

SERVICE MANUAL

W650SH

notebook



Notebook Computer

W650SH

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 **W650SH** 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

Preface

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 19V, 4.74A (90 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.

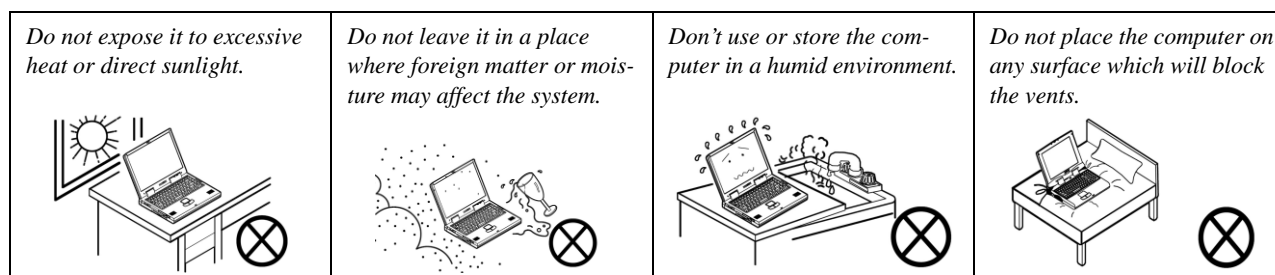
Instructions for Care and Operation

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

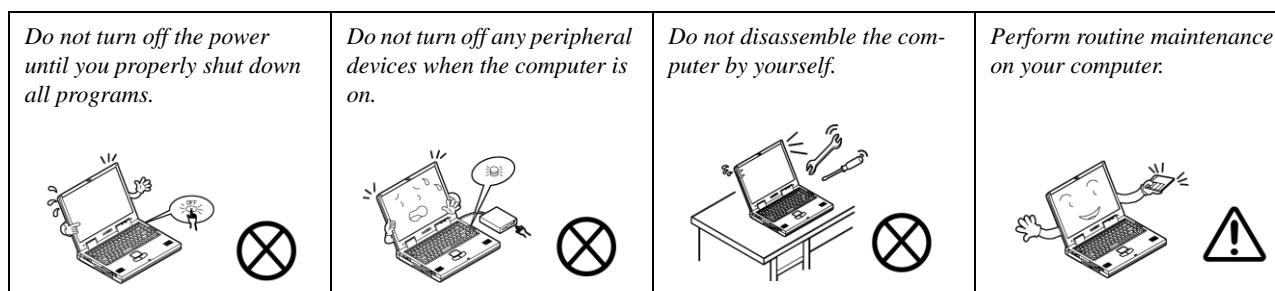
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.



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.

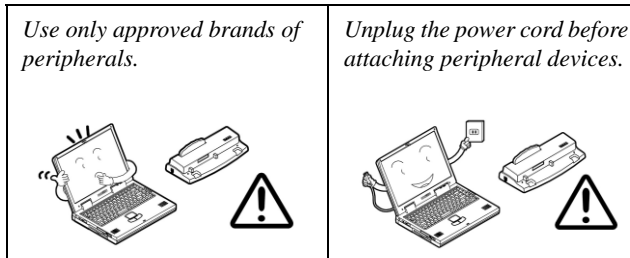


3. **Follow the proper working procedures for the computer.** Shut the computer down properly and don't forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.



Preface

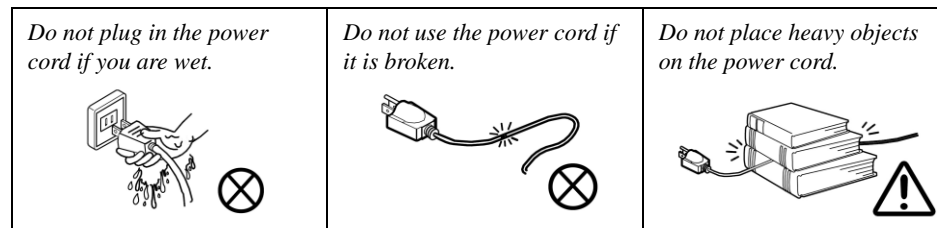
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**



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.



Power Safety Warning

Before you undertake any upgrade procedures, make sure that you have turned off the power, and disconnected all peripherals and cables (including telephone lines and power cord). It is advisable to also remove your battery in order to prevent accidentally turning the machine on.

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.

Preface

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".

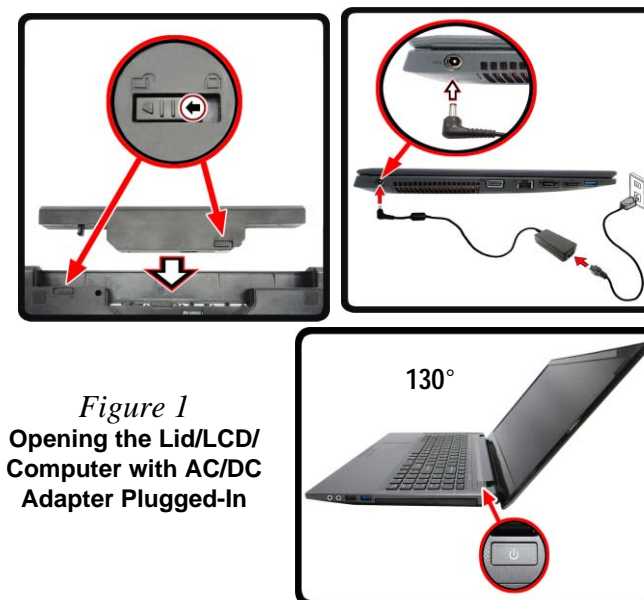


Figure 1
**Opening the Lid/LCD/
Computer with AC/DC
Adapter Plugged-In**



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 **W650SH** 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*, 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 **W650SH** 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.

Introduction

Specifications



Latest Specification Information

The specifications listed here are correct at the time of sending them to the press. Certain items (particularly processor types/speeds) may be changed, delayed or updated due to the manufacturer's release schedule. Check with your service center for more details.



CPU

The CPU is not a user serviceable part. Accessing the CPU in any way may violate your warranty.

Processor Options

Intel® Core™ i7 Processor

i7-4900MQ (2.80GHz)

8MB L3 Cache, 22nm, DDR3L-1600MHz, TDP 47W

i7-4800MQ (2.7GHz), i7-4700MQ (2.4GHz)

6MB L3 Cache, 22nm, DDR3L-1600MHz, TDP 47W

i7-4702MQ (2.80GHz)

6MB L3 Cache, 22nm, DDR3L-1600MHz, TDP 37W

Core Logic

Intel® HM86 Chipset

BIOS

48Mb SPI Flash ROM

AMI BIOS

Memory

Two 204 Pin 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

One Changeable 2.5" 9.5mm (h) SATA HDD

(Factory Option) One 12.7mm(h) Optical Device Type Drive (Super Multi Drive/Blu-Ray Combo Drive/Blu-Ray Writer Drive)

Or

(Factory Option) One Changeable Caddy Bay 12.7mm (h) Optical Device Drive (ODD), 2.5" 9.5 mm (h) Hard Disk Drive (HDD) with SATA Interface

(Factory Option) One mSATA Solid State Drive (SSD)

LCD

15.6" (39.62cm) HD / FHD

Audio

High Definition Audio Compliant Interface

2 * Built-In Speakers

Built-In Microphone

Sound Blaster™ Cinema

Security

Security (Kensington® Type) Lock Slot

BIOS Password

Video Adapter

Intel® Integrated GPU and NVIDIA® Discrete GPU

Supports NVIDIA® Optimus Technology

Intel Integrated GPU

Intel® HD Graphics 4600

Dynamic Frequency (Intel Dynamic Video Memory Technology for up to **1.7GB**)

Microsoft DirectX®11 Compatible

NVIDIA® Discrete GPU

NVIDIA® GeForce 740M

2GB GDDR3 Video RAM on board

Microsoft DirectX® 11.1 Compatible

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

Communication

Built-In Gigabit Ethernet LAN
2M HD PC Camera Module
(Factory Option) 3G Mini-Card Module

WLAN/ Bluetooth Half Mini-Card Modules:

(Factory Option) Intel® 7260AN (802.11a/g/n)+ Bluetooth 4.0

(Factory Option) Intel® 7260BN (802.11b/g/n)+ Bluetooth 4.0

(Factory Option) Third-Party Wireless LAN (802.11b/g/n)

(Factory Option) Third-Party Wireless LAN (802.11a/c) + Bluetooth 4.0

(Factory Option) Third-Party Wireless LAN (802.11b/g/n) + Bluetooth 4.0

Mini Card Slots

Slot 1 for **WLAN** Module or **WLAN and Bluetooth** Combo Module

(Factory Option) Slot 2 for **3G** Module or mSATA **SSD**

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

Environmental Spec**Temperature**

Operating: 5°C - 35°C

Non-Operating: -20°C - 60°C

Relative Humidity

Operating: 20% - 80%

Non-Operating: 10% - 90%

Power

6 Cell Smart Lithium-Ion Battery Pack, 48.84WH

(Factory Option) 6 Cell Smart Lithium-Ion Battery Pack, 62.16WH

Full Range AC/DC Adapter

AC Input: 100 - 240V, 50 - 60Hz

DC Output: 19V, 4.74A (90W)

Dimensions & Weight

374mm (w) * 252mm (d) * 14 - 31.4mm (h)

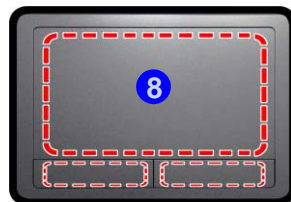
(Height Excluding Battery Area)

2.5kg (with ODD and 62.16WH Battery)

Introduction

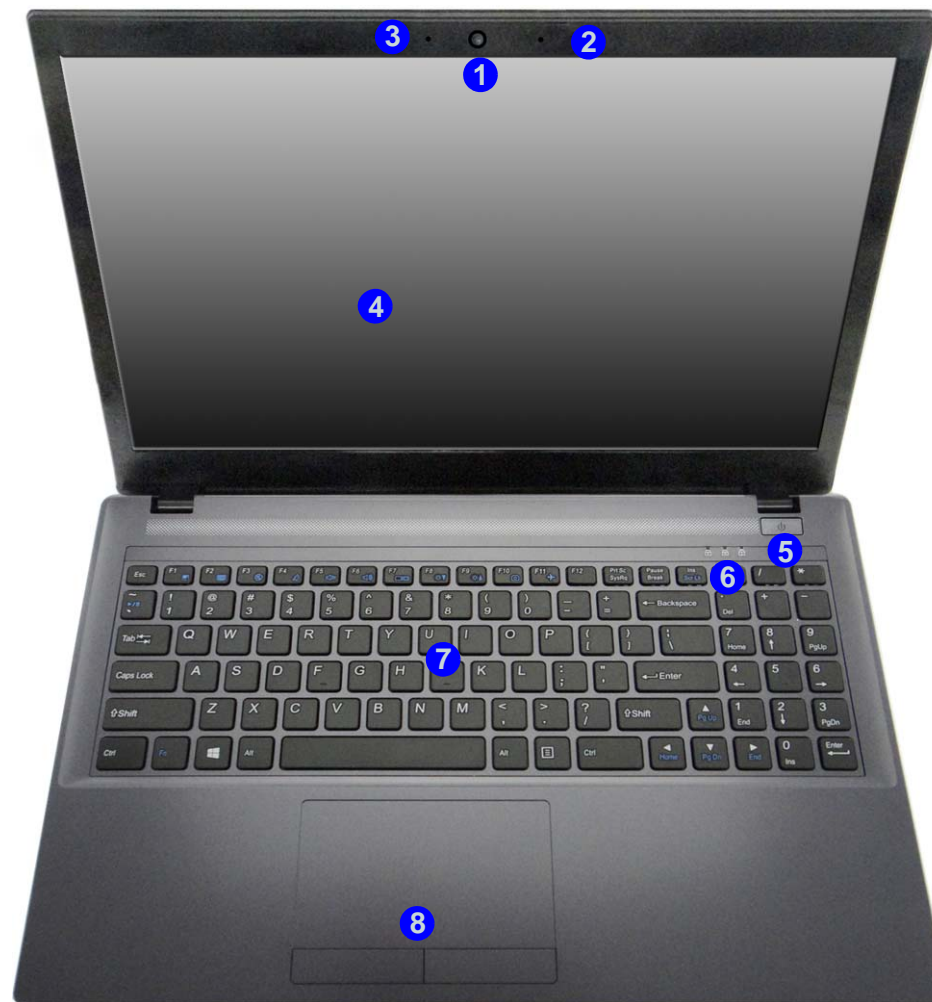
Figure 1
Top View

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 - Top View with LCD Panel Open



External Locator - Front & Right Side Views

FRONT VIEW



Figure 2
Front View

1. LED Indicator
2. Multi-in-1 Card Reader

RIGHT SIDE VIEW



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

Introduction

External Locator - Left Side & Rear View

Figure 4
Left Side 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

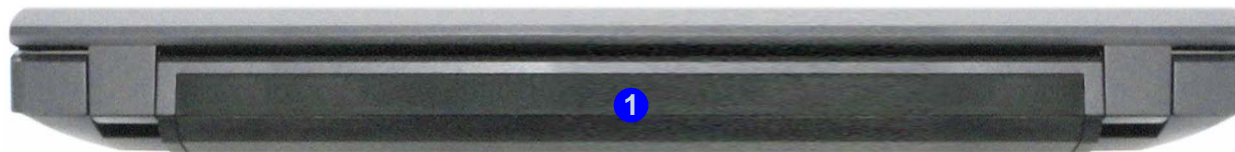
LEFT SIDE VIEW



Figure 5
Rear View

1. Battery

REAR VIEW



External Locator - Bottom View

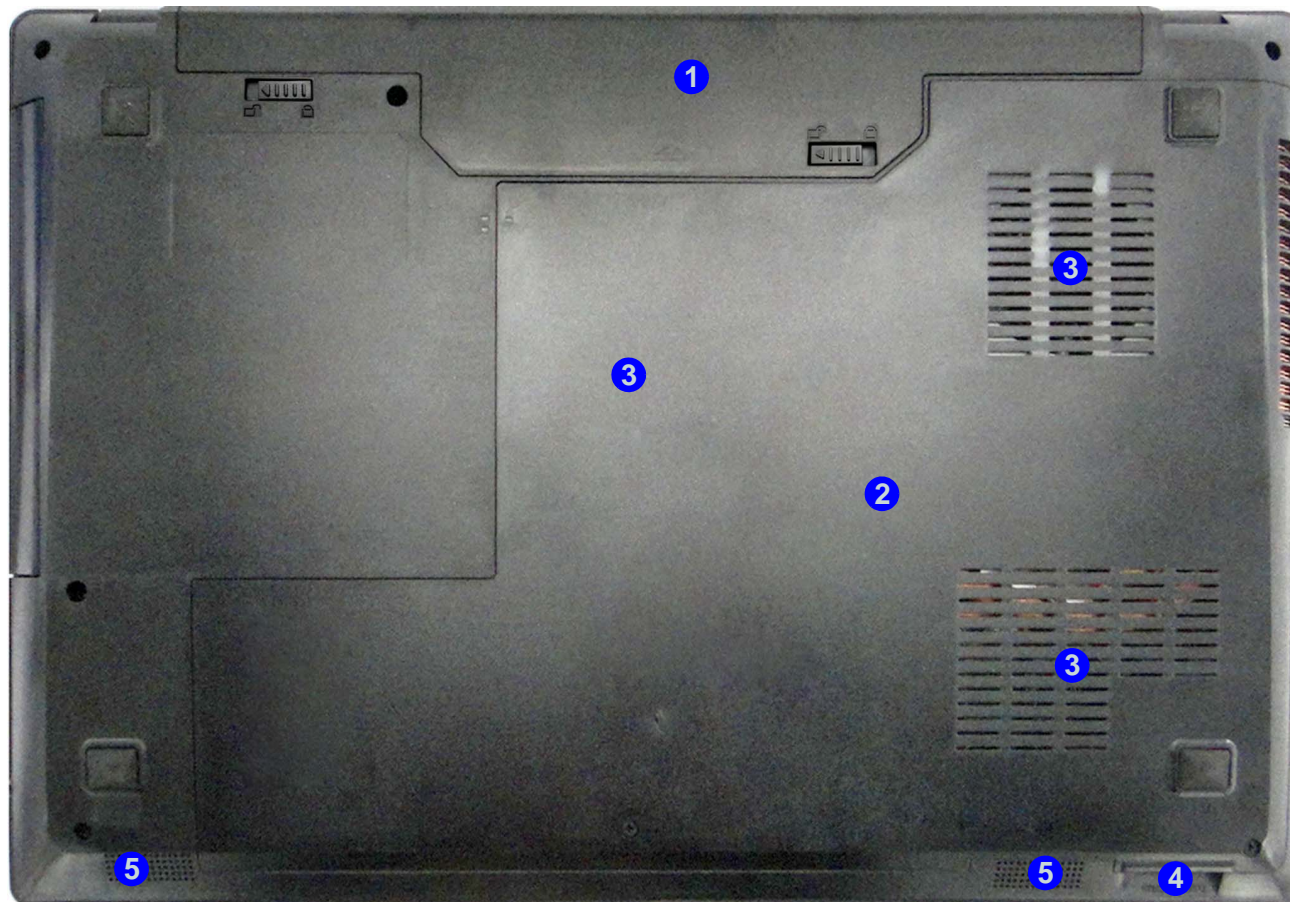


Figure 6
Bottom View

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



Overheating

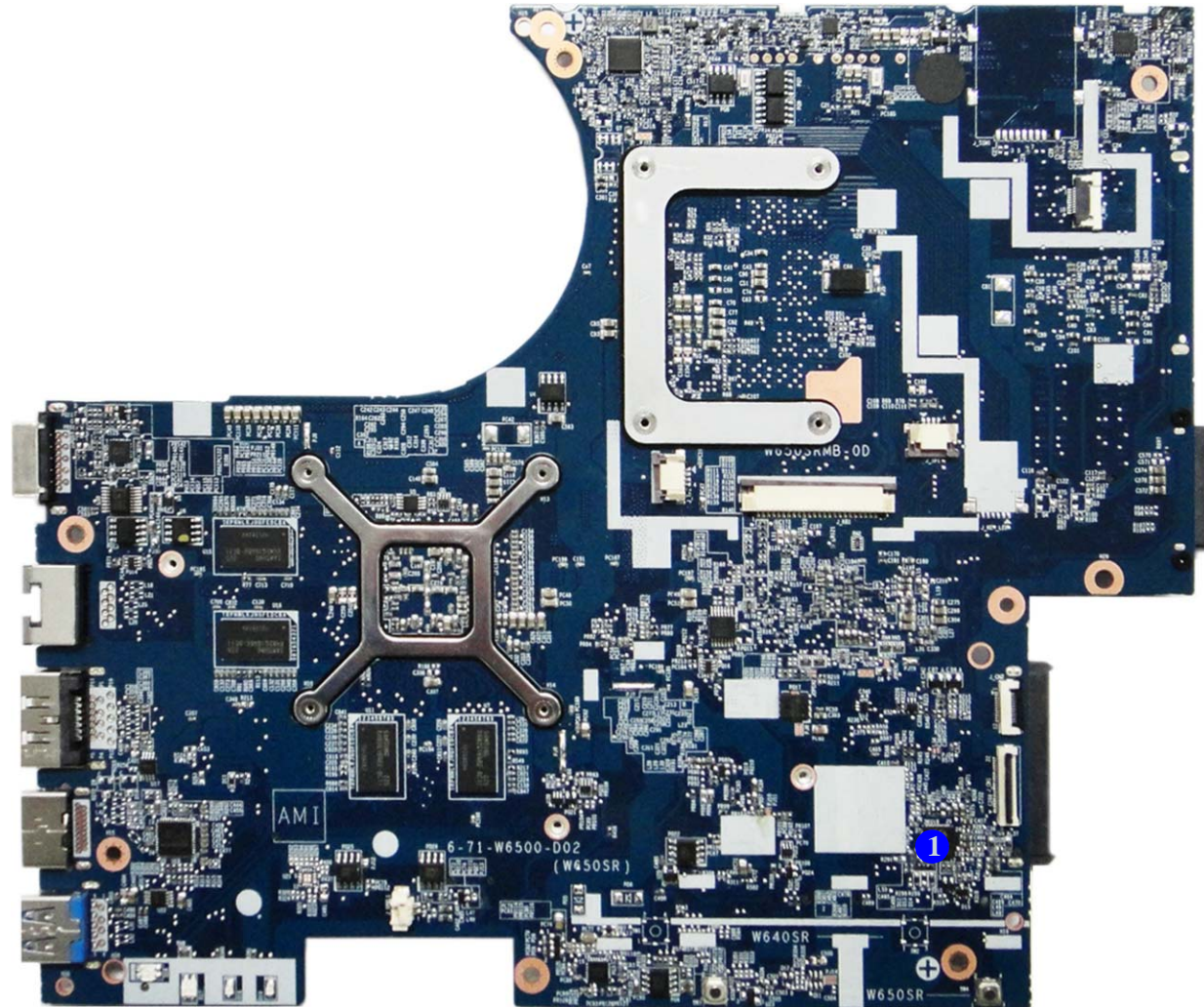
To prevent your computer from overheating, make sure nothing blocks any vent while the computer is in use.

Introduction

Figure 7
**Mainboard Top
Key Parts**

1. Audio Codec

Mainboard Overview - Top (Key Parts)



Mainboard Overview - Bottom (Key Parts)

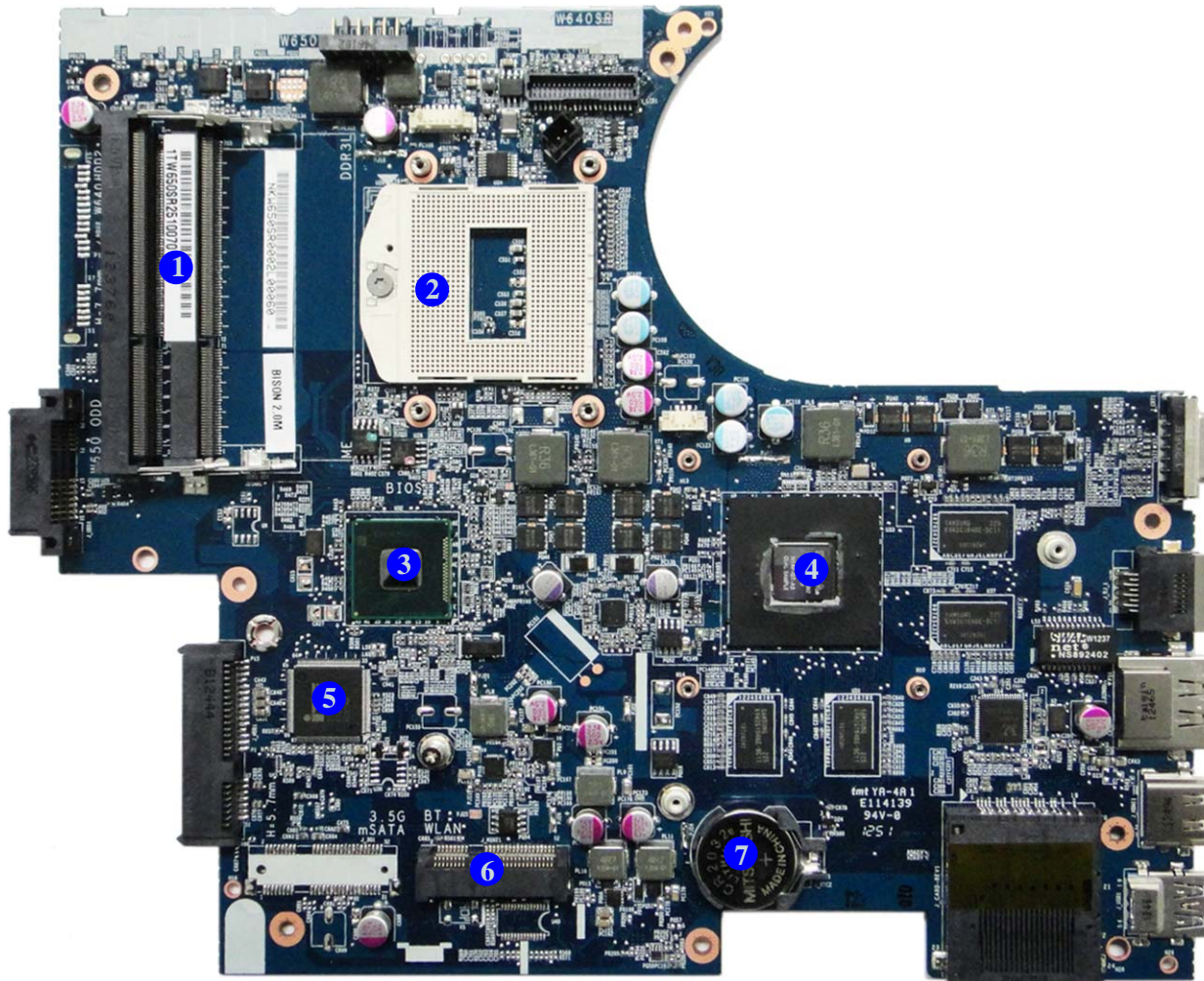


Figure 8
**Mainboard Bottom
Key Parts**

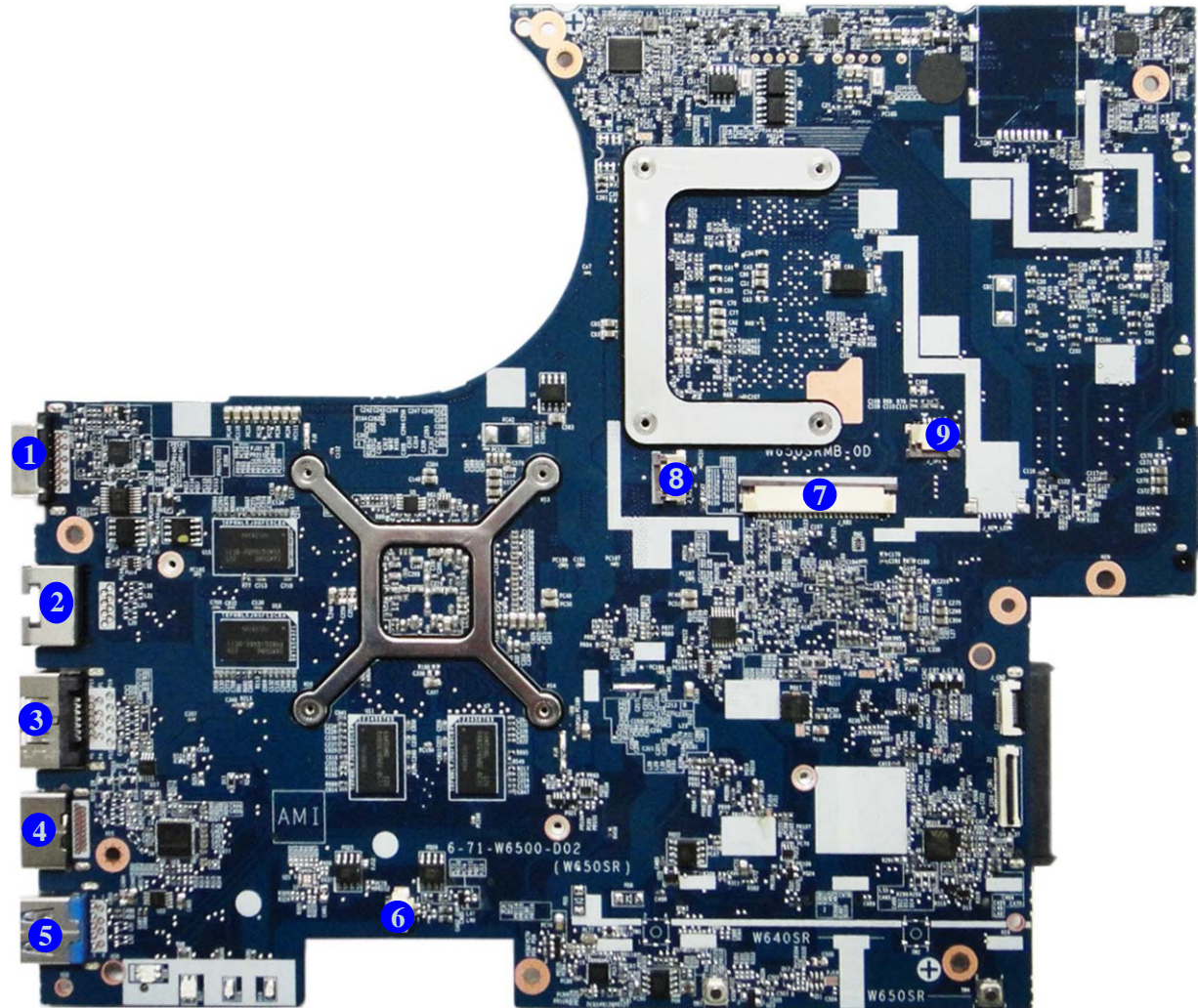
1. Memory Slots
DDR3 SO-DIMM
2. CPU Socket (no
CPU installed)
3. Platform Controller
Hub
4. GPU
5. KBC-ITE IT8518
6. Mini-Card
Connector (WLAN
Module)
7. CMOS Battery

Introduction

Figure 9
**Mainboard 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.

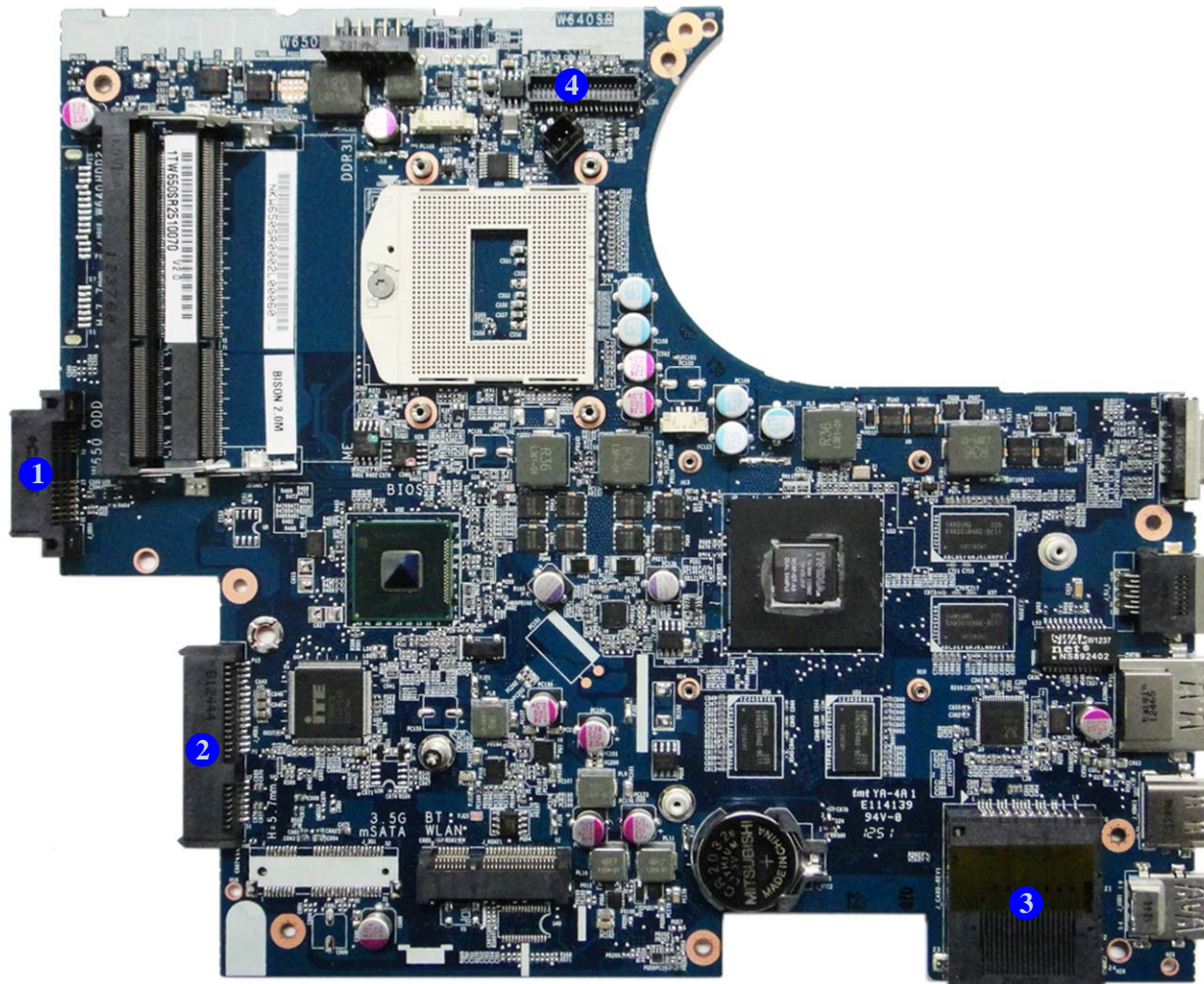
Mainboard Overview - Top (Connectors)



Mainboard Overview - Bottom (Connectors)

Figure 10
**Mainboard 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 **W650SH** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

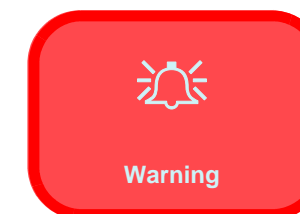
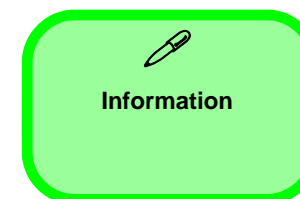
We suggest you completely review any procedure before you take the computer apart.

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  lists the relevant parts you will have after the disassembly process is complete. **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  will also provide any possible helpful information. A box with a  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.



Power Safety Warning

Before you undertake any upgrade procedures, make sure that you have turned off the power, and disconnected all peripherals and cables (including telephone lines and power cord). It is advisable to also remove your battery in order to prevent accidentally turning the machine on.

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.**

To remove the Battery:

1. Remove the battery *page 2 - 5*

To remove the Keyboard:

1. Remove the battery *page 2 - 5*
2. Remove the keyboard *page 2 - 6*

To remove the HDD:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 7*

To remove the Optical Device:

1. Remove the battery *page 2 - 5*
2. Remove the Optical device *page 2 - 10*

To remove the System Memory:

1. Remove the battery *page 2 - 5*
2. Remove the system memory *page 2 - 12*

To remove and install a Processor:

1. Remove the battery *page 2 - 5*
2. Remove the processor *page 2 - 14*
3. Install the processor *page 2 - 16*

To remove the Wireless LAN Module:

1. Remove the battery *page 2 - 5*
2. Remove the WLAN *page 2 - 17*

To remove the MSATA Module:

1. Remove the battery *page 2 - 5*
2. Remove the MSATA *page 2 - 18*

To remove the CCD Module:

1. Remove the battery *page 2 - 5*
2. Remove the CCD module *page 2 - 19*

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*).

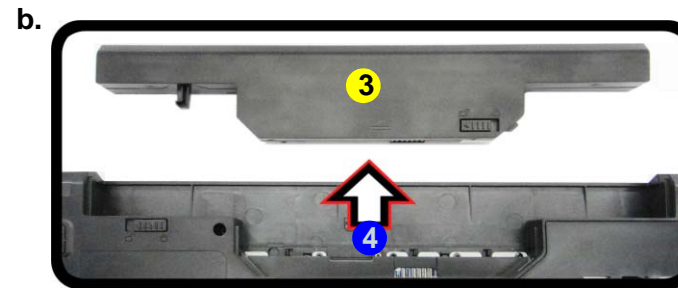
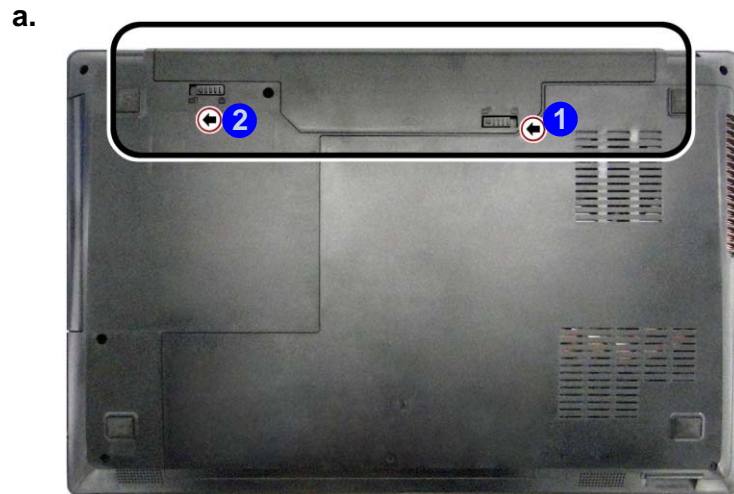
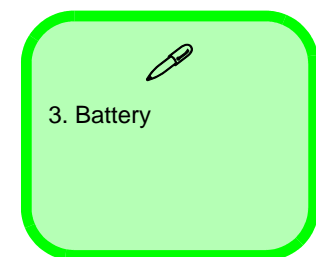


Figure 1
Battery Removal

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



Disassembly

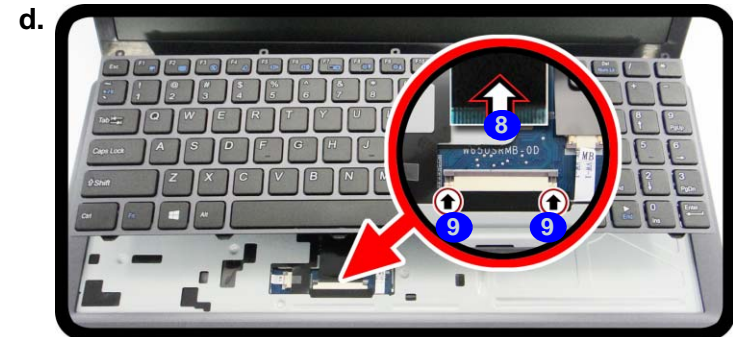
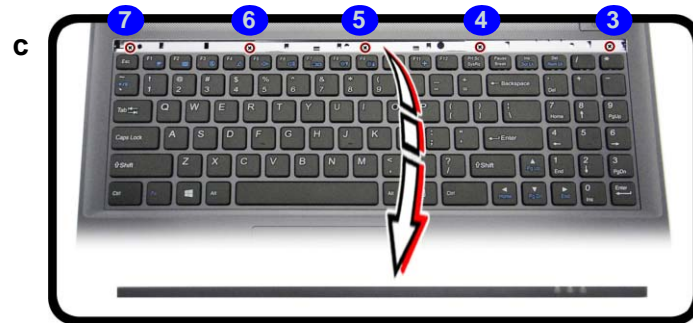
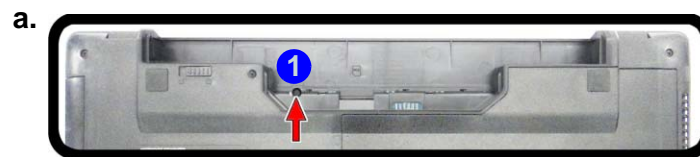
Figure 2

Keyboard Removal

- Press at point **1** to un-snap LED cover module.
- Remove the LED cover module.
- Remove the screws.
- Carefully lift the keyboard up and disconnect the ribbon cable.
- Remove the keyboard.

Removing the Keyboard

- Turn **off** the computer, turn it over, remove the battery ([page 2 - 5](#)).
- 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](#)).
- Turn the computer over, remove the unsnap LED cover module **2** from the computer ([Figure 2b](#)).
- Remove screws **3** - **7** from the keyboard ([Figure 2c](#)).
- 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](#)).
- Carefully lift the keyboard **10** off the computer ([Figure 2e](#)).



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](#)).

a.



b.

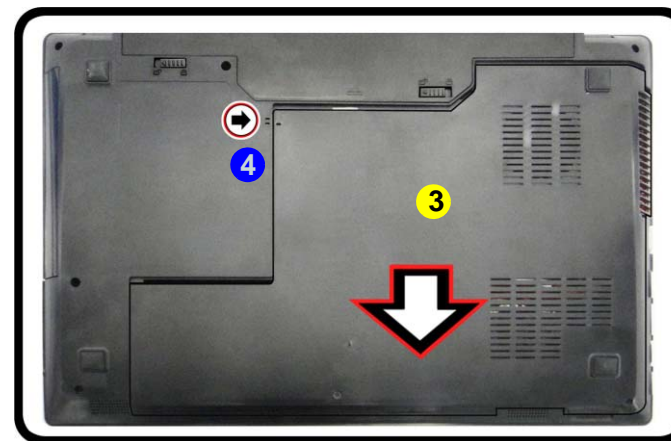
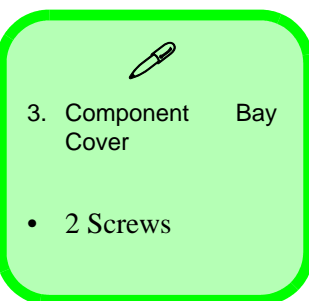


Figure 3
HDD Assembly Removal

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

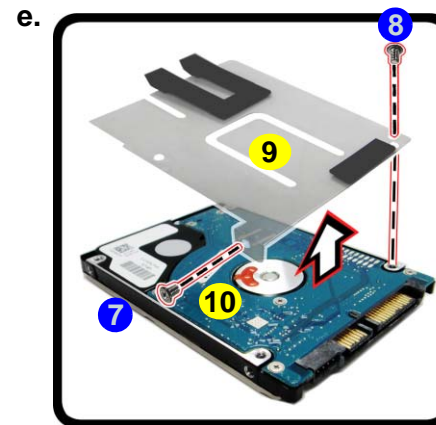
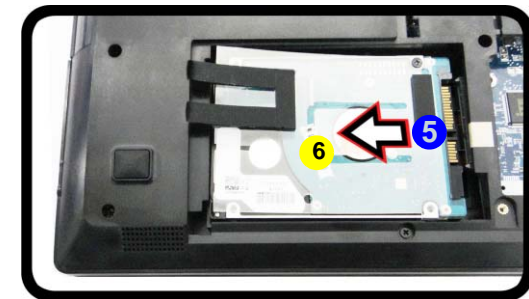
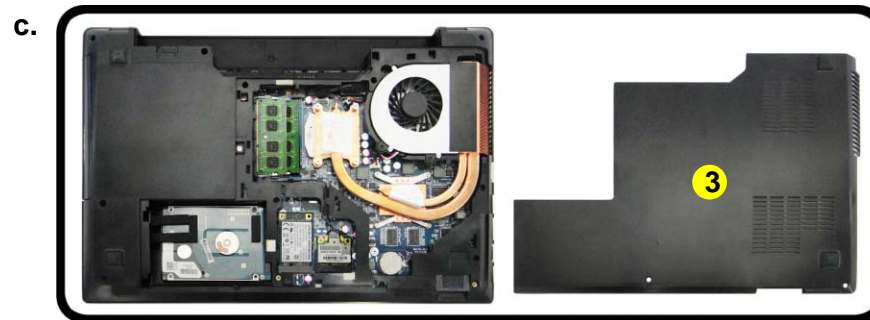


Disassembly

Figure 4
**HDD Assembly
Removal (cont'd.)**

- c. Remove the bay cover.
- d. Lift the rubber and slide the HDD assembly in the direction of the arrow to lift the HDD assembly out.
- e. Remove the screws and adhesive cover.

- 4. Remove the component bay cover **3** (*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.

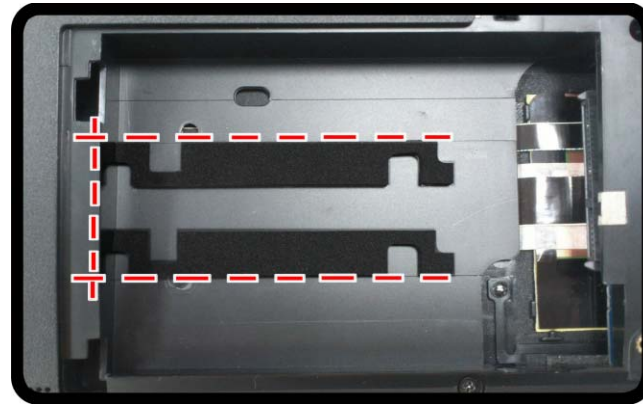


Figure 5
**Foam Rubber
Insert for 7mm(H)
HDDs**

- 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.

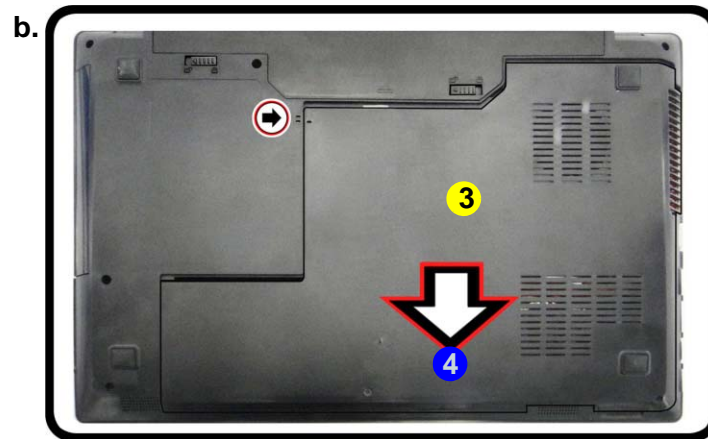
Disassembly

Figure 6
**Optical Device
Removal**

- Remove the screws.
- Remove the component bay cover.
- Remove the screw at point ⑤.
- Use a screwdriver to carefully push out the optical device at point ⑥.

Removing the Optical (CD/DVD) Device

- Turn **off** the computer, and remove the battery ([page 2 - 5](#)).
- Locate the component bay cover and remove screws ① - ② ([Figure 6a](#)).
- Remove the component bay cover ③ in the direction of the arrow ④ ([Figure 6b](#)).
- Remove the screw at point ⑤ ([Figure 6c](#)).
- Use a screwdriver to carefully push out the optical device ⑦ at point ⑥ ([Figure 6d](#)).



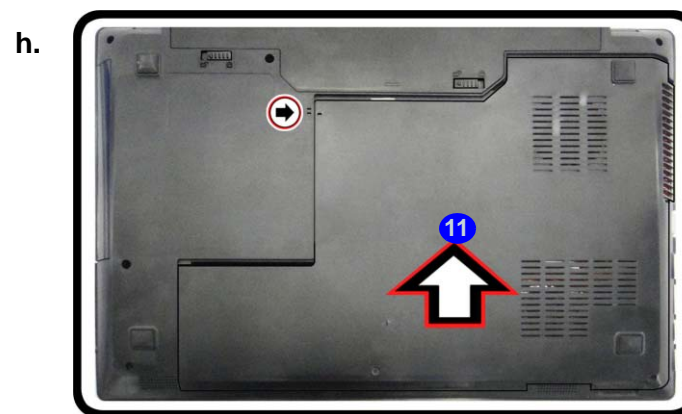
3. Component Bay Cover


• 2 Screws

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.

Figure 7
Optical Device Removal (cont'd.)

- e. Pry the bezel off the optical device.
- f. Separate the bezel and optical device.
- g. Install the front bezel.
- h. Replace the component bay cover and screws.





7. Optical Device

- 1 Screw

Disassembly

Figure 8
RAM Module Removal

- Remove the screws from the component bay cover.
- 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

Removing the System Memory (RAM)

The computer has two memory sockets for 204 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDRIII (DDR3L) Up to 1600 MHz. The main memory can be expanded up to 8GB. The SO-DIMM modules supported are 1024MB and 2048MB **DDRIII** Modules. The total memory size is automatically detected by the POST routine once you turn on your computer.

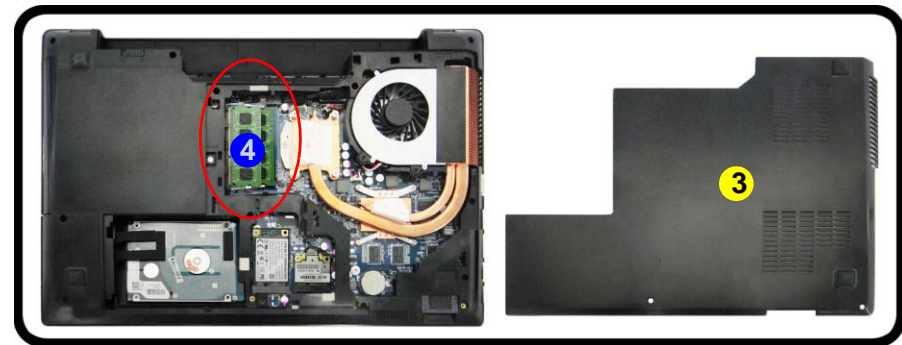
Memory Upgrade Process

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](#)).

a.

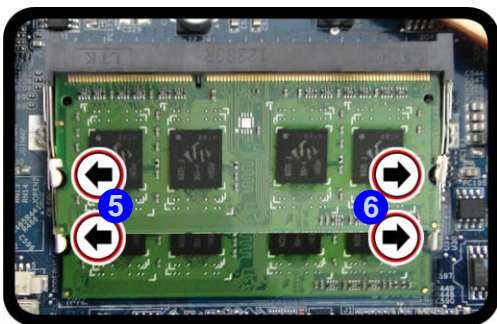


b.



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.

c.



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).

d.

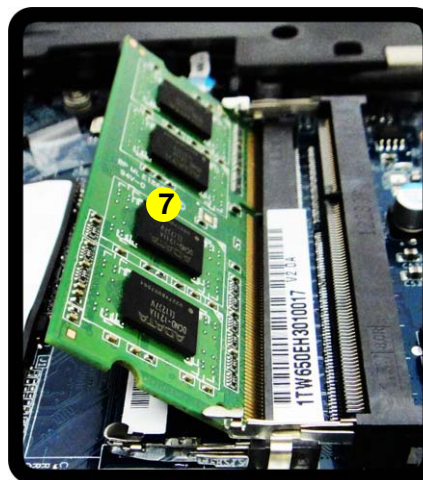


Figure 9

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.



7. RAM Module

Disassembly

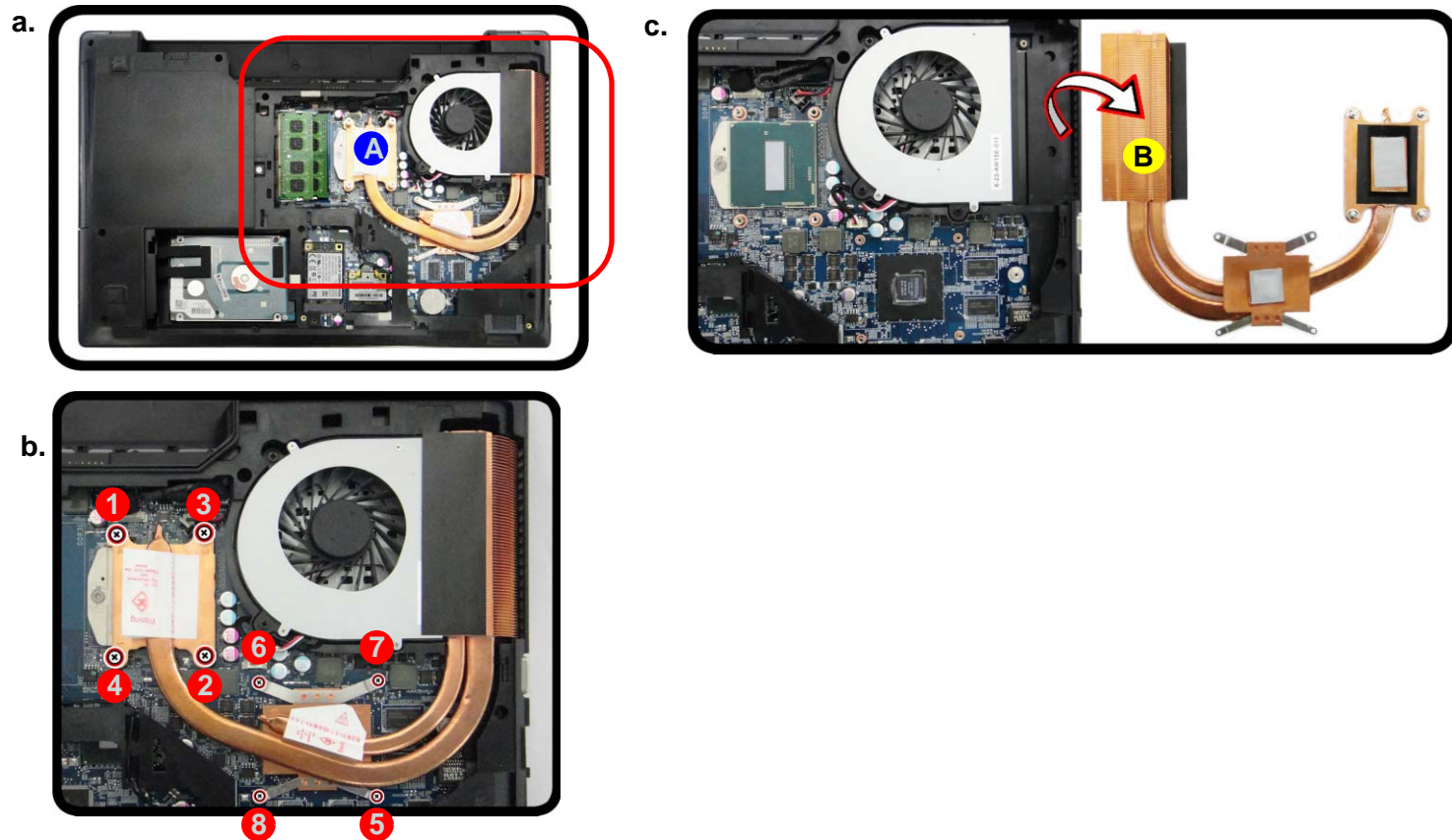
Figure 10
Processor Removal

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

Removing and Installing a Processor

Processor Removal Procedure

- Turn **off** the computer, turn it over, remove the battery ([page 2 - 5](#)) and the component bay cover ([page 2 - 7](#)).
- The CPU heat sink will be visible at point **A** ([Figure 10a](#)).
- 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](#))).
- Carefully (it may be hot) remove the heat sink unit **B** off the computer ([Figure 10c](#)).

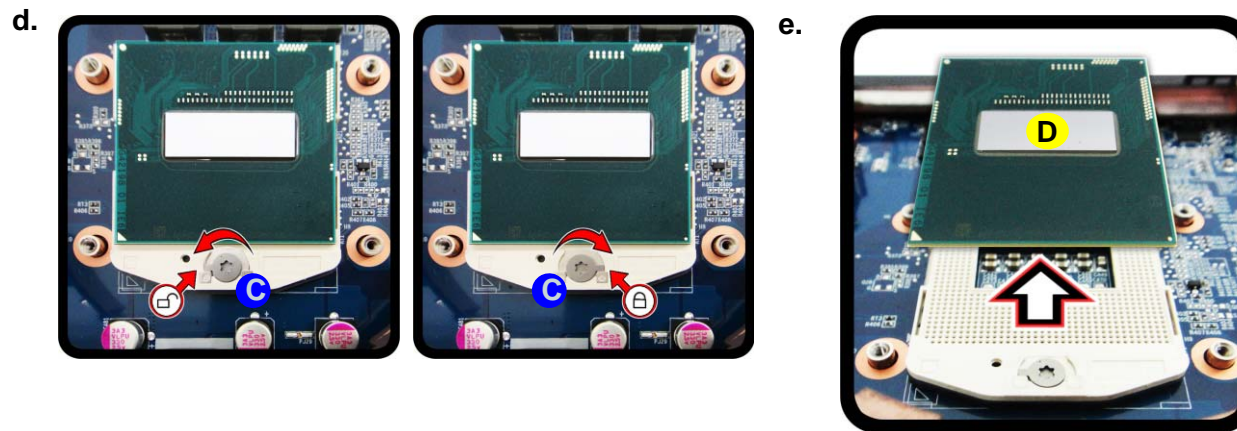


B. Heat Sink

- 8 Screws

Figure 11
**Processor Removal
(cont'd)**

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



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.




D. CPU

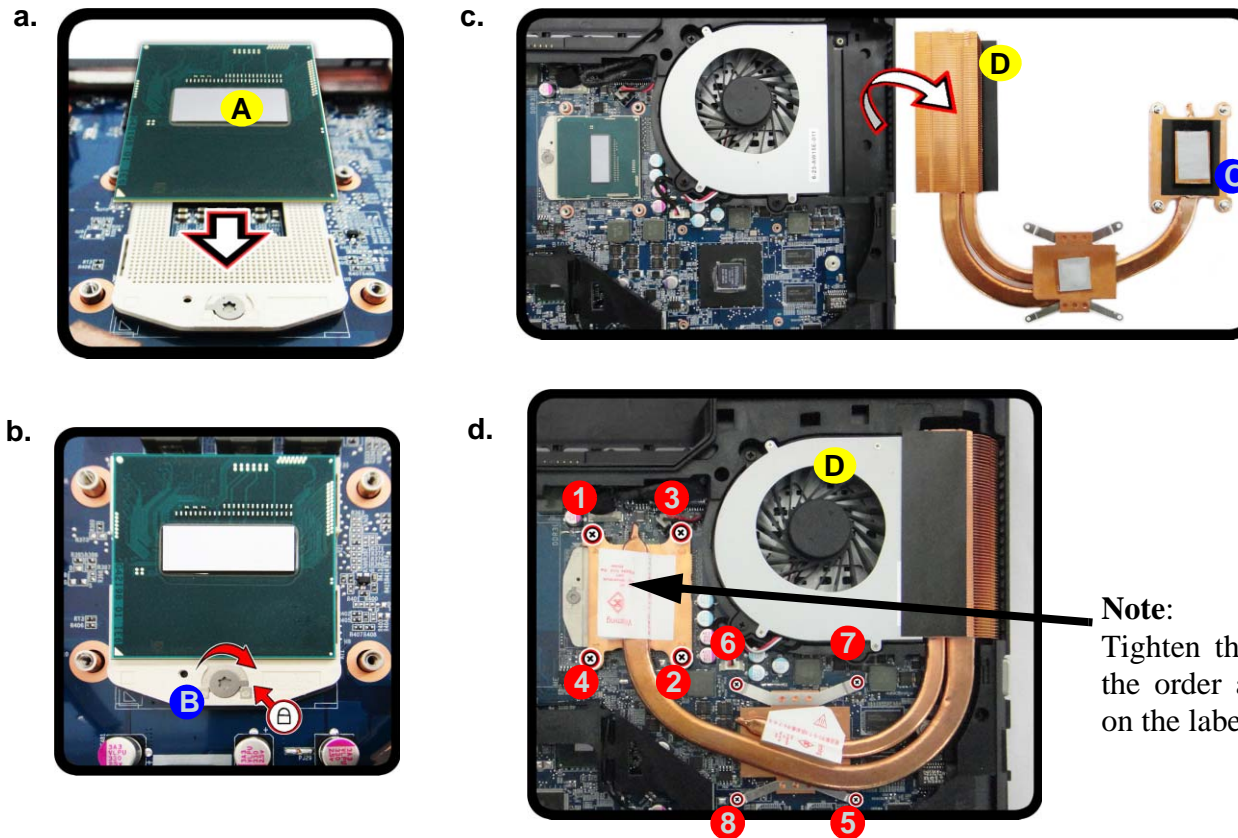
Disassembly

Figure 12
Processor Installation

- Insert the CPU.
- Turn the release latch towards the lock symbol.
- Insert the heat sink.
- Tighten the screws.

Processor Installation Procedure

- 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  (*Figure 12b*).
- Remove the sticker **C**** (*Figure 12c*) from the heat sink unit (if it is a new unit).
- Insert the heat sink **D** as indicated in *Figure 12c*.
- 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*).
- Replace the CPU fan, component bay cover and tighten the screws (*page 2 - 14*).



Note:
Tighten the screws in the order as indicated on the label.

A. CPU
D. Heat Sink

- 4 Screws

Removing 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 **4** ([Figure 13b](#)).
4. The Wireless LAN module **5** ([Figure 13c](#)) will pop-up, and you can remove it from the computer.

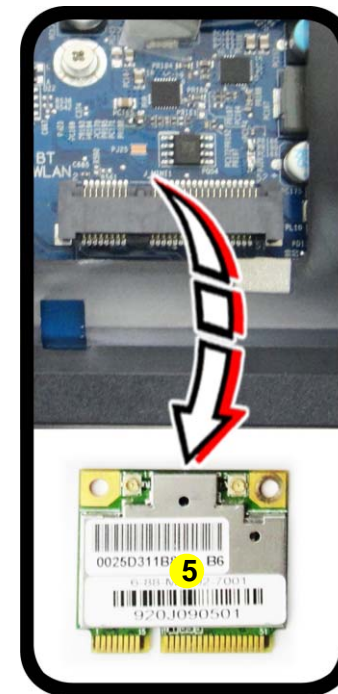
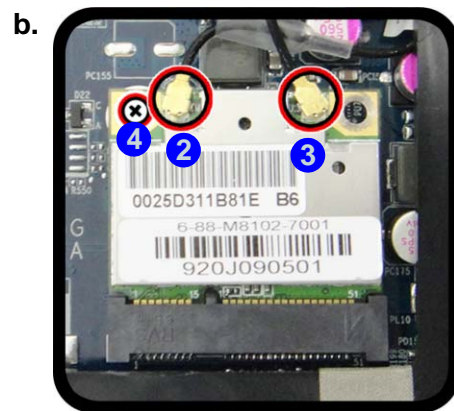
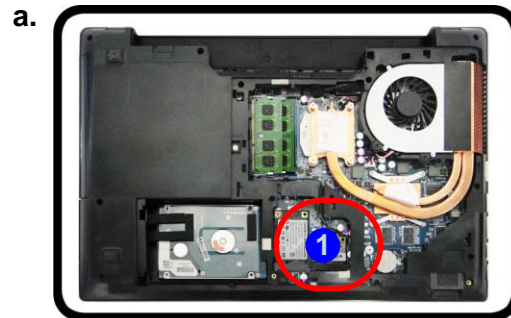


Figure 13
**Wireless LAN
Module Removal**

- 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](#)).



5. Wireless LAN Module

- 1 Screw

Disassembly

Figure 14
**MSATA Module
Removal**

- Locate the module.
- Remove the screw.
- The module will pop-up.
- Lift the module up off the socket.

Removing the MSATA Module

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



3. MSATA Module

- 1 Screw

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 **5** upwards before carefully lifting it up.
4. Remove the LCD front cover **5** ([Figure 15c](#)).

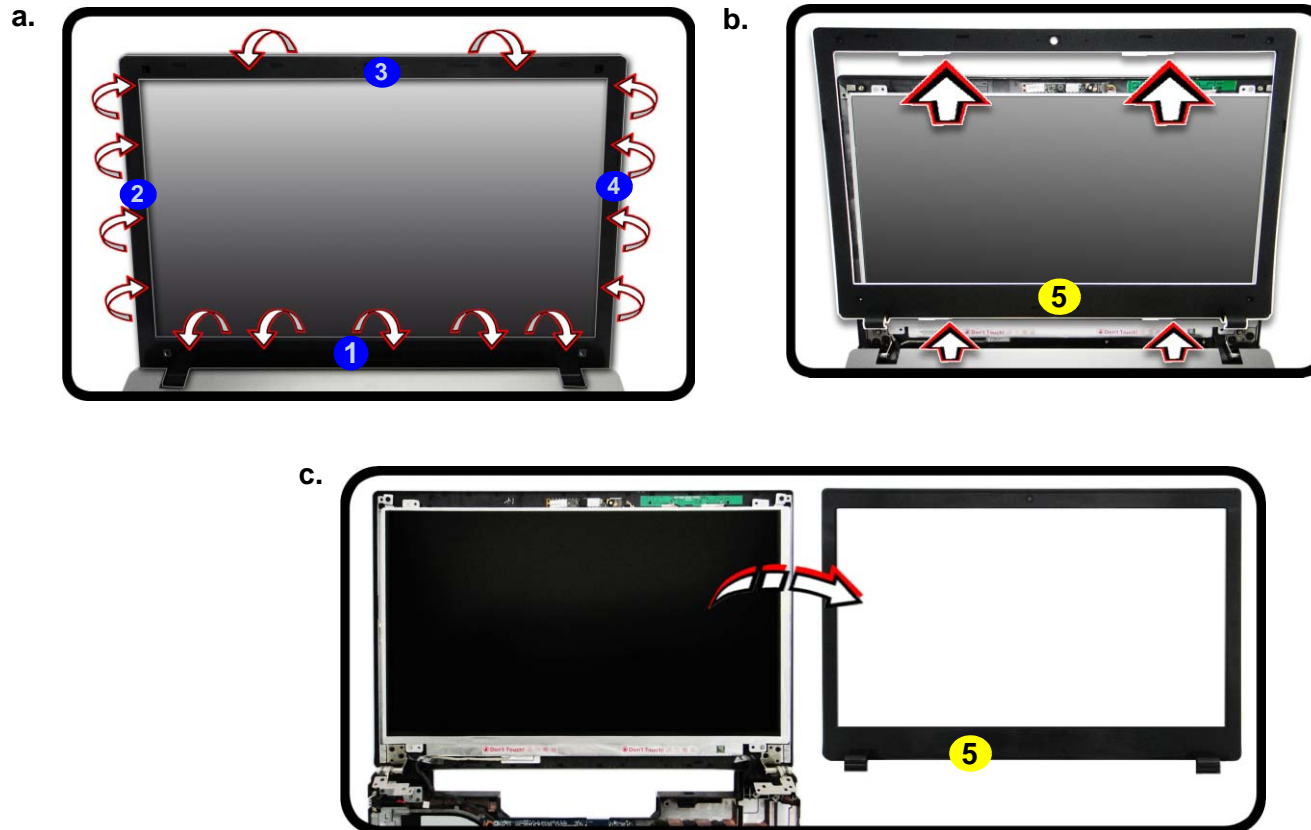


Figure 15
CCD Removal

- 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.



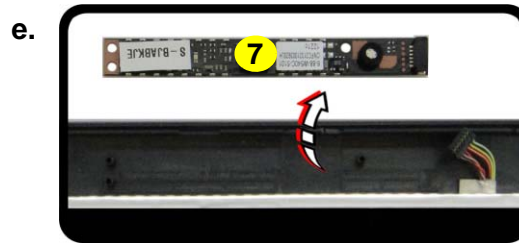
5. LCD Front Cover

Disassembly

Figure 16
CCD Removal
(cont'd)

- d. Disconnect the cable.
- e. Remove the CCD module.

- 5. Disconnect the cable ⑥.
- 6. Remove the CCD module ⑦ (*Figure 16f*).
- 7. Reverse the process to install a new CCD module.



7. CCD Module

Appendix A:Part Lists

This appendix breaks down the **W650SH** 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 A - 1
**Part List Illustration
Location**

Part	
Top	<i>page A - 3</i>
Bottom	<i>page A - 4</i>
COMBO	<i>page A - 5</i>
DVD Dual Drive	<i>page A - 6</i>
HDD	<i>page A - 7</i>
2nd HDD	<i>page A - 8</i>
LCD	<i>page A - 9</i>

Top

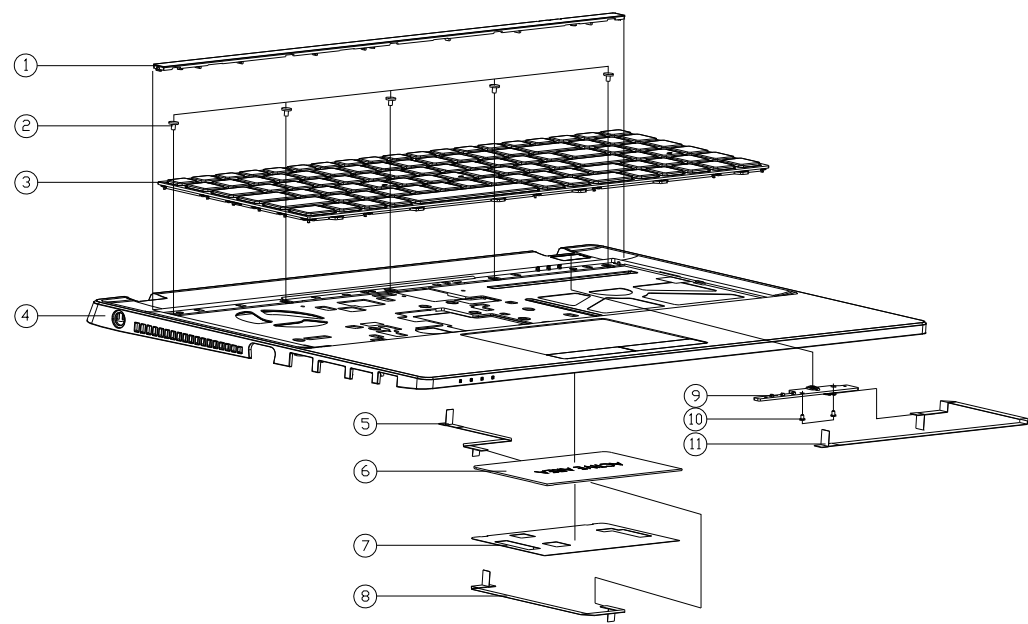
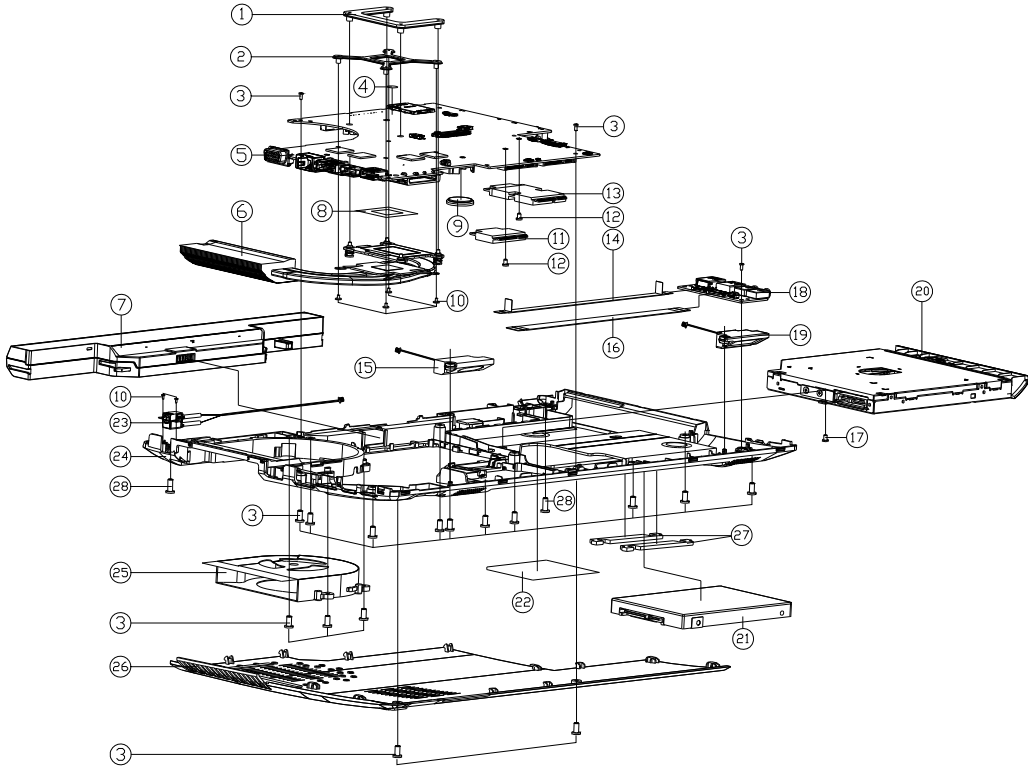


Figure A - 1
Top

ITEM	PART NAME	PART NO	REMARK
1	KB COVER PC+ABS W650SR	6-42-W6502-043	FOR W650SX
1	EPSON KB COVER PC+ABS W652SH-E	6-42-W6522-010-E	FOR W652SH-E
2	SCREW M2x2.5L KI BK/Z ICT NY835 T-03	6-35-B6120-2RB	
3	W650 K/B USA(BLACK) FRAME(US) MODULE W650SR	6-79-W650SR0K-010-W	
4	TOP CASE MODULE W650SRCHANGE	6-39-W6502-015	FOR W650SX
4	TOP CASE MODULE (EPSON) W652SH-E	6-39-W6522-010-E	FOR W652SH-E
5	FFC CABLE FOR TP_ON1 TO MB 4PIN (HS) W650SR	6-43-W6500-021	
6	TOUCH PAD ELAN SA055D-6200 W650CH	6-49-W65E3-010	
7	TOUCH PAD W650 (004524150) BLACK PET+TEA #02 W650SR	6-40-W6502-023	
8	FFC CABLE FOR TP_ON2 TO MB 4PIN (HS) W650SR	6-43-W6500-031	
9	POWER SWITCH BOARD V30A W650CH	6-77-W650S-003A-A	
10	SCREW M2x3L KI NI ICT NY (00-043,01-04)	6-35-B1120-3RE	
11	FFC CABLE FOR POWER BOARD TO MB 10PIN (HS) W650SR	6-43-W6500-011	

Bottom

Figure A - 2
Bottom



ITEM	PART	NAME	PART	NO	REMARK
1	CPU SUPPORT BRACKET	SECC T15 P08H	6-33-X510S-011		
2	VGA SUPPORTER	SUS430 X7200	6-33-X720S-040		
3	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
4	MYLAR	D10 FRB3 M760S	6-40-M760S-010		
5	MAIN BOARD	V30 (W/3D) W650SR	6-77-W650SR00-003		
5	MAIN BOARD	V30 (W/3D) W650SR	6-77-W650SR00-003-1		
5	MAIN BOARD	V30 (W/3D) W650SH	6-77-W650SH00-003		
5	MAIN BOARD	V30 (W/3D) W650SH	6-77-W650SH00-003-1		
5	MAIN BOARD	V30 W650SH-E	6-77-W650SH00-003		
6	CPU HEAT SINK MODULE	W650SR	6-31-W650N-101		
7	BATTERY	2V 200AH CR2032 (OUTSUSHO)	6-87-W650S-407A2		(OPTION)
7	BATTERY	2V 200AH CR2032 (OUTSUSHO)	6-87-W650S-40A2		(OPTION)
7	BATTERY	2V 200AH CR2032 (OUTSUSHO)	6-87-W650S-4E7C		(OPTION)
7	BATTERY	2V 200AH CR2032 (OUTSUSHO)	6-87-W650S-4E4C		(OPTION)
8	VGA CHIP	MTLAK 30X30 NPP-GE2 M001U	6-40-MB60S-091		FOR W650SR
9	BATTERY	2V 200AH CR2032 (OUTSUSHO)	6-87-W650S-407A2		(OPTION)
10	BATTERY	2V 200AH CR2032 (OUTSUSHO)	6-87-W650S-40A2		(OPTION)
11	BATTERY	2V 200AH CR2032 (OUTSUSHO)	6-87-W650S-4E7C		(OPTION)
11	BATTERY	2V 200AH CR2032 (OUTSUSHO)	6-87-W650S-4E4C		(OPTION)
12	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
13	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
14	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
15	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
16	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
17	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
18	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
19	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
20	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
21	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
22	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
23	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
24	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
25	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
26	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
27	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
28	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
29	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
30	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
31	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
32	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
33	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
34	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
35	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
36	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
37	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
38	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
39	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
40	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
41	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
42	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
43	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
44	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
45	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
46	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
47	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
48	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
49	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
50	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
51	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
52	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
53	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
54	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
55	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
56	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
57	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
58	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
59	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
60	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
61	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
62	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
63	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
64	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
65	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
66	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
67	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
68	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
69	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
70	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
71	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
72	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
73	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
74	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
75	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
76	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
77	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
78	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
79	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
80	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
81	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
82	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
83	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
84	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
85	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
86	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
87	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
88	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
89	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
90	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
91	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
92	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
93	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
94	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
95	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
96	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
97	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
98	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
99	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		
100	SCREW	M2.5x6L K 1/2 ICT NY	6-35-B012S-60A		

COMBO

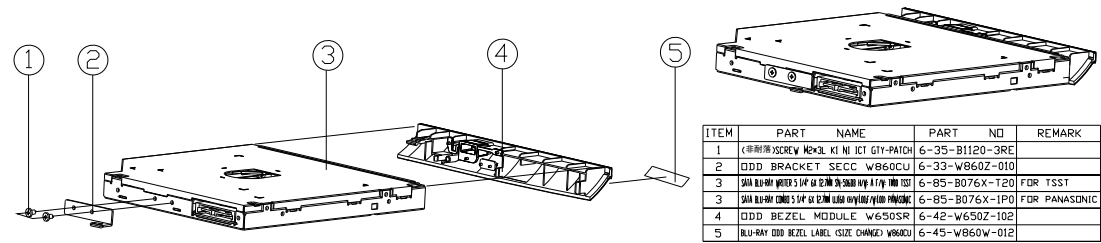
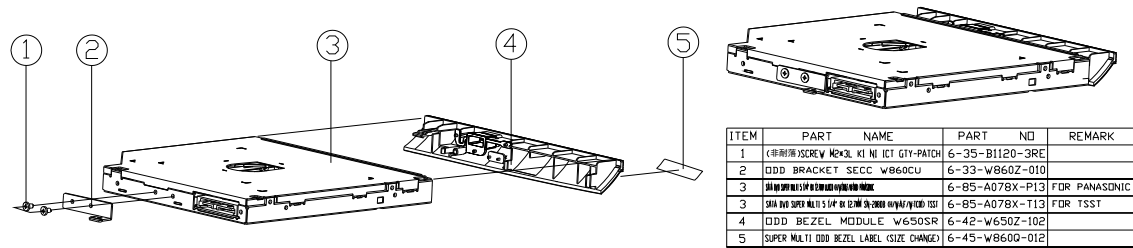


Figure A - 3
COMBO

DVD DUAL

Figure A - 4
DVD DUAL



HDD

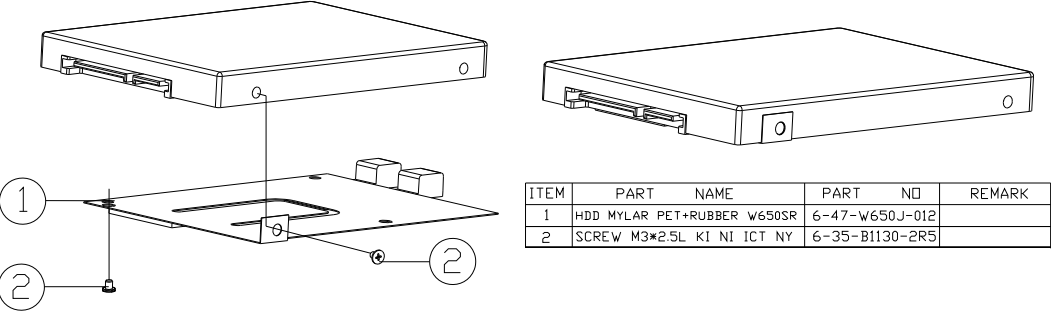
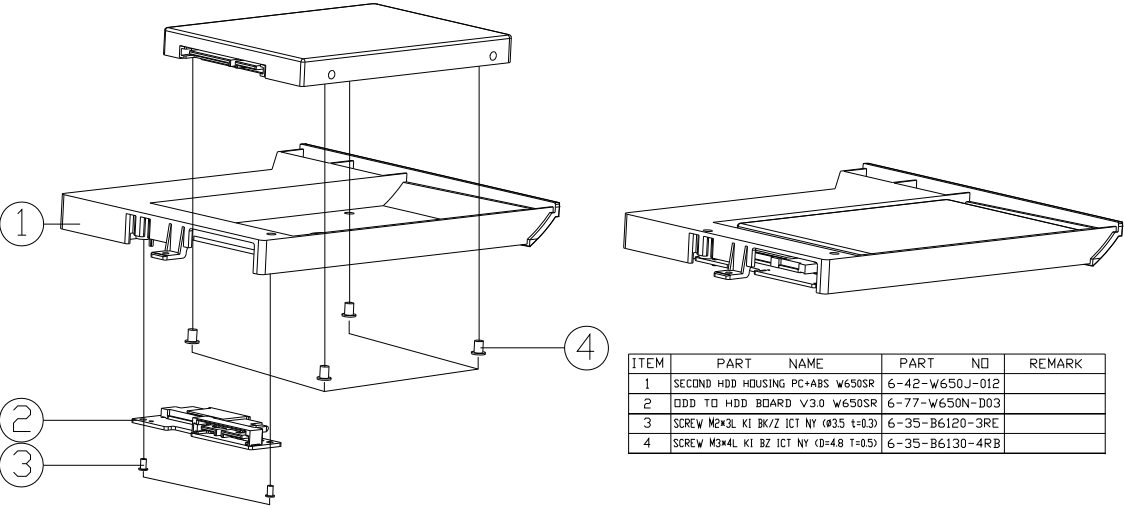


Figure A - 5
HDD

2nd HDD

Figure A - 6
2nd HDD



Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the **W650SH** notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

Diagram - Page	Diagram - Page	Diagram - Page
System Block Diagram - Page B - 2	VGA I/O - Page B - 18	HDD, TP, Audio, USB - Page B - 34
Processor 1/7-DMI, FDI, PEG - Page B - 3	VGA NVVDD Decoupling - Page B - 19	HDMI, RJ45, Fan, KBC, LED - Page B - 35
Processor 2/7- CLK, MISC - Page B - 4	CRT, Holes - Page B - 20	AUDIO CODEC VT1802S - Page B - 36
Processor 3/7- (DDR3) - Page B - 5	Lynx 1/9 - Page B - 21	KBC-ITE IT8587 - Page B - 37
Processor 4/7- Power - Page B - 6	Lynx 2/9 - Page B - 22	5VS, 3VS, 3.3VM, 5VM - Page B - 38
Processor 5/7- GFX PWR - Page B - 7	Lynx 3/9 - Page B - 23	1.05V - Page B - 39
Processor 6/7- GND - Page B - 8	Lynx 4/9 - Page B - 24	VDD3, VDD5 - Page B - 40
Processor 7/7- RSVD - Page B - 9	Lynx 5/9 - Page B - 25	1.5V or 1.35V / 0.75VS, 1.5VS - Page B - 41
DDR3 SO-DIMM_1 - Page B - 10	Lynx 6/9 - Page B - 26	POWER VCORE - Page B - 42
DDR3 SO-DIMM_2 - Page B - 11	Lynx 7/9 - Page B - 27	N14P, NVVDD, PEX, FBVDDQ - Page B - 43
PS8625 - Page B - 12	Lynx 8/9 - Page B - 28	AC IN, CHARGER - Page B - 44
PANEL, INVERTER - Page B - 13	Lynx 9/9 - Page B - 29	AUDIO BOARD - Page B - 45
VGA PCI-E Interface - Page B - 14	3G, WLAN, PCIE, CON - Page B - 30	POWER SWITCH BOARD - Page B - 46
VGA Frame Buffer Interface - Page B - 15	USB Charge, CCD, TPM, Power Con - Page B - 31	ODD to HDD BOARD - Page B - 47
VGA Frame Buffer A - Page B - 16	eSATA/USB3.0, LED - Page B - 32	
VGA Frame Buffer C - Page B - 17	Card Reader (RTL8411) - Page B - 33	

Table B - 1
**SCHEMATIC
DIAGRAMS**

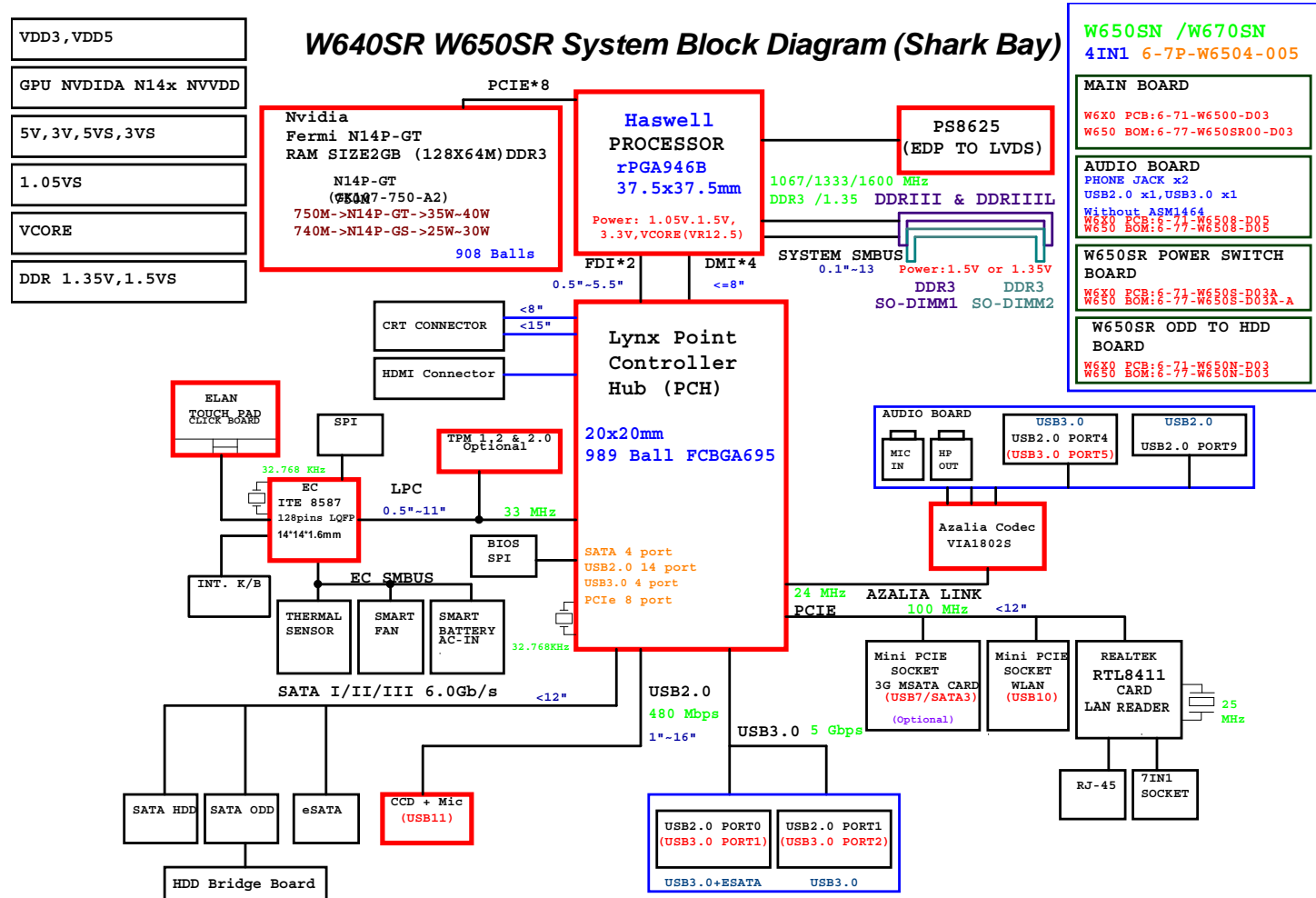


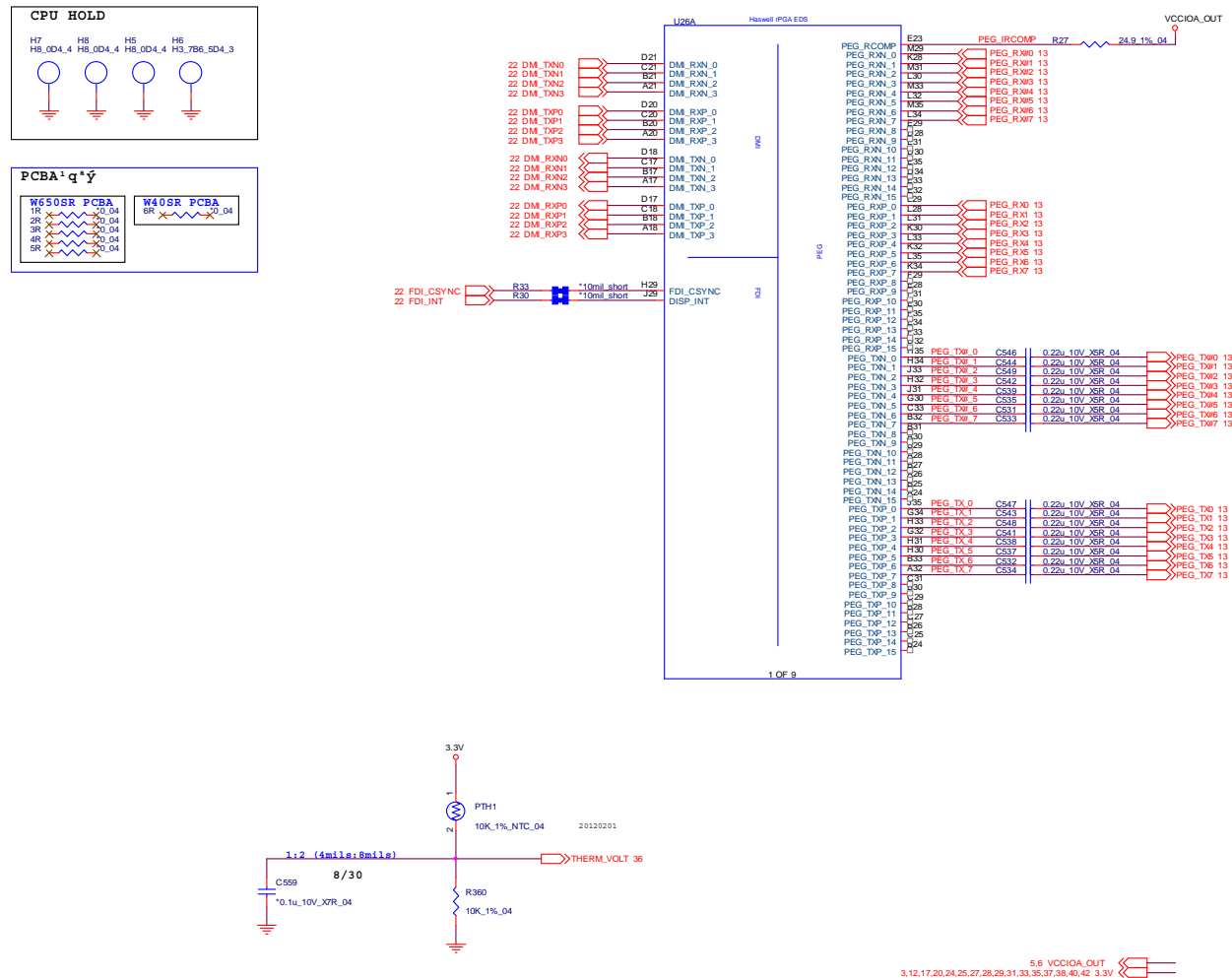
Version Note

The schematic diagrams in this chapter are based upon version 6-7P-W6504-005. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

System Block Diagram

Sheet 1 of 46
System Block
Diagram

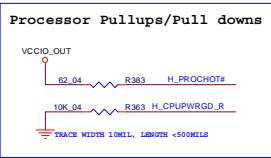




Schematic Diagrams

Processor 2/7- CLK, MISC

Sheet 3 of 46
Processor 2/7-CLK,
MISC



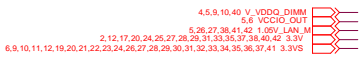
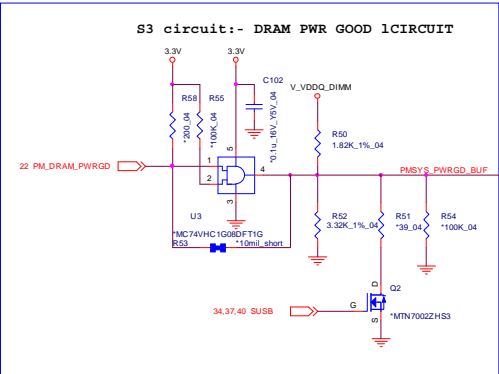
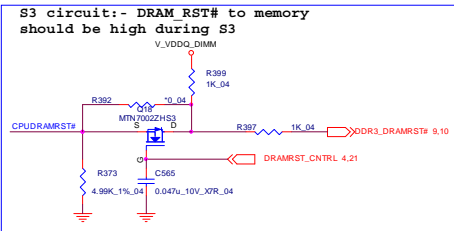
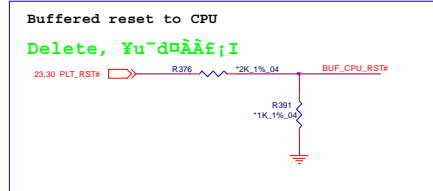
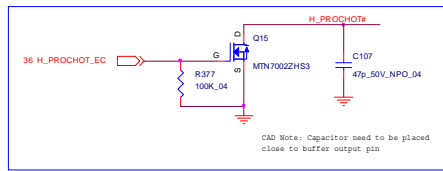
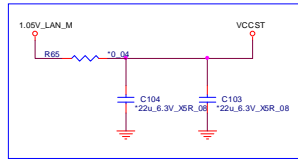
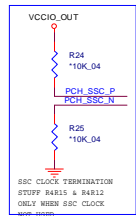
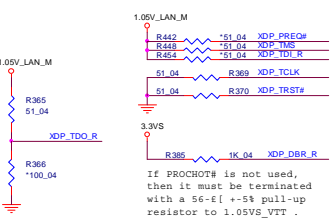
Haswell Processor 2/7 (CLK,MISC,JTAG)



DDR3 Compensation Signals

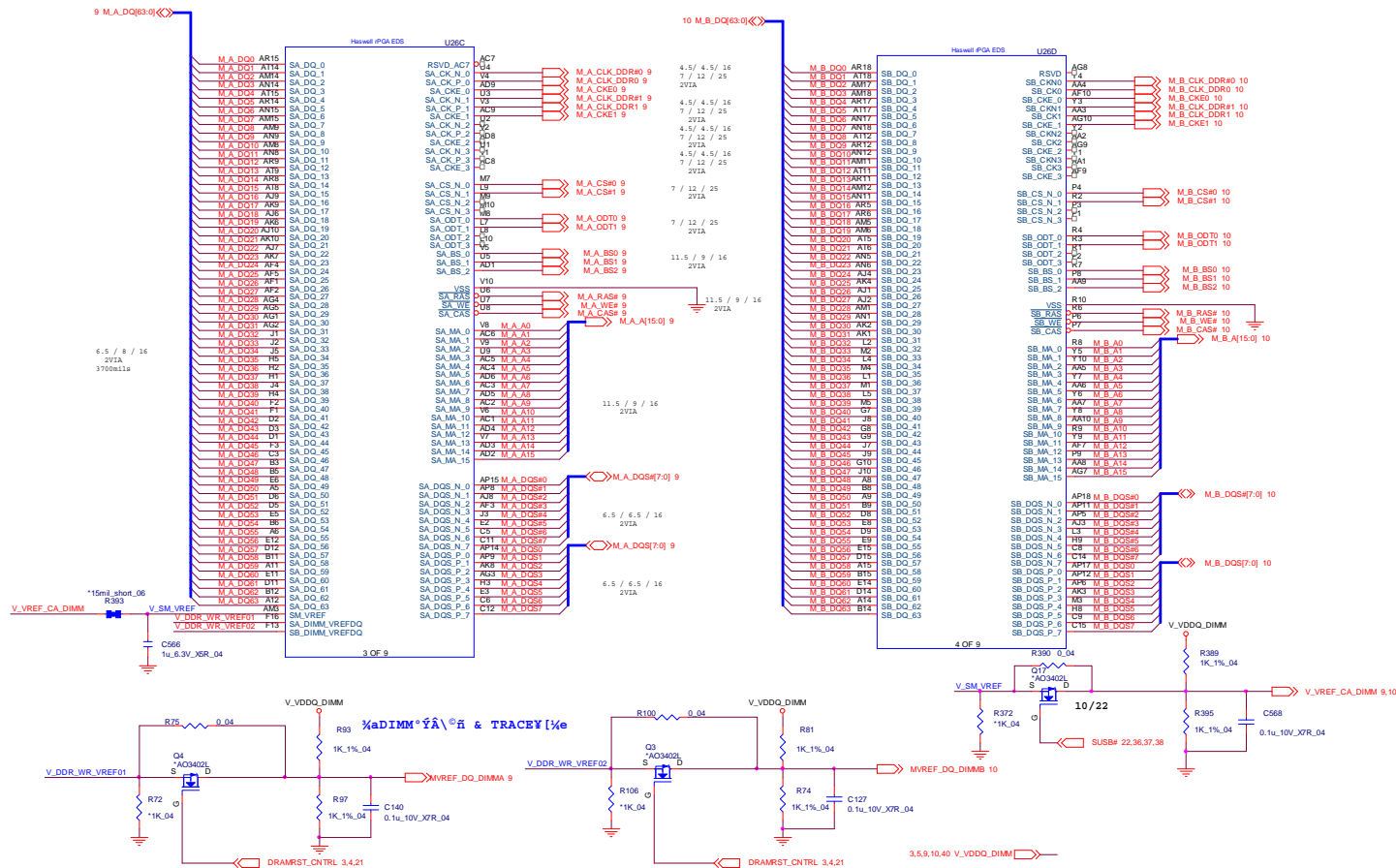


PU/PD for JTAG signals



Processor 3/7- (DDR3)

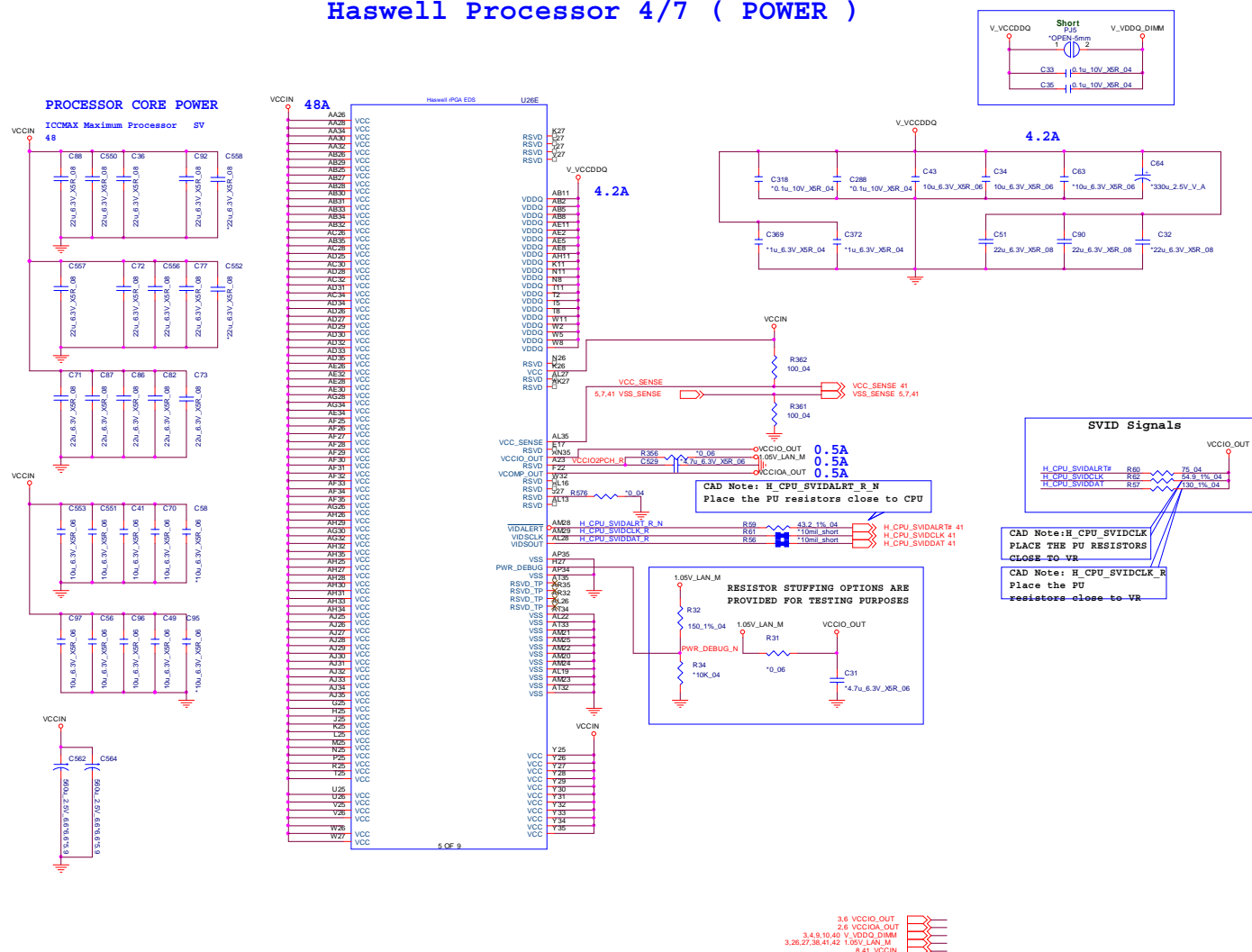
Haswell Processor 3/7 (DDR3)



Processor 4/7- Power

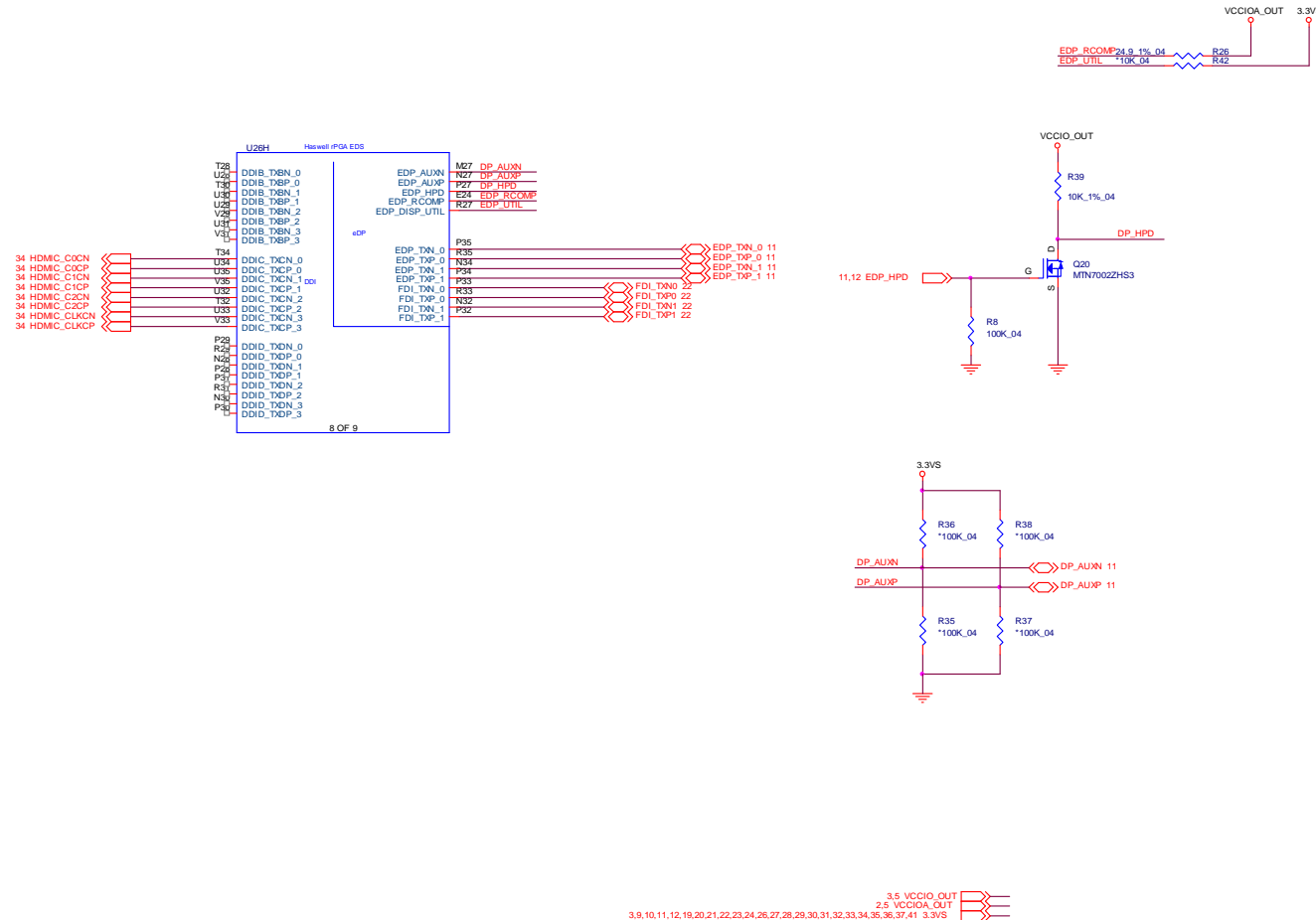
Sheet 5 of 46
Processor 4/7-
Power

Haswell Processor 4/7 (POWER)



Processor 5/7- GFX PWR

Haswell Processor 5/7 (GRAPHICS POWER)

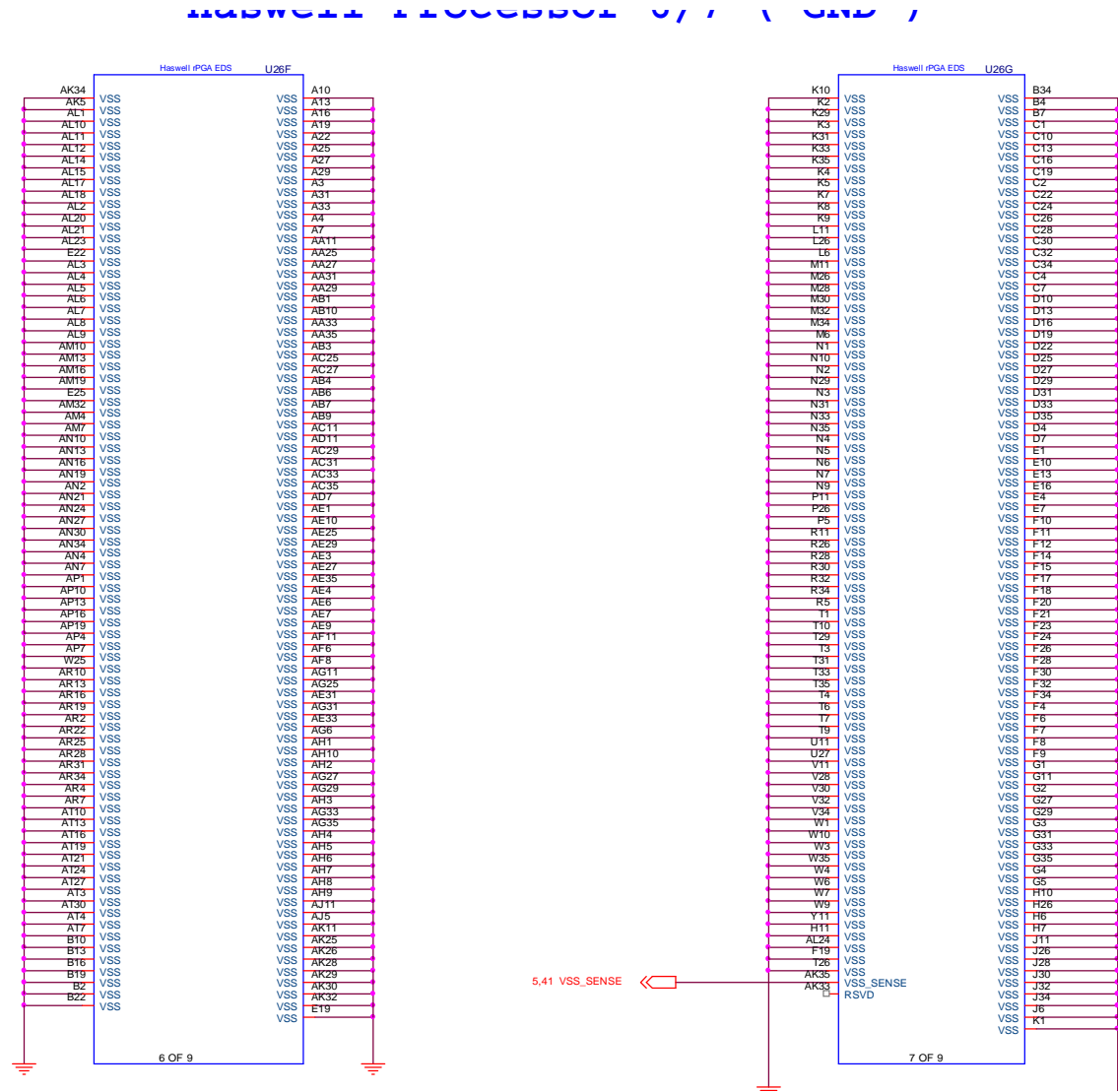


Sheet 6 of 46
Processor 5/7- GFX
PWR

Schematic Diagrams

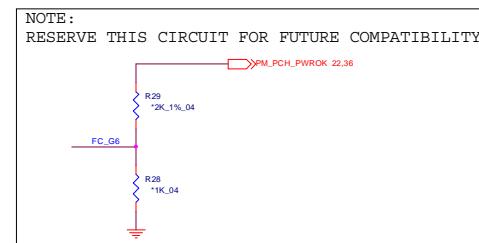
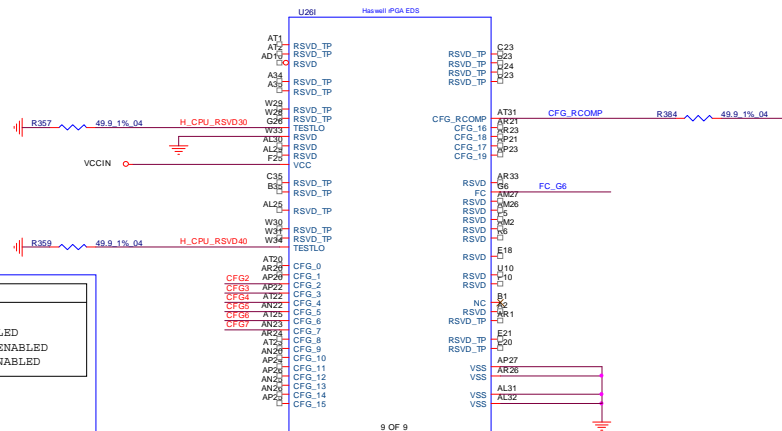
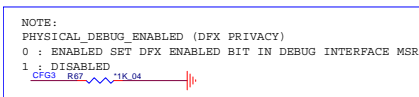
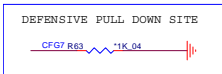
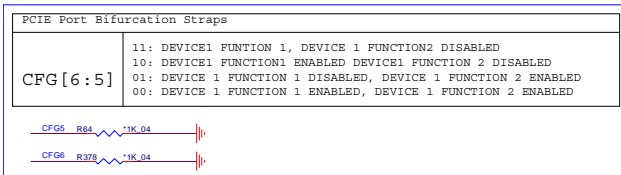
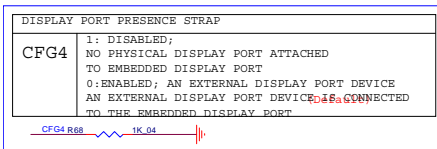
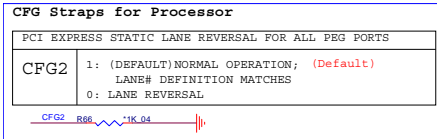
Processor 6/7- GND

Sheet 7 of 46
Processor 6/7- GND



Processor 7/7- RSVD

Haswell Processor 7/7 (RESERVED)



5.41 VCCIN

Sheet 8 of 46
Processor 7/7-
RSVD

DDR3 SO-DIMM_1

SO-DIMM A 0

CHANGE TO STANDARD

5.2mm

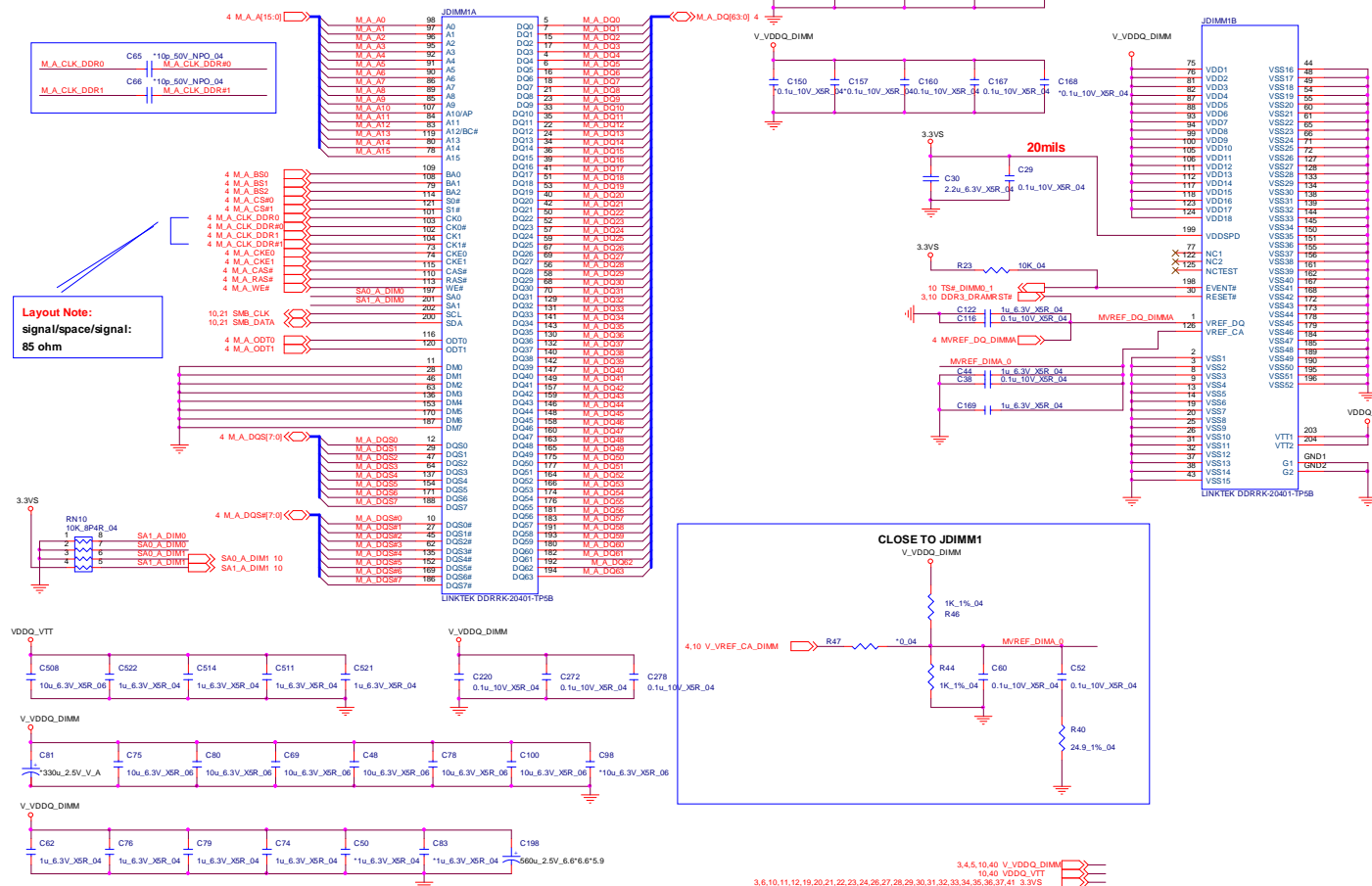
6-86-24204-005

6-86-24204-002

B.Schematic Diagrams

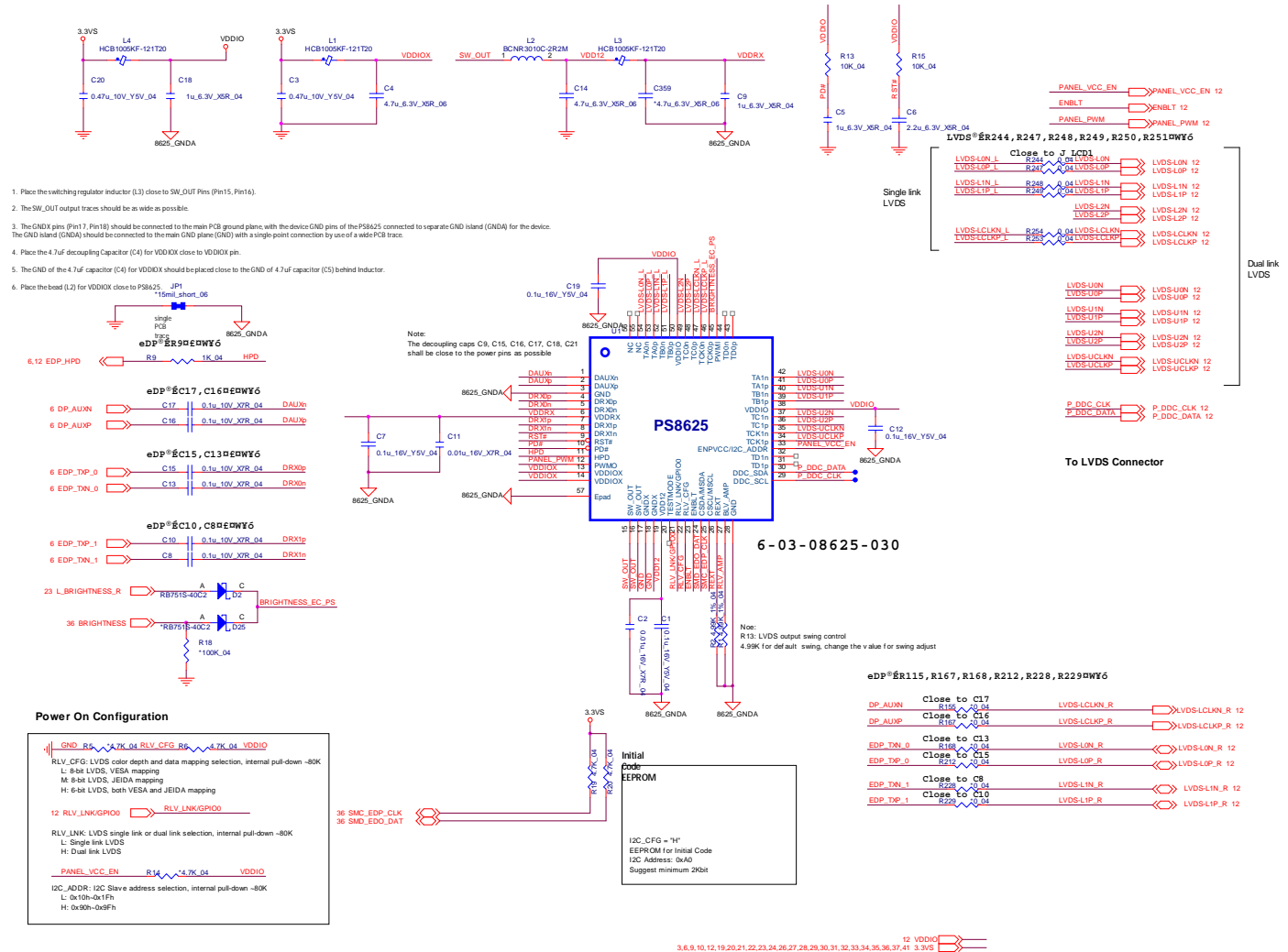
Sheet 9 of 46
DDR3 SO-DIMM_0

Layout Note:
signal/space/signal:
85 ohm



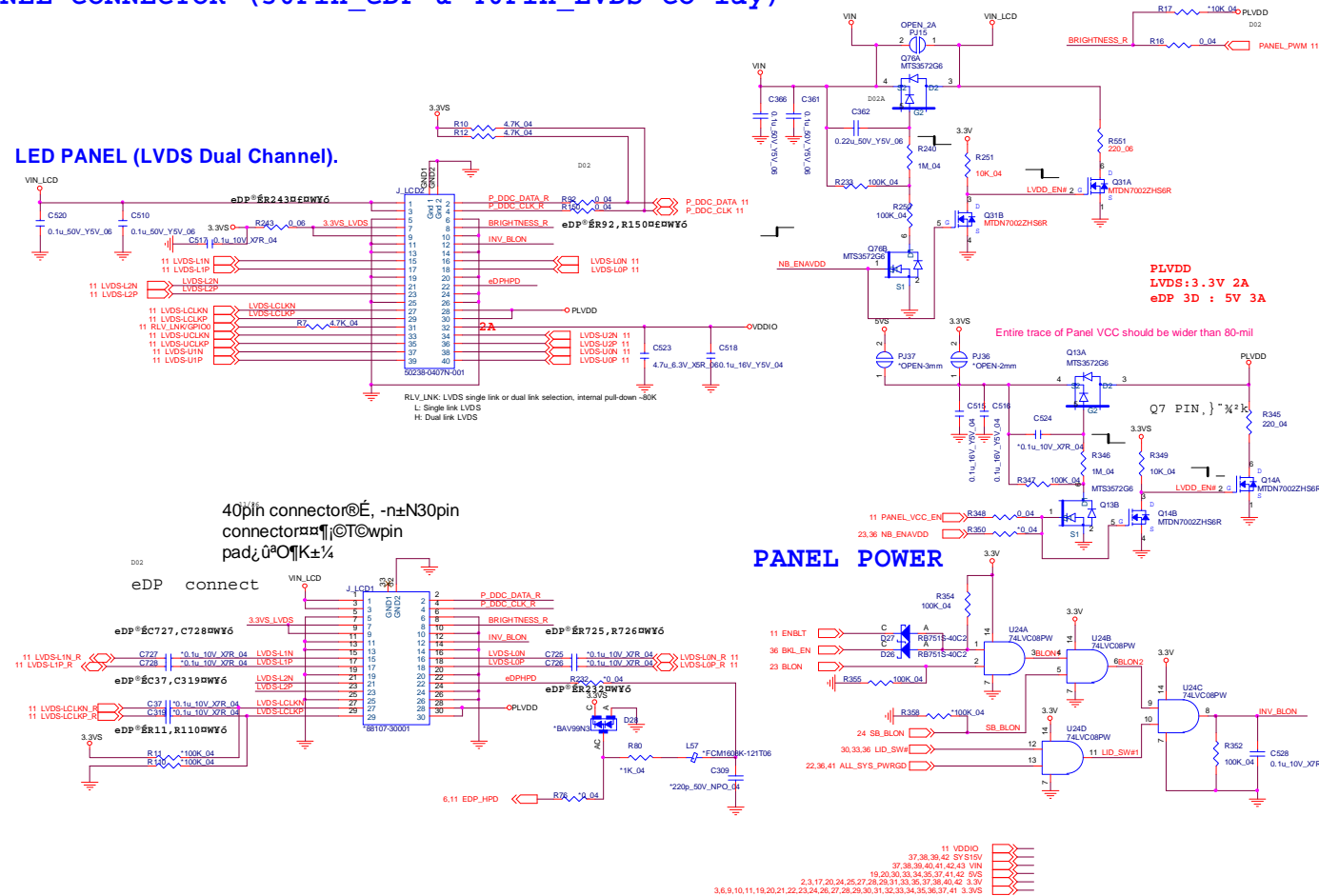
PS8625

Sheet 11 of 46
PS8625



Schematic Diagrams

BRIGHTNESS

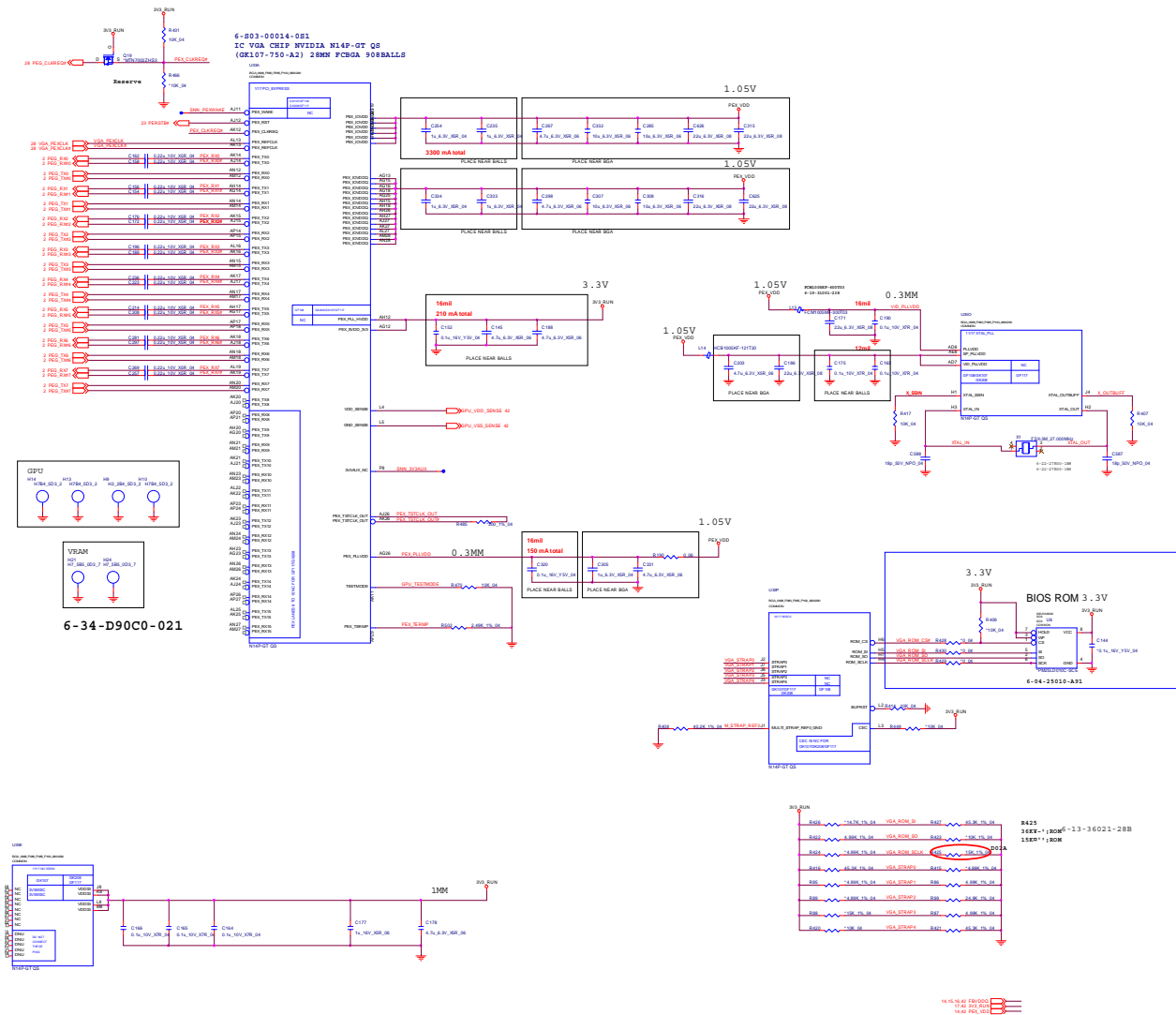


PANEL, INVERTER B - 13

VGA PCI-E Interface

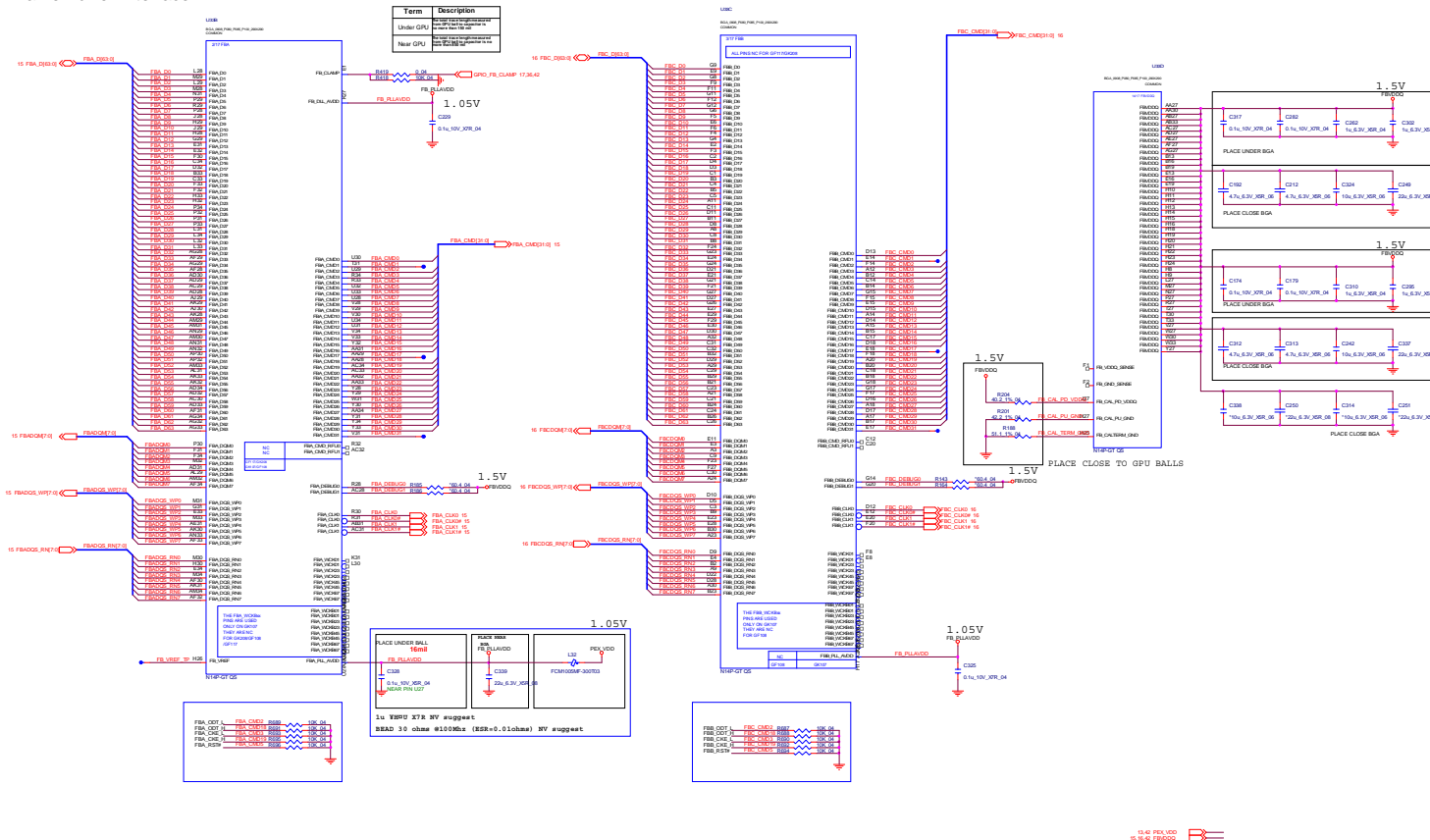
B. Schematic Diagrams

Sheet 13 of 46
VGA PCI-E
Interface



VGA Frame Buffer Interface

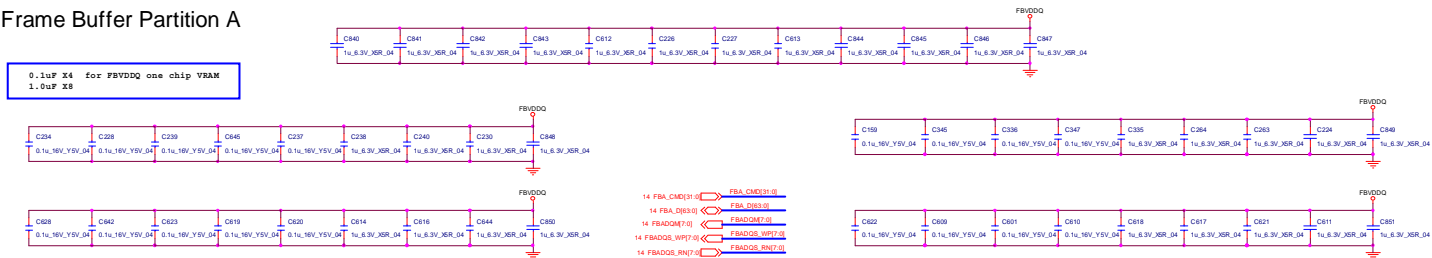
Frame Buffer Interface



Sheet 14 of 46
VGA Frame Buffer
Interface

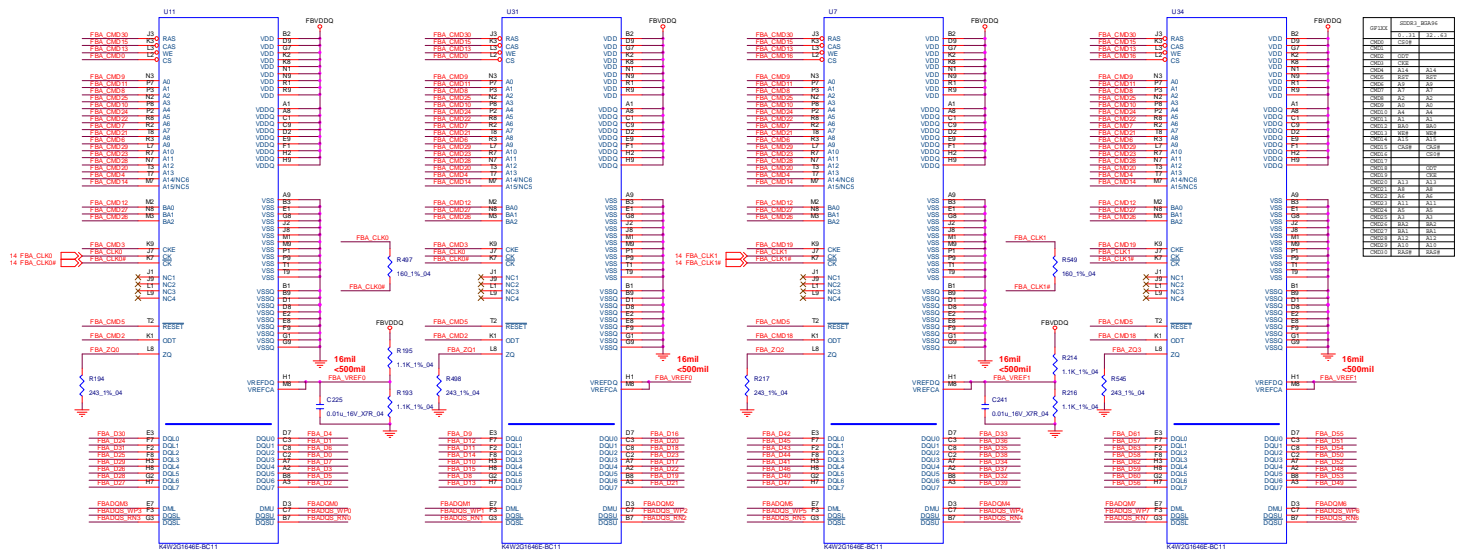
VGA Frame Buffer A

Frame Buffer Partition A



B. Schematic Diagrams

Sheet 15 of 46
VGA Frame Buffer
A



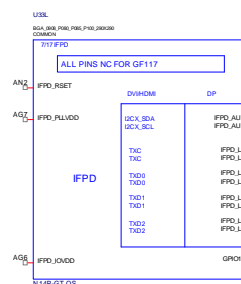
14,16,42 FBVDDQ

Frame Buffer Partition B

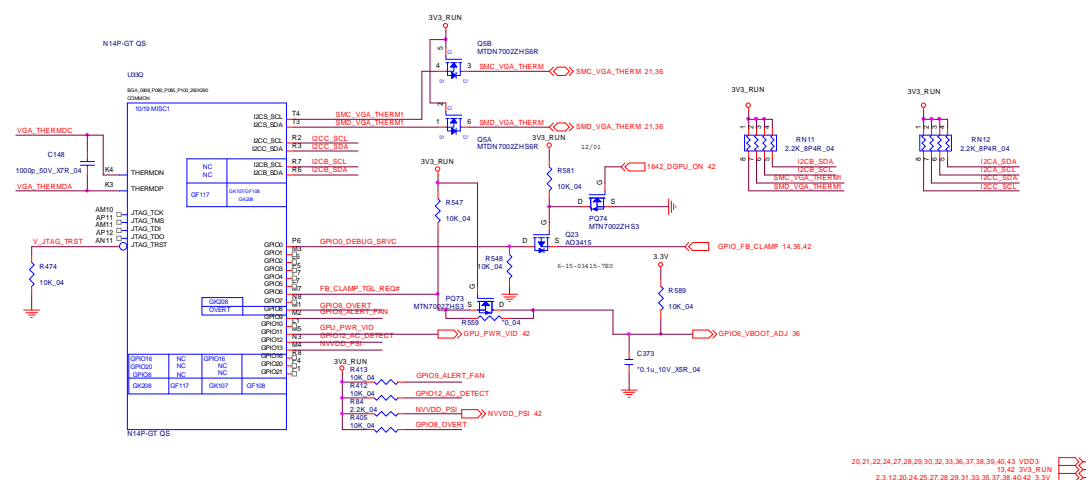
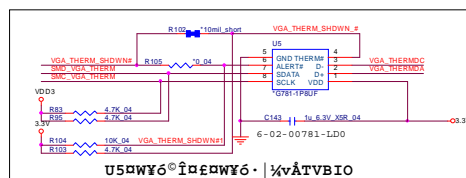
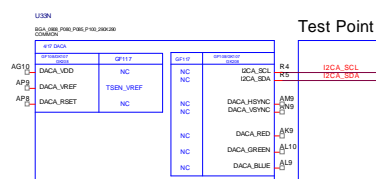
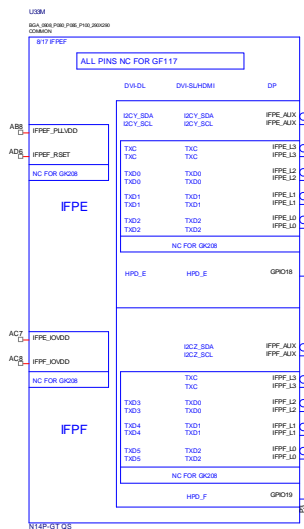


VGA I/O

Sheet 17 of 46
VGA I/O



Term	Description
Under GPU	The total trace length measured from GPU ball to capacitor is no more than 150 mil
Near GPU	The total trace length measured from GPU ball to capacitor is more than 150 mil

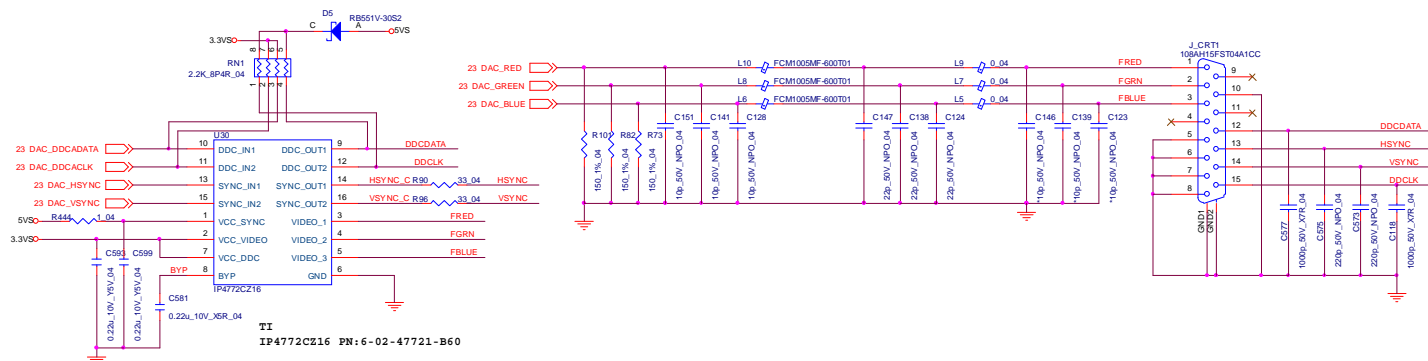


B.Schematic Diagrams

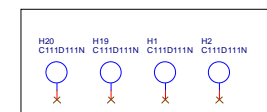
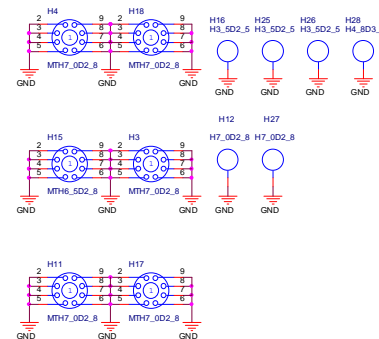
Sheet 18 of 46
VGA NVVDD
Decoupling



CRT



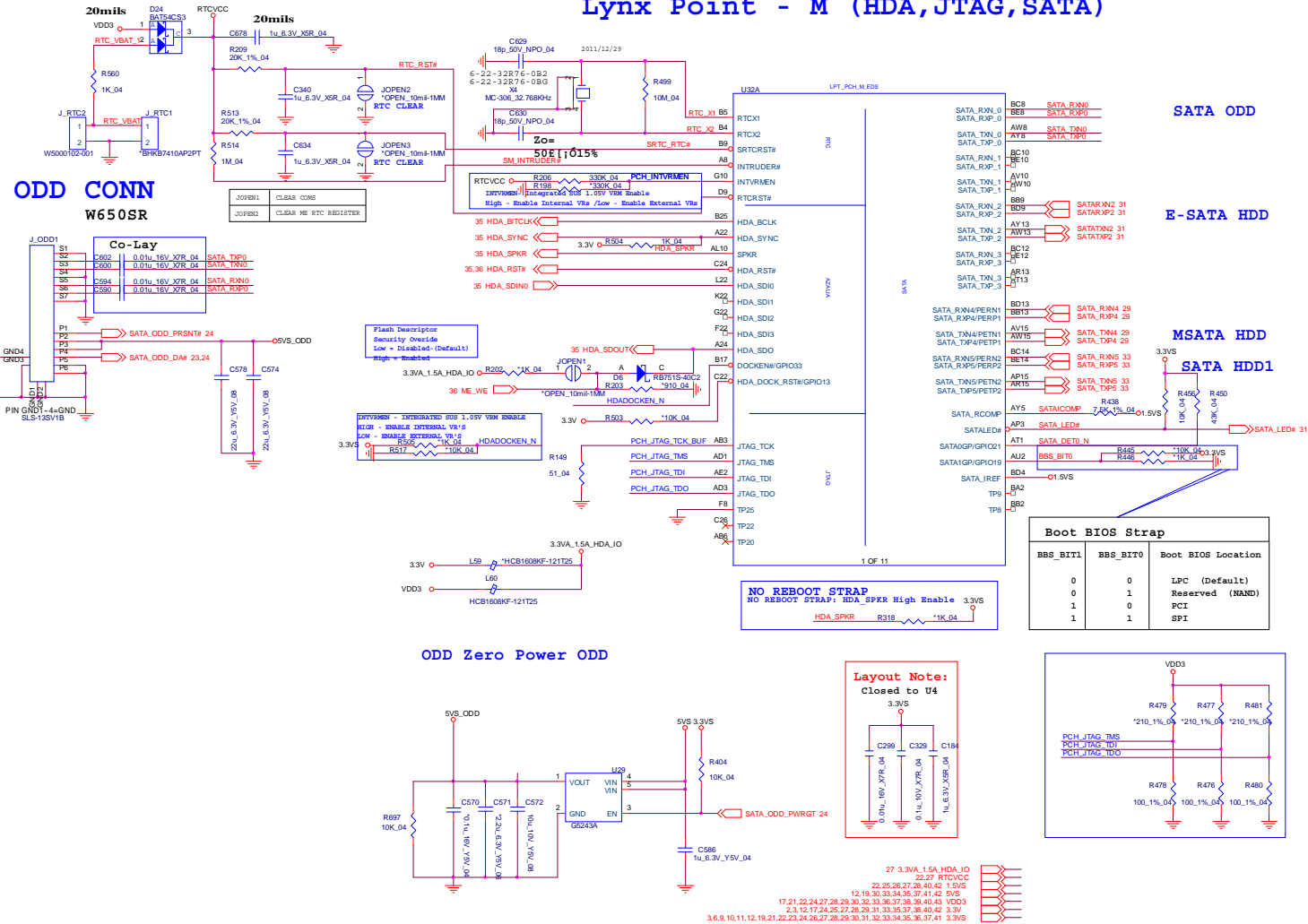
Sheet 19 of 46
CRT, Holes



3,6,9,10,11,12,20,21,22,23,24,26,27,28,29,30,31,32,33,34,35,36,37,41 3.3VS
12 20 30 33 34 35 37 41 42 5VS

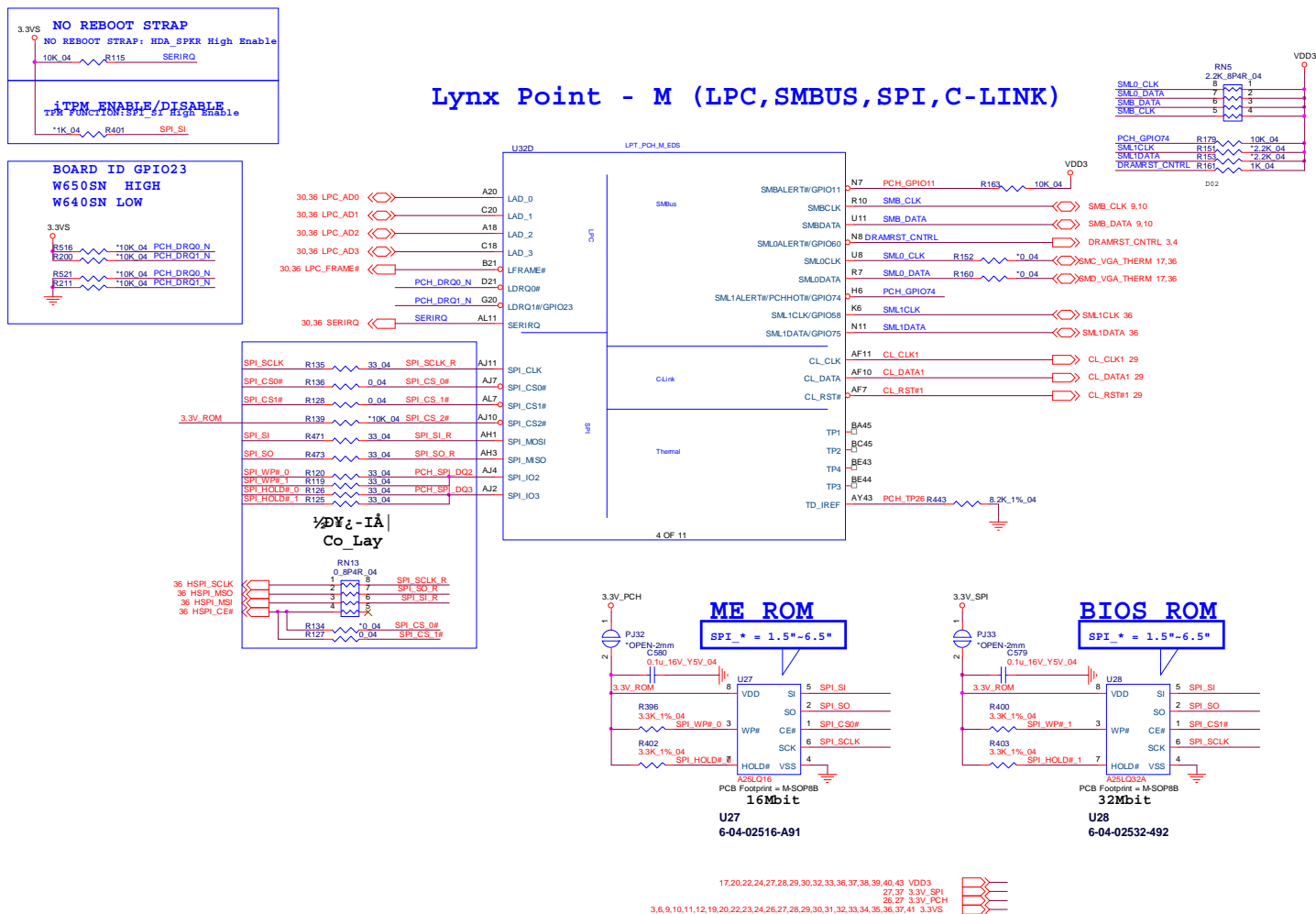
Lynx 1/9

Lynx Point - M (HDA, JTAG, SATA)

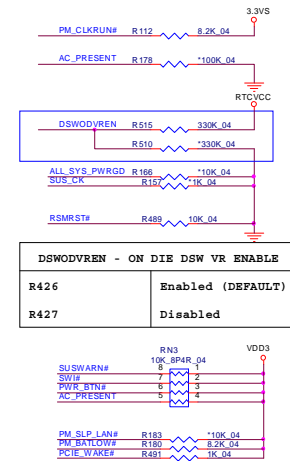
Sheet 20 of 46
Lynx 1/9

Lynx 2/9

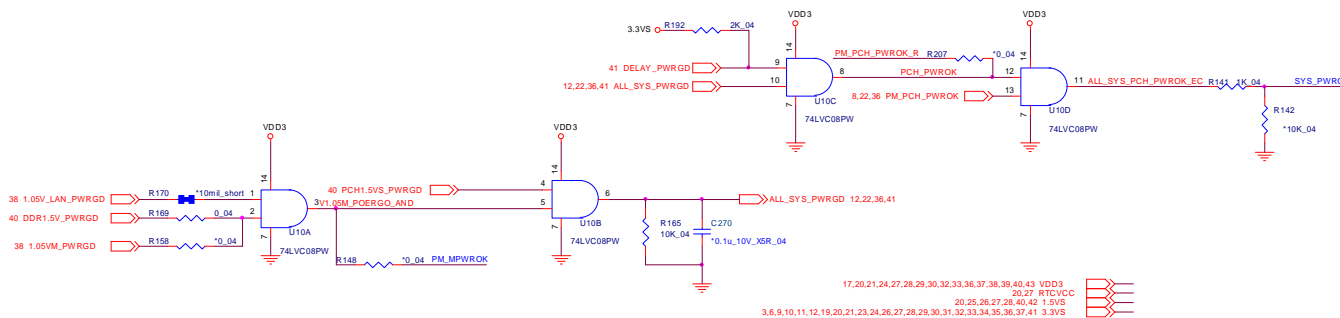
B. Schematic Diagrams



Lynx 3/9

[illegible]

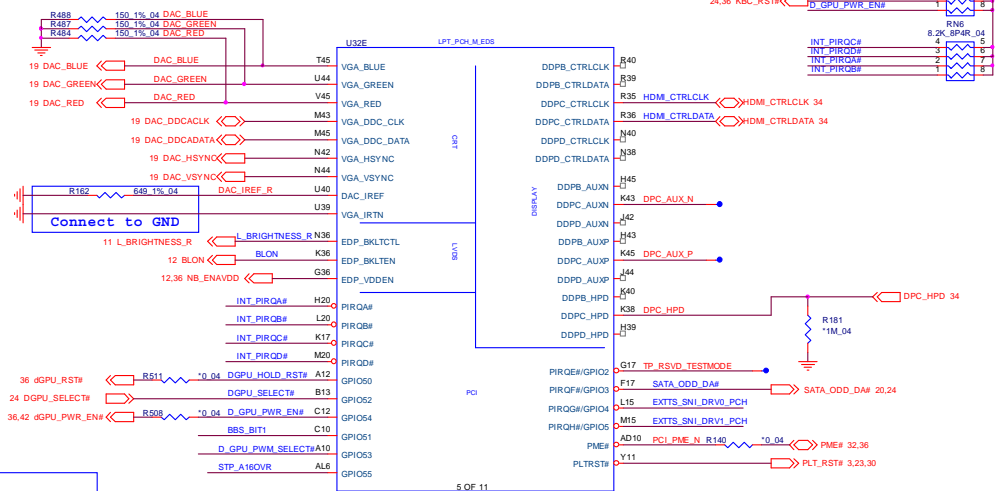
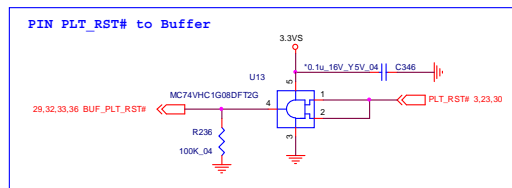
B.Schematic Diagrams



Lynx 4/9

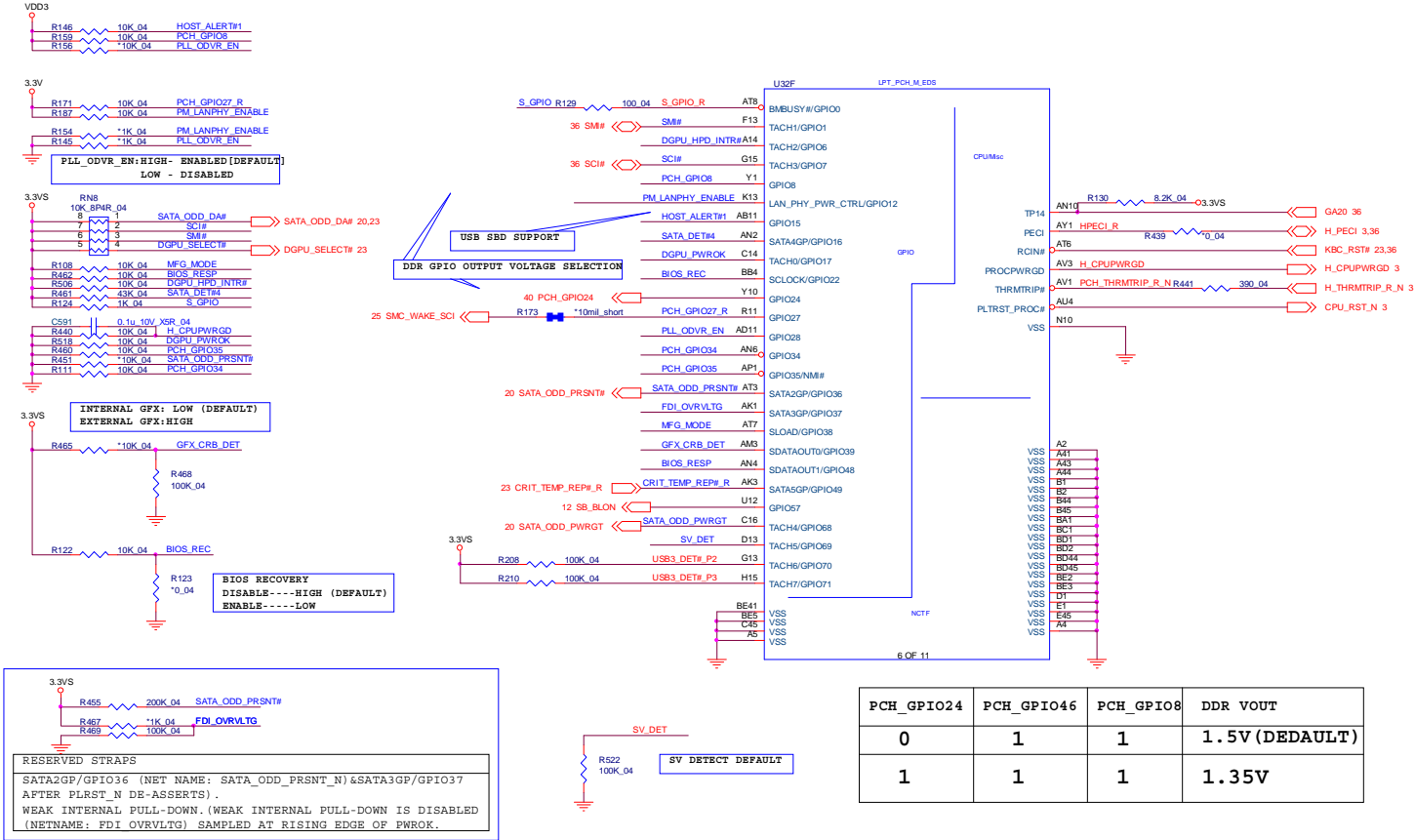
Sheet 23 of 46
Lynx 4/9

A circuit diagram showing a 1K resistor (R114) connected to ground and a signal line labeled STP_A16OVR.



Lynx 5/9

Lynx Point - M (GPIO,CPU/MISC,NCTF)

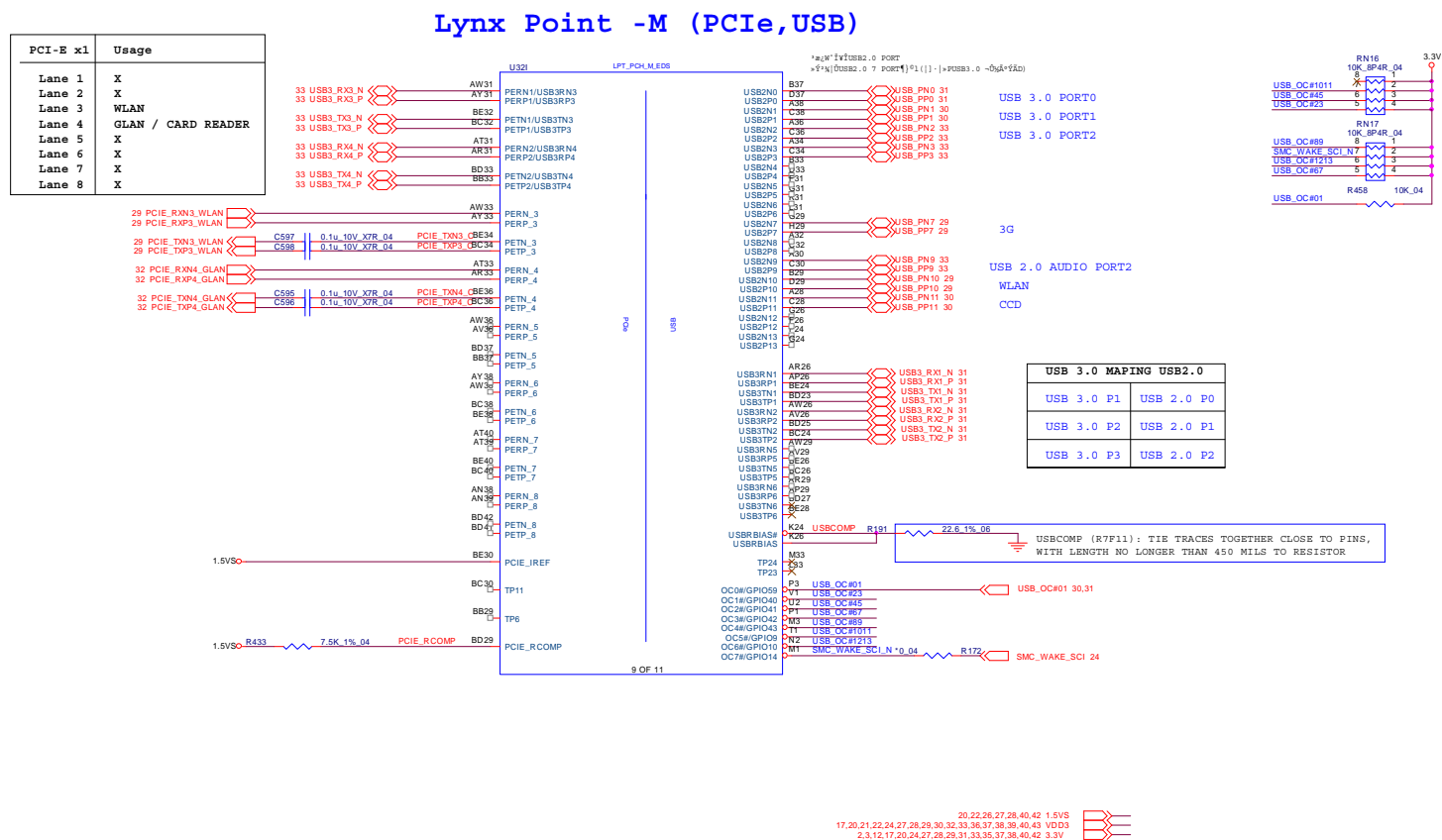


17,20,21,22,27,28,29,30,32,33,36,37,38,39,40,43 VDD3
2,3,12,17,20,25,27,28,29,31,33,35,37,38,40,42 3.3V
3,6,9,10,11,12,19,20,21,22,23,26,27,28,29,30,31,32,33,34,36,37,41 3.3VS

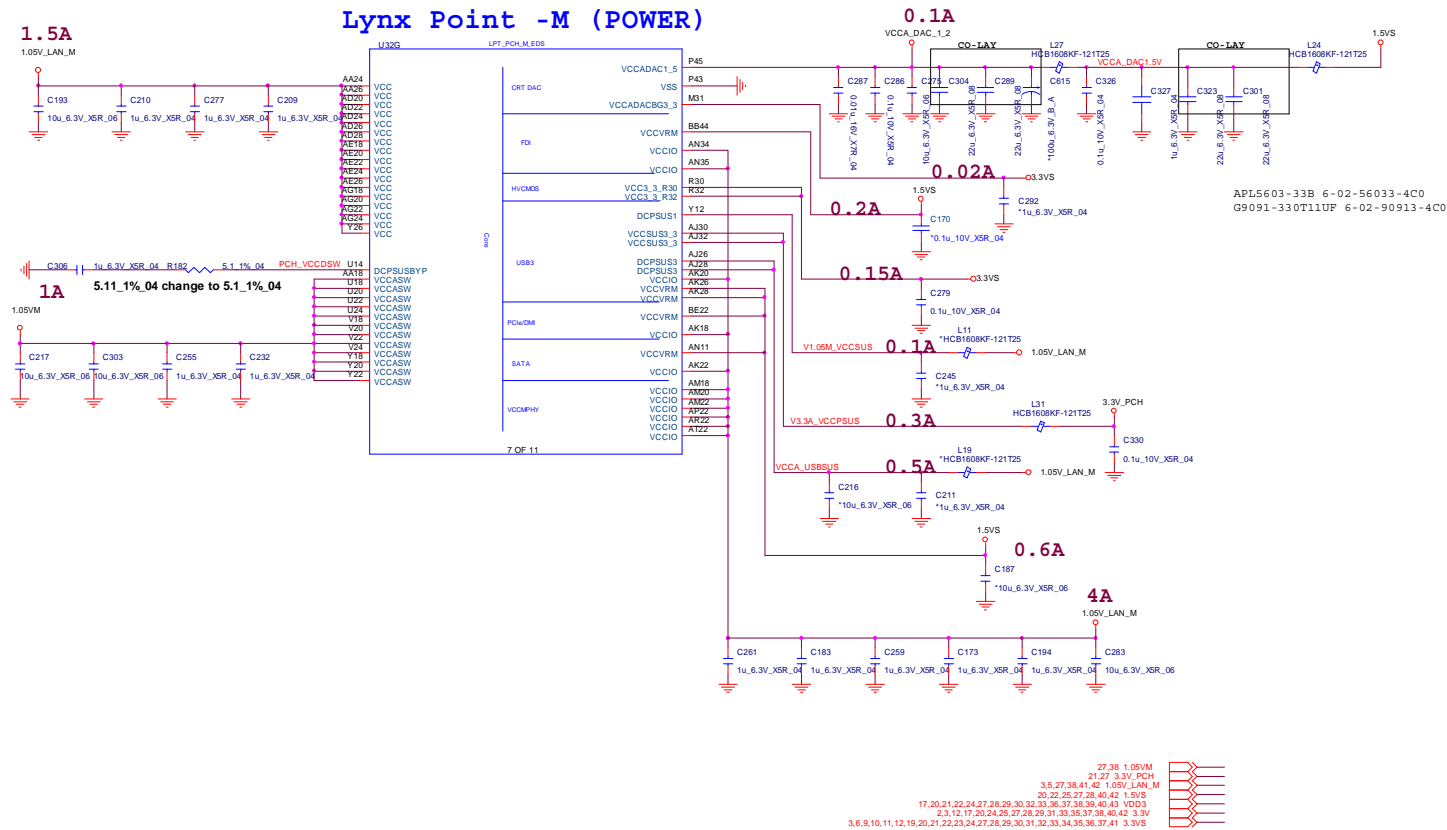
Sheet 24 of 46
Lynx 5/9

Lynx 6/9

Sheet 25 of 46
Lynx 6/9



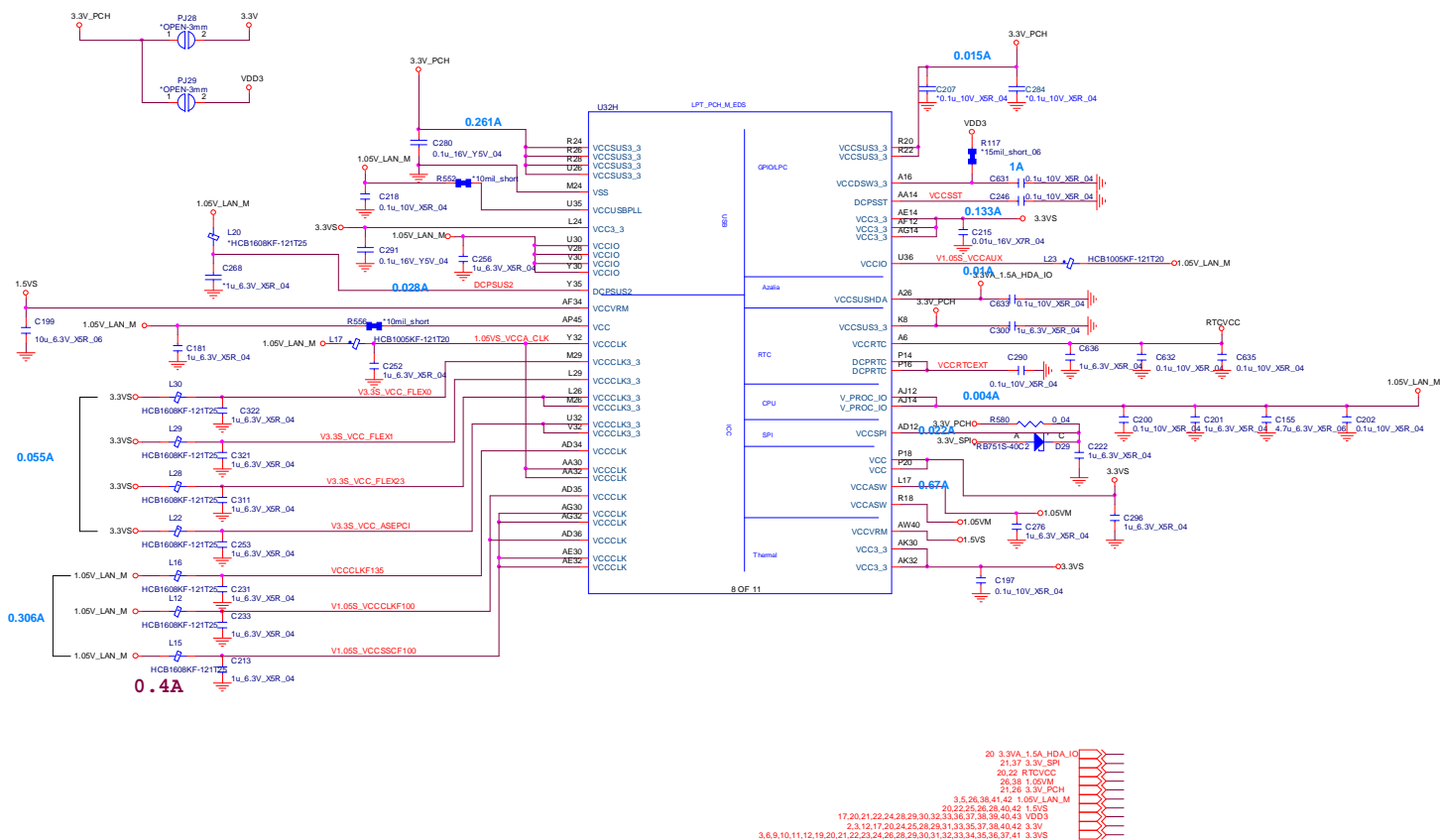
Sheet 26 of 46
Lynx 7/9



Lynx 8/9

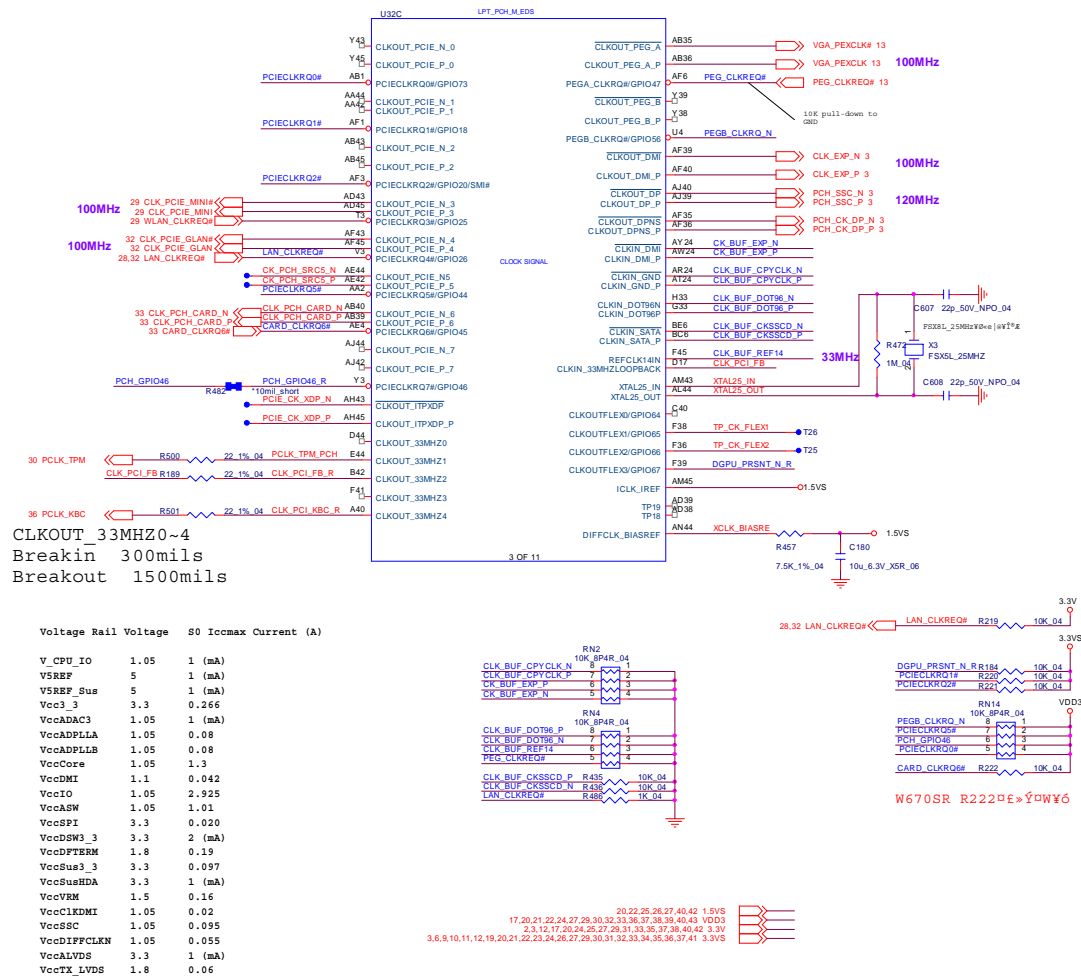
Sheet 27 of 46
Lynx 8/9

Lynx Point - M (POWER)



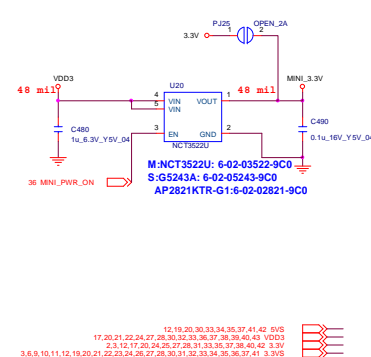
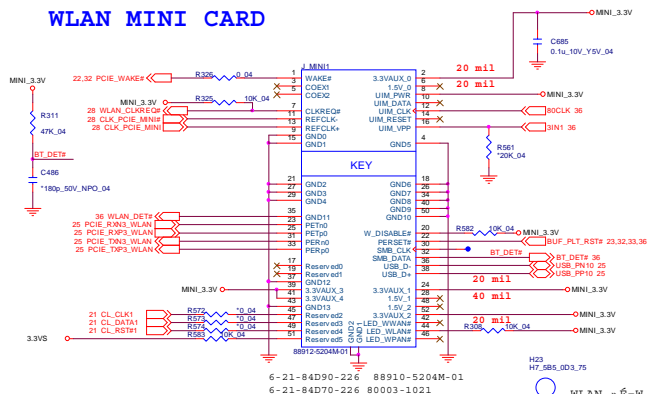
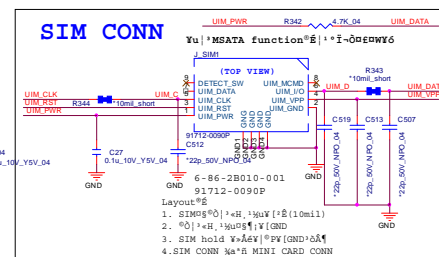
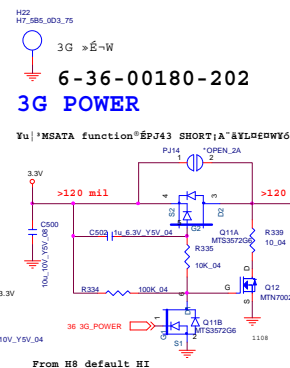
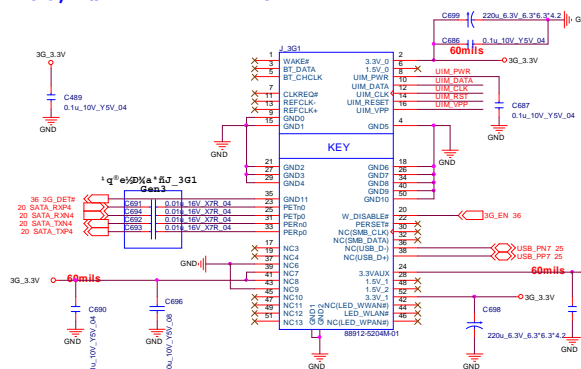
B.Schematic Diagrams

Lynx Point -M (CLK)



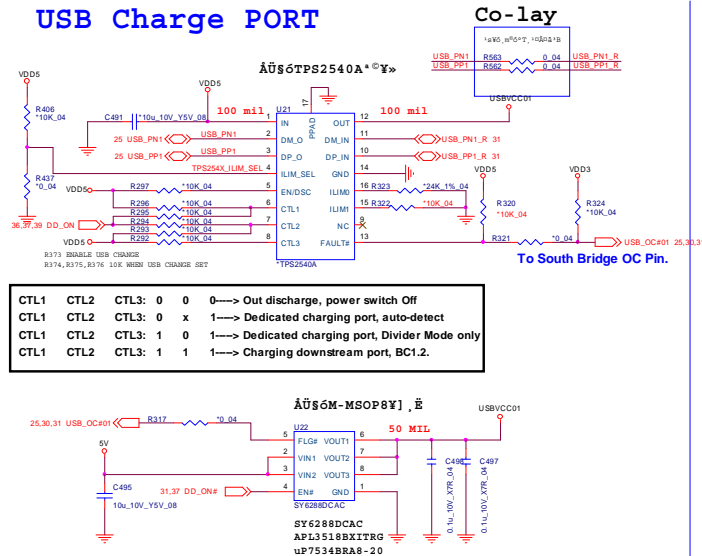
B. Schematic Diagrams

Sheet 29 of 46
3G, WLAN, PCIE,
CON

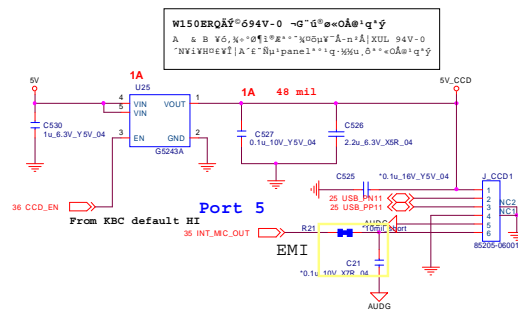


USB Charge, CCD, TPM, Power Con

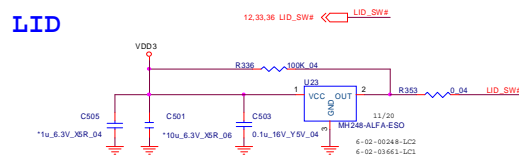
USB Charge PORT



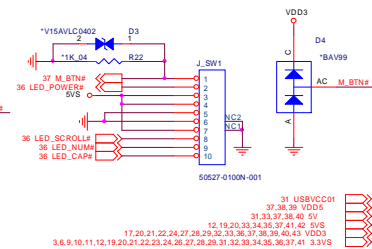
CCD+Mic



LID



FOR POWER SWITCH BOARD

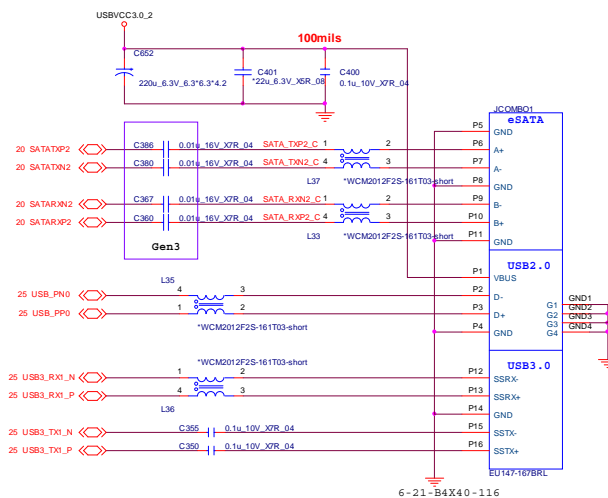


Sheet 30 of 46
USB Charge, CCD,
TPM, Power Con

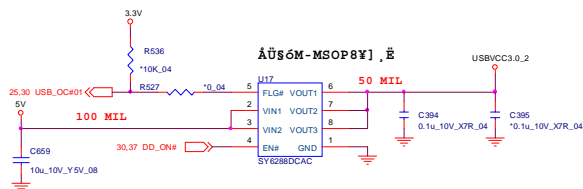
eSATA/USB3.0, LED

Sheet 31 of 46
eSATA/USB3.0,
LED

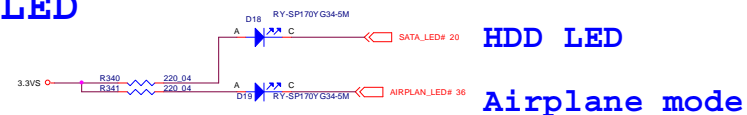
ESATA+USB3.0 USB3.0 PORT(PORT1)



USB POWER SWITCH



LED

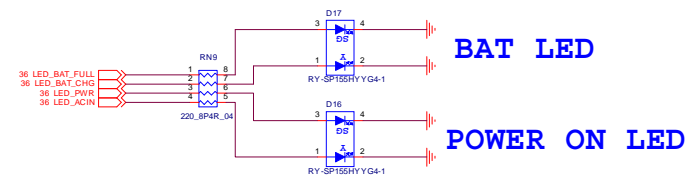


WLAN/BLUETOOTH LED

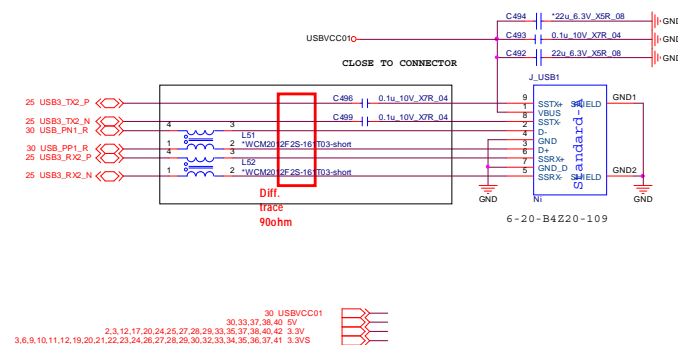


LED Foot Print

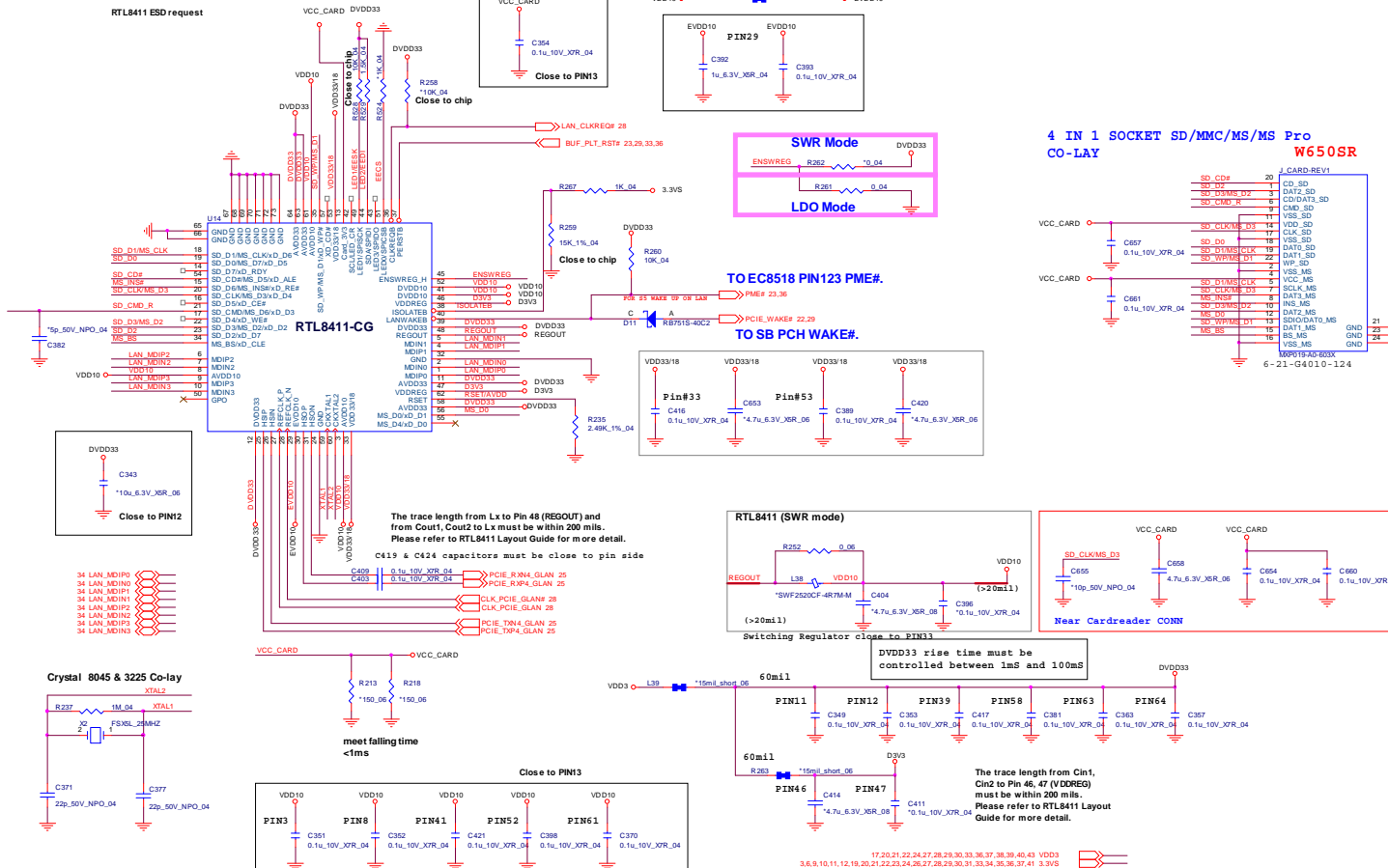
		WLAN LED
Windows 7	WLAN ON	«G
	WLAN OFF	Ⓜ E «G
Windows 8	Airplane ON	«G
	Airplane OFF	Ⓜ E «G



USB3.0 PORT (PORT3)



Sheet 32 of 46
Card Reader
(RTL8411)

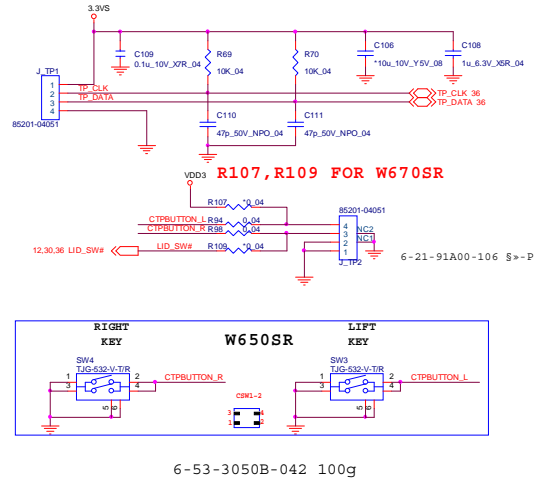


Schematic Diagrams

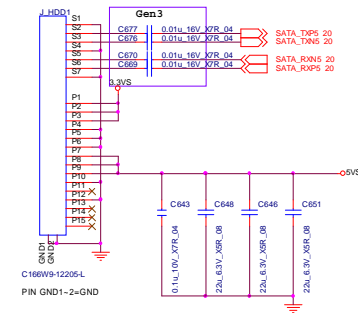
HDD, TP, Audio, USB

Sheet 33 of 46
HDD, TP, Audio,
USB

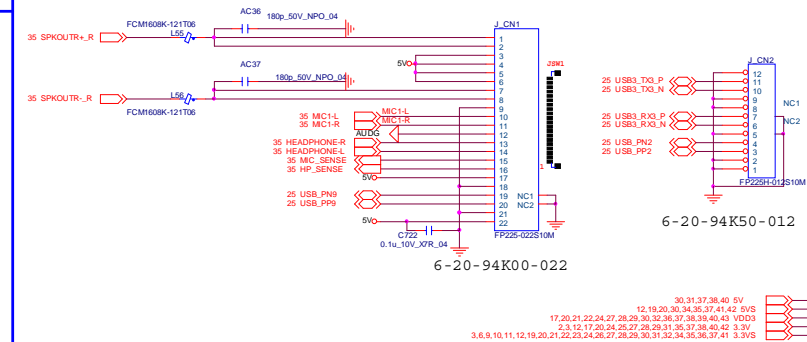
CLICK TP



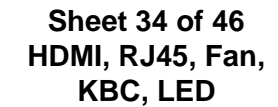
HDD CONNECT1 (MASTER)



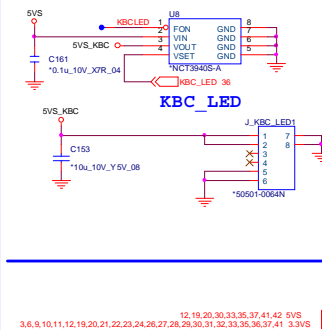
FOR AUDIO BOARD



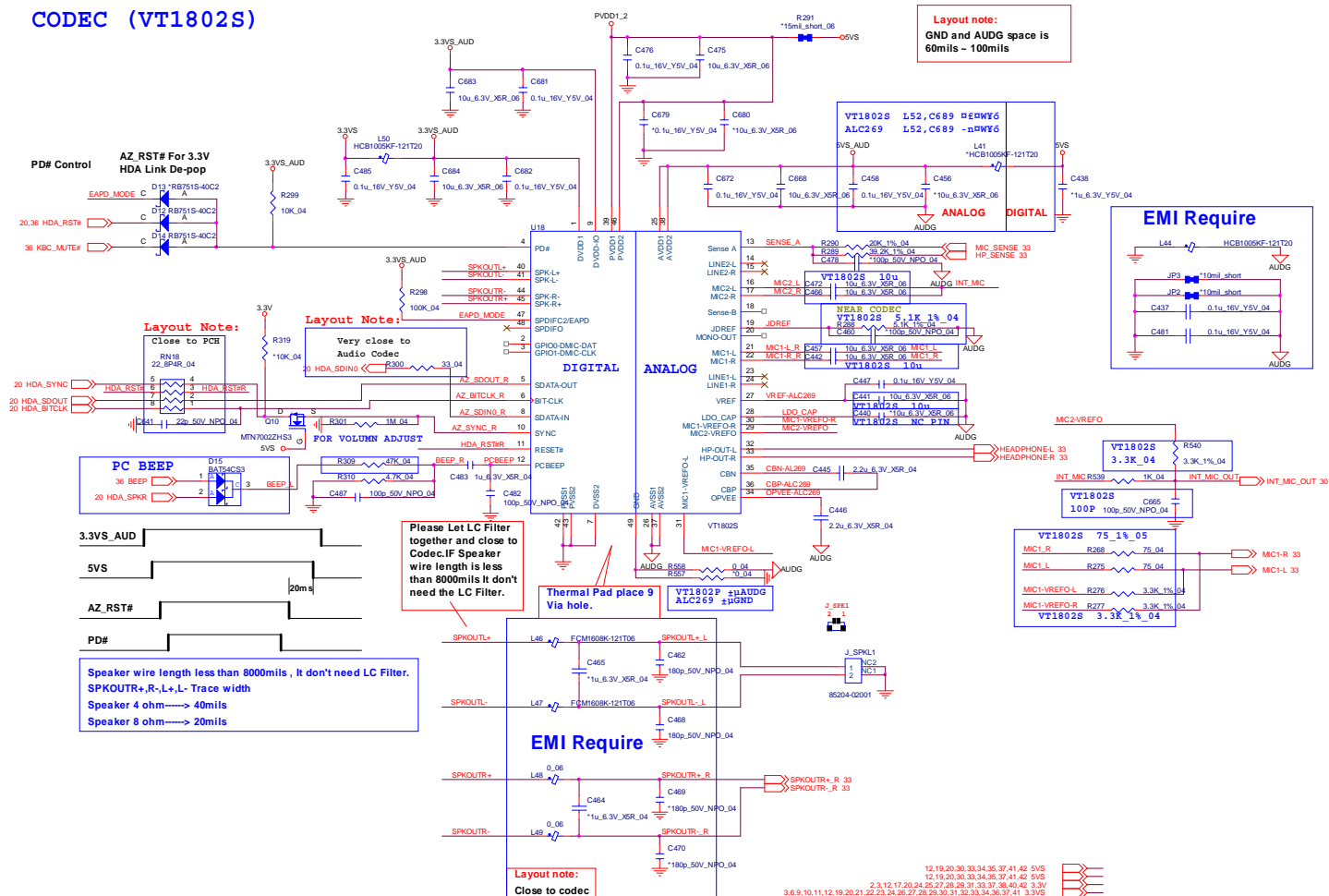
HDMI LEVEL SHIFT



KBC LED CONTROL

[illegible]

CODEC (VT1802S)



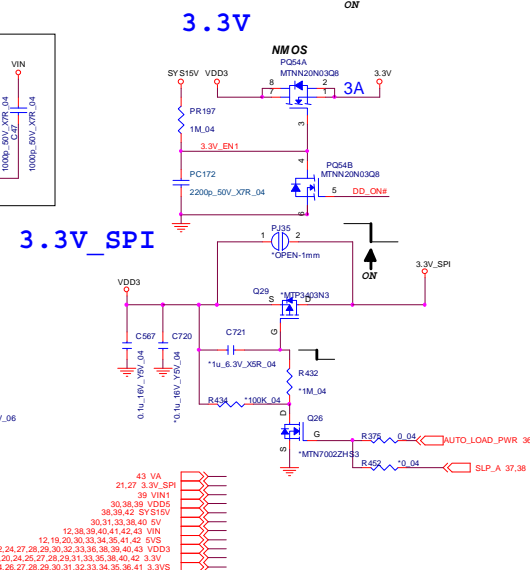
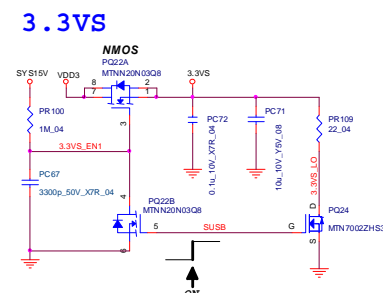
B.Schematic Diagrams

6-03-08587-FX



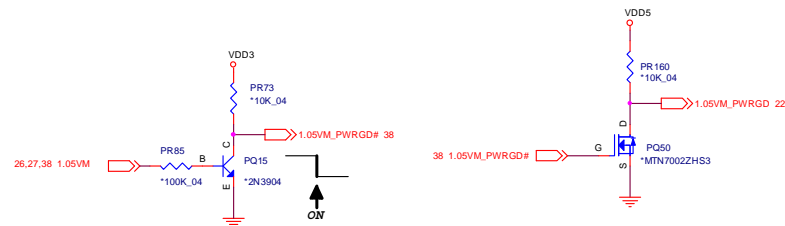
B. Schematic Diagrams

Sheet 37 of 46
5VS, 3VS, 3.3VM,
5VM



B.Schematic Diagrams

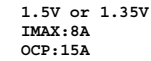
The schematic shows the power supply circuitry. It starts with a SYS15V input connected through a PR88 resistor (5.1K_04) to a VIT_ENP pin. A capacitor C341 (*2200p_50V_X7R_04) is connected to ground. The output of this stage goes through a PQ17 MOSFET (MD S1512/TPCA8057-H) controlled by P_J8 and OPEN_2A signals. The MOSFET's drain is connected to a 1.05VM input and its source to a DO2A pin. Following the MOSFET, there are two capacitors: PC59 (*0.1u_10V_XVR_04) and PC60 (*10u_10V_Y5V_04). The signal then passes through a PR86 resistor (51.1%_04) to a DQ16A pin. A second MOSFET, PQ16B (MTDN7002ZH56R), is connected between DQ16A and SLP_A 37. A 2uF capacitor is also present at the output.



26,27,38 1.05VM
30,37,39 VDD5
37,39,42 SY5V
30,31,33,37,40 5V
3,5,26,27,41,42 1.05V_LAN_M
12,37,39,40,41,42,43 VIN
17,20,21,22,24,27,28,29,30,32,33,36,37,39,40,43 VDD3
2,3,12,17,20,24,25,27,28,29,31,33,35,37,40,42 3.3V

VDD3, VDD5

1.5V or 1.35V/0.75VS



1.35V
ICC_MAX_VDDQ=4.2A

PCH_GPIO24	PCH_GPIO46	PCH_GPIO8	DDR VOUT
0	1	1	1.5V (DEDAULT)
1	1	1	1.35V

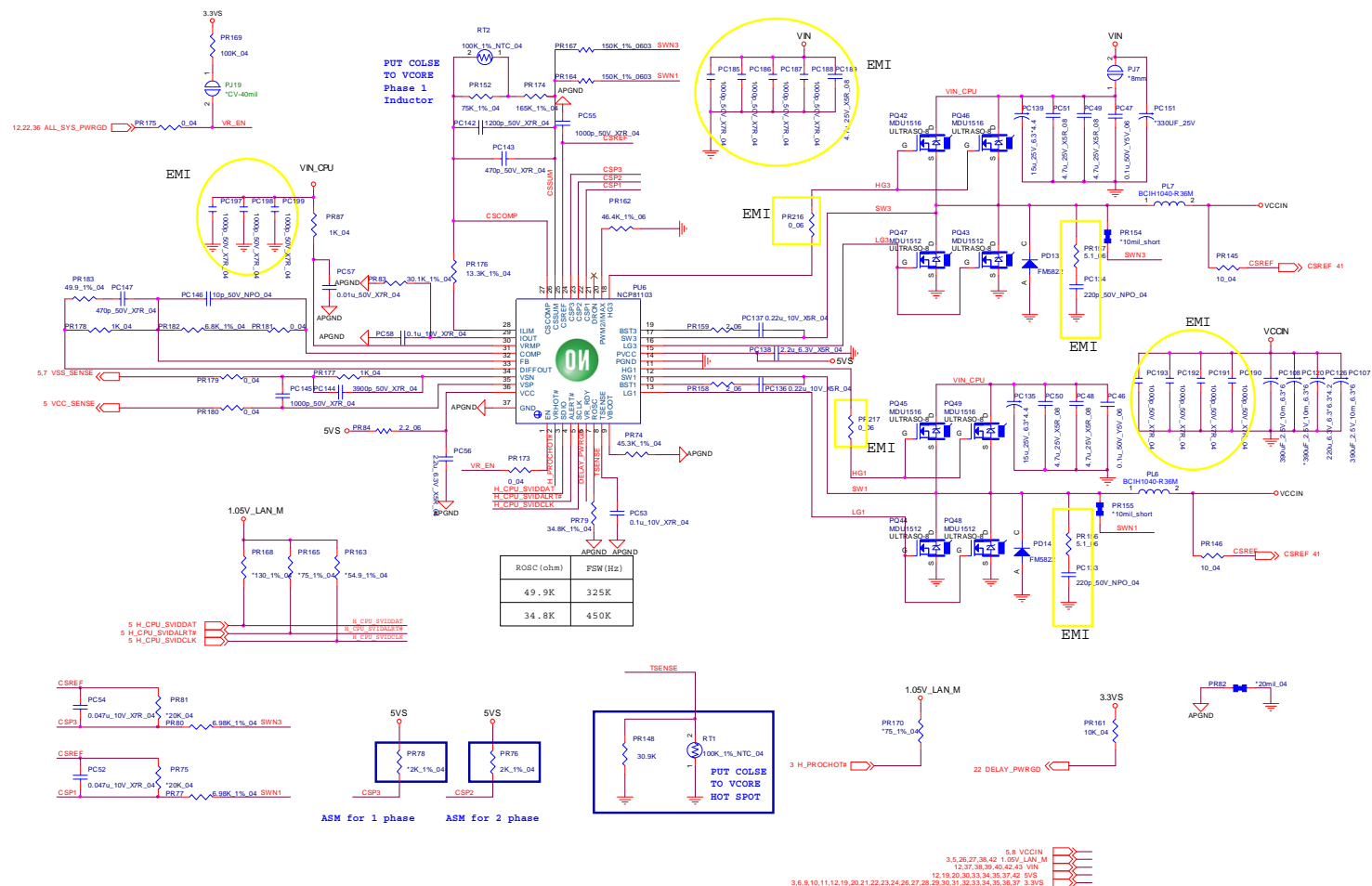


rise time= 3.3ms

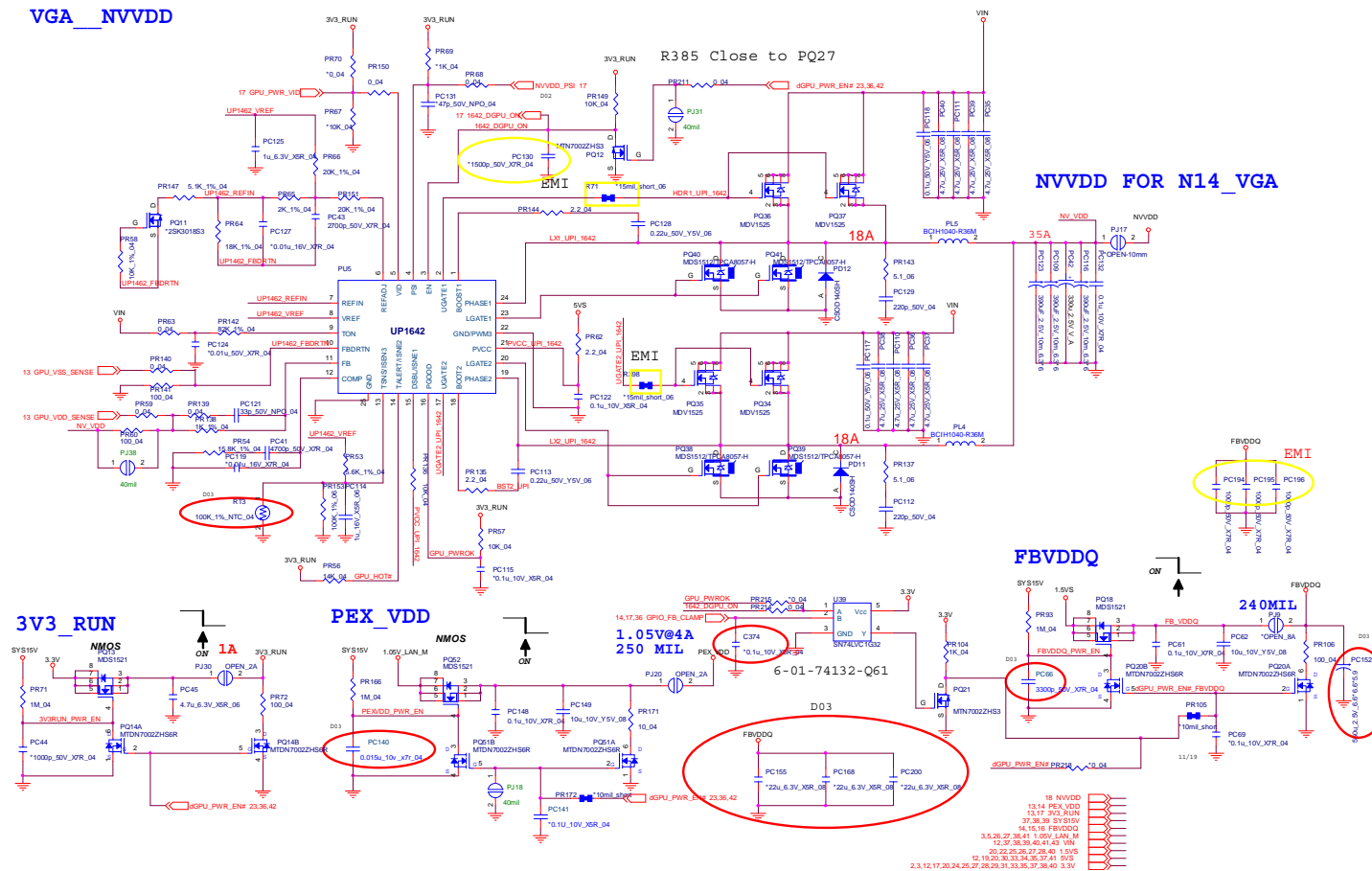
POWER VCORE

B. Schematic Diagrams

Sheet 41 of 46
POWER VCORE



Sheet 42 of 46
N14P,NVVDD,PEX,
FBVDDQ



AC IN, CHARGER

[illegible]

B. Schematic Diagrams

Sheet 43 of 46
AC IN, CHARGER

6-71-W6508-D05

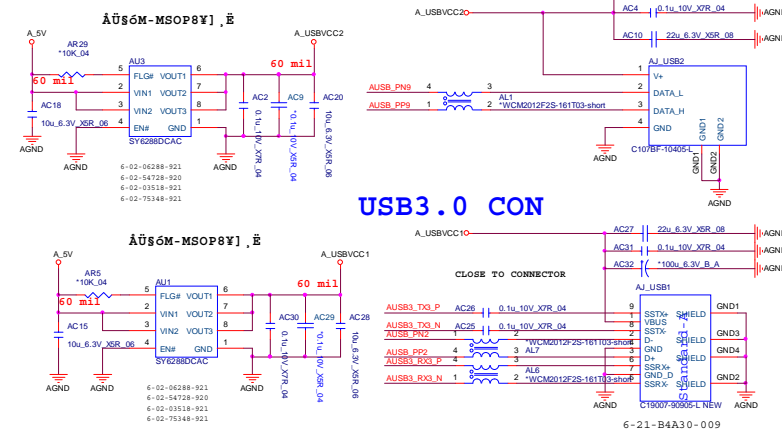
The diagram illustrates the pin connections for the USB8P&N-Ujup-Uin connector. It shows two main connector blocks, AJ_AUD1 and AJ_AUD2, with their respective pin numbers and signal names. The connections are as follows:

- AJ_AUD1 (Left):**
 - Pin 22: ASPKOUTR+ (R)
 - Pin 21: ASPKOUTR- (R)
 - Pin 18: -OA_SV
 - Pin 17: ASPKOUTR- (R)
 - Pin 16: ASPKOUTR- (R)
 - Pin 15: ASPKOUTR- (R)
 - Pin 14: AMIC+L
 - Pin 13: AMIC+T
 - Pin 12: AHEADPHONER
 - Pin 11: AHEADPHONIC
 - Pin 10: AMIC_SENSE
 - Pin 9: AMP_SENSE
 - Pin 8: -OA_SV
 - Pin 7: AUSB_PN9
 - Pin 6: AUSB_PP1
 - Pin 5: AUSB_PP1
 - Pin 4: AUSB_PP1
 - Pin 3: AUSB_PP1
 - Pin 2: AUSB_PP1
 - Pin 1: AUSB_PP1
- AJ_AUD2 (Right):**
 - Pin 1: AUSB3_TX0_P
 - Pin 2: AUSB3_TX0_N
 - Pin 3: AUSB3_TX0_P
 - Pin 4: AUSB3_TX0_N
 - Pin 5: AUSB3_RX0_P
 - Pin 6: AUSB3_RX0_N
 - Pin 7: AUSB3_RX0_P
 - Pin 8: AUSB3_RX0_N
 - Pin 9: AUSB_PN2
 - Pin 10: AUSB_PP2
 - Pin 11: AUSB_PP2
 - Pin 12: AUSB_PP2

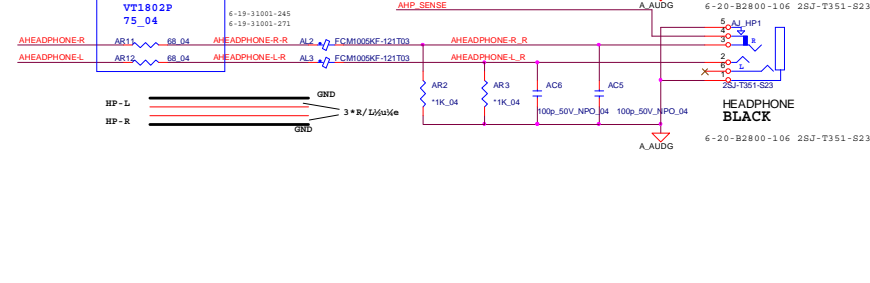
Additional components and labels include:

- AGND:** Ground connections for pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- FP225H-022510M:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- FP225H-012510M:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- 8B204-02001:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- ASPKOUTR+ (R):** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- ASPKOUTR- (R):** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AMIC+L:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AMIC+T:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AHEADPHONER:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AHEADPHONIC:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AMIC_SENSE:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AMP_SENSE:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AUSB_PN9:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AUSB_PP1:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AUSB3_TX0_P:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AUSB3_TX0_N:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AUSB3_RX0_P:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AUSB3_RX0_N:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AUSB_PN2:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.
- AUSB_PP2:** A component connected to pins 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and 12.

USB PORT (PORT9) USB2.0 CON



AUDIO BOARD B - 45

Resistor 32 or 33_04
meet WLK Test

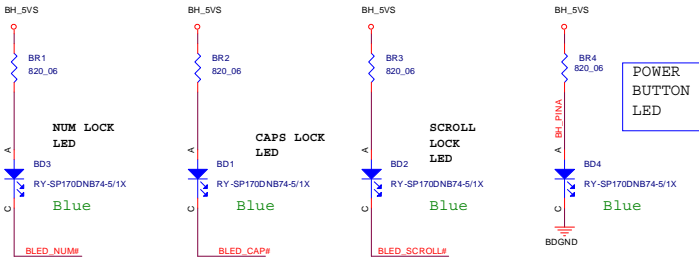
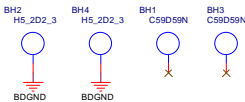
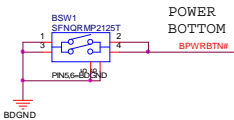
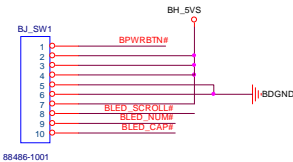
POWER SWITCH BOARD

B.Schematic Diagrams

Sheet 45 of 46
POWER SWITCH
BOARD

POWER & LED BOARD

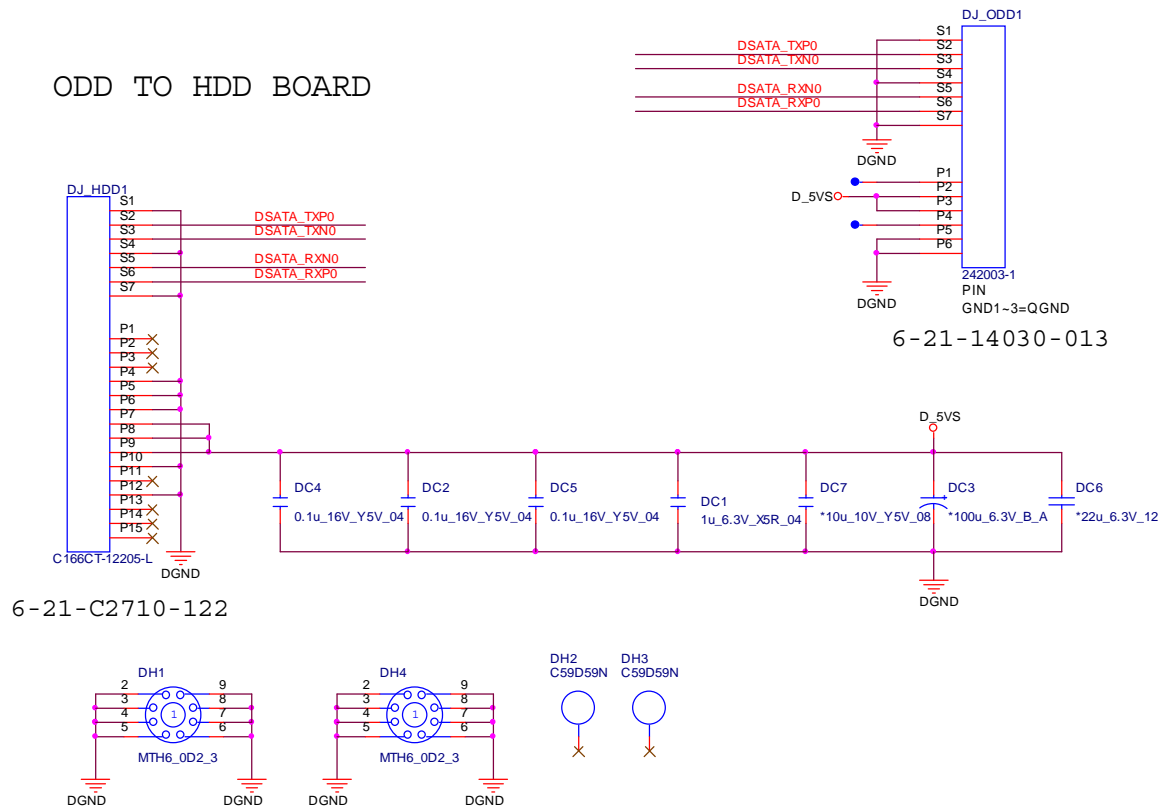
6-71-W650S-D03-A



ODD to HDD BOARD

6-71-W650N-D03

ODD TO HDD BOARD



Sheet 46 of 46
ODD to HDD
BOARD

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 **F10** to save any changes you have made and exit the BIOS to restart the computer.



BIOS Version

Make sure you download the latest correct version of the BIOS appropriate for the computer model you are working on.

You should only download BIOS versions that are V1.01.XX or higher as appropriate for your computer model.

Note that BIOS versions are not backward compatible and therefore **you may not downgrade your BIOS to an older version** after upgrading to a later version (e.g if you upgrade a BIOS to ver 1.01.05, you **MAY NOT** then go back and flash the BIOS to ver 1.01.04).

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 **F9**) and select “**Yes**” to confirm the selection.
5. Press **F10** 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.