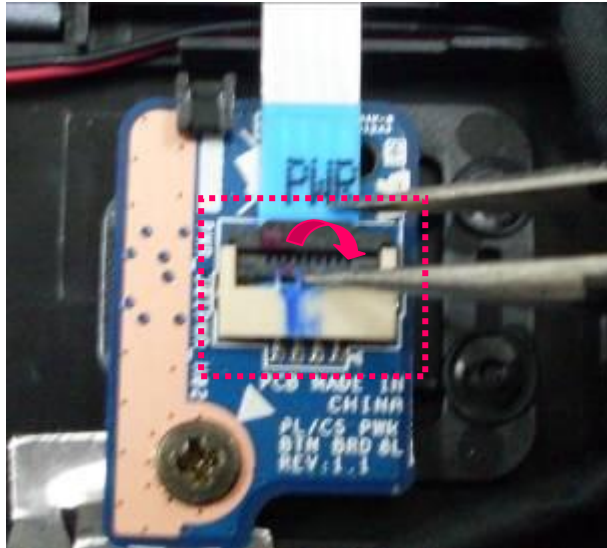
2. Remove 1 screw (M2*3) as the following which fix the power board.

3. Take the power board out of the top case.
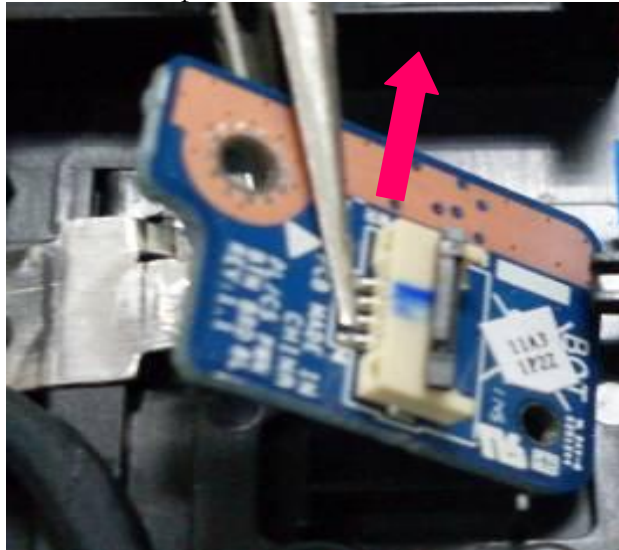
4.11 Remove the WLAN Board

1. Disconnect the Connector.
2. Remove 1 screw (M2*3) as the following, and take the WLAN board out of the system.
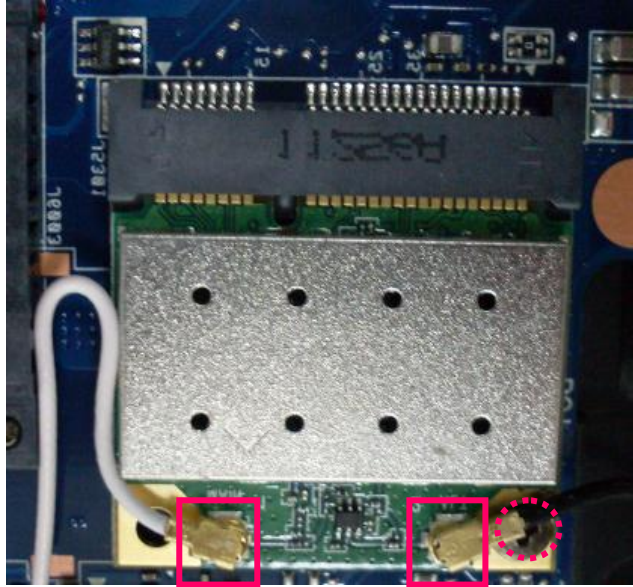
4.12 Remove the ODD Board

1. Disconnect the ODD FFC.
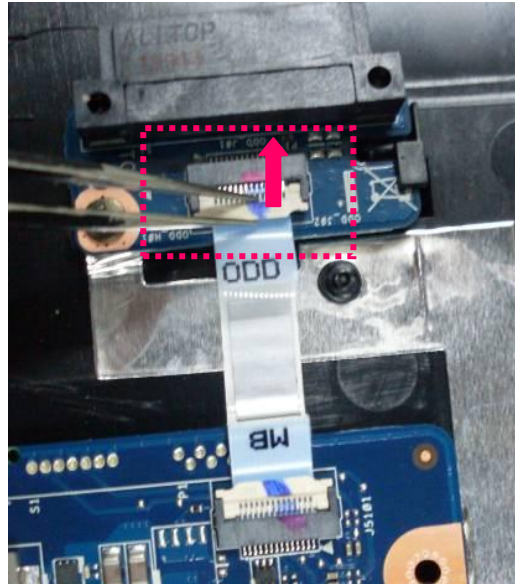
2. Remove the following 1 screw (M2*3) securing the ODD Board and take the ODD board out of the top case.
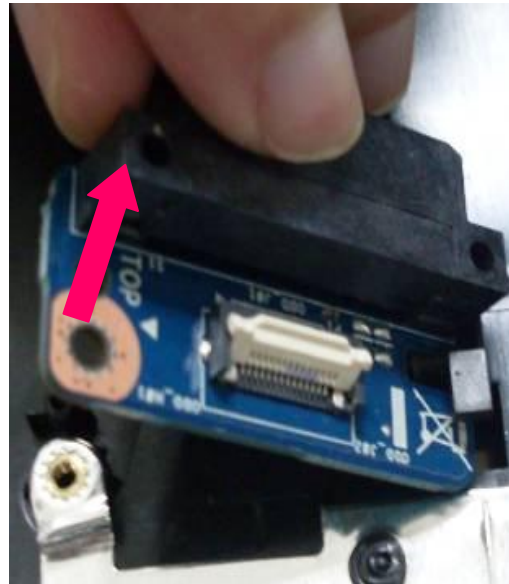
4.13 Remove the USB Board

1. Disconnect the USB board FFC.
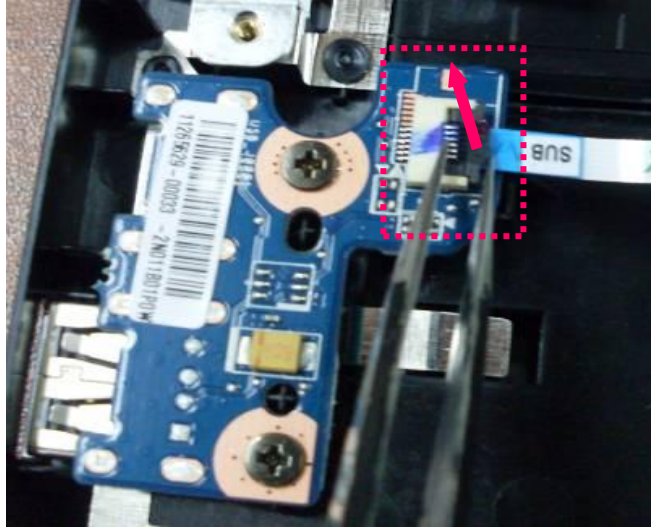
2. Remove the following 2 screws (M2*3) securing the USB board. Take the USB board out of the top case.
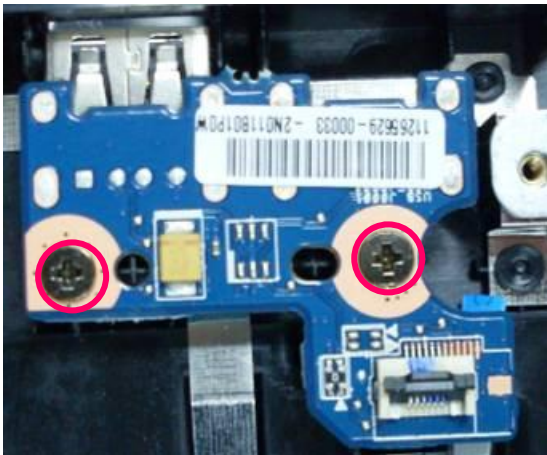
4.14 Remove the DC-IN cable

1. Disconnect the DC-IN cable from the main board.

2. Remove the DC-IN cable from the top case.
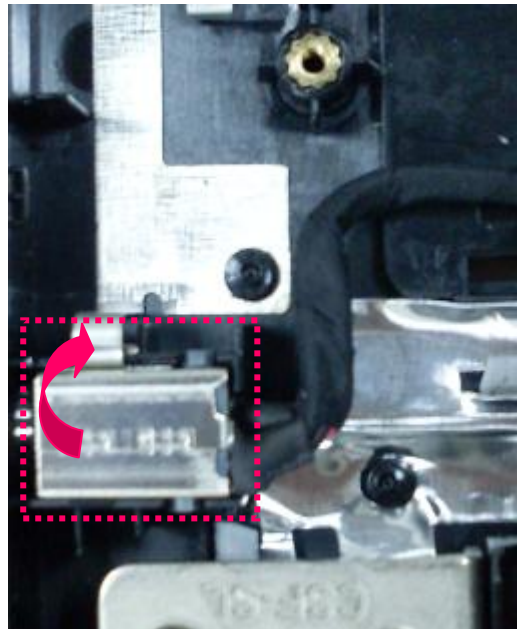
4.15 Remove the Thermal Module

1. Remove the following 2 screws (M2*5) securing the fan and disconnect the fan cable that connecting the fan with motherboard.
2. Remove 6 screws (M2*6) on the thermal module, then take the thermal module away.
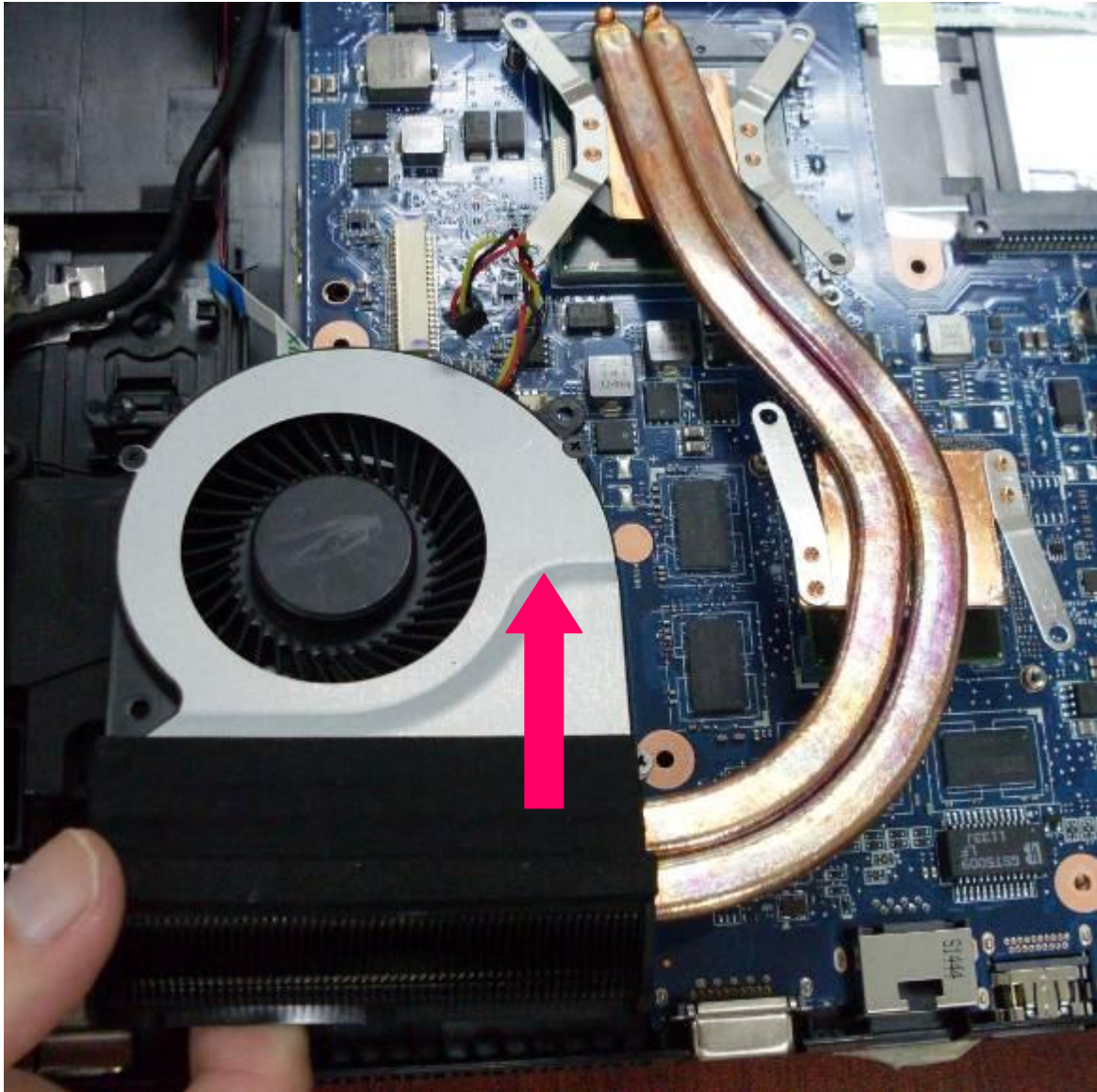
4.16 Remove the Main Board

1. Disconnect the LVDS COMS cable and audio cable from main board.
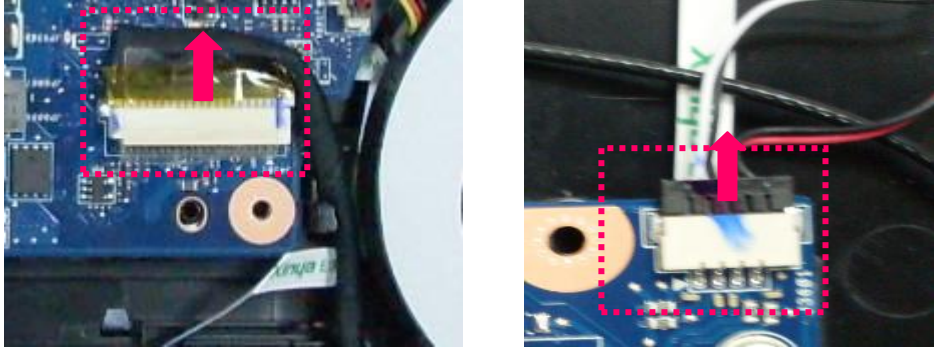
2. Remove 2 screws (M2*3) from the SD board and 2 screws (M2*3) from main board.
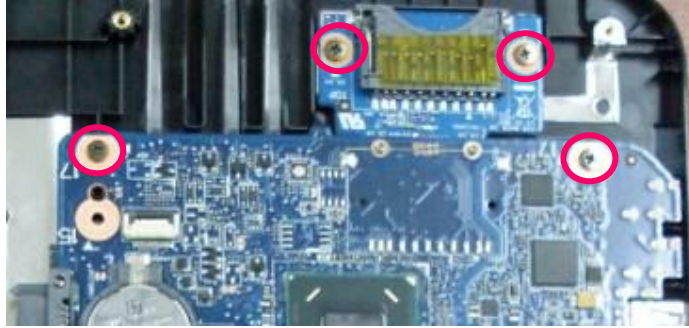
3. Removing the main PCB from the bottom case
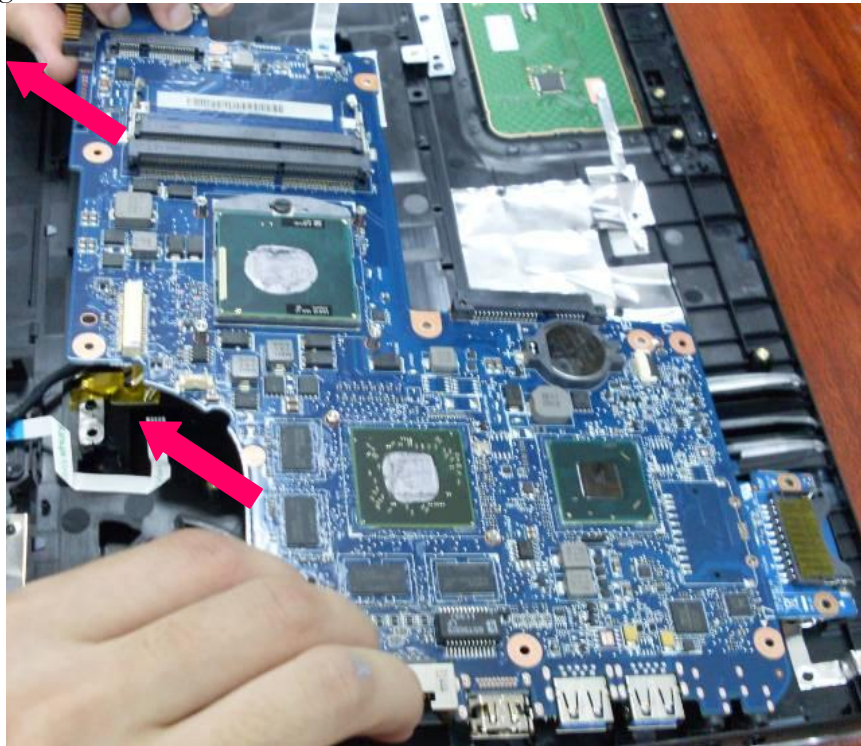
4.   Disconnect the ODD FFC and USB FFC from main board.
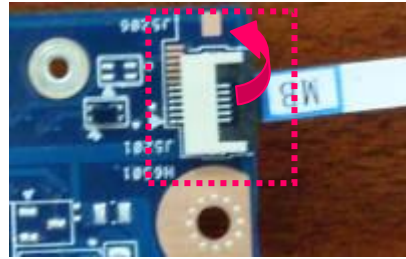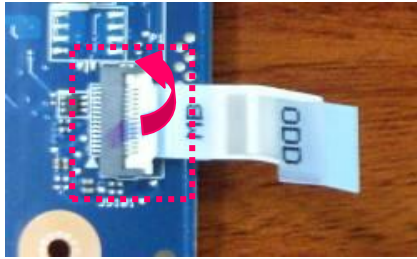
## 4.17 Remove CPU

1. Unlock the CPU by turning the cam counterclockwise on the CPU socket 180 degrees using a flat-blade screwdriver.
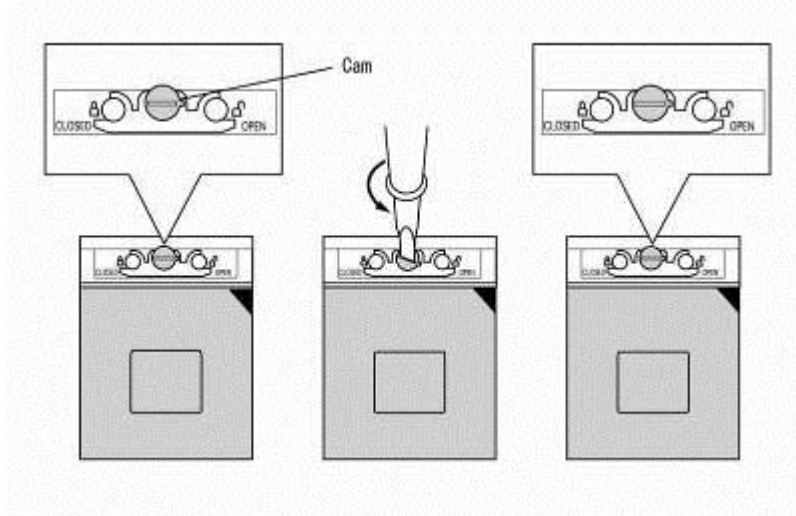
2. Remove the CPU.

4.18 Remove the Speaker

1. Remove the speaker from the top case.
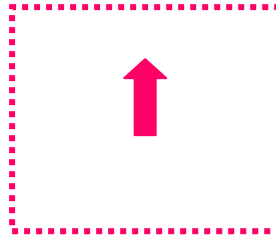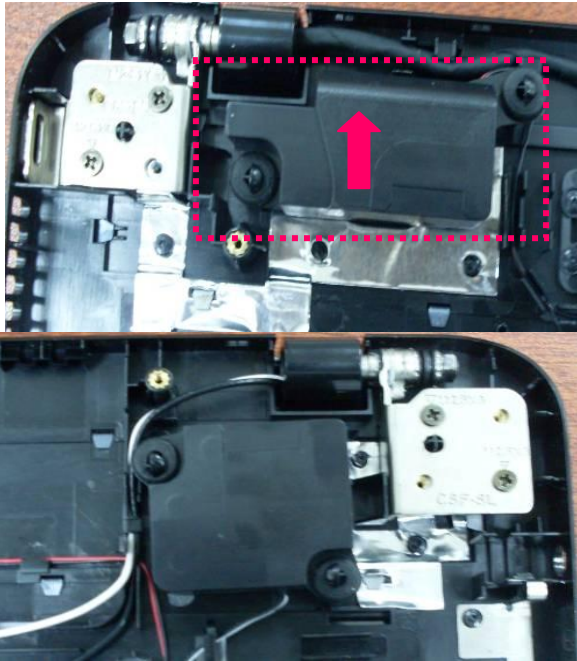
4.19 Remove the LCD module

1. Remove the following 4 screws securing the LCD Module.
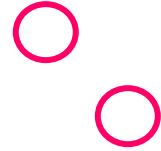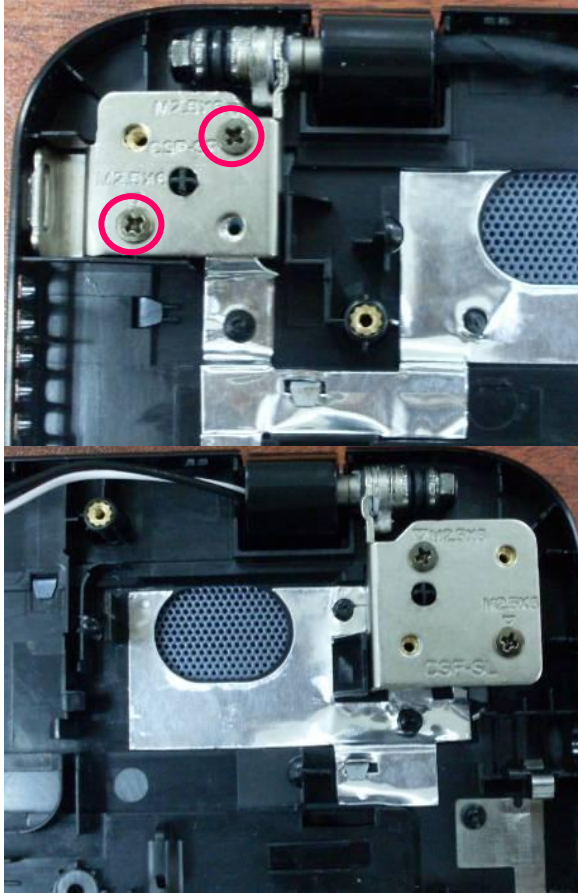
2. Remove the top case out of the system.
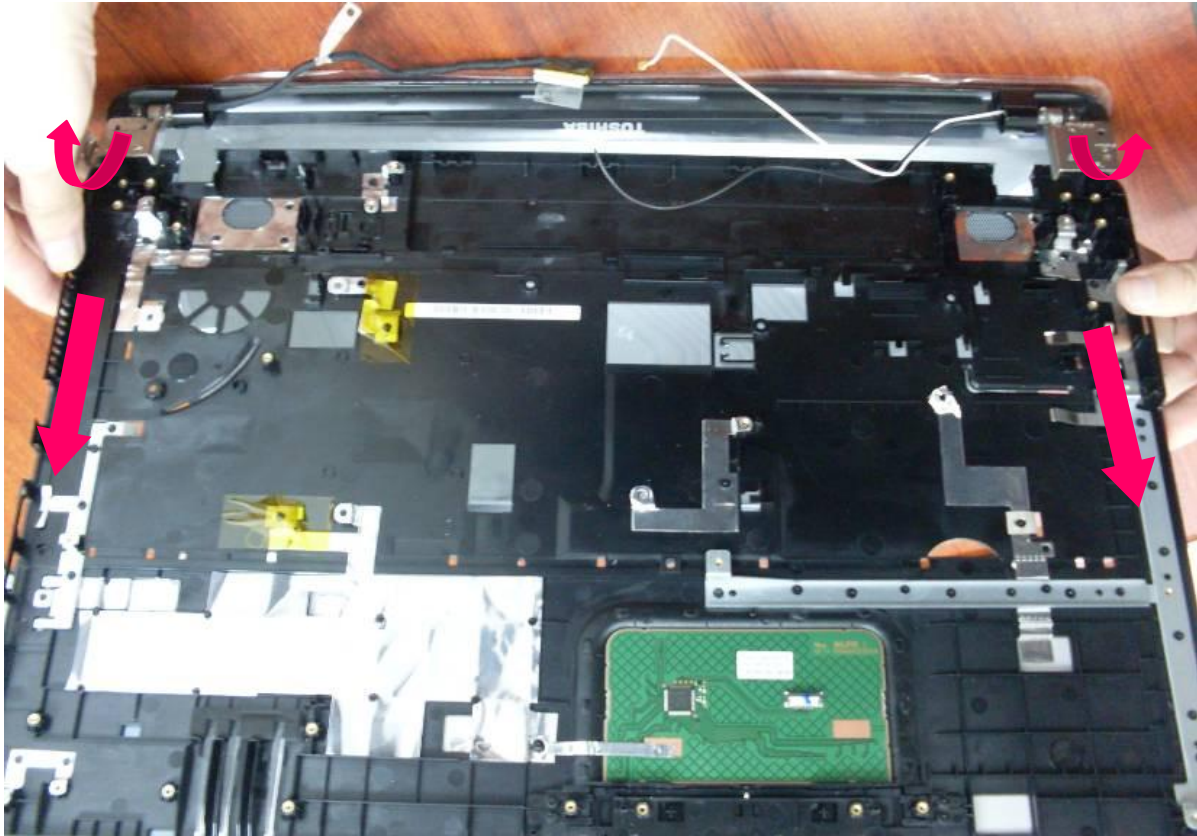
4.20 Remove the LCD unit

1. Remove 4 screw covers on the LCD bezel.
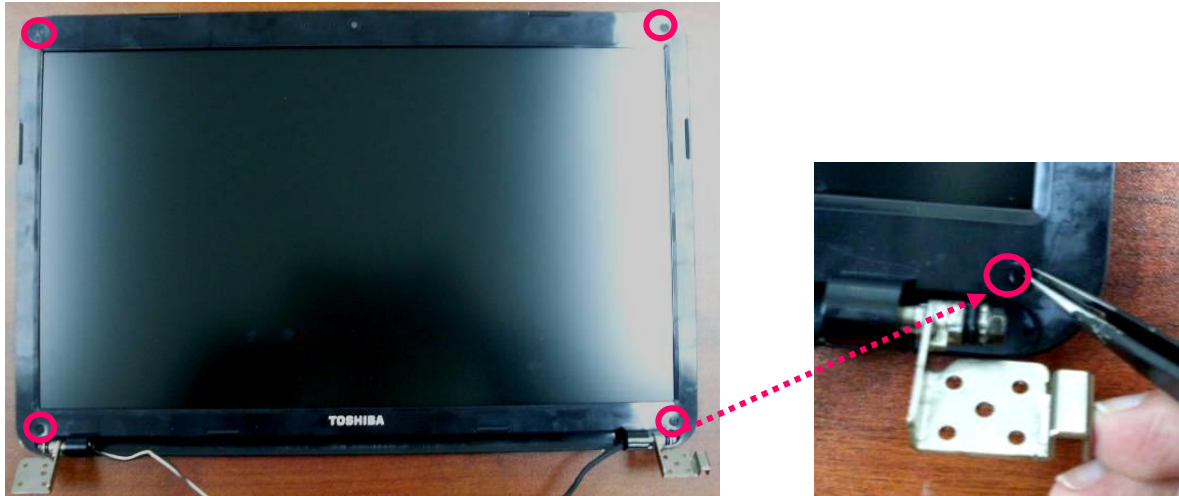
2. Remove the following 4 screws (M2.5*4) securing the LCD bezel.

3. Pry the outside edges softly to separate LCD front bezel from LCD panel and take it away.

4. Disconnect the camera cable
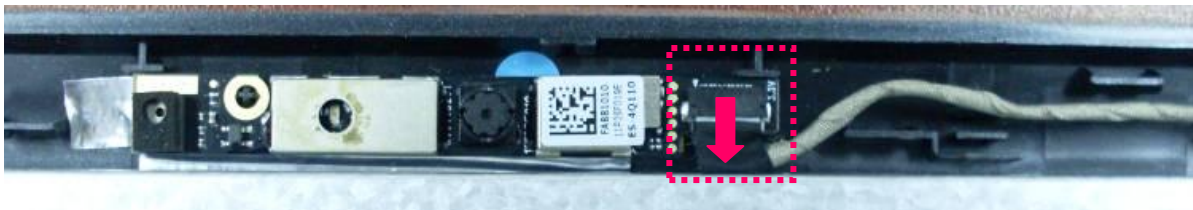
5.   Remove 4 screws (M2.5*4) on LCD hinge caps.
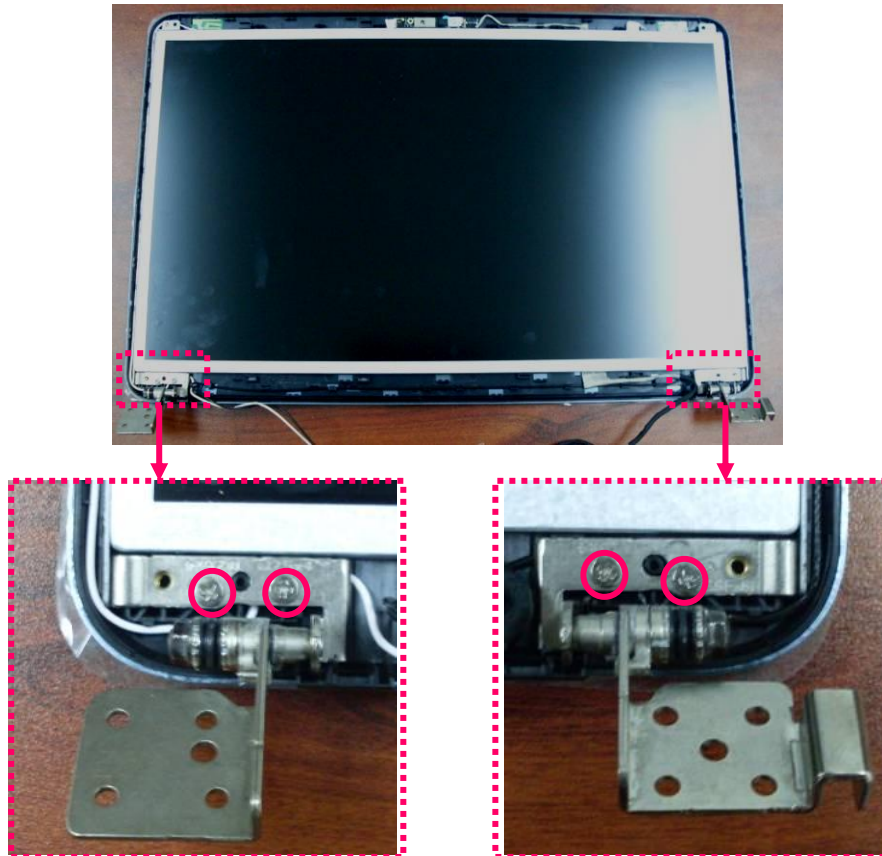
6.   Remove the LCD unit from LCD back cover, and place the LCD back cover facedown on a protective surface, disconnect the LVDS cable.
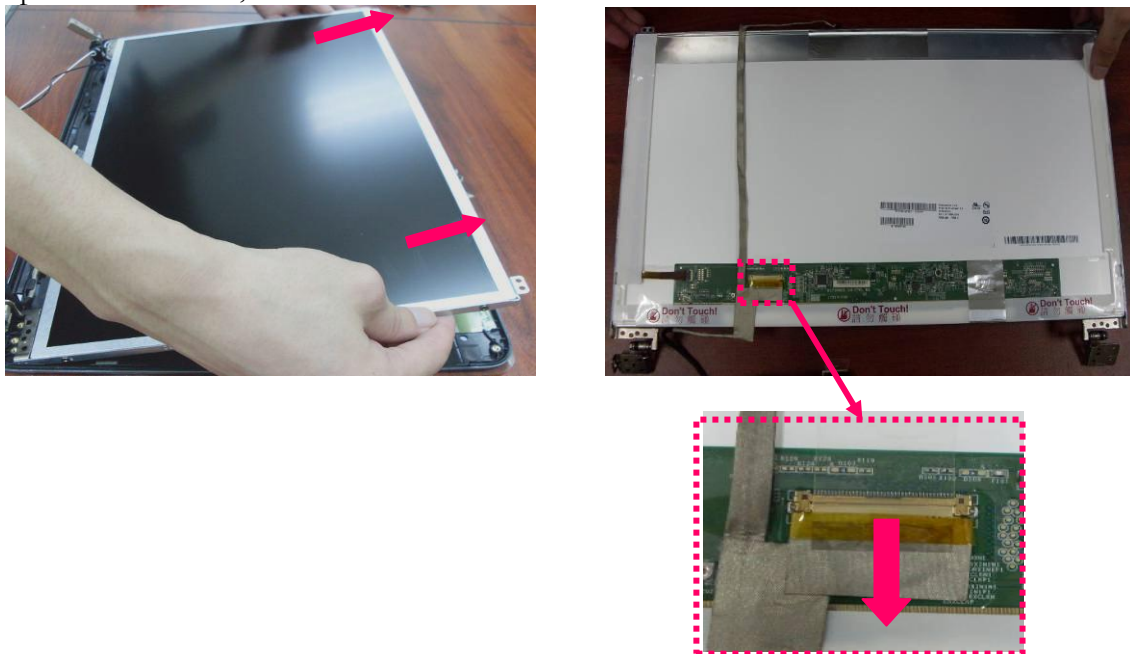
7.   Remove 8 screws (M2*3) securing the LCD supports and then remove them.
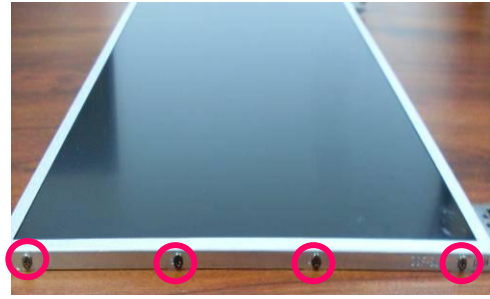
4.21 Remove the Camera

1. Take the camera out of the LCD back cover.

4.22 Replace the Camera

1. Install the Camera on the LCD back cover.

4.23 Replace the LCD Unit

1. To assemble the LCD brackets on L-R side of panel and fix 8 screws (M2*3) to each LCD Brackets.

2. To connect the LVDS CMOS cable with LCD panel and then assemble the LCD panel on the LCD back cover.

3. To fix 4 screws (M2.5*4) on LCD hinge caps.
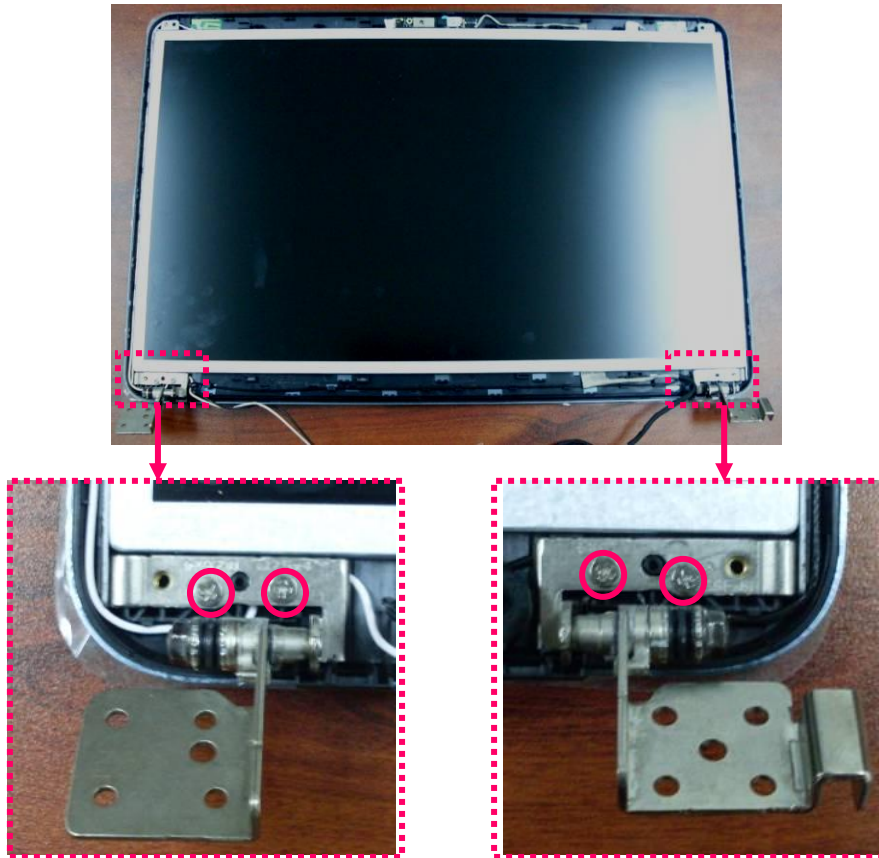
4. Connect the camera cable
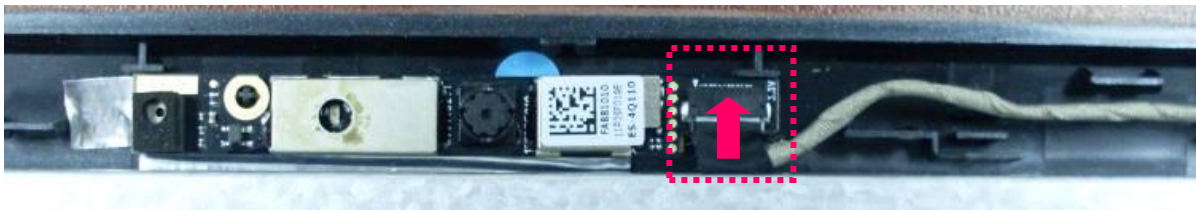
5. Seat the LCD front bezel pressing firmly all around to secure the latches.
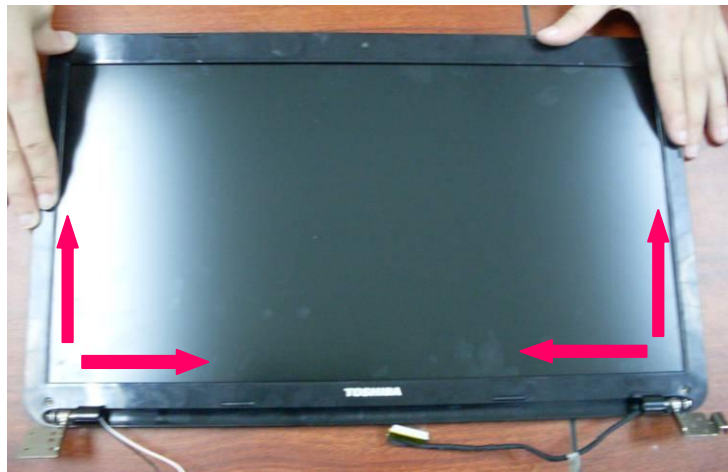
6. To fix the following 4 screws (M2.5*4) securing the LCD bezel.

7. To fix the following 4 screws (M2.5*4) securing the LCD bezel.

8. Install 4 screw covers on the LCD bezel.
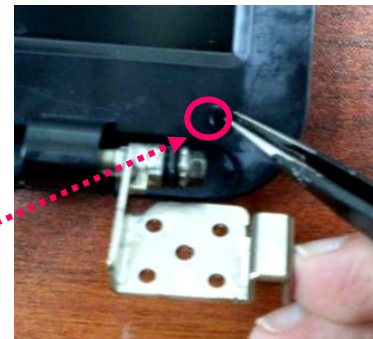
4.24 Replace the LCD Module

1. Install the top case on the system.
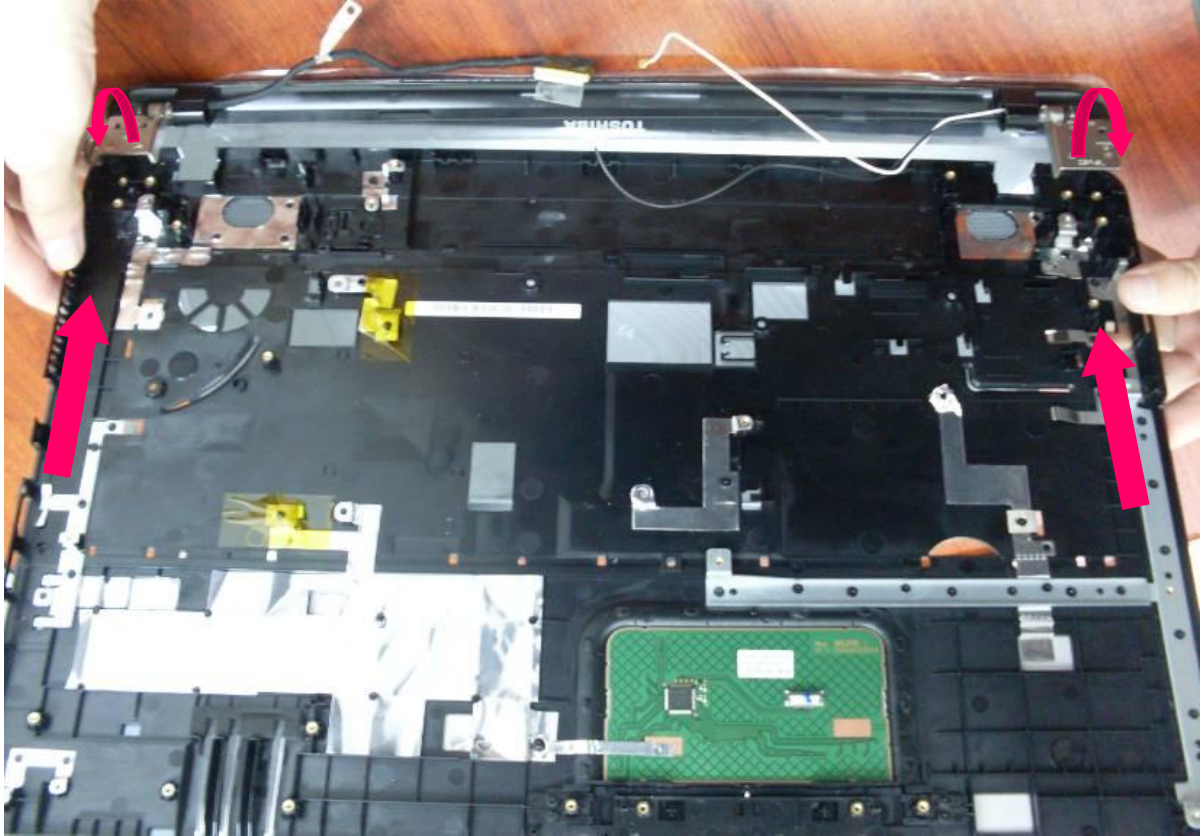
2. Fix the following 4 screws securing the LCD Module.
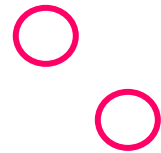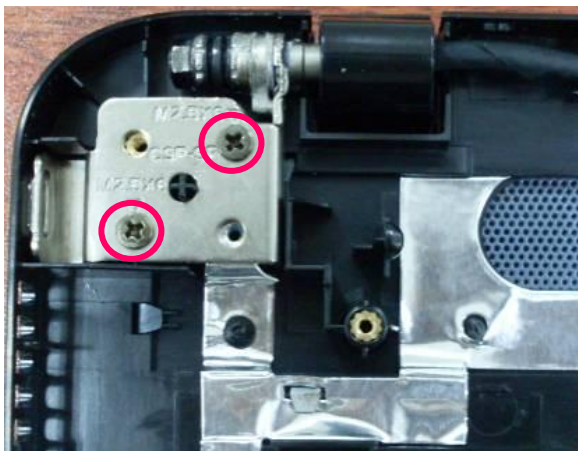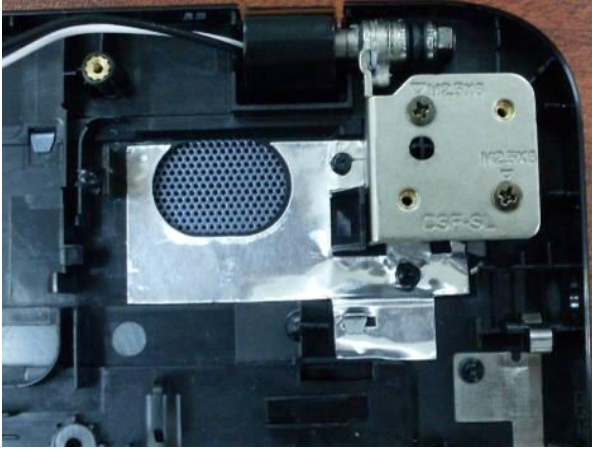
4.25 Replace theTouch pad Button board

1. Install the touch pad button board into the bottom case. Fix 2 screws (M2*3) as the following which securing the Touch pad button board.
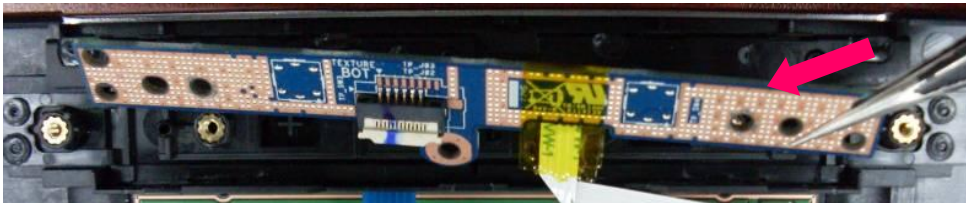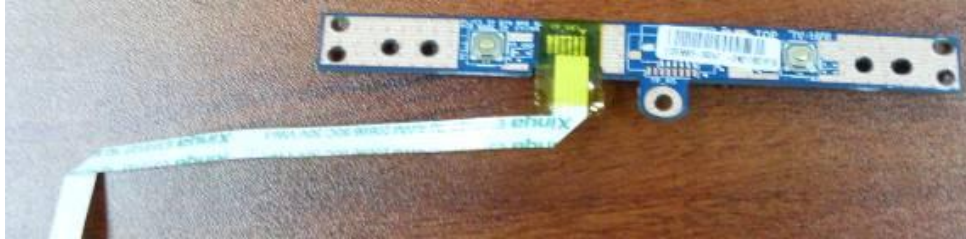
4.26 Replace theTouch pad Board

1. Connect the Touch pad board FFC and paste the tape to fix the cable.
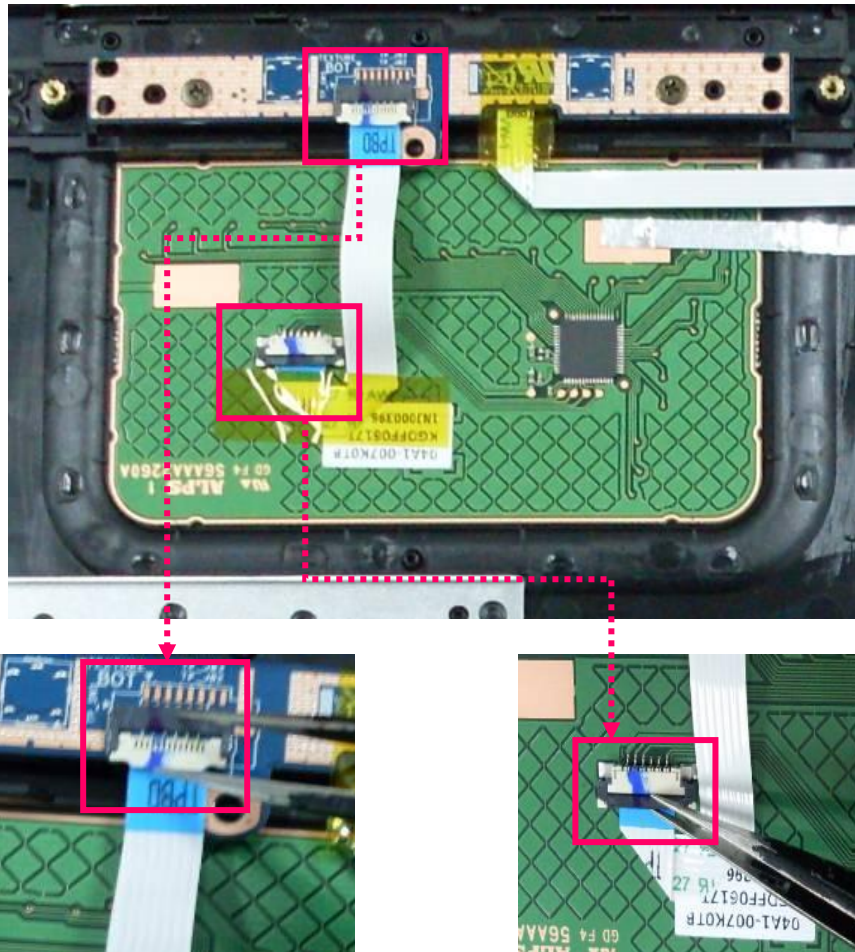
4.27 Replace the Speaker

1. Install the speaker on the top case.
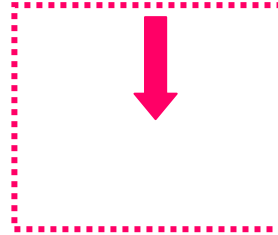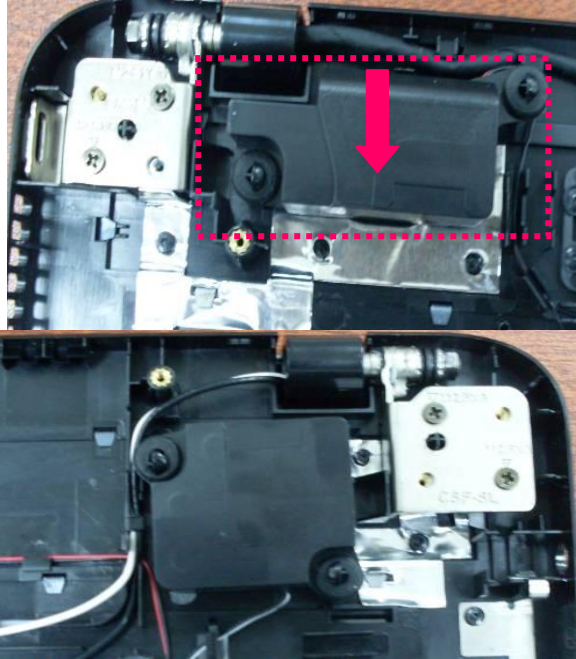
4.28 Replace CPU

1. Install the CPU.

2. Lock the CPU by turning the cam clockwise on the CPU socket 180 degrees using a flat-blade screwdriver.
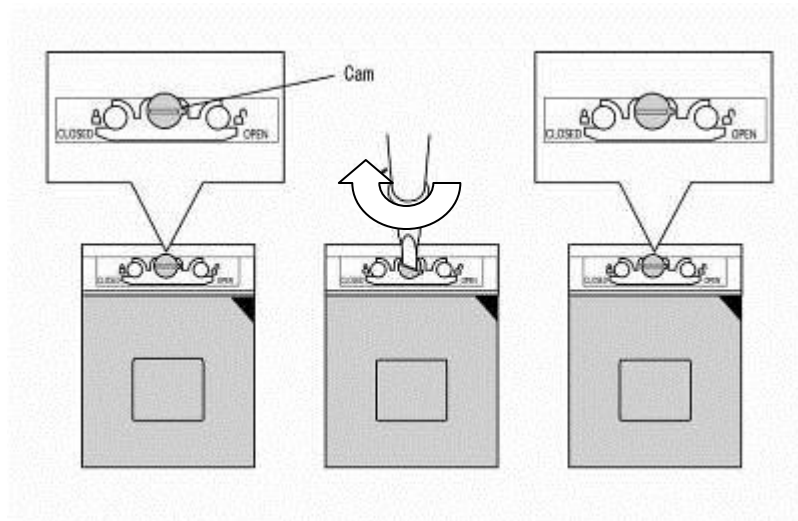
4.29 Replace the Main Board

1. Connect the ODD FFC and USB FFC to main board.
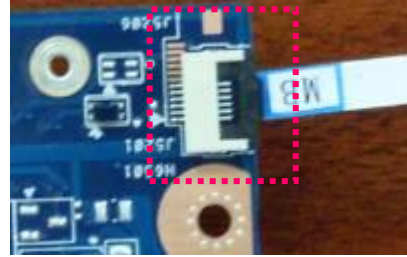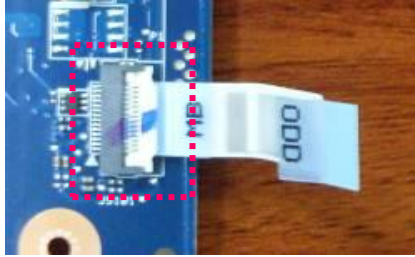
2. Connect the power FFC to main board.
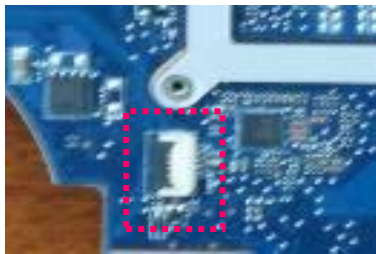
3. Install the main PCB into the bottom case. To fix 2 screws (M2*3) on the SD board and 2 screws (M2*3) on main board.

4. Connect the LVDS COMS cable to main board.
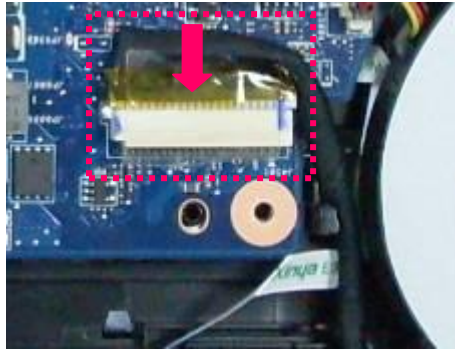
4.30 Replace the Thermal module

1. Install thermal module on the main board. Fix 6 screws (M2*6) on the thermal module.
2. Connect the fan cable that connecting the fan with main board. Fix the following 2 screws (M2*5) securing the fan.

4.31 Replace the DC-IN cable

1. Install the DC-IN cable in the top case.
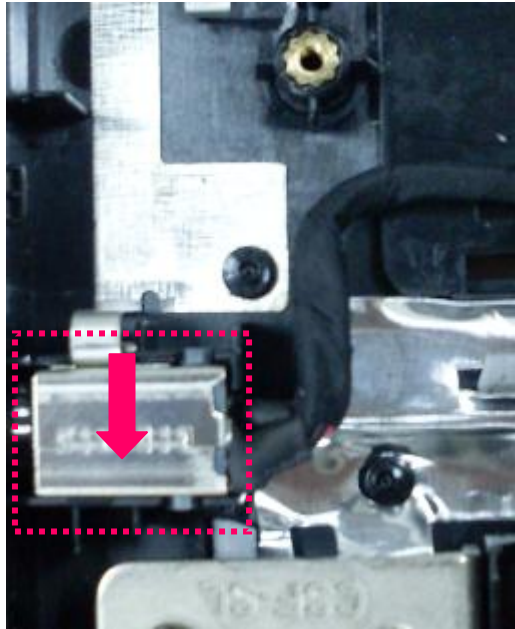
2. Connect the DC-IN cable to the main board.

4.32 Replace the USB Board

1. Install the USB board on the top case. Fix the following 2 screws (M2*3) securing the USB board.
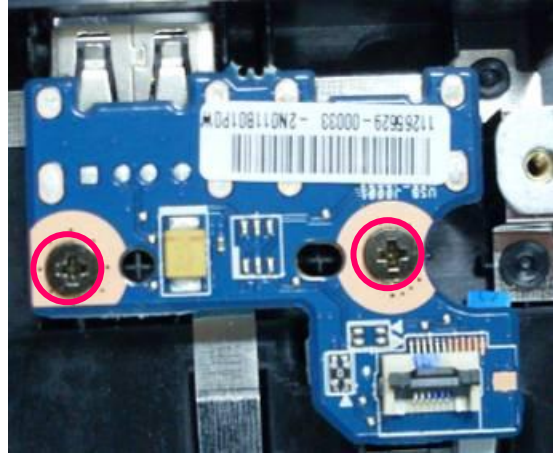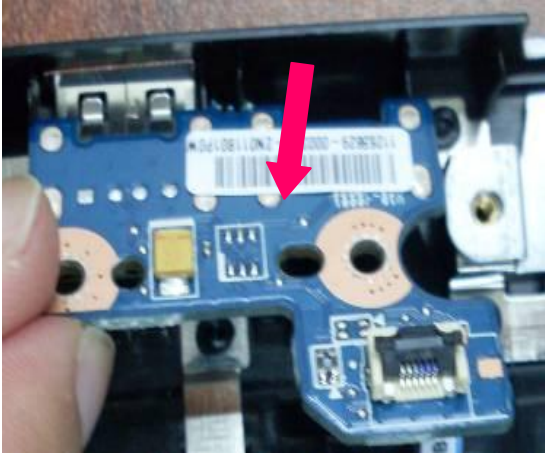
2. Connect the USB board FFC.
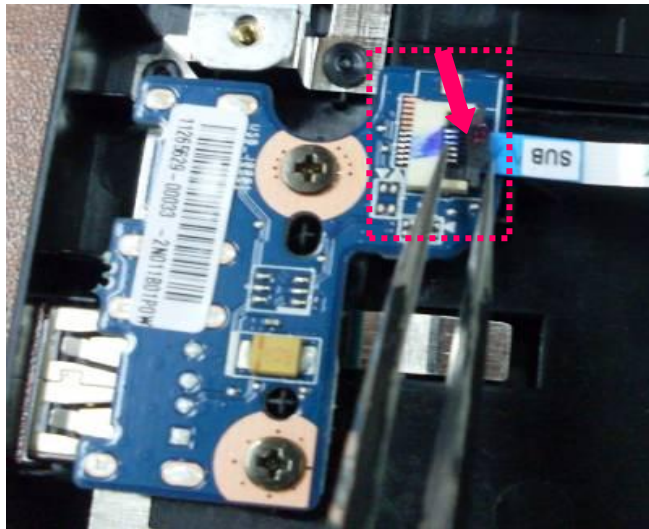
4.33 Replace the ODD Board

1. Install the ODD board on the top case. Fix the following 1 screw (M2*3) securing the ODD Board.

2. Connect the ODD FFC.
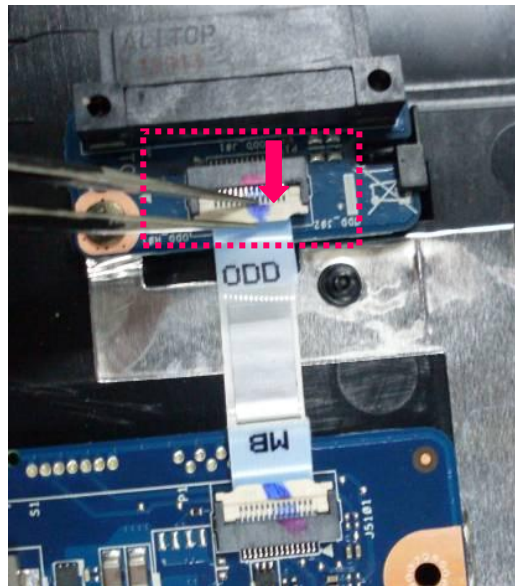
4.34 Replace the WLAN Board

1. Install the WLAN board into the system. Fix 1 screw (M2*3) as the following. Connect those two Connectors.
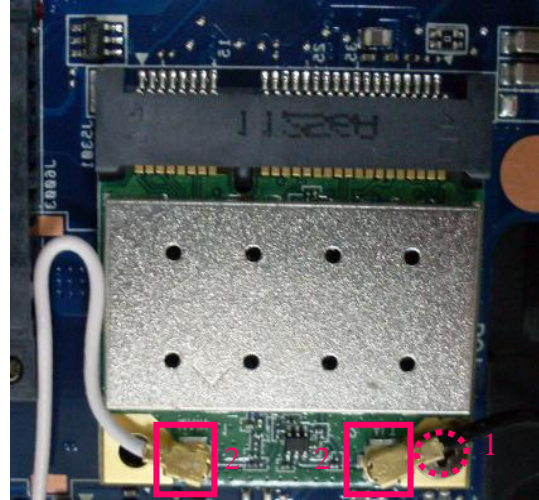
4.35 Replace the Power Board

1. Install power board on the top case. Fix 1 screw (M2*3) as the following which fix the power board.
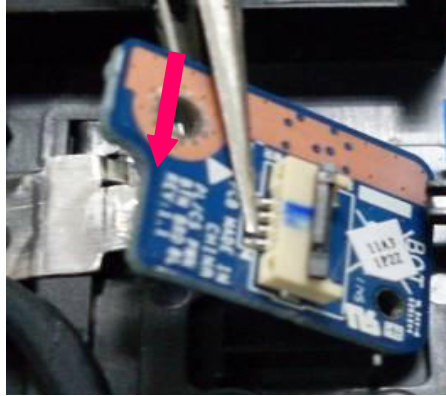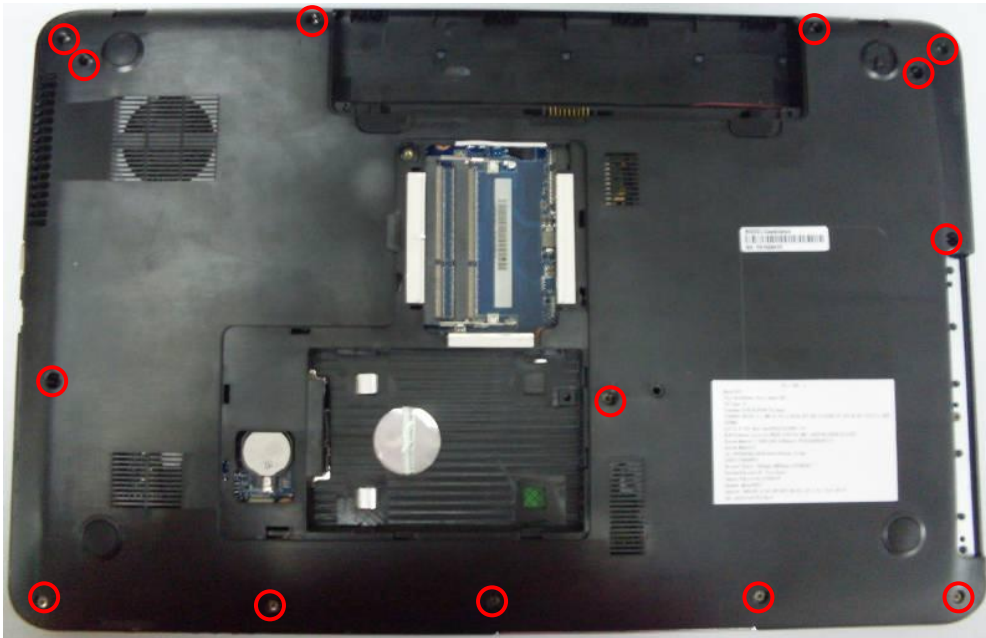

2. Connect the Power FFC to power board.
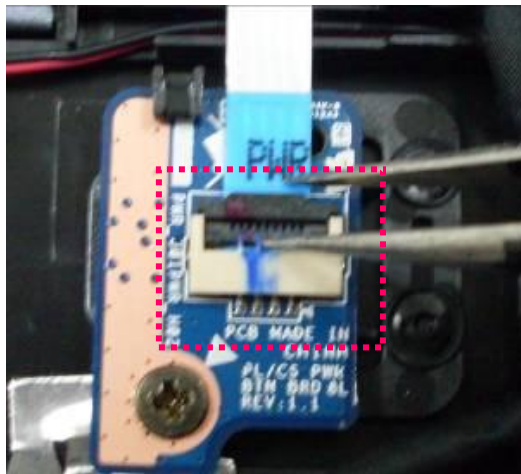
4.36 Replace the Bottom case

1. Install the bottom case on to the top cover.

2. Connect the Touch pad FFC to the main board. Fix 8 screws (M2*6) securing the Top cover.
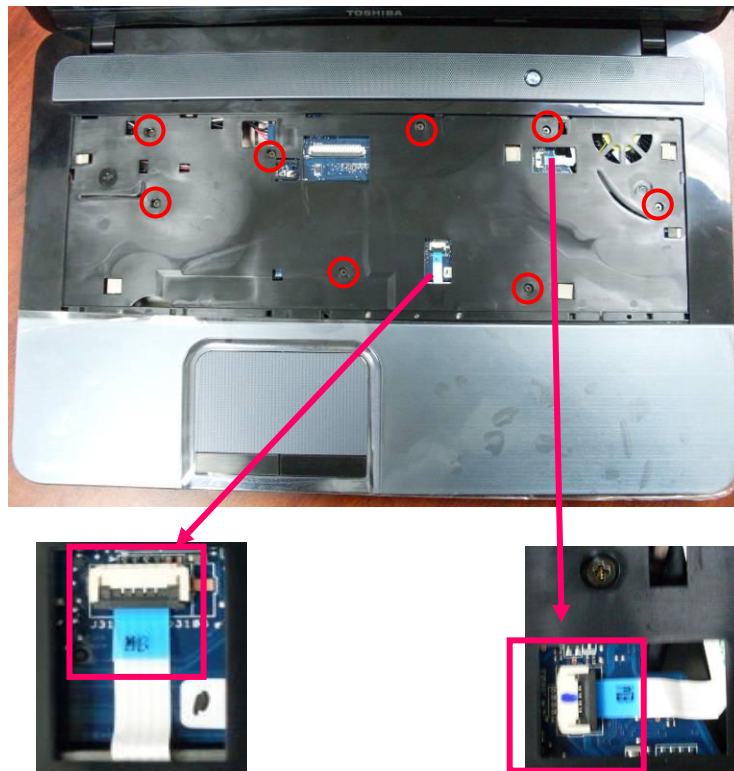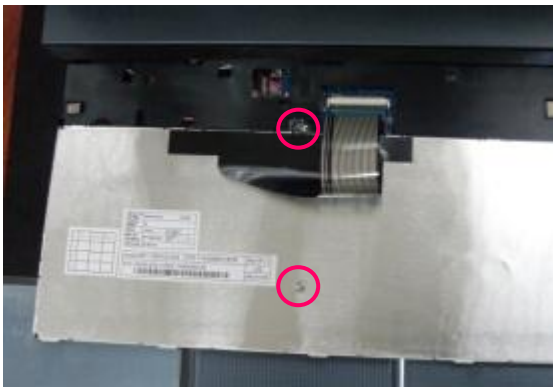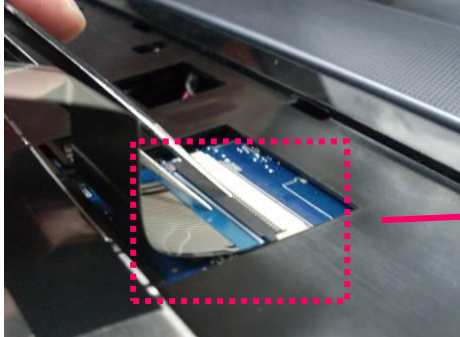
3. Turn the bottom case face up, fix 14 screws (M2*6) securing the bottom case.
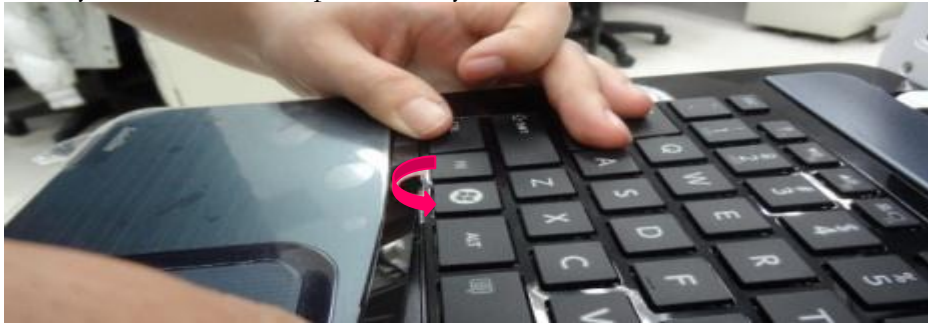
4.37 Replace the Keyboard

1. Connect the keyboard flexible cable on the main board. Lift the keyboard plate upward a little and lay it down on the top case. Press the edges of the keyboard to lock all latches, press the point among Key 6, 7 and Y to fix the keyboard nut on the top case.

2. Install the keyboard cover on top case softly.

4.38 Replace the Optical Disc Driver Module

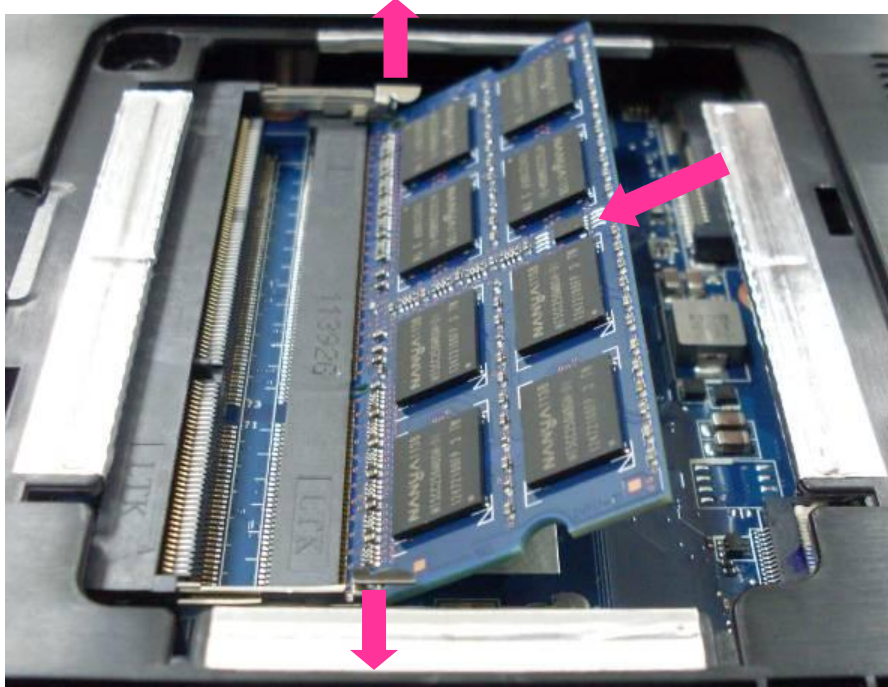1. Fix 2 screws (M2*3) securing the ODD bracket and install ODD bezel ASSY.

2. While push the module towards the direction of the arrow in the figure below, install the Optical Disc Drive module.
3. Fix 1 screw (M2*6) securing the latch of the Optical Disc Drive.

4.39 Replace the Memory Module

1. Press two latches outward and install the memory module.

4.40 Replace the HDD
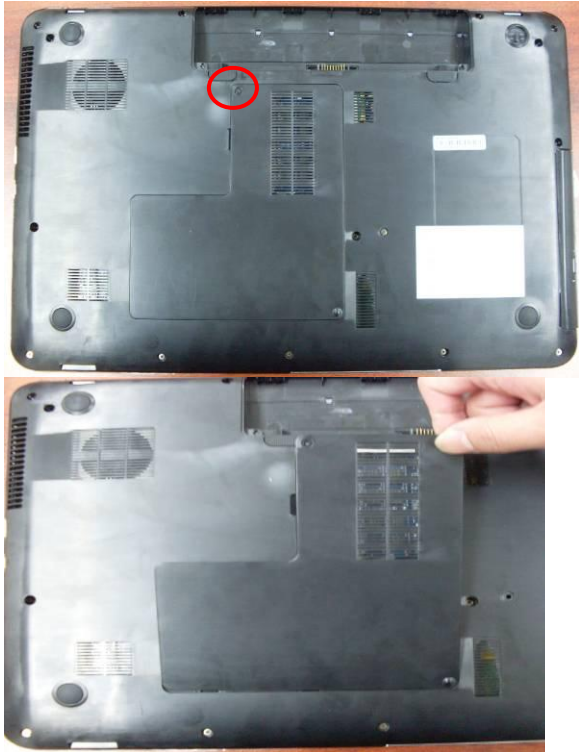
1. Install the HDD Mylar to HDD.

2. Place the HDD assembly on a flat surface, and fix 4 screws (M3*3).

3. Push the HDD assembly to the connector of the HDD cable. Be careful not to damage the connector.

4. Turn the computer upside down.
5. Install the HDD cover and fix 1 screw (M2*6) to it.

4.41 Replace the Media card

1. Grasp the Media card and push it in.

4.42 Replace the Battery pack

1. Turn the computer face down. Release the battery lock. Push in the battery pack while sliding the battery latch. Connect the AC adapter to the computer.