

# SERVICE MANUAL

*notebook*

NK60SB / NK60SE





**Notebook Computer**  
**NK60SB / NK60SE**  
**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 **NK60SB** / **NK60SE** 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

## Preface

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### IMPORTANT SAFETY INSTRUCTIONS

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

1. Do not use this product near water, for example near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
2. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
5. This product is intended to be supplied by a Listed Power Unit as follows:
  - AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19.5V, 7.7A (**150** 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.

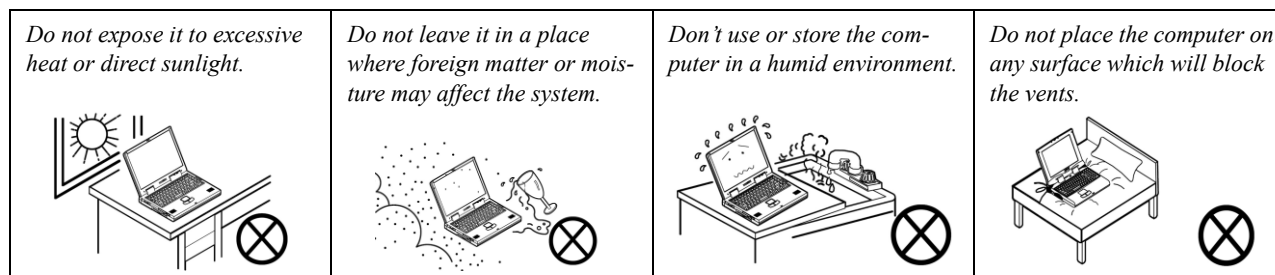
## Instructions for Care and Operation

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

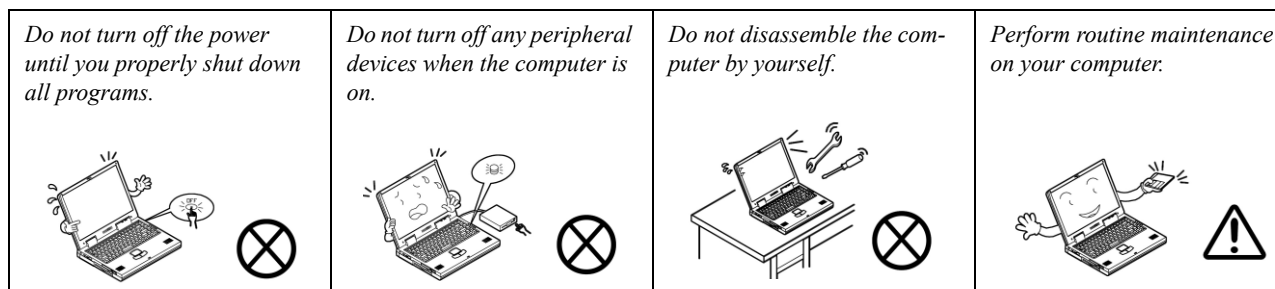
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.



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.

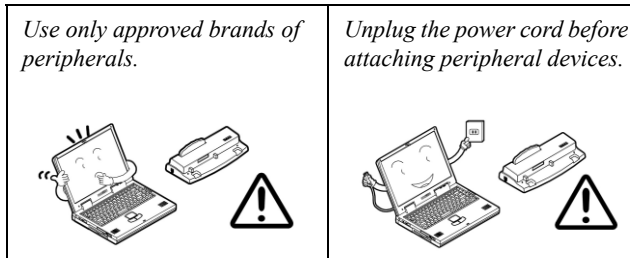


3. **Follow the proper working procedures for the computer.** Shut the computer down properly and don't forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.



## Preface

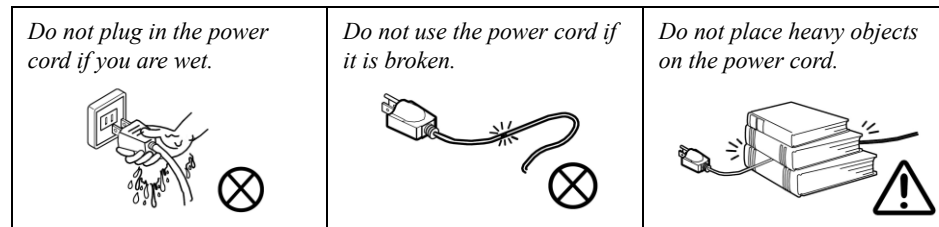
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**



## Power Safety

The computer has specific power requirements:

- Only use a power adapter approved for use with this computer.
- Your AC adapter may be designed for international travel but it still requires a steady, uninterrupted power supply. If you are unsure of your local power specifications, consult your service representative or local power company.
- The power adapter may have either a 2-prong or a 3-prong grounded plug. The third prong is an important safety feature; do not defeat its purpose. If you do not have access to a compatible outlet, have a qualified electrician install one.
- When you want to unplug the power cord, be sure to disconnect it by the plug head, not by its wire.
- Make sure the socket and any extension cord(s) you use can support the total current load of all the connected devices.
- Before cleaning the computer, make sure it is disconnected from any external power supplies.



### Power Safety Warning

Before you undertake any upgrade procedures, make sure that you have turned off the power, and disconnected all peripherals and cables (including telephone lines 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

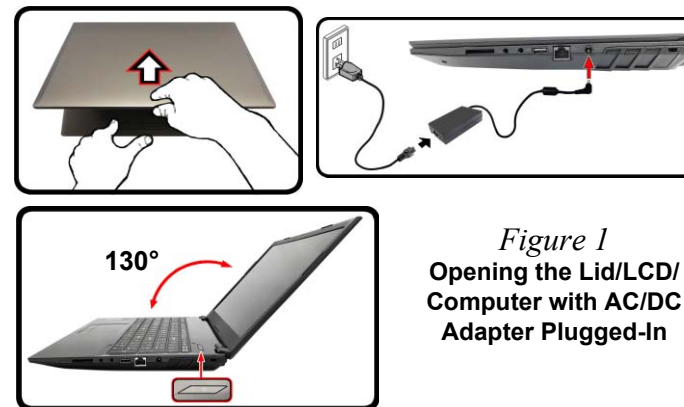
You may also need to consult the following manual for additional information:

### 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 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 130 degrees); use the other hand (as illustrated in Figure 1) to support the base of the computer (**Note: Never** lift the computer by the lid/LCD).
7. Press the power button to turn the computer "on".




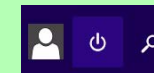
*Figure 1*  
**Opening the Lid/LCD/  
Computer with AC/DC  
Adapter Plugged-In**




### Shut Down

Note that you should always shut your computer down by choosing the **Shut down** command in **Windows** (see below). This will help prevent hard disk or system problems.

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



**Or**

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

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# Chapter 1: Introduction

## Overview

This manual covers the information you need to service or upgrade the **NK60SB / NK60SE** series notebook computer. Information about operating the computer (e.g. getting started, and the *Setup* utility) is in the *User's Manual*. Information about drivers (e.g. VGA & audio) is also found in the *User's Manual*. The manual is shipped with the computer.

Operating systems (e.g. *Windows 10*, etc.) have their own manuals as do application softwares (e.g. word processing and database programs). If you have questions about those programs, you should consult those manuals.

The **NK60SB / NK60SE** series notebook is designed to be upgradeable. See [Disassembly on page 2 - 1](#) for a detailed description of the upgrade procedures for each specific component. Please take note of the warning and safety information indicated by the “” symbol.

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

## Introduction

# Specifications



### Latest Specification Information

The specifications listed here are correct at the time of sending them to the press. Certain items (particularly processor types/speeds) may be changed, delayed or updated due to the manufacturer's release schedule. Check with your service center for more details.



### CPU

The CPU is not a user serviceable part. Accessing the CPU in any way may violate your warranty.

## Processor Options

### Intel® Core™ i7 Processor

#### i7-10700 (2.90GHz)

16MB Smart Cache, 14nm, DDR4-2933MHz, TDP 65W

### Intel® Core™ i5 Processor

#### i5-10600 (3.30GHz)

12MB Smart Cache, 14nm, DDR4-2666MHz, TDP 65W

#### i5-10500 (3.10GHz)

12MB Smart Cache, 14nm, DDR4-2666MHz, TDP 65W

#### i5-10400 (2.90GHz)

12MB Smart Cache, 14nm, DDR4-2666MHz, TDP 65W

### Intel® Core™ i3 Processor

#### i3-10320 (3.80GHz)

8MB Smart Cache, 14nm, DDR4-2666MHz, TDP 65W

#### i3-10310 (3.70GHz)

8MB Smart Cache, 14nm, DDR4-2666MHz, TDP 65W

#### i3-10100 (3.60GHz)

6MB Smart Cache, 14nm, DDR4-2666MHz, TDP 65W

### Intel® Pentium® Processor

#### Gold G6600 (4.20GHz)

4MB Smart Cache, 14nm, DDR4-2666MHz, TDP 58W

### Intel® Celeron Processor

#### Celeron G5920 (3.50GHz)

2MB Smart Cache, 14nm, DDR4-2666MHz, TDP 58W

## Core Logic

Intel® H470 Chipset

## BIOS

128Mb SPI Flash ROM

INSYDE BIOS

## LCD Options

16.1" (40.89cm), 16:9, FHD (1920x1080)

## Memory

Dual Channel DDR4

Two 260 Pin SO-DIMM Sockets

Supporting up to **3200MHz DDR4** 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.)

## Video Adapter

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

#### Supports Microsoft Hybrid Graphics

### Intel Integrated GPU

#### Intel® UHD Graphics 630

Dynamic Frequency

Intel Dynamic Video Memory Technology

Microsoft DirectX®12 Compatible

#### Intel® UHD Graphics 610 (G5920 only)

Dynamic Frequency

Intel Dynamic Video Memory Technology

Microsoft DirectX®12 Compatible

### NVIDIA® Discrete GPU

#### NVIDIA® GeForce GTX 1650Ti (NK60SE)

**4GB** GDDR5 Video RAM on board

Microsoft DirectX® 12 Compatible

#### NVIDIA® GeForce GTX 1650 (NK60SB)

**4GB** GDDR5 Video RAM on board

Microsoft DirectX® 12 Compatible

<b>Storage</b>	<b>Interface</b>	<b>Environmental Spec</b>
One Changeable 2.5" 7mm (h) SATA HDD/SSD <b>(Factory Option) One M.2 2280 SATA Solid State Drive (SSD)</b> Or <b>(Factory Option) Two M.2 2280 PCIe Gen3 x4 Solid State Drives supporting RAID level 0/1</b>	One USB 3.2 Gen 2 Type-C Port* <i>*The maximum amount of current supplied by USB Type-C ports is 500mA (USB 2.0)/900mA (USB 3.2).</i> Two USB USB 3.2 Gen 2 Type-A Ports One USB 2.0 Port One Mini DisplayPort 1.4 One HDMI-Out Port One Microphone-In Jack One 2-In-1 Audio Jack (Headphones / Microphone) One RJ-45 LAN Jack One DC-In Jack	<b>Temperature</b> Operating: 5°C - 35°C Non-Operating: -20°C - 60°C <b>Relative Humidity</b> Operating: 20% - 80% Non-Operating: 10% - 90%
<b>Audio</b>	<b>Card Reader</b>	<b>Power</b>
High Definition Audio Compliant Interface 2 * Built-In Speakers Built-In Array Microphone Sound Blaster™ Cinema 6	Embedded Multi-In-1 Card Reader MMC (MultiMedia Card) / RS MMC SD (Secure Digital) / Mini SD / SDHC/ SDXC	Full Range AC/DC Adapter AC Input: 100 - 240V, 50 - 60Hz DC Output: 19.5V, 7.7A <b>(150W)</b> Removable 6 Cell Smart Lithium-Ion Battery Pack, 47WH
<b>Security</b>	<b>M.2 Slots</b>	<b>Dimensions &amp; Weight</b>
Security (Kensington® Type) Lock Slot BIOS Password Intel PTT for systems without hardware TPM	Slot 1 for <b>Combo WLAN and Bluetooth</b> Module Slot 2 for <b>SATA or PCIe Gen3 x4 SSD</b> Slot 3 for <b>PCIe Gen3 x4 SSD</b>	378mm (w) * 250mm (d) * 29.8mm (h) <b>2.3kg</b> (Barebone with 47WH Battery)
<b>Keyboard</b>	<b>Communication</b>	
Full-size Keyboard (with Numeric Keypad) Or <b>(Factory Option) Full-size Multi-Color LED Keyboard (with Numeric Keypad)</b>	1.0M HD PC Camera Module Built-In 10/100/1000Mb Base-TX Ethernet LAN <b><u>WLAN/ Bluetooth M.2 Modules:</u></b> <b>(Factory Option) Intel® Dual Band Wi-Fi 6 AX200 Wireless LAN (802.11ax) + Bluetooth</b> <b>(Factory Option) Intel® Dual Band Wi-Fi 6 AX201 Wireless LAN (802.11ax) + Bluetooth</b> <b>(Factory Option) Intel® Dual Band Wireless-AC 9462 Wireless LAN (802.11ac) + Bluetooth</b>	
<b>Pointing Device</b>		
Built-in Touchpad (with Microsoft PTP Multi Gesture & Scrolling Functionality)		

## Introduction

*Figure 1*  
**Top View**

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

## External Locator - Top View with LCD Panel Open



## External Locator - Front & Right Side Views

*Figure 2*  
**Front View**

1. LED Indicator

FRONT VIEW



RIGHT SIDE VIEW



*Figure 3*  
**Right Side View**

1. Multi-in-1 Card Reader
2. Audio Jack
3. Microphone-In Jack
4. USB 2.0 Port
5. RJ-45 LAN Jack
6. DC-In Jack
7. Security Lock Slot

## Introduction

### External Locator - Left Side & Rear View

*Figure 4*

#### Left Side View

1. Vent
2. Mini Display Port
3. HDMI-Out Port
4. USB 3.2 Gen 2 Type-C Port
5. USB 3.2 Gen 2 Type-A Ports

LEFT SIDE VIEW



REAR VIEW



*Figure 5*

#### Rear View

1. Battery
2. Vent

## External Locator - Bottom View



*Figure 6*  
**Bottom View**

1. Battery
2. Vent
3. Speakers



### Overheating

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

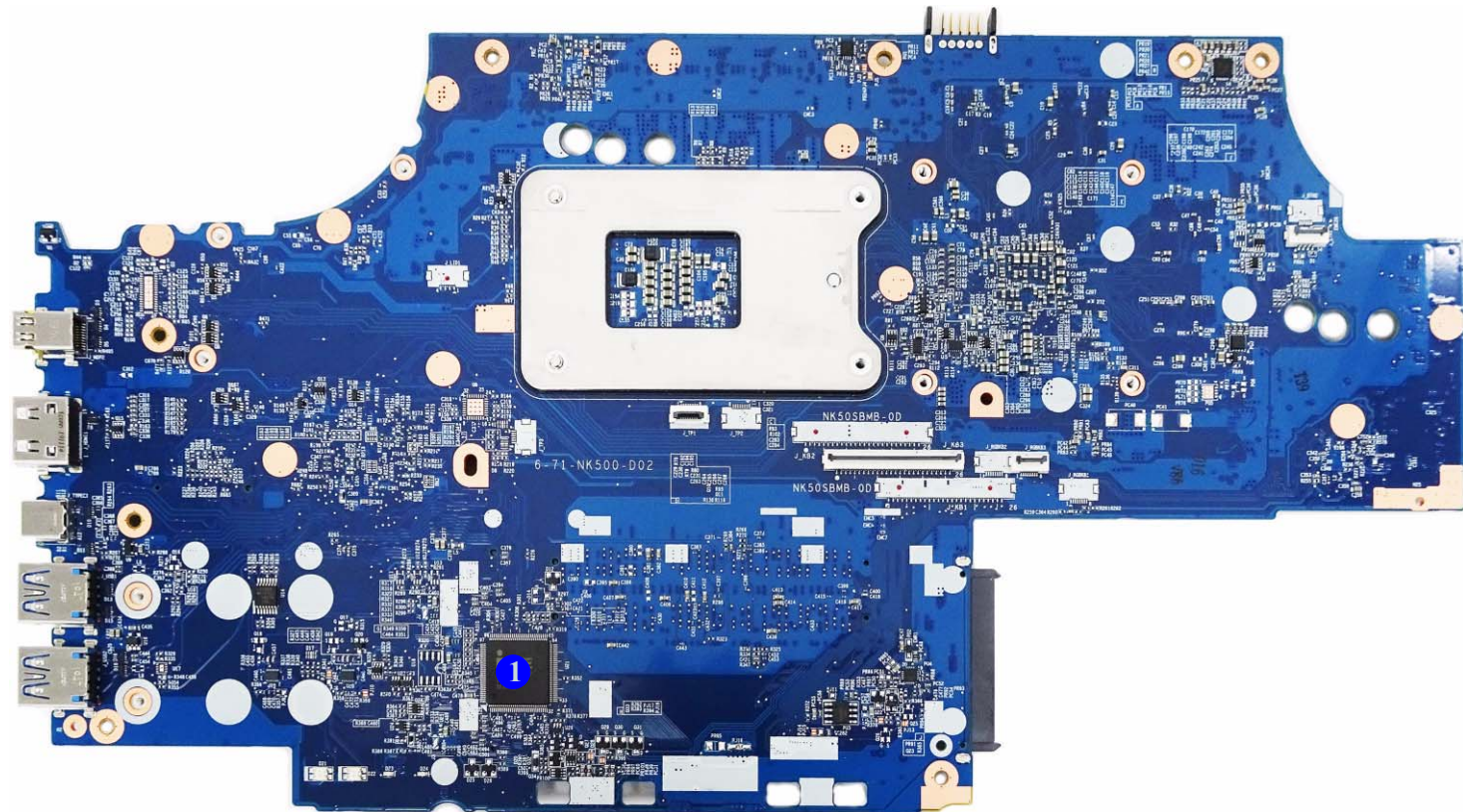


## Introduction

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

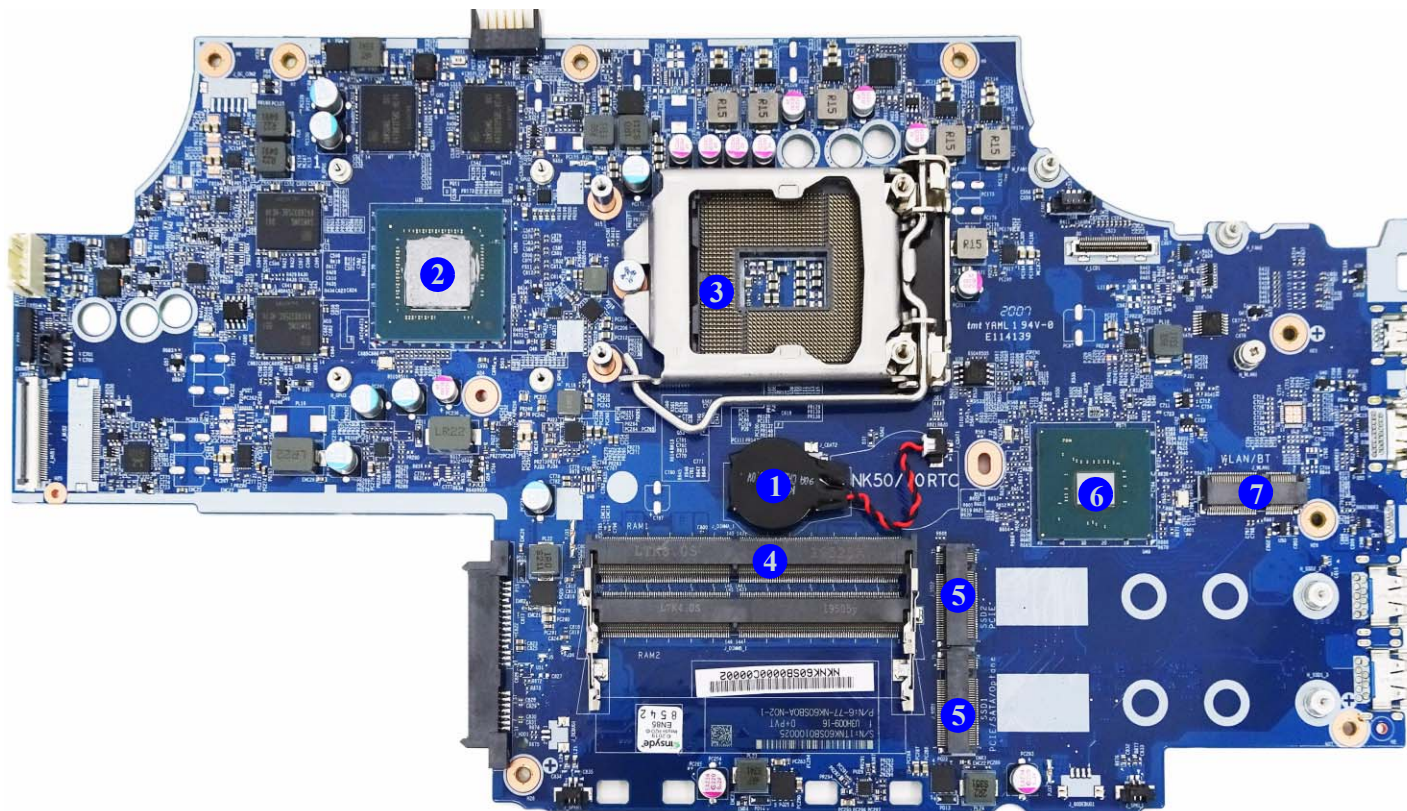
1. KBC-ITE IT5570

## Mainboard Overview - Top (Key Parts)





## Mainboard Overview - Bottom (Key Parts)



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

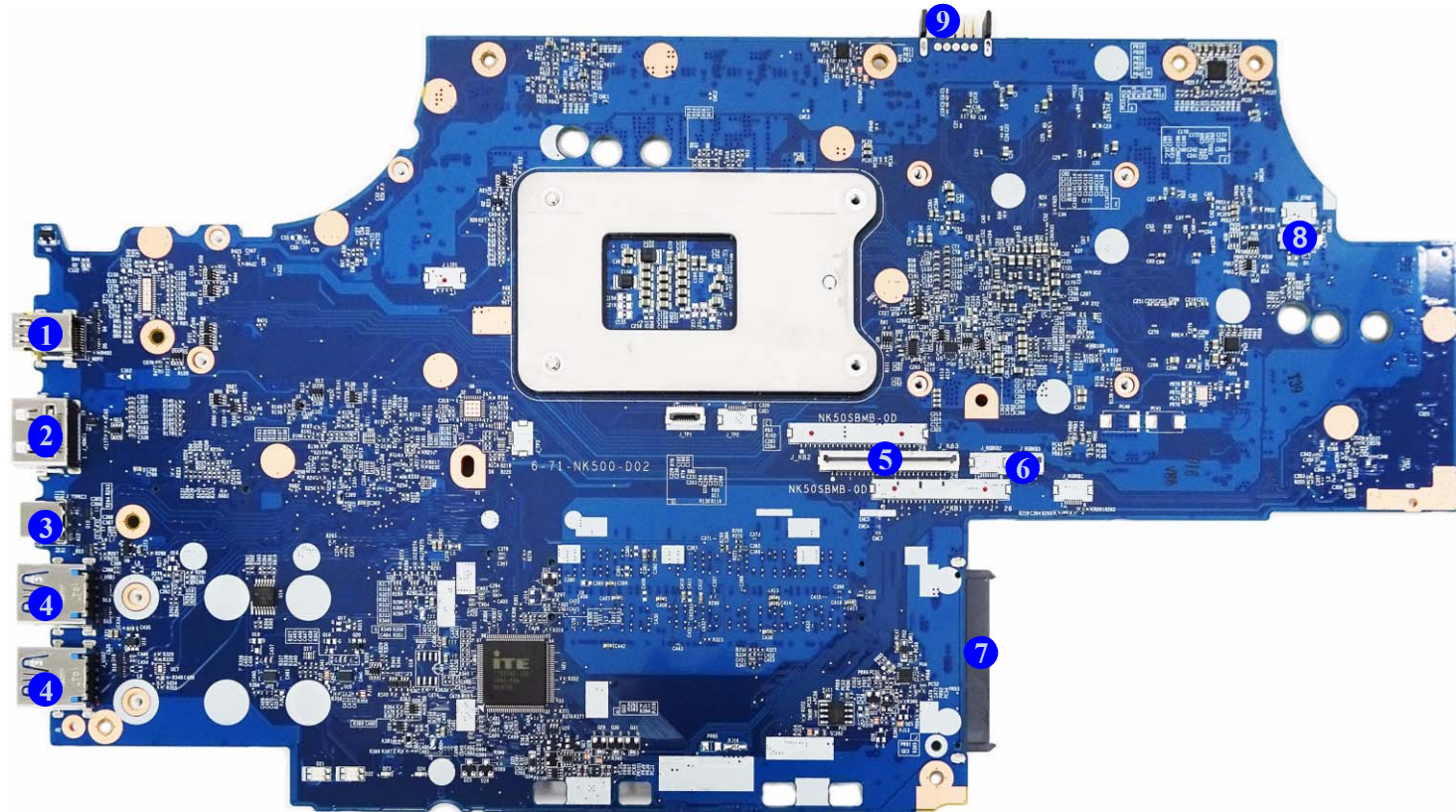
1. CMOS Battery
2. GPU
3. CPU (not installed)
4. Memory Slots  
DDR4 SO-DIMM
5. M.2-Card  
Connector (SSD  
Module)
6. PCH
7. M.2-Card  
Connector (WLAN  
Module)

## Introduction

*Figure 9*  
**Mainboard Top  
Connectors**

1. Mini Display Port
2. HDMI-Out Port
3. USB Port 3.2 (Type C) Connector
4. USB Port 3.2 (Type A) Connector
5. Keyboard Cable Connector
6. KB LED Connector
7. HDD Connector
8. Power Button Connector
9. Battery Connector

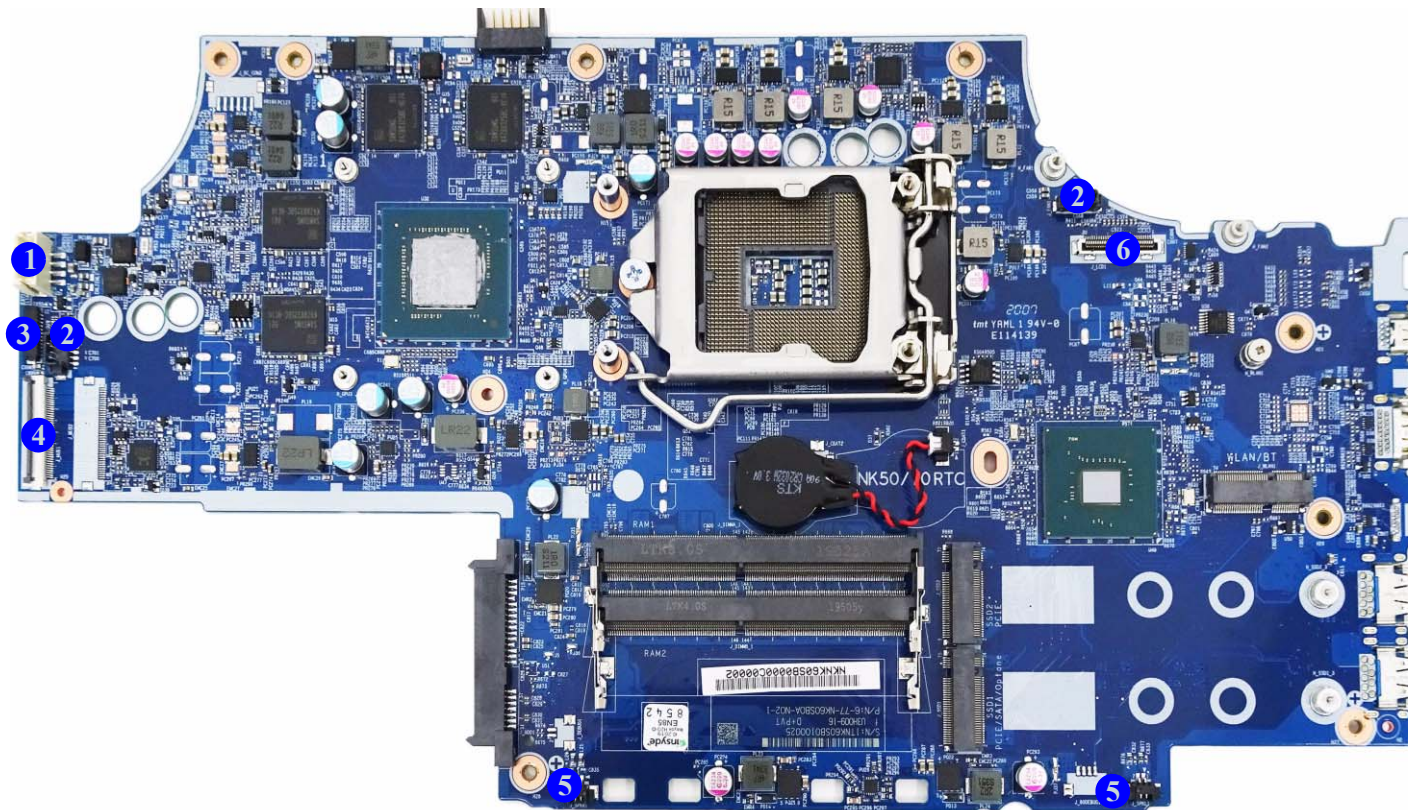
## Mainboard Overview - Top (Connectors)





*Figure 10*  
**Mainboard Bottom  
Connectors**

1. DC-In Connector
2. Fan Connector
3. CCD Connector
4. J\_MUX Connector
5. Speaker Connector
6. LCD Connector






# Chapter 2: Disassembly



## Overview

This chapter provides step-by-step instructions for disassembling the *NK60SB / NK60SE* series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

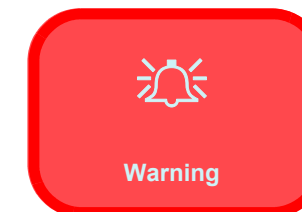
We suggest you completely review any procedure before you take the computer apart.

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.



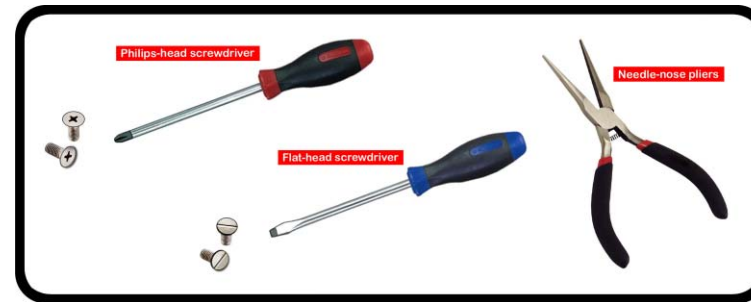
## Disassembly

**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 - 6*

### To remove the Keyboard:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the keyboard *page 2 - 8*

### To remove and install the Processor:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the processor *page 2 - 9*
4. Install the processor *page 2 - 11*

### To remove the System Memory:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the system memory *page 2 - 12*

### To remove the M.2 SSD:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the SSD *page 2 - 13*

### To remove the Wireless LAN Module:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the WLAN *page 2 - 14*

### To remove the CCD Module:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the CCD module *page 2 - 16*



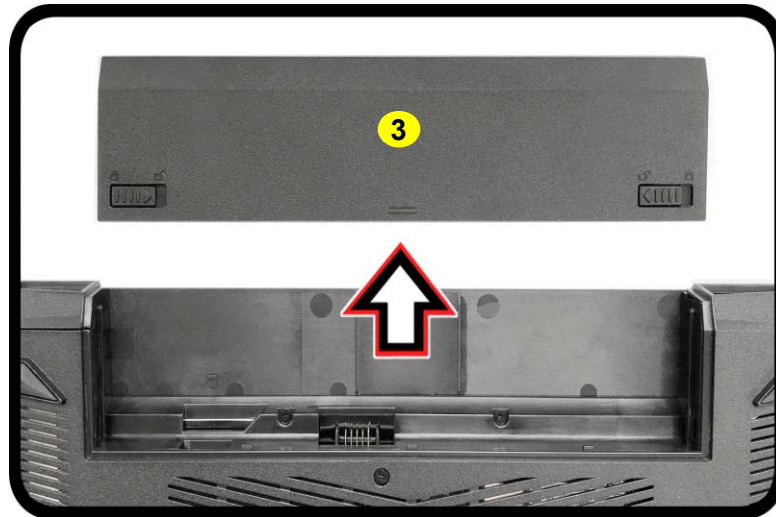
## Removing the Battery

1. Turn the computer **off**, and turn it over.
2. Slide the latch **1** in the direction of the arrow (*Figure 1a*).
3. Slide the latch **2** in the direction of the arrow.
4. While holding the latch **2**, slide the battery **3** out of the compartment (*Figure 1b*).
5. Reverse the process to install a new battery.

a.



b.



*Figure 1*  
**Battery Removal**

- a. Slide the latch **1** in the direction of the arrow. and slide the latch **2** in the direction of the arrow.
- b. Remove the battery.



3. Battery

## Disassembly

*Figure 2*  
**HDD Assembly  
Removal**

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

### 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.

### 7. Bottom Case

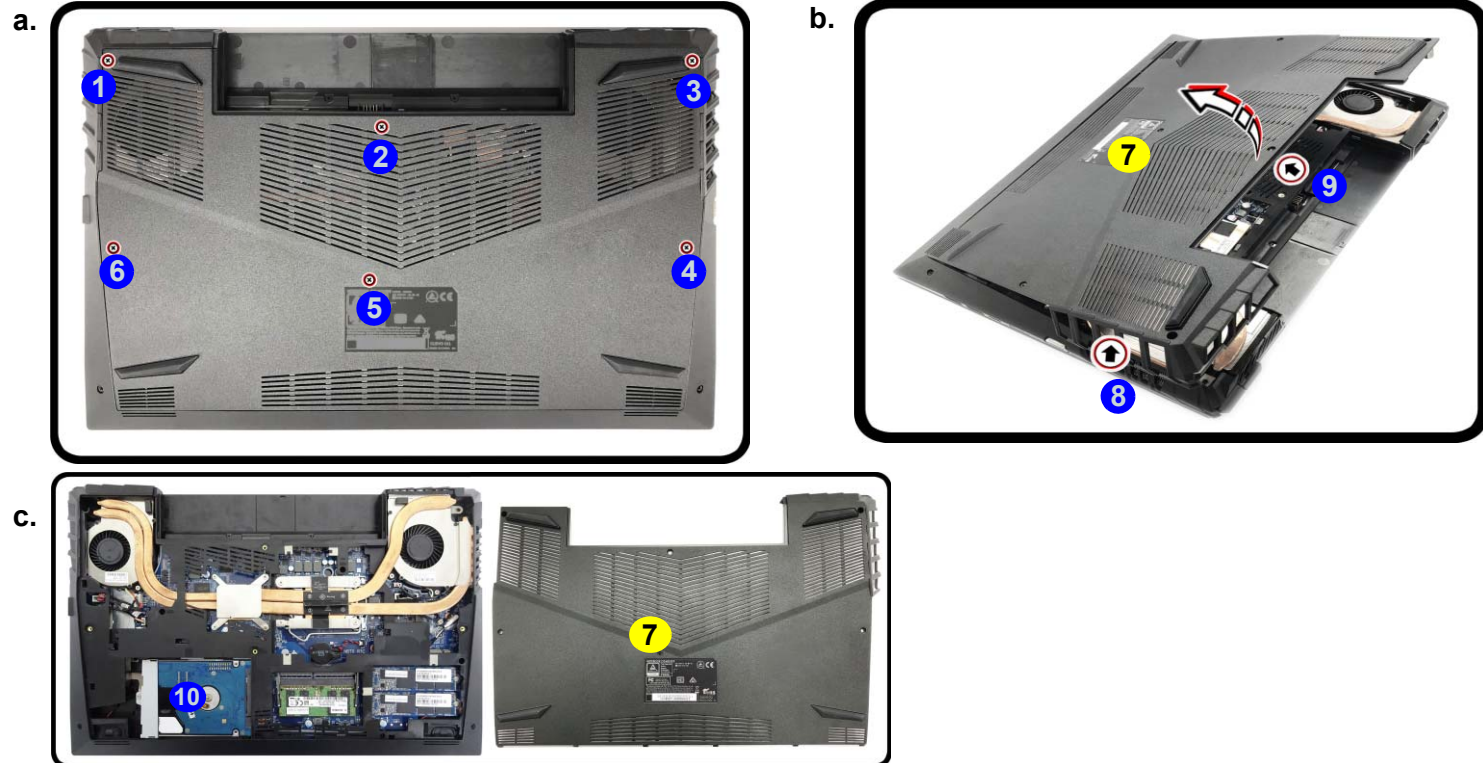
- 6 Screws

## Removing the Hard Disk Drive

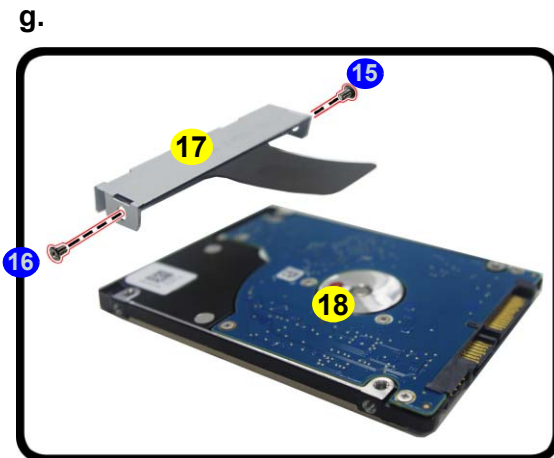
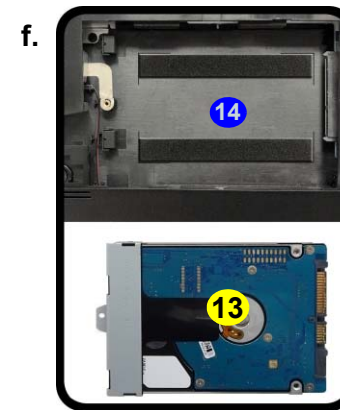
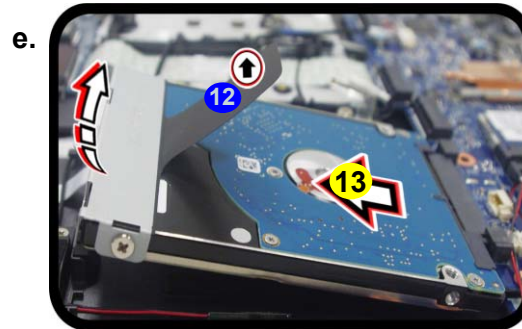
The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 7mm (h). Follow your operating system's installation instructions, and install all necessary drivers and utilities (as outlined in **Chapter 4 of the User's Manual**) when setting up a new hard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

### Hard Disk Disassembly Process

- Turn **off** the computer, and remove the battery ([page 2 - 5](#)).
- Remove screws **1** - **6** ([Figure 2a](#)).
- Carefully lift the bottom case **7** up from point **8** first and then **9** to remove it ([Figure 2b](#)).
- The HDD will be visible at point **10** on the mainboard ([Figure 2c](#)).



5. Remove screws **11** from the HDD assembly (**Figure 3d**).
6. Slightly lift and pull the hard disk assembly in the direction of arrow **12** (**Figure 3e**).
7. Lift the hard disk assembly **13** out of the bay **14** (**Figure 3f**).
8. Remove screws **15** - **16** and bracket **17** from the hard disk **18** (**Figure 3g**).
9. 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.



13. HDD Assembly  
17. Bracket  
18. HDD

- 3 Screws

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

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

## Disassembly

*Figure 4*  
**Keyboard Removal**

- a. Remove the screws from the bottom of the computer and then eject the keyboard using a special eject stick to push the keyboard out while releasing the keyboard as shown.
  - b. Lift the keyboard up and disconnect the keyboard ribbon cable from the locking collar socket.
  - c. Remove the keyboard.
1. Turn **off** the computer, remove the battery ([page 2 - 5](#)) and bottom cover ([page 2 - 6](#)).
  2. Remove screws **1** - **2** from the bottom of the computer.
  3. Open it up with the LCD on a flat surface before pressing at point **3** to release the keyboard module (use the special eject stick **4** to do this) while releasing the keyboard in the direction of the arrow **5** as shown ([Figure 4a](#)).
  4. Carefully lift the keyboard **6** up, being careful not to bend the keyboard ribbon cable **7**. Disconnect the keyboard ribbon cable **7** from the locking collar socket by using a flat-head screwdriver to pry the locking collar pins **8** away from the base ([Figure 4b](#)).
  5. Carefully lift the keyboard **6** off the computer ([Figure 4c](#)).
  6. Reverse the process to install a new keyboard (do not forget to replace all the screws).



### Re-inserting the Keyboard

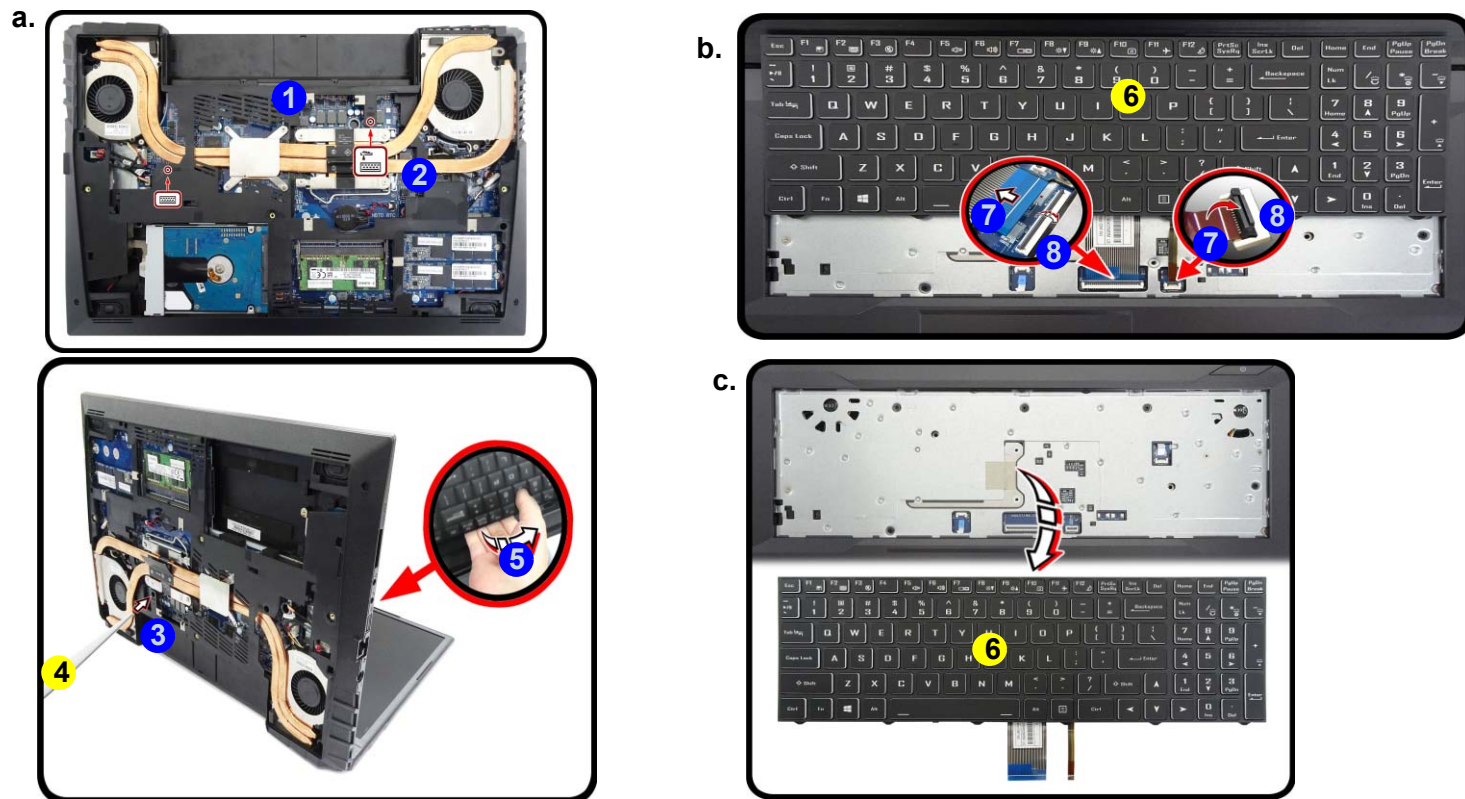
When re-inserting the keyboard firstly, align the keyboard tabs at the bottom of the keyboard with the slots in the case.



4. Eject Stick
6. Keyboard

- 2 Screws

## Removing the Keyboard



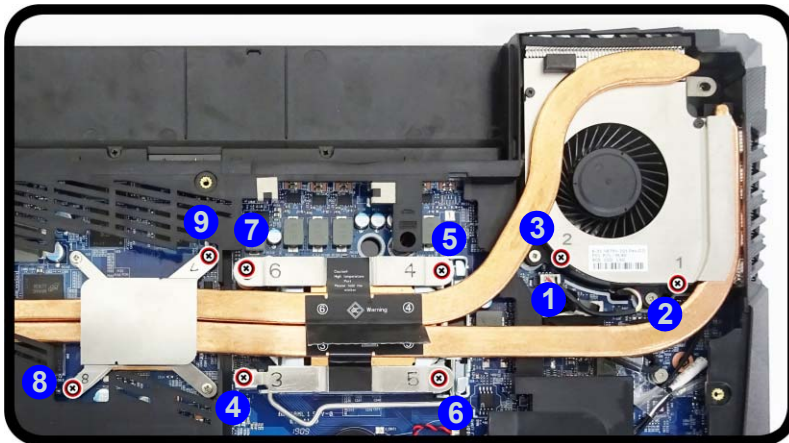


# Removing and Installing the Processor

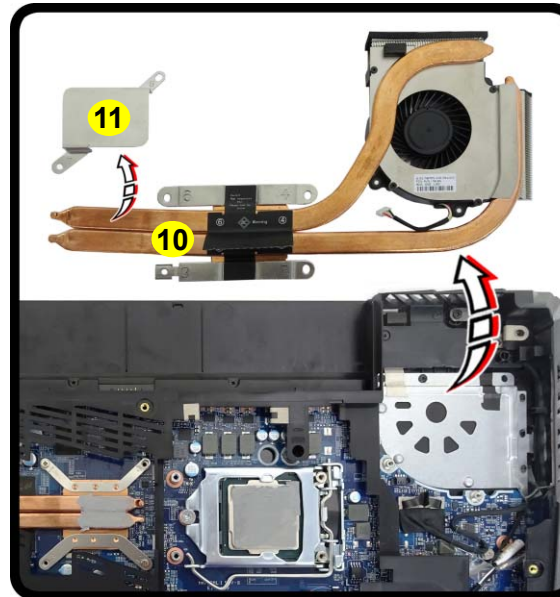
## Processor Removal Procedure

1. Turn **off** the computer, remove the battery ([page 2 - 5](#)) and bottom cover ([page 2 - 6](#)).
2. Disconnect the cable **1** and remove screws **2** - **9** from the CPU fan & heat sink unit **10** in the order indicated on the label (i.e screw **9** first through to screw **2** last [Figure 5a](#)).
3. Carefully (it may be hot) remove the heat sink unit **10** as shown by the arrow ([Figure 5b](#)).

a.



b.



*Figure 5*  
**Processor  
Removal  
Procedure**

- a. Disconnect the fan cable and remove the screws in the correct order.
- b. Carefully remove the heat sink unit and bracket as shown.



10. Heat Sink Unit  
11. Heat Sink Bracket

- 8 Screws

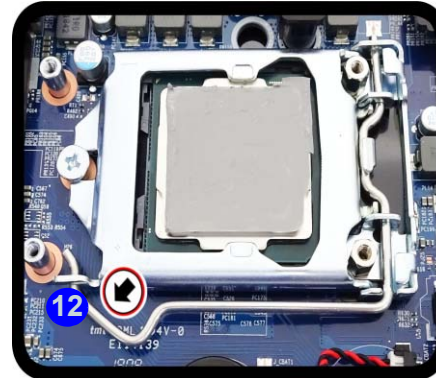
## Disassembly

*Figure 6*  
**Processor Removal**  
**(cont'd)**

- c. Move the latch and bracket fully in the direction indicated to unlock the CPU.
- d. Lift the CPU out of the socket.

4. Press down and hold the latch **12** (with the latch held down you will be able to release it).
5. Move the latch **12** and bracket **13** fully in the direction indicated to unlock the CPU (*Figure 6d*).
6. Carefully (it may be hot) lift the CPU **A** up out of the socket (*Figure 6e*).
7. See [page 2 - 11](#) for information on inserting a new CPU.
8. When re-inserting the CPU, pay careful attention to the pin alignment, it will fit only one way (DO NOT FORCE IT!).

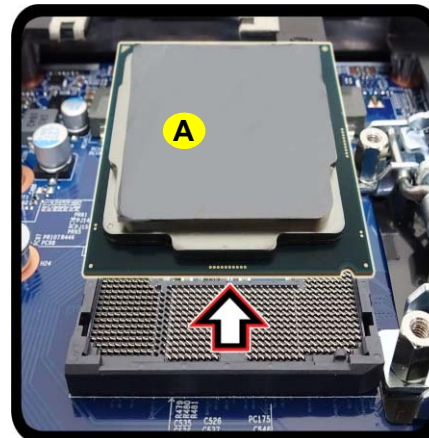
c.



Unlock



d.



Caution

The heat sink, and CPU area in general, contains parts which are subject to high temperatures. Allow the area time to cool before removing these parts.



A. CPU

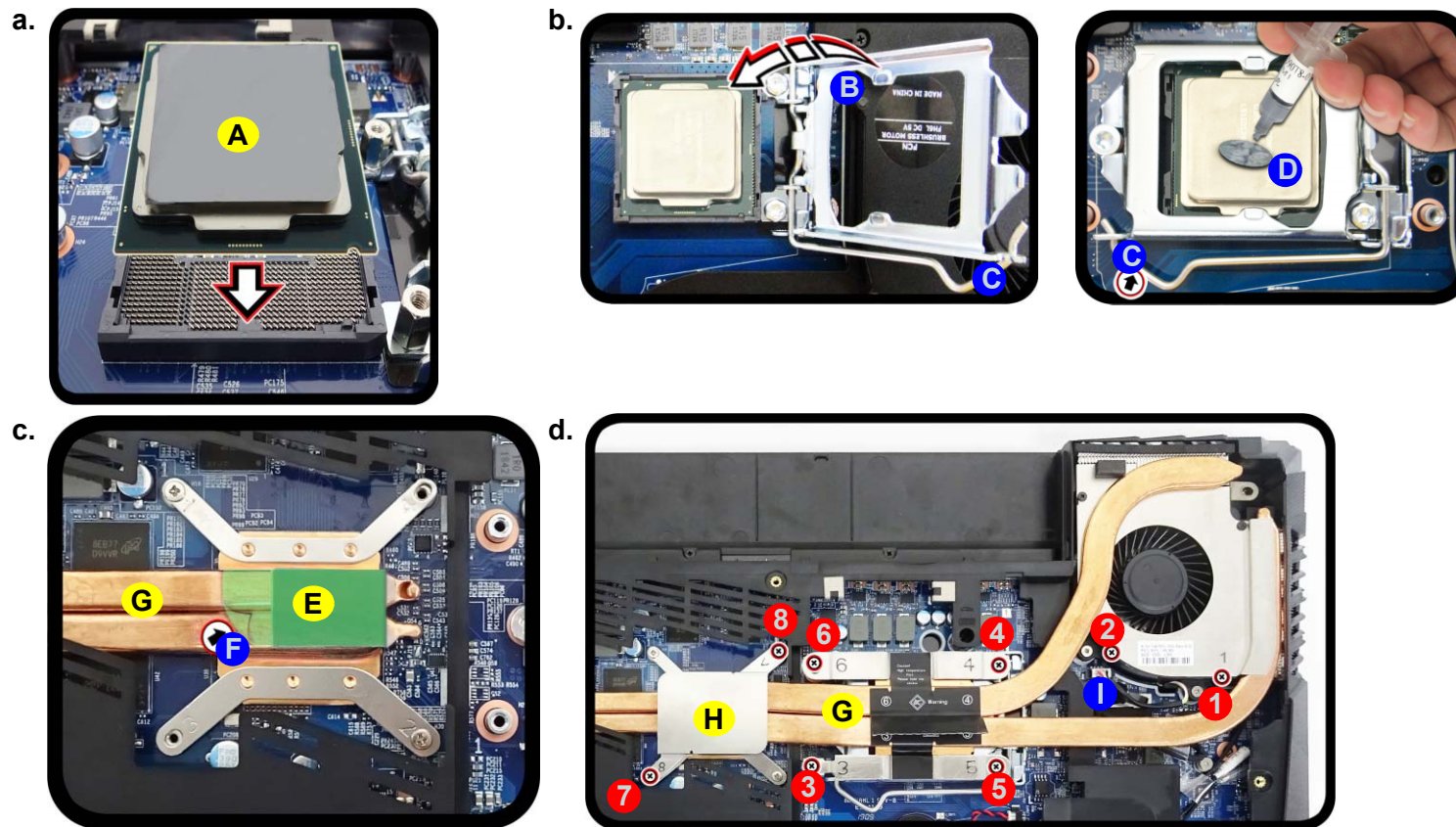


## Processor Installation Procedure

1. Insert the CPU **A**; pay careful attention to the pin alignment (**Figure 7a**), it will fit only one way (DO NOT FORCE IT!).
2. Move the bracket **B** and latch **C** fully in the direction indicated to lock the CPU.
3. Apply the thermal grease **D** to the top of the CPU as shown (**Figure 7b**).
4. Insert the heat sink unit **G** and bracket **H** and tighten the CPU heat sink screws in the order **1** - **7** (the order as indicated on the label and **Figure 7d**).
5. Connect the CPU fan cable **I**, replace the component bay cover and tighten the screws (**page 2 - 6**).

*Figure 7*  
**Processor Installation**

- a. Insert the CPU.
- b. Move the latch and bracket fully in the direction indicated to lock the CPU. Apply thermal grease.
- c. Place the thermal pad.
- d. Insert the heat sink and bracket. Tighten the screws.



- A. CPU  
G. Heat Sink Unit  
H. Heat Sink Bracket
- 8 Screws

## Disassembly

*Figure 8*  
**RAM Module Removal**

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



### Contact Warning

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



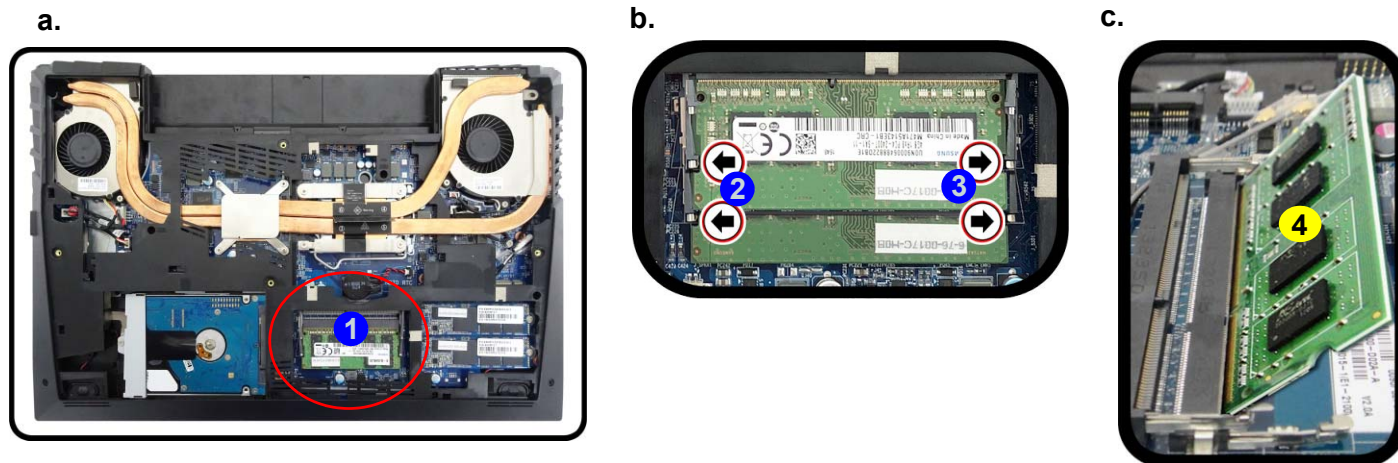
### 4. RAM Module

## 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 3200 MHz. The main memory can be expanded up to 16GB. The total memory size is automatically detected by the POST routine once you turn on your computer.

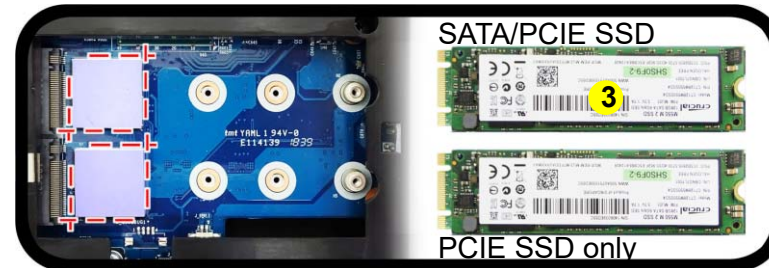
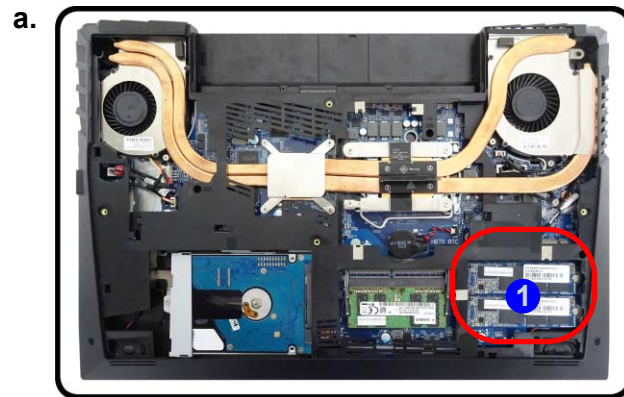
### Memory Upgrade Process

- Turn **off** the computer, turn it over, remove the battery ([page 2 - 5](#)).
- The RAM-2 modules will be visible at point **1** on the mainboard ([Figure 8a](#)).
- Gently pull the two release latches (**2** & **3**) on the sides of the memory socket in the direction indicated by the arrows ([Figure 8b](#)). The RAM module **4** will pop-up ([Figure 8c](#)), and you can then remove it.
- Pull the latches to release the second module if necessary.
- Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
- The module will only fit one way as defined by its pin alignment. Make sure the module is seated as far into the slot as it will go. **DO NOT FORCE IT**; it should fit without much pressure.
- Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
- Replace the bottom cover and the screws (see [page 2 - 6](#)).
- Restart the computer to allow the BIOS to register the new memory configuration as it starts up.



## Removing the M.2 SSD Module

1. Turn **off** the computer, turn it over, remove the battery ([page 2 - 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 the thermal pad and all the screws).



*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.



3.M2 SSD Module

- 1 Screw



## Disassembly

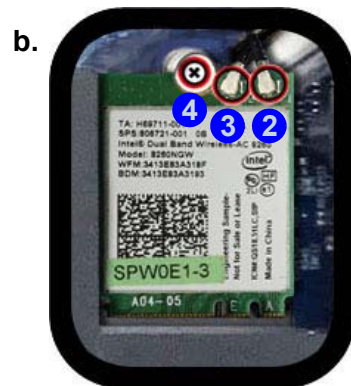
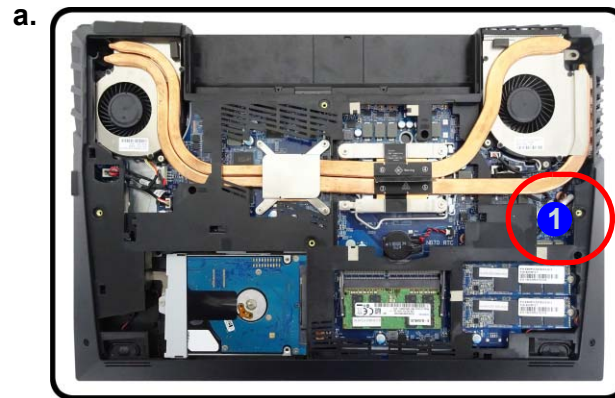
*Figure 10*  
**Wireless LAN  
Module Removal**

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

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

## Removing the Wireless LAN Module

- Turn **off** the computer, turn it over, remove the battery (*page 2 - 5*).
- The Wireless LAN module will be visible at point **1** on the mainboard (*Figure 10a*).
- Carefully disconnect the cables **2** & **3**, and then remove the screw **4** (*Figure 10b*).
- The Wireless LAN module **5** (*Figure 10c*) will pop-up, and you can remove it from the computer.
- Reverse the process to install a new module (do not forget to replace all the screws).



5. Wireless LAN Module

- 1 Screw

## Wireless LAN, Combo Module Cables

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

Module Type	Antenna Type	Cable Color	Cable Cover Type
WLAN/WLAN & Bluetooth Combo	WL 1	Black	Transparent
	WL 2	Black	White

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

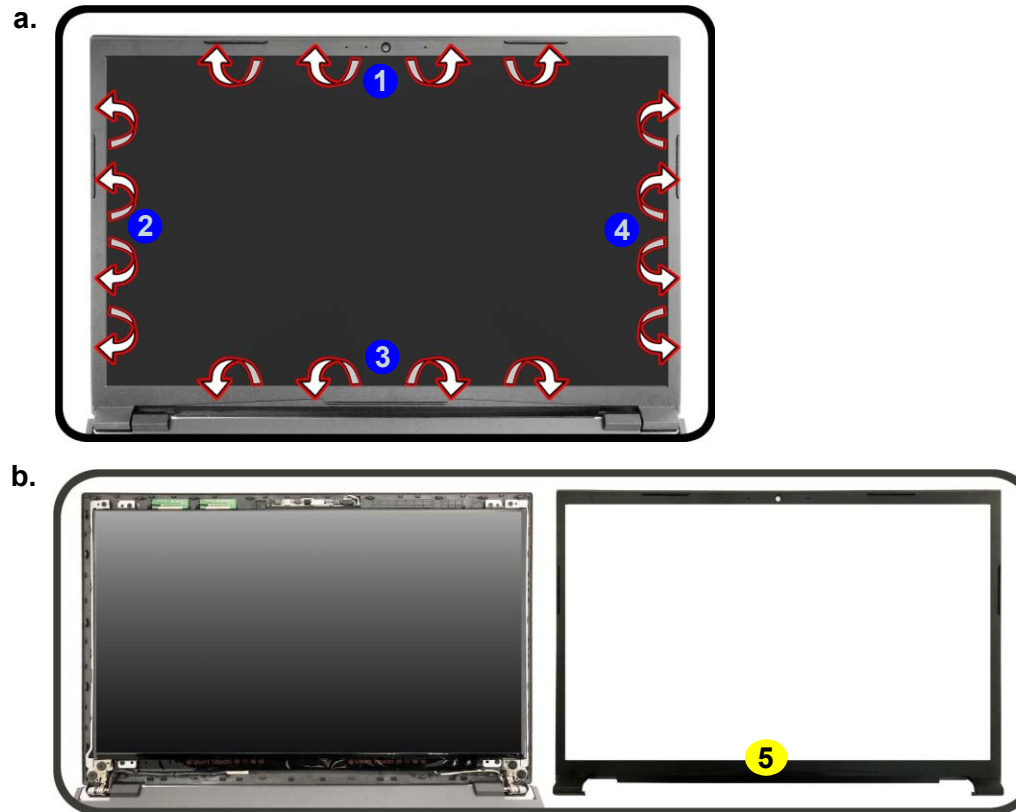
## Disassembly

*Figure 11*  
**CCD Removal**

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

## Removing the CCD

1. Turn **off** the computer, turn it over to remove the battery ([page 2 - 5](#)).
2. Lay the computer down on a flat surface with the top case up forming a 90 degree angle.
3. Run your fingers around the inner frame of the LCD panel to lift at the upper point **1** as indicated by the arrows, continue to lift up the inner frame at points **2** - **4** as indicated by the arrows ([Figure 11a](#)).
4. Remove the LCD front cover **5** ([Figure 11b](#)).



5. LCD Front Cover



5. Disconnect the cable ⑥ (*Figure 12c*).
6. Remove the CCD module ⑦ (*Figure 12d*).
7. Reverse the process to install a new CCD module.



*Figure 12*  
**CCD Removal**  
**(cont'd)**

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



7. CCD Module



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# Appendix A:Part Lists

This appendix breaks down the *NK60SB/NK60SE* series notebook's construction into a series of illustrations. The component part numbers are indicated in the tables opposite the drawings.

**Note:** This section indicates the *manufacturer's* part numbers. Your organization may use a different system, so be sure to cross-check any relevant documentation.

**Note:** Some assemblies may have parts in common (especially screws). However, the part lists DO NOT indicate the total number of duplicated parts used.

**Note:** Be sure to check any update notices. The parts shown in these illustrations are appropriate for the system at the time of publication. Over the product life, some parts may be improved or re-configured, resulting in *new* part numbers.

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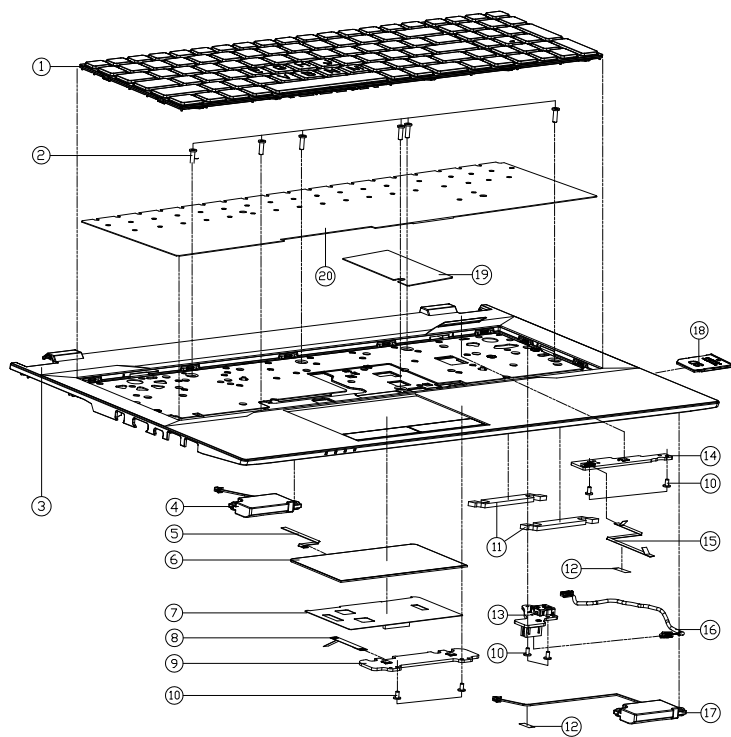
## Part List Illustration Location

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

*Table A - 1*  
**Part List Illustration  
Location**

Part	
Top	<i>page A - 3</i>
Bottom	<i>page A - 4</i>
Main Board	<i>page A - 5</i>
HDD	<i>page A - 6</i>
LCD	<i>page A - 7</i>

Top

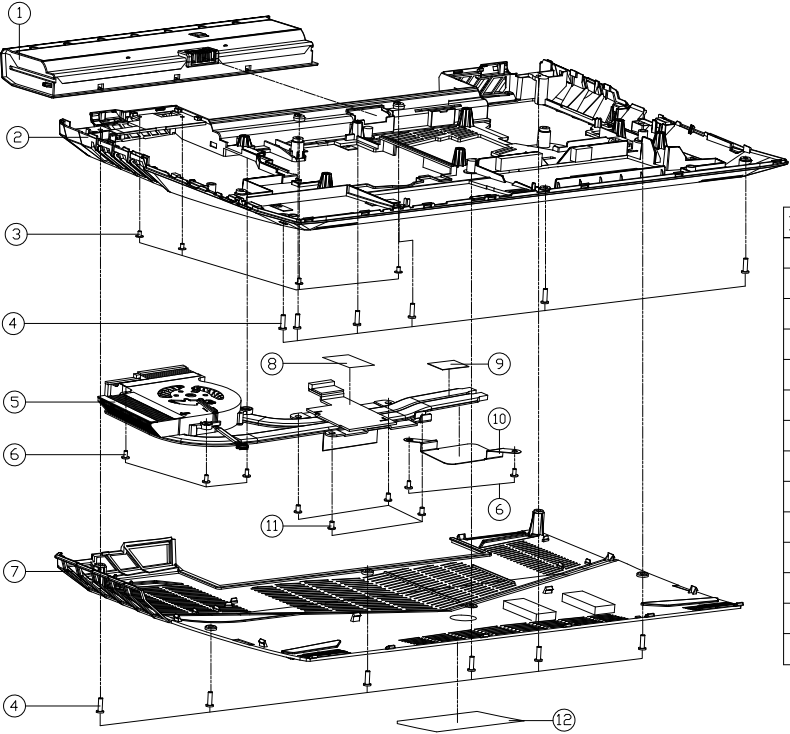


ITEM	PART NAME	PART NO	REMARK
1	KB FOR MULTI 15C BL KB US SERIES NB70TH	6-NB70TH-KB-MCL-US	
1	KB FOR NON BL KB US SERIES NK60SB	6-NK60SB-KB-NBL-US	
1	KB FOR MULTI 15C BL KB US SERIES NB70TH	6-80-N15Z0-212-1M	
1	KB FOR MULTI 15C BL KB US SERIES NB70TH	6-80-N15Z0-21D-1M	
2	.SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
3	TOP CASE MODULE NB50TA	6-39-NB5A2-013	
4	SPK+CABLE L L25*14 2W 4? 35MM VTS0251405-01 NB50TJ1	6-23-5NB50-0L0-1	
5	FFC CABLE FOR TP TO MB 60MM 60V 8PIN (OX) NK50SB	6-43-NK500-040	
6	TOUCH PAD ELAN PTP SA650-6201 (100*55MM) N750WJ (F/W 12)	6-49-N75W3-011	
7	TOUCH PAD MYLAR PET+G9000 NB50TA	6-40-NB5A2-020	
8	FFC CABLE CLICK TO TP (P=1.0) 41MM 60V 4PIN N550RC	6-43-N5500-052	
9	CLICK BOARD V2.0 NK60SB	6-77-NK502-D02-B	
10	.SCREW M2*4L KI NI ICT NY (DD=04.5,DT=0.4)	6-35-B1120-4RE	
11	SPONGE (76*10*25T) CR4305 FOR 7MM HDD W540EXCHANGE	6-47-0019A-763	
12	TAPE MYLAR TRANSPARENT (20*10*0.05) P180HM	6-40-P1803-020	
13	DC JACK BOARD V2.0 NK70SB	6-77-NK70C-D02	
14	POWER SW BOARD V2.0 NK60SB	6-77-NK70S-D02-A	
15	FFC POWER TO MB 92.5MM 3.3V 4PIN NB50TJ1(CNJS)	6-43-NB500-020-2	
16	WIRE CABLE FOR DC-IN TO MB 60MM 30V 4PIN (HL) NB50TA	6-43-NB5A0-030	
17	SPK+CABLE R L25*14 2W 4? 250MM VTS0251405-02 NB50TJ1	6-23-5NB50-0R0-1	
18	DUMMY 3MM NON PUSH TYPE PC+ABS (C720P-700EXCHANGE) V9700W	6-42-W9708-011	
19	W BL KB MYLAR NK60SB	6-40-NK602-010	KB FOR NON BL KB SERIES
20	KB MYLAR FOR W BACKLIGHT NB70TJ1	6-40-NB702-030	KB FOR NON BL KB SERIES

Figure A - 1  
Top

# Bottom

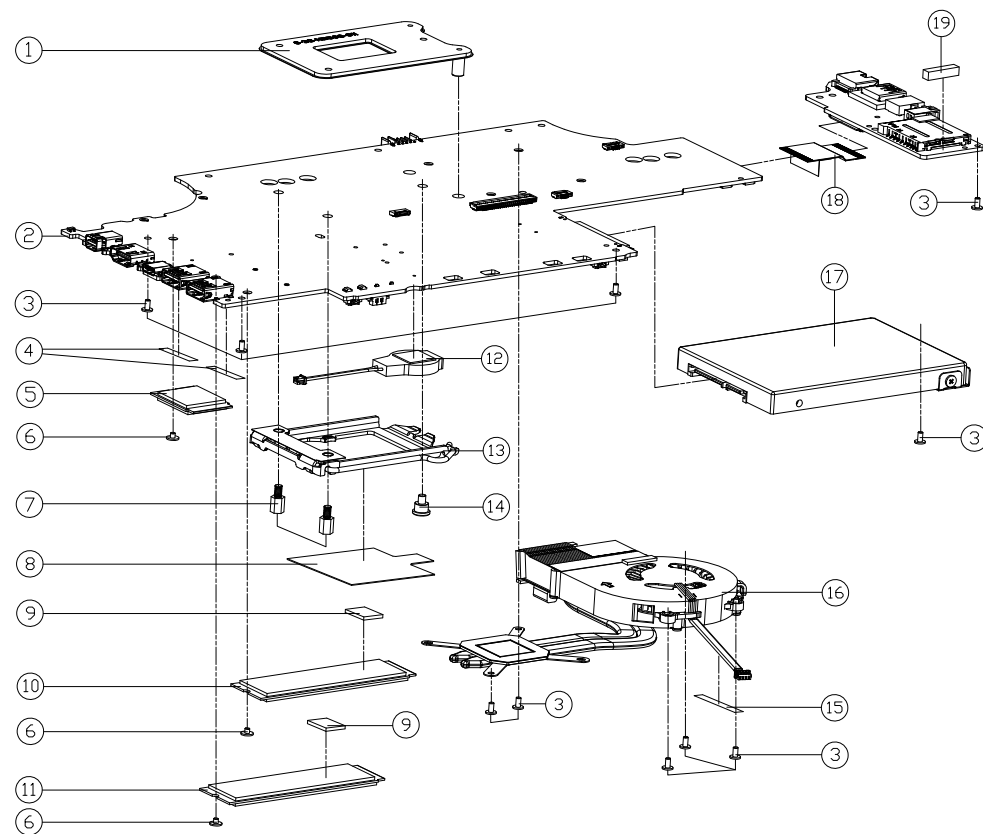
Figure A - 2  
Bottom



ITEM	PART NAME	PART NO	REMARK
1	DATP S LI 108V/4AH/47WH 3CP SMP/SHI CAC (0802025) 98022201/B (TEXTURE) NBS0TJ1	6-87-NB50S-41C02	
1	DATP S LI 108V/4AH/47WH 3CP SMP/ALC CAC (0802025) 98022201/F (TEXTURE) NBS0TJ1	6-87-NB50S-41D02	
2	BOTTOM CASE MODULE NB50TA	6-39-NB5A3-013	
3	SCREW M2*3L KI BZ ICT NY (DD=04.5,DT=0.4)	6-35-B6120-3RD	
4	SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
5	CPU HEATSINK MODULE NK60SB	6-31-NK60N-100	
6	SCREW M2*4L KI NI ICT NY (DD=04.5,DT=0.4)	6-35-B1120-4RE	
7	CPU COVER MODULE NB50TJ1	6-42-NB508-103	
8	GREASE GA-690(0.6G) P157SM	6-47-P1578-020	
9	THERMAL PAD PSX 20*15*0.20T M860TU	6-47-M8608-010	
10	PIPE SUPPORT PLATE (SUS301) NB70TJ1	6-33-NB702-021	
11	SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
12	PRODUCT LABEL FOR NK60SB	6-45-NK60SB03-010	
12	PRODUCT LABEL FOR NK60SE	6-45-NK60SE03-010	



Main Board

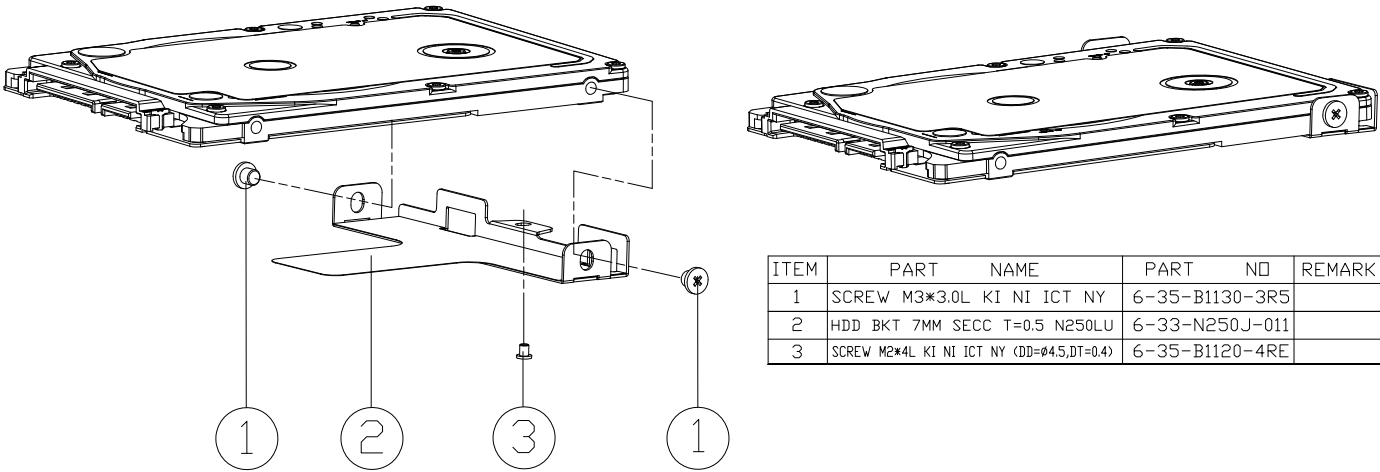


ITEM	PART NAME	PART NO	REMARK
1	CPU SUPPLY VOLTAGE 3V/5V/1.8V/1.5V/1.2V/1.0V/0.9V/0.8V/0.7V/0.6V/0.5V/0.4V/0.3V/0.2V/0.1V/0.0V	6-33-NB50S-011	
2	MAIN BOARD V2.0 (CPU/MULTI BOARD V2.0) NK60SD	6-77-NK60SBOA-N02-1	
2	MAIN BOARD V2.0 (CPU/MULTI BOARD V2.0) NK60SD	6-77-NK60SEDA-N02	
2	MAIN BOARD V2.0 (CPU/MULTI BOARD V2.0) NK60SD	6-77-NK60SEDA-N02-1	
3	SCREW M2x4L KI NI ICT NY (DD=0.45,DT=0.4)	6-35-B1120-4RE	
4	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
5	HEAT SINK FOR CPU SOCKET 1.5V/1.8V/1.5V/1.2V/1.0V/0.9V/0.8V/0.7V/0.6V/0.5V/0.4V/0.3V/0.2V/0.1V/0.0V	6-88-N15CF-4210	
5	HEAT SINK FOR CPU SOCKET 1.5V/1.8V/1.5V/1.2V/1.0V/0.9V/0.8V/0.7V/0.6V/0.5V/0.4V/0.3V/0.2V/0.1V/0.0V	6-88-L140F-4210	
5	HEAT SINK FOR CPU SOCKET 1.5V/1.8V/1.5V/1.2V/1.0V/0.9V/0.8V/0.7V/0.6V/0.5V/0.4V/0.3V/0.2V/0.1V/0.0V	6-88-NV40F-4210	
5	HEAT SINK FOR CPU SOCKET 1.5V/1.8V/1.5V/1.2V/1.0V/0.9V/0.8V/0.7V/0.6V/0.5V/0.4V/0.3V/0.2V/0.1V/0.0V	6-88-N24GF-4200	
6	SCREW M2x4L KI NI ICT NY (DD=0.45,DT=0.4)	6-35-B1120-2RA	
7	SCREW M3x0.5L NI ICT NY FOR CPU SOCKET	6-35-Z1130-SR0-1	
8	CPU SOCKET MYLAR FOR D900F	6-40-D90FS-070	
9	THERMAL PAD M4500 (17.3x17.3x2.75)MM N750BU	6-48-N7503-010	
10	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D5116-Z02	OPTION
10	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D5132-Z03	OPTION
10	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D511T-S05	OPTION
10	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D515B-B00	OPTION
10	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D515B-S0A	OPTION
10	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D515B-S0B	OPTION
10	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D515B-T00	OPTION
10	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D515B-K00	OPTION
10	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D515B-102	OPTION
10	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D51R6-K00	OPTION
10	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D51R6-H04	OPTION
10	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D51C8-H03	OPTION
11	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D5116-Z02	ONLY FOR PCIE
11	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D511T-S05	ONLY FOR PCIE
11	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D515B-S0A	ONLY FOR PCIE
11	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D515B-S0B	ONLY FOR PCIE
11	SSD 128GB SATA 3.5" 7MM NVMe PCIe 3.0x4 LAMERS	6-85-D51R6-K00	ONLY FOR PCIE
12	BATE 20MM 5V 200MAH W/CABLE 50MM N30000355W000 C01000	6-23-22015-TE0	
13	ILM FOR CPU SOCKET 6 LG4200P CUMMEL-61-1000-400	6-86-25C00-003	
14	SCREW M3x3.5L BZ/Z ICT NY	6-35-Z2130-3R5	
15	TAPE MYLAR (A),MYLAR M550J	6-40-M55J2-010	
16	VGA HEATSINK MODULE NK60SB	6-31-NK60N-200	
17	W/HDD ASS'Y NB50TK1	6-79-NB50TK1J-010	
17	W/O HDD ASS'Y NB50TK1	6-79-NB50TK1J-020	
18	FFC CABLE AUDIO TO HD 30MM PITCH-45 5V 40PIN C01000 N050TA	6-43-NB5A0-020-1	
19	SPONGE 18x5x5.6T CR4382 NBS0TA	6-47-0019A-18K	

Figure A - 3  
Main Board

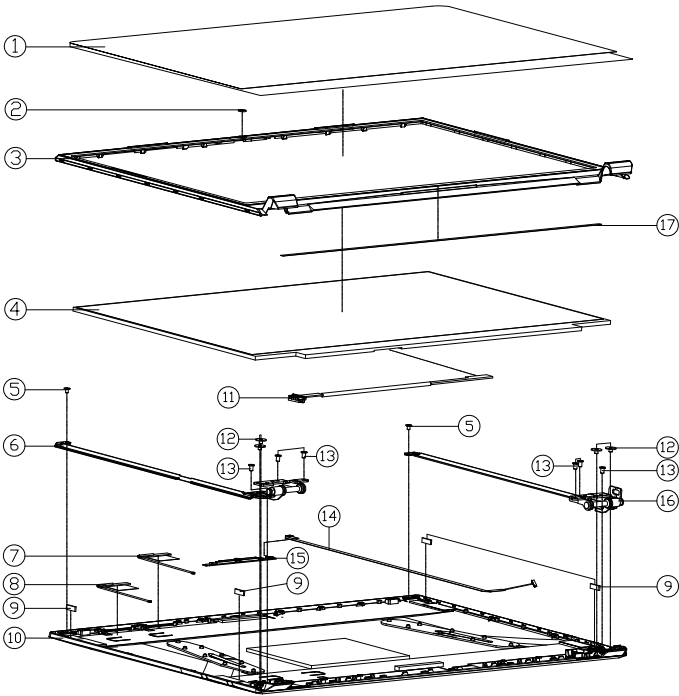
HDD

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=0.4)	6-35-B1120-4RE	

LCD



ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP W650RC	6-40-W6508-020	
2	CCD LENS (VIEWING AREA 4MMX6MMX6*3)W940TU	6-42-W9401-020-2	
3	FRONT COVER MODULE NB60TK1	6-39-NB601-013	
4	LCD M6.1" FHD/WVA/N7/NDN GT/EDP INNOLUX N61HCA-EA1 (LED) 32MM	6-50-MBB32-V130	
4	LCD M6.1" FHD/WVA/N7/NDN GT/EDP INNOLUX N61HCA-EA2 (LED) 32MM	6-50-MBB32-V020	
5	SCREW M2*3L KI BZ ICT NY (DD=0.45,DT=0.4)	6-35-B6120-3RD	
6	HINGE L (SK7+SGCC) NB60TK1	6-33-NB601-0L1	
7	ANTENNA IPEX4 WLAN WGT WL1 PCB CL 2.4G/5G WL1- 500MM NB60TK1	6-23-7NB60-011	
8	ANTENNA IPEX4 WLAN WGT WL2 PCB CL 2.4G/5G WL2- 450MM NB60TK1	6-23-7NB60-021	
9	RUBBER L10*W3.5*1.05T NB60TK1	6-47-NB601-030	
10	BACK COVER MODULE NB60TK1	6-39-NB601-024	
11	WIRE CABLE FOR EXP FHD 144HZ 350MM (D) 19V 30PIN TO 40PIN (CMU/PLS CONN4LX09002) NB60TK1	6-43-NB601-010-1S	
11	WIRE CABLE FOR EXP FHD 350MM (D) 19V 30PIN (CMU/PLS CONN4LX09002) NB60TK1	6-43-NB501-010-2S	
12	SCREW M2.5*2.5L KI BK/Z ICT NY(0.6)	6-35-B6125-2R5	
13	SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
14	WIRE + FFC CABLE FOR CCD D-MIC 600MM 3.3V 8P TO 12P (4HL) NB60TK1	6-43-NB60T-010	
15	OVC CAMERA CORDON (TWO) ONT020202020 IN 10 DVS24 N500 195MM WHITE-LED WITH MICROBROW BORDER WITH FFD	6-88-N15ZC-5100	OPTION
15	OVC CAMERA CORDON (TWO) ONT020202020 IN 10 DVS24 N500 195MM WHITE-LED WITH MICROBROW BORDER WITH FFD	6-88-N15ZC-4900	OPTION
16	HINGE R (SK7+SGCC) NB60TK1	6-33-NB601-0R1	
17	LCD FRONT COVER DOUBLE SIDE TAPE(FM32022K 330*440.21)FOR N650HC	6-40-N85C1-030-1	

Figure A - 5  
LCD



# Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the *NK60SB / NK60SE* 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>HDMI Repeater - Page B - 23</i>	<i>VDDQ, VTT_MEM, 2.5V - Page B - 44</i>
<i>Processor 1/5 - Page B - 3</i>	<i>Panel Conn - Page B - 24</i>	<i>MP2979 - Page B - 45</i>
<i>Processor 2/5 - Page B - 4</i>	<i>PCH 1/9 - Page B - 25</i>	<i>VCore Output Stage - Page B - 46</i>
<i>Processor 3/5 - Page B - 5</i>	<i>PCH 2/9 - Page B - 26</i>	<i>VCCGT, VCCSA - Page B - 47</i>
<i>Processor 4/5 - Page B - 6</i>	<i>PCH 3/9 - Page B - 27</i>	<i>VCCIO - Page B - 48</i>
<i>Processor 5/5 - Page B - 7</i>	<i>PCH 4/9 - Page B - 28</i>	<i>1.8VA - Page B - 49</i>
<i>DDR4 CHA SO-DIMM_0 - Page B - 8</i>	<i>PCH 5/9 - Page B - 29</i>	<i>AC_In, Charger - Page B - 50</i>
<i>DDR4 CHB SO-DIMM_0 - Page B - 9</i>	<i>PCH 6/9 - Page B - 30</i>	<i>NVVDD1 - Page B - 51</i>
<i>VGA PCI-E Interface - Page B - 10</i>	<i>PCH 7/9 - Page B - 31</i>	<i>NVVDD2 - Page B - 52</i>
<i>VGA Frame Buffer Interface - Page B - 11</i>	<i>PCH 8/9 - Page B - 32</i>	<i>FBVDDQ - Page B - 53</i>
<i>VGA Frame Buffer A - Page B - 12</i>	<i>PCH 9/9 - Page B - 33</i>	<i>IV8_AON, PEX_VDD - Page B - 54</i>
<i>VGA Frame Buffer A - Page B - 13</i>	<i>KBC-ITE IT5570 - Page B - 34</i>	<i>DC Jack Board - Page B - 55</i>
<i>VGA Frame Buffer B - Page B - 14</i>	<i>Audio Codec - Page B - 35</i>	<i>Power SW Board - Page B - 56</i>
<i>VGA Frame Buffer B - Page B - 15</i>	<i>M.2 PCIE4X SSD - Page B - 36</i>	<i>Click Board - Page B - 57</i>
<i>VGA I/O - Page B - 16</i>	<i>USB Type-C, M.2 WLAN+BT - Page B - 37</i>	<i>Multi Board - Page B - 58</i>
<i>VGA I/O - Page B - 17</i>	<i>USB Type-A, TPM - Page B - 38</i>	<i>LAN RTL8411B - Page B - 59</i>
<i>VGA Sequence / GPIO - Page B - 18</i>	<i>RGB KB, Fan, LED - Page B - 39</i>	<i>DC Jack Board - Page B - 60</i>
<i>VGA Decoupling - Page B - 19</i>	<i>HDD, CCD, TP, LID, PWR SW - Page B - 40</i>	<i>Power SW Board - Page B - 61</i>
<i>mDP Conn - Page B - 20</i>	<i>5V, 5VS, 3.3V, 3.3VS, NV3V3 - Page B - 41</i>	<i>LID Board - Page B - 62</i>
<i>DP Redriver - Page B - 21</i>	<i>VDD3, VDD5 - Page B - 42</i>	
<i>HDMI - Page B - 22</i>	<i>1.05A, VCCST/STG/SFR - Page B - 43</i>	

Table B - 1  
**SCHEMATIC  
DIAGRAMS**

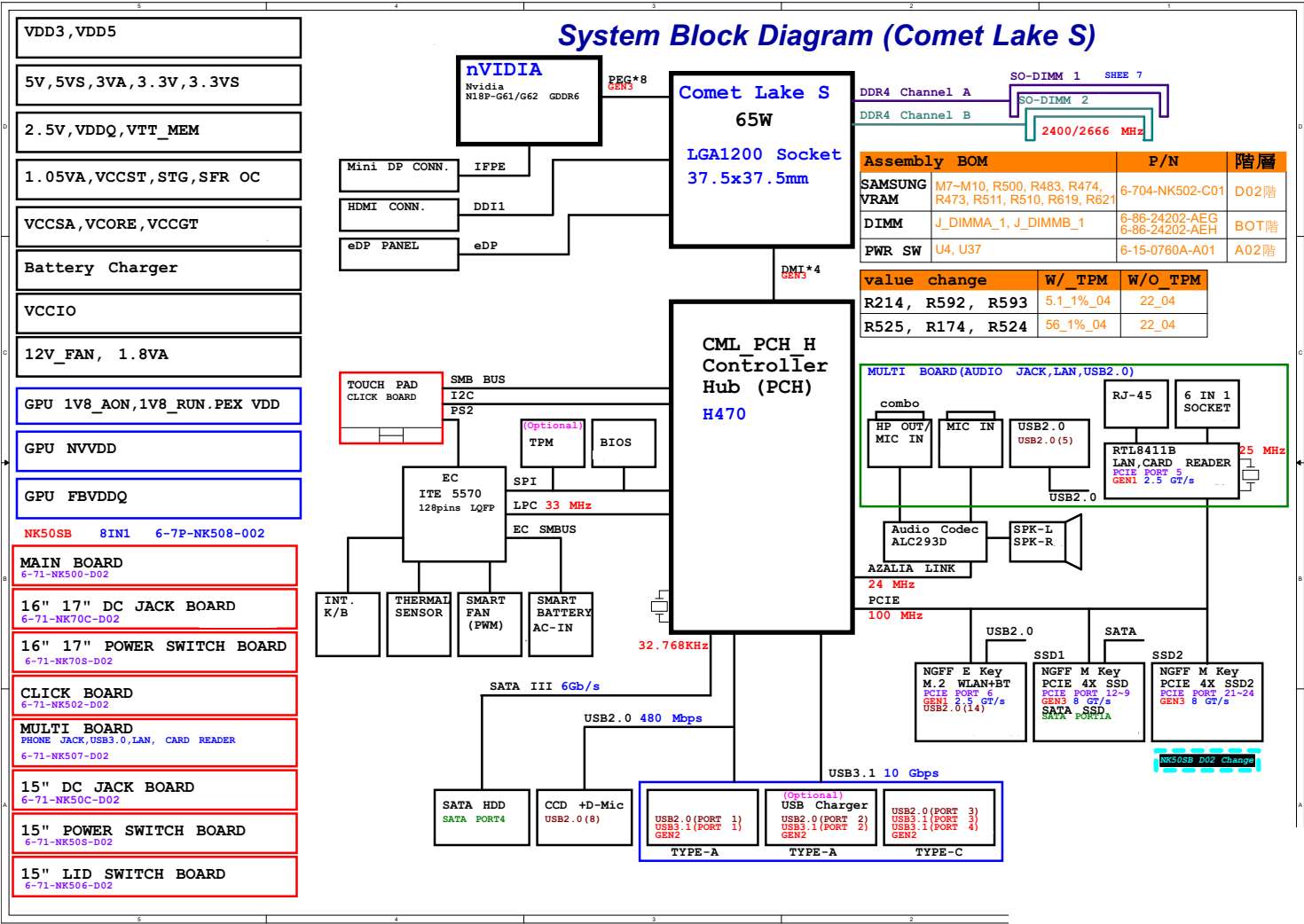


## Version Note

The schematic diagrams in this chapter are based upon version 6-7P-NK508-002. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

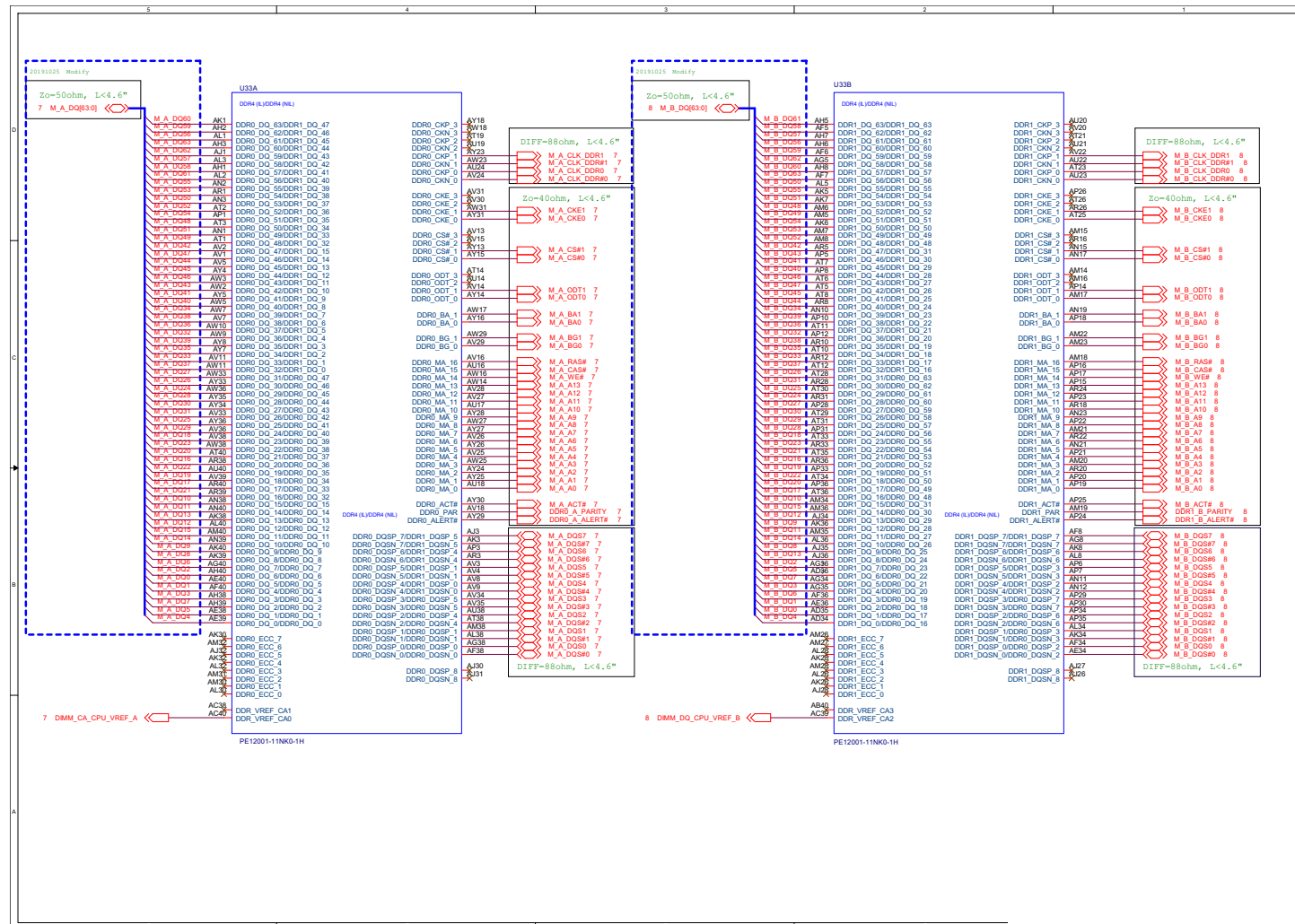
System Block Diagram

Sheet 1 of 61  
System Block Diagram





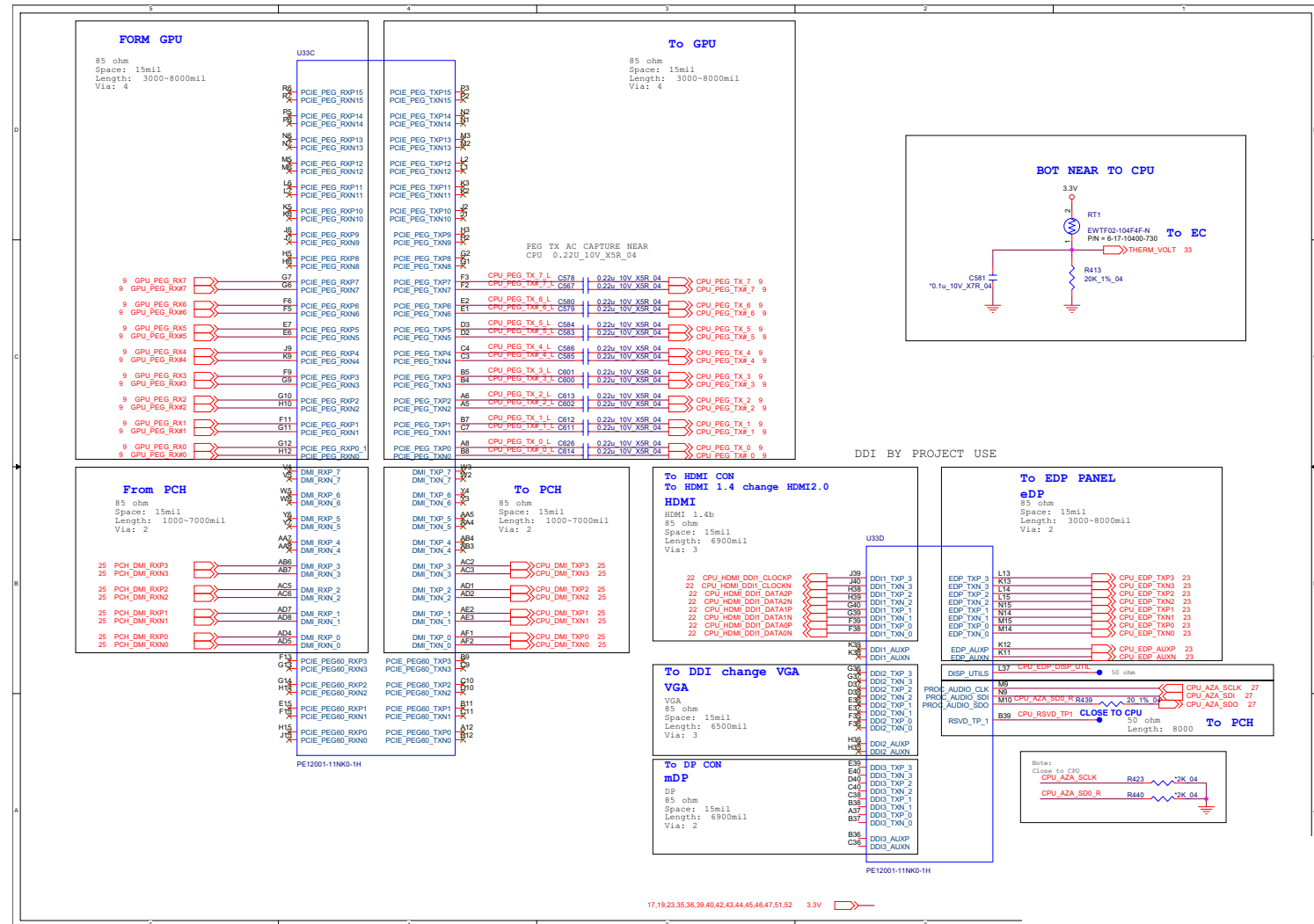
## B.Schematic Diagrams



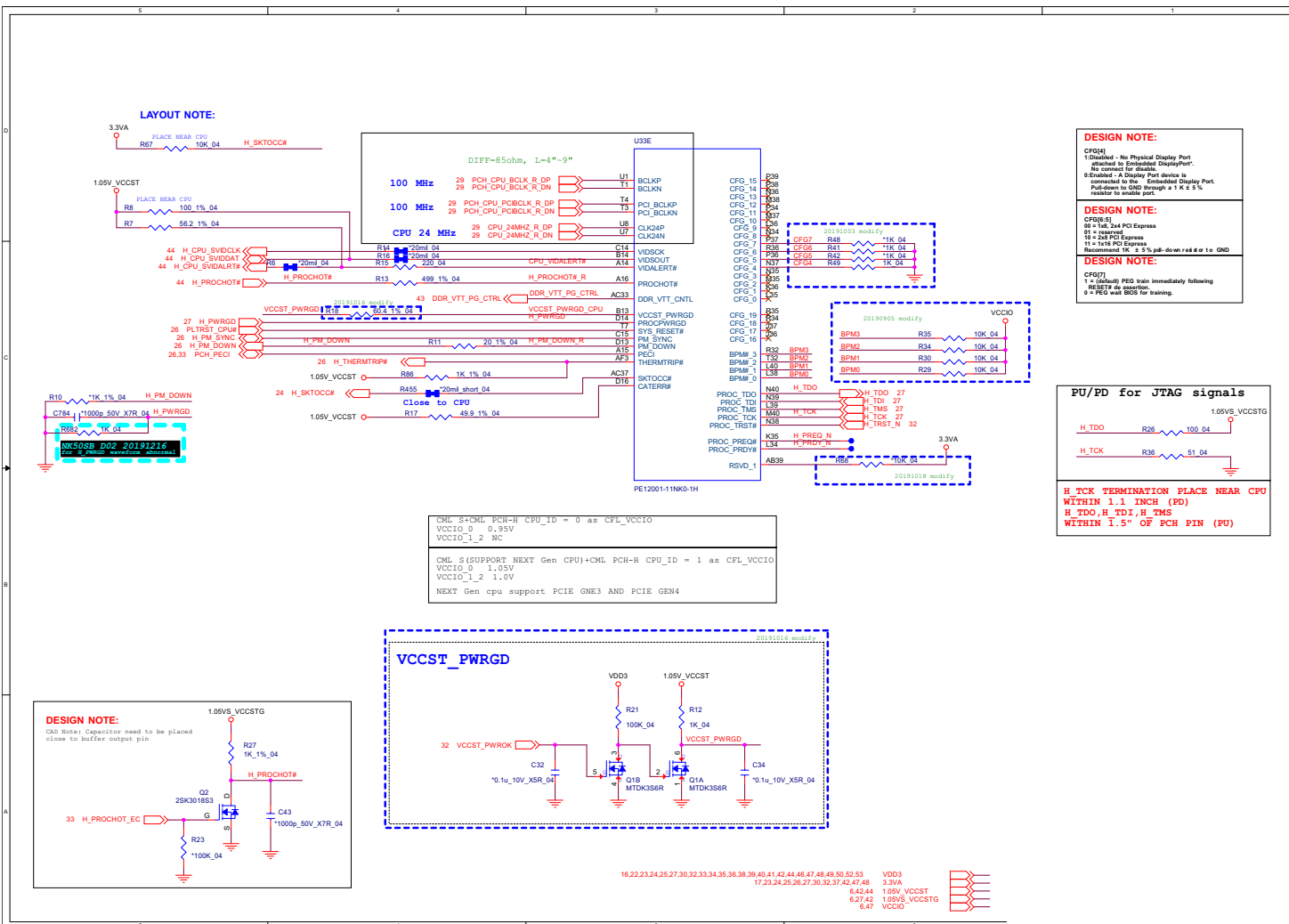
## Schematic Diagrams

# Processor 2/5

Sheet 3 of 61  
Processor 2/5

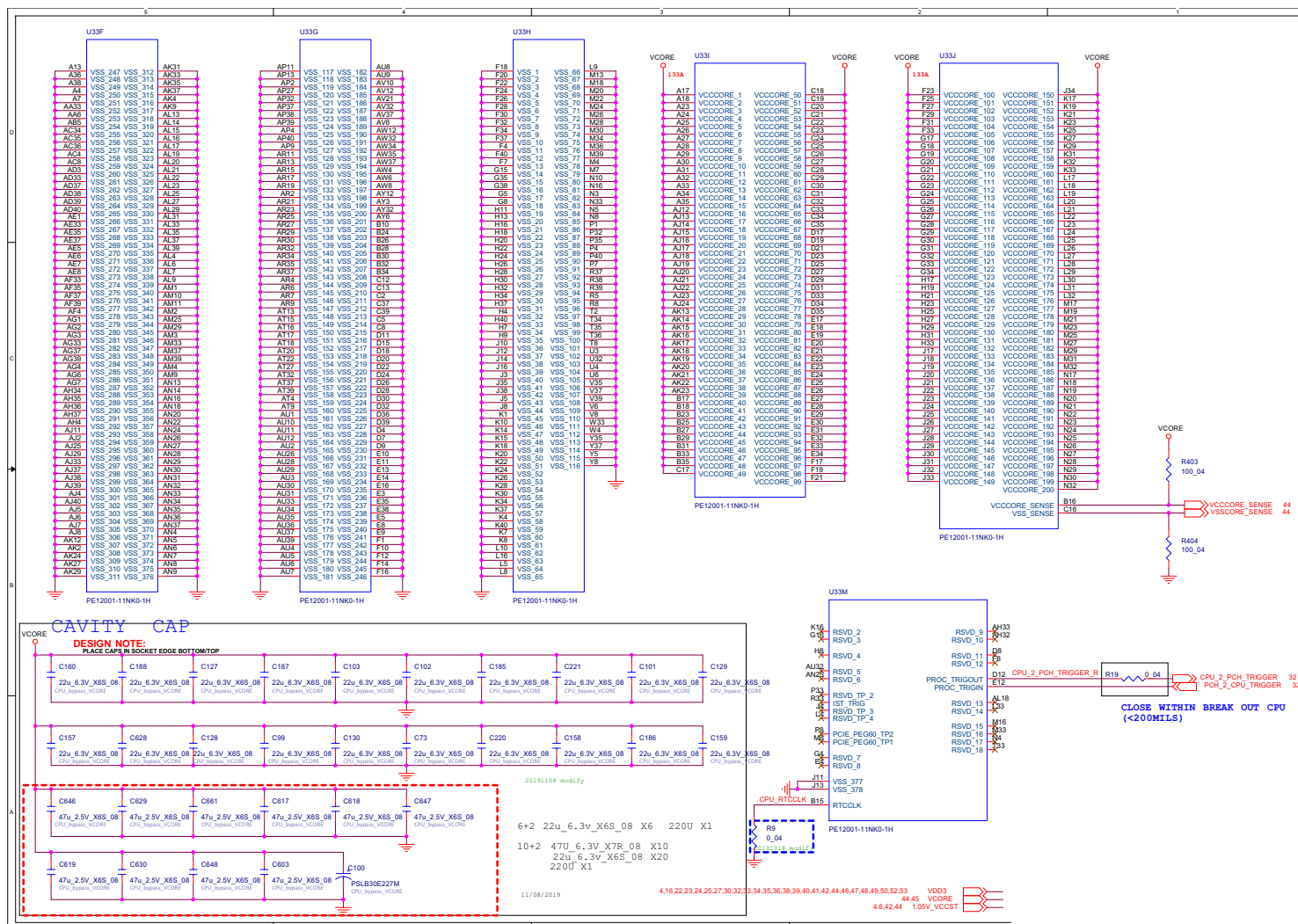


## Processor 3/5

Sheet 4 of 61  
Processor 3/5

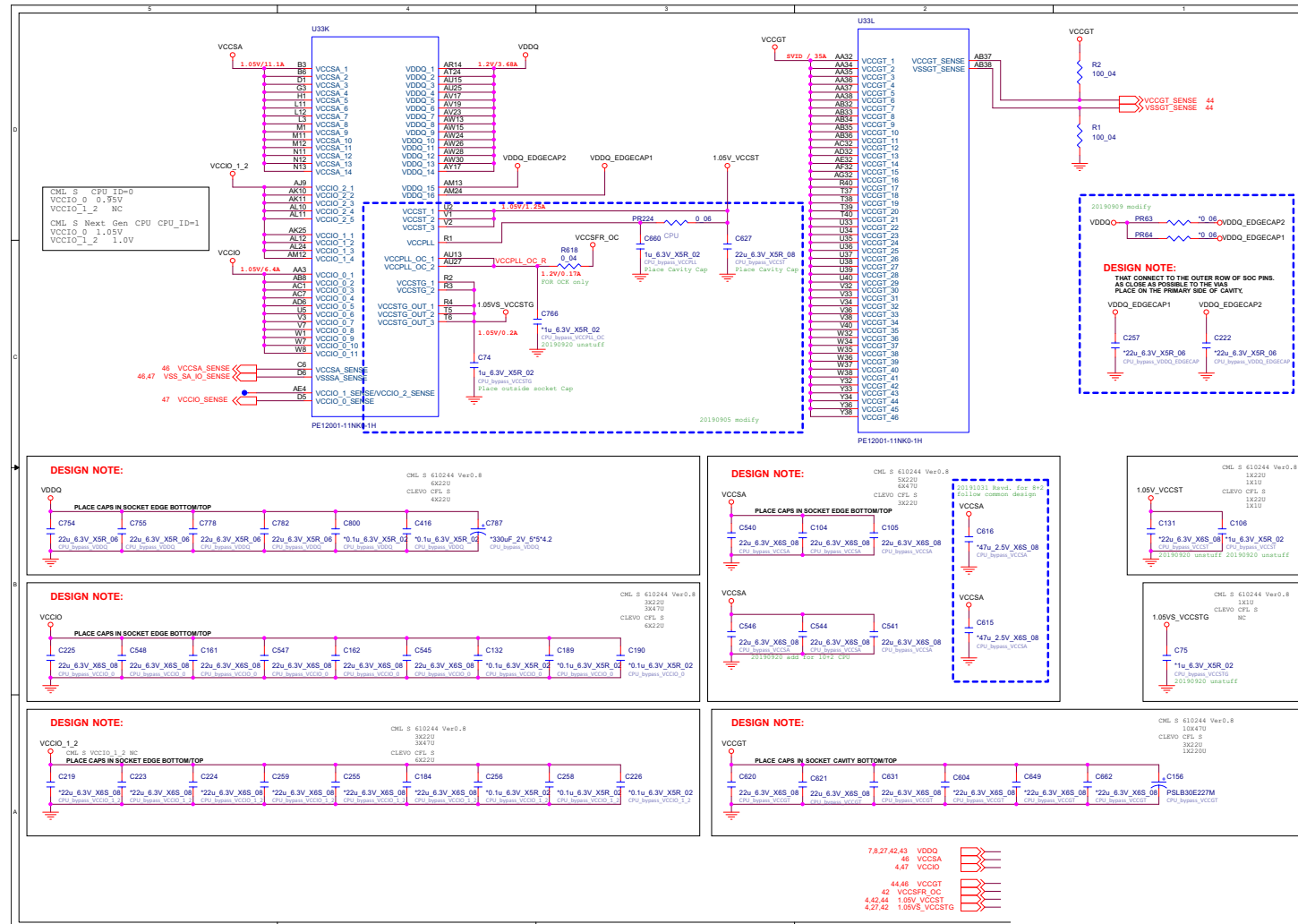
## Processor 4/5

Sheet 5 of 61  
Processor 4/5



**Processor 5/5 B - 7**

## B.Schematic Diagrams

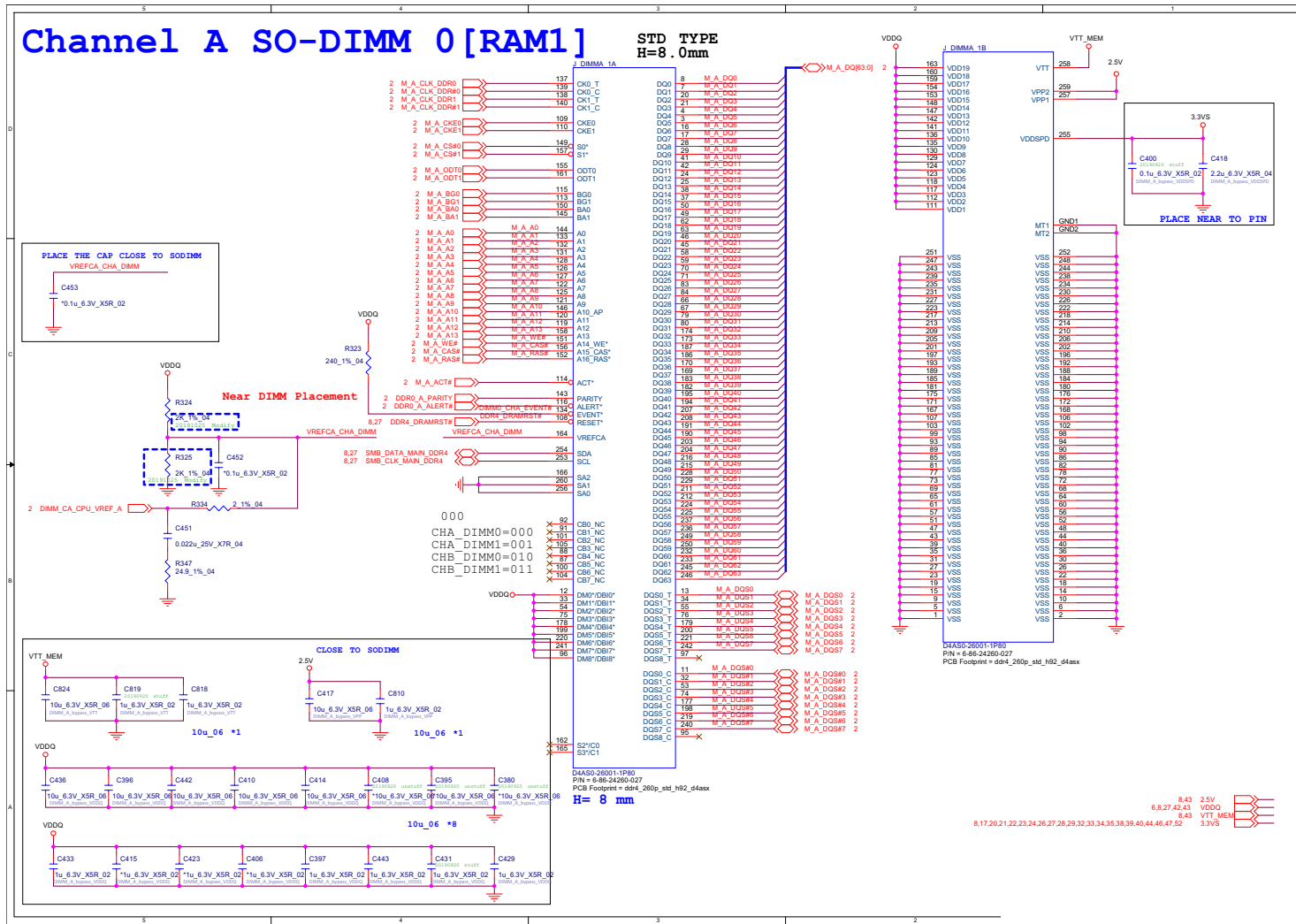


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## DDR4 CHA SO-DIMM\_0

## B. Schematic Diagrams

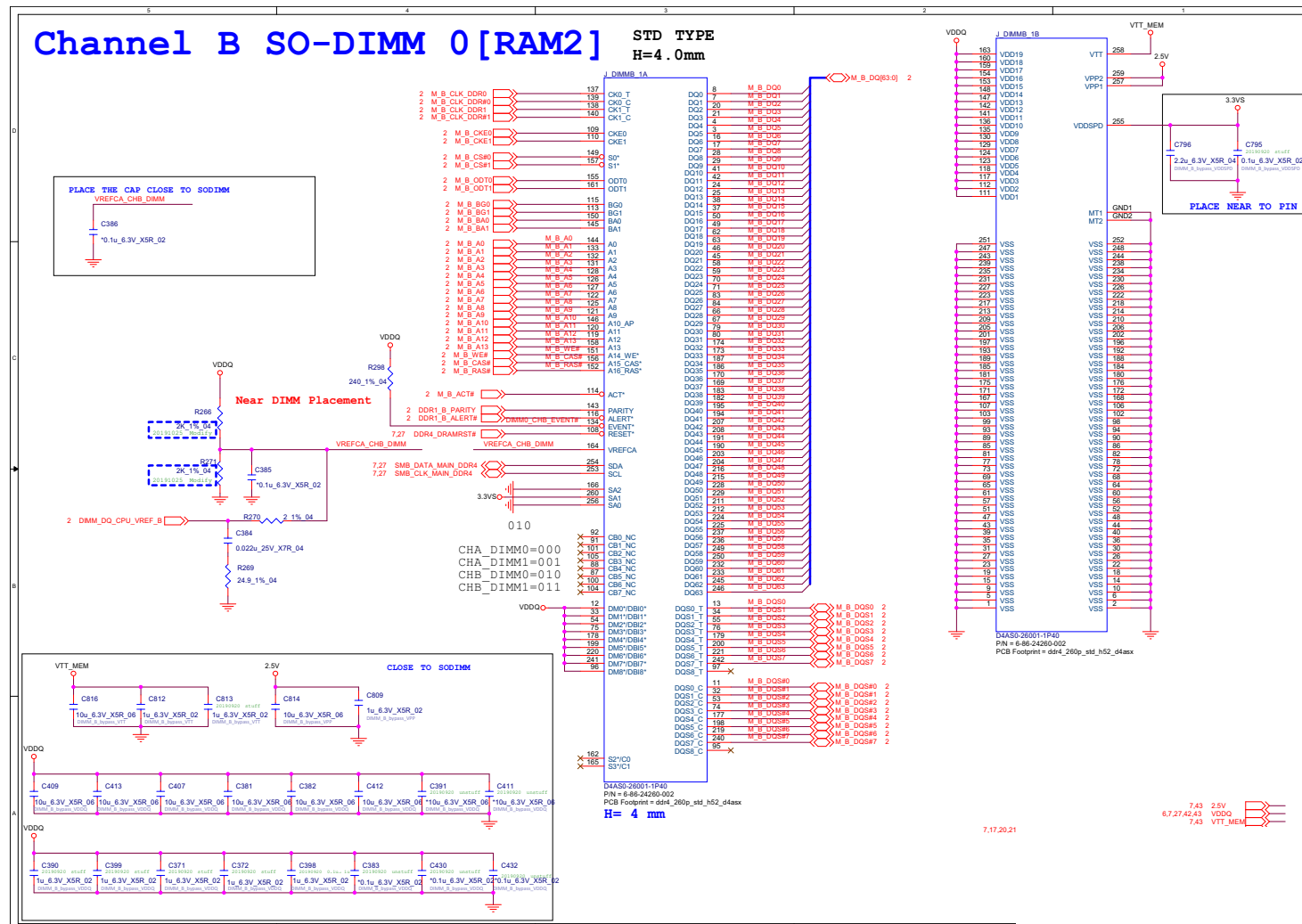
Sheet 7 of 61  
DDR4 CHA SO-  
DIMM\_0





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## DDR4 CHB SO-DIMM\_0



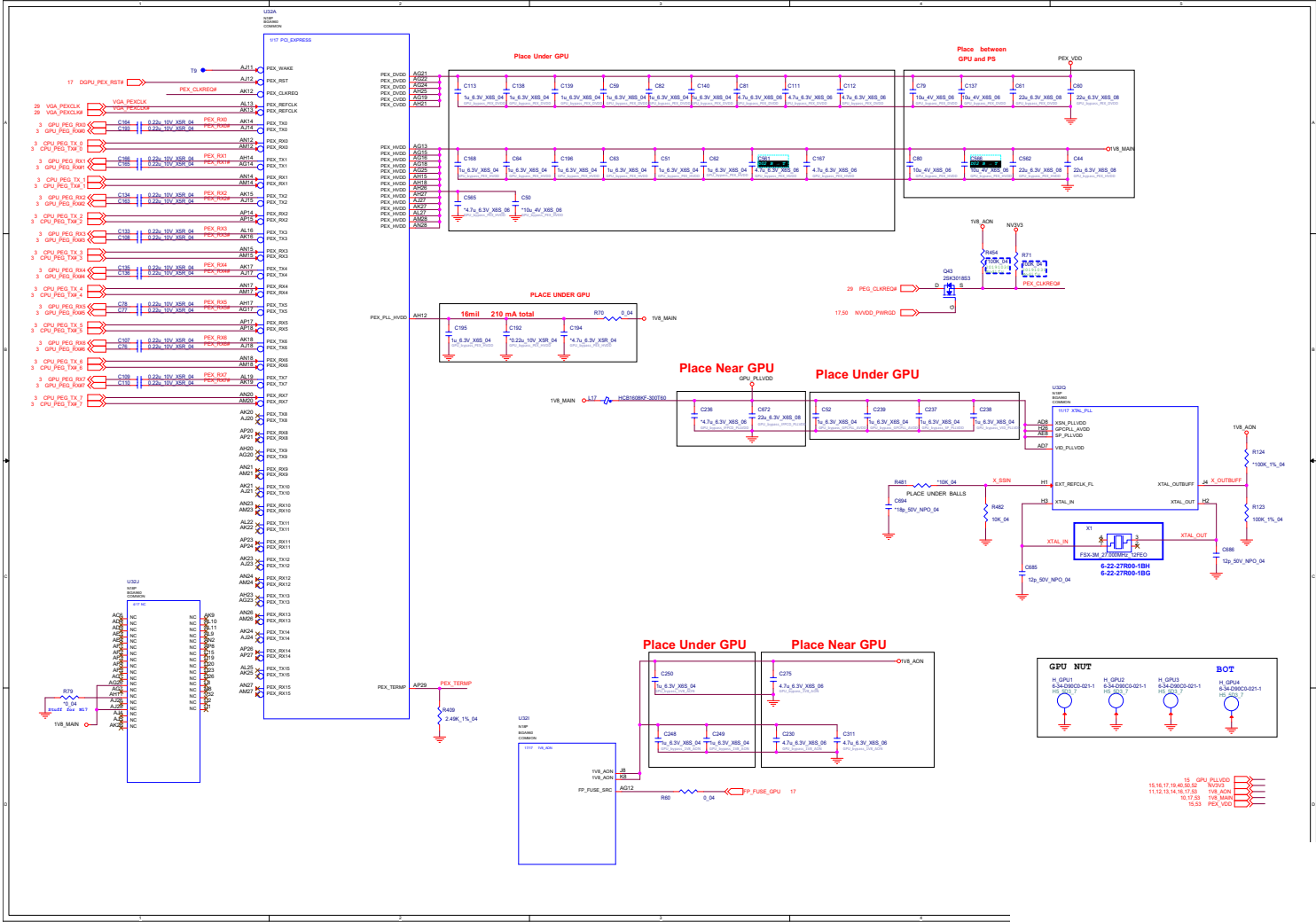
Sheet 8 of 61  
DDR4 CHB SO-  
DIMM\_0

## B.Schematic Diagrams

Schematic Diagrams

VGA PCI-E Interface

Sheet 9 of 61  
VGA PCI-E  
Interface



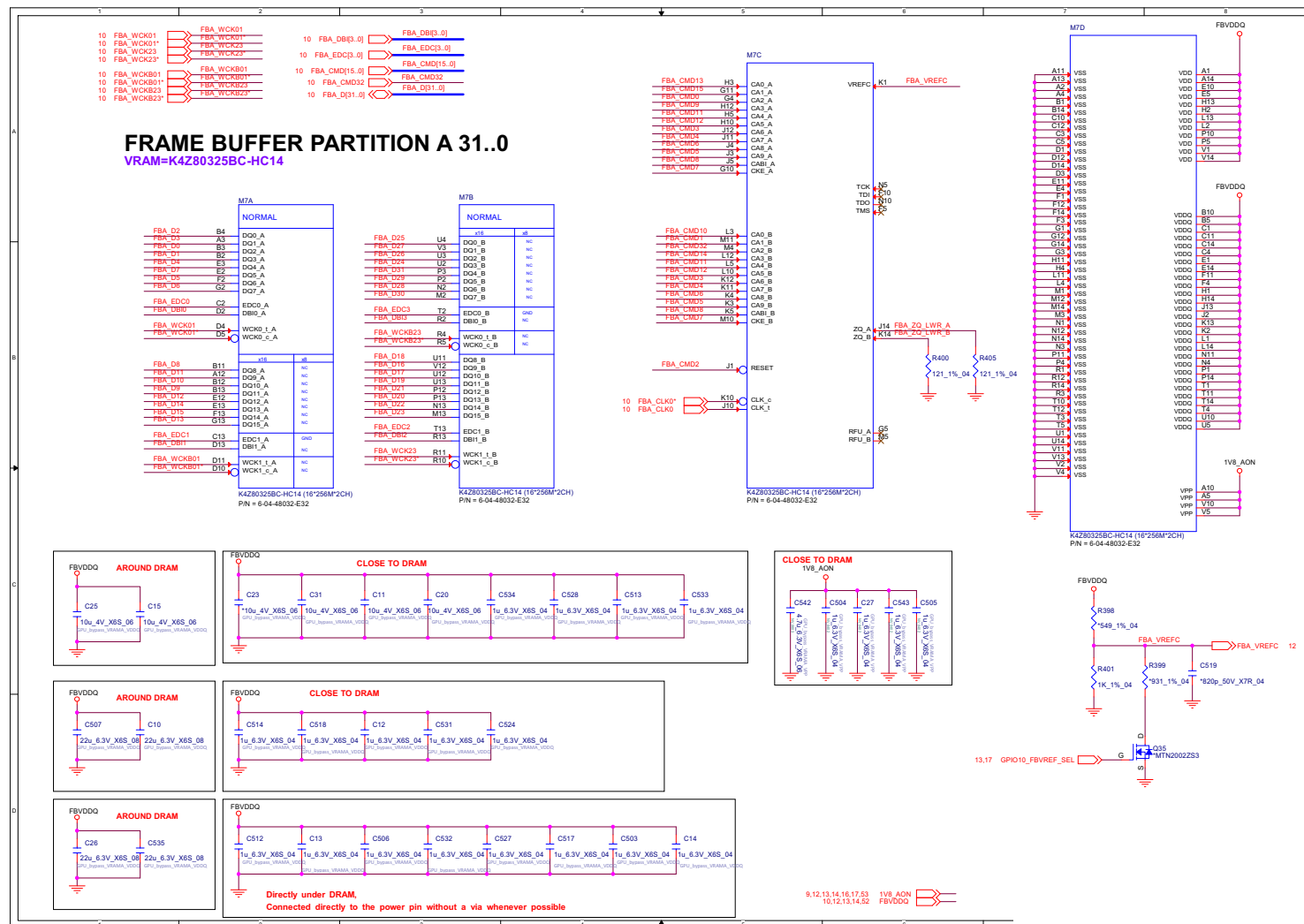
**Sheet 10 of 61**  
**VGA Frame Buffer**  
**Interface**



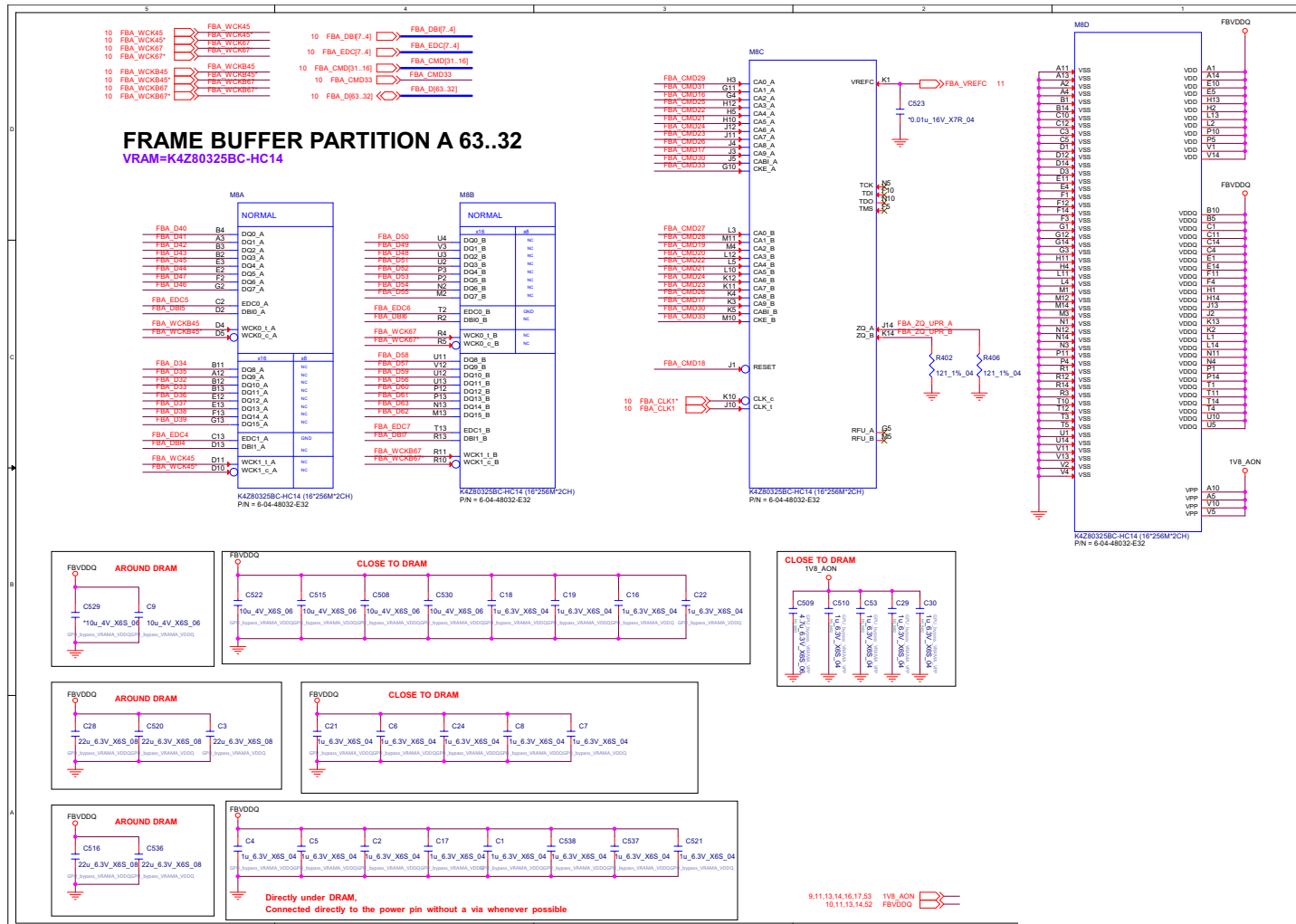
## VGA Frame Buffer A

## B.Schematic Diagrams

Sheet 11 of 61  
VGA Frame Buffer  
A



## VGA Frame Buffer A

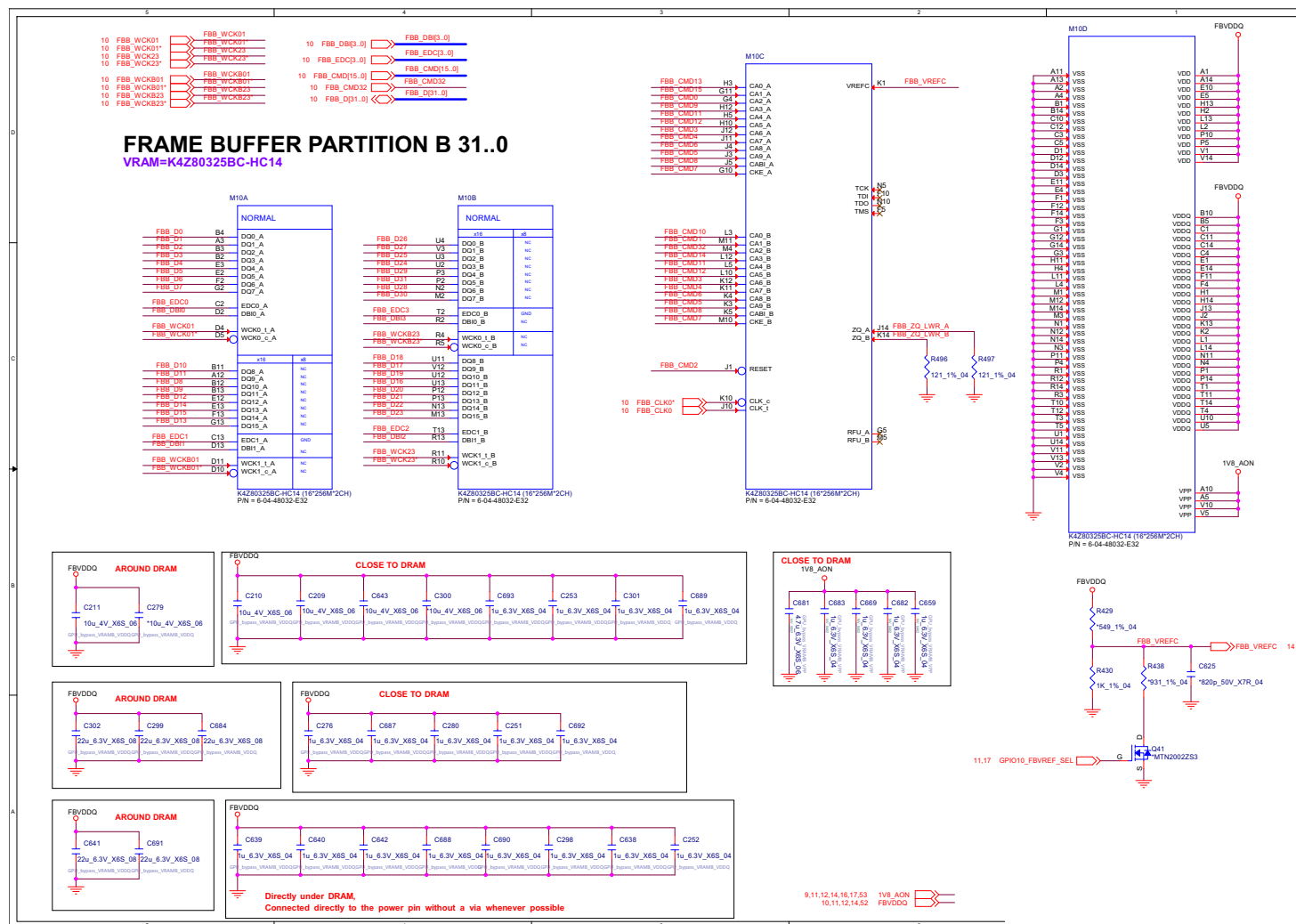


Sheet 12 of 61  
VGA Frame Buffer  
A

## VGA Frame Buffer B

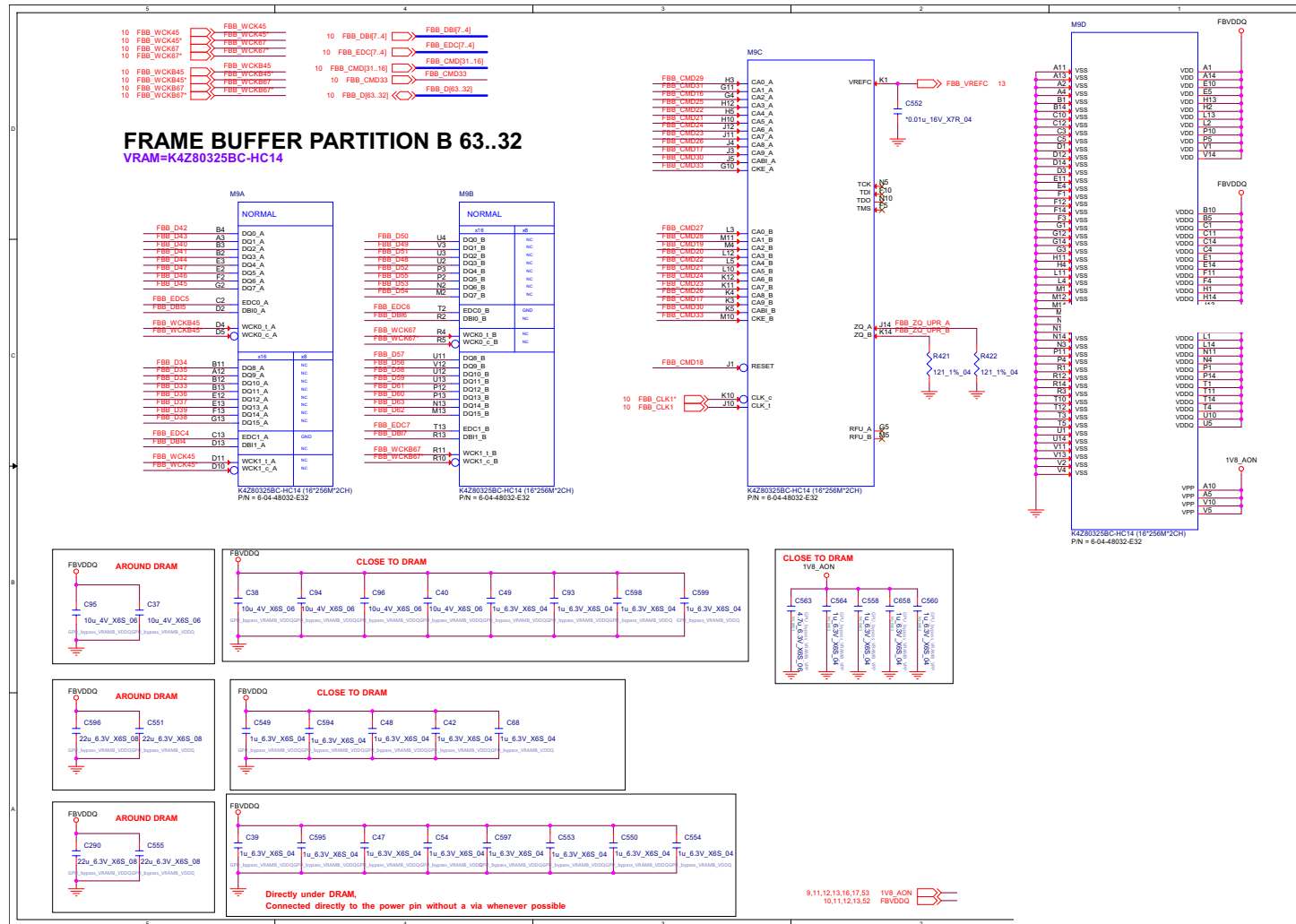
## B. Schematic Diagrams

Sheet 13 of 61  
VGA Frame Buffer  
B





## VGA Frame Buffer B

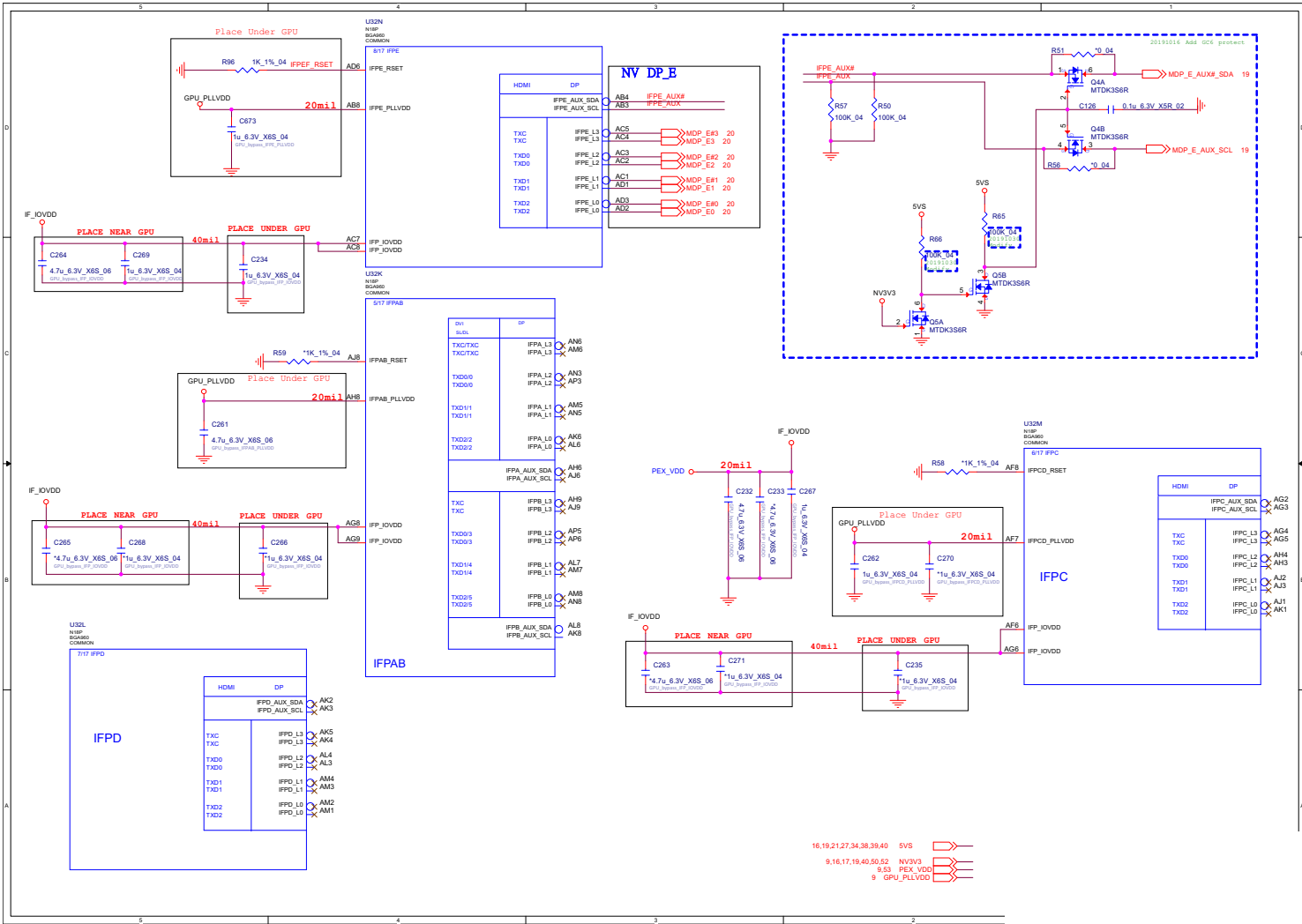


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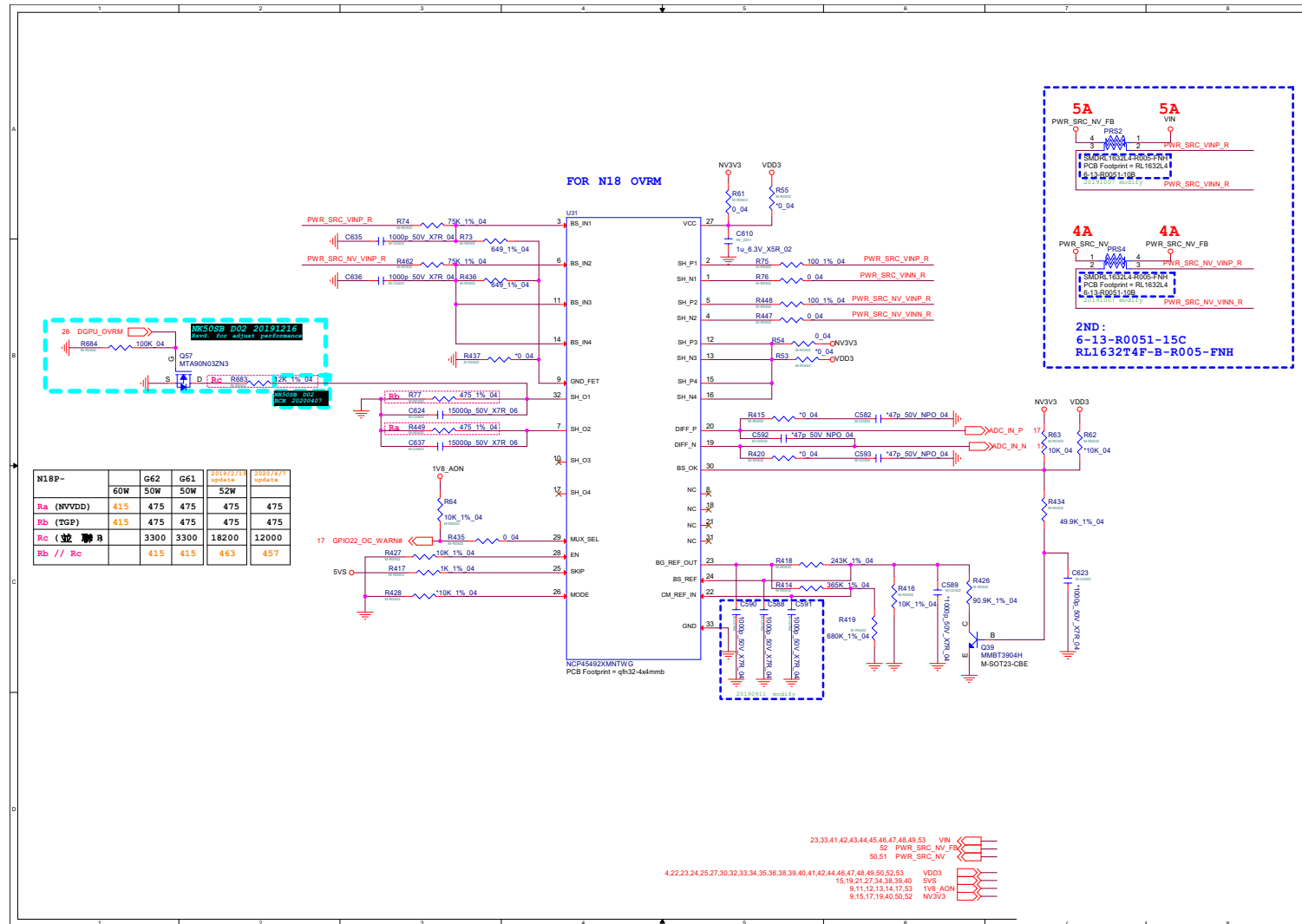
## VGA I/O

## B.Schematic Diagrams

**Sheet 15 of 61**  
**VGA I/O**



# VGA I/O

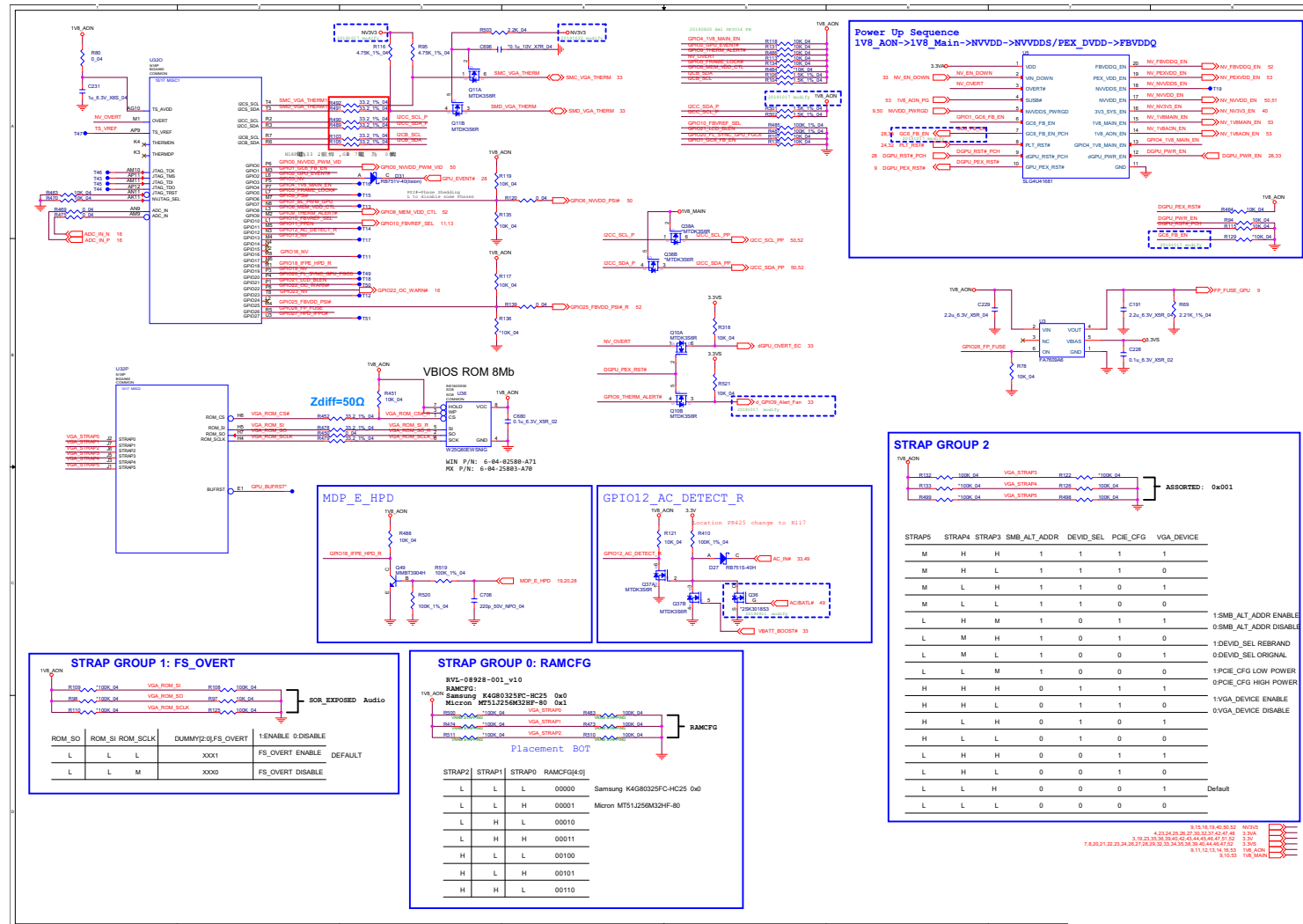


Sheet 16 of 61  
VGA I/O

## Schematic Diagrams

## VGA Sequence / GPIO

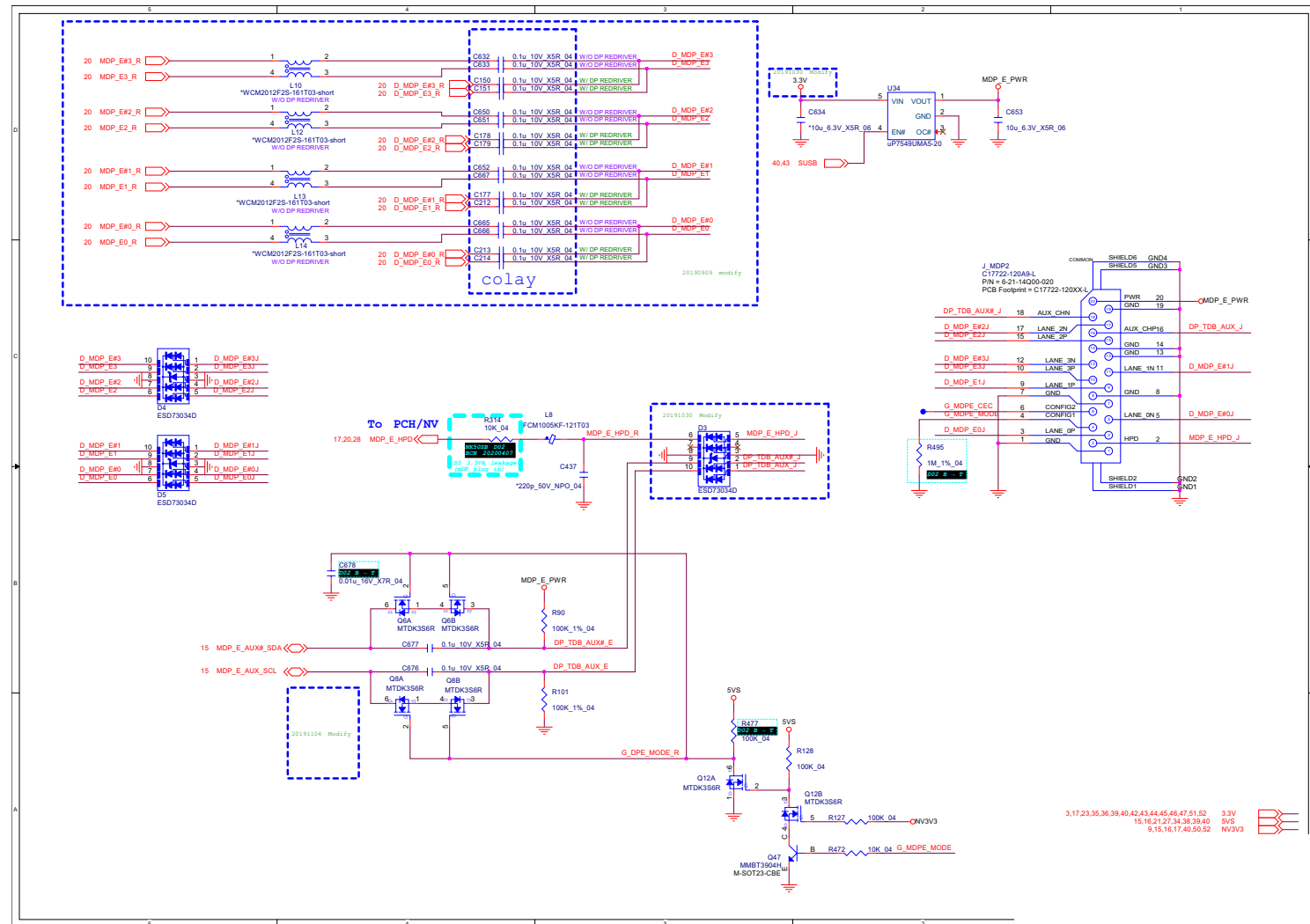
Sheet 17 of 61  
VGA Sequence /  
GPIO





## mDP Conn

**Sheet 19 of 61**  
**mDP Conn**



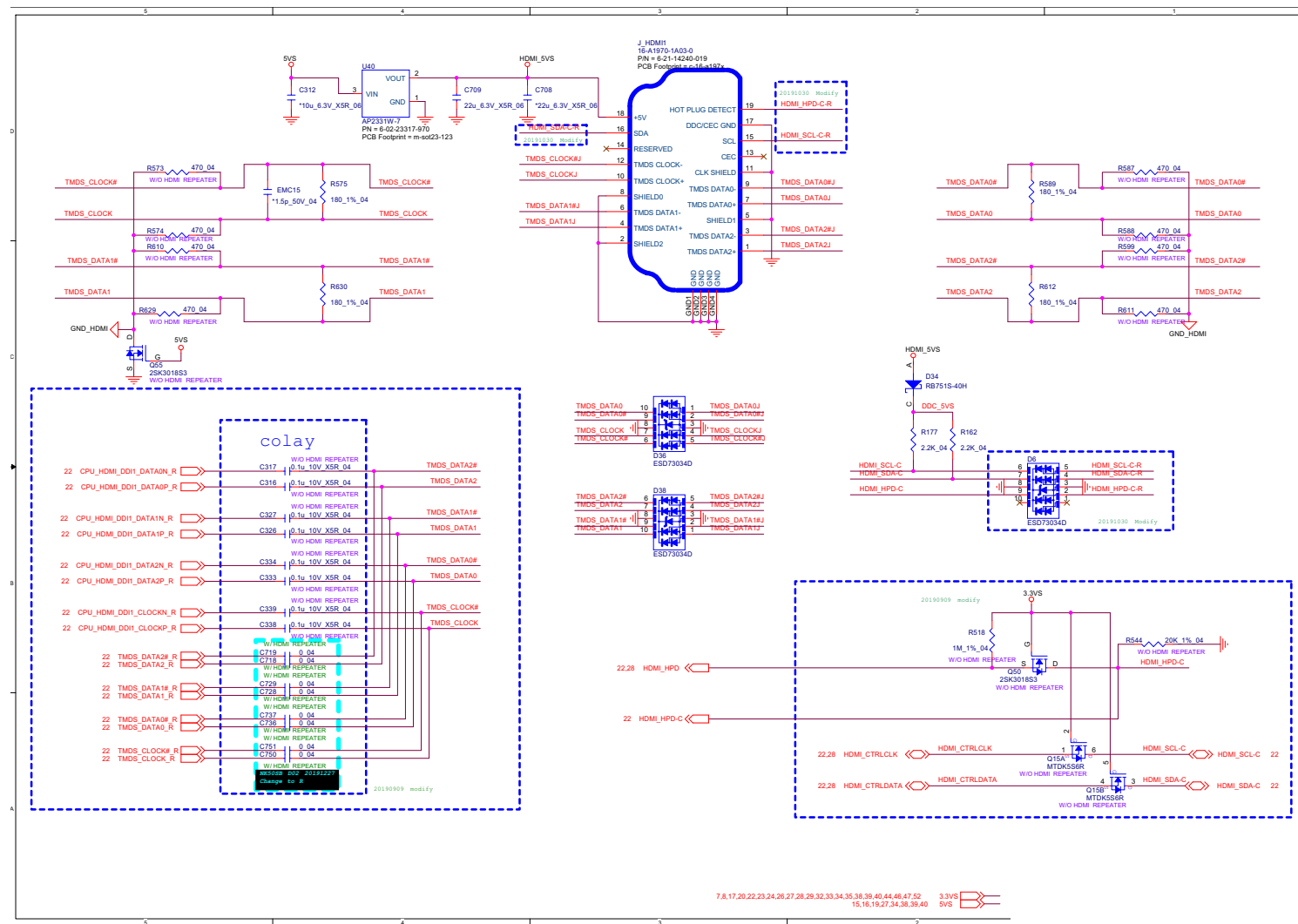


## B.Schematic Diagrams

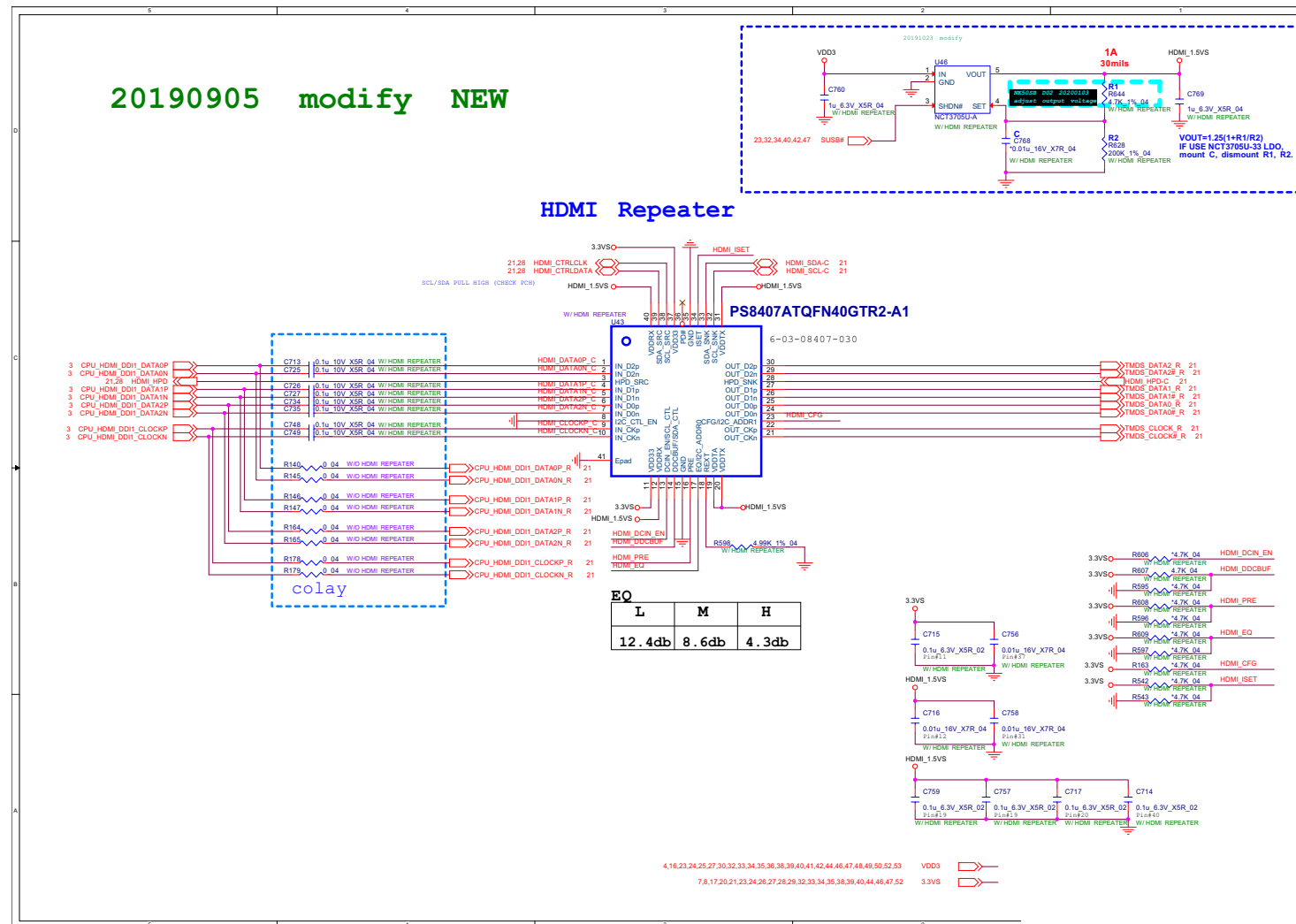


## HDMI

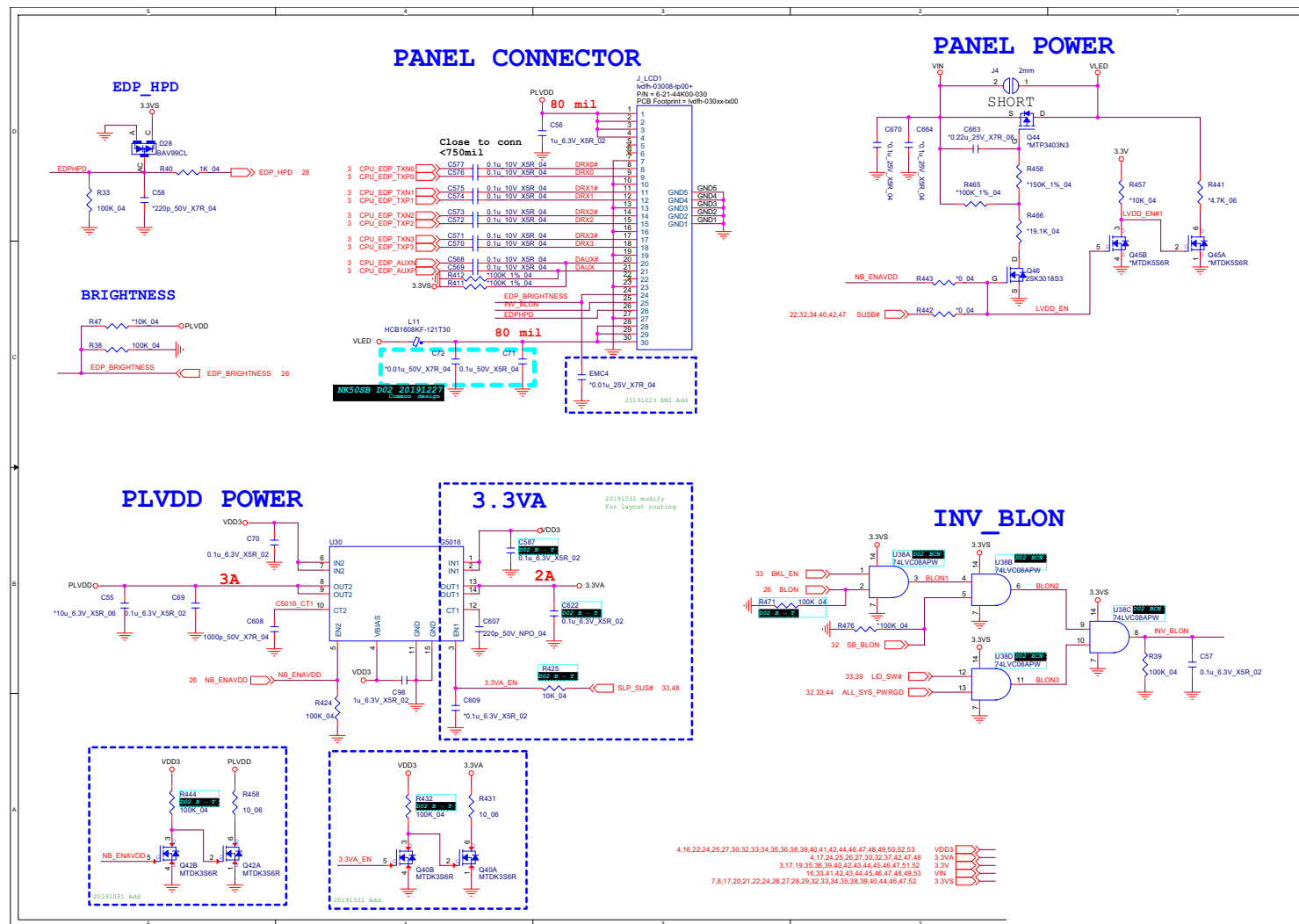
**Sheet 21 of 61**  
**HDMI**



## HDMI Repeater

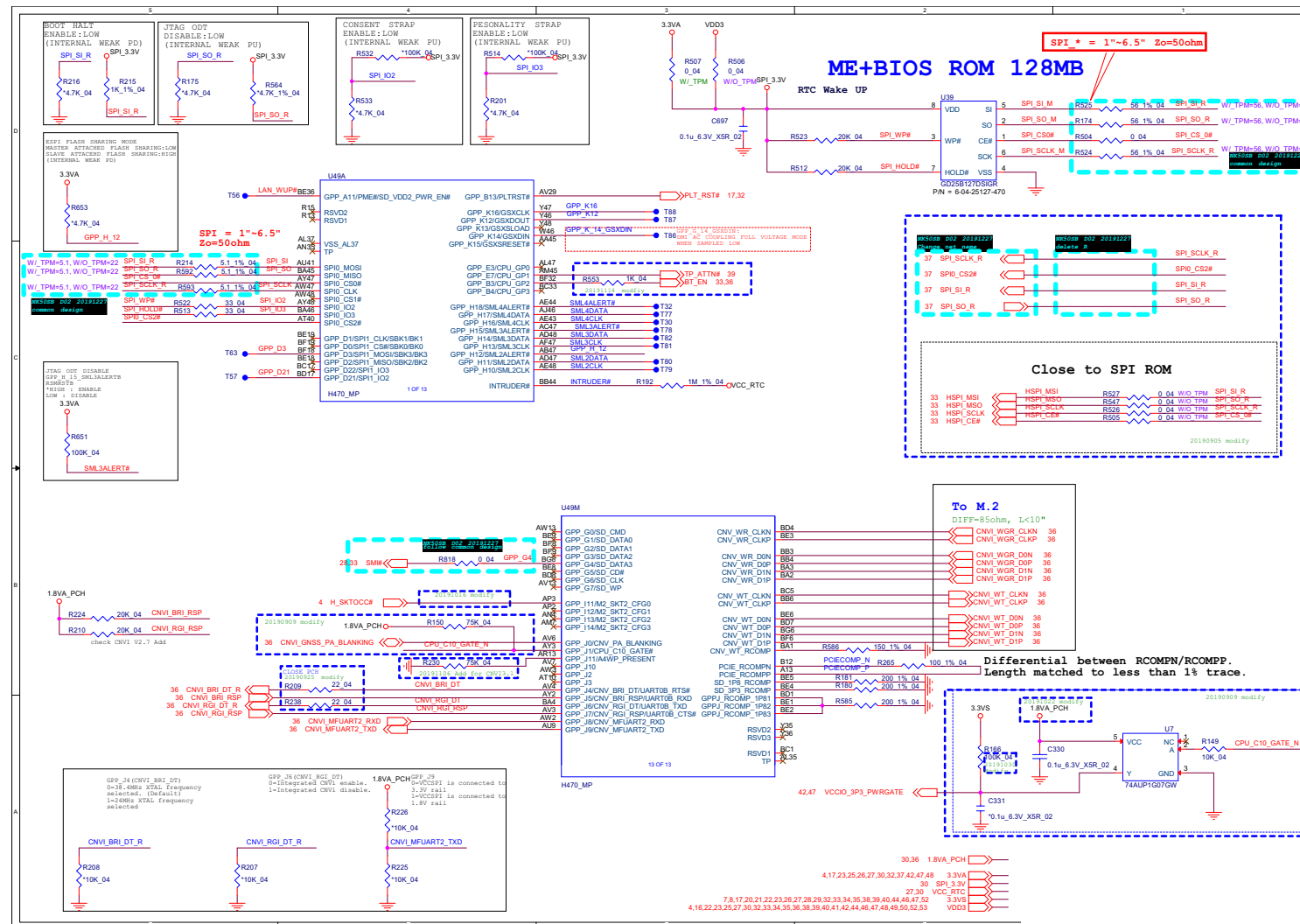
Sheet 22 of 61  
HDMI Repeater

**Sheet 23 of 61**  
**Panel Conn**



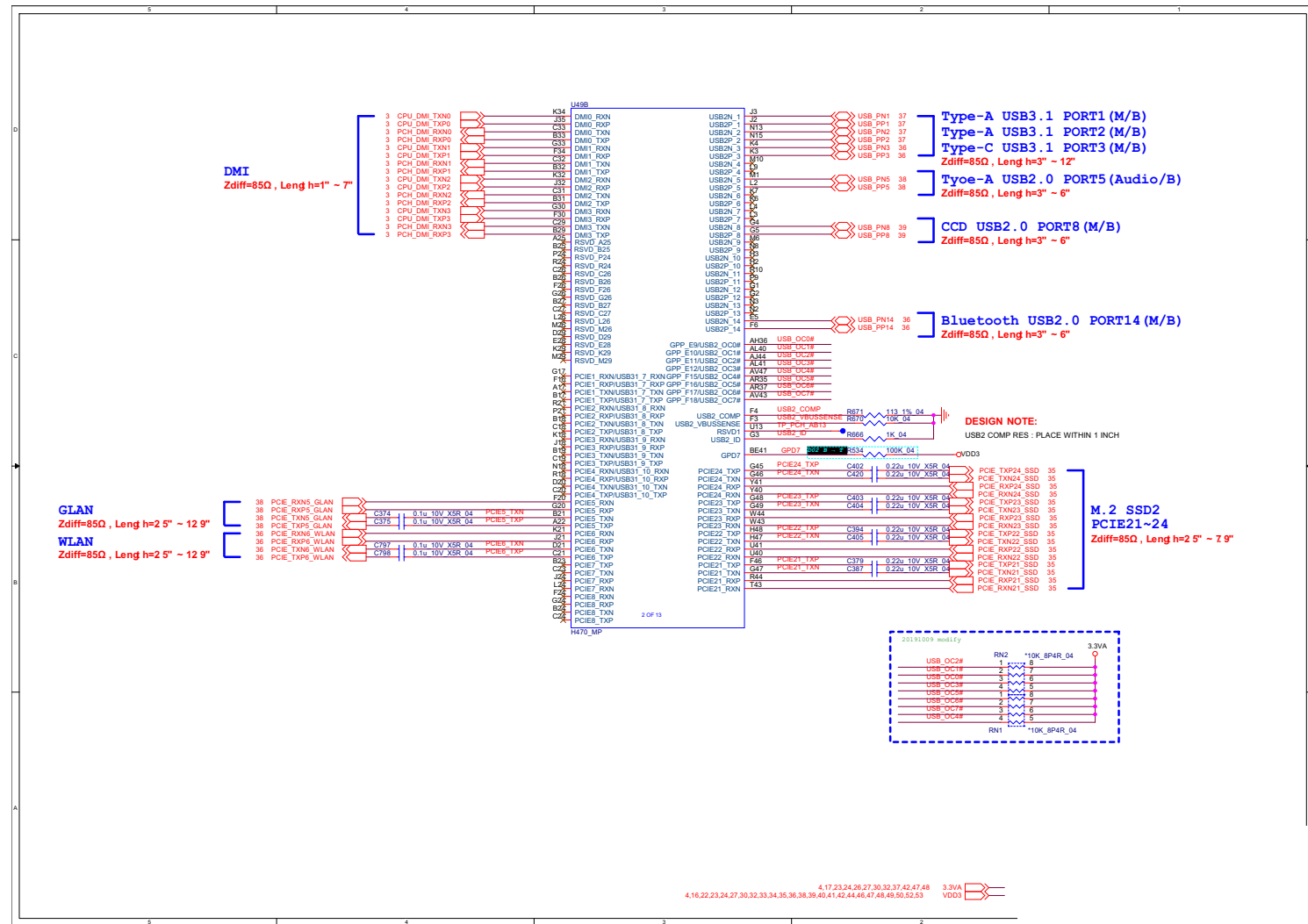
## Schematic Diagrams

**PCH 1/9**



## PCH 2/9

Sheet 25 of 61  
PCH 2/9

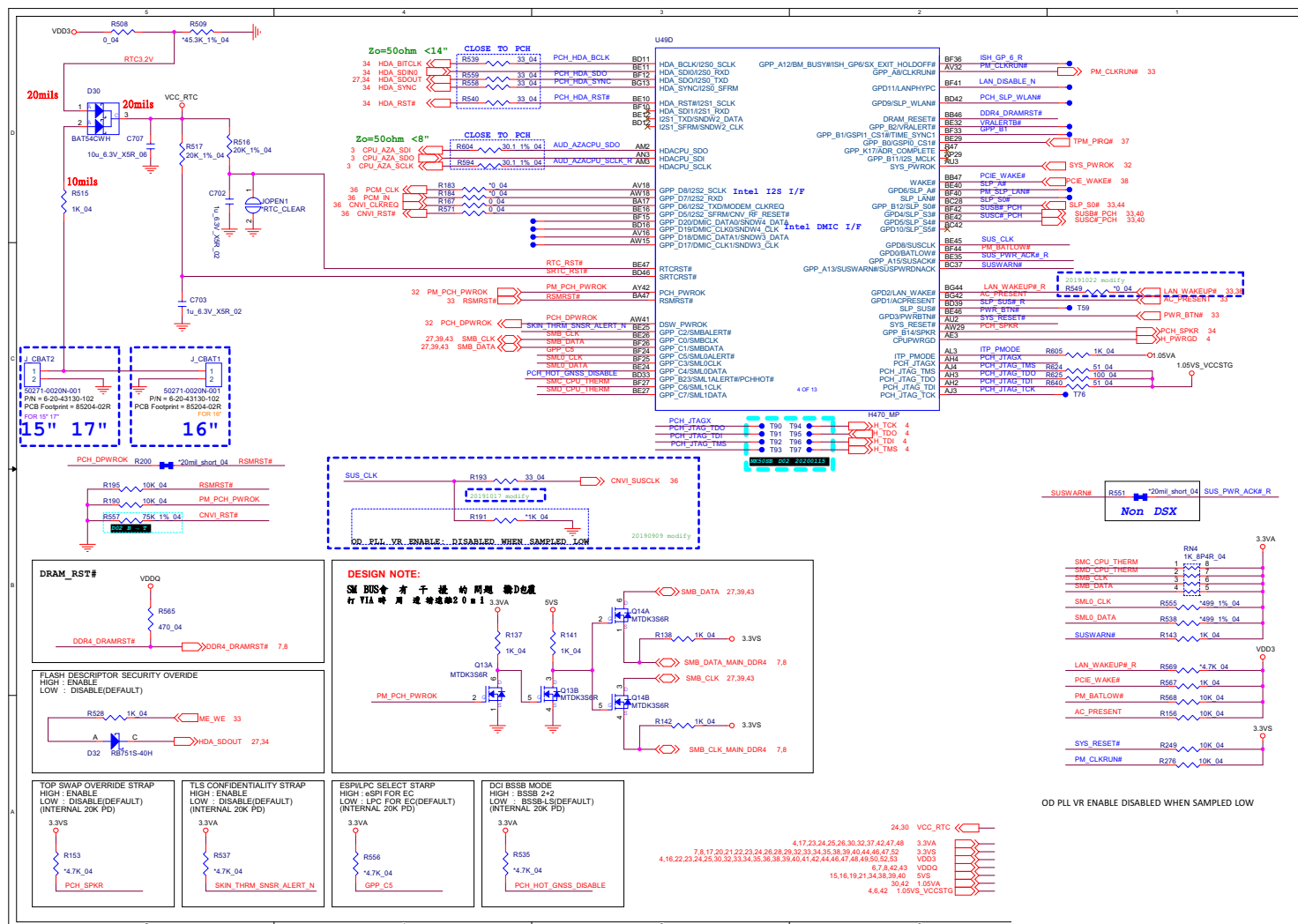




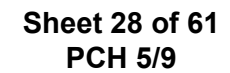
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**PCH 4/9**

## B. Schematic Diagrams



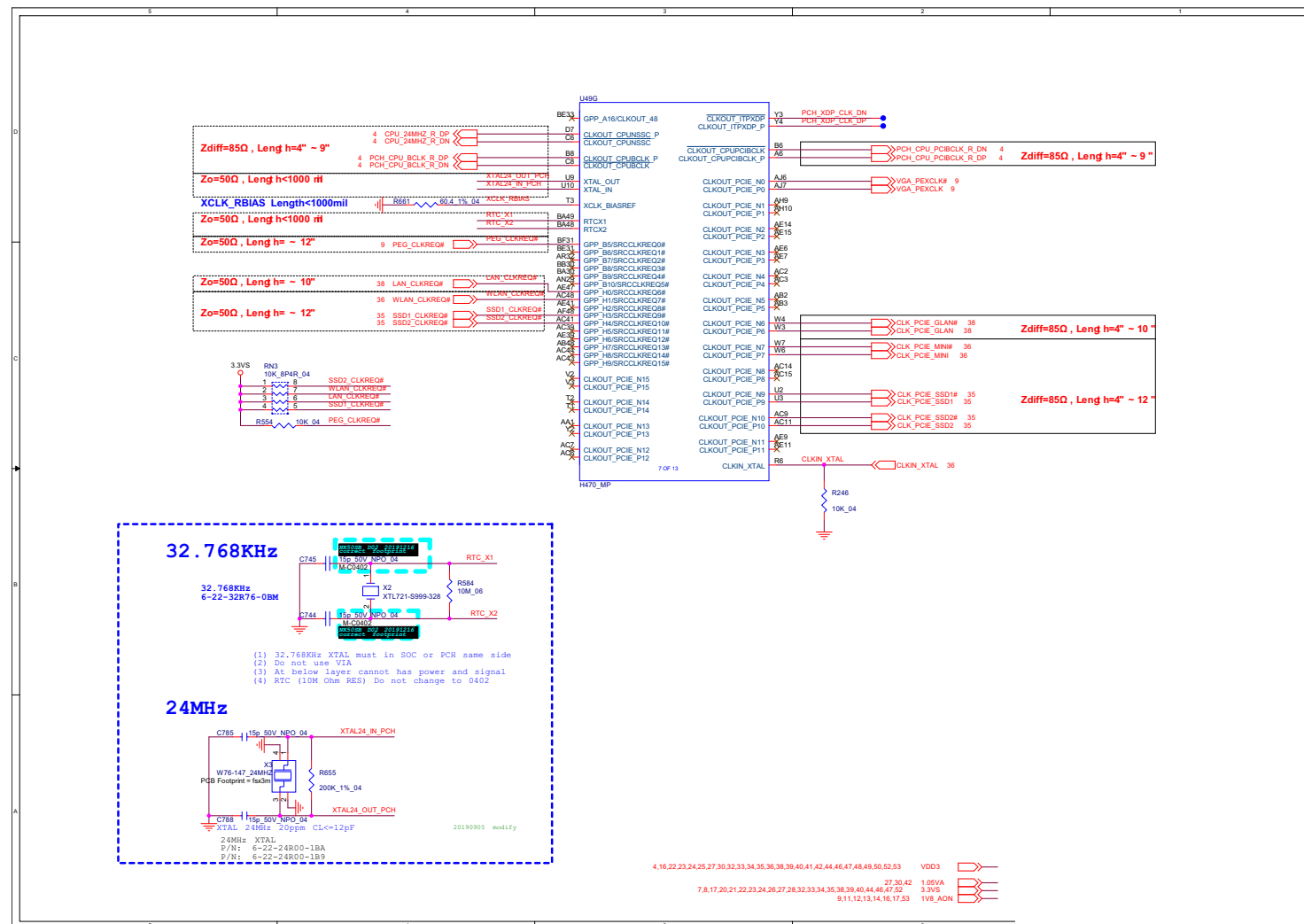
**PCH 5/9 B - 29**



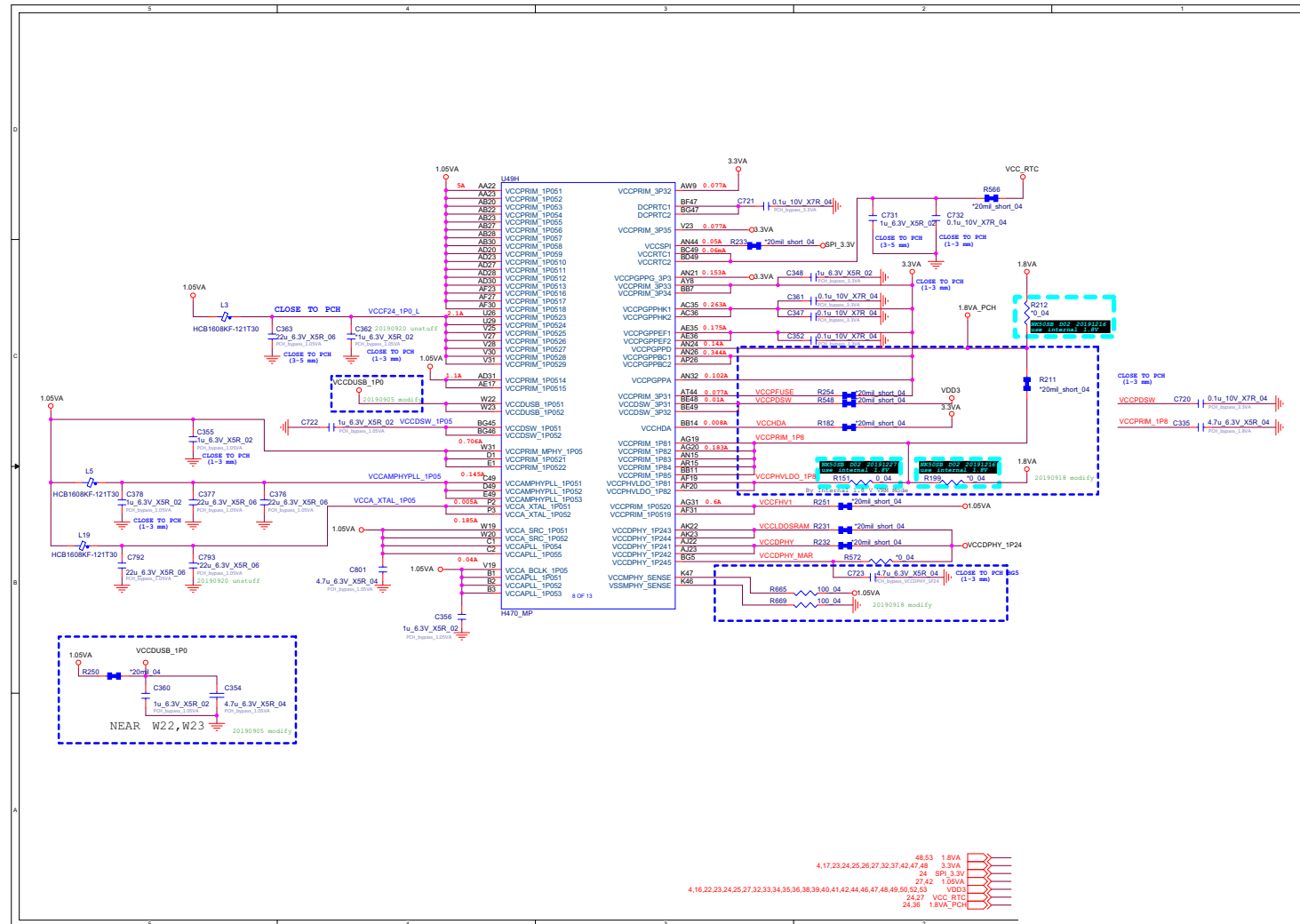
**PCH 6/9**

## B. Schematic Diagrams

**Sheet 29 of 61**  
**PCH 6/9**



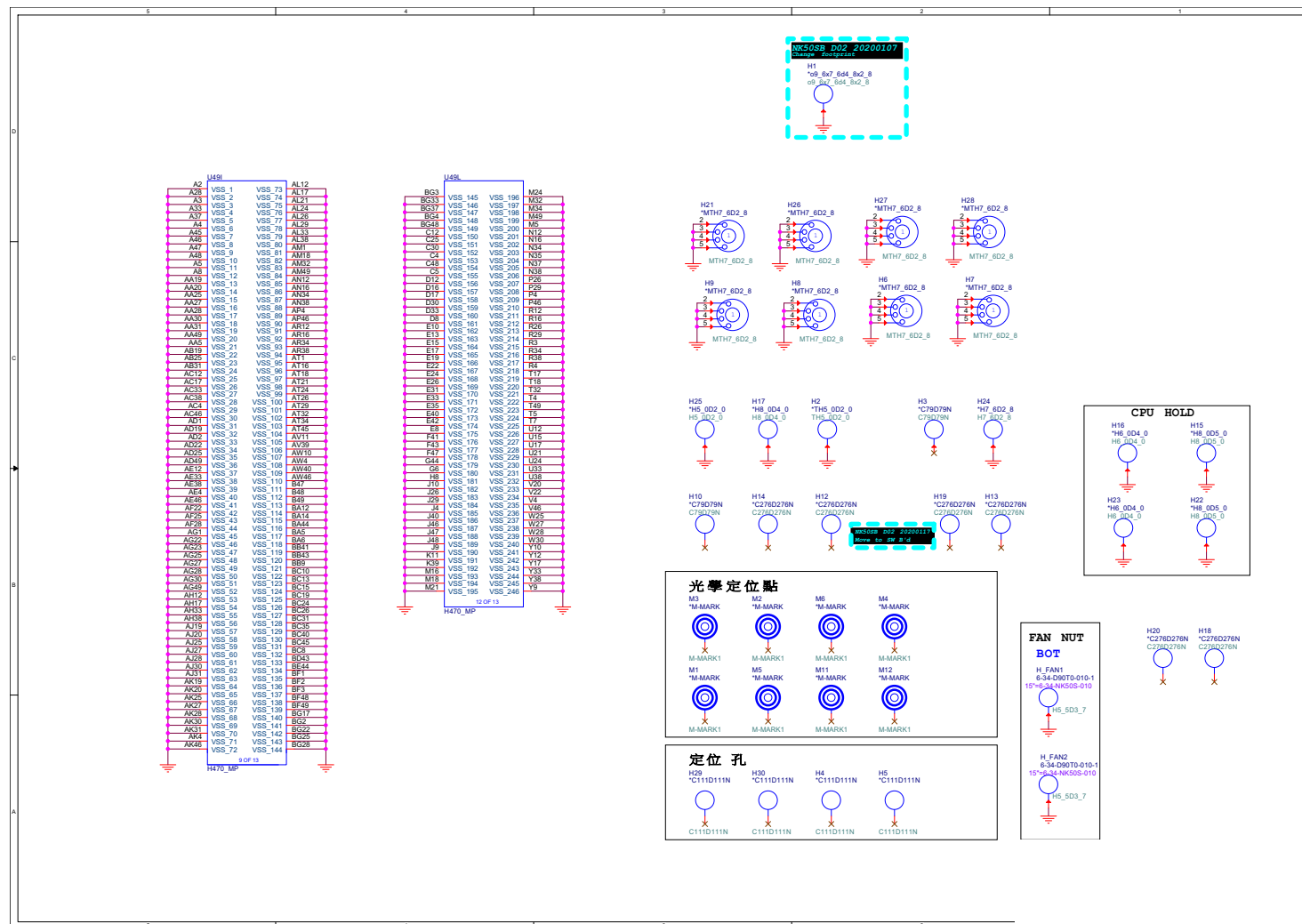
## PCH 7/9

Sheet 30 of 61  
PCH 7/9

**PCH 8/9**

**Sheet 31 of 61**  
**PCH 8/9**

## B.Schematic Diagrams



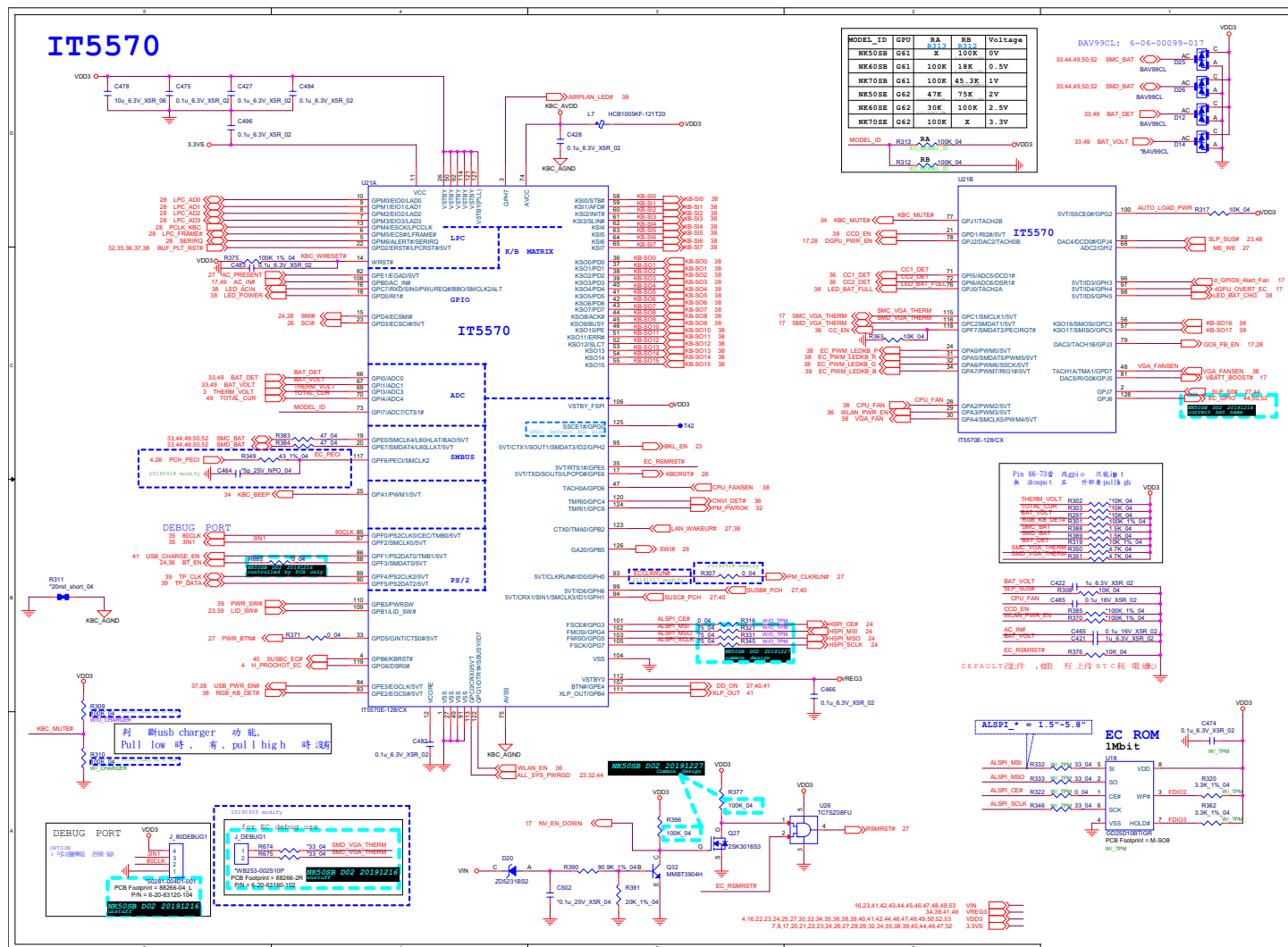


**Sheet 32 of 61**  
**PCH 9/9**

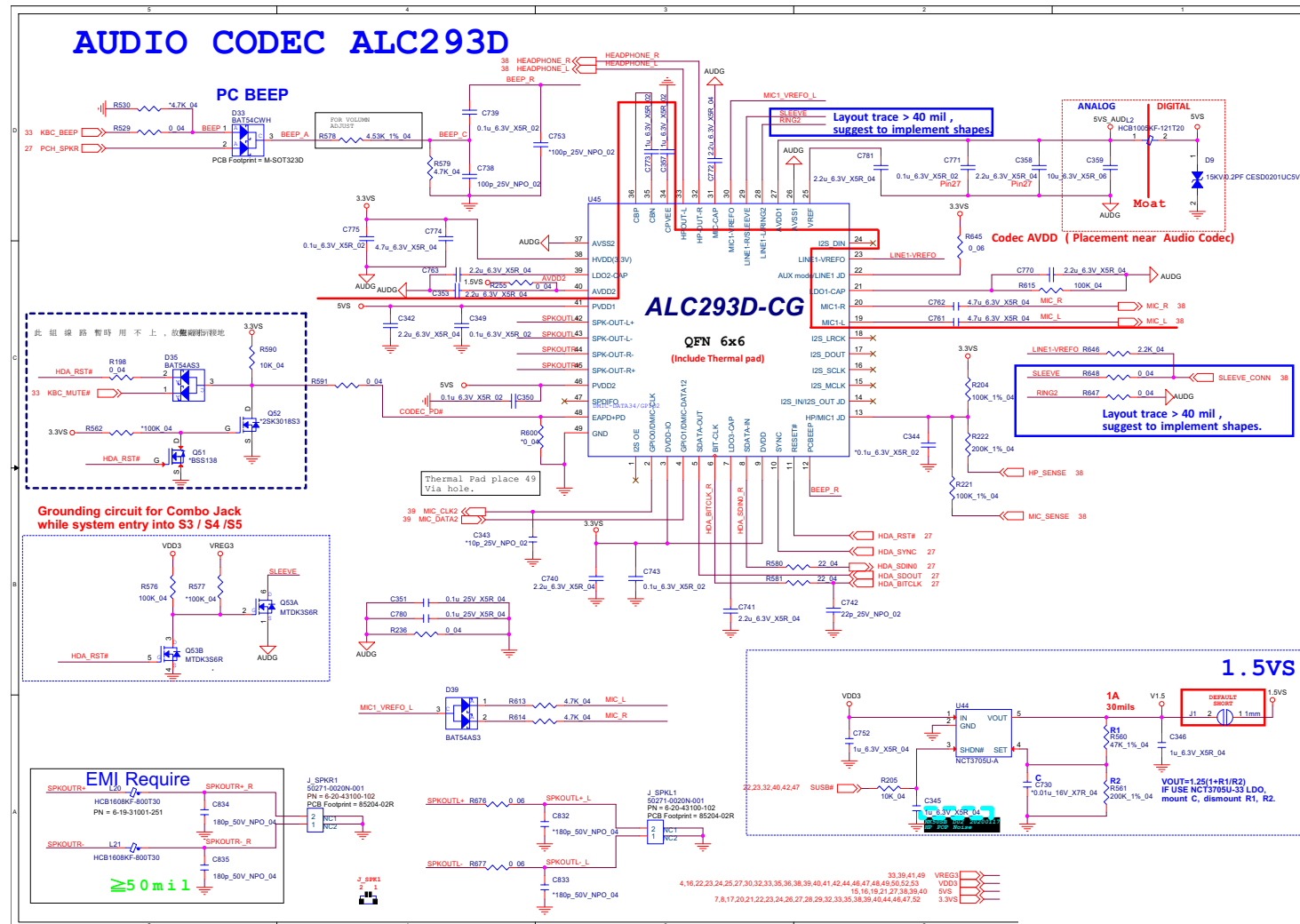


# KBC-ITE IT5570

Sheet 33 of 61  
KBC-ITE IT5570

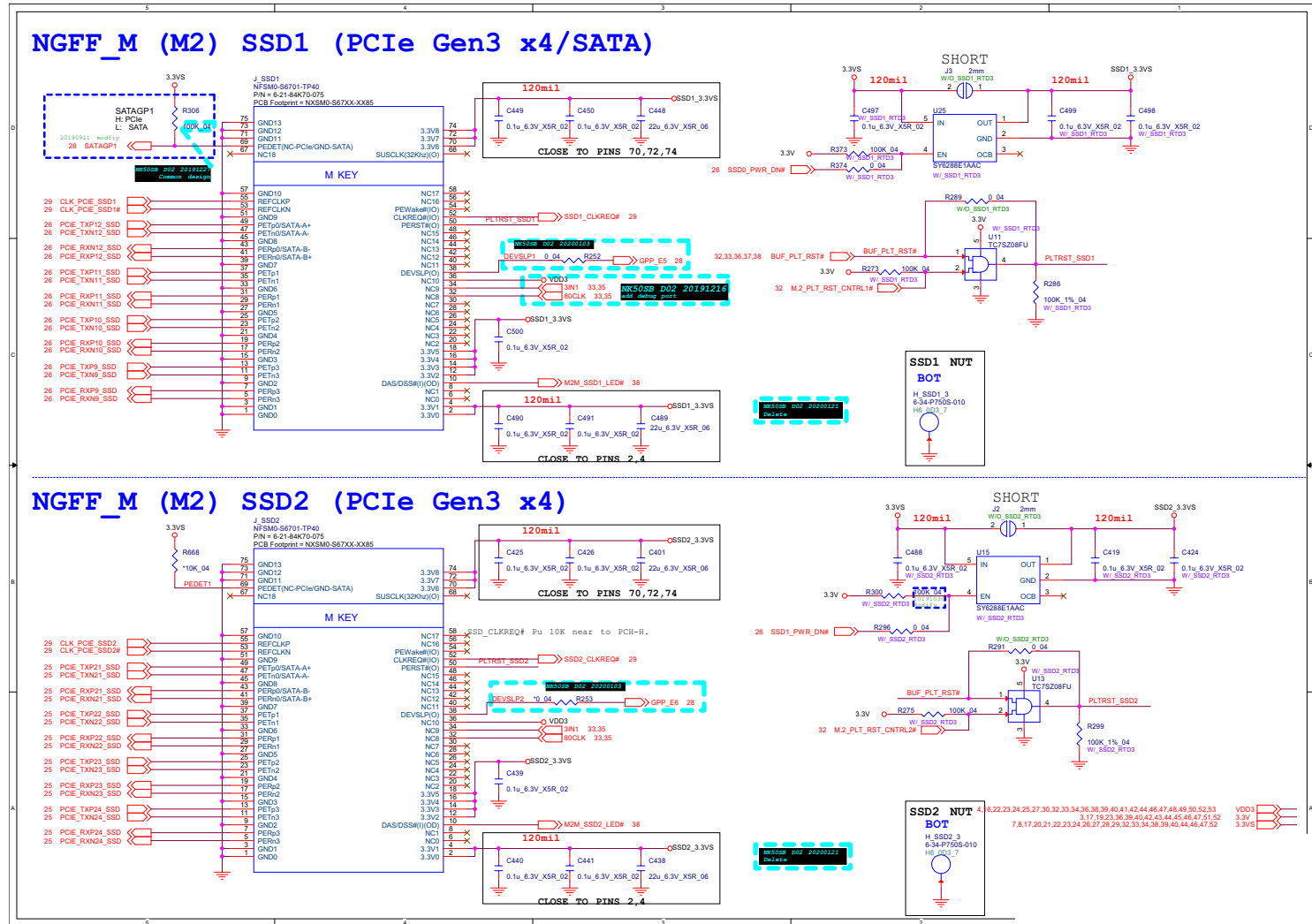


**Audio Codec B - 35**



# M.2 PCIE4X SSD

Sheet 35 of 61  
M.2 PCIE4X SSD

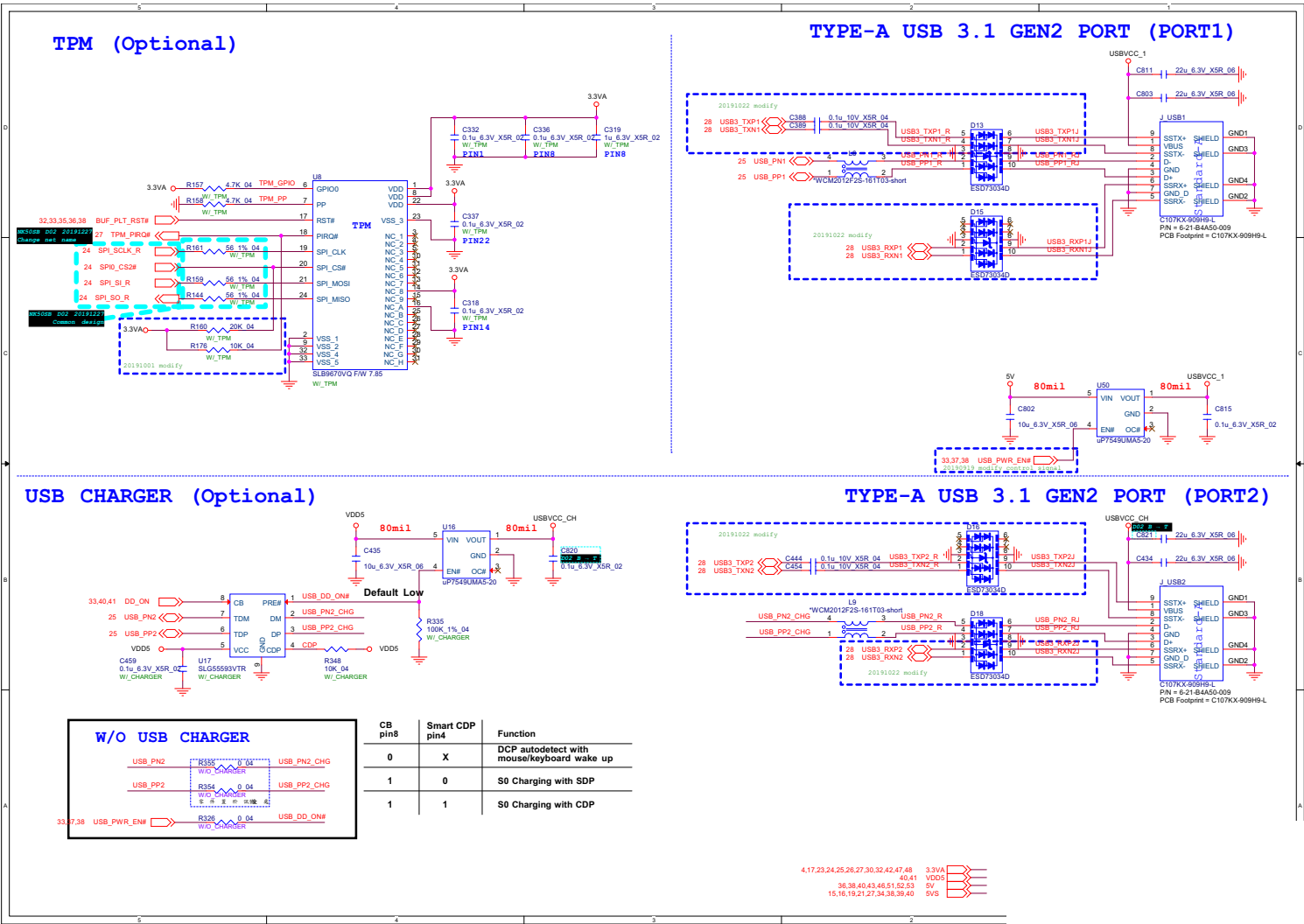


## B.Schematic Diagrams

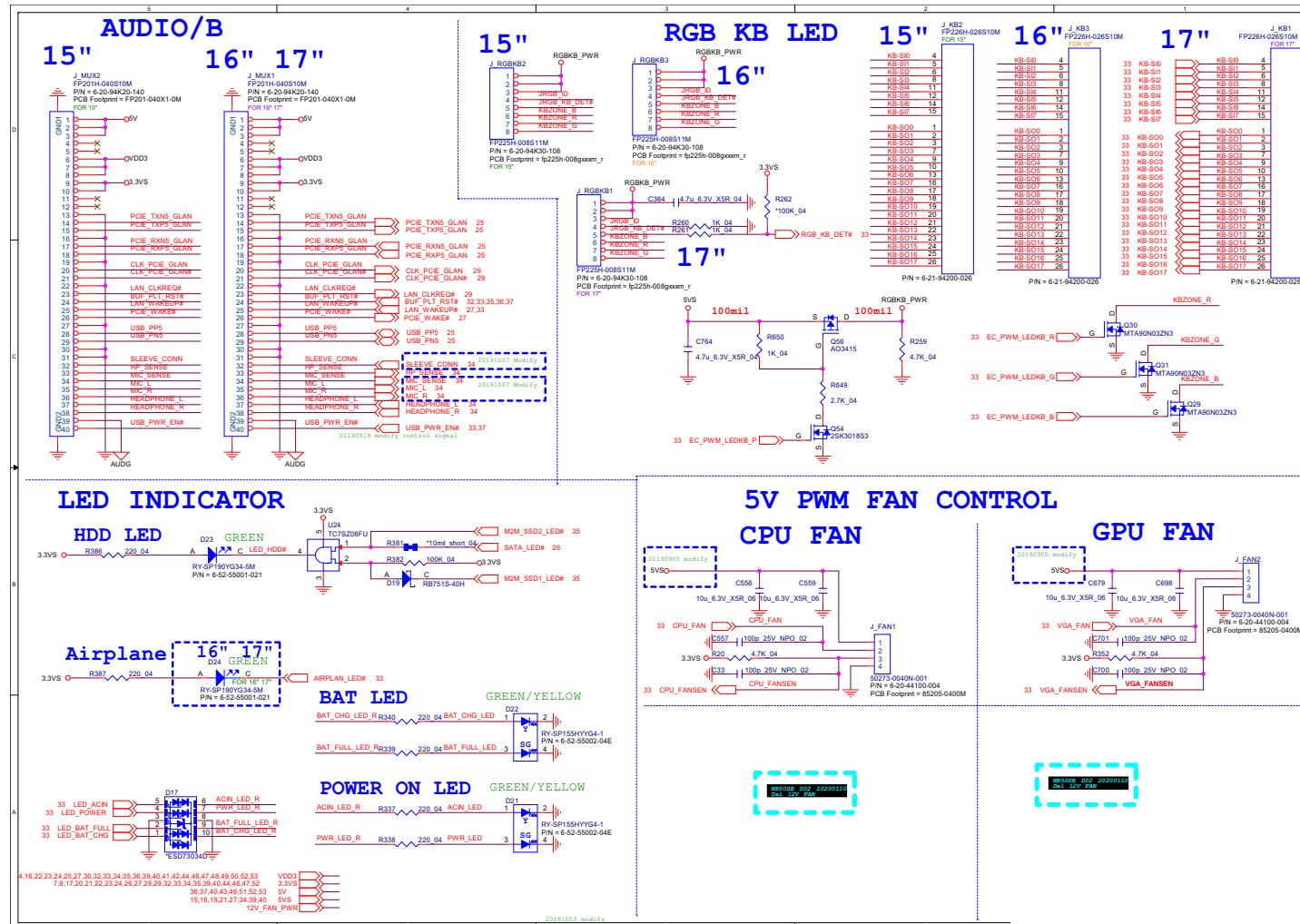
Schematic Diagrams

USB Type-A, TPM

Sheet 37 of 61  
USB Type-A, TPM



**RGB KB, Fan, LED B - 39**

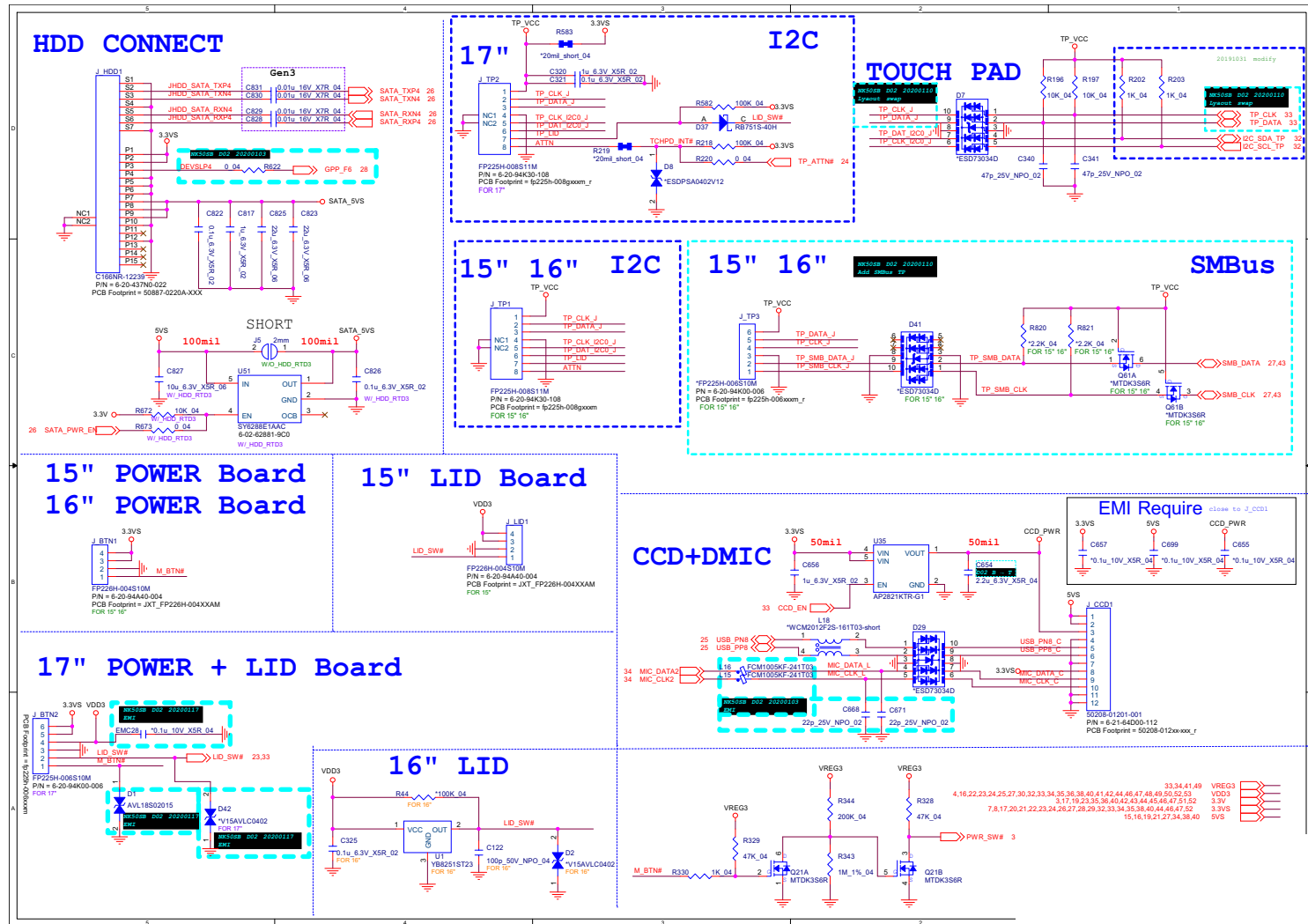




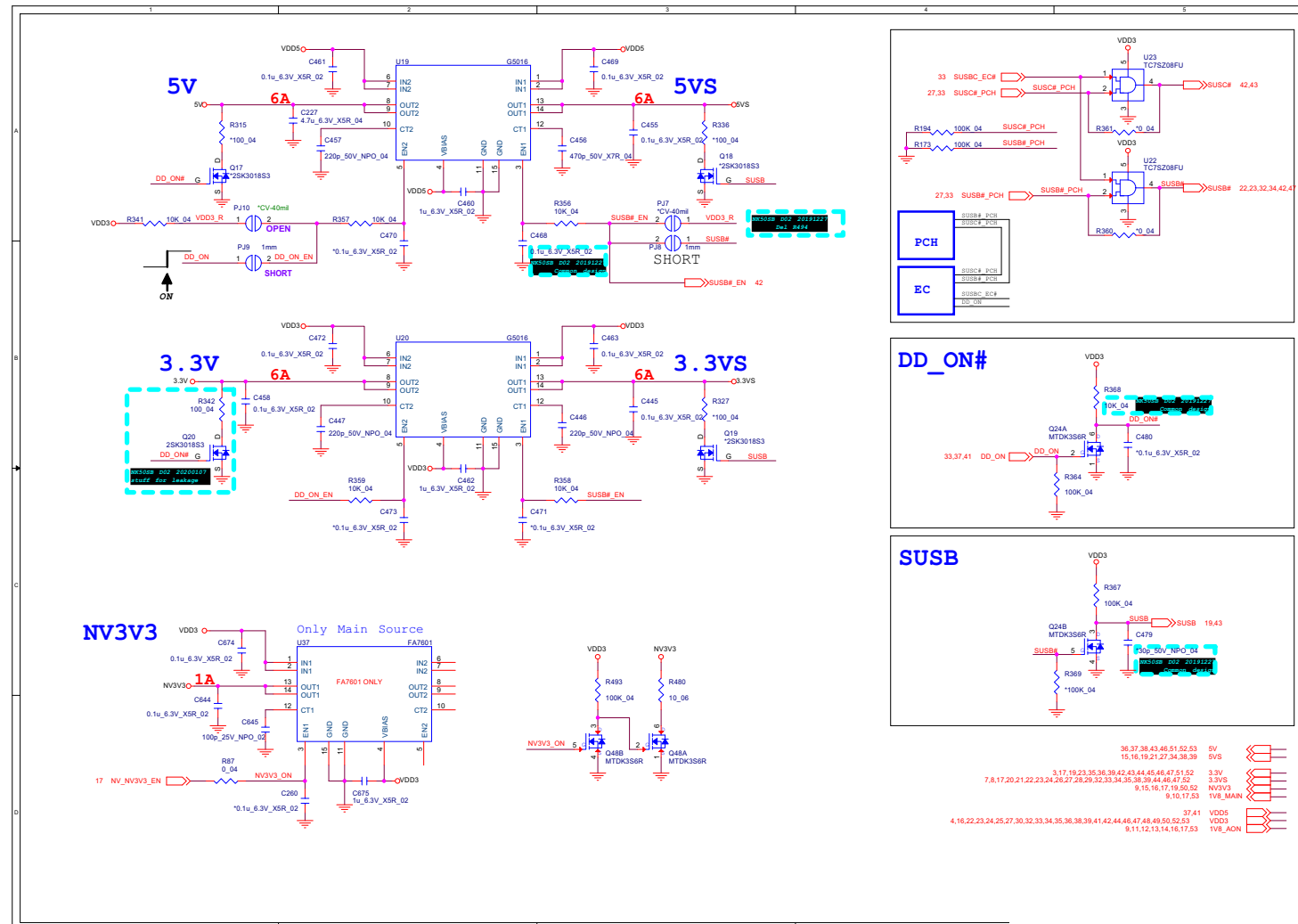
## Schematic Diagrams

# HDD, CCD, TP, LID, PWR SW

Sheet 39 of 61  
HDD, CCD, TP, LID,  
PWR SW



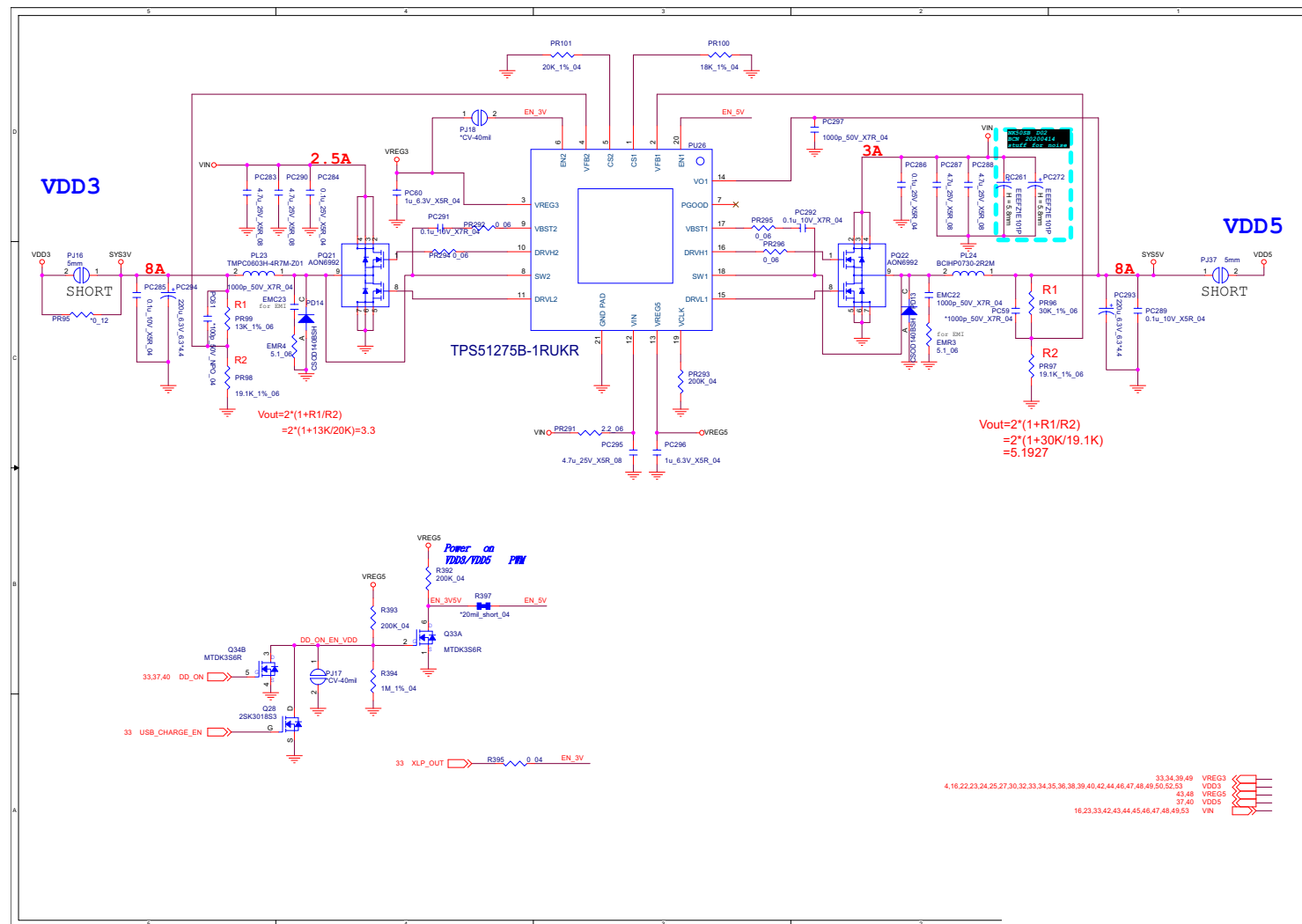
# 5V, 5VS, 3.3V, 3.3VS, NV3V3



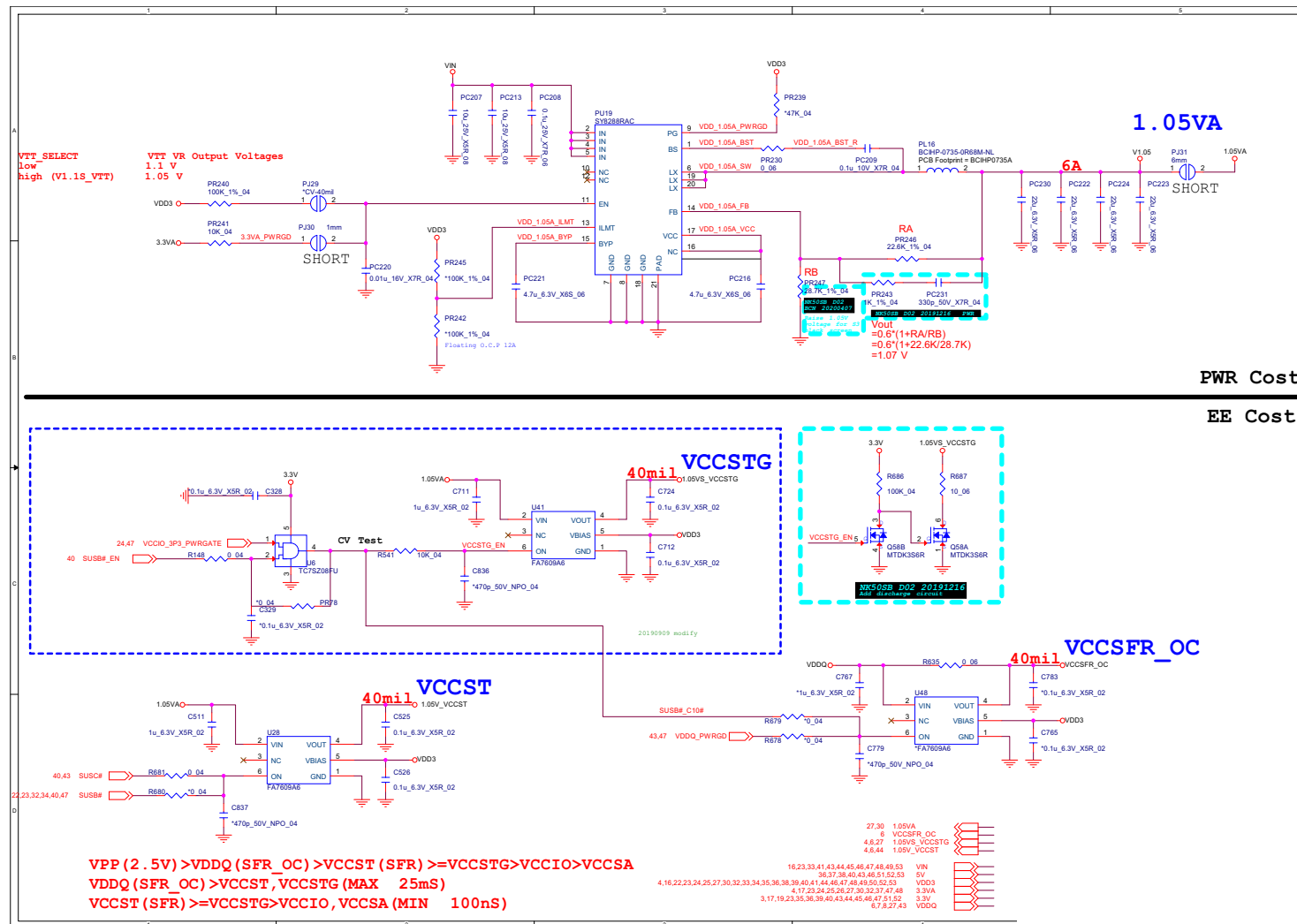
Sheet 40 of 61  
5V, 5VS, 3.3V,  
3.3VS, NV3V3

## VDD3, VDD5

**Sheet 41 of 61**  
**VDD3, VDD5**



## 1.05A, VCCST/STG/SFR

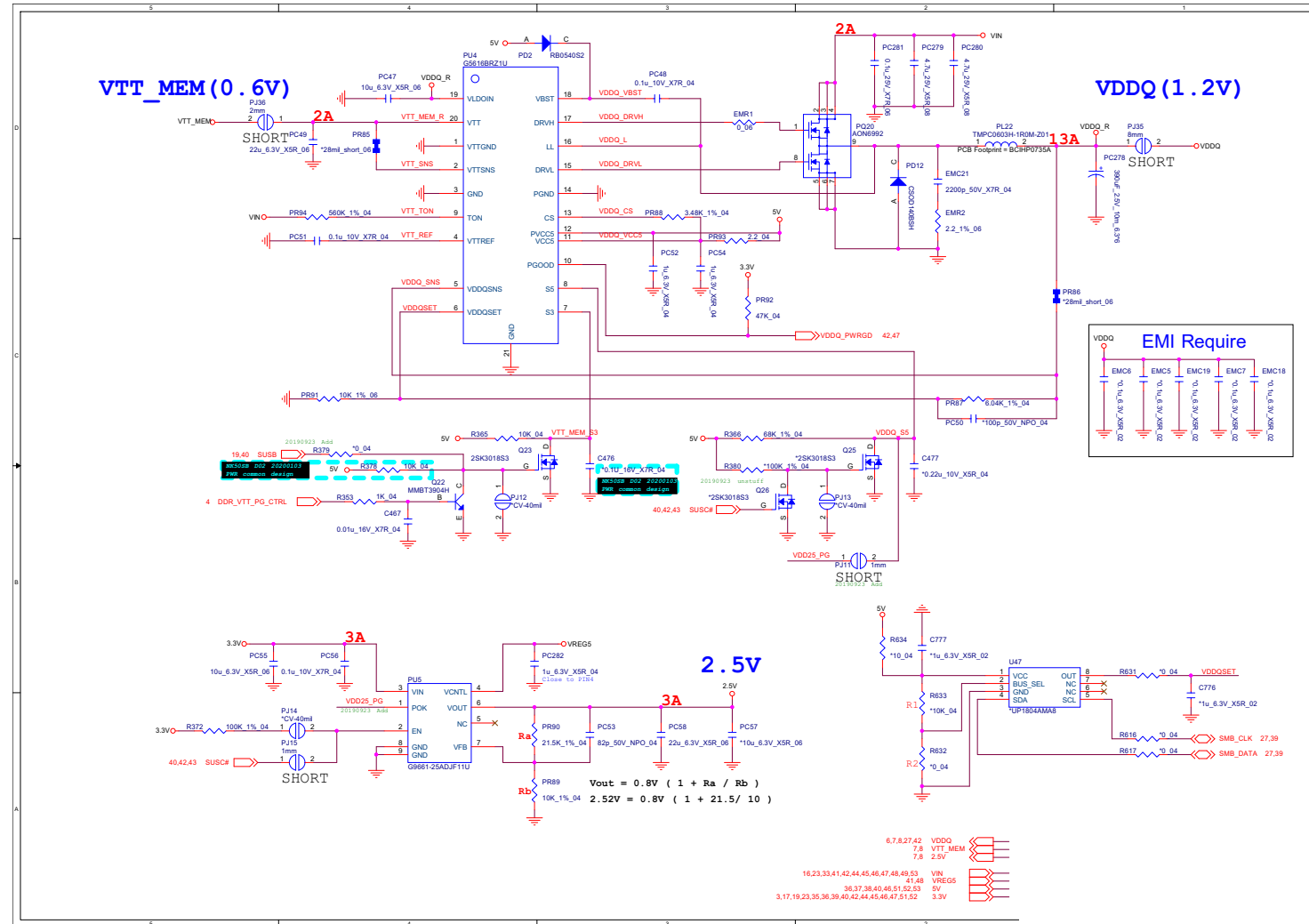


Sheet 42 of 61  
1.05A, VCCST/STG/  
SFR

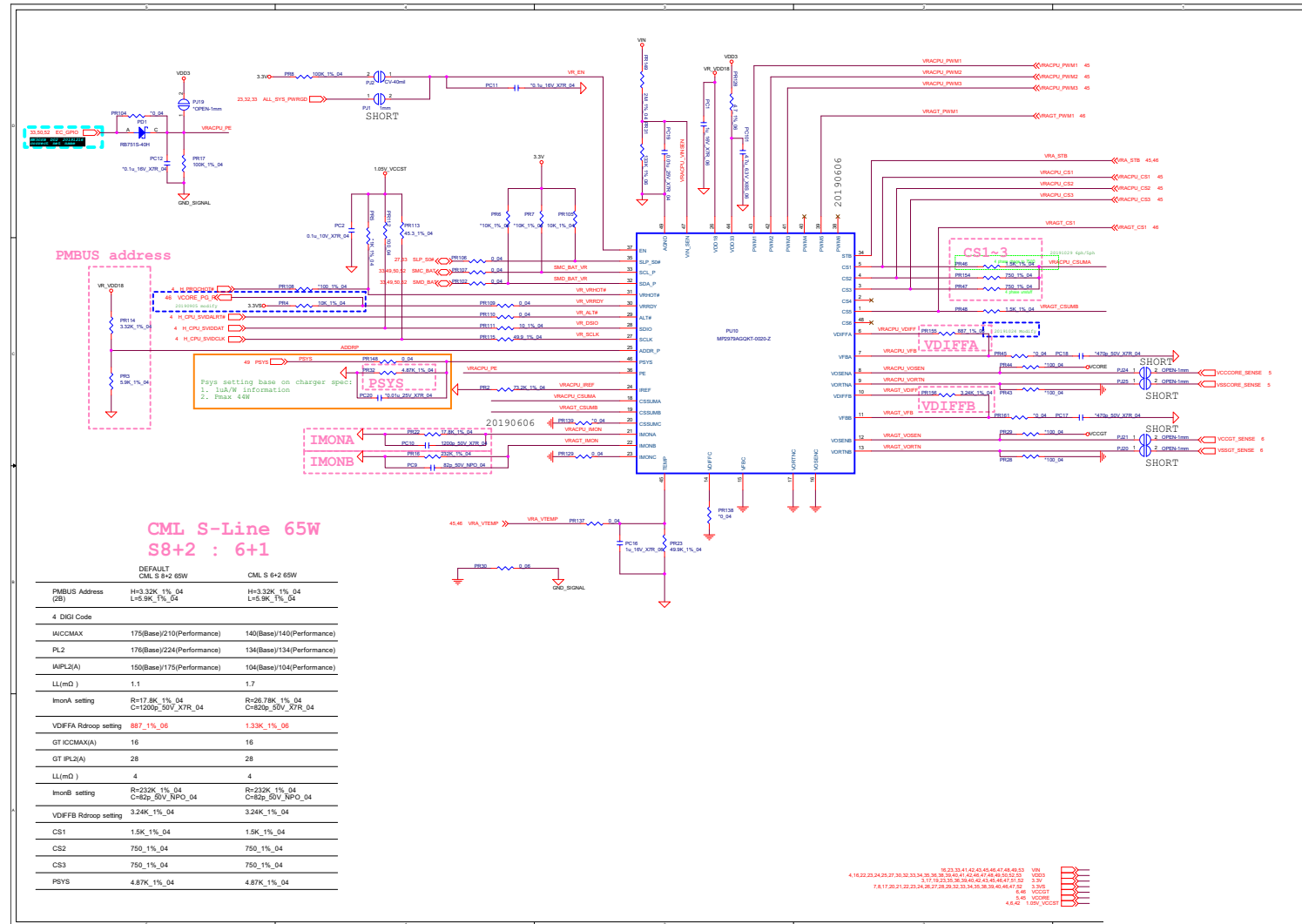
## Schematic Diagrams

# VDDQ, VTT\_MEM, 2.5V

Sheet 43 of 61  
VDDQ, VTT\_MEM,  
2.5V



## MP2979

Sheet 44 of 61  
MP2979

## VCore Output Stage

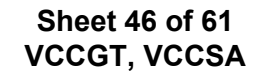
4 phase = phase 1+2+3+4  
5 phase = phase 2+3+4+5+6

16,23,33,41,42,43,44,46,47,48,49,53 VIN  
3,17,19,23,35,36,39,40,42,43,44,46,47,51,52 3.3V  
5.44 VDDIOB

Sheet 45 of 61  
VCore Output  
Stage

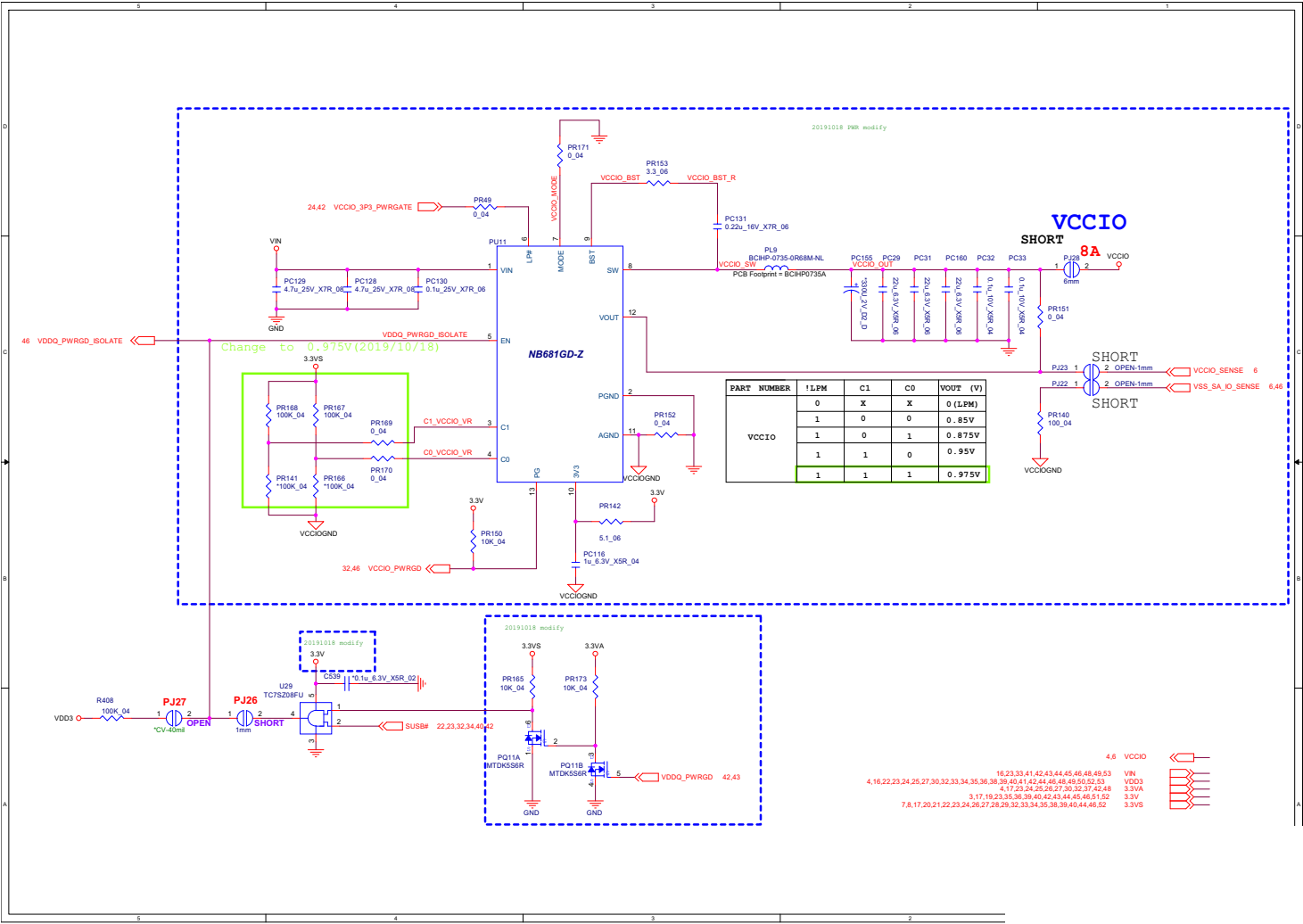


## VCCGT, VCCSA B - 47



VCCIO

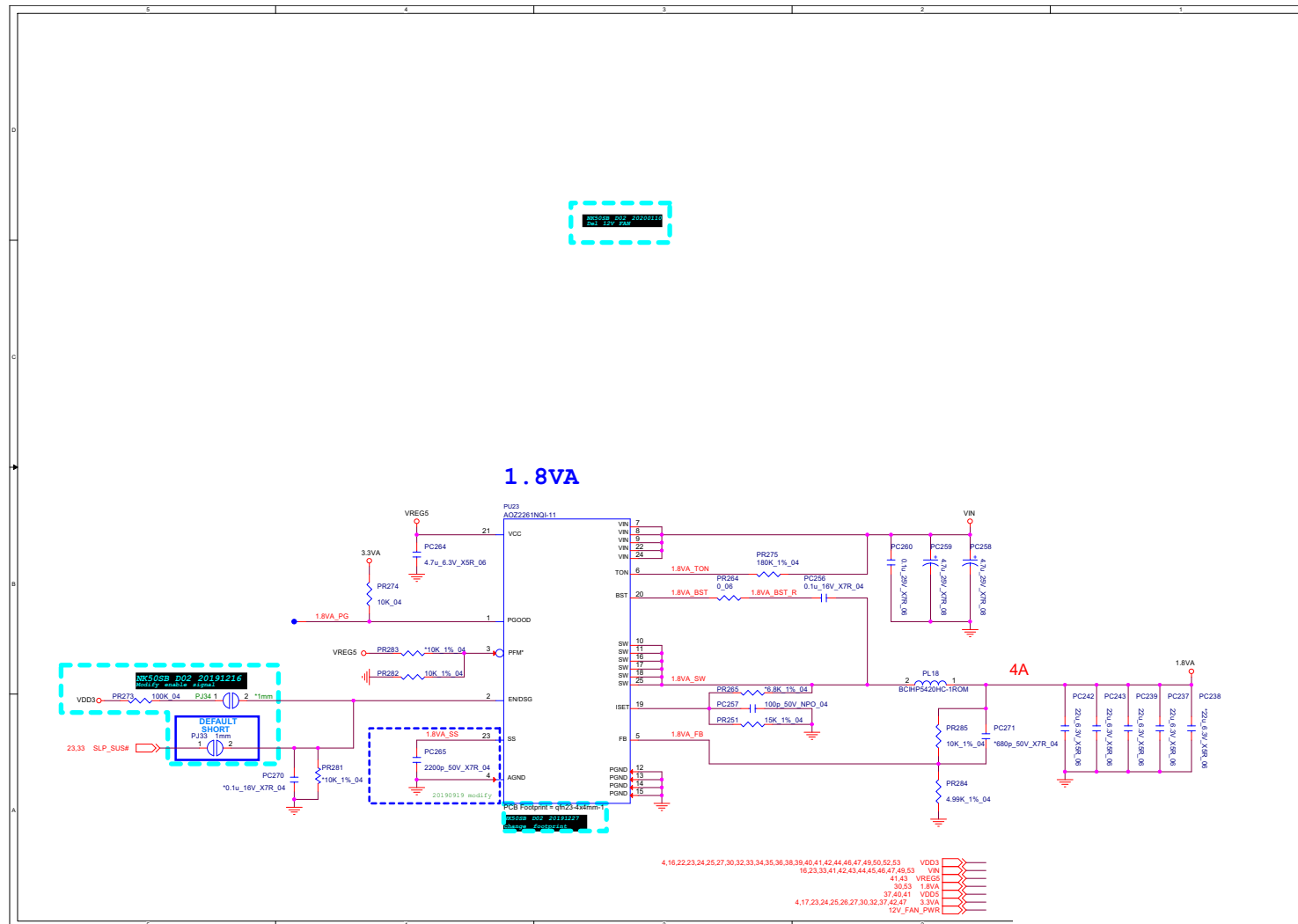
Sheet 47 of 61  
VCCIO



# 1.8VA

Sheet 48 of 61  
1.8VA

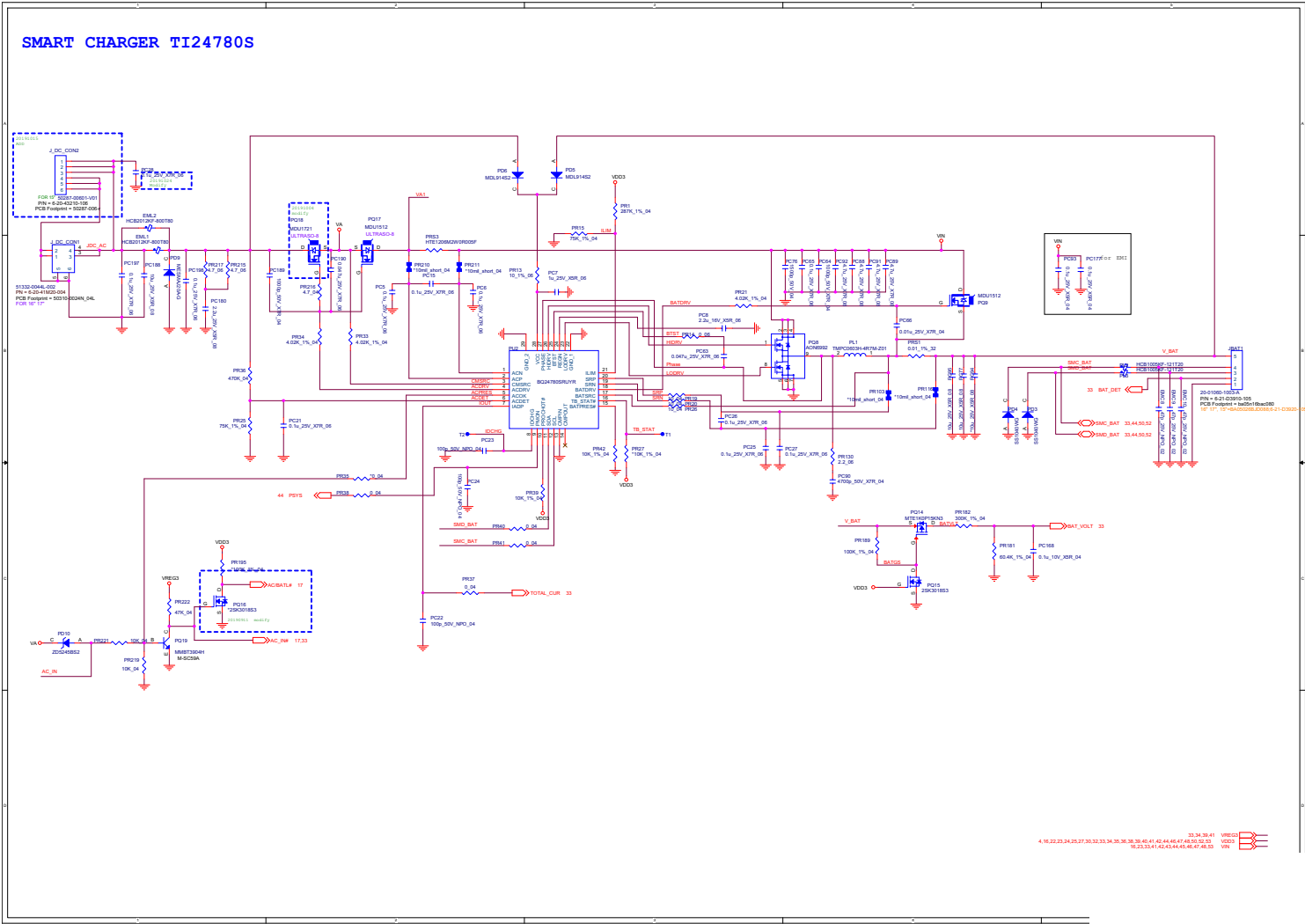
B.Schematic Diagrams



Schematic Diagrams

AC\_In, Charger

Sheet 49 of 61  
AC\_In, Charger

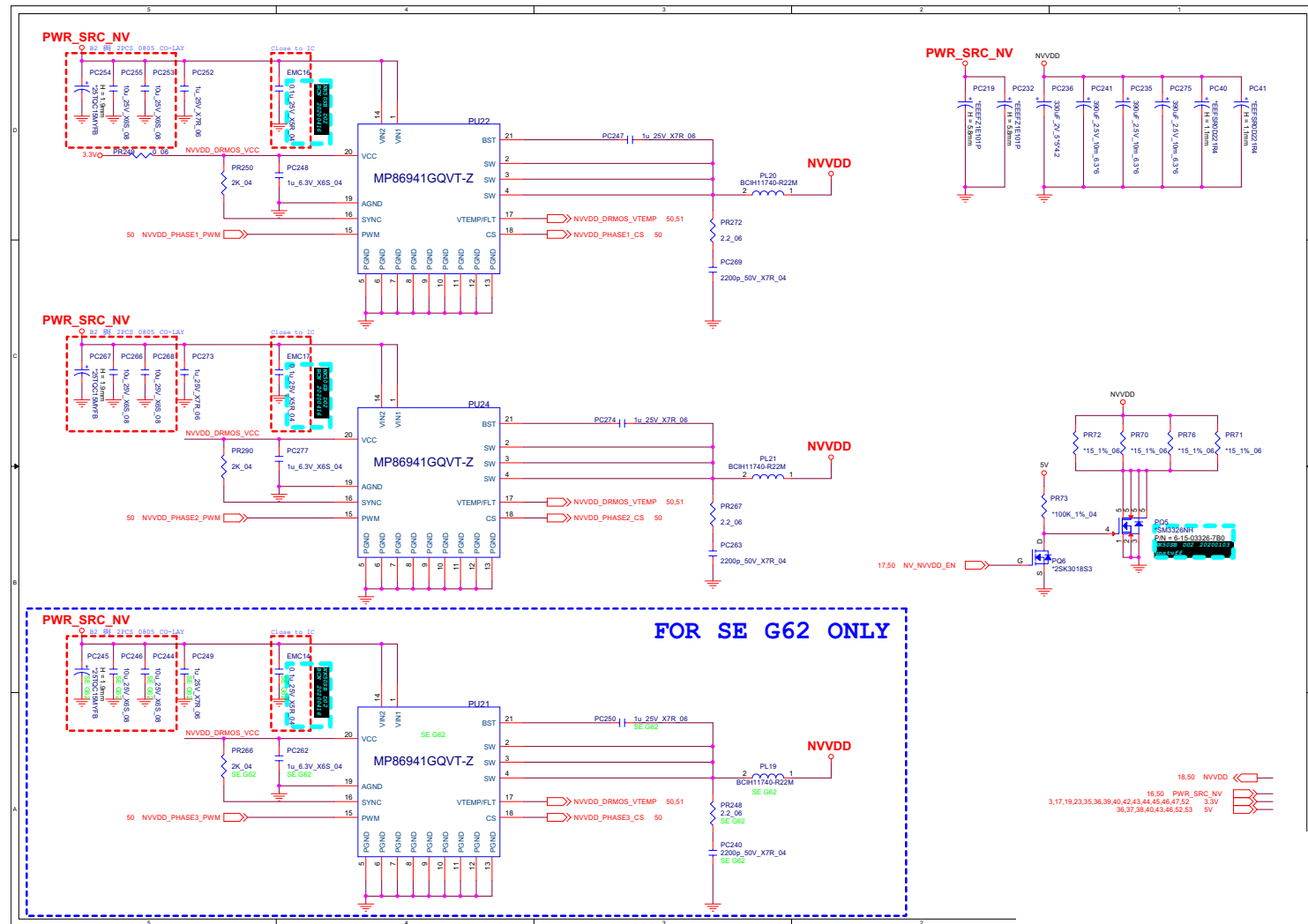


**NVVDD1 B - 51**

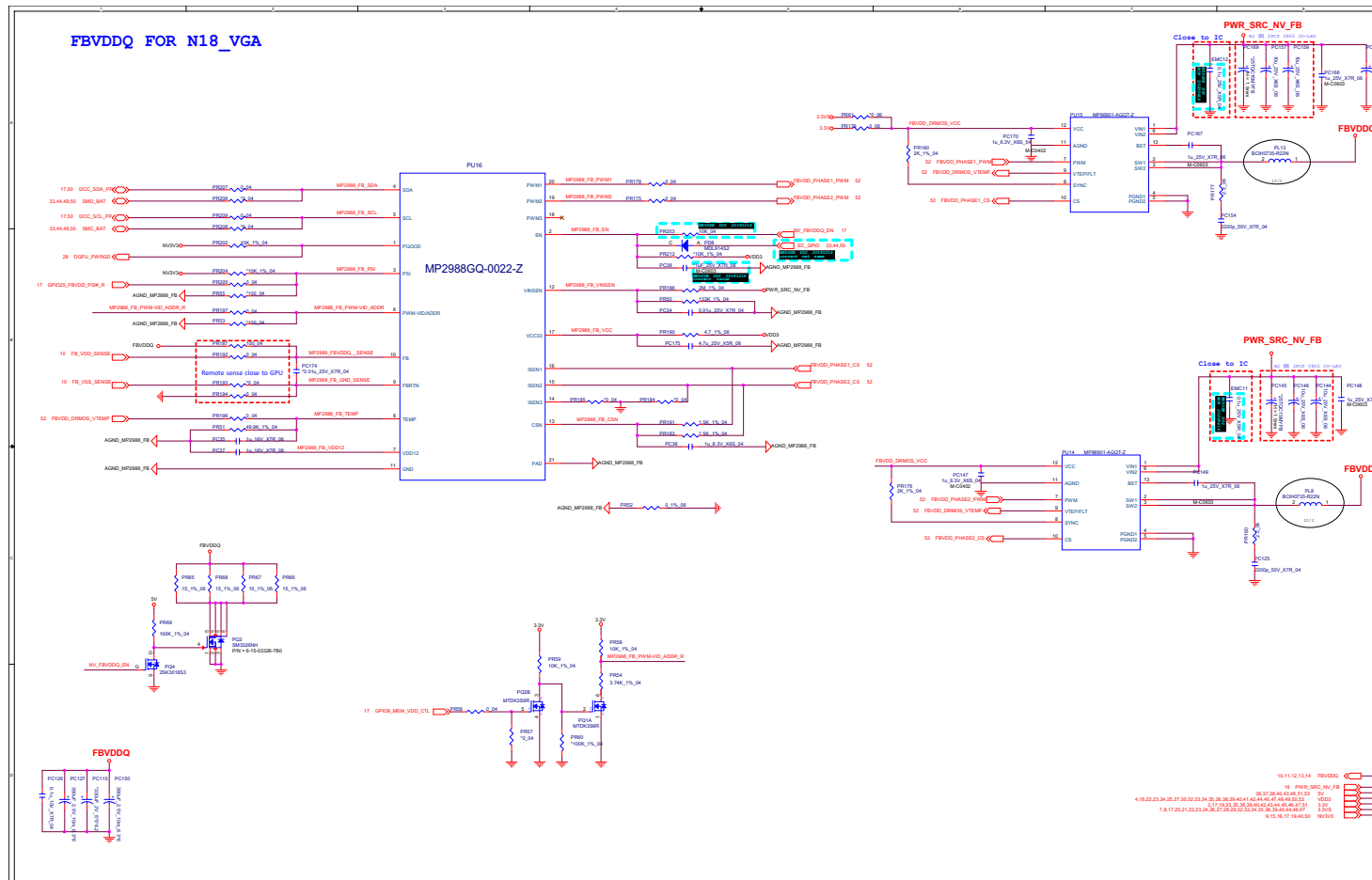


## Schematic Diagrams

## NVVDD2

Sheet 51 of 61  
NVVDD2

## Schematic Diagrams

**FBVDDQ**

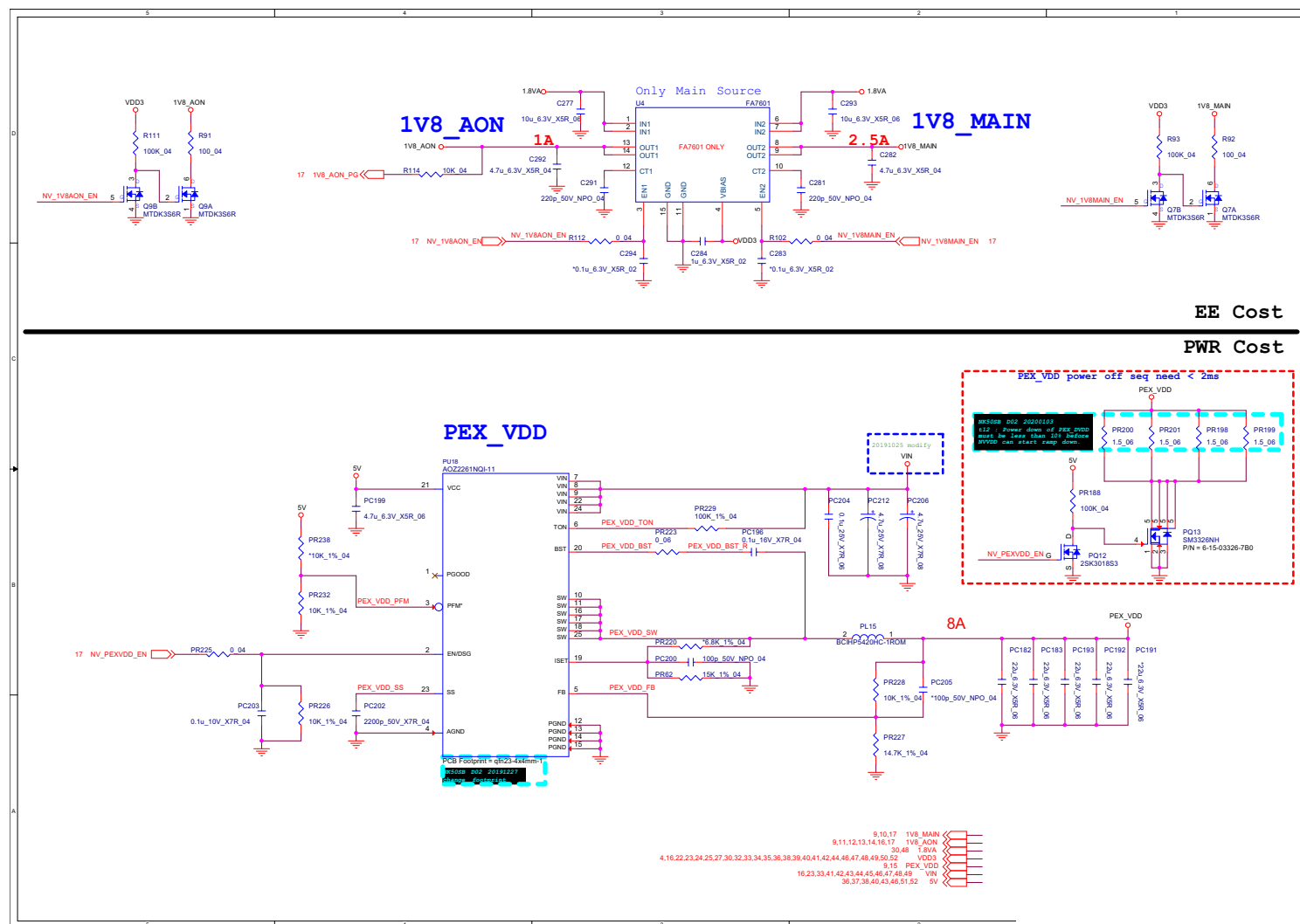
**Sheet 52 of 61**  
**FBVDDQ**

## B.Schematic Diagrams

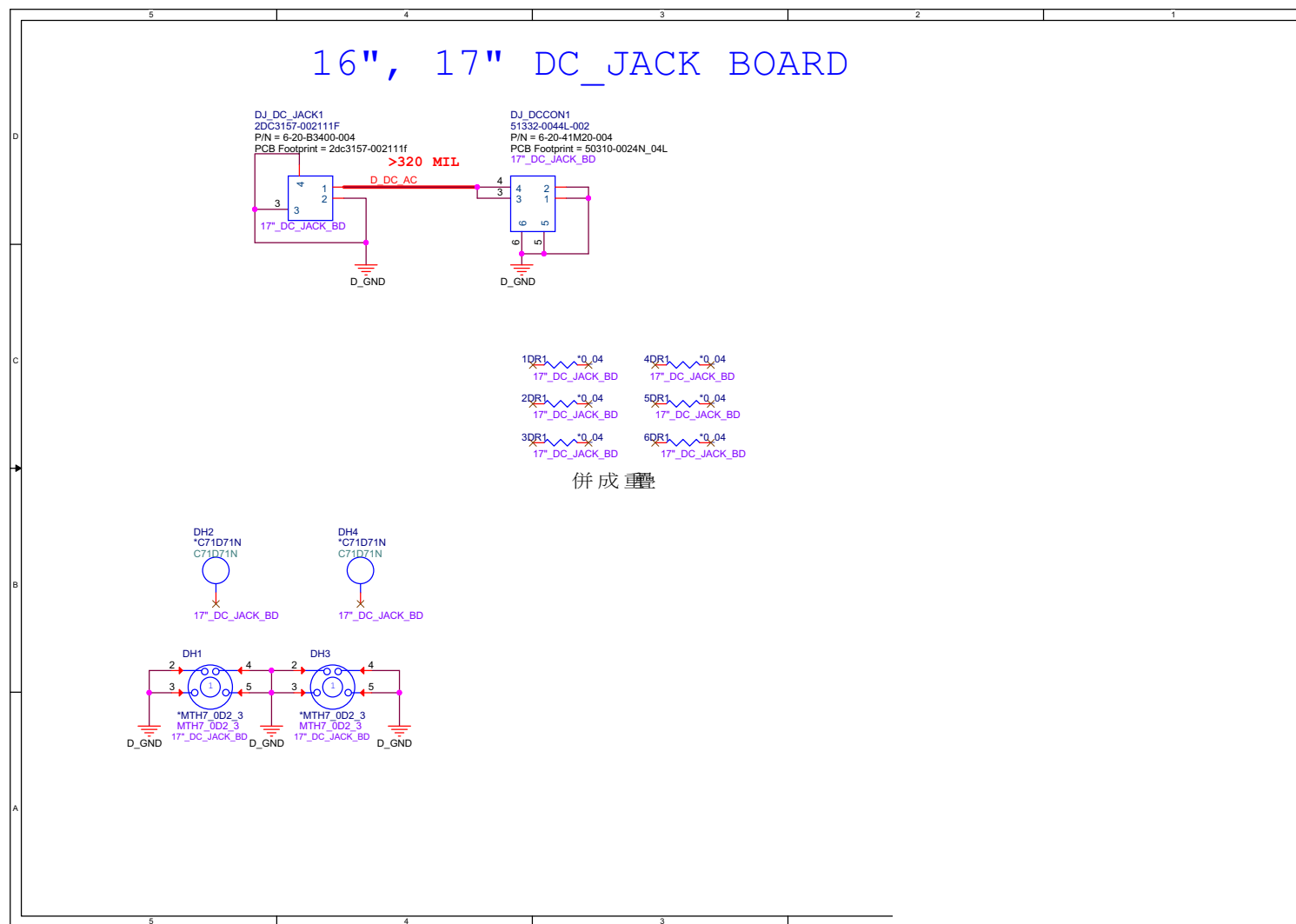


## 1V8\_AON, PEX\_VDD

Sheet 53 of 61  
1V8\_AON,  
PEX\_VDD



## DC Jack Board

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DC Jack Board

17" POWER SW BOARD: W/LID: 6-77-NK70S-D01  
16" POWER SW BOARD: W/O LID: 6-77-NK70S-D01-A

17" POWER SW BOARD: W/LID: 6-77-NK70S-D01  
16" POWER SW BOARD: W/O LID: 6-77-NK70S-D01-A

**17"**

B\_3.3VS  
B\_VDD3

BR3 330\_04 WHITE  
17" PWR BD FOR 17"

BR2 330\_04 WHITE  
17" PWR BD FOR 17"

BR1 330\_04 WHITE  
17" PWR BD FOR 17"

B\_VDD3  
BR4 \*100K 1%\_04  
17" PWR BD FOR 17"

BU1 YB8251ST23  
P/N = 6-02-08251-LC0  
17" PWR BD FOR 17"

B\_LID\_SW#

B\_SW2 17" PWR BD FOR 17"  
FP225H-006S10M  
P/N = 6-20-94K00-006  
PCB Footprint = FP225H-006S10M\_R  
20191104 Modify

B\_SW1 17" PWR BD FOR 17"  
FP225H-006S10M  
P/N = 6-20-94A40-004  
PCB Footprint = JX1\_FP225H-004S10M\_R  
20191104 Modify

B\_SW1 16" PWR BD FOR 16"  
FP226H-004S10M  
P/N = 6-20-94A40-004  
PCB Footprint = JX1\_FP226H-004S10M\_R  
20191104 Modify

POWER BOTTOM  
BSW1  
T4JB10B0R  
P/N = 6-53-31500-B41  
PCB Footprint = T4JB16-1Q  
17" PWR BD

BH1 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH2 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH3 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH4 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH5 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH6 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH7 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH8 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH9 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH10 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH11 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH12 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH13 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH14 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH15 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH16 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH17 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH18 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH19 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH20 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH21 \*MTH7\_0D2\_3  
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17" PWR BD

BH22 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH23 \*MTH7\_0D2\_3  
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17" PWR BD

BH24 \*MTH7\_0D2\_3  
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17" PWR BD

BH25 \*MTH7\_0D2\_3  
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17" PWR BD

BH26 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH27 \*MTH7\_0D2\_3  
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17" PWR BD

BH28 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH29 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH30 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH31 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH32 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH33 \*MTH7\_0D2\_3  
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17" PWR BD

BH34 \*MTH7\_0D2\_3  
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17" PWR BD

BH35 \*MTH7\_0D2\_3  
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17" PWR BD

BH36 \*MTH7\_0D2\_3  
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17" PWR BD

BH37 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH38 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH39 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH40 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH41 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH42 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH43 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH44 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH45 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH46 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH47 \*MTH7\_0D2\_3  
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17" PWR BD

BH48 \*MTH7\_0D2\_3  
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17" PWR BD

BH49 \*MTH7\_0D2\_3  
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17" PWR BD

BH50 \*MTH7\_0D2\_3  
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17" PWR BD

BH51 \*MTH7\_0D2\_3  
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17" PWR BD

BH52 \*MTH7\_0D2\_3  
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17" PWR BD

BH53 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH54 \*MTH7\_0D2\_3  
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17" PWR BD

BH55 \*MTH7\_0D2\_3  
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17" PWR BD

BH56 \*MTH7\_0D2\_3  
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17" PWR BD

BH57 \*MTH7\_0D2\_3  
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17" PWR BD

BH58 \*MTH7\_0D2\_3  
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17" PWR BD

BH59 \*MTH7\_0D2\_3  
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17" PWR BD

BH60 \*MTH7\_0D2\_3  
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17" PWR BD

BH61 \*MTH7\_0D2\_3  
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17" PWR BD

BH62 \*MTH7\_0D2\_3  
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17" PWR BD

BH63 \*MTH7\_0D2\_3  
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17" PWR BD

BH64 \*MTH7\_0D2\_3  
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17" PWR BD

BH65 \*MTH7\_0D2\_3  
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17" PWR BD

BH66 \*MTH7\_0D2\_3  
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17" PWR BD

BH67 \*MTH7\_0D2\_3  
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17" PWR BD

BH68 \*MTH7\_0D2\_3  
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17" PWR BD

BH69 \*MTH7\_0D2\_3  
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17" PWR BD

BH70 \*MTH7\_0D2\_3  
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17" PWR BD

BH71 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH72 \*MTH7\_0D2\_3  
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17" PWR BD

BH73 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH74 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH75 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH76 \*MTH7\_0D2\_3  
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17" PWR BD

BH77 \*MTH7\_0D2\_3  
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17" PWR BD

BH78 \*MTH7\_0D2\_3  
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17" PWR BD

BH79 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH80 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH81 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH82 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH83 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH84 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

BH85 \*MTH7\_0D2\_3  
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17" PWR BD

BH86 \*MTH7\_0D2\_3  
MTH7\_0D2\_3  
17" PWR BD

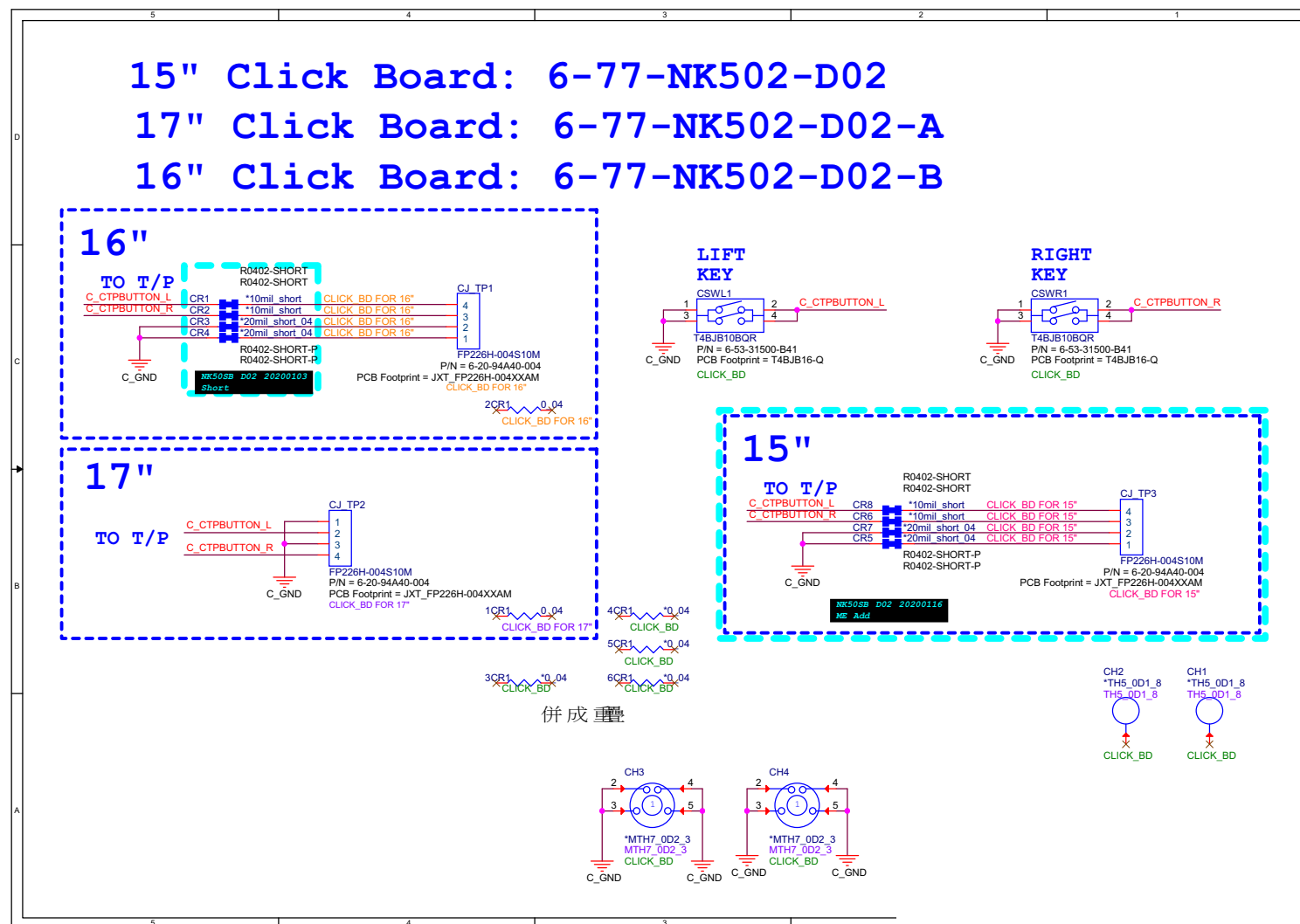
BH87 \*MTH7\_0D2\_3

## Click Board

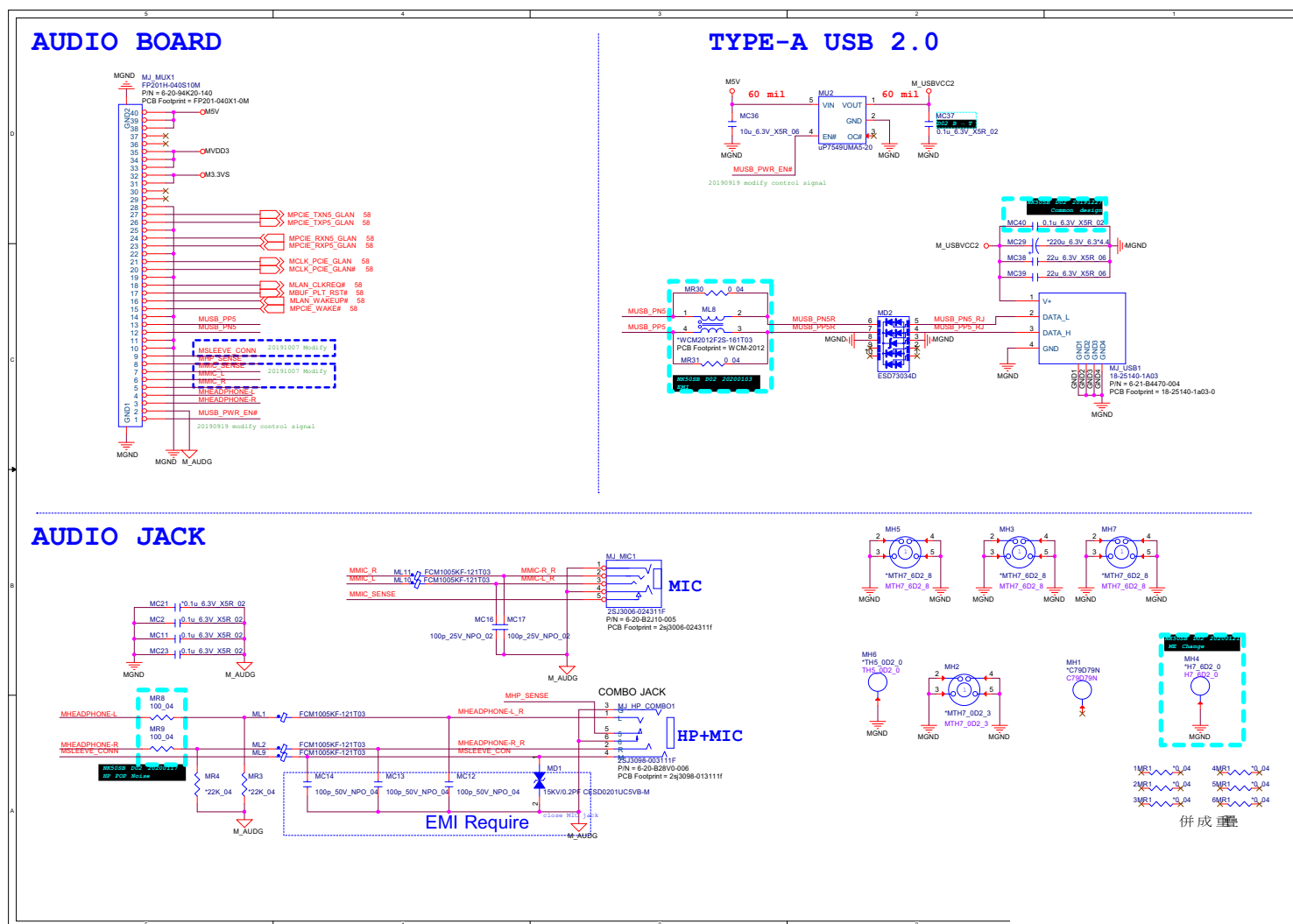
15" Click Board: 6-77-NK502-D02

17" Click Board: 6-77-NK502-D02-A

16" Click Board: 6-77-NK502-D02-B

Sheet 56 of 61  
Click Board

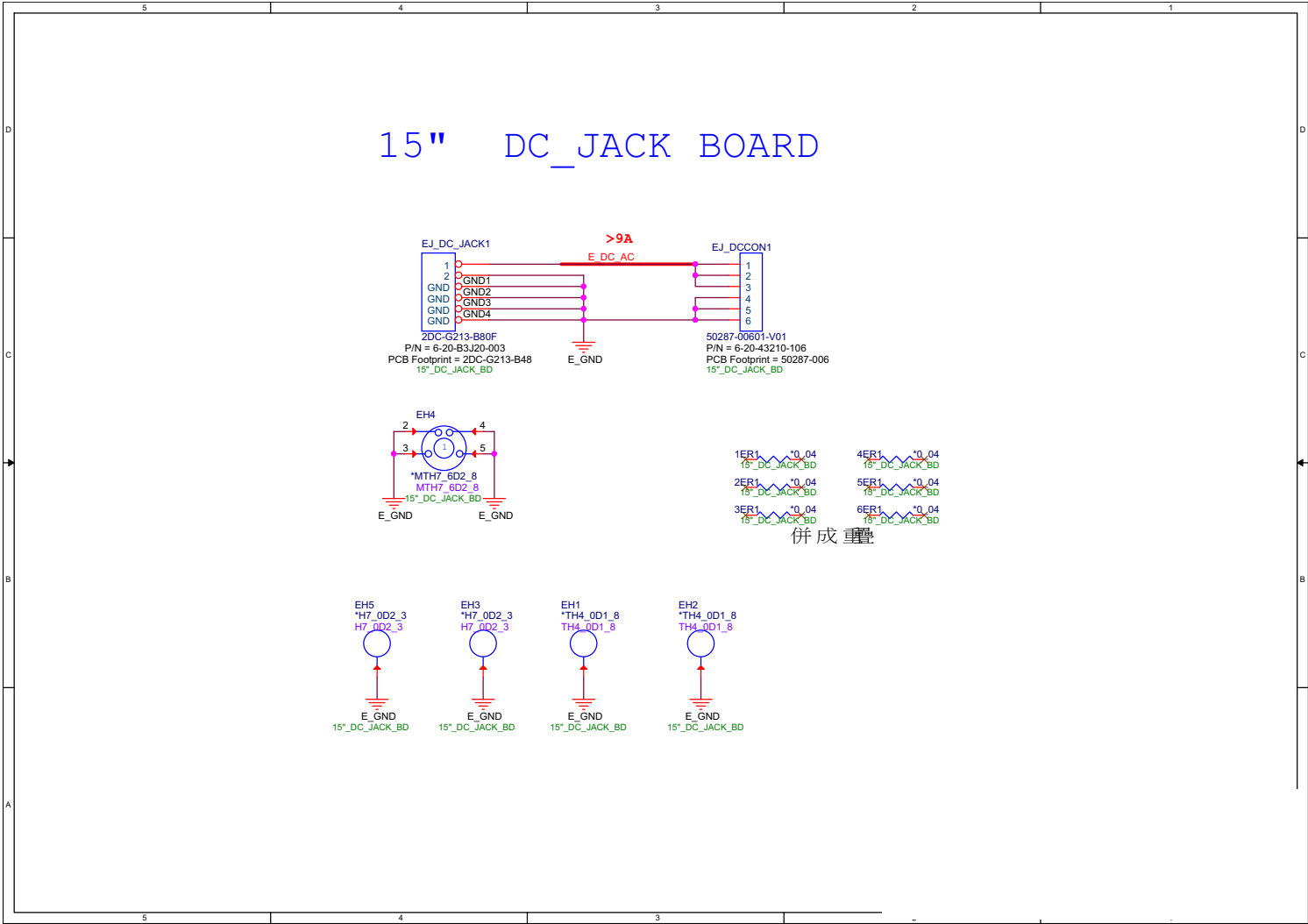
**Sheet 57 of 61**  
**Multi Board**





DC Jack Board

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DC Jack Board





## Power SW Board B - 61



LID Board

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LID Board

