SERVICE MANUAL

notebook

NL50RU / NL53RU

Notebook Computer

NL50RU / NL53RU

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 ***NL50RU / NL53RU*** 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, 3.42A (**65** Watts) minimum AC/DC Adapter.

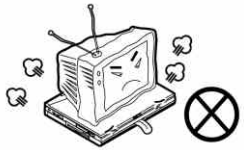
FCC Statement

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.

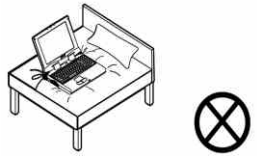
Instructions for Care and Operation

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.

Do not expose the computer to any shock or vibration.	*Do not place it on an unstable surface.*	*Do not place anything heavy on the computer.*
		

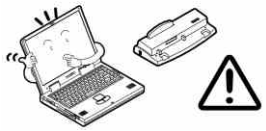
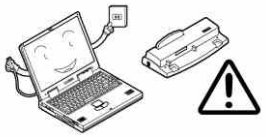
2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

Do not expose it to excessive heat or direct sunlight.	*Do not leave it in a place where foreign matter or moisture may affect the system.*	*Don't use or store the computer in a humid environment.*	*Do not place the computer on any surface which will block the vents.*
			

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.

Do not turn off the power until you properly shut down all programs.	*Do not turn off any peripheral devices when the computer is on.*	*Do not disassemble the computer by yourself.*	*Perform routine maintenance on your computer.*
			

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**.

Use only approved brands of peripherals.	*Unplug the power cord before attaching peripheral devices.*
	

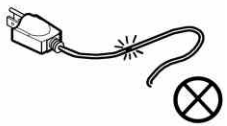
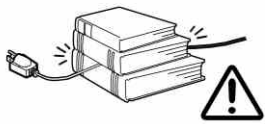
Power Safety

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.

Do not plug in the power cord if you are wet.	*Do not use the power cord if it is broken.*	*Do not place heavy objects on the power cord.*
		

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. Securely attach any peripherals you want to use with the computer (e.g. keyboard and mouse) to their ports.
4. **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.
5. 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).
6. 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).

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.

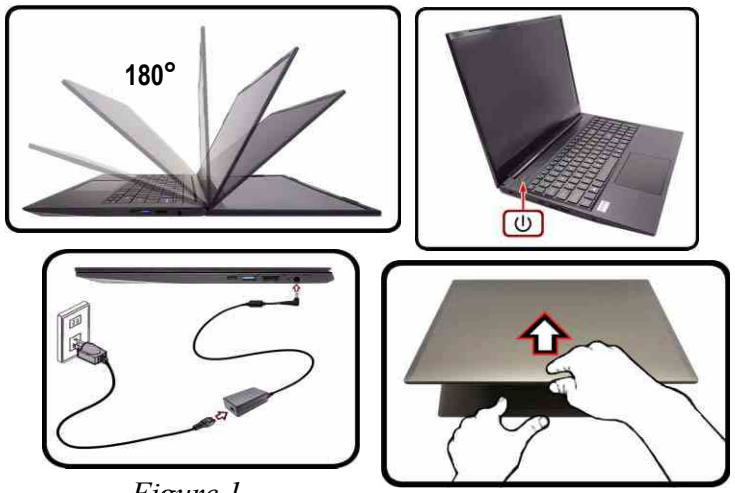


Figure 1
Opening the Lid/LCD/ Computer with AC/DC Adapter Plugged-In

Shut Down

Note that you should always shut your computer down by choosing **Shut Down** from the **Start** Menu.

This will help prevent hard disk or system problems.

Contents

Introduction 1-1

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

Disassembly 2-1

Overview 2-1
Maintenance Tools 2-2
Connections 2-2
Maintenance Precautions 2-3
Disassembly Steps 2-4
Removing the Battery 2-5
Removing the Hard Disk Drive 2-7
Removing the System Memory (RAM) 2-9
Removing the Keyboard 2-11
Removing the Wireless LAN Module 2-12
Wireless LAN, and Combo Module Cables 2-13
Removing the 4G Module 2-14
Removing the M.2 SSD Module 2-15
Removing the CCD 2-16

Part Lists A-1

Part List Illustration Location A-2
Top A-3
Bottom A-4
LCD A-5
HDD A-6
MB A-7

Schematic Diagrams.....B-1

System Block Diagram B-2
Processor 1/11 .....B-3
Processor 2/11 .....B-4
Processor 3/11 .....B-5
Processor 4/11 .....B-6
Processor 5/11 .....B-7
Processor 6/11 .....B-8
Processor 7/11 .....B-9
Processor 8/11 .....B-10
Processor 9/11 .....B-11
Processor 10/11 .....B-12
Processor 11/11 .....B-13
DDR4 SO-DIMM_0 .....B-14
DDR4 SO-DIMM_1 .....B-15
HDMI B-16
Panel B-17
PD TI65987 .....B-18
Type-C B-19
LED KB, FP B-20
SATA HDD, TPM B-21
Audio Codec B-22
KBC ITE IT5570 .....B-23
WLAN B-24
M Key PCIE SSD B-25
3G/LTE B-26

USB Type-A B-27
Conn, CCD, Fan, TP B-28
3V, 5V, 3VS, 5VS, 1.2VS, 1.5VS B-29
VDD3, VDD5 ..... B-30
VDDPS, 1.8V, 1.8VS B-31
VDDQ, VDDQ_VTT, 2.5V B-32
DC Jack, PD PWR B-33
MP2945GU B-34
VDDCR B-35
1.8VA, VDDP B-36
Charger, AC IN B-37
RTL8411H B-38
Multi-Conn, SIM B-39
Multi USB Type-A B-40
RTS5227S B-41
PWR BTN Board B-42

Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the ***NL50RU / NL53RU*** series notebook computer. Information about operating the computer (e.g. getting started, and the *Setup* utility) is in the *User's Manual*. Information about dri-vers (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 ***NL50RU / NL53RU*** 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.

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

AMD Ryzen™ Processor
7-4700 (2.0 GHz), TDP 15W
5-4600 (2.1 GHz), TDP 15W
5-4500 (2.375 GHz), TDP 15W

BIOS

128Mb SPI Flash ROM
Insyde BIOS

Memory

Dual Channel DDR4
Two 260 Pin SO-DIMM Socket 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

15.6" (39.62cm), 16:9, FHD (1920x1080)

Storage

Model with 36WH Battery
One Changeable 2.5" 7mm (h) SATA HDD/SSD
(**Factory Option**) One M.2 **SATA/PCIe Gen3 x4** Solid State Drive (SSD)

Model with 49WH Battery
One M.2 **SATA/PCIe Gen3 x4** Solid State Drive (SSD)

Video Adapter

AMD Radeon Graphics
HDR Support
FreeSync Support
Microsoft DirectX®12 Compatible

Pointing Device

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

Keyboard

Full-size Keyboard (with 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

Security

Security (Kensington® Type) Lock Slot
BIOS Password
(**Factory Option**) TPM 2.0

M.2 Slots

Slot 1 for **WLAN and Bluetooth** Combo Module
Slot 2 for **SATA** or **PCIe Gen3 x4 SSD**
(**Factory Option**) Slot 3 for **LTE** Module

Card Reader

MicroSD Card Reader

Communication

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

1.0M HD Camera Module

(**Factory Option**) **4G** M.2 Module

WLAN/ Bluetooth M.2 Modules:

(**Factory Option**) Intel® Dual Band Wi-Fi 6 AX200 Wireless LAN (**802.11ax**) + Bluetooth

(**Factory Option**) Intel® Dual Band Wireless-AC 9260 Wireless LAN (**802.11ac**) + Bluetooth

(**Factory Option**) Realtek Dual Band Wi-Fi 5 RTL8821CE Wireless LAN (**802.11ac**) + Bluetooth

Interface

One USB 3.2 Gen 2 Type-C Port*

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

Or

(**Factory Option**) One DisplayPort 1.4 over USB 3.2 Gen 2 Type-C Port with Power Delivery (DC-In)

One USB 3.2 Gen 1 Type-A Port

Two USB 2.0 Ports

One HDMI-Out Port

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

One RJ-45 LAN Jack

One DC-in Jack

Power

Full Range AC/DC Adapter

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

DC Output: 19V, 3.42A (**65W**)

(**Factory Option)** 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) * 19.9mm (h)

(Height Excluding Battery Area)

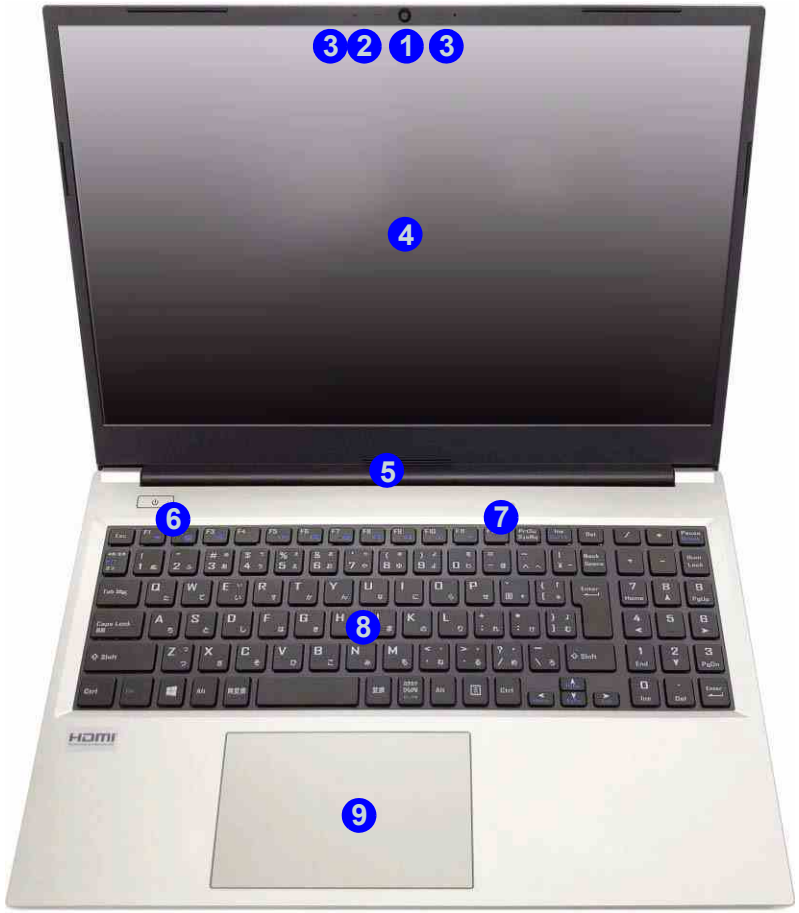
1.59kg (Barebone with 36WH Battery)

Or

1.65kg (Barebone with 49WH Battery)

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 in white.*
3. Built-In Array Microphone
4. LCD
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**) DisplayPort 1.4 over USB 3.2 Gen 2 Type-C Port with Power Delivery (DC-In)*
3. USB 3.2 Gen 1 Type-A Port
4. HDMI-Out Port
5. Battery Power LED Indicator
6. DC-In Jack

External Locator - Left Side & Rear View

Figure 4
Left Side View

1. Security Lock Slot
2. RJ-45 LAN Jack
3. USB 2.0 Ports
4. MicroSD Card Reader
5. (**Factory Option**) USIM Card Reader (for 4G USIM Cards)
6. 2-In-1 Audio Jack (Headphone and Microphone)
7. Speaker

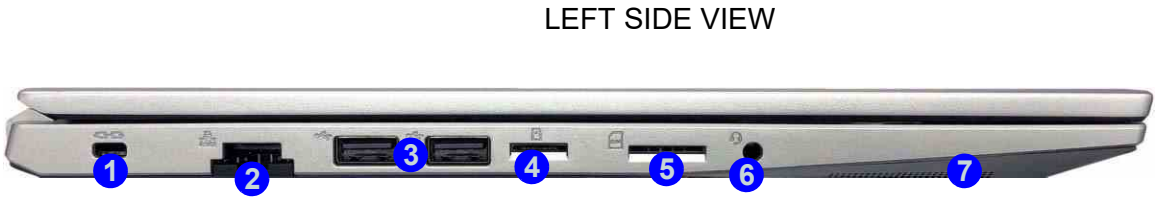


Figure 5
Rear View

External Locator - Bottom View

Figure 6
Bottom View

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

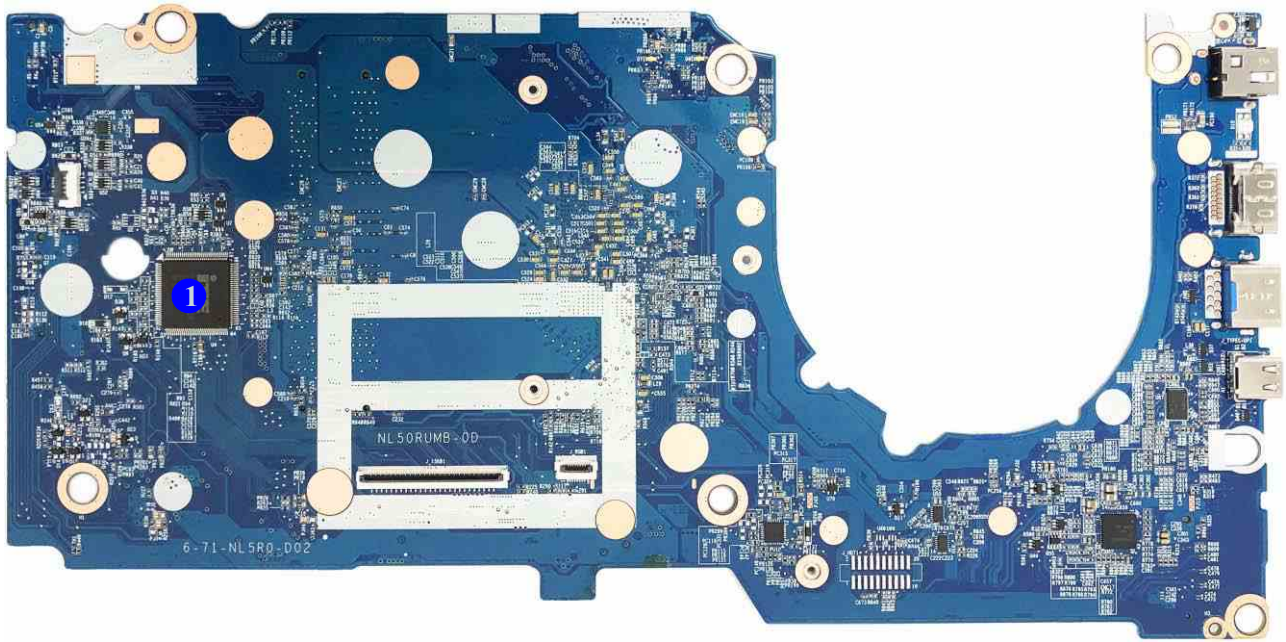
Overheating

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

Mainboard Overview - Top (Key Parts)

Figure 7
Mainboard Top Key Parts

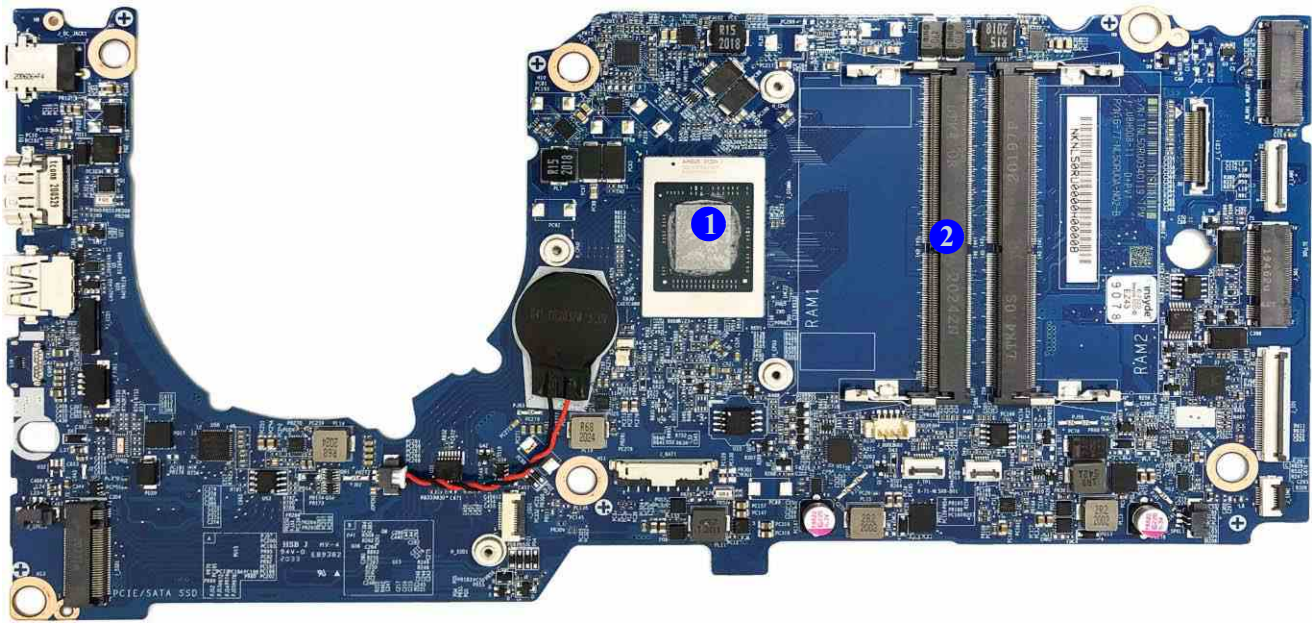
1. KBC-ITE IT5570



Mainboard Overview - Bottom (Key Parts)

Figure 8
Mainboard Bottom Key Parts

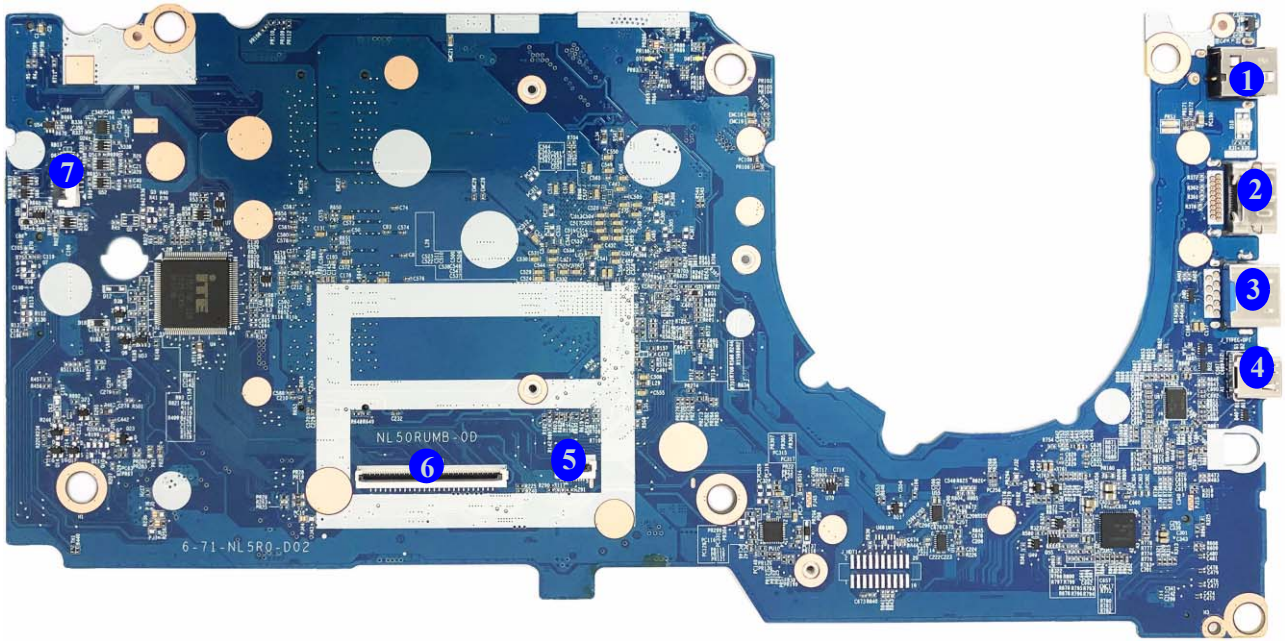
1. CPU
2. Memory Slots DDR4 SO-DIMM



Mainboard Overview - Top (Connectors)

Figure 9
Mainboard Top Connectors

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



Mainboard Overview - Bottom (Connectors)

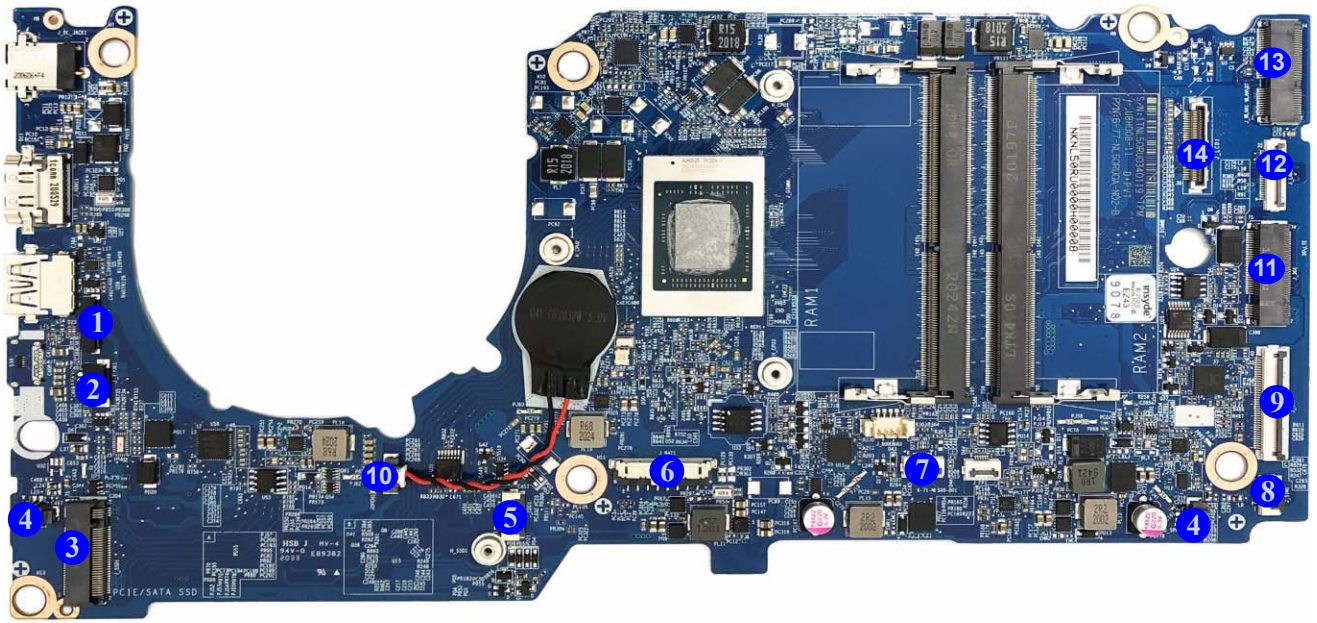


Figure 10
Mainboard Bottom Connectors

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. USIM Card Reader Connector
9. USB Board Connector
10. CMOS Battery Connector
11. 3G/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 ***NL50RU / NL53RU*** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

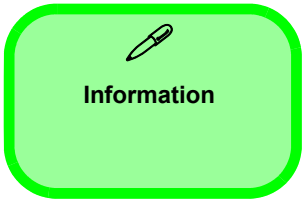
We suggest you completely review any procedure before you take the computer apart.

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.



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.

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.

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.

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 - 7*

To remove the System Memory:

1. Remove the battery *page 2 - 5*
2. Remove the system memory *page 2 - 9*

To remove the Keyboard:

1. Remove the battery *page 2 - 5*
2. Remove the keyboard *page 2 - 11*

To remove the Wireless LAN Module:

1. Remove the battery *page 2 - 5*
2. Remove the WLAN *page 2 - 12*

To remove the 4G Module:

1. Remove the battery *page 2 - 5*
2. Remove the 4G *page 2 - 14*

To remove the M.2 SSD Module:

1. Remove the battery *page 2 - 5*
2. Remove the SSD module *page 2 - 15*

To remove the CCD Module:

1. Remove the battery *page 2 - 5*
2. Remove the CCD module *page 2 - 16*

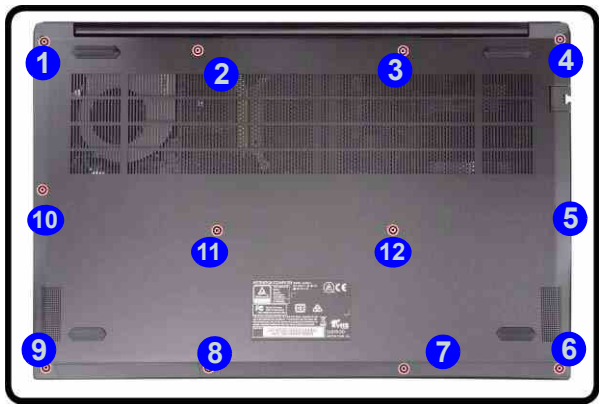
Removing the Battery

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*).

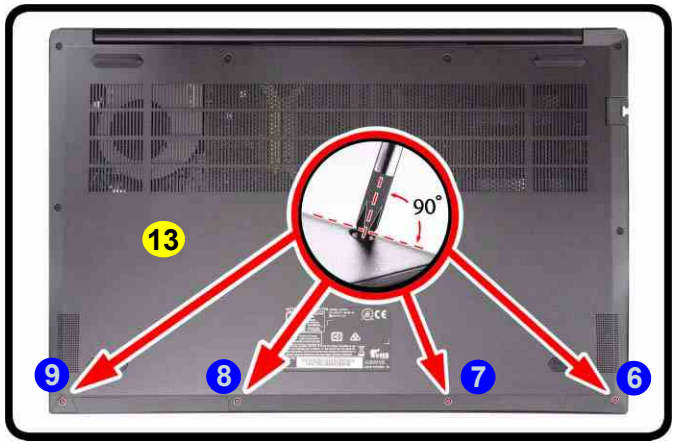
Figure 1
Battery Removal

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

a.



b.



c.

13. Bottom Case

- 12 Screws

Figure 2
Battery Removal (cont'd.)

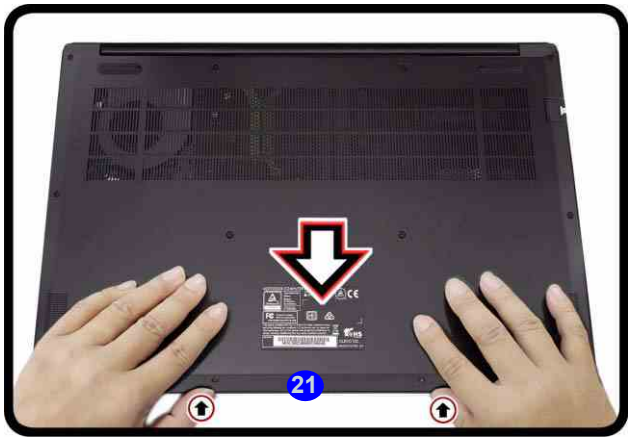
c. Disconnect the cable and remove the screws.
d. Lift the battery off the computer.
f. Close the bottom cover as shown.

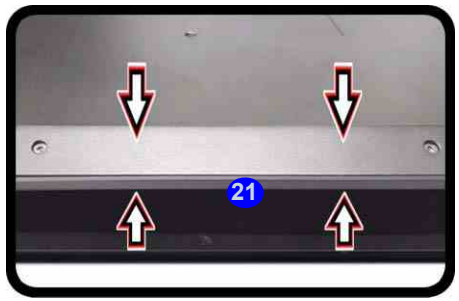
6. Carefully disconnect the cable 15, then remove screws 16 - 19 (***Figure 2d***).
7. Lift the battery 20 off the computer (***Figure 2e***).
8. Reverse the process to install a new battery (do not forget to replace all the screws and bottom cover).
9. Make sure you close the bottom cover by applying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

d.

e.

f.





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

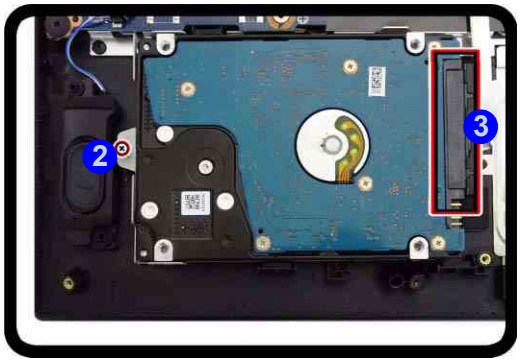
The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 7.0mm (h). Follow your operating system's installation instructions, and install all necessary drivers and utilities (as outlined in **Chapter 4 of the User's Manual**) when setting up a new 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 3a*).
3. Remove screws 2 from the HDD assembly. Slightly lift and disconnect the hard disk assembly from the connector 3 (*Figure 3b*).
4. Lift the hard disk assembly 4 out of the bay 5 (*Figure 3c*).

a.

b.



c.

Figure 3
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

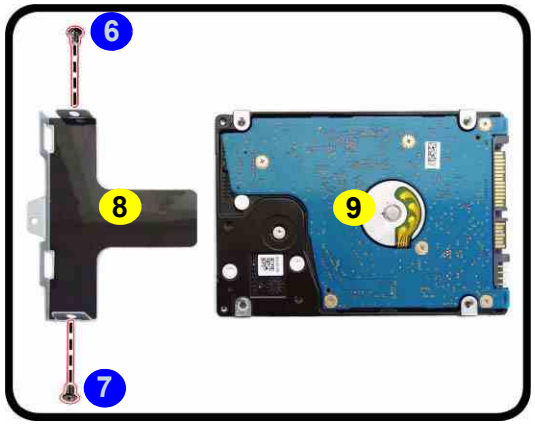
- 1 Screw

Figure 4
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 4d*).
6. Reverse the process to install a new hard disk (do not forget to replace the screws).

d.



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 3200MHz. 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

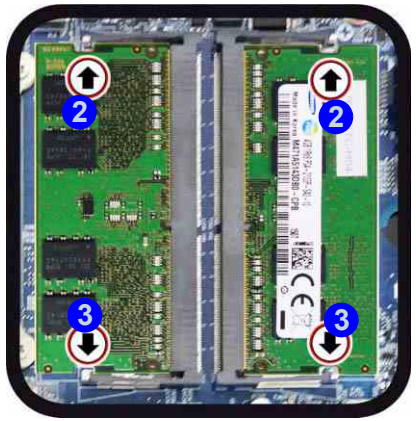
1. Turn **off** the computer, turn it over to remove the battery (*page 2 - 5*).
2. The RAM modules will be visible at point 1 on the mainboard (*Figure 5b*).
3. Gently pull the two release latches (2 & 3) on the sides of the memory socket in the direction indicated by the arrows (*Figure 5b*).
4. The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

Figure 5
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.

a.

b.



c.

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

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

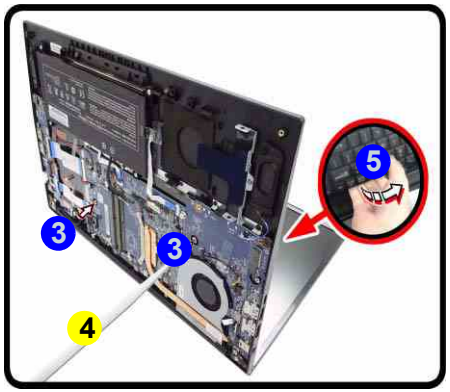
1. Turn **off** the computer, turn it over to remove the battery (*page 2 - 5*).
2. Locate the release points 1 - 2 from the open bottom case (*Figure 6a*).
3. Open it up with the LCD on a flat surface before pressing at point 3 to release the keyboard module (use the specific eject stick 4 to do this)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

Figure 6
Keyboard Removal

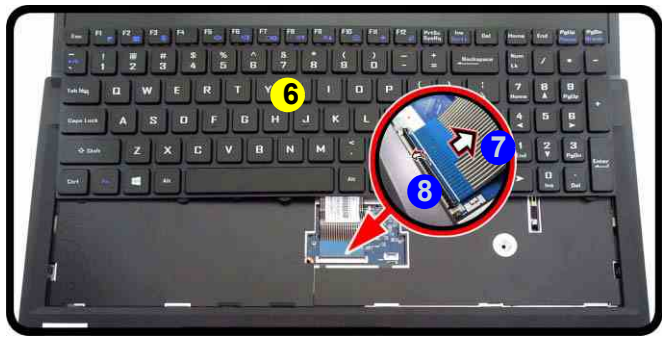
a. Remove the screws.
b. Release the keyboard by pressing at point 3.
c. Disconnect the keyboard ribbon cable from the locking collar socket.
d. Remove the keyboard.

a.

b.



c.



d.

4. Eject Stick
6. Keyboard

Figure 7
Wireless LAN Module Removal

a. Locate the WLAN.
b. Disconnect the cable and remove the screw.
c. 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 7b***).

5.Wireless LAN Module

- 1 Screw

Removing the Wireless LAN Module

1. Turn **off** the computer, turn it over to remove the battery (***page 2 - 5***).
2. The Wireless LAN module will be visible at point 1 on the mainboard (***Figure 7a***).
3. Carefully disconnect the cables 2 & 3, and then remove the screw 4 (***Figure 7b***)
4. The Wireless LAN module 5 (***Figure 7c***) 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).

a.

b.

c.

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	WM 1	Black	Transparent
	WM 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).

Figure 8
4G Module Removal

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

Removing the 4G Module

1. Turn **off** the computer, turn it over to remove the battery (***page 2 - 5***).
2. The module will be visible at point 1 on the mainboard (***Figure 7a***).
3. Carefully disconnect the cables 2 & 3, and then remove the screw 4 (***Figure 7b***)
4. The module 5 (***Figure 7c***) 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).

a.

b.

c.

5.4G Module

- 1 Screw

Removing the M.2 SSD Module

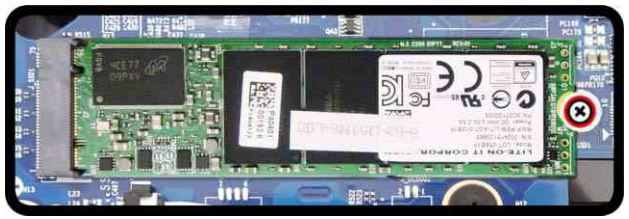
1. Turn **off** the computer, turn it over to remove the battery (*page 2 - 5*).
2. The M.2 SSD module will be visible at point 1 on the mainboard (*Figure 9a*).
3. Remove the screw 2 (*Figure 9b*)
4. The M.2 SSD module 3 (*Figure 9c*) will pop-up, and you can remove it from the computer.
5. Reverse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

Figure 9
M.2 SSD Module Removal

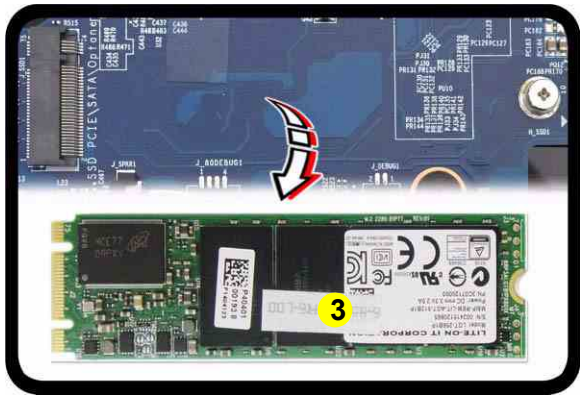
a. Locate the M.2 SSD.
b. Remove the screw.
c. The M.2 SSD module will pop up.

a.

b.



c.



3.M2 SATA Module

- 1 Screw

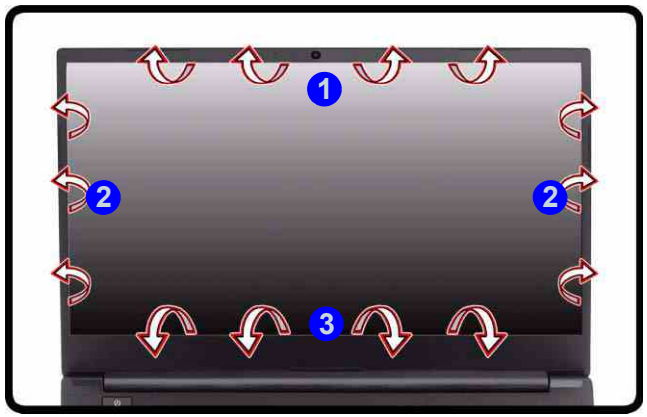
Figure 10
CCD Removal

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.

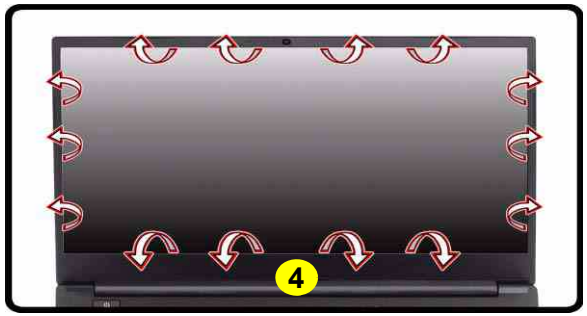
Removing the CCD

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 10a*).
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 4 upwards (*Figure 10b*).

a.



b.



4. LCD Front Cover

•

4. Disconnect the cable 5 (*Figure 11f*).
5. Remove the CCD module 6 (*Figure 11g*).
6. Reverse the process to install a new CCD module.

Figure 11
CCD Removal (cont'd.)

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

c.

d.

6. CCD Module

Appendix A: Part Lists

This appendix breaks down the ***NL50RU / NL53RU*** 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.

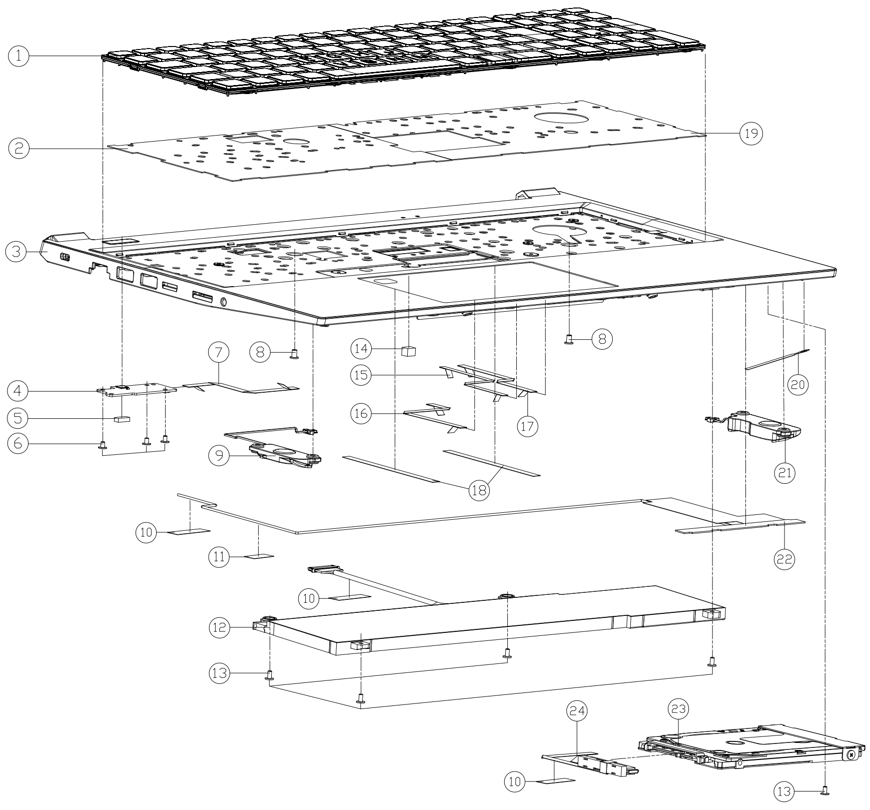
Part List Illustration Location

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

Table A - 1
Part List Illustration Location

Part	
Top	*page A - 3*
Bottom	*page A - 4*
LCD	*page A - 5*
HDD	*page A - 6*
MB	*page A - 7*

Top

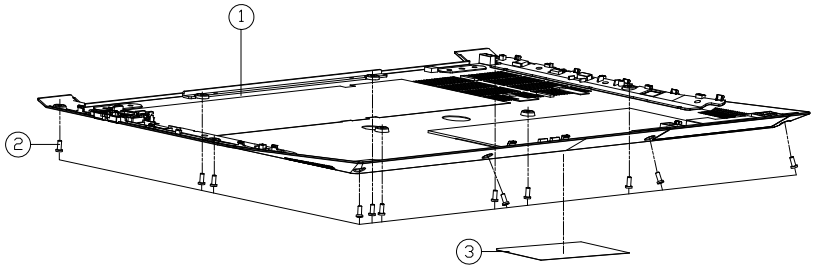


ITEM	PART NAME	PART NO	REMARK
1	KB USA CVM18H83US-430 N150ZU BLACK ISOLATION WITH WIN10 KEY	6-80-N15Z0-012-1	
1	KB BRAZILIAN CVM18H88PA-430 N150ZU BLACK ISOLATION WITH WIN10 KEY	6-80-N15Z0-333-1	
1	KB JAPANESE CVM18H80J0-430 N150ZU BLACK ISOLATION WITH WIN10 KEY	6-80-N15Z0-212-1	
1	KB UK CVM18H86GB-430 N150ZU BLACK ISOLATION WITH WIN10 KEY(KAPOK)	6-80-N15Z0-192-K	
1	BL KB UK CVM18H96GB9430 N150ZU BLACK WHITE SILVER LINING PRINTING ISOLATION WITH WIN10 KEY (332.95MM)	6-80-N15Z0-19D-1	
1	BL KB JAPANESE CVM18H90J09430 N150ZU BLACK WHITE SILVER LINING PRINTING ISOLATION WITH WIN10 KEY (332.95MM)	6-80-N15Z0-21D-1	
1	BL KB BRAZILIAN CVM18H98PA9430 N150ZU BLACK WHITE SILVER LINING PRINTING ISOLATION WITH WIN10 KEY (332.95MM)	6-80-N15Z0-33E-1	
1	BL KB USA CVM18H93US9430 N150ZU BLACK WHITE SILVER LINING PRINTING ISOLATION WITH WIN10 KEY (332.95MM)	6-80-N15Z0-01D-1	
1	KB JAPANESE CVM19G90J0-4301 NL50CU BLACK ISOLATION WITH WIN10 KEY (332.95MM) FOR MCJ	6-80-N15Z0-212-1M	
1	BL KB JAPANESE CVM19H0J09430 NL50CU BLACK WHITE SILVER LINING PRINTING ISOLATION WITH WIN10 KEY (332.95MM) FOR MCJ	6-80-N15Z0-21D-1M	
2	KB MYLAR LEFT NL50RU	6-40-NL5R2-011	FOR NON BL KB GB SERIES
3	(PRE-PROCESS) TOP CASE (W/O FP) MODULE NL50RU	6-78-NL50RU02-010	
3	(PRE-PROCESS) TOP CASE (W/FP) MODULE NL50RU	6-78-NL50RU02-020	
3	(PRE-PROCESS) TOP CASE (W/O FP) MODULE NL53RU	6-78-NL53RU02-010	
3	(PRE-PROCESS) TOP CASE (W/FP) MODULE NL53RU	6-78-NL53RU02-020	
4	POWER SWITCH BOARD V2.0 NL50RU	6-77-NL5RS-D02	
5	RUBBER POWER SILICONE (10*5*3) NL50GU	6-47-NL502-070	
6	.SCREW M2*3L KI NI ICT NY (DD=Ø4.0,DT=0.8)	6-35-B1120-3RD	
7	FFC CABLE FOR POWER TO MB L=82MM 60V PITCH 1.0/4PIN (QX) NL50CU	6-43-NL5C0-031-1	
8	SCREW M2.5*4L (D=4.6,T=0.8) KI NI ICT NY	6-35-B1125-4RA	
9	SPK+CABLE L L44*23 2W 4? L150MM VTS251410-03 NL50CU	6-23-5NL5C-0L0	
10	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
11	TAPE MYLAR TRANSPARENT (20*10*0.05) P180HM	6-40-P1803-020	
12	BAT.P S LI 11.4V/3.23AH/36WH 3S1P SCUD/EBTEB R54K03990011 (3175MAH) NL40GU	6-87-NL40S-33G21	
12	BAT.P S LI 11.4V/3.175AH/36WH PSE 3S1P GETAC/VEKEN (POLYMER)541391120001 /(3175MAH)	6-87-NL4CS-32B01	
12	BAT.P S LI 15.2V/3.23AH/49WH 4S1P SCUD/EBTEB R54K03990012(3175MAH) NL40CU(LABEL48W CHANGE TO 49W)	6-87-NL4CS-43G01	
12	BAT.P S LI 15.2V/3.23AH/49WH 4S1P SMP/VEKEN 980QA040H(3175MAH) NL40CU	6-87-NL4CS-41B01	
13	SCREW M2*4L KI NI ICT NY (DD=Ø4.5,DT=0.8)	6-35-B1120-4RC	
14	RUBBER (7*6T*5) NL50RU	6-47-NL5R2-030	
15	FFC CABLE FOR FP TO MB L=101MM 60V PITCH 0.5/6PIN (HT) NL50RU	6-43-NL5R0-021	FOR W/FP
16	FFC CABLE FOR TP TO MB L=102MM 60V PITCH 0.5/8PIN (HT) NL50RU	6-43-NL5R0-030	FOR W/O FP
17	FFC CABLE FOR TP TO MB L=91MM 60V PITCH 0.5/8PIN (HT) NL50RU	6-43-NL5R0-011	FOR W/FP
18	TP CONDUCTIVE CLOTH (63*5*0.1T) NL50GU	6-47-NL502-030	
19	KB MYLAR RIGHT NL50RU	6-40-NL5R2-021	FOR NON BL KB GB SERIES
20	TOP BOSS GASSKET 2 (36*7*0.1T) NL50GU	6-47-00190-369	
21	SPK+CABLE R L44*23 2W 4? L50MM VTS251410-04 NL50CU	6-23-5NL5C-0R0	
22	ANTENNA IPEX4 3G+LTE JEM LTE-2 PCB BR 0.7G/0.9G/1.5G/1.8G/1.9G/2.1G/2.6GHZ L=400MM NL50CU	6-23-7NL5C-041	
23	W/O HDD ASS'Y (FOR 36WH BAT) NL50CU	6-79-NL50CU0J-010	FOR 36WH BAT
23	W/HDD ASS'Y NL50CU	6-79-NL50CU0J-020	
24	HDD CONKSAW-16BDBKAB-U)+PCB+W/CABLE+DATE CODE (FFC CABLE 98.2MM) 12P NL50RU	6-23-FNL5R-011	FOR 36WH BAT.

Figure A - 1
Top

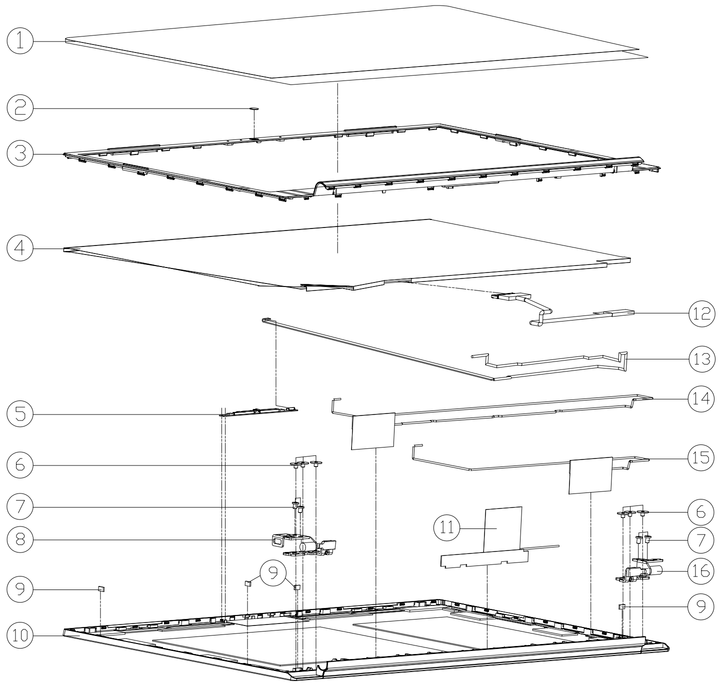
Bottom

Figure A - 2
Bottom



ITEM	PART NAME	PART NO	REMARK
1	BOTTOM CASE MODULE NL50RU	6-39-NL5R3-012	
2	SCREW M2*5L KI(T=0.8 D=3.5) BK/Z ICT NY	6-35-B6120-5RC	
3	PRODUCT LABEL FOR NL50RU	6-45-NL50RU03-010	
3	PRODUCT LABEL FOR NL53RU	6-45-NL53RU03-010	

LCD

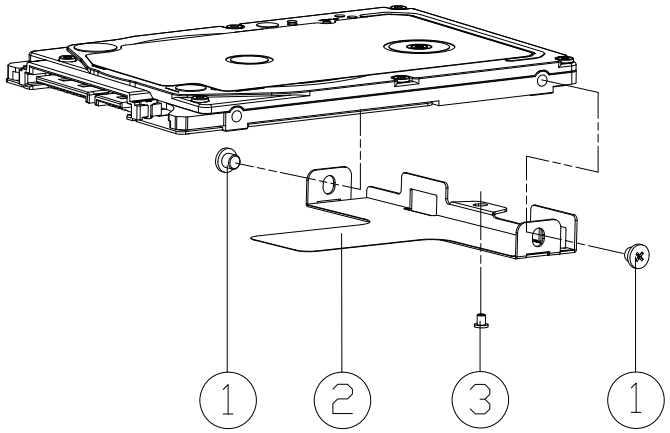


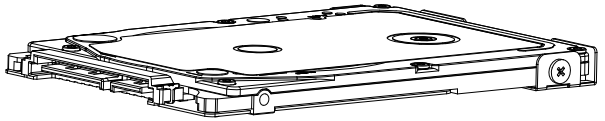
ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP N150ZU	6-40-N15Z8-010	
2	CCD LENS PMMA (DIAMETER 3.6MM) (MP1) P970EN	6-42-P97N1-011-1	
3	FRONT COVER MODULE NL50GU	6-39-NL501-012	
4	LCD N15.6" FHD/NON GT/EDP AU B156HTN06.1 (H/W:1A/0A) LED 3.2 MM	6-50-LBB32-G004	
4	LCD N15.6" FHD/WVA/N7/NON GT/EDP INNOLUX N156HCA-EA1 (LED) 3.2MM	6-50-LBB32-V020	
4	LCD N15.6" FHD/IPS/N4/NON GT/EDP LG LP156WFC-SPD3 LED 3.2MM	6-50-LBB32-L01A	
4	LCD N15.6" FHD/NON GT/EDP BOE NT156FHM-N61 (LED) 3.2 MM	6-50-LBB32-Z007	
5	UVC CAMERA BISON FIX(RGB) BNH419VXB-000 1M HD OV9734 N150ZU FW0601 W/WHITE-LED W/2D-MIC(NARROW BORDER WITH FFC)	6-88-N15ZC-4900	OPTION
5	UVC CAMERA CHICONY FIX(RGB) CNFIH3821003920LH 1M HD OV9734 N150ZU FW5404 W/WHITE-LED W/2D-MIC(NARROW BORDER WITH FFC)	6-88-N15ZC-5100	OPTION
6	SCREW M2.5*2.5L KI BK/Z ICT NY(Ø8,T=0.6)	6-35-B6125-2R5	
7	.SCREW M2.5*5L KI BK/Z ICT NY	6-35-B6125-5RA	
8	HINGE L (SK7) NL50RU	6-33-NL5R1-0L1	
9	LCD RUBBER (4.8*3*1.0) NL40GU	6-47-NL401-051	
10	BACK COVER MODULE NL50GU	6-39-NL501-022	
10	BACK COVER MODULE NL53RU	6-39-NL5R1-322	
11	ANTENNA IPEX4 3G+LTE JEM LTE-1 PCB BR 0.7G/0.9G/1.5G/1.8G/1.9G/2.1G/2.6GHZ L=250MM NL50CU	6-23-7NL5C-032	
12	WIRE CABLE FOR EDP 250MM I 30V 30PIN (HT/LW CON:LVD-A30LPMSG) NL50CU	6-43-NL5C1-013-1N	
13	CCD CABLE L=450MM 30V 8PIN (HT) NL50CU	6-43-NL5CT-011-1	
14	ANTENNA IPEX4 WLAN JEM WL2 PCB OR 40X9MM 2.4G/5G/6G L= 600MM NL50RU	6-23-7NL5R-020	
15	ANTENNA IPEX4 WLAN JEM WL1 PCB OR 40X9MM 2.4G/5G/6G L= 400MM NL50RU	6-23-7NL5R-010	
16	HINGE R (SK7) NL50RU	6-33-NL5R1-0R1	

Figure A - 3
LCD

HDD

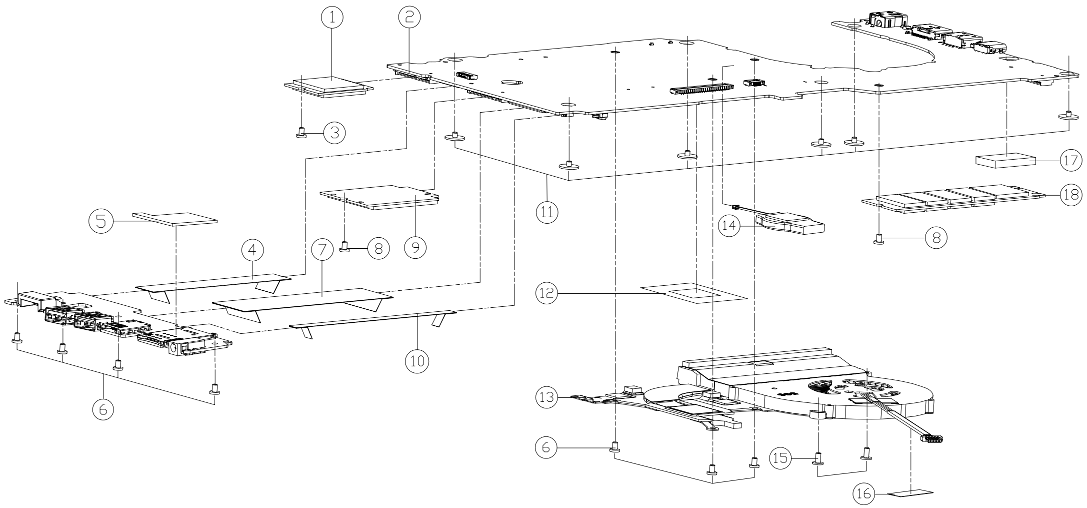
Figure A - 4
HDD





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=ø4.5,DT=0.8)	6-35-B1120-4RC	

MB



ITEM	PART NAME	PART NO	REMARK
1	WLAN+BT COMBO DUAL BAND INTEL THUNDER PEAK 2 [illegible] NON-VPRO 2X2 AC+BT BT5.0 M2 2230 [illegible]	6-88-P75FF-4210	OPTION
1	WLAN+BT COMBO DUAL BAND INTEL CYCLONE PEAK 2 AX200NGW.GAV NON-VPRO 2X2 AX+BT BT5.0 M2 2230	6-88-N15CF-4210	OPTION
1	WLAN+BT COMBO AZUREWAVE AW-CB304NF (RTL8822CE) DC DIVERSITY ANTENNA PCI-E +BT5.0 USB AC+BT BT5.0 M2 2230	6-88-NL5RF-7000	OPTION
2	[illegible]	6-77-NL50RU0A-N02-A	
2	[illegible]	6-77-NL50RU0A-N02-4B	
2	[illegible]	6-77-NL50RU0A-N02-B	
2	[illegible]	6-77-NL50RU0A-N02-4D	
2	[illegible]	6-77-NL50RU0A-N02-11C	
2	[illegible]	6-77-NL50RU0A-N02-14D	
3	SCREW M2*3.2L BNI ICT NY FOR M2	6-35-Z9120-3R2	
4	FFC CABLE FOR RJ TO MB L=73MM 60V PITCH 0.5/22PIN (QX) NL50CU	6-43-NL5C0-051-1	
5	W/O 3G RUBBER(26.2*19.2)SILICON RUBBER P650SE	6-47-P6502-020	
6	.SCREW M2*3L KI NI ICT NY (DD=ø4.0,DT=0.8)	6-35-B1120-3RD	
7	FFC CABLE FOR IO TO MB L=79MM 60V PITCH 0.5/40PIN (QX) NL50CU	6-43-NL5C0-021-1	
8	SCREW M2*2L KI NI ICT NY (DD=ø5 ,T=0.8)	6-35-B1120-2RA	
9	LTE 4G MODULE FIBOCOM L830-EB CAT 6 FOR EUROPE M2 CARD USB INTERFACE DEFAULT WITHOUT GPS/GLONASS	6-88-NJ506-0C00	OPTION
10	FFC CABLE FOR 3G TO MB L=80MM 60V PITCH 0.5/8PIN (QX) NL50CU	6-43-NL5C0-011-1	
11	SCREW M2*2L KI BK/Z ICT NY(ø8,T=0.6)	6-35-B6120-2RE	
12	CPU MYLAR NL50RU	6-40-NL5RS-010	
13	THERMAL MODULE NL50RU	6-31-NL5R3-101	
14	BAT. 20MM 3V 220MAH W/CABLE 55MM BCR2032H5	6-23-22015-TE0	
15	SCREW M2*4L KI NI ICT NY (DD=ø4.5,DT=0.8)	6-35-B1120-4RC	
16	TAPE MYLAR TRANSPARENT (20*10*0.05) P180HM	6-40-P1803-020	
17	THERMAL PAD FOR M.2 SSD TFLEXB35 30MM*18MM NL50CU	6-48-NL5CS-010	
18	SSD M2 2280 1TB WD SDBPNTY-1T00 (SN730) PCIE G3X4 3D TLC 96 LAYERS	6-85-D511T-W01	OPTION
18	SSD M2 2280 1TB SAMSUNG MZVLQ1T0HALB-XXXXX (PM991) PCIE G3X4 DRAMLESS 3D TLC 96 LAYERS	6-85-D511T-S05	OPTION
18	SSD M2 2280 1TB SAMSUNG MZVLB1T0HBLR-00000 (PM981A) PCIE G3X4 3D TLC 96 LAYERS	6-85-D511T-S04	OPTION
18	SSD M2 2280 512GB WD SDBPNTY-512G (SN730) PCIE G3X4 3D TLC 96 LAYERS	6-85-D515B-W02	OPTION
18	SSD M2 2280 512GB SAMSUNG MZVLB512HBJQ-XXXXX (PM981A) PCIE G3X4 3D TLC 96 LAYERS	6-85-D515B-S0A	OPTION
18	SSD M2 2280 512GB SAMSUNG MZVLQ512HALU-XXXXX (PM991) PCIE G3X4 DRAMLESS 3D TLC 96 LAYERS	6-85-D515B-S0B	OPTION
18	SSD M2 2280 512GB MICRON MTFDDAV512TDL(1300) SATA3 3D TLC 96 LAYERS	6-85-D515B-102	OPTION
18	SSD M2 2280 512GB KINGSTON RBU-SNS8180S3/512GJ (RBU-SNS8180S3) SATA3 3D TLC 64 LAYERS	6-85-D515B-K00	OPTION
18	SSD M2 2280 512GB BIWIN CNF82GS2402-512 (N2202) SATA3 3D TLC 64 LAYERS	6-85-D515B-B00	OPTION
18	SSD M2 2280 512GB TEAMGROUP TE512GS510SM80 (S510) SATA3 3D TLC 96 LAYERS	6-85-D515B-T00	OPTION
18	SSD M2 2280 256GB MICRON MTFDDAV256TBN (1100) SATA3 (MICRON 3D TLC 64 LAYERS)	6-85-D51R6-101	
18	SSD M2 2280 256GB WD SDBPNTY-256G (SN730) PCIE G3X4 3D TLC 96 LAYERS	6-85-D51R6-W02	

Figure A - 5
MB

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the ***NL50RU / NL53RU*** notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

Diagram - Page	Diagram - Page	Diagram - Page
System Block Diagram - Page B - 2	*PD TI65987 - Page B - 18*	*MP2945GU - Page B - 34*
Processor 1/11 - Page B - 3	*Type-C - Page B - 19*	*VDDCR - Page B - 35*
Processor 2/11 - Page B - 4	*LED KB, FP - Page B - 20*	*1.8VA, VDDP - Page B - 36*
Processor 3/11 - Page B - 5	*SATA HDD, TPM - Page B - 21*	*Charger, AC IN - Page B - 37*
Processor 4/11 - Page B - 6	*Audio Codec - Page B - 22*	*RTL8411H - Page B - 38*
Processor 5/11 - Page B - 7	*KBC ITE IT5570 - Page B - 23*	*Multi-Conn, SIM - Page B - 39*
Processor 6/11 - Page B - 8	*WLAN - Page B - 24*	*Multi USB Type-A - Page B - 40*
Processor 7/11 - Page B - 9	*M Key PCIE SSD - Page B - 25*	*RTS5227S - Page B - 41*
Processor 8/11 - Page B - 10	*3G/LTE - Page B - 26*	*PWR BTN Board - Page B - 42*
Processor 9/11 - Page B - 11	*USB Type-A - Page B - 27*	
Processor 10/11 - Page B - 12	*Conn, CCD, Fan, TP - Page B - 28*	
Processor 11/11 - Page B - 13	*3V, 5V, 3VS, 5VS, 1.2VS, 1.5VS - Page B - 29*	
DDR4 SO-DIMM_0 - Page B - 14	*VDD3, VDD5 - Page B - 30*	
DDR4 SO-DIMM_1 - Page B - 15	*VDDPS, 1.8V, 1.8VS - Page B - 31*	
HDMI - Page B - 16	*VDDQ, VDDQ_VTT, 2.5V - Page B - 32*	
Panel - Page B - 17	*DC Jack, PD PWR - Page B - 33*	

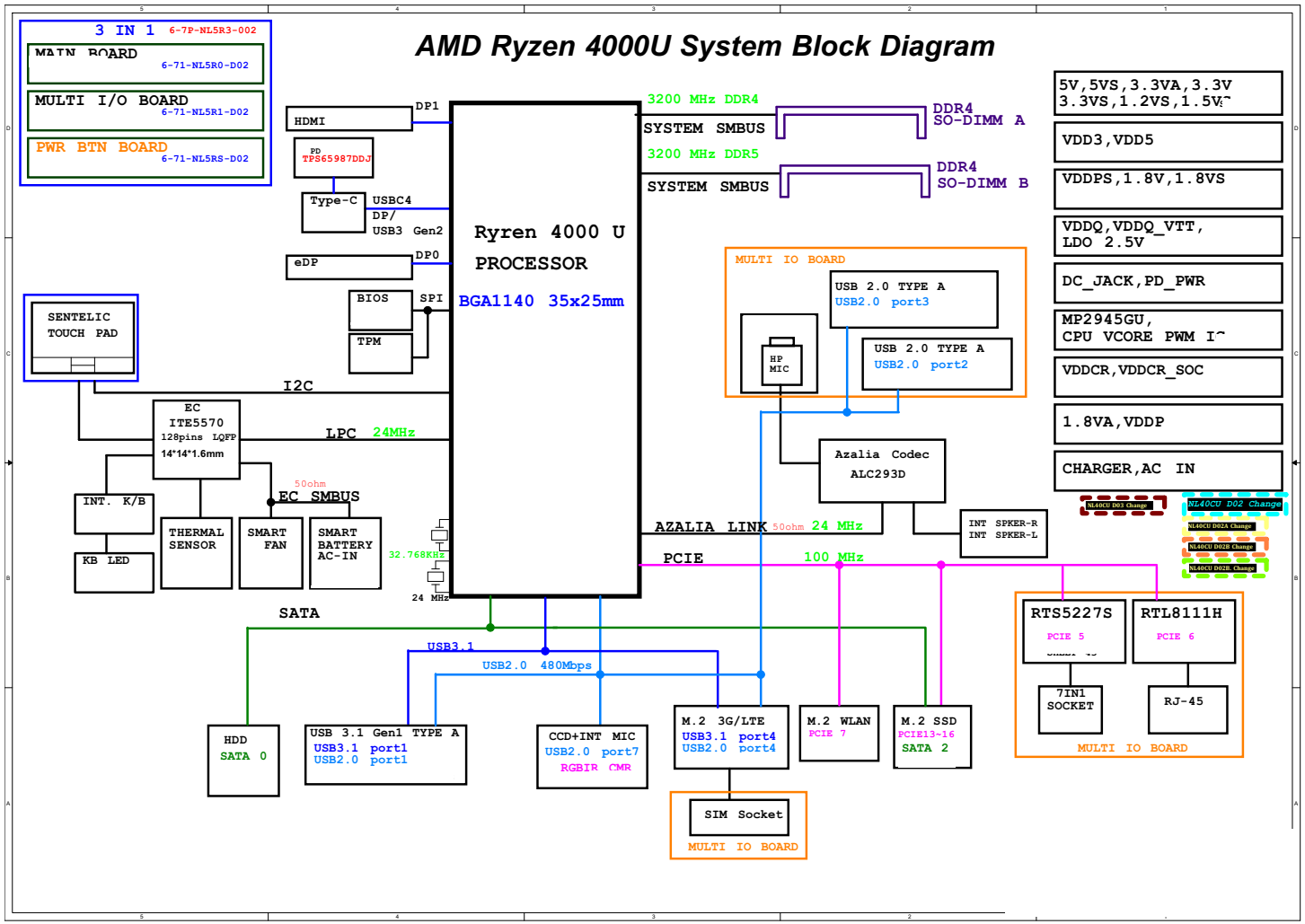
Table B - 1
SCHEMATIC DIAGRAMS

Version Note

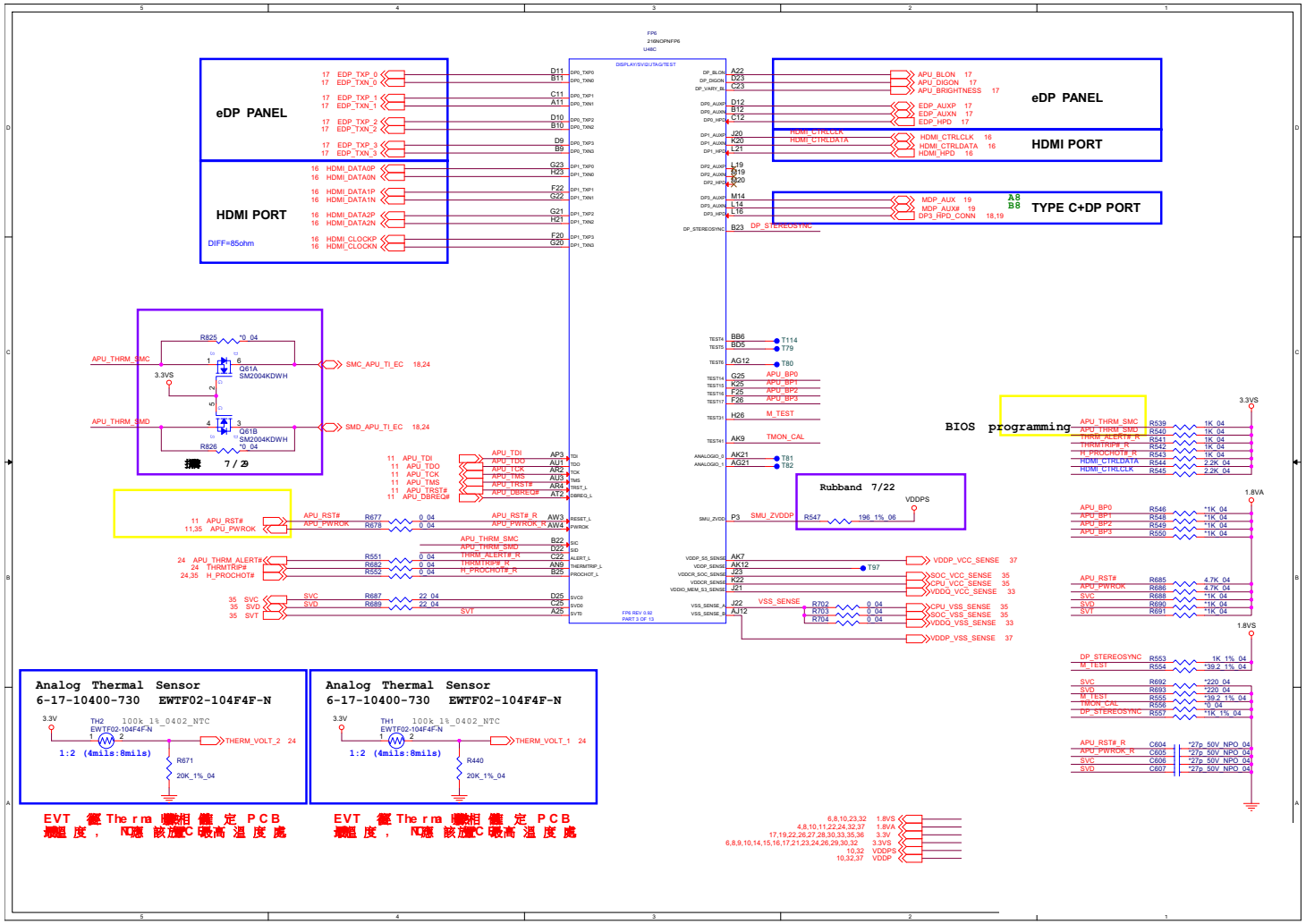
The schematic diagrams in this chapter are based upon version 6-7P-NL5R3-002. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

System Block Diagram

Sheet 1 of 41
System Block Diagram



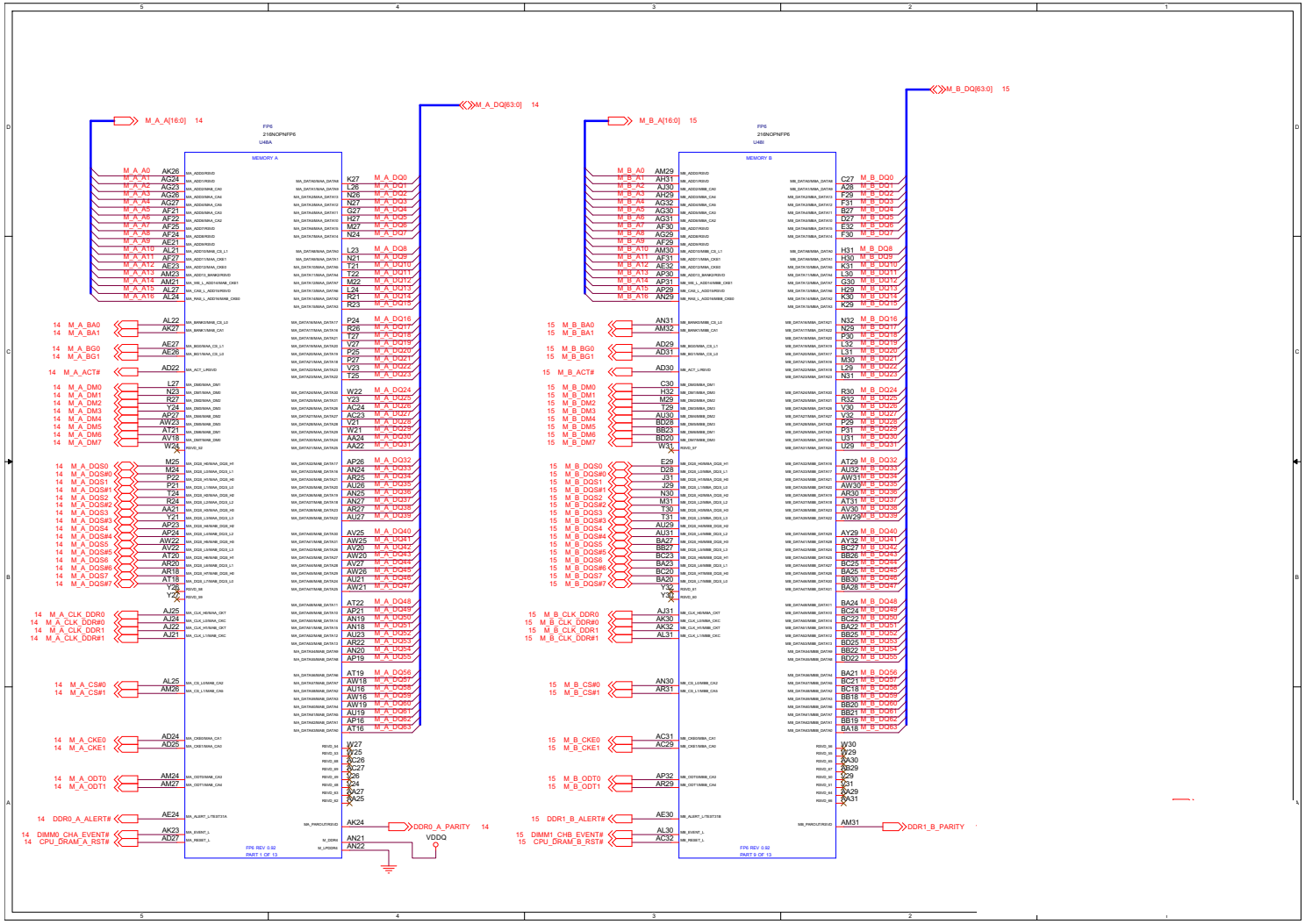
Processor 1/11



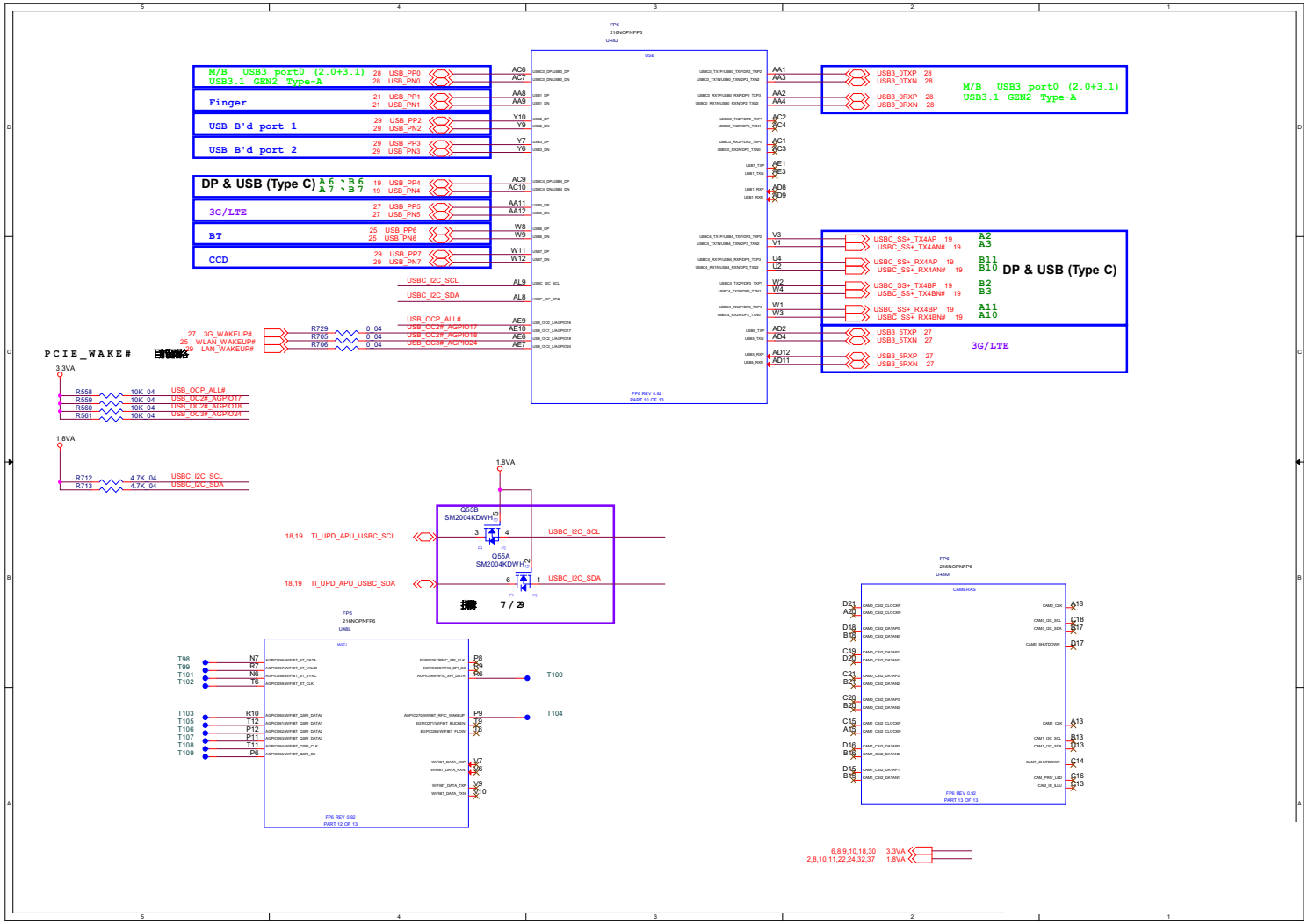
Sheet 2 of 41
Processor 1/11

Processor 2/11

Sheet 3 of 41
Processor 2/11



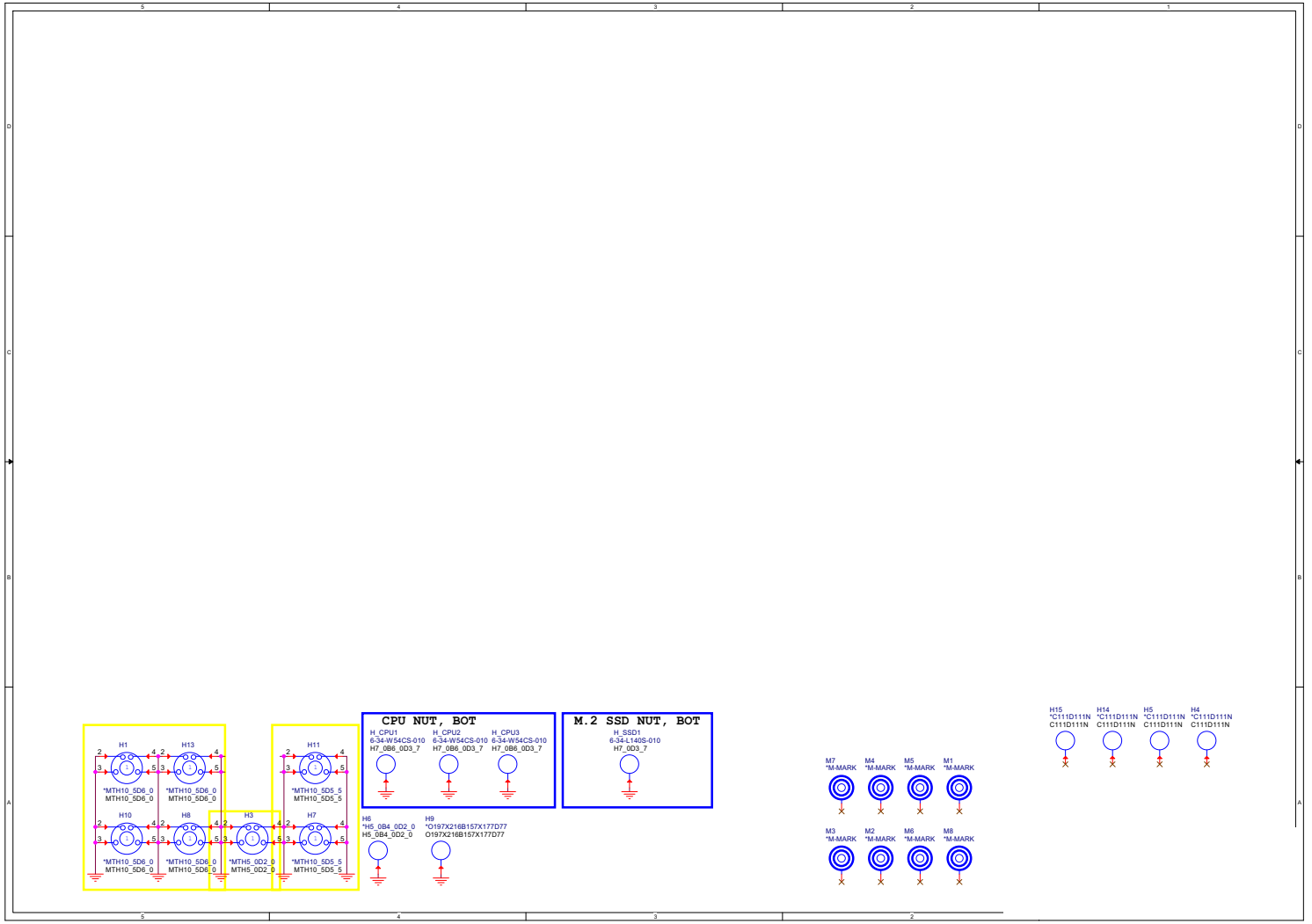
Processor 3/11



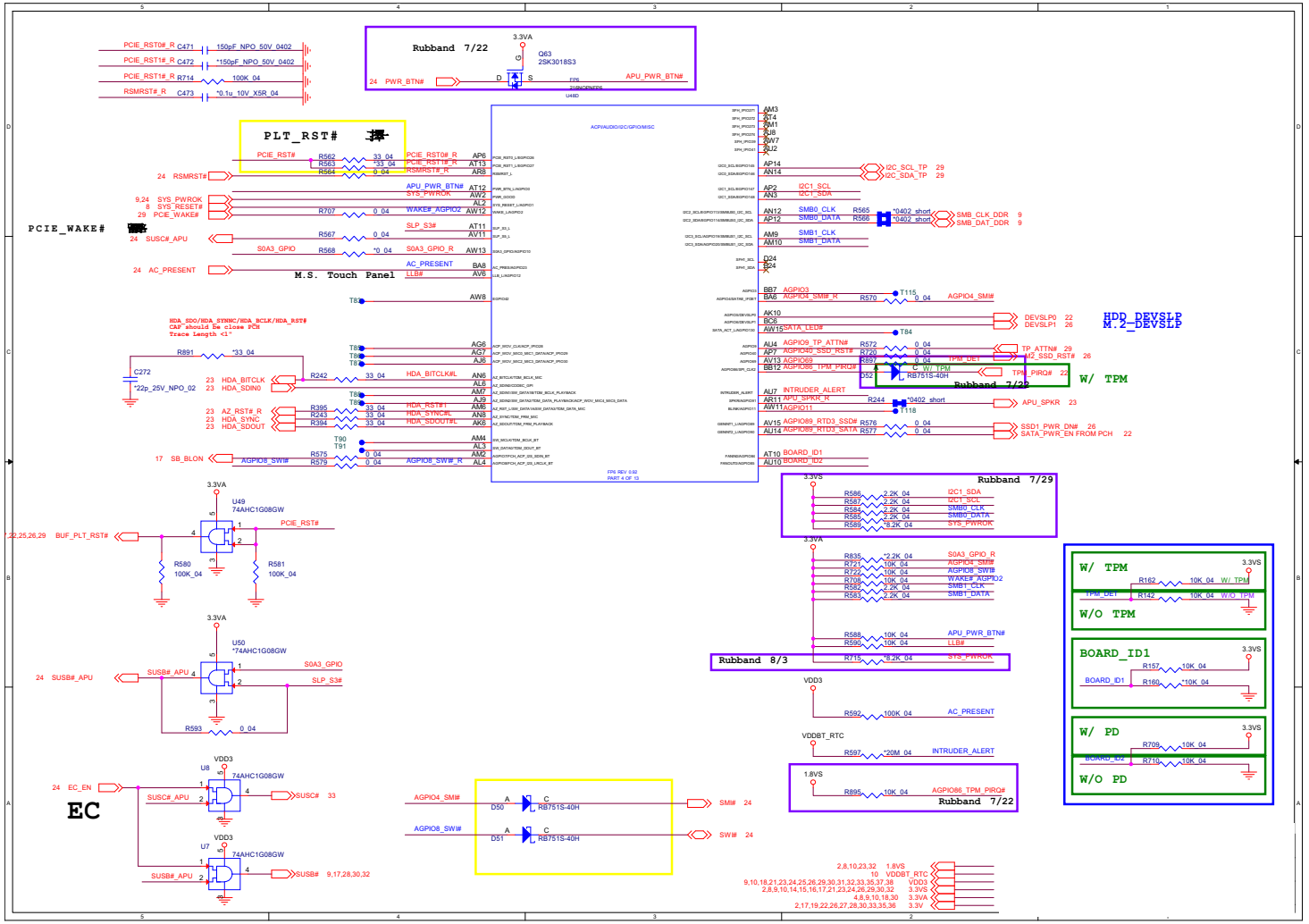
Sheet 4 of 41
Processor 3/11

Processor 4/11

Sheet 5 of 41
Processor 4/11



Processor 5/11

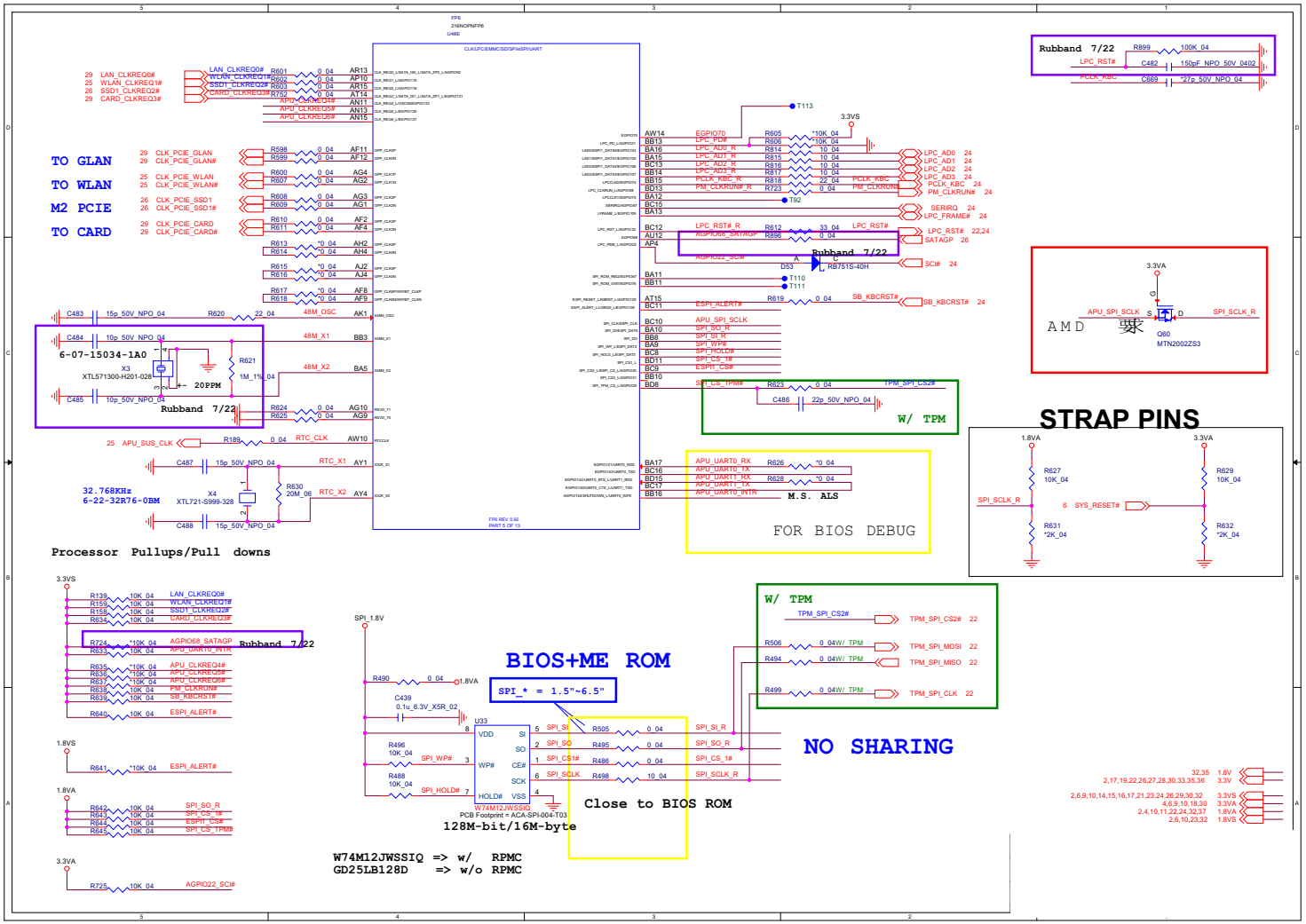


Sheet 6 of 41
Processor 5/11

Processor 6/11

Sheet 7 of 41
Processor 6/11

Processor 7/11

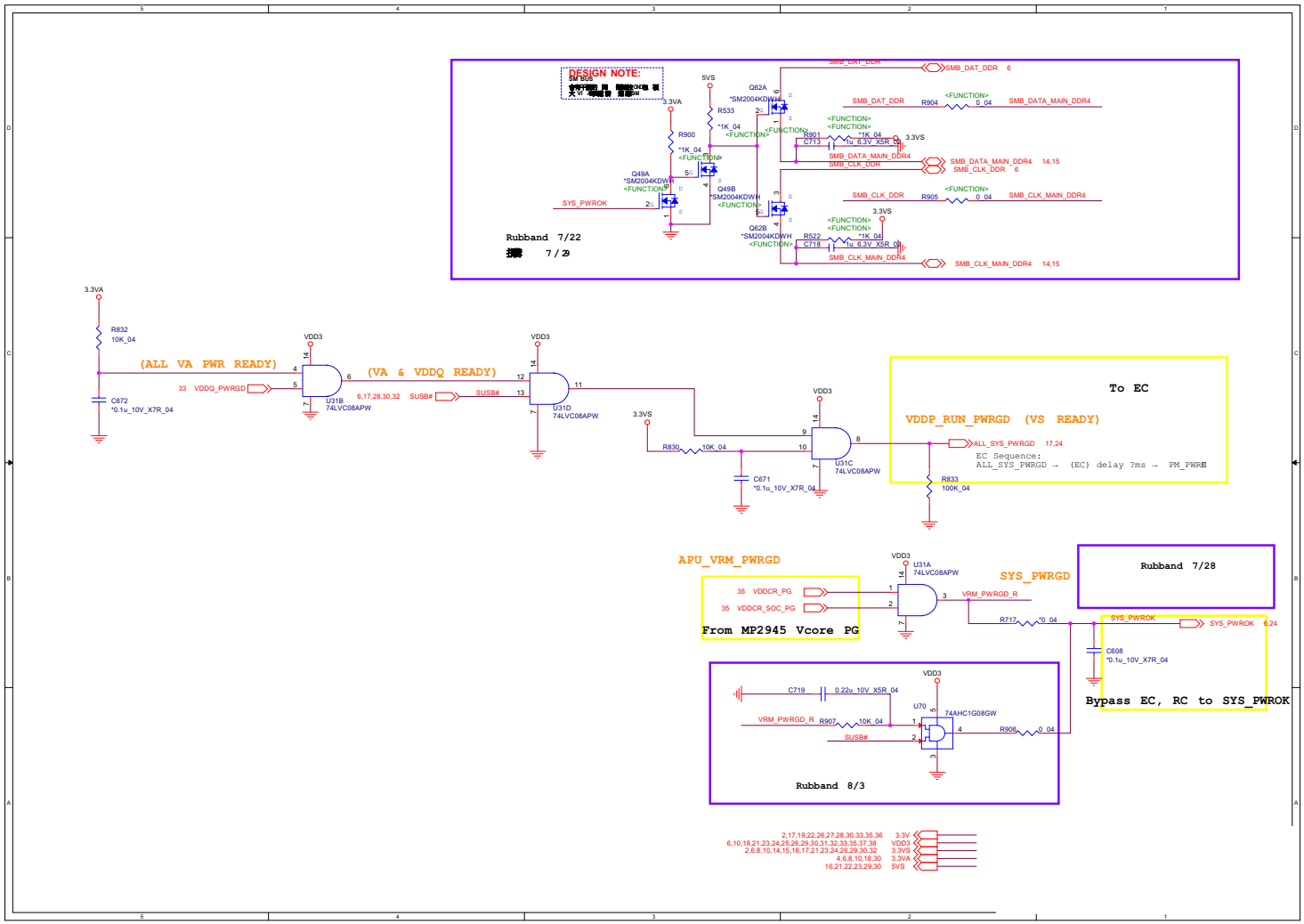


Sheet 8 of 41
Processor 7/11

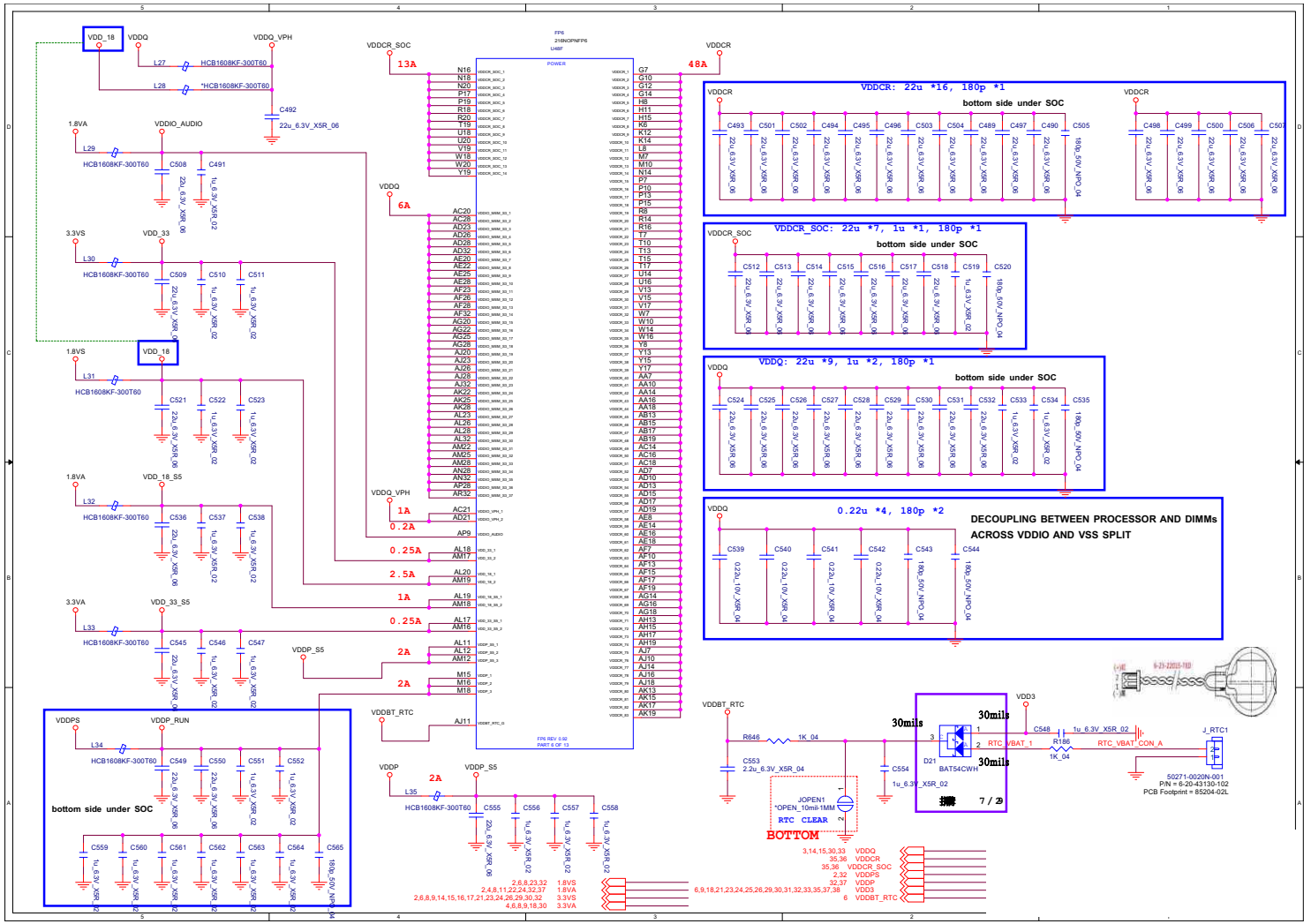
B.Schematic Diagrams

Processor 8/11

Sheet 9 of 41
Processor 8/11



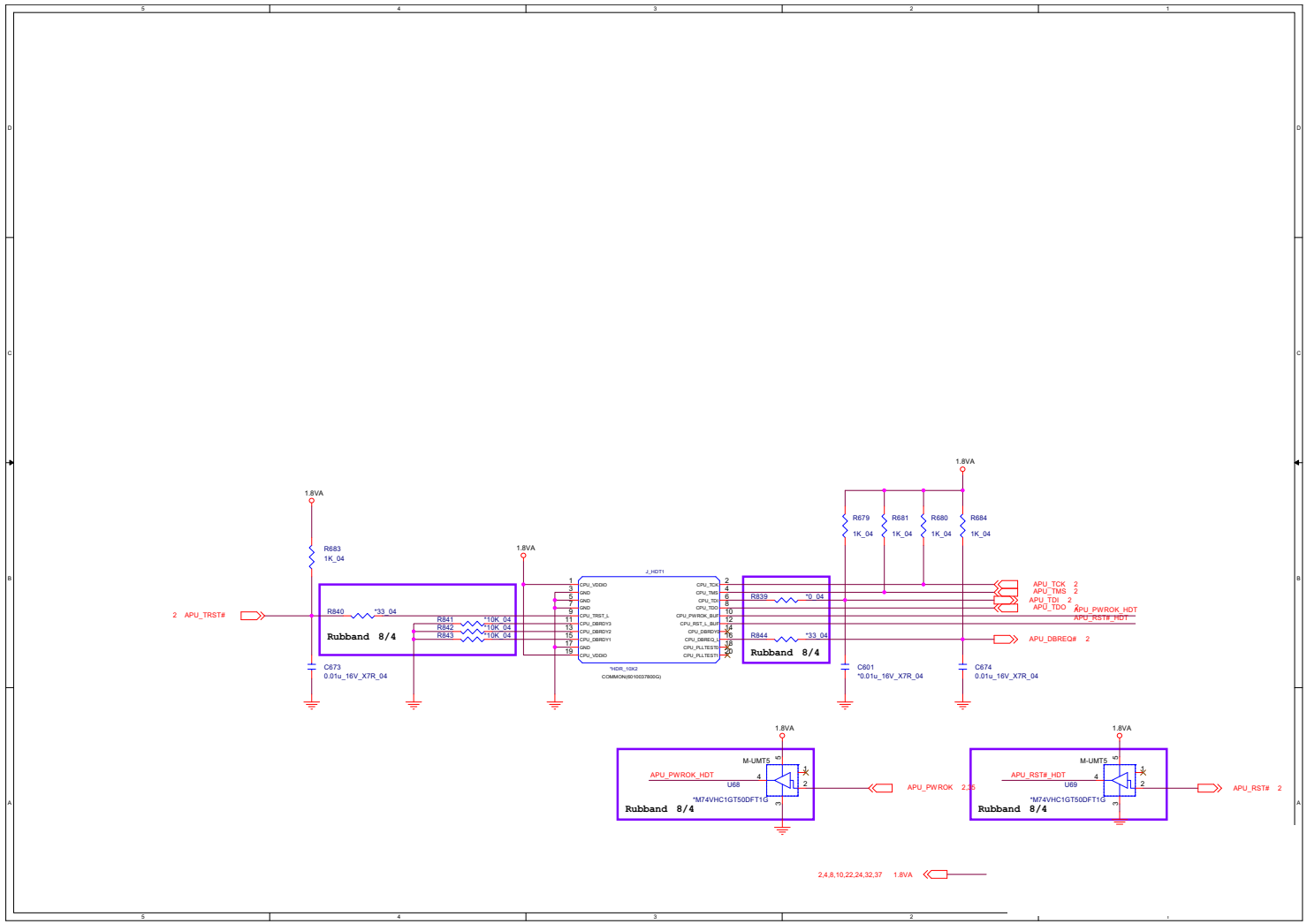
Processor 9/11



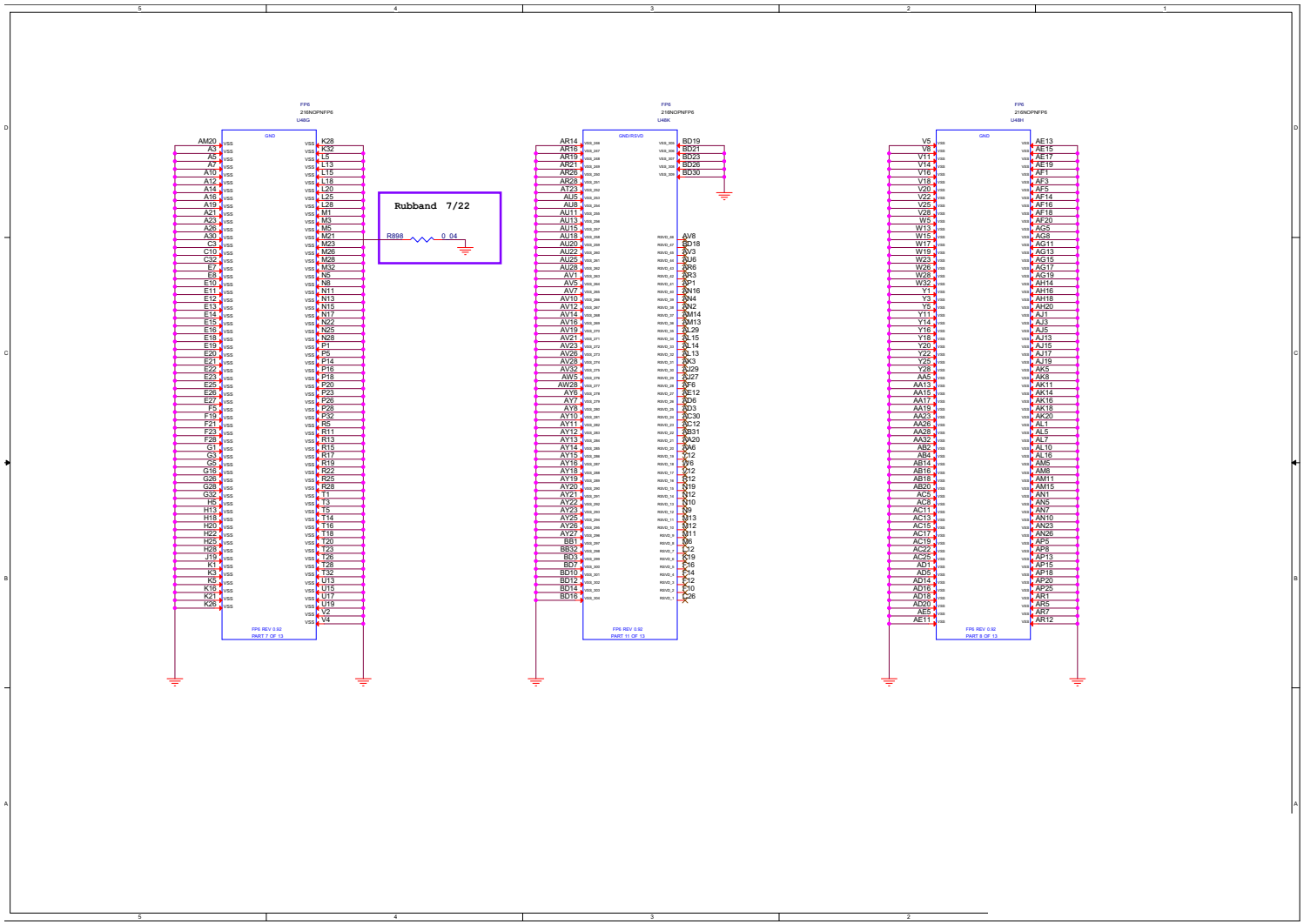
Sheet 10 of 41
Processor 9/11

Processor 10/11

Sheet 11 of 41
Processor 10/11



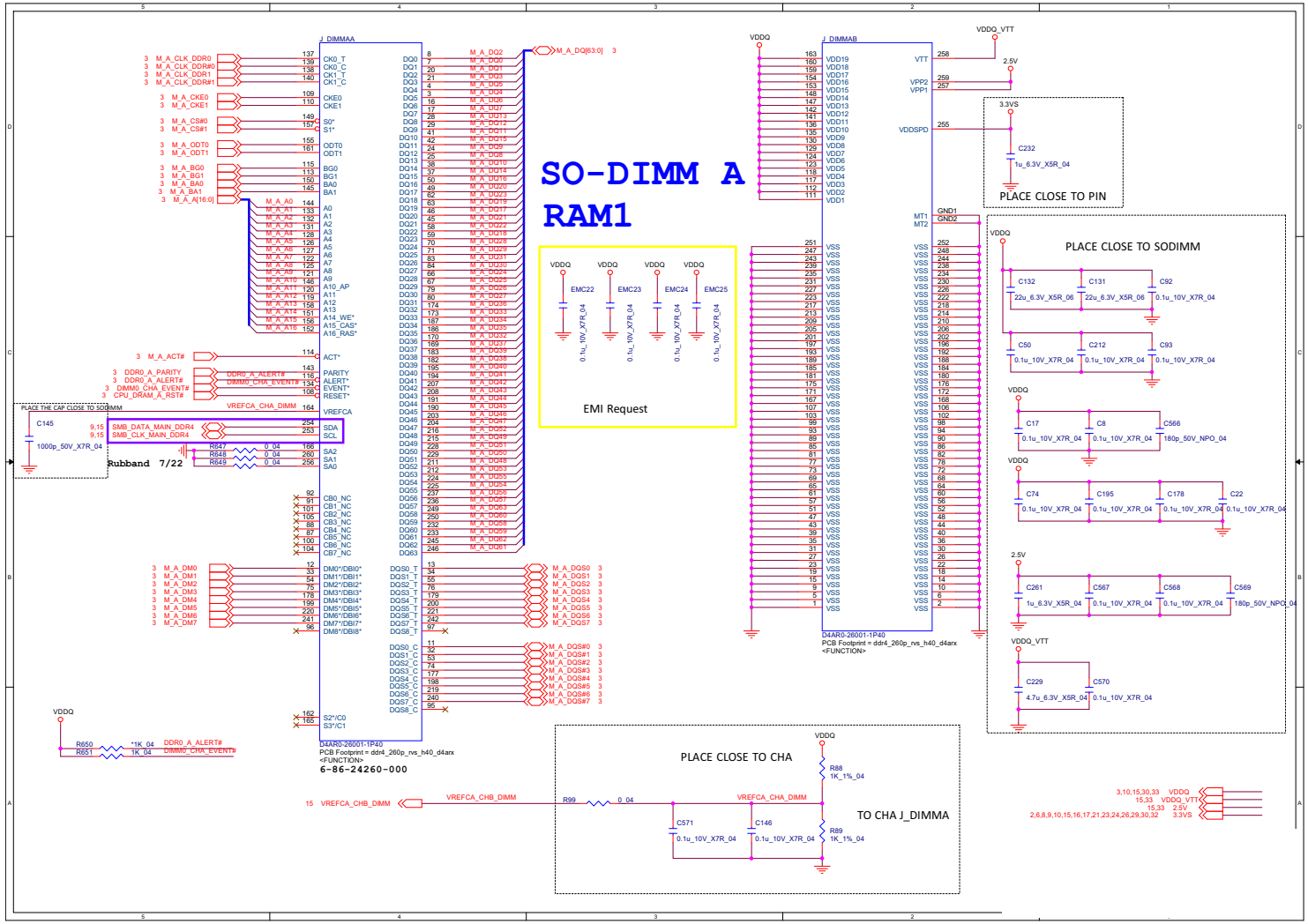
Processor 11/11



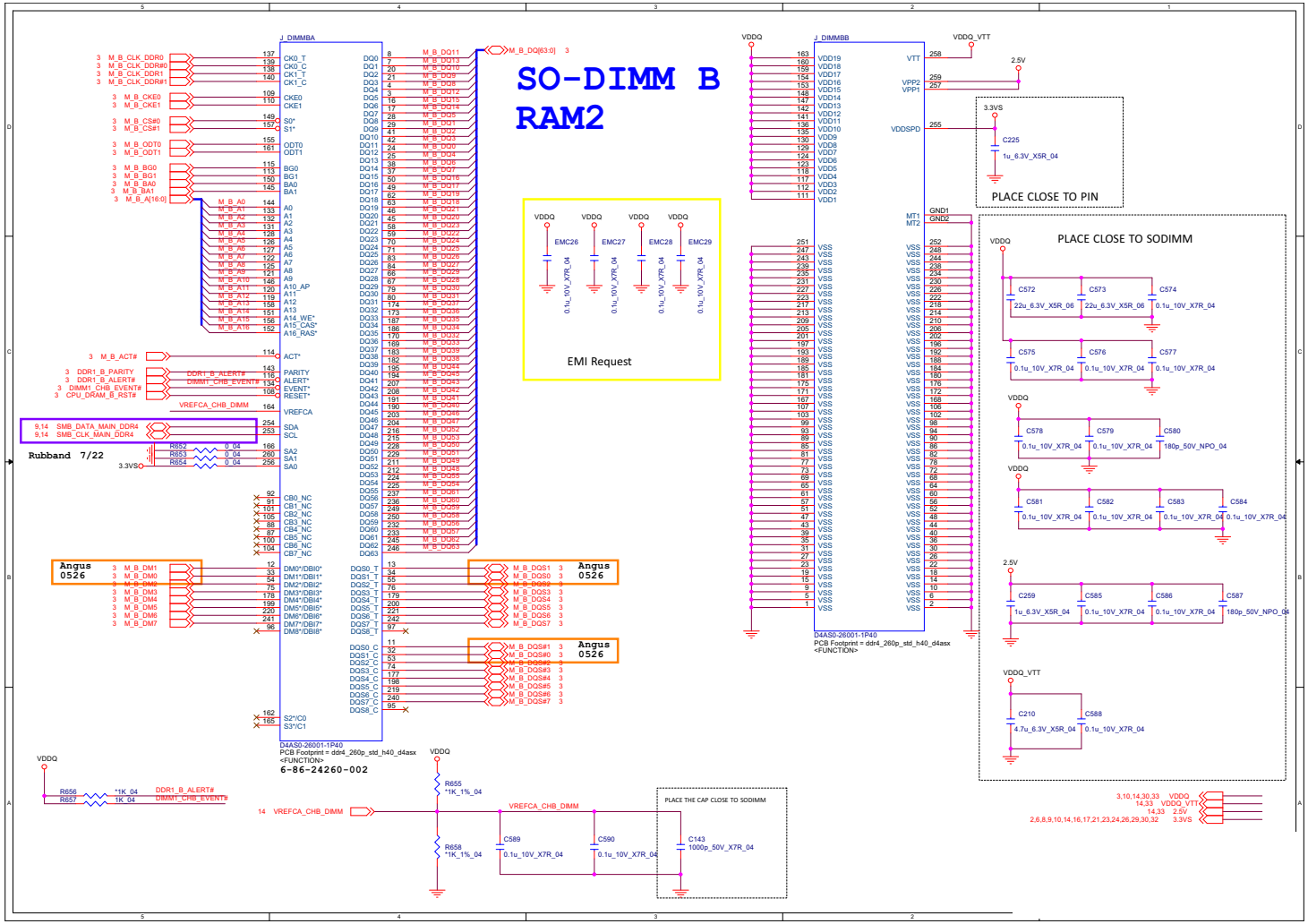
Sheet 12 of 41
Processor 11/11

DDR4 SO-DIMM_0

Sheet 13 of 41
DDR4 SO-DIMM_0



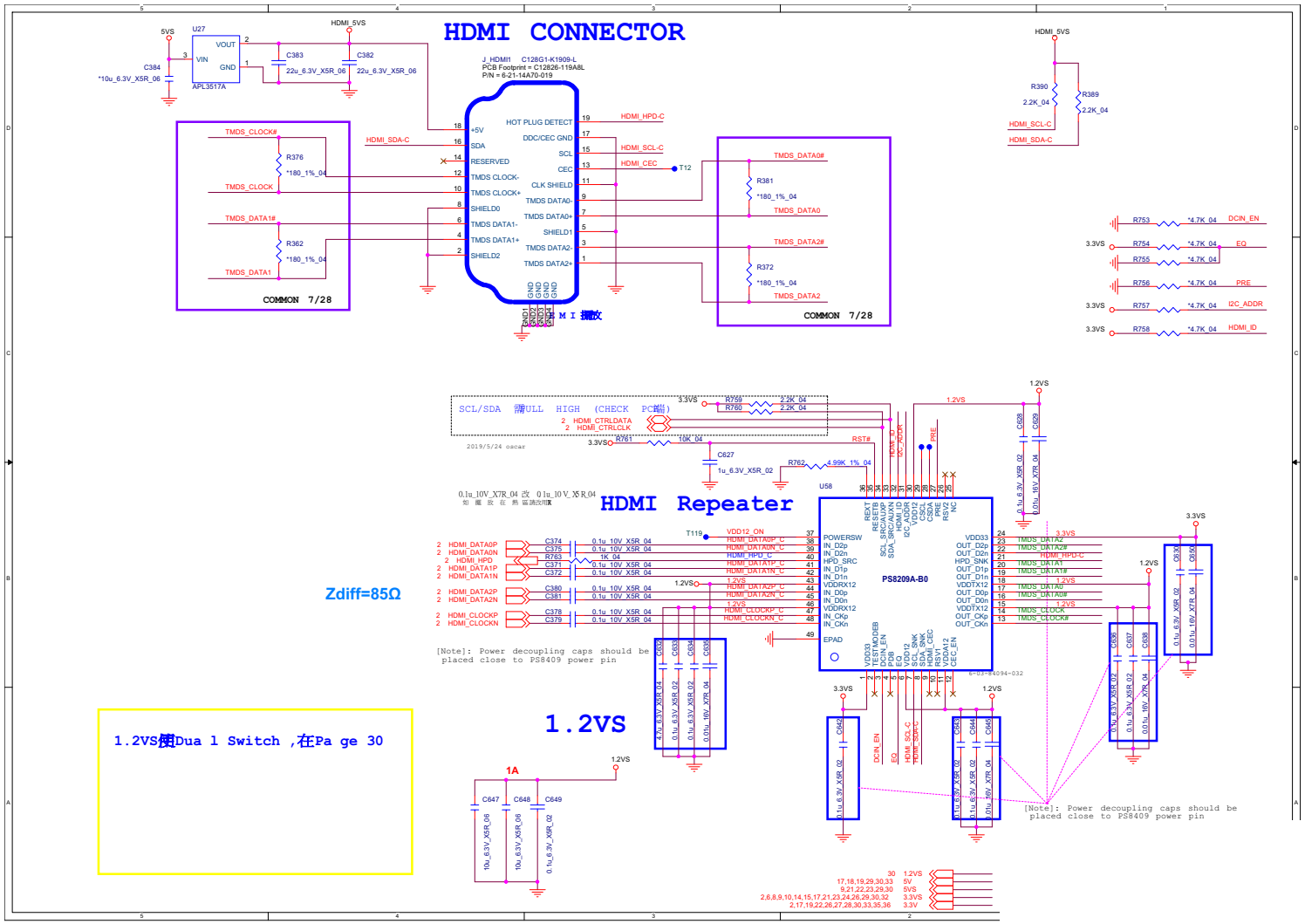
DDR4 SO-DIMM_1



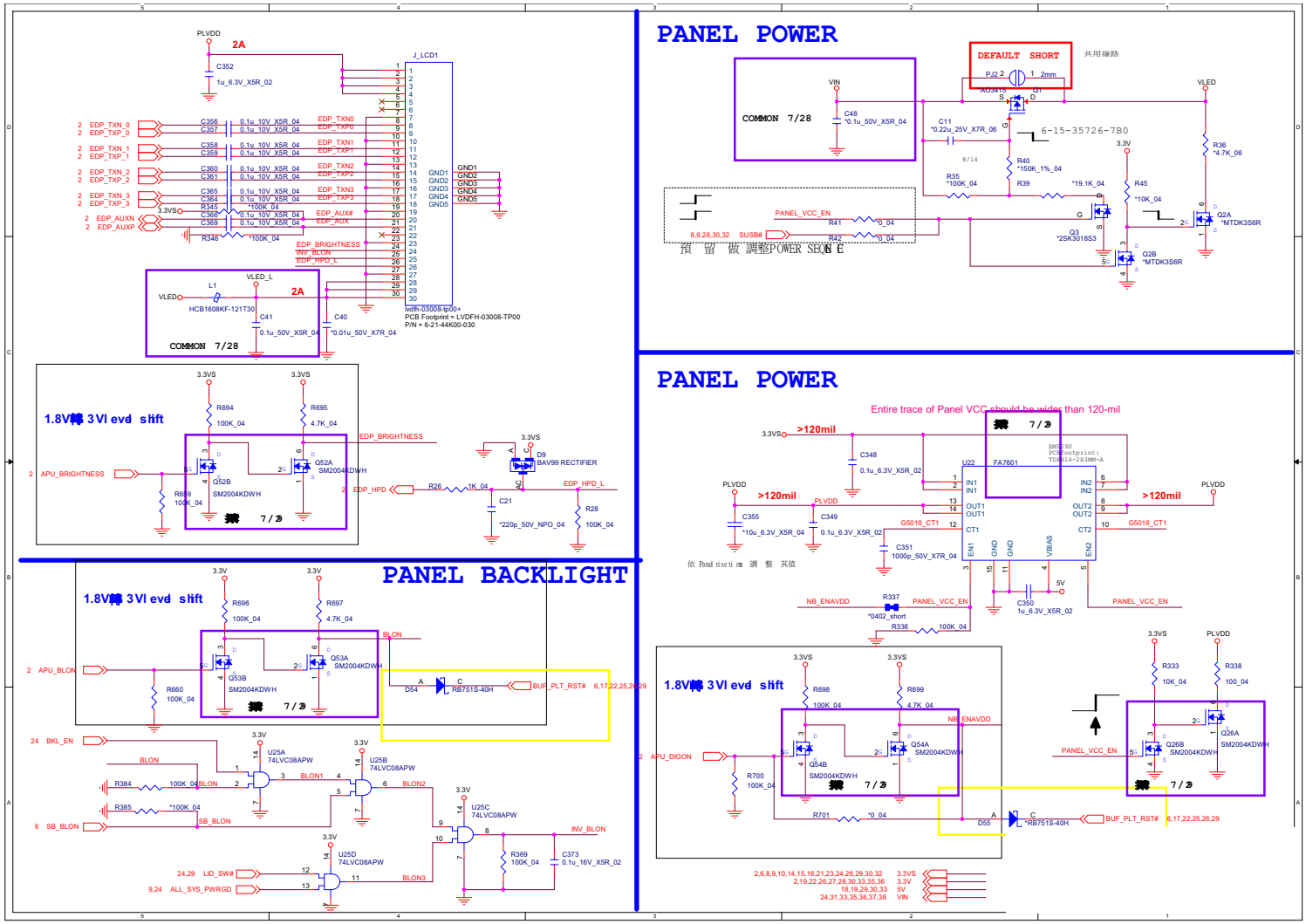
Sheet 14 of 41
DDR4 SO-DIMM_1

HDMI

Sheet 15 of 41
HDMI



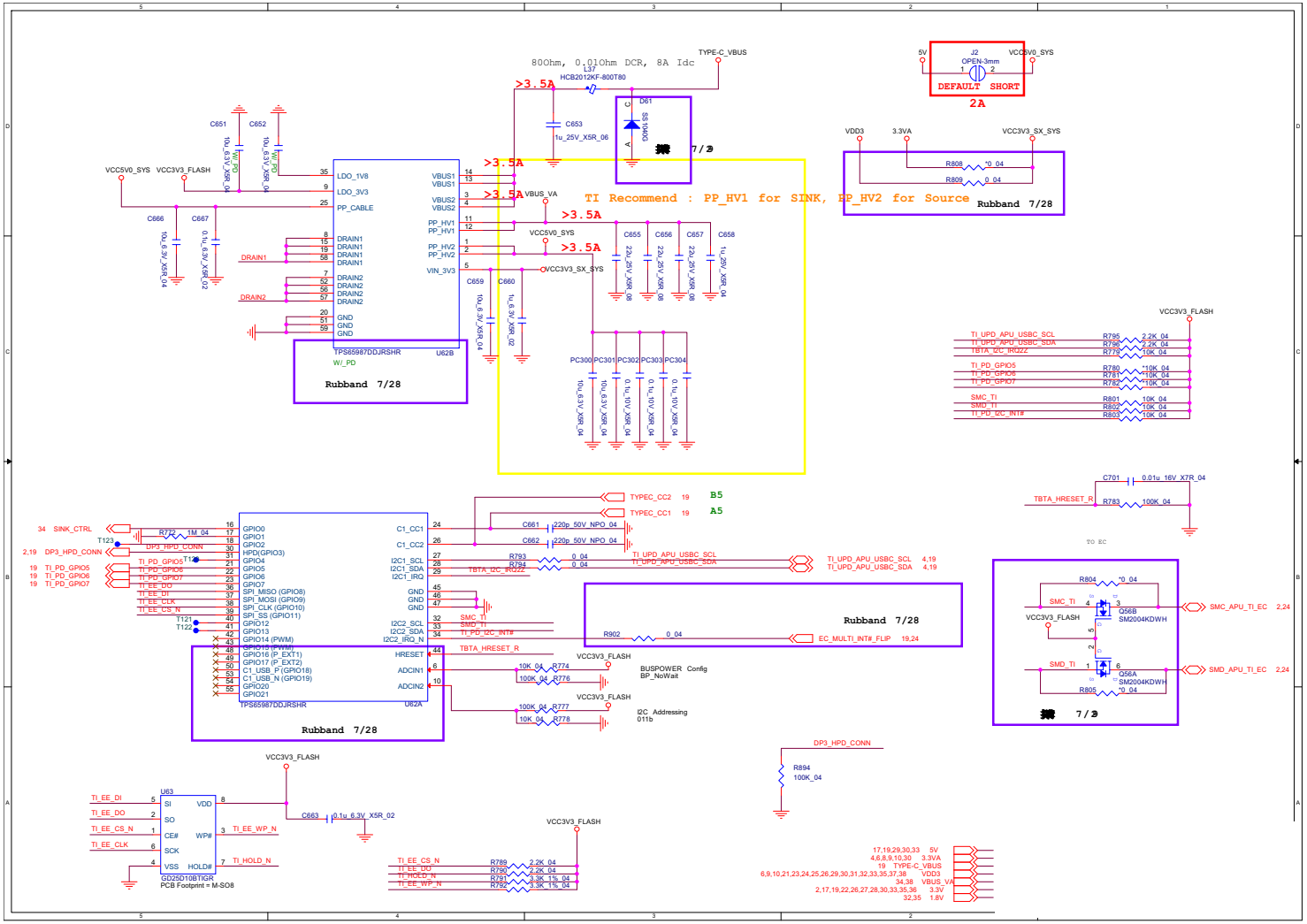
Panel



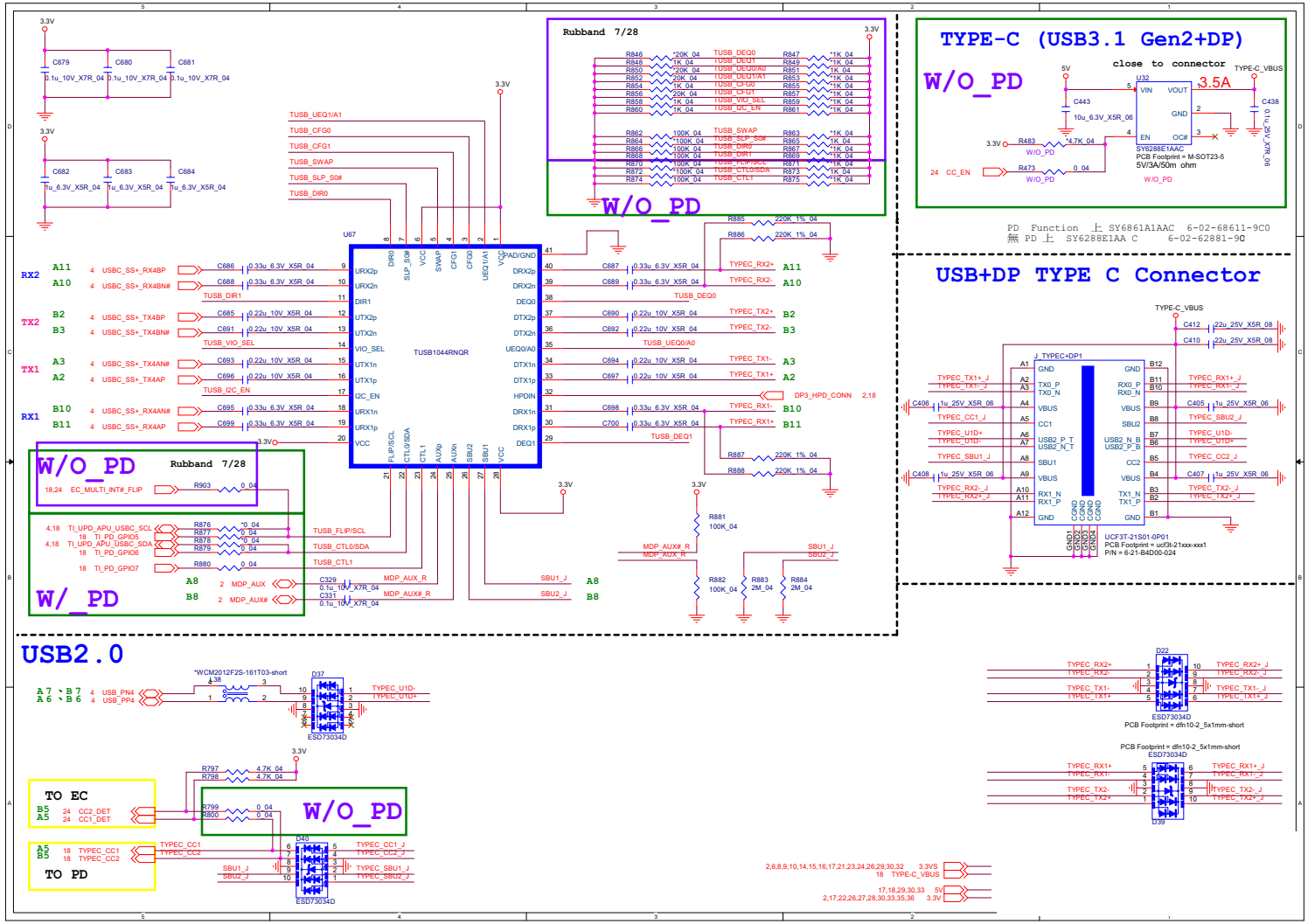
Sheet 16 of 41
Panel

PD TI65987

Sheet 17 of 41
PD TI65987



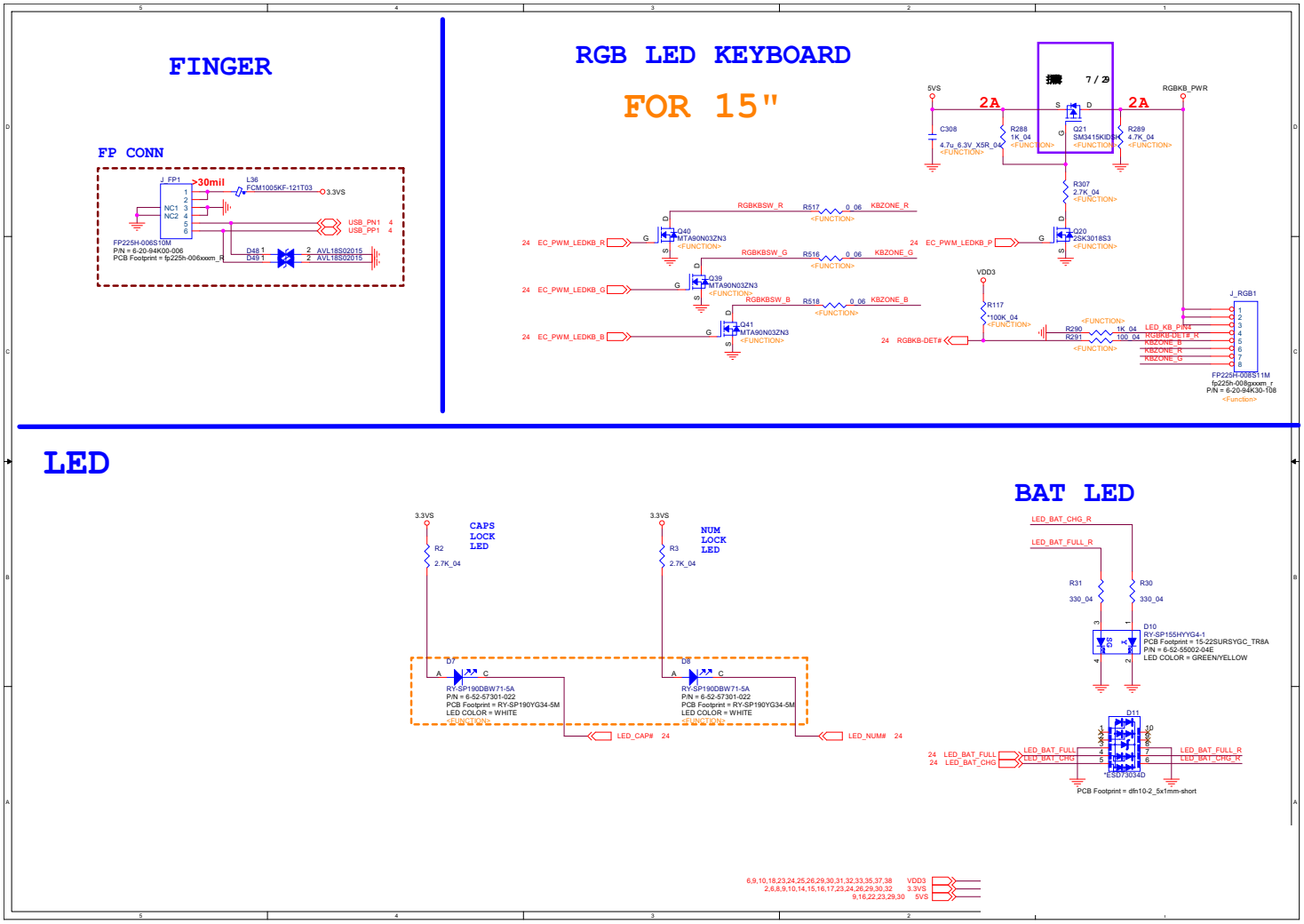
Type-C



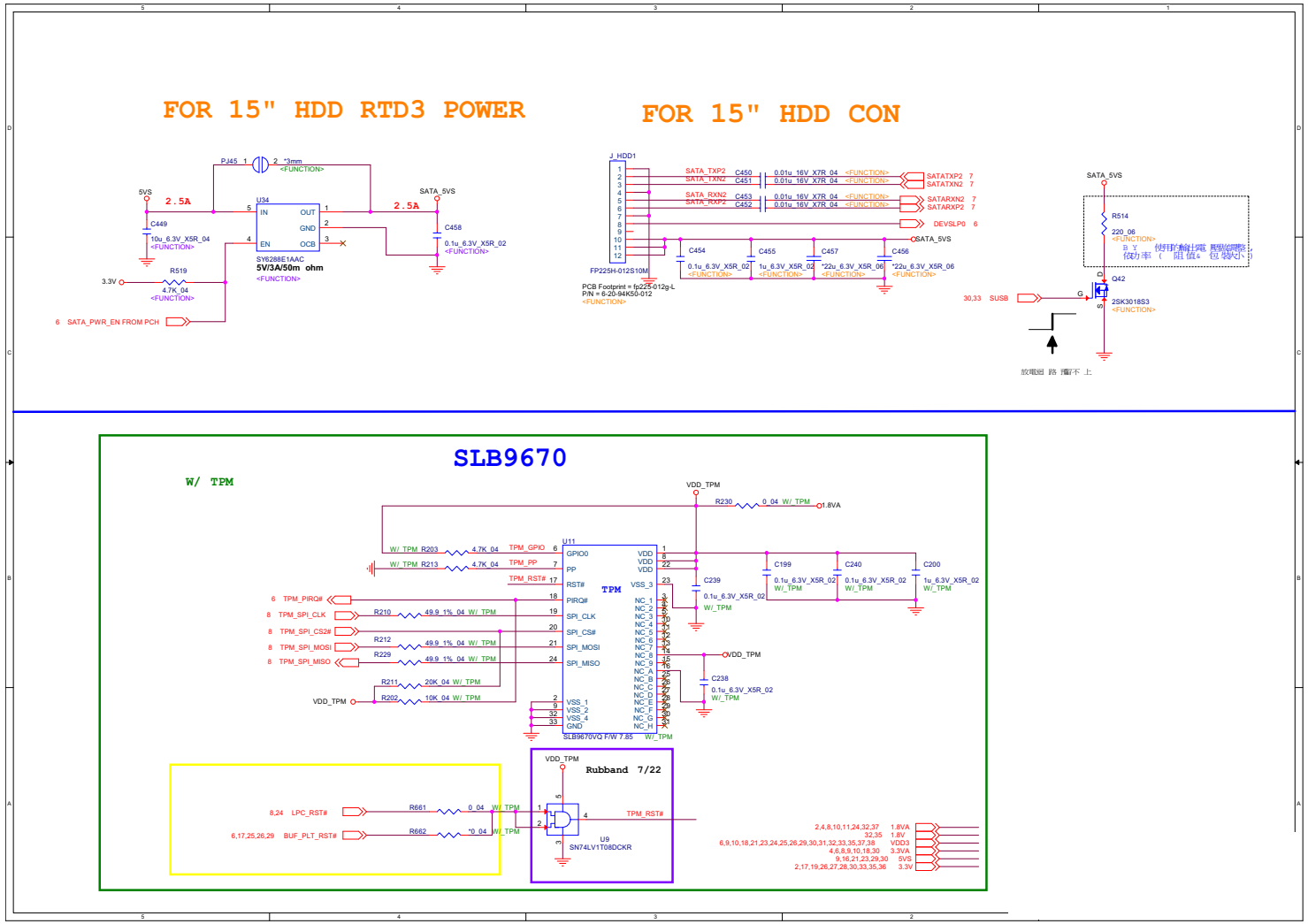
Sheet 18 of 41
Type-C

LED KB, FP

Sheet 19 of 41
LED KB, FP



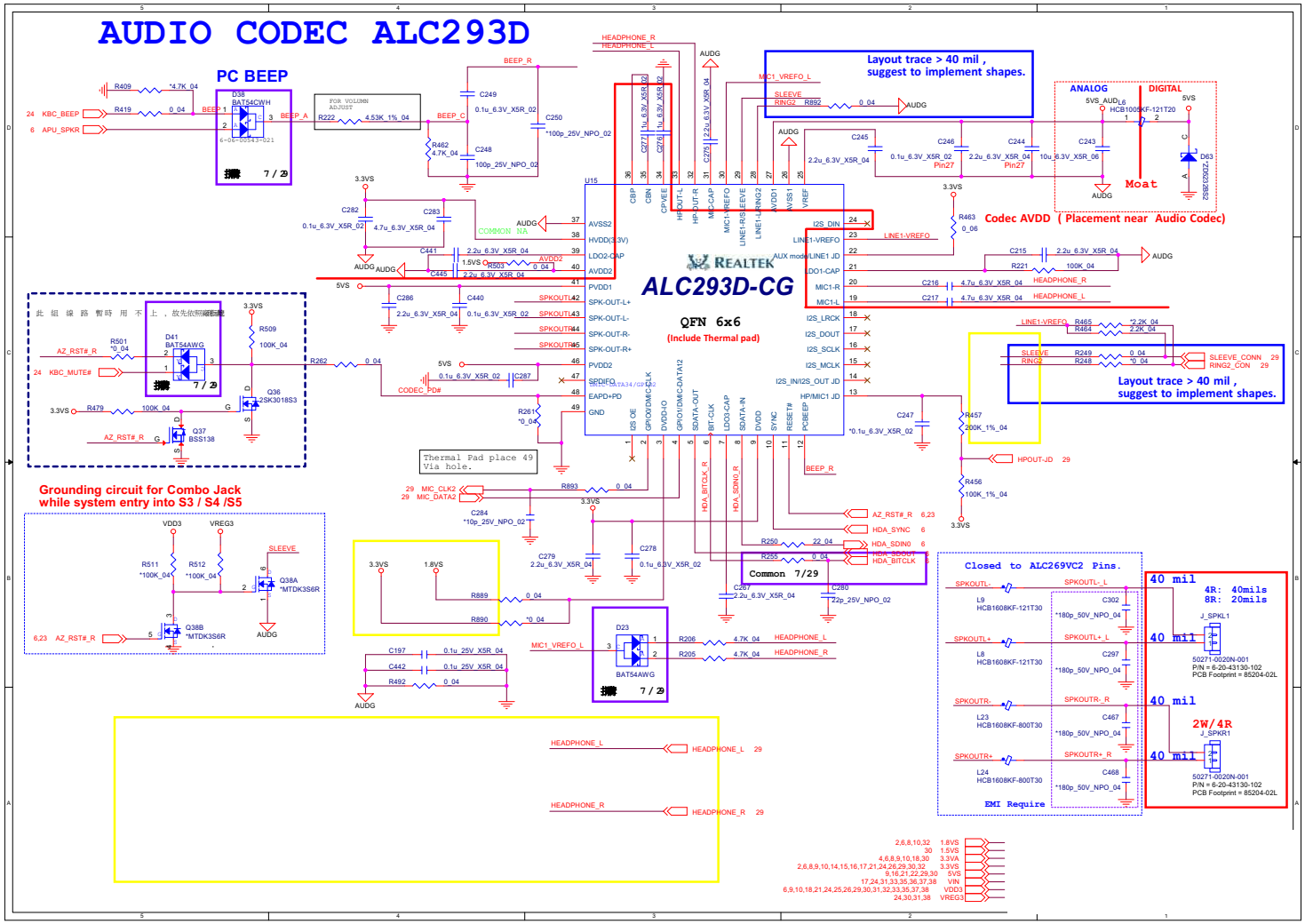
SATA HDD, TPM



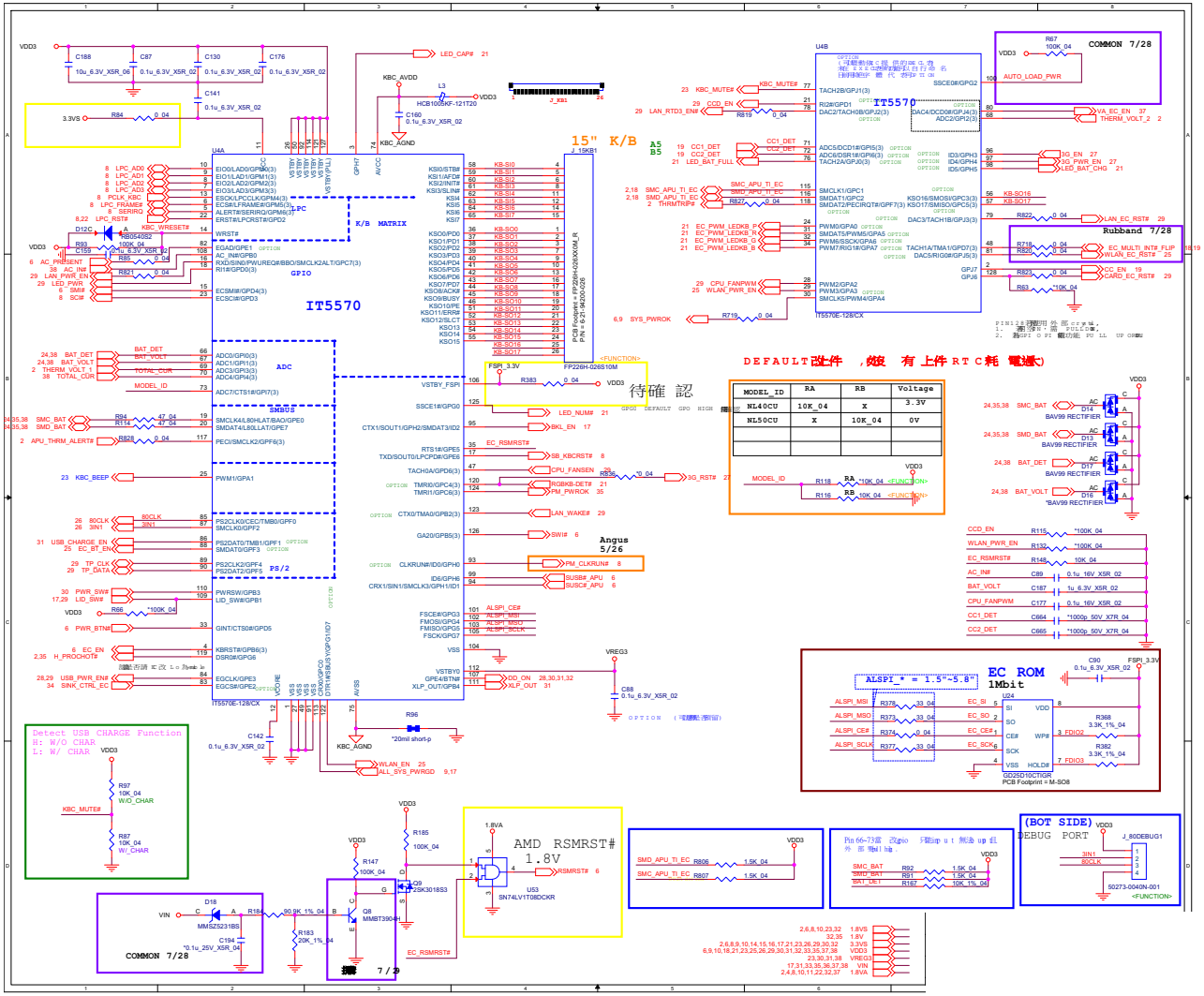
Sheet 20 of 41
SATA HDD, TPM

Audio Codec

Sheet 21 of 41
Audio Codec



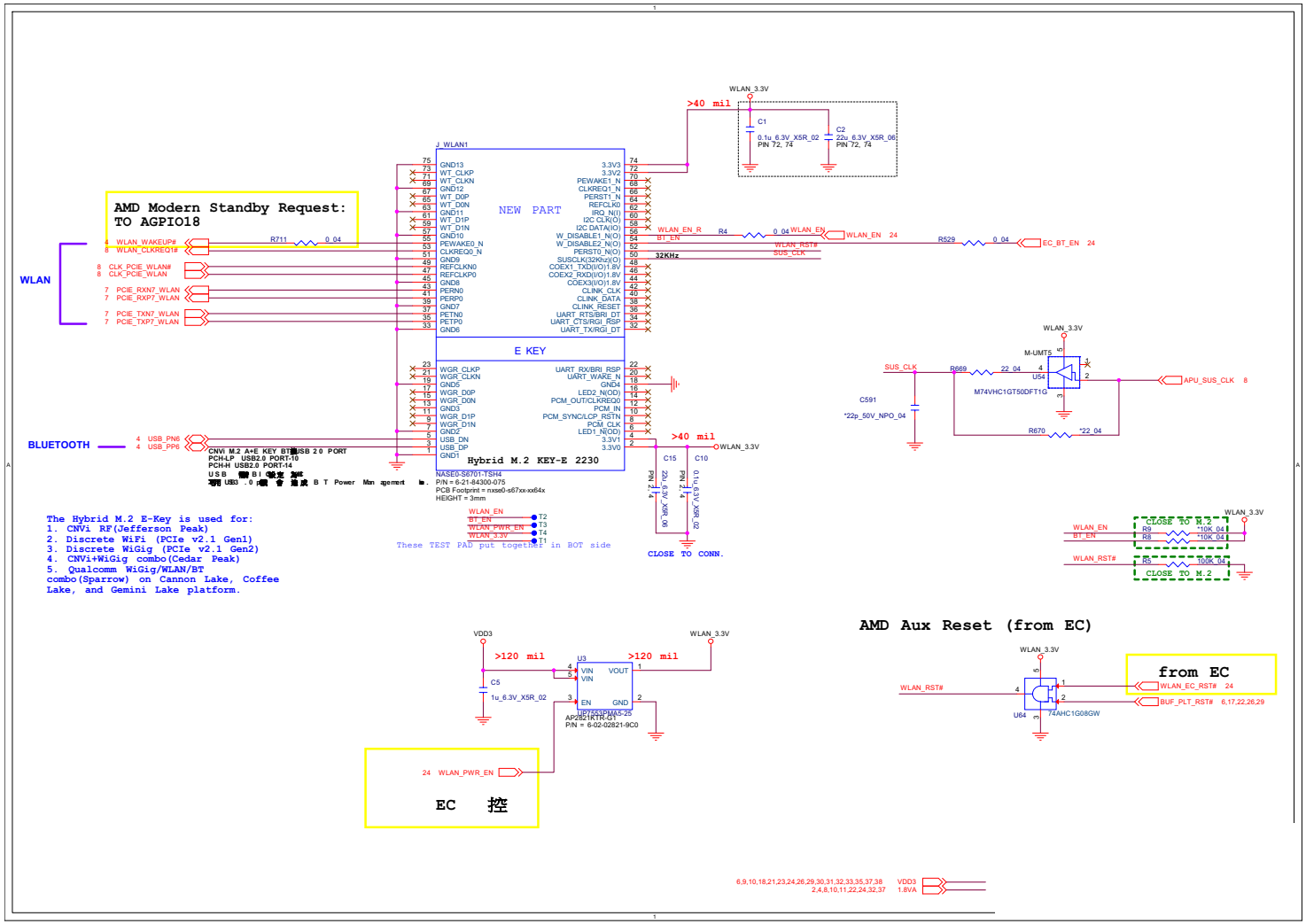
KBC ITE IT5570



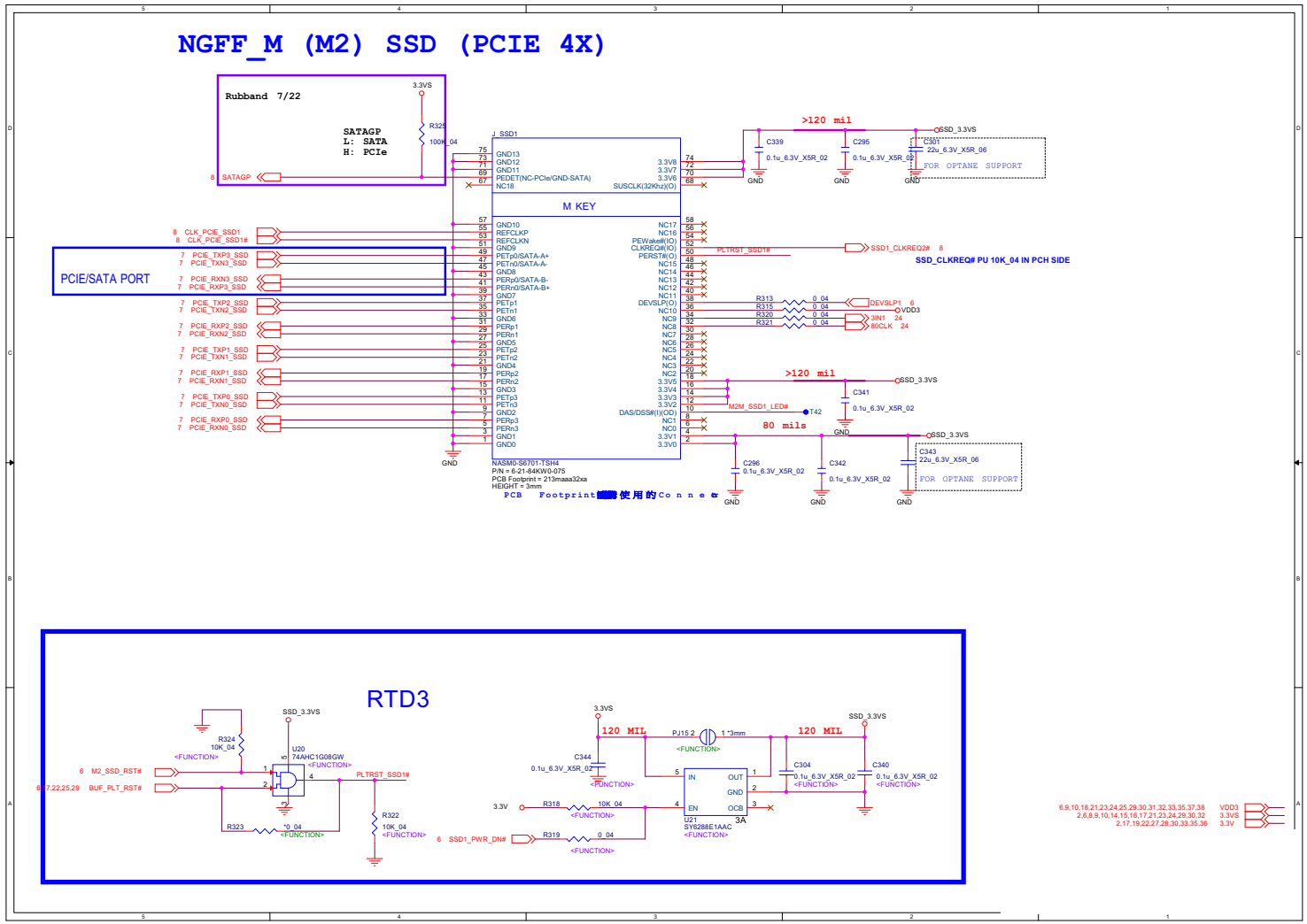
Sheet 22 of 41
KBC ITE IT5570

WLAN

Sheet 23 of 41
WLAN



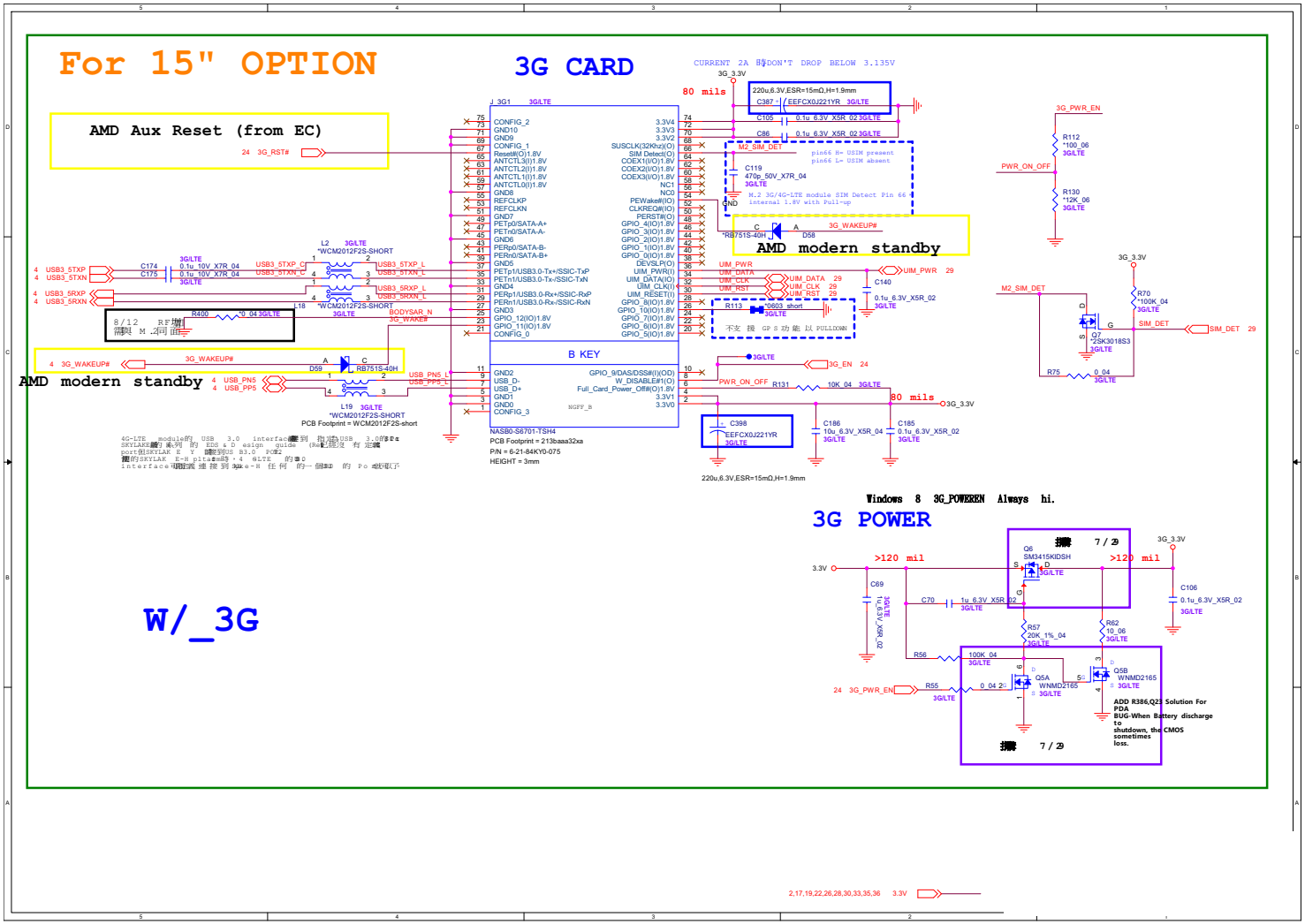
M Key PCIE SSD



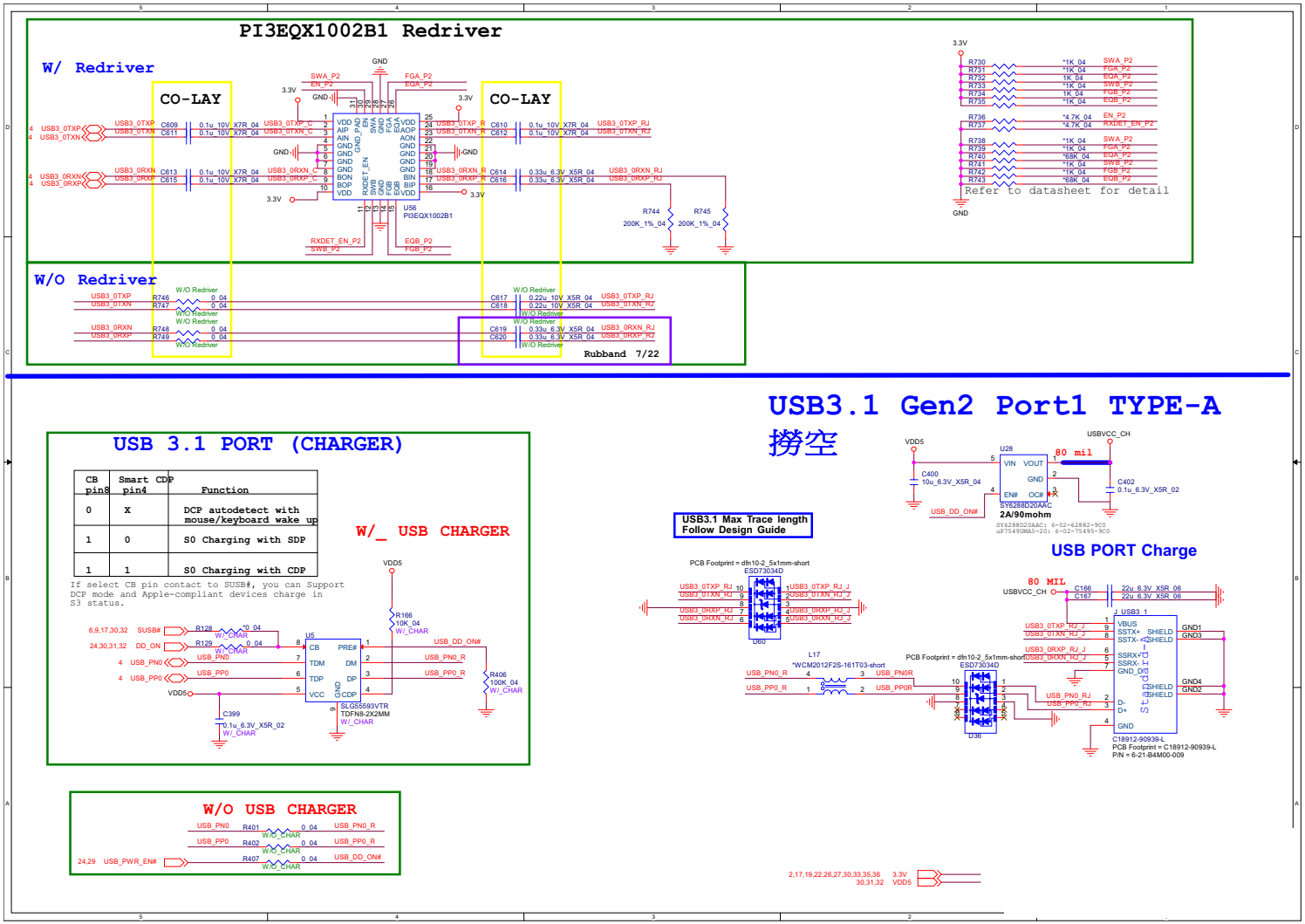
Sheet 24 of 41
M Key PCIE SSD

3G/LTE

Sheet 25 of 41
3G/LTE



USB Type-A

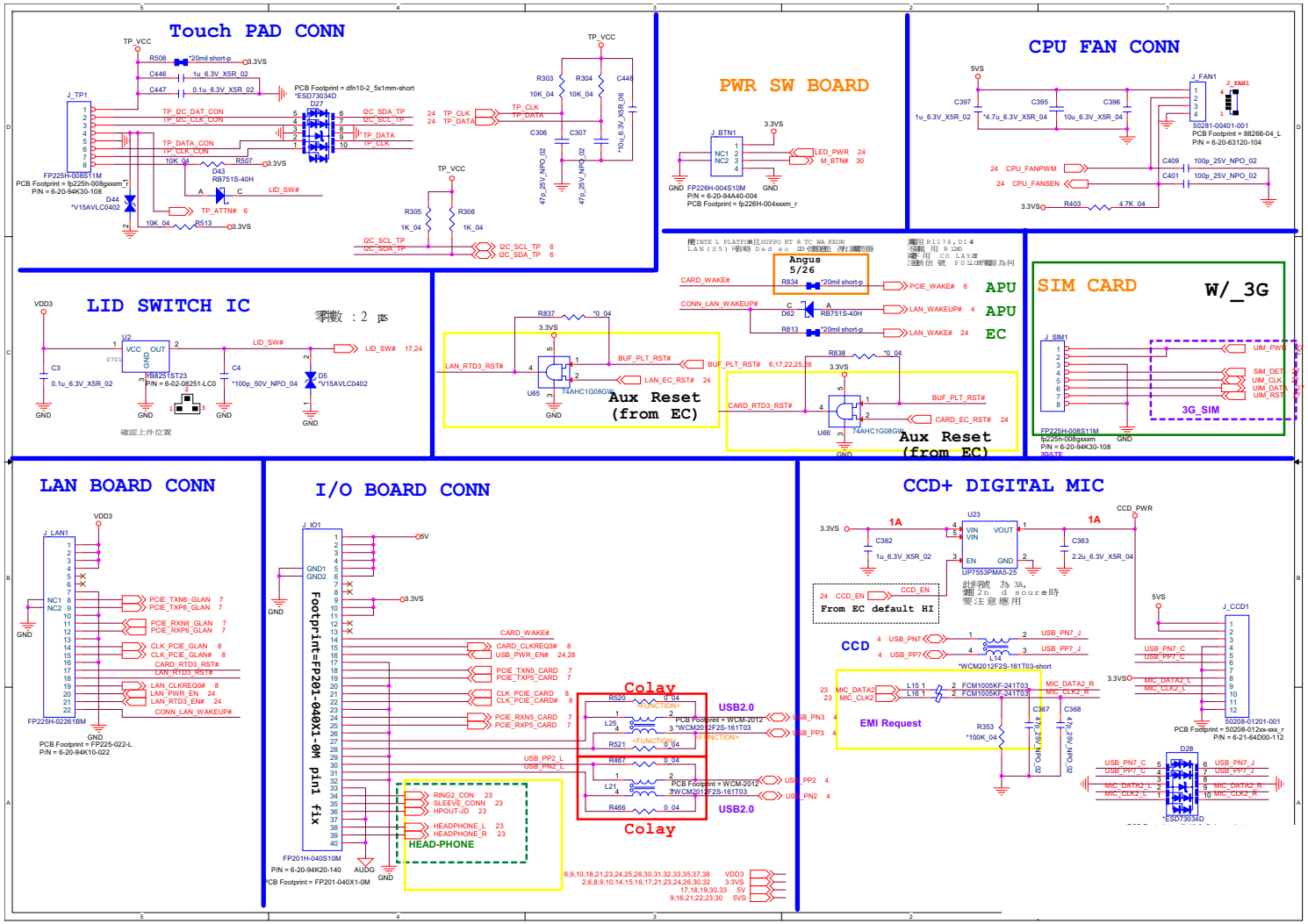


CB pin8	Smart CDP pin4	Function
0	X	DCP autodetect with mouse/keyboard wake up
1	0	S0 Charging with SDP
1	1	S0 Charging with CDP

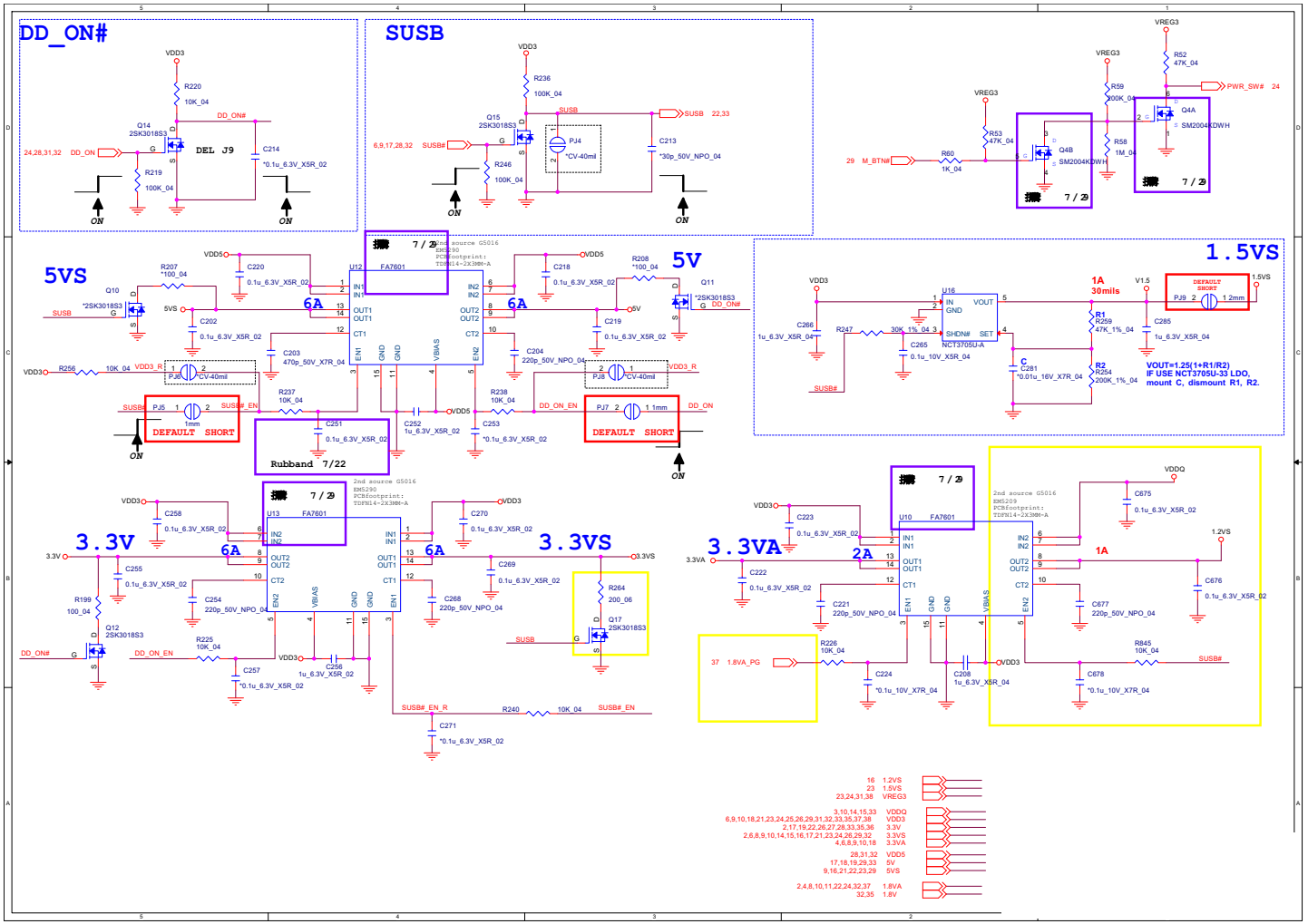
If select CB pin contact to SUSB#, you can Support DCP mode and Apple-compliant devices charge in S3 status.

Conn, CCD, Fan, TP

Sheet 27 of 41
Conn, CCD, Fan, TP



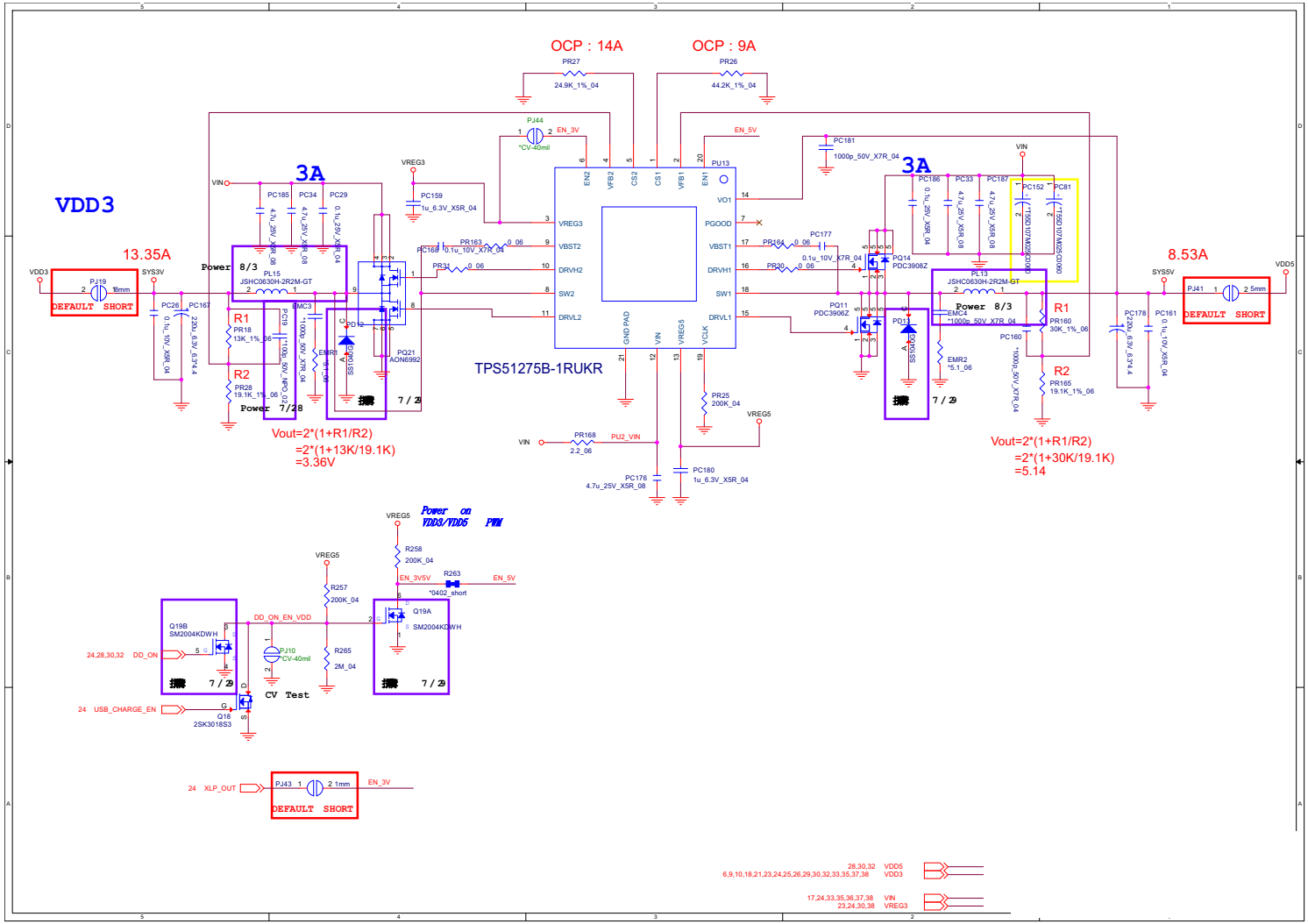
3V, 5V, 3VS, 5VS, 1.2VS, 1.5VS



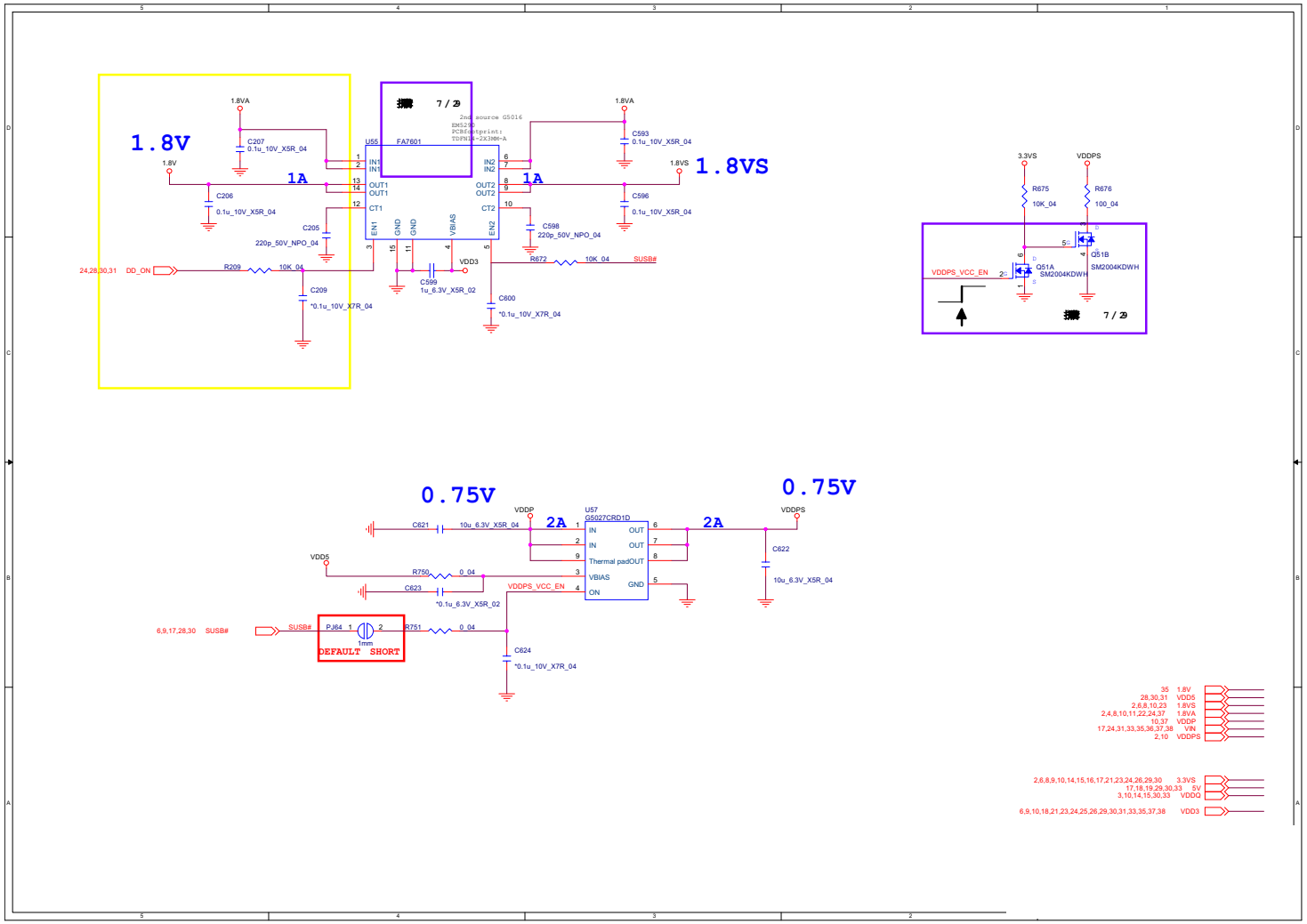
Sheet 28 of 41
3V, 5V, 3VS, 5VS,
1.2VS, 1.5VS

VDD3, VDD5

Sheet 29 of 41
VDD3, VDD5



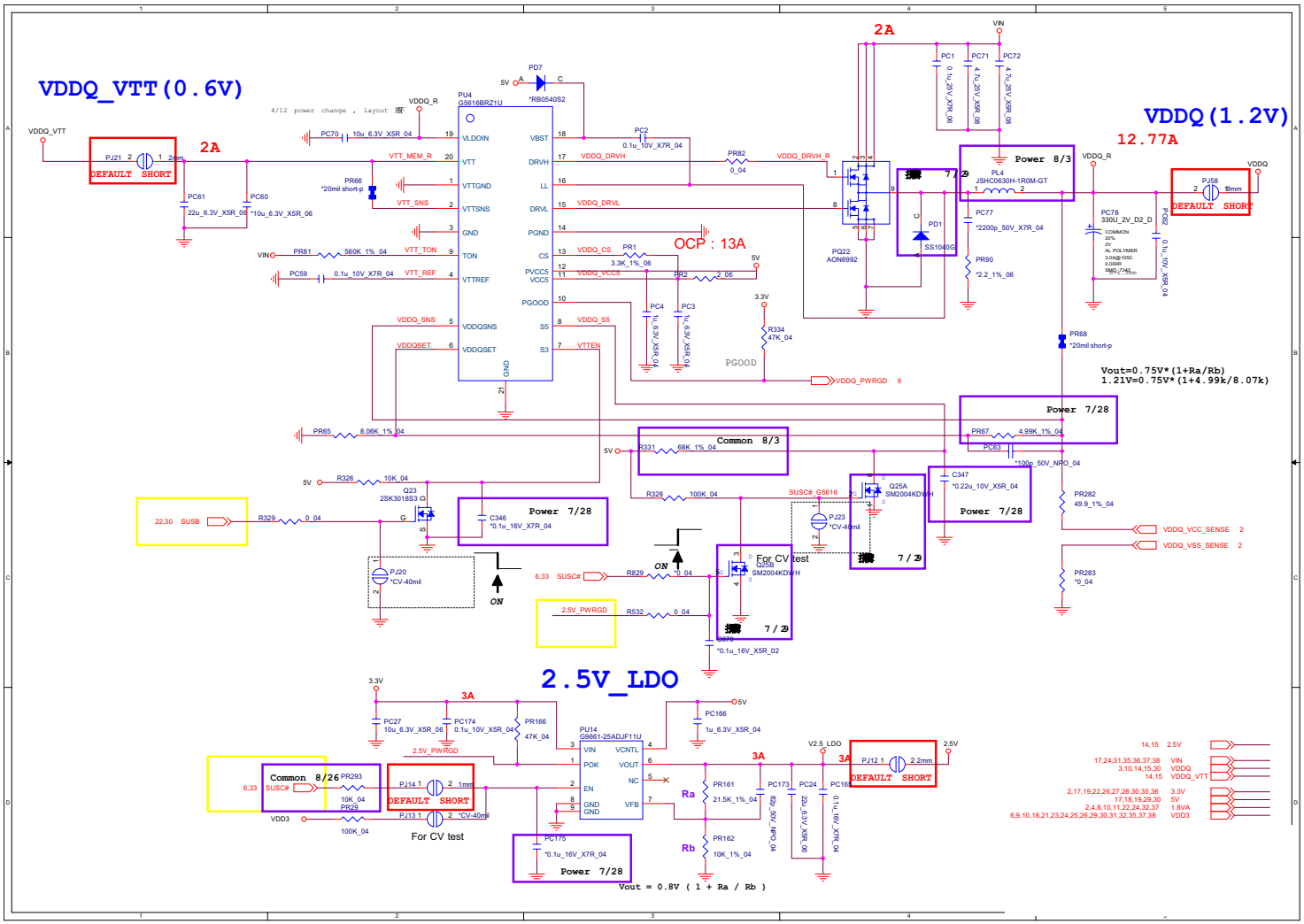
VDDPS, 1.8V, 1.8VS



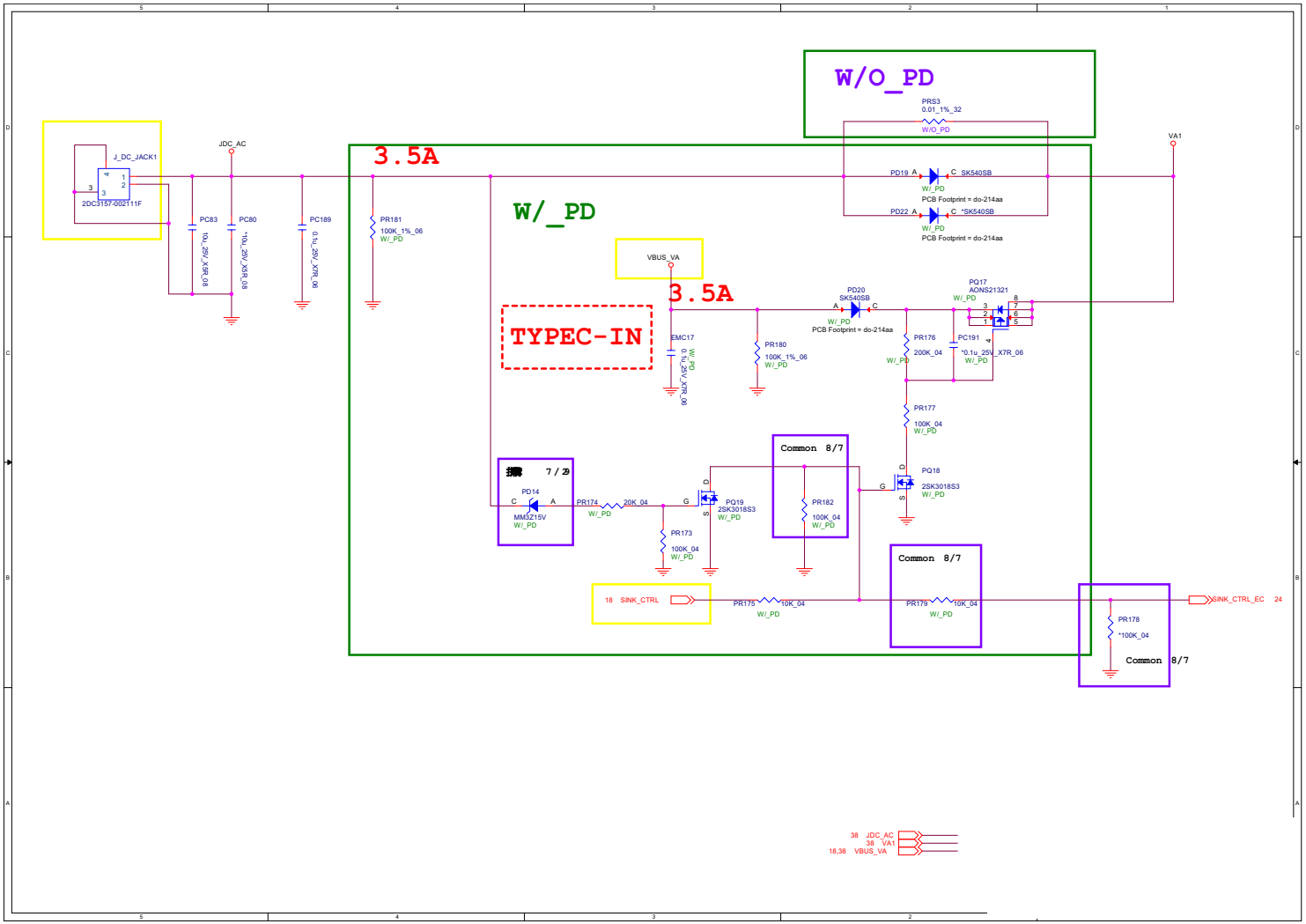
Sheet 30 of 41
VDDPS, 1.8V, 1.8VS

VDDQ, VDDQ_VTT, 2.5V

Sheet 31 of 41
VDDQ, VDDQ_VTT, 2.5V



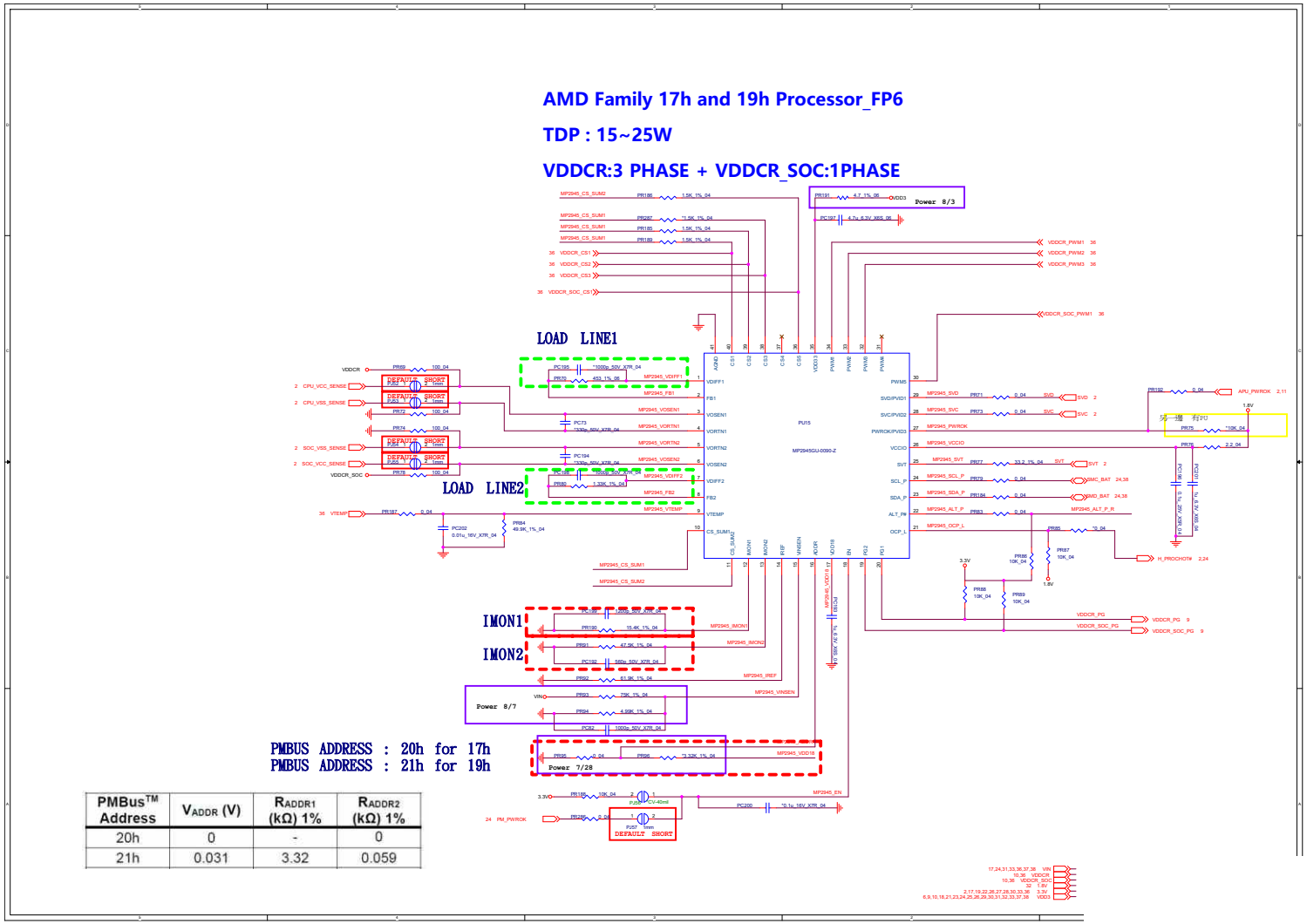
DC Jack, PD PWR



Sheet 32 of 41
DC Jack, PD PWR

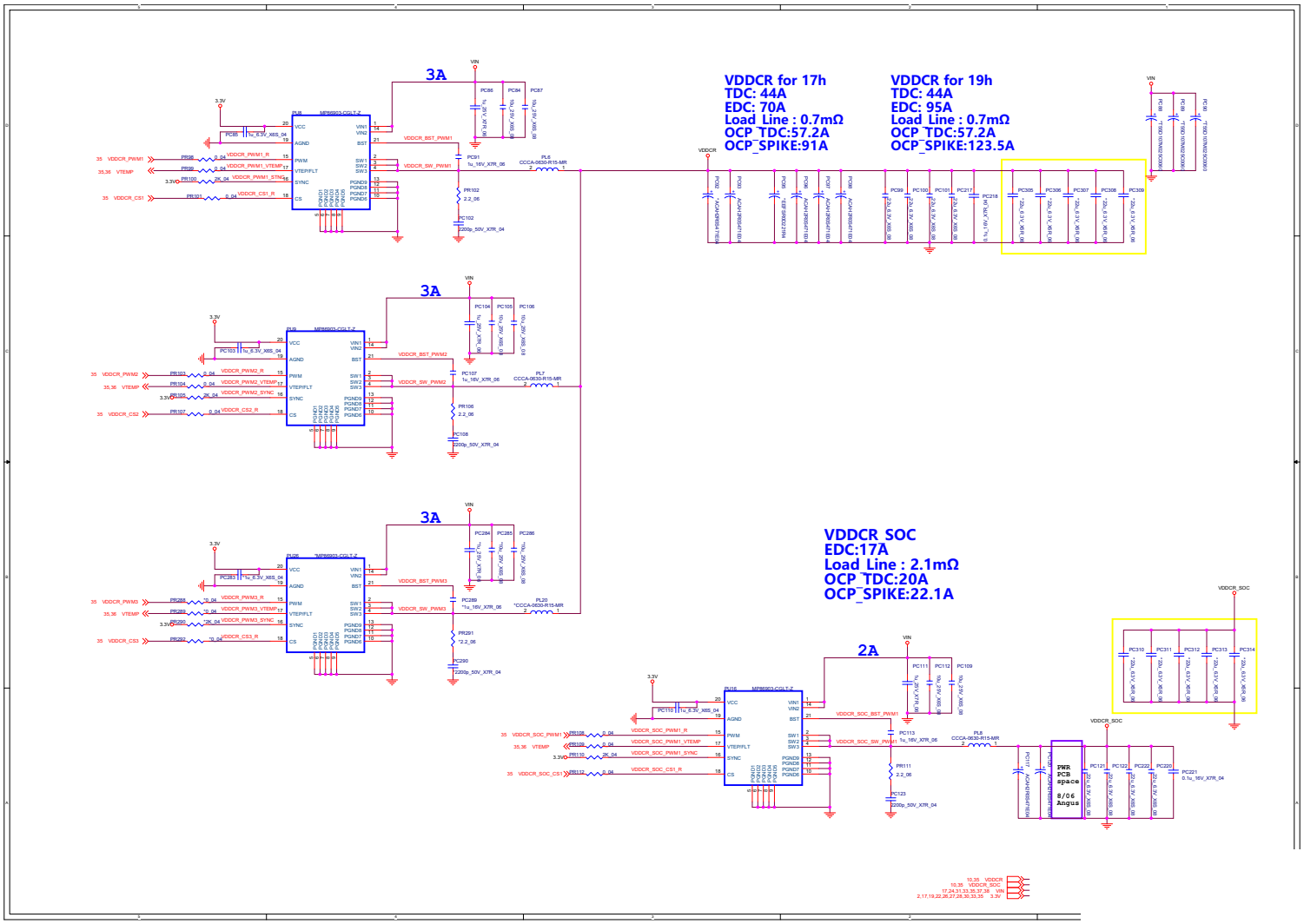
MP2945GU

Sheet 33 of 41
MP2945GU



PMBus™ Address	VADDR (V)	RADDR1 (kΩ) 1%	RADDR2 (kΩ) 1%
20h	0	-	0
21h	0.031	3.32	0.059

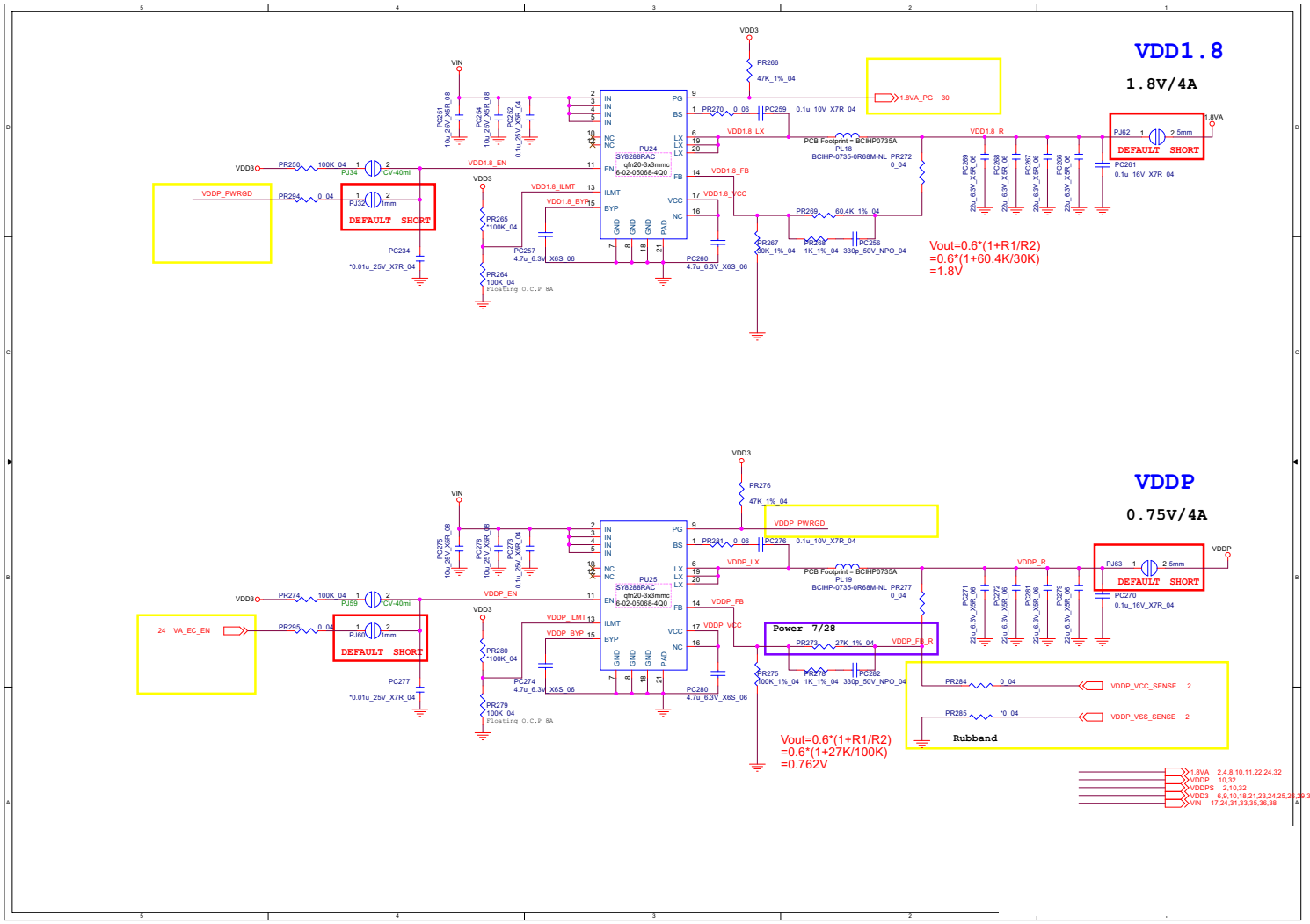
VDDCR



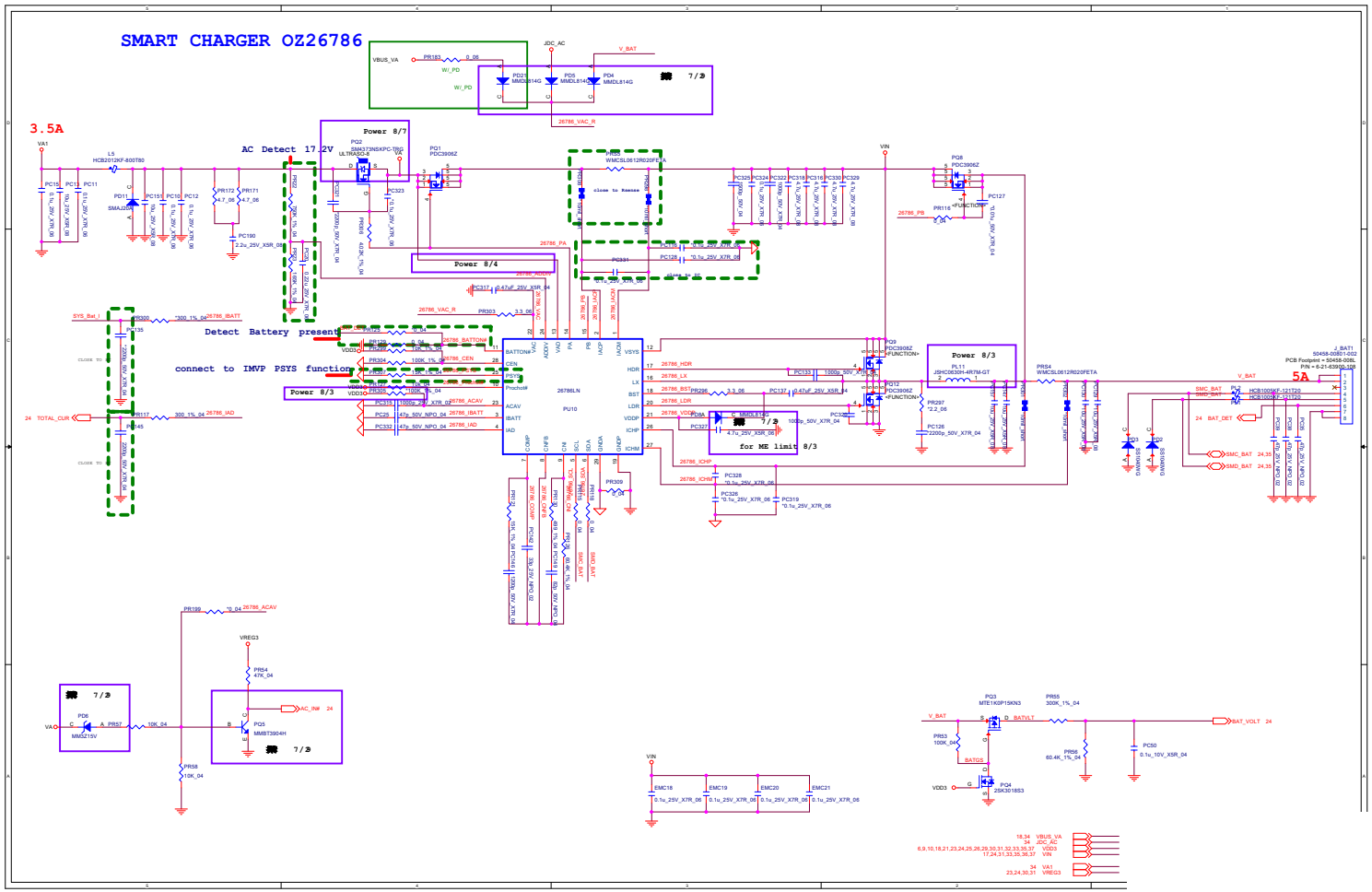
Sheet 34 of 41
VDDCR

1.8VA, VDDP

Sheet 35 of 41
1.8VA, VDDP



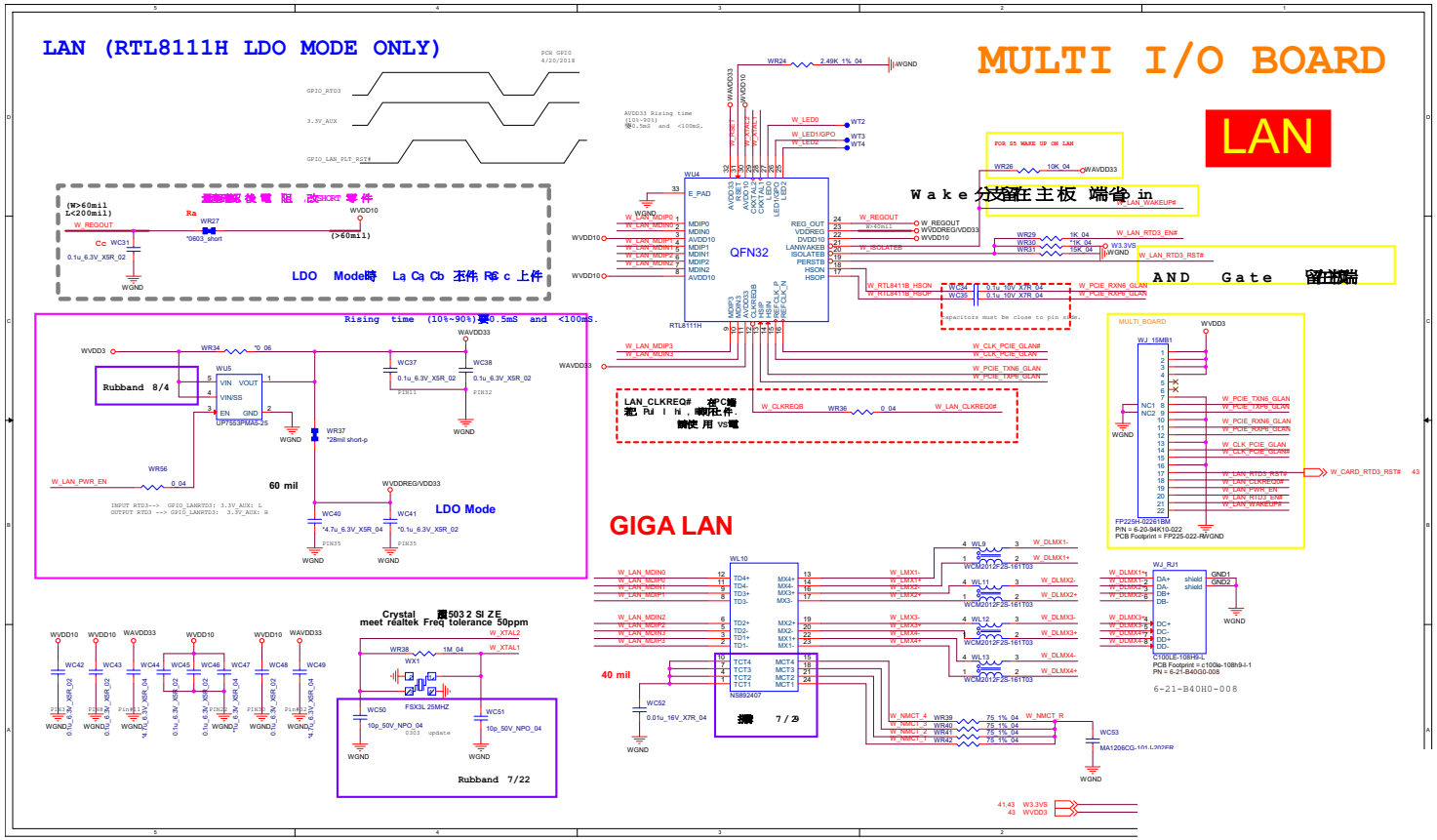
Charger, AC IN



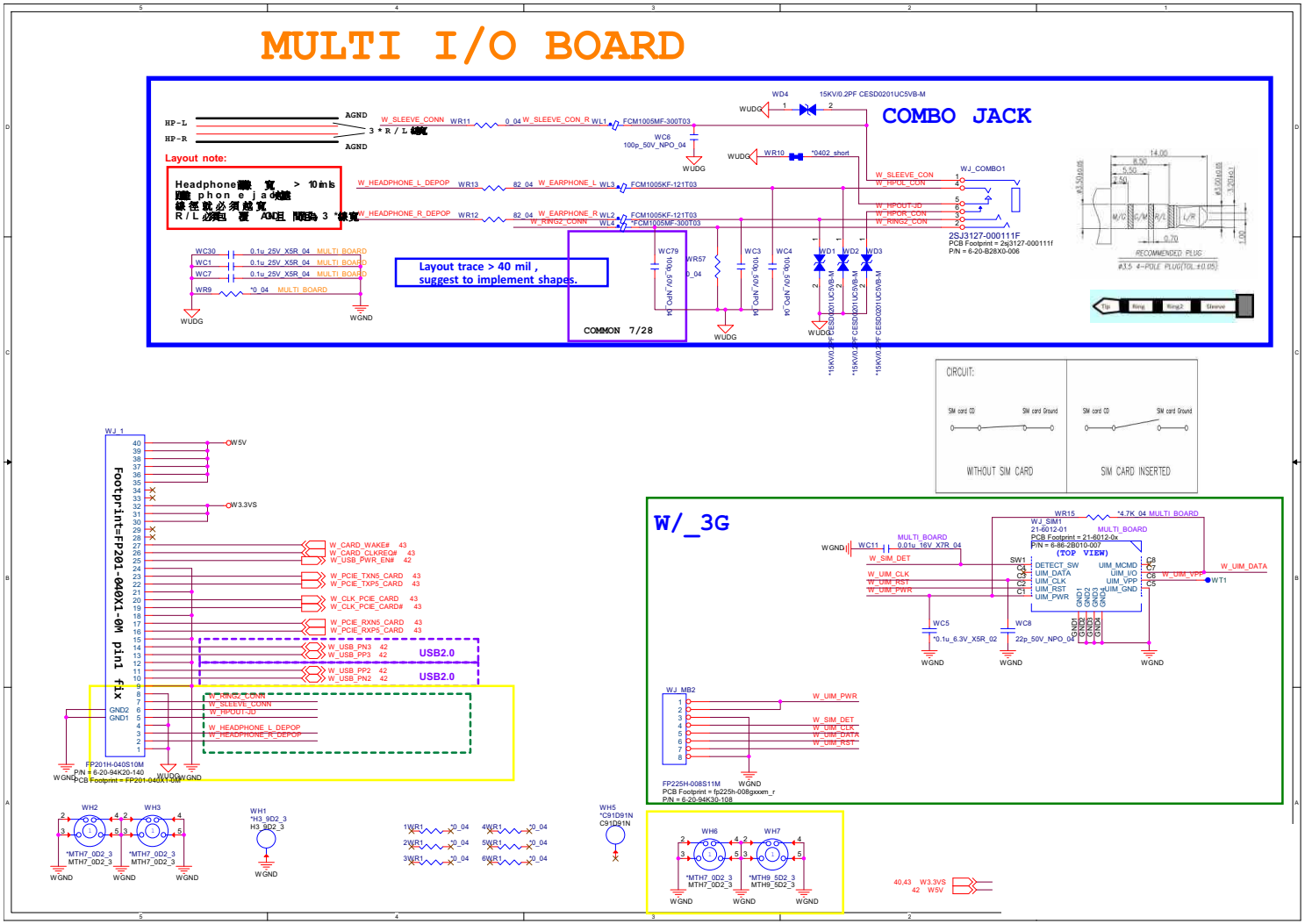
Sheet 36 of 41
Charger, AC IN

RTL8411H

Sheet 37 of 41
RTL8111H



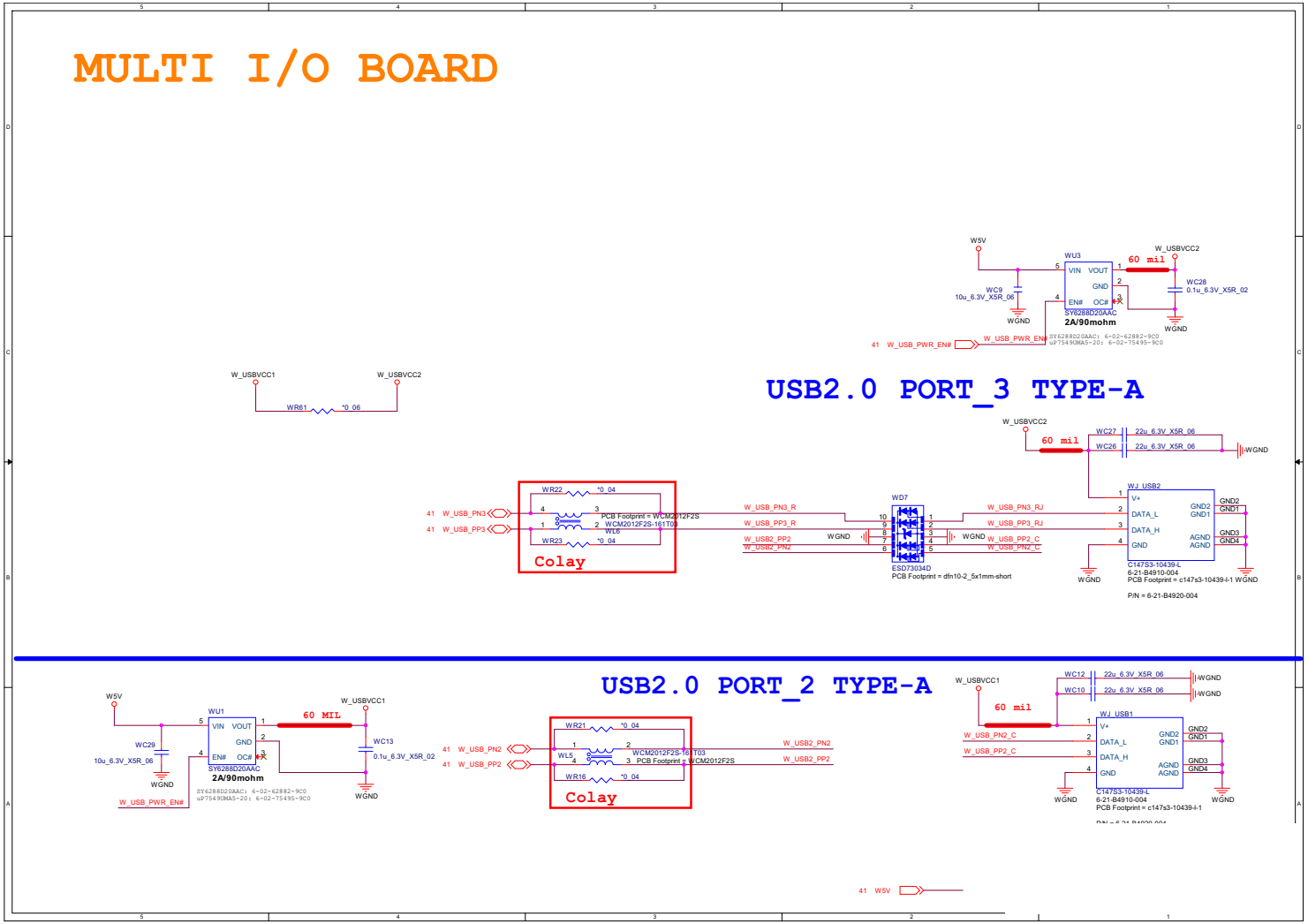
Multi-Conn, SIM



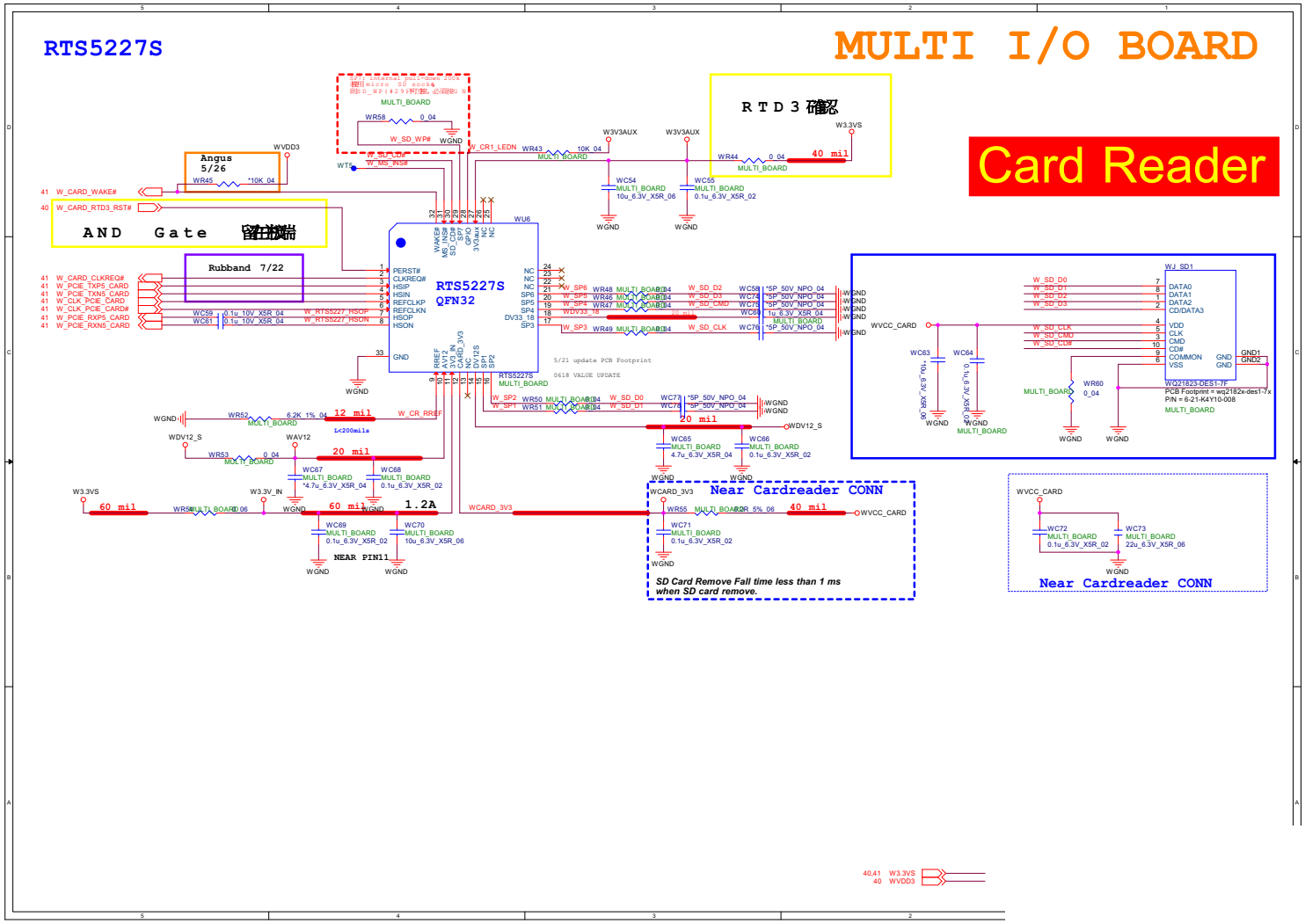
Sheet 38 of 41
Multi-Conn, SIM

Multi USB Type-A

Sheet 39 of 41
Multi USB Type-A



RTS5227S



Sheet 40 of 41
RTS5227S

B.Schematic Diagrams

PWR BTN Board

Sheet 41 of 41
PWR BTN Board