

# SERVICE MANUAL

P650SE / P651SE

*notebook*





**Notebook Computer**

**P650SE / P651SE**

**Service Manual**

### Notice

The company reserves the right to revise this publication or to change its contents without notice. Information contained herein is for reference only and does not constitute a commitment on the part of the manufacturer or any subsequent vendor. They assume no responsibility or liability for any errors or inaccuracies that may appear in this publication nor are they in anyway responsible for any loss or damage resulting from the use (or misuse) of this publication.

This publication and any accompanying software may not, in whole or in part, be reproduced, translated, transmitted or reduced to any machine readable form without prior consent from the vendor, manufacturer or creators of this publication, except for copies kept by the user for backup purposes.

Brand and product names mentioned in this publication may or may not be copyrights and/or registered trademarks of their respective companies. They are mentioned for identification purposes only and are not intended as an endorsement of that product or its manufacturer.

Version 1.0  
November 2014

### Trademarks

**Intel and Intel Core** are trademarks of Intel Corporation.

**Windows<sup>®</sup>** is a registered trademark of Microsoft Corporation.

Other brand and product names are trademarks and /or registered trademarks of their respective companies.



## 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 *P650SE* / *P651SE* series notebook PC.

The following information is included:

Chapter 1, Introduction, provides general information about the location of system elements and their specifications.

Chapter 2, Disassembly, provides step-by-step instructions for disassembling parts and subsystems and how to upgrade elements of the system.

Appendix A, Part Lists

Appendix B, Schematic Diagrams

Appendix C, Updating the FLASH ROM BIOS

## IMPORTANT SAFETY INSTRUCTIONS

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

1. Do not use this product near water, for example near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
2. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
5. This product is intended to be supplied by a Listed Power Unit as follows:
  - AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19V, 9.5A (**180 Watts**) minimum AC/DC Adapter.

### 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.

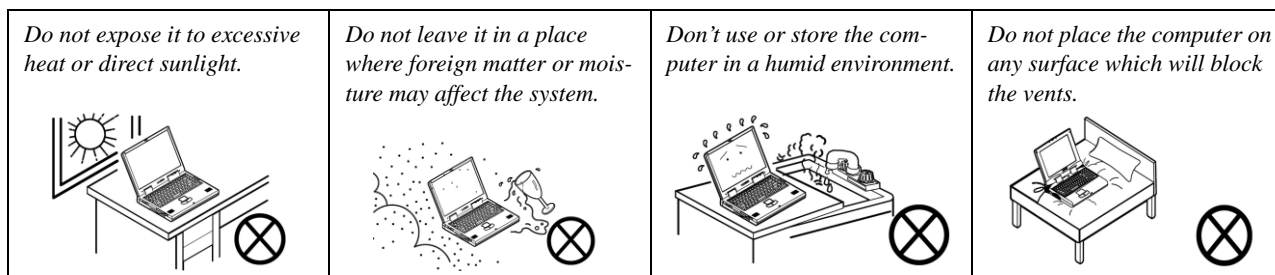
## Instructions for Care and Operation

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.



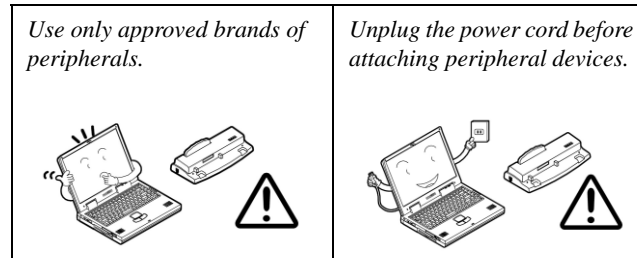
2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.



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.



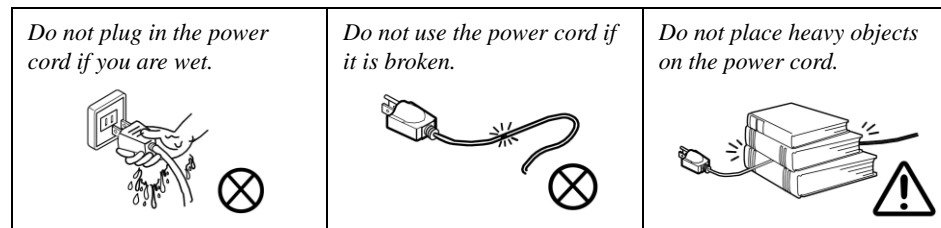
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**



## 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.

### Related Documents

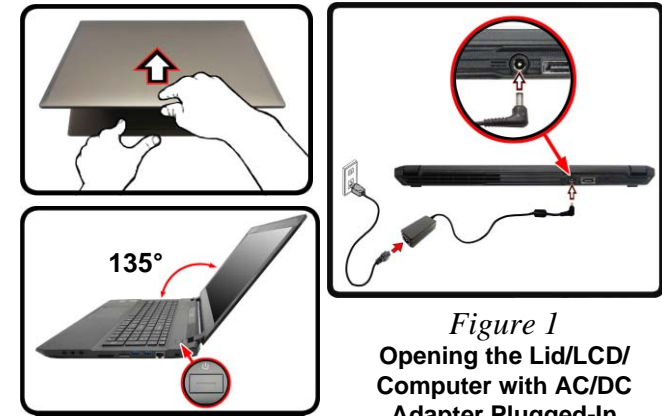
You may also need to consult the following manual for additional information:

#### 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 at the rear 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 135 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 choosing the **Shut down** command in **Windows** (see below). This will help prevent hard disk or system problems.

Click the icon  in the **Start Screen** and choose **Shut down** from the menu.



**Or**

Right-click the **Start button**  at the bottom of the **Start Screen** or the **Desktop** and choose **Shut down or sign out** > **Shut down** from the context menu.

# Contents

## Introduction .....1-1

Overview .....	1-1
Specifications .....	1-2
External Locator - Top View with LCD Panel Open .....	1-4
External Locator - Front & Right Side Views .....	1-5
External Locator - Left Side & Rear View .....	1-6
External Locator - Bottom View .....	1-7
Mainboard Overview - Top (Key Parts) .....	1-8
Mainboard Overview - Bottom (Key Parts) .....	1-9
Mainboard Overview - Top (Connectors) .....	1-10
Mainboard Overview - Bottom (Connectors) .....	1-11

## Disassembly .....2-1

Overview .....	2-1
Maintenance Tools .....	2-2
Connections .....	2-2
Maintenance Precautions .....	2-3
Disassembly Steps .....	2-4
Removing the Keyboard .....	2-5
Removing the Battery .....	2-6
Removing the Hard Disk Drive .....	2-8
Removing the System Memory (RAM) .....	2-10
Removing the M.2 SSD Module .....	2-13
Removing the Wireless LAN Module .....	2-14
Wireless LAN, Combo, 3G & LTE Module Cables .....	2-15
Removing and Installing the 3G/SATA Module .....	2-16

## Part Lists .....A-1

Part List Illustration Location .....	A-2
Top .....	A-3
Bottom .....	A-4

Main Board .....	A-5
HDD .....	A-6
LCD .....	A-7

## Schematic Diagrams.....B-1

System Block Diagram .....	B-2
Processor 1/7-DMI, FDI, PEG .....	B-3
Processor 2/7- CLK, MISC .....	B-4
Processor 3/7- (DDR3L) .....	B-5
Processor 4/7- Display .....	B-6
Processor 5/7- Power .....	B-7
Processor 6/7- POGND .....	B-8
Processor 7/7- RSVD .....	B-9
DDR3 CHA SO-DIMM_0 .....	B-10
DDR3 CHA SO-DIMM_1 .....	B-11
DDR3 CHB SO-DIMM_0 .....	B-12
DDR3 CHB SO-DIMM_1 .....	B-13
Panel, Inverter .....	B-14
RTD2136N-CG .....	B-15
Mini DP Port D .....	B-16
Mini DP Port B .....	B-17
HDMI Connector .....	B-18
VGA PCI Express .....	B-19
VGA Frame Buffer Partition .....	B-20
Frame Buffer Partition A .....	B-21
Frame Buffer Partition B .....	B-22
Frame Buffer Partition A_B .....	B-23
GPU Frame Buffer Partition .....	B-24
Frame Buffer Partition C .....	B-25
Frame Buffer Partition D .....	B-26
Frame Buffer Partition C_D .....	B-27

## Preface

---


GPU Decoupling .....	B-28	NVVDD Phase 1 & 2 .....	B-60
DACA Interface XTAL .....	B-29	FBVDDQ .....	B-61
IFP I/O Interface .....	B-30	Audio Board .....	B-62
Misc - GPIO, I2C and ROM .....	B-31	Power Board .....	B-63
GPU NVVDD, FBVDDQ, and GND .....	B-32	HDD Board .....	B-64
Lynx 1/9 .....	B-33	LED Board .....	B-65
Lynx 2/9 .....	B-34	Finger Sensor Board .....	B-66
Lynx 3/9 .....	B-35	Click Board .....	B-67
Lynx 4/9 .....	B-36	USB Board 1/4 .....	B-68
Lynx 5/9 .....	B-37	USB Board 2/4 .....	B-69
Lynx 6/9 .....	B-38	USB Board 3/4 .....	B-70
Lynx 7/9 .....	B-39	USB Board 4/4 .....	B-71
Lynx 8/9 .....	B-40	Power Board .....	B-72
Lynx 9/9 .....	B-41	LED Board .....	B-73
USB3.0 + eSATA Combo .....	B-42	<b>Updating the FLASH ROM BIOS..... C-1</b>	
USB Charger .....	B-43	Download the BIOS .....	C-1
M.2 3G + M.2 SATA .....	B-44	Unzip the downloaded files to a bootable CD/DVD or USB Flash drive .....	C-1
M.2 WLAN+BT, PCIE4X SSD .....	B-45	Set the computer to boot from the external drive .....	C-1
Realtek ALC892 .....	B-46	Use the flash tools to update the BIOS .....	C-2
TPA2008D2 .....	B-47	Restart the computer (booting from the HDD) .....	C-2
Subwoofer .....	B-48		
KBC-ITE IT8587 .....	B-49		
TPM, CCD, TP .....	B-50		
Fan, LID, KB, LED, G Sensor .....	B-51		
Connector .....	B-52		
DDR 1.35V / 0.75VS, PCH 1.5V .....	B-53		
VDD3, VDD5 .....	B-54		
5V, 5VS, 3.3V, 3.3VS, 3.3VA .....	B-55		
1.05 Series .....	B-56		
AC_In, Charger .....	B-57		
POWER V-Core1 .....	B-58		
PEX_VDD, 3V3_AON, 3V3_RUN .....	B-59		

# Chapter 1: Introduction

## Overview

This manual covers the information you need to service or upgrade the **P650SE / P651SE** series notebook computer. Information about operating the computer (e.g. getting started, and the *Setup* utility) is in the *User's Manual*. Information about drivers (e.g. VGA & audio) is also found in the *User's Manual*. The manual is shipped with the computer.

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

The **P650SE / P651SE** 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**  
**i7-4980HQ (2.80GHz), i7-4870HQ (2.50GHz), i7-4710HQ (2.50GHz)**  
 6MB L3 Cache, **22nm**, DDR3L-1600MHz, TDP 47W

### Core Logic

Intel® HM87 Chipset

### BIOS

AMI BIOS (48Mb SPI Flash-ROM)

### LCD

15.6" (39.62cm), 16:9, QFHD (3840x2160)/ WQHD+ (2880x1620)/FHD (1920x1080)

### Video Adapter

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

#### Intel Integrated GPU

**Intel® HD Graphics 5200 (Core i7-4980HQ/i7-4870HQ CPU Integrated)**

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

Microsoft DirectX®11.1 Compatible

**Intel® HD Graphics 4600 (Core i7-4710HQ CPU Integrated)**

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

Microsoft DirectX®11.1 Compatible

#### NVIDIA Discrete GPU

**NVIDIA® GeForce GTX 970M**

**3GB** GDDR5 Video RAM

Microsoft DirectX®12 Compatible

### Memory

Four 204 Pin SO-DIMM Sockets Supporting **DDR3L 1600MHz** Memory

(The real memory operating frequency depends on the FSB of the processor.)

Memory Expandable from **4GB (minimum)** up to **32GB (maximum)**

### Storage

**(Factory Option)** Two **SATA** M.2 2280 SSDs supporting RAID level 0/1

Or

**(Factory Option)** One **PCIe** M.2 2280 SSD

**Two** changeable 2.5" (6cm) **7.0mm** (h) **SATA** (Serial) Hard Disk Drives/Solid State Drives (SSD) supporting RAID level 0/1

Or

**One** changeable 2.5" (6cm) **9.5mm** (h) **SATA** (Serial) Hard Disk Drive/Solid State Drive (SSD)

### Security

Security (Kensington® Type) Lock Slot

BIOS Password

**(Factory Option)** Fingerprint Reader Module

Trusted Platform Module 2.0

### Pointing Device

Built-in Touchpad (scrolling key functionality integrated)

### Keyboard

Full-size Winkey **Illuminated White-LED** Keyboard (with numeric keypad)

**Audio**

High Definition Audio Compliant Interface  
 S/PDIF Digital Output  
 Two Speakers  
 Sound Blaster Audio  
 ANSP™ 3D sound technology on headphone output  
 Built-In Array Microphone

**Note:** External 5.1CH Audio Output Supported by Headphone, Microphone and S/PDIF Out Jacks

**Interface**

Three USB 3.0 Ports (Including one AC/DC Powered USB port)  
 One eSATA Port (USB 3.0 Port Combined)  
 One HDMI-Out Port  
 Two Mini DisplayPorts (1.2)  
 One S/PDIF Out Jack  
 One Headphone/Speaker-Out Jack  
 One Microphone-In Jack  
 One RJ-45 LAN Jack  
 One DC-In Jack

**Card Reader**

Embedded Multi-In-1 Push-Push Card Reader  
 MMC (MultiMedia Card) / RS MMC  
 SD (Secure Digital) / Mini SD / SDHC/ SDXC

**M.2 Slots**

Slot 1 for **Combo WLAN and Bluetooth** Module  
 Slot 2 for **SATA** or **PCIe SSD**  
**(Factory Option)** Slot 3 for **SATA SSD** or **3G/4G** Module

**Communication**

Built-In Gigabit Ethernet LAN  
 2.0M FHD PC Camera Module  
**(Factory Option)** M.2 3G/4G Module

**WLAN/ Bluetooth M.2 Modules:**

**(Factory Option)** Intel® Wireless-AC 7265 Wireless LAN **(802.11ac)** + Bluetooth **4.0**

**(Factory Option)** Intel® Wireless-N 7265 Wireless LAN **(802.11b/g/n)** + Bluetooth **4.0**

**(Factory Option)** Intel® Wireless-AC 3160 Wireless LAN **(802.11ac)** + Bluetooth **4.0**

**(Factory Option)** Qualcomm® Atheros Killer Wireless-AC 1525 Wireless LAN **(802.11ac)** + Bluetooth **4.0**

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

**(Factory Option)** Third-Party Wireless LAN **802.11ac** + 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**

Embedded 4-Cell Polymer Battery Pack, 60WH

Full Range AC/DC Adapter

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

DC Output: 19V, 9.5A (**180W**)

**Dimensions & Weight**

385mm (w) \* 271mm (d) \* 25mm (h)

2.5kg (Barebone with 60WH Battery)'

## Introduction

# External Locator - Top View with LCD Panel Open

Figure 1  
Top View

1. PC Camera
2. \*PC Camera LED  
*\*When the PC camera is in use, the LED will be illuminated.*
3. Built-In Array Microphone
4. LCD
5. Speakers
6. Power Button
7. Keyboard
8. Touchpad & Buttons
9. Fingerprint Reader (Optional)





## External Locator - Front & Right Side Views

Figure 2  
Front View

1. LED Indicator

FRONT VIEW



RIGHT SIDE VIEW

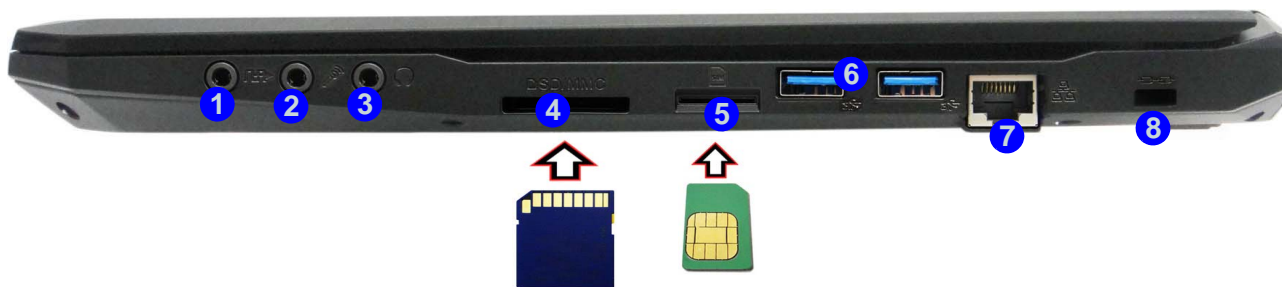


Figure 3  
Right Side View

1. S/PDIF-Out Jack
2. Microphone-In Jack
3. Headphone-Out Jack
4. Multi-in-1 Card Reader
5. USIM Card Reader (for 3G/4G USIM Cards)
6. USB 3.0 Ports
7. RJ-45 LAN Jack
8. Security Lock Slot

## Introduction

### External Locator - Left Side & Rear View

*Figure 4*  
**Left Side View**

1. Vent
2. HDMI-Out Port
3. Powered USB 3.0 Port
4. Mini DisplayPorts

LEFT SIDE VIEW



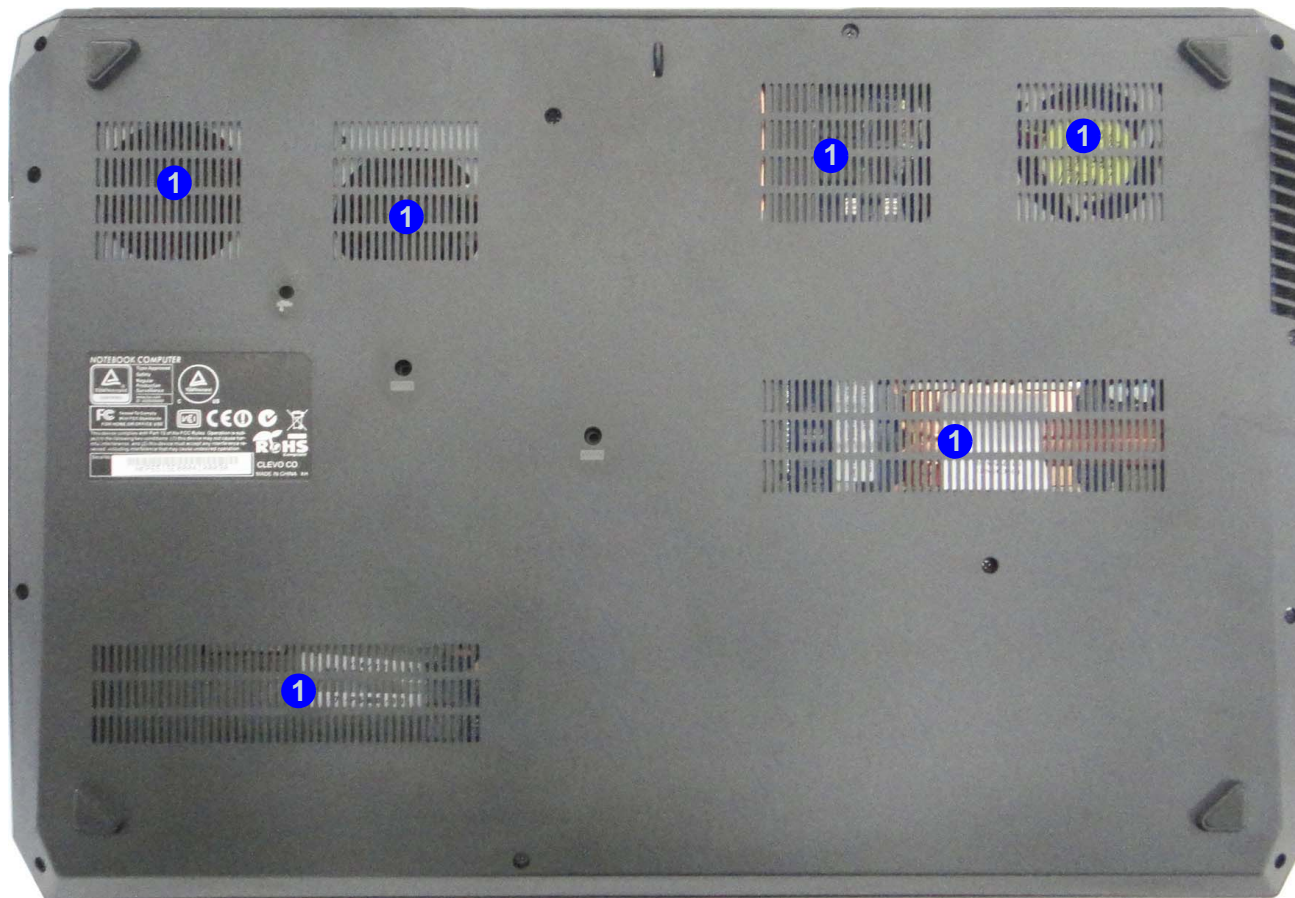
*Figure 5*  
**Rear View**

1. Vent
2. DC-In Jack
3. Combined eSATA/USB 3.0 Port

REAR VIEW



## External Locator - Bottom View



*Figure 6*  
**Bottom View**

1. Vent



### Overheating

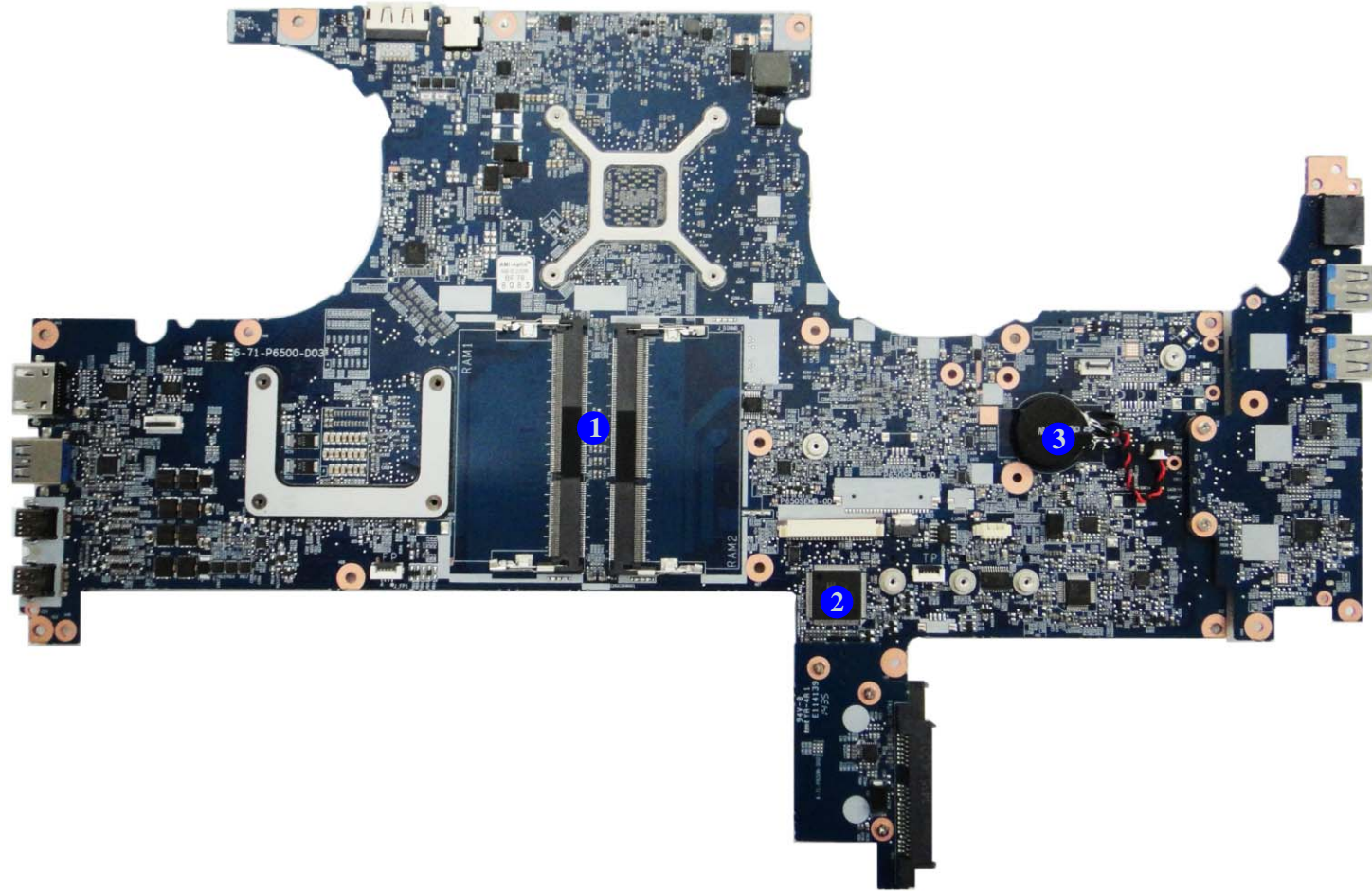
To prevent your computer from overheating, make sure nothing blocks any vent while the computer is in use.

## Introduction

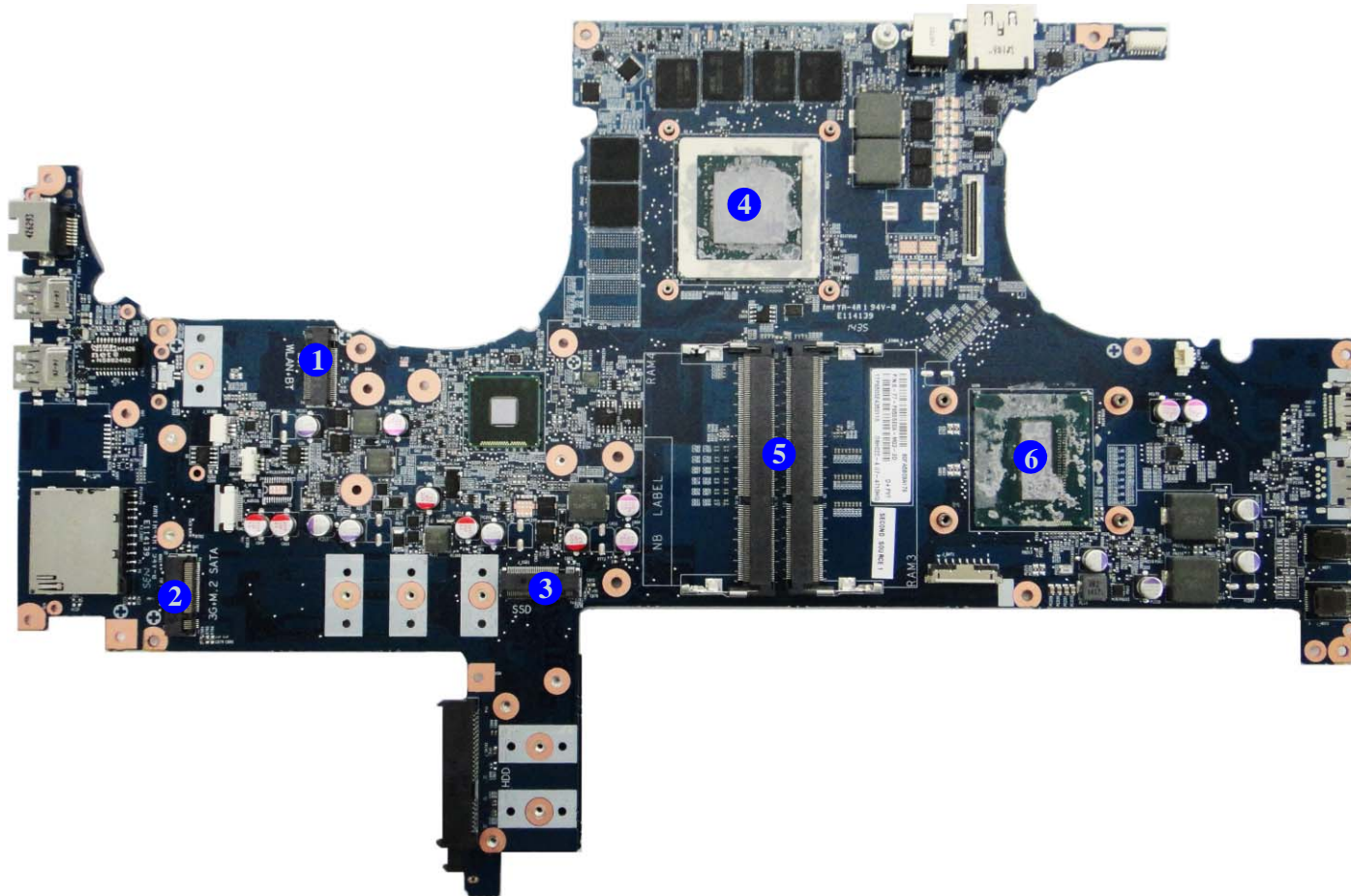
*Figure 7*  
**Mainboard Top  
Key Parts**

1. Memory Slots  
DDR3 SO-DIMM
2. KBC-ITE IT8587
3. CMOS Battery

## Mainboard Overview - Top (Key Parts)



## Mainboard Overview - Bottom (Key Parts)



*Figure 8*  
**Mainboard Bottom  
Key Parts**

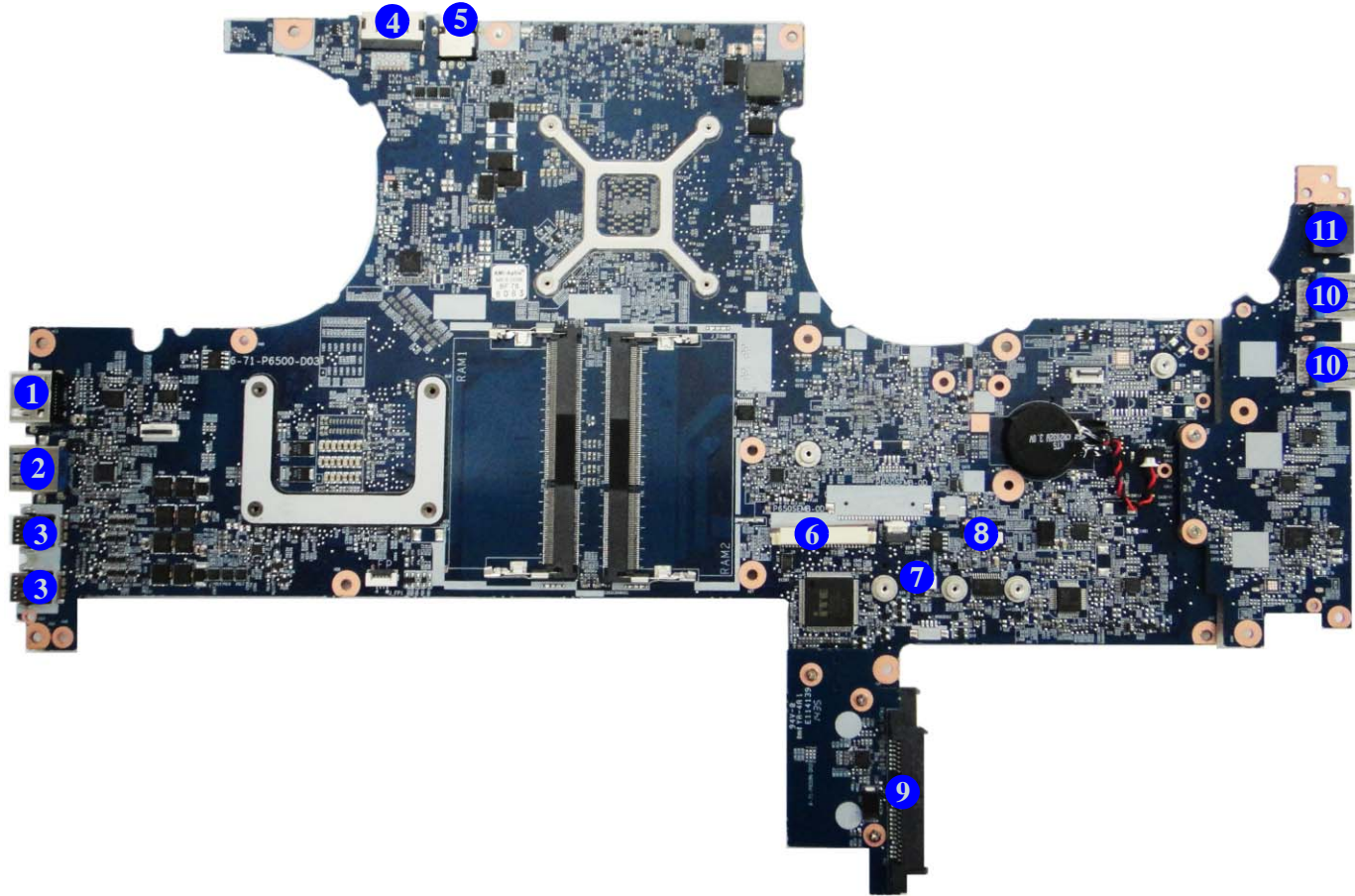
1. Mini-Card Connector (WLAN Module)
2. Mini-Card Connector (M.2 3G/SATA Module)
3. Mini-Card Connector (M.2 PCIE/SATA SSD Module)
4. GPU-GTX970M
5. Memory Slots (DDR3 SO-DIMM)
6. CPU

## Introduction

*Figure 9*  
**Mainboard Top  
Connectors**

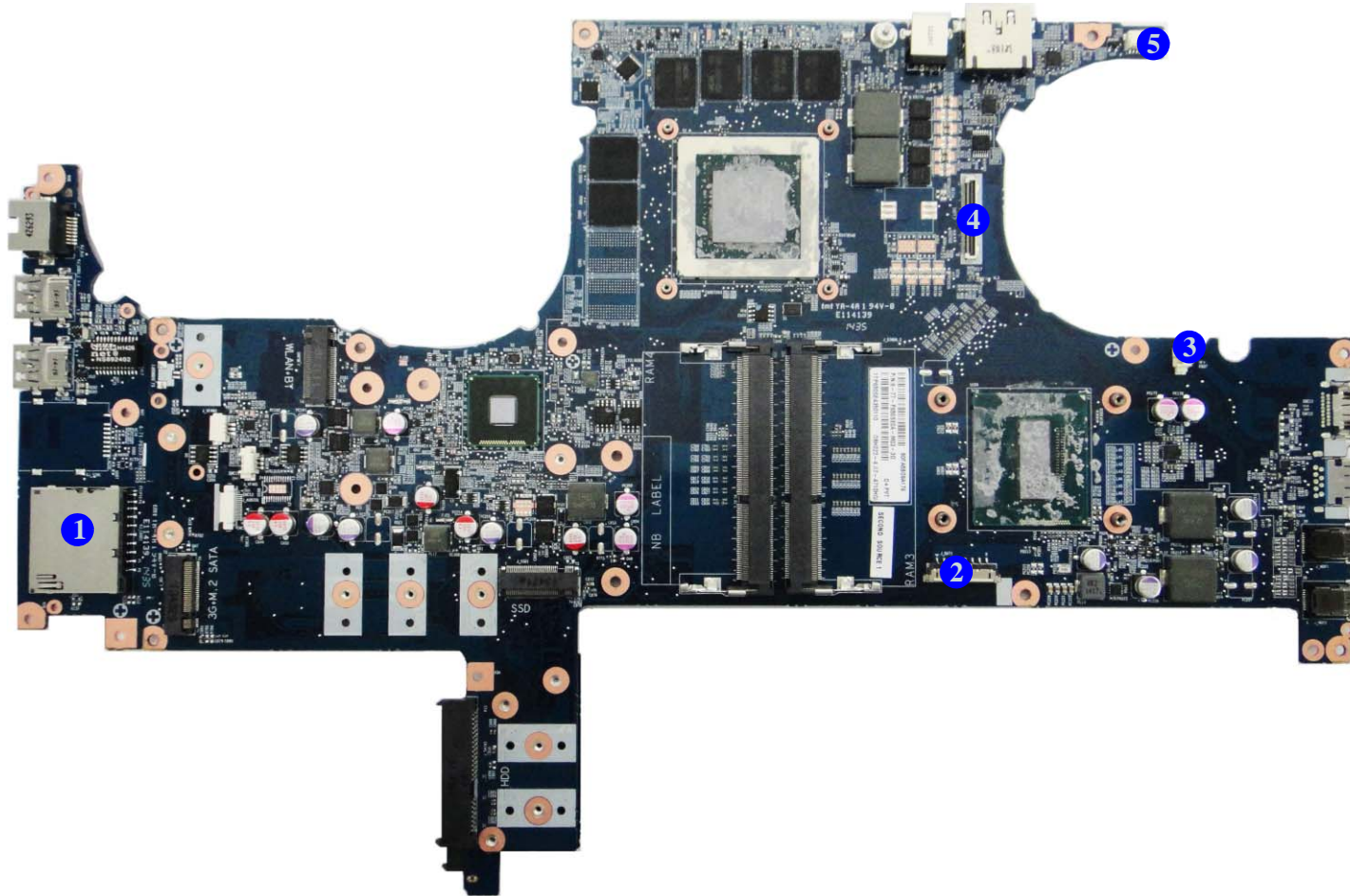
1. HDMI-Out Port
2. USB Port 3.0  
Connector
3. Mini Display Port
4. eSATA + USB 3.0
5. DC-In Jack
6. Keyboard Cable  
Connector
7. TP Connector
8. Speaker  
Connector
9. HDD Connector
10. USB Port 3.0  
Connector
11. RJ-45 LAN Jack

## Mainboard Overview - Top (Connectors)



## Mainboard Overview - Bottom (Connectors)

*Figure 10*  
**Mainboard Bottom  
Connectors**



1. Multi-in-1 Card Reader
2. Battery Connector
3. Fan Connector
4. LCD Cable Connector
5. CCD Connector






# Chapter 2: Disassembly


## Overview

This chapter provides step-by-step instructions for disassembling the *P650SE / P651SE* series notebook's parts and sub-systems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

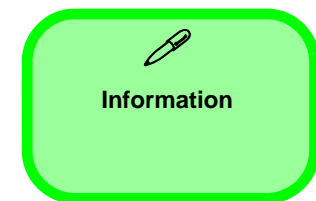
We suggest you completely review any procedure before you take the computer apart.

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-borne 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 Keyboard:

1. Remove the keyboard *page 2 - 5*

#### To remove the Battery:

1. Remove the battery *page 2 - 6*

#### To remove the HDD:

1. Remove the battery *page 2 - 6*
2. Remove the HDD *page 2 - 8*

#### To remove the System Memory:

1. Remove the battery *page 2 - 6*
2. Remove the system memory *page 2 - 10*

#### To remove the M.2 SSD:

1. Remove the battery *page 2 - 6*
2. Remove the SSD *page 2 - 13*

#### To remove the Wireless LAN Module:

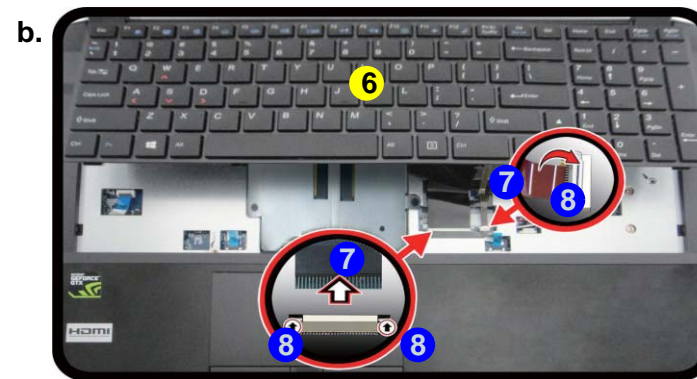
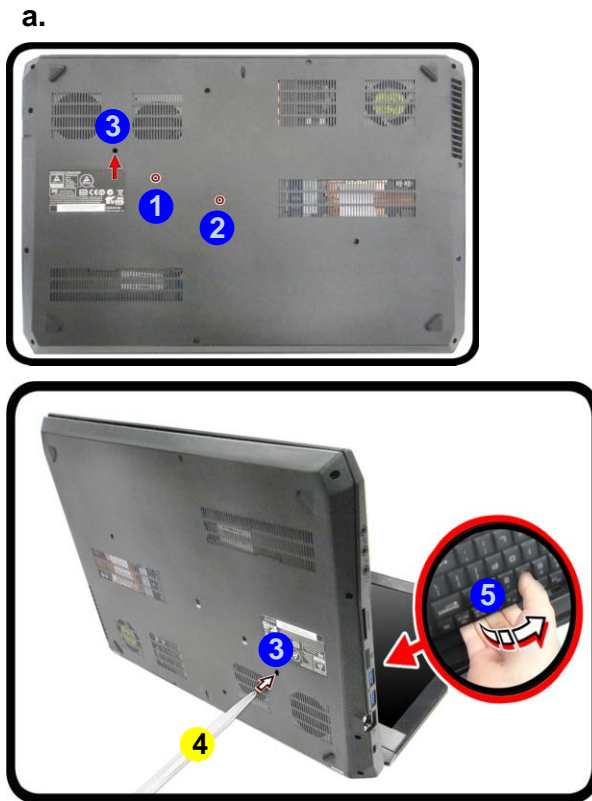
1. Remove the battery *page 2 - 6*
2. Remove the WLAN *page 2 - 14*

#### To remove and install the 3G/SATA Module:

1. Remove the battery *page 2 - 6*
2. Remove the 3G *page 2 - 16*
3. Remove the SATA *page 2 - 17*
4. Install the 3G/SATA *page 2 - 18*

## Removing the Keyboard

1. Turn **off** the computer, turn it over.
2. Remove screws **1** - **2** from the bottom of the computer.
3. Open it up with the LCD on a flat surface before pressing at point **3** to release the keyboard module (use the special eject stick **4** to do this) while releasing the keyboard in the direction of the arrow **5** as shown (*Figure 1a*).
4. Carefully lift the keyboard **6** up, being careful not to bend the keyboard ribbon cable **7**. Disconnect the keyboard ribbon cable **7** from the locking collar socket by using a flat-head screwdriver to pry the locking collar pins **8** away from the base (*Figure 1b*).
5. Carefully lift the keyboard **6** off the computer (*Figure 1c*).



*Figure 1*  
**Keyboard Removal**

- a. Remove the screws from the bottom of the computer and then eject the keyboard using a special eject stick to push the keyboard out while releasing the keyboard as shown.
- b. Lift the keyboard up and disconnect the keyboard ribbon cable from the locking collar socket.
- c. Remove the keyboard.



### Re-inserting the Keyboard

When re-inserting the keyboard firstly, align the keyboard tabs at the bottom of the keyboard with the slots in the case.



4. Eject Stick
6. Keyboard

- 2 Screws

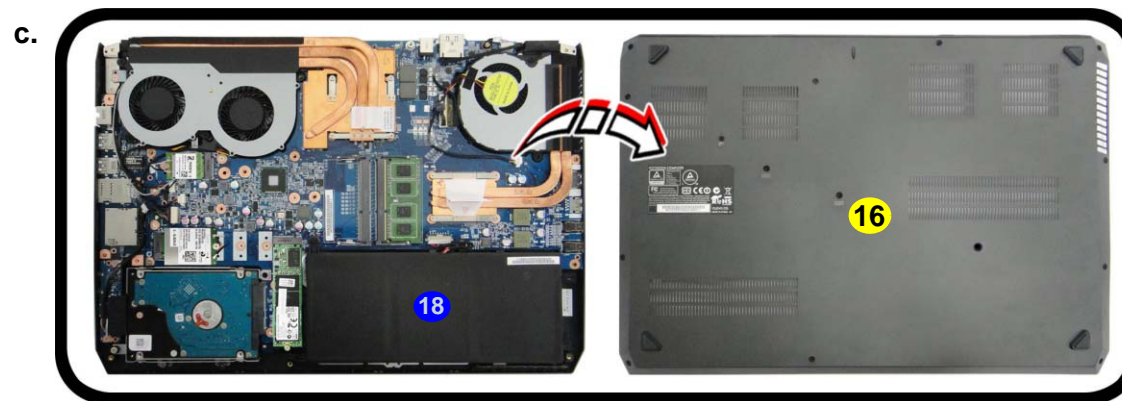
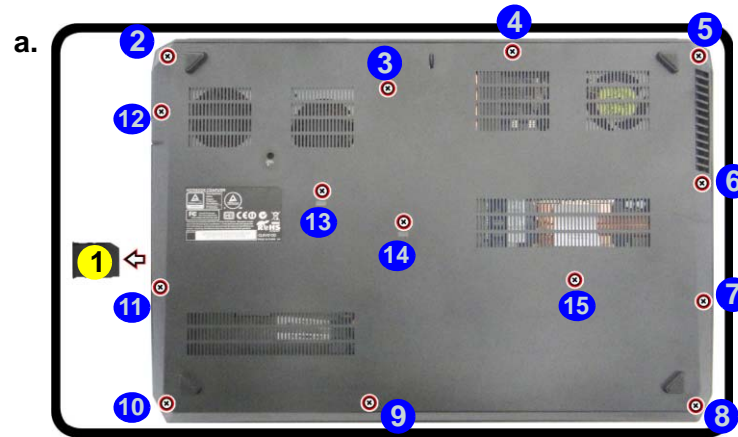
## Disassembly

*Figure 2*  
**Battery Removal**

- Remove the SD card cover and screws.
- Remove the bottom case.
- Locate the battery.

## Removing the Battery

- Turn the computer off, and turn it over.
- Remove the SD card cover **1** and screws **2** - **15** (*Figure 2a*).
- Carefully lift the bottom case **16** up in the direction of the arrow **17** and remove it (*Figure 2b*).
- The battery will be visible at point **18** on the computer (*Figure 2c*).



### Screw Size

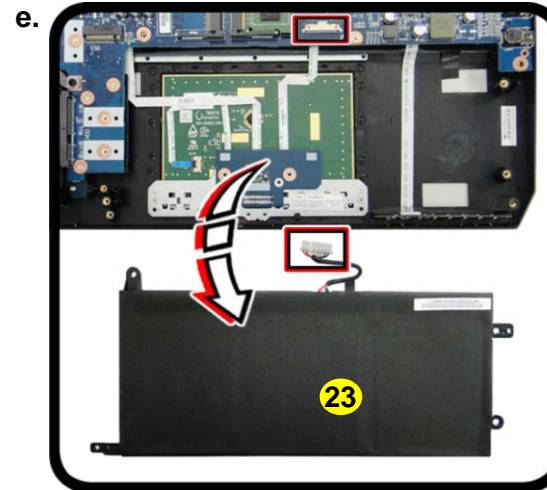
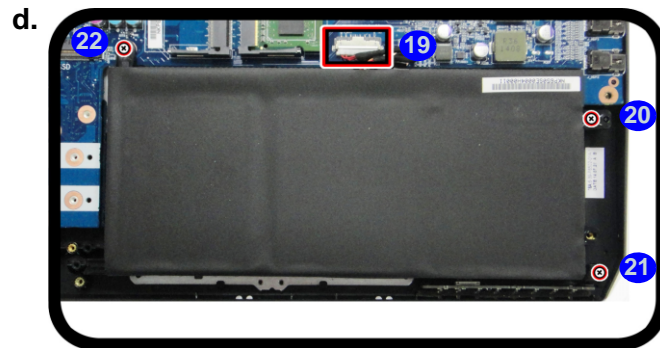
Note that the size of screws **2** & **5** is M2.5 x 8L.



1. SD Card Cover  
16. Bottom Case

- 14 Screws

- Carefully disconnect the cable **19**, then remove screws **20** - **22** (*Figure 3b*).
- Lift the battery **23** off the computer (*Figure 3e*).
- Reinsert the bottom case starting from point **24** as shown (*Figure 3f*) to avoid damaging the rear eSATA/USB 3.0 port. Tighten the screws to secure the bottom case in place.



*Figure 3*  
**Battery Removal**  
(cont'd.)

- Disconnect the cable and remove the screws.
- Lift the battery off the computer.
- Reinsert the bottom case and tighten the screws.



24. Battery

- 4 Screws

## Disassembly

*Figure 4*  
**HDD Assembly  
Removal**

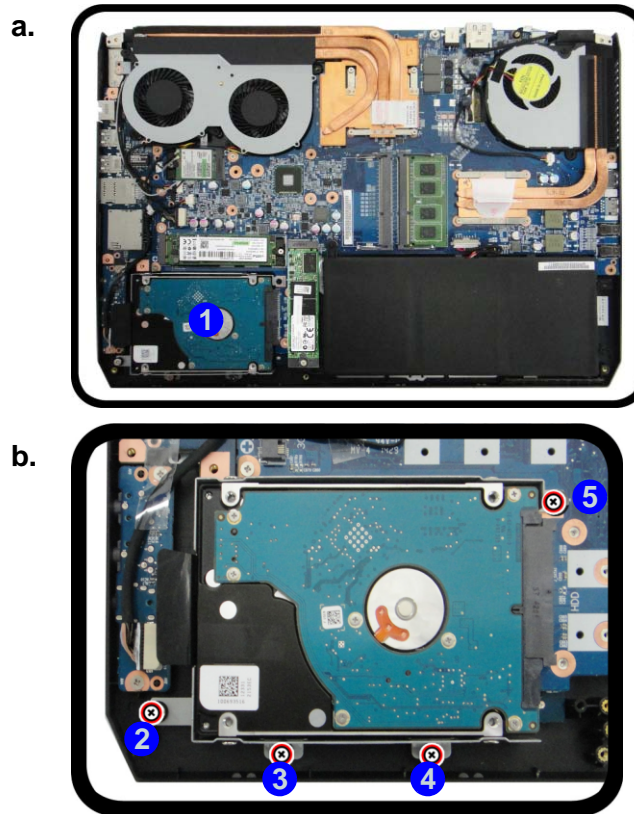
- Locate the HDD.
- Remove the screws.

## 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 Disassembly Process

- Turn **off** the computer, and remove the battery ([page 2 - 6](#)).
- The HDD will be visible at point **1** on the mainboard ([Figure 4a](#)).
- Remove screws **2** - **5** from the HDD assembly ([Figure 4b](#)).



- Hard Disk

  - 4 Screws



#### 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.

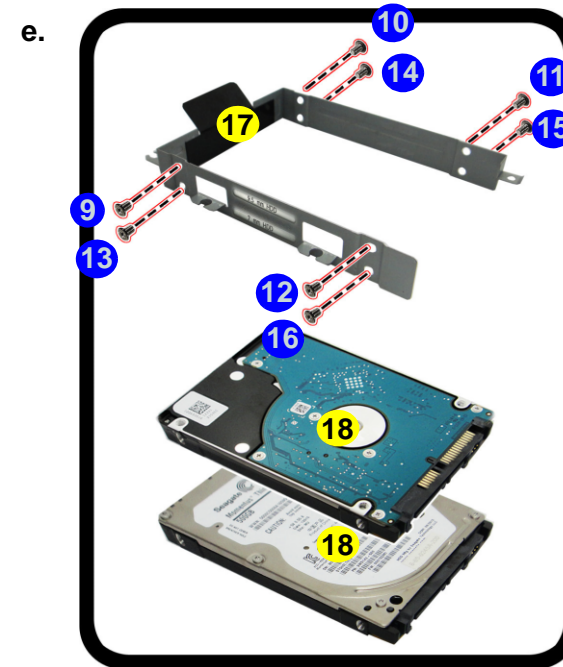
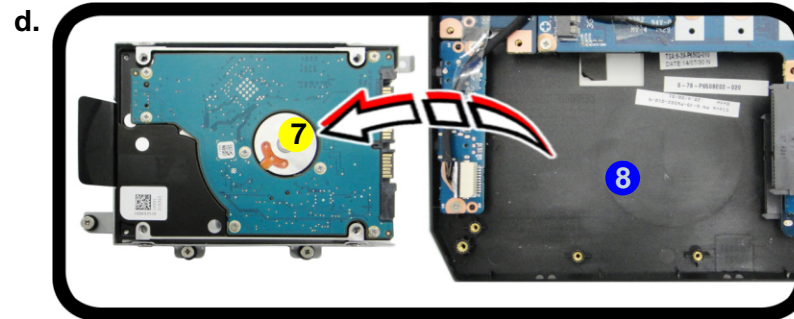
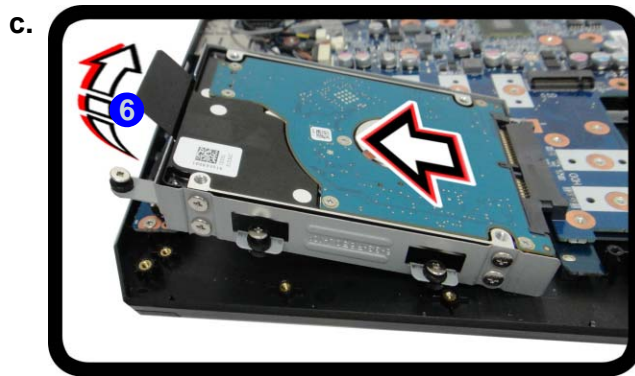
If you have access to the internet, download the latest application and hardware driver updates for the operating system you plan to install. Copy these to a removable medium.




4. Slightly lift and pull the hard disk in the direction of arrow 6 (Figure 5c).
5. Lift the hard disk assembly 7 out of the bay 8 (Figure 5d).
6. Remove screws 9 - 16 and bracket 17 from the hard disk 18 (Figure 5e).
7. Reverse the process to install a new hard disk (do not forget to replace the screws).

Figure 5  
HDD Assembly  
Removal (cont'd.)

- c. Slightly lift and pull the HDD in the direction of the arrow.
- d. Lift the HDD assembly out of the bay.
- e. Remove the screws and bracket from the HDD.






**Installing 9.5mm or 7mm HDD**

Note that the hard disks pictured on the following pages are all 7mm(h) hard disk drive.

In some cases 9.5mm(h) hard disk drives will be installed. It can be installed on either upper or lower slot.

There are two hard disk drive options:  
**Two** changeable 2.5" (6cm) **7.0mm** (h) **SATA** (Serial) Hard Disk Drives/Solid State Drives (SSD) supporting RAID level 0/1  
 Or  
**One** changeable 2.5" (6cm) **9.5mm** (h) **SATA** (Serial) Hard Disk Drive/Solid State Drive (SSD)

For more information, contact your distributor/supplier, and bear in mind your warranty terms.



7. HDD Assembly  
 17. Adhesive Cover  
 18. HDD

- 8 Screws

## Disassembly

*Figure 6*  
**RAM-1 Module Removal**

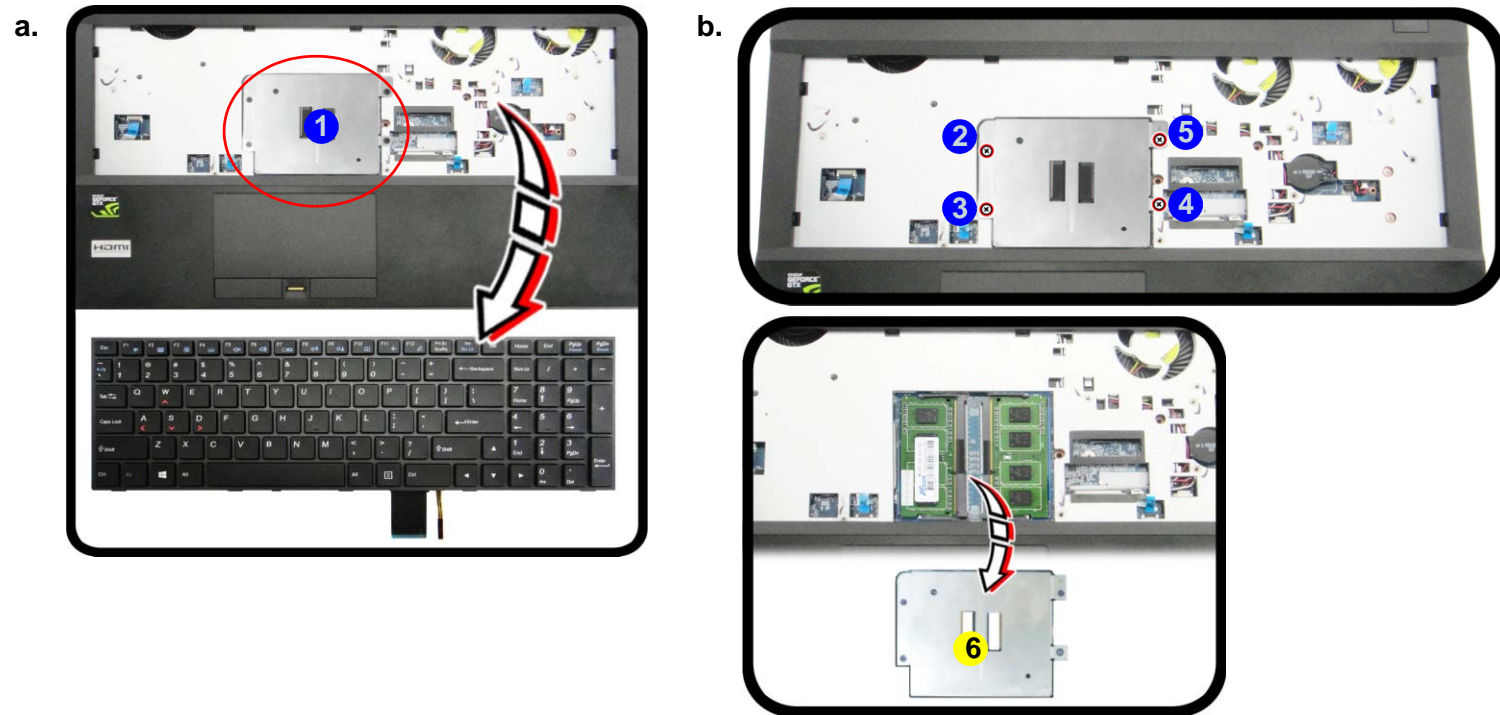
- The RAM modules will be visible at point ①.
- Remove the screws and lift the shielding plate out.

## Removing the System Memory (RAM)

The computer has two memory sockets for 204 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR3L Up to 1600 MHz. The main memory can be expanded up to 32GB. The SO-DIMM modules supported are 1024MB and 2048MB **DDR3L** Modules. The total memory size is automatically detected by the POST routine once you turn on your computer.

### Memory-1 Upgrade Process

- Turn **off** the computer, turn it over, remove the keyboard ([page 2 - 5](#)).
- The RAM modules will be visible at point ① after removing the shielding plate ([Figure 6a](#)).
- Remove screws ② - ⑤ and lift the shielding plate ⑥ off the computer ([Figure 6b](#)).



#### 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.



#### 6. RAM Shielding Plate

- 4 Screws

- Gently pull the two release latches (7 & 8) on the sides of the memory socket in the direction indicated by the arrows (Figure 8c). The RAM module 9 will pop-up (Figure 8d), and you can then remove it.
- Pull the latches to release the second module if necessary.
- Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
- 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.
- Press the module in and down towards the mainboard until the slot levers click into place to secure the module.

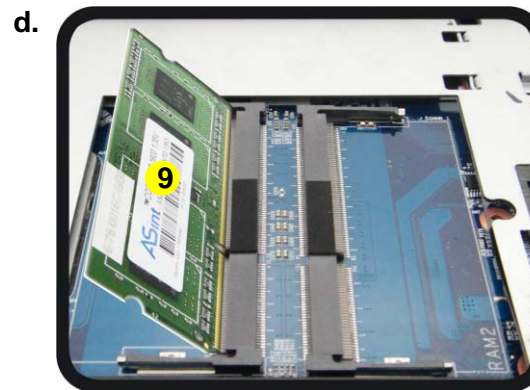
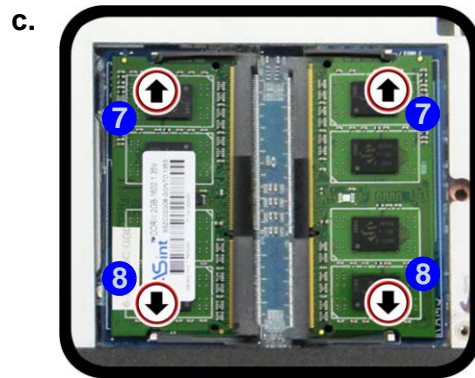


Figure 7  
RAM-1 Module  
Removal (cont'd)

- Pull the release latches.
- 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.



9. RAM Module

## Disassembly

*Figure 8*  
**RAM-2 Module Removal**

- The RAM modules will be visible at point **1** on the mainboard.
- Pull the release latches.
- Remove the module.



### Contact Warning

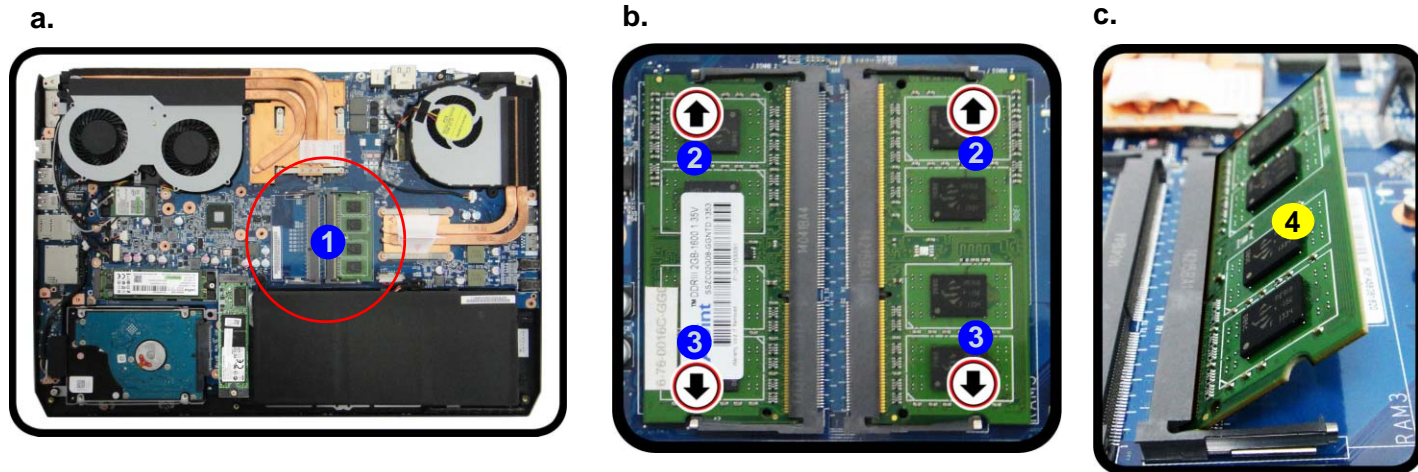
Be careful not to touch the metal pins on the module's connecting edge. Even the cleanest hands have oils which can attract particles, and degrade the module's performance.



### 4. RAM Module

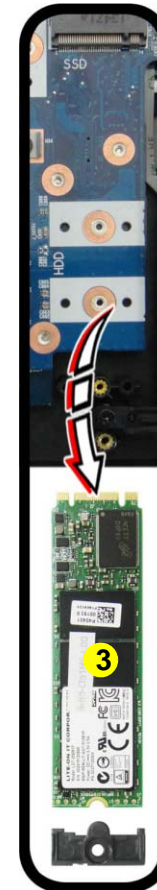
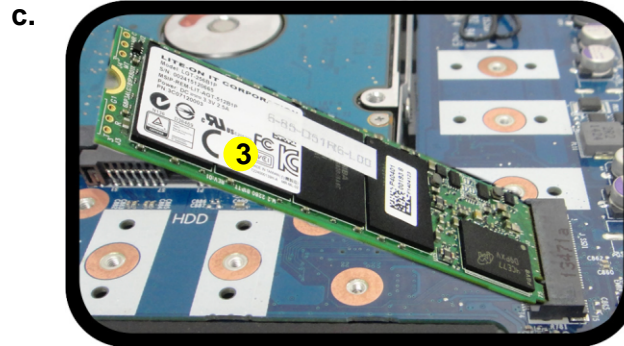
## Memory-2 Upgrade Process


- Turn **off** the computer, turn it over, remove the battery ([page 2 - 6](#)).
- The RAM-2 modules will be visible at point **1** on the mainboard ([Figure 8a](#)).
- Gently pull the two release latches (**2** & **3**) on the sides of the memory socket in the direction indicated by the arrows ([Figure 8b](#)). The RAM module **4** will pop-up ([Figure 8c](#)), and you can then remove it.
- Pull the latches to release the second module if necessary.
- Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
- 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.
- Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
- Replace the bottom cover and the screws (see [page 2 - 6](#)).
- Restart the computer to allow the BIOS to register the new memory configuration as it starts up.



## Removing the M.2 SSD Module

1. Turn **off** the computer, turn it over, remove the battery ([page 2 - 6](#)).
2. The M.2 SSD module will be visible at point **1** on the mainboard ([Figure 9a](#)).
3. Remove the screw **2** ([Figure 9b](#))
4. The M.2 SSD module **3** ([Figure 9c](#)) will pop-up, and you can remove it from the computer.





3.M2 SSD Module

- 1 Screw

- a. Locate the M.2 SSD.  
 b. Remove the screw.  
 c. The M.2 SSD module will pop up.

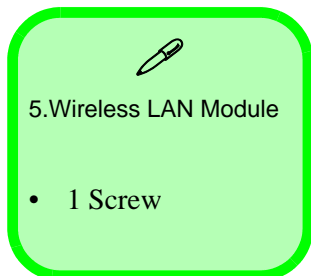
*Figure 9*  
**M.2 SSD Module Removal**

## Disassembly

*Figure 10*  
**Wireless LAN  
Module Removal**

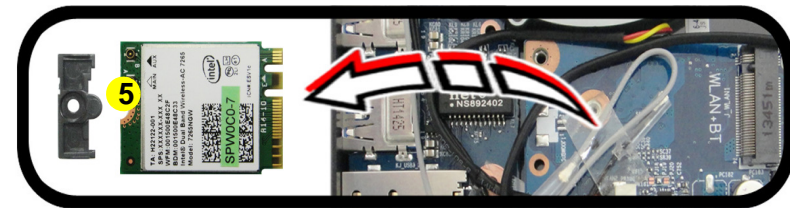
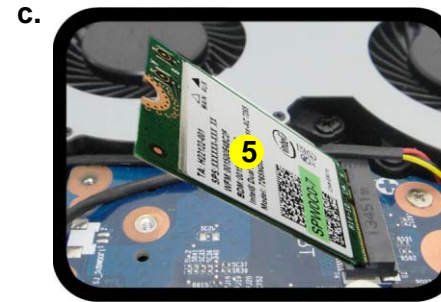
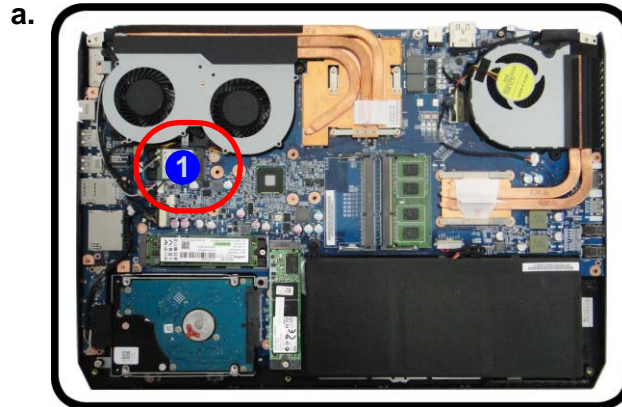
- Locate the WLAN.
- Disconnect the cables **2** and **3**, and remove the screw **4**.
- The WLAN module will pop up.

Note: Make sure you reconnect the antenna cable to the “1 + 2” socket (*Figure 10b*).



## Removing the Wireless LAN Module

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



## Wireless LAN, Combo, 3G & LTE Module Cables

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

Module Type	Antenna Type	Cable Color	Cable Cover Type
WLAN/WLAN & Bluetooth Combo	WM 1	Black	Transparent
	WM 2	Gray	
	WM 3	White	
LTE Broadband	LTE 1	Black	Black
	LTE 2	Gray	
3G Broadband	3G 1	Black	Black
	3G 2	Gray	

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

## Removing and Installing the 3G/SATA Module

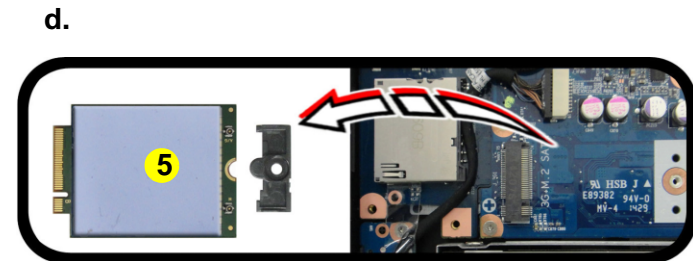
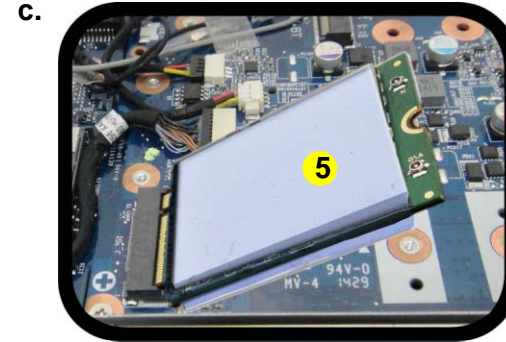
Figure 11

### 3G Module Removal

- Locate the module.
- Disconnect the cables and remove the screw.
- The module will pop-up.
- Lift the module up off the socket.

### 3G Module Removal Procedure

- Turn off the computer, remove the battery ([page 2 - 6](#)).
- Locate the module, it is visible at point **1** ([Figure 11a](#)).
- Carefully disconnect the cables **2** & **3**, and then remove the screw **4** from the module ([Figure 11b](#)).
- The module **3** will pop-up ([Figure 11c](#)).
- Lift the module **5** up and off the computer ([Figure 11d](#)).



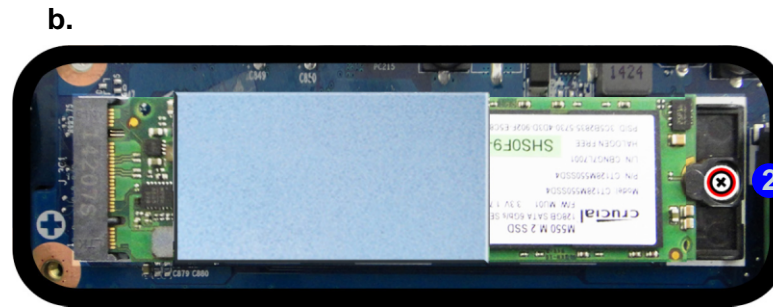
5. 3G Module

- 1 Screw




### SATA Module Removal Procedure

1. Turn off the computer, remove the battery ([page 2 - 6](#)).
2. Locate the module, it is visible at point **1** ([Figure 12a](#)).
3. Remove the screw **2** from the module ([Figure 12b](#)).
4. The module **3** will pop-up ([Figure 12c](#)).
5. Lift the module **3** up and off the computer ([Figure 12d](#)).



*Figure 12*  
**SATA Module Removal**

- a. Locate the module.
- b. Disconnect the cables and remove the screw.
- c. The module will pop-up.
- d. Lift the module up off the socket.



3. SATA Module

- 1 Screw

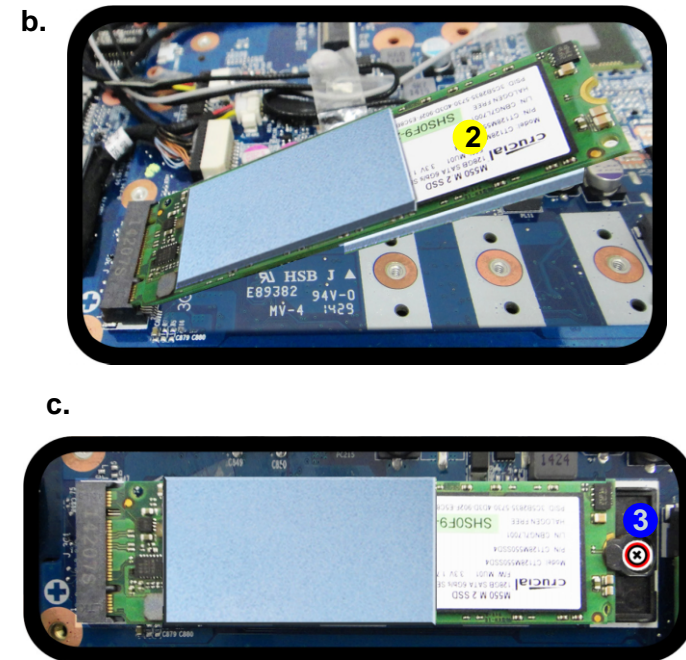
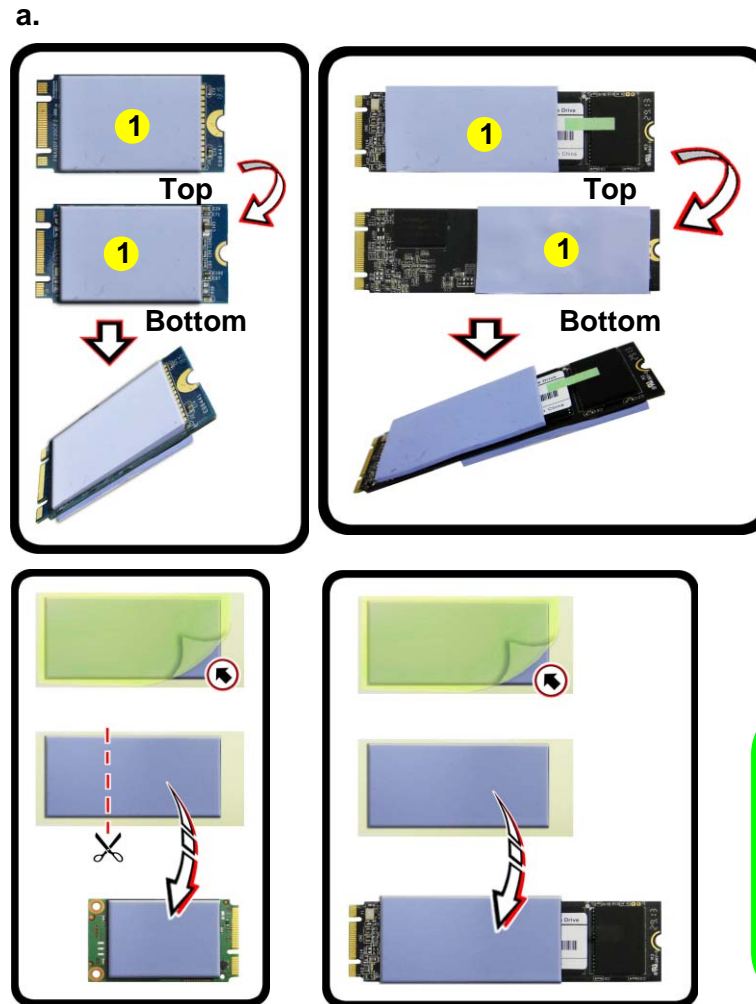
## Disassembly

*Figure 13*  
**3G/SATA Module Installation**

- Place the thermal pad.
- Insert the module.
- Tighten the screw.

### 3G/SATA Installation Procedure

- Place the thermal pad **1** on the module as shown (*Figure 13a*).
- Insert the module **2** in the computer (*Figure 13b*).
- Tighten the screw **3** to secure it in place (*Figure 13c*).



- Thermal Pad
- M2 SATA Module

- 1 Screw



#### Thermal Pad

Be sure to place the thermal pad's adhesive side down onto the module surface.

The thermal pad needs to be cut (along the two markers as shown) to fit the corresponding size of the module.

---

# Appendix A:Part Lists

This appendix breaks down the *P650SE / P651SE* 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.

---

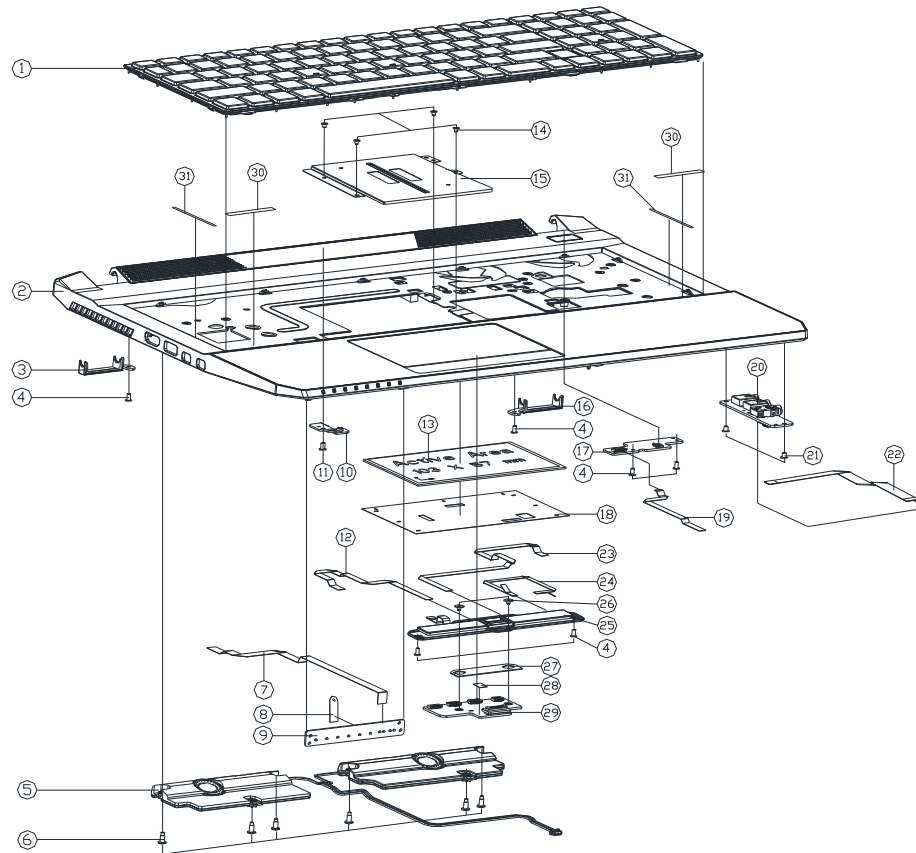
## Part List Illustration Location

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>
Main Board	<i>page A - 5</i>
HDD	<i>page A - 6</i>
LCD	<i>page A - 7</i>

# Top

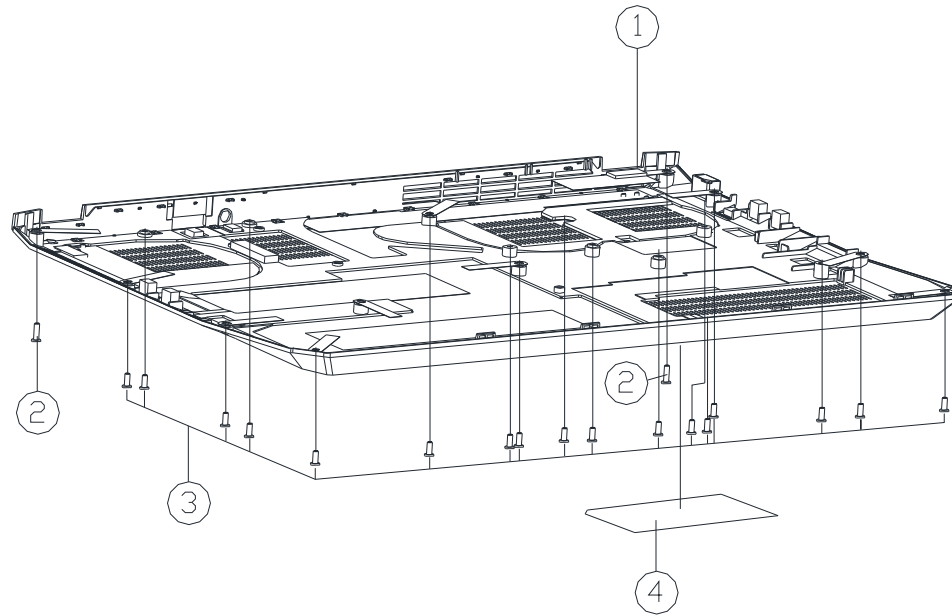


ITEM	PART NAME	NAME
1	MYLAR PET 35x45x0.3MM FE	TOP CASE GAP
2	TOP CASE MODULE (DNKYD)KAPF	TOP CASE MODULE
3	HINGE COVER L (TELJUN)TGT05BK-ENG	HINGE COVER L
4	SCREW M2x4L KI NI ICT NY (20-#)	SCREW
5	SPACER FROM ML 340 13.2TY 0 (DZ02) L-2AS	SPACER
6	SCREW M2x6.2L NI ICT NY FD	SCREW
7	FTC CABLE LED TO MO (P-45) 182MM 6BY	FTC CABLE LED
8	BOTTOM CASE GASKET 3 (30x7x)	BOTTOM CASE GASKET
9	LED BOARD V3.0 P650	LED BOARD
10	SPK BRK-3 (SECC T=1.0MM)	SPK BRK-3
11	SCREW M2.5x4L KI BK/D	SCREW
12	FTC CABLE TNGR TO MO (P-10) 123MM 6I	FTC CABLE TNGR
13	TOUCH PAD SYNAPTICS TM-01474-0	TOUCH PAD
14	SCREW M2x2L KI BK/Z ICT NY	SCREW
15	DDR BRACKET (SUS304)	DDR BRACKET
16	HINGE COVER R MODULE	HINGE COVER R MODULE
17	POWER BOARD V1.0B P	POWER BOARD
18	TOUCH PAD MYLAR PET (25x66)	TOUCH PAD MYLAR PET
19	FTC CABLE POWER TO MO (P-10) 923MM 6I	FTC CABLE POWER
20	AUDIO BOARD V3.0 P1	AUDIO BOARD
21	SCREW M2.5x3L KI NI ICT	SCREW
22	FTC CABLE AUDIO TO MO(P10-45) 946MM 6I	FTC CABLE AUDIO
23	FTC CABLE TRANSFER TO MO (P-10) 196MM 6I	FTC CABLE TRANSFER
24	FTC CABLE TP TO CLICK (P-45) 112MM 6I	FTC CABLE TP TO CLICK
25	FUNCTION KEY FOR CLICK BUTTON MODULE W/O	FUNCTION KEY FOR CLICK BUTTON MODULE W/O
25	FUNCTION KEY FOR CLICK BUTTON MODULE W	FUNCTION KEY FOR CLICK BUTTON MODULE W
26	SCREW M2x2L KI BK/Z ICT NY	SCREW
27	CLICK W/O TP MYLAR PET (48x44x0.5)	CLICK W/O TP MYLAR PET
28	CLICK W/TP MYLAR PET (53x55x0.5)	CLICK W/TP MYLAR PET
29	CLICK BRACKET FROM V30 (P79)W/NEED SCREW	CLICK BRACKET FROM V30
29	CLICK TRANSFER BOARD V3.0 (W/O)	CLICK TRANSFER BOARD V3.0
30	MYLAR MAGNET 35x45x0.3MM FE	MYLAR MAGNET
31	TOP CASE GAP MYLAR(50x15x1.0)	TOP CASE GAP

Figure A - 1  
Top

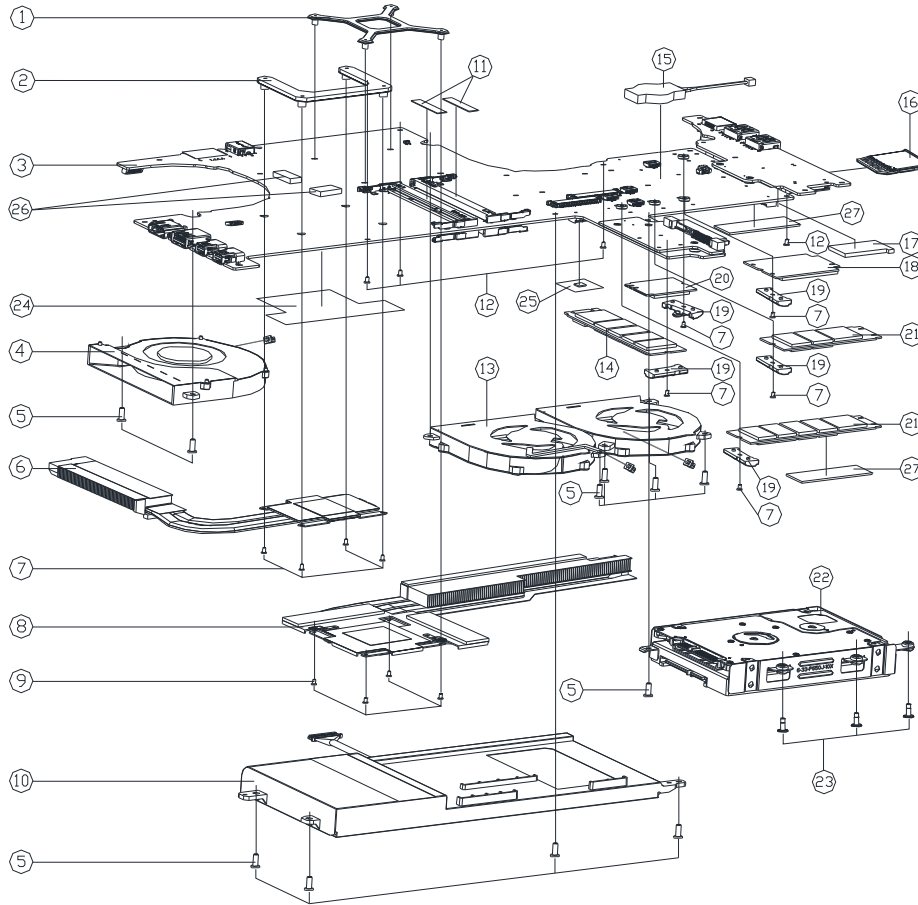
# Bottom

Figure A - 2  
Bottom



ITEM	PART NAME	PART NO	REMARK
1	BOTTOM CASE MODULE P650SE	6-39-P6503-014	
1	BOTTOM CASE MODULE P651SE	6-39-P6513-011	
2	SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
3	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
4	PRODUCT LABEL FOR P650SE	6-45-P650SE03-011	
4	PRODUCT LABEL FOR P651SE	6-45-P651SE03-010	

# Main Board



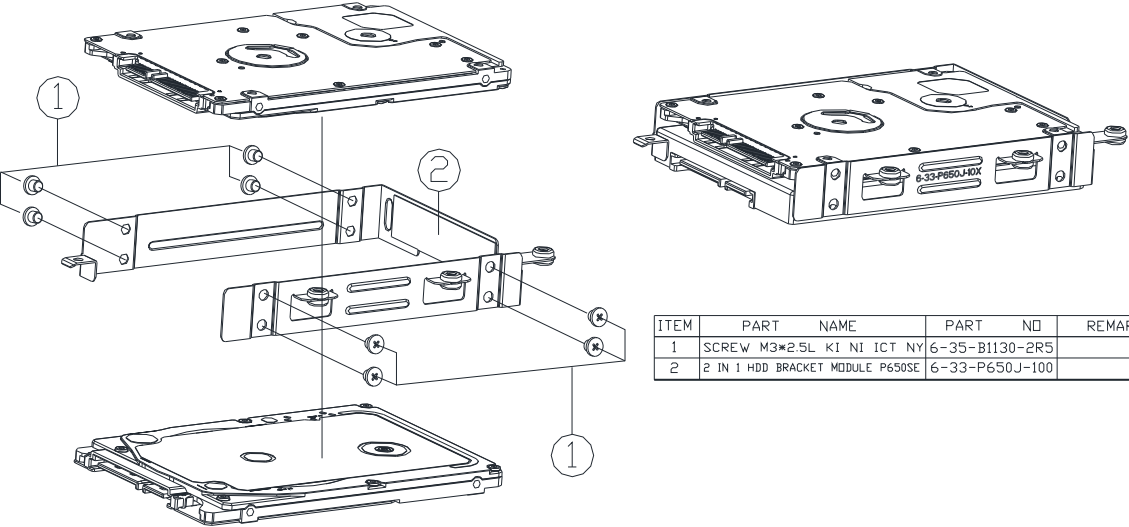
ITEM	PART NAME	PART NO	REMARK
1	VGA SUPPORTER SUS430 X7200	6-33-X720S-040	
2	CPU SUPPORT BRACKET SEC 1-15 P650M	6-33-X510S-011	
3	HEAT SINK MODULE OF PROCESSOR P650E	6-77-P650S0A-N03-B	
3	HEAT SINK MODULE OF PROCESSOR P650E	6-77-P650S0A-N03-C	
3	HEAT SINK MODULE OF PROCESSOR P650E	6-77-P650S0A-N03-D	
3	HEAT SINK MODULE OF PROCESSOR P650E	6-77-P650S0A-N03-E	
3	HEAT SINK MODULE OF PROCESSOR P650E	6-77-P650S0P-003-AF	
4	CPU FAN MODULE OF PROCESSOR P650E	6-31-P6502-101	
5	SCREW M2.5X6L X 8Z ICT NY	6-35-B212S-6RA	
6	CPU HEATSINK MODULE P650SE	6-31-P650N-101	
7	SCREW M2x4L KI NY ICT NY (30-44031-05)	6-35-B1120-4RA	
8	CPU HEATSINK MODULE P650SE	6-31-P6502-201	
9	SCREW M2.5X4L X1.25 X 8Z ICT NY	6-35-B2116-30S	
10	HEAT SINK MODULE OF PROCESSOR P650E	6-87-P650S-4251-1	
10	HEAT SINK MODULE OF PROCESSOR P650E	6-87-P650S-4251	
10	HEAT SINK MODULE OF PROCESSOR P650E	6-87-P650S-4U3	
10	HEAT SINK MODULE OF PROCESSOR P650E	6-87-P650S-4U31	
10	HEAT SINK MODULE OF PROCESSOR P650E	6-87-P650S-4252-1	
10	HEAT SINK MODULE OF PROCESSOR P650E	6-87-P650S-4252	
11	HEAT SINK MODULE OF PROCESSOR P650E	6-87-P650S-030	
12	SCREW M2.5X3L KI NY ICT NY	6-35-B1125-300	
13	CPU FAN MODULE OF PROCESSOR P650E	6-31-P6502-201	
14	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D405B-500	PCIE 2.0 可選品
14	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D5196-L00	OPTION
14	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D5196-B00	OPTION
14	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D5196-100	OPTION
14	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D5158-100	OPTION
14	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D4000-Z02	OPTION
14	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D40CB-L02	PCIE 2.0 可選品
14	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D404J-101	OPTION
14	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D4000-101	OPTION
14	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D5196-N00	OPTION
15	HEAT SINK MODULE OF PROCESSOR P650E	6-23-2E015-TE0	
16	HEAT SINK MODULE OF PROCESSOR P650E	6-42-W9708-020	
17	VIO 2 ANTENNA POSITION RUBBER PAD	6-47-P6502-030	OPTION
18	HEAT SINK MODULE OF PROCESSOR P650E	6-88-5210W-8800	
19	HEAT SINK MODULE OF PROCESSOR P650E	6-88-W3306-8841	
19	HEAT SINK MODULE OF PROCESSOR P650E	6-42-P6503-031	
20	HEAT SINK MODULE OF PROCESSOR P650E	6-88-P650F-8100	OPTION
20	HEAT SINK MODULE OF PROCESSOR P650E	6-88-P6502-4250	OPTION
20	HEAT SINK MODULE OF PROCESSOR P650E	6-88-P6502-4210	OPTION
20	HEAT SINK MODULE OF PROCESSOR P650E	6-88-P6502-4230	OPTION
20	HEAT SINK MODULE OF PROCESSOR P650E	6-88-5210F-9400	OPTION
21	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D5196-B00	OPTION
21	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D5196-100	OPTION
21	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D5158-100	OPTION
21	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D4000-Z02	OPTION
21	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D404J-101	OPTION
21	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D4000-101	OPTION
21	HEAT SINK MODULE OF PROCESSOR P650E	6-85-D5196-N00	OPTION
22	W/D HDD ASS'Y P650SE	6-79-P650S0J-010	
22	W/HDD ASS'Y P650SE	6-79-P650S0J-020	
22	W/D 2ND HDD ASS'Y P650SE	6-79-P650S0J-030	
22	W/ 2ND HDD ASS'Y P650SE	6-79-P650S0J-040	
22	W/HDD ASS'Y P650SG	6-79-P650S0G-020	
22	W/D 2ND HDD ASS'Y P650SG	6-79-P650S0G-030	
22	W/ 2ND HDD ASS'Y P650SG	6-79-P650S0G-040	
23	SCREW M2x4L KI NY FOR SPEAKER	6-35-Z1120-6R2	FOR P650SE, 47
24	HEAT SINK MODULE OF PROCESSOR P650E	6-47-P650S-020	
25	AL FOL+THERMAL PAD 20x20 P650E	6-40-P650S-020	
26	RUBBER NO SOLUTION 60 DEGREE P650E	6-47-P6502-030	
27	HEAT SINK MODULE OF PROCESSOR P650E	6-48-P650S-020	

Figure A - 3  
Main Board

A.Part Lists

# HDD

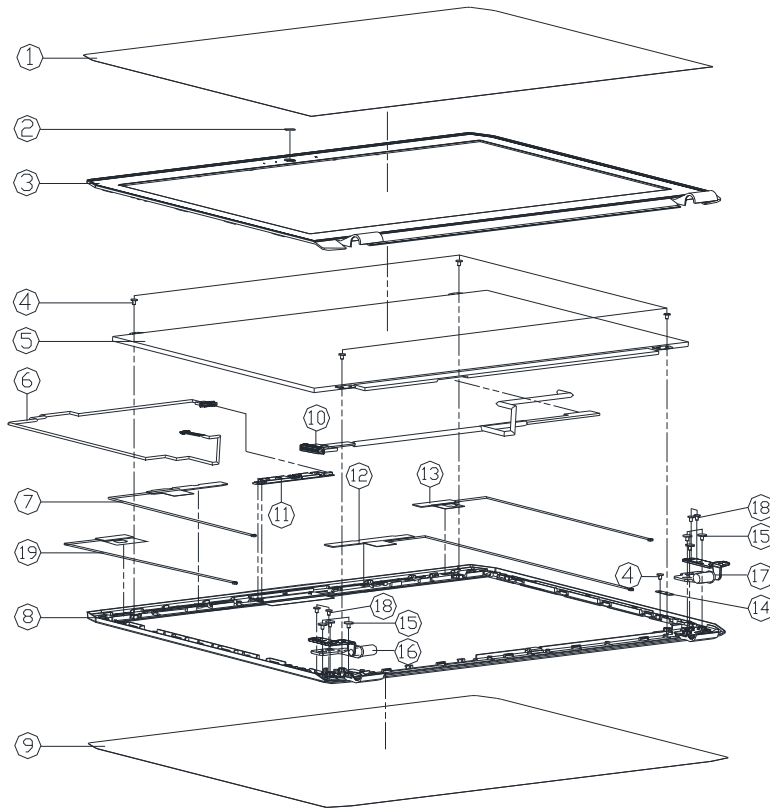
Figure A - 4  
HDD



ITEM	PART NAME	PART NO	REMARK
1	SCREW M3*2.5L K1 NI ICT NY	6-35-B1130-2R5	
2	2 IN 1 HDD BRACKET MODULE P650SE	6-33-P650J-100	



# LCD



ITEM	PART NAME	PART NO	REMARK
1	LCD FRONT COVER PROTECTION MIRROR (PET-30695) P650SE	6-40-P6501-010	
2	CCD LENS PMMA P650SE	6-42-P6501-010	
3	LCD FRONT COVER MODULE P650SE	6-39-P6501-013	
4	SCREW M2x2.5L KI BK/2 ICT NY 1# 435 T=05	6-35-B6120-2RD	
5	LCD 15.6" 600 QD CLARE TYPE SHARP (S530) 300MM 300MM LED 32MM	6-50-L1131-A00	
5	LCD 15.6" FHD CLARE TYPE (IPS) IPS (P65) 300MM 300MM LED 32MM	6-50-L1226-M00	
5	LCD 15.6" W/HD / FEP CLARE TYPE (PANGSANG) 300MM 300MM LED 32MM	6-50-L6235-P00	
5	LCD 15.6" FHD/CEP CLARE TYPE AU (SH64TN036) 32MM	6-50-LB232-G06	
5	LCD 15.6" W/HD / FEP (IPS) (P65) (PANGSANG) 300MM 300MM LED 32MM	6-50-L6230-P00	
5	LCD 15.6" FHD CHIMEI (N556)CE-LAI (LED) 32 MM	6-50-LB232-D01	
5	LCD 15.6" FHD /CEP AU (SH64TN036) (LED) 32MM	6-50-LB232-G08	
5	LCD 15.6" FHD CHIMEI (N556)CE-LAI (CLARE) TYPE (LED) 32 MM	6-50-LB232-D00	
5	LCD 15.6" 600 QD (IPS) MODE SHARP (S530) 300MM 300MM LED 32MM	6-50-L1231-A00	
6	WIRE CABLE FOR CCD S530MM 300V 8PIN P650SE	6-43-P650T-011	
7	ANTENNA PEEL SHALE JIN LI 2 PCB (K400A) 150MM 150MM 1.500MM P650SE	6-23-7P650-071	※ 液晶パネルに貼付する 时可以贴 LITE 2.5mm
8	LCD BACK COVER MODULE P650SE	6-39-P6501-024	
8	LCD BACK COVER MODULE P651SE	6-39-P6511-023	
9	LCD BACK COVER PROTECTION MIRROR (PET-30695) P650SE	6-40-P6501-020	
10	WIRE CABLE FOR (S530) 300MM 300V 8PIN P650SE	6-43-P6501-051	
10	WIRE CABLE FOR (S530) 300MM 300V 8PIN P650SE	6-43-P6501-021-P	
10	WIRE CABLE FOR (S530) 300MM 300V 8PIN P6501-031-P	6-43-P6501-031-P	
10	WIRE CABLE FOR (S530) 300MM 300V 8PIN P6501-041-P	6-43-P6501-041-P	
10	WIRE CABLE FOR (S530) 300MM 300V 8PIN P6501-011-P	6-43-P6501-011-P	
11	WIRE CABLE FOR (S530) 300MM 300V 8PIN P650C-4900	6-88-P650C-4900	OPTION
12	ANTENNA PEEL SHALE JIN LI 2 PCB (K400A) 150MM 150MM 1.500MM P650SE	6-23-7P650-060	※ 液晶パネルに貼付する 时可以贴 LITE 2.5mm
13	ANTENNA PEEL SHALE JIN LI 2 PCB (K400A) 150MM 150MM 1.500MM P650SE	6-23-7P650-041	OPTION
14	LCD PANEL BRACKET (SECC) P650SE	6-33-P6501-010	ONLY FOR SHARP
15	SCREW M2x2L KI BK/2 ICT NY(40#,T=06)	6-35-B6120-2RE	
16	LCD HINGE L (SK7) P650SE	6-33-P6501-0L1	
17	LCD HINGE R (SK7) P650SE	6-33-P6501-0R1	
18	SCREW M2.5x3L KI NI ICT NY	6-35-B1125-3R0	
19	ANTENNA PEEL SHALE JIN LI 2 PCB (K400A) 150MM 150MM 1.500MM P650SE	6-23-7P650-051	

Figure A - 5  
LCD



# Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the *P650SE / P651SE* notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

Diagram - Page	Diagram - Page	Diagram - Page
<i>System Block Diagram - Page B - 2</i>	<i>Frame Buffer Partition C - Page B - 25</i>	<i>Fan, LID, KB, LED, G Sensor - Page B - 51</i>
<i>Processor 1/7-DMI, FDI, PEG - Page B - 3</i>	<i>Frame Buffer Partition D - Page B - 26</i>	<i>Connector - Page B - 52</i>
<i>Processor 2/7- CLK, MISC - Page B - 4</i>	<i>Frame Buffer Partition C_D - Page B - 27</i>	<i>DDR 1.35V / 0.75VS, PCH 1.5V - Page B - 53</i>
<i>Processor 3/7- (DDR3L) - Page B - 5</i>	<i>GPU Decoupling - Page B - 28</i>	<i>VDD3, VDD5 - Page B - 54</i>
<i>Processor 4/7- Display - Page B - 6</i>	<i>DACA Interface XTAL - Page B - 29</i>	<i>5V, 5VS, 3.3V, 3.3VS, 3.3VA - Page B - 55</i>
<i>Processor 5/7- Power - Page B - 7</i>	<i>IFP I/O Interface - Page B - 30</i>	<i>1.05 Series - Page B - 56</i>
<i>Processor 6/7- POGND - Page B - 8</i>	<i>Misc - GPIO, I2C and ROM - Page B - 31</i>	<i>AC_In, Charger - Page B - 57</i>
<i>Processor 7/7- RSVD - Page B - 9</i>	<i>GPU NVVDD, FBVDDQ, and GND - Page B - 32</i>	<i>POWER V-Core1 - Page B - 58</i>
<i>DDR3 CHA SO-DIMM_0 - Page B - 10</i>	<i>Lynx 1/9 - Page B - 33</i>	<i>PEX_VDD, 3V3_AON, 3V3_RUN - Page B - 59</i>
<i>DDR3 CHA SO-DIMM_1 - Page B - 11</i>	<i>Lynx 5/9 - Page B - 37</i>	<i>NVVDD Phase 1 &amp; 2 - Page B - 60</i>
<i>DDR3 CHB SO-DIMM_0 - Page B - 12</i>	<i>Lynx 6/9 - Page B - 38</i>	<i>FBVDDQ - Page B - 61</i>
<i>DDR3 CHB SO-DIMM_1 - Page B - 13</i>	<i>Lynx 7/9 - Page B - 39</i>	<i>Audio Board - Page B - 62</i>
<i>Panel, Inverter - Page B - 14</i>	<i>Lynx 8/9 - Page B - 40</i>	<i>Power Board - Page B - 63</i>
<i>RTD2136N-CG - Page B - 15</i>	<i>Lynx 9/9 - Page B - 41</i>	<i>HDD Board - Page B - 64</i>
<i>Mini DP Port D - Page B - 16</i>	<i>USB3.0 + eSATA Combo - Page B - 42</i>	<i>LED Board - Page B - 65</i>
<i>Mini DP Port B - Page B - 17</i>	<i>USB Charger - Page B - 43</i>	<i>Finger Sensor Board - Page B - 66</i>
<i>HDMI Connector - Page B - 18</i>	<i>M.2 3G + M.2 SATA - Page B - 44</i>	<i>Click Board - Page B - 67</i>
<i>VGA PCI Express - Page B - 19</i>	<i>M.2 WLAN+BT, PCIE4X SSD - Page B - 45</i>	<i>USB Board 1/4 - Page B - 68</i>
<i>VGA Frame Buffer Partition - Page B - 20</i>	<i>Realtek ALC892 - Page B - 46</i>	<i>USB Board 2/4 - Page B - 69</i>
<i>Frame Buffer Partition A - Page B - 21</i>	<i>TPA2008D2 - Page B - 47</i>	<i>USB Board 3/4 - Page B - 70</i>
<i>Frame Buffer Partition B - Page B - 22</i>	<i>Subwoofer - Page B - 48</i>	<i>USB Board 4/4 - Page B - 71</i>
<i>Frame Buffer Partition A_B - Page B - 23</i>	<i>KBC-ITE IT8587 - Page B - 49</i>	<i>Power Board - Page B - 72</i>
<i>GPU Frame Buffer Partition - Page B - 24</i>	<i>TPM, CCD, TP - Page B - 50</i>	<i>LED Board - Page B - 73</i>

Table B - 1  
**SCHEMATIC  
DIAGRAMS**

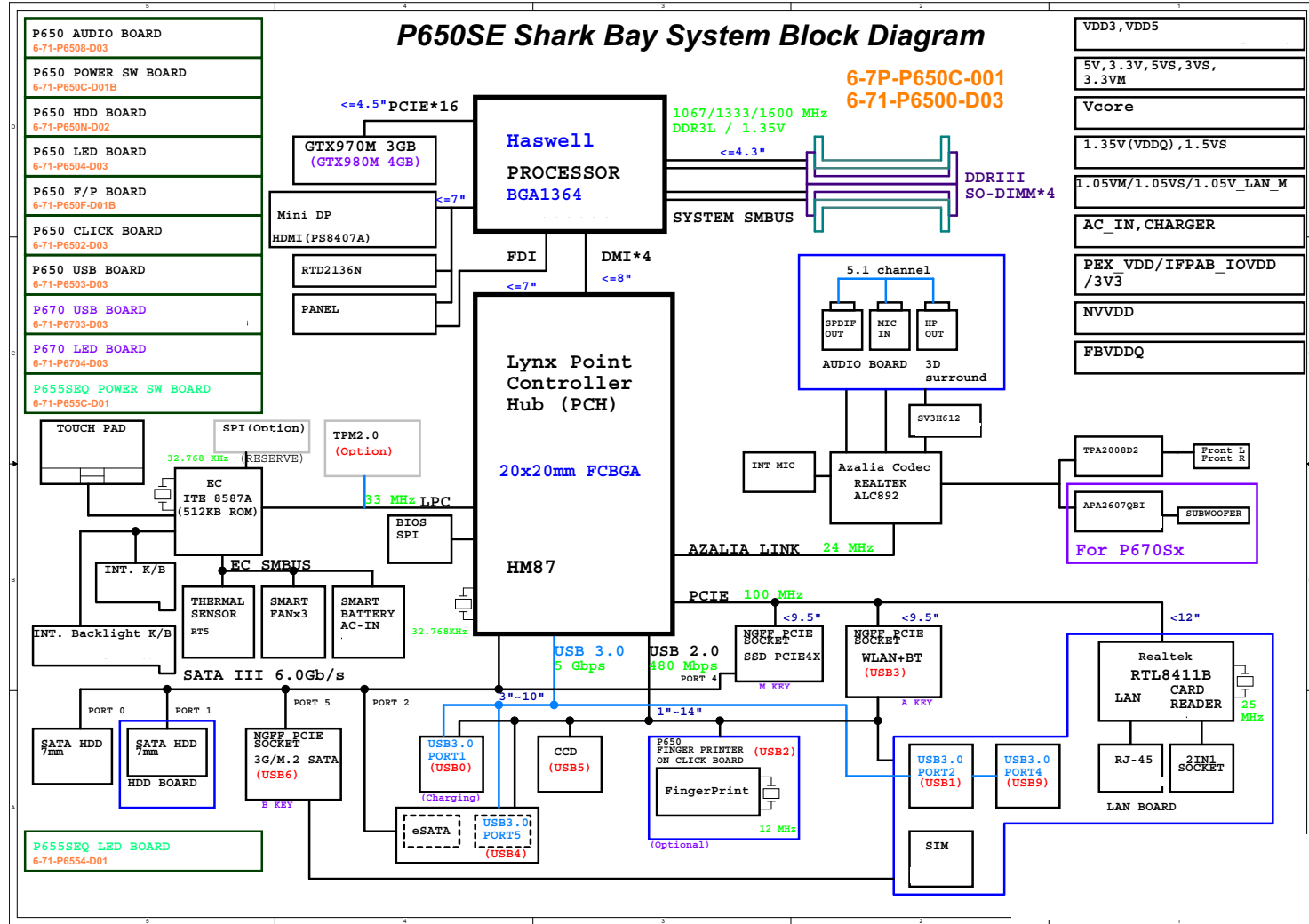


**Version Note**

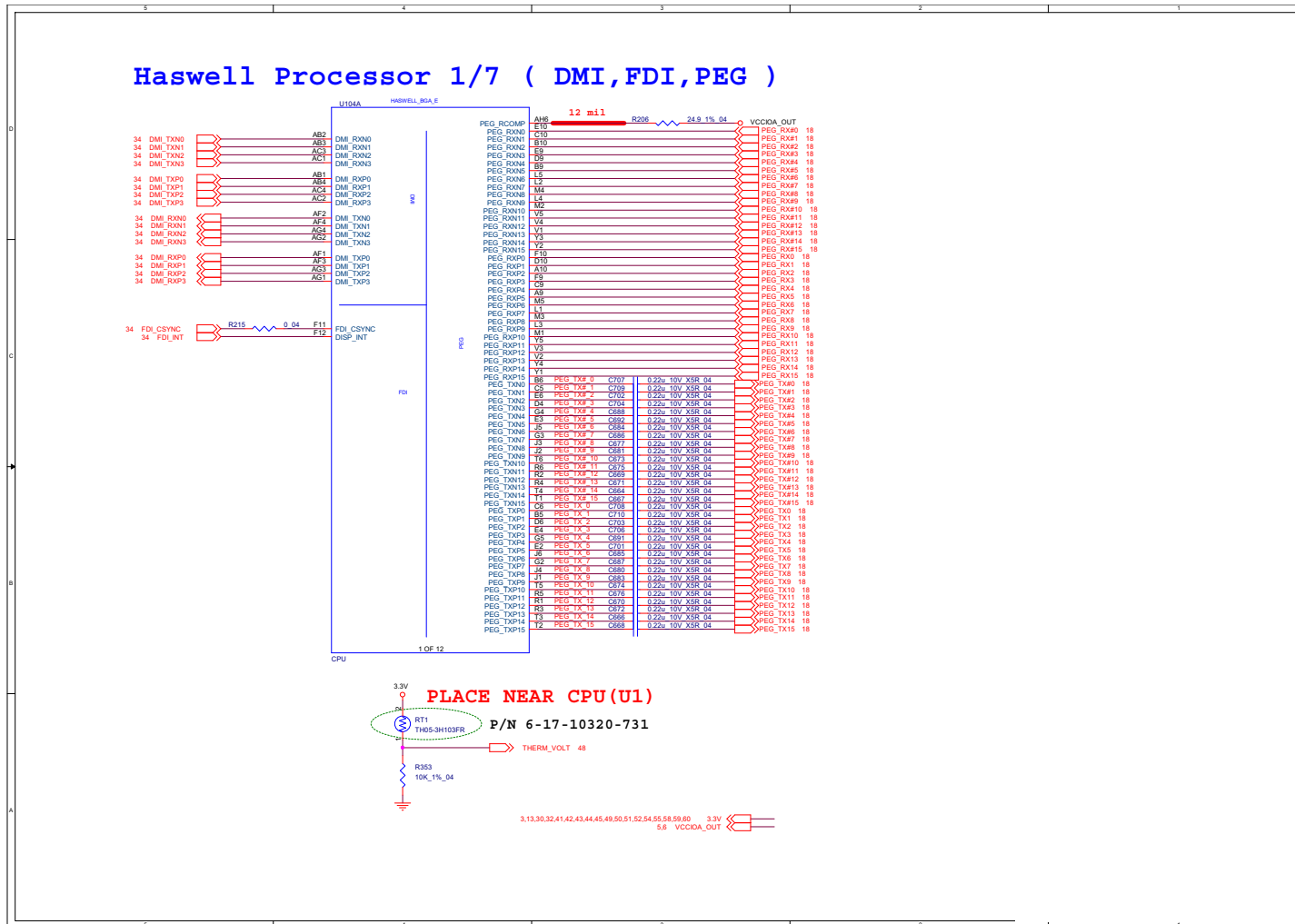
The schematic diagrams in this chapter are based upon version 6-7P-P650C-001. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

# System Block Diagram

Sheet 1 of 72  
System Block  
Diagram



# Processor 1/7-DMI, FDI, PEG

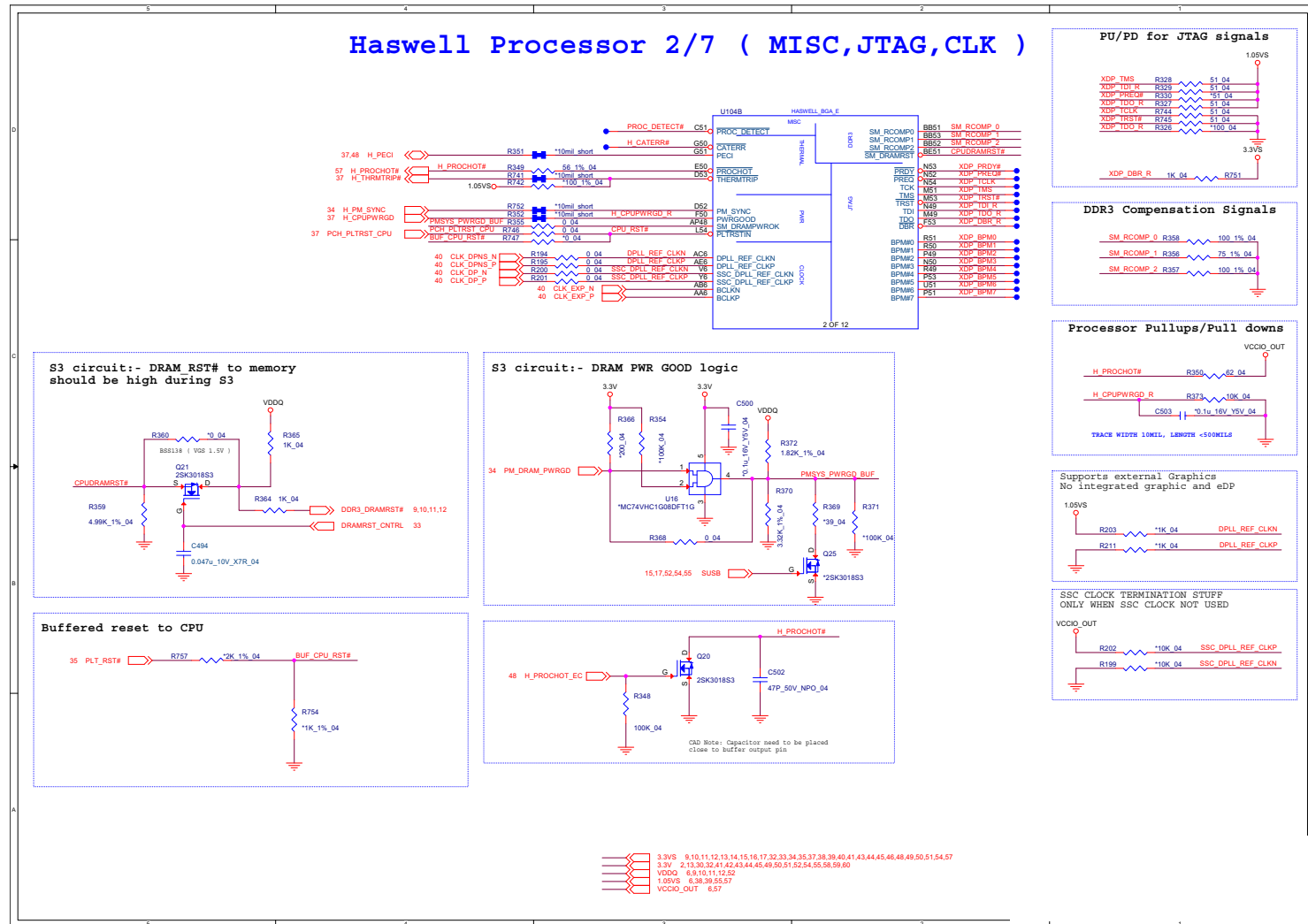


Sheet 2 of 72  
 Processor 1/7-DMI,  
 FDI, PEG

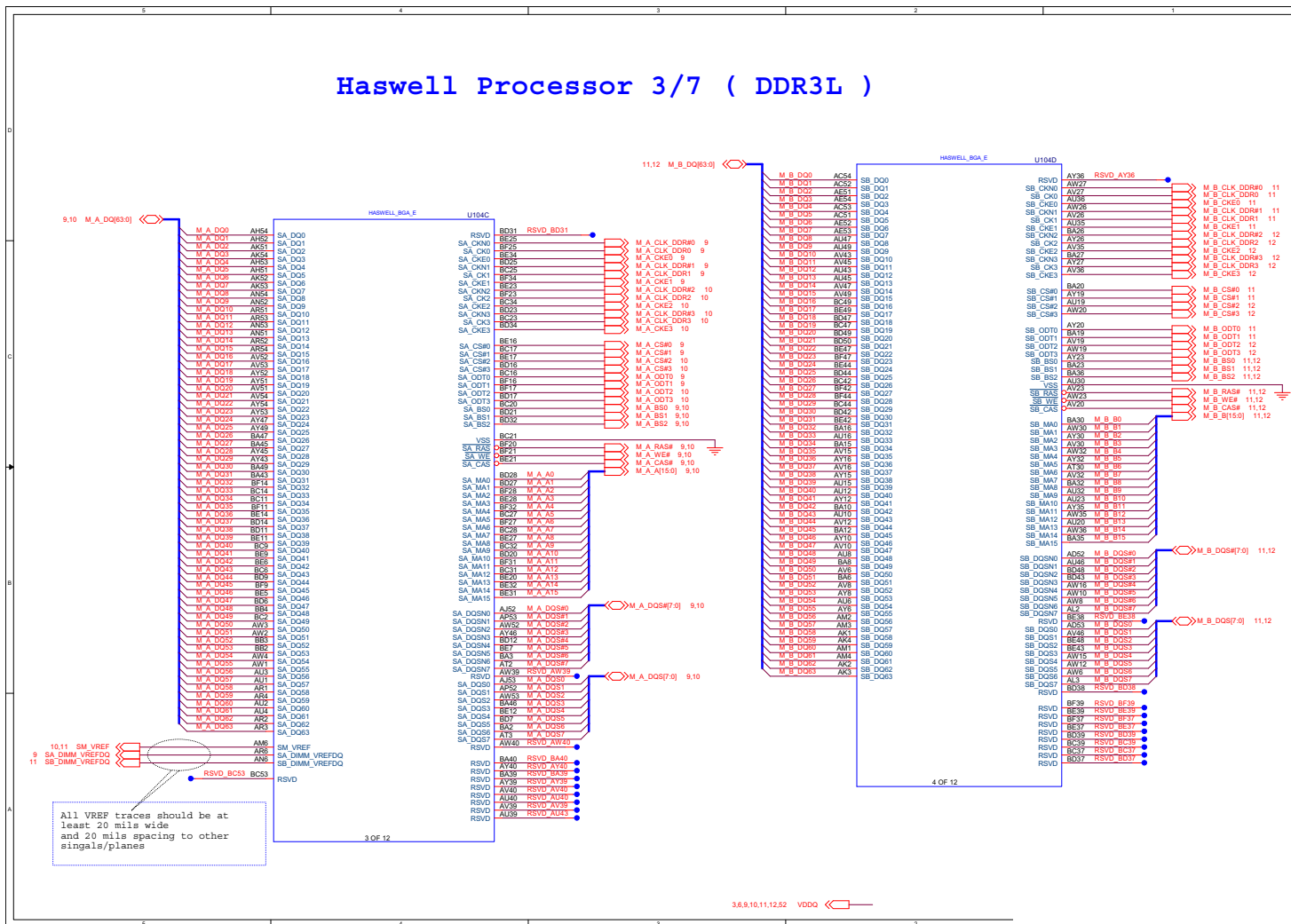
B.Schematic Diagrams

# Processor 2/7- CLK, MISC

Sheet 3 of 72  
Processor 2/7-CLK,  
MISC



# Processor 3/7- (DDR3L)

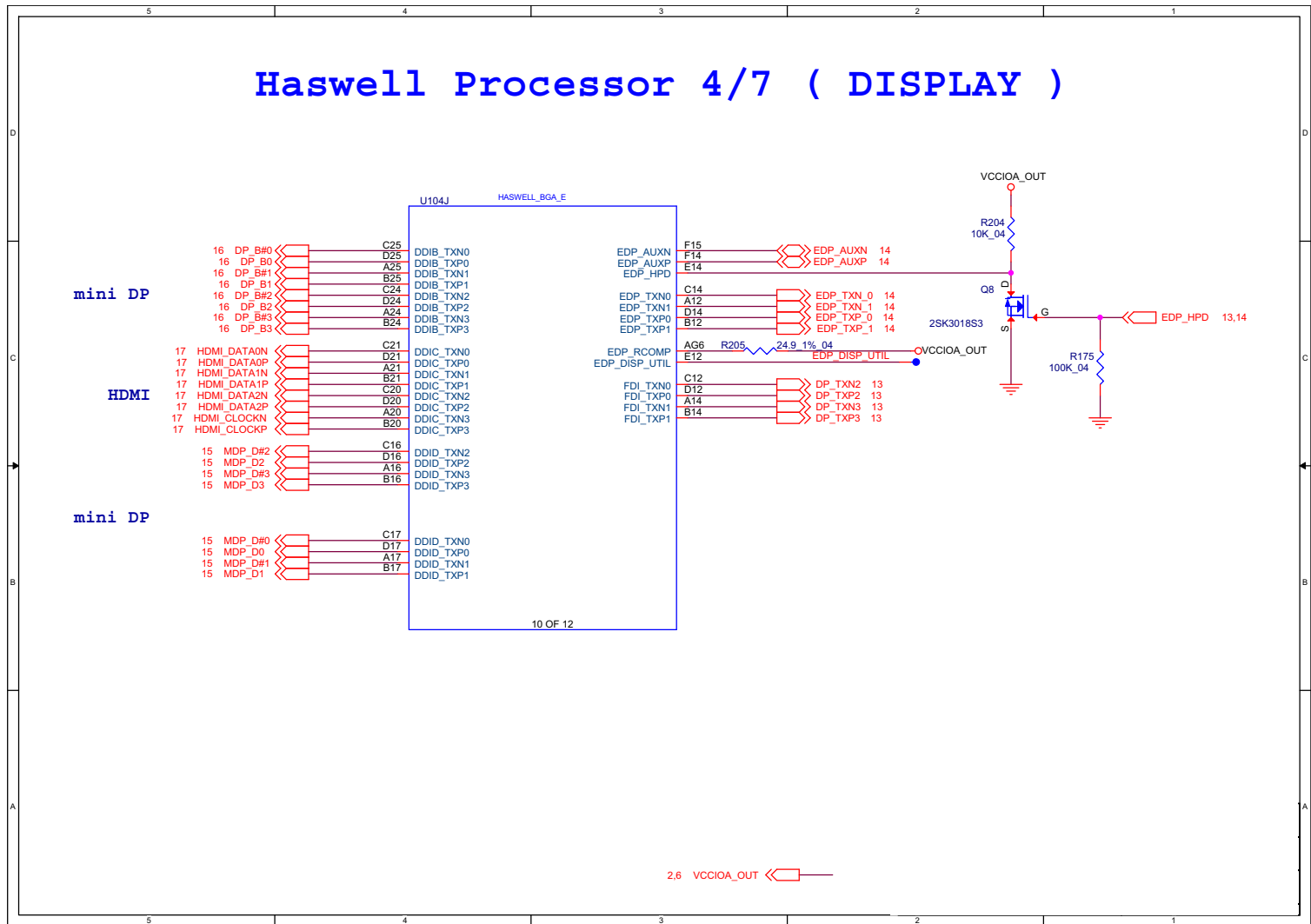


B.Schematic Diagrams

Sheet 4 of 72  
Processor 3/7-  
(DDR3L)

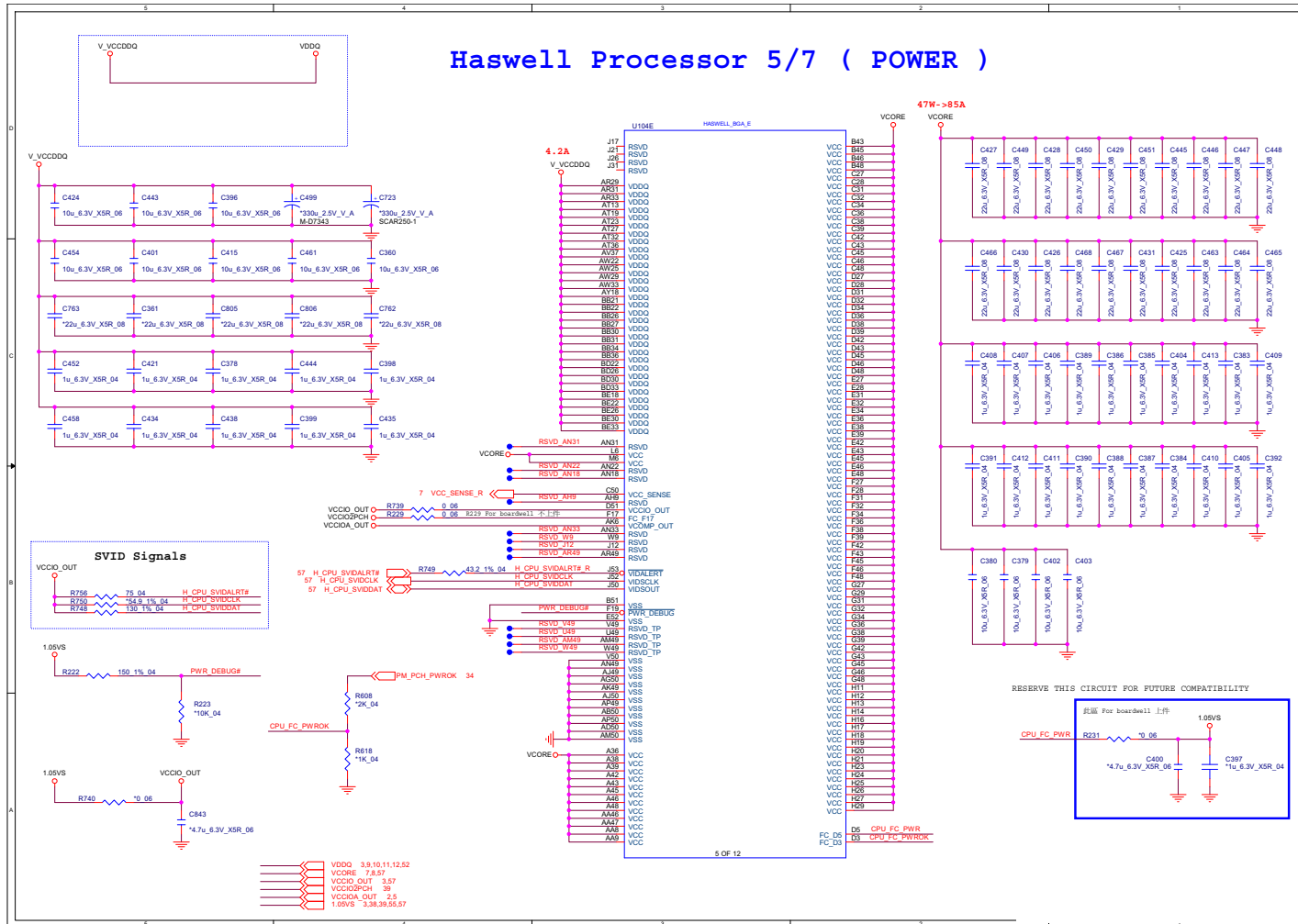
# Processor 4/7- Display

Sheet 5 of 72  
Processor 4/7-  
Display





# Processor 5/7- Power



Sheet 6 of 72  
Processor 5/7-  
Power

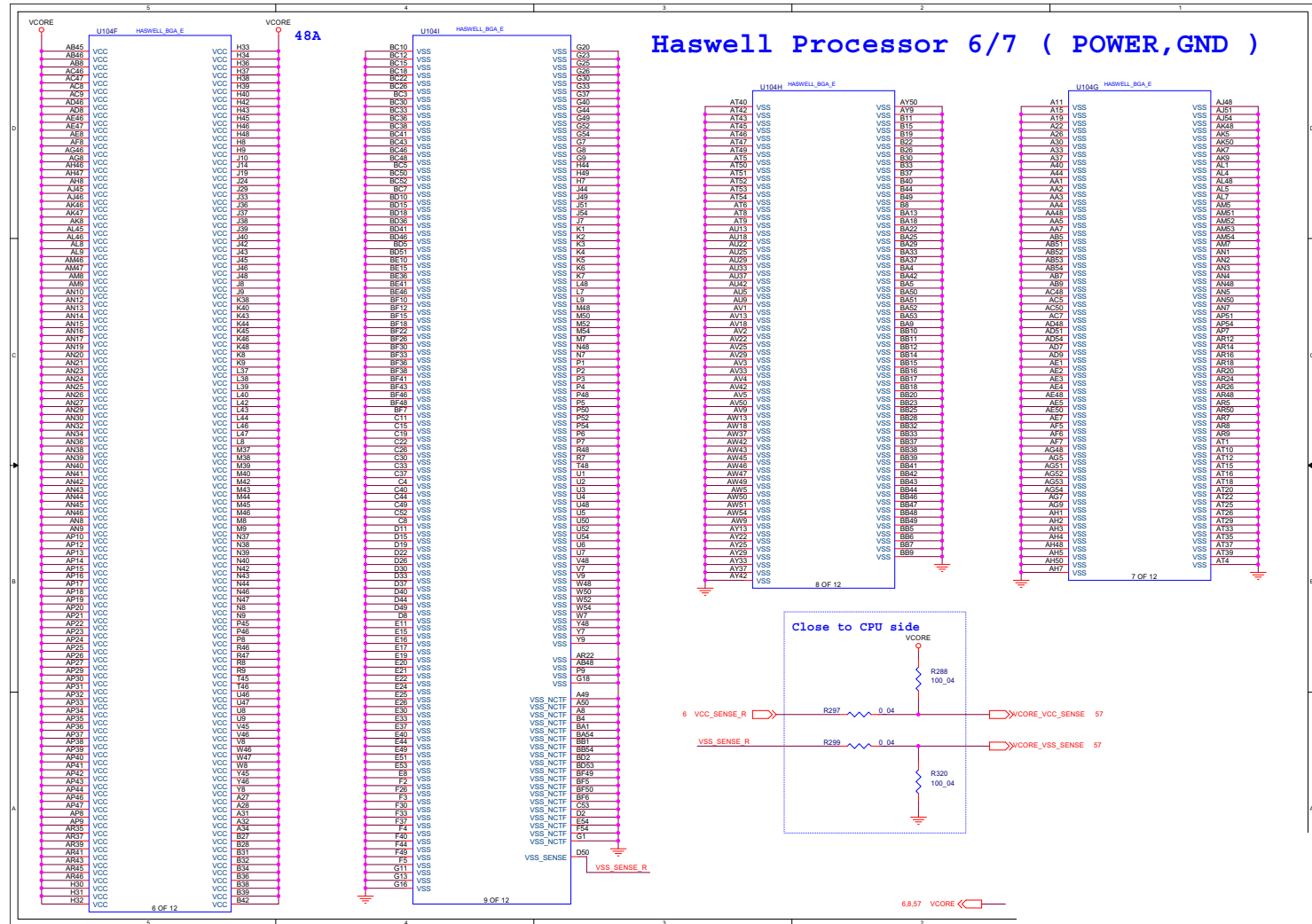
B.Schematic Diagrams

# Schematic Diagrams

## Processor 6/7- POGND

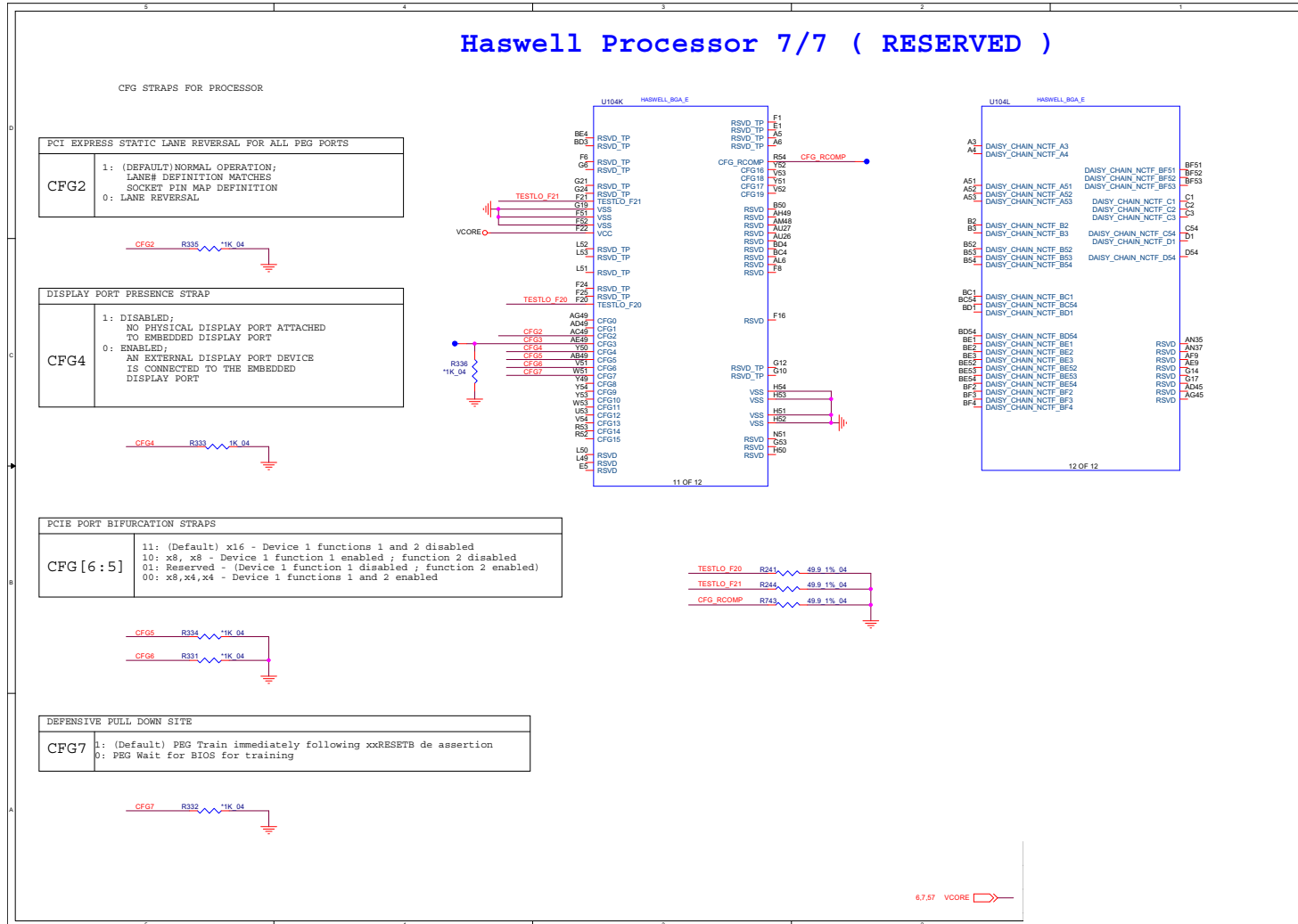
B.Schematic Diagrams

Sheet 7 of 72  
Processor 6/7- GND



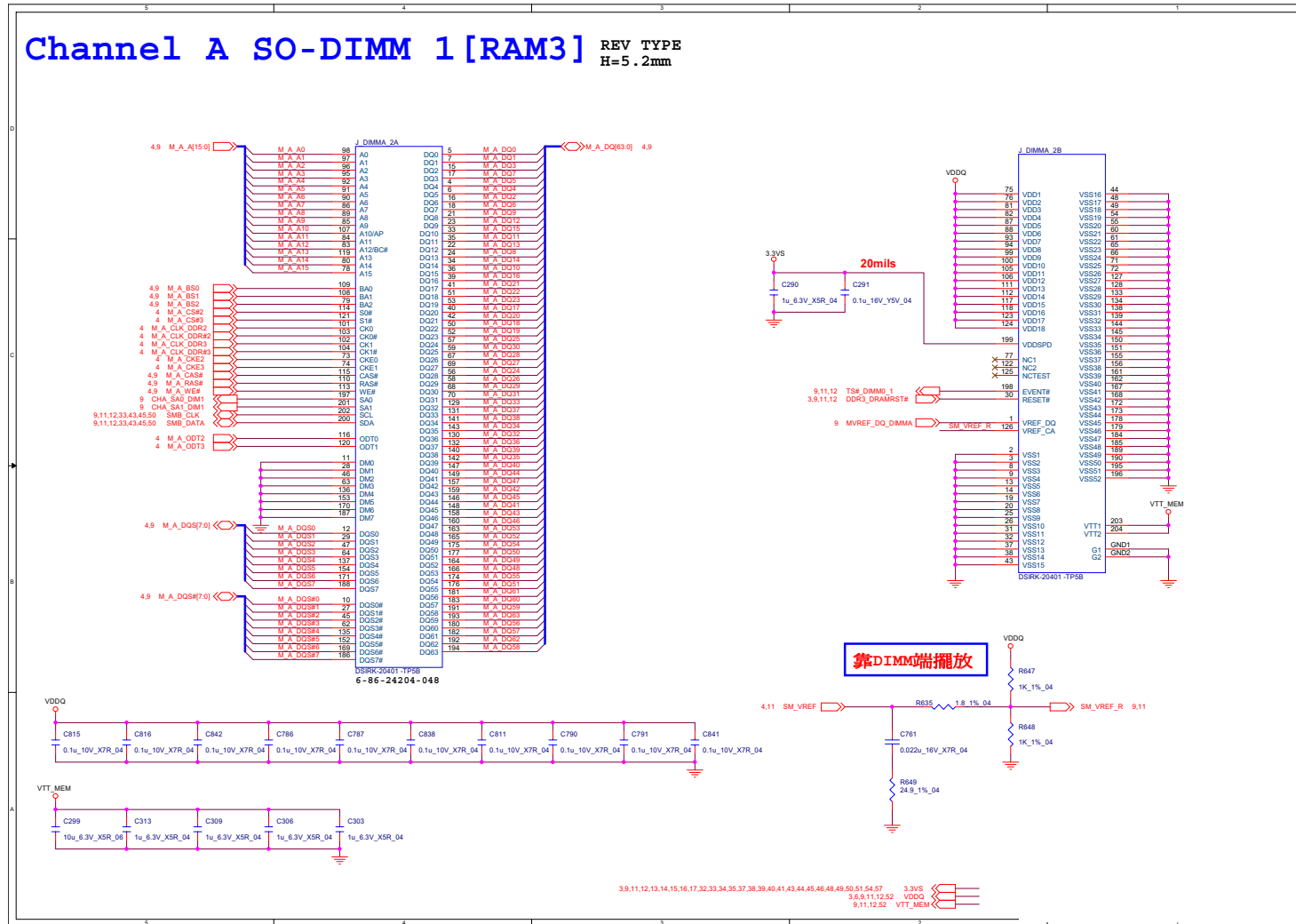
# Processor 7/7- RSVD

Sheet 8 of 72  
Processor 7/7-  
RSVD





# DDR3 CHA SO-DIMM\_1

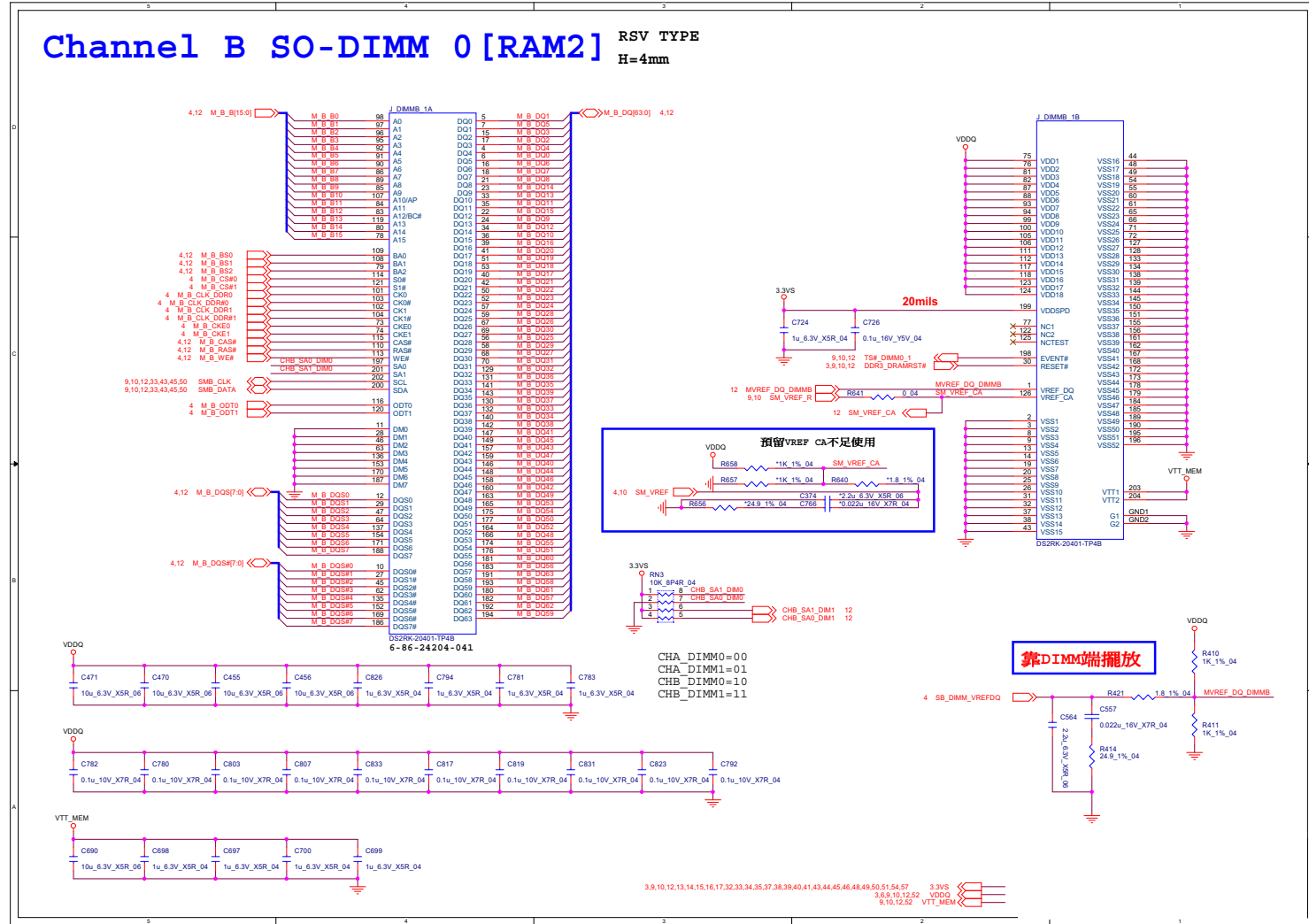


B.Schematic Diagrams

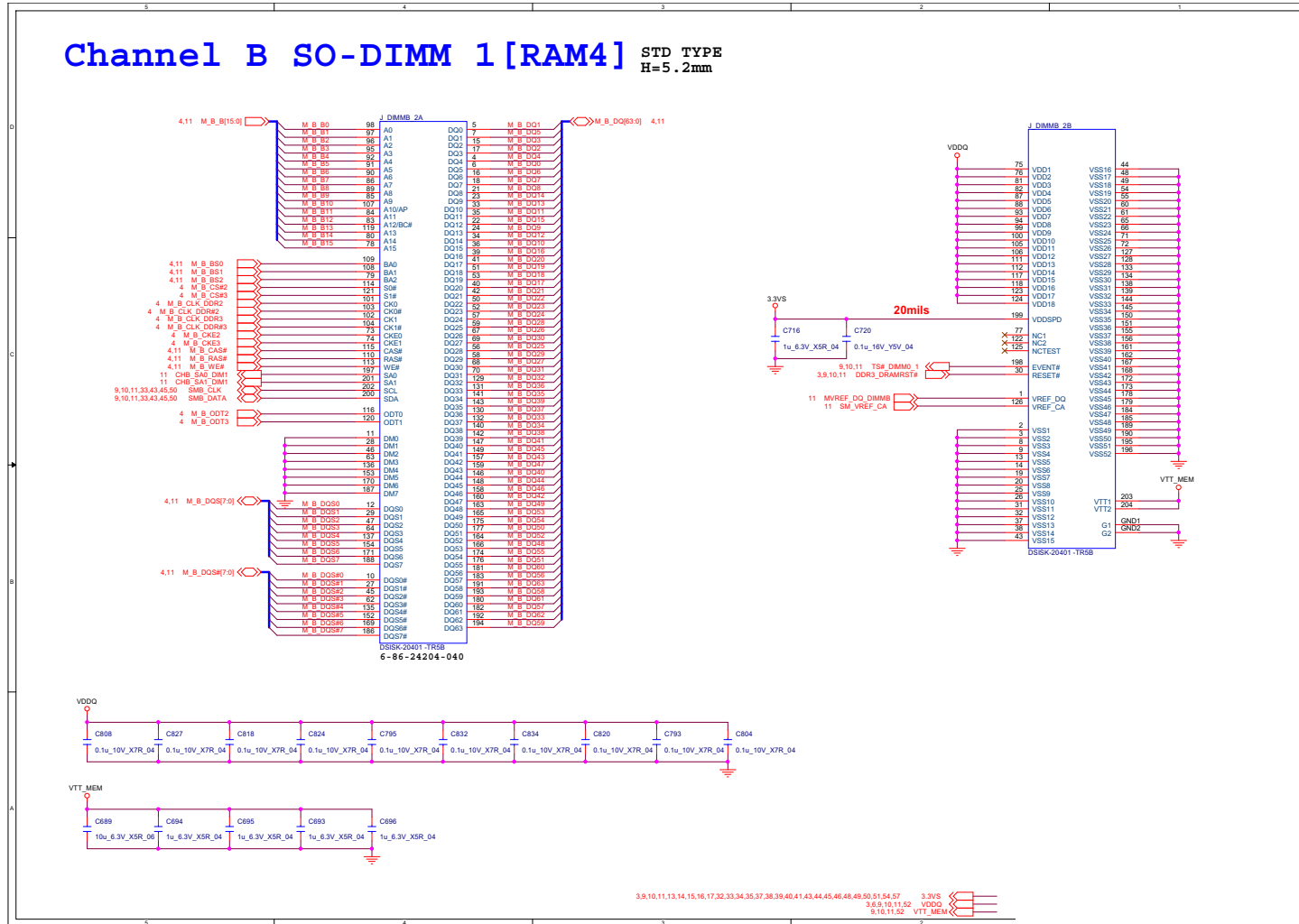
Sheet 10 of 72  
DDR3 CHA SO-DIMM\_1

# DDR3 CHB SO-DIMM\_0

Sheet 11 of 72  
DDR3 CHB SO-  
DIMM\_0



# DDR3 CHB SO-DIMM\_1

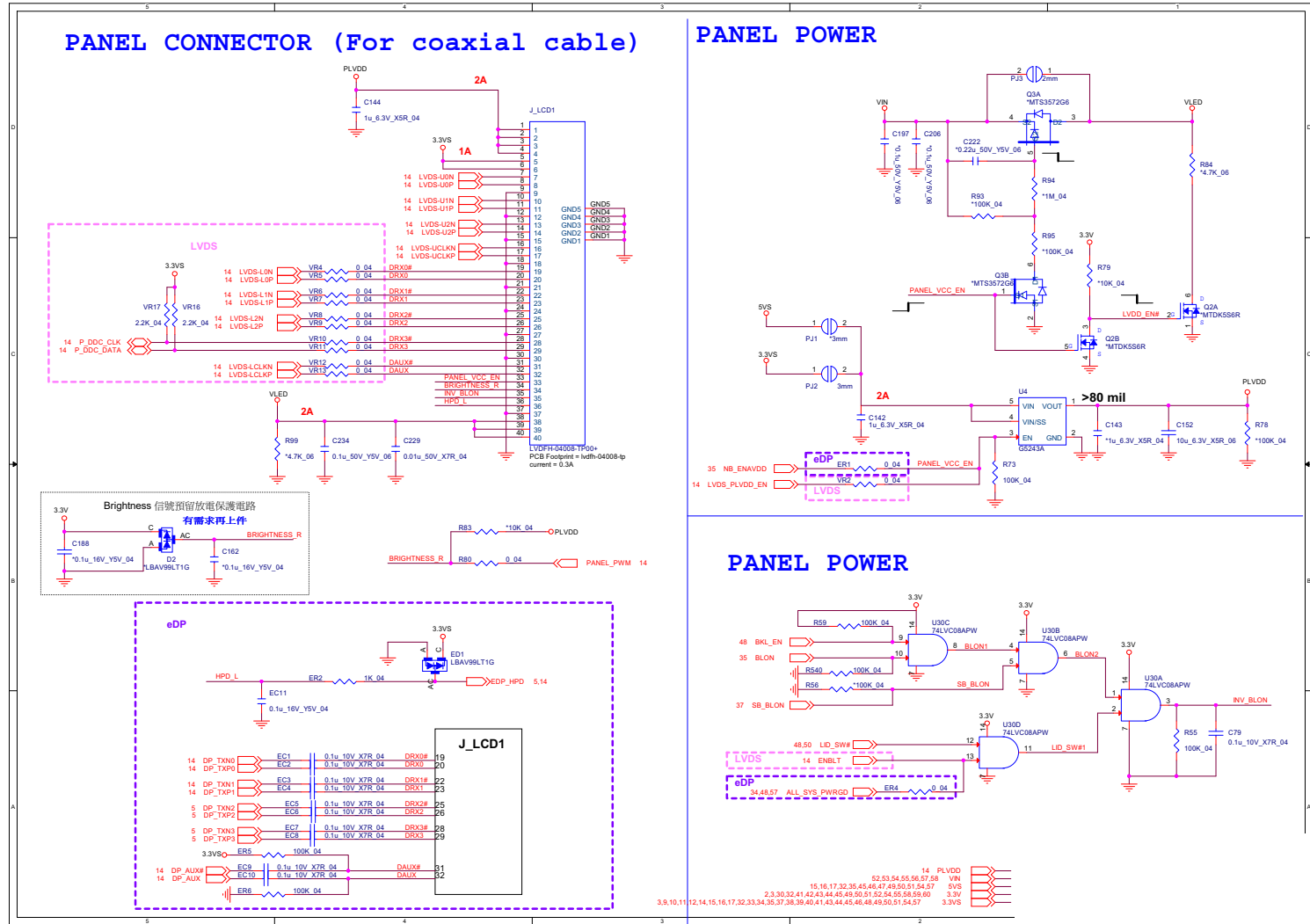


Sheet 12 of 72  
DDR3 CHB SO-DIMM\_1

B.Schematic Diagrams

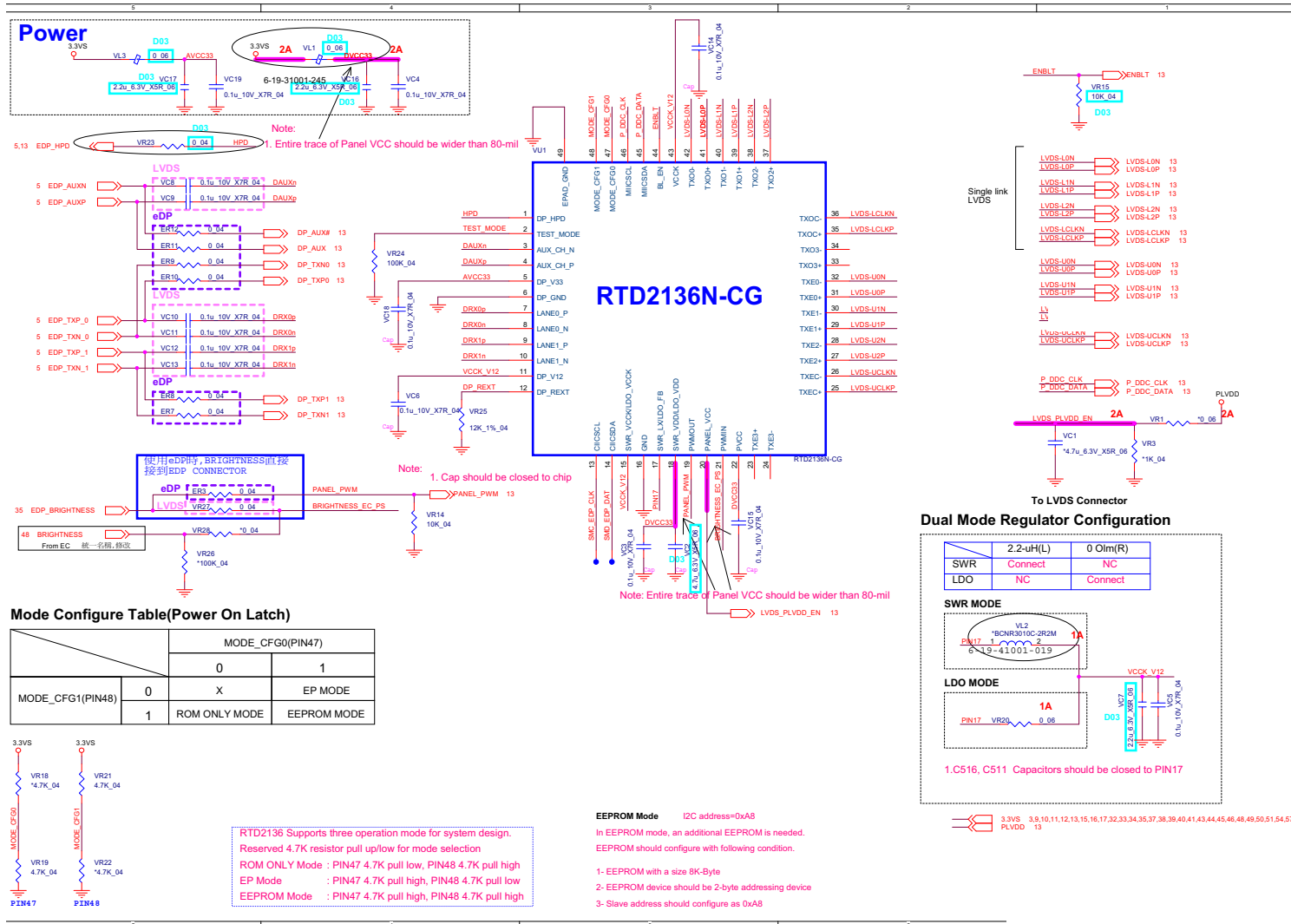
# Panel, Inverter

Sheet 13 of 72  
Panel, Inverter





# RTD2136N-CG

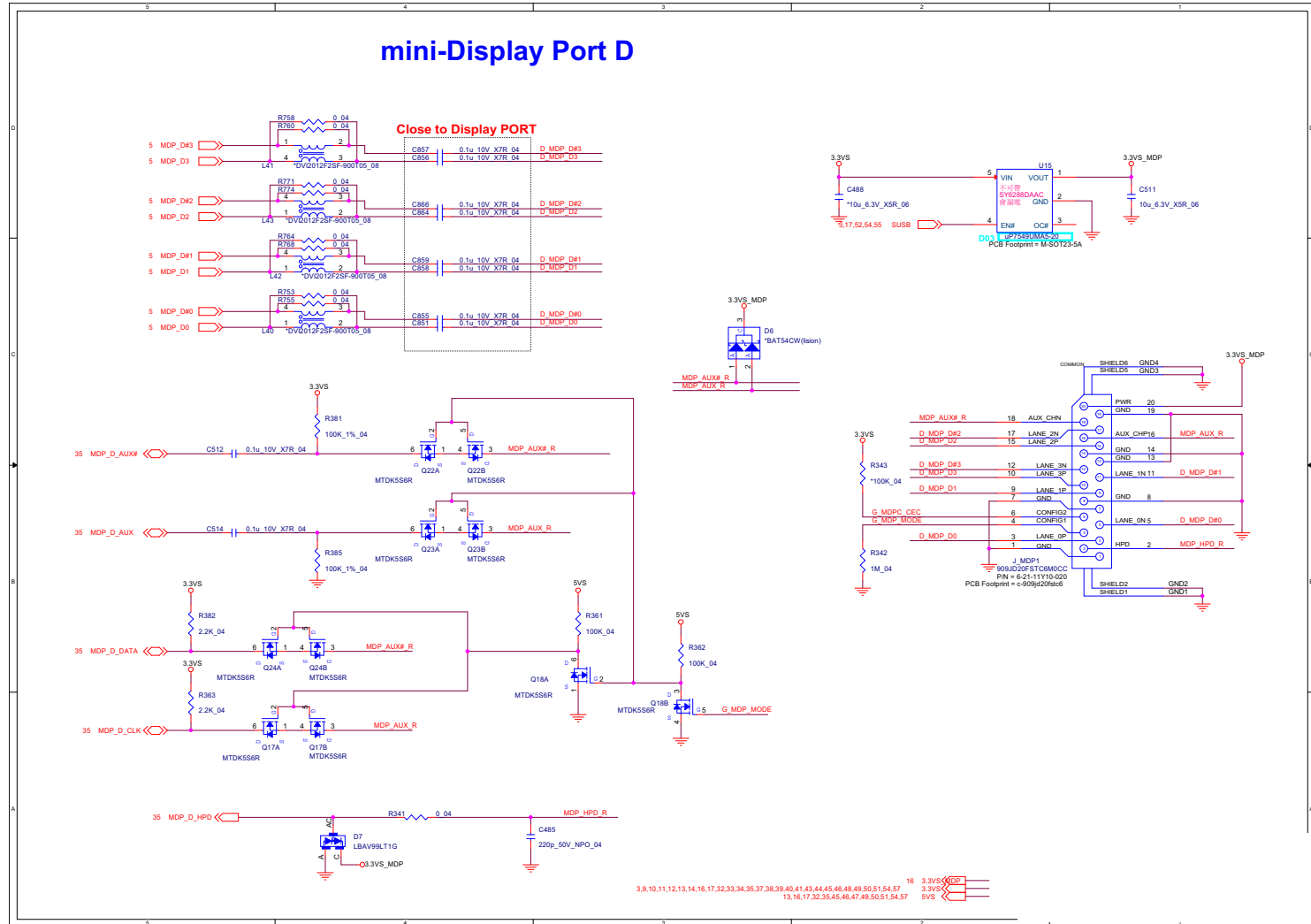


Sheet 14 of 72  
RTD2136N-CG

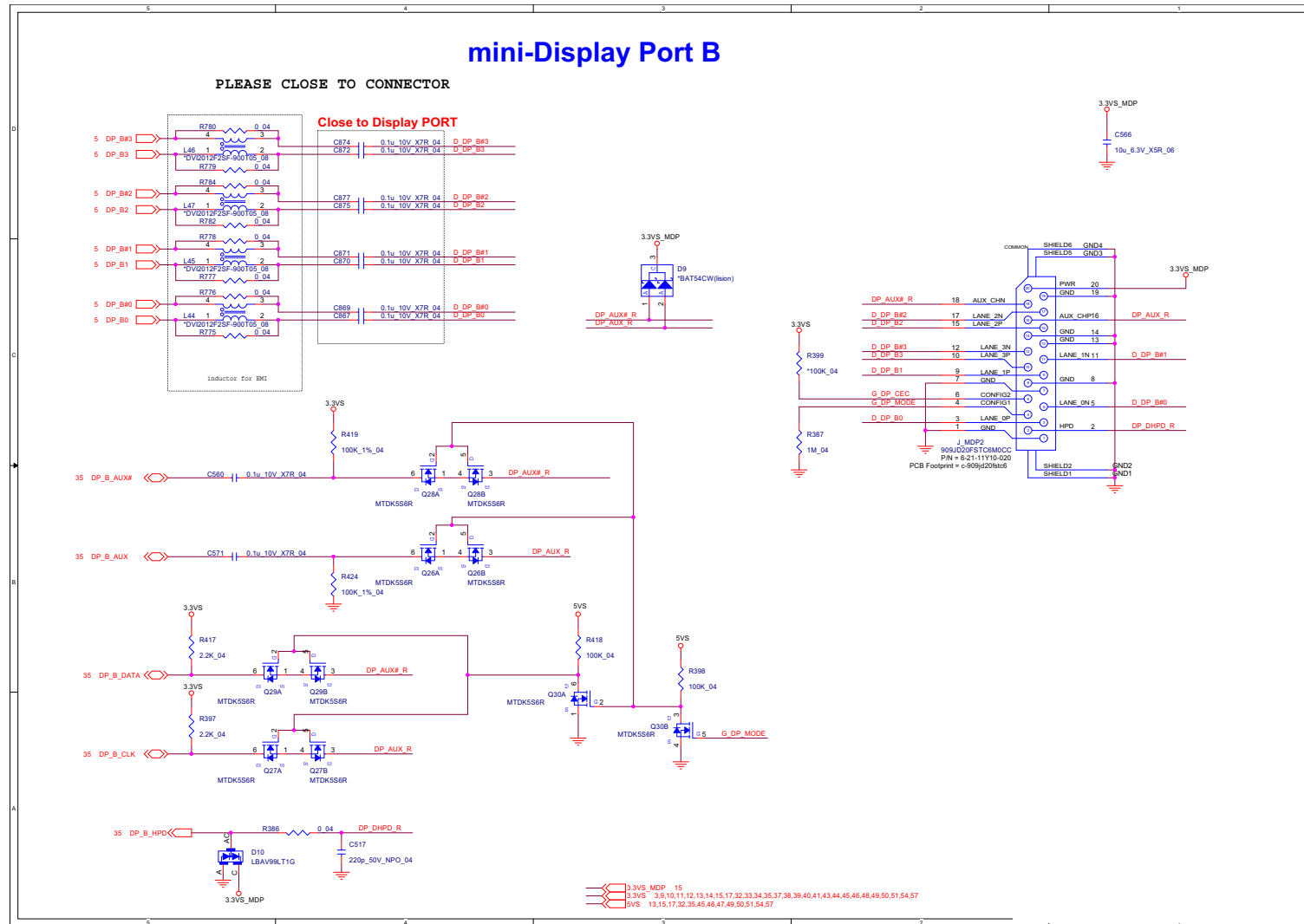
B.Schematic Diagrams

# Mini DP Port D

Sheet 15 of 72  
Mini DP Port D



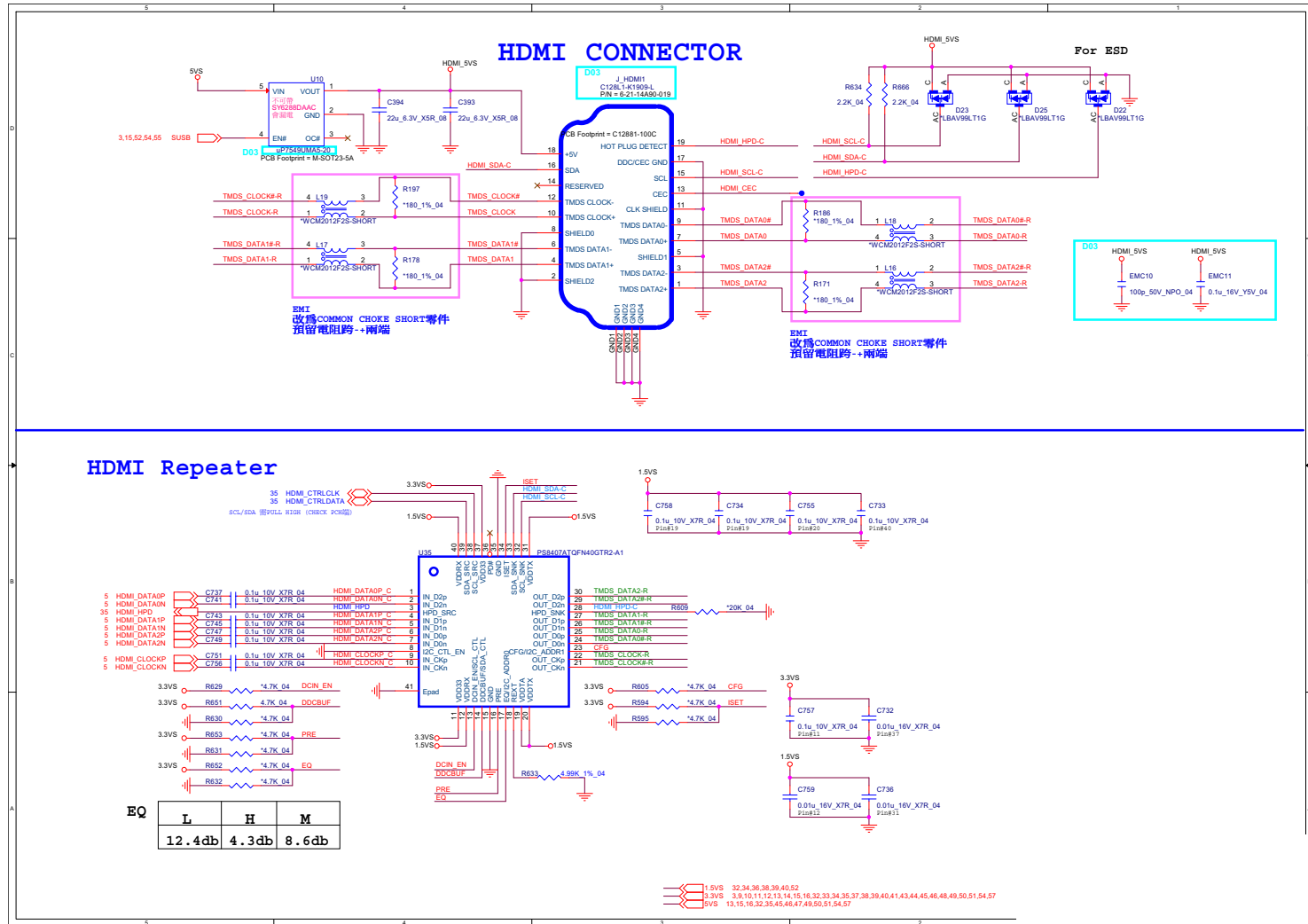
# Mini DP Port B



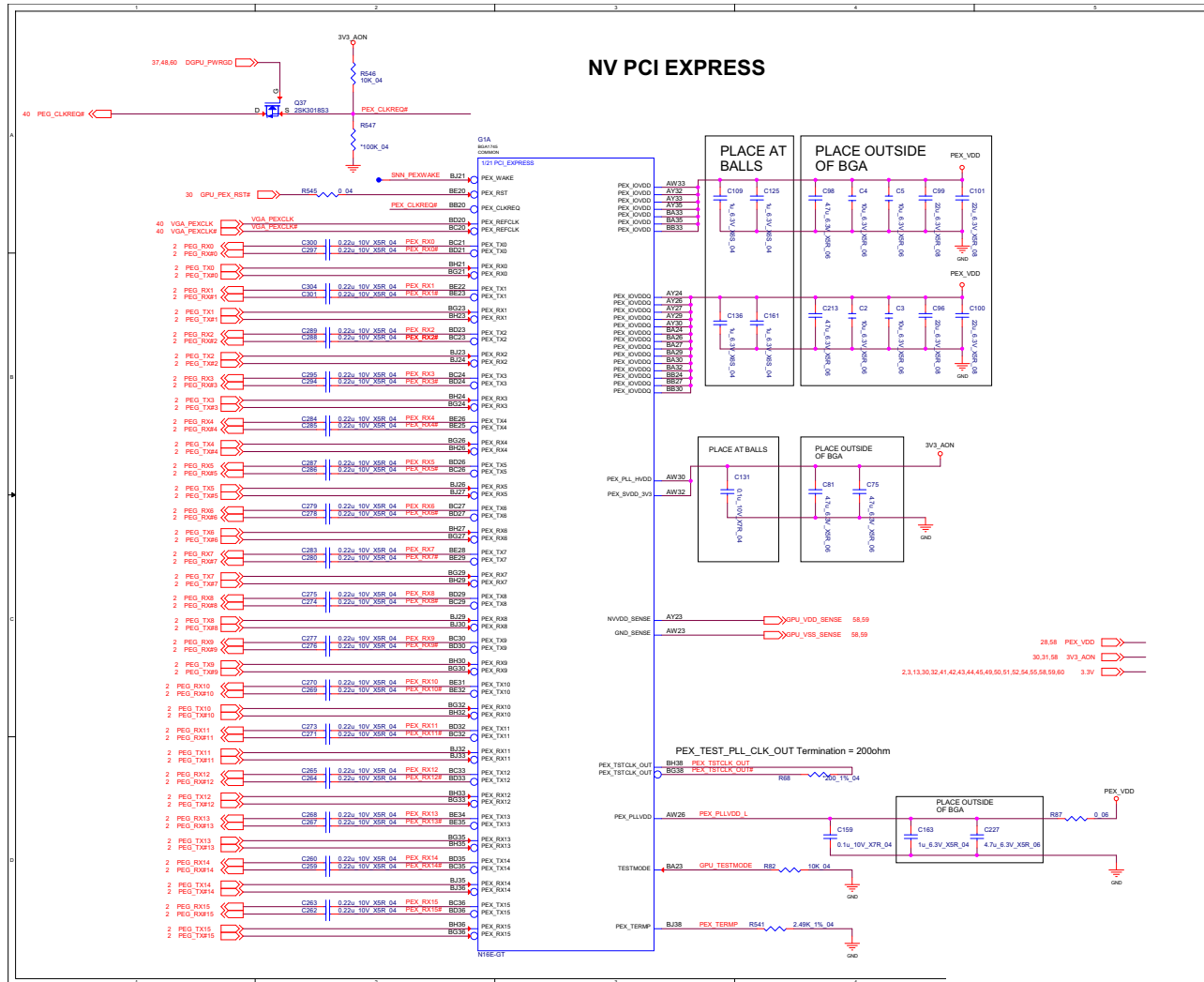
Sheet 16 of 72  
Mini DP Port B

# HDMI Connector

Sheet 17 of 72  
HDMI Connector



# VGA PCI Express

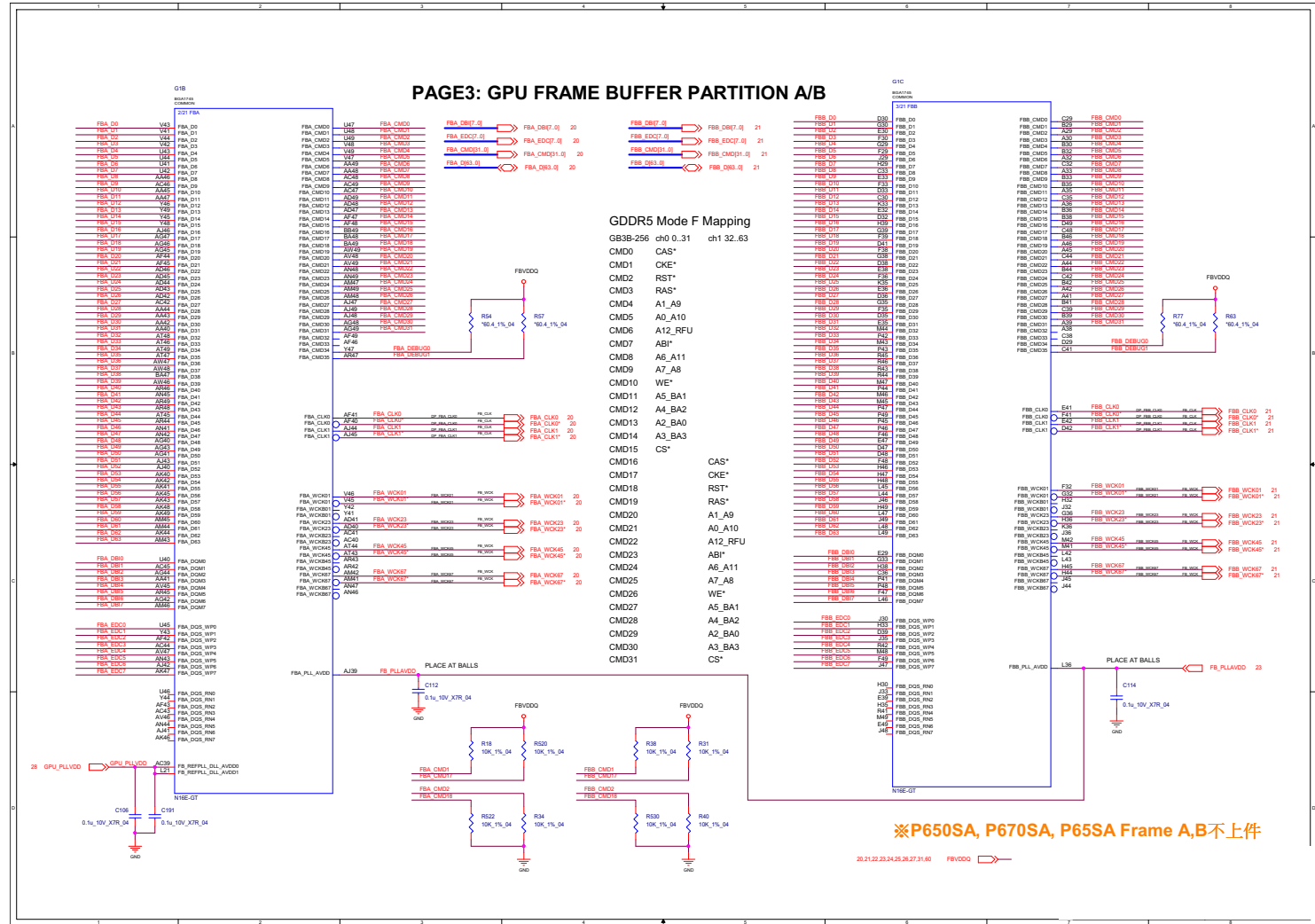


Sheet 18 of 72  
VGA PCI Express

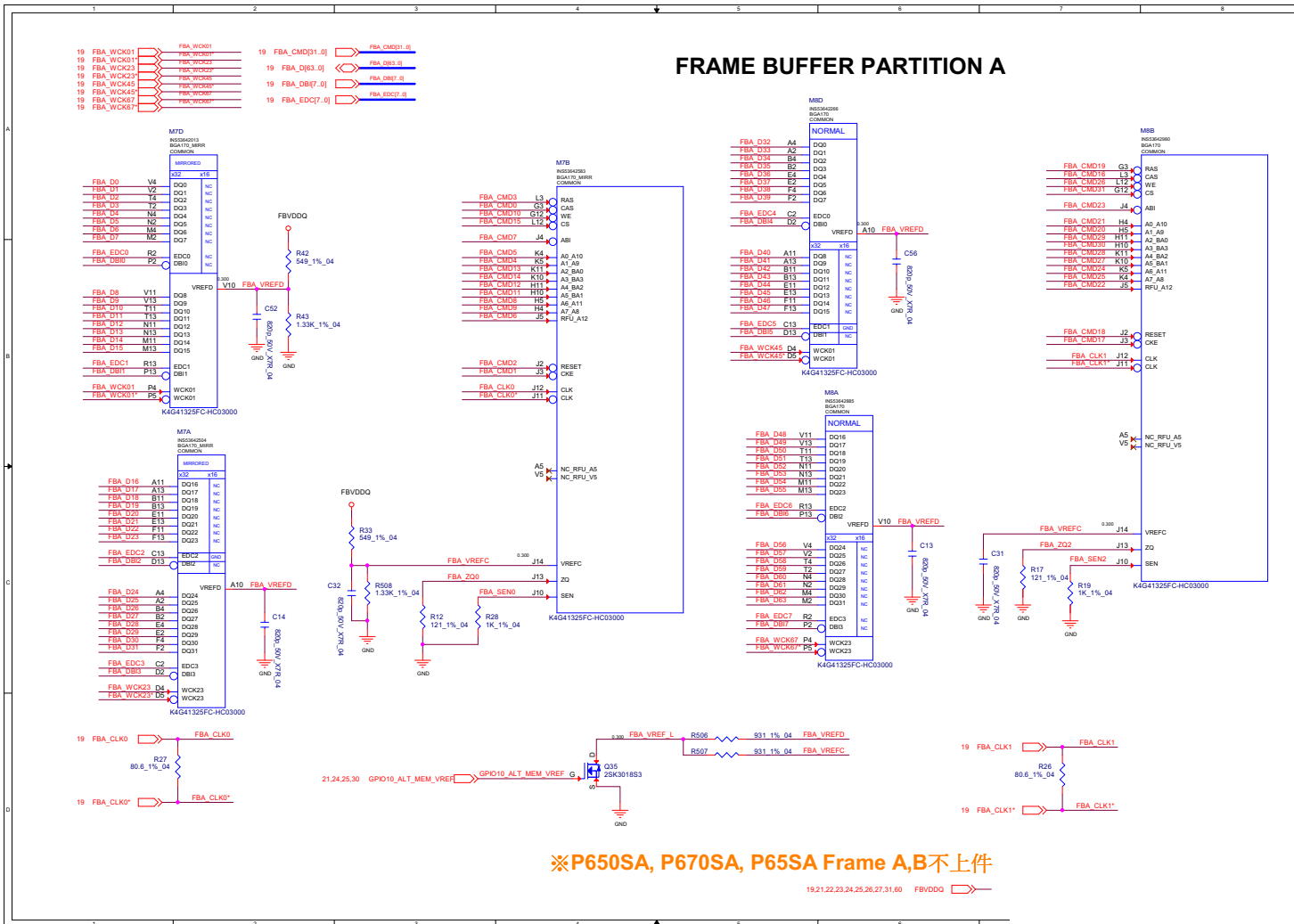
B.Schematic Diagrams

# VGA Frame Buffer Partition

Sheet 19 of 72  
VGA Frame Buffer Partition



# Frame Buffer Partition A

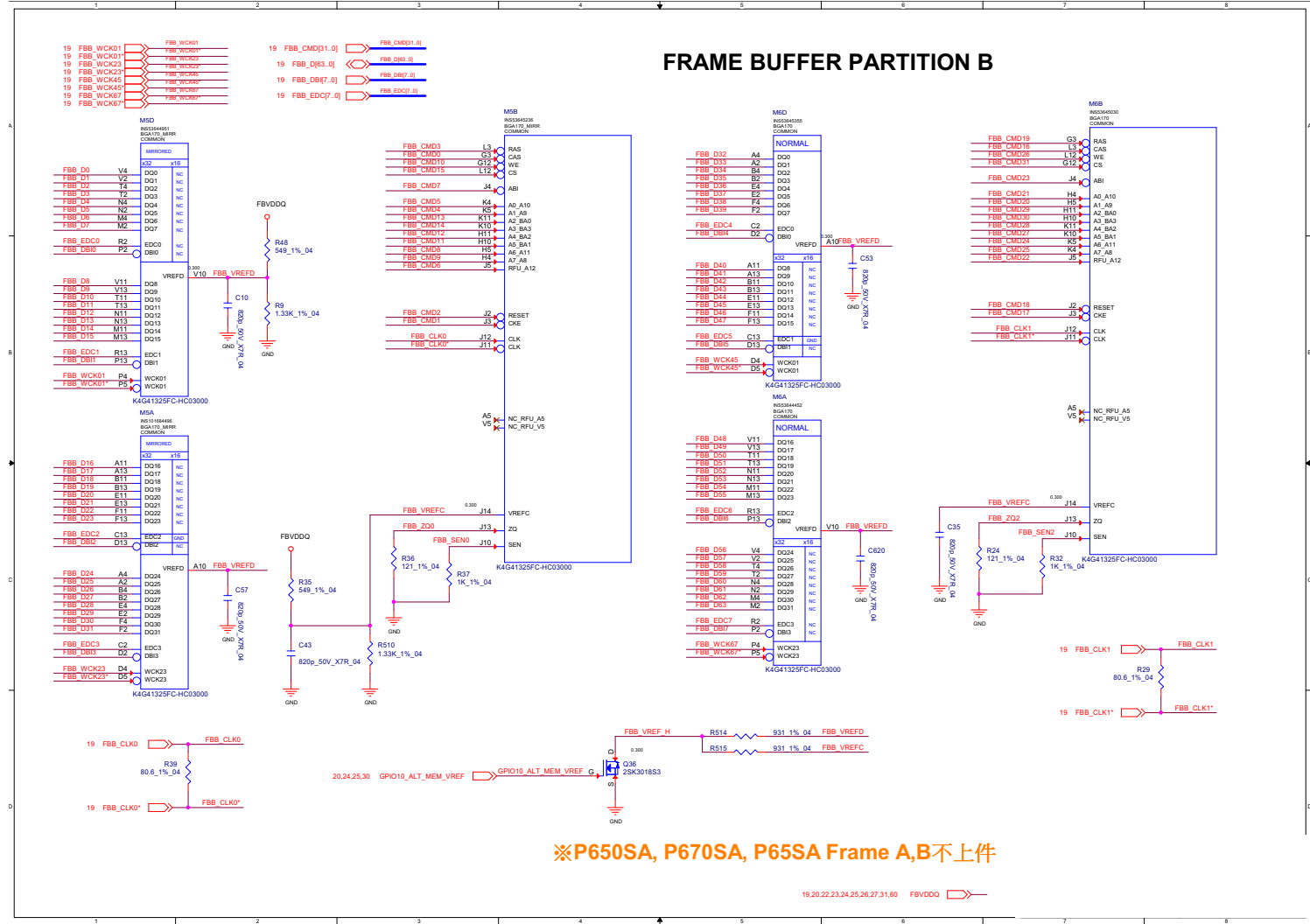


B.Schematic Diagrams

Sheet 20 of 72  
Frame Buffer  
Partition A

# Frame Buffer Partition B

Sheet 21 of 72  
Frame Buffer  
Partition B

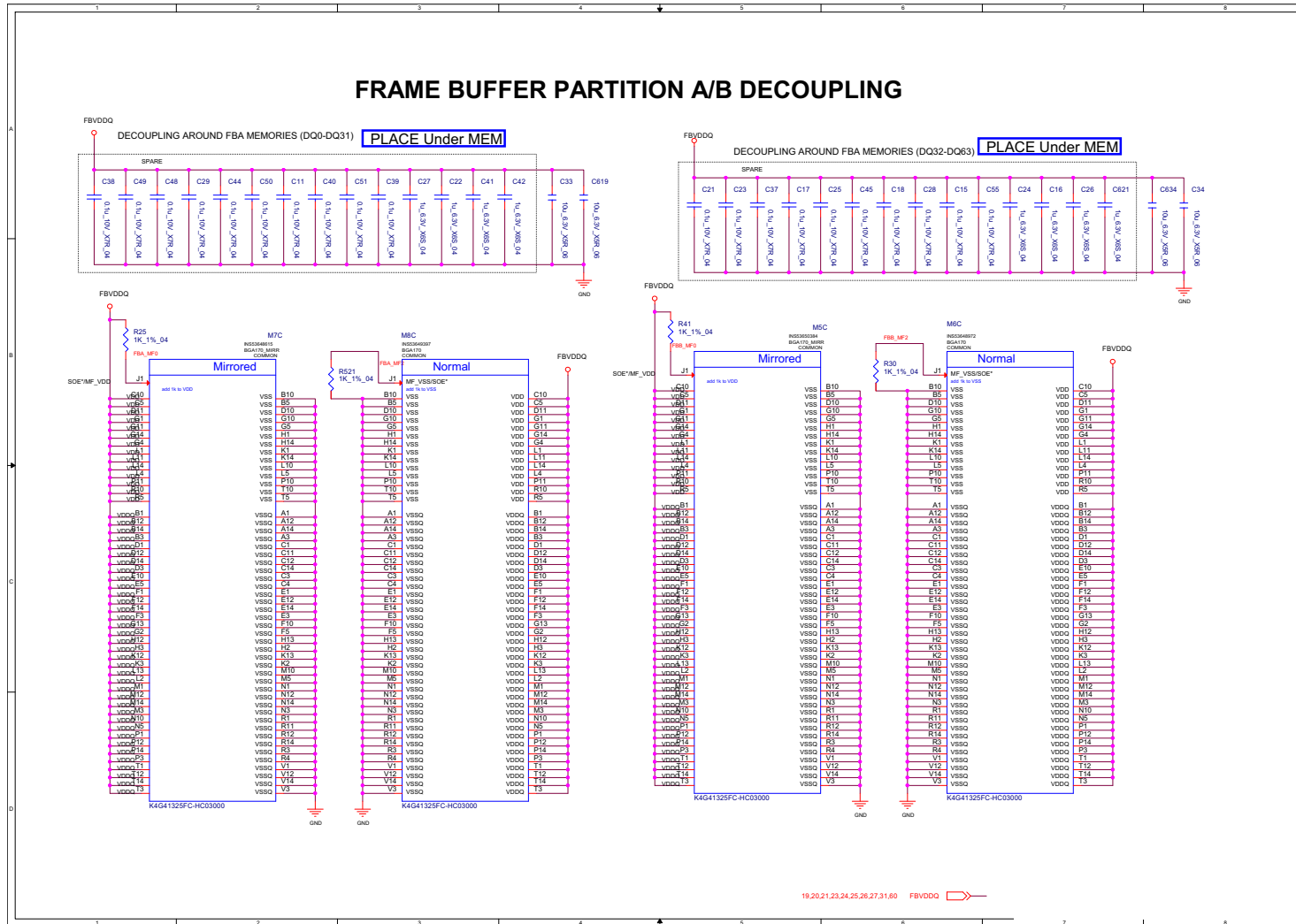




# Frame Buffer Partition A\_B

Sheet 22 of 72  
Frame Buffer  
Partition A\_B

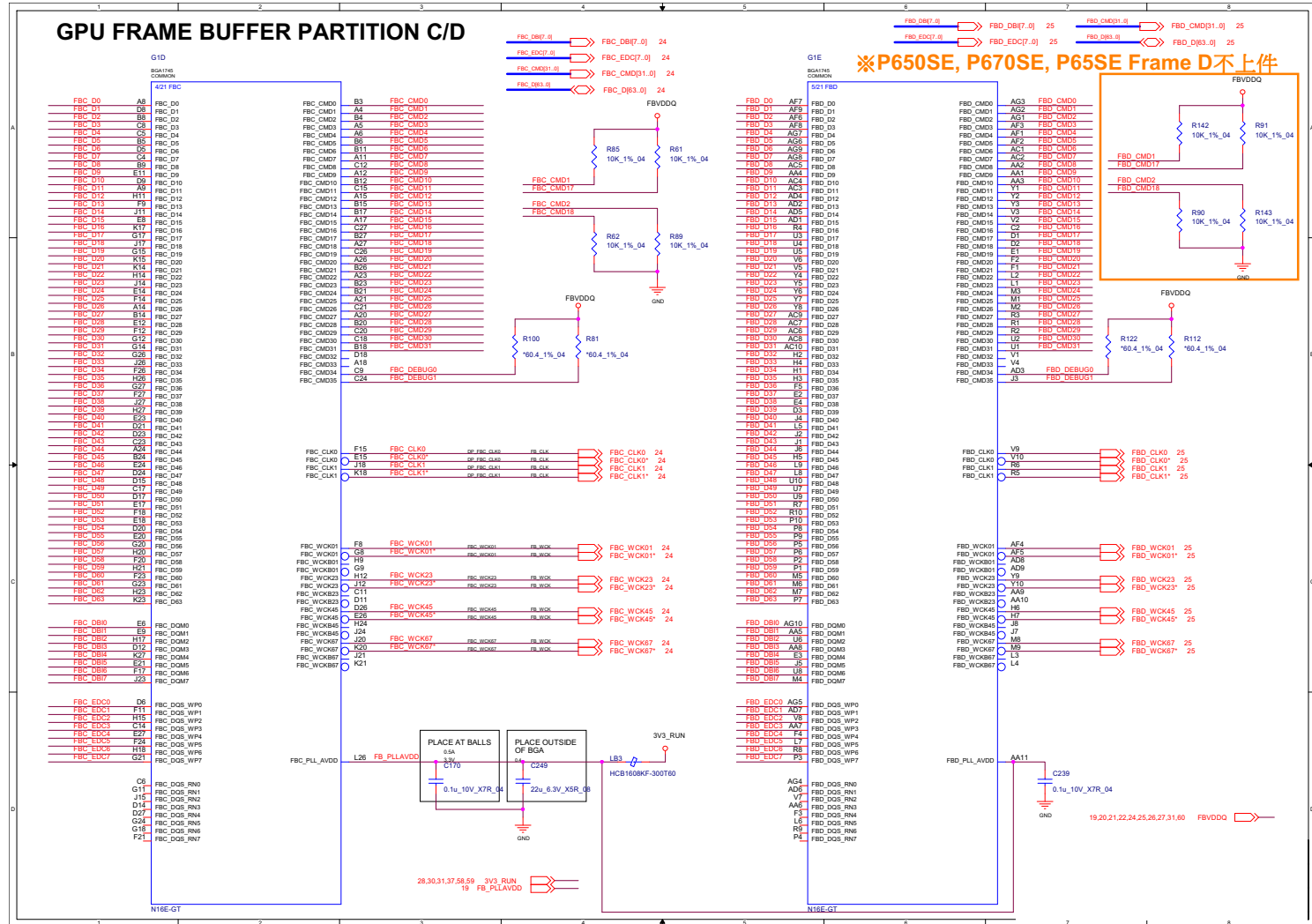
## FRAME BUFFER PARTITION A/B DECOUPLING



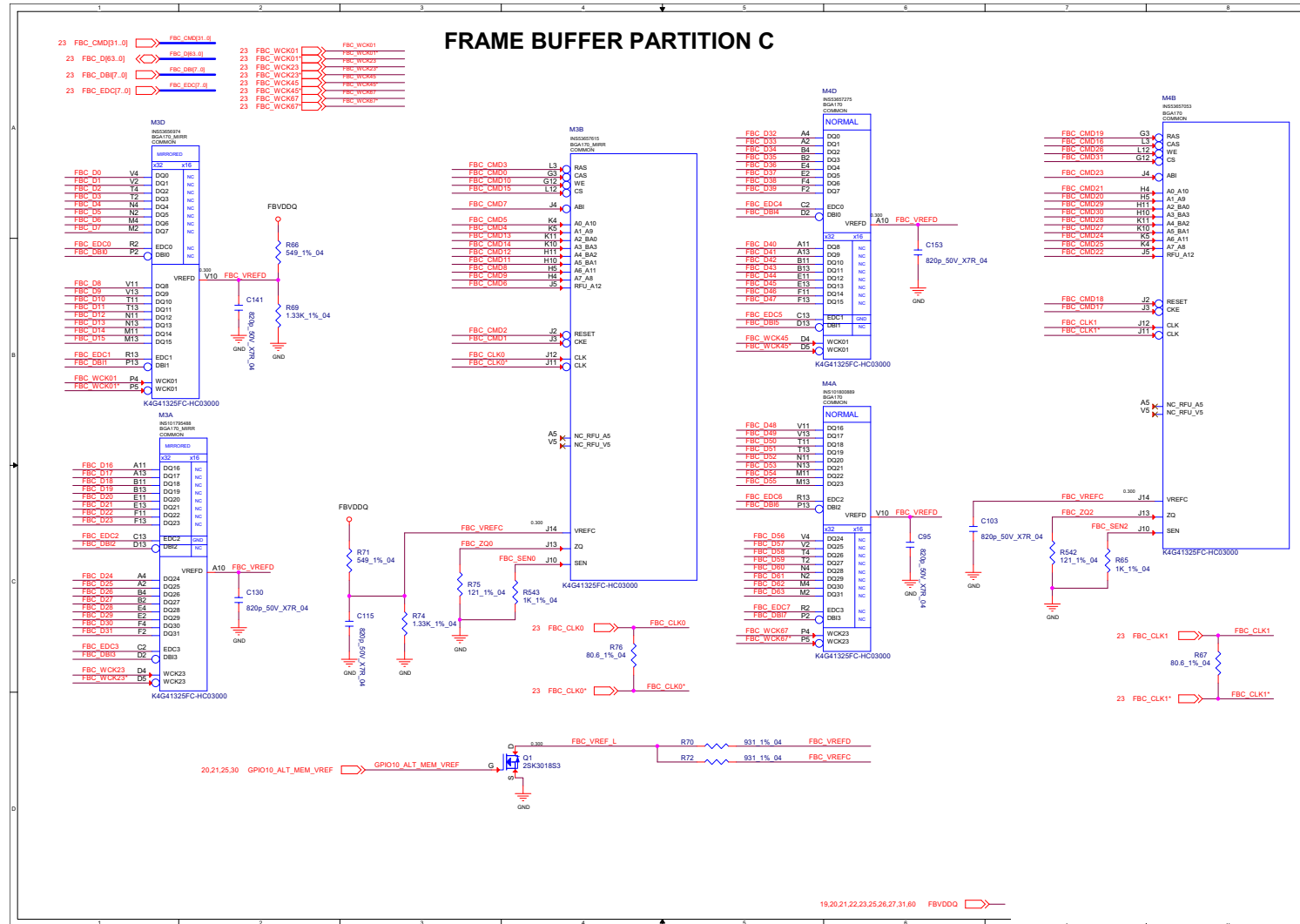
# GPU Frame Buffer Partition

B.Schematic Diagrams

Sheet 23 of 72  
GPU Frame Buffer Partition



# Frame Buffer Partition C

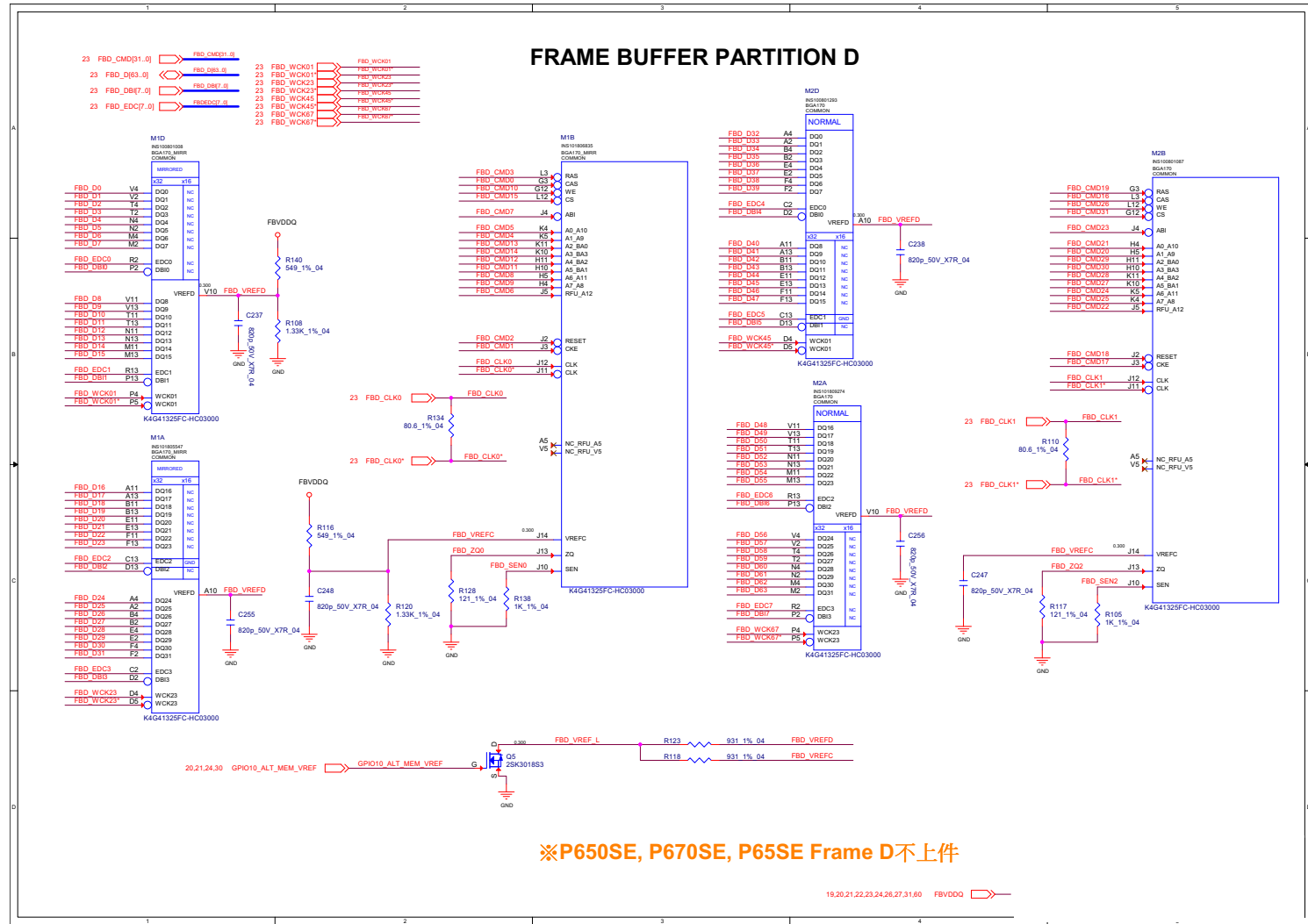


Sheet 24 of 72  
 Frame Buffer  
 Partition C

B.Schematic Diagrams

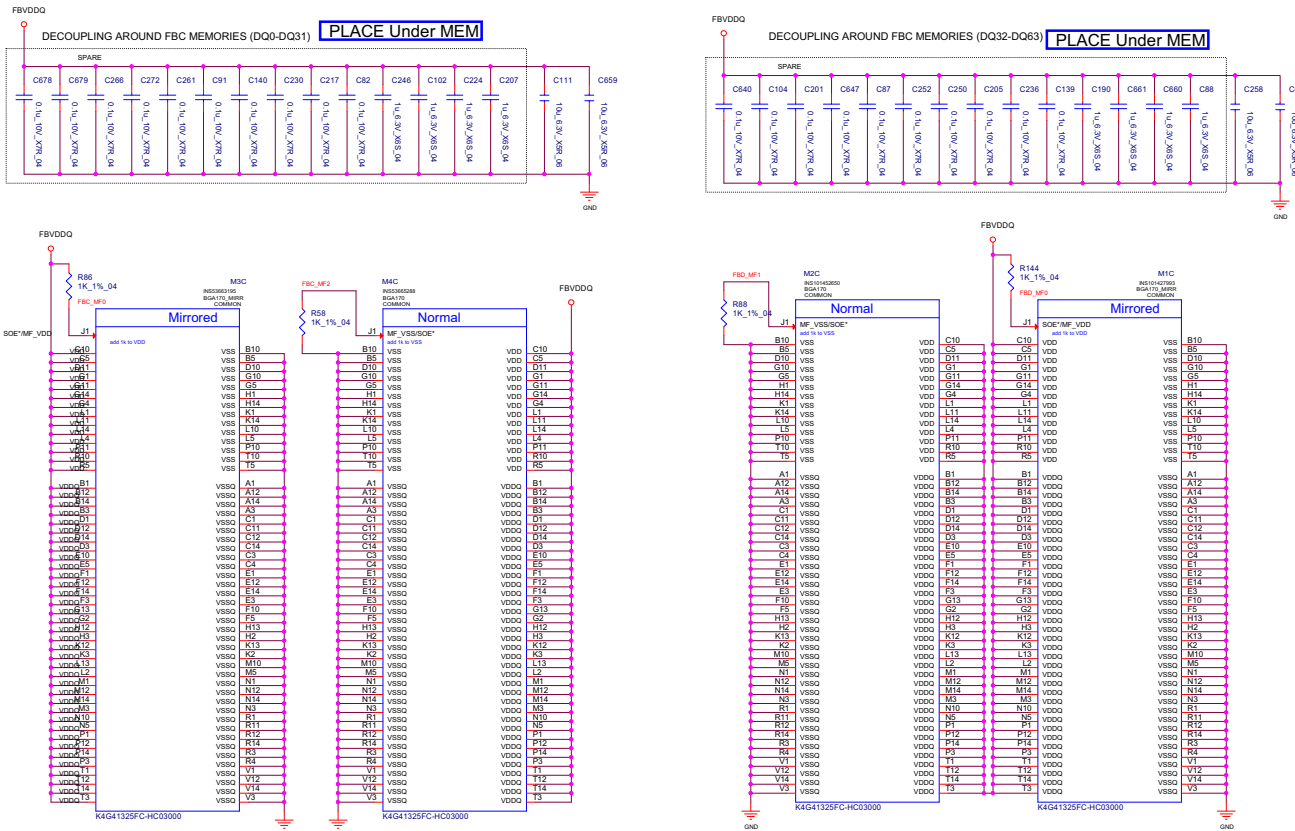
# Frame Buffer Partition D

Sheet 25 of 72  
Frame Buffer  
Partition D



# Frame Buffer Partition C\_D

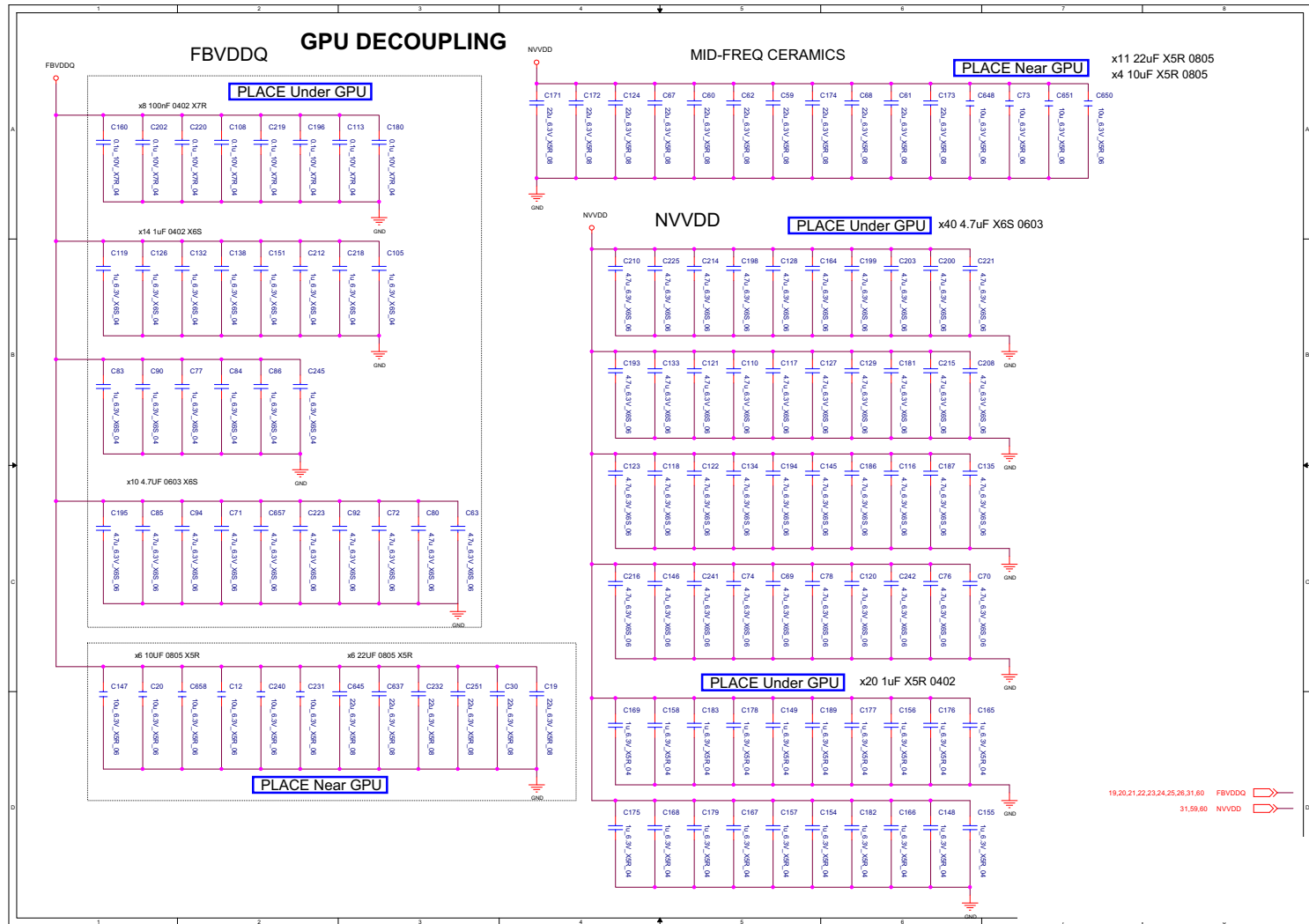
## FRAME BUFFER PARTITION C/D DECOUPLING



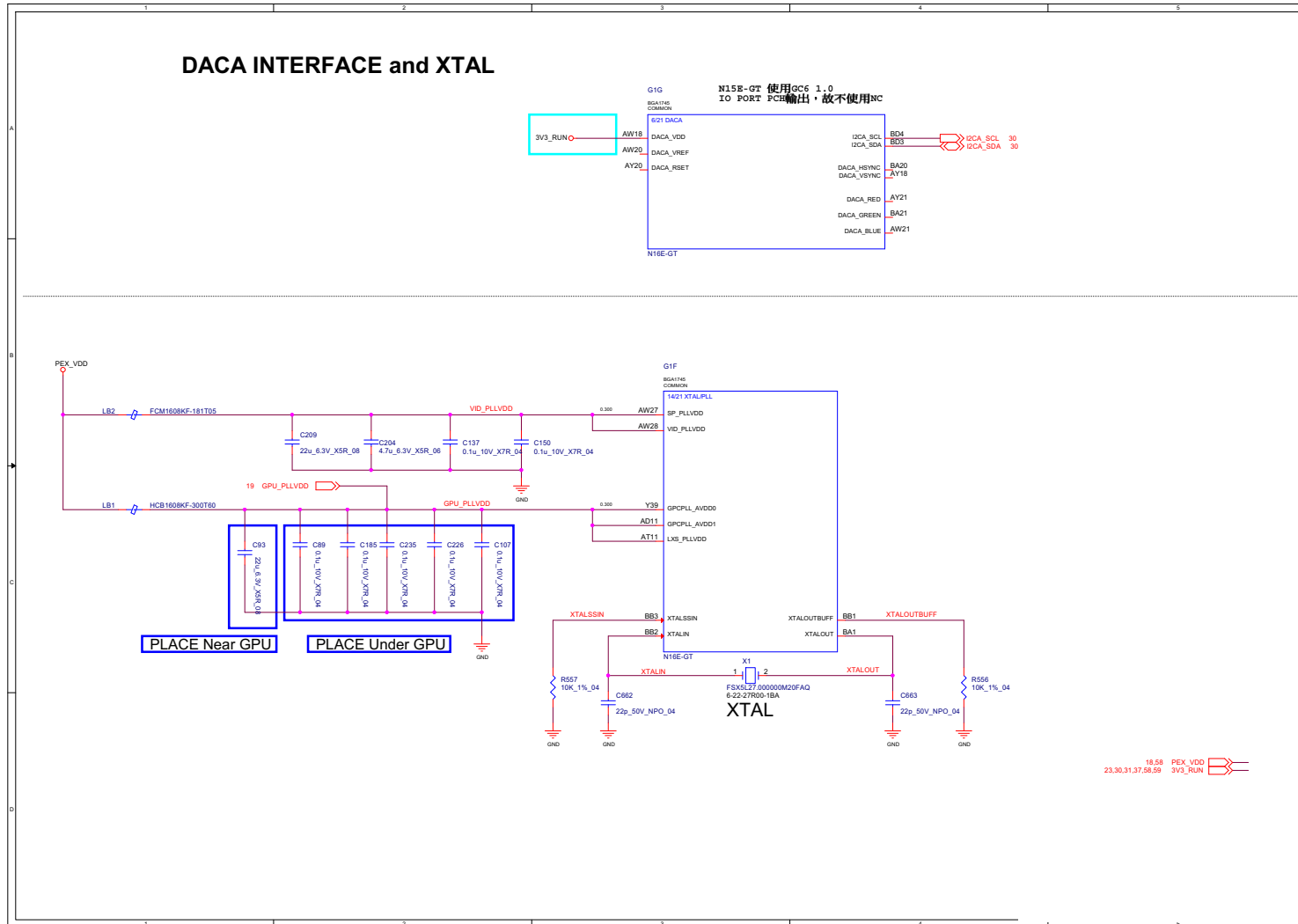
Sheet 26 of 72  
Frame Buffer  
Partition C\_D

B.Schematic Diagrams

# GPU Decoupling

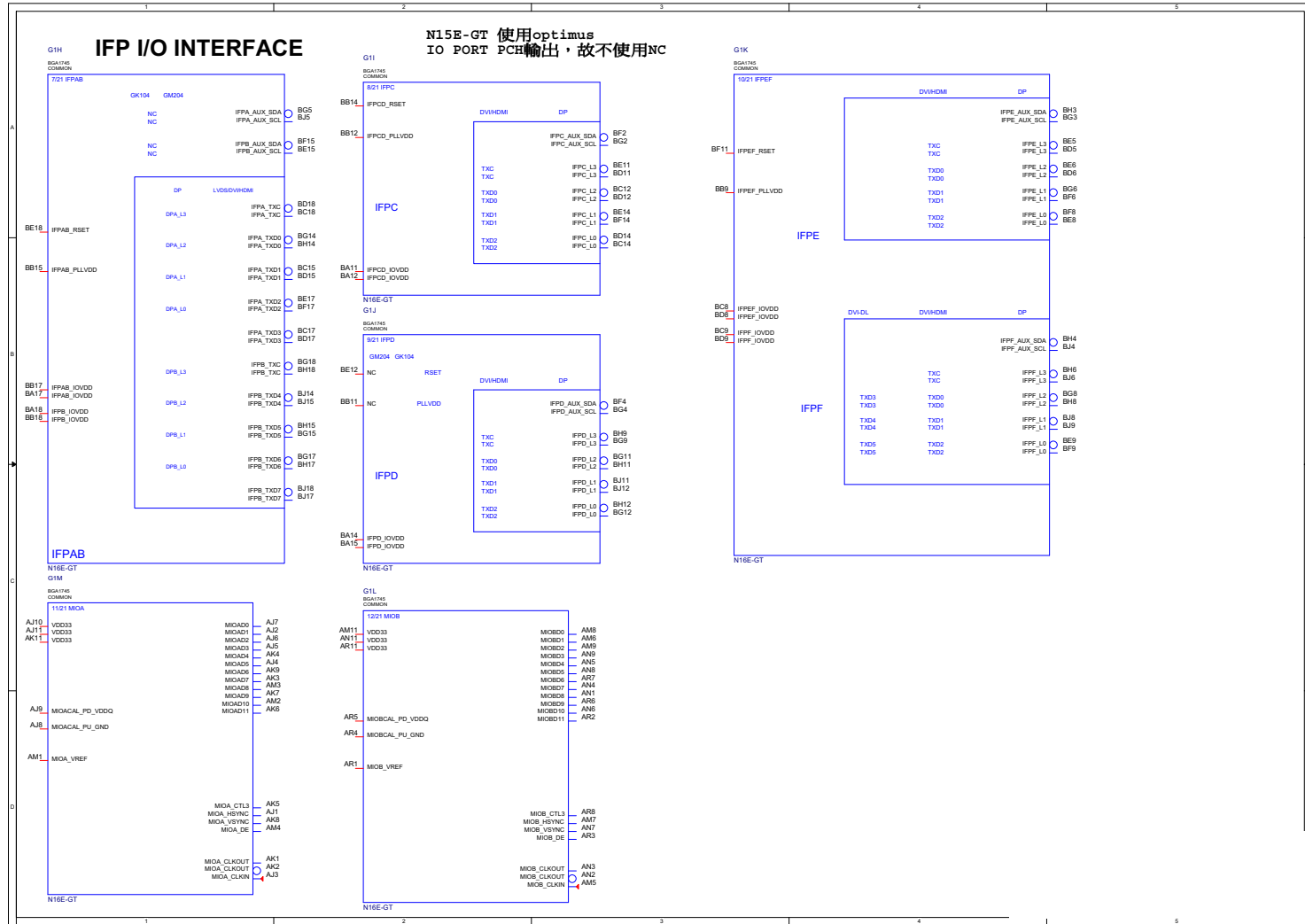


# DACA Interface XTAL



Sheet 28 of 72  
DACA Interface and  
XTAL

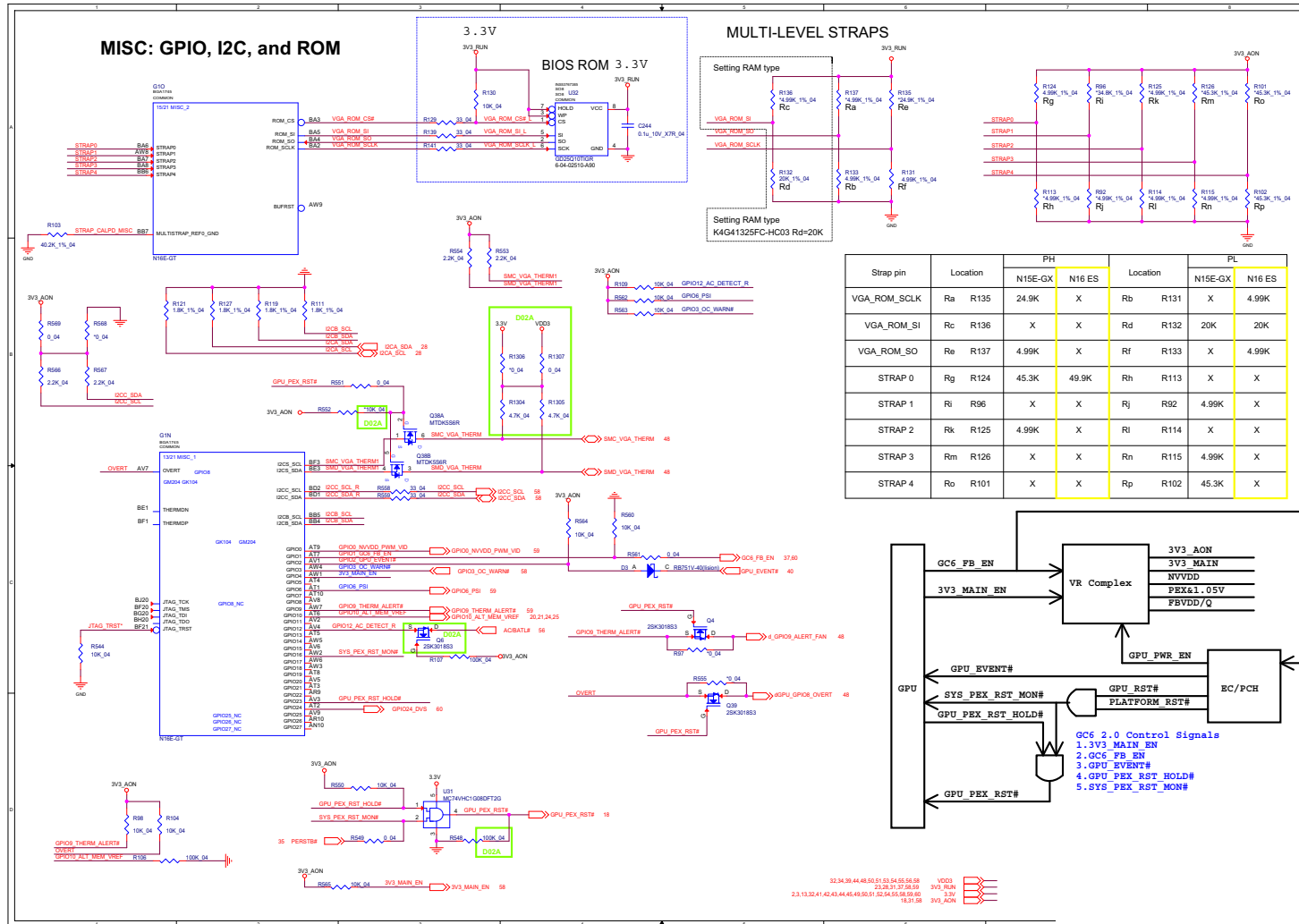
# IFP I/O Interface



Sheet 29 of 72  
IFP I/O Interface



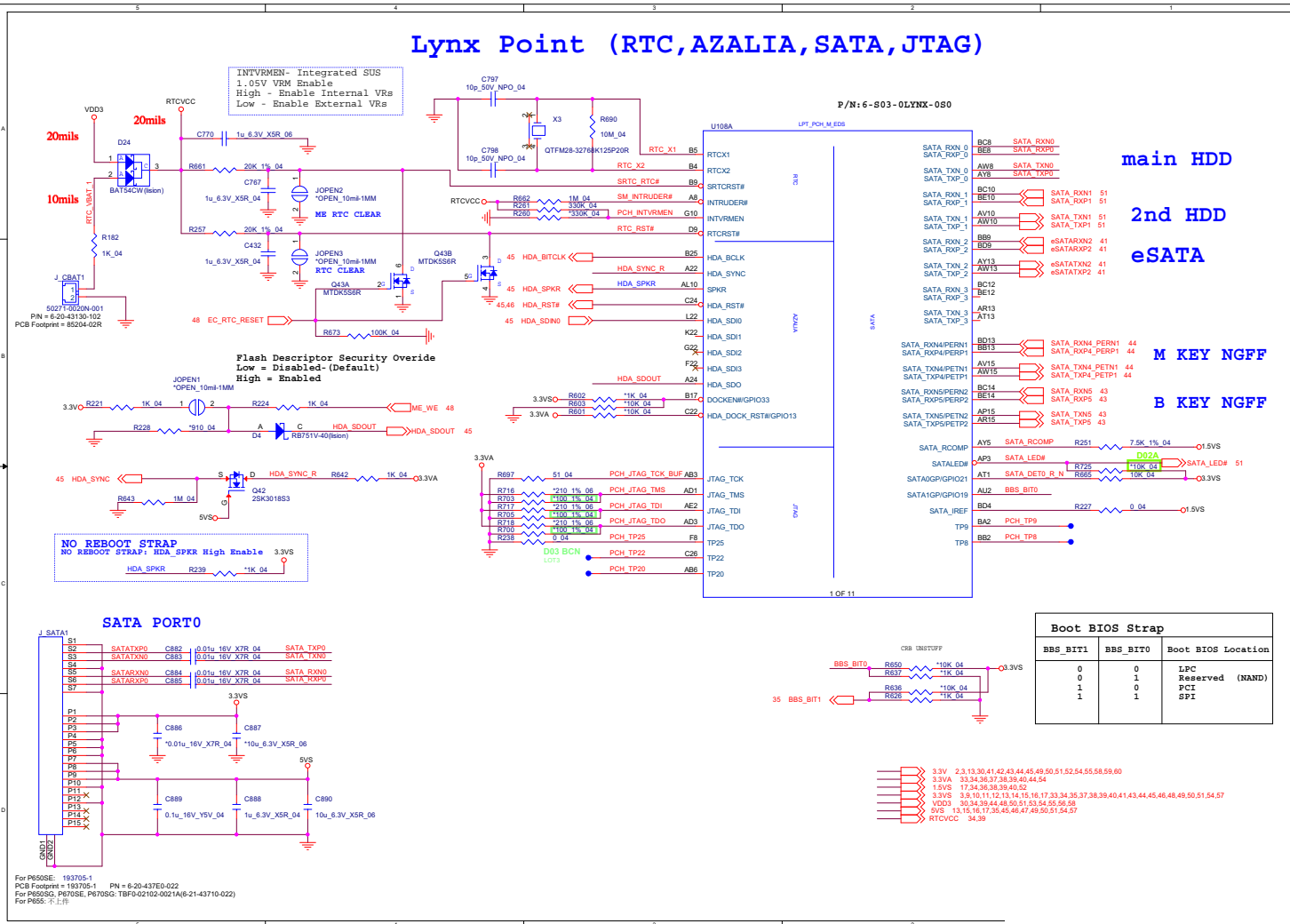
# Misc - GPIO, I2C and ROM



Sheet 30 of 72  
Misc - GPIO, I2C  
and ROM



# Lynx 1/9

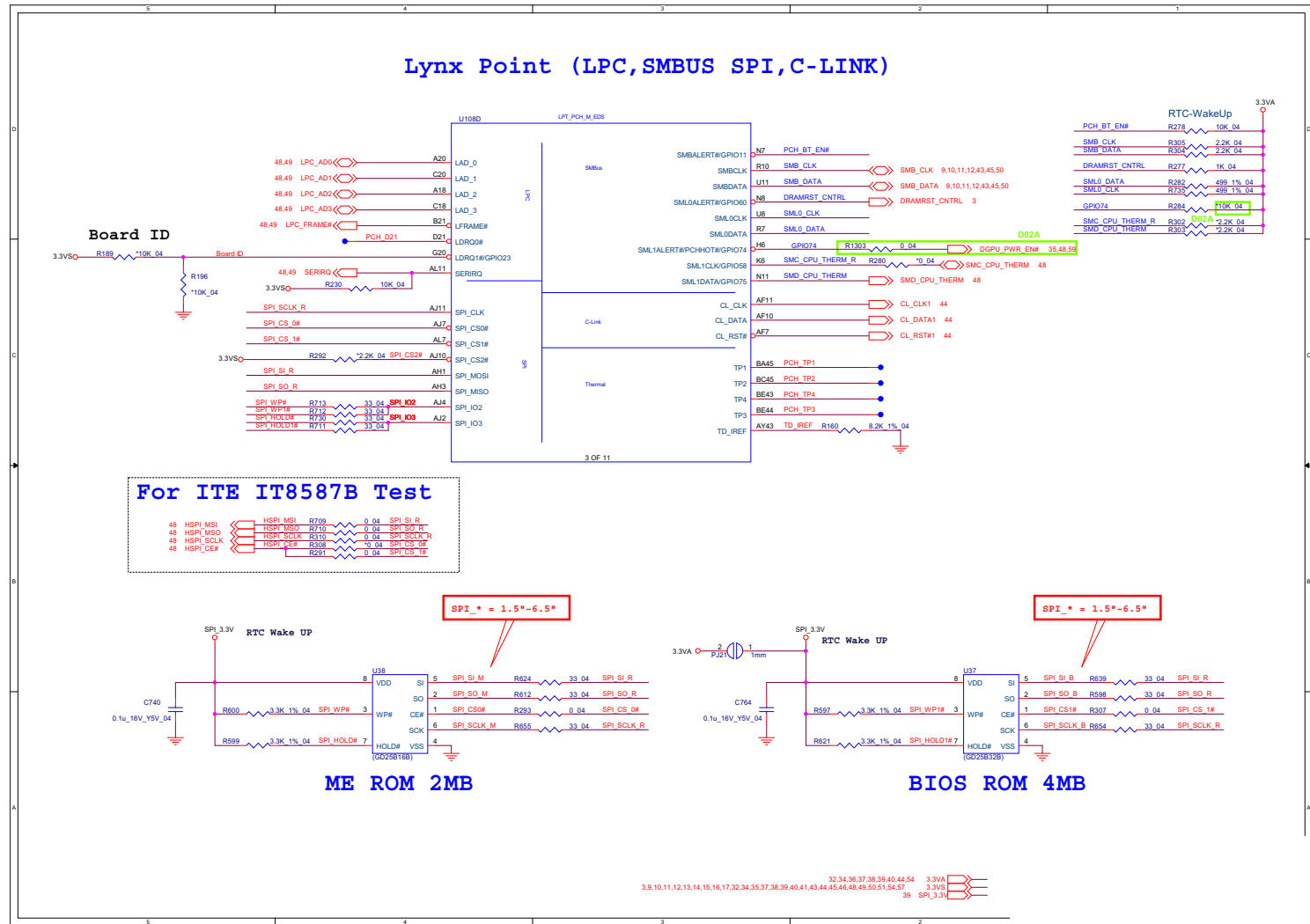


Sheet 32 of 72  
Lynx 1/9

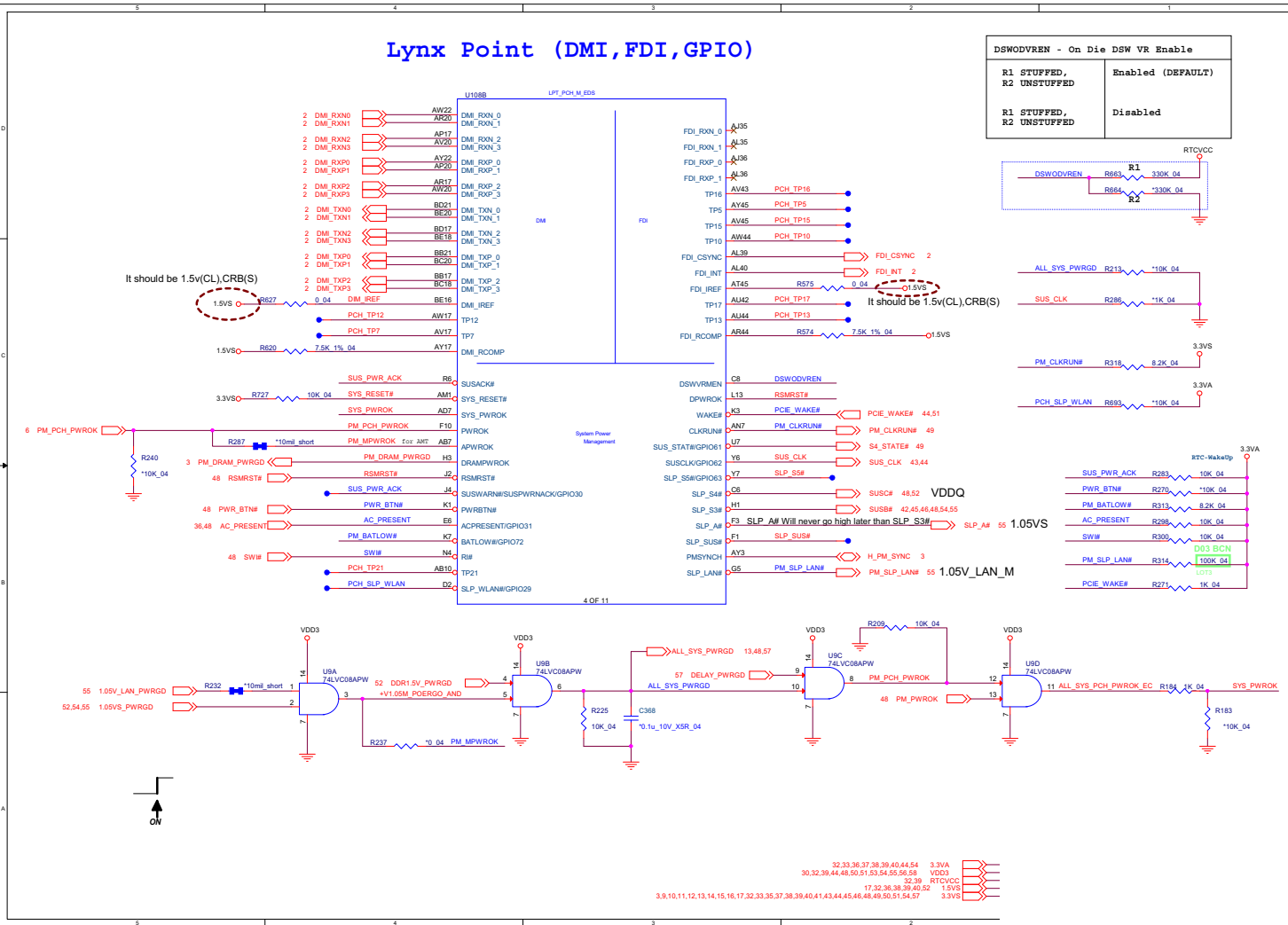
B.Schematic Diagrams

# Lynx 2/9

Sheet 33 of 72  
Lynx 2/9



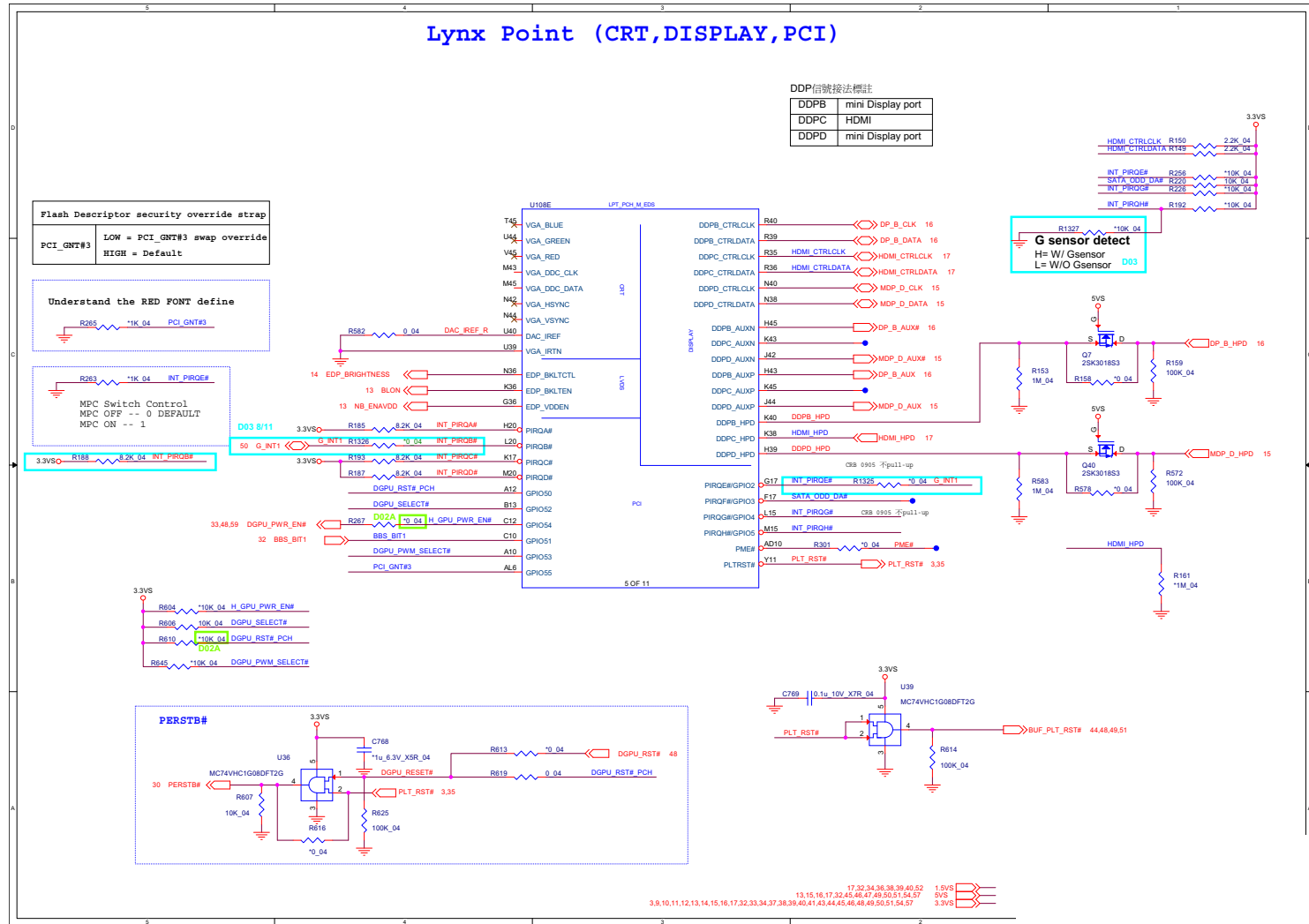
# Lynx 3/9



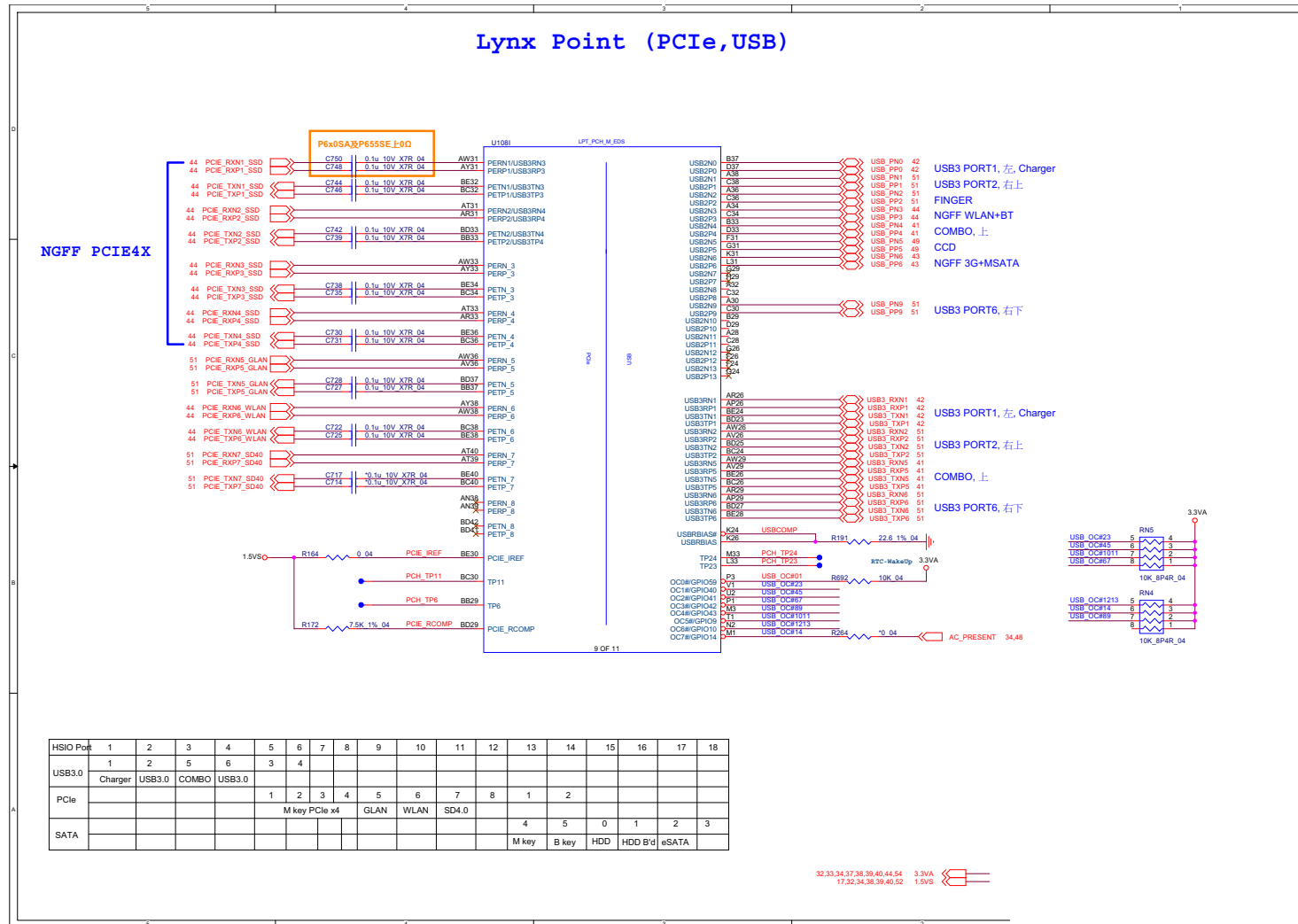
Sheet 34 of 72  
Lynx 3/9

# Lynx 4/9

Sheet 35 of 72  
Lynx 4/9



# Lynx 5/9

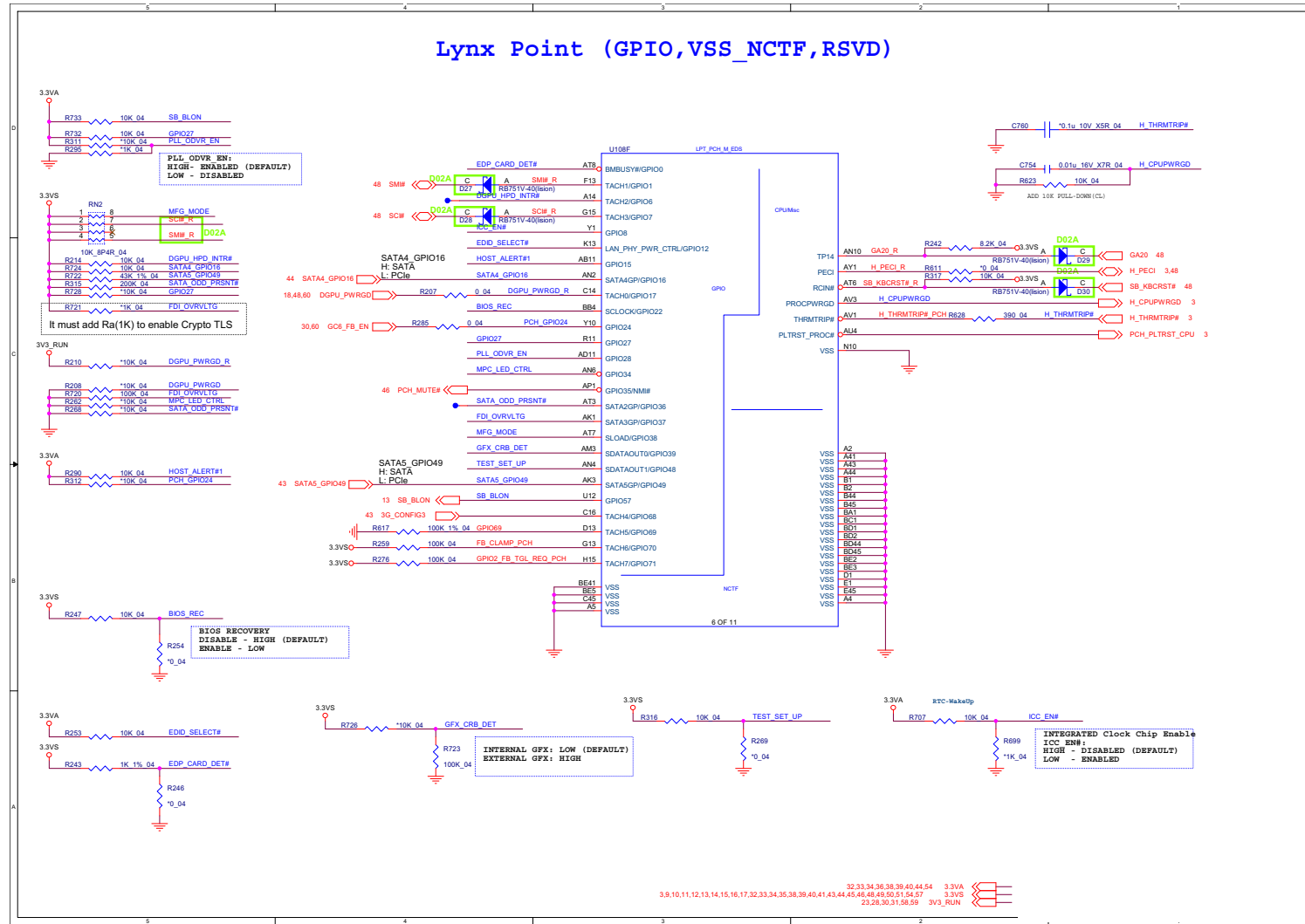


Sheet 36 of 72  
Lynx 5/9

B.Schematic Diagrams

# Lynx 6/9

Sheet 37 of 72  
Lynx 6/9

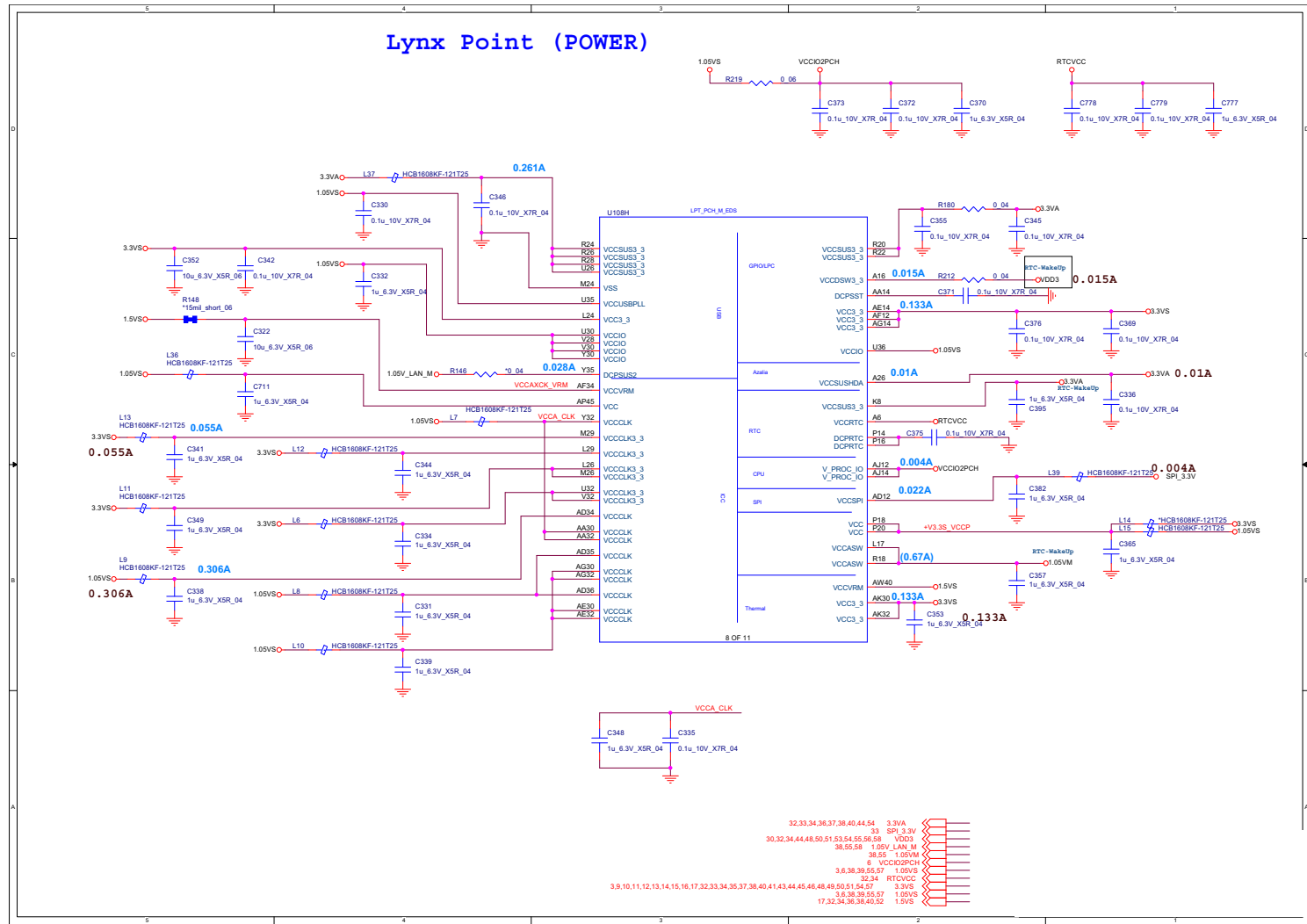






# Schematic Diagrams

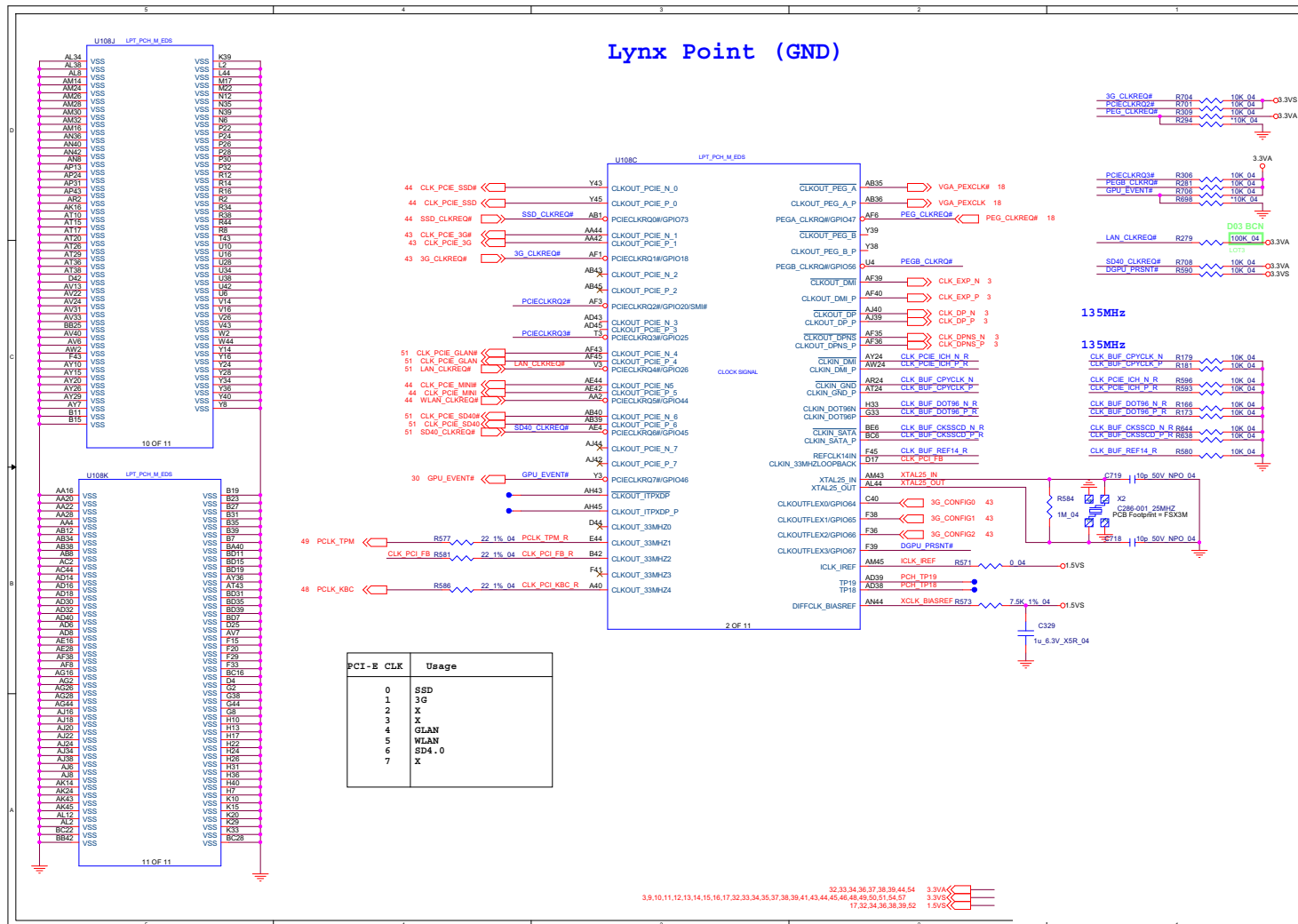
## Lynx 8/9



Sheet 39 of 72  
Lynx 8/9

B.Schematic Diagrams

# Lynx 9/9

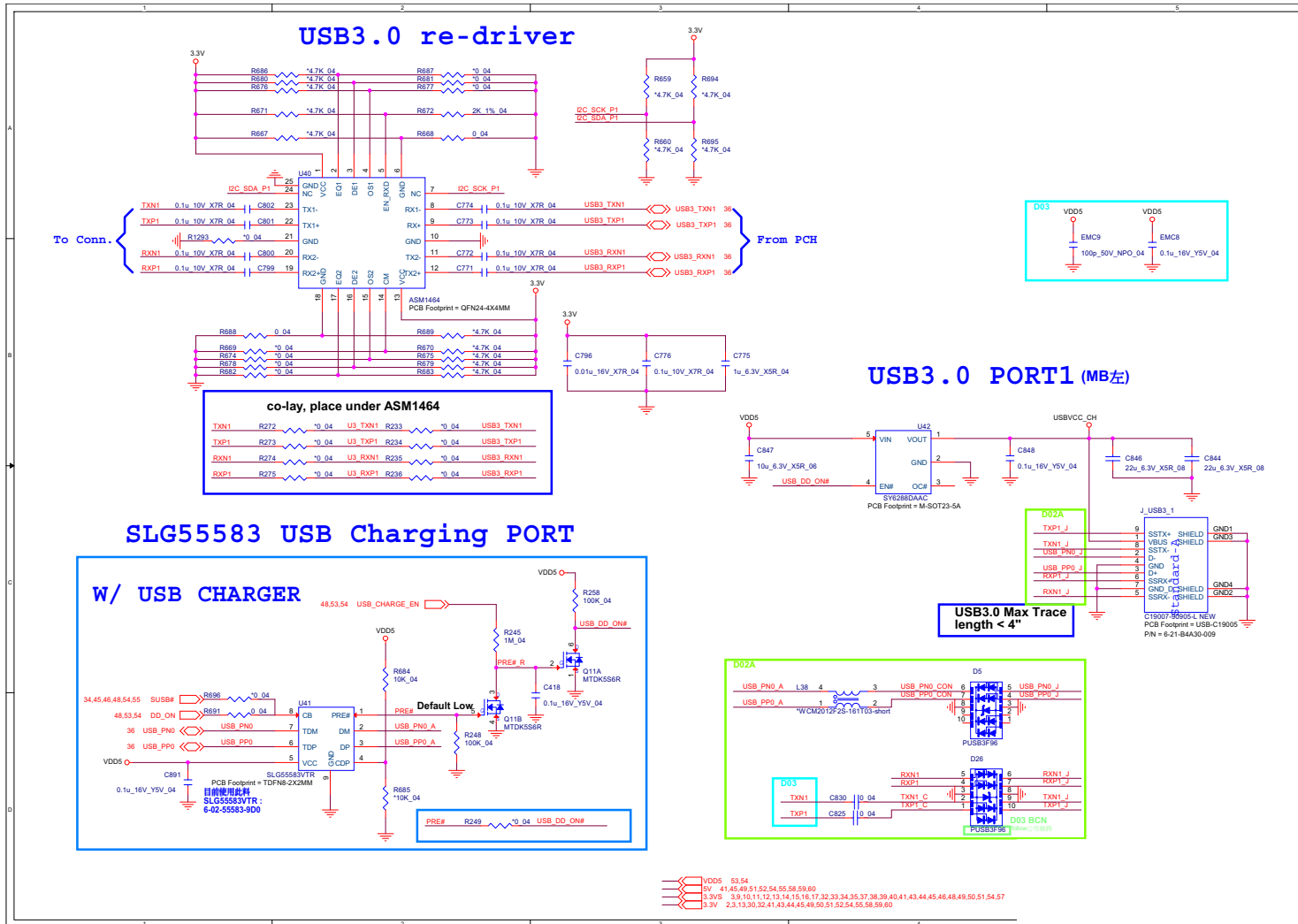


Sheet 40 of 72  
Lynx 9/9

B.Schematic Diagrams



# USB Charger

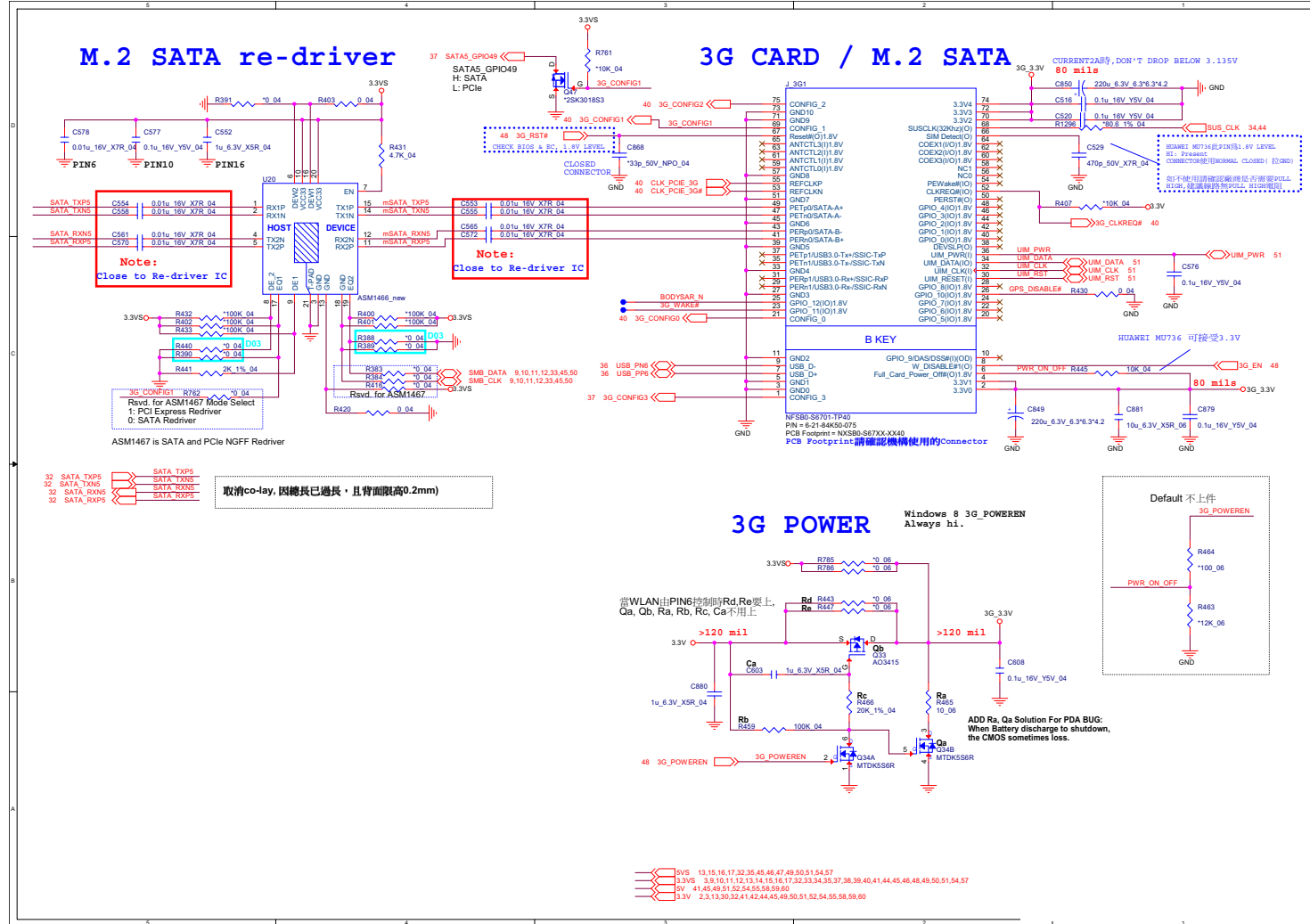


Sheet 42 of 72  
USB Charger

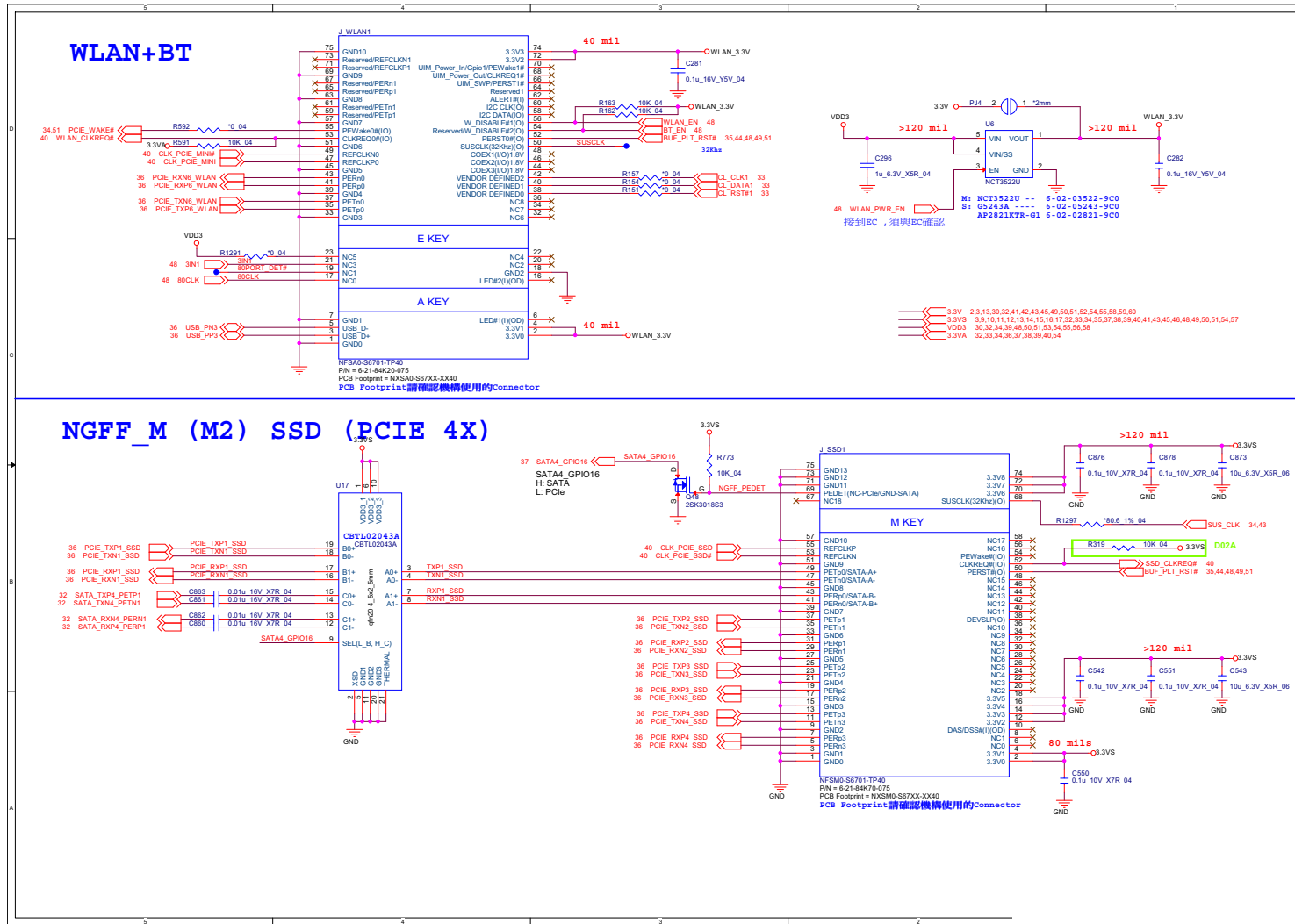
B.Schematic Diagrams

# M.2 3G + M.2 SATA

Sheet 43 of 72  
M.2 3G + M.2 SATA



# M.2 WLAN+BT, PCIE4X SSD

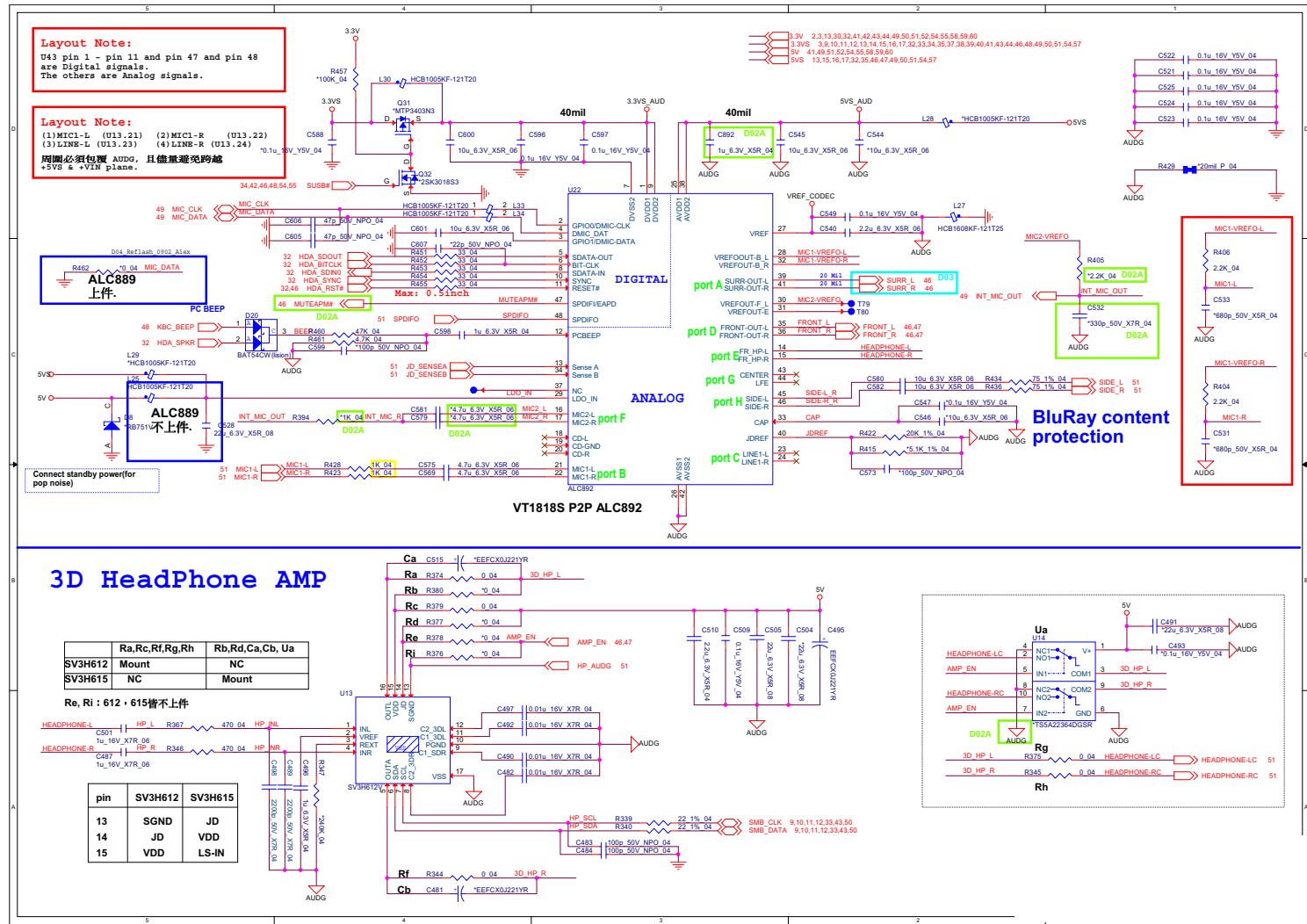


Sheet 44 of 72  
M.2 WLAN+BT,  
PCIE4X SSD

B.Schematic Diagrams

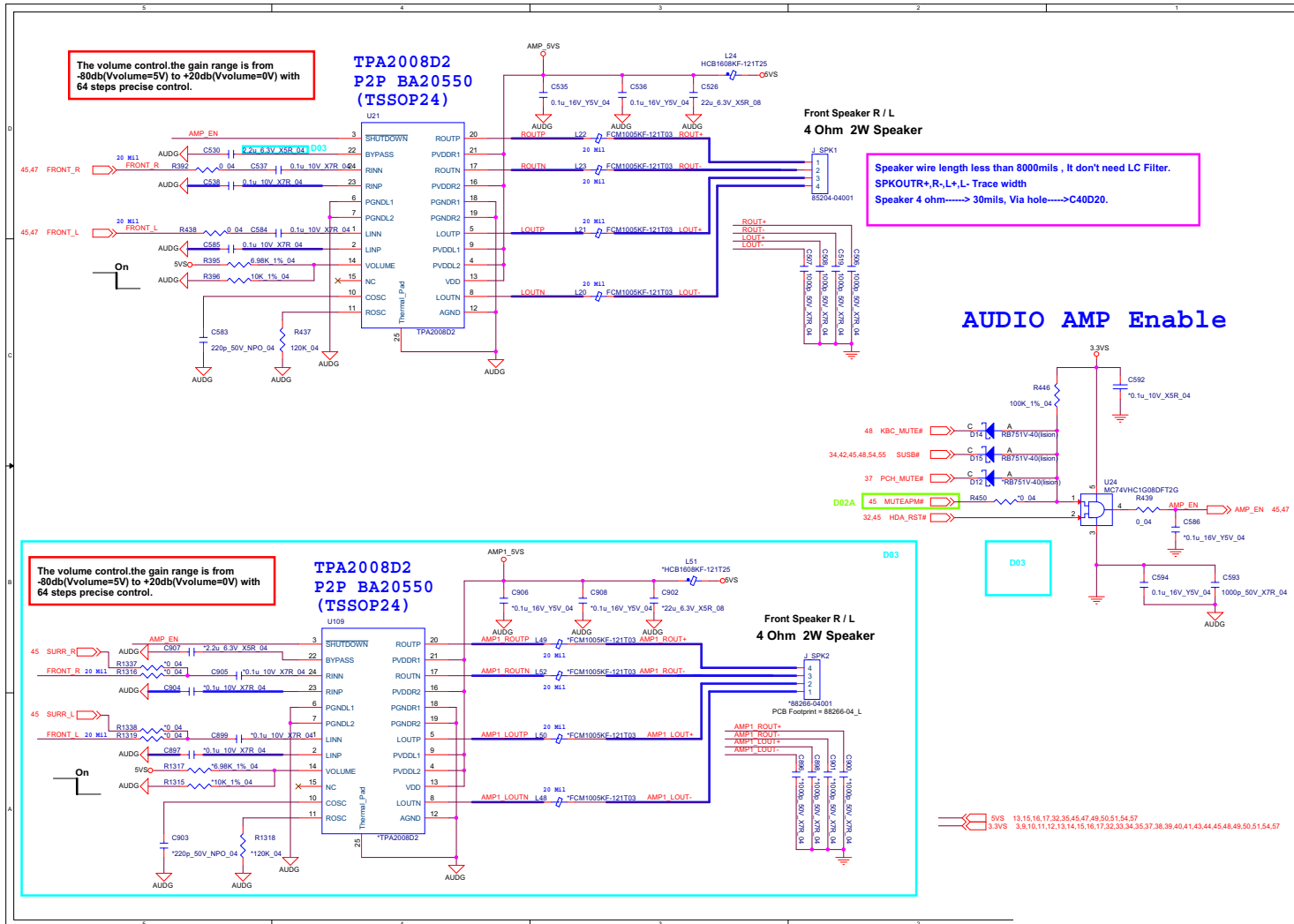
# Realtek ALC892

Sheet 45 of 72  
Realtek ALC892





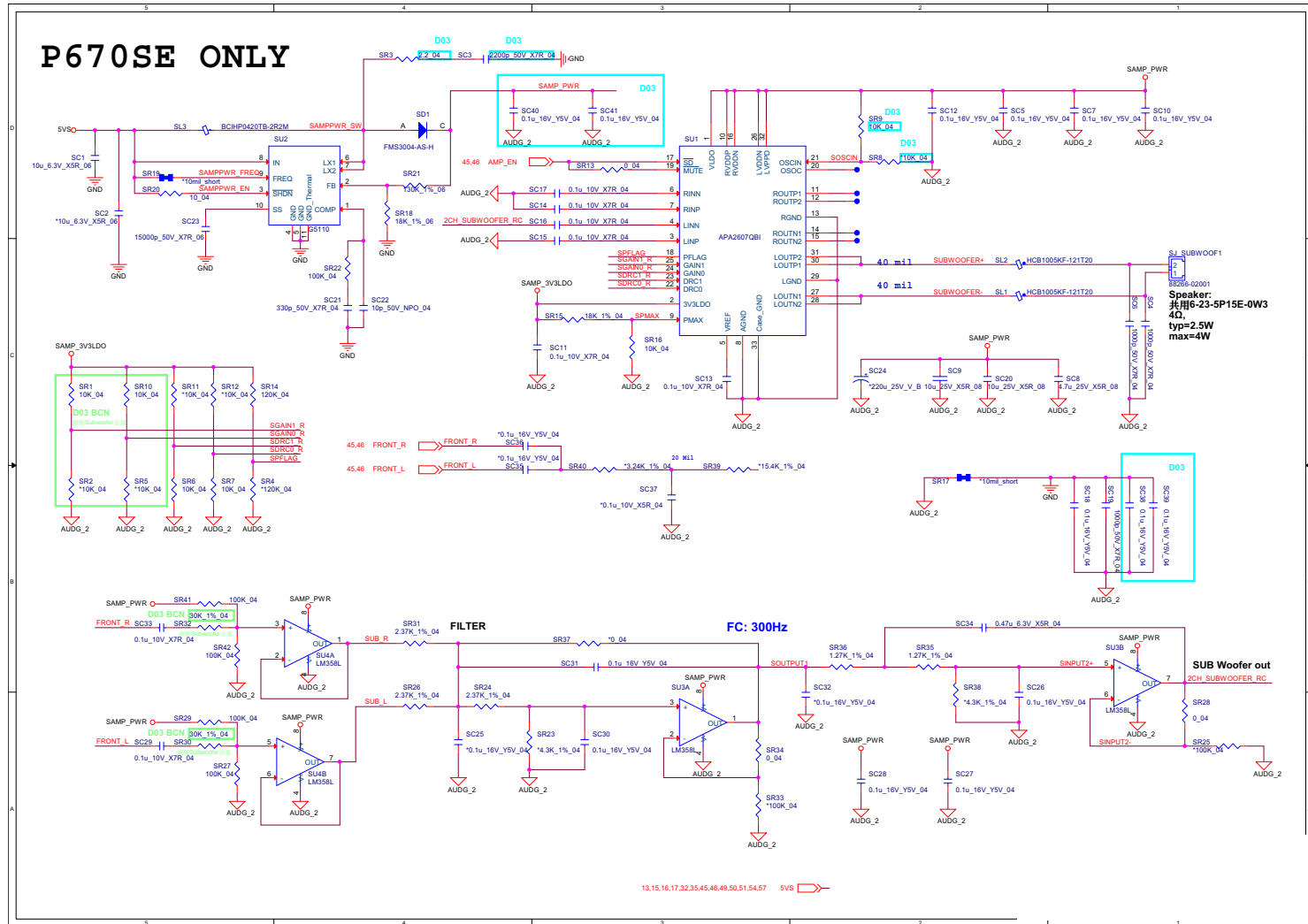
# TPA2008D2



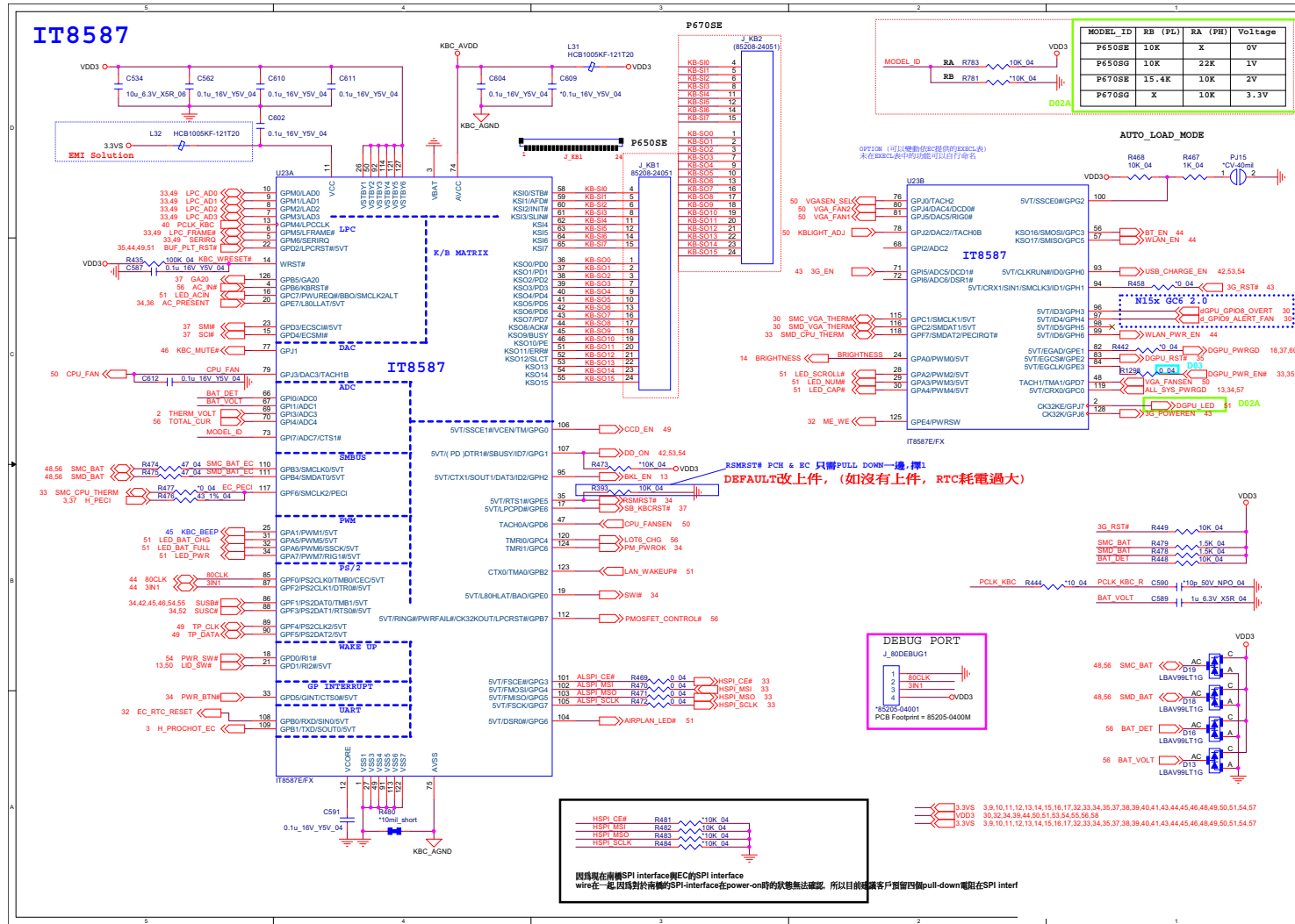
Sheet 46 of 72  
TPA2008D2

# Subwoofer

Sheet 47 of 72  
Subwoofer



# KBC-ITE IT8587

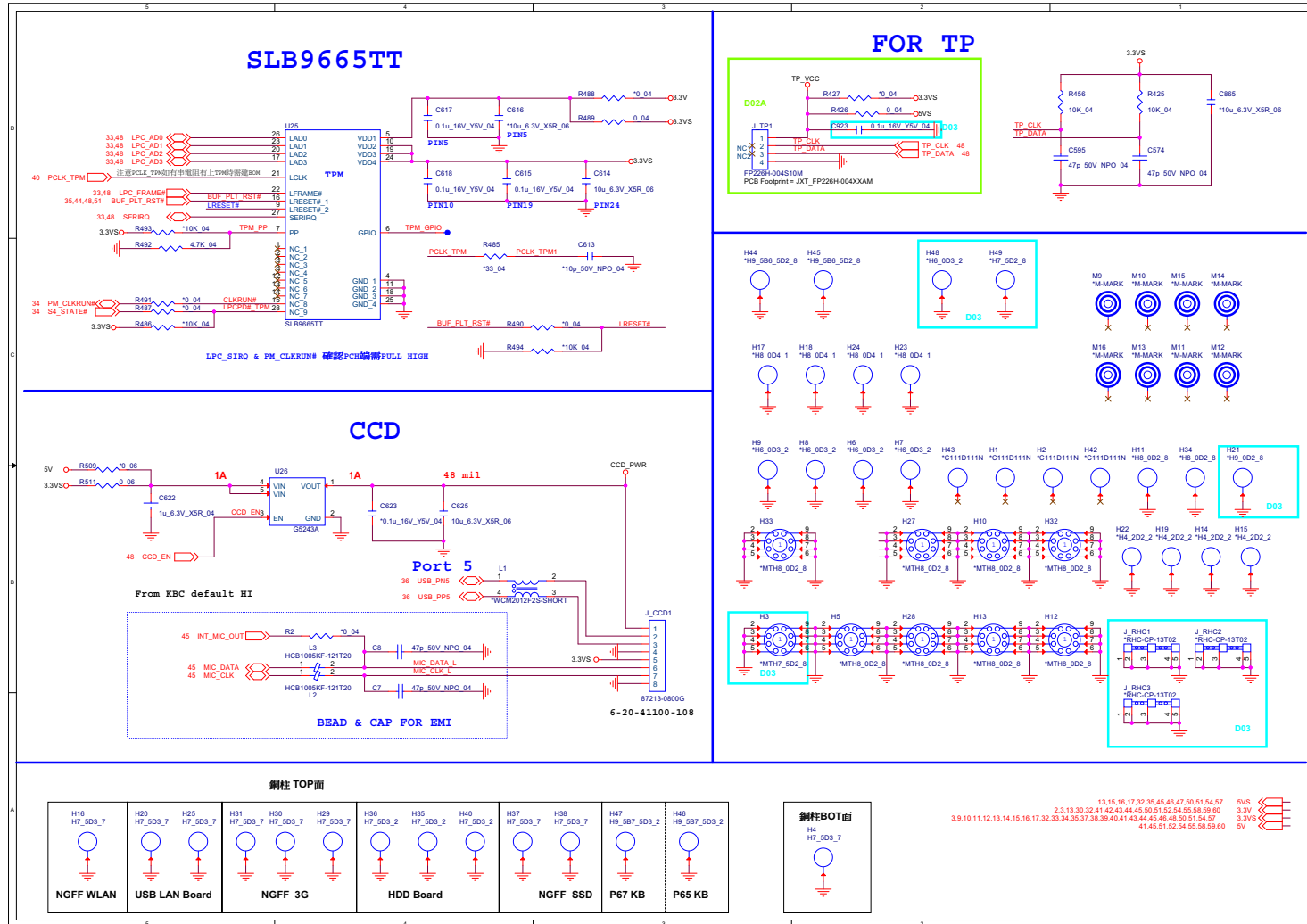


Sheet 48 of 72  
KBC-ITE IT8587

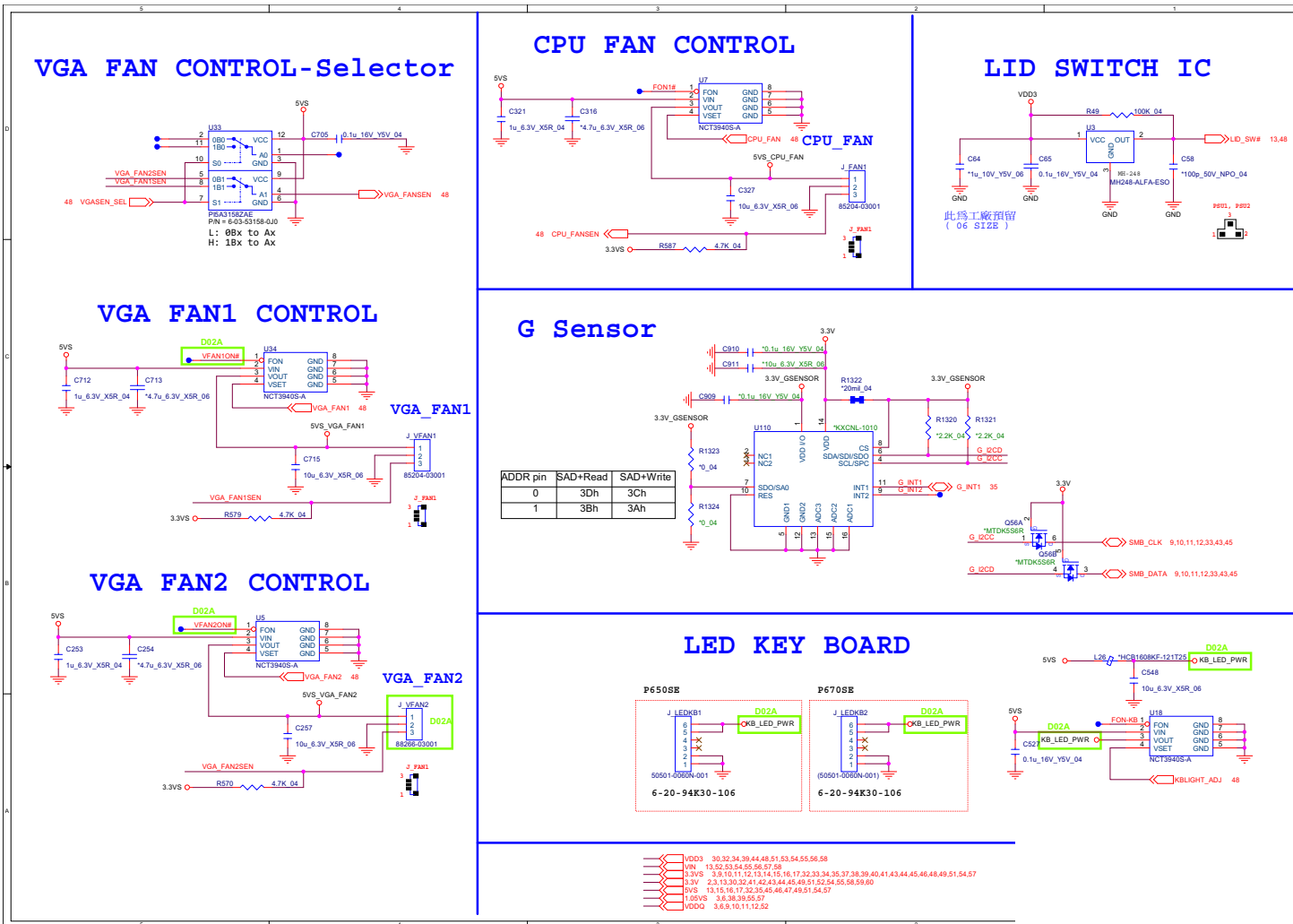
B.Schematic Diagrams

# TPM, CCD, TP

Sheet 49 of 72  
TPM, CCD, TP



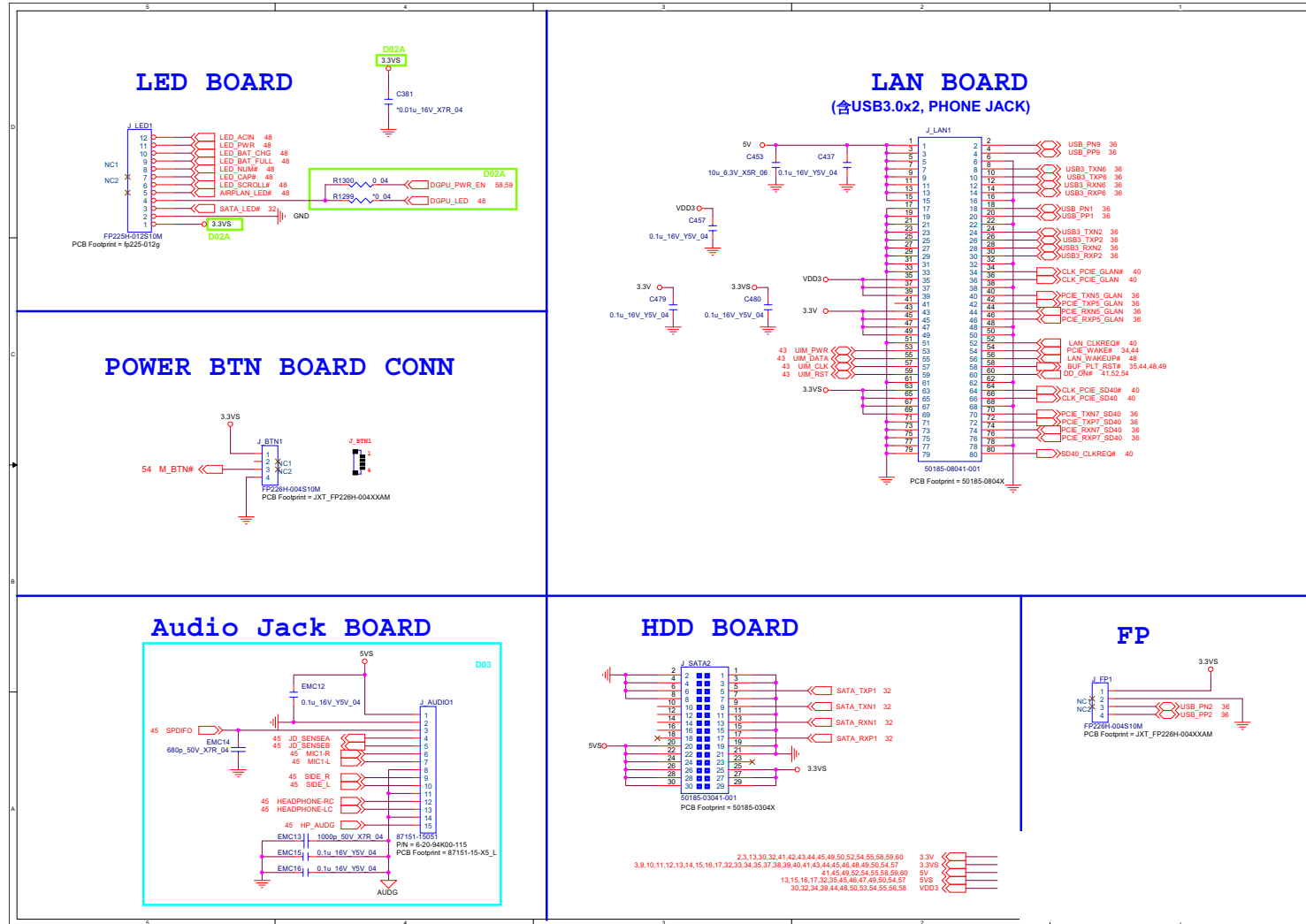
# Fan, LID, KB, LED, G Sensor



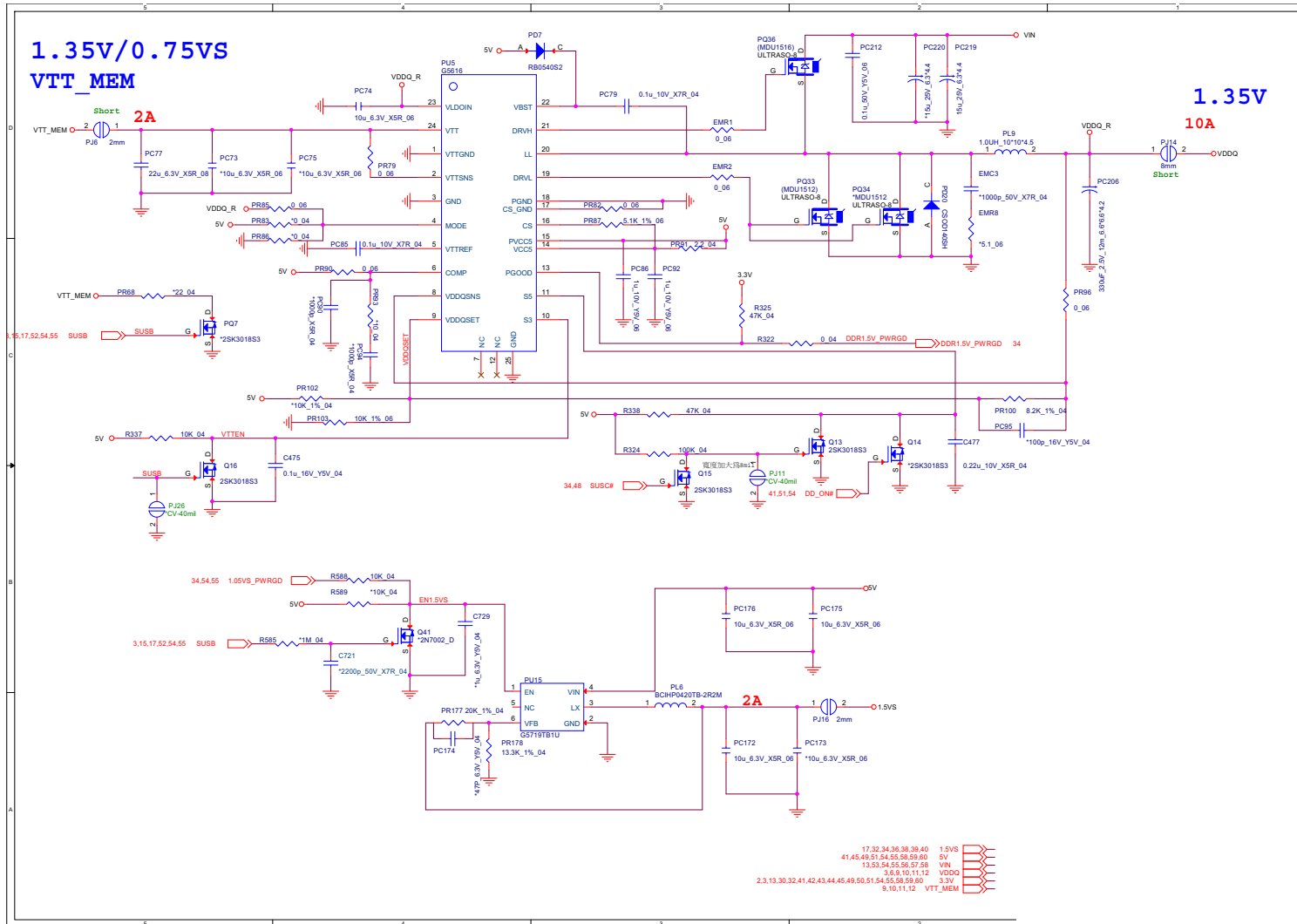
Sheet 50 of 72  
Fan, LID, KB, LED,  
G Sensor

# Connector

Sheet 51 of 72  
Connector



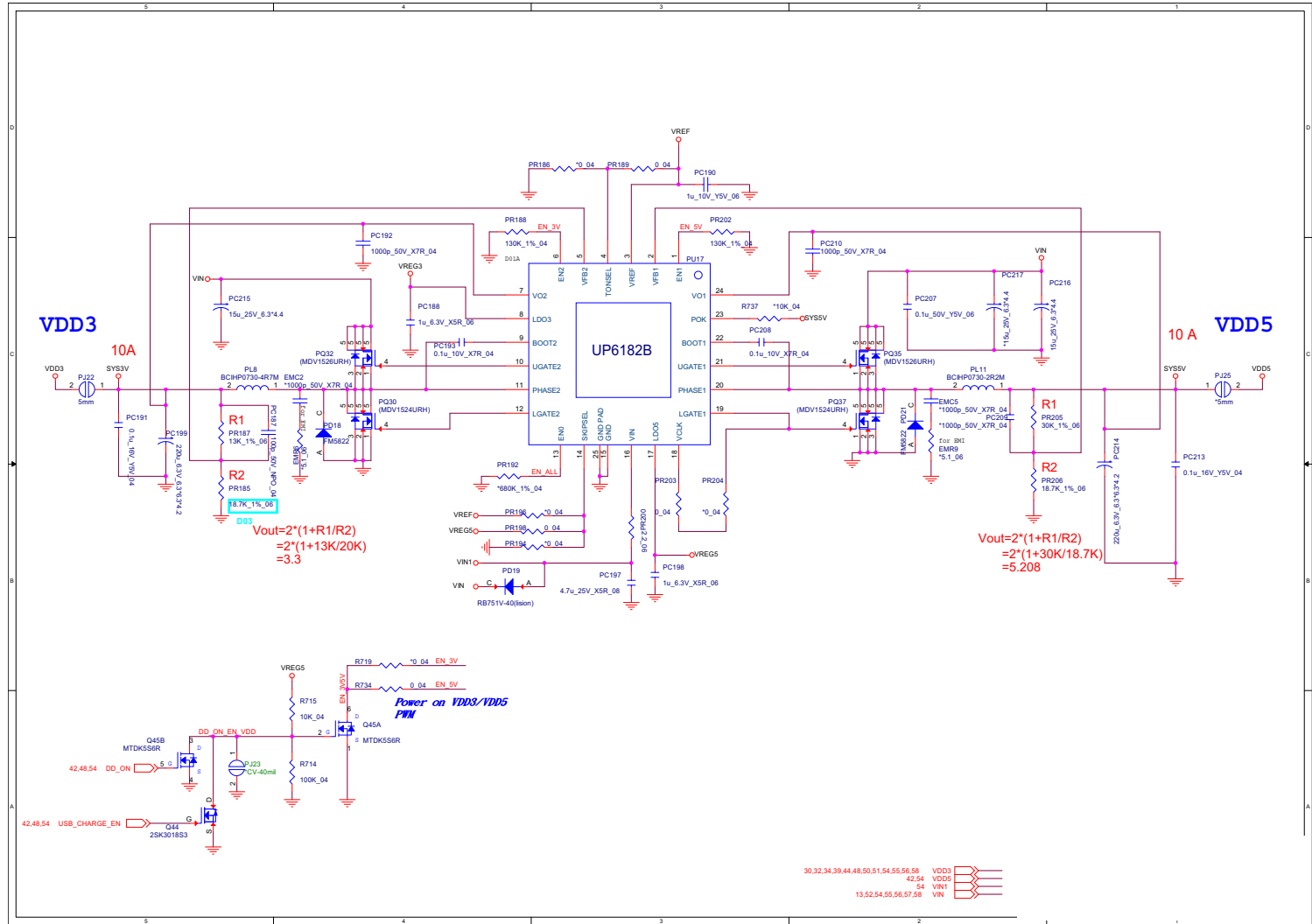
# DDR 1.35V / 0.75VS, PCH 1.5V



Sheet 52 of 72  
DDR 1.35V/0.75VS,  
PCH 1.5V

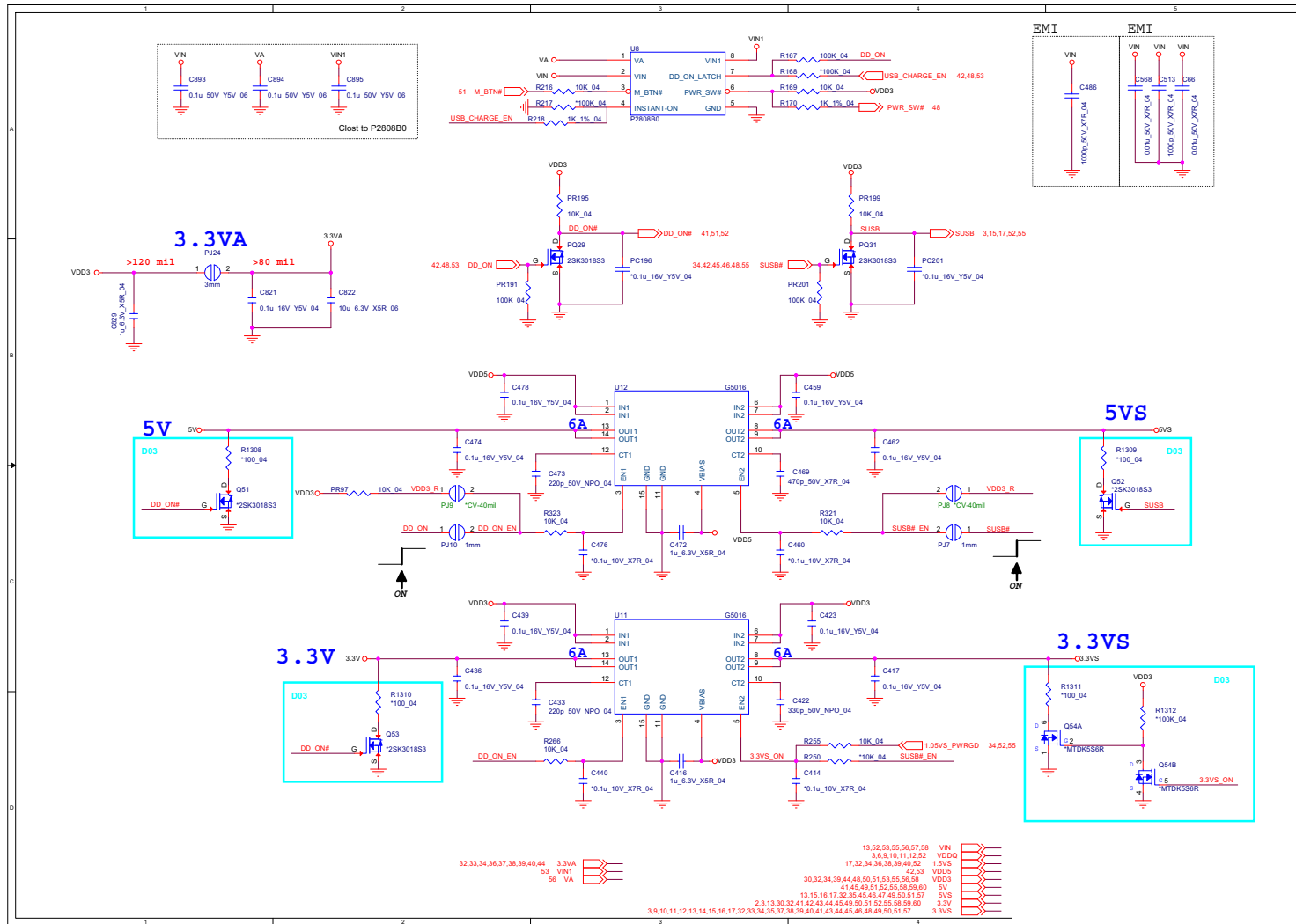
# VDD3, VDD5

Sheet 53 of 72  
VDD3, VDD5



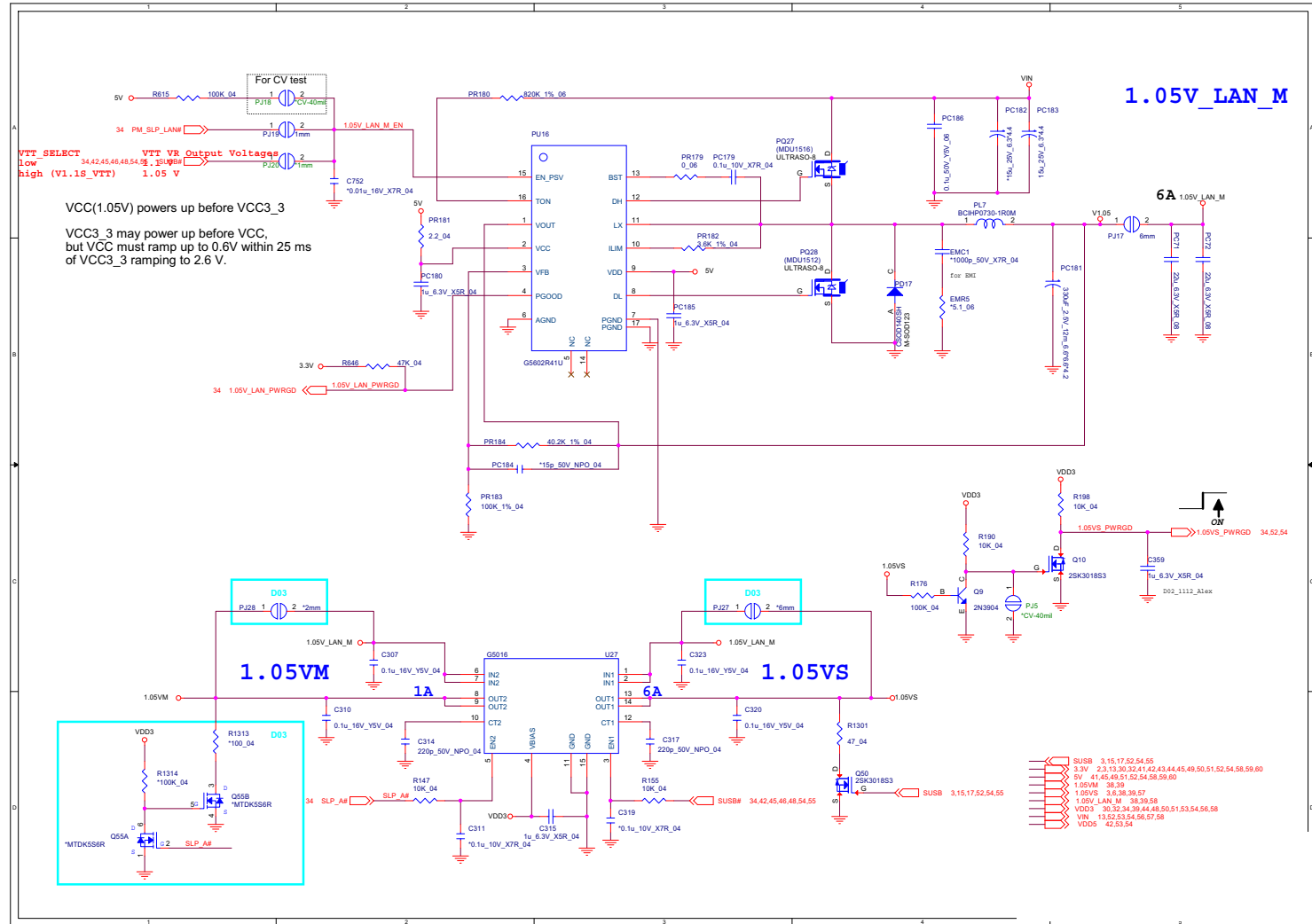


# 5V, 5VS, 3.3V, 3.3VS, 3.3VA



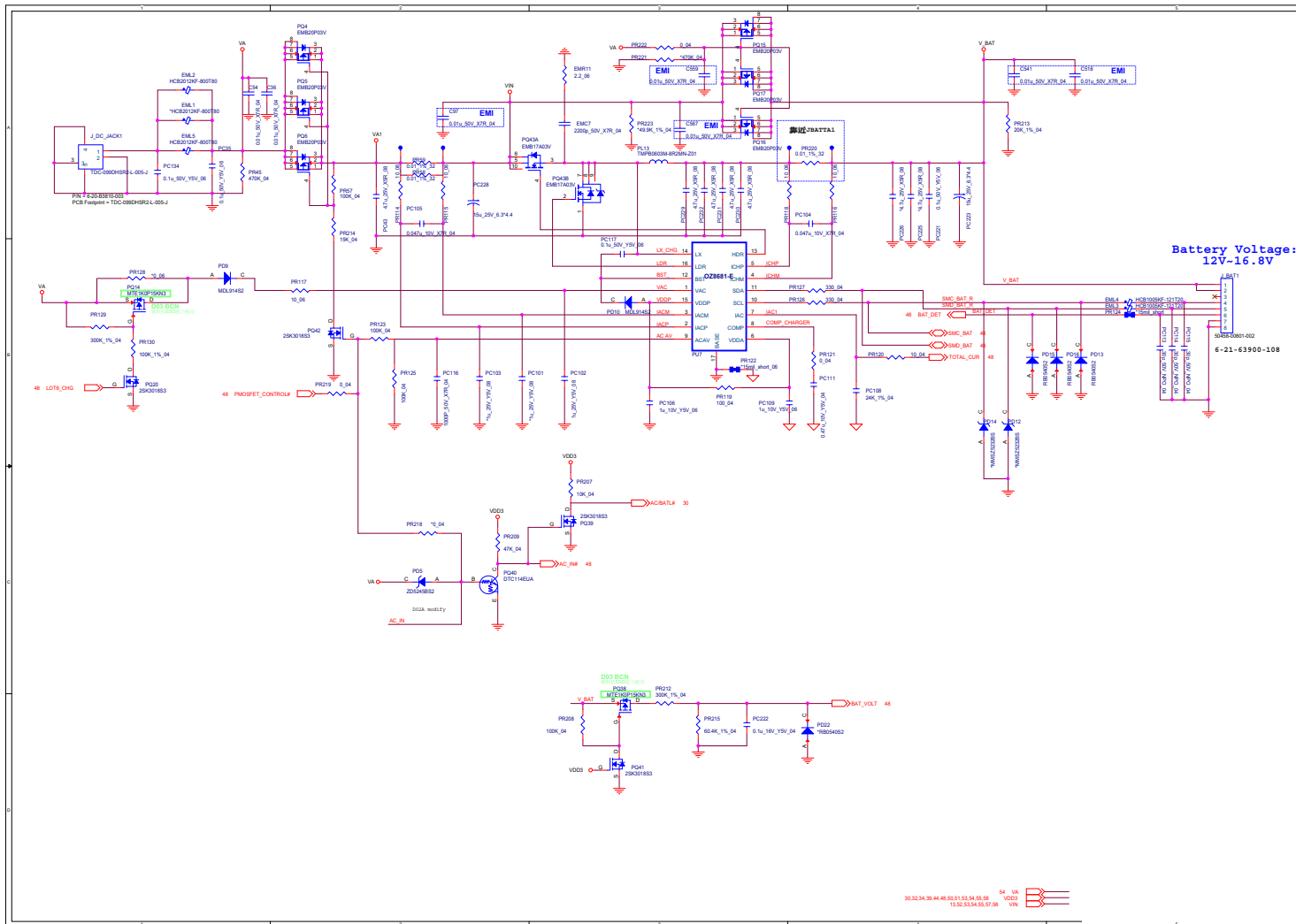
Sheet 54 of 72  
5V, 5VS, 3.3V,  
3.3VS, 3.3VA

# 1.05 Series



Sheet 55 of 72  
 1.05 Series

# AC\_In, Charger



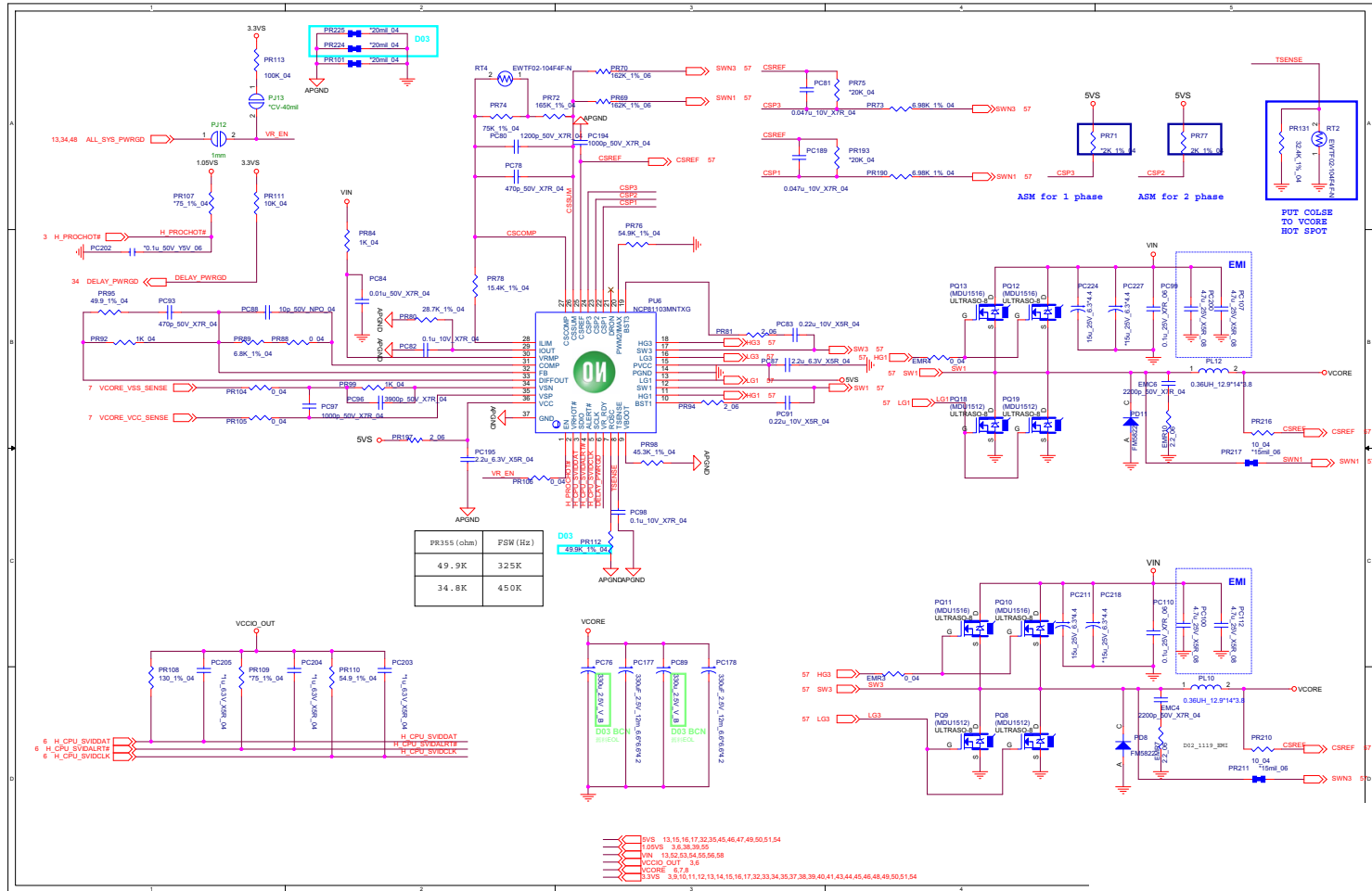
Battery Voltage:  
12V-16.8V

Sheet 56 of 72  
AC\_In, Charger

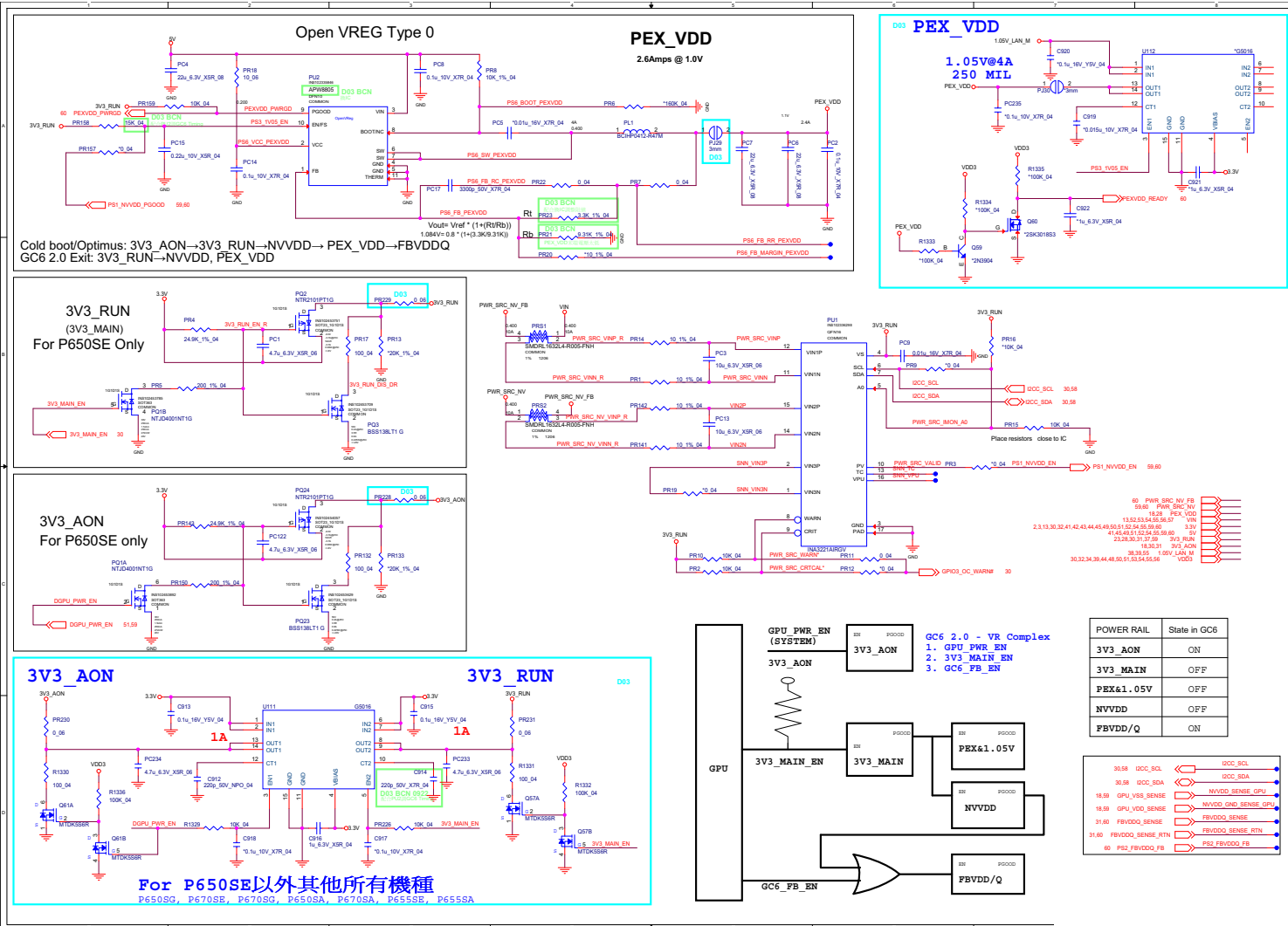
B.Schematic Diagrams

# POWER V-Core1

Sheet 57 of 72  
POWER V-Core1



# PEX\_VDD, 3V3\_AON, 3V3\_RUN

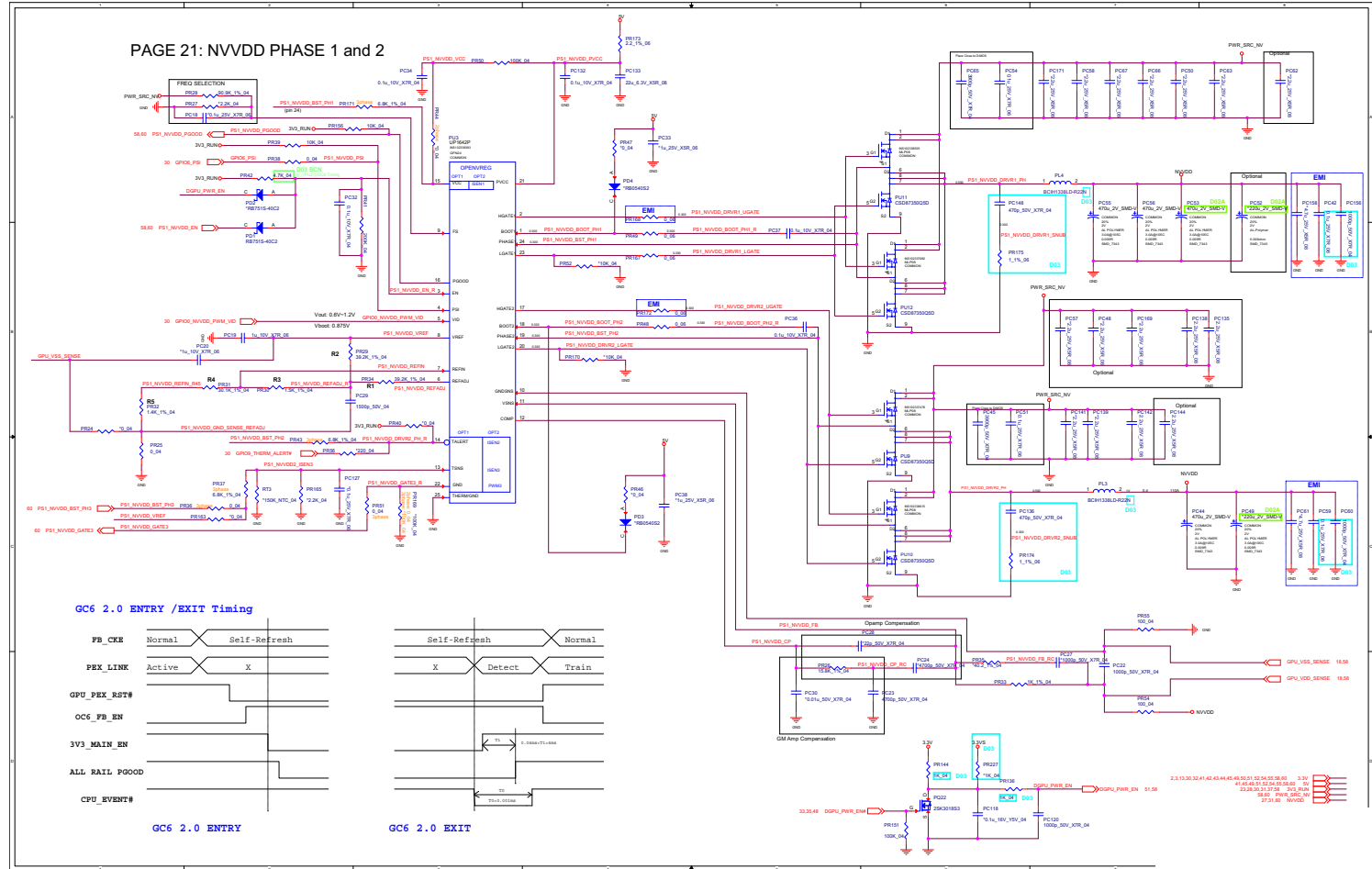


Sheet 58 of 72  
PEX\_VDD,  
3V3\_AON,  
3V3\_RUN

B.Schematic Diagrams

# Schematic Diagrams

## NVDD Phase 1 & 2

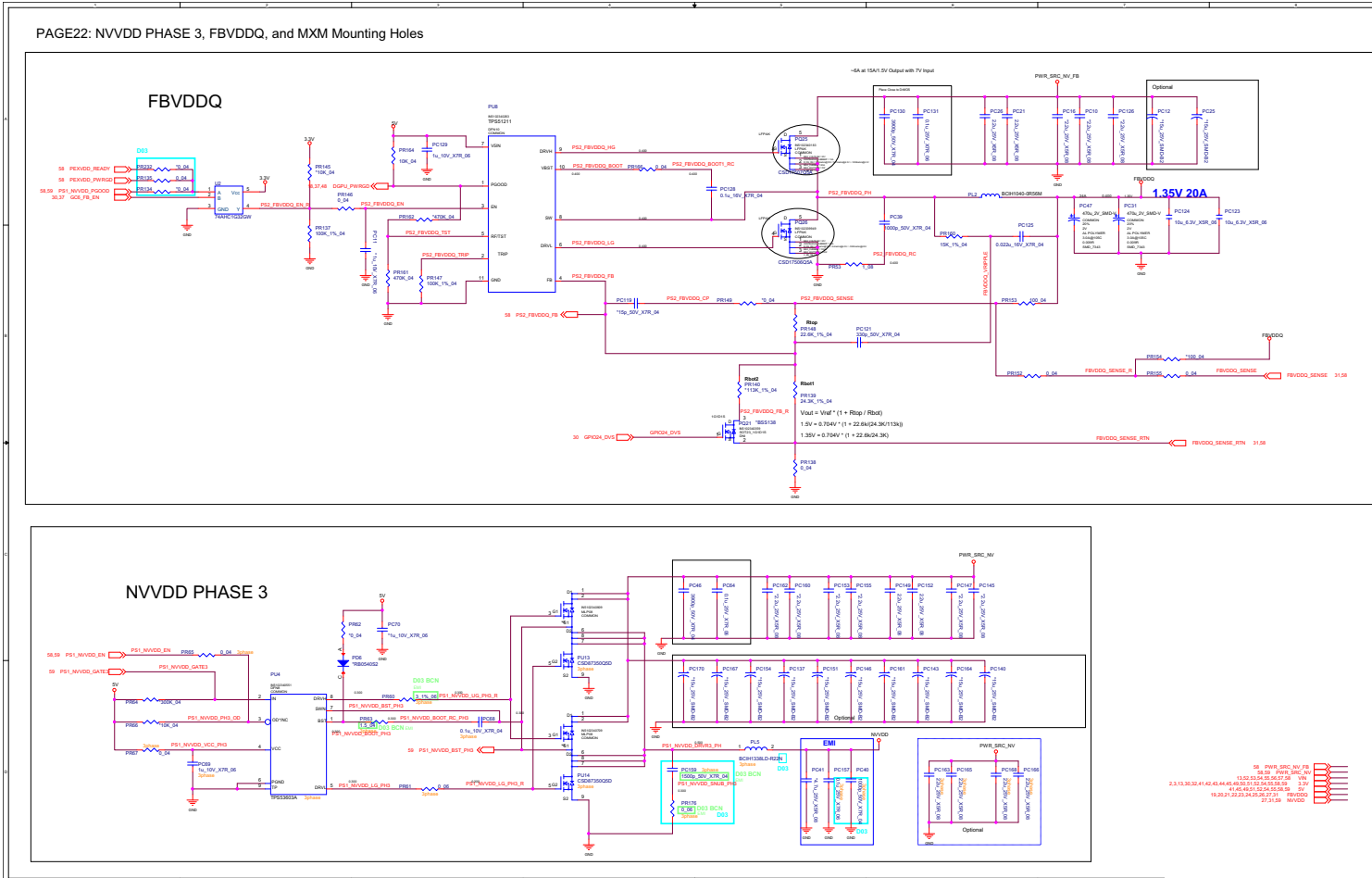


B.Schematic Diagrams

Sheet 59 of 72  
NVDD Phase 1 & 2

# FBVDDQ

PAGE22: NVVDD PHASE 3, FBVDDQ, and MXM Mounting Holes

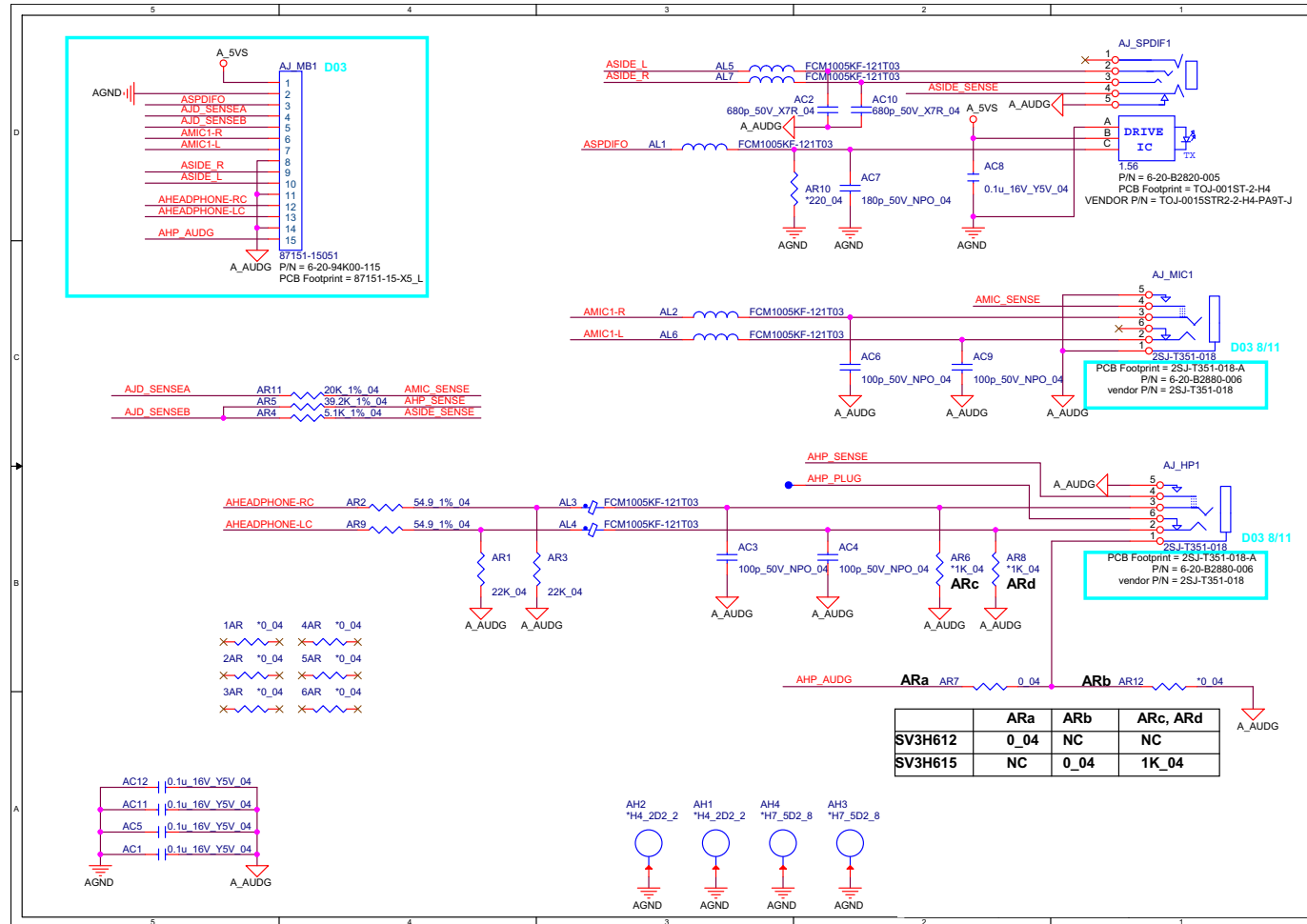


Sheet 60 of 72  
FBVDD

B.Schematic Diagrams

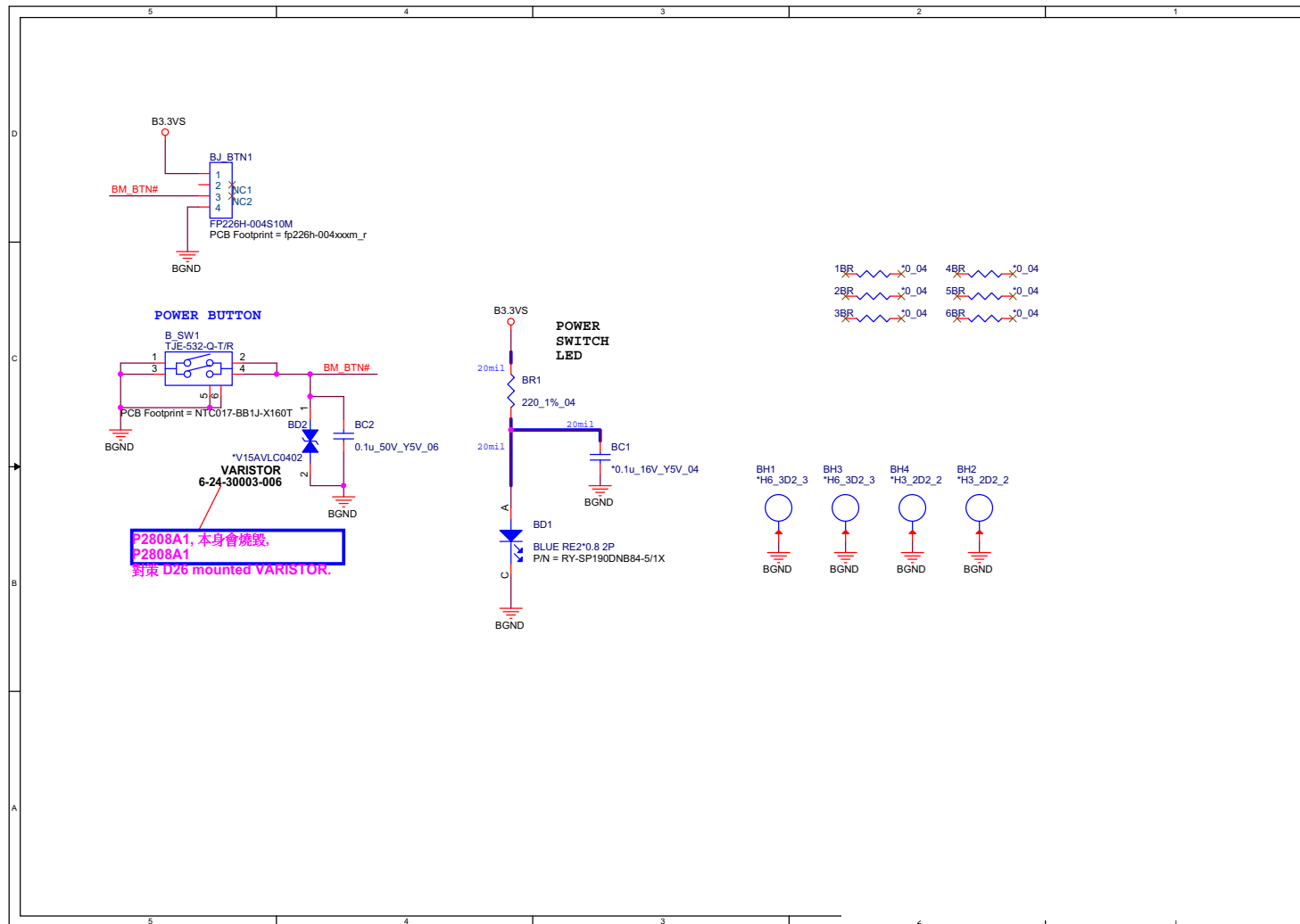
# Audio Board

Sheet 61 of 72  
Audio Board





# Power Board



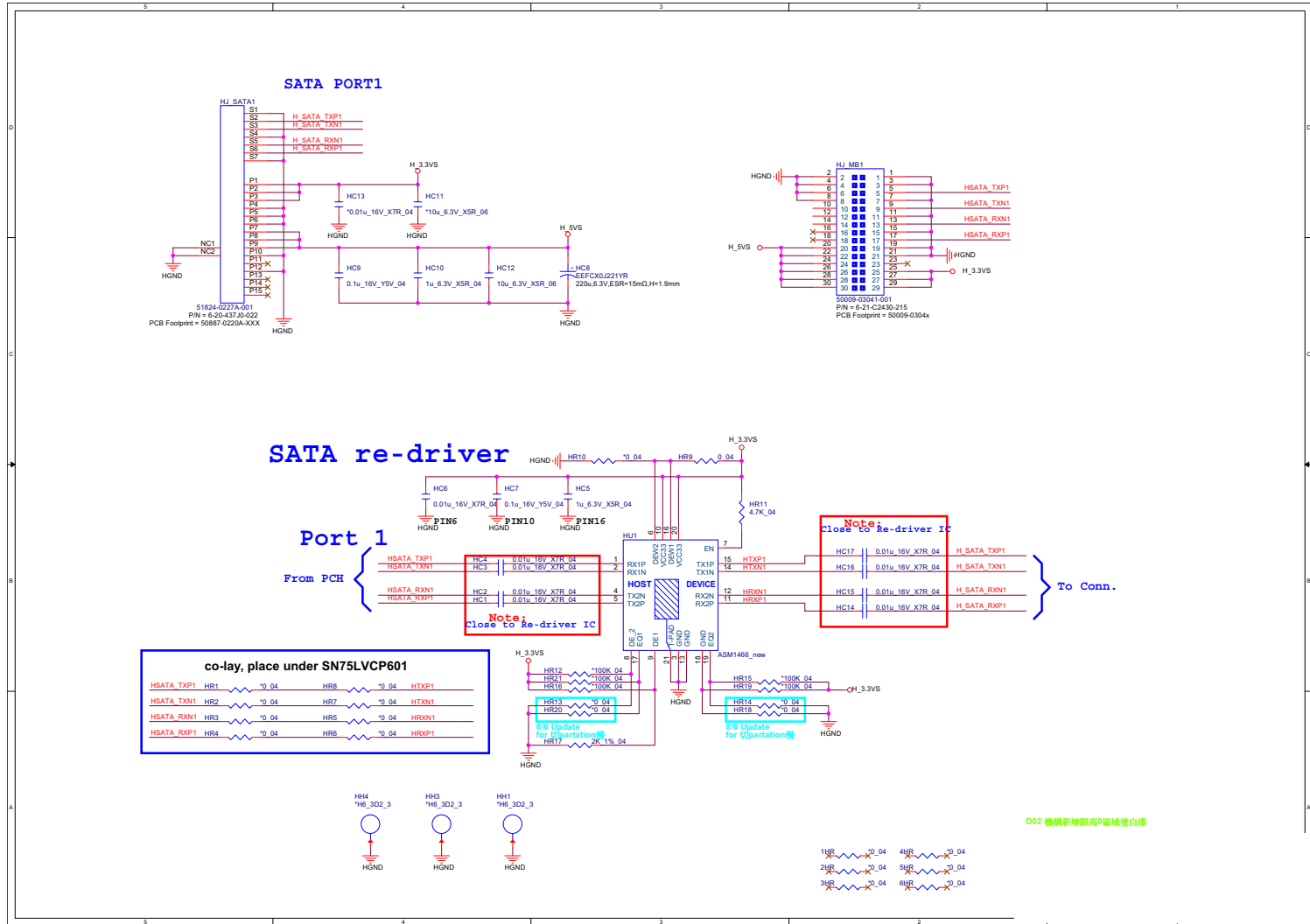
Sheet 62 of 72  
Power Board

B.Schematic Diagrams

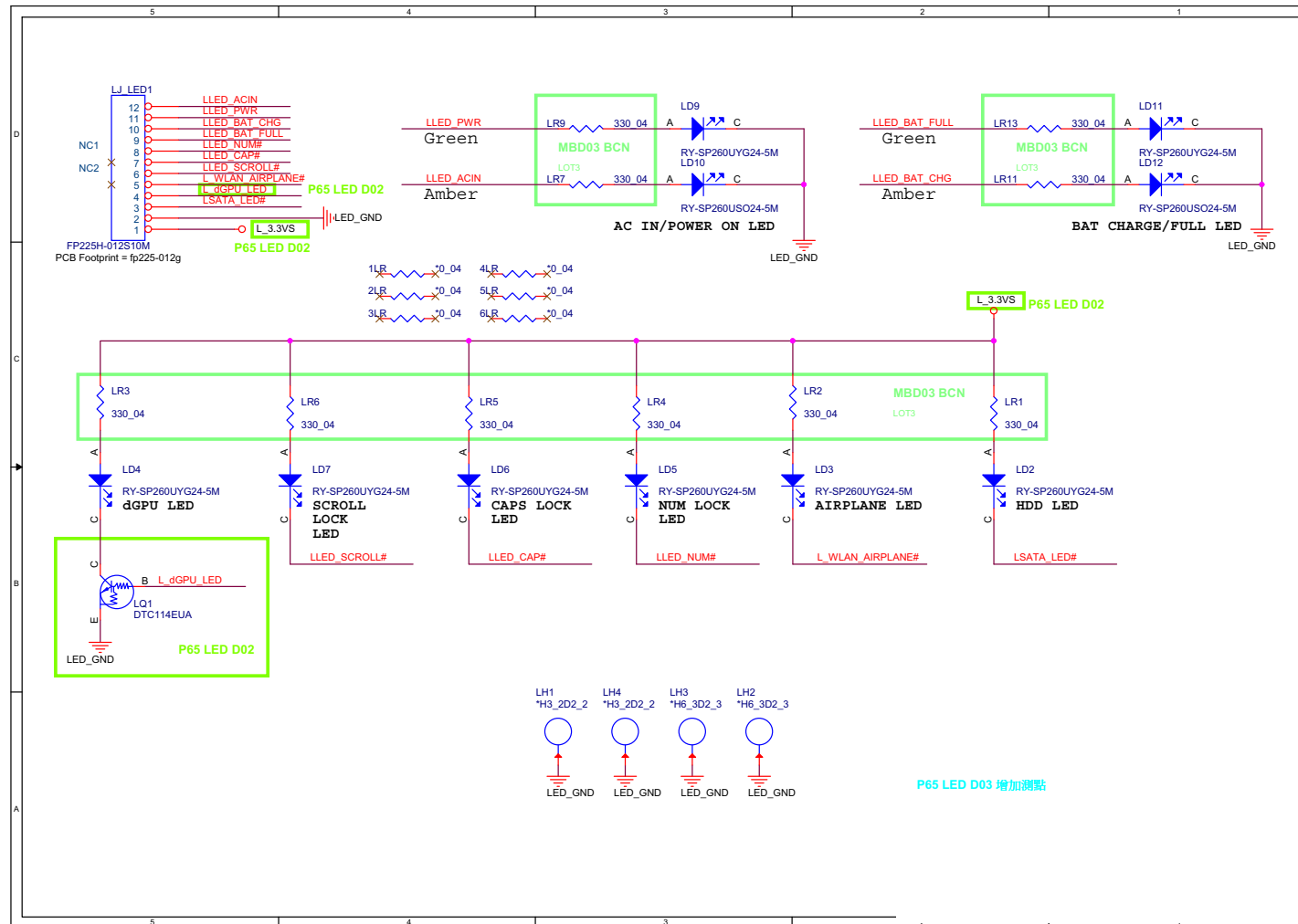
# Schematic Diagrams

## HDD Board

Sheet 63 of 72  
HDD Board



# LED Board

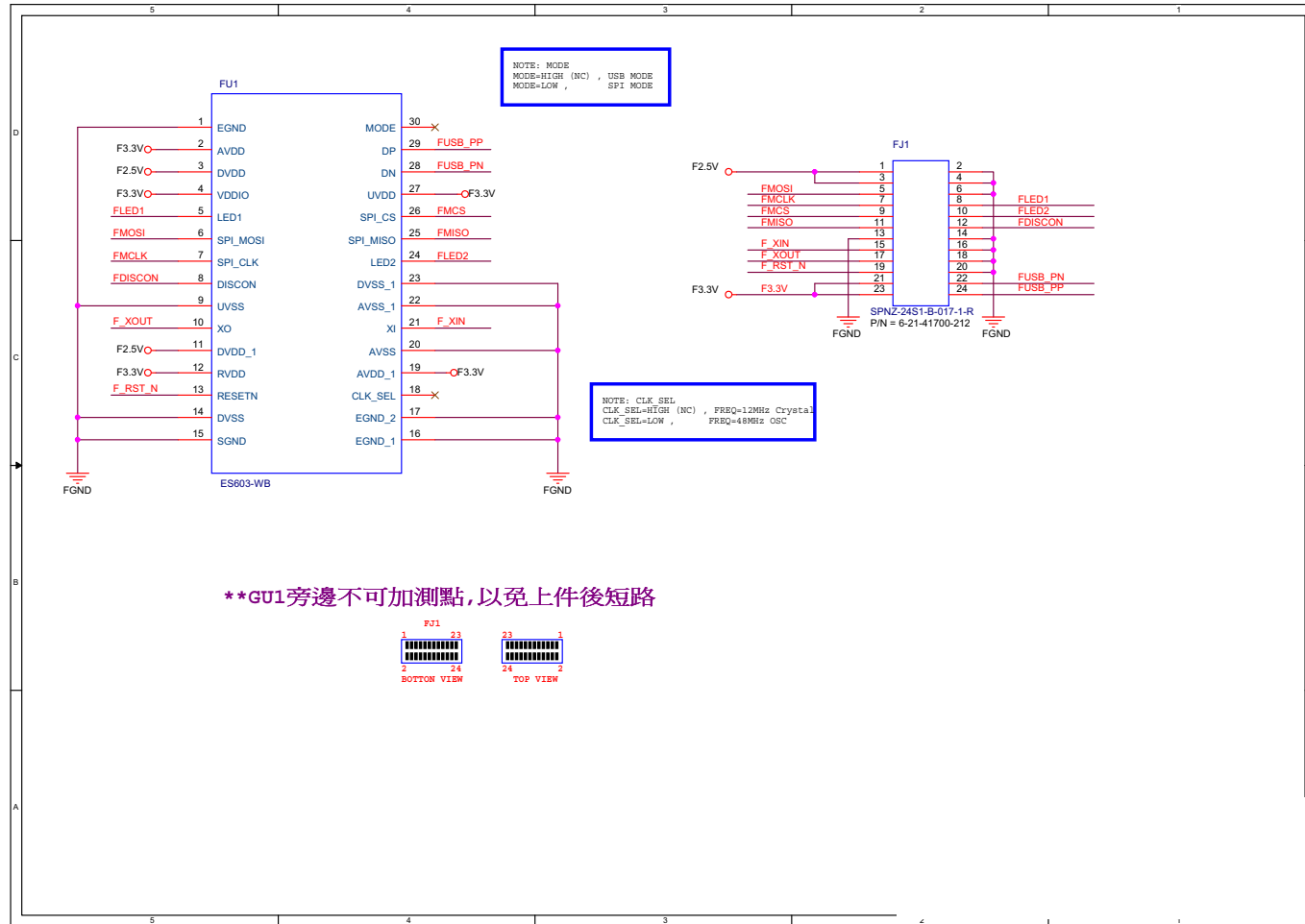


Sheet 64 of 72  
LED Board

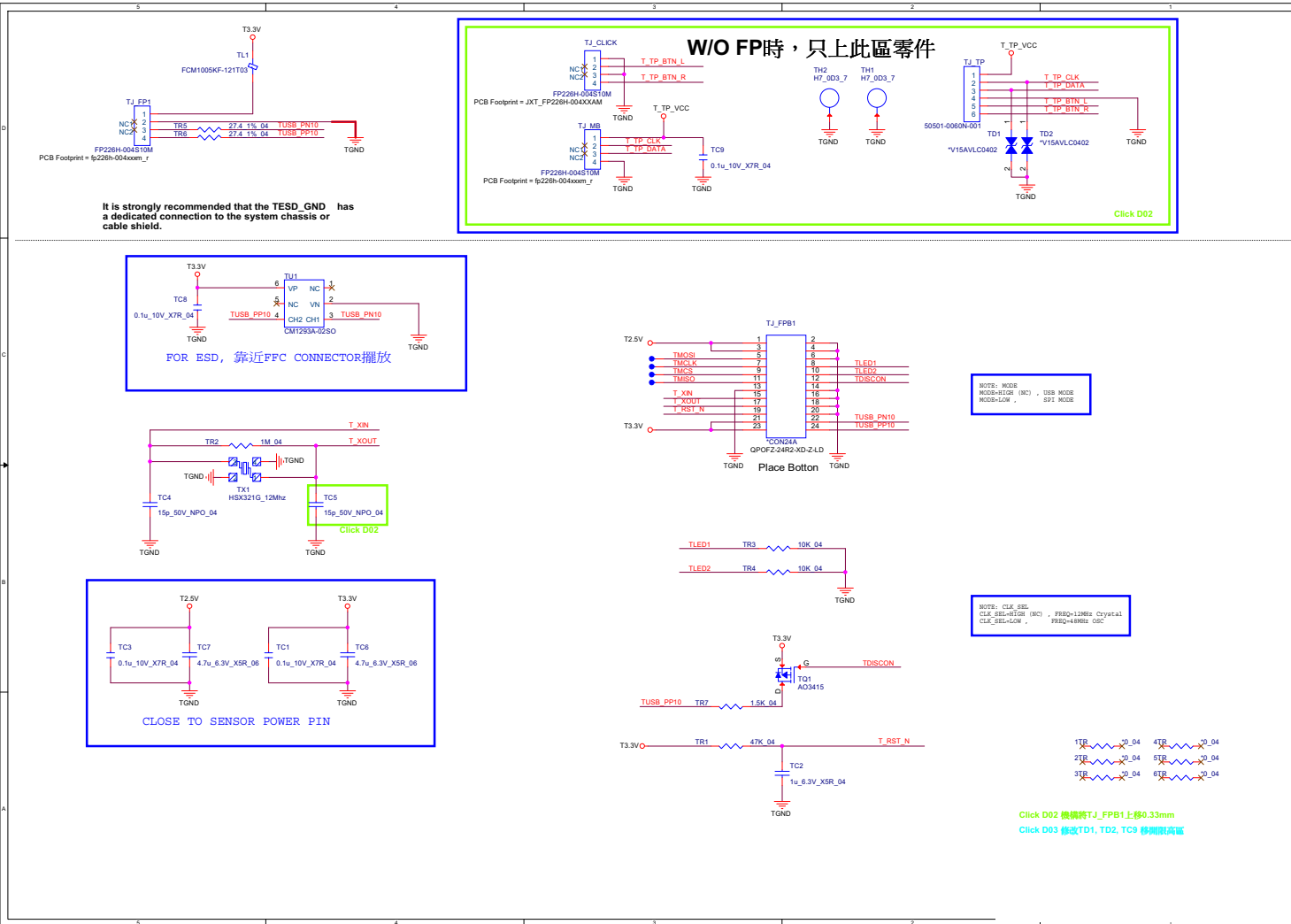
B.Schematic Diagrams

# Finger Sensor Board

Sheet 65 of 72  
Finger Sensor  
Board



# Click Board

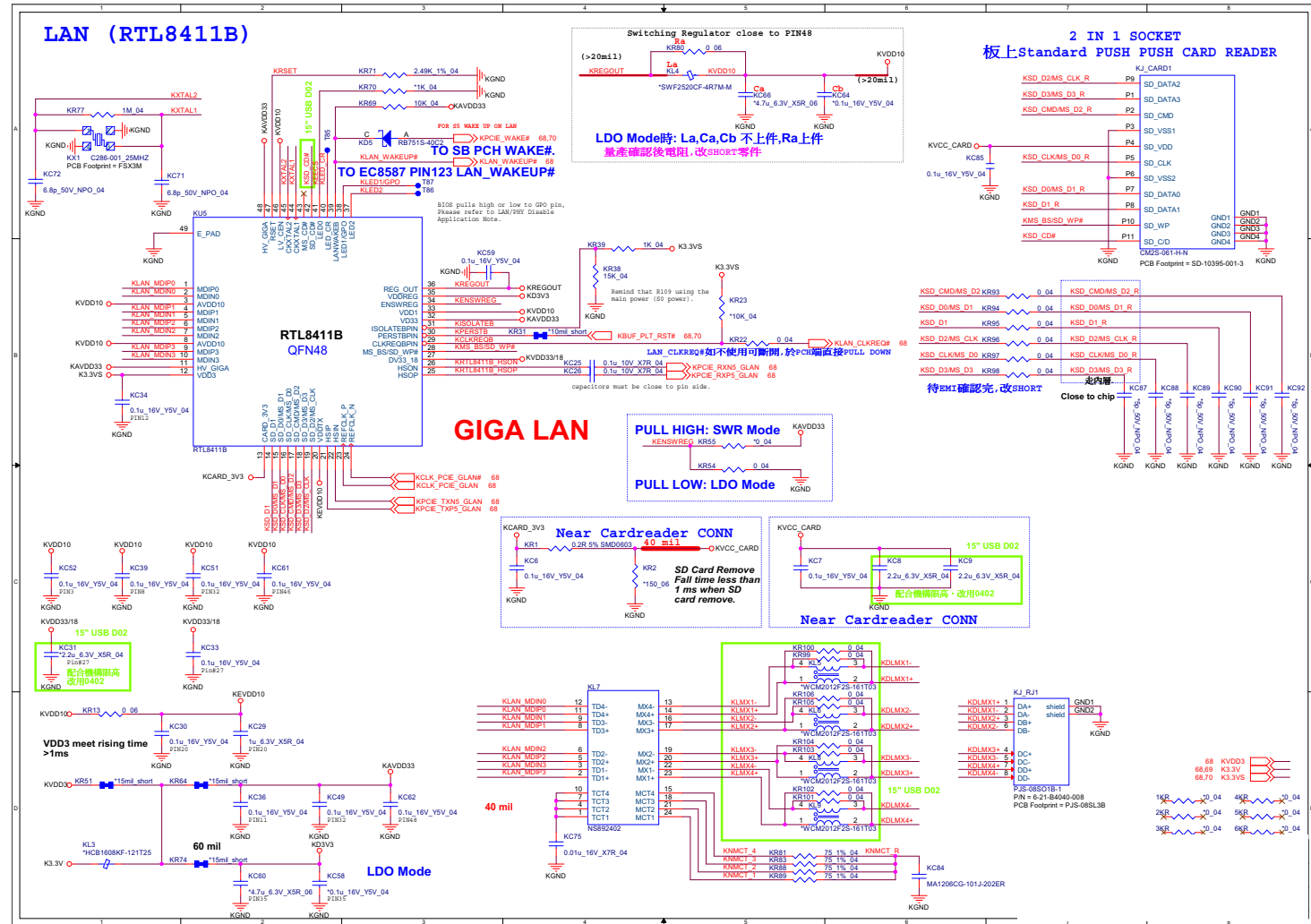


Sheet 66 of 72  
Click Board

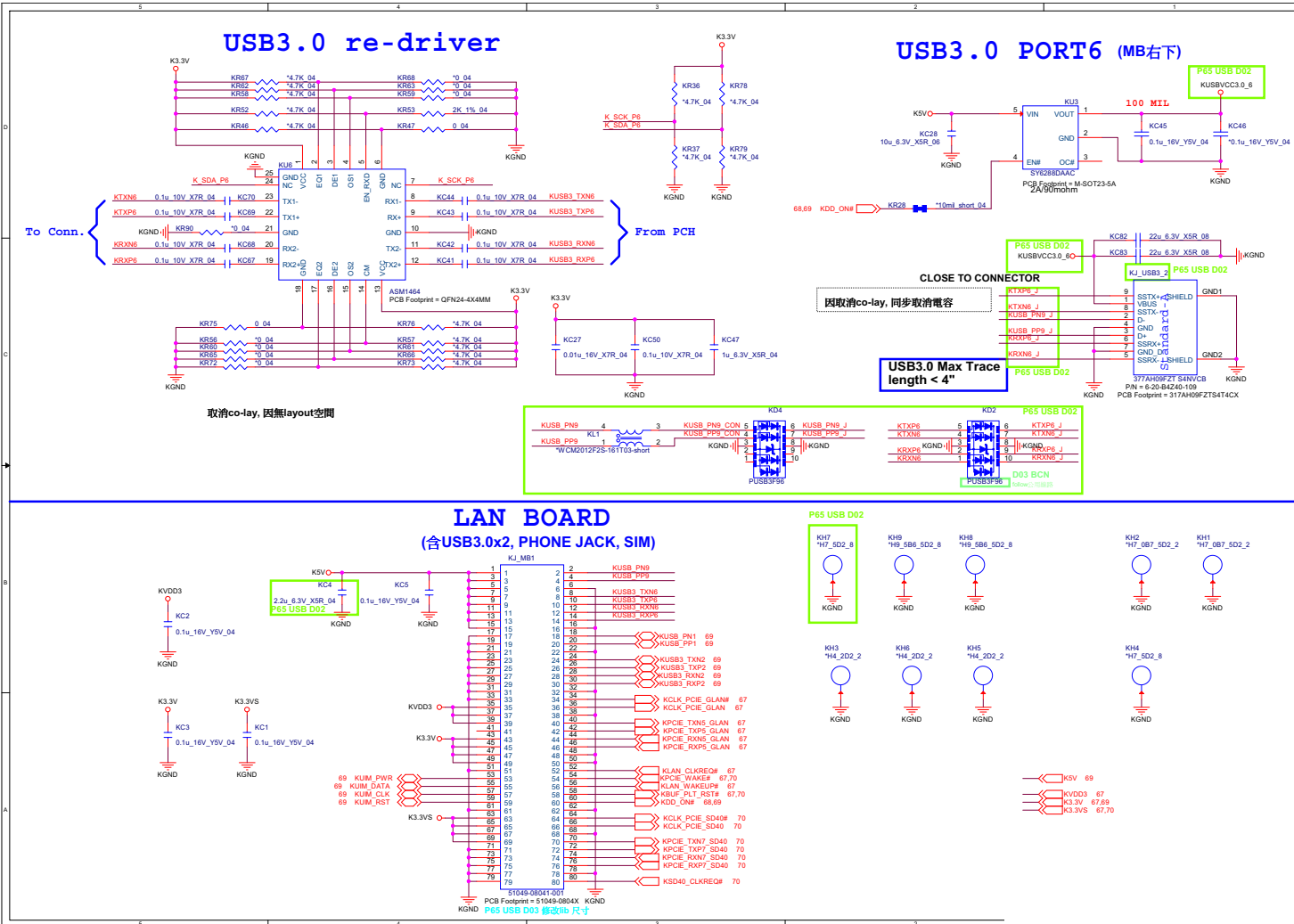
B.Schematic Diagrams

# USB Board 1/4

Sheet 67 of 72  
USB Board 1/4



# USB Board 2/4

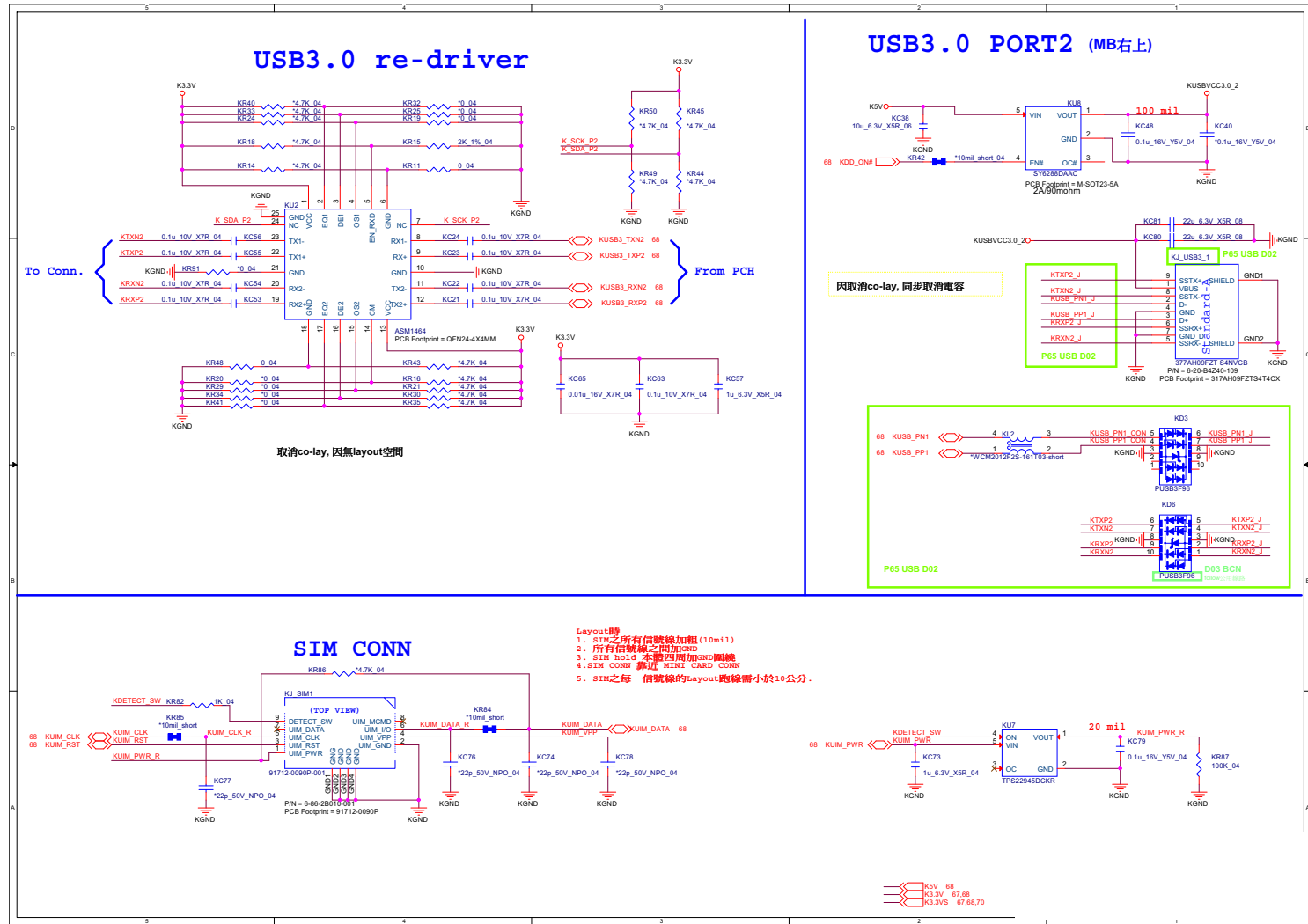


Sheet 68 of 72  
USB Board 2/4

B.Schematic Diagrams

# USB Board 3/4

Sheet 69 of 72  
USB Board 3/4

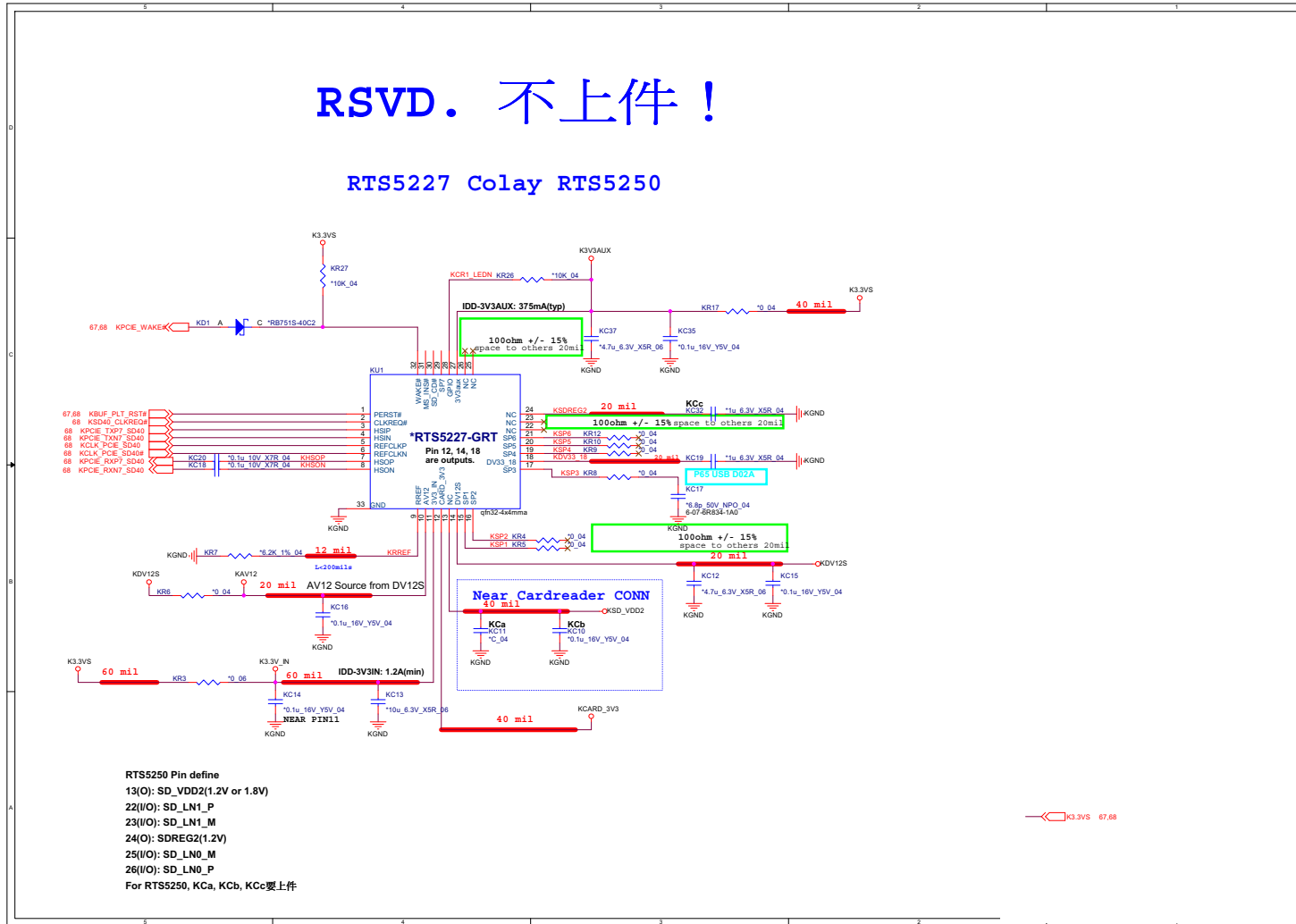




# USB Board 4/4

RSVD. 不上件!

RTS5227 Colay RTS5250

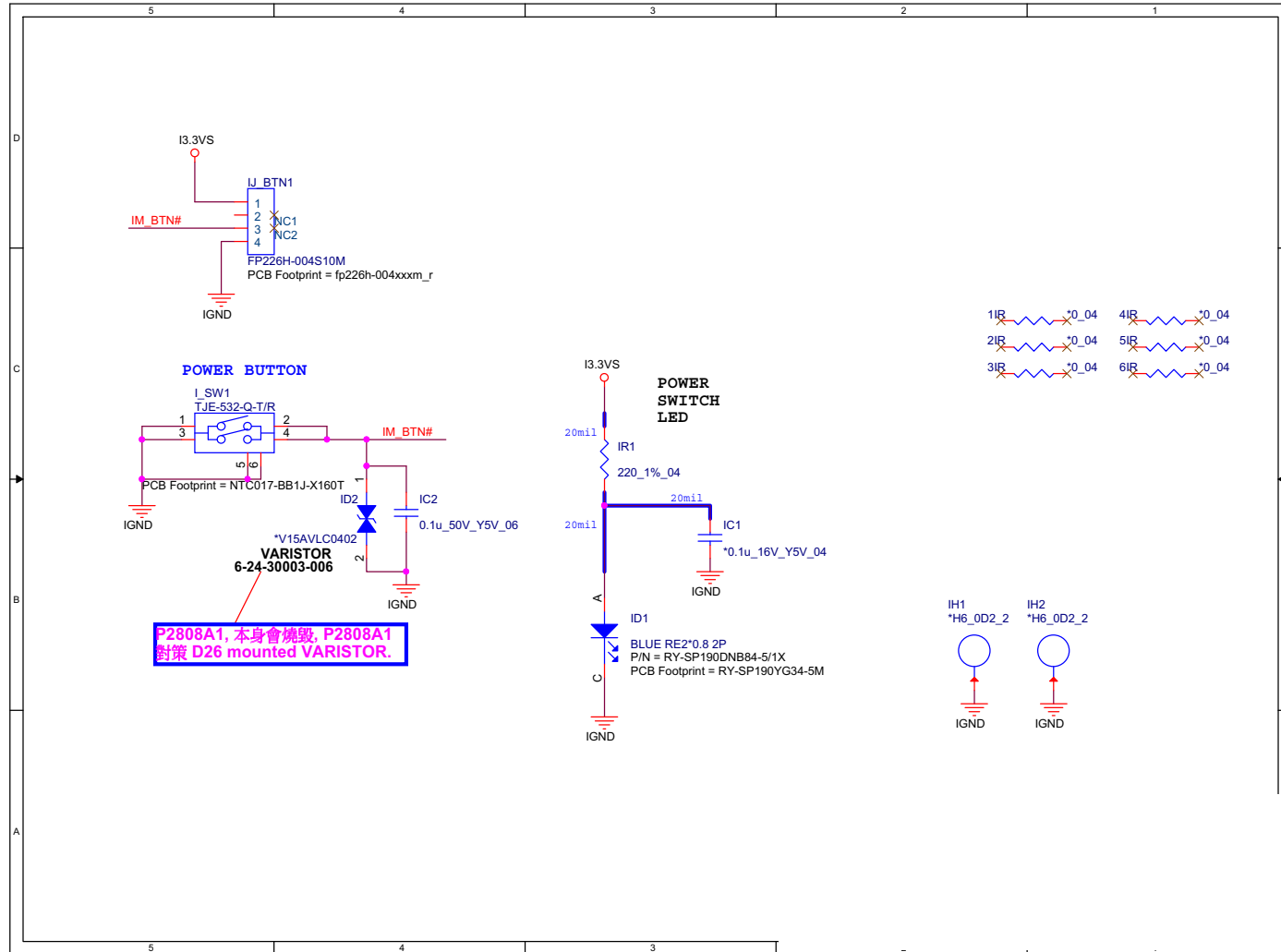


Sheet 70 of 72  
USB Board 4/4

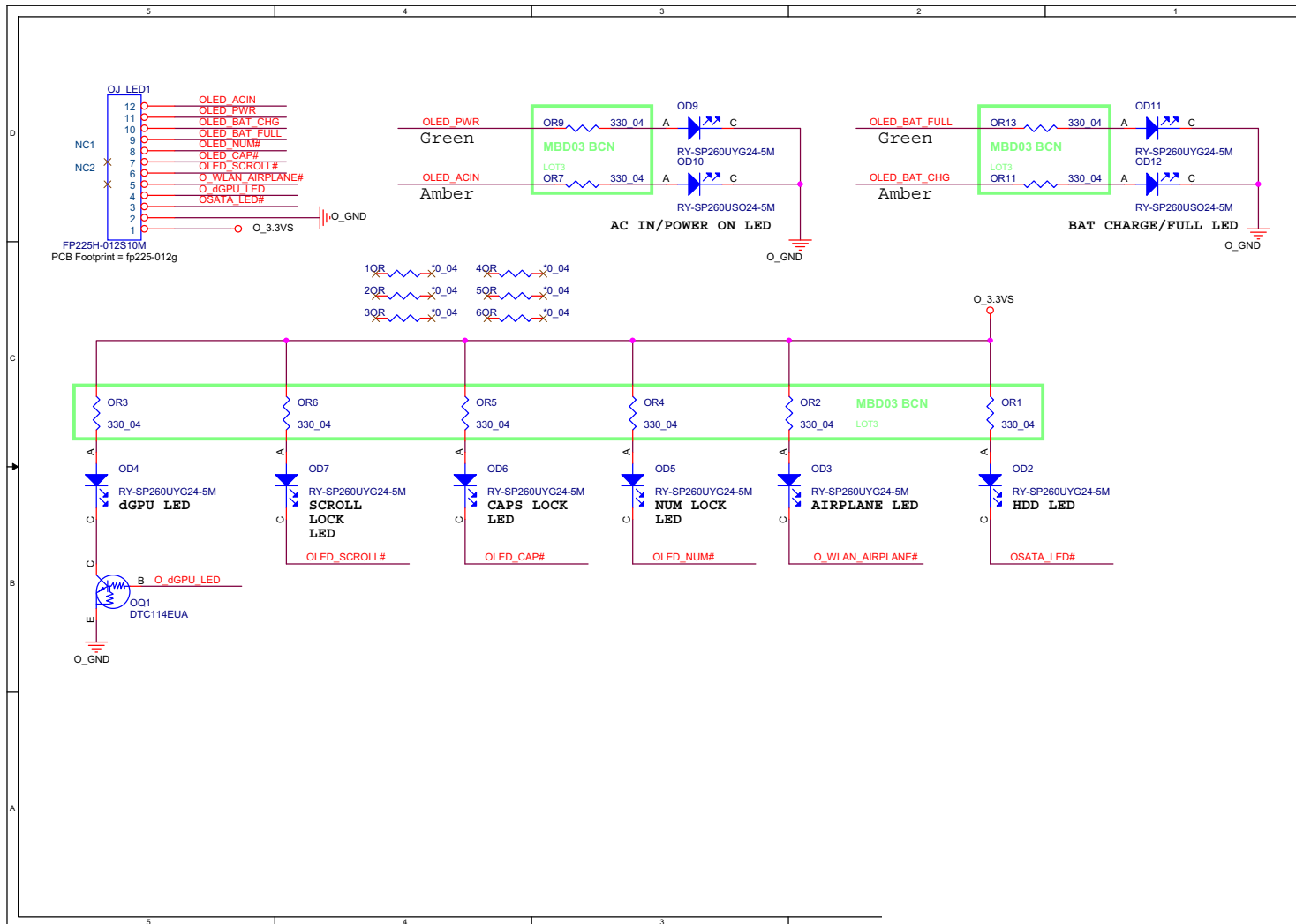
B.Schematic Diagrams

# Power Board

Sheet 71 of 72  
P655SEQ Power Board



# LED Board



Sheet 72 of 72  
P655SE  
LED Board

**Schematic Diagrams**

# Appendix C: Updating the FLASH ROM BIOS

## To update the FLASH ROM BIOS, you must:

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

## Download the BIOS

1. Go to [www.clevo.com.tw](http://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 “**EFI Shell**”. You will then be prompted to give “**Y**” or “**N**” responses to the programs being loaded by EFI Shell. Choose “**N**” for any memory management programs.
2. You should now see **DISK fsX:\>** (X is the designated drive number for the CD/DVD drive/USB flash drive).
3. **Type the following command:**

**fsX:\> Flash.nsh**

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.