

SERVICE MANUAL

notebook

NL50MU / NL51MU / NL52MU



Notebook Computer

NL50MU / NL51MU / NL52MU

Service Manual

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About this Manual

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

It is organized to allow you to look up basic information for servicing and/or upgrading components of the *NL50MU* / *NL51MU* / *NL52MU* series notebook PC.

The following information is included:

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

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

Appendix A, Part Lists

Appendix B, Schematic Diagrams

IMPORTANT SAFETY INSTRUCTIONS

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

1. Do not use this product near water, for example near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
2. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
5. This product is intended to be supplied by a Listed Power Unit with an AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19V, 2.37A (**45 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:

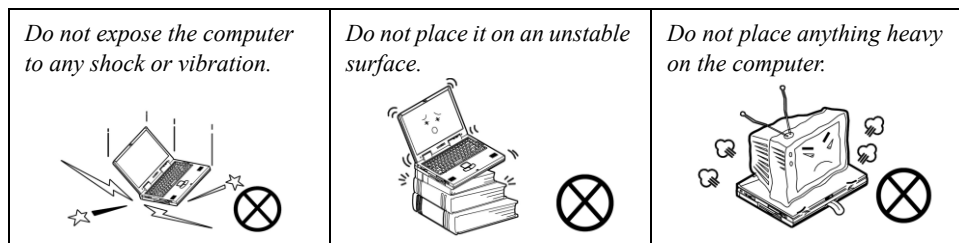
This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operation.

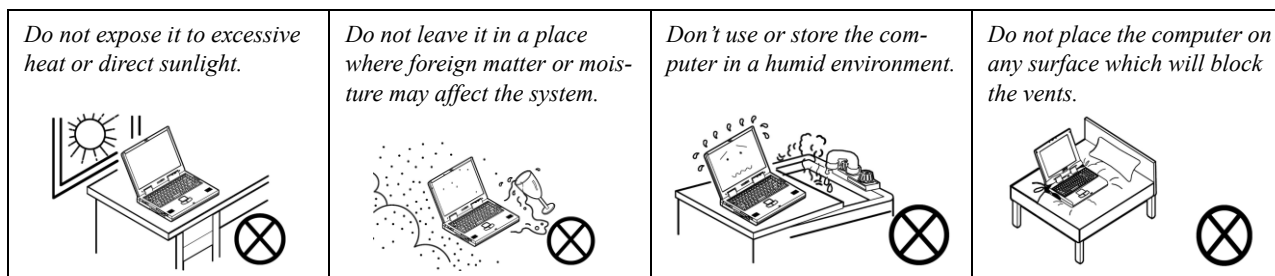
Instructions for Care and Operation

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

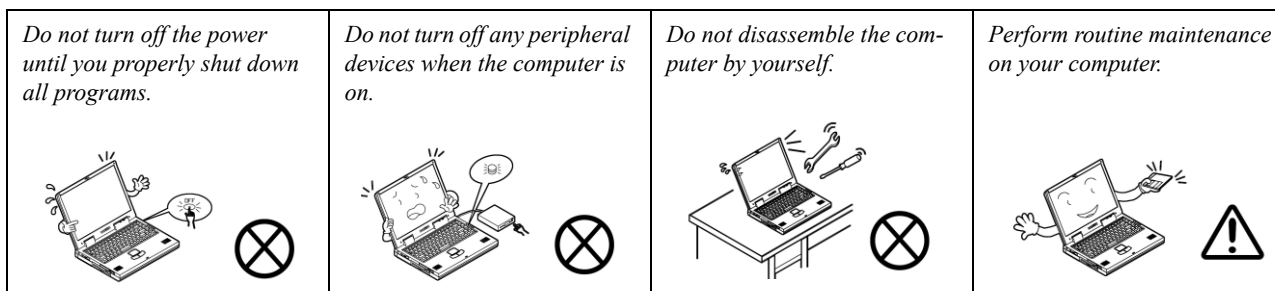
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.



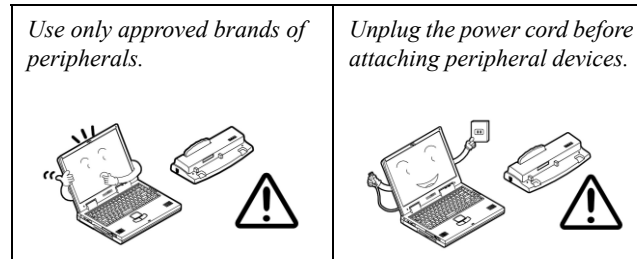
2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.



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.



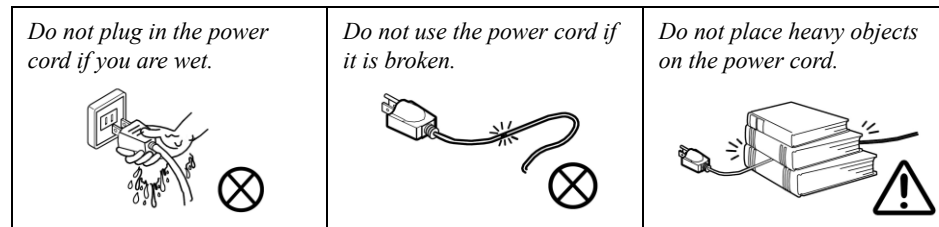
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**



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. **When first setting up the computer use the following procedure** (as to safeguard the computer during shipping, the battery will be locked to not power the system until first connected to the AC/DC adapter and initially set up as below):
 - Attach the AC/DC adapter cord to the DC-In jack on the right of the computer, then plug the AC power cord into an outlet, and connect the AC power cord to the AC/DC adapter. The battery will now be unlocked.
6. Use one hand to raise the lid/LCD to a comfortable viewing angle (do not exceed 180 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 on the left side of the computer to turn the computer "on" (note that the lid/LCD must be open for the power button to function).

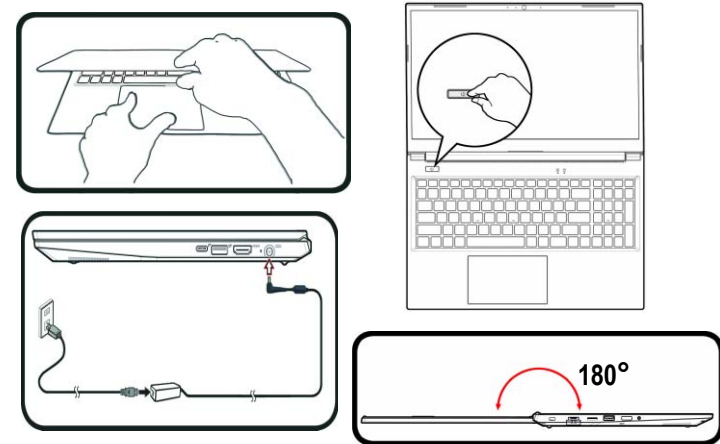


Figure 1
**Opening the Lid/LCD/
Computer with AC/DC
Adapter Plugged-In**

Powering the Computer On

After every disassembly, make sure that the bottom case's screws are all inserted and tightened before turning the computer on.

Shut Down

Note that you should always shut your computer down by choosing **Shut Down** command in **Windows**.

This will help prevent hard disk or system problems.

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Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the *NL50MU/NL51MU/NL52MU* 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. *Window 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 *NL50MU/NL51MU/NL52MU* 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.

Note that this computer model series may support a range of CPUs and/or video adapters.

To find out which CPU is installed on your system go to the **Start** menu and select **Settings**, and then select **System** and click **About**. This will also provide information on the amount of **Installed RAM** etc.

To get information on your system's **video adapter** go to the **Start** menu and select **Settings**, and then select **System** and click **Display > Advanced display settings > Display adapter properties**.



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

i7-1195G7 (1.30GHz)

i7-1165G7 (1.20GHz)

Intel® Core™ i5 Processor

i5-1155G7 (1.00GHz)

i5-1135G7 (0.90GHz)

Intel® Core™ i3 Processor

i3-1115G4 (1.70GHz)

BIOS

128Mb SPI Flash ROM

Insyde BIOS

Memory

Dual Channel DDR4

Two 260 Pin SO-DIMM Sockets Supporting **DDR4 3200MHz** Memory

Memory Expandable up to 32GB

Compatible with 4GB, 8GB or 16GB Modules

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

LCD Options

LCD, 15.6" (39.62cm), 16:9, HD (1366x768)/FHD (1920x1080)

Card Reader

MicroSD Card Reader

Storage

One Changeable 2.5" 7mm (h) SATA HDD/SSD

(**Factory Option**) One M.2 **PCIe Gen4 x4** Solid State Drive (SSD)

Video Adapter

Intel Iris X Graphics (i7-1195G7/i5-1155G7/i5-1135G7)

HDR Support

Rec. 2020 (Wide Color Gamut)

Microsoft DirectX® 12 Compatible

Intel Iris Graphics (i7-1165G7)

HDR Support

Rec. 2020 (Wide Color Gamut)

Microsoft DirectX® 12 Compatible

Intel UHD Graphics (i3-1115G4)

HDR Support

Rec. 2020 (Wide Color Gamut)

Microsoft DirectX® 12 Compatible

Pointing Device

Built-in Touchpad (with Microsoft PTP Multi Gesture & Scrolling Functionality)

Keyboard

Full-size Keyboard (with Embedded Numeric Keypad)

Or

(**Factory Option**) Full-size **Multi-Color** LED Keyboard (with Numeric Keypad)

Audio

High Definition Audio Compliant Interface

2 * Built-In Speakers

Built-In Array Microphone

Or

Nahimic Audio

Security

Security (Kensington® Type) Lock Slot

BIOS Password

Intel PTT for Systems Without TPM Hardware

(**Factory Option**) TPM 2.0

M.2 Slots

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

Slot 2 for **PCIe Gen4 x4 SSD**

(**Factory Option**) Slot 3 for **4G** Module

Communication

Built-In 10/100/1000Mb Base-TX Ethernet LAN

1.0M HD Webcam

(**Factory Option for Model B**) **4G** M.2 Module

WLAN/ Bluetooth M.2 Modules:

(**Factory Option**) Intel® Dual Band Wi-Fi 6 AX200, 2x2 AX Wireless LAN + Bluetooth

(**Factory Option**) Intel® Dual Band Wi-Fi 6 AX201, 2x2 AX Wireless LAN + Bluetooth

(**Factory Option**) Intel® Dual Band Wi-Fi 5 Wireless-AC 9462, 1x1 AC Wireless LAN + Bluetooth

(**Factory Option**) Intel® Dual Band Wi-Fi 5 Wireless-AC 9560, 2x2 AC Wireless LAN + Bluetooth

Interface

One USB 3.2 Gen 2 Type-C Port*

Or

(**Factory Option**) One USB 3.2 Gen 2 Type-C Port with DisplayPort and Power Delivery (DC-In)

**The maximum amount of current supplied by USB Type-C ports is 500mA (USB 2.0)/900mA (USB3.2).*

One USB 3.2 Gen 2 Type-A Port

Or

(**Factory Option**) One Powered USB 3.2 Gen 2 Type-A Port

One HDMI-Out Port

One 2-In-1 Audio Jack (Headphone / Microphone)

One RJ-45 LAN Jack

One DC-in Jack

Two USB 2.0 Ports

Power

Full Range AC/DC Adapter

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

DC Output: 19V, 2.37A (**45W**)

Embedded 3 Cell Smart Lithium-Ion Battery Pack, 36WH
(**Factory Option**) Embedded 4 Cell Smart Lithium-Ion Battery Pack, 49WH

Environmental Spec

Temperature

Operating: 5°C - 35°C

Non-Operating: -20°C - 60°C

Relative Humidity

Operating: 20% - 80%

Non-Operating: 10% - 90%

Dimensions & Weight

360.4mm (w) * 239.3mm (d) * 19.7mm (h)

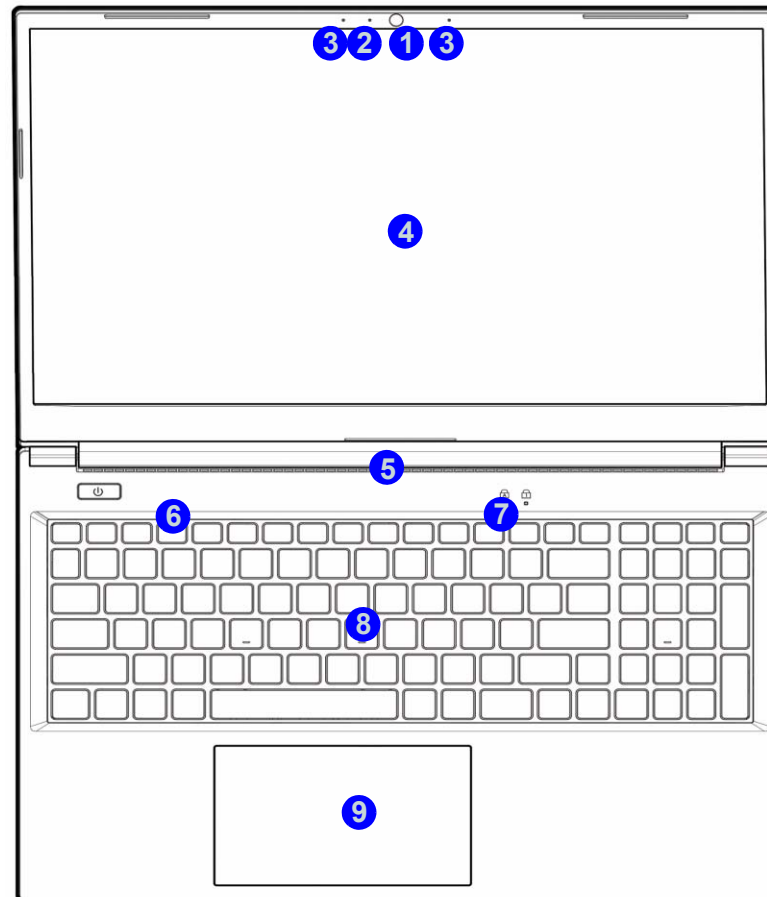
1.59kg (Barebone with 36WH Battery)

Introduction

Figure 1
Top View

External Locator - Top View with LCD Panel Open

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



External Locator - Front & Right Side Views

Figure 2
Front View

FRONT VIEW

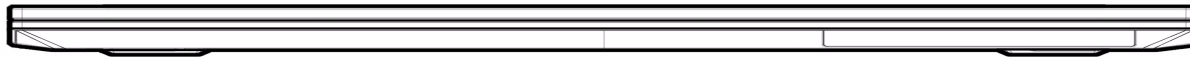


Figure 3
Right Side View

RIGHT SIDE VIEW



1. Speaker
2. USB 3.2 Gen 2 Type-C Port
Or
(Factory Option) USB 3.2 Gen 2 Type-C Port with DisplayPort and Power Delivery (DC-In)
3. USB 3.2 Gen 2 Type-A Port
Or
(Factory Option) Powered USB 3.2 Gen 2 Type-A Port
4. HDMI-Out Port
5. Battery Power LED Indicator
6. DC-In Jack

Introduction

External Locator - Left Side & Rear View

Figure 4
Left Side View

1. Security Lock Slot
2. RJ-45 LAN Jack
3. MicroSD Card Reader
4. USB 2.0 Port
5. (Factory Option) SIM Card Socket
6. 2-In-1 Audio Jack (Headphone and Microphone)
7. Speaker

LEFT SIDE VIEW



Figure 5
Rear View

REAR VIEW



External Locator - Bottom View

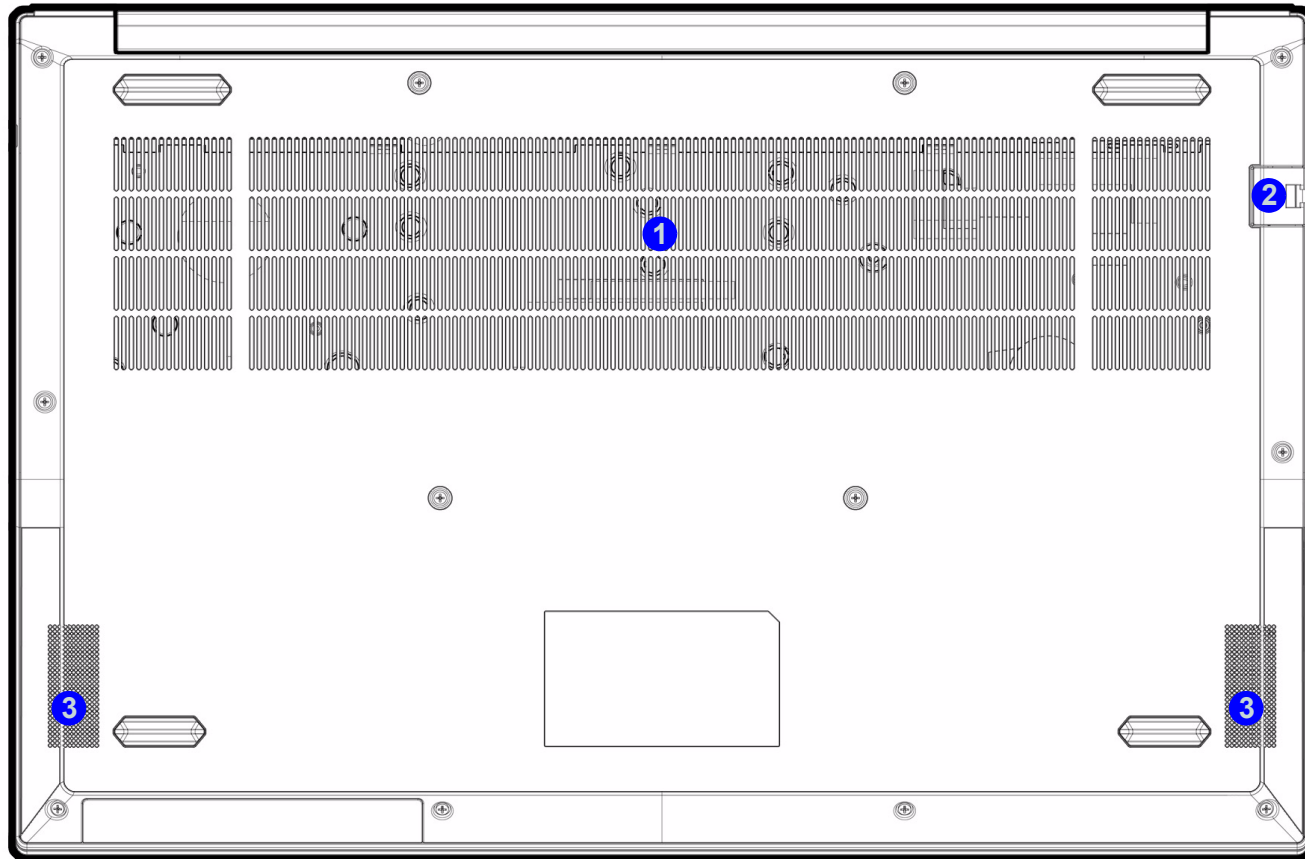


Figure 6
Bottom View

- 1. Vent
- 2. RJ-45 LAN Jack
- 3. Speakers


Overheating

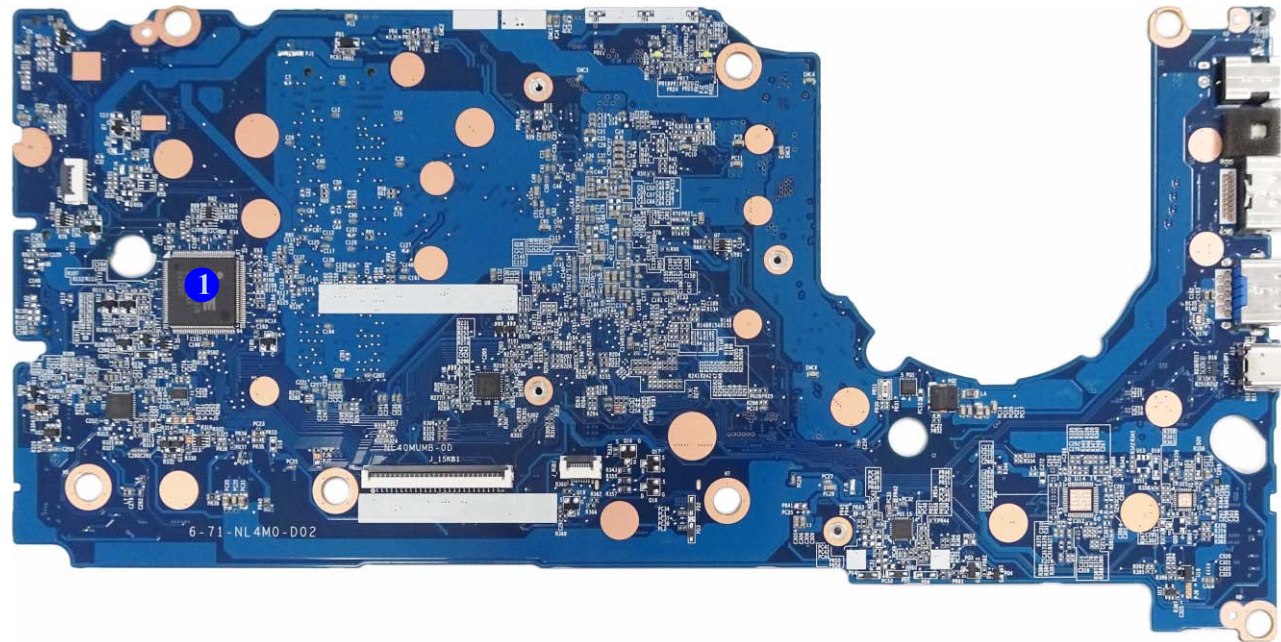
To prevent your computer from overheating, make sure nothing blocks any vent while the computer is in use.

Introduction

Figure 7
Mainboard Top
Key Parts

Mainboard Overview - Top (Key Parts)

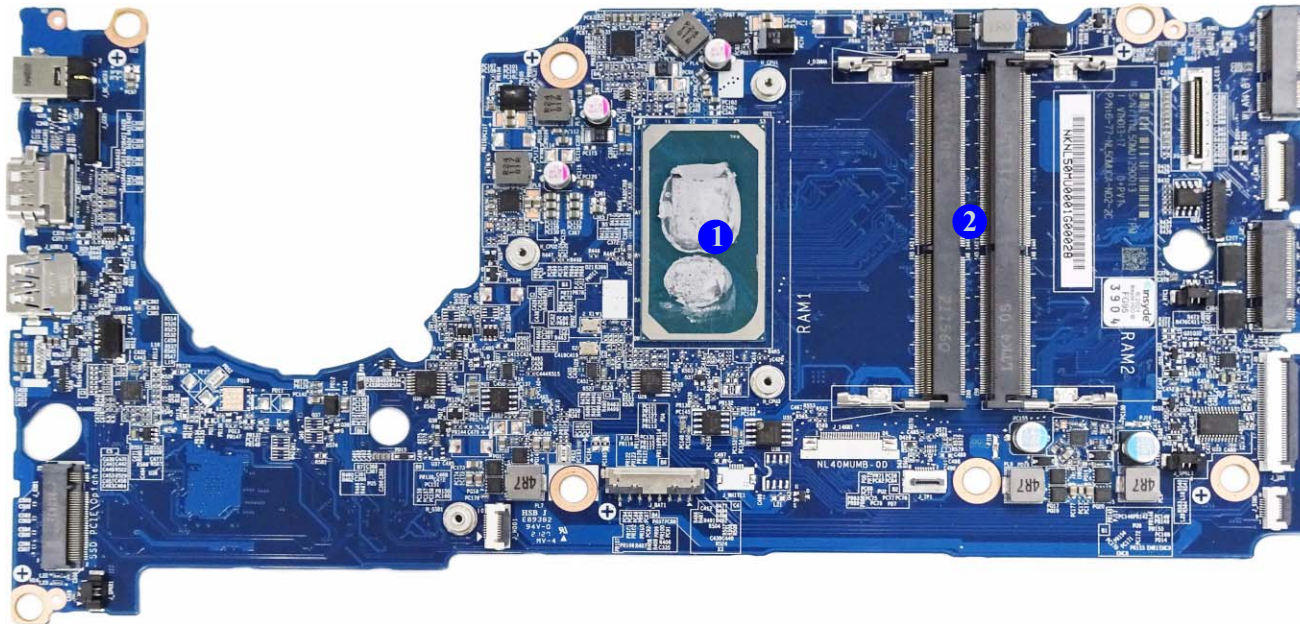
1. KBC-ITE IT5570



Mainboard Overview - Bottom (Key Parts)

Figure 8
**Mainboard Bottom
Key Parts**

1. CPU
2. Memory Slots
DDR4 SO-DIMM

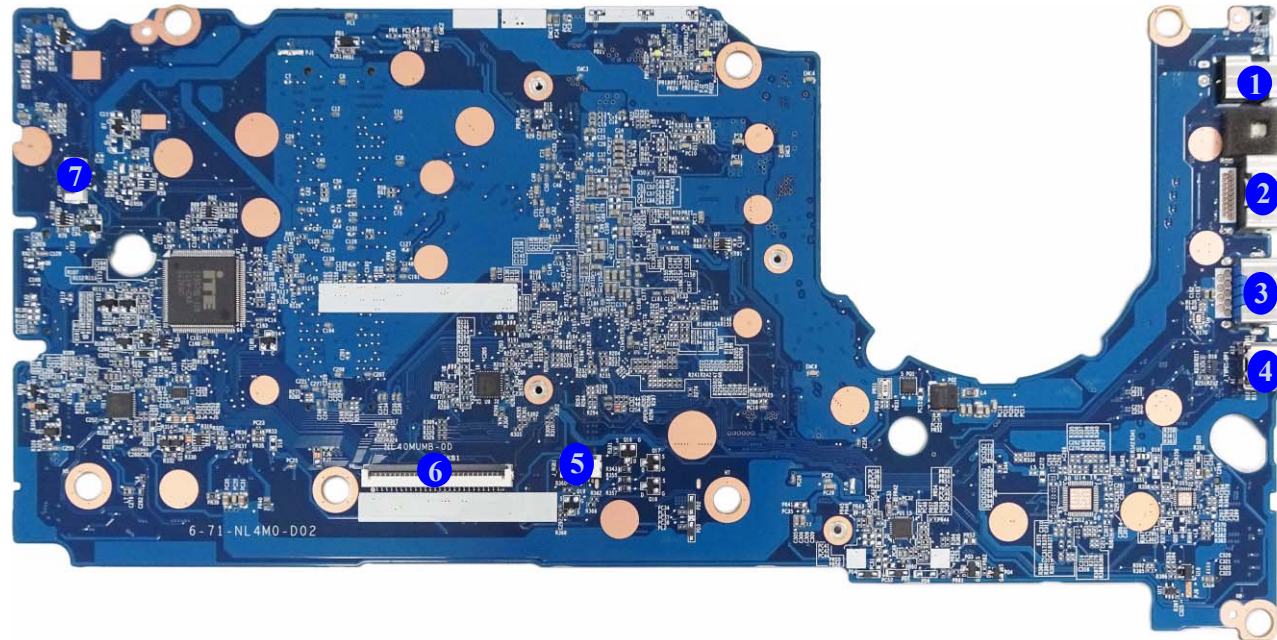


Introduction

Figure 9
**Mainboard Top
Connectors**

1. DC-In Jack
2. HDMI-Out Port
3. USB 3.2 Gen 2 Type-A Port
4. USB 3.2 Gen 2 Type-C Port
5. LED Keyboard Connector
6. Keyboard Cable Connector
7. Power BTN Connector

Mainboard Overview - Top (Connectors)



Mainboard Overview - Bottom (Connectors)

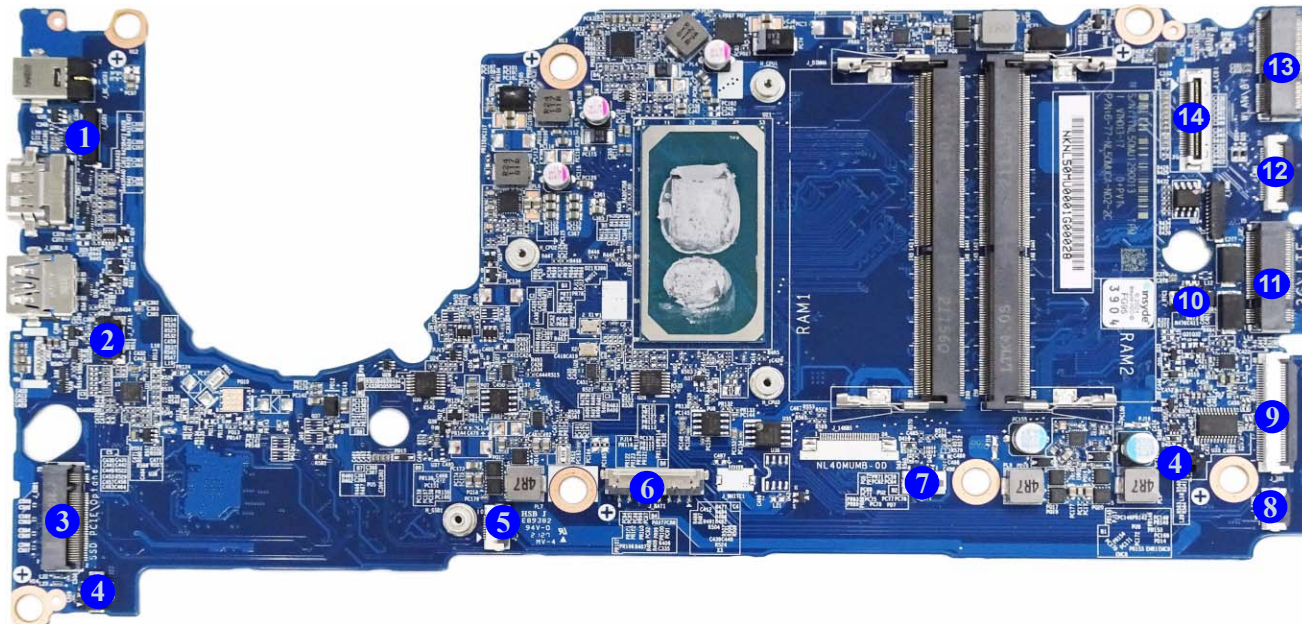


Figure 10
**Mainboard Bottom
Connectors**

1. CCD Cable Connector
2. Fan Connector
3. M.2 Card Connector
4. Speaker Connecto
5. HDD Connector
6. Battery Connector
7. Touchpad Connector
8. SIM Connector
9. USB Board Connector
10. CMOS Battery Connector
11. LTE Connector
12. LAN Board Connector
13. WLAN/BT Connector
14. LCD Cable Connector


Chapter 2: Disassembly



Overview

This chapter provides step-by-step instructions for disassembling the *NL50MU/NL51MU/NL52MU* series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

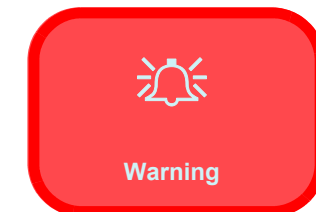
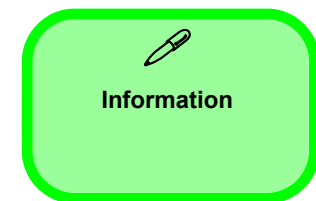
We suggest you completely review any procedure before you take the computer apart.

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

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

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

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



Disassembly

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

Maintenance Tools

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

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



Connections

Connections within the computer are one of four types:

Locking collar sockets for ribbon connectors

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

Pressure sockets for multi-wire connectors

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

Pressure sockets for ribbon connectors

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

Board-to-board or multi-pin sockets

To separate the boards, gently rock them from side to side as you pull them apart. If the connection is very tight, use a small flat-head screwdriver - use just enough force to start.

Maintenance Precautions

The following precautions are a reminder. To avoid personal injury or damage to the computer while performing a removal and/or replacement job, take the following precautions:

1. **Don't drop it.** Perform your repairs and/or upgrades on a stable surface. If the computer falls, the case and other components could be damaged.
2. **Don't overheat it.** Note the proximity of any heating elements. Keep the computer out of direct sunlight.
3. **Avoid interference.** Note the proximity of any high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage components and/or data. You should also monitor the position of magnetized tools (i.e. screwdrivers).
4. **Keep it dry.** This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.
5. **Be careful with power.** Avoid accidental shocks, discharges or explosions.
 - Before removing or servicing any part from the computer, turn the computer off and detach any power supplies.
 - When you want to unplug the power cord or any cable/wire, be sure to disconnect it by the plug head. Do not pull on the wire.
6. **Peripherals** – Turn off and detach any peripherals.
7. **Beware of static discharge.** ICs, such as the CPU and main support chips, are vulnerable to static electricity. Before handling any part in the computer, discharge any static electricity inside the computer. When handling a printed circuit board, do not use gloves or other materials which allow static electricity buildup. We suggest that you use an anti-static wrist strap instead.
8. **Beware of corrosion.** As you perform your job, avoid touching any connector leads. Even the cleanest hands produce oils which can attract corrosive elements.
9. **Keep your work environment clean.** Tobacco smoke, dust or other air-born particulate matter is often attracted to charged surfaces, reducing performance.
10. **Keep track of the components.** When removing or replacing any part, be careful not to leave small parts, such as screws, loose inside the computer.

Cleaning

Do not apply cleaner directly to the computer, use a soft clean cloth.

Do not use volatile (petroleum distillates) or abrasive cleaners on any part of the computer.

(For Computer Models Supplied with Light Blue Cleaning Cloth) Some computer models in this series come supplied with a light blue cleaning cloth. To clean the computer case with this cloth follow the instructions below.

- Power off the computer and peripherals.
- Disconnect the AC/DC adapter from the computer.
- Use a little water to dampen the cloth slightly.
- Clean the computer case with the cloth.
- Dry the computer with a dry cloth, or allow it time to dry before turning on.
- Reconnect the AC/DC adapter and turn the computer on.



Power Safety Warning

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

Disassembly Steps

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

To remove the Battery:

1. Remove the battery *page 2 - 5*

To remove the HDD:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 9*

To remove the System Memory:

1. Remove the battery *page 2 - 5*
2. Remove the system memory *page 2 - 11*

To remove the Keyboard:

1. Remove the battery *page 2 - 5*
2. Remove the keyboard *page 2 - 13*

To remove the Wireless LAN Module:

1. Remove the battery *page 2 - 5*
2. Remove the WLAN *page 2 - 14*

To remove the 4G Module:

1. Remove the battery *page 2 - 5*
2. Remove the 4G *page 2 - 16*

To remove the M.2 SSD Module:

1. Remove the battery *page 2 - 5*
2. Remove the SSD module *page 2 - 17*

To remove the CCD Module:

1. Remove the battery *page 2 - 5*
2. Remove the CCD module *page 2 - 18*

Removing the Battery

Note that battery removal procedure will differ depending on the battery type installed:

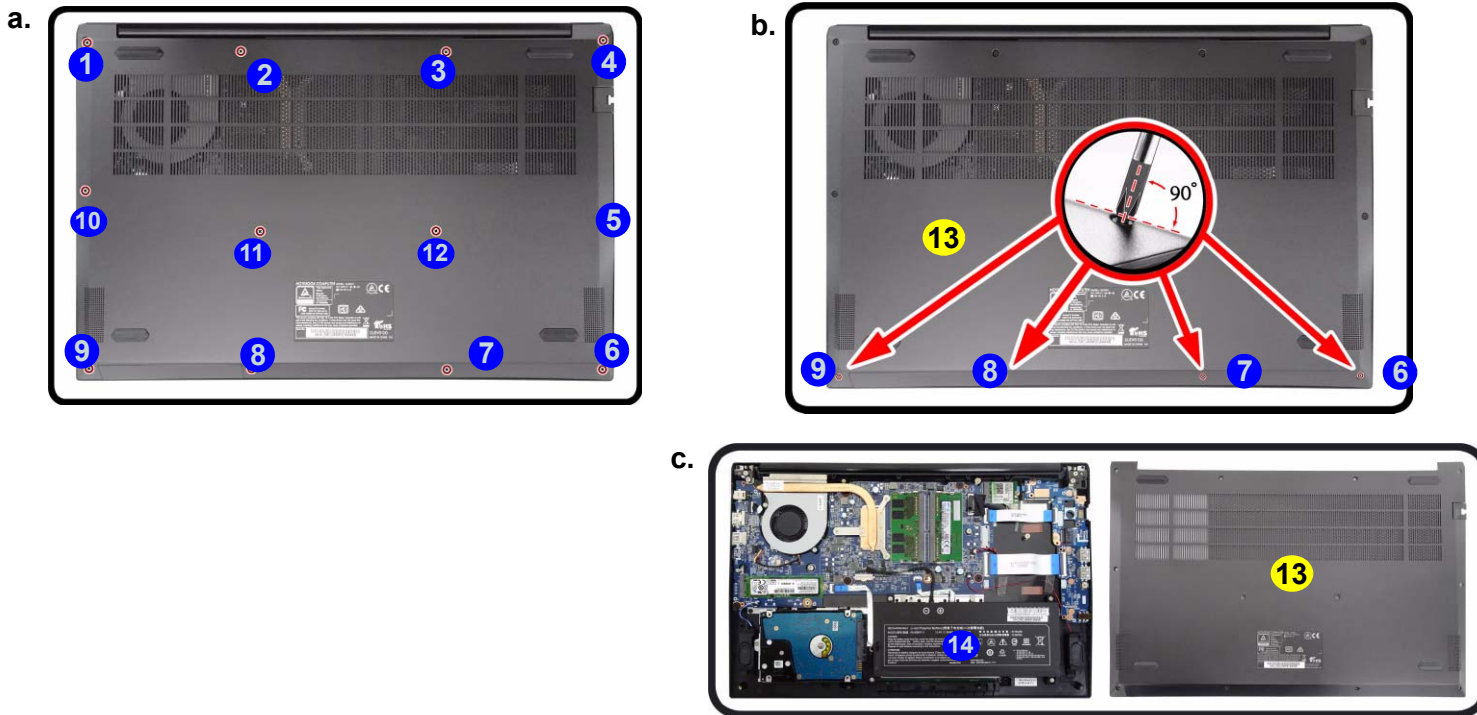
- See 36WH Battery Upgrade Process on [page 2 - 5](#)
- See 48WH Battery Upgrade Process on [page 2 - 7](#)


36WH Battery Upgrade Process

1. Turn **off** the computer, turn it over.
2. Remove screws **1** - **12** on the bottom case (*Figure 1a*).
3. Note to remove screws **6** - **9**, do so with the screwdriver angled at about 90 degrees to the computer surface as shown (*Figure 1b*).
4. Carefully lift the bottom case **13** up and remove it.
5. The battery will be visible at point **14** on the computer (*Figure 1c*).

Figure 1
Battery Removal - 36WH

- a. Remove the screws.
- b. Remove the bottom case.
- c. Locate the battery.





13. Bottom Case

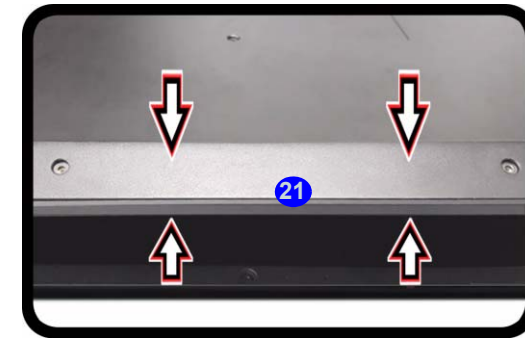
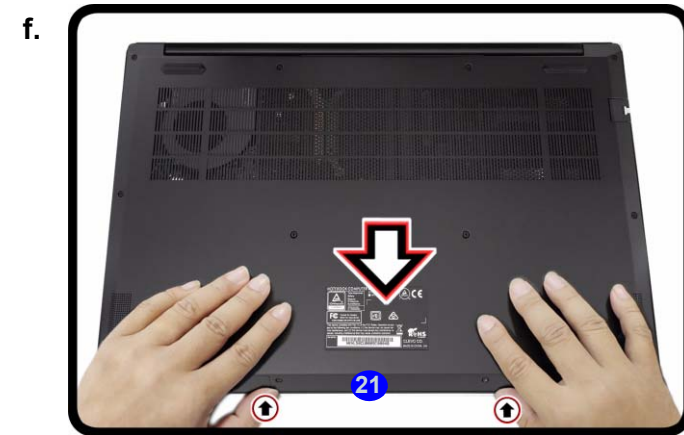
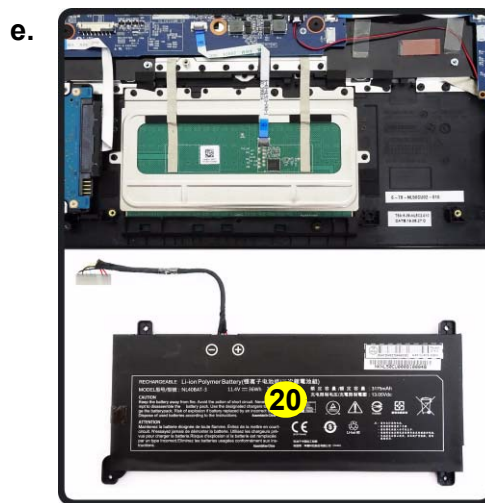
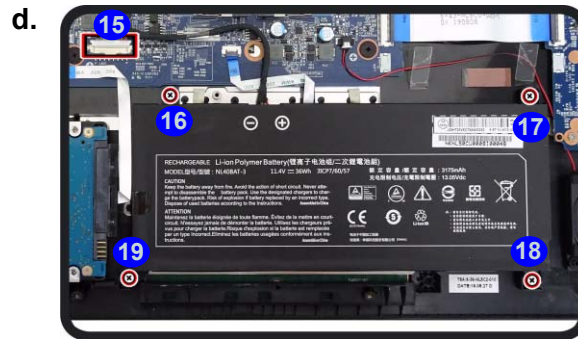
- 12 Screws

Disassembly

Figure 2
Battery Removal -
36WH (cont'd.)

- c. Disconnect the cable and remove the screws.
- d. Lift the battery off the computer.
- f. Close the bottom cover as shown.

6. Carefully disconnect the cable **15**, then remove screws **16** - **19** (*Figure 2d*).
7. Lift the battery **20** off the computer (*Figure 2e*).
8. Reverse the process to install a new battery (do not forget to replace all the screws and bottom cover).
9. Make sure you close the bottom cover by applying pressure at point **21** as shown (*Figure 2f*).



Powering the Computer On

After every disassembly, make sure that the bottom case's screws are all inserted and tightened before turning the computer on.



20. Battery

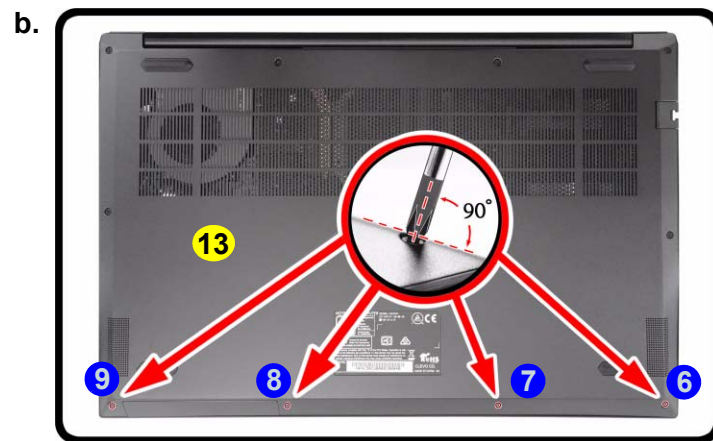
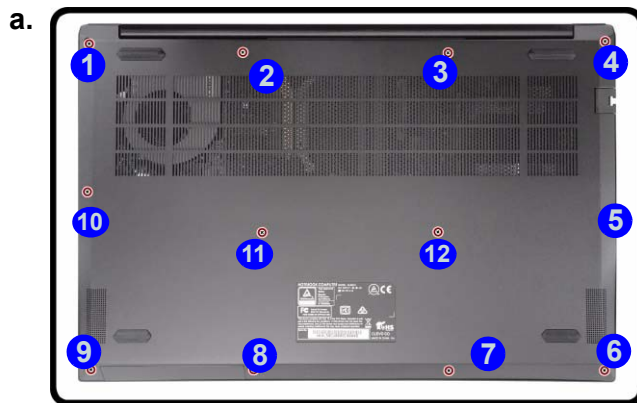
- 4 Screws


48WH Battery Upgrade Process


1. Turn **off** the computer, turn it over.
2. Remove screws **1** - **12** on the bottom case (**Figure 1a**).
3. Note to remove screws **6** - **9**, do so with the screwdriver angled at about 90 degrees to the computer surface as shown (**Figure 1b**).
4. Carefully lift the bottom case **13** up and remove it.
5. The battery will be visible at point **14** on the computer (**Figure 1c**).

Figure 3
Battery Removal - 48WH

- a. Remove the screws.
- b. Remove the bottom case.
- c. Locate the battery.




Hard Disk
Note that Models using a 48WH battery will not have a hard disk installed.

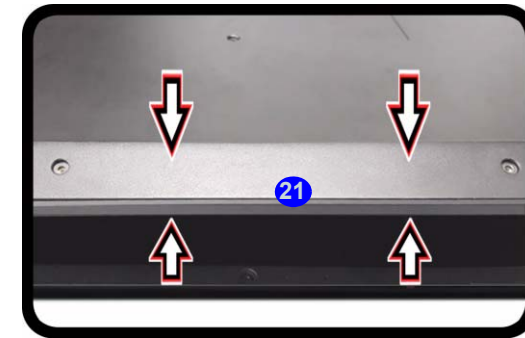
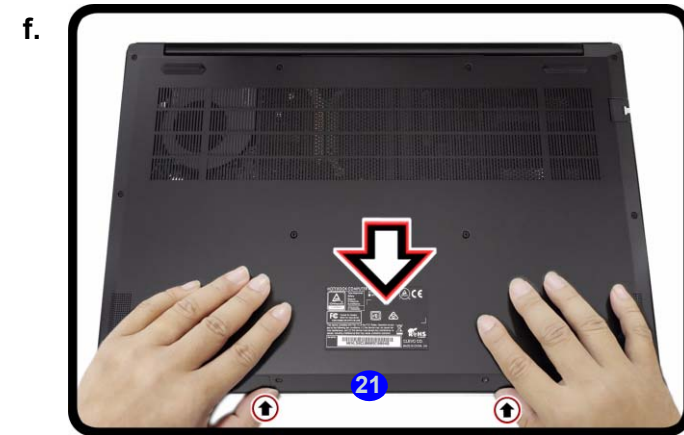
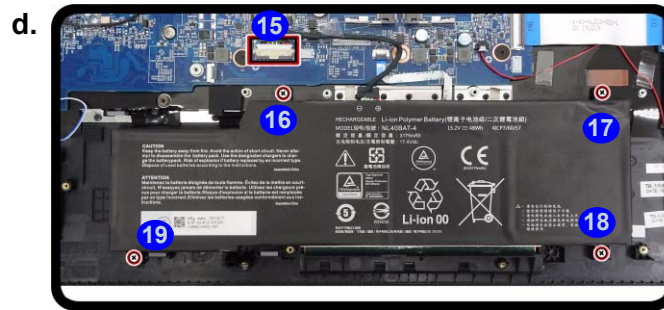


13. Bottom Case
• 12 Screws

Disassembly

Figure 4
Battery Removal -
48WH (cont'd.)


- c. Disconnect the cable and remove the screws.
- d. Lift the battery off the computer.
- f. Close the bottom cover as shown.

6. Carefully disconnect the cable **15**, then remove screws **16** - **19** (*Figure 2d*).
7. Lift the battery **20** off the computer (*Figure 2e*).
8. Reverse the process to install a new battery (do not forget to replace all the screws and bottom cover).
9. Make sure you close the bottom cover by applying pressure at point **21** as shown (*Figure 2f*).

Powering the
Computer On

After every disassembly, make sure that the bottom case's screws are all inserted and tightened before turning the computer on.



20. Battery

- 4 Screws

Removing the Hard Disk Drive

Note that Models using a 48WH battery will not have a hard disk installed.

The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 7.0mm (h). Follow your operating system's installation instructions, and install all necessary drivers and utilities (as outlined in **Chapter 4 of the User's Manual**) when setting up a new hard disk.

Hard Disk Upgrade Process

1. Turn **off** the computer, and remove the battery ([page 2 - 5](#)).
2. The HDD will be visible at point **1** on the mainboard ([Figure 5a](#)).
3. Remove screws **2** from the HDD assembly. Slightly lift and disconnect the hard disk assembly from the connector **3** ([Figure 5b](#)).
4. Lift the hard disk assembly **4** out of the bay **5** ([Figure 5c](#)).

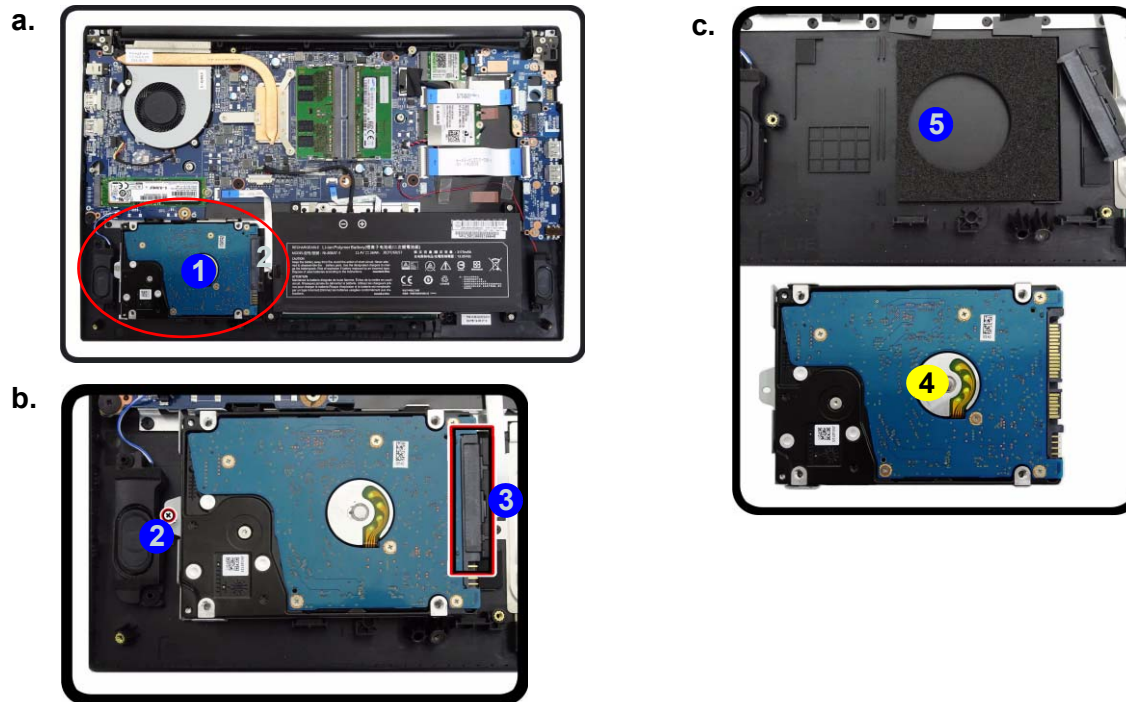


Figure 5
HDD Assembly Removal

- a. Locate the HDD.
- b. Remove the screws and disconnect the HDD from the connector.
- c. Lift the HDD assembly out of the bay.



Powering the Computer On

After every disassembly, make sure that the bottom case's screws are all inserted and tightened before opening the Lid/LCD and turning the computer on.



4. HDD Assembly

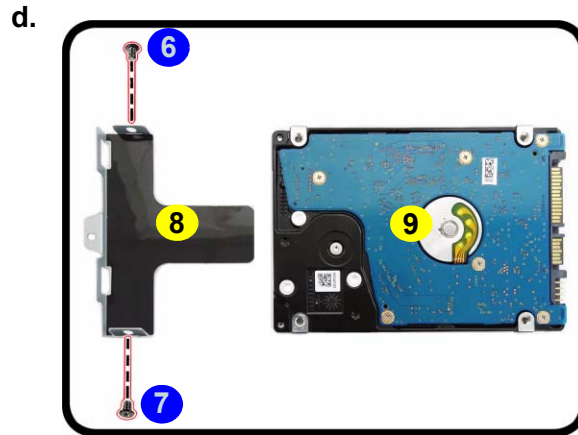
- 1 Screw

Disassembly

Figure 6
**HDD Assembly
Removal (cont'd.)**

d. Remove the screws and bracket from the HDD.

5. Remove screws **6** - **7** and bracket **8** from the hard disk **9** (*Figure 6d*).
6. Reverse the process to install a new hard disk (do not forget to replace the 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.



6. Bracket
 7. HDD
- 2 Screws

Removing the System Memory (RAM)

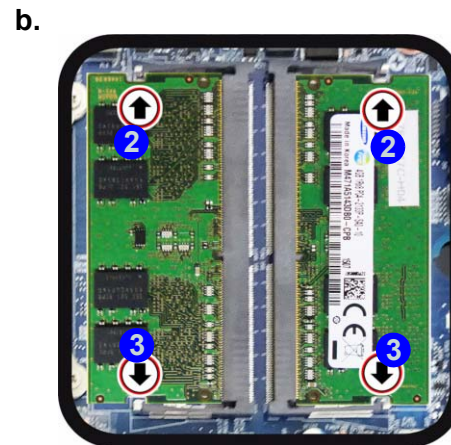
The computer has two memory sockets for 260 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR4 2400MHz. The main memory can be expanded up to 32GB. The total memory size is automatically detected by the POST routine once you turn on your computer.

Memory Upgrade Process

1. Turn **off** the computer, turn it over to remove the battery ([page 2 - 5](#)).
2. The RAM modules will be visible at point **1** on the mainboard ([Figure 7b](#)).
3. Gently pull the two release latches (**2** & **3**) on the sides of the memory socket in the direction indicated by the arrows ([Figure 7b](#)).
4. The RAM module **4** will pop-up ([Figure 7c](#)), and you can then remove it.


Figure 7
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.


Single Memory Module Installation

If your computer has a single memory module, then insert the module into the **Channel 0 (JDIMM1 / RAM1)** socket.


4. RAM Module

Disassembly

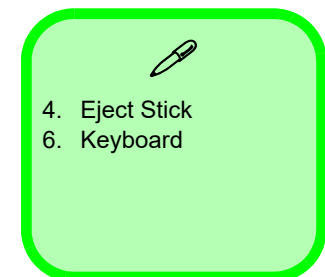
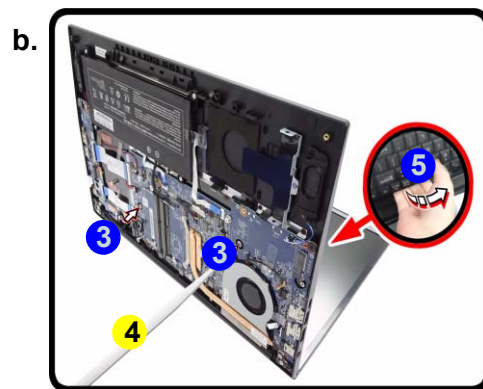
5. Pull the latches to release the second module if necessary.
6. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
7. The module will only fit one way as defined by its pin alignment. Make sure the module is seated as far into the slot as it will go. DO NOT FORCE IT; it should fit without much pressure.
8. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
9. Replace the bottom case and the screws (see [page 2 - 5](#)).
10. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.

Removing the Keyboard

1. Turn **off** the computer, turn it over to remove the battery ([page 2 - 5](#)).
2. Locate the release points **1** - **2** from the open bottom case ([Figure 8a](#)).
3. Open it up with the LCD on a flat surface before pressing at point **3** to release the keyboard module (use the specific eject stick **4** to do this) while releasing the keyboard in the direction of the arrow **5** as shown ([Figure 8b](#)).
4. Carefully lift the keyboard **6** up, being careful not to bend the keyboard ribbon cable **7**. Disconnect the keyboard ribbon cable from the locking collar socket **8** ([Figure 8c](#)).
5. Carefully lift up the keyboard **6** off the computer ([Figure 8d](#)).
6. Reverse the process to install the keyboard (be careful not to bend the keyboard ribbon cable).

Figure 8
Keyboard Removal

- a.
- b. Release the keyboard by pressing at point **3**.
- c. Disconnect the keyboard ribbon cable from the locking collar socket.
- d. Remove the keyboard.

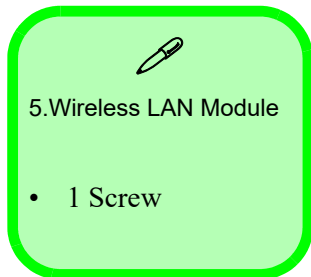


Disassembly

Figure 9
**Wireless LAN
Module Removal**

- Locate the WLAN.
- Disconnect the cable and remove the screw.
- The WLAN module will pop up and lift it out of the computer.

Note: Make sure you reconnect the antenna cable to the “1 + 2” socket (*Figure 9b*).



Removing the Wireless LAN Module

- Turn **off** the computer, turn it over to remove the battery (*page 2 - 5*).
- The Wireless LAN module will be visible at point **1** on the mainboard (*Figure 9a*).
- Carefully disconnect the cables **2** & **3**, and then remove the screw **4** (*Figure 9b*)
- The Wireless LAN module **5** (*Figure 9c*) will pop-up, and you can remove it from the computer.
- Reverse the process to install a new module (do not forget to replace all the screws and bottom cover).



Wireless LAN, and 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	WL 1	Black	Transparent
	WL 2	Black	White
LTE Broadband	LTE 1	Black	Black
	LTE 2	Black	Blue

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

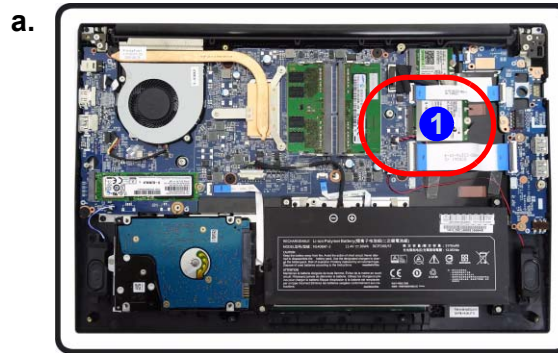
Disassembly

Figure 10
4G Module Removal

- Locate the WLAN.
- Disconnect the cable and remove the screw.
- The WLAN module will pop up and lift it out of the computer.

Removing the 4G Module

- Turn off the computer, turn it over to remove the battery (page 2 - 5).
- The module will be visible at point ① on the mainboard (Figure 9a).
- Carefully disconnect the cables ② & ③, and then remove the screw ④ (Figure 9b)
- The module ⑤ (Figure 9c) will pop-up, and you can remove it from the computer.
- Reverse the process to install a new module (do not forget to replace all the screws and bottom cover).



5.4G Module

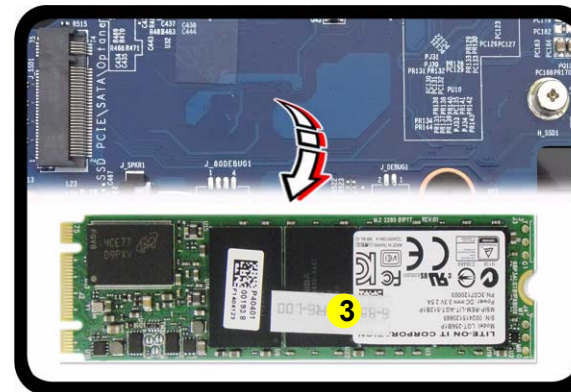
- 1 Screw


Removing the M.2 SSD Module

1. Turn **off** the computer, turn it over to remove the battery ([page 2 - 5](#)).
2. The M.2 SSD module will be visible at point **1** on the mainboard ([Figure 11a](#)).
3. Remove the screw **2** ([Figure 11b](#))
4. The M.2 SSD module **3** ([Figure 11c](#)) will pop-up, and you can remove it from the computer.
5. Reverse the process to install a new module (do not forget to replace all the screws and bottom cover).

Figure 11
M.2 SSD Module Removal

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





3.M2 SATA Module

- 1 Screw

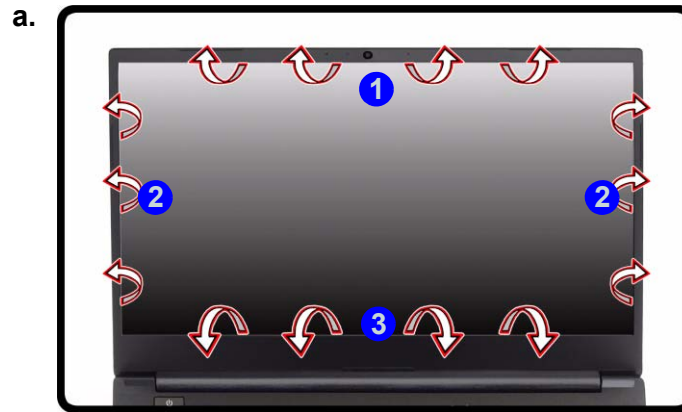
Disassembly

Figure 12
CCD Removal

- a. Run your fingers around the inner frame of the LCD panel at the points indicated by the arrows.
- b. Lay the computer down on a flat surface with the top case up forming a 90 degree angle. Lift the LCD front panel upwards.

Removing the CCD

1. Turn **off** the computer, turn it over to remove the battery ([page 2 - 5](#)).
2. Run your fingers around the inner frame of the LCD panel at the points as indicated by the arrows **1** - **3** ([Figure 12a](#)).
3. Lay the computer down on a flat surface with the top case up forming a 90 degree angle. Carefully lift and remove the LCD front cover **5** upwards ([Figure 12b](#)).



4. LCD Front Cover

4. Disconnect the cable **5** (Figure 13f).
5. Remove the CCD module **6** (Figure 13g).
6. Reverse the process to install a new CCD module.



Figure 13
CCD Re
(cont)

- c. Disconnect
- d. Remove the
ule.

Appendix A: Part Lists

This appendix breaks down the *NL50MU/NL51MU/NL52MU* 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.

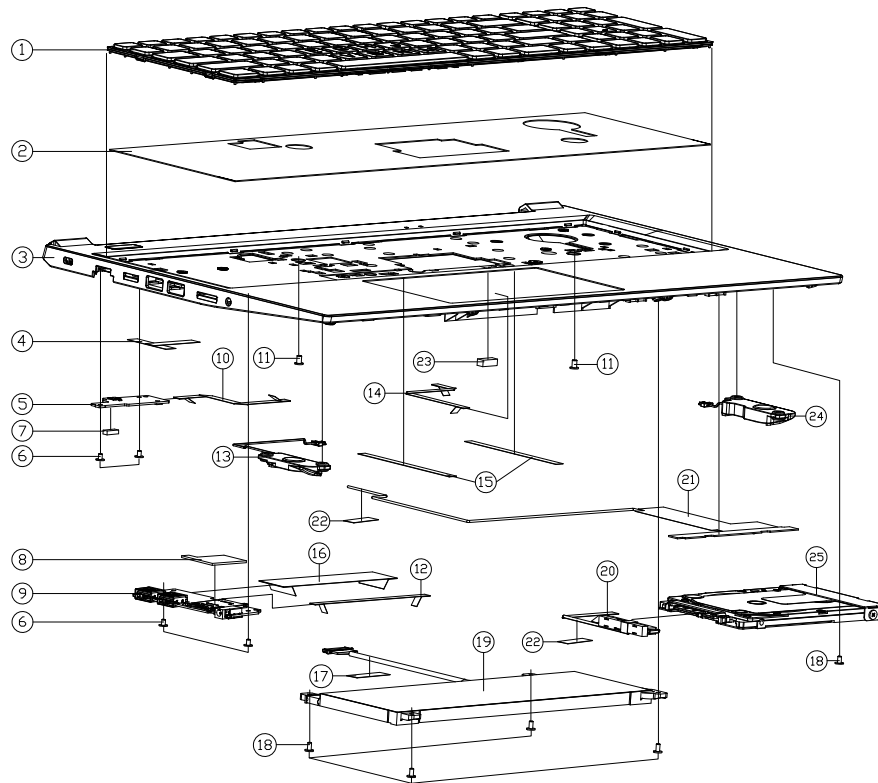
Part List Illustration Location

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

Top

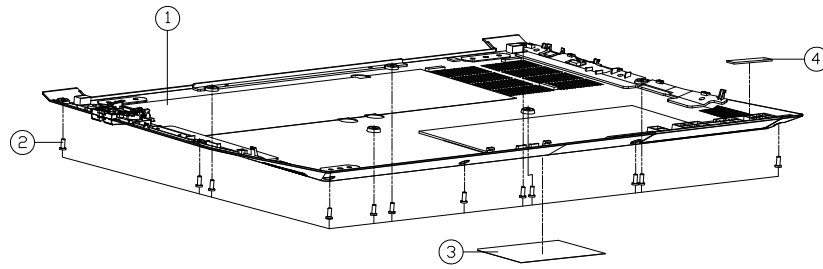


ITEM	PART NAME	PART NO	REMARK
1	EX USA CYMBRELOC FOR M500 BLACK ISOLATION WITH VIND KEY	6-80-NISZ0-012-1	
1	EX BRITLON CYMBRELOC FOR M500 BLACK ISOLATION WITH VIND KEY	6-80-NISZ0-333-1	
1	EX JAPANESE CYMBRELOC FOR M500 BLACK ISOLATION WITH VIND KEY	6-80-NISZ0-212-1	
1	EX UK CYMBRELOC FOR M500 BLACK ISOLATION WITH VIND KEY/REMOVED	6-80-NISZ0-192-K	
1	R/O CYMBRELOC FOR BLACK W/RE STRIP LONG PINS ISOLATION WITH VIND KEY (CE20M)	6-80-NISZ0-19D-1	
1	R/O JAPANESE CYMBRELOC FOR BLACK W/RE STRIP LONG PINS ISOLATION WITH VIND KEY (CE20M)	6-80-NISZ0-21D-1	
1	R/O BRITLON CYMBRELOC FOR BLACK W/RE STRIP LONG PINS ISOLATION WITH VIND KEY (CE20M)	6-80-NISZ0-33E-1	
1	R/O UK CYMBRELOC FOR BLACK W/RE STRIP LONG PINS ISOLATION WITH VIND KEY (CE20M)	6-80-NISZ0-01D-1	
1	EX JAPANESE CYMBRELOC FOR BLACK ISOLATION WITH VIND KEY (CE20M) FOR NL	6-80-NISZ0-212-1M	
1	R/O JAPANESE CYMBRELOC FOR BLACK W/RE STRIP LONG PINS ISOLATION WITH VIND KEY (CE20M) FOR NL	6-80-NISZ0-21D-1M	
2	MYLAR MAGENT 323.25x100x0.45MM FDR NL50CU	6-40-NL5C1-010	FOR FOR NON NL 43 SERIES
3	(PRE-PROCESS) TOP CASE MODULE NL50CU	6-78-NL50CU02-011	
3	(PRE-PROCESS) TOP CASE MODULE NL50CU	6-78-NL50CU02-011	
3	(PRE-PROCESS) TOP CASE MODULE NL50CU	6-78-NL50CU02-010	
4	CONDUCTIVE CLOTH FOR TP (32x7x0.11) N9501F	6-47-N95T2-010	
5	PWR BTN BOARD V1.0 NL50MU	6-77-NL5MC-D01	
6	SCREW M2x4L KI NI ICT NY (00-#4.0,BT-08)	6-35-B1120-3RD	
7	RUBBER POWER SILICONE (10x5x3) NL50CU	6-47-NL502-070	
8	W/D 3G RUBBER26.2492SILICON RUBBER P650GE	6-47-P6502-020	FOR W/D LTE
9	I/O BOARD (W/LTE) V1.0 NL50MU	6-77-NL5MI-D01	
9	I/O BOARD (W/D LTE) V1.0 NL50MU	6-77-NL5MI-D01-1	
10	FFC CABLE FOR POWER TO HD L-30MM ON PITCH 1.27MM QFD NL50CU	6-43-NL50C-031-1	
11	SCREW M2.5x4L (0-4.6,T-08) KI NI ICT NY	6-35-B1125-4RA	
12	FFC CABLE FOR 3G TO HD L-30MM ON PITCH 1.27MM QFD NL50CU	6-43-NL50C-011-1	
13	SPK-CABLE L 42.45x5.8x 2W 41 150MM 646660 NL50MU	6-23-5NL5R-NL0	
14	FFC CABLE FOR TP TO HD L-120MM ON PITCH 1.27MM QFD NL50CU	6-43-NL50C-041-1	
15	TP CONDUCTIVE CLOTH (63x5x0.11) NL50CU	6-47-NL502-030	
16	FFC CABLE FOR HD TO HD L-30MM ON PITCH 1.27MM QFD NL50CU	6-43-NL50C-021-1	
17	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
18	SCREW M2x4L KI NI ICT NY (00-#4.5,BT-08)	6-35-B1120-4RC	
19	BAT 511 14V/2200mAh 2EP 3040X16 X8027000 027000 NL400	6-87-NL40S-33G21	
19	BAT 511 14V/2200mAh 2EP 3040X16 X8027000 027000 NL400	6-87-NL4CS-32B01	
19	BAT 511 14V/2200mAh 2EP 3040X16 X8027000 027000 NL400	6-87-NL4CS-43G01	
19	BAT 511 14V/2200mAh 2EP 3040X16 X8027000 027000 NL400	6-87-NL4CS-41B01	
20	HD COMPHO-WIDE-FILE COME FFC CABLE 9.5MMx3.5X300MM	6-23-FNL5C-011	FOR 36WH BAT.
21	HD COMPHO-WIDE-FILE COME FFC CABLE 9.5MMx3.5X300MM	6-23-FNL5C-041	
22	TAPE MYLAR TRANSPARENT (20x10x0.05) P1803M	6-40-P1803-020	
23	TOP CASE RUBBER 10x5x6 NL50CU	6-47-NL5C2-060	
24	SPK-CABLE R 53.5x4.3 2W 41 50MM 646650 NL50MU	6-23-5NL5R-NR0	
25	W/D HDD ASSY (FOR 36WH BAT) NL50CU	6-79-NL50CU0J-010	FOR 36WH BAT.
25	W/HDD ASSY NL50CU	6-79-NL50CU0J-020	

Figure A - 1
Top

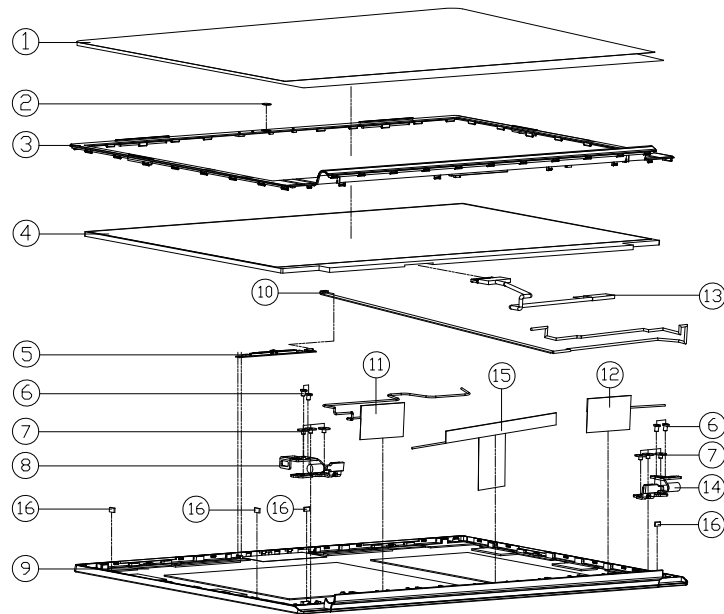
Bottom

Figure A - 2
Bottom



ITEM	PART NAME	PART NO	REMARK
1	BOTTOM CASE MODULE(EXCHANGE) NL50CU	6-39-NL5C3-019	
2	SCREW M2*5L KI(T=0.8 D=3.5) BK/Z ICT NY	6-35-B6120-5RC	
3	PRODUCT LABEL FOR NL50MU	6-45-NL50MU03-010	
3	PRODUCT LABEL FOR NL51MU	6-45-NL51MU03-010	
3	PRODUCT LABEL FOR NL52MU	6-45-NL52MU03-010	
4	SPONGE (45*10*2.65T) CR4382 NB50TL	6-47-0019A-45J	

LCD

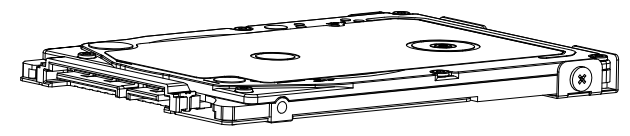
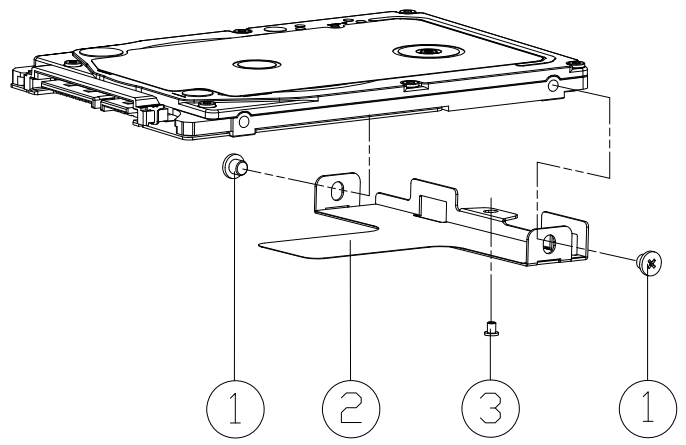


ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP N150ZU	6-40-N15Z8-010	
2	CCD LENS PMMA (DIAMETER 3.6MM) (MP1) P970EN	6-42-P97N1-011-1	
3	FRONT COVER MODULE NL50GU	6-39-NL501-012	
4	LCD N156" HD/NDN GT/EEP TMOULX N15680A-EA3 (LED) 32 MM	6-50-LBB32-Z005	
4	LCD N156" FHD/VVA/VA/NDN GT/EEP LG LP156VFB-SPD3 32MM	6-50-LBB32-L01E	
4	LCD N156" FHD/VVA/VA/NDN GT/EEP AU B156VH021 HVA/HD0 (BRACKET) 32MM	6-50-LBB32-G015	
4	LCD N156" FHD/NDN GT/EEP BOE NT156FHM-N61 (LED) 32 MM	6-50-LBB32-Z007	
5	THE COVER FROM TUNING DIMENSION IN IT D1574 HSDU FROM WHITE-LED WITH REDUCED BRIGHTNESS (TD)	6-88-N15ZC-4900	OPTION
5	THE COVER FROM TUNING DIMENSION IN IT WITH MC 4072 D1574 HSDU FROM WHITE-LED	6-88-N15ZC-5102	OPTION
6	.SCREW M2.5*5L K1 BK/Z ICT NY	6-35-B6125-5RA	
7	SCREW M2.5*2.5L K1 BK/Z ICT NY(Ø8,T=0.6)	6-35-B6125-2R5	
8	HINGE L (SK7) NL50GU	6-33-NL501-1L1	
9	BACK COVER MODULE NL50GU	6-39-NL501-022	
9	BACK COVER MODULE NL51CU	6-39-NL5C1-121	
9	BACK COVER MODULE(AL 5052) NL52LU	6-39-NL521-020	
10	CCD CABLE L=450MM 30V 8PIN (HL) NL50CU	6-43-NL5CT-011	
11	ANTENNA IPEX4 VLAH JEM WL2 PCB DR 40X5MM 2.4G/5G L= 550MM NL50CU	6-23-7NL5C-021	
12	ANTENNA IPEX4 VLAH JEM WL1 PCB DR 40X5MM 2.4G/5G L= 550MM NL50CU	6-23-7NL5C-011	
13	WIRE CABLE FOR EEP 250MM 1.30V 30PIN GFL/W CON&VIO-AS0LPROSD NL50CU	6-43-NL5C1-013-1N	
14	HINGE R (SK7) NL50GU	6-33-NL501-1R1	
15	ANTENNA IPEX4 5G/LTE JEM LITE-1 PCB DR 40X5MM 2.4G/5G/2G/LTE L=250MM NL50CU	6-23-7NL5C-032	
16	LCD RUBBER (4.8*3*1.0) NL40GU	6-47-NL401-051	

Figure A - 3
LCD

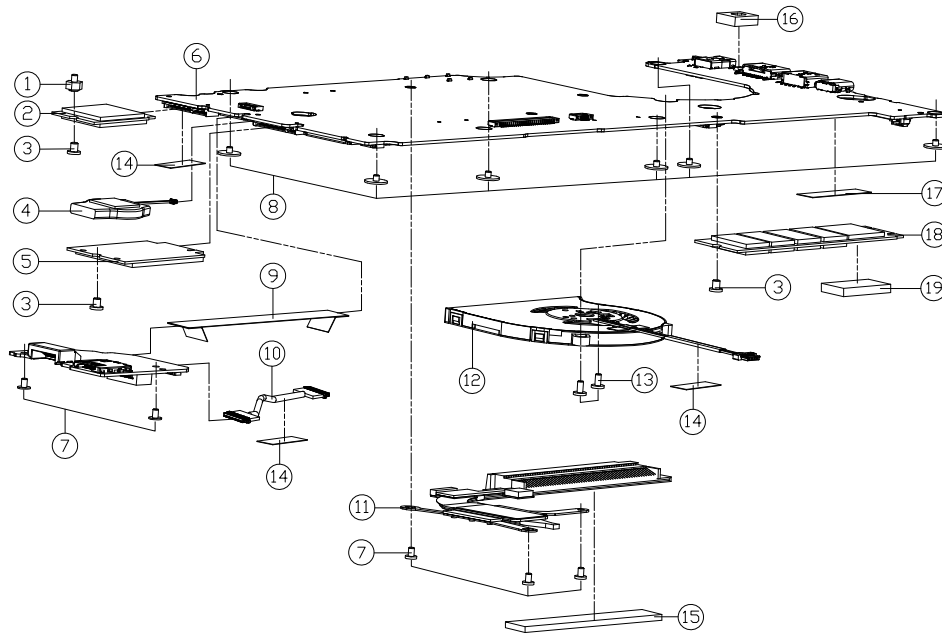
HDD

Figure A - 4
HDD



ITEM	PART NAME	PART NO	REMARK
1	SCREW M3*3.0L KI NI ICT NY	6-35-B1130-3R5	
2	HDD BKT 7MM SECC T=0.5 N250LU	6-33-N250J-011	
3	SCREW M2*4L KI NI ICT NY (DD=#4.5,DT=0.8)	6-35-B1120-4RC	

MB



ITEM	PART NAME	PART NO	REMARK
1	SCREW M2x2L Ø2.5 S-50 STEEL ICT NY FOR HEAT CONDUCTIBLE MOLD	6-35-ZA120-2R5-2	
2	WAFER CONDUCTIVE PAD WITH ADHESIVE FOR 2 CHANNELS WITH PWR AND GND FOR 2Z	6-88-N24GF-4200	OPTION
2	WAFER CONDUCTIVE PAD WITH ADHESIVE FOR 2 CHANNELS WITH PWR AND GND FOR 2Z	6-88-N24GF-4220	OPTION
2	WAFER CONDUCTIVE PAD WITH ADHESIVE FOR 2 CHANNELS WITH PWR AND GND FOR 2Z	6-88-N15CF-4210	OPTION
2	WAFER CONDUCTIVE PAD WITH ADHESIVE FOR 2 CHANNELS WITH PWR AND GND FOR 2Z	6-88-NV40F-4210	OPTION
2	WAFER CONDUCTIVE PAD WITH ADHESIVE FOR 2 CHANNELS WITH PWR AND GND FOR 2Z	6-88-X17KF-4210	OPTION
2	WAFER CONDUCTIVE PAD WITH ADHESIVE FOR 2 CHANNELS WITH PWR AND GND FOR 2Z	6-88-NL5RF-7000	OPTION
3	SCREW M2x2L KI NI ICT NY (ØD=ØS, T=Ø.8)	6-35-B1120-2RA	
4	BAT. 2000 3V 2200mAh W/CABLE SS3MM BCR2020HS	6-23-22015-TE0	
5	LE 4 6MMx12MMx1.5MM FOR 4 PIN TYPE OF 2Z AND 4Z CHANNELS WITH PWR AND GND	6-88-NJ506-0C00	OPTION
6	WAFER CONDUCTIVE PAD WITH ADHESIVE FOR 2 CHANNELS WITH PWR AND GND FOR 2Z	6-77-NL50M0A-N02-A	
6	WAFER CONDUCTIVE PAD WITH ADHESIVE FOR 2 CHANNELS WITH PWR AND GND FOR 2Z	6-77-NL50M0A-N02-BC	
6	WAFER CONDUCTIVE PAD WITH ADHESIVE FOR 2 CHANNELS WITH PWR AND GND FOR 2Z	6-77-NL50M0A-N02-5D	
6	WAFER CONDUCTIVE PAD WITH ADHESIVE FOR 2 CHANNELS WITH PWR AND GND FOR 2Z	6-77-NL50M0A-N02-7B	
7	SCREW M2x3L KI NI ICT NY (ØD=Ø4.0, DT=Ø.8)	6-35-B1120-3RD	
8	SCREW M2x4L KI BK/Z ICT NY(Ø4.5, DT=0.6)	6-35-B6120-2RE	
9	FFC CABLE FOR 4PINS TO M-L-1P50MM 6V PITCH 45222PMM 400 NLS0MU	6-43-NL5M0-010	
10	WIRE CABLE FOR M-L-1P50MM 6V PITCH 45222PMM 400 NLS0MU	6-43-NL5M0-020	
11	CPU HEATSINK MODULE NLS0MU	6-31-NL5M2-101	
12	FAN MODULE (WINNMA) PWM NI41WU	6-31-N14WS-102-1	
13	SCREW M2x4L KI NI ICT NY (ØD=Ø4.5, DT=Ø.8)	6-35-B1120-4RC	
14	TAPE MYLAR TRANSPARENT (20x10x0.05) P180HM	6-40-P1803-020	
15	FIN SPONGE S155+D5-1S (66x41x2.65MM) NLS0MU	6-47-NL5M2-010	
16	SPONGE (Ø19x5x1.65) FOR D.C. LENS DS-1S NL48GU	6-47-0019A-A14	
17	TAPE MYLAR (C), MYLAR M550J	6-40-M55J2-030	
18	SSD M2 2280 1TB DRAGON DRAGON-10000 PERFORMANCE SSD 3D TLC % LAYERS	6-85-D511T-S04	OPTION
18	SSD M2 2280 1TB DRAGON DRAGON-10000 PERFORMANCE SSD 3D TLC % LAYERS	6-85-D511T-W01	OPTION
18	SSD M2 2280 1TB DRAGON DRAGON-10000 PERFORMANCE SSD 3D TLC % LAYERS	6-85-D511T-H01	OPTION
18	SSD M2 2280 512GB DRAGON DRAGON-51200 PERFORMANCE SSD 3D TLC % LAYERS	6-85-D515B-S0A	OPTION
18	SSD M2 2280 512GB DRAGON DRAGON-51200 PERFORMANCE SSD 3D TLC % LAYERS	6-85-D515B-B01	OPTION
18	SSD M2 2280 512GB DRAGON DRAGON-51200 PERFORMANCE SSD 3D TLC % LAYERS	6-85-D51R6-W02	OPTION
19	THERMAL PAD FOR M2 SSD TFLXDR55 30MMx30MM NLS0CU	6-48-NL5CS-010	

Figure A - 5
MB



Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the *NL50MU / NL51MU / NL52MU* 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>Panel - Page B - 18</i>	<i>2.5V, VCCST, VCCSTG - Page B - 34</i>
<i>Processor 1/12 - Page B - 3</i>	<i>USB Type-C ANX7443 - Page B - 19</i>	<i>Power PD Function - Page B - 35</i>
<i>Processor 2/12 - Page B - 4</i>	<i>ANX7411, Type-C - Page B - 20</i>	<i>NCP81269 - Page B - 36</i>
<i>Processor 3/12 - Page B - 5</i>	<i>ASM1543 - Page B - 21</i>	<i>3.3V, 5V, 3VS, 5VS, CTL - Page B - 37</i>
<i>Processor 4/12 - Page B - 6</i>	<i>LED KB, LED - Page B - 22</i>	<i>Charger, AC IN - Page B - 38</i>
<i>Processor 5/12 - Page B - 7</i>	<i>SATA HDD, TPM - Page B - 23</i>	<i>VCCIN - Page B - 39</i>
<i>Processor 6/12 - Page B - 8</i>	<i>Audio Codec - Page B - 24</i>	<i>RTL8411B - Page B - 40</i>
<i>Processor 7/12 - Page B - 9</i>	<i>KBC ITE IT5570 - Page B - 25</i>	<i>Multi Board RTS5227S / OZ711 - Page B - 41</i>
<i>Processor 8/12 - Page B - 10</i>	<i>WLAN - Page B - 26</i>	<i>LAN Transformer - Page B - 42</i>
<i>Processor 9/12 - Page B - 11</i>	<i>M Key PCIE SSD - Page B - 27</i>	<i>LAN Board Connector - Page B - 43</i>
<i>Processor 10/12 - Page B - 12</i>	<i>3G/LTE - Page B - 28</i>	<i>14" I/O Board - Page B - 44</i>
<i>Processor 11/12 - Page B - 13</i>	<i>USB Type-A - Page B - 29</i>	<i>15" I/O Board 1 - Page B - 45</i>
<i>Processor 12/12 - Page B - 14</i>	<i>Conn, CCD, Fan, TP - Page B - 30</i>	<i>15" I/O Board 2 - Page B - 46</i>
<i>DDR4 SO-DIMM_A - Page B - 15</i>	<i>VDD3, VDD5 - Page B - 31</i>	<i>PWR Button Board - Page B - 47</i>
<i>DDR4 SO-DIMM_B - Page B - 16</i>	<i>VDDQ, VDDQ_VTT, 1.8VA - Page B - 32</i>	<i>Power Sequence - Page B - 48</i>
<i>HDMI - Page B - 17</i>	<i>3.3VA, 1.8V - Page B - 33</i>	

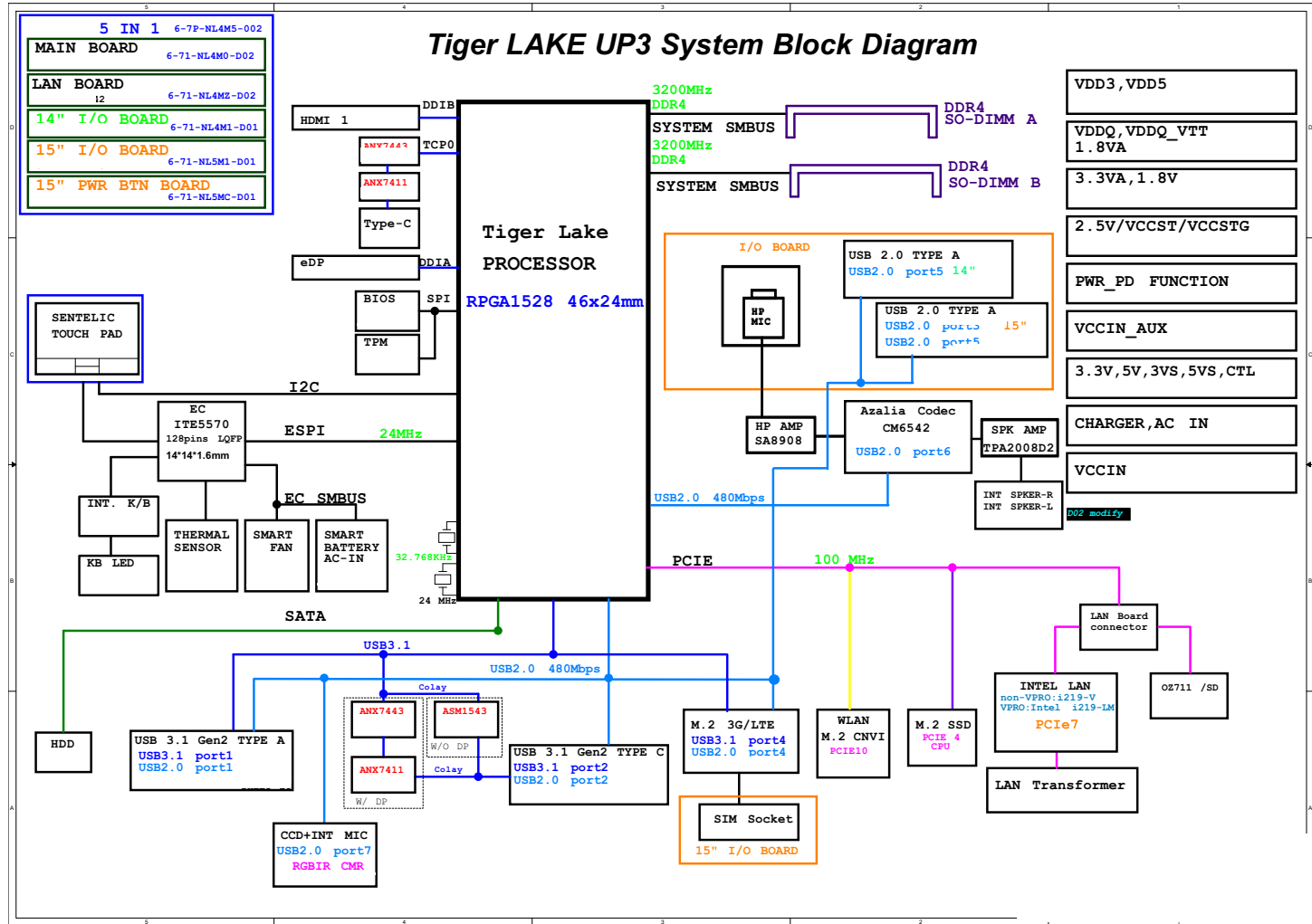
Table B - 1
**SCHEMATIC
DIAGRAMS**



Version Note

The schematic diagrams in this chapter are based upon version 6-7P-NL4M5-002. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

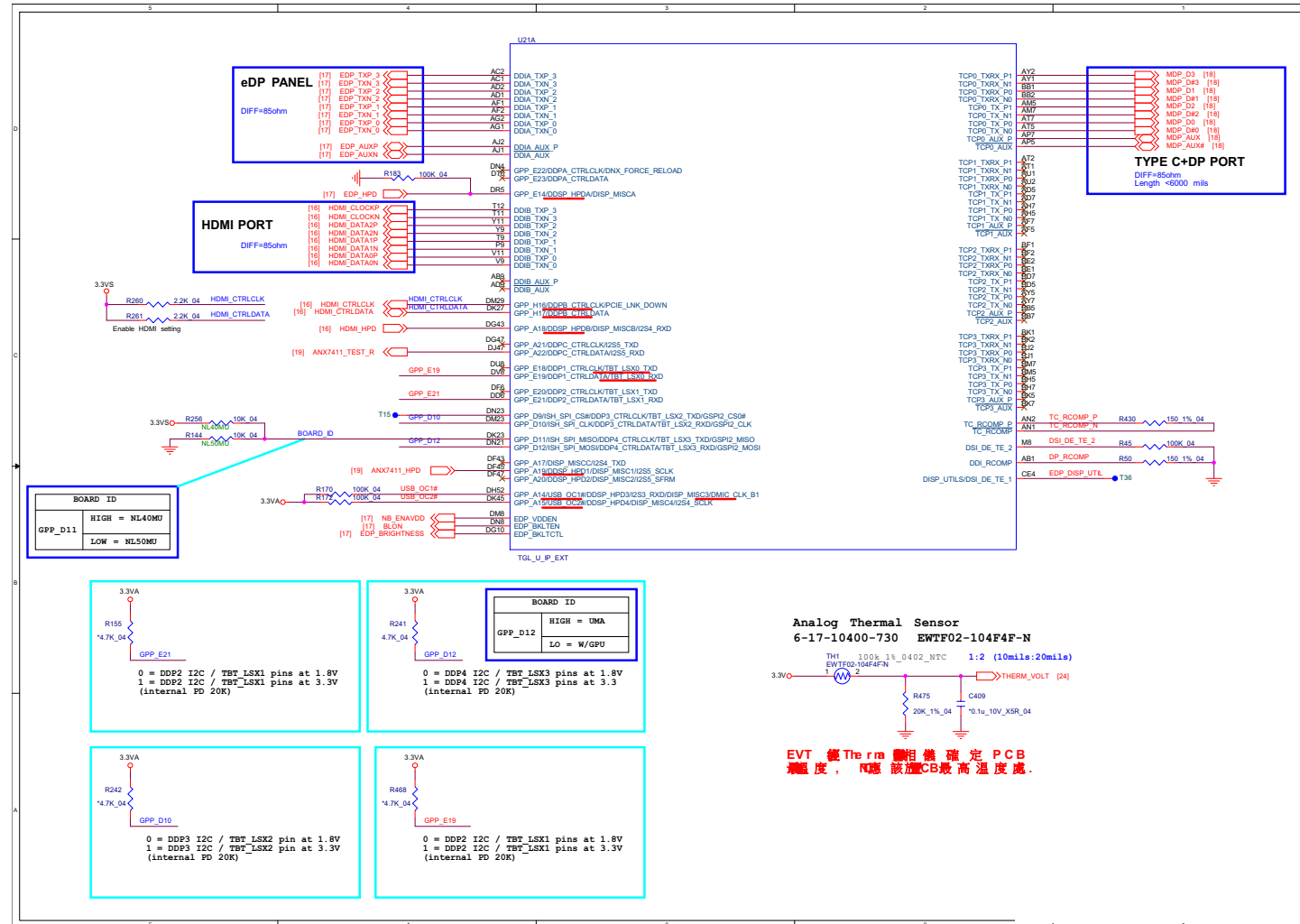
System Block Diagram



Sheet 1 of 47
System Block
Diagram

B.Schematic Diagrams

Processor 1/12

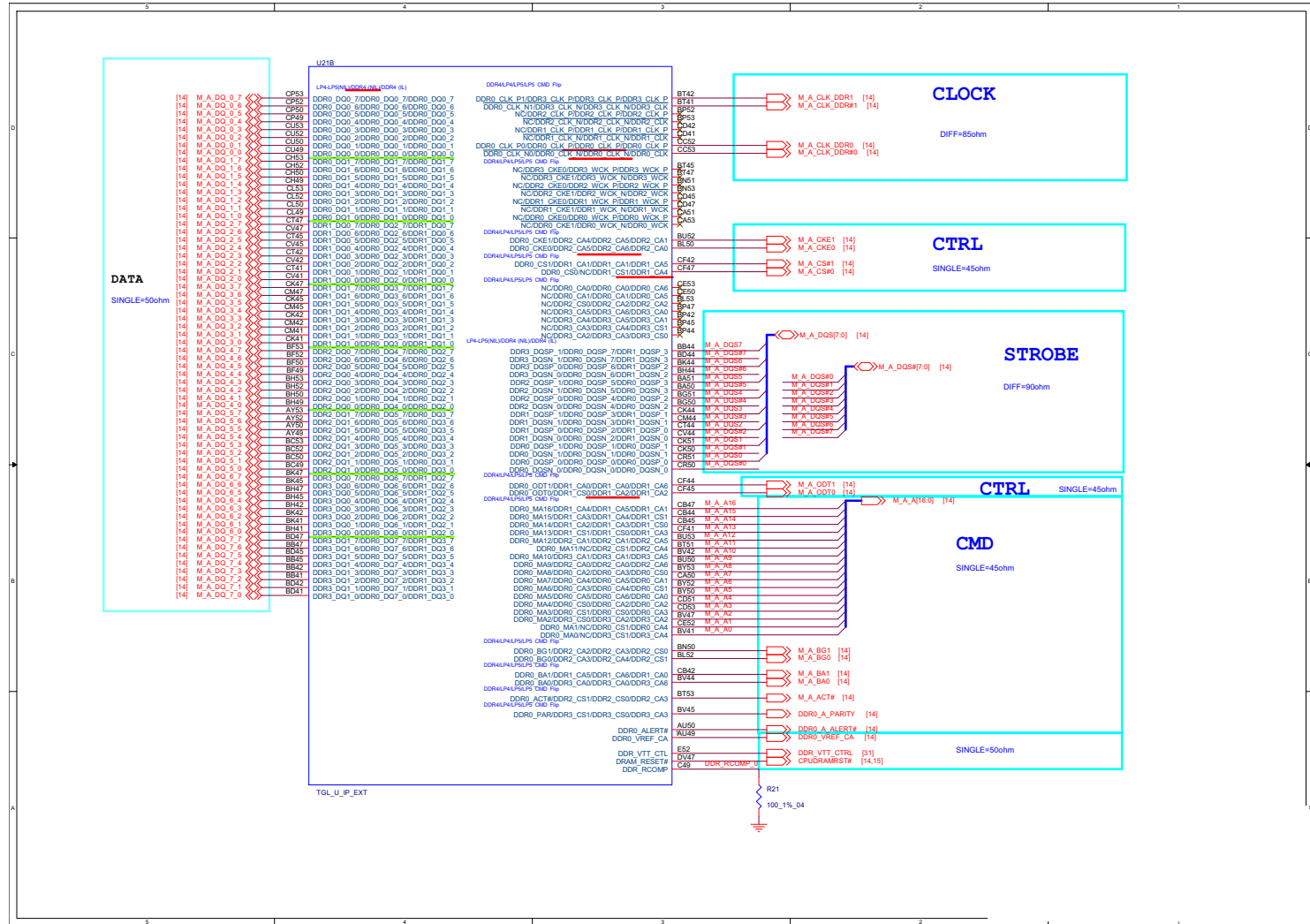


Sheet 2 of 47
Processor 1/12

B.Schematic Diagrams

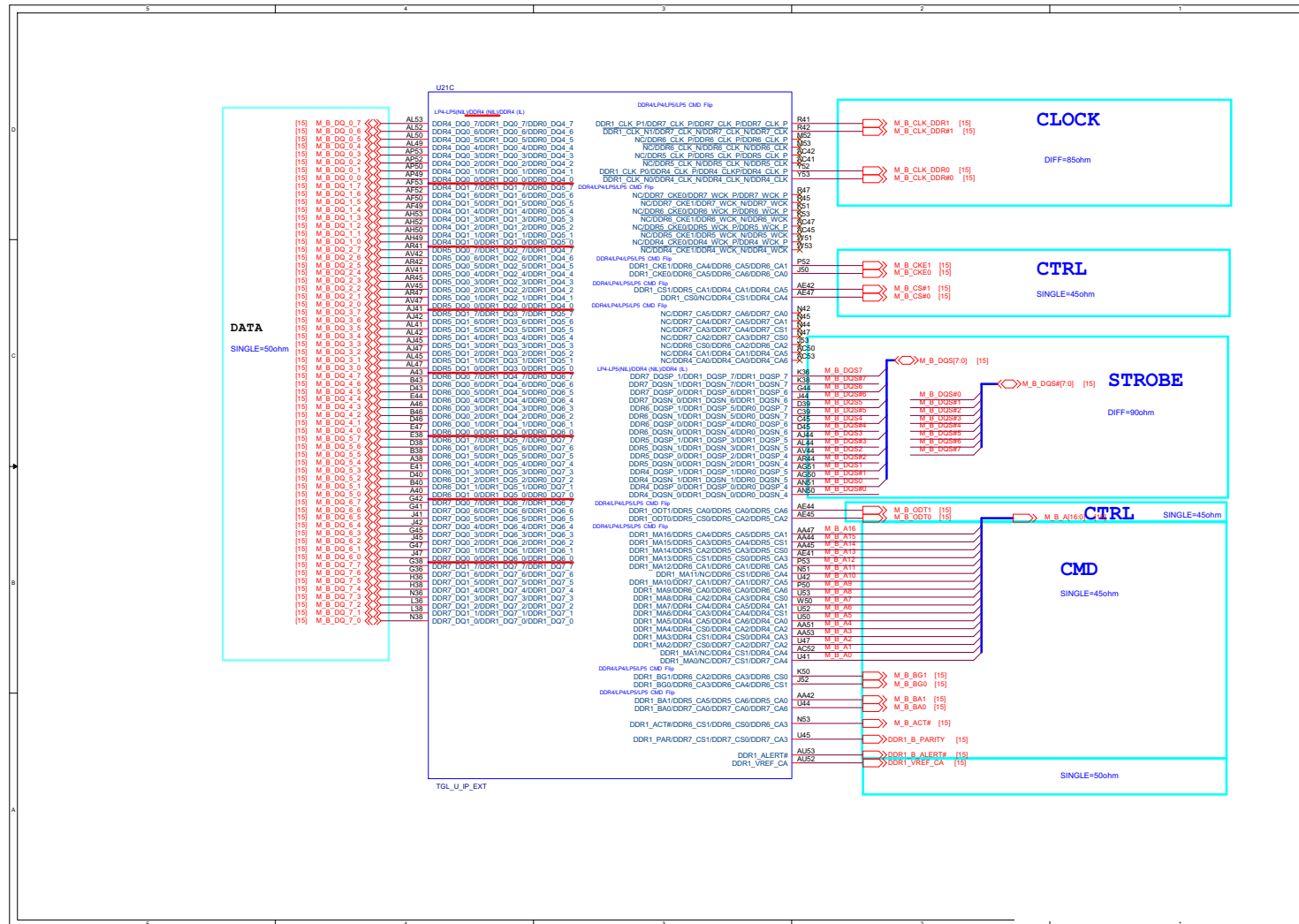
Processor 2/12

Sheet 3 of 47
Processor 2/12

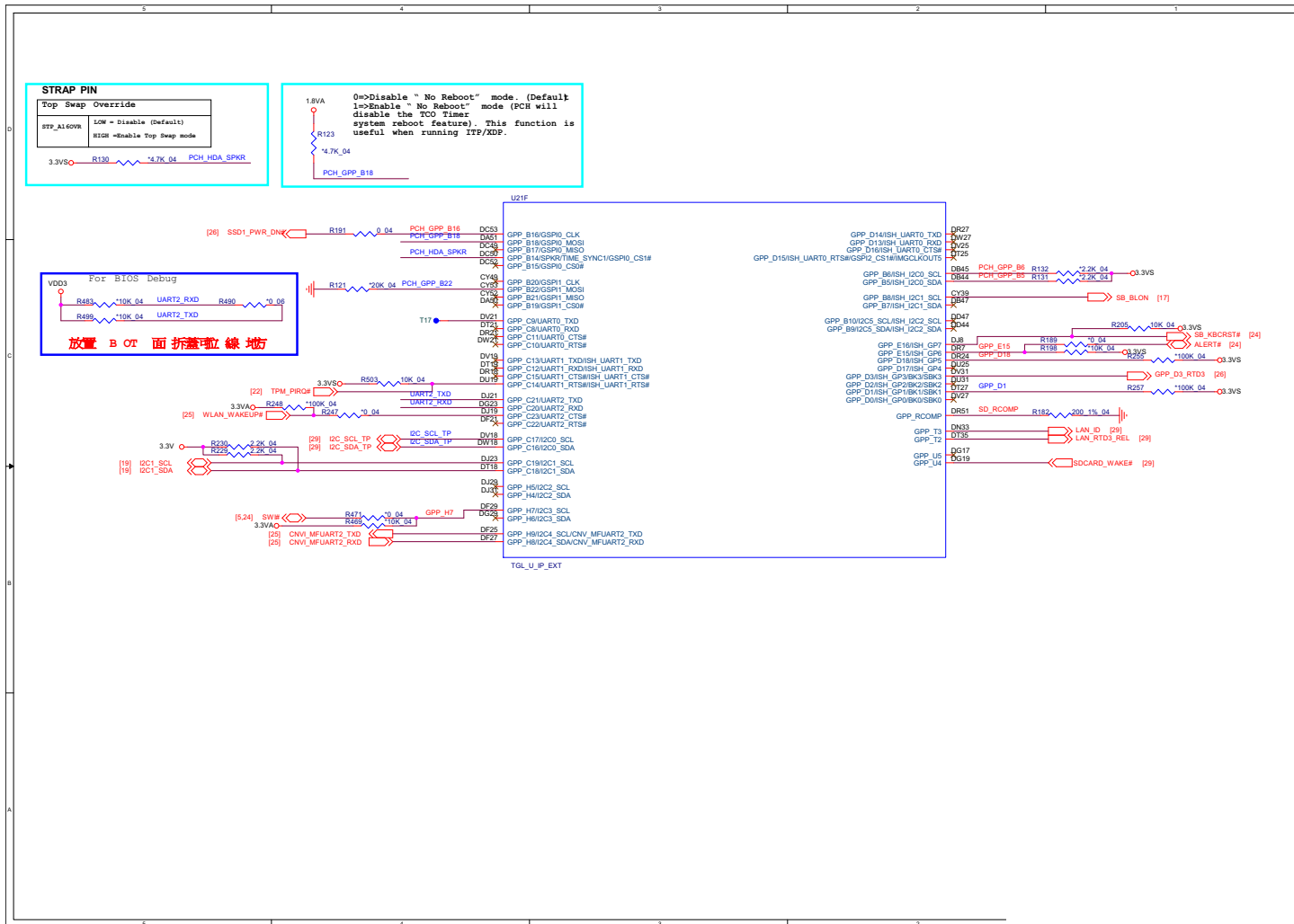


Processor 3/12

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Processor 3/12



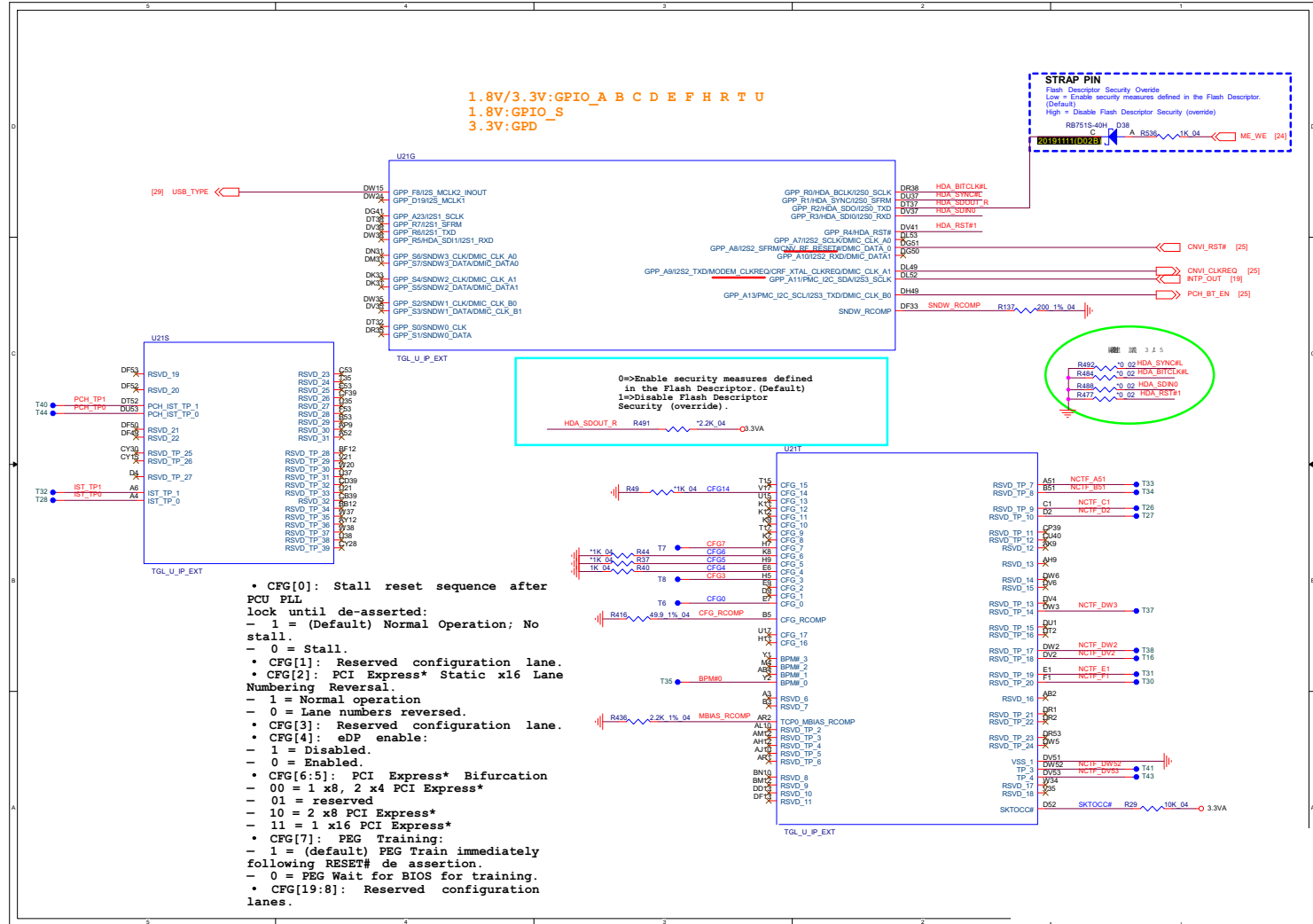
Processor 5/12



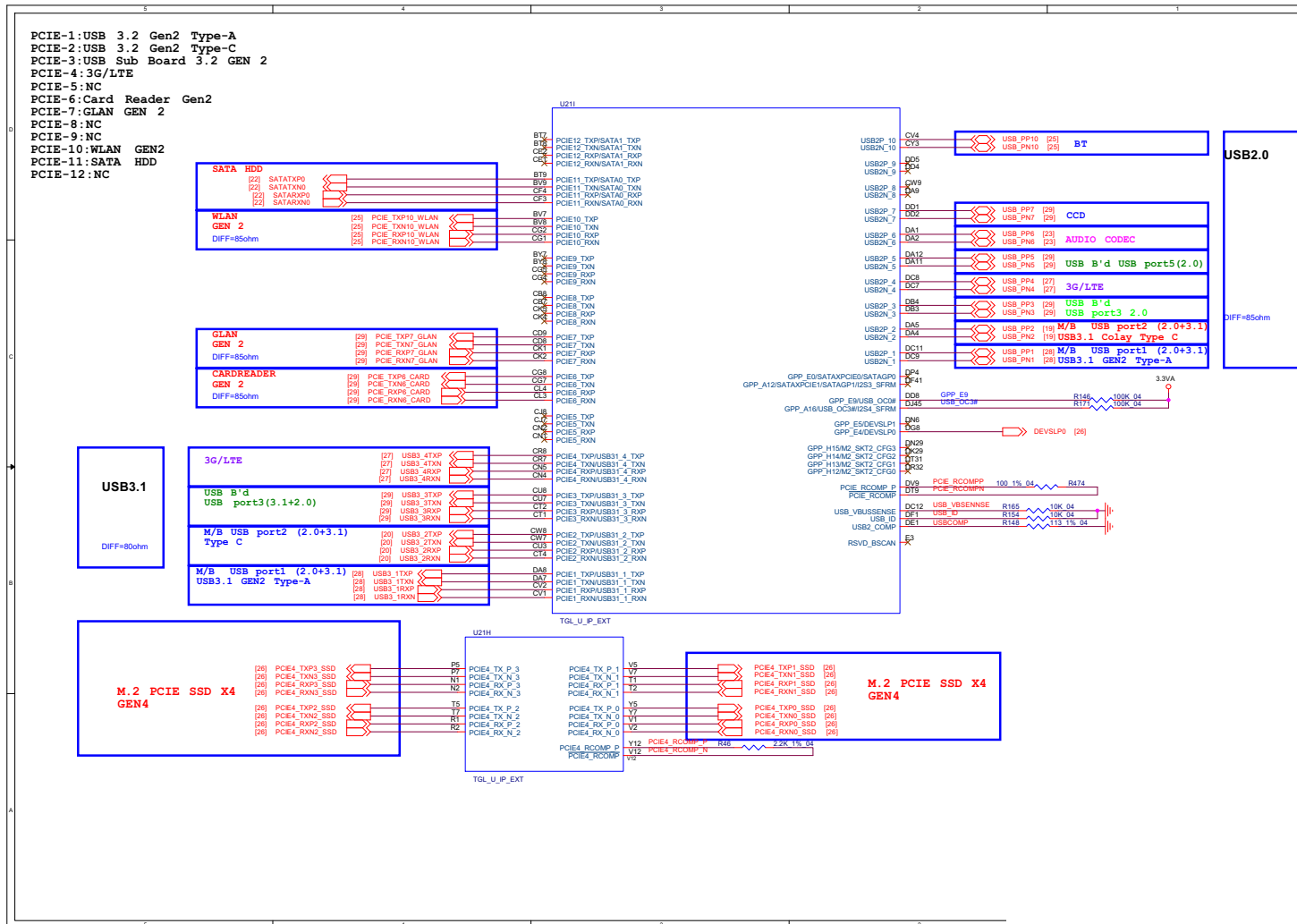
Sheet 6 of 47
Processor 5/12

Processor 6/12

Sheet 7 of 47
Processor 6/12



Processor 7/12

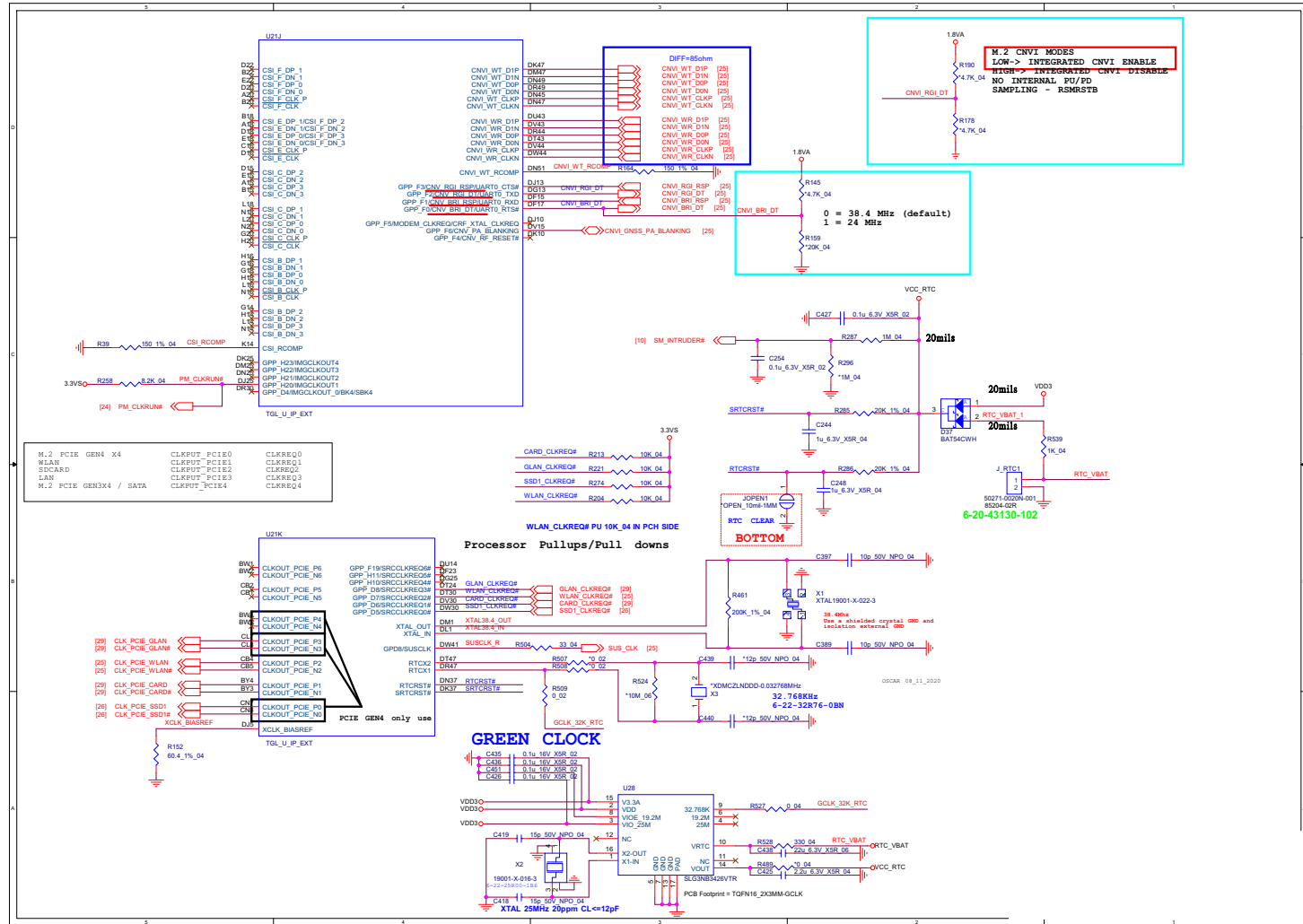


Sheet 8 of 47
Processor 7/12

B.Schematic Diagrams

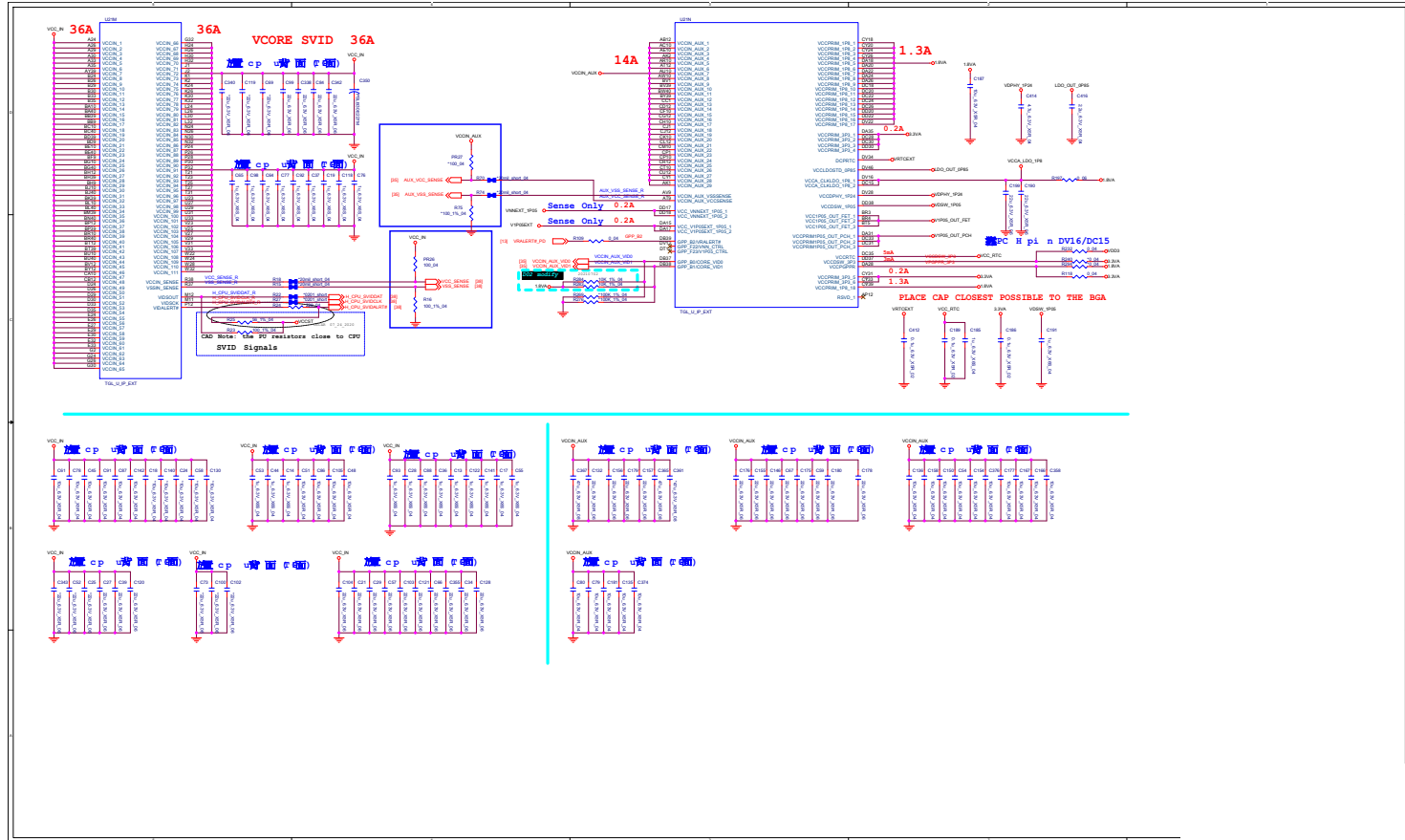
Processor 8/12

Sheet 9 of 47
Processor 8/12

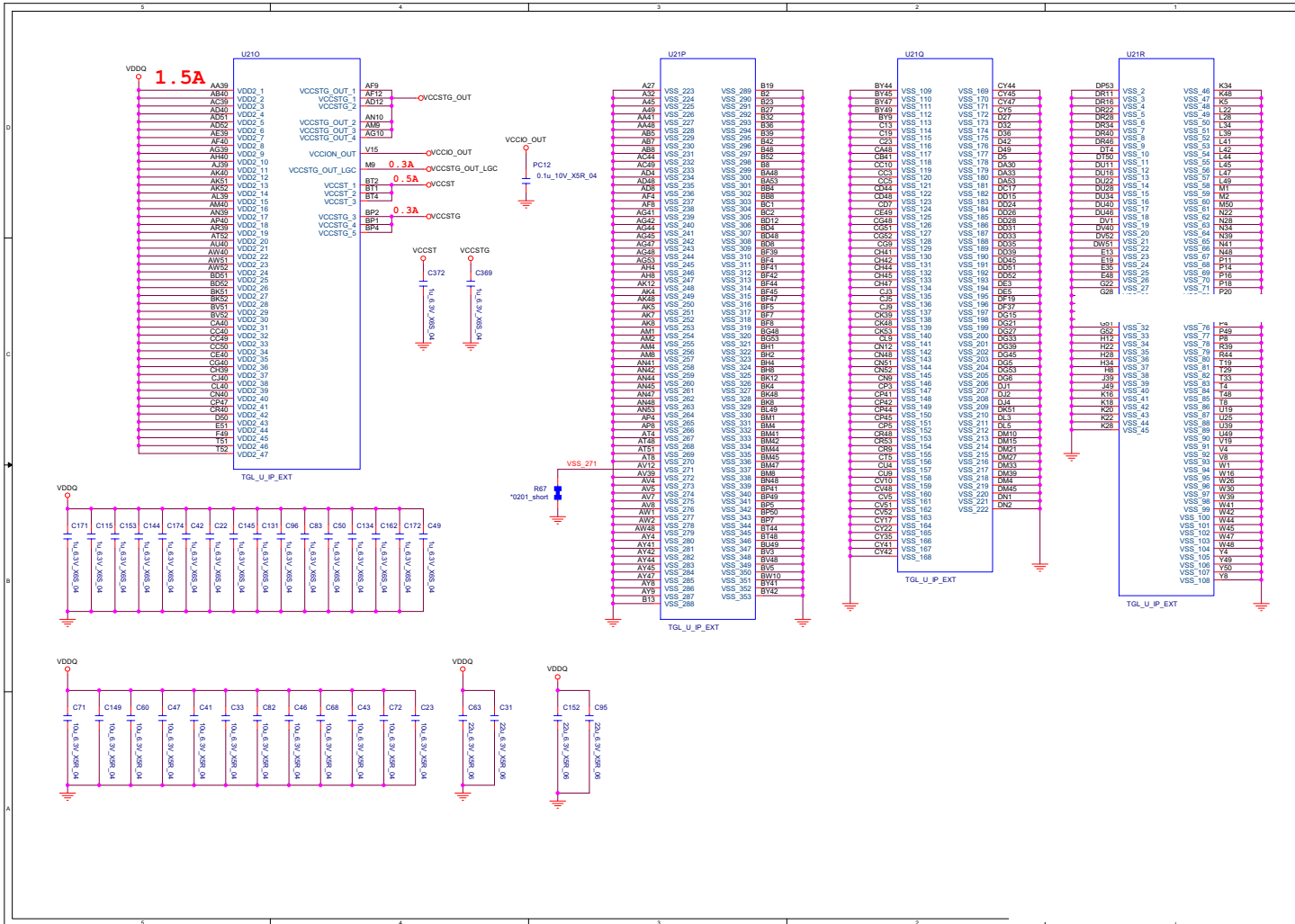


Schematic Diagrams

Processor 10/12



Processor 11/12

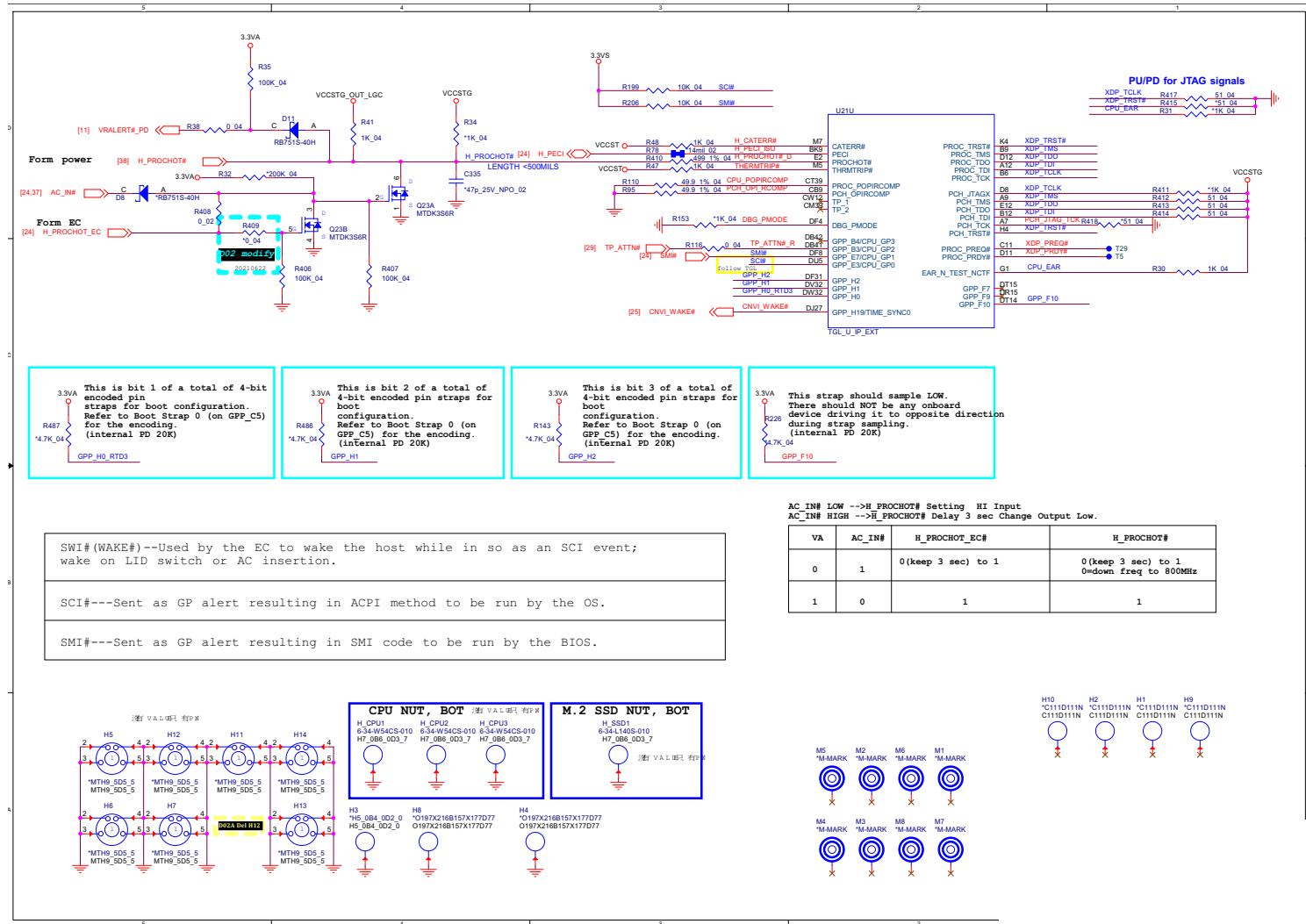


Sheet 12 of 47
Processor 11/12

B.Schematic Diagrams

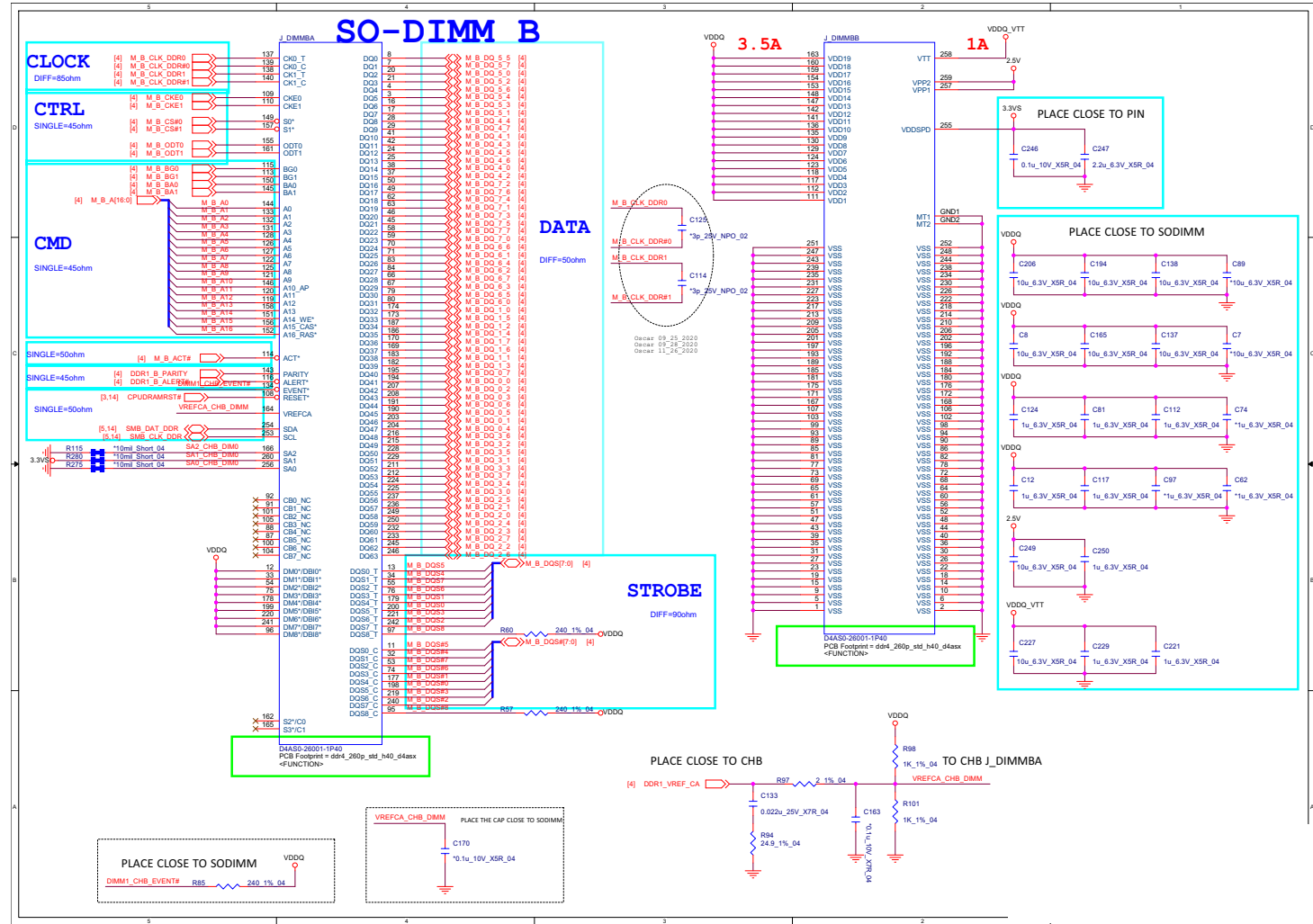
Processor 12/12

Sheet 13 of 47
Processor 12/12

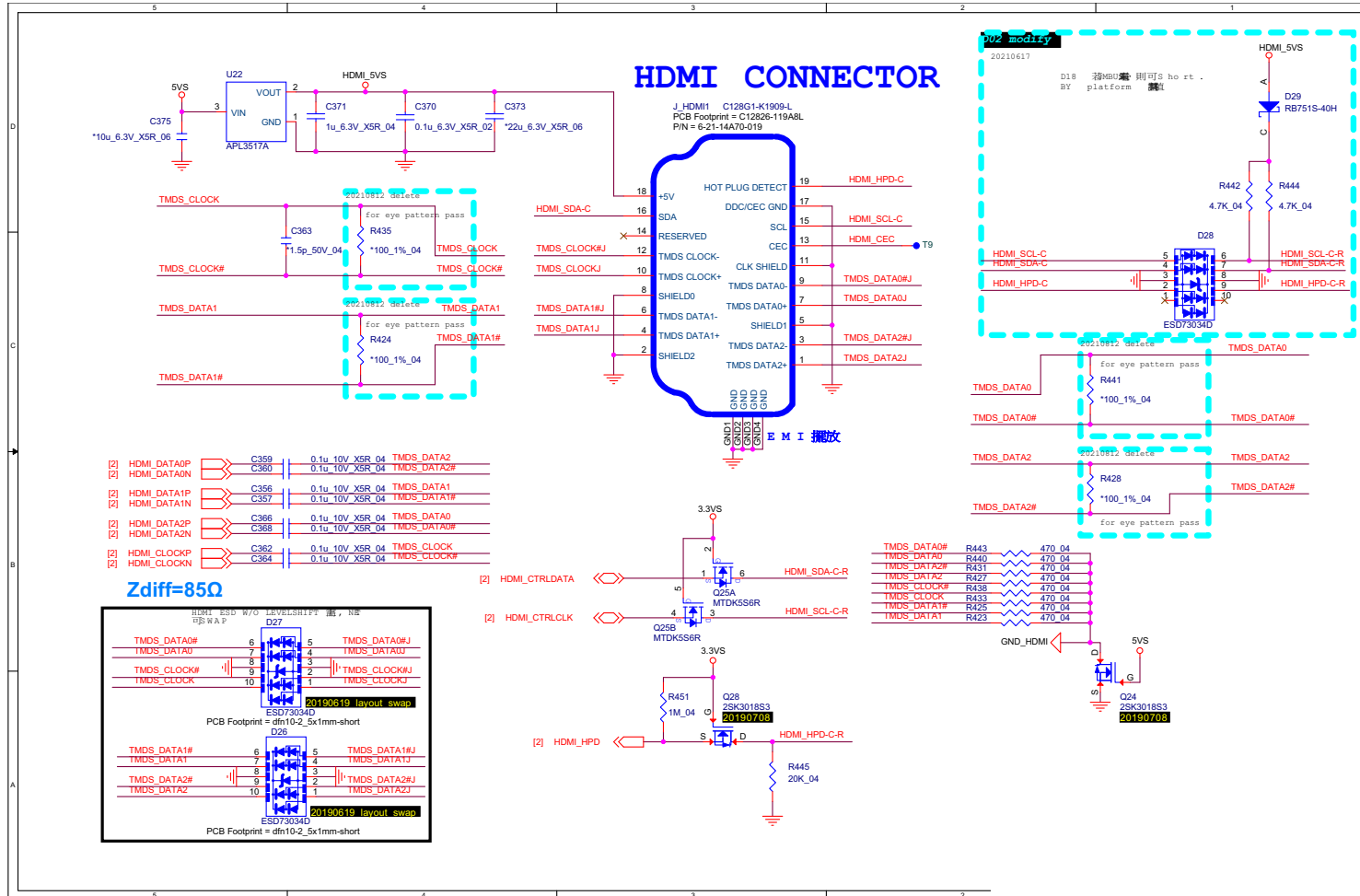


DDR4 SO-DIMM_B

Sheet 15 of 47
DDR4 SO-DIMM_B



HDMI

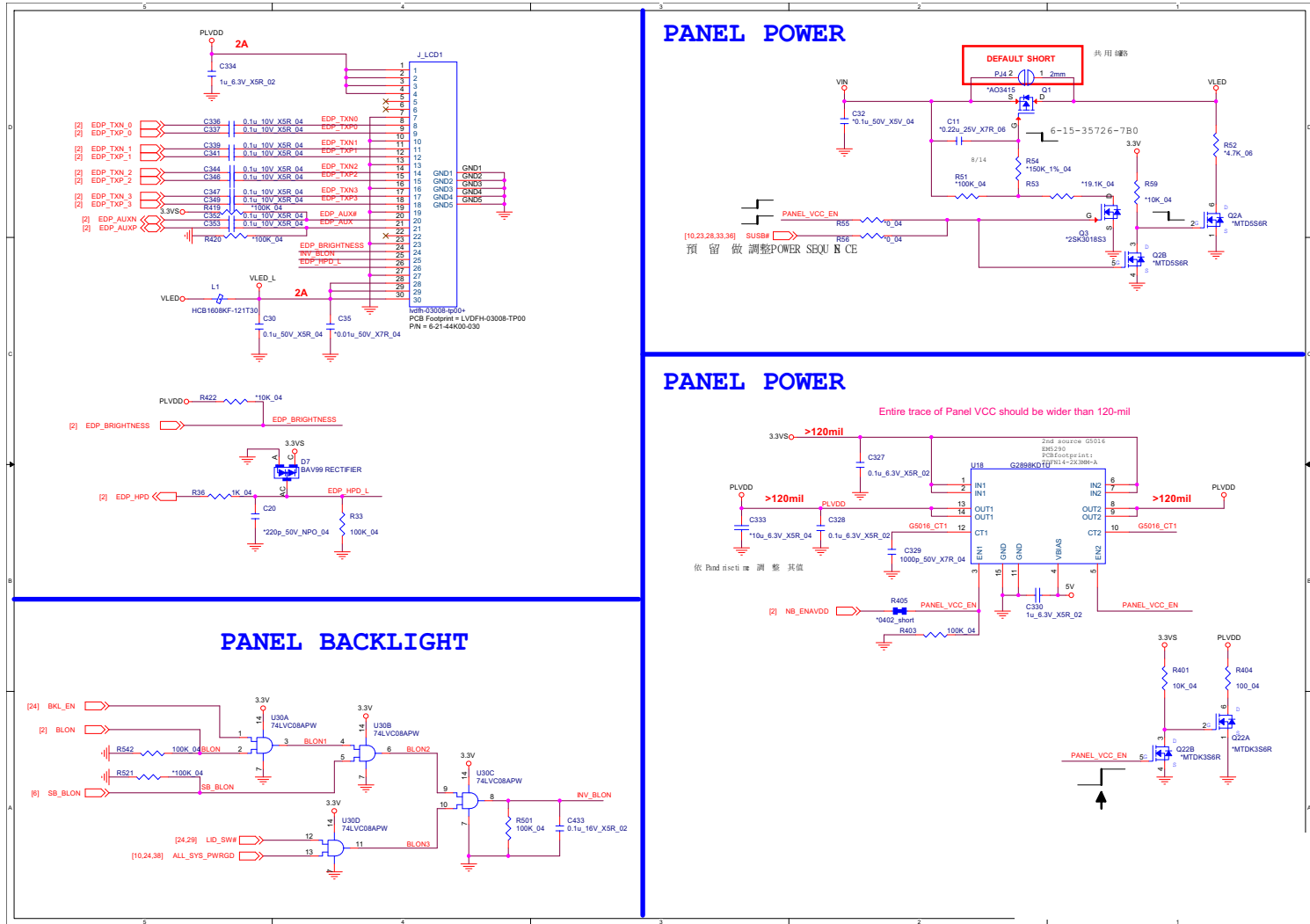


Sheet 16 of 47
HDMI

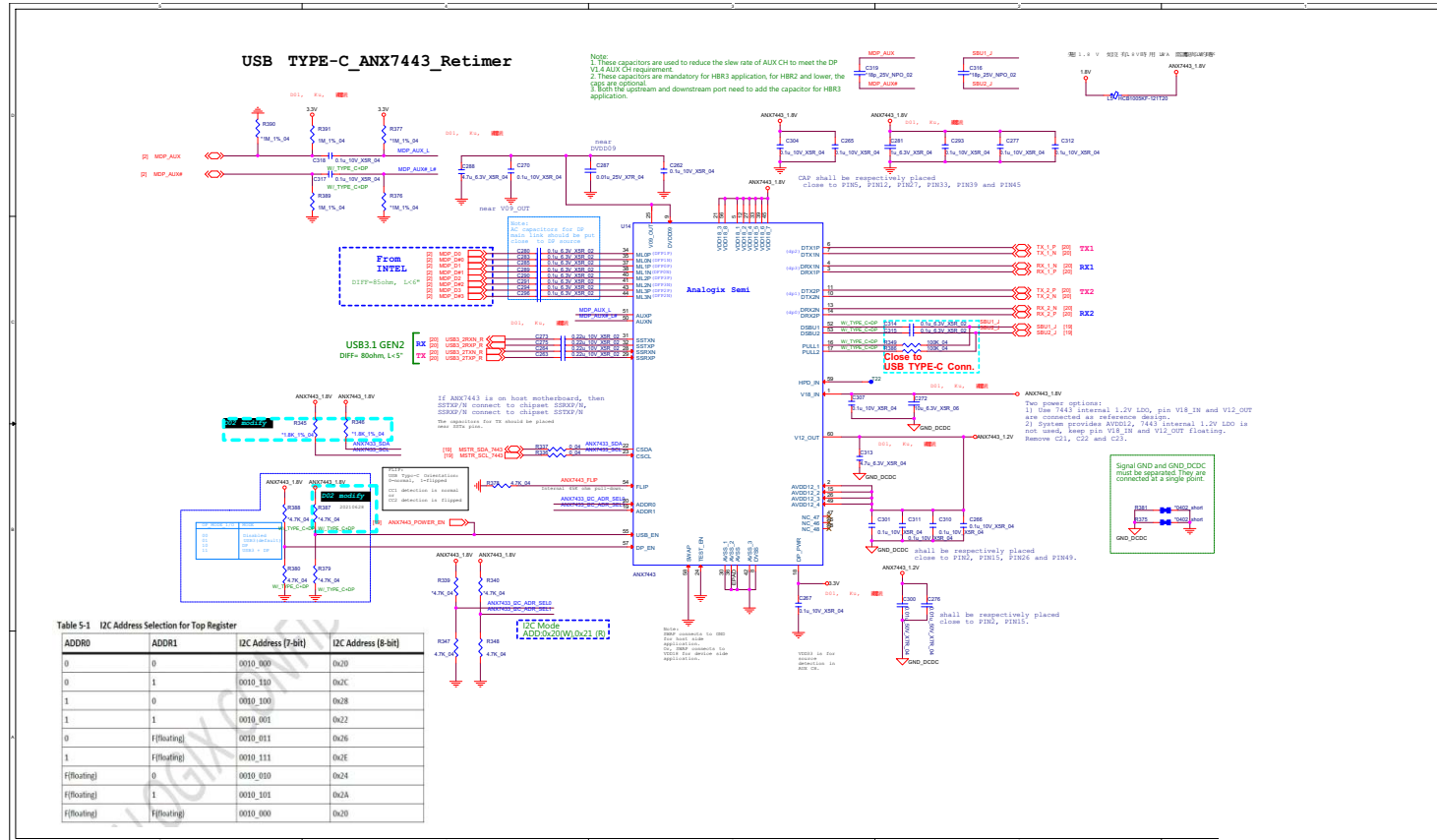
Schematic Diagrams

Panel

Sheet 17 of 47
Panel



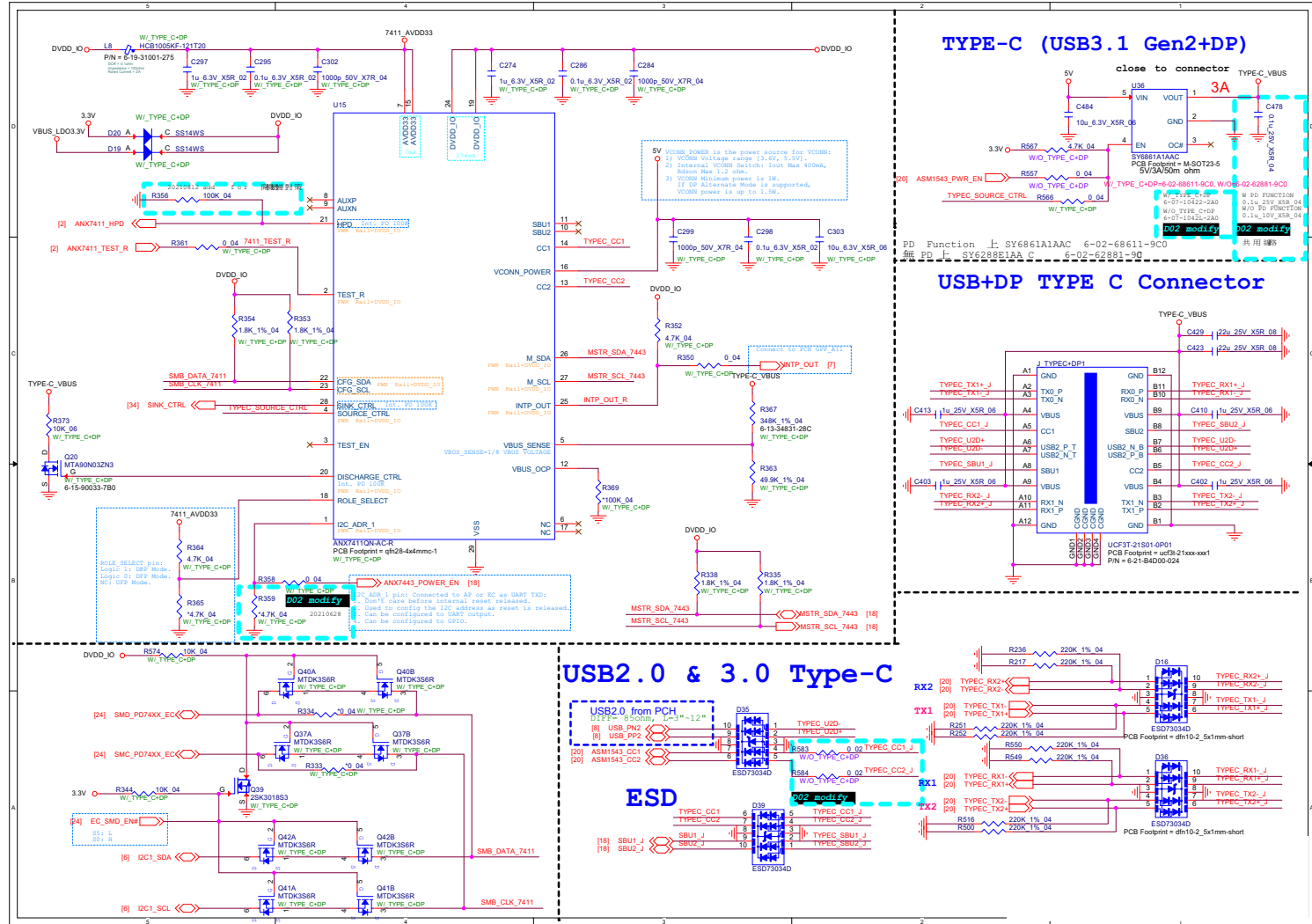
USB Type-C ANX7443



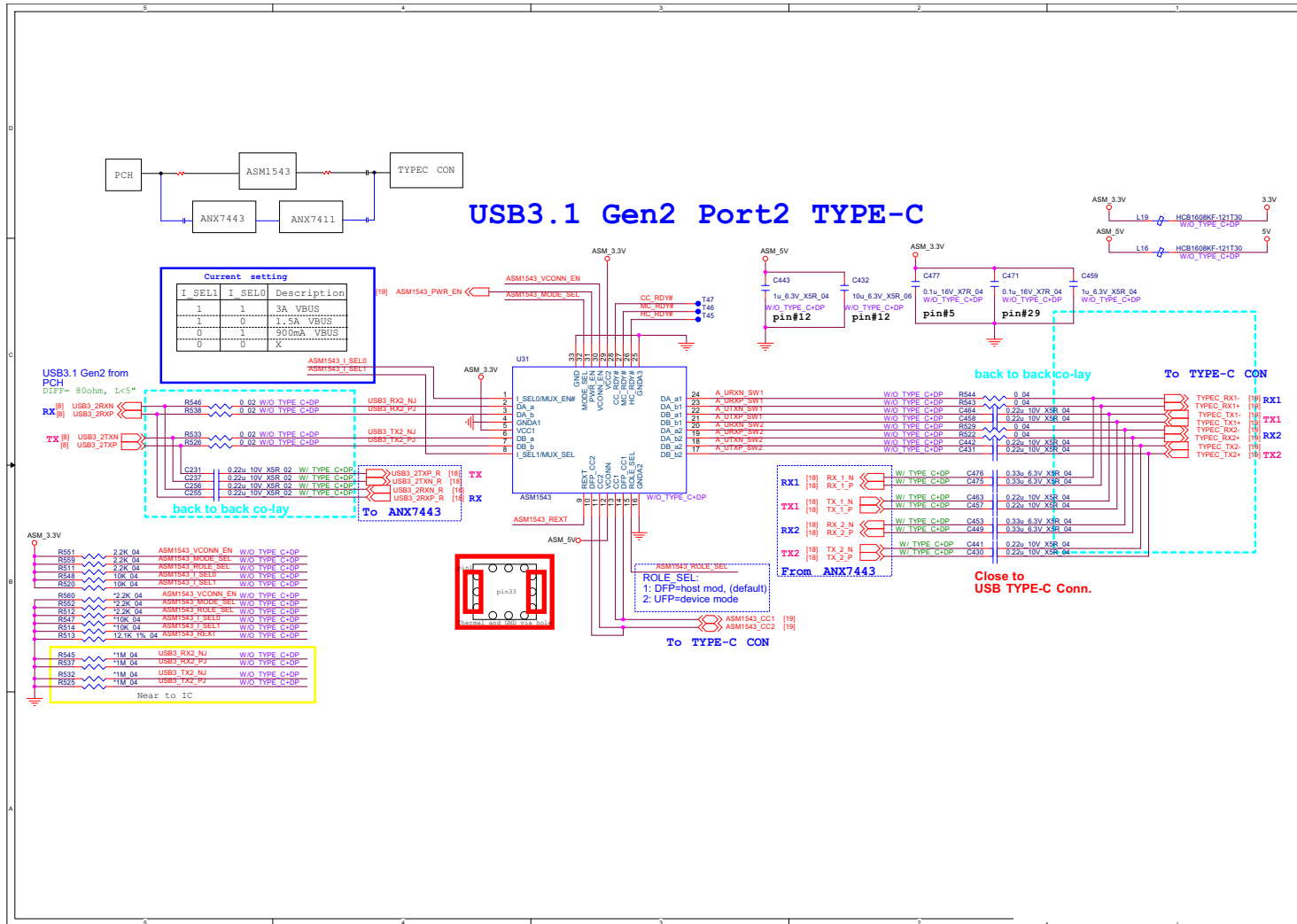
Sheet 18 of 47
 USB Type-C
 ANX7443

ANX7411, Type-C

Sheet 19 of 47
ANX7411, Type-C



ASM1543

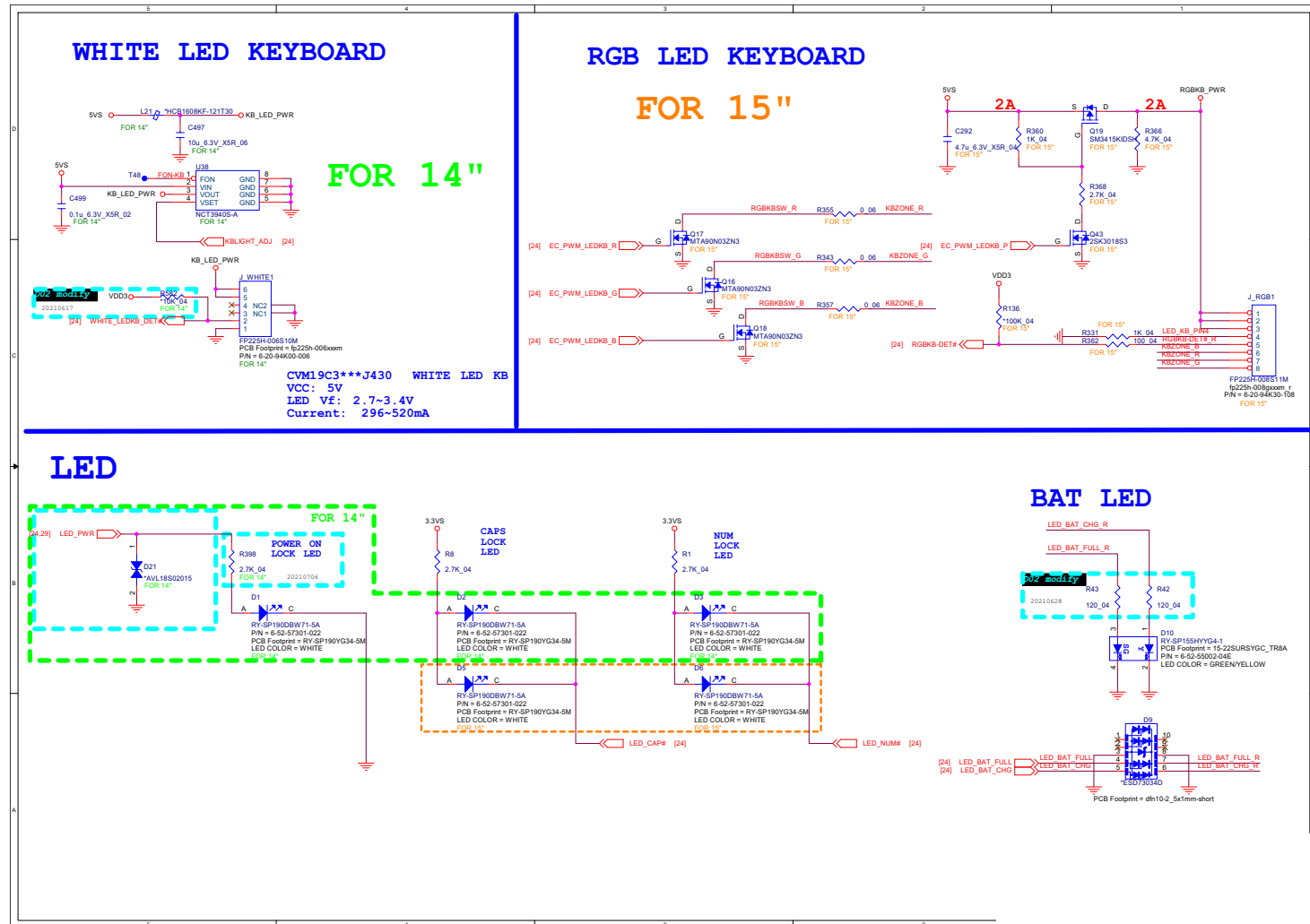


Sheet 20 of 47
ASM1543

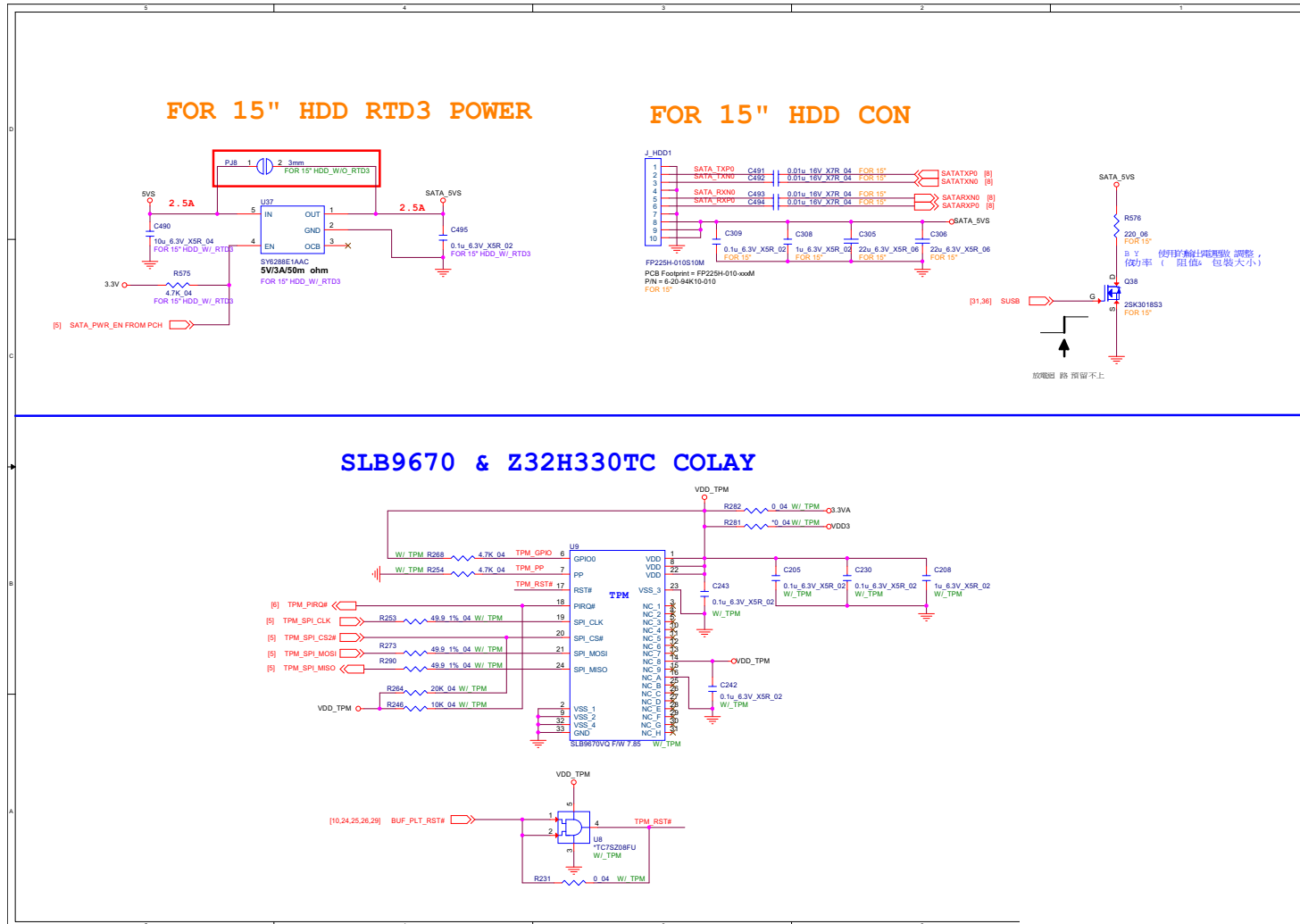
Schematic Diagrams

LED KB, LED

Sheet 21 of 47
LED KB, LED



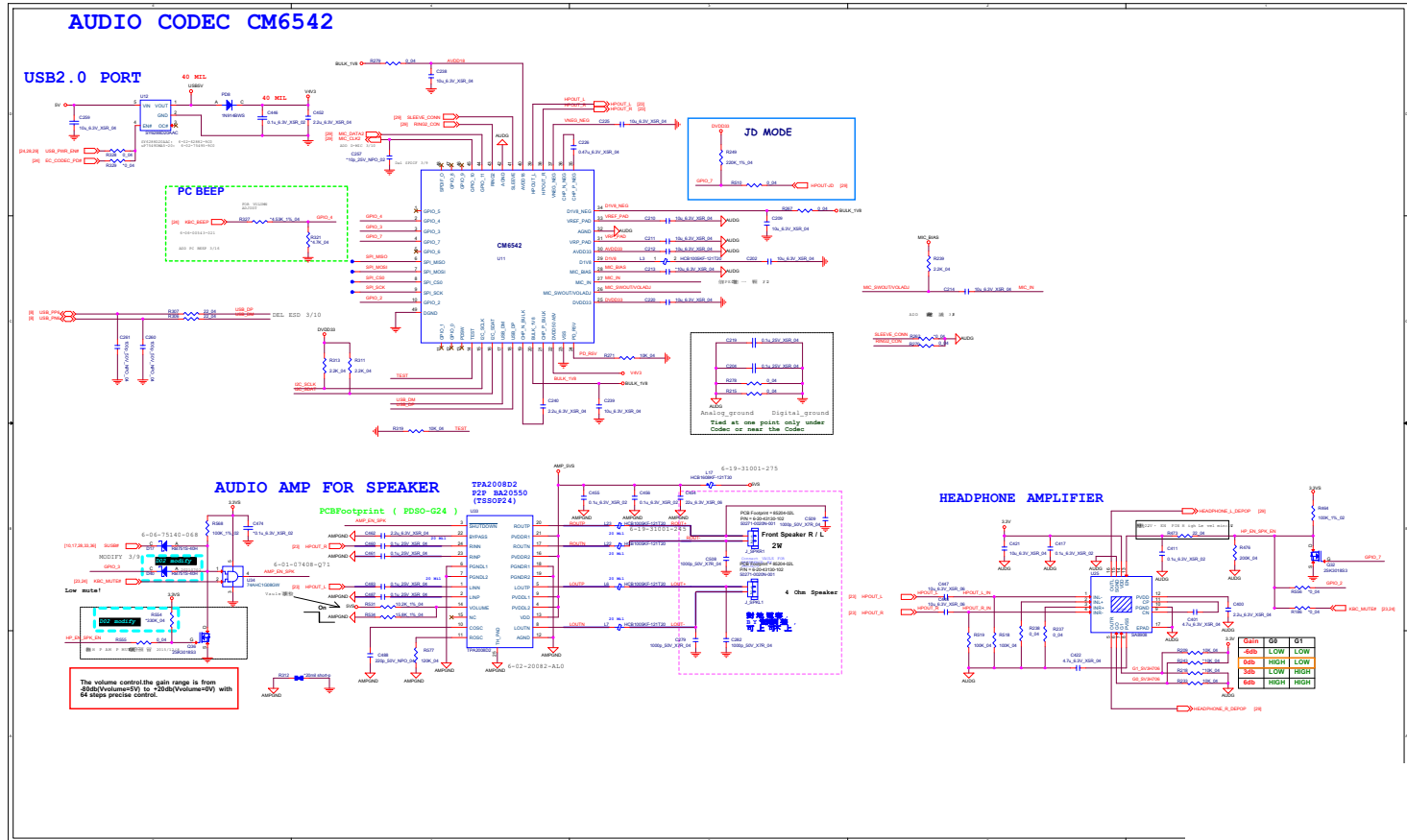
SATA HDD, TPM



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SATA HDD, TPM

B.Schematic Diagrams

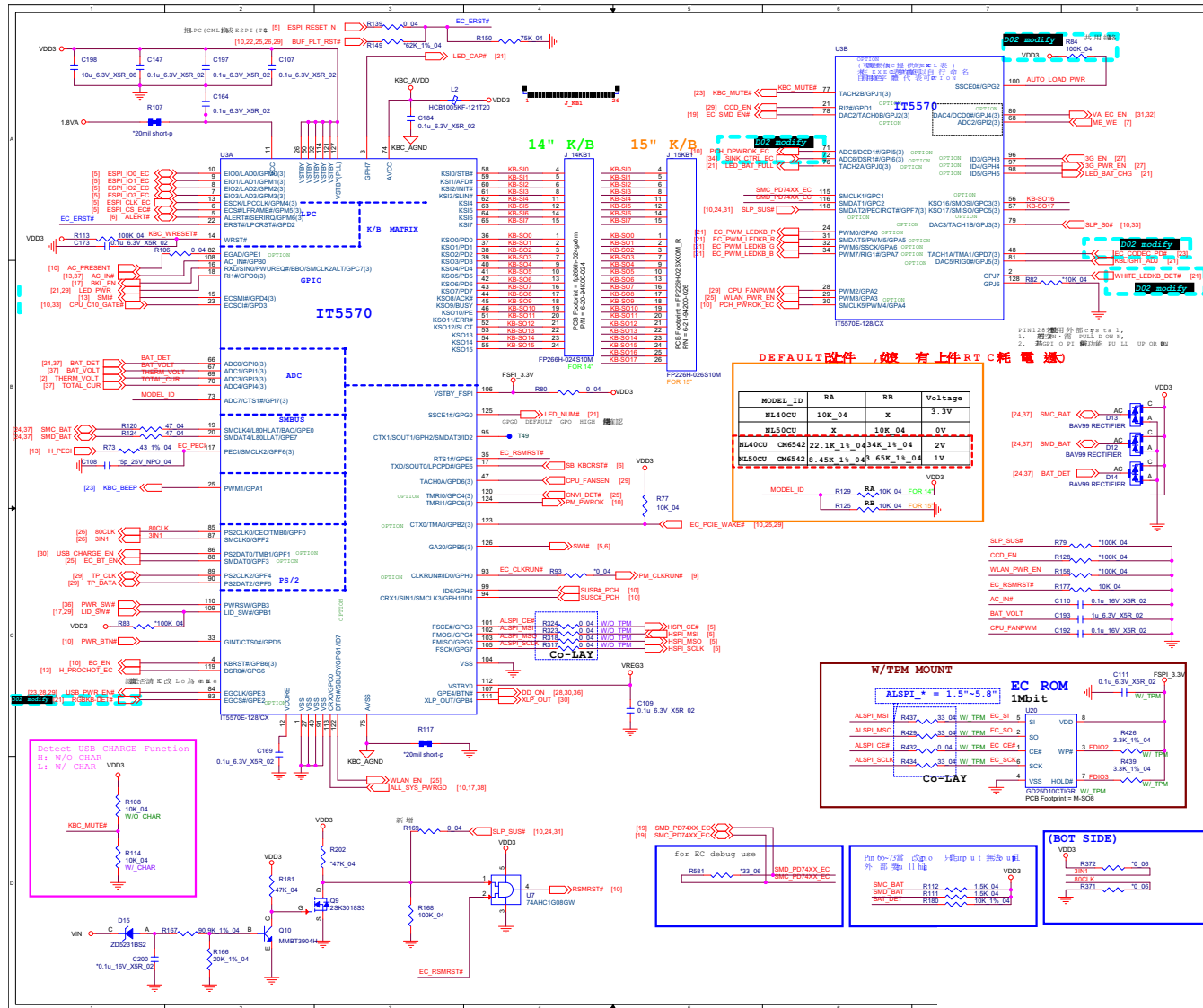
Audio Codec



Sheet 23 of 47
Audio Codec

B.Schematic Diagrams

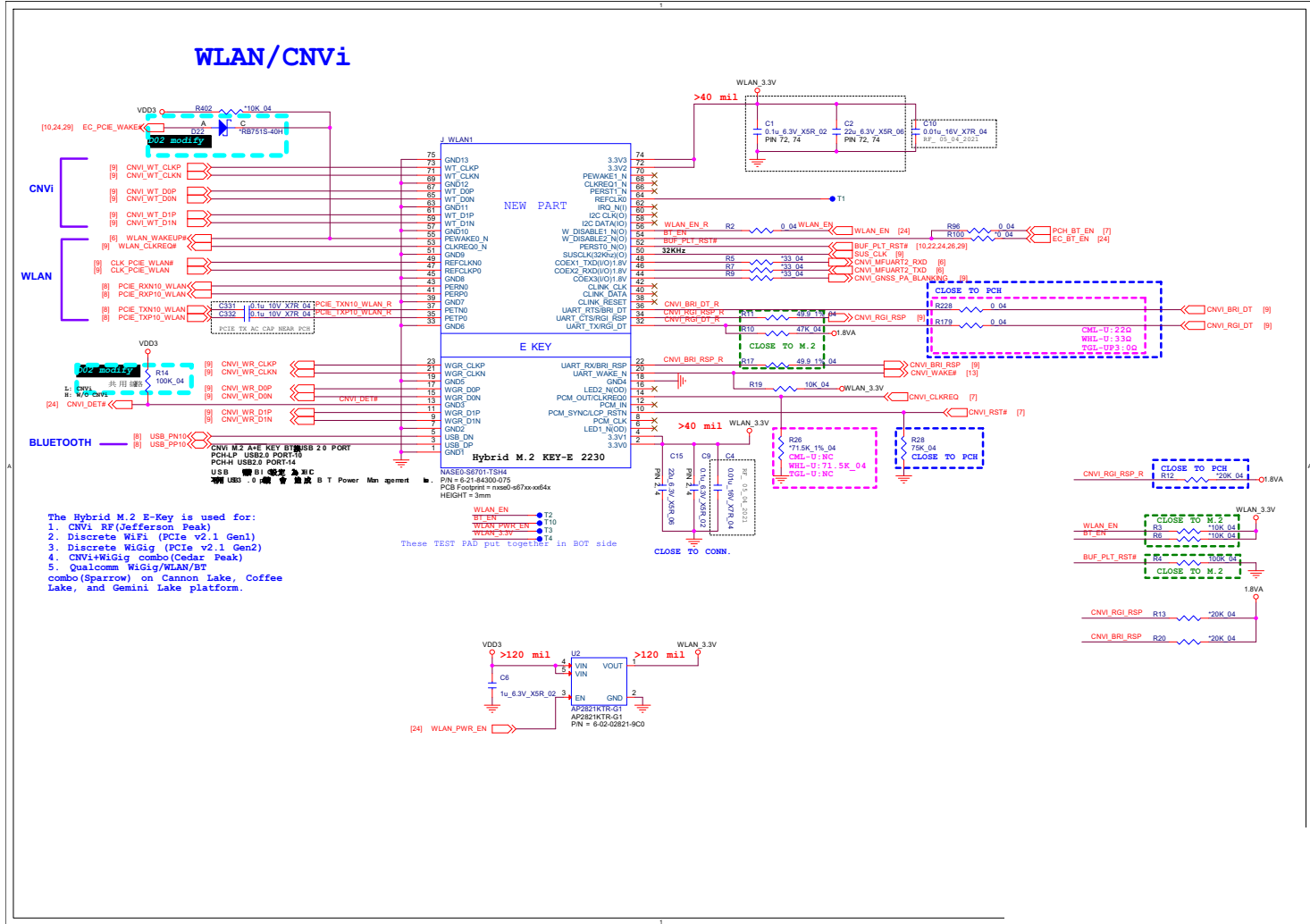
KBC ITE IT5570



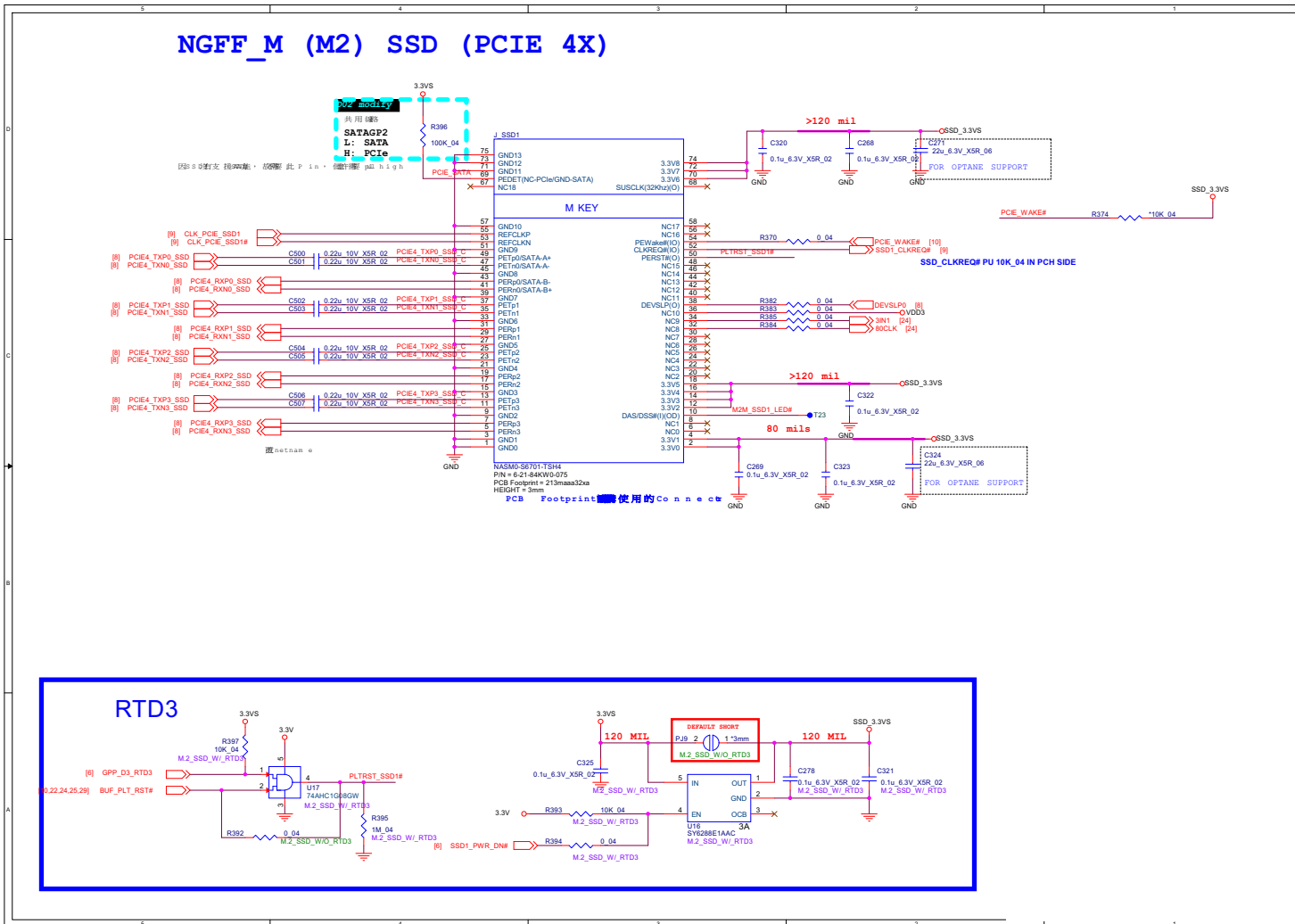
Sheet 24 of 47
KBC ITE IT5570

WLAN

Sheet 25 of 47
WLAN



M Key PCIe SSD

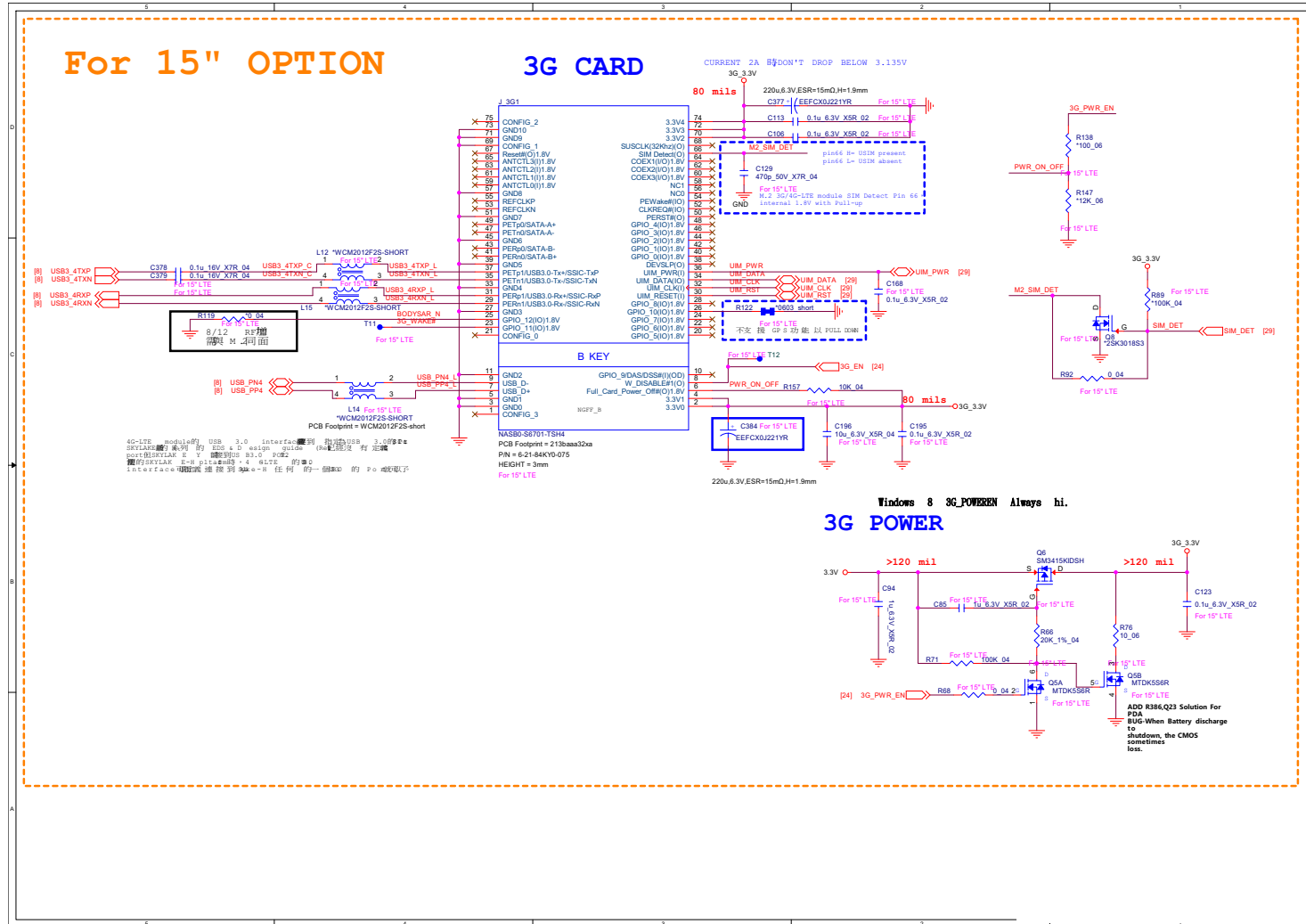


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M Key PCIe SSD

B.Schematic Diagrams

3G/LTE

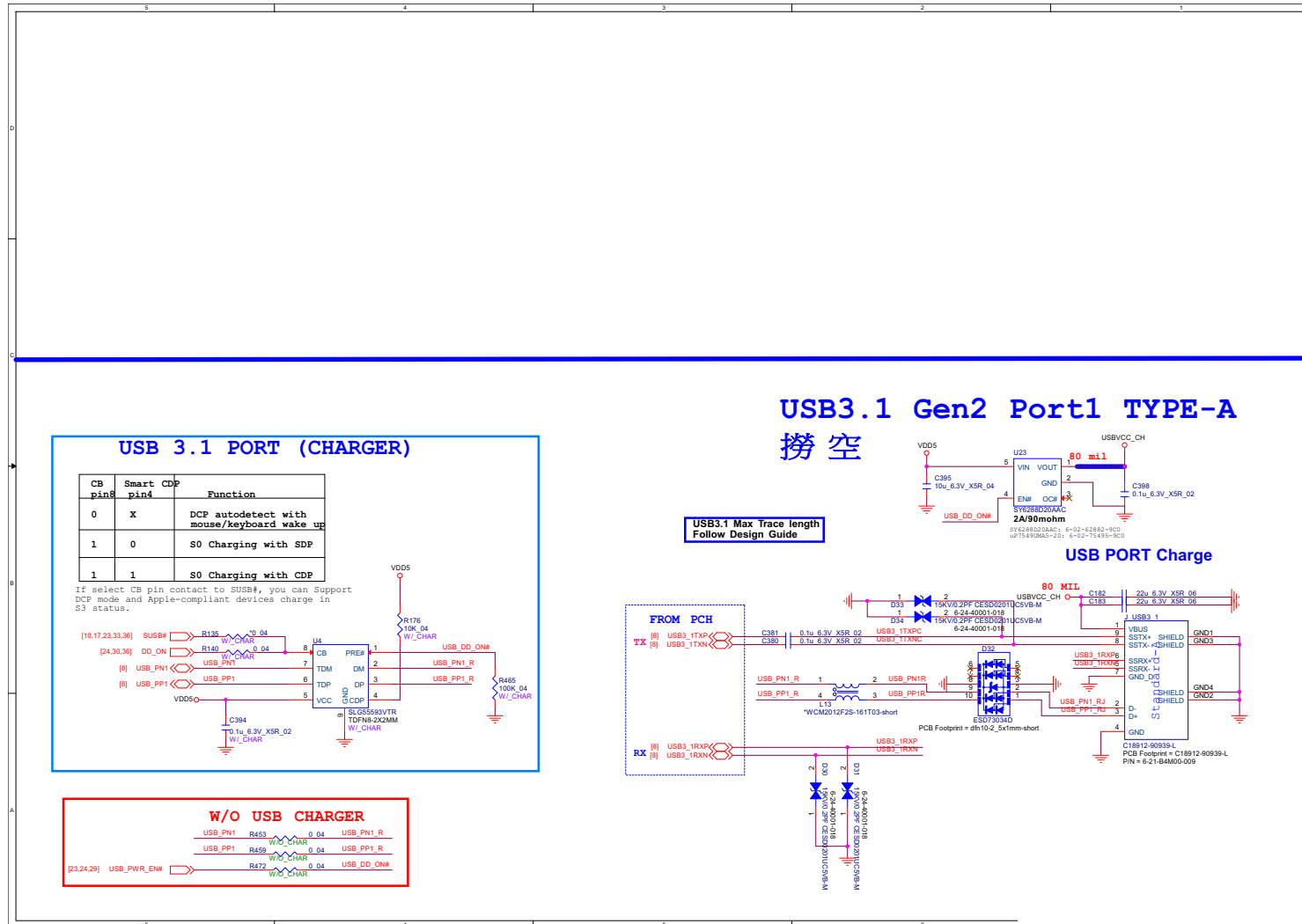
Sheet 27 of 47
3G/LTE



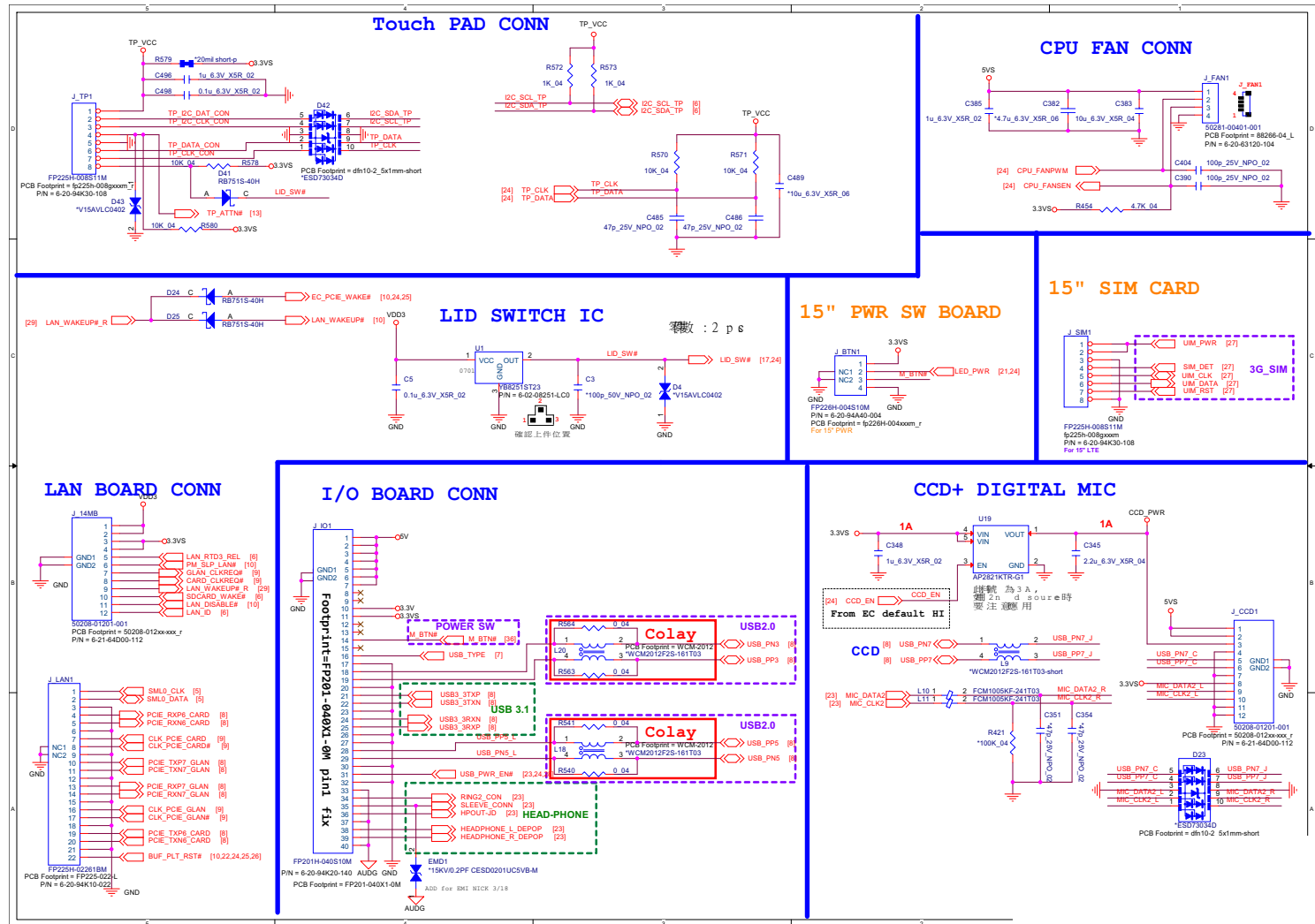
USB Type-A

Sheet 28 of 47
USB Type-A

B.Schematic Diagrams



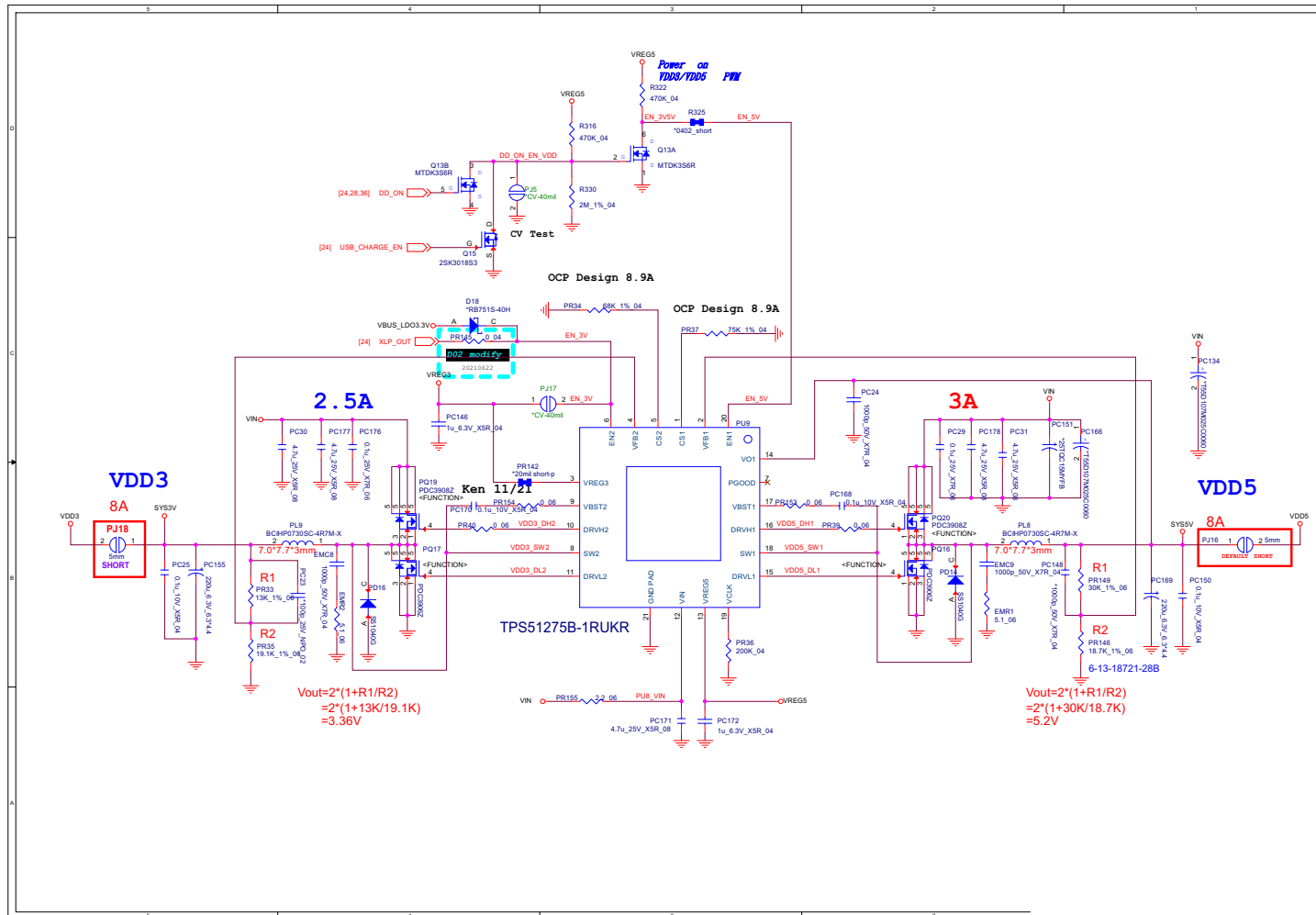
Conn, CCD, Fan, TP



B.Schematic Diagrams

Sheet 29 of 47
Conn, CCD, Fan, TP

VDD3, VDD5

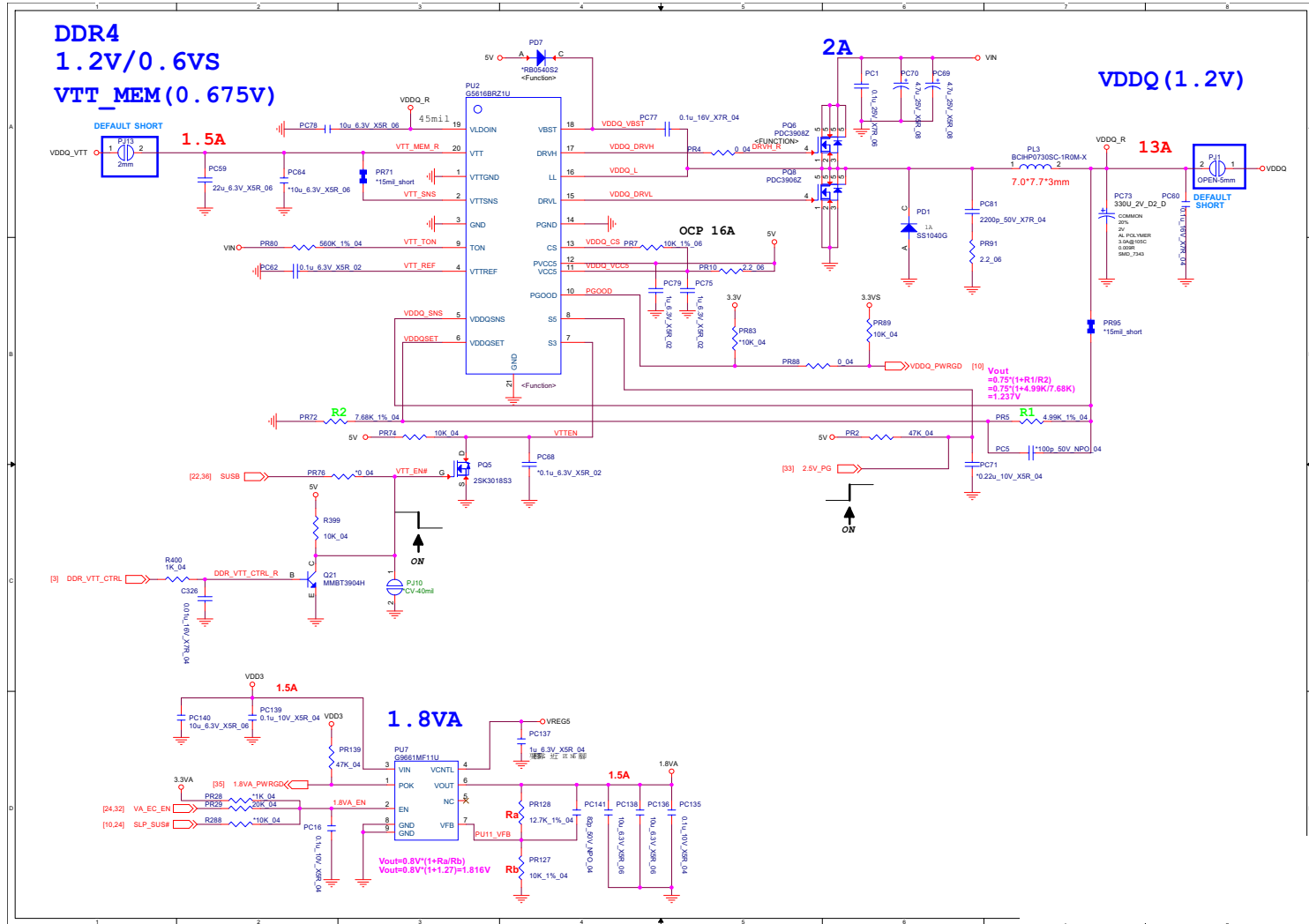


Sheet 30 of 47
VDD3, VDD5

B.Schematic Diagrams

Schematic Diagrams

VDDQ, VDDQ_VTT, 1.8VA



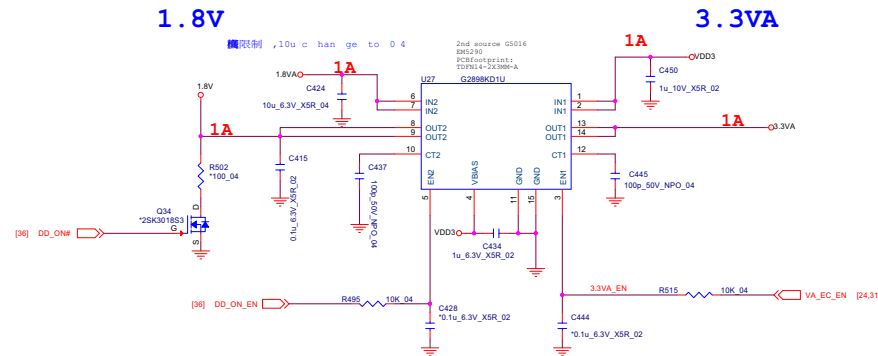
B.Schematic Diagrams

Sheet 31 of 47
VDDQ, VDDQ_VTT,
1.8VA

3.3VA, 1.8V

W/ TPM			W/O TPM			
C316	0.1u	6.3V_X5R_02	6-07-10421-2K0			
C317	0.1u	6.3V_X5R_02	6-07-10421-2K0	R404	100K_04	6-14-1043B-01B
C321	0.1u	6.3V_X5R_02	6-07-10421-2K0	R599	0_04	6-14-0003B-01B
C327	0.1u	6.3V_X5R_02	6-07-10421-2K0	R600	0_04	6-14-0003B-01B
R271	0_04		6-14-0003B-01B	R601	0_04	6-14-0003B-01B
R414	15_1%_04		6-13-15R01-28C	R602	0_04	6-14-0003B-01B
R416	15_1%_04		6-13-15R01-28C	R253	0_04	6-14-0003B-01B
R417	15_1%_04		6-13-15R01-28C	R260	0_04	6-14-0003B-01B
R419	15_1%_04		6-13-15R01-28C	R261	0_04	6-14-0003B-01B
R415	15_1%_04		6-13-15R01-28C	R269	0_04	6-14-0003B-01B
R418	15_1%_04		6-13-15R01-28C			
R445	15_1%_04		6-13-15R01-28C			
R395	10K_04		6-14-1033B-01B			
R132	10_04		6-14-1003B-01B			
R143	10_04		6-14-1003B-01B			
R155	10_04		6-14-1003B-01B			
R156	10_04		6-14-1003B-01B			
R157	10_04		6-14-1003B-01B			
R446	10_04		6-14-1003B-01B			
C309	1u	6.3V_X5R_02	6-07-10511-2K0			
R389	4.7K_04		6-14-4723B-11B			
U10	SLB9670VQ		6-03-09670-030			
R255	3.3K_1%_04		6-13-33011-28B			
R274	3.3K_1%_04		6-13-33011-28B			
R254	33_04		6-14-3303B-11B			
R272	33_04		6-14-3303B-11B			
R273	33_04		6-14-3303B-11B			
U25	GD25D10BTIGR		6-04-02510-A91			
R390	4.7K_04		6-14-4723B-11B			

W/ USB CHARGER 3.1 TYPEA			W/O USB CHARGER 3.1 TYPEA			
C371^	0.1u	6.3V_X5R_02	6-07-10421-2K0	R199	0_04	6-14-0003B-01B
C379	0.1u	6.3V_X5R_02	6-07-10421-2K0	R200	0_04	6-14-0003B-01B
C364	10u	6.3V_X5R_04	6-07-10611-2A0	R472	0_04	6-14-0003B-01B
R462^	0_04		6-14-0003B-01B	R282	10K_04	6-14-1033B-01B
R470^	100K_04		6-14-1043B-11B			
R281	10K_04		6-14-1033B-01B			
R473^	10K_04		6-14-1033B-01B			
C380	22u	6.3V_X5R_06	6-07-22611-2G0			
C382	22u	6.3V_X5R_06	6-07-22611-2G0			
D4	ESD73034D		6-24-40001-022			
D5	ESD73034D		6-24-40001-022			
U22^	SLG55593VTR		6-02-55593-9D0			
U20	uP7549UMA5-20		6-02-75495-9C0			
J USB3	1 2UB3M04-023201F		6-21-B4M00-009			
L9	WCM2012F2S-900T04		6-19-41001-287			
C150	0.22u	10V_X5R_04	6-07-2242L-2A0			
C151	0.22u	10V_X5R_04	6-07-2242L-2A0			
C488	0.33u	6.3V_X5R_04	6-07-33421-2A0			
C489	0.33u	6.3V_X5R_04	6-07-33421-2A0			

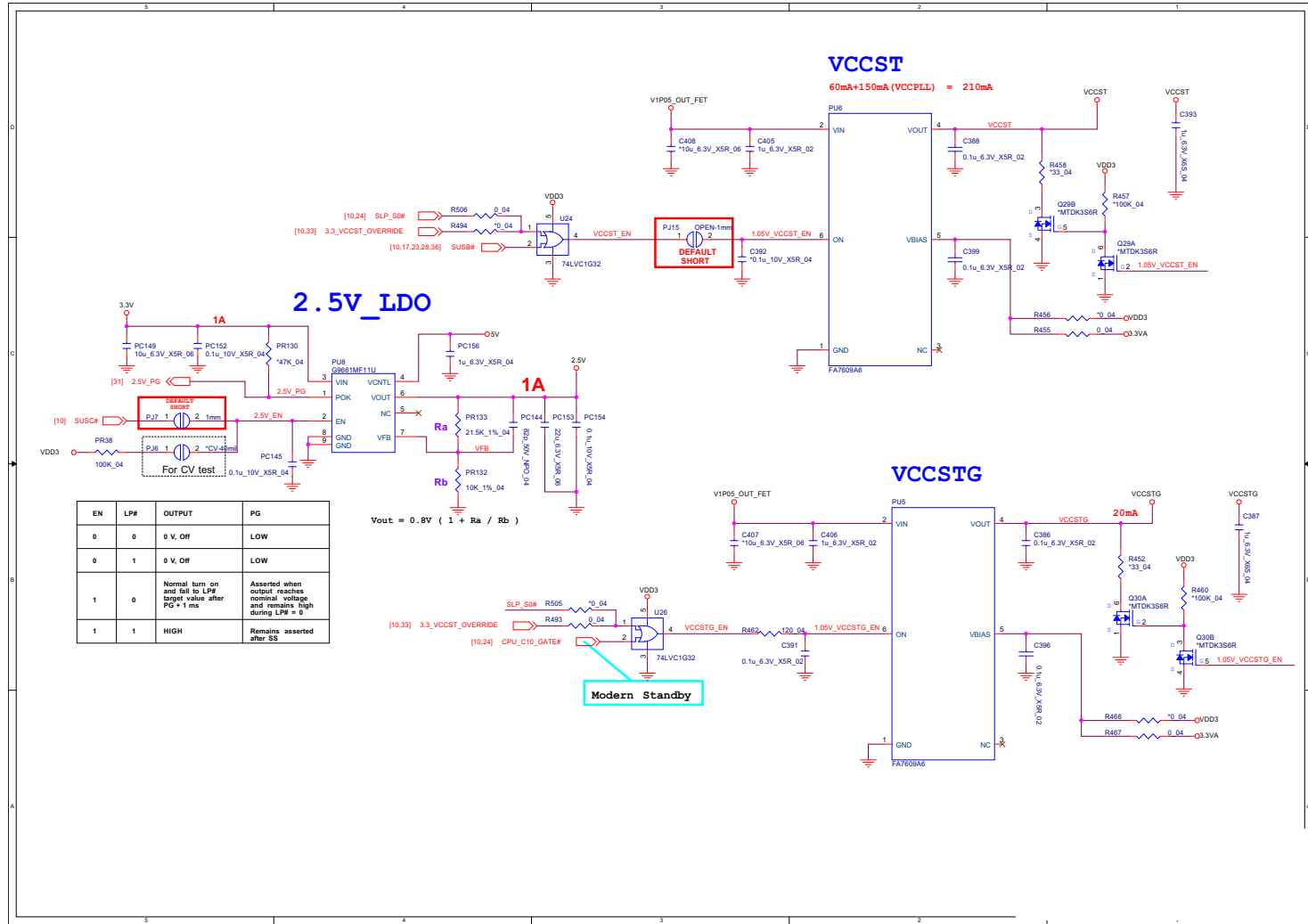


Sheet 32 of 47
3.3VA, 1.8V

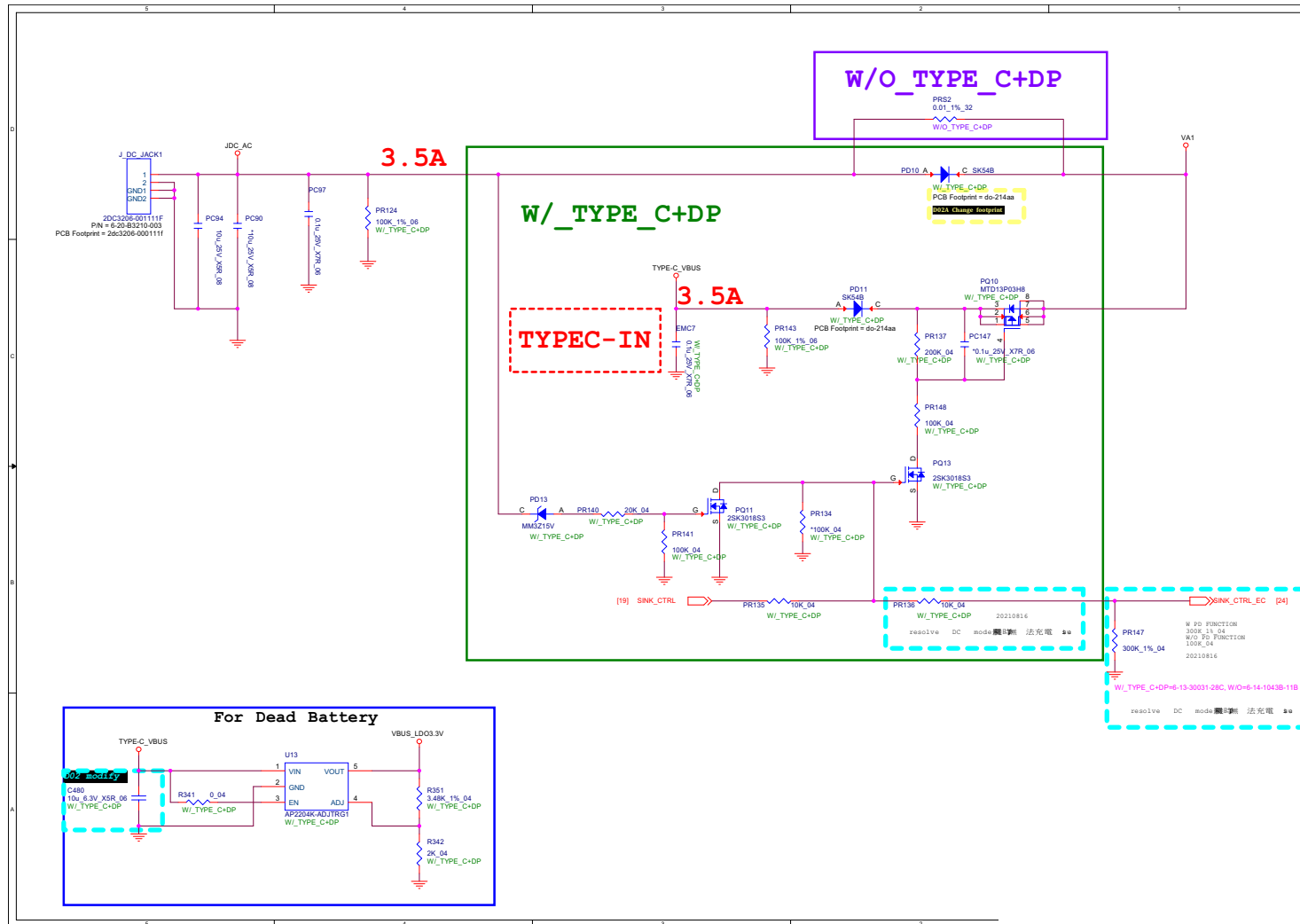
Schematic Diagrams

2.5V, VCCST, VCCSTG

Sheet 33 of 47
2.5V, VCCST,
VCCSTG



Power PD Function

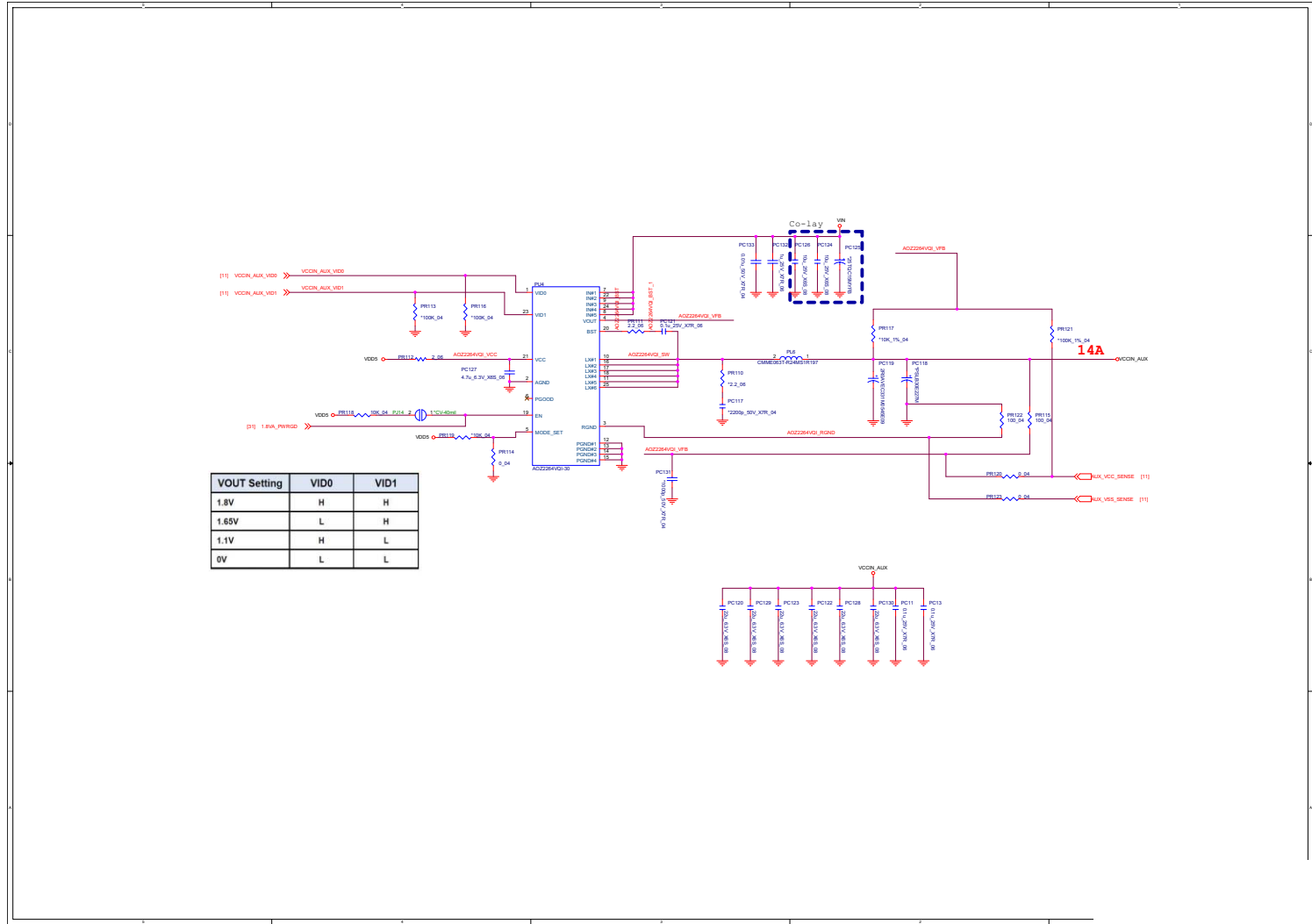


Sheet 34 of 47
Power PD Function

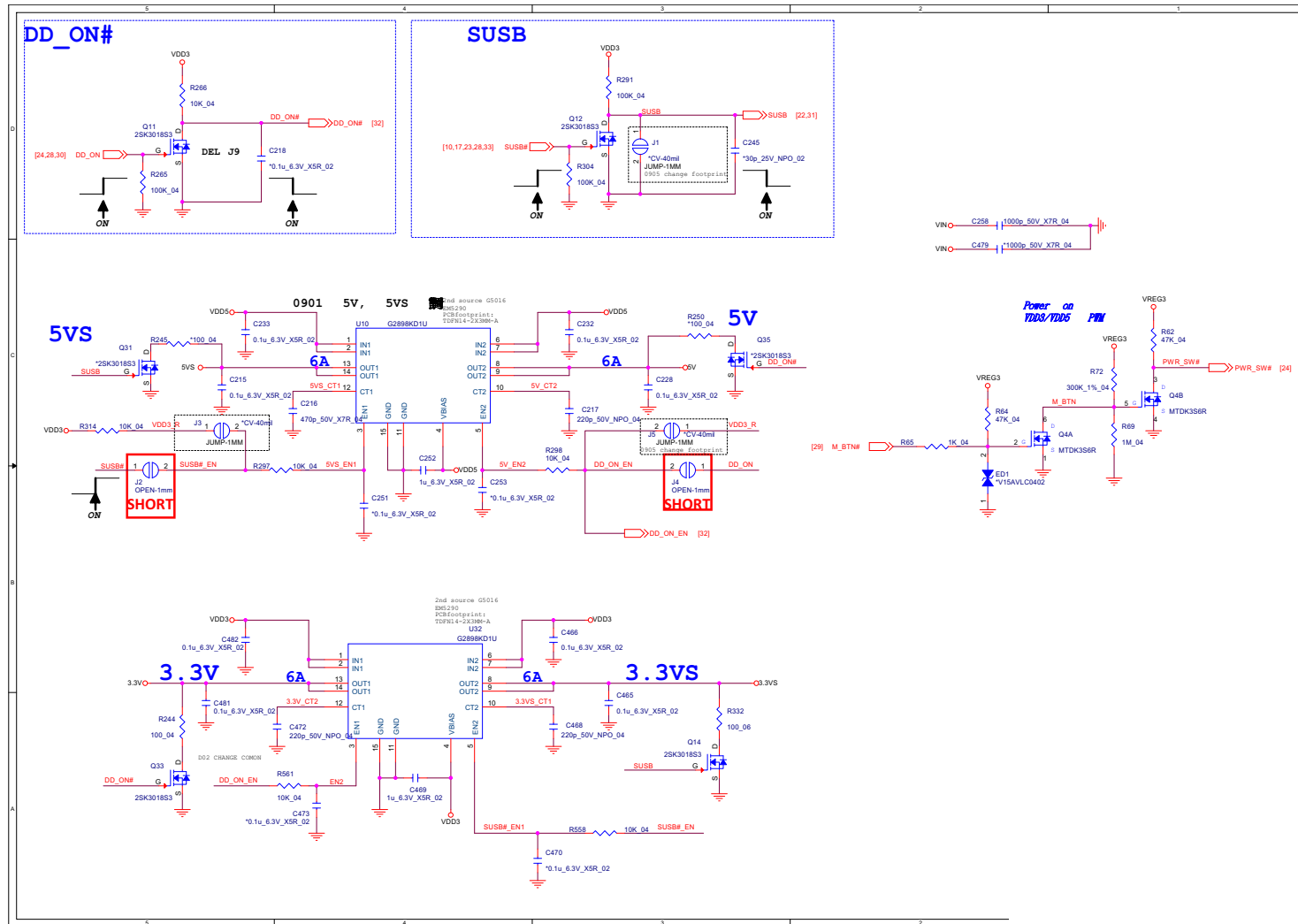
B.Schematic Diagrams

NCP81269

Sheet 35 of 47
NCP81269



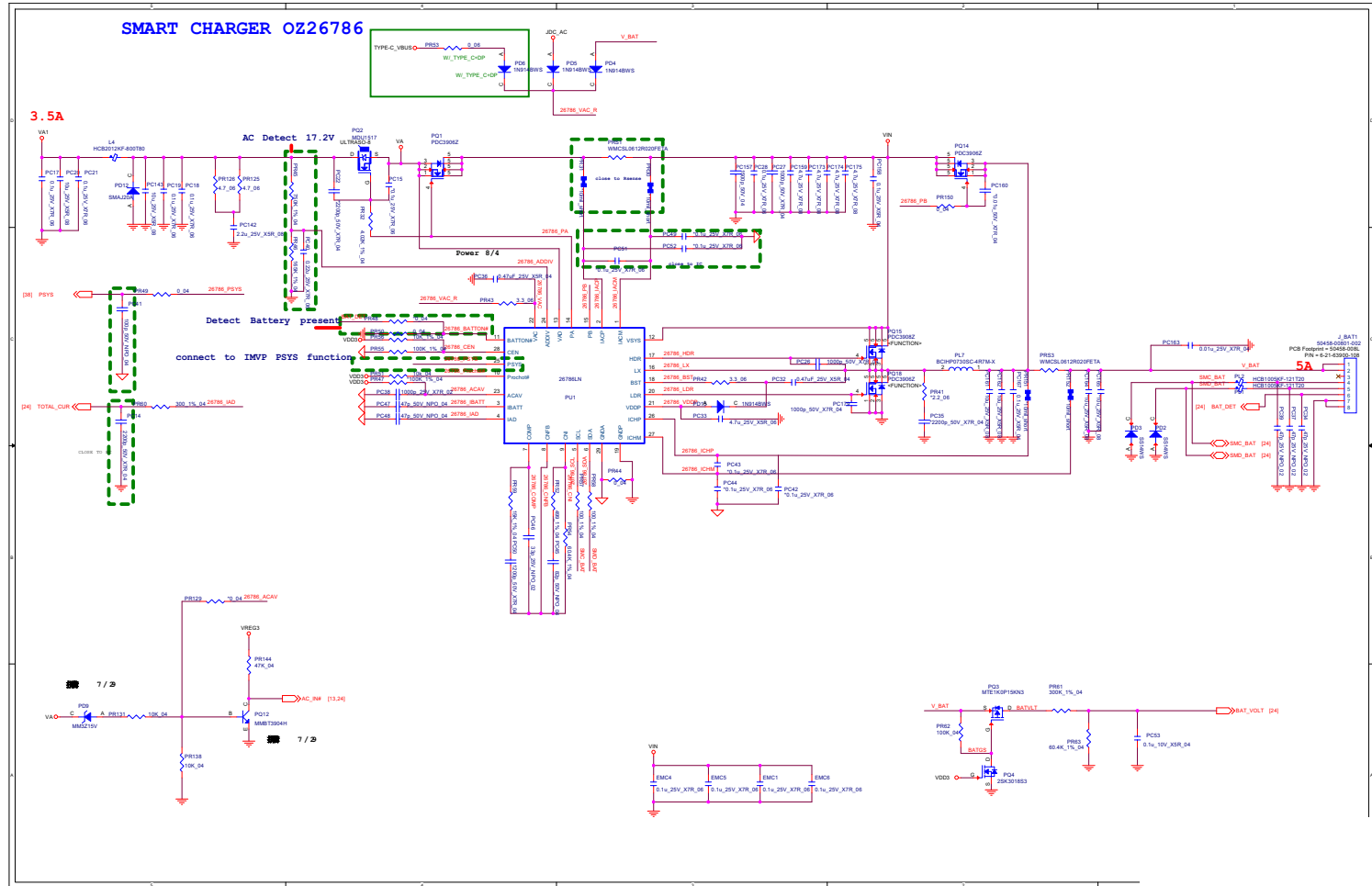
3.3V, 5V, 3VS, 5VS, CTL



Sheet 36 of 47
3.3V, 5V, 3VS, 5VS,
CTL

B.Schematic Diagrams

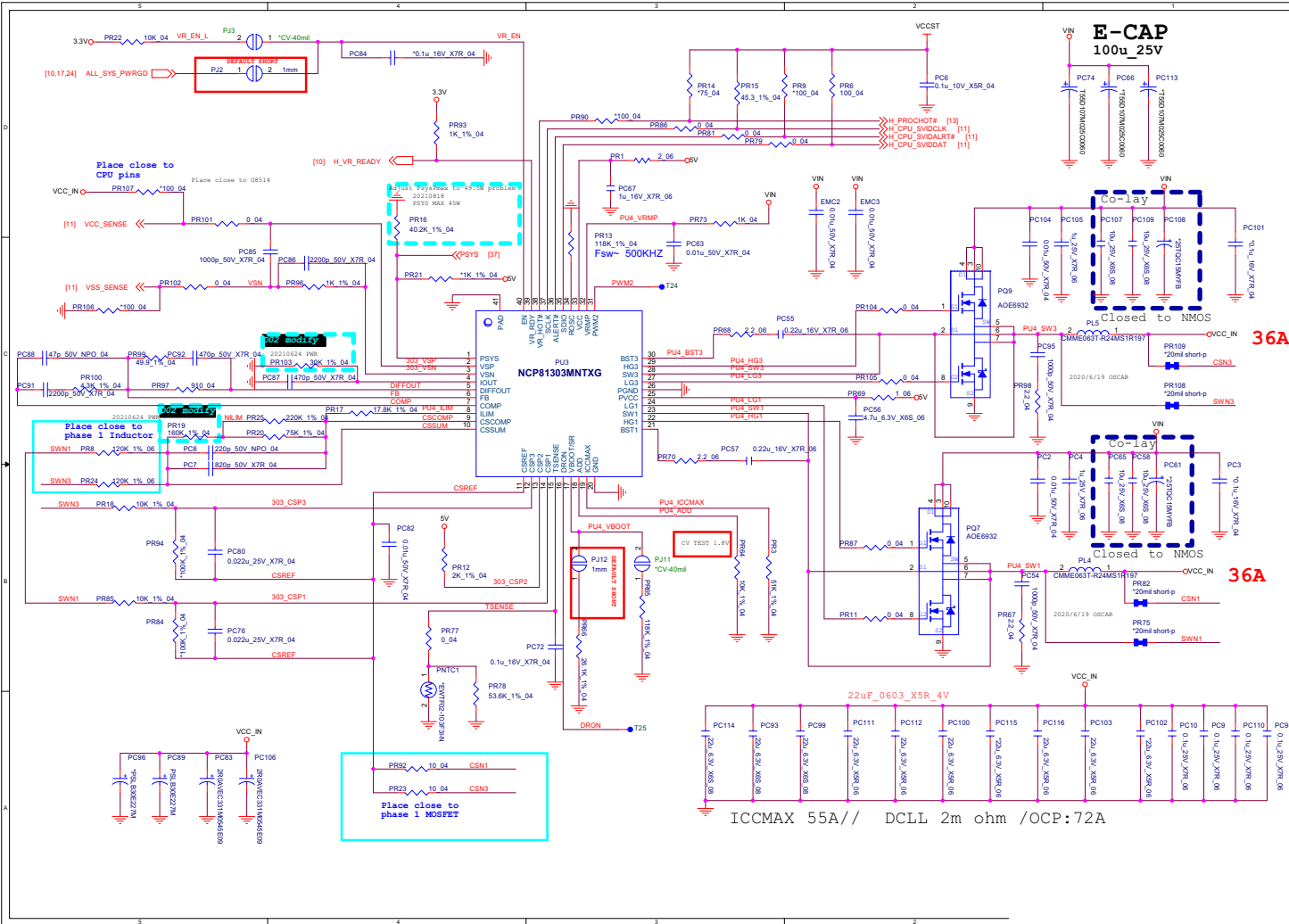
Charger, AC IN



B.Schematic Diagrams

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Charger, AC IN

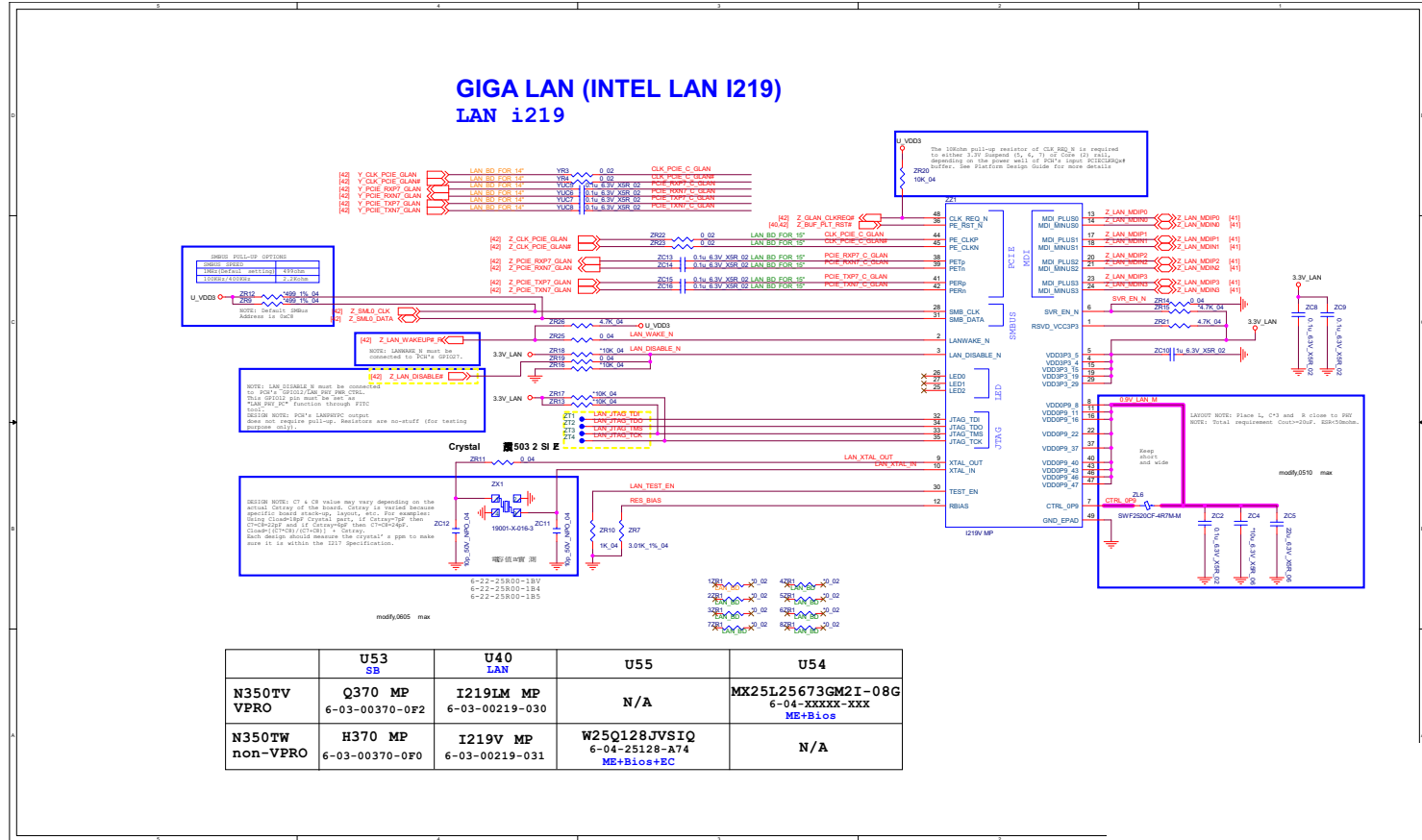
VCCIN



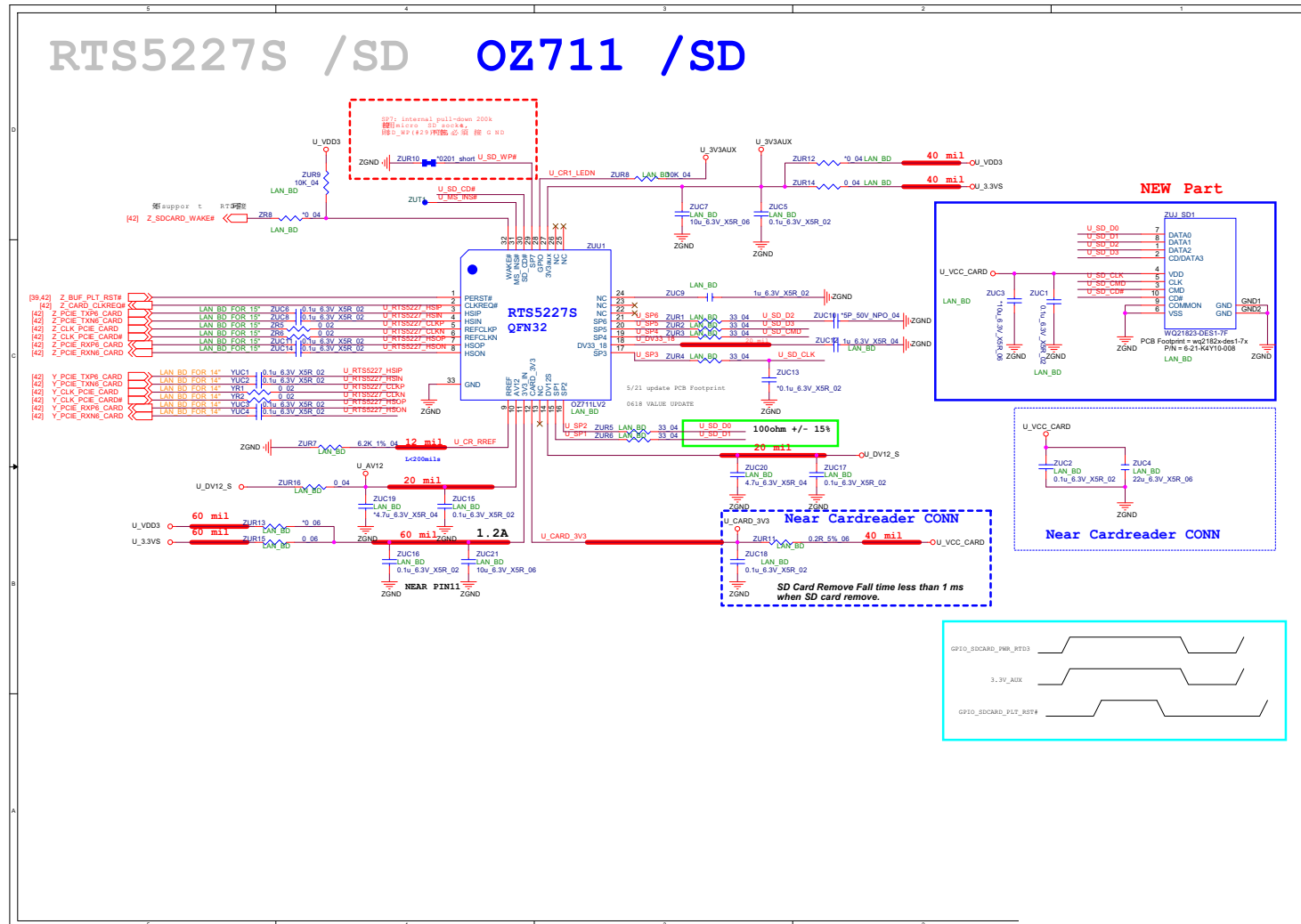
Sheet 38 of 47
VCCIN

RTL8411B

Sheet 39 of 47
LAN I219-LM



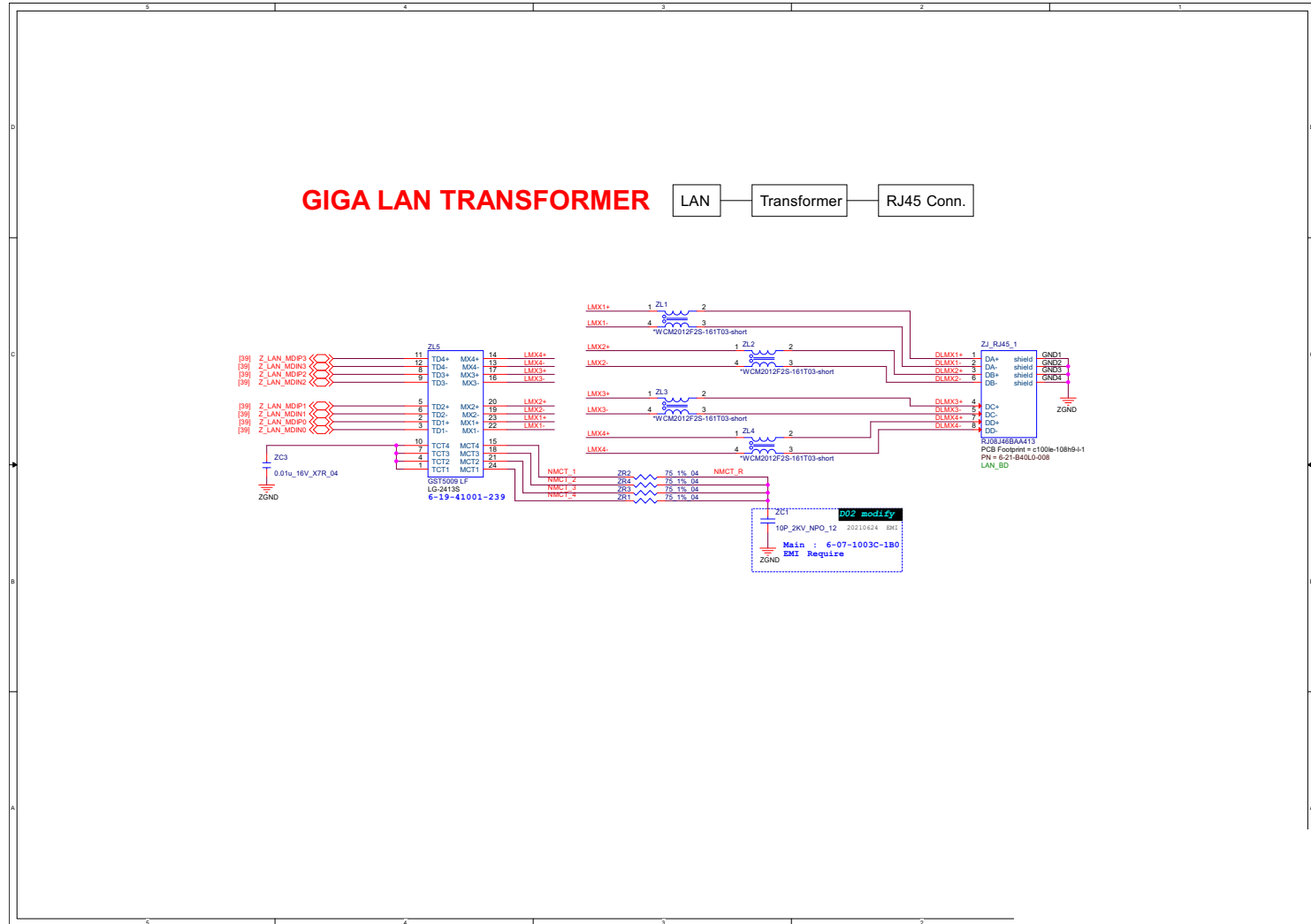
Multi Board RTS5227S / OZ711



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Multi Board
RTS5227S / OZ711

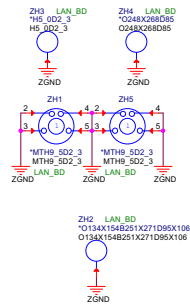
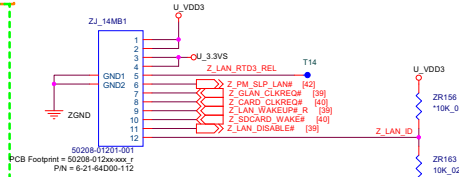
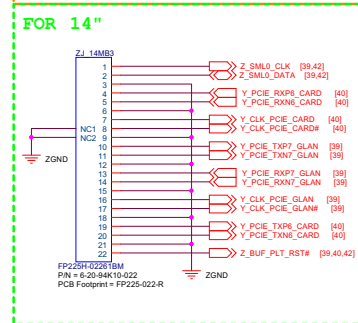
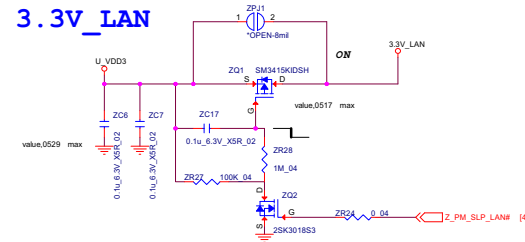
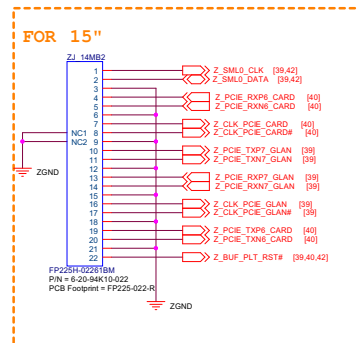
LAN Transformer

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LAN Transformer



LAN Board Connector

LAN & SD Card connector for Sub Board

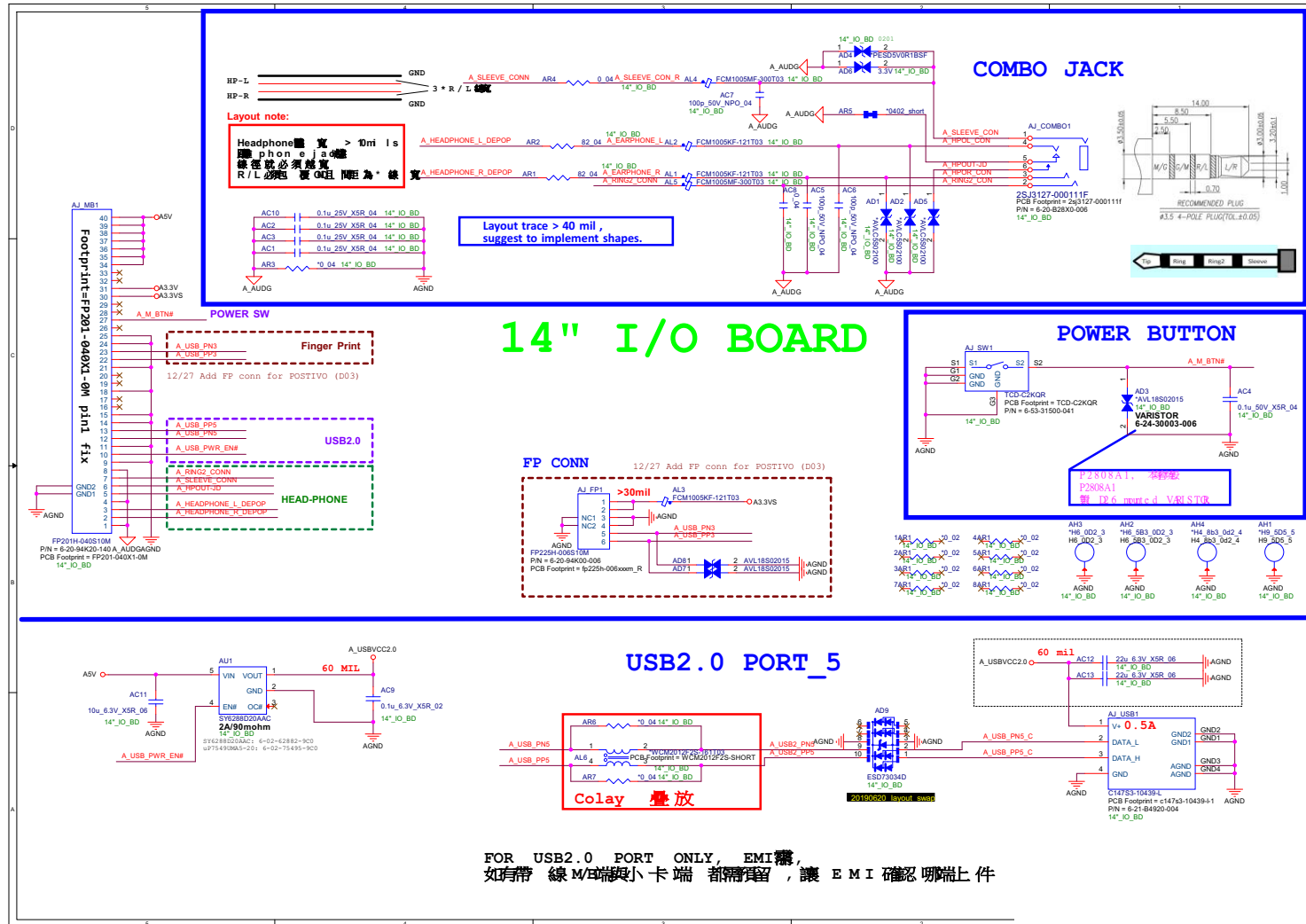


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LAN Board
Connector

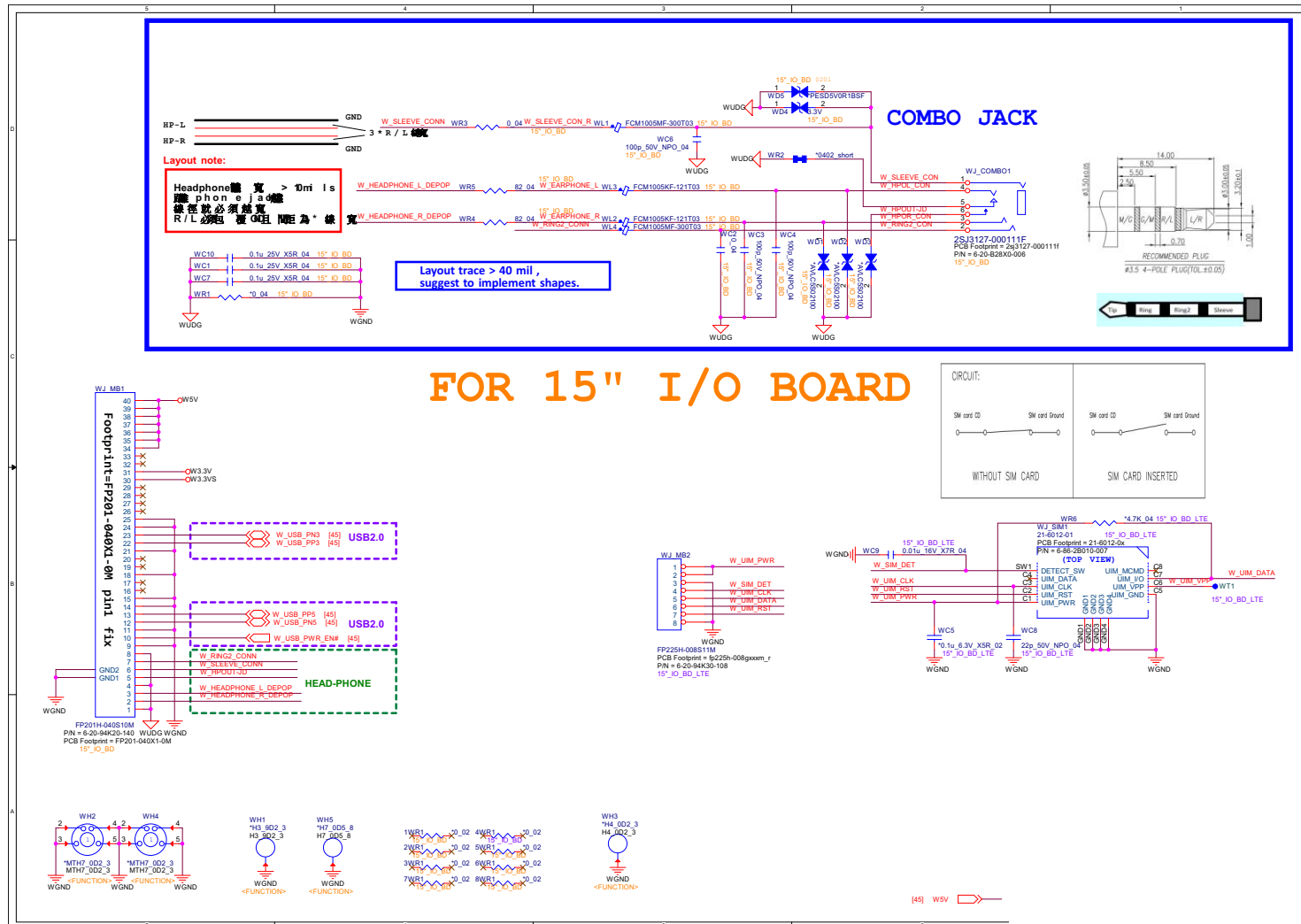
Schematic Diagrams

14" I/O Board

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14" I/O Board



15" I/O Board 1



FOR 15" I/O BOARD

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15" I/O Board 1

B.Schematic Diagrams

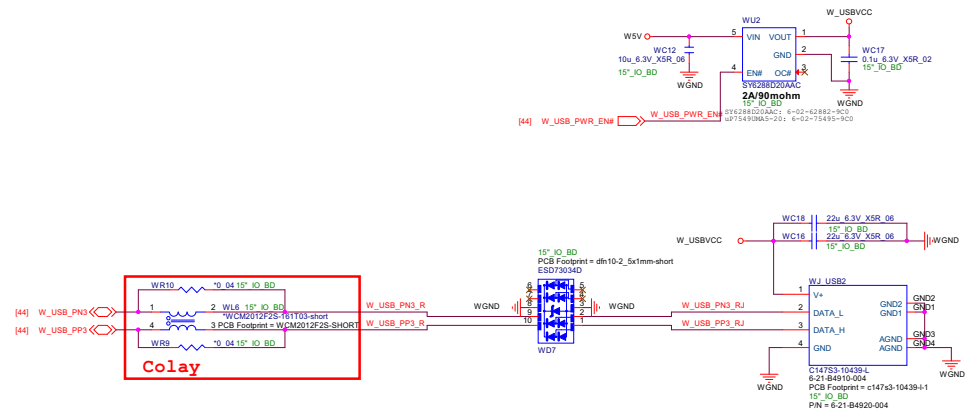
Schematic Diagrams

15" I/O Board 2

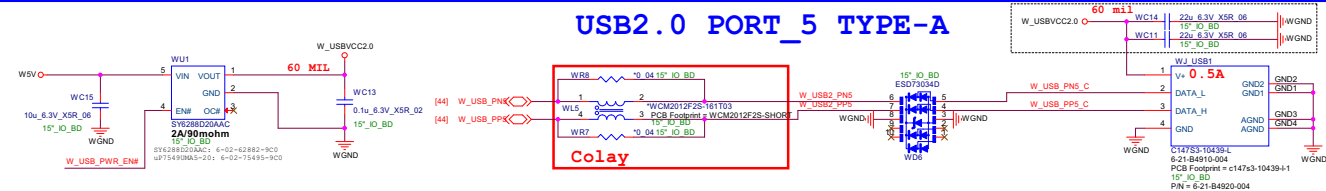
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15" I/O Board 2

FOR 15" I/O BOARD

USB2.0 PORT_3 TYPE-A



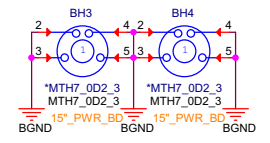
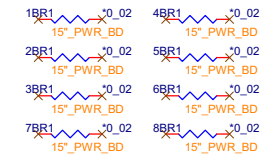
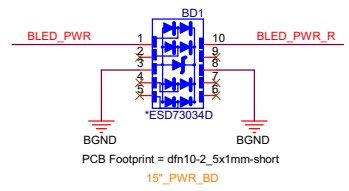
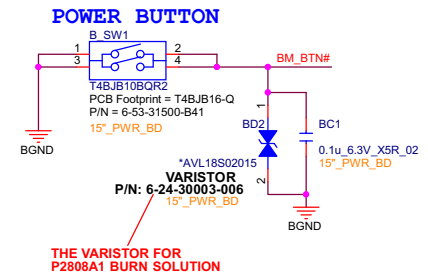
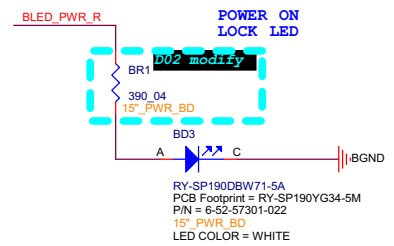
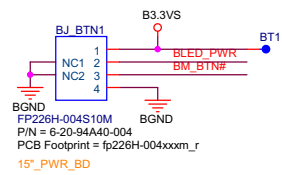
USB2.0 PORT_5 TYPE-A



FOR USB2.0 PORT ONLY, EMI霧,
如有帶線W/端與小卡端 都需真留,讓EMI 確認哪端上件

PWR Button Board

FOR 15" POWER BUTTON BOARD



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PWR Button Board

Power Sequence

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Power Sequence

