

SERVICE MANUAL

P870KM(-G)



**Notebook Computer
P870KM(-G)
Service Manual**

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About this Manual

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

It is organized to allow you to look up basic information for servicing and/or upgrading components of the **P870KM(-G)** 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

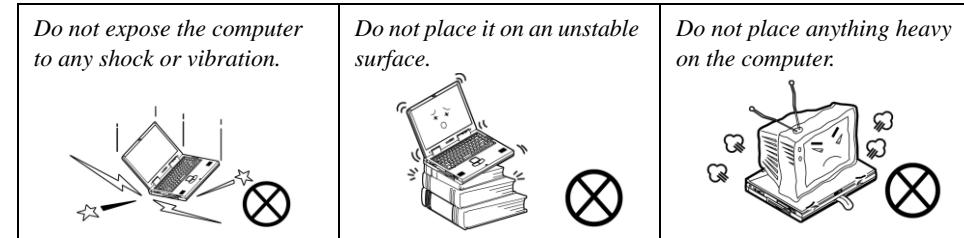
Follow basic safety precautions, including those listed below, to reduce the risk of fire, electric shock and injury to persons when using any electrical equipment:

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 - Dual Full Range AC/DC Adapters – AC in 100 - 240V, 50 - 60Hz DC Output 19.5V, 11.8A (**230 Watts**) with Power Converter Box.

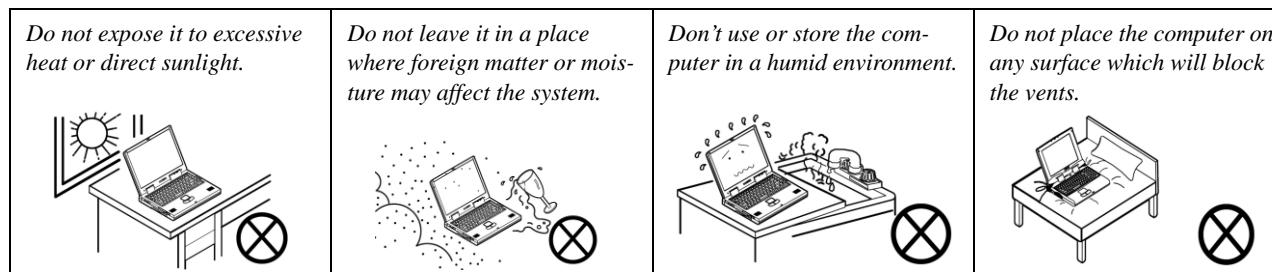
Instructions for Care and Operation

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

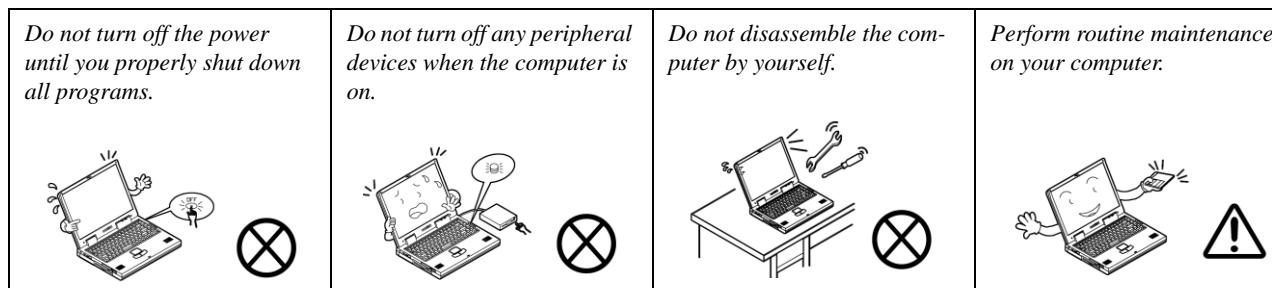
- 1. Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.



- 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



Removal Warning

When removing any cover(s) and screw(s) for the purposes of device upgrade, remember to replace the cover(s) and screw(s) before restoring power to the system.

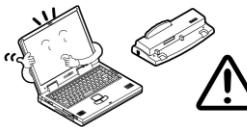
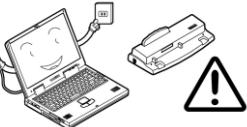
Also note the following when the cover is removed:

- Hazardous moving parts.
- Keep away from moving fan blades

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). You must also remove your battery in order to prevent accidentally turning the machine on.

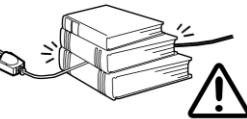
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices.**

<p><i>Use only approved brands of peripherals.</i></p> 	<p><i>Unplug the power cord before attaching peripheral devices.</i></p> 
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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.

<p><i>Do not plug in the power cord if you are wet.</i></p> 	<p><i>Do not use the power cord if it is broken.</i></p> 	<p><i>Do not place heavy objects on the power cord.</i></p> 
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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 Disc

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. Attach the AC/DC adapter to the DC-In jack at the rear of the computer, then plug the AC power cord into an outlet, and connect the AC power cord to the AC/DC adapter (**make sure you use the adapter when first setting up the computer**, 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).
6. Use one hand to raise the lid/LCD to a comfortable viewing angle (do not exceed 135 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".

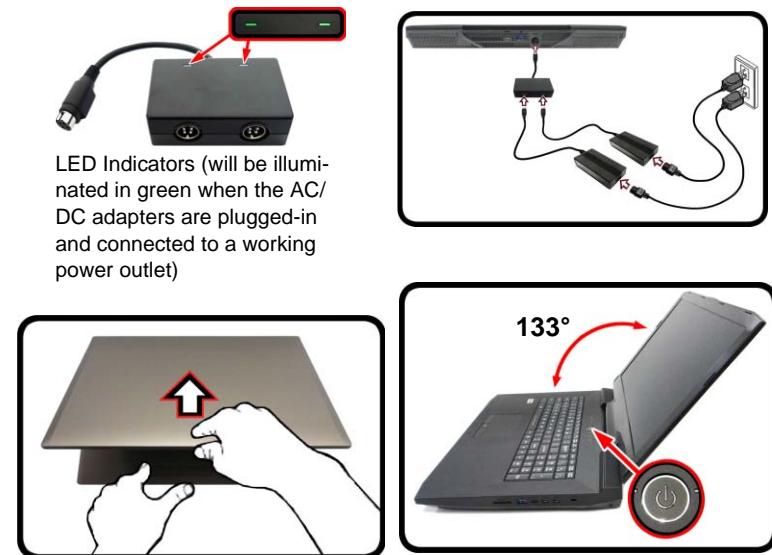


Figure 1
Opening the Lid/LCD/
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Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the **P870KM(-G)** 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 *User's Manual*. That manual is shipped with the computer.

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

The **P870KM(-G)** 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 note 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.

Processor Options

i7-7700K (4.20GHz)*

8MB Smart Cache, **14nm**, DDR4-2400MHz, TDP 91W

i5-7600K (3.80GHz)*

6MB Smart Cache, **14nm**, DDR4-2400MHz, TDP 91W

i5-7400 (3.00GHz)

6MB Smart Cache, **14nm**, DDR4-2400MHz, TDP 65W

* Supports CPU overclocking technology depending on CPU SKU

Video Adapter Options

NVIDIA® GeForce GTX 1070 PCIe Video Card

8GB GDDR5 Video RAM on board

Supports GPU Overclocking

Supports **NVIDIA® SLI Technology**

NVIDIA® GeForce GTX 1080 PCIe Video Card

8GB GDDR5X Video RAM

Supports GPU Overclocking

LCD Options

17.3" (43.94cm), 16:9, UHD (3840x2160)/*QHD
(2560x1440)/FHD (1920x1080)

*Note: QHD panels are available for systems with NVIDIA® G-SYNC™Technology only

Core Logic

Intel® Z270 Chipset

BIOS

AMI BIOS (64Mb SPI Flash-ROM)

Pointing Device

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

Keyboard

Full Color **Illuminated** Full-size Winkey Keyboard (with numeric keypad and anti-ghost keys)

Memory

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

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

Memory Expandable from **8GB (minimum)** up to **64GB (maximum)**

Supports XMP 2666/3000 MHz (XMP depends on processor and works in dual channel)



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.

Audio

High Definition Audio Compliant Interface

S/PDIF Digital Output

Two Speakers

Sound Blaster Audio

ESS™ SABRE HIFI DAC for High Resolution Headphone Audio

Built-In Array Microphone

Sub-Woofer

Note: External 7.1CH Audio Output Supported by Microphone-In, Line-In and Line-Out and 2-in-1 Audio Jack

Introduction

Storage

Two changeable 2.5" (6cm) 7.0mm (h) / 9.5mm (h) SATA (Serial) Hard Disk Drives/Solid State Drives (SSD) supporting RAID level 0/1

(Factory Option) Two M.2 SATA 2280 SSDs supporting RAID level 0/1

Or

(Factory Option) Three M.2 PCIe Gen3 x4 2280 SSDs supporting RAID level 0/1

Security

Security (Kensington® Type) Lock Slot

BIOS Password

Fingerprint Reader Module

Trusted Platform Module 2.0

Intel PTT for Systems Without TPM Hardware

Interface

Five USB 3.0 (USB 3.1 Gen 1) Ports (Including one AC/DC Powered USB port)

Two USB 3.1 Gen 2 Ports (Type C)

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 Line-In Jack

Two RJ-45 LAN Jacks

One DC-In Jack

M.2 Slots

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

Slot 2 for **SATA or PCIe Gen3 x4 SSD**

Slot 3 for **SATA or PCIe Gen3 x4 SSD**

Slot 4 for **PCIe Gen3 x4 SSD**

Communication

Built-In Qualcomm 10/100/1000Mb Base-TX Ethernet LAN
2.0M FHD PC Camera Module

WLAN/ Bluetooth M.2 Modules:

(Factory Option) Intel® Dual Band Wireless-AC 8265 Wireless LAN (802.11ac) + Bluetooth 4.1

(Factory Option) Intel® Dual band Wireless-AC 3168 Wireless LAN (802.11ac) + Bluetooth 4.0

(Factory Option) Qualcomm® Atheros Killer™ Wireless-AC 1535 Wireless LAN (802.11ac) + Bluetooth 4.1

(Factory Option) Wireless LAN (802.11ad) + Bluetooth 4.1 combo

Card Reader

Embedded Multi-In-1 Push-Push Card Reader

MMC (MultiMedia Card) / RS MMC

SD (Secure Digital) / Mini SD / SDHC/ SDXC (up to UHS-II)

Features

Supports NVIDIA® G-SYNC™ Technology

(G-SYNC is only supported if you have a G-SYNC capable display and a GTX series video adapter)

Virtual Reality Ready

Power

Embedded 8-cell Smart Lithium-Ion Battery Pack, 89WH

Dual Full Range AC/DC Adapters with the Power Converter Box

Full Range AC/DC Adapter

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

DC Output: 19.5V, 11.8A (230W)



Power Converter

You must use the power converter supplied with the dual AC/DC adapters connected to power this computer. Do not use a single AC/DC adapter to power the system.

Environmental Spec

Temperature

Operating: 10°C - 35°C

Non-Operating: -20°C - 60°C

Relative Humidity

Operating: 20% - 80%

Non-Operating: 10% - 90%

Dimensions & Weight

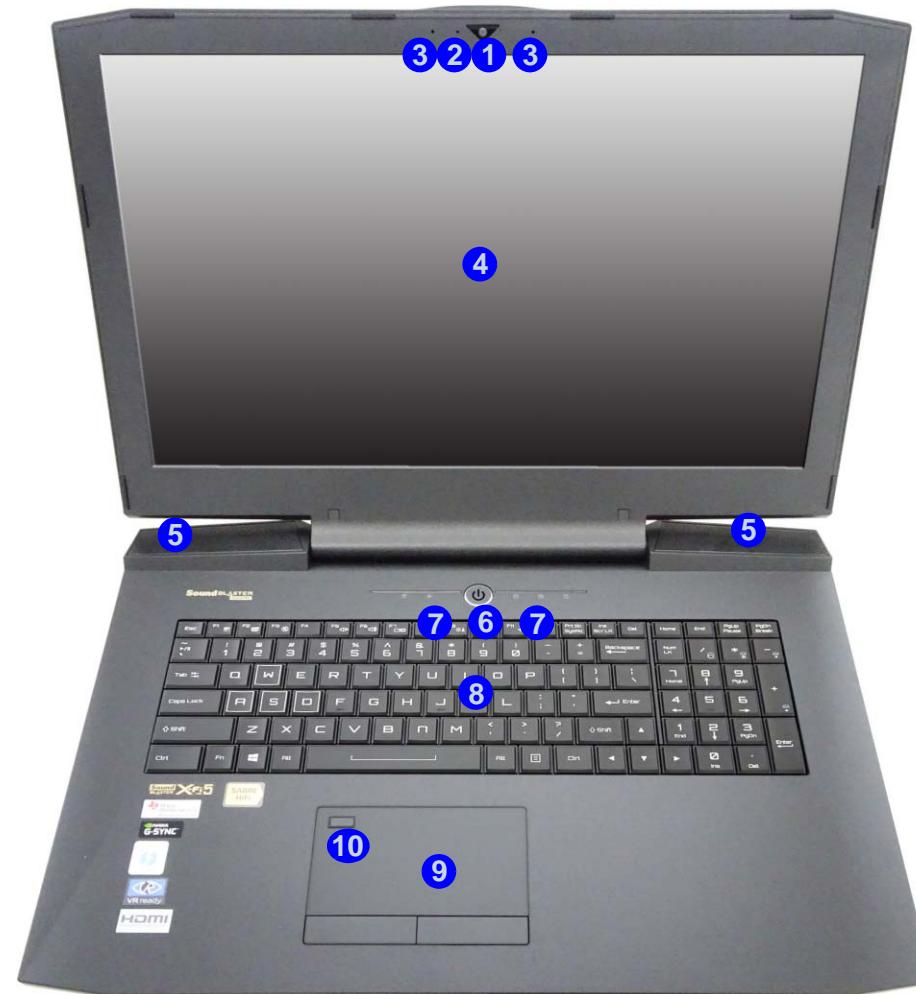
428mm (w) * 308mm (d) * 47.2mm (h)

4.8kg (Barebone System with 1 Video Card and 89WH Battery)

Introduction

Figure 1
Top View

1. PC Camera
2. PC Camera LED
3. Built-In Array Microphone
4. LCD
5. Speakers
6. Power Button
7. LED Indicators
8. Keyboard
9. TouchPad and Buttons
10. Fingerprint Reader



External Locator - Front & Right side Views

Figure 2
Front Views

1. LED Power Indicators
2. Vents

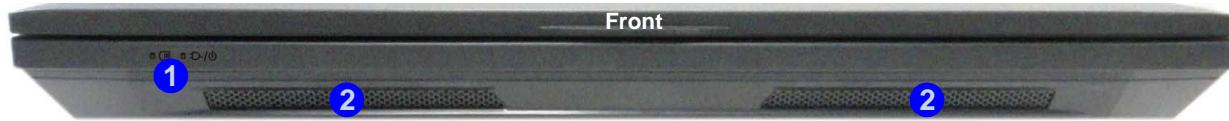
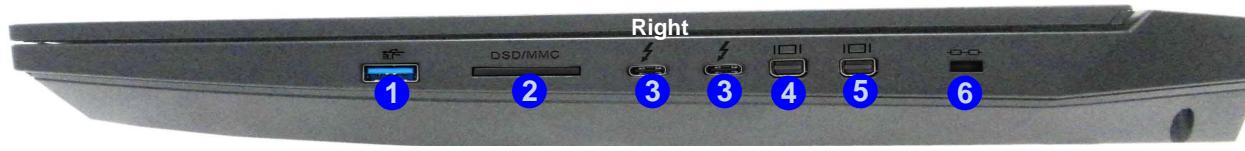


Figure 3
Right Side Views

1. USB 3.0/3.1 Port
2. Multi-in-1 Card Reader
3. USB 3.1 Ports
4. Mini Display Port 1
5. Mini Display Port 2
6. Security Lock Slot



Introduction

External Locator - Left Side & Rear View

Figure 4

Left Side View

1. RJ-45 LAN Jacks
2. USB 3.0 Ports
3. Powered USB 3.0/
3.1 Port
4. Line-In Jack
5. Microphone Jack
6. Line-Out Jack
7. Headphone & S/
PDIF-Out combo
Jack



Figure 5

Rear View

1. Vent/Fan Intake
2. HDMI-Out Port
3. USB 3.0/3.1 Port
4. DC-In Jack



External Locator - Bottom View

Figure 6
Bottom View

1. Vents
2. Sub Woofer



1. Introduction



Overheating

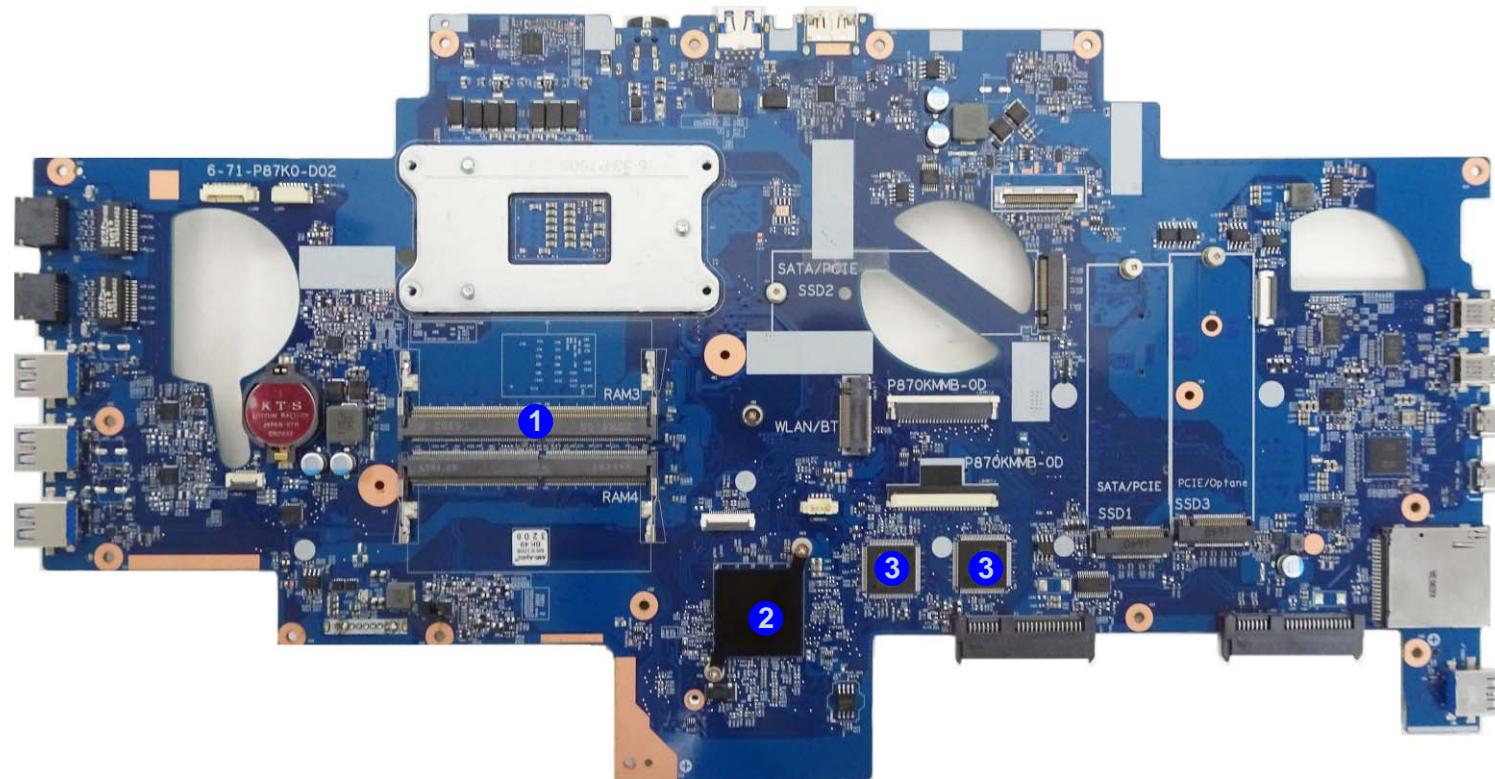
To prevent your computer from overheating make sure nothing blocks the vent/fan intakes while the computer is in use.

Introduction

Figure 7
Mainboard Top
Key Parts

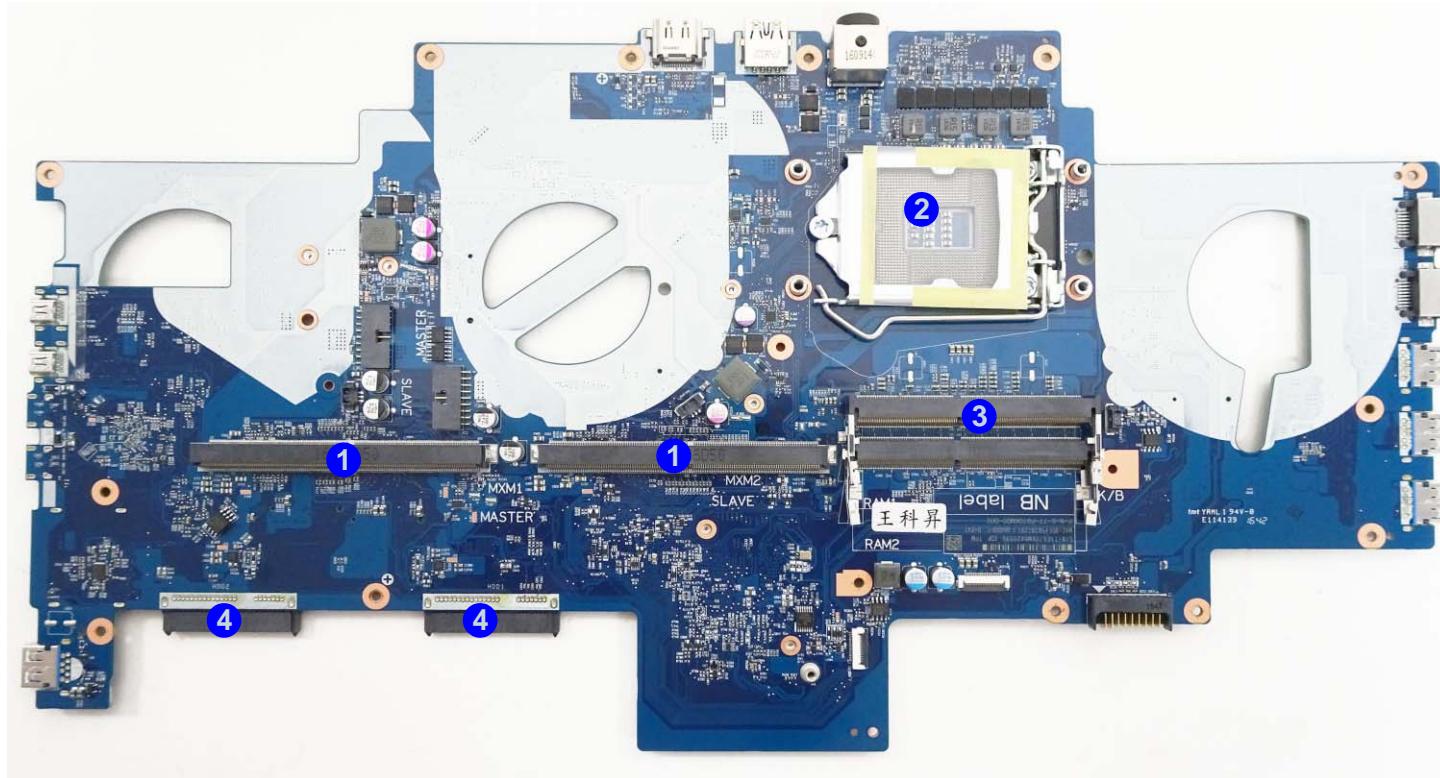
1. Memory Slots
DDR4 SO-DIMM
2. Platform
Controller Hub
3. KBC ITE IT8587

Mainboard Overview - Top (Key Parts)



Mainboard Overview - Bottom (Key Parts)

Figure 8
Mainboard Bottom
Key Parts

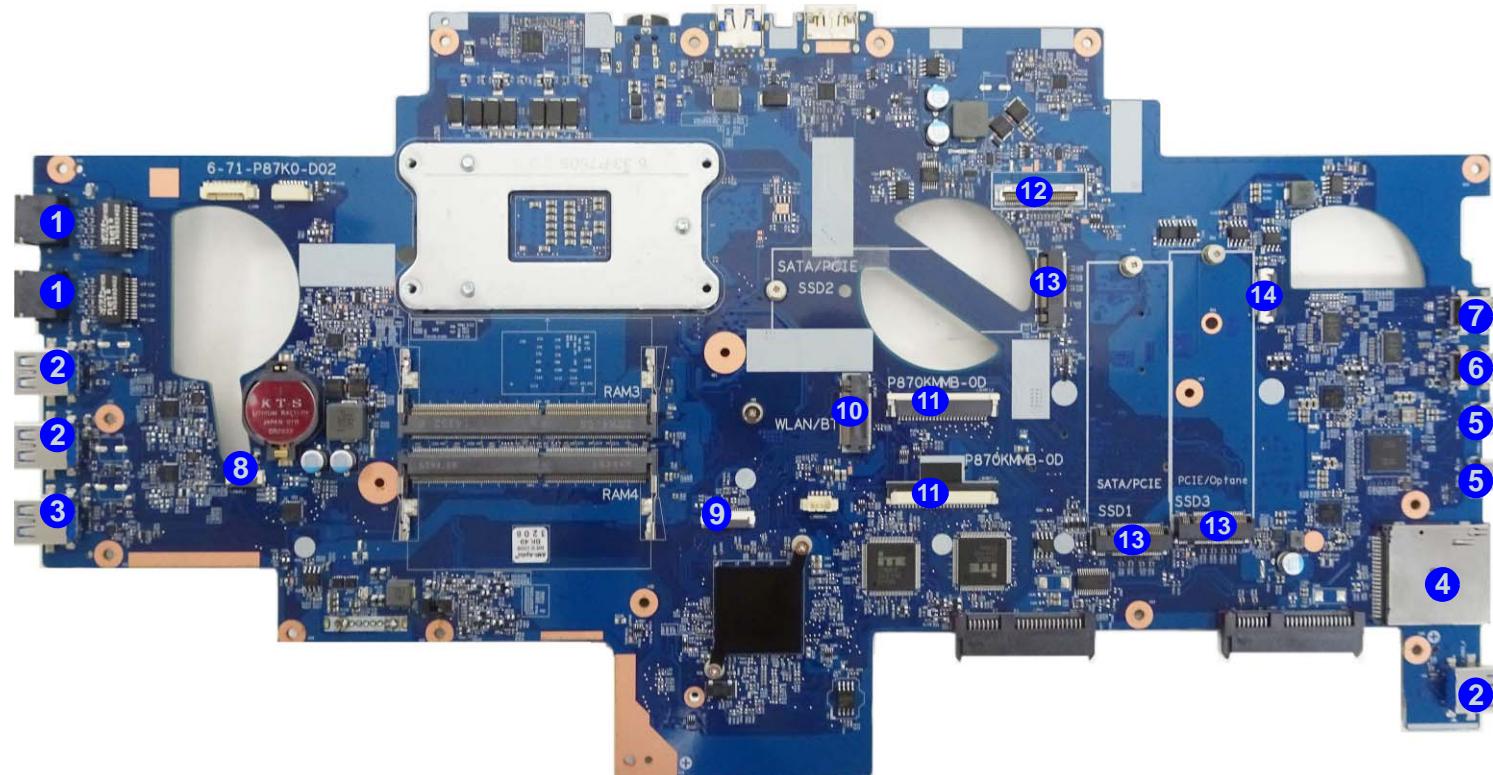


Introduction

Figure 9
Mainboard Top
Connectors

1. RJ-45 LAN Jacks
2. USB 3.0/3.1 Ports
3. Powered USB 3.0/
3.1 Port
4. Multi-in-1 Card
Reader
5. USB 3.1 Port
6. Mini Display Port 1
7. Mini Display Port 2
8. KB LED Connector
9. TP Connector
10. WLAN Card
Connector
11. Keyboard Cable
Connector
12. Panel Cable
Connector
13. M.2 Card
Connector
14. Button LED
Connector

Mainboard Overview - Top (Connectors)



Mainboard Overview - Bottom (Connectors)

Figure 10
Mainboard Bottom
Connectors



Introduction

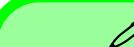
Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the **P870KM(-G)** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

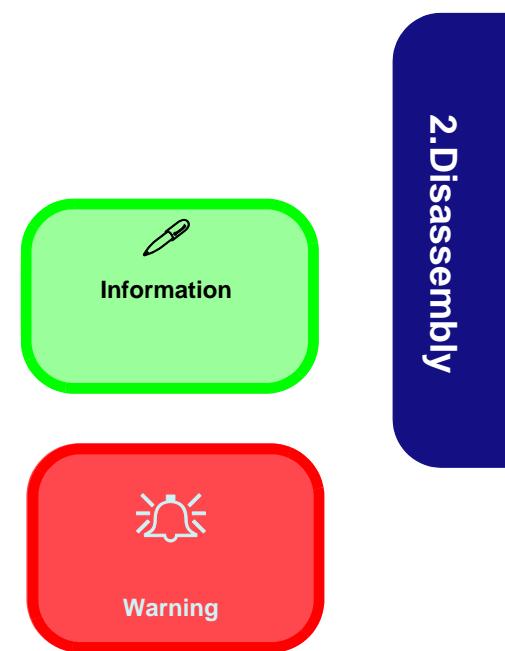
We suggest you completely review any procedure before you take the computer apart.

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

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

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

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



Disassembly

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

Maintenance Tools

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

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

Connections

Connections within the computer are one of four types:

Locking collar sockets for ribbon connectors

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

Pressure sockets for multi-wire connectors

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

Pressure sockets for ribbon connectors

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

Board-to-board or multi-pin sockets

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

Maintenance Precautions

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

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

Cleaning

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

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



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). You must 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 - 7](#)

To remove the Primary System Memory:

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

To remove the System Memory under the Keyboard:

1. Remove the battery [page 2 - 5](#)
2. Remove the keyboard [page 2 - 12](#)
3. Remove the system memory [page 2 - 13](#)

To remove and install the Video Card:

1. Remove the battery [page 2 - 5](#)
2. Remove the video card-2 [page 2 - 14](#)
2. Remove the video card-1 [page 2 - 15](#)
3. Install the video card [page 2 - 16](#)

To remove and install the Processor:

1. Remove the battery [page 2 - 5](#)
2. Remove the video card [page 2 - 14](#)
3. Remove the processor [page 2 - 17](#)
4. Install the processor [page 2 - 19](#)

To remove the WLAN Module:

1. Remove the battery [page 2 - 5](#)
2. Remove the keyboard [page 2 - 12](#)
3. Remove the wireless LAN [page 2 - 20](#)

To remove the WiGig Module:

1. Remove the battery [page 2 - 5](#)
2. Remove the keyboard [page 2 - 12](#)
3. Remove the WiGig [page 2 - 22](#)

To remove and install the M.2 SSD:

1. Remove the battery [page 2 - 5](#)
2. Remove the keyboard [page 2 - 12](#)
3. Remove the M.2 SSD-1 [page 2 - 23](#)
4. Remove the M.2 SSD-2 [page 2 - 24](#)
5. Install the M.2 SSD [page 2 - 25](#)

Removing the Battery

1. Turn the computer **off**, and turn it over.
2. Remove the screws **1** - **9** (*Figure 1a*).
3. Carefully lift the bottom case **10** up in the direction of the arrow **11** and remove it (*Figure 1b*).
4. The battery will be visible at point **12** on the computer (*Figure 1c*).

Figure 1
Battery Removal

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



10. Bottom Case

- 9 Screws

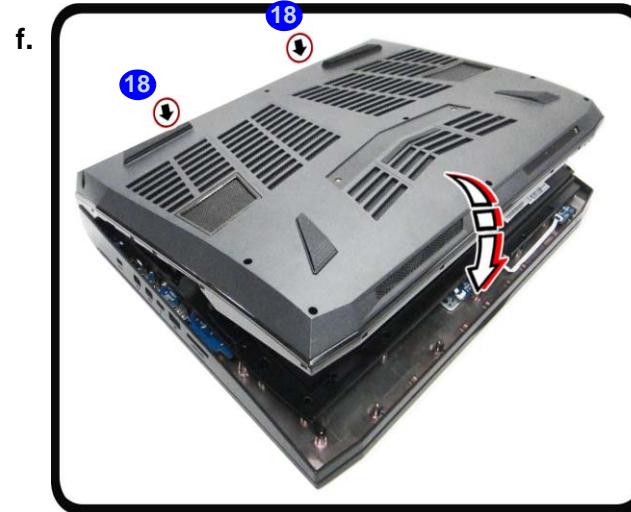
2. Disassembly

Disassembly

Figure 2
Battery Removal
(cont'd.)

- d. Remove the screws.
- e. Lift the battery off the computer.
- f. Reinsert the bottom case and tighten the screws.

5. Carefully remove screws 13 - 16 (**Figure 2b**).
6. Lift the battery 17 off the computer (**Figure 2e**).
7. Reinsert the bottom case starting from point 18 as shown (**Figure 2f**) to avoid damaging the rear eSATA/USB 3.0 port. Tighten the screws to secure the bottom case in place.



17. Battery

- 4 Screws

2 - 6 Removing the Battery

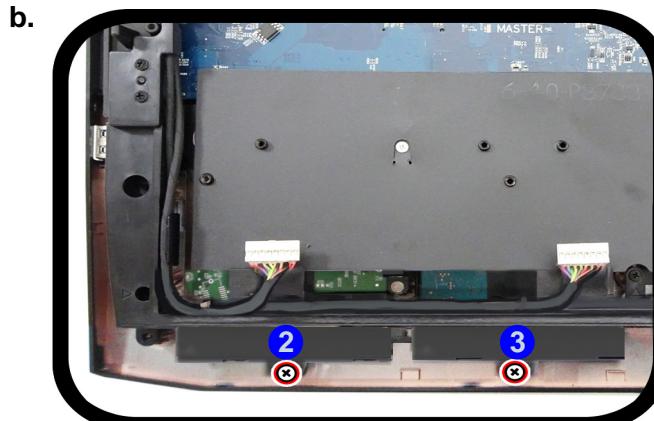
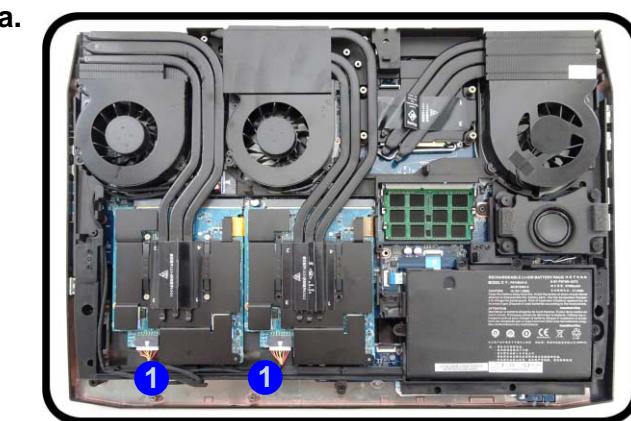
Figure 3
HDD Assembly
Removal

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/9.5mm (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 Removal Process

1. Turn **off** the computer, and remove the battery ([page 2 - 5](#)).
2. The HDD(s) will be visible at point **1** on the mainboard ([Figure 3a](#)).
3. Remove screws **2** / **3** from the HDD assembly ([Figure 3b](#)).



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.



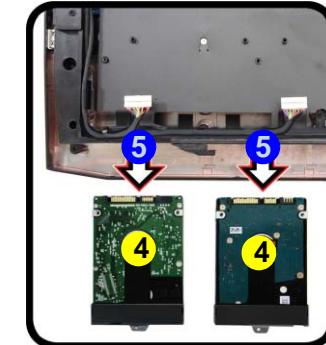
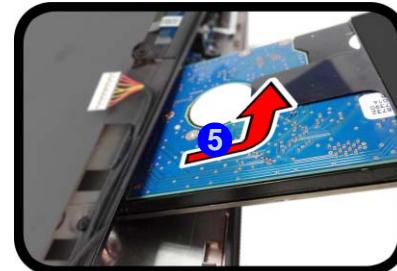
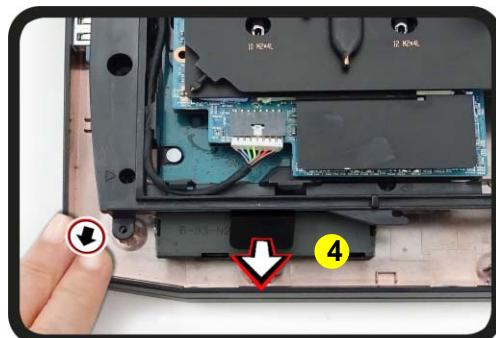
- 2 Screws

Disassembly

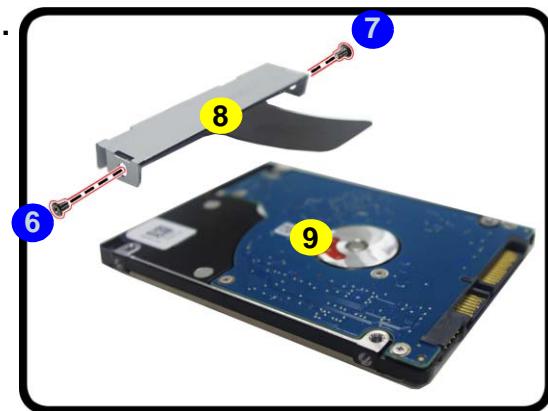
Figure 4 HDD Assembly Removal (cont'd.)

- c. Slightly lift and pull the HDD in the direction of the arrow.
- d. Remove the screws and bracket from the HDD.
4. Slightly lift the hard disk assembly **4** by the tab at an angle while holding the notebook in place, and pull it in the direction of arrow **5** to release it (*Figure 4c*).
5. Remove the hard disk assembly out of the bay.
6. Remove screws **6** - **7** and bracket **8** from the hard disk **9** (*Figure 4d*).
7. Reverse the process to install a new hard disk (do not forget to replace the screws and take care when inserting the new hard disk by lifting the mylar underneath the video card for smooth insertion).

c.



d.



4. HDD Assembly
8. HDD Bracket
9. HDD
• 2 Screws



Installing 9.5mm or 7mm HDD

Note that the hard disks pictured on the following pages are all 7mm(h) hard disk drive.

There are two hard disk drive options:

Two changeable 2.5" (6cm) **7.0mm (h)** SATA (Serial) Hard Disk Drives/Solid State Drives (SSD) supporting RAID level 0/1

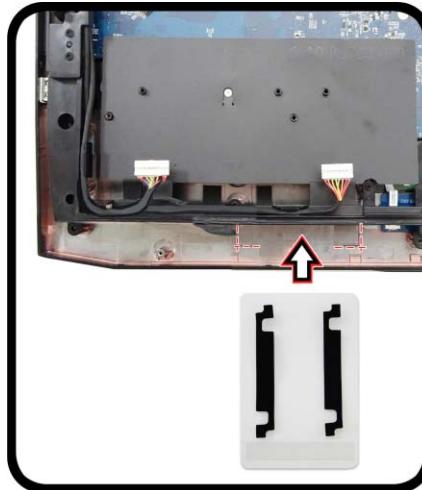
Or

One changeable 2.5" (6cm) **9.5mm (h)** SATA (Serial) Hard Disk Drive/Solid State Drive (SSD)

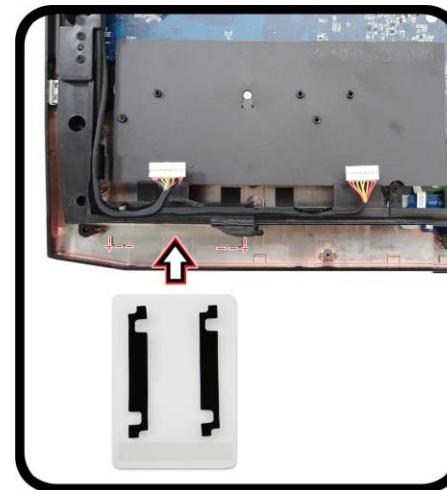
For more information, contact your distributor/supplier, and bear in mind your warranty terms.

Hard Disk Size Note (Foam Rubber Insert)

Note that the hard disks pictured on these pages are all 9.5mm(H) hard disk drives. In some cases 7mm(H) hard disk drives will be installed.



HDD-1



HDD-2

Figure 5
**Foam Rubber
Insert for 7mm(H)
HDDs**

- If you are replacing a 9.5mm(H) HDD with a 7mm(H) HDD then insert the foam rubber insert.
- If you are replacing a 7mm(H) HDD with a 9.5mm(H) HDD then remove the foam rubber insert.

Disassembly

Figure 6 RAM Module Removal

- a. Locate the module.
- b. Gently pull the two release latches on the sides of the memory socket(s) in the direction indicated below.
- c. The RAM module will pop-up, and you can remove it.

Removing the Primary System Memory (RAM)

The computer has **four** memory sockets for 260 pin Small Outline Dual In-line (SO-DIMM) **DDR 4** type memory modules. The total memory size is automatically detected by the POST routine once you turn on your computer.

Note that **four SO-DIMMs are only supported by Quad-Core CPUs; Dual-Core CPUs support two SO-DIMMs maximum.**

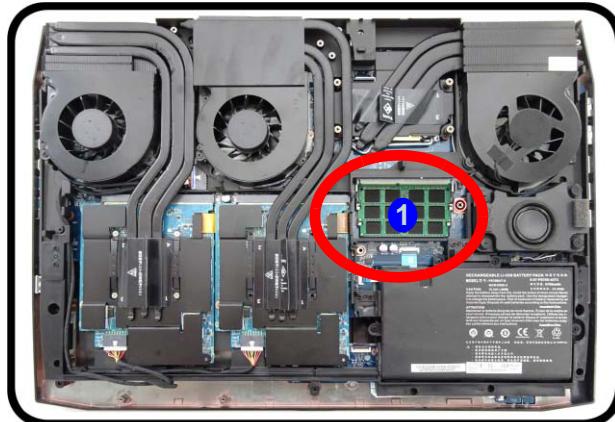
Two primary memory sockets are located under component bay cover (the bottom case cover), and two secondary memory sockets are located under the keyboard (not user upgradable). If you are installing only two RAM modules then they should be installed in the primary memory sockets under the component bay cover.

Note that the RAM located under the keyboard is not user upgradable.

Memory Upgrade Process

1. Turn **off** the computer, and turn it over, remove the battery ([page 2 - 5](#)).
2. The modules will be visible at point **1** ([Figure 6a](#)).
3. Gently pull the two release latches (**2** & **3**) on the sides of the memory socket(s) in the direction indicated below ([Figure 6b](#)).
4. The RAM module **4** will pop-up, and you can remove it ([Figure 6c](#)).

a.

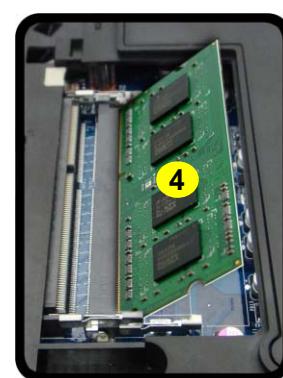


4. RAM Module

b.



c.



5. Pull the latches to release the second module if necessary.
6. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
7. The module's pin alignment will allow it to only fit one way. Make sure the module is seated as far into the slot as it will go. DO NOT FORCE the module; it should fit without much pressure.
8. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
9. Replace the bay cover and screws.
10. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.



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.

Disassembly

Figure 7 Keyboard Removal

- a. Remove the screw.
- b. Eject the keyboard using a special eject stick to push the keyboard out while releasing the keyboard as shown.

Removing the System Memory (RAM) from Under the Keyboard

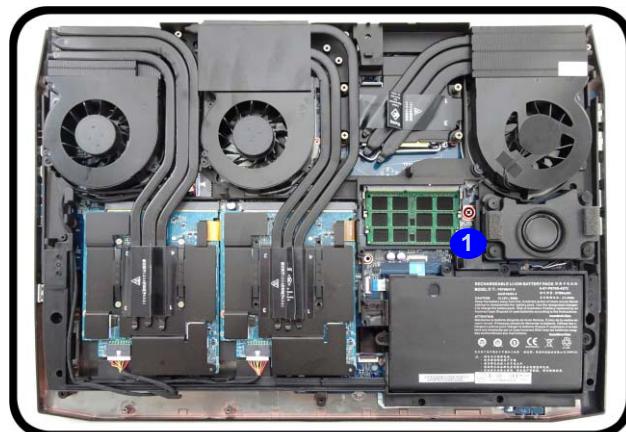
The computer has **four** memory sockets for 260 pin Small Outline Dual In-line (SO-DIMM) **DDR 4** type memory modules. The total memory size is automatically detected by the POST routine once you turn on your computer.

Two primary memory sockets are located under component bay cover (the bottom case cover), and two secondary memory sockets are located under the keyboard. If you are installing only two RAM modules then they should be installed in the primary memory sockets under the component bay cover.

Memory Upgrade Process

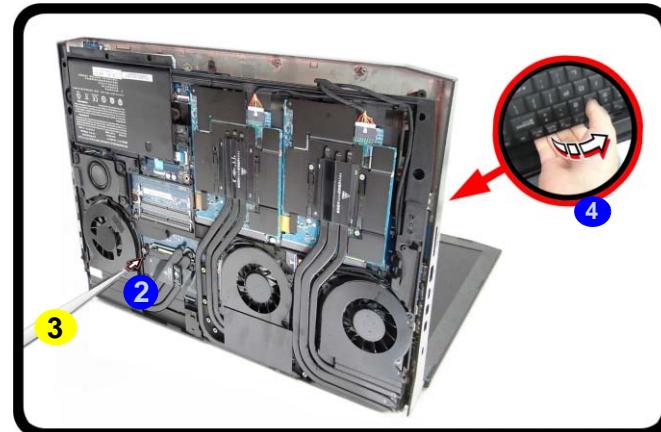
1. Turn off the computer, and turn it over, remove the battery ([page 2 - 5](#)).
2. Remove the screw ① ([Figure 7a](#)).
3. Open it up with the LCD on a flat surface before pressing at point ② to release the keyboard module (use an eject stick ③ with a diameter no bigger than 2.5mm) to do this while releasing the keyboard in the direction of the arrow ④ as shown ([Figure 7b](#)).

a.

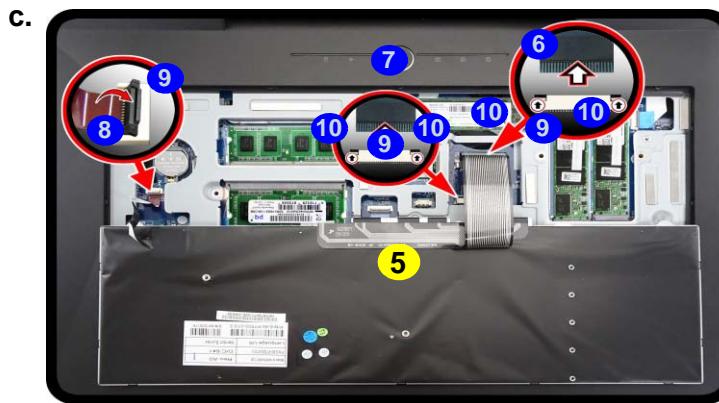


- 3. Eject Stick
 - 1 Screw

b.



4. Carefully lift the keyboard **5** up, being careful not to bend the keyboard ribbon cables **6** - **8**.
5. Disconnect the keyboard ribbon cables **6** - **8** from the locking collar socket **9** by using a small flat-head screwdriver to pry the locking collar pins **10** away from the base (**Figure 8c**).
6. Remove the keyboard and the memory sockets **11** & **12** will be visible (**Figure 8d**).
7. Gently pull the two release latches (**13** & **14**) on the sides of the memory socket(s) in the direction indicated below.
8. The RAM module **15** will pop-up, and you can remove it (**Figure 8e**).
9. Pull the latches to release the second module if necessary.
10. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
11. The module's pin alignment will allow it to only fit one way. Make sure the module is seated as far into the slot as it will go. DO NOT FORCE the module; it should fit without much pressure.
12. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
13. Replace the keyboard, bay cover and screws.
14. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.



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.



Figure 8
KB & RAM Module Removal

- c. Lift the keyboard up, and disconnect the keyboard ribbon cable from the locking collar socket.
- d. Remove the keyboard and the memory sockets will be visible.
- e. Pull the two release latches on the sides of the memory socket(s) in the direction indicated.

5. Keyboard
15. RAM Modules

Disassembly

Figure 9
Video Card-2
Removal Procedure

- a. Remove the screws in the correct order.
- b. Carefully remove the heat sink units.
- c. Remove the video card cable connector and screws. The video card will pop up.
- d. Remove the video card.



Caution

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



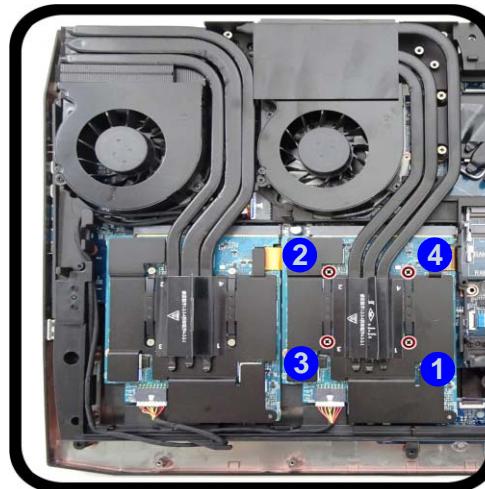
5. Heat Sink Unit
10. Video Card
• 6 Screws

Removing and Installing the Video Card

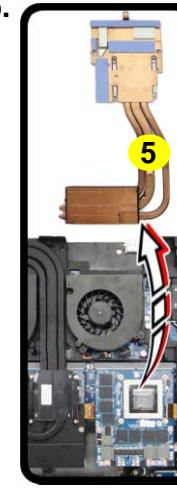
Video Card-2 Removal Procedure

1. Turn off the computer, turn it over and remove the battery ([page 2 - 5](#)).
2. Remove screws ① - ④ from the heat sink unit in the order indicated on the label (i.e screw ④ first through to screw ① last) ([Figure 9a](#)).
3. Carefully (it may be hot) remove the heat sink unit ⑤ ([Figure 9b](#)).
4. Remove the connector ⑥ & ⑦ and screws ⑧ & ⑨ from the video card. The video card ⑩ will pop up.
5. Remove the video card ⑩ ([Figure 9d](#)).

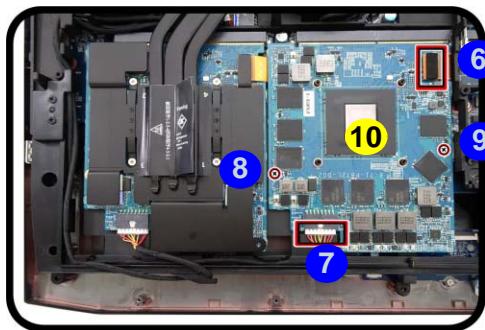
a.



b.



c.



6

7

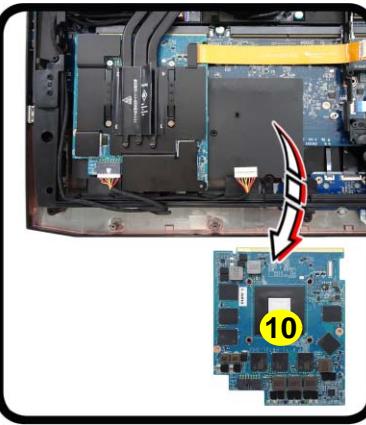
8

9

10



d.



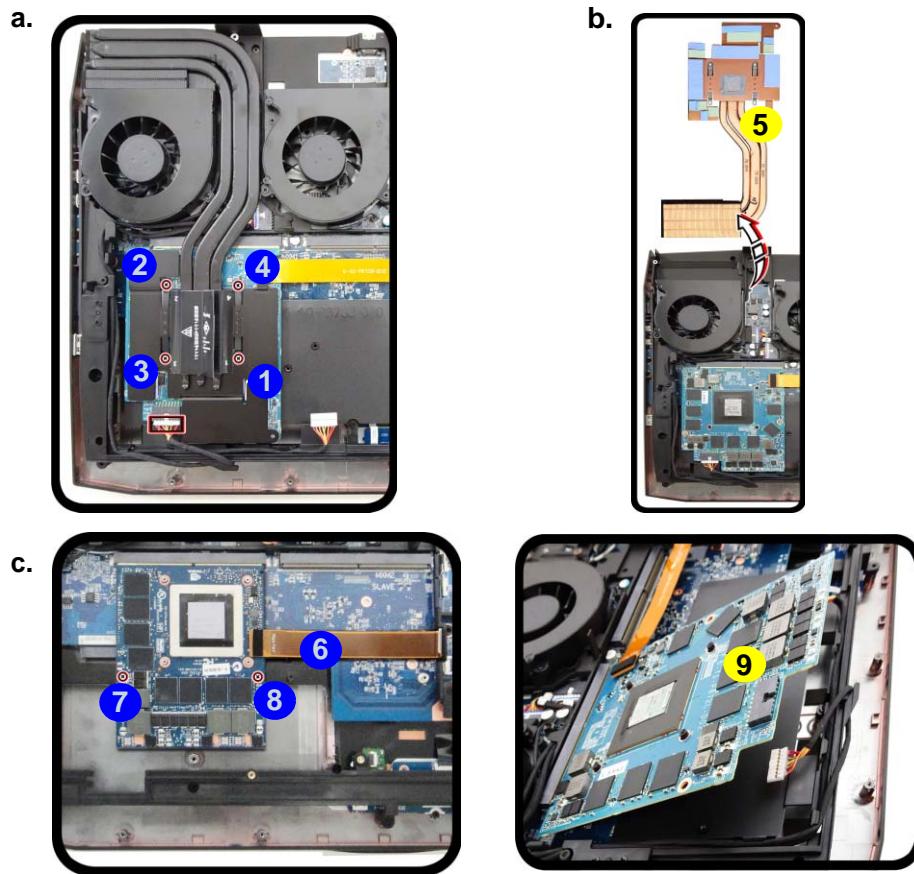
Heat Sink Screw Removal and Insertion

Remove the screws from the heat sink in the order indicated here: 4-3-2-1.

When tightening the screws, make sure that they are tightened in the order: 1-2-3-4.

Video Card-1 Removal Procedure

1. Turn off the computer, turn it over and remove the battery ([page 2 - 5](#)) and Video card-2 ([page 2 - 14](#)).
2. Remove screws **1** - **4** from the heat sink unit in the order indicated on the label (i.e screw **4** first through to screw **1** last) ([Figure 10a](#)).
3. Carefully (it may be hot) remove the heat sink unit **5** ([Figure 10b](#)).
4. Remove connector **6** (in case of two video cards) and screws **7** & **8** from the video card. The video card **9** will pop up ([Figure 10c](#)).
5. Remove the video card **9** ([Figure 10d](#)).



Heat Sink Screw Removal and Insertion

Remove the screws from the heat sink in the order indicated here: **4-3-2-1**.

When tightening the screws, make sure that they are tightened in the order: **1-2-3-4**.

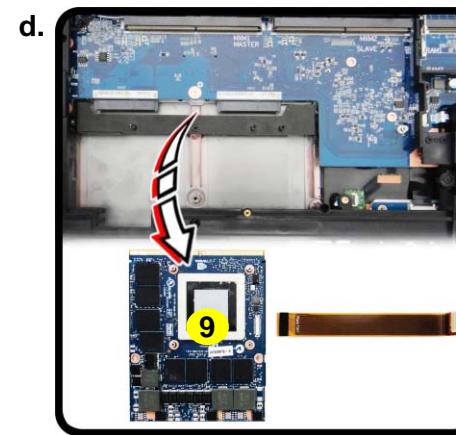


Figure 10
Video Card-1
Removal Procedure

- a. Remove the screws in the correct order.
- b. Carefully remove the heat sink units.
- c. Remove the video card cable connector and screws. The video card will pop up.
- d. Remove the video card.



Caution

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

**5. Heat Sink Unit
9. Video Card**

- **6 Screws**

Disassembly

Figure 11
Installing a New Video Card

- e. Insert the video card at a 30 degree angle.
- f. Fit the connectors straight and even, and secure the card with the screws.

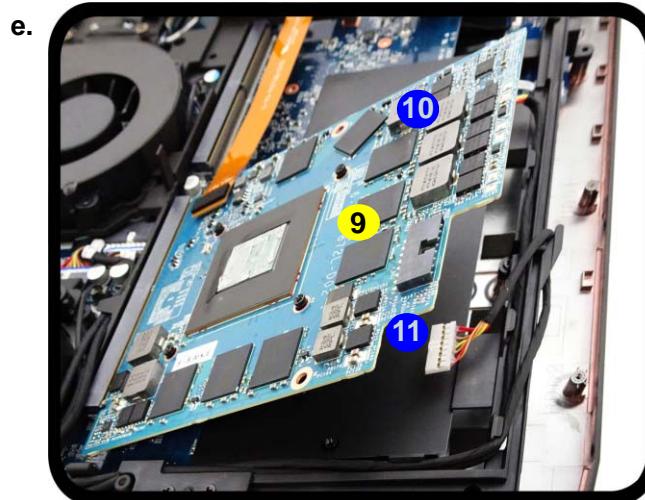


Caution

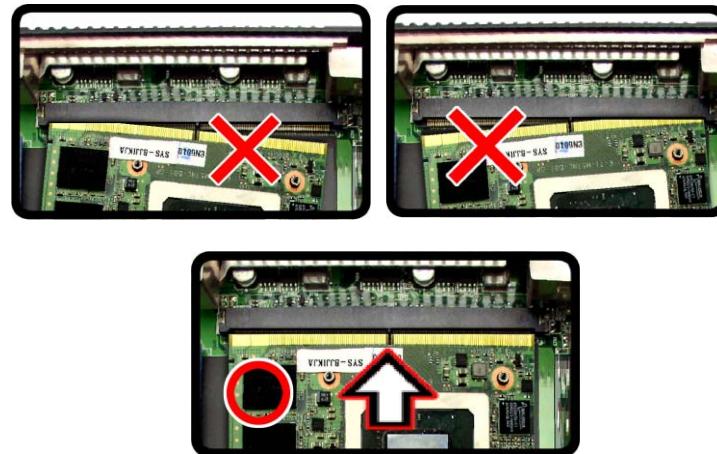
The heat sink, and video card area in general, contains parts which are subject to high temperatures. Allow the area time to cool before removing these parts.

Installing a New Video Card

1. Prepare to fit the video card **9** into the slot by holding it at about a 30° angle (*Figure 11e*).
2. The card needs to be fully into the slot, and the video card and socket have a guide-key and pin which align to allow the card to fit securely (*Figure 11f*).
3. Fit the connectors firmly into the socket, straight and evenly.



f.



4. DO NOT attempt to push one end of the card in ahead of the other.
5. The card's pin alignment will allow it to only fit one way. **Make sure the module is seated as far into the socket as it will go.** DO NOT FORCE the card; it should fit without much pressure.
6. Secure the card with screws **10** & **11** (*Figure 10 on page 2 - 15*).
7. Place the heat sink back on the card, and secure the screws in the order indicated in *Figure 10 on page 2 - 15*.
8. Reinsert the component bay cover, and secure with the screws as indicated in *Figure 2 on page 2 - 6*.

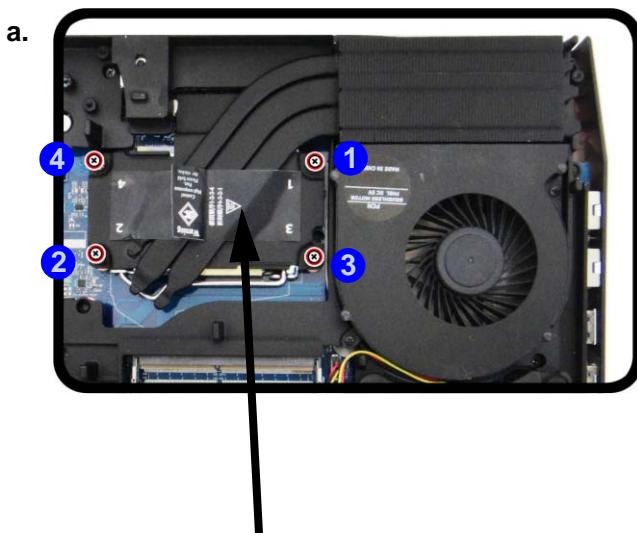


9. Video Card
• 2 Screws

Removing and Installing the Processor

Processor Removal Procedure

1. Turn off the computer, remove the battery ([page 2 - 5](#)) and video card-2 heatsink ([page 2 - 14](#)).
2. Remove screws **1** - **4** from the heat sink unit in the order indicated on the label (i.e screw **4** first through to screw **1** last [Figure 12a](#)).
3. Carefully (it may be hot) remove the heat sink unit **5** ([Figure 12b](#)).

**Note:**

Loosen the screws in the reverse order 4-3-2-1 as indicated.

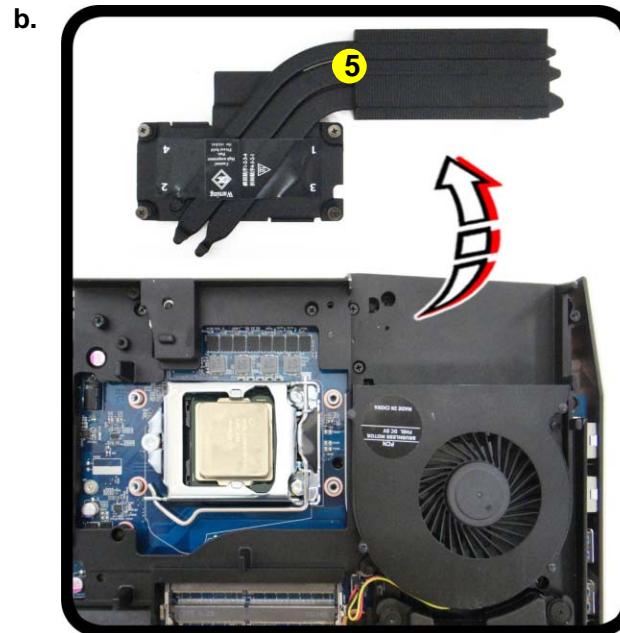


Figure 12
Processor
Removal
Procedure

- a. Remove the screws in the correct order.
- b. Carefully remove the heat sink unit.

**5. Heat Sink Unit**

- 4 Screws

Disassembly

Figure 13
Processor Removal
(cont'd)

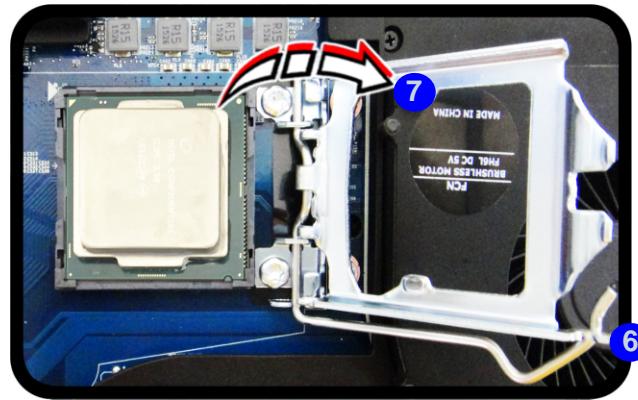
4. Press down and hold the latch **6** (with the latch held down you will be able to release it).
5. Move the latch **6** and bracket **7** fully in the direction indicated to unlock the CPU (**Figure 13c**).
6. Carefully (it may be hot) lift the CPU **A** up out of the socket (**Figure 13d**).
7. See [page 2 - 19](#) 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. Move the latch and bracket fully in the direction indicated to unlock the CPU.
- d. Lift the CPU out of the socket.

c.



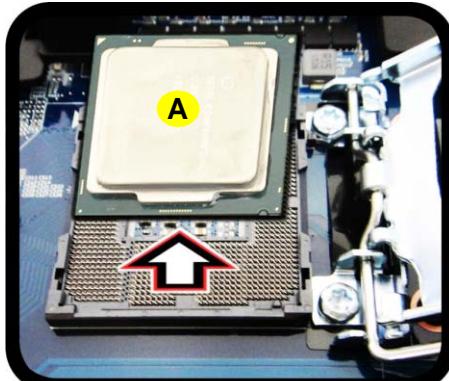
Unlock



6

7

d.



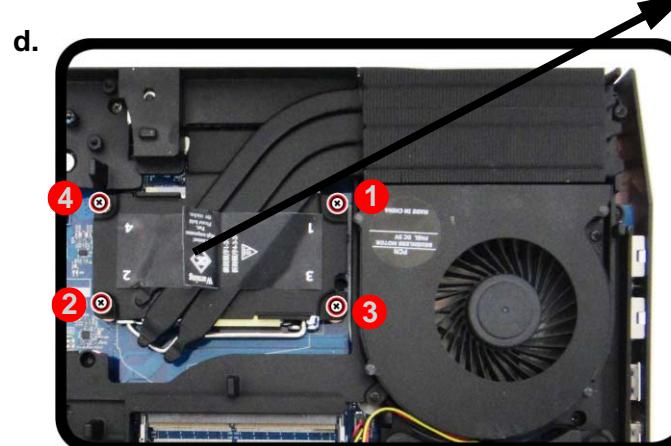
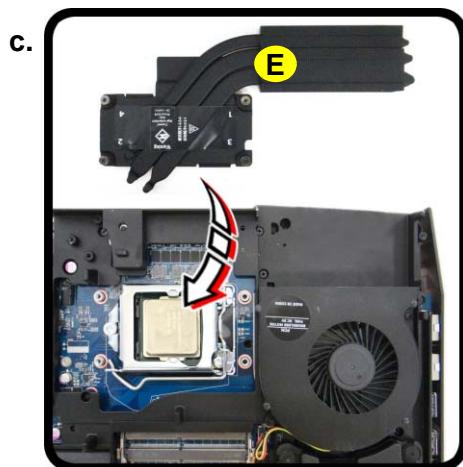
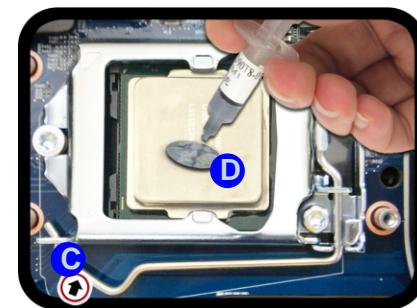
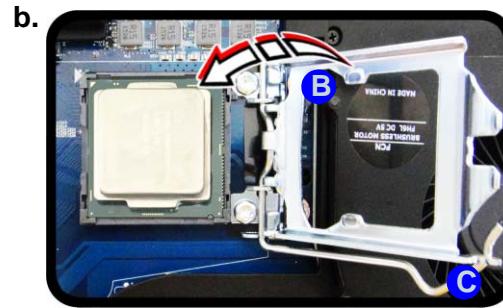
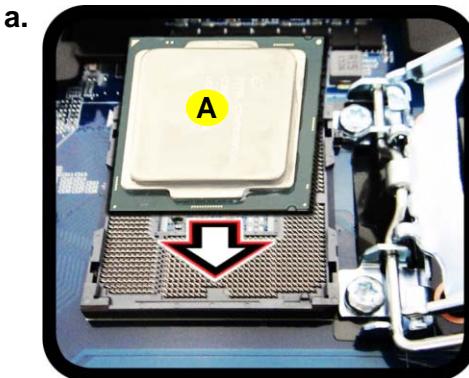
Caution

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 14a*), 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 14b*).
4. Insert the heat sink unit **E** as indicated in *Figure 14c*.
5. Tighten the CPU heat sink screws in the order **1** - **4** (the order as indicated on the label and *Figure 14d*).
6. Replace the CPU fan, component bay cover and tighten the screws ([page 2 - 17](#)).



Note:

Tighten the screws in the order 1-2-3-4 as indicated.

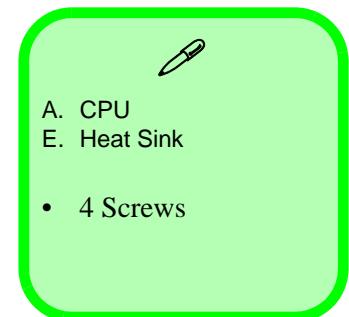


Figure 14
Processor
Installation

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

Disassembly

Figure 15

Wireless LAN Module Removal

- The Wireless LAN module will be visible at point 1 under the keyboard.
- Disconnect the cables and remove the screw.
- The WLAN module will pop up.
- Lift the WLAN module out.

Removing the Wireless LAN Module

- Turn off the computer, remove the battery ([page 2 - 5](#)) and the keyboard ([page 2 - 12](#)).
- The Wireless LAN module will be visible at point 1 under the keyboard ([Figure 15a](#)).
- Carefully disconnect cables 2 - 3, then remove screw 4 from the module socket ([Figure 15b](#)).
- The Wireless LAN module 5 will pop-up ([Figure 15c](#)).
- Lift the Wireless LAN module ([Figure 15d](#)) up and off the computer.

a.



c.



b.



d.



5. WLAN Module

- 1 Screw

Wireless LAN, Combo Module Cables

Note that the cables for connecting to the antennae on WLAN, WLAN & Bluetooth Combo, WiGig 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	Gray	
	WM 3	White	
WiGig	WM 1	Blue	White
	WM 2	Black	Transparent
	WM 3	Black	

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

2. Disassembly

Disassembly

Figure 16
WiGig Module
Removal

- The module will be visible at point ① under the keyboard
- Disconnect the cables and remove the screw.
- The module will pop up.
- Lift the module out.

Removing the WiGig Module

- Turn off the computer, remove the battery ([page 2 - 5](#)) and the keyboard ([page 2 - 12](#)).
- The module will be visible at point ① under the keyboard ([Figure 16a](#)).
- Carefully disconnect cables ② - ④, then remove screw ⑤ from the module socket ([Figure 16b](#)).
- The module ⑥ will pop-up ([Figure 16c](#)).
- Lift the module ([Figure 16d](#)) up and off the computer.

a.



b.



5. WiGig Module
- 1 Screw

c.



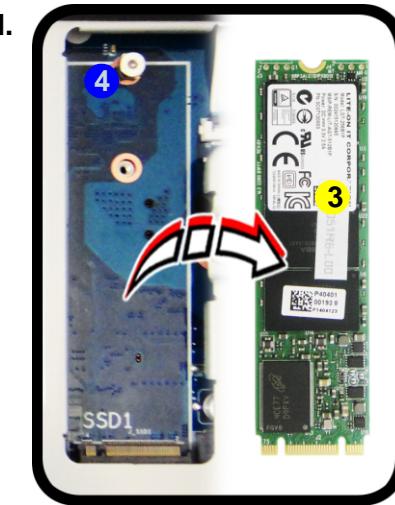
d.



Removing the M.2 SSD Module

Removing the M.2 SSD-1 Module

1. Turn off the computer, remove the battery ([page 2 - 5](#)), and component bay cover ([page 2 - 10](#)).
2. Locate the module; it is visible at point **1** ([Figure 17a](#)).
3. Carefully remove the screw **2** from the module ([Figure 17b](#)).
4. The M.2 SSD module **3** will pop-up ([Figure 17c](#)).
5. Lift the M.2 SSD module **3** up and off the computer ([Figure 17d](#)).
6. Reverse the process to install a new module (make sure that the hexagonal screw **4** is in the correct location).



*Figure 17
M.2 SSD-1 Module
Removal*

- a. Locate the module.
- b. Remove the screw.
- c. The module will pop-up.
- d. Lift the module up off the socket.

3. M.2 SSD Module

- 1 Screw

Disassembly

Figure 18
M.2 SSD-2 Module Removal

- a. Locate the module.
- b. Remove the screws.
- c. The module will pop up.
- d. Lift the module out.

Removing the M.2 SSD-2 Module

1. Turn **off** the computer, and turn it over, remove the battery ([page 2 - 5](#)).
2. Locate the module; it is visible at point **1** ([Figure 18a](#)).
3. Remove the screw **2** from the SSD ([Figure 18a](#)).
4. The M.2 SSD module **3** will pop-up ([Figure 18b](#)).
5. Lift the M.2 SSD module **3** up and off the computer ([Figure 18c](#)).
6. Reverse the process to install a new module (make sure that the hexagonal screw **3** is in the correct location depending upon the size of the module).

a.



b.



c.



d.



3. M.2 SSD Module
• 1 Screw

M.2 SSD Installation Procedure

1. Insert the module **1** in the computer (*Figure 19a*).
2. Tighten the screw **2** to secure it in place (*Figure 19b*).
3. Only place the thermal pad **3** on the module's chip edge as shown when using specific module (*Figure 19c*).

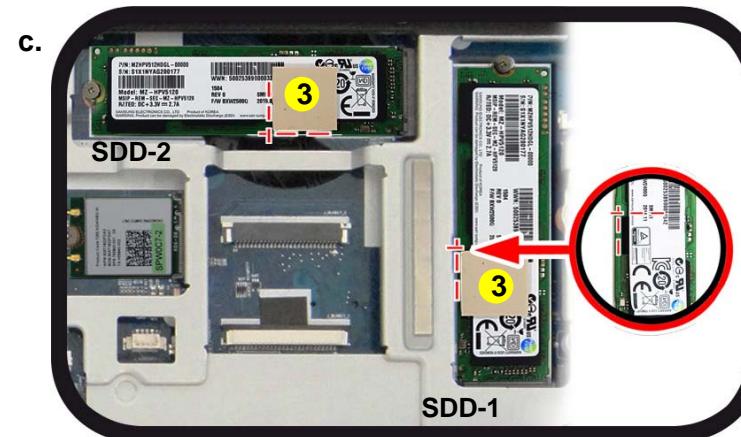
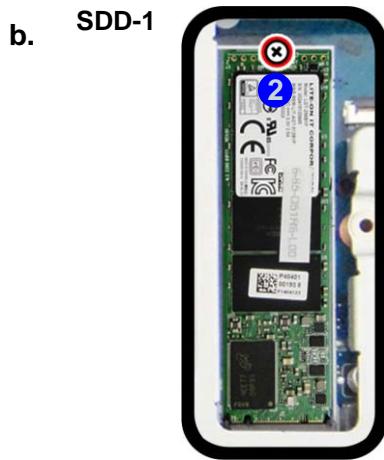


Figure 19
**M.2 SSD Module
Installation**

- a. Insert the module.
- b. Tighten the screw.
- c. Place the thermal pad as shown.



Caution

The thermal pad is only required when using Samsung SM951 M.2 SSD module. Make sure you place the thermal pad's adhesive side down on the module surface as illustrated.



- 1. M.2 SSD Module
- 3. Thermal Pad
- 1 Screw

2. Disassembly

Disassembly

Appendix A: Part Lists

This appendix breaks down the **P870KM(-G)** 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 Lists

Part List Illustration Location

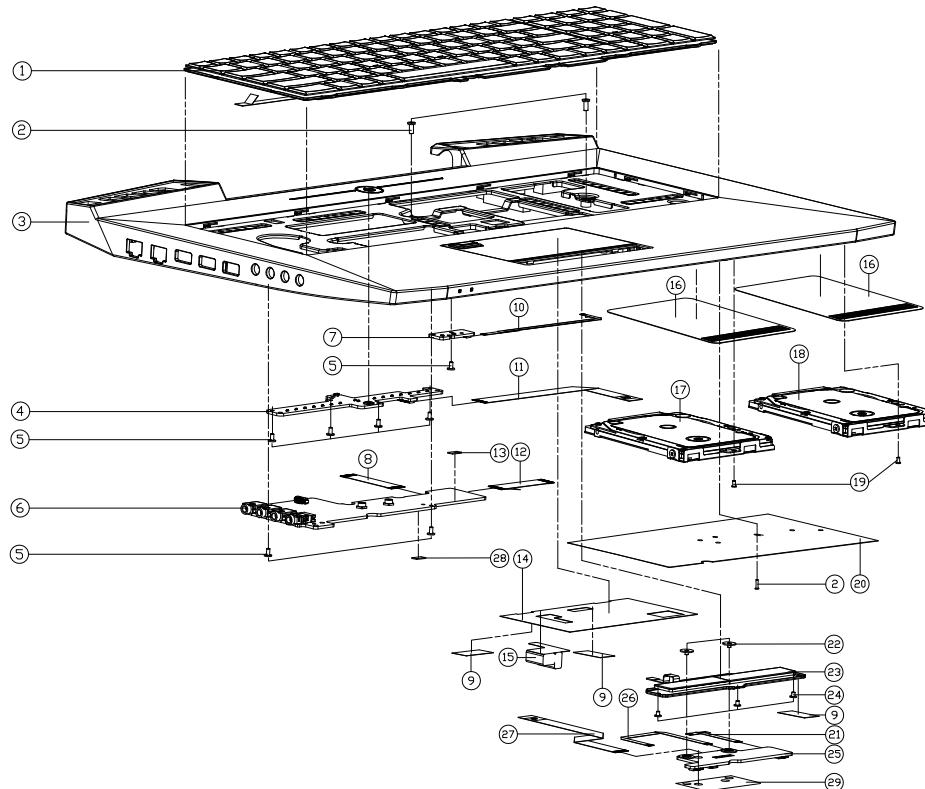
The following table indicates where to find the appropriate part list illustration.

Table A- 1

Part List Illustration Location

Parts	
Top	<i>page A - 3</i>
Bottom	<i>page A - 4</i>
LCD	<i>page A - 5</i>
MB (Dual VGA)	<i>page A - 6</i>
MB (N17E-G3)	<i>page A - 7</i>
VGA (N17E-G2)	<i>page A - 8</i>
VGA (N17E-G3)	<i>page A - 9</i>
HDD	<i>page A - 10</i>

Top

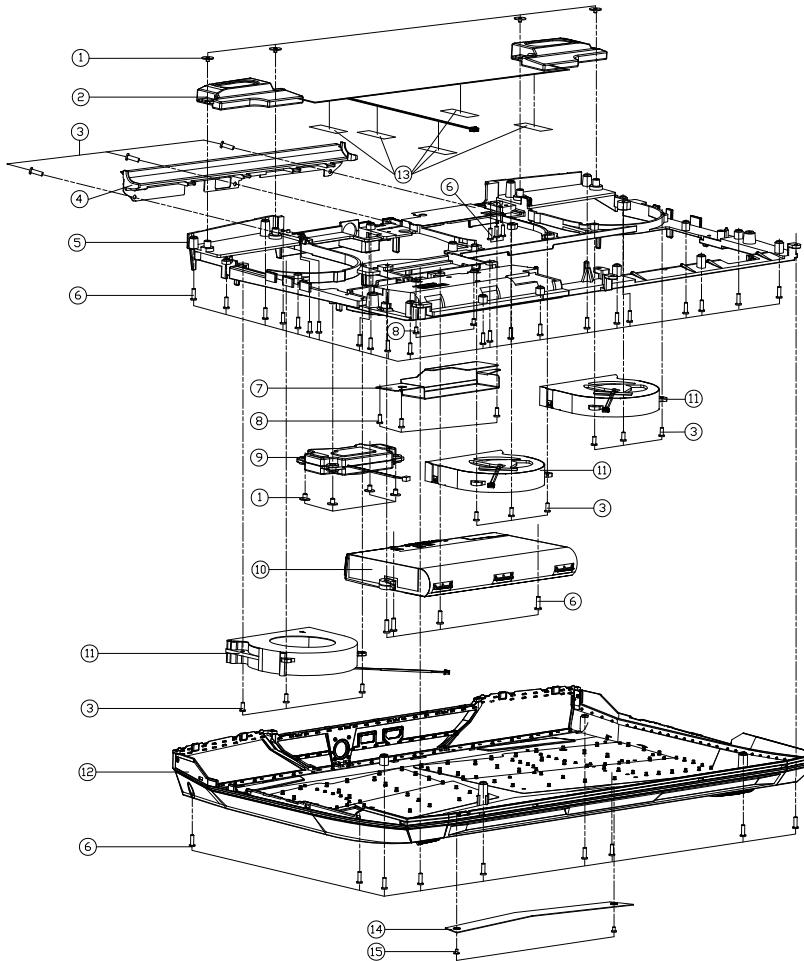


ITEM	PART NAME	PART NO	REMARK
1	TOP CASE ASSY FOR TOP CASE MODULE FOR P870DM	6-80-P7500-013-3	
2	SCREW M2.5*8L K1 BK/Z NY ICT	6-35-B6125-8R0	
3	(PRE-PROCESS) TOP CASE MODULE FOR TP P870M3	6-78-P870DM32-010	
3	(PRE-PROCESS) TOP CASE MODULE FOR TP P870KM	6-78-P870KM02-010	
4	POWER SWITCHED BOARD V1.0 P870DM2	6-77-P872S-D01	
5	SCREW M2*4L K1 NI ICT NY (D=+4.5,D=0.4)	6-35-B1120-4RE	
6	AUDIO BOARD V2.0A P870DM2	6-77-P8728-D02A	
7	CHARGER LED BOARD V2.0 P870DM	6-77-P8704-D02	FOR P870DM2/3
7	CHARGER LED BOARD V1.0 P870KM	6-77-P87K4-D01	FOR P870KM/KM1
8	I/F CABLE FOR HD TO HDD 0.08 22PIN Pitch 1.27MM GRY/PURPLE	6-43-P8700-051	
9	GASKET BLACK (30*7*0.13T) W370ET	6-47-00190-016	
10	I/F CABLE FOR CLK 0.08 12PIN Pitch 1.27MM GRY/PURPLE	6-43-P8700-062	
11	I/F CABLE FOR HD TO POWER 0.08 22PIN Pitch 1.27MM GRY/PURPLE	6-43-P8700-012	FOR P870DM2/3
11	I/F CABLE FOR HD TO POWER 0.08 22PIN Pitch 1.27MM GRY/PURPLE	6-43-P87K0-010	FOR P870KM/KM1
12	I/F CABLE FOR HD TO AUDIO 0.08 22PIN Pitch 1.27MM GRY/PURPLE	6-43-P8730-010-2	
13	AUDIO BOARD RUBBER(6.5*6.1*4.5) TESA955 P870M3	6-47-P873S-010	
14	TOP TP MYLAR PET P870DM FOR PTP	6-40-P8702-061	
15	ESD GASKET(30*23*9.5T) FOR TOP CASE P870DM	6-47-00190-306	
16	MYLAR FOR 7MM HDD P870DM	6-40-P8702-050	
17	W/D MAIN HDD ASSY P870DM	6-79-P870DM0J-010	
17	W/MAIN HDD ASSY' P870DM	6-79-P870DM0J-020	
18	W/D 2ND HDD ASSY P870DM	6-79-P870DM0J-030	
18	W/2ND HDD ASSY P870DM	6-79-P870DM0J-040	
19	SCREW M2*3L K1 BZ ICT NY (D=+4.5,D=0.4)	6-35-B6120-3RD	
20	MYLAR FOR BOTTOM (174*79*0.2) P870M3	6-40-P8733-080	
21	I/F CABLE FOR TP TO CLK 0.08 22PIN Pitch 1.27MM GRY/PURPLE	6-43-P8700-071	
22	SCREW M2*2L K1 BK/Z ICT NY(8,T=0.6)	6-35-B6120-2RE	
23	FUNCTION KEY FOR CLICK BUTTON MODULE W/O FINER PS606	6-23-KP65R-022	
24	SCREW M2*2.5L K1 NI ICT NY (H4 T=0.5 1#)	6-35-B1120-2R6	
25	CLICK BOARD V2.0A P870DM2	6-77-P8722-D02A	
26	I/F CABLE FOR TP TO CLK 0.08 22PIN Pitch 1.27MM GRY/PURPLE	6-43-P8732-011-2	
27	I/F CABLE FOR HD TO CLK 0.08 22PIN Pitch 1.27MM GRY/PURPLE	6-43-P8700-032	
28	TOP SPONGE L CR2030 (12*5*1.1T) P670SG	6-47-0019A-12D	
29	MYLAR FOR W/D FP CLICK P870DM3	6-40-P8732-030	

Figure A - 1
Top

Part Lists**Bottom**

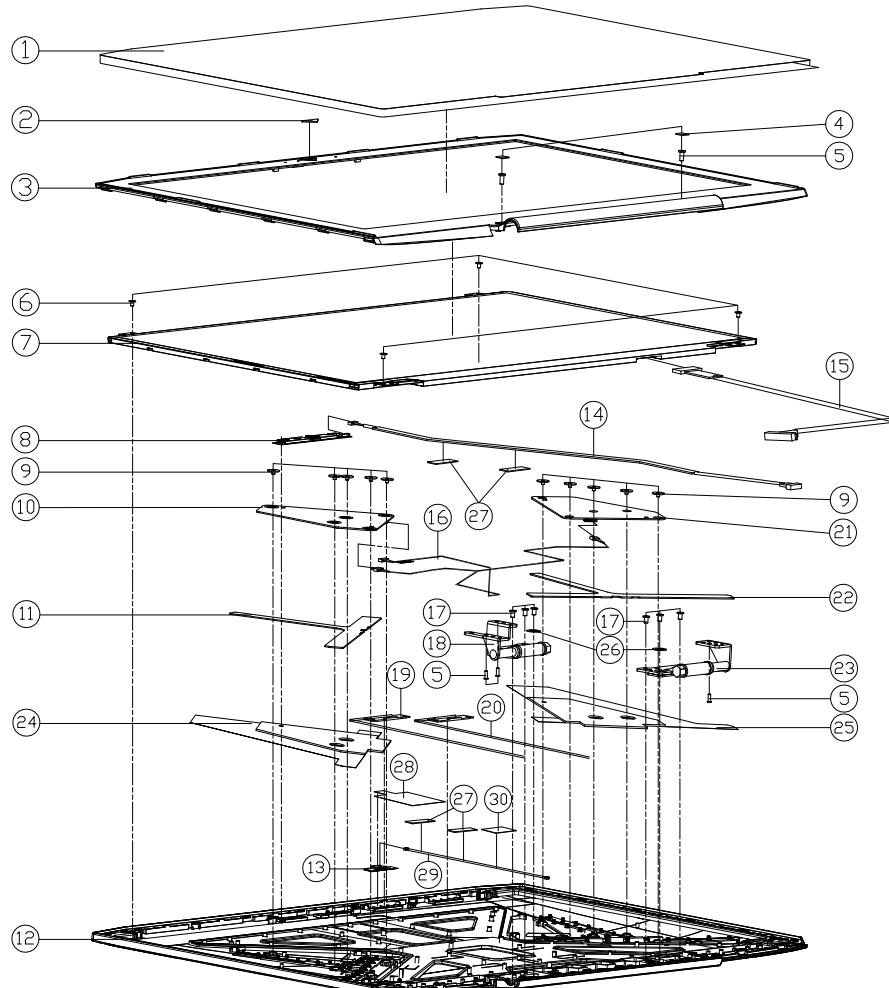
Figure A - 2
Bottom



ITEM	PART NAME	PART NO	REMARK
1	SCREW M2*2L KI BK/Z ICT NY(Φ8,T=0.6)	6-35-B6120-2RE	
2	SPEAKER CABLE MAIN RYL R 390MM/L 160MM 2W 4Ω P870DM(NEW)	6-23-5P870-0S2	
3	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
4	REAR PLATE MODULE P870DM	6-42-P8702-302	
5	MIDDLE FRAME MODULE P870DM3	6-42-P8733-204	
6	SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
7	SAFTY BARRIER MESH SPCC P870DM2	6-33-P872S-021	FOR 單卡
8	SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
9	SPEAKER SUBWOOFER MODULE 123MMX50MMT 2W 6Ω POF WOOFER P870DM(NEW)	6-23-5P870-0W3	
10	BATP S LI 1512V/539W/89WH 452P SMP/PS2/KC/CAC 9801/02280F P870DM	6-87-P870S-4273A	
11	12V 8219 FAN MODULE ADDA P750DM2	6-31-P75D3-202	
12	BOTTOM CASE MODULE P870DM3	6-39-P8733-012	
13	TOP CASE MYLAR FR83 25X7X0.05 P180HM	6-40-P1802-030	
14	AI PRODUCT LABEL FOR P870DM2 (CHANGE RATING)	6-33-P870DM23-011	
14	AI PRODUCT LABEL FOR P870DM2G (CHANGE RATING)	6-33-P870DM2G-011	
14	AI PRODUCT LABEL FOR P870KM	6-33-P870KM03-010	
14	AI PRODUCT LABEL FOR P870KM-G	6-33-P870KMG3-010	
15	SCREW M2x3L KI BZ ICT NY (Dd=0.45, Df=0.4)	6-35-B6120-3RD	

A - 4 Bottom

LCD



ITEM	PART NAME	PART NO	REMARK
1	LCD PROTECT MYLAR BOPP P870DM2	6-40-P8728-010	
2	CCD LENS <PC> P870DM	6-42-P870T-010	
3	LCD FRONT COVER MODULE P870DM2	6-39-P8721-010	
4	FRONT COVER SCREW MYLAR PC P870DM	6-40-P8708-030	
5	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
6	SCREW M2*3L KI BZ ICT NY (OD=04.5,DT=0.4)	6-35-B6120-3RD	
7	LCD 17.3" FHD / IPS / EDP LG LP173WF4-SPL2 " SUPPORT SV G-SYNC" LED 40MM	6-50-NB240-V00	
7	LCD 17.3" FHD / IPS / EDP LG LP173WF4-SPL2 " SUPPORT SV G-SYNC" LED 40MM	6-50-NB240-L01	
7	LCD 17.3" UHD / IPS (4HVA) / EDP AU B172ZANB010 LED 40MM	6-50-N1240-G00	
7	LCD 17.3" FHD / IPS / EDP LG LP173WF4-SPL1 " SUPPORT SV G-SYNC" LED 40MM	6-50-NB204-L00	
7	LCD 17.3" FHD / IPS / EDP AU B173HANL02 (2BBLK) (NT) LED 40MM	6-50-NB240-G00	
7	LCD 17.3" FHD / IPS / EDP LG LP173WF4-SPL1 (LED 40MM)	6-50-NB240-L00	
7	LCD 17.3" QHD2K/IPS/VRSP G-SYNC/EIP AU B173QH010 LED 40MM	6-50-N6240-G00	
7	LCD 17.3" FHD/IPS/VRSP G-SYNC/EIP AU B173HANL01 LED 40MM	6-50-NB240-G01	
8	INC CERAMIC COIN FOR BACKLIGHTBOARD 20MM DIA20MM 0.5MM THICKNESS WHITE LED V23 MC	6-88-W65DC-5100	
8	INC CERAMIC COIN FOR BACKLIGHTBOARD 20MM DIA20MM 0.5MM THICKNESS WHITE LED V23 MC	6-88-P775C-4900	
8	INC CERAMIC COIN FOR BACKLIGHTBOARD 20MM DIA20MM 0.5MM THICKNESS WHITE LED V23 MC	6-88-P775C-5100	
9	SCREW M2x2L KI BK/Z ICT NY (0.8,T=0.6)	6-35-B6120-2RE	
10	BACK LIGHT BOARD (LEFT) V2.0 P870DM	6-77-P8706-D02	
11	BACK LIGHT GUIDE PLATE-L (PC) P870DM	6-42-P8701-022	
12	LCD BACK COVER MODULE P870DM	6-39-P8701-024	
13	ANTENNA PEKA WLAN V2.0 PCB 245/56 CABLE BLACK 1.50MM FPC/PCB	6-88-P8722-8100	FDR 6-88-P872F-8100
14	WIRE CABLE FOR CCD 500MM 30V 8PIN (HTD) P870DM	6-43-P870T-010-1	
15	WIRE CABLE FOR EIP 160MM 3V 3P (1) 0.1A/C CONDUITLESS PORTION	6-43-P8701-011-L	
15	CONDUIT CABLE FOR EIP (4020) 16MM 3V 4P (1) 0.1A/C CONDUITLESS PORTION	6-43-P8701-020-1L	
16	WIRE CABLE FOR BACK LIGHT GUIDE LED TO MB 16MM 5V 8PIN (HTD) PORTION	6-43-P8707-011-1	
17	SCREW M2.5*4L KI NT ICT NY	6-35-21125-4R0	
18	HINGE-L <SK7> P870DM	6-33-P8701-1L1	
19	ANTENNA PEKA WLAN V2.0 PCB AL 245/562 V2.0 PCB 0.5MM FPC/PCB	6-23-7W97L-011	
20	ANTENNA PEKA WLAN V2.0 PCB AL 245/562 V2.0 PCB 0.5MM FPC/PCB	6-23-7P870-020	
21	BACK LIGHT BOARD (RIGHT) V2.0 P870DM	6-77-P8705-D02	
22	BACK LIGHT GUIDE PLATE-R (PC) P870DM	6-42-P8701-012	
23	HINGE-R <SK7> P870DM	6-33-P8701-1R1	
24	MYLAR(140*108.5*0.1T) FOR BACK LIGHT-L P870DM	6-40-P8701-030	
25	MYLAR(140*108.5*0.1T) FOR BACK LIGHT-R P870DM	6-40-P8701-020	
26	WASHER Ø6*Ø3*0.3t <MYLAR>	6-37-02000-601	
27	TOP CASE MYLAR FR83 25*7*0.05 P180HM	6-40-P1802-030	
28	802.11AD COPPER FOIL P775DM2	6-47-P7751-211	FDR 6-88-P872F-8100
29	B021AD CABLE 640MM NCMJ02JA6400TE MURATA CONNECTOR P070M2	6-23-7P872-010	FDR 6-88-P872F-8100
30	B021AD TAPE MYLAR(BLACK)(35*20*0.2T) P870DM2	6-40-P872S-030	FDR 6-88-P872F-8100

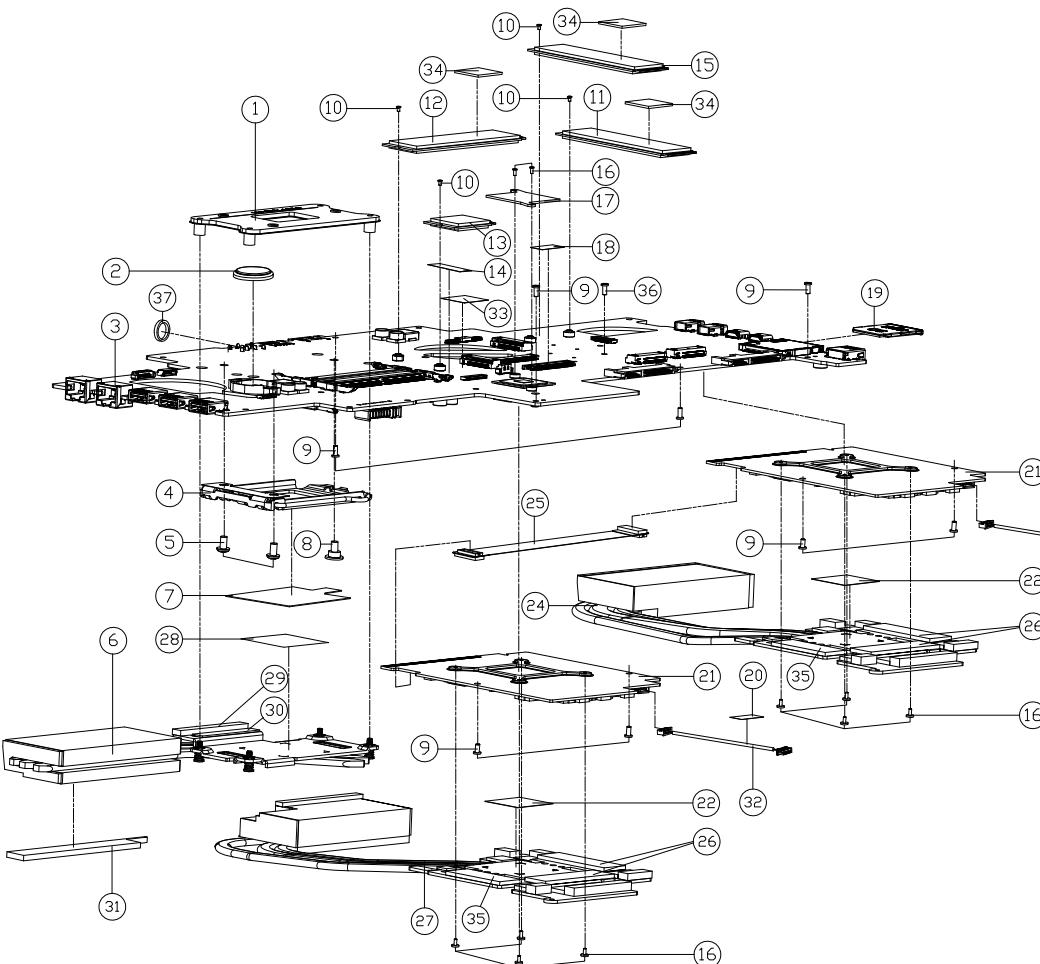
Figure A - 3
LCD

A. Part Lists

Part Lists

MB (Dual VGA)

Figure A - 4
MB (Dual VGA)



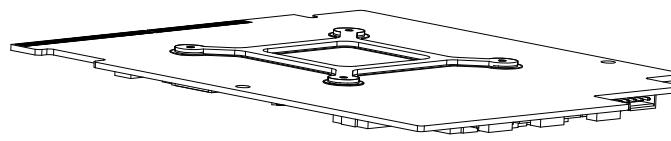
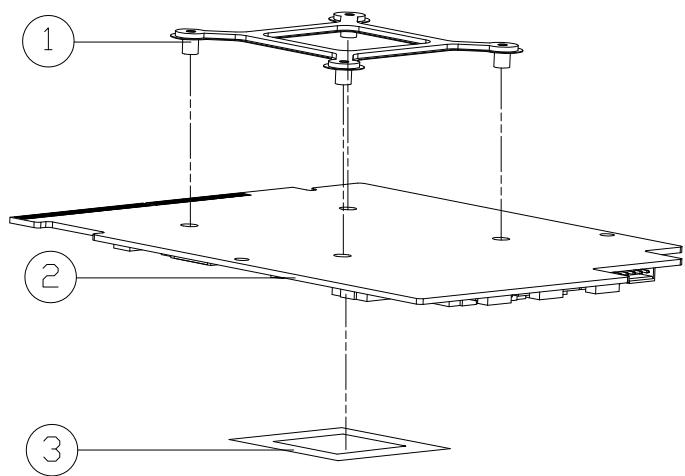
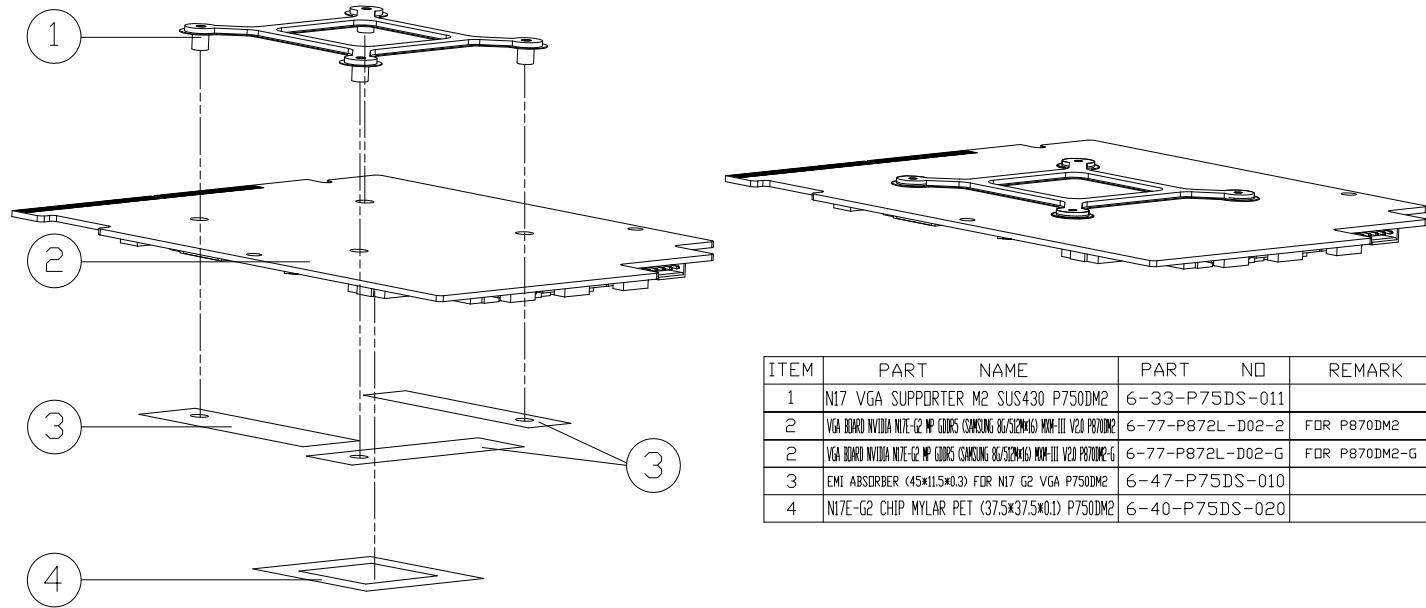
MB (N17E-G3)

Figure A - 5
MB (N17E-G3)

ITEM	PART NAME	PART NO	REMARK
1	N17 VGA SUPPORTER M2 SUS430 P750DM2	6-33-P75DS-011	
2	VGA BOARD NVIDIA N17E-G3 MP CDRSX OMRON 8G/S12M16 XMH-III V2.0 P870DM2	6-77-P872L-D12	FOR P870DM2/DM3
2	VGA BOARD NVIDIA N17E-G3 MP CDRSX OMRON 8G/S12M16 XMH-III V2.0 P870DM2-G	6-77-P872L-D12-A	FOR P870DM2-G/DM3-G
3	N17E-G2 CHIP MYLAR PET (37.5*37.5*0.1) P750DM2	6-40-P75DS-020	

Part Lists**VGA (N17E-G2)**

Figure A - 6
VGA (N17E-G2)



VGA (N17E-G3)

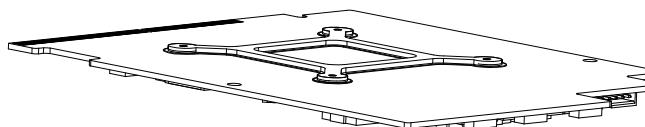
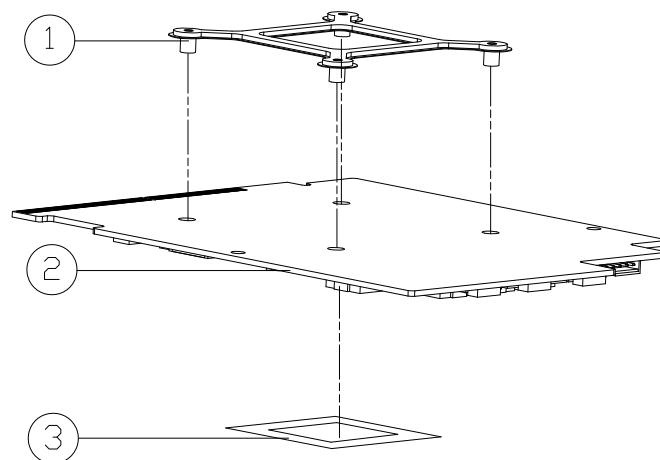


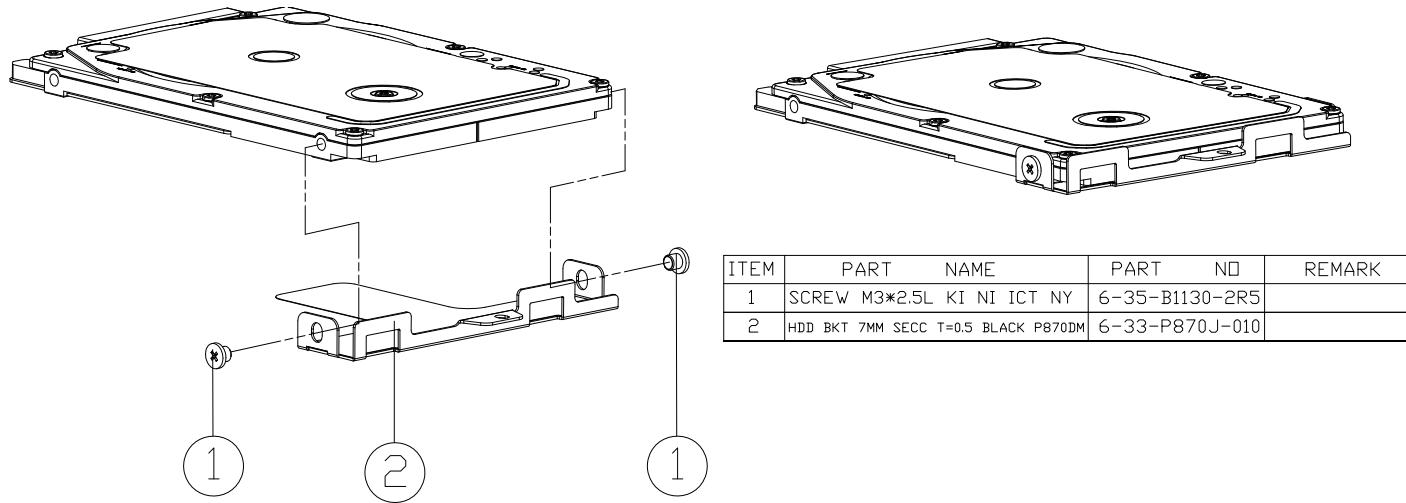
Figure A - 7
VGA (N17E-G3)

ITEM	PART NAME	PART NO	REMARK
1	N17 VGA SUPPORTER M2 SUS430 P750DM2	6-33-P75DS-011	
2	VGA BOARD NVIDIA N17E-G3 MP GDDR5X (NVIDIA 8G/512Mx16) MXM-III V2.0 P870DM2	6-77-P872L-D12	FDR P870DM2/DM3
2	VGA BOARD NVIDIA N17E-G3 MP GDDR5X (NVIDIA 8G/512Mx16) MXM-III V2.0 P870DM2-G	6-77-P872L-D12-A	FDR P870DM2-G/DM3-G
3	N17E-G2 CHIP MYLAR PET (37.5*37.5*0.1) P750DM2	6-40-P75DS-020	

Part Lists

HDD

Figure A - 8
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 BLACK P870DM	6-33-P870J-010	

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the **P870KM(-G)** notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

Diagram - Page	Diagram - Page	Diagram - Page
<i>Block Diagram - Page B - 2</i>	<i>Main EC IT8587 - Page B - 23</i>	<i>2.5V, 5VS_2 - Page B - 44</i>
<i>Processor 1/5 - Page B - 3</i>	<i>Second EC IT8587 - Page B - 24</i>	<i>Fan_Power 12V - Page B - 45</i>
<i>Processor 2/5 - Page B - 4</i>	<i>TPM SLB9665TT - Page B - 25</i>	<i>AMP10V, VCCSA - Page B - 46</i>
<i>Processor 3/5 - Page B - 5</i>	<i>CPU, VGA Fan Conn - Page B - 26</i>	<i>DDR4 VDDQ & VTT, VCCPLL_OC - Page B - 47</i>
<i>Processor 4/5 - Page B - 6</i>	<i>Backlight Keyboard - Page B - 27</i>	<i>Power Charger, DC IN - Page B - 48</i>
<i>Processor 5/5 - Page B - 7</i>	<i>CCD, USB Charging - Page B - 28</i>	<i>VCCIO, 1.0VA - Page B - 49</i>
<i>DDR4 CHA SO-DIMM_0 - Page B - 8</i>	<i>AR_TBT - Page B - 29</i>	<i>VCore - Page B - 50</i>
<i>DDR4 CHA SO-DIMM_1 - Page B - 9</i>	<i>AR_Power - Page B - 30</i>	<i>VCore Output Stage - Page B - 51</i>
<i>DDR4 CHB SO-DIMM_0 - Page B - 10</i>	<i>TPS65982, Type C1 - Page B - 31</i>	<i>VDD3, VDD5 - Page B - 52</i>
<i>DDR4 CHB SO-DIMM_1 - Page B - 11</i>	<i>TPS65982, Type C2 - Page B - 32</i>	<i>Charger LED Board - Page B - 53</i>
<i>MXM 3.0 Master - Page B - 12</i>	<i>PS8338B+mDP_1 - Page B - 33</i>	<i>Click Board - Page B - 54</i>
<i>MXM 3.0 Slave - Page B - 13</i>	<i>PS8338B+mDP_2 - Page B - 34</i>	<i>Finger Sensor Board - Page B - 55</i>
<i>Panel, Inverter - Page B - 14</i>	<i>M.2 WLAN+BT - Page B - 35</i>	<i>Power Switch LED Board - Page B - 56</i>
<i>HDMI - Page B - 15</i>	<i>M.2 M Key - Page B - 36</i>	<i>Audio Codec - Page B - 57</i>
<i>SPT-H 1/7 - Page B - 16</i>	<i>RTS5250 - Page B - 37</i>	<i>Audio Board (Speaker) - Page B - 58</i>
<i>SPT-H 2/7 - Page B - 17</i>	<i>LAN_1 E2500 - Page B - 38</i>	<i>Audio Board (Subwoofer) - Page B - 59</i>
<i>SPT-H 3/7 - Page B - 18</i>	<i>LAN_2 E2500 - Page B - 39</i>	<i>ESS DAC - Page B - 60</i>
<i>SPT-H 4/7 - Page B - 19</i>	<i>Click, Finger Conn - Page B - 40</i>	<i>HP AMP - Page B - 61</i>
<i>SPT-H 5/7 - Page B - 20</i>	<i>HDD & Second HDD - Page B - 41</i>	<i>Audio Jack - Page B - 62</i>
<i>SPT-H 6/7 - Page B - 21</i>	<i>USB Port - Page B - 42</i>	<i>Power Sequence - Page B - 63</i>
<i>SPT-H 7/7 - Page B - 22</i>	<i>5VS, 3.3VS, 1.0 V Series - Page B - 43</i>	

Table B - 1
Schematic
Diagrams



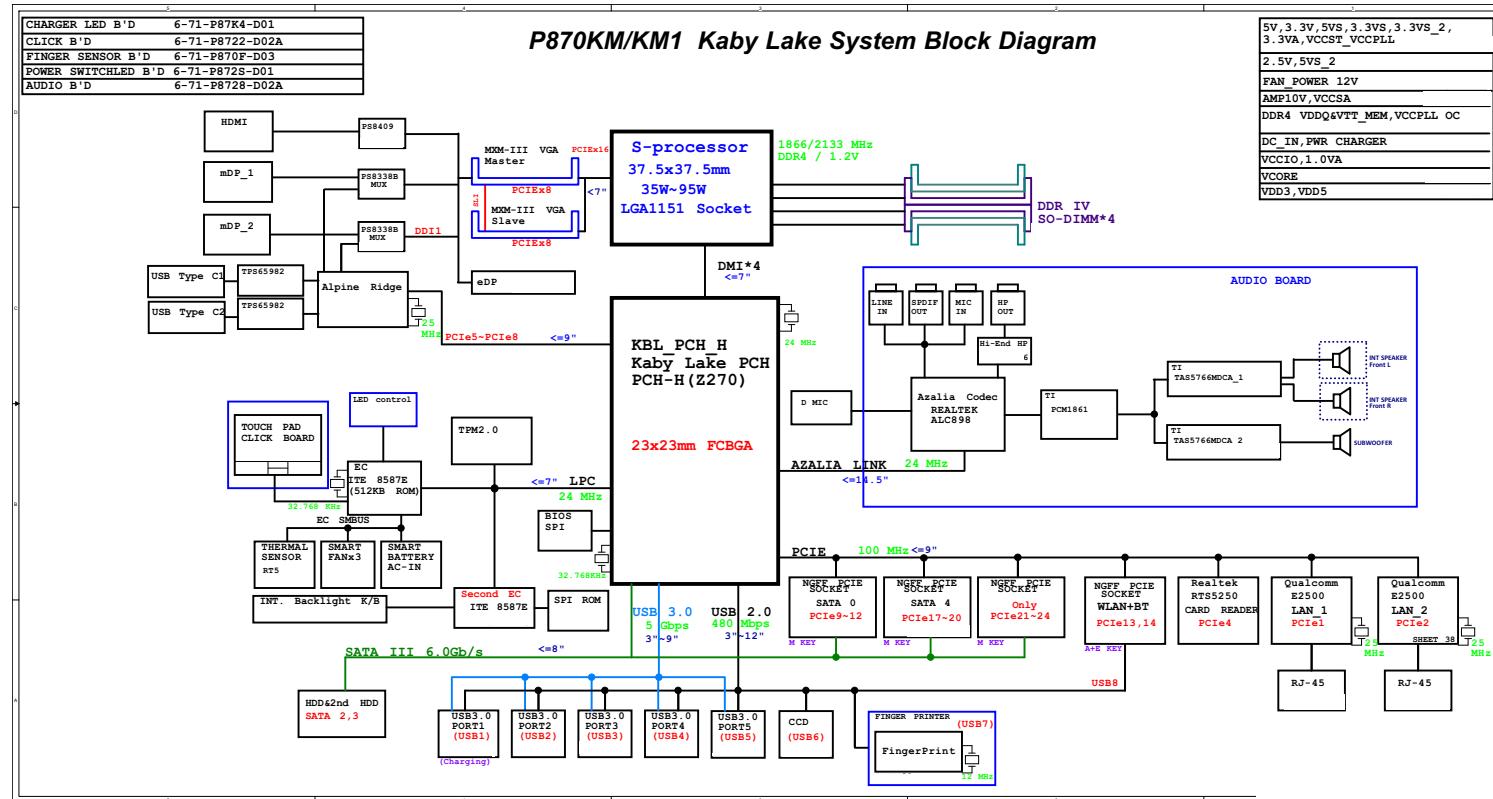
Version Note

The schematic diagrams in this chapter are based upon version 6-7P-P87K6-002. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

Schematic Diagrams

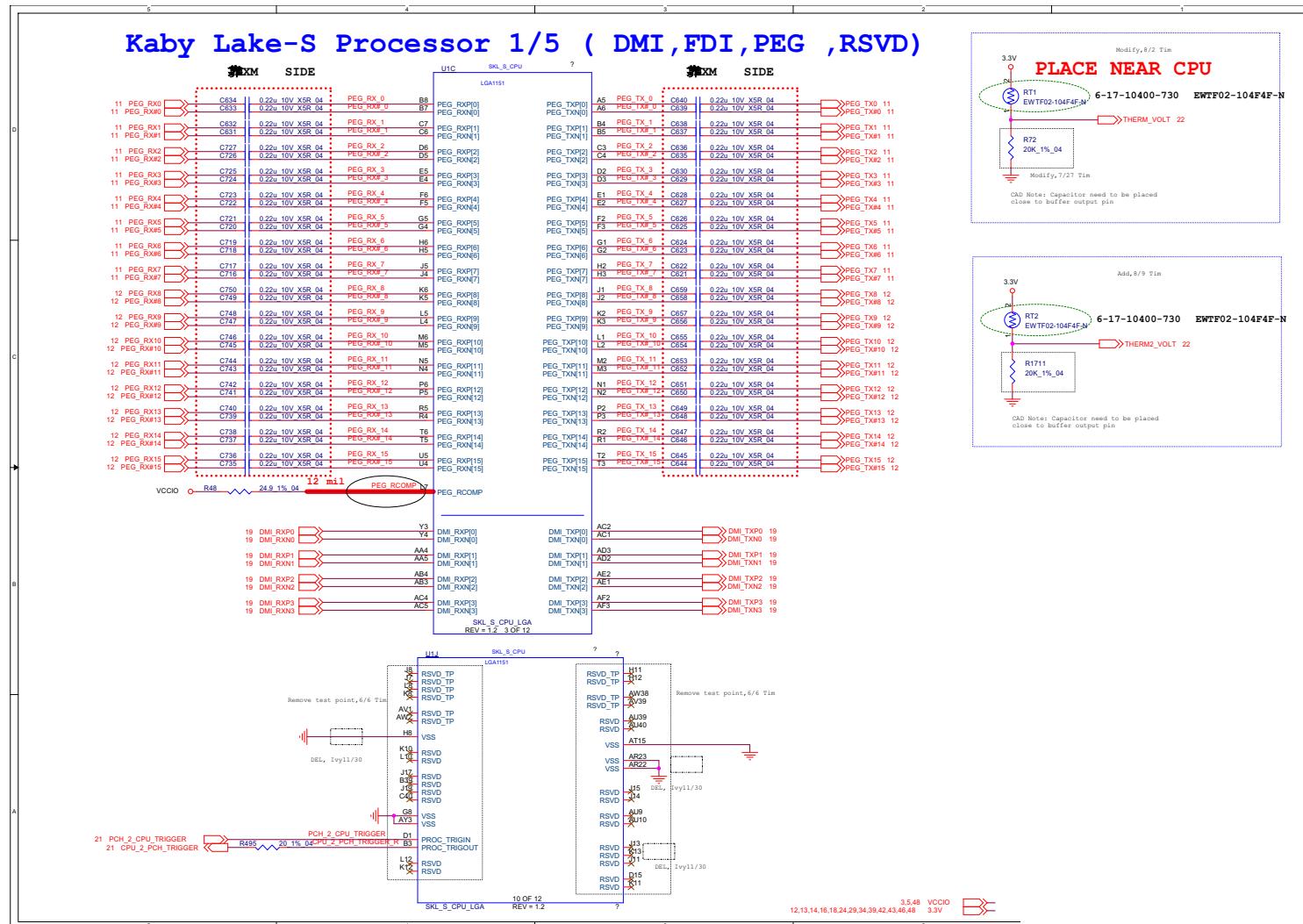
Block Diagram

Sheet 1 of 62
Block Diagram



Schematic Diagrams

Processor 1/5



Sheet 2 of 62
Processor 1/5

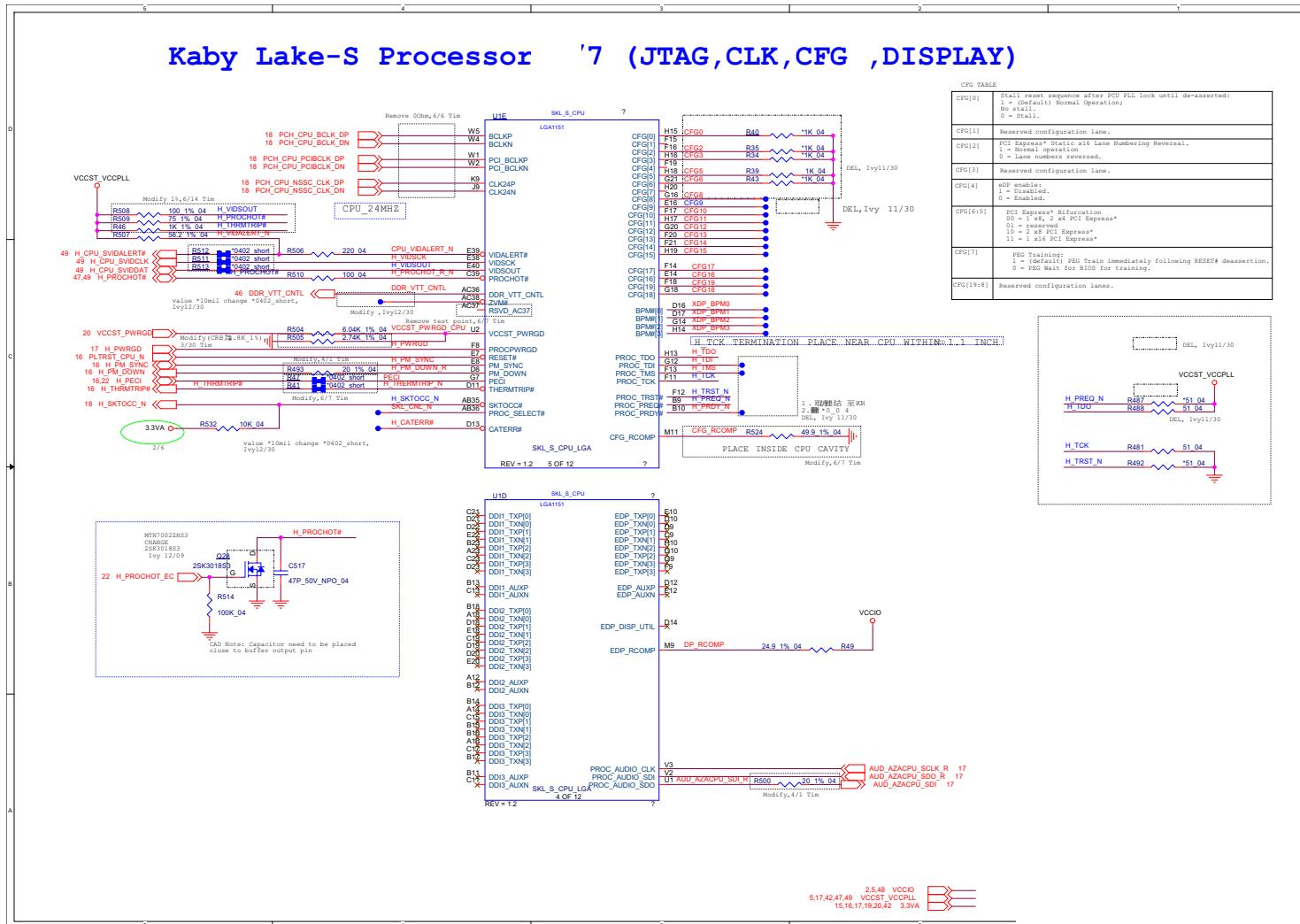
B.Schematic Diagrams

B.Schematic Diagrams

Schematic Diagrams

Processor 2/5

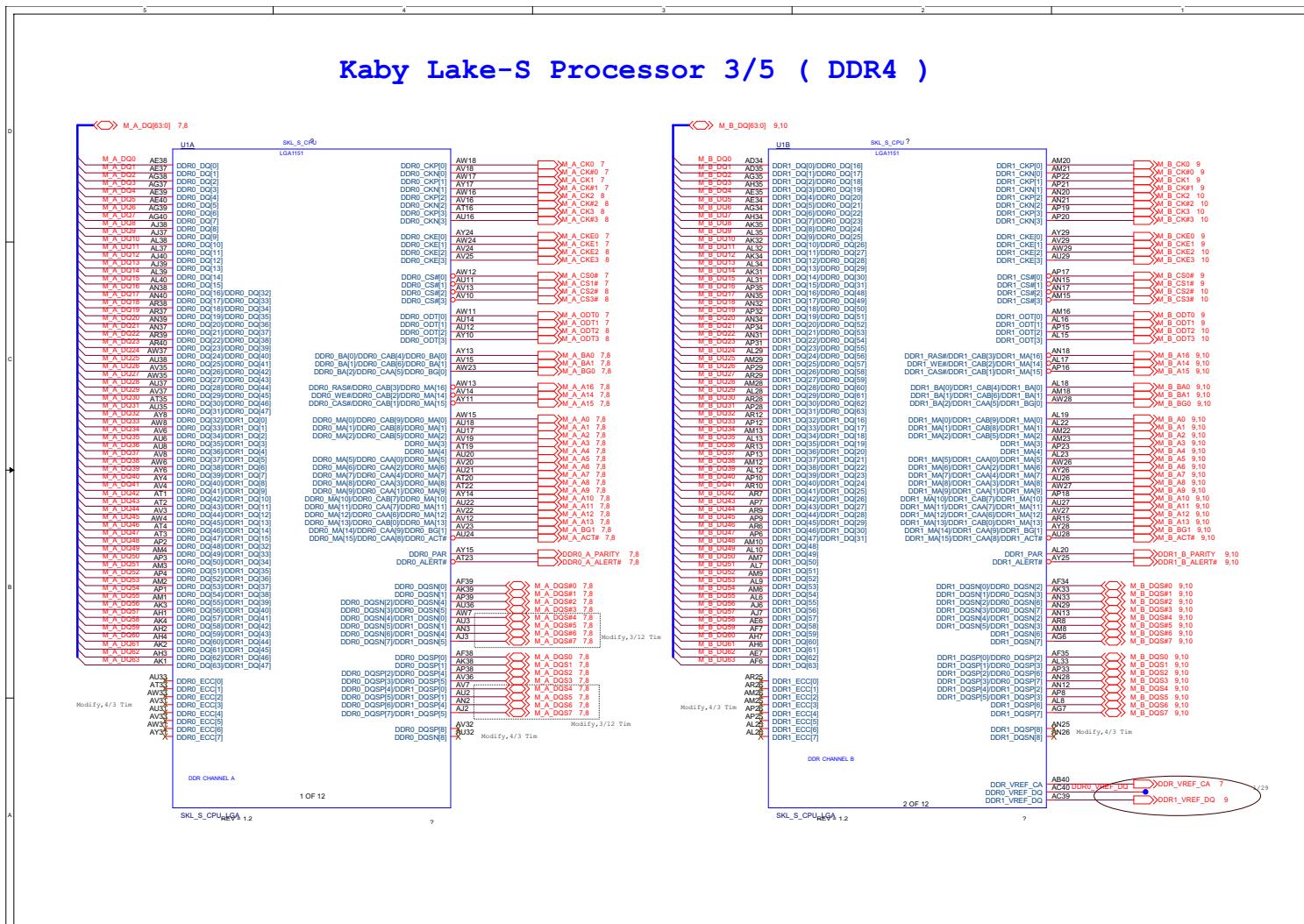
Sheet 3 of 62
Processor 2/5



B - 4 Processor 2/5

Schematic Diagrams

Processor 3/5



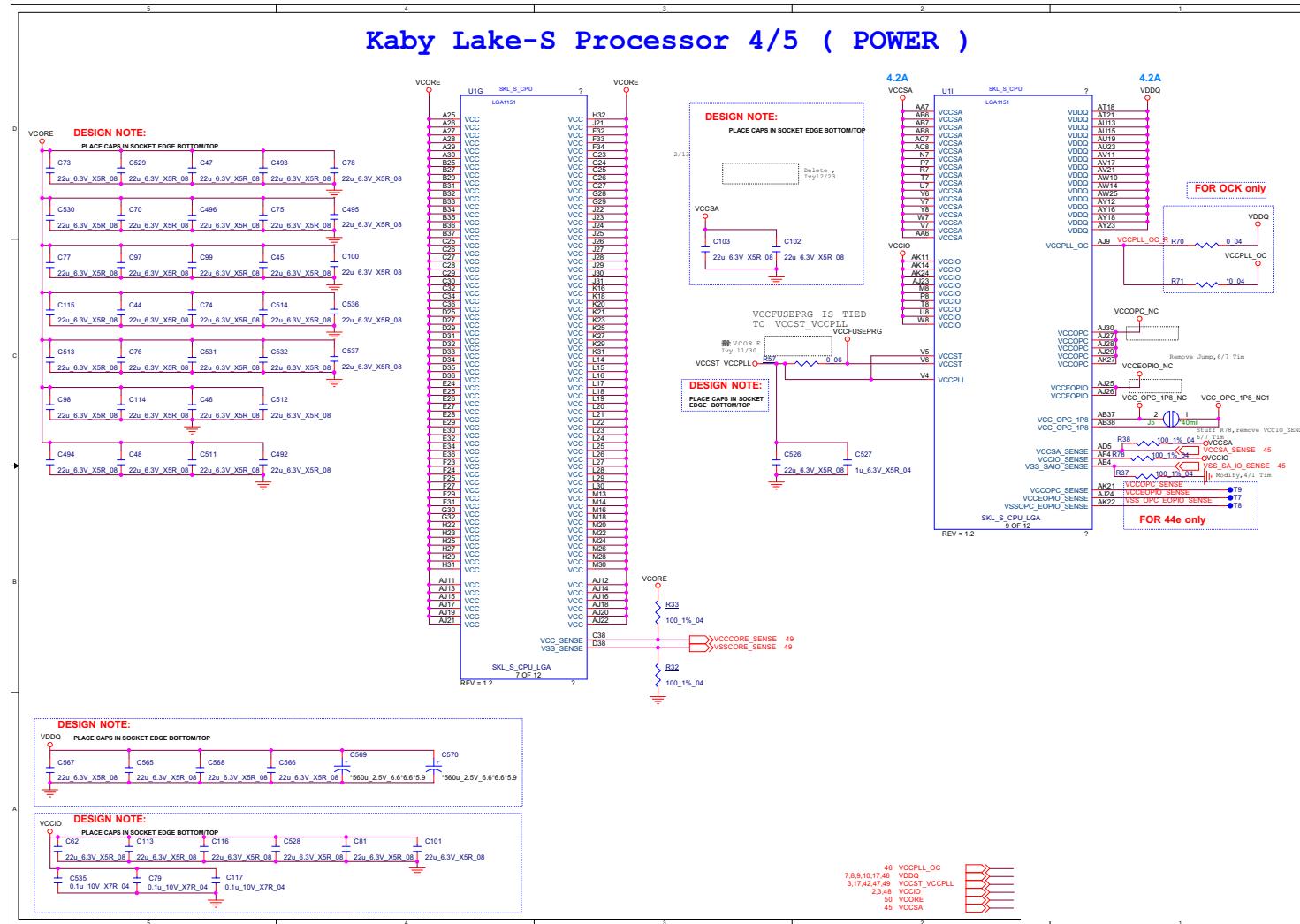
B.Schematic Diagrams

Sheet 4 of 62
Processor 3/5

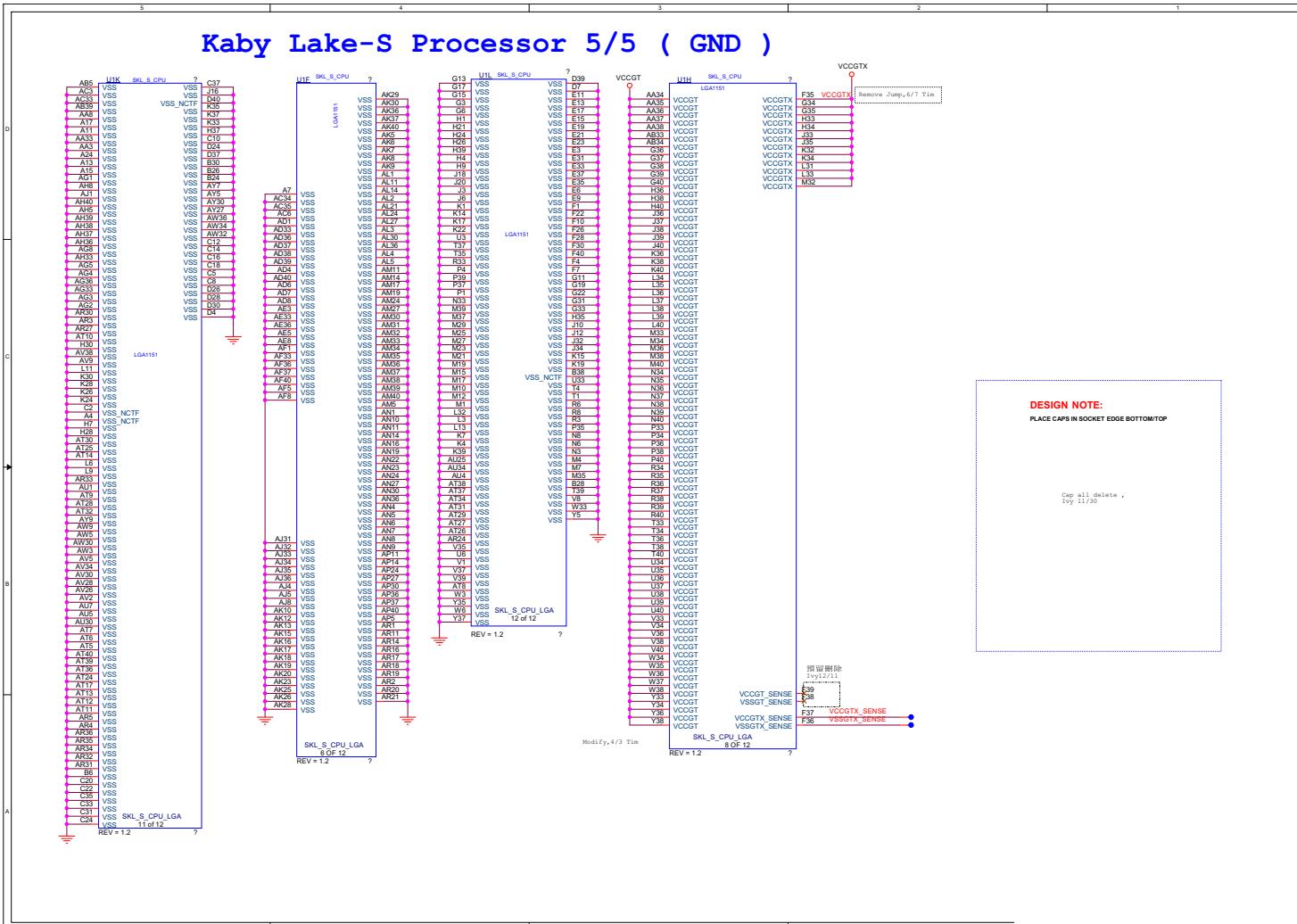
Schematic Diagrams

Processor 4/5

Sheet 5 of 62
Processor 4/5



Processor 5/5



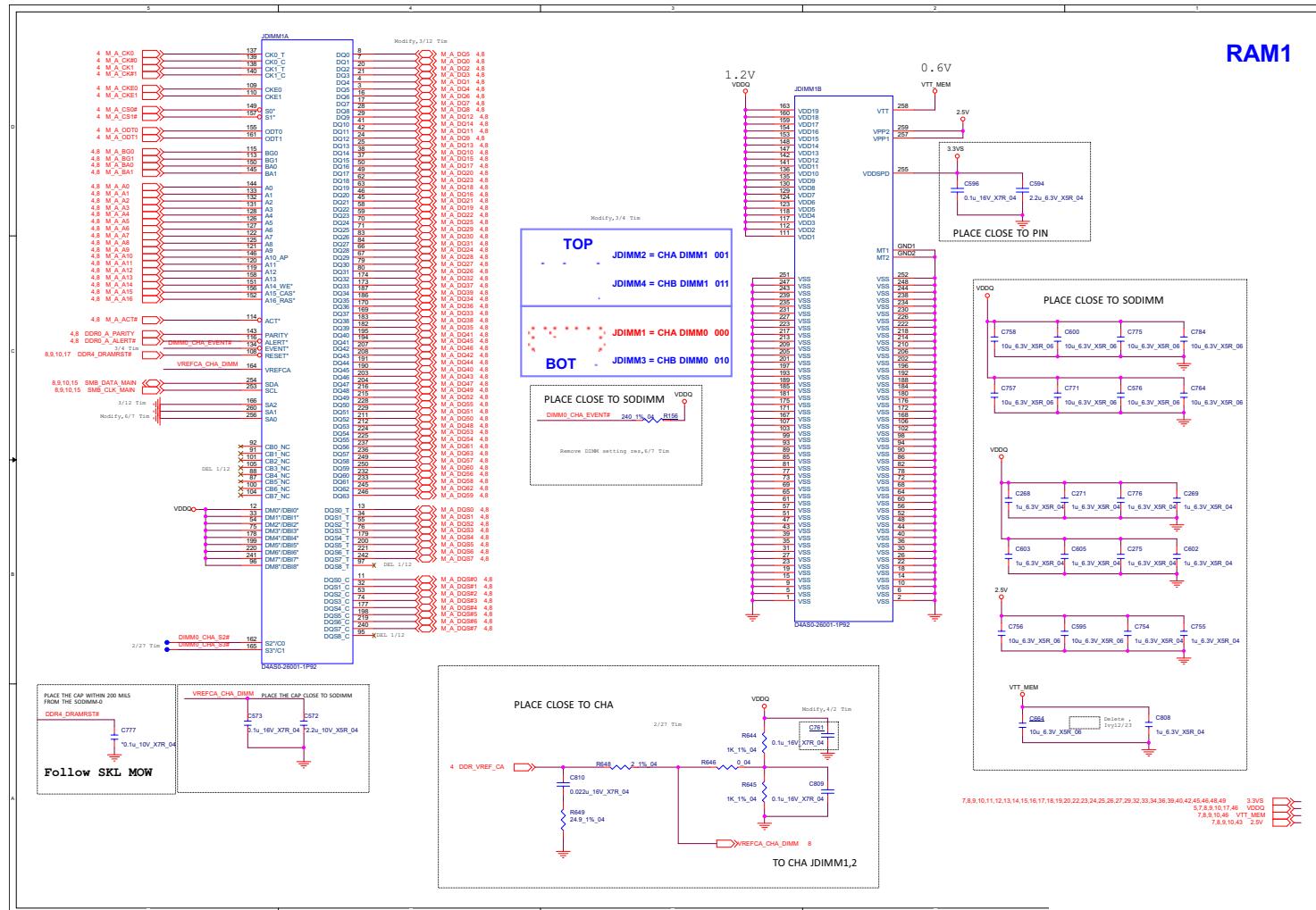
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Processor 5/5

B. Schematic Diagrams

Schematic Diagrams

DDR4 CHA SO-DIMM_0

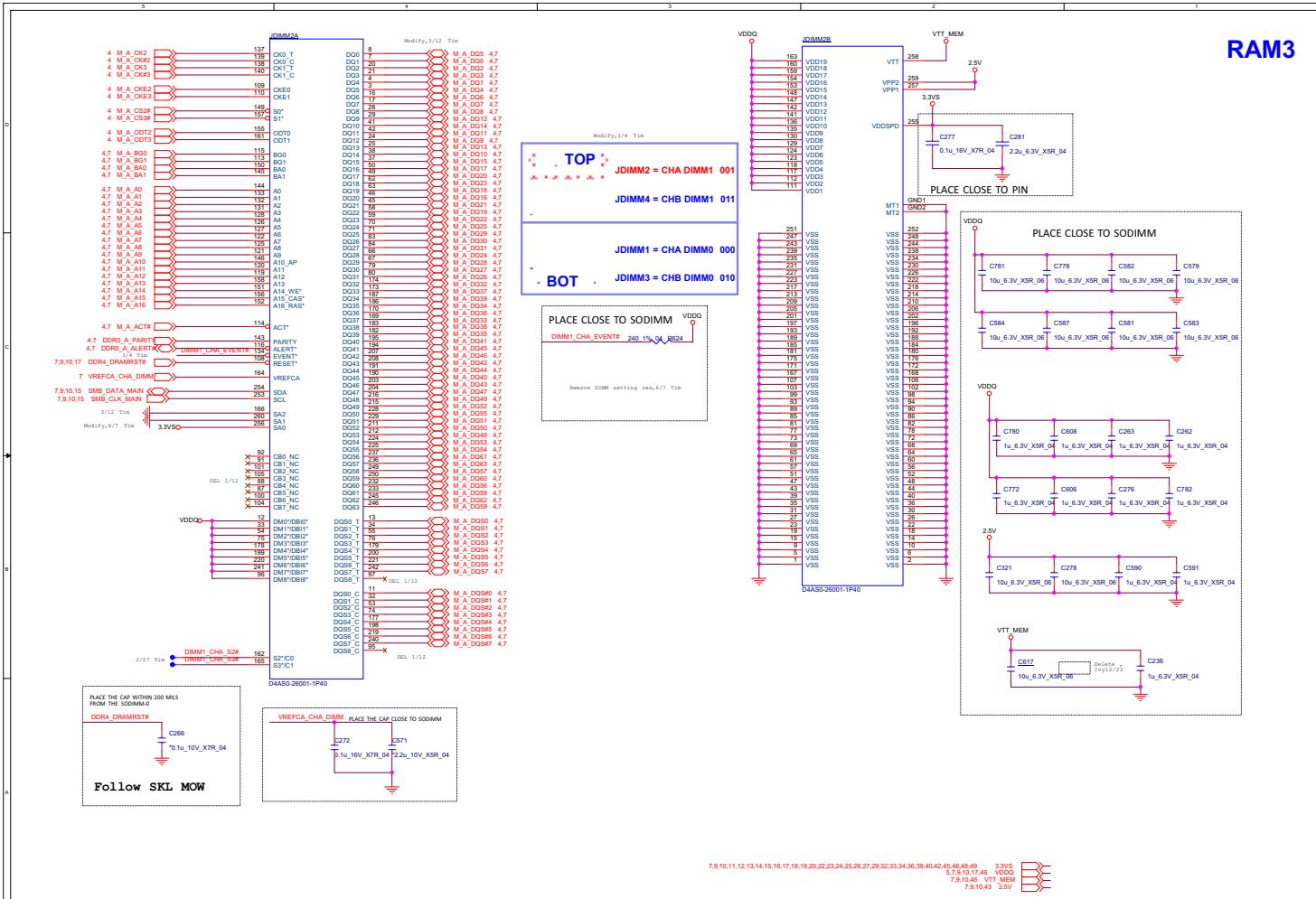
Sheet 7 of 62
DDR4 CHA SO-
DIMM _0



B.Schematic Diagrams

Sheet 8 of 62
DDR4 CHA SO-
DIMM 1

DDR4 CHA SO-DIMM_1

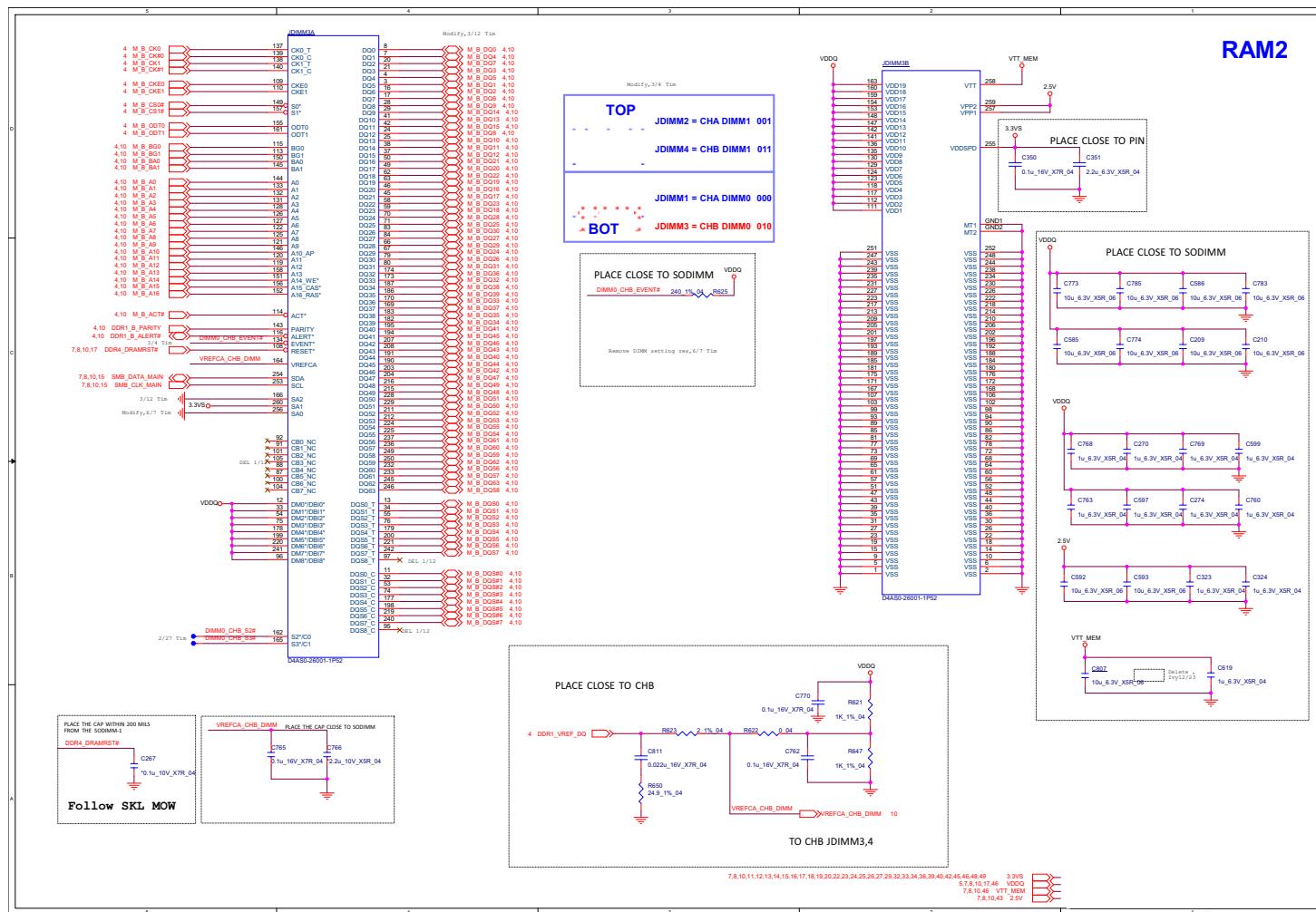


B.Schematic Diagrams

Schematic Diagrams

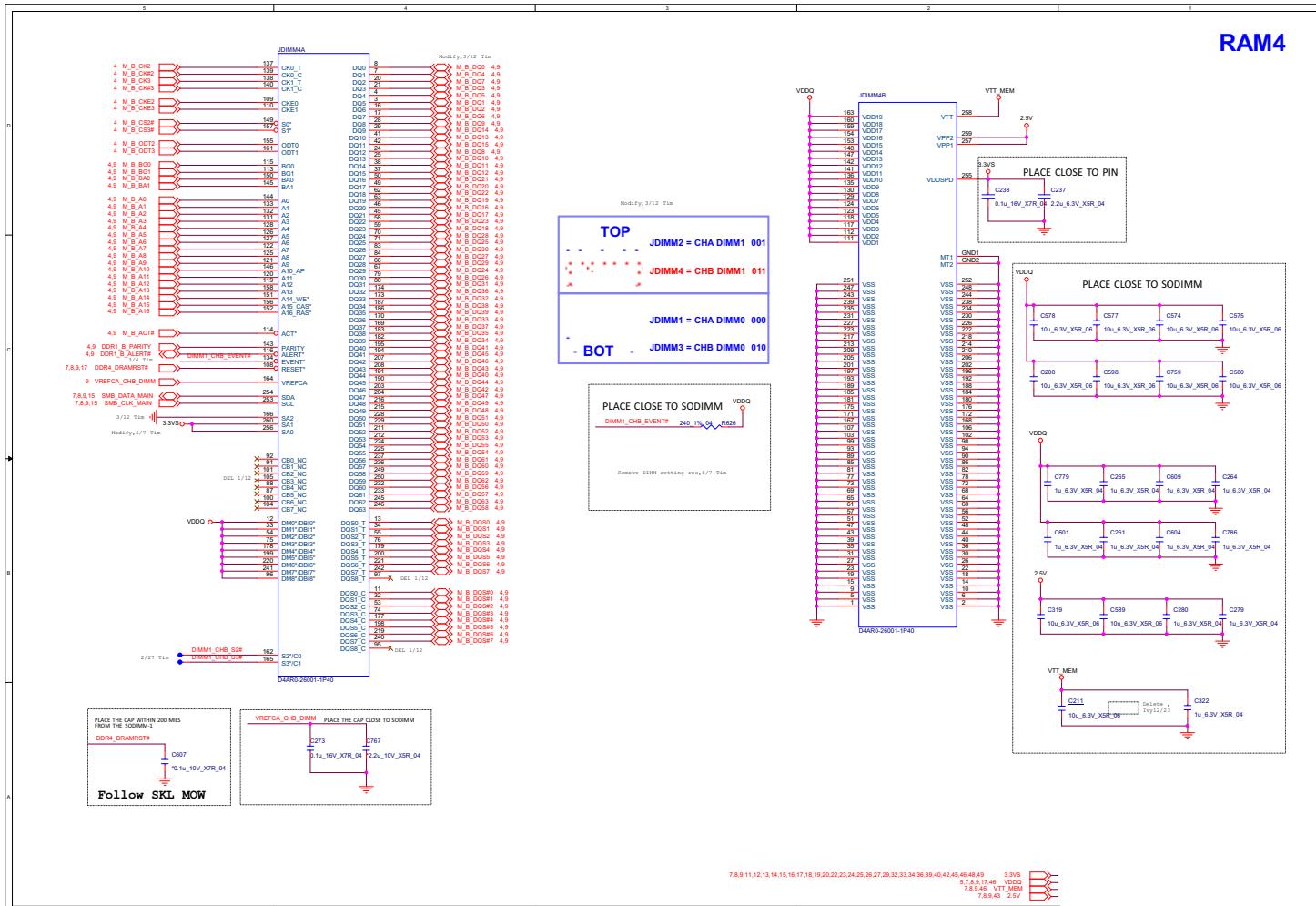
DDR4 CHB SO-DIMM_0

Sheet 9 of 62
DDR4 CHB SO-
DIMM _0



Schematic Diagrams

DDR4 CHB SO-DIMM_1



B.Schematic Diagrams

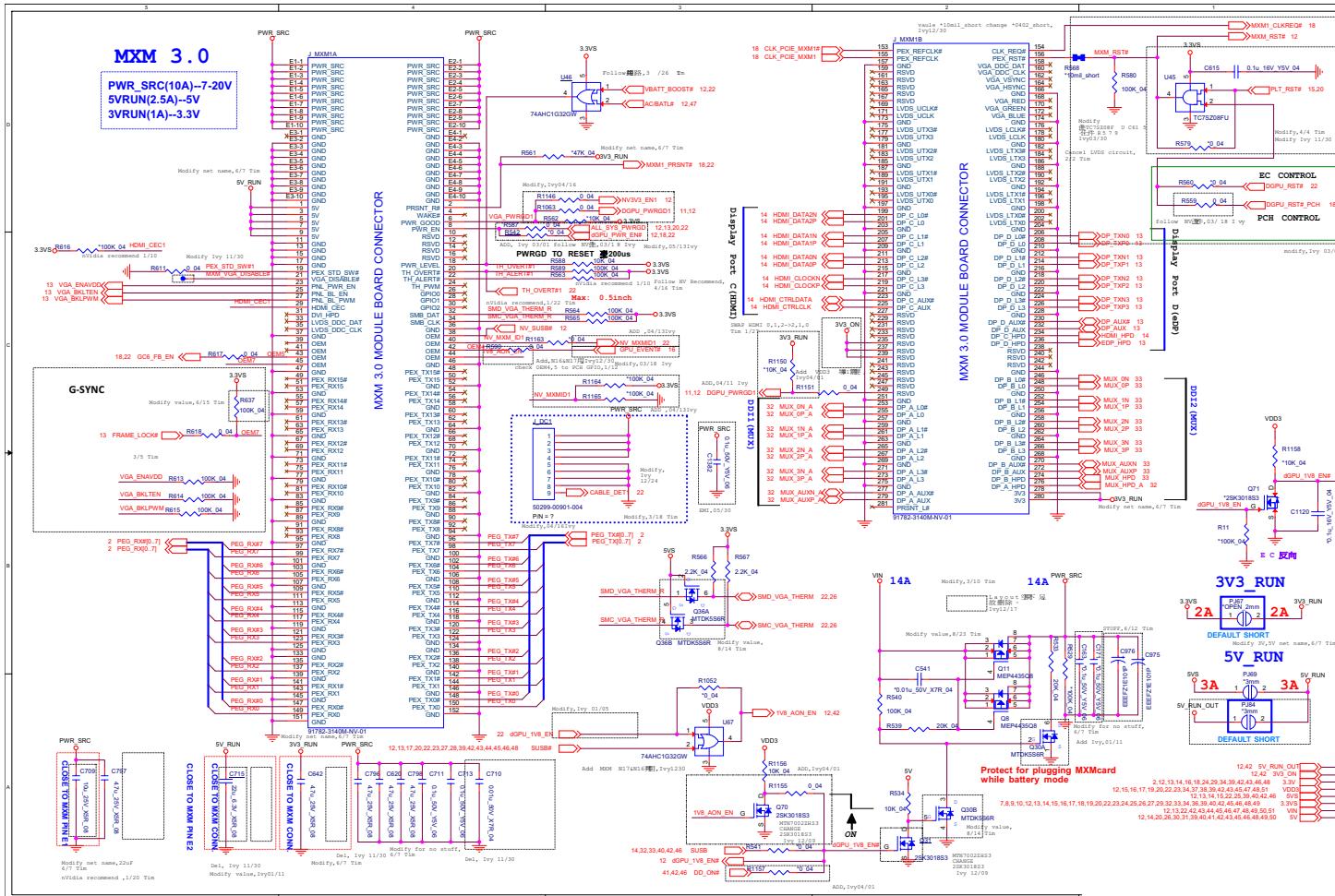
Sheet 10 of 62
DDR4 CHB SO-
DIMM 1

B.Schematic Diagrams

Schematic Diagrams

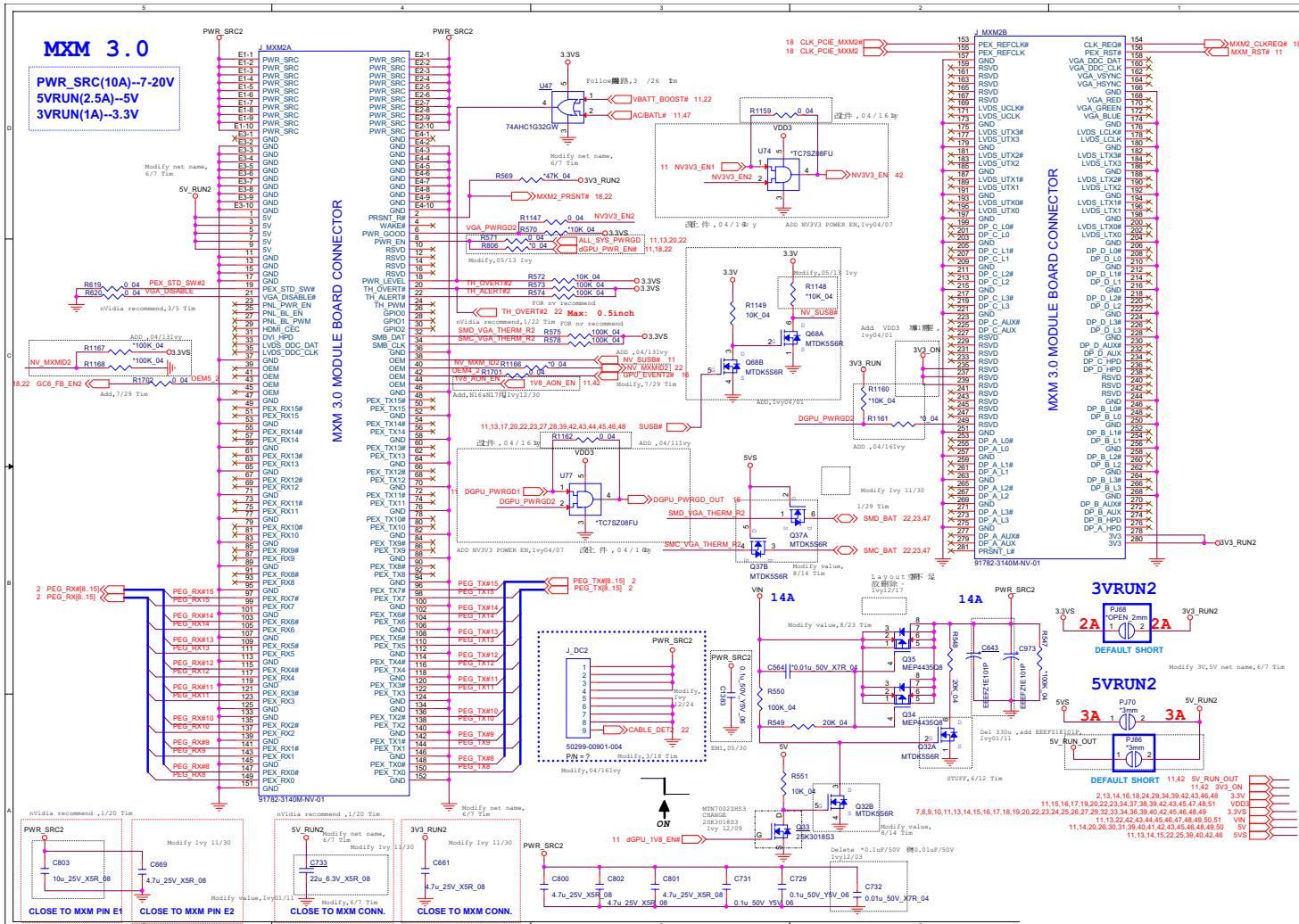
MXM 3.0 Master

Sheet 11 of 62
MXM 3.0 Master



Schematic Diagrams

MXM 3.0 Slave



Sheet 12 of 62
MXM 3.0 Slave

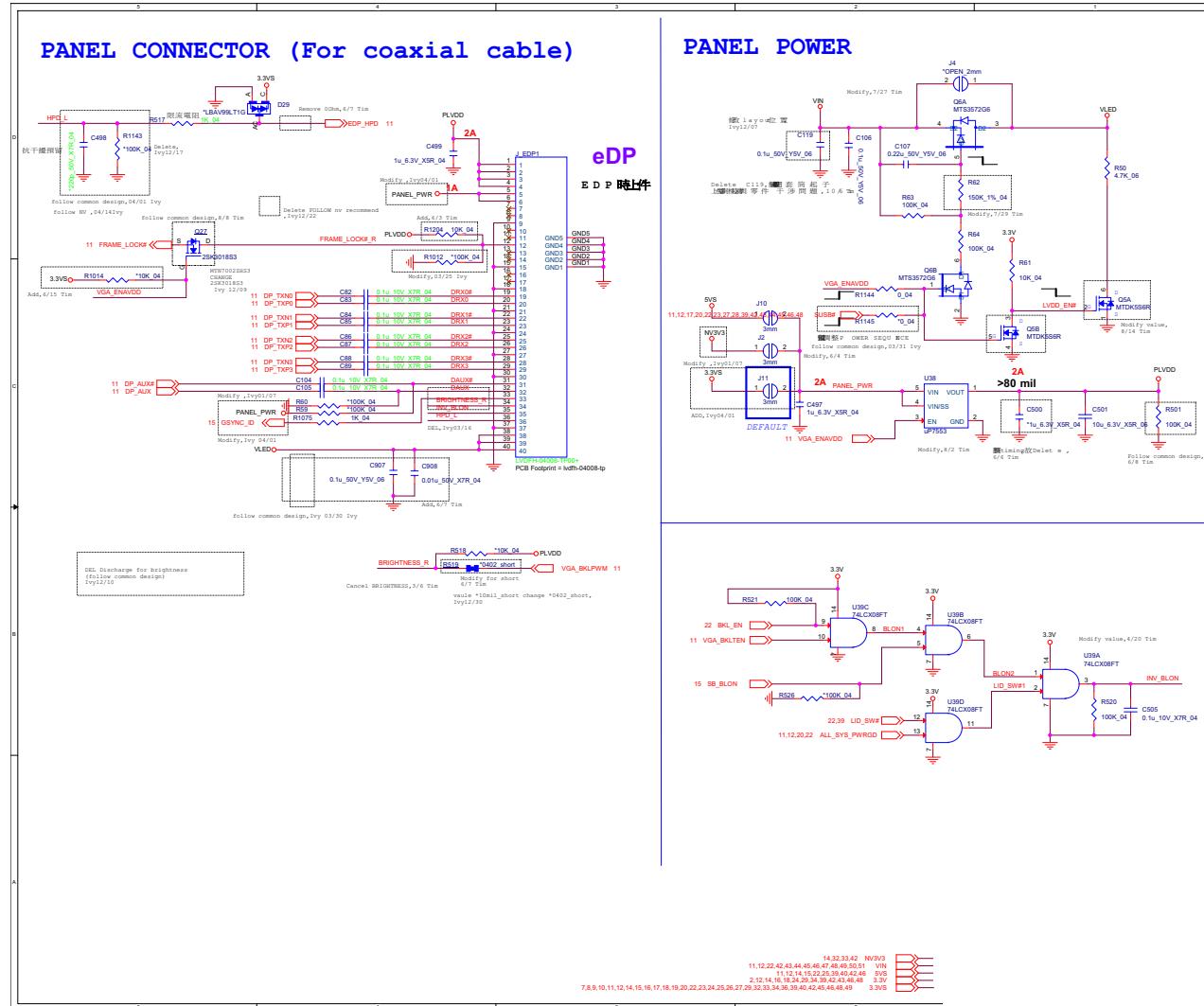
B.Schematic Diagrams

Schematic Diagrams

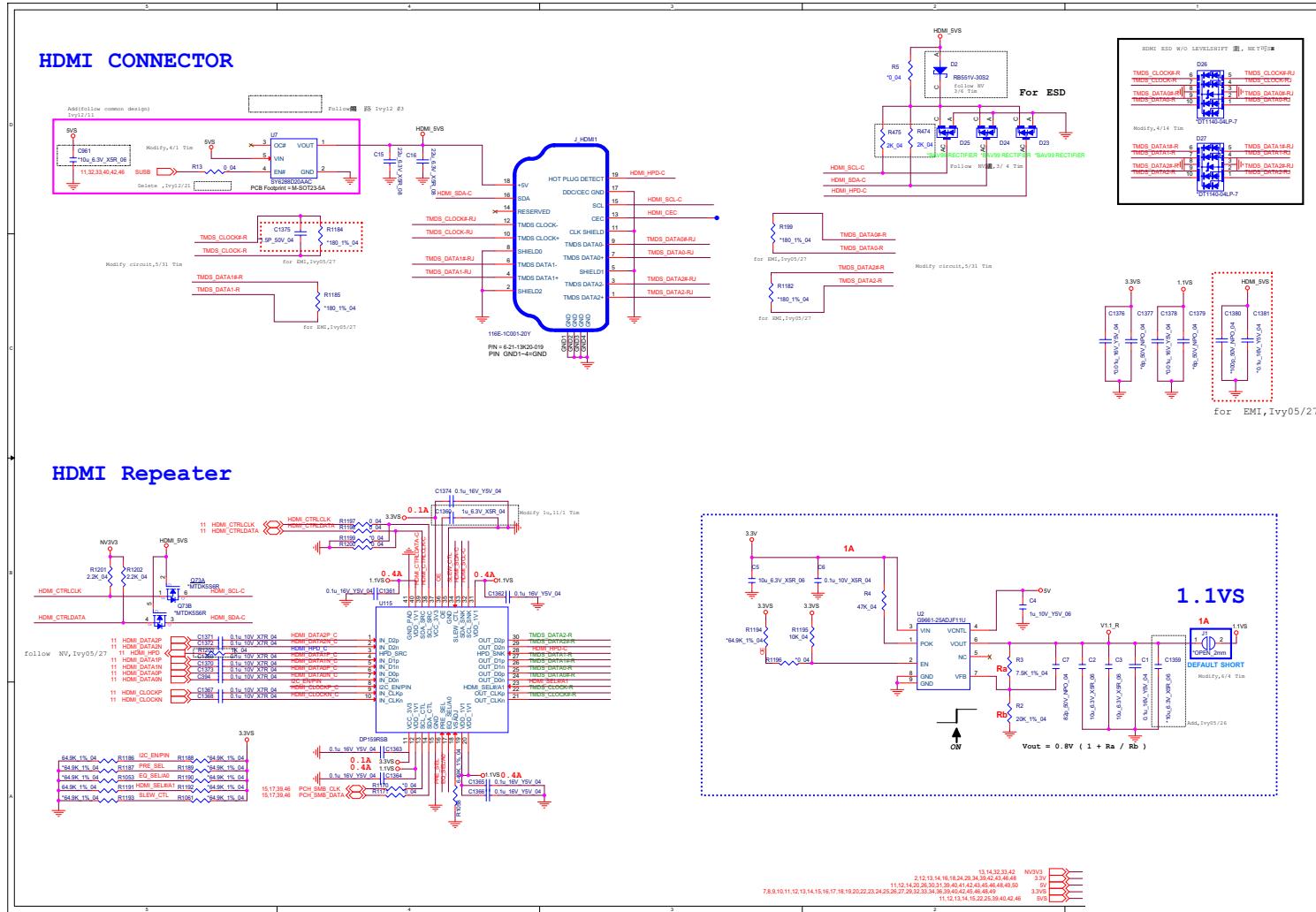
Panel, Inverter

Sheet 13 of 62

Panel, Inverter



HDMI



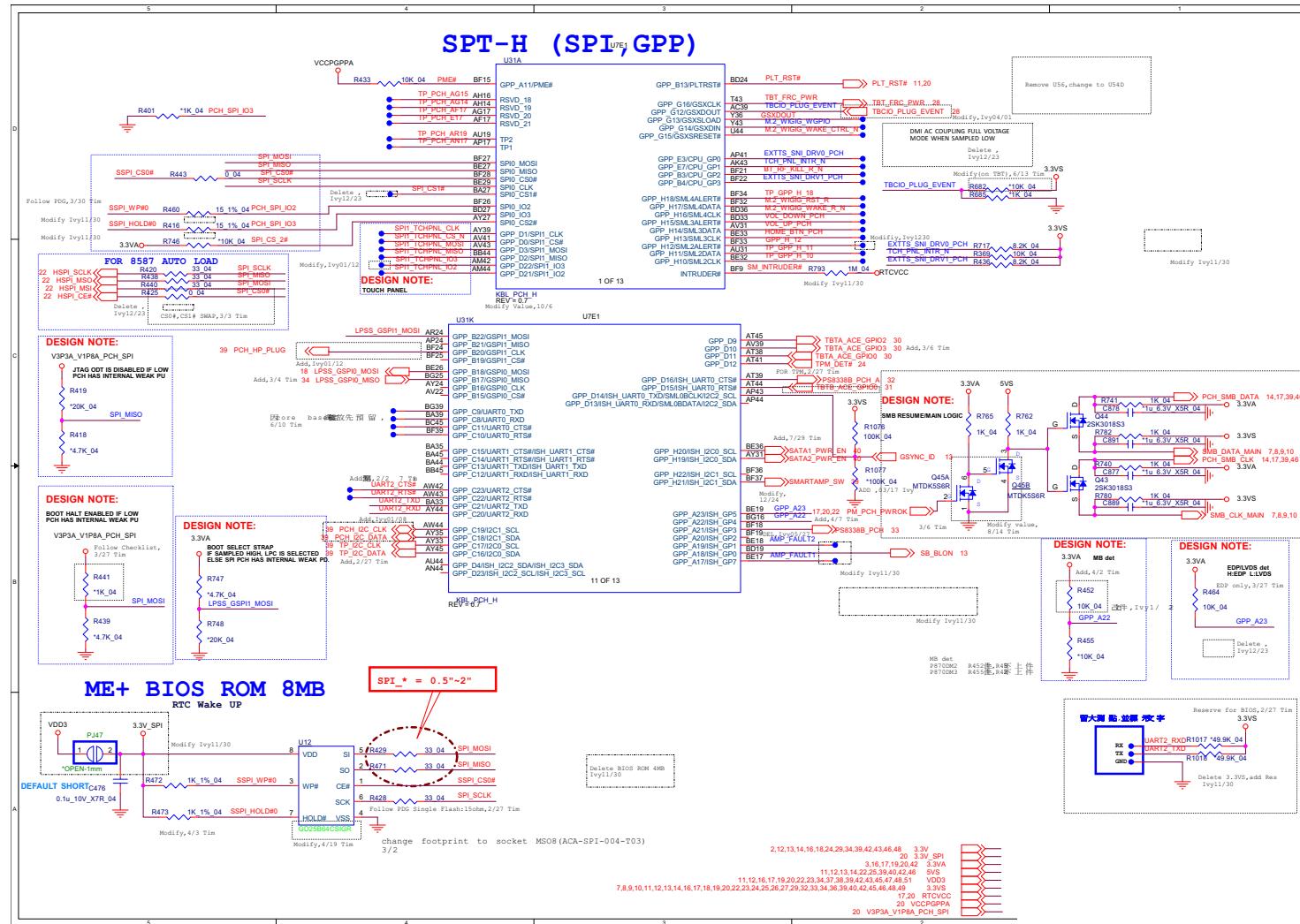
HDMI B - 15

Sheet 14 of 62
HDMI

B.Schematic Diagrams

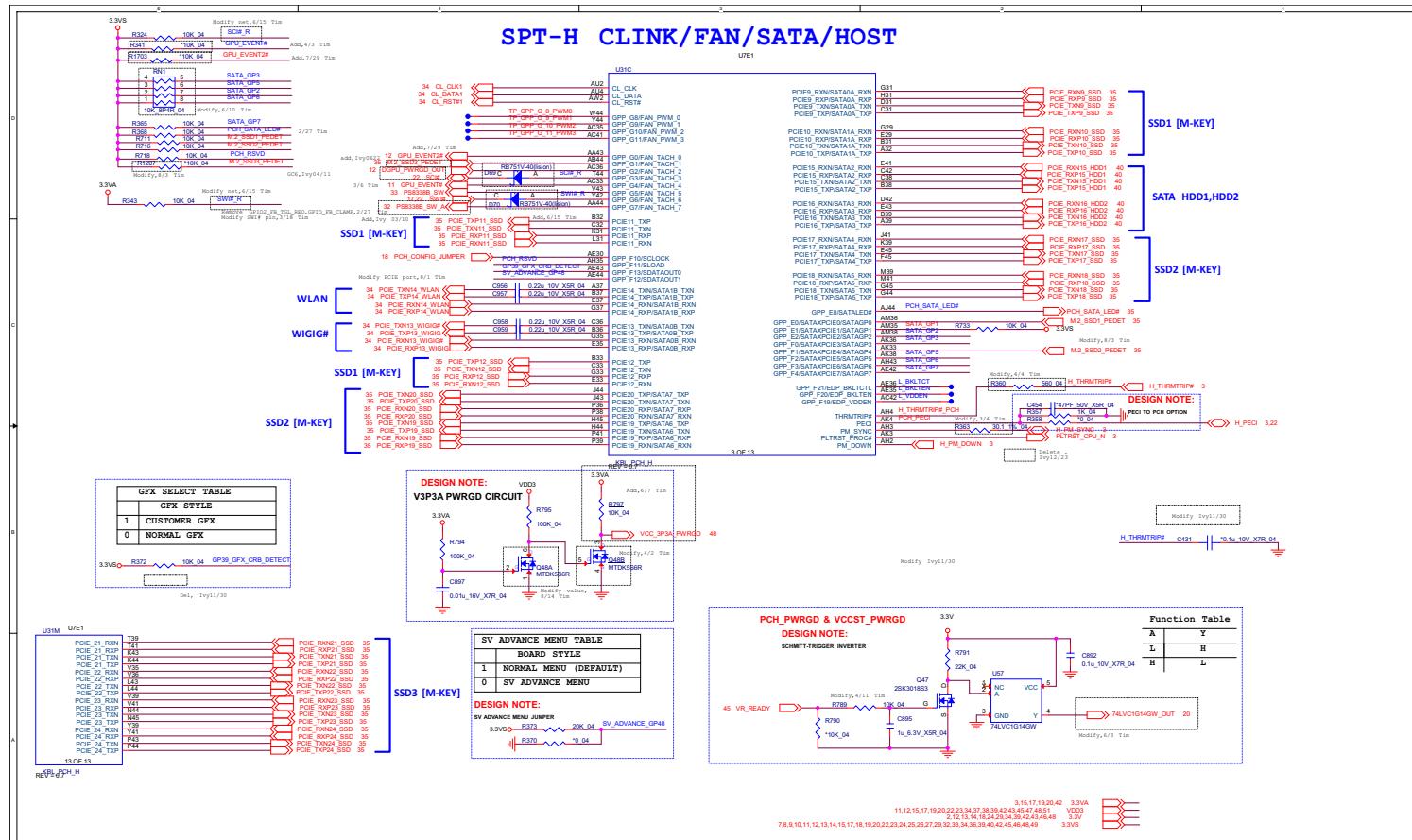
Schematic Diagrams

SPT-H 1/7



Schematic Diagrams

SPT-H 2/7



Sheet 16 of 62
SPT-H 2/7

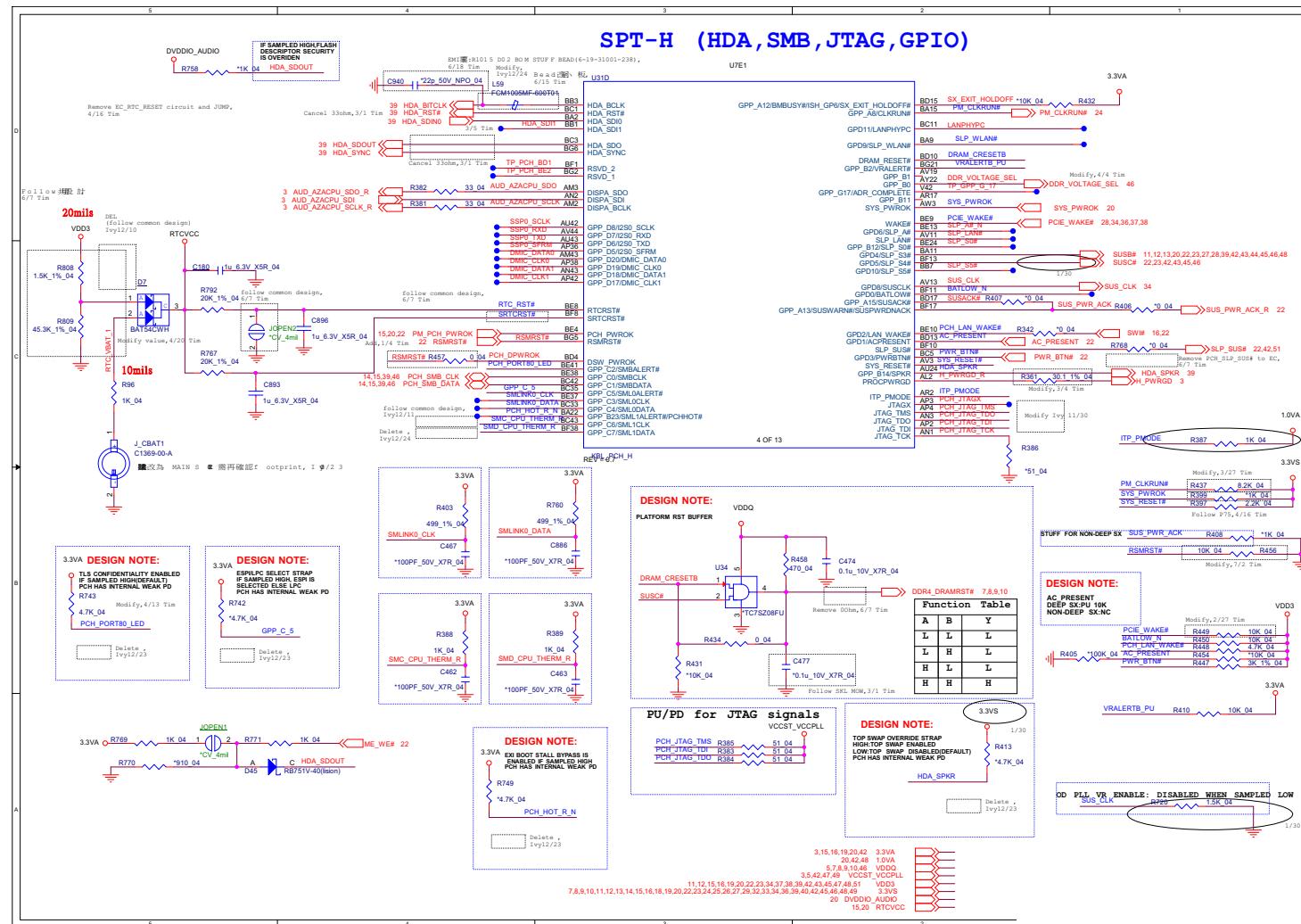
B.Schematic Diagrams

B.Schematic Diagrams

Schematic Diagrams

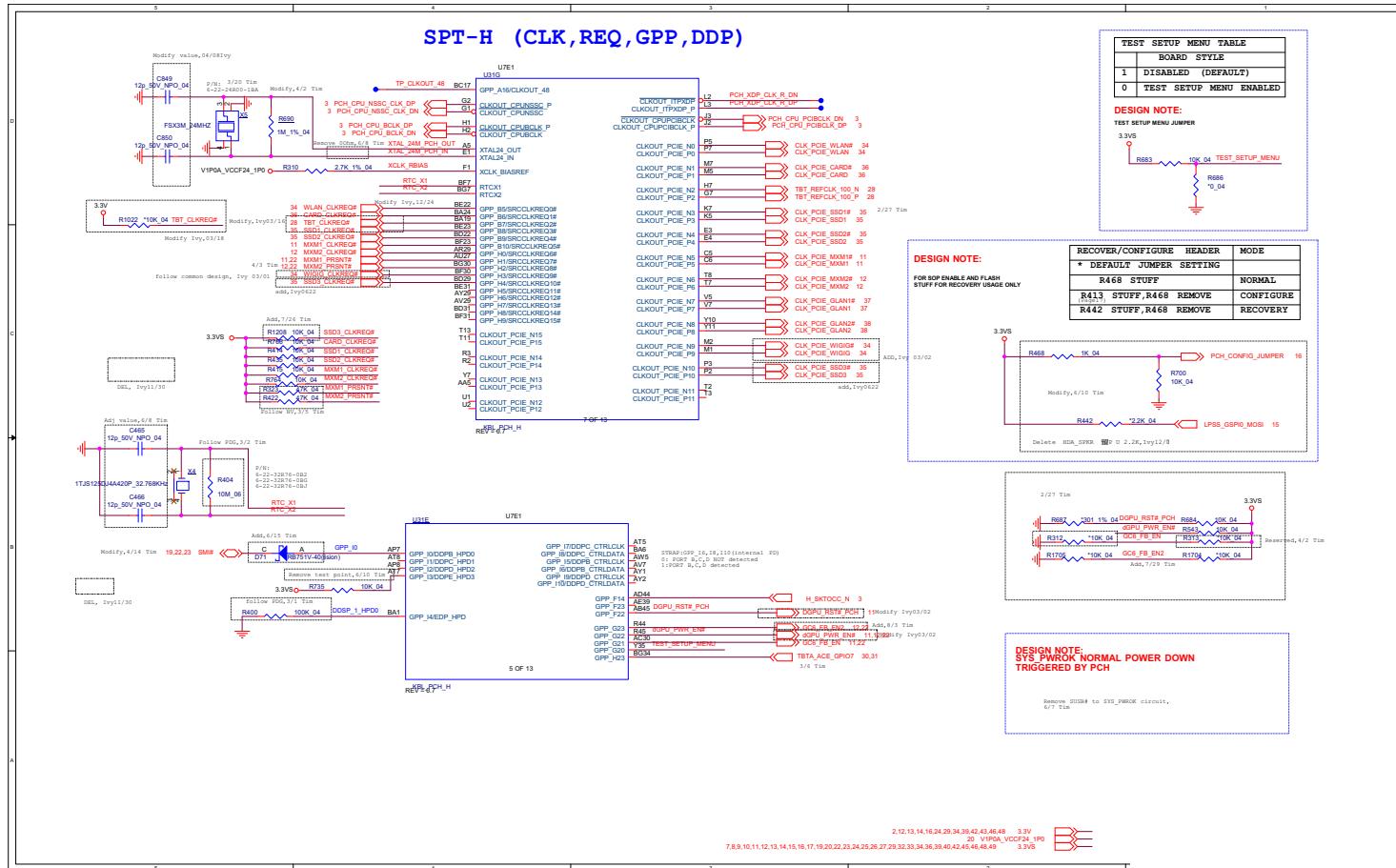
SPT-H 3/7

Sheet 17 of 62
SPT-H 3/7



Schematic Diagrams

SPT-H 4/7



B.Schematic Diagrams

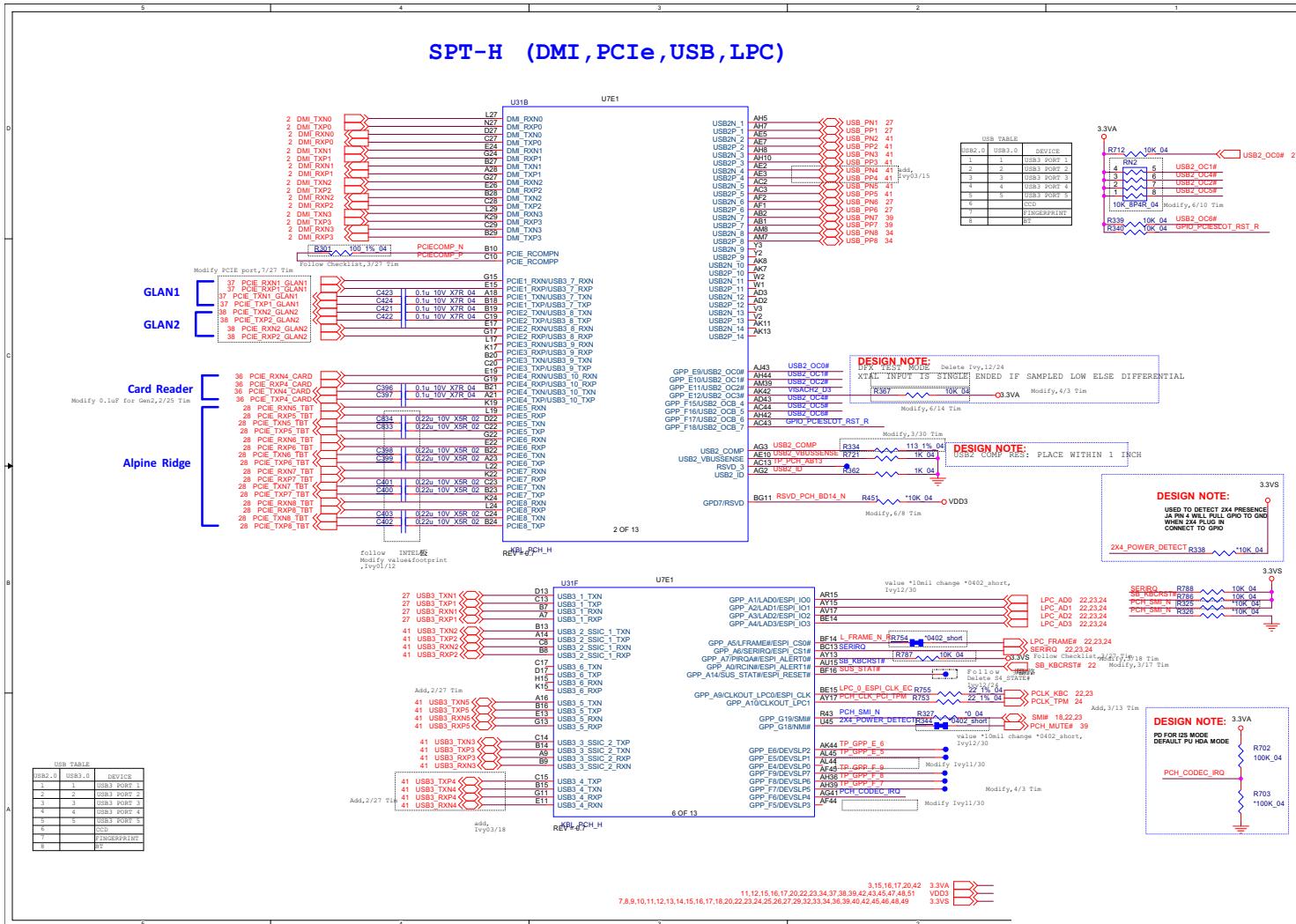
Sheet 18 of 62
SPT-H 4/7

B. Schematic Diagrams

Schematic Diagrams

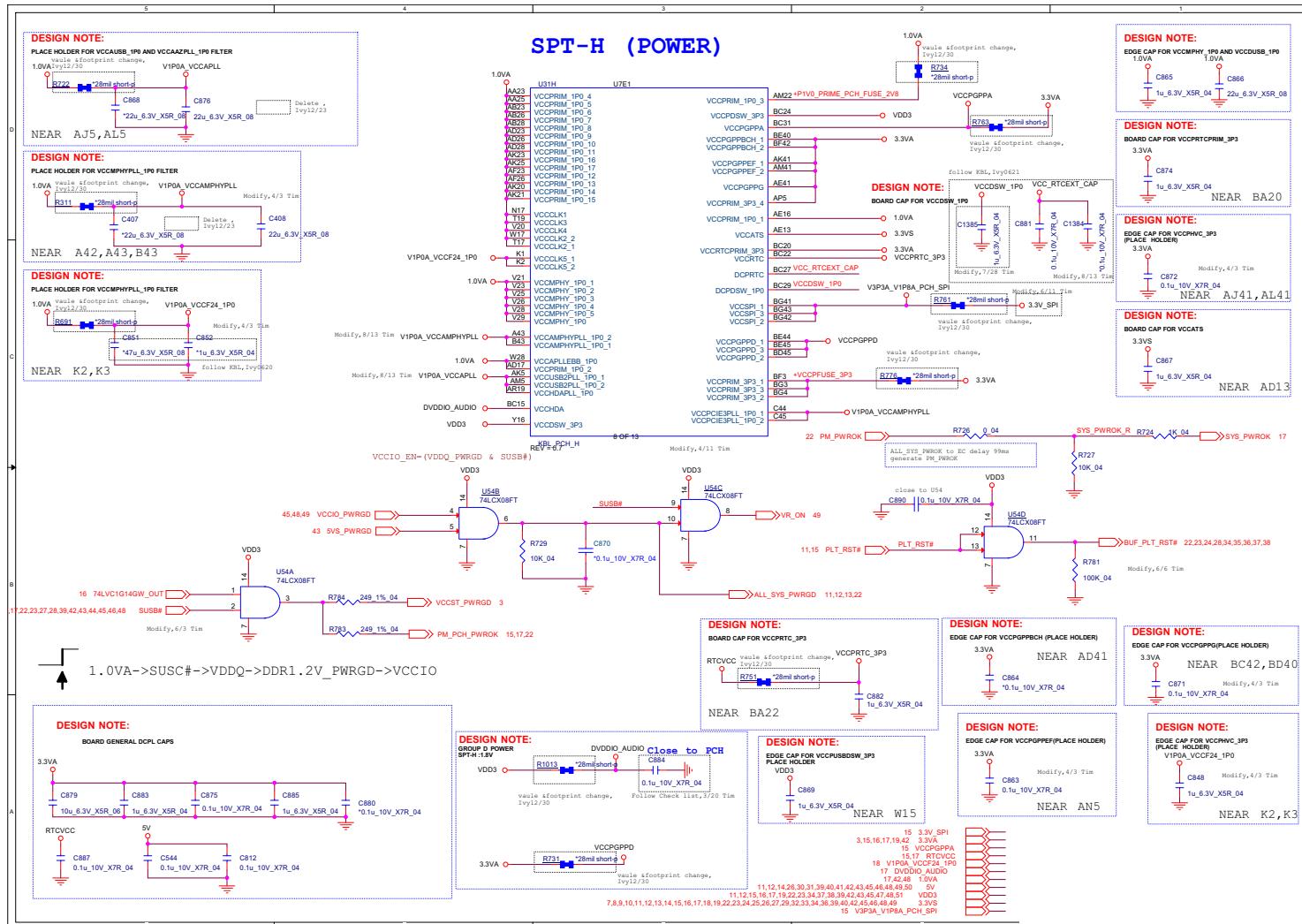
SPT-H 5/7

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SPT-H 5/7



Schematic Diagrams

SPT-H 6/7



B.Schematic Diagrams

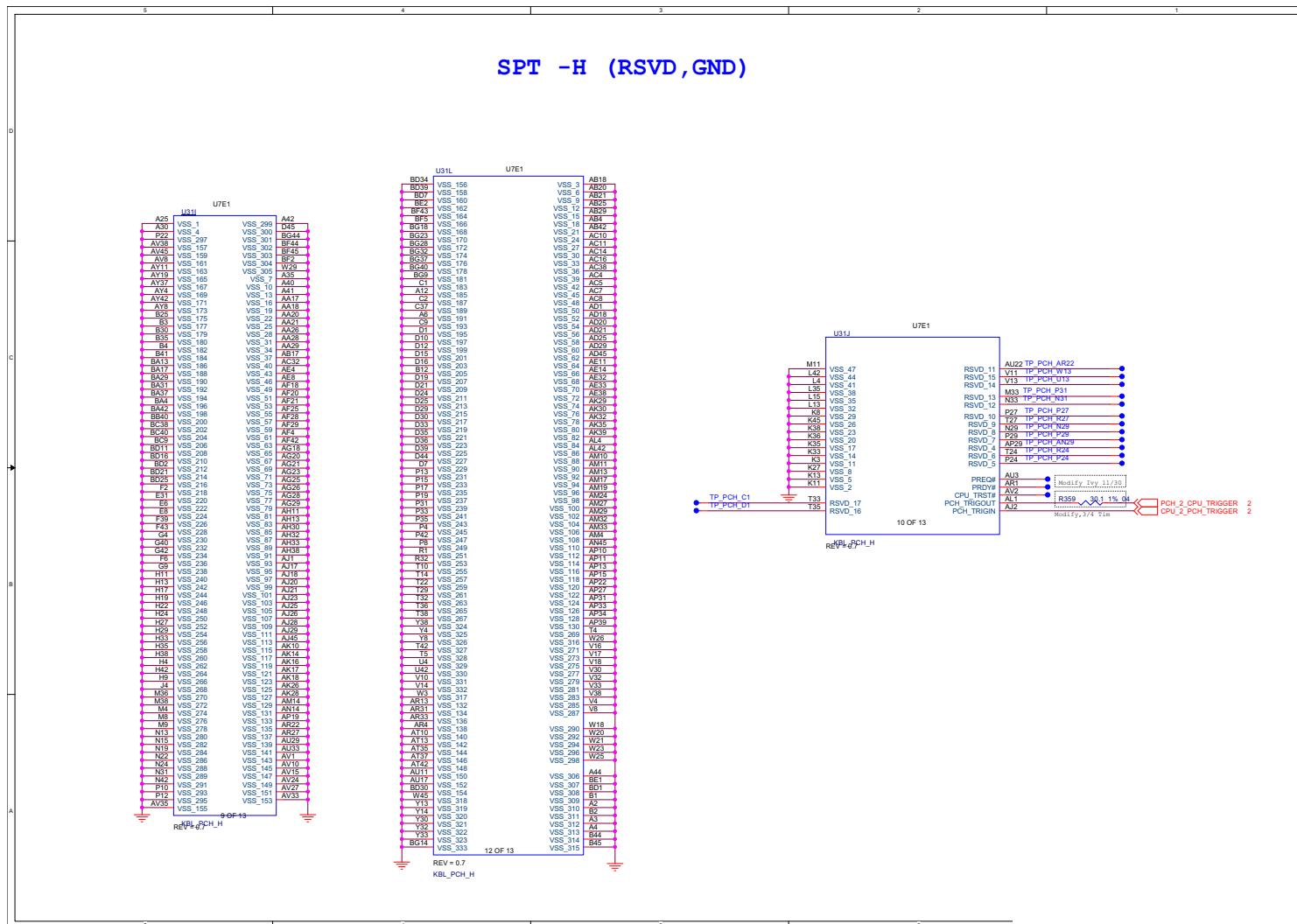
Sheet 20 of 62
SPT-H 6/7

B.Schematic Diagrams

Schematic Diagrams

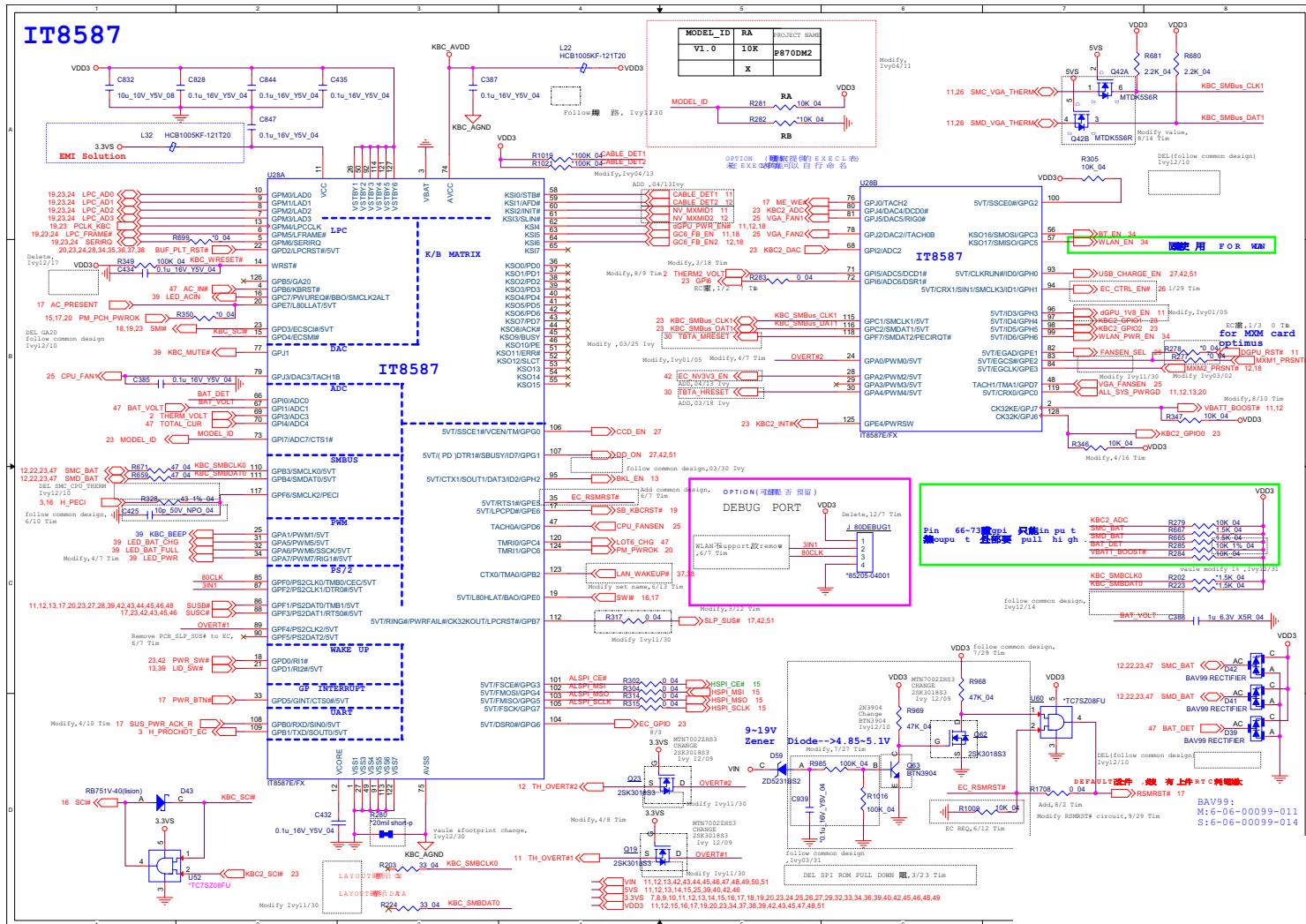
SPT-H 7/7

Sheet 21 of 62
SPT-H 7/7



Schematic Diagrams

Main EC IT8587



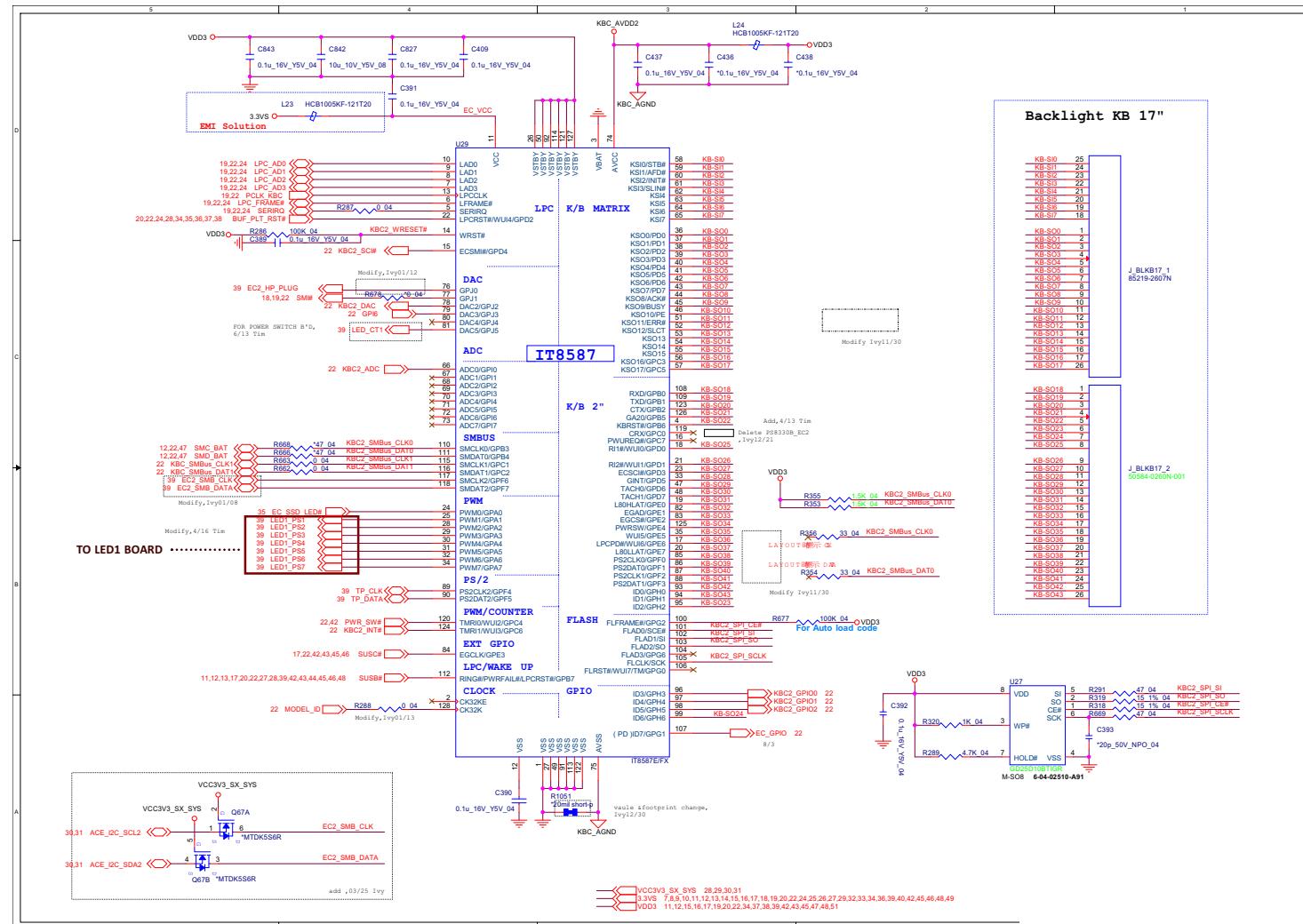
B.Schematic Diagrams

Sheet 22 of 62
Main EC IT8587

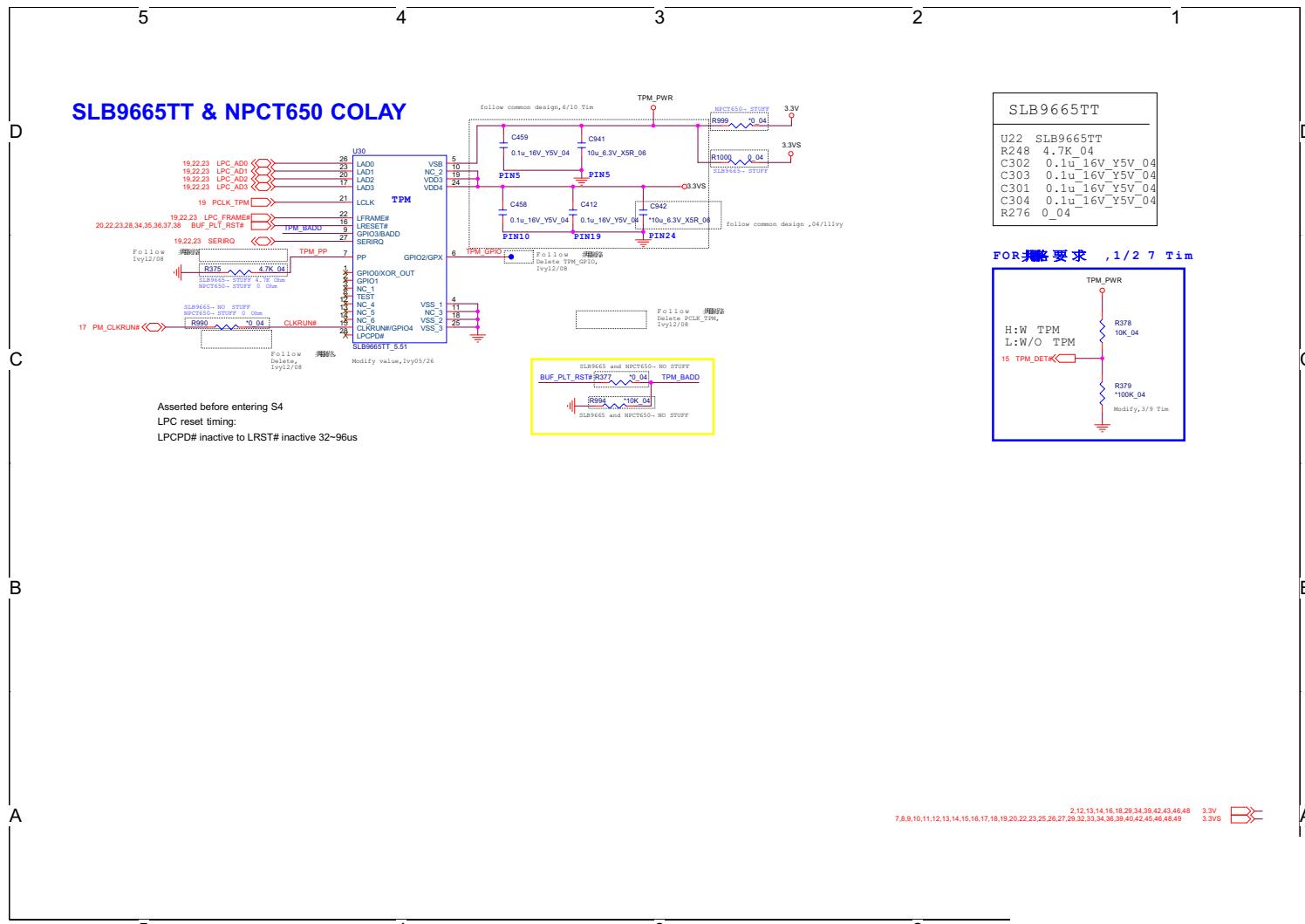
Schematic Diagrams

Second EC IT8587

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Second EC IT8587



TPM SLB9665TT



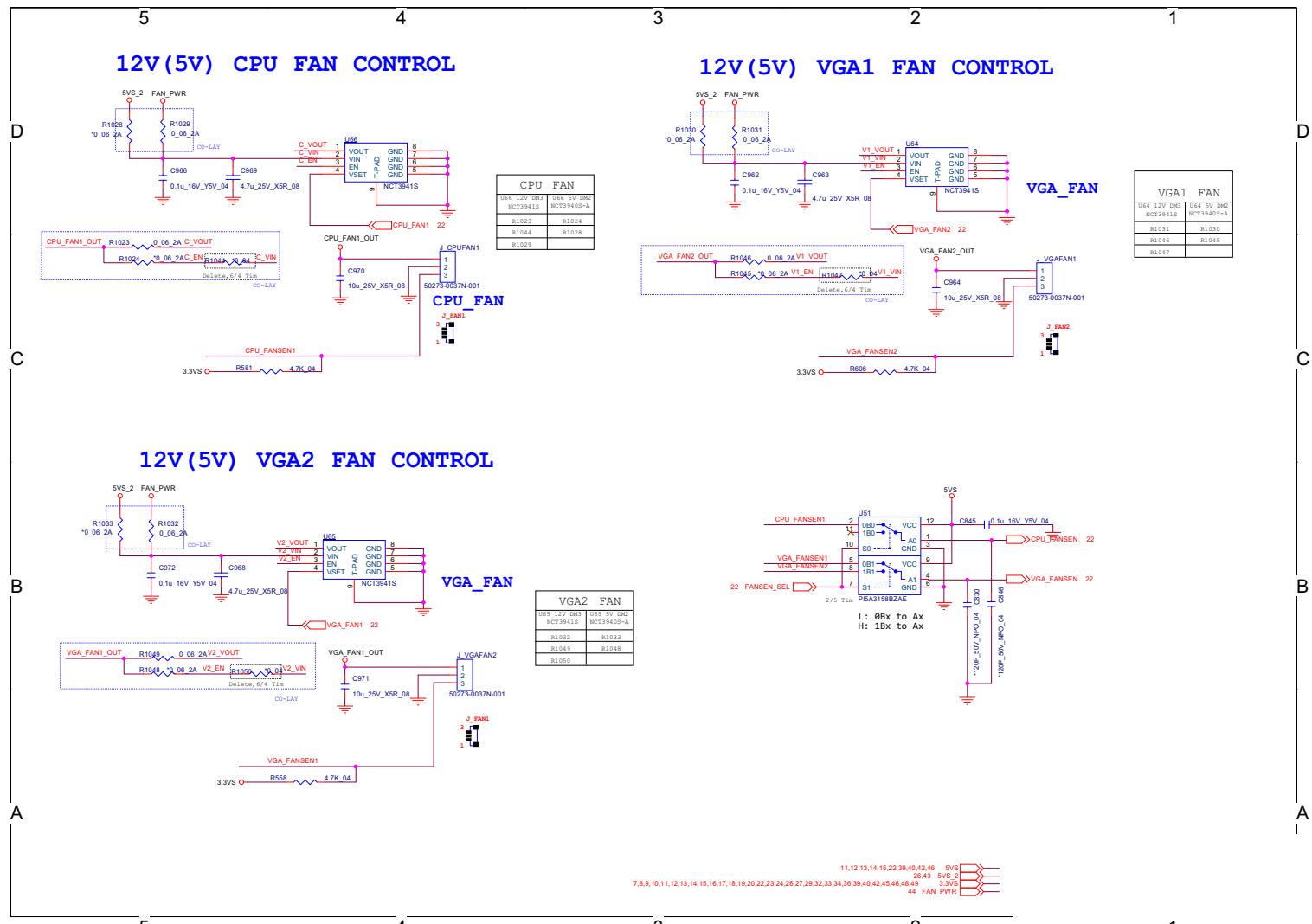
Sheet 24 of 62
TPM SLB9665TT

Schematic Diagrams

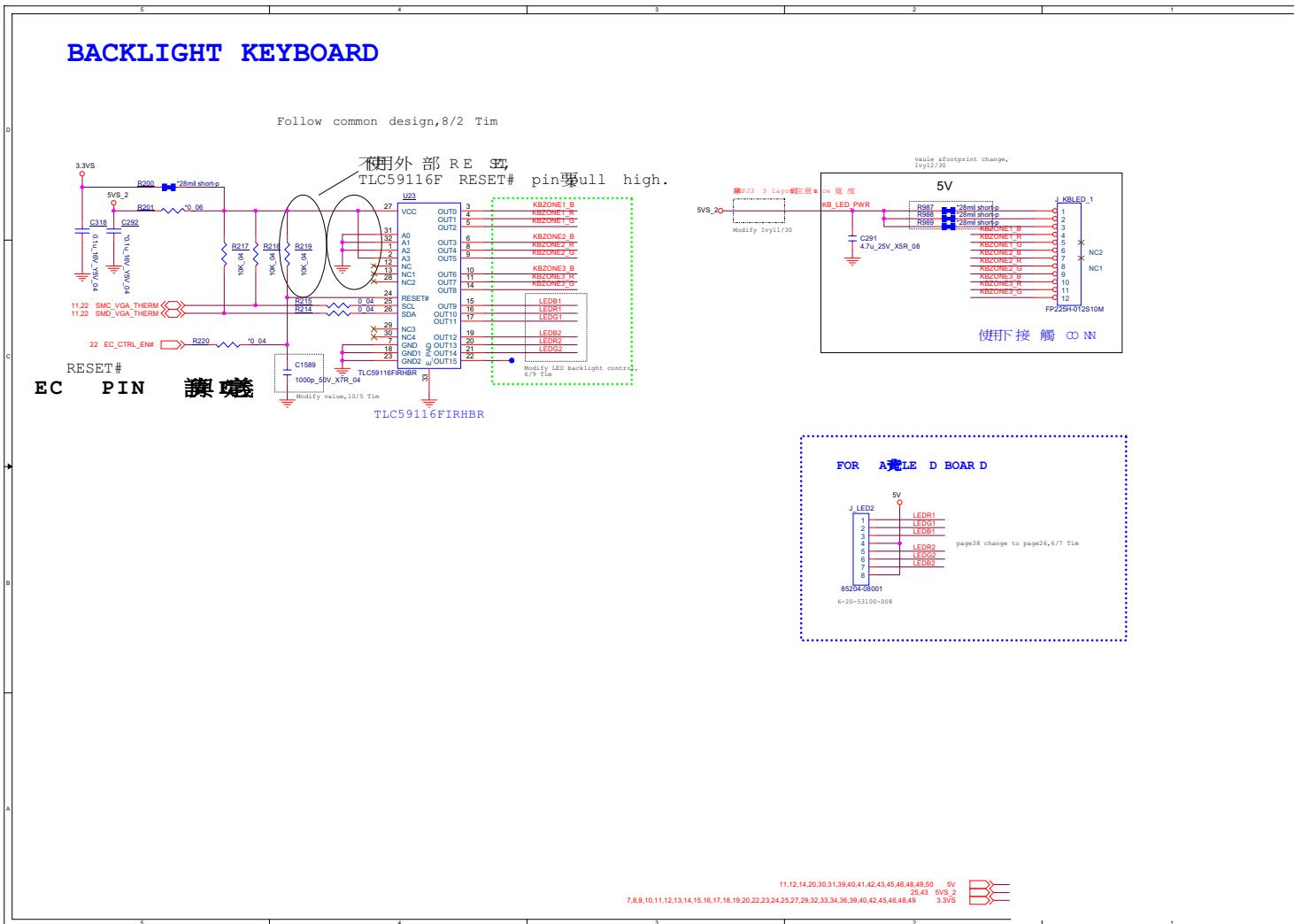
CPU, VGA Fan Conn

Sheet 25 of 62

CPU, VGA Fan Conn



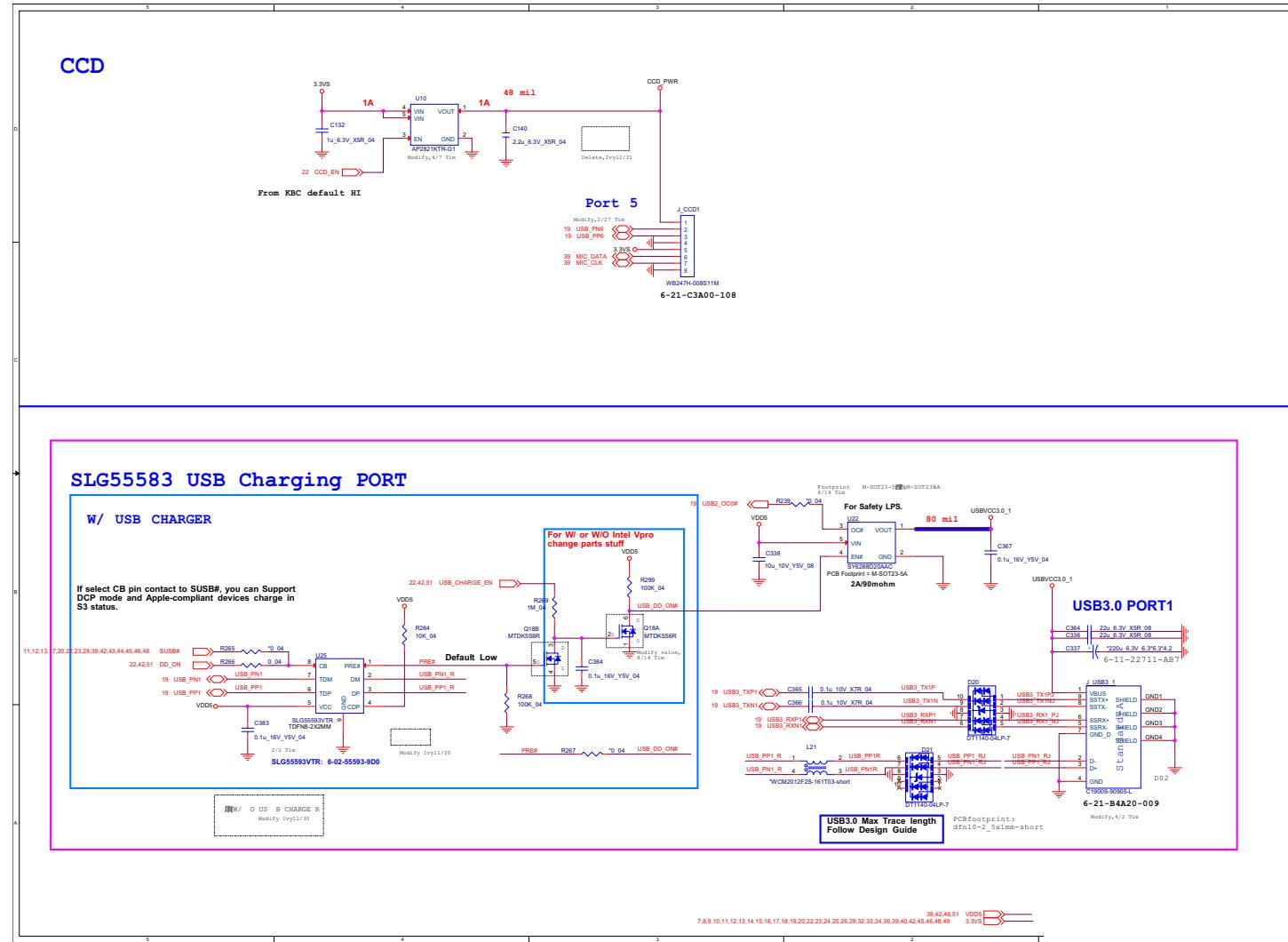
Backlight Keyboard



Sheet 26 of 62
Backlight Keyboard

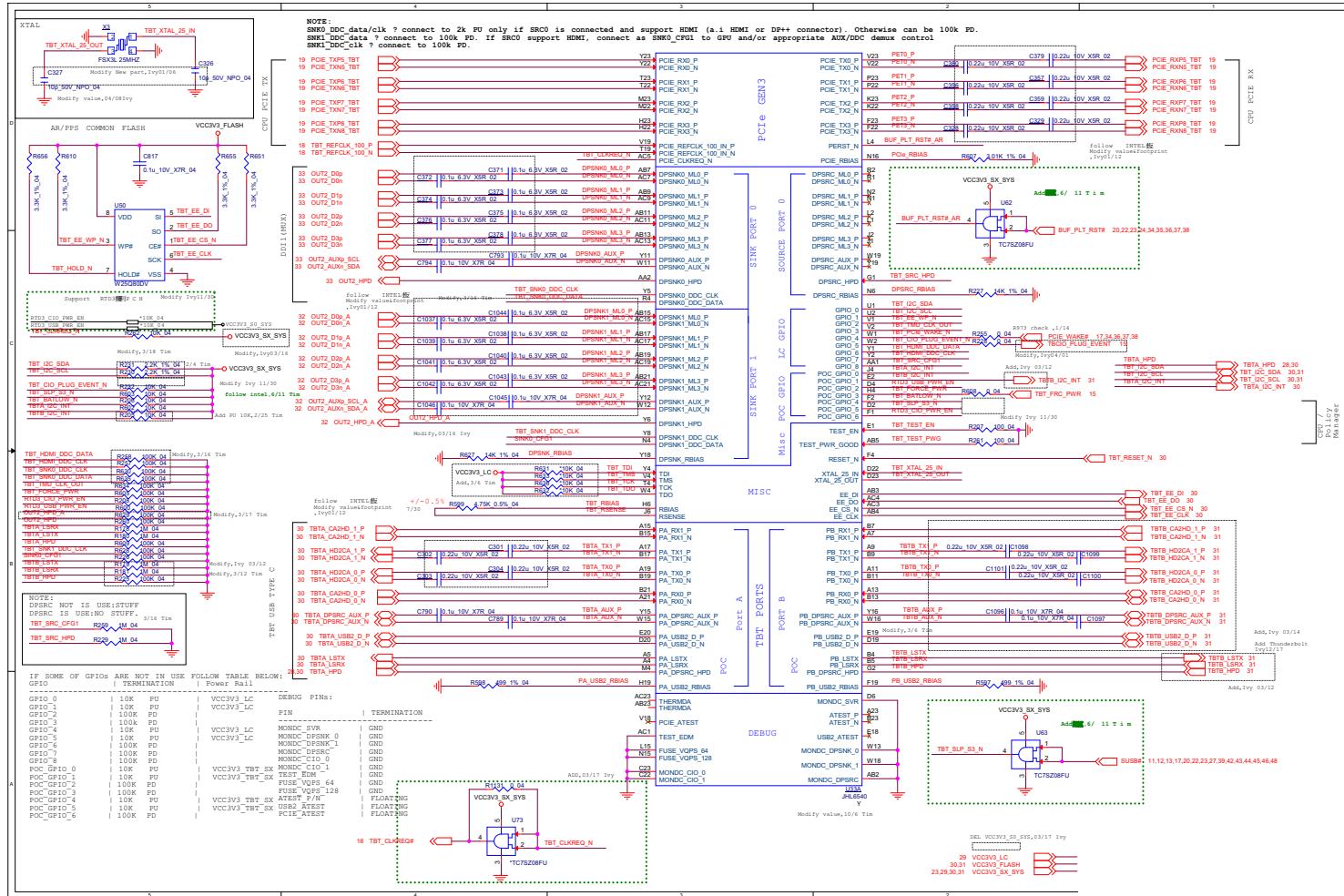
Schematic Diagrams**CCD, USB Charging**

Sheet 27 of 62
CCD, USB
Charging



Schematic Diagrams

AR_TBT

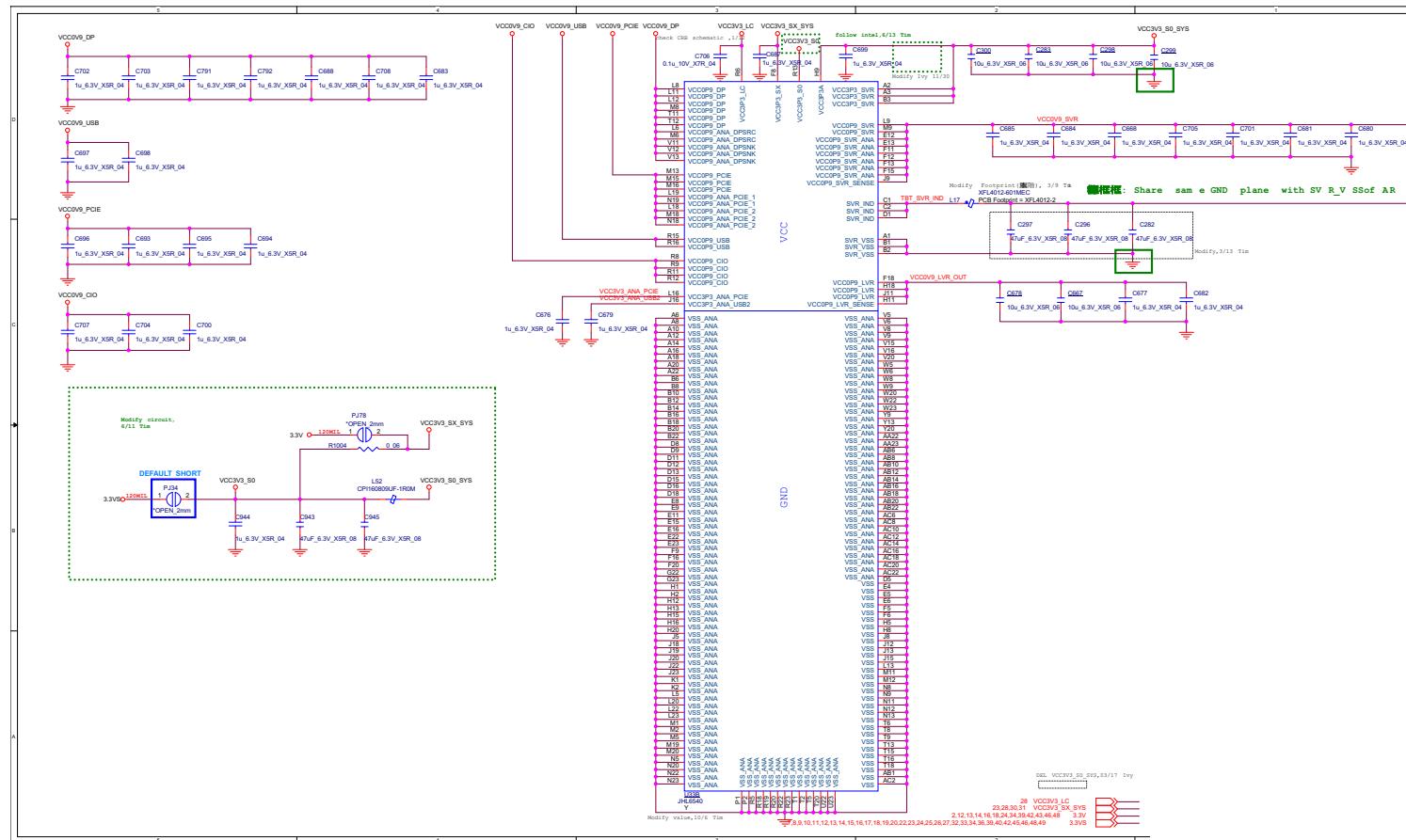


B.Schematic Diagrams

B.Schematic Diagrams

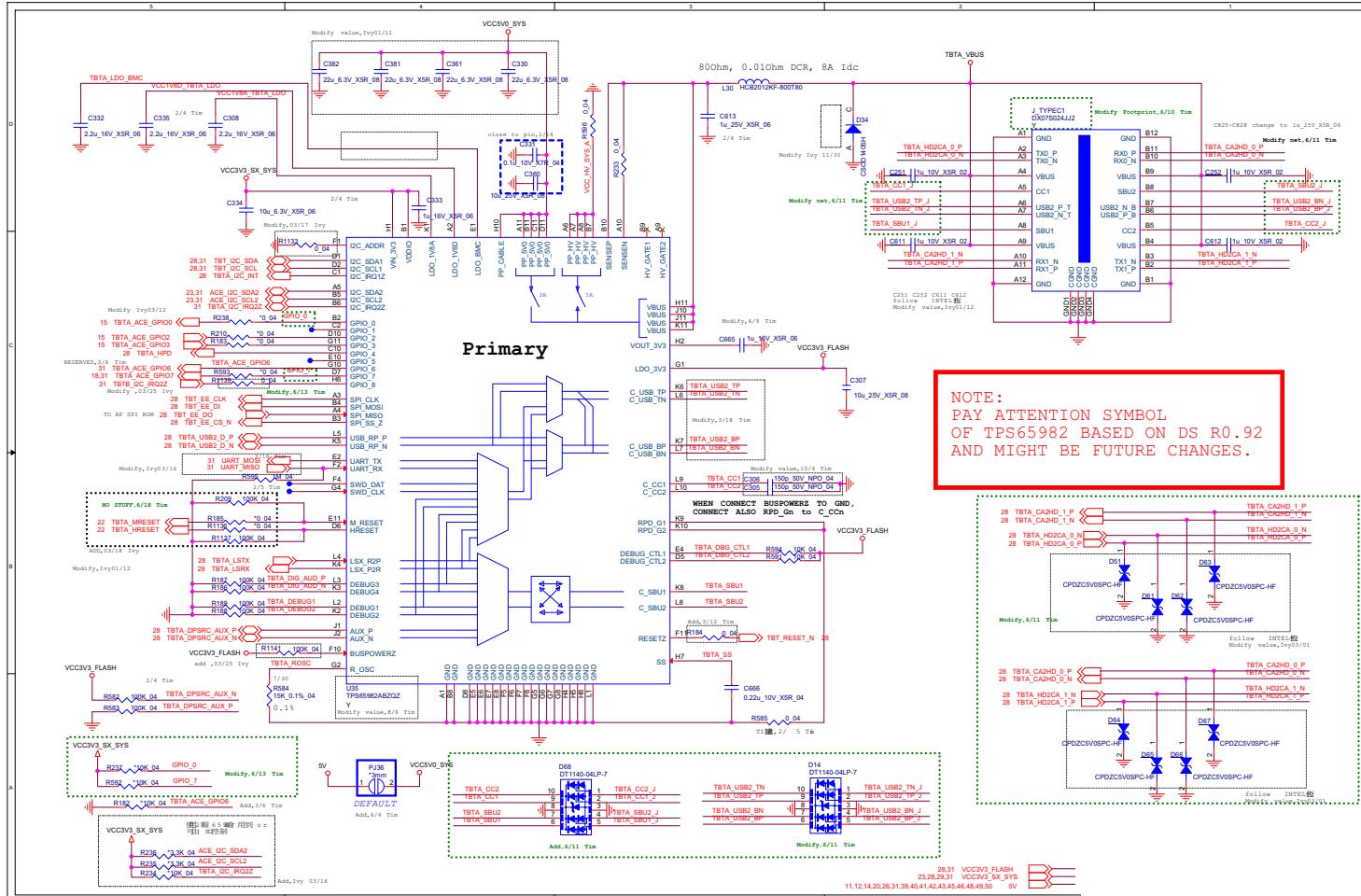
Schematic Diagrams

AR_Power



Sheet 29 of 62
AR_Power

TPS65982, Type C1



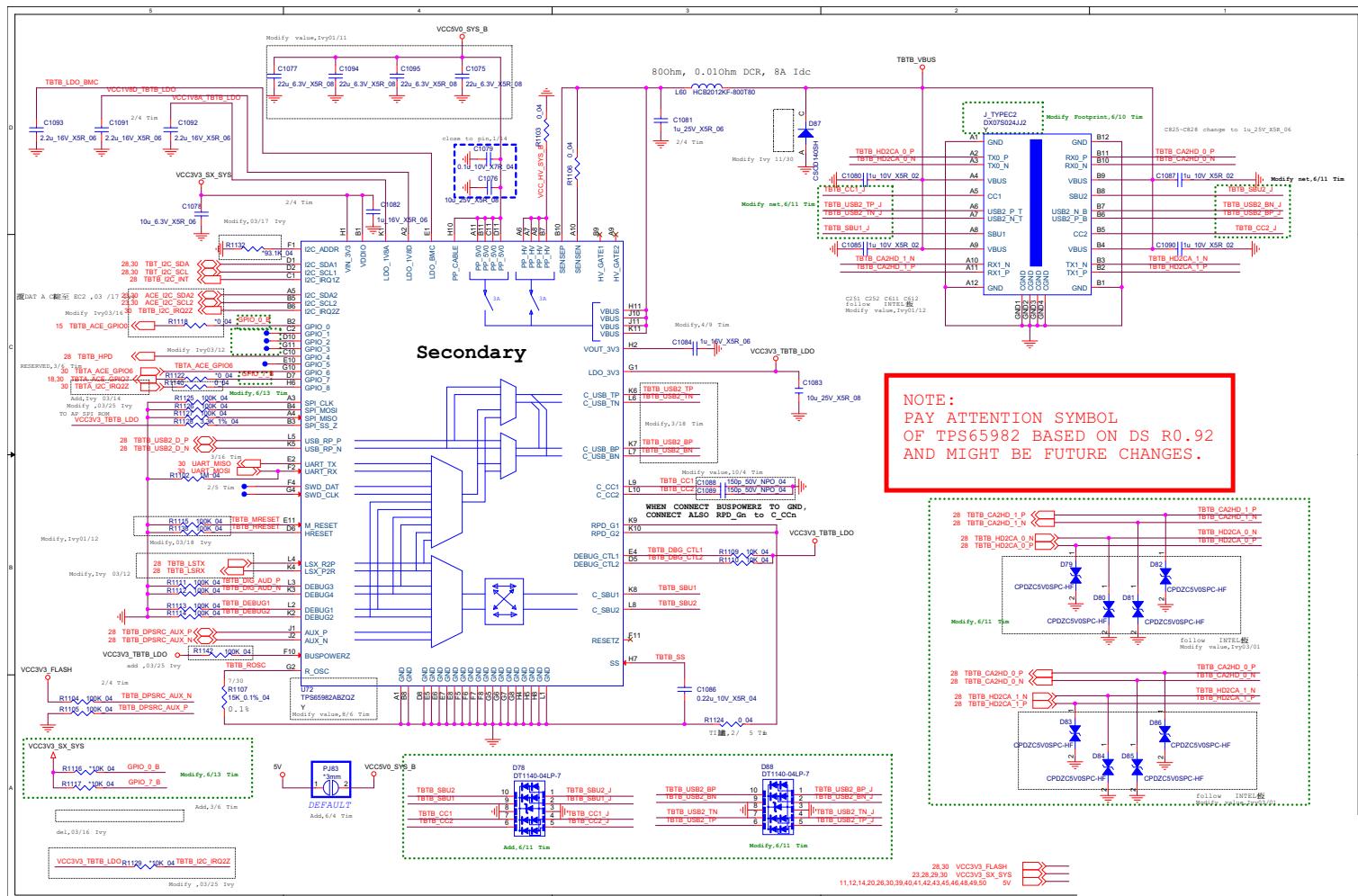
Sheet 30 of 62
TPS65982, Type C1

B.Schematic Diagrams

Schematic Diagrams

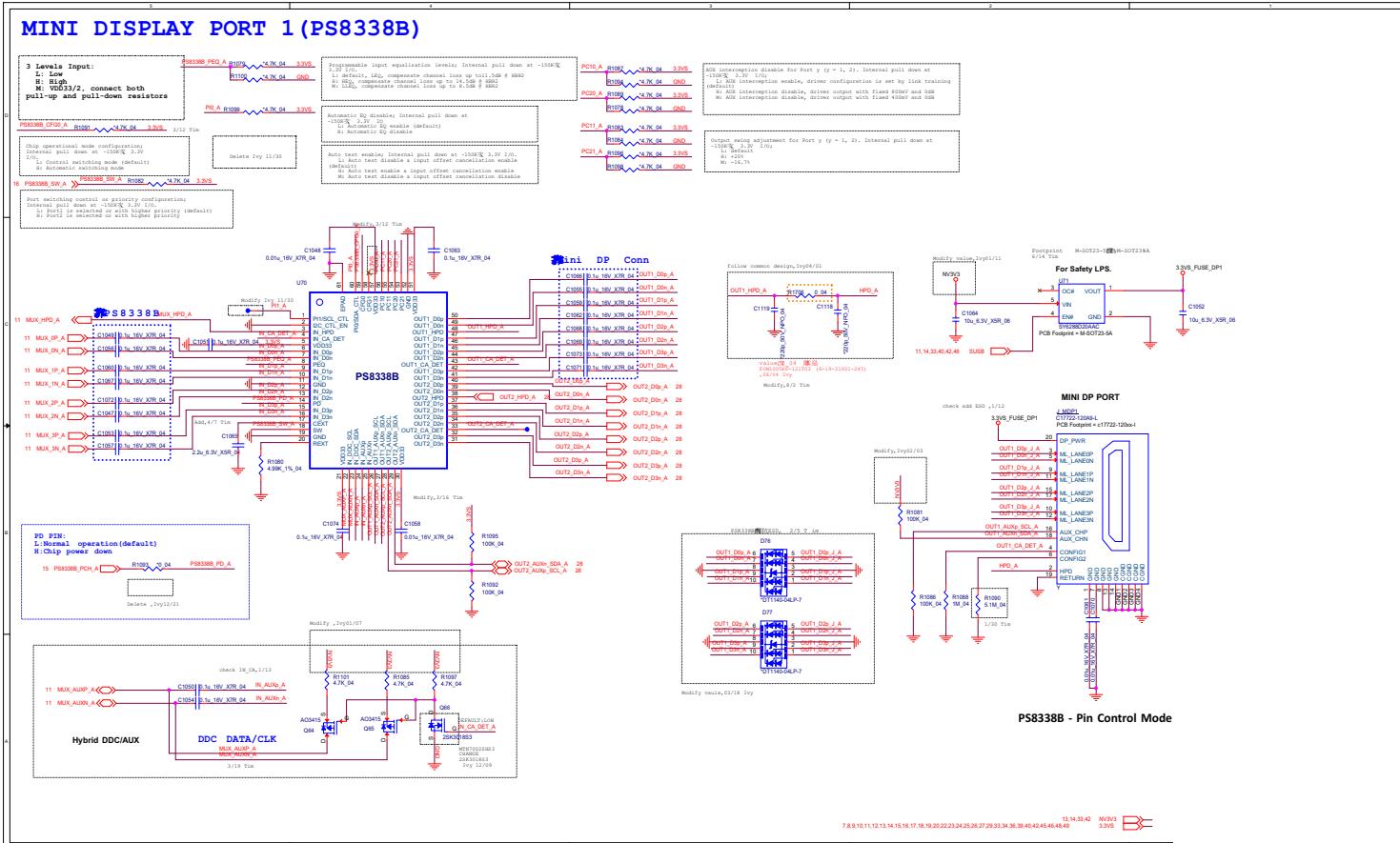
TPS65982, Type C2

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TPS65982, Type C2



Schematic Diagrams

PS8338B+mDP_1



Sheet 32 of 62
PS8338B+mDP 1

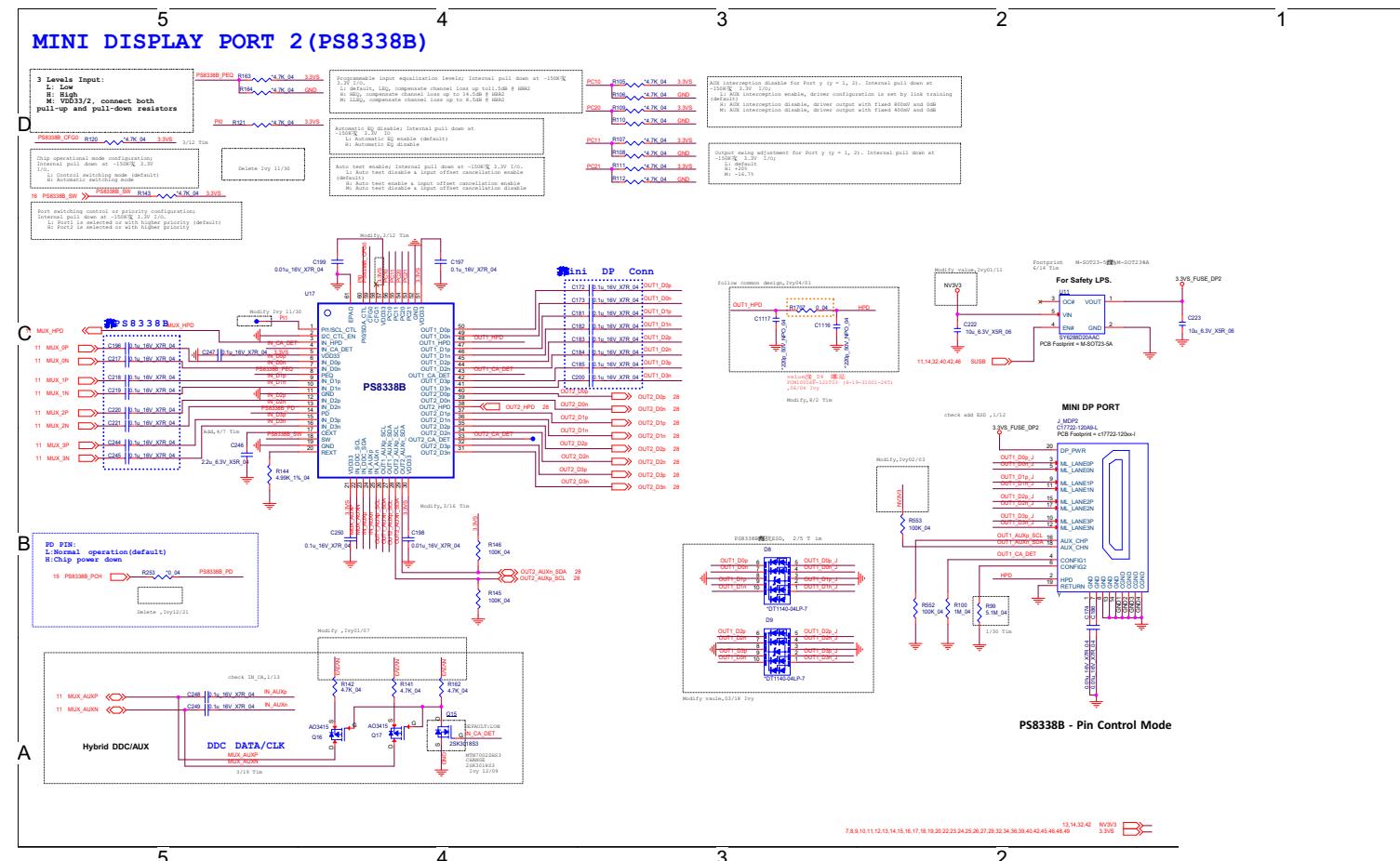
B.Schematic Diagrams

B.Schematic Diagrams

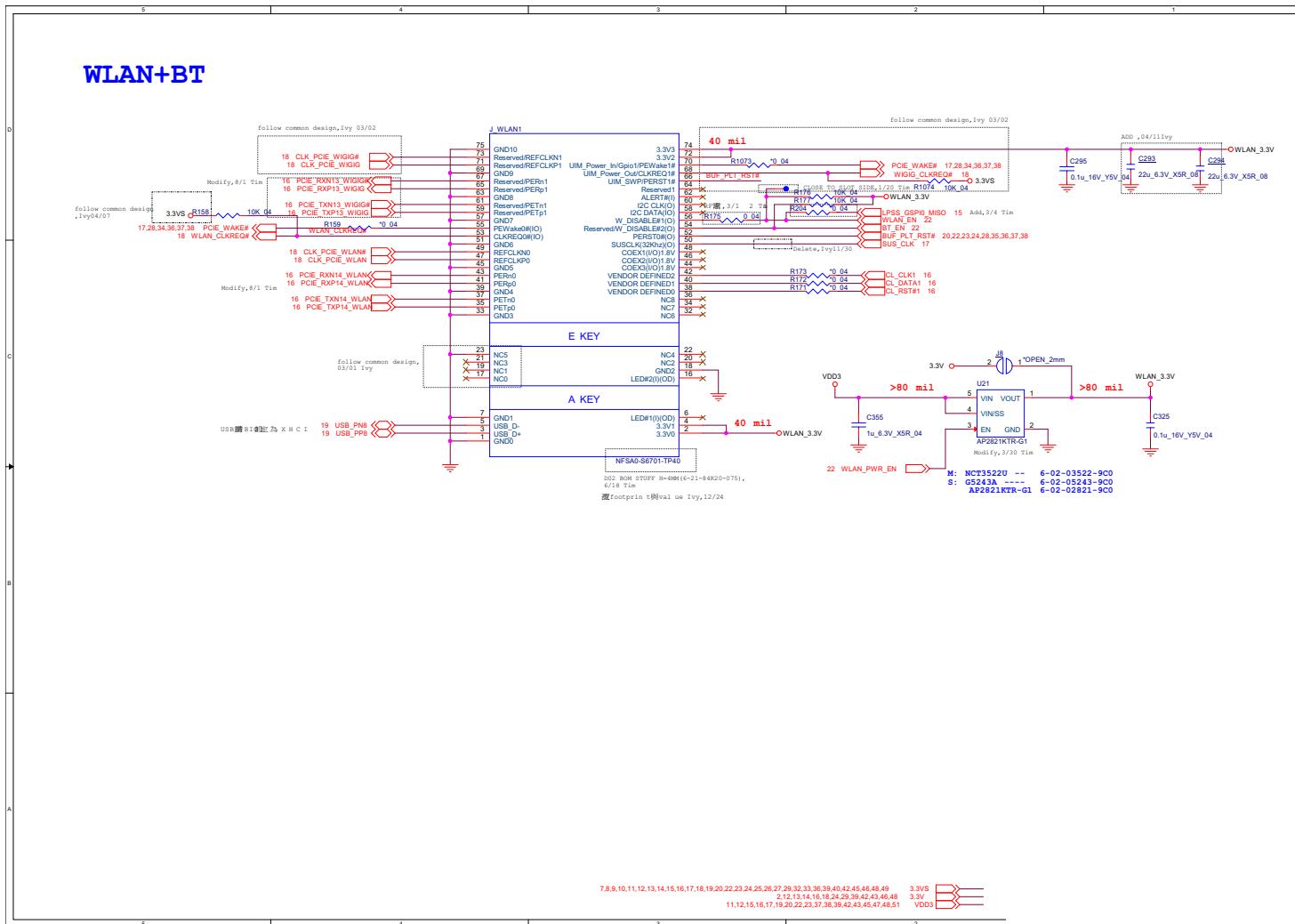
Schematic Diagrams

PS8338B+mDP_2

Sheet 33 of 62
PS8338B+mDP_2



M.2 WLAN+BT

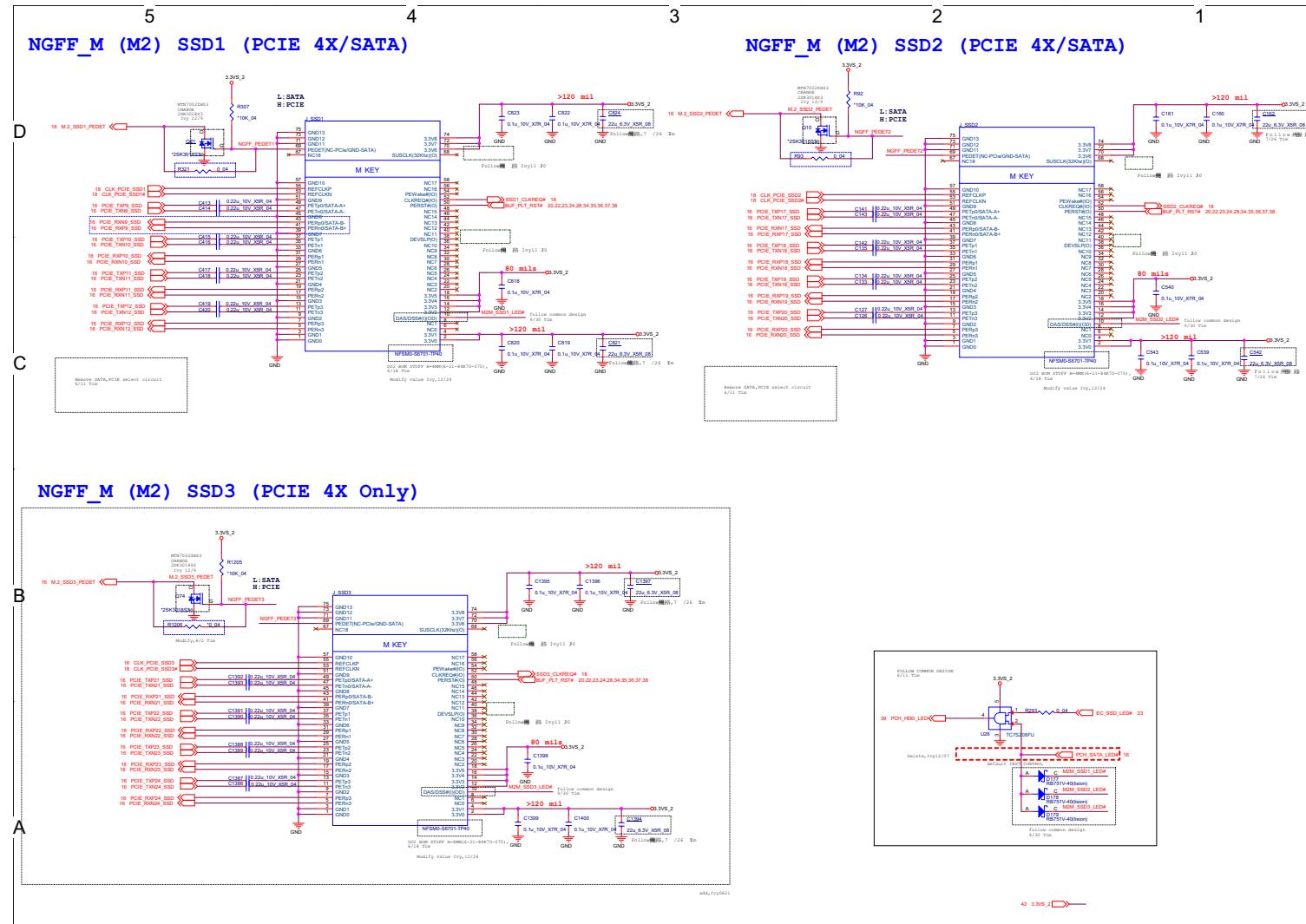


Sheet 34 of 62
M.2 WLAN+BT

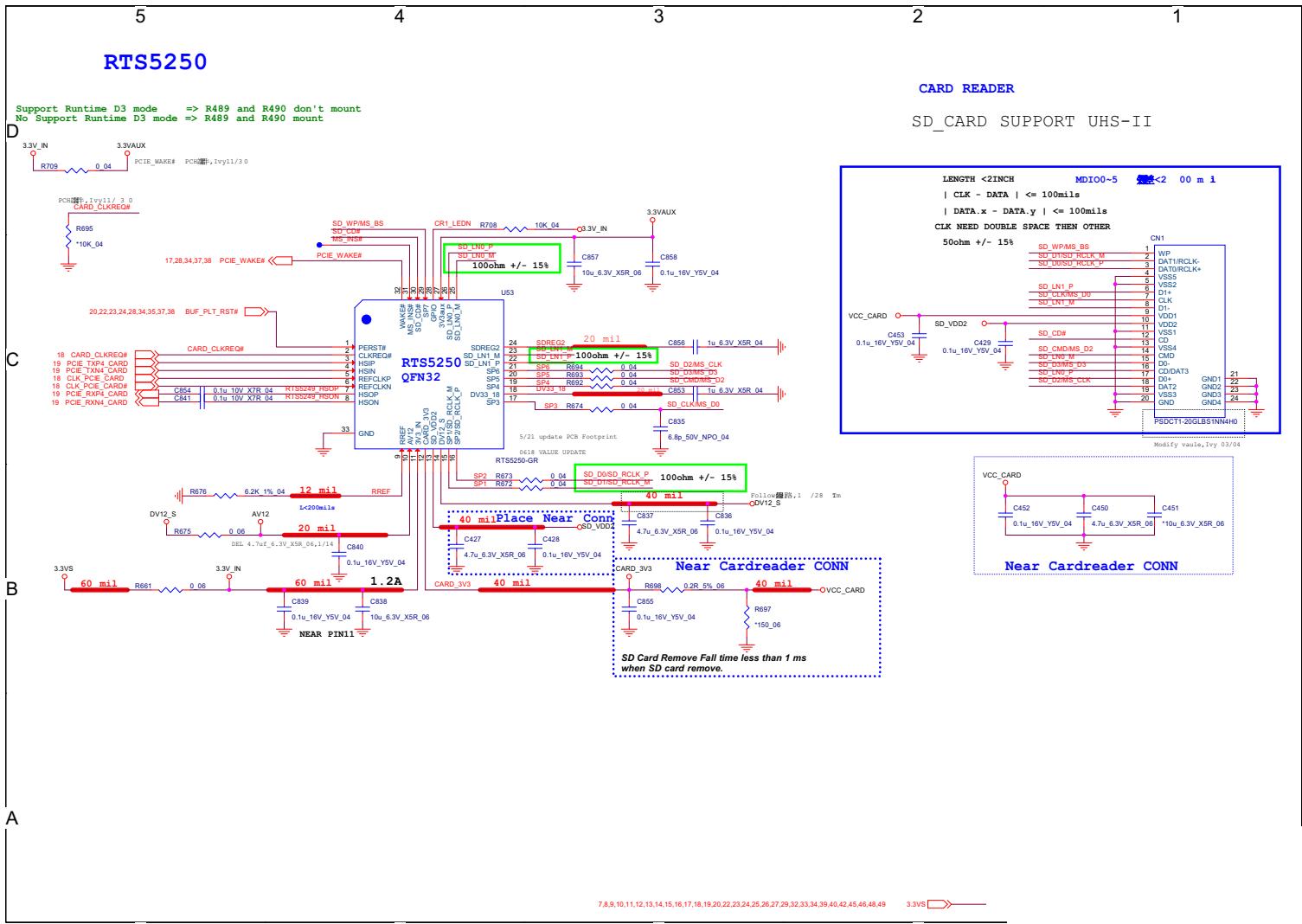
B.Schematic Diagrams

Schematic Diagrams

M.2 M Key



RTS5250



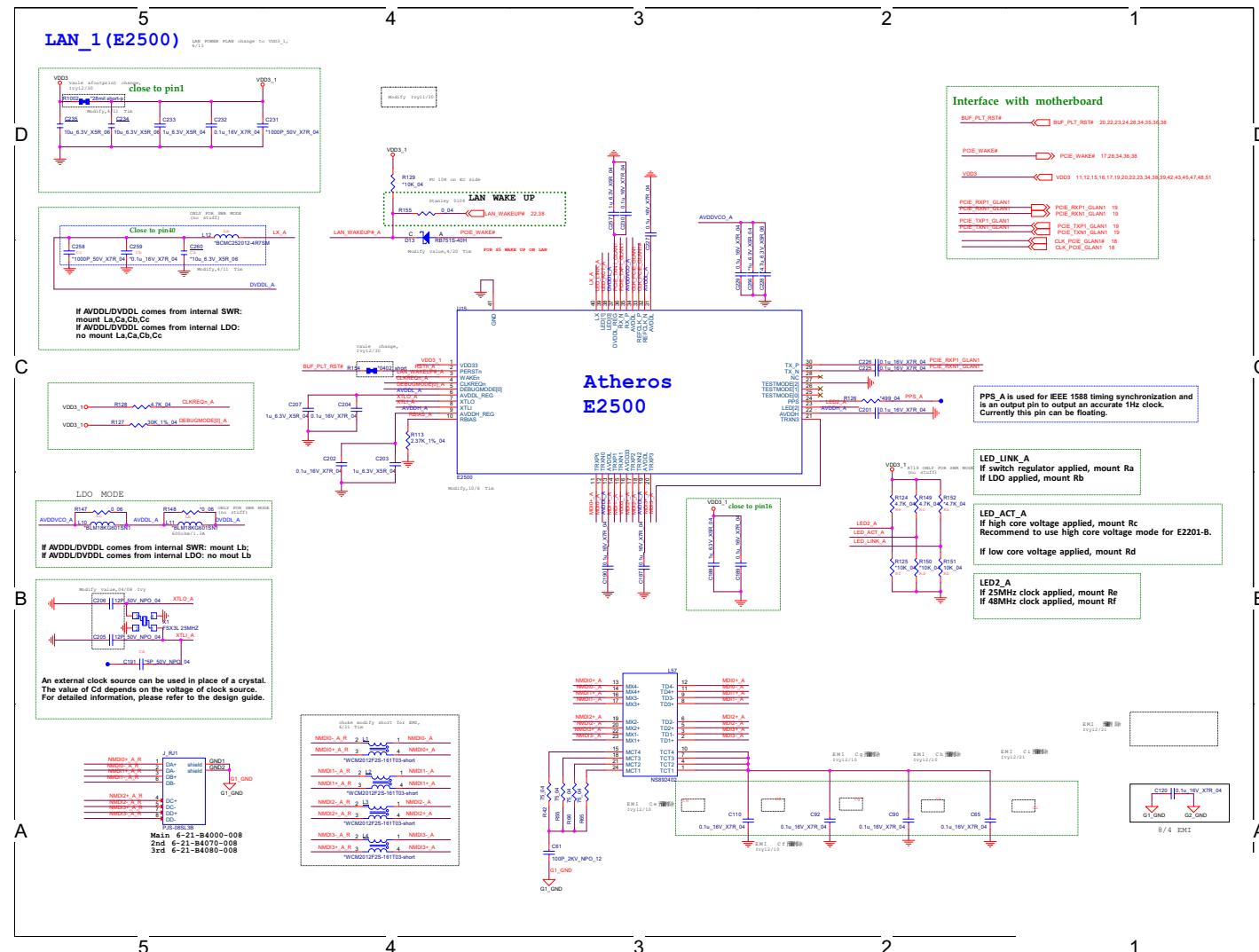
Sheet 36 of 62
RTS5250

B.Schematic Diagrams

Schematic Diagrams

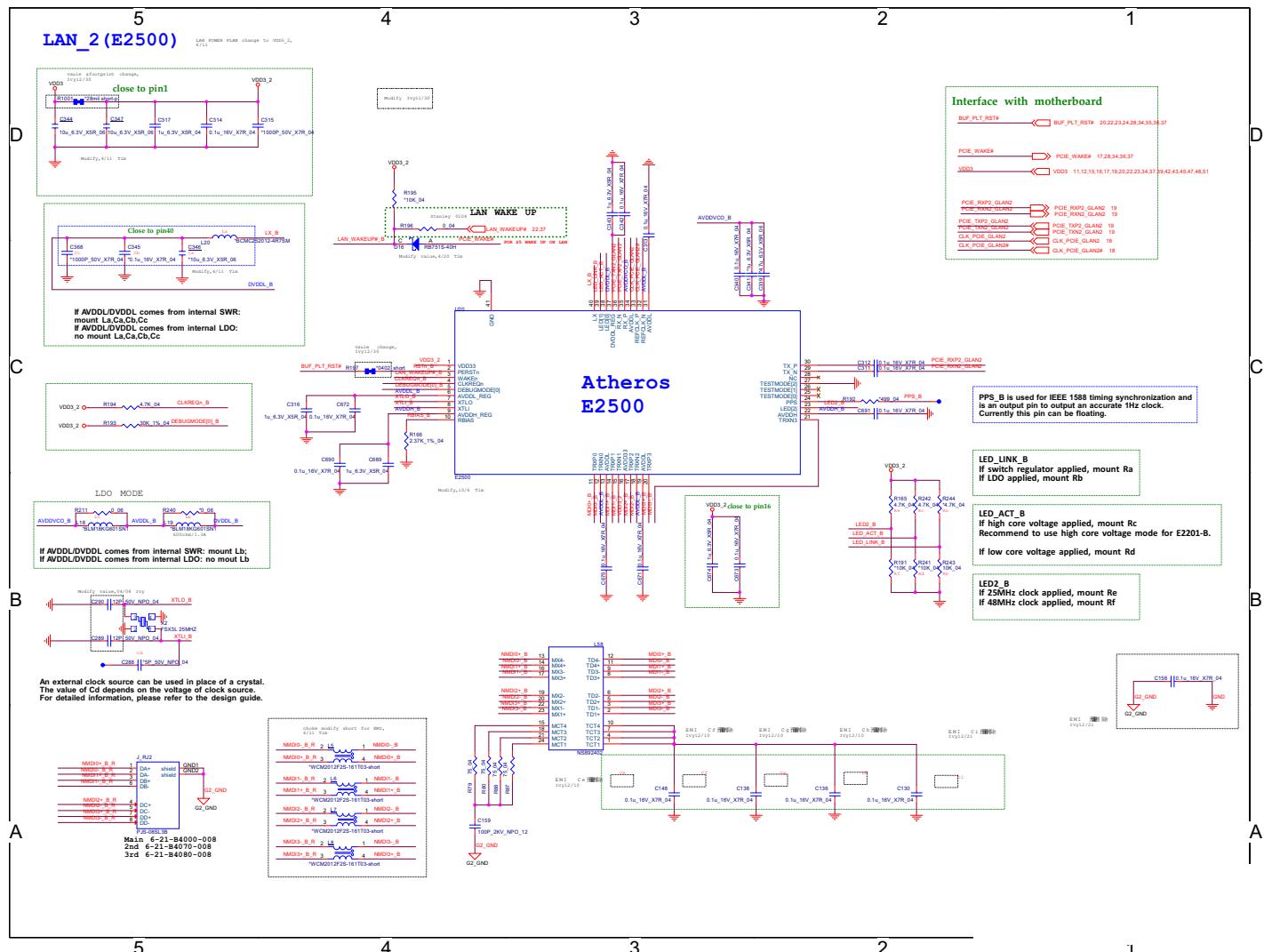
LAN_1 E2500

Sheet 37 of 62
LAN_1 E2500



Schematic Diagrams

LAN_2 E2500

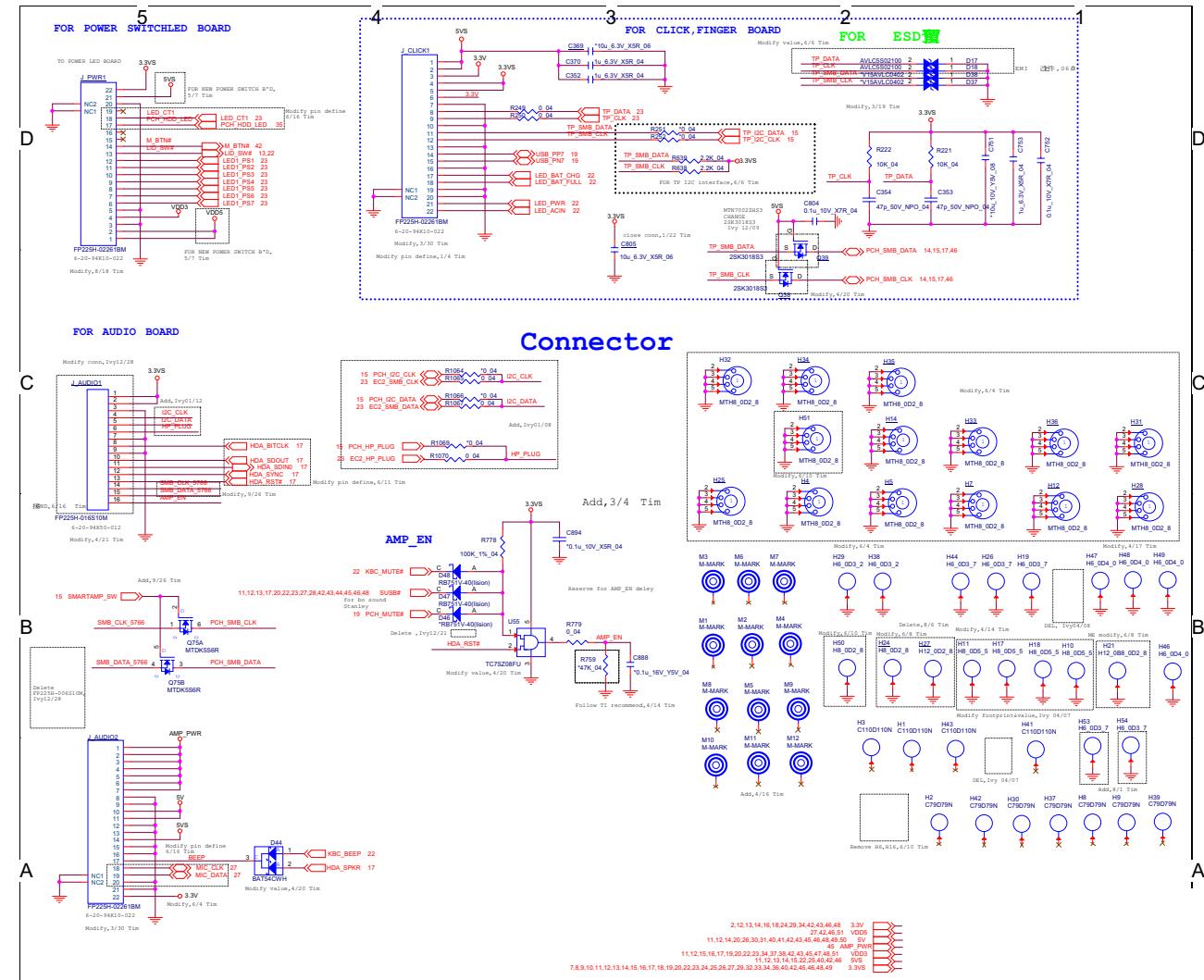


Sheet 38 of 62
LAN_2 E2500

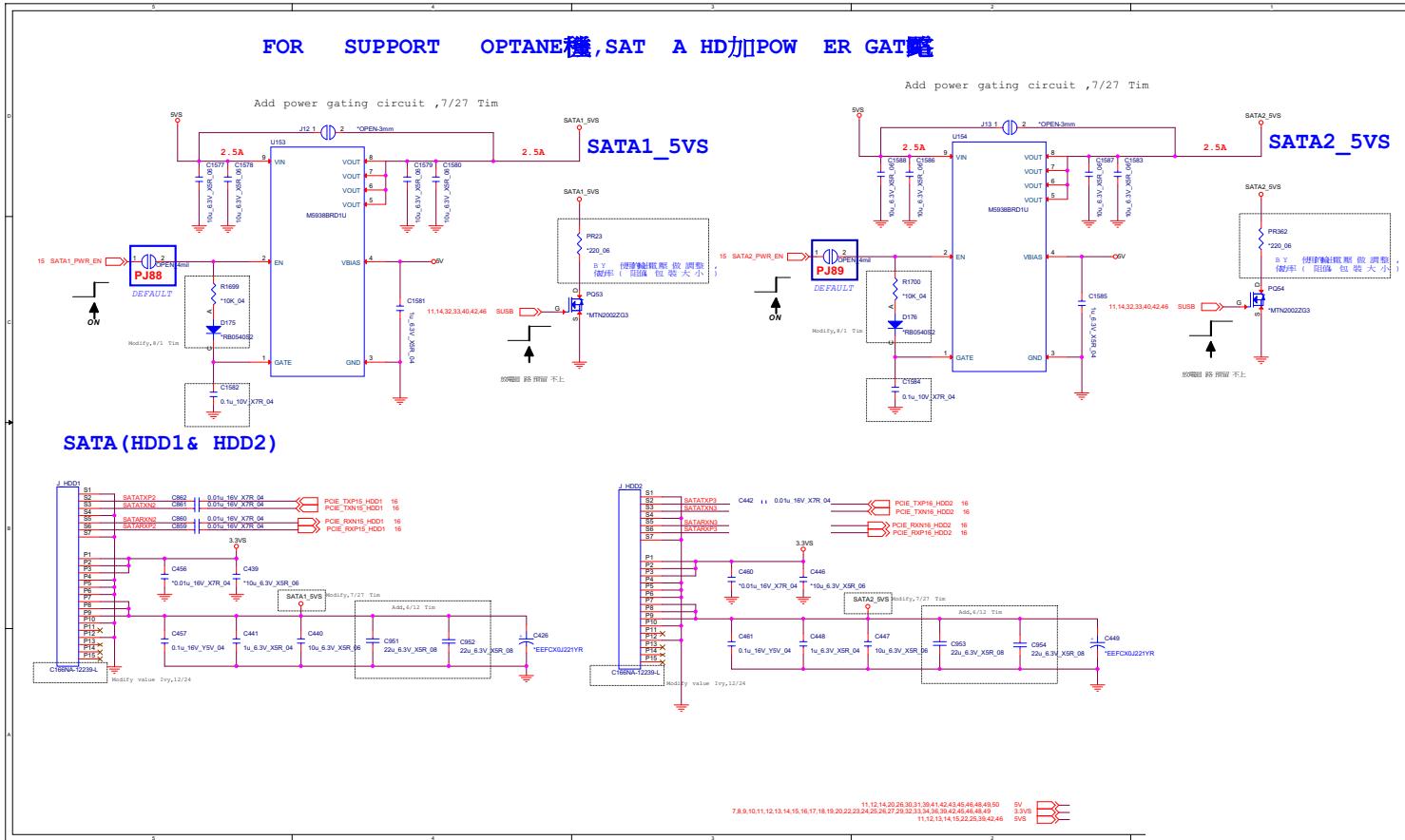
B.Schematic Diagrams

Schematic Diagrams

Click, Finger Conn



HDD & Second HDD

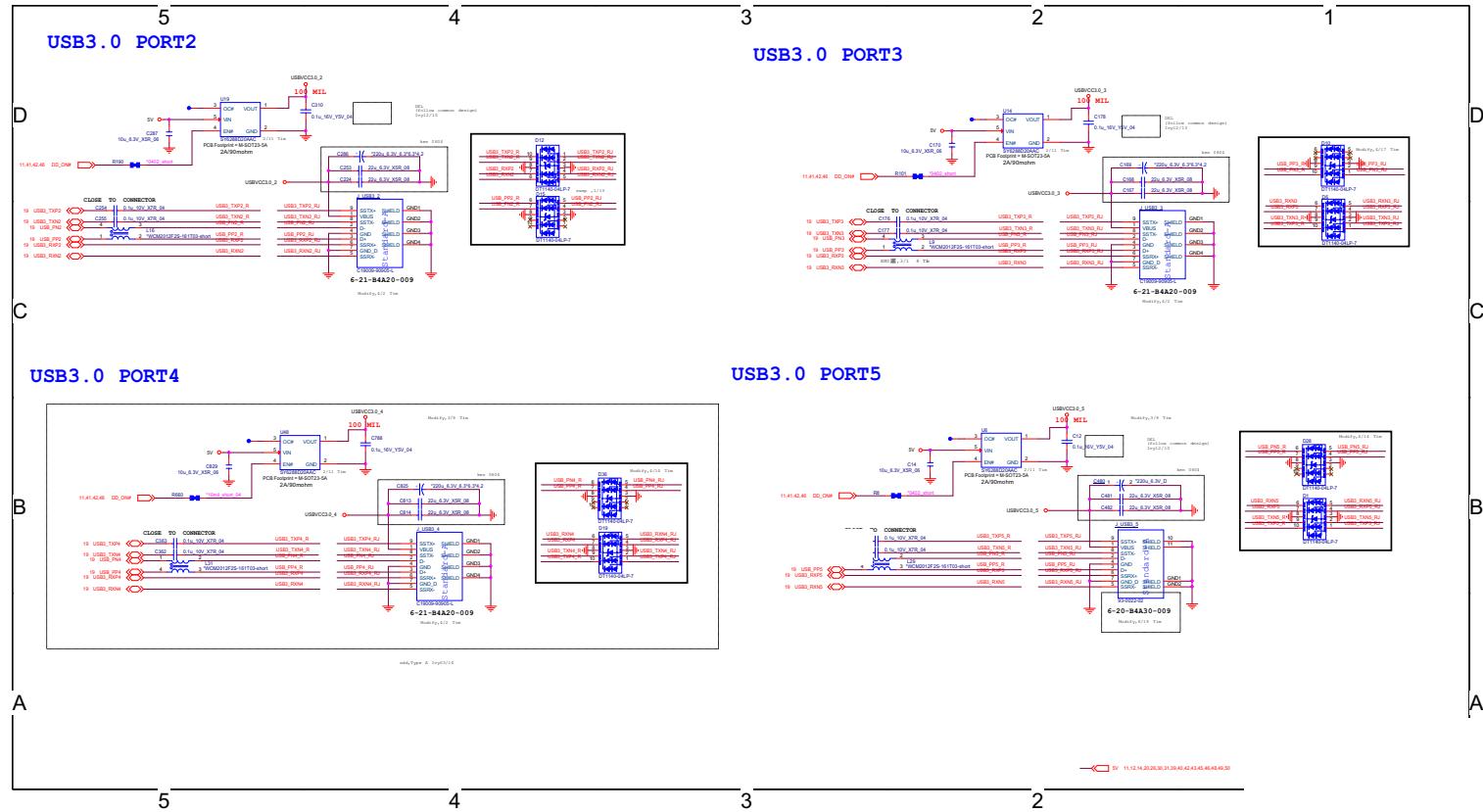


Sheet 40 of 62
HDD & Second
HDD

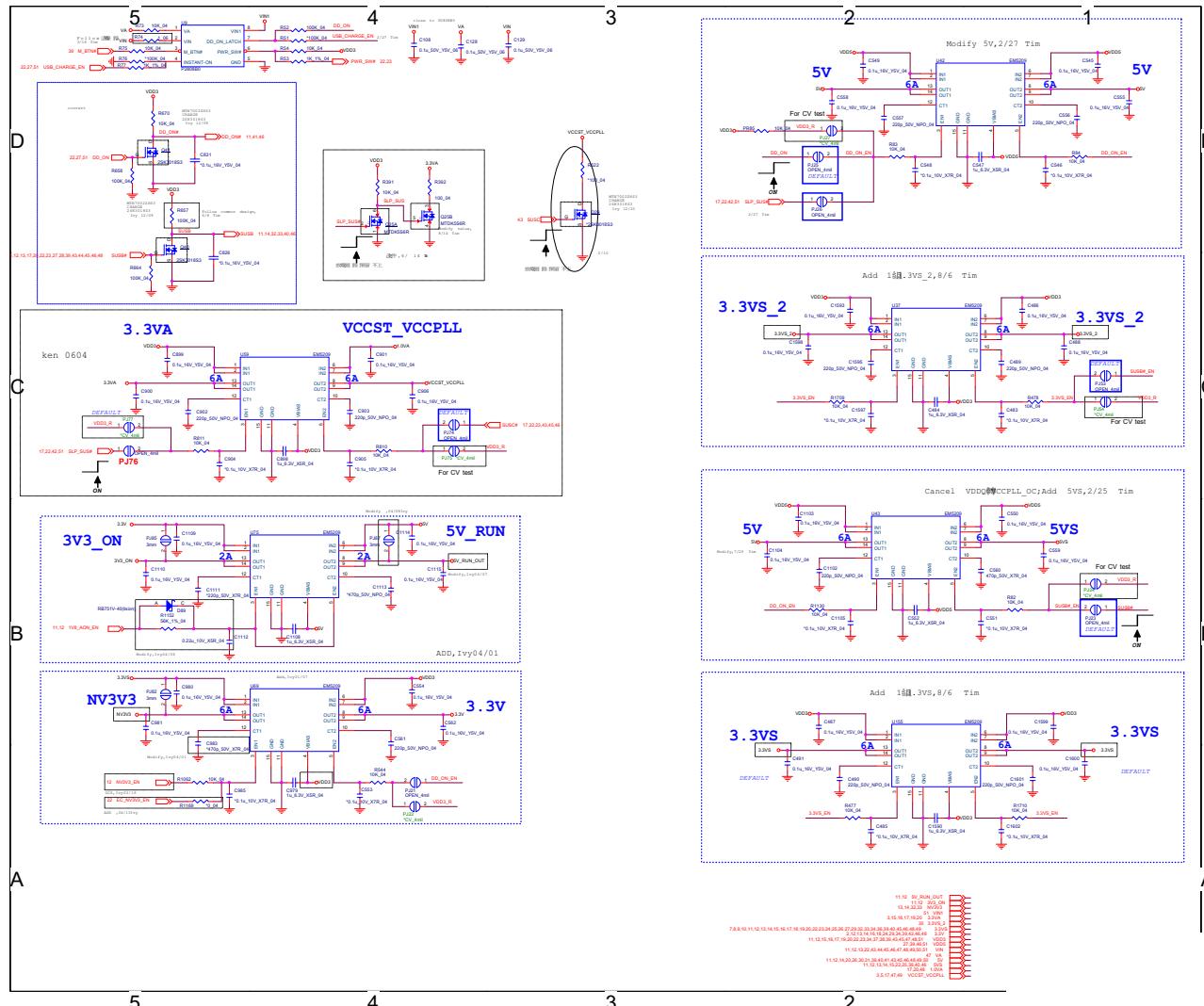
Schematic Diagrams

USB Port

Sheet 41 of 62
USB Port



5VS, 3.3VS, 1.0 V Series



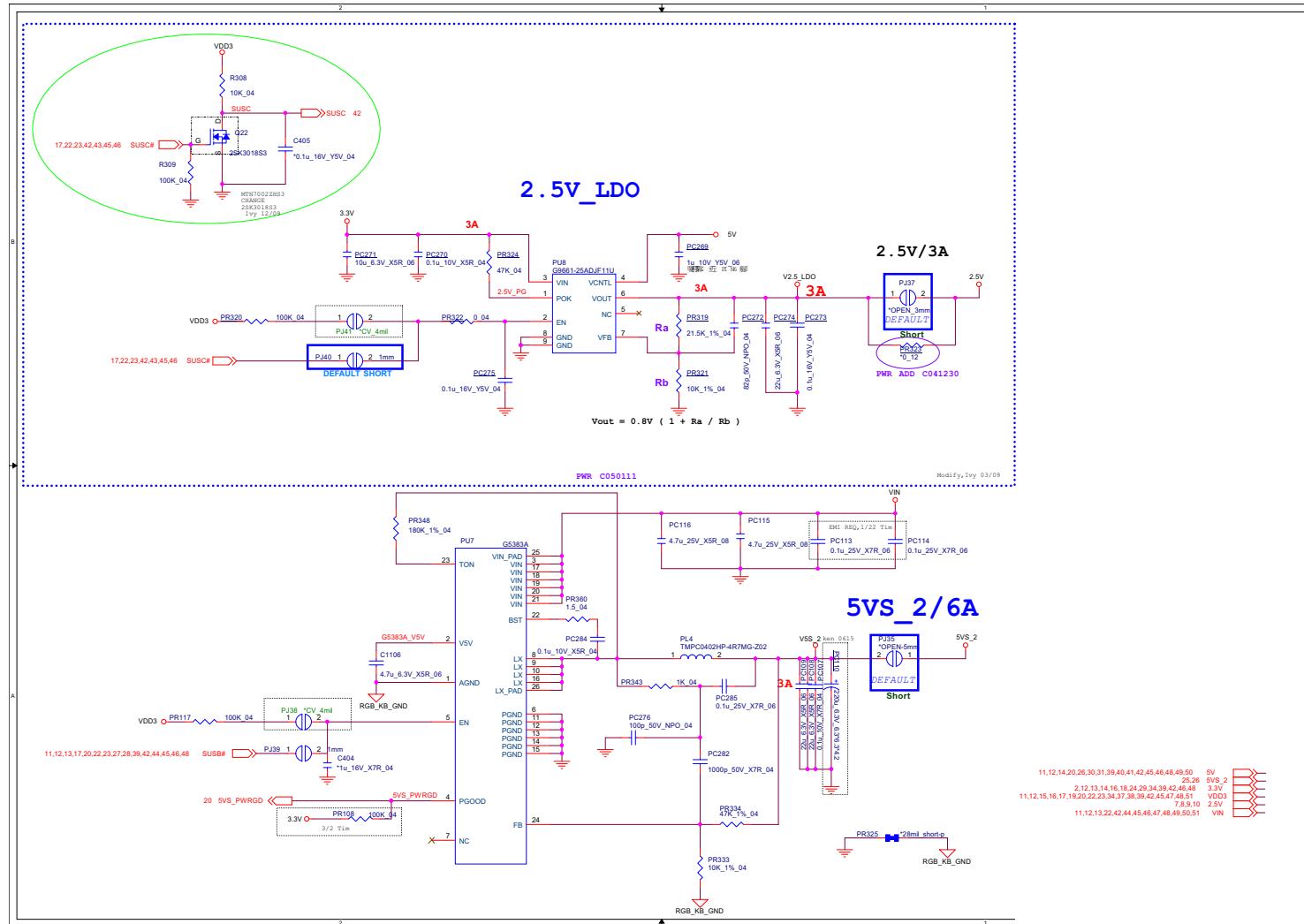
Sheet 42 of 62
5VS, 3.3VS, 1.0V
Series

B. Schematic Diagrams

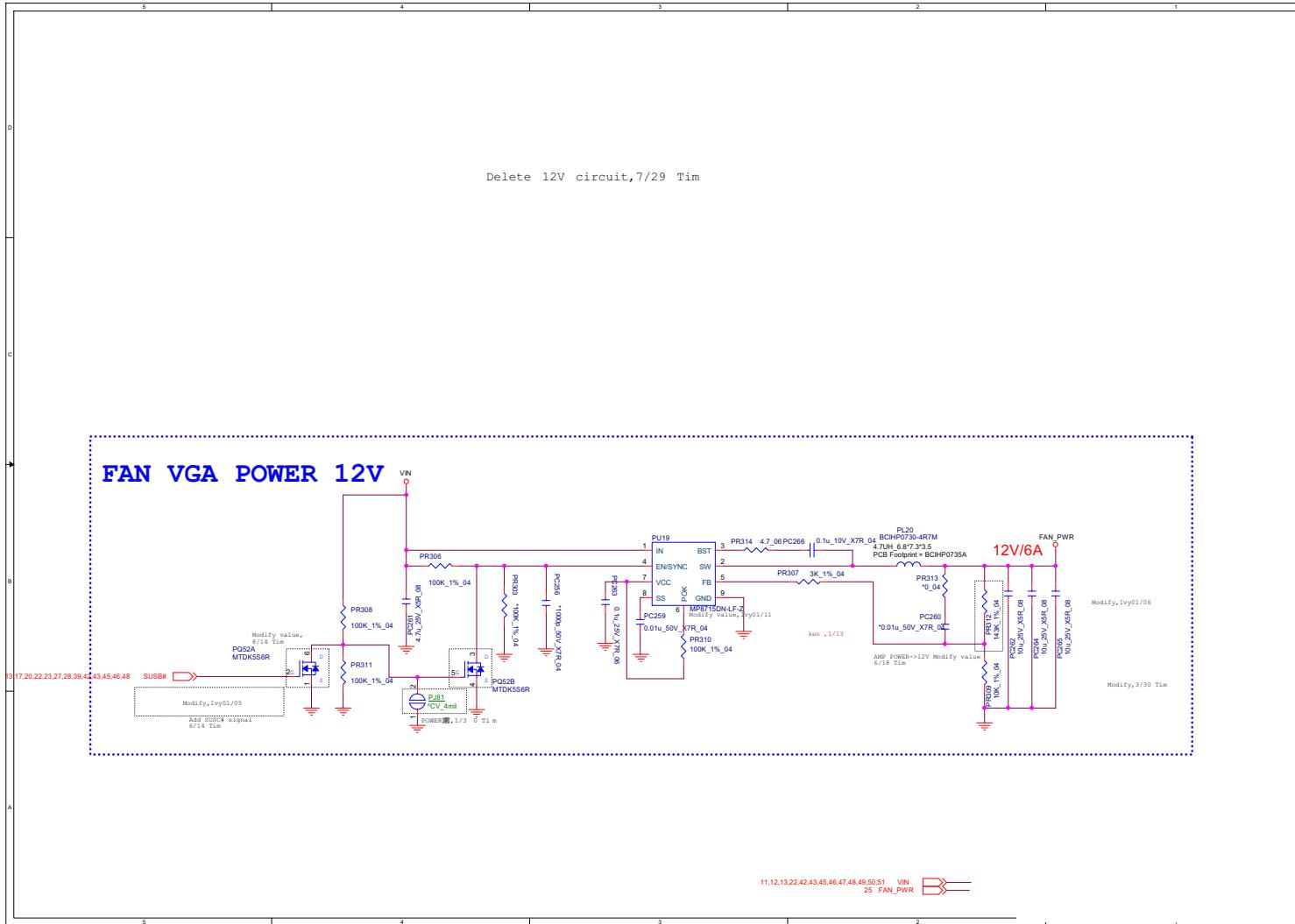
Schematic Diagrams

2.5V, 5VS_2

Sheet 43 of 62
2.5V, 5VS_2



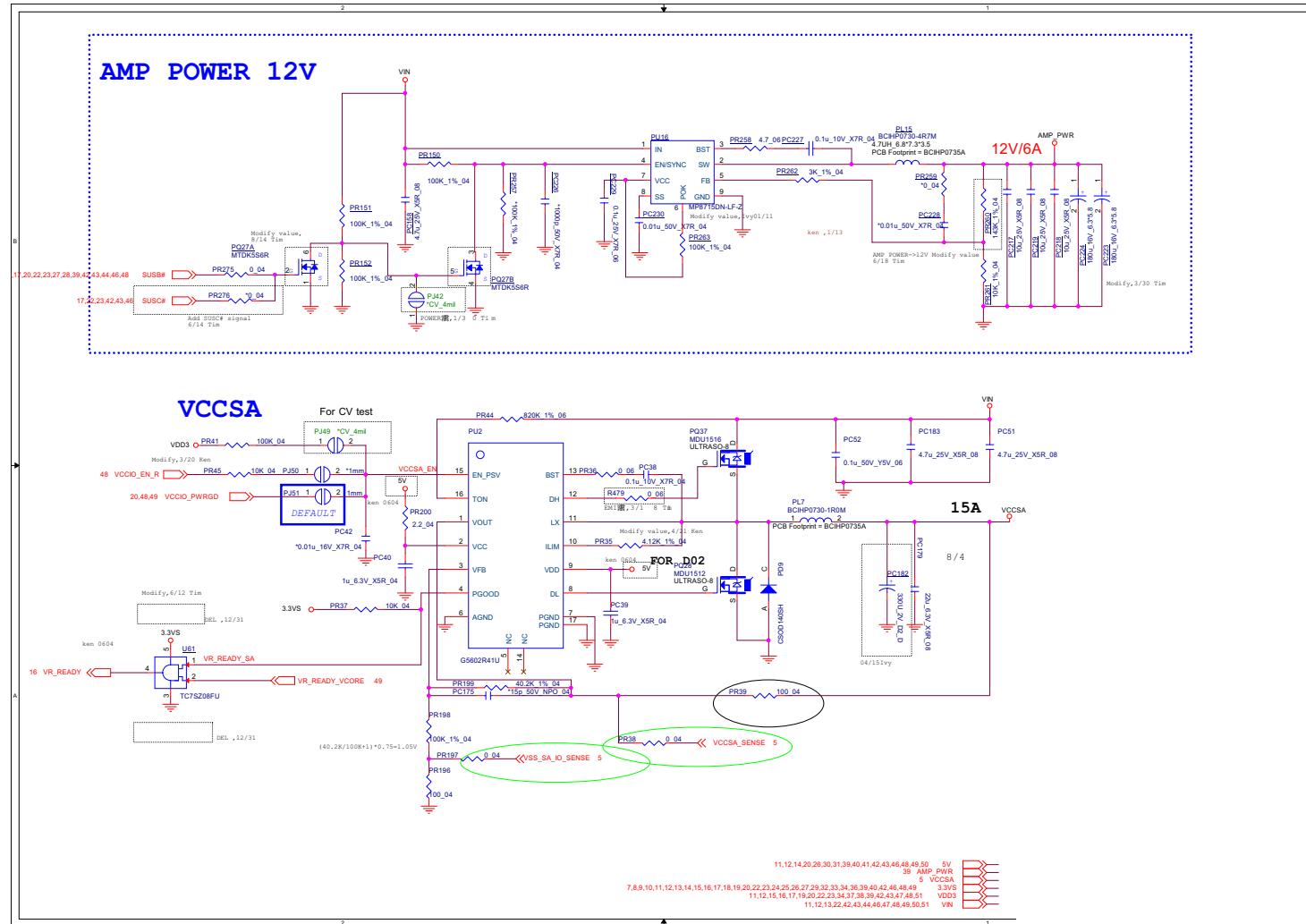
Fan_Power 12V



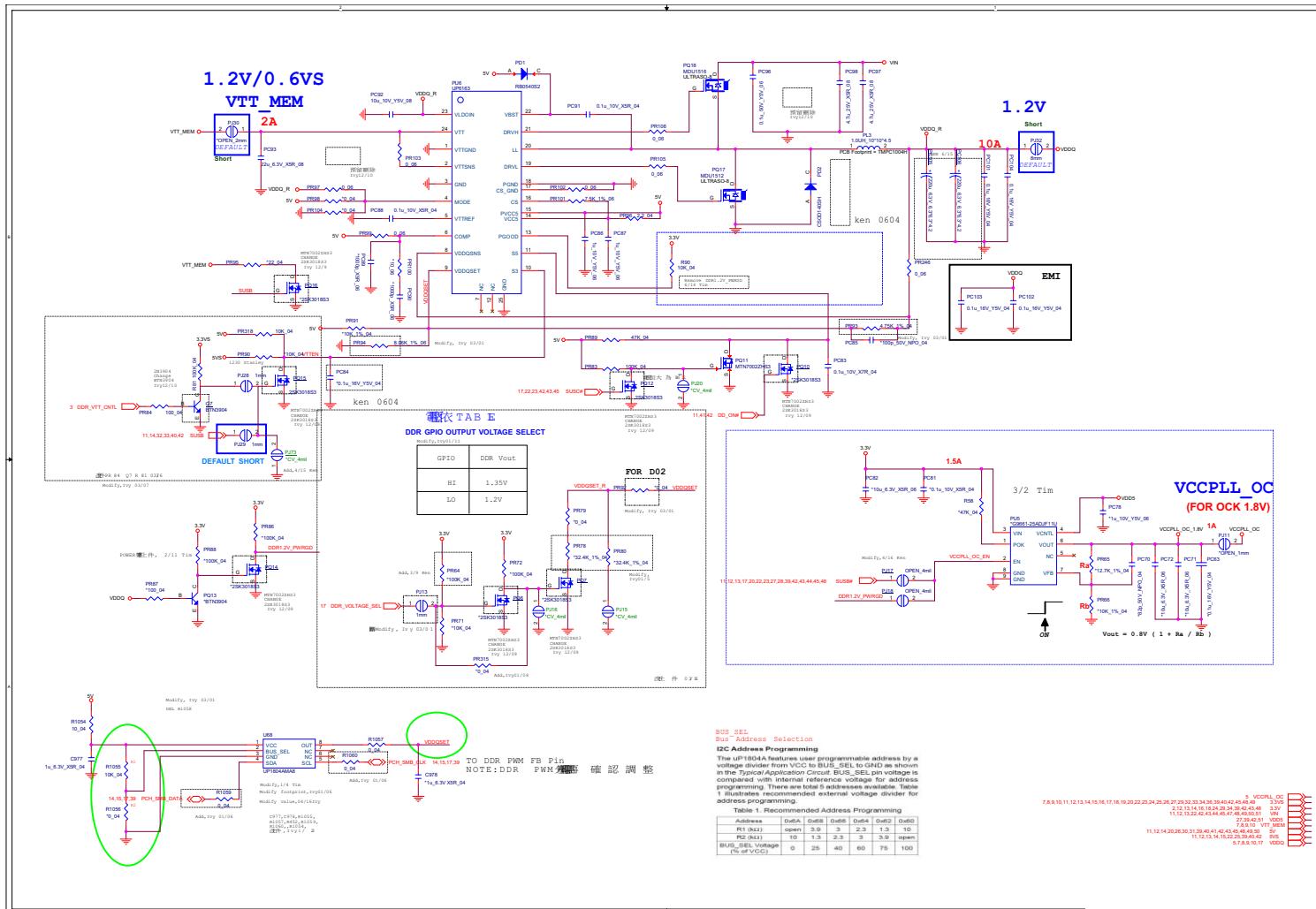
Sheet 44 of 62
Fan_Power 12V

Schematic Diagrams**AMP10V, VCCSA**

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AMP10V, VCCSA



DDR4 VDDQ & VTT, VCCPLL_OC



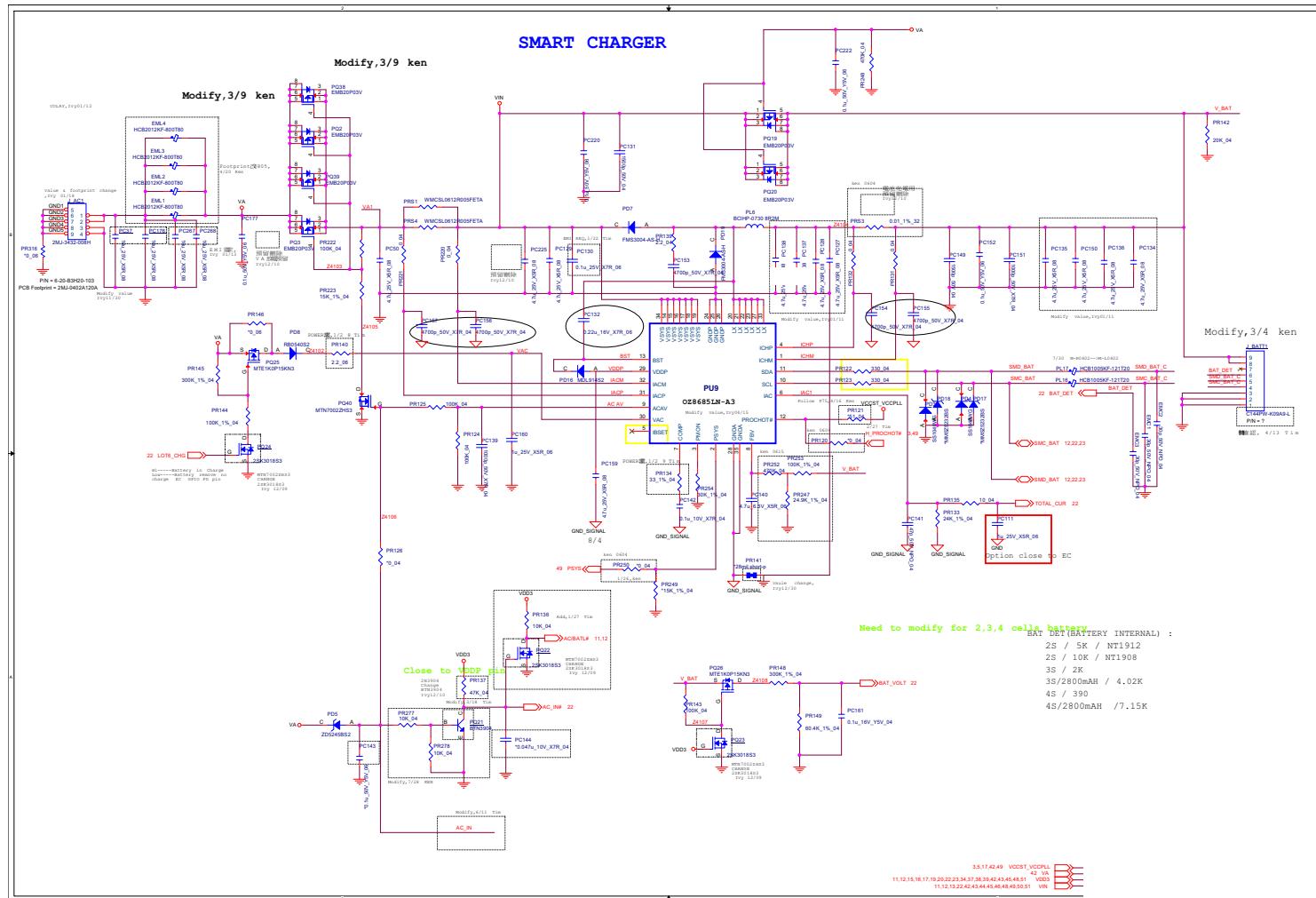
Sheet 46 of 62
DDR4 VDDQ & VTT,
VCCPLL_OC

B.Schematic Diagrams

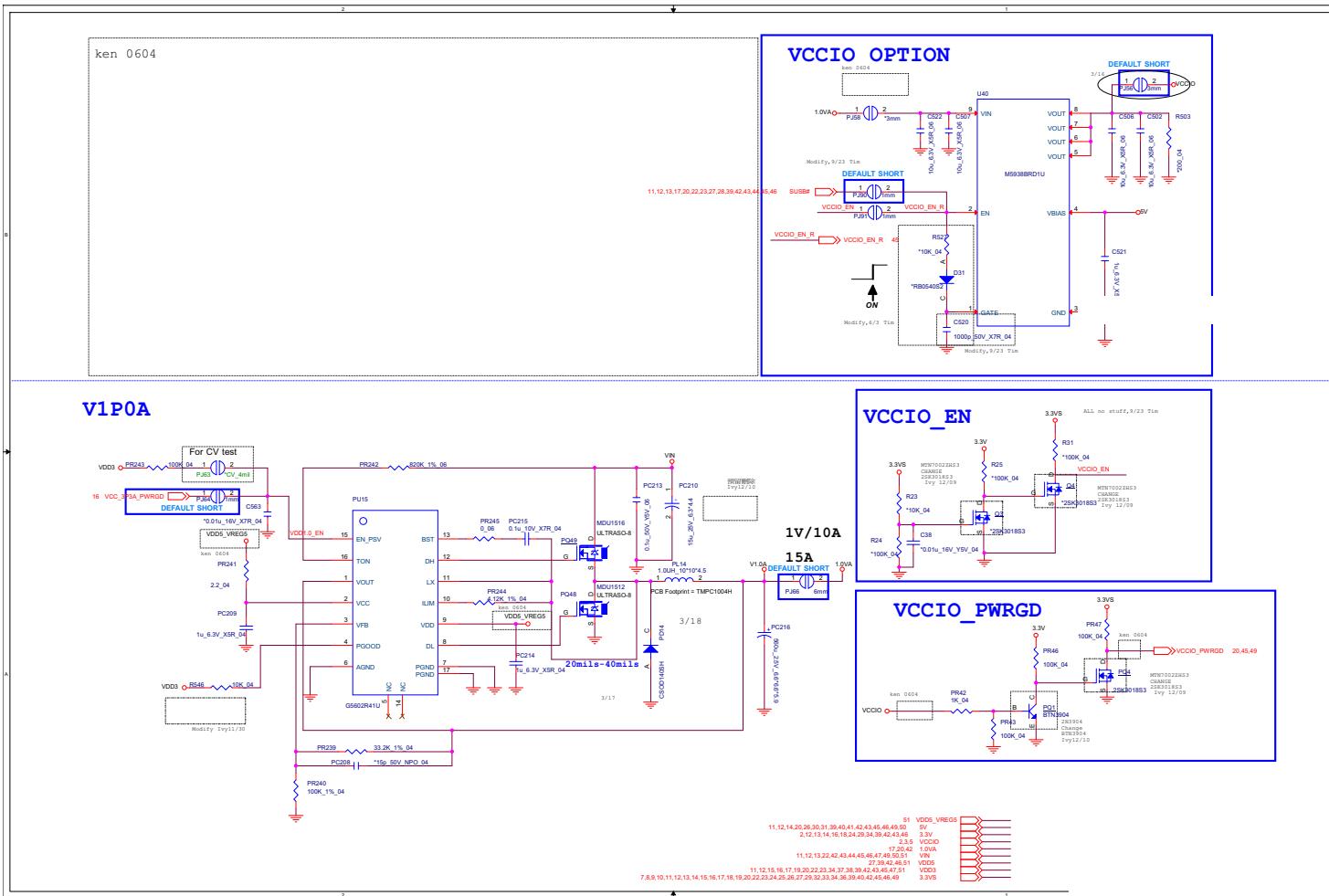
Schematic Diagrams

Power Charger, DC IN

Sheet 47 of 62
Power Charger,
DC IN



VCCIO, 1.0VA

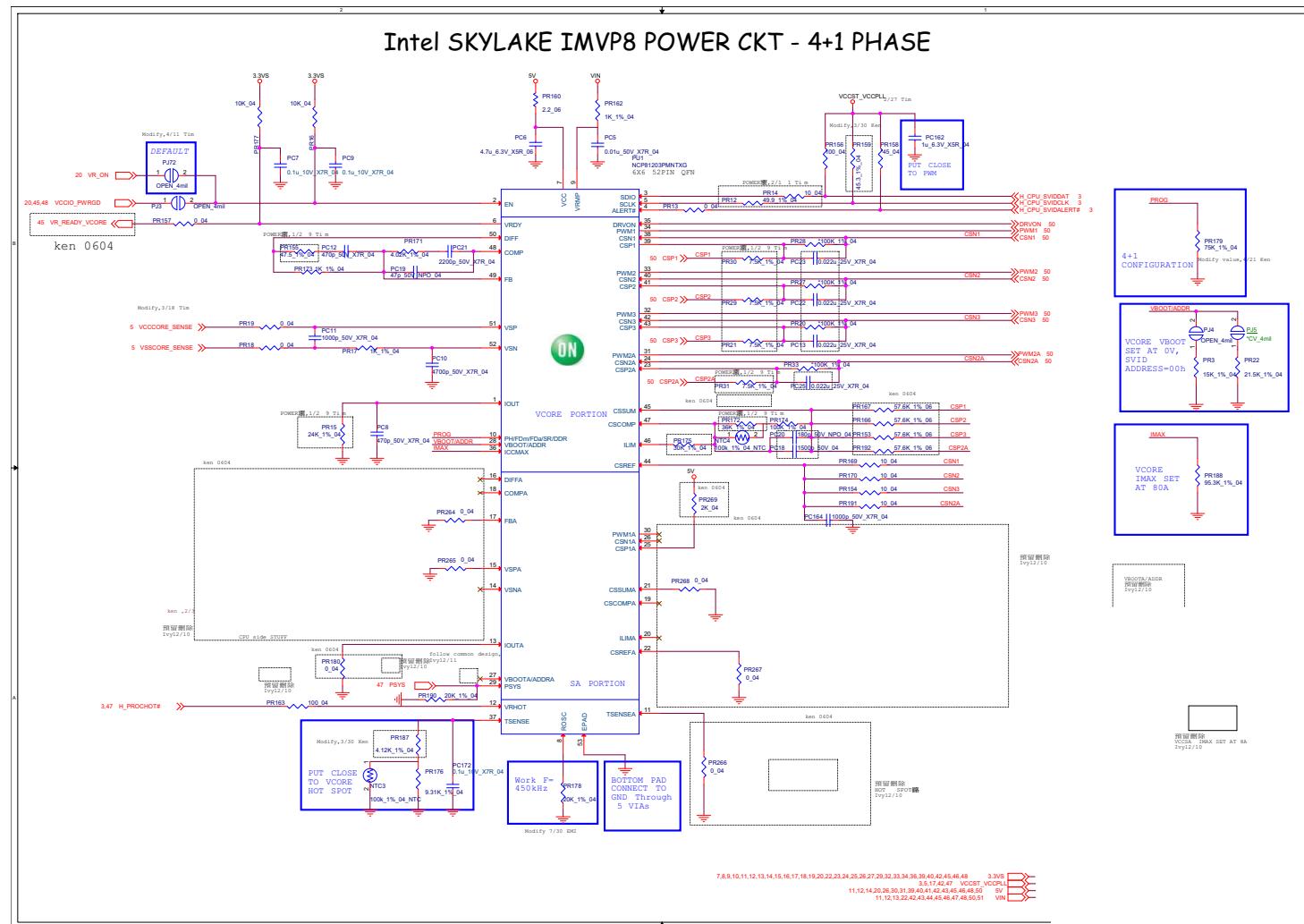


Sheet 48 of 62
VCCIO, 1.0VA

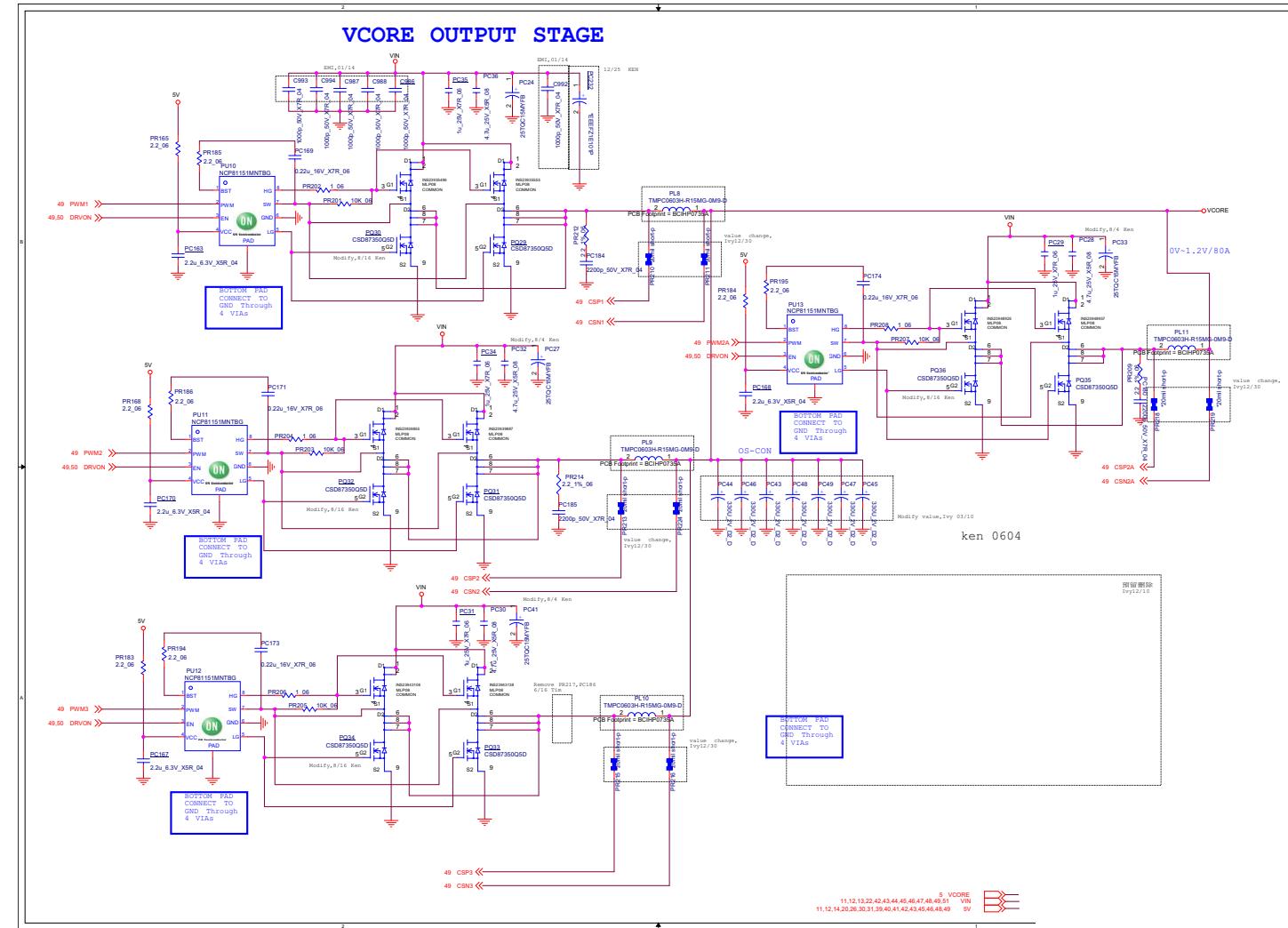
Schematic Diagrams

vCore

Sheet 49 of 62
VCore



VCore Output Stage



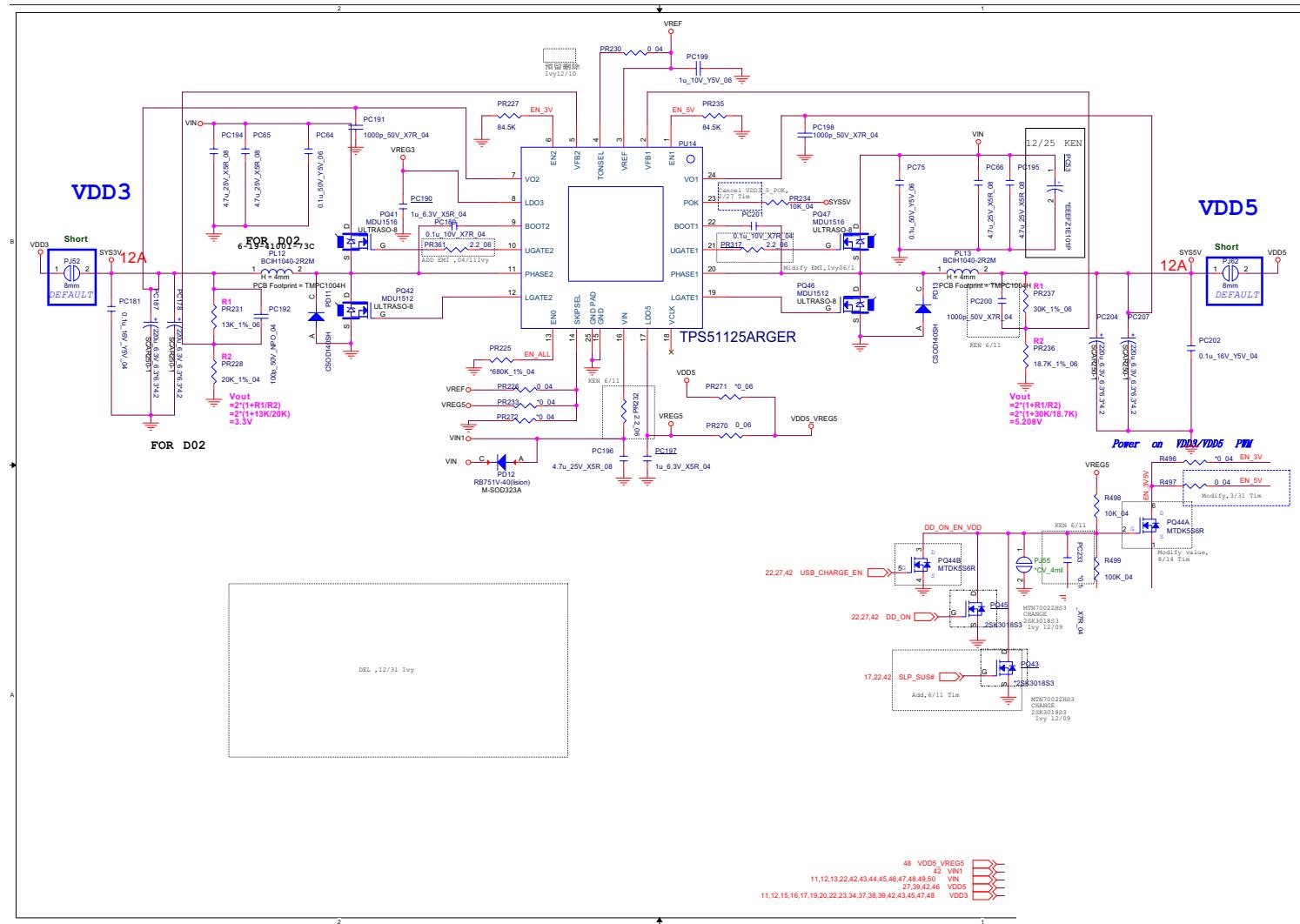
Sheet 50 of 62
VCore Output
Stage

B. Schematic Diagrams

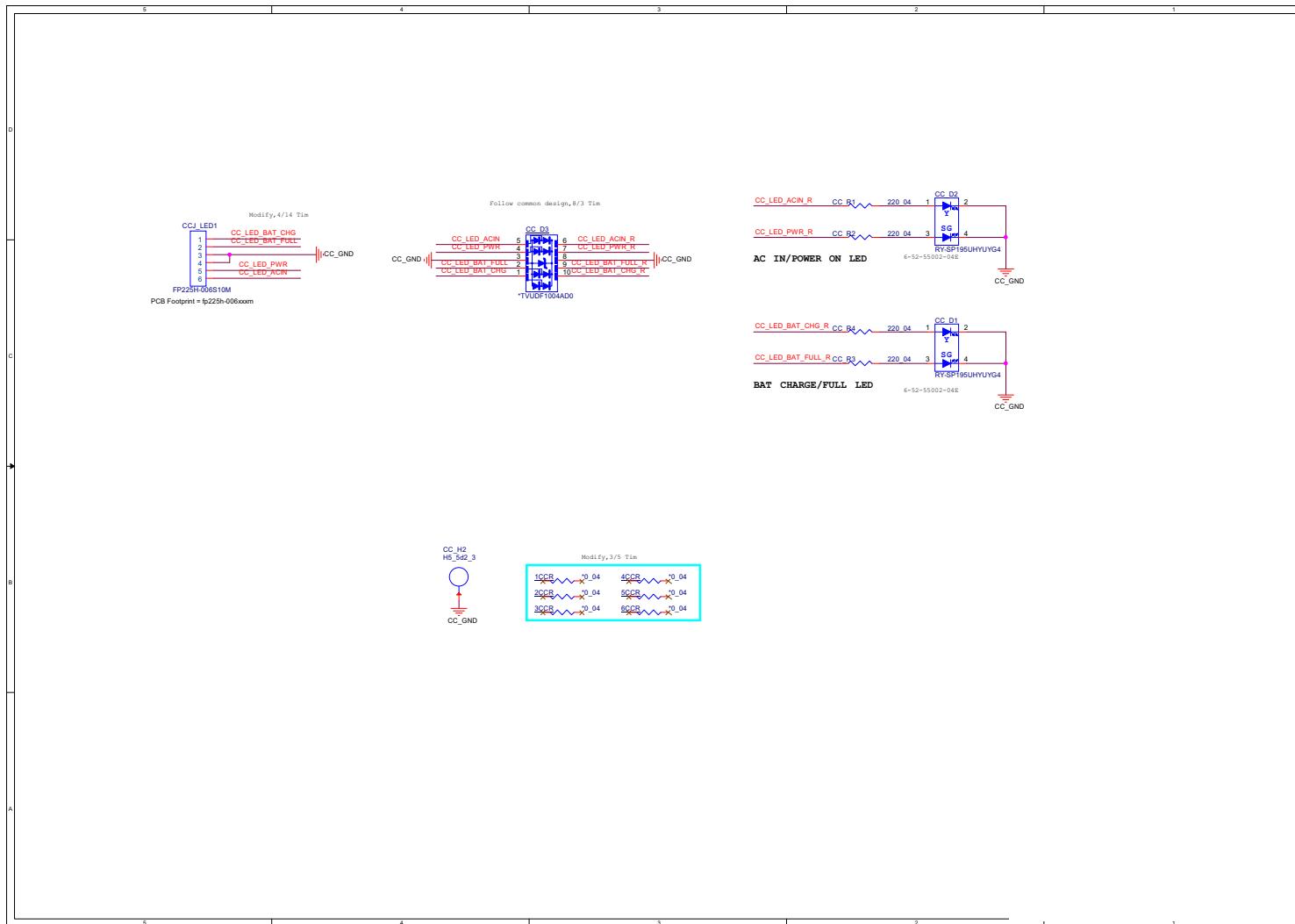
Schematic Diagrams

VDD3, VDD5

Sheet 51 of 62
VDD3, VDD5



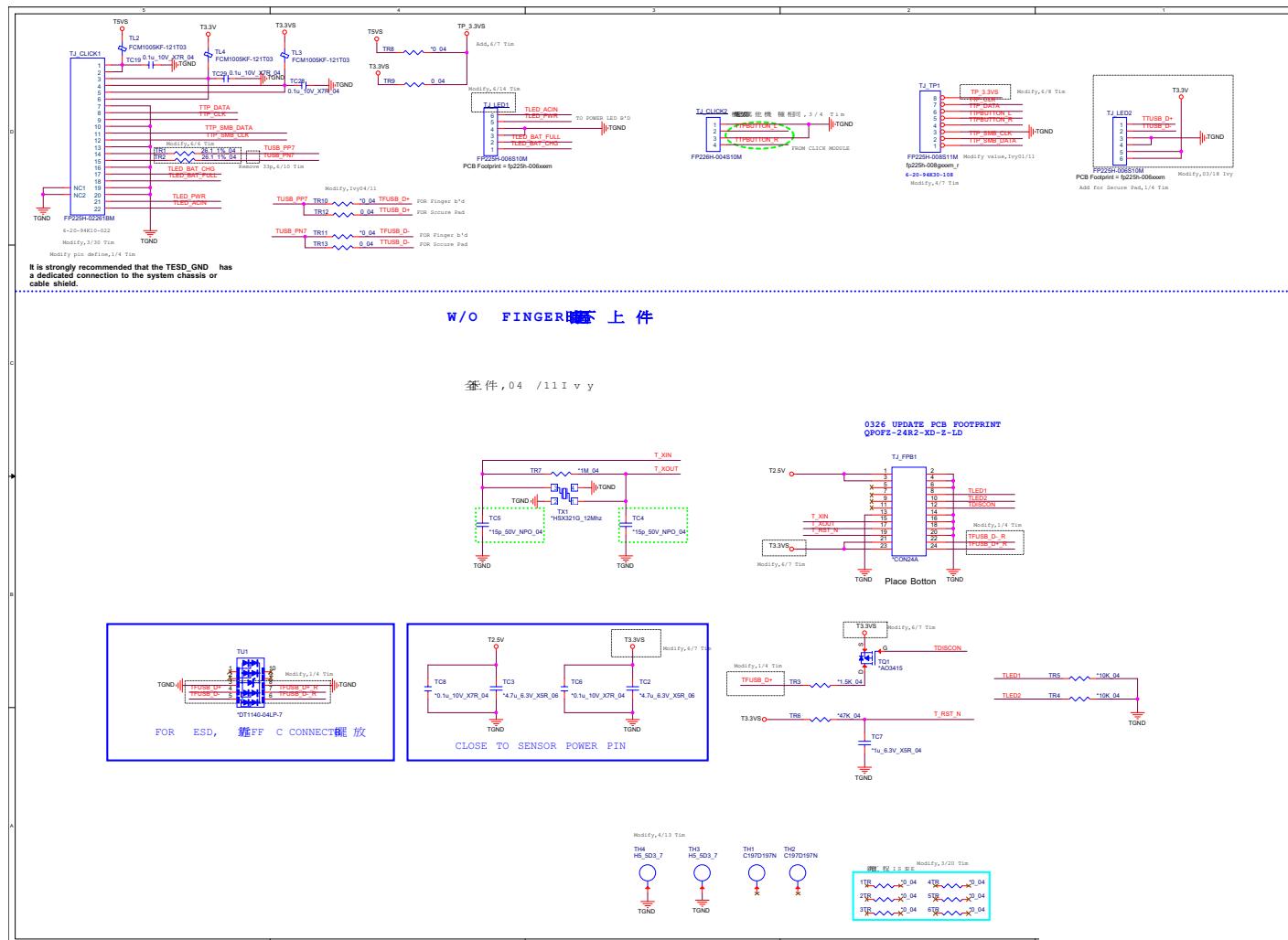
Charger LED Board



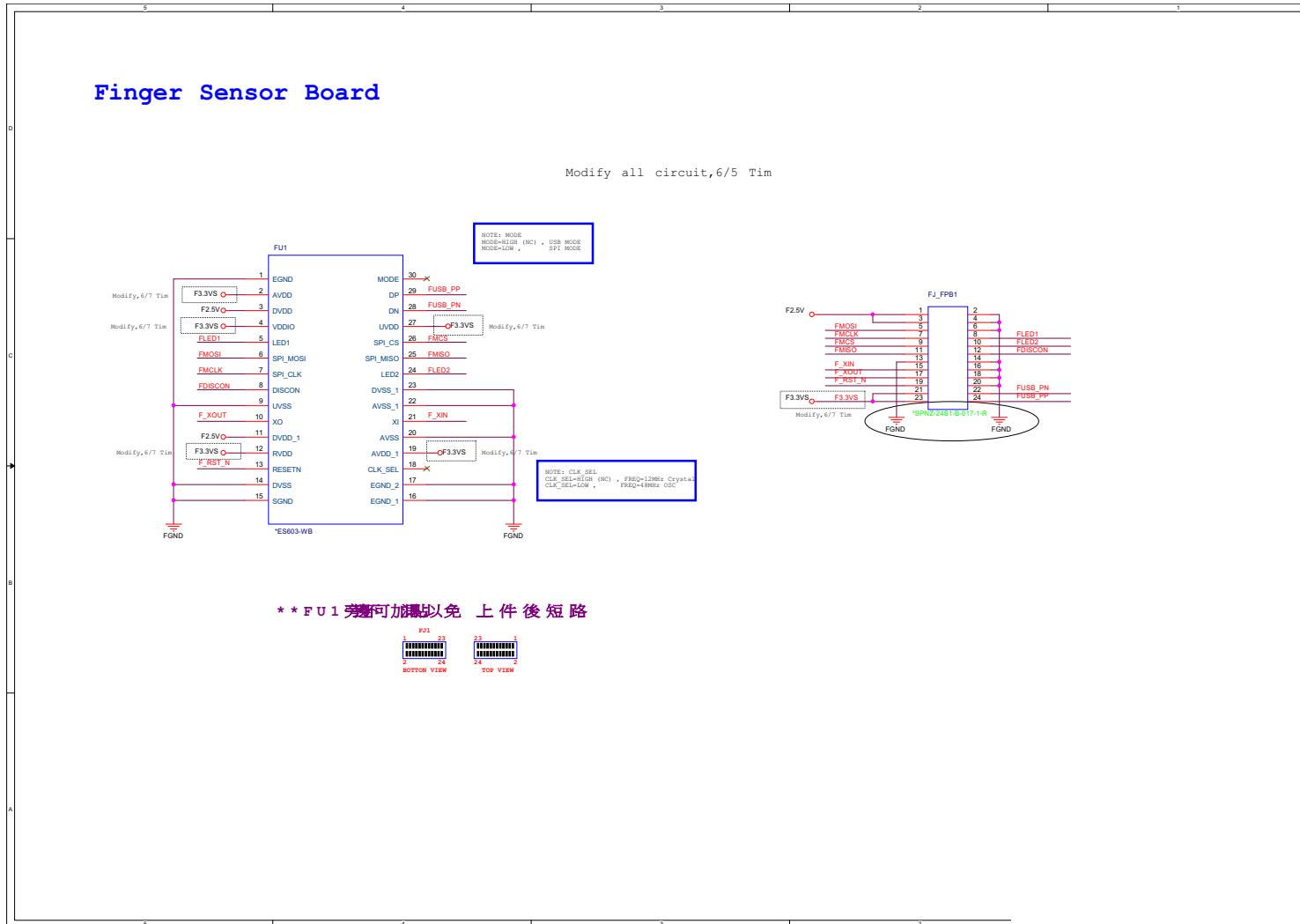
Sheet 52 of 62
Charger LED Board

Schematic Diagrams

Click Board



Finger Sensor Board

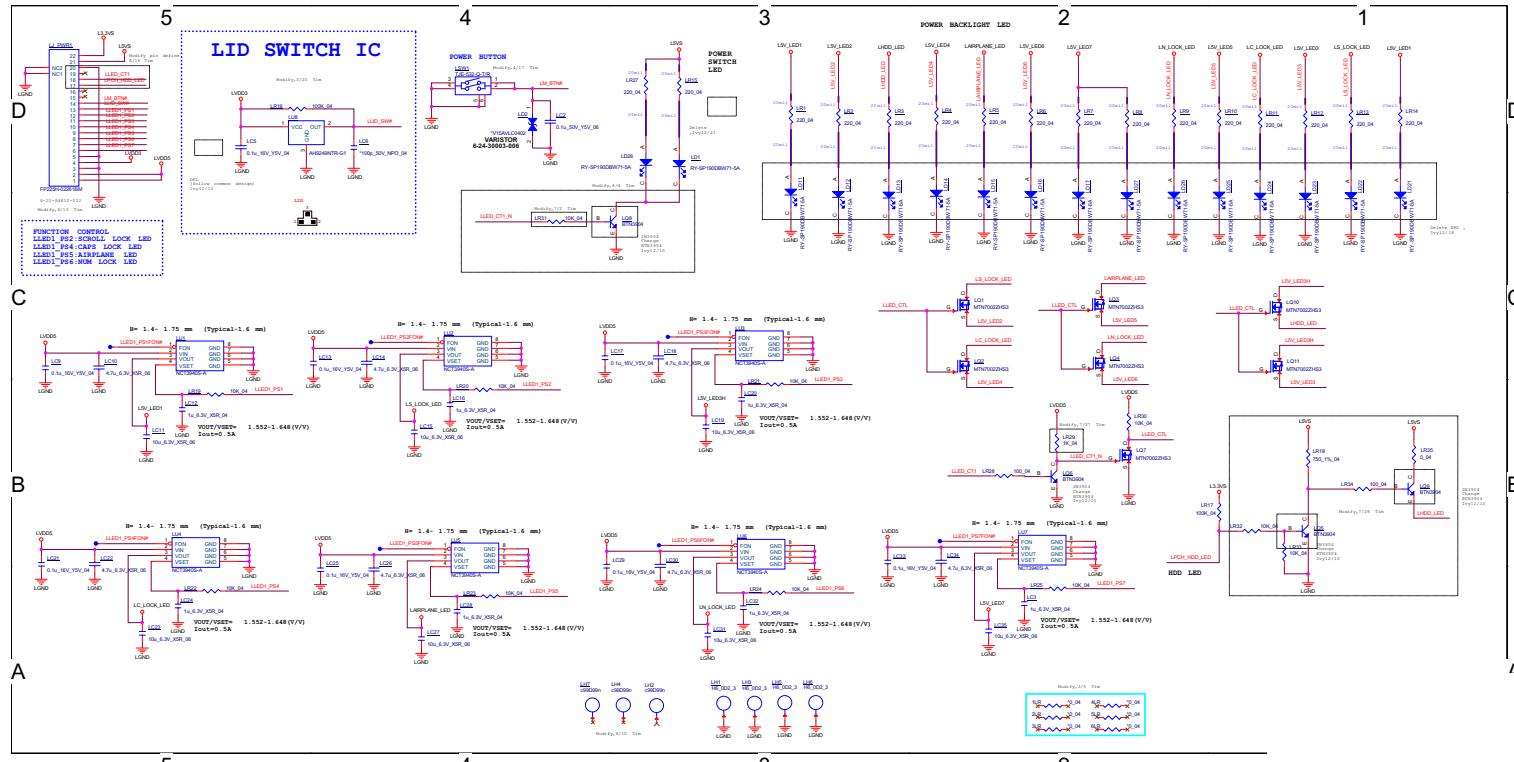


Sheet 54 of 62
Finger Sensor
Board

Schematic Diagrams

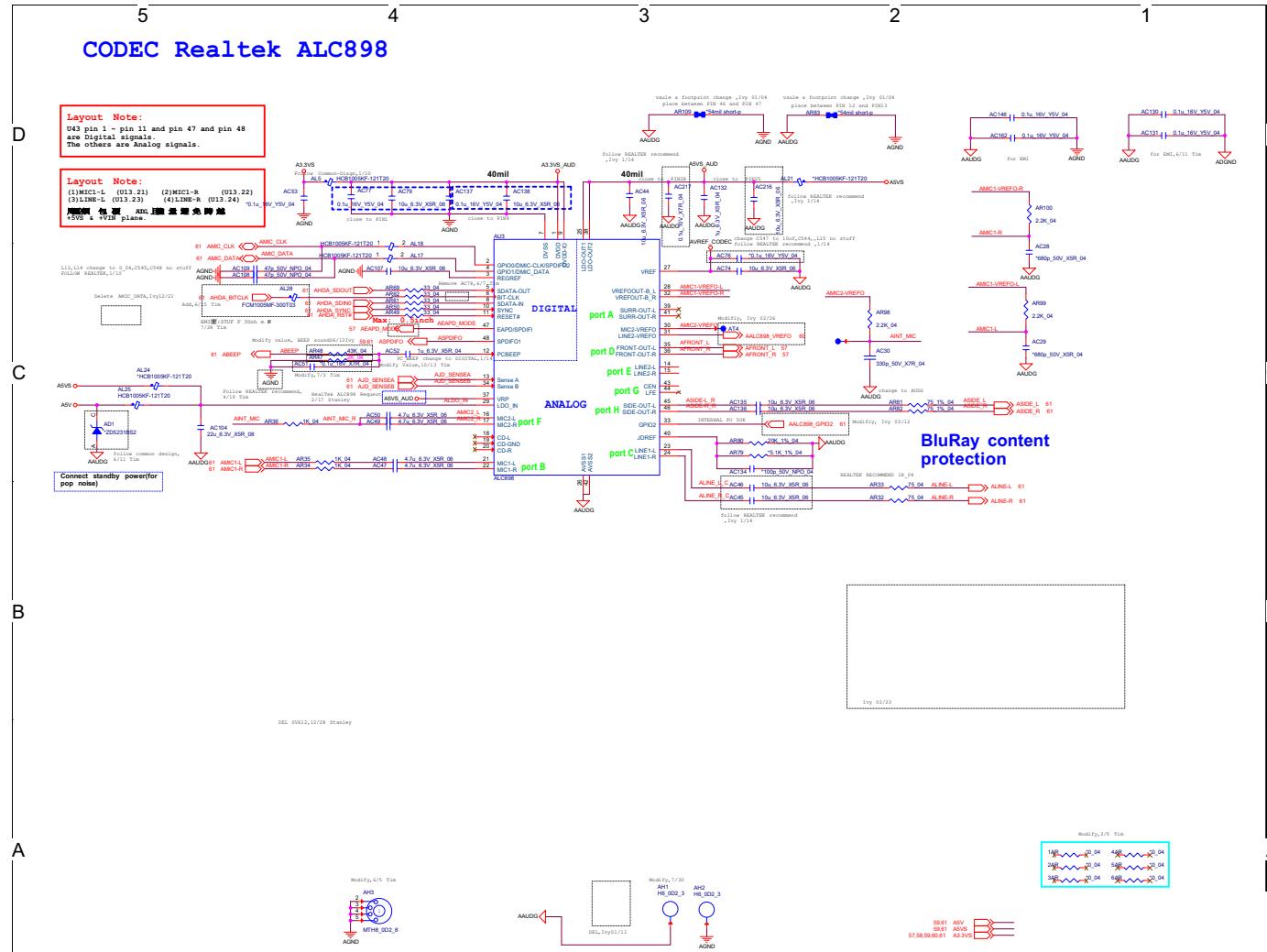
Power Switch LED Board

Sheet 55 of 62
Power Swtch LED
Board



Schematic Diagrams

Audio Codec



Sheet 56 of 62
Audio Codec

B.Schematic Diagrams

B.Schematic Diagrams

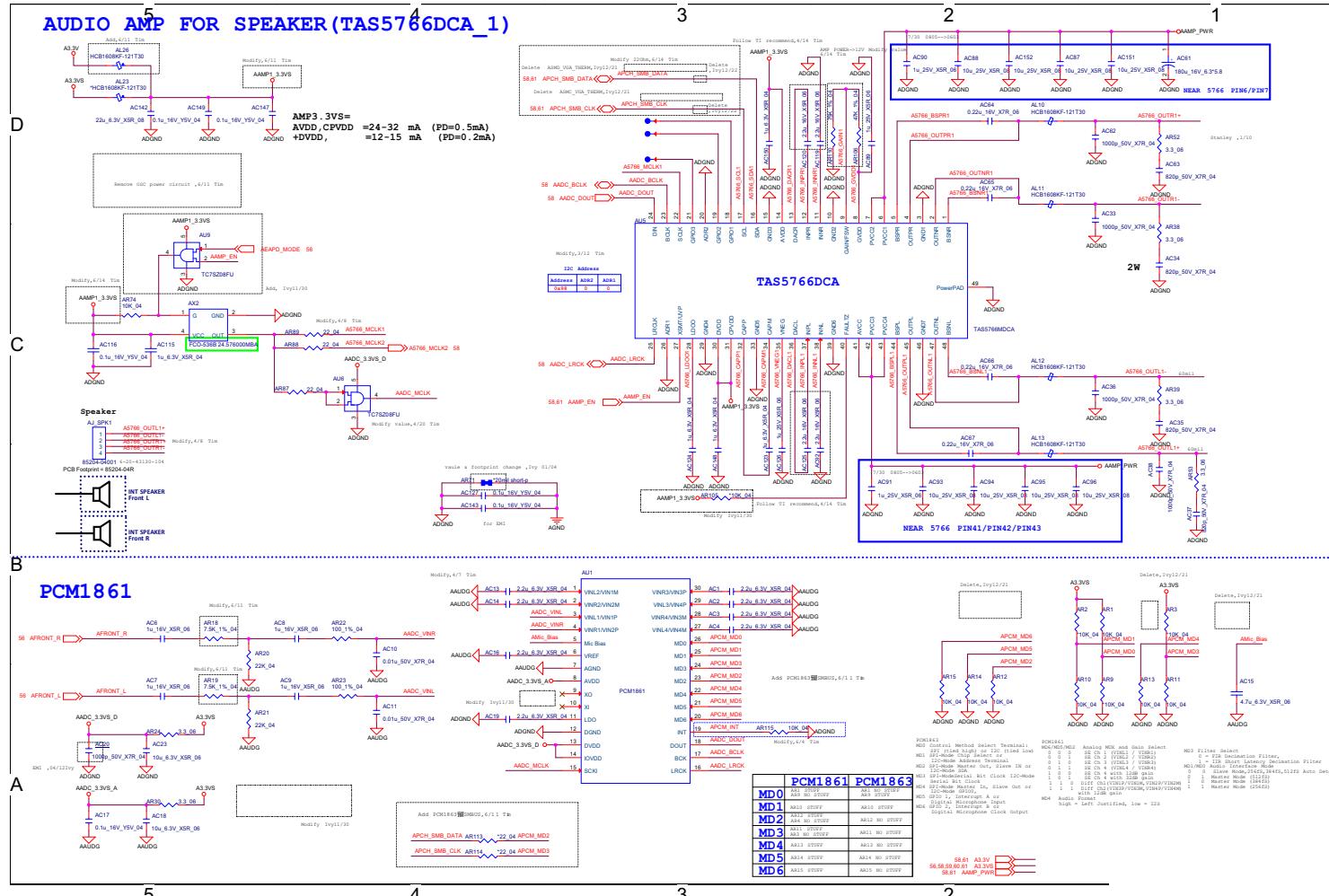
Schematic Diagrams

Audio Board (Speaker)

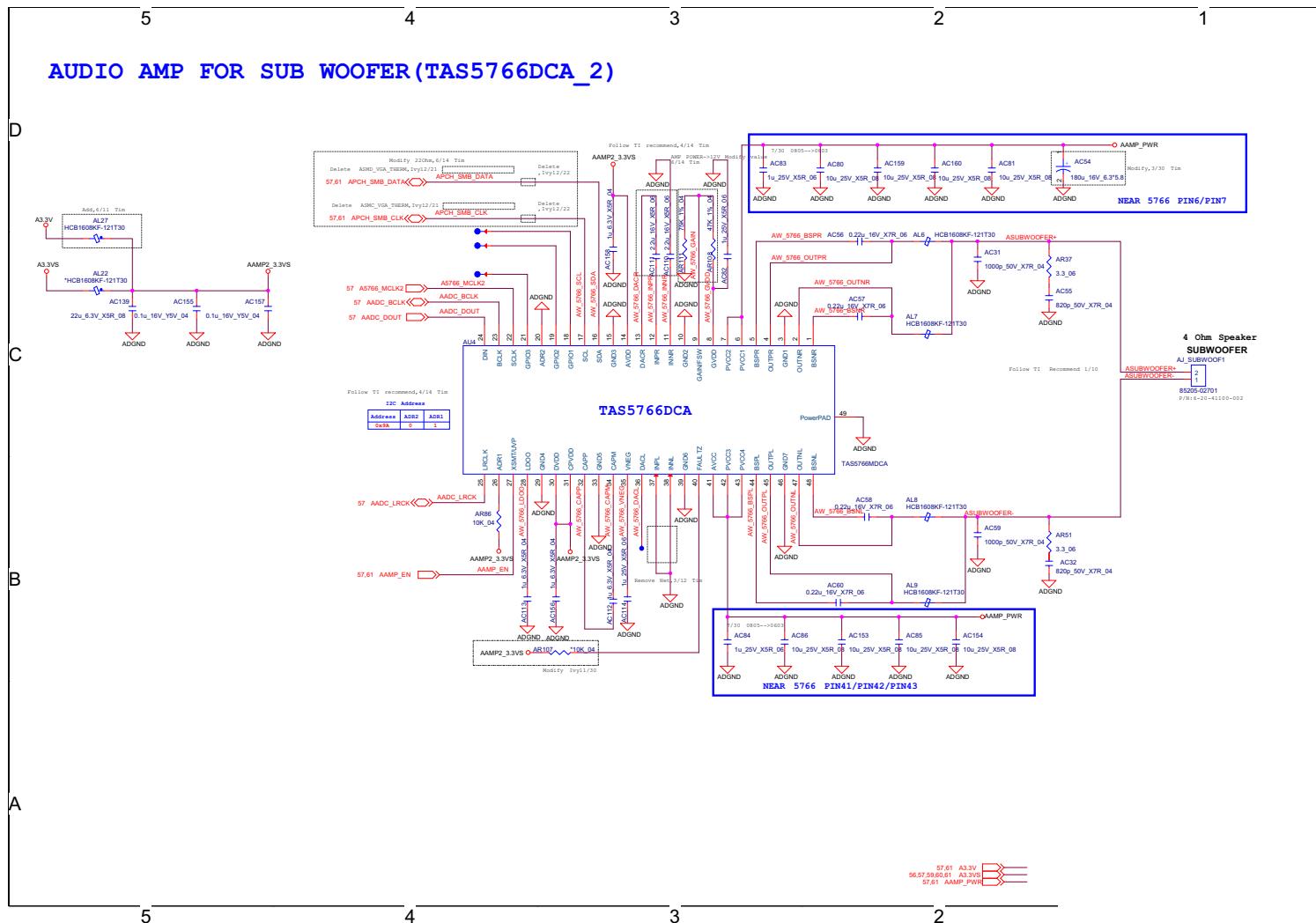
Sheet 57 of 62

Audio Board

(Speaker)



Audio Board (Subwoofer)

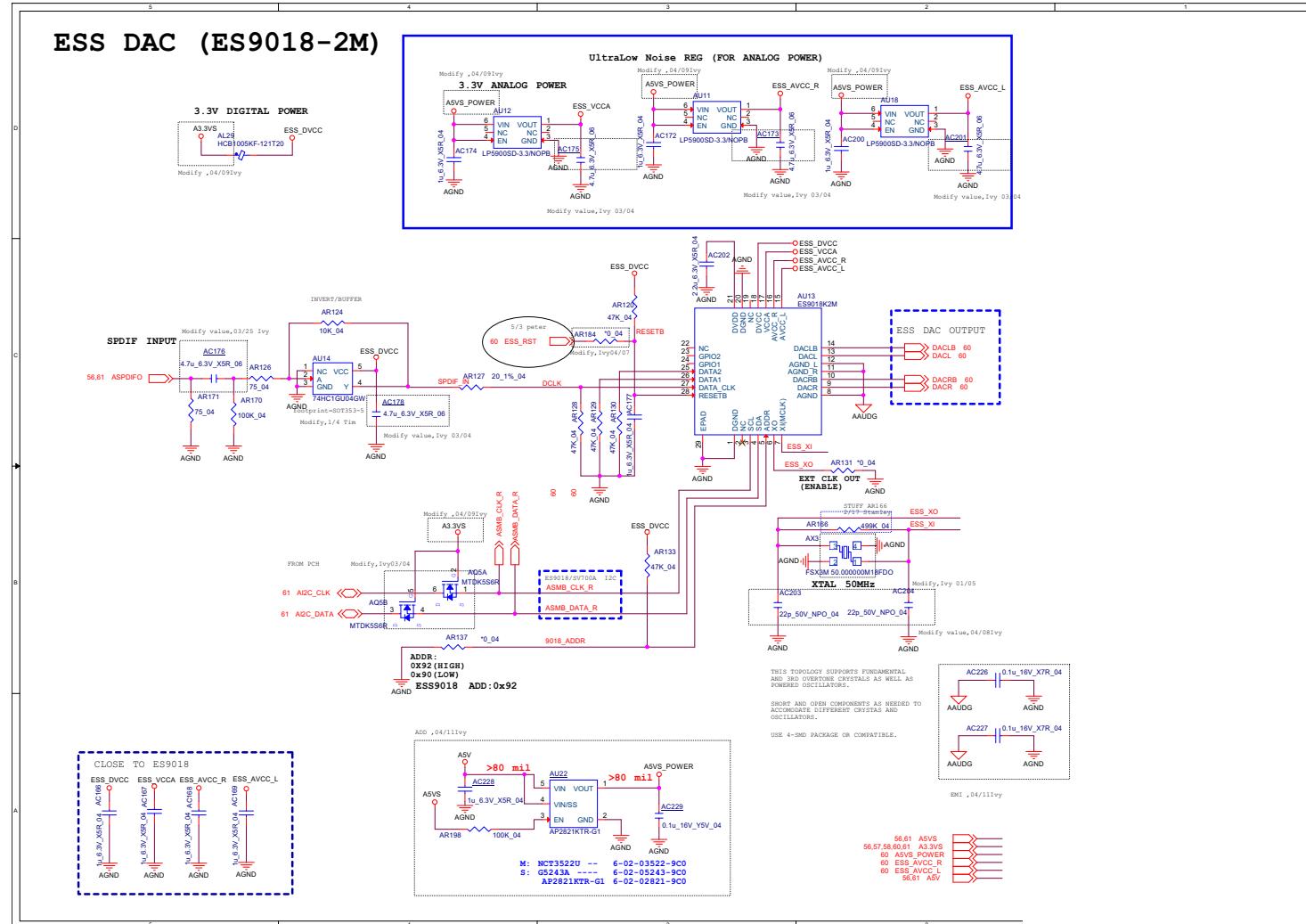


B.Schematic Diagrams

Schematic Diagrams

ESS DAC

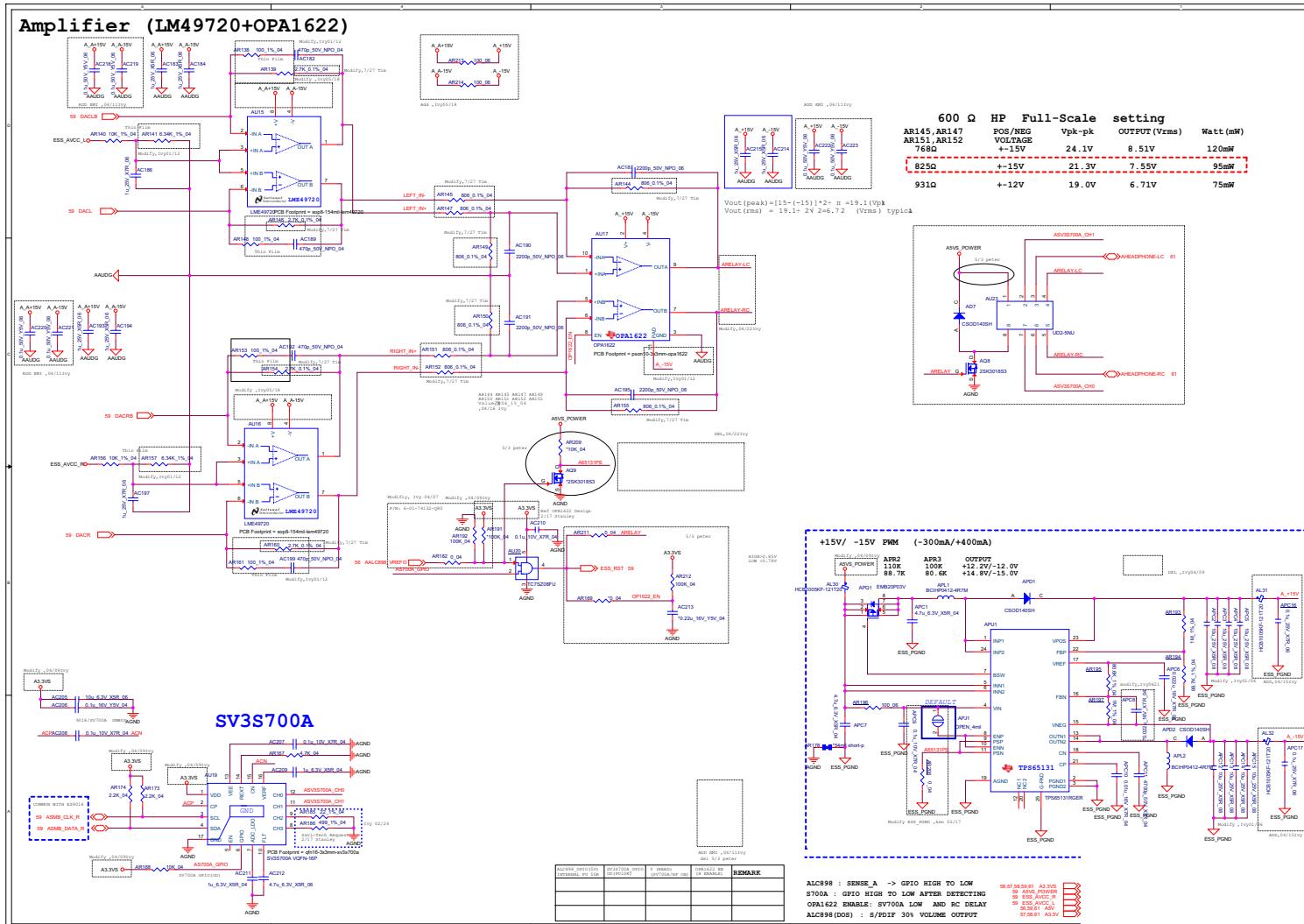
Sheet 59 of 62
ESS DAC



B - 60 ESS DAC

Schematic Diagrams

HP AMP



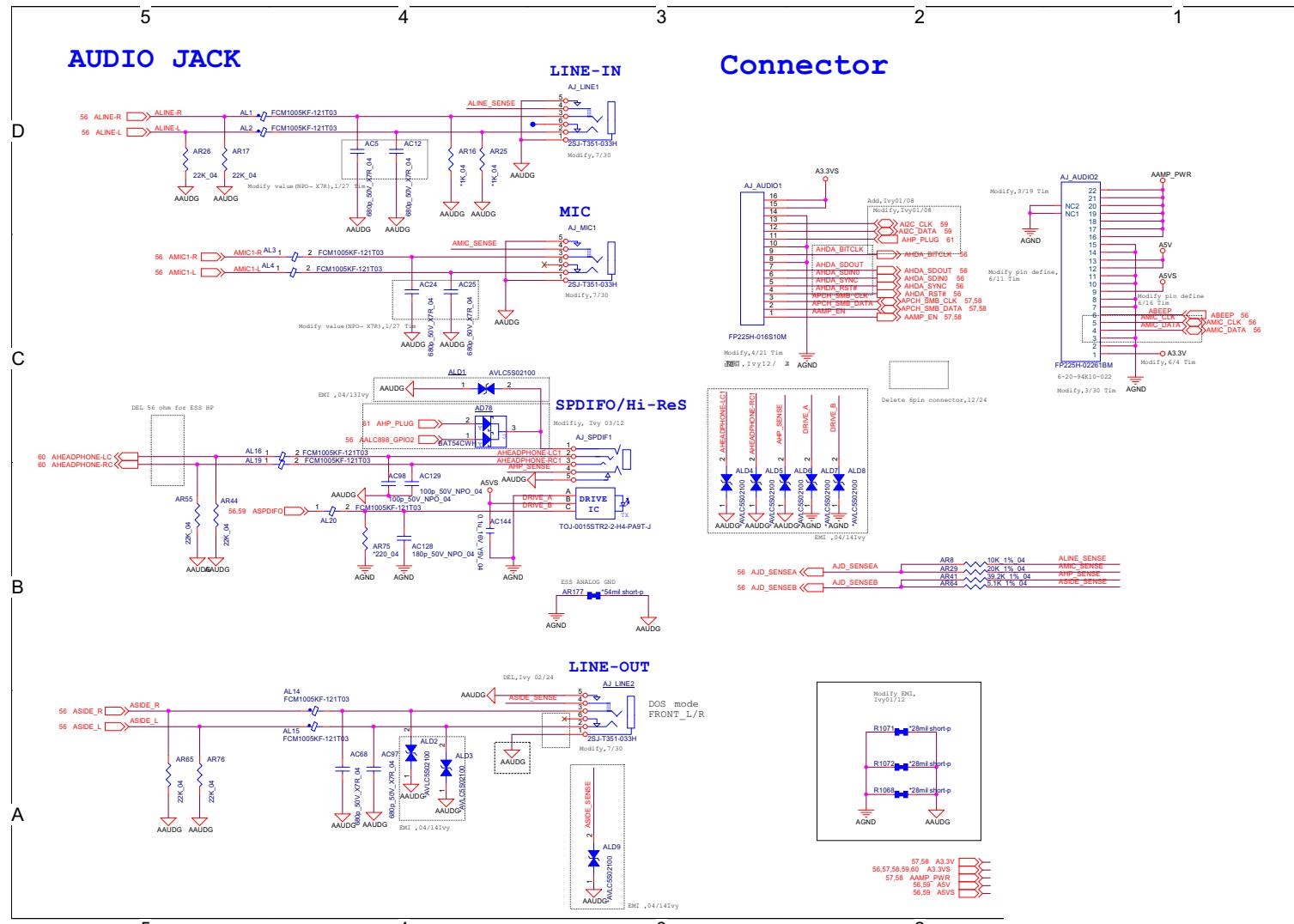
B.Schematic Diagrams

Sheet 60 of 62
HP AMP

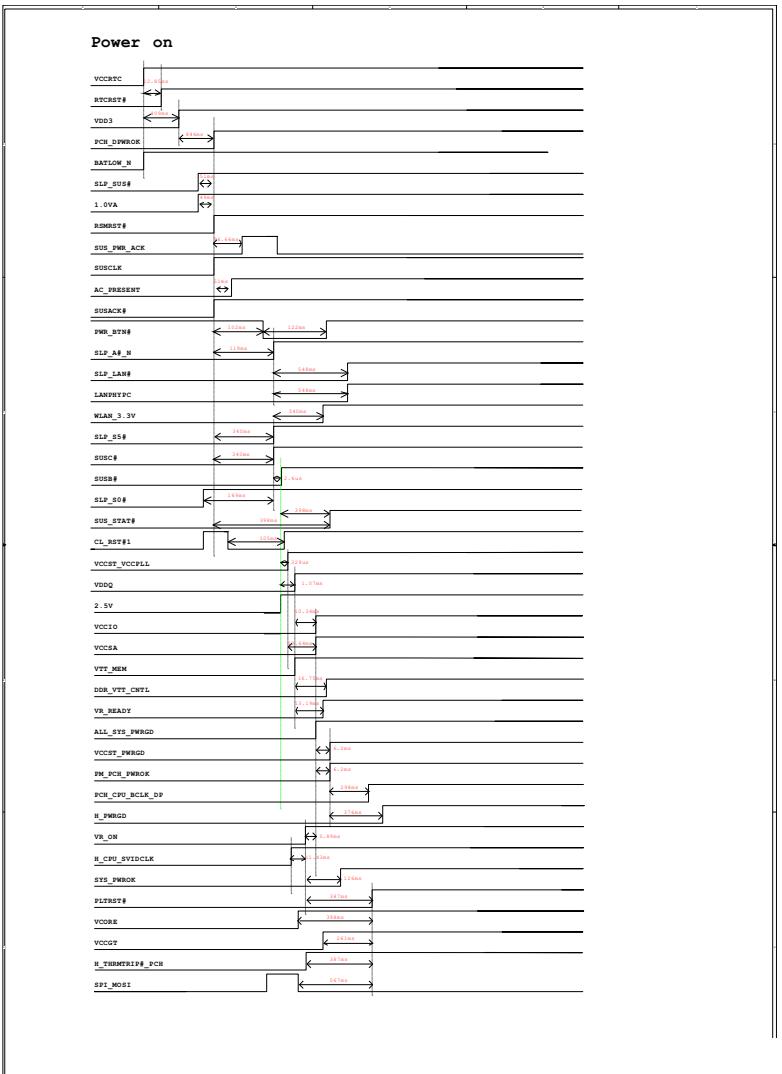
Schematic Diagrams

Audio Jack

Sheet 61 of 62
Audio Jack



Power Sequence



Sheet 62 of 62
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 “**Starting MS-DOS**”. You will then be prompted to give “**Y**” or “**N**” responses to the programs being loaded by DOS. Choose “**N**” for any memory management programs.
2. You should now be at the DOS prompt e.g: DISK **C:****>** (C is the designated drive letter for the CD/DVD drive/USB flash drive).
3. **Type the following command** at the DOS prompt:

C:> Flash.bat****

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.