User Manual
Notebook Computer

W650SC

Service Manual
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About this Manual

This manual is intended for service personnel who have completed sufficient training to undertake the maintenance and inspection of personal computers.

It is organized to allow you to look up basic information for servicing and/or upgrading components of the W650SC series notebook PC.

The following information is included:

Chapter 1, Introduction, provides general information about the location of system elements and their specifications. Chapter 2, Disassembly, provides step-by-step instructions for disassembling parts and subsystems and how to upgrade elements of the system.

Appendix A, Part Lists
Appendix B, Schematic Diagrams
Appendix C, Updating the FLASH ROM BIOS
IMPORTANT SAFETY INSTRUCTIONS

Follow basic safety precautions, including those listed below, to reduce the risk of fire, electric shock and injury to persons when using any electrical equipment:

1. Do not use this product near water, for example near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
2. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
5. This product is intended to be supplied by a Listed Power Unit as follows:

   - AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19.5V, 6.15A (120 Watts) minimum AC/DC Adapter.

CAUTION

This Computer's Optical Device is a Laser Class 1 Product

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
This device may not cause harmful interference.
This device must accept any interference received, including interference that may cause undesired operation.
Instructions for Care and Operation

The notebook computer is quite rugged, but it can be damaged. To prevent this, follow these suggestions:

1. **Don’t drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.

   - Do not expose the computer to any shock or vibration.
   - Do not place it on an unstable surface.
   - Do not place anything heavy on the computer.

2. **Keep it dry, and don’t overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

   - Do not expose it to excessive heat or direct sunlight.
   - Do not leave it in a place where foreign matter or moisture may affect the system.
   - Don’t use or store the computer in a humid environment.
   - Do not place the computer on any surface which will block the vents.

3. **Follow the proper working procedures for the computer.** Shut the computer down properly and don’t forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.

   - Do not turn off the power until you properly shut down all programs.
   - Do not turn off any peripheral devices when the computer is on.
   - Do not disassemble the computer by yourself.
   - Perform routine maintenance on your computer.
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.

5. **Take care when using peripheral devices.**

   ![Use only approved brands of peripherals.](image1)

   ![Unplug the power cord before attaching peripheral devices.](image2)

---

**Power Safety**

The computer has specific power requirements:

- Only use a power adapter approved for use with this computer.
- Your AC adapter may be designed for international travel but it still requires a steady, uninterrupted power supply. If you are unsure of your local power specifications, consult your service representative or local power company.
- The power adapter may have either a 2-prong or a 3-prong grounded plug. The third prong is an important safety feature; do not defeat its purpose. If you do not have access to a compatible outlet, have a qualified electrician install one.
- When you want to unplug the power cord, be sure to disconnect it by the plug head, not by its wire.
- Make sure the socket and any extension cord(s) you use can support the total current load of all the connected devices.
- Before cleaning the computer, make sure it is disconnected from any external power supplies.

![Do not plug in the power cord if you are wet.](image3)

![Do not use the power cord if it is broken.](image4)

![Do not place heavy objects on the power cord.](image5)
Battery Precautions

- Only use batteries designed for this computer. The wrong battery type may explode, leak or damage the computer.
- Do not continue to use a battery that has been dropped, or that appears damaged (e.g. bent or twisted) in any way. Even if the computer continues to work with a damaged battery in place, it may cause circuit damage, which may possibly result in fire.
- Recharge the batteries using the notebook’s system. Incorrect recharging may make the battery explode.
- Do not try to repair a battery pack. Refer any battery pack repair or replacement to your service representative or qualified service personnel.
- Keep children away from, and promptly dispose of a damaged battery. Always dispose of batteries carefully. Batteries may explode or leak if exposed to fire, or improperly handled or discarded.
- Keep the battery away from metal appliances.
- Affix tape to the battery contacts before disposing of the battery.
- Do not touch the battery contacts with your hands or metal objects.

Battery Guidelines

The following can also apply to any backup batteries you may have.

- If you do not use the battery for an extended period, then remove the battery from the computer for storage.
- Before removing the battery for storage charge it to 60% - 70%.
- Check stored batteries at least every 3 months and charge them to 60% - 70%.

Battery Disposal

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

Caution

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used battery according to the manufacturer’s instructions.

Battery Level

Click the battery icon in the taskbar to see the current battery level and charge status. A battery that drops below a level of 10% will not allow the computer to boot up. Make sure that any battery that drops below 10% is recharged within one week.
Related Documents
You may also need to consult the following manual for additional information:

User’s Manual on CD/DVD
This describes the notebook PC’s features and the procedures for operating the computer and its ROM-based setup program. It also describes the installation and operation of the utility programs provided with the notebook PC.

System Startup
1. Remove all packing materials.
2. Place the computer on a stable surface.
3. Insert the battery and make sure it is locked in position.
4. Securely attach any peripherals you want to use with the computer (e.g. keyboard and mouse) to their ports.
5. Attach the AC/DC adapter to the DC-In jack on the left of the computer, then plug the AC power cord into an outlet, and connect the AC power cord to the AC/DC adapter.
6. Use one hand to raise the lid/LCD to a comfortable viewing angle (do not exceed 130 degrees); use the other hand (as illustrated in Figure 1) to support the base of the computer (Note: Never lift the computer by the lid/LCD).
7. Press the power button to turn the computer “on”.

Shut Down
Note that you should always shut your computer down by clicking **Settings** in the Charms Bar (use the Windows Logo Key + C key combination to access the Charms Bar) and choosing **Shut down** from the **Power** menu.
This will help prevent hard disk or system problems.
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Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the W650SC series notebook computer. Information about operating the computer (e.g. getting started, and the Setup utility) is in the User’s Manual. Information about drivers (e.g. VGA & audio) is also found in the User’s Manual. The manual is shipped with the computer.

Operating systems (e.g. Windows 8.1, etc.) have their own manuals as do application softwares (e.g. word processing and database programs). If you have questions about those programs, you should consult those manuals.

The W650SC series notebook is designed to be upgradeable. See Disassembly on page 2 - 1 for a detailed description of the upgrade procedures for each specific component. Please take note of the warning and safety information indicated by the “！” symbol.

The balance of this chapter reviews the computer’s technical specifications and features.
## Specifications

### Processor Options

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<tr>
<td>8MB L3 Cache, 22nm, DDR3L-1600MHz, TDP 47W</td>
</tr>
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<td>i7-4810MQ (2.80GHz), i7-4710MQ (2.50GHz)</td>
</tr>
<tr>
<td>6MB L3 Cache, 22nm, DDR3L-1600MHz, TDP 47W</td>
</tr>
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<td>i7-4610M (3.00GHz)</td>
</tr>
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<td>4MB L3 Cache, 22nm, DDR3L-1600MHz, TDP 37W</td>
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<table>
<thead>
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<th>Intel® Core™ i3 Processor</th>
</tr>
</thead>
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<td>i3-4110M (2.60GHz)</td>
</tr>
<tr>
<td>3MB L3 Cache, 22nm, DDR3L-1600MHz, TDP 37W</td>
</tr>
</tbody>
</table>

### Core Logic

Intel® HM86 Chipset

### BIOS

48Mb SPI Flash ROM
AMI BIOS

### Memory

Two 204Pin SO-DIMM Sockets Supporting DDR3L 1600MHz Memory
Memory Expandable up to 16GB
(The real memory operating frequency depends on the FSB of the processor.)

### Storage

(Factory Option) One 12.7mm(h) Optical Device Type Drive (Super Multi Drive)
(Factory Option) 2.5" 9.5mm 2nd HDD/SSD caddy
One Changeable 2.5" 9.5mm/7.0mm (h) SATA HDD/SSD
(Factory Option) One mSATA Solid State Drive (SSD)

### LCD Options

15.6" (39.62cm) HD / FHD

### Video Adapter

Intel® Integrated GPU and NVIDIA® Discrete GPU
Supports Microsoft Hybrid Graphics

Intel Integrated GPU
Intel® HD Graphics 4600
Dynamic Frequency (Intel Dynamic Video Memory Technology for up to 1.7GB)
Microsoft DirectX®11.1 Compatible

NVIDIA® Discrete GPU
NVIDIA® GeForce GTX 950M
2GB DDR3 Video RAM on board
Microsoft DirectX® 12 Compatible

### Audio

High Definition Audio Compliant Interface
2 * Built-In Speakers
Built-In Microphone
Sound Blaster™ Cinema 2

### Security

Security (Kensington® Type) Lock Slot
BIOS Password
(Factory Option) TPM v 2.0

### Keyboard

Full-size “WinKey” keyboard (with numeric keypad)

### Pointing Device

Built-In Touchpad
### Interface
- One USB 2.0 Port
- Two USB 3.0 Ports
- One eSATA Port (USB 3.0 Combo)
- One HDMI-Out Port
- One External Monitor Port
- One Headphone-Out Jack
- One Microphone-In Jack
- One RJ-45 LAN Jack
- One DC-in Jack

### Mini Card Slots
- Slot 1 for **WLAN** Module or **WLAN and Bluetooth** Combo Module
- Slot 2 for mSATA **SSD**
- Or
- **(Factory Option)** Slot 2 for **M.2 3G/4G Module**

### Card Reader
- Embedded Multi-in-1 Card Reader
  - MMC (MultiMedia Card) / RS MMC
  - SD (Secure Digital) / Mini SD / SDHC/ SDXC
  - MS (Memory Stick) / MS Pro / MS Duo

### Communication
- Built-In Gigabit Ethernet LAN
- 1.0M HD PC Camera Module
- **(Factory Option)** 2.0M FHD PC Camera Module
- **(Factory Option)** 3G or 4G M.2 Module

**WLAN/ Bluetooth Half Mini-Card Modules:**
- **(Factory Option)** Intel® Wireless-AC 3160 Wireless LAN (802.11ac) + Bluetooth 4.0
- **(Factory Option)** Intel® Wireless-AC 7260 Wireless LAN (802.11ac) + Bluetooth 4.0
- **(Factory Option)** Intel® Wireless-N 7260 Wireless LAN (802.11b/g/n)
- **(Factory Option)** Third-Party Wireless LAN (802.11b/g/n)
- **(Factory Option)** Third-Party Wireless LAN (802.11b/g/n) + Bluetooth 4.0

### Environmental Spec
- **Temperature**
  - Operating: 5°C - 35°C
  - Non-Operating: -20°C - 60°C
- **Relative Humidity**
  - Operating: 20% - 80%
  - Non-Operating: 10% - 90%

### Power
- Full Range AC/DC Adapter
  - AC Input: 100 - 240V, 50 - 60Hz
  - DC Output: 19.5V, 6.15A (120W)
- **(Factory Option)** Removable 6 Cell Smart Lithium-Ion Battery Pack, 62.16WH
- **(Factory Option)** Removable 6 Cell Smart Lithium-Ion Battery Pack, 48.84WH

### Dimensions & Weight
- 374mm (w) * 252mm (d) * 14 - 31.4mm (h)
- OR
- 374mm (w) * 249.5mm (d) * 14.8 - 32.8mm (h)
- 2.5kg (Barebone with ODD and 62.16WH Battery)
1. Introduction

Introduction

1. PC Camera
2. Built-In Microphone
3. *PC Camera LED
   *When the PC camera is in use, the LED will be illuminated in red.
4. LCD
5. Power Button
6. LED Indicator
7. Keyboard
8. Touchpad &
   Buttons

Note that the Touchpad and Buttons valid operational area is that indicated within the red dotted lines.
External Locator - Front & Right Side Views

Figure 2
Front View
1. LED Indicator
2. Multi-in-1 Card Reader

Figure 3
Right Side View
1. Microphone-In Jack
2. Headphone-Out Jack
3. USB Ports
4. Optical Device Drive Bay
5. Emergency Eject Hole
6. Security Lock Slot
External Locator - Left Side & Rear View

1. DC-In Jack
2. Vent
3. External Monitor Port
4. RJ-45 LAN Jack
5. Combined eSATA/USB 3.0 Port
6. HDMI-Out Port
7. USB 3.0 Ports

Figure 4
Left Side View

LEFT SIDE VIEW

Figure 5
Rear View

REAR VIEW

1. Battery
Introduction

External Locator - Bottom View

Figure 6
Bottom View

1. Battery
2. Component Bay Cover
3. Vent
4. Multi-in-1 Card Reader
5. Speakers

Overheating
To prevent your computer from overheating, make sure nothing blocks any vent while the computer is in use.
Mainboard Overview - Top (Key Parts)

1. Audio Codec
Mainboard Overview - Bottom (Key Parts)

Figure 8
Mainboard Bottom
Key Parts

1. Memory Slots
   DDR3 SO-DIMM
2. CPU Socket (no CPU installed)
3. Platform Controller Hub
4. GPU
5. KBC-ITE IT8518
6. Mini-Card Connector (3G Module)
7. Mini-Card Connector (WLAN Module)
8. CMOS Battery
Mainboard Overview - Top (Connectors)

1. CRT Port
2. RJ-45 LAN Jack
3. ESATA + USB 3.0
4. HDMI-Out Port
5. USB Port 3.0 Connector
6. Speaker Connector
7. Keyboard Cable Connector
8. TP Connector
9. TP Connector
Mainboard Overview - Bottom (Connectors)

1. ODD Connector
2. HDD Connector
3. Multi-in-1 Card Reader
4. LCD Cable Connector
Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the \textit{W650SC} series notebook’s parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

We suggest you completely review any procedure before you take the computer apart.

Procedures such as upgrading/replacing the RAM, optical device and hard disk are included in the User’s Manual but are repeated here for your convenience.

To make the disassembly process easier each section may have a box in the page margin. Information contained under the figure # will give a synopsis of the sequence of procedures involved in the disassembly procedure. A box with a \textbullet \textbullet\textbullet lists the relevant parts you will have after the disassembly process is complete. \textbf{Note}: The parts listed will be for the disassembly procedure listed ONLY, and not any previous disassembly step(s) required. Refer to the part list for the previous disassembly procedure. The amount of screws you should be left with will be listed here also.

A box with a \textbullet \textbullet \textbullet will also provide any possible helpful information. A box with a \textbullet \textbullet \textbullet contains warnings.

An example of these types of boxes are shown in the sidebar.
Disassembly

**NOTE:** All disassembly procedures assume that the system is turned **OFF**, and disconnected from any power supply (the battery is removed too).

**Maintenance Tools**
The following tools are recommended when working on the notebook PC:

- M3 Philips-head screwdriver
- M2.5 Philips-head screwdriver (magnetized)
- M2 Philips-head screwdriver
- Small flat-head screwdriver
- Pair of needle-nose pliers
- Anti-static wrist-strap

**Connections**
Connections within the computer are one of four types:

- **Locking collar sockets for ribbon connectors**
  To release these connectors, use a small flat-head screwdriver to gently pry the locking collar away from its base. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.

- **Pressure sockets for multi-wire connectors**
  To release this connector type, grasp it at its head and gently rock it from side to side as you pull it out. Do not pull on the wires themselves. When replacing the connection, do not try to force it. The socket only fits one way.

- **Pressure sockets for ribbon connectors**
  To release these connectors, use a small pair of needle-nose pliers to gently lift the connector away from its socket. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.

- **Board-to-board or multi-pin sockets**
  To separate the boards, gently rock them from side to side as you pull them apart. If the connection is very tight, use a small flat-head screwdriver - use just enough force to start.
Maintenance Precautions
The following precautions are a reminder. To avoid personal injury or damage to the computer while performing a removal and/or replacement job, take the following precautions:

1. **Don’t drop it.** Perform your repairs and/or upgrades on a stable surface. If the computer falls, the case and other components could be damaged.

2. **Don’t overheat it.** Note the proximity of any heating elements. Keep the computer out of direct sunlight.

3. **Avoid interference.** Note the proximity of any high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage components and/or data. You should also monitor the position of magnetized tools (i.e. screwdrivers).

4. **Keep it dry.** This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

5. **Be careful with power.** Avoid accidental shocks, discharges or explosions.
   - Before removing or servicing any part from the computer, turn the computer off and detach any power supplies.
   - When you want to unplug the power cord or any cable/wire, be sure to disconnect it by the plug head. Do not pull on the wire.

6. **Peripherals** – Turn off and detach any peripherals.

7. **Beware of static discharge.** ICs, such as the CPU and main support chips, are vulnerable to static electricity. Before handling any part in the computer, discharge any static electricity inside the computer. When handling a printed circuit board, do not use gloves or other materials which allow static electricity buildup. We suggest that you use an anti-static wrist strap instead.

8. **Beware of corrosion.** As you perform your job, avoid touching any connector leads. Even the cleanest hands produce oils which can attract corrosive elements.

9. **Keep your work environment clean.** Tobacco smoke, dust or other air-born particulate matter is often attracted to charged surfaces, reducing performance.

10. **Keep track of the components.** When removing or replacing any part, be careful not to leave small parts, such as screws, loose inside the computer.

Cleaning
Do not apply cleaner directly to the computer, use a soft clean cloth.
Do not use volatile (petroleum distillates) or abrasive cleaners on any part of the computer.
## Disassembly Steps

The following table lists the disassembly steps, and on which page to find the related information. **PLEASE PERFORM THE DISASSEMBLY STEPS IN THE ORDER INDICATED.**

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<td>2. Remove the WLAN</td>
<td>2 - 17</td>
</tr>
</tbody>
</table>
Removing the Battery

1. Turn the computer off, and turn it over.
2. Slide the latch 1 in the direction of the arrow (Figure 1a).
3. Slide the latch 2 in the direction of the arrow, and hold it in place (Figure 1a).
4. Slide the battery 3 in the direction of the arrow 4 (Figure 1b).

Figure 1
Battery Removal

a. Slide the latch and hold it in place.
b. Slide the battery in the direction of the arrow.
Disassembly

Removing the Keyboard

1. Turn off the computer, turn it over, remove the battery (page 2 - 5).
2. Carefully press at point 1, from the bottom of the computer to unsnap the LED cover module (use the eject pin tool to do this - Figure 2a).
3. Turn the computer over, remove the unsnap LED cover module 2 from the computer (Figure 2b).
4. Remove screws 3 - 7 from the keyboard (Figure 2c).
5. Lift the keyboard up, being careful not to bend the keyboard ribbon cable 8. Disconnect the keyboard ribbon cable from the locking collar socket 9 (Figure 2d).
6. Carefully lift the keyboard 10 off the computer (Figure 2e).

Figure 2
Keyboard Removal

a. Press at point 1 to unsnap LED cover module.
b. Remove the LED cover module.
c. Remove the screws.
d. Carefully lift the keyboard up and disconnect the ribbon cable.
e. Remove the keyboard.

2. LED Cover Module
10. Keyboard
• 5 Screws
Removing the Hard Disk Drive

The hard disk drive can be taken out to accommodate other 2.5” serial (SATA) hard disk drives with a height of 9.5mm or 7mm (h). Follow your operating system’s installation instructions, and install all necessary drivers and utilities (as outlined in Chapter 4 of the User’s Manual) when setting up a new hard disk.

Hard Disk Upgrade Process
1. Turn off the computer, and remove the battery (page 2 - 5).
2. Locate the component bay cover and remove screws 1 - 2 (Figure 3a).
3. Slide the component bay cover 3 until the cover and case indicators 4 are aligned (Figure 3b).

Figure 3
HDD Assembly Removal

a. Remove the screws.
b. Remove the component bay cover.
Disassembly

4. Remove the component bay cover (Figure 4c).
5. Lift the HDD sponge up at point 4 and grip the tab to slide the hard disk assembly in the direction of arrow 5 to lift the hard disk assembly 6 out (Figure 4d).
6. Remove the screws 7 - 8 and the adhesive cover 9 from the hard disk 10 (Figure 4e).
7. Reverse the process to install a new hard disk (do not forget to replace the screws and bay cover).

HDD System Warning

New HDD’s are blank. Before you begin make sure:

- You have backed up any data you want to keep from your old HDD.
- You have all the CD-ROMs and FDDs required to install your operating system and programs.
- If you have access to the internet, download the latest application and hardware driver updates for the operating system you plan to install. Copy these to a removable medium.

3. Component Bay Cover
6. HDD Assembly
9. Adhesive Cover
10. HDD
- 2 Screws
Hard Disk Size Note (Foam Rubber Insert)
Note that the hard disks pictured on the following pages are all 9.5mm(H) hard disk drives. In some cases 7mm(H) hard disk drives will be installed. For more information contact your distributor/supplier, and bear in mind your warranty terms.

- If you are replacing a 9.5mm(H) HDD with a 7mm(H) HDD then insert the foam rubber insert (as shown above).

- If you are replacing a 7mm(H) HDD with a 9.5mm(H) HDD then remove the foam rubber insert.
Removing the Optical (CD/DVD) Device

1. Turn off the computer, and remove the battery (page 2 - 5).
2. Locate the component bay cover and remove screws 1 - 2 (Figure 6a).
3. Remove the component bay cover 3 in the direction of the arrow 4 (Figure 6b).
4. Remove the screw at point 5 (Figure 6c).
5. Use a screwdriver to carefully push out the optical device 7 at point 6 (Figure 6d).
6. Carefully pry the bezel \( 9 \) off the optical device at point \( 8 \) (Figure 7e).
7. Separate the bezel \( 9 \) and the optical device.
8. Reverse the process to attach the front bezel \( 9 \) with the new optical device at point \( 10 \) (Figure 7g).
9. Insert the new device and carefully slide it into the computer (the device only fits one way. DO NOT FORCE IT; The screw holes should line up).
10. Replace the bay cover by pushing it at point \( 11 \) until the cover and case indicator are aligned, then tighten the screws.
11. Restart the computer to allow it to automatically detect the new device.
Removing the System Memory (RAM)

The computer has two memory sockets for 204 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR3L up to 1600 MHz. The main memory can be expanded up to 16GB. The total memory size is automatically detected by the POST routine once you turn on your computer.

Memory Upgrade Process

1. Turn off the computer, turn it over, and remove the battery (page 2 - 5).
2. Remove screws 1 - 2 from the component bay cover (Figure 8a).
3. Carefully remove the bay cover 3.
4. The RAM modules will be visible at point 4 on the mainboard (Figure 8b).

Disassembly

Removing the System Memory (RAM)

Figure 8
RAM Module Removal

a. Remove the screws from the component bay cover.
b. Remove the component bay cover. The RAM modules will be visible at point 4 on the mainboard.

Contact Warning

Be careful not to touch the metal pins on the module's connecting edge. Even the cleanest hands have oils which can attract particles, and degrade the module's performance.

3. Component Bay Cover
   • 2 Screws

2 - 12 Removing the System Memory (RAM)
5. Gently pull the two release latches (5 & 6) on the sides of the memory socket in the direction indicated by the arrows (Figure 9c). The RAM module (7) will pop-up (Figure 9d), and you can then remove it.

6. Pull the latches to release the second module if necessary.

7. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.

8. The module will only fit one way as defined by its pin alignment. Make sure the module is seated as far into the slot as it will go. DO NOT FORCE IT; it should fit without much pressure.

9. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.

10. Replace the component bay cover and the screws (see page 2 - 12).

11. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.

---

**Figure 9**

RAM Module Removal (cont’d)

c. Pull the release latches.
d. Remove the module.

---

**Contact Warning**

Be careful not to touch the metal pins on the module’s connecting edge. Even the cleanest hands have oils which can attract particles and degrade the module’s performance.

---

**Single Memory Module Installation**

If your computer has a single memory module, then insert the module into the Channel 0 (JDIMM1) socket. In this case this is the lower memory socket (the socket closest to the mainboard).
Removing and Installing a Processor

Processor Removal Procedure

1. Turn off the computer, turn it over, remove the battery (page 2 - 5) and the component bay cover (page 2 - 7).
2. The CPU heat sink will be visible at point A (Figure 10a).
3. Loosen the CPU heat sink screws in the order 8, 7, 6, 5, 4, 3, 2 & 1 (the reverse order as indicated on the label (Figure 10b)).
4. Carefully (it may be hot) remove the heat sink unit B off the computer (Figure 10c).

- Locate the CPU heat sink.
- Remove the screws.
- Carefully remove the heat sink unit.

B. Heat Sink
- 8 Screws
5. Turn the release latch towards the unlock symbol to release the CPU (*Figure 11f*).
6. Carefully (it may be hot) lift the CPU up and out of the socket (*Figure 11g*).
7. Reverse the process to install a new CPU.
8. When re-inserting the CPU, pay careful attention to the pin alignment, it will fit only one way (DO NOT FORCE IT!)

---

**Caution**

The heat sink, and CPU area in general, contains parts which are subject to high temperatures. Allow the area time to cool before removing these parts.

*Figure 11*
Processor Removal (cont'd)

d. Turn the release latch to unlock the CPU.
e. Lift the CPU out of the socket.
Disassembly

**Processor Installation Procedure**

1. Insert the CPU **A** (*Figure 12a*), and pay careful attention to the pin alignment; it will fit only one way (DO NOT FORCE IT!), and turn the release latch **B** towards the lock symbol **C** (*Figure 12b*).

2. **Remove the sticker** **C** (*Figure 12c*) from the heat sink unit (if it is a new unit).

3. Insert the heat sink **D** as indicated in *Figure 12c*.

4. Tighten the CPU heat sink screws in the order **1**. **2**. **3**. **4**. **5**. **6**. **7** & **8** (the order as indicated on the label and *Figure 12d*).

5. Replace the CPU fan, component bay cover and tighten the screws (**page 2 - 14**).

---

**Figure 12**

**Processor Installation**

a. Insert the CPU.

b. Turn the release latch towards the lock symbol.

c. Insert the heat sink.

d. Tighten the screws.

---

**Note:**
Tighten the screws in the order as indicated on the label.
Removal of the Wireless LAN Module

1. Turn off the computer, turn it over, remove the battery (page 2 - 5) and the component bay cover (page 2 - 7).
2. The Wireless LAN module will be visible at point 1 on the mainboard (Figure 13a).
3. Carefully disconnect the cables 2 & 3, and then remove the screw 1 (Figure 13b).
4. The Wireless LAN module 5 (Figure 13c) will pop-up, and you can remove it from the computer.

---

Figure 13

Wireless LAN Module Removal

a. Locate the WLAN.
b. Disconnect the cables and remove the screw.
c. The WLAN module will pop up.

Note: Make sure you reconnect the antenna cable to the “1 + 2” socket (Figure 13b).
Wireless LAN, Combo, 3G & LTE Module Cables

Note that the cables for connecting to the antennae on WLAN, WLAN & Bluetooth Combo, 3G and LTE modules are not labelled. The cables/covers (each cable will have either a black or transparent cable cover) are color coded for identification as outlined in the table below.

<table>
<thead>
<tr>
<th>Module Type</th>
<th>Antenna Type</th>
<th>Cable Color</th>
<th>Cable Cover Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>WLAN/WLAN &amp; Bluetooth Combo</td>
<td>WM 1</td>
<td>Black</td>
<td>Transparent</td>
</tr>
<tr>
<td></td>
<td>WM 2</td>
<td>Gray</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WM 3</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>LTE Broadband</td>
<td>LTE 1</td>
<td>Black</td>
<td>Black</td>
</tr>
<tr>
<td></td>
<td>LTE 2</td>
<td>Gray</td>
<td></td>
</tr>
<tr>
<td>3G Broadband</td>
<td>3G 1</td>
<td>Black</td>
<td>Black</td>
</tr>
<tr>
<td></td>
<td>3G 2</td>
<td>Gray</td>
<td></td>
</tr>
</tbody>
</table>

Cable 1 is usually connected to antenna 1 (Main) on the module, and cable 2 to antenna 2 (Aux).
Removing the 3G Module

1. Turn off the computer, turn it over, remove the battery (page 2 - 14) and the component bay cover (page 2 - 12).
2. The 3G module will be visible at point 1 on the mainboard (Figure 14a).
3. Carefully remove the screw 2 (Figure 14b).
4. Carefully slide the 3G module 3 (in the direction of the arrow 4 - Figure 14c) out of the interface adaptor and then lift it up (do not exceed 10 degrees) to remove it from the computer (Figure 14d).
5. Carefully remove the screw 5 (Figure 14e).
6. The mini-card interface adaptor 6 will pop-up, and you can remove it from the computer (Figure 14f).

Figure 14
3G Module Removal

a. Locate the 3G module.
b. Remove the screw.
c. Slide the module in the direction of the arrow and lift it out.
d. Remove the 3G module.
e. Remove the screw.
f. Remove the interface adaptor.

3. 3G Module
6. Interface Adaptor

- 2 Screws
Removing and Installing the MSATA Module

MSATA Removal Procedure

1. Turn off the computer, remove the battery (page 2 - 14), and component bay cover (page 2 - 7).
2. Locate the module, it is visible at point 1 (Figure 15a).
3. Carefully remove the screw 2 from the module (Figure 15b).
4. Lift the module 3 up and off the computer (Figure 15c).

---

3. MSATA Module
- 1 Screw
MSATA Installation Procedure

1. Place the thermal pad 1 as shown (Figure 16a).
2. Insert the module 2 in the computer (Figure 16b).
3. Tighten the screw 3 to secure it in place (Figure 16c).

a. b. c.

Figure 16
MSATA Module Installation

a. Place the thermal pad.
b. Insert the module.
c. Tighten the screw.
2 - 22 Removing the CCD

1. Turn **off** the computer, turn it over, and remove the battery (page 2 - 14).
2. Run your fingers around the inner frame of the LCD panel at the points as indicated by the arrows 1 - 4.
3. Lay the computer down on a flat surface with the top case up forming a 90 degree angle. Push the LCD front cover upwards before carefully lifting it up (Figure 17b).
4. Remove the LCD front cover 5 (Figure 17c).

---

**Figure 17**

**CCD Removal**

a. Run your fingers around the inner frame of the LCD panel at the points indicated by the arrows.
b. Lay the computer down on a flat surface with the top case up forming a 90 degree angle. Push the LCD front panel upwards before carefully lifting it up.
c. Remove the LCD front cover.
5. Disconnect the cable (Figure 18d).
6. Remove the CCD module (Figure 18e).
7. Reverse the process to install a new CCD module.

d. Disconnect the cable.
e. Remove the CCD module.
Disassembly
Appendix A: Part Lists

This appendix breaks down the *W650SC* series notebook’s construction into a series of illustrations. The component part numbers are indicated in the tables opposite the drawings.

**Note:** This section indicates the manufacturer’s part numbers. Your organization may use a different system, so be sure to cross-check any relevant documentation.

**Note:** Some assemblies may have parts in common (especially screws). However, the part lists DO NOT indicate the total number of duplicated parts used.

**Note:** Be sure to check any update notices. The parts shown in these illustrations are appropriate for the system at the time of publication. Over the product life, some parts may be improved or re-configured, resulting in new part numbers.
## Part List Illustration Location

The following table indicates where to find the appropriate part list illustration.

<table>
<thead>
<tr>
<th>Part</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>page A - 3</td>
</tr>
<tr>
<td>Bottom</td>
<td>page A - 4</td>
</tr>
<tr>
<td>DVD Dual Drive</td>
<td>page A - 5</td>
</tr>
<tr>
<td>HDD</td>
<td>page A - 6</td>
</tr>
<tr>
<td>2nd HDD</td>
<td>page A - 7</td>
</tr>
<tr>
<td>LCD</td>
<td>page A - 8</td>
</tr>
</tbody>
</table>
### Figure A - 3

**DVD DUAL**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PART NAME</th>
<th>PART NO</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>REV. XNL K. 10 X1 21 CE-HX06</td>
<td>6-35-6L120-01K</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>O/E BRACKET RECC 6-33-W8662-01G</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>O/E 676X-L05 TFP FL31</td>
<td>6-85-6076X-L05</td>
<td>TFP TEST</td>
</tr>
<tr>
<td>4</td>
<td>O/E REVEL MIDDLE WA5355P</td>
<td>6-85-6078X-T4</td>
<td>TFP TIST</td>
</tr>
<tr>
<td>5</td>
<td>O/E WEEL OR SCREW, WIPE, 21 CMN0</td>
<td>6-45-V8662-02G</td>
<td></td>
</tr>
</tbody>
</table>
HDD

Figure A - 4
HDD
2nd HDD

Figure A - 5
2nd HDD

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PART NAME</th>
<th>PART ID</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2nd HDD</td>
<td>A-2000-001-20</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2nd HDD 1</td>
<td>A-2000-001-21</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2nd HDD 2</td>
<td>A-2000-001-22</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the W650SC notebook’s PCB’s. The following table indicates where to find the appropriate schematic diagram.

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<th>Diagram - Page</th>
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</thead>
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<td>HDD, TP, Audio, USB - Page B - 34</td>
</tr>
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<td>VGA NVVDD Decoupling - Page B - 19</td>
<td>HDMI, RJ45, Fan, KBC, LED - Page B - 35</td>
</tr>
<tr>
<td>Processor 2/7- CLK, MISC - Page B - 4</td>
<td>CRT - Page B - 20</td>
<td>AUDIO CODEC VT1802S - Page B - 36</td>
</tr>
<tr>
<td>Processor 3/7- (DDR3) - Page B - 5</td>
<td>Lynx 1/9 - Page B - 21</td>
<td>KBC-ITE IT8587 - Page B - 37</td>
</tr>
<tr>
<td>Processor 4/7- Power - Page B - 6</td>
<td>Lynx 2/9 - Page B - 22</td>
<td>5VS, 3VS, 3.3V, 5V - Page B - 38</td>
</tr>
<tr>
<td>Processor 5/7- GFX PWR - Page B - 7</td>
<td>Lynx 3/9 - Page B - 23</td>
<td>1.05V - Page B - 39</td>
</tr>
<tr>
<td>Processor 7/7- RSVD - Page B - 9</td>
<td>Lynx 5/9 - Page B - 25</td>
<td>1.5V or 1.35V / 0.75VS, 1.5VS - Page B - 41</td>
</tr>
<tr>
<td>DDR3 SO-DIMM_1 - Page B - 10</td>
<td>Lynx 6/9 - Page B - 26</td>
<td>POWER VCORE - Page B - 42</td>
</tr>
<tr>
<td>PS8625 - Page B - 12</td>
<td>Lynx 8/9 - Page B - 28</td>
<td>DC IN, CHARGER - Page B - 44</td>
</tr>
<tr>
<td>PANEL, INVERTER - Page B - 13</td>
<td>Lynx 9/9 - Page B - 29</td>
<td>AUDIO BOARD - Page B - 45</td>
</tr>
<tr>
<td>VGA PCI-E Interface - Page B - 14</td>
<td>Mini PCIe, Fan Con - Page B - 30</td>
<td>POWER SWITCH BOARD - Page B - 46</td>
</tr>
<tr>
<td>VGA Frame Buffer Interface - Page B - 15</td>
<td>USB Charge, CCB, TPM, Power Con - Page B - 31</td>
<td>ODD to HDD BOARD - Page B - 47</td>
</tr>
<tr>
<td>VGA Frame Buffer A - Page B - 16</td>
<td>eSATA/USB3.0, LED - Page B - 32</td>
<td></td>
</tr>
<tr>
<td>VGA Frame Buffer C - Page B - 17</td>
<td>Card Reader (RTL8411B) - Page B - 33</td>
<td></td>
</tr>
</tbody>
</table>
Processor 1/7-DMI, FDI, PEG

Haswell rPGA Processor 1/7 (DMI,PEG,FDI)

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Processor 1/7-DMI, FDI, PEG
Processor 3/7- (DDR3)

Haswell Processor 3/7 (DDR3)
Haswell Processor 7/7 ( RESERVED )

NOTE:
- PHYSICAL DISPLAY DISABLED (PCI EXPRESS)
  0: REMOVED, BUT PCI REMOVED BUT IN DISPLAY INTERFACE NML
  1: DISABLED

CFG2 1: (DEFAULT) NORMAL OPERATION; LANE# DEFINITION MATCHES
0: LANE REVERSAL

PCI EXPRESS STATIC LANE REVERSAL FOR ALL PEG PORTS
CFG[6:5] 11: DEVICE1 FUNCTION 1, DEVICE 1 FUNCTION2 DISABLED
10: DEVICE1 FUNCTION1 ENABLED DEVICE1 FUNCTION 2 DISABLED
01: DEVICE 1 FUNCTION 1 DISABLED, DEVICE 1 FUNCTION 2 ENABLED
00: DEVICE 1 FUNCTION 1 ENABLED, DEVICE 1 FUNCTION 2 ENABLED

PCIE Port Bifurcation Straps

CFG Straps for Processor
CFG4
1: DISABLED; NO PHYSICAL DISPLAY PORT ATTACHED TO EMBEDDED DISPLAY PORT
0: ENABLED; AN EXTERNAL DISPLAY PORT DEVICE IS CONNECTED TO THE EMBEDDED DISPLAY PORT

DISPLAY PORT PRESENCE STRAP
NOTE:
RESERVE THIS CIRCUIT FOR FUTURE COMPATIBILITY

PHYSICAL_DEBUG_ENABLED (DFX PRIVACY)
0: ENABLED SET DFX ENABLED BIT IN DEBUG INTERFACE MSR
1: DISABLED

DEFENSIVE PULL DOWN SITE
DDR3 SO-DIMM_2

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DDR3 SO-DIMM_1
Schematic Diagrams

VGA Frame Buffer A

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VGA Frame Buffer A
VGA Frame Buffer C

Frame Buffer Partition B

Sheet 16 of 46
VGA Frame Buffer C
VGA NVVDD Decoupling
Lynx Point -M (DMI,FDI,PWRGD)
Schematic Diagrams

Lynx 4/9

B.Schematic Diagrams

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Lynx Point -M (CRT,LVDS,PCI,DISPLAY)
USB Charge, CCD, TPM, Power Con

W/O USB CHARGER

USB3.0 PORT(PORT3)

CCD+Mic

FOR POWER SWITCH BOARD

LID

TPM 2.0 (SLB9665TT)

LRESET# 16

LFRAME# 22

LCLK2 1

LAD3 17

LAD2 20

LAD1 23

LAD0 26

PWM# 16

PM_CLKRUN# 22

GND 1

VDD1 24

VDD2 19

VDD3 23

GND 2 11

GND 3 18

GPIO 6 33

XTALI 13 36

VDD0 24

VDD3 23

VDD2 19

VDD1 15

GND 1 4

GND 2 11

GND 3 18

GPIO 6 33

XTALI 13 36

VDD0 24

VDD3 23

VDD2 19

VDD1 15

GND 1 4

GND 2 11

GND 3 18

GPIO 6 33

XTALI 13 36

VDD0 24

VDD3 23

VDD2 19

VDD1 15
Schematic Diagrams

eSATA/USB3.0, LED

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B - 32 eSATA/USB3.0, LED
Card Reader (RTL8411B)
HDMI, RJ45, Fan, KBC, LED

HDMI LEVEL SHIFT

HDMI CONNECTOR

GIGA LAN (RTL8411)
LAN POART

KBC LED CONTROL

CPU FAN CONTROL
1.5V or 1.35V / 0.75VS, 1.5VS

Schematic Diagrams
Schematic Diagrams
Appendix C: Updating the FLASH ROM BIOS

To update the FLASH ROM BIOS, you must:

- Download the BIOS update from the web site.
- Unzip the files onto a bootable CD/DVD/USB Flash Drive.
- Reboot your computer from an external CD/DVD/USB Flash Drive.
- Use the flash tools to update the flash BIOS using the commands indicated below.
- Restart the computer booting from the HDD and press F2 at startup enter the BIOS.
- Load setup defaults from the BIOS and save the default settings and exit the BIOS to restart the computer.
- After rebooting the computer you may restart the computer again and make any required changes to the default BIOS settings.

Download the BIOS
1. Go to www.clevo.com.tw and point to E-Services and click E-Channel.
2. Use your user ID and password to access the appropriate download area (BIOS), and download the latest BIOS files (the BIOS file will be contained in a batch file that may be run directly once unzipped) for your computer model (see sidebar for important information on BIOS versions).

Unzip the downloaded files to a bootable CD/DVD/ or USB Flash drive
1. Insert a bootable CD/DVD/USB flash drive into the CD/DVD drive/USB port of the computer containing the downloaded files.
2. Use a tool such as Winzip or Winrar to unzip all the BIOS files and refresh tools to your bootable CD/DVD/USB flash drive (you may need to create a bootable CD/DVD with the files using a 3rd party software).

Set the computer to boot from the external drive
1. With the bootable CD/DVD/USB flash drive containing the BIOS files in your CD/DVD drive/USB port, restart the computer and press F2 (in most cases) to enter the BIOS.
2. Use the arrow keys to highlight the Boot menu.
3. Use the “+” and “-” keys to move boot devices up and down the priority order.
4. Make sure that the CD/DVD drive/USB flash drive is set first in the boot priority of the BIOS.
5. Press F4 to save any changes you have made and exit the BIOS to restart the computer.
BIOS Update

Use the flash tools to update the BIOS

1. Make sure you are not loading any memory management programs such as HIMEM by holding the F8 key as you see the message “Starting MS-DOS”. You will then be prompted to give “Y” or “N” responses to the programs being loaded by DOS. Choose “N” for any memory management programs.
2. You should now be at the DOS prompt e.g: DISK C:\> (C is the designated drive letter for the CD/DVD drive/USB flash drive).
3. **Type the following command** at the DOS prompt:
   
   C:\> Flash.bat

4. The utility will then proceed to flash the BIOS.
5. You should then be prompted to press any key to restart the system or turn the power off, and then on again but make sure you remove the CD/DVD/USB flash drive from the CD/DVD drive/USB port before the computer restarts.

Restart the computer (booting from the HDD)

1. With the CD/DVD/USB flash drive removed from the CD/DVD drive/USB port the computer should restart from the HDD.
2. Press F2 as the computer restarts to enter the BIOS.
3. Use the arrow keys to highlight the Exit menu.
4. Select Load Setup Defaults (or press F3) and select “Yes” to confirm the selection.
5. Press F4 to save any changes you have made and exit the BIOS to restart the computer.

Your computer is now running normally with the updated BIOS

You may now enter the BIOS and make any changes you require to the default settings.