

# SERVICE MANUAL

*notebook*

N870HK1





**Notebook Computer**

**N870HK1**

**Service Manual**

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Version 1.0  
January 2017

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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 *N870HK1* series notebook PC.

The following information is included:

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

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

Appendix A, Part Lists

Appendix B, Schematic Diagrams

Appendix C, Updating the FLASH ROM BIOS

### **IMPORTANT SAFETY INSTRUCTIONS**

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

1. Do not use this product near water, for example near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
2. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
5. This product is intended to be supplied by a Listed Power Unit as follows:
  - AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19.5V, 6.15A (**120** Watts) minimum AC/DC Adapter.

### **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.

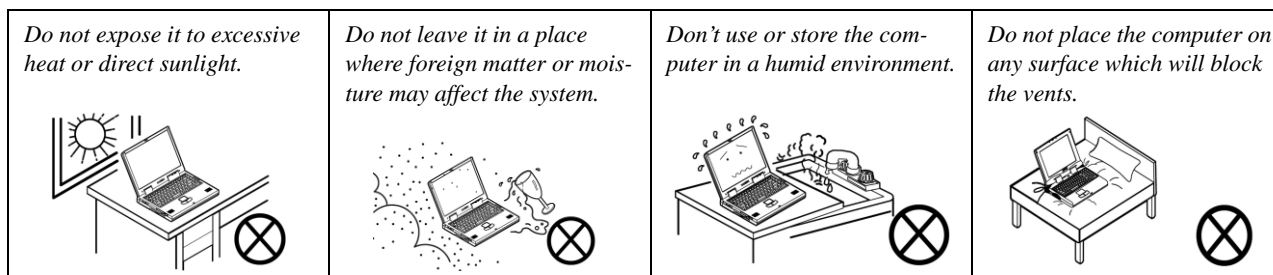
## Instructions for Care and Operation

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

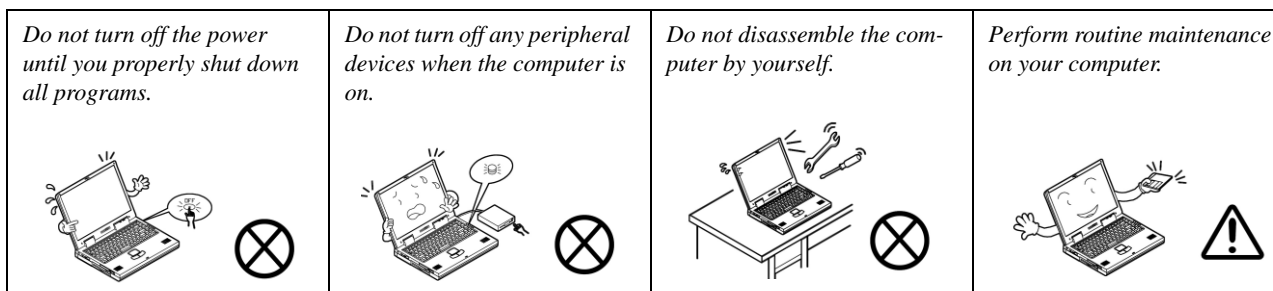
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.



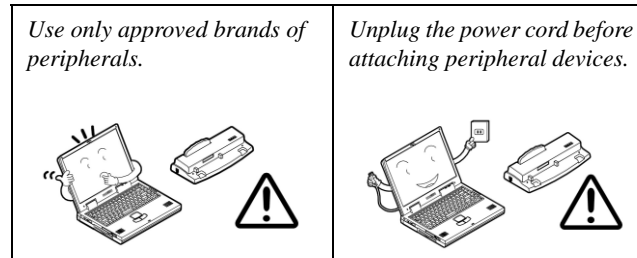
2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.



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.



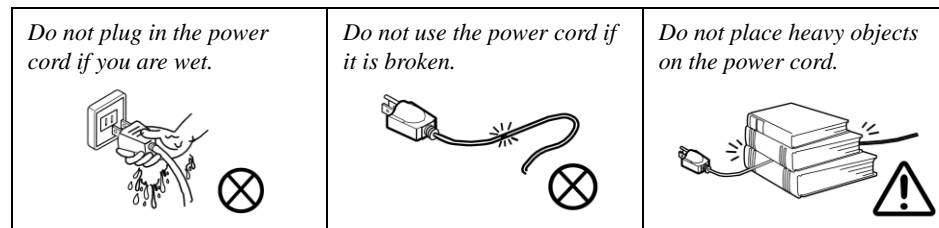
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**



## 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

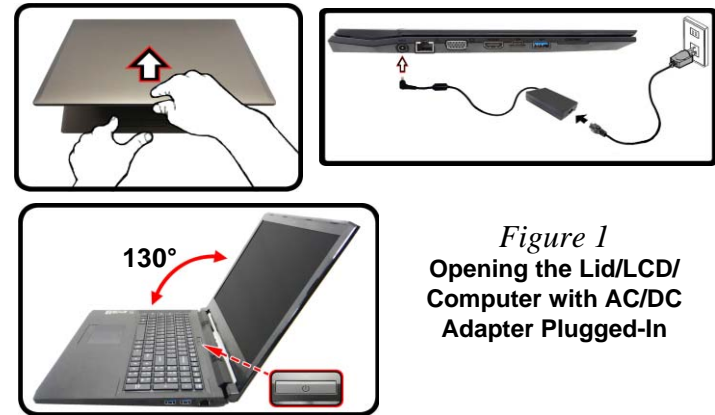
You may also need to consult the following manual for additional information:

#### 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 on the left of the computer, then plug the AC power cord into an outlet, and connect the AC power cord to the AC/DC adapter.
6. Use one hand to raise the lid/LCD to a comfortable viewing angle (do not exceed 130 degrees); use the other hand (as illustrated in Figure 1) to support the base of the computer (**Note: Never** lift the computer by the lid/LCD).
7. Press the power button to turn the computer "on".



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


#### Shut Down

Note that you should always shut your computer down by 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.

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# Chapter 1: Introduction

## Overview

This manual covers the information you need to service or upgrade the **N870HK1** 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 10*, 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 **N870HK1** 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

**i7-7700HQ (2.80GHz)**

8MB Smart Cache, 14nm, DDR4-2400MHz, TDP 45W

#### Intel® Core™ i5 Processor

**i5-7300HQ (2.50GHz)**

6MB Smart Cache, 14nm, DDR4-2400MHz, TDP 45W

#### Intel® Core™ i3 Processor

**i3-7100H (3.00GHz)**

3MB Smart Cache, 14nm, DDR4-2400MHz, TDP 35W

### Core Logic

Intel® HM175 Chipset

### BIOS

64Mb SPI Flash ROM

AMI BIOS

### Memory

Two 260 Pin SO-DIMM Sockets Supporting **DDR4 2400MHz** Memory

Memory Expandable up to 32GB

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

### LCD Options

17.3" (43.94cm), 16:9, UHD (3840x2160)/FHD (1920x1080)

### Video Adapter

#### Intel® Integrated GPU and NVIDIA® Discrete GPU

Supports Microsoft Hybrid Graphics

#### Intel Integrated GPU

##### Intel® HD Graphics 630

Dynamic Frequency

Intel Dynamic Video Memory Technology

Microsoft DirectX®12 Compatible

#### NVIDIA® Discrete GPU

##### NVIDIA® GeForce GTC 1050G Ti

**4GB** GDDR5 Video RAM on board

Microsoft DirectX® 12 Compatible

### Storage

One Changeable 2.5" 7.0mm (h) SATA3 HDD/SSD

(**Factory Option**) One M.2 **SATA/PCIe Gen3 x4** Solid State Drive (SSD)

### Audio

High Definition Audio Compliant Interface

2 \* Built-In Speakers

Built-In Array Microphone

Sound Blaster™ Cinema 3

### Security

Security (Kensington® Type) Lock Slot

Intel PTT for systems without hardware TPM

(**Factory Option**) TPM v 2.0

(**Factory Option**) Fingerprint Reader Module

**Keyboard**

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

Or

**(Factory Option) Full Color Illuminated** Full-size Keyboard (with numeric keypad)

**Pointing Device**

Built-in Touchpad

**Interface**

One USB 2.0 Port

One USB 3.0 (USB 3.1 Gen 1) Type A Port

One USB 3.0 (USB 3.1 Gen 1) Type A Port and one USB 3.0 (USB 3.1 Gen 1) Type C Port

Or

**(Factory Option)** One USB 3.1 Gen 2 Type A Port and one USB 3.1 Gen 2 Type C Port

One HDMI-Out Port

Two Mini DisplayPort 1.2

One Headphone-Out Jack

One Microphone-In Jack

One RJ-45 LAN Jack

One DC-in Jack

**Card Reader**

Embedded Multi-In-1 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 Gen3 x4 SSD**

**Communication**

Built-In Gigabit Ethernet LAN

1.0M HD PC Camera Module

**(Factory Option)** 2.0M FHD PC Camera Module

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

**(Factory Option)** Intel® Wireless-AC 8265 Wireless LAN **(802.11ac)** + Bluetooth **4.1**

**(Factory Option)** Intel® Wireless-AC 3168 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**

Full Range AC/DC Adapter

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

DC Output: 19.5V, 6.15A **(120W)**

**(Factory Option)** Built-in 6 Cell Battery Pack, 62WH

**(Factory Option)** Built-in 6 Cell Battery Pack, 47WH

**Dimensions & Weight**

418.5mm (w) \* 288.7mm (d) \* 27.4mm (h)

**2.9kg** (Barebone with 47WH 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

FRONT VIEW



*Figure 2*  
**Front View**  
1. LED Indicator

RIGHT SIDE VIEW



*Figure 3*  
**Right Side View**  
1. Headphone-Out Jack  
2. Microphone-In Jack  
3. USB 2.0 Port  
4. USB 3.0 Port  
5. Vent

## Introduction

### External Locator - Left Side & Rear View

*Figure 4*

#### Left Side View

1. Security Lock Slot
2. DC-In Jack
3. RJ-45 LAN Jack
4. Mini Display Port
5. HDMI-Out Port
6. USB 3.0 (USB 3.1 Gen 1) Type C Port  
Or  
**(Factory Option)**  
USB 3.1 Gen 2  
Type C Port
7. USB 3.0 (USB 3.1 Gen 1) Type A Port  
Or  
**(Factory Option)**  
USB 3.1 Gen 2  
Type A Port
8. Multi-in-1 Card Reader

LEFT SIDE VIEW



REAR VIEW

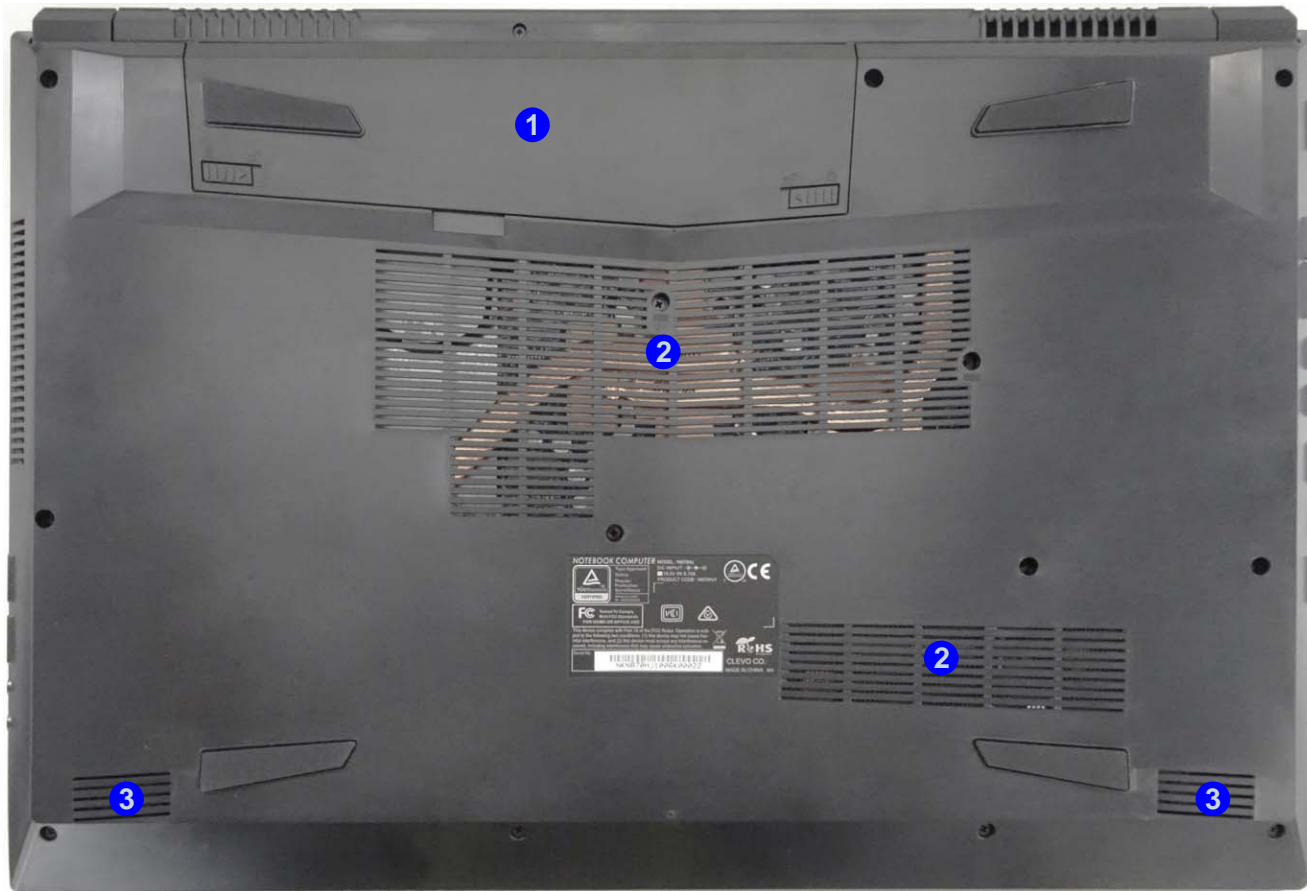


*Figure 5*

#### Rear View

1. Vent

## External Locator - Bottom View



*Figure 6*  
**Bottom View**

1. Battery
2. Vent
3. Speakers



### Overheating

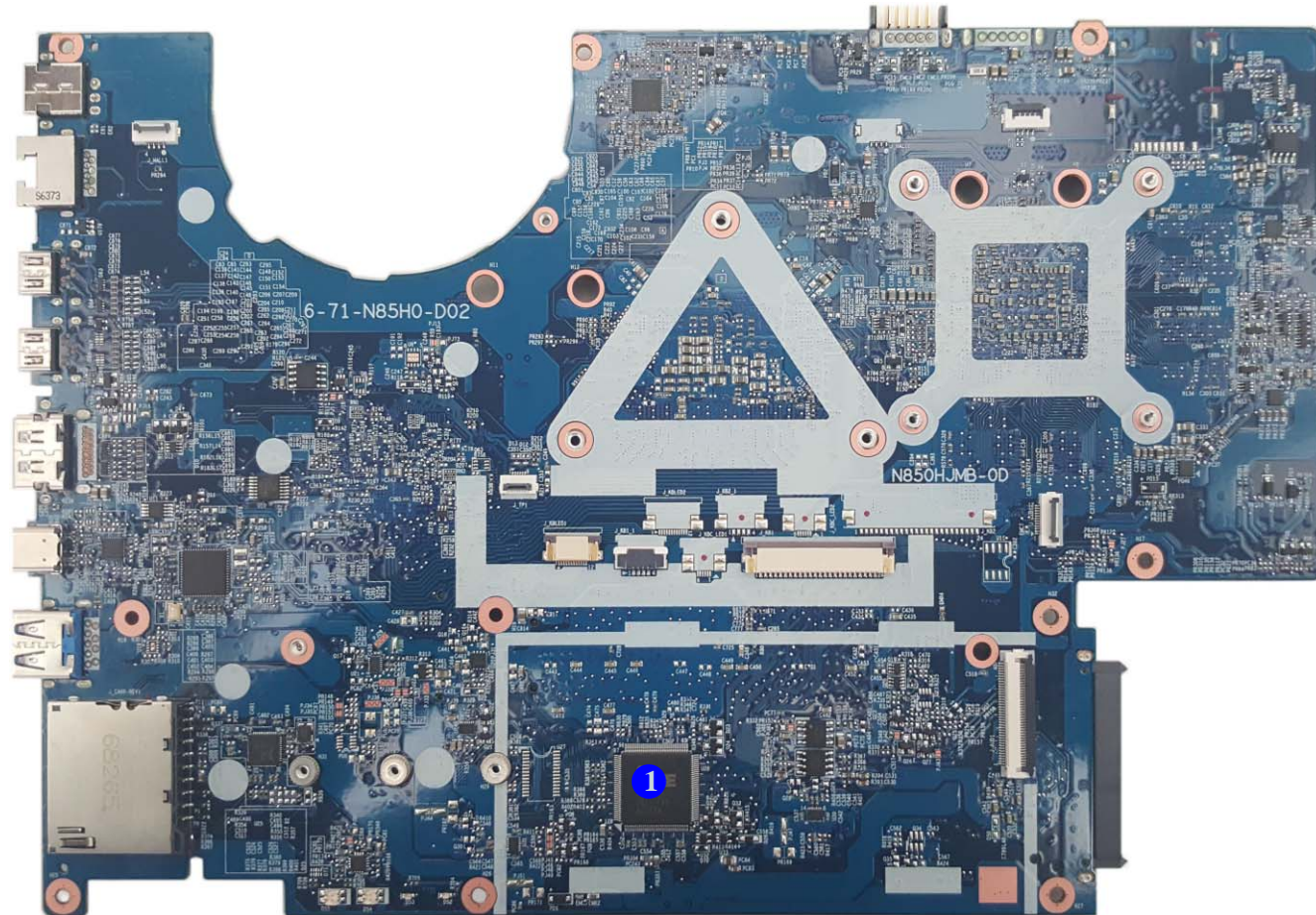
To prevent your computer from overheating, make sure nothing blocks any vent while the computer is in use.

## Introduction

*Figure 7*  
Mainboard Top  
Key Parts

1. KBC-ITE IT8587

## Mainboard Overview - Top (Key Parts)



## Mainboard Overview - Bottom (Key Parts)

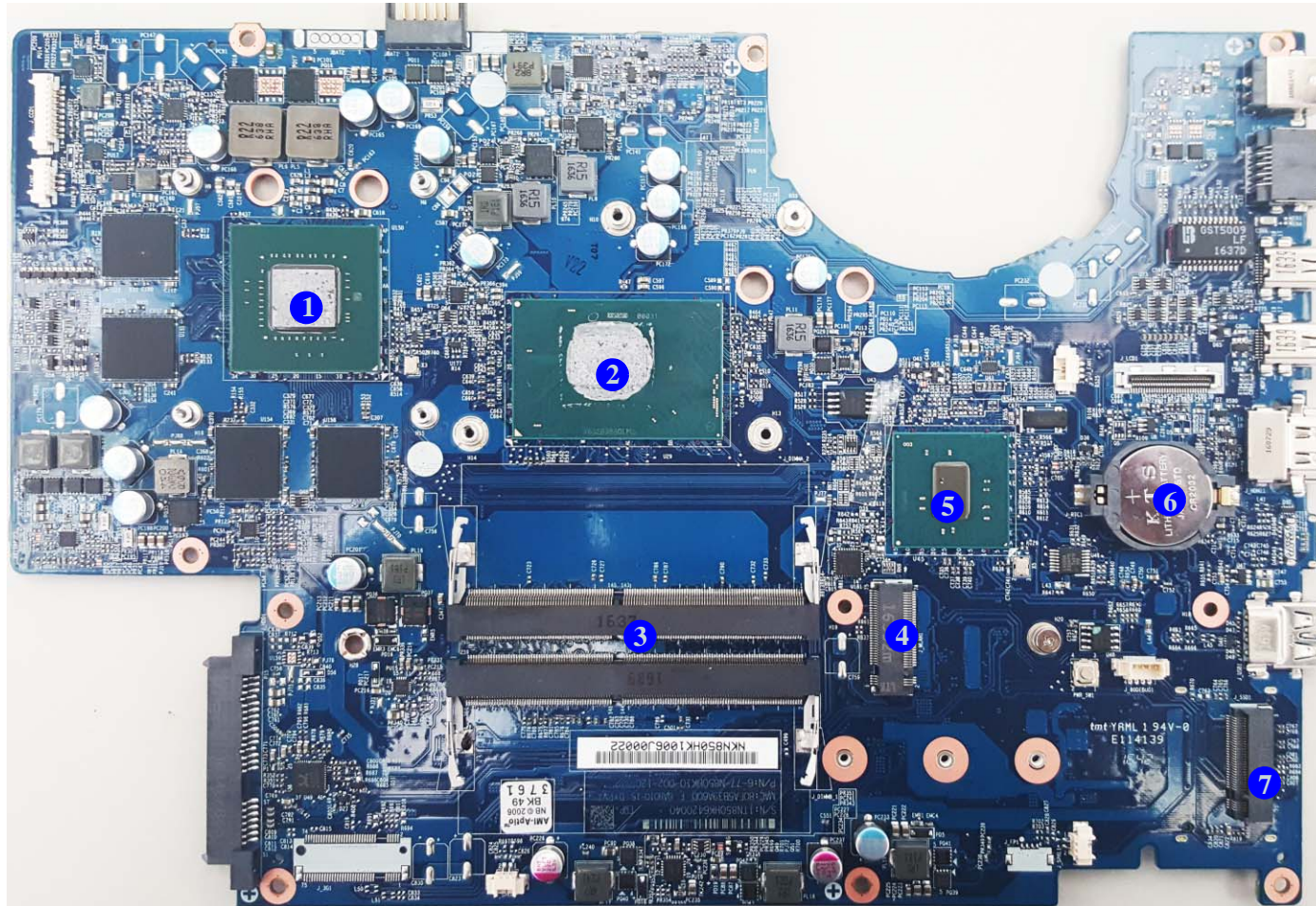


Figure 8  
Mainboard Bottom  
Key Parts

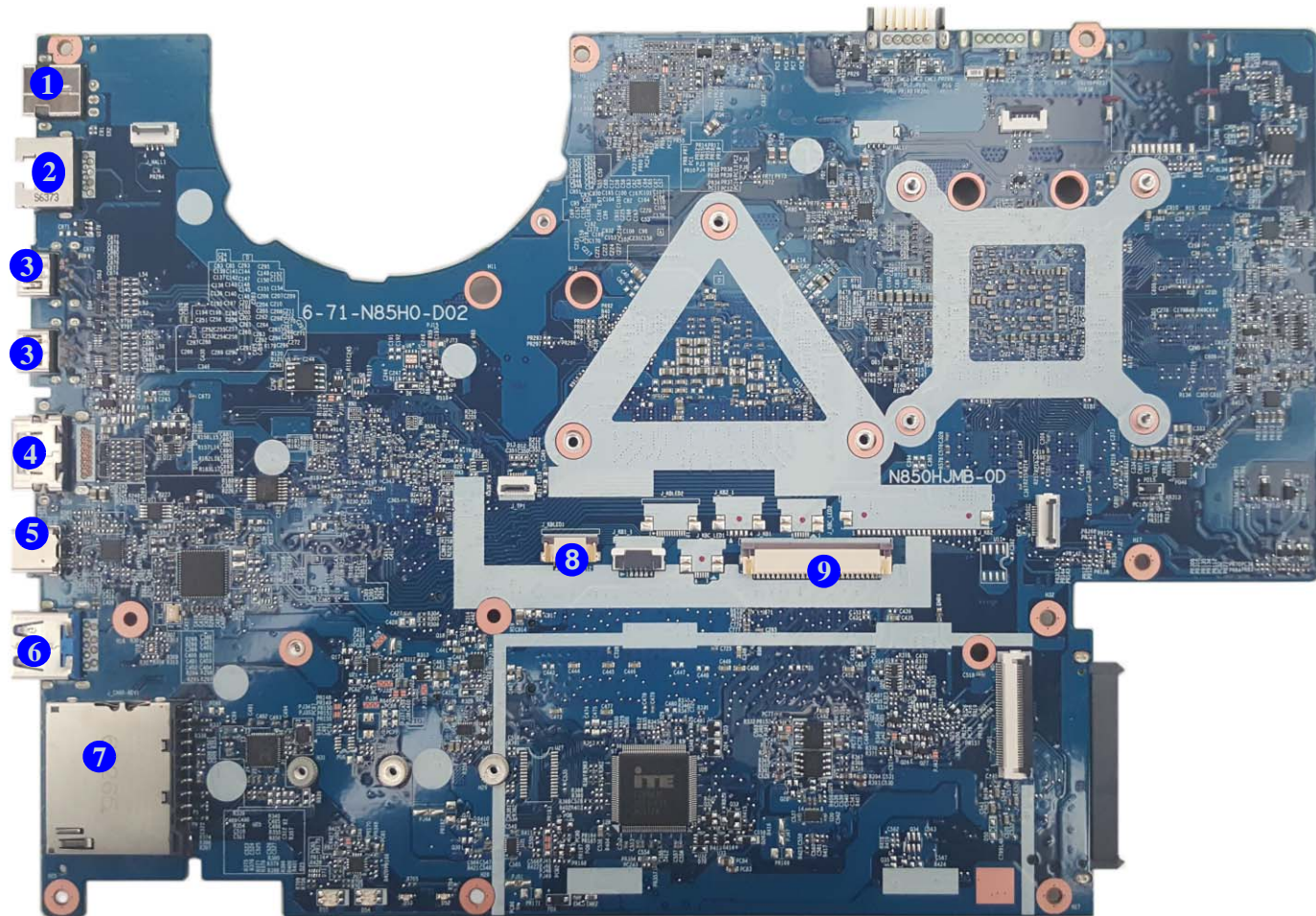
1. GPU
2. CPU
3. Memory Slots  
DDR4 SO-DIMM
4. Mini-Card  
Connector (WLAN  
Module)
5. PCH
6. CMOS Battery
7. M.2-Card  
Connector (SSD  
Module)

## Introduction

*Figure 9*  
**Mainboard Top  
Connectors**

## Mainboard Overview - Top (Connectors)

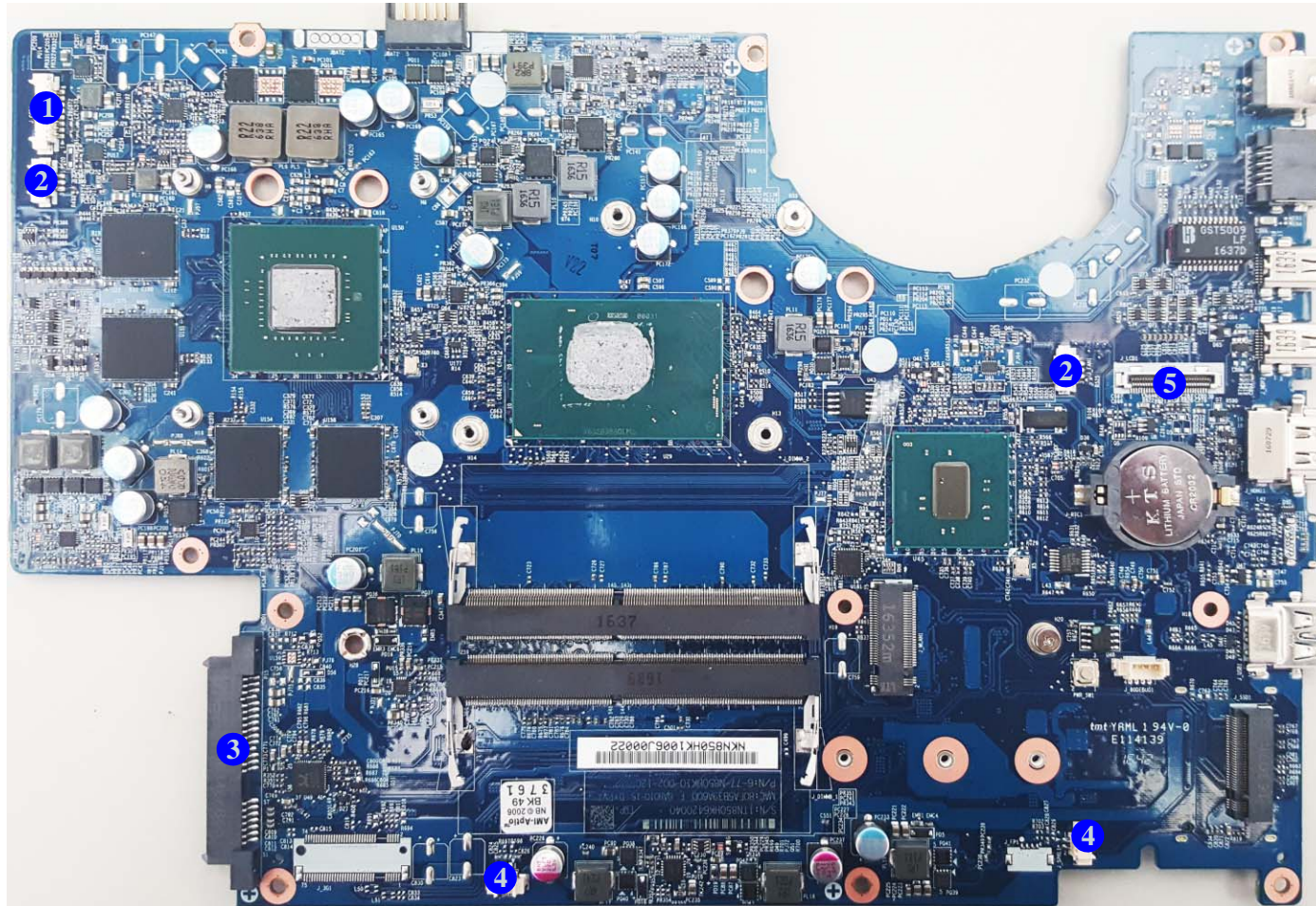
1. DC-In Jack
2. RJ-45 LAN Jack
3. Mini Display Port
4. HDMI-Out Port
5. USB Port 3.0/3.1 (Type C) Connector
6. USB Port 3.0/3.1 (Type A) Connector
7. Multi-in-1 Card Reader
8. KB LED Connector
9. Keyboard Cable Connector



## Mainboard Overview - Bottom (Connectors)

*Figure 10*  
**Mainboard Bottom  
Connectors**

1. CCD Connector
2. Fan Connector
3. HDD Connector
4. Speaker Connector
5. LCD Connector








# Chapter 2: Disassembly

## Overview

This chapter provides step-by-step instructions for disassembling the *N870HK1* series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

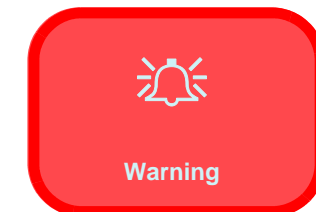
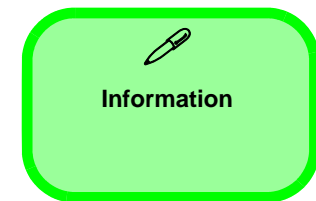
We suggest you completely review any procedure before you take the computer apart.

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-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 Battery:

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

#### To remove the Keyboard:

1. Remove the keyboard [page 2 - 6](#)

#### To remove the HDD:

1. Remove the battery [page 2 - 5](#)
2. Remove the HDD [page 2 - 7](#)

#### To remove the System Memory:

1. Remove the battery [page 2 - 5](#)
2. Remove the HDD [page 2 - 7](#)
3. Remove the system memory [page 2 - 9](#)

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

1. Remove the battery [page 2 - 5](#)
2. Remove the HDD [page 2 - 7](#)
3. Remove the SSD [page 2 - 10](#)

#### To remove the Wireless LAN Module:

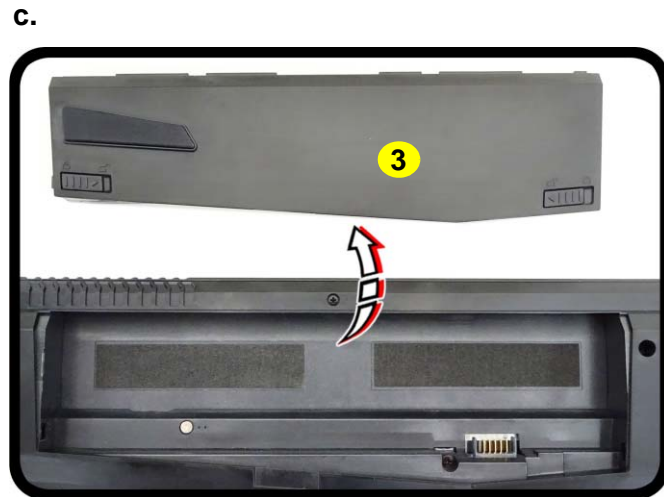
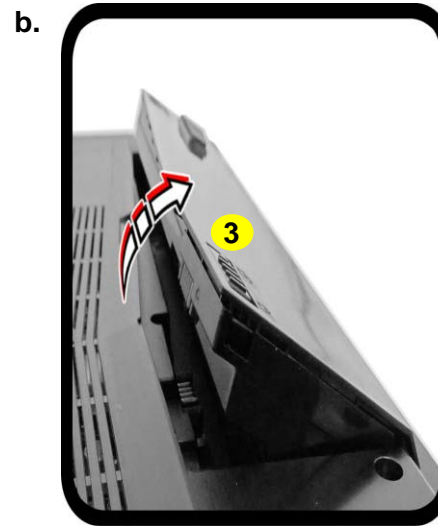
1. Remove the battery [page 2 - 5](#)
2. Remove the HDD [page 2 - 7](#)
3. Remove the WLAN [page 2 - 11](#)

#### To remove the CCD Module:

1. Remove the battery [page 2 - 5](#)
2. Remove the HDD [page 2 - 7](#)
3. Remove the CCD module [page 2 - 13](#)

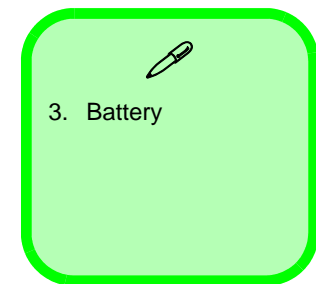
## Removing the Battery

1. Turn the computer **off**, and turn it over.
2. Slide the latch **1** in the direction of the arrow (*Figure 1a*).
3. Slide the latch **2** in the direction of the arrow.
4. While holding the latch **2**, lift the battery **3** (*Figure 1b*) out of the compartment (*Figure 1c*).



*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. Lift the battery.
- c. Remove the battery.



## Disassembly

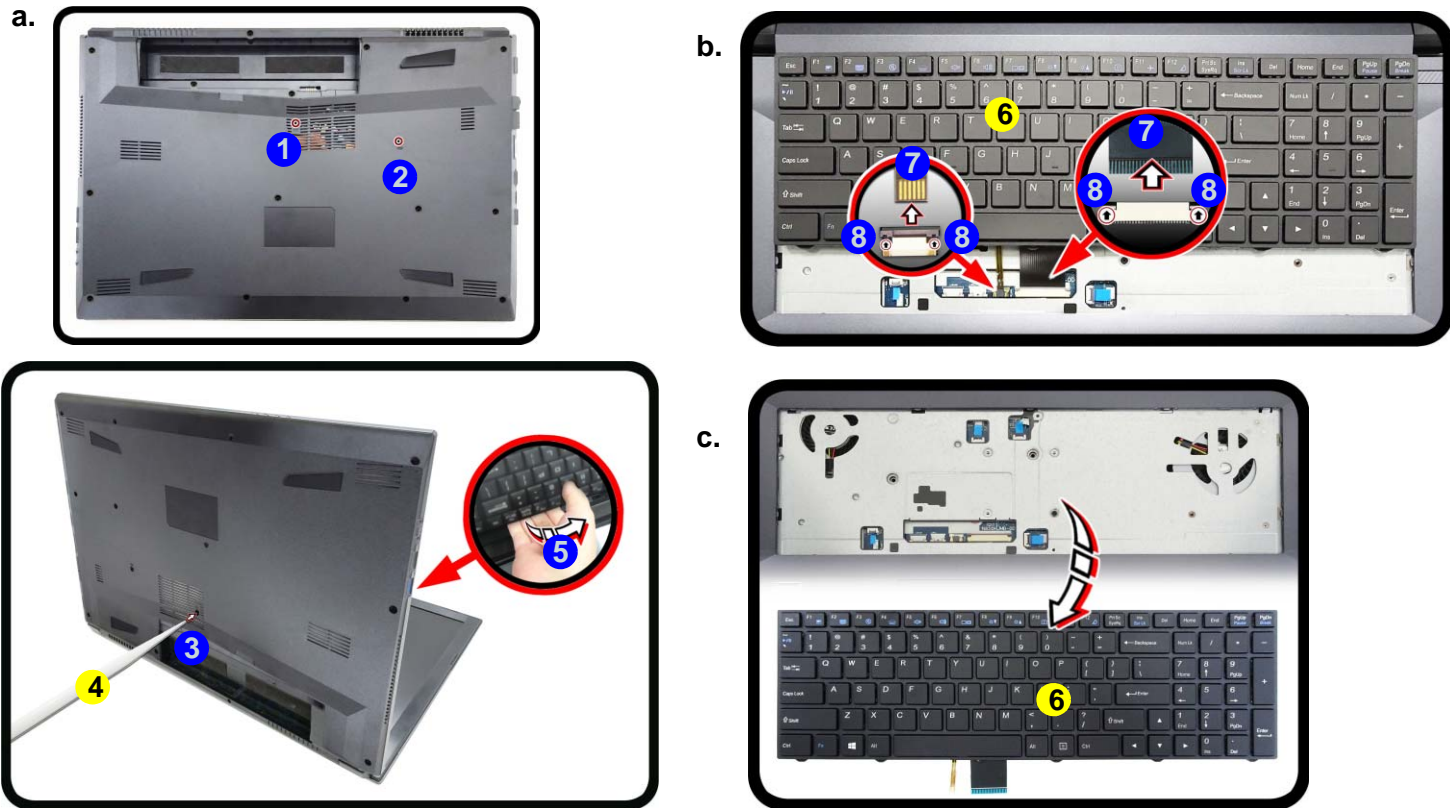
Figure 1

### Keyboard Removal

- 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.
- Lift the keyboard up and disconnect the keyboard ribbon cable from the locking collar socket.
- Remove the keyboard.

## Removing the Keyboard

- Turn **off** the computer, turn it over.
- Remove screws **1** - **2** from the bottom of the computer.
- 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**).
- 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**).
- Carefully lift the keyboard **6** off the computer (**Figure 1c**).



#### 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.



- Eject Stick
- Keyboard

- 2 Screws

## Removing the Hard Disk Drive

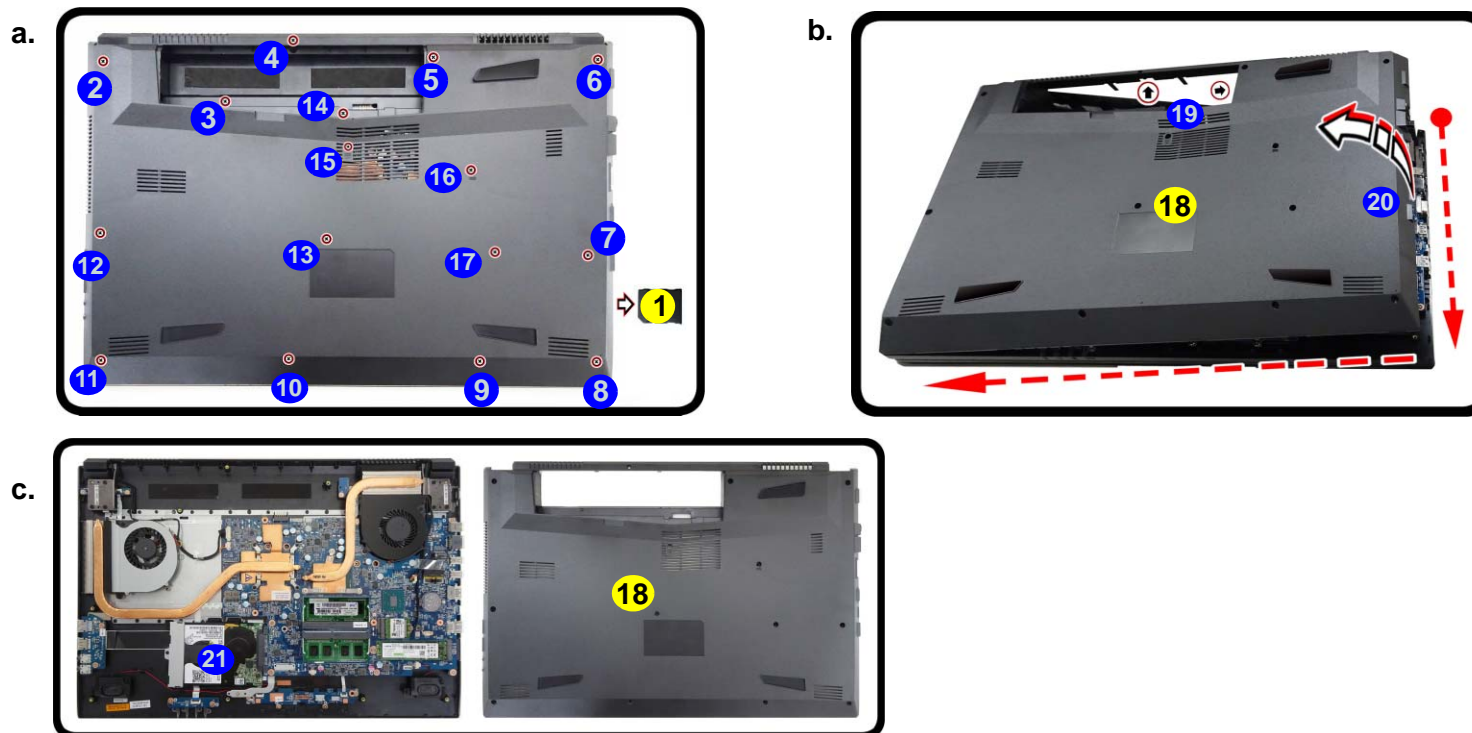
The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 7mm (h). Follow your operating system's installation instructions, and install all necessary drivers and utilities (as outlined in **Chapter 4 of the User's Manual**) when setting up a new hard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


### Hard Disk Disassembly Process

1. Turn **off** the computer, and remove the battery ([page 2 - 5](#)).
2. Remove the SD card cover **1** and screws **2 - 17** ([Figure 2a](#)).
3. Carefully push to release the bottom case **18** from point **19** and then lift it up from point **20** to release the bottom case and ports as indicated by the arrows ([Figure 2b](#)).
4. The HDD will be visible at point **21** on the mainboard ([Figure 2c](#)).

*Figure 2*  
**HDD Assembly Removal**

- a. Remove the SD card cover and screws.
- b. Remove the bottom case.
- c. Locate the HDD.





18. Bottom Case

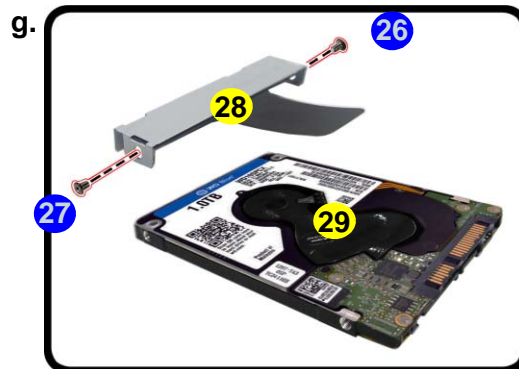
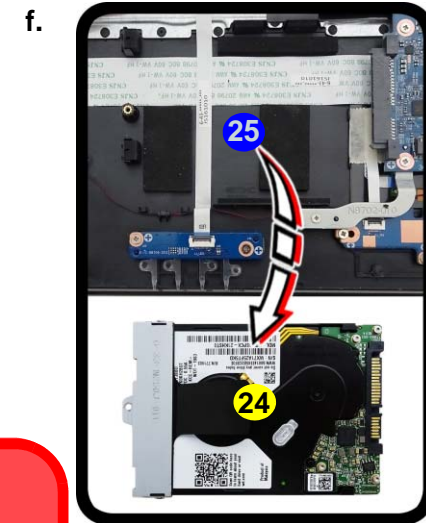
- 16 Screws


## Disassembly

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

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

5. Remove screws **22** from the HDD assembly (*Figure 3b*).  
 6. Slightly lift and pull the hard disk assembly in the direction of arrow **23** (*Figure 3c*).  
 7. Lift the hard disk assembly **24** out of the bay **25** (*Figure 3d*).  
 8. Remove screws **26** - **27** and bracket **28** from the hard disk **29** (*Figure 3e*).  
 9. Reverse the process to install a new hard disk (do not forget to replace the screws).



-   
 24. HDD Assembly  
 28. Bracket  
 29. HDD
- 2 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.

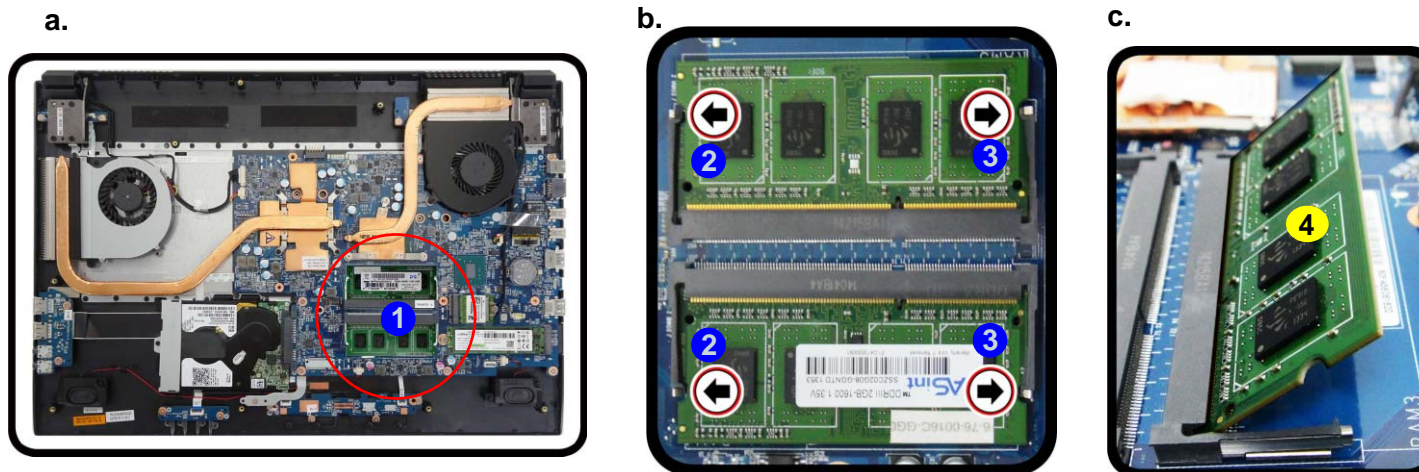


## Removing the System Memory (RAM)

The computer has two memory sockets for 260 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR4 2400 MHz. The main memory can be expanded up to 16GB. The total memory size is automatically detected by the POST routine once you turn on your computer.

### Memory Upgrade Process

1. Turn **off** the computer, turn it over, remove the battery ([page 2 - 5](#)).
2. The RAM-2 modules will be visible at point **1** on the mainboard ([Figure 4a](#)).
3. Gently pull the two release latches (**2** & **3**) on the sides of the memory socket in the direction indicated by the arrows ([Figure 4b](#)). The RAM module **4** will pop-up ([Figure 4c](#)), and you can then remove it.
4. Pull the latches to release the second module if necessary.
5. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
6. 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.
7. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
8. Replace the bottom cover and the screws (see [page 2 - 5](#)).
9. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.



*Figure 4*  
**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

## Disassembly

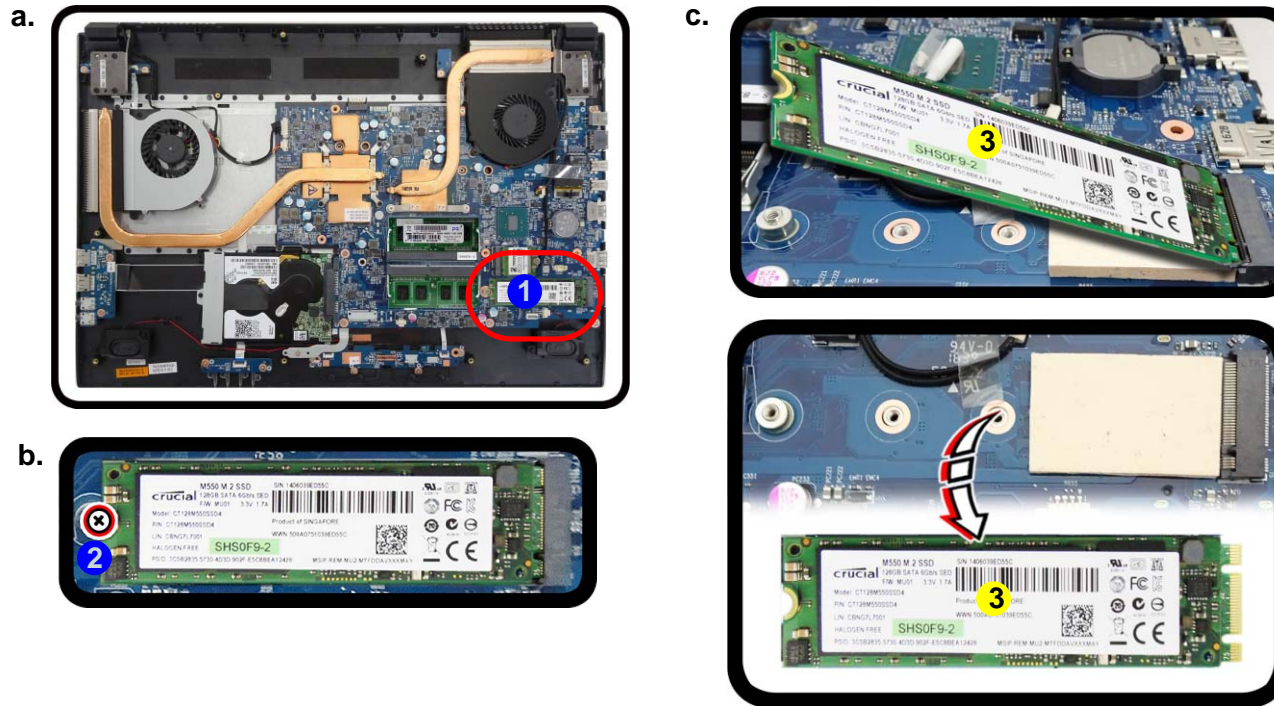
*Figure 5*  
M.2 SSD Module  
Removal

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

## Removing and Installing the M.2 SSD Module

### M.2 SSD Module Removal Procedure

- Turn off the computer, turn it over, remove the battery ([page 2 - 5](#)).
- The M.2 SSD module will be visible at point **1** on the mainboard ([Figure 5a](#)).
- Remove the screw **2** ([Figure 5b](#)).
- The M.2 SSD module **3** ([Figure 5c](#)) will pop-up, and you can remove it from the computer.

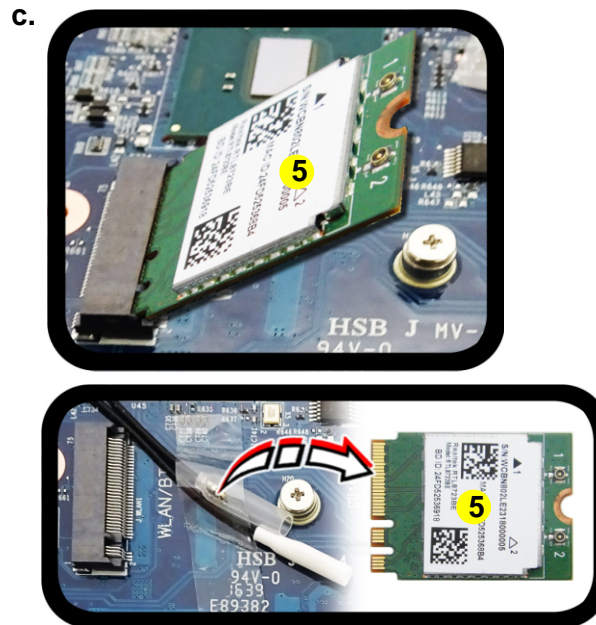
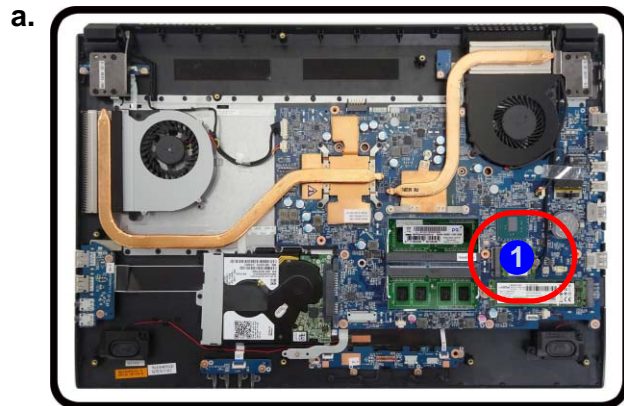


3.M2 SSD Module

- 1 Screw

## Removing the Wireless LAN Module


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



*Figure 6*  
**Wireless LAN  
Module Removal**

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

Note: Make sure you reconnect the antenna cable to the “1 + 2” socket ([Figure 6b](#)).



5. Wireless LAN Module

- 1 Screw

## Wireless LAN, Combo Module Cables

Note that the cables for connecting to the antennae on WLAN, WLAN & Bluetooth Combo 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	

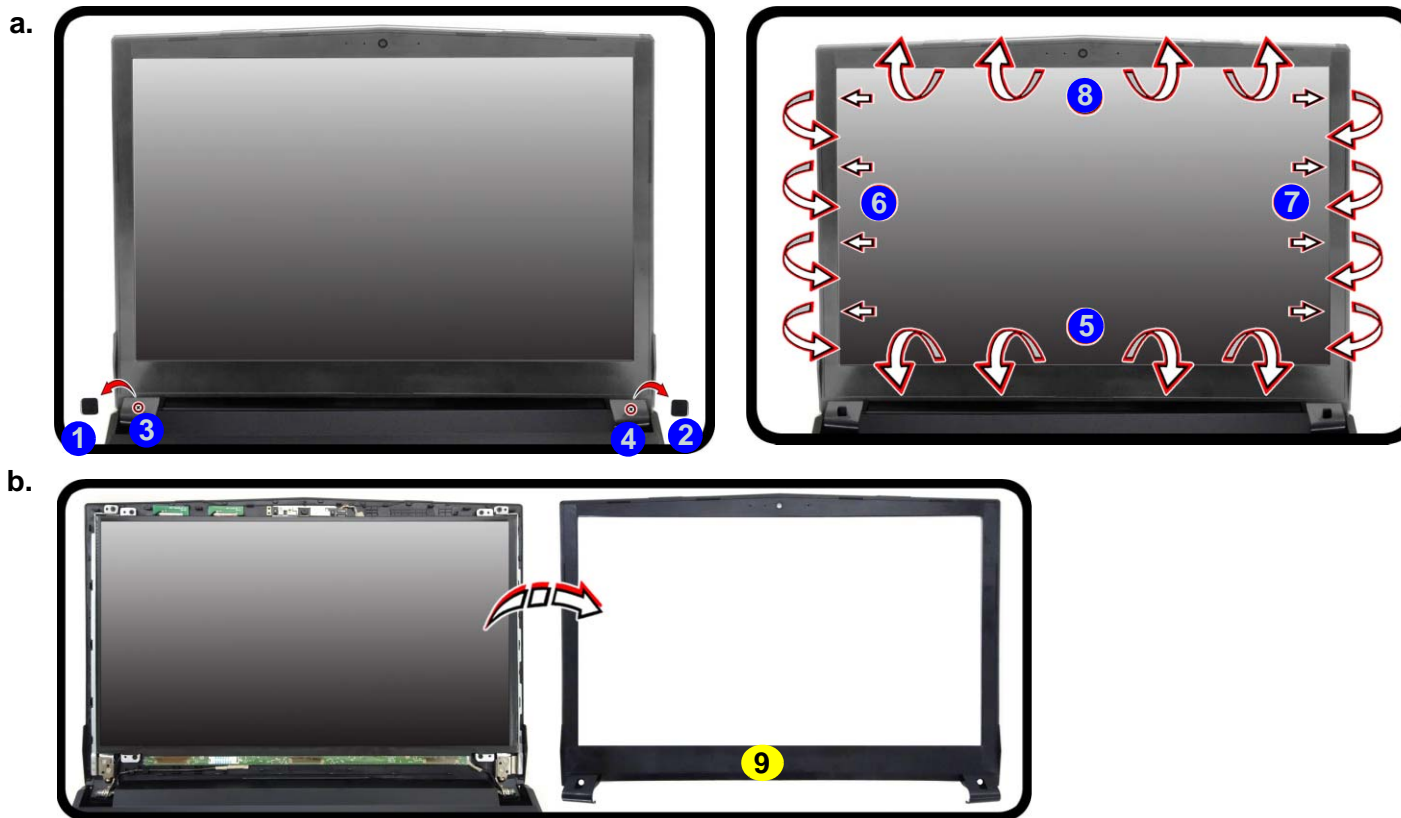
Cable 1 is usually connected to antenna 1 (Main) on the module, and cable 2 to antenna 2 (Aux).


## Removing the CCD

1. Turn **off** the computer, turn it over to remove the battery ([page 2 - 5](#)).
2. Lay the computer down on a flat surface with the top case up forming a 90 degree angle. Carefully remove the rubber covers **1** - **2** and screws **3** - **4**.
3. Run your fingers around the inner frame of the LCD panel to lift at the upper point **5** as indicated by the arrows, and slightly push and lift up the inner frame at the middle points **6** - **7** as indicated by the arrows and then run your fingers around the inner frame at the lower point **8** as indicated by the arrows ([Figure 7a](#)).
4. Remove the LCD front cover **5** ([Figure 7b](#)).

*Figure 7*  
**CCD Removal**

- a. Remove rubber and screws and then carefully release the inner frame of the LCD panel at the points indicated by the arrows.
- b. Remove the LCD front cover.





9. LCD Front Cover

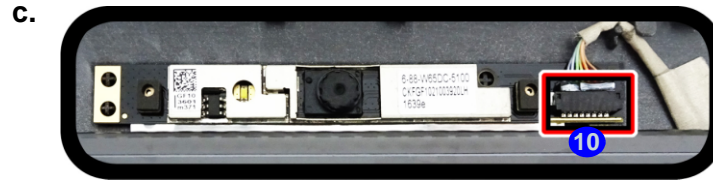
- 2 Screws

## Disassembly

*Figure 8*  
**CCD Removal**  
**(cont'd)**

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

5. Disconnect the cable **10** (*Figure 8c*).  
 6. Remove the CCD module **11** (*Figure 8d*).  
 7. Reverse the process to install a new CCD module.



11. CCD Module

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# Appendix A:Part Lists

This appendix breaks down the *N870HK1* 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.

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## Part List Illustration Location

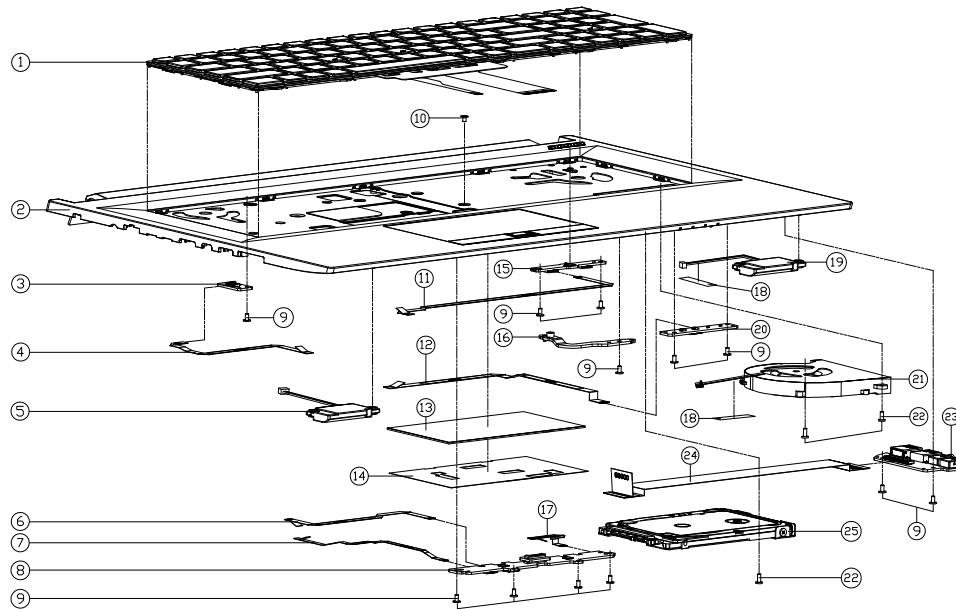
The following table indicates where to find the appropriate part list illustration.

*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

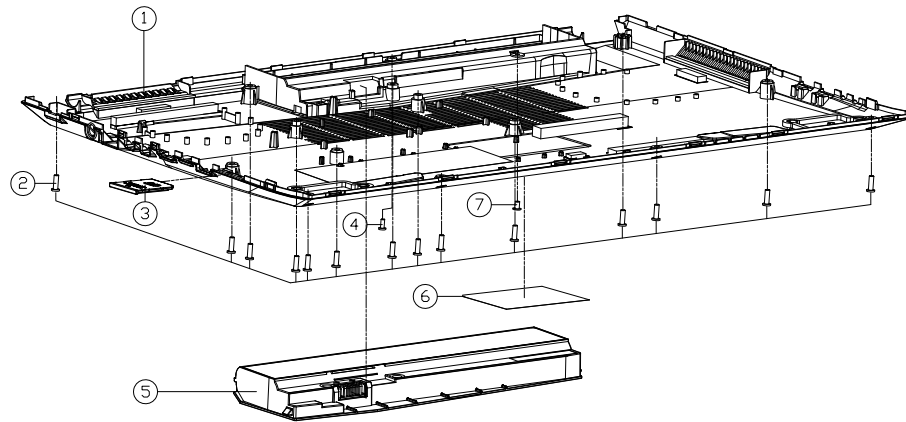


ITEM	PART NAME	PART NO	REMARK
1	W/ D HDD ASS'Y N870HC	6-80-N7500-012-1	
1	W/ D HDD ASS'Y N870HC	6-80-N8500-010-1	
2	TOP CASE MODULE W/ FPR N870HK1	6-39-N87K2-012	FDR W/FP
2	TOP CASE MODULE W/O FPR N870HK1	6-39-N87K2-022	FDR W/O FP
3	HALL SENSOR BOARD V3.0 N850HC	6-77-N8501-D03	
4	FFC HALL SENSOR TO MB 135MM 3.3V 4PIN N870HC(H)	6-43-N8700-050	
5	SPRING L 2MM LSV @ 2MM B 23MM H 4H FFC (C) BCU AND RUBBER	6-23-5N250-0L2	
6	FFC CABLE CLOCK-FPR TO MB 155MM 3V 4PIN N870HC(H)	6-43-N87K0-011	ONLY FDR W/ FP
7	FFC CLOCK TO MB 143MM 3.3V 6PIN N870HC(H)	6-43-N8700-010	
8	CLOCK BOARD W/FP V2@FINGER BOARD V1.0 N870HJ1	6-77-N85HA-N02-A	FDR W/FP
8	CLOCK BOARD W/O FP V2.0 N870HJ1	6-77-N85H2-D02-B	FDR W/O FP
9	SCREW M2X4 KI NI ICT NY (OD=4.5,DT=4.4)	6-35-B1120-4RE	
10	SCREW M2X3 KI BZ ICT NY (OD=4.5,DT=4.4)	6-35-B6120-3RD	
11	FFC POWER TO MB 226MM 3.3V 4PIN N870HC(H)	6-43-N8700-041	
12	FFC LED TO MB 200MM 3V 12PIN N870HC(H)	6-43-N8700-030	
13	TOUCH PAD SYMPLECTIC TM-4063-002 RESISTOR (0.6X6MM)	6-49-P65S3-010	
14	TOP TP MYLAR PET P775DM2	6-40-P7752-211	
15	POWER SW BOARD V3.0 N870HC	6-77-N850S-D03-B	
16	MB BRACKET (SGCC) N870HC	6-33-N8702-010	
17	FFC CLOCK TO TP 55MM 3.3V 8IN N870HC(H)	6-43-N8702-011	
18	TAPE MYLAR (C) MYLAR M550J	6-40-M55J2-030	
19	SPRING L 2MM LSV @ 2MM B 23MM H 4H FFC (C) BCU AND RUBBER	6-23-5N250-0R2	
20	LED BOARD V4.0 N870HC	6-77-N8704-D04	
21	FAN MODULE (A-POWER) N150SD	6-31-N1502-302	
22	SCREW M2X5 KI(T=0.8 D=4.0) BK/Z ICT NY	6-35-B6120-5R0	
23	AUDIO BOARD V3.0 N870HC	6-77-N850B-D03-A	
24	FFC AUDIO TO MB 202MM 5V 4PIN N870HC(H)	6-43-N8700-020	
25	W/O HDD ASS'Y N870HC	6-79-N870CJ-010	
25	W/ HDD ASS'Y N870HC	6-79-N870CJ-020	

Figure A - 1  
Top

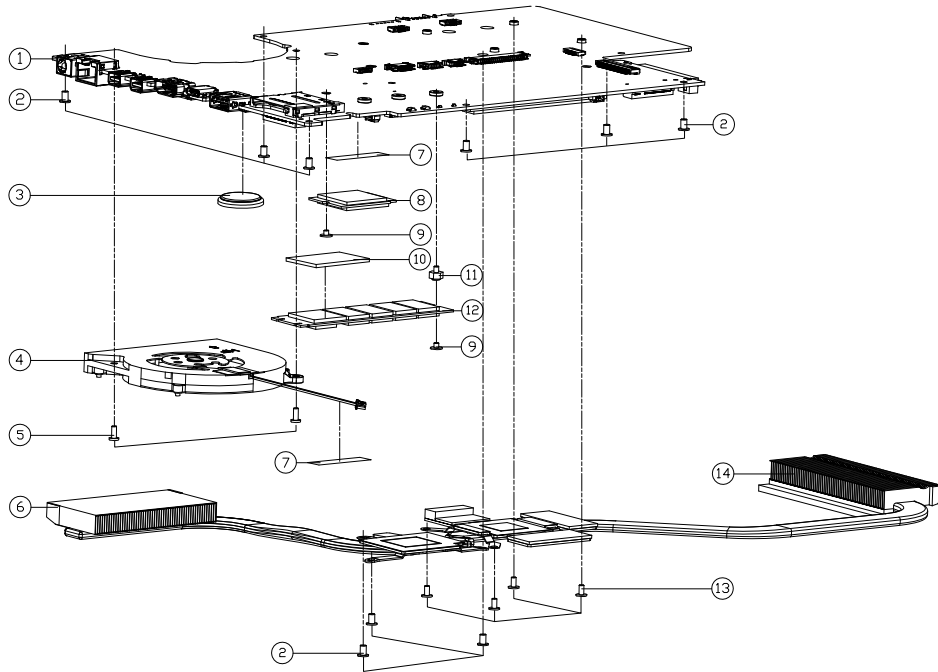
# Bottom

Figure A - 2  
Bottom



ITEM	PART NAME	PART NO	REMARK
1	BOTTOM CASE MODULE N870HK1	6-39-N87K3-012	
2	.SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
3	DUMMY PIN NEW PUSH TYPE PC+ABS (C723P-770EXCHANGED) V97703UM	6-42-W9708-011	
4	SCREW M2*5L K1CT=0.8 D=4.0 BK/Z ICT NY	6-35-B6120-5R0	
5	MAT 5 LI 010V/5A/40V/2W 32P 0PPALZ (TEXTURED) CAC 0000253 500/4225P MESH	6-87-N850S-6E71	
5	MAT 5 LI 010V/4A/40V/2W 32P 0PPALZ (TEXTURED) PSL/AC/CAC 0000253 500/4225P MESH	6-87-N850S-4C41	
5	MAT 5 LI 010V/5A/40V/2W 32P 0PPALZ (TEXTURED) CAC 54038880002 MESH	6-87-N850S-6U71	
5	MAT 5 LI 010V/4A/40V/2W 32P 0PPALZ (TEXTURED) PSL/AC/CAC 54038880002 MESH	6-87-N850S-4U41	
6	PRODUCT LABEL FOR N870HK1	6-45-N870HK13-010	
6	PRODUCT LABEL FOR N870HJ1	6-45-N870HJ13-010	
7	.SCREW M2*4L KI NI ICT NY (DD=04.5,DT=0.4)	6-35-B1120-4RE	

# Main Board

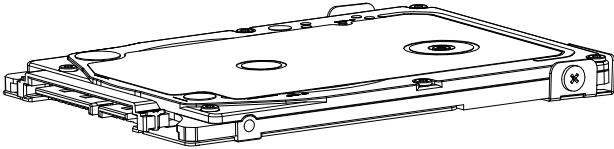
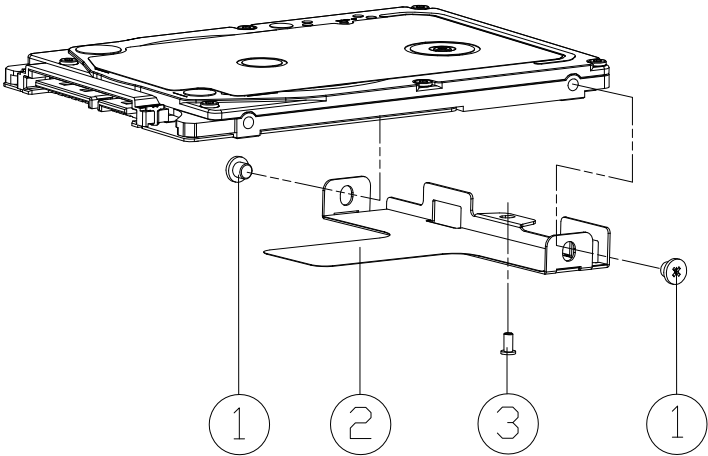


ITEM	PART NAME	PART NO	REMARK
1	MAIN BOARD(CPU/I7-7700HQ/2560 V20 (CEPXA/TPM)SSD) N870K1	6-77-N870HK10-D02-4C	
1	MAIN BOARD(CPU/I5-7200HQ/2560 V20 (CEPXA/SSD)TPM) N870K1	6-77-N870HK10-D02-12D	
1	MAIN BOARD(CPU/I3-7000HQ/3200 V20 (CEPXA/TPM)SSD) N870K1	6-77-N870HK10-D02-14E	
1	MAIN BOARD(CPU/I5-7300HQ/2560 V20 (CEPXA/TPM)SSD) N870K1	6-77-N870HK10-D02-4D	
1	MAIN BOARD(CPU/I3-7000HQ/3200 V20 (CEPXA/TPM)SSD) N870K1	6-77-N870HK10-D02-4E	
1	MAIN BOARD(CPU/I7-7700HQ/2560 V20 (CEPXA/TPM)SSD) N870K1	6-77-N870HK10-D02-4C	
1	MAIN BOARD(CPU/I5-7300HQ/2560 V20 (CEPXA/TPM)SSD) N870K1	6-77-N870HK10-D02-13D	
1	MAIN BOARD(CPU/I3-7000HQ/3200 V20 (CEPXA/TPM)SSD) N870K1	6-77-N870HK10-D02-15E	
2	.SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
3	BATTERY 3V 220MA BBBCR2032B (KTS)	6-23-6A2B2-030	
4	CPU FAN MODULE (FORCECON) N550RC	6-31-N5502-102	
5	SCREW M2*5L K1CT=0.8 D=4.0 BK/Z ICT NY	6-35-B6120-5R0	
6	CPU45W+VGA50W HEATSINK MODULE N870K1(FOR CPU ONLY)	6-31-N87K2-101	
7	TAPE MYLAR (C)MYLAR M550J	6-40-M55J2-030	
8	ALUMI COVER DRG. DRG. INTEL SHINY PEAR SHINY DRG. N870K1 (R4Z R2Z Z20 PS50)	6-88-P65SF-4210	OPTION
8	ALUMI COVER DRG. DRG. INTEL INDIATOR PEAR SHINY DRG. N870K1 (R4Z R2Z Z20 PS50)	6-88-P65SF-4200	OPTION
8	ALUMI COVER DRG. DRG. INTEL VIBRATOR SHINY DRG. N870K1 (R4Z R2Z Z20 PS50)	6-88-N240F-4200	OPTION
9	SCREW M2*2L KI NI ICT NY (DD=0.5 ,T=0.5)	6-35-B1120-2R0	
10	THERMAL PAD R3300 (30*20*2.75)MM FOR M2 SSD N850K1	6-48-N850S-010	
11	SCREW M2*2.5L 0H=2.5 B=50 STEEL ICT NY FOR NEFF CARDOCHARGE	6-35-ZA120-2R5-1	
12	SSD M2 2280 512GB SHINGO NV1V528LP-0000 PCIe GEN4 30 TLC	6-85-D515B-S05	OPTION
12	SSD M2 2280 512GB PHISON S0MP512G12-S11 (SSD) SATA3 TLC	6-85-D515B-H01	OPTION
12	SSD M2 2280 512GB INTEL SSP00KWS512G (SSD) PCIe GEN4 30 TLC	6-85-D515B-Z00	OPTION
12	SSD M2 2280 256GB CRUCIAL CT256M200SSD (M2) SATA3 MLC	6-85-D51R0-100	OPTION
13	SCREW M2*3L K1 BZ ICT NY (DD=0.45,DT=0.4)	6-35-B6120-3RD	
14	CPU45W+VGA50W HEATSINK MODULE N870K1 (FOR VGA ONLY)	6-31-N87K2-200	

Figure A - 3  
Main Board

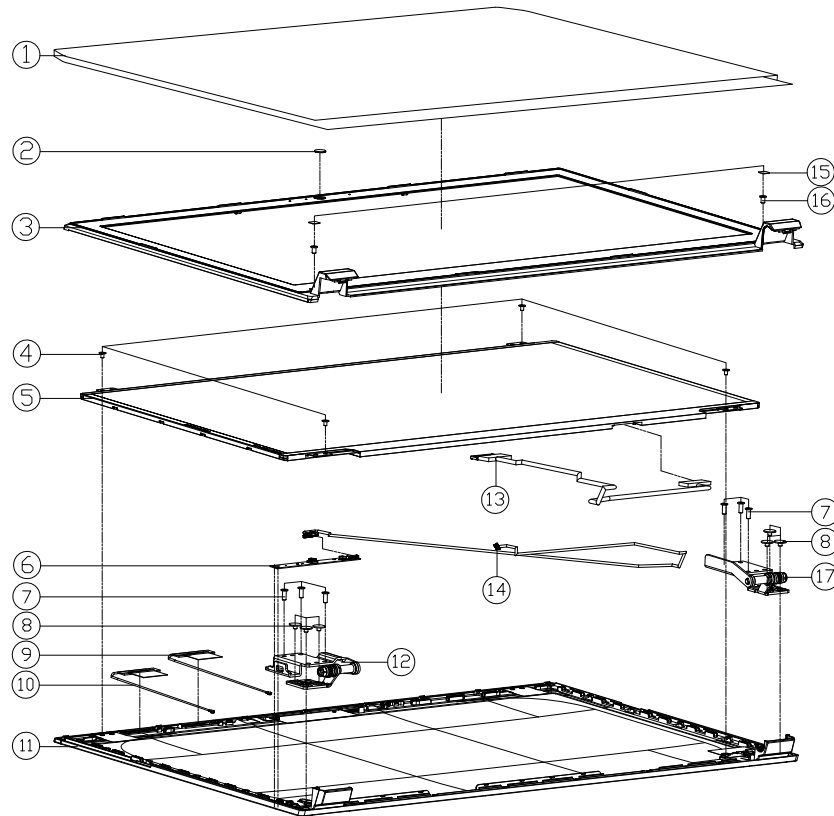
# HDD

Figure A - 4  
HDD



ITEM	PART NAME	PART NO	REMARK
1	SCREW M3*2.5L KI NI ICT NY	6-35-B1130-2R5	
2	HDD BKT 7MM SECC T=0.5 N250LU	6-33-N250J-011	
3	SCREW M2*5L KI(T=0.8 D=4.0) BK/Z ICT NY	6-35-B6120-5R0	

# LCD



ITEM	PART NAME	PART NO	REMARK
1	BOPP MYLAR 272*437*T=0.05 FOR P670RS	6-40-P67S1-010	
2	LCD CCD LENS PMMA P177SM (ELAYNE)	6-42-P177T-010-1	
3	FRONT COVER MODULE N870HC	6-39-N8701-012	
4	SCREW M2*3L KI BZ ICT NY (DD=04.5,DT=0.4)	6-35-B6120-3RD	
5	LED 17.3" HD/ AHS / N7/EIP INNO LUX N173KCE-E31 (LED) 4.0MM	6-50-NB240-V00	
5	LCD 17.3" HD+/ EDP AU B173RTN02.1 (LED) 4.0MM	6-50-NA140-G00	
5	LCD 17.3" HD+/ EDP INNO LUX N173F6A-E34(LED) 4.0MM	6-50-NA140-V00	
5	LED 17.3" HD / IPS OHVA / EDP AU B173ZAN0.2 SUPPORT SW 6-SMC 1" LED 4MM	6-50-N1240-G00	
5	LED 17.3" HD / IPS V5V 6-SMC/AN 67/ EDP LG L9729K4-SPE2 (LED) 4MM	6-50-NBB40-L080	
6	IOC CAMERA CCDM TX (O)FISHEYESEL21 28 FIB D2CM V500C FVARE W/WHITE-LED W/2-PC	6-88-W65DC-5110	OPTION
6	IOC CAMERA CCDM TX (O)FISHEYESEL21 28 FIB D2CM V500C FVARE W/WHITE-LED W/2-PC	6-88-W51PC-5100	OPTION
6	IOC CAMERA CCDM TX (O)FISHEYESEL21 28 FIB D2CM V500C FVARE W/WHITE-LED W/2-PC	6-88-N650C-4910	OPTION
6	IOC CAMERA CCDM TX (O)FISHEYESEL21 28 FIB D2CM V500C FVARE W/WHITE-LED W/2-PC	6-88-W65DC-5100	OPTION
6	IOC CAMERA CCDM TX (O)FISHEYESEL21 28 FIB D2CM V500C FVARE W/WHITE-LED W/2-PC	6-88-P775C-4901	OPTION
6	IOC CAMERA CCDM TX (O)FISHEYESEL21 28 FIB D2CM V500C FVARE W/WHITE-LED W/2-PC	6-88-W51PC-5110	OPTION
6	IOC CAMERA CCDM TX (O)FISHEYESEL21 28 FIB D2CM V500C FVARE W/WHITE-LED W/2-PC	6-88-N650C-4900	OPTION
7	SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
8	SCREW M2.5*2.5L KI BK/Z ICT NY(Ø8,T=0.6)	6-35-B6125-2R5	
9	ANTENNA IPERX VLAN WGT VL-1 PCB AL 2.4G/5.8G VL-1-50MM P870M	6-23-7P870-010	
10	ANTENNA IPERX VLAN WGT VL-2 PCB AL 2.4G/5.8G VL-2-50MM P870M	6-23-7P640-020	
11	BACK COVER MODULE N870HC	6-39-N8701-022	
12	HINGE L (SECC) N870HC	6-33-N8701-0L0	
13	WIRE CABLE FOR EIP 450MM 33V 30PIN CO 047/10V CON53A-06-30P-400P N870HC	6-43-N8701-010-2Q	
13	WIRE CABLE FOR EIP 450MM 33V 30PIN CO 047/10V CON53A-06-30P-400P N870HC	6-43-N87K1-010-N	
14	WIRE CABLE FOR CCD D-MIC 700MM 3.3V 8P (HL) N870HC	6-43-N870T-010	
15	FRONT COVER SCREW MYLAR PC P750ZM	6-40-P7508-030	
16	SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
17	HINGE R (SECC) N870HC	6-33-N8701-0R0	

Figure A - 5  
LCD



# Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the *N870HK1* 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>PCH 1/9 - Page B - 25</i>	<i>DDR 1.2V / 0.6VS, 2.5V - Page B - 48</i>
<i>Processor 1/6 - Page B - 3</i>	<i>PCH 2/9 - Page B - 26</i>	<i>VCore, VCCGT Output Stage - Page B - 49</i>
<i>Processor 2/6 - Page B - 4</i>	<i>PCH 3/9 - Page B - 27</i>	<i>VCC_Core &amp; VCCGT - Page B - 50</i>
<i>Processor 3/6 - Page B - 5</i>	<i>PCH 4/9 - Page B - 28</i>	<i>L0DX_VCCSTG/VCCSFR_OC, 3.3VA - Page B - 51</i>
<i>Processor 4/6 - Page B - 6</i>	<i>PCH 5/9 - Page B - 29</i>	<i>VCCSA - Page B - 52</i>
<i>Processor 5/6 - Page B - 7</i>	<i>PCH 6/9 - Page B - 30</i>	<i>AC_In, Charger - Page B - 53</i>
<i>Processor 6/6 - Page B - 8</i>	<i>PCH 7/9 - Page B - 31</i>	<i>NVVDD - Page B - 54</i>
<i>DDR3 CHA SO-DIMM - Page B - 9</i>	<i>PCH 8/9 - Page B - 32</i>	<i>NVVDDS - Page B - 55</i>
<i>DDR3 CHB SO-DIMM - Page B - 10</i>	<i>PCH 9/9 - Page B - 33</i>	<i>FBVDDQ - Page B - 56</i>
<i>VGA PCI-E Interface - Page B - 11</i>	<i>M.2 3G Card - Page B - 34</i>	<i>PEX_VDD/3V3/1.8V - Page B - 57</i>
<i>VGA Frame Buffer Interface - Page B - 12</i>	<i>M.2 WLAN+BT, SSD - Page B - 35</i>	<i>Audio Board - Page B - 58</i>
<i>VGA Frame Buffer A - Page B - 13</i>	<i>ASM1142 &amp; 2142 - Page B - 36</i>	<i>Power Switch Board - Page B - 59</i>
<i>VGA Fraem Buffer A - Page B - 14</i>	<i>ASM Power - Page B - 37</i>	<i>Hall Sensor Board - Page B - 60</i>
<i>VGA Frame Buffer B - Page B - 15</i>	<i>USB Conn, USB Charger - Page B - 38</i>	<i>Click Board - Page B - 61</i>
<i>VGA Frame Buffer B - Page B - 16</i>	<i>Card Reader / LAN RTL8411B - Page B - 39</i>	<i>LED Board - Page B - 62</i>
<i>VGA I/O - Page B - 17</i>	<i>HDD, Click TP, Audio, Hall Con. - Page B - 40</i>	<i>Finger Print Board - Page B - 63</i>
<i>NVIDIA Power Sequence - Page B - 18</i>	<i>LED, CCD, TPM, Power SW Con. - Page B - 41</i>	<i>Power Sequence - Page B - 64</i>
<i>NVIDIA GPIO Level Shift - Page B - 19</i>	<i>Audio Codec ALC269 VC2 - Page B - 42</i>	
<i>VGA NVVDD Coupling - Page B - 20</i>	<i>KBC IT8587 - Page B - 43</i>	
<i>MDP - Page B - 21</i>	<i>RGB KB Only - Page B - 44</i>	
<i>MDP + PS8330B - Page B - 22</i>	<i>5V, 5VS, 3.3V, 3.3VS, 3.3VA - Page B - 45</i>	
<i>Panel, Inverter - Page B - 23</i>	<i>VDD1.0V, VCCIO - Page B - 46</i>	
<i>HDMI - Page B - 24</i>	<i>VDD3, VDD5 - Page B - 47</i>	

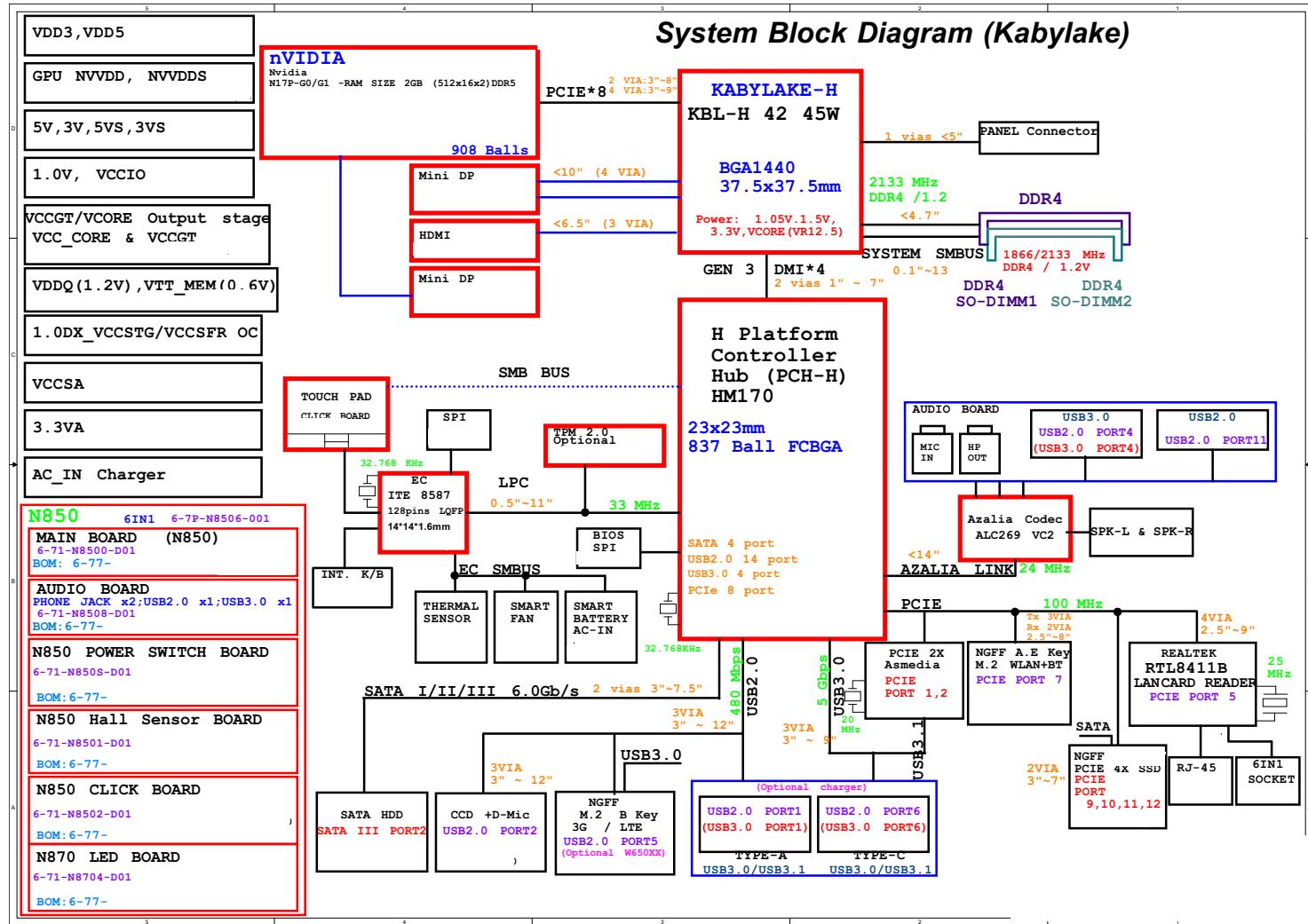
*Table B - 1*  
**SCHEMATIC  
DIAGRAMS**



### Version Note

The schematic diagrams in this chapter are based upon version 6-7P-N85H7-002. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

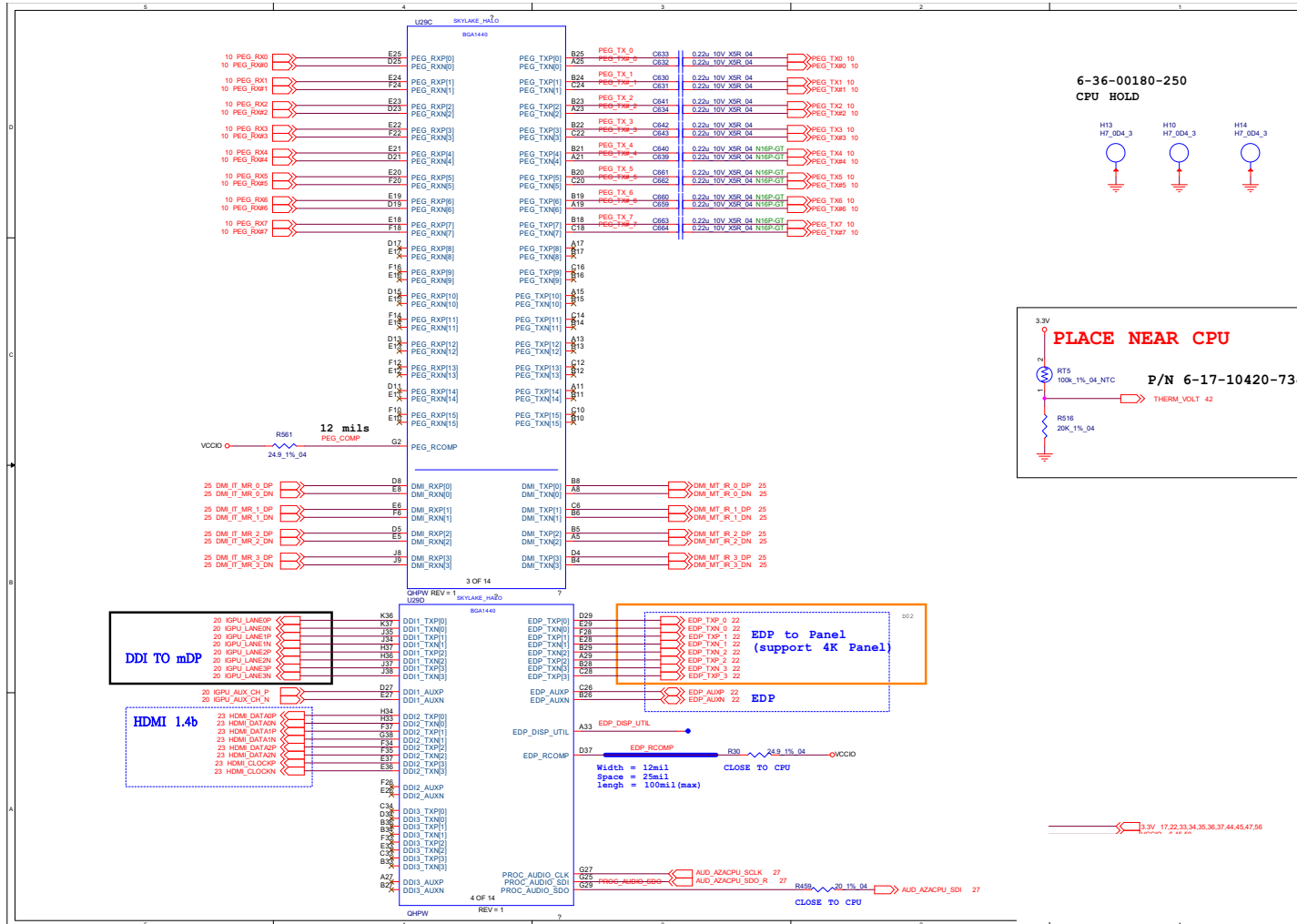
# System Block Diagram



Sheet 1 of 63  
System Block  
Diagram



# Processor 1/6



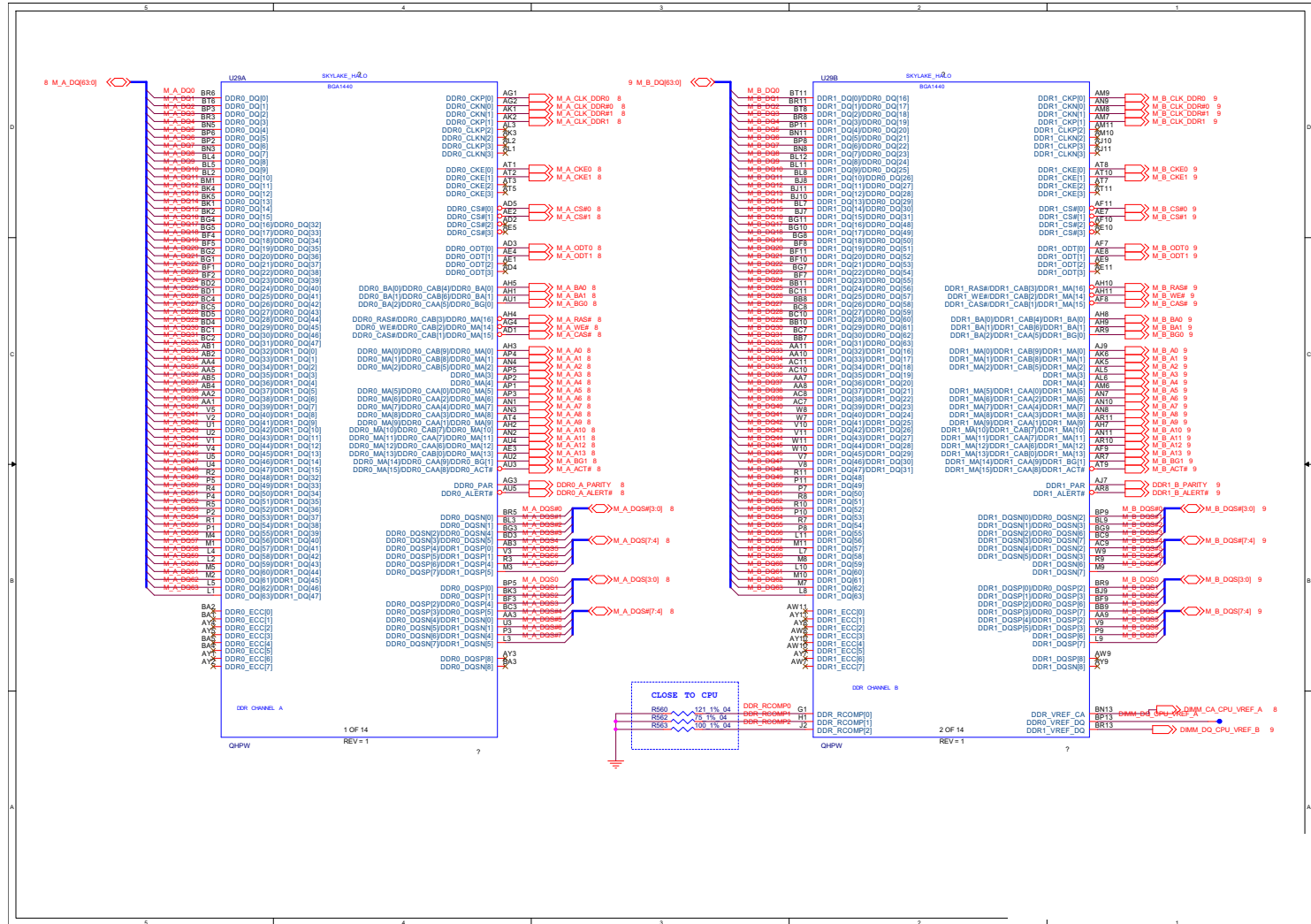
B.Schematic Diagrams

Sheet 2 of 63  
Processor 1/6

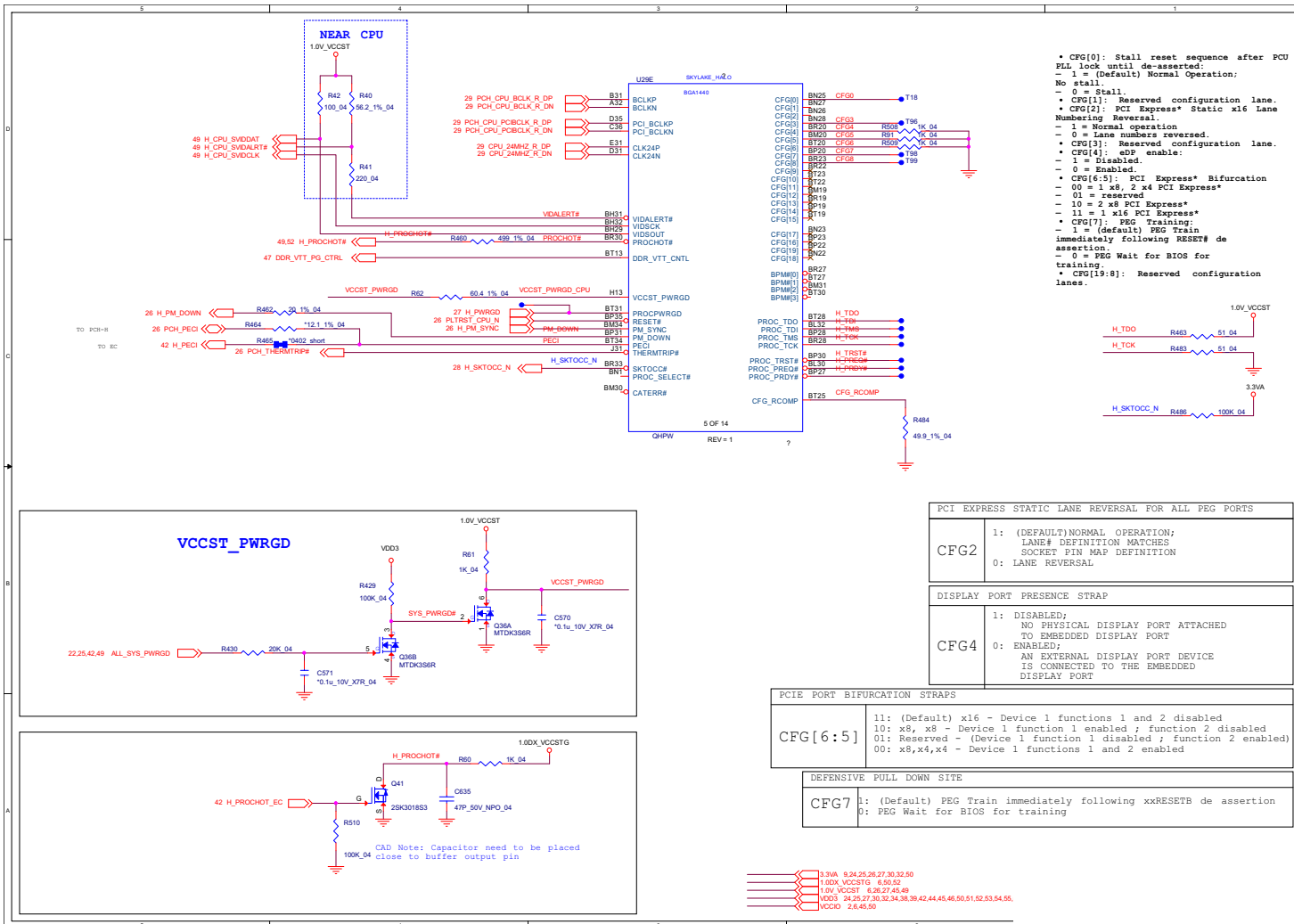
# Processor 2/6

B.Schematic Diagrams

Sheet 3 of 63  
Processor 2/6



# Processor 3/6

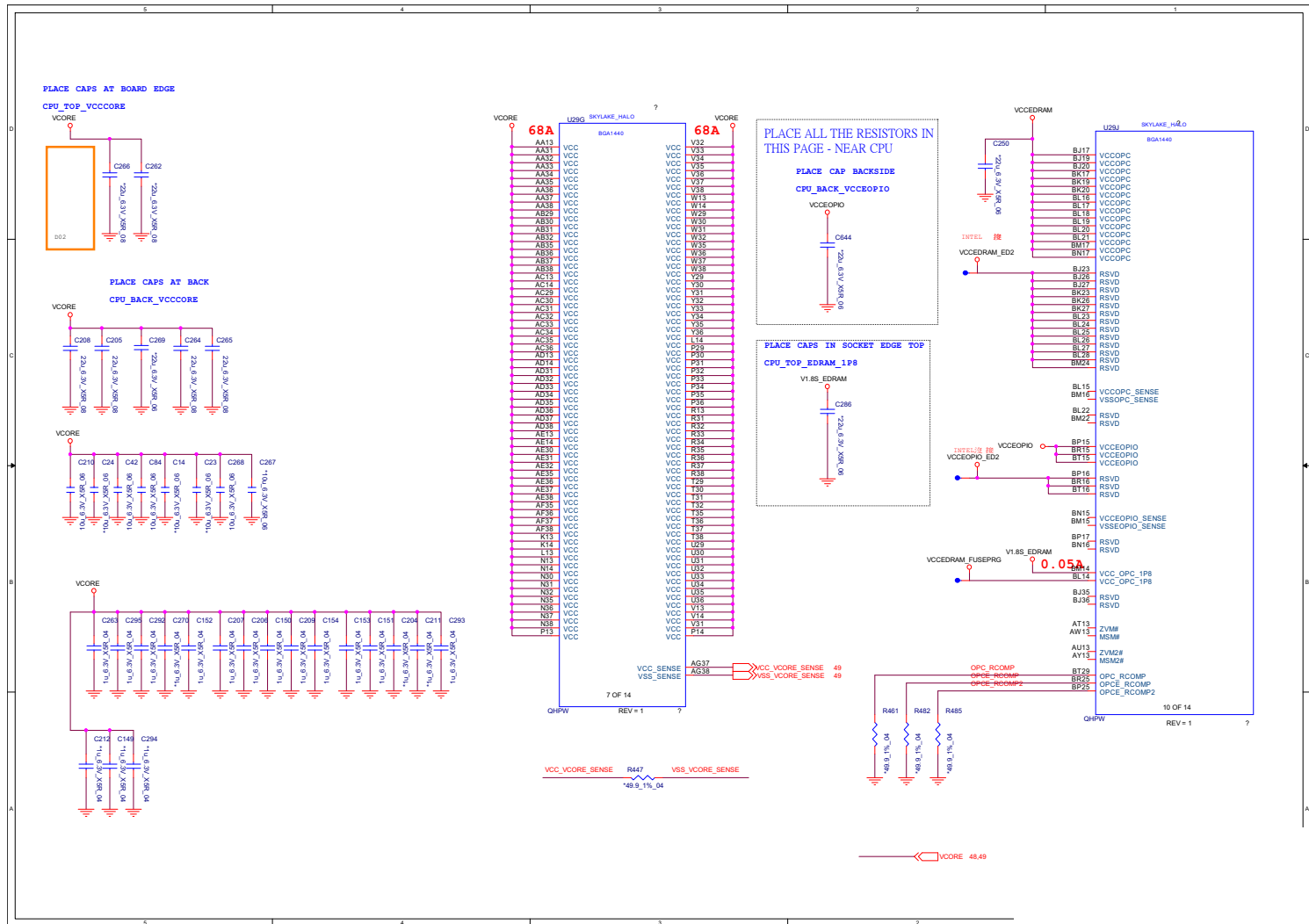


Sheet 4 of 63  
Processor 3/6

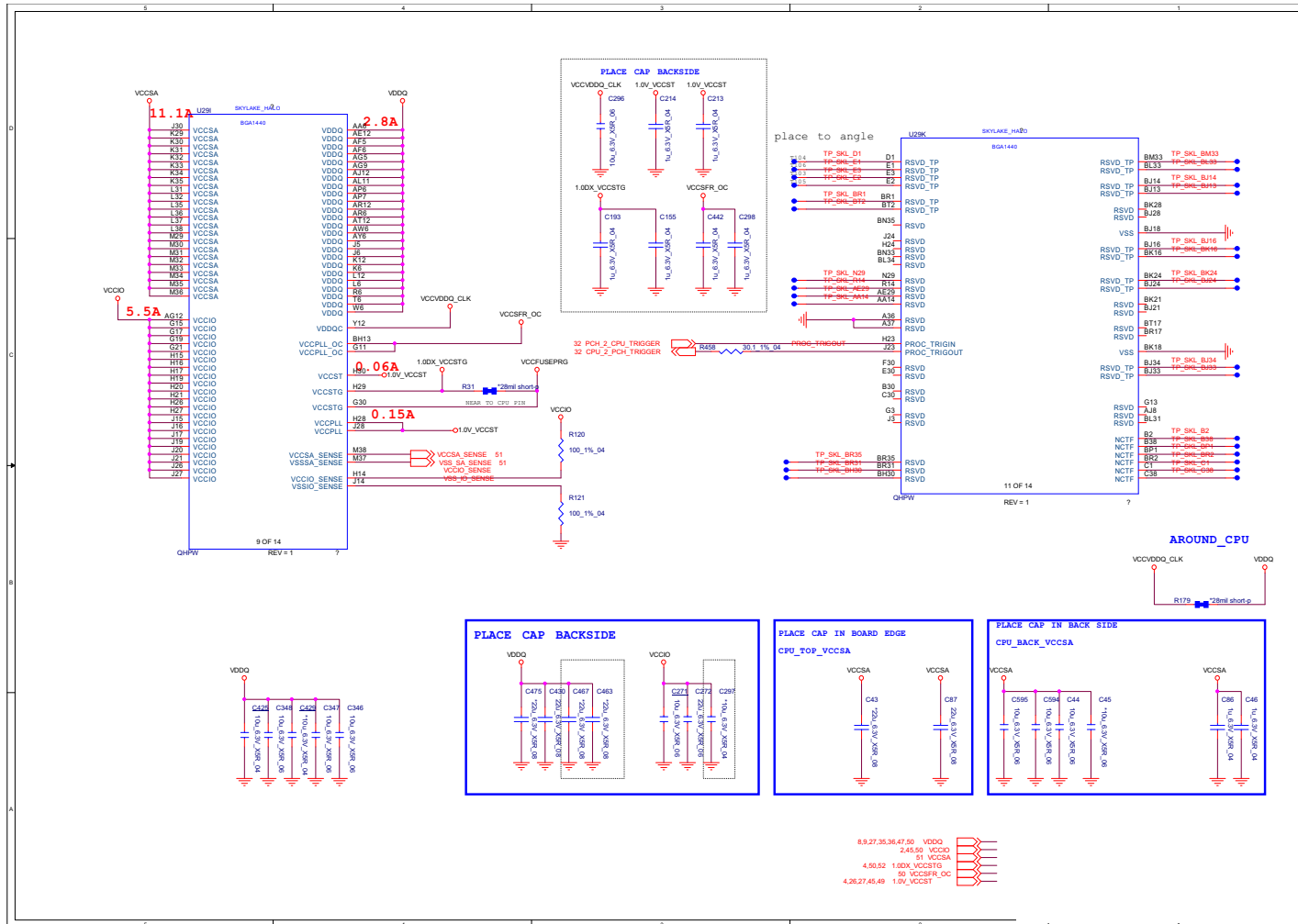
B.Schematic Diagrams

# Processor 4/6

Sheet 5 of 63  
Processor 4/6



# Processor 5/6

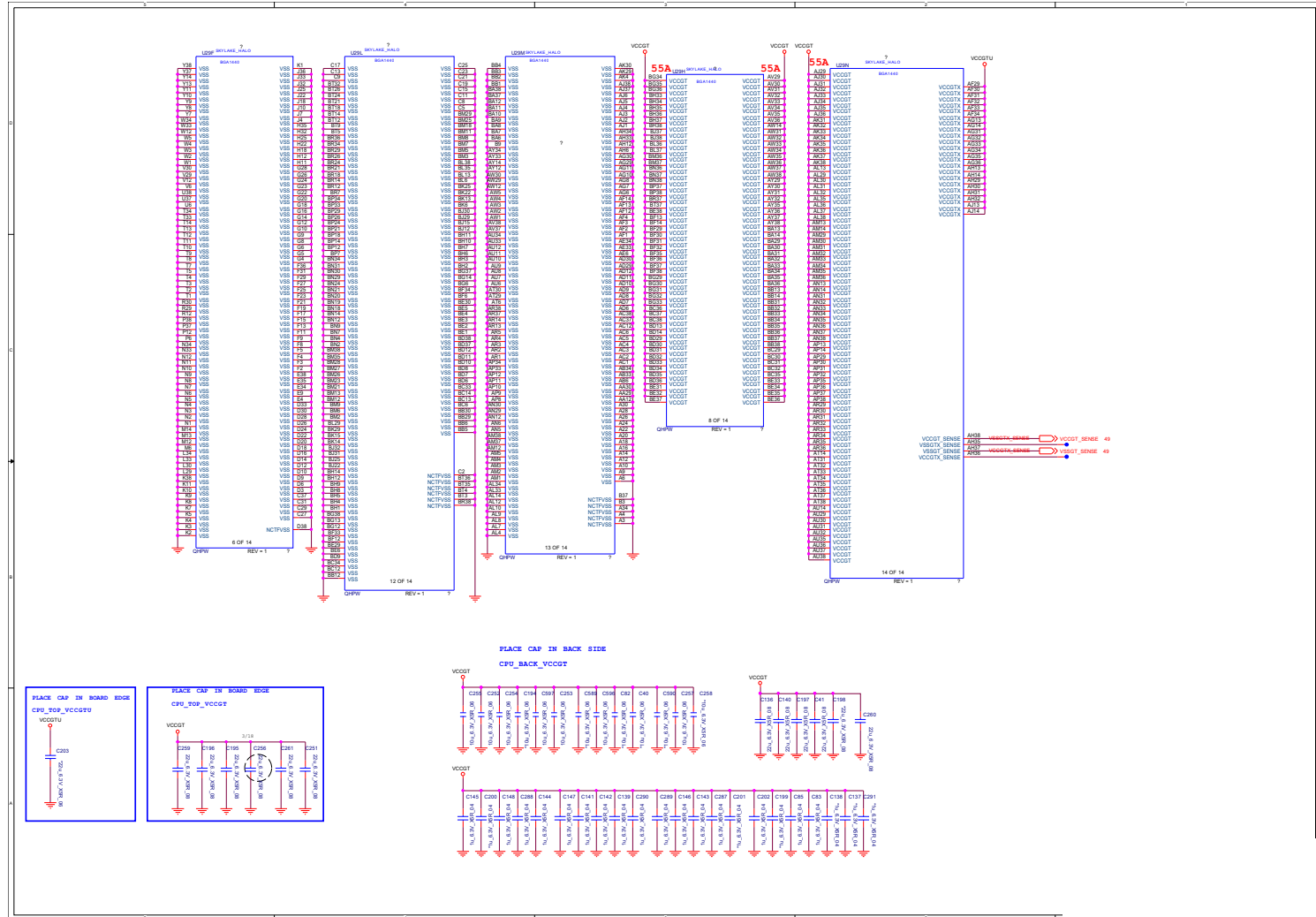


Sheet 6 of 63  
Processor 5/6

B.Schematic Diagrams

# Processor 6/6

Sheet 7 of 63  
Processor 6/6

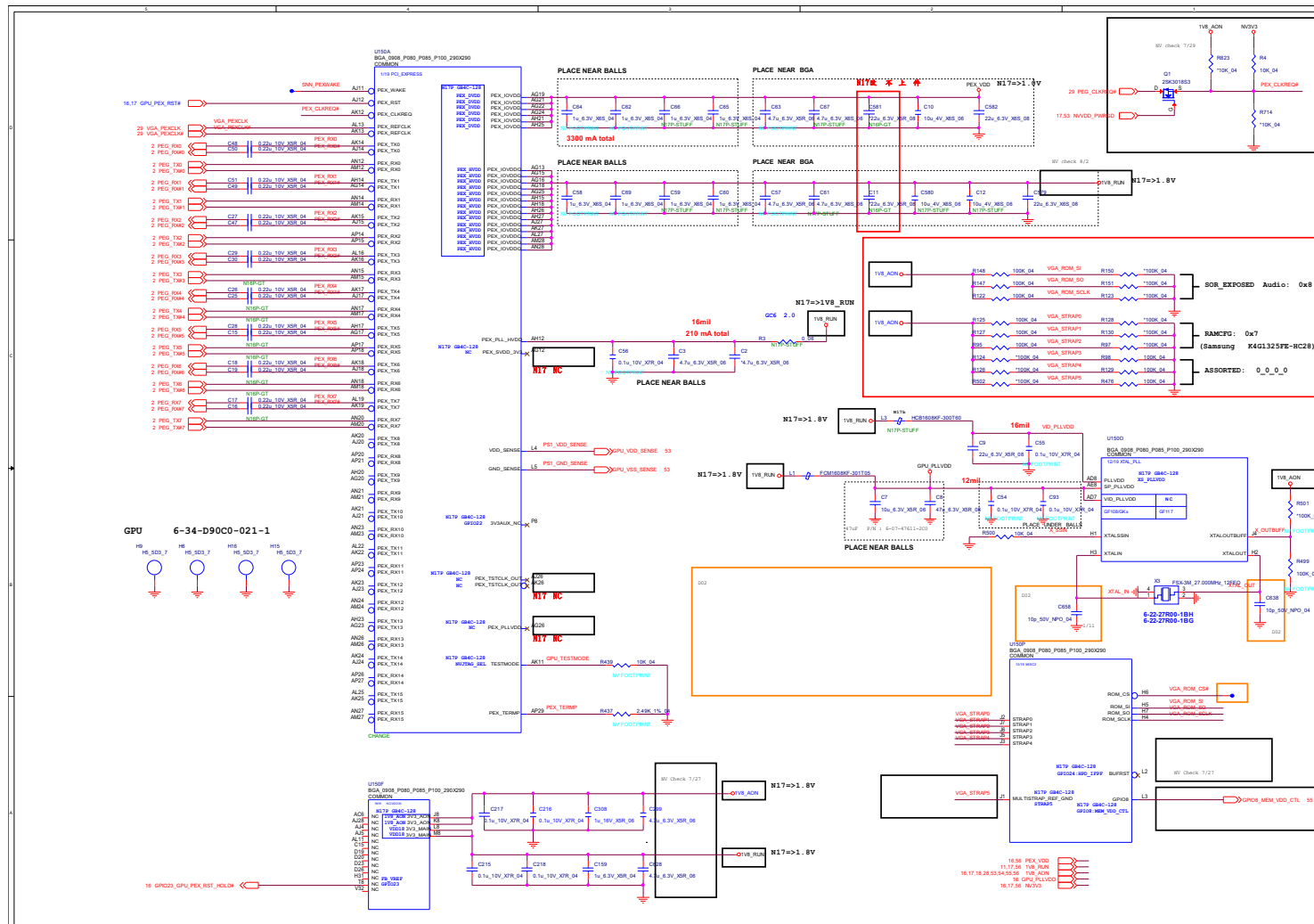








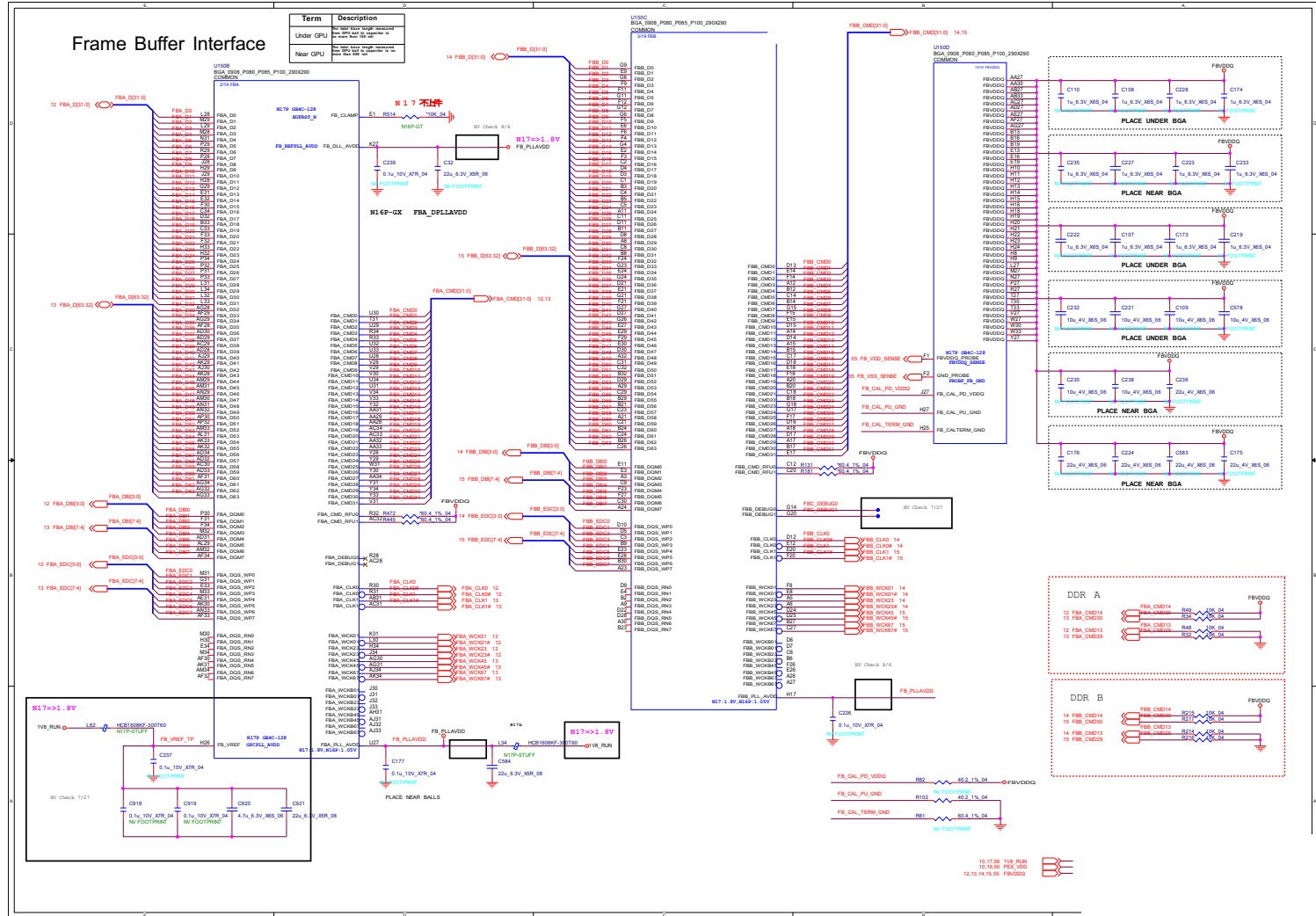
# VGA PCI-E Interface



Sheet 10 of 63  
VGA PCI-E  
Interface

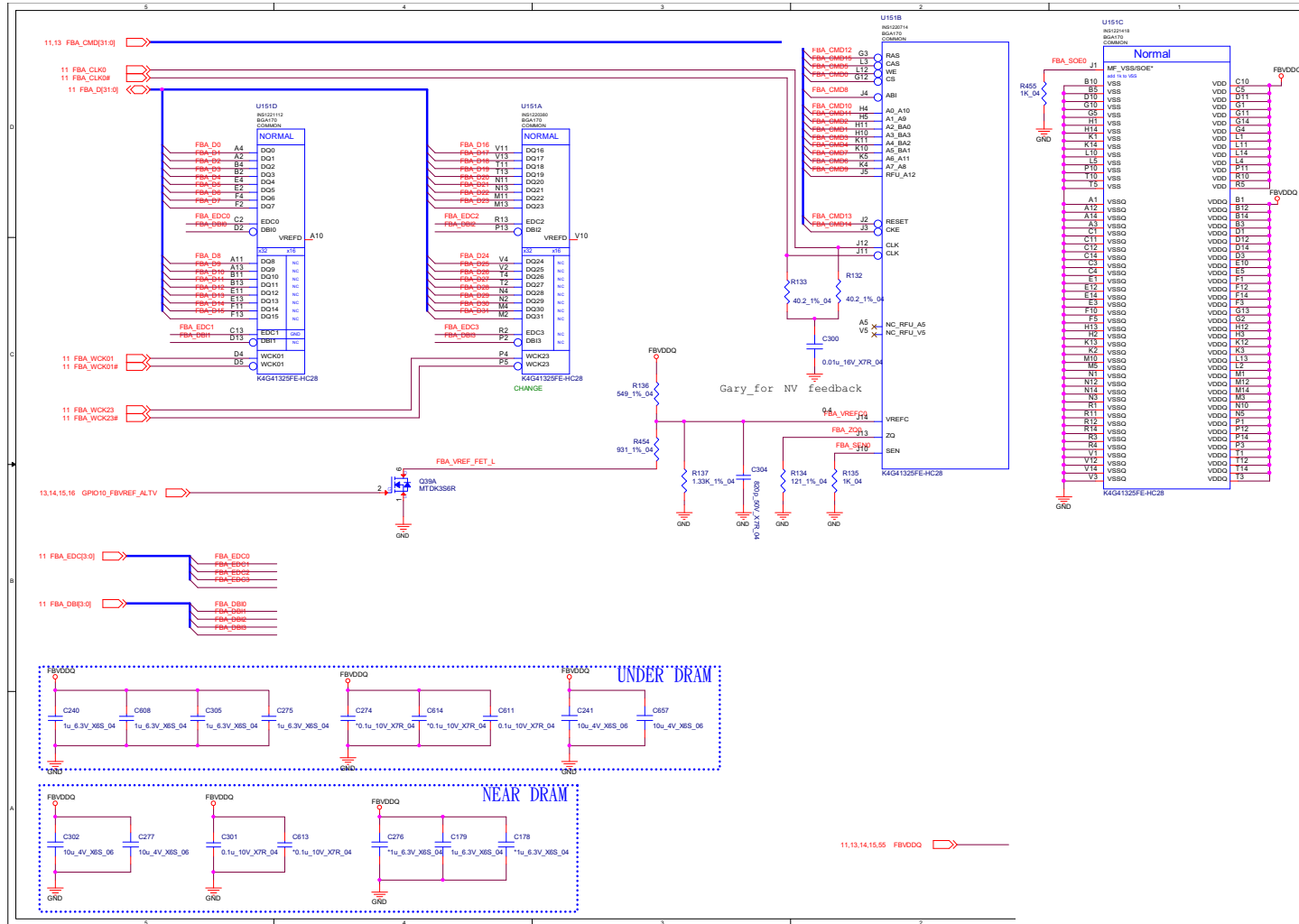
# VGA Frame Buffer Interface

Sheet 11 of 63  
VGA Frame Buffer Interface



B - 12 VGA Frame Buffer Interface

# VGA Frame Buffer A

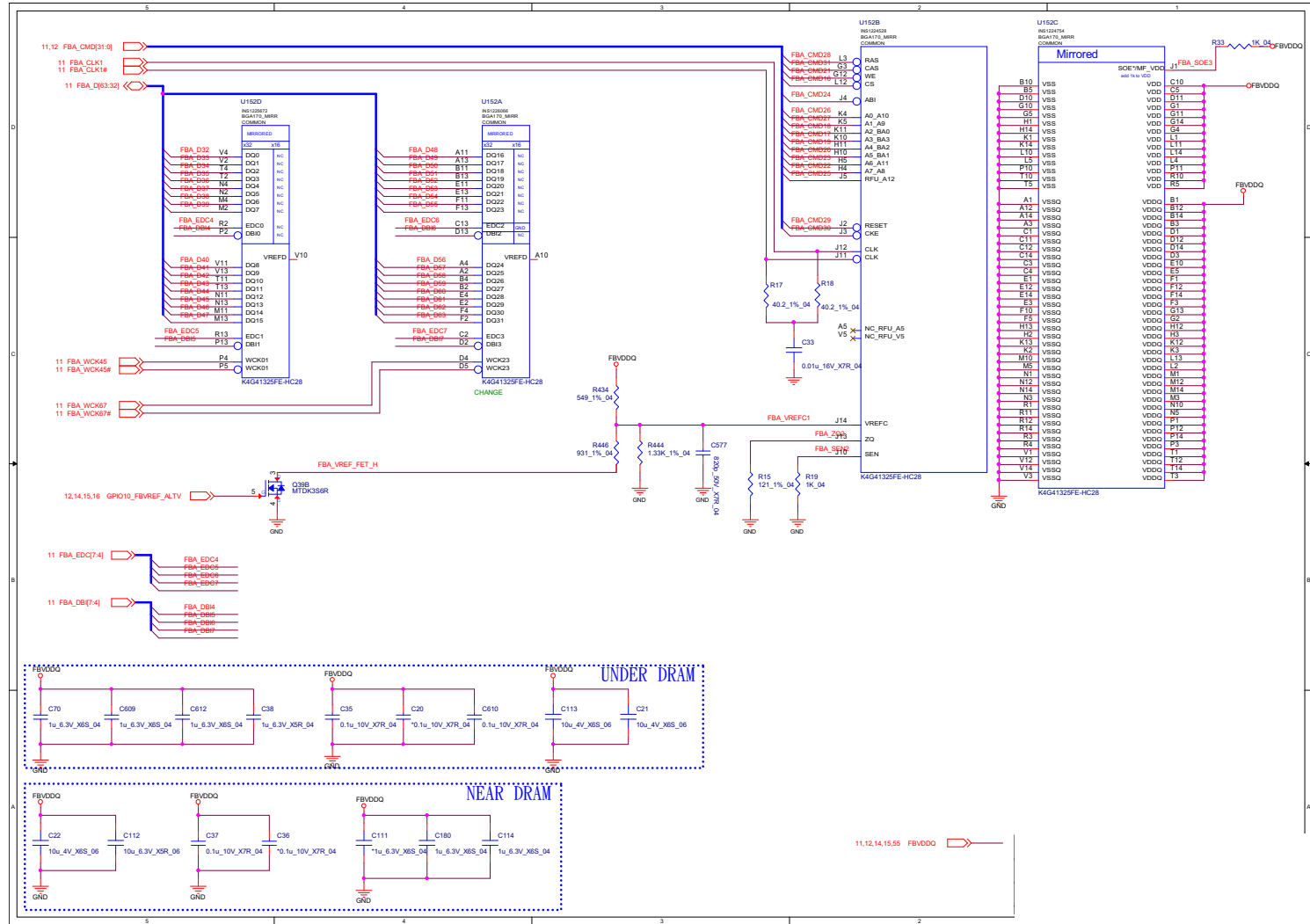


Sheet 12 of 63  
VGA Frame Buffer  
A

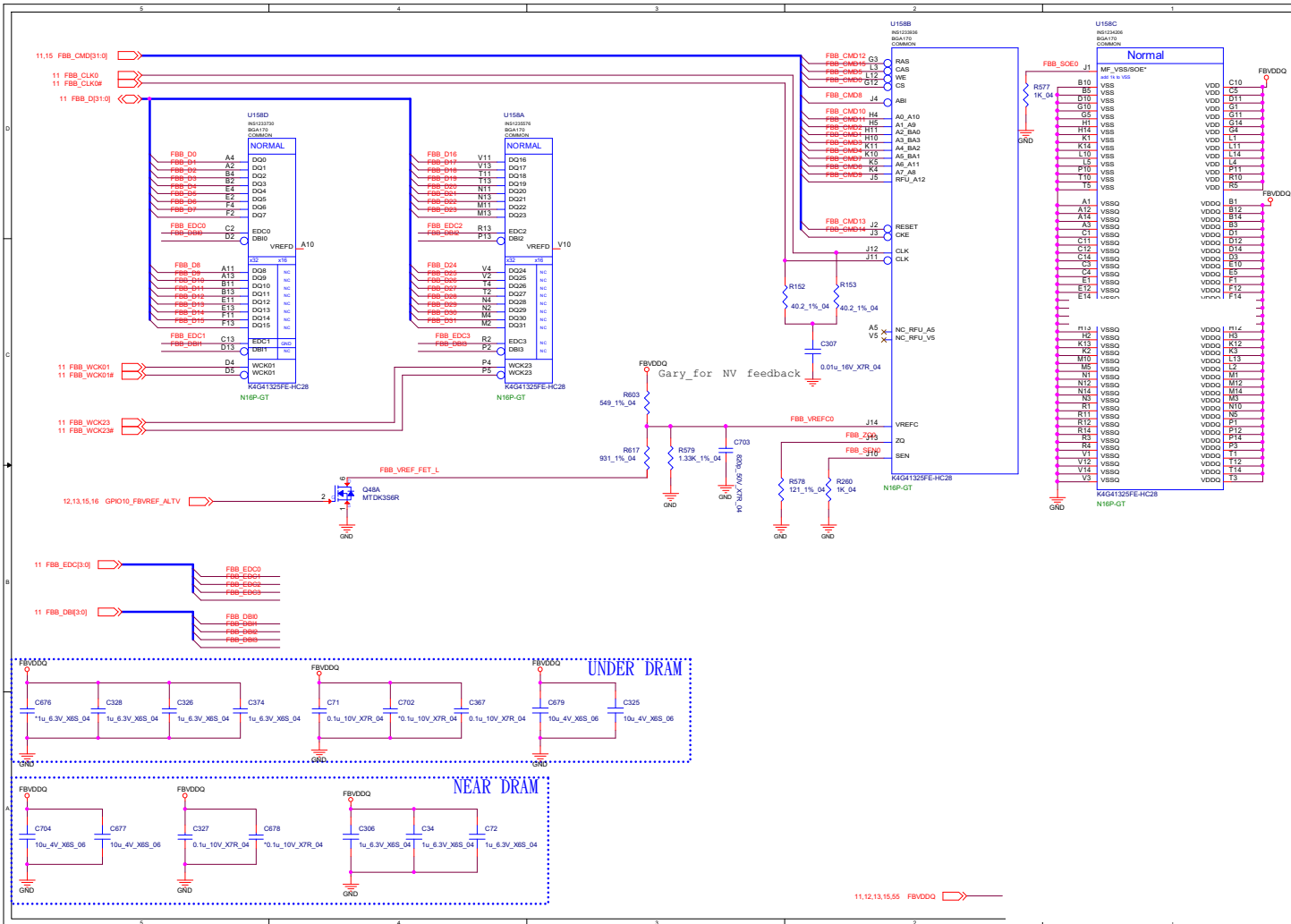
B.Schematic Diagrams

# VGA Fraem Buffer A

Sheet 13 of 63  
VGA Frame Buffer  
A



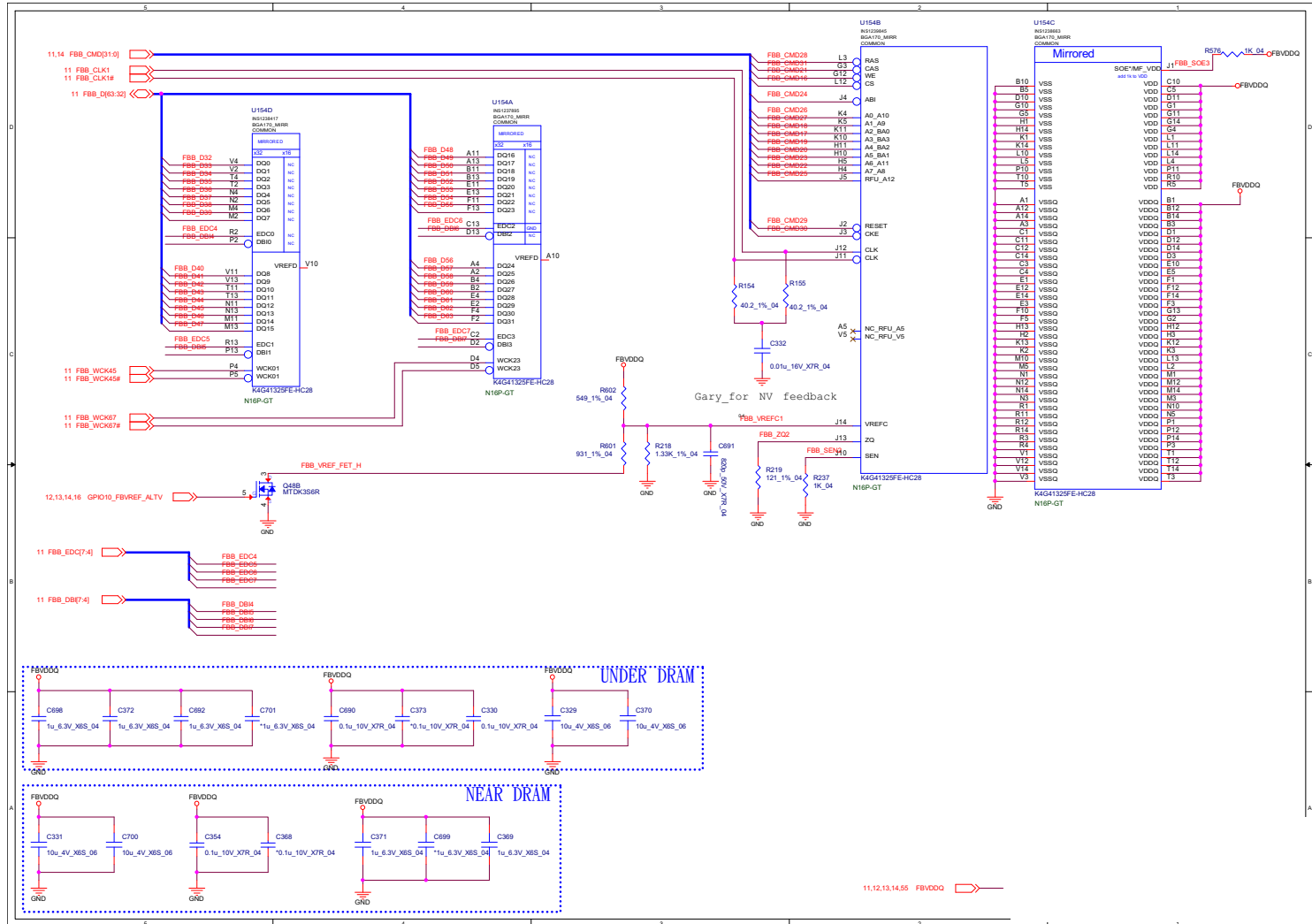
# VGA Frame Buffer B



Sheet 14 of 63  
VGA Frame Buffer  
B

B.Schematic Diagrams

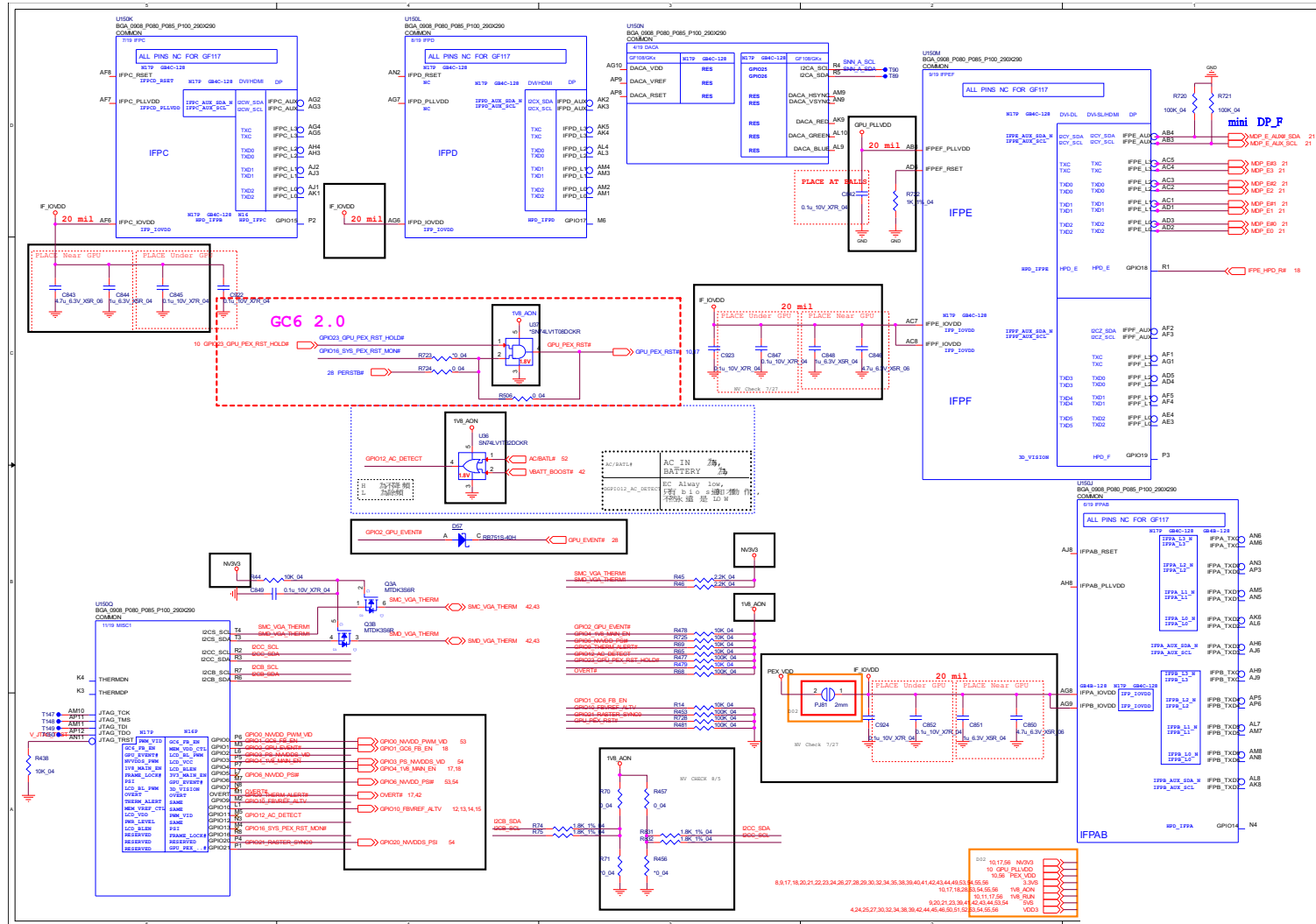
# VGA Frame Buffer B



Sheet 15 of 63  
VGA Frame Buffer  
B

B. Schematic Diagrams

# VGA I/O

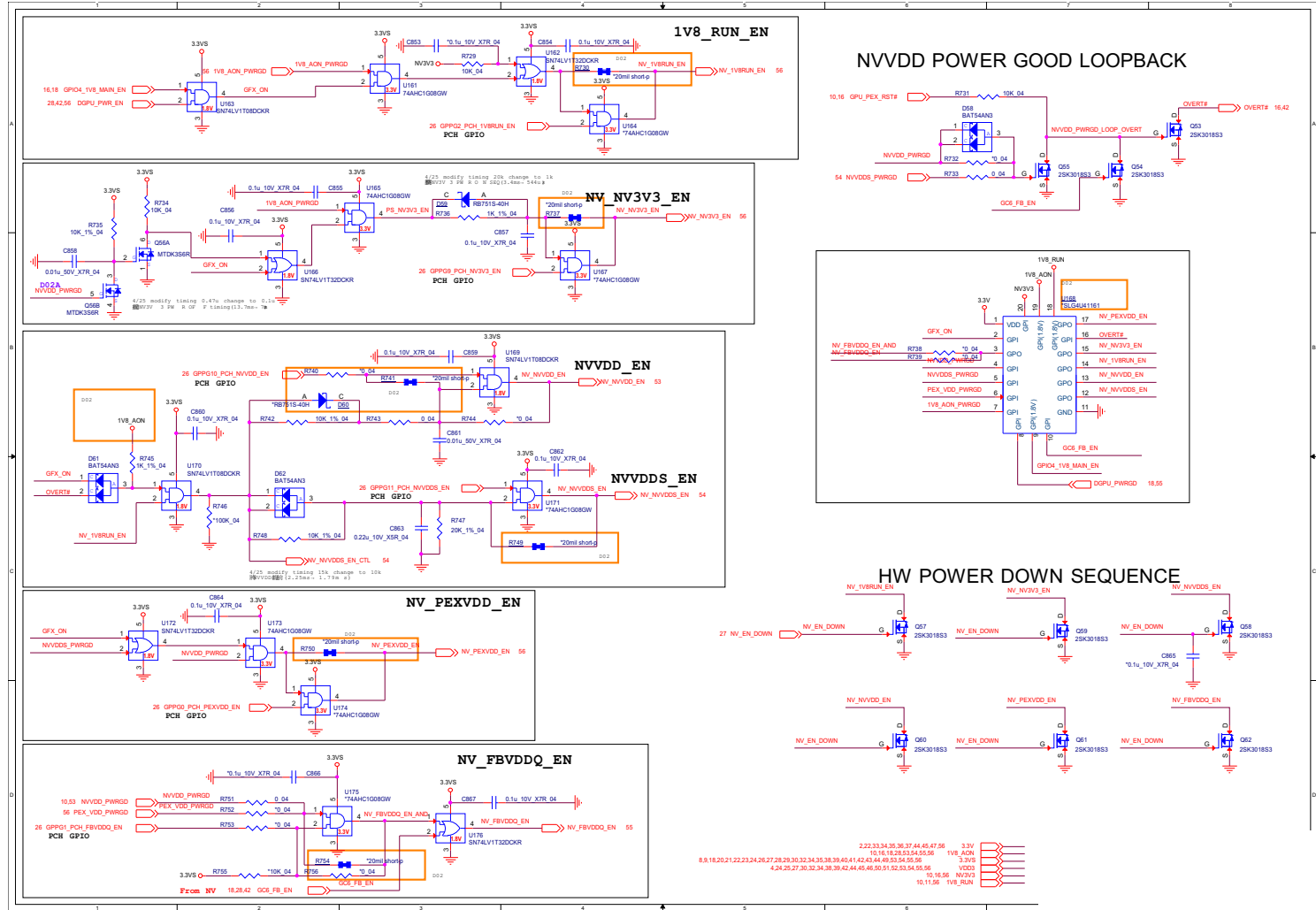


Sheet 16 of 63  
VGA I/O

B.Schematic Diagrams

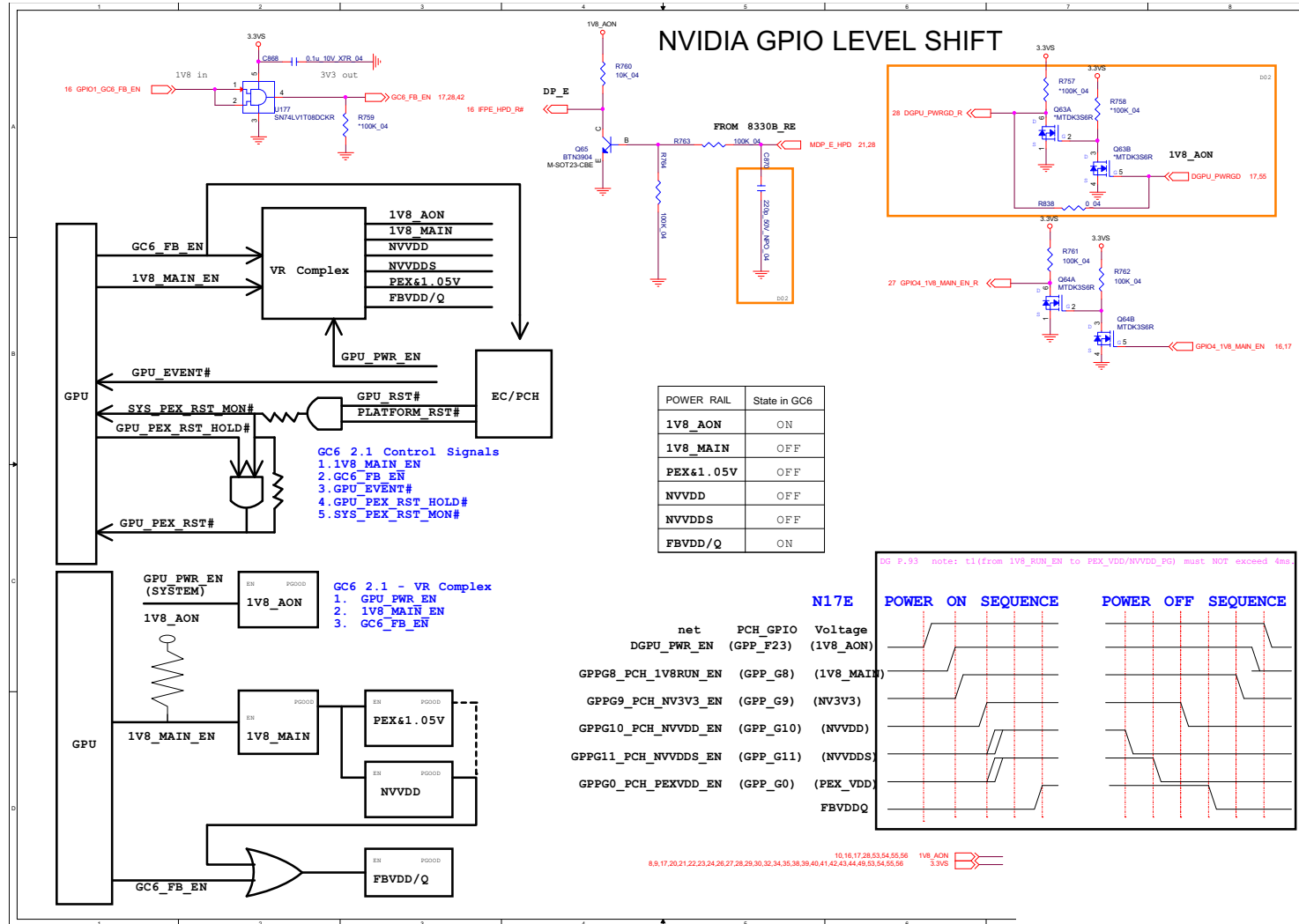
# NVIDIA Power Sequence

Sheet 17 of 63  
NVIDIA Power  
Sequence





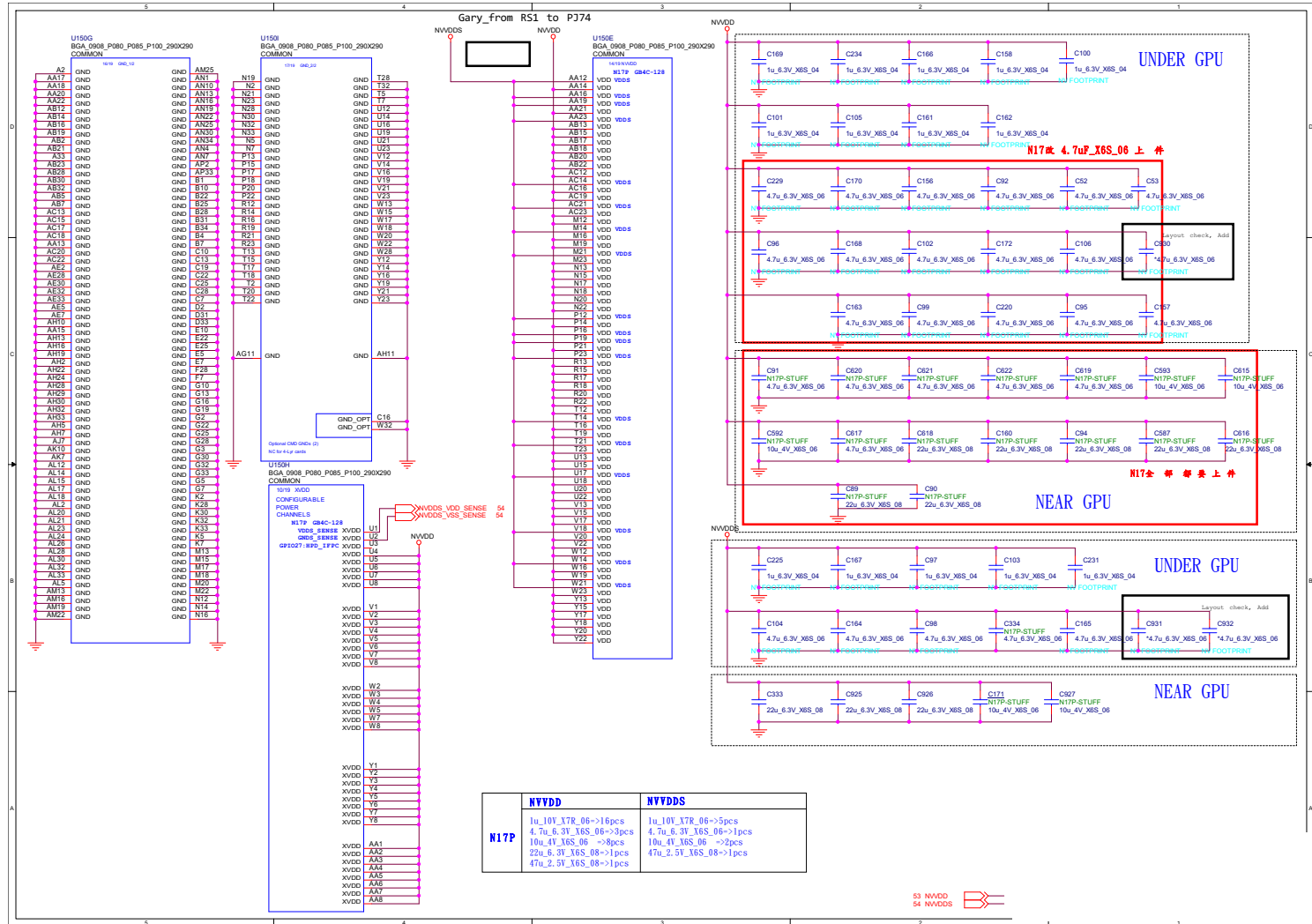
# NVIDIA GPIO Level Shift



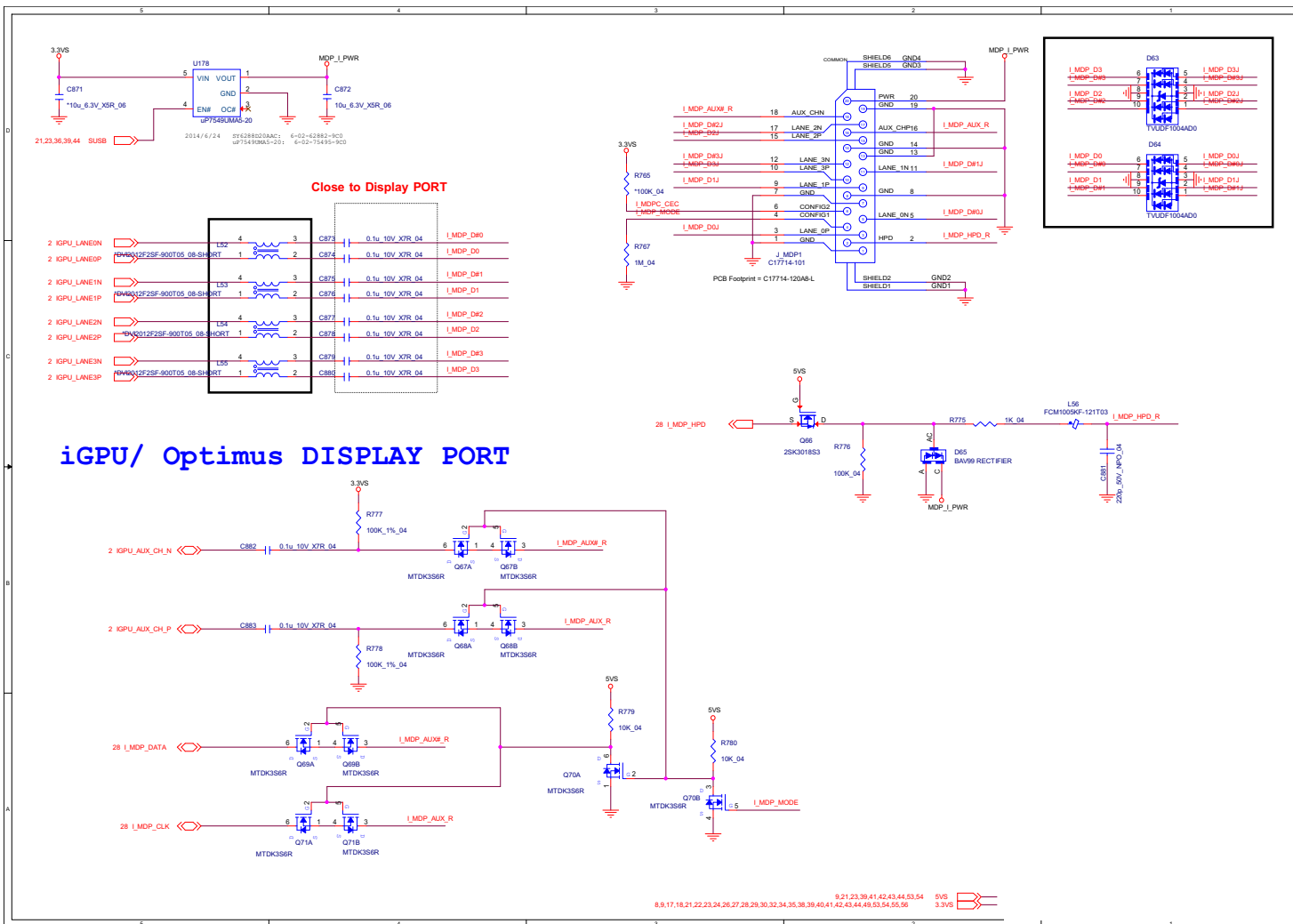
Sheet 18 of 63  
NVIDIA GPIO Level Shift

# VGA NVVDD Coupling

Sheet 19 of 63  
VGA NVVDD  
Coupling



MDP

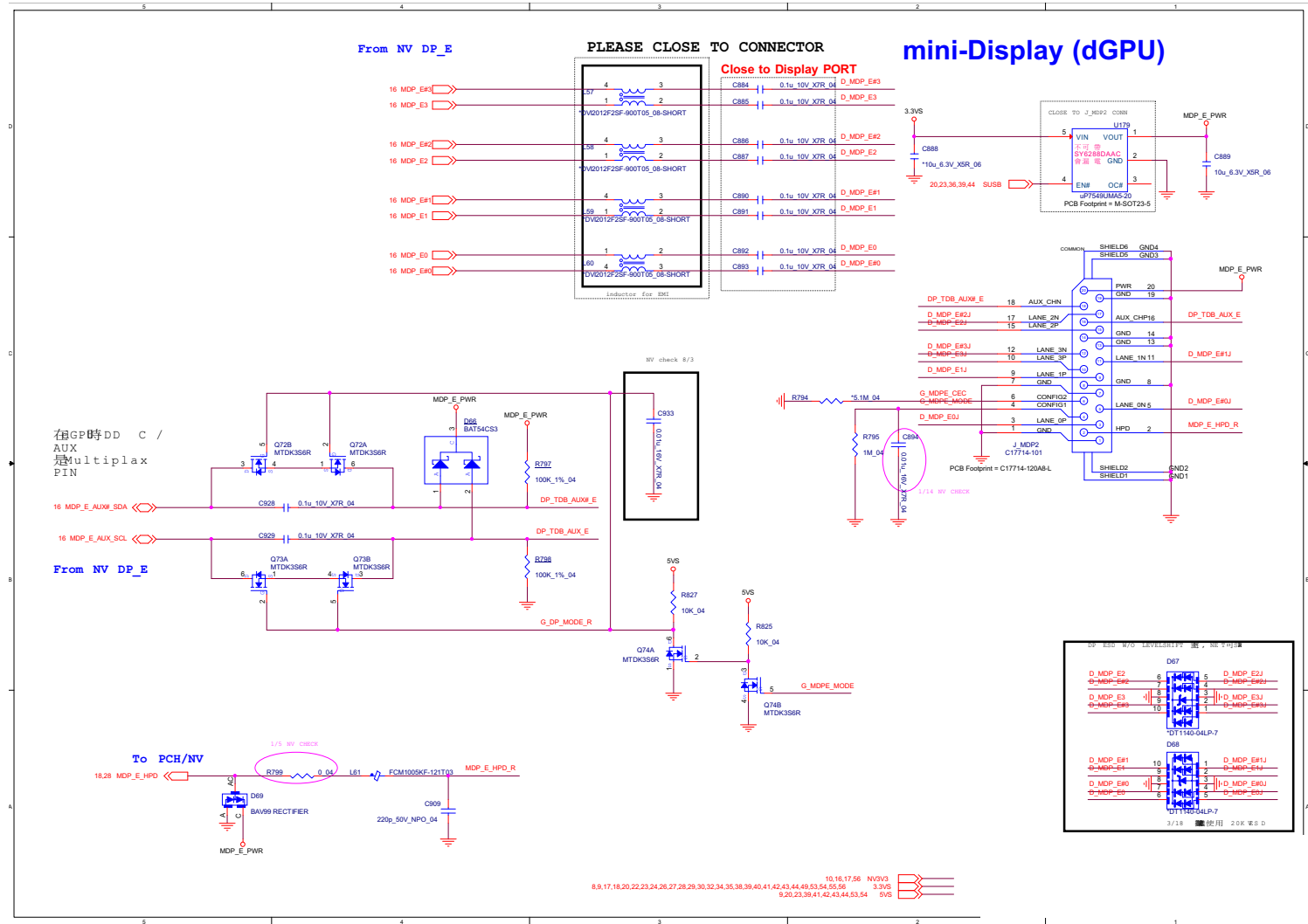


Sheet 20 of 63  
MDP

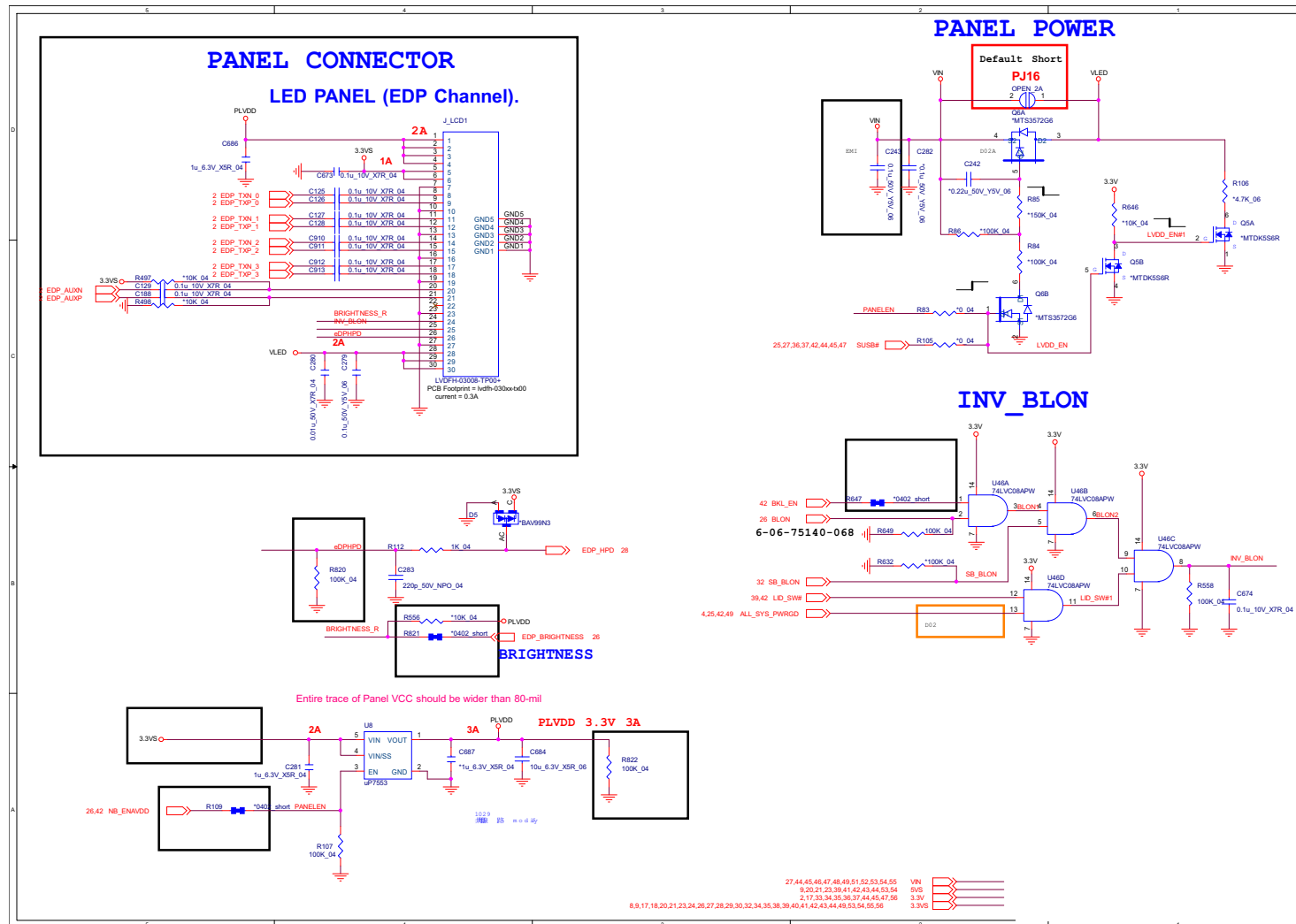
B.Schematic Diagrams

# MDP + PS8330B

Sheet 21 of 63  
MDP + PS8330B



Panel, Inverter

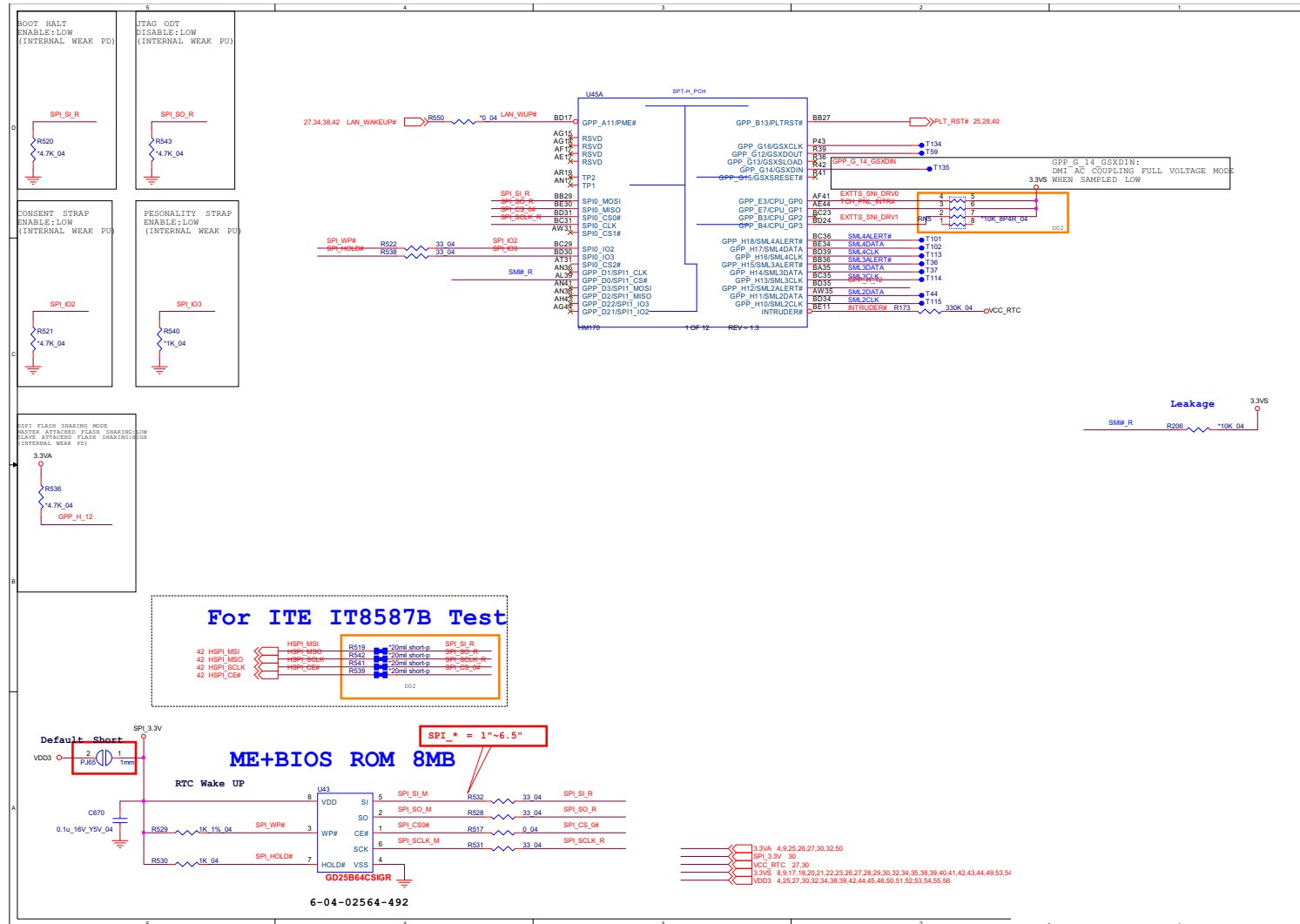


Sheet 22 of 63  
Panel, Inverter

B.Schematic Diagrams



# PCH 1/9

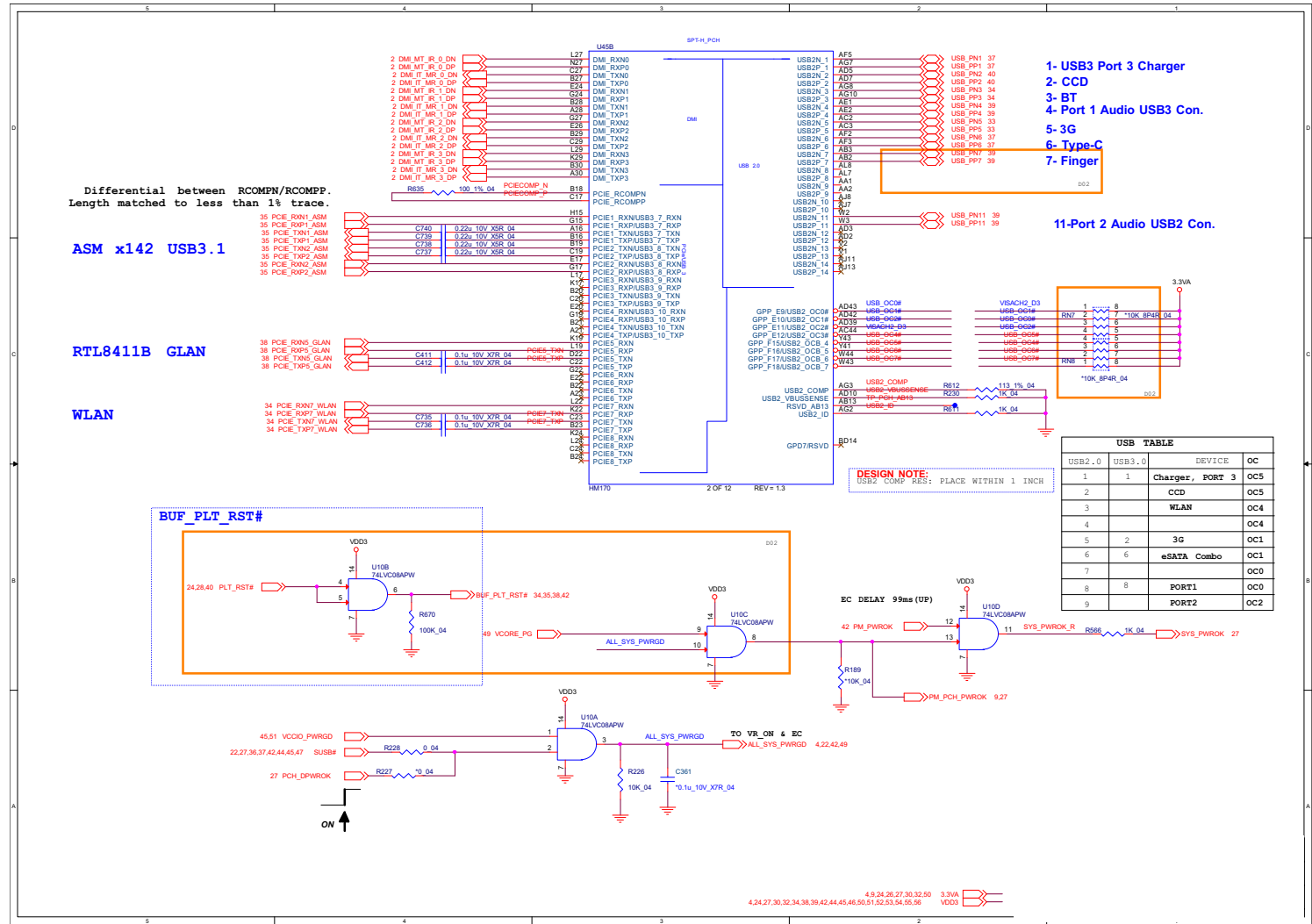


Sheet 24 of 63  
PCH 1/9

B.Schematic Diagrams

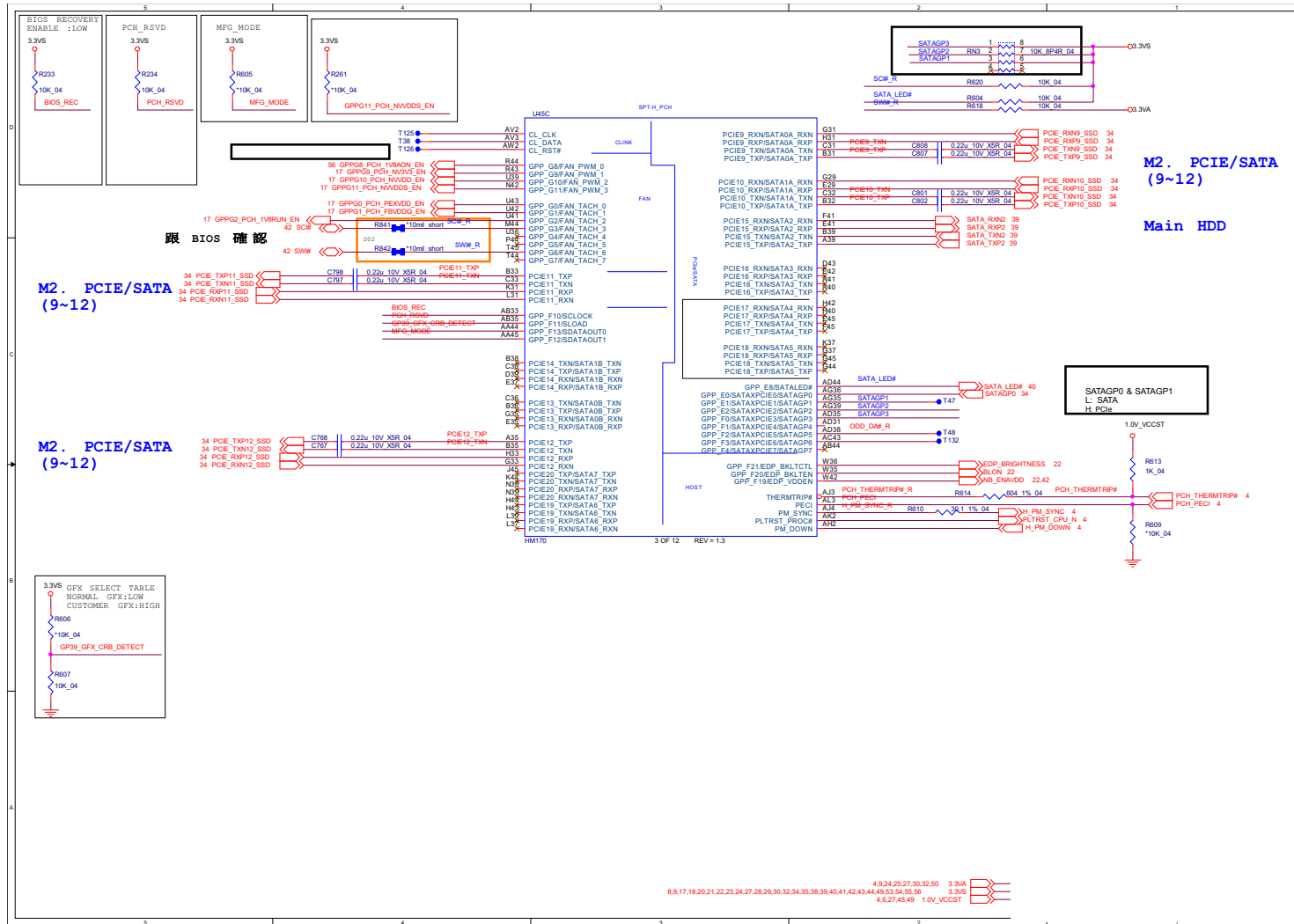
# PCH 2/9

Sheet 25 of 63  
PCH 2/9





# PCH 3/9

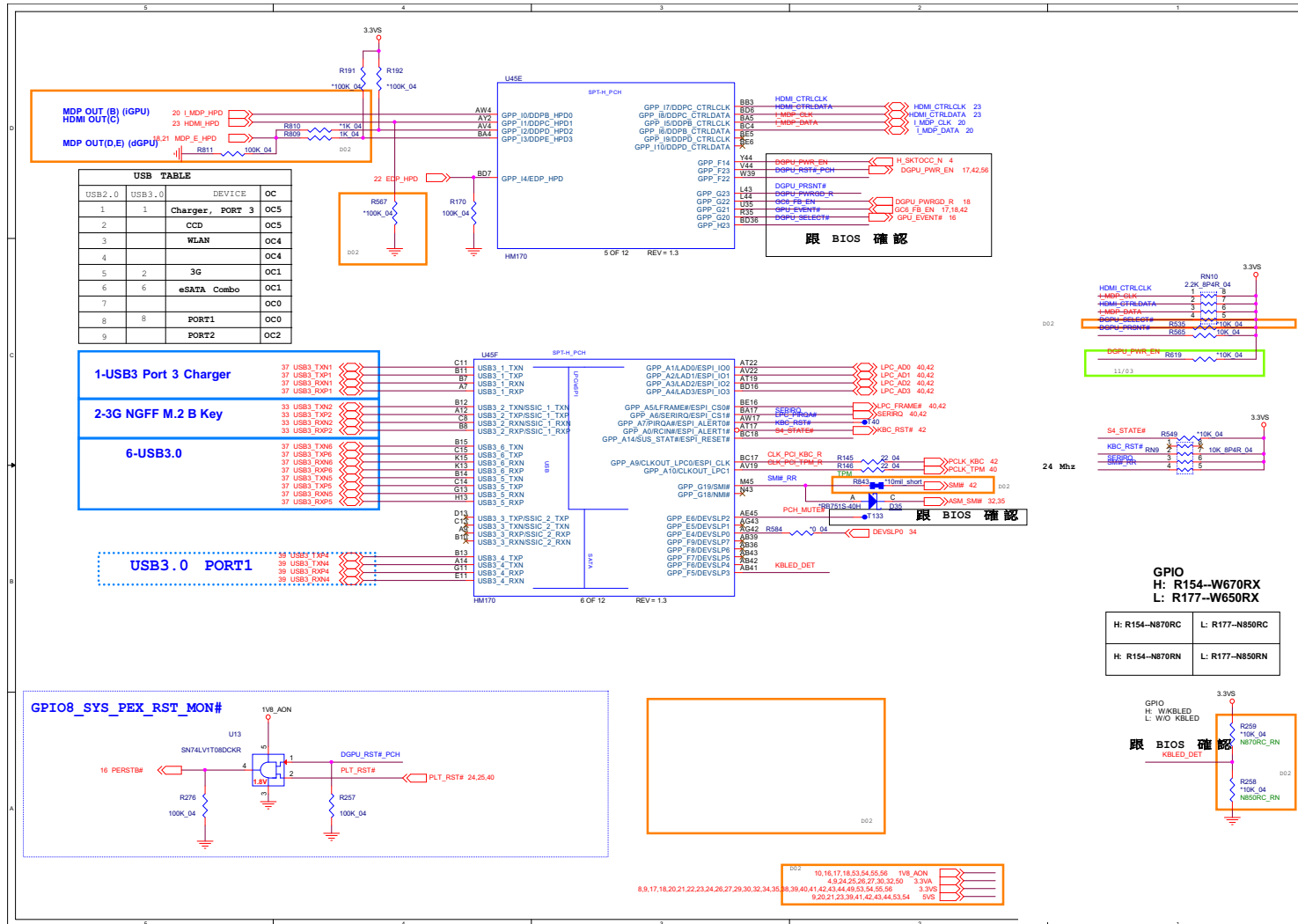


Sheet 26 of 63  
PCH 3/9

B.Schematic Diagrams



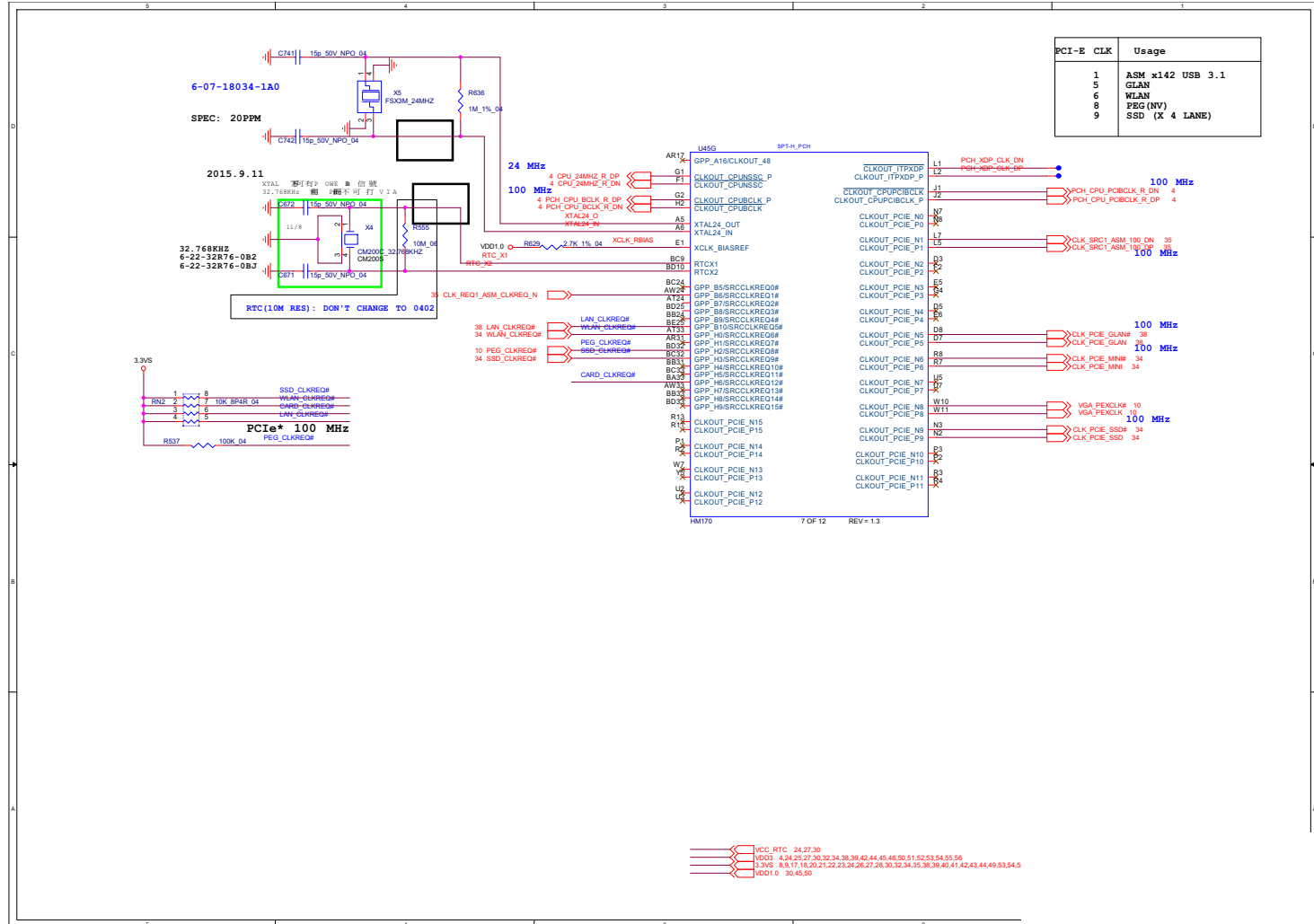
PCH 5/9



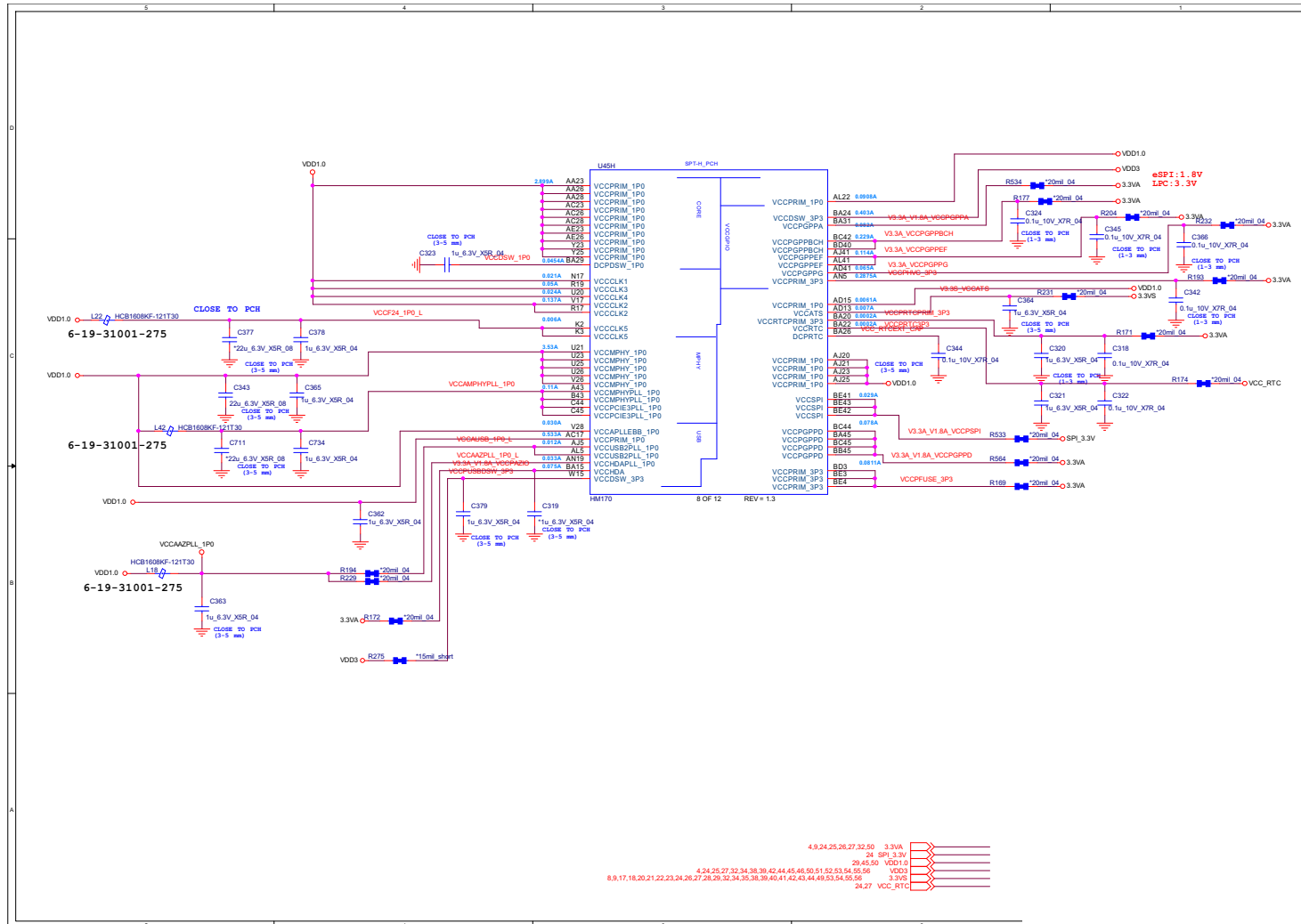
Sheet 28 of 63  
PCH 5/9

PCH 6/9

Sheet 29 of 63  
PCH 6/9



PCH 7/9



Sheet 30 of 63  
PCH 7/9

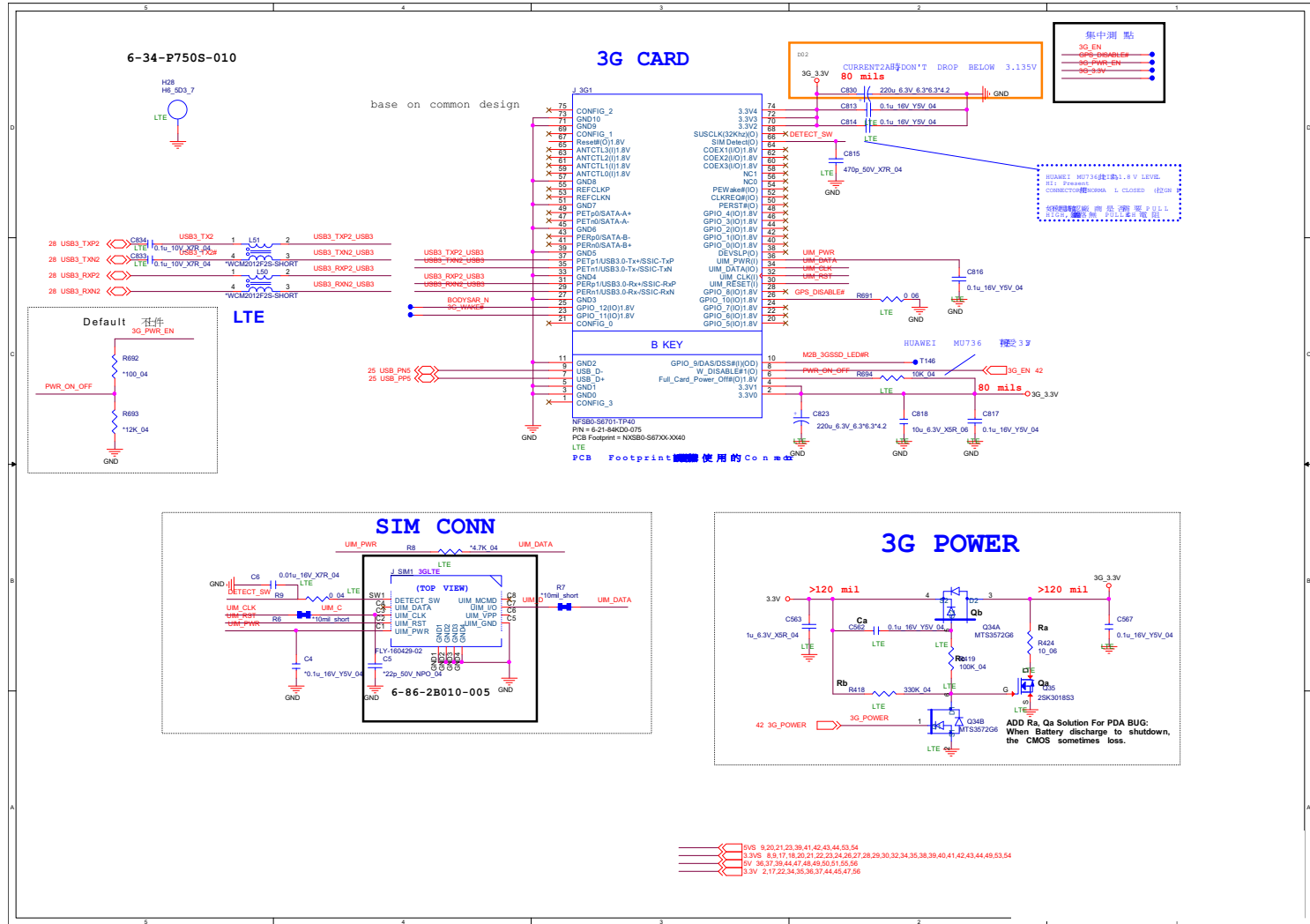
B.Schematic Diagrams





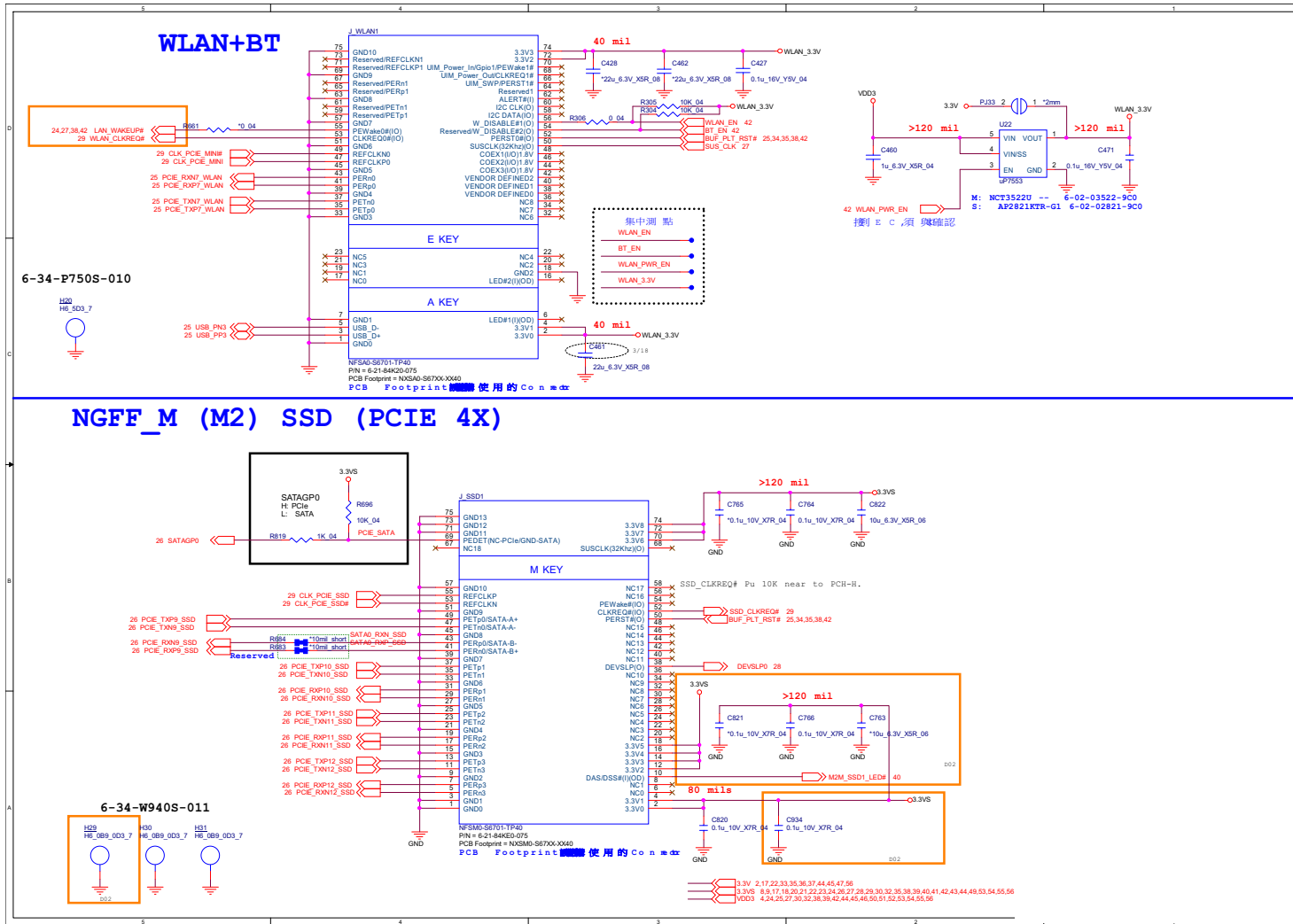
# M.2 3G Card

Sheet 33 of 63  
M.2 3G Card





# M.2 WLAN+BT, SSD

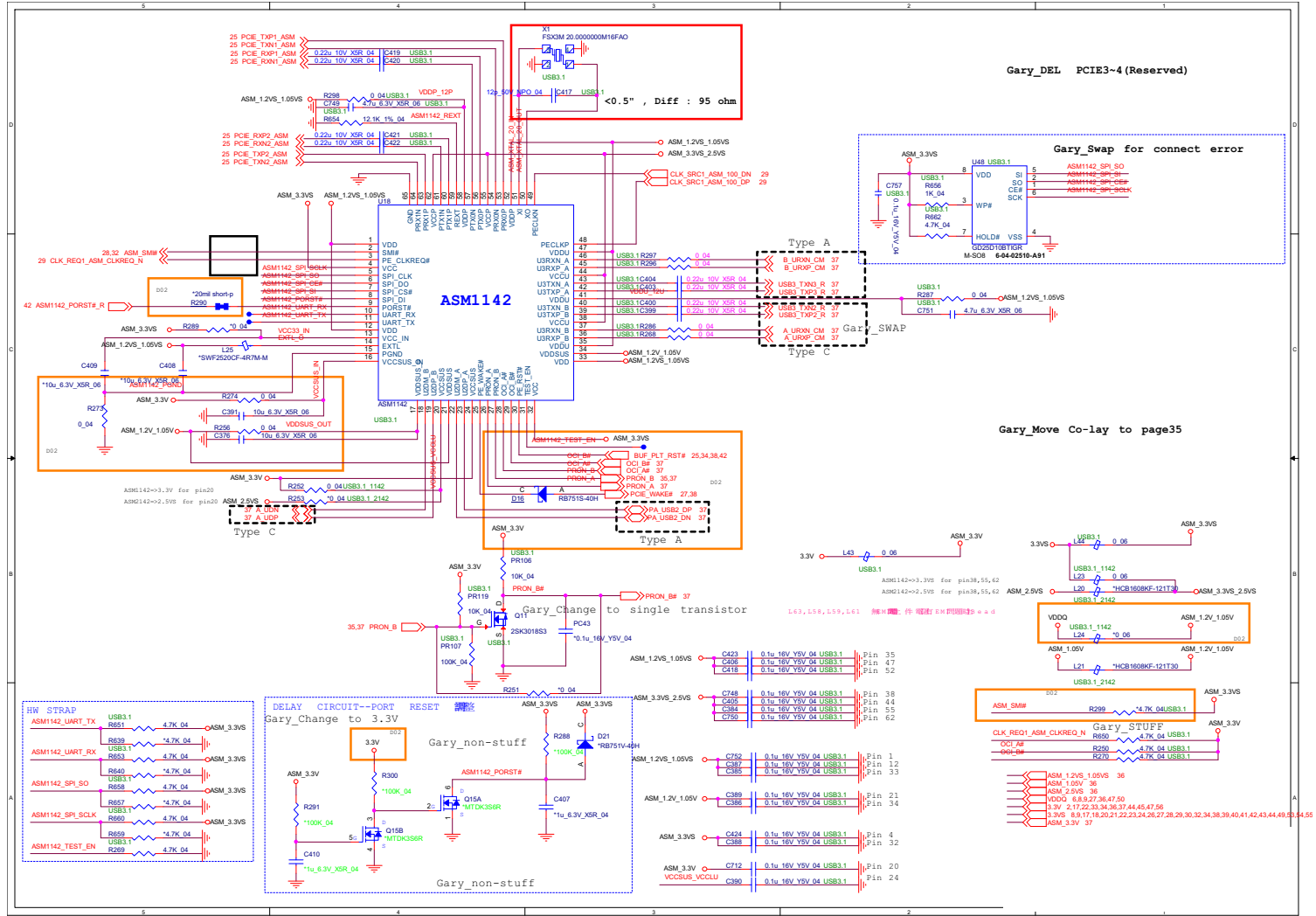


Sheet 34 of 63  
M.2 WLAN+BT,  
SSD

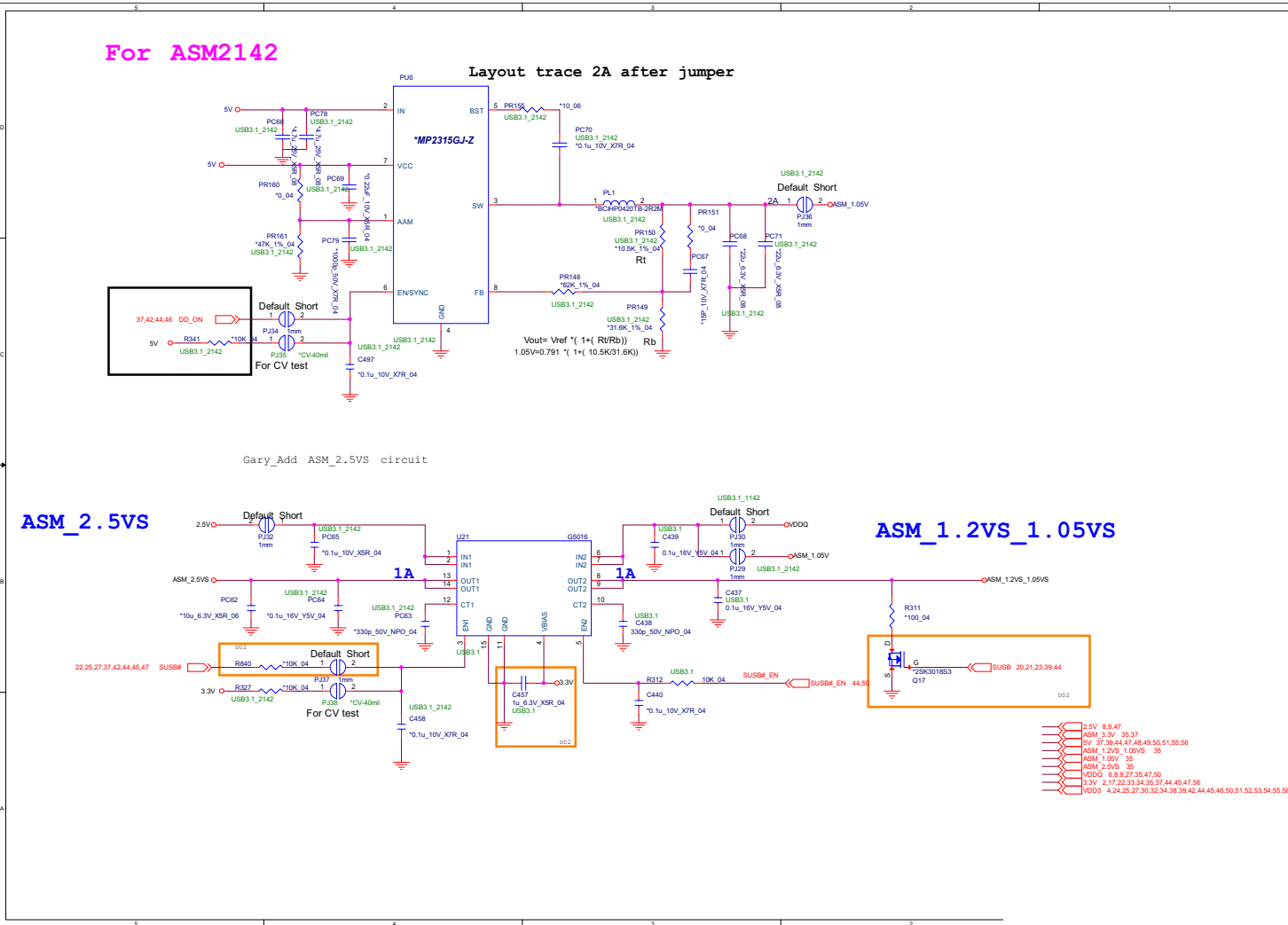
B.Schematic Diagrams

# ASM1142 & 2142

Sheet 35 of 63  
ASM1142 & 2142



# ASM Power

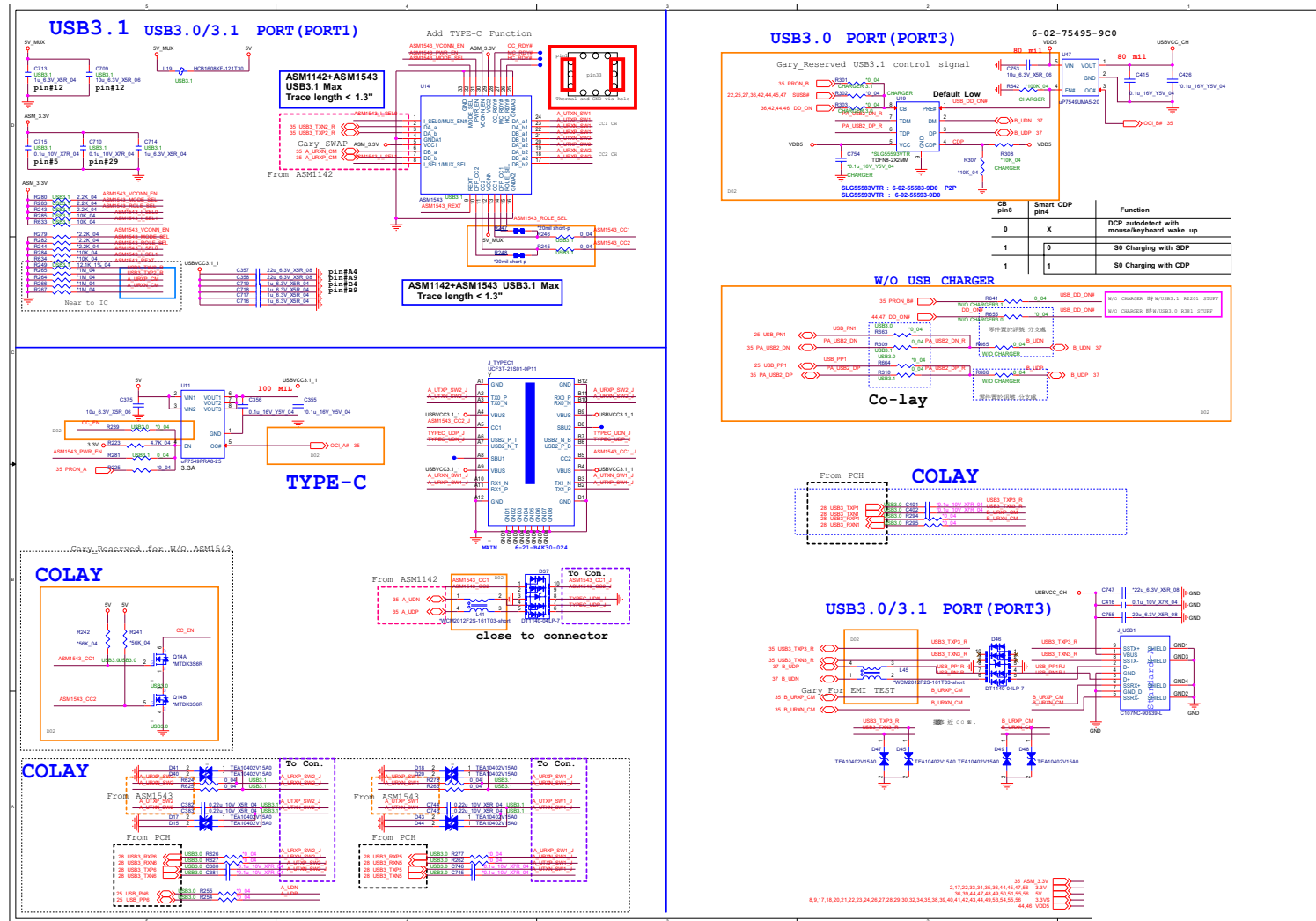


Sheet 36 of 63  
ASM Power

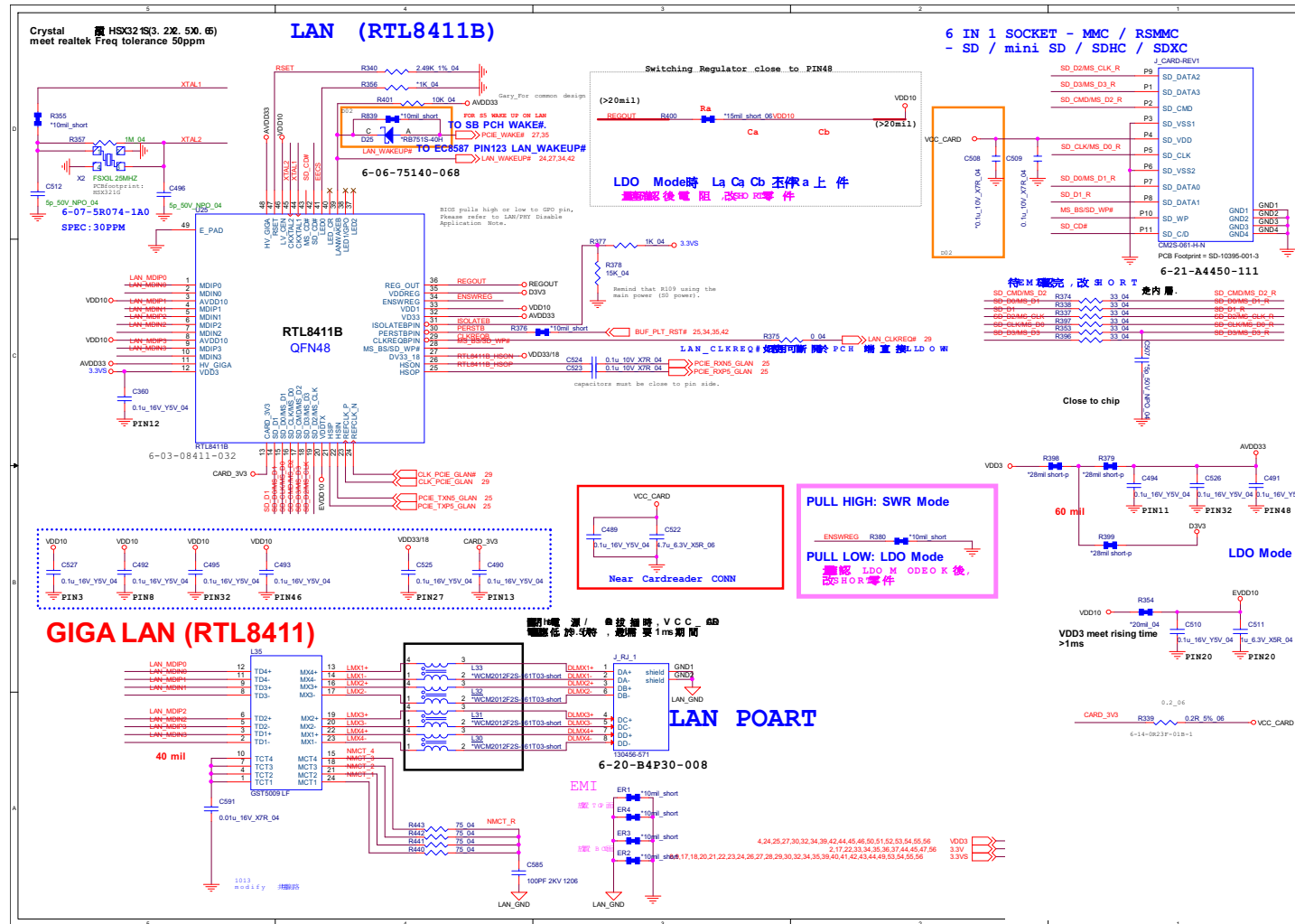
B.Schematic Diagrams

# USB Conn, USB Charger

Sheet 37 of 63  
USB Conn, USB  
Charger



# Card Reader / LAN RTL8411B

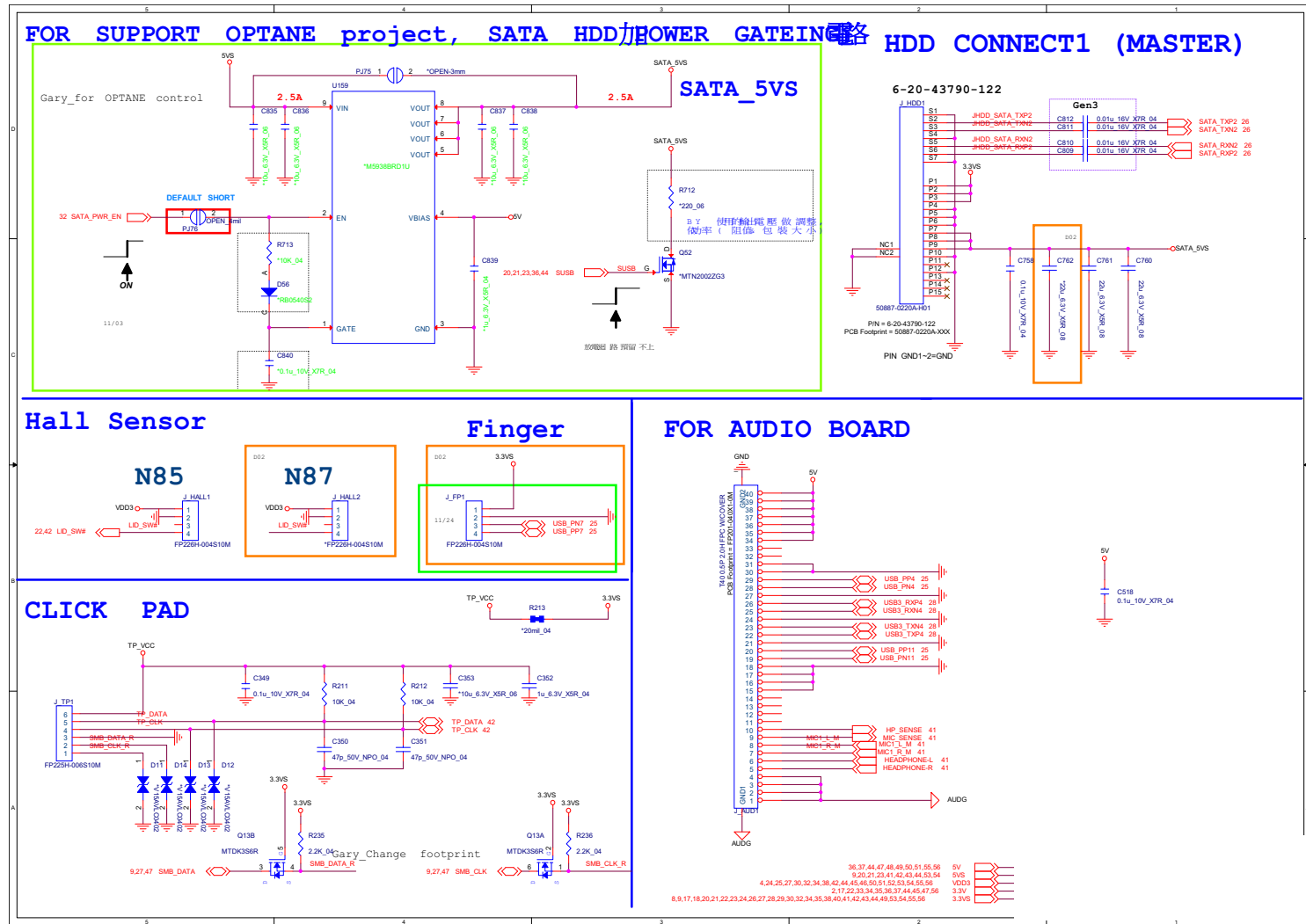


Sheet 38 of 63  
Card Reader /  
LAN RTL8411B

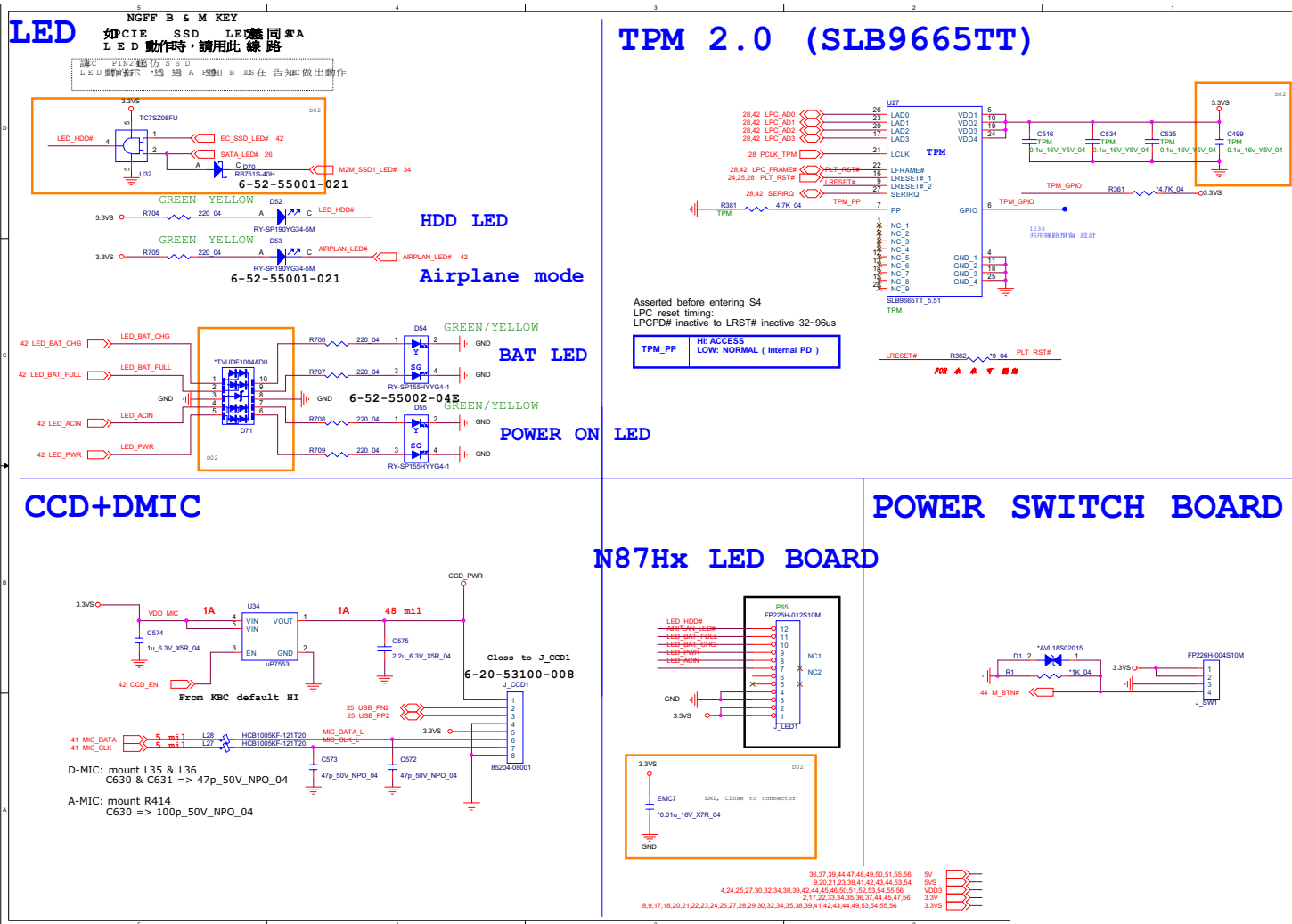
B.Schematic Diagrams

# HDD, Click TP, Audio, Hall Con.

Sheet 39 of 63  
HDD, Click TP,  
Audio, Hall Con.



# LED, CCD, TPM, Power SW Con.

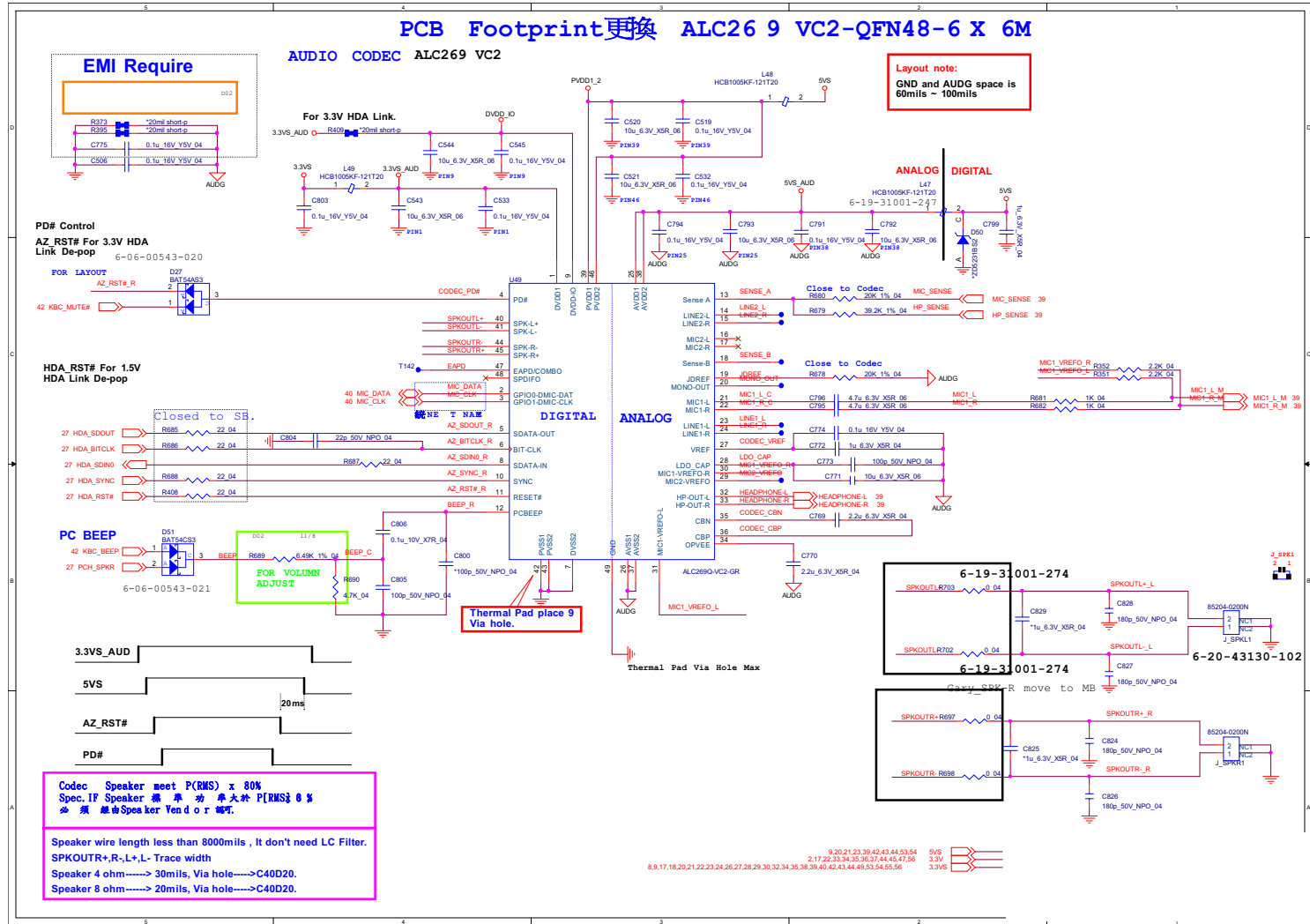


Sheet 40 of 63  
 LED, CCD, TPM,  
 Power SW Con.

B.Schematic Diagrams

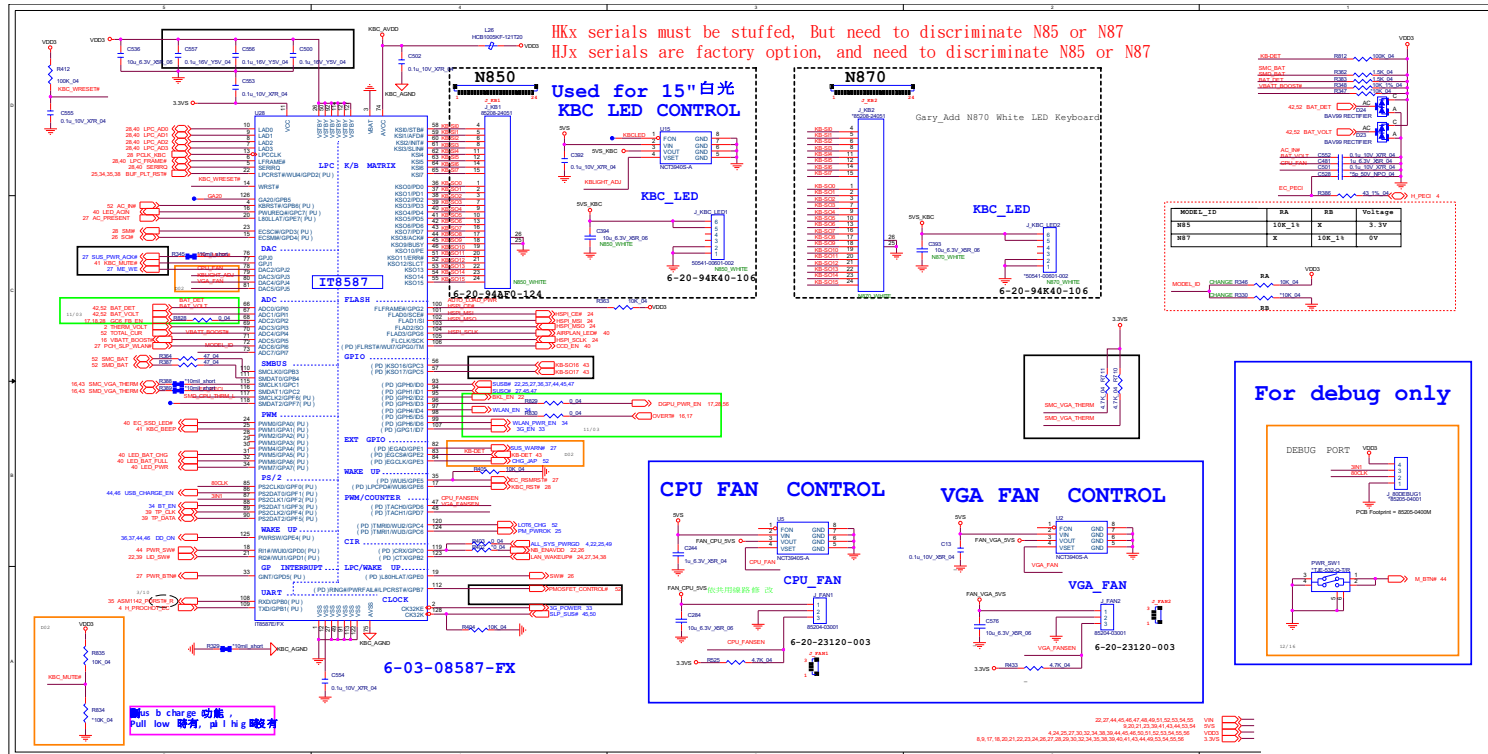
# Audio Codec ALC269 VC2

Sheet 41 of 63  
Audio Codec  
ALC269 VC2





# KBC IT8587



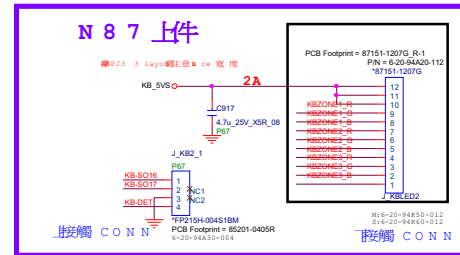
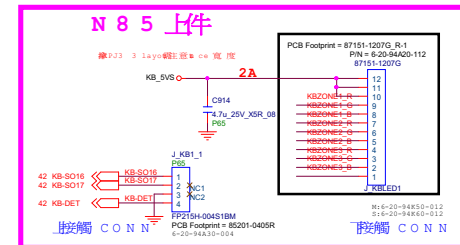
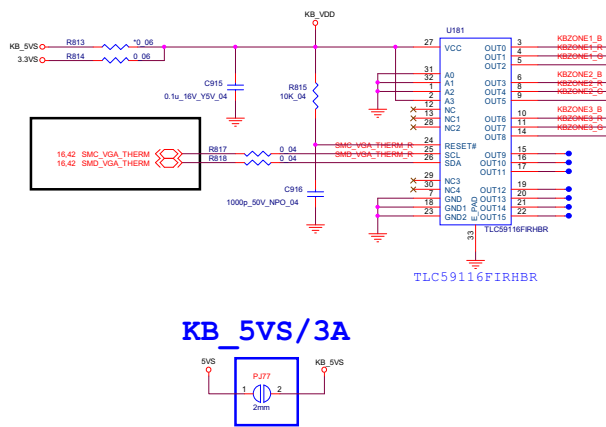
Sheet 42 of 63  
KBC IT8587

# RGB KB Only

Sheet 43 of 63  
RGB KB Only

HKx serials must be stuffed, But need to discriminate N85 or N87  
HJx serials are factory option, and need to discriminate N85 or N87

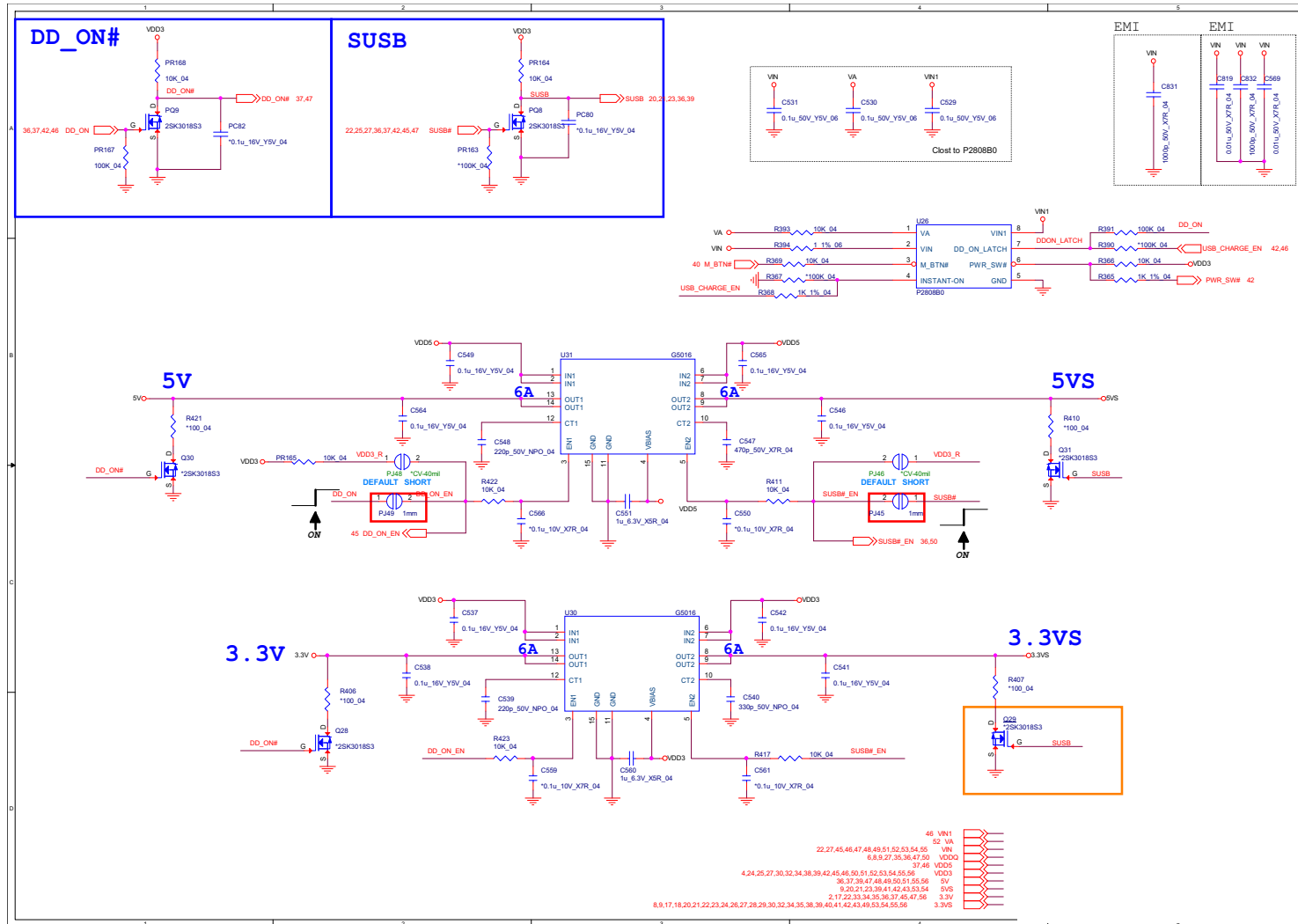
## RGB KB Only



HK/HK1 serial, white and RGB light keyboard,  
all of compoments must be stuffed



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

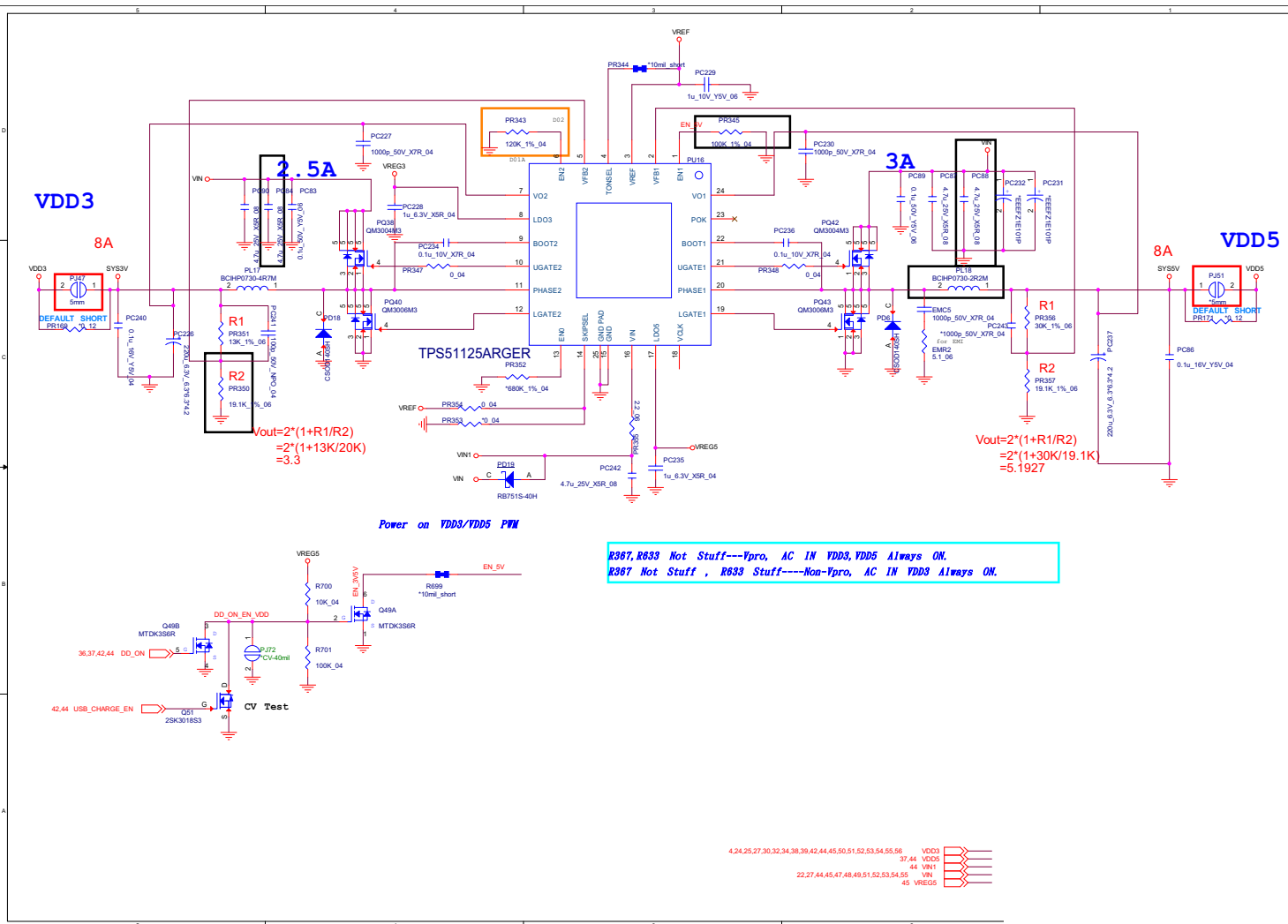


Sheet 44 of 63  
5V, 5VS, 3.3V,  
3.3VS, 3.3VA

B.Schematic Diagrams



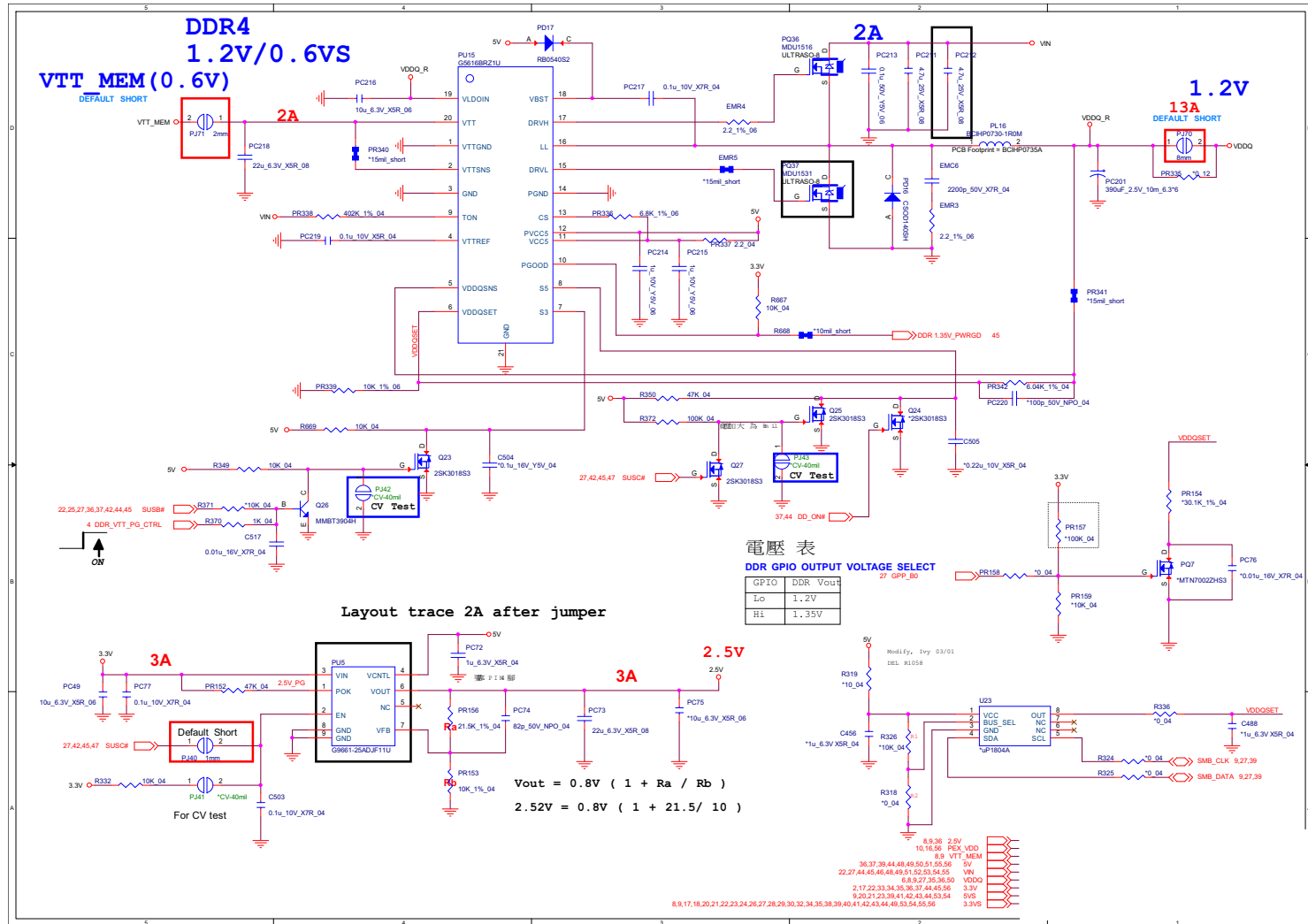
# VDD3, VDD5



Sheet 46 of 63  
VDD3, VDD5

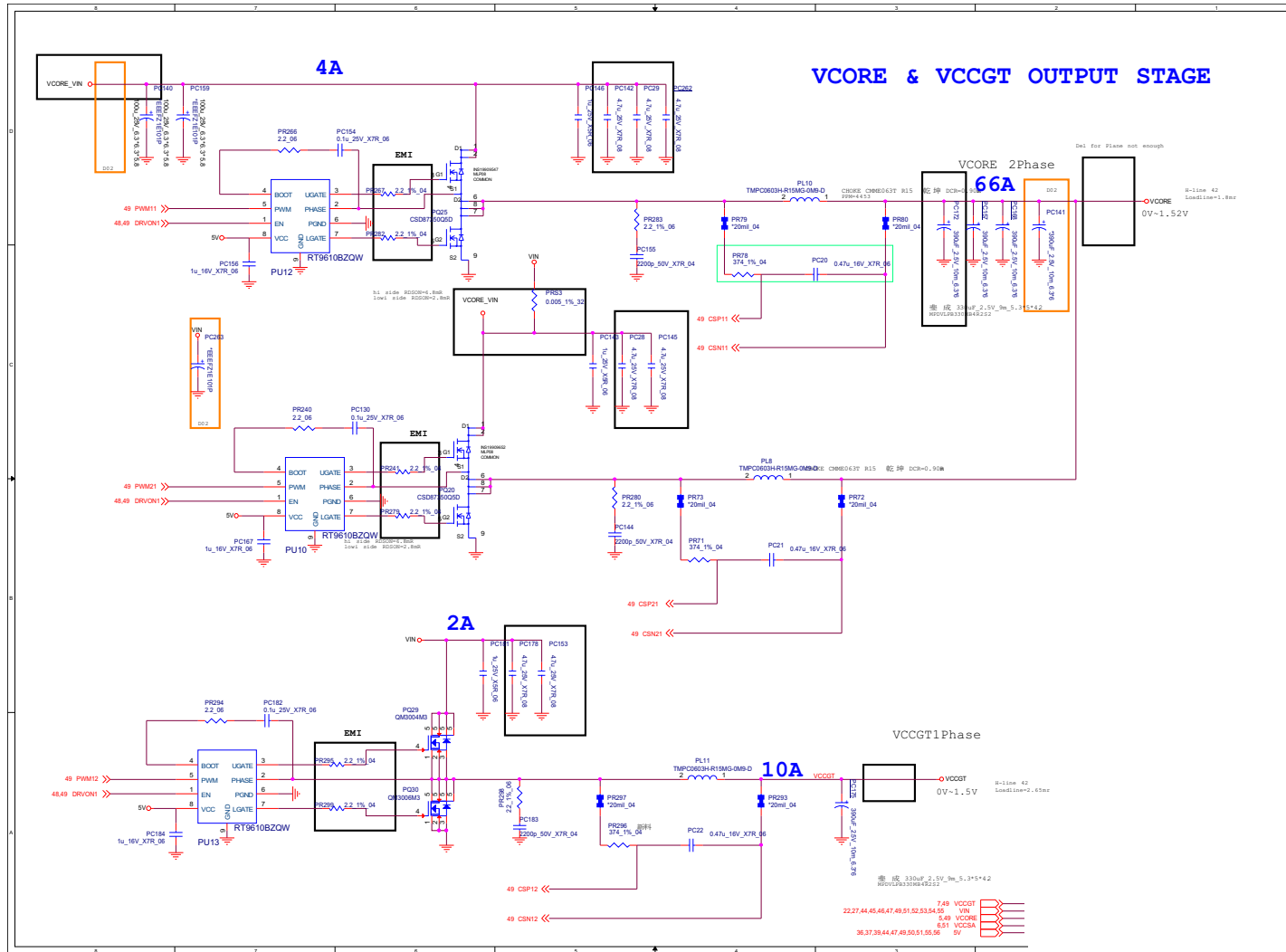
B.Schematic Diagrams

# DDR 1.2V / 0.6VS, 2.5V



Sheet 47 of 63  
 DDR 1.2V / 0.6VS,  
 2.5V

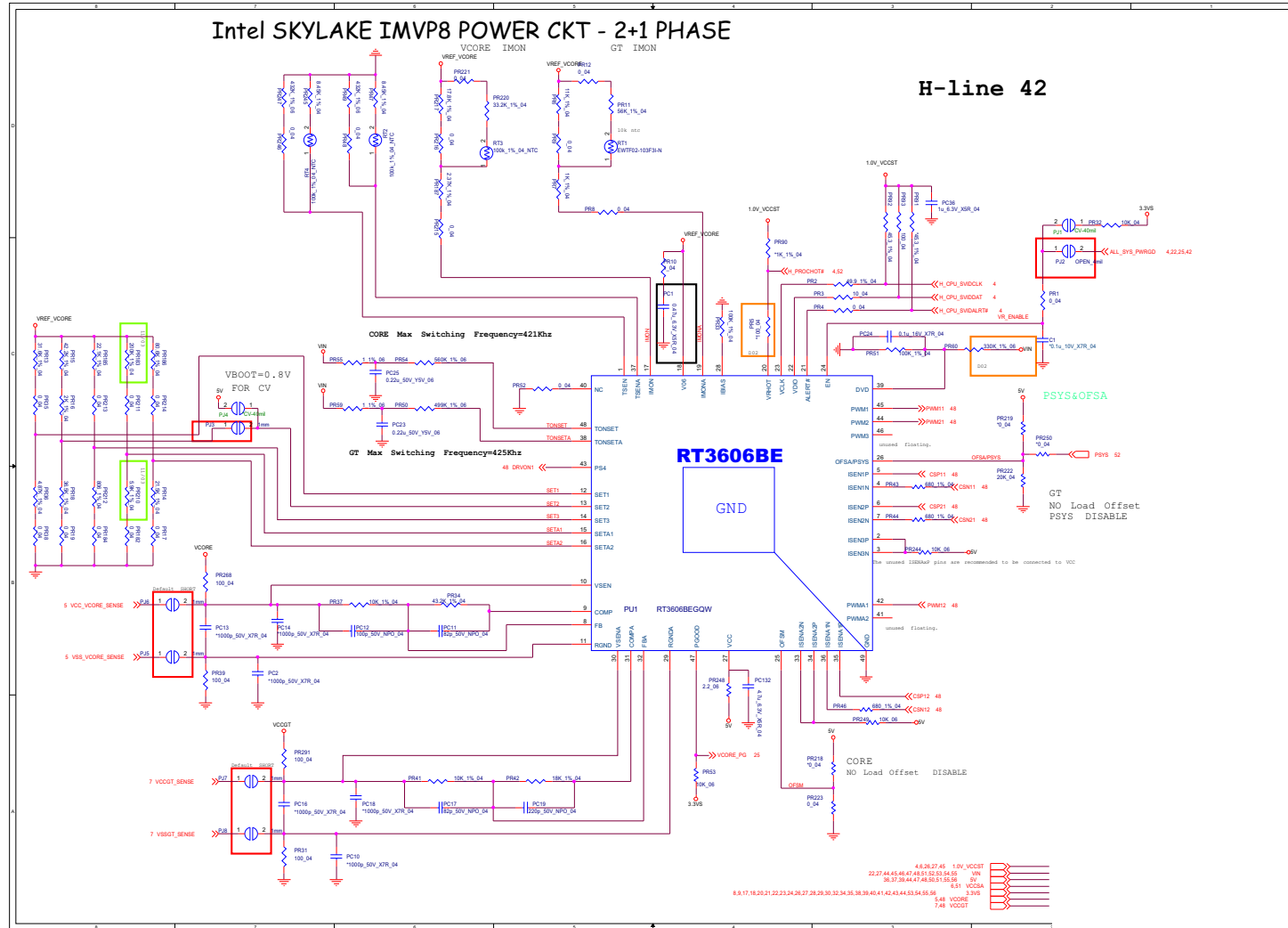
# VCore, VCCGT Output Stage



Sheet 48 of 63  
VCore, VCCGT  
Output Stage

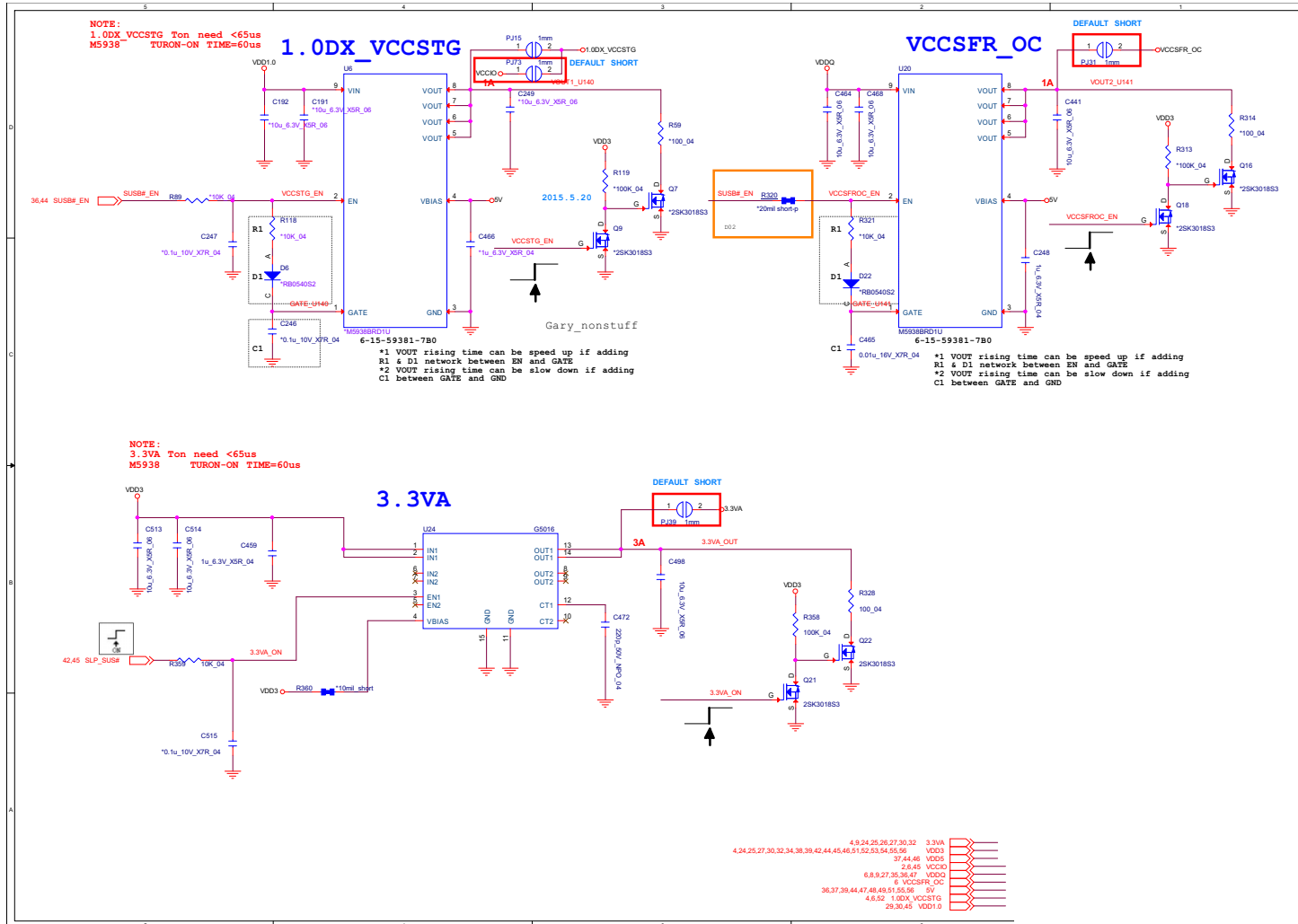
# VCC\_Core & VCCGT

Sheet 49 of 63  
VCC\_Core &  
VCCGT





# 1.0DX\_VCCSTG/VCCSFR\_OC, 3.3VA

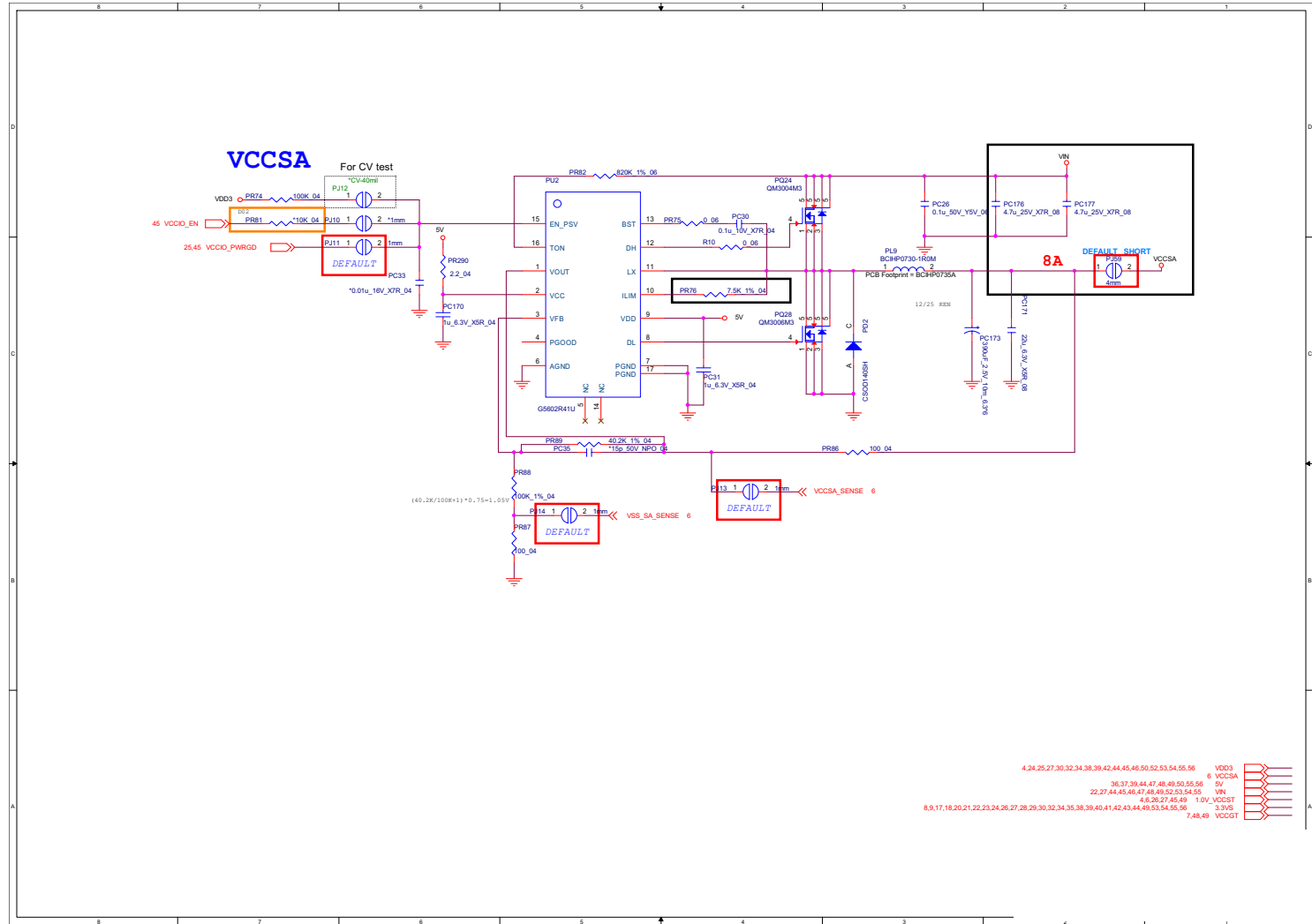


Sheet 50 of 63  
1.0DX\_VCCSTG/  
VCCSFR\_OC,  
3.3VA

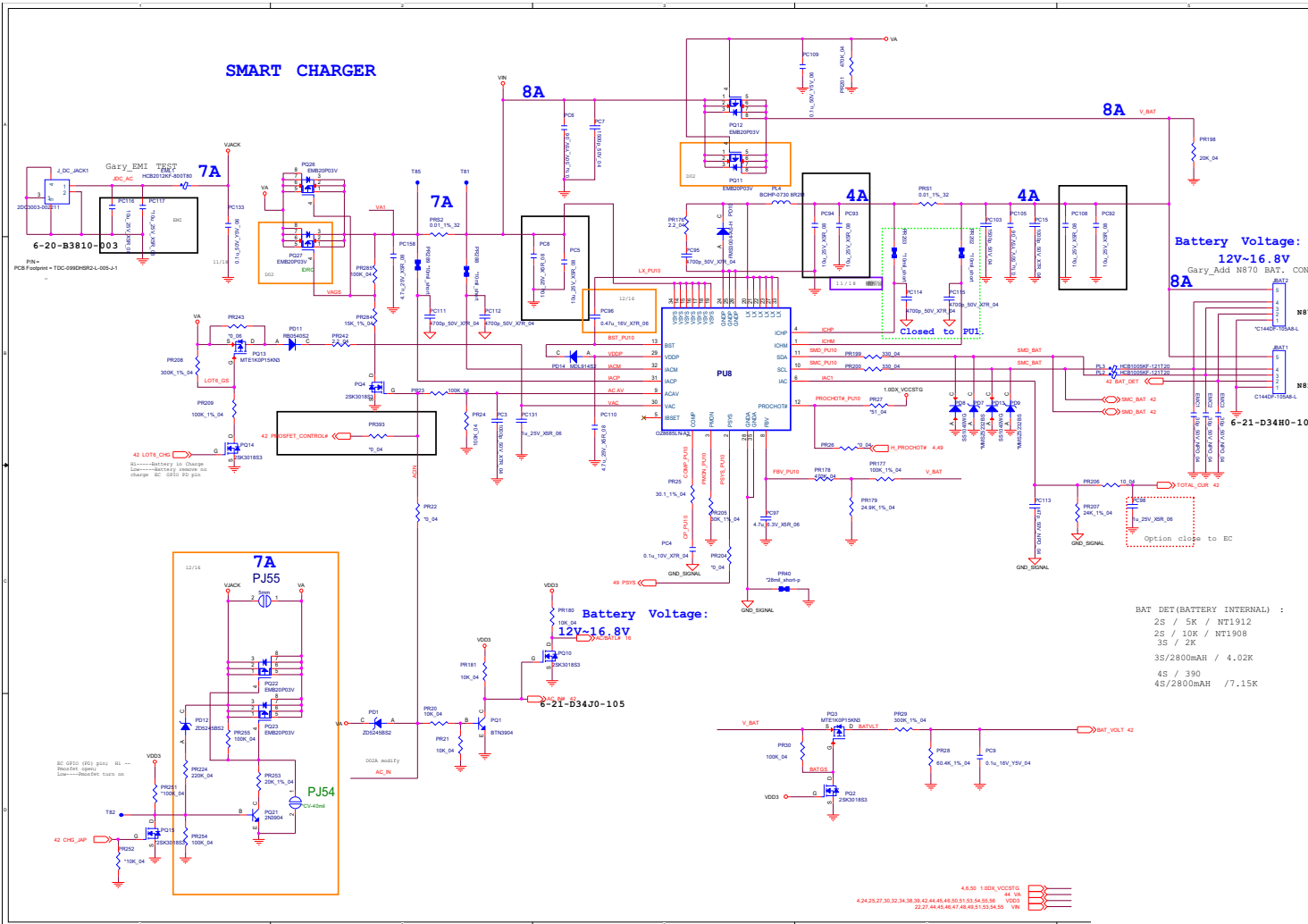
B.Schematic Diagrams

# VCCSA

Sheet 51 of 63  
VCCSA



# AC\_In, Charger



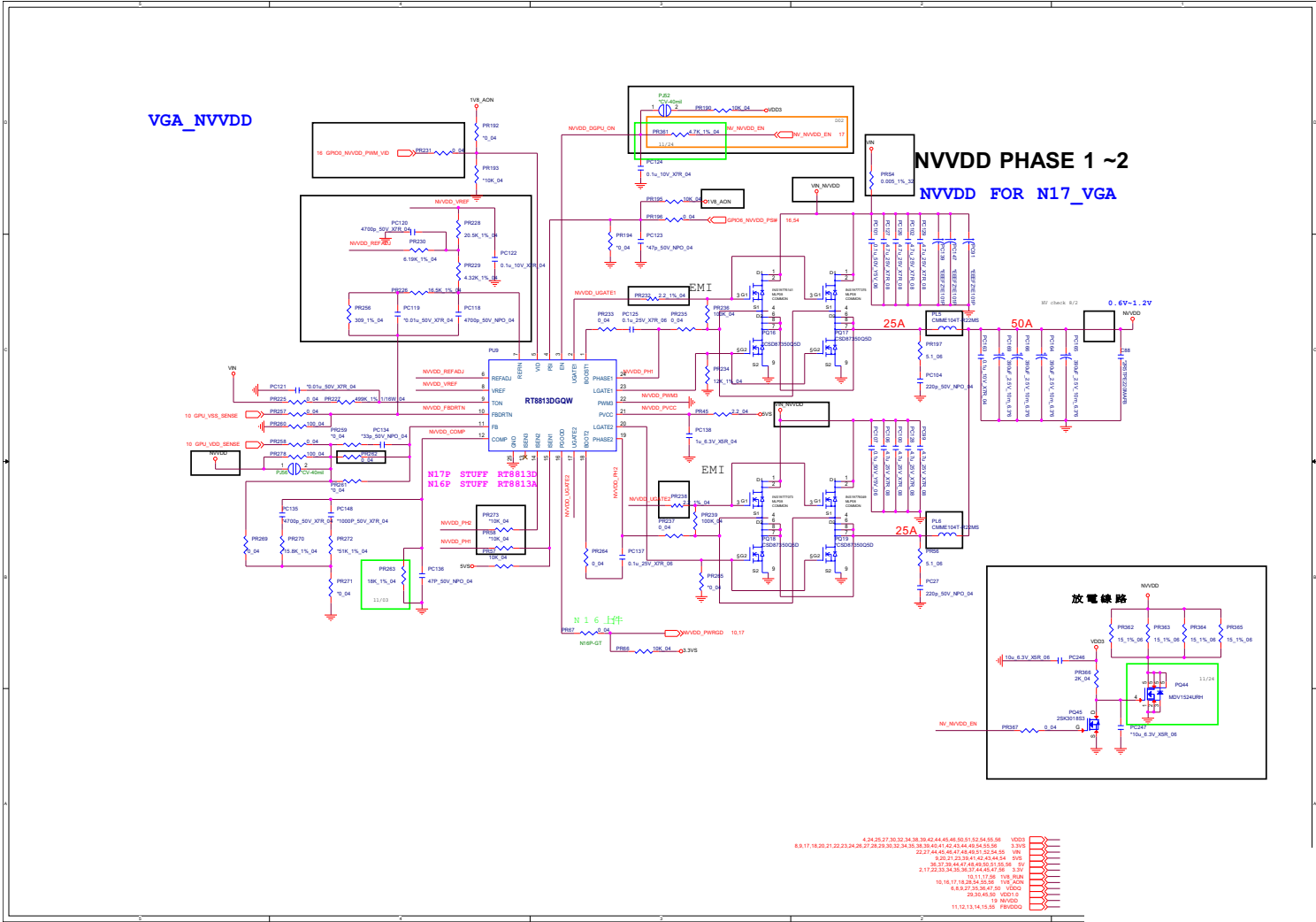
B.Schematic Diagrams

Sheet 52 of 63  
AC\_In, Charger

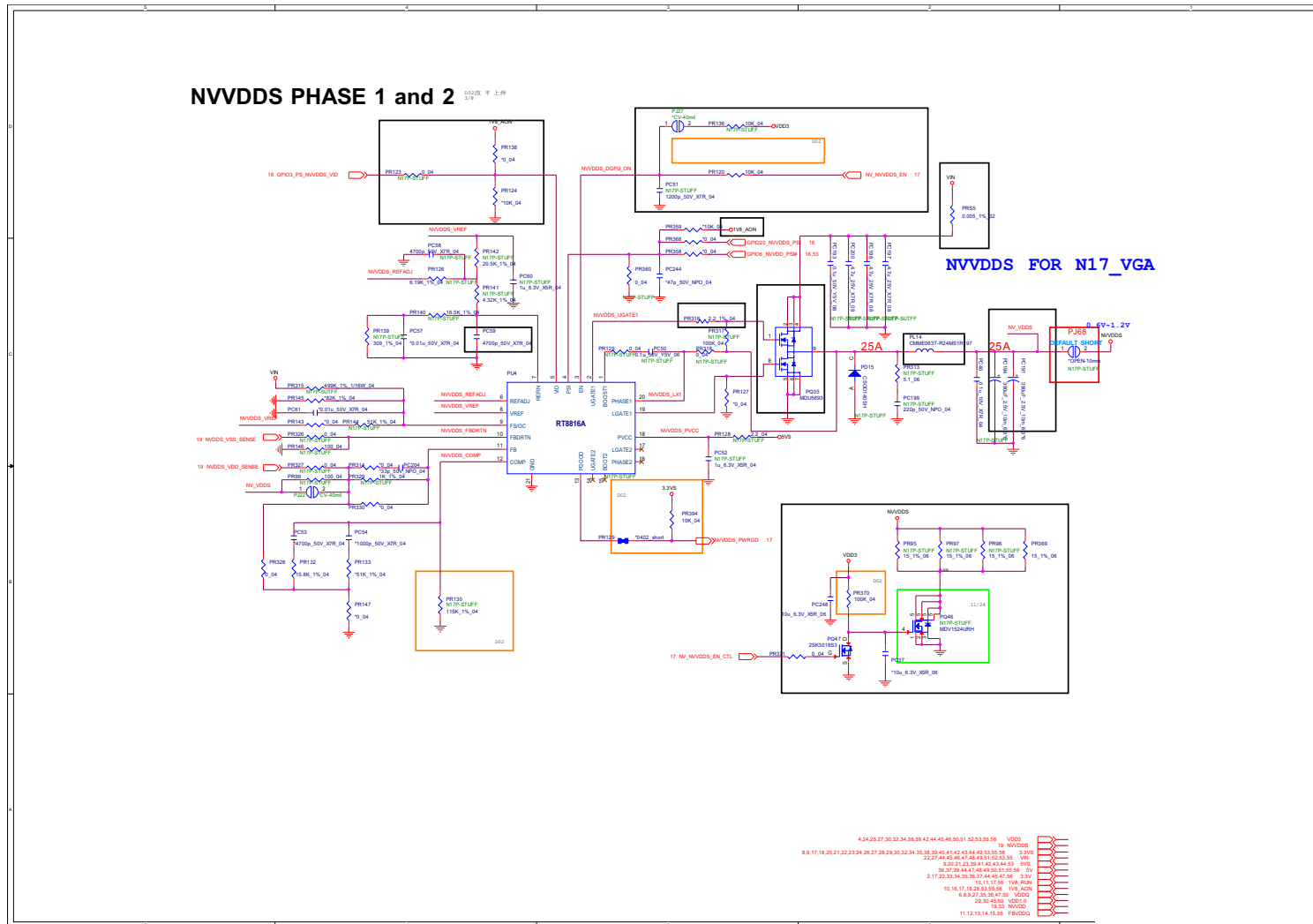
# NVVDD

B.Schematic Diagrams

Sheet 53 of 63  
NVVDD



# NVVDDS

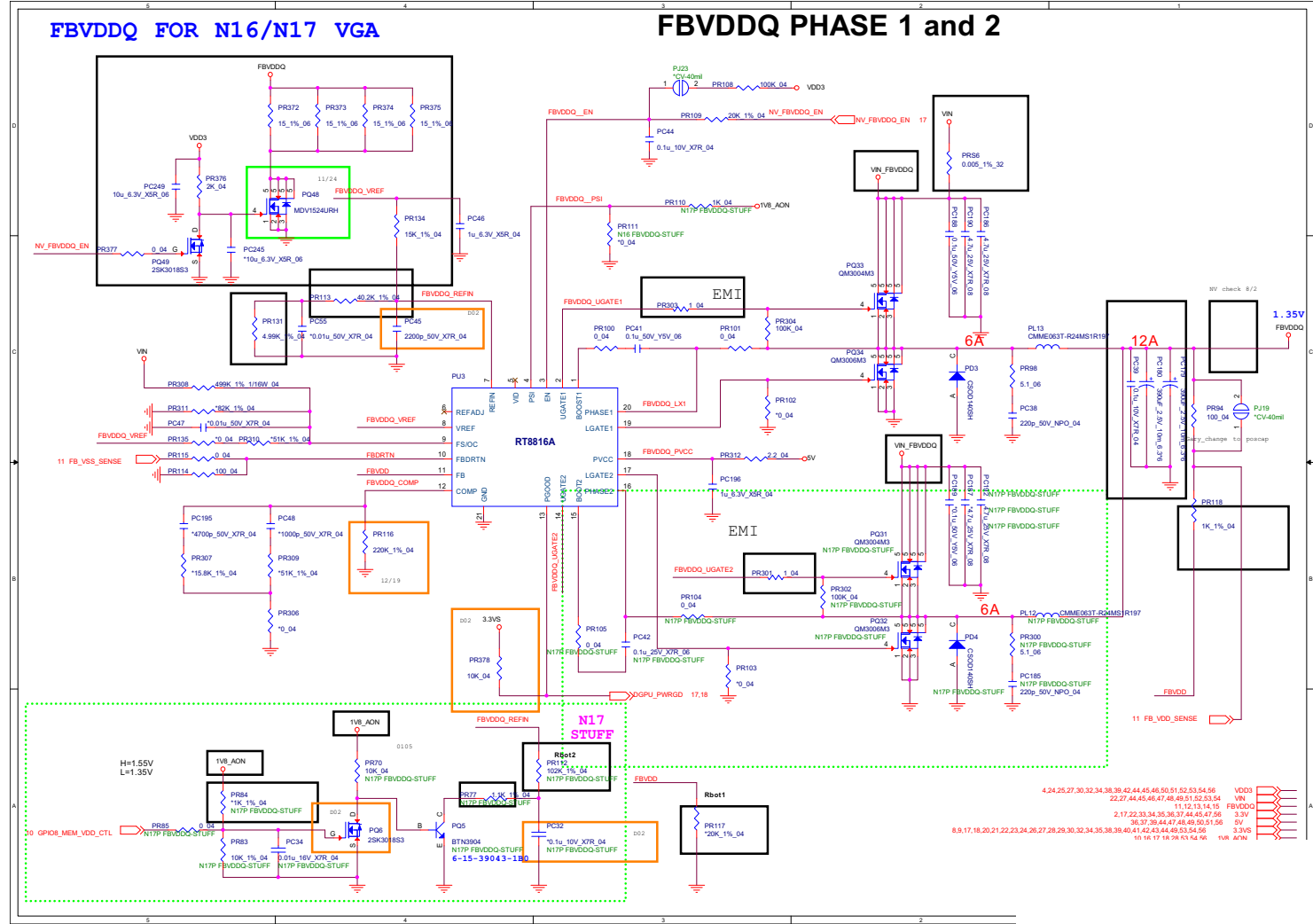


Sheet 54 of 63  
NVVDDS

B.Schematic Diagrams

# Schematic Diagrams

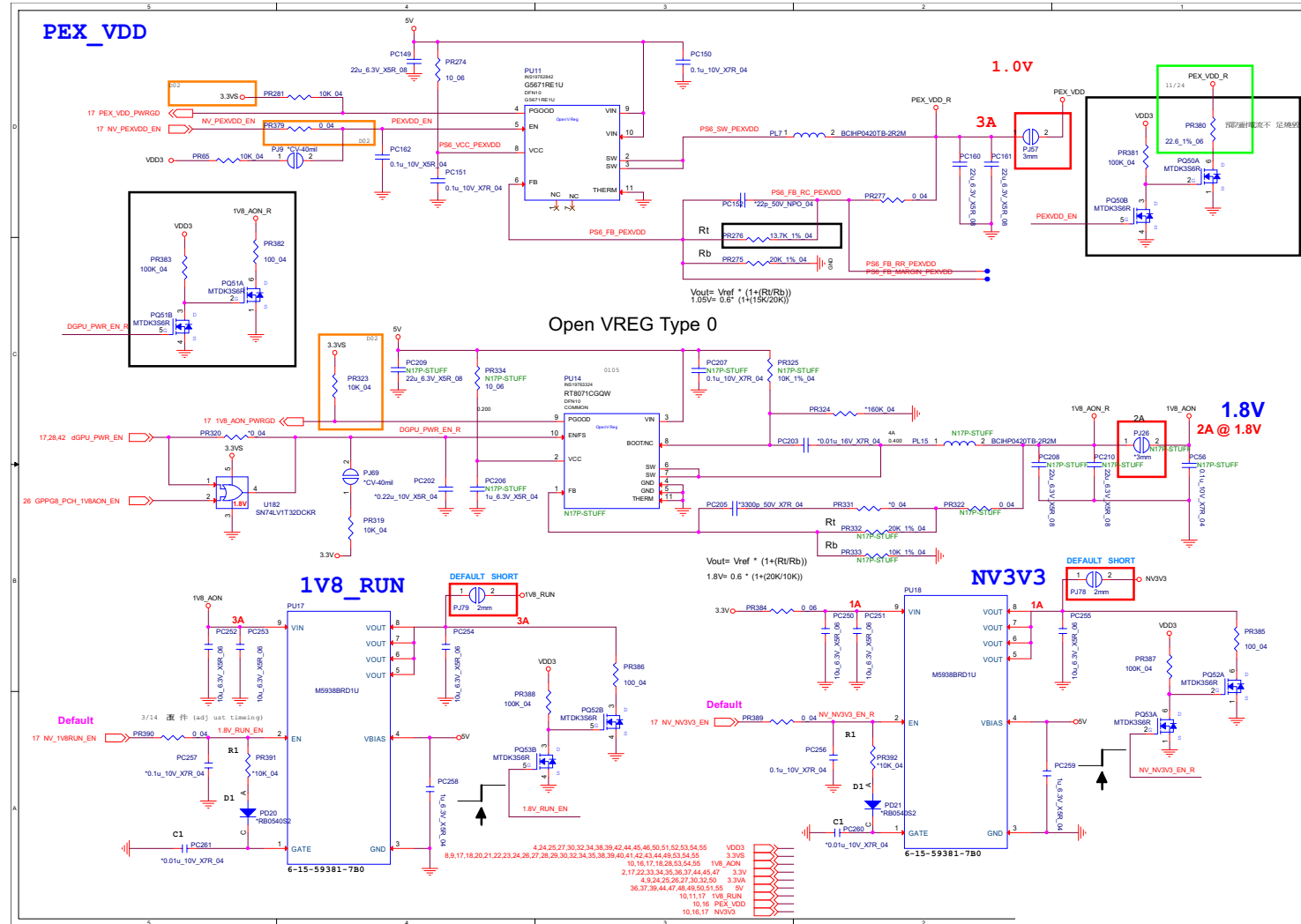
## FBVDDQ



Sheet 55 of 63  
FBVDDQ

B.Schematic Diagrams

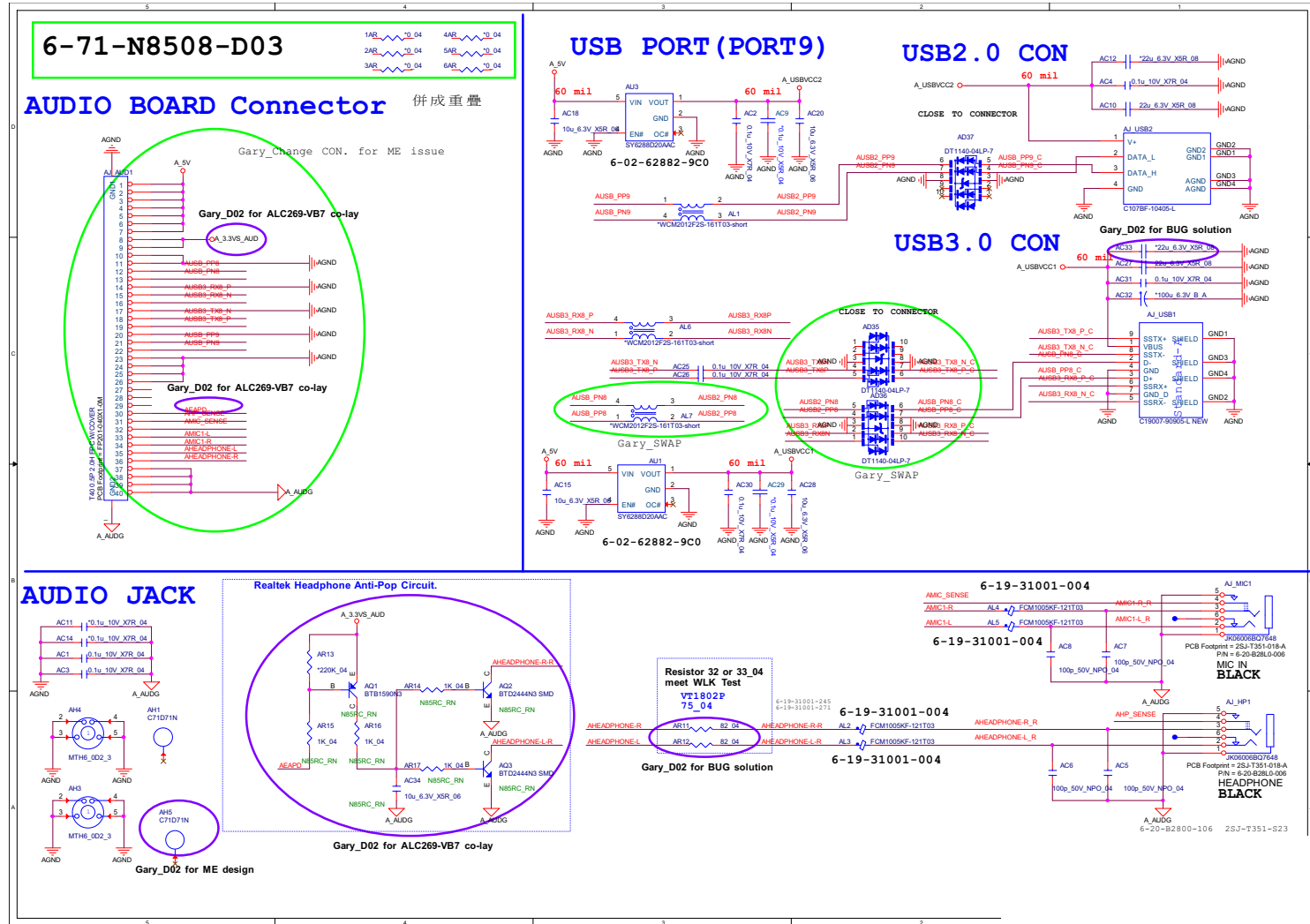
# PEX\_VDD/3V3/1.8V



Sheet 56 of 63  
PEX\_VDD/3V3/1.8V

B.Schematic Diagrams

# Audio Board

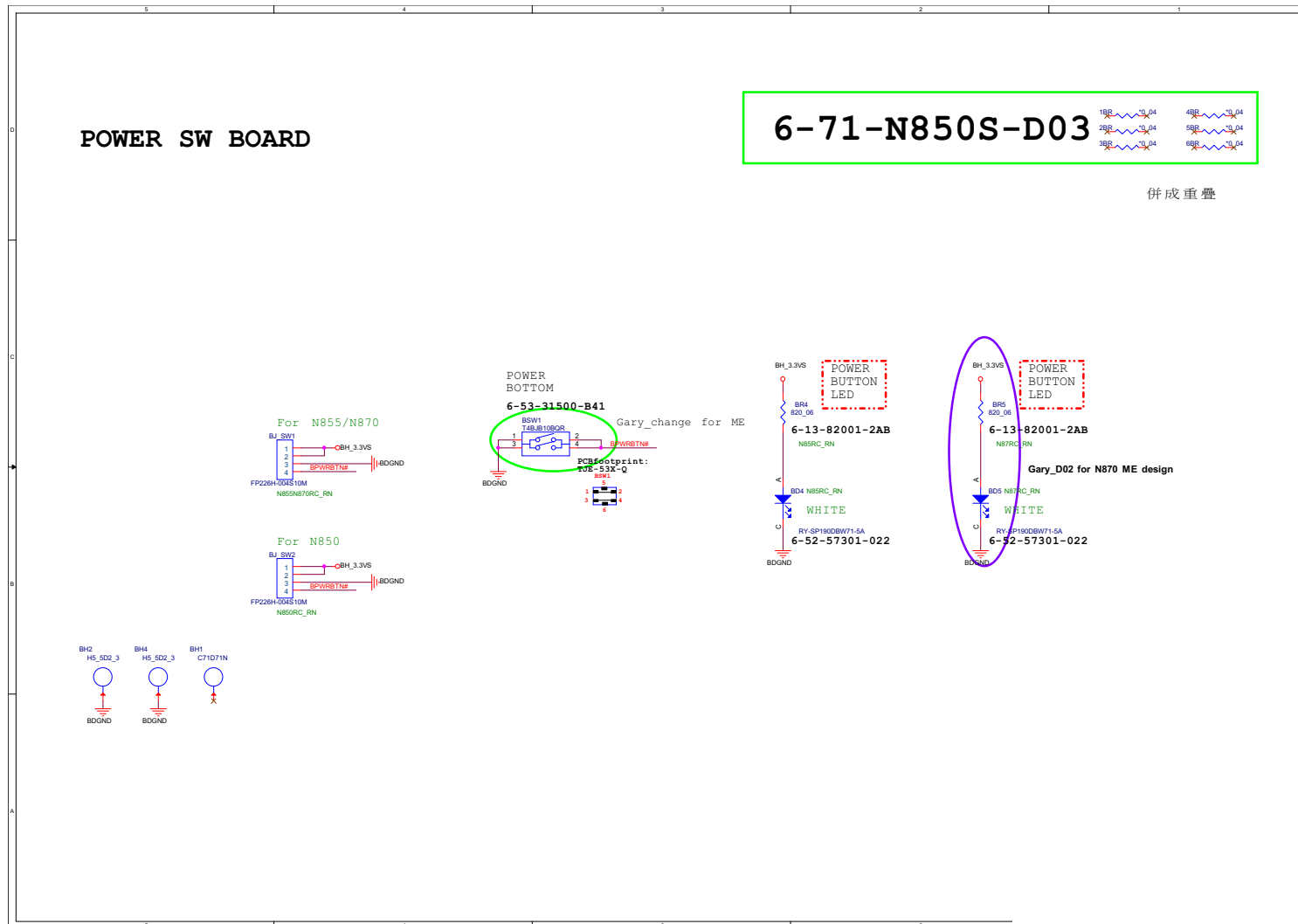


B.Schematic Diagrams

Sheet 57 of 63  
Audio Board



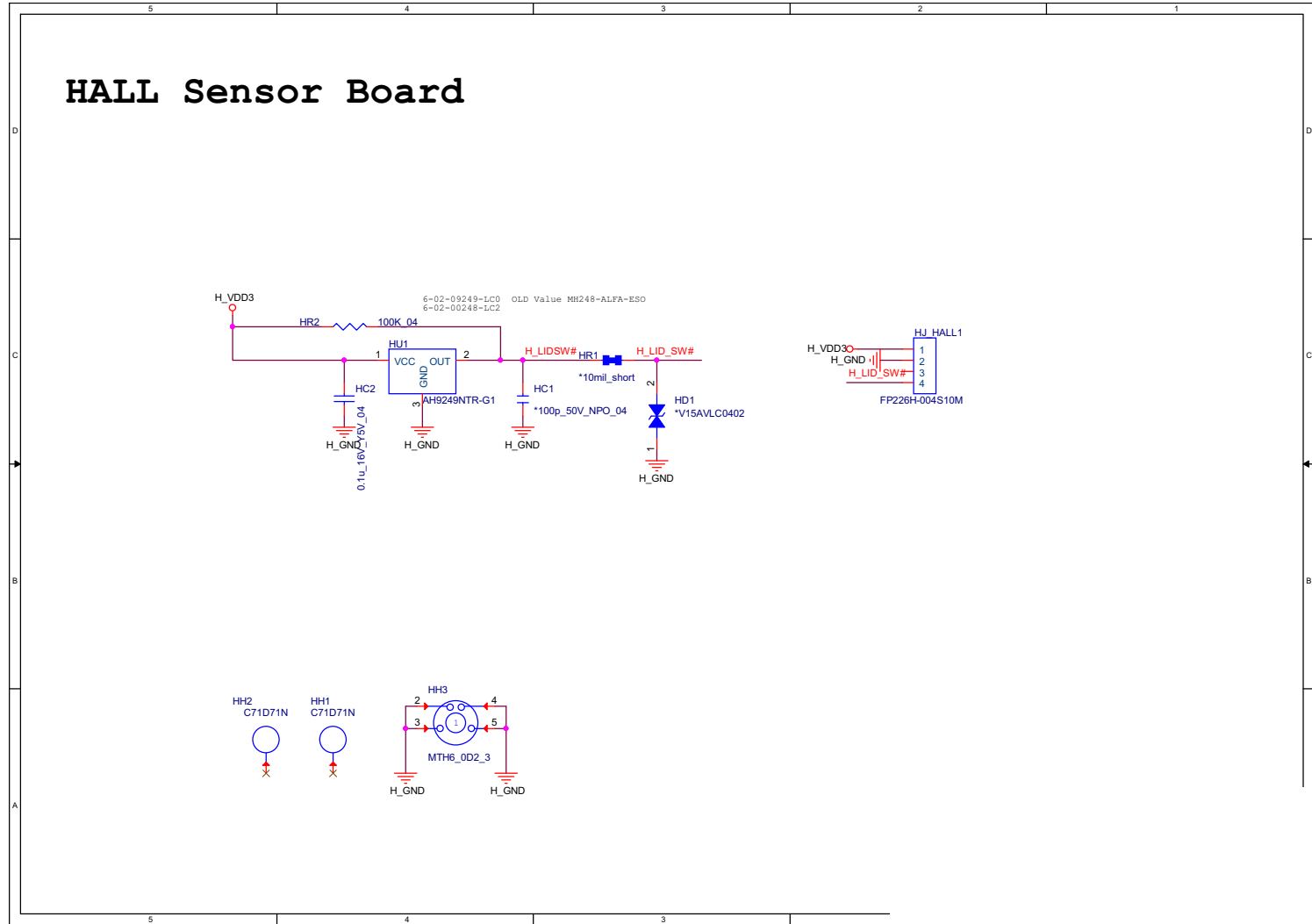
# Power Switch Board



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Power Switch Board

B.Schematic Diagrams

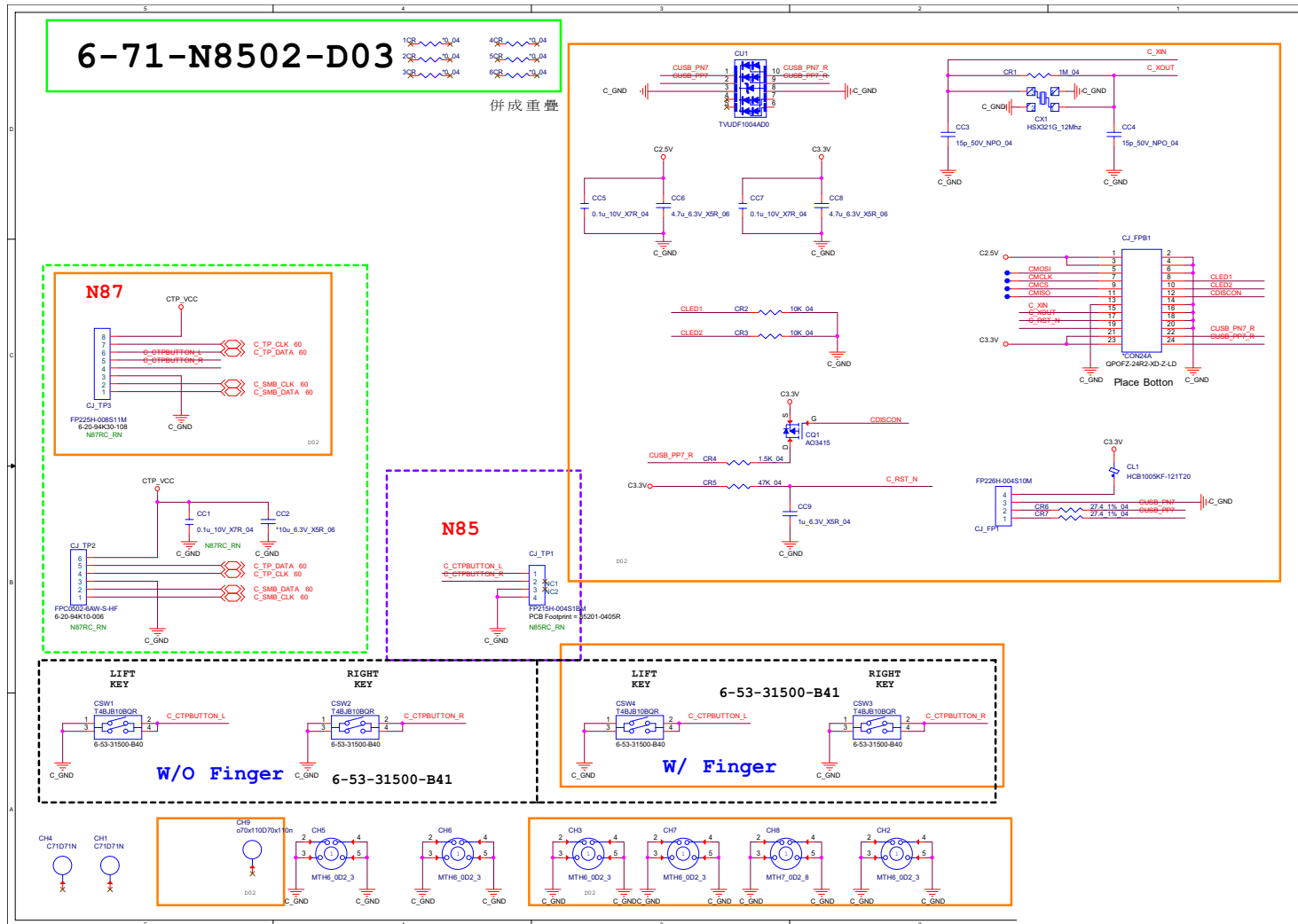
# Hall Sensor Board



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Hall Sensor Board

B.Schematic Diagrams

# Click Board

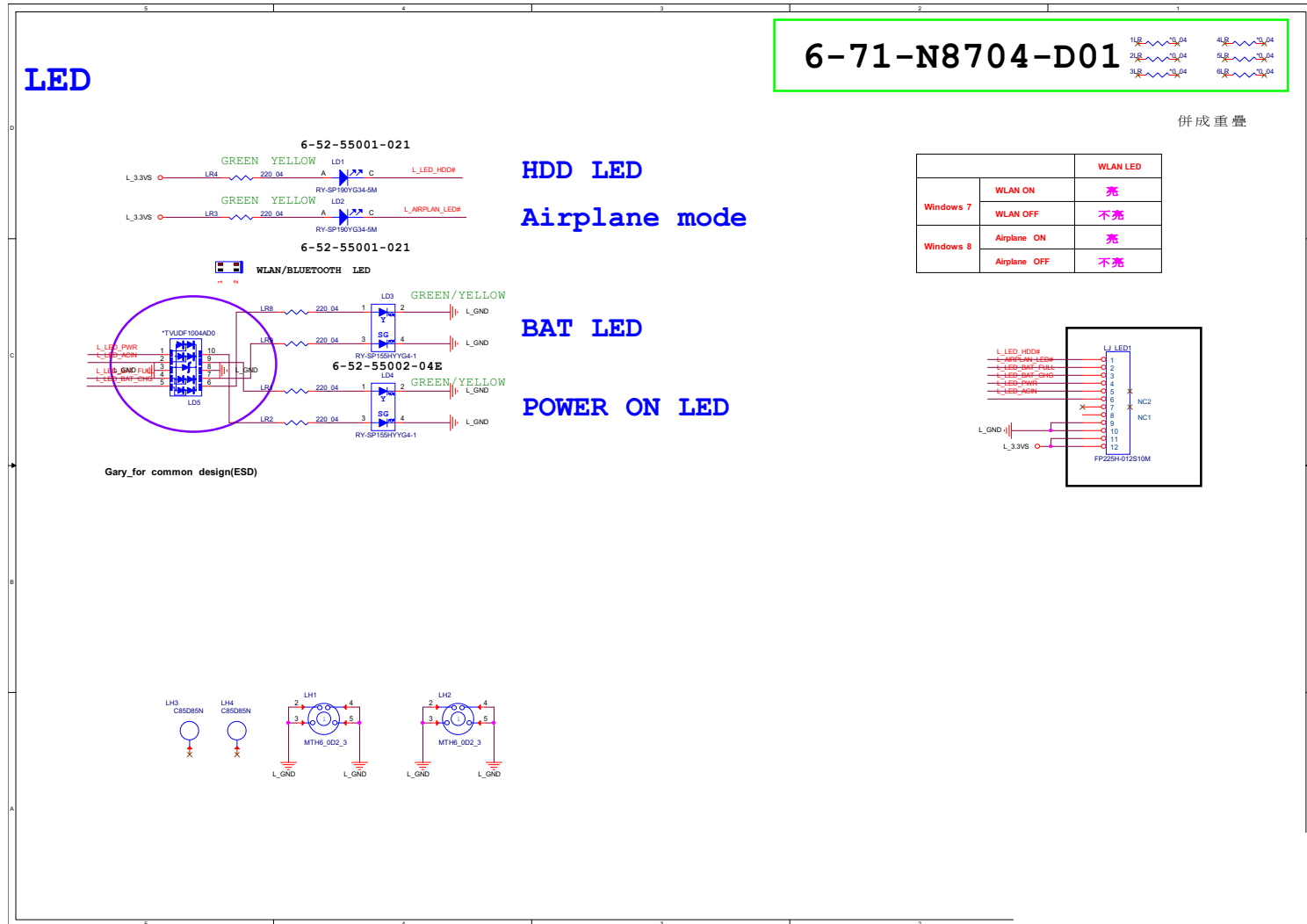


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Click Board

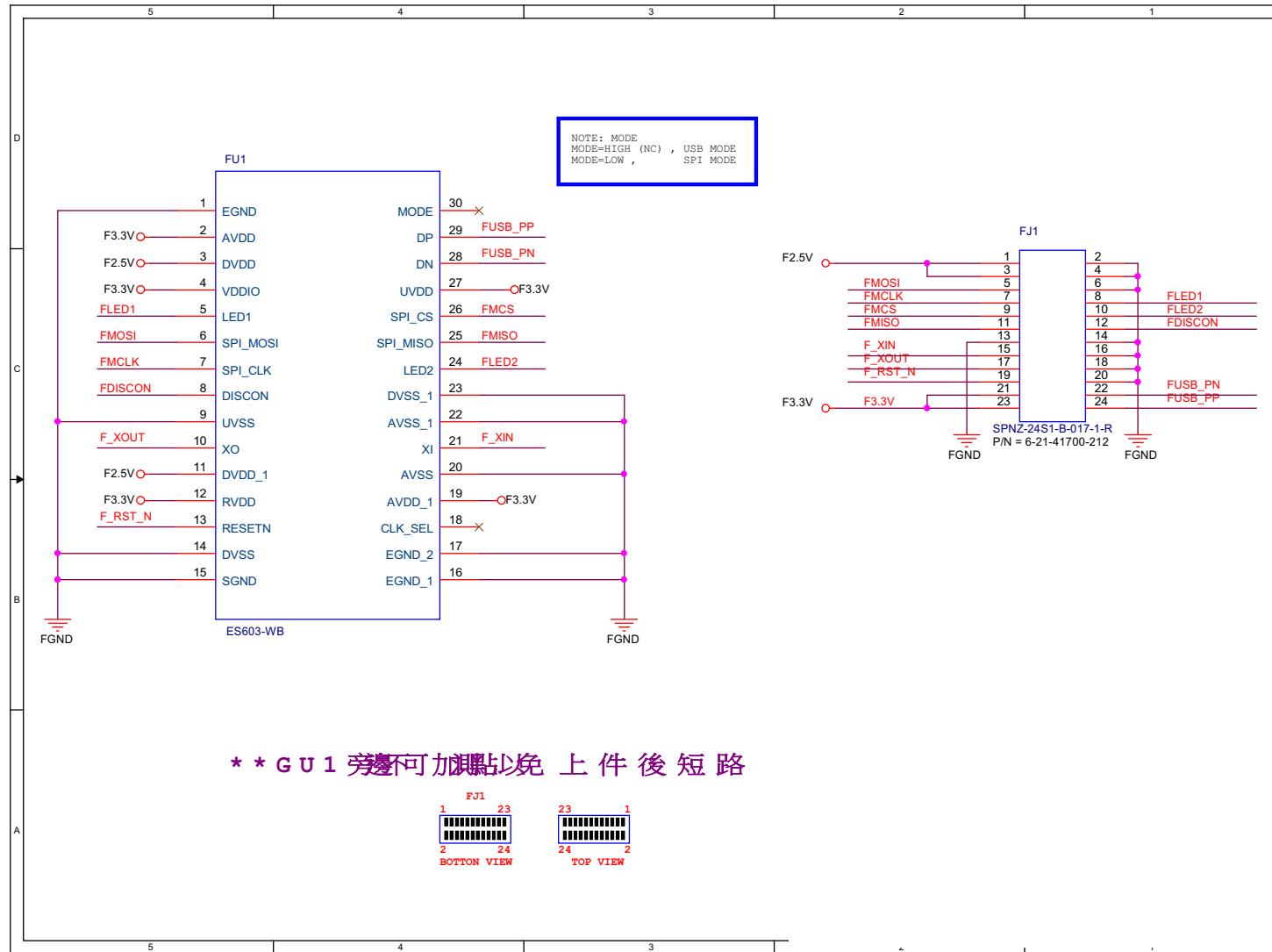
B.Schematic Diagrams

# LED Board

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LED Board



# Finger Print Board

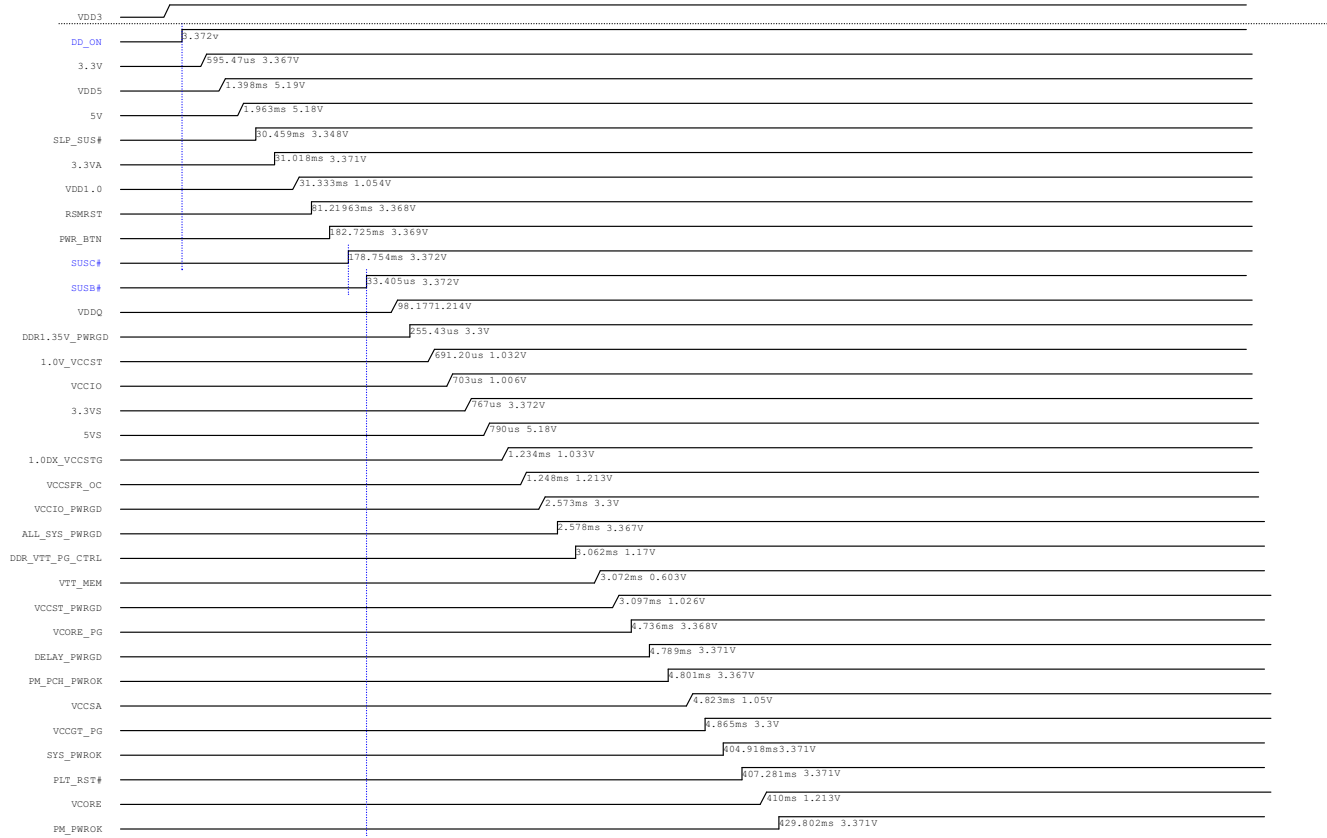


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 Finger Print Board

B.Schematic Diagrams

# Power Sequence

## W650RN POWER ON SEQUENCE



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Power 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](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 **V1.0X.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 1.0X.05, you **MAY NOT** then go back and flash the BIOS to ver 1.0X.04).

## BIOS Update

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### 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.