

# SERVICE MANUAL

*notebook*

**NK60SB / NK60SE**





**Notebook Computer**

**NK60SB / NK60SE**

**Service Manual**

Vinafix.com

## Notice

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

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

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

Version 1.0  
May 2020

Vinafix.com

## Trademarks

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

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

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





## About this Manual

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

It is organized to allow you to look up basic information for servicing and/or upgrading components of the **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

Vinafix.com

## Preface

---

### 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.

Vinafix.com

### 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.

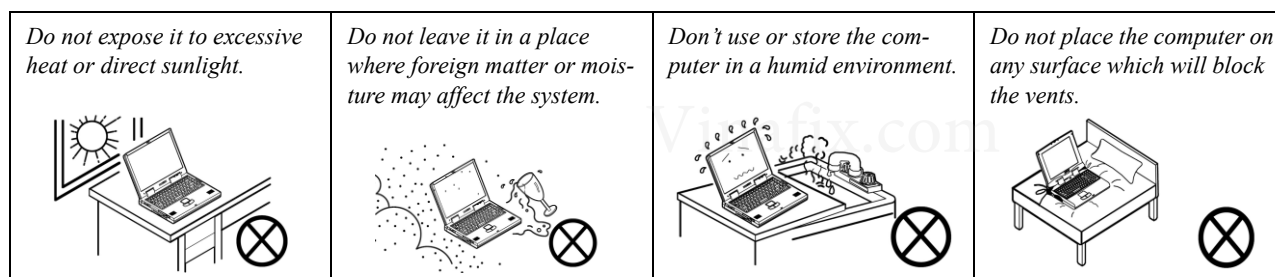
## Instructions for Care and Operation

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

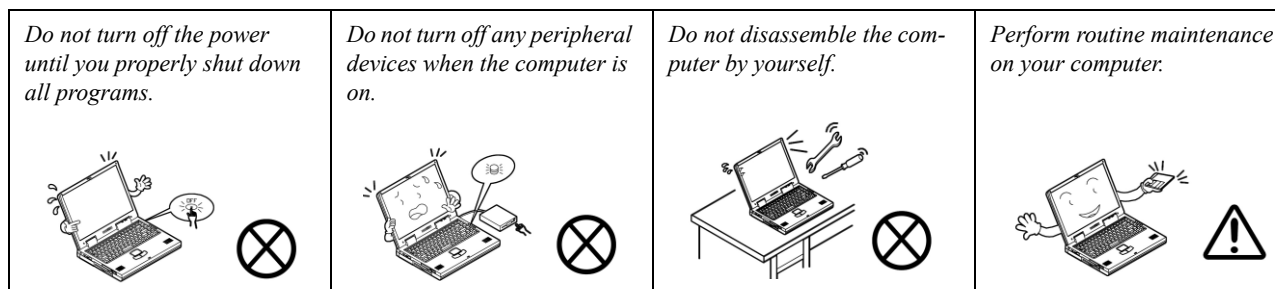
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.



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.

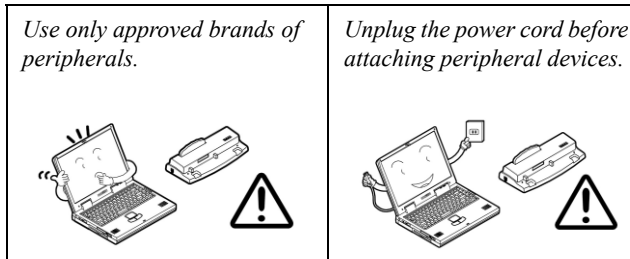


3. **Follow the proper working procedures for the computer.** Shut the computer down properly and don't forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.



## Preface

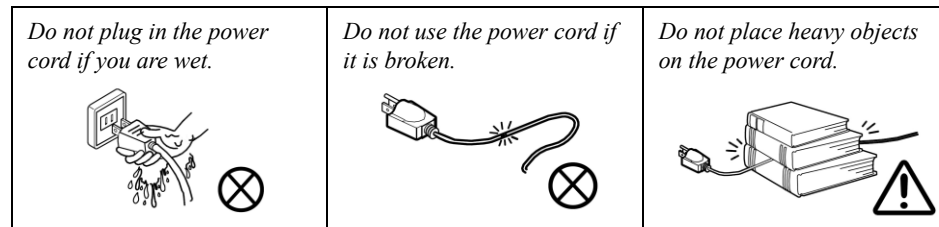
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**



## 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

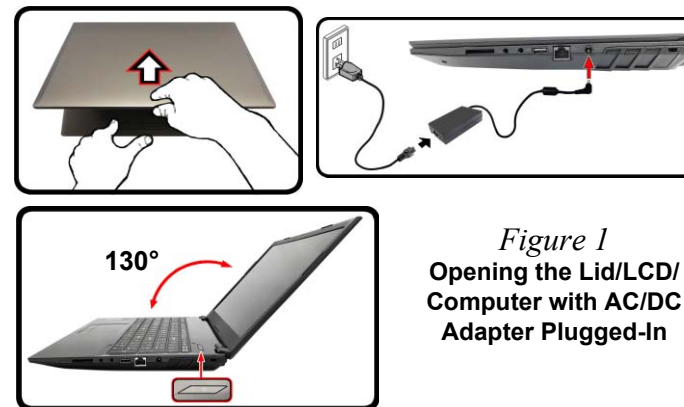
You may also need to consult the following manual for additional information:

### 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.

# 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 .....	2-6
Removing the Keyboard .....	2-8
Removing and Installing the Processor .....	2-9
Removing the System Memory (RAM) .....	2-12
Removing the M.2 SSD Module .....	2-13
Removing the Wireless LAN Module .....	2-14
Wireless LAN, Combo Module Cables .....	2-15
Removing the CCD .....	2-16

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

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

Bottom .....	A-4
Main Board .....	A-5
HDD .....	A-6
LCD .....	A-7

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

System Block Diagram .....	B-2
Processor 1/5 .....	B-3
Processor 2/5 .....	B-4
Processor 3/5 .....	B-5
Processor 4/5 .....	B-6
Processor 5/5 .....	B-7
DDR4 CHA SO-DIMM_0 .....	B-8
DDR4 CHB SO-DIMM_0 .....	B-9
VGA PCI-E Interface .....	B-10
VGA Frame Buffer Interface .....	B-11
VGA Frame Buffer A .....	B-12
VGA Frame Buffer A .....	B-13
VGA Frame Buffer B .....	B-14
VGA Frame Buffer B .....	B-15
VGA I/O .....	B-16
VGA I/O .....	B-17
VGA Sequence / GPIO .....	B-18
VGA Decoupling .....	B-19
mDP Conn .....	B-20
DP Redriver .....	B-21
HDMI .....	B-22
HDMI Repeater .....	B-23
Panel Conn .....	B-24
PCH 1/9 .....	B-25
PCH 2/9 .....	B-26

## Preface

---

PCH 3/9 .....	B-27	LAN RTL8411B .....	B-59
PCH 4/9 .....	B-28	DC Jack Board .....	B-60
PCH 5/9 .....	B-29	Power SW Board .....	B-61
PCH 6/9 .....	B-30	LID Board .....	B-62
PCH 7/9 .....	B-31		
PCH 8/9 .....	B-32		
PCH 9/9 .....	B-33		
KBC-ITE IT5570 .....	B-34		
Audio Codec .....	B-35		
M.2 PCIE4X SSD .....	B-36		
USB Type-C, M.2 WLAN+BT .....	B-37		
USB Type-A, TPM .....	B-38		
RGB KB, Fan, LED .....	B-39		
HDD, CCD, TP, LID, PWR SW .....	B-40		
5V, 5VS, 3.3V, 3.3VS, NV3V3 .....	B-41		
VDD3, VDD5 .....	B-42		
1.05A, VCCST/STG/SFR .....	B-43		
VDDQ, VTT_MEM, 2.5V .....	B-44		
MP2979 .....	B-45		
VCore Output Stage .....	B-46		
VCCGT, VCCSA .....	B-47		
VCCIO .....	B-48		
1.8VA .....	B-49		
AC_In, Charger .....	B-50		
NVVDD1 .....	B-51		
NVVDD2 .....	B-52		
FBVDDQ .....	B-53		
1V8_AON, PEX_VDD .....	B-54		
DC Jack Board .....	B-55		
Power SW Board .....	B-56		
Click Board .....	B-57		
Multi Board .....	B-58		




# 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>
<p>One Changeable 2.5" 7mm (h) SATA HDD/SSD</p> <p><b>(Factory Option) One M.2 2280 SATA Solid State Drive (SSD)</b></p> <p>Or</p> <p><b>(Factory Option) Two M.2 2280 PCIe Gen3 x4 Solid State Drives supporting RAID level 0/1</b></p>
<b>Audio</b>
<p>High Definition Audio Compliant Interface</p> <p>2 * Built-In Speakers</p> <p>Built-In Array Microphone</p> <p>Sound Blaster™ Cinema 6</p>
<b>Security</b>
<p>Security (Kensington® Type) Lock Slot</p> <p>BIOS Password</p> <p>Intel PTT for systems without hardware TPM</p>
<b>Keyboard</b>
<p>Full-size Keyboard (with Numeric Keypad)</p> <p>Or</p> <p><b>(Factory Option) Full-size Multi-Color LED Keyboard (with Numeric Keypad)</b></p>
<b>Pointing Device</b>
<p>Built-in Touchpad (with Microsoft PTP Multi Gesture &amp; Scrolling Functionality)</p>

<b>Interface</b>
<p>One USB 3.2 Gen 2 Type-C Port*</p> <p><i>*The maximum amount of current supplied by USB Type-C ports is 500mA (USB 2.0)/900mA (USB 3.2).</i></p> <p>Two USB USB 3.2 Gen 2 Type-A Ports</p> <p>One USB 2.0 Port</p> <p>One Mini DisplayPort 1.4</p> <p>One HDMI-Out Port</p> <p>One Microphone-In Jack</p> <p>One 2-In-1 Audio Jack (Headphones / Microphone)</p> <p>One RJ-45 LAN Jack</p> <p>One DC-In Jack</p>
<b>Card Reader</b>
<p>Embedded Multi-In-1 Card Reader</p> <p>MMC (MultiMedia Card) / RS MMC</p> <p>SD (Secure Digital) / Mini SD / SDHC/ SDXC</p>
<b>M.2 Slots</b>
<p>Slot 1 for <b>Combo WLAN and Bluetooth</b> Module</p> <p>Slot 2 for <b>SATA</b> or <b>PCIe Gen3 x4 SSD</b></p> <p>Slot 3 for <b>PCIe Gen3 x4 SSD</b></p>
<b>Communication</b>
<p>1.0M HD PC Camera Module</p> <p>Built-In 10/100/1000Mb Base-TX Ethernet LAN</p> <p><b><u>WLAN/ Bluetooth M.2 Modules:</u></b></p> <p><b>(Factory Option) Intel® Dual Band Wi-Fi 6 AX200 Wireless LAN (802.11ax) + Bluetooth</b></p> <p><b>(Factory Option) Intel® Dual Band Wi-Fi 6 AX201 Wireless LAN (802.11ax) + Bluetooth</b></p> <p><b>(Factory Option) Intel® Dual Band Wireless-AC 9462 Wireless LAN (802.11ac) + Bluetooth</b></p>

<b>Environmental Spec</b>
<p><b>Temperature</b></p> <p>Operating: 5°C - 35°C</p> <p>Non-Operating: -20°C - 60°C</p> <p><b>Relative Humidity</b></p> <p>Operating: 20% - 80%</p> <p>Non-Operating: 10% - 90%</p>
<b>Power</b>
<p>Full Range AC/DC Adapter</p> <p>AC Input: 100 - 240V, 50 - 60Hz</p> <p>DC Output: 19.5V, 7.7A (<b>150W</b>)</p> <p>Removable 6 Cell Smart Lithium-Ion Battery Pack, 47WH</p>
<b>Dimensions &amp; Weight</b>
<p>378mm (w) * 250mm (d) * 29.8mm (h)</p> <p><b>2.3kg</b> (Barebone with 47WH Battery)</p>

## 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



Vinafix.com

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



Vinafix.com

REAR VIEW



*Figure 5*

#### Rear View

1. Battery
2. Vent

Vinafix.com

## 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.

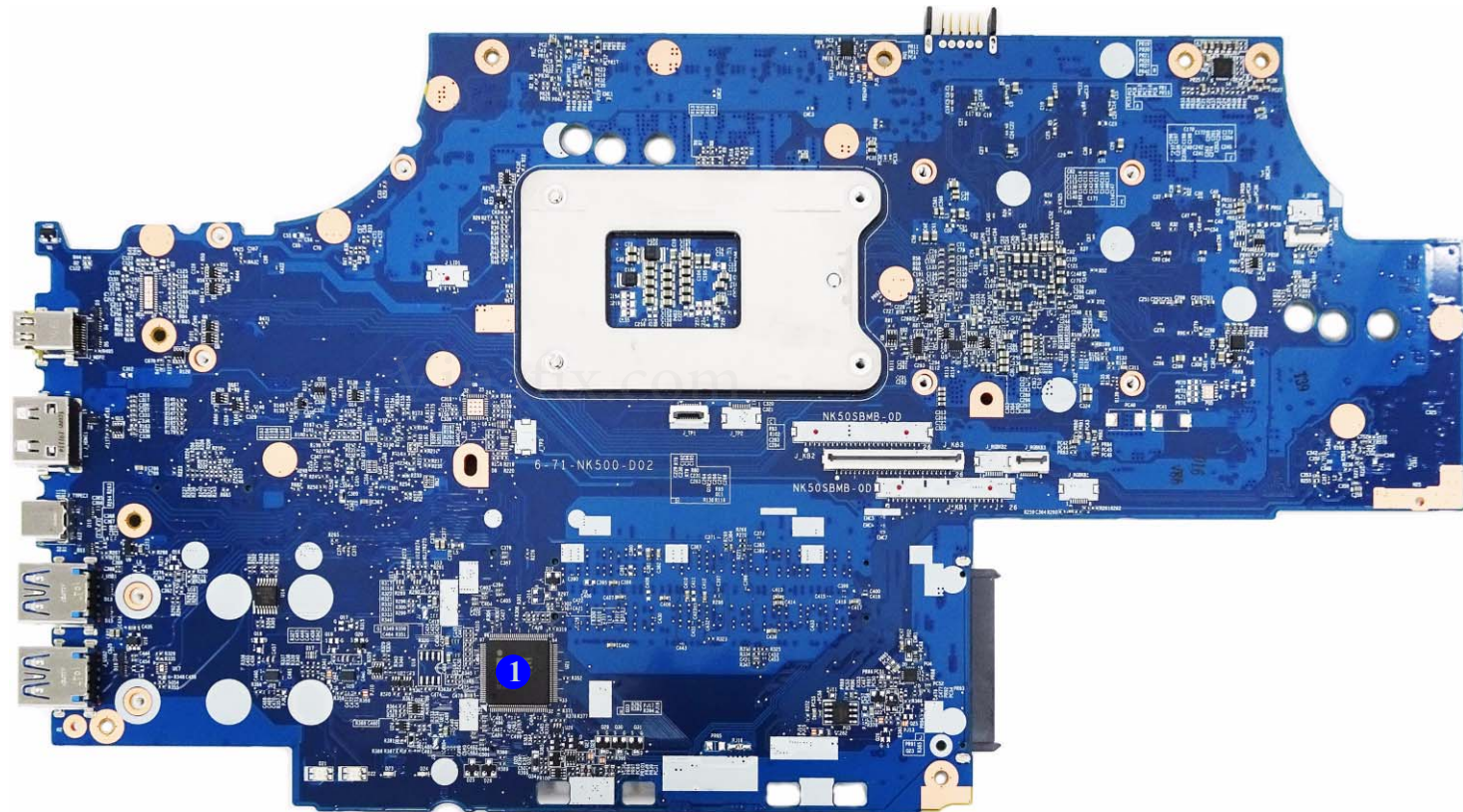


## Introduction

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

1. KBC-ITE IT5570

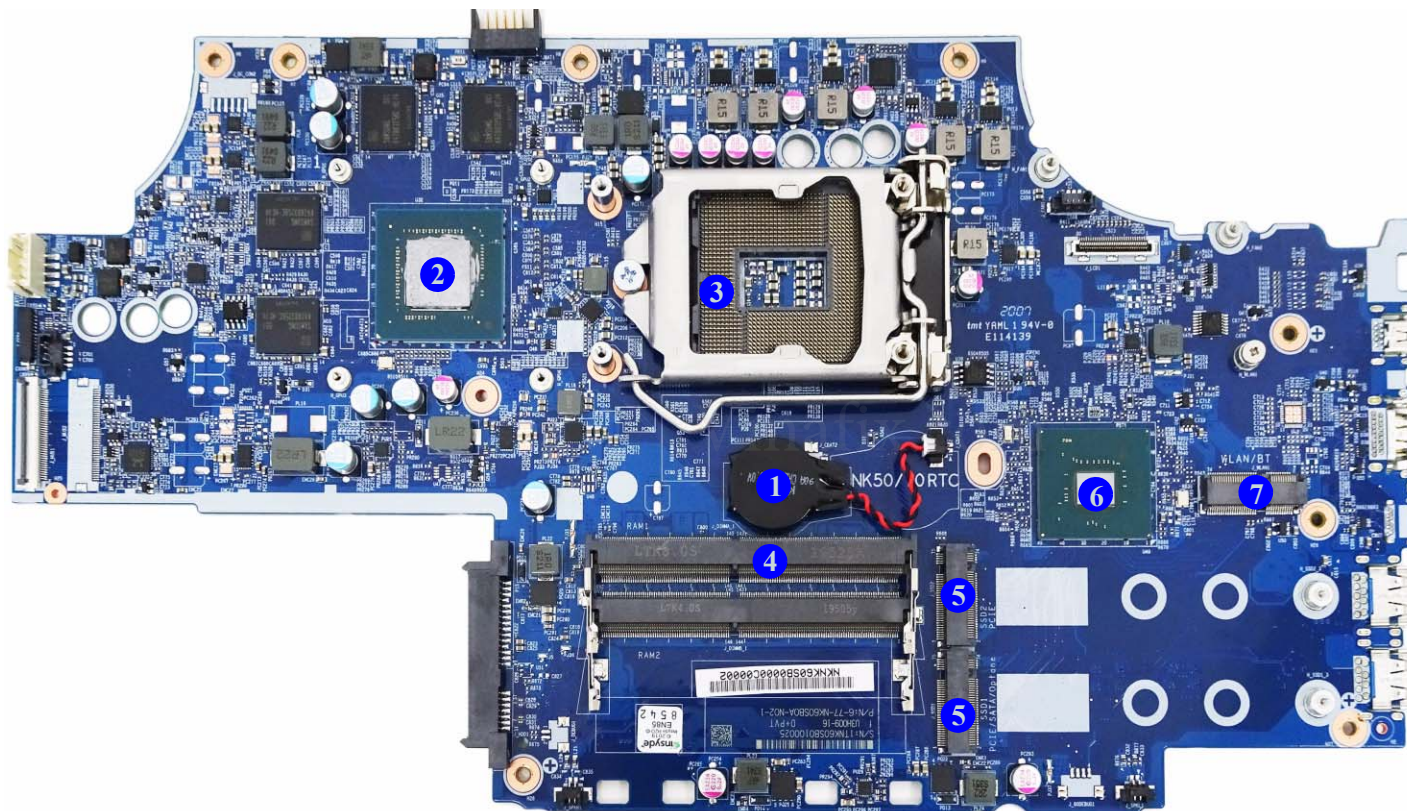
## Mainboard Overview - Top (Key Parts)





## Mainboard Overview - Bottom (Key Parts)

Vinafix.com



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

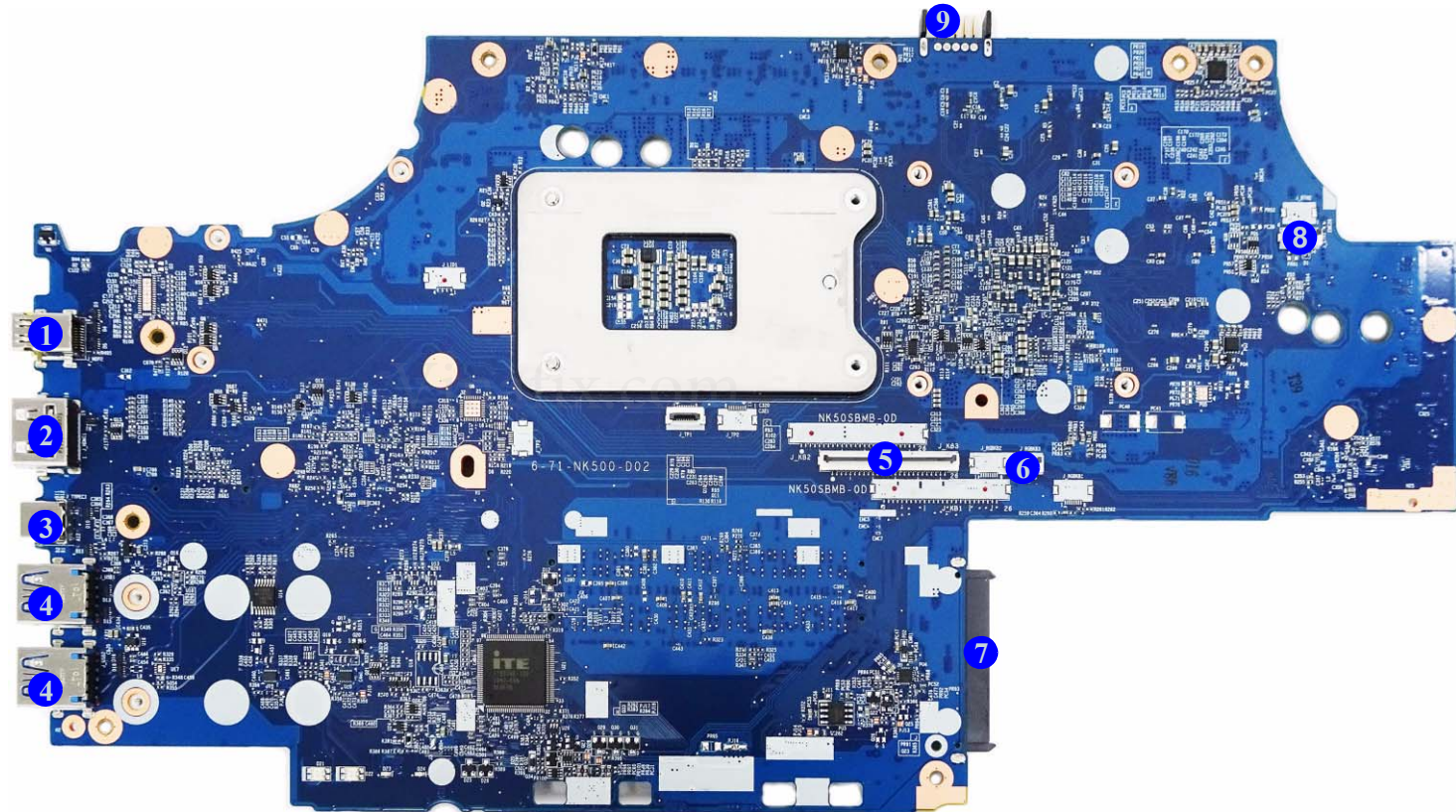
1. CMOS Battery
2. GPU
3. CPU (not installed)
4. Memory Slots  
DDR4 SO-DIMM
5. M.2-Card  
Connector (SSD  
Module)
6. PCH
7. M.2-Card  
Connector (WLAN  
Module)

## 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)

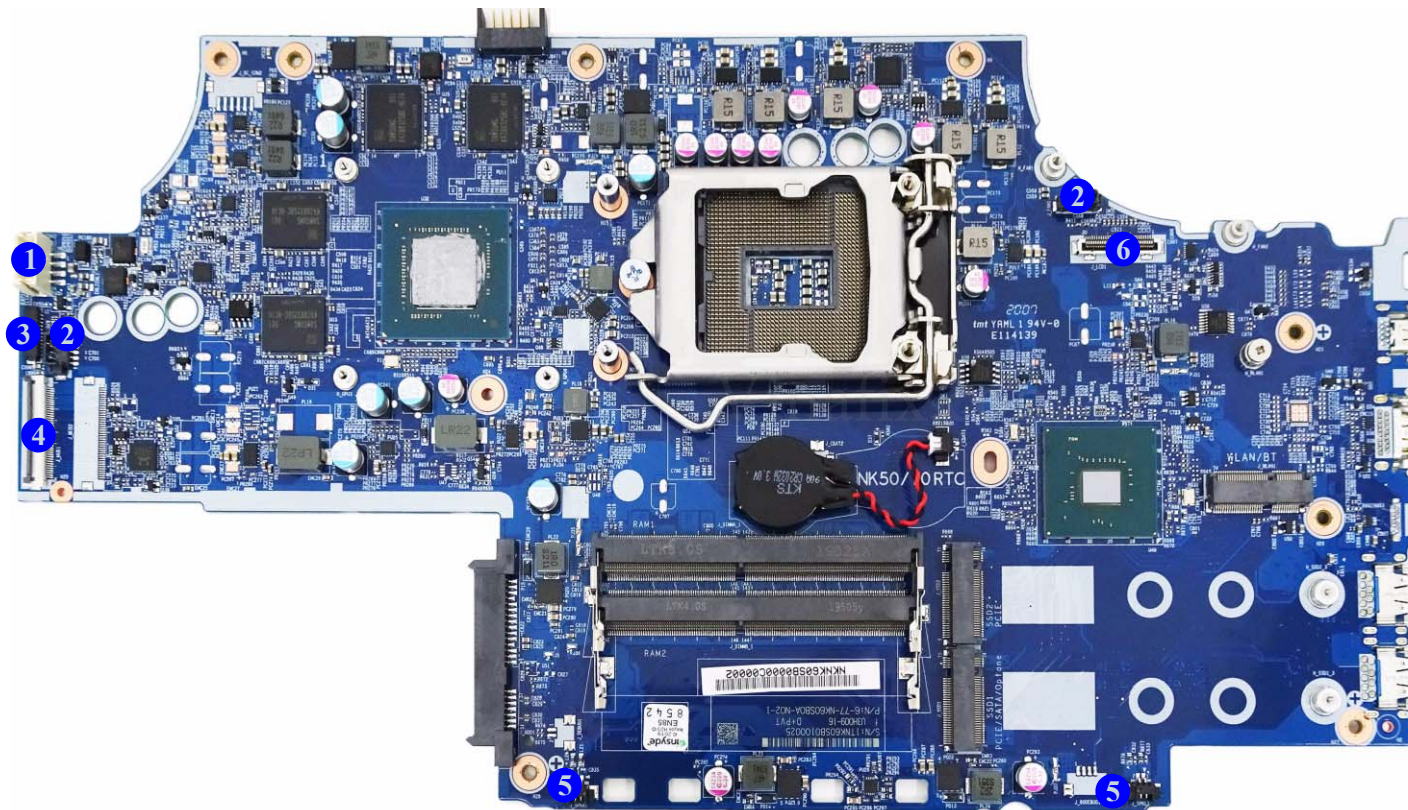




## Mainboard Overview - Bottom (Connectors)

*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



Vinafix.com


# 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.

  
Information

Warning

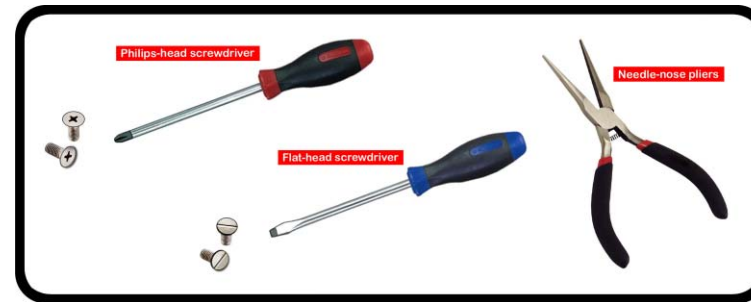
## Disassembly

**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](#)



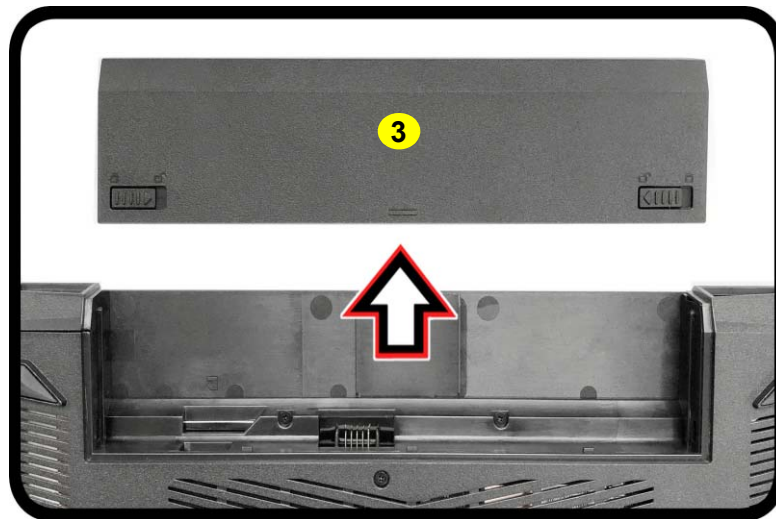
## Removing the Battery

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

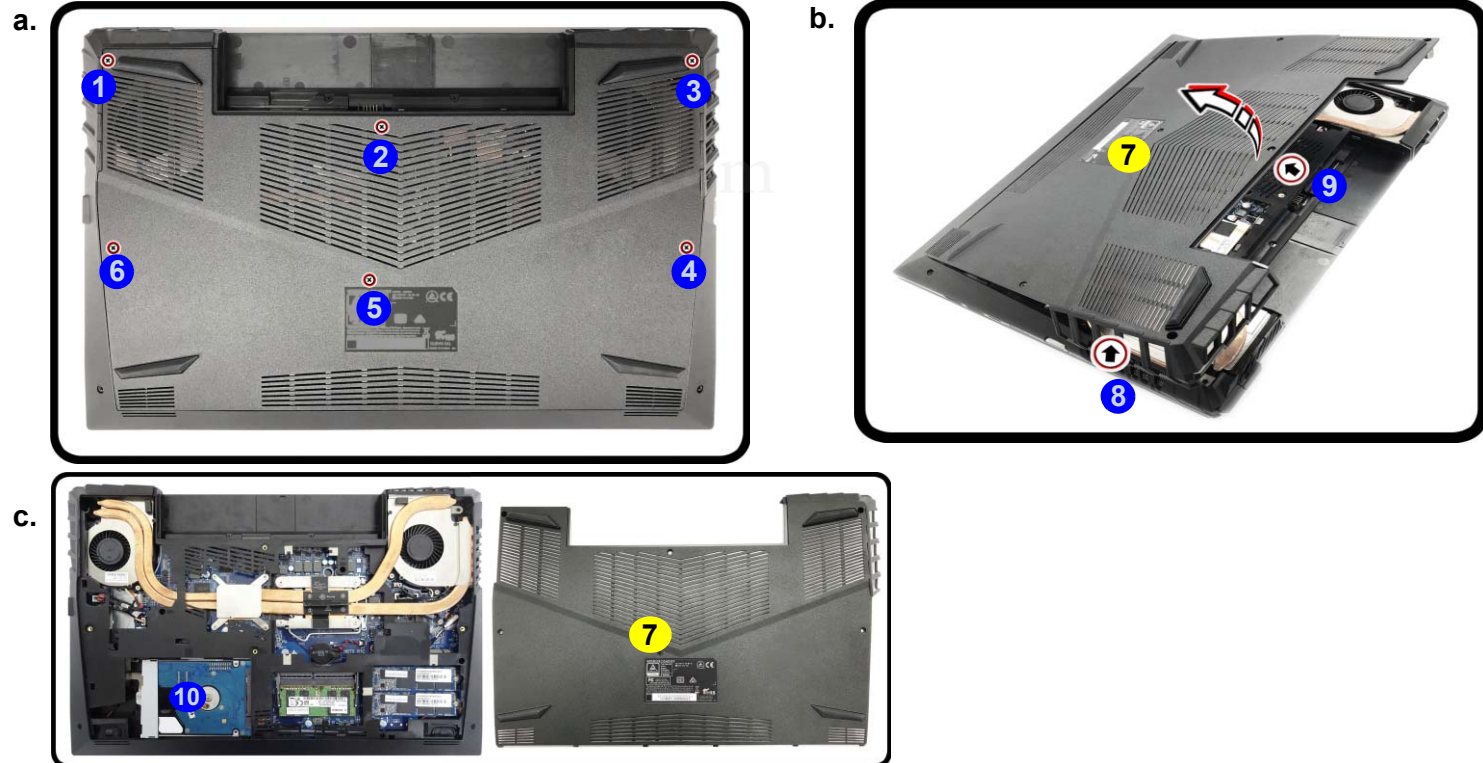
- 6 Screws

## Removing the Hard Disk Drive

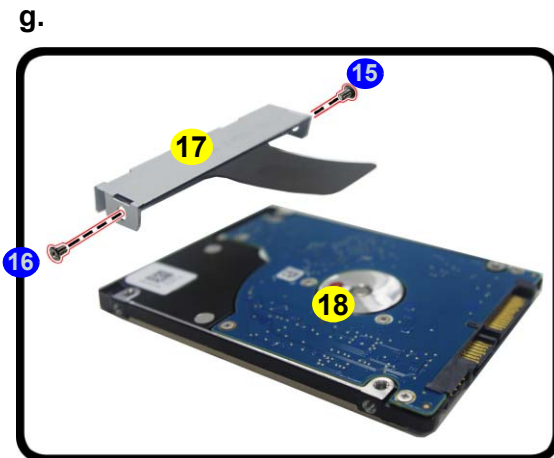
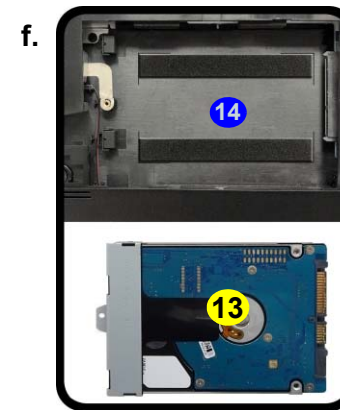
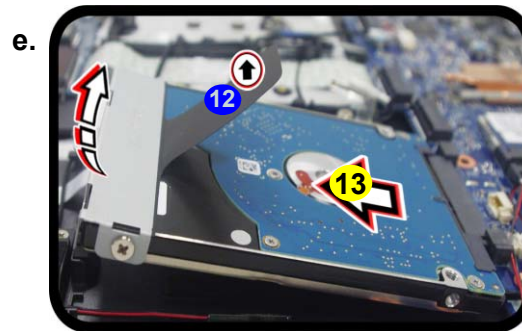
The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 7mm (h). Follow your operating system's installation instructions, and install all necessary drivers and utilities (as outlined in **Chapter 4 of the User's Manual**) when setting up a new hard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

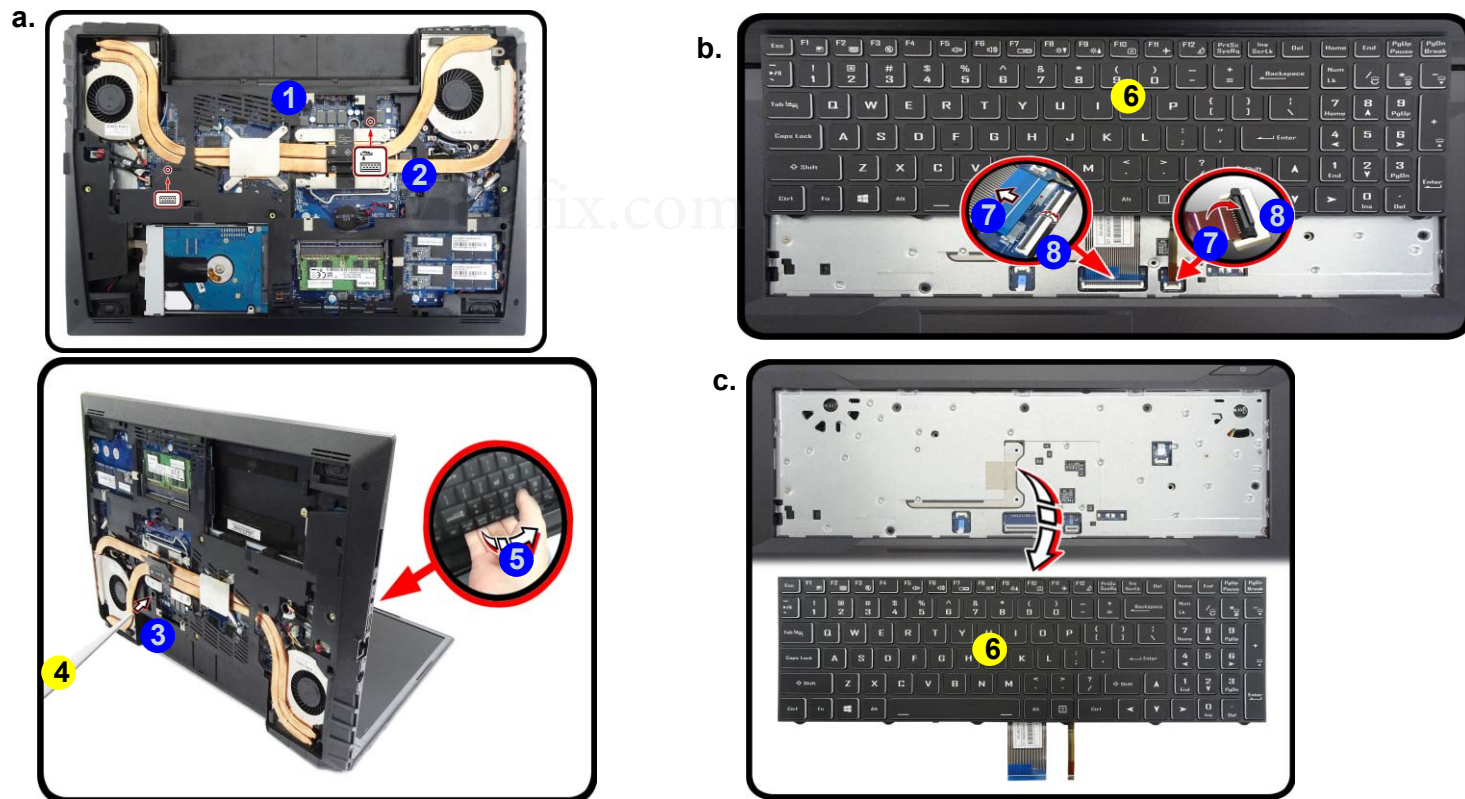
When re-inserting the keyboard firstly, align the keyboard tabs at the bottom of the keyboard with the slots in the case.



4. Eject Stick
6. Keyboard

- 2 Screws

## Removing the Keyboard



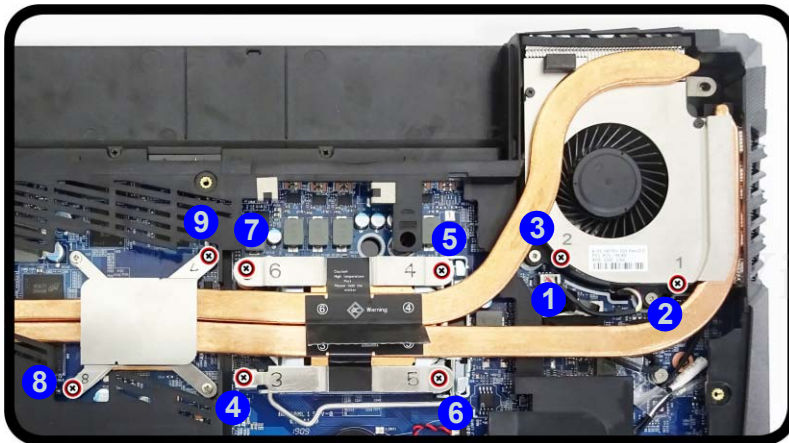


# Removing and Installing the Processor

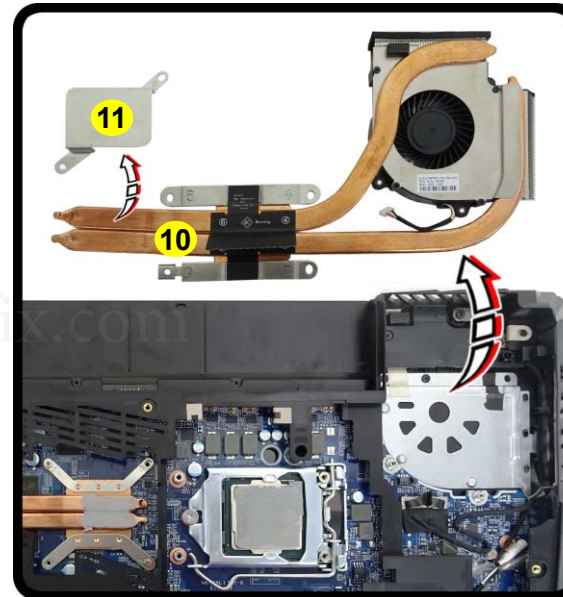
## Processor Removal Procedure

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.

Vinafix.com



10. Heat Sink Unit  
11. Heat Sink Bracket

- 8 Screws

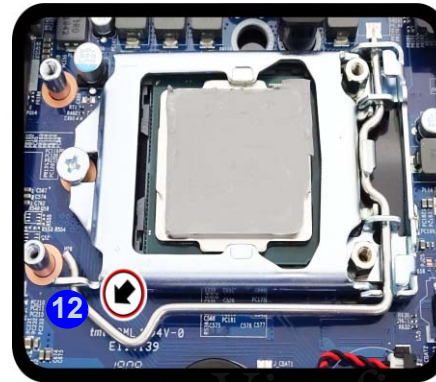
## Disassembly

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

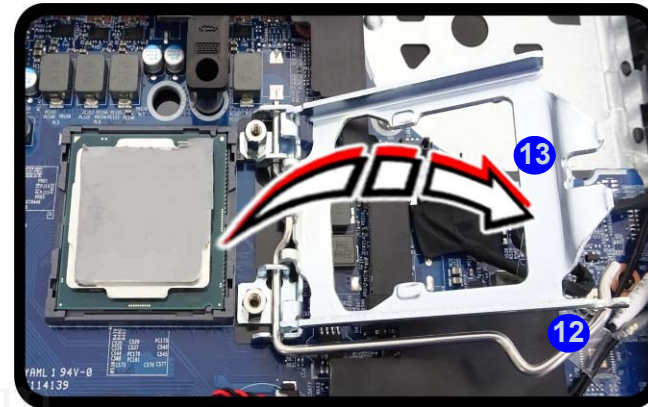
- c. Move the latch and bracket fully in the direction indicated to unlock the CPU.
- d. Lift the CPU out of the socket.

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!).

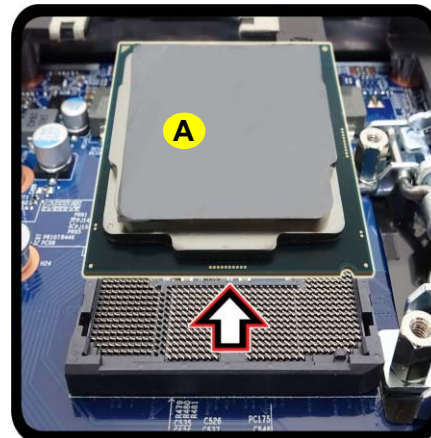
c.



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.



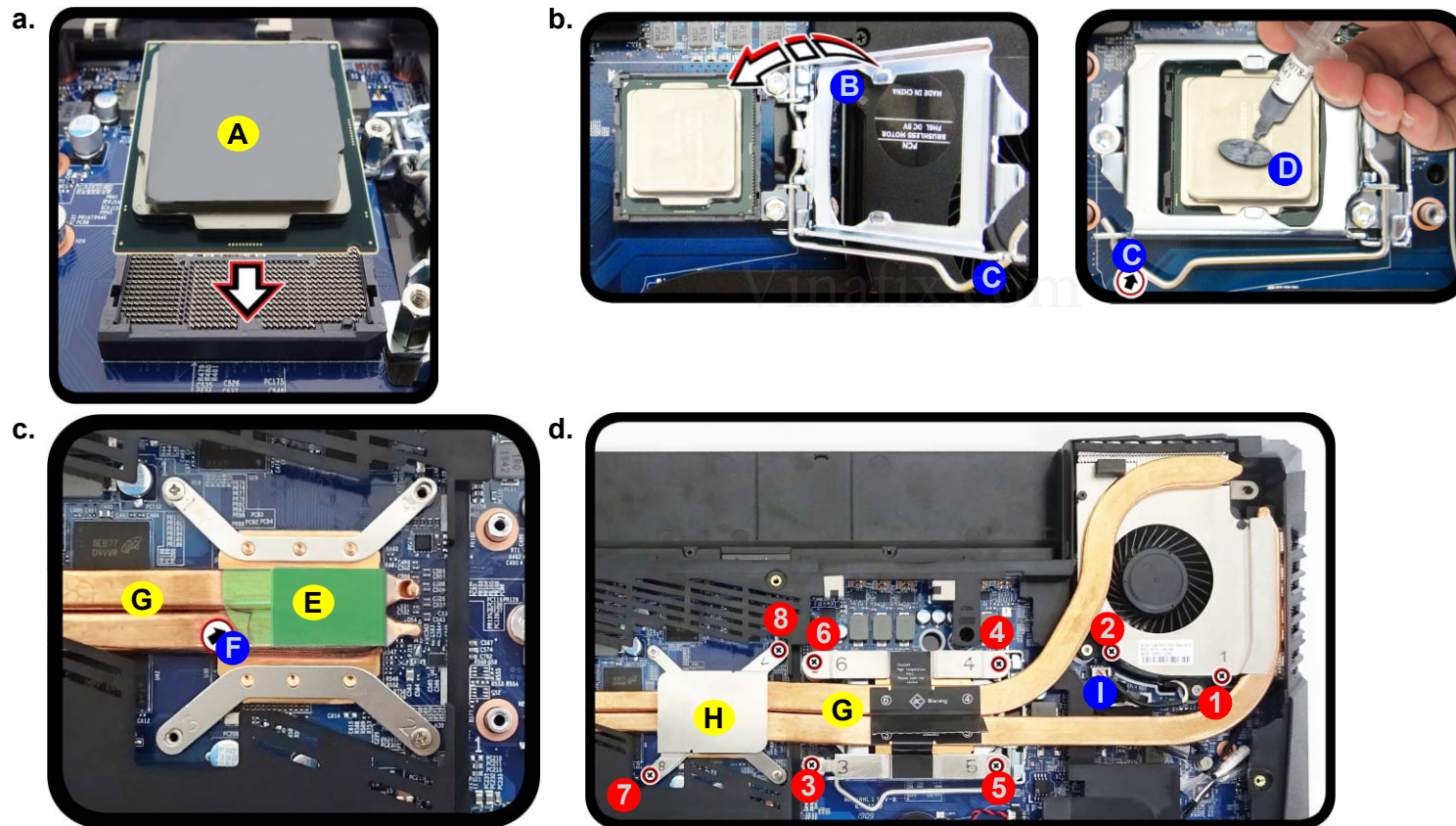
A. CPU


## 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.



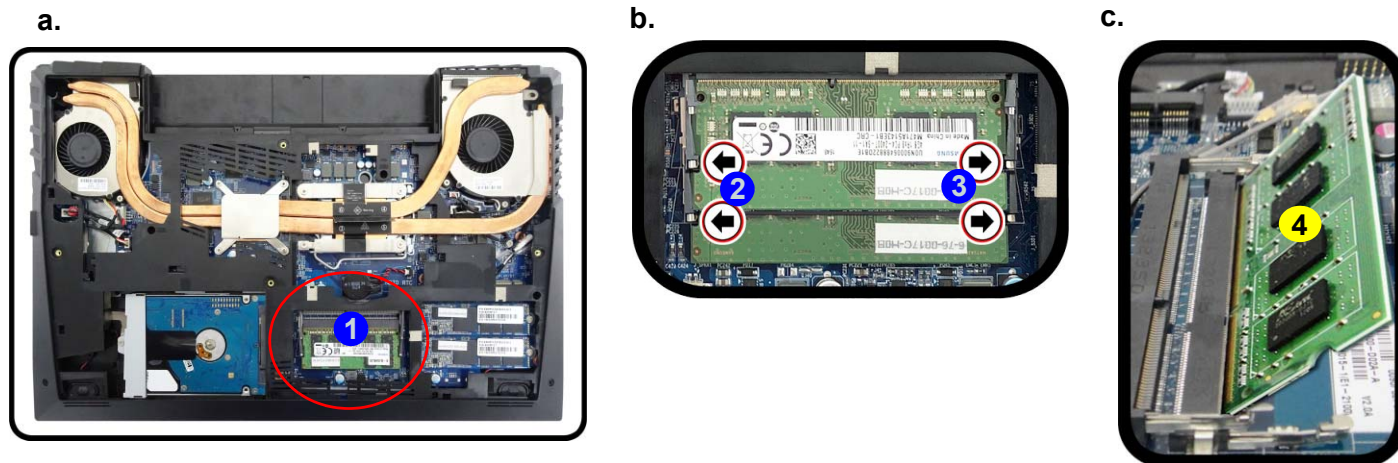
### 4. RAM Module

## 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

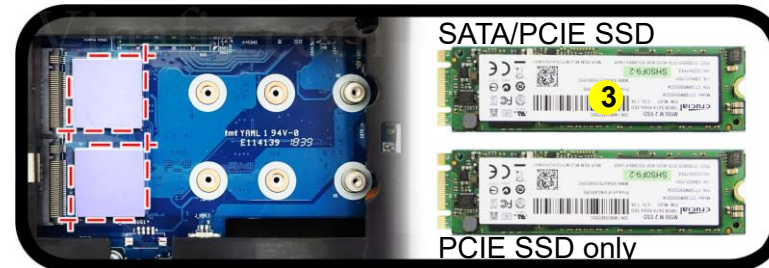
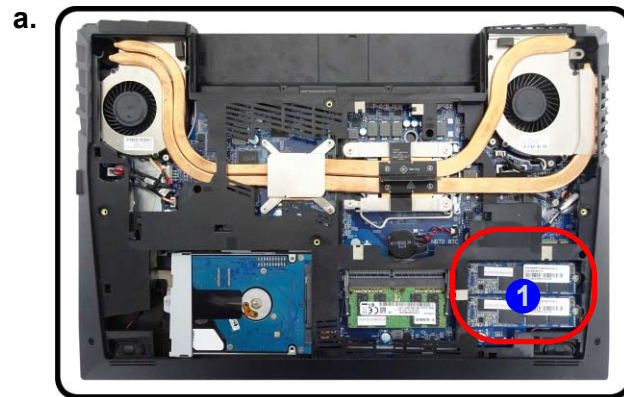
- Turn **off** the computer, turn it over, remove the battery ([page 2 - 5](#)).
- The RAM-2 modules will be visible at point **1** on the mainboard ([Figure 8a](#)).
- Gently pull the two release latches (**2** & **3**) on the sides of the memory socket in the direction indicated by the arrows ([Figure 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

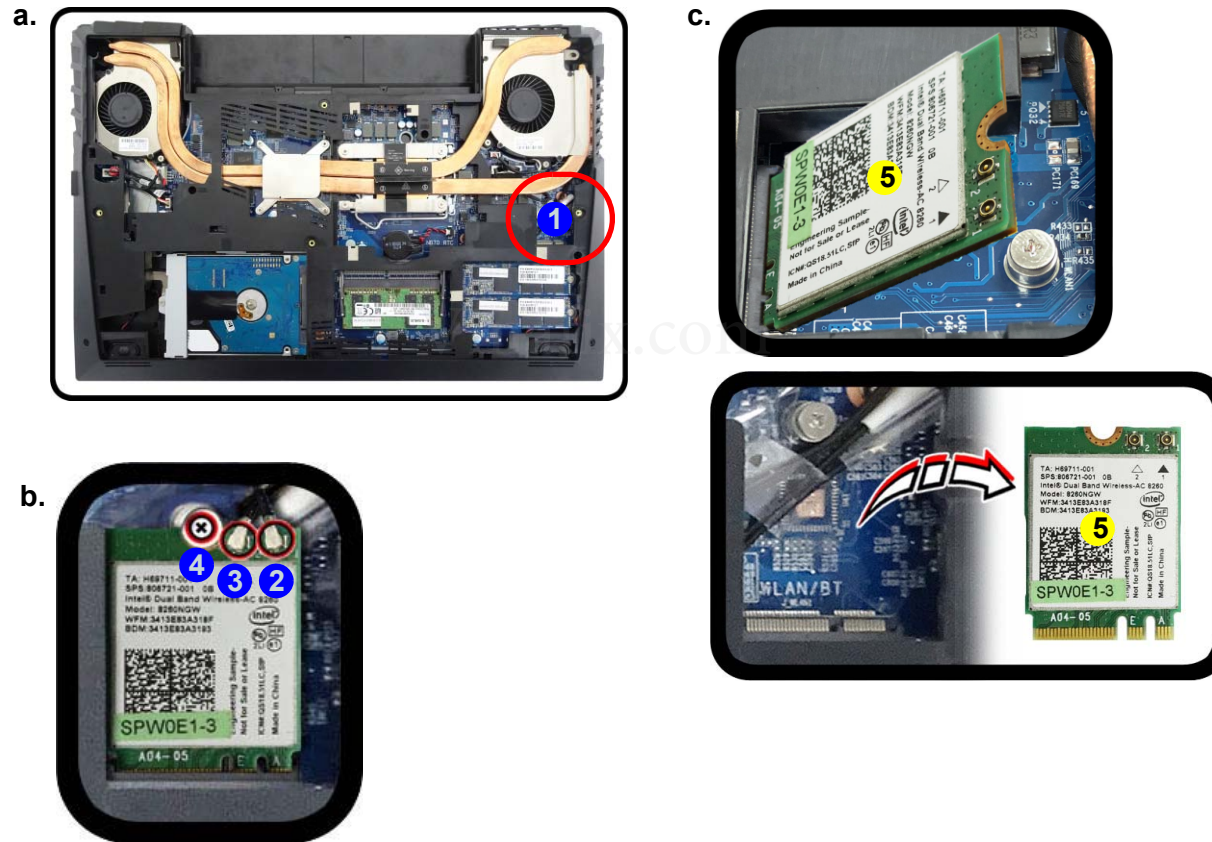
*Figure 10*  
**Wireless LAN  
Module Removal**

- 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).



## 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).

Vinafix.com

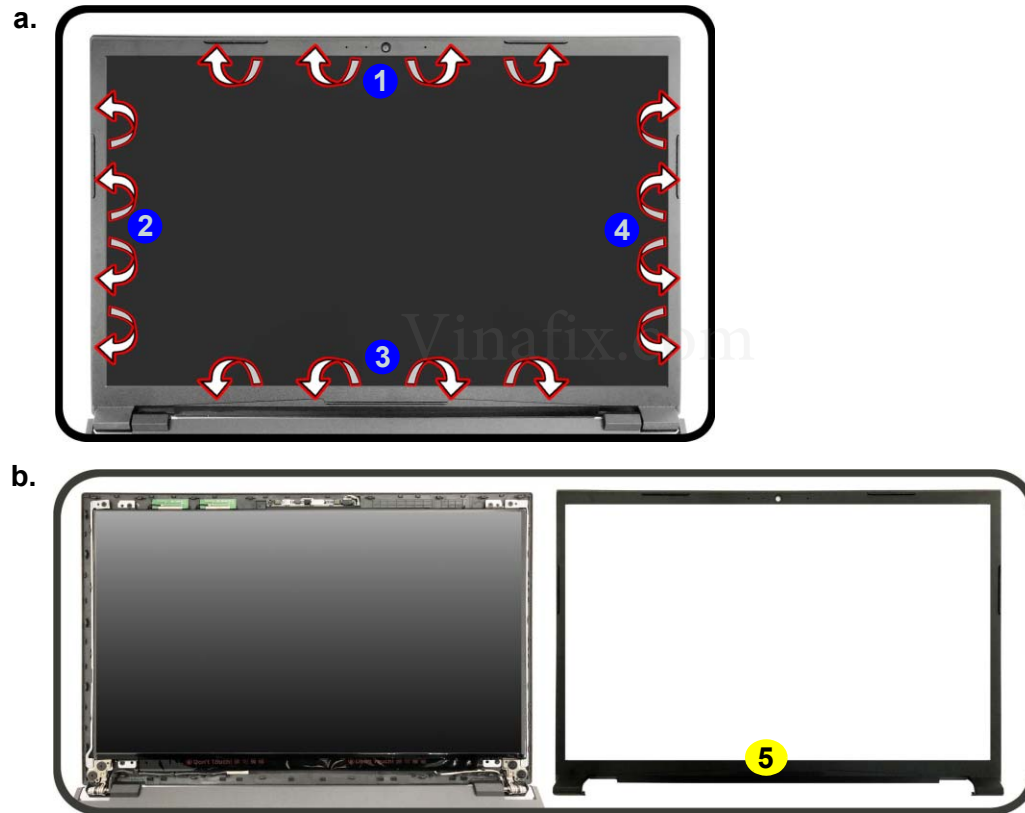
## Disassembly

*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.

c.



d.



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

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



7. CCD Module

Vinafix.com

---

# 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.

Vinafix.com

---

## Part List Illustration Location

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

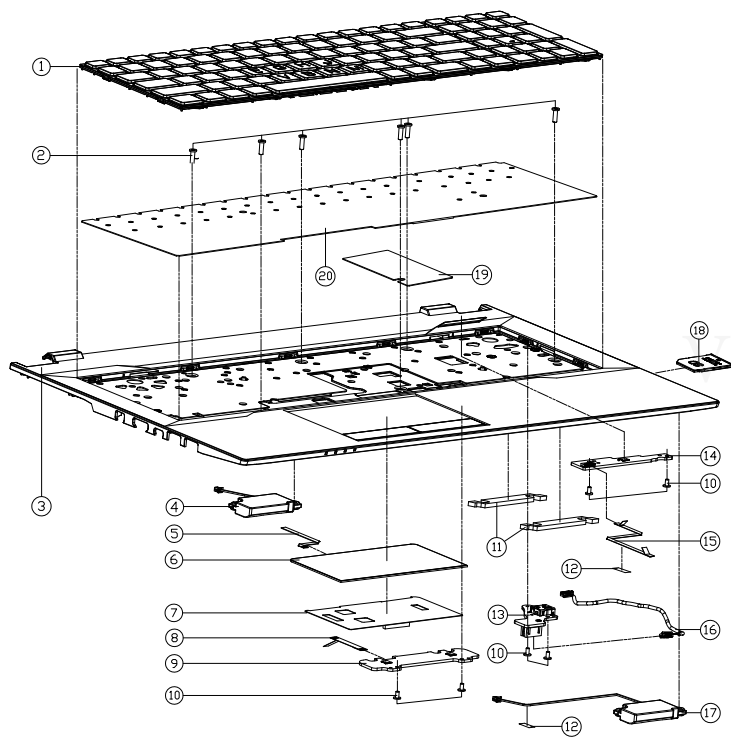
*Table A - 1*  
**Part List Illustration  
Location**

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>

Vinafix.com



Top

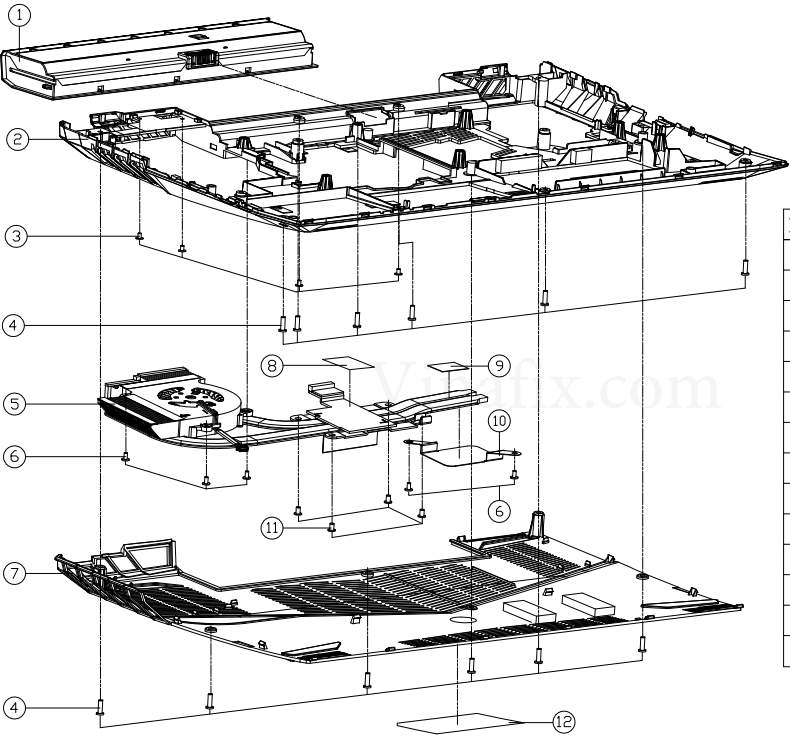


ITEM	PART NAME	PART NO	REMARK
1	KB FOR MULTI 15C BL KB US SERIES NB70TH	6-NB70TH-KB-MCL-US	
1	KB FOR NON BL KB US SERIES NK60SB	6-NK60SB-KB-NBL-US	
1	KB FOR MULTI 15C BL KB US SERIES NB70TH	6-80-N15Z0-212-1M	
1	KB FOR MULTI 15C BL KB US SERIES NB70TH	6-80-N15Z0-21D-1M	
2	.SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
3	TOP CASE MODULE NB50TA	6-39-NB5A2-013	
4	SPK+CABLE L L25X14 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) N750WU (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 W54(ELCHANGE)	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 L25X14 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

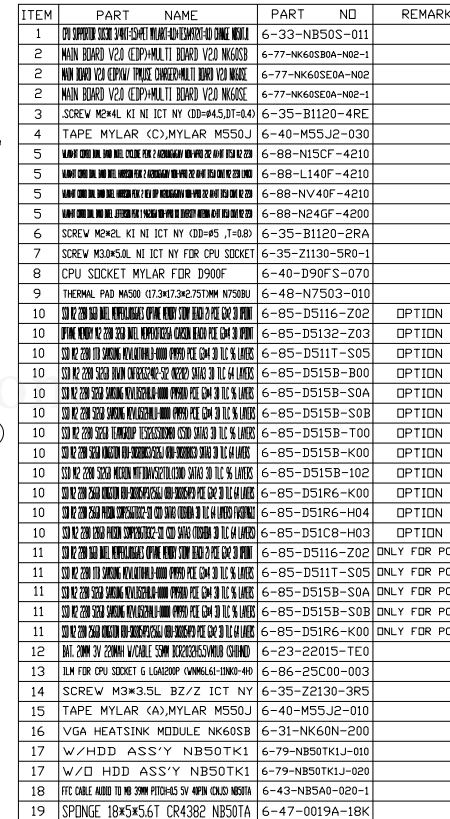
# Bottom

Figure A - 2  
Bottom



ITEM	PART NAME	PART NO	REMARK
1	DATP S LI 108V/4AH/47WH 33CP SMP/SHI CAC (0802025) 98022201/B (TEXTURE) NB50TA	6-87-NB50S-41C02	
1	DATP S LI 108V/4AH/47WH 33CP SMP/ALC CAC (0802025) 98022201/F (TEXTURE) NB50TA	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	

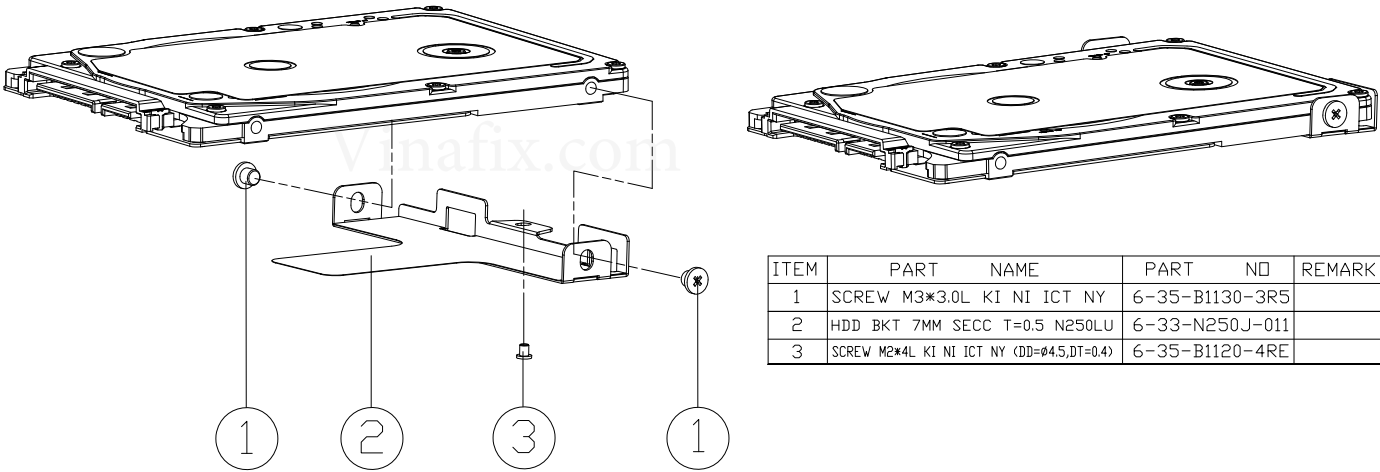
## A.Part Lists



## A. Part Lists

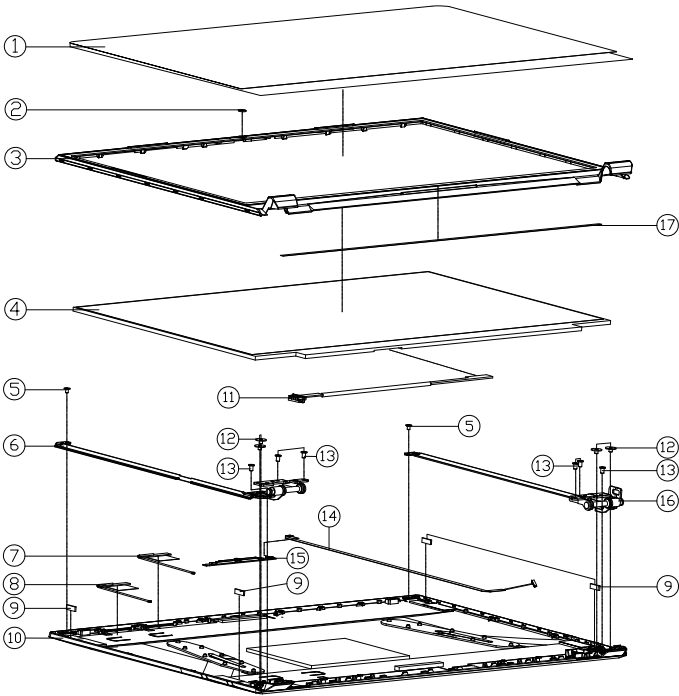
HDD

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 4MMX(PMMA)6*3)W940TU	6-42-W9401-020-2	
3	FRONT COVER MODULE NB60TK1	6-39-NB601-013	
4	LCD 116.1" FHD/WVA/N7/NDN GT/EDP INNOLUX N61HCA-EA1 (LED) 32MM	6-50-MBB32-V130	
4	LCD 116.1" FHD/WVA/N7/NDN GT/EDP INNOLUX N61HCA-EA2 (LED) 32MM	6-50-MBB32-V020	
5	SCREW M2*3L KI BZ ICT NY (DD=Ø4.5,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(Ø8,T=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	UVI CAMERA CORDON (TWO) ONT0282822K IN 10 DVS24 N520 195MM WHITE-LED WITH MICROBROW BORDER WITH FFD	6-88-N15ZC-5100	OPTION
15	UVI CAMERA CORDON (TWO) ONT0282822K IN 10 DVS24 N520 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(FM32822K 330*440.2)FOR NB50HC	6-40-N85C1-030-1	

Figure A - 5  
LCD

Vinafix.com



# 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**

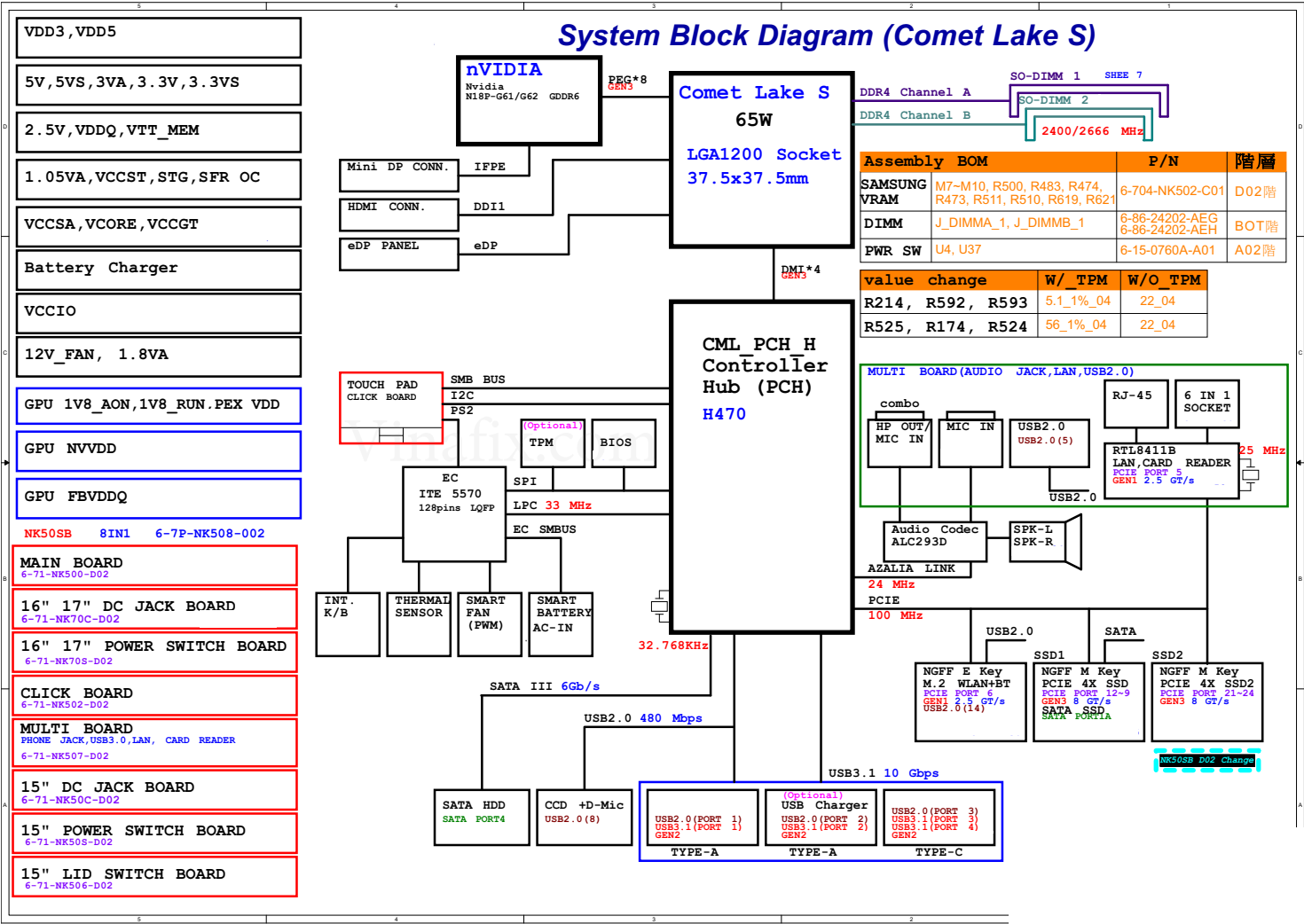


## Version Note

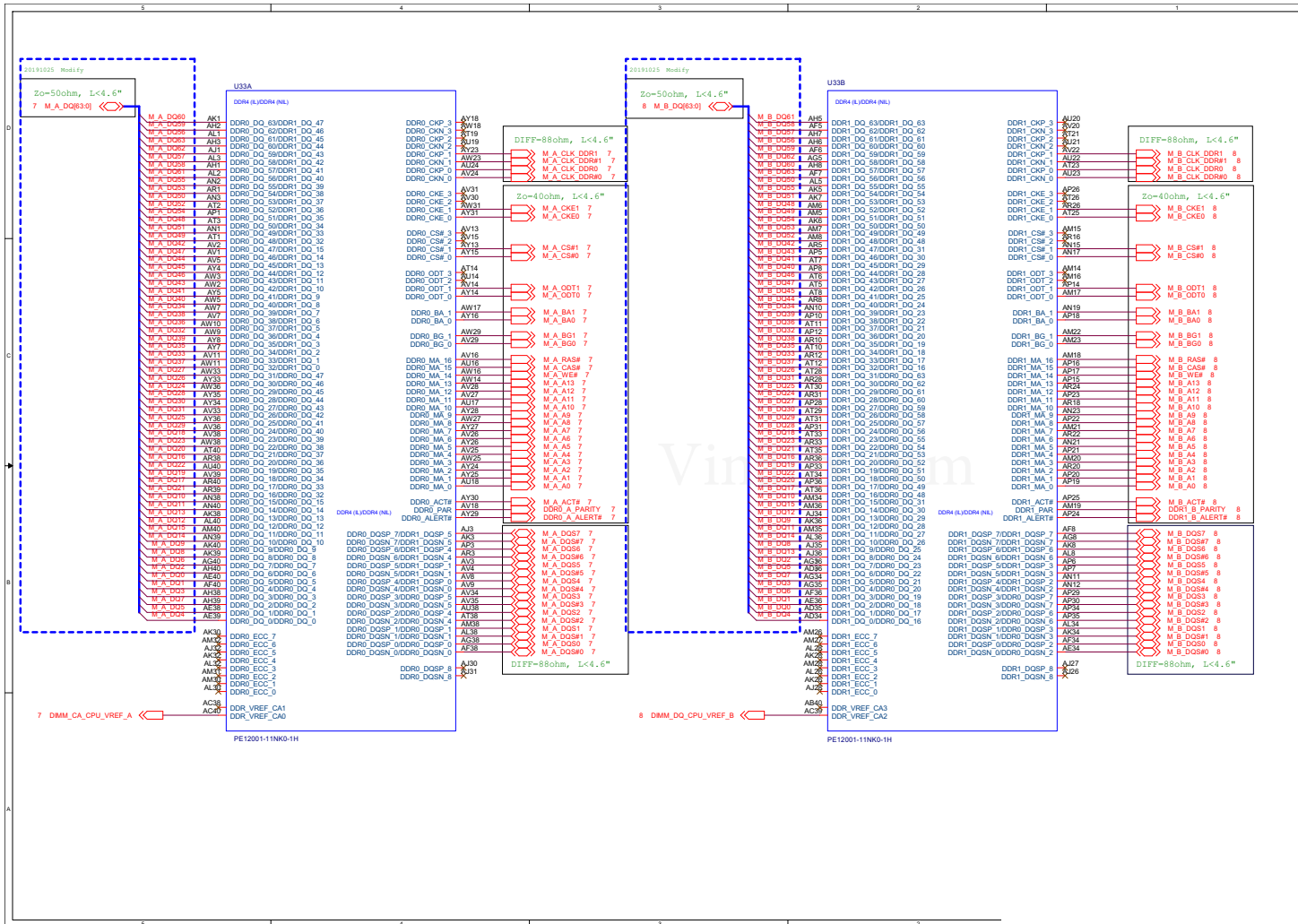
The schematic diagrams in this chapter are based upon version 6-7P-NK508-002. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

System Block Diagram

Sheet 1 of 61  
System Block  
Diagram



## Processor 1/5



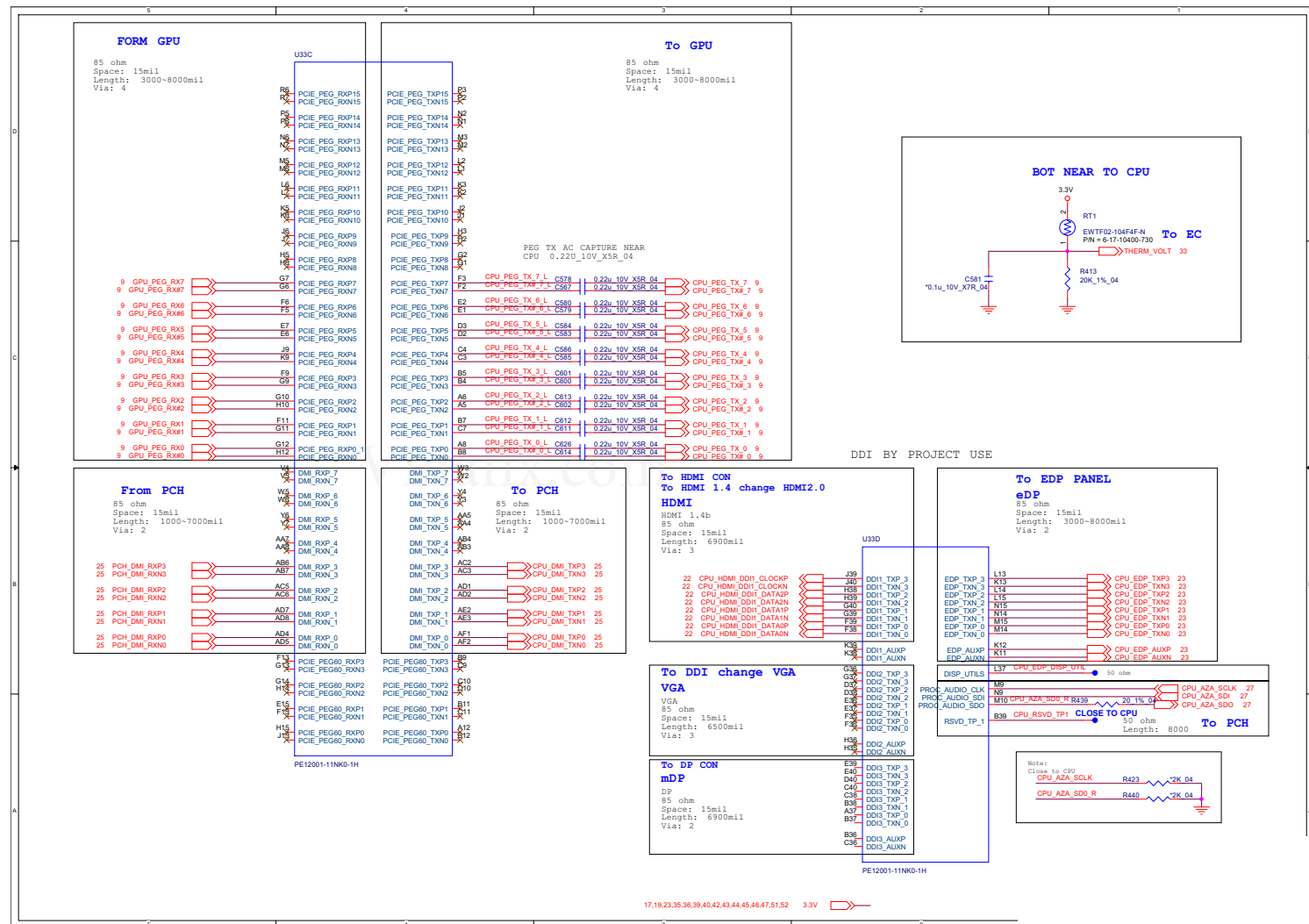
Sheet 2 of 61  
Processor 1/5

B.Schematic Diagrams

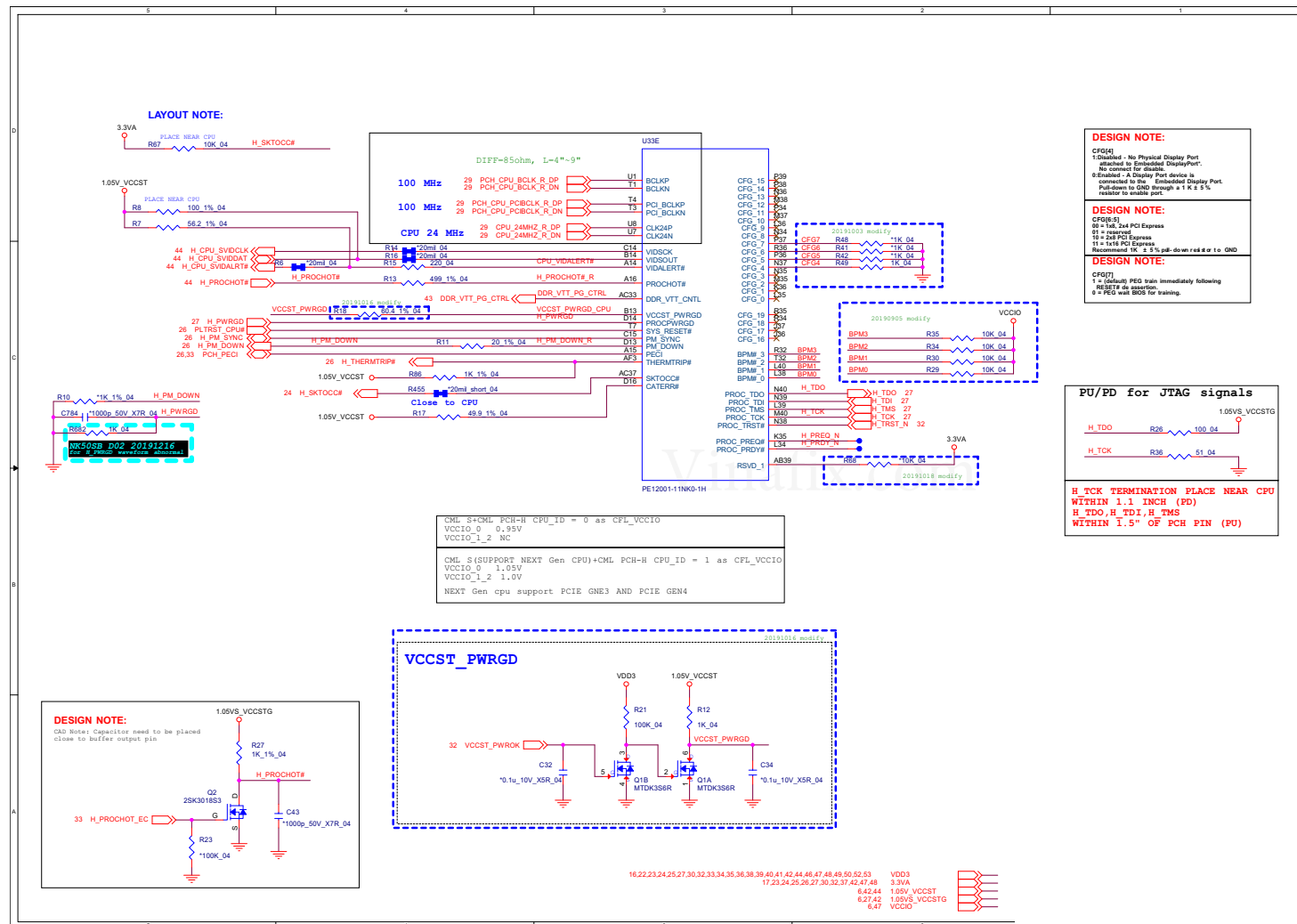
## Schematic Diagrams

## Processor 2/5

Sheet 3 of 61  
Processor 2/5



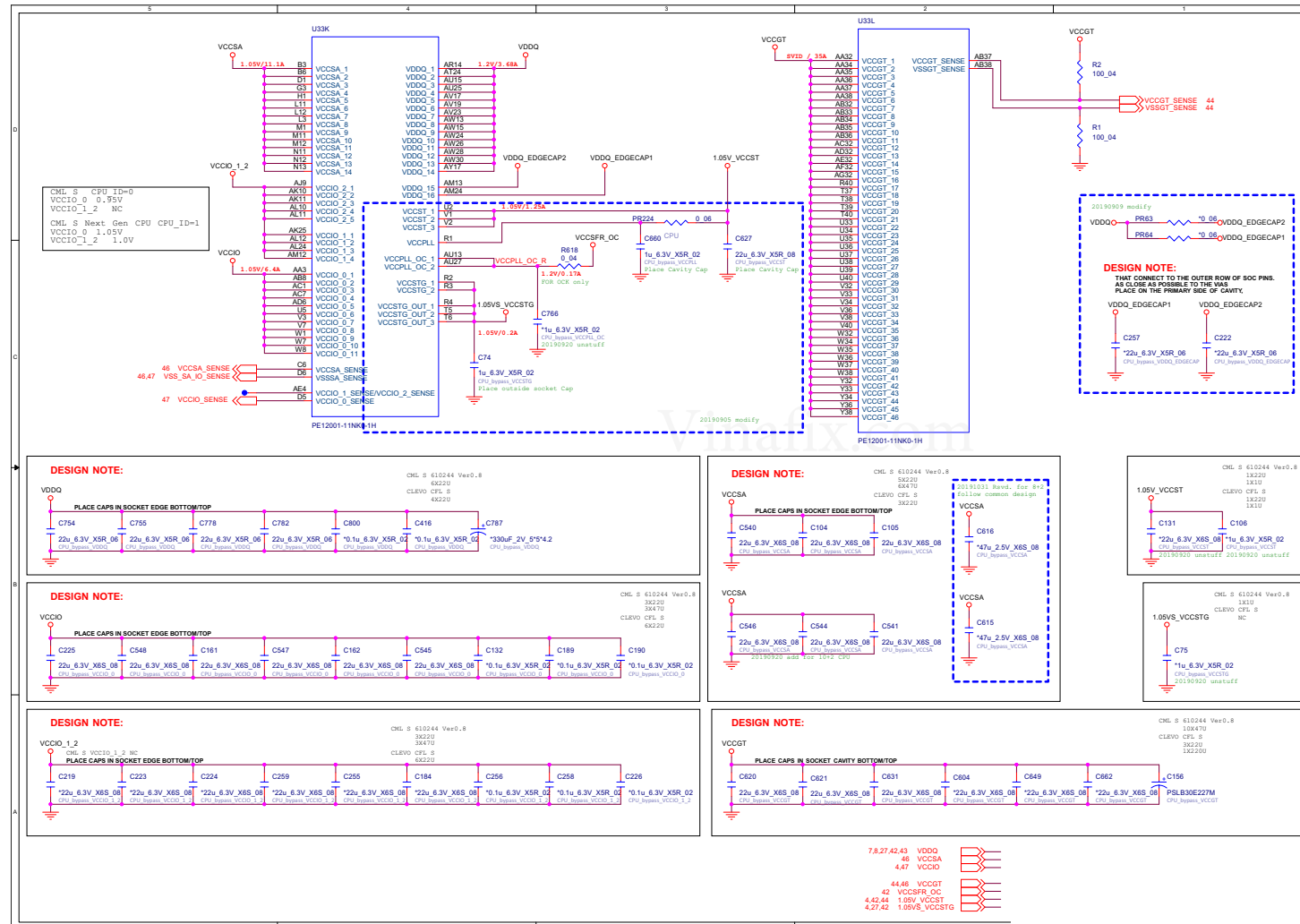
**Processor 3/5 B - 5**







**Processor 5/5 B - 7**

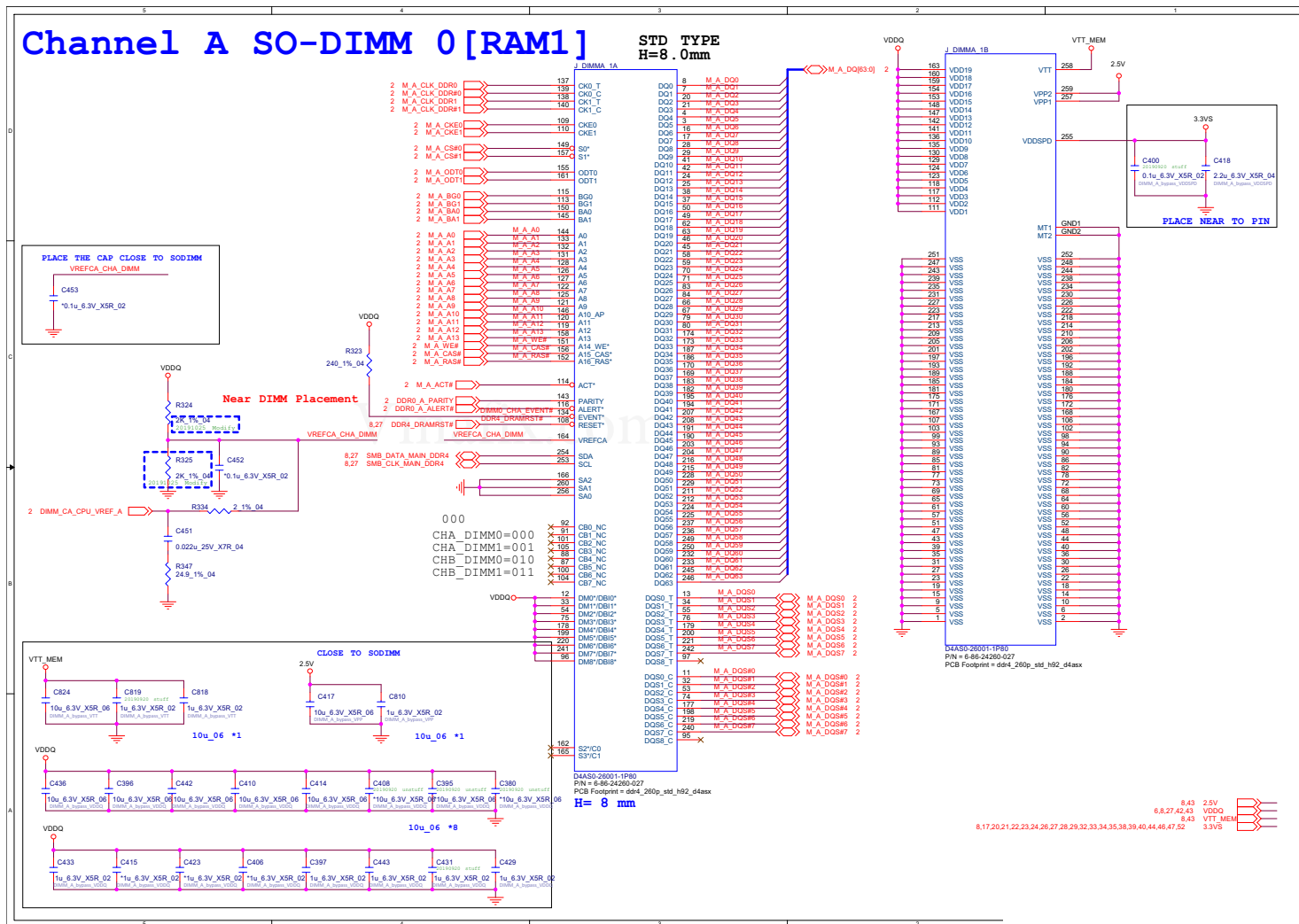


\_\_\_\_\_

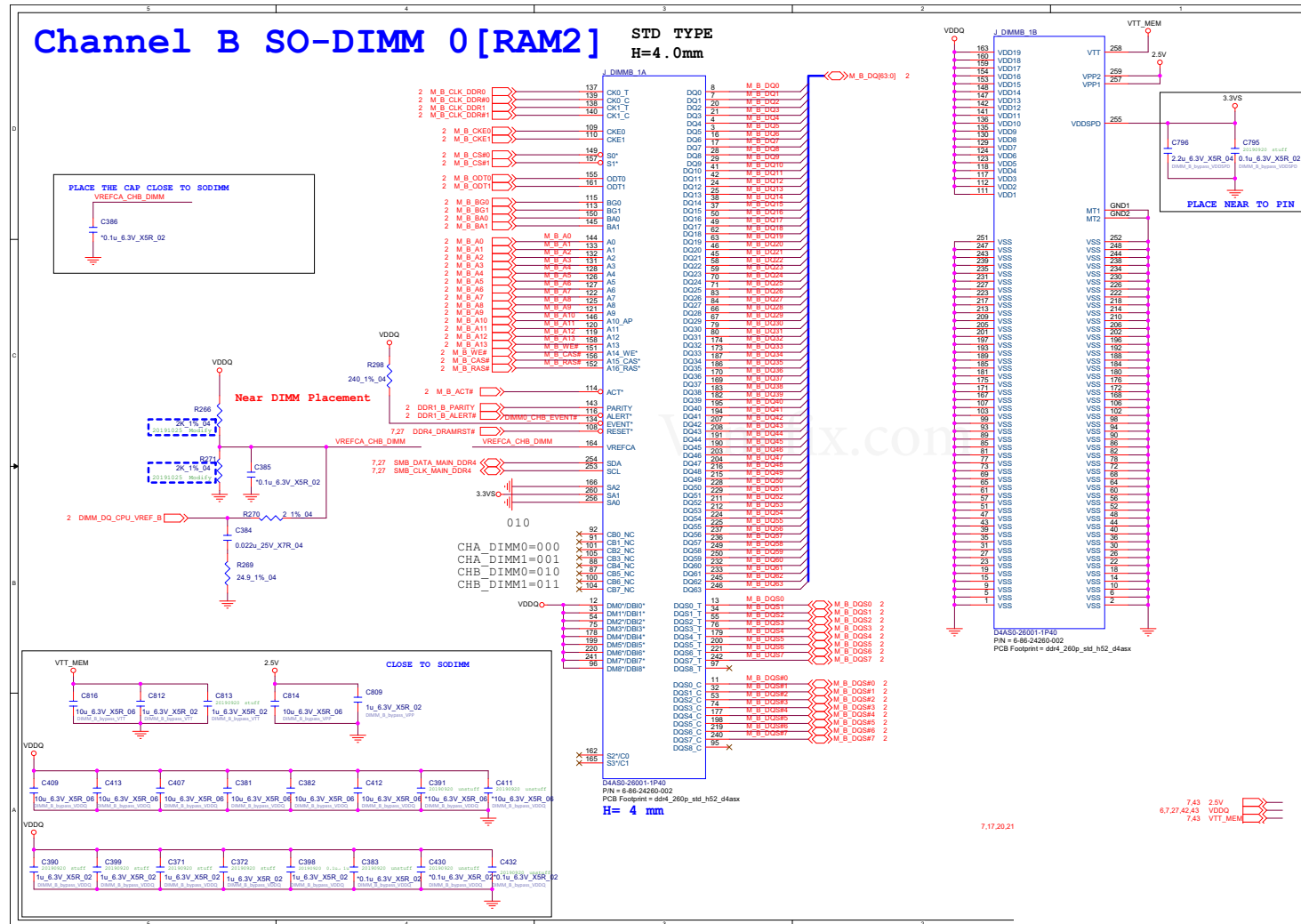
## DDR4 CHA SO-DIMM\_0

## B. Schematic Diagrams

Sheet 7 of 61  
DDR4 CHA SO-  
DIMM 0



## DDR4 CHB SO-DIMM\_0

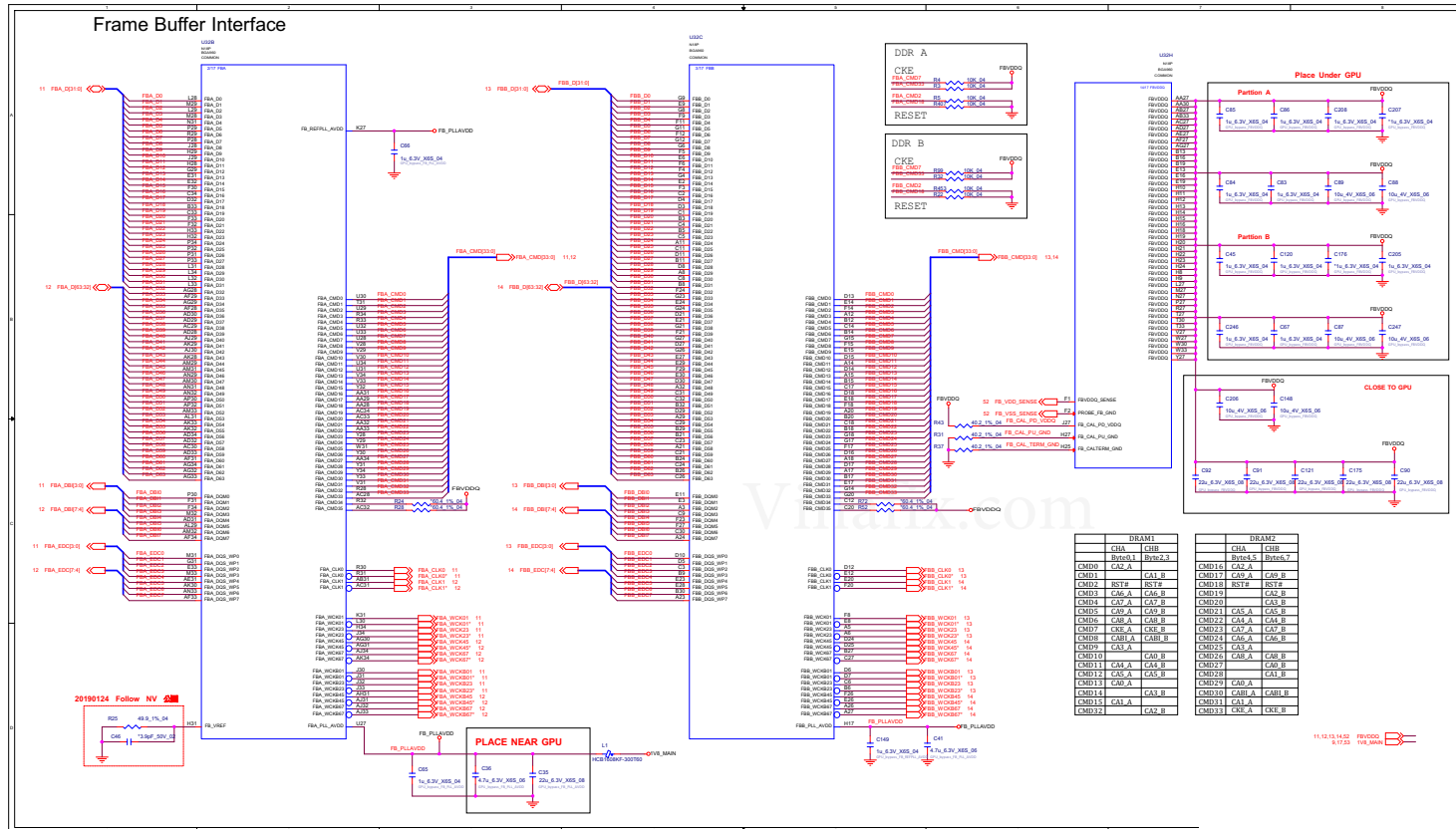


## B.Schematic Diagrams

Sheet 8 of 61  
DDR4 CHB SO-  
DIMM\_0



## VGA Frame Buffer Interface

Sheet 10 of 61  
VGA Frame Buffer Interface

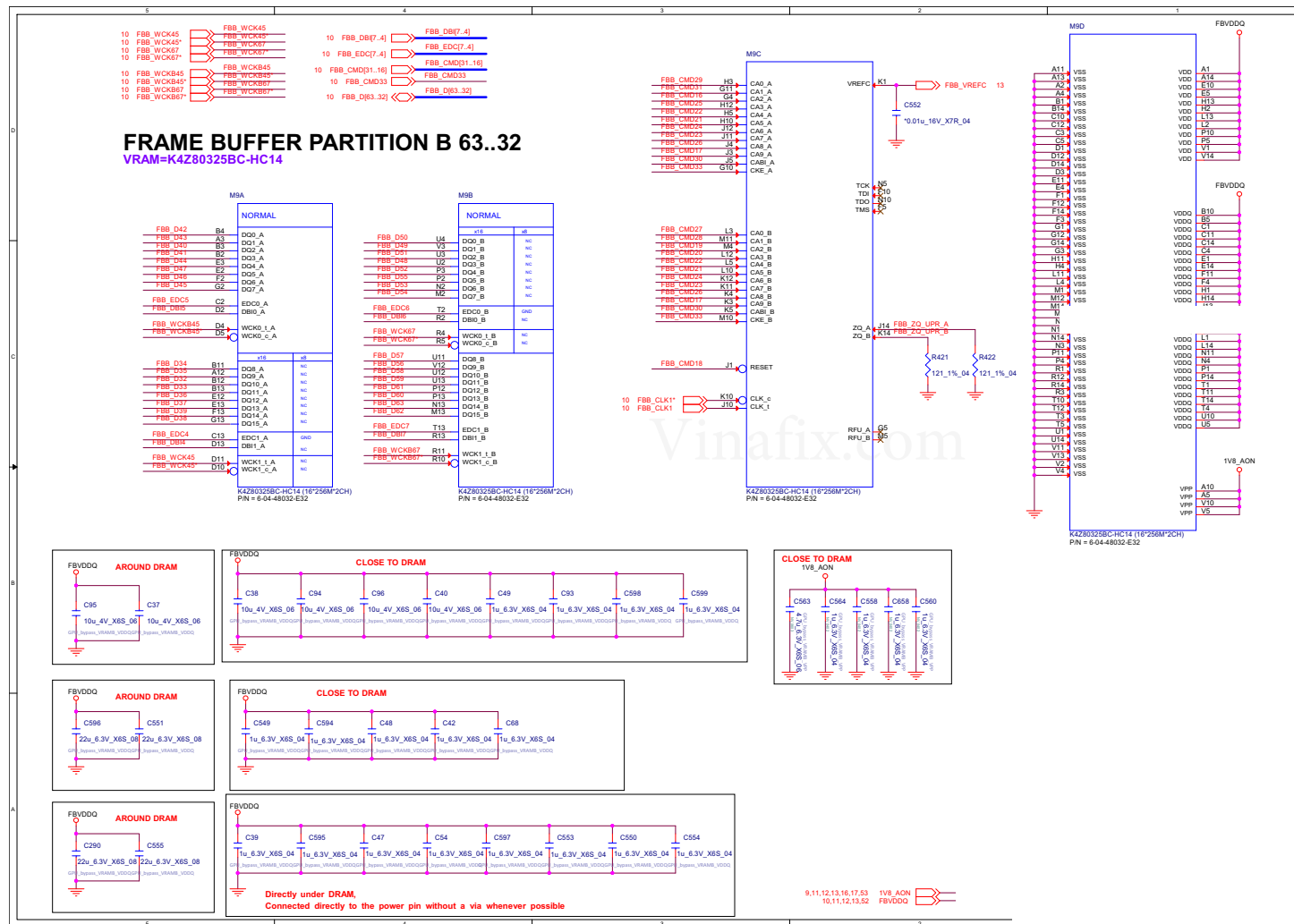




[illegible]



## VGA Frame Buffer B

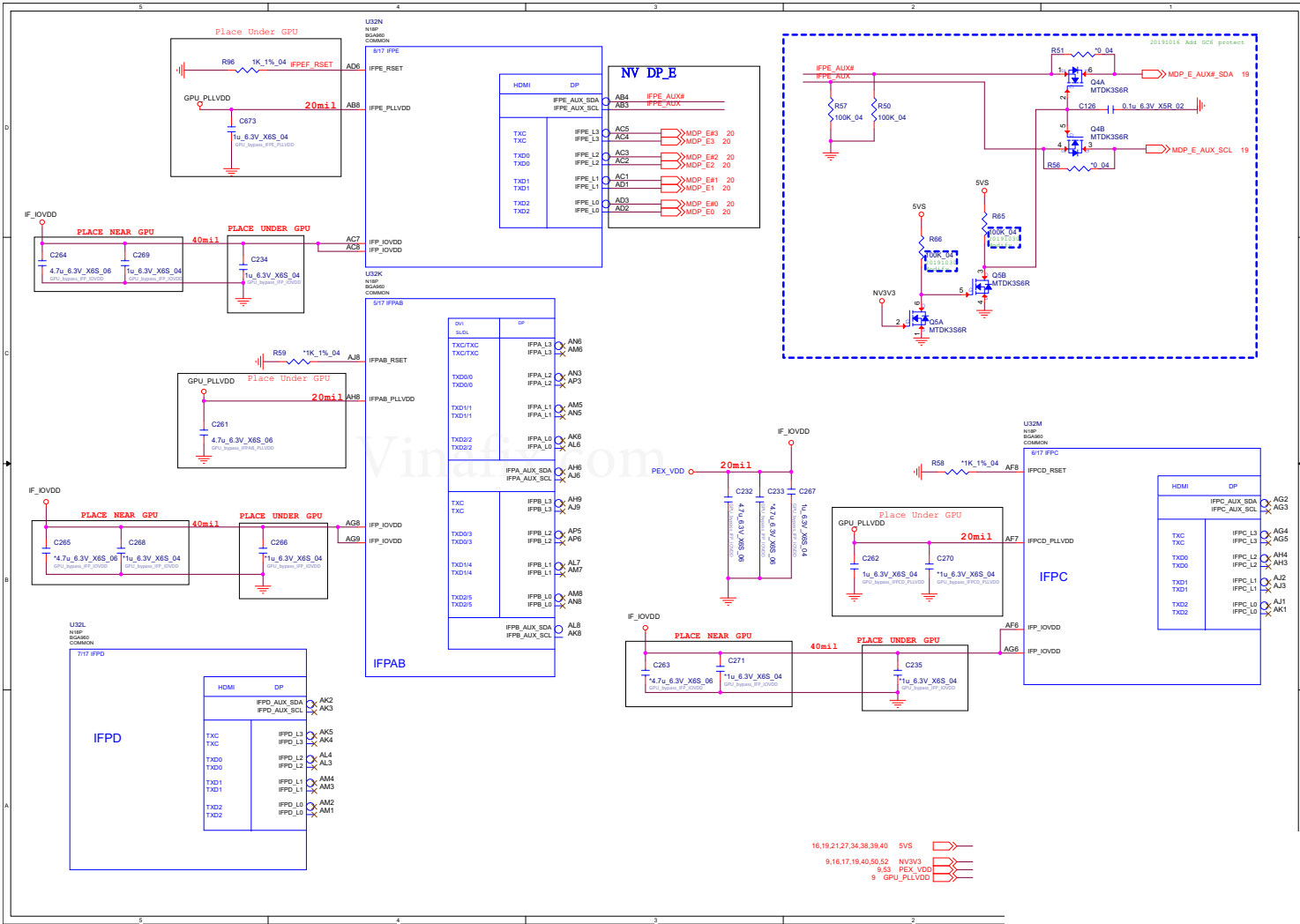
Sheet 14 of 61  
VGA Frame Buffer B

\_\_\_\_\_

## VGA I/O

## B.Schematic Diagrams

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



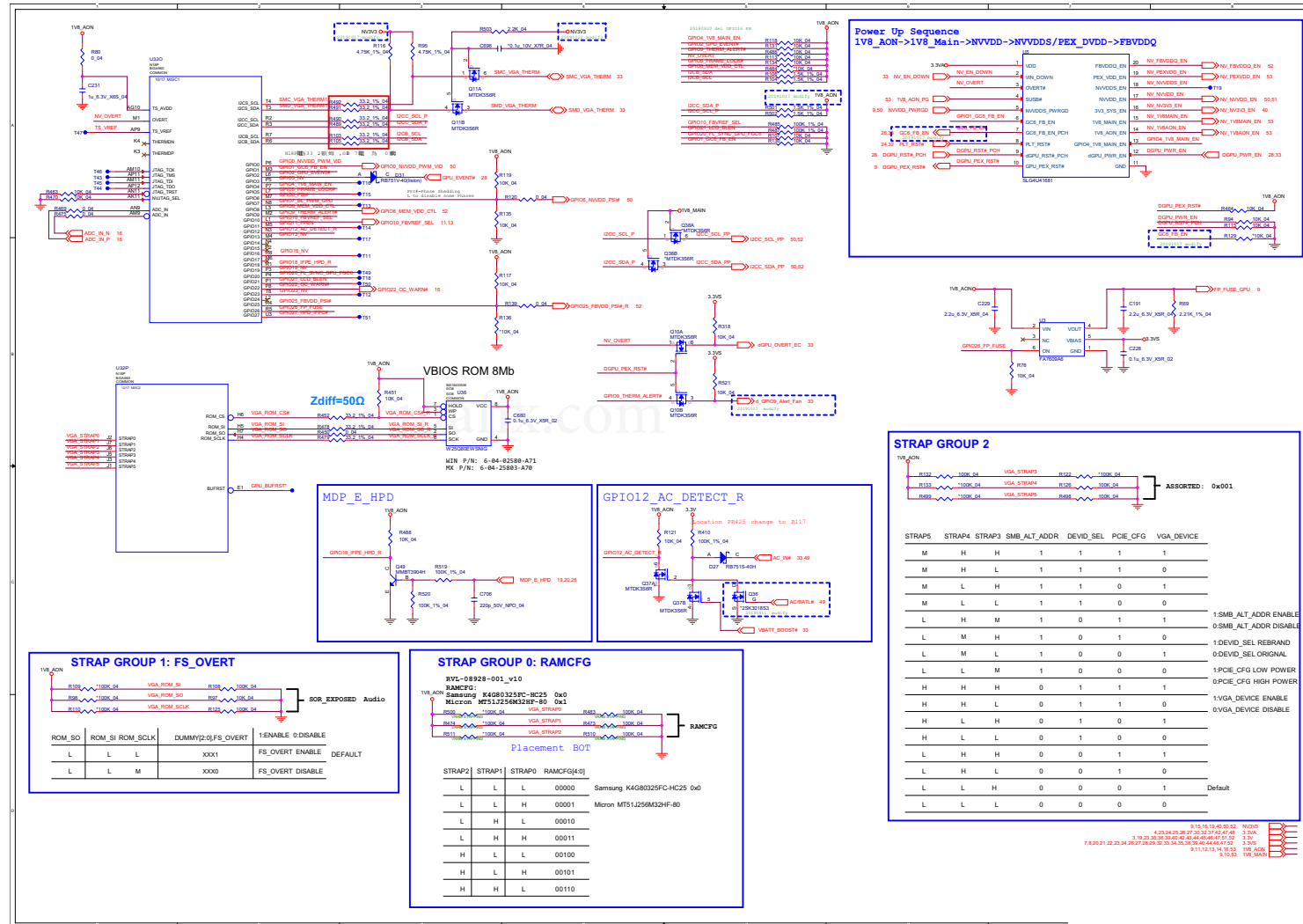




## Schematic Diagrams

## VGA Sequence / GPIO

Sheet 17 of 61  
VGA Sequence /  
GPIO

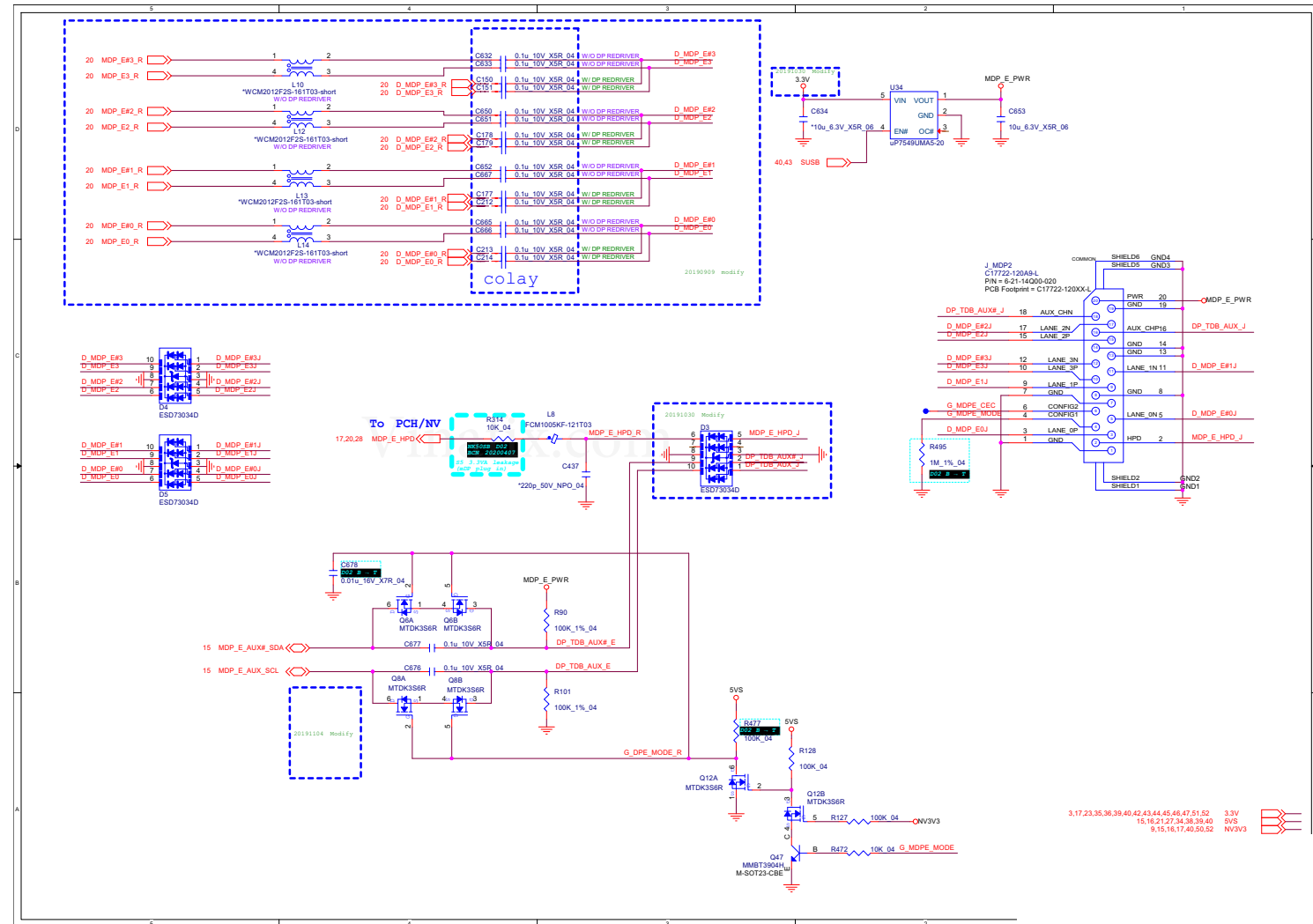


## GA Decoupling B - 19



# mDP Conn

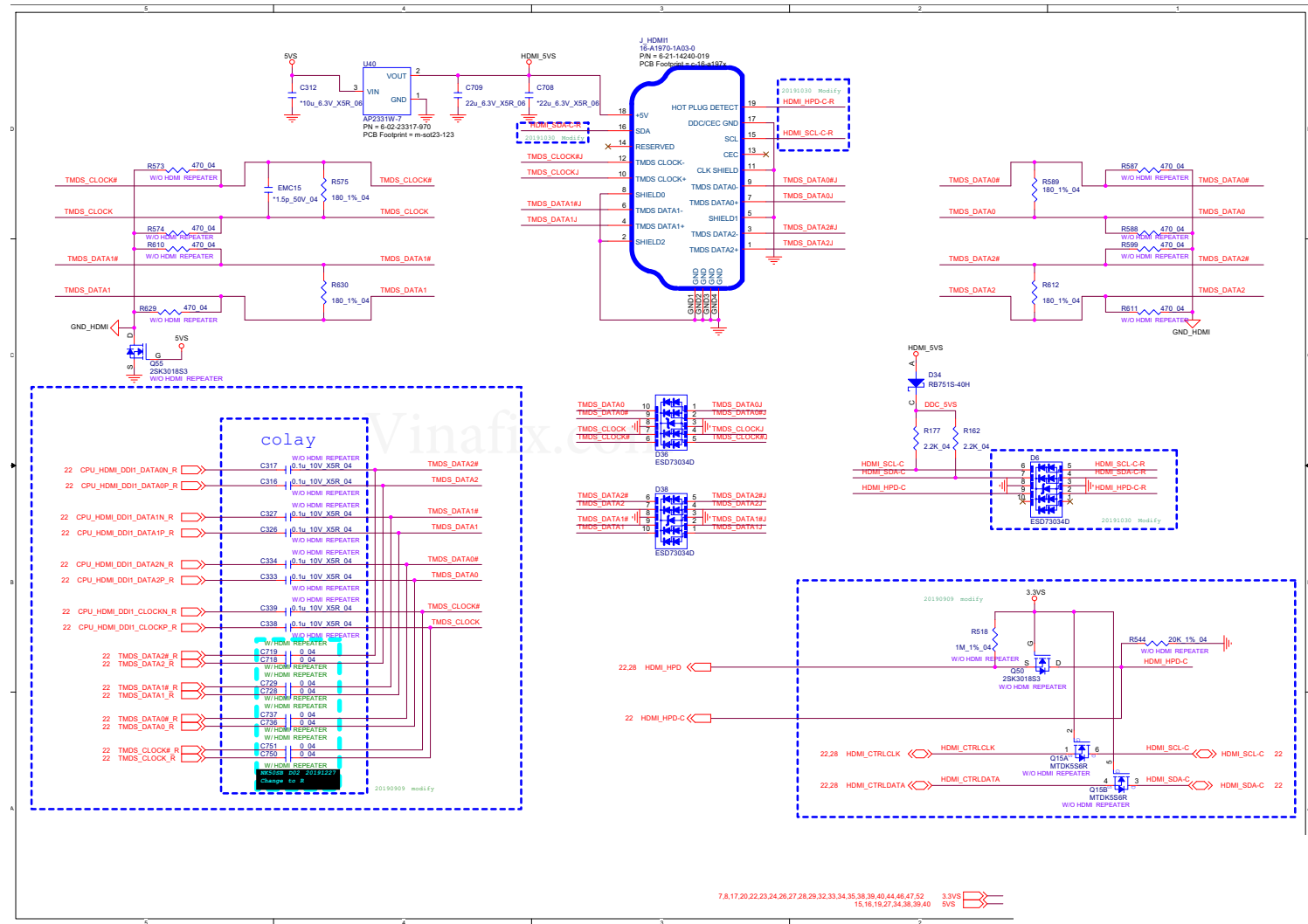
Sheet 19 of 61  
mDP Conn





## Schematic Diagrams

## HDMI

Sheet 21 of 61  
HDMI

## HDMI Repeater B - 23

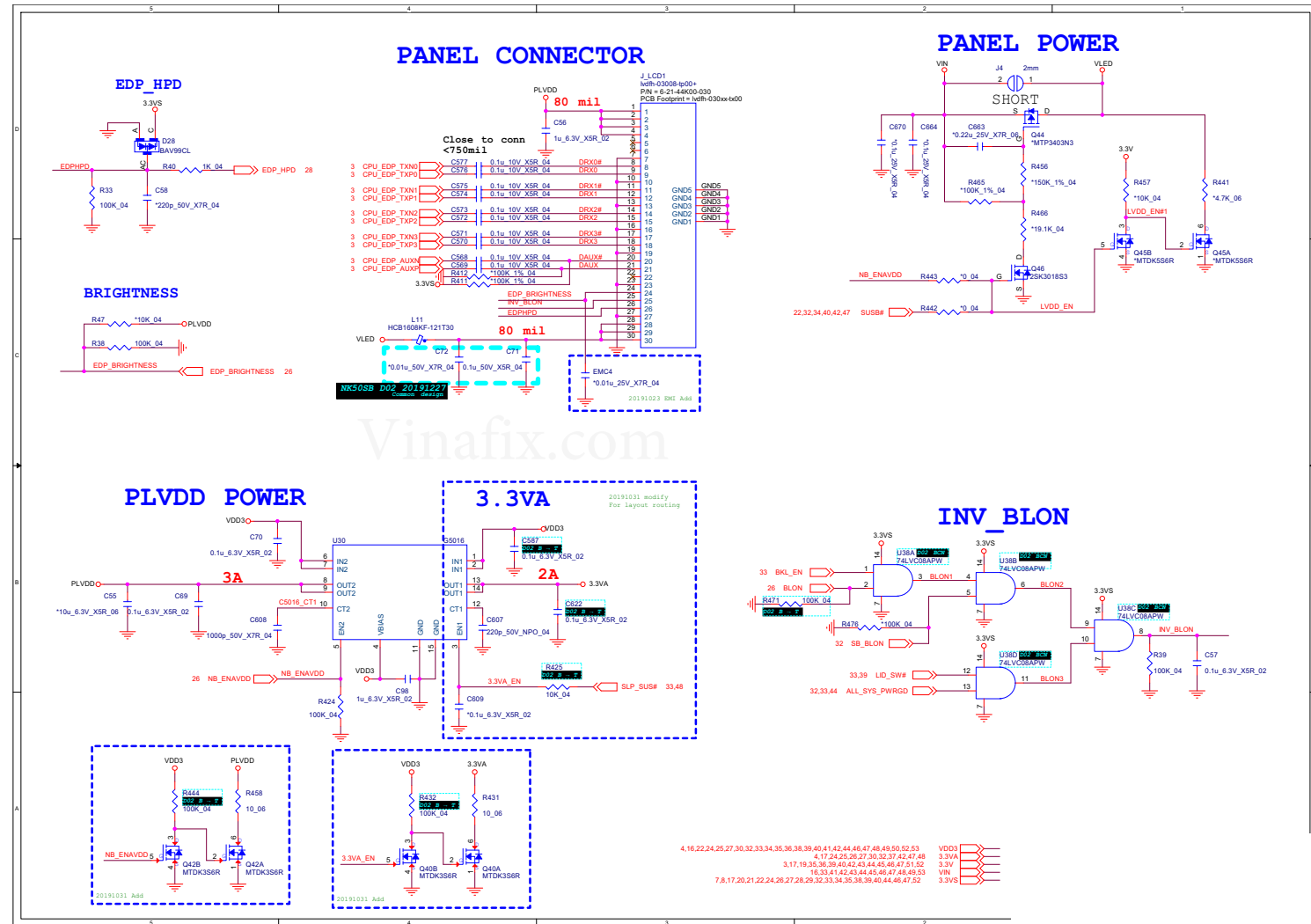




## Schematic Diagrams

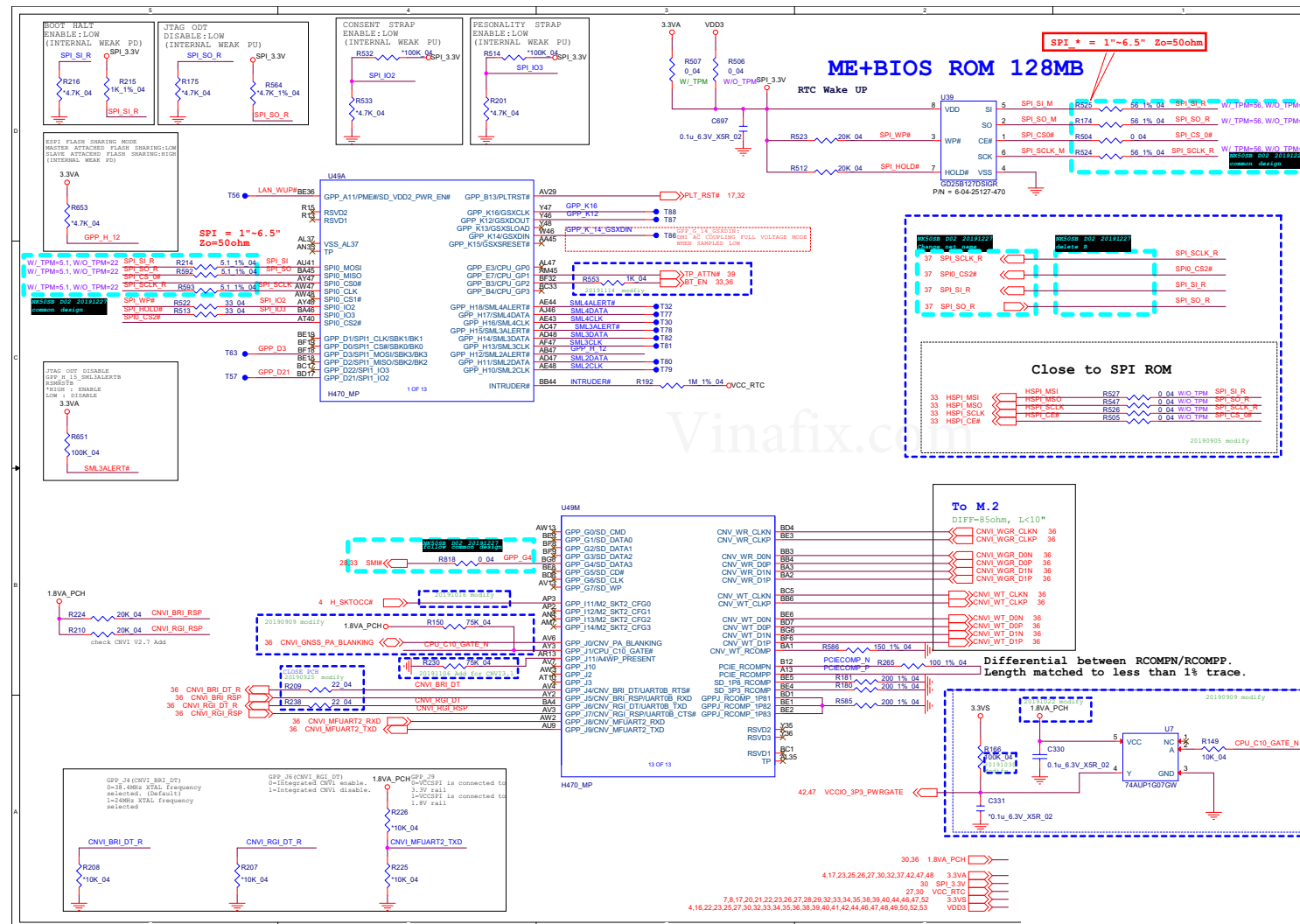
## Panel Conn

Sheet 23 of 61  
Panel Conn



## Schematic Diagrams

**PCH 1/9**

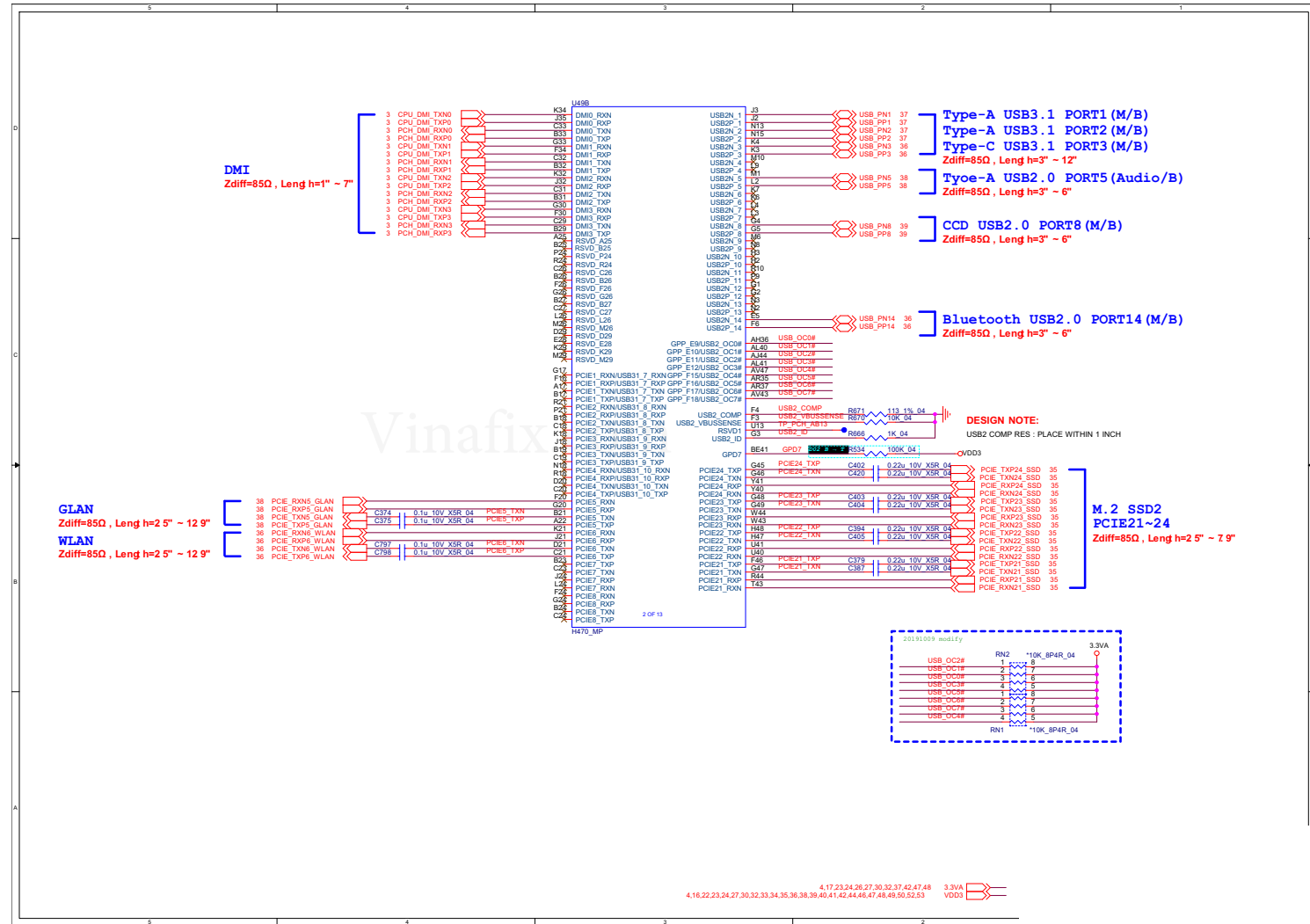


## B.Schematic Diagrams

**Sheet 24 of 61**  
**PCH 1/9**

## PCH 2/9

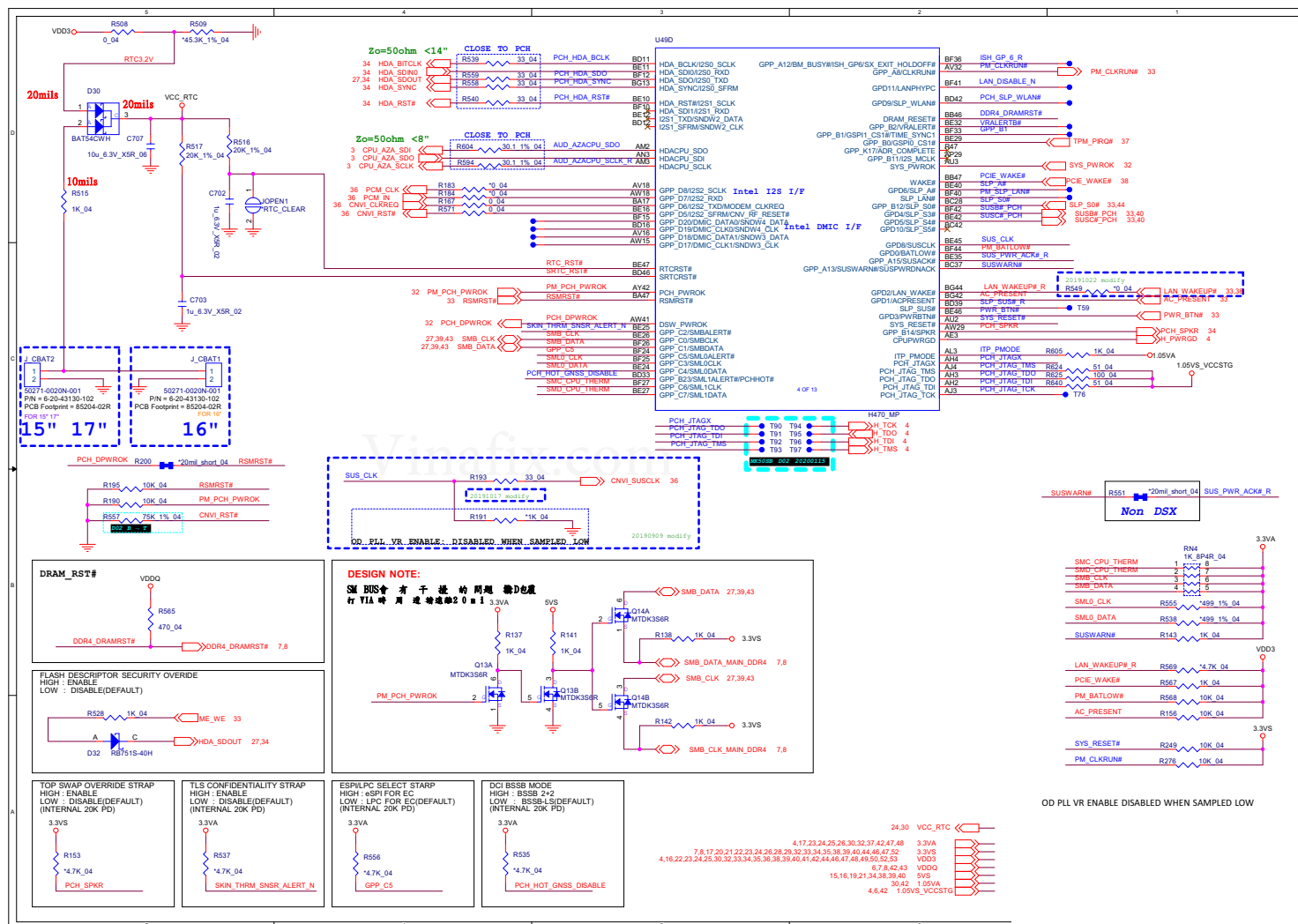
Sheet 25 of 61  
PCH 2/9



[illegible]

**PCH 4/9**

## B.Schematic Diagrams



**TEST SETUP MENU TABLE**

TEST SETUP MENU TABLE	
BOARD STYLE	
1	DISABLED (DEFAULT)
0	TEST SETUP MENU ENABLED

**DESIGN NOTE:**  
TEST SETUP MENU JUMPER

3.3VS  
R258  
R257  
10K 04  
20190910 modify

21,22 HDMI\_HPD  
17,19,20 MDP\_E\_HPD  
23 EDP\_HPD

**H470\_M0**

AT6  
AN0  
AN5  
AN6

GPP\_I0DDPB\_HPD0/ISP\_MISC0  
GPP\_I1DDPC\_HPD1/ISP\_MISC1  
GPP\_I2DDPD\_HPD2/ISP\_MISC2  
GPP\_I3DDPF\_HPD3/ISP\_MISC3  
GPP\_I4EDP\_HPD/ISP\_MISC4  
GPP\_F14IPS\_ON  
GPP\_K23MCLKOUT1  
GPP\_K22MCLKOUT1  
GPP\_K20  
GPP\_H23TIME\_SYNC

8 OF 13

**H470\_M0**

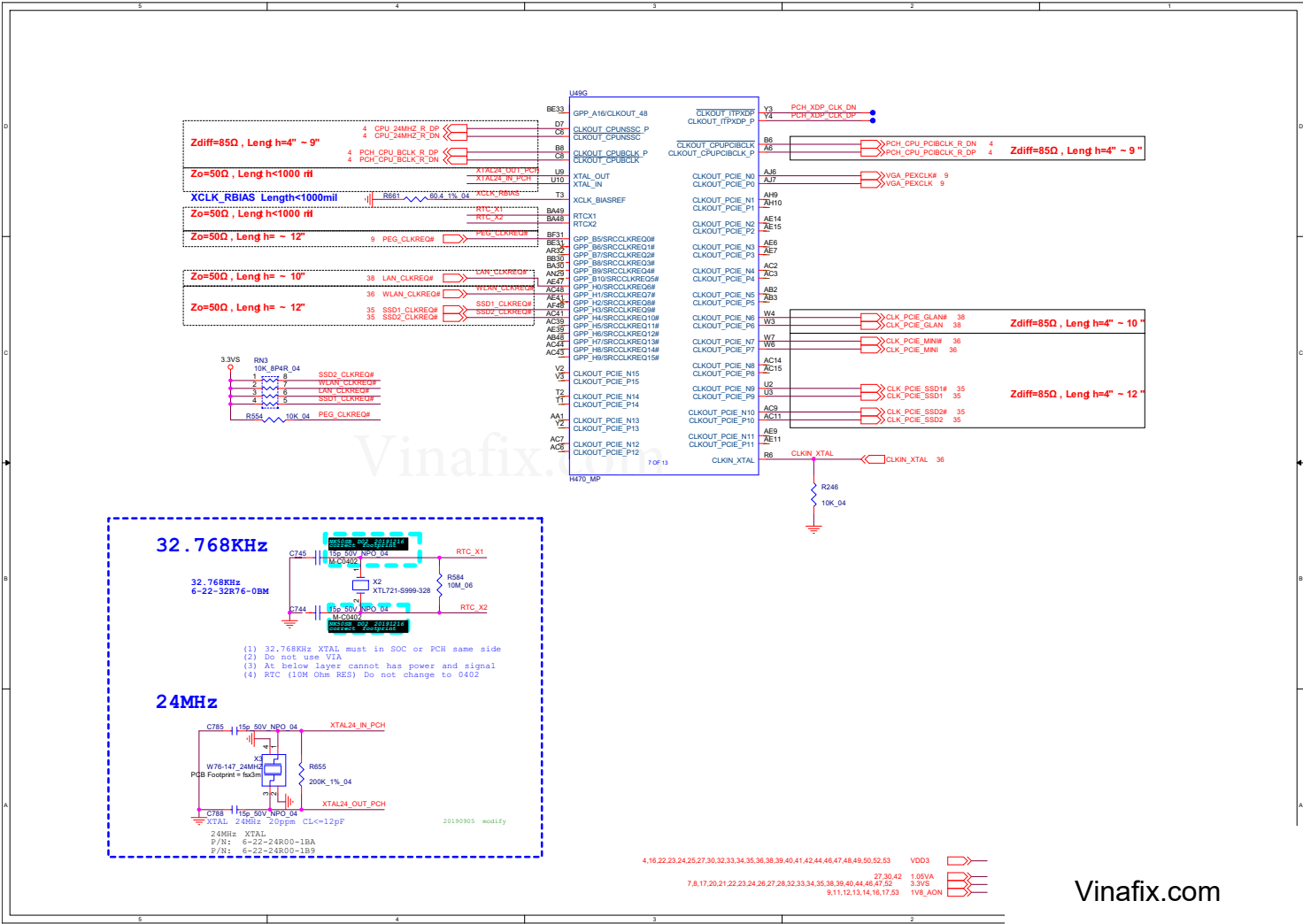
AL13  
AL8  
AL9  
AL10  
AL11  
AL12  
AL13  
AL14  
AL15  
AL16  
AL17  
AL18  
AL19  
AL20  
AL21  
AL22  
AL23  
AL24  
AL25  
AL26  
AL27  
AL28  
AL29  
AL30  
AL31  
AL32  
AL33  
AL34  
AL35  
AL36  
AL37  
AL38  
AL39  
AL40  
AL41  
AL42  
AL43  
AL44  
AL45  
AL46  
AL47  
AL48  
AL49  
AL50  
AL51  
AL52  
AL53  
AL54  
AL55  
AL56  
AL57  
AL58  
AL59  
AL60  
AL61  
AL62  
AL63  
AL64  
AL65  
AL66  
AL67  
AL68  
AL69  
AL70  
AL71  
AL72  
AL73  
AL74  
AL75  
AL76  
AL77  
AL78  
AL79  
AL80  
AL81  
AL82  
AL83  
AL84  
AL85  
AL86  
AL87  
AL88  
AL89  
AL90  
AL91  
AL92  
AL93  
AL94  
AL95  
AL96  
AL97  
AL98  
AL99  
AL100  
AL101  
AL102  
AL103  
AL104  
AL105  
AL106  
AL107  
AL108  
AL109  
AL110  
AL111  
AL112  
AL113  
AL114  
AL115  
AL116  
AL117  
AL118  
AL119  
AL120  
AL121  
AL122  
AL123  
AL124  
AL125  
AL126  
AL127  
AL128  
AL129  
AL130  
AL131  
AL132  
AL133  
AL134  
AL135  
AL136  
AL137  
AL138  
AL139  
AL140  
AL141  
AL142  
AL143  
AL144  
AL145  
AL146  
AL147  
AL148  
AL149  
AL150  
AL151  
AL152  
AL153  
AL154  
AL155  
AL156  
AL157  
AL158  
AL159  
AL160  
AL161  
AL162  
AL163  
AL164  
AL165  
AL166  
AL167  
AL168  
AL169  
AL170  
AL171  
AL172  
AL173  
AL174  
AL175  
AL176  
AL177  
AL178  
AL179  
AL180  
AL181  
AL182  
AL183  
AL184  
AL185  
AL186  
AL187  
AL188  
AL189  
AL190  
AL191  
AL192  
AL193  
AL194  
AL195  
AL196  
AL197  
AL198  
AL199  
AL200  
AL201  
AL202  
AL203  
AL204  
AL205  
AL206  
AL207  
AL208  
AL209  
AL210  
AL211  
AL212  
AL213  
AL214  
AL215  
AL216  
AL217  
AL218  
AL219  
AL220  
AL221  
AL222  
AL223  
AL224  
AL225  
AL226  
AL227  
AL228  
AL229  
AL230  
AL231  
AL232  
AL233  
AL234  
AL235  
AL236  
AL237  
AL238  
AL239  
AL240  
AL241  
AL242  
AL243  
AL244  
AL245  
AL246  
AL247  
AL248  
AL249  
AL250  
AL251  
AL252  
AL253  
AL254  
AL255  
AL256  
AL257  
AL258  
AL259  
AL260  
AL261  
AL262  
AL263  
AL264  
AL265  
AL266  
AL267  
AL268  
AL269  
AL270  
AL271  
AL272  
AL273  
AL274  
AL275  
AL276  
AL277  
AL278  
AL279  
AL280  
AL281  
AL282  
AL283  
AL284  
AL285  
AL286  
AL287  
AL288  
AL289  
AL290  
AL291  
AL292  
AL293  
AL294  
AL295  
AL296  
AL297  
AL298  
AL299  
AL300  
AL301  
AL302  
AL303  
AL304  
AL305  
AL306  
AL307  
AL308  
AL309  
AL310  
AL311  
AL312  
AL313  
AL314  
AL315  
AL316  
AL317  
AL318  
AL319  
AL320  
AL321  
AL322  
AL323  
AL324  
AL325  
AL326  
AL327  
AL328  
AL329  
AL330  
AL331  
AL332  
AL333  
AL334  
AL335  
AL336  
AL337  
AL338  
AL339  
AL340  
AL341  
AL342  
AL343  
AL344  
AL345  
AL346  
AL347  
AL348  
AL349  
AL350  
AL351  
AL352  
AL353  
AL354  
AL355  
AL356  
AL357  
AL358  
AL359  
AL360  
AL361  
AL362  
AL363  
AL364  
AL365  
AL366  
AL367  
AL368  
AL369  
AL370  
AL371  
AL372  
AL373  
AL374  
AL375  
AL376  
AL377  
AL378  
AL379  
AL380  
AL381  
AL382  
AL383  
AL384  
AL385  
AL386  
AL387  
AL388  
AL389  
AL390  
AL391  
AL392  
AL393  
AL394  
AL395  
AL396  
AL397  
AL398  
AL399  
AL400  
AL401  
AL402  
AL403  
AL404  
AL405  
AL406  
AL407  
AL408  
AL409  
AL410  
AL411  
AL412  
AL413  
AL414  
AL415  
AL416  
AL417  
AL418  
AL419  
AL420  
AL421  
AL422  
AL423  
AL424  
AL425  
AL426  
AL427  
AL428  
AL429  
AL430  
AL431  
AL432  
AL433  
AL434  
AL435  
AL436  
AL437  
AL438  
AL439  
AL440  
AL441  
AL442  
AL443  
AL444  
AL445  
AL446  
AL447  
AL448  
AL449  
AL450  
AL451  
AL452  
AL453  
AL454  
AL455  
AL456  
AL457  
AL458  
AL459  
AL460  
AL461  
AL462  
AL463  
AL464  
AL465  
AL466  
AL467  
AL468  
AL469  
AL470  
AL471  
AL472  
AL473  
AL474  
AL475  
AL476  
AL477  
AL478  
AL479  
AL480  
AL481  
AL482  
AL483  
AL484  
AL485  
AL486  
AL487  
AL488  
AL489  
AL490  
AL491  
AL492  
AL493  
AL494  
AL495  
AL496  
AL497  
AL498  
AL499  
AL500  
AL501  
AL502  
AL503  
AL504  
AL505  
AL506  
AL507  
AL508  
AL509  
AL510  
AL511  
AL512  
AL513  
AL514  
AL515  
AL516  
AL517  
AL518  
AL519  
AL520  
AL521  
AL522  
AL523  
AL524  
AL525  
AL526  
AL527  
AL528  
AL529  
AL530  
AL531  
AL532  
AL533  
AL534  
AL535  
AL536  
AL537  
AL538  
AL539  
AL540  
AL541  
AL542  
AL543  
AL544  
AL545  
AL546  
AL547  
AL548  
AL549  
AL550  
AL551  
AL552  
AL553  
AL554  
AL555  
AL556  
AL557  
AL558  
AL559  
AL560  
AL561  
AL562  
AL563  
AL564  
AL565  
AL566  
AL567  
AL568  
AL569  
AL570  
AL571  
AL572  
AL573  
AL574  
AL575  
AL576  
AL577  
AL578  
AL579  
AL580  
AL581  
AL582  
AL583  
AL584  
AL585  
AL586  
AL587  
AL588  
AL589  
AL590  
AL591  
AL592  
AL593  
AL594  
AL595  
AL596  
AL597  
AL598  
AL599  
AL600  
AL601  
AL602  
AL603  
AL604



Schematic Diagrams

PCH 6/9

Sheet 29 of 61  
PCH 6/9

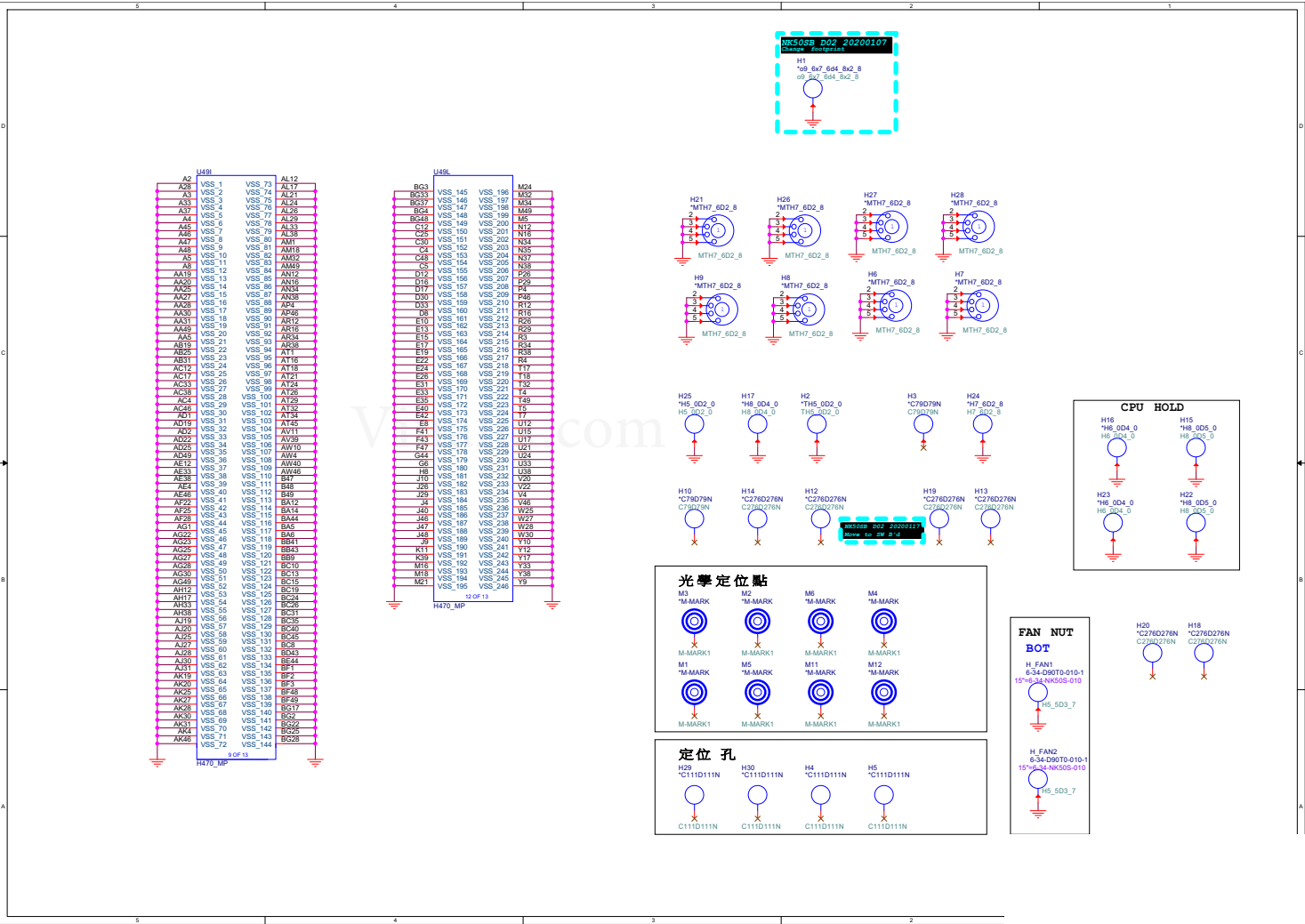


**Sheet 30 of 61**  
**PCH 7/9**



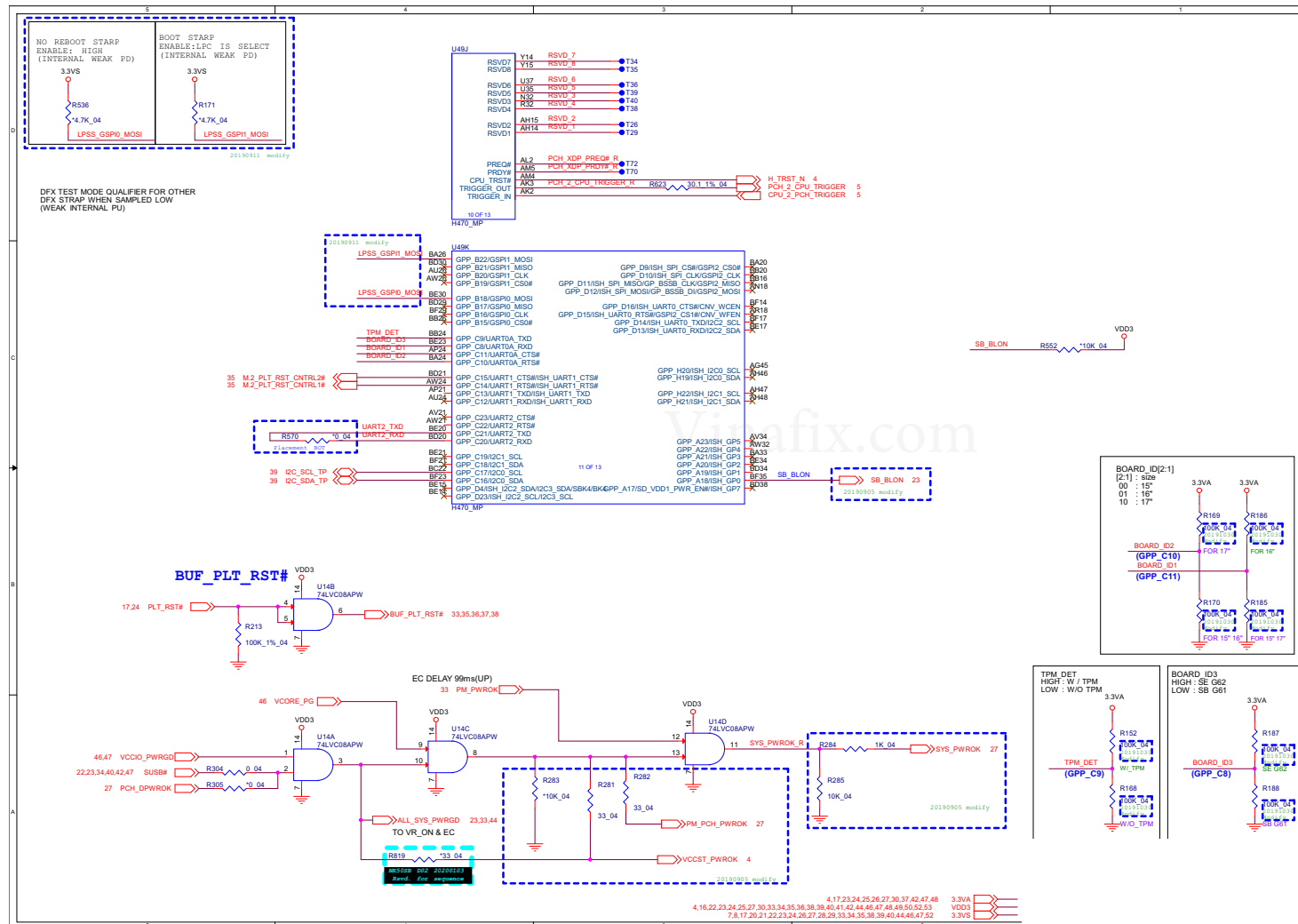
PCH 8/9

Sheet 31 of 61  
PCH 8/9



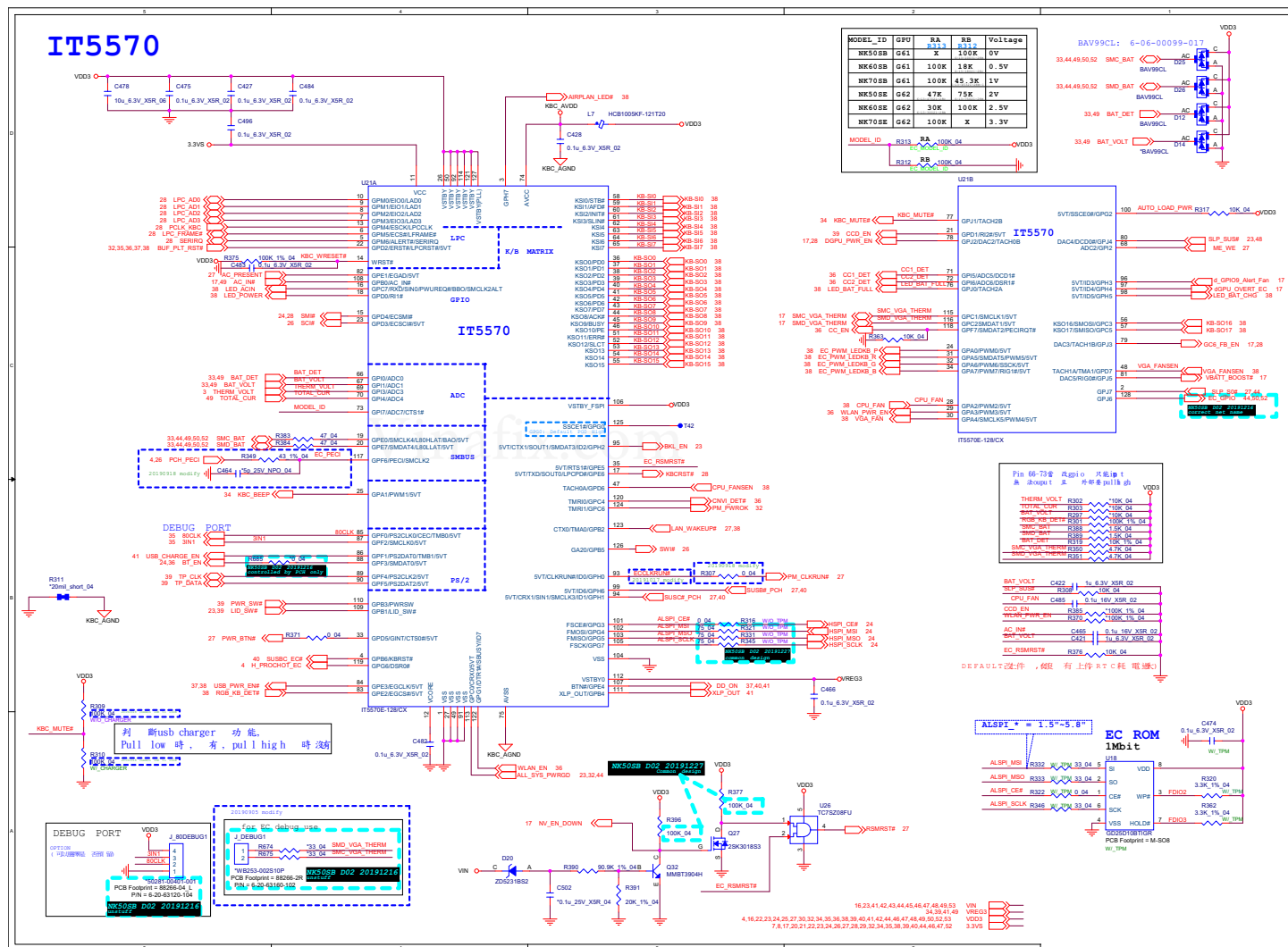
## B.Schematic Diagrams

**PCH 9/9 B - 33**

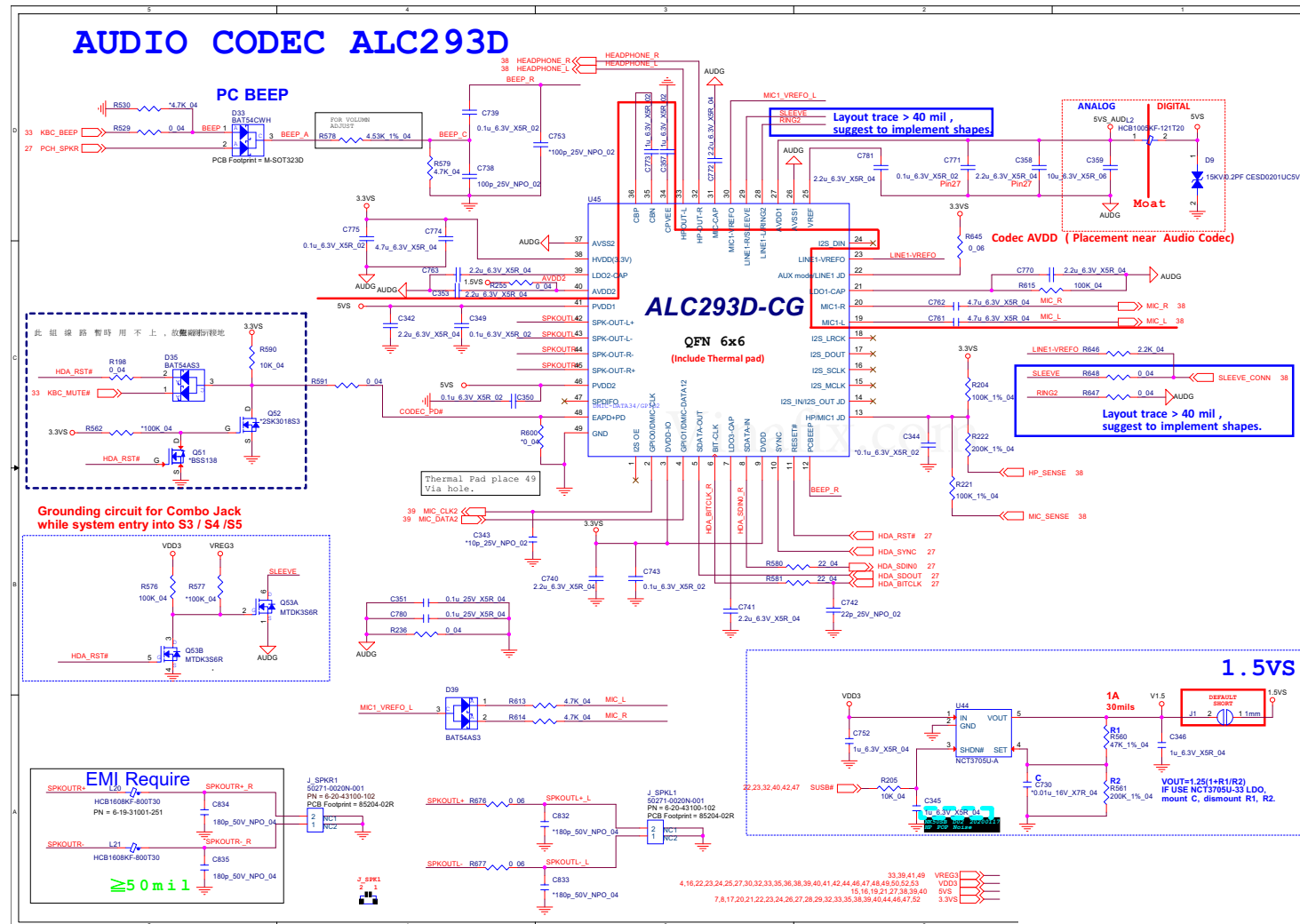


# KBC-ITE IT5570

**Sheet 33 of 61**  
**KBC-ITE IT5570**



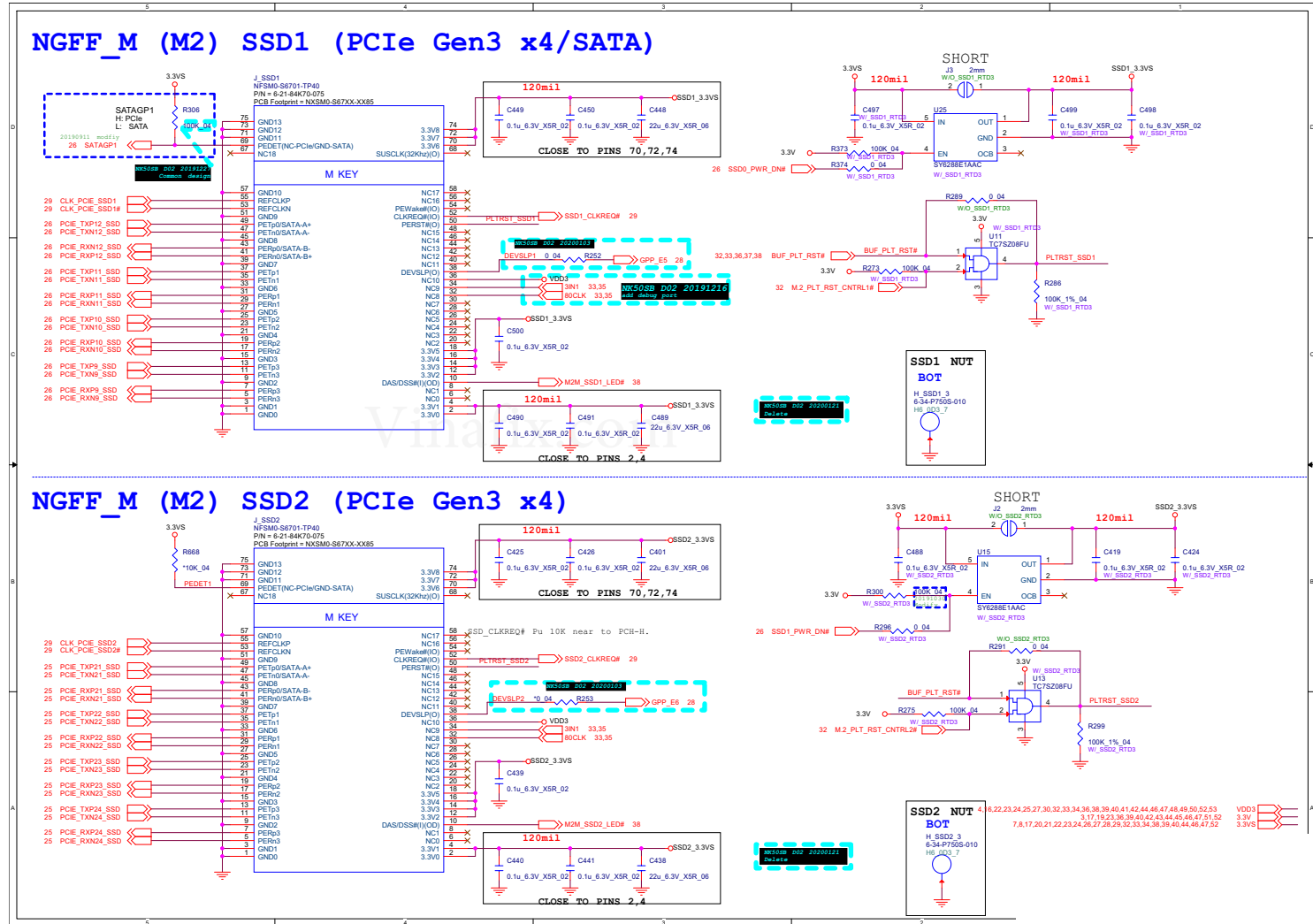
**Audio Codec B - 35**



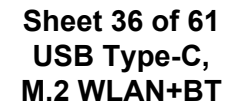


# M.2 PCIE4X SSD

Sheet 35 of 61  
M.2 PCIE4X SSD



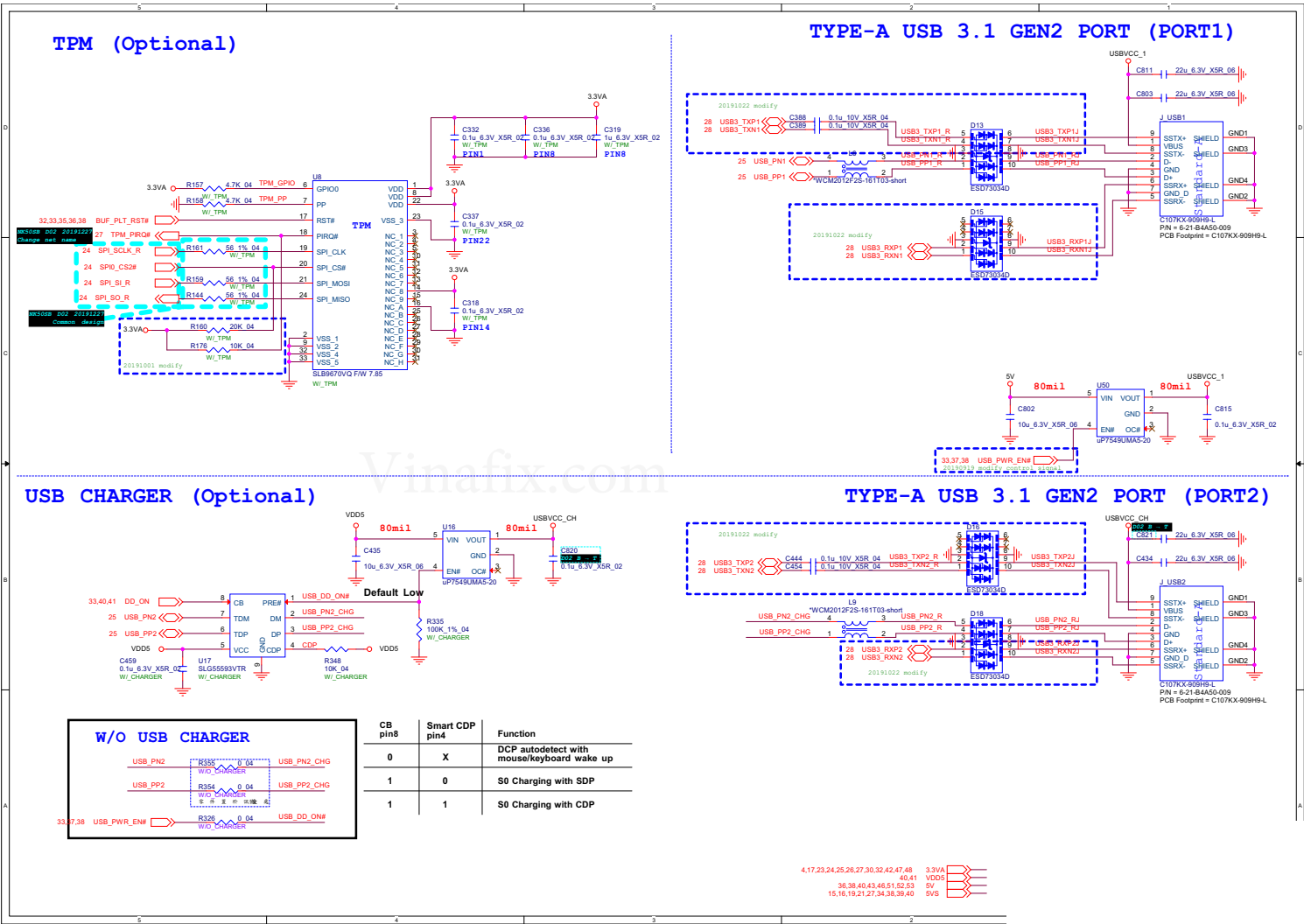
Vinafix.com



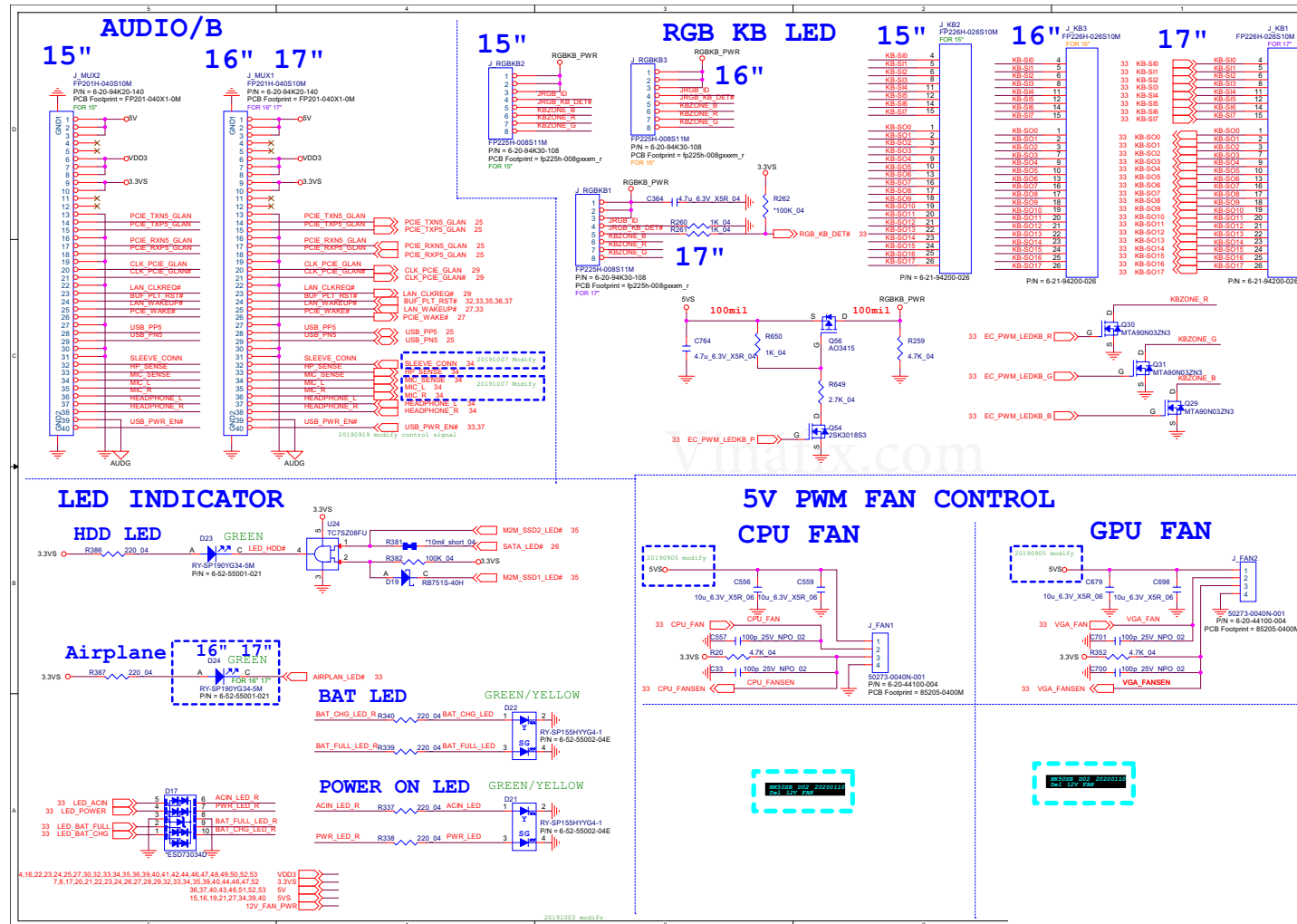
Schematic Diagrams

USB Type-A, TPM

Sheet 37 of 61  
USB Type-A, TPM



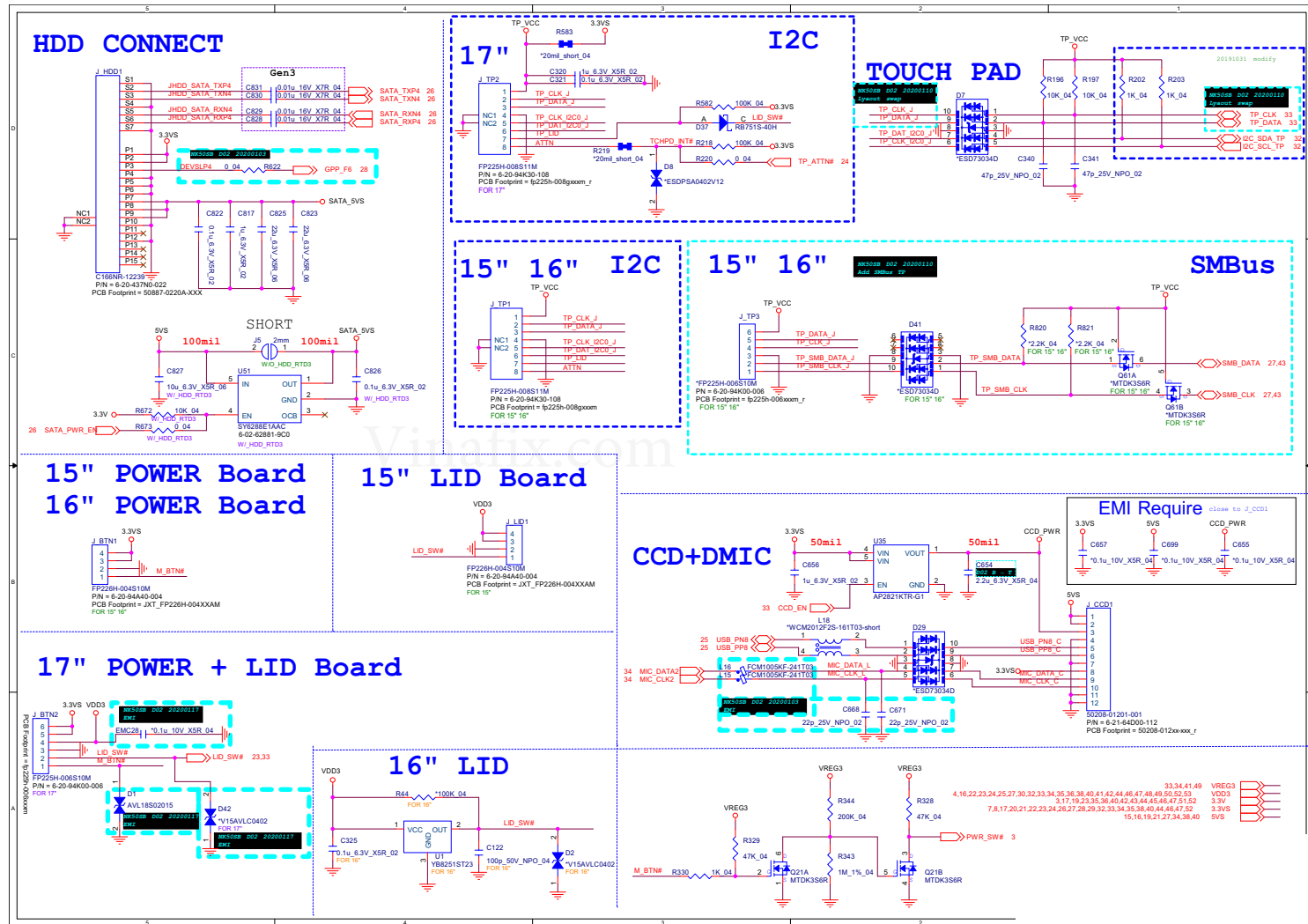
**RGB KB, Fan, LED B - 39**



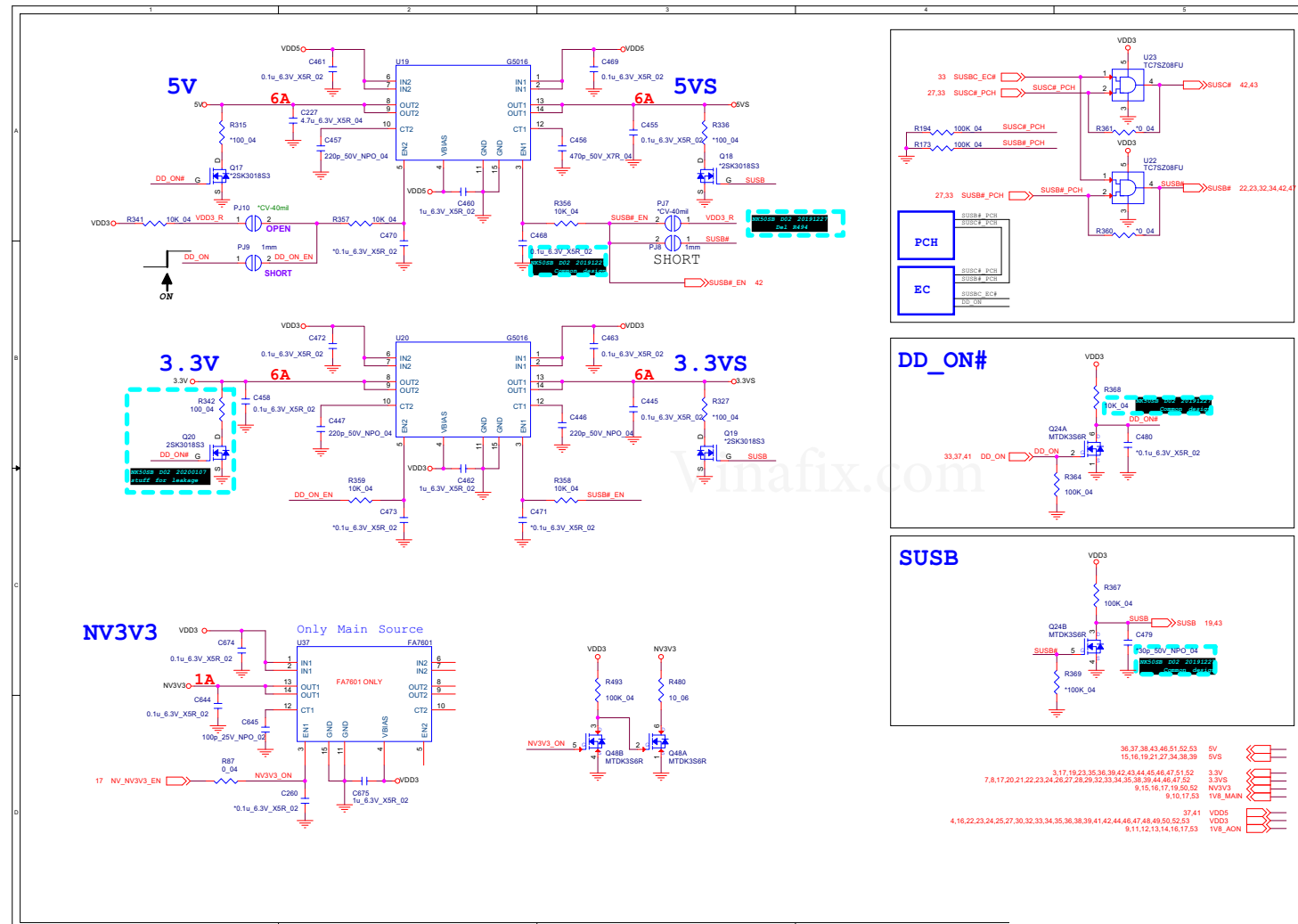
## Schematic Diagrams

# HDD, CCD, TP, LID, PWR SW

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



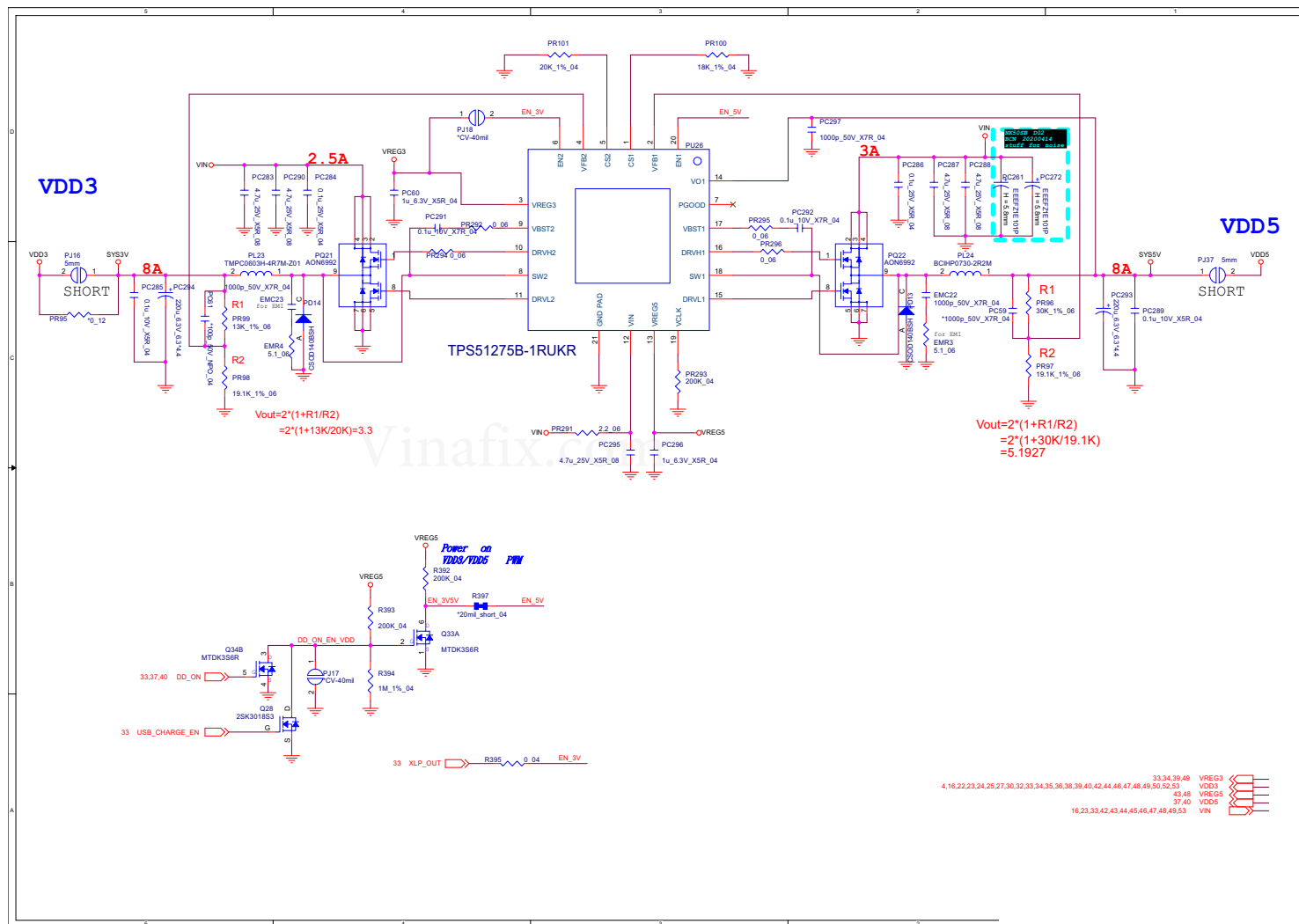
# 5V, 5VS, 3.3V, 3.3VS, NV3V3



## VDD3, VDD5

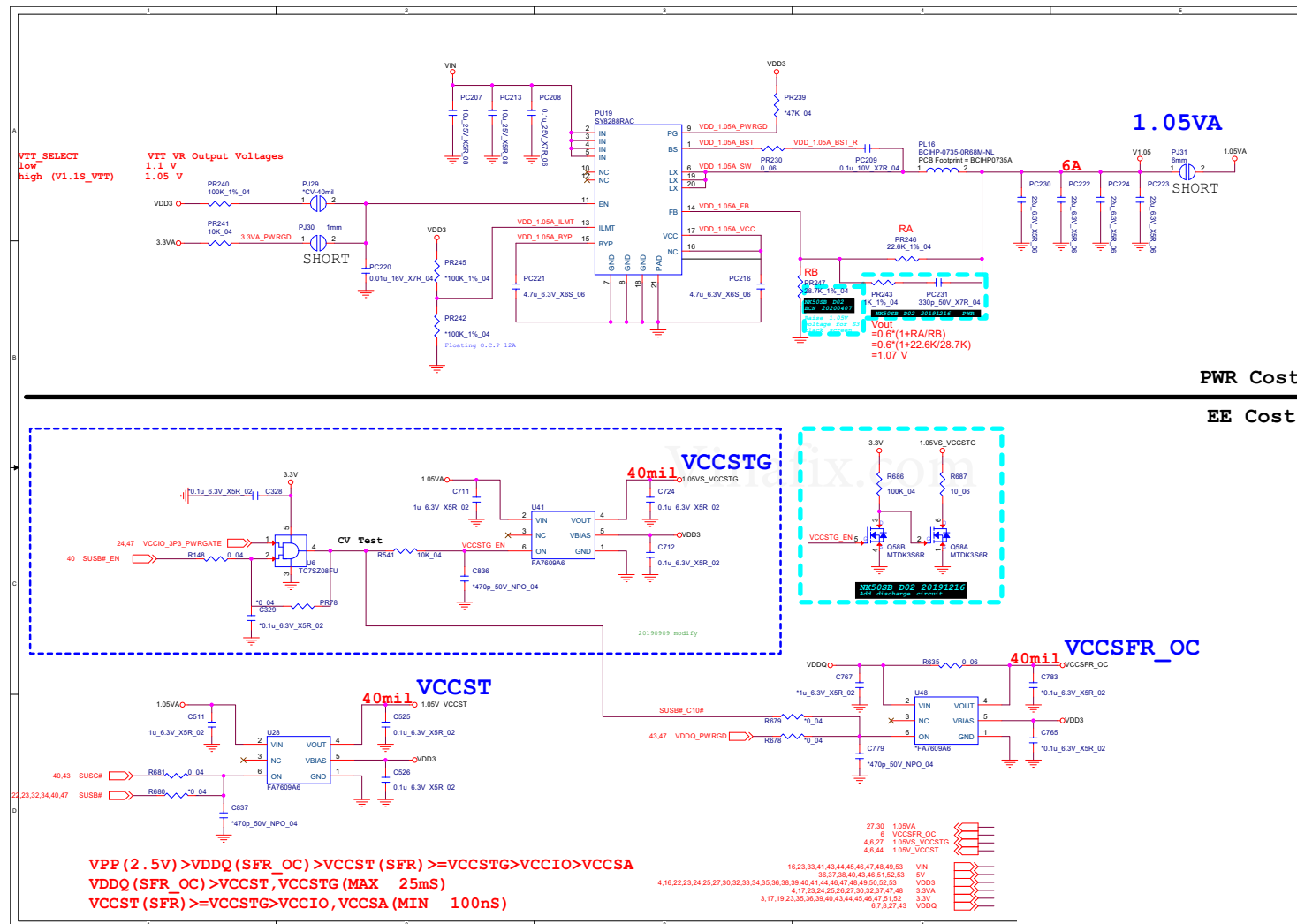
## B.Schematic Diagrams

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





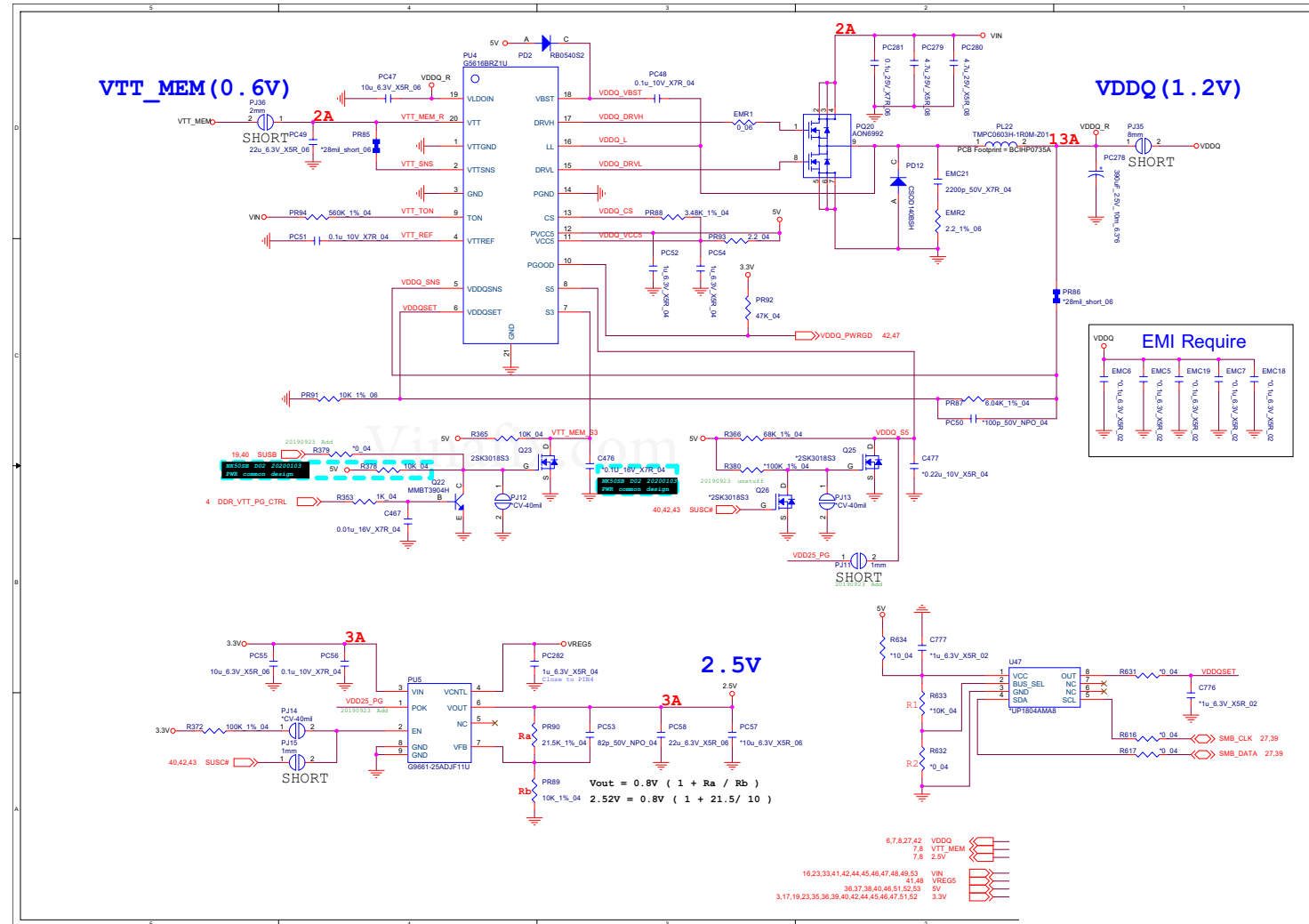
## 1.05A, VCCST/STG/SFR



## Schematic Diagrams

## VDDQ, VTT\_MEM, 2.5V

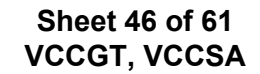
Sheet 43 of 61  
VDDQ, VTT\_MEM,  
2.5V





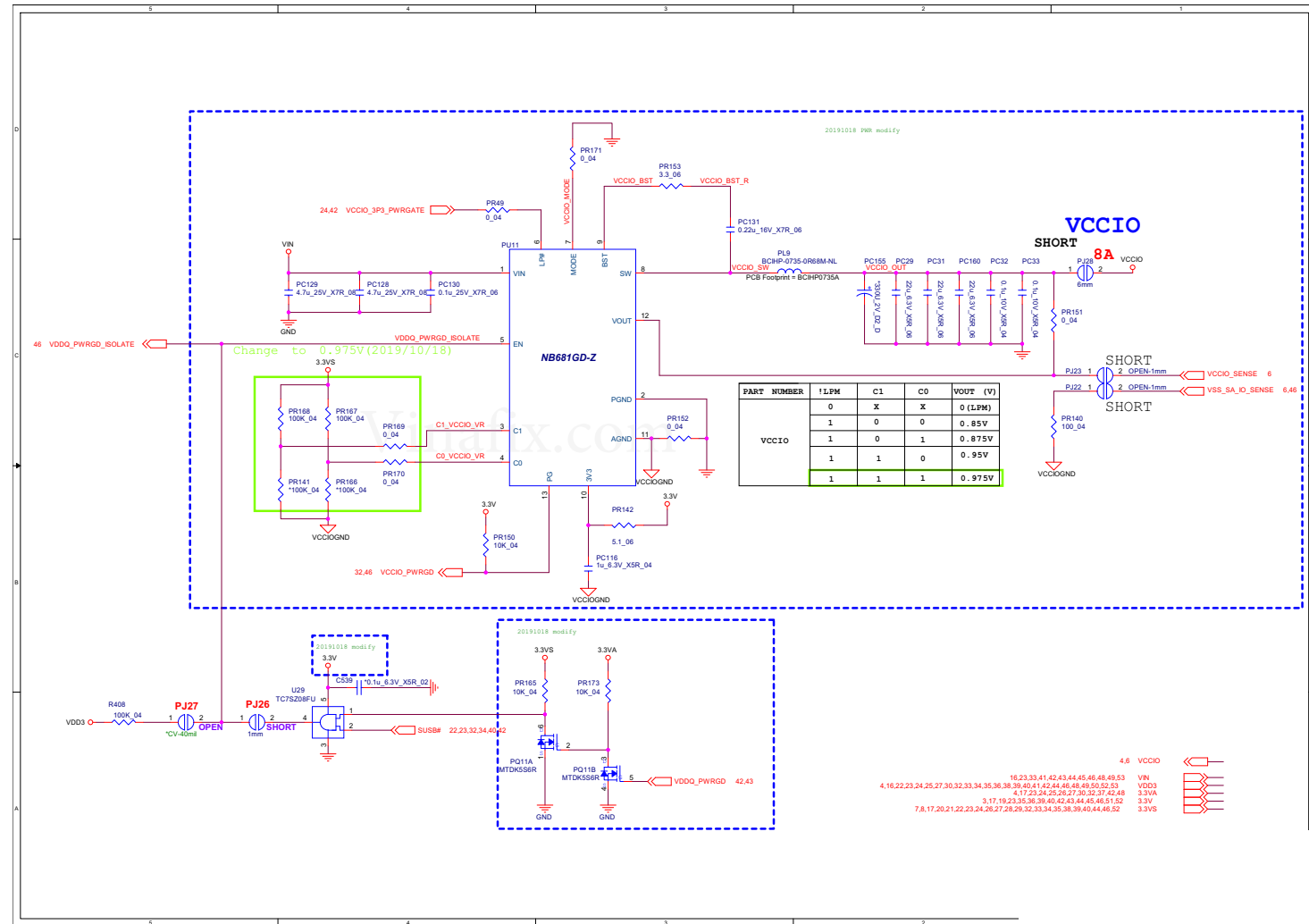


## VCCGT, VCCSA B - 47



## VCCIO

**Sheet 47 of 61**  
**VCCIO**

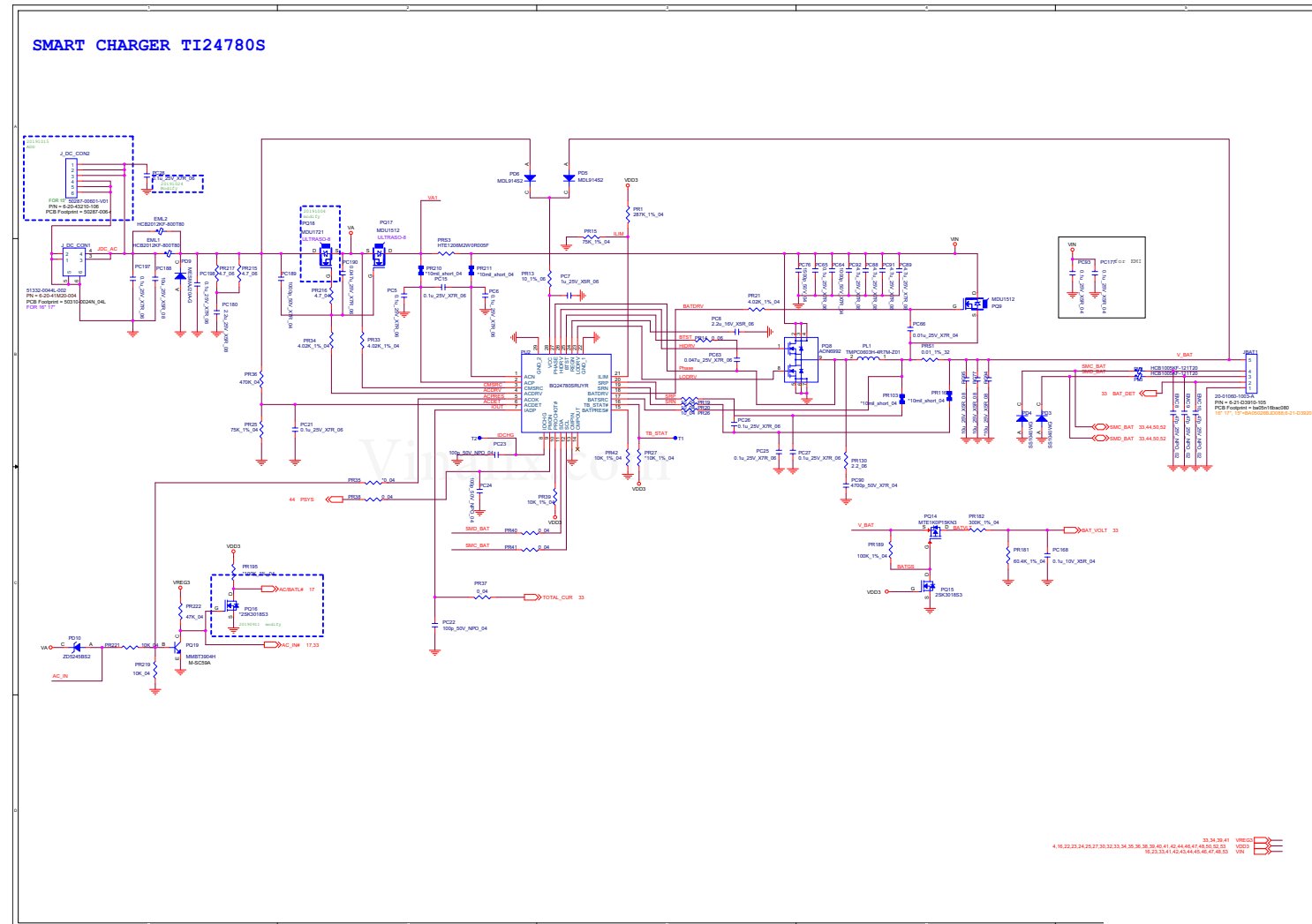




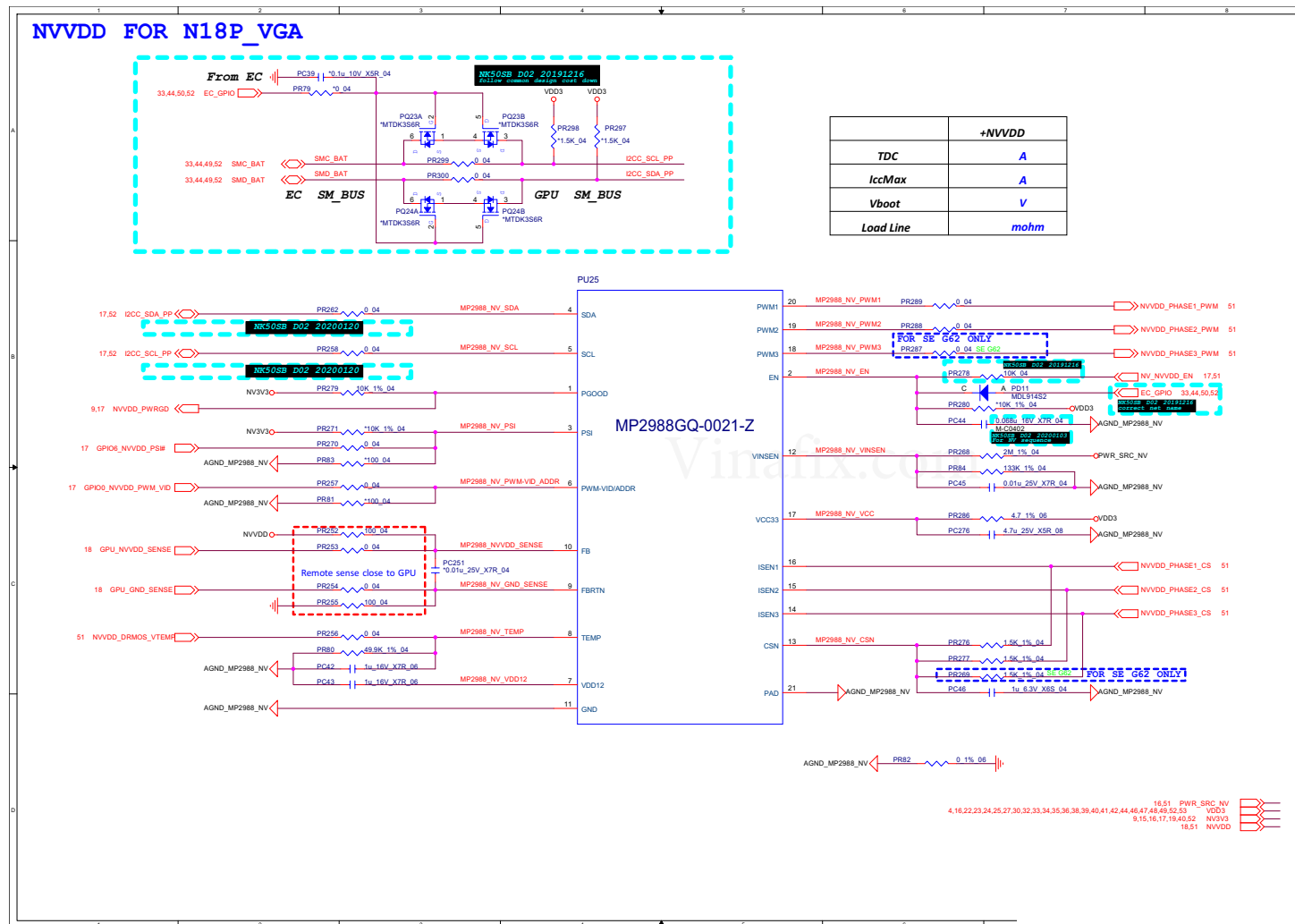


## AC\_In, Charger

Sheet 49 of 61  
AC\_In, Charger

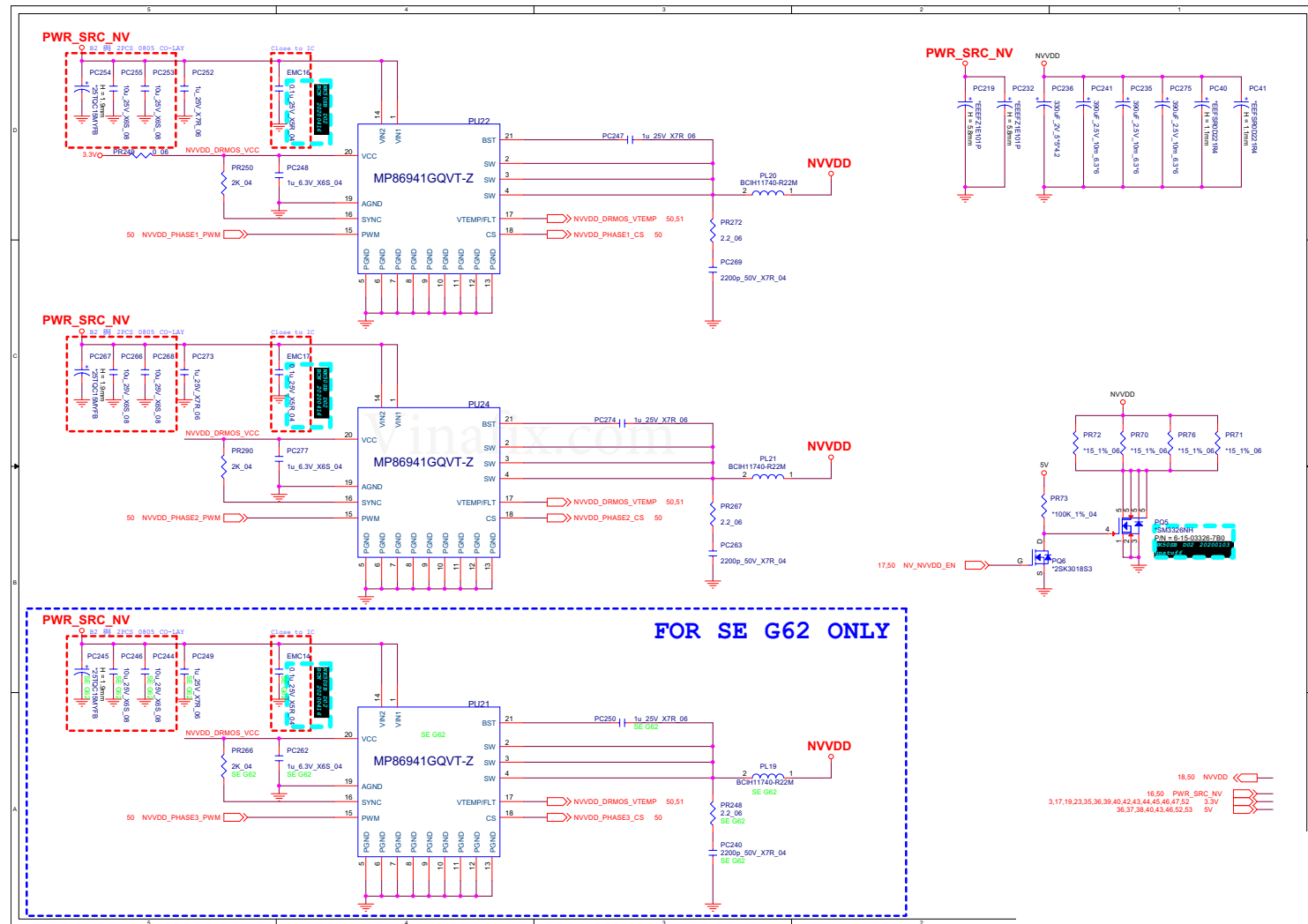


## NVVDD1

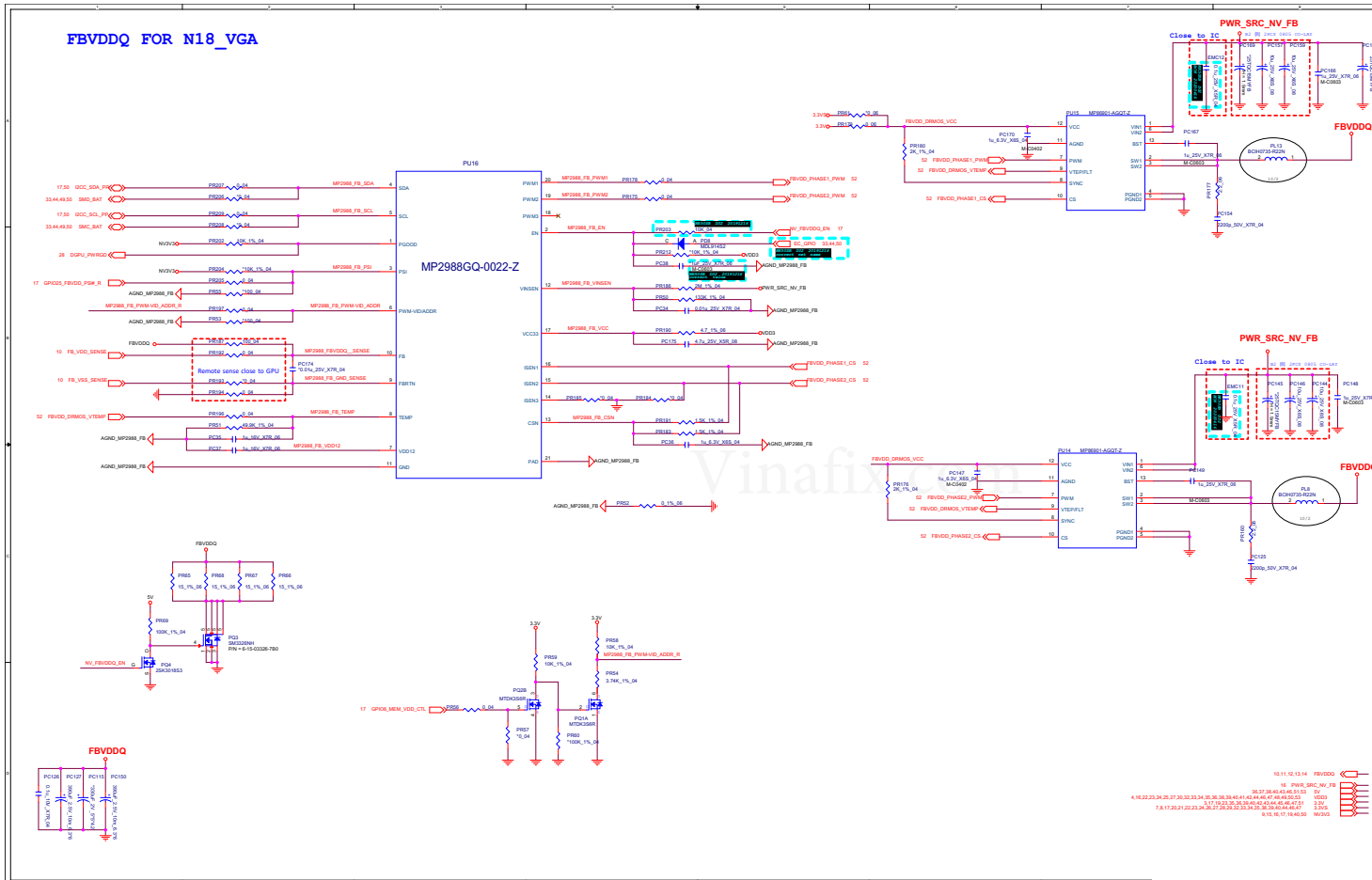
Sheet 50 of 61  
NVVDD1

## Schematic Diagrams

## NVVDD2

Sheet 51 of 61  
NVVDD2

# FBVDDQ

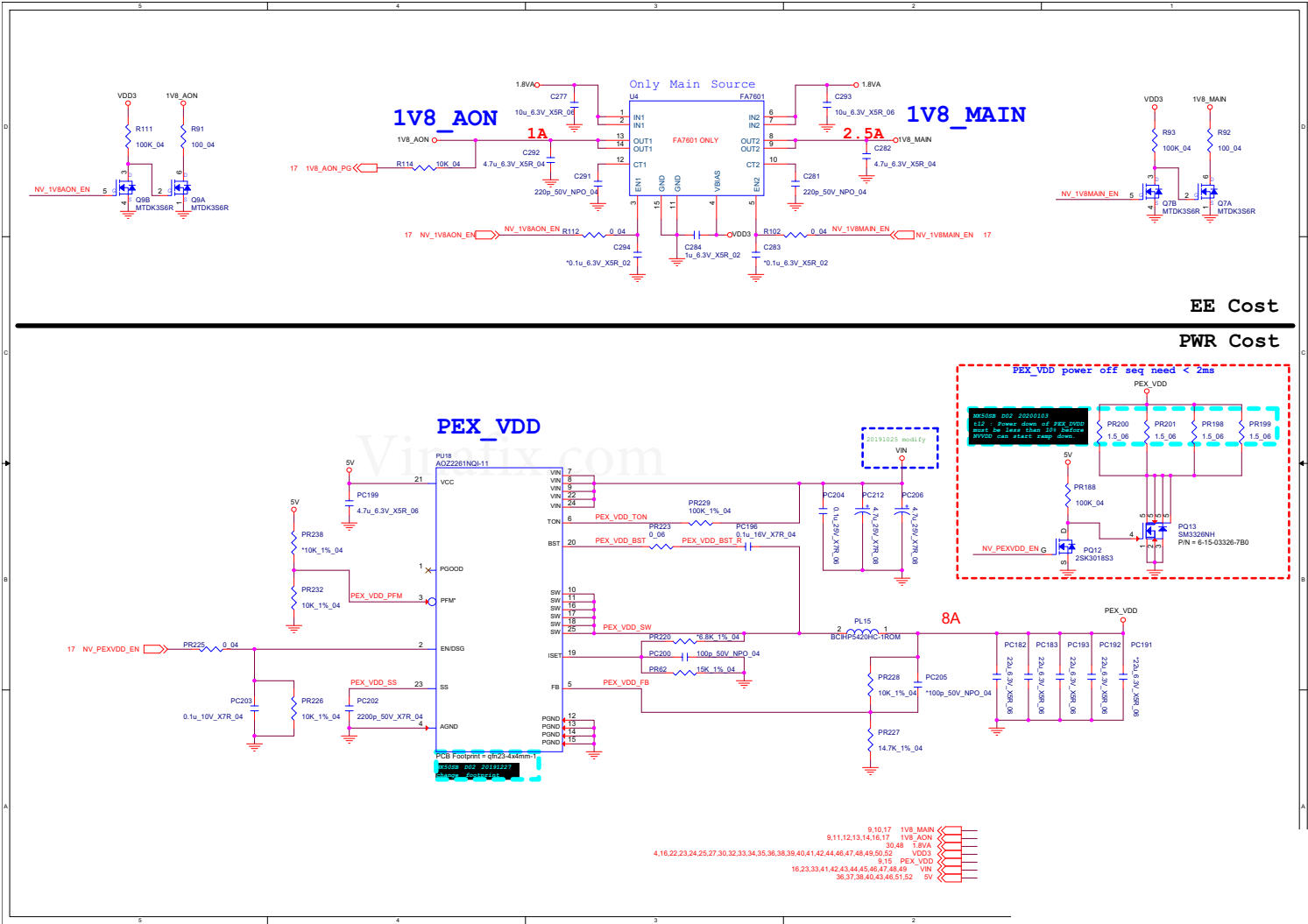


Sheet 52 of 61  
FBVDDQ

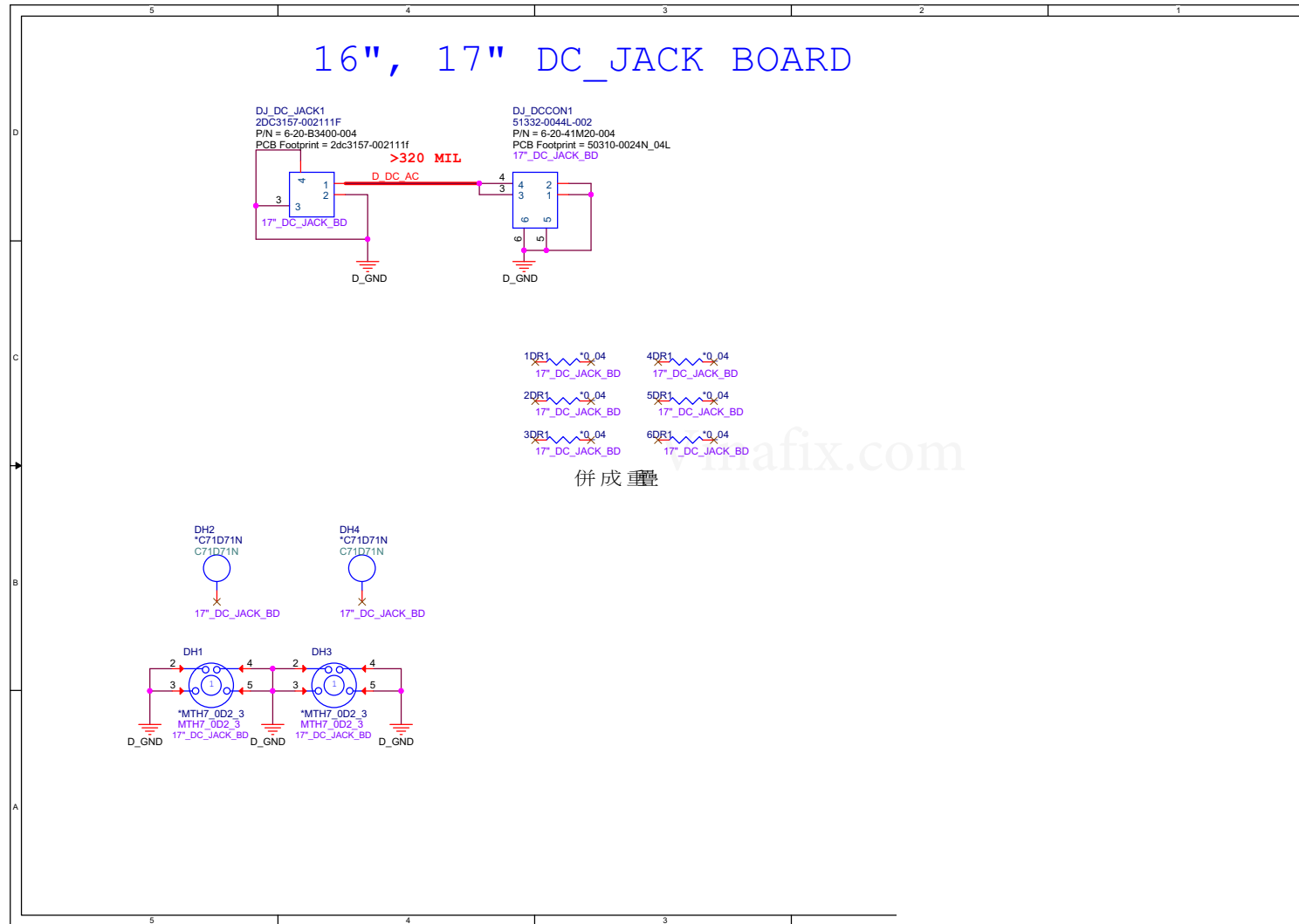
Schematic Diagrams

1V8\_AON, PEX\_VDD

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

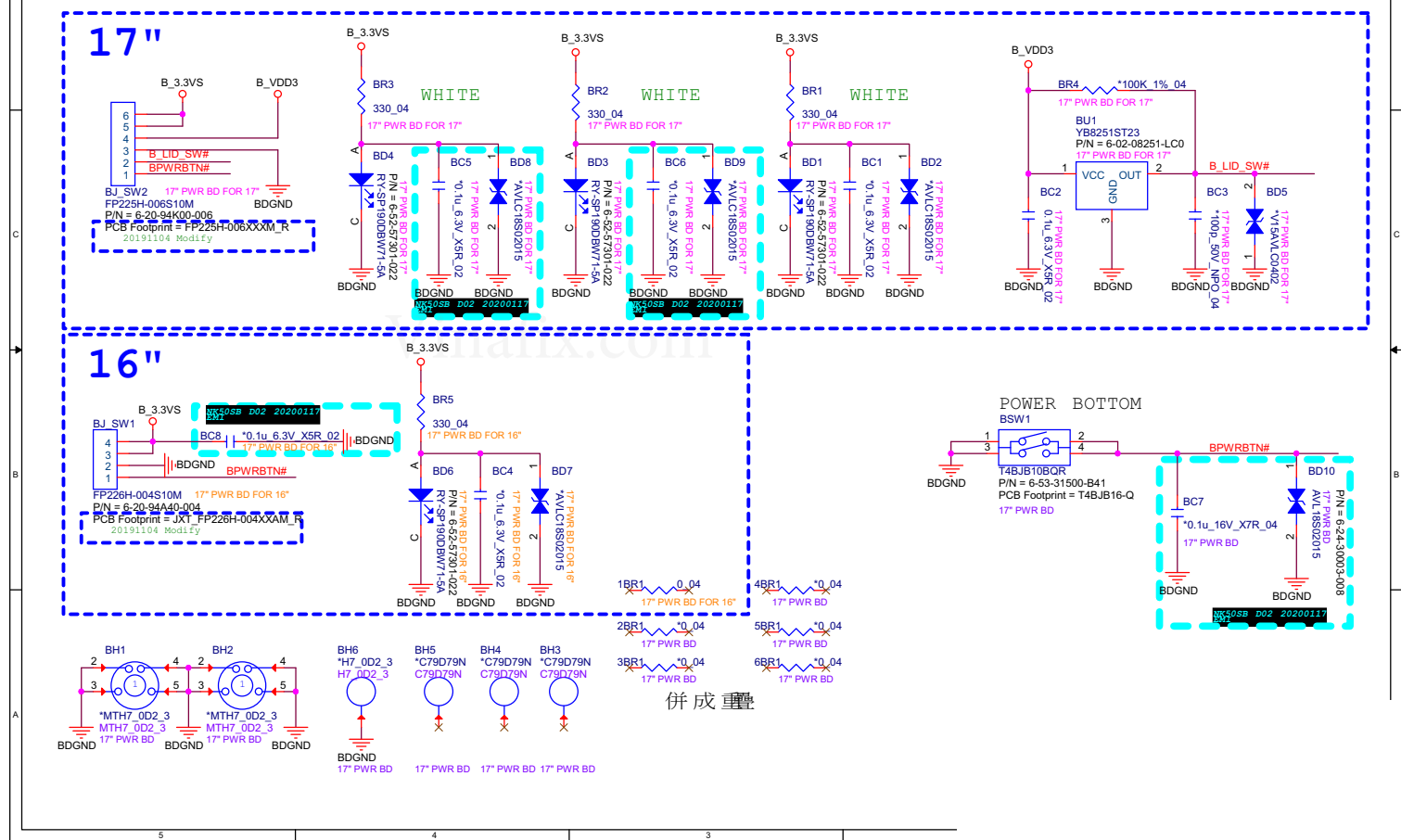


## DC Jack Board

Sheet 54 of 61  
DC Jack Board

# Power SW Board

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



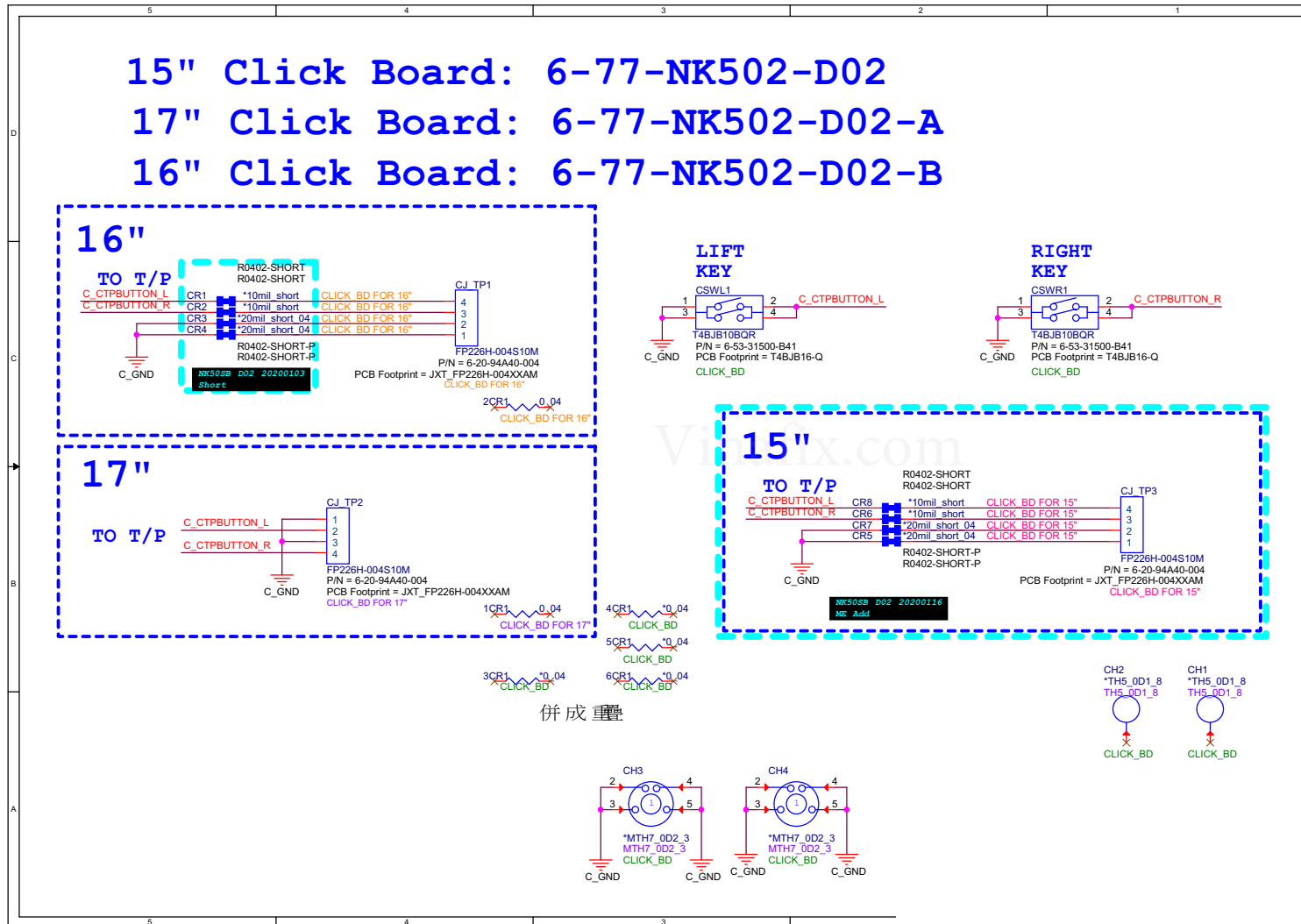


## Click Board

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

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

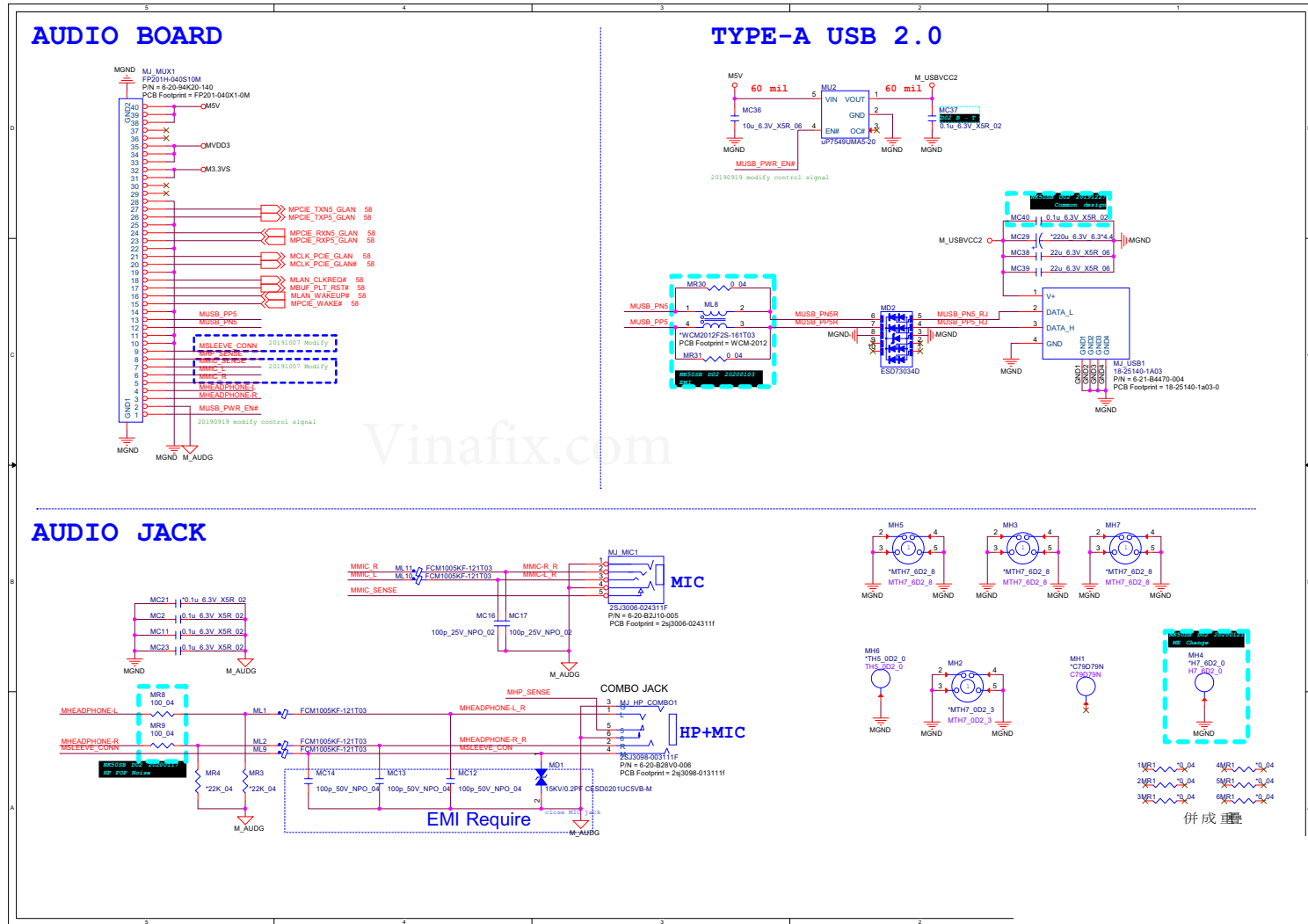
16" Click Board: 6-77-NK502-D02-B

Sheet 56 of 61  
Click Board

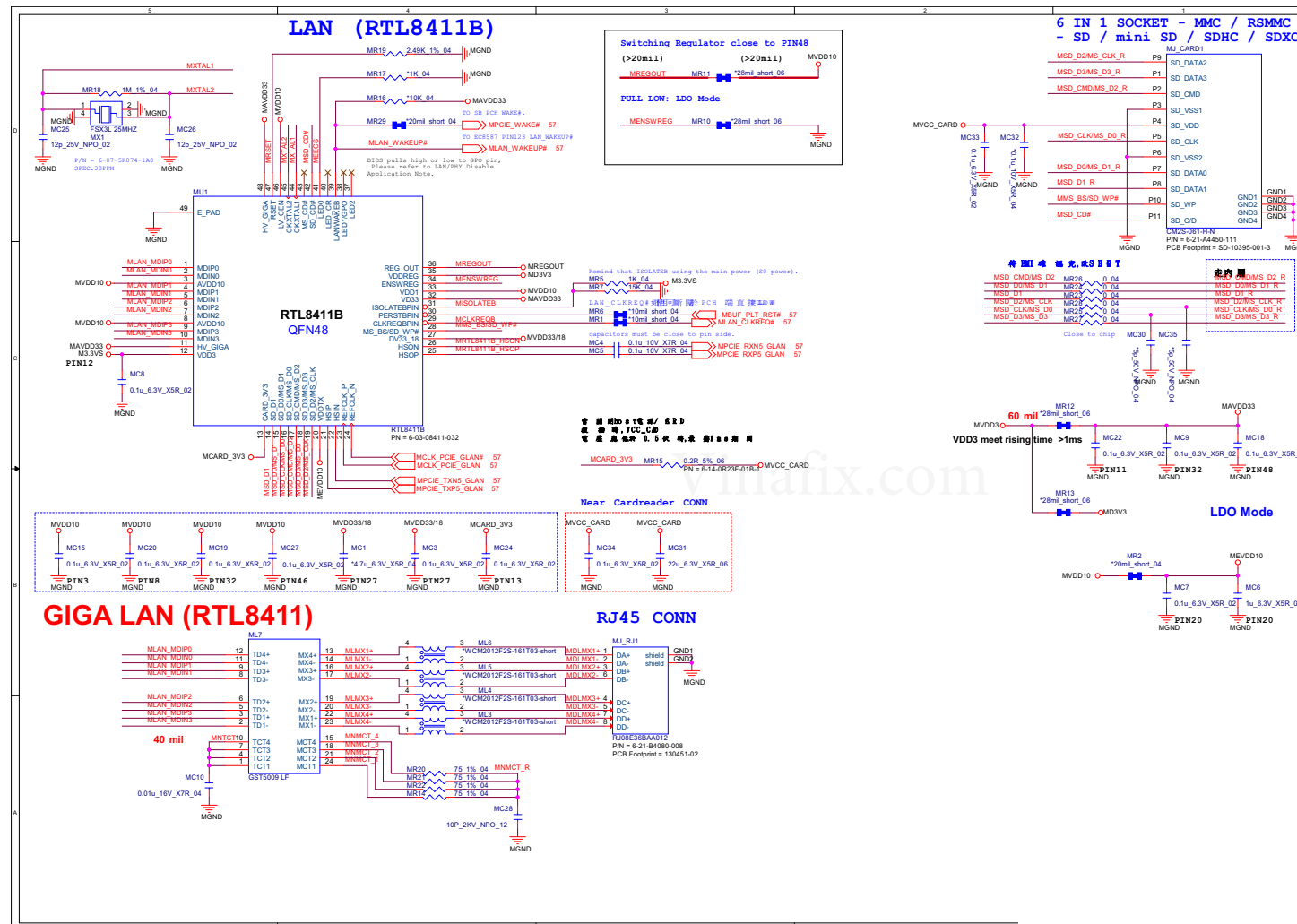
B.Schematic Diagrams

# Multi Board

Sheet 57 of 61  
Multi Board

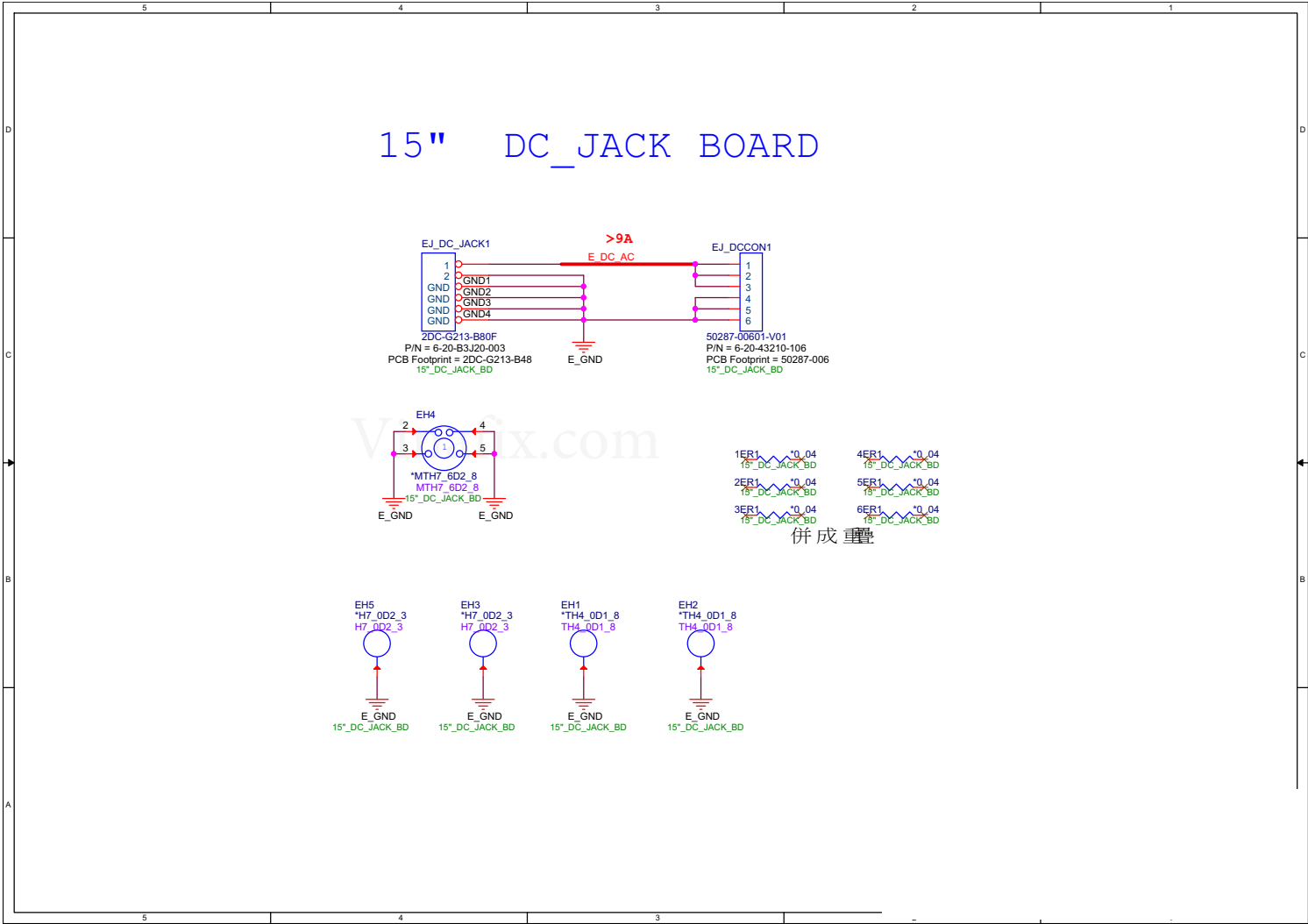


## LAN RTL8411B B - 59

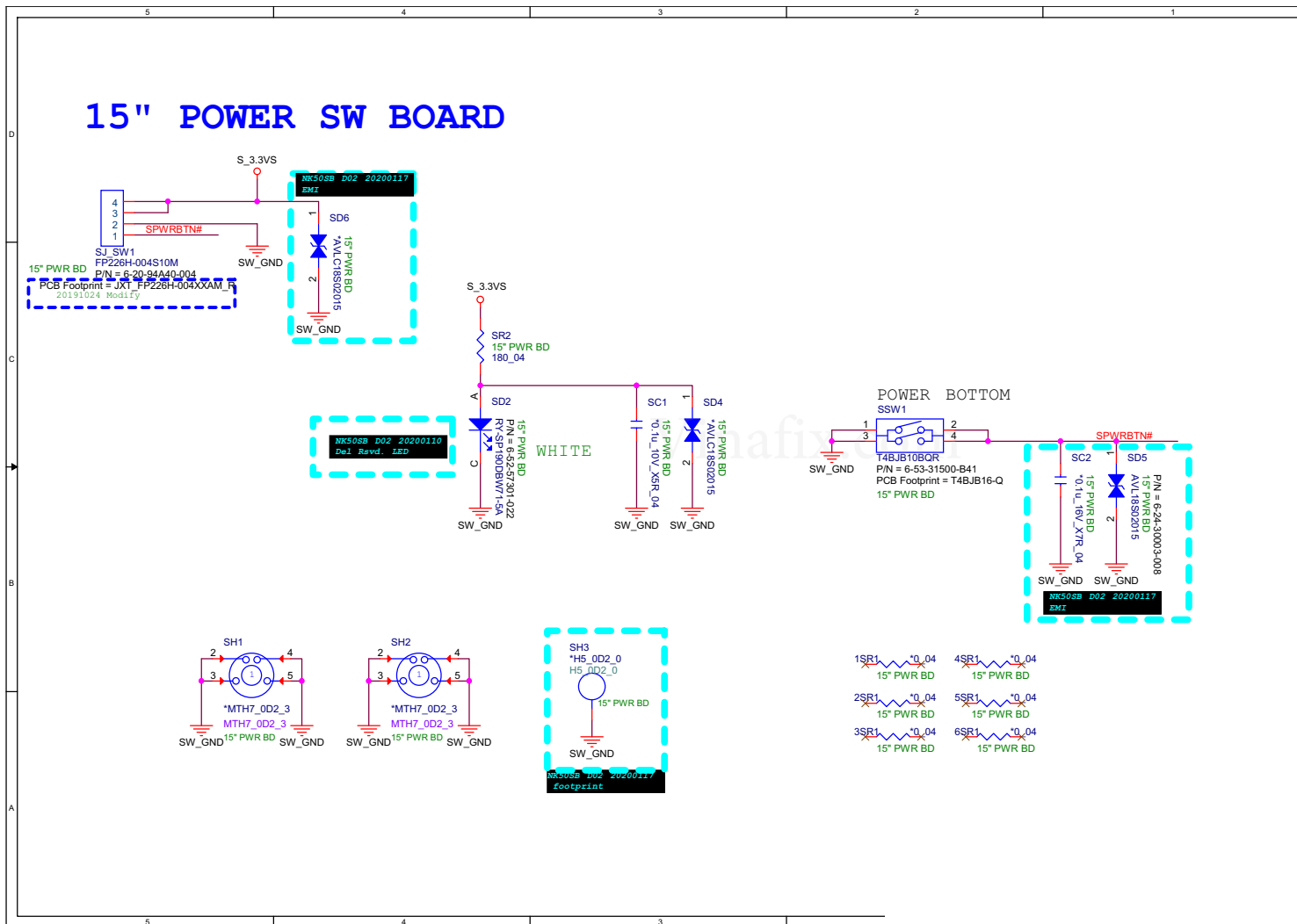


DC Jack Board

Sheet 59 of 61  
DC Jack Board



## Power SW Board

Sheet 60 of 61  
Power SW Board

LID Board

Sheet 61 of 61  
LID Board

