

SERVICE MANUAL

W230ST

notebook



Notebook Computer

W230ST

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 **W230ST** 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

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:
 - Full Range AC/DC Adapter - AC Input 100 - 240V, 50 - 60Hz, DC Output 19.5V, 6.15A (**120W**) minimum.

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

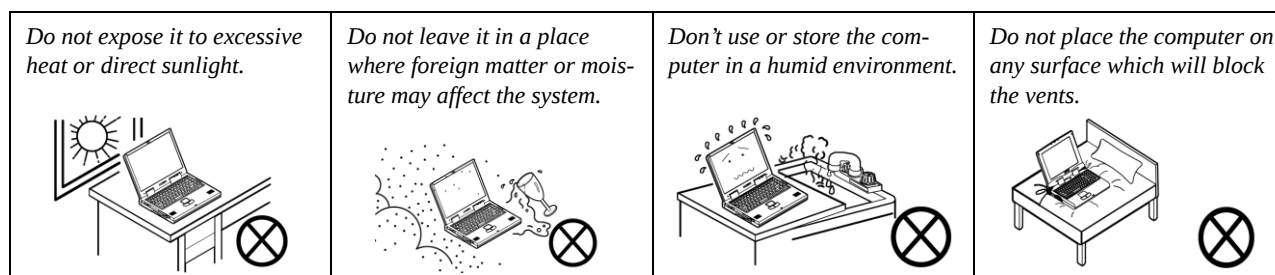
Instructions for Care and Operation

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.

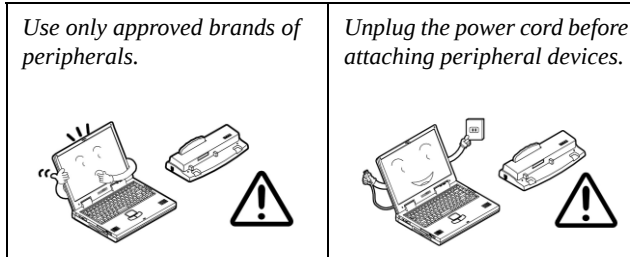


3. **Follow the proper working procedures for the computer.** Shut the computer down properly and don't forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.



Preface

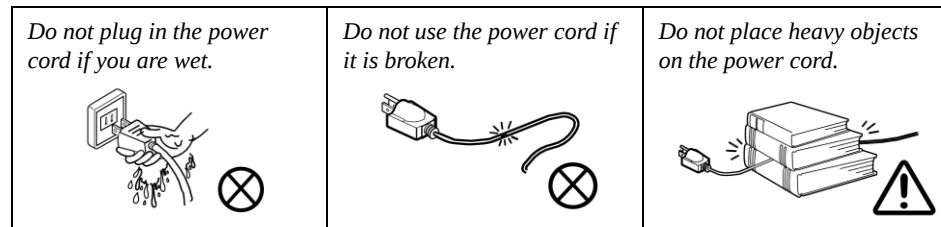
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**



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). 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

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.

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Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the **W230ST** 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 *User's Manual*. That manual is shipped with the computer.

Operating systems (e.g. *Windows 8*, etc.) have their own manuals as do application software (e.g. word processing and database programs). If you have questions about those programs, you should consult those manuals.

The **W230ST** 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 note the warning and safety information indicated by the “” symbol.

The balance of this chapter reviews the computer's technical specifications and features.

Introduction

System Specifications

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

Core Logic

Intel® HM87 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) Two mSATA Solid State Drives (SSD) supporting RAID Level 0/1

LCD

13.3" (33.78cm) 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

Keyboard

Illuminated "WinKey" keyboard (with embedded numeric keypad)

Pointing Device

Built-in Touchpad

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 765M

2GB GDDR3 Video RAM on board

Microsoft DirectX® 11.1 Compatible

Interface

One USB 2.0 Port

Three USB 3.0 Ports (Including one AC/DC Powered USB 3.0 Port)

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**

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

Card Reader

Embedded Multi-In-1 Push-Push Card Reader

MMC (MultiMedia Card) / RS MMC

SD (Secure Digital) / Mini SD / SDHC/ SDXC

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® Wireless-AC 7260 Wireless LAN (**802.11a/c**) + Bluetooth 4.0

(Factory Option) Intel® Wireless-N 7260 Wireless LAN (**802.11a/g/n**) + Bluetooth 4.0

(Factory Option) Intel® Wireless-N 7260 Wireless LAN (**802.11b/g/n**) + Bluetooth 4.0

(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**)

6 Cell Smart Lithium-Ion Battery Pack, 62.16WH

Dimensions & Weight

330mm (w) * 227mm (d) * 31.9mm (h)

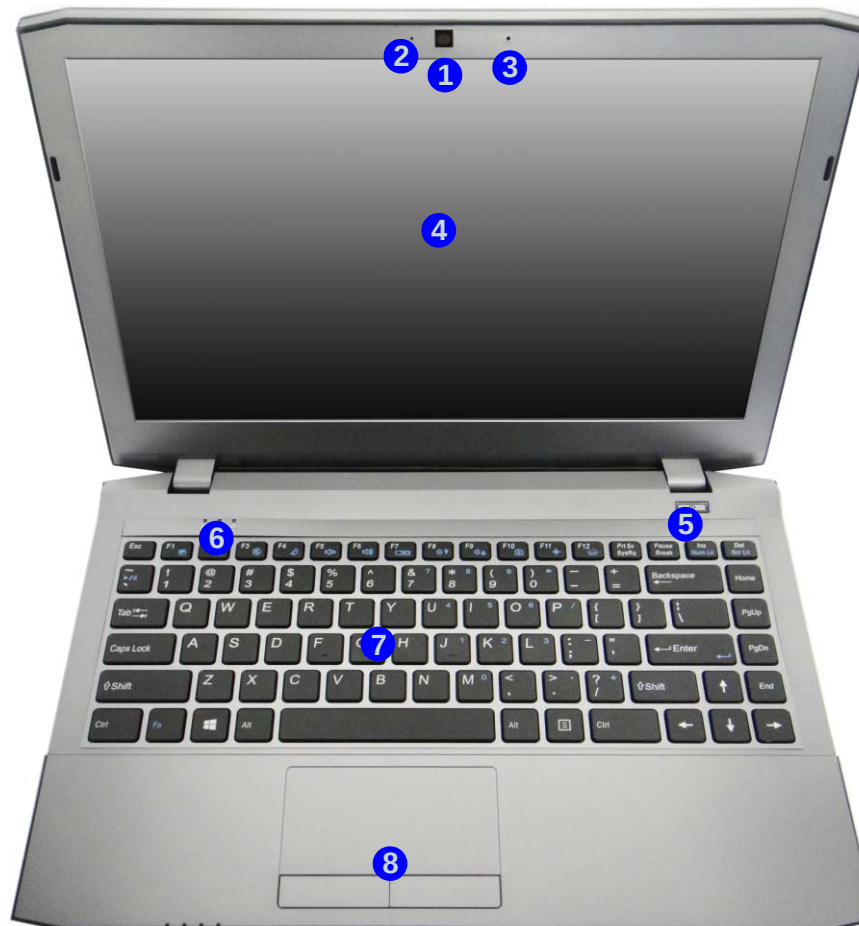
2.0kg with Battery

Introduction

Figure 1
Top View

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

External Locator - Front View with LCD Panel Open



External Locator - Front & Right side Views



Figure 2
Front Views

1. LED Indicators
2. Vent
3. Multi-in-1 Card Reader



Figure 3
Right Side Views

1. USB 3.0 Ports
2. HDMI-Out Port
3. External Monitor Port
4. RJ-45 LAN Jack
5. DC-In Jack
6. Security Lock Slot

Introduction

External Locator - Left Side & Rear View

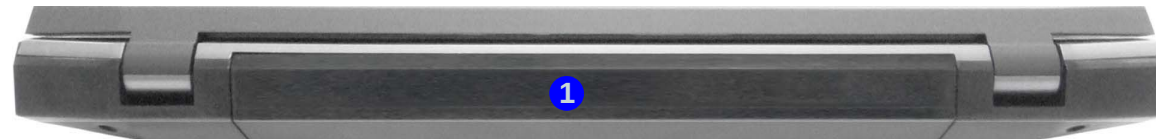
Figure 4
Left Side View

1. Vent
2. USB 2.0 Port
3. Headphone-Out Jack
4. Microphone-In Jack



Figure 5
Rear View

1. Battery



External Locator - Bottom View

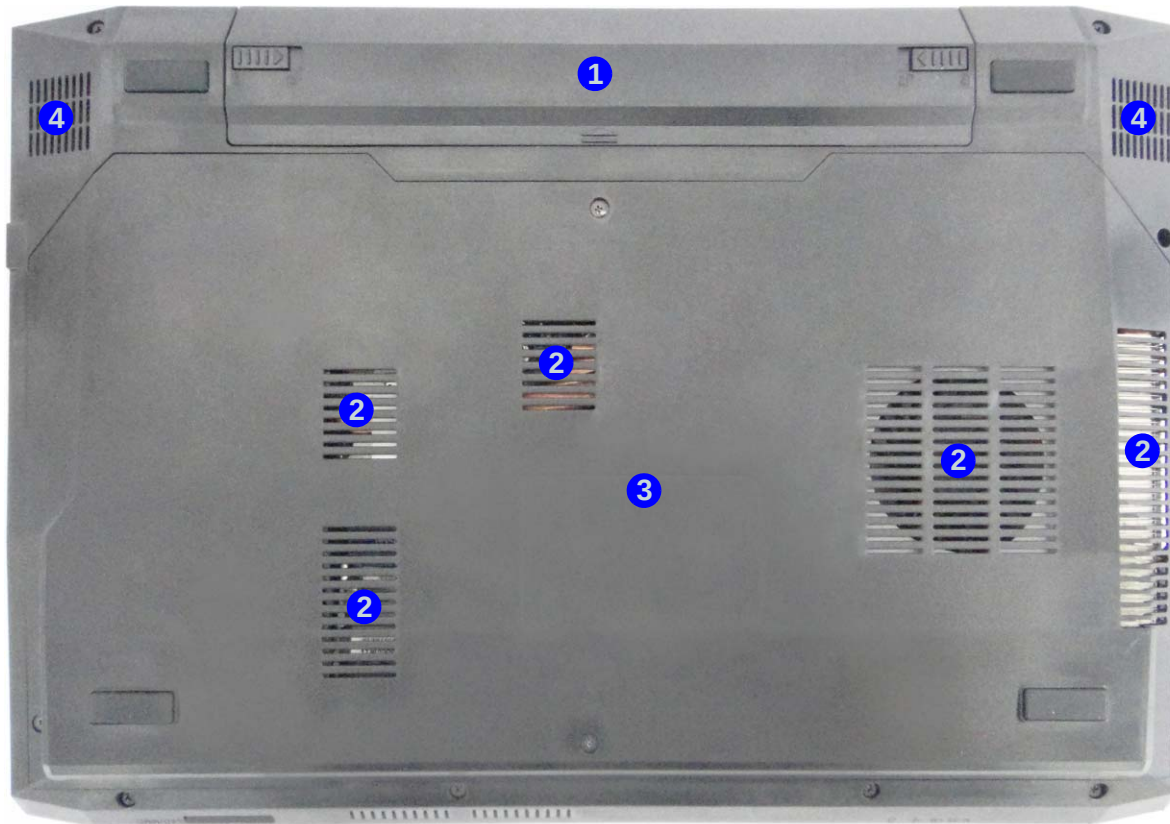


Figure 6
Bottom View

1. Battery
2. Vent
3. Component Bay Cover
4. Speakers



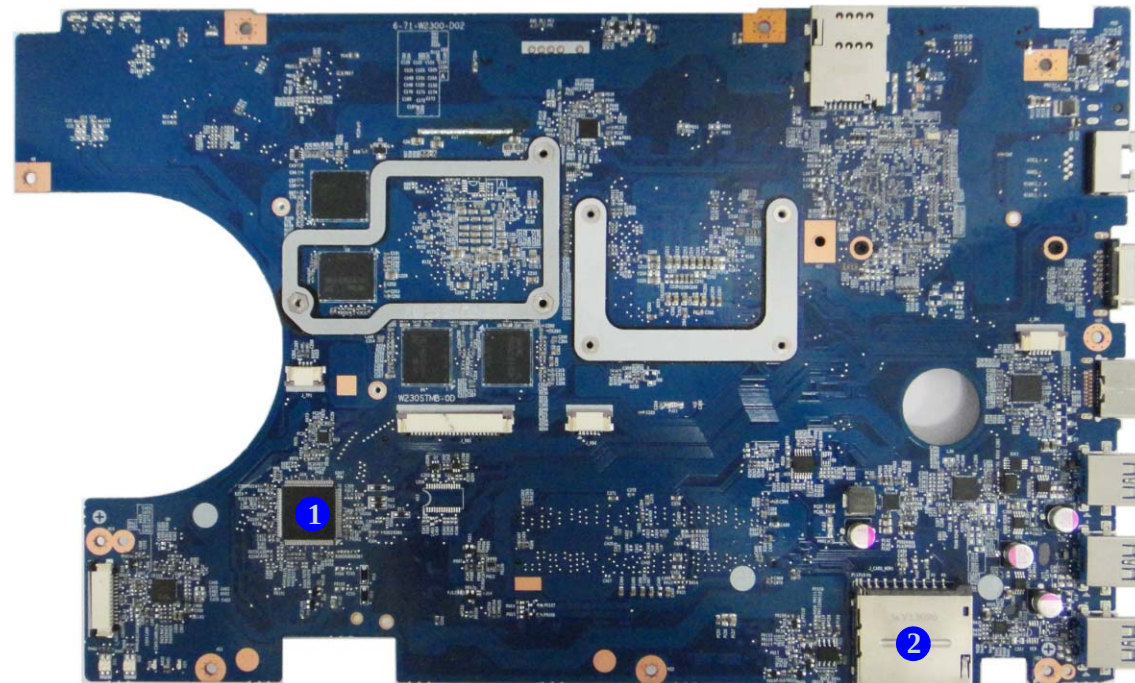
Overheating

To prevent your computer from overheating make sure nothing blocks the vent/fan intakes while the computer is in use.

Figure 7
Mainboard Top
Key Parts

Mainboard Overview - Top (Key Parts)

1. KBC



Mainboard Overview - Bottom (Key Parts)

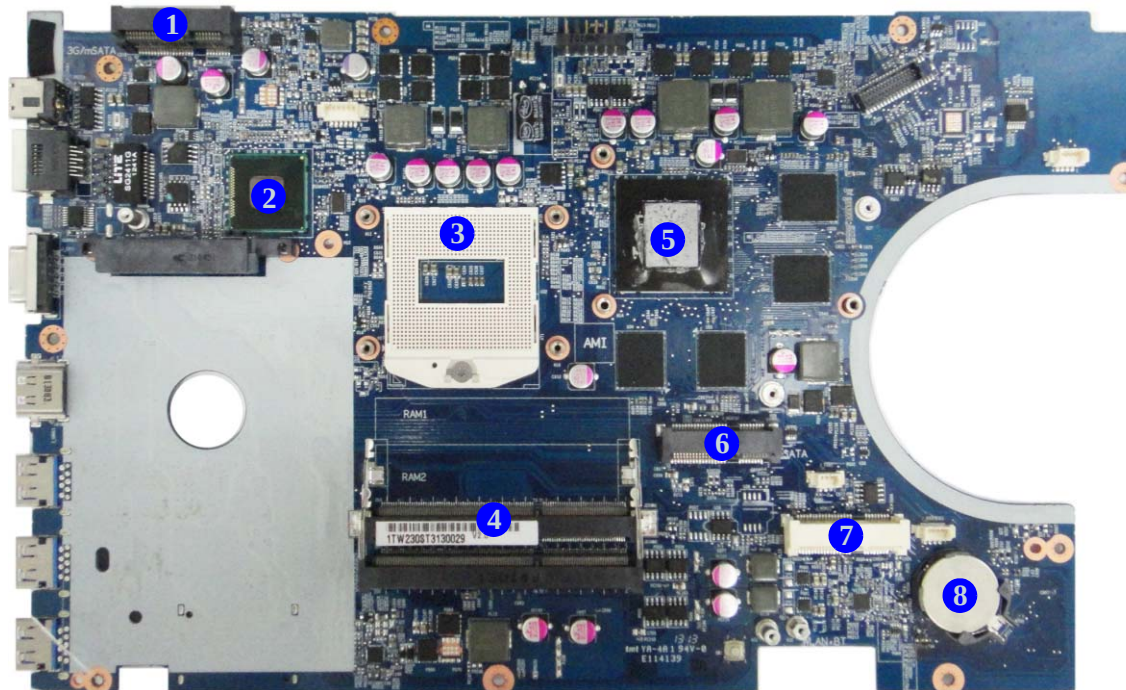


Figure 8
**Mainboard Bottom
Key Parts**

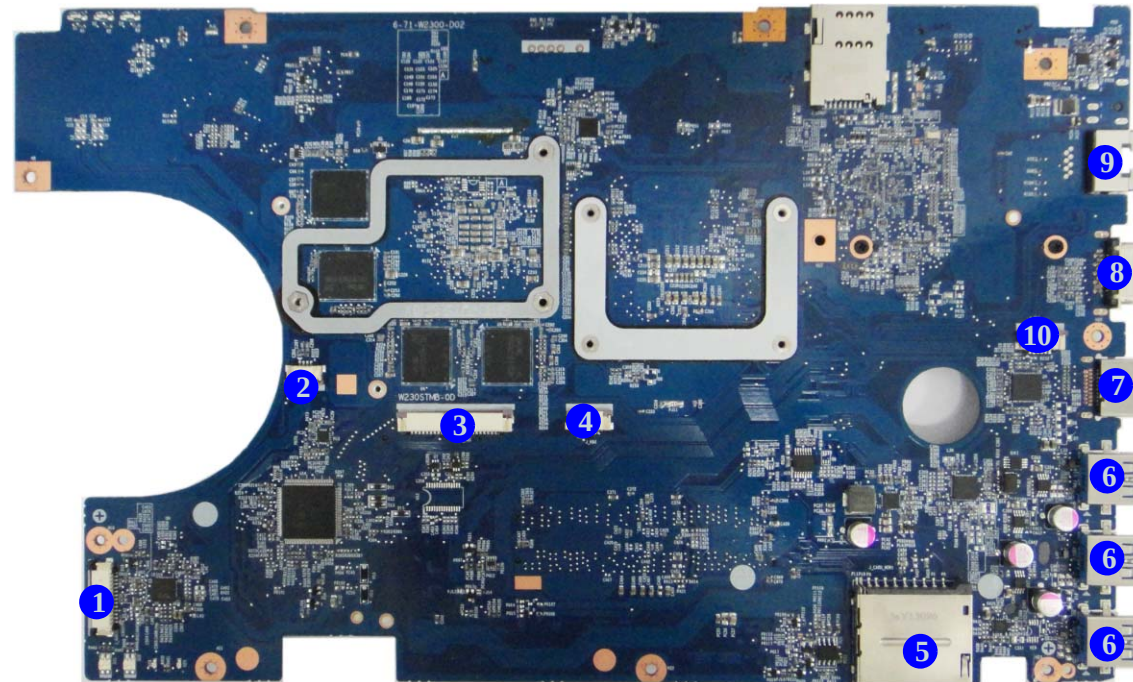
1. Mini-Card Connector (3G/MSATA Module)
2. Controller
3. CPU Socket
4. Memory Slots DDR3 So-DIMM
5. VGA NVidia
6. Mini-Card Connector (MSATA Module)
7. Mini-Card Connector (WLAN Module)
8. CMOS Battery

Introduction

Figure 9
**Mainboard Top
Connectors**

1. Audio Cable Connector
2. Touchpad Connector
3. Keyboard Cable Connector
4. Keyboard LED Connector
5. Multi-in-1 Card Reader
6. USB 3.0 Ports
7. HDMI-Out Port
8. External Monitor Port
9. RJ-45 LAN Jack
10. Power Switch Cable Connector

Mainboard Overview - Top (Connectors)



Mainboard Overview - Bottom (Connectors)

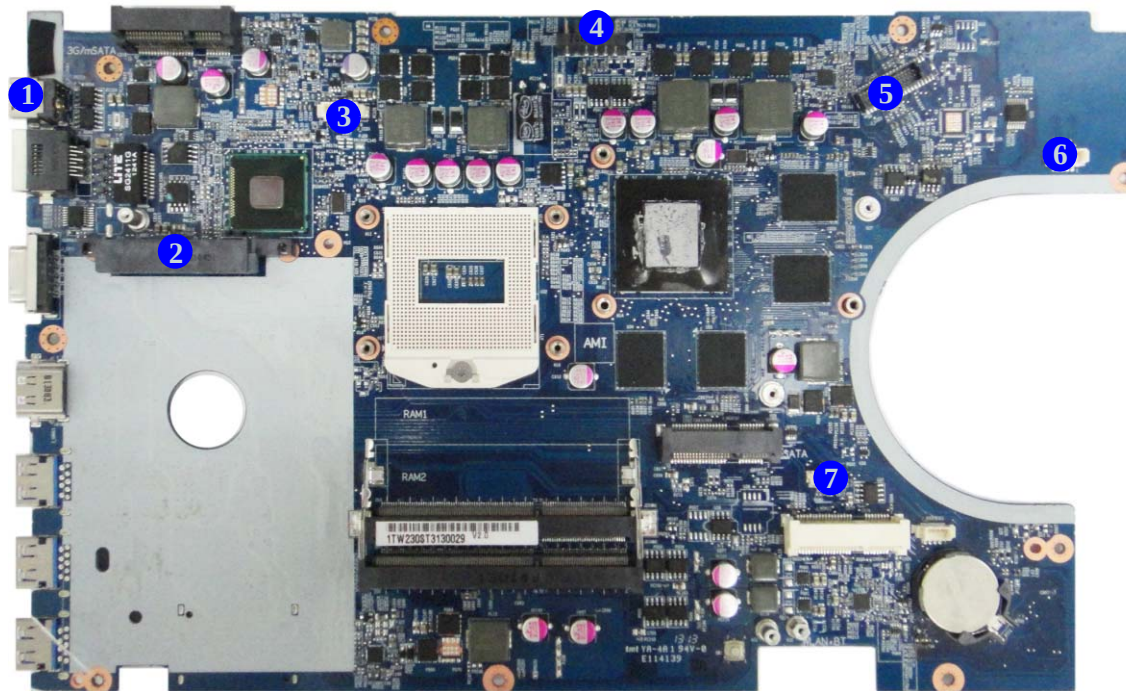


Figure 10
**Mainboard Bottom
Connectors**

1. DC-In Jack
2. HDD1 Connector
3. CCD Cable
Connector
4. Battery Connector
5. LCD Cable
Connector
6. Speaker Cable
Connector
7. Fan Cable
Connector

Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the **W230ST** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

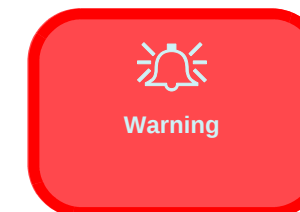
We suggest you completely review any procedure before you take the computer apart.

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 HDD:

1. Remove the battery [page 2 - 5](#)
2. Remove the HDD [page 2 - 6](#)

To remove and install the Processor:

1. Remove the battery [page 2 - 5](#)
2. Remove the Processor [page 2 - 9](#)
3. Install the Processor [page 2 - 11](#)

To remove the Keyboard:

1. Remove the battery [page 2 - 5](#)
2. Remove the keyboard [page 2 - 12](#)

To remove the System Memory:

1. Remove the battery [page 2 - 5](#)
2. Remove the system memory [page 2 - 13](#)

To remove the 3G Module:

1. Remove the battery [page 2 - 5](#)
2. Remove the 3G module [page 2 - 14](#)

To remove the WLAN Module:

1. Remove the battery [page 2 - 5](#)
2. Remove the WLAN module [page 2 - 15](#)

To remove the mSATA Module:

1. Remove the battery [page 2 - 5](#)
2. Remove the mSATA module [page 2 - 16](#)

To remove the CCD Module:

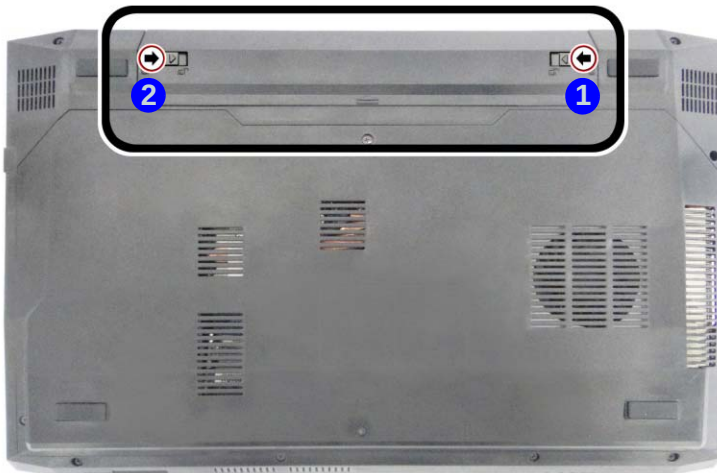
1. Remove the battery [page 2 - 5](#)
2. Remove the CCD module [page 2 - 17](#)

Removing the Battery

If you are confident in undertaking upgrade procedures yourself, for safety reasons it is best to remove the battery.

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

a.



b.

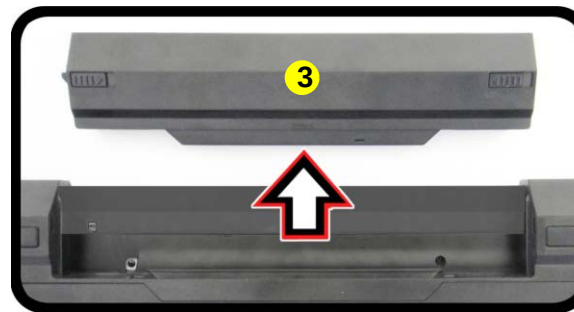


Figure 1
Battery Removal

- a. Slide the latch **1** in the direction of the arrow. and slide the latch **2** in the direction of the arrow.
- b. Slide the battery out of the bay as indicated.



3. Battery

Disassembly

Figure 2
**HDD Assembly
Removal**

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

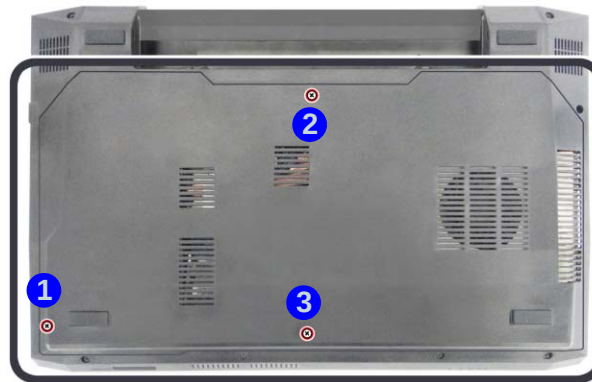
Removing the Hard Disk Drive

The hard disk drive is mounted in a removable case and can be taken out to accommodate other 2.5" 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.

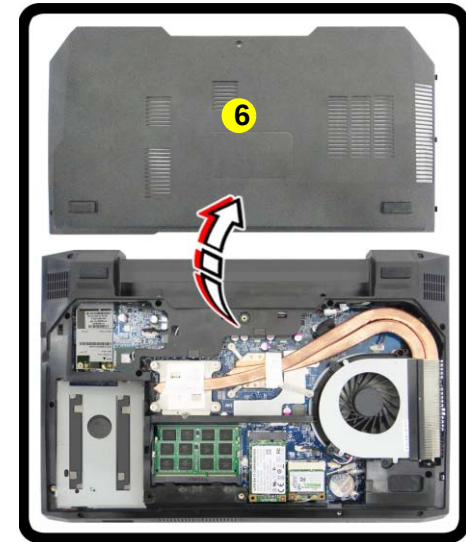
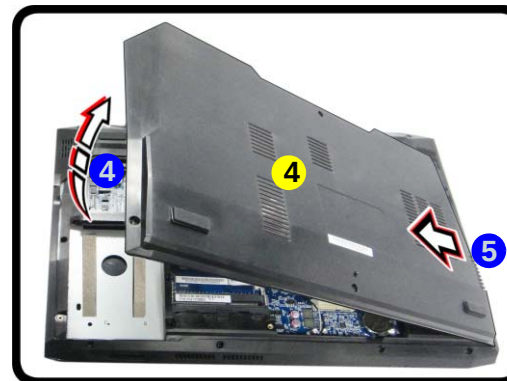
Hard Disk Upgrade Process

1. Turn off the computer, and turn it over and remove the battery ([page 2 - 5](#)).
2. Locate the Hard disk bay cover and remove screw ① - ③.
3. Lift and pull the bay cover in the direction of the arrow ④ and ⑤. Remove the bay cover ⑥.

a.



b.

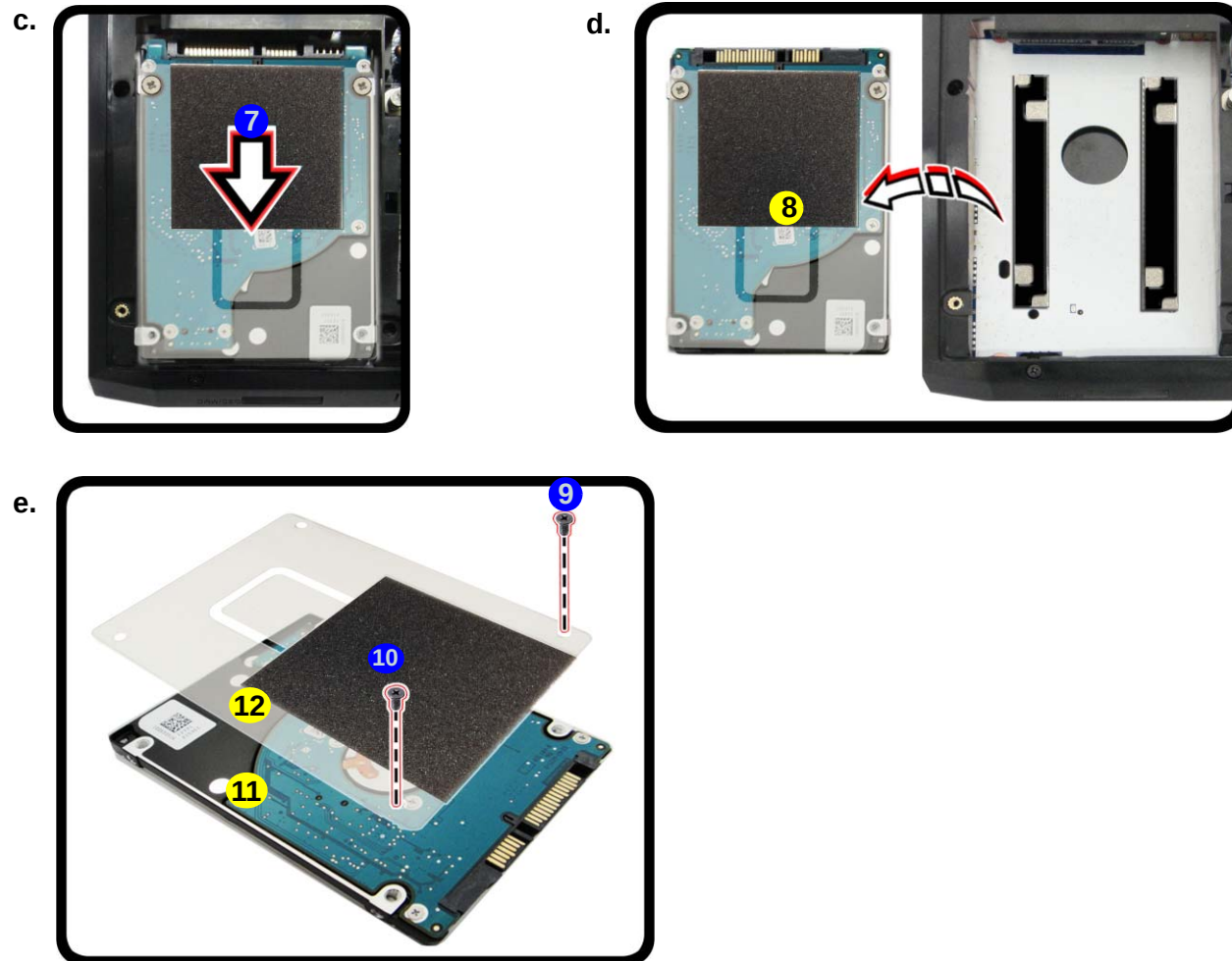


6. Hard Disk Bay Cover

- 1 Screws

Figure 3
**HDD Assembly
Removal (cont'd.)**

- c. Slide the hard disk assembly out.
- d. Lift the hard disk assembly out of the computer.
- e. Remove the screws to release the hard disk from the mylar.



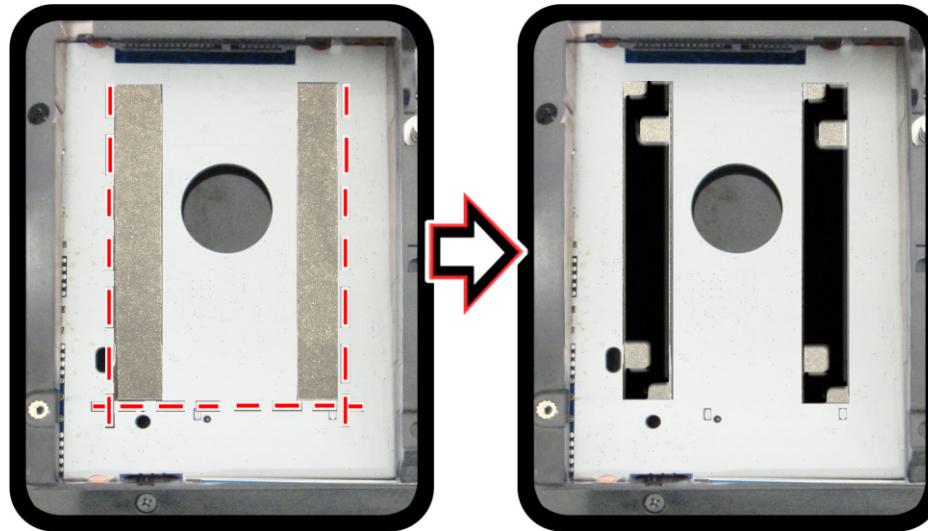
11. Hard Disks
12. Hard Disk Mylar
- 2 Screws

Disassembly

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 4
**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.

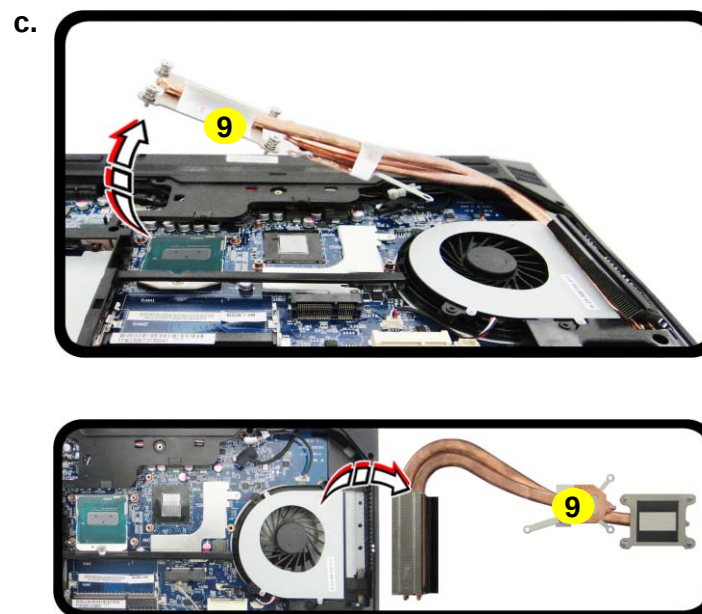
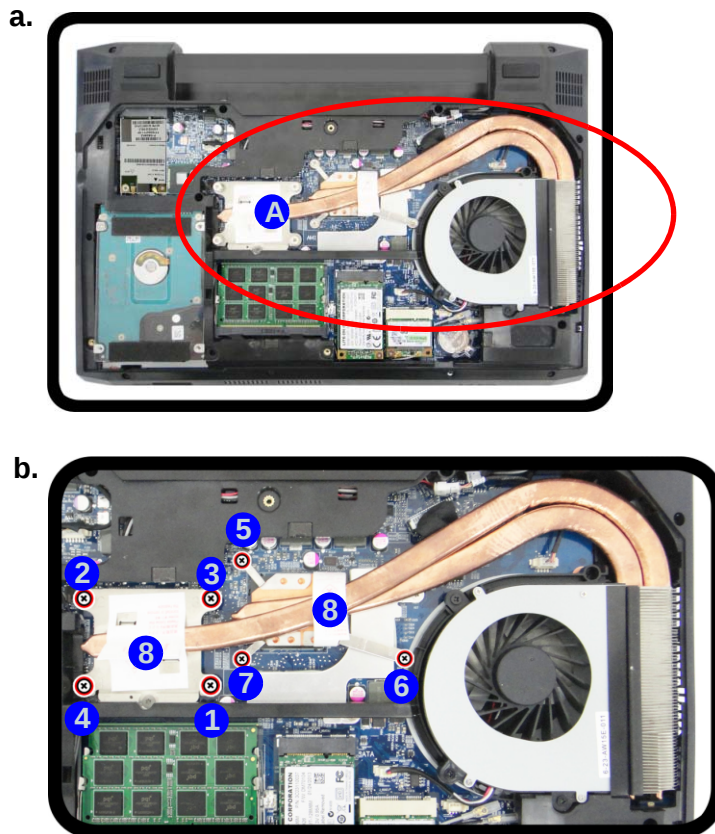
Removing and Installing the Processor

Processor Removal Procedure

1. Turn off the computer, and turn it over, remove the battery ([page 2 - 5](#)), and component bay cover ([page 2 - 6](#)).
2. The CPU heat sink will be visible at point **A** on the mainboard.
3. Remove screws **7**, **6**, **5**, **4**, **3**, **2**, **1**, the reverse order indicated on the label ([Figure 5b](#)).
4. Grip the heat sink tab **8** and carefully lift the heat sink **9** up straight (**do angle it as you lift it**) about a centimeter in order to clear the fan unit, and then angle it around 45° to remove it from the computer.

Figure 5
Processor Removal

- a. Locate the heat sink.
- b. Remove the screws.
- c. Grip the heat sink tab and carefully lift the heat sink up and off the computer.



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.



9. CPU Heat Sink

- 7 Screws

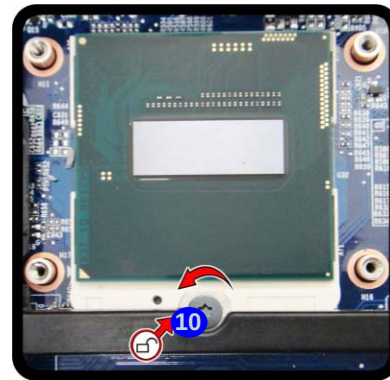
Disassembly

Figure 6
Processor Removal
(cont'd)

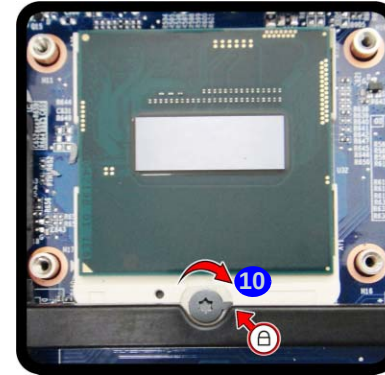
- d. Turn the release latch to unlock the CPU.
e. Lift the CPU out of the socket.

5. Turn the release latch **10** towards the unlock symbol  to release the CPU (*Figure 6d*).
6. Carefully (it may be hot) lift the CPU **11** up and out of the socket (*Figure 6e*).
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!).

d.

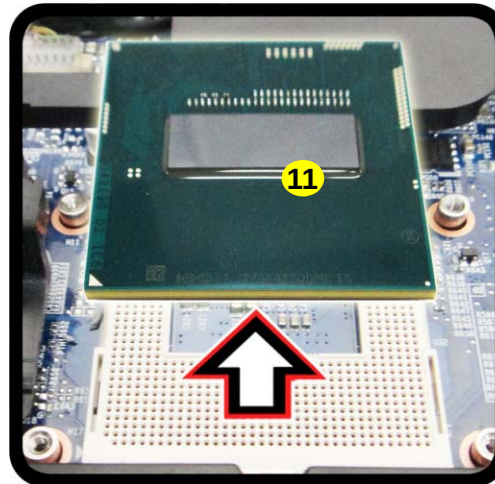


Unlock



Lock

e.



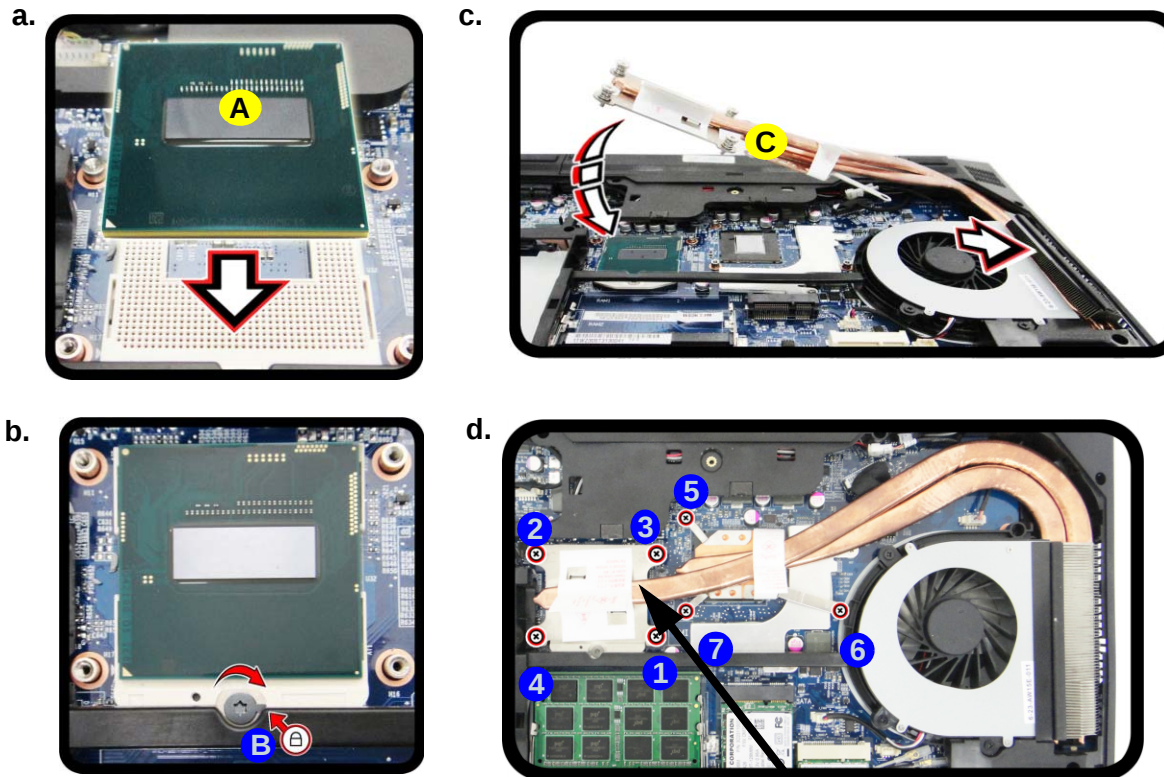
Caution

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.

11. CPU

Processor Installation Procedure

1. Insert the CPU **A** (**Figure 7a**), 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 7b**).
2. Insert the heat sink **C** at an angle of around 30° as indicated in **Figure 7c**.
3. Tighten the CPU heat sink screws in the order **1**, **2**, **3**, **4**, **5**, **6** & **7** (the order as indicated on the label and **Figure 7d**).
4. Replace the component bay cover.



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

Figure 7
**Processor
Installation**

- a. Insert the CPU.
- b. Turn the release latch towards the lock symbol.
- c. Insert the heat sink.
- d. Tighten the screws.

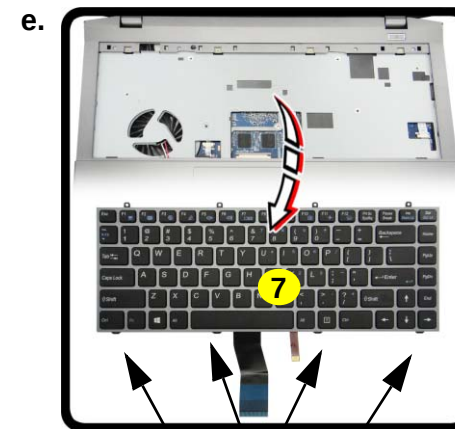
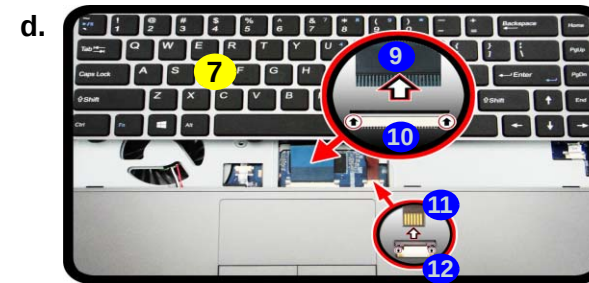
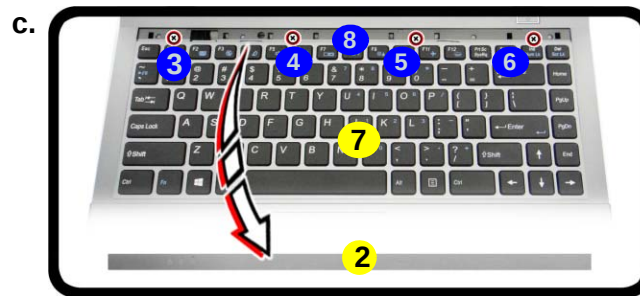
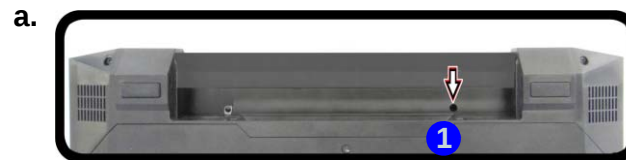
- A. CPU
C. Heat Sink
- 7 Screws

Disassembly

Figure 8

Keyboard Removal

- Use a screwdriver to carefully push out the speakers cover at point 1.
 - Turn the computer over, unsnap the center cover module upward from the center of the computer.
 - Lift the LED cover module and remove the screws from the keyboard.
 - Carefully lift the keyboard up and disconnect the cables from the locking collar.
 - Remove the keyboard.
- Turn off the computer, and turn it over and remove the battery (page 2 - 5), and component bay cover (page 2 - 6).
 - Use a screwdriver to carefully push out the center cover 2 at point 1.
 - Turn the computer over, unsnap the center cover 2 upward from the center of the computer (Figure 8b).
 - Remove screws 3 - 6 from the keyboard (Figure 8c).
 - Carefully lift the keyboard 7 up from point 8, being careful not to bend the keyboard cables.
 - Disconnect the keyboard ribbon cable 9 from the locking collar socket 10 and the keyboard LED cable 11 from its locking collar socket 12 (Figure 8d).
 - Carefully lift up the keyboard 7 (Figure 8e) off the computer.
 - Reverse the process to replace the keyboard (make sure to reconnect the keyboard cables).



Keyboard Tabs



Re-Inserting the Keyboard

When re-inserting the keyboard firstly align the **four** keyboard tabs at the bottom (Figure 8e) of the keyboard with the slots in the case.

- 2. Center Cover
- 7. Keyboard

- 4 Screws

Removing the System Memory (RAM)

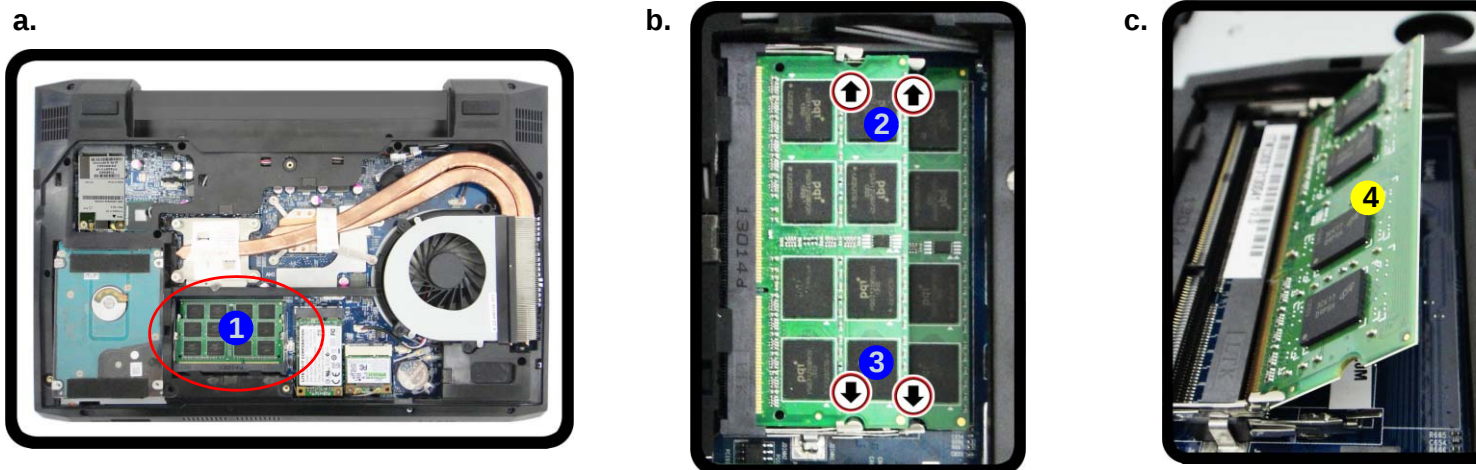
The computer has **two** memory sockets for 204 pin Small Outline Dual In-line (SO-DIMM) **DDR3L** type memory modules. The total memory size is automatically detected by the POST routine once you turn on your computer.

Primary System Memory Upgrade Process

1. Turn **off** the computer, turn it over and remove the battery ([page 2 - 5](#)) and component bay cover ([page 2 - 6](#)).
2. The RAM modules will be visible at point **1** on the mainboard.
3. Gently pull the two release latches (**2** & **3**) on the sides of the memory socket in the direction indicated by the arrows ([Figure 9b](#)). The RAM module **4** will pop-up ([Figure 9c](#)), and you can then remove it.
4. Pull the latches to release the second module if necessary.

Figure 9
RAM Module Removal

- a. The RAM modules will be visible at point **1** on the mainboard.
- b. Pull the release latches.
- c. 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.

4. RAM Module

5. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
6. The module's pin alignment will allow it to only fit one way. Make sure the module is seated as far into the slot as it will go. **DO NOT FORCE** the module; it should fit without much pressure.
7. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
8. Replace the bay cover and screws.
9. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.

Disassembly

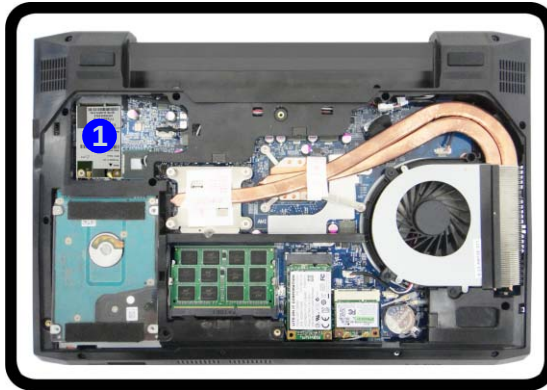
Figure 10
3G Module Removal

- a. Locate the 3G module.
- b. Remove the screw and disconnect the cables.
- c. The module will pop-up.
- d. Remove the 3G module.

Removing the 3G Module

1. Turn off the computer, turn it over and remove the battery ([page 2 - 5](#)), and component bay cover ([page 2 - 6](#)).
2. The 3G module will be visible at point **1** on the mainboard ([Figure 10a](#)).
3. Carefully remove the screw **2** and disconnect cables **3** & **4** ([Figure 10b](#)).
4. The 3G module **5** ([Figure 10c](#)) will pop-up, and you can remove it from the computer ([Figure 10 d](#)).

a.



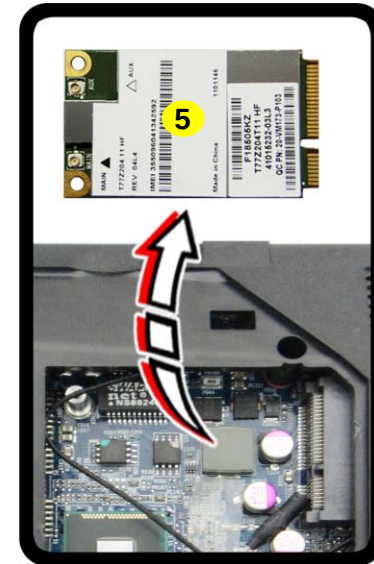
b.



c.



d.



5. 3G Module

- 1 Screw

Removing the WLAN Module

1. Turn off the computer, turn it over and remove the battery ([page 2 - 5](#)), and component bay cover ([page 2 - 6](#)).
2. The WLAN module will be visible at point **1** on the mainboard ([Figure 11a](#)).
3. Carefully remove the screw **2** and disconnect cables **3** & **4** ([Figure 11b](#)).
4. The WLAN module **5** ([Figure 11c](#)) will pop-up, and you can remove it from the computer ([Figure 11d](#)).

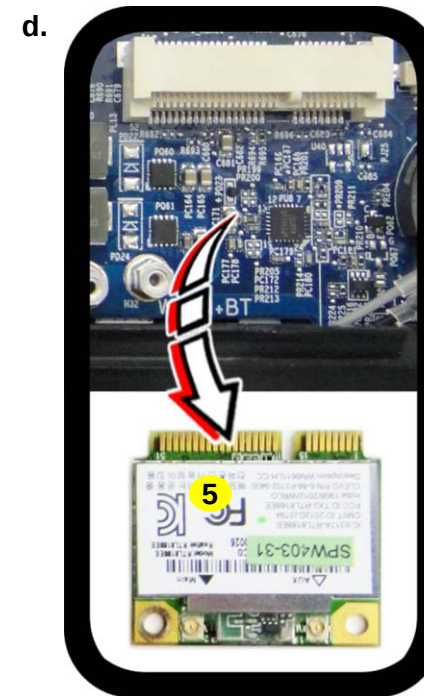
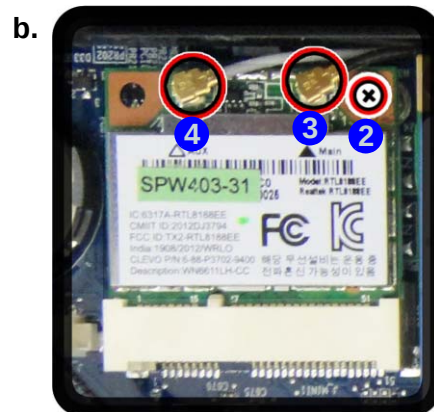
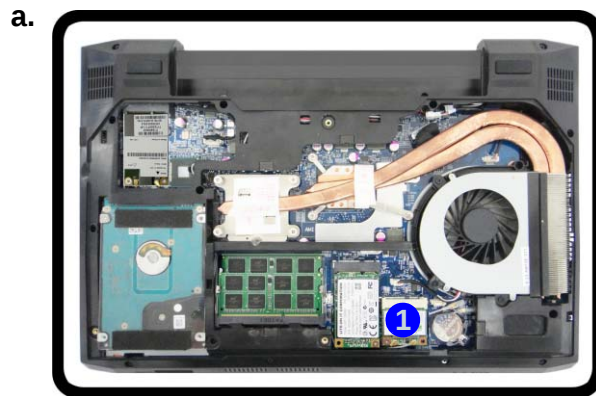


Figure 11
WLAN Module Removal

- a. Locate the WLAN module.
- b. Remove the screw and disconnect the cables.
- c. The module will pop-up.
- d. Remove the WLAN module.

- 
5. WLAN Module
- 1 Screw

Disassembly

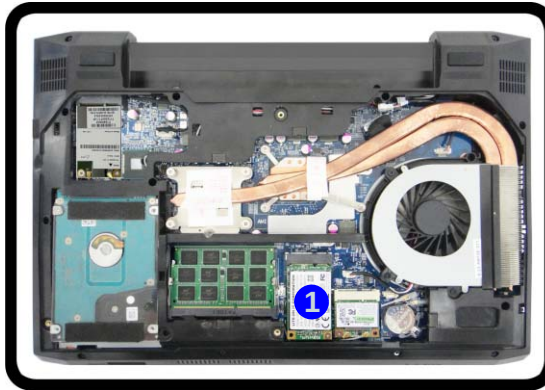
Figure 12
mSATA Module Removal

- a. Locate the mSATA module.
- b. Remove the screw.
- c. The module will pop-up.
- d. Remove the mSATA module.

Removing the mSATA Module

1. Turn off the computer, turn it over and remove the battery ([page 2 - 5](#)), and component bay cover ([page 2 - 6](#)).
2. The mSATA module will be visible at point **1** on the mainboard ([Figure 12a](#)).
3. Carefully remove the screw **2** ([Figure 12b](#)).
4. The mSATA module **3** ([Figure 12c](#)) will pop-up, and you can remove it from the computer ([Figure 12d](#)).

a.



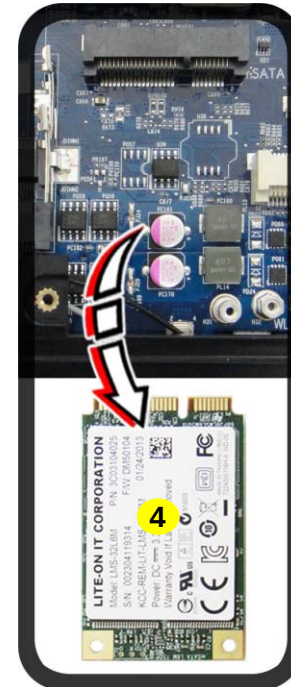
b.



c.



d.



4. mSATA Module

- 1 Screw

Removing the CCD Module

1. Turn **off** the computer, turn it over, and remove the battery ([page 2 - 5](#)).
2. Carefully run your fingers around the inner frame of the LCD panel at the points as indicated by the arrows **1** - **3** ([Figure 13a](#)).
3. Carefully remove the LCD front panel **4** off ([Figure 13b](#)).
4. Disconnect the cable **5** ([Figure 13c](#)).
5. Remove the CCD module **6** ([Figure 13d](#)).
6. Reverse the process to install a new CCD module.

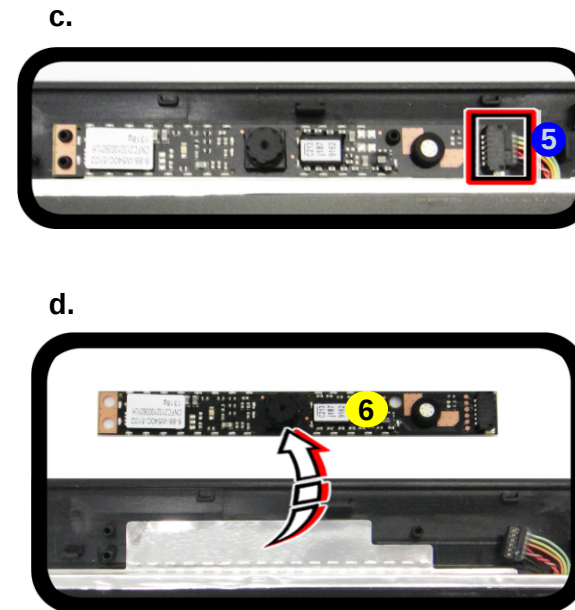
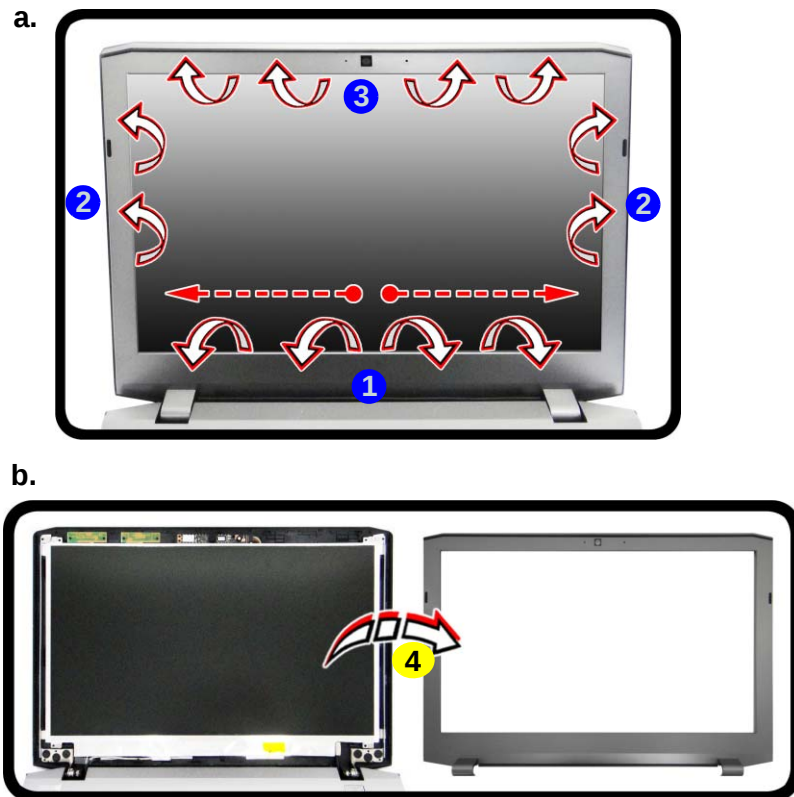


Figure 13
**CCD Module
Removal**

- a. Carefully run your fingers around the inner frame of the LCD panel at the points indicated by the arrows.
- b. Remove the LCD front panel.
- c. Disconnect the cable.
- d. Remove the CCD module.



4. LCD Front Panel
6. CCD Module

Appendix A: Part Lists

This appendix breaks down the **W230ST** 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

Parts	
Top	<i>page A - 3</i>
Bottom	<i>page A - 4</i>
LCD	<i>page A - 5</i>
HDD	<i>page A - 6</i>

Top

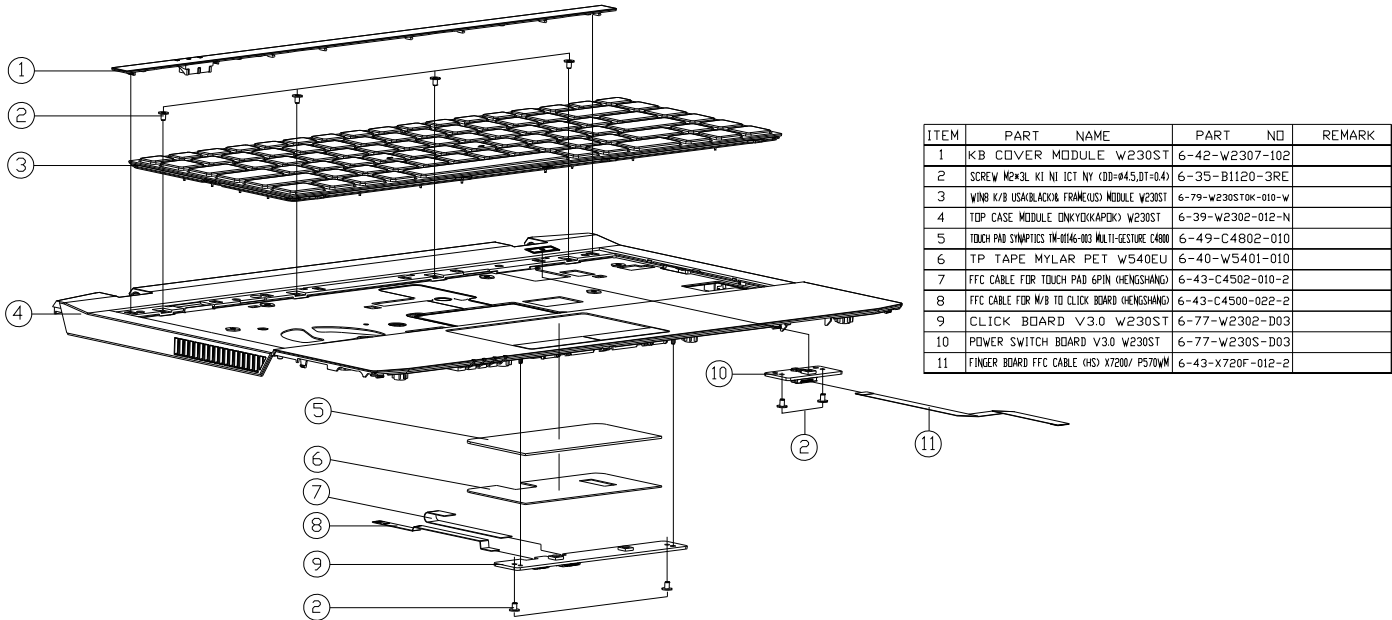
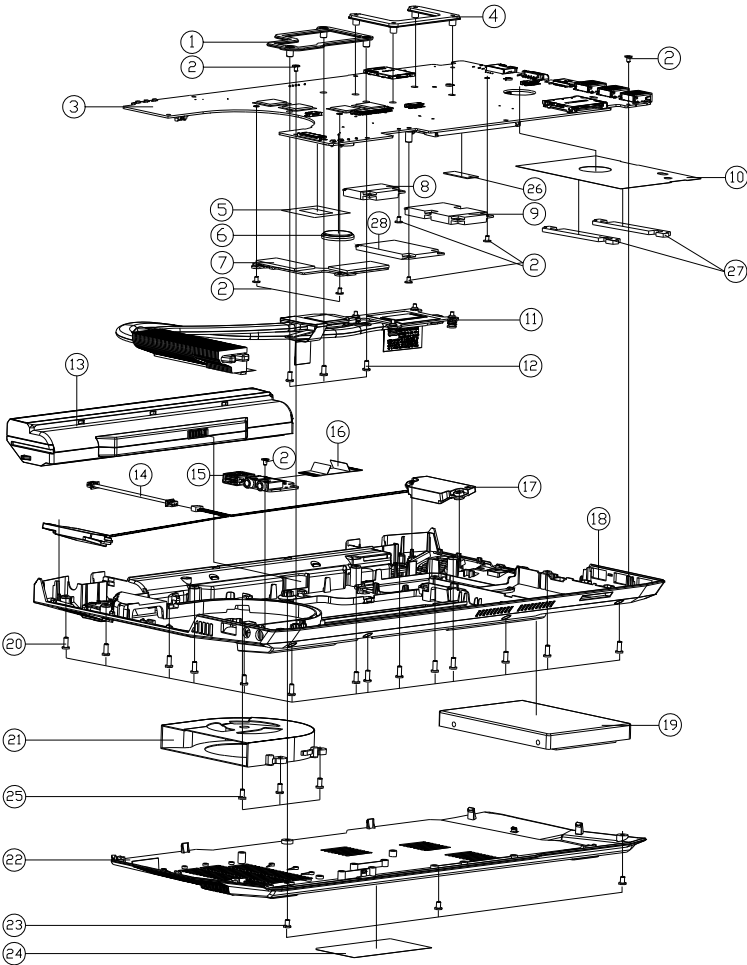


Figure A - 1
Top

Part Lists

Bottom

Figure A - 2
Bottom



ITEM	PART	NAME	PART	NO	REMARK
1	VGA SUPPORTER	SECC W150ERQ	6-33-W15ES-012		
2	SCREW	M2x3L KI NI ICT NY (00-445,01-44)	6-35-B1120-3RE		
3	MAIN BOARD	V3.0 (CEP W/3G) W230ST	6-77-W230ST00-D03		
3	MAIN BOARD	V3.0 (CEP W/3G) W230ST	6-77-W230ST00-D03-1		
3	MAIN BOARD	V3.0 (LVBS W/3G) W230ST	6-77-W230ST00-D03-2		
3	MAIN BOARD	V3.0 (LVBS W/3G) W230ST	6-77-W230ST00-D03-3		
3	MAIN BOARD	V3.0 (HMT C2) CEP W/3G W230ST	6-77-W230ST00-D03-4		
3	MAIN BOARD	V3.0 (HMT C2) CEP W/3G W230ST	6-77-W230ST00-D03-5		
3	MAIN BOARD	V3.0 (HMT C2) LVBS W/3G W230ST	6-77-W230ST00-D03-6		
3	MAIN BOARD	V3.0 (HMT C2) LVBS W/3G W230ST	6-77-W230ST00-D03-7		
4	CPU SUPPORT BRACKET	SECC T115 P159M	6-33-X510S-011		
5	VGA CHIP MYLAR	CR2032 (NITSUBISHI)	6-40-W35SS-010		
6	BATTERY 3V	210MA CR2032 (NITSUBISHI)	6-23-6201S-607		
7	VRAM THERMAL MODULE	W230ST	6-33-W230S-101		
8	VRAM THERMAL MODULE	W230ST	6-88-P17EF-4200		(OPTION)
8	VRAM THERMAL MODULE	W230ST	6-88-W345F-9400		(OPTION)
8	VRAM THERMAL MODULE	W230ST	6-88-W345F-7000		(OPTION)
8	VRAM THERMAL MODULE	W230ST	6-88-W255F-4200		(OPTION)
8	VRAM THERMAL MODULE	W230ST	6-88-P3702-9400		(OPTION)
8	VRAM THERMAL MODULE	W230ST	6-88-P3702-7000		(OPTION)
8	VRAM THERMAL MODULE	W230ST	6-88-W230F-4200		(OPTION)
8	VRAM THERMAL MODULE	W230ST	6-88-W230F-4210		(OPTION)
8	VRAM THERMAL MODULE	W230ST	6-88-W650W-8800		(OPTION)
10	M/B HDD MYLAR	PET W230ST	6-40-W230S-011		
11	CPU/VGA HEATING MODULE	GEL PAD W230ST	6-31-W230N-102		
12	SCREW	M2.5x3L KI NI ICT NY	6-35-B1125-3R0		
13	WIRE CABLE FOR SPEAKER	TRANSFER 4P 7MM (4) W230ST	6-43-W230S-4271		
14	WIRE CABLE FOR SPEAKER	TRANSFER 4P 7MM (4) W230ST	6-43-W230S-010		
15	AUDIO BOARD	V3.0 W230ST	6-77-W230B-D03		
16	ITC CABLE FOR AUDIO BOARD	TO MP (4) W230ST	6-43-W230B-012		
17	SPEAKER	FRONT RL 5W 8Ω 24V 40 TYPICAL P159M	6-23-5P15E-051		
18	BOTTOM CASE MODULE	W230ST	6-39-W2303-012		
19	W/D HDD ASS'Y	W230ST	6-79-W230ST0J-010		
20	W/D HDD ASS'Y	W230ST	6-79-W230ST0J-020		
20	SCREW	M2.5x6L K BZ ICT NY	6-35-B212S-6RA		
21	CPU COVER MODULE	W230ST	6-23-AW15E-011		
22	CPU COVER MODULE	W230ST	6-42-W230B-102		
23	SCREW	M2.5x4L KKT-05 B-45) BK/2 ICT	6-35-B612S-4R0		
24	PRODUCT LABEL	FOR W230ST	6-45-W230S103-010		
25	SCREW	M2.5x5L KI NI ICT NY	6-35-B112S-SRA		
26	TOP CASE MYLAR	FR03 25474035 P159M	6-40-P1802-030		
27	SPEAKER	(4)W230ST DR03S FOR 7MM (4) W230ST	6-47-0019A-760		FOR 7mm hole only
28	VRAM THERMAL MODULE	W230ST	6-85-D4032-L02		

LCD

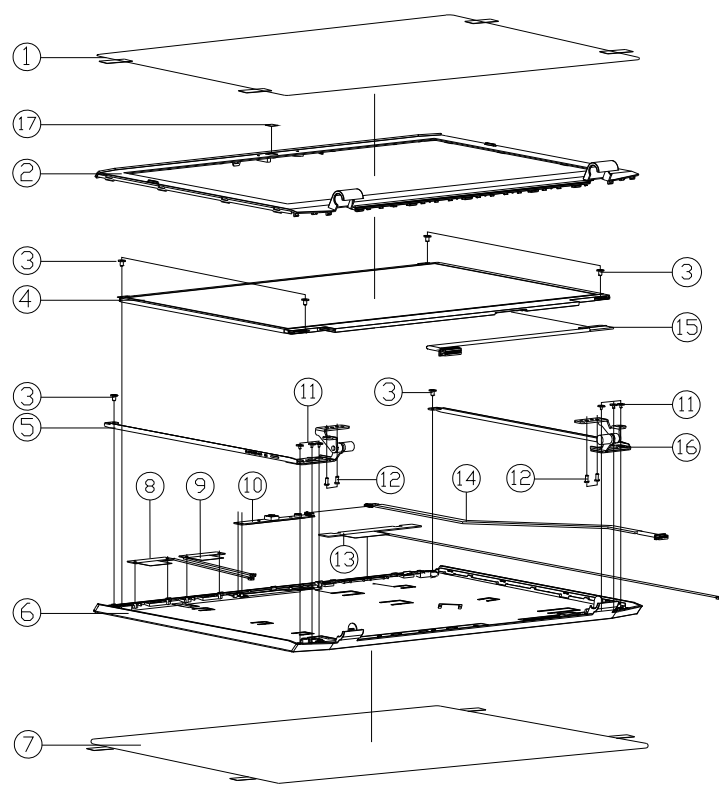


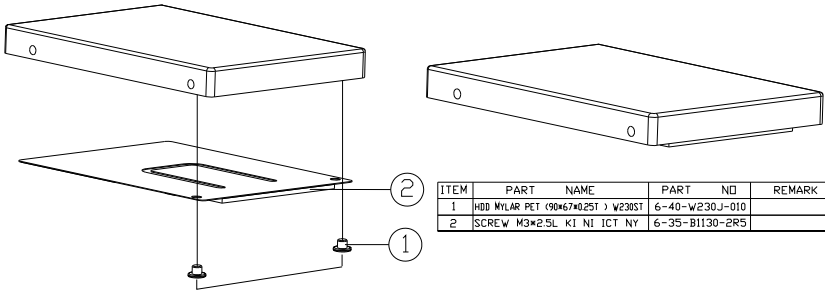
Figure A - 3
LCD

ITEM	PART NAME	PART NO	REMARK
1	LCD FRONT COVER PROTECTION FILM (PET-300X5) W230ST	6-40-W2308-010	
2	LCD FRONT COVER MODULE W230ST	6-39-W2301-012	
3	SCREW M2X4 KI NY ICT NY (00-45.01-04)	6-35-B1120-3RE	
4	LCD 13.3" FHD CHIMEI W230ST-EAL (LED) (ECP) 300M	6-50-GB228-D00	OPTION
4	LCD 13.3" FHD CHIMEI W230ST-H00 (LED) (ECP) 300M	6-50-GB230-H00	OPTION
4	LCD 13.3" HD+ CHIMEI W230ST-L31 (LED) 300M	6-50-GA130-D00	OPTION
4	LCD 13.3" HD+ CHIMEI W230ST-L31 (LED) (ECP) 300M	6-50-GA130-C00	OPTION
5	LCD HINGE L SECC+S50C W230ST	6-33-W2301-0L1	
6	LCD BACK COVER MODULE W230ST	6-39-W2301-022	
7	LCD BACK COVER PROTECTION FILM (PET-300X5) W230ST	6-40-W2308-020	
8	ANTENNA W230ST W230ST 24/250/25 1-750M W230ST	6-23-7W230-030	
9	ANTENNA W230ST W230ST 24/250/25 1-750M W230ST	6-23-7W230-040	
10	ANTENNA W230ST W230ST 24/250/25 1-750M W230ST	6-88-W540C-4902	OPTION
10	ANTENNA W230ST W230ST 24/250/25 1-750M W230ST	6-88-W540C-5102	OPTION
11	SCREW M2X2L KI BK/Z ICT NY(00,1-06)	6-35-B6120-2RE	
12	SCREW M2.5X6L K BZ ICT NY	6-35-82125-6RA	
13	ANTENNA W230ST W230ST 24/250/25 1-750M W230ST	6-23-7W230-011	
14	WIRE CABLE FOR CCD 6P 36AWG (4L) W230ST	6-43-W230T-010	
15	WIRE CABLE FOR CCD 6P 36AWG (4L) W230ST	6-43-W2301-010-K	
15	WIRE CABLE FOR CCD 6P 36AWG (4L) W230ST	6-43-W2301-020-K	
16	LCD HINGE R SECC+S50C W230ST	6-33-W2301-0R1	
17	CCD LENS (PMMA) P375SM	6-42-P3751-020	

Part Lists

HDD

Figure A - 4
HDD



Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the W230ST 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 Frame Buffer B - Page B - 19	SATA HDD, MSATA1, KB Control - Page B - 36
Haswell 1/7 - Page B - 3	VGA Frame Buffer B - Page B - 20	HDMI, RJ45 - Page B - 37
Haswell 2/7 - Page B - 4	VGA I/O - Page B - 21	Audio Codec VT1802S - Page B - 38
Haswell 3/7 - Page B - 5	VGA NVDD Decoupling - Page B - 22	KBC ITE IT8587 - Page B - 39
Haswell 4/7 - Page B - 6	Lynx 1/9 - Page B - 23	5V, 5VS, 3.3V, 3VS, 3.3VM - Page B - 40
Haswell 5/7 - Page B - 7	Lynx 2/9 - Page B - 24	VDD3, VDD5 - Page B - 41
Haswell 6/7 - Page B - 8	Lynx 3/9 - Page B - 25	1.5V or 1.35V, 0.75VS, 1.5VS - Page B - 42
Haswell 7/7 - Page B - 9	Lynx 4/9 - Page B - 26	1.05VS, 1.05V_M, 1.05V_LAN_M - Page B - 43
DDR3 SO-DIMM A_0 - Page B - 10	Lynx 5/9 - Page B - 27	Power V-Core - Page B - 44
DDR3 SO-DIMM B_0 - Page B - 11	Lynx 6/9 - Page B - 28	VGA NVVDD, PEX_VDD - Page B - 45
PS8625 - Page B - 12	Lynx 7/9 - Page B - 29	FBVDDQ - Page B - 46
Panel, Inverter, CRT - Page B - 13	Lynx 8/9 - Page B - 30	AC-In, Charger - Page B - 47
CRT - Page B - 14	Lynx 9/9 - Page B - 31	LED Board - Page B - 48
VGA PCI-E Interface - Page B - 15	Mini PCIE, 3G, Fan, Audio Con - Page B - 32	Audio Board - Page B - 49
VGA Frame Buffer Interface - Page B - 16	USB Charge, CCD, TPM, Multi-Con - Page B - 33	Click Board - Page B - 50
VGA Frame Buffer A - Page B - 17	USB3.0 Connector - Page B - 34	Power Switch Board - Page B - 51
VGA Frame Buffer A - Page B - 18	Card Reader / LAN RTL8411B - Page B - 35	POWER ON SEQUENCE - Page B - 52

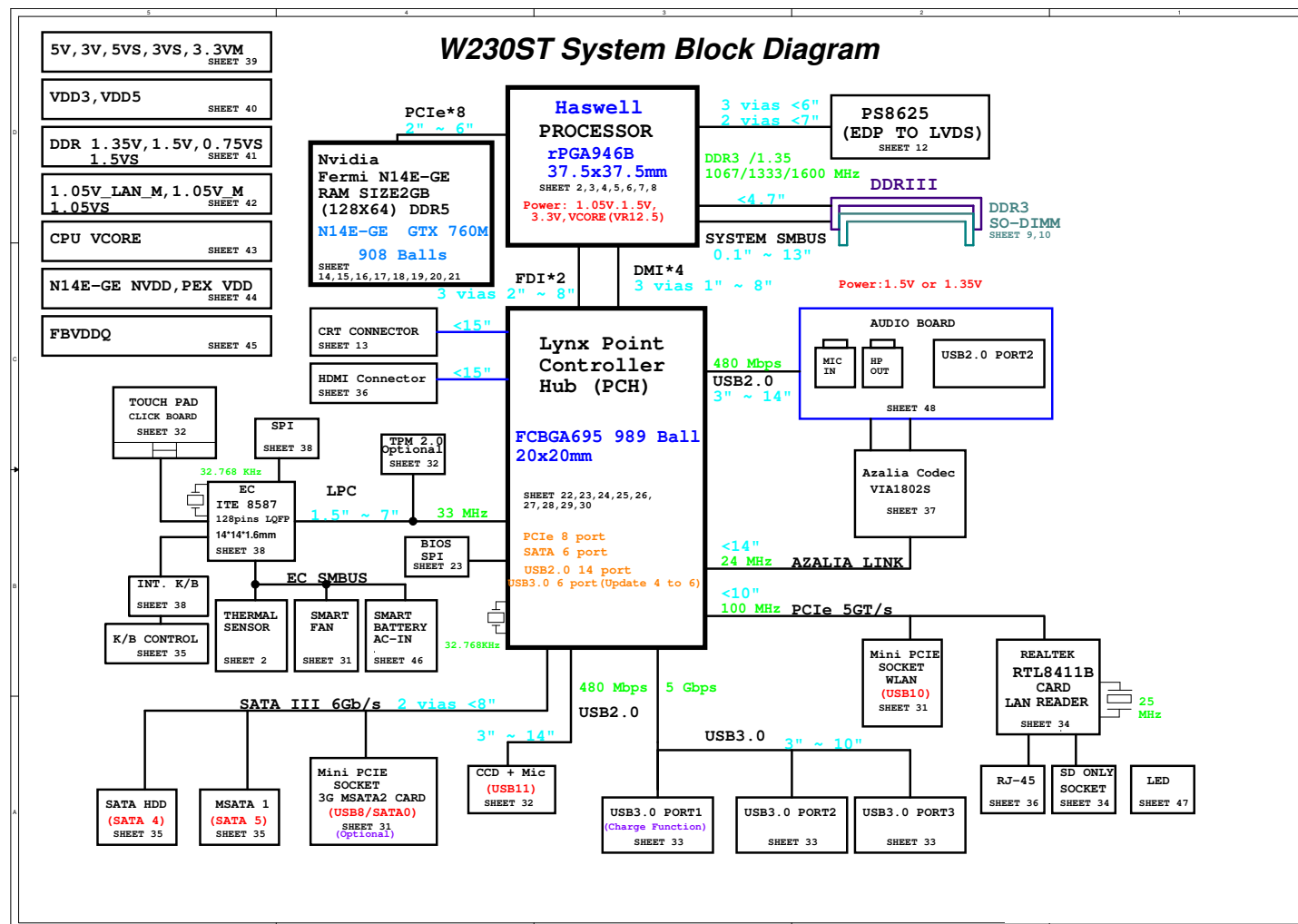
Table B - 1
Schematic
Diagrams



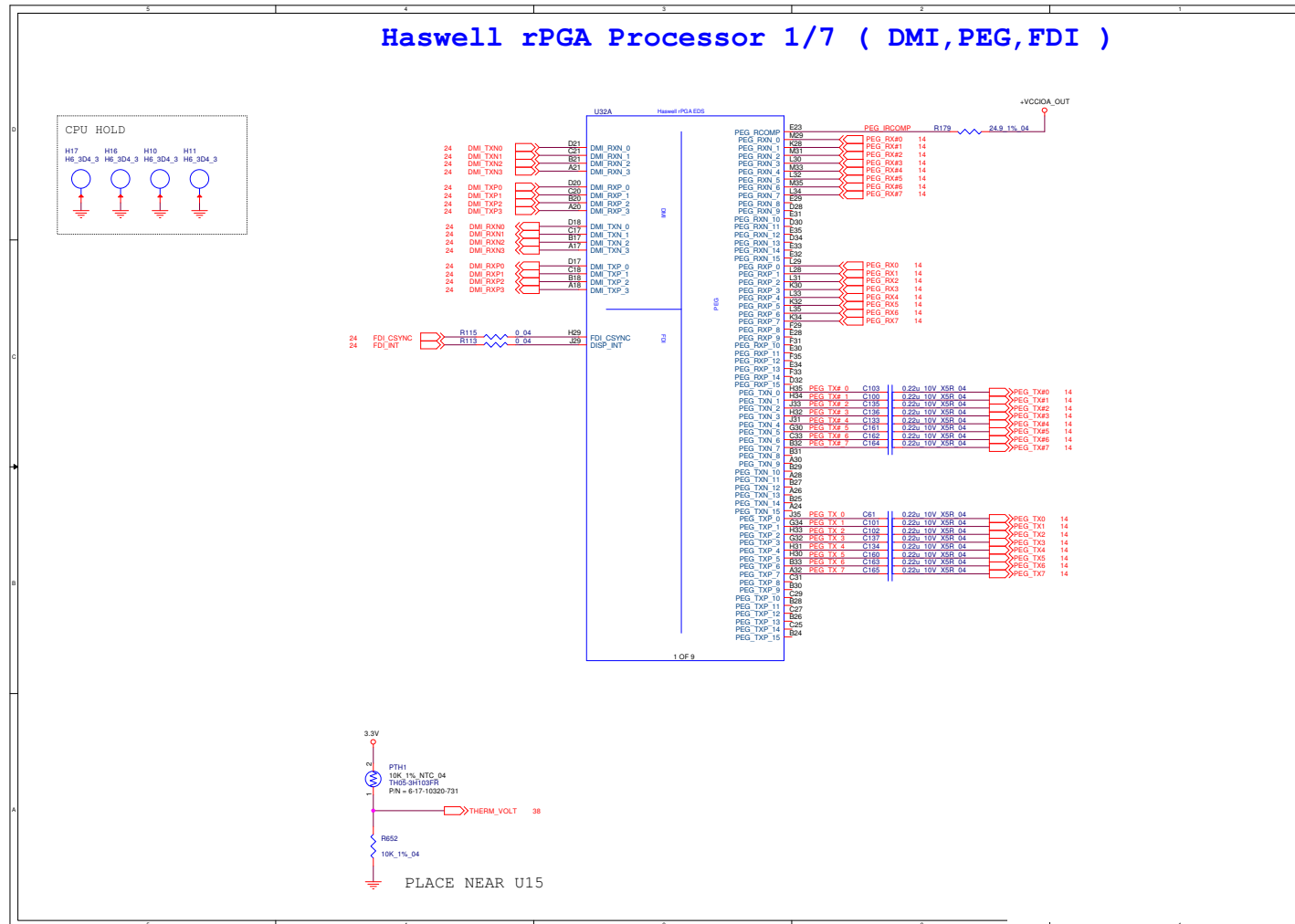
Version Note

The schematic diagrams in this chapter are based upon version 6-7P-W2304-003. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

Sheet 1 of 51
System Block
Diagram

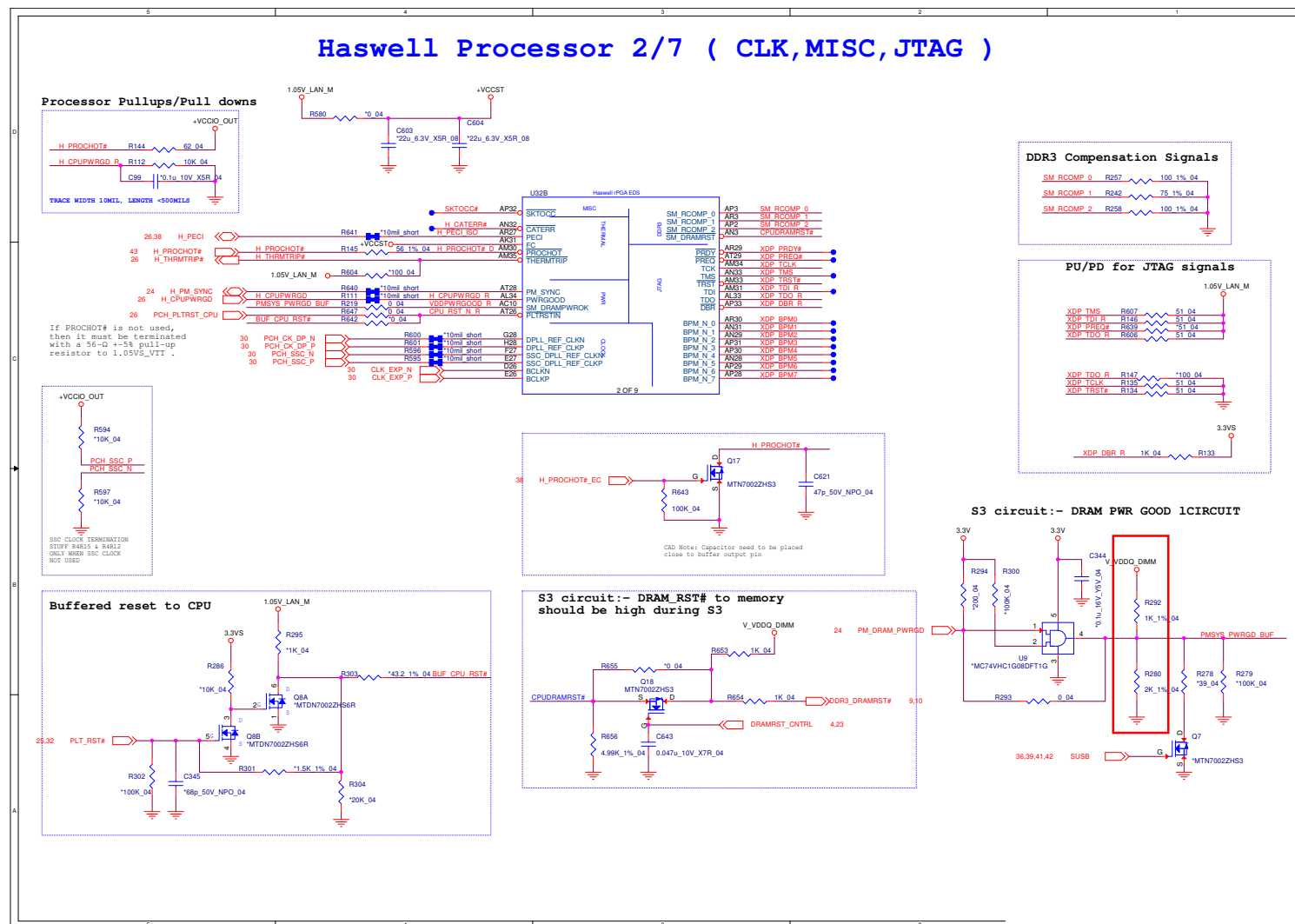


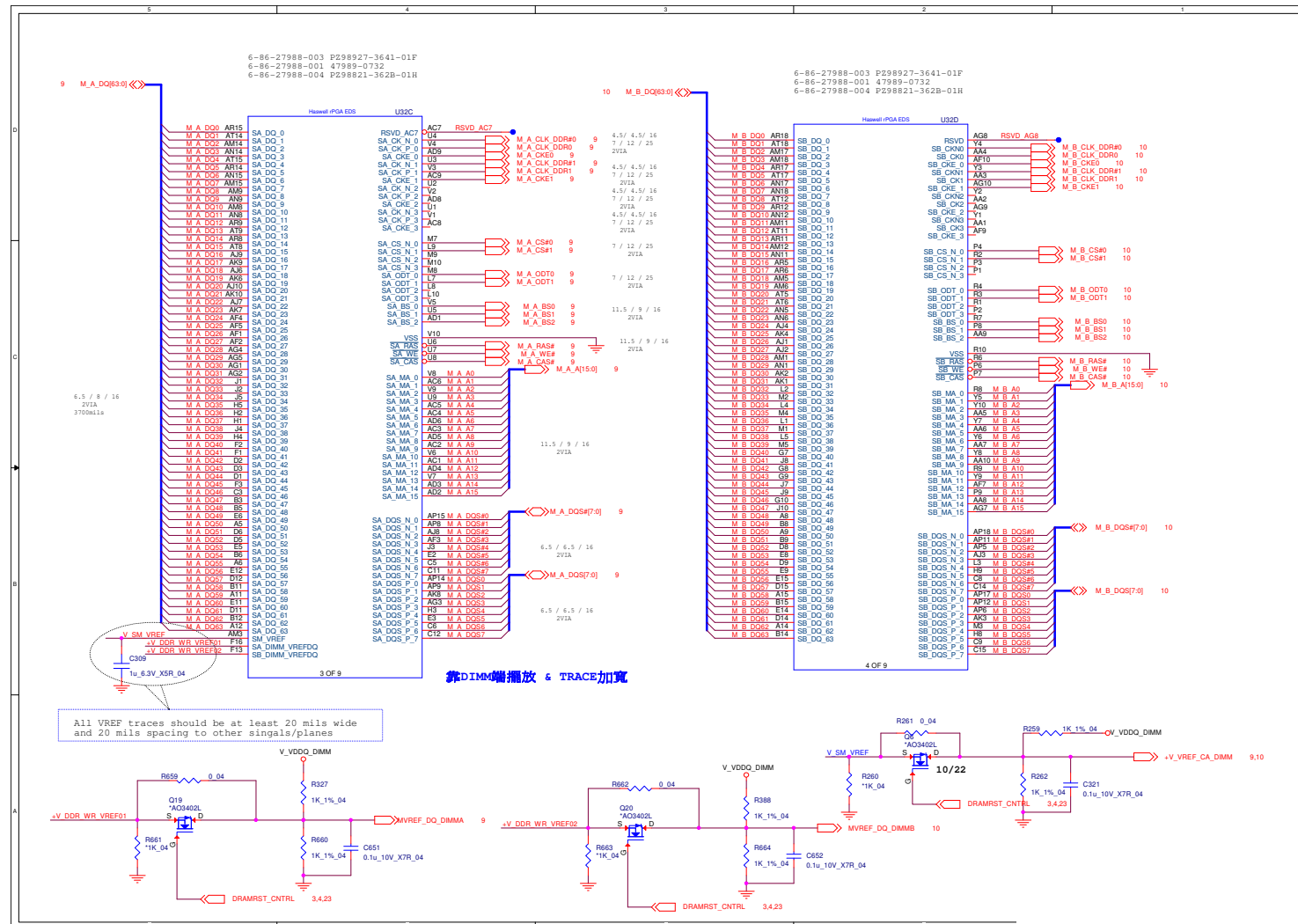
Haswell 1/7



Sheet 2 of 51
Haswell 1/7

B - 4 Haswell 2/7



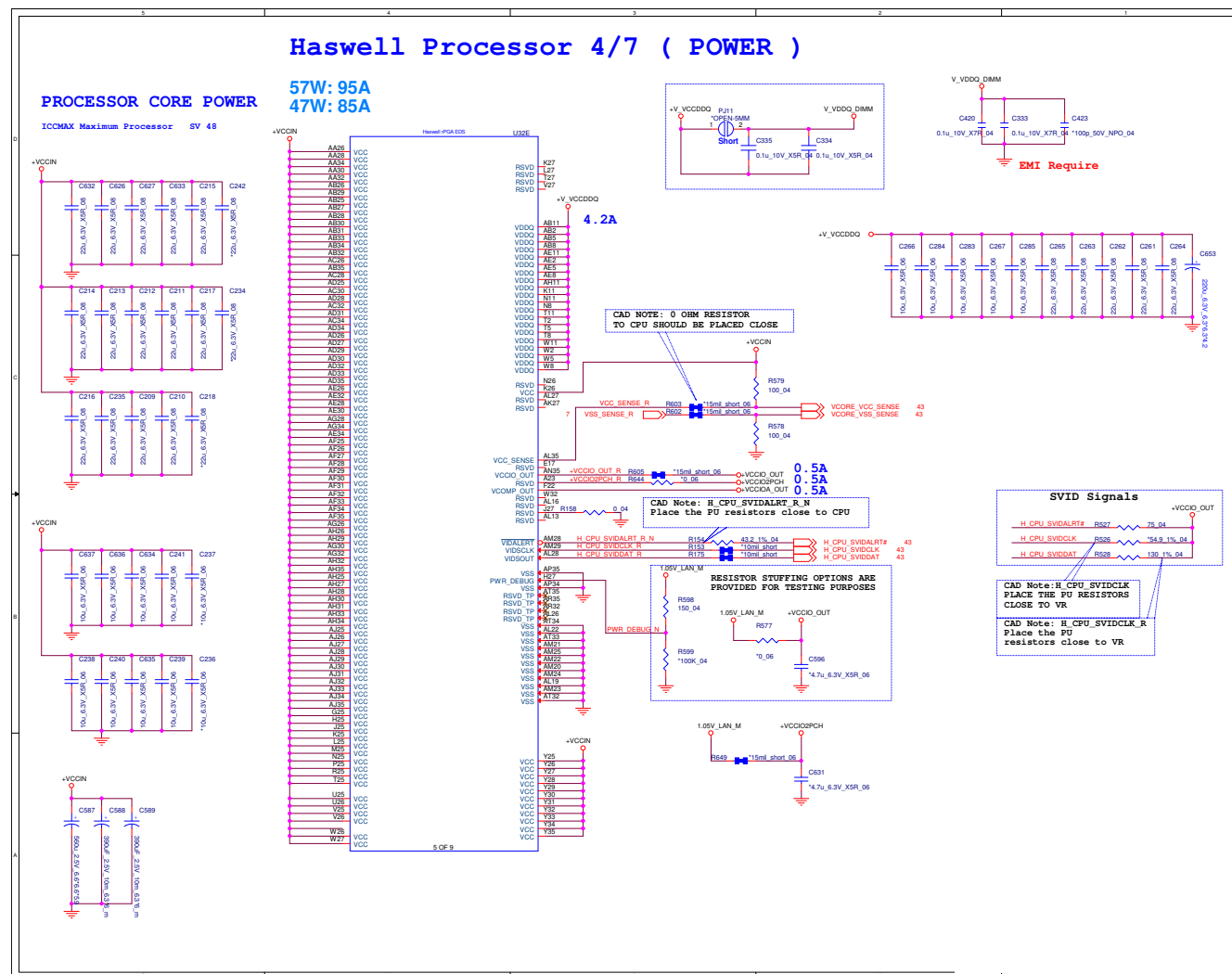


Sheet 4 of 51
Haswell 3/7

B.Schematic Diagrams

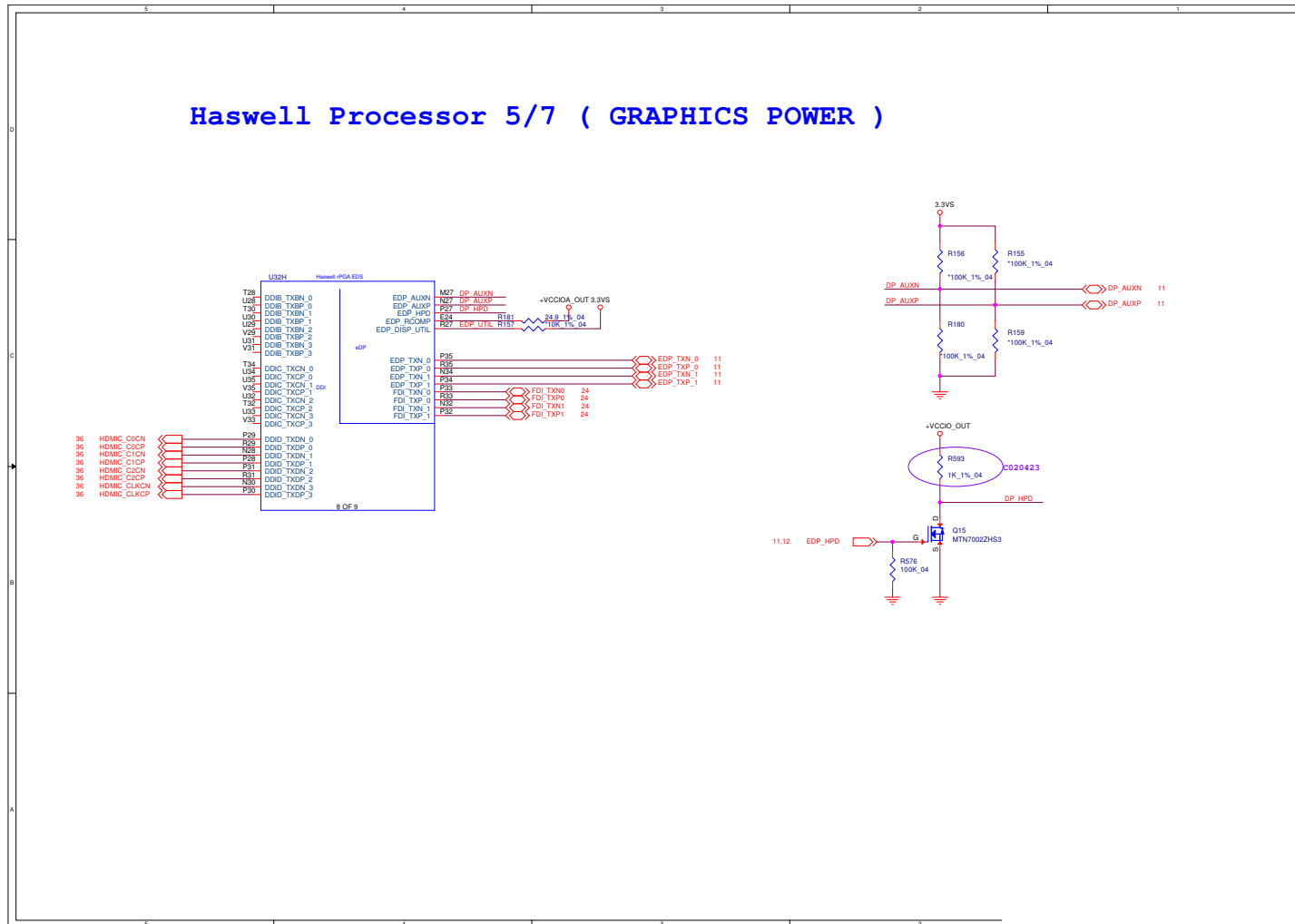
Haswell 4/7

Sheet 5 of 51
Haswell 4/7



Haswell 5/7

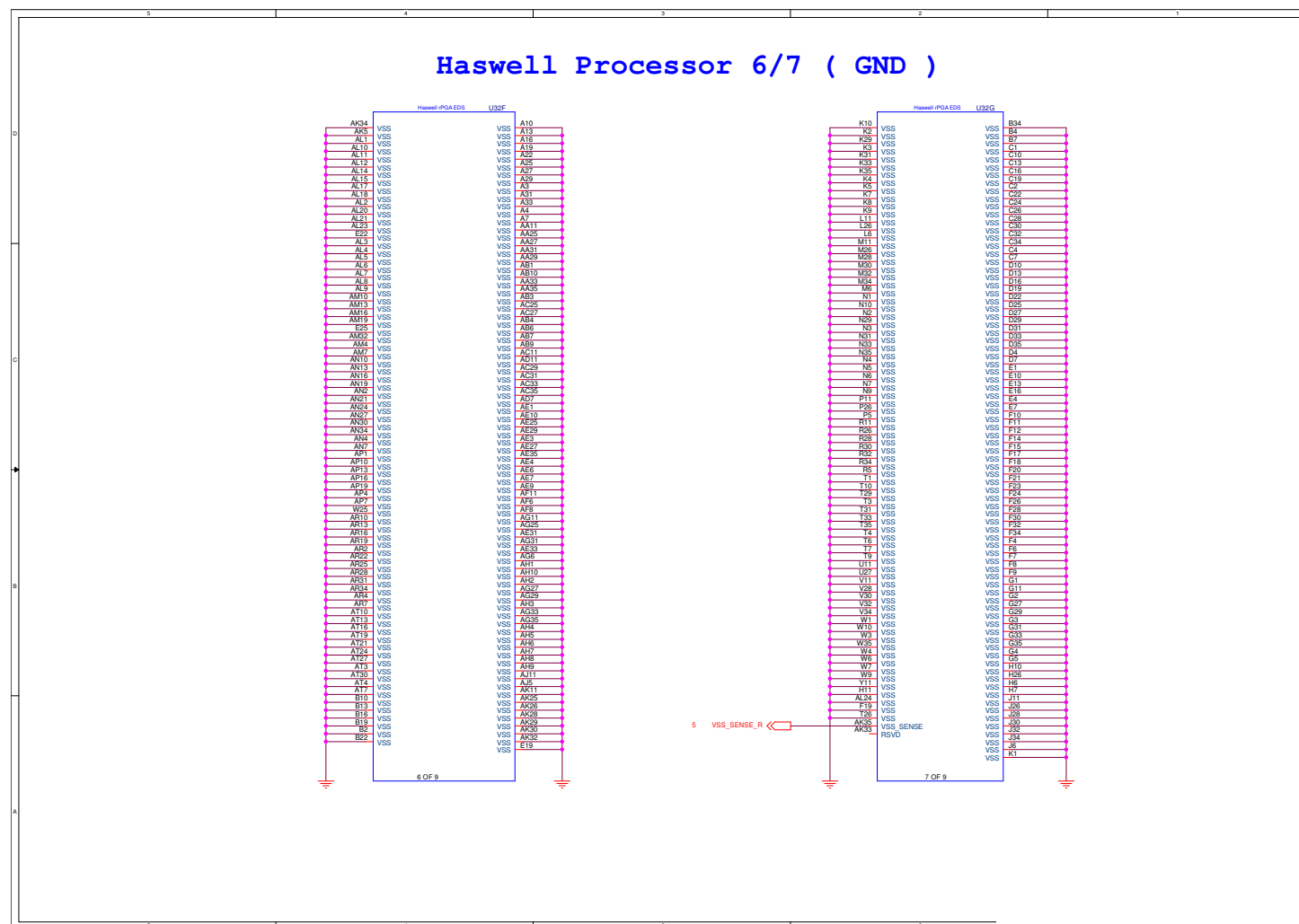
Sheet 6 of 51
Haswell 5/7



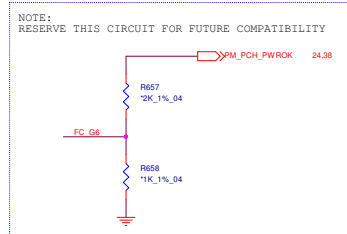
Haswell 6/7

B. Schematic Diagrams

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Haswell 6/7

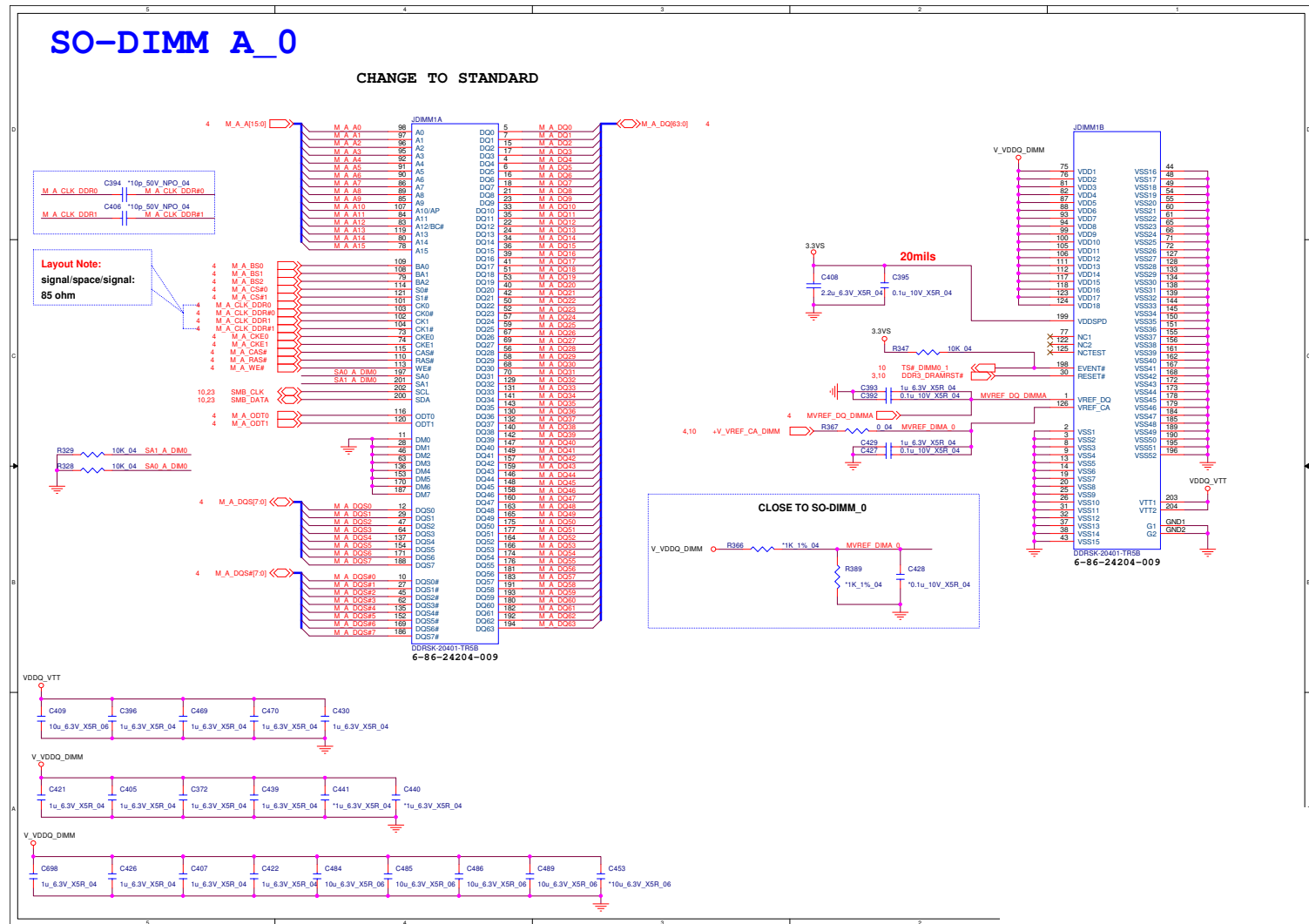


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Haswell 7/7



DDR3 SO-DIMM A_0

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DDR3 SO-DIMM
A_0



PS8625

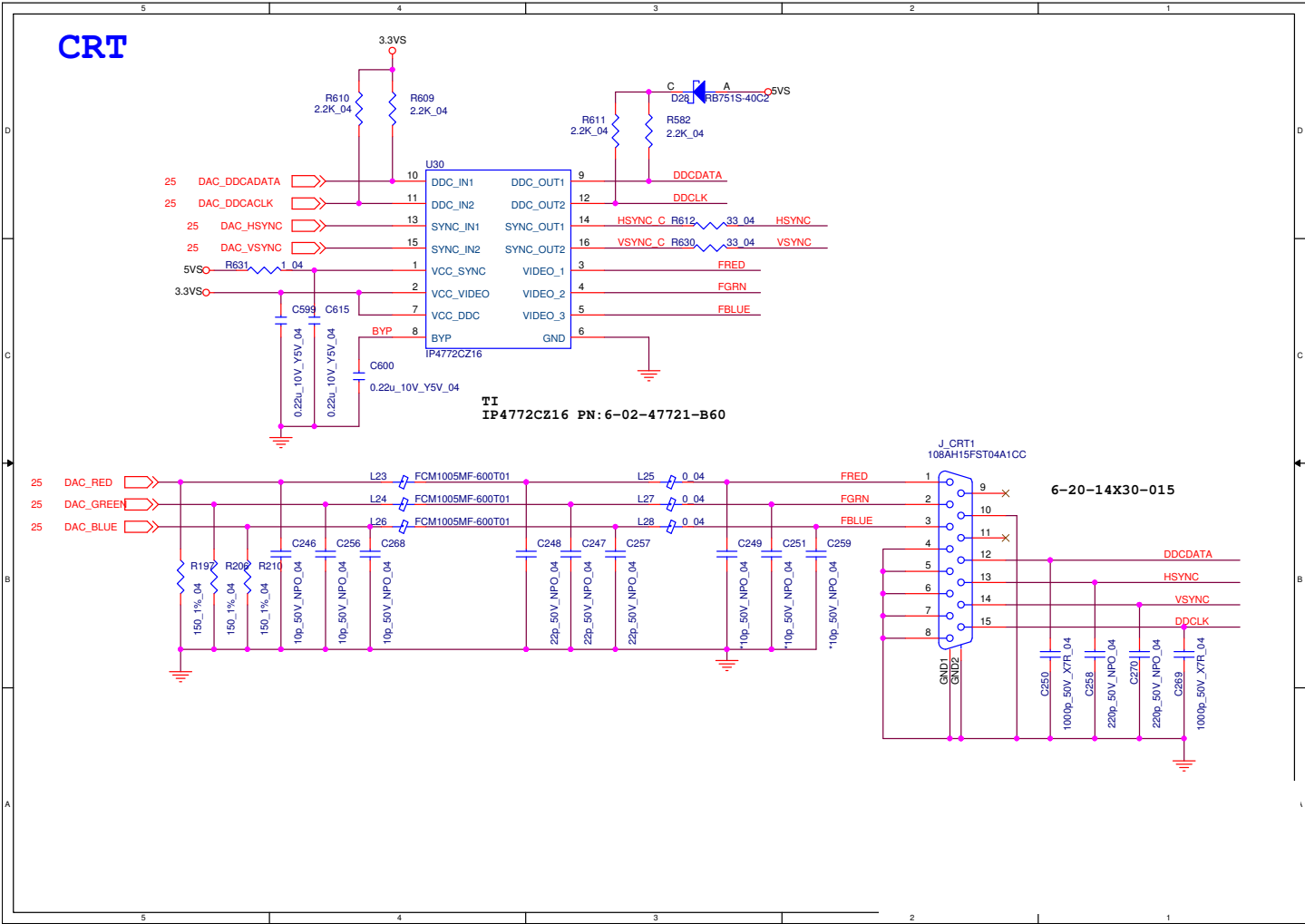
Sheet 11 of 51
PS8625



Schematic Diagrams

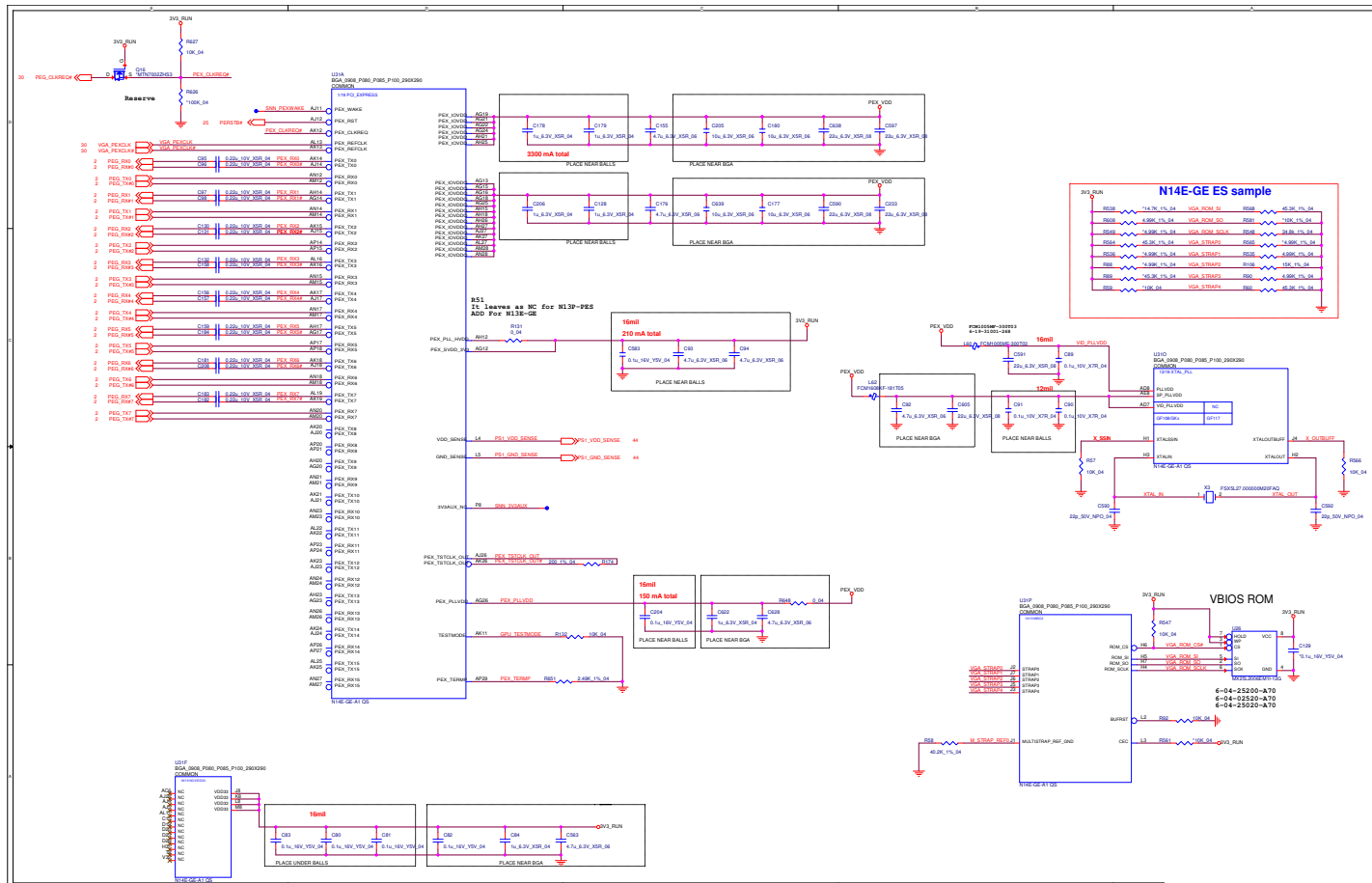
CRT

Sheet 13 of 51
CRT



VGA PCI-E Interface

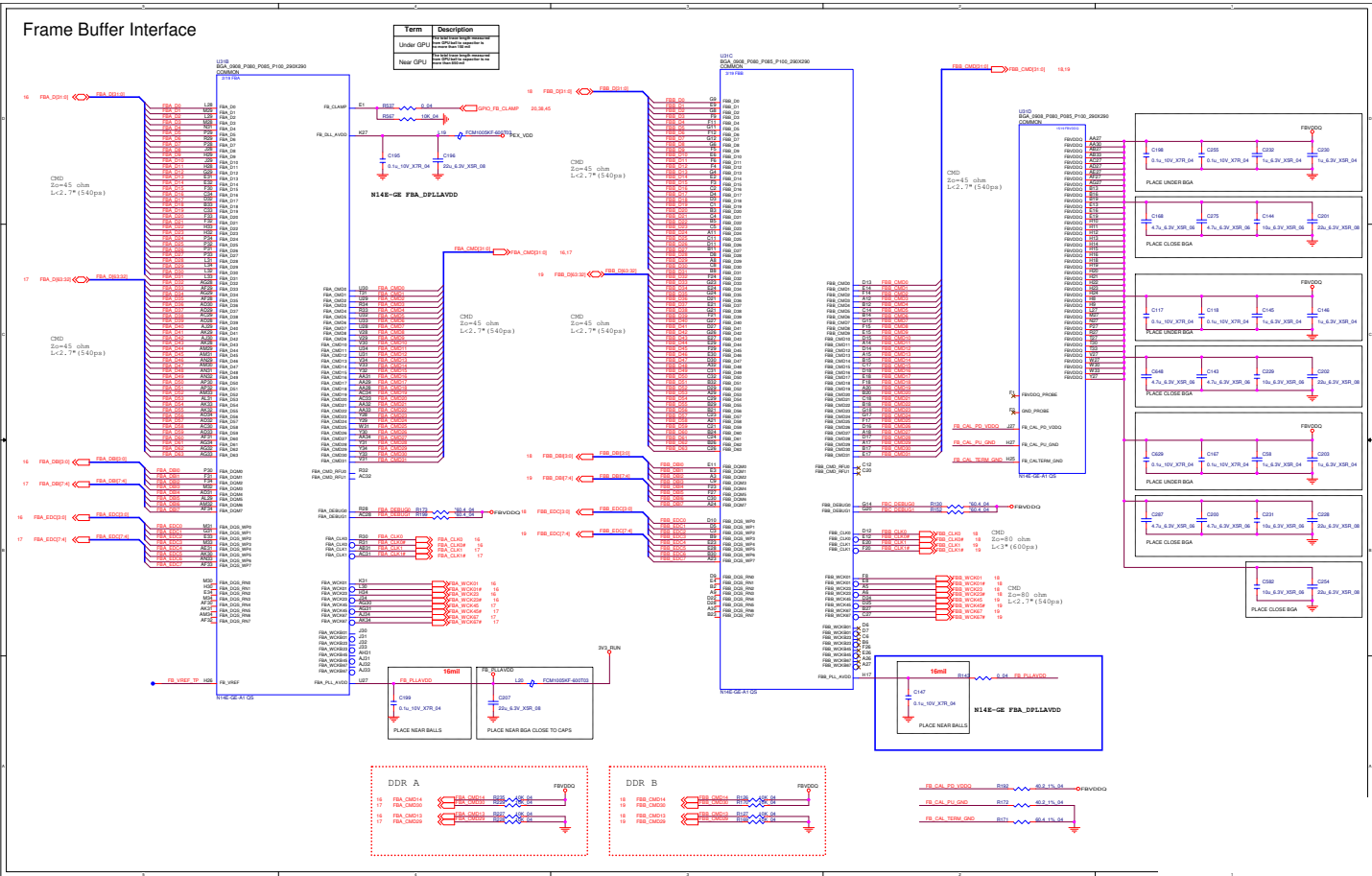
Sheet 14 of 51
VGA PCI-E
Interface



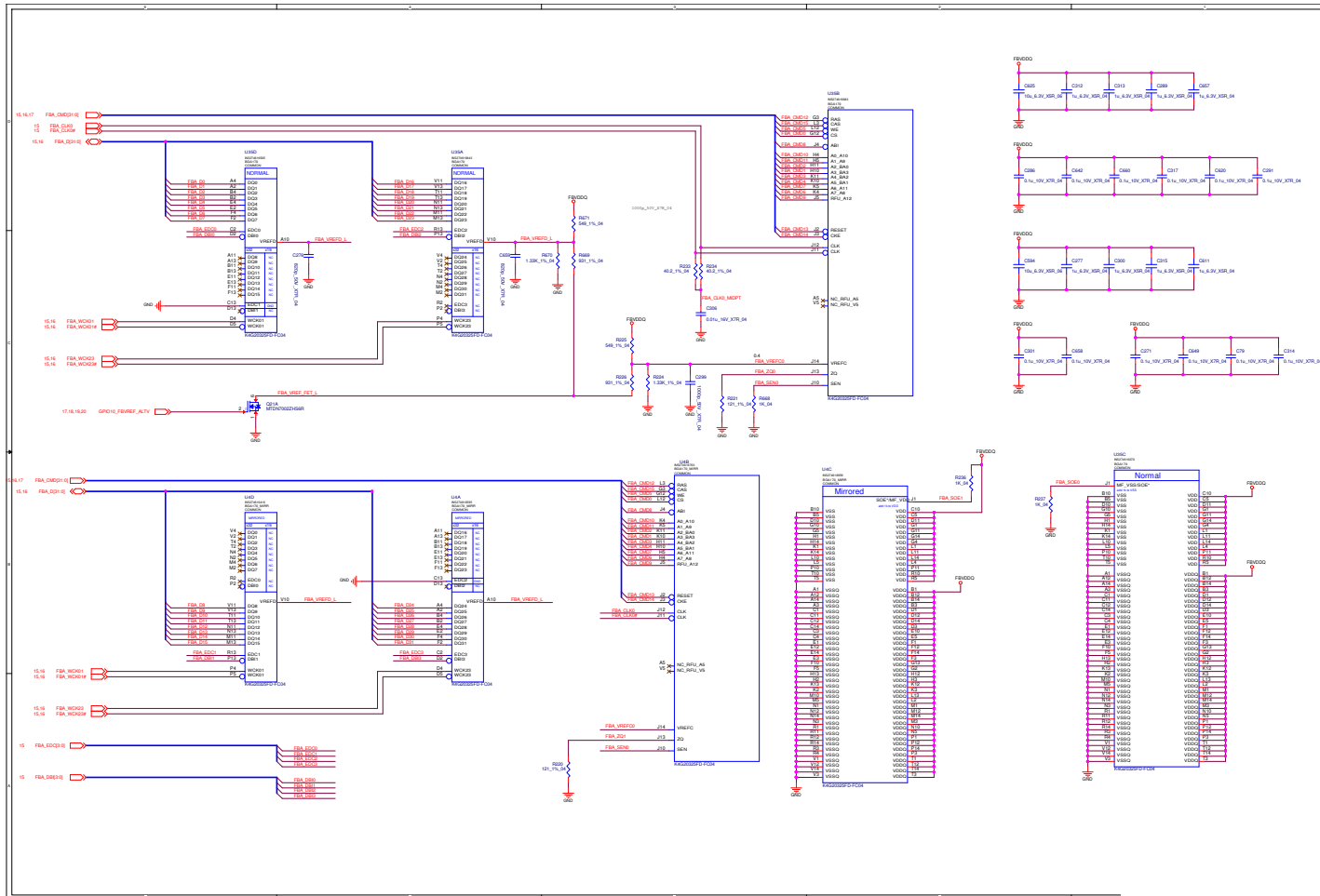
Schematic Diagrams

VGA Frame Buffer Interface

Sheet 15 of 51
VGA Frame Buffer Interface

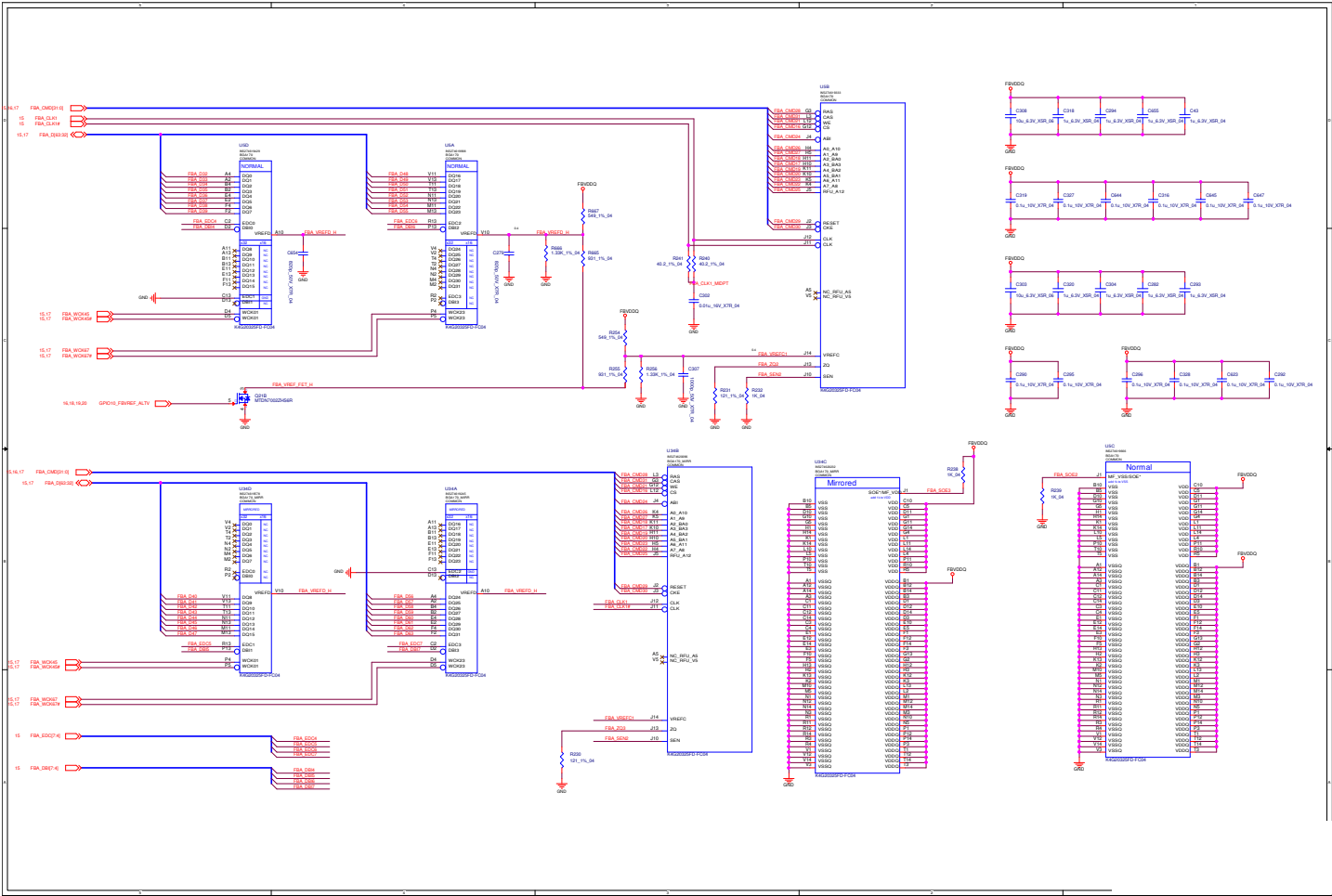


VGA Frame Buffer A



Sheet 16 of 51
VGA Frame Buffer
A

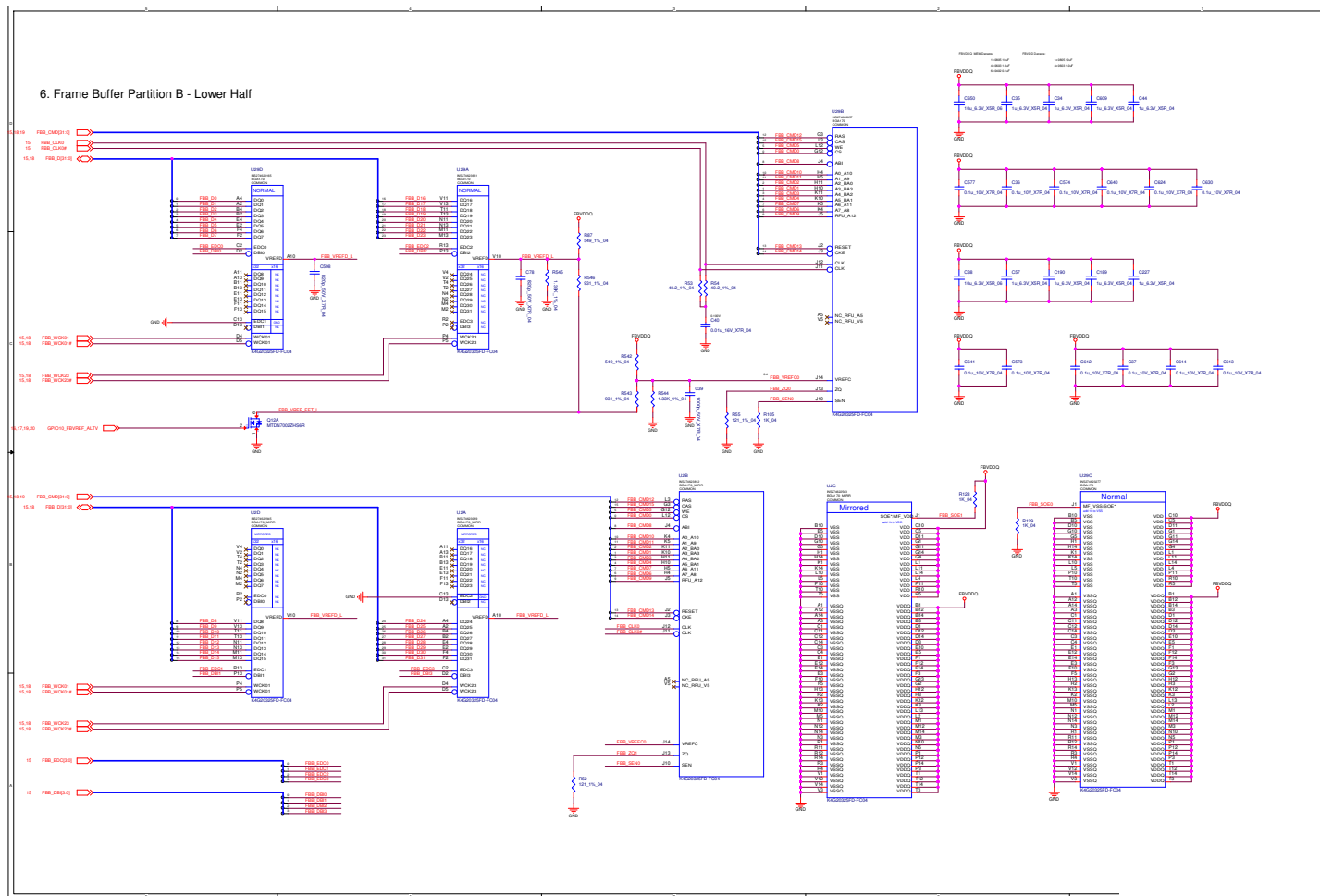
VGA Frame Buffer A



Sheet 17 of 51
VGA Frame Buffer
A

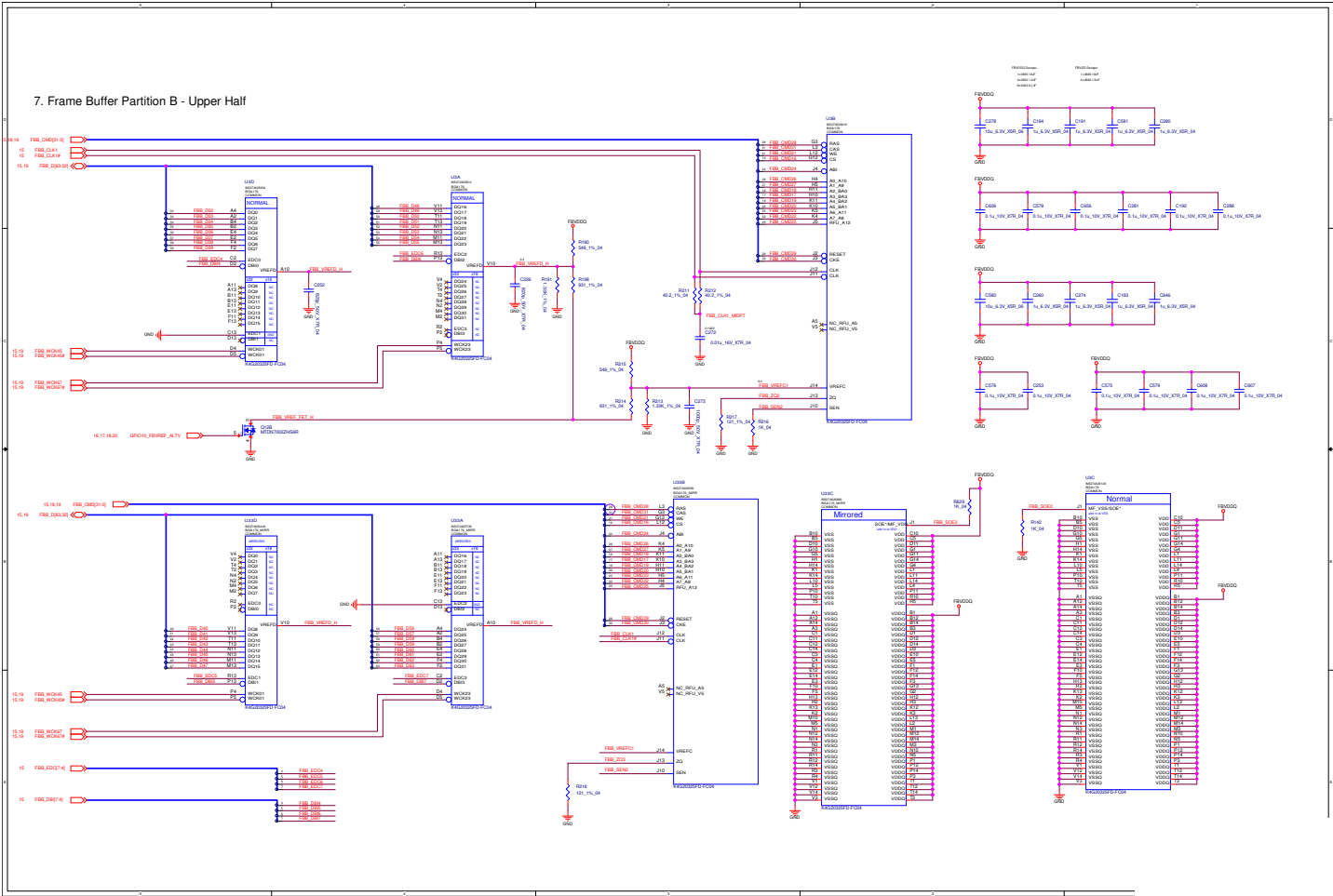
VGA Frame Buffer B

Sheet 18 of 51
VGA Frame Buffer
B

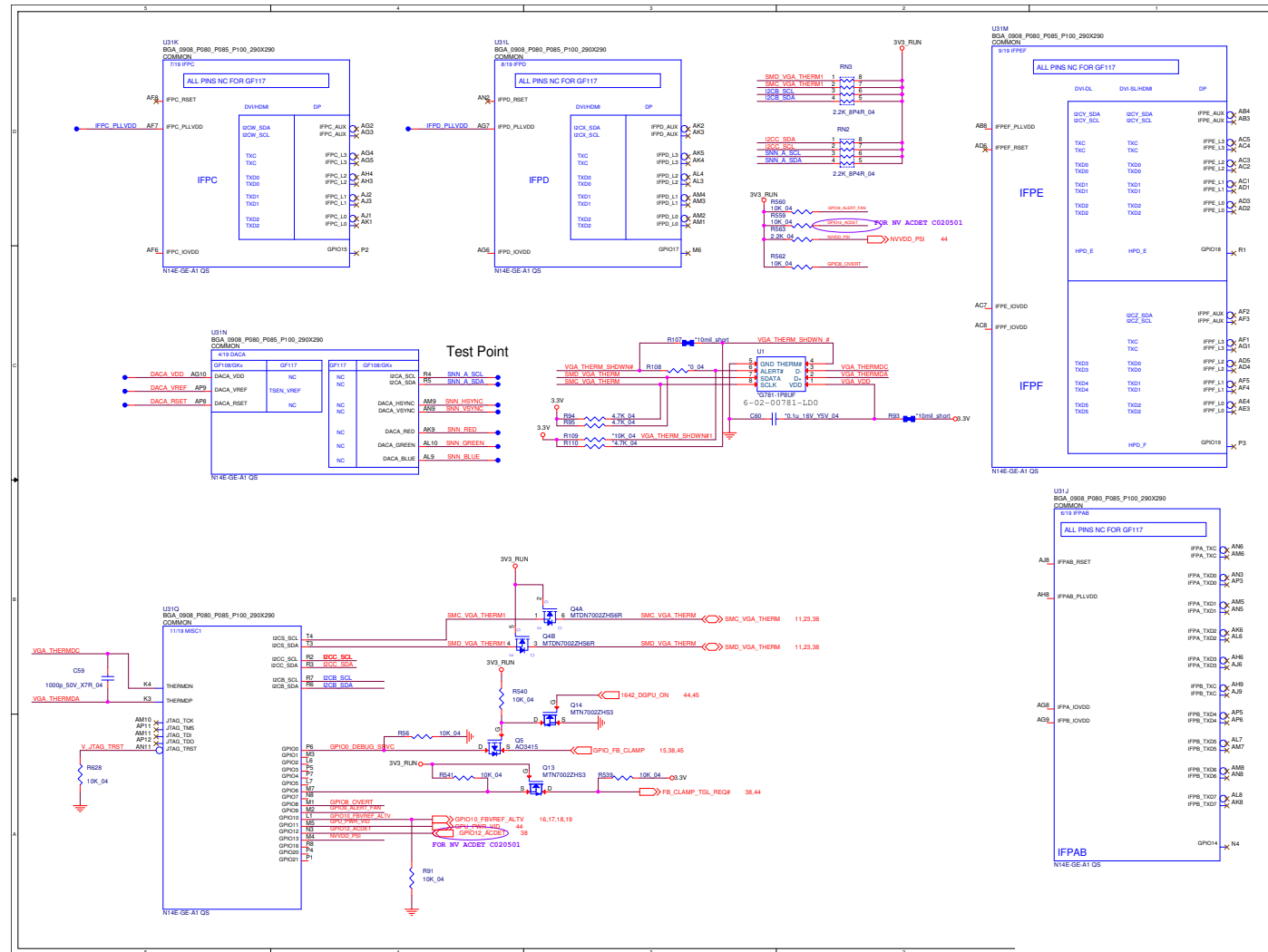


VGA Frame Buffer B

Sheet 19 of 51
VGA Frame Buffer
B



VGA I/O

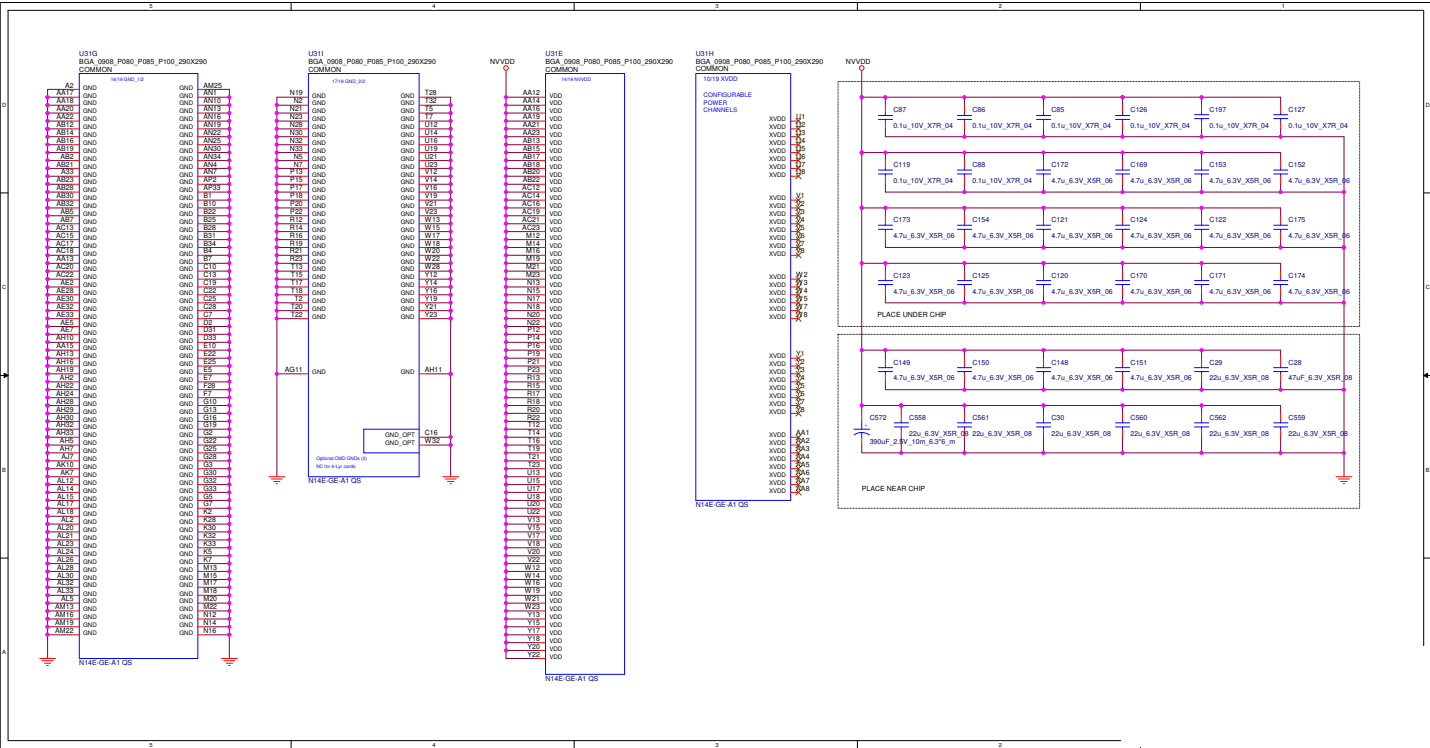


Sheet 20 of 51
VGA I/O

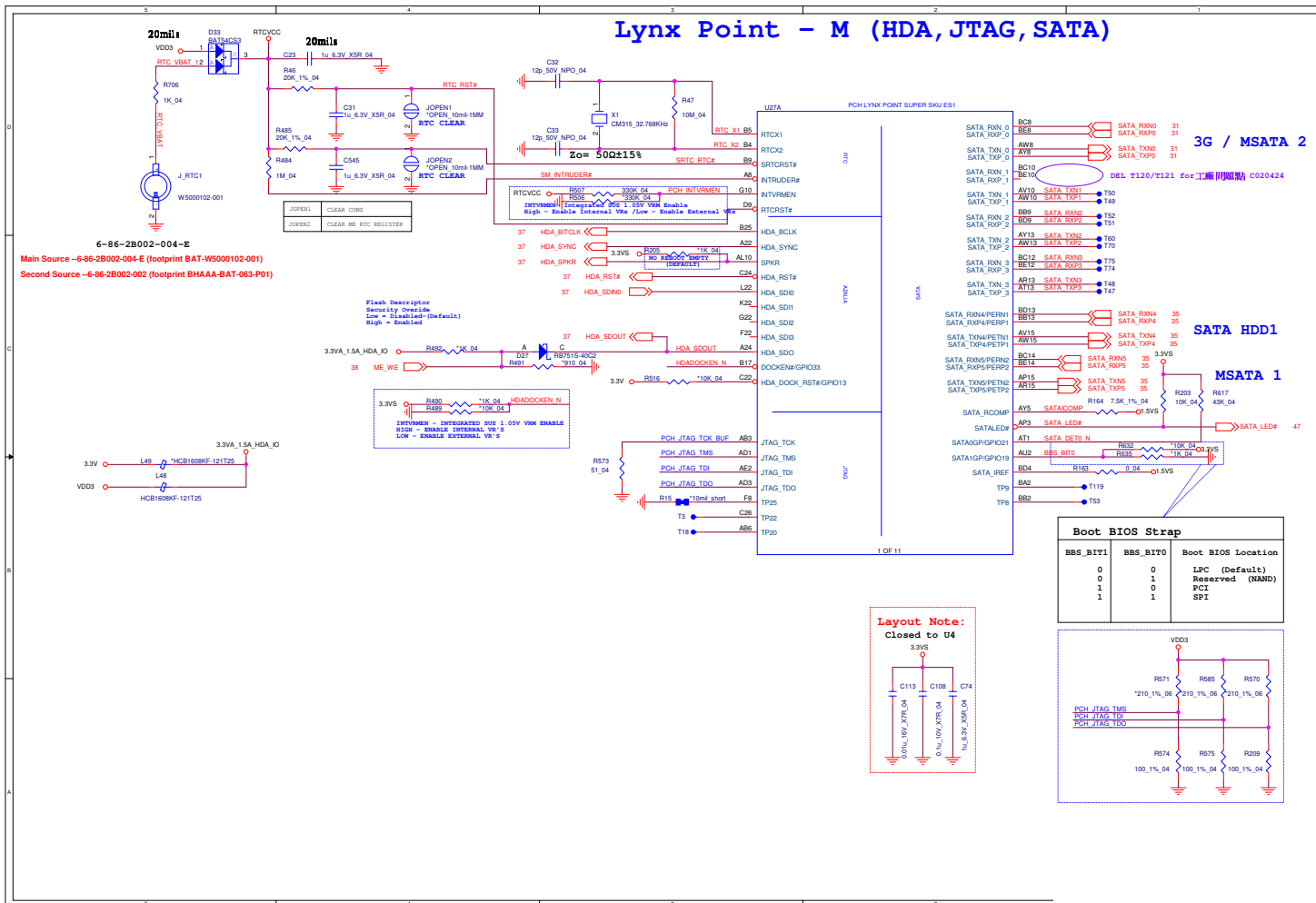
Schematic Diagrams

VGA NVDD Decoupling

Sheet 21 of 51
VGA NVDD
Decoupling

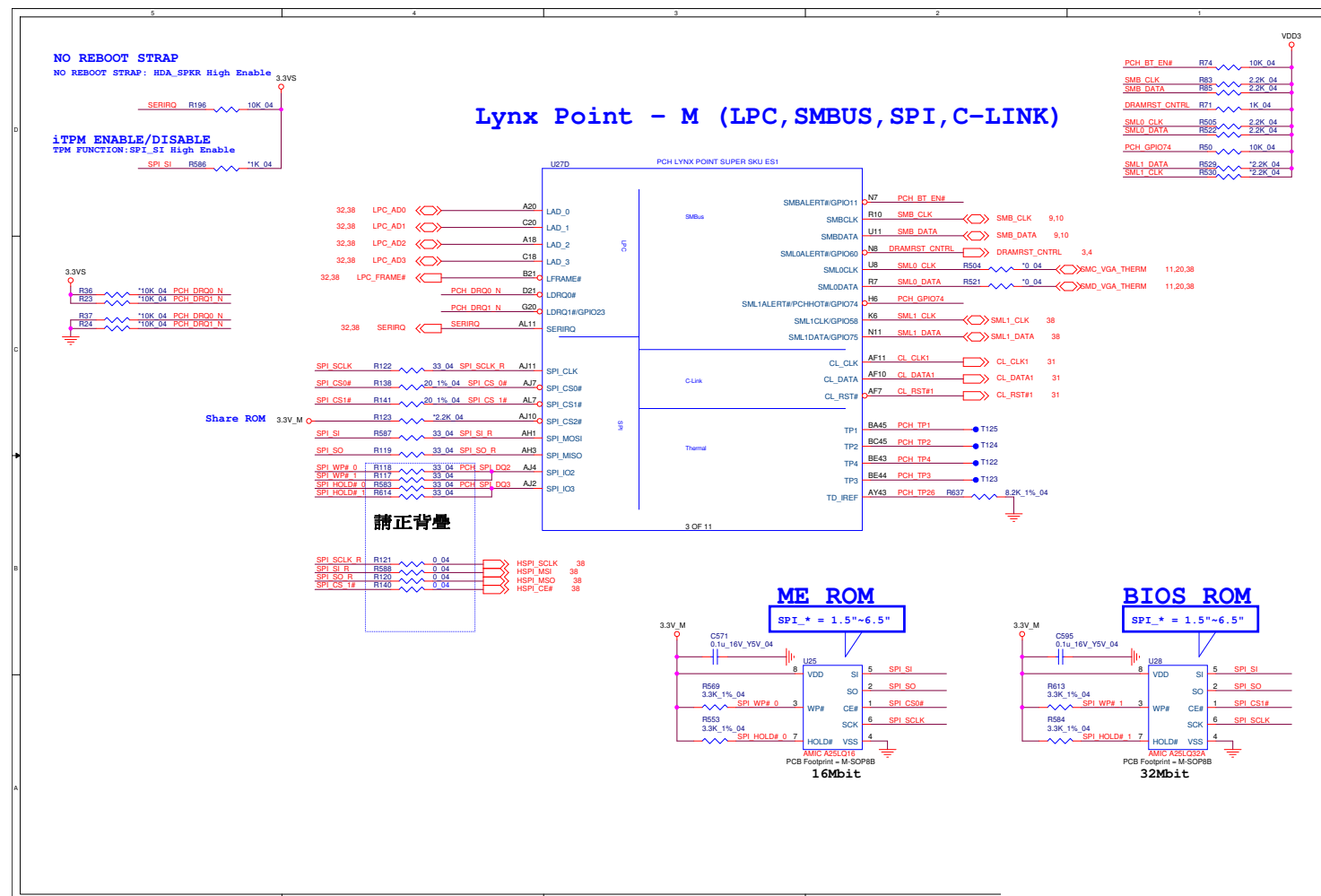


Lynx 1/9

Sheet 22 of 51
Lynx 1/9

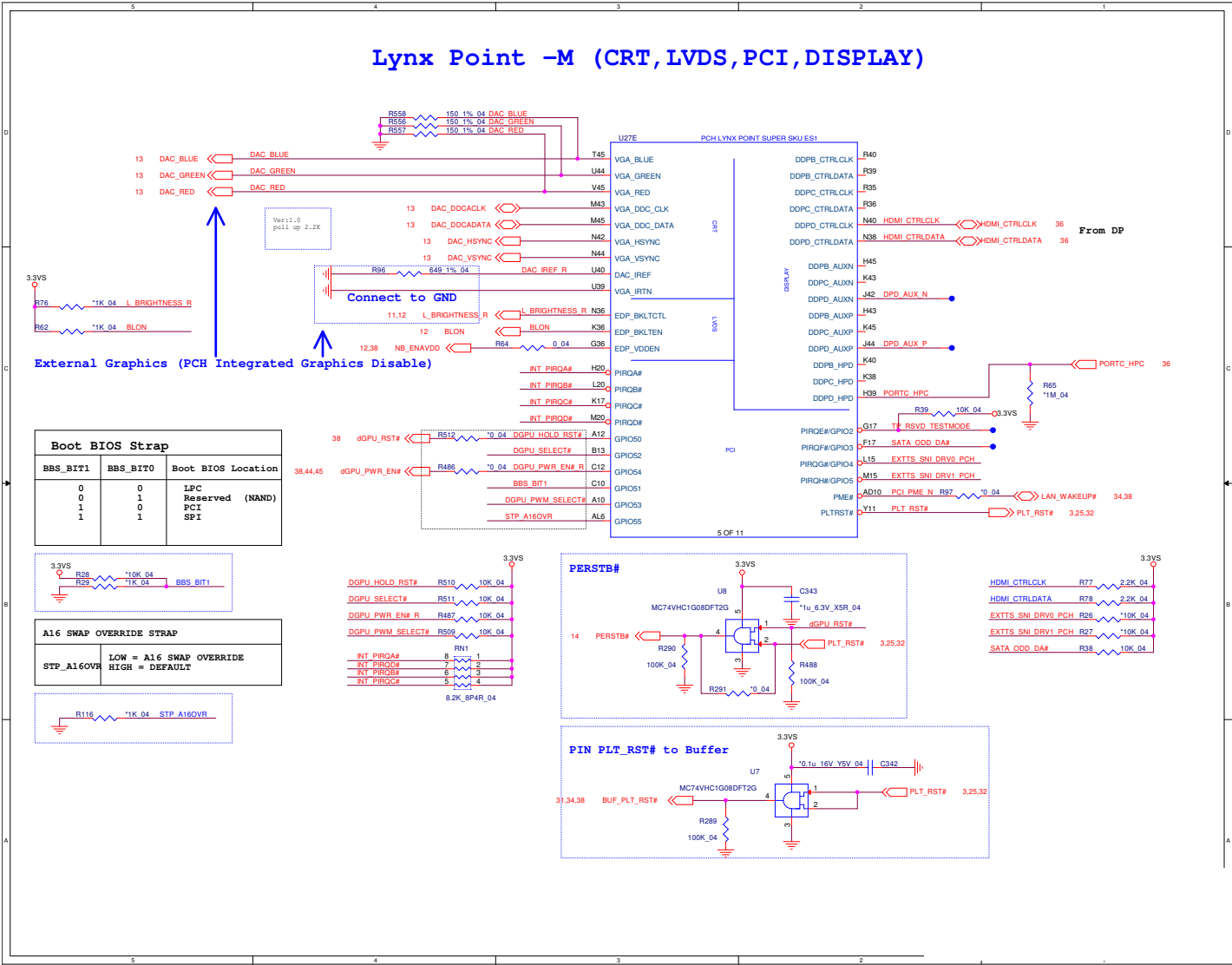
Lynx 2/9

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Lynx 2/9

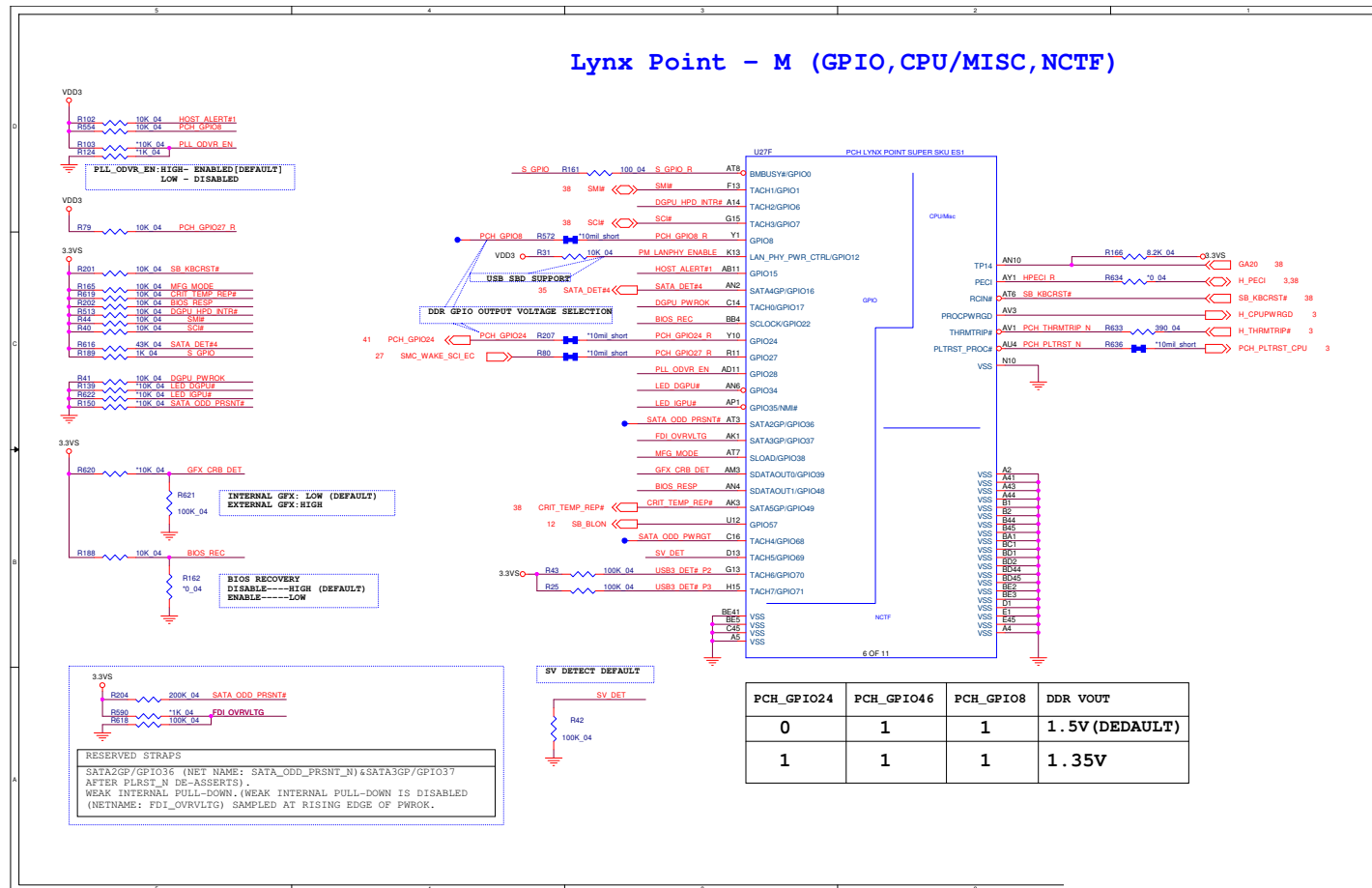


Lynx 4/9

Sheet 25 of 51
Lynx 4/9

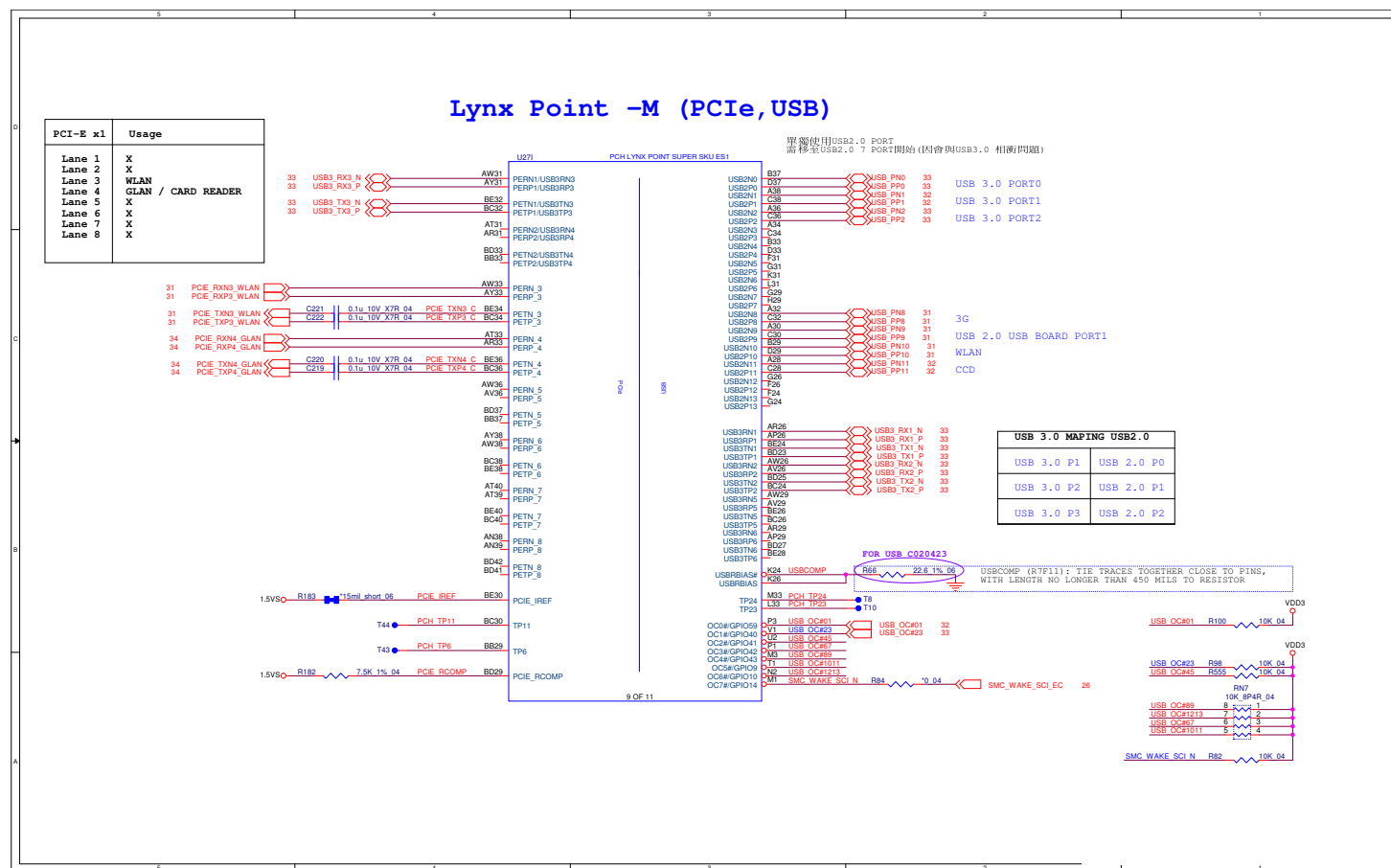


Lynx 5/9

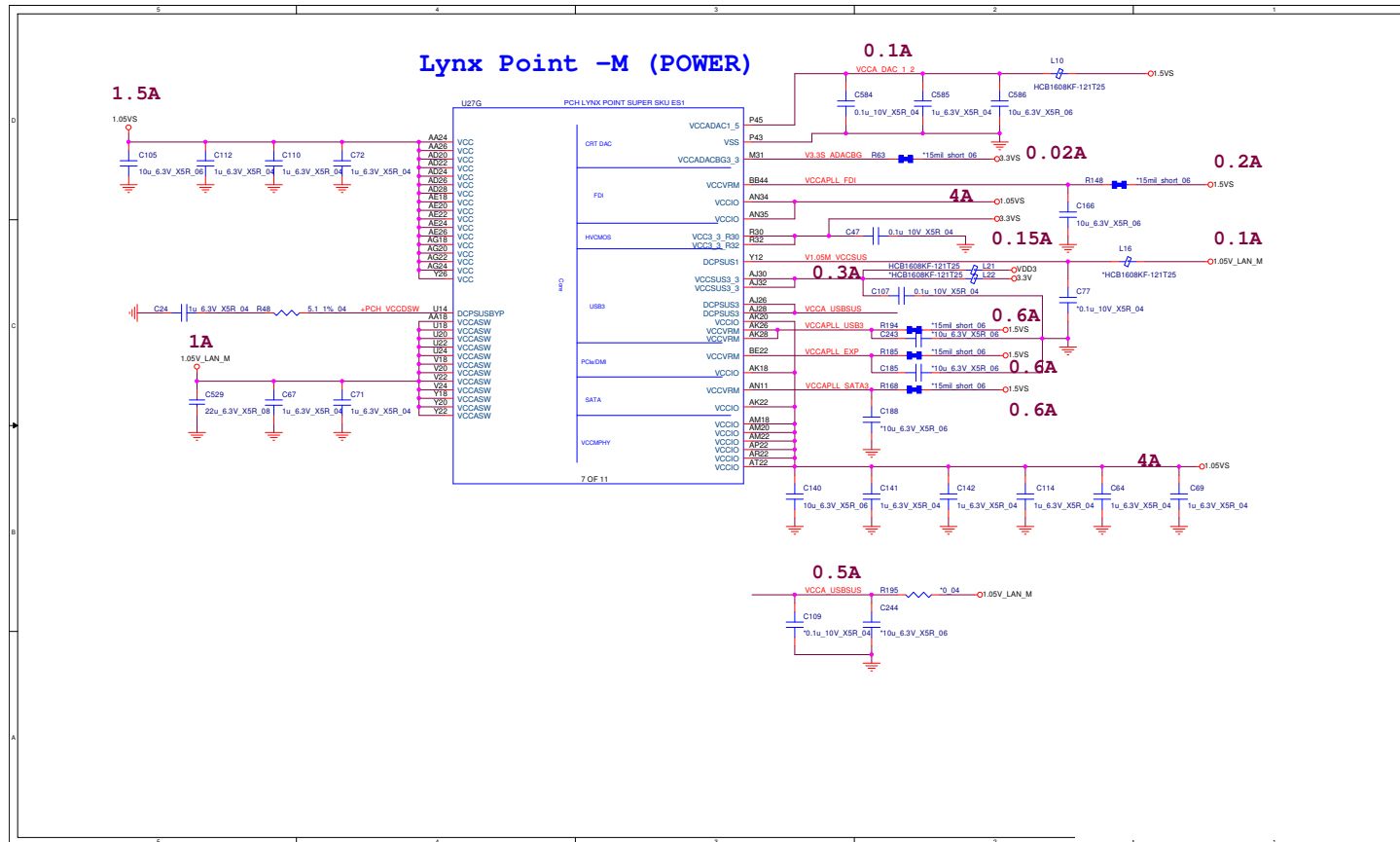
Sheet 26 of 51
Lynx 5/9

Lynx 6/9

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Lynx 6/9

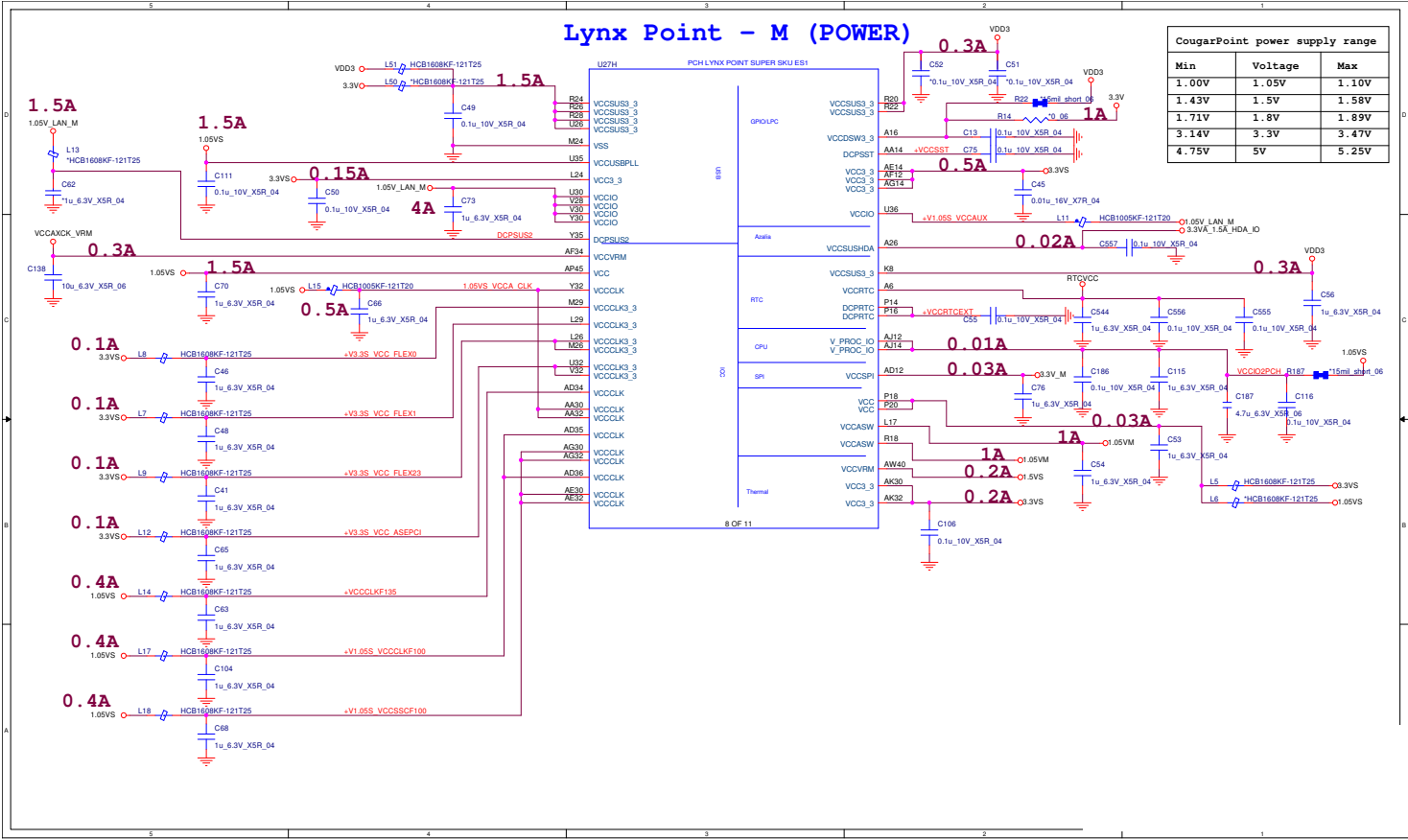


Lynx 7/9



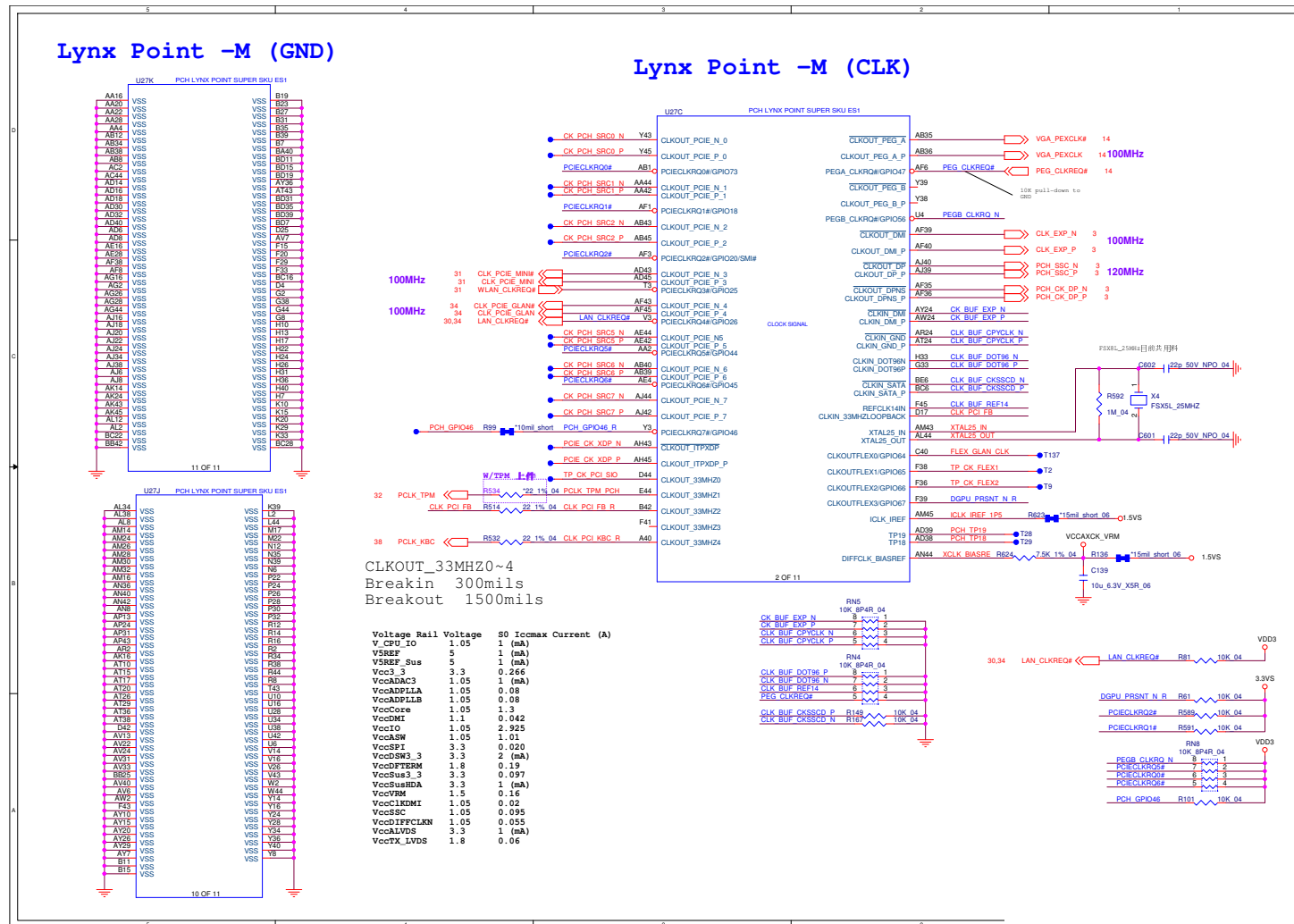
Sheet 28 of 51
Lynx 7/9

Lynx 8/9



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Lynx 8/9

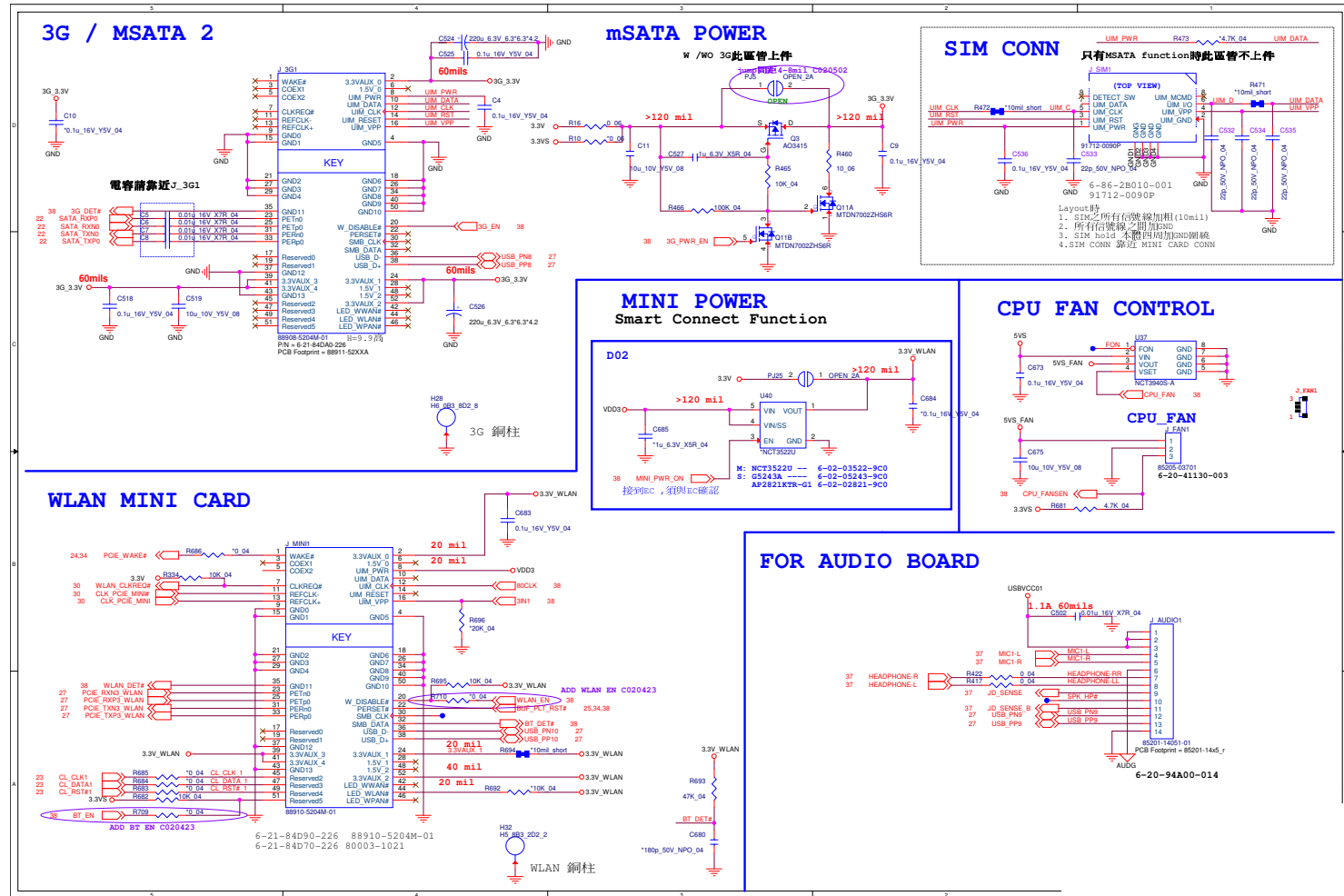
Lynx 9/9

Sheet 30 of 51
Lynx 9/9

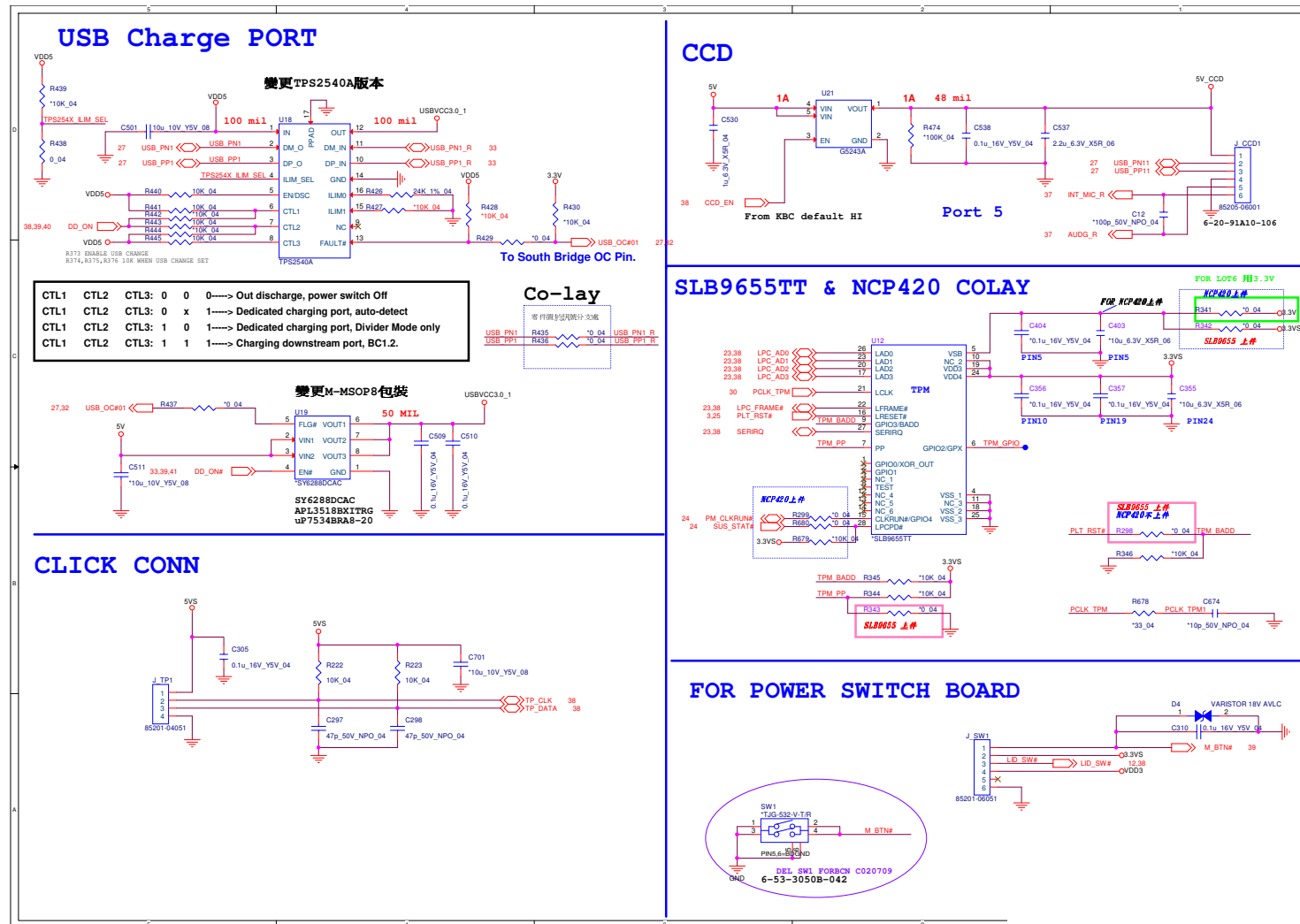
Schematic Diagrams

Mini PCIE, 3G, Fan, Audio Con

Sheet 31 of 51
Mini PCIE, 3G, FAN,
Audio Con



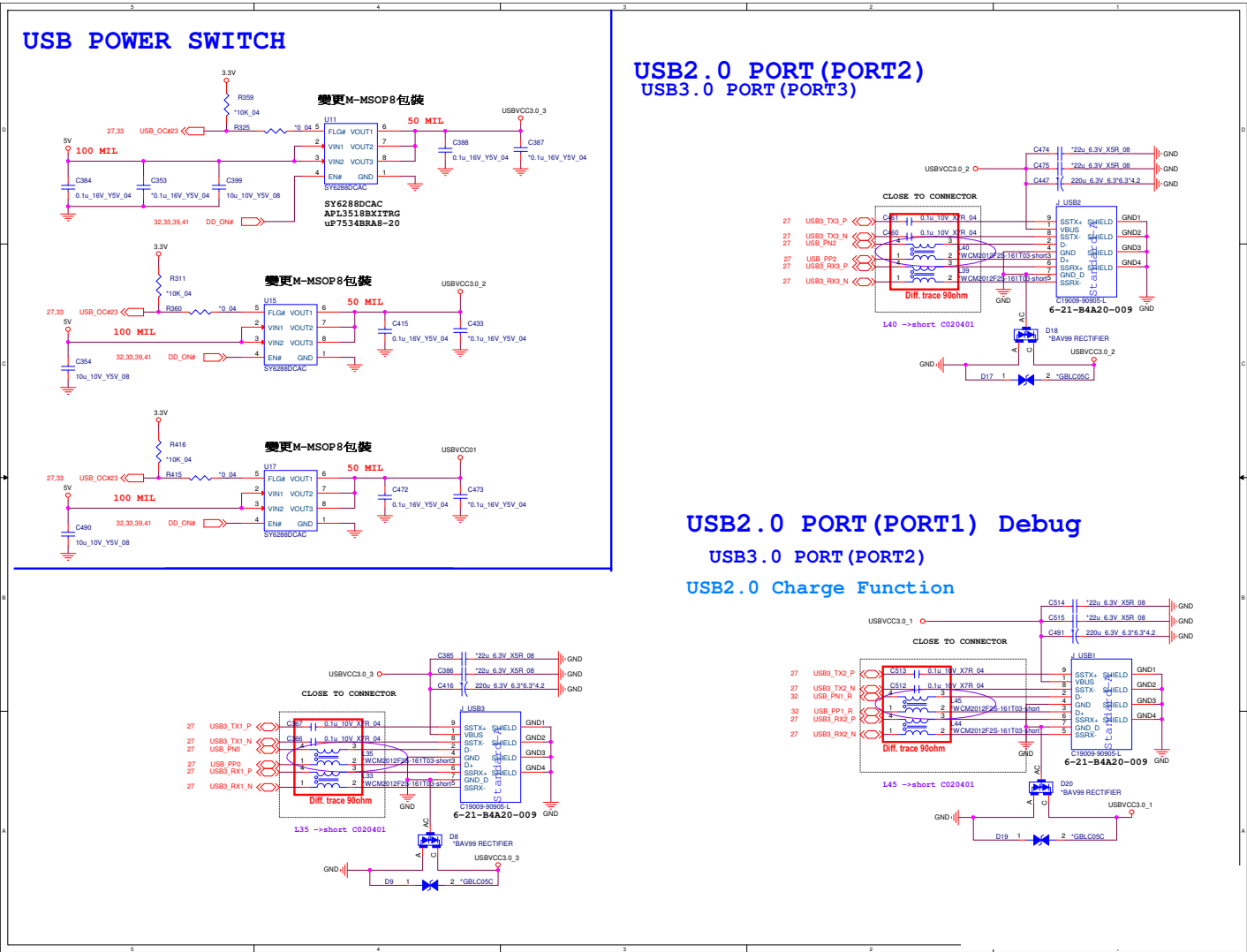
USB Charge, CCD, TPM, Multi-Con



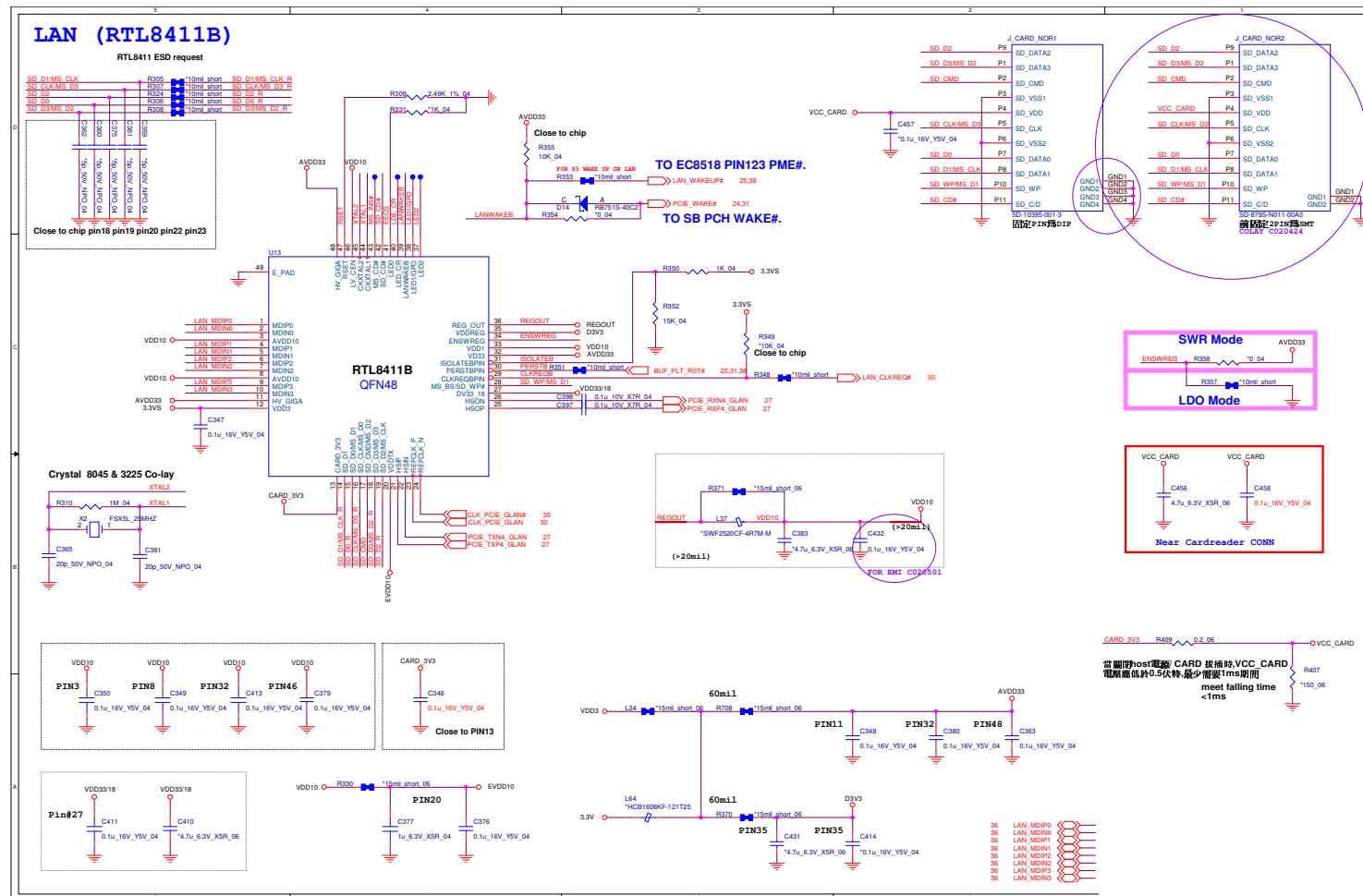
Sheet 32 of 51
USB Charge, CCD,
TPM, Multi-Con

USB3.0 Connector

Sheet 33 of 51
USB3.0 Connector



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Card Reader /
LAN RTL8411B



GIGA LAN (RTL8411)

LAN POART

HDMI LEVEL SHIFT

HDMI CONNECTOR

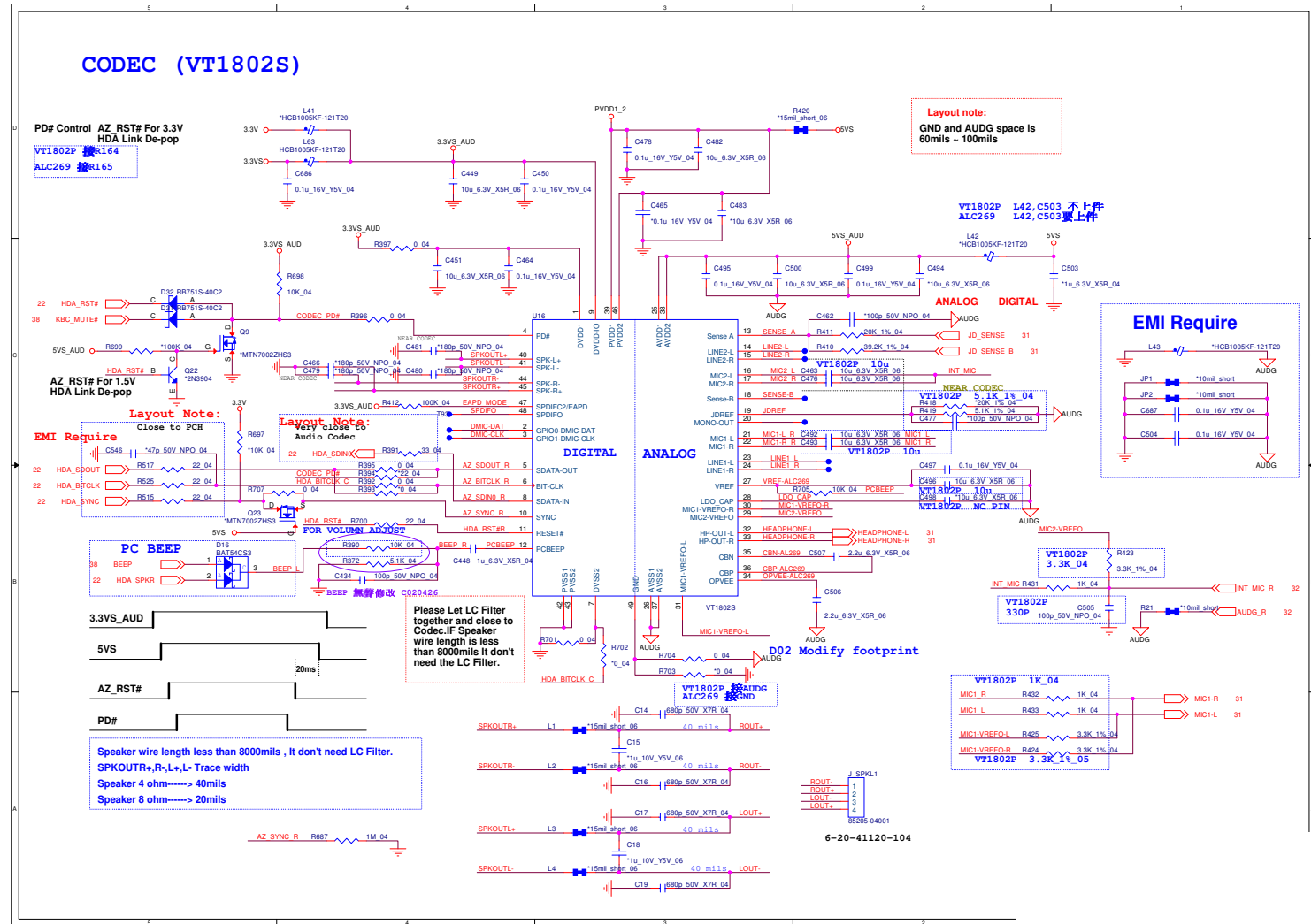
無level shief時D5,D6,D7要上件

For ESD

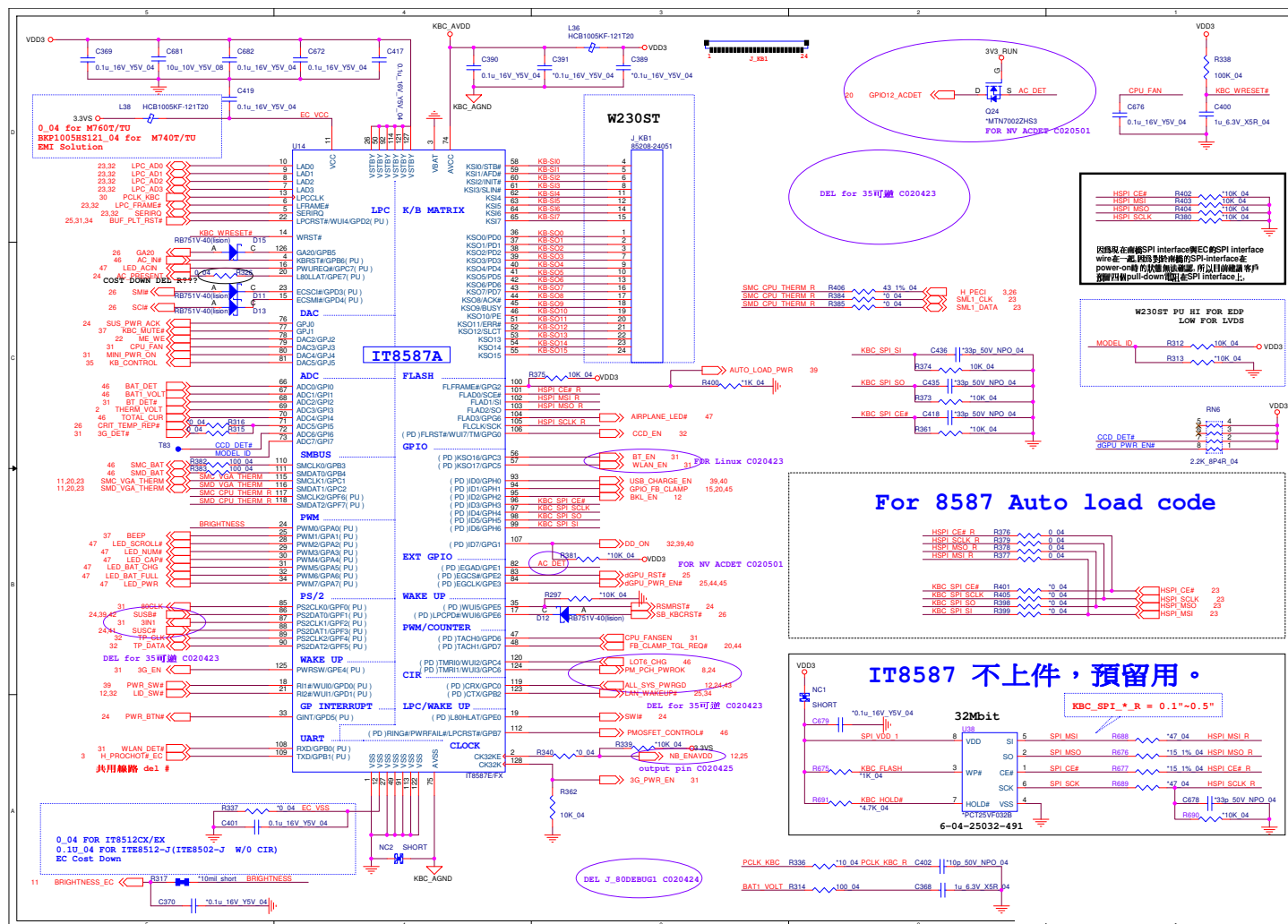
PN 6N01-4-GND 6-21-14200-019

Audio Codec VT1802S

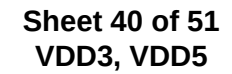
Sheet 37 of 51
Audio Codec
VT1802S



B.Schematic Diagrams



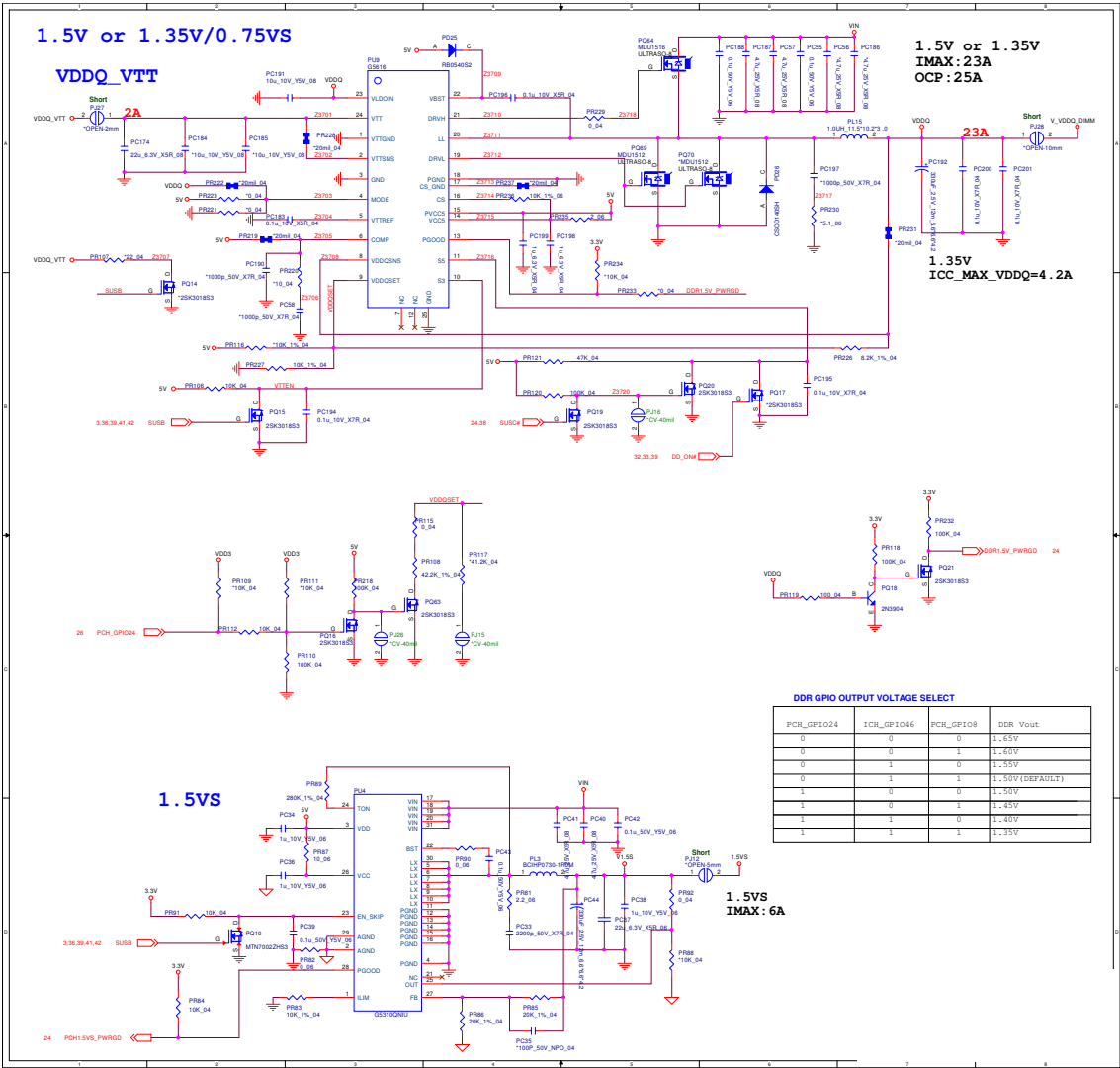
VDD3, VDD5 B - 41



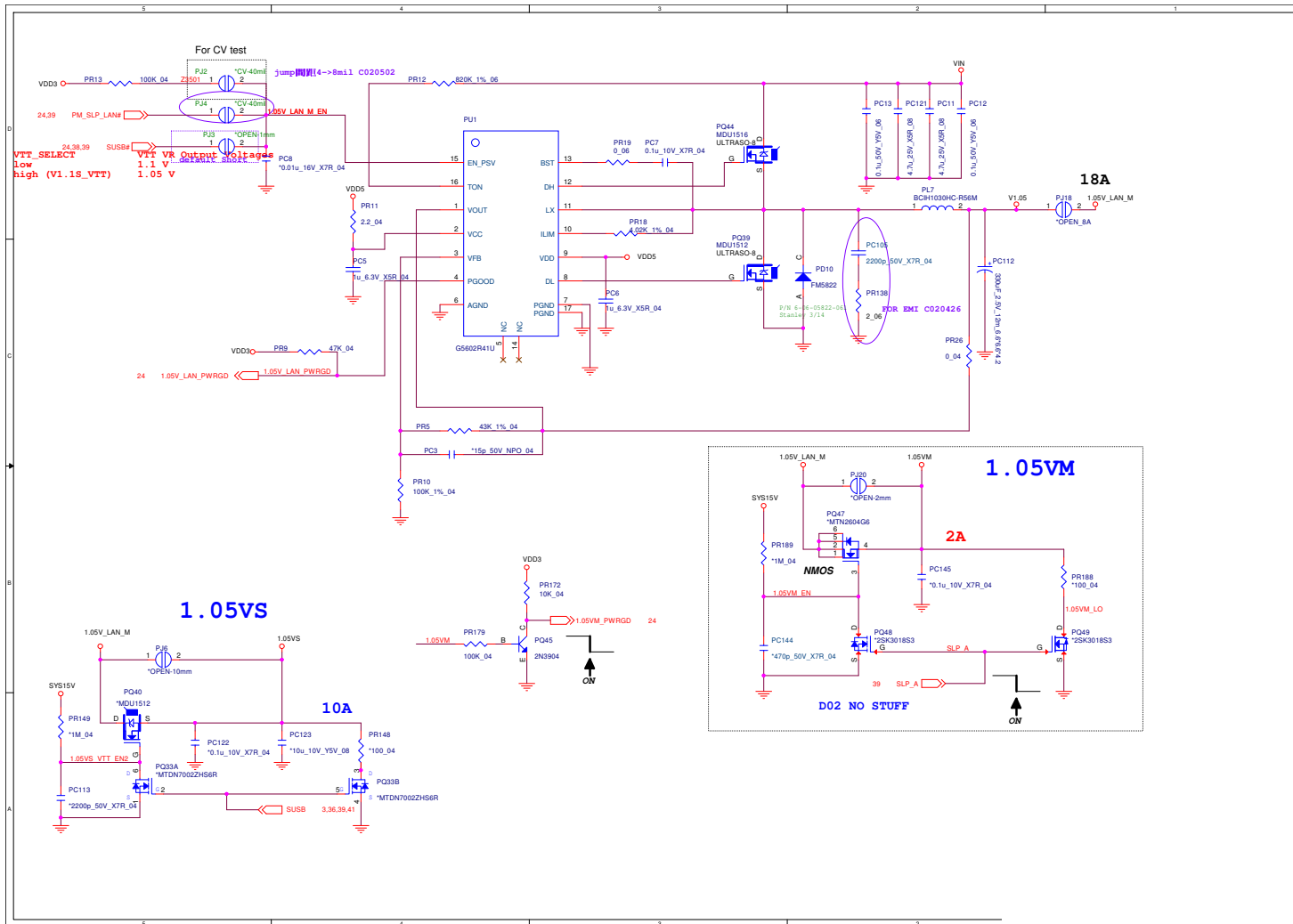
Schematic Diagrams

1.5V or 1.35V, 0.75VS, 1.5VS

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1.5V or 1.35V,
0.75VS, 1.5VS

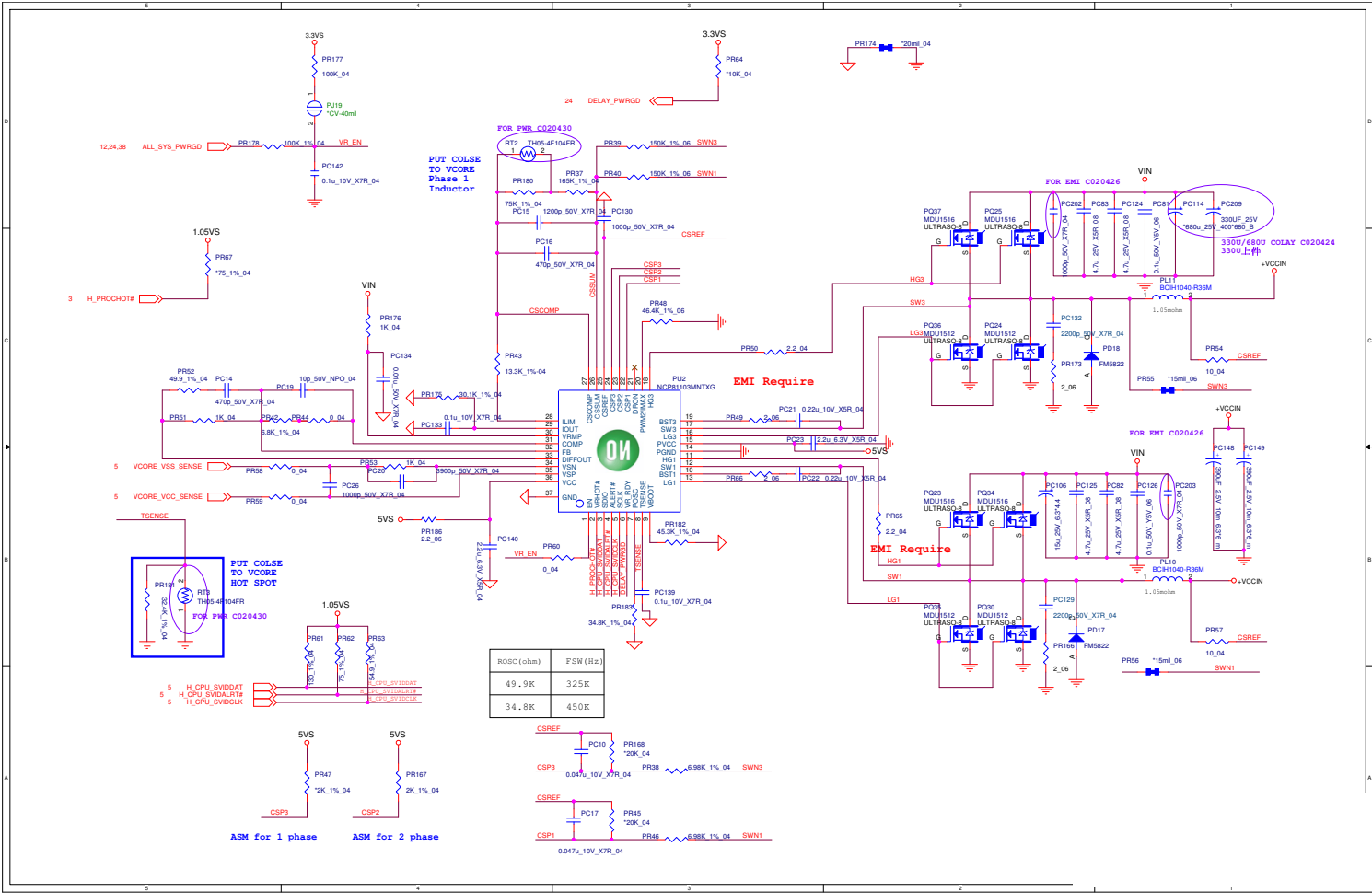


1.05VS, 1.05V_M, 1.05V_LAN_M



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1.05VS, 1.05V_M,
1.05V_LAN_M

Power V-Core

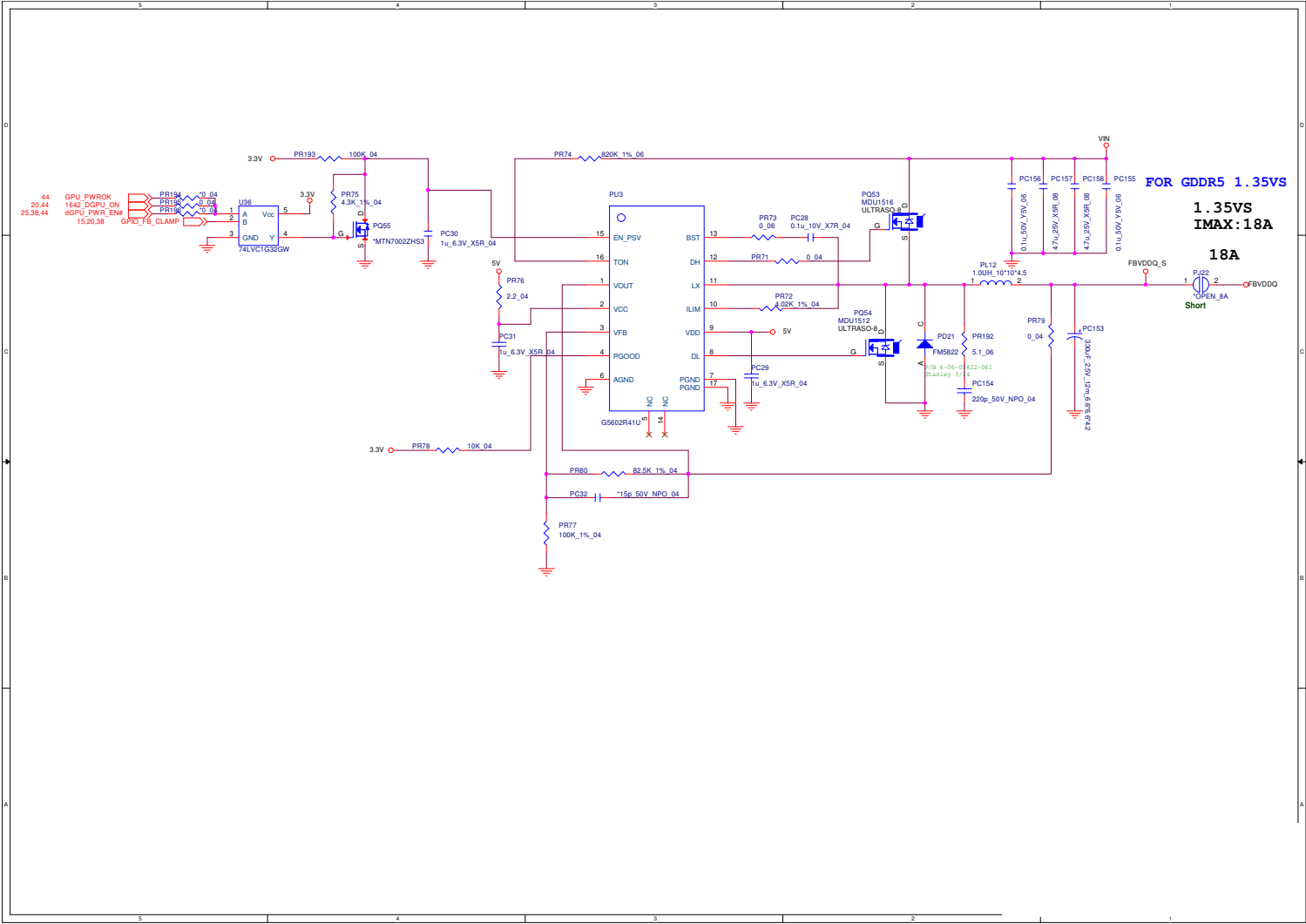


B.Schematic Diagrams

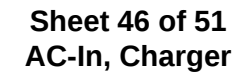
Schematic Diagrams

FBVDDQ

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FBVDDQ

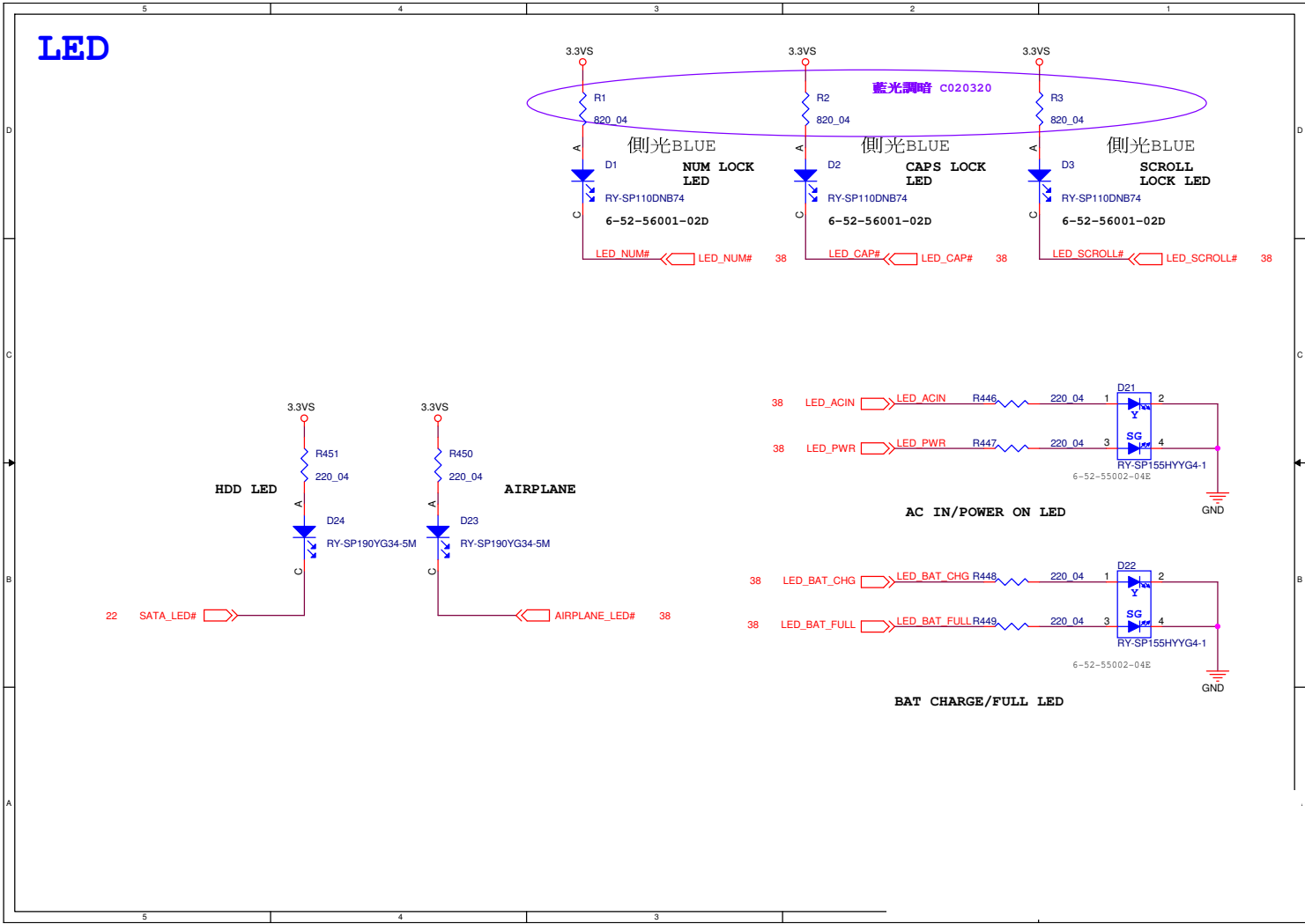


B.Schematic Diagrams

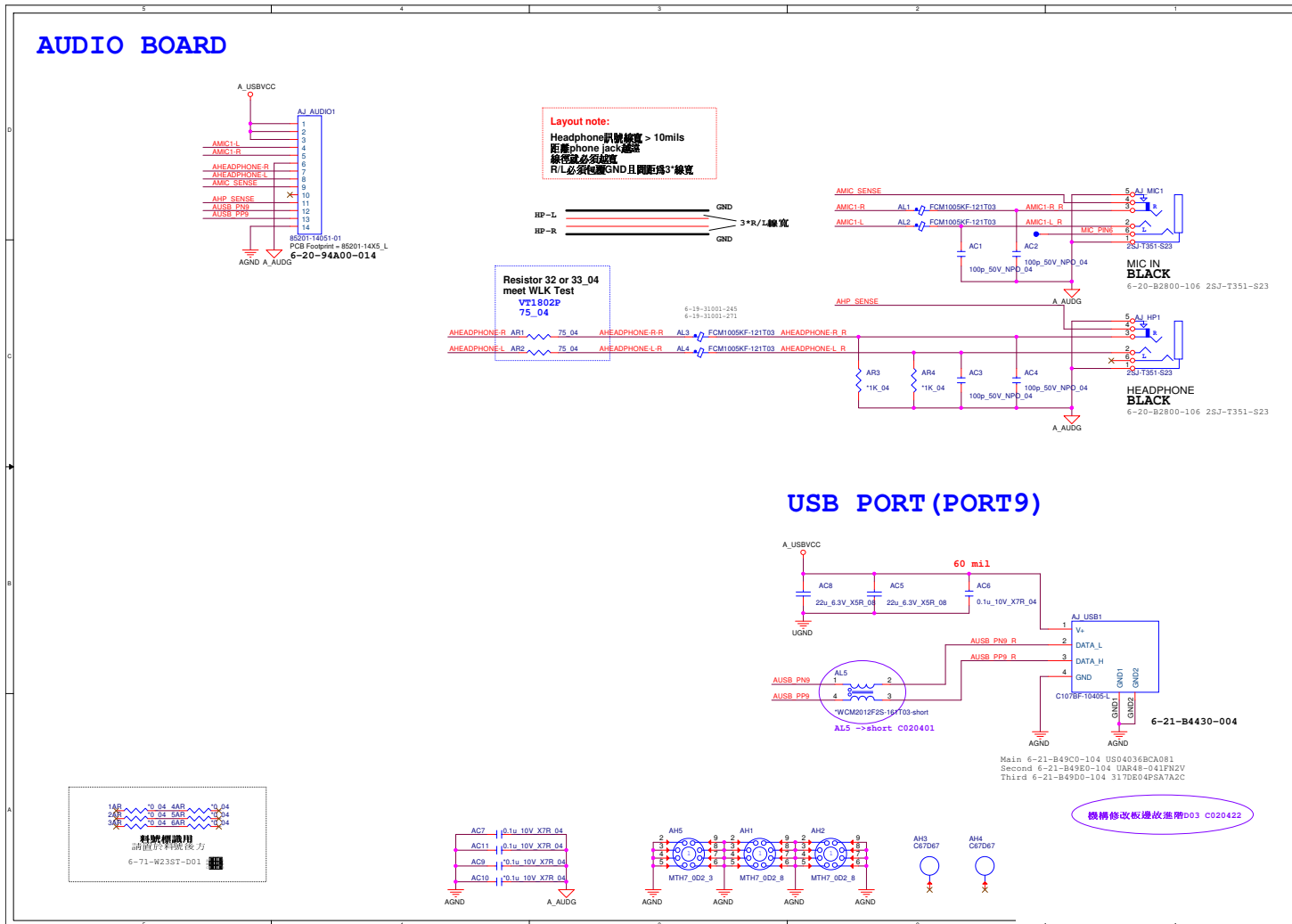


LED Board

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LED Board



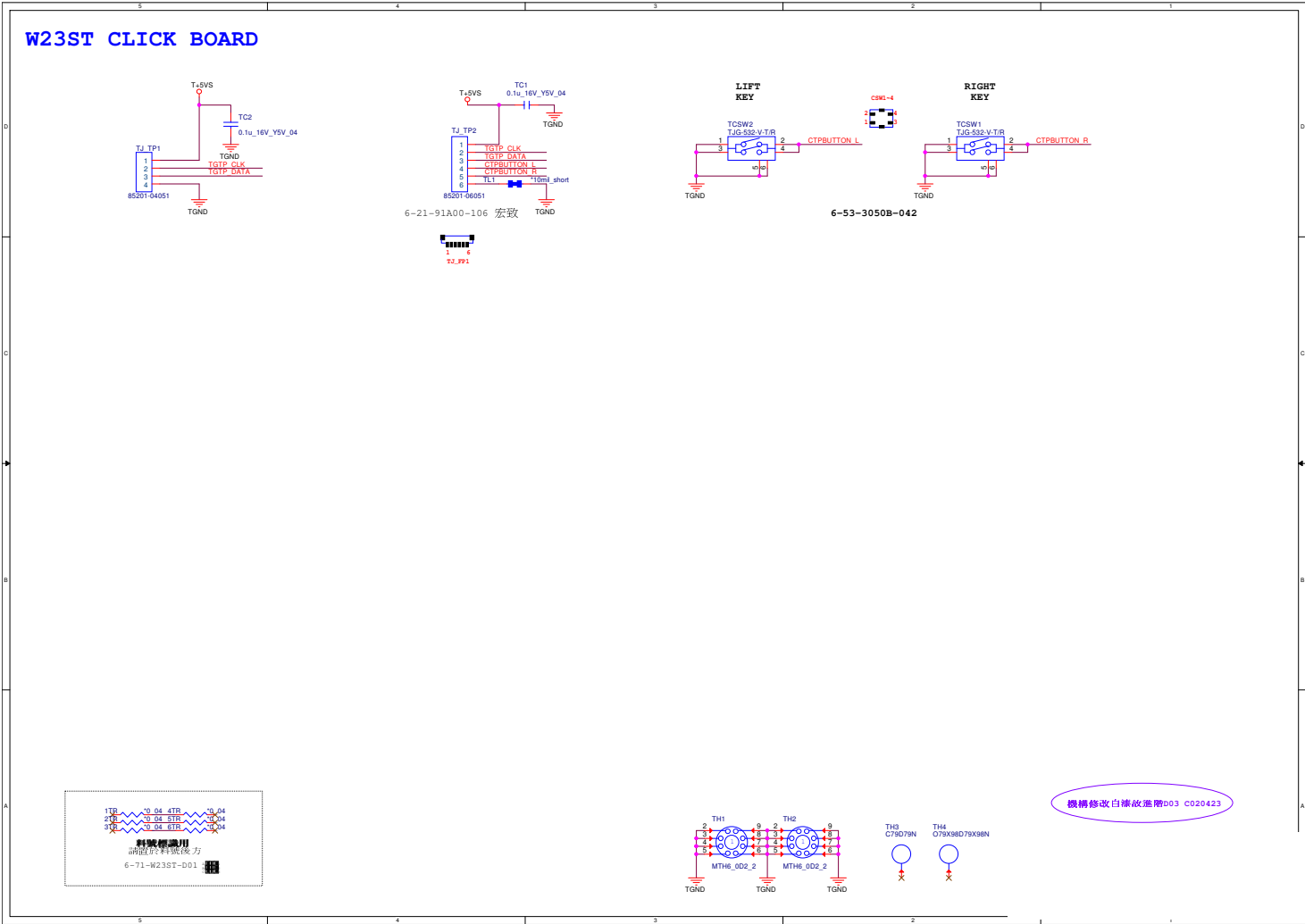
Audio Board

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Audio Board

Schematic Diagrams

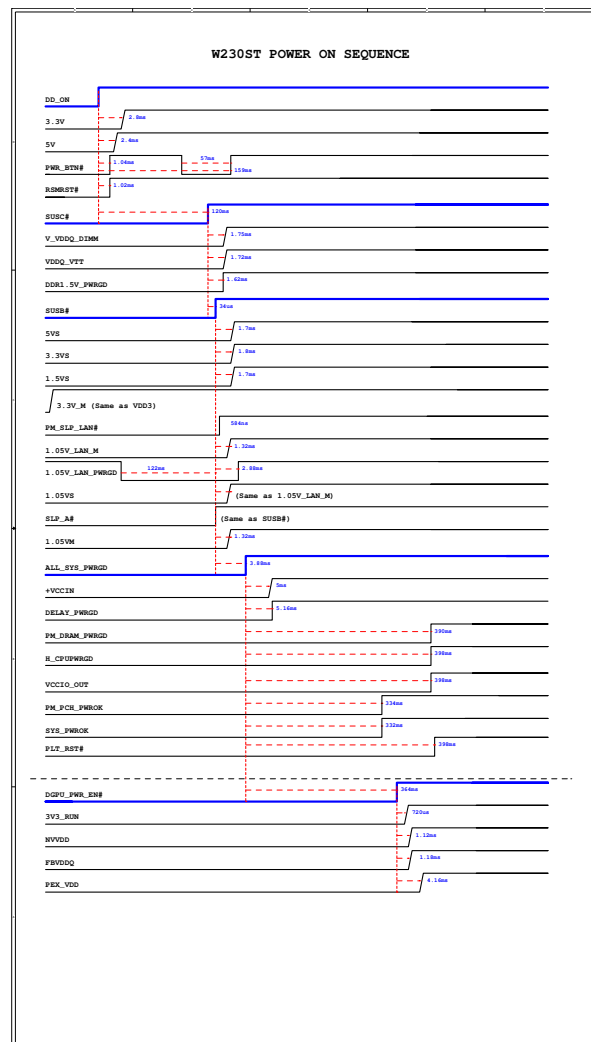
Click Board

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Click Board



Sheet 50 of 51
Power Switch
Board

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POWER ON
SEQUENCE



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 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 **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.