SERVICE MANUAL

W270ENQ

notebook

Notebook Computer

W270ENQ

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 ***W270ENQ*** 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**W) 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.

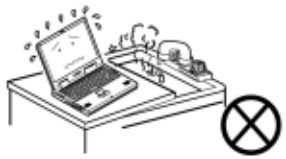
Instructions for Care and Operation

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.*
		

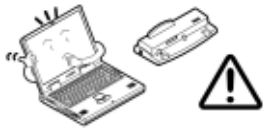
2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

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.*
	

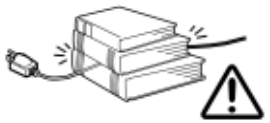
Power Safety

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

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

Shut Down

Note that you should always shut your computer down by choosing **Shut Down** from the **Start** Menu.

This will help prevent hard disk or system problems.

Contents

Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the ***W270ENQ*** series notebook computer. Information about operating the computer (e.g. getting started, and the *Setup* utility) is in the *User's Manual*. Information about dri-vers (e.g. VGA & audio) is also found in the *User's Manual*. The manual is shipped with the computer.

Operating systems (e.g. *Window 7,* 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 ***W270ENQ*** 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
Note all processor packages are rPGA988B
Intel® Core i7-3820QM (2.7GHz) Quad-Core Mobile Processor 8M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-3720QM (2.6GHz) Quad-Core Mobile Processor 6M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-3610QM (2.3GHz) Quad-Core Mobile Processor 6M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-3520M (2.9GHz) Mobile Processor 4M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 35W
Intel® Core i5-3360M (2.8GHz) Mobile Processor 3M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 35W
Intel® Core i5-3320M (2.6GHz) Mobile Processor 3M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 35W
Intel® Core i5-3210M (2.5GHz) Mobile Processor 3M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 35W
Intel® Core i5-3110M (2.4GHz) Mobile Processor 3M L3 Cache, 22nm (22 Nanometer), DDR3-1600MHz, TDP 35W

Intel® Core i7-2860QM (2.5GHz) Quad-Core Mobile Processor 8M L3 Cache, 32nm (32 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-2820QM (2.3GHz) Quad-Core Mobile Processor 8M L3 Cache, 32nm (32 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-2760QM (2.4GHz) Quad-Core Mobile Processor 6M L3 Cache, 32nm (32 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-2720QM (2.2GHz) Quad-Core Mobile Processor 6M L3 Cache, 32nm (32 Nanometer), DDR3-1600MHz, TDP 45W
Intel® Core i7-2670QM (2.2GHz) Quad-Core Mobile Processor 6M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 45W
Intel® Core i7-2630QM (2.0GHz) Quad-Core Mobile Processor 6M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 45W
Intel® Core i7-2640M (2.8GHz) Mobile Processor 4M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W
Intel® Core i7-2620M (2.7GHz) Mobile Processor 4M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i5-2540M (2.6GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i5-2520M (2.5GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i5-2450M (2.5GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i5-2430M (2.4GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i5-2410M (2.3GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i3-2370M (2.4GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i3-2350M (2.3GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i3-2330M (2.2GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Core i3-2310M (2.1GHz) Mobile Processor
3M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Pentium® B970 (2.3GHz)
2M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Pentium® B960 (2.2GHz)
2M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Pentium® B950 (2.1GHz)
2M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Intel® Pentium® B940 (2.0GHz)
2M L3 Cache, 32nm (32 Nanometer), DDR3-1333MHz, TDP 35W

Core Logic

Mobile Intel® HM76 Express Chipset

Display

17.3” / 43.94cm HD+ (1600 * 900) / FHD (1920 * 1080) 16:9 Backlit Panel

Memory

Dual Channel **DDRIII (DDR3)**

Two 204 Pin SO-DIMM sockets supporting DDR3 1333MHz/1600MHz (real operational frequency depends on the FSB of the processor)

Memory Expandable up to **8GB** (using 1GB / 2GB / 4GB SO-DIMM Modules)

Video Controller

Intel® Integrated GPU and NVIDIA® GeForce GT 630M Video:

Supports NVIDIA® Optimus Switchable GPU Technology between iGPU and dGPU

Intel® HD Graphics 4000 / Intel® HD Graphics 3000 / Intel® HD Graphics
(*GPU is Dependent on Processor*):

Dynamic Frequency
Intel Dynamic Video Memory Technology for up to 1.7GB
Microsoft DirectX®10 Compatible (*for Intel® HD Graphics 3000 / Intel® HD Graphics*)
Microsoft DirectX®11 Compatible (*for Intel® HD Graphics 4000*)

NVIDIA® GeForce GT 630M Discrete GPU:
1GB DDR3 Video RAM
or
2GB DDR3 Video RAM
Supports PCIe * 8
Microsoft DirectX®11 Compatible
NVIDIA PhysX™
GeForce CUDA™ Technology
NVIDIA® Optimus 2012 Technology

BIOS

48Mb SPI Flash ROM
AMI BIOS

Storage

One Changeable 12.7mm(h) Super Multi/Blu-ray Combo Optical Device Drive with SATA Interface (**Factory Option**)

One Changeable 2.5" / 9.5 mm (h) HDD with SATA (Serial) Interface

Audio

High Definition Audio Interface
Built-In Microphone
2 * Built-In Speakers
THX TruStudio Pro

Keyboard, Pointing Device & Buttons

Isolated Keyboard with Numeric Keypad
Built-in Touchpad with Multi-Gesture Functionality

Interface

One USB 2.0 Port
Two USB 3.0 Ports
One eSATA Port
One External Monitor Port
One HDMI1.4a Out Port (with HDCP)
One Headphone-Out Jack
One Microphone-In Jack
One RJ-45 LAN Jack
One DC-In Jack

Card Reader

Embedded Multi-In-1 Card Reader
- MMC/ RS MMC
- SD/ Mini SD / SDHC/ SDXC
- MS/ MS Pro/ MS Duo

Note: Some of these cards require PC adapters that are usually supplied with the cards.

Slots

For Half Size WLAN Combo Module with PCIe and USB Interface

Communication

Built-In 10/100/1000Mb Base-TX **Ethernet LAN**

Intel® Centrino® Advanced-N 6235 (2*2 802.11 a/g/n) Half Mini-Card PCIe WLAN & Bluetooth 4.0 Combo Module (**Factory Option**)

Intel® Centrino® Wireless-N 2230 (1*2 802.11 b/g/n) Half Mini-Card PCIe WLAN & Bluetooth 4.0 Combo Module (**Factory Option**)

Combo WLAN (802.11b/g/n) **and Bluetooth v3.0+HS** Half Mini-Card Module with PCIe Interface (**Factory Option**)

Combo WLAN (802.11b/g/n) **and Bluetooth v4.0+HS** Half Mini-Card Module with PCIe Interface (**Factory Option**)

WLAN 802.11b/g/n Half Mini-Card Module with PCIe Interface (**Factory Option**)

1.3M/2.0M Pixel **PC Camera Module** with USB interface (**Factory Option**)

Power Management

Supports Wake on LAN
Supports Wake on USB

Power

Full Range AC/DC Adapter
AC input 100 - 240V, 50 - 60Hz,
DC Output 19V, 4.74A (**90** Watts)

Removable 6 Cell Smart Lithium Ion Battery Pack 48.84WH

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

Security

Security (Kensington® Type) Lock Slot

BIOS Password

Operating System

Windows® 7 with Service Pack 1

Design Feature

IMR (Injected Molded Resin) LCD Back Covers (For Some **Model Designs**)

Environmental Spec

Temperature

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

Relative Humidity

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

Dimensions & Weight

413mm (w) * 270mm (d) * 14 - 40.5mm(h)
3kg with ODD & 48.84WH Battery

External Locator - Top View with LCD Panel Open

Figure 1
Top View

1. PC Camera (**Optional**)
2. LCD
3. Power Button
4. LED Status Indicators
5. Keyboard
6. Built-In Microphone
7. Touchpad & Buttons

External Locator - Front & Right Side Views

Figure 2
Front View

1. LED Power Indicator

FRONT VIEW

Figure 3
Right Side View

1. Microphone-In Jack
2. Headphone-Out Jack
3. USB 2.0 Port
4. Optical Device Drive Bay
5. Emergency Eject Hole
6. Security Lock Slot

RIGHT SIDE VIEW

External Locator - Left Side & Rear View

/

LEFT SIDE VIEW

Figure 4
Left Side View

1. DC-In Jack
2. External Monitor Port
3. RJ-45 LAN Jack
4. HDMI-Out Port
5. USB 3.0 Ports
6. Vent
7. Multi-in-1 Card Reader
8. e-SATA Port

REAR VIEW

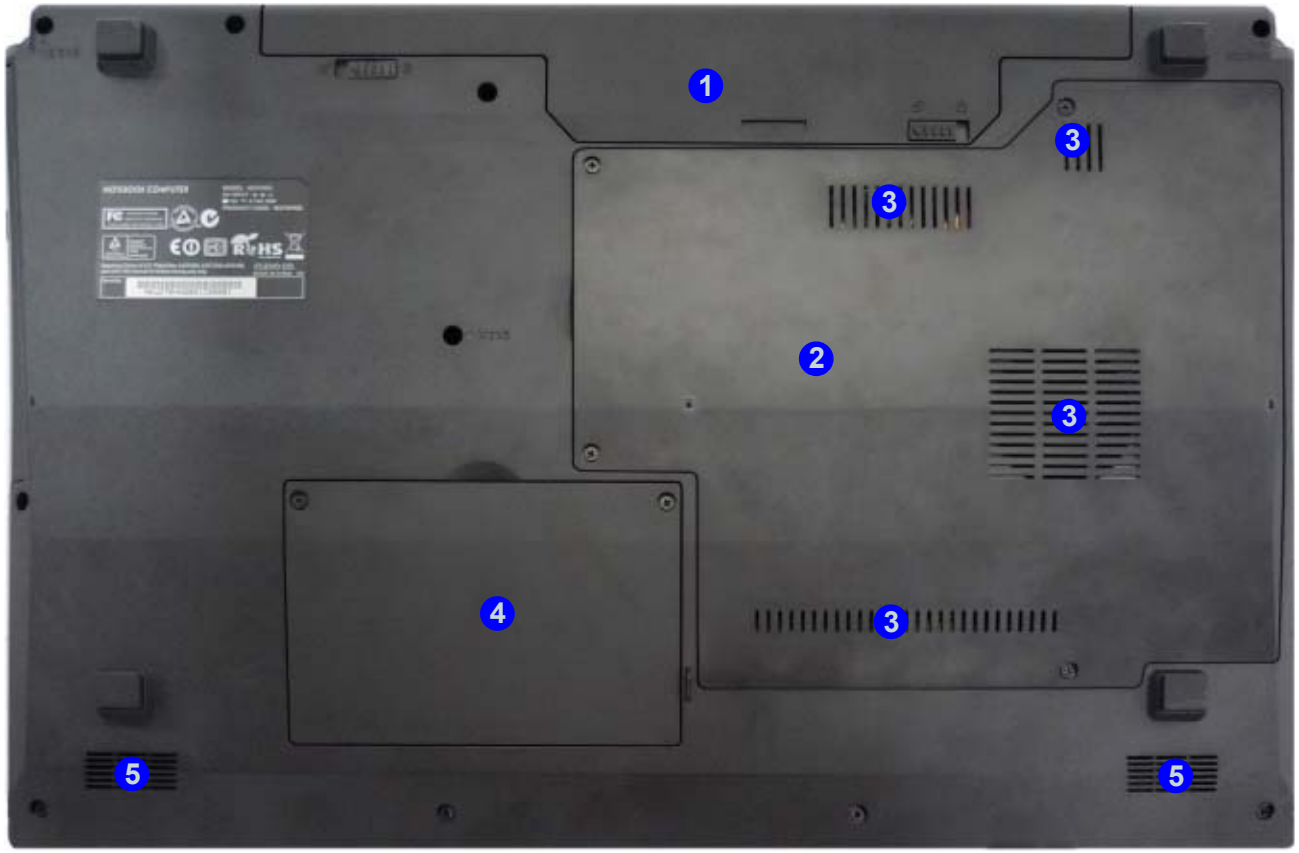
Figure 5
Rear View

1. Battery

External Locator - Bottom View

Figure 6
Bottom View

1. Battery
2. Component Bay Cover
3. Vent
4. Hard Disk Bay Cover
5. 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)

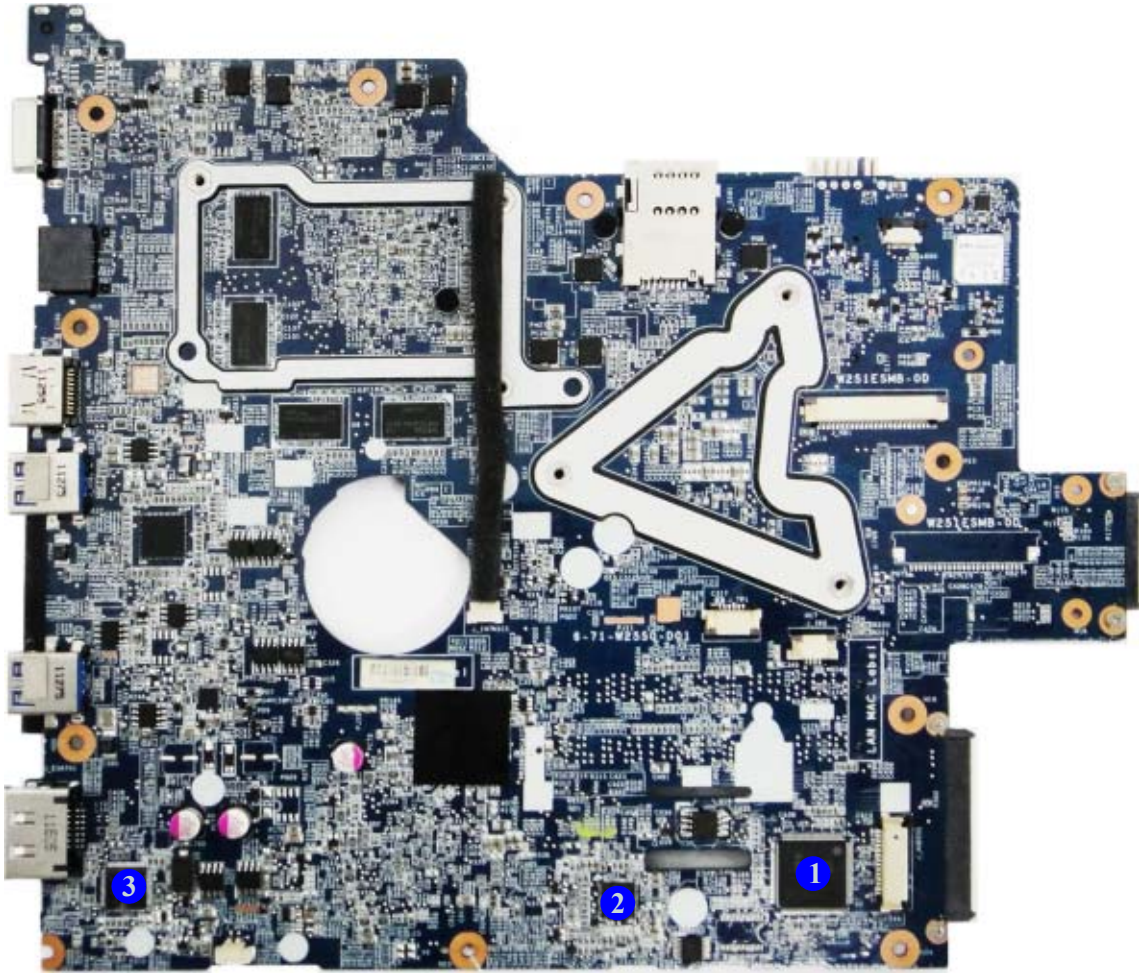


Figure 7
Mainboard Top Key Parts

1. KBC-ITE IT8518
2. VIA VT1802P
3. Realtek RTL8411

Mainboard Overview - Bottom (Key Parts)

Figure 8
Mainboard Bottom Key Parts

1. Memory Slots DDR3 SO-DIMM
2. CMOS Battery
3. Mini-Card Connector (WLAN Module)
4. CPU Socket (no CPU installed)
5. nVIDIA VGA
6. Platform Controller Hub

Mainboard Overview - Top (Connectors)

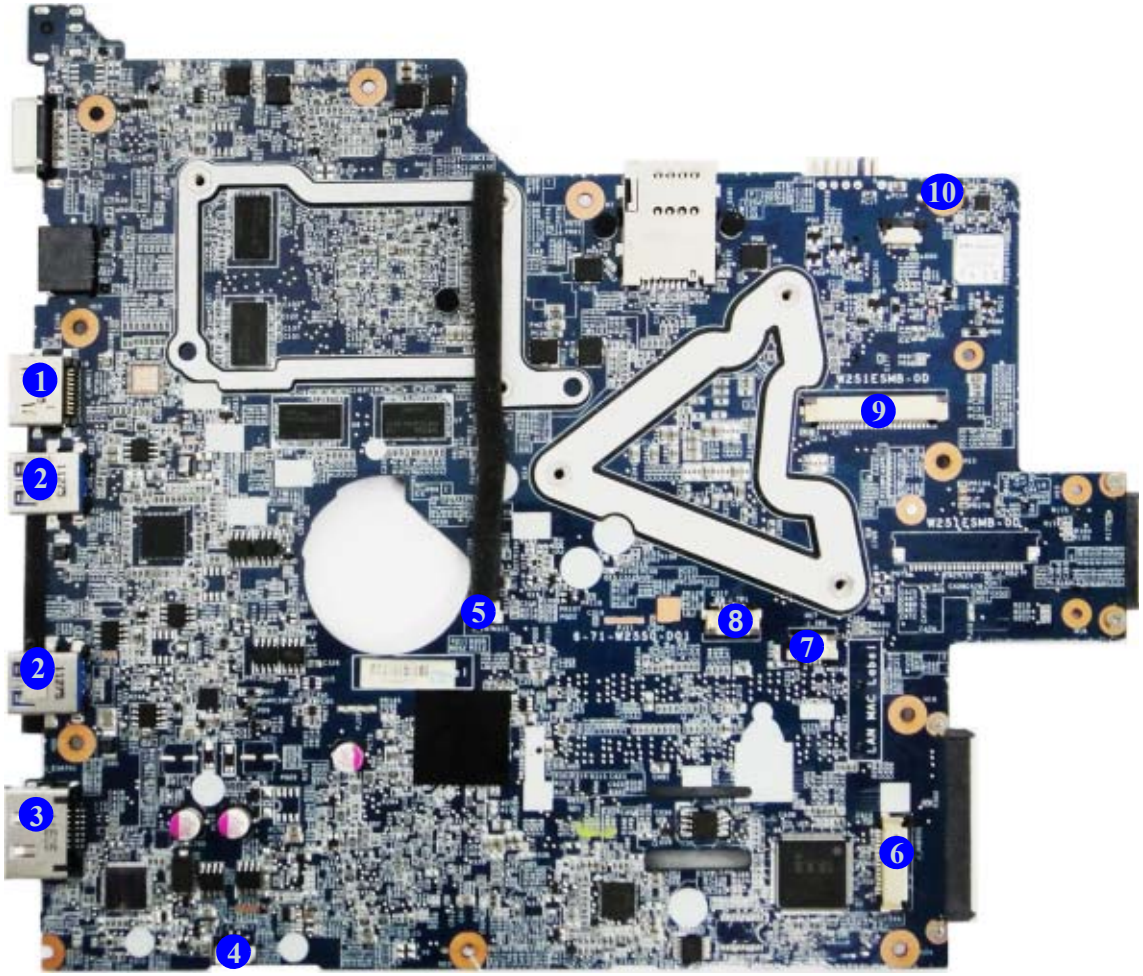


Figure 9
Mainboard Top Connectors

1. HDMI-Out Port
2. USB Port 3.0
3. eSATA Port
4. Speaker Cable Connector
5. Microphone Cable Connector
6. Audio Board Connector
7. TouchPad Cable Connector 1
8. TouchPad Cable Connector 2
9. Keyboard Cable Connector
10. Switch Board Cable Connector

Mainboard Overview - Bottom (Connectors)

Figure 10
Mainboard Bottom Connectors

1. ODD Connector
2. HDD Connector
3. CPU Fan Cable Connector
4. Multi-in-1 Card Reader
5. RJ-45 LAN Jack
6. External Monitor Port
7. DC-In Jack
8. CCD Cable Connector
9. LCD Cable Connector

Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the ***W270ENQ*** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

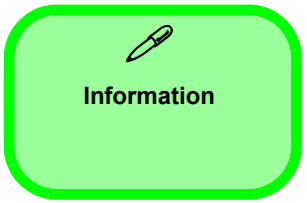
We suggest you completely review any procedure before you take the computer apart.

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). 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 Optical device *page 2 - 8*

To remove the System Memory:

1. Remove the battery *page 2 - 5*
2. Remove the system memory *page 2 - 9*

To remove and install a Processor:

1. Remove the battery *page 2 - 5*
2. Remove the processor *page 2 - 11*
3. Install the processor *page 2 - 13*

To remove the Wireless LAN Module:

1. Remove the battery *page 2 - 5*
2. Remove the WLAN module *page 2 - 14*

To remove the Keyboard:

1. Remove the battery *page 2 - 5*
2. Remove the keyboard *page 2 - 15*

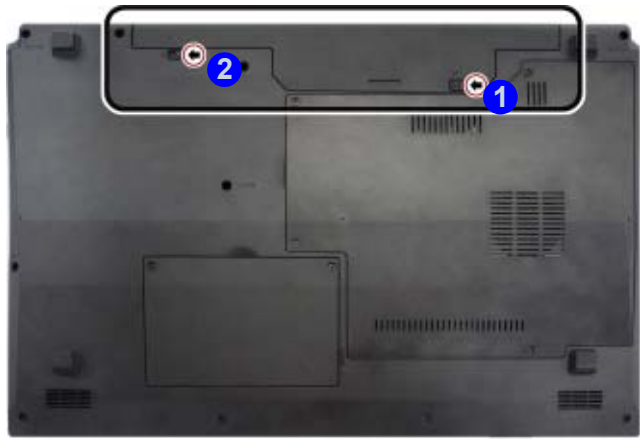
Removing the Battery

1. Turn the computer **off**, and turn it over.
2. Slide the latch 1 in the direction of the arrow (***Figure 1a***).
3. Slide the latch 2 in the direction of the arrow, and hold it in place (***Figure 1a***).
4. Slide the battery 3 in the direction of the arrow 4 (***Figure 1b***).

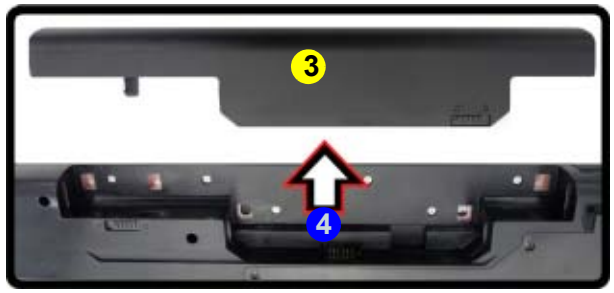
Figure 1
Battery Removal

a. Slide the latch and hold it in place.
b. Slide the battery in the direction of the arrow.

a.



b.



3. Battery

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 (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.

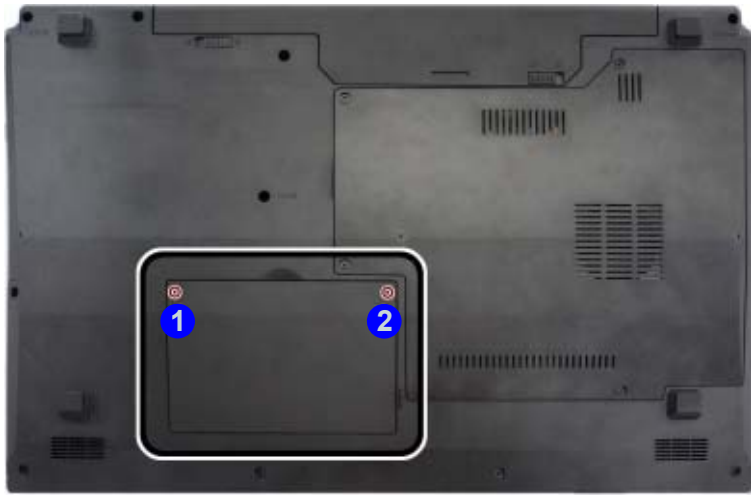
Figure 2
HDD Assembly Removal

a. Locate the HDD bay cover and remove the screws.

Hard Disk Upgrade Process

1. Turn **off** the computer, and remove the battery (***page 2 - 5***).
2. Locate the hard disk bay cover and remove screws 1 & 2 (***Figure 2a***).

a.



- 2 Screws

HDD System Warning

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

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

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

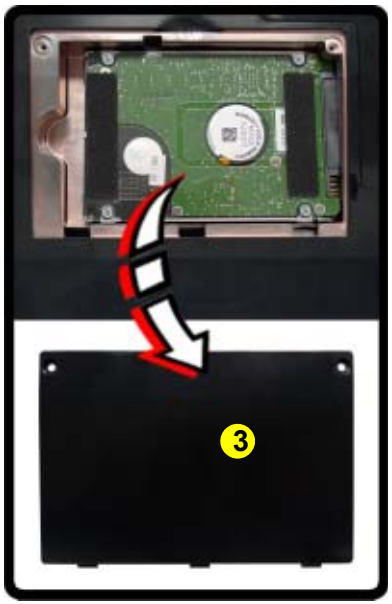
If you have access to the internet, download the latest application and hardware driver updates for the operating system you plan to install. Copy these to a removable medium.

3. Remove the hard disk bay cover 3 (*Figure 3b*).
4. Grip the tab and slide the hard disk in the direction of arrow 4 (*Figure 3c*).
5. Lift the hard disk assembly 5 out of the bay 6 (*Figure 3d*).
6. Remove the screw 7 - 10 and the mylar cover 11 from the hard disk 12 (*Figure 3e*).
7. Reverse the process to install a new hard disk (do not forget to replace all the screws and covers).

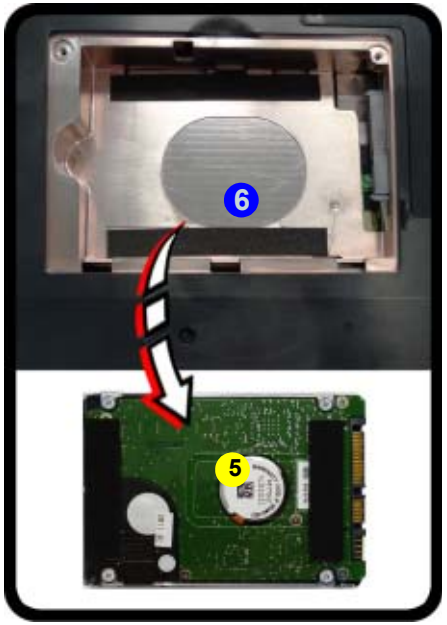
Figure 3
HDD Assembly Removal (cont'd.)

b. Remove the HDD bay cover.
c. Grip the tab and slide the HDD assembly in the direction of the arrow.
d. Lift the HDD assembly out of the bay.
e. Remove the screws and mylar cover.

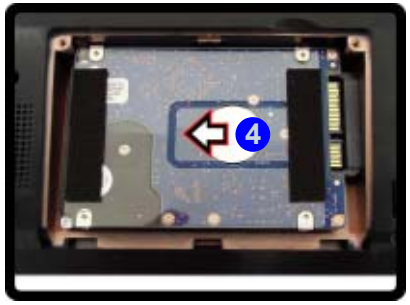
b.



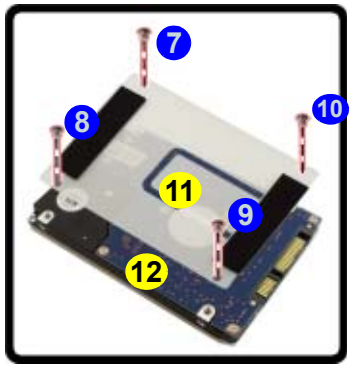
d.



c.



e.



3. HDD Bay Cover
5. HDD Assembly
11. Mylar Cover
12. HDD

- 4 Screws

Figure 4
Optical Device Removal

a. Remove the screw at point 1.
b. Use a screwdriver to carefully push out the optical device at point 2.

Removing the Optical (CD/DVD) Device

1. Turn **off** the computer, remove the battery (***page 2 - 5***) and hard disk (***page 2 - 6***).
2. Remove the screw at point 1 (***Figure 4a***).
3. Use a screwdriver to carefully push out the optical device 3 at point 2 (***Figure 4b***).
4. 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).
5. Replace the hard disk bay cover.
6. Restart the computer to allow it to automatically detect the new device.

a.

b.

3. Optical Device

- 1 Screw

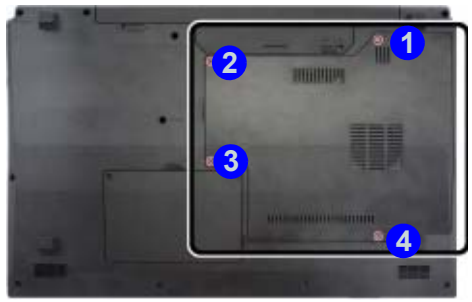
Removing the System Memory (RAM)

The computer has two memory sockets for 204 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDRIII (DDR3) Up to 1066/1333 MHz. The main memory can be expanded up to 8GB. The SO-DIMM modules supported are 1024MB and 2048MB **DDRIII** 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 and remove the battery (*page 2 - 5*).
2. Remove screws 1 - 4 from the component bay cover (*Figure 5a*).
3. Carefully (**a fan and cable are attached to the under side of the cover**) lift up the bay cover 5 .
4. Carefully disconnect the fan cable 6, and remove the cover 5 (*Figure 5b*).
5. The RAM modules will be visible at point 7 on the mainboard.

a.



b.

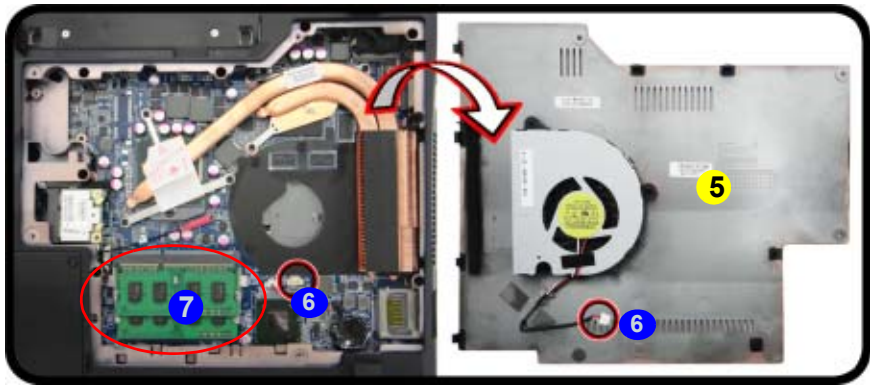


Figure 5
RAM Module Removal

a. Remove the screws from the component bay cover.
b. The RAM modules will be visible at point 5 on the mainboard.
c. Pull the release latches.
d. 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.

5. Component Bay Cover

- 4 Screws

Figure 6
RAM Module Removal (cont'd)

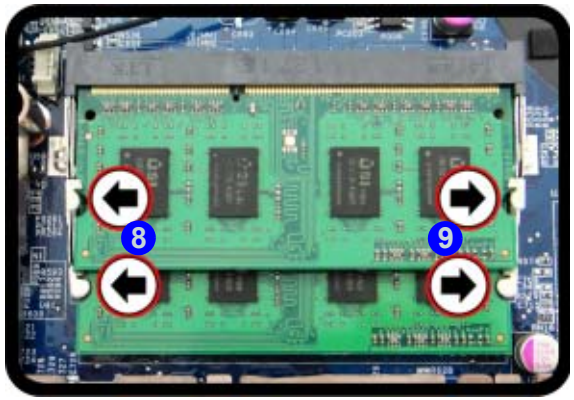
c. Pull the release latches.
d. Remove the module.
e. Replace bay cover.

6. Gently pull the two release latches (8 & 9) on the sides of the memory socket in the direction indicated by the arrows (***Figure 6c***). The RAM module 10 will pop-up (***Figure 6d***), and you can then remove it.
7. Pull the latches to release the second module if necessary.
8. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
9. 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.
10. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
11. Replace the bay cover (***Figure 6e***) and the screws (**make sure you reconnect the fan cable before screwing down the bay cover**).
12. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.

Contact Warning

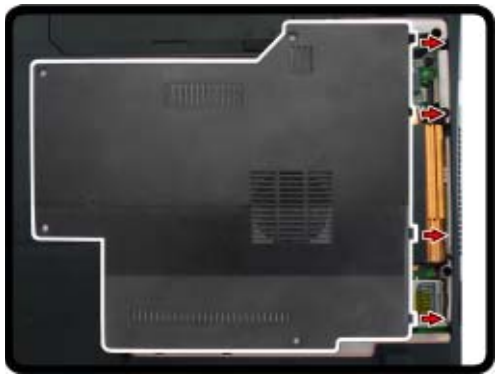
Be careful not to touch the metal pins on the module's connecting edge. Even the cleanest hands have oils which can attract particles, and degrade the module's performance.

c.



d.

e.



10. RAM

Cover Pins

Note that this computer model has **four** cover pins. These pins need to be aligned with slots in the case to insure a proper cover fit, before screwing down the bay cover.

Removing and Installing a Processor

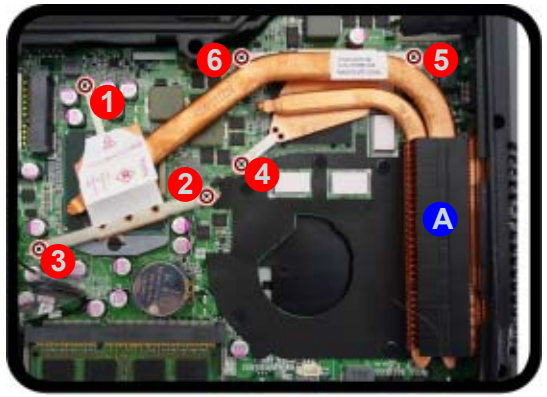
Processor Removal Procedure

1. Turn **off** the computer, turn it over, and remove the battery (*page 2 - 5*) and the component bay cover (*page 2 - 9*).
2. The CPU heat sink will be visible at point A (*Figure 7a*).
3. Loosen the CPU heat sink screws in the order 6, 5, 4, 3, 2 & 1 (the reverse order as indicated on the label *Figure 7a*).
4. Grip the heat sink tab and carefully lift the heat sink 7 up and off the computer (*Figure 7b*).

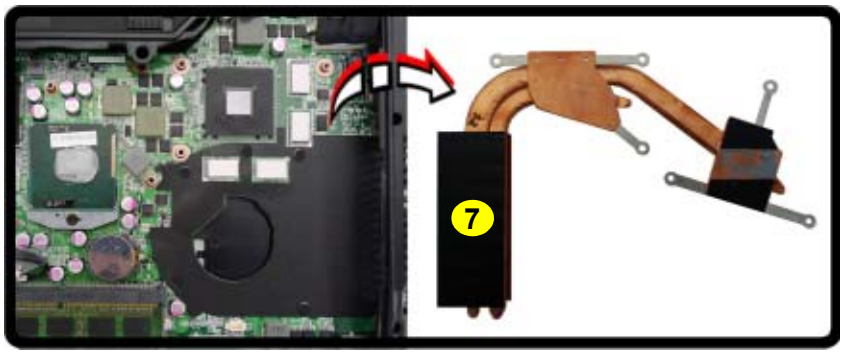
Figure 7
Processor Removal

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

a.



b.



7. Heat Sink

- 6 Screws

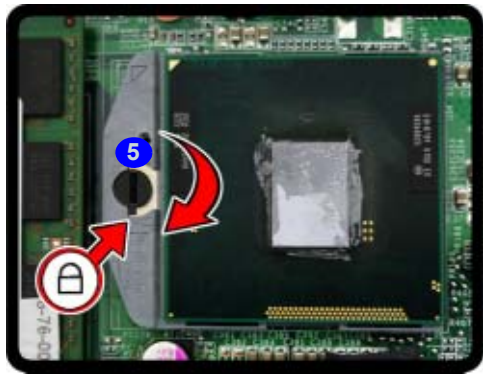
Figure 8
Processor Removal (cont'd)

c. Turn the release latch to unlock the CPU.
d. Lift the CPU out of the socket.

5. Turn the release latch 5 towards the unlock symbol to release the CPU (***Figure 8d***).
6. Carefully (it may be hot) lift the CPU 6 up and out of the socket (***Figure 8e***).
7. Reverse the process to install a new CPU.
8. When re-inserting the CPU, pay careful attention to the pin alignment, it will fit only one way (DO NOT FORCE IT!).

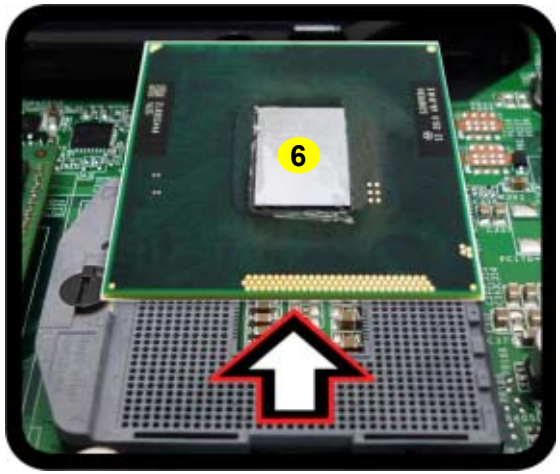
c.

Unlock



Lock

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.

6. CPU

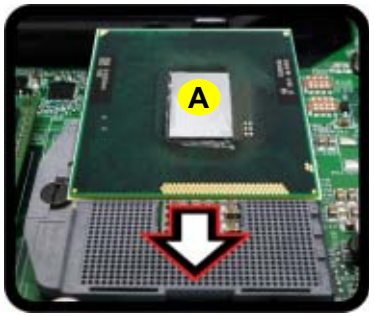
Processor Installation Procedure

1. Insert the CPU A (*Figure 9a*), pay careful attention to the pin alignment, it will fit only one way (DO NOT FORCE IT!), and turn the release latch B towards the lock symbol (*Figure 9b*).
2. **Remove the sticker** C (*Figure 9c*) from the heat sink.
3. Insert the heat sink D as indicated in *Figure 9d*.
4. Tighten the CPU heat sink screws in the order r 1, 2, 3, 4,, 5 & 3 (the order as indicated on the label and *Figure 9d*).
5. Replace the component bay cover (don't forget to replace the fan cable) and tighten the screws (*page 2 - 9*).

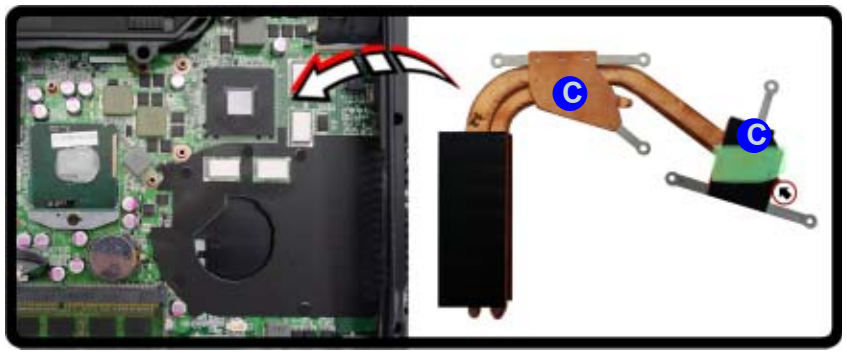
Figure 9
Processor Installation

a. Insert the CPU.
b. Turn the release latch towards the lock symbol.
c. Remove the sticker from the heat sink and insert the heat sink.
d. Tighten the screws.

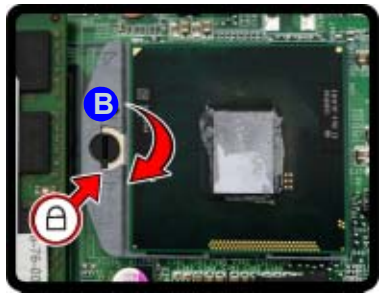
a.



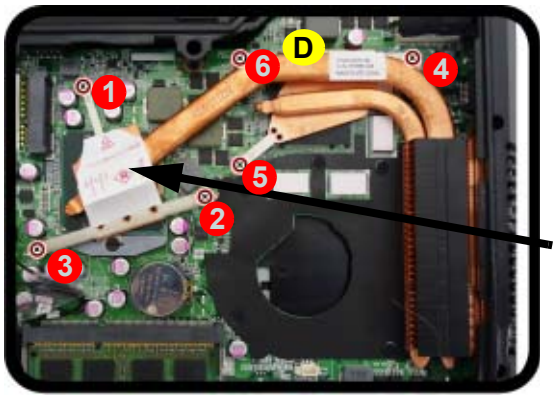
c.



b.



d.



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

A. CPU
D. Heat Sink

- 3 Screws

Removing the Wireless LAN Module

1. Turn **off** the computer, turn it over, and remove the battery (***page 2 - 5***) and the component bay cover (***page 2 - 9***).
2. The Wireless LAN module will be visible at point 1 on the mainboard (***Figure 10a***).
3. Carefully disconnect the cables 2 - 3, and then remove the screw 4 (***Figure 10b***).
4. The Wireless LAN module 4 (***Figure 10c***) will pop-up, and you can remove it from the computer.

Figure 10
Wireless LAN Module Removal

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

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

a.

c.

b.

4.Wireless LAN Module

- 2 Screw

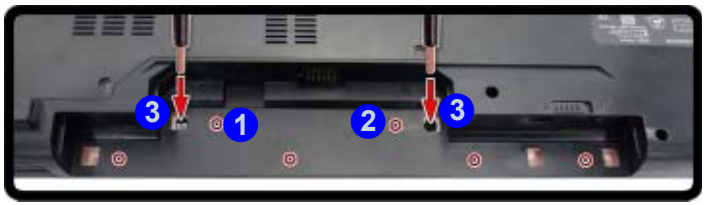
Removing the Keyboard

1. Turn **off** the computer, and remove the battery (*page 2 - 5*).
2. Remove screws 1 - 2 from the bottom of the computer (inside the battery compartment), and then press at point 3 to unsnap the LED cover module (use the eject pin tool provided to do this *Figure 11a*).
3. Turn the computer over, unsnap up the LED cover module 4 from the center of the computer (*Figure 11b*).
4. Remove screws 5 - 9 from the keyboard (*Figure 11c*).
5. Carefully lift the keyboard 10 up, being careful not to bend the keyboard ribbon cable 11. Disconnect the keyboard ribbon cable 11 from the locking collar socket 12 by using a flat-head screwdriver to pry the locking collar pins 13 away from the base (*Figure 11d*).
6. Carefully lift up the keyboard 10 (*Figure 11d*) off the computer.

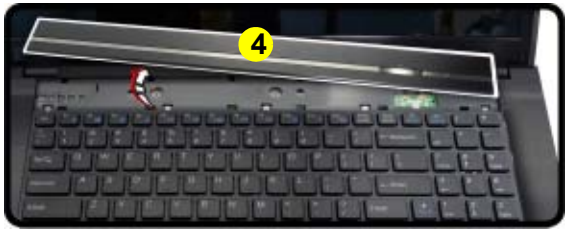
Figure 11
Keyboard Removal

a. Remove screws from the bottom of the computer.
b. Turn the computer over, unsnap up the LED cover module from the center of the computer.
c. Remove screws from the keyboard.
d. Carefully lift the keyboard up and disconnect the keyboard ribbon cable from the locking collar socket by using a flat-head screwdriver to pry the locking collar pins away from the base.
e. Remove the keyboard.

a.

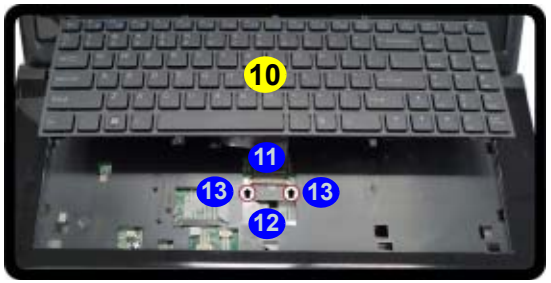


b.

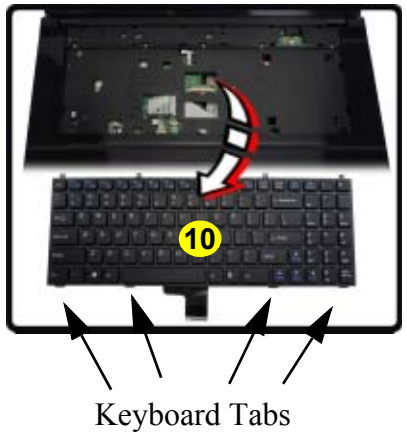


c.

d.



e.



Keyboard Tabs

Re-Inserting the Keyboard

When re-inserting the keyboard firstly align the **four** keyboard tabs at the bottom (*Figure 11e*) at the bottom of the keyboard with the slots in the case.

4. LED Cover Module
10. Keyboard

- 7 Screws

Appendix A:Part Lists

This appendix breaks down the ***W270ENQ*** 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.

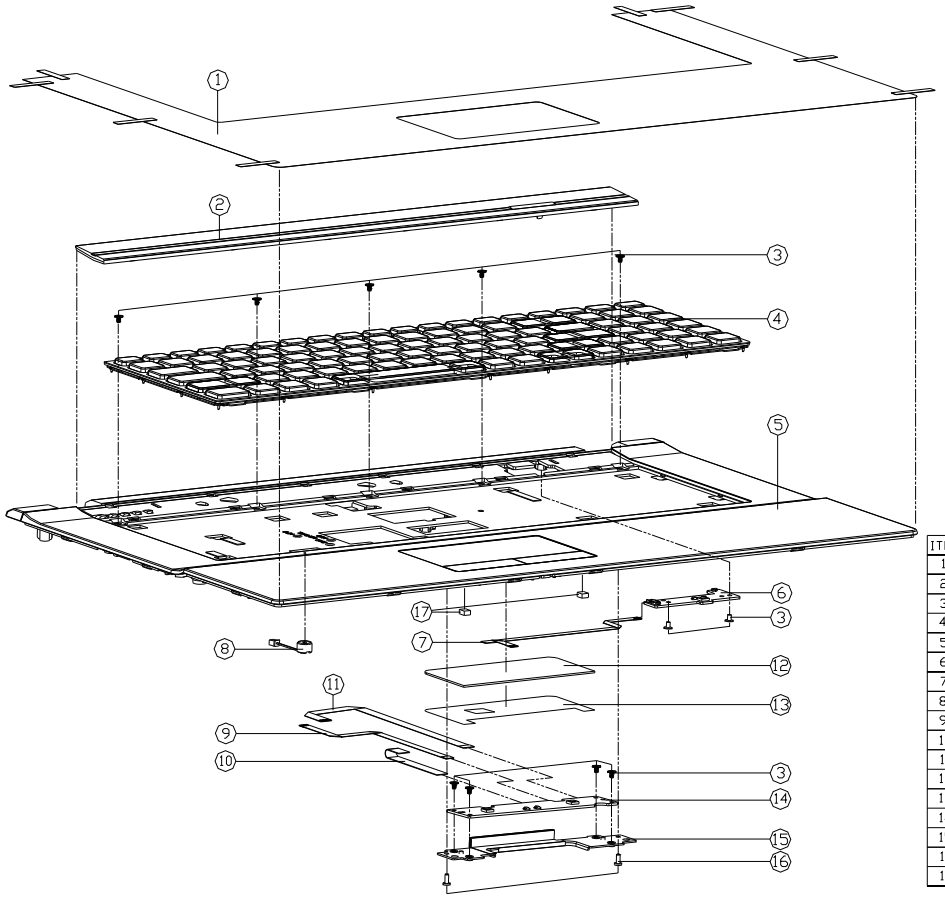
Part List Illustration Location

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

Table A - 1
Part List Illustration Location

Part	W270ENQ
Top	*page A - 3*
Bottom	*page A - 4*
SATA BLU RAY COMBO	*page A - 5*
DVD Dual Drive	*page A - 6*
LCD	*page A - 7*

Top

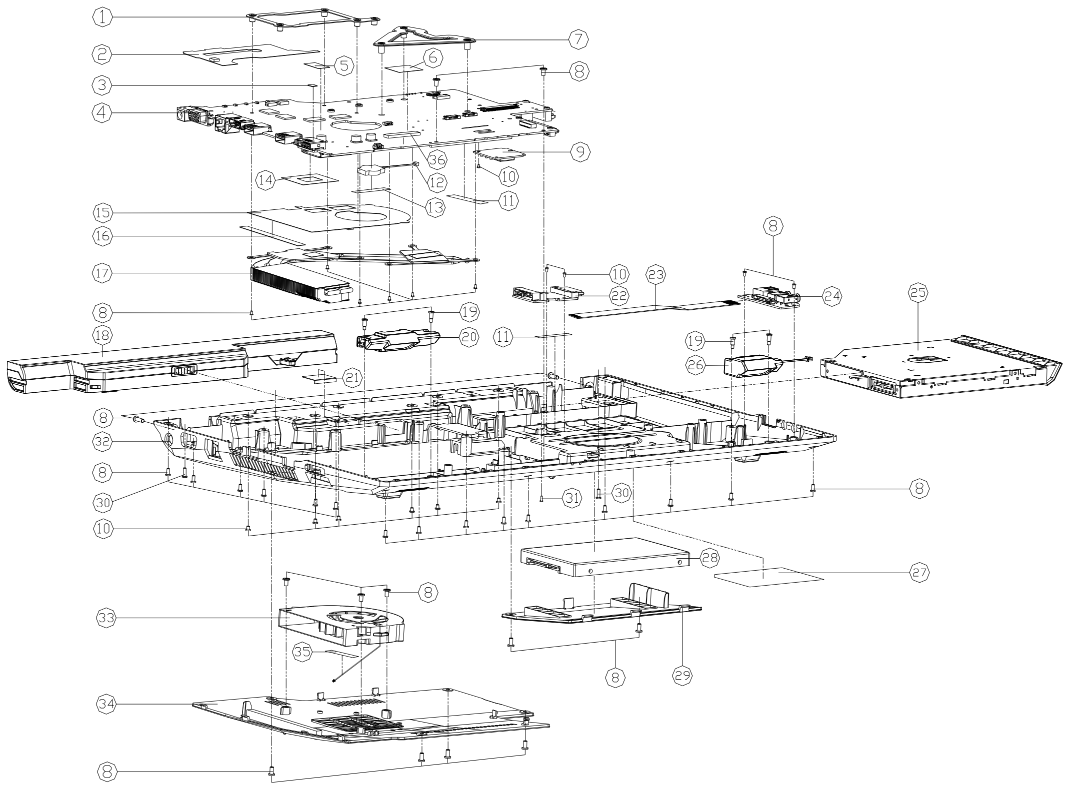


ITEM	PART NAME	PART NO	REMARK
1	PALM REST PROTECT MYLAR (8835) W270HUQ	6-40-W27H8-011	
2	KB COVER MODULE W270HUQ	6-42-W27H8-102	
3	SCREW M2*3L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-3RE	
4	K/B USA(BLACK)& FRAME(US) MODULE W270HUQ	6-79-W270HUQK-010	
5	TOP CASE MODULE(CHANGE) W270HUQ	6-39-W27H2-014	
6	POWER SWITCH BOARD V1.0A W270HPQ	6-77-W25PS-D11A-A	
7	FFC CABLE 8PIN FOR M/B TO POWER BOARD (HB) W270HUQ	6-43-W27H0-041-2	
8	MC CABLE(灰色)	6-23-EM54G-012-2	
9	FFC CABLE 6PIN FOR M/B TO CLICK BOARD (HB) W270HNQ	6-43-W27N0-011-2	
10	FFC CABLE FOR TOUCH PAD 6PIN C4500	6-43-C4502-010-2	
11	FFC CABLE 4PIN FOR M/B TO CLICK BOARD (HB) W270SUQ	6-43-W27S0-010-1	
12	TOUCH PAD ELAN SB4Z9-6103 MULTI-FINGER GESTURE W251HPQ	6-49-W25A2-011	
13	TAPE MYLAR (C) (86*38.80MM) C4105	6-40-00150-861	
14	CLICK BOARD V2.0A W251HPQ	6-77-W25P2-D02A	
15	TP BRACKET MODULE (SECC 0.8T) W270HUQ	6-33-W27H2-101	
16	SCREW M2*5L KICT=0.8 D=4.0) BK/Z ICT NY	6-35-B6120-5R0	
17	SPONGE (5*5*6TMM) FOR W270BAQ	6-47-0019A-051	

Figure A - 1
Top

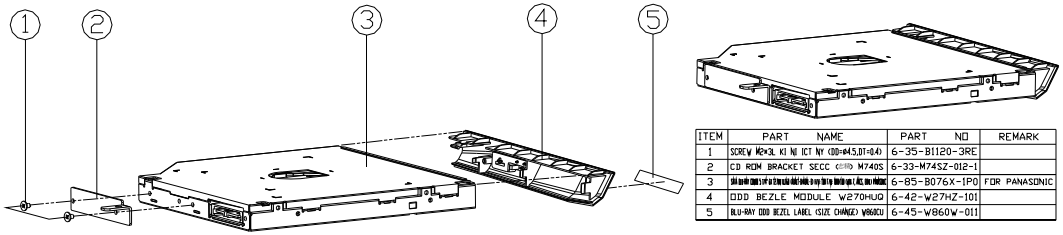
Bottom

Figure A - 2
Bottom



ITEM	PART NAME	PART NO	REMARK
1	VGA SUPPORTER SECC W270ESQ	6-33-W27SS-010	
2	MB MYLAR MODULE(FR83+5011N+RUBBER) W251HPQ	6-40-W25PS-200	
3	GASKET (8*8*2) FOR DC JACK TP80V	6-47-00190-08E	
4	MAIN BOARD V2.0 (W/O 3G)(HM76)(VRAM 2G) W270ENQ-2	6-77-W27S0-DN2-3	
4	MAIN BOARD V2.0 (W/O 3G)(HM76)(W/O TI) W270ENQ	6-77-W27S0-DN2-1	
4	MAIN BOARD V2.0 (W/O 3G)(HM76)(W/O TI) W270ESQ	6-77-W27S0-D02-3	
4	MAIN BOARD V1.0 (W/O 3G) (GE2) W270EPQ	6-77-W27S0-D01-3P	
4	MAIN BOARD V1.0A (W/O 3G) W270HSQ	6-77-W27S0-DH1A-1	
5	MYLAR KB BRIDGE BD PET W270HUQ	6-40-W27HZ-010	
6	AUDIO BOARD MYLAR 20*20*0.15T (PET+3M 467) C4500	6-40-C450S-030	
7	CPU SUPPORT BRACKET SECC W251HPQ	6-33-W25PS-013	
8	SCREW M2.5*5L KI BK/Z ICT NY	6-35-B6125-5RA	
9	WLAN+BT COMBO LITEON WCBN610LH-CC 802.11BGN 1X1 (PCI-E) +BT4.0 LE (USB) +REALTEK BT SOFTWARE HALF MINI-CARD	6-88-W345F-9400	(OPTION)
9	WLAN LITEON WN6606LH-CC(VL) RTL8188CE-VL 2 ANT. 802.11BGN 1X1 HALF MINI-CARD PCI-E W250HUQ	6-88-W25H2-9400	(OPTION)
9	WLAN+BT COMBO CASTLENET RTL8188CEBT-GP951 802.11BGN 1X1+BT3.0 HS HALF MINI-CARD PIN9 AND PIN51 (RTL8188CE-BT) C555	6-88-C555F-5300	(OPTION)
9	WLAN AZUREWAVE AW-NE104H 802.11BGN HALF MINI-CARD PCI-E RTL8191SE R30 DELETE W760C	6-88-W76C2-7001	(OPTION)
9	WLAN+BT COMBO AZUREWAVE AW-NB037H 802.11BGN 1X1+BT3.0 HS HALF MINI-CARD PIN9 AND PIN51(RTL8188CE-BT) C555	6-88-C555F-7001	(OPTION)
9	WLAN 802.11 BGN RTL8192CE CASTLENET RTL8192CE 2X2 HALF MINI-CARD PCI-E	6-88-W1102-5300	(OPTION)
9	WLAN 802.11 BGN WN6608LH-CC LITEON RTL8192CE 2X2 HALF MINI-CARD PCI-E VIDER	6-88-W1102-9400	(OPTION)
9	WLAN+BT COMBO INTEL WIRELESS-N 2230 JACKSON PEAK 1 2230BNHMW 2X2 BGN+BT 4.0 LE HALF MINI-CARD PCI-E PUMA	6-88-P17EF-4200	(OPTION)
9	WLAN+BT COMBO INTEL ADVANCED-N 6235 JACKSON PEAK 2 6235ANHMW 2X2 AGN+BT 4.0 LE HALF MINI-CARD PCI-E	6-88-W25SF-4200	(OPTION)
9	WLAN INTEL 6300AN_HMW NON 802.11AGN HALF MINI-CARD PCI-E 3X3 PUMA PEAK (WIFI LINK 6300)	6-88-M77C2-4220	(OPTION)
10	SCREW M2*3L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-3RE	
11	TAPE MYLAR (B),MYLAR M550J	6-40-M55J2-020	
12	BAT. 20MM 3V 220MAH W/CABLE 55MM BCR2032W5.5KMIGB	6-23-22015-TC0	
13	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
14	VGA CHIP MYLAR(30*30) NB9P-GE2 M860TU	6-40-M860S-091	
15	MYLAR MB FAN MODULE(FR83+5011N+RUBBER) W251HPQ	6-40-W25PS-400	
16	RUBBER (81*10*0.5) SILICON FOR MB BOTTOM W251HPQ	6-47-0019A-807	
17	CPU&VGA HEATSINK MODULE (AL FIN) W270ESQ	6-31-W27SN-101	
18	BAT.P S LI 11.1V/4.4AH/48.84WH 3S2P SMP/LISHEN PSE 980T2056F W244EUQ	6-87-W24ES-4W4	(OPTION)
18	BAT.P S LI 11.1V/5.6AH/62.16WH 3S2P SMP/SDI 980T2033F E4120	6-87-E412S-4D7A	(OPTION)
18	BAT.P S LI 11.1V/4.4AH/48.84WH 3S2P MITAC/LISHEN PSE 541382960004 W244EUQ	6-87-C480S-4G4B	(OPTION)
19	SCREW M2*6.2L NI ICT NY FOR SPEAKER	6-35-Z1120-6R2	
20	SPK+CABLE (L) 14*62 2W 4? 15MM LT25I231XX -L (IVY) W251HPQ	6-23-5W25P-020-2	
21	SIM CARD MYLAR (19.54*19.4*0.35) L19.54* W19.4 *T0.35 W270HUQ	6-40-W27H3-020	
22	BRIDGE ODD BOARD V1.0A W270HPQ	6-77-W25PN-D01A-A	
23	(ONLY FOR BLUE PCB)FFC CABLE 14P M/B TO AUDIO BOARD W270BUQ(HB)	6-43-W27B0-010-1	
24	AUDIO BOARD V2.0B W251ESQ	6-77-W25P8-D02B-A	
25	SATA BLU-RAY COMBO ASS'Y (OPTION)	6-79-W270ESQW-010	
25	SATA DVD SUPER MULTI ASS'Y (OPTION)	6-79-W270ESQQ-000	
25	W/O ODD ASS'Y W270HUQ (OPTION)	6-79-W270HUQZ-000	
25	SATA BLU-RAY COMBO ASS'Y W270ENQ (OPTION)	6-79-W270ENQW-010	
26	SPK+CABLE (R) 34*66 2W 4? 25MM LT25I231XX -R (IVY) W251HPQ	6-23-5W25P-010-2	
27	PRODUCT LABEL FOR W270ENQ-2	6-45-W270ENQ2-010	
27	PRODUCT LABEL FOR W270ENQ	6-45-W270ENQ3-010	
27	PRODUCT LABEL FOR W270ESQ(CHANGE GLUE)	6-45-W270ESQ3-012	
27	PRODUCT LABEL FOR W270EPQ	6-45-W270EPQ3-010	
27	PRODUCT LABEL FOR W270HSQ	6-45-W270HSQ3-010	
28	W/HDD ASS'Y E5120Q	6-79-E5120Q0J-020	
28	W/O HDD ASS'Y E5120Q	6-79-E5120Q0J-010	
28	W/O HDD ASS'Y C4800	6-79-C480000J-010	
29	HDD COVER PC+ABS W270HUQ	6-42-W27HJ-011	
30	SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
31	SCREW M2*5L KI(T=0.8 D=4.0) BK/Z ICT NY	6-35-B6120-5R0	
32	BOTTOM CASE MODULE ASS'Y W270HUQ	6-39-W27H3-013	
33	FAN+CON. 70*77.5*12.5MM 5V 0.4A 0FAJ000009 3700RPM FORCECON W150HRN	6-23-AW15H-010	
34	CPU COVER MODULE W270HNQ	6-42-W27N3-101	
35	TAPE MYLAR (A),MYLAR M550J	6-40-M55J2-010	
36	RUBBER (L23*W5*H6.6) W270ESQ	6-47-W27S2-010	

SATA BLU RAY COMBO

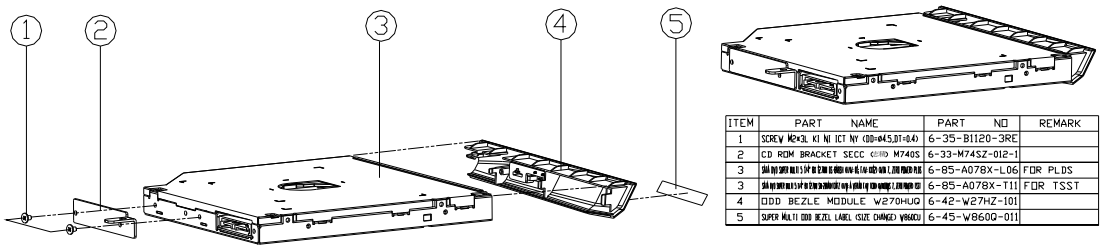


ITEM	PART NAME	PART NO	REMARK
1	SCREW M2×3L KI NI ICT NY (OD=Φ4.5,DT=0.4)	6-35-B1120-3RE	
2	CD ROM BRACKET SECC ODD M740S	6-33-M74SZ-012-1	
3	[illegible]	6-85-B076X-1P0	FOR PANASONIC
4	ODD BEZLE MODULE W270HUQ	6-42-W27HZ-101	
5	BLU-RAY ODD BEZEL LABEL (SIZE CHANGE) W860U	6-45-W860W-011	

Figure A - 3
SATA BLU RAY COMBO

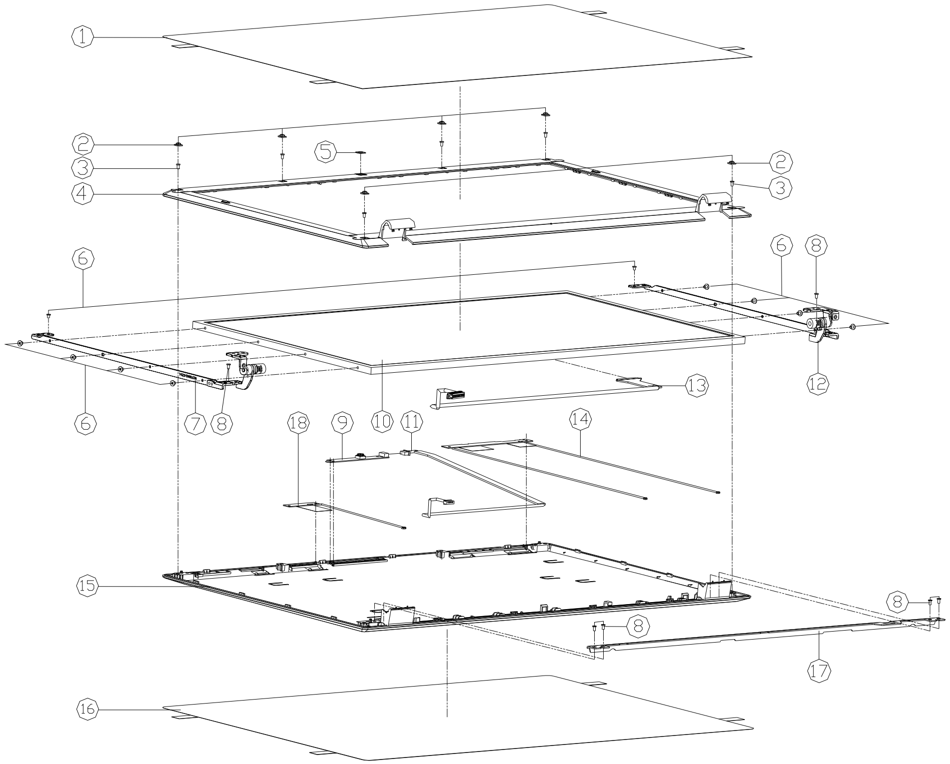
DVD DUAL

Figure A - 4
DVD DUAL



ITEM	PART NAME	PART NO	REMARK
1	SCREW M2*3L KI NI ICT NY (OD=Ø4.5,DT=0.4)	6-35-B1120-3RE	
2	CD ROM BRACKET SECC [illegible] M740S	6-33-M74SZ-012-1	
3	[illegible]	6-85-A078X-L06	FOR PLDS
3	[illegible]	6-85-A078X-T11	FOR TSST
4	ODD BEZLE MODULE W270HUQ	6-42-W27HZ-101	
5	SUPER Multi ODD BEZEL LABEL (SIZE CHANGE) W860DU	6-45-W860Q-011	

LCD



ITEM	PART NAME	PART NO	REMARK
1	LCD FRONT CASE PROTECT MYLAR PET B7110	6-40-B7118-012	
2	LCD COVER SCREW RUBBER SLICON W270HUQ	6-47-W27H8-020	
3	SCREW M2.5*5L KI BK/Z ICT NY	6-35-B6125-5RA	
4	LCD FRONT COVER MODULE (CHANGE) W270HUQ	6-39-W27H1-012	
5	CCD LENS PMMA W270HUQ	6-40-W27H1-060	
5	W/O CCD LENS PMMA W270HUQ	6-40-W27H1-070	
6	SCREW M2*3L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-3RE	
7	LCD HINGE L K7 W270HUQ	6-33-W27H1-021	
8	SCREW M2*5L KI(T=0.8 D=4.0) BK/Z ICT NY	6-35-B6120-5R0	
9	UVC CAMERA BISON FIX BN28M6YG5-300 1.3M HYNIX161 W251CUQ FW0607	6-88-W25CC-4900	OPTION
9	UVC CAMERA CHICONY FIX CNFA1A9 1.3M HIMAX HM1355 W258HUQ-C	6-88-W25UC-5100	OPTION
9	UVC CAMERA BISON FIX BN28M6SG3-320 1.3M 6AA W246HUQ	6-88-E51QC-4904	OPTION
9	UVC CAMERA BISON FIX BN28M6SG3-300 1.3M 6AA W258HUQ-C	6-88-E51QC-4902	OPTION
9	UVC CAMERA BISON FIX BN28U5XK1-000 2M HIMAX2050 P150HM	6-88-X510C-4900	OPTION
9	UVC CAMERA BISON FIX BN28V9VG2-000_V1.0 OV7675 300K M1100	6-88-W150C-5100	OPTION
10	LCD 17.3" FHD CHIMEI N173HGE-L21 (GLARE TYPE) (LED) 6.0 MM	6-50-NB260-D00	
10	LCD 17.3" FHD CHIMEI N173HGE-L11 (LED) 6.0 MM	6-50-NB260-D01	
10	LCD 17.3" HD+ AU B173RW01 V2 H/W:5A (LED) 5.8MM	6-50-NA158-G00	
10	LCD 17.3" HD+ CHIMEI N173O6-L02 (GLARE TYPE) (LED) 5.8MM	6-50-NA158-D00	
10	LCD 17.3" HD+ LG LP173WD1-TLD3 (LED) 6.0 MM	6-50-NA160-L02	
10	LCD 17.3" FHD HANNSTAR HSD173PUW1-A GLARE TYPE (LED) 5.8 MM	6-50-NB258-N00	
10	LCD 17.3" FHD LG LP173WF1-TLC1 (GLARE TYPE) (LED) 6.0MM	6-50-NB260-L00	
10	LCD 17.3" HD+ LG LP173WD1-TLP3 (LED) (40/60HZ) 6.0 MM	6-50-NA160-L07	
11	WIRE CABLE FOR CCD 5P 436MM (HL) FOR W270HUQ	6-43-W27HT-010	
12	LCD HINGE R K7 W270HUQ	6-33-W27H1-011	
13	WIRE CABLE FOR LVDS 335MM (FVC/ACES CON50384-04023-002) W270HPQ	6-43-W27P1-010-E	
14	ANTENNA WIMAX COMBO FVC WM1+WM2 PCB H:0.6MM 2.4G/3.5GHZ/5G WM1=640mm WM2=640mm W250HPQ	6-23-7W25P-020	
15	LCD BACK COVER MODULE W270HUQ	6-39-W27H1-021	
16	BACK COVER PROTECT MYLAR (PET+3M8915) W270HUQ	6-40-W27H1-041	
17	LCD SUPPORT SECC W270HUQ	6-33-W27H1-031	
18	ANTENNA WIMAX FVC WM-3PCB 2.4G/3.5GHZ/5G WM3= 750MM B7100	6-23-7B710-031	FOR W270HNQ/HPQ
18	ANTENNA WIMAX FVC WM3 PCB 2.4G/3.5GHZ/5G WM3= 750MM W270HPQ	6-23-7W27P-010	FOR W270ESQ/ENQ

Figure A - 5
LCD

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the ***W270ENQ*** notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

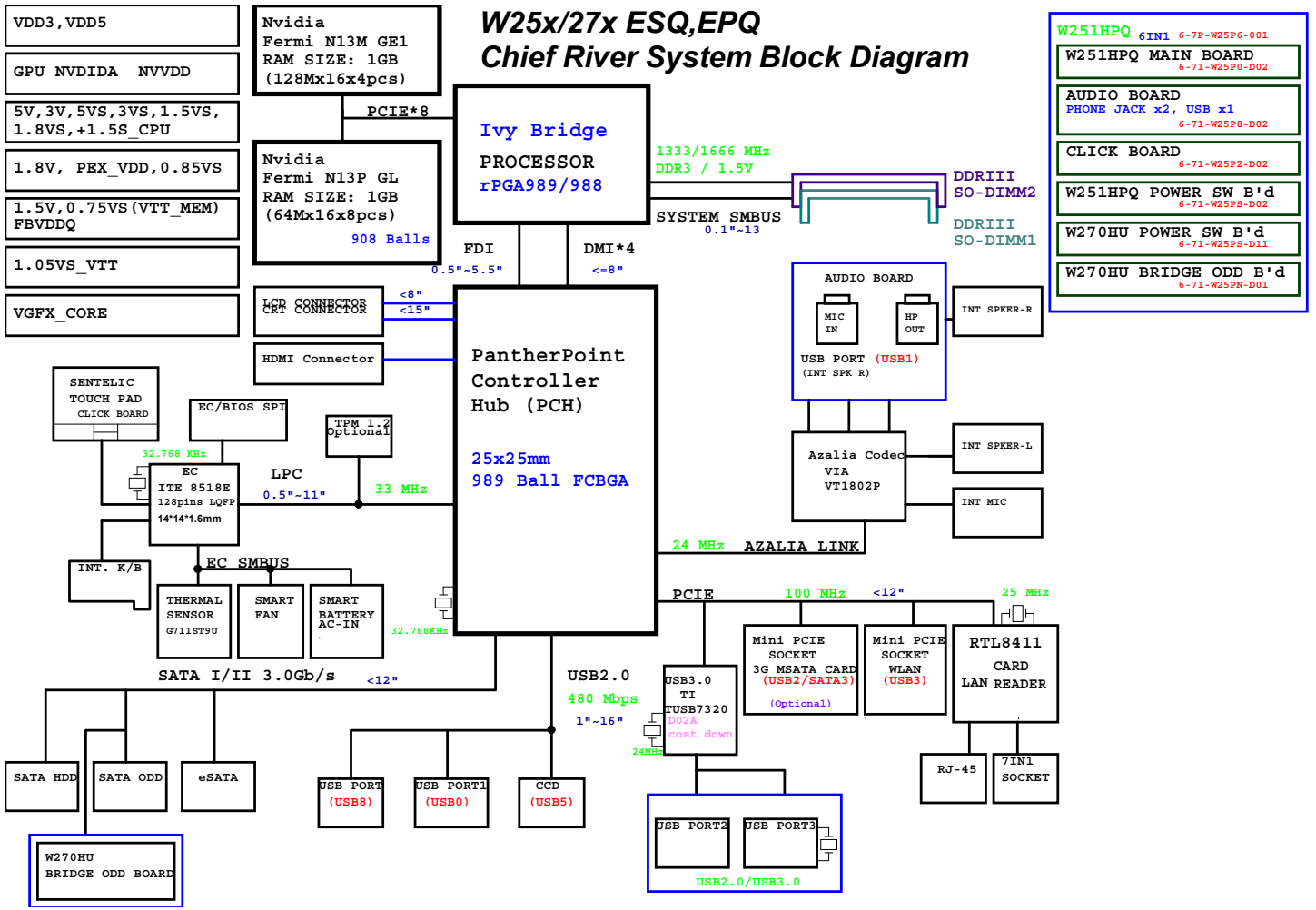
Table B - 1
SCHEMATIC DIAGRAMS

Version Note

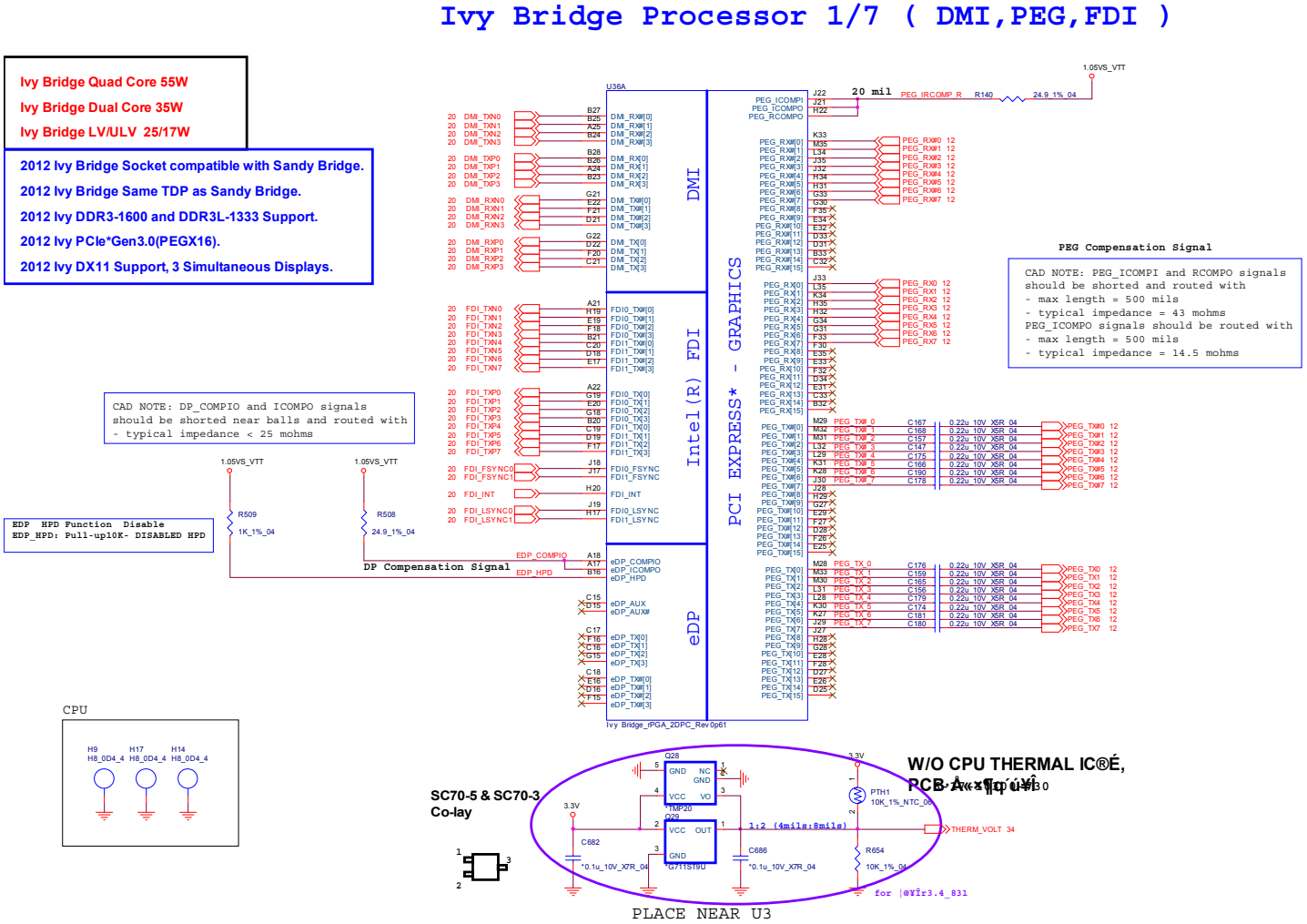
The schematic diagrams in this chapter are based upon version 6-7P-W25S6-003. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

System Block Diagram

Sheet 1 of 50
System Block Diagram



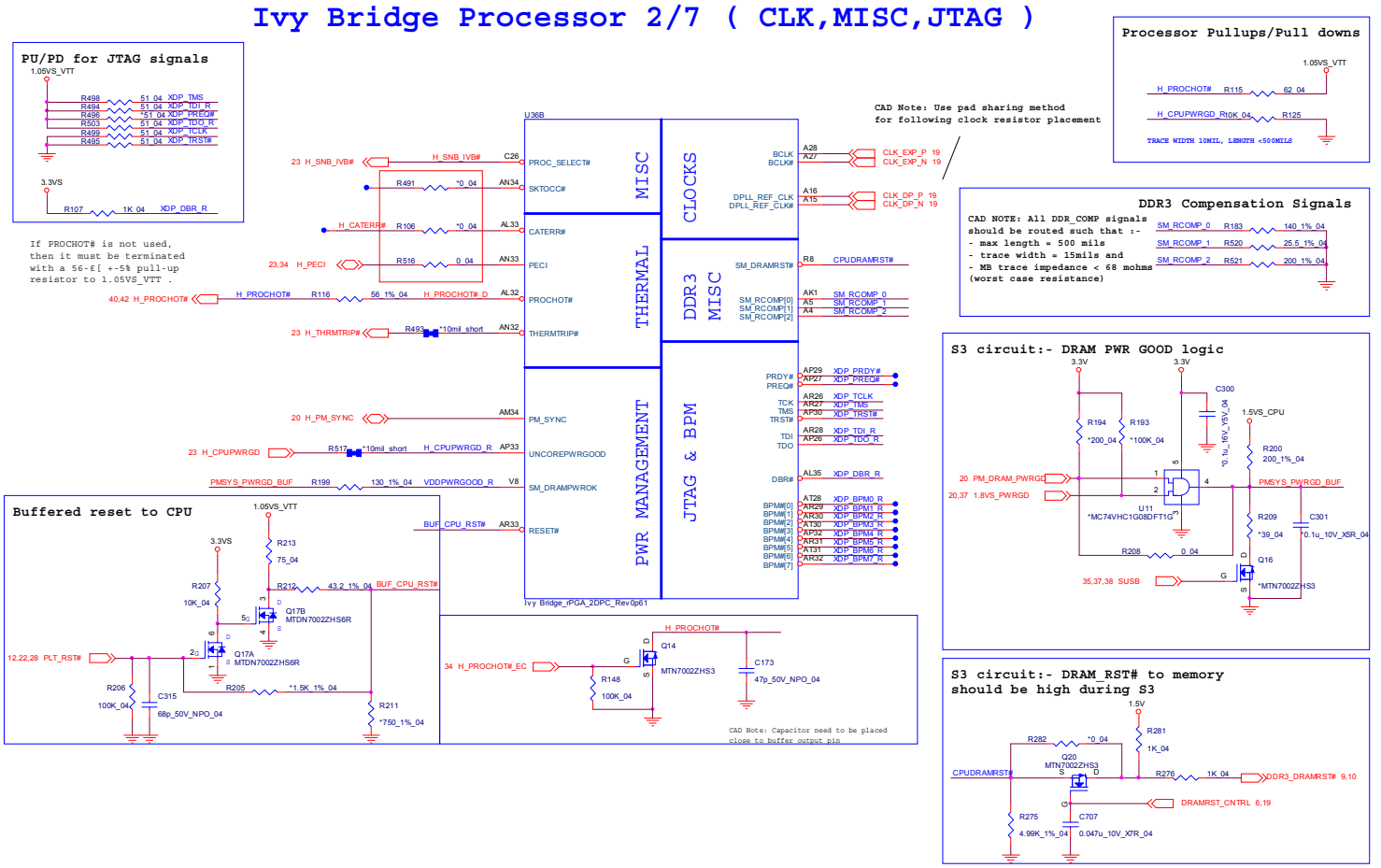
Processor 1/7-DMI, FDI, PEG



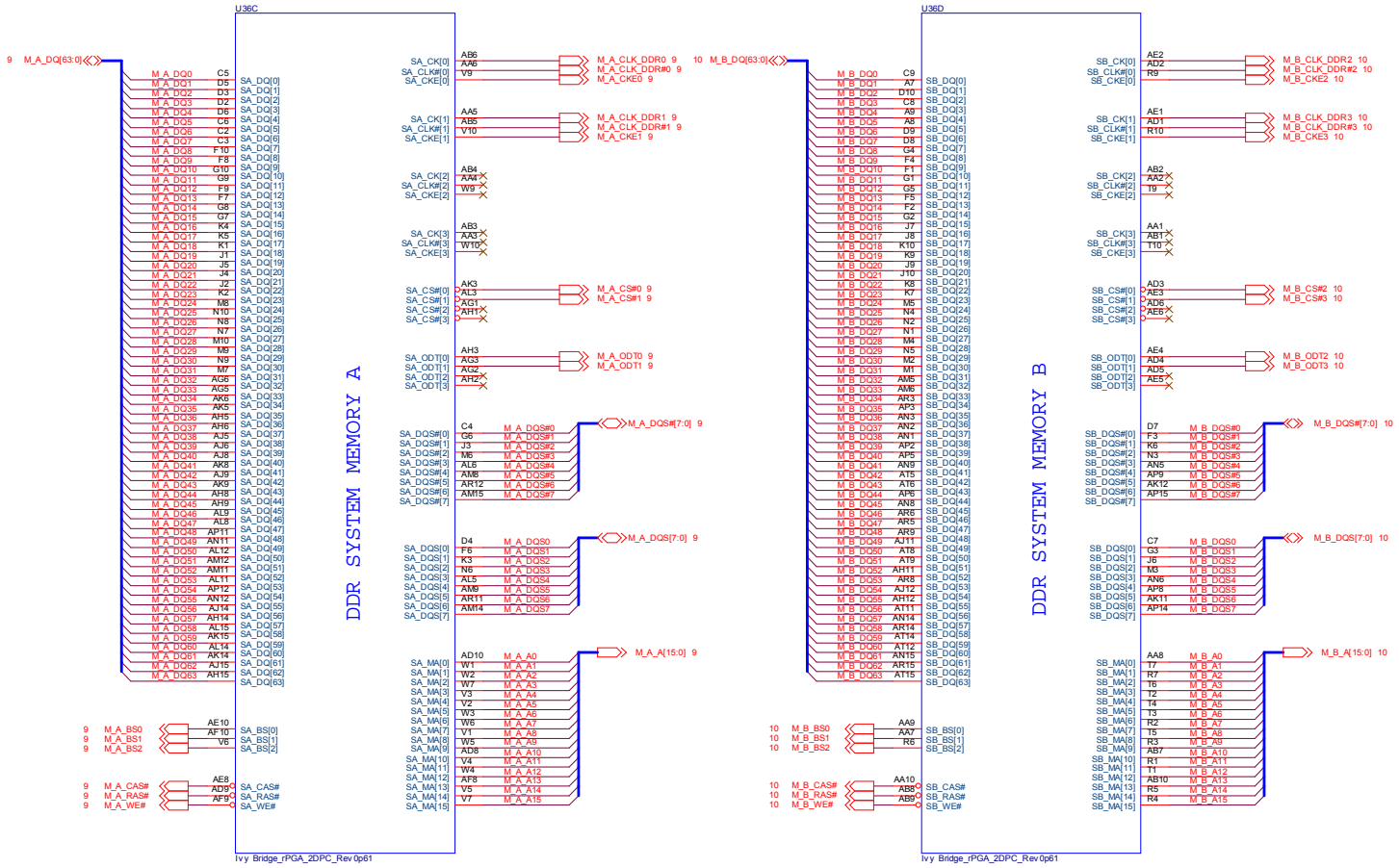
Sheet 2 of 50
Processor 1/7-DMI, FDI, PEG

Processor 2/7- CLK, MISC

Sheet 3 of 50
Processor 2/7-CLK, MISC



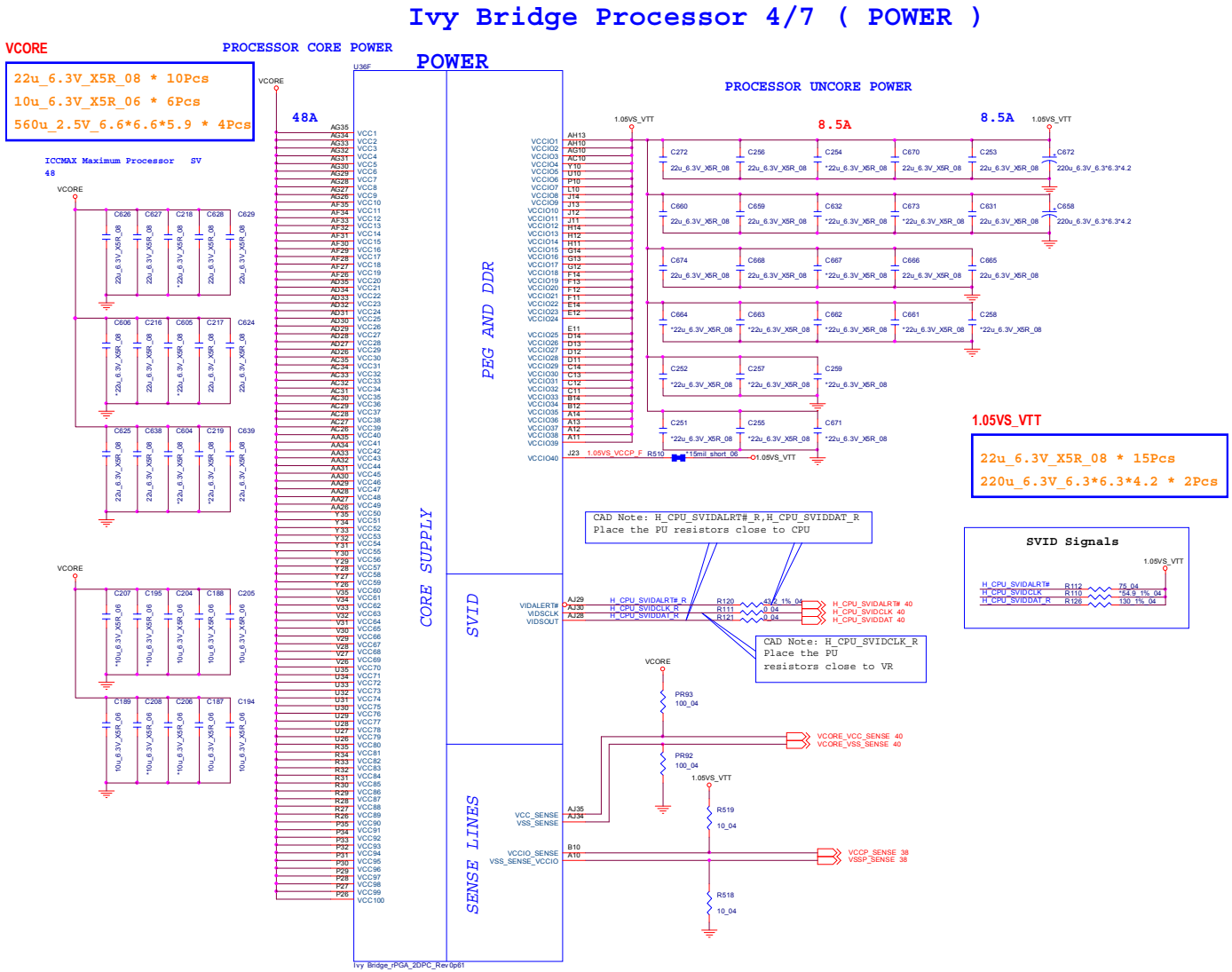
Processor 3/7- (DDR3)



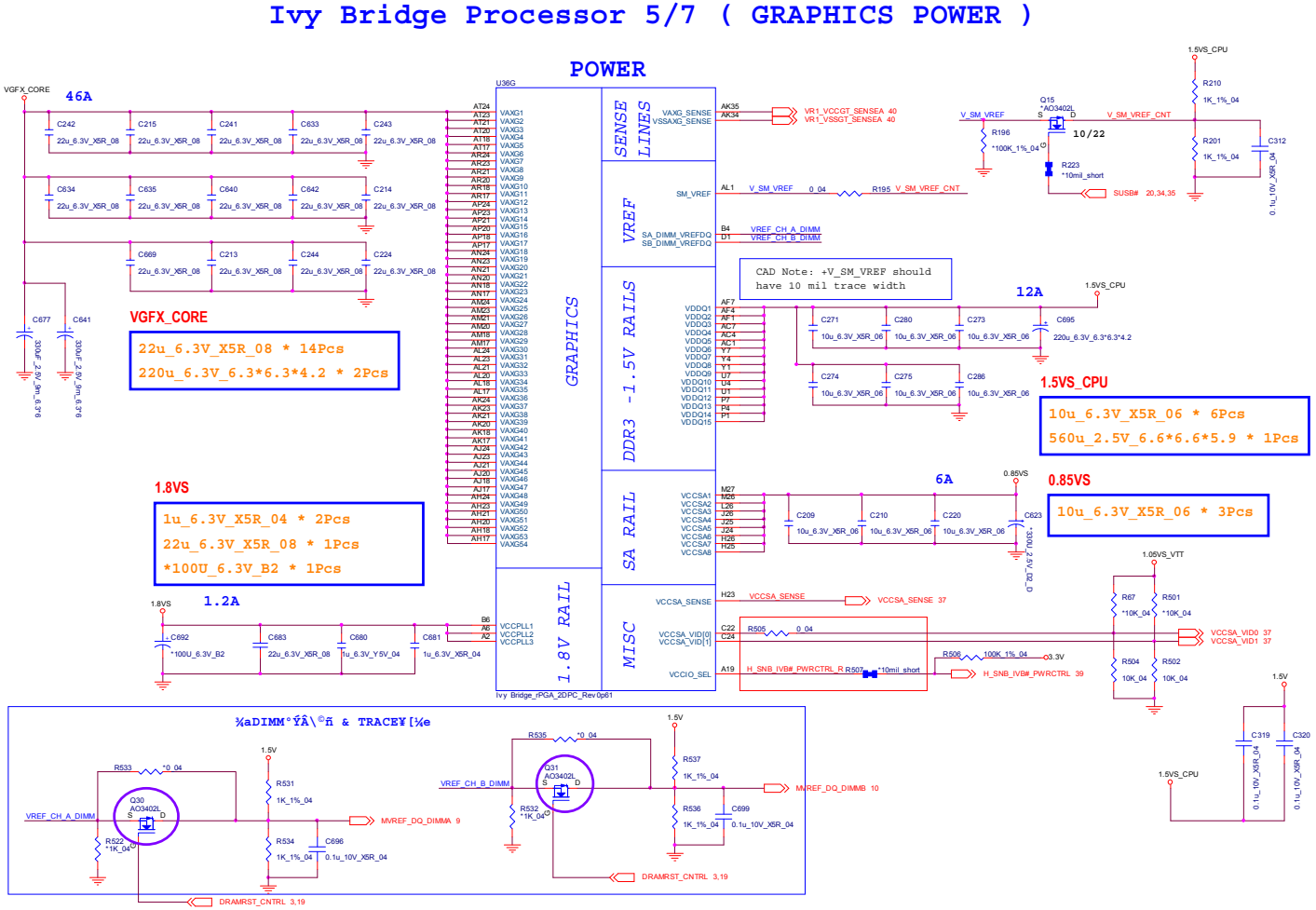
Sheet 4 of 50
Processor 3/7- (DDR3)

Processor 4/7- Power

Sheet 5 of 50
Processor 4/7-Power



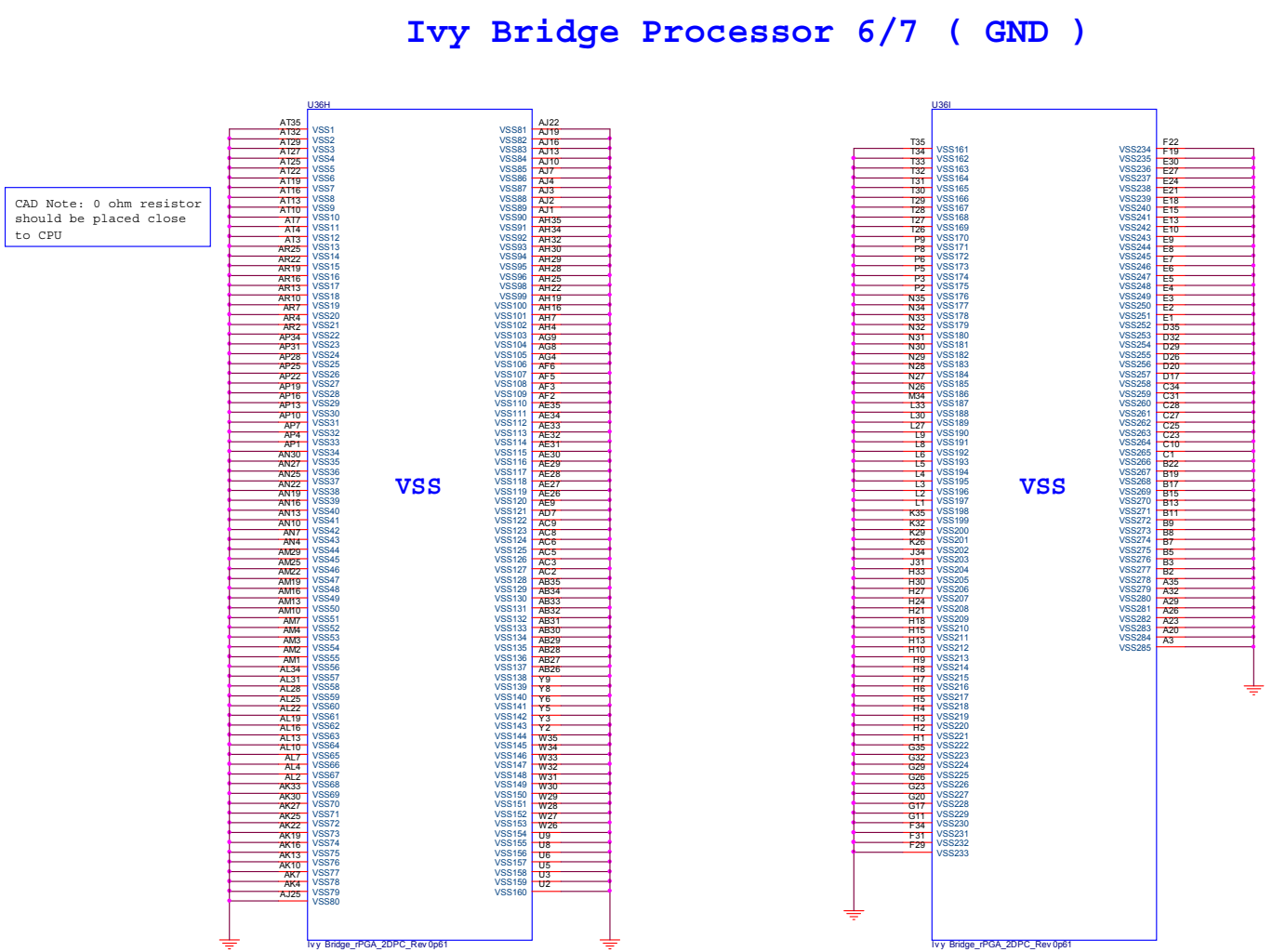
Processor 5/7- GFX PWR



Sheet 6 of 50
Processor 5/7- GFX PWR

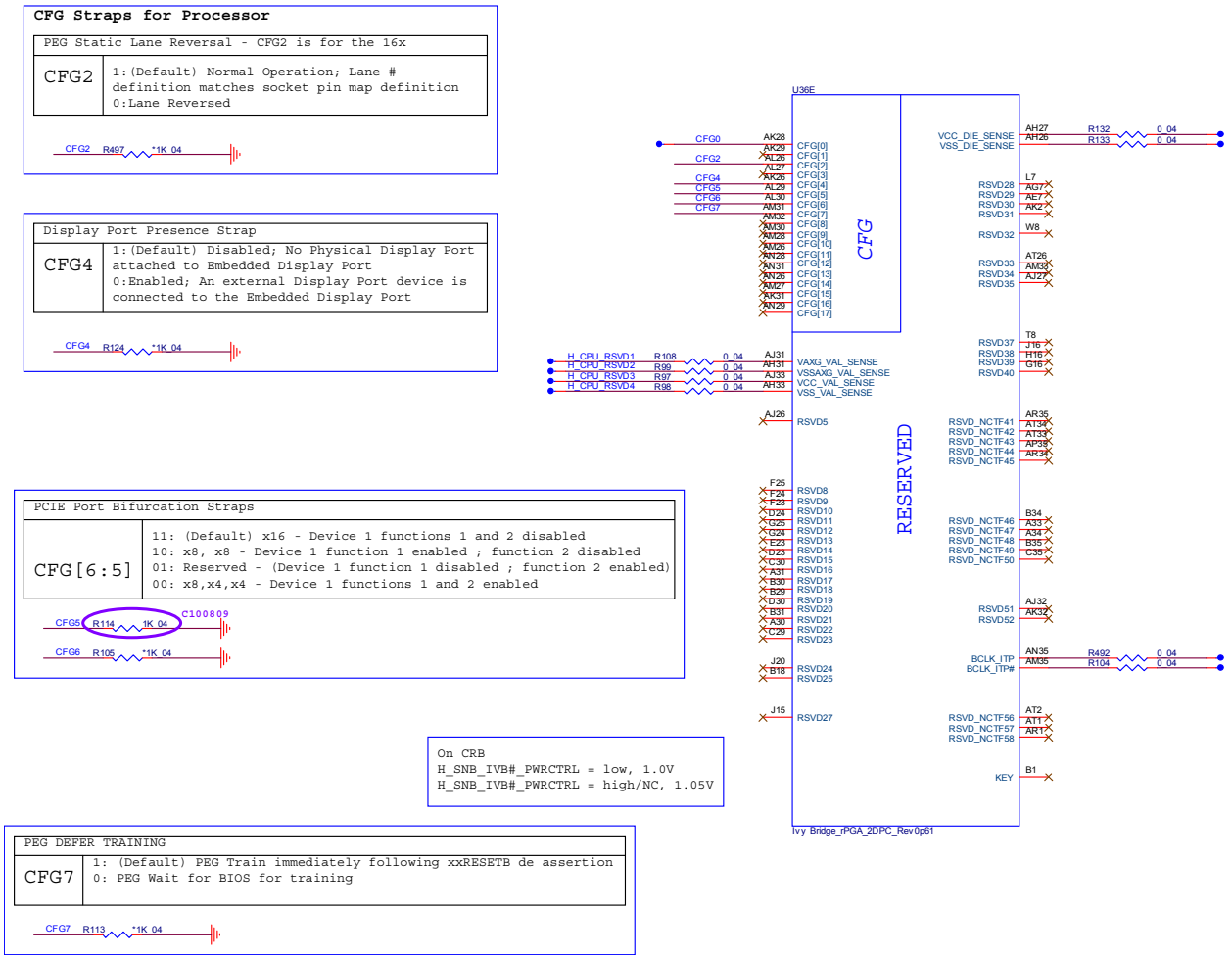
Processor 6/7- GND

Sheet 7 of 50
Processor 6/7- GND



Processor 7/7- RSVD

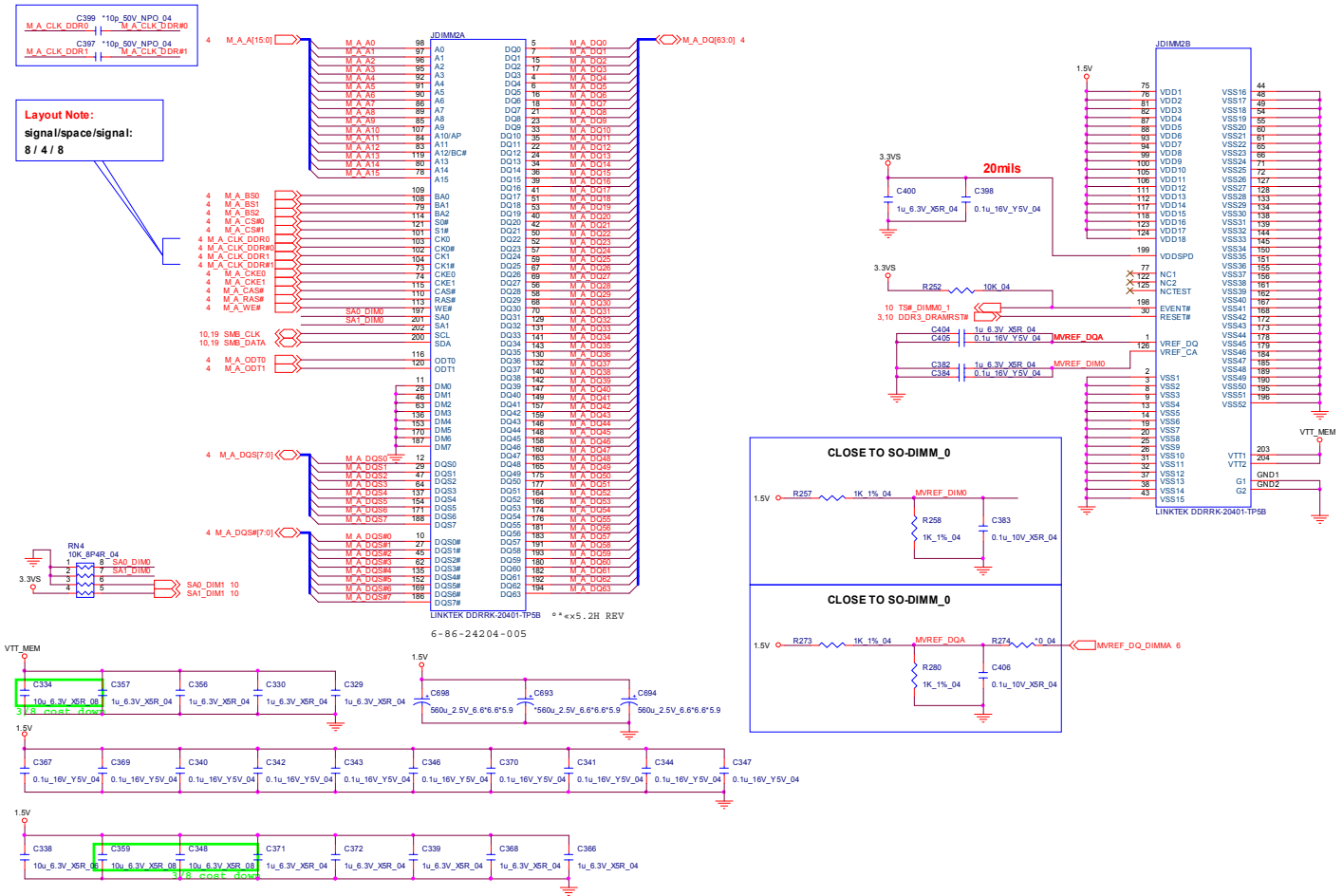
Ivy Bridge Processor 7/7 (RESERVED)



Sheet 8 of 50
Processor 7/7- RSVD

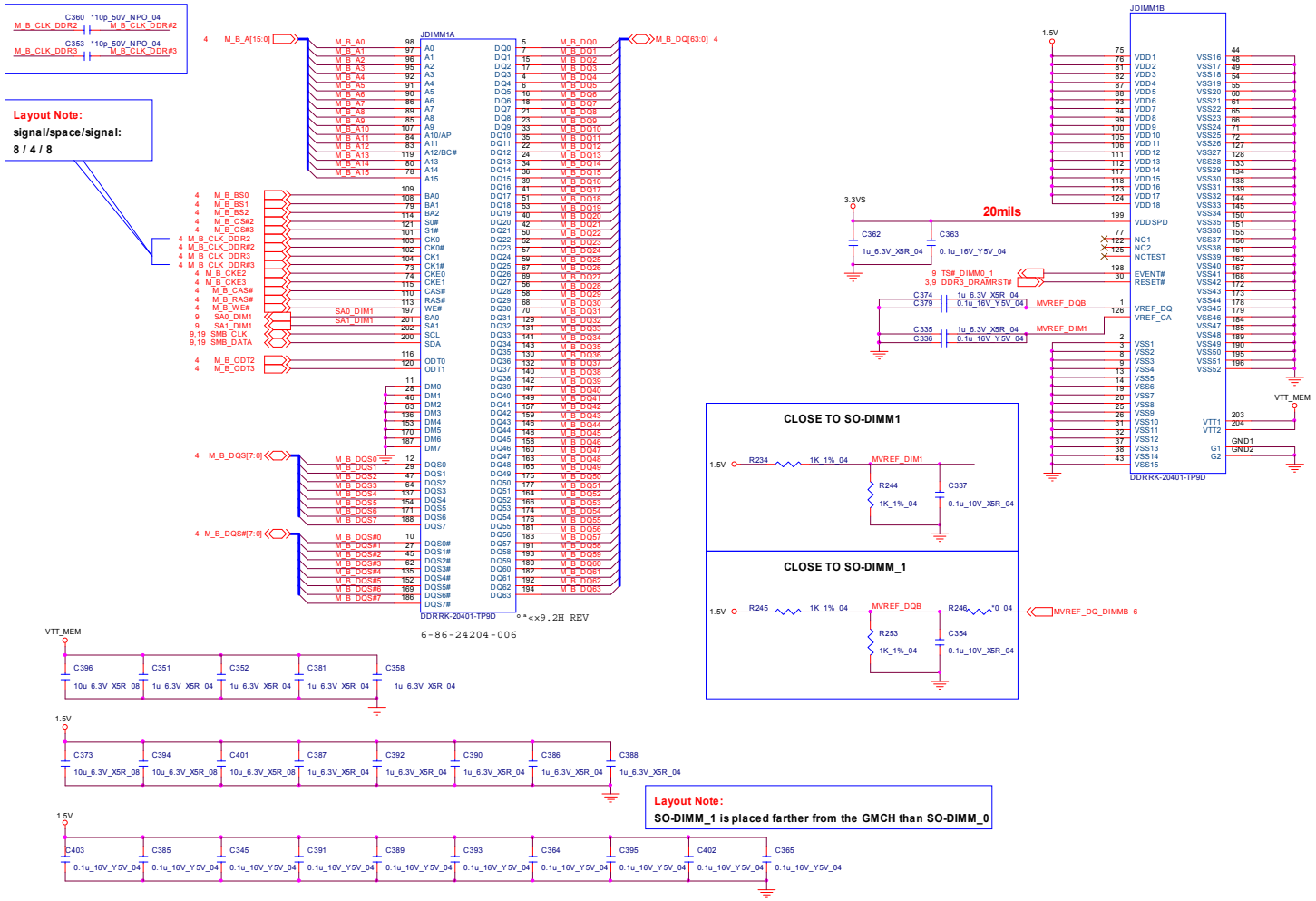
DDR3 SO-DIMM_0

Sheet 9 of 50
DDR3 SO-DIMM_0



DDR3 SO-DIMM_1

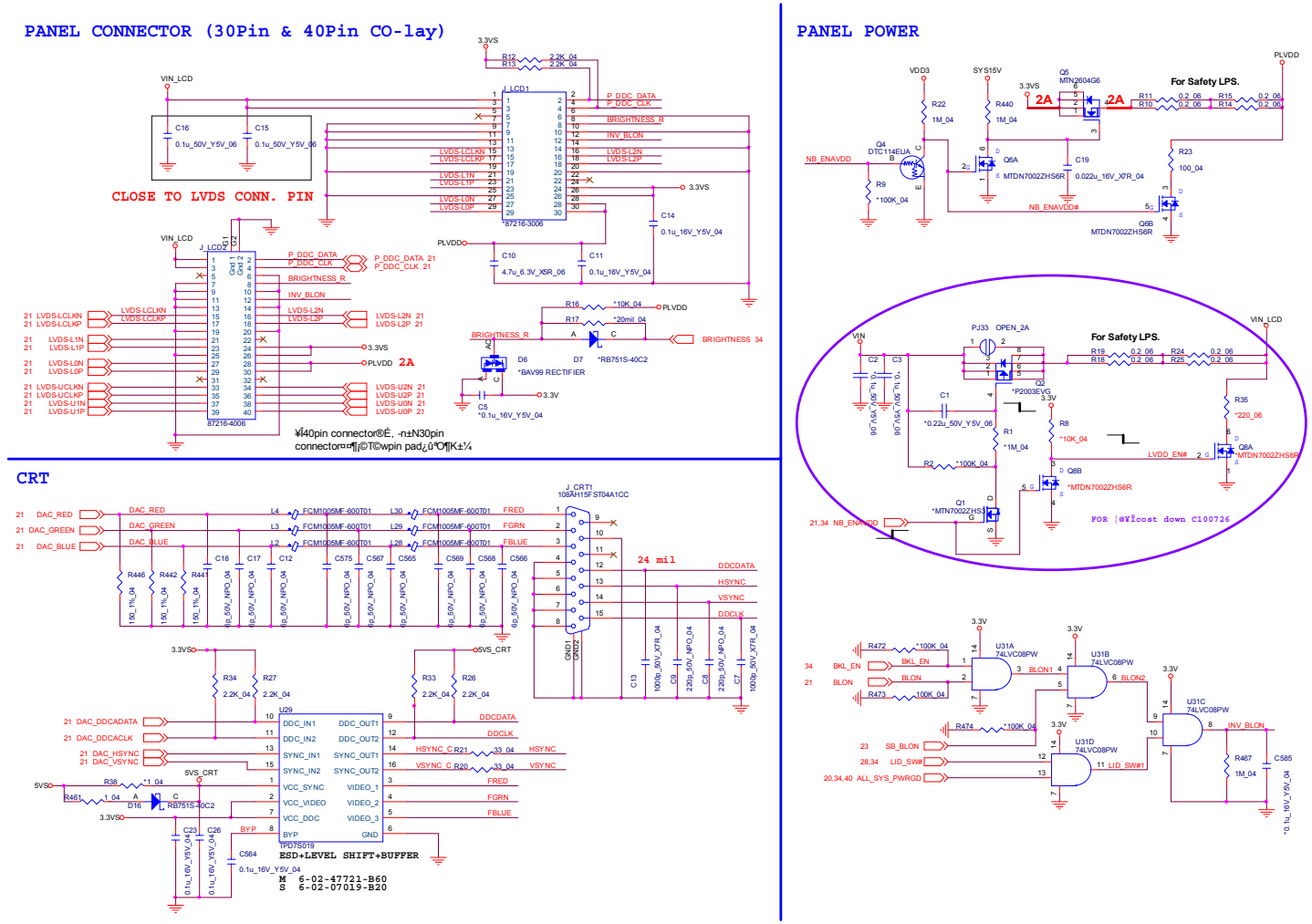
SO-DIMM B



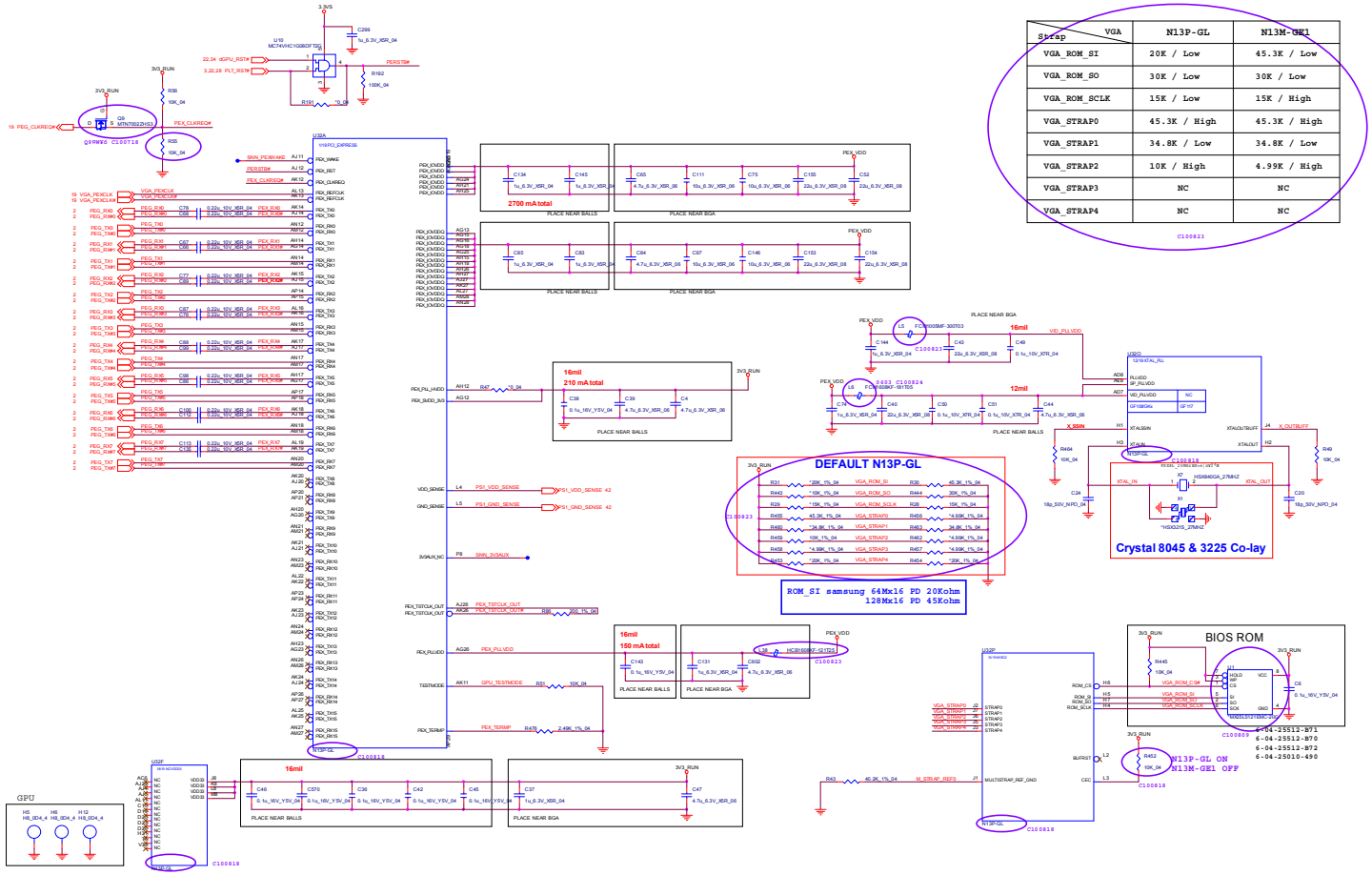
Sheet 10 of 50
DDR3 SO-DIMM_1

PANEL, INVERTER, CRT

Sheet 11 of 50
PANEL, INVERTER, CRT



VGA PCI-E Interface



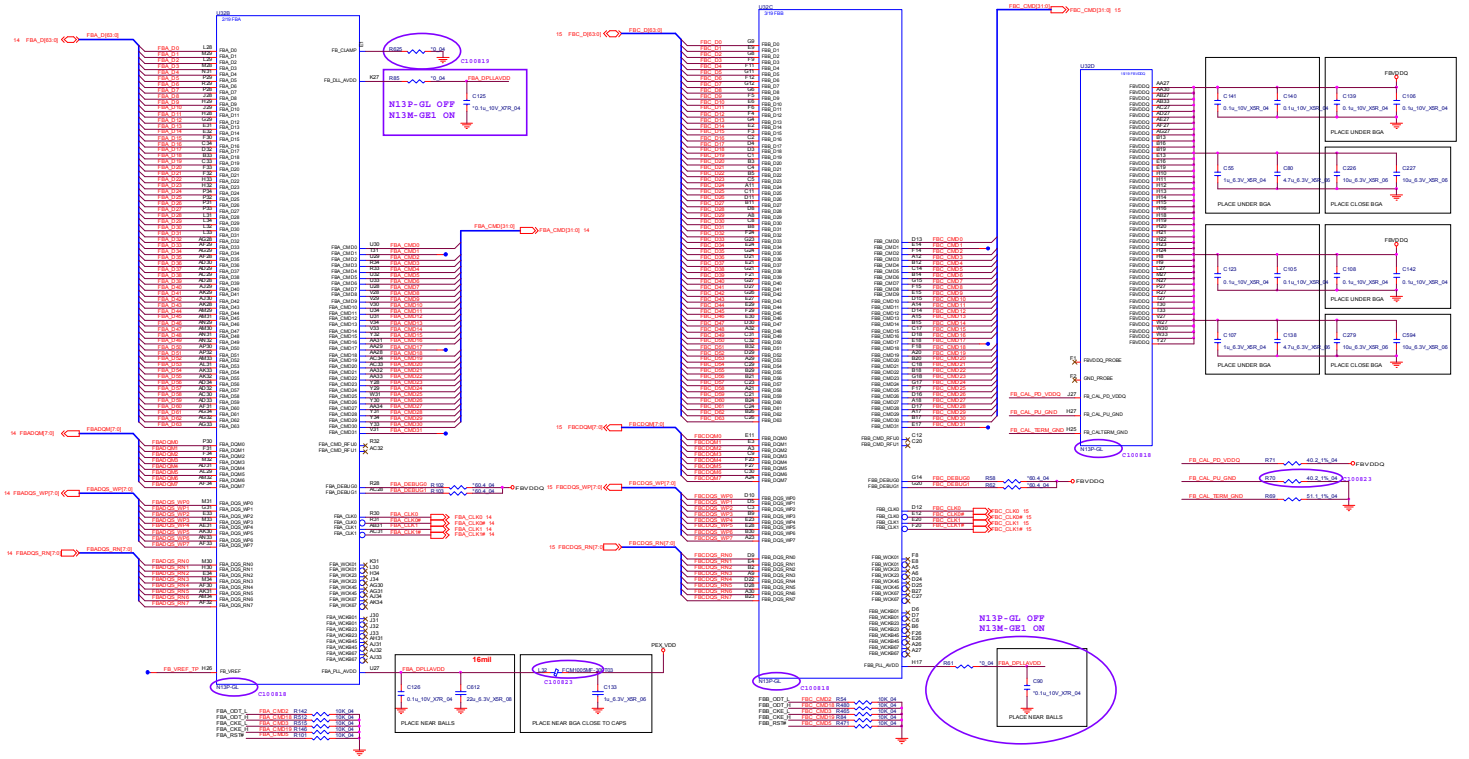
Strap / VGA	N13P-GL	N13M-GE1
VGA_ROM_SI	20K / Low	45.3K / Low
VGA_ROM_SO	30K / Low	30K / Low
VGA_ROM_SCLK	15K / Low	15K / High
VGA_STRAP0	45.3K / High	45.3K / High
VGA_STRAP1	34.8K / Low	34.8K / Low
VGA_STRAP2	10K / High	4.99K / High
VGA_STRAP3	NC	NC
VGA_STRAP4	NC	NC

Sheet 12 of 50
VGA PCI-E Interface

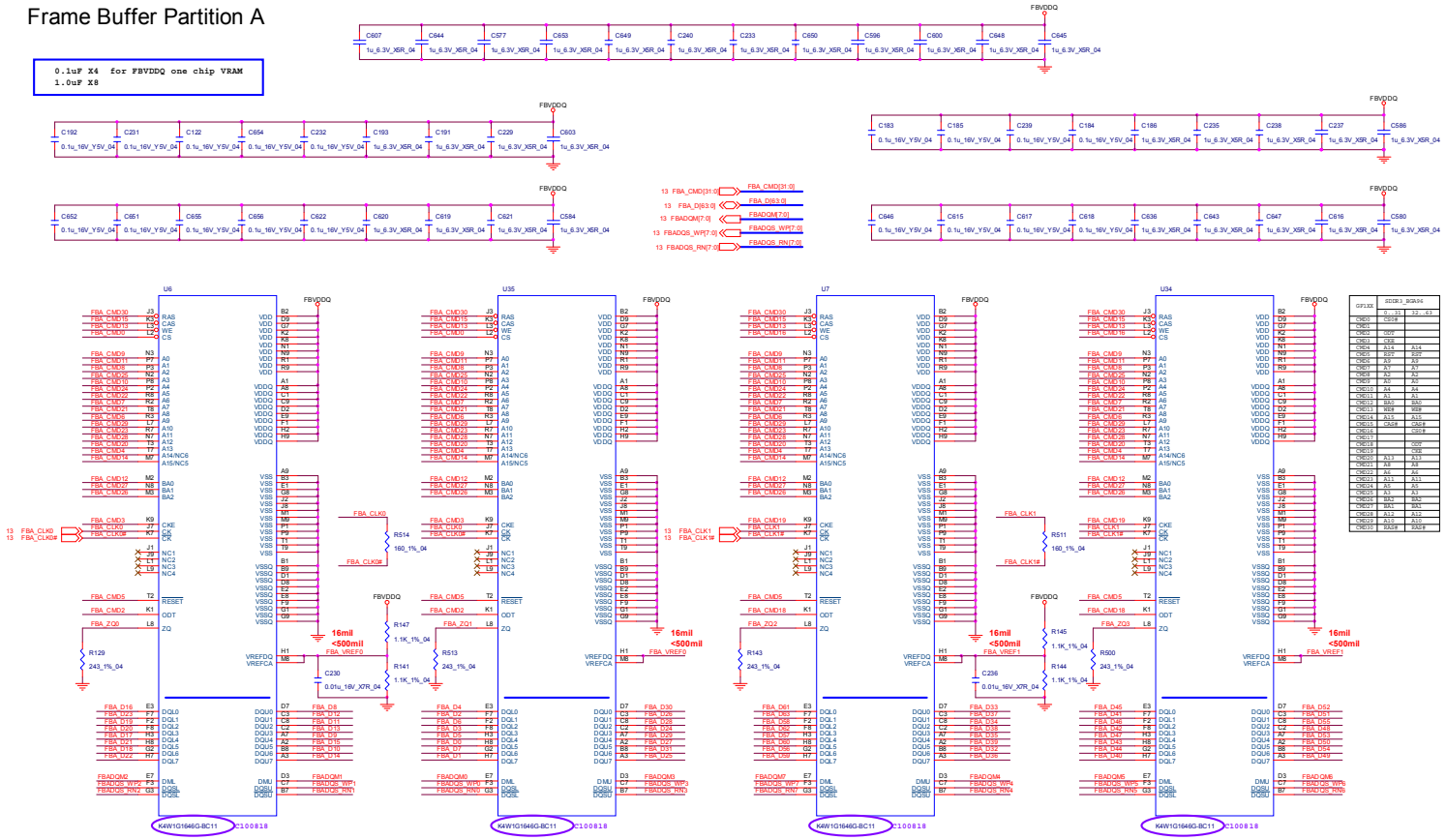
VGA Frame Buffer Interface

Sheet 13 of 50
VGA Frame Buffer Interface

Frame Buffer Interface



VGA Frame Buffer A

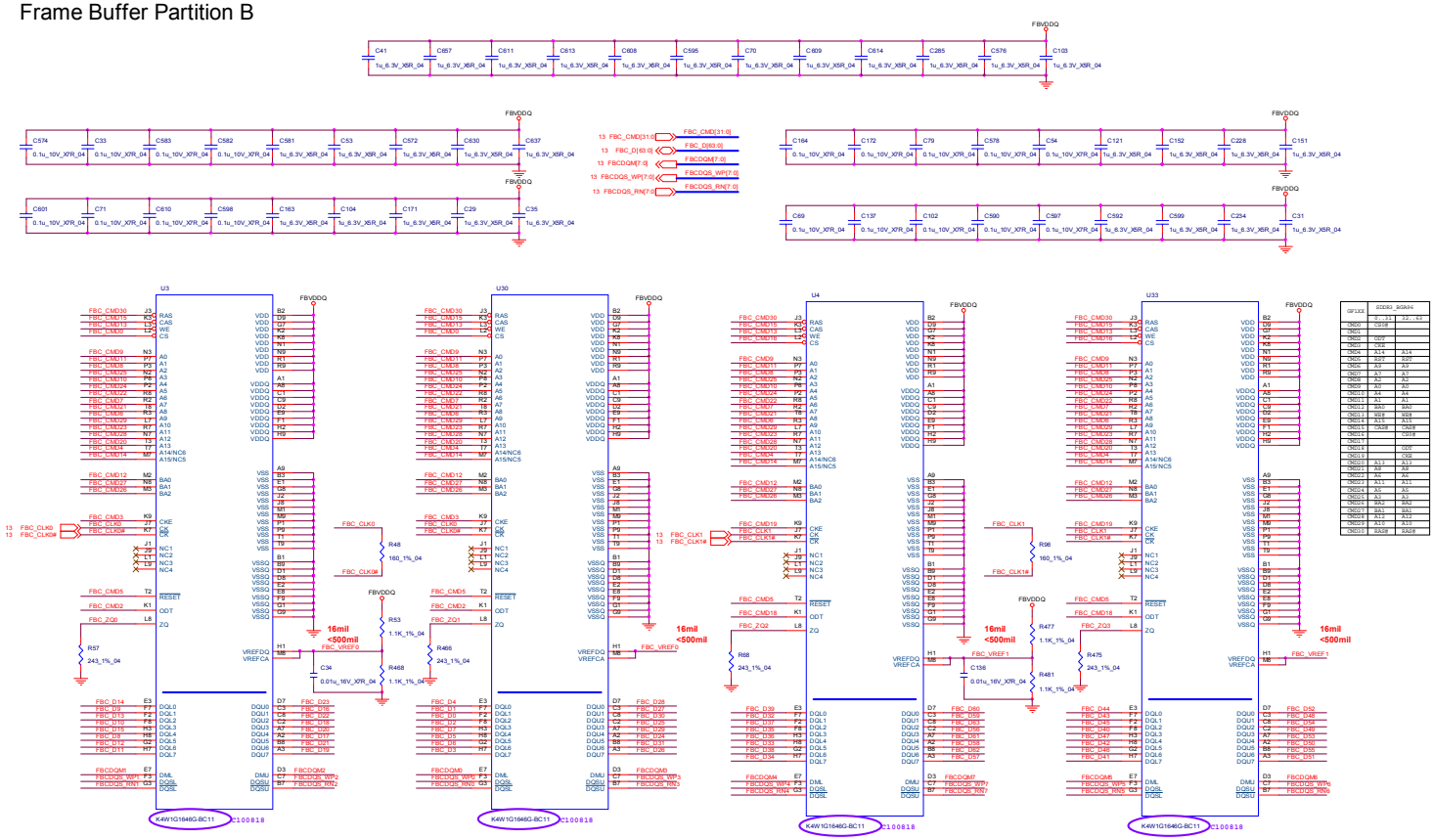


Sheet 14 of 50
VGA Frame Buffer A

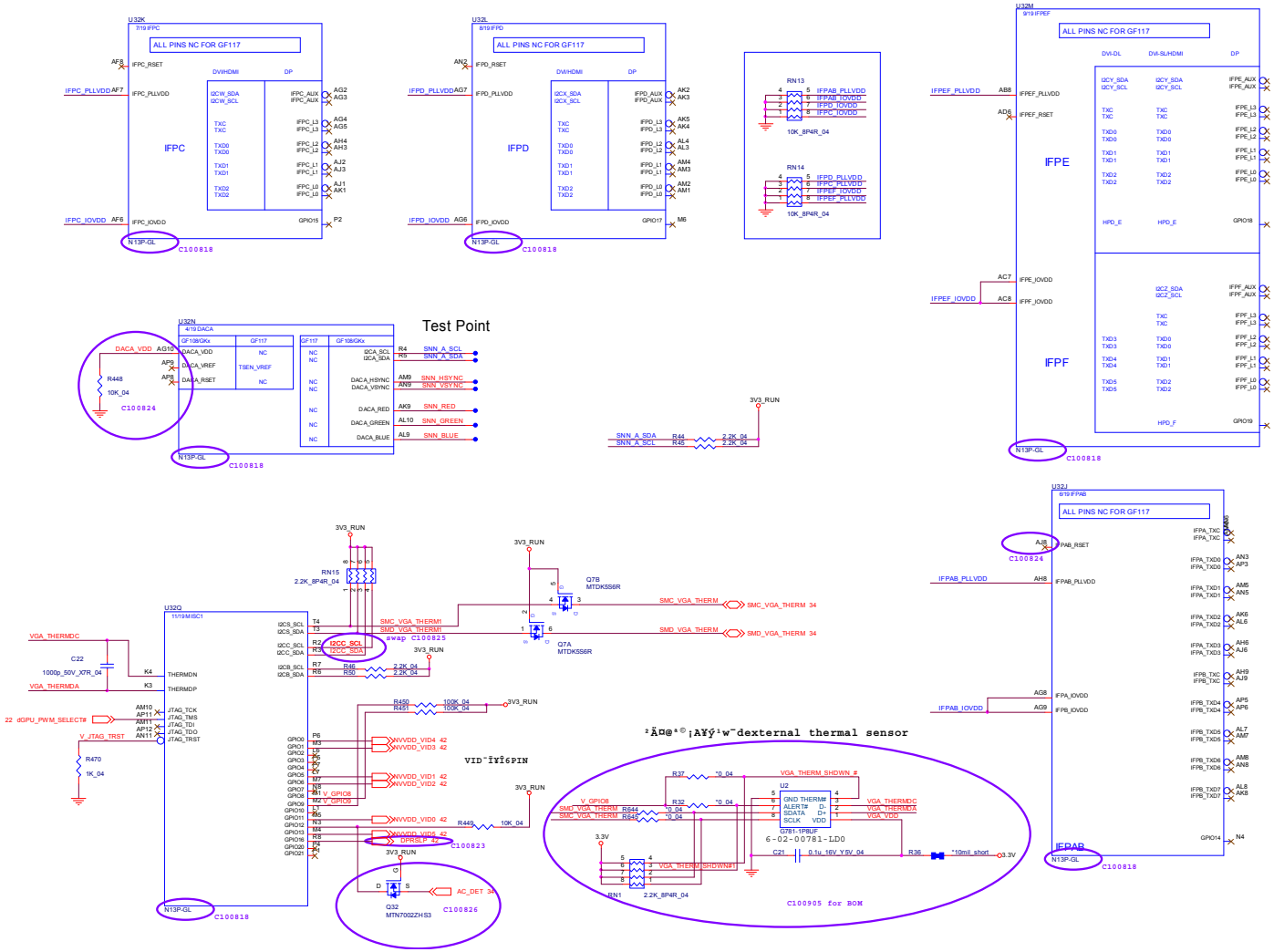
VGA Frame Buffer C

Sheet 15 of 50
VGA Frame Buffer C

Frame Buffer Partition B



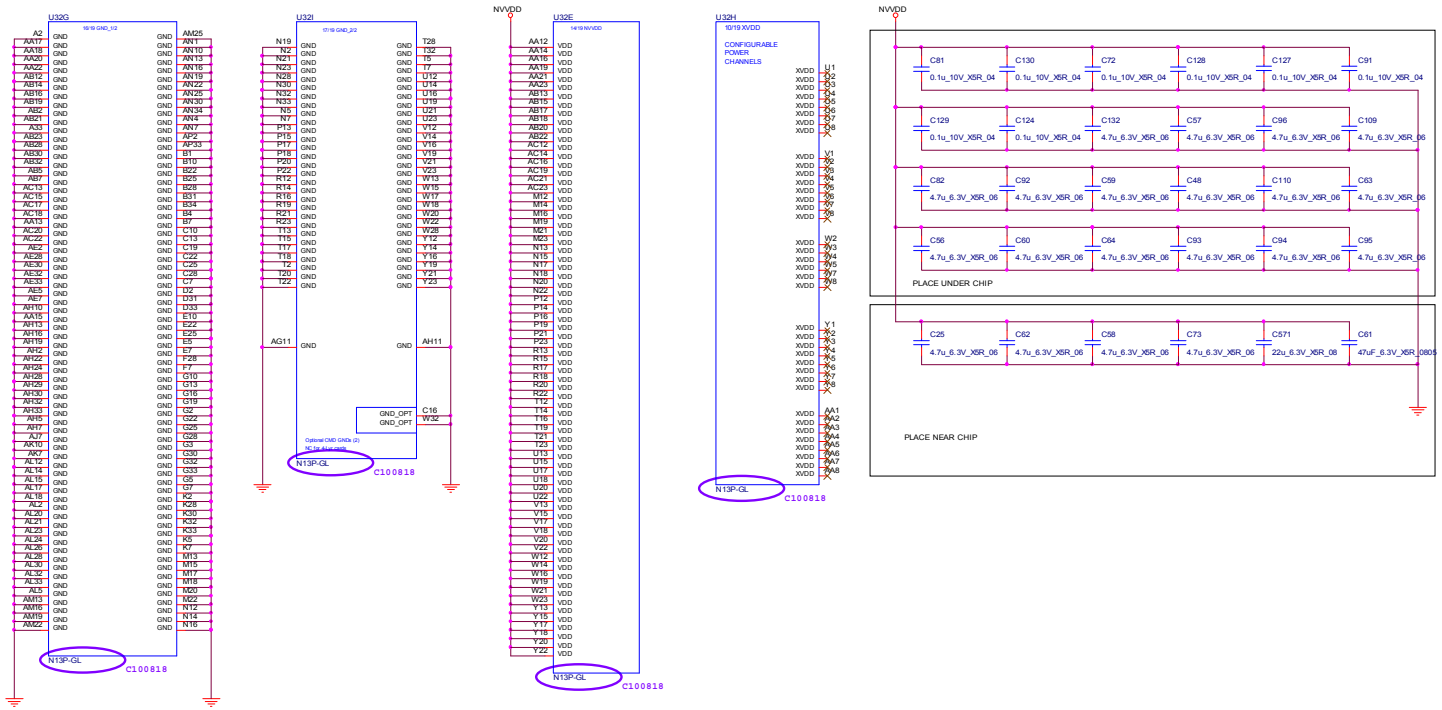
VGA I/O



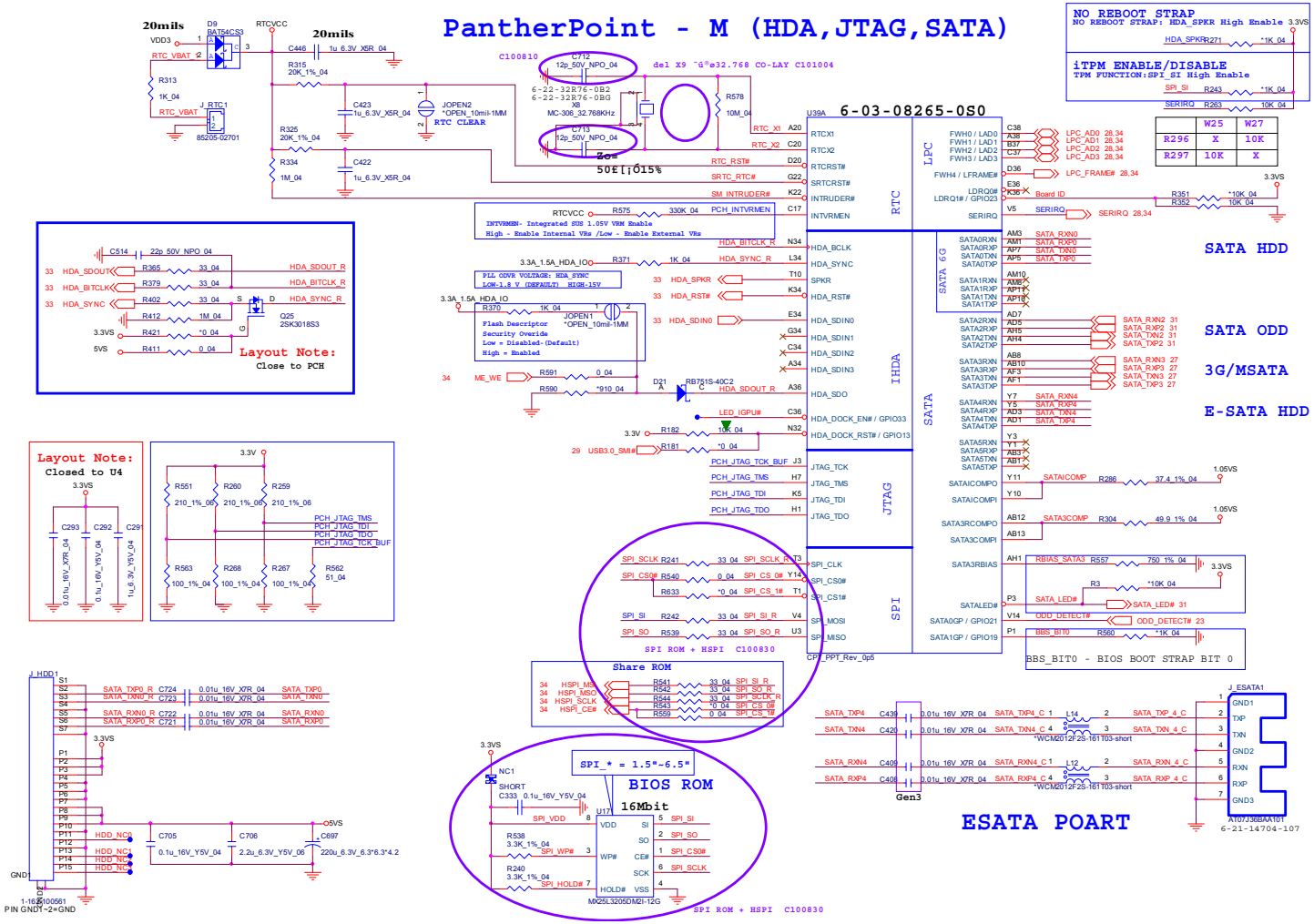
Sheet 16 of 50
VGA I/O

VGA NVVDD Cecoupling

Sheet 17 of 50
VGA NVVDD Cecoupling



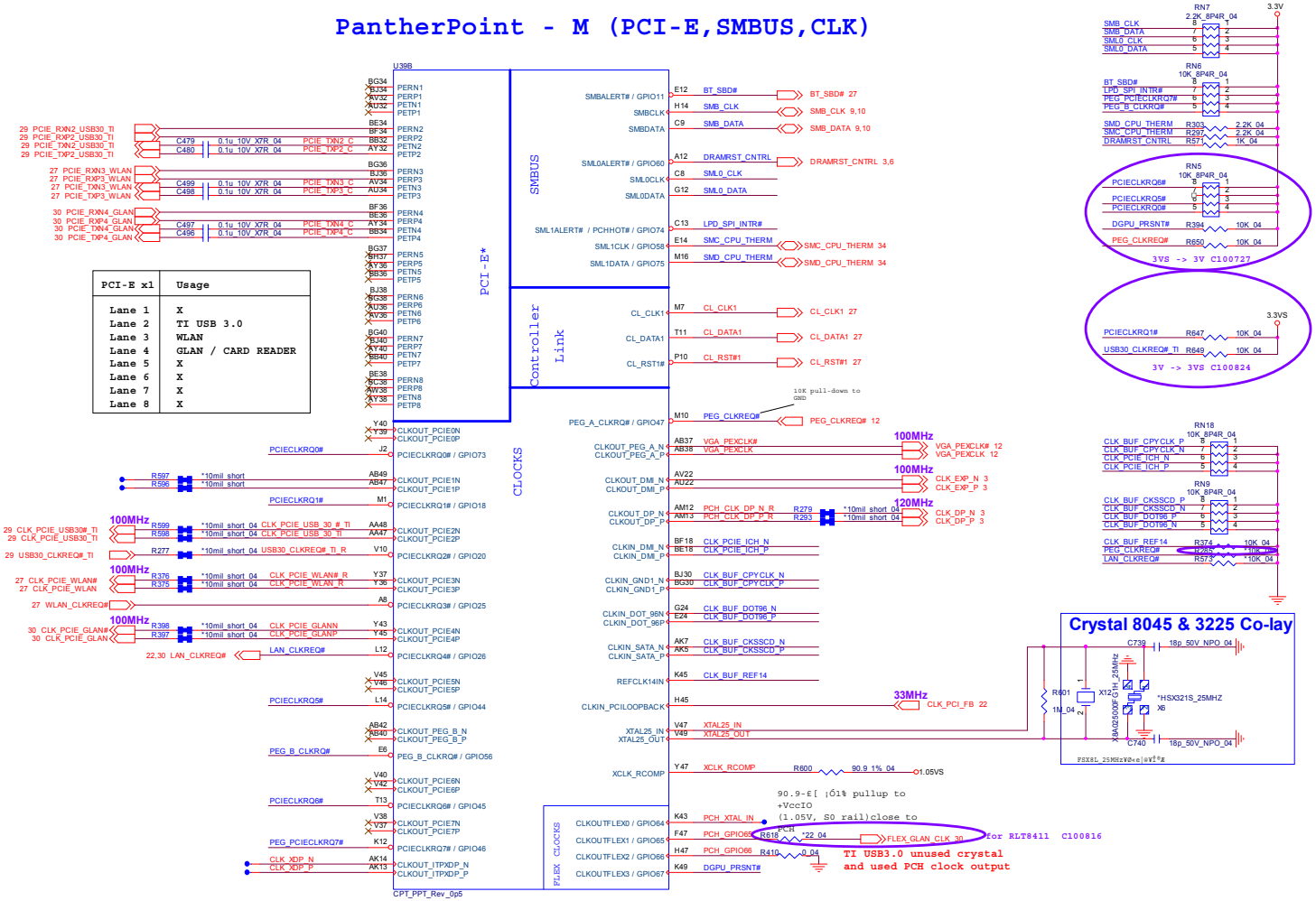
PCH 1/9- RTC, HDA, SATA



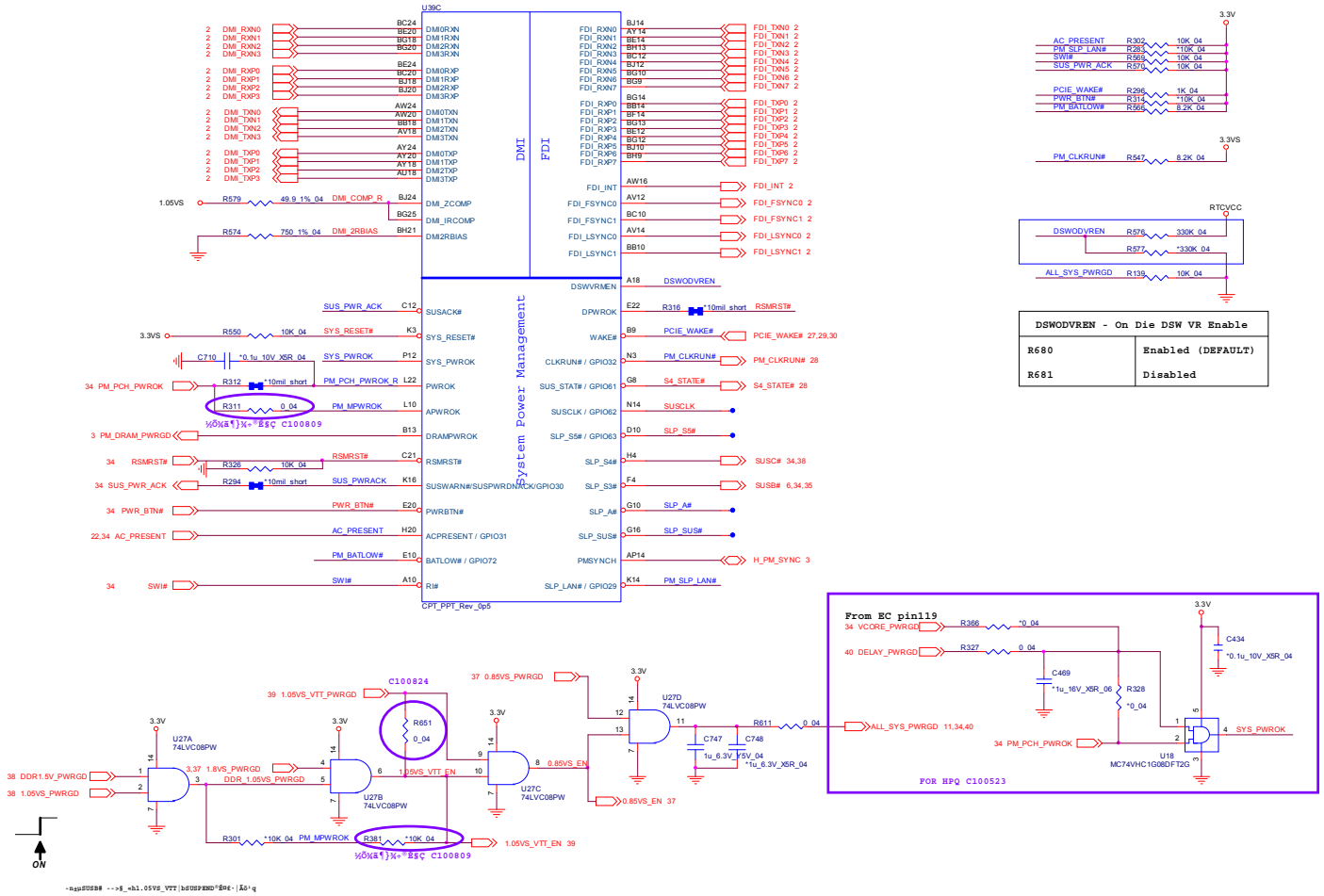
Sheet 18 of 50
PCH 1/9- RTC, HDA, SATA

PCH 2/9- PCIE, SMBUS, CLK

Sheet 19 of 50
PCH 2/9- PCIE, SMBUS, CLK



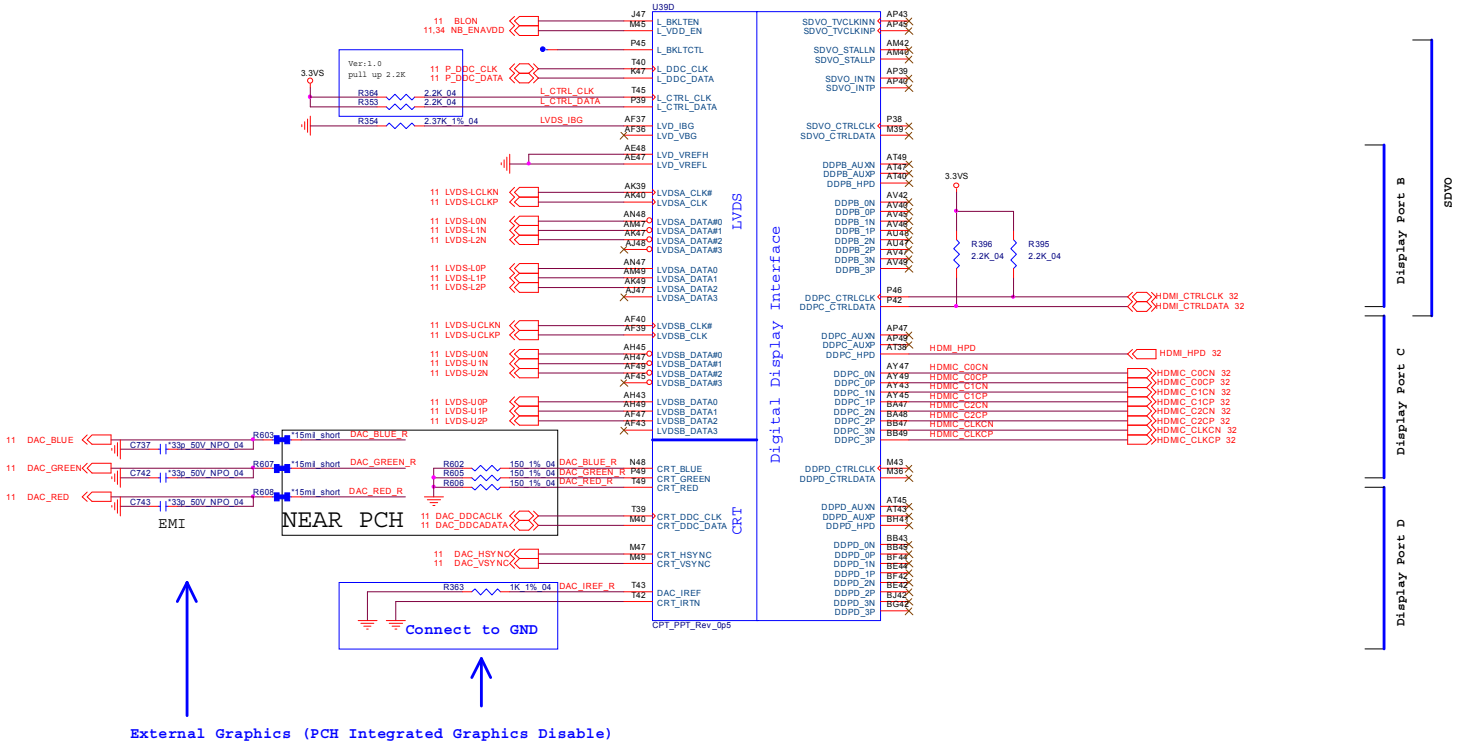
PCH 3/9- DMI, FDI, PWRGD



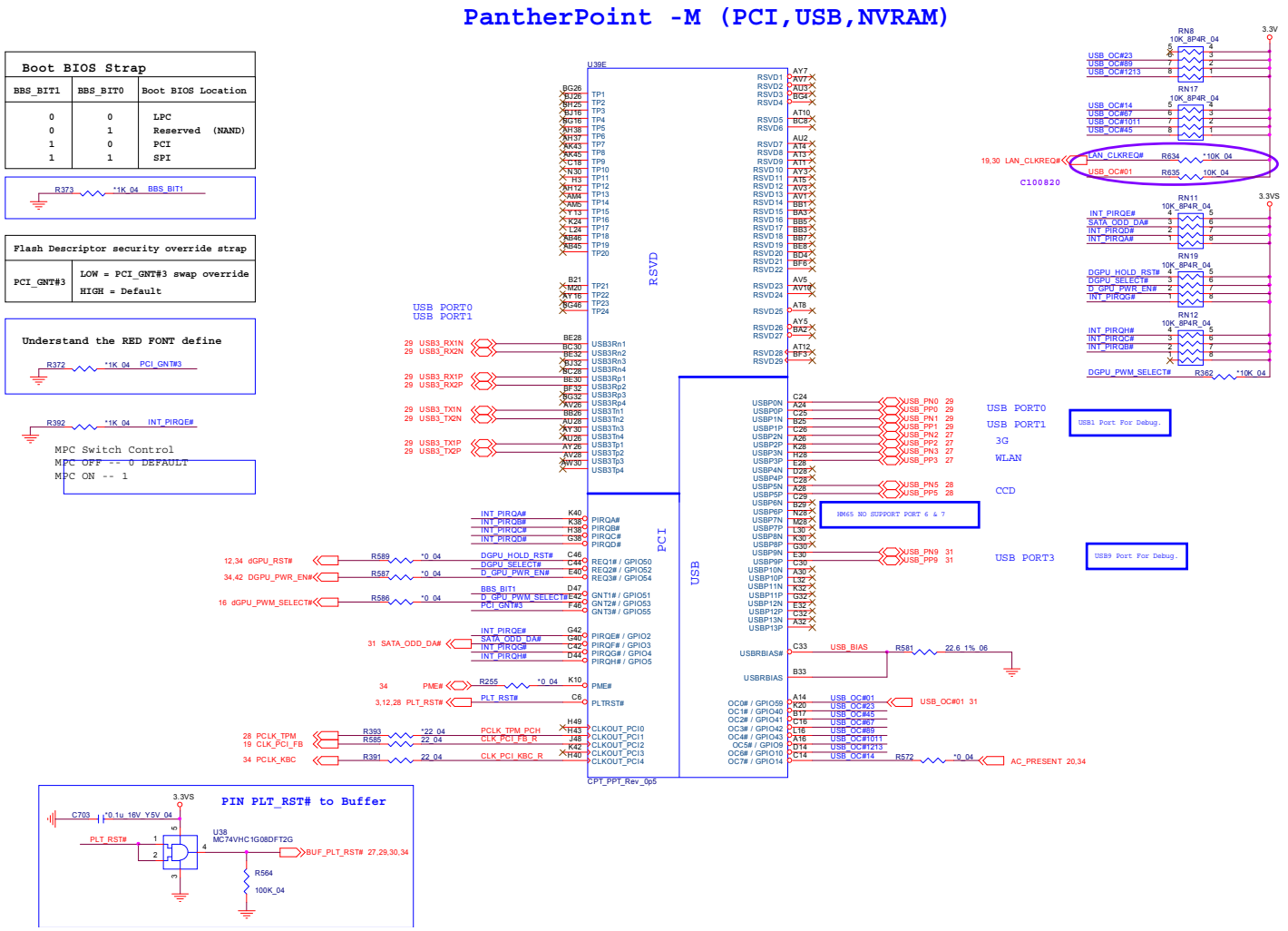
Sheet 20 of 50
PCH 3/9- DMI, FDI, PWRGD

PCH 4/9- LVDS, DDI, CRT

Sheet 21 of 50
PCH 4/9- LVDS, DDI, CRT



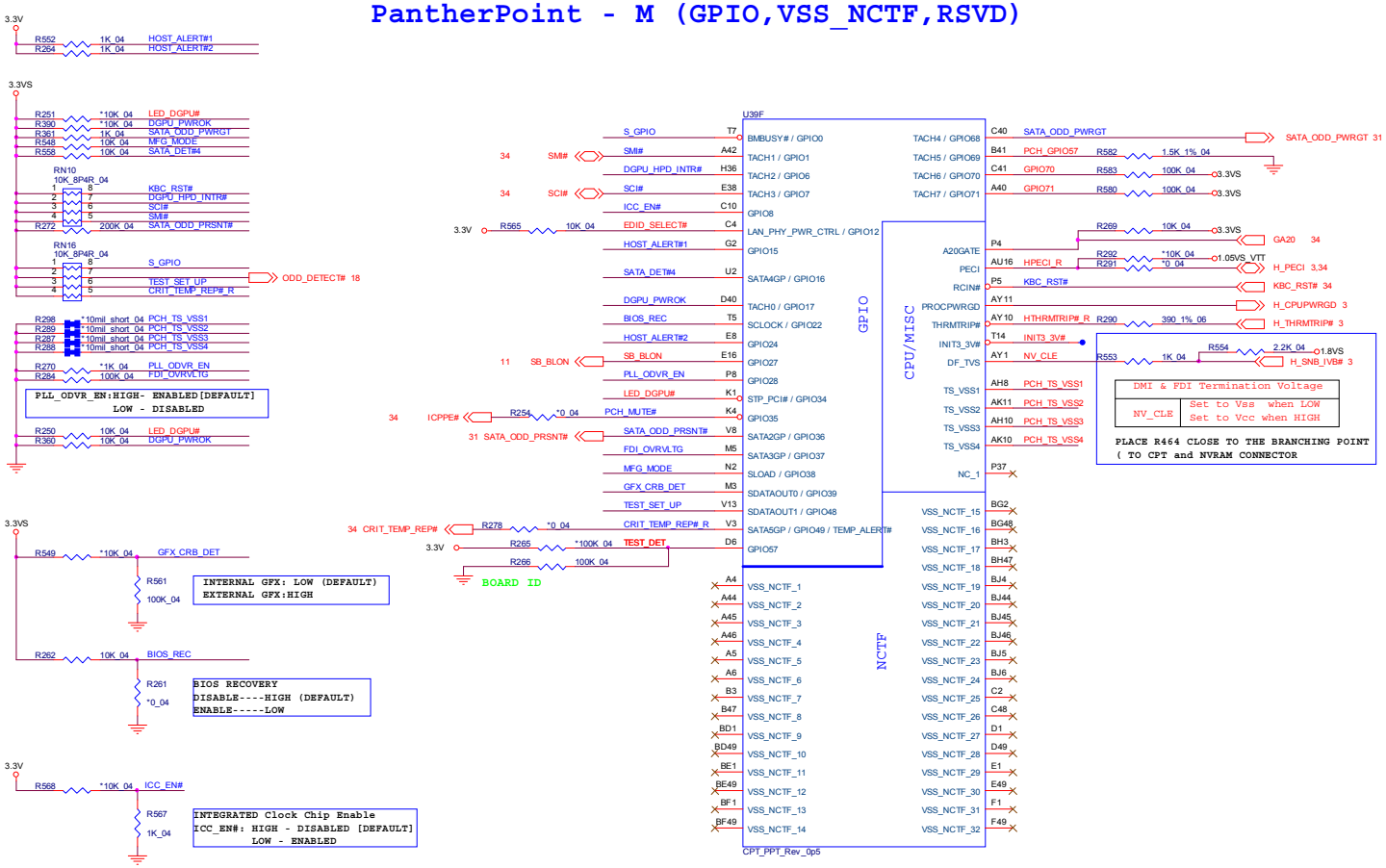
PCH 4/9- PCI, USB, RSVD



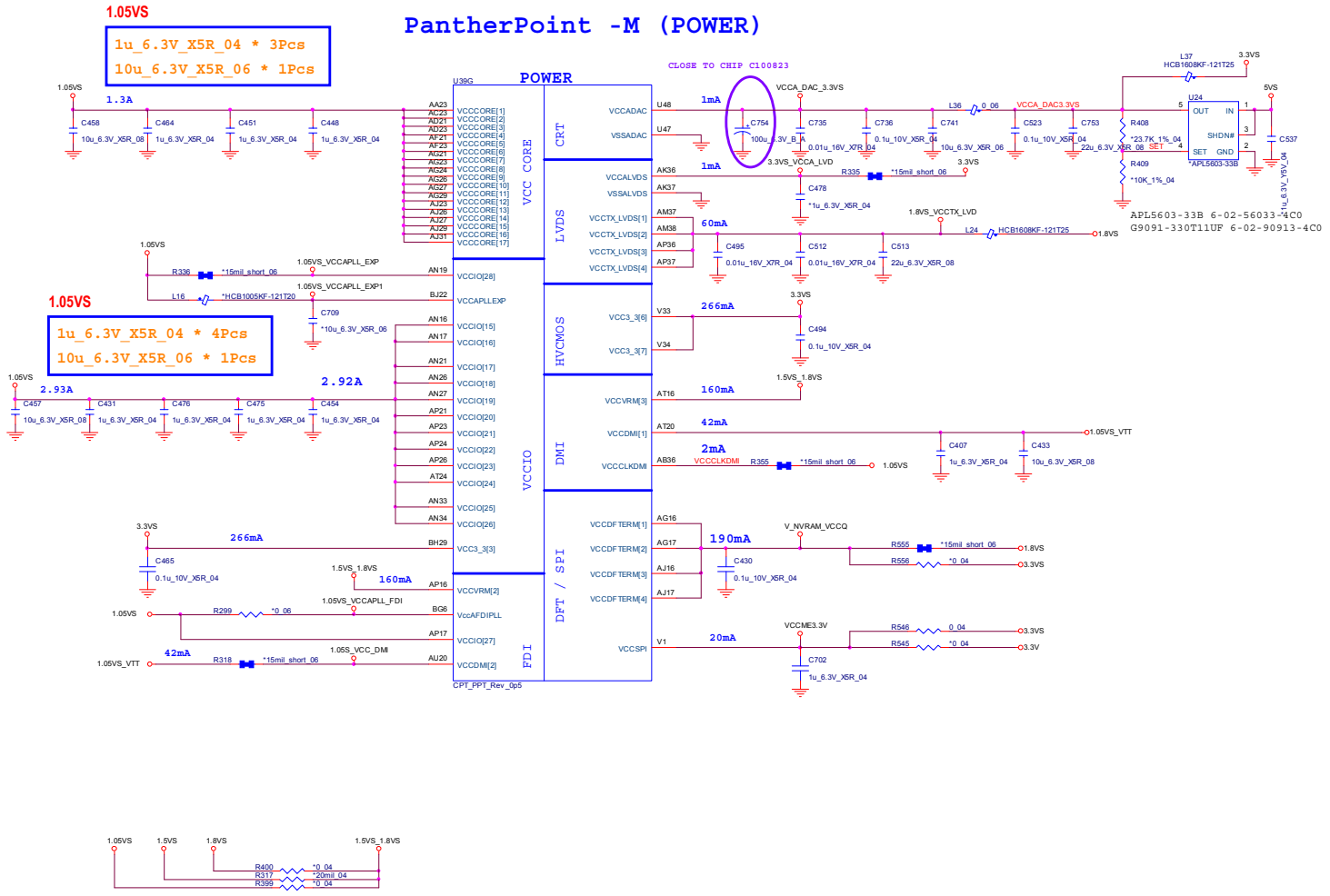
Sheet 22 of 50
PCH 4/9- PCI, USB, RSVD

PCH 6/9- GPIO, CPU

Sheet 23 of 50
PCH 6/9- GPIO, CPU



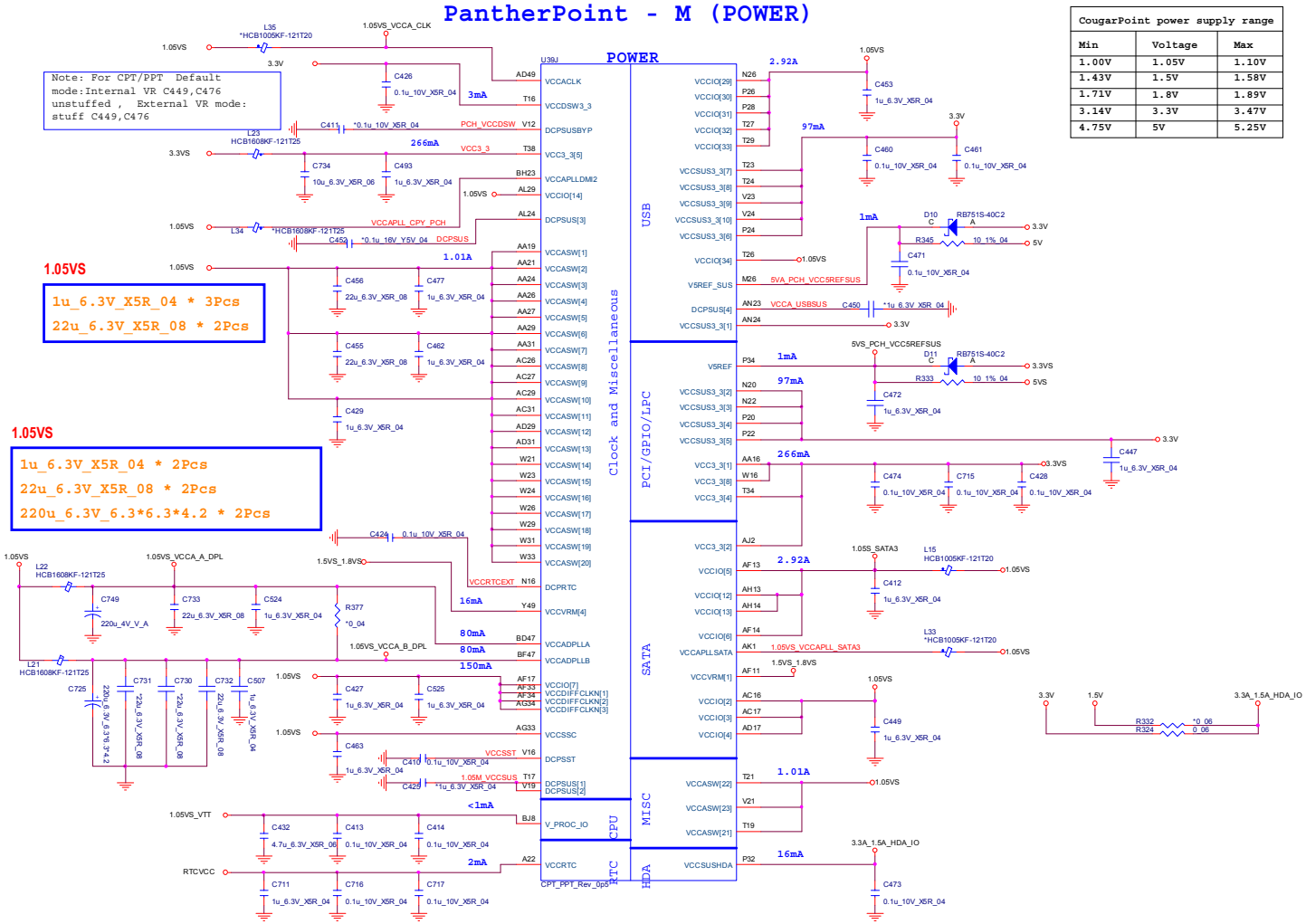
PCH 7/9- PWR



Sheet 24 of 50
PCH 7/9- PWR

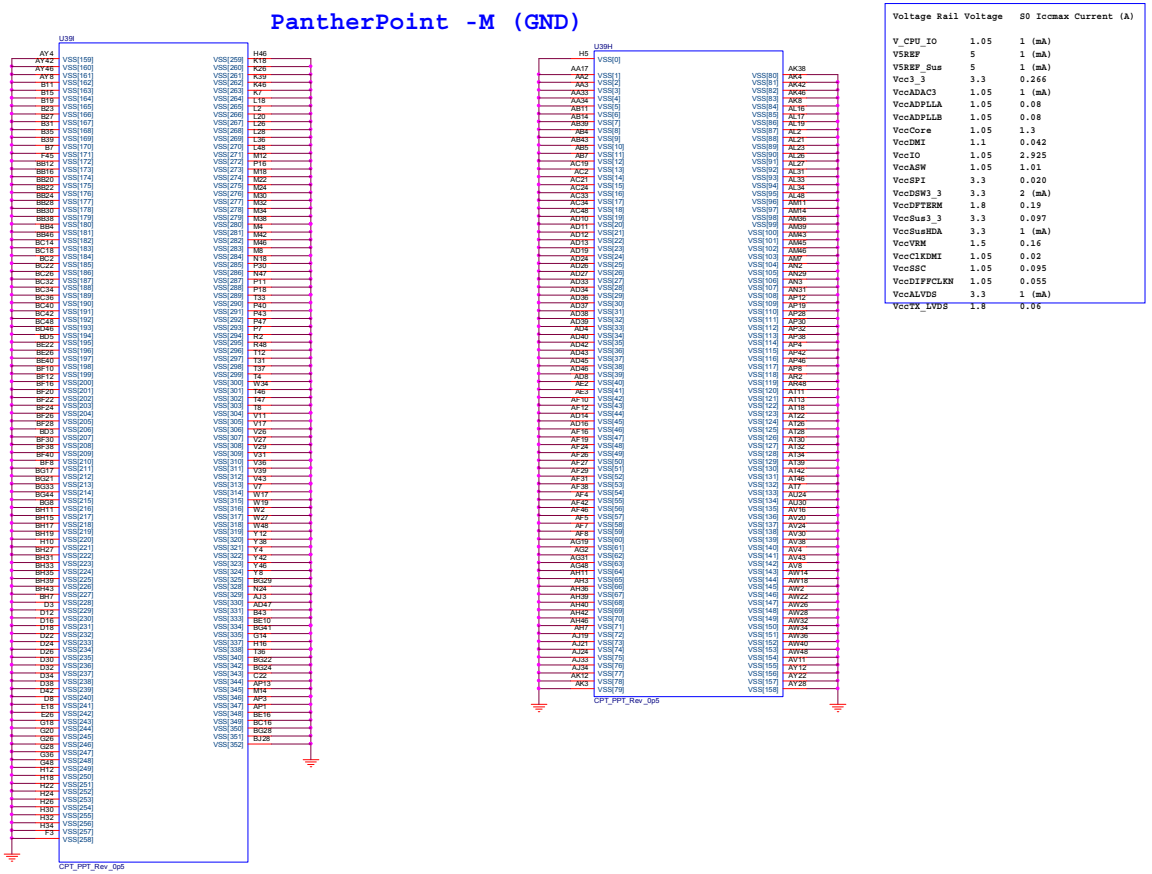
PCH 8/9 POWER

Sheet 25 of 50
PCH 8/9 POWER



CougarPoint power supply range		
Min	Voltage	Max
1.00V	1.05V	1.10V
1.43V	1.5V	1.58V
1.71V	1.8V	1.89V
3.14V	3.3V	3.47V
4.75V	5V	5.25V

PCH 9/9- GND

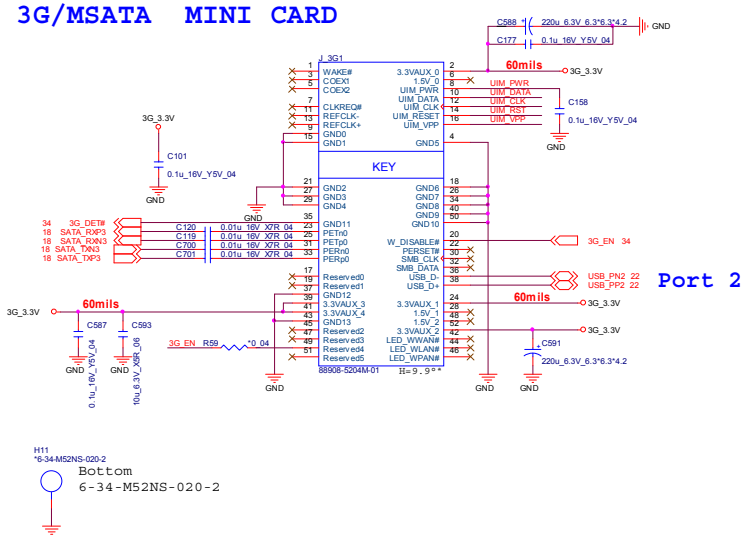


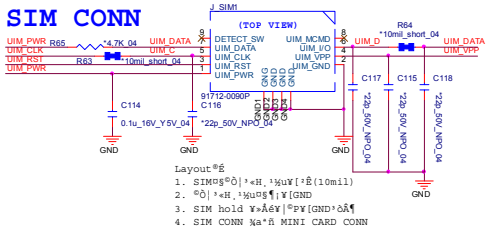
Voltage Rail	Voltage	S0 Iccmax Current (A)
V_CPU_IO	1.05	1 (mA)
V5REF	5	1 (mA)
V5REF_Sus	5	1 (mA)
Vcc3_3	3.3	0.266
VccADAC3	1.05	1 (mA)
VccADPLLA	1.05	0.08
VccADPLLB	1.05	0.08
VccCore	1.05	1.3
VccDMI	1.1	0.042
VccIO	1.05	2.925
VccASW	1.05	1.01
VccSPI	3.3	0.020
VccDSW3_3	3.3	2 (mA)
VccDFTERM	1.8	0.19
VccSus3_3	3.3	0.097
VccSusHDA	3.3	1 (mA)
VccVRM	1.5	0.16
VccClkDMI	1.05	0.02
VccSSC	1.05	0.095
VccDIFFCLKN	1.05	0.055
VccALVDS	3.3	1 (mA)
VccTX_LVDS	1.8	0.06

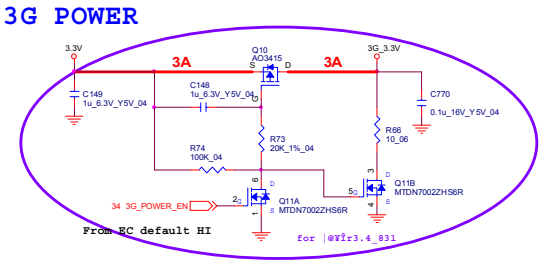
Sheet 26 of 50
PCH 9/9- GND

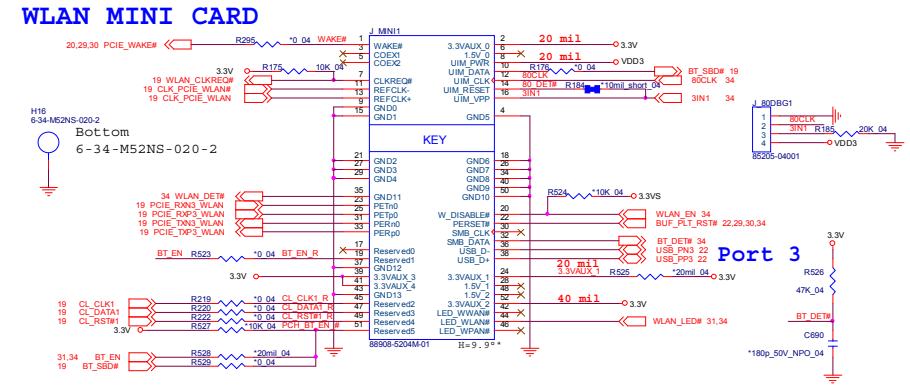
WLAN, 3G, MINI PCIE

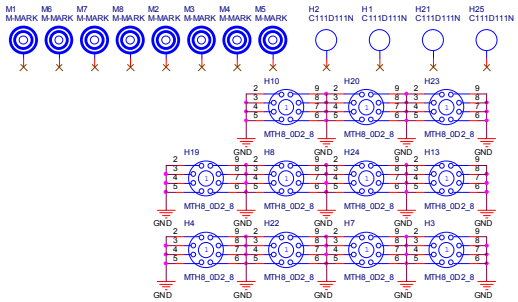
Sheet 27 of 50
WLAN, 3G, MINI PCIE



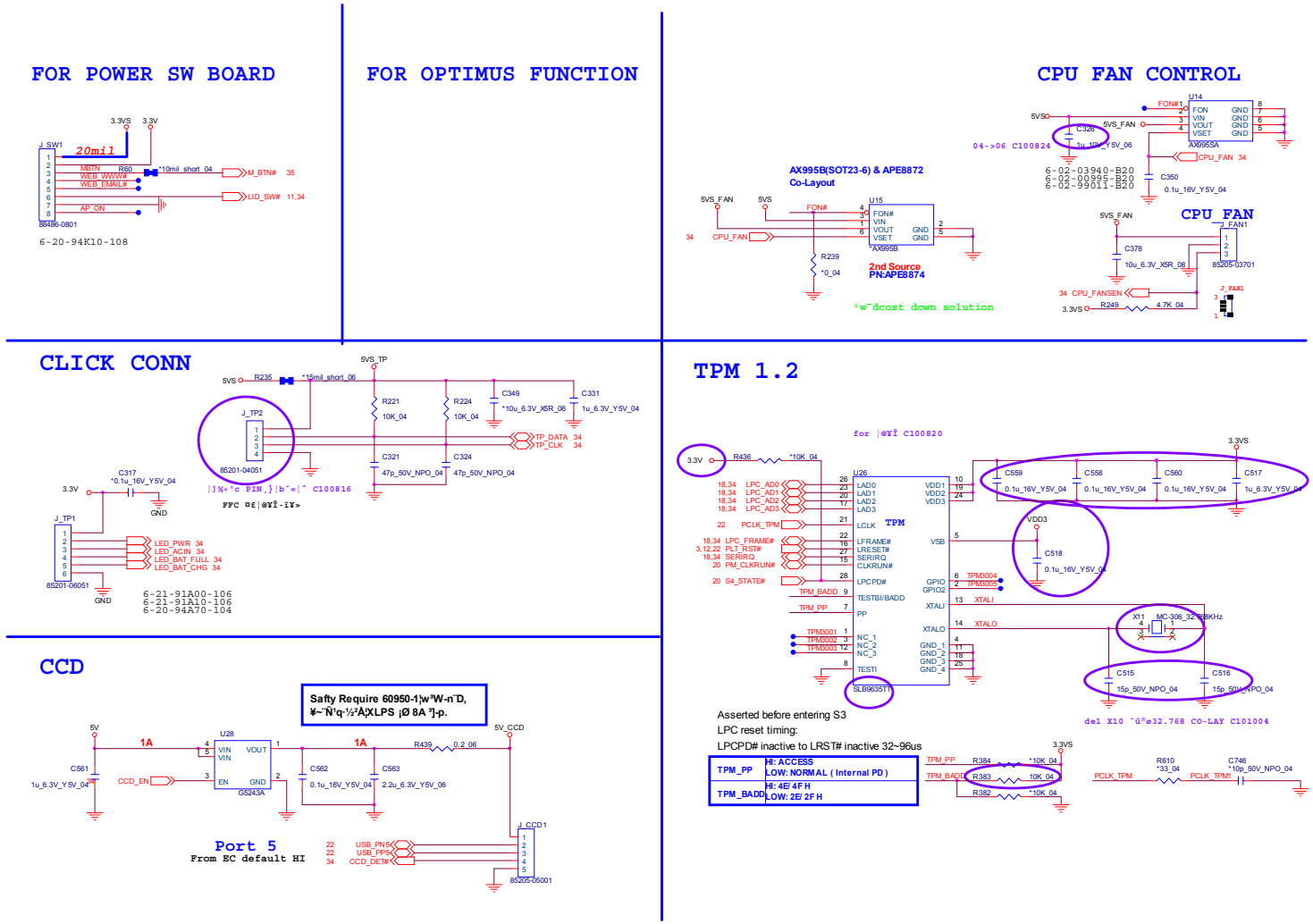








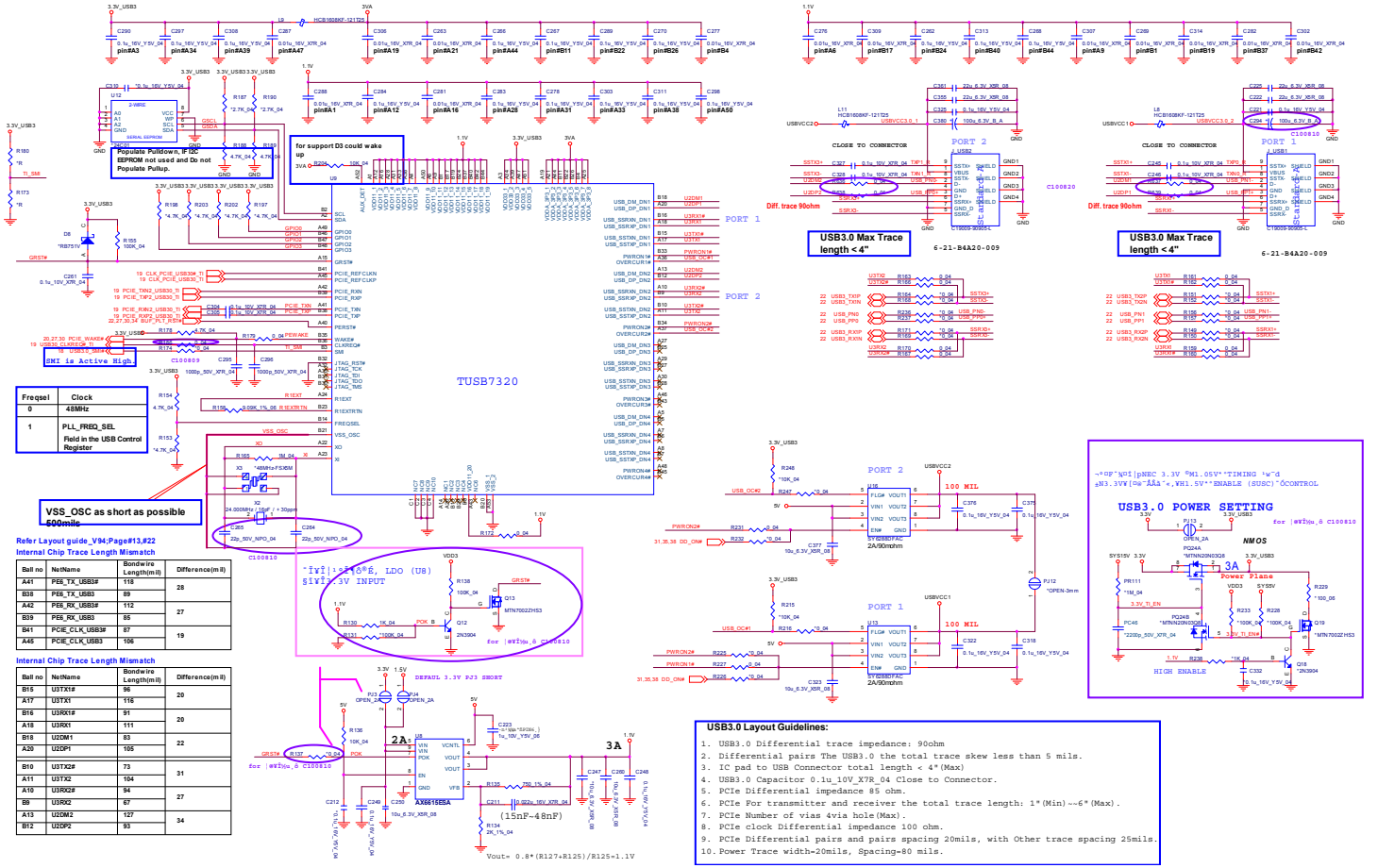
CCD, TPM, MULTI CON



Sheet 28 of 50
CCD, TPM, MULTI CON

USB3.0

Sheet 29 of 50
USB3.0



Freqsel	Clock
0	48MHz
1	PLL_FREQ_SEL Field in the USB Control Register

Refer Layout guide_V94;Page#13,#22

Internal Chip Trace Length Mismatch

Ball no	NetName	Bondwire Length(m il)	Difference(m il)
A41	PEE_TX_USB3#	118	28
B38	PEE_TX_USB3	89	
A42	PEE_RX_USB3#	112	27
B39	PEE_RX_USB3	85	
B41	PCIE_CLK_USB3#	87	19
A45	PCIE_CLK_USB3	106	

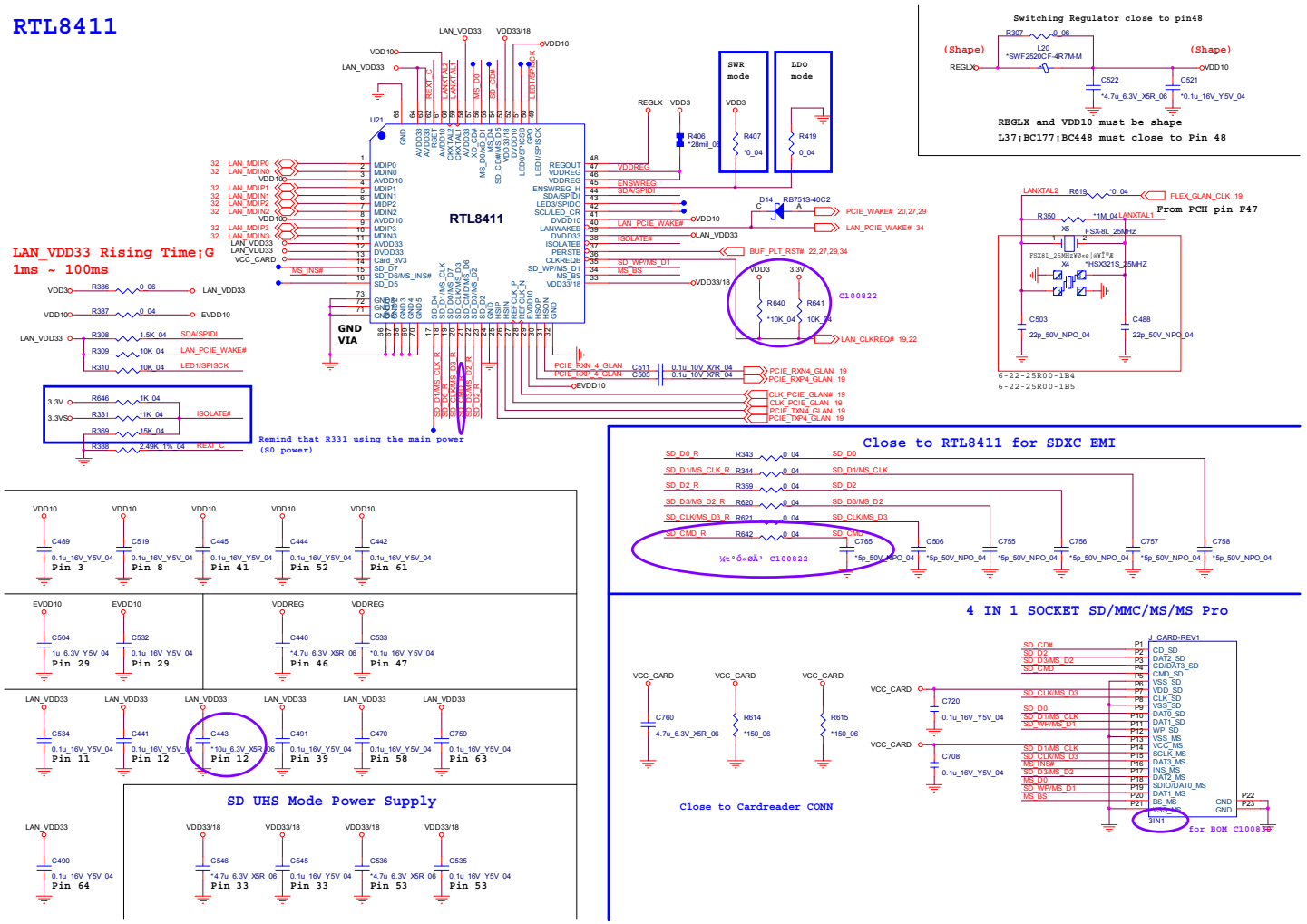
Internal Chip Trace Length Mismatch

Ball no	NetName	Bondwire Length(m il)	Difference(m il)
B15	U3TX1#	96	20
A17	U3TX1	116	
B16	U3RX1#	91	20
A18	U3RX1	111	
B18	U2DM1	83	22
A20	U2DP1	105	
B10	U3TX2#	73	31
A11	U3TX2	104	
A10	U3RX2#	94	27
B9	U3RX2	67	
A13	U2DM2	127	34
B12	U2DP2	93	

USB3.0 Layout Guidelines:

1. USB3.0 Differential trace impedance: 90ohm
2. Differential pairs The USB3.0 the total trace skew less than 5 mils.
3. IC pad to USB Connector total length < 4"(Max)
4. USB3.0 Capacitor 0.1u_10V_X7R_04 Close to Connector.
5. PCIe Differential impedance 85 ohm.
6. PCIe For transmitter and receiver the total trace length: 1"(Min)~6"(Max).
7. PCIe Number of vias 4via hole(Max).
8. PCIe clock Differential impedance 100 ohm.
9. PCIe Differential pairs and pairs spacing 20mils, with Other trace spacing 25mils.
10. Power Trace width-20mils, Spacing-80 mils.

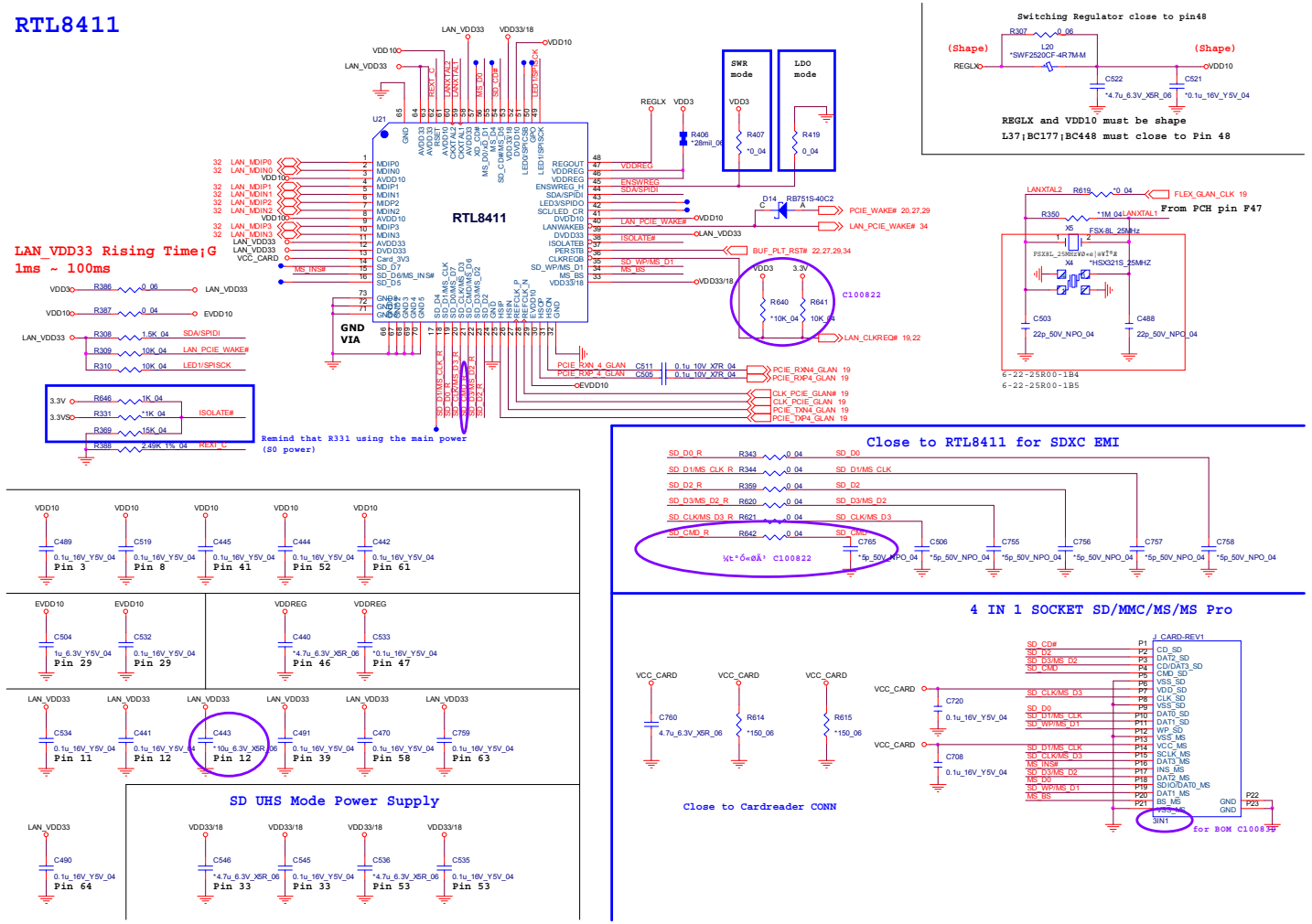
Card Reader (RTL8411)



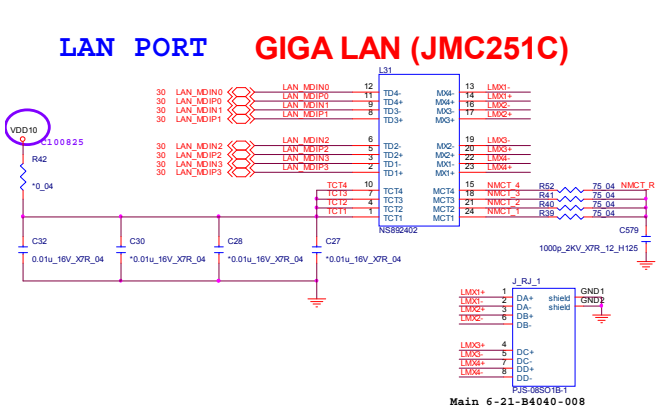
Sheet 30 of 50
Card Reader (RTL8411)

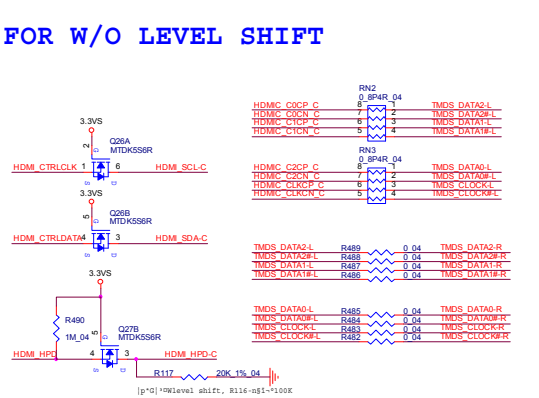
SATA ODD, LED, USB CHARGE

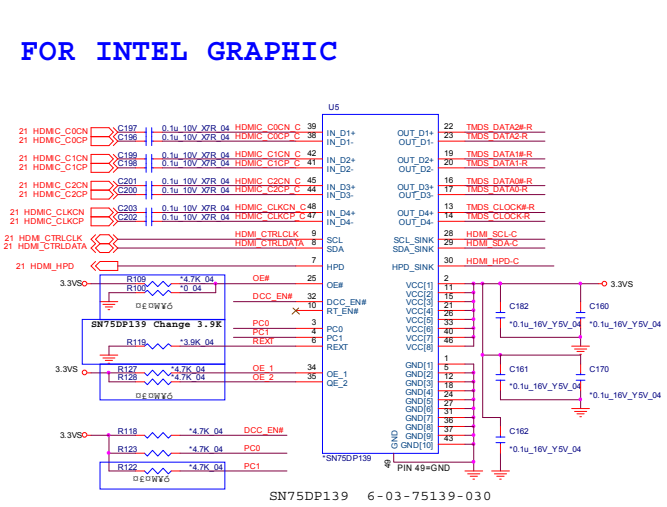
Sheet 31 of 50
SATA ODD, LED,
USB CHARGE

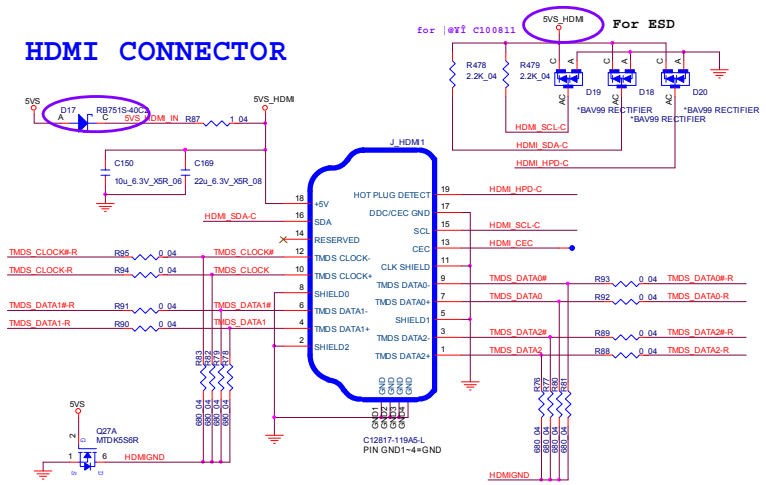


HDMI, RJ45





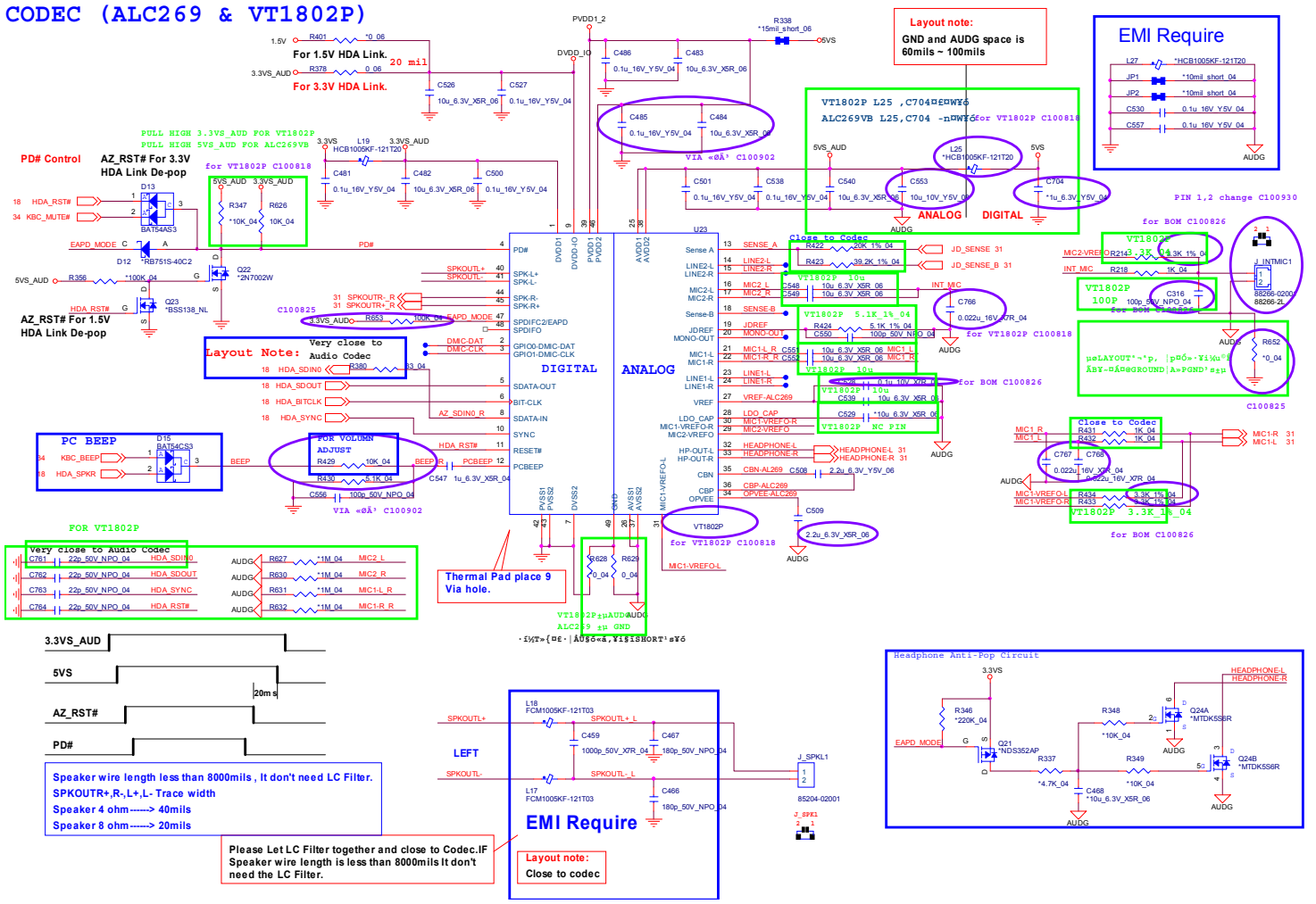




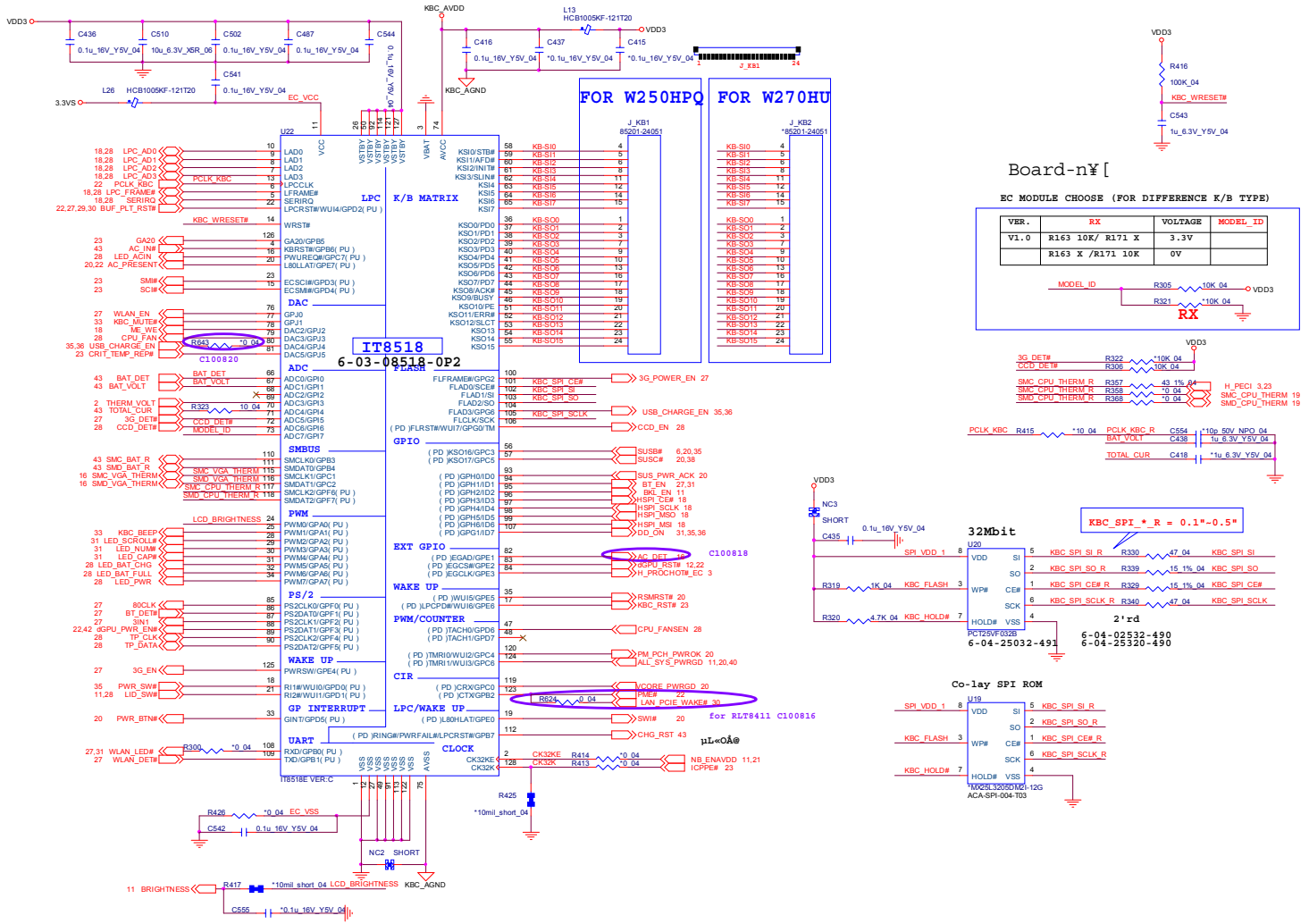
Sheet 32 of 50
HDMI, RJ45

AUDIO CODEC VT1802P

Sheet 33 of 50
AUDIO CODEC
VT1802P



KBC-ITE IT8518E

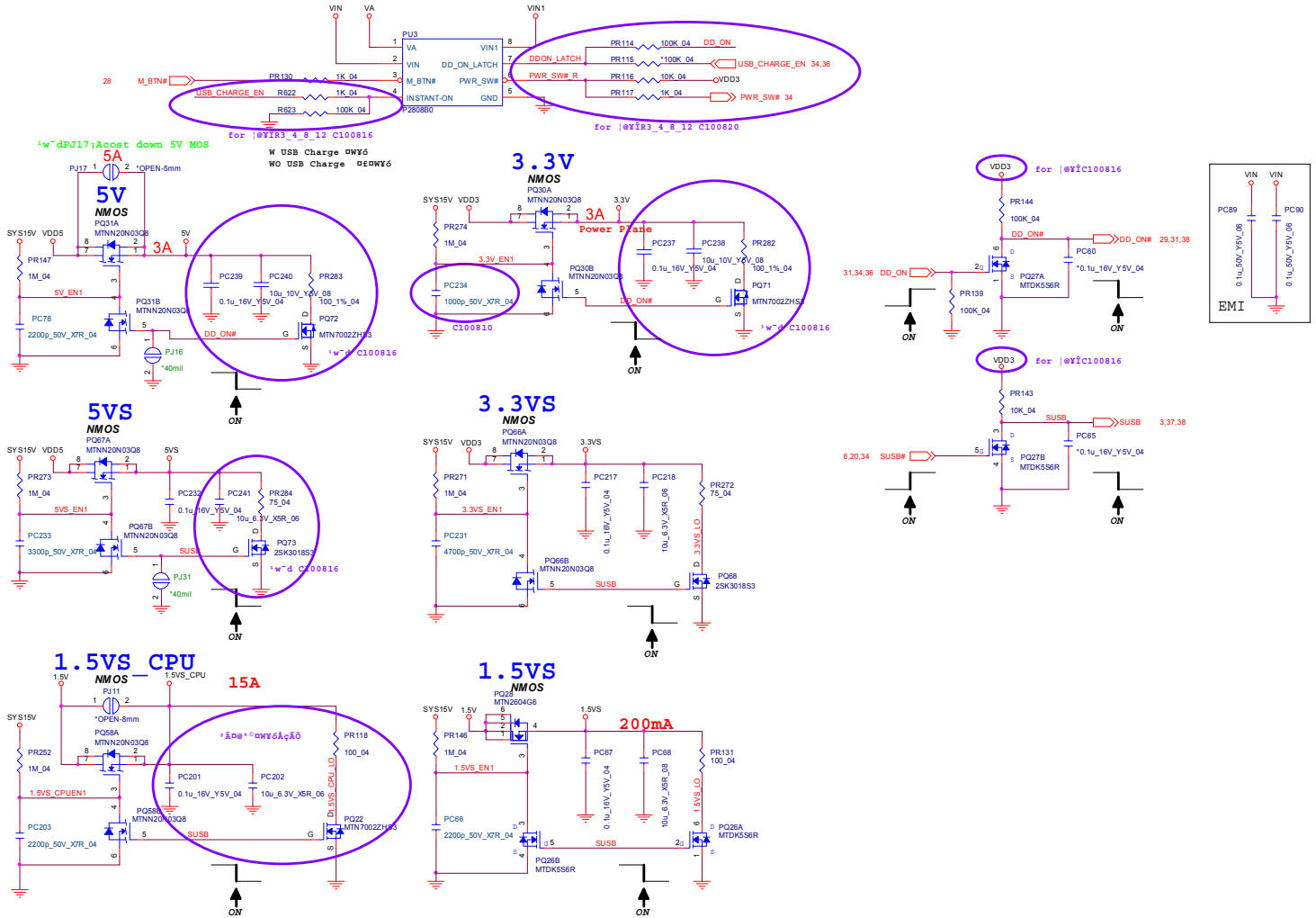


Sheet 34 of 50
KBC-ITE IT8518E

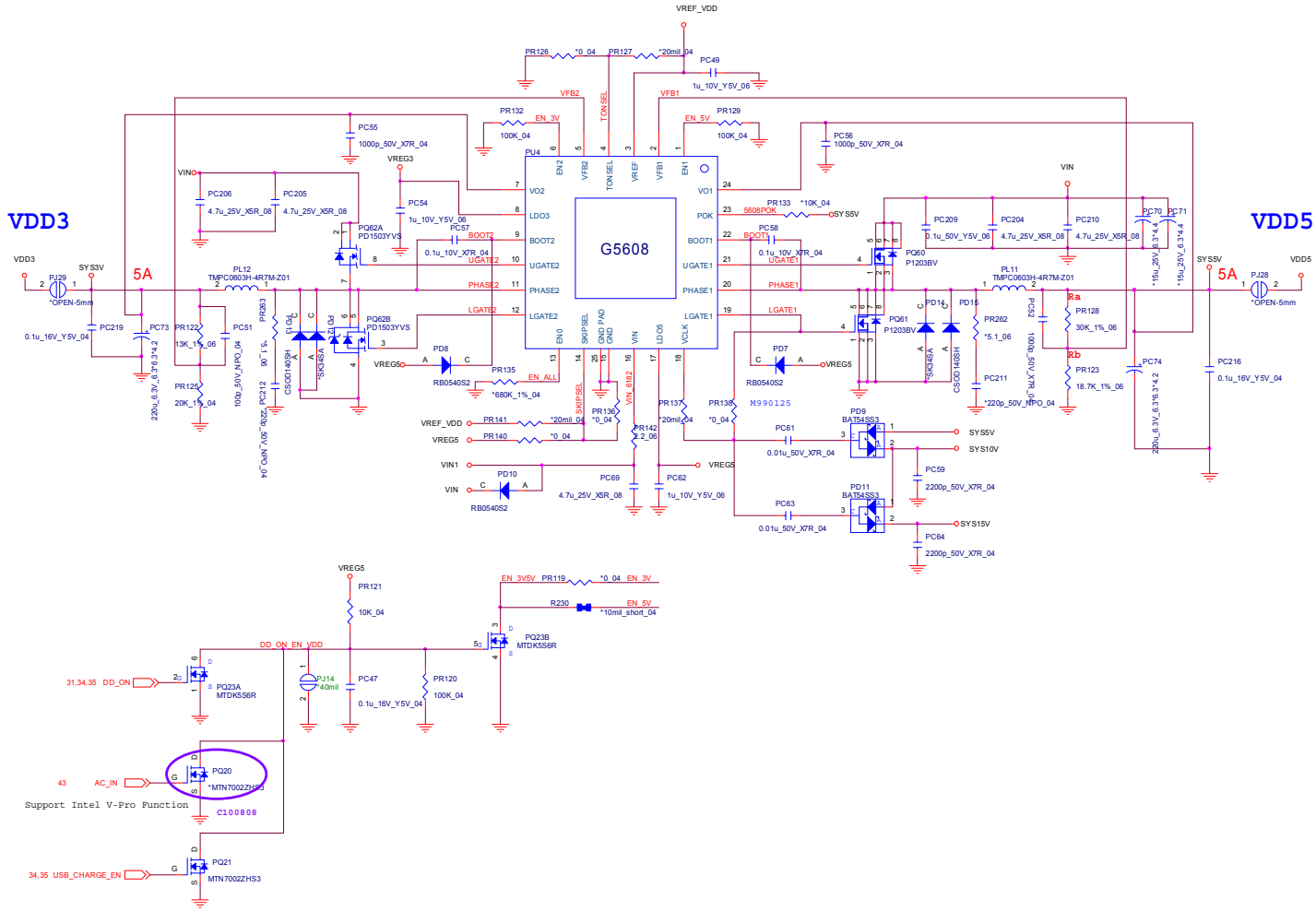
B.Schematic Diagrams

5VS, 3VS, 1.5VS CPU

Sheet 35 of 50
5VS, 3VS, 1.5VS CPU



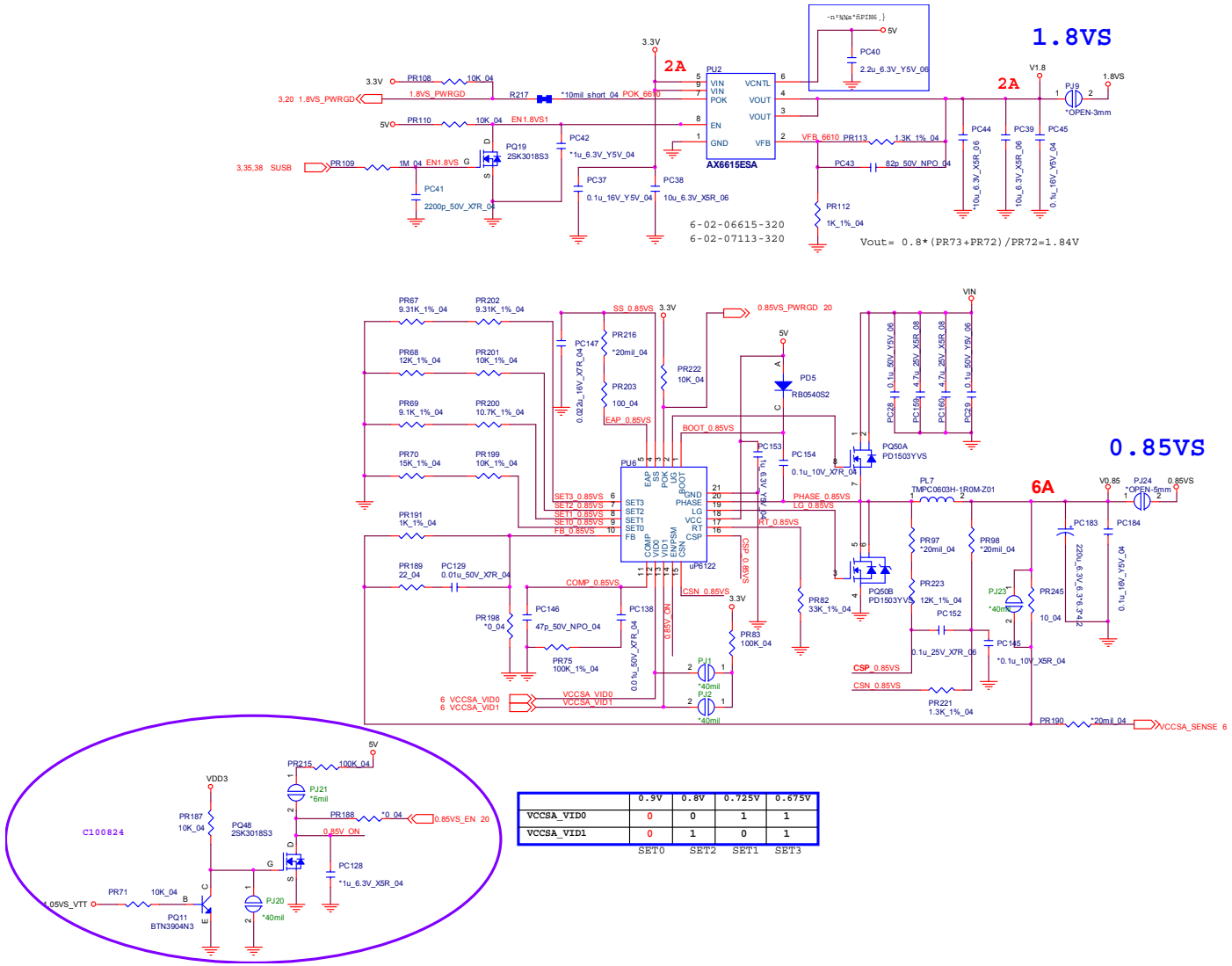
VDD3, VDD5



Sheet 36 of 50
VDD3, VDD5

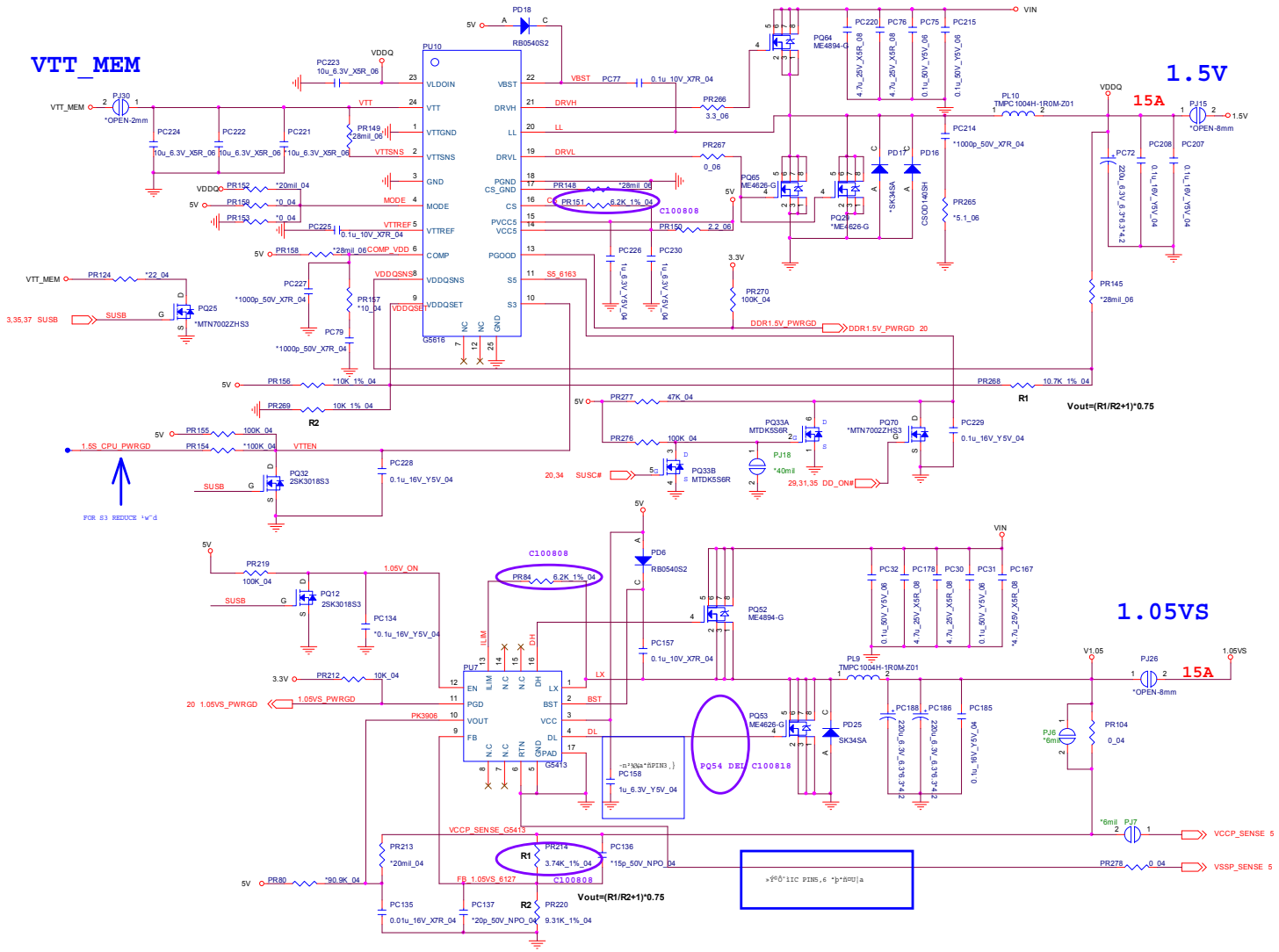
Power 0.85VS, 1.8VS

Sheet 37 of 50
Power 0.85VS, 1.8VS



	0.9V	0.8V	0.725V	0.675V
VCCSA_VID0	0	0	1	1
VCCSA_VID1	0	1	0	1
	SET0	SET2	SET1	SET3

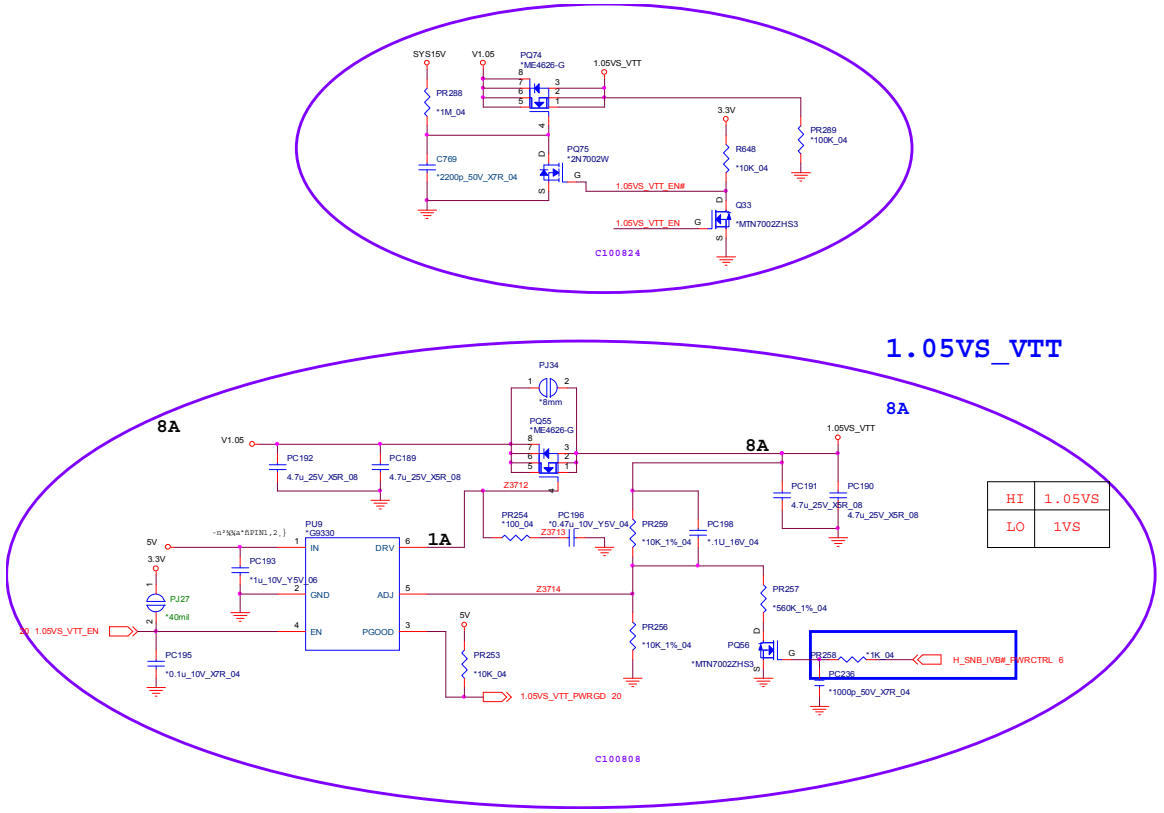
POWER 1.5V/1.05VS



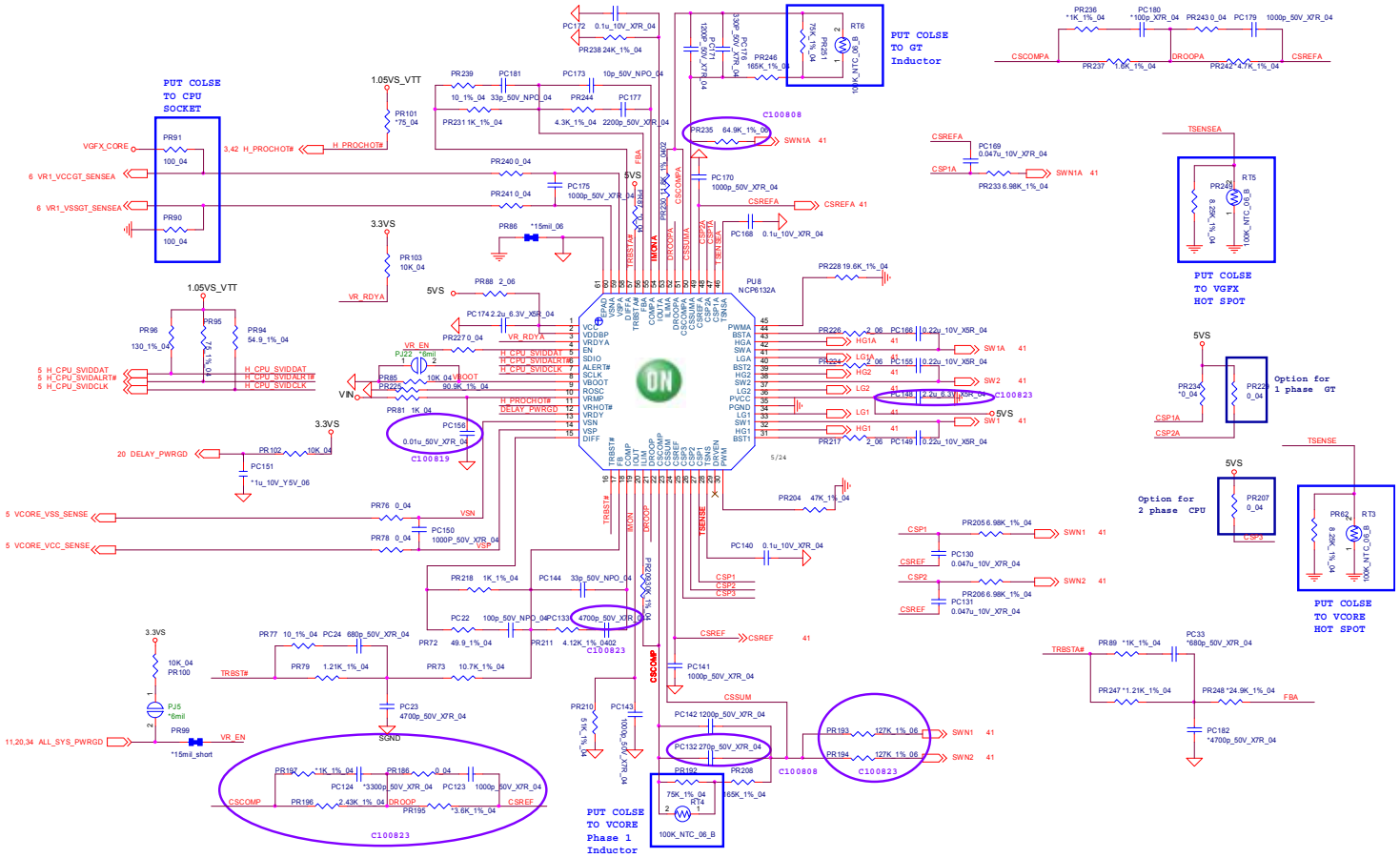
Sheet 38 of 50
POWER 1.5V/
1.05VS

POWER 1.05V/1.05VS VTT

Sheet 39 of 50
POWER 1.05VS/
1.05VS VTT



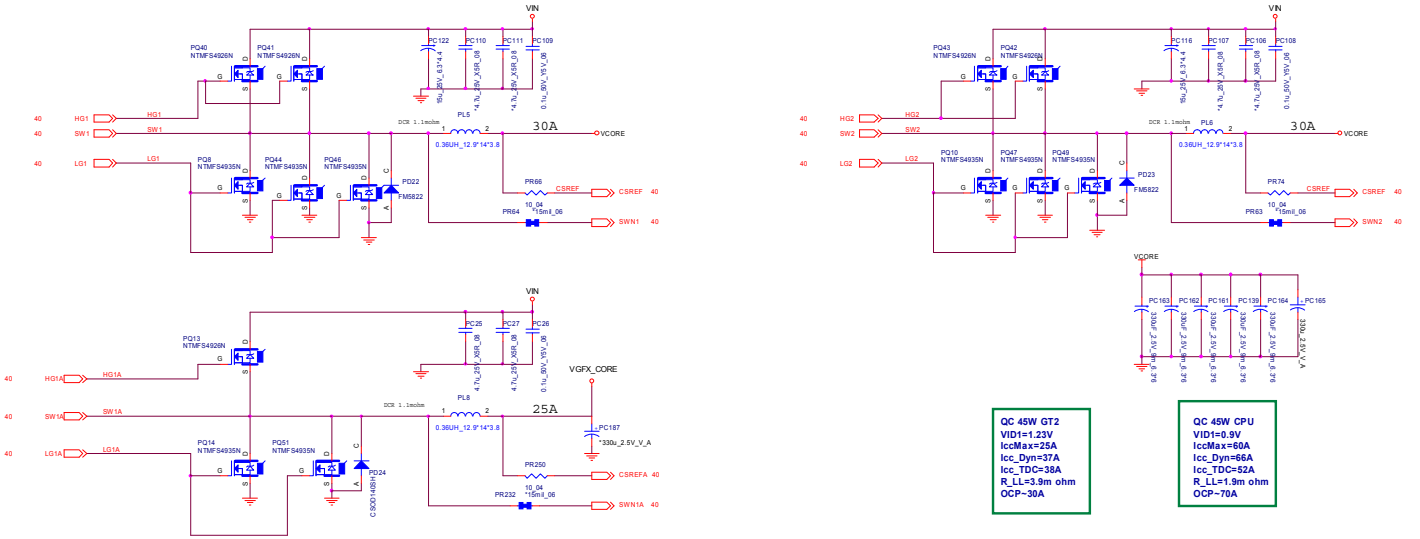
POWER VCORE1



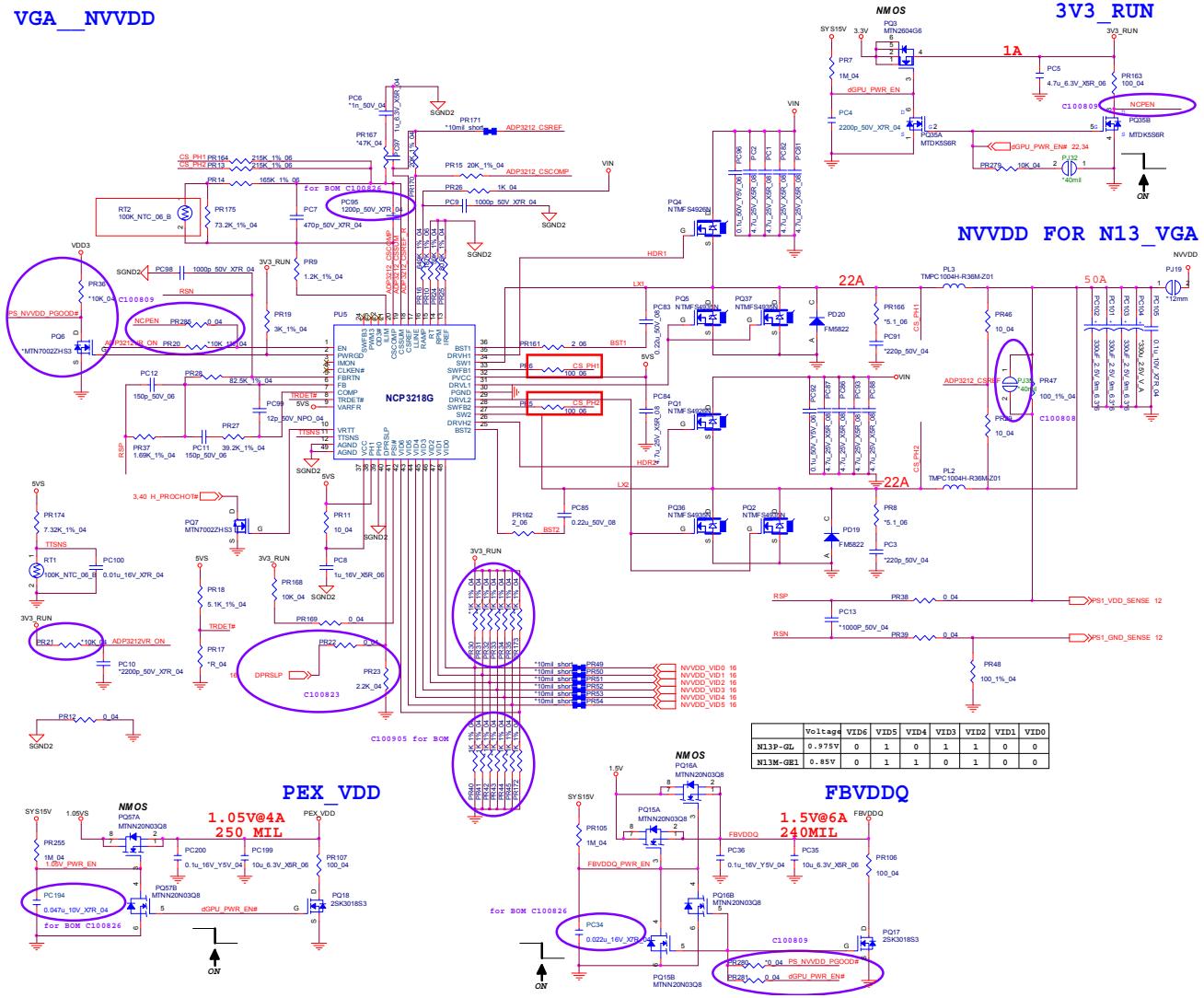
Sheet 40 of 50
POWER VCORE1

POWER VCORE2

Sheet 41 of 50
POWER VCORE2



Power VGA NVVDD/PEX_VDD



	Voltage	VID6	VID5	VID4	VID3	VID2	VID1	VID0
N13P-GL	0.975V	0	1	0	1	1	0	0
N13M-GE1	0.85V	0	1	1	0	1	0	0

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Power VGA
NVVDD/PEX_VDD

AC IN, CHARGER

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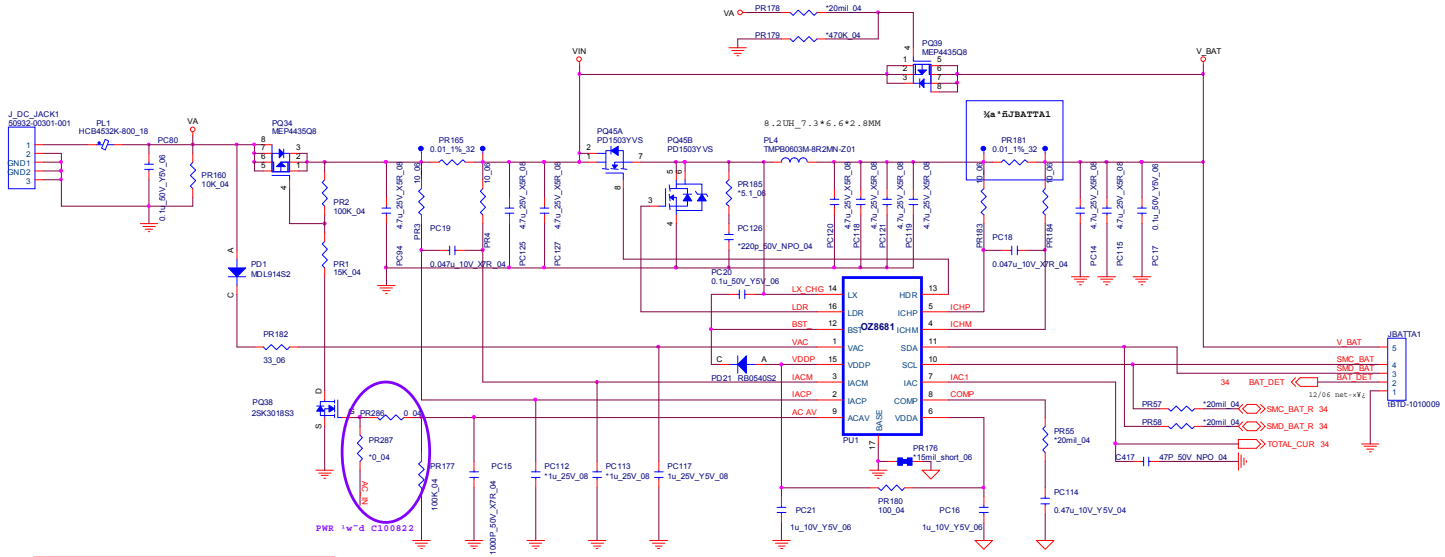
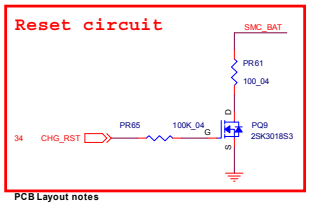
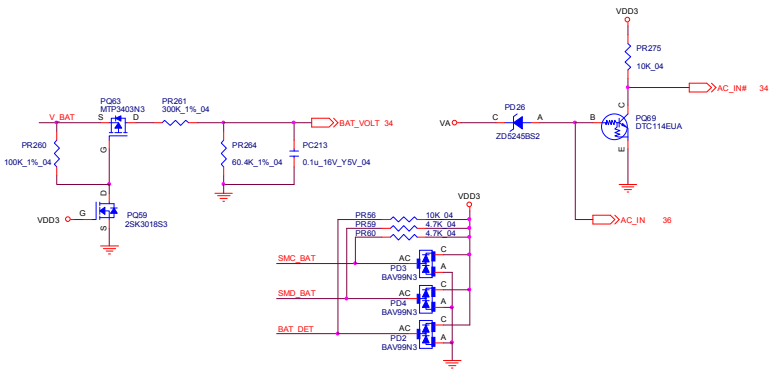
AC IN, CHARGER







PCB Layout notes

1) All pow er traces should be routed on the outer layers GNDP, VAD, VSYS, LX, VCHG, VBATT

2) Use Kelvin connections for R3, R4 (seperate force and measurement traces)

3) R23 and R24 are dummy resistors, for layout purposes only (serves as single point connection betw een GNDP & GNDA)

4) Footprint TO-236 is equivalent to SOT-23

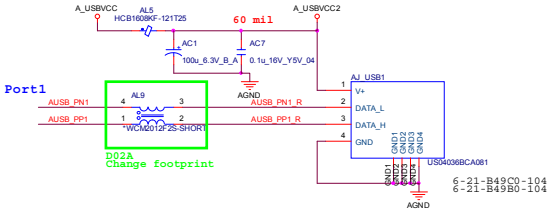
5) Footprint SIP1P is a single hole axial pad

6) All resisitors, capacitors and semiconductors are SMD

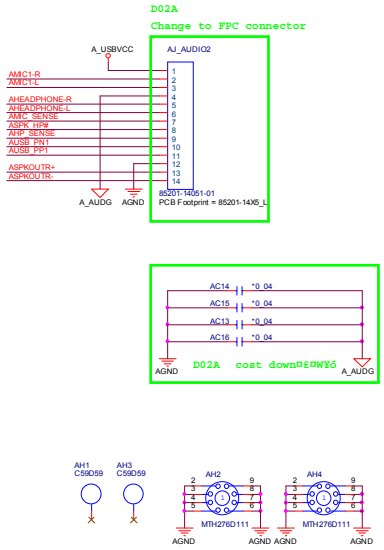
7) Potentiometers, and test points are axial devices

AUDIO BOARD

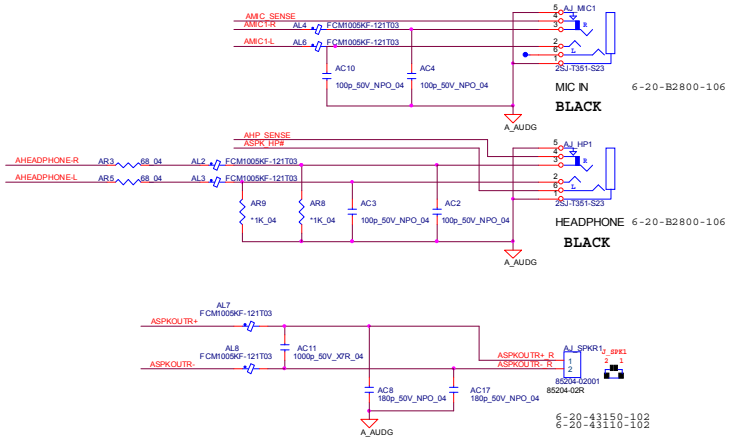
USB PORT



TO M/B



AUDIO JACK



Sheet 44 of 50
AUDIO BOARD

CLICK BOARD

CLICK BOARD

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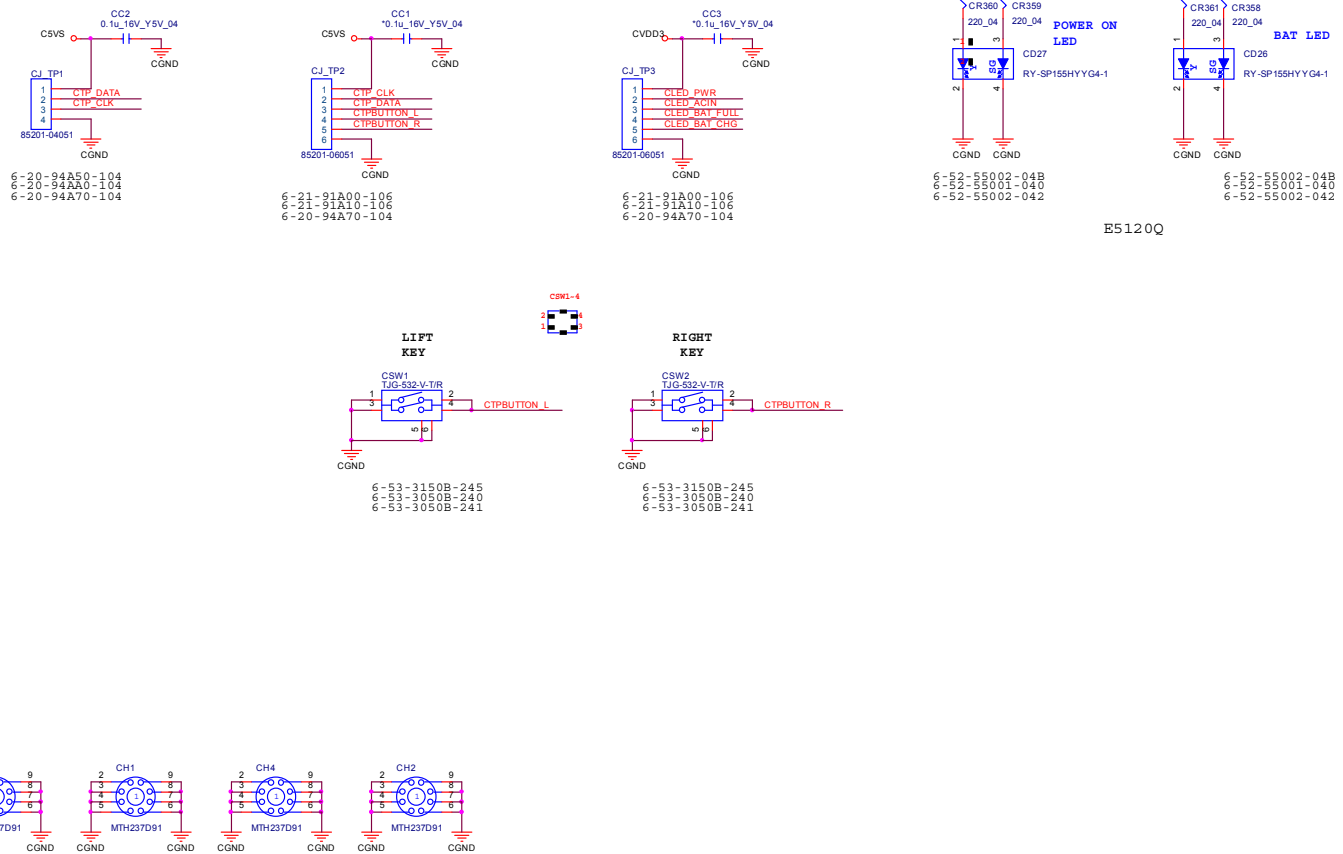
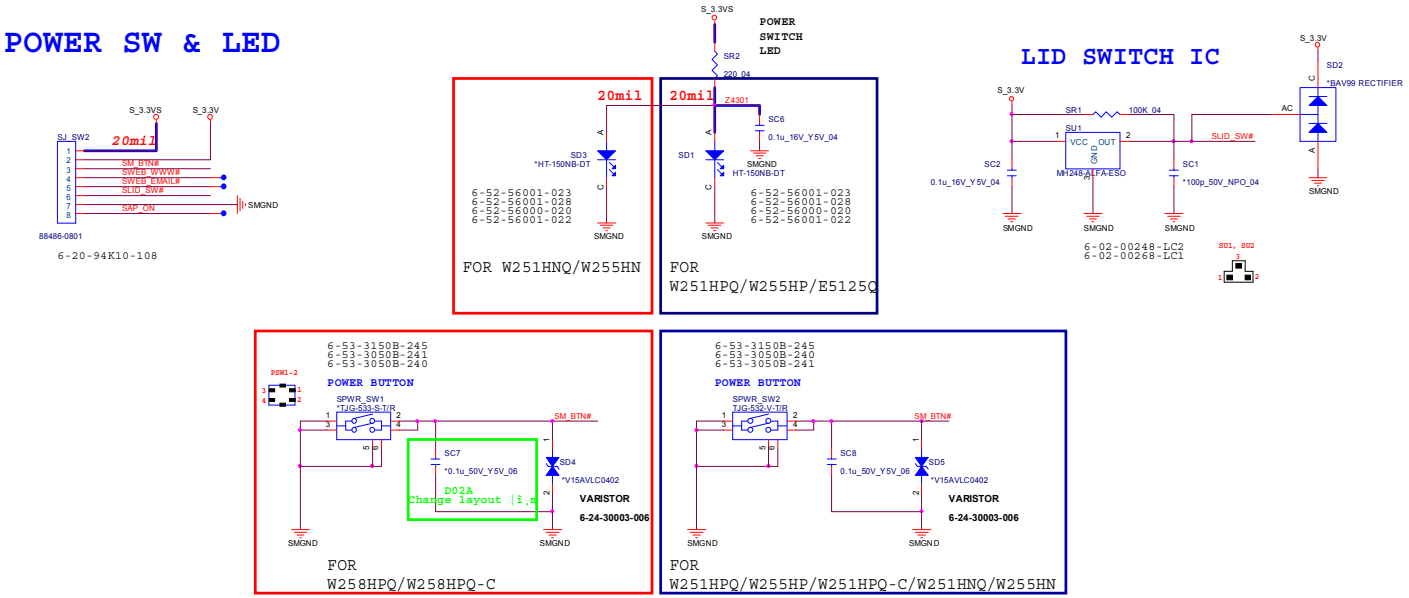
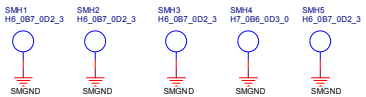
CLICK BOARD



W251HPQ POWER SW BOARD





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W251HPQ POWER
SW BOARD

W270HU BRIDGE ODD BOARD

ODD BOARD FOR W270HU

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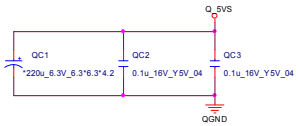
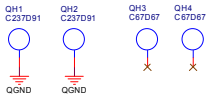
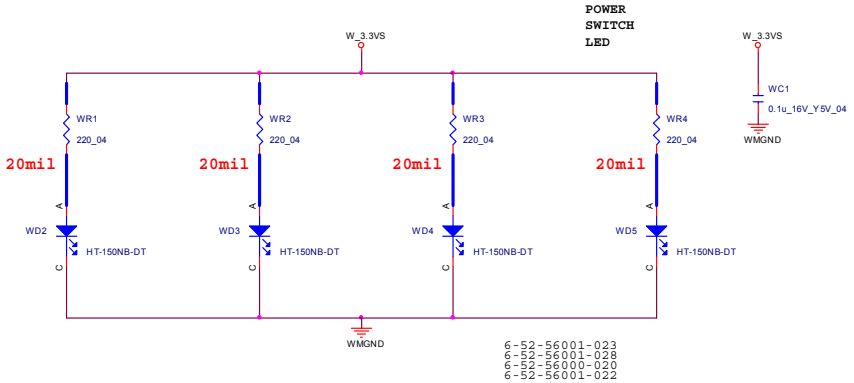
W270HU BRIDGE
ODD BOARD

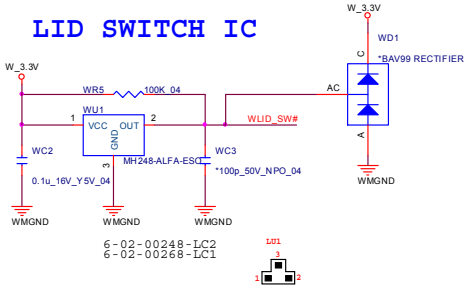


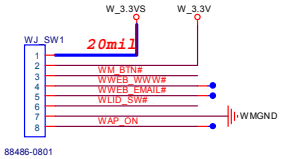


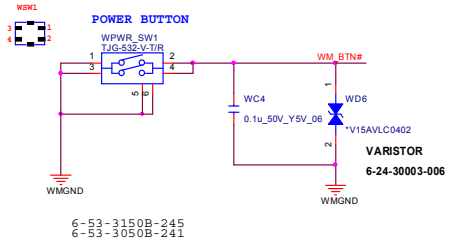
W270HU POWER SW BOARD

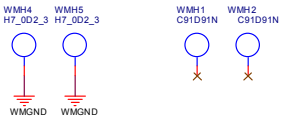
POWER SW & LED











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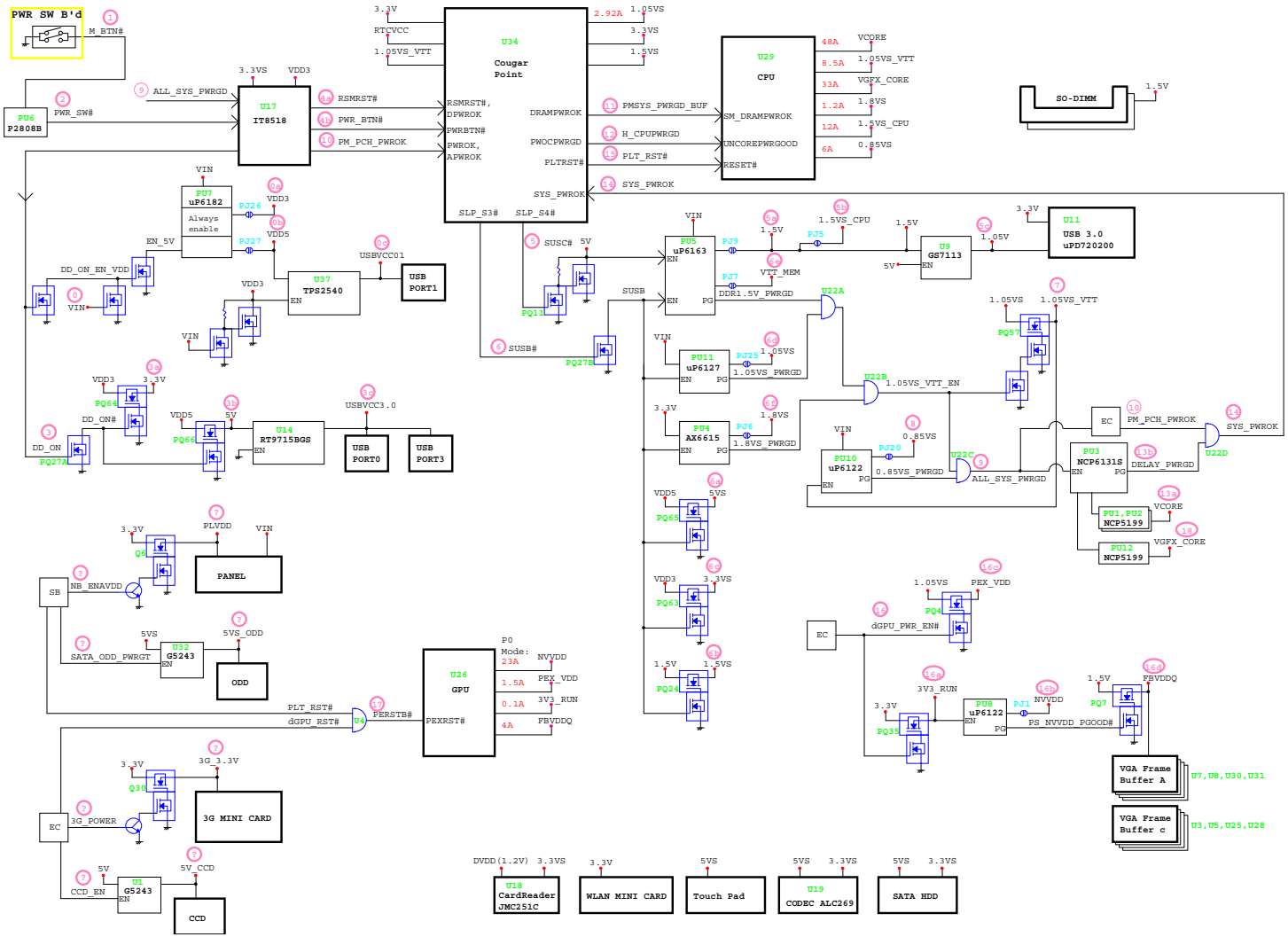
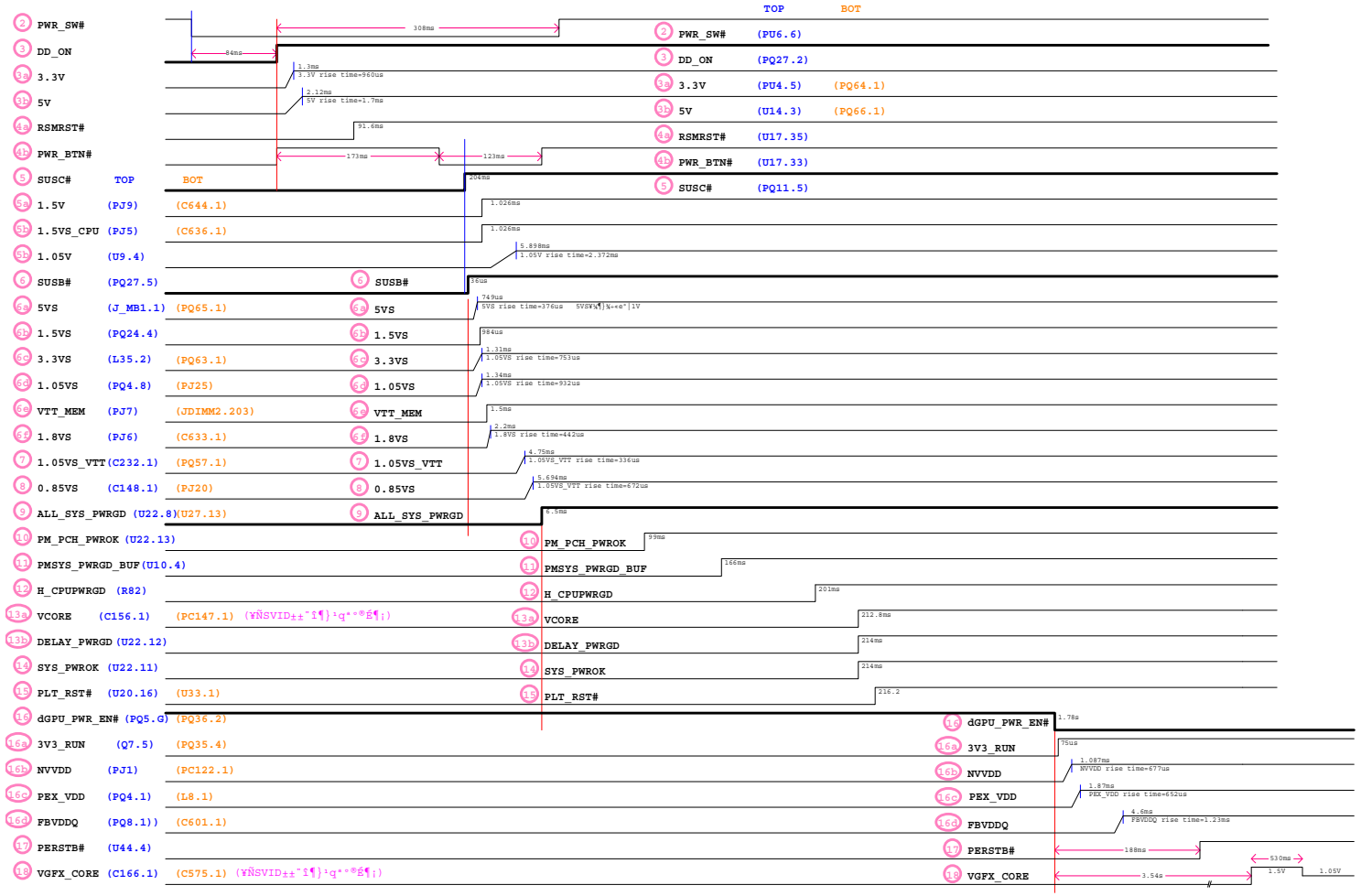
W270HU POWER SW BOARD

Power Diagram

Sheet 49 of 50
Power Diagram



Power On SEQ



Sheet 50 of 50
Power On SEQ

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 "**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.