SERVICE MANUAL

N650DU

notebook

Notebook Computer

N650DU

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 ***N650DU*** 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 with an AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19V, 4.74A (**90** Watts) minimum AC/DC Adapter.

CAUTION

This Computer's Optical Device is a Laser Class 1 Product

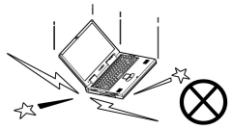
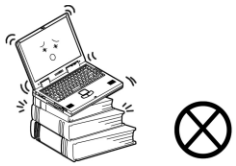
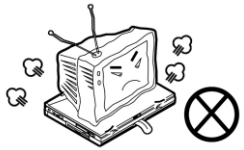
FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
This device may not cause harmful interference.
This device must accept any interference received, including interference that may cause undesired operation.

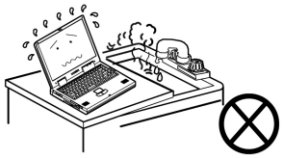
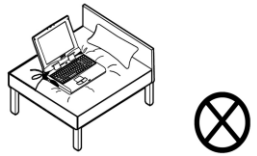
Instructions for Care and Operation

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

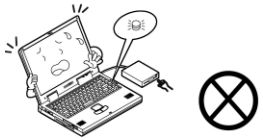
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.

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

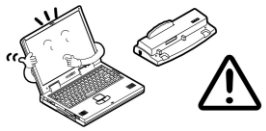
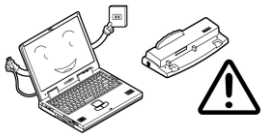
2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

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

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

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

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

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

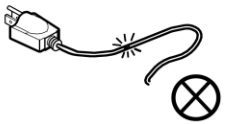
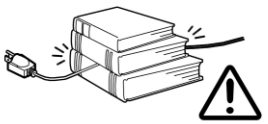
Power Safety

The computer has specific power requirements:

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

Power Safety Warning

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

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

Battery Precautions

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

Battery Guidelines

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

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

Battery Disposal

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

Caution

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

Battery Level

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

Related Documents

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

User's Manual on CD/DVD

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

System Startup

1. Remove all packing materials.
2. Place the computer on a stable surface.
3. 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 right of the computer, then plug the AC power cord into an outlet, and connect the AC power cord 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".

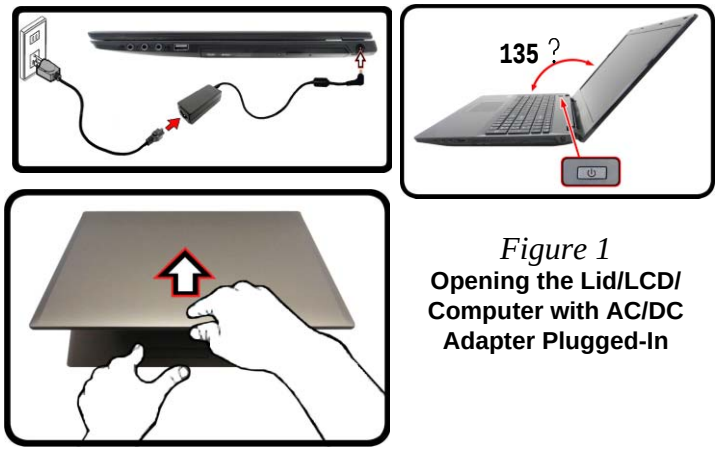
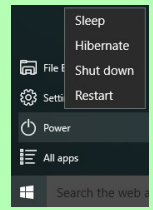


Figure 1
Opening the Lid/LCD/ Computer with AC/DC Adapter Plugged-In

Shut Down

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

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



Contents

Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the ***N650DU*** series notebook computer. Information about operating the computer (e.g. getting started, and the *Setup* utility) is in the *User's Manual*. Information about drivers (e.g. VGA & audio) is also found in the *User's Manual*. The manual is shipped with the computer.

Operating systems (e.g. *Window 8.1*, etc.) have their own manuals as do application softwares (e.g. word processing and database programs). If you have questions about those programs, you should consult those manuals.

The ***N650DU*** series notebook is designed to be upgradeable. See ***Disassembly on page 2 - 1*** for a detailed description of the upgrade procedures for each specific component. Please take note of the warning and safety information indicated by the "  " symbol.

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

Specifications

Latest Specification Information

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

CPU

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

Processor Options

Intel® Core™ i7 Processor
i7-6700 (3.40GHz)
8MB Smart Cache, **14nm**, DDR4-2133MHz, TDP 65W
Intel® Core™ i5 Processor
i5-6500 (3.20GHz)
6MB Smart Cache, **14nm**, DDR4-2133MHz, TDP 65W
Intel® Core™ i3 Processor
i3-6320 (3.90GHz)
4MB Smart Cache, **14nm**, DDR4-2133MHz, TDP 51W
Intel® Pentium™ Processor
G4520 (3.60GHz)
3MB Smart Cache, **14nm**, DDR4-2133MHz, TDP 51W

Intel® Celeron™ Processor
G3920 (2.90GHz)
2MB Smart Cache, **14nm**, DDR4-2133MHz, TDP 47W

Core Logic

Intel® H170 Chipset

BIOS

64Mb SPI Flash ROM
AMI BIOS

Memory

Two 260 Pin SO-DIMM Sockets Supporting **DDR4 2133MHz** Memory
Memory Expandable up to 32GB

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

Video Adapter

Intel GPU (CPU integrated)

Intel HD Graphics 530 (Core i7/i5/i3/Pentium CPU Integrated)
Dynamic Frequency (Intel Dynamic Video Memory Technology)
Microsoft DirectX® 12 Compatible

Intel HD Graphics 510 (Celeron CPU Integrated)
Dynamic Frequency (Intel Dynamic Video Memory Technology)
Microsoft DirectX® 12 Compatible

LCD Options

15.6" (39.62cm), 16:9, HD (1366x768)/ FHD (1920x1080)

Storage

One Changeable 2.5" 9.5mm/7.0mm (h) SATA HDD/SSD
(**Factory Option**) One 9.5mm(h) Optical Device Type Drive (Super Multi Drive)
Or
(**Factory Option**) 2.5" 7.0mm 2nd HDD/SSD caddy
(**Factory Option**) One M.2 **SATA/PCIe Gen3 x4** Solid State Drive (SSD)

Audio

High Definition Audio Compliant Interface
2 * Built-In Speakers
Built-In Microphone
Or
(**Factory Option**) Built-In Array Microphone

Security

Security (Kensington® Type) Lock Slot

BIOS Password

(**Factory Option**) TPM v2.0

Intel PTT for systems without hardware TPM

Keyboard

Full-size “WinKey” keyboard (with numeric keypad)

Or

(**Factory Option**) Full-size “WinKey” **Illuminated White-LED** Keyboard (with numeric keypad)

Pointing Device

Built-in Touchpad

Card Reader

Embedded Multi-In-1 Card Reader

MMC (MultiMedia Card) / RS MMC

SD (Secure Digital) / Mini SD / SDHC/ SDXC

M.2 Slots

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

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

(**Factory Option**) Slot 3 for **3G/4G** Module

Interface

One USB 2.0 Port

Two USB 3.0 (USB 3.1 Gen 1) Type A Ports

Or

(**Factory Option**) One USB 3.1 Gen 2 Type A Port and one USB 3.0 (USB 3.1 Gen 1) Type A Port

One USB 3.0 (USB 3.1 Gen 1) Type C Port

Or

(**Factory Option**) One USB 3.1 Gen 2 Type C Port

One HDMI-Out Port

One External Monitor Port

One Headphone-Out Jack

One Microphone-In Jack

One S/PDIF Coaxial Output Jack

One RJ-45 LAN Jack

One DC-in Jack

Communication

Built-In Gigabit Ethernet LAN

1.0M HD PC Camera Module

Or

(**Factory Option**) 2.0M FHD PC Camera Module

(**Factory Option**) M.2 **3G** or **4G** Module

WLAN/ Bluetooth M.2 Modules:

(**Factory Option**) Intel® Wireless-AC 8260 Wireless LAN (**802.11ac**) + Bluetooth **4.1**

(**Factory Option**) Intel® Wireless-AC 3165 Wireless LAN (**802.11ac**) + Bluetooth **4.0**

(**Factory Option**) Intel® Wireless-N 7265 Wireless LAN (**802.11b/g/n**) + Bluetooth **4.0**

(**Factory Option**) Third-Party Wireless LAN (**802.11b/g/n**) + Bluetooth **4.0**

Environmental Spec

Temperature

Operating: 5°C - 35°C

Non-Operating: -20°C - 60°C

Relative Humidity

Operating: 20% - 80%

Non-Operating: 10% - 90%

Power

Full Range AC/DC Adapter

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

DC Output: 19V, 4.74A (**90W**)

Removable 6 Cell Smart Lithium-Ion Battery Pack, 48.84WH

(**Factory Option**) Removable 6 Cell Smart Lithium-Ion Battery Pack, 62.16WH

Dimensions & Weight

379mm (w) * 263.4mm (d) * 32.5mm (h)

2.63kg (Barebone with 48.84WH Battery)

External Locator - Top View with LCD Panel Open

Figure 1
Top View

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

External Locator - Front & Right Side Views

FRONT VIEW

Figure 2
Front View

1. Multi-in-1 Card Reader
2. LED Indicator

RIGHT SIDE VIEW

Figure 3
Right Side View

1. S/PDIF-Out Jack
2. Microphone Jack
3. Headphone Jack
4. USB 2.0 Ports
5. Optical Device Drive Bay
6. Emergency Eject Hole
7. DC-In Jack

External Locator - Left Side & Rear View

Figure 4
Left Side View

1. Security Lock Slot
2. HDMI-Out Port
3. RJ-45 LAN Port
4. External Monitor Port
5. Vent
6. USB 3.0/3.1 Port (Type C)
7. USB 3.0/3.1 Ports (Type A)

LEFT SIDE VIEW

Figure 5
Rear View

1. Battery

REAR VIEW

External Locator - Bottom View

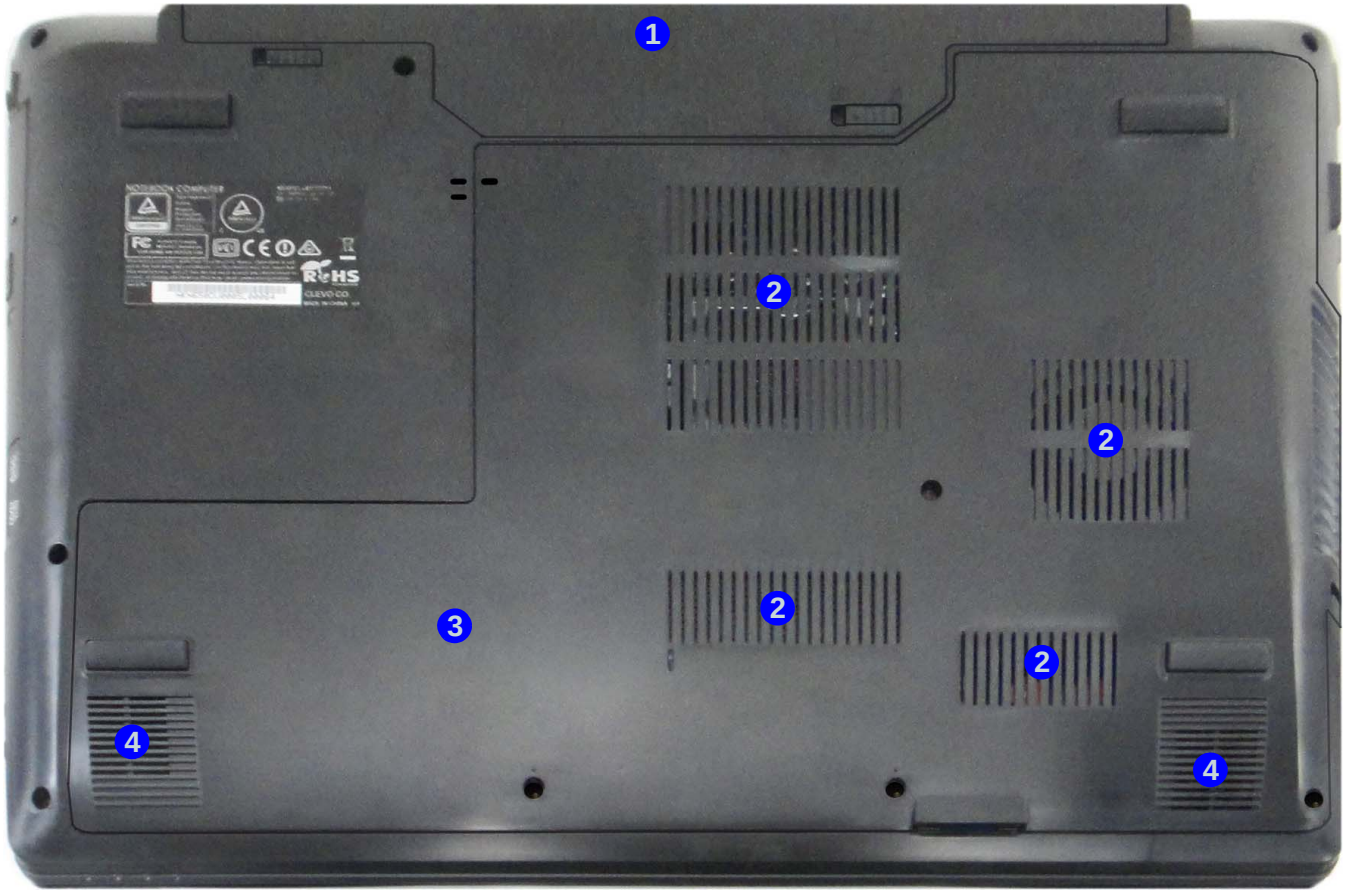


Figure 6
Bottom View

1. Battery
2. Vent
3. Component Bay Cover
4. Speakers

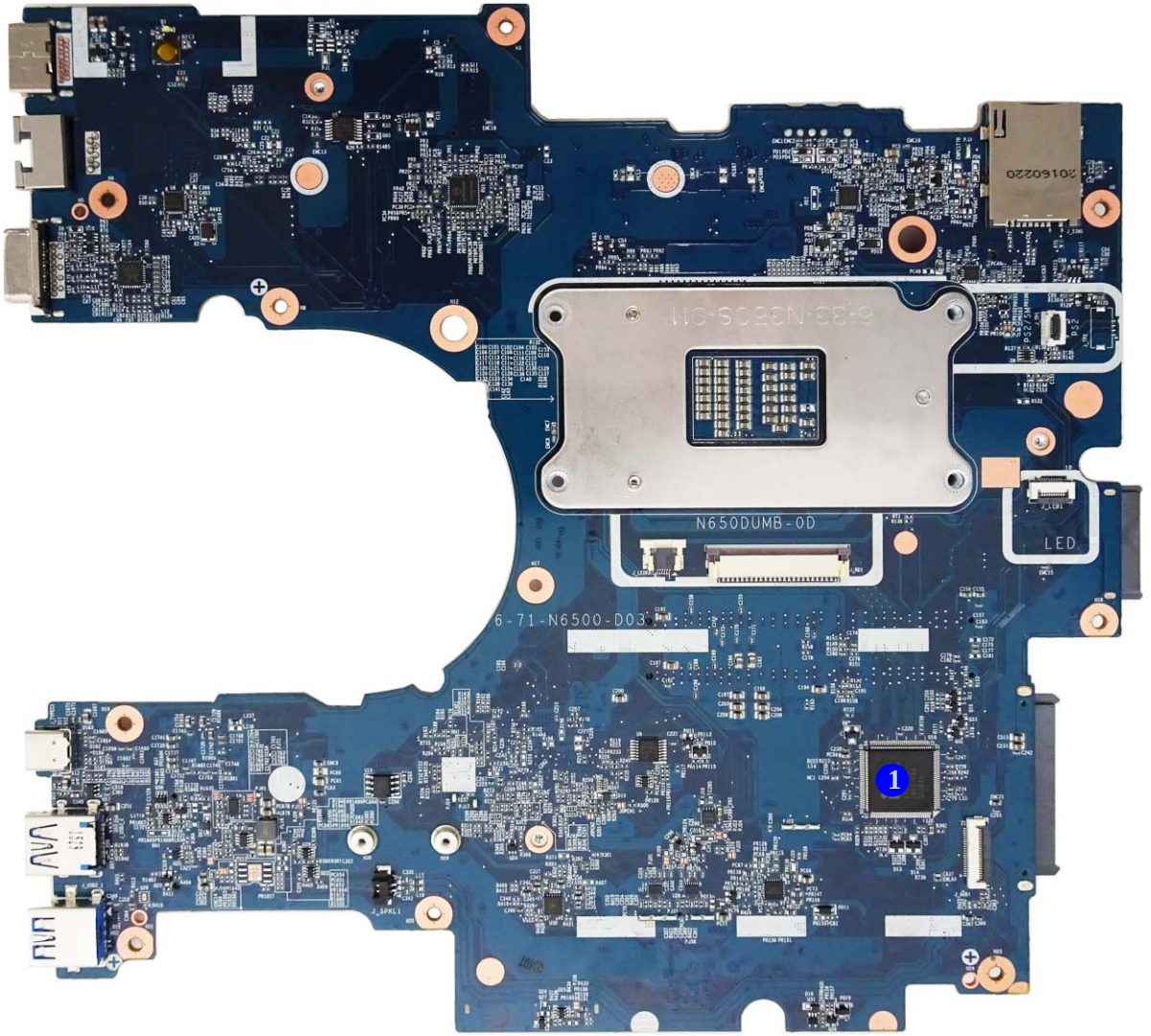
Overheating

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

Mainboard Overview - Top (Key Parts)

Figure 7
Mainboard Top Key Parts

1. KBC-ITE IT8587



Mainboard Overview - Bottom (Key Parts)

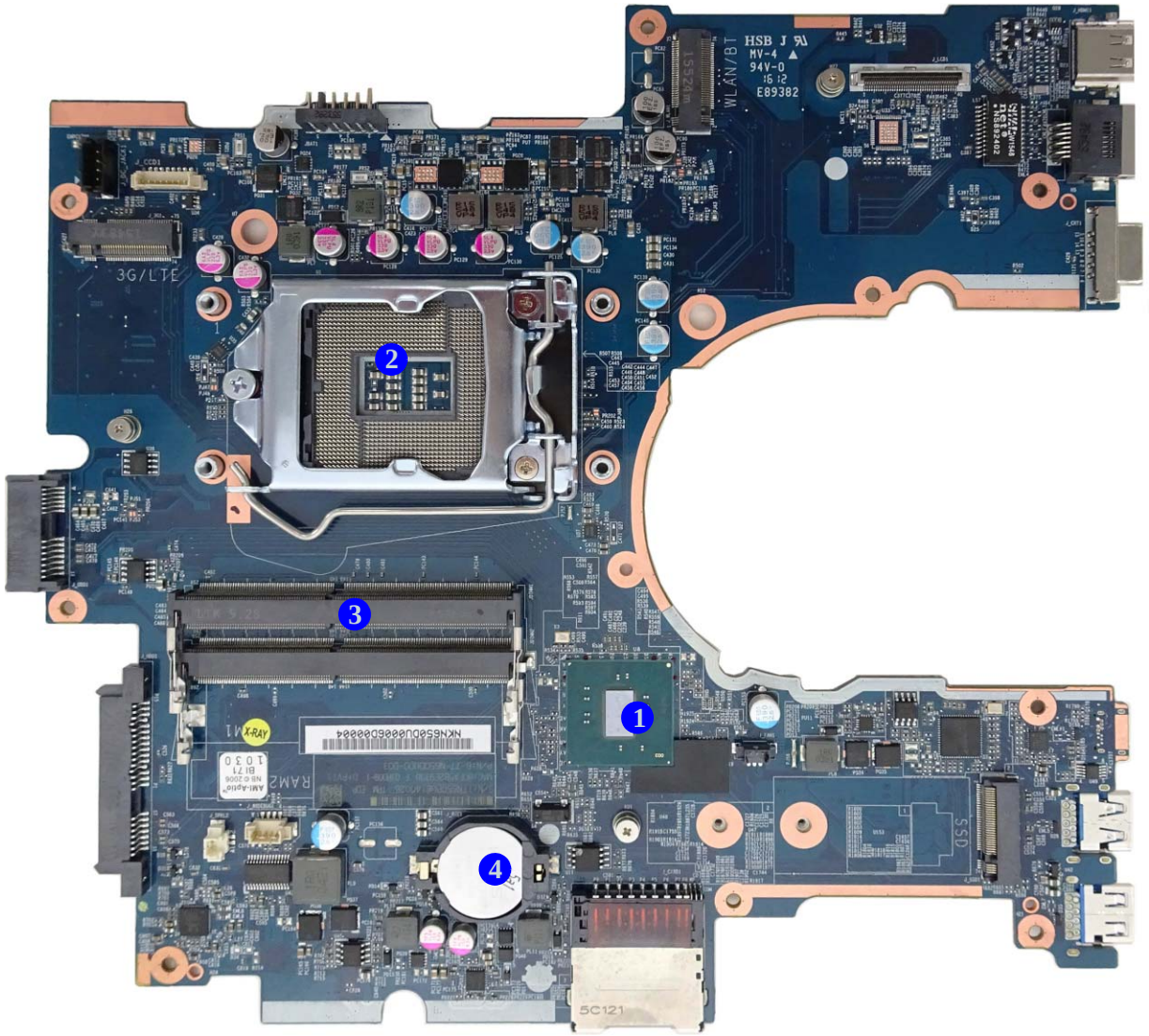


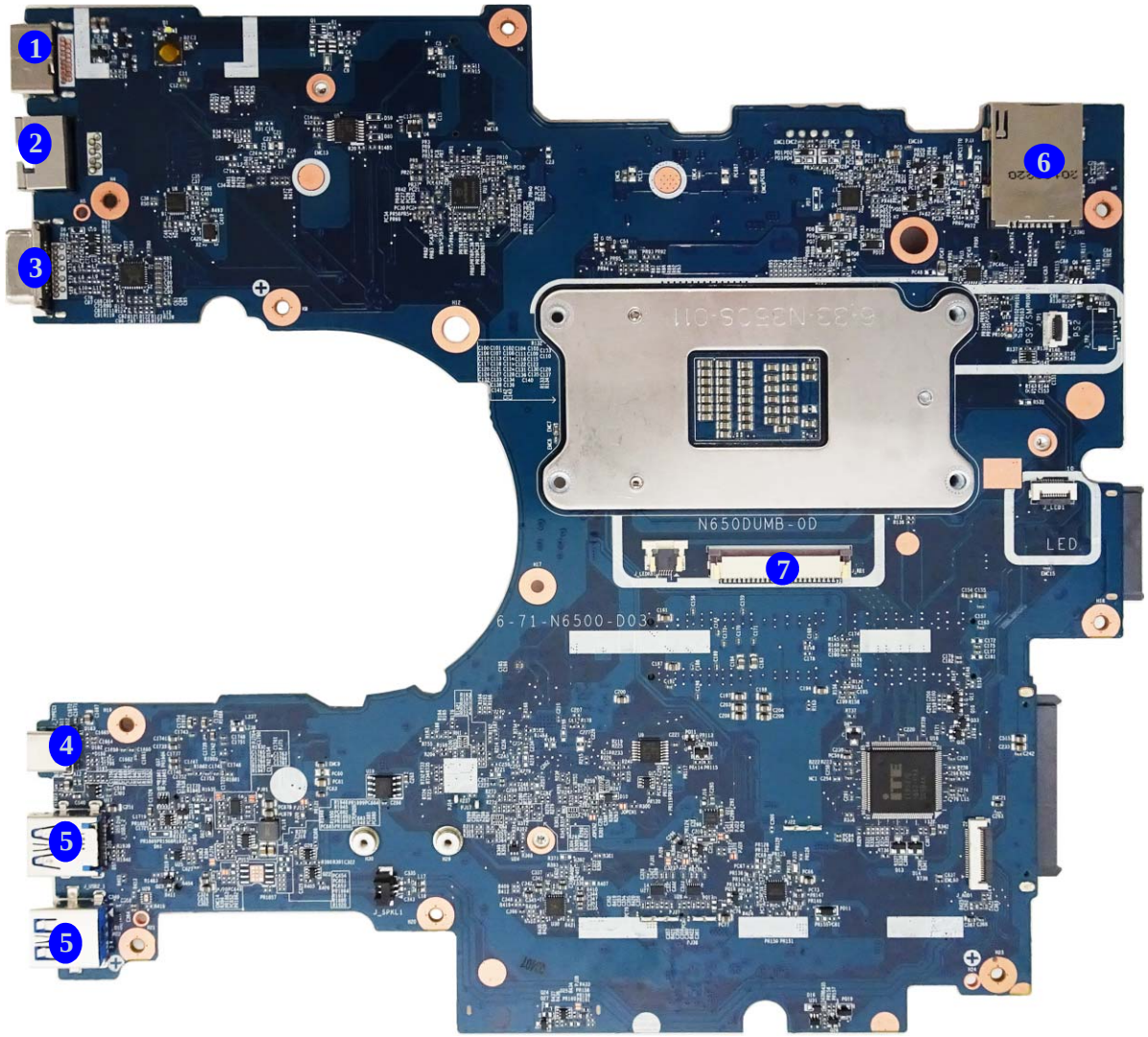
Figure 8
Mainboard Bottom Key Parts

1. PCH
2. CPU
3. Memory Slots DDR4 SO-DIMM
4. CMOS Battery

Mainboard Overview - Top (Connectors)

Figure 9
Mainboard Top Connectors

1. HDMI-Out Port
2. RJ-45 LAN Port
3. External Monitor Port
4. USB Ports 3.0/3.1 (Type C)
5. USB Ports 3.0/3.1 (Type A)
6. SIM Card Reader
7. Keyboard Cable Connector



Mainboard Overview - Bottom (Connectors)

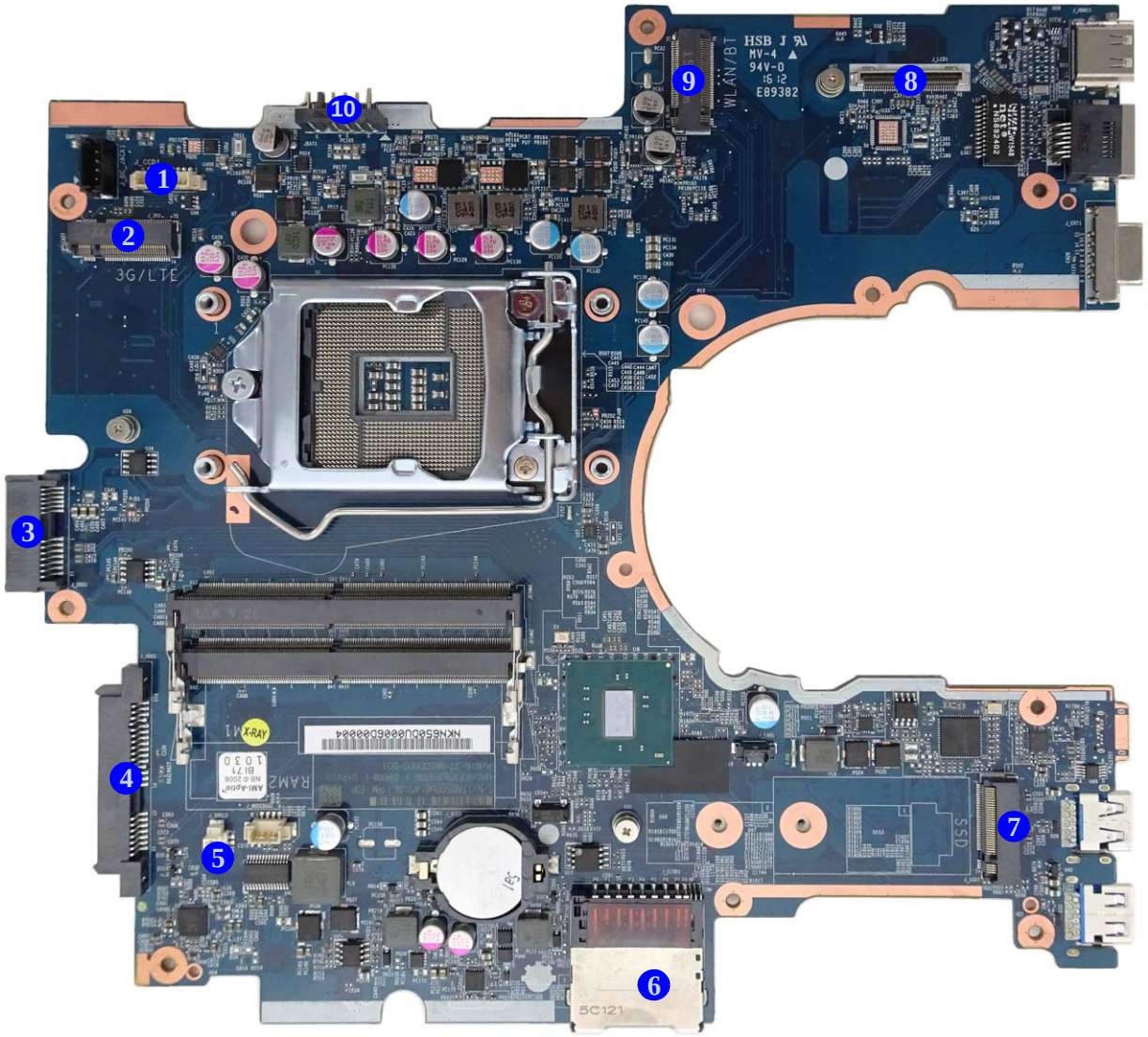


Figure 10
Mainboard Bottom Connectors

1. CCD Connector
2. 3G/4G Card Connectort
3. ODD Connector
4. HDD Connector
5. Speaker Connector
6. Multi-in-1 CardReader
7. SSD Card Connector
8. LCD Cable Connector
9. WLAN Connector
10. Battery Connector

Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the ***N650DU*** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

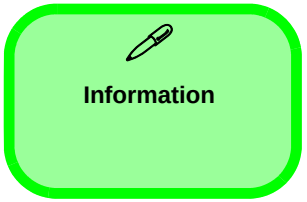
We suggest you completely review any procedure before you take the computer apart.

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

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

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

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



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

Maintenance Tools

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

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

Connections

Connections within the computer are one of four types:

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

Maintenance Precautions

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

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

Power Safety Warning

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

Cleaning

Do not apply cleaner directly to the computer, use a soft clean cloth.
Do not use volatile (petroleum distillates) or abrasive cleaners on any part of the computer.

Disassembly Steps

The following table lists the disassembly steps, and on which page to find the related information. **PLEASE PERFORM THE DISASSEMBLY STEPS IN THE ORDER INDICATED.**

To remove the Battery:

1. Remove the battery *page 2 - 5*

To remove the HDD:

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

To remove the Optical Device:

1. Remove the battery *page 2 - 5*
2. Remove the ODD *page 2 - 10*

To remove the System Memory:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the system memory *page 2 - 11*

To remove and install a Processor:

1. Remove the battery *page 2 - 5*
2. Remove the processor *page 2 - 13*
3. Install the processor *page 2 - 15*

To remove the Keyboard:

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

To remove the 3G Module:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the 3G *page 2 - 18*

To remove the WLAN Module:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the WLAN *page 2 - 19*

To remove the M.2 SSD:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the SSD *page 2 - 21*

To remove the CCD Module:

1. Remove the battery *page 2 - 5*
2. Remove the HDD *page 2 - 6*
3. Remove the CCD module *page 2 - 22*

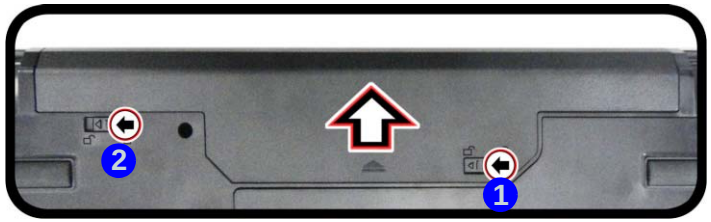
Removing the Battery

1. Turn **off** the computer, turn it over.
2. Slide the latch 1 in the direction of the arrow (***Figure 1a***).
3. Slide the latch 2 in the direction of the arrow, and hold it in place (***Figure 1a***).
4. Slide the battery 3 in the direction of the arrow 4 and lift it out (***Figure 1b***).
5. Make sure the latch 5 is in the unlock position and then slide the battery into the bay in the direction of the arrow until it locks into position. Make sure both locks are locked after the battery is in the bay (***Figure 1c***).

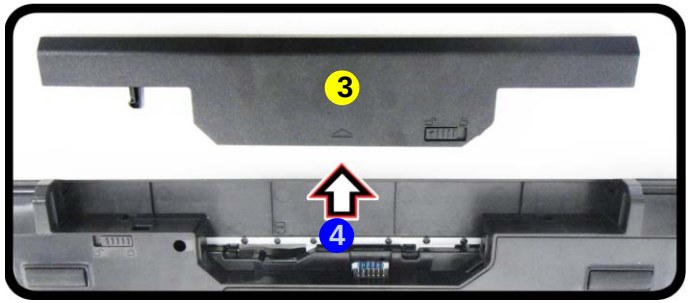
Figure 1
Battery Removal

a. Slide the latch and hold it in place.
b. Slide the battery out.
c. Slide the battery in.

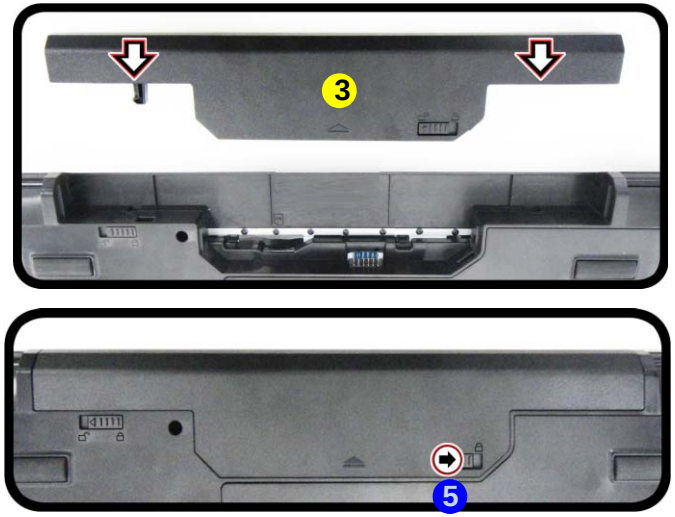
a.



b.



c.



3. Battery

Figure 2
HDD Assembly Removal

a. Remove the screws.
b. Remove the bay cover.
c. Locate the HDD assembly.

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 9.5mm or 7.0mm (h). Follow your operating system's installation instructions, and install all necessary drivers and utilities (as outlined in **Chapter 4 of the User's Manual**) when setting up a new hard disk.

Hard Disk Upgrade Process

1. Turn **off** the computer, turn it over to remove the battery (***page 2 - 5***).
2. Remove the screws 1 - 4 (***Figure 2a***).
3. Slide the component bay cover 5 until the cover and case indicator 6 are aligned and remove it (***Figure 2b***).
4. The hard disk drive will be visible at point 7 (***Figure 2c***).

HDD System Warning

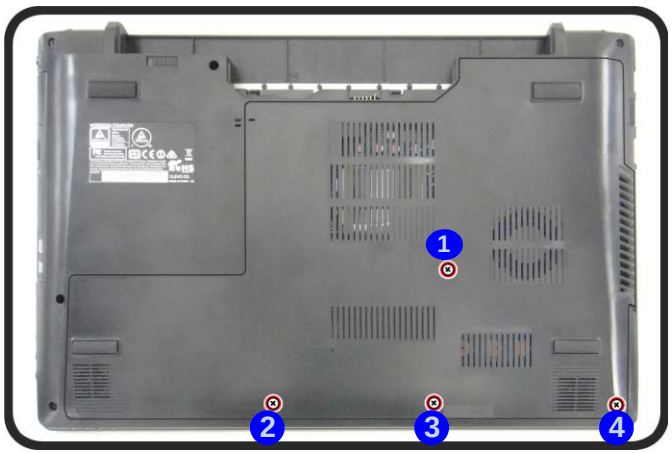
New HDD's are blank. Before you begin make sure:

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

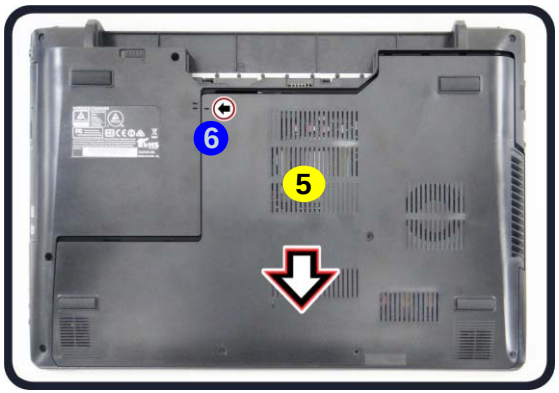
You have all the CD-ROMs and FDDs required to install your operating system and programs.

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.

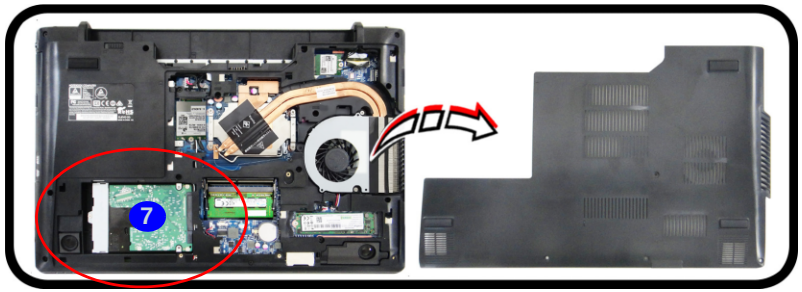
a.



b.



c.



5. HDD Bay Cover

- 4 Screws

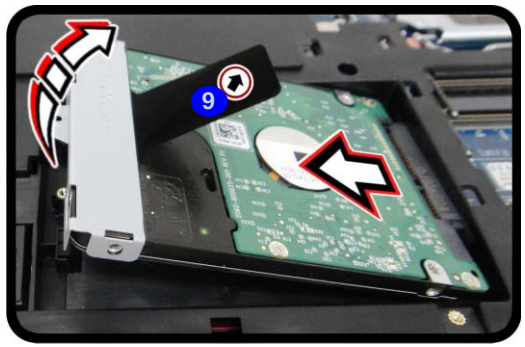
5. Remove the screw 8 from the hard disk assembly (*Figure 3d*).
6. Slightly lift and pull the hard disk assembly in the direction of arrow 9 (*Figure 3e*).
7. Lift the hard disk assembly 10 out of the bay 11 (*Figure 3f*).
8. Remove the screws 12 - 13 and the HDD bracket 14 from the hard disk 15 (*Figure 3g*).
9. Reverse the process to install a new hard disk (do not forget to replace all the screws and bottom cover).

Figure 3
HDD Assembly Removal (cont'd.)

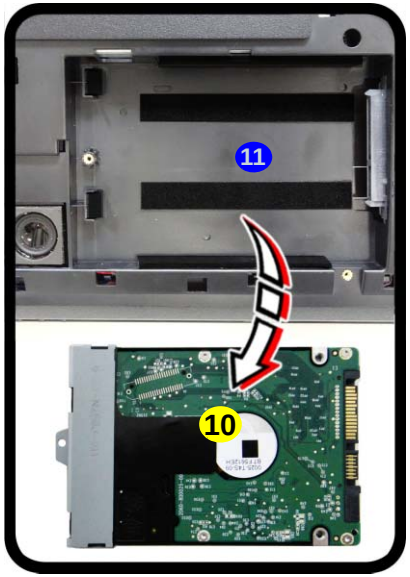
d. Remove the screw.
e. Slightly lift and pull the HDD assembly in the direction of the arrow.
f. Lift the HDD assembly out of the bay.
g. Remove the screws and HDD bracket.

d.

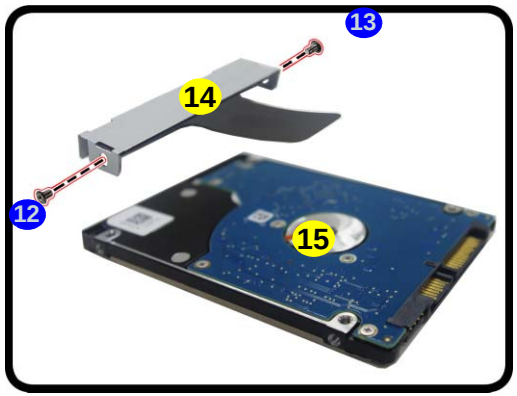
e.



f.



g.



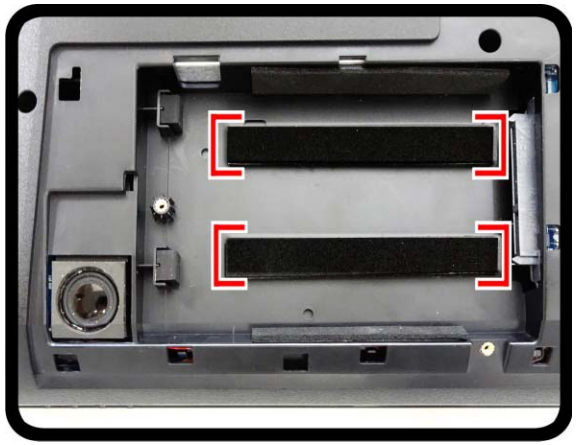
10. HDD Assembly
14. HDD Bracket
15. HDD

- 3 Screws

Hard Disk Size Note (Foam Rubber Insert)

Note that the hard disks pictured on the following pages are all 9.5mm(H) hard disk drives. In some cases 7mm(H) hard disk drives will be installed. For more information contact your distributor/supplier, and bear in mind your warranty terms.

Figure 4
Foam Rubber Insert for 7mm(H) HDDs



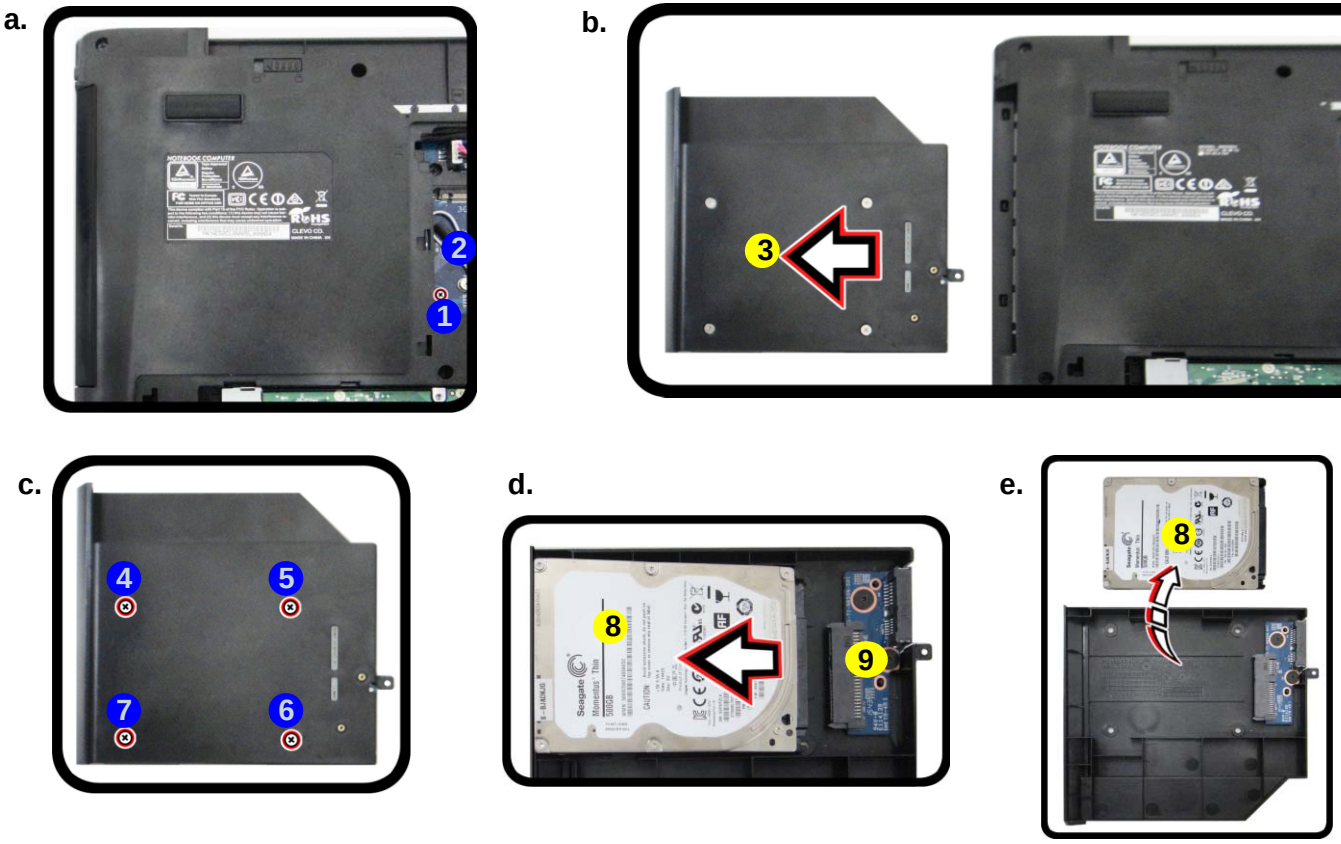
- If you are replacing a 9.5mm(H) HDD with a 7mm(H) HDD then insert another foam rubber insert on top of the existing one (as shown above).
- If you are replacing a 7mm(H) HDD with a 9.5mm(H) HDD then remove the upper foam rubber insert (only the upper insert).

Removing the Caddy/2nd HDD

1. Turn **off** the computer, turn it over, and remove the battery (*page 2 - 5*) and the component bay cover (*page 2 - 6*).
2. Remove the screw at point 1, and use a screwdriver to carefully push out the caddy 3 at point 2.
3. Remove screws 4 - 7 (*Figure 5c*) to release the hard disk.
4. Separate the hard disk 8 from the connector 9 (*Figure 5d*).
5. Lift the hard disk 8 out (*Figure 5e*).
6. Reverse the process to install a new HDD (do not forget to replace the screws and bottom cover).
7. Restart the computer to allow it to automatically detect the new device.

Figure 5
Caddy/2nd HDD Removal

a. Remove the screw.
b. Remove the caddy from the ODD bay.
c. Remove the screws.
d. Separate the HDD and connector.
e. Lift the HDD off the caddy.



HDD

Only use 7.0 mm(H) HDD for the second HDD/caddy.

3. Caddy
5. HDD
9. HDD Connector

- 5 Screws

Figure 6
ODD Removal

a. Remove the screw.
b. Push the optical device out of the computer.
c. Pry the bezel off the optical device.
d. Separate the bezel and optical device
e. Install the front bezel.

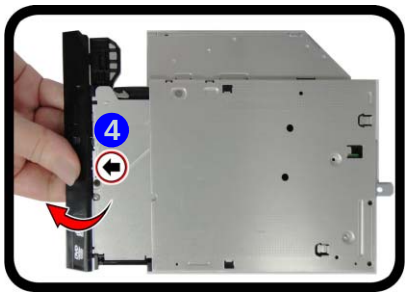
Removing the Optical Device

1. Turn **off** the computer, turn it over, and remove the battery (***page 2 - 5***) and the component bay cover (***page 2 - 6***).
2. Remove the screw at point 1, and use a screwdriver to carefully push out the optical device 3 at point 2.
3. Carefully pry the bezel 5 off the optical device at point 4 (***Figure 6c***).
4. Separate the bezel 5 and the optical device as shown (***Figure 6d***).
5. Reverse the process to attach the front bezel 5 with the new optical device at point 6 (***Figure 6e***).
6. Insert the new device and carefully slide it into the computer (the device only fits one way. DO NOT FORCE IT; The screw holes should line up). Replace the bottom cover and tighten the screws.
7. Restart the computer to allow it to automatically detect the new device.

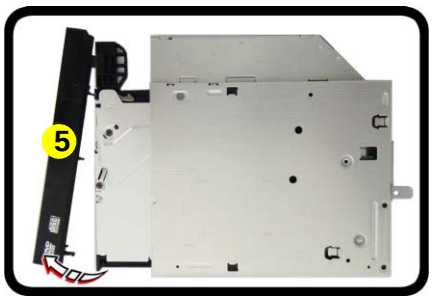
a.

b.

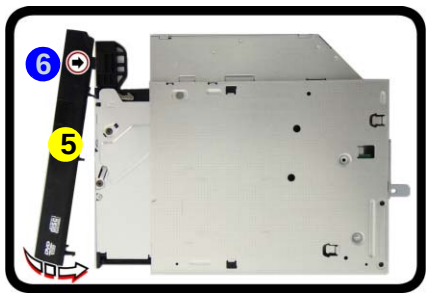
c.



d.



e.



3. Optical Device
5. Bezel Cover

- 1 Screws

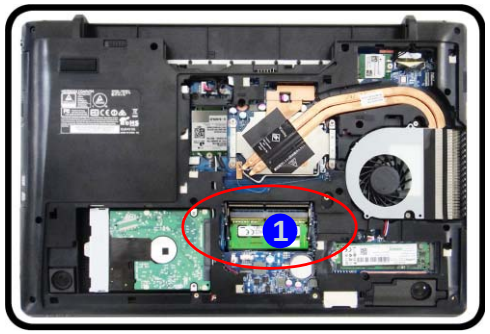
Removing the System Memory (RAM)

The computer has two memory sockets for 204 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR3L Up to 1066/1333 MHz. The main memory can be expanded up to 8GB. The SO-DIMM modules supported are 1024MB and 2048MB **DDR3L** Modules. The total memory size is automatically detected by the POST routine once you turn on your computer.

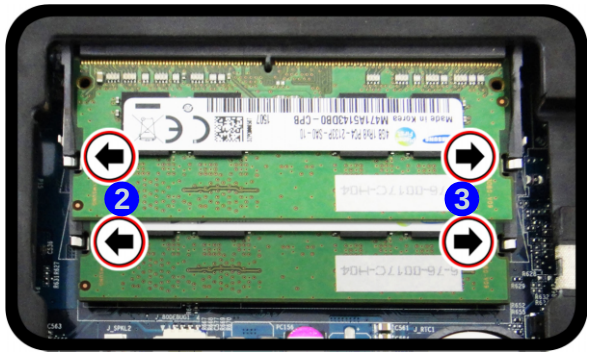
Memory Upgrade Process

1. Turn **off** the computer, turn it over to remove the battery (***page 2 - 5***) and bottom cover (***page 2 - 6***).
2. The RAM modules will be visible at point 1 on the mainboard (***Figure 7b***).
3. Gently pull the two release latches (2 & 3) on the sides of the memory socket in the direction indicated by the arrows (***Figure 7b***). The RAM module 4 will pop-up (***Figure 7c***), and you can then remove it.

a.



b.



c.

Figure 7
RAM Module Removal

a. The RAM modules will be visible at point 1 on the mainboard.
b. Pull the release latches.
c. Remove the module.

Contact Warning

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

4. RAM Module

Figure 8
RAM Module Assembly

d. Insert the RAM modules properly.

4. Pull the latches to release the second module if necessary.
5. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
6. The module will only fit one way as defined by its pin alignment. Make sure the module is seated as far into the slot as it will go. DO NOT FORCE IT; it should fit without much pressure.
7. Replace the bottom case and the screws (see ***page 2 - 6***).
8. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.

d.

4. RAM Module

Removing and Installing a Processor

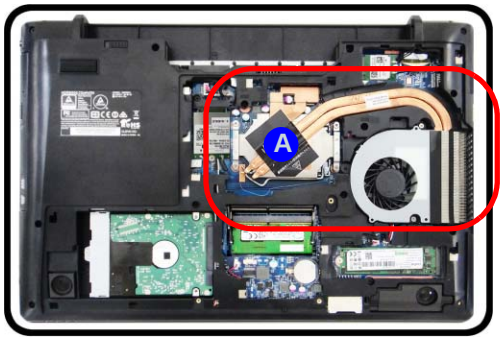
Processor Removal Procedure

1. Turn **off** the computer, turn it over, and remove the battery (***page 2 - 5***), component bay cover (***page 2 - 6***) and RAM (***page 2 - 11***).
2. The CPU heat sink will be visible at point A (***Figure 9a***).
3. 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 9b***).
4. Carefully (it may be hot) remove the heat sink unit B (***Figure 9c***).

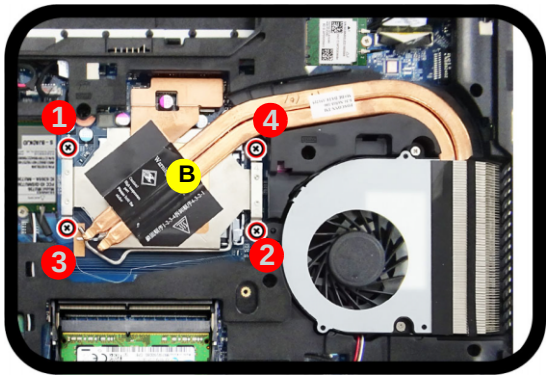
Figure 9
Processor Removal

a. The CPU heat sink will be visible at point A.
b. Remove the screws from the CPU heatsink.
c. Carefully lift the heat sink up and off the computer.

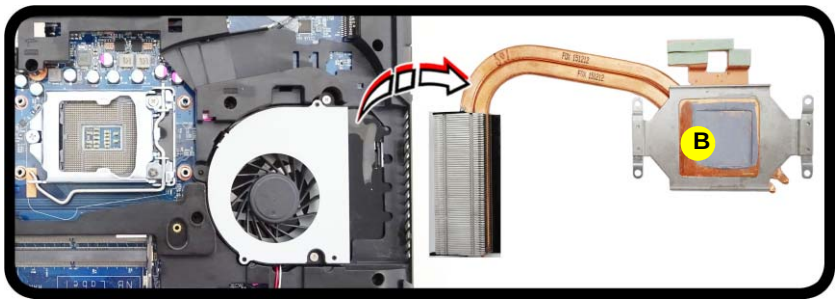
a.



b.



c.



B. Heat Sink

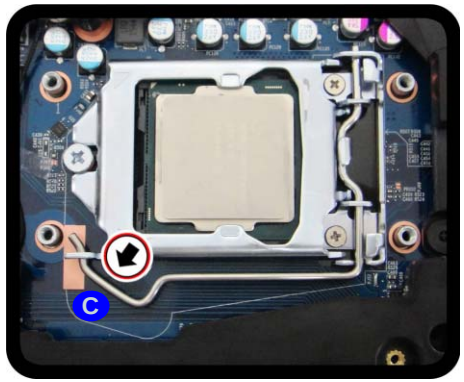
- 4 Screws

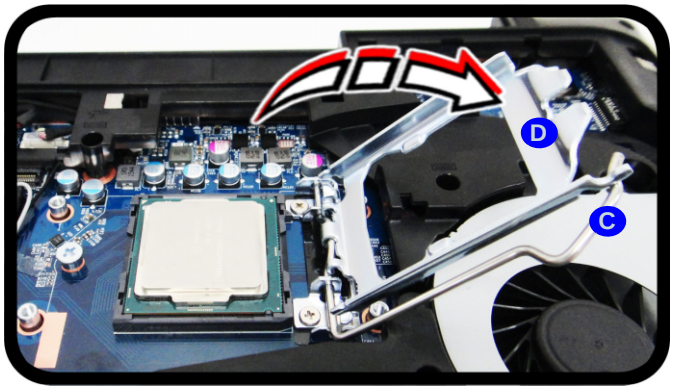
Figure 10
Processor Removal (cont'd)

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

5. Press down and hold the latch C (with the latch held down you will be able to release it).
6. Move the latch C and bracket D fully in the direction indicated to unlock the CPU(***Figure 10c***).
7. Carefully (it may be hot) lift the CPU E up and out of the socket (***Figure 10e***).
8. See ***page 2 - 15*** for information on inserting a new CPU.
9. When re-inserting the CPU, pay careful attention to the pin alignment, it will fit only one way (DO NOT FORCE IT!).

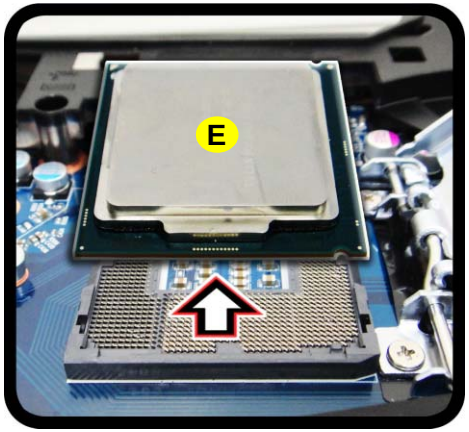
d.





Unlock

e.



E. CPU

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.

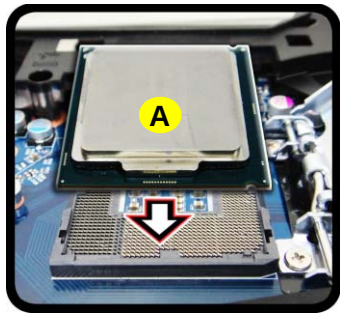
Processor Installation Procedure

1. Insert the CPU A (*Figure 11a*), pay careful attention to the pin alignment, it will fit only one way (DO NOT FORCE IT!) (*Figure 11a*).
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 11b*).
4. **Remove the sticker** E (*Figure 11c*) from the heat sink unit (if it is a new unit).
5. Insert the heat sink unit F as indicated in *Figure 11c*.
6. Tighten the CPU heat sink screws in the order 1 - 4 (the order as indicated on the label and *Figure 11d*).
7. Replace the component bay cover and tighten the screws.

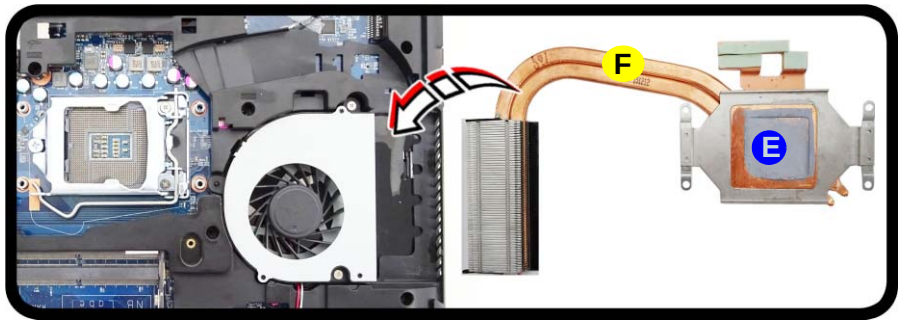
Figure 11
Processor Installation

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

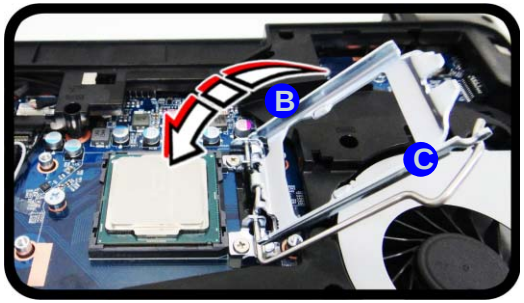
a.

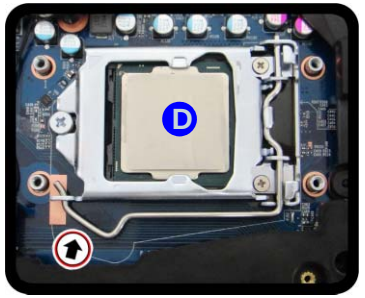


c.

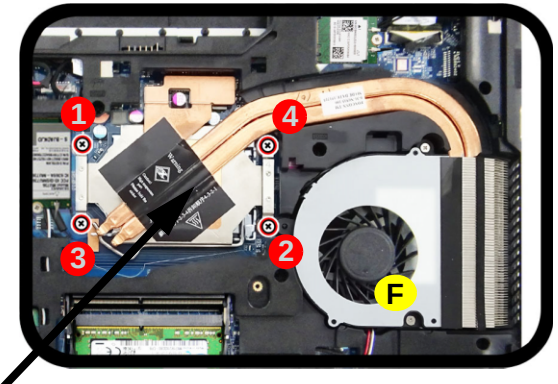


b.





d.



Note:
Tighten the screws in the order as indicated on the label.

A. CPU
F. Heat Sink

- 4 Screws

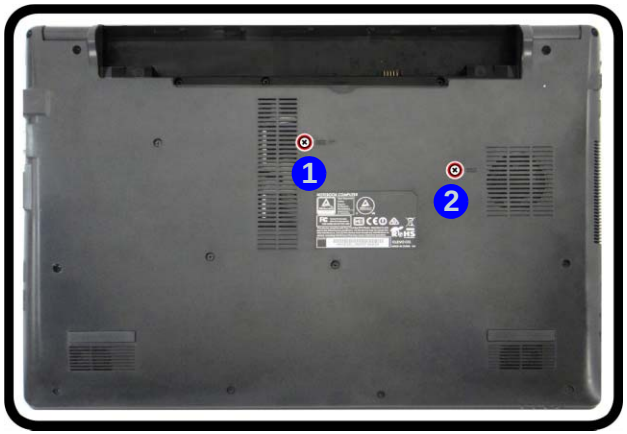
Figure 12
Keyboard Removal

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

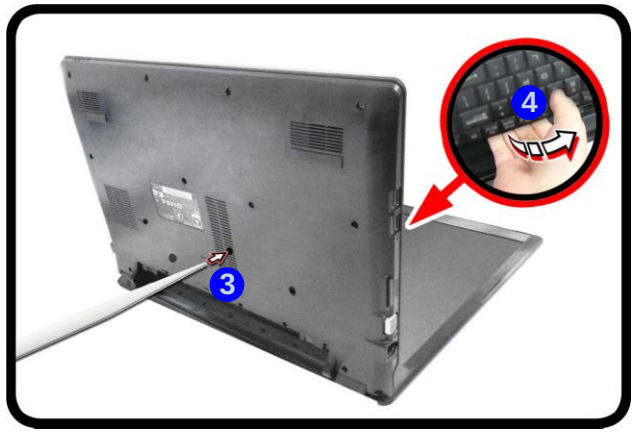
Removing the Keyboard

1. Turn **off** the computer, turn it over to remove the battery (*page 2 - 5*).
2. Remove screws 1 - 2 from the bottom case (*Figure 12a*).
3. Open it up with the LCD on a flat surface before pressing at point 3 to release the keyboard module (use the special eject stick to do this) while releasing the keyboard in the direction of the arrow 4 as shown (*Figure 12c*).
4. Carefully lift the keyboard 5 up, being careful not to bend the keyboard ribbon cable 6. Disconnect the keyboard ribbon cable from the locking collar socket 7 (*Figure 12d*).
5. Carefully lift up the keyboard 5 off the computer (*Figure 12e*).

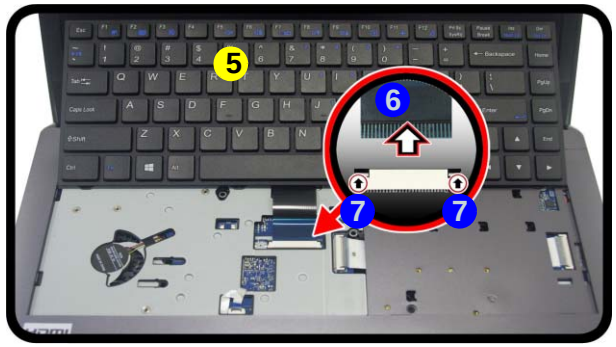
a.



b.



c.



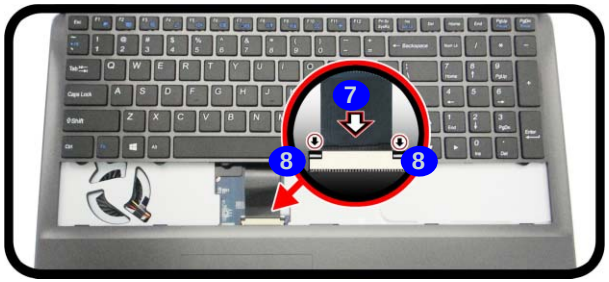
d.

5. Keyboard

- 2 Screws

6. Connect the keyboard ribbon cable to the locking collar socket 8, and be careful not to bend the keyboard ribbon cable 7 (*Figure 13d*).
7. Insert the keyboard 4 at point 9 and then slide the keyboard in at point 10 and 11 (*Figure 13e*).
8. Tighten the screws 12 - 13 to secure the keyboard (*Figure 13f*).

d.



e.

f.

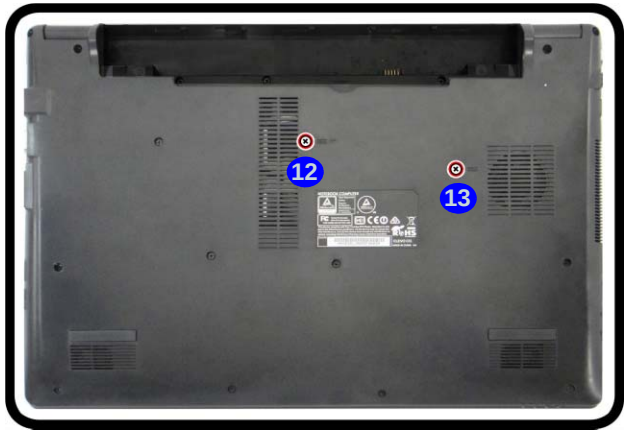


Figure 13
Keyboard Assembly

d. Connect the keyboard ribbon cable to the locking collar socket.
e. Insert the keyboard at point 9 and slide it in.
f. Tigthen the screws.

4. Keyboard

- 2 Screws

Figure 14
3G Module Removal

a. Locate the 3G.
b. Disconnect the cable and remove the screw.
c. The 3G module will pop up and lift it out of the computer.

Note: Make sure you reconnect the antenna cable to the "1 + 2" socket (***Figure 14b***).

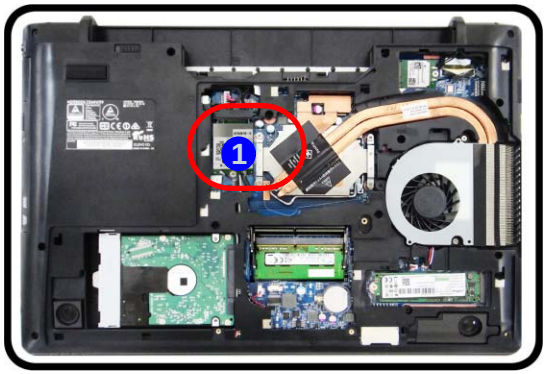
5.3G Module

- 1 Screw

Removing the 3G Module

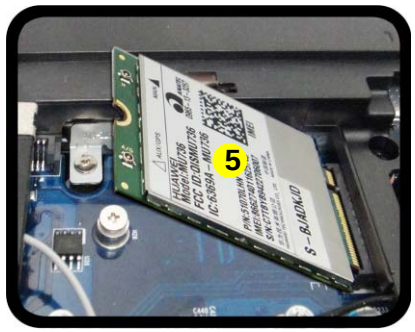
1. Turn **off** the computer, turn it over to remove the battery (***page 2 - 5***) and bottom cover (***page 2 - 6***).
2. The 3G module will be visible at point 1 on the mainboard (***Figure 14a***).
3. Carefully disconnect the cables 2 & 3, and then remove the screw 4 (***Figure 14b***)
4. The 3G module 5 (***Figure 14c***) will pop-up, and you can remove it from the computer.
5. Reverse the process to install a new module (do not forget to replace all the screws and bottom cover).

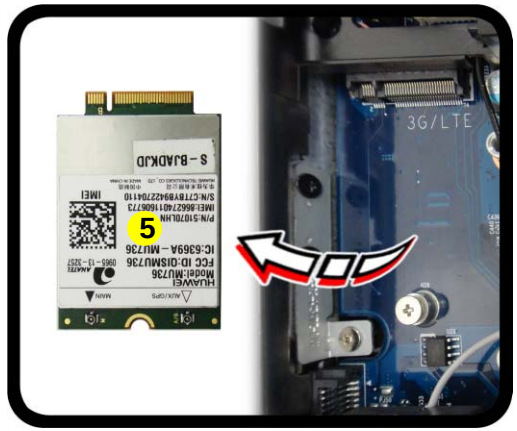
a.



b.

c.

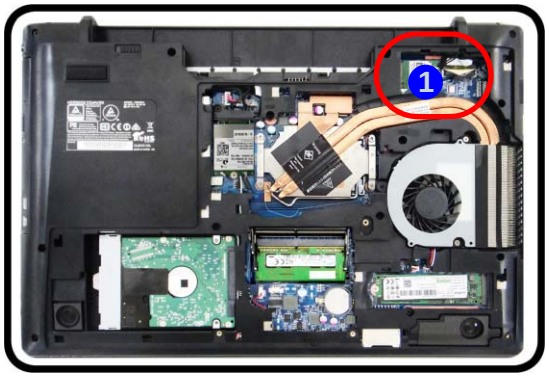




Removing the WLAN Module

1. Turn **off** the computer, turn it over to remove the battery (***page 2 - 5***) and bottom cover (***page 2 - 6***).
2. The WLAN module will be visible at point 1 on the mainboard (***Figure 14a***).
3. Carefully disconnect the cables 2 & 3, and then remove the screw 4 (***Figure 14b***)
4. The WLAN module 5 (***Figure 14c***) will pop-up, and you can remove it from the computer.
5. Reverse the process to install a new module (do not forget to replace all the screws and bottom cover).

a.



b.

c.

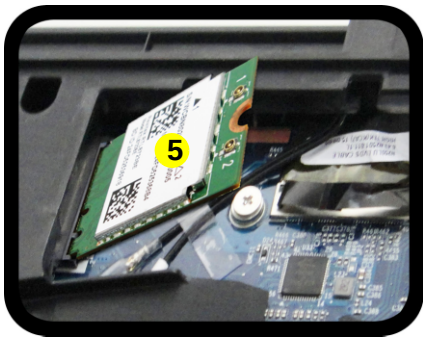


Figure 15
WLAN Module Removal

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

Note: Make sure you reconnect the antenna cable to the "1 + 2" socket (***Figure 14b***).

5.3G Module

- 1 Screw

Wireless LAN, Combo, 3G & LTE Module Cables

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

Module Type	Antenna Type	Cable Color	Cable Cover Type
WLAN/WLAN & Bluetooth Combo	WM 1	Black	Transparent
	WM 2	Black	White
LTE Broadband	LTE 1	Black	Black
	LTE 2	Blue	
3G Broadband	3G 1	Black	Black
	3G 2	Gray	

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

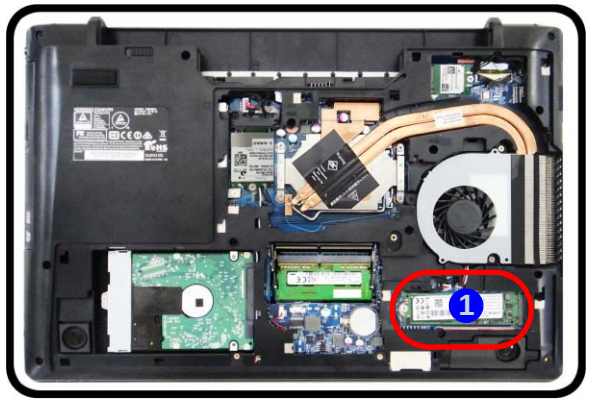
Removing the M.2 SSD Module

1. Turn **off** the computer, turn it over to remove the battery (***page 2 - 5***) and bottom cover (***page 2 - 6***).
2. The M.2 SSD module will be visible at point 1 on the mainboard (***Figure 16a***).
3. Remove the screw 2 (***Figure 16b***)
4. The M.2 SSD module 3 (***Figure 16c***) will pop-up, and you can remove it from the computer.
5. Reverse the process to install a new module (do not forget to replace all the screws and bottom cover).

Figure 16
M.2 SSD Module Removal

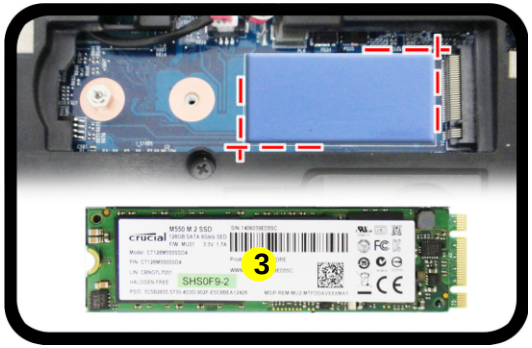
a. Locate the module.
b. Remove the screw.
c. The module will pop up.

a.



b.

c.



3.M2 SSD Module

- 1 Screw

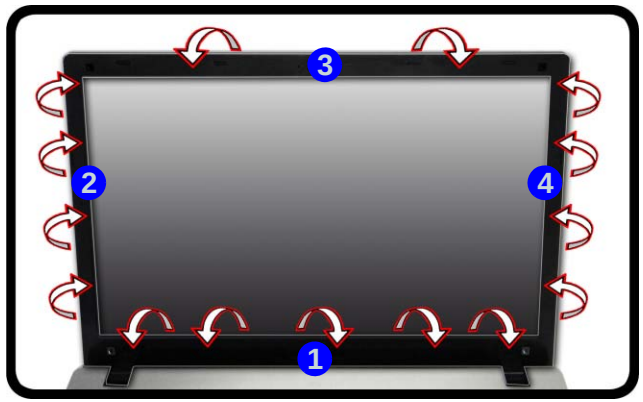
Figure 17
CCD Removal

a. Run your fingers around the inner frame of the LCD panel at the points indicated by the arrows.
b. Lay the computer down on a flat surface with the top case up forming a 90 degree angle. Push the LCD front panel upwards before carefully lifting it up.
c. Remove the LCD front cover.

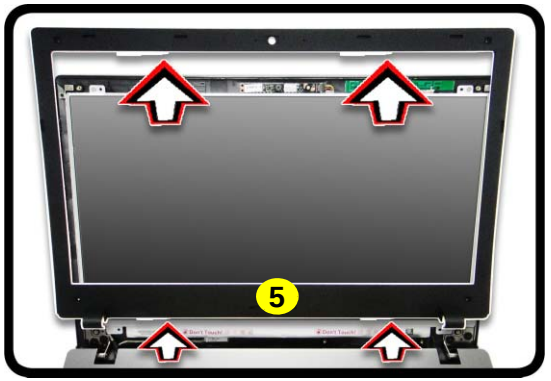
Removing the CCD

1. Turn **off** the computer, turn it over to remove the battery (*page 2 - 5*).
2. Run your fingers around the inner frame of the LCD panel at the points as indicated by the arrows 1 - 4 (*Figure 17a*).
3. Lay the computer down on a flat surface with the top case up forming a 90 degree angle. Push the LCD front cover 5 upwards before carefully lifting it up.
4. Remove the LCD front cover 5 (*Figure 17c*).

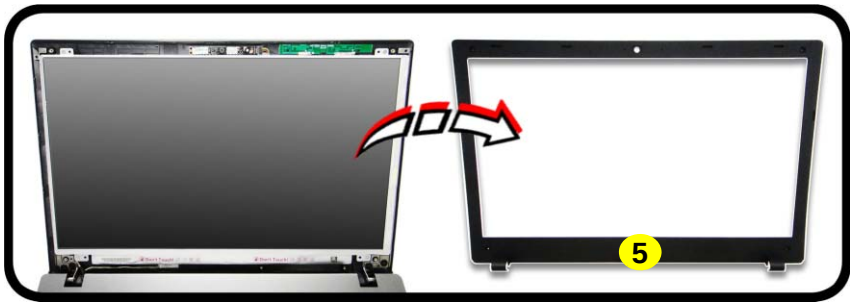
a.



b.



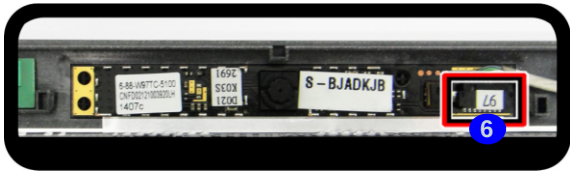
c.



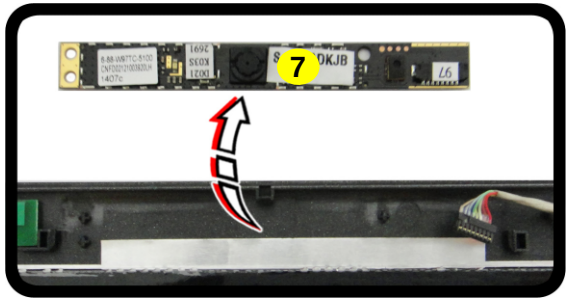
5. LCD Front Cover

5. Disconnect the cable 6.
6. Remove the CCD module 7 (*Figure 18f*).
7. Reverse the process to install a new CCD module.

d.



e.



Figur
CCD Re
(con

d. Disconnect
e. Remove the
ule.

2.Disassembly

7. CCD Modu

Appendix A:Part Lists

This appendix breaks down the ***N650DU*** series notebook's construction into a series of illustrations. The component part numbers are indicated in the tables opposite the drawings.

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

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

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

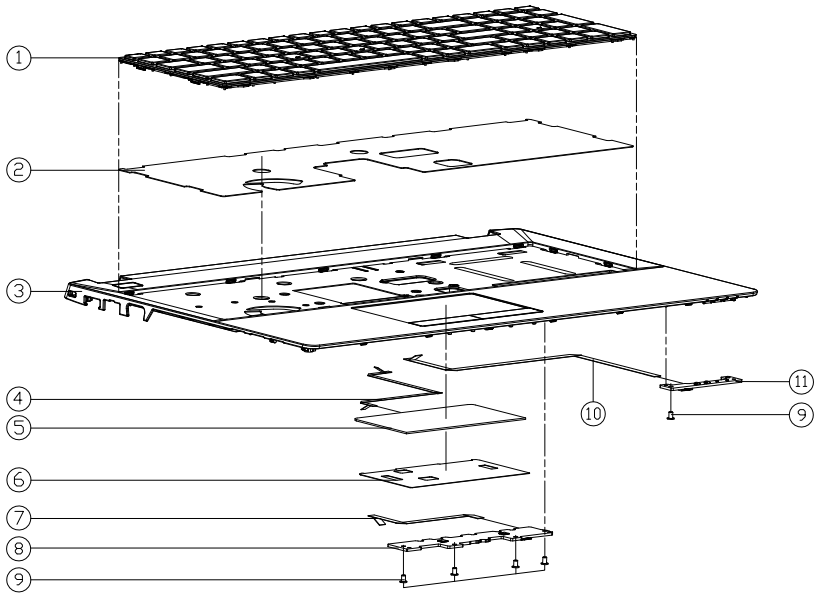
Part List Illustration Location

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

Table A - 1
Part List Illustration Location

Part	W950LU
Top	*page A - 3*
Bottom	*page A - 4*
LCD	*page A - 5*
DVD	*page A - 6*
HDD	*page A - 7*
2ND HDD	*page A - 8*
MB	*page A - 9*

Top

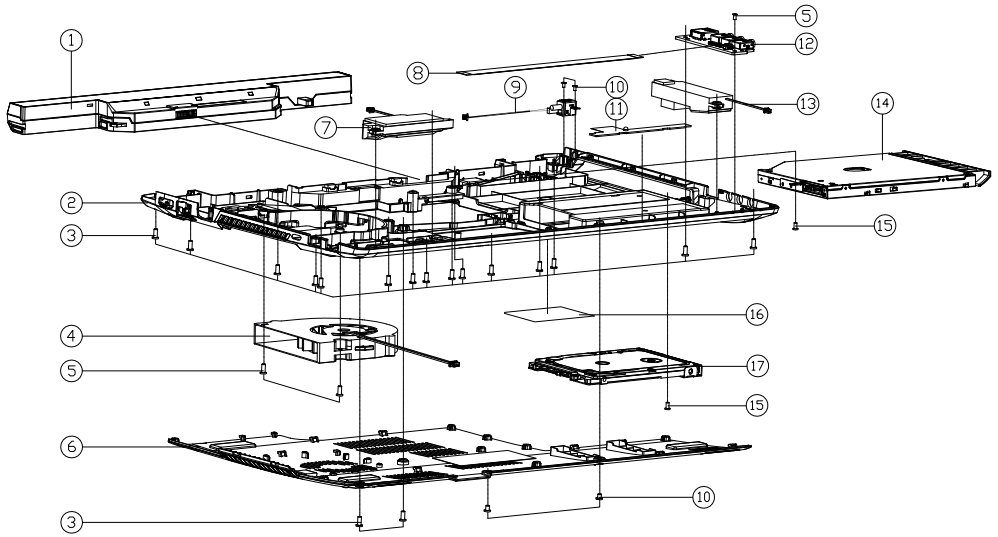


ITEM	PART NAME	PART NO	REMARK
1	WIN8 K/B USA(BLACK)& FRAME(US) MODULE FOR N250LU	6-79-N250LU0K-011-W	
2	WO BL KB MYLAR PET MYLAR+DSIS N650DU	6-40-N6502-023	ONLY FOR W/O BL KB
3	TOP CASE MODULE N650DU	6-39-N6502-014	
4	TP TO MB FFC CABLE 5V 6P PITCH=0.5MM L=210MM (HT) N650DU	6-43-N6502-032	
5	TOUCH PAD SYNAPTICS TM-03189-001(100*55MM) N250LU	6-49-N2503-010	
6	TOP TP MYLAR PET N250LU	6-40-N2502-040	
7	CLICK TO TP FFC CABLE 5V 4P L=100MM (HT) N650DU	6-43-N6502-011	
8	CLICK BOARD V2.0A N650DU	6-77-N6502-D02A	
9	.SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
10	LED TO MB FFC CABLE 5V 10P L=234MM (HT) N650DU	6-43-N6500-011	
11	FRONT LED BOARD V2.0 N650DU	6-77-N6504-D02	

Figure A - 1
Top

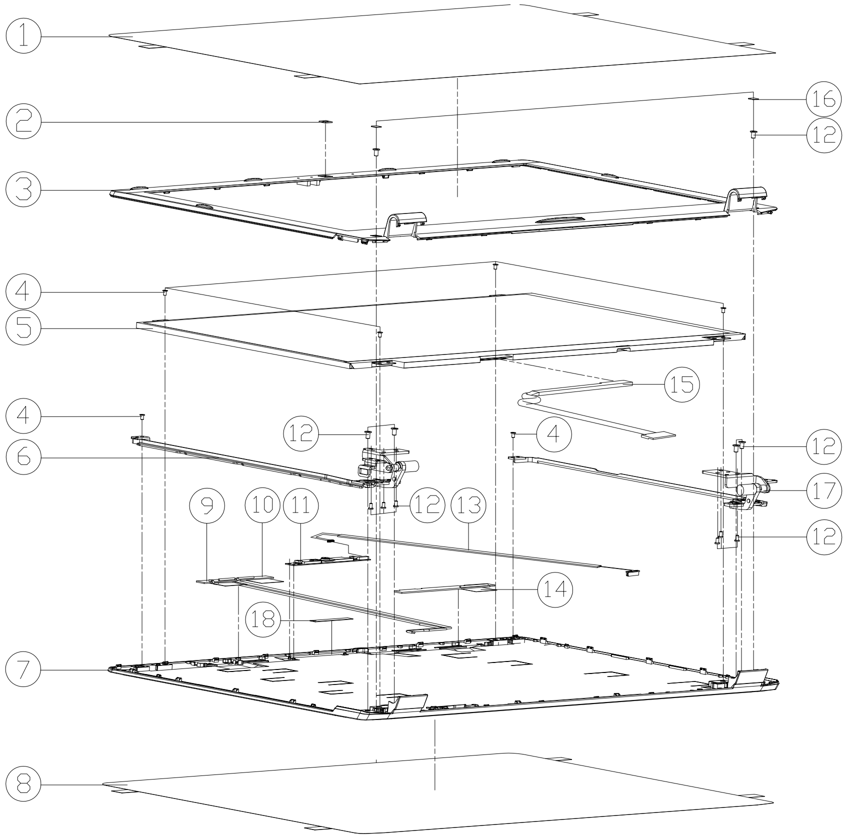
Bottom

Figure A - 2
Bottom



ITEM	PART NAME	PART NO	REMARK
1	[illegible]	6-87-W650S-4D7A4	(OPTION)
1	[illegible]	6-87-N650S-4CF1	(OPTION)
1	[illegible]	6-87-N650S-4U4	(OPTION)
1	[illegible]	6-87-W650S-4D4A5	(OPTION)
2	BOTTOM CASE MODULE N650DU	6-39-N6503-015	
3	SCREW M2.5*6L K BZ ICT NY	6-35-82125-6RA	
4	[illegible]	6-23-AW15H-010	
5	.SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
6	CPU COVER MODULE N650DU	6-42-N6508-102	
7	SPK+CABLE L 2V 47 45MM DS-188M-2L-K6-HF N650DU V1J	6-23-5N650-0L1	
8	FFC AUDIO TO MB 22PIN 0.5PITCH 178MM N350DV (HT)	6-43-N3500-070-1	
9	DC CABLE FOR JACK PJ206-[illegible]	6-43-W65R0-033	
10	SCREW M2*3L KI BZ ICT NY (DD=Φ4.5,DT=0.4)	6-35-B6120-3RD	
11	[illegible]	6-23-7N650-030	
12	AUDIO BOARD V2.0 N650DU	6-77-N6508-D02	
13	SPK+CABLE R 2V 47 190MM DS-188M-2L-K7-HF N650DU V1J	6-23-5N650-0R1	
14	W/O ODD ASS'Y N650DU	6-79-N650DU0Z-000	(OPTION)
14	SATA DVD SUPER MULTI ASS'Y (OPTION)	6-79-N650DU0Q-001	(OPTION)
14	2ND HDD CADDY ASS'Y W/O HDD N650DU	6-79-N650DU0J-030	(OPTION)
14	2ND HDD CADDY ASS'Y W/HDD N650DU	6-79-N650DU0J-040	(OPTION)
15	SCREW M2*4L KI NI ICT NY (DD=Φ4.5,DT=0.4)	6-35-B1120-4RE	
16	PRODUCT LABEL FOR N650DU	6-45-N650DU03-010	
17	W/O HDD ASS'Y N650DU	6-79-N650DU0J-010	(OPTION)
17	W/HDD ASS'Y N650DU	6-79-N650DU0J-020	(OPTION)

LCD

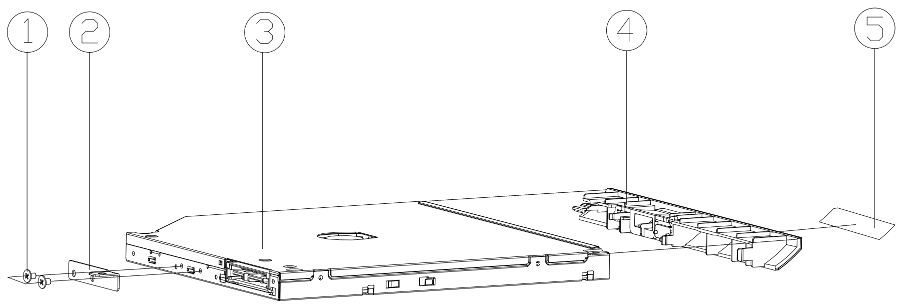


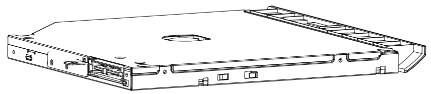
ITEM	PART NAME	PART NO	REMARK
1	LCD FRONT COVER PROTECT MYLAR PET N650DU	6-40-N6508-010	
2	CCD LENS (PMMA+TESA4982) 6.4*6.4*0.6T N650DU	6-42-N6501-010	
3	FRONT COVER MODULE N650DU	6-39-N6501-013	
4	SCREW M2*3L KI BZ ICT NY (DD=Ø4.5,DT=0.4)	6-35-B6120-3RD	
5	LCD 15.6" FHD/IPS/EDP LG LP156WF6-SPK1 (N4) (LED) 3.2MM	6-50-LB232-L06	
5	LCD 15.6" HD EDP GLARE TYPE INNOLUX N156BGE-E42 (LED) 3.6 MM	6-50-L8136-V00	
5	LCD 15.6" HD EDP INNOLUX N156BGE-EA2 (LED) 3.25 MM	6-50-L8132-V00	
5	LCD 15.6" HD SAMSUNG LTN156AT35-301(LED) 3.8MM	6-50-L8138-M01	
6	HINGE L (SK7+SGCC) SNR N650DU	6-33-N6501-0L3	
7	BACK COVER MODULE N650DU	6-39-N6501-023	
8	LCD BACK COVER PROTECT MYLAR PET N650DU	6-40-N6508-020	
9	ANTENNA IPEX4 WLAN WGT WL2 PCB AL 2.4G/5GHZ WL2=350MM N650DU	6-23-7N650-020	
10	ANTENNA IPEX4 WLAN WGT WL1 PCB AL 2.4G/5GHZ WL1=350MM N650DU	6-23-7N650-010	
11	UVC CAMERA CHICONY FIX CNFFH5921003921LH 1M HD OV9734 W510PU FW1019 W/WHITE-LED W/2D-MIC	6-88-W51PC-5110	OPTION
11	UVC CAMERA CHICONY FIX CNFFH5921003920LH 1M HD OV9734 W510PU FW1018 W/WHITE-LED W/D-MIC	6-88-W51PC-5100	OPTION
11	UVC CAMERA CHICONY FIX CKFGF1021003920LH 2M FHD OV2740 W650DC FW3601 W/WHITE-LED W/2D-MIC	6-88-W65DC-5100	OPTION
11	UVC CAMERA CHICONY FIX CKFGF1021003921LH 2M FHD OV2740 W650DC FW3602 W/WHITE-LED W/D-MIC	6-88-W65DC-5110	OPTION
12	SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
13	WIRE CABLE FOR CCD D-MIC 500MM 3.3V 8P (HL) N250LU	6-43-N250T-011	
14	ANTENNA IPEX-4 3G+LTE WGT LTE-1 PCB 0.7G/0.8G/0.9G/1.4G/1.8G/1.9G/2.1G/2.6GHZ L=550MM P750ZM	6-23-7P750-030	
15	WIRE CABLE FOR EDP 200MM 19V 40PIN LCD出線端縮1.5MM (I) (HL/LC CON-L05M30S-HF) N240LU	6-43-N2401-011-L	
15	WIRE CABLE FOR LVDS 200MM 19V 40PIN LCD出線端縮1.5MM (I) (HL/LC CON-L01M40S) N250LU	6-43-N2501-011-L	
16	FRONT COVER SCREW MYLAR(PC+SM468)(5*5*0.35T) N150SD	6-40-N1501-010	
17	HINGE R (SK7+SGCC) SNR N650DU	6-33-N6501-0R3	
18	GASKET (43*9*0.25T)	6-47-00190-433	

Figure A - 3
LCD

DVD

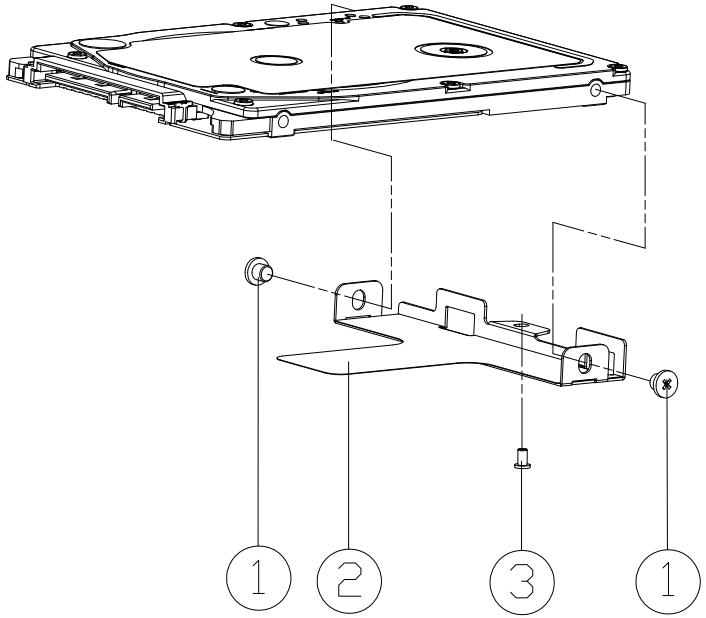
Figure A - 4
DVD

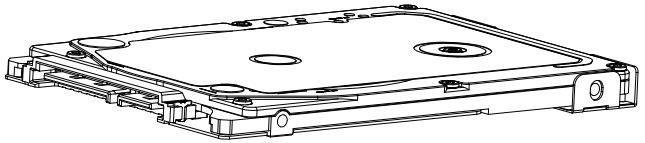




ITEM	PART NAME	PART NO	REMARK
1	SCREW M2*3L KI BZ ICT NY (DD=Ø4.5,DT=0.4)	6-35-B6120-3RD	
2	ODD BRACKET SECC W547BL	6-33-W547Z-011	
3	SATA DVD SUPER MULTI 5 1/4" 8X 9.5MM SU-208 (H/W: A VER.HB F/W: TC00) (WIN 10) TSST	6-85-A088X-T08	FOR TSST
3	SATA DVD SUPER MULTI 5 1/4" 8X 9.5MM DU-8A6SHXXX F/W: DC61 H/W: 01 (WIN 8) PLDS	6-85-A088X-L04	FOR PLDS
4	ODD BEZEL MODULE N650DU	6-42-N650Z-102	
5	SUPER MULTI ODD BEZEL LABEL NO BLU-RAY N650DU	6-45-N650Q-020	

HDD



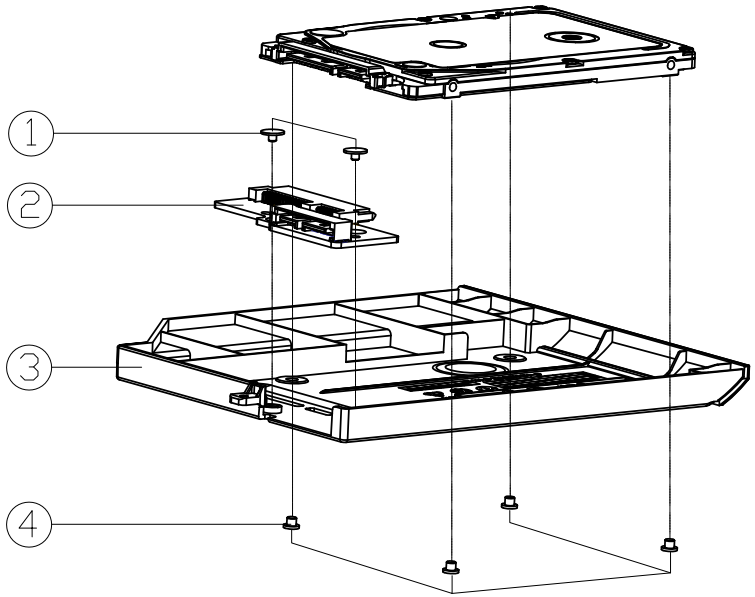


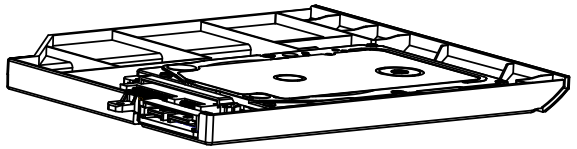
ITEM	PART NAME	PART NO	REMARK
1	SCREW M3*2.5L KI NI ICT NY	6-35-B1130-2R5	
2	HDD BKT 7MM SECC T=0.5 N250LU	6-33-N250J-011	
3	SCREW M2*4L KI NI ICT NY (DD=Ø4.5,DT=0.4)	6-35-B1120-4RE	

Figure A - 5
HDD

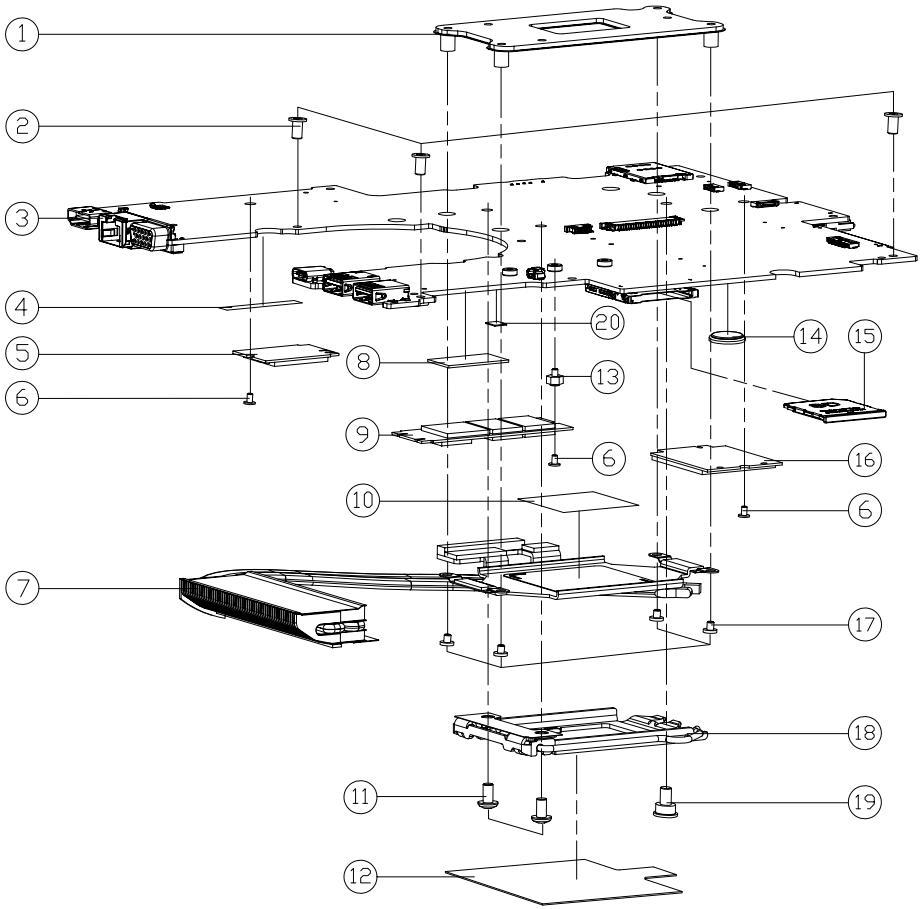
2nd HDD

Figure A - 6
2nd HDD





ITEM	PART NAME	PART NO	REMARK
1	SCREW M2*2L KI BK/Z ICT NY(Ø8,T=0.6)	6-35-B6120-2RE	
2	□DD T□ HDD B□ARD V2.0 N650DU	6-77-N650N-D02	
3	DUMMY □DD CASE M□DULE N650DU	6-42-N650Z-202	
4	SCREW M3*2.5L KI NI ICT NY	6-35-B1130-2R5	



ITEM	PART NAME	PART NO	REMARK
1	CPU SUPPORT FOR LGA 1150 SUS301 N350DV	6-33-N350S-011	
2	.SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
3	MAIN BOARD V3.0 (EDPXUSB3.1XW/TPM_LTE) N650DU	6-77-N650DU00-D03	
3	MAIN BOARD V3.0 (EDPXUSB3.1XW/O TPM_LTE) N650DU	6-77-N650DU00-D03-3	
3	MAIN BOARD V3.0 (EDPXUSB3.0XW/O TPM_LTE) N650DU	6-77-N650DU00-D03-7	
3	MAIN BOARD V3.0 (LVDSXUSB3.0XW/TPM_LTE) N650DU	6-77-N650DU00-D03-12	
3	MAIN BOARD V3.0 (EDPXUSB3.1XW/TPMXW/O LTE) N650DU	6-77-N650DU00-D03-1	
3	MAIN BOARD V3.0 (EDPXUSB3.1XW/LTEXW/O TPM) N650DU	6-77-N650DU00-D03-2	
3	MAIN BOARD V3.0 (EDPXUSB3.0XW/TPM_LTE) N650DU	6-77-N650DU00-D03-4	
3	MAIN BOARD V3.0 (EDPXUSB3.0XW/TPMXW/O LTE) N650DU	6-77-N650DU00-D03-5	
3	MAIN BOARD V3.0 (EDPXUSB3.0XW/LTEXW/O TPM) N650DU	6-77-N650DU00-D03-6	
4	TAPE MYLAR TRANSPARENT (30*5*0.05) W25IHPQ	6-40-W25P3-010	
5	[illegible]	6-88-S210F-9400	OPTION
5	[illegible]	6-88-P67RF-4200	OPTION
5	[illegible]	6-88-W95LF-4240	OPTION
5	[illegible]	6-88-N170F-5100	OPTION
5	[illegible]	6-88-N240F-4200	OPTION
6	SCREW M2*2L KI NI ICT NY (DD=Ø5 ,T=0.5)	6-35-B1120-2R0	
7	CPU HEATSINK MODULE N650DU	6-31-N6503-102	
8	THERMAL PAD MA500 (39*19.5*2.75T)MM N550RC	6-48-N550S-010	
9	SSD M2 2280 512GB SAMSUNG MZVLV512HCJH-00000 (PM951) PCIE G3X4 TLC	6-85-D515B-S03	OPTION
9	SSD M2 2280 512GB SAMSUNG MZNLN512HCJH-00000 (PM871) SATA3 V2 EVO	6-85-D515B-S01	OPTION
9	SSD M2 2280 512GB SAMSUNG MZVPV512HDGL-00000 (SM951 NVME) PCIE G3X4 MLC	6-85-D515B-S02	OPTION
9	SSD M2 2280 512GB SAMSUNG MZHPV512HDGL-XXXXX (SM951) PCIE G3X4 MLC	6-85-D515B-S00	OPTION
9	SSD M2 2280 256GB CRUCIAL CT256M2300S34 (M2300) SATA3 MLC	6-85-D51R0-100	OPTION
9	SSD M2 2280 256GB SAMSUNG MZNLN256HJPP-00000 (PM871) SATA3 V2 EVO	6-85-D51R6-S01	OPTION
10	THERMAL PAD PSX 35*35*0.2MM N350DV	6-48-N350S-010	
11	SCREW M3*5.0L KI NI ICT NY	6-35-B1130-5R0	
12	CPU SOCKET MYLAR FOR D900F	6-40-D90FS-070	
13	SCREW M2*2.5L (H=2.5 D=5) STEEL ICT NY FOR NGFF CARD(CHANGE MATERIAL)	6-35-ZA120-2R5	
14	BATTERY 3V 220MA BBBCR2032B (KTS)	6-23-6A2B2-030	
15	DUMMY SD PSUH PUSH TYPE PC+ABS (C7230P-7010E) V9705SUW	6-42-W9708-010	
16	WCDMA HUAWEI MU736 HSPA+ NGFF CARD USB INTERFACE WITHOUT GPS S210TU	6-88-S210W-8810	OPTION
16	[illegible]	6-88-W3306-8841	OPTION
16	[illegible]	6-88-W3306-8830	OPTION
17	SCREW M3*2.5L KI NI ICT NY	6-35-B1130-2R5	
18	ILM FOR CPU SOCKET(METAL) LGA 1150P (PT44L31-6401)	6-86-25B50-001-S	
19	SCREW M3*3.5L BZ/Z ICT NY	6-35-Z2130-3R5	
20	PCB PET MYLAR FOR FAN CAL.BE N650DU	6-40-N6503-030	

Figure A - 7
HDD

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the ***N650DU*** notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

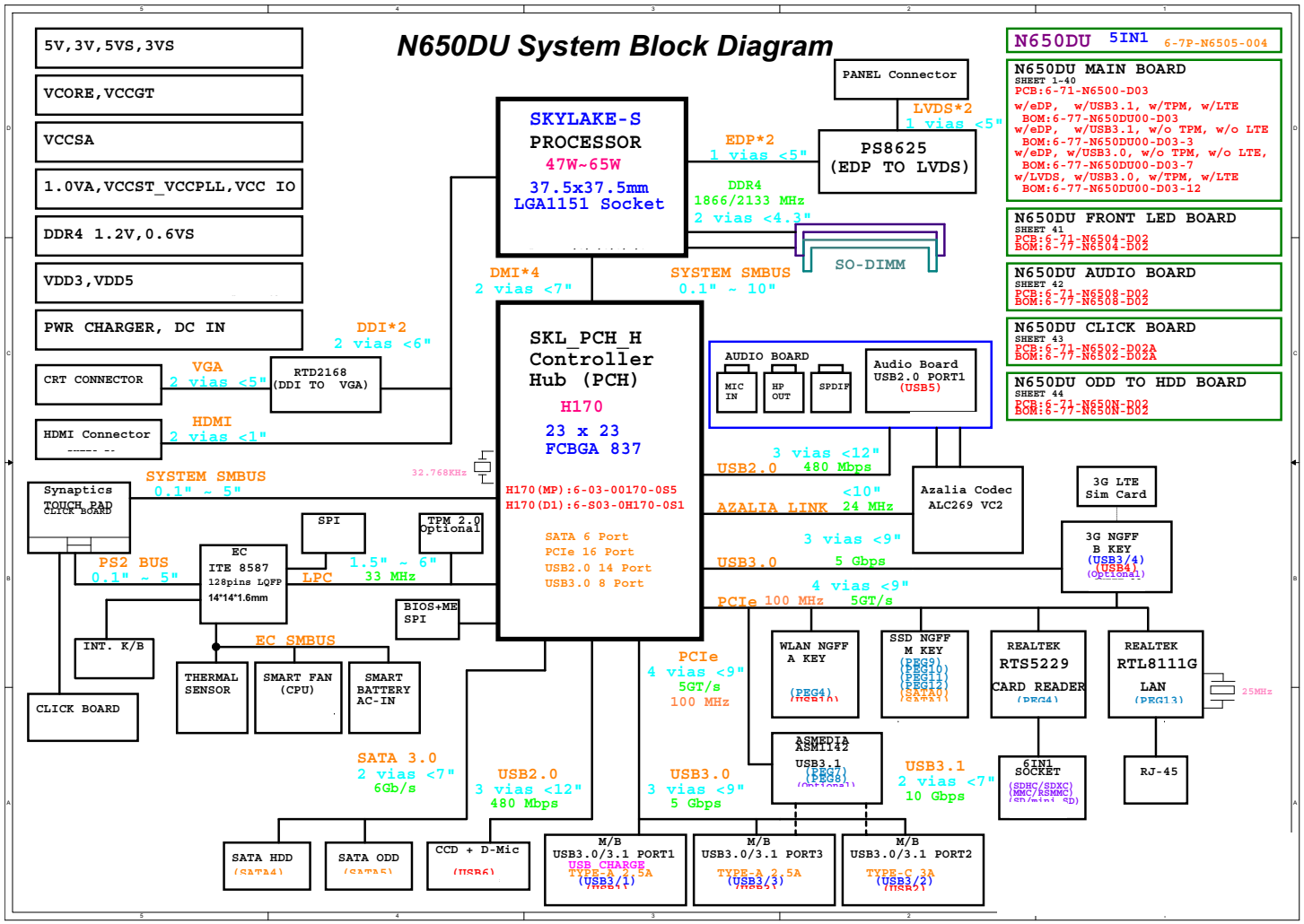
Table B - 1
SCHEMATIC DIAGRAMS

Version Note

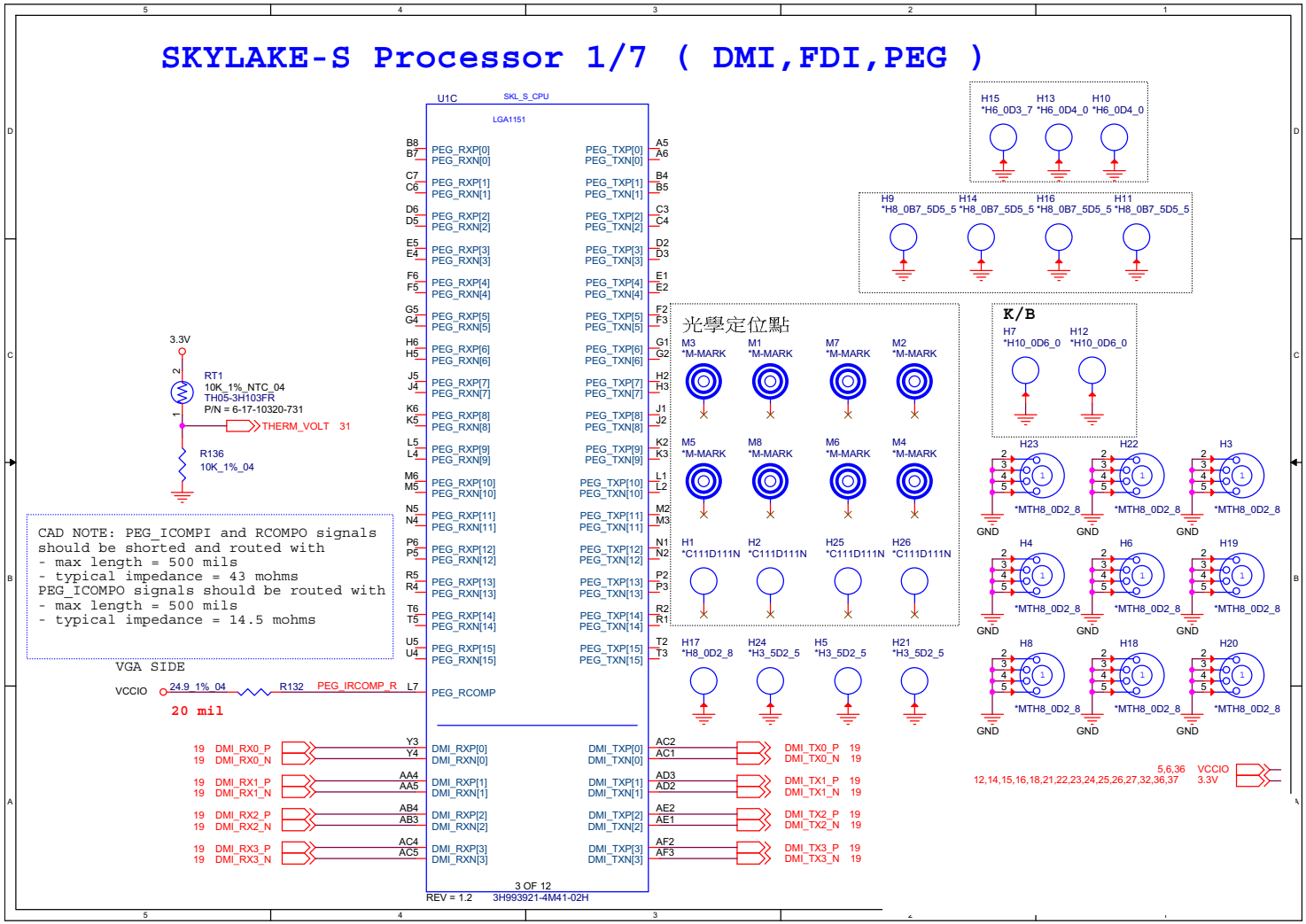
The schematic diagrams in this chapter are based upon version 6-7P-N6505-004. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

System Block Diagram

Sheet 1 of 44
System Block Diagram



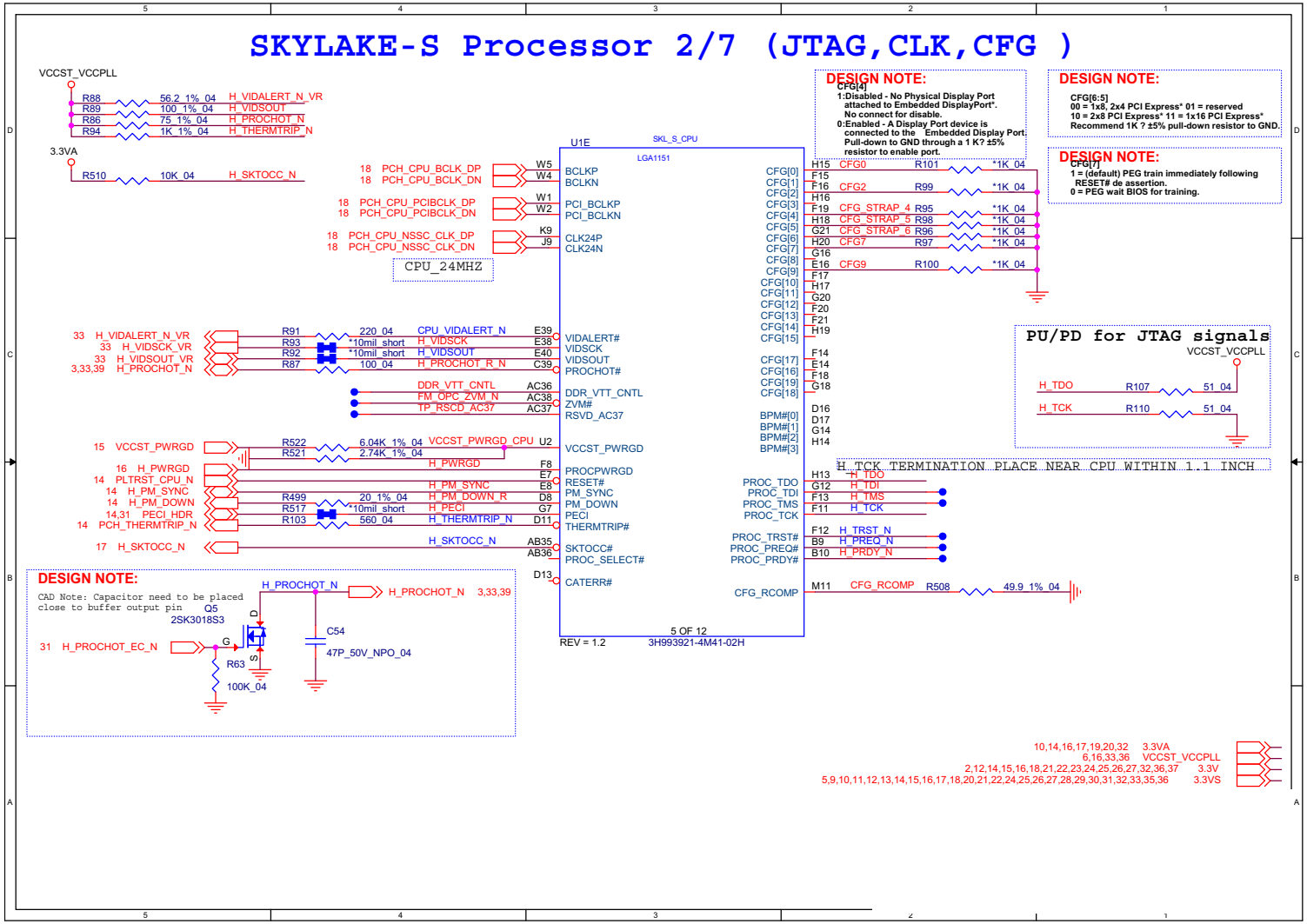
Processor 1/7



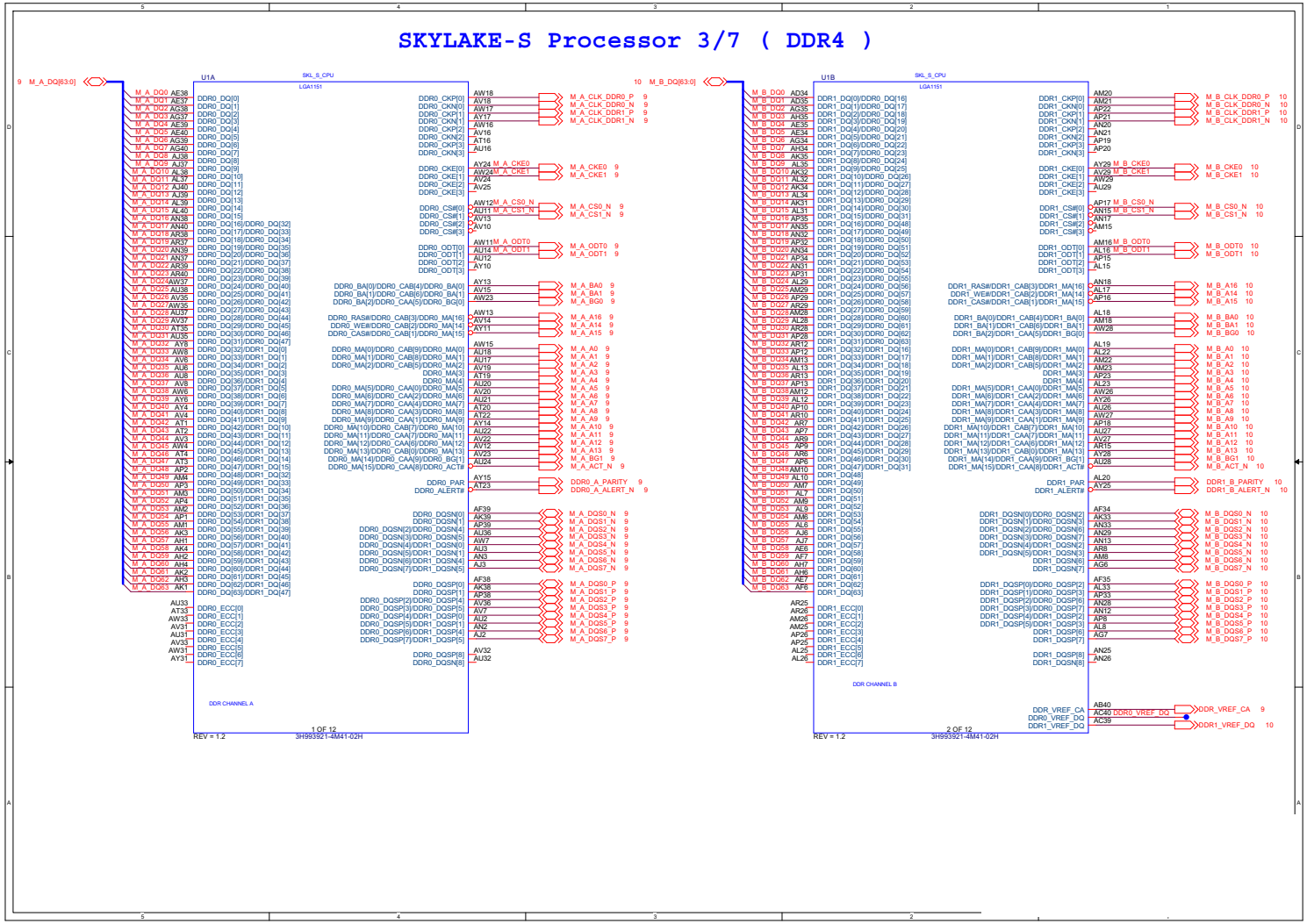
Sheet 2 of 44
Processor 1/7

Processor 2/7

Sheet 3 of 44
Processor 2/7



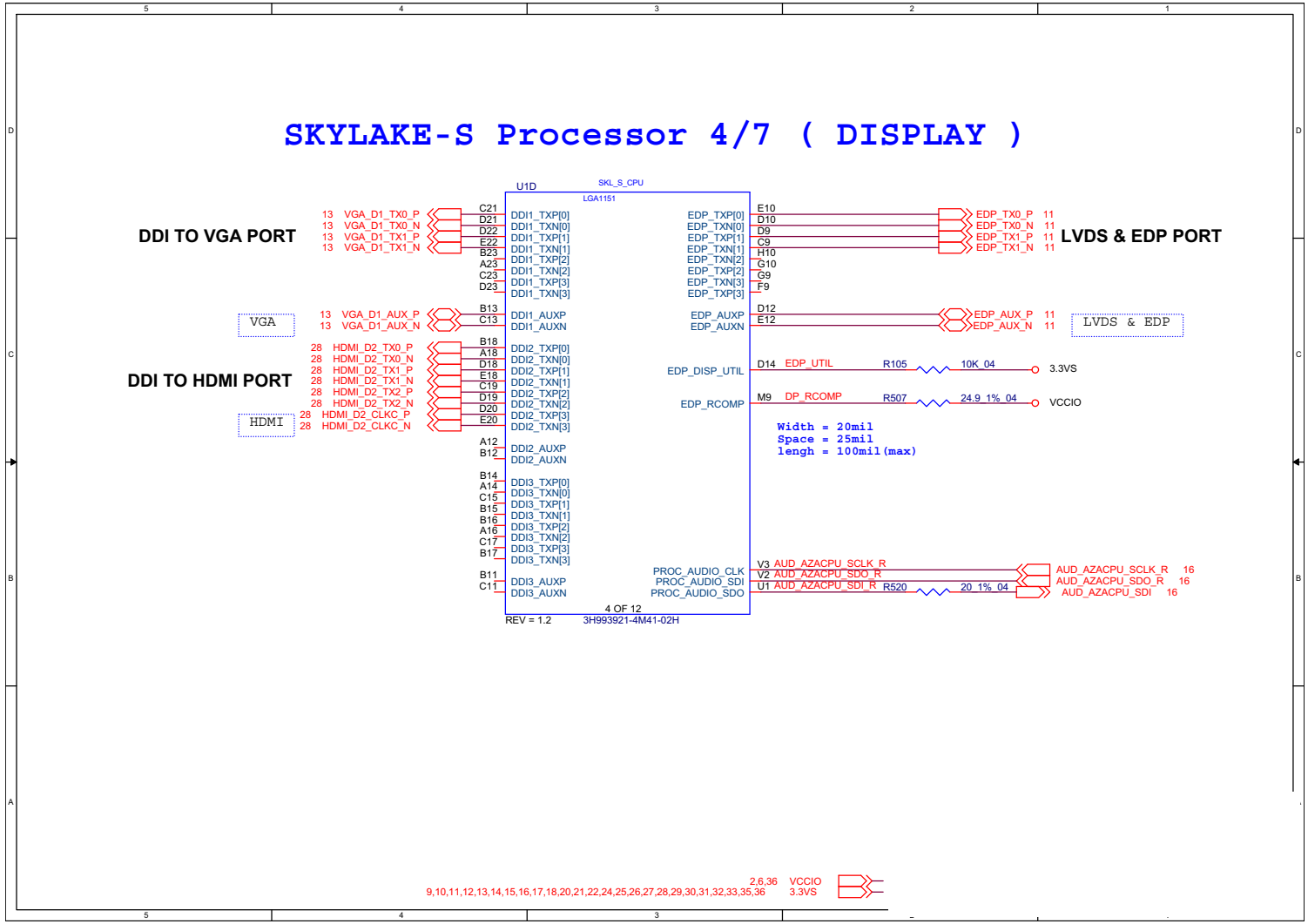
Processor 3/7



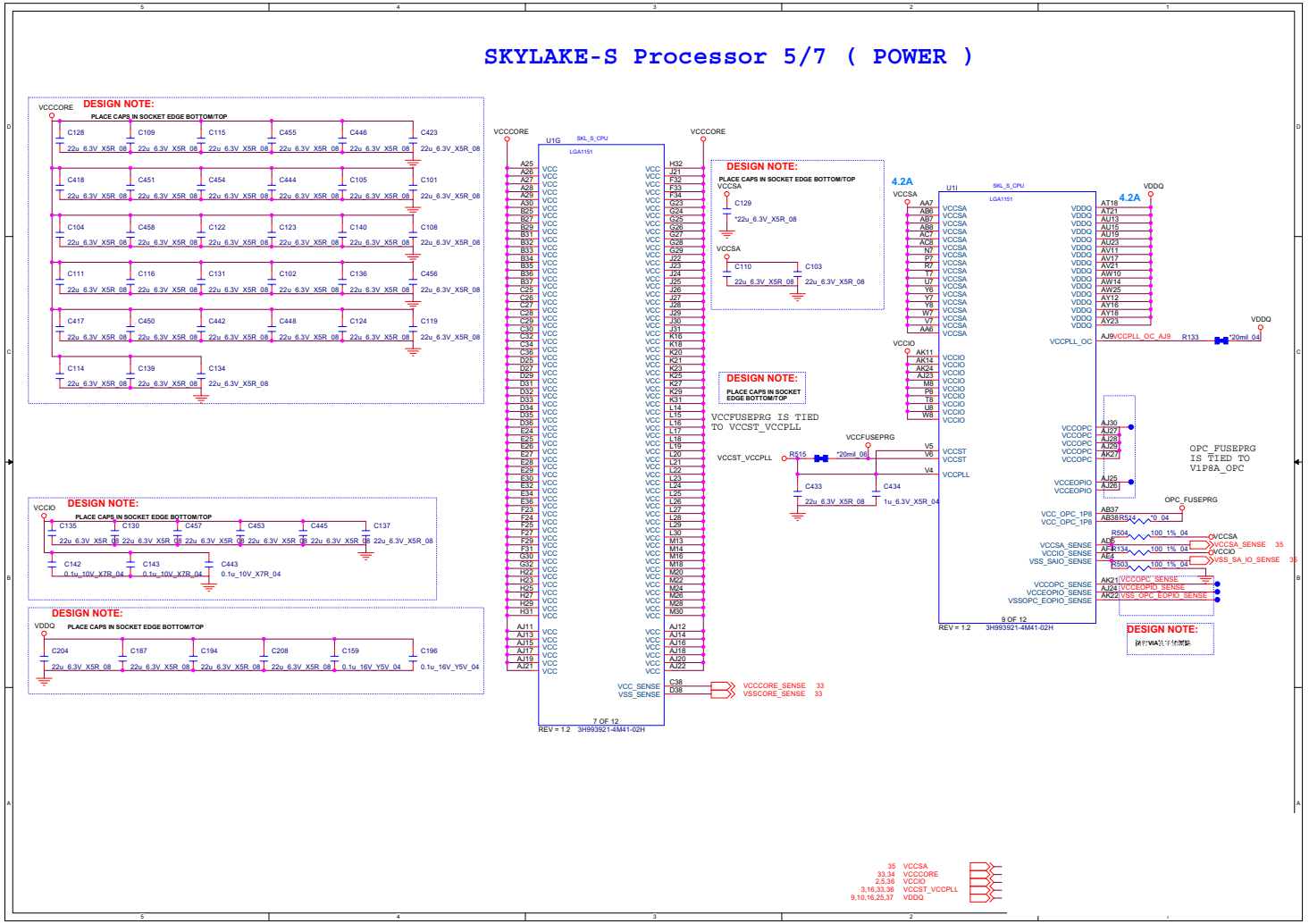
Sheet 4 of 44
Processor 3/7

Processor 4/7

Sheet 5 of 44
Processor 4/7



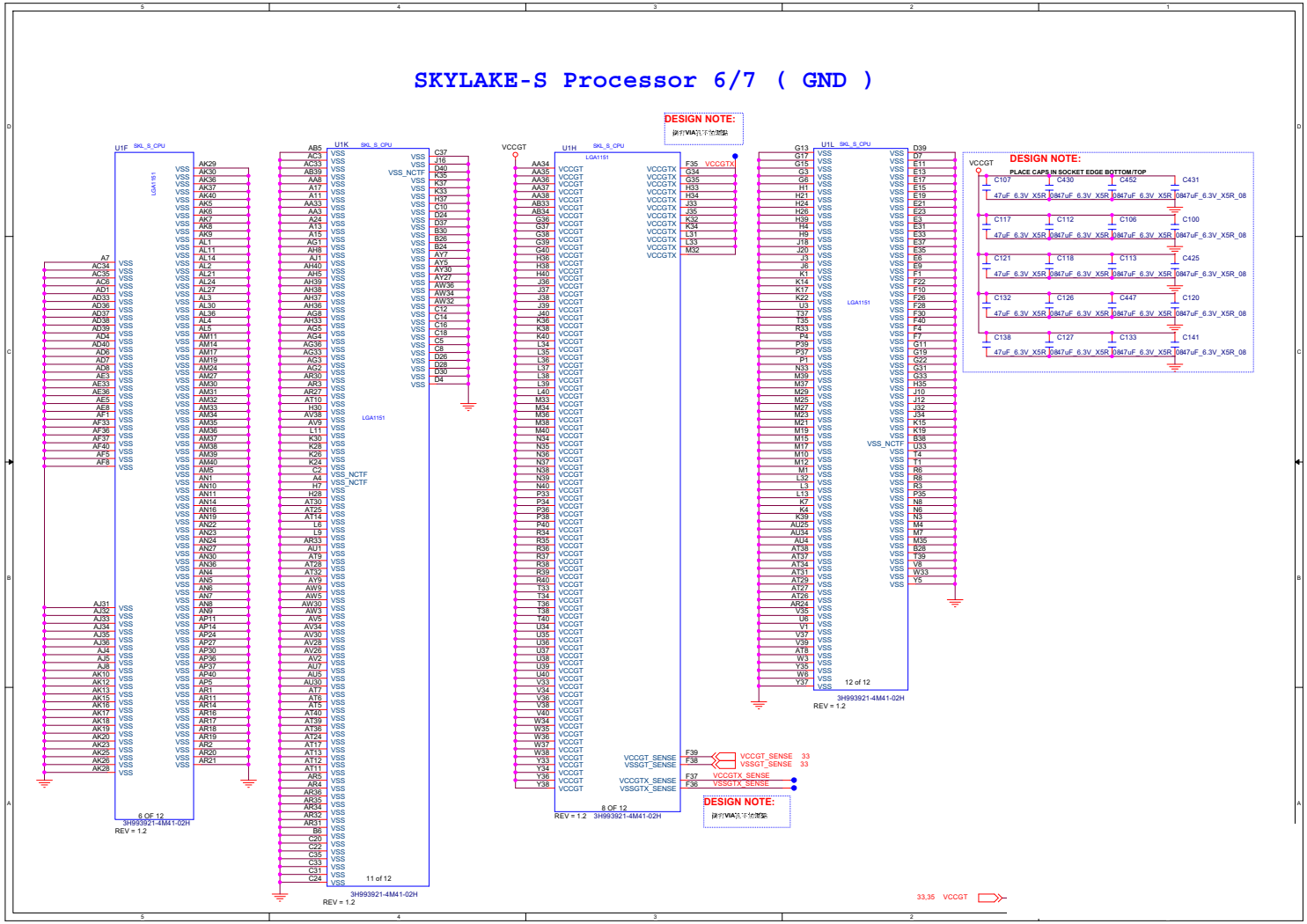
Processor 5/7



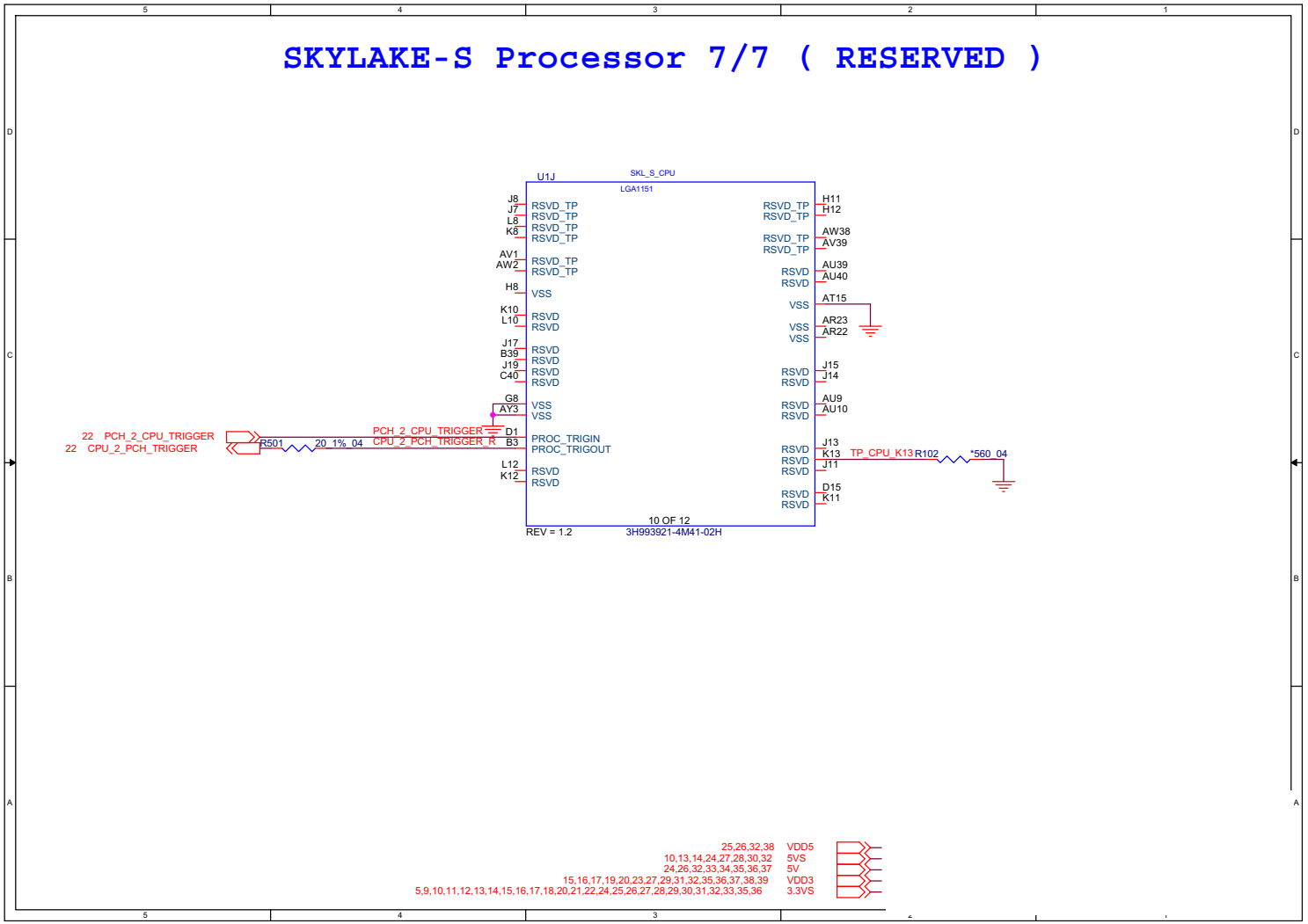
Sheet 6 of 44
Processor 5/7

Processor 6/7

Sheet 7 of 44
Processor 6/7



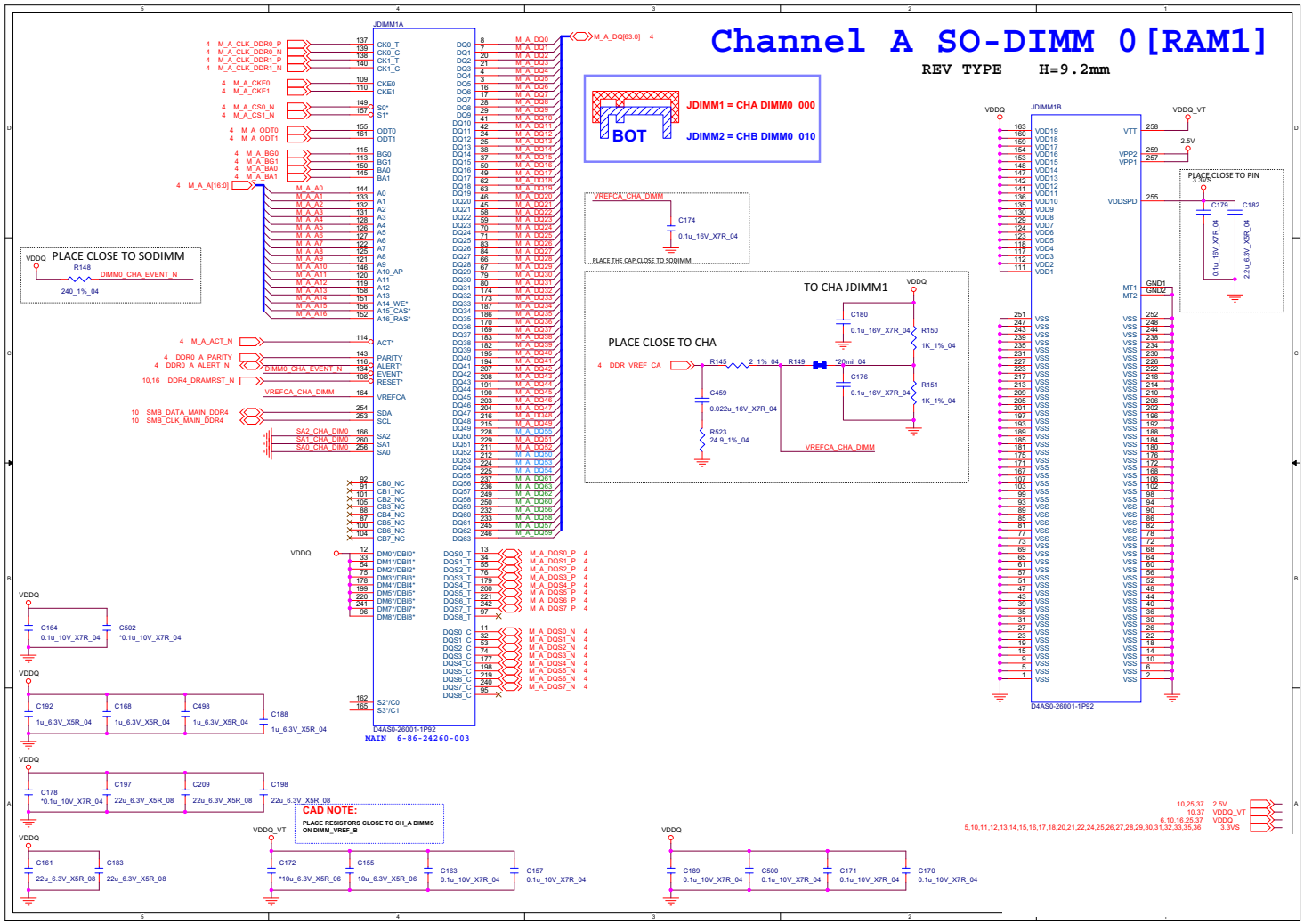
Processor 7/7



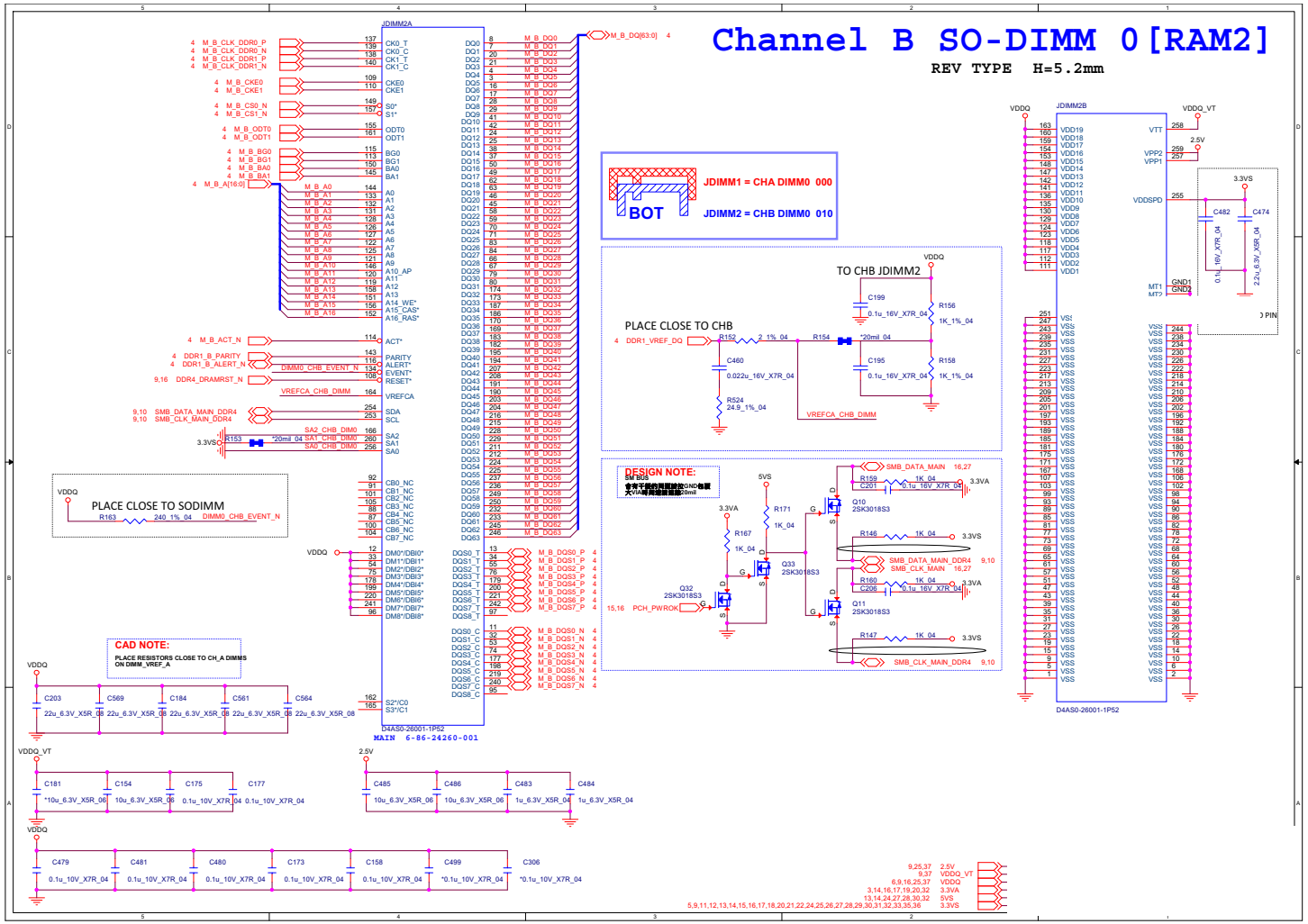
Sheet 8 of 44
Processor 7/7

DDR4 CHA SO-DIMM_0

Sheet 9 of 44
DDR4 CHA SO-DIMM_0



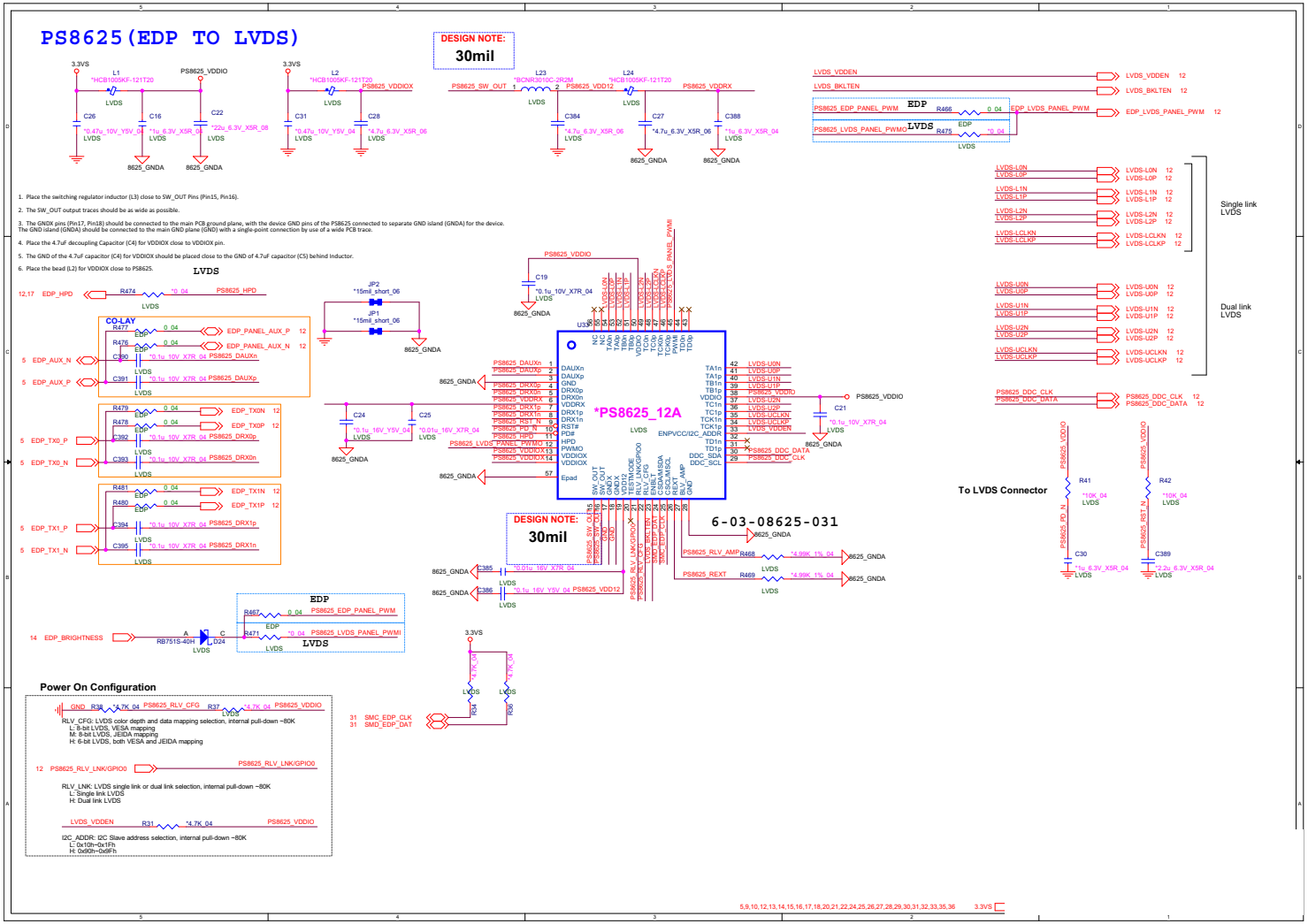
DDR4 CHB SO-DIMM_0



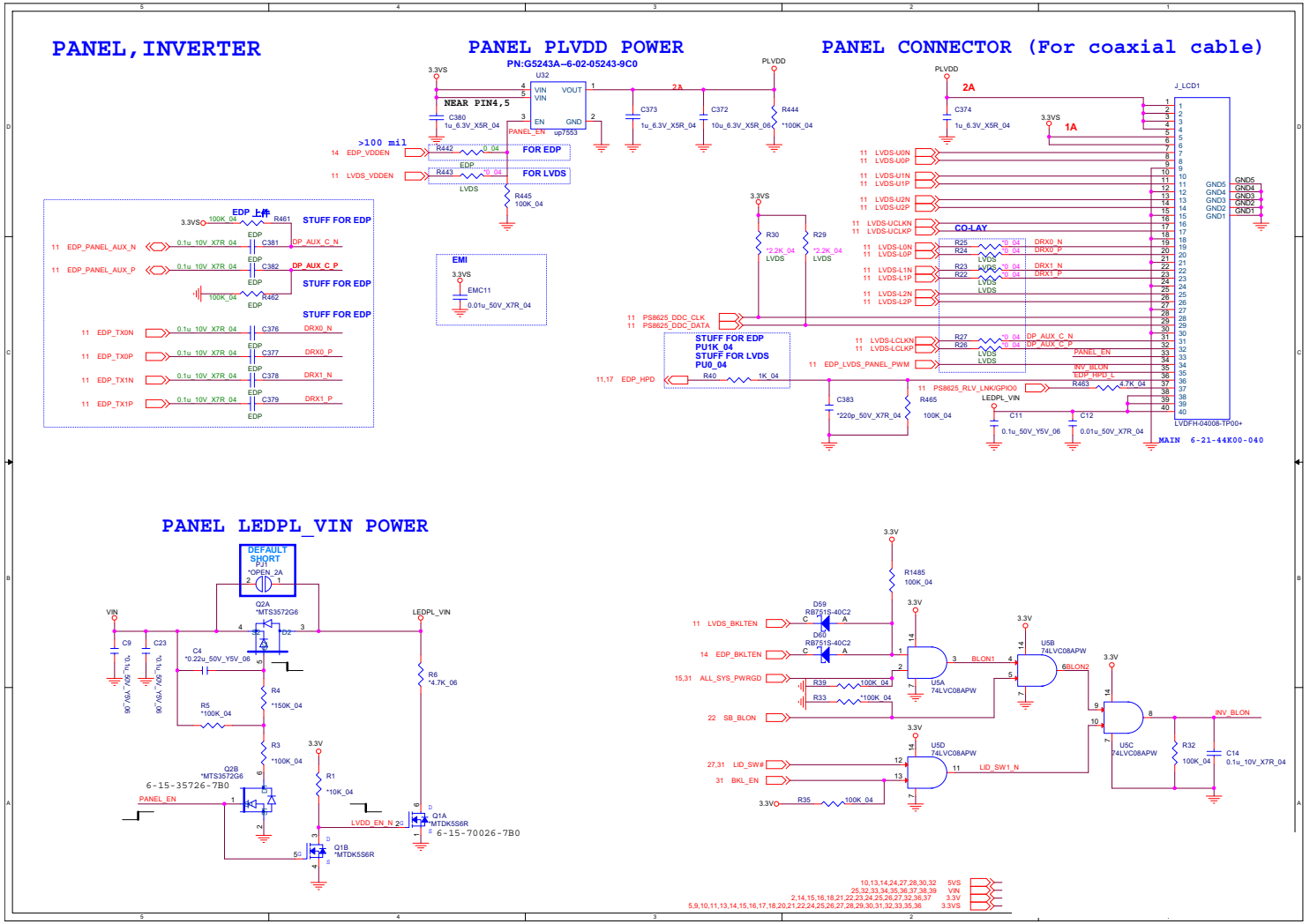
Sheet 10 of 44
DDR4 CHB SO-DIMM_0

PS8625

Sheet 11 of 44
PS8625



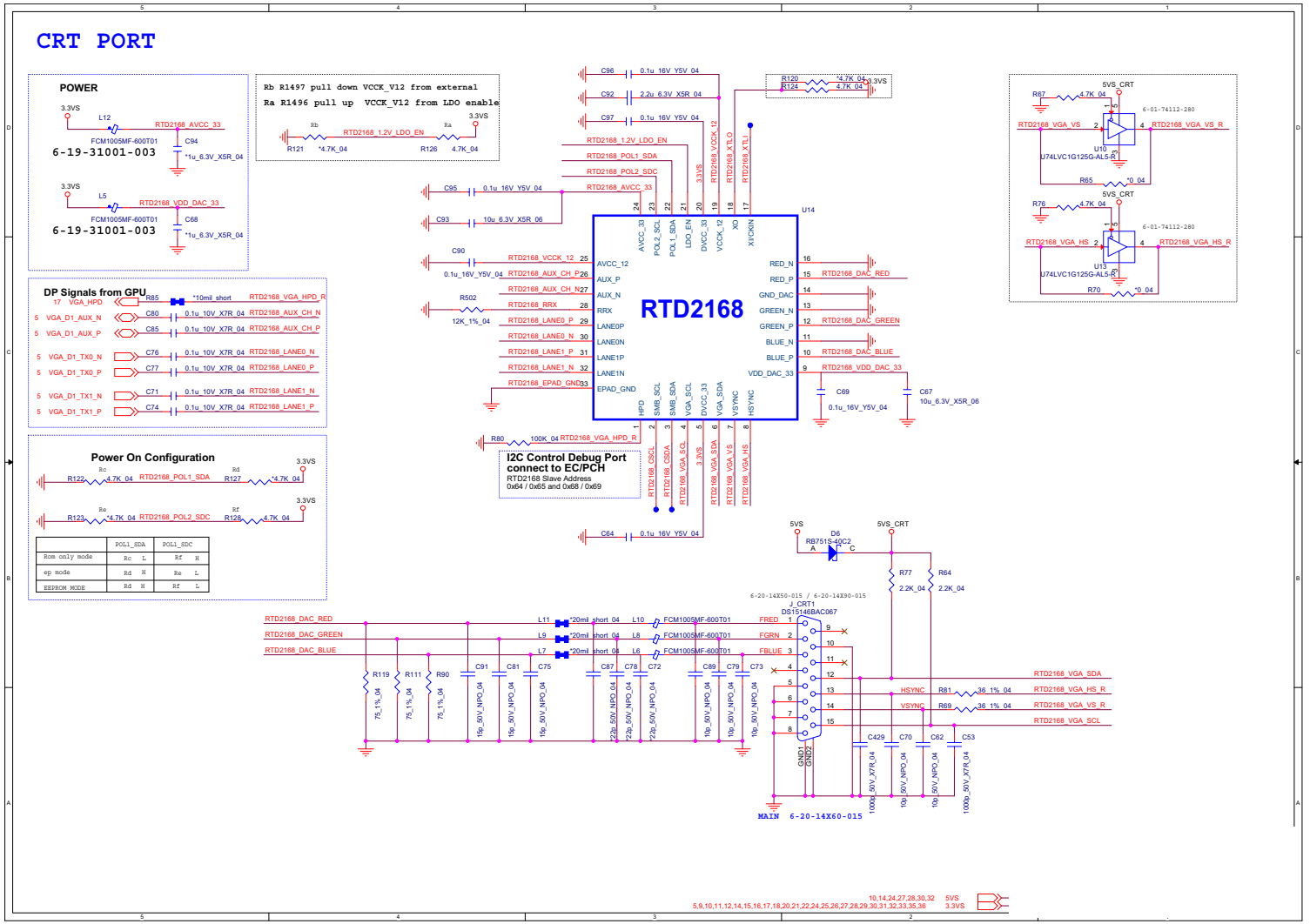
Panel, Inverter



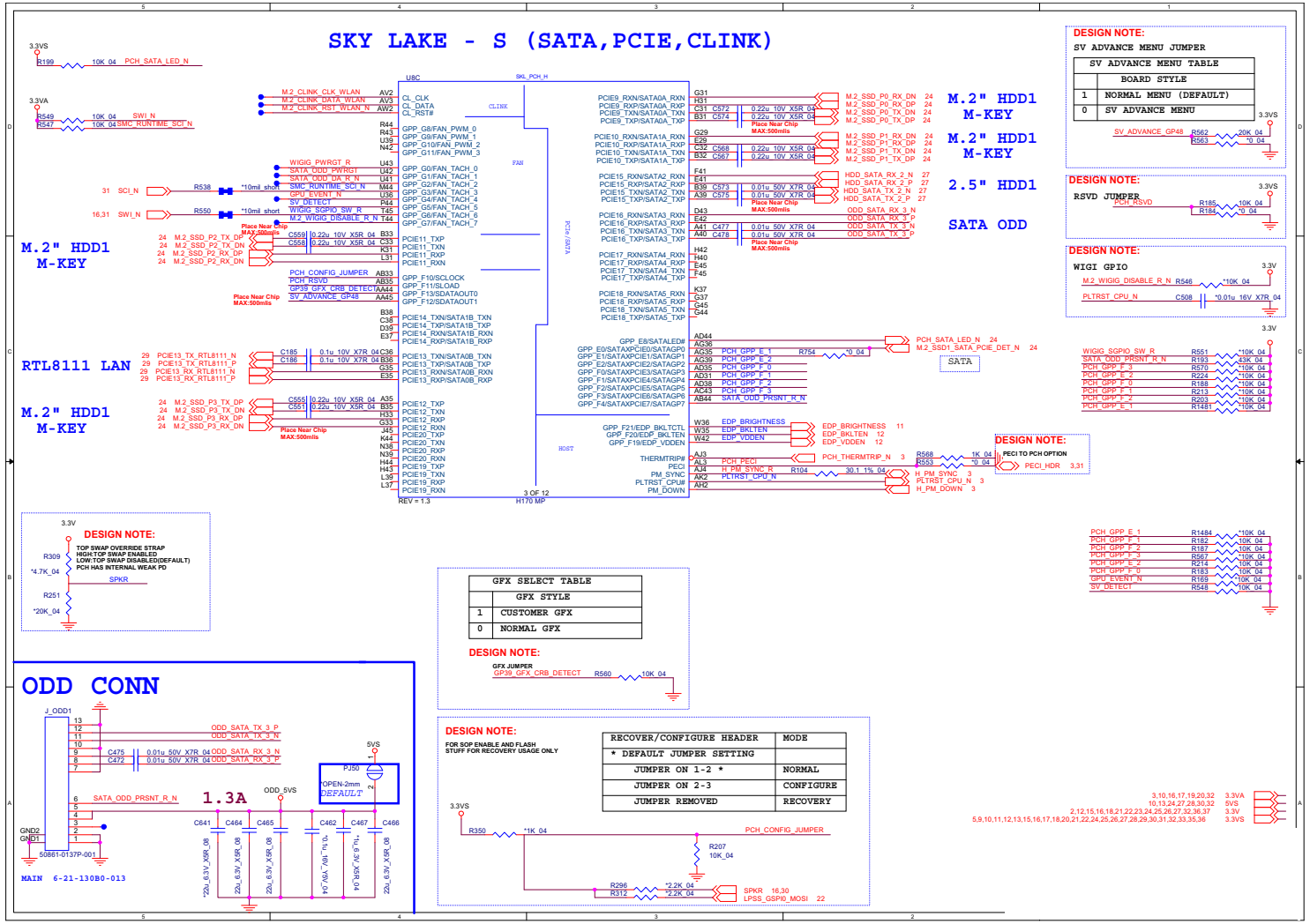
Sheet 12 of 44
Panel, Inverter

CRT

Sheet 13 of 44
CRT



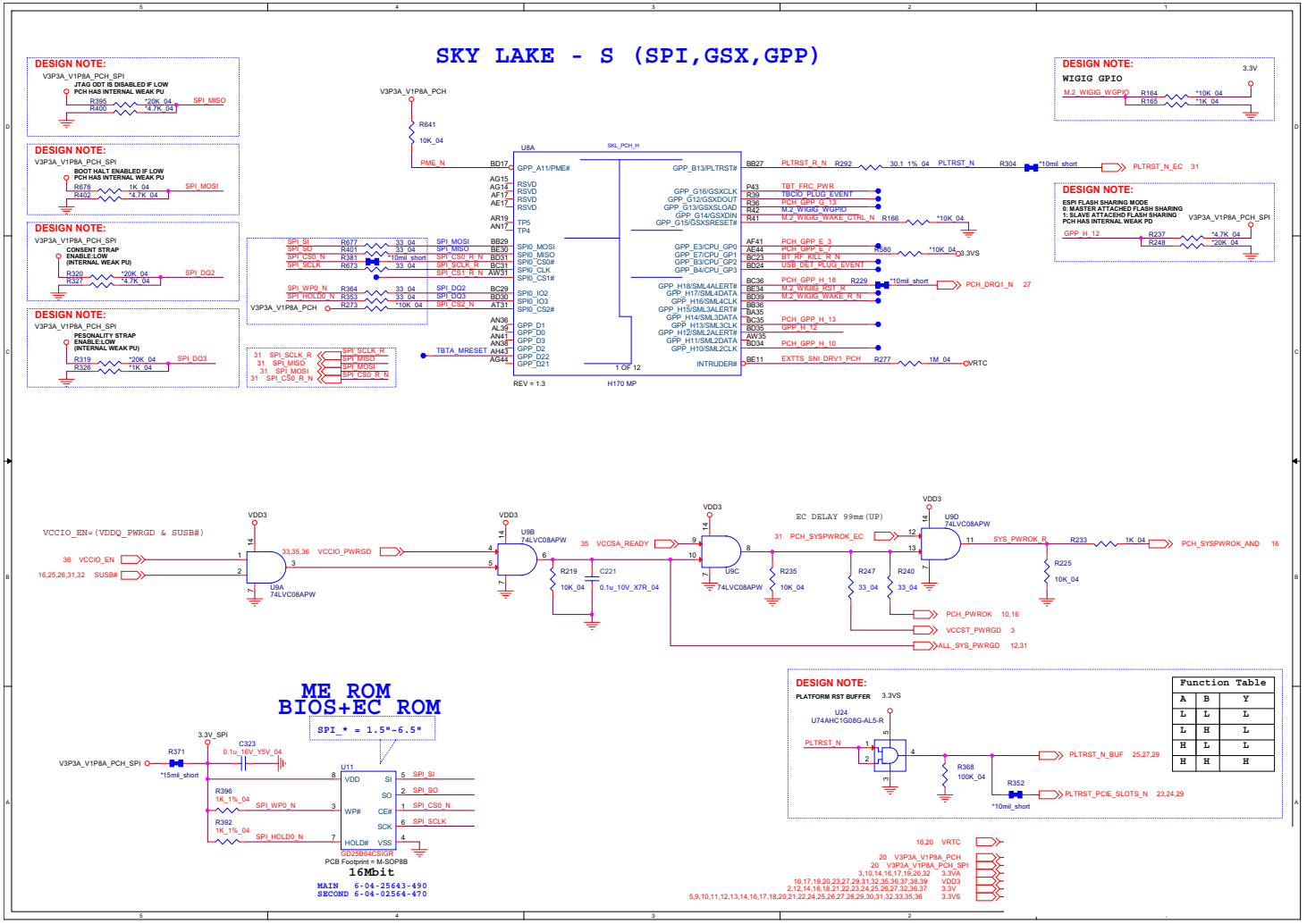
Skylake-H 1/9



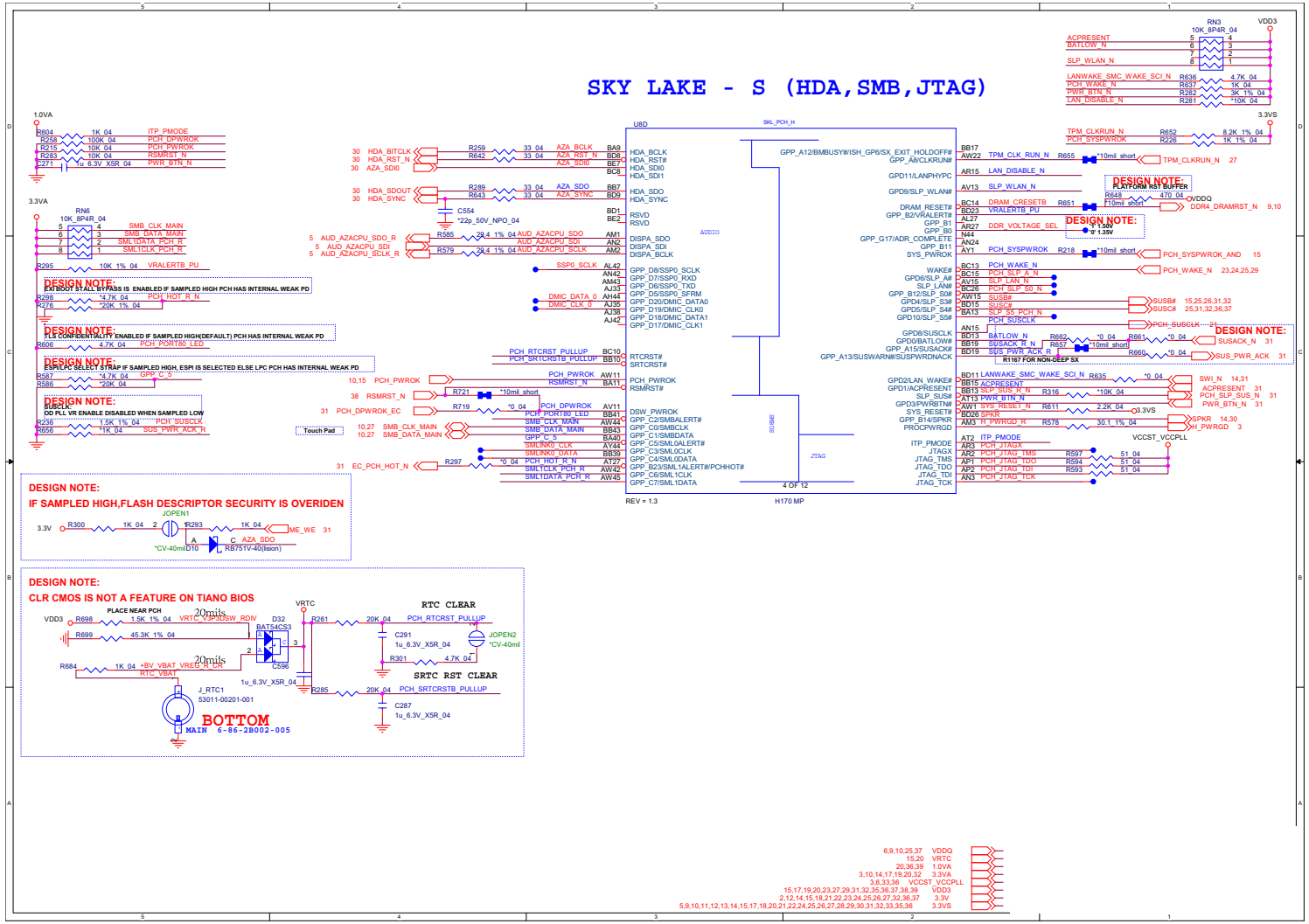
Sheet 14 of 44
Skylake - H 1/9

Skylake-H 2/9

Sheet 15 of 44
Skylake - H 2/9



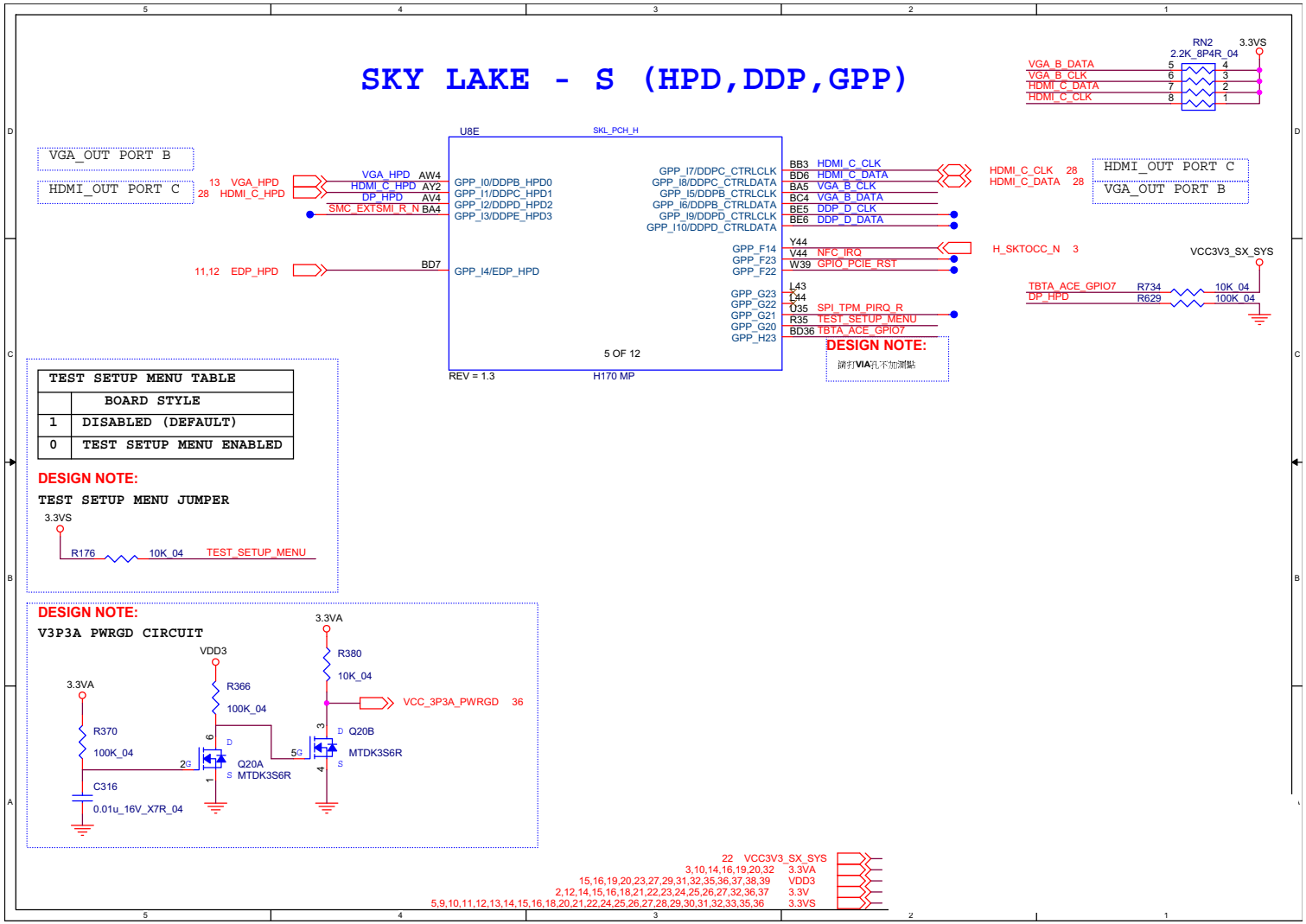
Skylake-H 3/9



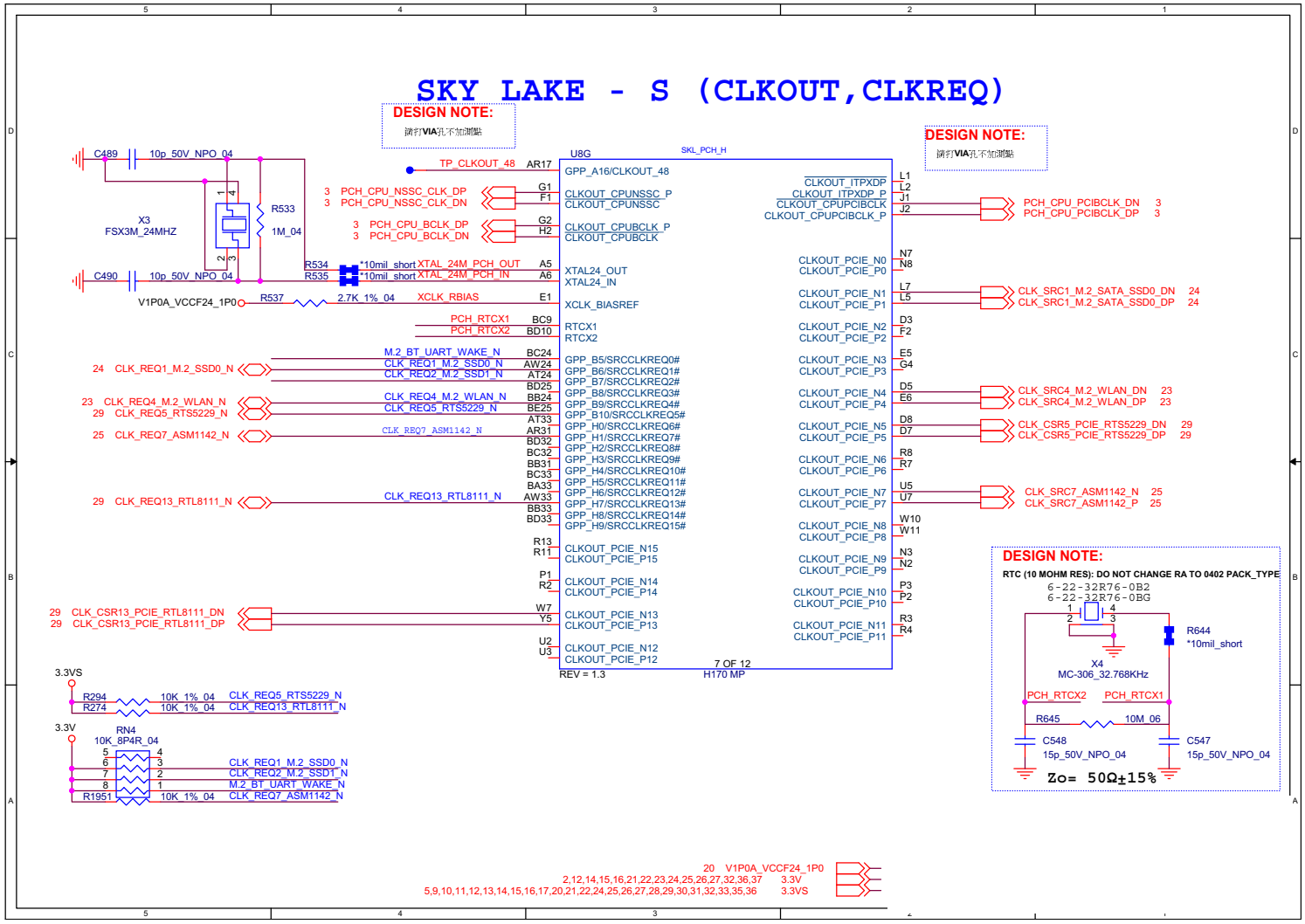
Sheet 16 of 44
Skylake - H 3/9

Skylake-H 4/9

Sheet 17 of 44
Skylake - H 4/9



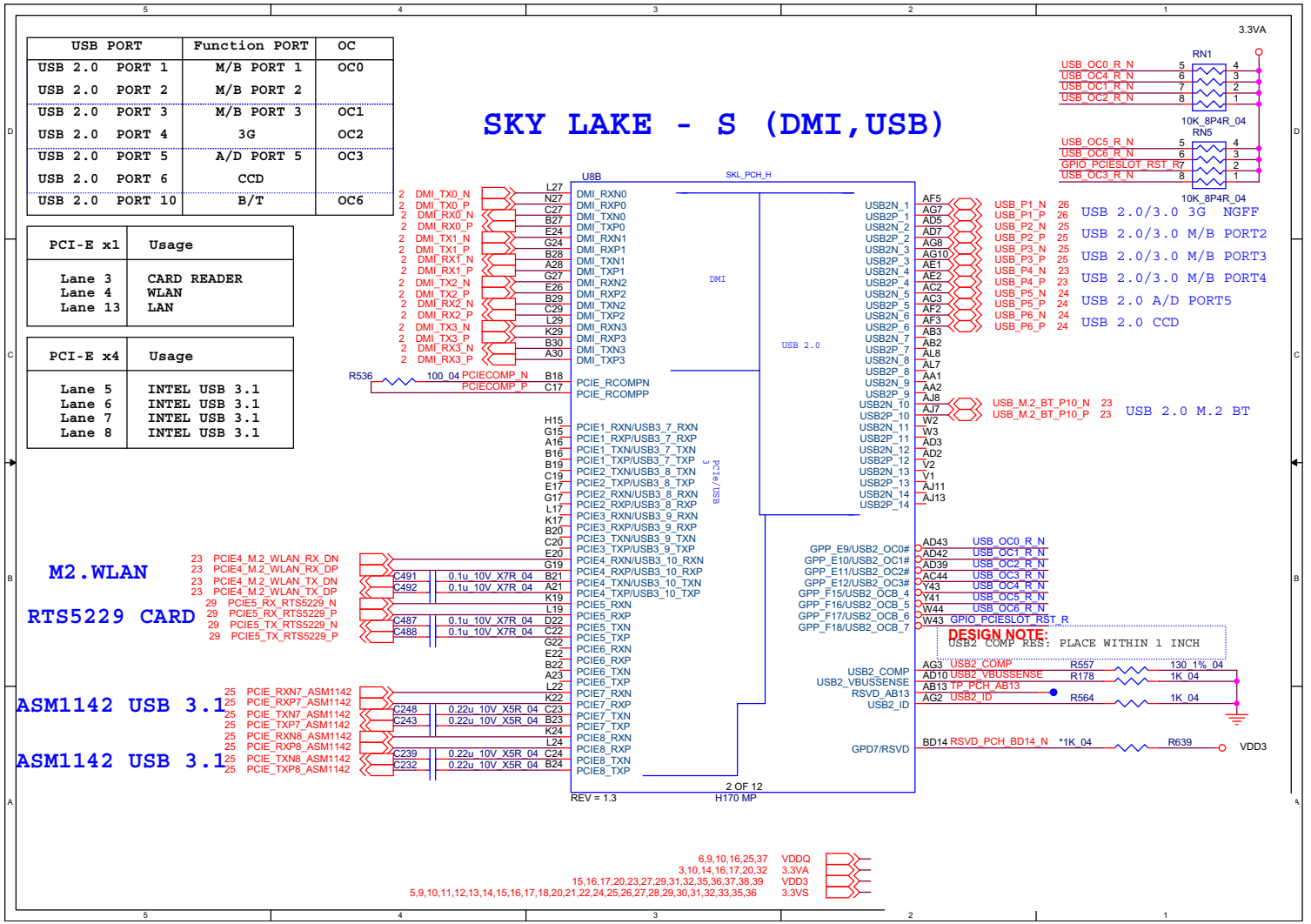
Skylake-H 5/9



Sheet 18 of 44
Skylake - H 5/9

Skylake-H 6/9

Sheet 19 of 44
Skylake - H 6/9

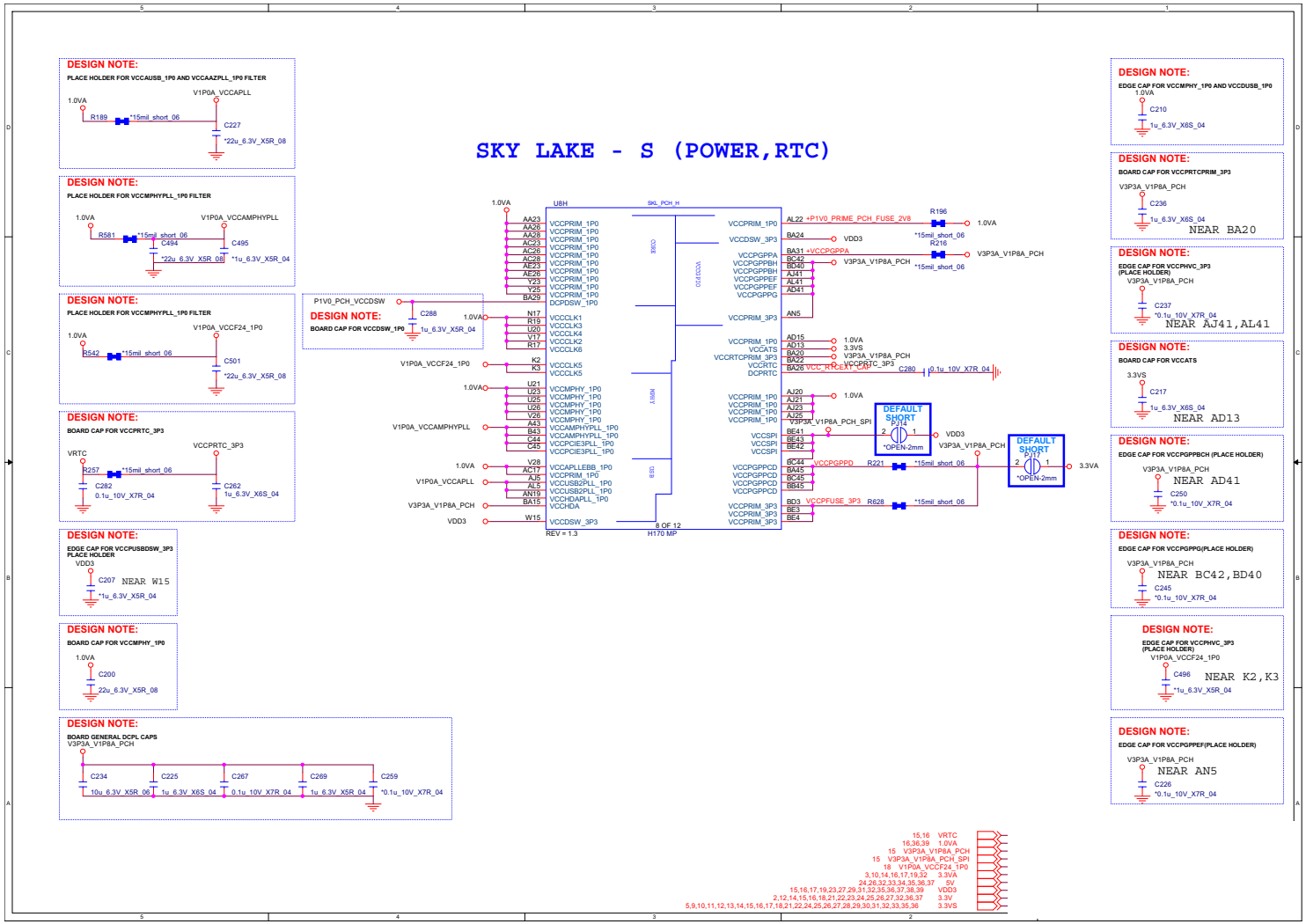


USB PORT	Function PORT	OC
USB 2.0 PORT 1	M/B PORT 1	OC0
USB 2.0 PORT 2	M/B PORT 2	
USB 2.0 PORT 3	M/B PORT 3	OC1
USB 2.0 PORT 4	3G	OC2
USB 2.0 PORT 5	A/D PORT 5	OC3
USB 2.0 PORT 6	CCD	
USB 2.0 PORT 10	B/T	OC6

PCI-E x1	Usage
Lane 3	CARD READER
Lane 4	WLAN
Lane 13	LAN

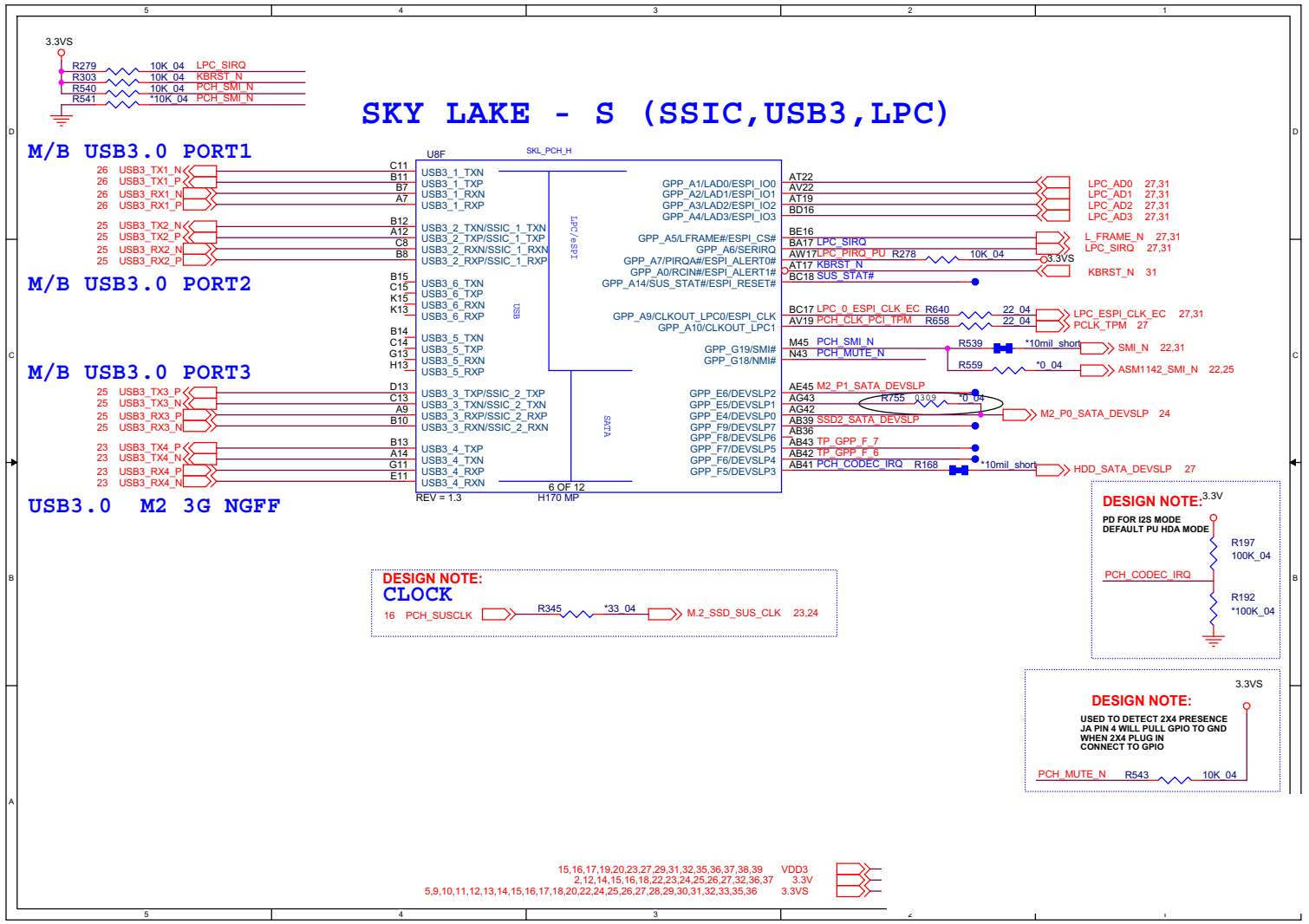
PCI-E x4	Usage
Lane 5	INTEL USB 3.1
Lane 6	INTEL USB 3.1
Lane 7	INTEL USB 3.1
Lane 8	INTEL USB 3.1

Skylake-H 7/9

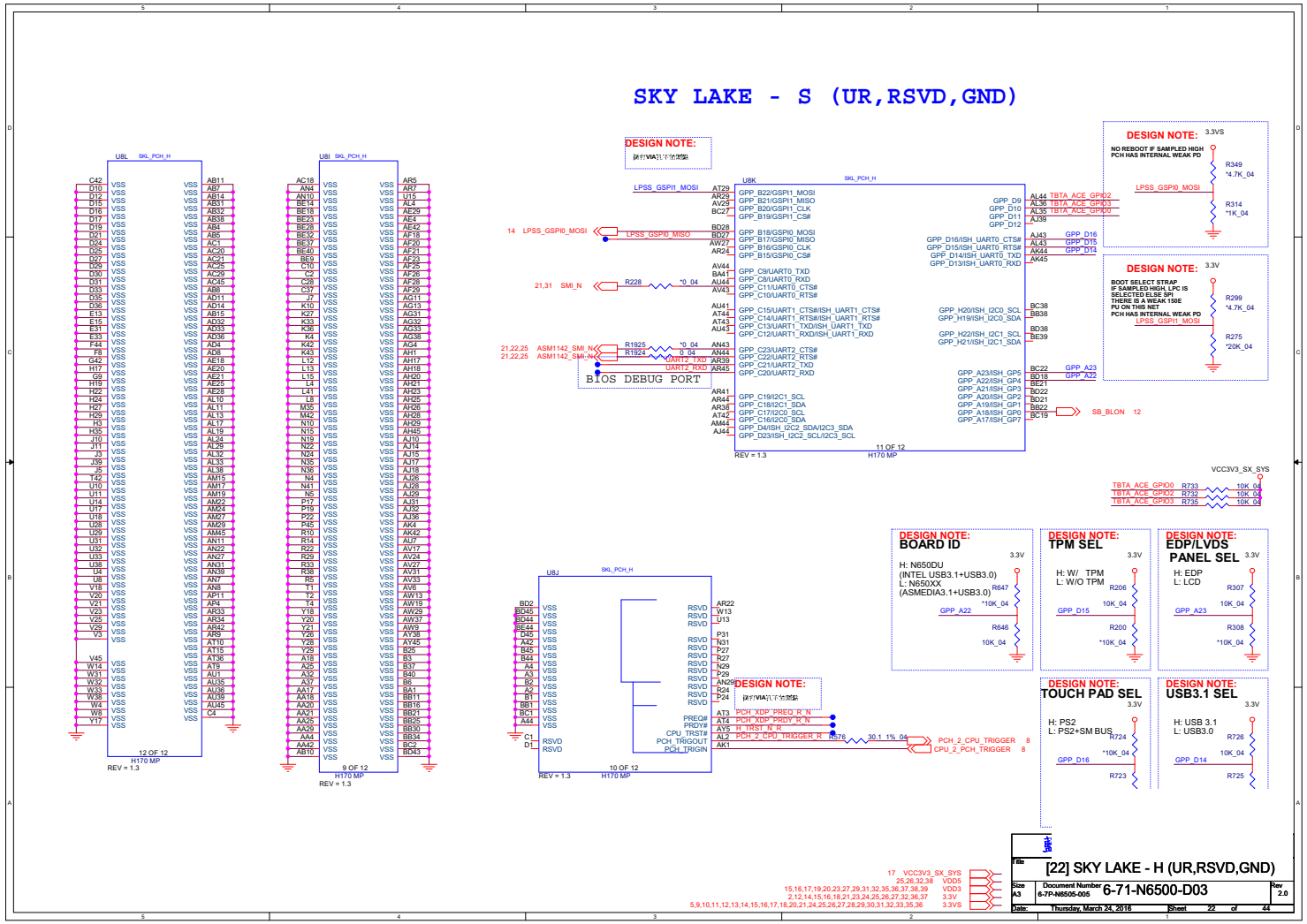

SKY LAKE - S (POWER,RTC)
DESIGN NOTE:
PLACE HOLDER FOR VCCAUSB_1P0 AND VCCAAZPLL_1P0 FILTER
DESIGN NOTE:
PLACE HOLDER FOR VCCMPHYPLL_1P0 FILTER
DESIGN NOTE:
PLACE HOLDER FOR VCCMPHYPLL_1P0 FILTER
DESIGN NOTE:
BOARD CAP FOR VCCPRTC_3P3
DESIGN NOTE:
EDGE CAP FOR VCCPUSBDSW_3P3 PLACE HOLDER
DESIGN NOTE:
BOARD CAP FOR VCCMPHY_1P0
DESIGN NOTE:
BOARD GENERAL DCPL CAPS
DESIGN NOTE:
BOARD CAP FOR VCCDSW_1P0
DESIGN NOTE:
EDGE CAP FOR VCCMPHY_1P0 AND VCCDUSB_1P0
DESIGN NOTE:
BOARD CAP FOR VCCPRTCPRIM_3P3
DESIGN NOTE:
EDGE CAP FOR VCCPHVC_3P3 (PLACE HOLDER)
DESIGN NOTE:
BOARD CAP FOR VCCATS
DESIGN NOTE:
EDGE CAP FOR VCCPGPPBCH (PLACE HOLDER)
DESIGN NOTE:
EDGE CAP FOR VCCPGPPG(PLACE HOLDER)
DESIGN NOTE:
EDGE CAP FOR VCCPHVC_3P3 (PLACE HOLDER)
DESIGN NOTE:
EDGE CAP FOR VCCPGPPEF(PLACE HOLDER)
U8H
REV = 1.3
8 OF 12
H170 MP
DEFAULT SHORT
DEFAULT SHORT

Skylake-H 8/9

Sheet 21 of 44
Skylake - H 8/9



Skylake-H 9/9

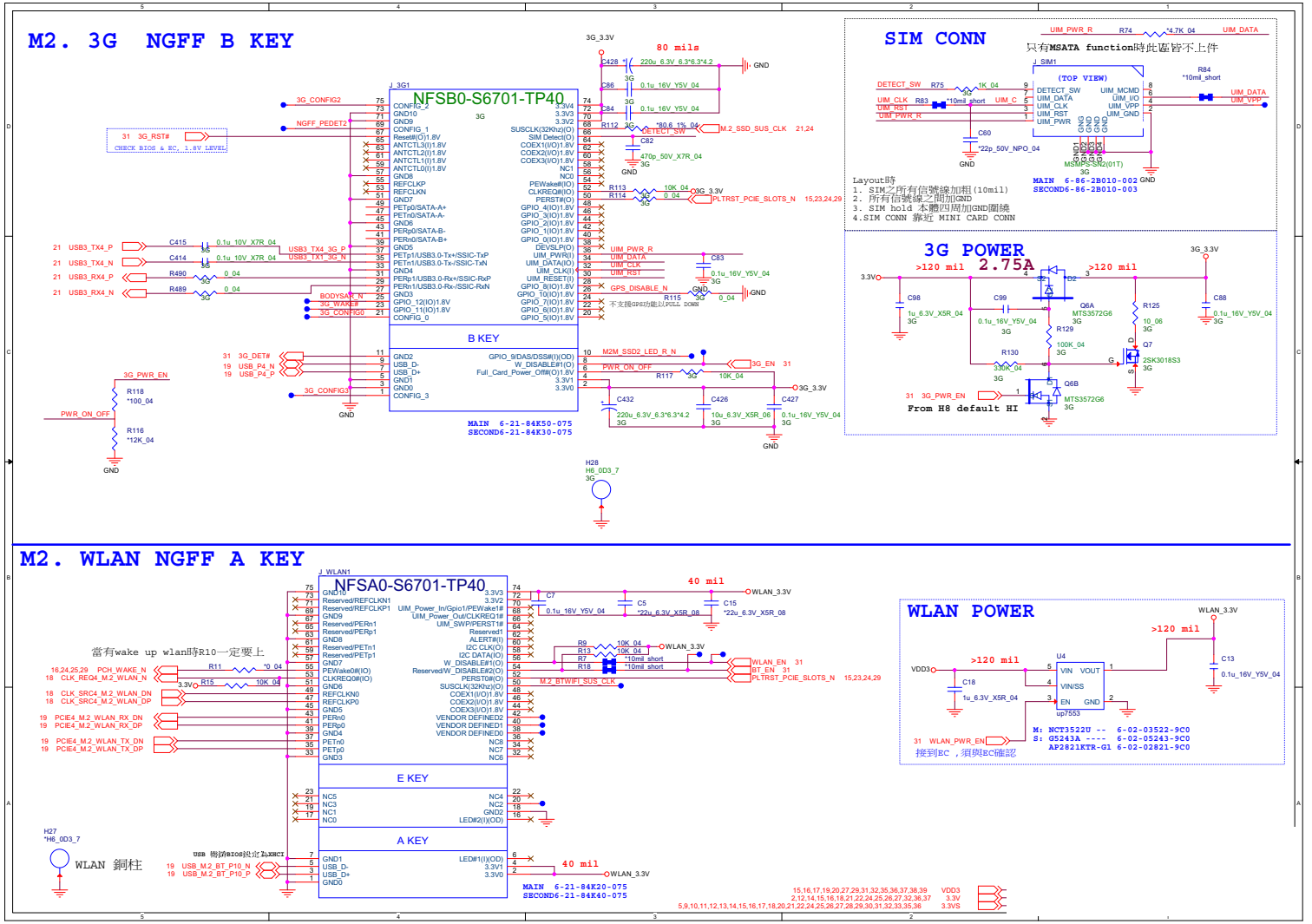


Sheet 22 of 44
Skylake - H 9/9

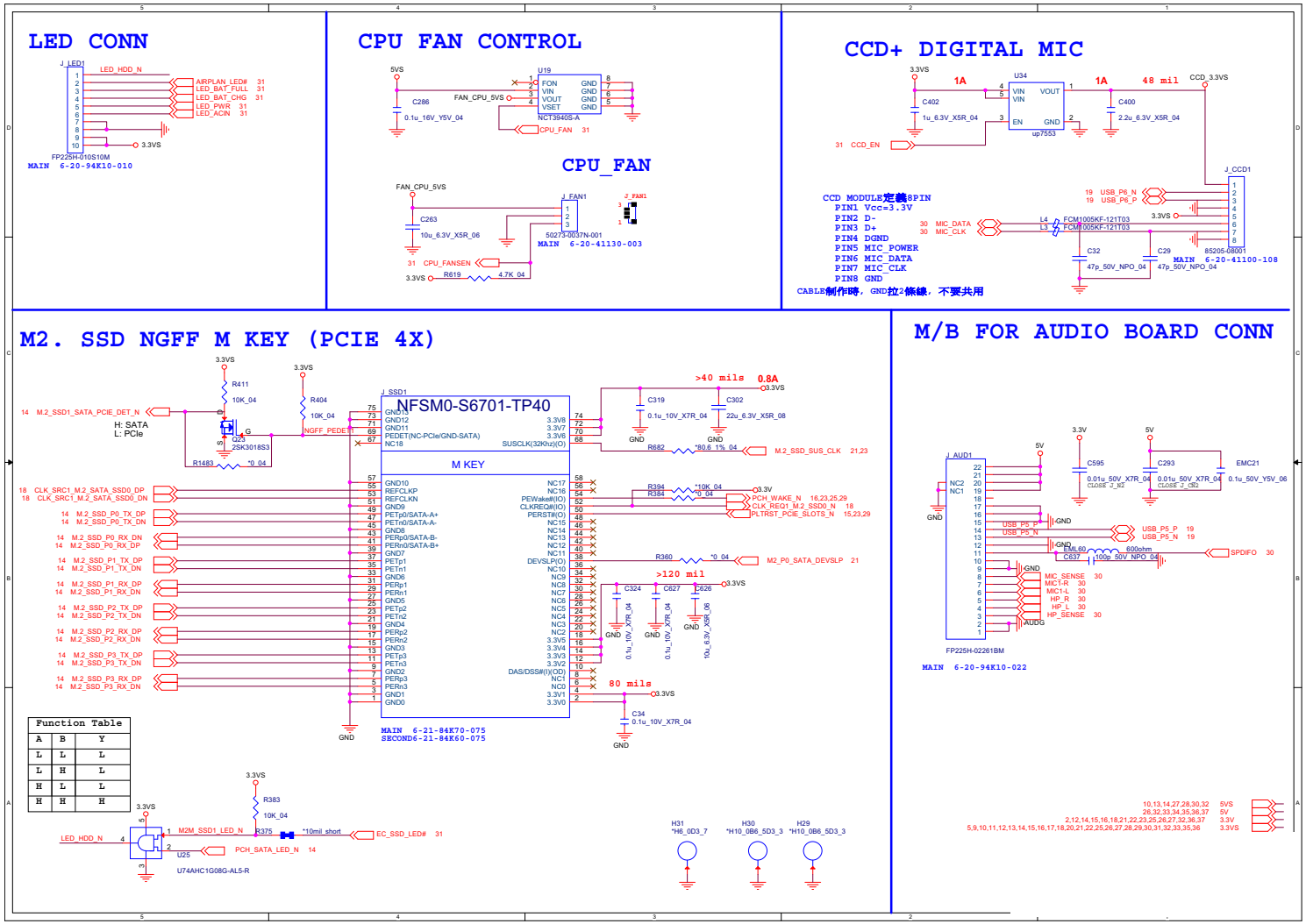
B.Schematic Diagrams

M.2 WLAN, 3G

Sheet 23 of 44
M.2 WLAN, 3G



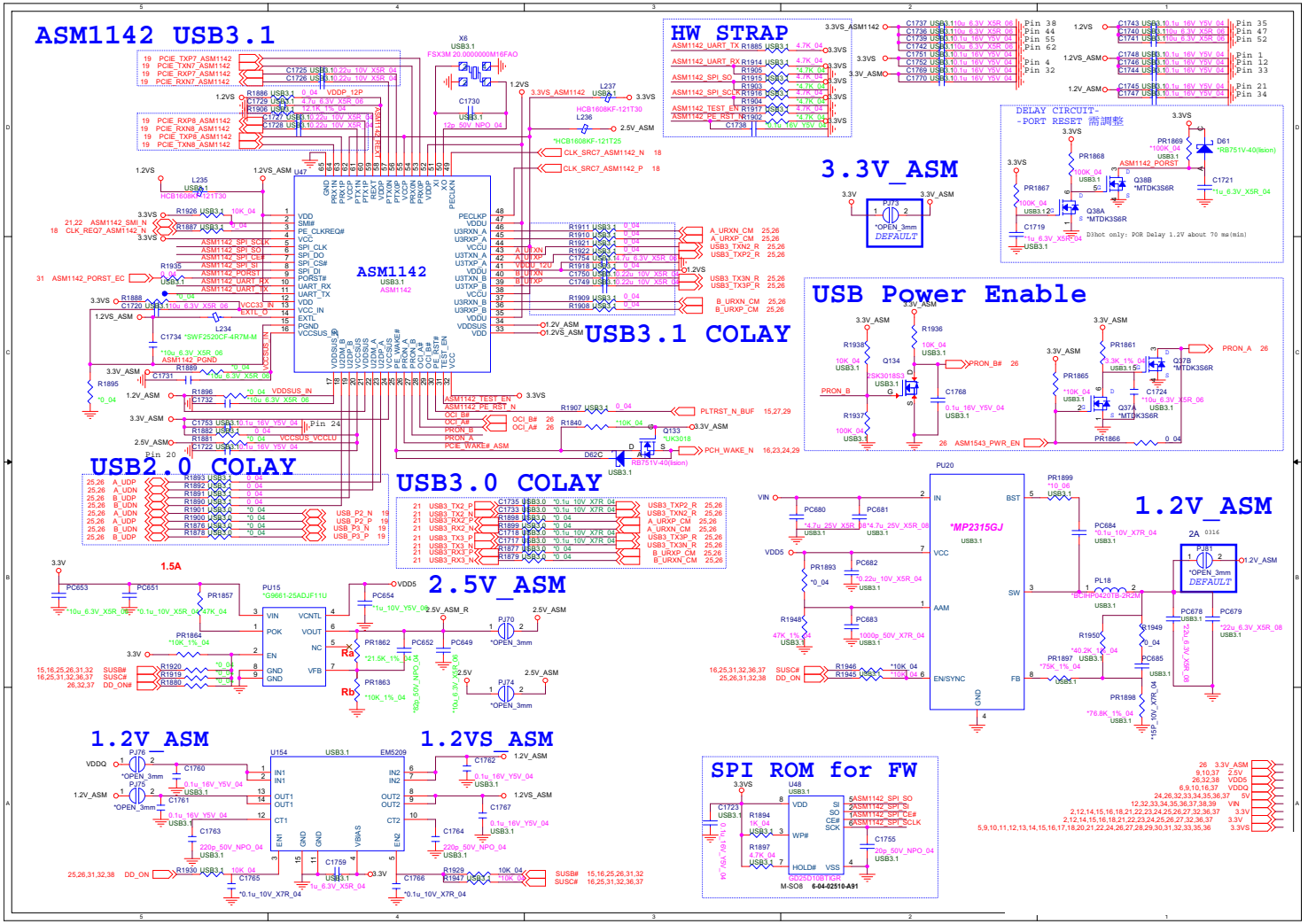
M.2 SSD, CCD, Fan, Audio, LED



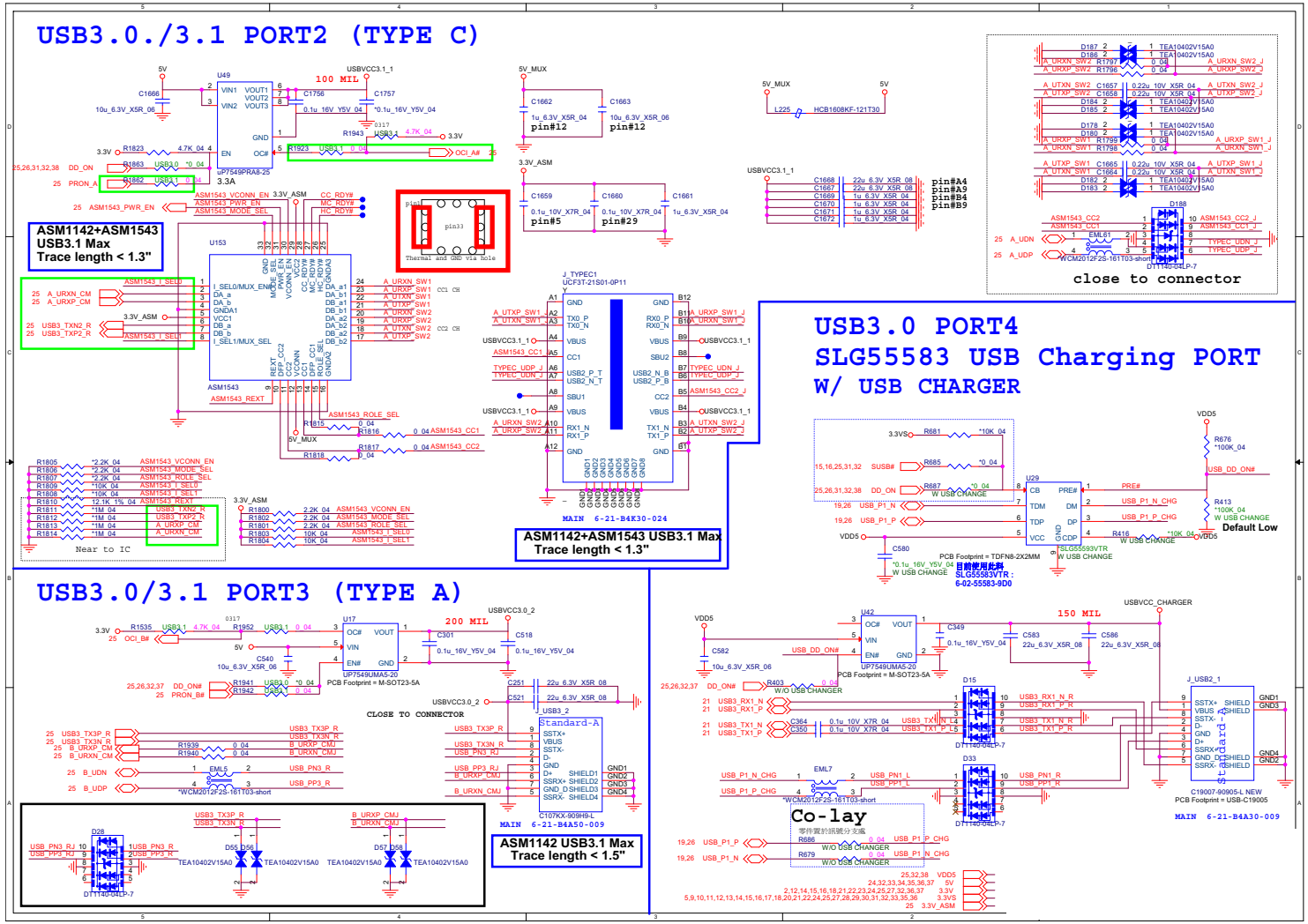
Sheet 24 of 44
M.2 SSD, CCD, Fan, Audio, LED

ASM1142

Sheet 25 of 44
ASM1142



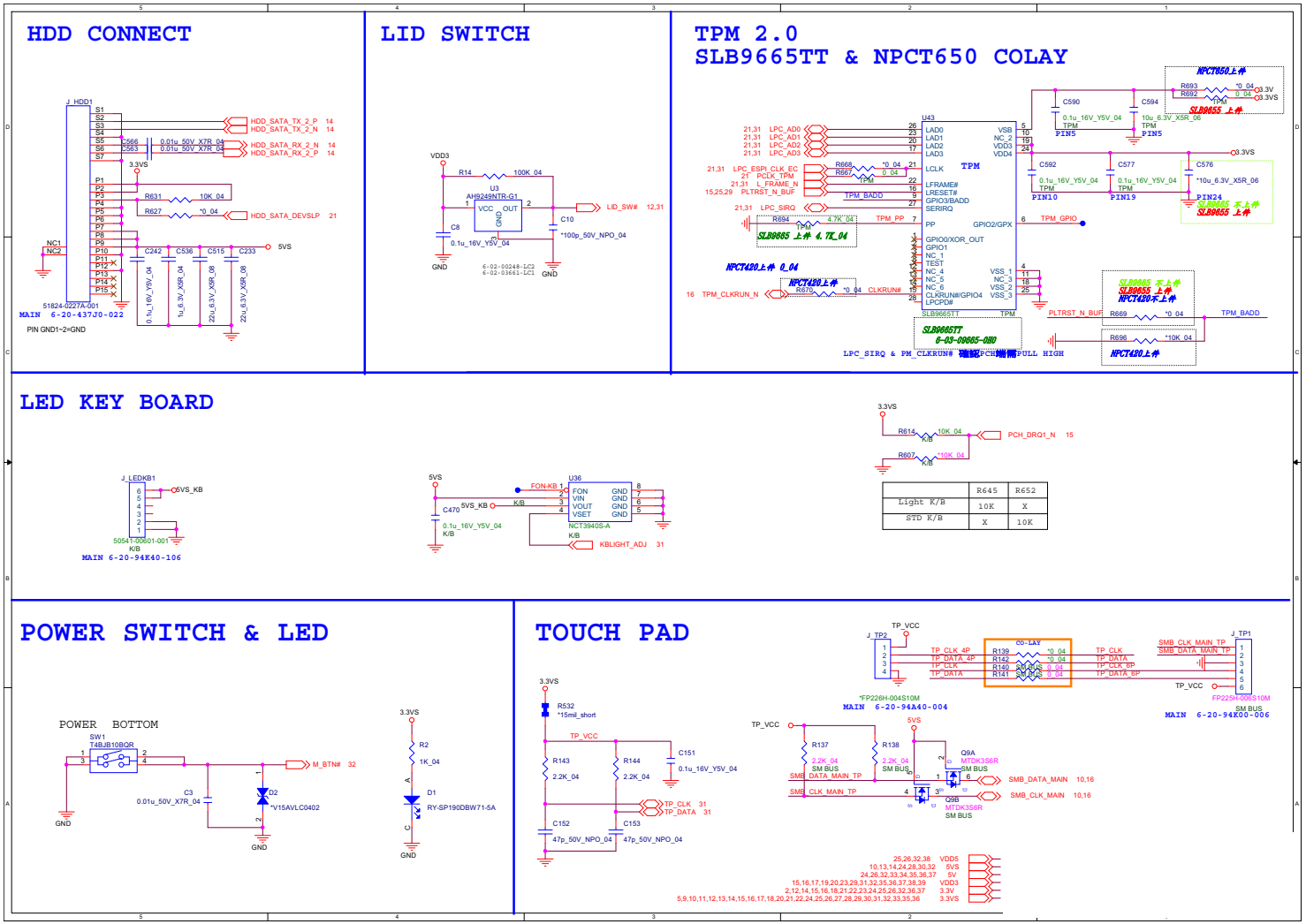
USB



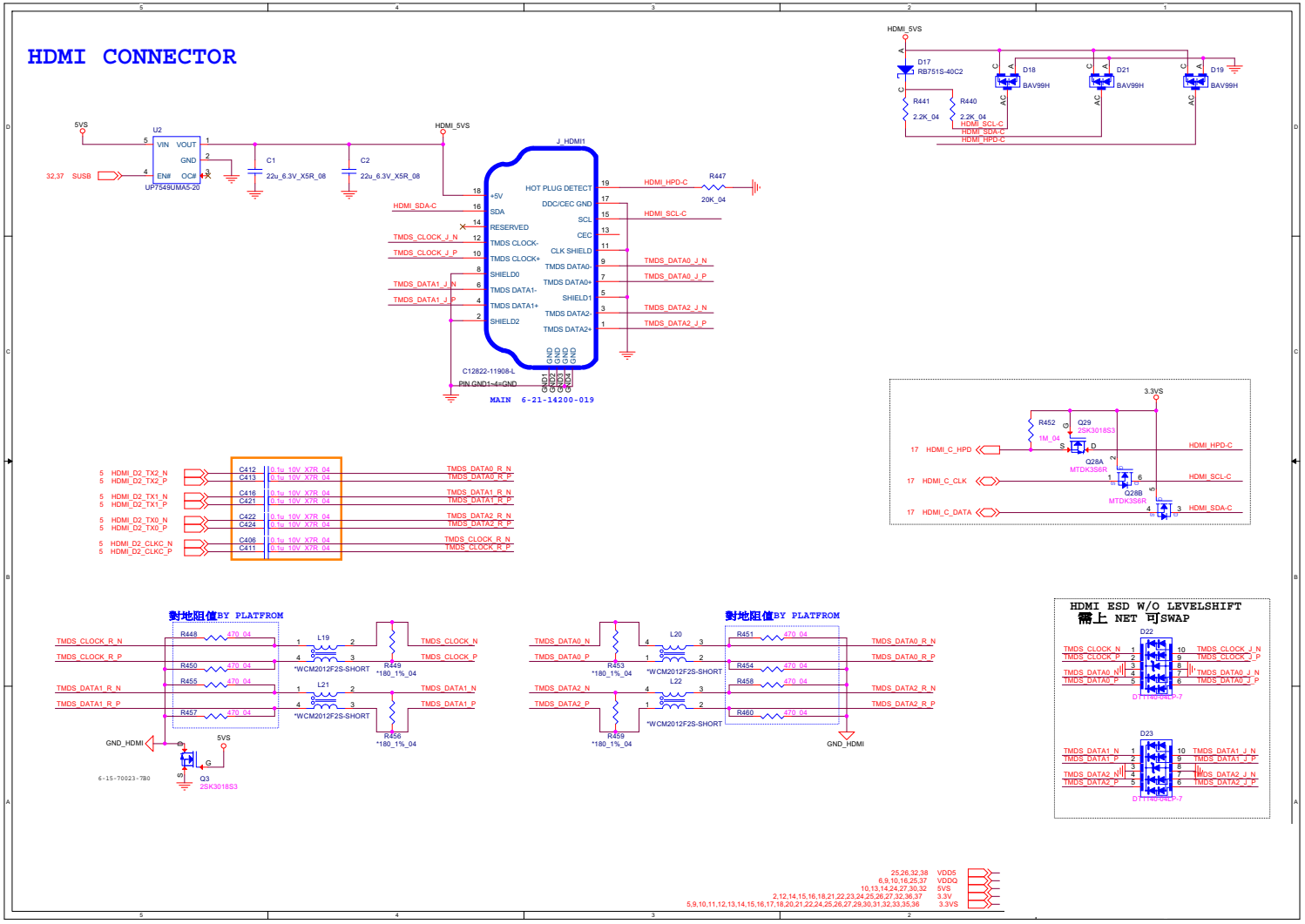
Sheet 26 of 44
USB

HDD, PWR LED, LID

Sheet 27 of 44
HDD, PWR LED, LID



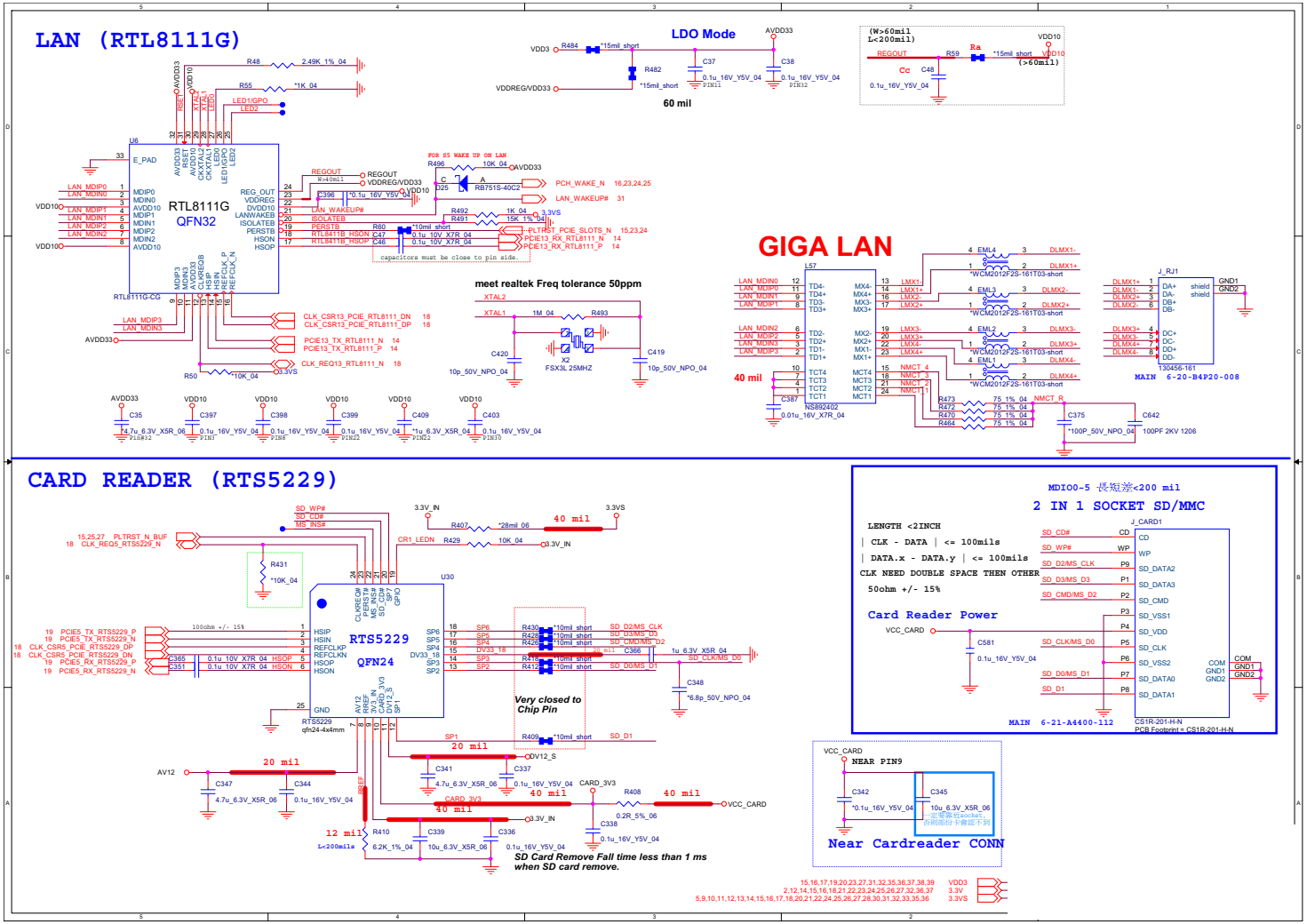
HDMI



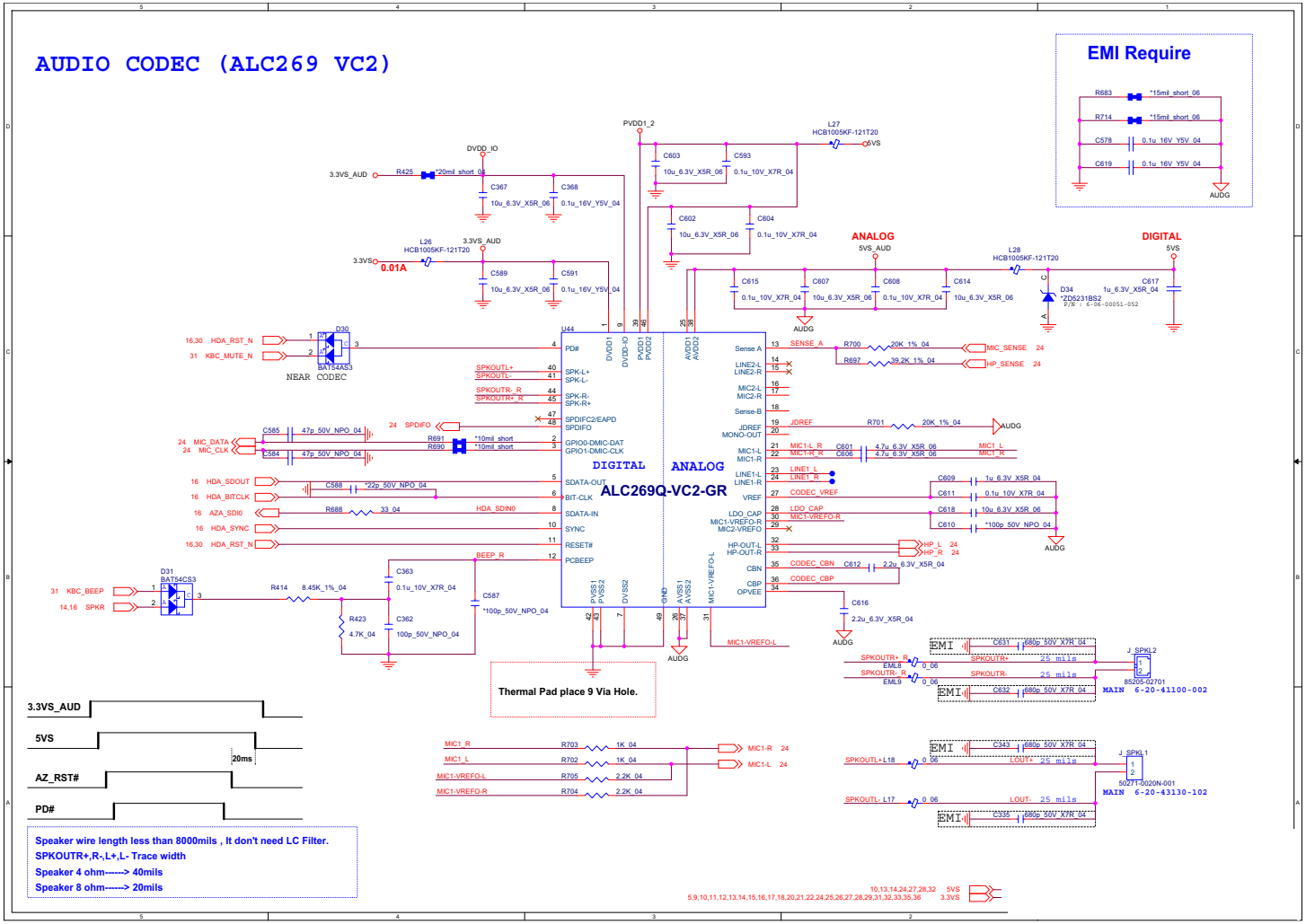
Sheet 28 of 44
HDMI

LAN, Card Reader

Sheet 29 of 44
LAN, Card Reader



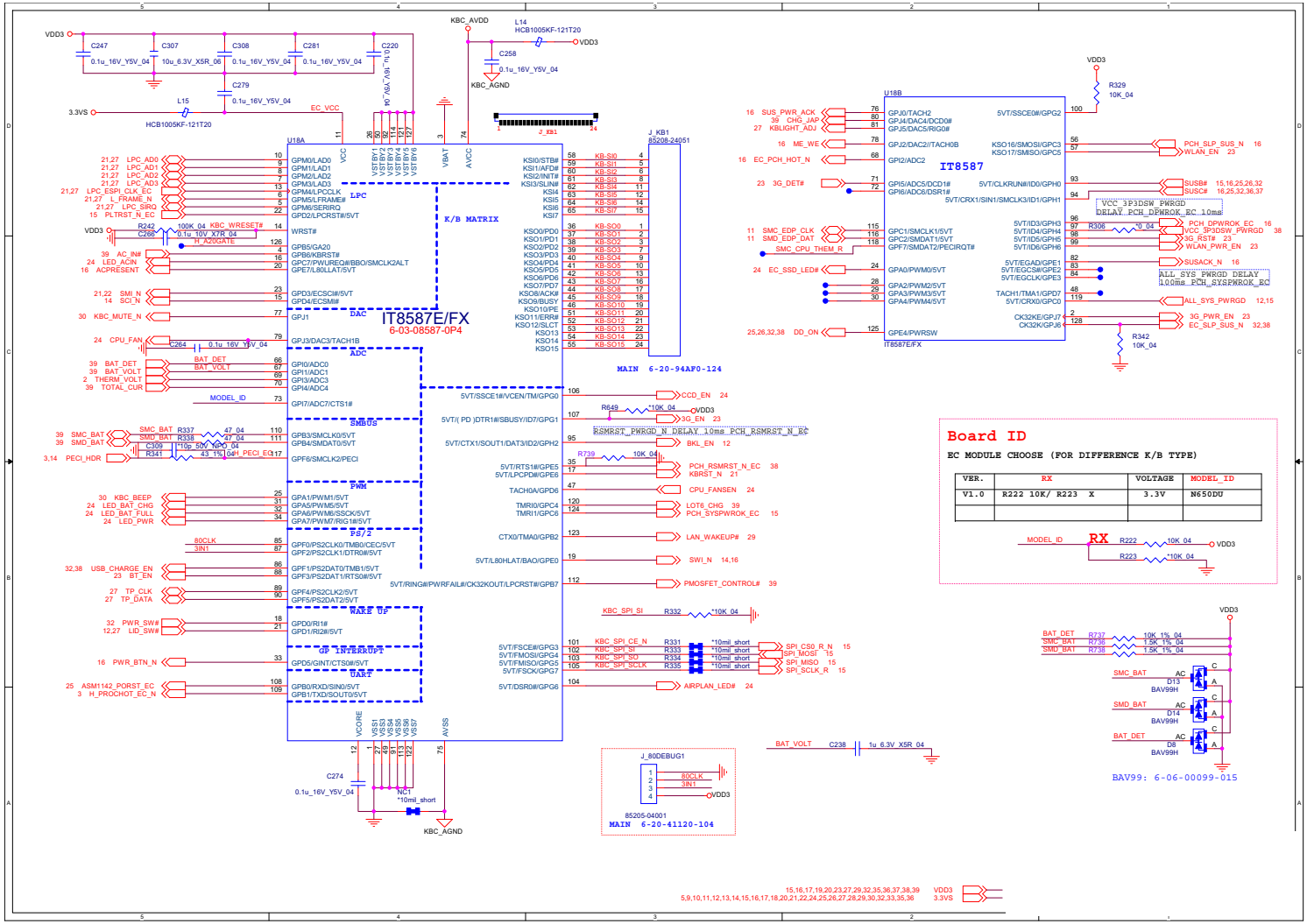
Audio Codec



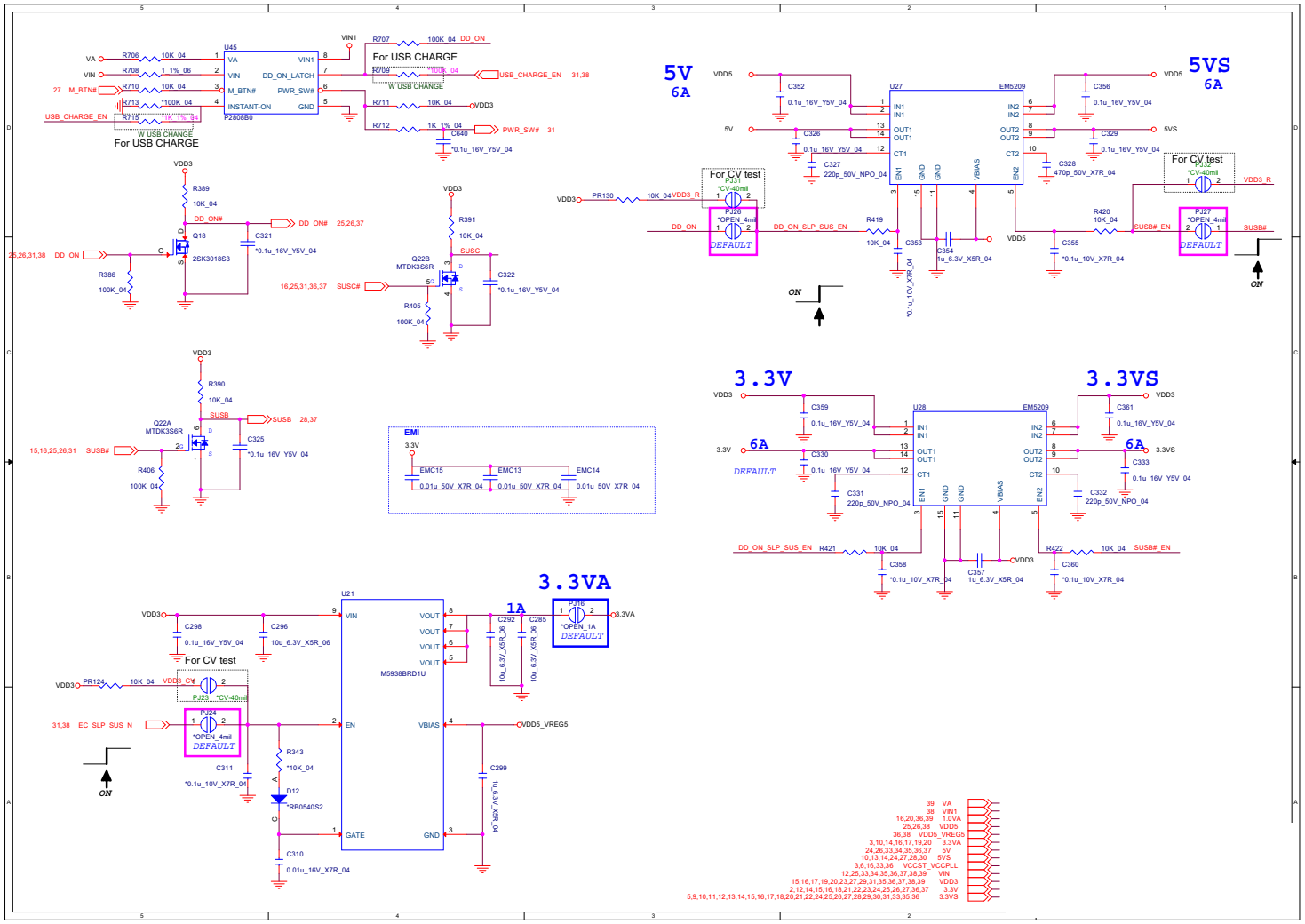
Sheet 30 of 44
Audio Codec

KBC-ITE IT8587

Sheet 31 of 44
KBC-ITE IT8587



5V, 5VS, 3.3V, 3VS, 3.3VA

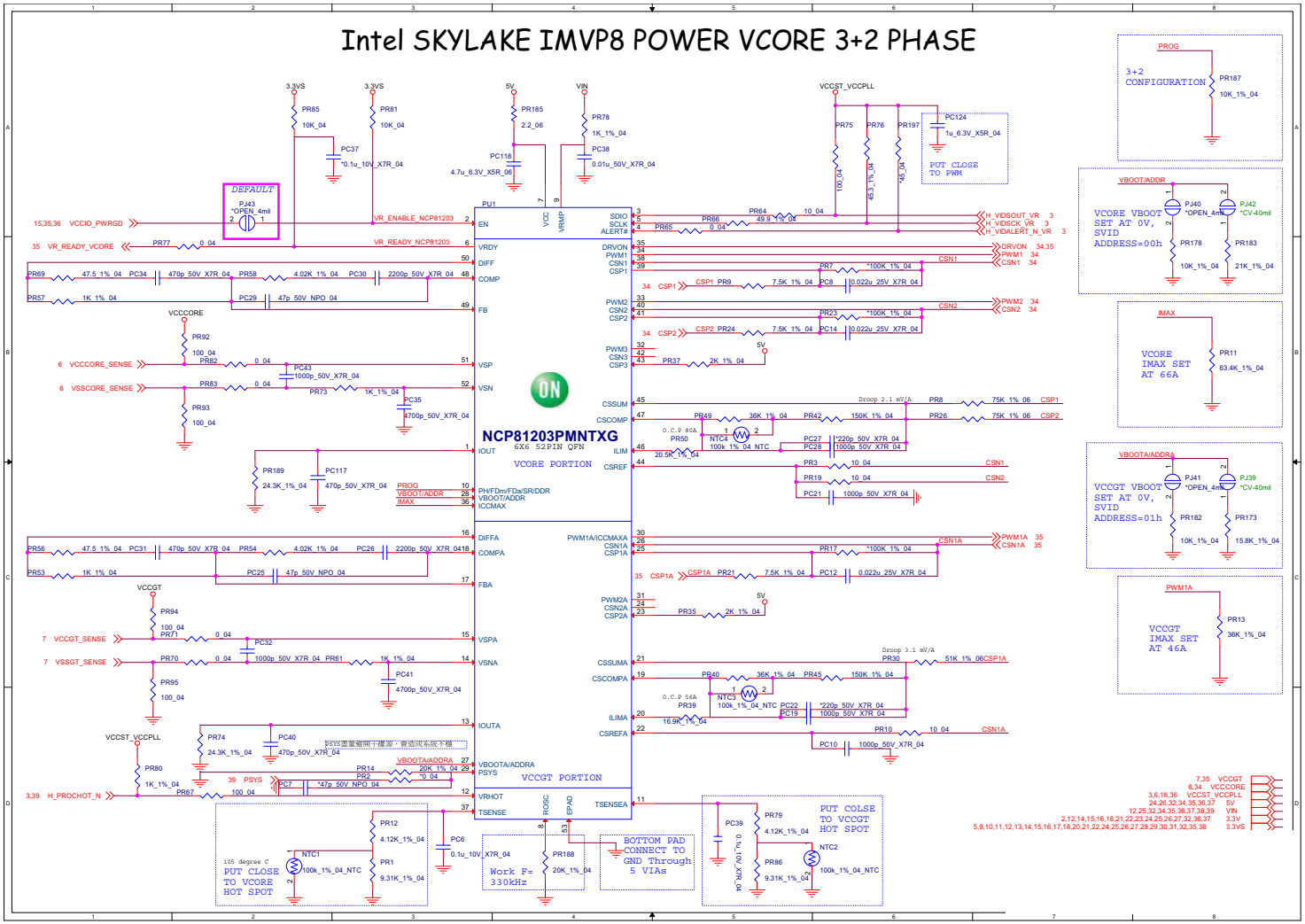


Sheet 32 of 44
5V, 5VS, 3.3V, 3VS, 3.3VA

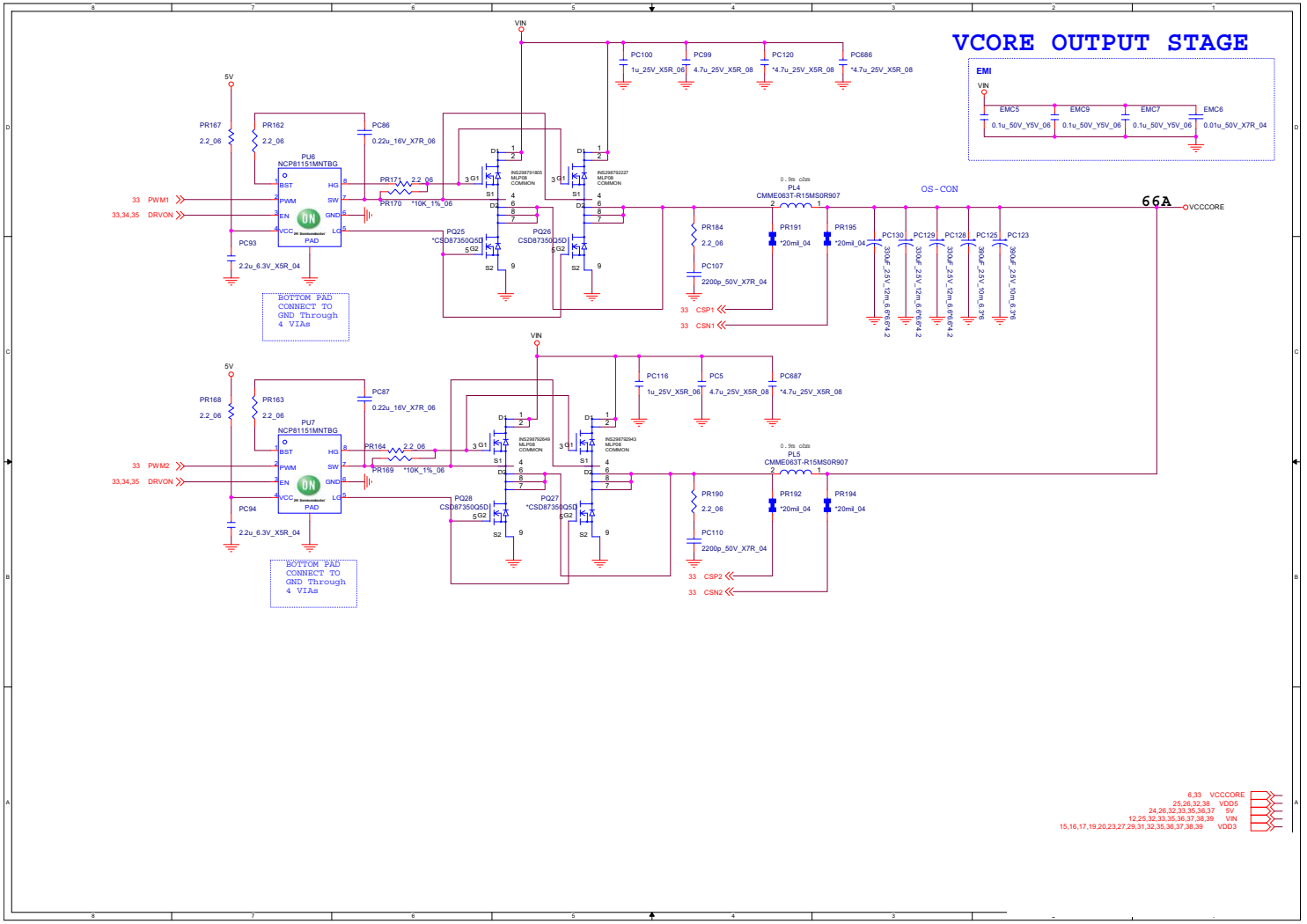
B.Schematic Diagrams

VCORE, VCCGT

Sheet 33 of 44
VCORE, VCCGT



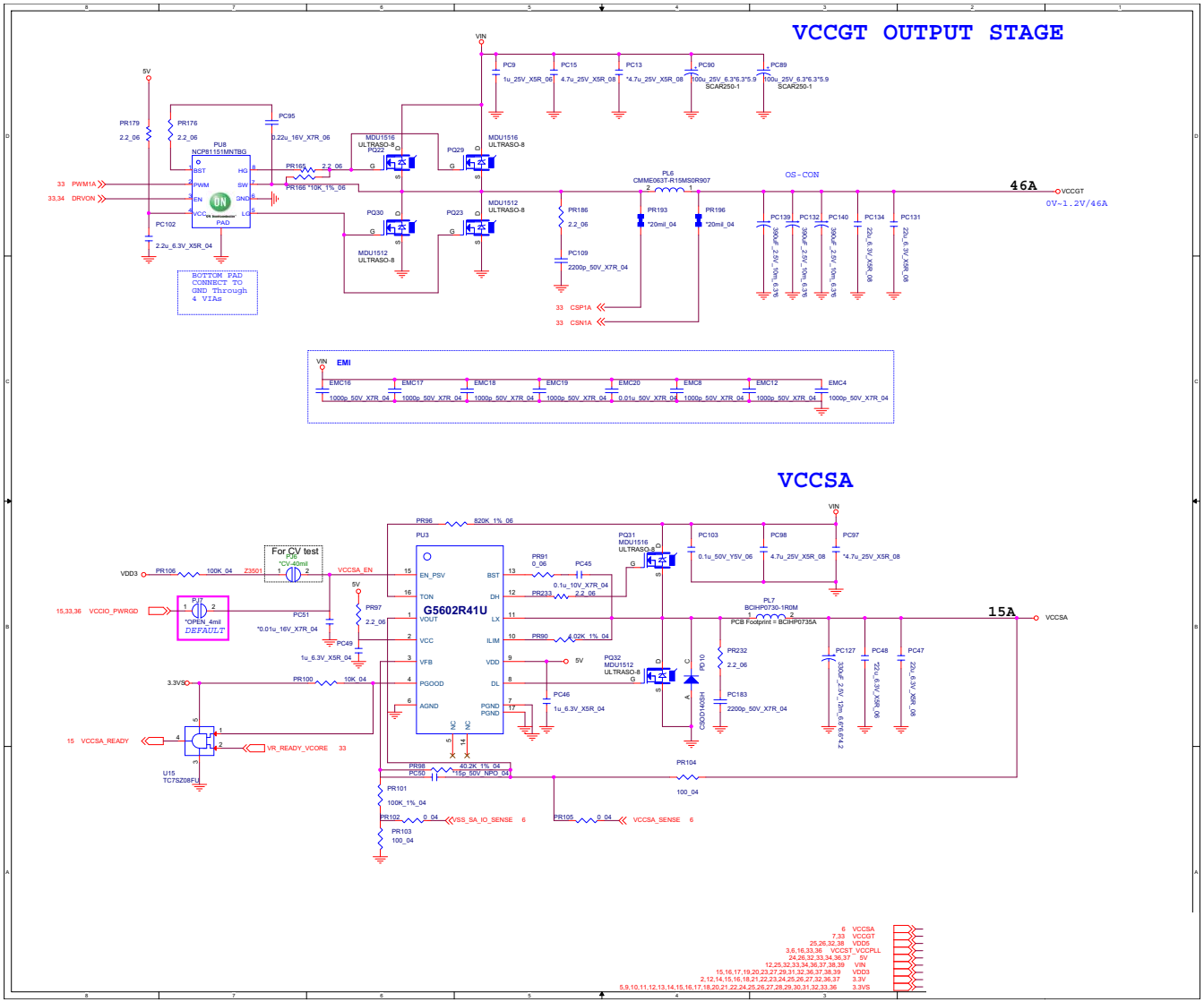
VCORE Output Stage



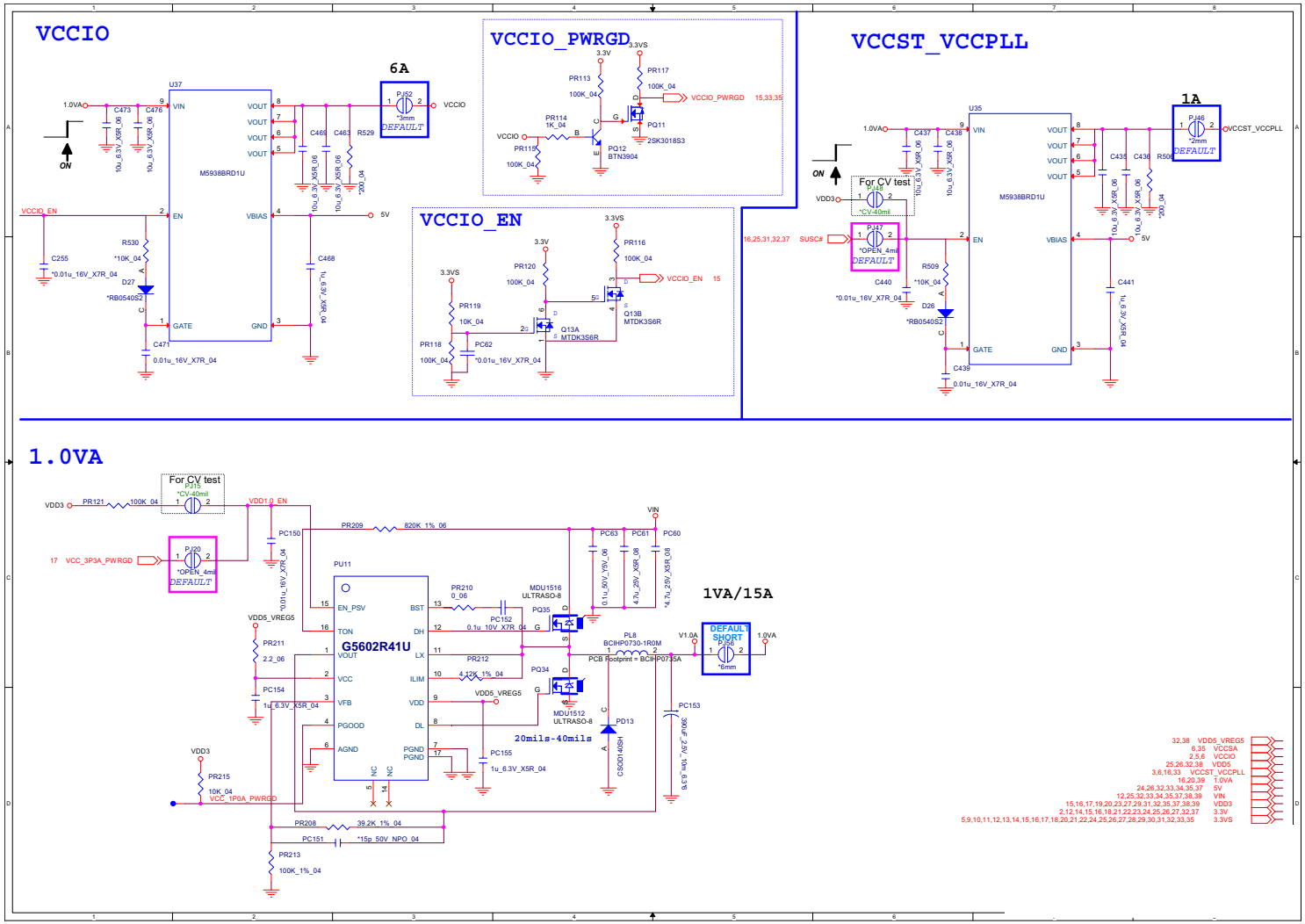
Sheet 34 of 44
VCORE Output Stage

VCCGT Output Stage, VCCSA

Sheet 35 of 44
VCCGT Output Stage, VCCSA



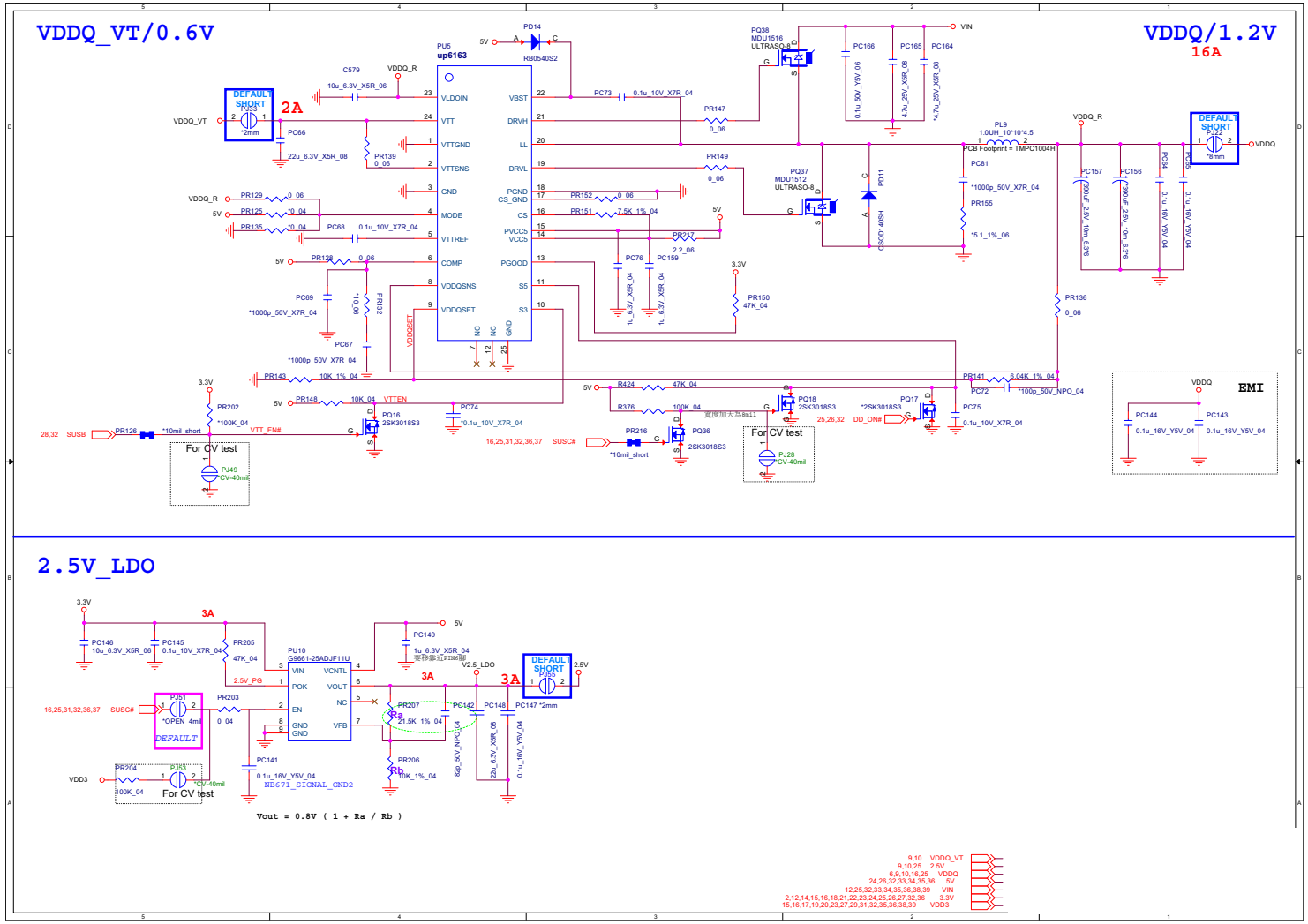
1.0VA, VCCIO



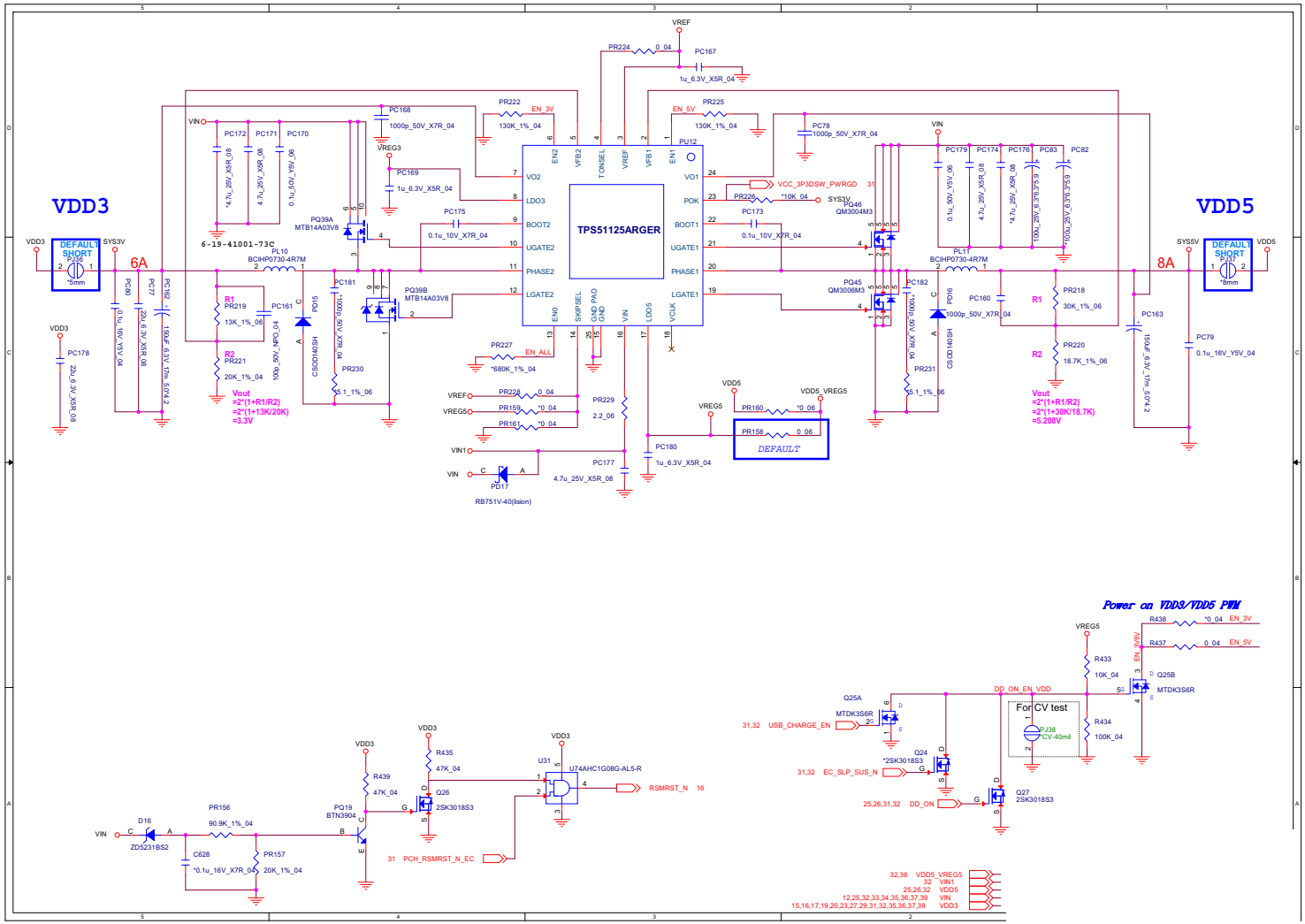
Sheet 36 of 44
1.0VA, VCCIO

DDR 1.2V, 0.6VS, 2.5V

Sheet 37 of 44
DDR 1.2V, 0.6VS, 2.5V



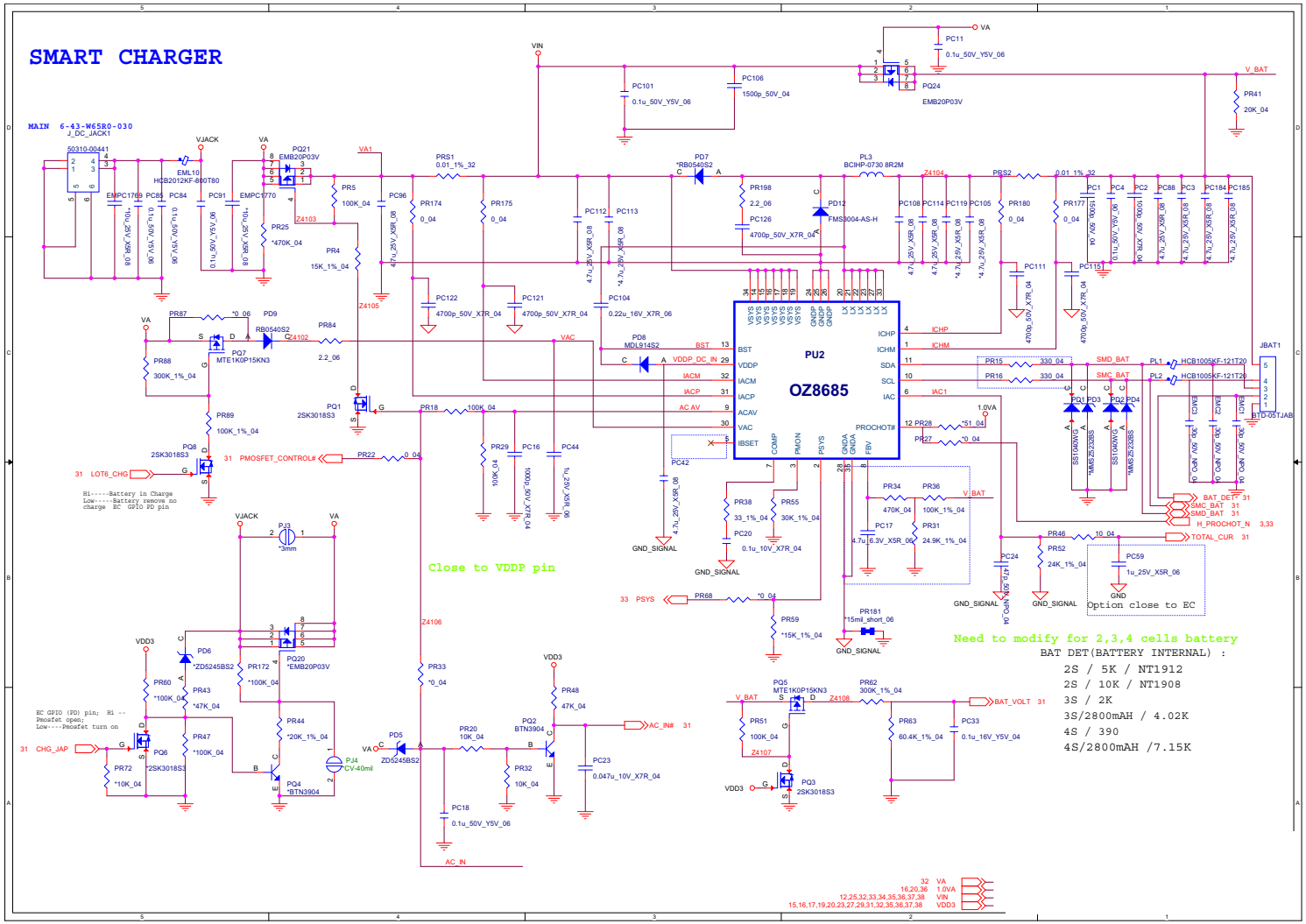
VDD3, VDD5



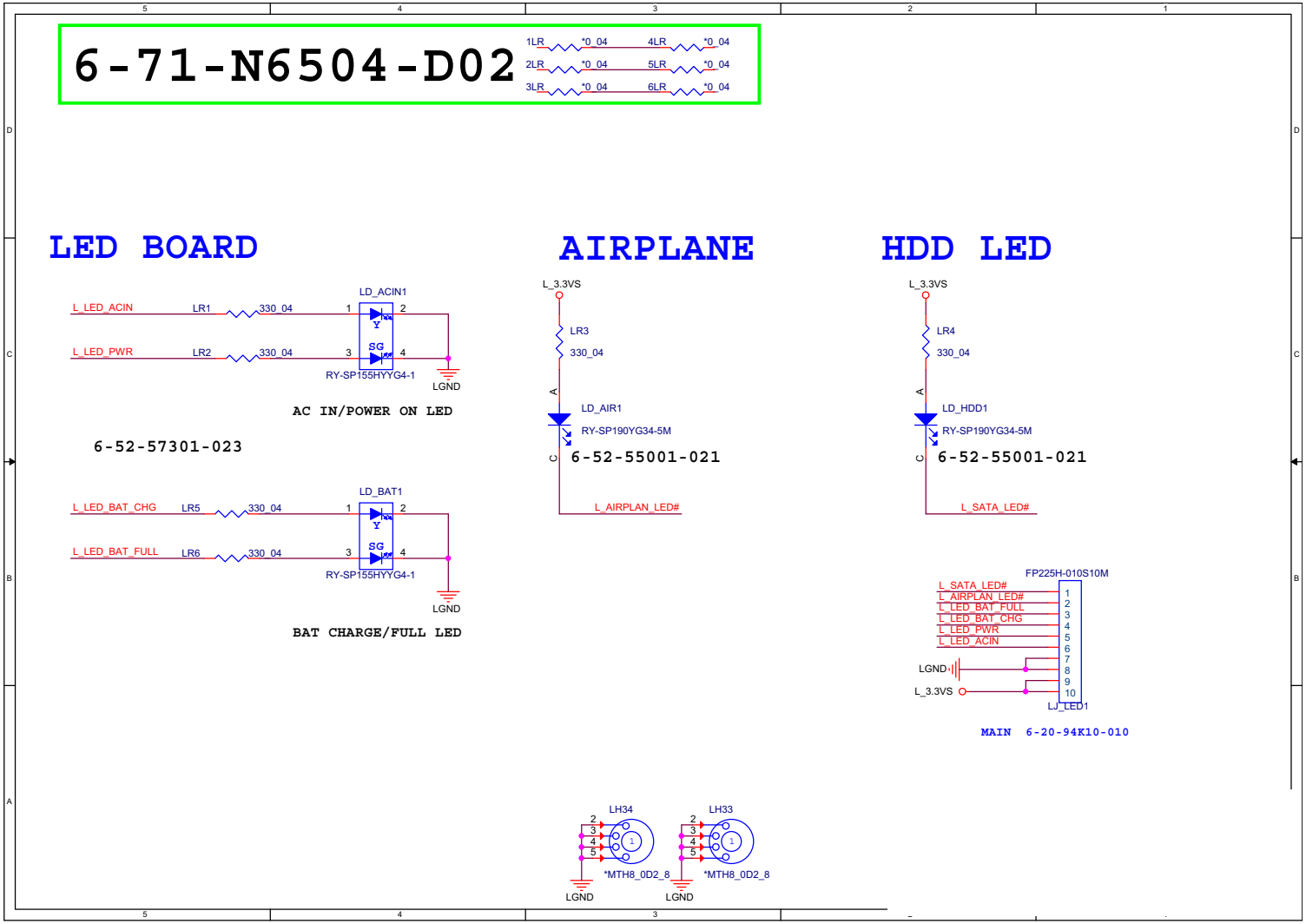
Sheet 38 of 44
VDD3, VDD5

AC_In, Charger

Sheet 39 of 44
AC_In, Charger



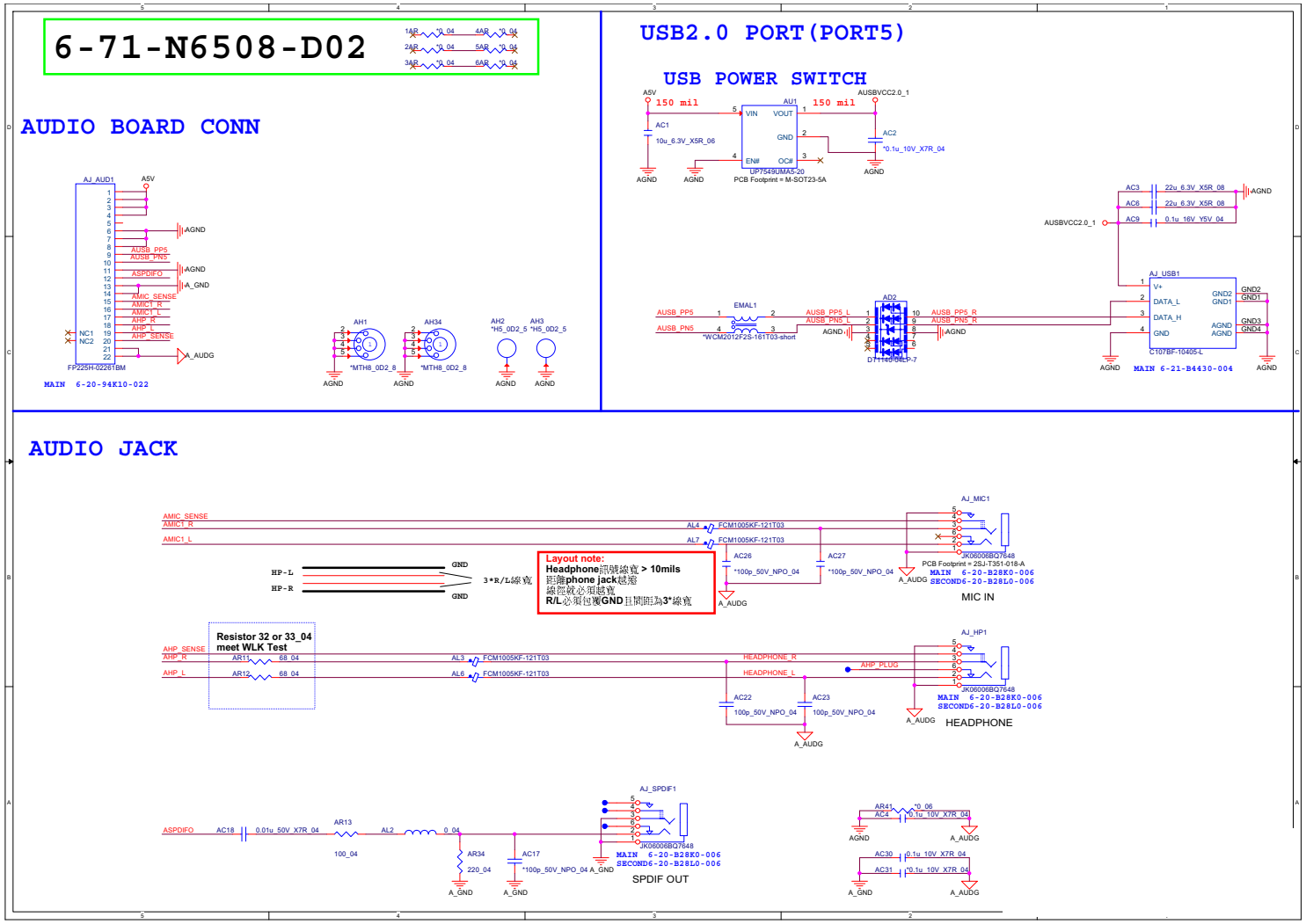
Front LED Board



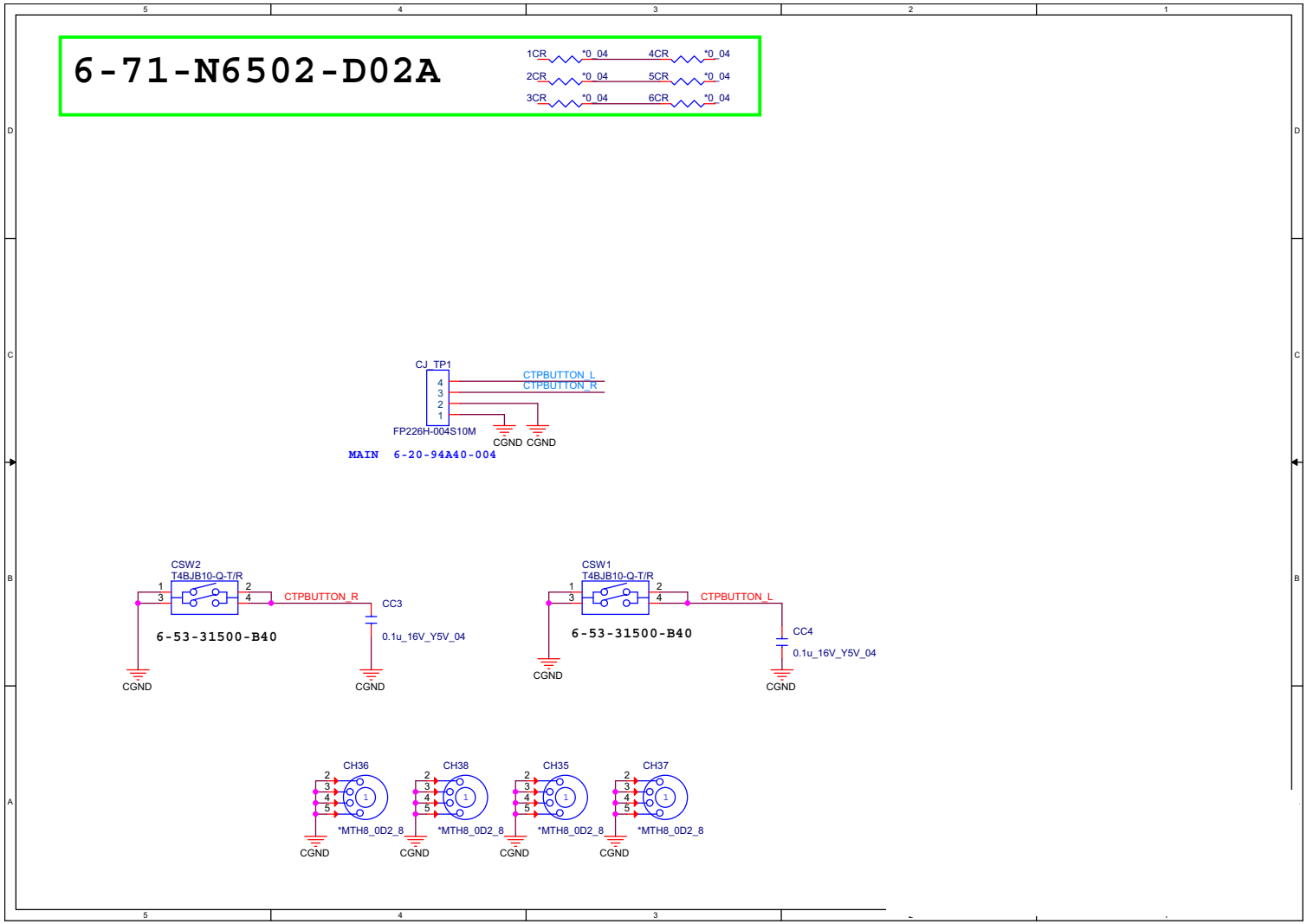
Sheet 40 of 44
Front LED Board

Audio Board

Sheet 41 of 44
Audio Board



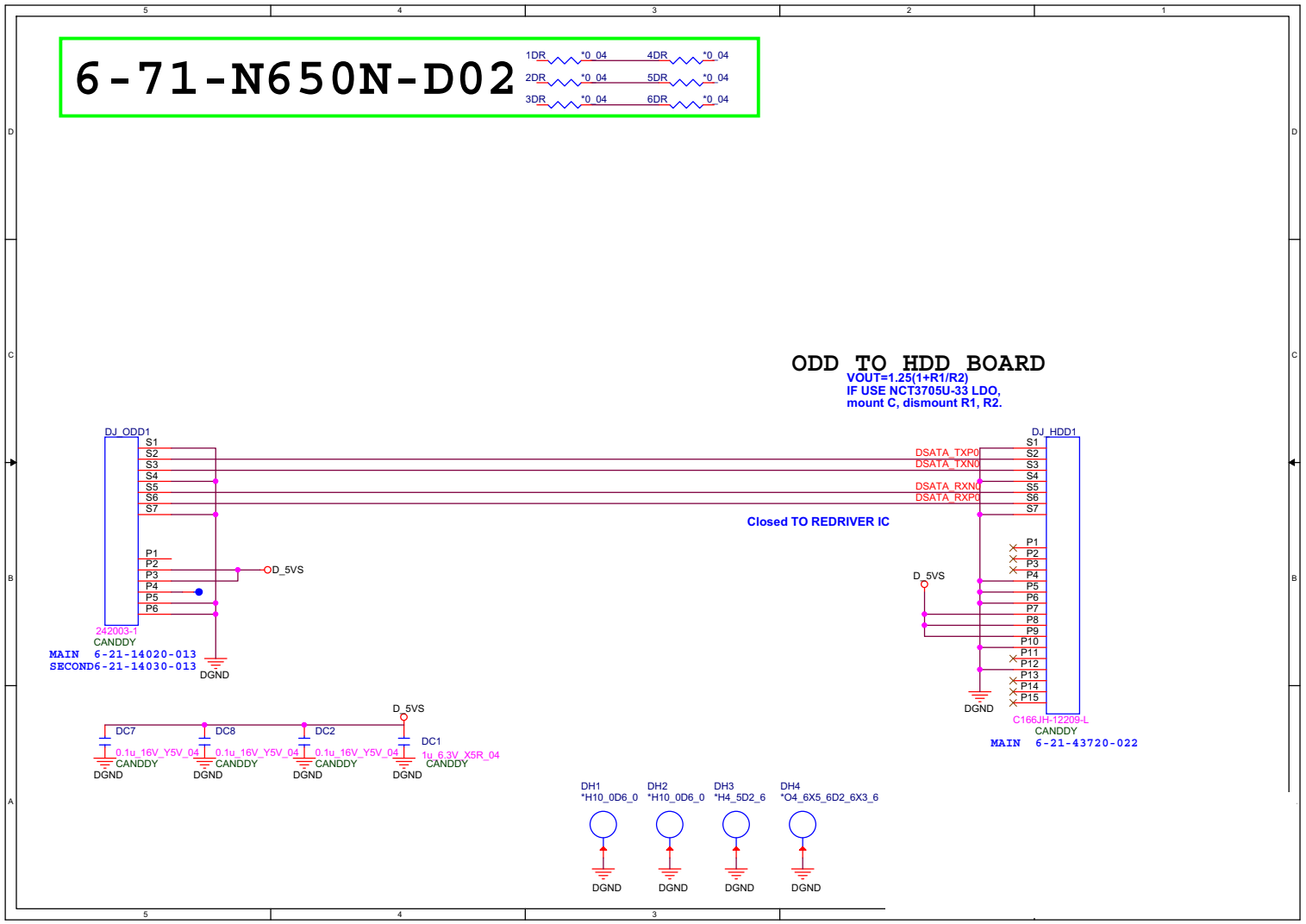
Click Board



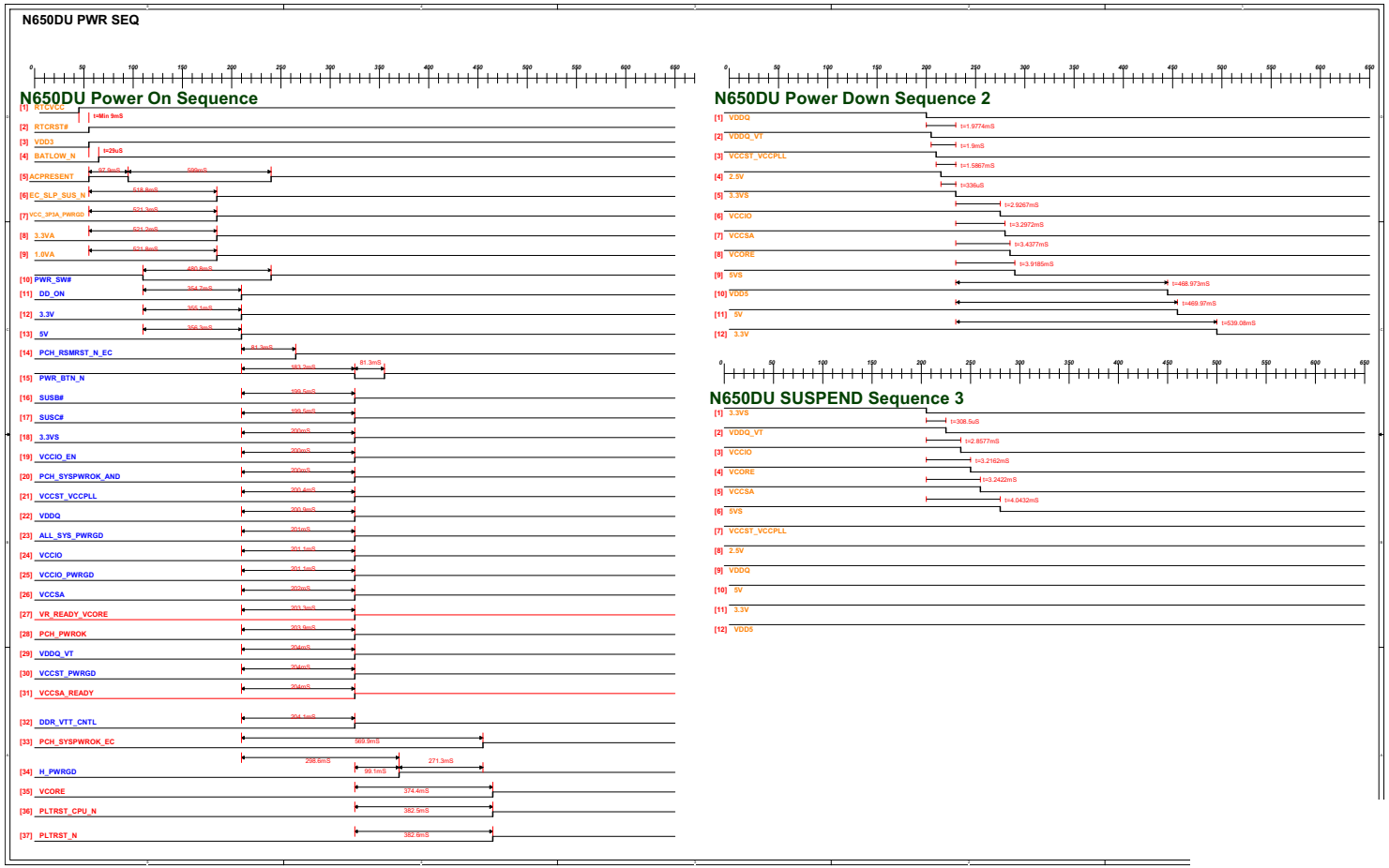
Sheet 42 of 44
Click Board

ODD to HDD Board

Sheet 43 of 44
ODD to HDD Board



Power Sequence



Sheet 44 of 44
Power Sequence

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 V1.01.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 1.01.05, you **MAY NOT** then go back and flash the BIOS to ver 1.01.04).

Use the flash tools to update the BIOS

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

   fsX:\> Flash.nsh

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

Restart the computer (booting from the HDD)

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

Your computer is now running normally with the updated BIOS

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