

SERVICE MANUAL

P950HR

notebook



Notebook Computer

P950HR

Service Manual

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Version 1.0
July 2017

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About this Manual

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

It is organized to allow you to look up basic information for servicing and/or upgrading components of the *P950HR* series notebook PC.

The following information is included:

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

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

Appendix A, Part Lists

Appendix B, Schematic Diagrams

Appendix C, Updating the FLASH ROM BIOS

IMPORTANT SAFETY INSTRUCTIONS

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

1. Do not use this product near water, for example near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
2. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
5. This product is intended to be supplied by a Listed Power Unit as follows:
 - AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19.5V, 9.23A (**180** Watts) minimum AC/DC Adapter.

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.

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

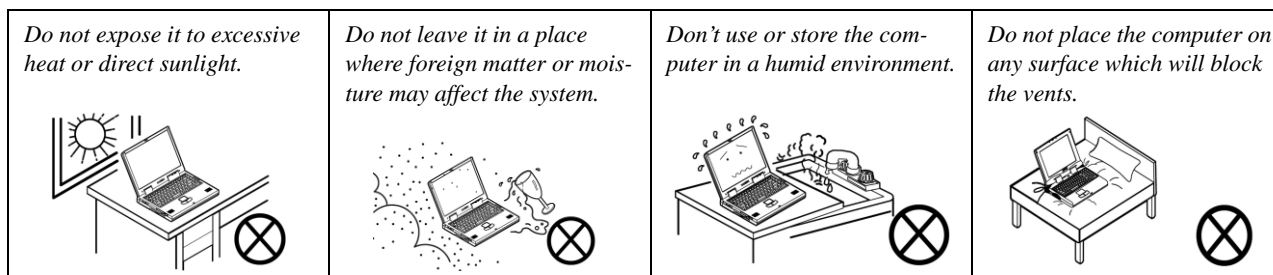
Instructions for Care and Operation

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

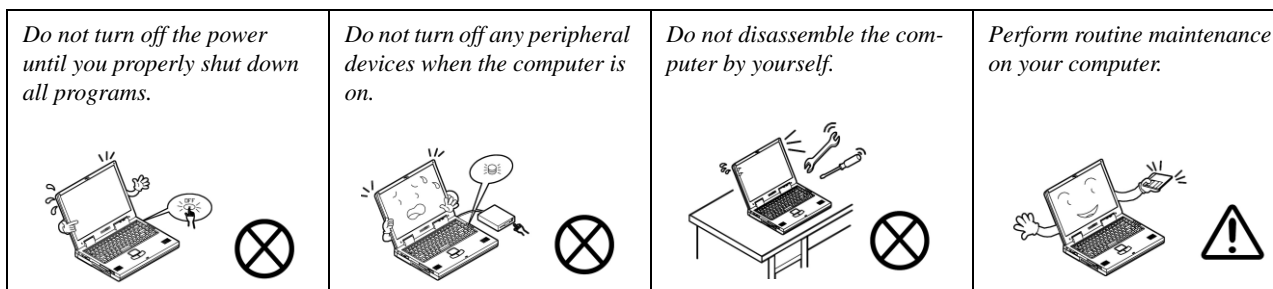
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.



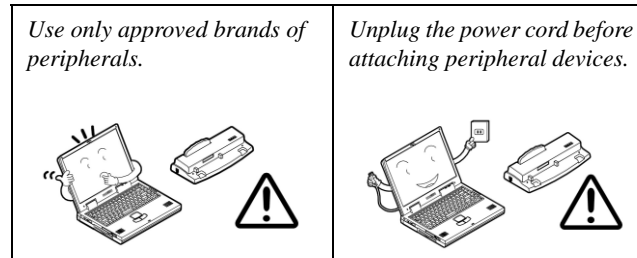
2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.



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



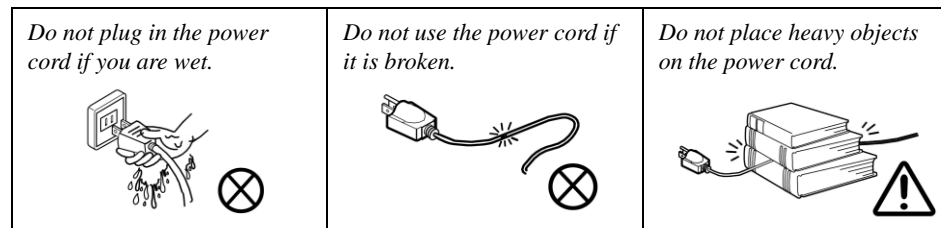
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**



Power Safety

The computer has specific power requirements:

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



Power Safety Warning

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

Battery Precautions

- Only use batteries designed for this computer. The wrong battery type may explode, leak or damage the computer.
- Do not continue to use a battery that has been dropped, or that appears damaged (e.g. bent or twisted) in any way. Even if the computer continues to work with a damaged battery in place, it may cause circuit damage, which may possibly result in fire.
- Recharge the batteries using the notebook's system. Incorrect recharging may make the battery explode.
- Do not try to repair a battery pack. Refer any battery pack repair or replacement to your service representative or qualified service personnel.
- Keep children away from, and promptly dispose of a damaged battery. Always dispose of batteries carefully. Batteries may explode or leak if exposed to fire, or improperly handled or discarded.
- Keep the battery away from metal appliances.
- Affix tape to the battery contacts before disposing of the battery.
- Do not touch the battery contacts with your hands or metal objects.

Battery Guidelines

The following can also apply to any backup batteries you may have.

- If you do not use the battery for an extended period, then remove the battery from the computer for storage.
- Before removing the battery for storage charge it to 60% - 70%.
- Check stored batteries at least every 3 months and charge them to 60% - 70%.




Battery Disposal

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

Caution

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used battery according to the manufacturer's instructions.

Battery Level

Click the battery icon  in the taskbar to see the current battery level and charge status. A battery that drops below a level of 10% will not allow the computer to boot up. Make sure that any battery that drops below 10% is recharged within one week.

Related Documents

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

User's Manual on CD/DVD

This describes the notebook PC's features and the procedures for operating the computer and its ROM-based setup program. It also describes the installation and operation of the utility programs provided with the notebook PC.

System Startup

1. Remove all packing materials.
2. Place the computer on a stable surface.
3. Insert the battery and make sure it is locked in position.
4. Securely attach any peripherals you want to use with the computer (e.g. keyboard and mouse) to their ports.
5. **When first setting up the computer use the following procedure** (as to safeguard the computer during shipping, the battery will be locked to not power the system until first connected to the AC/DC adapter and initially set up as below):
 - Attach the AC/DC adapter cord to the DC-In jack on the left of the computer, then plug the AC power cord into an outlet, and connect the AC power cord to the AC/DC adapter and **leave it there for 6 seconds or longer**.
 - Remove the adapter cord from the computer's DC-In jack, and then plug it back in again; 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".





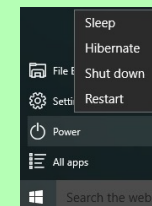
Figure 1
**Opening the Lid/LCD/
Computer with AC/DC
Adapter Plugged-In**



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.

1. Click the Start Menu icon .
2. Click the **Power** item .
3. Choose **Shut Down** from the menu.



Contents

Introduction1-1

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

Disassembly2-1

Overview	2-1
Maintenance Tools	2-2
Connections	2-2
Maintenance Precautions	2-3
Disassembly Steps	2-4
Removing the Keyboard	2-5
Removing the Battery	2-6
Removing the Hard Disk Drive	2-8
Removing the System Memory (RAM)	2-10
Removing the M.2 SSD Module	2-11
Removing the Wireless LAN Module	2-13
Wireless LAN, Combo, 3G & LTE Module Cables	2-14
Removing the 3G/4G Module	2-15
Removing the CCD	2-16

Part ListsA-1

Part List Illustration Location	A-2
Top with FP	A-3

Top without FP	A-4
Bottom	A-5
Main Board	A-6
HDD	A-7
LCD	A-8

Schematic Diagrams.....B-1

System Block Diagram	B-2
Processor 1/7	B-3
Processor 2/7	B-4
Processor 3/7	B-5
Processor 4/7	B-6
Processor 5/7	B-7
Processor 6/7	B-8
Processor 7/7	B-9
DDR4 CHA SO-DIMM_0	B-10
DDR4 CHB SO-DIMM_0	B-11
Panel, Inverter	B-12
Mini DP Port	B-13
HDMI Connector	B-14
VGA PCI Express	B-15
GPU Frame Buffer Partition	B-16
Frame Buffer Partition A	B-17
Frame Buffer Partition B	B-18
Frame Buffer Partition A_B	B-19
GPU Frame Buffer Partition	B-20
Frame Buffer Partition C	B-21
Frame Buffer Partition D	B-22
Frame Buffer Partition C_D	B-23
GPU Decoupling 1	B-24
GPU Decoupling 2	B-25

Preface


Straps and XTAL	B-26	DDR 1.2V / 0.6VS	B-58
IFP I/O Interface	B-27	Power 1.0V, VCCIO	B-59
Misc - GPIO, I2C and ROM	B-28	VCore & VCCGT Output 1	B-60
GPU NVVDD, FBVDDQ	B-29	VCore & VCCGT Output 2	B-61
GPU GND & Sequence	B-30	VCCSA	B-62
PCH 1/9	B-31	AC_In, Charger	B-63
PCH 2/9	B-32	NVVDDS	B-64
PCH 3/9	B-33	NVVDD 1	B-65
PCH 4/9	B-34	NVVDD 2	B-66
PCH 5/9	B-35	FBVDDQ	B-67
PCH 6/9	B-36	LAN Board	B-68
PCH 7/9	B-37	Reader Board	B-69
PCH 8/9	B-38	USB Board	B-70
PCH 9/9	B-39	LED Board	B-71
KBC IT8587	B-40	Click Board	B-72
Backlight KB	B-41	Power Board	B-73
Realtek ALC1220	B-42	Power Sequence	B-74
Smart AMP ALC1305	B-43	USB Board	B-75
3D AMP Headphone	B-44	Updating the FLASH ROM BIOS..... C-1	
ASM2142 1/3	B-45	Download the BIOS	C-1
ASM2142 2/3	B-46	Unzip the downloaded files to a bootable CD/DVD or	
ASM2142 3/3	B-47	USB Flash drive	C-1
M.2 3G/LTE	B-48	Set the computer to boot from the external drive	C-1
M.2 WLAN+BT, PCIE4X SSD	B-49	Use the flash tools to update the BIOS	C-2
TPM, TP	B-50	Restart the computer (booting from the HDD)	C-2
Connector	B-51		
Fan, LID, KB LED	B-52		
5V, 5VS, 3.3V, 3.3VS, 3.3VA	B-53		
1.0DX_VCCSTG/VCCSFR_OC/2.5V	B-54		
1V8_RUN/AON, NV3V3	B-55		
PEX_VDD	B-56		
VDD3, VDD5	B-57		

Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the **P950HR** 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 **P950HR** 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 Speed & Computer in DC Mode

Note that when the computer is in DC mode (powered by the battery only) the CPU may not run at full speed. This is a design feature implemented in order to protect the battery.



SO-DIMM Memory Types

All SO-DIMM memory modules installed in the system should be identical (the same size and brand) in order to prevent unexpected system behavior.

Do not mix SO-DIMM memory module sizes and brands otherwise unexpected system problems may occur.

Processor Options

i7-7700HQ (2.80GHz)

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

i5-7300HQ (2.50GHz)

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

Supports Intel® CPU over-clocking technology on i7-6820HK

Core Logic

Intel® HM175 Express Chipset

LCD Options

15.6" (39.62cm), 16:9, UHD (3840x2160)/FHD (1920x1080)

BIOS

AMI BIOS (64Mb SPI Flash-ROM)

Memory

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

Memory Expandable from **8GB (minimum)** up to **32GB (maximum)**

Security

Security (Kensington® Type) Lock Slot

BIOS Password

Intel PTT for Systems Without TPM Hardware

(**Factory Option**) TPM 2.0

(**Factory Option**) Fingerprint Reader Module

Video Adapter Options

Microsoft Hybrid Graphics Mode or Discrete Graphics Mode

Supports up to 4 Active Displays

Supports NVIDIA Surround View via HDMI x 1 and MiniDP x2

Intel Integrated GPU

Intel® HD Graphics 630

Dynamic Frequency

Intel Dynamic Video Memory Technology

Microsoft DirectX®12 Compatible

NVIDIA® Discrete GPU

NVIDIA® GeForce GTX 1070 Max-Q

8GB GDDR5 Video RAM

Microsoft DirectX®12 Compatible

Supports GPU Overclocking

Pointing Device

(**Factory Option**) Built-In Secure Pad (with Microsoft PTP Multi Gesture & Scrolling Functionality)

Or

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

Keyboard

Full Color Illuminated Full-size Winkey Keyboard (with numeric keypad)

Storage

One changeable 2.5" (6cm) **7.0mm (h) SATA** (Serial) Hard Disk Drive/Solid State Drive (SSD)
(Factory Option) One M.2 SATA/PCIe Gen3 x4 Solid State Drive (SSD)

Audio

High Definition Audio Compliant Interface
S/PDIF Digital Output
Two Speakers
Sound Blaster Audio
ANSP™ 3D sound technology on headphone output
Built-In Array Microphone

Communication

Built-In Gigabit Ethernet LAN
2.0M FHD PC Camera Module
(Factory Option) M.2 3G/4G Module

WLAN/ Bluetooth M.2 Modules:

(Factory Option) Intel® Wireless-AC 8265 Wireless LAN **(802.11ac)** + Bluetooth **4.2**
(Factory Option) Intel® Wireless-AC 3168 Wireless LAN **(802.11ac)** + Bluetooth **4.2**
(Factory Option) Qualcomm® Atheros Killer™ Wireless-AC 1535 Wireless LAN **(802.11ac)** + Bluetooth **4.1**

Card Reader

Embedded Multi-In-1 Push-Push Card Reader
MMC (MultiMedia Card) / RS MMC
SD (Secure Digital) / Mini SD / SDHC/ SDXC

M.2 Slots

Slot 1 for **Combo WLAN and Bluetooth** Module
Slot 2 for **SATA or PCIe Gen3 x4 SSD**
(Factory Option) Slot 3 for 3G/4G Module

Interface

Two USB 3.1 Gen 2* Type-C Ports
**The maximum amount of current supplied by USB Type-C ports is 500mA (USB 2.0)/900mA (USB 3.1).*
Three USB 3.0 (USB 3.1 Gen 1) Type-A Ports (Including one AC/DC Powered USB Port)
Two Mini DisplayPorts (1.3)
One HDMI-Out Port
One 2-In-1 Audio Jack (Headphone & S/PDIF Optical Output Combo Jack)
One Microphone-In Jack
One Line-Out Jack
One RJ-45 LAN Jack
One DC-In Jack



USB 3.1 Gen 2

Note that when a single USB device is plugged in to a USB 3.1 Gen 2 port the data transfer speed will be 10Gbps, however when two devices are plugged in to both USB 3.1 Gen 2 ports, this bandwidth will be shared between the ports.

Environmental Spec

Temperature

Operating: 5°C - 35°C
Non-Operating: -20°C - 60°C

Relative Humidity

Operating: 20% - 80%
Non-Operating: 10% - 90%

Power

Embedded 4-Cell Polymer Battery Pack, 55WH
Full Range AC/DC Adapter
AC Input: 100 - 240V, 50 - 60Hz
DC Output: 19.5V, 9.23A (**180W**)

Dimensions & Weight

380mm (w) * 252mm (d) * 18.6mm (h)
2.0kg (Barebone with 60WH Battery)

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. LCD
5. Speakers
6. Power Button
7. Keyboard
8. Touchpad & Buttons
9. Fingerprint Reader (Optional)

External Locator - Top View with LCD Panel Open



External Locator - Front & Right Side Views

FRONT VIEW



Figure 2
Front View
1. LED Indicator

RIGHT SIDE VIEW



Figure 3
Right Side View
1. Microphone-In Jack
2. Headphone & S/PDIF Combo Jack
3. USB 3.0 (USB 3.1 Gen 1) Port
4. Multi-in-1 Card Reader
5. USIM Card Reader (for 3G/4G USIM Cards)
6. RJ-45 LAN Jack
7. Security Lock Slot

Introduction

External Locator - Left Side & Rear View

Figure 4
Left Side View

1. Vent
2. DC-In Jack
3. HDMI-Out Port
4. Mini DisplayPorts
5. USB 3.1 Gen 2 Type-C Ports
6. USB 3.0 (USB 3.1 Gen 1) Port
7. Powered USB 3.0 Port

LEFT SIDE VIEW



Figure 5
Rear View

1. Vent

REAR VIEW



External Locator - Bottom View

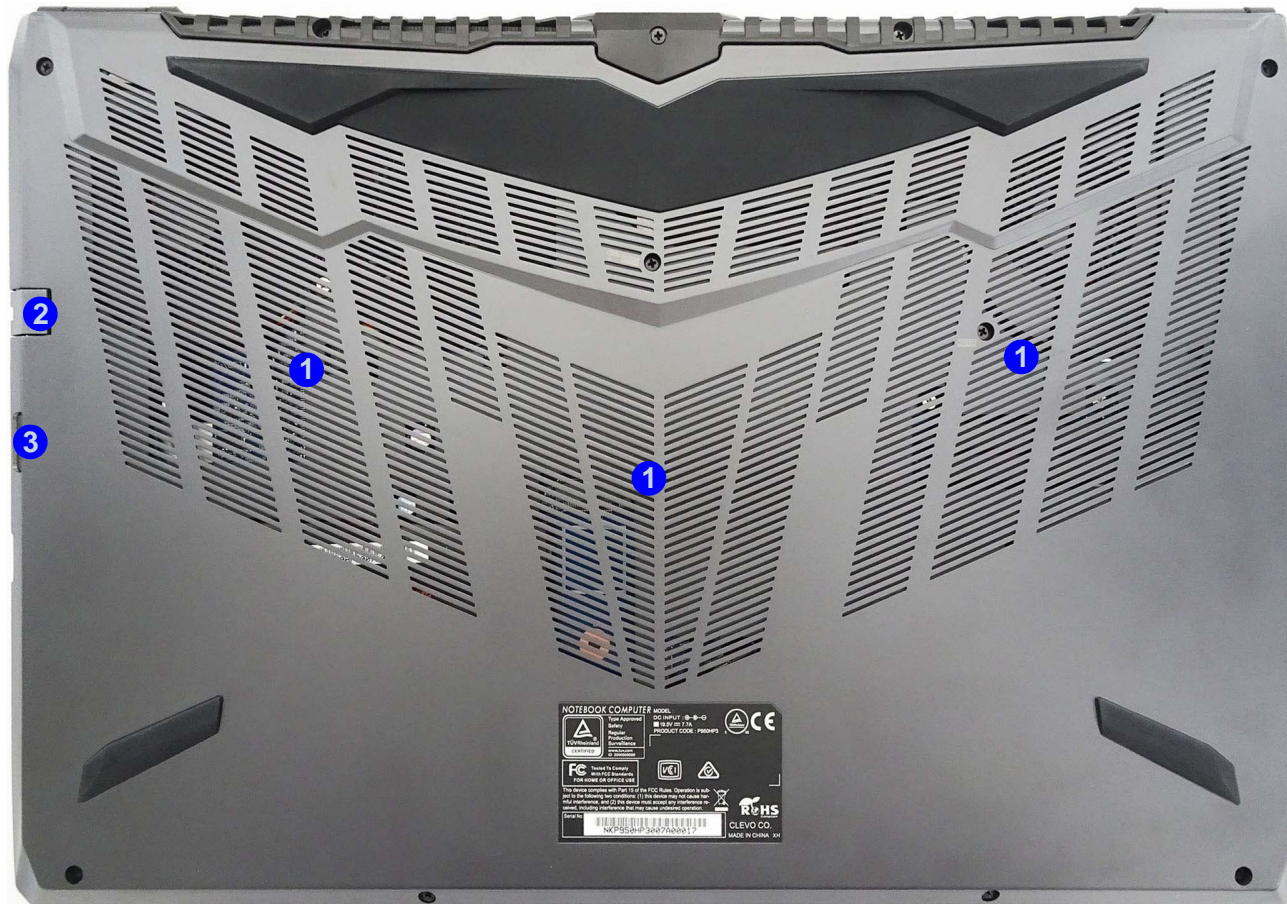


Figure 6
Bottom View

1. Vent
2. RJ-45 LAN Jack
3. USIM Card Reader (for 3G/4G USIM Cards)


Overheating

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

Introduction

Figure 7
Mainboard Top
Key Parts

1. KBC-ITE IT8587

Mainboard Overview - Top (Key Parts)



Mainboard Overview - Bottom (Key Parts)

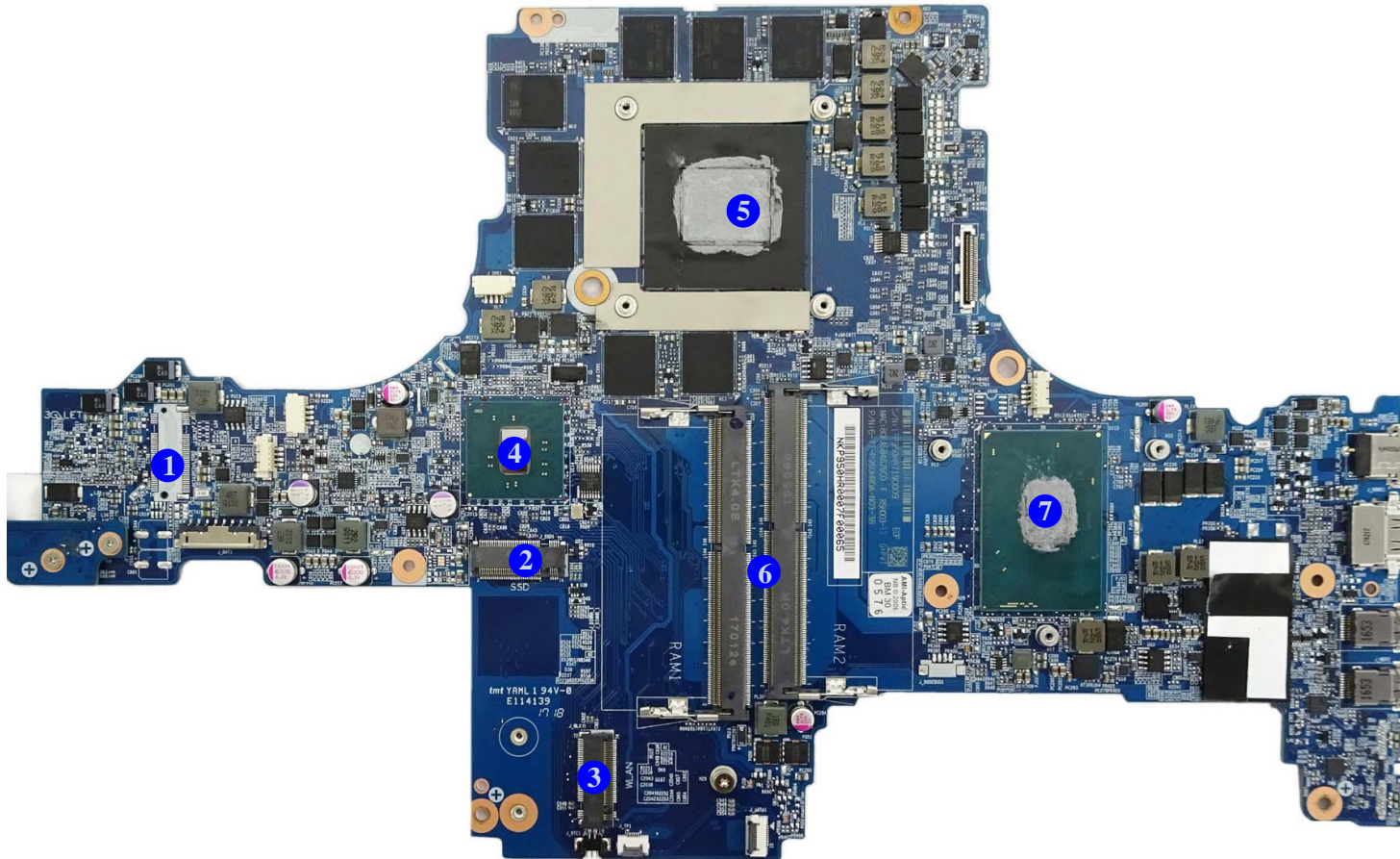


Figure 8
**Mainboard Bottom
Key Parts**

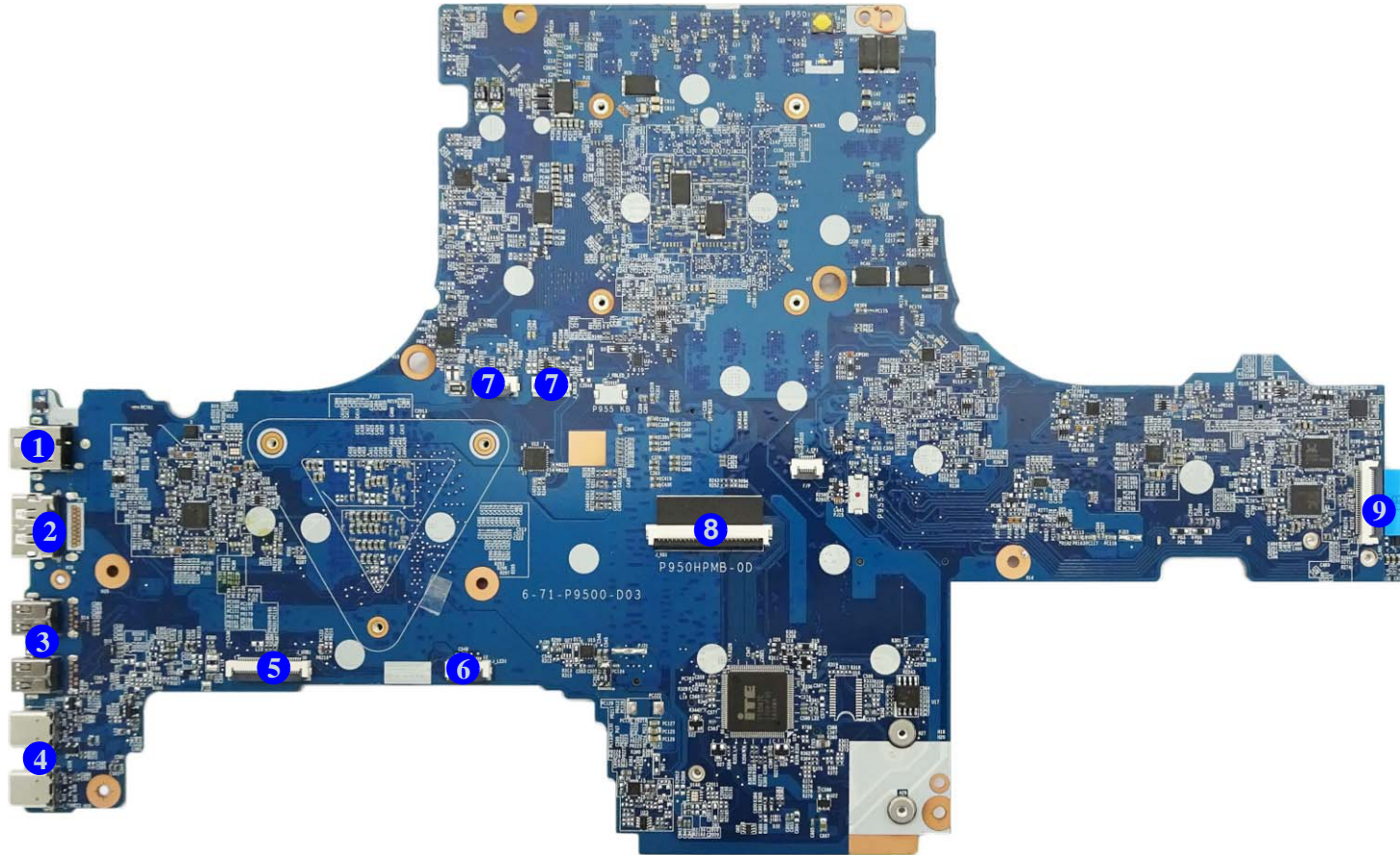
1. Mini-Card Connector (M.2 3G/SATA Module)
2. Mini-Card Connector (M.2 PCIE/SATA SSD Module)
3. Mini-Card Connector (WLAN Module)
4. PCH
5. GPU-GTX1070
6. Memory Slots DDR4 SO-DIMM
7. CPU

Introduction

Figure 9
**Mainboard Top
Connectors**

1. DC-In Jack
2. HDMI Port
3. Mini Display Ports
4. USB Port 3.1
Connector
5. USB Board
Connector
6. LED Board
Connector
7. LED KB
Connector
8. Keyboard Cable
Connector
9. LAN Board
Connector

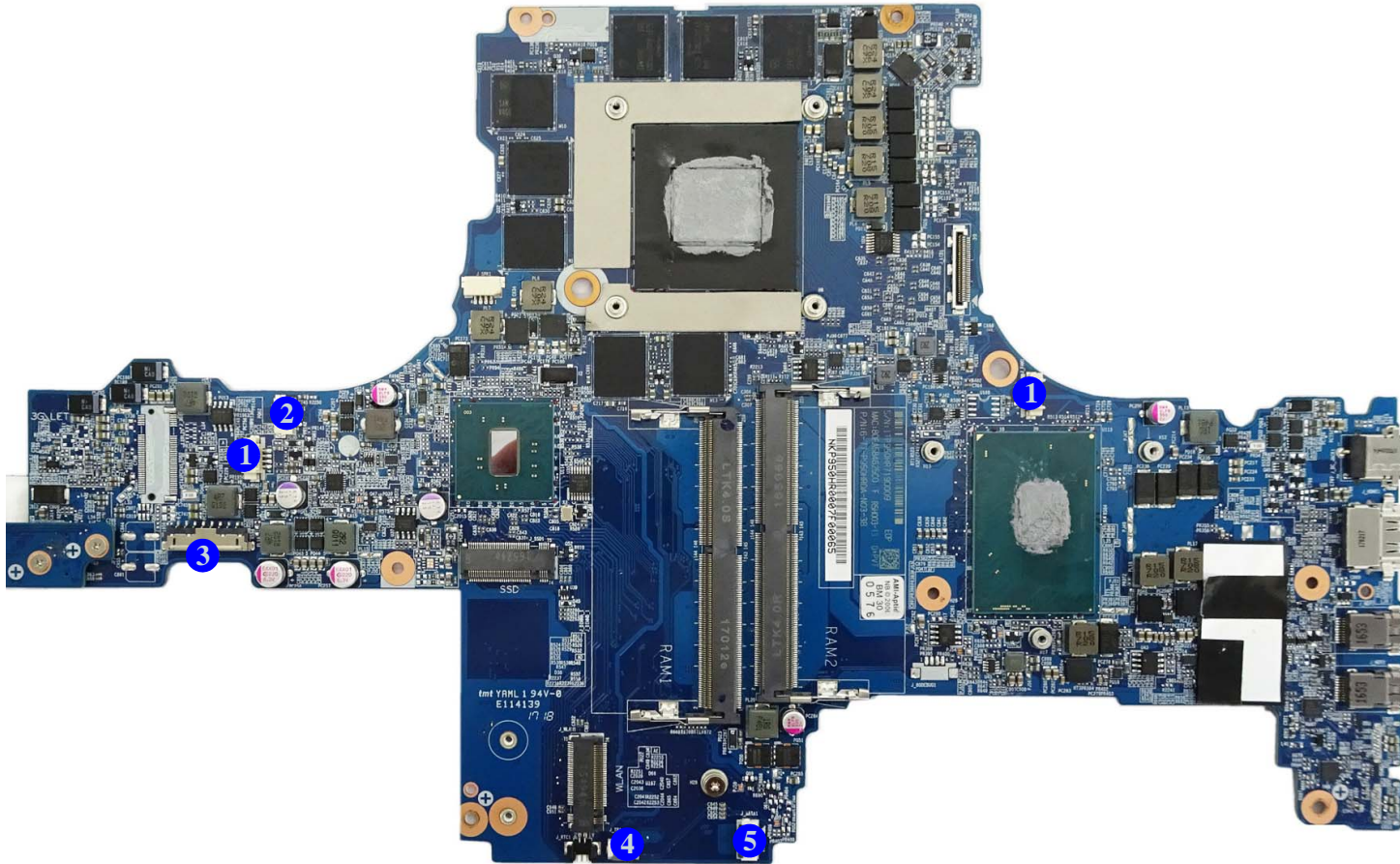
Mainboard Overview - Top (Connectors)



Mainboard Overview - Bottom (Connectors)

Figure 10
**Mainboard Bottom
Connectors**

1. Fan Connector
2. Fan Connector
3. Battery Connector
4. Touchpad Cable Connector
5. HDD Connector




Chapter 2: Disassembly



Overview

This chapter provides step-by-step instructions for disassembling the **P950HR** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

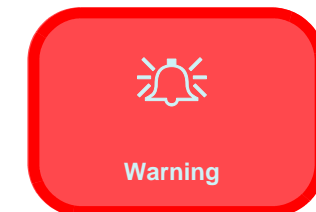
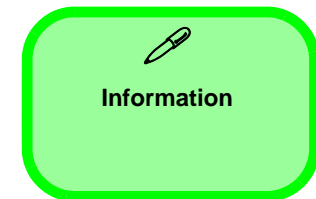
We suggest you completely review any procedure before you take the computer apart.

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

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

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

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



Disassembly

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

Maintenance Tools

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

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

Connections

Connections within the computer are one of four types:

Locking collar sockets for ribbon connectors	To release these connectors, use a small flat-head screwdriver to gently pry the locking collar away from its base. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.
Pressure sockets for multi-wire connectors	To release this connector type, grasp it at its head and gently rock it from side to side as you pull it out. Do not pull on the wires themselves. When replacing the connection, do not try to force it. The socket only fits one way.
Pressure sockets for ribbon connectors	To release these connectors, use a small pair of needle-nose pliers to gently lift the connector away from its socket. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.
Board-to-board or multi-pin sockets	To separate the boards, gently rock them from side to side as you pull them apart. If the connection is very tight, use a small flat-head screwdriver - use just enough force to start.

Maintenance Precautions

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

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

Cleaning

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

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

(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 Keyboard:

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

To remove the Battery:

1. Remove the keyboard [page 2 - 5](#)
2. Remove the battery [page 2 - 6](#)

To remove the HDD:

1. Remove the keyboard [page 2 - 5](#)
2. Remove the battery [page 2 - 6](#)
3. Remove the HDD [page 2 - 8](#)

To remove the System Memory:

1. Remove the keyboard [page 2 - 5](#)
2. Remove the battery [page 2 - 6](#)
3. Remove the system memory [page 2 - 10](#)

To remove and install the M.2 SSD:

1. Remove the keyboard [page 2 - 5](#)
2. Remove the battery [page 2 - 6](#)
3. Remove the M.2 SSD [page 2 - 11](#)
4. Install the M.2 SSD [page 2 - 12](#)

To remove the Wireless LAN Module:

1. Remove the keyboard [page 2 - 5](#)
2. Remove the battery [page 2 - 6](#)
3. Remove the WLAN [page 2 - 13](#)

To remove the 3G/4G Module:

1. Remove the keyboard [page 2 - 5](#)
2. Remove the battery [page 2 - 6](#)
3. Remove the 3G/4G [page 2 - 15](#)

To remove the CCD Module:

1. Remove the keyboard [page 2 - 5](#)
2. Remove the battery [page 2 - 6](#)
3. Remove the CCD module [page 2 - 16](#)

Removing the Keyboard

1. Turn **off** the computer, turn it over.
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 1a*).
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 1b*).
5. Carefully lift the keyboard **6** off the computer (*Figure 1c*).

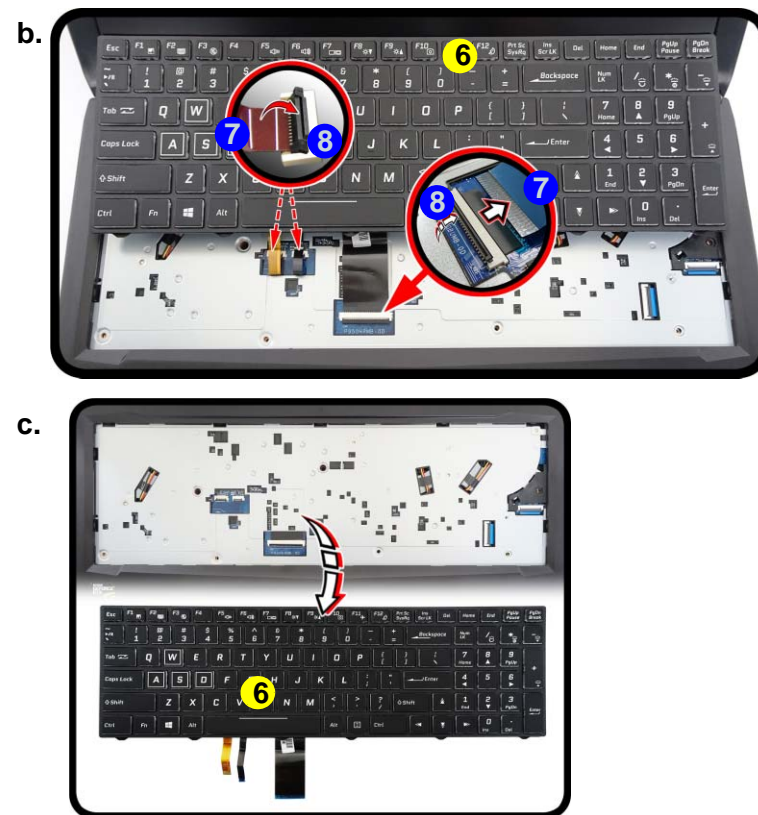
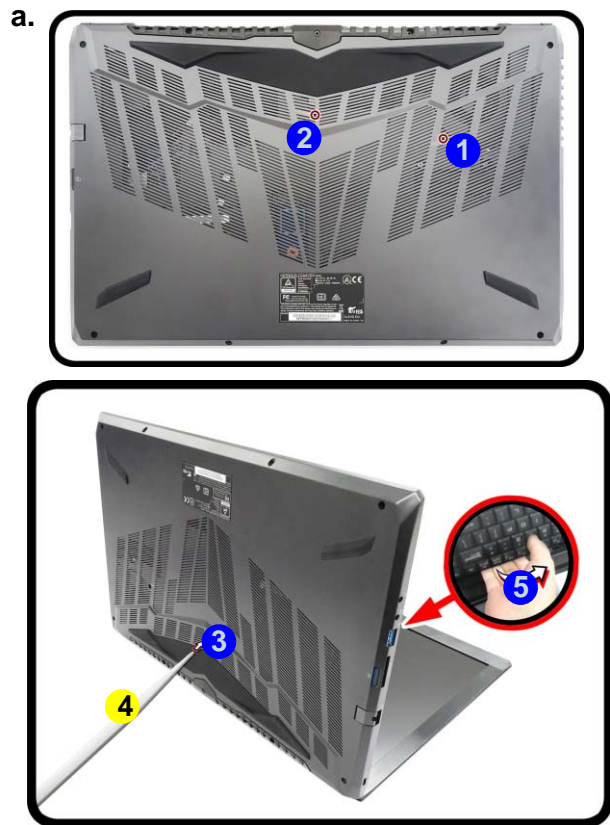


Figure 1
Keyboard Removal

- 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.



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

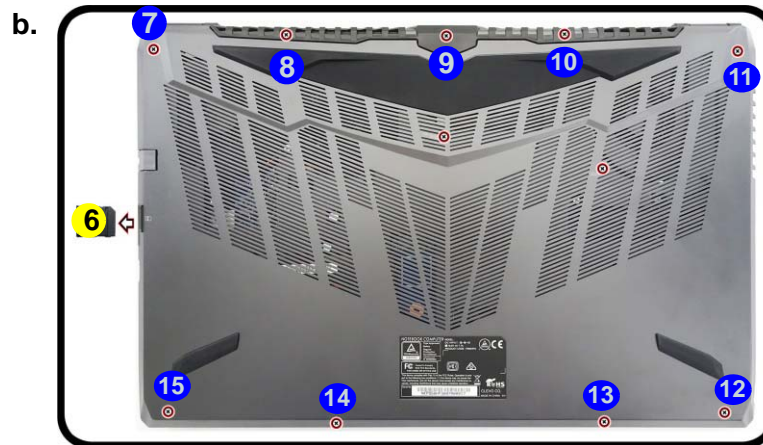
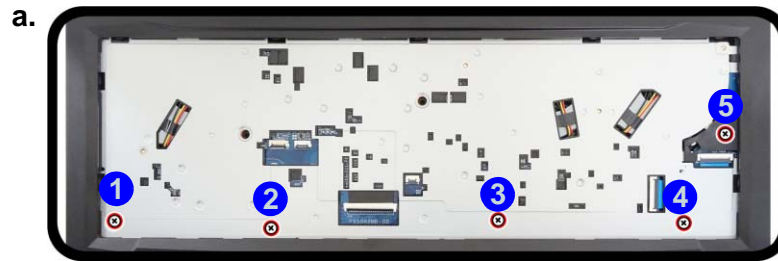
Disassembly

Figure 2
Battery Removal

- Remove the screws.
- Remove the SD cover and screws.
- Remove the bottom case.

Removing the Battery

- Turn the computer off, and remove the keyboard ([page 2 - 5](#)).
- Remove screws **1** - **5** ([Figure 2a](#)).
- Remove the SD card cover **6** and screws **7** - **15** ([Figure 2b](#)).
- Carefully lift the bottom case **16** up in the direction of the arrow at point **17** and remove it ([Figure 2c](#)).



- 1. SD Card Cover
- 16. Bottom Case

- 14 Screws

5. The battery will be visible at point **18** on the computer (*Figure 3d*).
6. Carefully disconnect the cable **19**, then remove screws **20** - **21** (*Figure 3e*).
7. Lift the battery **22** off the computer (*Figure 3f*).
8. Reverse the process to install a new battery (do not forget to replace all the screws and bottom cover).

Figure 3
Battery Removal
(cont'd.)

- d. Locate the battery.
- e. Disconnect the cable and remove the screws.
- f. Lift the battery off the computer.



23. Battery

- 2 Screws

Figure 4
**HDD Assembly
Removal**

- Locate the HDD.
- Remove the screw.

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 - 6](#)).
- The HDD will be visible at point **1** on the mainboard ([Figure 4a](#)).
- Remove screws **2** from the HDD assembly ([Figure 4b](#)).



6. Hard Disk

- 1 Screw



HDD System Warning

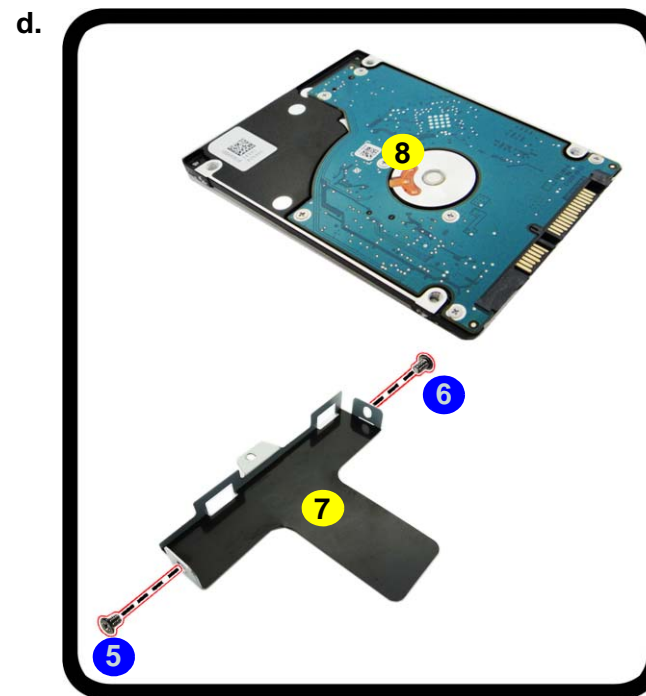
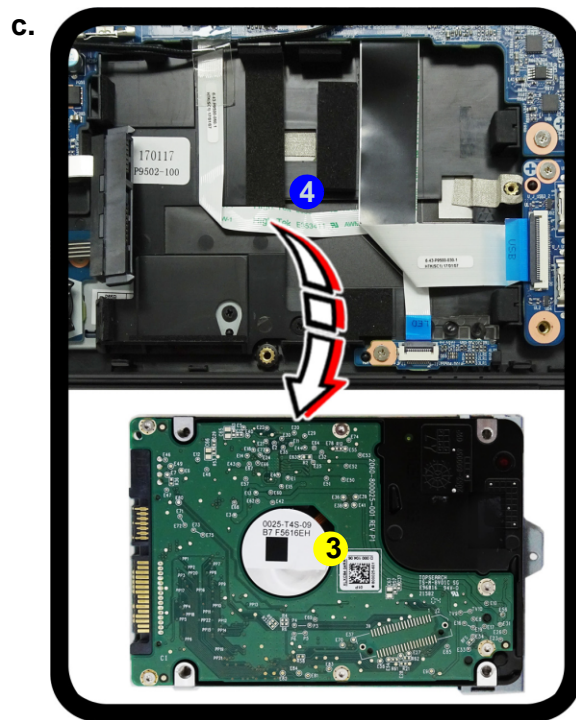
New HDD's are blank. Before you begin make sure:

You have backed up any data you want to keep from your old HDD.

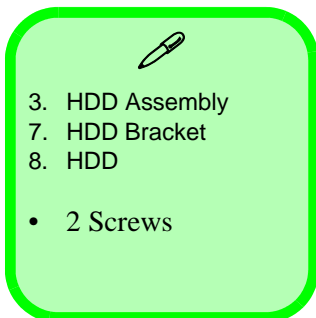
You have all the CD-ROMs and FDDs required to install your operating system and programs.

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.

4. Slightly slide and pull the hard disk out.
5. Lift the hard disk assembly **3** out of the bay **4** (*Figure 5c*).
6. Remove screws **5** - **6** and bracket **7** from the hard disk **8** (*Figure 5d*).
7. Reverse the process to install a new hard disk (do not forget to replace the screws).



- c. Slide and pull the HDD assembly out of the bay.
- d. Remove the screws and bracket from the HDD.



Disassembly

Figure 6
RAM Module Removal

- The RAM modules will be visible at point **1** on the mainboard.
- 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.



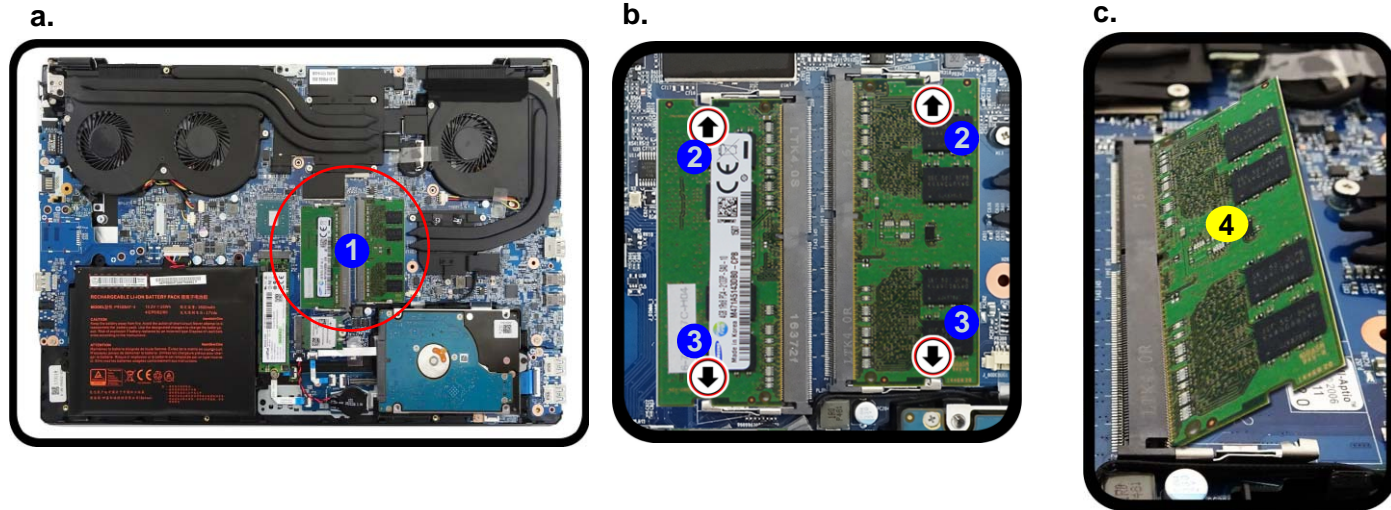
4. RAM Module

Removing the System Memory (RAM)

The computer has four memory sockets for 260 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR4 Up to 2400 MHz. The main memory can be expanded up to 64GB. 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 - 6](#)).
- The RAM-2 modules will be visible at point **1** on the mainboard ([Figure 6a](#)).
- Gently pull the two release latches (**2** & **3**) on the sides of the memory socket in the direction indicated by the arrows ([Figure 6b](#)). The RAM module **4** will pop-up ([Figure 6c](#)), 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.



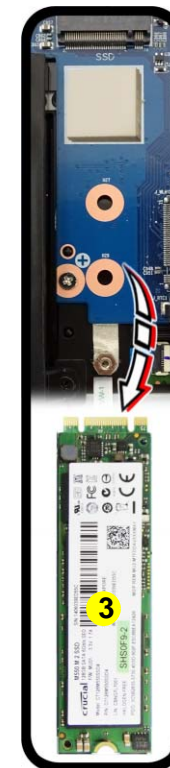
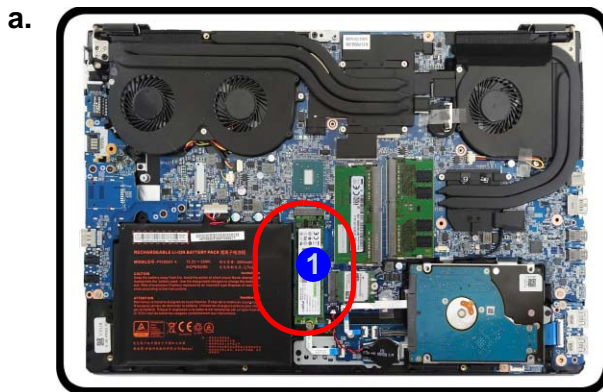
Removing the M.2 SSD Module


M.2 SSD-1 Removal Procedure

1. Turn **off** the computer, turn it over, remove the battery ([page 2 - 6](#)).
2. The M.2 SSD module will be visible at point **1** on the mainboard ([Figure 7a](#)).
3. Remove the screw **2** ([Figure 7b](#)).
4. The M.2 SSD module **3** ([Figure 7c](#)) will pop-up, and you can remove it from the computer.
5. Reverse the process to install a new module (do not forget to replace the screws and thermal pad).

Figure 7
M.2 SSD-1 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 8 M.2 SSD Module Installation

- Place the thermal pad.
- Insert the module.
- Tighten the screw.

M.2 SSD Installation Procedure

- Place the thermal pad **1** on the mainboard as shown (*Figure 8a*).
- Insert the module **2** in the computer (*Figure 8b*).
- Tighten the screw **3** to secure it in place (*Figure 8c*).



Thermal Pad

Be sure to place the thermal pad's adhesive side down onto the mainboard surface as shown.



- Thermal Pad
- M2 SSD Module

- 1 Screw

Removing the Wireless LAN Module


1. Turn **off** the computer, turn it over, remove the battery ([page 2 - 6](#)).
2. The Wireless LAN module will be visible at point **1** on the mainboard ([Figure 9a](#)).
3. Carefully disconnect the cables **2** & **3**, and then remove the screw **4** ([Figure 9b](#)).
4. The Wireless LAN module **5** ([Figure 9c](#)) will pop-up, and you can remove it from the computer.



Figure 9
**Wireless LAN
Module Removal**

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

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



5. Wireless LAN Module

- 1 Screw

Wireless LAN, Combo, 3G & LTE Module Cables

Note that the cables for connecting to the antennae on WLAN, WLAN & Bluetooth Combo, 3G and LTE modules are not labelled. The cables/covers (each cable will have either a black or transparent cable cover) are color coded for identification as outlined in the table below.

Module Type	Antenna Type	Cable Color	Cable Cover Type
WLAN/WLAN & Bluetooth Combo	WM 1	Black	Transparent
	WM 2	Black	White
LTE Broadband	LTE 1	Black	Black
	LTE 2	Black	Blue

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

Removing the 3G/4G Module


3G/4G Module Removal Procedure

1. Turn off the computer, remove the battery ([page 2 - 6](#)).
2. Locate the module, it is visible at point **1** ([Figure 10a](#)).
3. Carefully disconnect the cables **2** & **3**, and then remove the screw **4** from the module ([Figure 10b](#)).
4. The module **5** will pop-up ([Figure 10c](#)).
5. Lift the module **5** up and off the computer ([Figure 10d](#)).

Figure 10
3G/4G Module Removal

- a. Locate the module.
- b. Disconnect the cables and remove the screw.
- c. The module will pop-up.
- d. Lift the module up off the socket.





5. 3G/4G Module

- 1 Screw

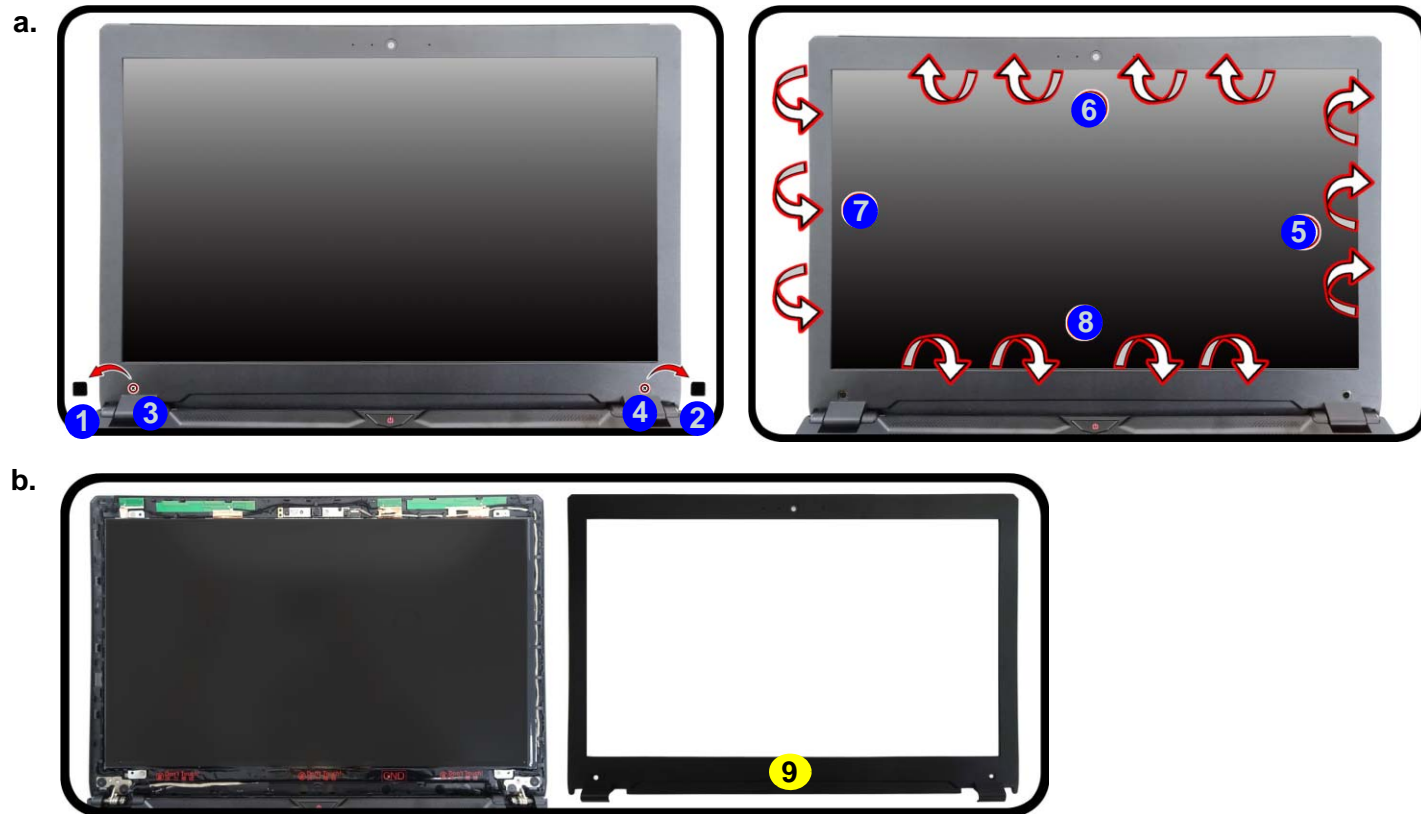
Disassembly

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 - 6](#)).
2. Lay the computer down on a flat surface with the top case up forming a 130 degree angle. Carefully remove the mylar covers **1** - **2** and screws **3** - **4**.
3. Run your fingers around the inner frame of the LCD panel to lift at points **5** - **6** as indicated by the arrows, and slightly lift up the outer frame at point **7** as indicated by the arrows, and then run your fingers again around the inner frame at the lower point **8** as indicated by the arrows ([Figure 11a](#)).
4. Remove the LCD front cover **5** ([Figure 11b](#)).



9. LCD Front Cover

- 2 Screws

5. Disconnect the cable **10** (*Figure 12c*).
6. Remove the CCD module **11** (*Figure 12d*).
7. Reverse the process to install a new CCD module.

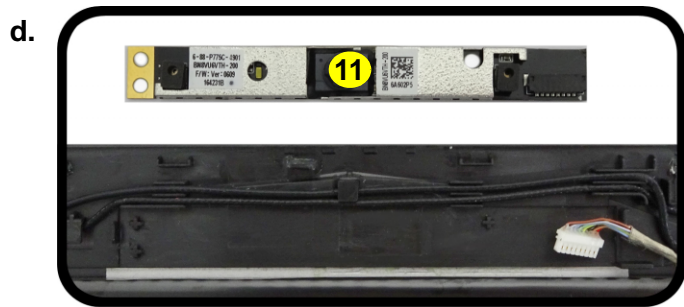
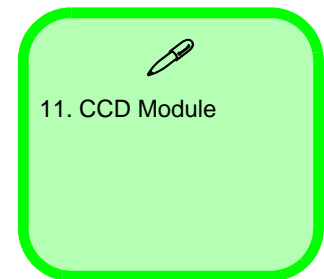


Figure 12
CCD Removal
(cont'd)

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



Appendix A:Part Lists

This appendix breaks down the *P950HR* series notebook's construction into a series of illustrations. The component part numbers are indicated in the tables opposite the drawings.

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

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

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

Part List Illustration Location

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

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

Part	
Top with FP	<i>page A - 3</i>
Top without FP	<i>page A - 4</i>
Bottom	<i>page A - 5</i>
Main Board	<i>page A - 6</i>
HDD	<i>page A - 7</i>
LCD	<i>page A - 8</i>

Top without FP

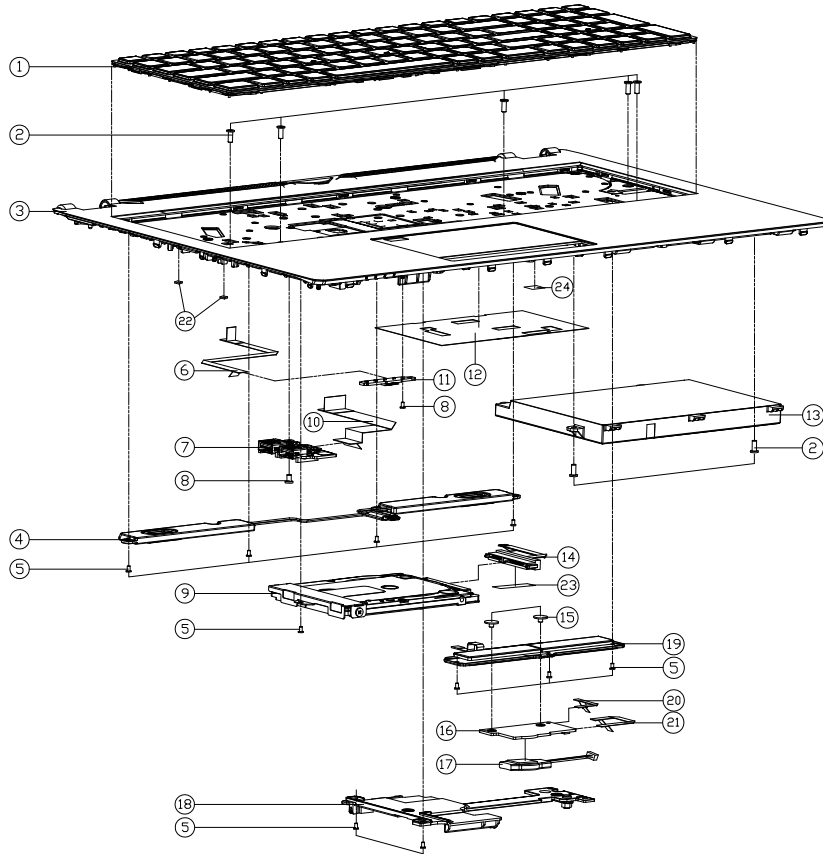
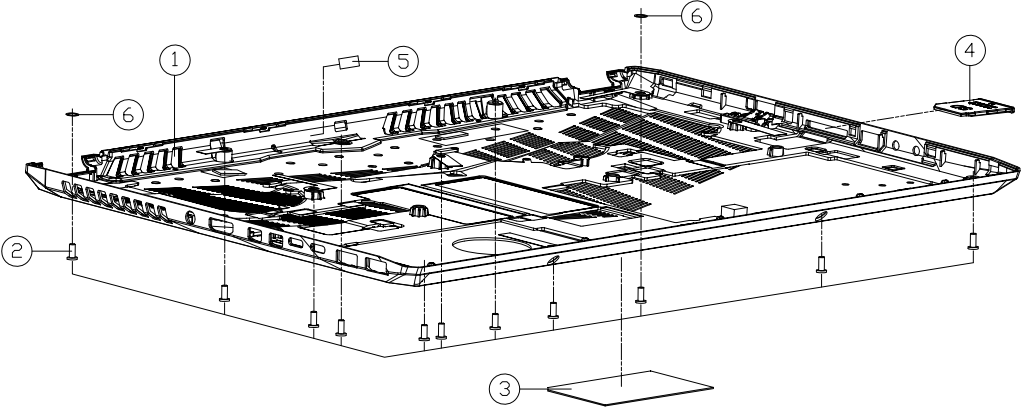


Figure A - 2
Top without FP

ITEM	PART NAME	PART NO	REMARK
1	W/O FINGERPRINT SENSOR BEZEL FRAME (SLIP-ON TYPE) (COLOR WITH VIBRO KEY) (FOR FRAME)	6-80-N8500-010-1	
2	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
3	(PRE-PROCESS) TOP CASE MODULE (W/O FP) FOR TP P950HR	6-78-P950HR02-020	
3	(PRE-PROCESS) TOP CASE MODULE (W/O FP) FOR TP P950HP6	6-78-P950HP62-020	
3	(PRE-PROCESS) TOP CASE MODULE (W/O FP) FOR TP P957HR	6-78-P957HR02-020	
3	(PRE-PROCESS) TOP CASE MODULE (W/O FP) FOR TP P957HR-H	6-78-P957HRH2-020	
3	(PRE-PROCESS) TOP CASE MODULE (W/O FP) FOR TP P957HR	6-78-P957HR02-040	
4	SPACER CABLE MAIN P/L R 7.0MM L 133MM 2V 40T 4P (GHOSTED) P950HR V3.0	6-23-5P950-0S3	
5	SCREW M2*3L KI BZ ICT NY (DD=04.5,DT=0.4)	6-35-B6120-3RD	
6	FFC CABLE LED TO MB L=141MM 5V 12P (OX) P950HP6	6-43-P9500-051	
7	USB3.0 BOARD V2.0 (W/ RE-DRIVER IC) P950HP6	6-77-P9503-D02	
8	SCREW M2*4L KI NI ICT NY (DD=04.5,DT=0.4)	6-35-B1120-4RE	
9	W/HDD ASS'Y P950HR	6-79-P950HR0J-010	
9	W/O HDD ASS'Y P950HR	6-79-P950HR0J-020	
10	FFC CABLE USB TO MB L=104.5MM 5V 30P (OX) P950HP6	6-43-P9500-031	
11	FRONT LED BOARD V2.0 P950HP6	6-77-P9504-D02	
12	TOP TP MYLAR PET P775DM2	6-40-P7752-211	
13	IMP'S U12SV/CAS/MS/SH P/E QSP 076/00/000 POLYMER SHIELDING PS950 LABEL CABLE	6-87-P950S-52B01	
13	IMP'S U12SV/CAS/MS/SH P/E QSP 076/00/000 POLYMER SHIELDING PS950 LABEL CABLE	6-87-P950S-51E01	
14	HDD CONN310G-100*PCB+W/CABLE (FFC CABLE 52MM) P950HP6	6-23-FP950-010	
15	SCREW M2*2L KI BK/Z ICT NY(Ø8,T=0.6)	6-35-B6120-2RE	
16	CLICK BOARD V2.0 P950HP6	6-77-P9502-D02	
17	BAT 20MM 2V 220MAH W/CABLE 55MM BCR2020HS(V)010 (SHIELD)	6-23-22015-TE0	
18	HDD HOLDER MODULE P950HP6	6-42-P9502-102	
19	FUNCTION KEY FOR CLICK BUTTON MODULE W/O FINGER P950HR6	6-23-KP65R-022	
20	FFC CABLE CLICK TO MB L=35MM 5V 6P (OX) P950HP6	6-43-P9500-020	
21	FFC CABLE CLICK TO TP L=60MM 5V 8P (OX) P950HP6	6-43-P9502-010	
22	TOP CASE SPONGE (5*5*1) CR4382 P950HP6	6-47-0019A-05K	ONLY FOR P950HP3/HP6
23	TAPE MYLAR (A),MYLAR M550J	6-40-M55J2-010	
24	MYLAR(7*6*0.15MM,BLACK) FOR P640RF	6-40-00150-760	

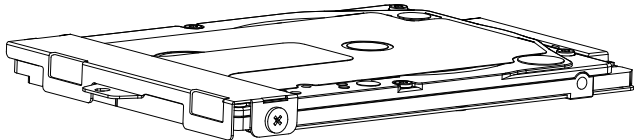
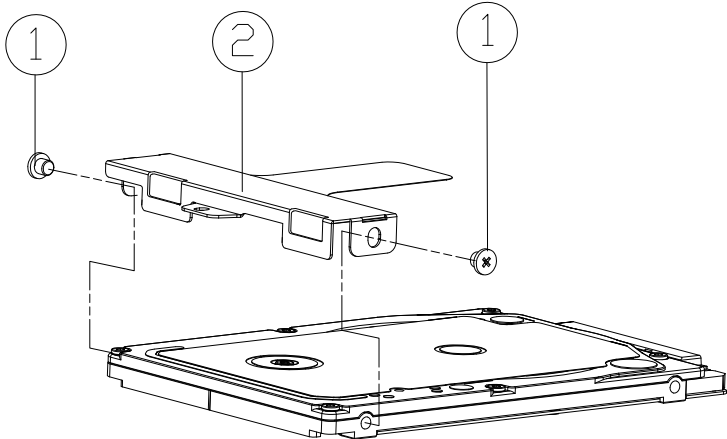
Bottom



ITEM	PART NAME	PART NO	REMARK
1	BOTTOM CASE MODULE P950HP6	6-39-P9503-014	for P950XX
1	BOTTOM CASE MODULE P950HP6	6-39-P9503-012	for P950XX
1	BOTTOM CASE MODULE P957HR	6-39-P9573-012	for P957XX
1	BOTTOM CASE MODULE P957HR	6-39-P9573-013	for P957XX
1	BOTTOM CASE MODULE P957HR	6-39-P9573-014	for P957XX
2	.SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
3	PRODUCT LABEL FOR P950HXCHANGE RATING	6-45-P950HR03-011	
3	PRODUCT LABEL FOR P950HXCHANGE RATING	6-45-P950HP63-011	
3	PRODUCT LABEL FOR P950HXCHANGE RATING	6-45-P950HP33-011	
3	PRODUCT LABEL FOR P957HR	6-45-P957HR03-010	
3	PRODUCT LABEL FOR P957HP6	6-45-P957HP63-010	
3	PRODUCT LABEL FOR P957HP3	6-45-P957HP33-010	
3	PRODUCT LABEL FOR P957HR-H	6-45-P957HRH3-010	
3	PRODUCT LABEL FOR P957HP6-H	6-45-P957HP6H-010	
3	PRODUCT LABEL FOR P957HP3-H	6-45-P957HP3H-010	
4	DUMMY NON PUSH TYPE PIN HAS 0.228" DIA. UNFINISHED VENTON	6-42-W9708-011	
5	BOTTOM CASE MYLAR (PET+SONY G400) P950HP6	6-40-P9503-040	FOR BTM-012 20
6	WASHER AL FOIL(0.6*0.3*0.25 MM)	6-37-02000-602	FOR BTM-012 20

Figure A - 3
Bottom

HDD



ITEM	PART NAME	PART NO	REMARK
1	SCREW M3*2.5L KI NI ICT NY	6-35-B1130-2R5	
2	HDD BKT 7MM SECC T=0.5 N250LU	6-33-N250J-011	

Figure A - 5
HDD

LCD

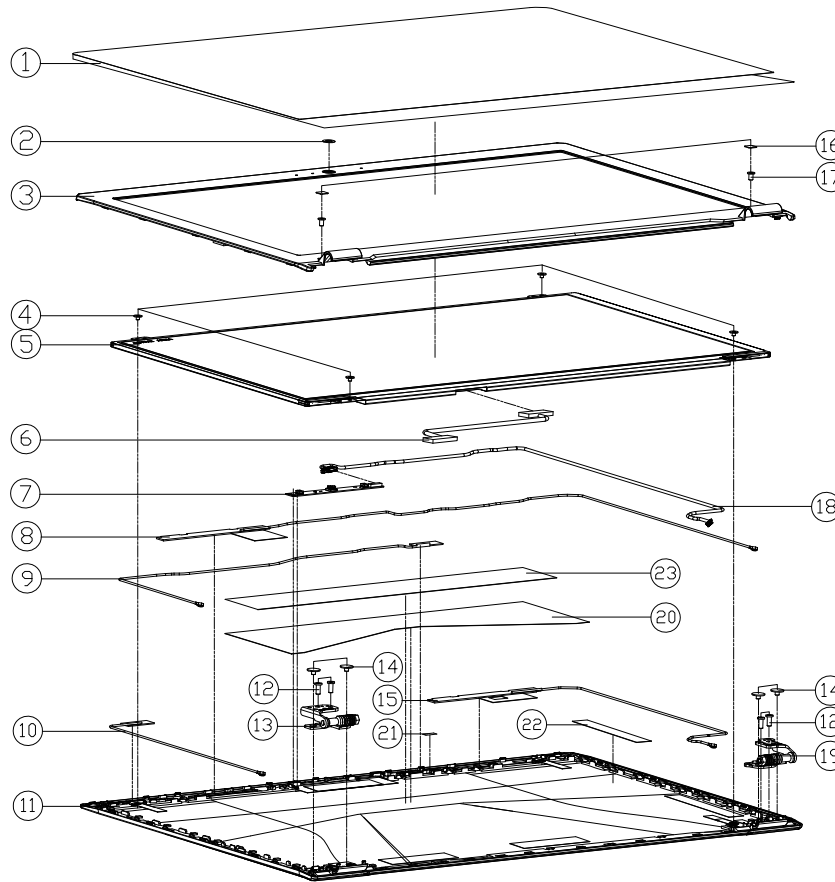


Figure A - 6
LCD

ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP N650DU	6-40-N6508-040	
2	CCD LENS PC P950HP6	6-42-P9501-020	
3	LCD FRONT COVER MODULE P950HP6	6-39-P9501-012	
4	SCREW M2*2L KI NI ICT NY (DD=#5 ,T=0.5)	6-35-B1120-2R0	
5	LCD 15.6" FHD/IPS/VEIP LG LP156WF6-SPK3 (M4) (LED) 32MM	6-50-LB232-L08	
5	LCD 15.6" FHD/IPS/VEIP LG LP156WF6-SPB1 (M4) (LED) 32MM	6-50-LB232-L04	
5	LCD 15.6" UHD (IPS/VEIP) LG LP156UDI-SPB1 (LED) 26MM	6-50-L1226-L00	
5	LCD 15.6" FHD/120HZ/AVSR G-SYNC/75HZ AU B564HTMS2 (LED)32MM	6-50-LB232-G17	
6	CABLE FOR EIP 402X 300M (D) 19V 40PIN 011/V CONNCT0106040 P950HP6	6-43-P9501-020-1N	
6	WIRE CABLE FOR EIP 300M (D) 19V 30PIN 011/V CONNCT0106040 P950HP6	6-43-P9501-010-2N	
7	INC CAMERA BEZEL FOR DISPLAY/BEZEL FOR FHD DISPLAY W/SONIC FINGER WHITE-LED VIB-MIC	6-88-W65DC-5100	OPTION
7	INC CAMERA BEZEL FOR DISPLAY/BEZEL FOR FHD DISPLAY W/SONIC FINGER WHITE-LED VIB-MIC	6-88-P775C-4901	OPTION
8	ANTENNA PEBA SHALE JEM LEE-2 PCB BR 030/040/050/060/070/080/090/100MM P950HP6	6-23-7P950-021	
9	ANTENNA IPEX4 WLAN JEM WL2 PCB DL 240/50HZ WL2-850MM	6-23-7P950-041	
10	ANTENNA IPEX4 WLAN JEM WL1 PCB DL 240/50HZ WL1-60MM COPPER FOL P950HP6	6-23-7P950-031	
11	BACK COVER MODULE P950HP6	6-39-P9501-022	
12	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
13	LCD HINGE L (SK7) SNR P950HP6	6-33-P9501-1L1-1	
14	SCREW M2.5*2.5L KI BK/2 ICT NY(08,T=0.6)	6-35-B6125-2R5	
15	ANTENNA PEBA SHALE JEM LEE-1 PCB BR 030/040/050/060/070/080/090/100MM P950HP6	6-23-7P950-013	
16	FRONT COVER SCREW MYLAR PC P750ZM	6-40-P7508-030	
17	SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
18	WIRE CABLE CCD+MIC TO MB 8PIN W840SU-T (HL)	6-43-W840T-012	
19	LCD HINGE R (SK7) SNR P950HP6	6-33-P9501-1R1-1	
20	LCD WATERPROOF MYLAR PET P950HP6	6-40-P9501-021	FDR P950HP6/HP3/HR
21	NITTO TAPE 156A (18*3) P950HP6	6-40-P9501-040	FDR P950HP6/HP3
22	LCD SPONGE (70*10*1T) SM55 P950HP6	6-47-0019A-70S	BOPAI(TERRANS FORCE?)
23	LCD WATERPROOF MYLAR PET FDR (BOPAI/TERRANS FORCE?) P950HP6	6-40-P9501-050	ONLY FOR P950HP6/HP3 ENLY FOR P950HP6-B

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the *P950HR* notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

Diagram - Page	Diagram - Page	Diagram - Page	Diagram - Page
System Block Diagram - Page B - 2	Frame Buffer Partition C_D - Page B - 23	3D AMP Headphone - Page B - 44	NVVDD 1 - Page B - 65
Processor 1/7 - Page B - 3	GPU Decoupling 1 - Page B - 24	ASM2142 1/3 - Page B - 45	NVVDD 2 - Page B - 66
Processor 2/7 - Page B - 4	GPU Decoupling 2 - Page B - 25	ASM2142 2/3 - Page B - 46	FBVDDQ - Page B - 67
Processor 3/7 - Page B - 5	Straps and XTAL - Page B - 26	ASM2142 3/3 - Page B - 47	LAN Board - Page B - 68
Processor 4/7 - Page B - 6	IFP I/O Interface - Page B - 27	M.2 3G/LTE - Page B - 48	Reader Board - Page B - 69
Processor 5/7 - Page B - 7	Misc - GPIO, I2C and ROM - Page B - 28	M.2 WLAN+BT, PCIE4X SSD - Page B - 49	USB Board - Page B - 70
Processor 6/7 - Page B - 8	GPU NVVDD, FBVDDQ - Page B - 29	TPM, TP - Page B - 50	LED Board - Page B - 71
Processor 7/7 - Page B - 9	GPU GND & Sequence - Page B - 30	Connector - Page B - 51	Click Board - Page B - 72
DDR4 CHA SO-DIMM_0 - Page B - 10	PCH 1/9 - Page B - 31	Fan, LID, KB LED - Page B - 52	Power Board - Page B - 73
DDR4 CHB SO-DIMM_0 - Page B - 11	PCH 2/9 - Page B - 32	5V, 5VS, 3.3V, 3.3VS, 3.3VA - Page B - 53	Power Sequence - Page B - 74
Panel, Inverter - Page B - 12	PCH 3/9 - Page B - 33	I.0DX_VCCSTG/VCCSFR_OC/2.5V - Page B - 54	USB Board - Page B - 75
Mini DP Port - Page B - 13	PCH 4/9 - Page B - 34	IV8_RUN/AON, NV3V3 - Page B - 55	
HDMI Connector - Page B - 14	PCH 5/9 - Page B - 35	PEX_VDD - Page B - 56	
VGA PCI Express - Page B - 15	PCH 6/9 - Page B - 36	VDD3, VDD5 - Page B - 57	
GPU Frame Buffer Partition - Page B - 16	PCH 7/9 - Page B - 37	DDR 1.2V / 0.6VS - Page B - 58	
Frame Buffer Partition A - Page B - 17	PCH 8/9 - Page B - 38	Power 1.0V, VCCIO - Page B - 59	
Frame Buffer Partition B - Page B - 18	PCH 9/9 - Page B - 39	VCore & VCCGT Output 1 - Page B - 60	
Frame Buffer Partition A_B - Page B - 19	KBC IT8587 - Page B - 40	VCore & VCCGT Output 2 - Page B - 61	
GPU Frame Buffer Partition - Page B - 20	Backlight KB - Page B - 41	VCCSA - Page B - 62	
Frame Buffer Partition C - Page B - 21	Realtek ALC1220 - Page B - 42	AC_In, Charger - Page B - 63	
Frame Buffer Partition D - Page B - 22	Smart AMP ALC1305 - Page B - 43	NVVDDS - Page B - 64	

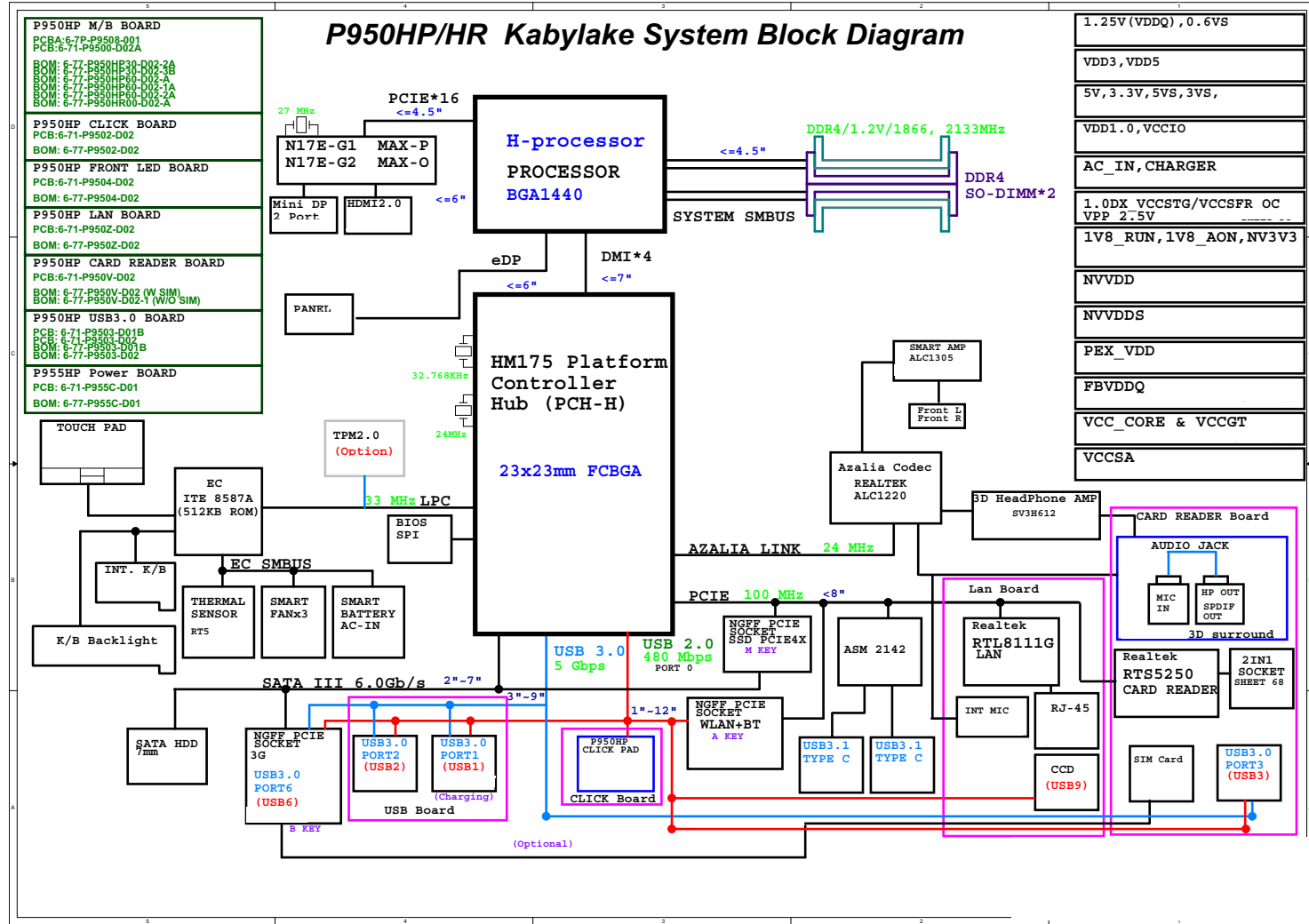
Table B - 1
SCHEMATIC
DIAGRAMS



Version Note

The schematic diagrams in this chapter are based upon version 6-7P-P9506-004. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

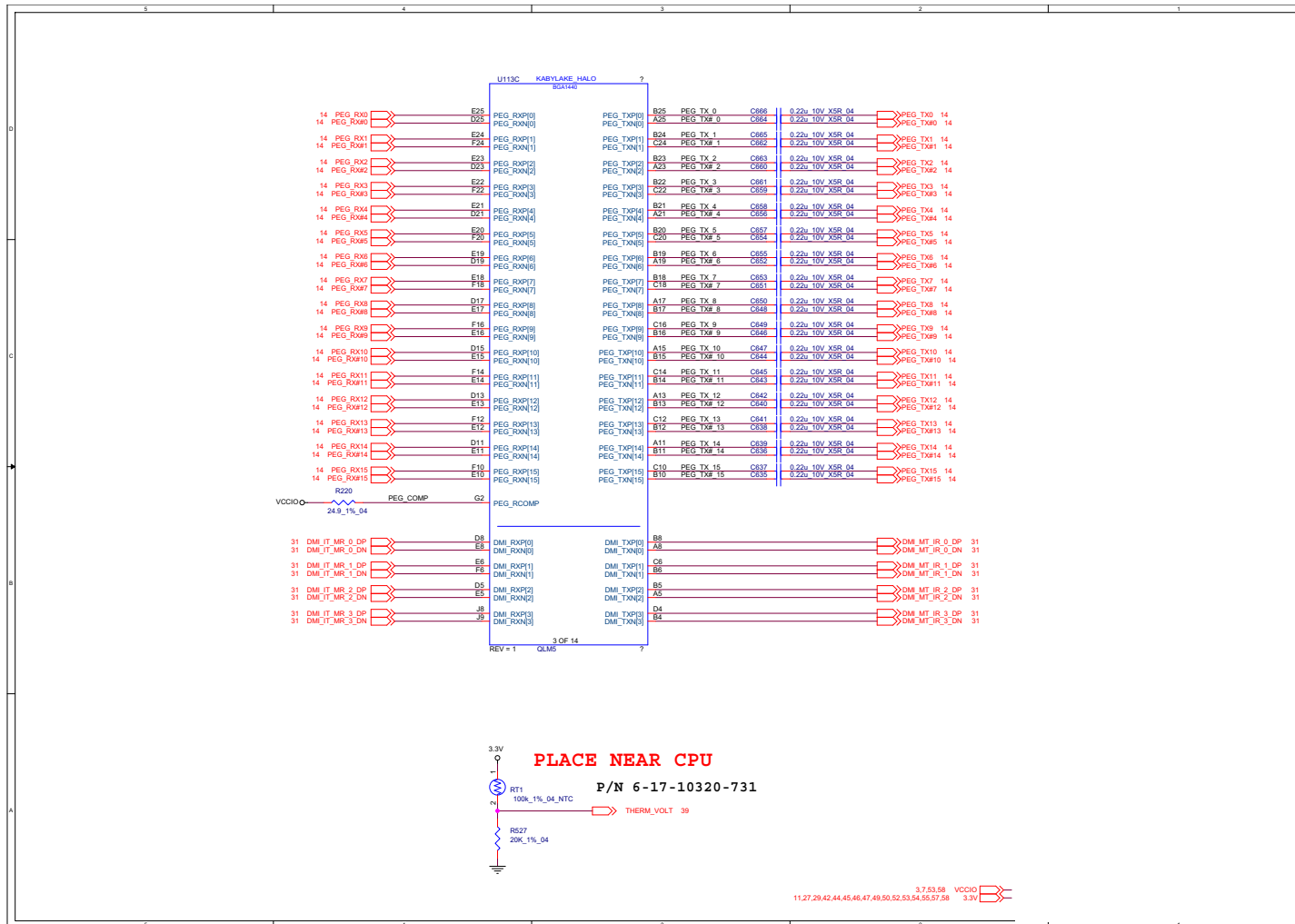
System Block Diagram



Sheet 1 of 74
System Block
Diagram

B.Schematic Diagrams

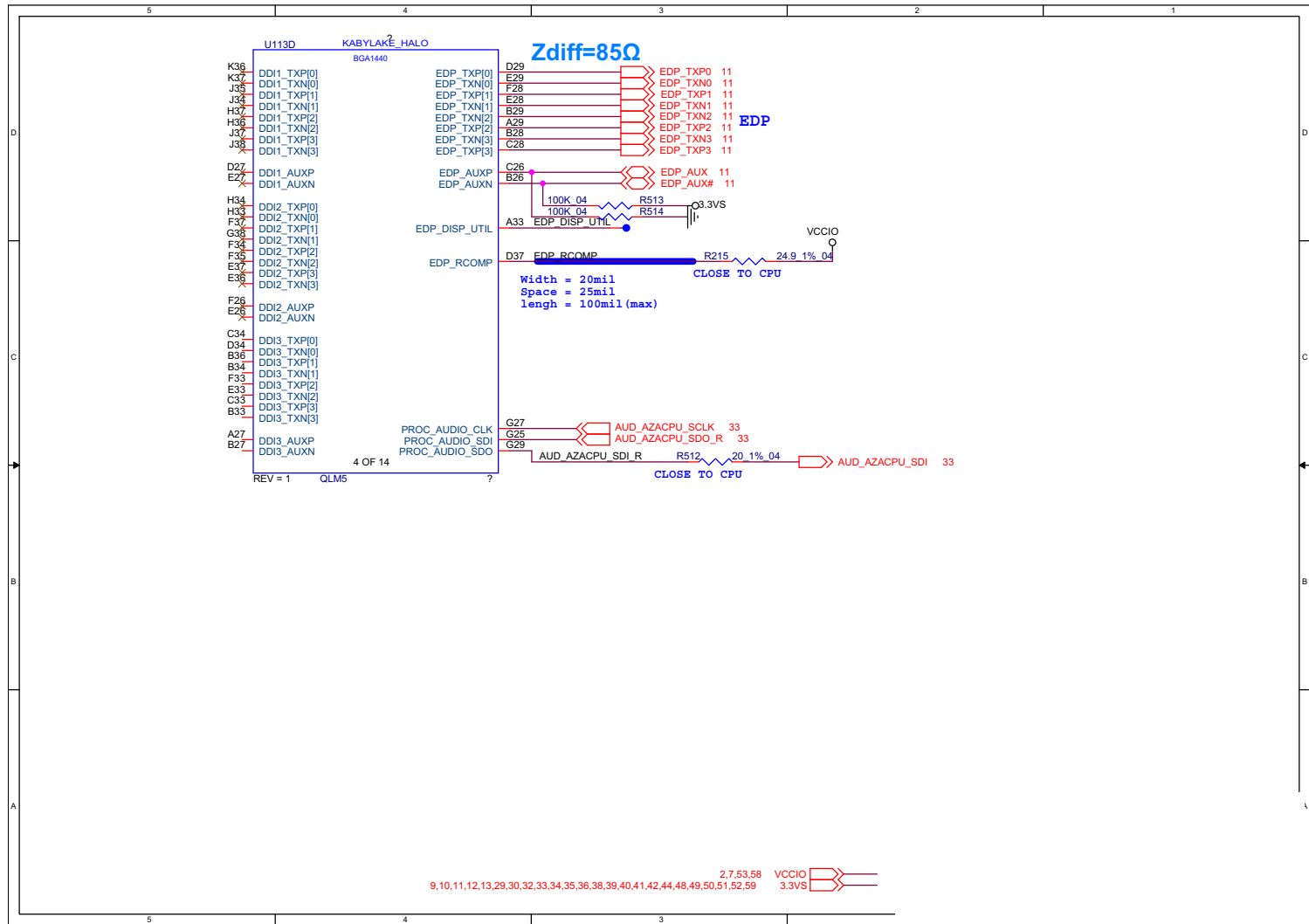
Processor 1/7



Sheet 2 of 74
Processor 1/7

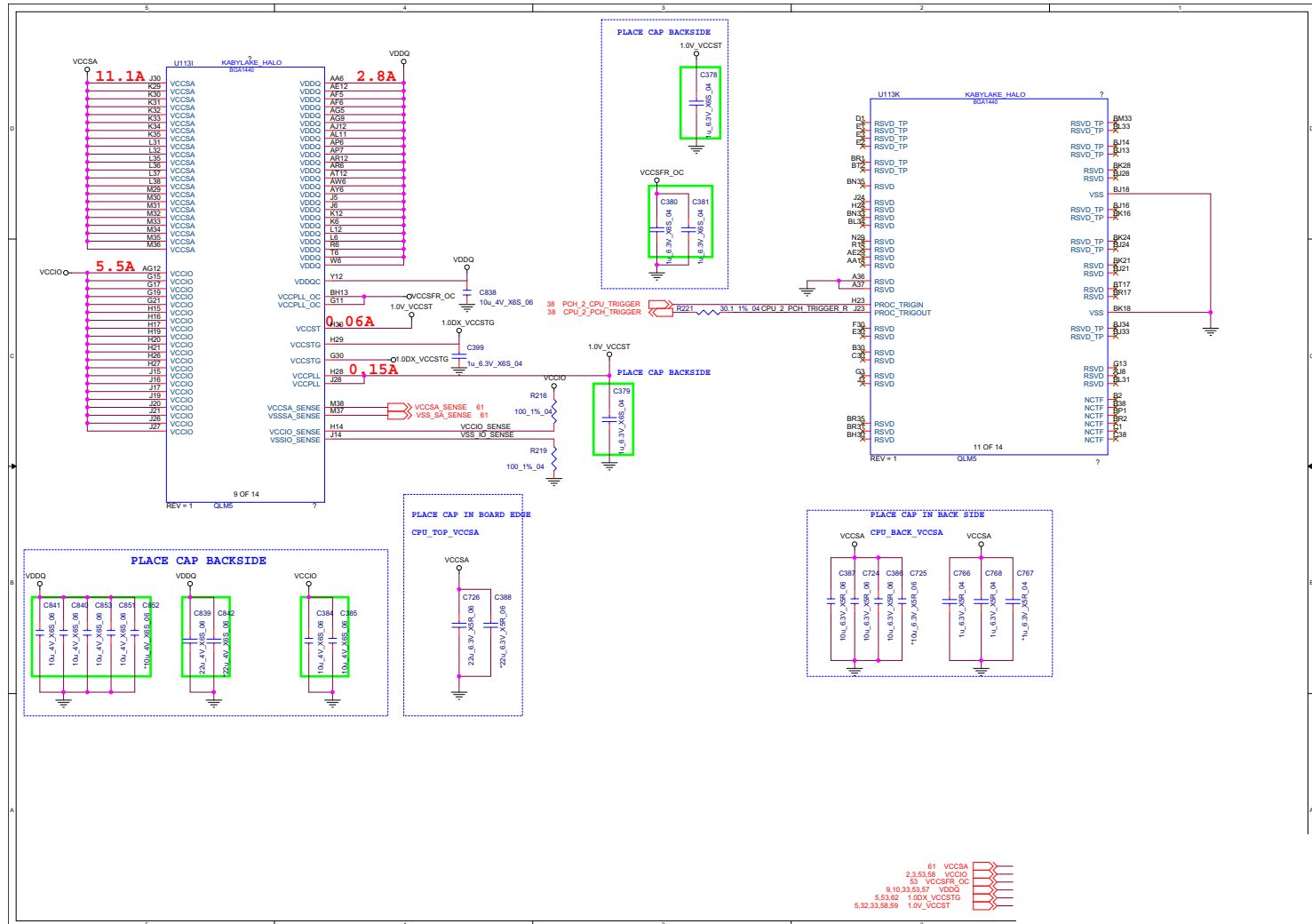
Processor 2/7

Sheet 3 of 74
Processor 2/7



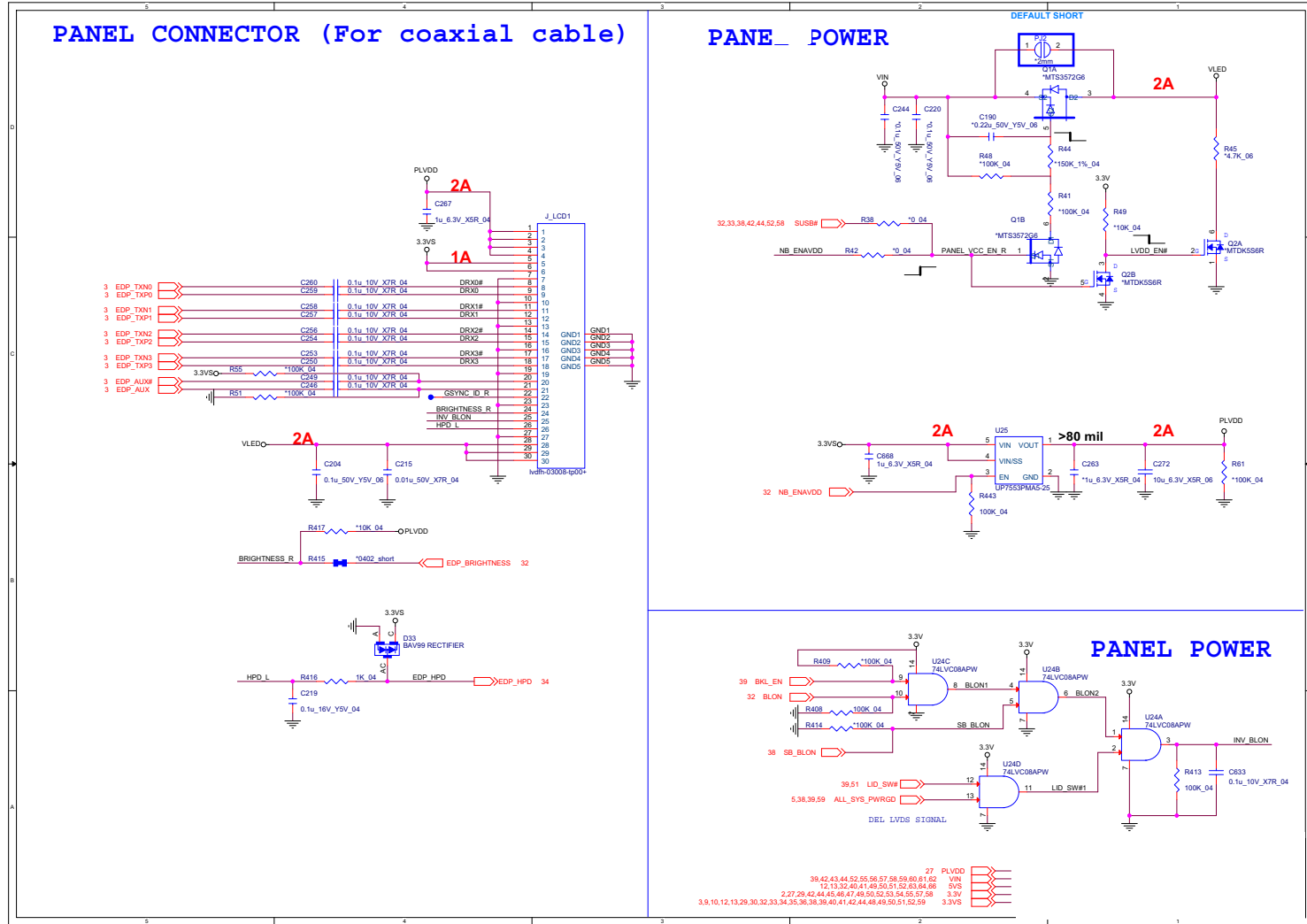
Processor 6/7

Sheet 7 of 74
Processor 6/



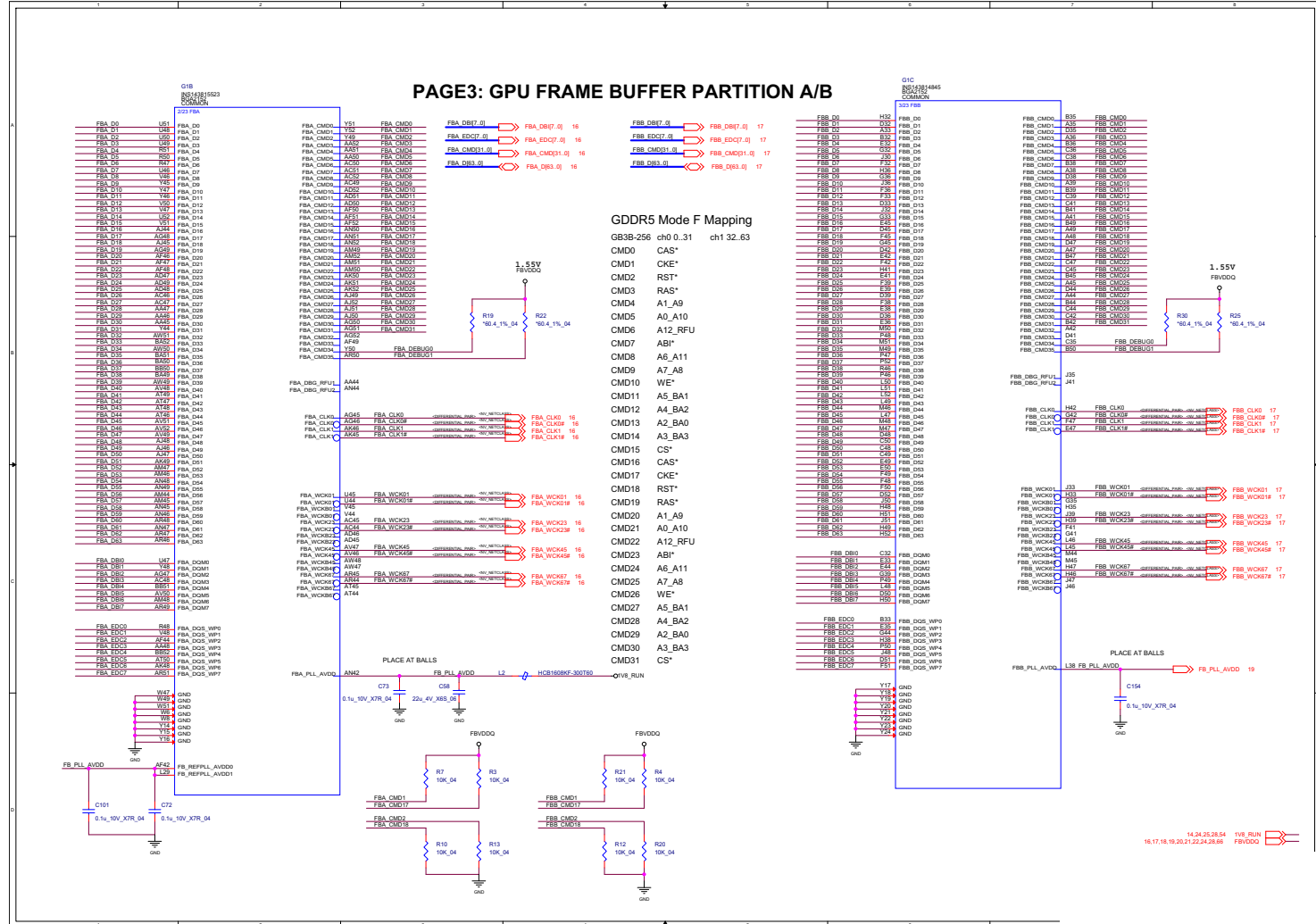
Panel, Inverter

Sheet 11 of 74
Panel, Inverter

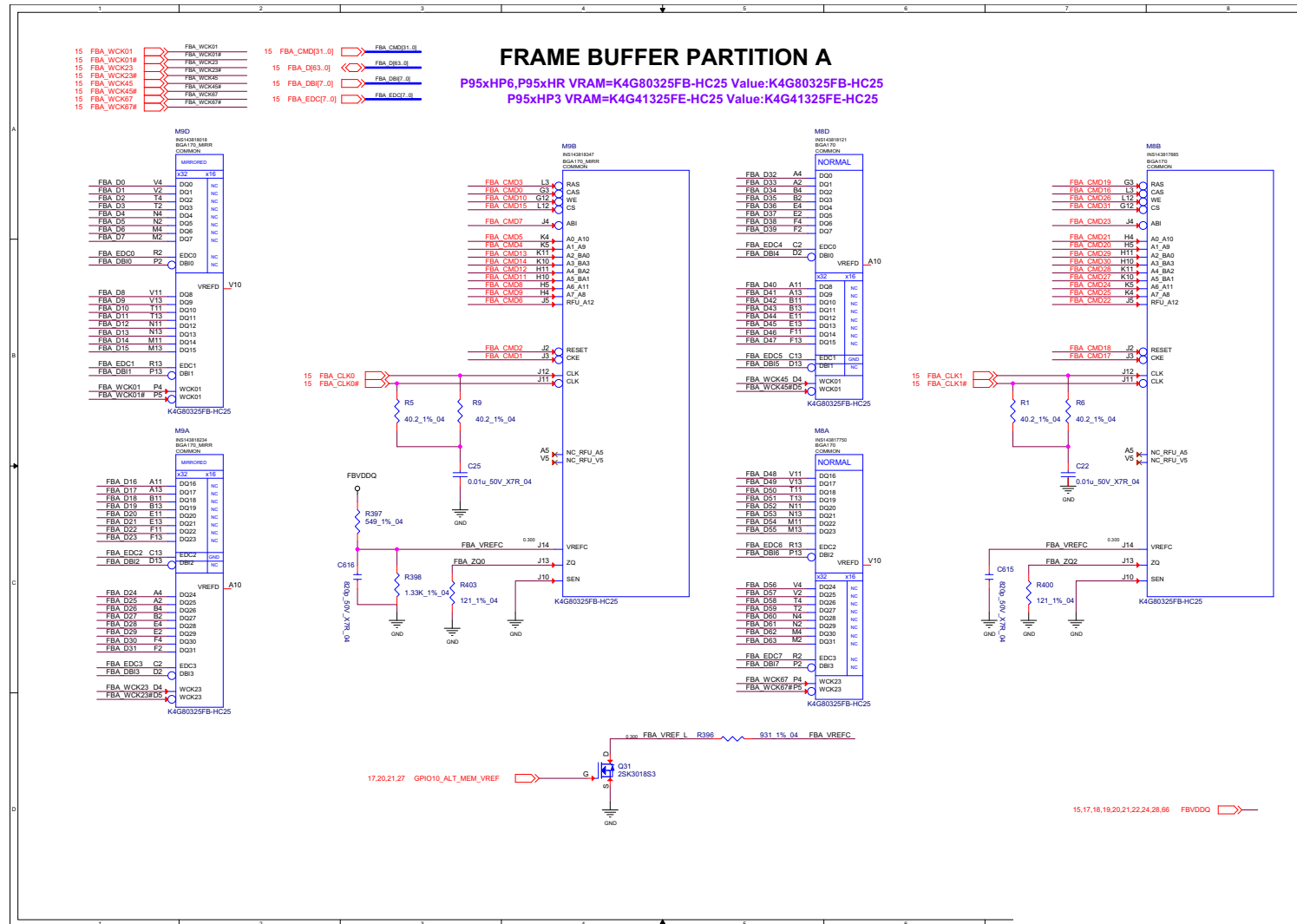


GPU Frame Buffer Partition

Sheet 15 of 74
GPU Frame Buffer Partition



Frame Buffer Partition A

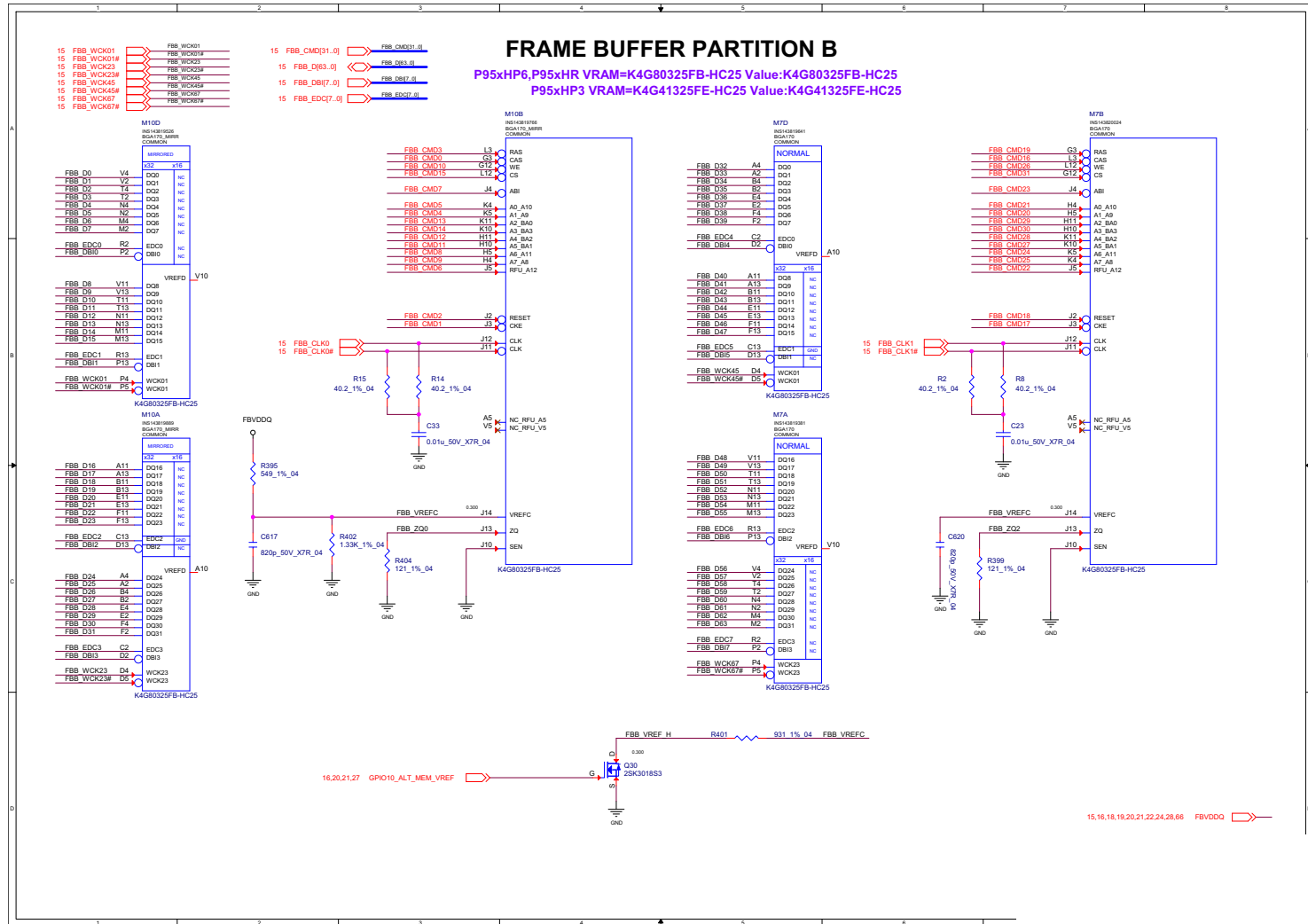


Sheet 16 of 74
 Frame Buffer
 Partition A

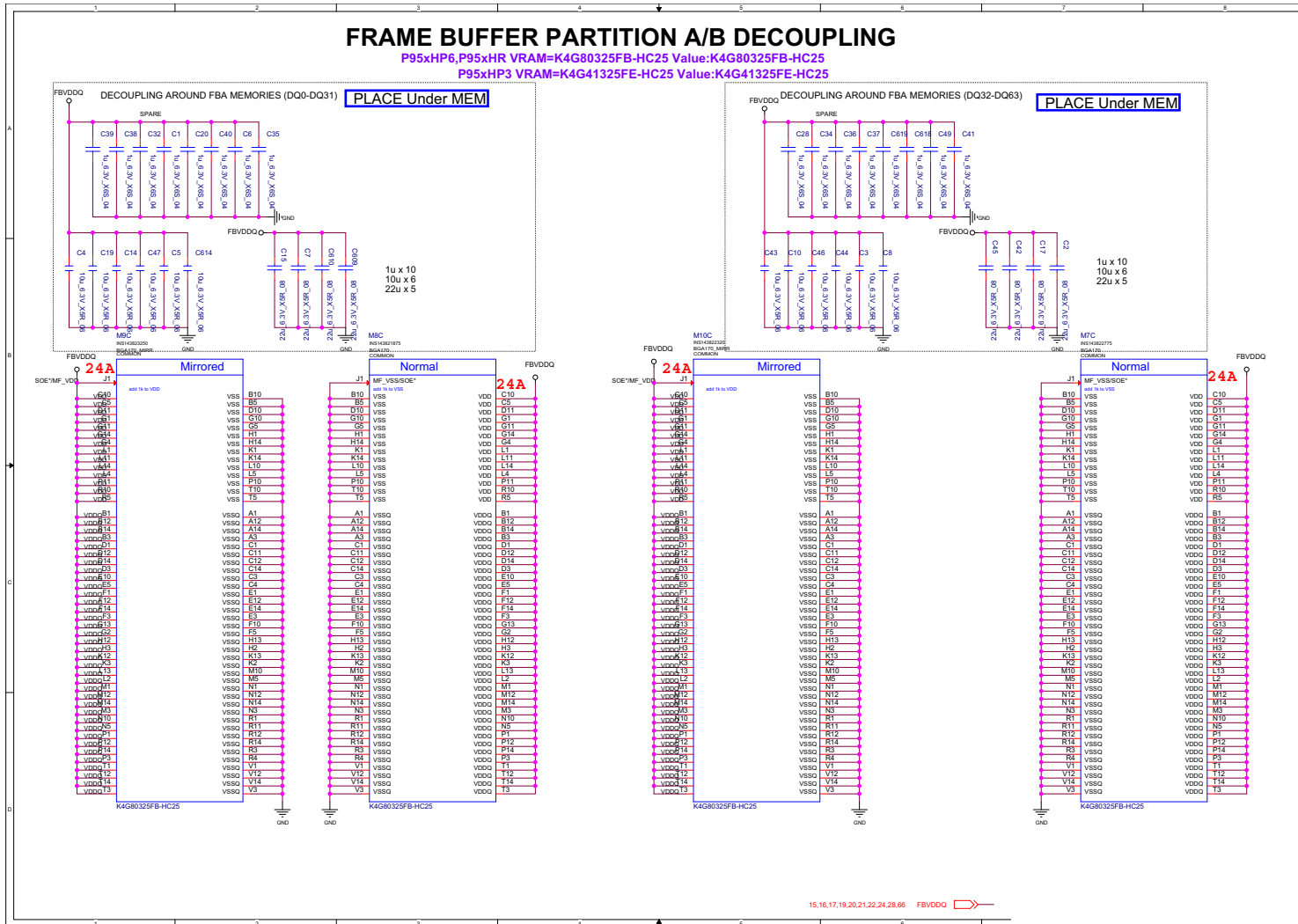
B.Schematic Diagrams

Frame Buffer Partition B

Sheet 17 of 74
Frame Buffer
Partition B



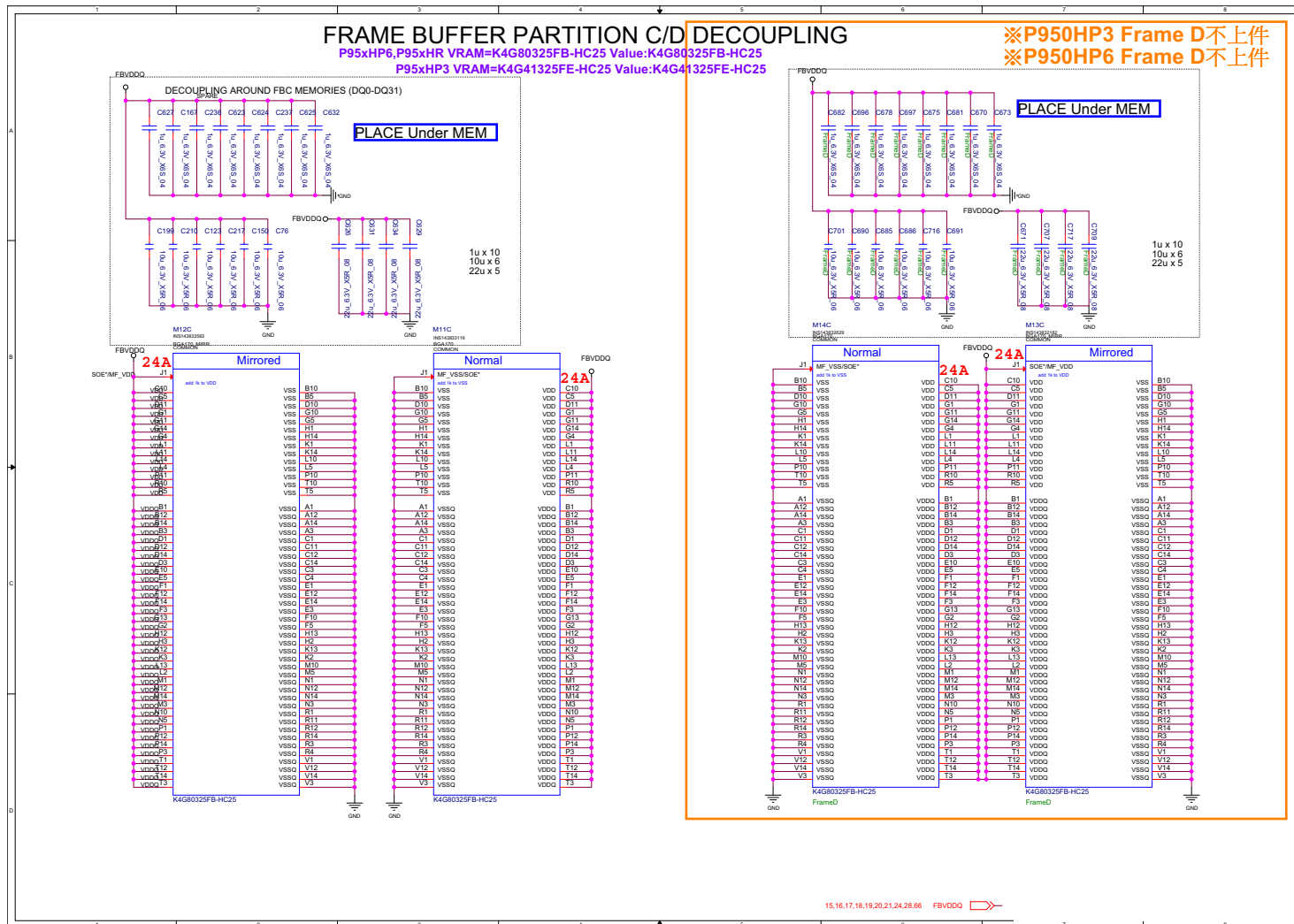
Frame Buffer Partition A_B



Sheet 18 of 74
 Frame Buffer
 Partition A_B

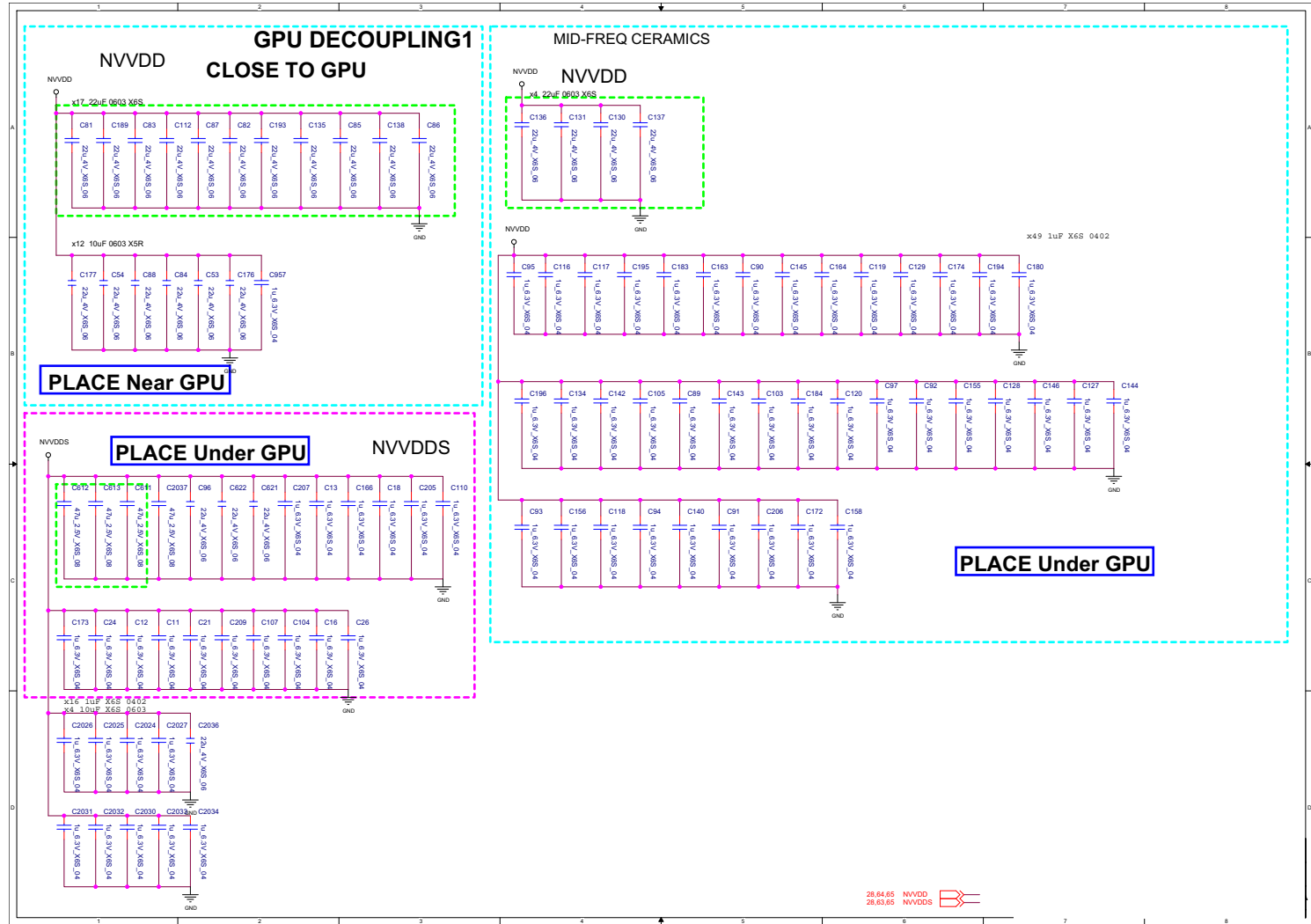
B.Schematic Diagrams

Frame Buffer Partition C_D

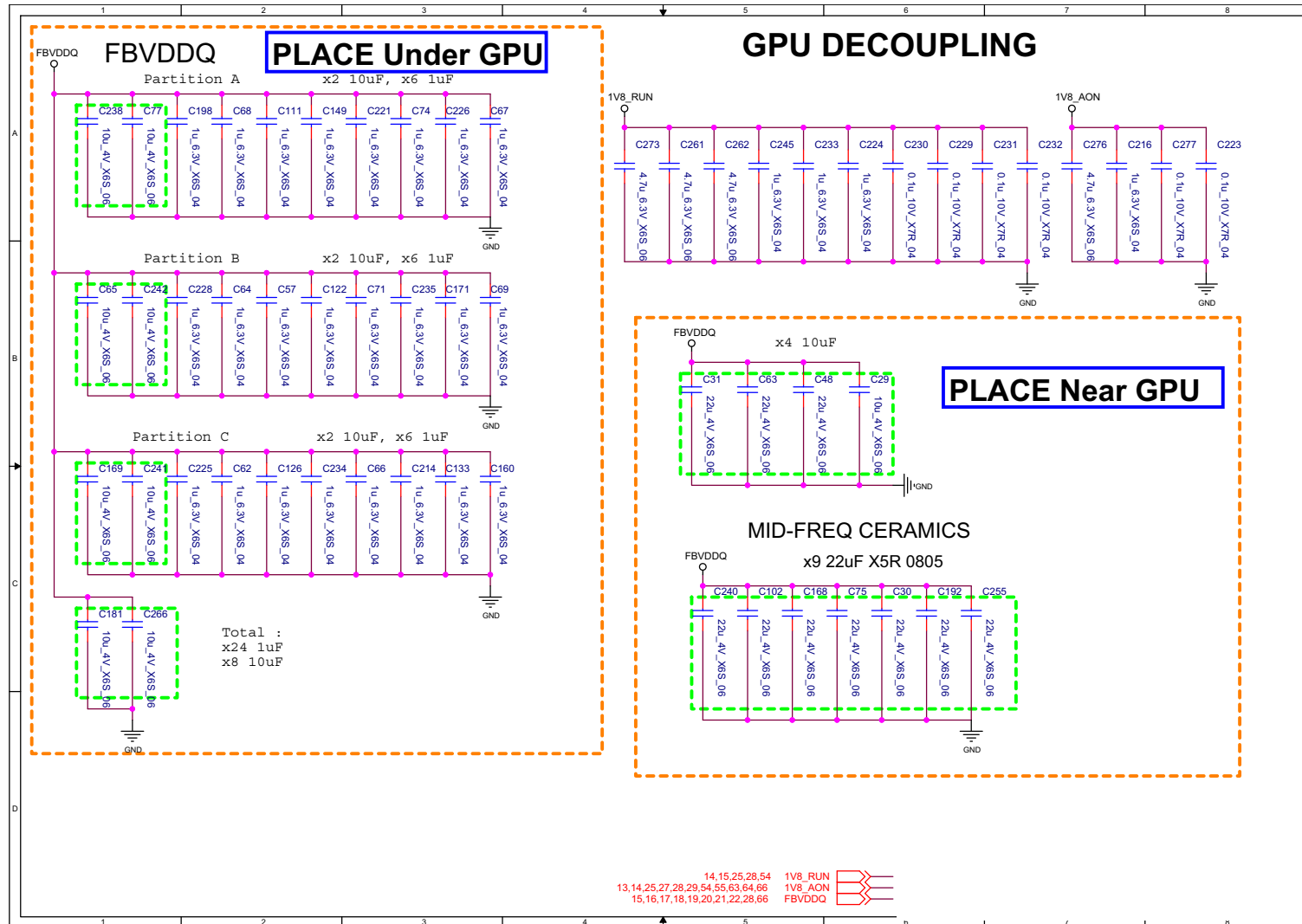


GPU Decoupling 1

Sheet 23 of 74
GPU Decoupling 1



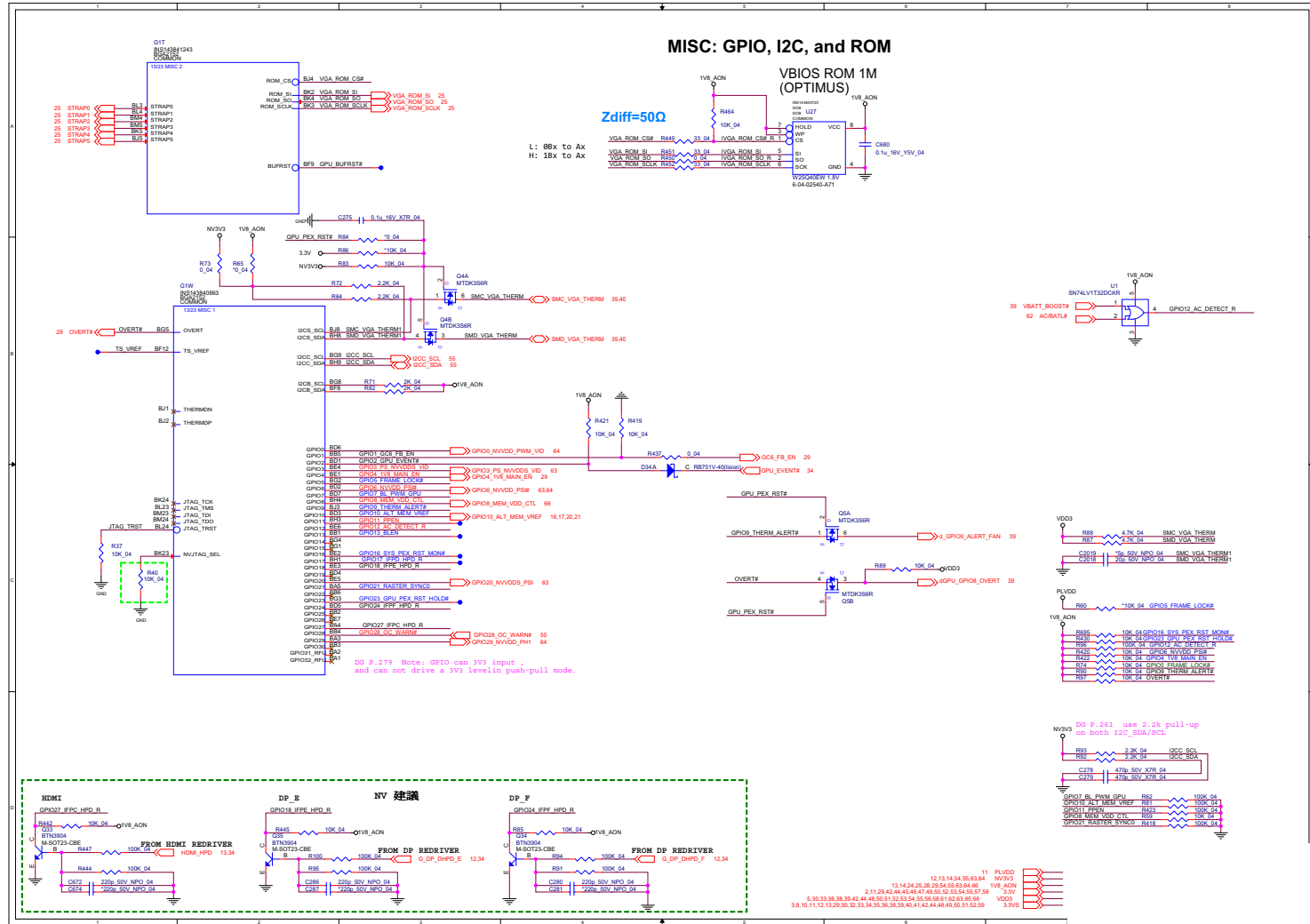
GPU Decoupling 2



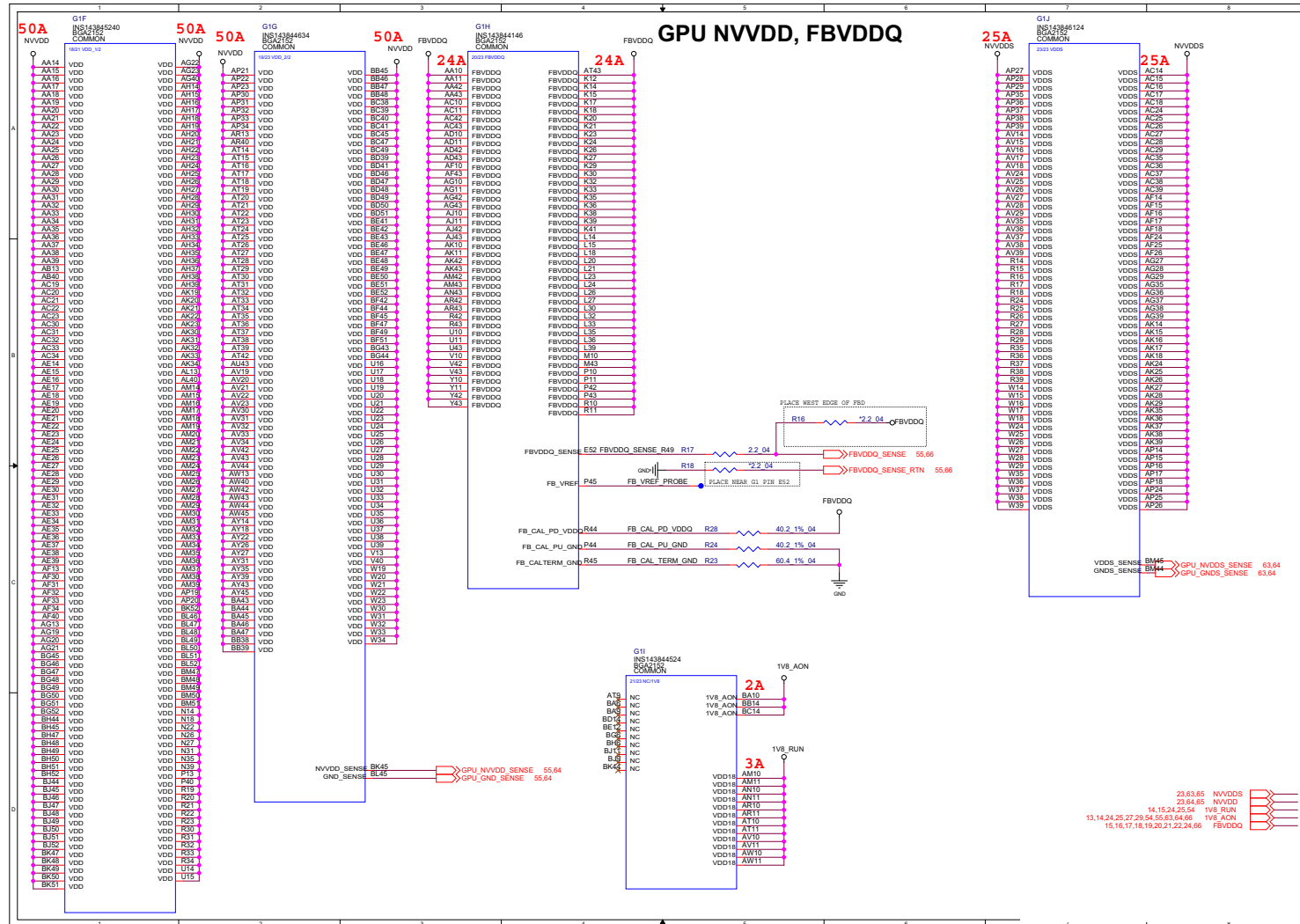
Sheet 24 of 74
GPU Decoupling 2

Misc - GPIO, I2C and ROM

Sheet 27 of 74
Misc - GPIO, I2C
and ROM



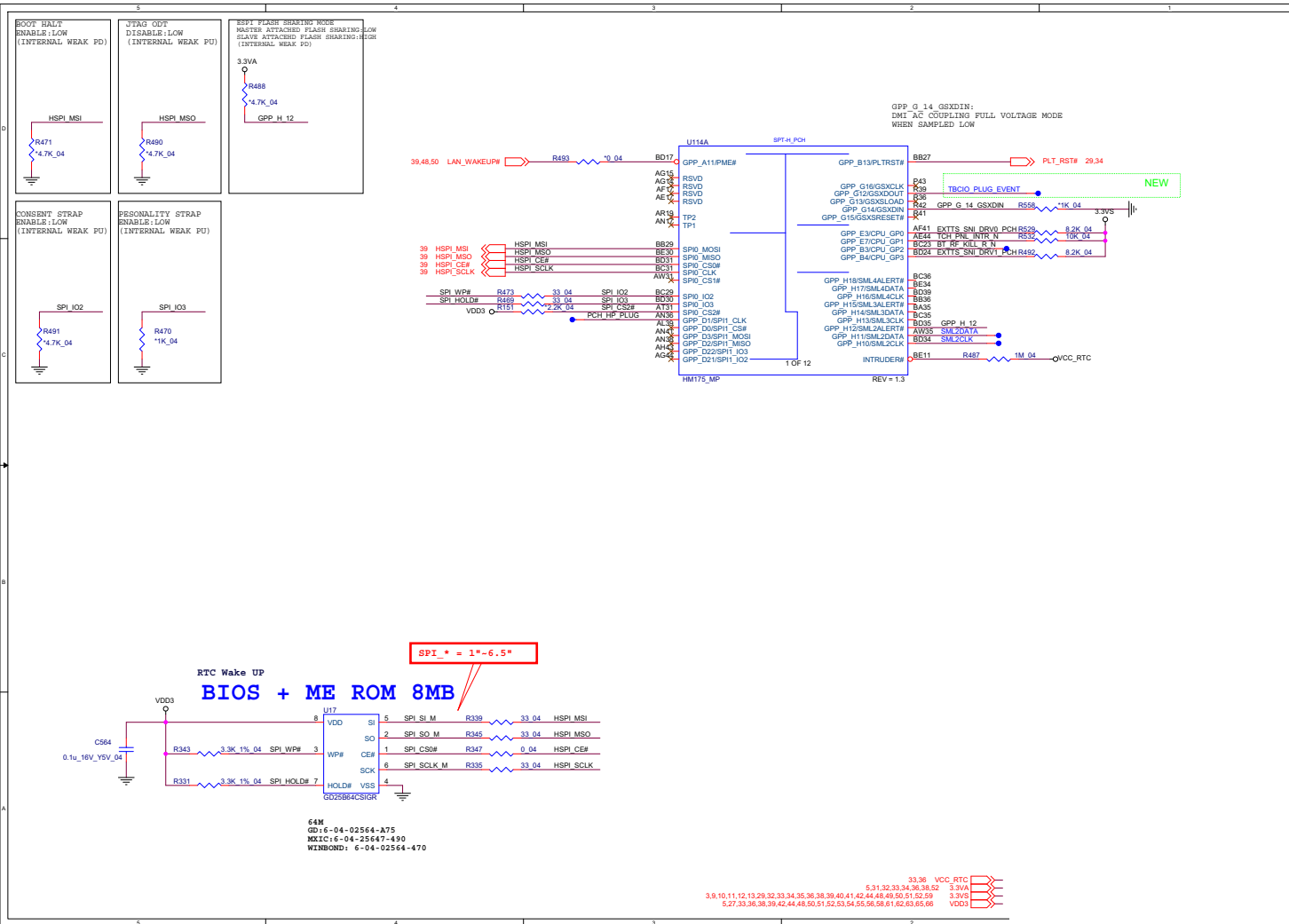
GPU NVWDD, FBVDDQ



Sheet 28 of 74
GPU NVWDD,
FBVDDQ

B.Schematic Diagrams

PCH 1/9

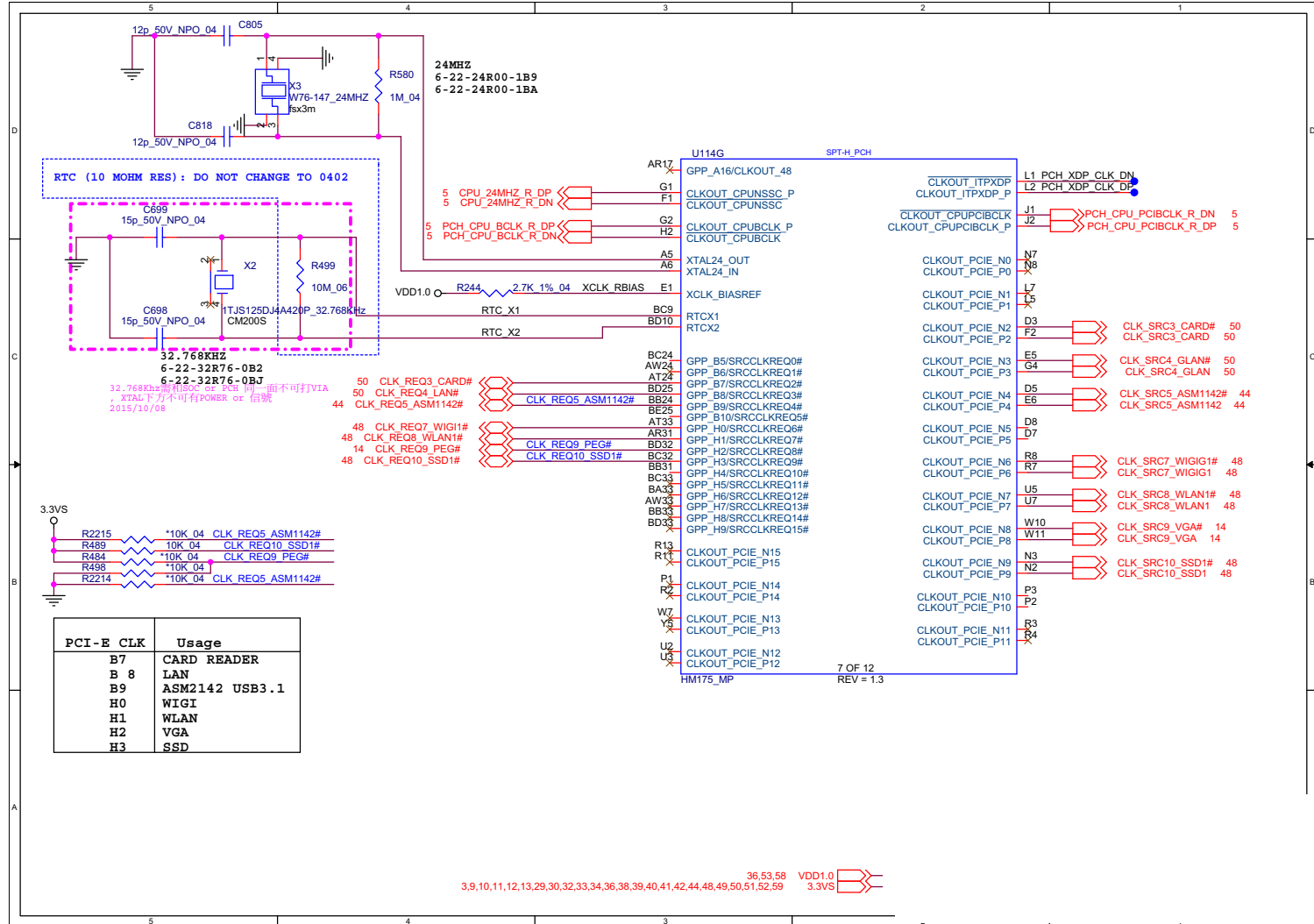


Sheet 30 of 74
PCH 1/9

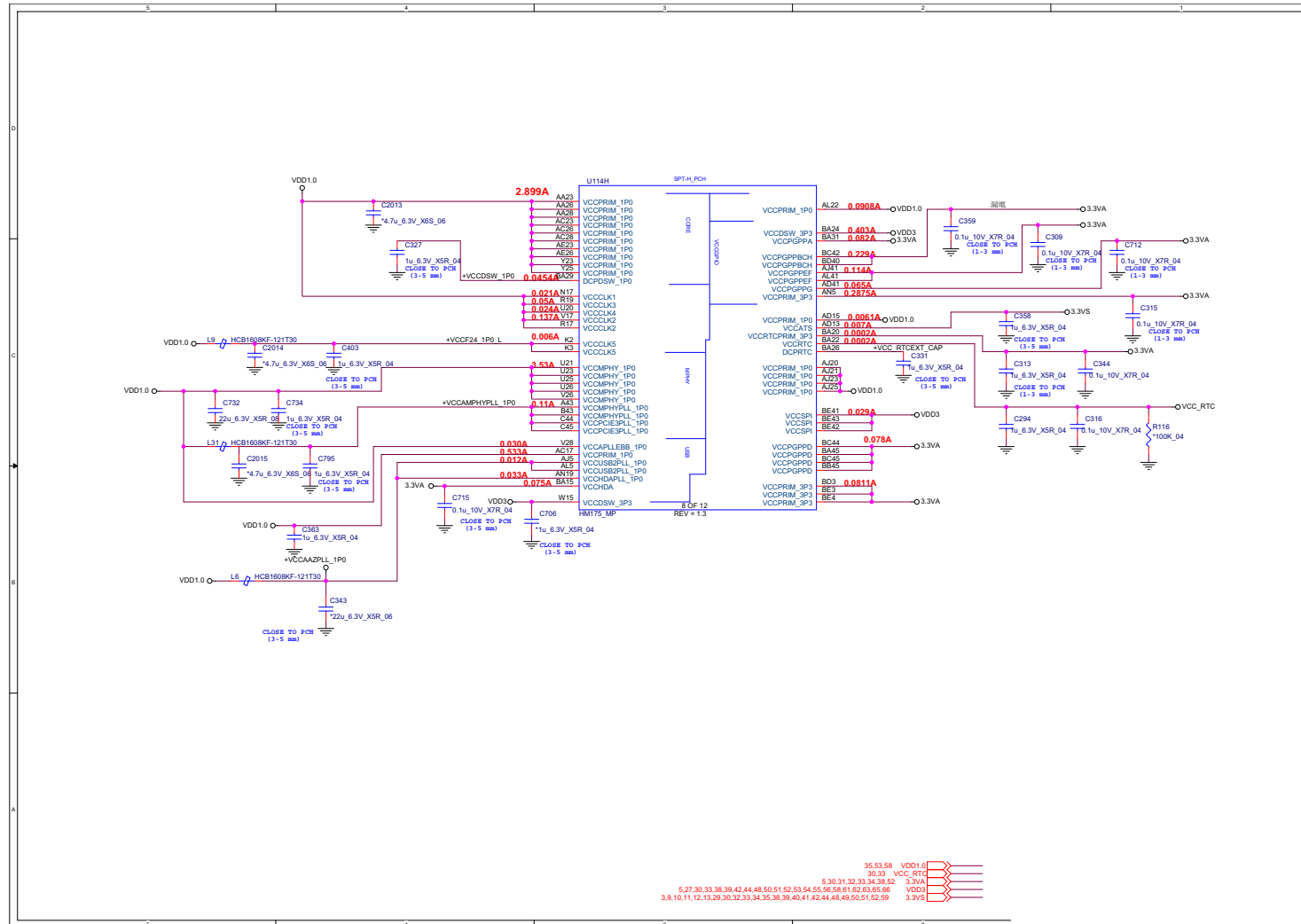
B.Schematic Diagrams

PCH 6/9

Sheet 35 of 74
PCH 6/9



PCH 7/9

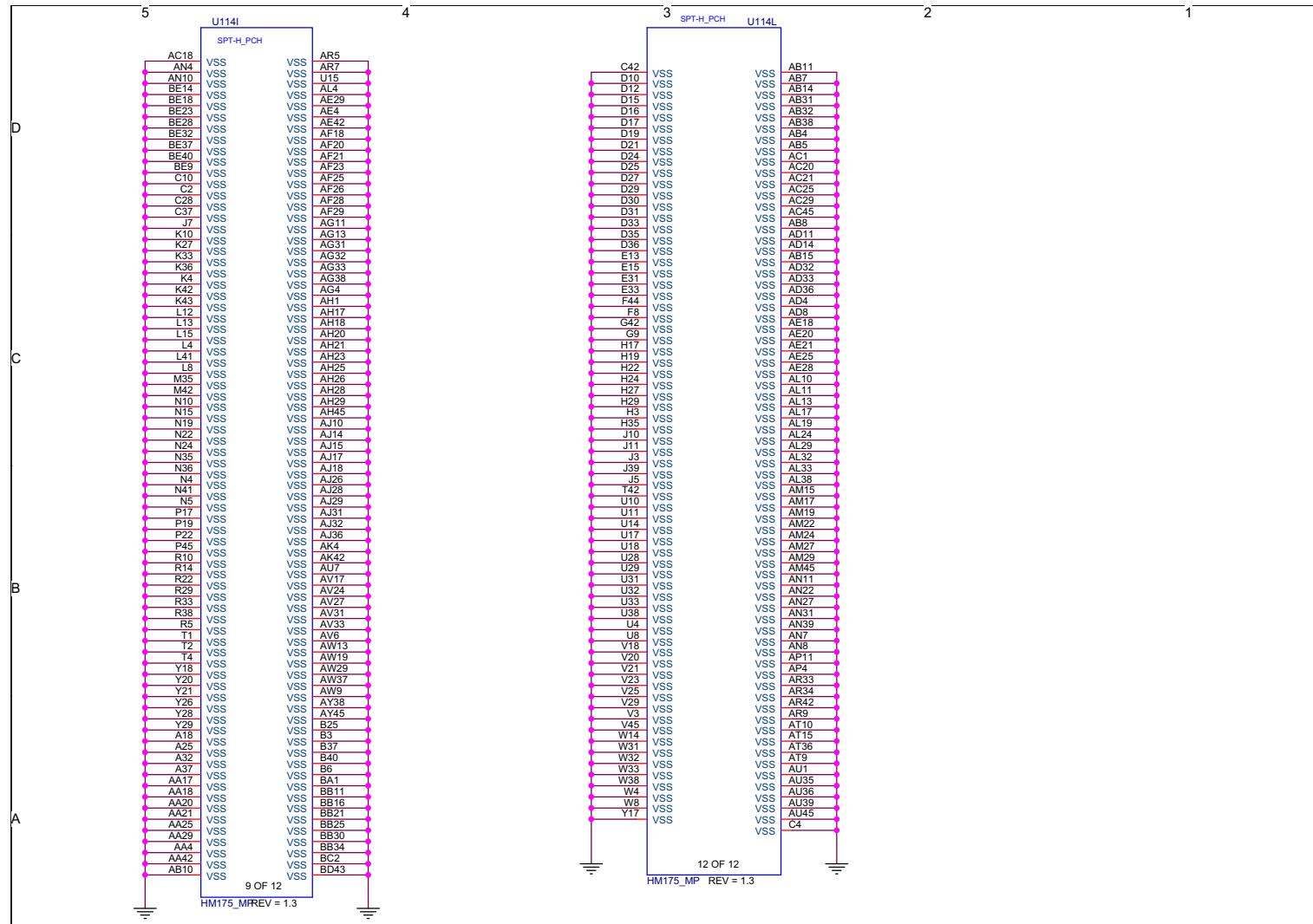


Sheet 36 of 74
PCH 7/9

B.Schematic Diagrams

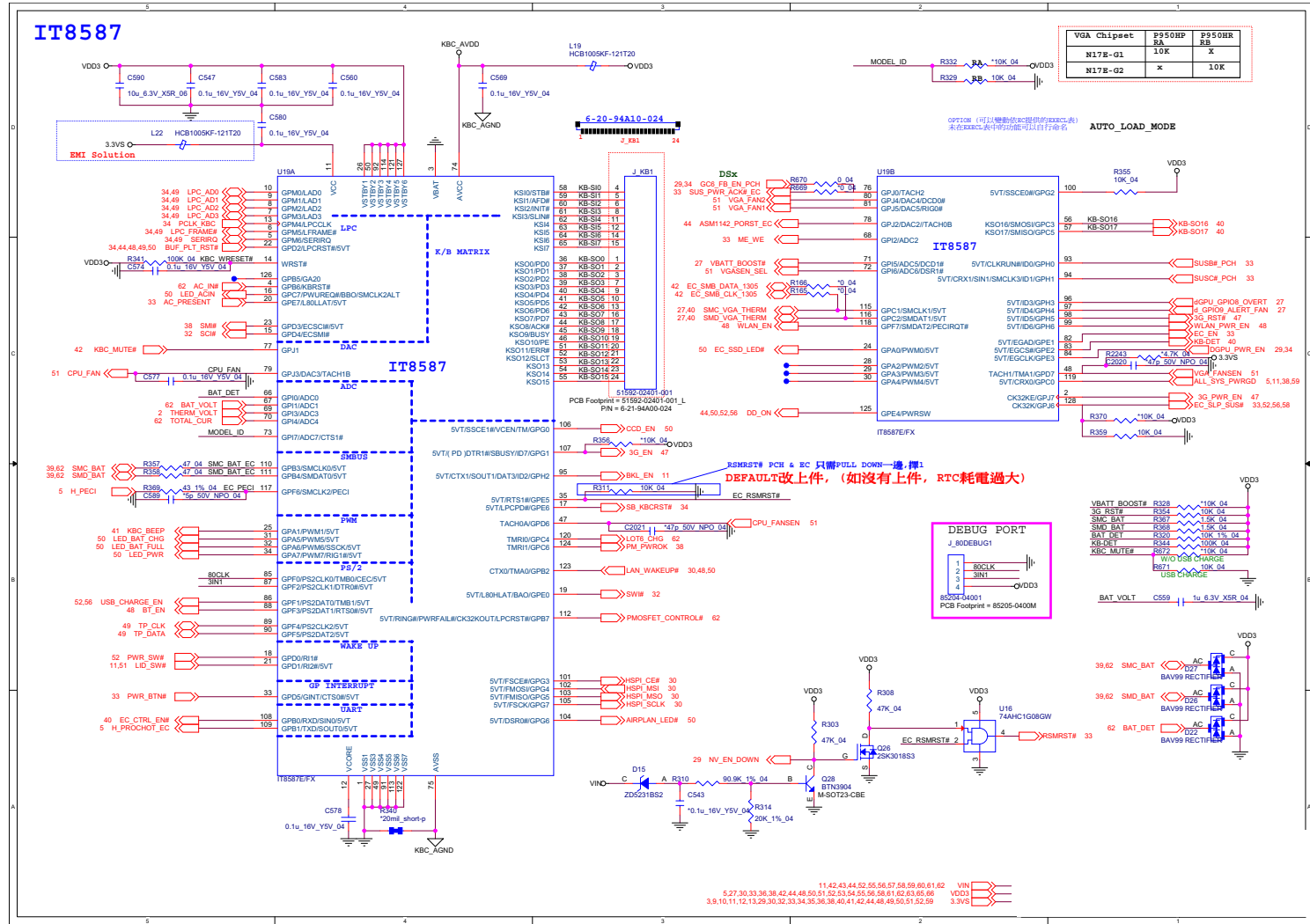
PCH 8/9

Sheet 37 of 74
PCH 8/9



KBC IT8587

Sheet 39 of 74
KBC IT8587

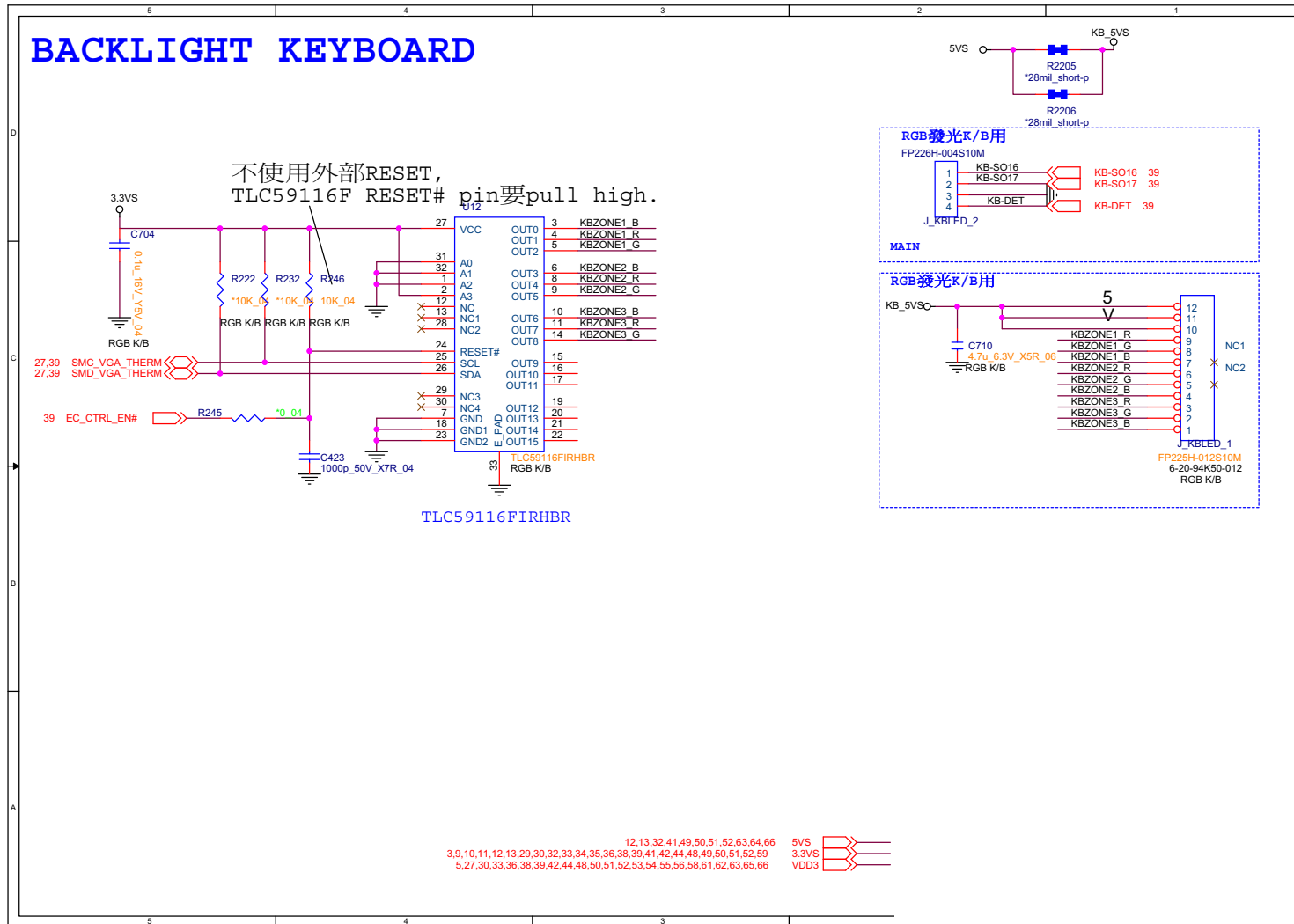


DEBUG PORT
J_BUG0EUG1
1: BCLK
2: SNI
3: Q/D03
PCB Footprint = 85205-0400M

DEFAULT改上件, (如沒有上件, RTC耗電過大)
R358 *10K 04
R359 *10K 04
R360 *10K 04
R361 *10K 04
R362 *10K 04
R363 *10K 04
R364 *10K 04
R365 *10K 04
R366 *10K 04
R367 *10K 04
R368 *10K 04
R369 *10K 04
R370 *10K 04
R371 *10K 04
R372 *10K 04
R373 *10K 04
R374 *10K 04
R375 *10K 04
R376 *10K 04
R377 *10K 04
R378 *10K 04
R379 *10K 04
R380 *10K 04
R381 *10K 04
R382 *10K 04
R383 *10K 04
R384 *10K 04
R385 *10K 04
R386 *10K 04
R387 *10K 04
R388 *10K 04
R389 *10K 04
R390 *10K 04
R391 *10K 04
R392 *10K 04
R393 *10K 04
R394 *10K 04
R395 *10K 04
R396 *10K 04
R397 *10K 04
R398 *10K 04
R399 *10K 04
R400 *10K 04

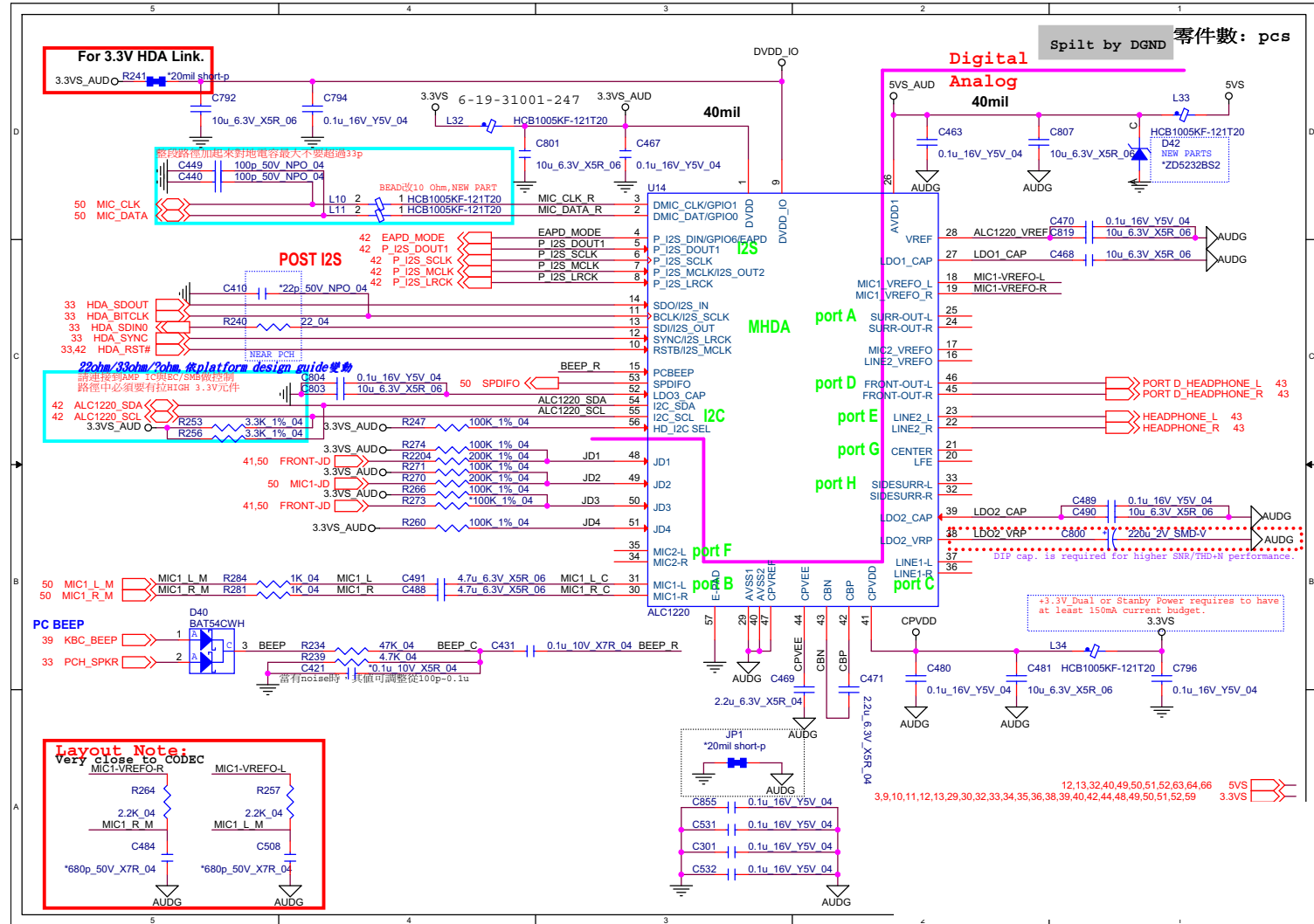
VIN 11,42,43,44,52,55,56,57,58,59,60,61,62
VDD3 5,27,30,33,36,38,42,44,48,50,51,52,53,54,55,56,58,61,62,63,65,66
3.3VS 9,10,11,12,13,29,30,32,33,34,35,36,38,40,41,42,44,48,49,50,51,52,59

Backlight KB

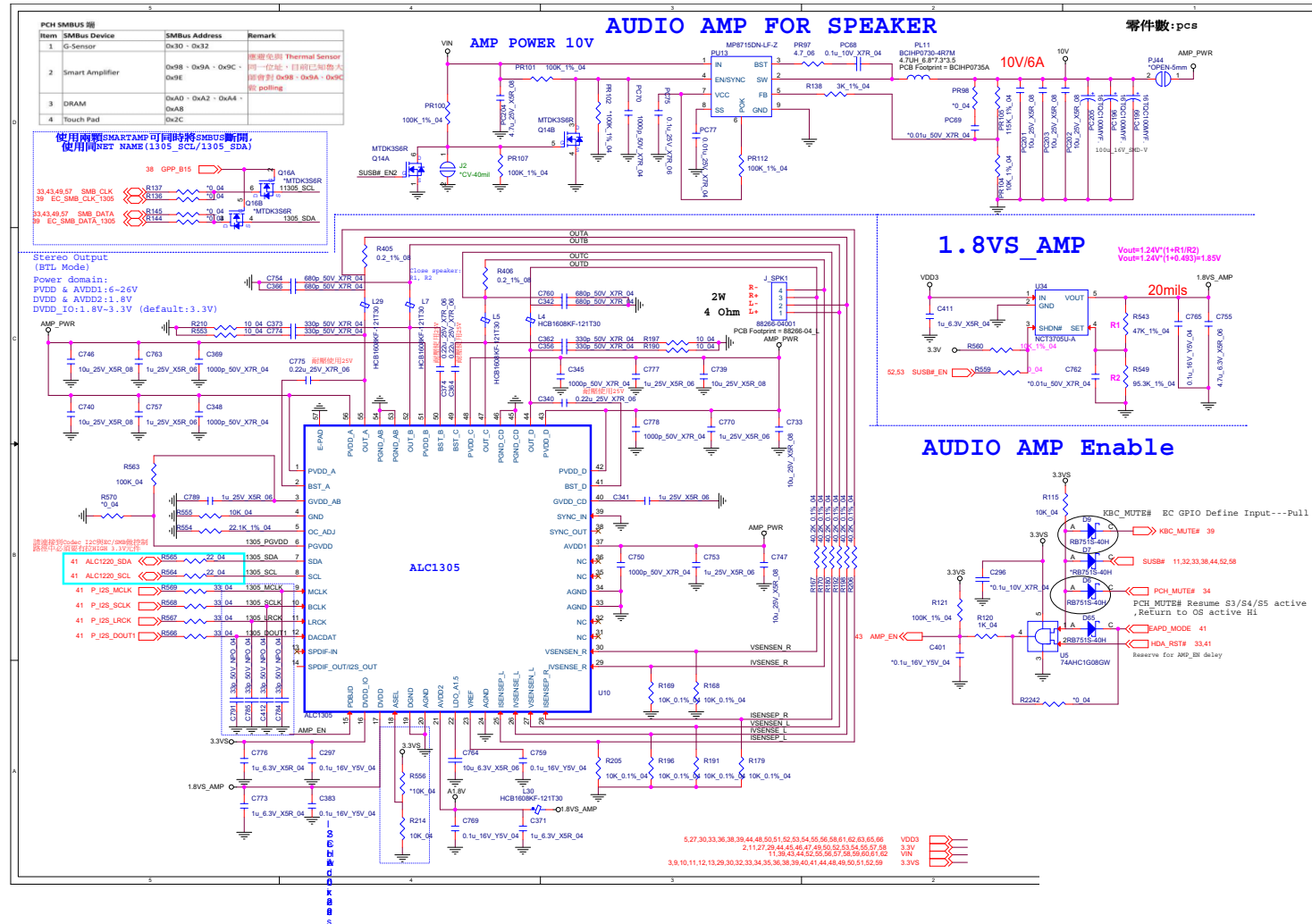


Sheet 40 of 74
Backlight KB

Realtek ALC1220



Smart AMP ALC1305

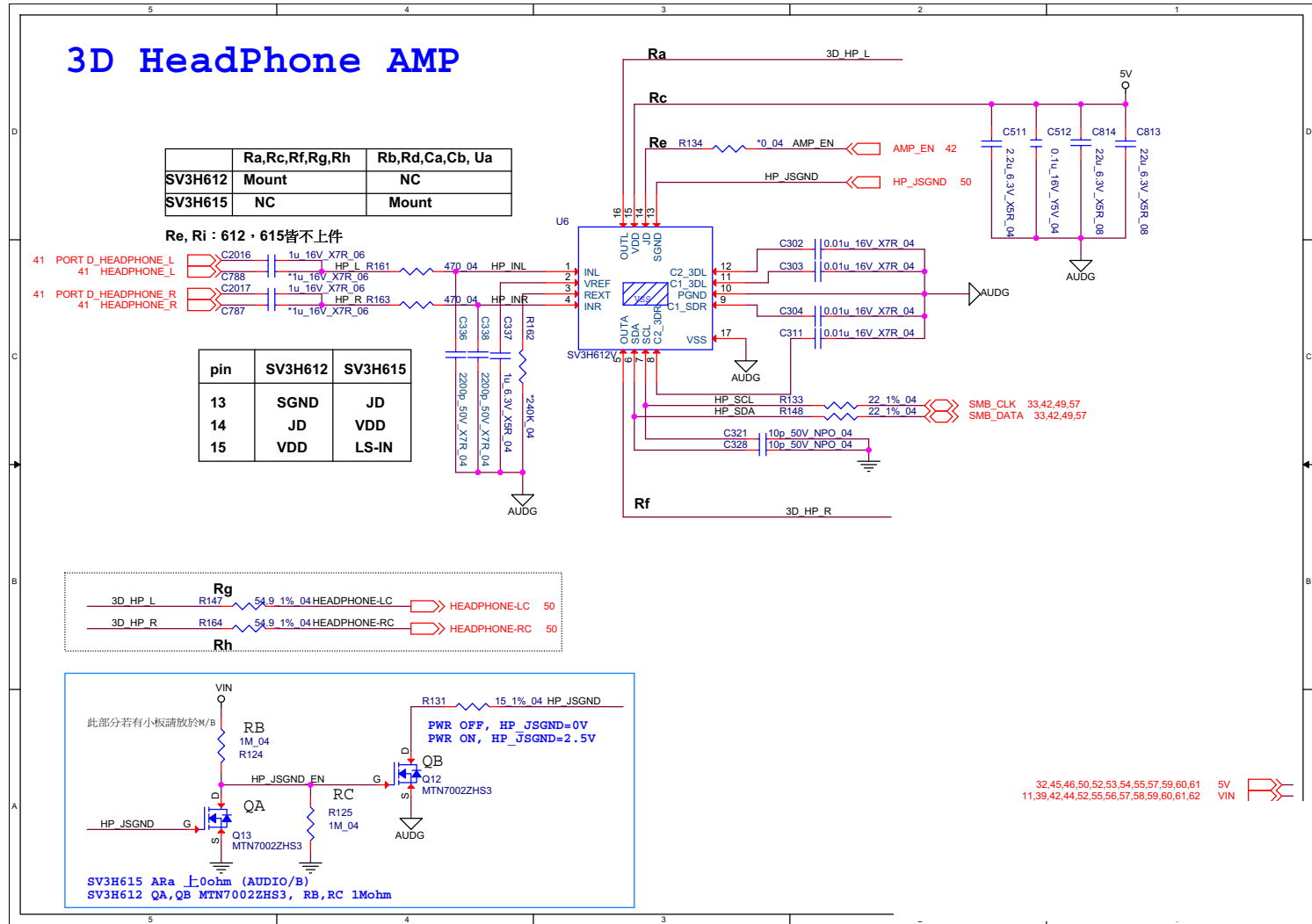


Sheet 42 of 74
Smart AMP
ALC1305

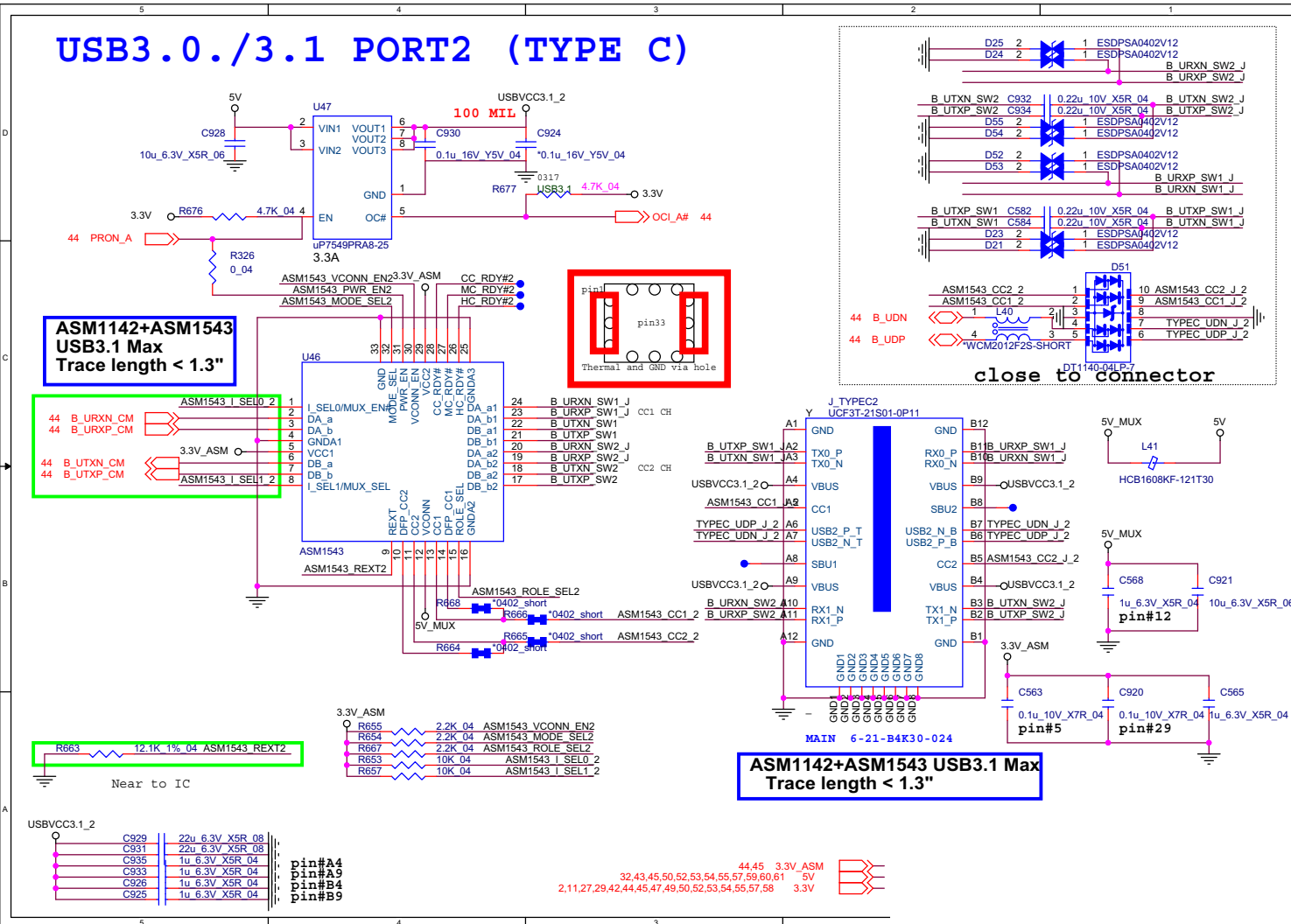
B.Schematic Diagrams

3D AMP Headphone

Sheet 43 of 74
3D AMP
Headphone



ASM2142 3/3

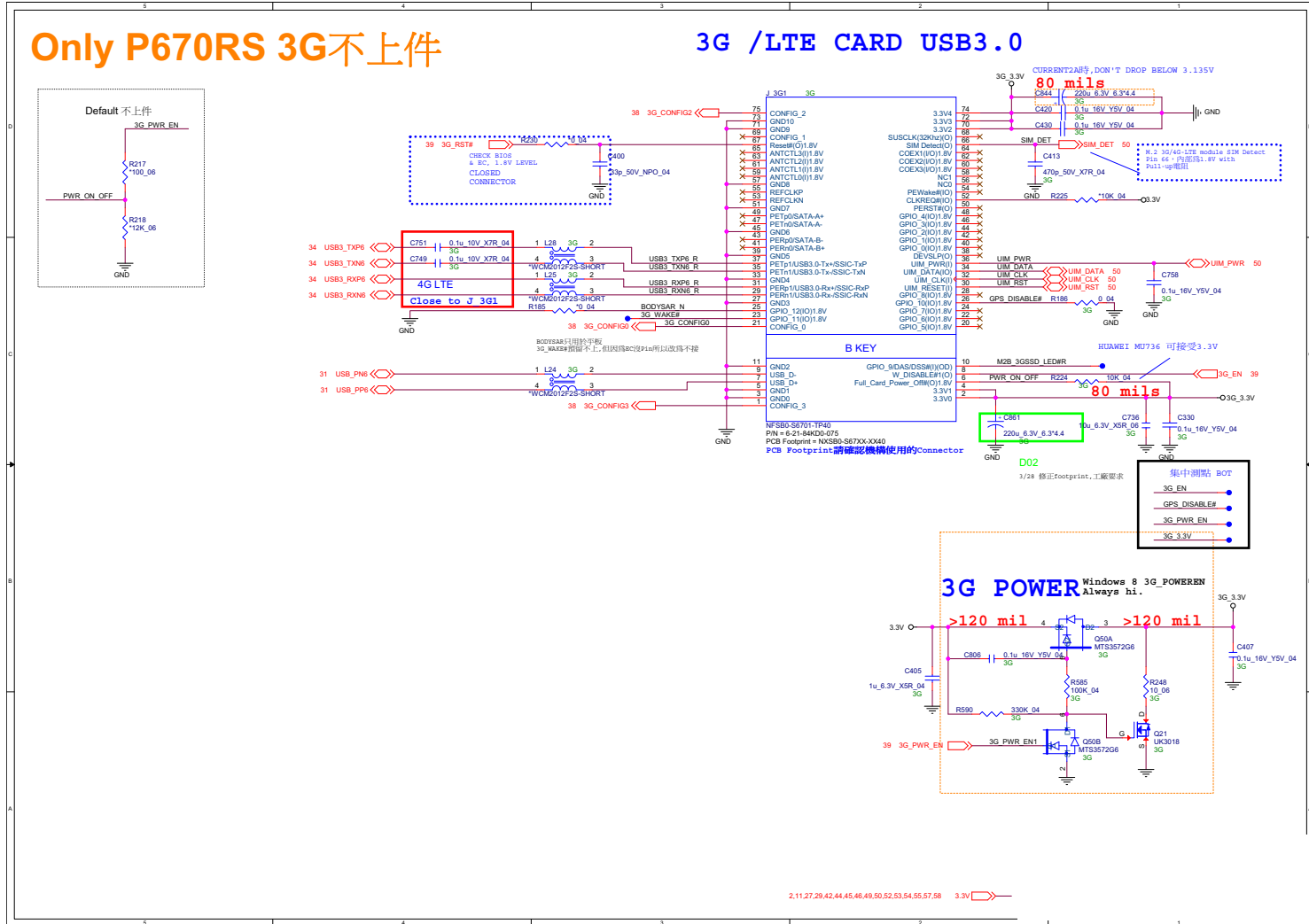


Sheet 46 of 74
ASM2142 3/3

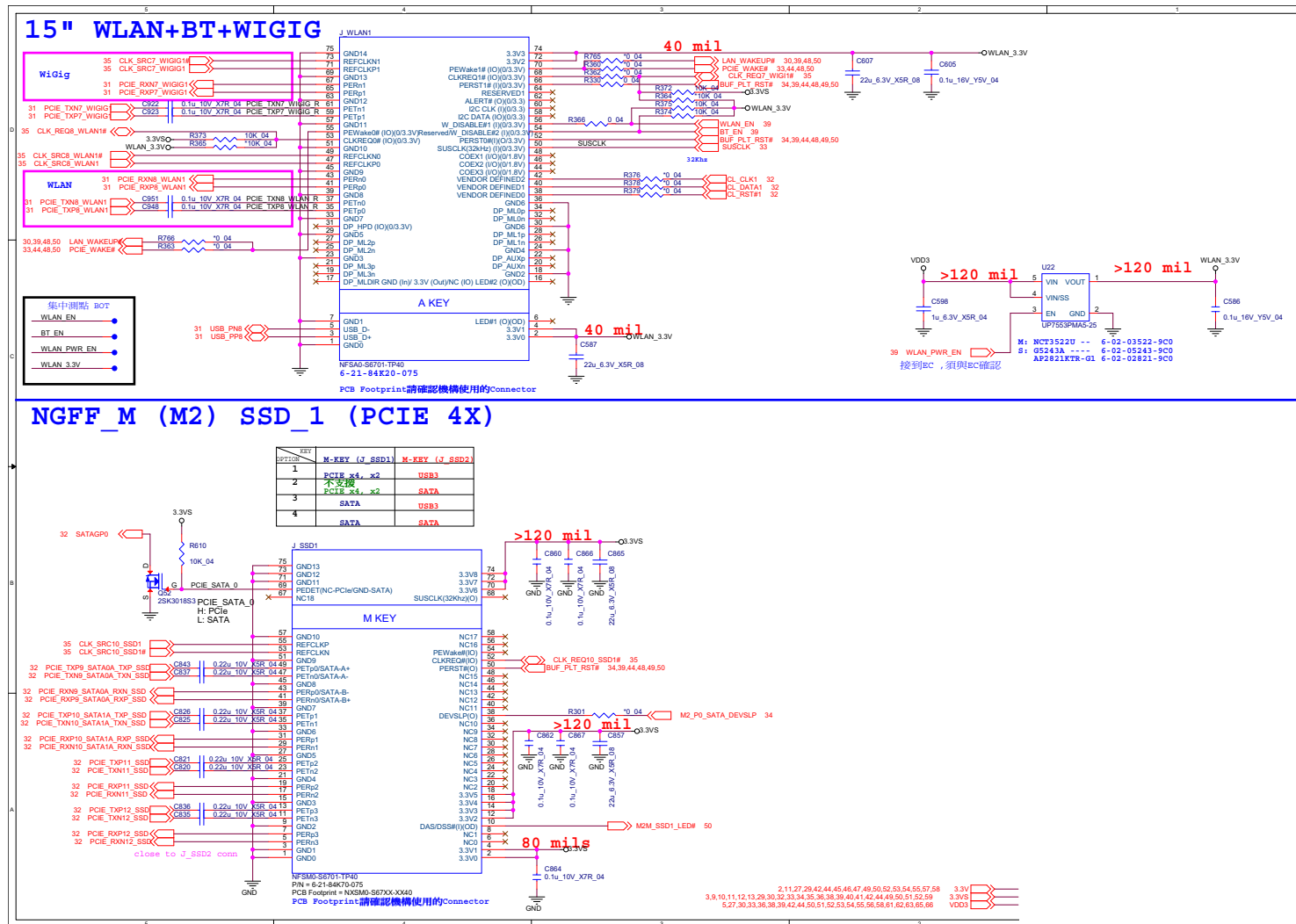
B.Schematic Diagrams

M.2 3G/LTE

Sheet 47 of 74
M.2 3G/LTE



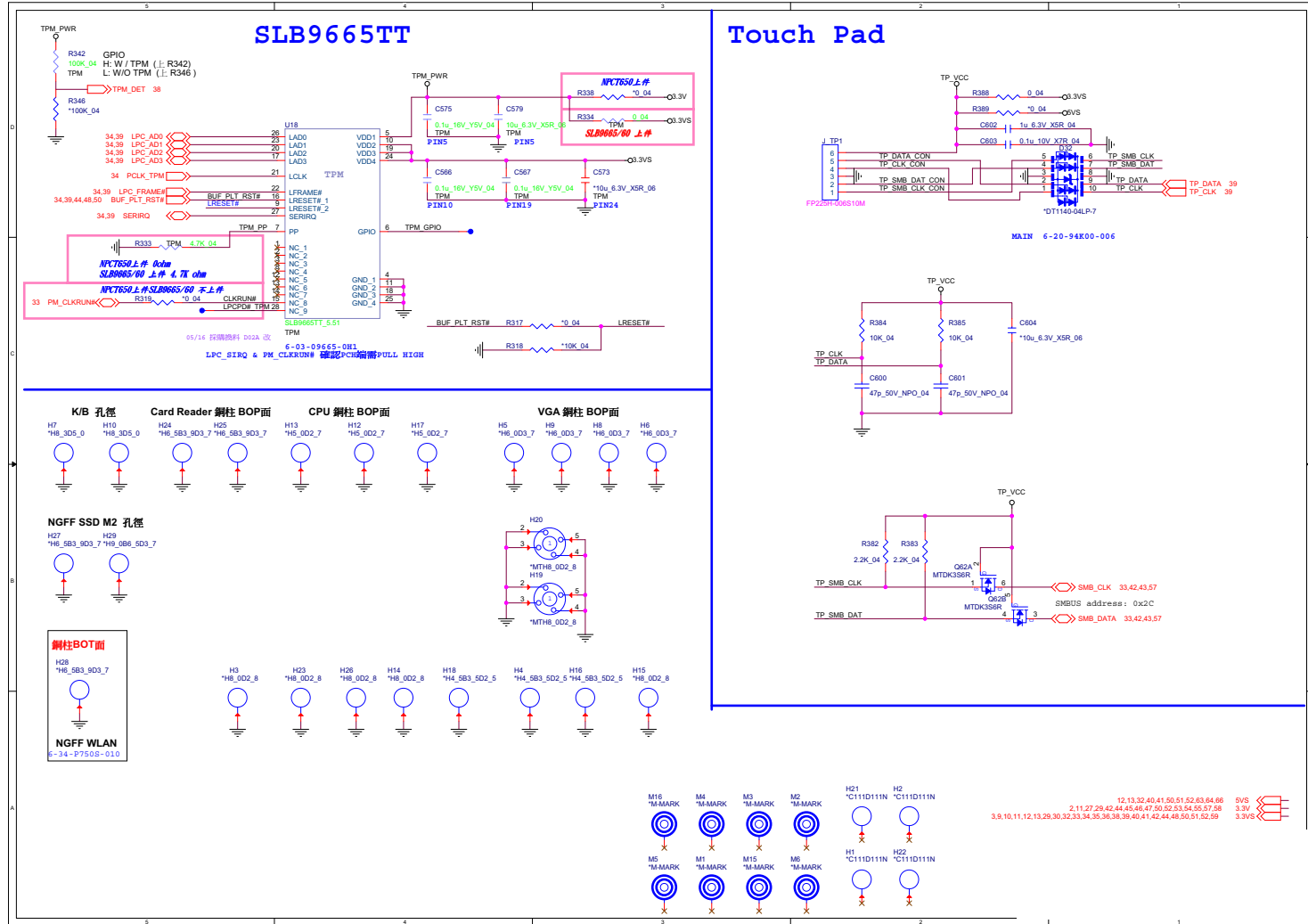
M.2 WLAN+BT, PCIE4X SSD



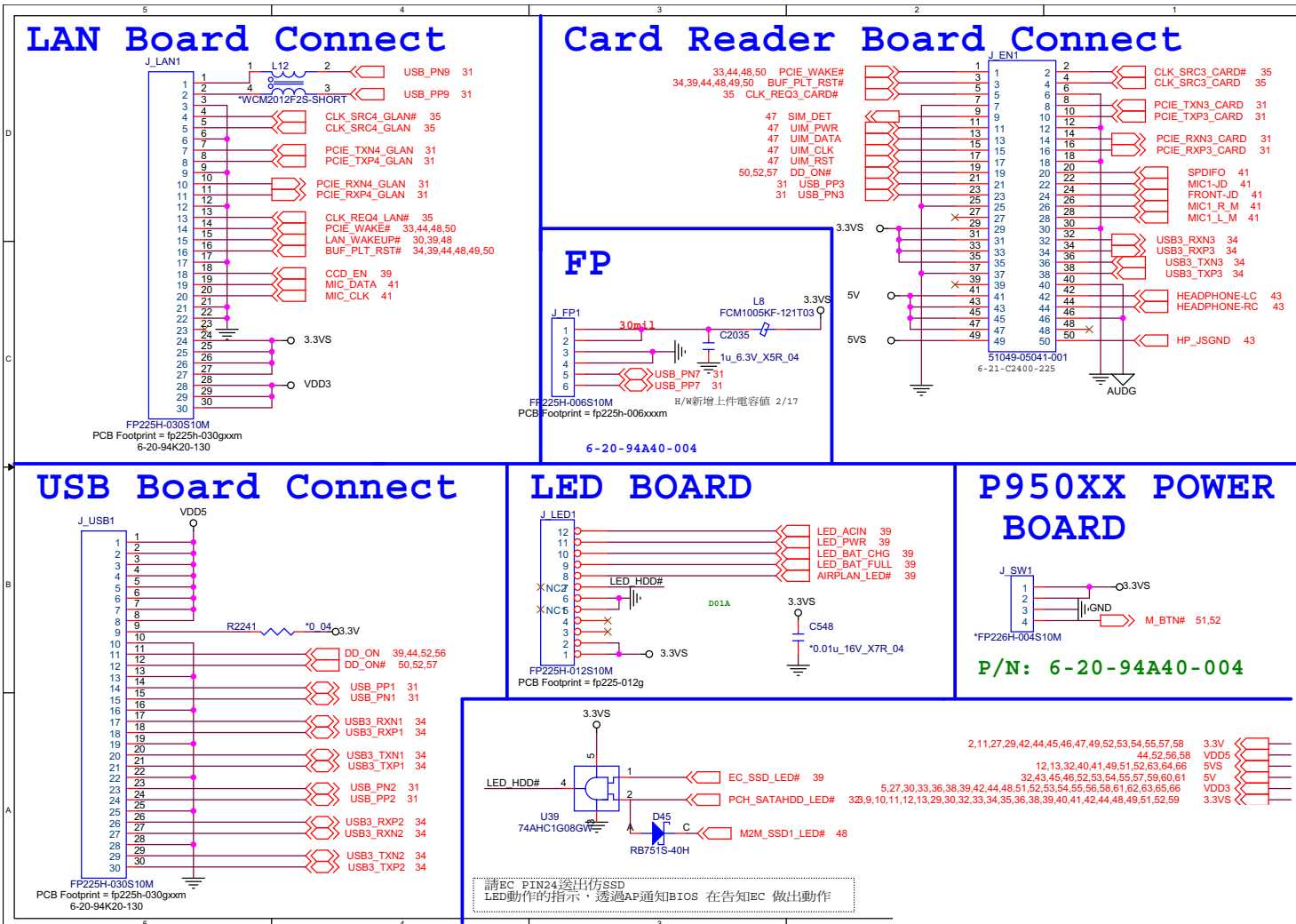
Sheet 48 of 74
M.2 WLAN+BT,
PCIE4X SSD

B.Schematic Diagrams

TPM, TP



Connector

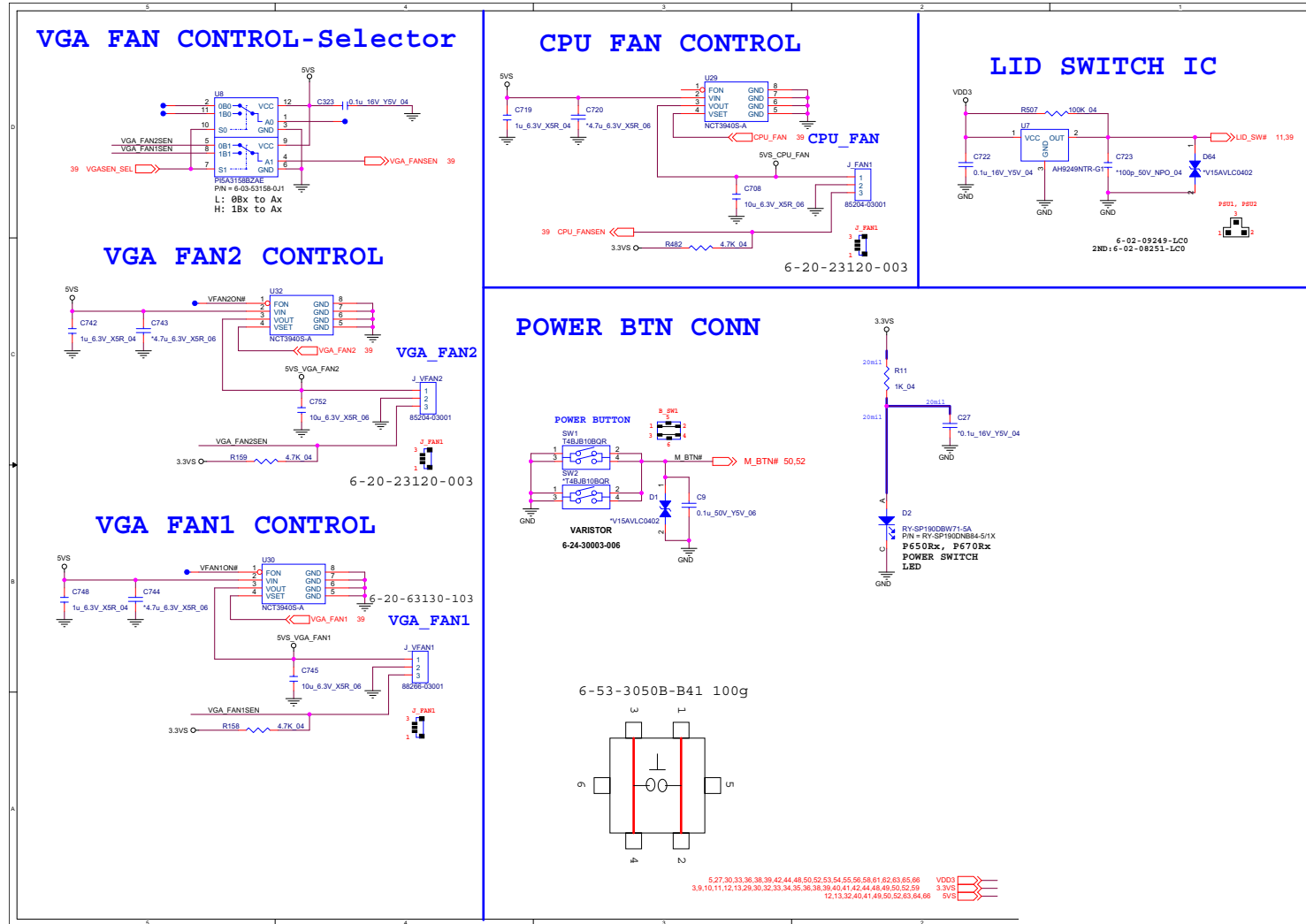


Sheet 50 of 74
Connector

B. Schematic Diagrams

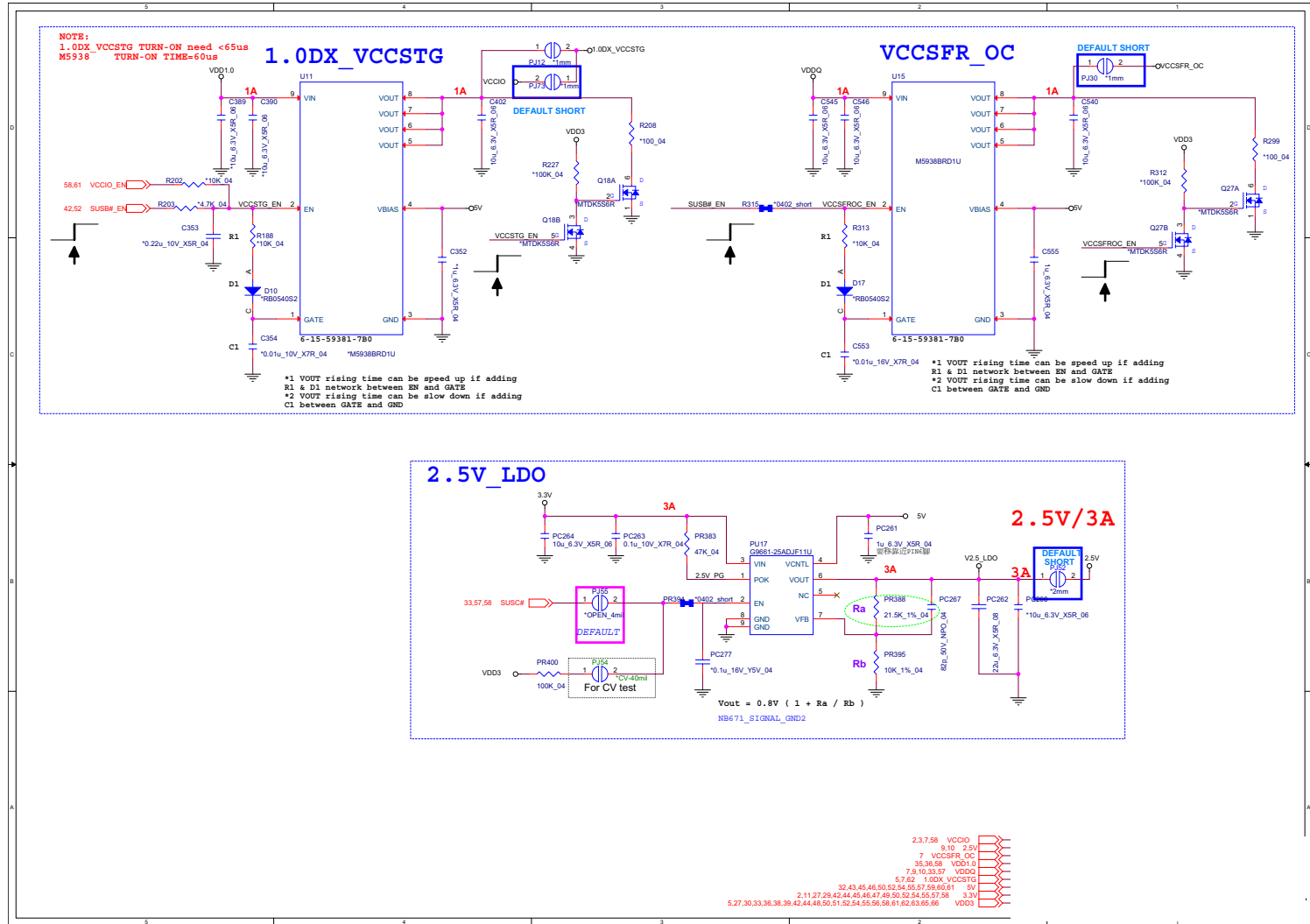
Fan, LID, KB LED

Sheet 51 of 74
Fan, LID, KB LED



Schematic Diagrams

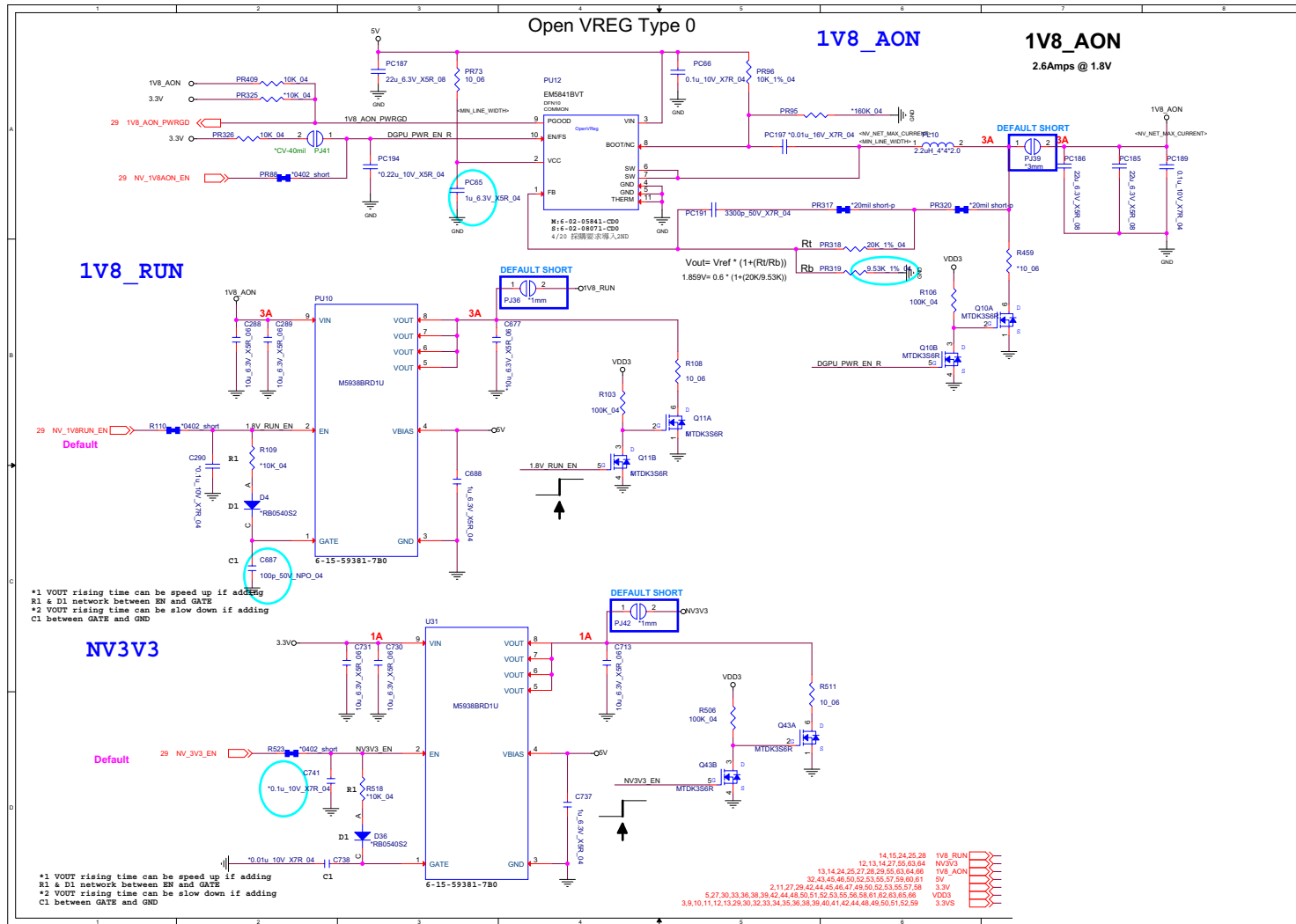
1.0DX_VCCSTG/VCCSFR_OC/2.5V



B.Schematic Diagrams

Sheet 53 of 74
 1.0DX_VCCSTG/
 VCCSFR_OC/2.5V

1V8_RUN/AON, NV3V3

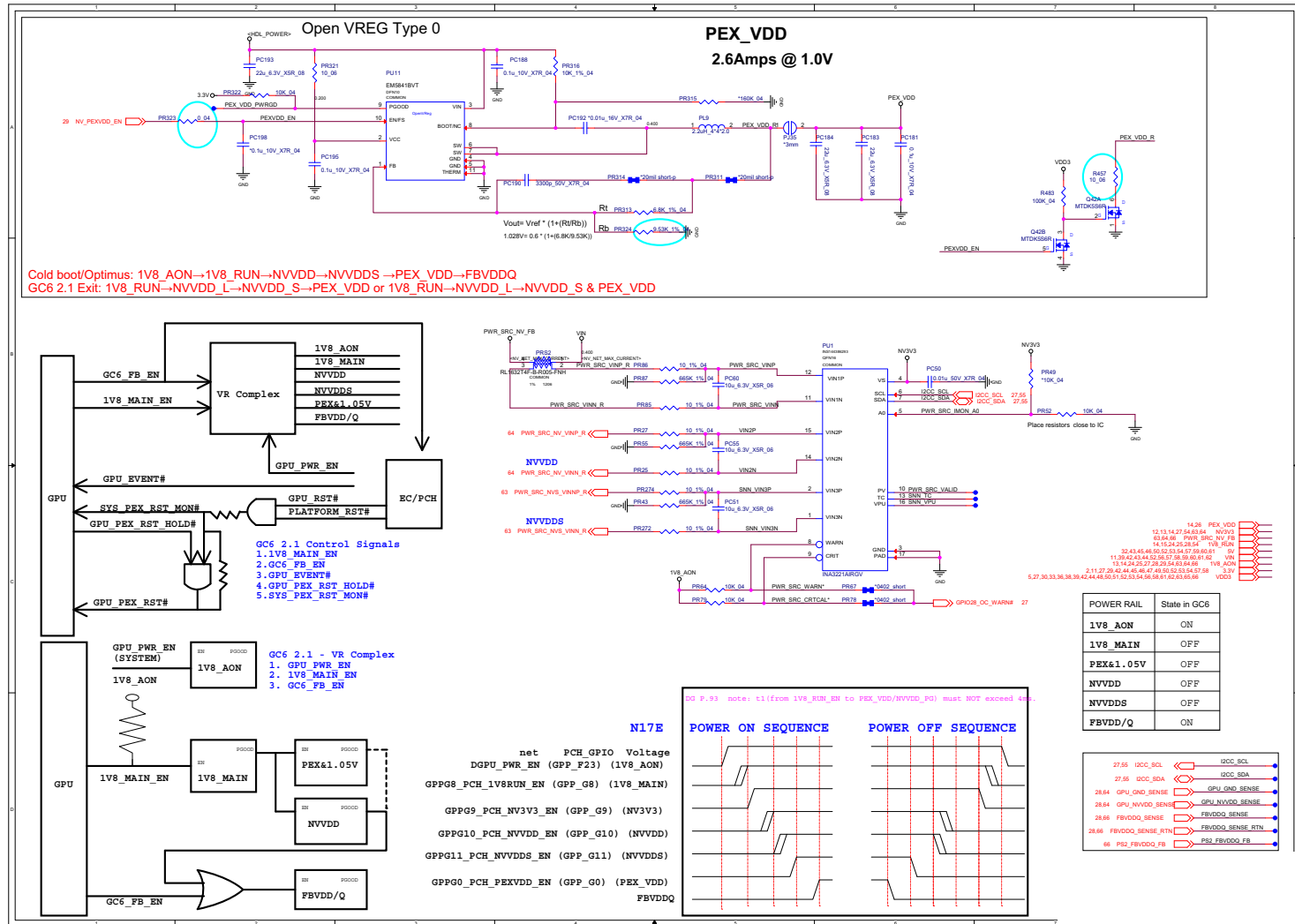


Sheet 54 of 74
1V8_RUN/AON,
NV3V3

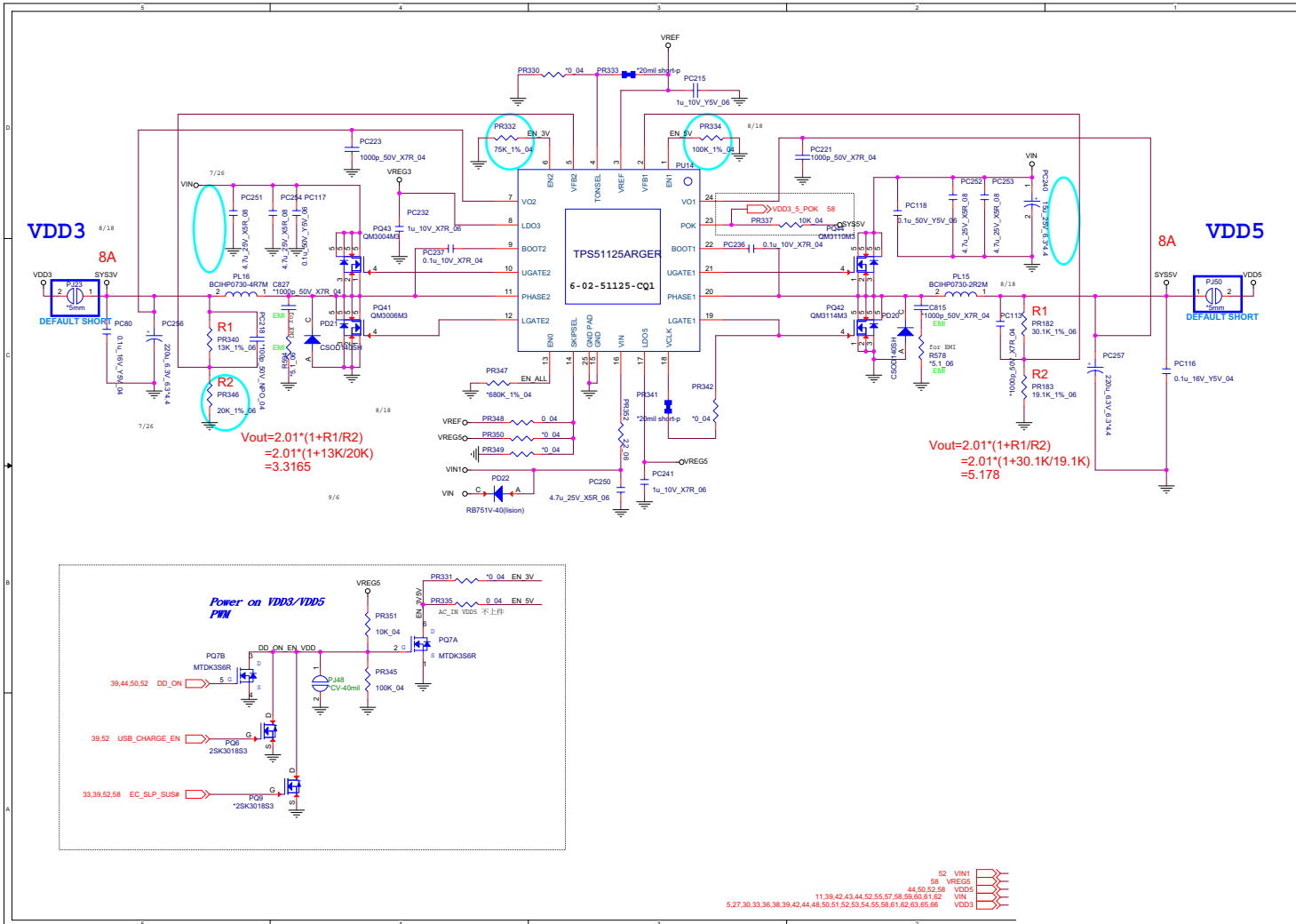
B.Schematic Diagrams

PEX_VDD

Sheet 55 of 74
PEX_VDD



VDD3, VDD5

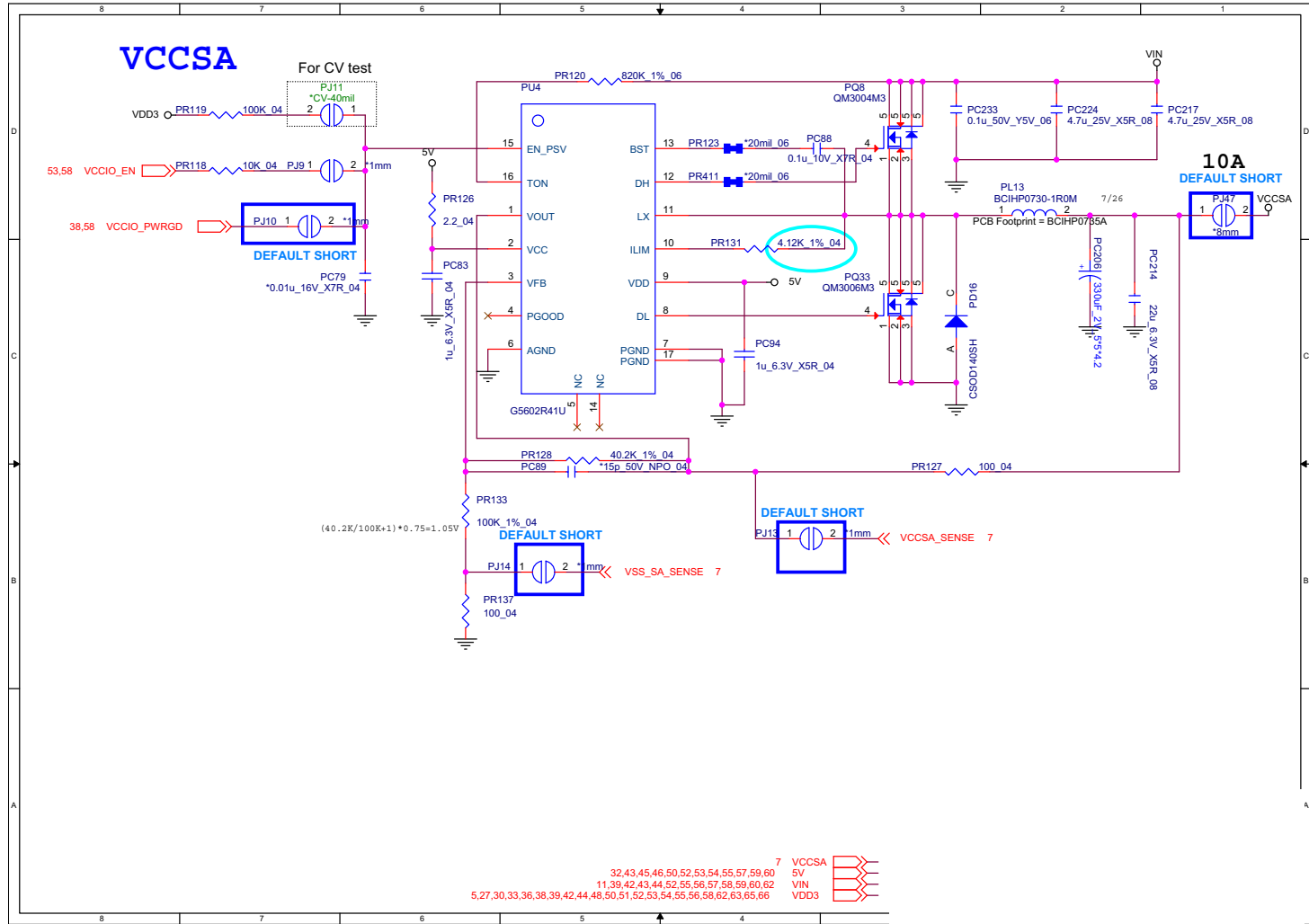


Sheet 56 of 74
VDD3, VDD5

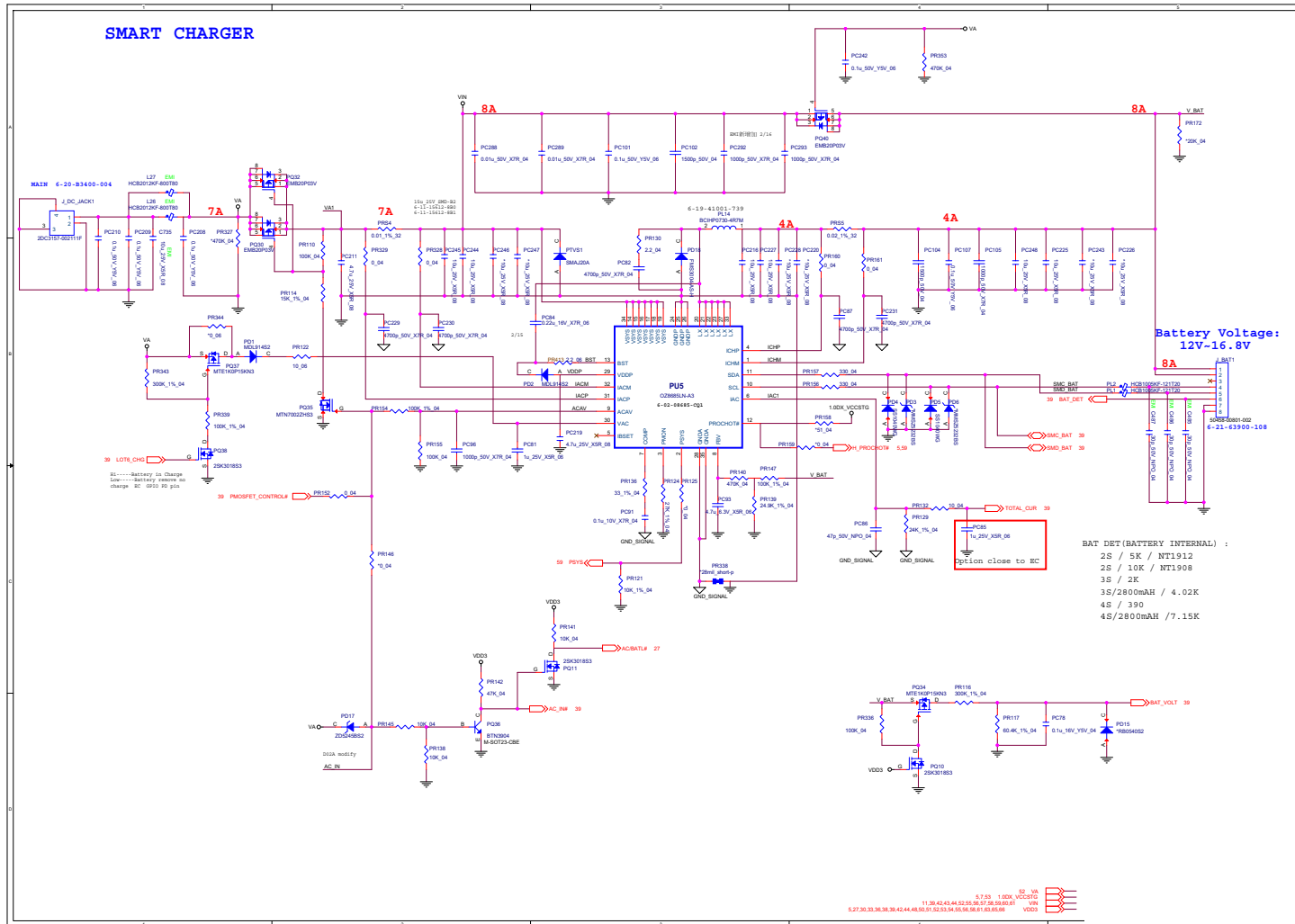
Schematic Diagrams

VCCSA

Sheet 61 of 74
VCCSA



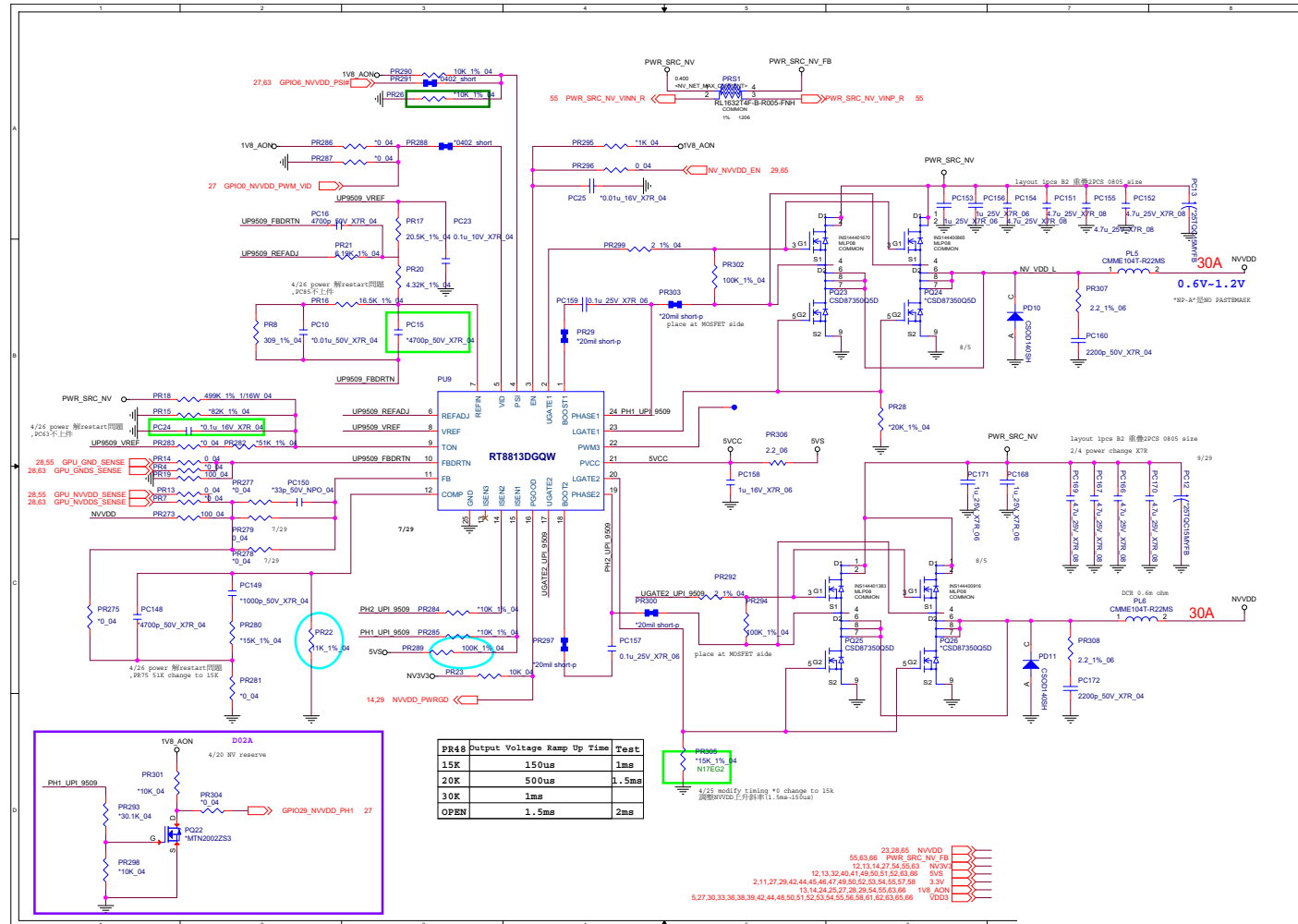
AC_In, Charger



Sheet 62 of 74
AC_In, Charger

B.Schematic Diagrams

NVVDD 1

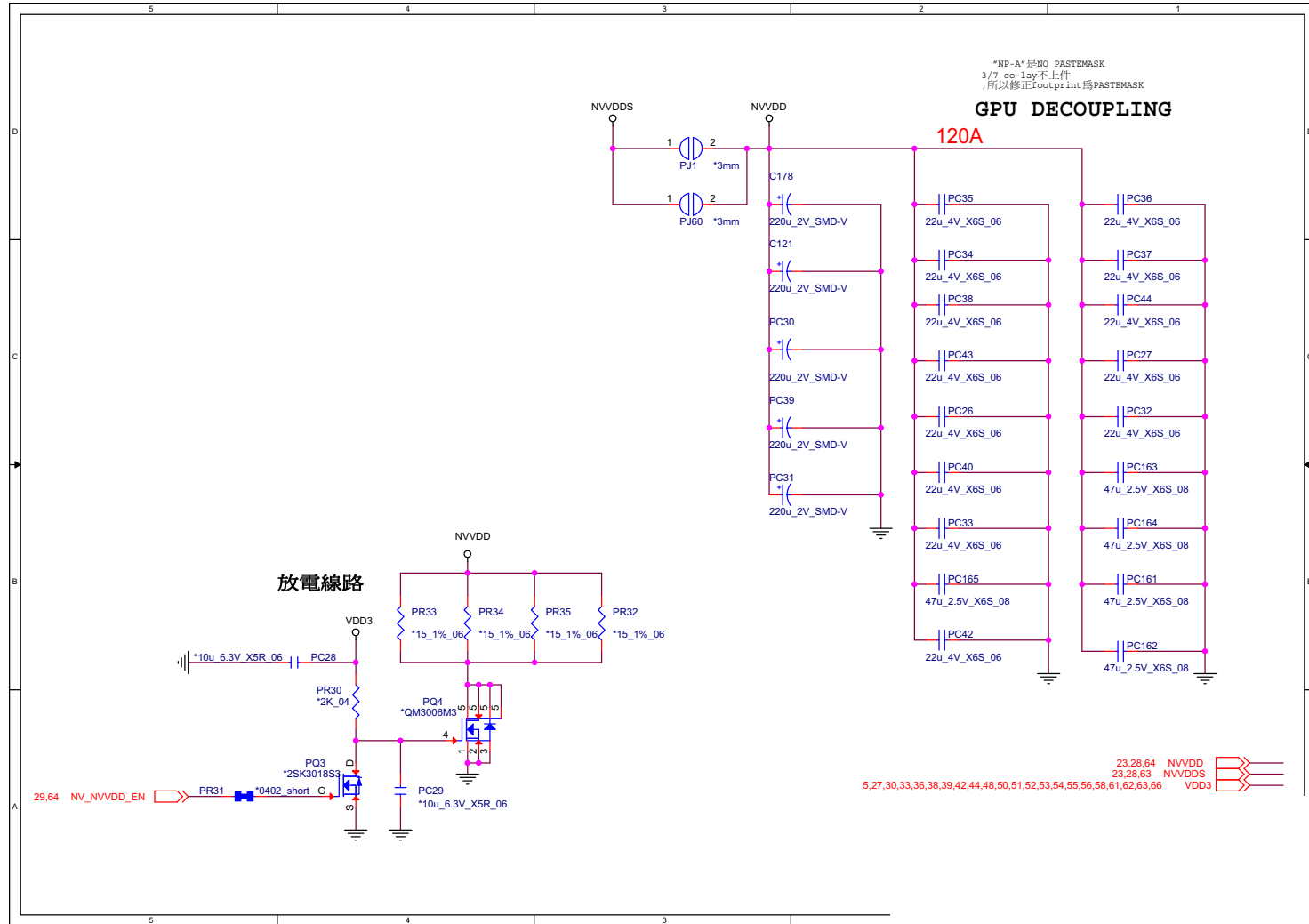


Sheet 64 of 74
NVVDD 1

B.Schematic Diagrams

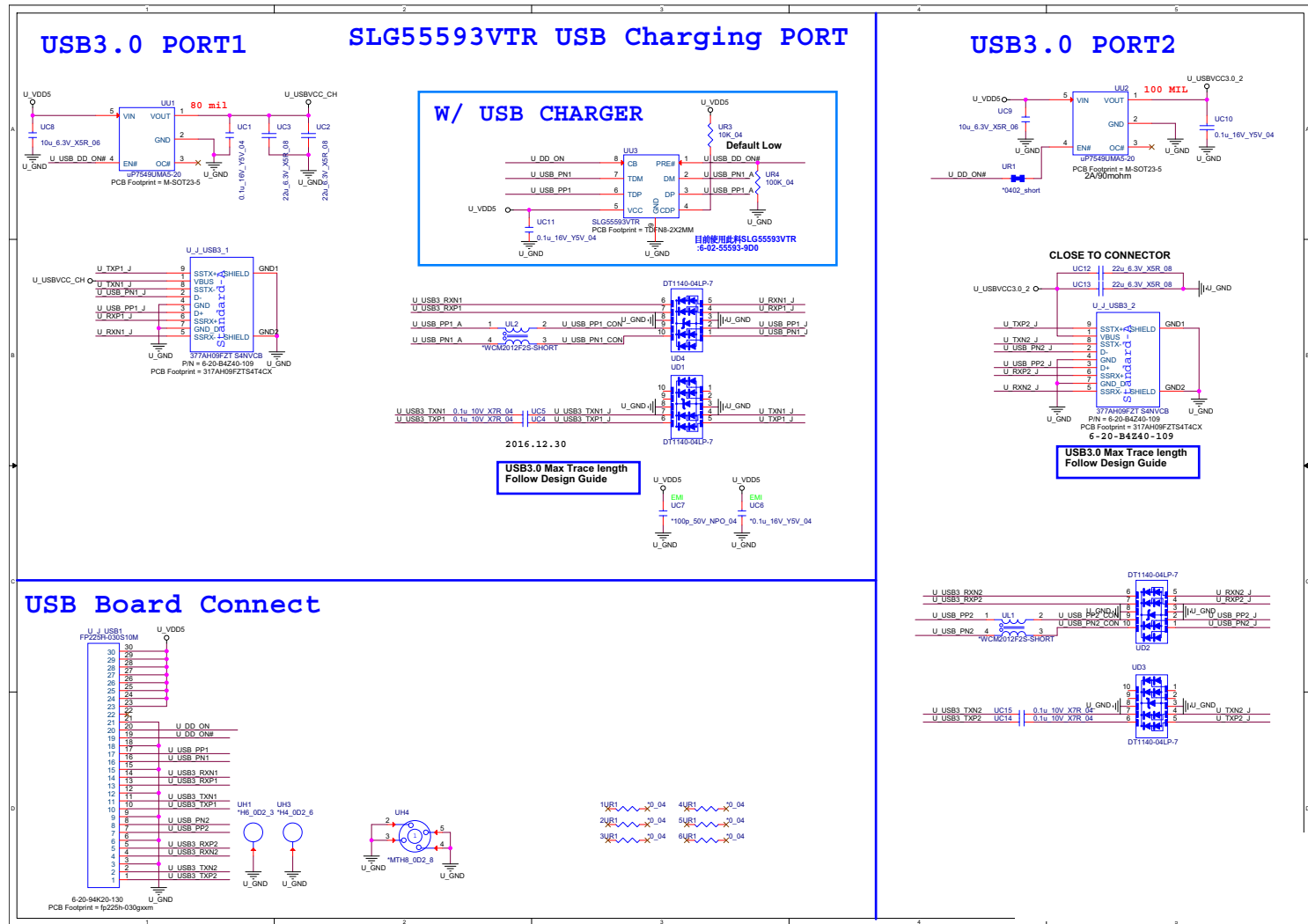
NVDD 2

Sheet 65 of 74
NVDD 2

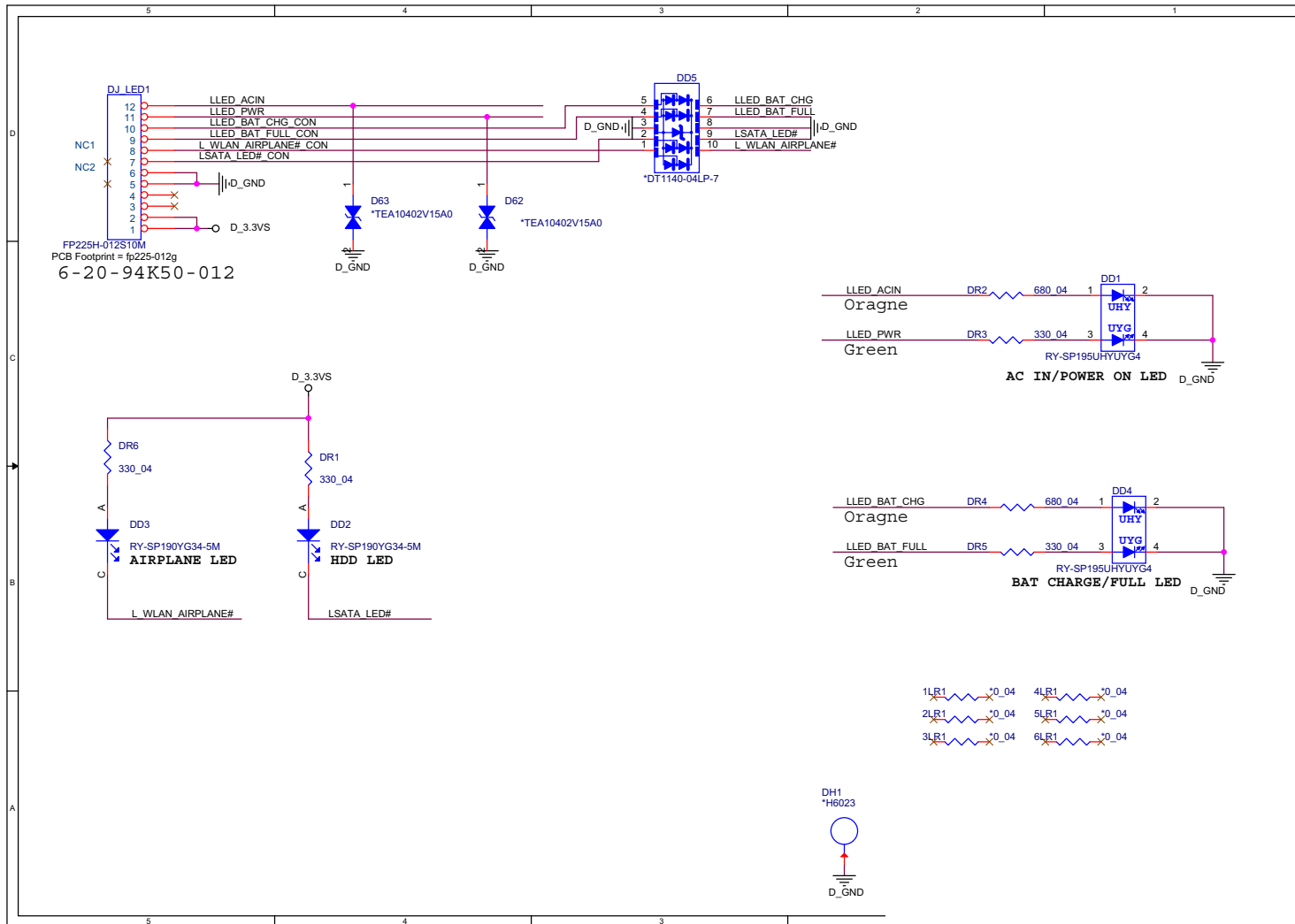


USB Board

Sheet 69 of 74
USB Board



LED Board

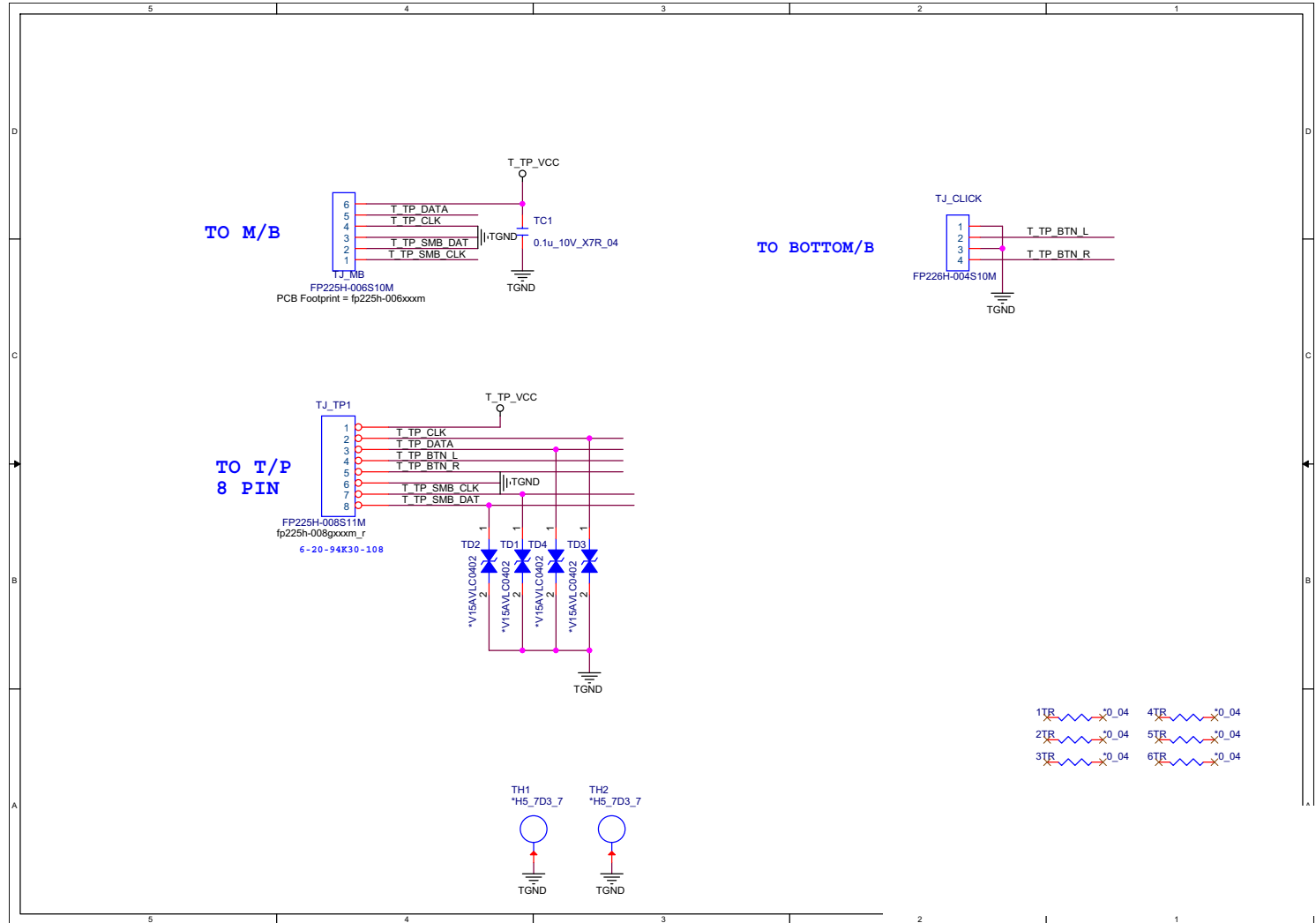


Sheet 70 of 74
LED Board

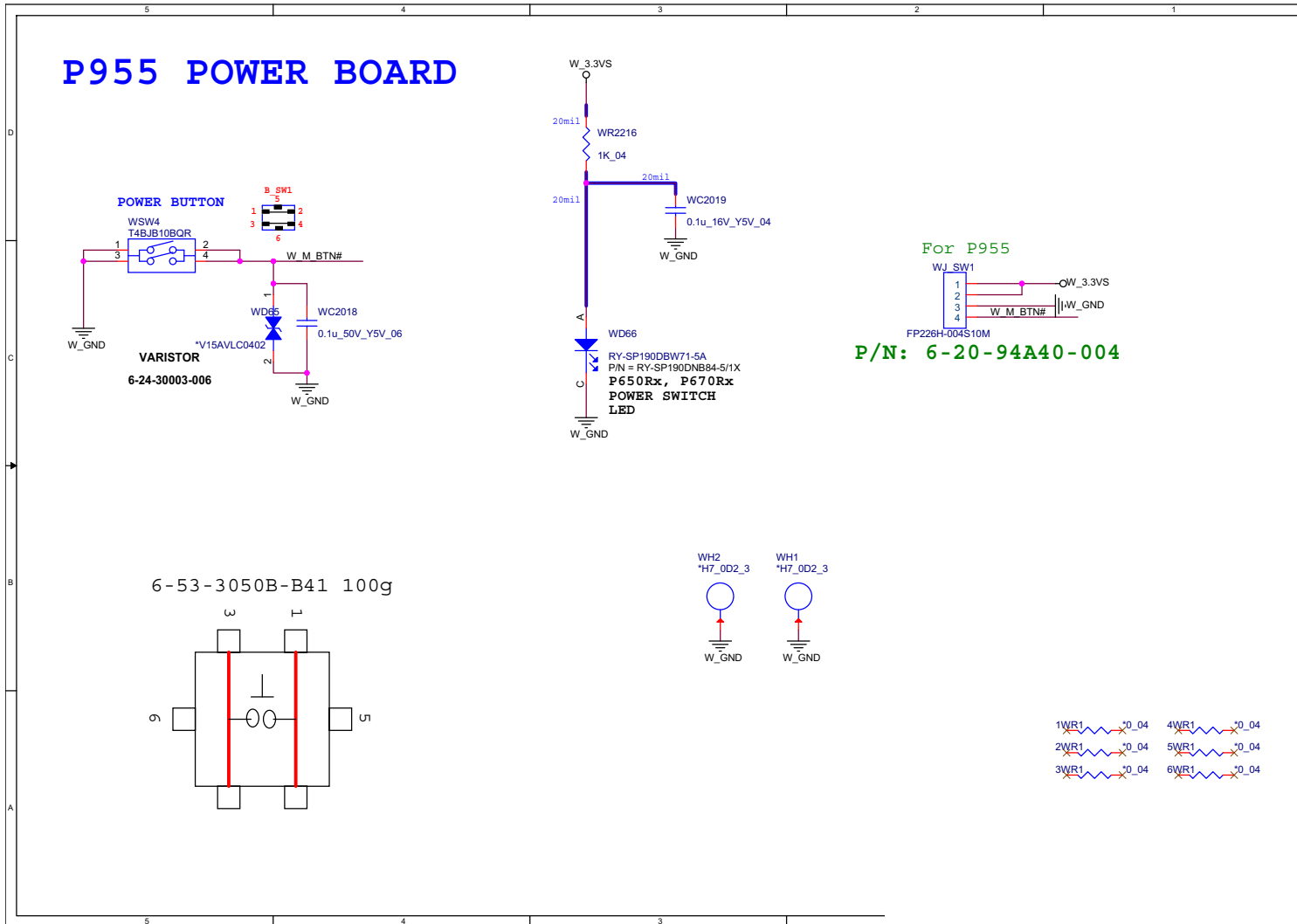
B.Schematic Diagrams

Click Board

Sheet 71 of 74
Click Board



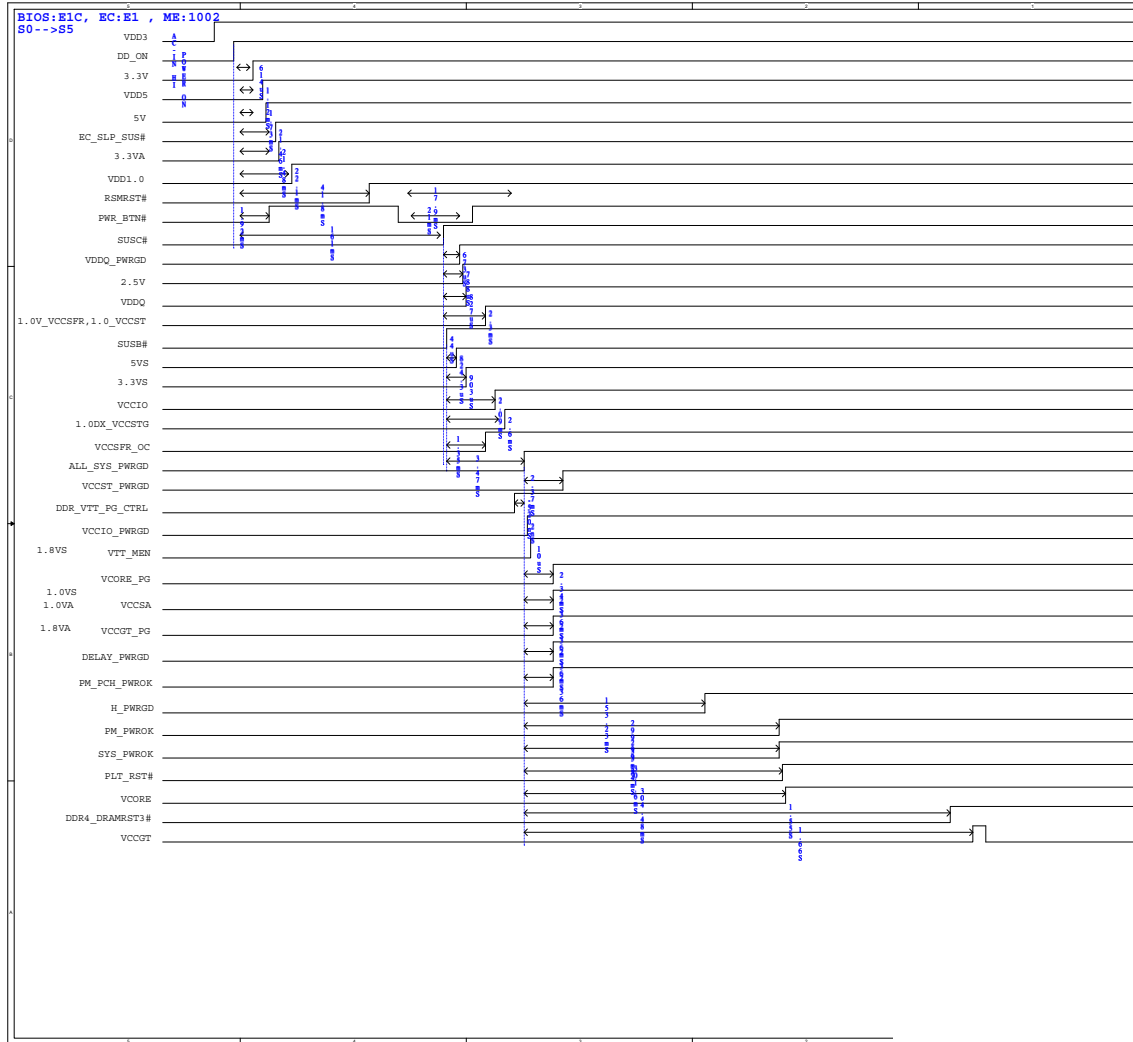
Power Board



Sheet 72 of 74
Power Board

B.Schematic Diagrams

Power Sequence



Sheet 73 of 74
Power Sequence

Schematic Diagrams

Appendix C: Updating the FLASH ROM BIOS

To update the FLASH ROM BIOS, you must:

- Download the BIOS update from the web site.
- Unzip the files onto a bootable CD/DVD/USB Flash Drive.
- Reboot your computer from an external CD/DVD/USB Flash Drive.
- Use the flash tools to update the flash BIOS using the commands indicated below.
- Restart the computer booting from the HDD and press **F2** at startup enter the BIOS.
- Load setup defaults from the BIOS and save the default settings and exit the BIOS to restart the computer.
- After rebooting the computer you may restart the computer again and make any required changes to the default BIOS settings.

Download the BIOS

1. Go to www.clevo.com.tw and point to **E-Services** and click **E-Channel**.
2. Use your user ID and password to access the appropriate download area (BIOS), and download the latest BIOS files (the BIOS file will be contained in a batch file that may be run directly once unzipped) for your computer model (see sidebar for important information on BIOS versions).

Unzip the downloaded files to a bootable CD/DVD or USB Flash drive

1. Insert a bootable CD/DVD/USB flash drive into the CD/DVD drive/USB port of the computer containing the downloaded files.
2. Use a tool such as Winzip or Winrar to unzip all the BIOS files and refresh tools to your bootable CD/DVD/USB flash drive (you may need to create a bootable CD/DVD with the files using a 3rd party software).

Set the computer to boot from the external drive

1. With the bootable CD/DVD/USB flash drive containing the BIOS files in your CD/DVD drive/USB port, restart the computer and press **F2** (in most cases) to enter the BIOS.
2. Use the arrow keys to highlight the **Boot** menu.
3. Use the “+” and “-” keys to move boot devices up and down the priority order.
4. Make sure that the CD/DVD drive/USB flash drive is set first in the boot priority of the BIOS.
5. Press **F4** to save any changes you have made and exit the BIOS to restart the computer.



BIOS Version

Make sure you download the latest correct version of the BIOS appropriate for the computer model you are working on.

You should only download BIOS versions that are V1.0X.XX or higher as appropriate for your computer model.

Note that BIOS versions are not backward compatible and therefore you may not downgrade your BIOS to an older version after upgrading to a later version (e.g if you upgrade a BIOS to ver 1.0X.05, you **MAY NOT** then go back and flash the BIOS to ver 1.0X.04).

BIOS Update

Use the flash tools to update the BIOS

1. Make sure you are not loading any memory management programs such as HIMEM by holding the **F8** key as you see the message “**EFI Shell**”. You will then be prompted to give “**Y**” or “**N**” responses to the programs being loaded by EFI Shell. Choose “**N**” for any memory management programs.
2. You should now see `DISK fsX:\>` (X is the designated drive number for the CD/DVD drive/USB flash drive).
3. **Type the following command:**

fsX:\> Flash.nsh

4. The utility will then proceed to flash the BIOS.
5. You should then be prompted to press any key to restart the system or turn the power off, and then on again but make sure you remove the CD/DVD/USB flash drive from the CD/DVD drive/USB port before the computer restarts.

Restart the computer (booting from the HDD)

1. With the CD/DVD/USB flash drive removed from the CD/DVD drive/USB port the computer should restart from the HDD.
2. Press **F2** as the computer restarts to enter the BIOS.
3. Use the arrow keys to highlight the **Exit** menu.
4. Select **Load Setup Defaults** (or press **F3**) and select “**Yes**” to confirm the selection.
5. Press **F4** to save any changes you have made and exit the BIOS to restart the computer.

Your computer is now running normally with the updated BIOS

You may now enter the BIOS and make any changes you require to the default settings.