SERVICE MANUAL

notebook

N870EK1 / N871EK1

Notebook Computer

N870EK1 / N871EK1

Service Manual

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HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

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 ***N870EK1 / N871EK1*** series notebook PC.

The following information is included:

Chapter 1, Introduction, provides general information about the location of system elements and their specifications.
Chapter 2, Disassembly, provides step-by-step instructions for disassembling parts and subsystems and how to upgrade elements of the system.

Appendix A, Part Lists
Appendix B, Schematic Diagrams
Appendix C, Updating the FLASH ROM BIOS

IMPORTANT SAFETY INSTRUCTIONS

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

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

- AC Input of 100 - 240V, 50 - 60Hz, DC Output of 19.5V, 6.15A (**120** Watts) minimum AC/DC Adapter.

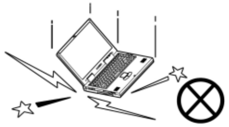
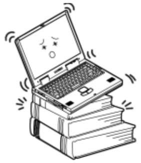
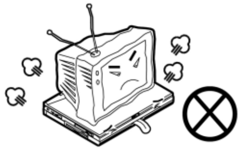
FCC Statement

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

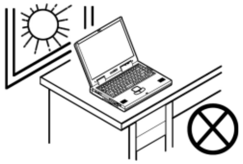
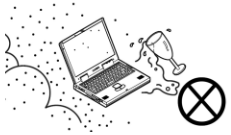
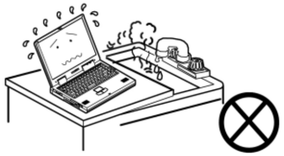
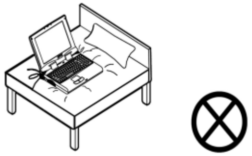
Instructions for Care and Operation

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

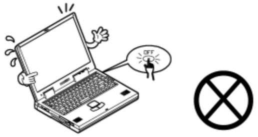
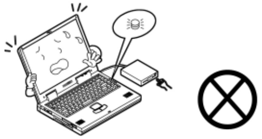
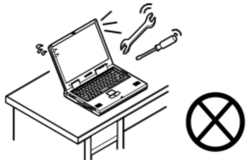
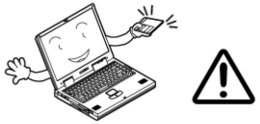
1. **Don’t drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.

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.* 

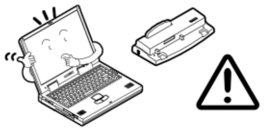
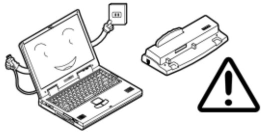
2. **Keep it dry, and don’t overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

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.* 

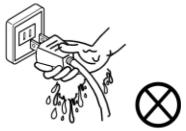
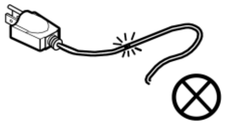
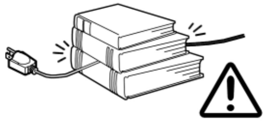
4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices**.

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.

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.* 

Power Safety Warning

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

Battery Precautions

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

Battery Guidelines

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

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

Battery Disposal

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

Caution

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

Battery Level

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

Related Documents

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

User’s Manual on CD/DVD
This describes the notebook PC’s features and the procedures for operating the computer and its ROM-based setup program. It also describes the installation and operation of the utility programs provided with the notebook PC.

System Startup

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

Powering the Computer On

After every disassembly, make sure that the bottom case’s screws are all inserted and tightened before turning the computer on.

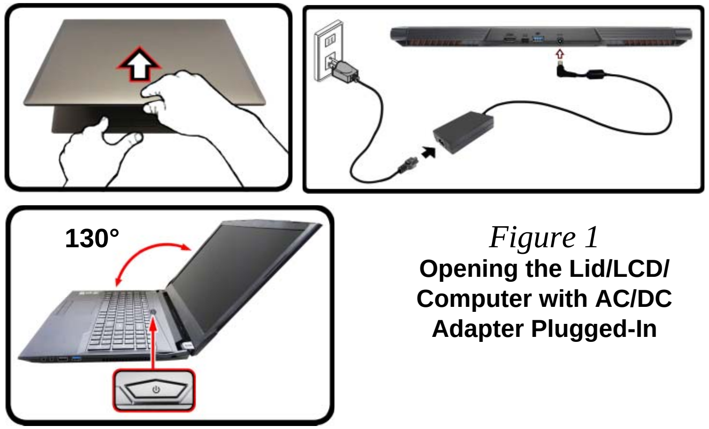


Figure 1
Opening the Lid/LCD/ Computer with AC/DC Adapter Plugged-In

Shut Down

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

Click the icon ⏻ in the **Start Screen** and choose **Shut down** from the menu.

Or

Right-click the **Start button** ⊞ at the bottom of the **Start Screen** or the **Desktop** and choose **Shut down or sign out > Shut down** from the context menu.

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Chapter 1: Introduction

Overview

This manual covers the information you need to service or upgrade the ***N870EK1 / N871EK1*** 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. *Windows 10,* etc.) have their own manuals as do application softwares (e.g. word processing and database programs). If you have questions about those programs, you should consult those manuals.

The ***N870EK1 / N871EK1*** 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
i7-8750H (2.20GHz)
9MB Smart Cache, **14nm**, DDR4-2666MHz, TDP 45W
Intel® Core™ i5 Processor
i5-8300H (2.30GHz)
9MB Smart Cache, **14nm**, DDR4-2666MHz, TDP 45W

Core Logic

Intel® HM370 Express Chipset

BIOS

128Mb SPI Flash ROM
AMI BIOS

Memory

Two 260 Pin SO-DIMM Sockets Supporting **DDR4 2400/ DDR4 2666MHz** Memory

Memory Expandable up to 32GB

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

LCD Options

17.3" (43.94cm), 16:9, FHD (1920x1080)

Audio

High Definition Audio Compliant Interface
2 * Built-In Speakers
Built-In Array Microphone
Sound Blaster™ Cinema 5

Video Adapter

Intel® Integrated GPU and NVIDIA® Discrete GPU

Supports Microsoft Hybrid Graphics

Intel Integrated GPU
Intel® UHD Graphics 630
Dynamic Frequency
Intel Dynamic Video Memory Technology
Microsoft DirectX®12 Compatible

NVIDIA® Discrete GPU
NVIDIA® GeForce GTX 1050 Ti
4GB GDDR5 Video RAM on board
Microsoft DirectX® 12 Compatible

Storage

One Changeable 2.5" 7.0mm (h) SATA3 HDD/SSD

(**Factory Option**) One M.2 **SATA/PCIe Gen3 x4** Solid State Drive (SSD)

Security

Security (Kensington® Type) Lock Slot
(**Factory Option**) TPM v2.0
(**Factory Option**) Fingerprint Reader Module
Intel PTT for systems without hardware TPM

Keyboard

Full Size White LED Illuminated Keyboard with Numeric Pad (**Factory Option**)

Full Size Colored RGB LED Illuminated Keyboard with Numeric Pad (**Factory Option**)

Pointing Device

Built-in Touchpad

Interface

One USB 2.0 Port
One USB 3.0 (USB 3.1 Gen 1) Type-A Port
One USB 3.1 Gen 2 Type-A Port
One USB 3.1 Gen 2 Type-C Port*

One HDMI-Out Port
Two Mini DisplayPorts
One External Monitor Port
One Headphone-Out Jack
One Microphone-In Jack
One RJ-45 LAN Jack
One DC-in Jack

USB 3.1 Gen 2

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

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**

Communication

Built-In Gigabit Ethernet LAN
1.0M HD PC Camera Module
(**Factory Option**) 2.0M FHD PC Camera Module

WLAN/ Bluetooth M.2 Modules:

(**Factory Option**) Intel® Dual Band Wireless-AC 9260 Wireless LAN (**802.11ac**) + Bluetooth

(**Factory Option**) Intel® Dual Band Wireless-AC 9560 Wireless LAN (**802.11ac**) + Bluetooth

(**Factory Option**) Intel® Dual band Wireless-AC 9462 Wireless LAN (**802.11ac**) + Bluetooth

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: 19.5V, 6.15A (**120W**)

(**Factory Option**) Removable 6 Cell Smart Lithium-Ion Battery Pack, 62WH

(**Factory Option**) Removable 6 Cell Smart Lithium-Ion Battery Pack, 47WH

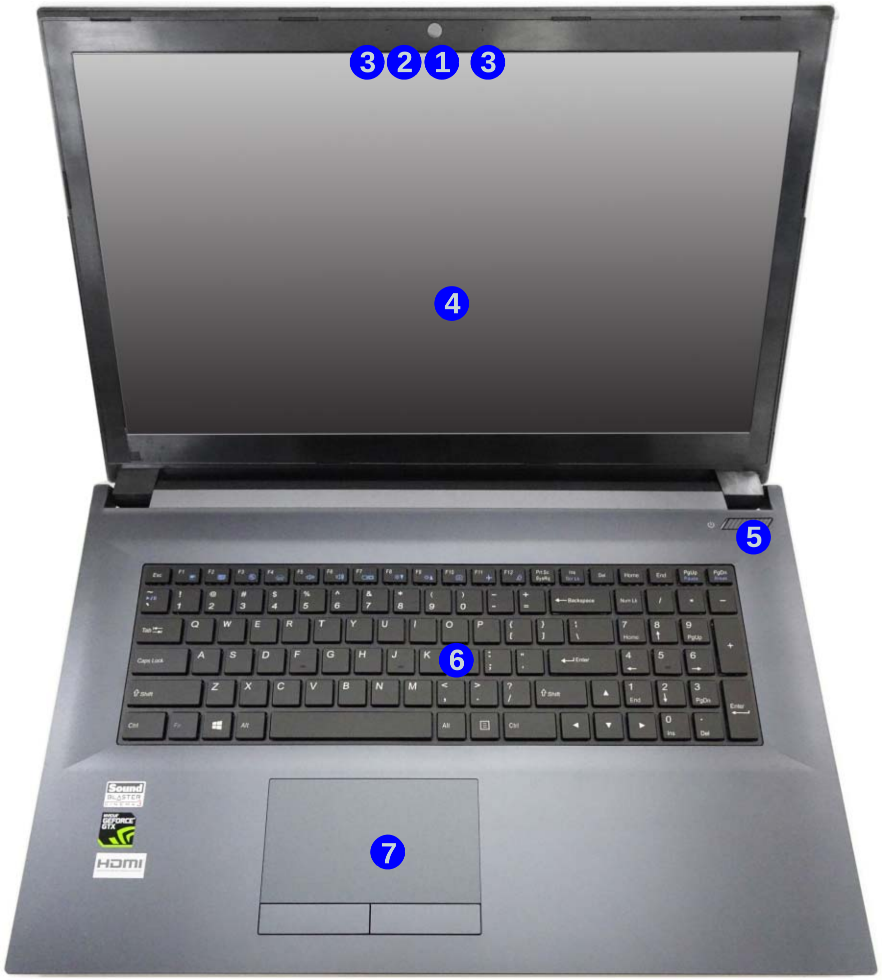
Dimensions & Weight

418.5mm (w) * 288.7mm (d) * 27.4mm (h)
2.9kg (Barebone with 47WH 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.*
3. Built-In Array Microphone
4. LCD
5. Power Button
6. Keyboard
7. Touchpad & Buttons



External Locator - Front & Right Side Views

Figure 2
Front View

1. LED Indicator

FRONT VIEW

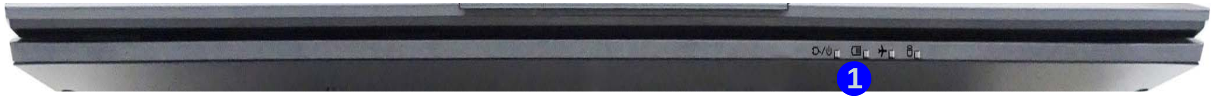
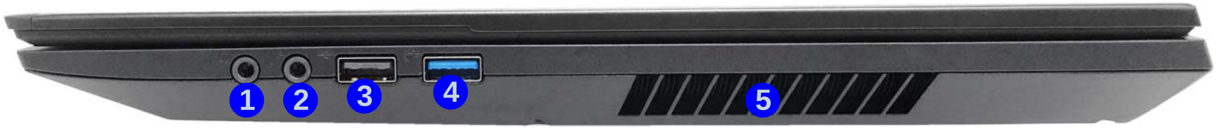


Figure 3
Right Side View

1. Headphone-Out Jack
2. Microphone-In Jack
3. USB 2.0 Port
4. USB 3.0 (USB 3.1 Gen 1) Type A Port
5. Vent

RIGHT SIDE VIEW



External Locator - Left Side & Rear View

Figure 4
Left Side View

1. Security Lock Slot
2. DC-In Jack
3. RJ-45 LAN Jack
4. Mini Display Port
5. HDMI-Out Port
6. USB 3.1 Gen 2 Type C Port
7. USB 3.1 Gen 2 Type A Port
8. Multi-in-1 Card Reader

LEFT SIDE VIEW

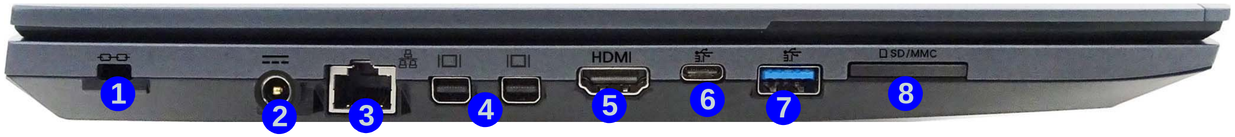
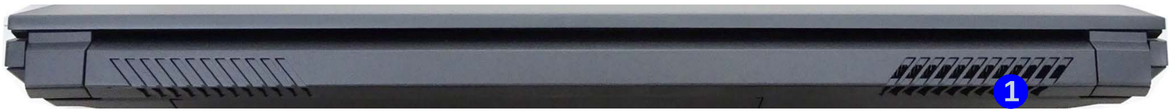


Figure 5
Rear View

1. Vent

REAR VIEW



External Locator - Bottom View

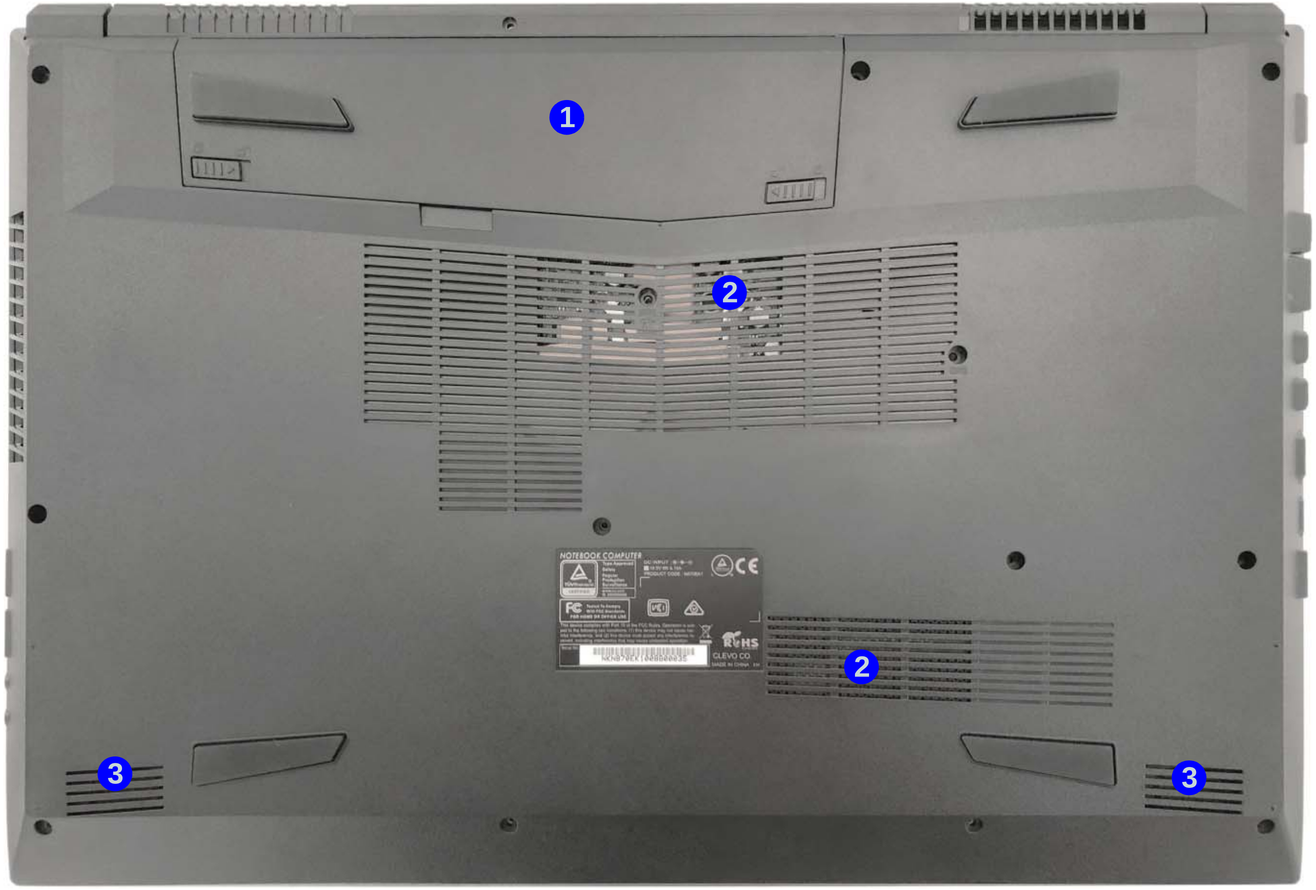


Figure 6
Bottom View

1. Battery
2. Vent
3. Speakers

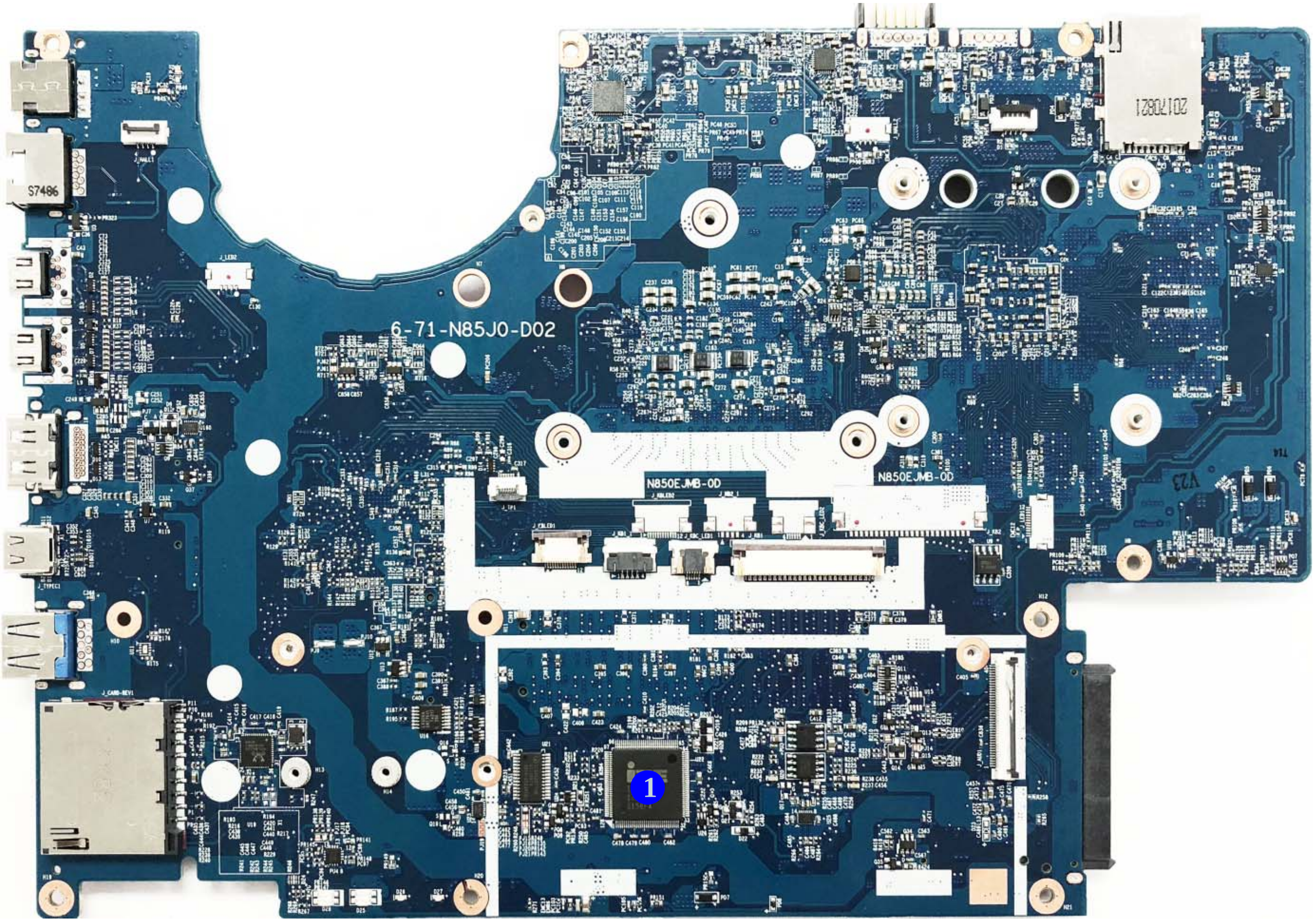
Overheating

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

Mainboard Overview - Top (Key Parts)

Figure 7
Mainboard Top Key Parts

1. KBC-ITE IT8587


6-71-N85J0-D02
N850EJMB-0D
N850EJMB-0D
1

Mainboard Overview - Bottom (Key Parts)

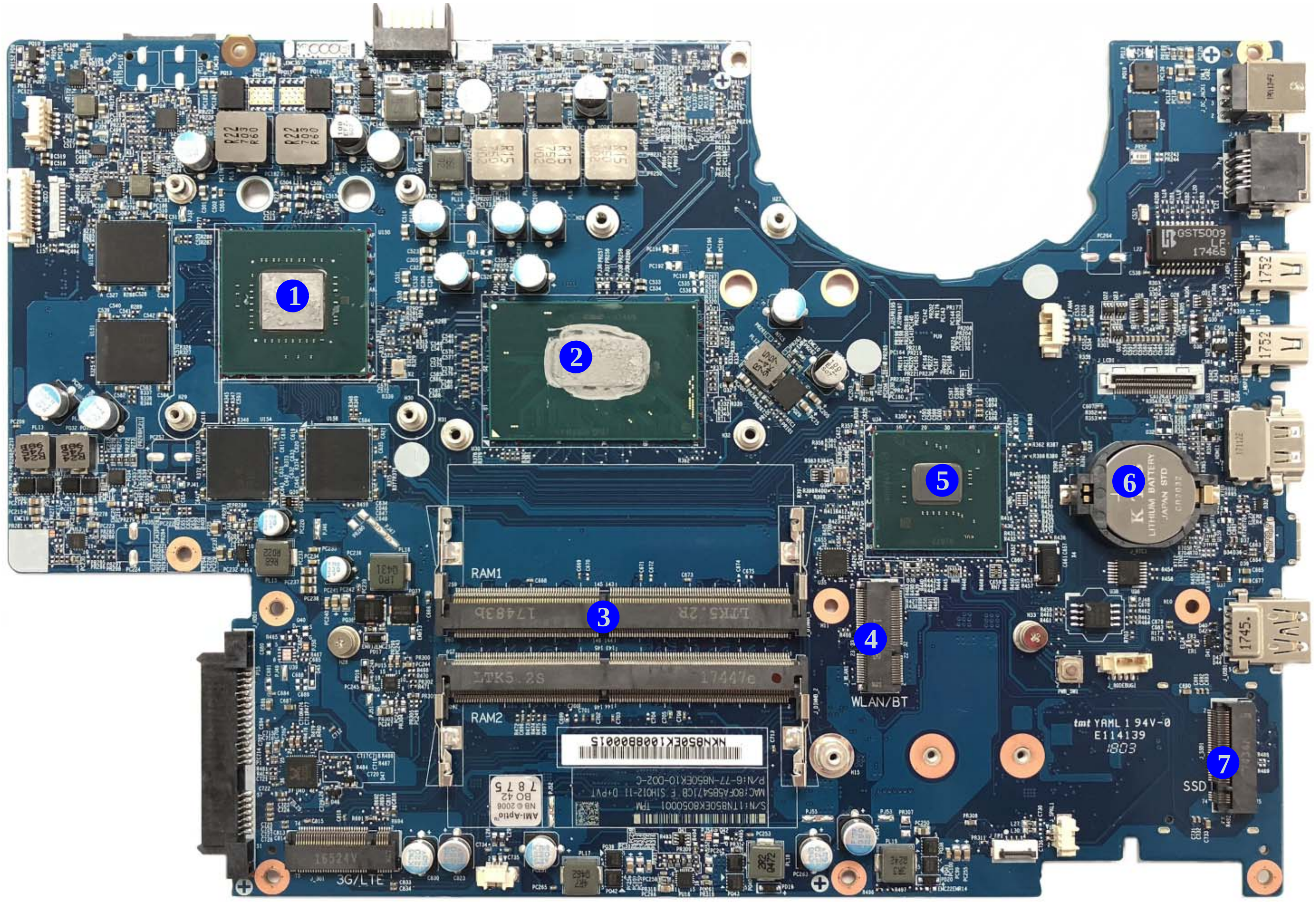

1
2
3
4
5
6
7
RAM1
RAM2
WLAN/BT
SSD
3G/LTE

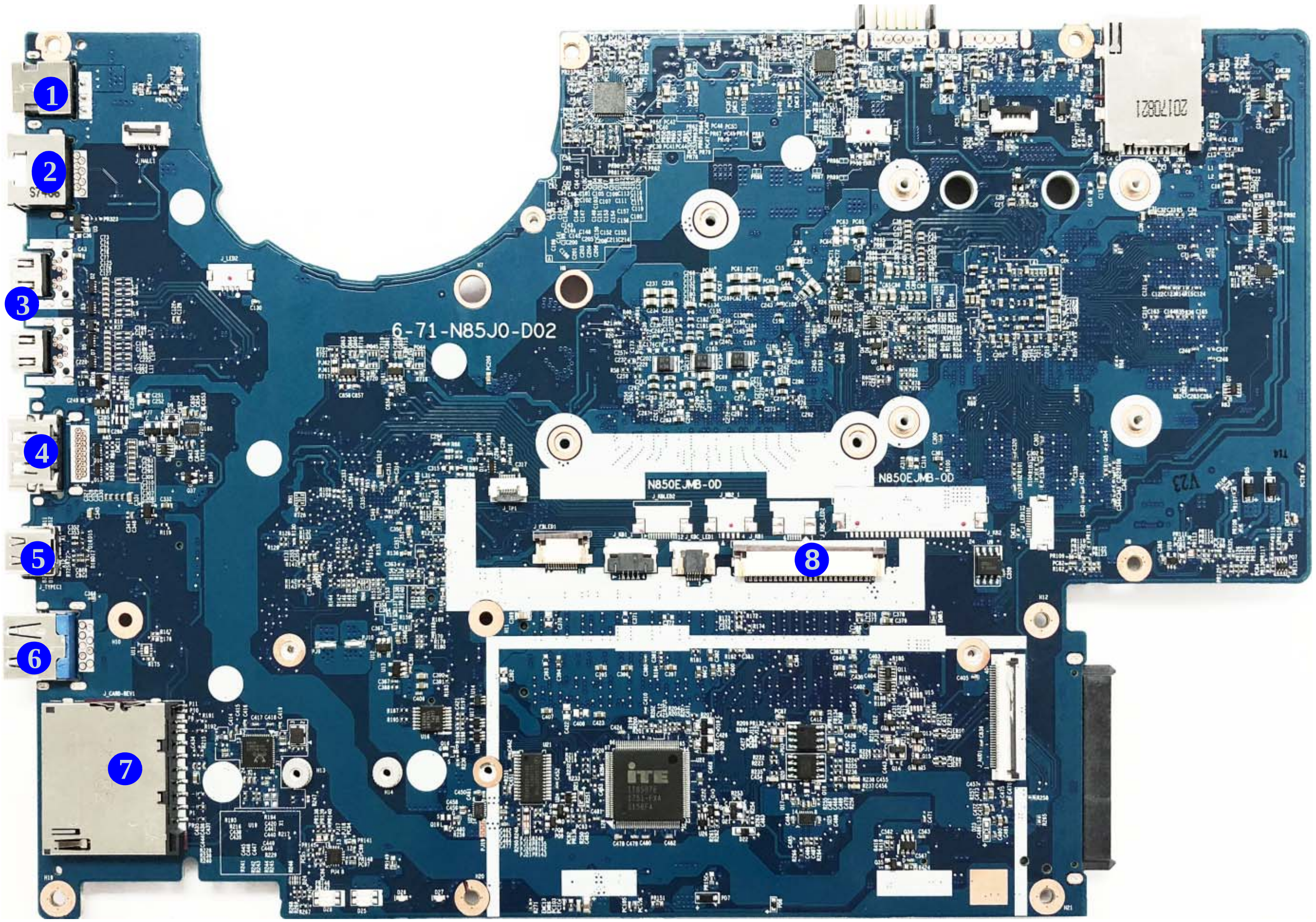
Figure 8
Mainboard Bottom Key Parts

1. GPU
2. CPU
3. Memory Slots DDR4 SO-DIMM
4. Mini-Card Connector (WLAN Module)
5. PCH
6. CMOS Battery
7. M.2-Card Connector (SSD Module)

Mainboard Overview - Top (Connectors)

Figure 9
Mainboard Top Connectors

1. DC-In Jack
2. RJ-45 LAN Jack
3. External Display Port
4. HDMI-Out Port
5. USB Port 3.0/3.1 (Type C) Connector
6. USB Port 3.0/3.1 (Type A) Connector
7. Multi-in-1 Card Reader
8. Keyboard Cable Connector


1
2
3
4
5
6
7
8
6-71-N85J0-D02
N850EJMB-0D
N850EJMB-0D

Mainboard Overview - Bottom (Connectors)

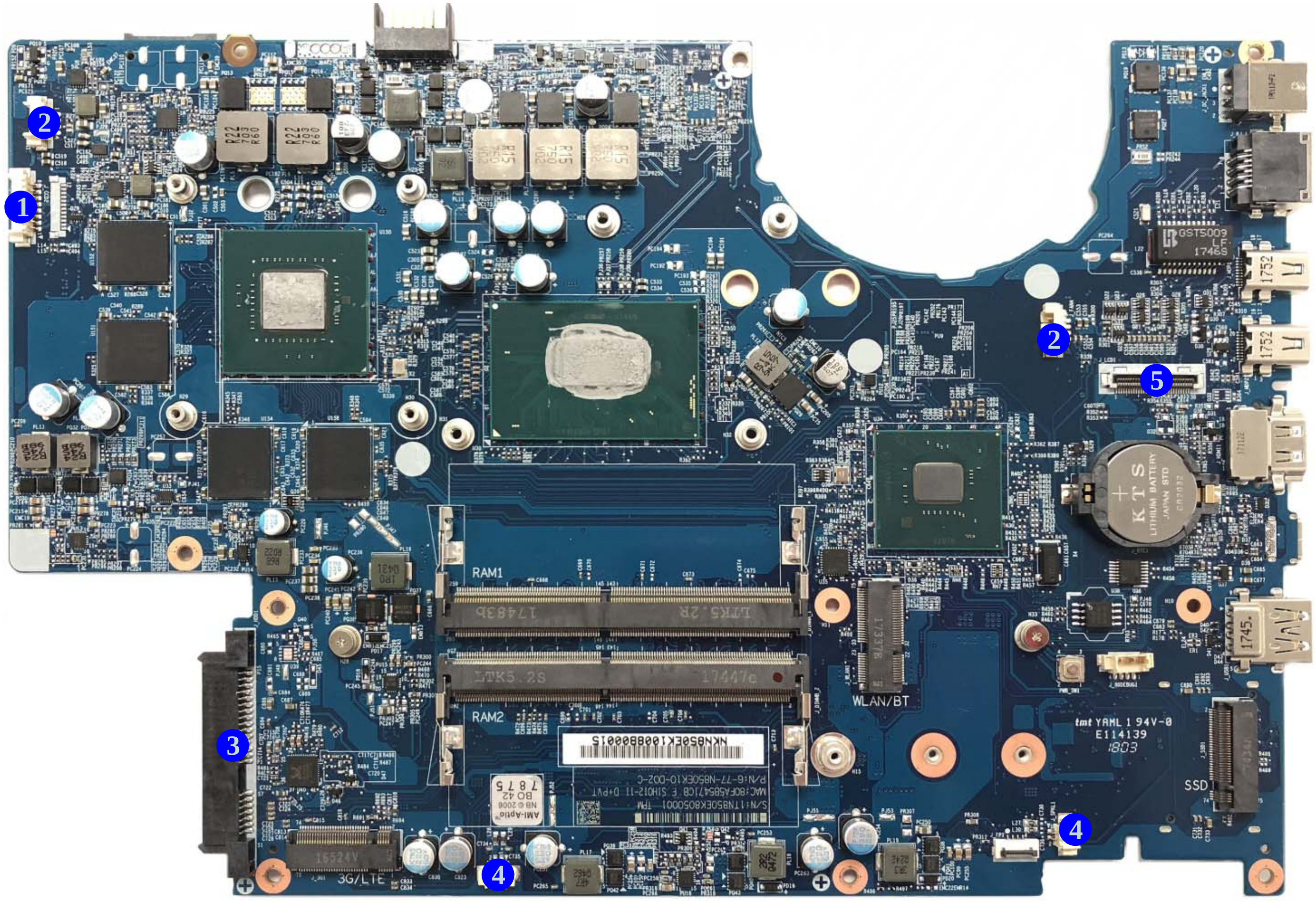

2
1
2
5
3
4
4
RAM1
RAM2
WLAN/BT
SSD
3G/LTE

Figure 10
Mainboard Bottom Connectors

1. CCD Connector
2. Fan Connector
3. HDD Connector
4. Speaker Connector
5. LCD Connector

Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the ***N870EK1 / N871EK1*** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

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

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

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

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

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

✎
Information

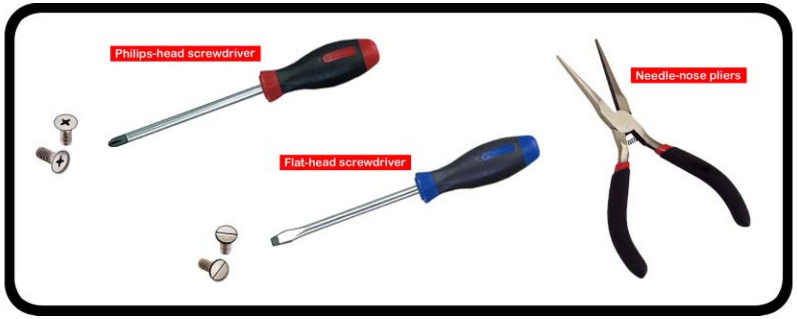
🔔
Warning

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.

(For Computer Models Supplied with Light Blue Cleaning Cloth) Some computer models in this series come supplied with a light blue cleaning cloth. To clean the computer case with this cloth follow the instructions below.

- Power off the computer and peripherals.
- Disconnect the AC/DC adapter from the computer.
- Use a little water to dampen the cloth slightly.
- Clean the computer case with the cloth.
- Dry the computer with a dry cloth, or allow it time to dry before turning on.
- Reconnect the AC/DC adapter and turn the computer on.

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 Keyboard:

1. Remove the keyboard	*page 2 - 6*

To remove the HDD:

1. Remove the battery	*page 2 - 5*
2. Remove the HDD	*page 2 - 7*

To remove the System Memory:

1. Remove the battery	*page 2 - 5*
2. Remove the HDD	*page 2 - 7*
3. Remove the system memory	*page 2 - 9*

To remove the M.2 SSD:

1. Remove the battery	*page 2 - 5*
2. Remove the HDD	*page 2 - 7*
3. Remove the SSD	*page 2 - 10*

To remove the Wireless LAN Module:

1. Remove the battery	*page 2 - 5*
2. Remove the HDD	*page 2 - 7*
3. Remove the WLAN	*page 2 - 11*

To remove the Heatsink:

1. Remove the battery	*page 2 - 5*
2. Remove the HDD	*page 2 - 7*
3. Remove the Heatsink	*page 2 - 13*

To remove the CCD Module:

1. Remove the battery	*page 2 - 5*
2. Remove the HDD	*page 2 - 7*
3. Remove the CCD module	*page 2 - 14*

Removing the Battery

1. Turn the computer **off**, and turn it over.
2. Slide the latch ① in the direction of the arrow (***Figure 1a***).
3. Slide the latch ② in the direction of the arrow.
4. While holding the latch ②, lift the battery ③ (***Figure 1b***) out of the compartment (***Figure 1c***).

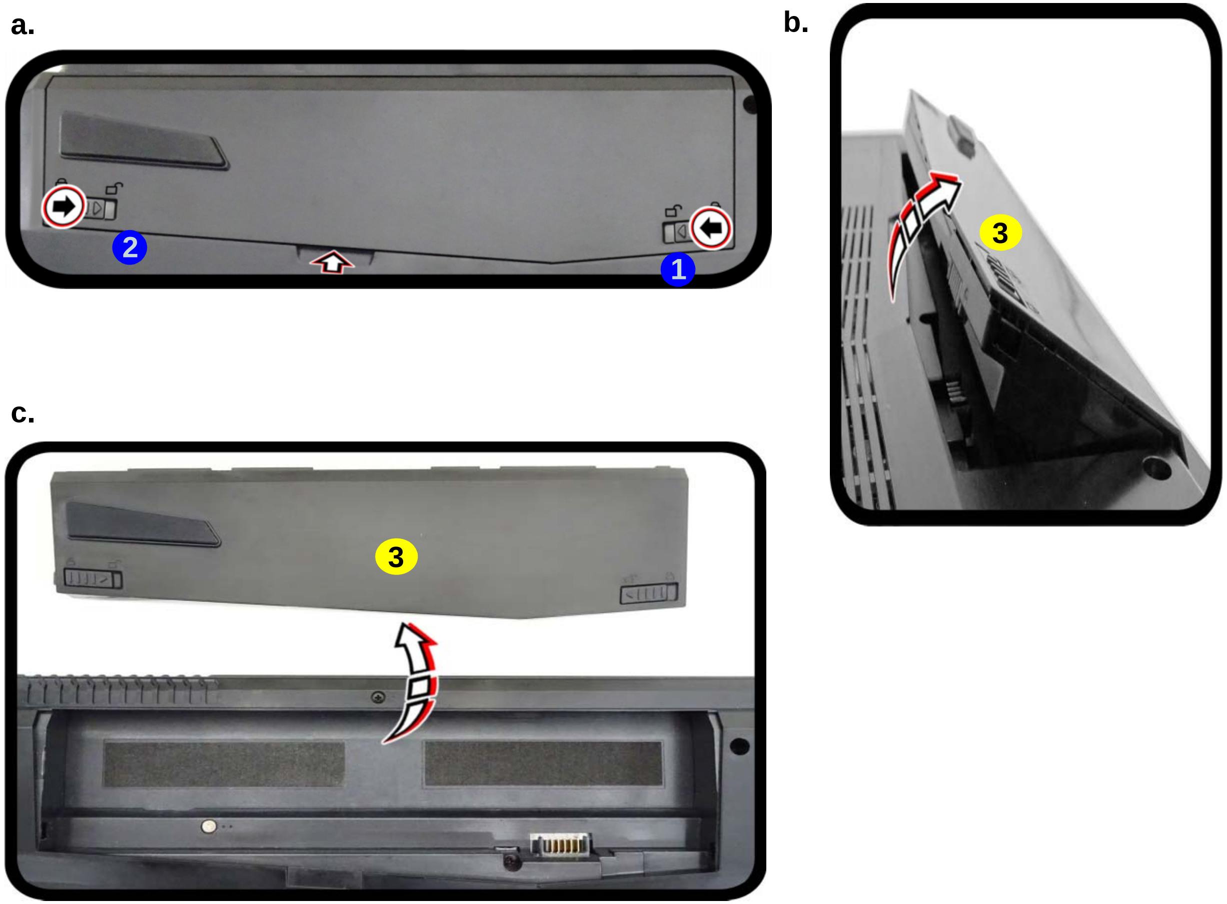


Figure 1
Battery Removal

a. Slide the latch ① in the direction of the arrow. and slide the latch ② in the direction of the arrow.
b. Lift the battery.
c. Remove the battery.

3. Battery

Removing the Keyboard

1. Turn **off** the computer, turn it over.
2. Remove screws ① - ② from the bottom of the computer.
3. Open it up with the LCD on a flat surface before pressing at point ③ to release the keyboard module (use the special eject stick ④ to do this) while releasing the keyboard in the direction of the arrow ⑤ as shown (***Figure 2a***).
4. Carefully lift the keyboard ⑥ up, being careful not to bend the keyboard ribbon cable ⑦. Disconnect the keyboard ribbon cable ⑦ from the locking collar socket by using a flat-head screwdriver to pry the locking collar pins ⑧ away from the base (***Figure 2b***).
5. Carefully lift the keyboard ⑥ off the computer (***Figure 2c***).

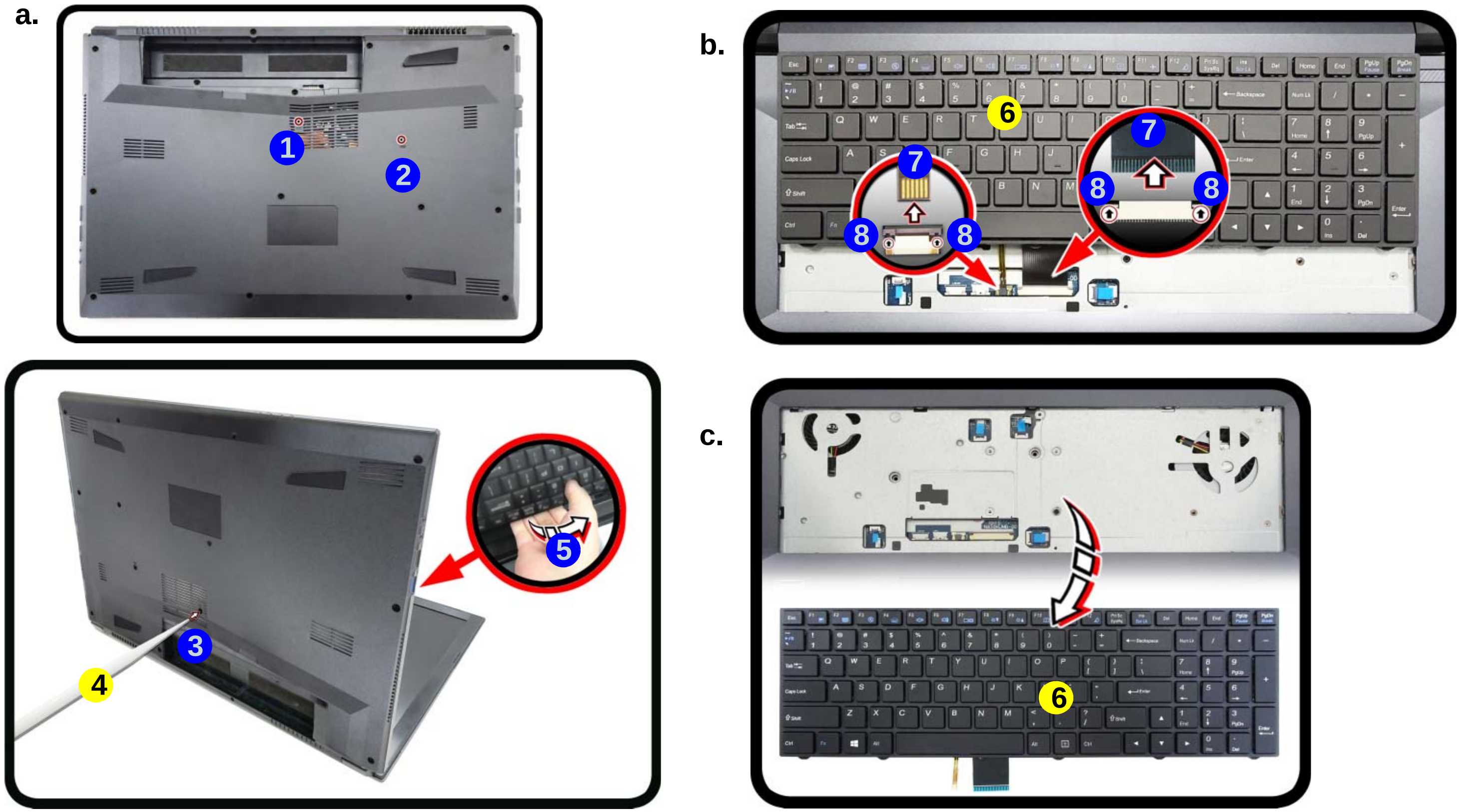


Figure 2
Keyboard Removal

a. Remove the screws from the bottom of the computer and then eject the keyboard using a special eject stick to push the keyboard out while releasing the keyboard as shown.
b. Lift the keyboard up and disconnect the keyboard ribbon cable from the locking collar socket.
c. Remove the keyboard.

Re-inserting the Keyboard

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

4. Eject Stick
6. Keyboard

- 2 Screws

Removing the Hard Disk Drive

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

Hard Disk Disassembly Process

1. Turn **off** the computer, and remove the battery (***page 2 - 5***).
2. Remove the SD card cover ① and screws ② - ⑰ (***Figure 3a***).
3. Carefully push to release the bottom case ⑱ from point ⑲ and then lift it up from point ⑳ to release the bottom case and ports as indicated by the arrows (***Figure 3b***).
4. The HDD will be visible at point ㉑ on the mainboard (***Figure 3c***).

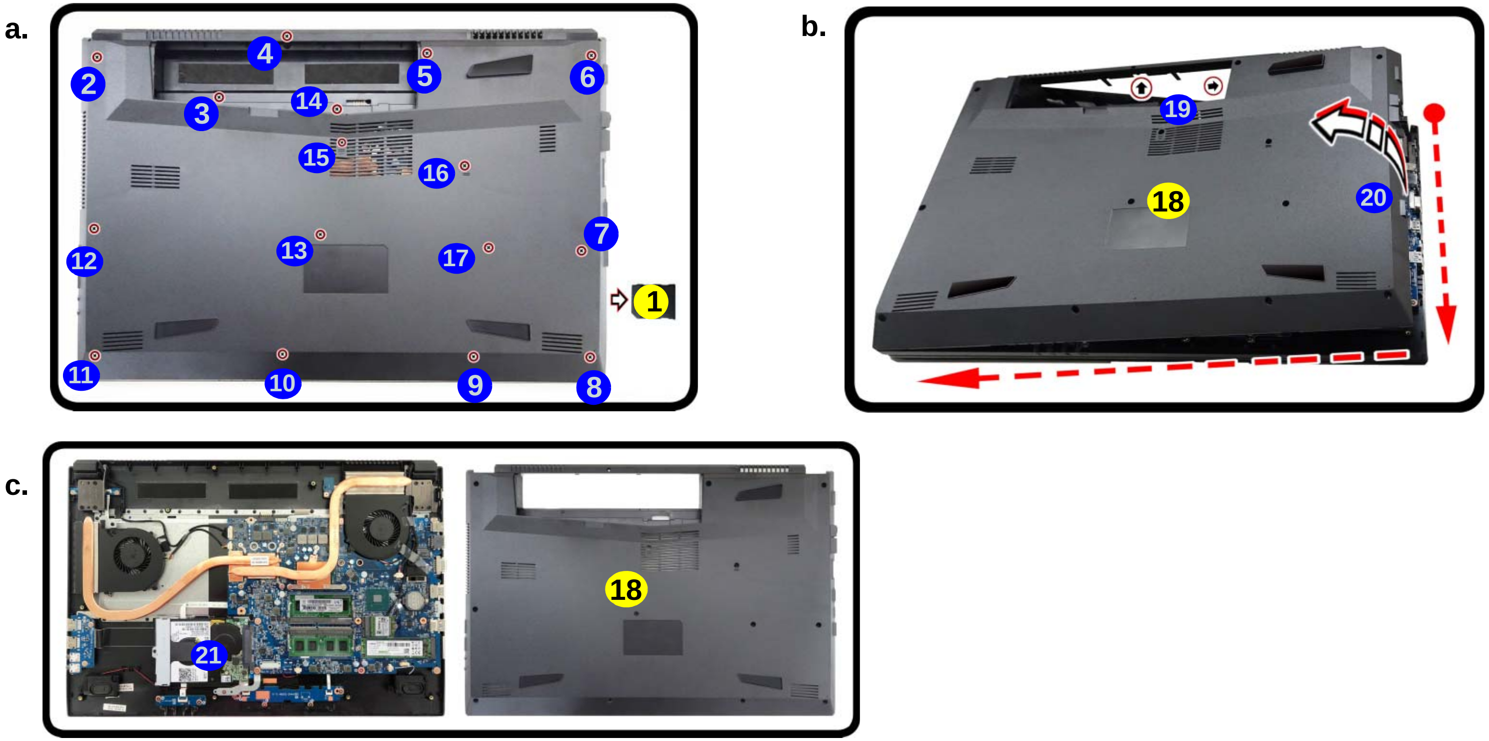


Figure 3
HDD Assembly Removal

a. Remove the SD card cover and screws.
b. Remove the bottom case.
c. Locate the HDD.

Powering the Computer On

After every disassembly, make sure that the bottom case’s screws are all inserted and tightened before turning the computer on.

18. Bottom Case

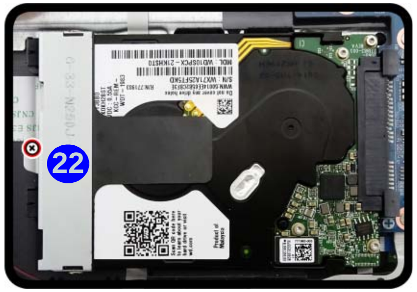
- 16 Screws

Figure 4
HDD Assembly Removal (cont'd.)

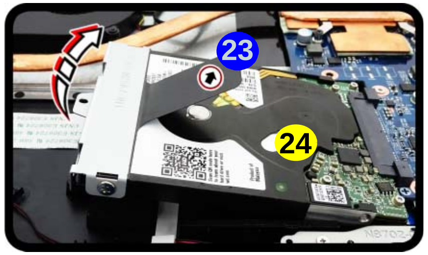
d. Remove the screws.
e. Slightly lift and pull the HDD in the direction of the arrow.
f. Lift the HDD assembly out of the bay.
g. Remove the screws and bracket from the HDD.

5. Remove screws ㉒ from the HDD assembly (***Figure 4b***).
6. Slightly lift and pull the hard disk assembly in the direction of arrow ㉓ (***Figure 4c***).
7. Lift the hard disk assembly ㉔ out of the bay ㉕ (***Figure 4d***).
8. Remove screws ㉖ - ㉗ and bracket ㉘ from the hard disk ㉙ (***Figure 4e***).
9. Reverse the process to install a new hard disk (do not forget to replace the screws).

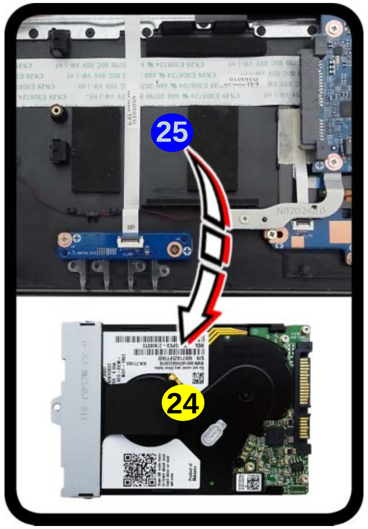
d.



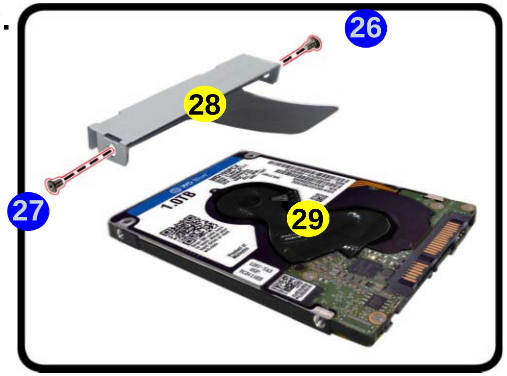
e.



f.



g.



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.

24. HDD Assembly
28. Bracket
29. HDD

- 2 Screws

Removing the System Memory (RAM)

The computer has two memory sockets for 260 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR4 2400 MHz. The main memory can be expanded up to 16GB. The total memory size is automatically detected by the POST routine once you turn on your computer.

Memory Upgrade Process

1. Turn **off** the computer, turn it over, remove the battery (***page 2 - 5***) and the bottom cover (***page 2 - 7***).
2. The RAM-2 modules will be visible at point ① on the mainboard (***Figure 5a***).
3. Gently pull the two release latches (② & ③) on the sides of the memory socket in the direction indicated by the arrows (***Figure 5b***). The RAM module ④ will pop-up (***Figure 5c***), and you can then remove it.
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. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
8. Replace the bottom cover and the screws (see ***page 2 - 7***).
9. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.

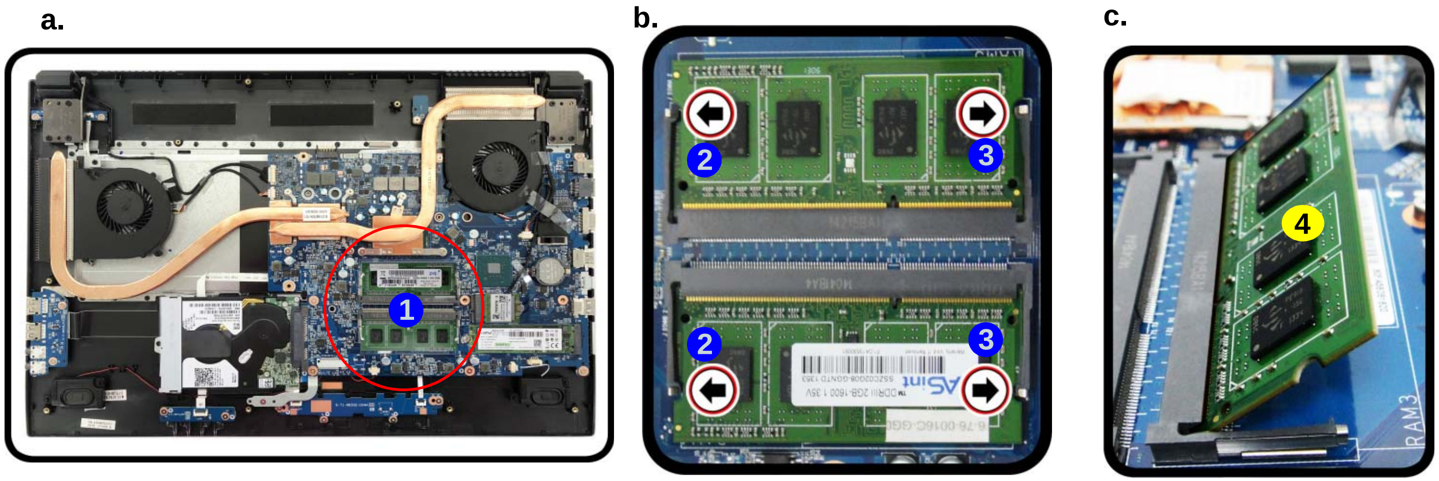


Figure 5
RAM Module Removal

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

Removing and Installing the M.2 SSD Module

M.2 SSD Module Removal Procedure

1. Turn **off** the computer, turn it over, remove the battery (***page 2 - 5***) and the bottom cover (***page 2 - 7***).
2. The M.2 SSD module will be visible at point ① on the mainboard (***Figure 6a***).
3. Remove the screw ② (***Figure 6b***)
4. The M.2 SSD module ③ (***Figure 6c***) will pop-up, and you can remove it from the computer.

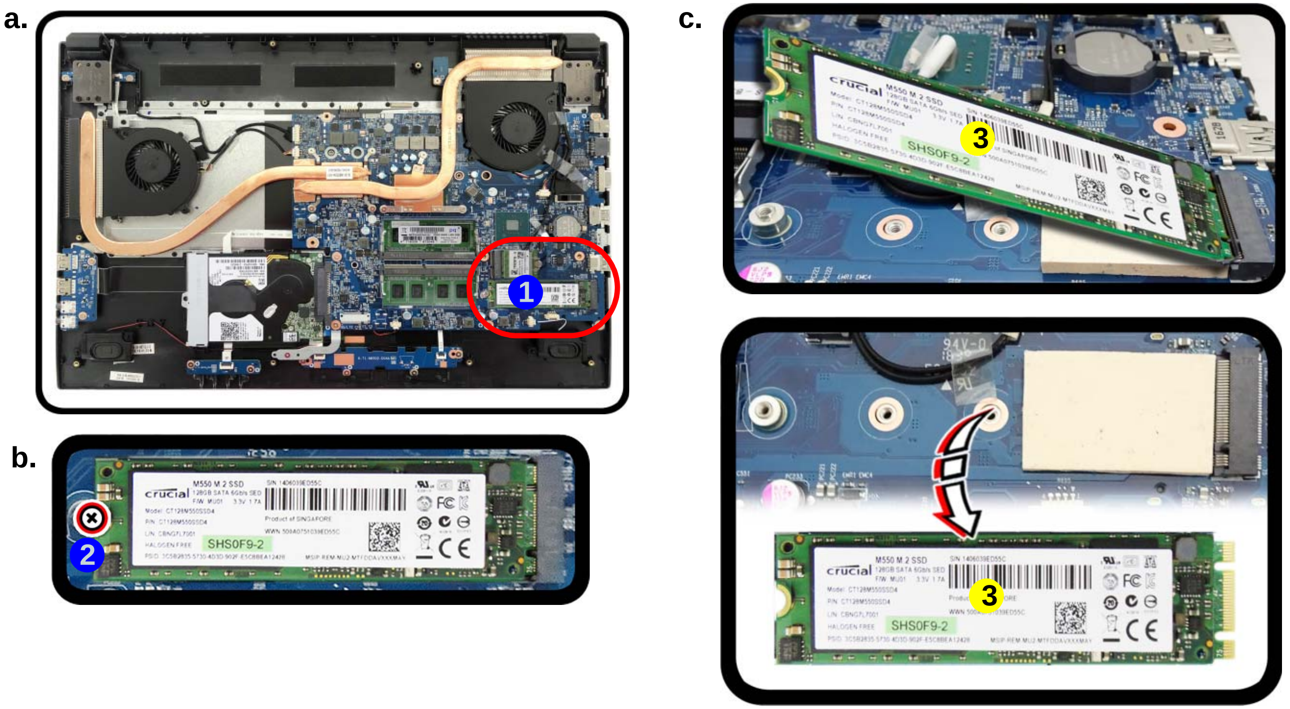


Figure 6
M.2 SSD Module Removal

a. Locate the M.2 SSD.
b. Remove the screw.
c. The M.2 SSD module will pop up.

3.M2 SSD Module

- 1 Screw

Removing the Wireless LAN Module

1. Turn **off** the computer, turn it over, remove the battery (***page 2 - 5***) and the bottom cover (***page 2 - 7***).
2. The Wireless LAN module will be visible at point ① on the mainboard (***Figure 7a***).
3. Carefully disconnect the cables ② & ③, and then remove the screw ④ (***Figure 7b***)
4. The Wireless LAN module ⑤ (***Figure 7c***) will pop-up, and you can remove it from the computer.

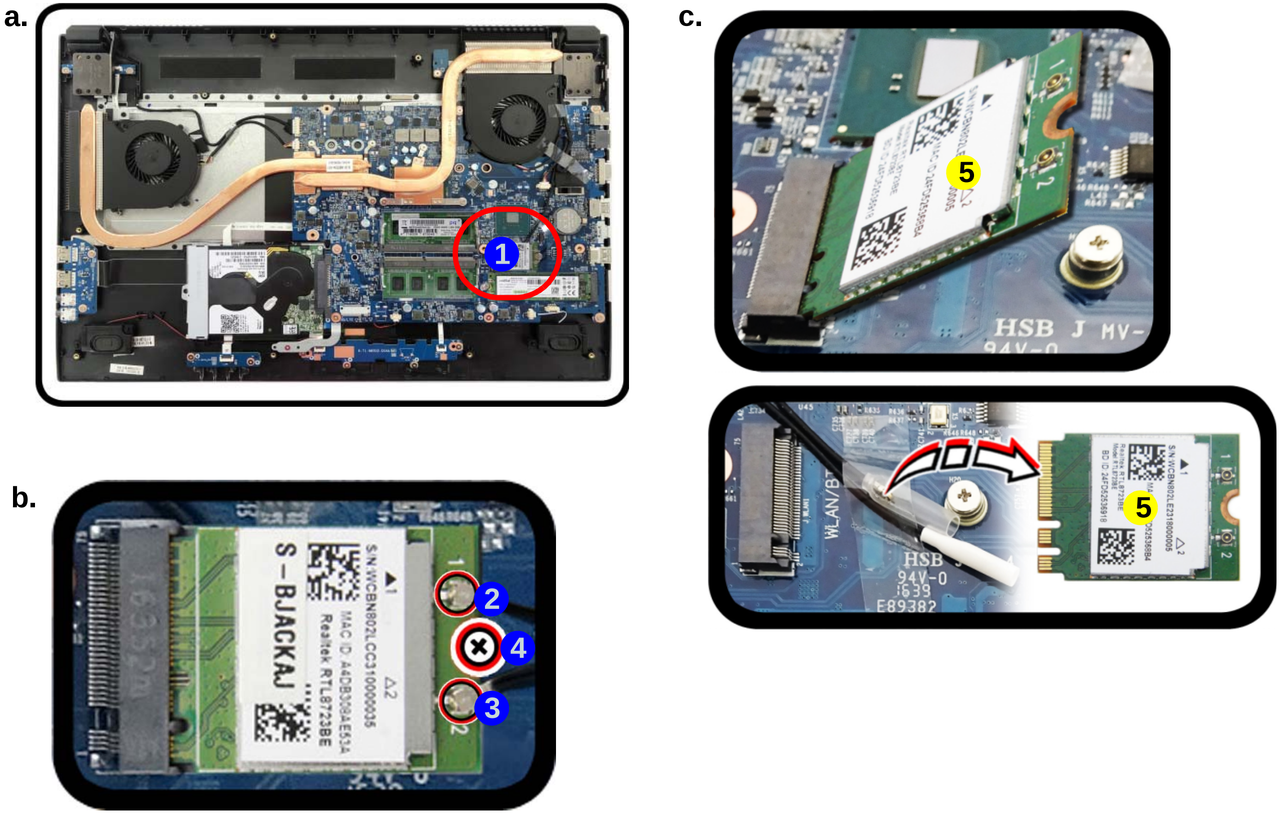


Figure 7
Wireless LAN Module Removal

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

Note: Make sure you reconnect the antenna cable to the “1 + 2” socket (***Figure 7b***).

5.Wireless LAN Module

- 1 Screw

Wireless LAN, Combo Module Cables

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

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

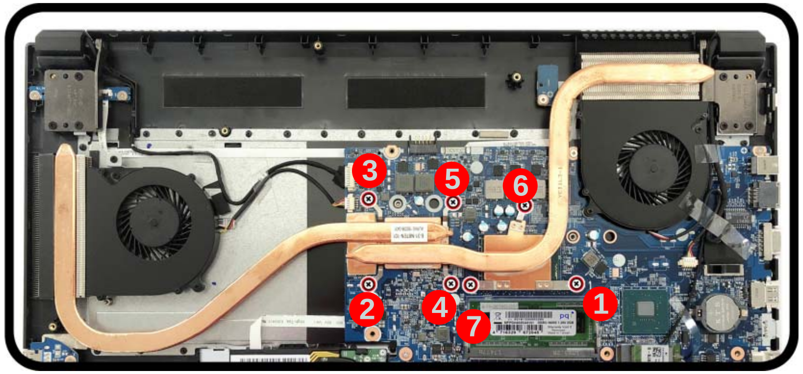
Cable 1 is usually connected to antenna 1 (Main) on the module, and cable 2 to antenna 2 (Aux).

Removing the CPU Heat Sink

Heat Sink Removal Procedure

1. Turn **off** the computer, turn it over, remove the battery (***page 2 - 5***) and the bottom cover (***page 2 - 7***).
2. Loosen the CPU heat sink screws in the order ⑦, ⑥, ⑤, ④, ③, ② & ① (the reverse order as indicated ***Figure 8a***).
3. Apply pressure to points Ⓐ - Ⓒ to lift carefully (it may be hot) the heat sink Ⓓ off the mainboard (***Figure 8b***).

a.



b.

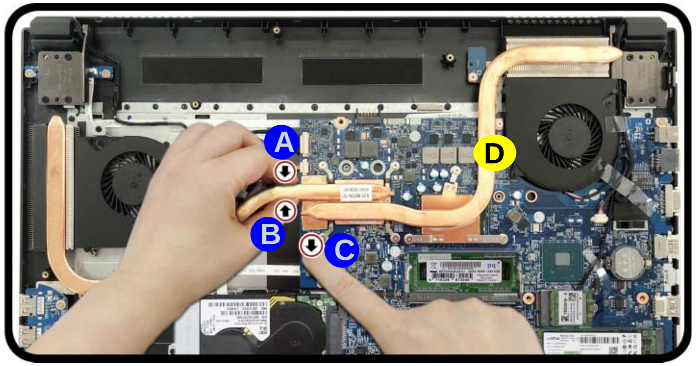


Figure 8
Heat Sink Removal

a. Remove the screws.
b. Carefully remove the heat sink unit.

D. Heat Sink

- 7 Screws

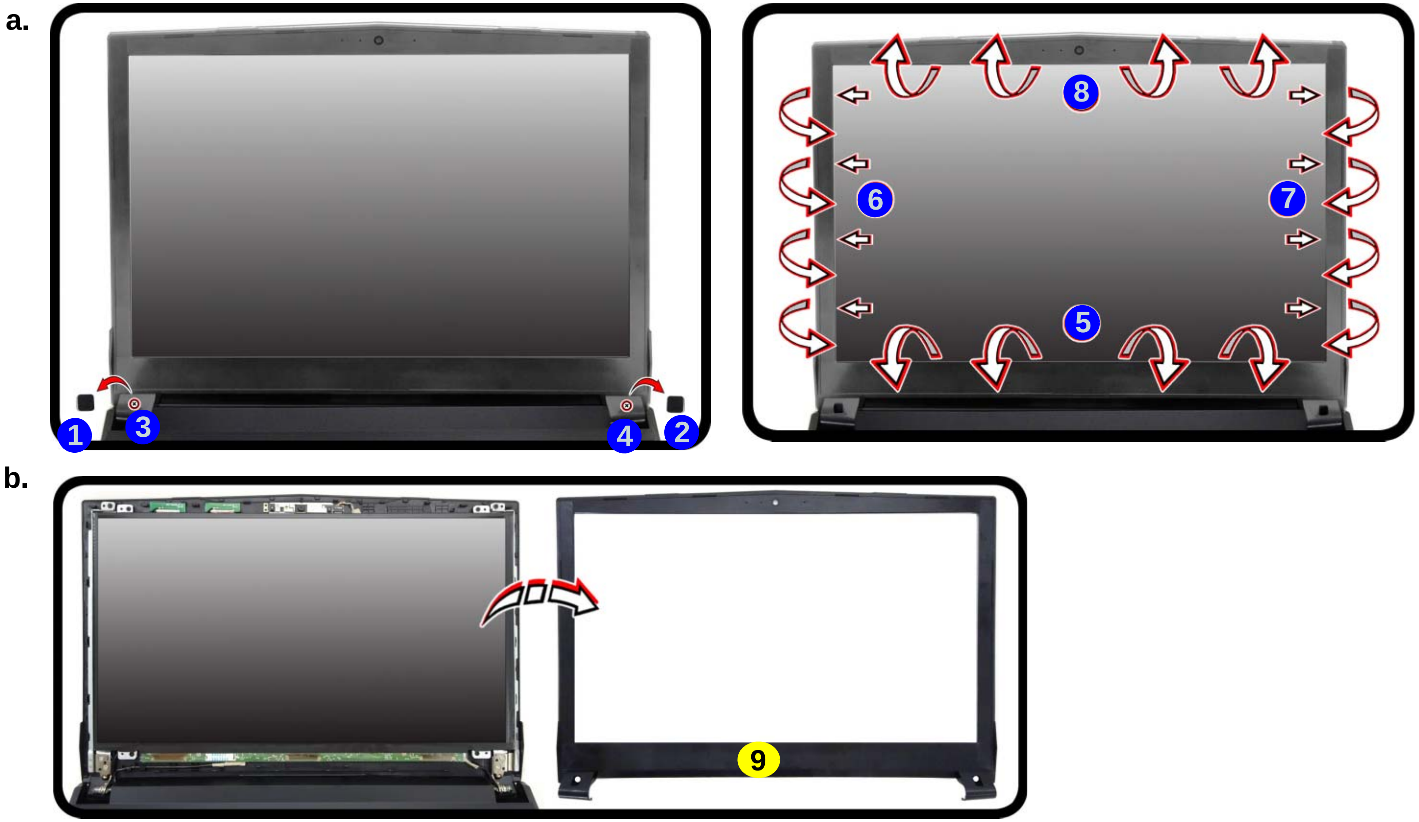
Removing the CCD

1. Turn **off** the computer, turn it over to remove the battery (***page 2 - 5***).
2. Lay the computer down on a flat surface with the top case up forming a 90 degree angle. Carefully remove the rubber covers ① - ② and screws ③ - ④.
3. Run your fingers around the inner frame of the LCD panel to lift at the upper point ⑤ as indicated by the arrows, and slightly push and lift up the inner frame at the middle points ⑥ - ⑦ as indicated by the arrows and then run your fingers around the inner frame at the lower point ⑧ as indicated by the arrows (***Figure 9a***).
4. Remove the LCD front cover ⑤ (***Figure 9b***).

Figure 9
CCD Removal

a. Remove rubber and screws and then carefully release the inner frame of the LCD panel at the points indicated by the arrows.

b. Remove the LCD front cover.

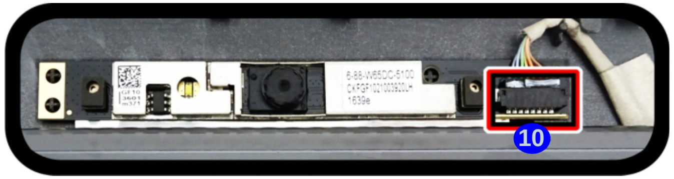


9. LCD Front Cover

- 2 Screws

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

c.



d.

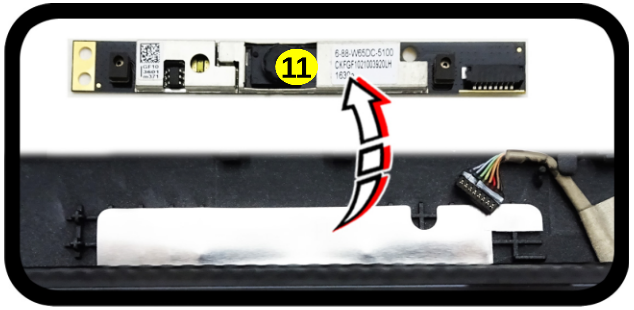


Figure 10
CCD Removal (cont'd)

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

11. CCD Module

Appendix A:Part Lists

This appendix breaks down the ***N870EK1 / N871EK1*** series notebook's construction into a series of illustrations. The component part numbers are indicated in the tables opposite the drawings.

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

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

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

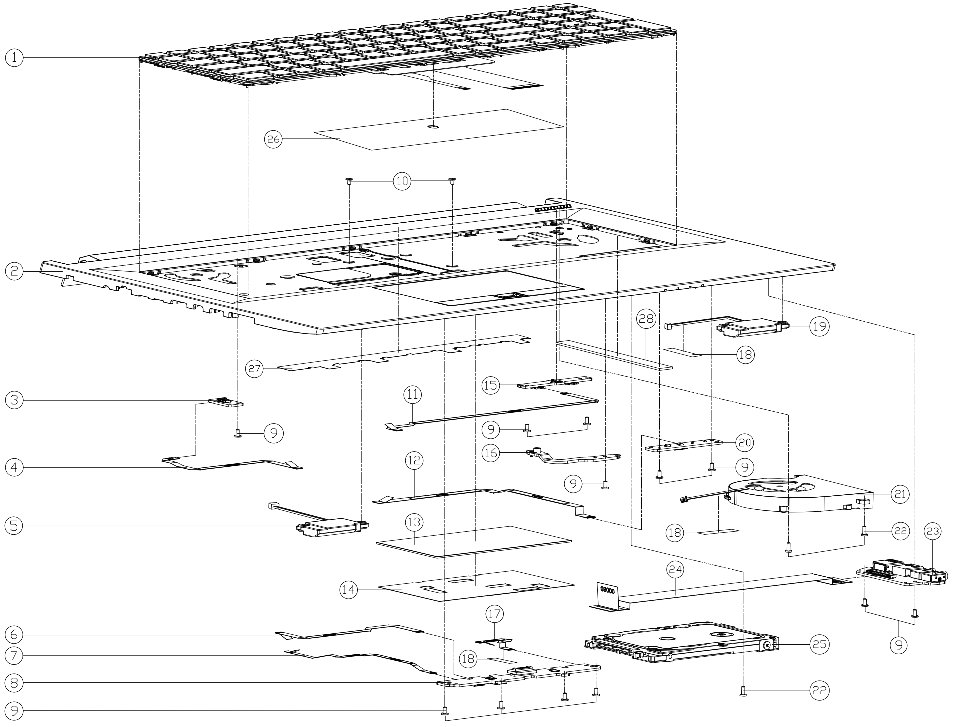
Part List Illustration Location

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

Table A - 1
Part List Illustration Location

Part	
Top	***page A - 3***
Bottom	***page A - 4***
Main Board	***page A - 5***
HDD	***page A - 6***
LCD	***page A - 7***

Top

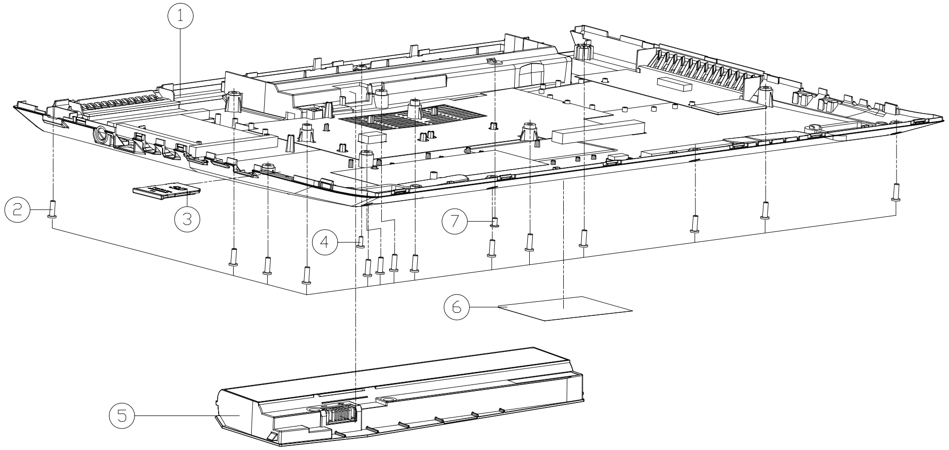


ITEM	PART NAME	PART NO	REMARK
1	WHITE BL KB USA CVM15F23USJ430B N750BU BLACK ISOLATION WITH WIN10 KEY + K/B FRAME	6-80-N7500-012-1	
1	MULTI BL KB USA CVM15F23USJ430B N650HK1 BLACK GAMING SILVER LINING PRINTING ISOLATION WITH WIN10 KEY + K/B FRAME	6-80-N8500-010-1	
2	TOP CASE MODULE W/ FPR N870HK1	6-39-N87K2-013	FOR W/FP
2	TOP CASE MODULE W/O FPR N870HK1	6-39-N87K2-022	FOR W/O FP
2	TOP CASE MODULE W/ FPR N871HK1	6-39-N87K2-111	FOR W/FP
2	TOP CASE MODULE W/O FPR N871HK1	6-39-N87K2-120	FOR W/O FP
2	TOP CASE MODULE N870HK1-Y	6-39-N87K2-022-Y	FOR W/O FP
3	HALL SENSOR BOARD V3.0A N850HC	6-77-N8501-D03A	
4	FFC HALLSENSOR TO MB 135MM 3.3V 4PIN N870HC(HT)	6-43-N8700-050	
5	SPK+CABLE L 23*44 1.5W 4? 35MM LT2514CKXP (IVY) N250LU (ADD RUBBER)	6-23-5N250-1L2	
6	FFC CABLE CLICK-FPR TO MB 135MM 3V 4PIN N870HK1(HT)	6-43-N87K0-011	ONLY FOR W/ FP
7	FFC CLICK TO MB 143MM 3.3V 6PIN N870HC(HT)	6-43-N8700-010	
8	CLICK BOARD W/FP V2.0+FINGER BOARD V1.0 N870HJ1	6-77-N85HA-N02-A	FOR W/FP
8	CLICK BOARD W/O FP V2.0 N870HJ1	6-77-N85H2-D02-B	FOR W/O FP
9	.SCREW M2*4L KI NI ICT NY (DD=Ø4.5,DT=0.4)	6-35-B1120-4RE	
10	SCREW M2*3L KI BZ ICT NY (DD=Ø4.5,DT=0.4)	6-35-B6120-3RD	
11	FFC POWER TO MB 226MM 3.3V 4PIN N870HC(HT)	6-43-N8700-041	
12	FFC LED TO MB 200MM 3V 12PIN N870HC(HT)	6-43-N8700-030	
13	TOUCH PAD SYNAPTICS TM-03163-002 P650RS (108*61MM)	6-49-P65S3-010	
14	TOP TP MYLAR PET P775DM2	6-40-P7752-211	
15	POWER SW BOARD V3.0 N870HC	6-77-N850S-D03-B	
16	MB BRACKET (SGCC) N870HC	6-33-N8702-010	
17	FFC CLICK TO TP 55MM 3.3V 8IN N870HC(HT)	6-43-N8702-011	
18	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
19	SPK+CABLE R 23*44 1.5W 4? 250MM LT2514CKXP (IVY) N250LU (ADD RUBBER)	6-23-5N250-1R2	
20	LED BOARD V4.0 N870HC	6-77-N8704-D04	
21	FAN MODULE (FCN) PWM LINE-70MM N850EK1	6-31-N85J2-100	
22	SCREW M2*5L KI(T=0.8 D=4.0) BK/Z ICT NY	6-35-B6120-5R0	
23	AUDIO BOARD V1.0 N850EJ	6-77-N85J8-D01	
24	FFC AUDIO TO MB 202MM 5V 40PIN N870HC(HT)	6-43-N8700-020	
25	W/O HDD ASS'Y N870HC	6-79-N870HC0J-010	
25	W/ HDD ASS'Y N870HC	6-79-N870HC0J-020	
26	BACKLIGHT KB THERMAL(169.1*45.5) AL FOIL+3M467 N550RC	6-47-N5507-010	
27	ALFOIL MYLAR TOP N870EK1	6-40-N8702-E10	
28	TOP VGA SIDE SPONGE 79*8*1.15 (CR4382+G4000) N870EK1	6-47-0019A-796	

Figure A - 1
Top

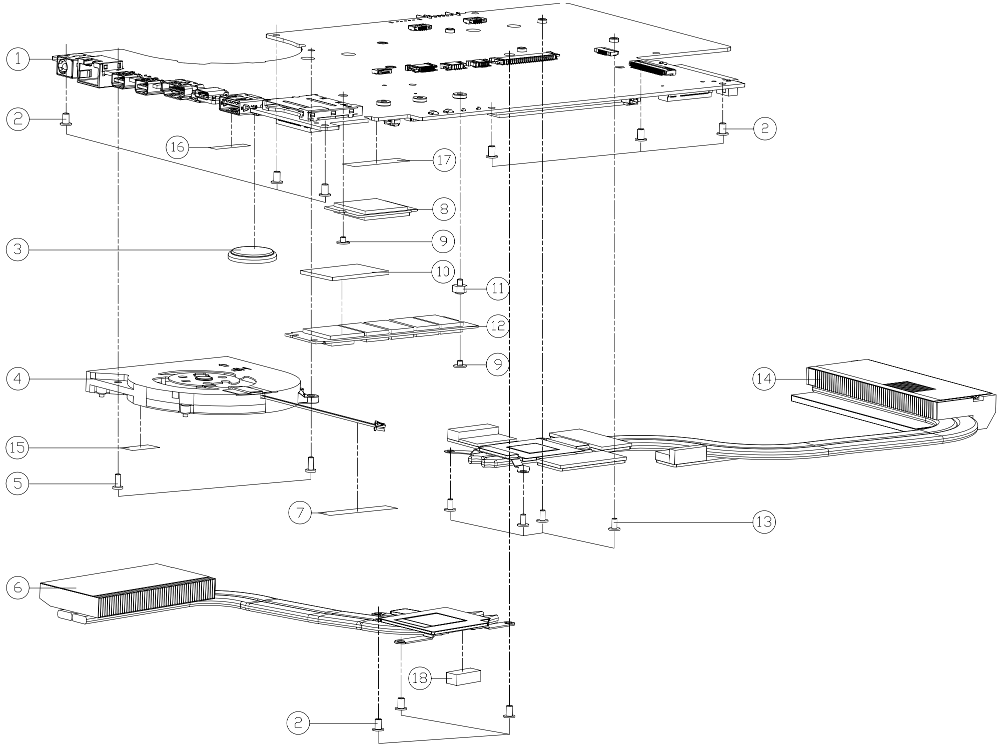
Bottom

Figure A - 2
Bottom



ITEM	PART NAME	PART NO	REMARK
1	BOTTOM CASE MODULE N870EK1	6-39-N8703-E10	
2	.SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
3	DUMMY 3IN1 NON PUSH TYPE PC+ABS (C7230P-701DE)(CHANGE) W970SUW	6-42-W9708-011	
4	SCREW M2*5L KI(T=0.8 D=4.0) BK/Z ICT NY	6-35-B6120-5R0	
5	BAT.P S LI 11.1V/5.6AH/62WH 3S2P SMP/LGC (TEXTURE) CQC (BQ30Z55) 980T/Q2193F N850HC	6-87-N850S-6E71	
5	BAT.P S LI 10.8V/4.4AH/47WH 3S2P SMP/SDI (TEXTURE) PSE/KC/CQC (BQ30Z55) 980T/Q2201F N850HZ	6-87-N85HS-41C00	
5	BAT.P S LI 11.1V/5.6AH/62WH 3S2P GETAC/SANYO (TEXTURE) CQC 541388680002 N850HC	6-87-N850S-6U71	
5	BAT.P S LI 10.8V/4.4AH/47WH 3S2P GETAC/SANYO (TEXTURE) PSE/KC/CQC 541388680001 N850HC	6-87-N850S-4U41	
5	BAT.P S LI 11.1V/5.6AH/62WH 3S2P SMP/LGC (TEXTURE) CQC (BQ30Z55) 980T/Q2193F N850HC LABEL CHANGE	6-87-N850S-6E72	
6	PRODUCT LABEL FOR N870EJ1	6-45-N870EJ13-010	
6	PRODUCT LABEL FOR N870EK1	6-45-N870EK13-010	
6	PRODUCT LABEL FOR N871EJ1	6-45-N871EJ13-010	
6	PRODUCT LABEL FOR N871EK1	6-45-N871EK13-010	
6	PRODUCT LABEL FOR N870EK1-Y	6-45-N870EK1Y-010	
6	PRODUCT LABEL FOR N870EJ1-Y	6-45-N870EJ1Y-010	
7	.SCREW M2*4L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-4RE	

Main Board



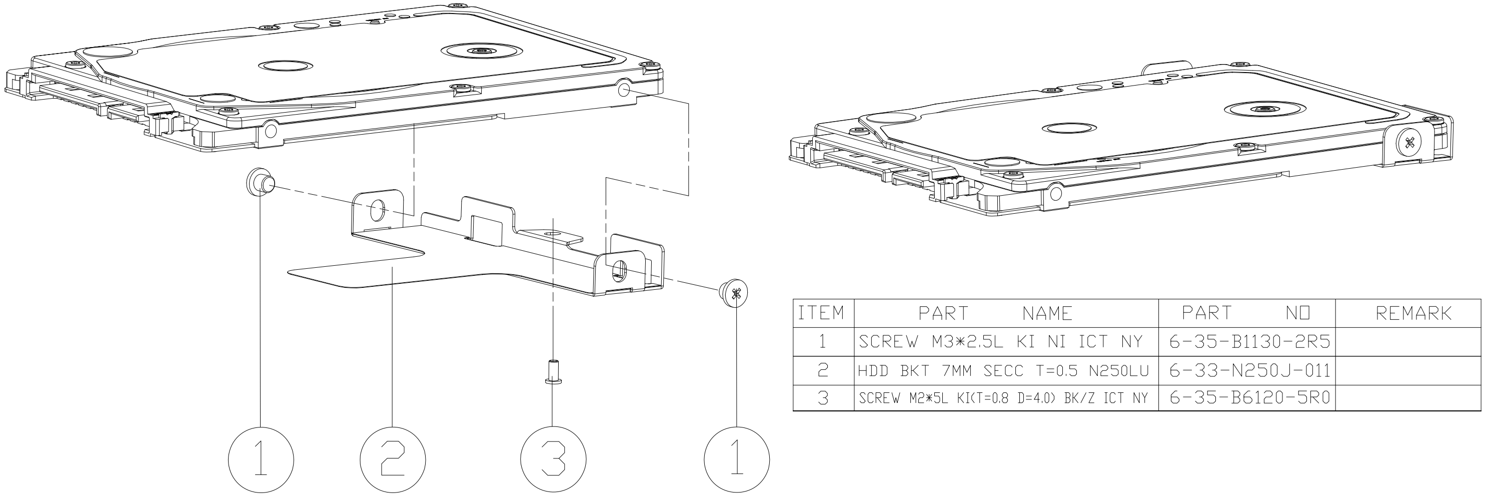
ITEM	PART NAME	PART NO	REMARK
1	MAIN BOARD(CPU/I7-8750H/2.2G) V2.0 (EDP)(W/TPM) N870EK1	6-77-N870EK10-D02-C	
1	MAIN BOARD(CPU/I7-8750H/2.2G) V2.0 (EDP)(W/O TPM) N870EK1	6-77-N870EK10-D02-1C	
1	MAIN BOARD(CPU/I5-8300H/2.3G) V2.0 (EDP)(W/O TPM) N870EK1	6-77-N870EK10-D02-1D	
1	MAIN BOARD(CPU/I5-8300H/2.3G) V2.0 (EDP)(W/TPM) N870EK1	6-77-N870EK10-D02-D	
1	MAIN BOARD(CPU/I7-8750H/2.2G) V2.0 (EDP)(W/TPM) N870EJ1	6-77-N870EJ10-D02-C	
1	MAIN BOARD(CPU/I7-8750H/2.2G) V2.0 (EDP)(W/O TPM) N870EJ1	6-77-N870EJ10-D02-1C	
1	MAIN BOARD(CPU/I5-8300H/2.3G) V2.0 (EDP)(W/O TPM) N870EJ1	6-77-N870EJ10-D02-1D	
1	MAIN BOARD(CPU/I5-8300H/2.3G) V2.0 (EDP)(W/TPM) N870EJ1	6-77-N870EJ10-D02-D	
2	.SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
3	BATTERY 3V 220MA BBBCR2032B (KTS)	6-23-6A2B2-030	
4	CPU FAN MODULE(FORCECON) PWM CONTROL N750WU	6-31-N75W2-101	
5	SCREW M2*5L KI(T=0.8 D=4.0) BK/Z ICT NY	6-35-B6120-5R0	
6	HEATSINK MODULE CPU45W N870EK1	6-31-N870N-EA0	
7	TAPE MYLAR (A),MYLAR M550J	6-40-M55J2-010	
8	WLAN+BT COMBO DUAL BAND INTEL SANDY PEAK 3168NGW 1X1 AC+BT BT4.2 M2 2230 P650RS	6-88-P65SF-4210	OPTION
8	WLAN+BT COMBO DUAL BAND INTEL THUNDER PEAK 2 9260NGW NON-VPRO 2X2 AC+BT BT5.0 M2 2230 P750TM	6-88-P75FF-4210	OPTION
8	WLAN+BT COMBO INTEL WIRELESS-AC 3165 (STONE PEAK 1), 1X1 AC + BT 3165NGWG PCI-E M2 2230 N240LU	6-88-N240F-4200	OPTION
8	WLAN+BT COMBO DUAL BAND INTEL JEFFERSON PEAK 2 9560NGW NON-VPRO 2X2 AC+BT BT5.0 CNVI M2 2230	6-88-N24GF-4220	OPTION
9	SCREW M2*2L KI NI ICT NY (DD=ø5 ,T=0.5)	6-35-B1120-2R0	
10	THERMAL PAD RS300 (30*20*2.75T)MM FOR M.2 SSD N850HC	6-48-N850S-010	
11	SCREW M2*2.5L (H=2.5 D=5) STEEL ICT NY FOR NGFF CARD(CHANGE)	6-35-ZA120-2R5-1	
12	SSD M.2 2280 1TB(1024GB) SAMSUNG MZVKW1T0HMLH-00000 (SM961) PCIE G3X4 3D MLC FW:CXY7300Q	6-85-D511T-S00	OPTION
12	SSD M.2 2280 512GB SAMSUNG MZVLB512HAJQ-00000 (PM981) PCIE G3*4 3D TLC 64 LAYERS	6-85-D515B-S08	OPTION
12	SSD M.2 2280 512GB INTEL SSDPEKKW512G7 (600P) PCIE G3X4 3D TLC FW:PSF100C	6-85-D515B-Z00	OPTION
12	SSD M.2 2280 256GB MICRON MTFDDAV256TBN (1100) SATA3 (MICRON 3D TLC 64 LAYERS)	6-85-D51R6-101	OPTION
12	SSD M.2 2280 256GB PHISON SSMP256GTB3C2-S11 (S11) SATA3 (TOSHIBA 3D TLC 64 LAYERS) FW:SBFM61.1	6-85-D51R6-H04	OPTION
12	SSD M.2 2280 1TB(1000GB) INTEL SSDSCKKW010X6 (540S) SATA3	6-85-D511T-Z00	OPTION
12	SSD M.2 2280 16GB INTEL MEMPEK1J016GAES (OPTANE MEMORY STONY BEACH 2) PCIE G3*2 3D XPOINT	6-85-D5116-Z02	OPTION
13	.SCREW M2*4L KI NI ICT NY (DD=ø4.5,DT=0.4)	6-35-B1120-4RE	
14	VGA50W HEATSINK MODULE N870HK1 (2 HEAT PIPE 20 ANGLE)	6-31-N87K2-201	FOR DOUBLE PIPE
15	TAPE MYLAR TRANSPARENT (20*10*0.05) P180HM	6-40-P1803-020	
16	TAPE MYLAR TRANSPARENT (30*5*0.05) W251HPQ	6-40-W25P3-010	
17	TAPE MYLAR (C),MYLAR M550J	6-40-M55J2-030	
18	RUBBER (L12*W5*H7.15) W25AHS	6-47-W25S2-020	

Figure A - 3

Main Board

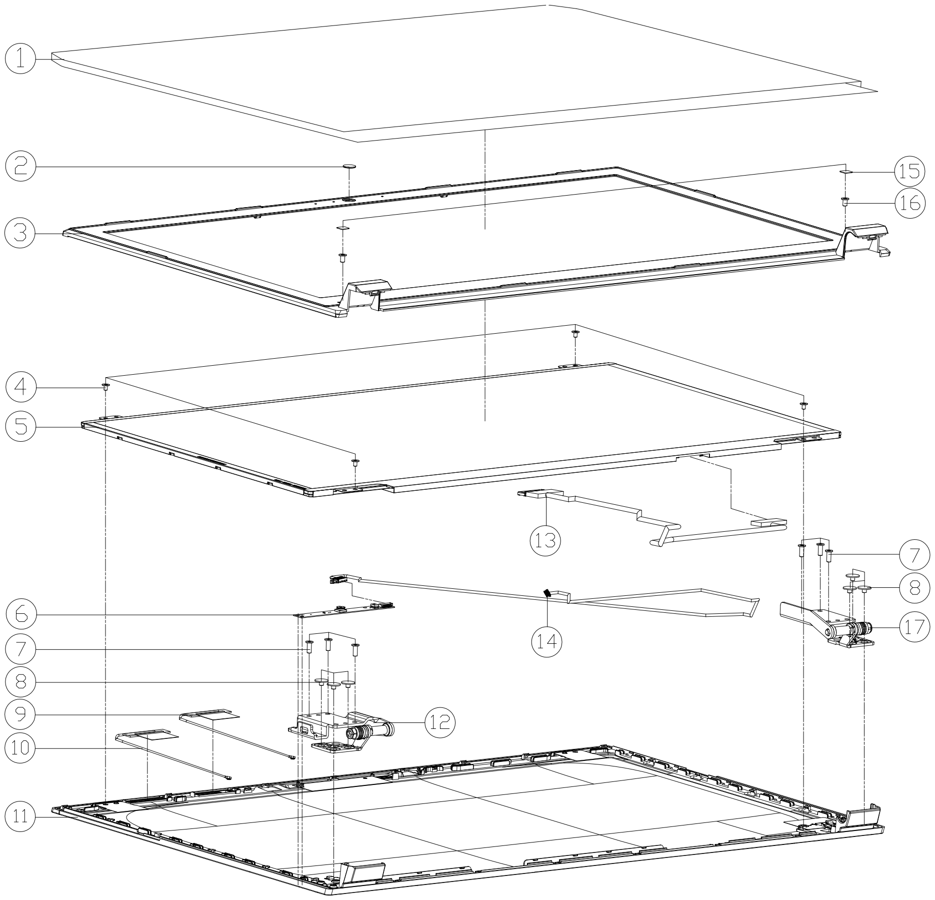
HDD

Figure A - 4
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*5L KI(T=0.8 D=4.0) BK/Z ICT NY	6-35-B6120-5R0	

LCD



ITEM	PART NAME	PART NO	REMARK
1	BOPP MYLAR 272*437*T=0.05 FOR P670RS	6-40-P67S1-010	
2	LCD CCD LENS PMMA P177SM (SINTOYO)	6-42-P177T-010-2	
3	FRONT COVER MODULE N870HC	6-39-N8701-012	
4	SCREW M2*3L KI BZ ICT NY (DD=ø4.5,DT=0.4)	6-35-B6120-3RD	
4	SCREW M2*3L KI CZ ICT NY (D=ø4.5,DT=0.6,LADDER=1.0)	6-35-B3120-3R0	FOR 6-50-N1240-G00 6-50-NBB40-G040
5	LCD 17.3" FHD/ AAS / N7/EDP INNOLUX N173HCE-E31 (LED) 4.0 MM	6-50-NB240-V00	
5	LCD 17.3" HD+/ EDP AU B173RTN02.1 (LED) 4.0MM	6-50-NA140-G00	
5	LCD 17.3" HD+/ EDP INNOLUX N173FGA-E34(LED) 4.0MM	6-50-NA140-V00	
5	LCD 17.3" UHD / IPS (AHVA) / EDP AU B173ZAN01.0 2A" SUPPORT S/W G-SYNC " LED 4.0MM	6-50-N1240-G00	
5	LCD 17.3" FHD / IPS /SW G-SYNC/NON GT/ EDP LG LP173WF4-SPF2 (EDID:3F) LED 4.0MM	6-50-NBB40-L080	
5	LCD 17.3" FHD / IPS /SW G-SYNC/NON GT/ EDP LG LP173WF4-SPF5 (EDID:C6) LED 4.0MM	6-50-NBB40-L081	
5	LCD 17.3" FHD/120HZ/N9/NON GT/EDP INNOLUX N173HHE-G32 (LED) 4.0 MM	6-50-NBB40-V070	
5	LCD 17.3" FHD/WVA/N7/NON GT/EDP BOE NV173FHM-N41 (LED) 4.0 MM (FG CODE:8940)	6-50-NBB40-Z021	
5	LCD 17.3" FHD/WVA/N7/NON GT/EDP INNOLUX N173HCE-E31 (LED) 4.0 MM	6-50-NBB40-V020	
5	LCD 17.3" FHD/120HZ/N9/3MS/NON GT/EDP INNOLUX N173HHE-G32 (H/W:C3) LED 4.0 MM	6-50-NBB40-V072	
5	LCD 17.3" FHD/AHVA/144HZ/NVSR G-SYNC/N7/NON GT/EDP AU B173HAN03.1 LED 4.0MM	6-50-NBB40-G040	
6	UVC CAMERA CHICONY FIX CKFGF1021003921LH 2M FHD OV2740 W650DC FW3602 W/WHITE-LED W/D-MIC	6-88-W65DC-5110	OPTION
6	UVC CAMERA CHICONY FIX CNFFH5921003920LH 1M HD OV9734 W510PU FW1018 W/WHITE-LED W/D-MIC	6-88-W51PC-5100	OPTION
6	UVC CAMERA BISON FIX BN8V16YTK-340 1M HD HYNIX HI165 N650DU FW0603 W/WHITE-LED W/D-MIC	6-88-N650C-4910	OPTION
6	UVC CAMERA CHICONY FIX CKFGF1021003920LH 2M FHD OV2740 W650DC FW3601 W/WHITE-LED W/2D-MIC	6-88-W65DC-5100	OPTION
6	UVC CAMERA BISON FIX BN8VU6VTH-200 2M FHD OV2740 P775KM FWXXXX W/WHITE-LED W/2D-MIC	6-88-P775C-4901	OPTION
6	UVC CAMERA BISON FIX(RGB) BN8V19XSF-000 1M HD HIMAX1091 N770WU FW0606 W/WHITE-LED W/2D-MIC	6-88-N770C-4910	OPTION
6	UVC CAMERA CHICONY FIX CNFFH5921003921LH 1M HD OV9734 W510PU FW1019 W/WHITE-LED W/2D-MIC	6-88-W51PC-5110	OPTION
6	UVC CAMERA BISON FIX BN8V16YTK-350 1M HD HYNIX HI165 N650DU FW0602 W/WHITE-LED W/2D-MIC	6-88-N650C-4900	OPTION
7	.SCREW M2.5*8L KI BK/Z NY ICT	6-35-B6125-8R0	
8	SCREW M2.5*2.5L KI BK/Z ICT NY(ø8,T=0.6)	6-35-B6125-2R5	
9	ANTENNA IPEX4 WLAN WGT WL1 PCB AL 2.4G/5GHZ WL1=600MM P870DM	6-23-7P870-010	
10	ANTENNA IPEX4 WLAN WGT WL-2 PCB AL 2.4G/5G WL-2= 550MM P640RE	6-23-7P640-020	
11	BACK COVER MODULE N870HC	6-39-N8701-023	
11	BACK COVER MODULE N871HC	6-39-N8711-021	
12	HINGE L (SECC) N870HC	6-33-N8701-0L0	
13	WIRE CABLE FOR EDP 450MM 19V 30PIN (I) (HT/LW CON:0CTCL016020N) N870HC	6-43-N8701-010-2N	
13	WIRE CABLE FOR EDP 4K 450MM 19V 30PIN (I) (HT/LW CON:LV03140-212-HF) N870HK1	6-43-N87K1-010-1N	
13	WIRE CABLE FOR EDP 4K 450MM 19V 30PIN (I) (HT/LW CON:LV03140-212-HF) N870HP6	6-43-N87P1-010-1N	
14	WIRE CABLE FOR CCD D-MIC 700MM 3.3V 8P (HT) N870HC	6-43-N870T-010-2	
15	FRONT COVER SCREW MYLAR PC P750ZM	6-40-P7508-030	
16	.SCREW M2.5*4L KI NI ICT NY	6-35-21125-4R0	
17	HINGE R (SECC) N870HC	6-33-N8701-0R0	

Figure A - 5

LCD

Appendix B: Schematic Diagrams

This appendix has circuit diagrams of the ***N870EK1 / N871EK1*** notebook's PCB's. The following table indicates where to find the appropriate schematic diagram.

Table B - 1
SCHEMATIC DIAGRAMS

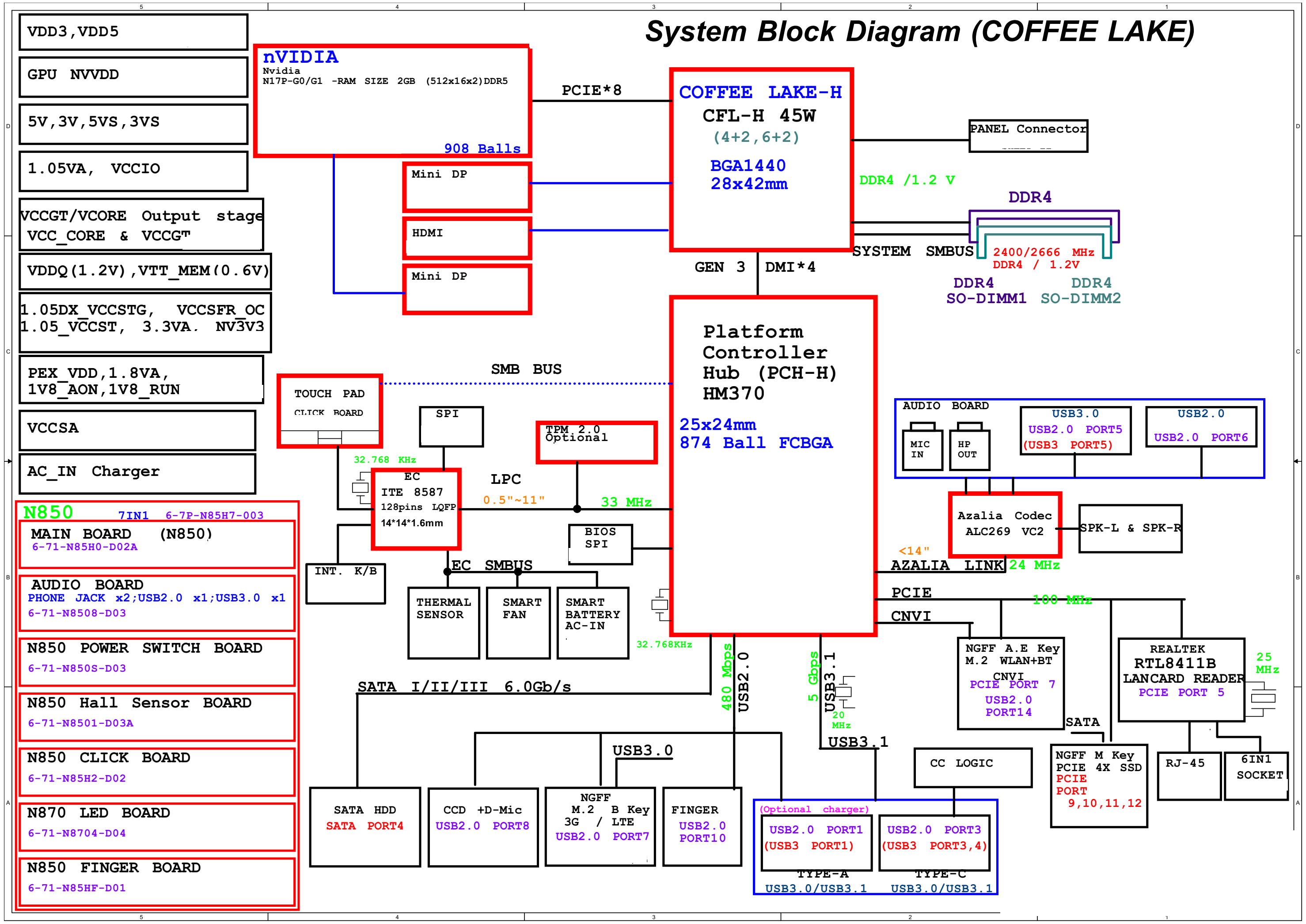
Diagram - Page	Diagram - Page	Diagram - Page
System Block Diagram - Page B - 2	*PCH 1/9 - Page B - 25*	*VCC_Core & VCCGT - Page B - 48*
Processor 1/6 - Page B - 3	*PCH 2/9 - Page B - 26*	*1.0DX_VCCSTG/VCCSFR_OC, 3.3VA - Page B - 49*
Processor 2/6 - Page B - 4	*PCH 3/9 - Page B - 27*	*VCCSA - Page B - 50*
Processor 3/6 - Page B - 5	*PCH 4/9 - Page B - 28*	*AC_In, Charger - Page B - 51*
Processor 4/6 - Page B - 6	*PCH 5/9 - Page B - 29*	*NVVDD - Page B - 52*
Processor 5/6 - Page B - 7	*PCH 6/9 - Page B - 30*	*FBVDDQ - Page B - 53*
Processor 6/6 - Page B - 8	*PCH 7/9 - Page B - 31*	*PEX_VDD/3V3/1.8V - Page B - 54*
DDR4 CHA SO-DIMM - Page B - 9	*PCH 8/9 - Page B - 32*	*Audio Board - Page B - 55*
DDR4 CHB SO-DIMM - Page B - 10	*PCH 9/9 - Page B - 33*	*Power Switch Board - Page B - 56*
VGA PCI-E Interface - Page B - 11	*M.2 3G Card - Page B - 34*	*Hall Sensor Board - Page B - 57*
VGA Frame Buffer Interface - Page B - 12	*M.2 WLAN+BT, SSD - Page B - 35*	*Click Board - Page B - 58*
VGA Frame Buffer A - Page B - 13	*USB Conn, USB Charger - Page B - 36*	*LED Board - Page B - 59*
VGA Frame Buffer A - Page B - 14	*Card Reader / LAN RTL8411B - Page B - 37*	*Finger Print Board - Page B - 60*
VGA Frame Buffer B - Page B - 15	*HDD, Click TP, Audio, Hall Con. - Page B - 38*	*Power Sequence - Page B - 61*
VGA Frame Buffer B - Page B - 16	*LED, CCD, TPM, Power SW Con. - Page B - 39*	
VGA I/O - Page B - 17	*Audio Codec ALC269 VC2 - Page B - 40*	
NVIDIA Power Sequence - Page B - 18	*KBC-ITE IT8587 - Page B - 41*	
NVIDIA GPIO Level Shift - Page B - 19	*RGB KB Only - Page B - 42*	
VGA NVVDD Coupling - Page B - 20	*5V, 5VS, 3.3V, 3.3VS, 3.3VA - Page B - 43*	
MDP - Page B - 21	*VDD1.0V, VCCIO - Page B - 44*	
MDP - Page B - 22	*VDD3, VDD5 - Page B - 45*	
Panel, Inverter - Page B - 23	*DDR 1.2V / 0.6VS, 2.5V - Page B - 46*	
HDMI - Page B - 24	*VCore, VCCGT Output Stage - Page B - 47*	

Version Note

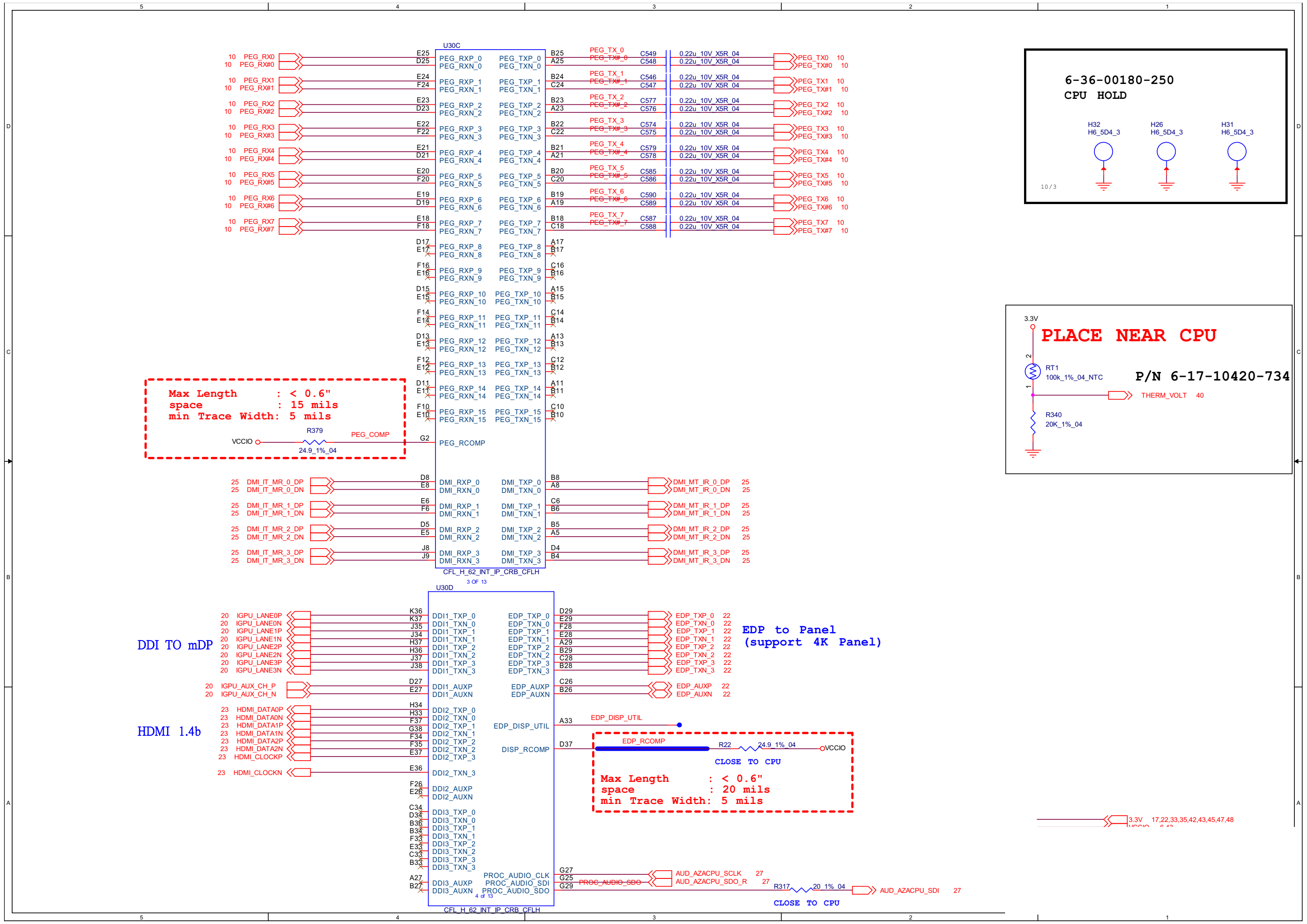
The schematic diagrams in this chapter are based upon version 6-7P-N85J7-002-1. If your mainboard (or other boards) are a later version, please check with the Service Center for updated diagrams (if required).

System Block Diagram

Sheet 1 of 60
System Block
Diagram


System Block Diagram (COFFEE LAKE)
VDD3,VDD5
GPU NVVDD
5V,3V,5VS,3VS
1.05VA, VCCIO
VCCGT/VCORE Output stage
VCC_CORE & VCCGT
VDDQ(1.2V),VTT_MEM(0.6V)
1.05DX_VCCSTG, VCCSFR_OC
1.05_VCCST, 3.3VA. NV3V3
PEX_VDD,1.8VA,
1V8_AON,1V8_RUN
VCCSA
AC_IN Charger
nVIDIA
Nvidia
N17P-G0/G1 -RAM SIZE 2GB (512x16x2)DDR5
908 Balls
Mini DP
HDMI
Mini DP
PCIE*8
COFFEE LAKE-H
CFL-H 45W
(4+2,6+2)
BGA1440
28x42mm
PANEL Connector
DDR4 /1.2 V
DDR4
SYSTEM SMBUS
2400/2666 MHz
DDR4 / 1.2V
DDR4
SO-DIMM1
DDR4
SO-DIMM2
GEN 3
DMI*4
Platform
Controller
Hub (PCH-H)
HM370
25x24mm
874 Ball FCBGA
SMB BUS
TOUCH PAD
CLICK BOARD
SPI
TPM 2.0
Optional
32.768 KHz
EC
ITE 8587
128pins LQFP
14*14*1.6mm
LPC
0.5"~11"
33 MHz
BIOS
SPI
INT. K/B
EC SMBUS
THERMAL
SENSOR
SMART
FAN
SMART
BATTERY
AC-IN
32.768KHz
AUDIO BOARD
MIC
IN
HP
OUT
USB3.0
USB2.0 PORT5
(USB3 PORT5)
USB2.0
USB2.0 PORT6
Azalia Codec
ALC269 VC2
SPK-L & SPK-R
<14"
AZALIA LINK
24 MHz
PCIE
100 MHz
CNVI
N850
7IN1 6-7P-N85H7-003
MAIN BOARD (N850)
6-71-N85H0-D02A
AUDIO BOARD
PHONE JACK x2;USB2.0 x1;USB3.0 x1
6-71-N8508-D03
N850 POWER SWITCH BOARD
6-71-N850S-D03
N850 Hall Sensor BOARD
6-71-N8501-D03A
N850 CLICK BOARD
6-71-N85H2-D02
N870 LED BOARD
6-71-N8704-D04
N850 FINGER BOARD
6-71-N85HF-D01
SATA I/II/III 6.0Gb/s
480 Mbps
USB2.0
5 Gbps
USB3.1
20 MHz
USB3.1
USB3.0
NGFF A.E Key
M.2 WLAN+BT
CNVI
PCIE PORT 7
USB2.0
PORT14
REALTEK
RTL8411B
LANCARD READER
PCIE PORT 5
25 MHz
SATA
SATA HDD
SATA PORT4
CCD +D-Mic
USB2.0 PORT8
NGFF
M.2 B Key
3G / LTE
USB2.0 PORT7
FINGER
USB2.0
PORT10
(Optional charger)
USB2.0 PORT1
(USB3 PORT1)
TYPE-A
USB3.0/USB3.1
USB2.0 PORT3
(USB3 PORT3,4)
TYPE-C
USB3.0/USB3.1
CC LOGIC
NGFF M Key
PCIE 4X SSD
PCIE
PORT
9,10,11,12
RJ-45
6IN1
SOCKET

Processor 1/6


U30C
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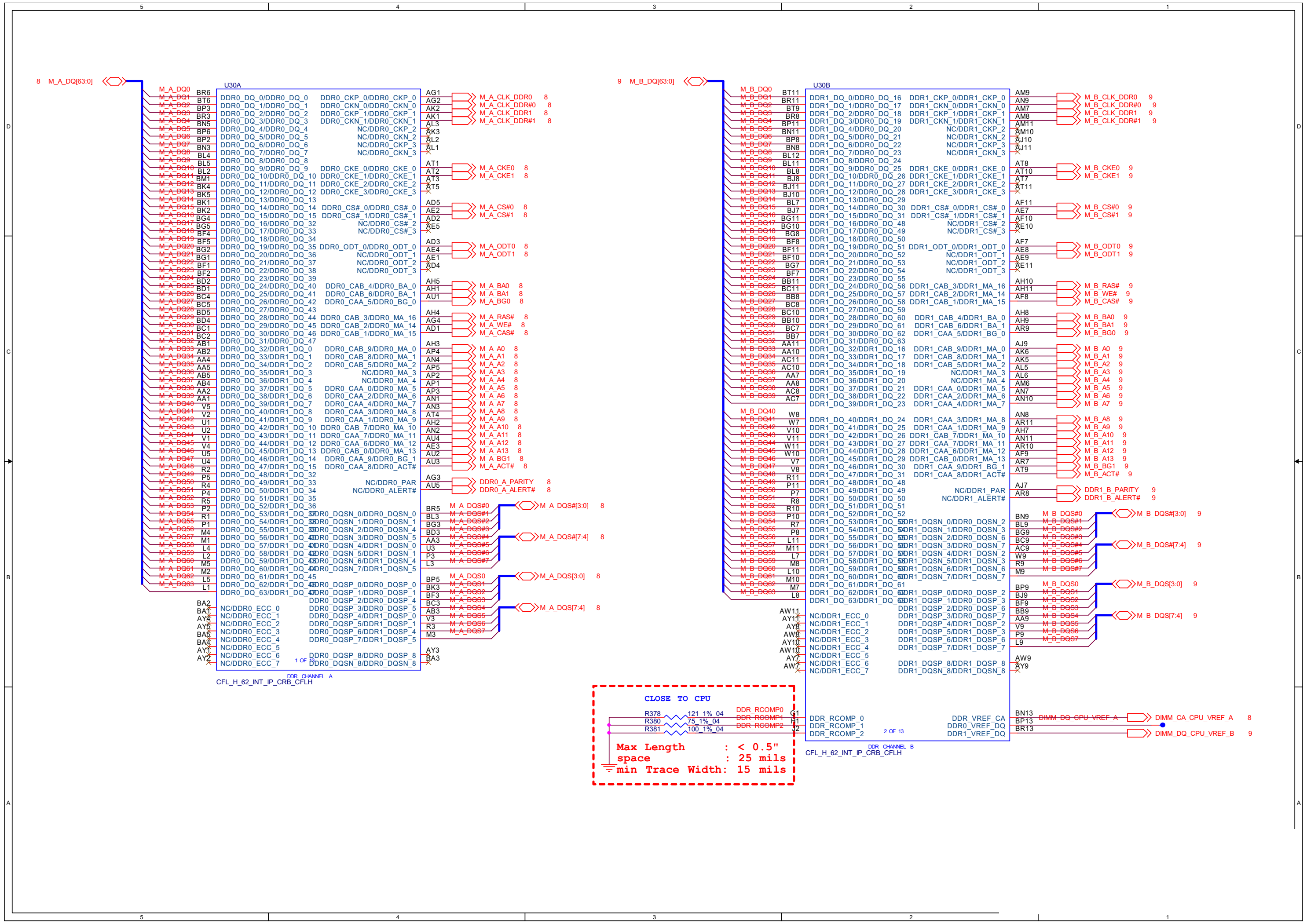
PEG_RXN_0 … PEG_RXN_15
PEG_TXP_0 … PEG_TXP_15
PEG_TXN_0 … PEG_TXN_15
PEG_RCOMP
R379
24.9_1%_04
VCCIO
PEG_COMP
Max Length : < 0.6"
space : 15 mils
min Trace Width: 5 mils
0.22u_10V_X5R_04
DMI_RXP_0 … DMI_RXP_3
DMI_RXN_0 … DMI_RXN_3
DMI_TXP_0 … DMI_TXP_3
DMI_TXN_0 … DMI_TXN_3
DMI_IT_MR_0_DP
DMI_MT_IR_0_DP
CFL_H_62_INT_IP_CRB_CFLH
3 OF 13
6-36-00180-250
CPU HOLD
H32
H26
H31
H6_5D4_3
3.3V
PLACE NEAR CPU
RT1
100k_1%_04_NTC
P/N 6-17-10420-734
THERM_VOLT 40
R340
20K_1%_04
U30D
DDI TO mDP
IGPU_LANE0P
IGPU_AUX_CH_P
IGPU_AUX_CH_N
HDMI 1.4b
HDMI_DATA0P
HDMI_CLOCKP
HDMI_CLOCKN
EDP_TXP_0
EDP_AUXP
EDP_AUXN
EDP to Panel
(support 4K Panel)
EDP_DISP_UTIL
DISP_RCOMP
EDP_RCOMP
R22
24.9_1%_04
VCCIO
CLOSE TO CPU
Max Length : < 0.6"
space : 20 mils
min Trace Width: 5 mils
PROC_AUDIO_CLK
PROC_AUDIO_SDI
PROC_AUDIO_SDO
AUD_AZACPU_SCLK 27
AUD_AZACPU_SDO_R 27
R317
20_1%_04
AUD_AZACPU_SDI 27
CLOSE TO CPU
3.3V 17,22,33,35,42,43,45,47,48
4 of 13
CFL_H_62_INT_IP_CRB_CFLH

Sheet 2 of 60
Processor 1/6

Processor 2/6

Sheet 3 of 60
Processor 2/6

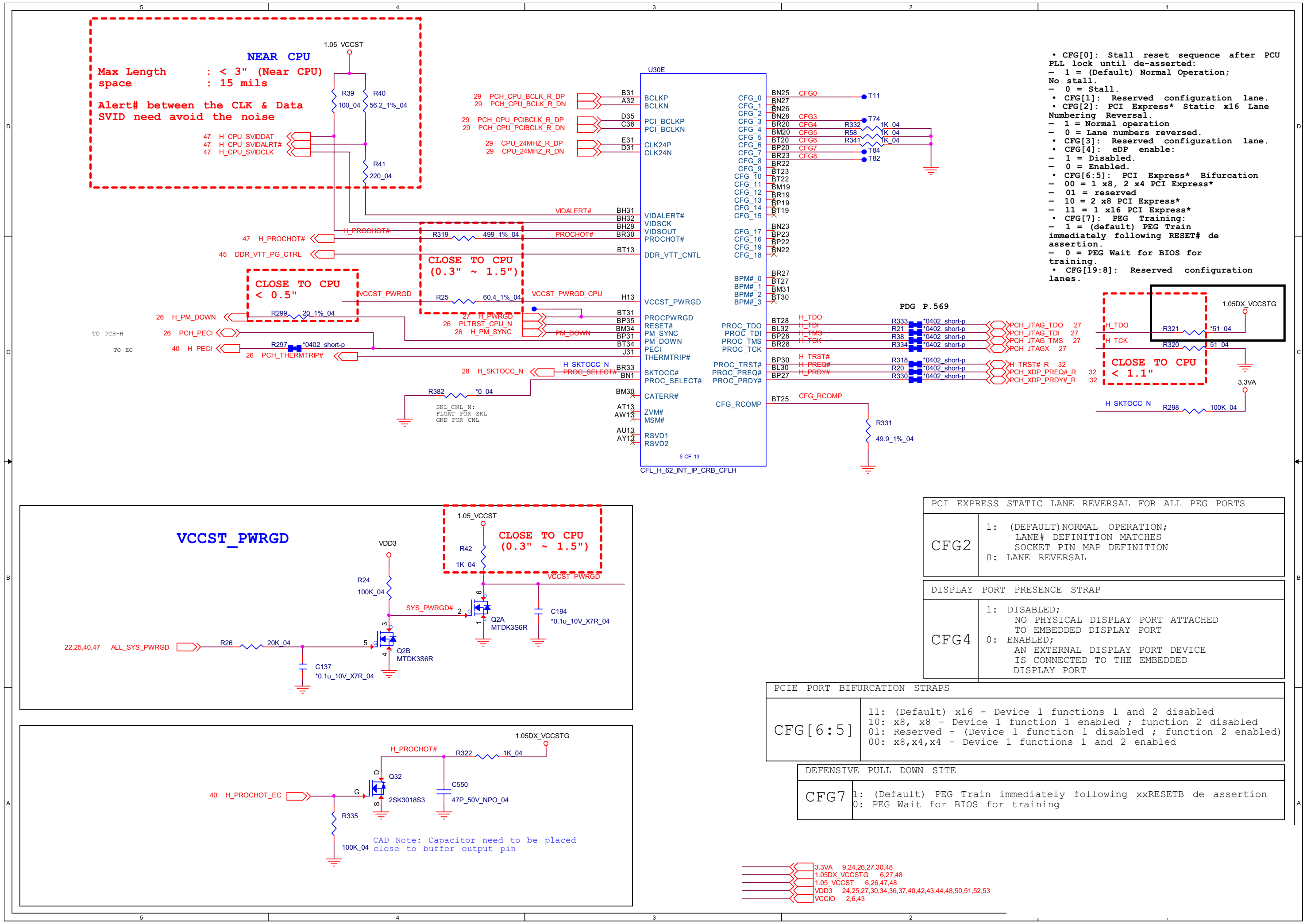


M_A_DQ[63:0]
U30A
DDR CHANNEL A
1 OF
CFL_H_62_INT_IP_CRB_CFLH
M_A_CLK_DDR0
M_A_CLK_DDR#0
M_A_CLK_DDR1
M_A_CLK_DDR#1
M_A_CKE0
M_A_CKE1
M_A_CS#0
M_A_CS#1
M_A_ODT0
M_A_ODT1
M_A_BA0
M_A_BA1
M_A_BG0
M_A_RAS#
M_A_WE#
M_A_CAS#
M_A_BG1
M_A_ACT#
DDR0_A_PARITY
DDR0_A_ALERT#
M_A_DQS#[3:0]
M_A_DQS#[7:4]
M_A_DQS[3:0]
M_A_DQS[7:4]
M_B_DQ[63:0]
U30B
DDR CHANNEL B
2 OF 13
CFL_H_62_INT_IP_CRB_CFLH
M_B_CLK_DDR0
M_B_CLK_DDR#0
M_B_CLK_DDR1
M_B_CLK_DDR#1
M_B_CKE0
M_B_CKE1
M_B_CS#0
M_B_CS#1
M_B_ODT0
M_B_ODT1
M_B_RAS#
M_B_WE#
M_B_CAS#
M_B_BA0
M_B_BA1
M_B_BG0
M_B_BG1
M_B_ACT#
DDR1_B_PARITY
DDR1_B_ALERT#
M_B_DQS#[3:0]
M_B_DQS#[7:4]
M_B_DQS[3:0]
M_B_DQS[7:4]
R378
R380
R381
121_1%_04
75_1%_04
100_1%_04
DDR_RCOMP0
DDR_RCOMP1
DDR_RCOMP2
G1
H1
J2
DDR_RCOMP_0
DDR_RCOMP_1
DDR_RCOMP_2
DDR_VREF_CA
DDR0_VREF_DQ
DDR1_VREF_DQ
BN13
BP13
BR13
DIMM_DQ_CPU_VREF_A
DIMM_CA_CPU_VREF_A
DIMM_DQ_CPU_VREF_B

CLOSE TO CPU

Max Length : < 0.5"
space : 25 mils
min Trace Width: 15 mils

Processor 3/6


NEAR CPU
Max Length : < 3" (Near CPU)
space : 15 mils
Alert# between the CLK & Data
SVID need avoid the noise
CLOSE TO CPU
(0.3" ~ 1.5")
CLOSE TO CPU
< 0.5"
CLOSE TO CPU
< 1.1"
U30E
CFL_H_62_INT_IP_CRB_CFLH
5 OF 13
PDG P.569
VCCST_PWRGD
CLOSE TO CPU
(0.3" ~ 1.5")
CAD Note: Capacitor need to be placed
close to buffer output pin
3.3VA 9,24,26,27,30,48
1.05DX_VCCSTG 6,27,48
1.05_VCCST 6,26,47,48
VDD3 24,25,27,30,34,36,37,40,42,43,44,48,50,51,52,53
VCCIO 2,6,43

- CFG[0]: Stall reset sequence after PCU PLL lock until de-asserted:
— 1 = (Default) Normal Operation; No stall.
— 0 = Stall.
- CFG[1]: Reserved configuration lane.
- CFG[2]: PCI Express* Static x16 Lane Numbering Reversal.
— 1 = Normal operation
— 0 = Lane numbers reversed.
- CFG[3]: Reserved configuration lane.
- CFG[4]: eDP enable:
— 1 = Disabled.
— 0 = Enabled.
- CFG[6:5]: PCI Express* Bifurcation
— 00 = 1 x8, 2 x4 PCI Express*
— 01 = reserved
— 10 = 2 x8 PCI Express*
— 11 = 1 x16 PCI Express*
- CFG[7]: PEG Training:
— 1 = (default) PEG Train immediately following RESET# de assertion.
— 0 = PEG Wait for BIOS for training.
- CFG[19:8]: Reserved configuration lanes.

PCI EXPRESS STATIC LANE REVERSAL FOR ALL PEG PORTS	
CFG2	1: (DEFAULT)NORMAL OPERATION; LANE# DEFINITION MATCHES SOCKET PIN MAP DEFINITION 0: LANE REVERSAL

DISPLAY PORT PRESENCE STRAP	
CFG4	1: DISABLED; NO PHYSICAL DISPLAY PORT ATTACHED TO EMBEDDED DISPLAY PORT 0: ENABLED; AN EXTERNAL DISPLAY PORT DEVICE IS CONNECTED TO THE EMBEDDED DISPLAY PORT

PCIE PORT BIFURCATION STRAPS	
CFG[6:5]	11: (Default) x16 - Device 1 functions 1 and 2 disabled 10: x8, x8 - Device 1 function 1 enabled ; function 2 disabled 01: Reserved - (Device 1 function 1 disabled ; function 2 enabled) 00: x8,x4,x4 - Device 1 functions 1 and 2 enabled

DEFENSIVE PULL DOWN SITE	
CFG7	1: (Default) PEG Train immediately following xxRESETB de assertion 0: PEG Wait for BIOS for training

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Processor 3/6

Processor 4/6

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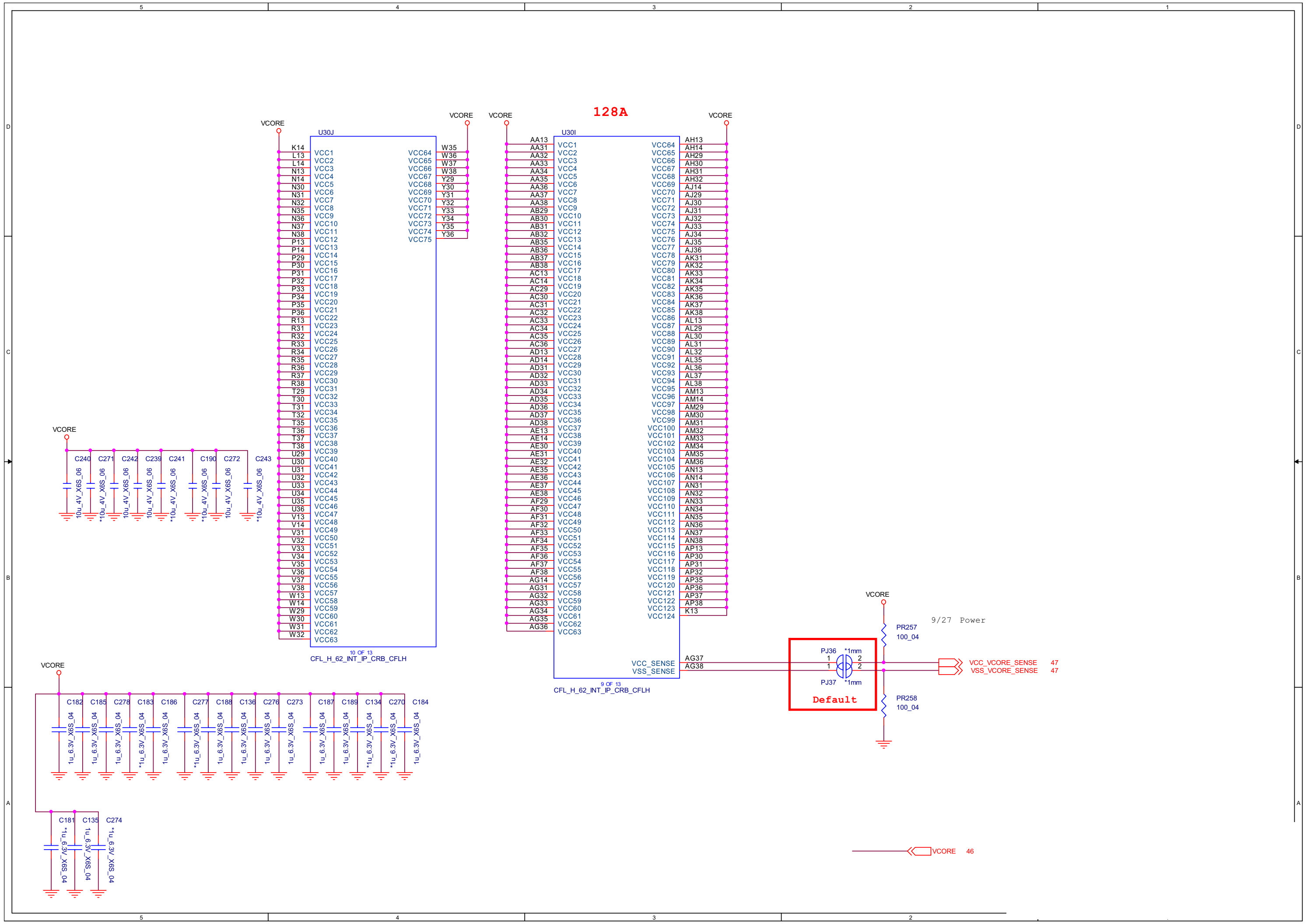
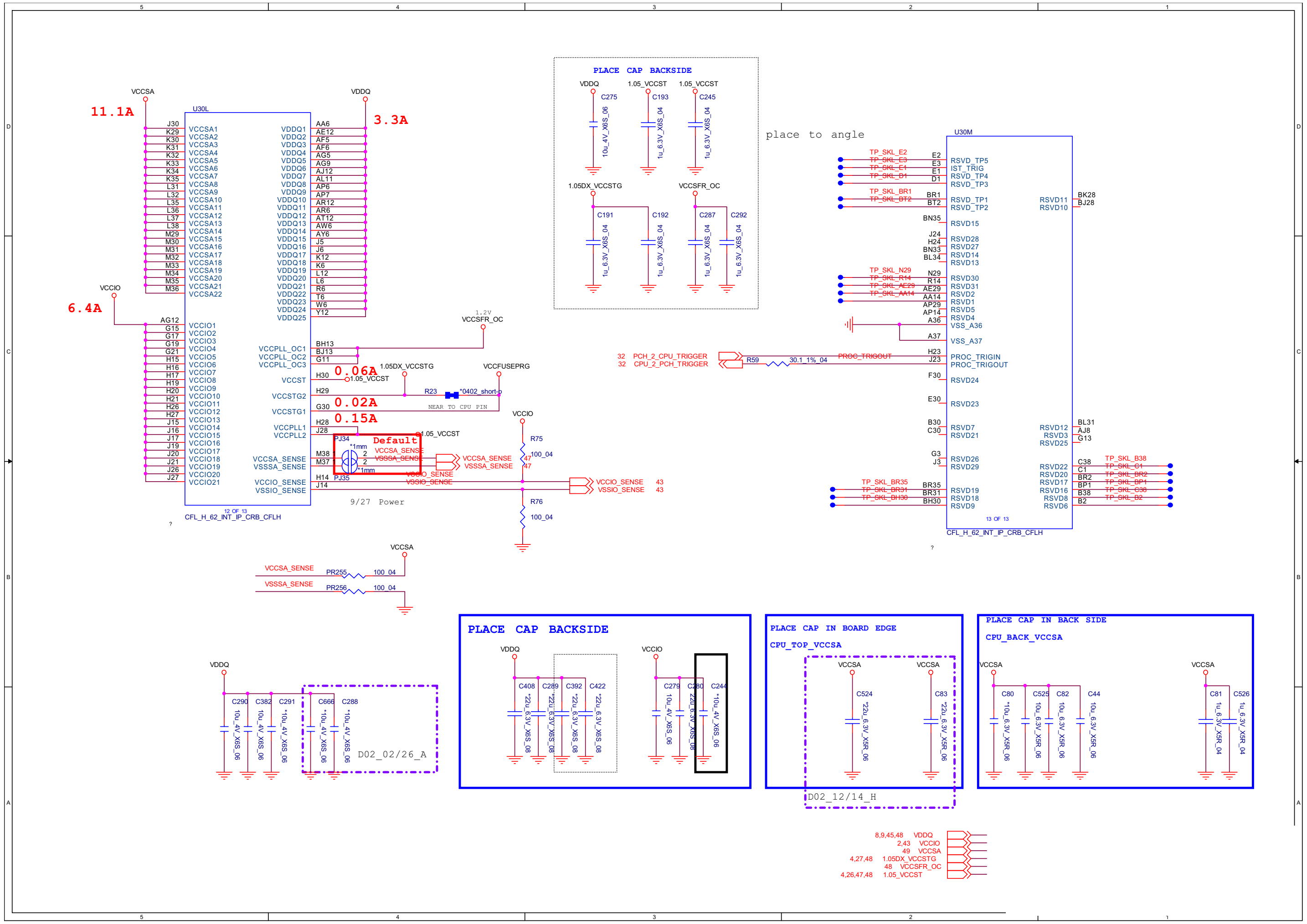
Processor 4/6


VCORE
U30J
U30I
128A
CFL_H_62_INT_IP_CRB_CFLH
10 OF 13
9 OF 13
VCC_SENSE
VSS_SENSE
AG37
AG38
PJ36 *1mm
PJ37 *1mm
Default
PR257 100_04
PR258 100_04
9/27 Power
VCC_VCORE_SENSE 47
VSS_VCORE_SENSE 47
VCORE 46
C240 C271 C242 C239 C241 C190 C272 C243
10u_4V_X6S_06
C182 C185 C278 C183 C186 C277 C188 C136 C276 C273 C187 C189 C134 C270 C184
1u_6.3V_X6S_04
C181 C135 C274

Processor 5/6



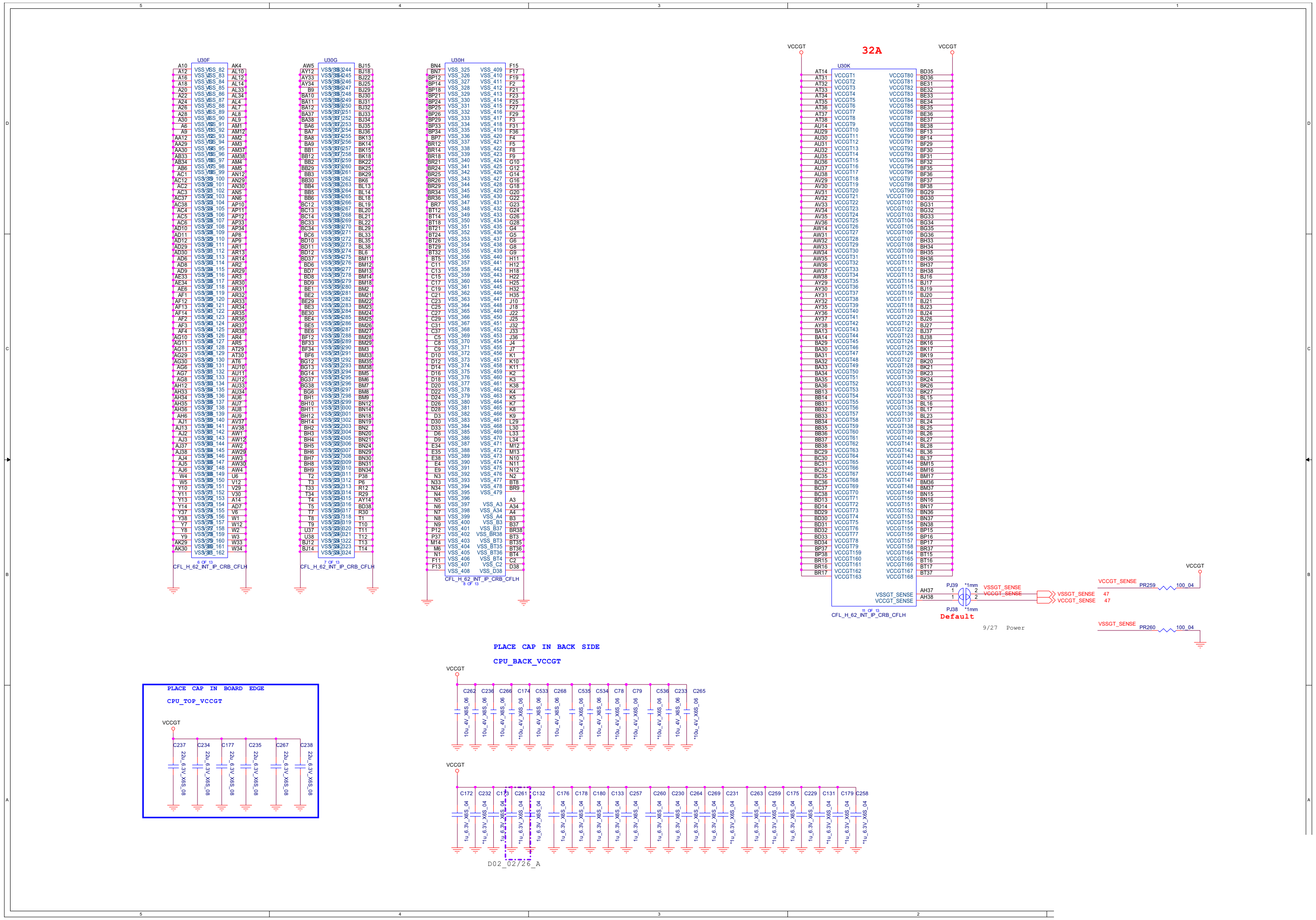
U30L
VCCSA
11.1A
VDDQ
3.3A
VCCIO
6.4A
1.2V
VCCSFR_OC
1.05DX_VCCSTG
VCCFUSEPRG
0.06A
0.02A
0.15A
NEAR TO CPU PIN
Default
VCCSA_SENSE
VSSSA_SENSE
VCCIO_SENSE
VSSIO_SENSE
9/27 Power
CFL_H_62_INT_IP_CRB_CFLH
12 OF 13
PLACE CAP BACKSIDE
place to angle
U30M
PCH_2_CPU_TRIGGER
CPU_2_PCH_TRIGGER
PROC_TRIGIN
PROC_TRIGOUT
13 OF 13
PLACE CAP IN BOARD EDGE
CPU_TOP_VCCSA
PLACE CAP IN BACK SIDE
CPU_BACK_VCCSA
D02_02/26_A
D02_12/14_H

Sheet 6 of 60
Processor 5/6

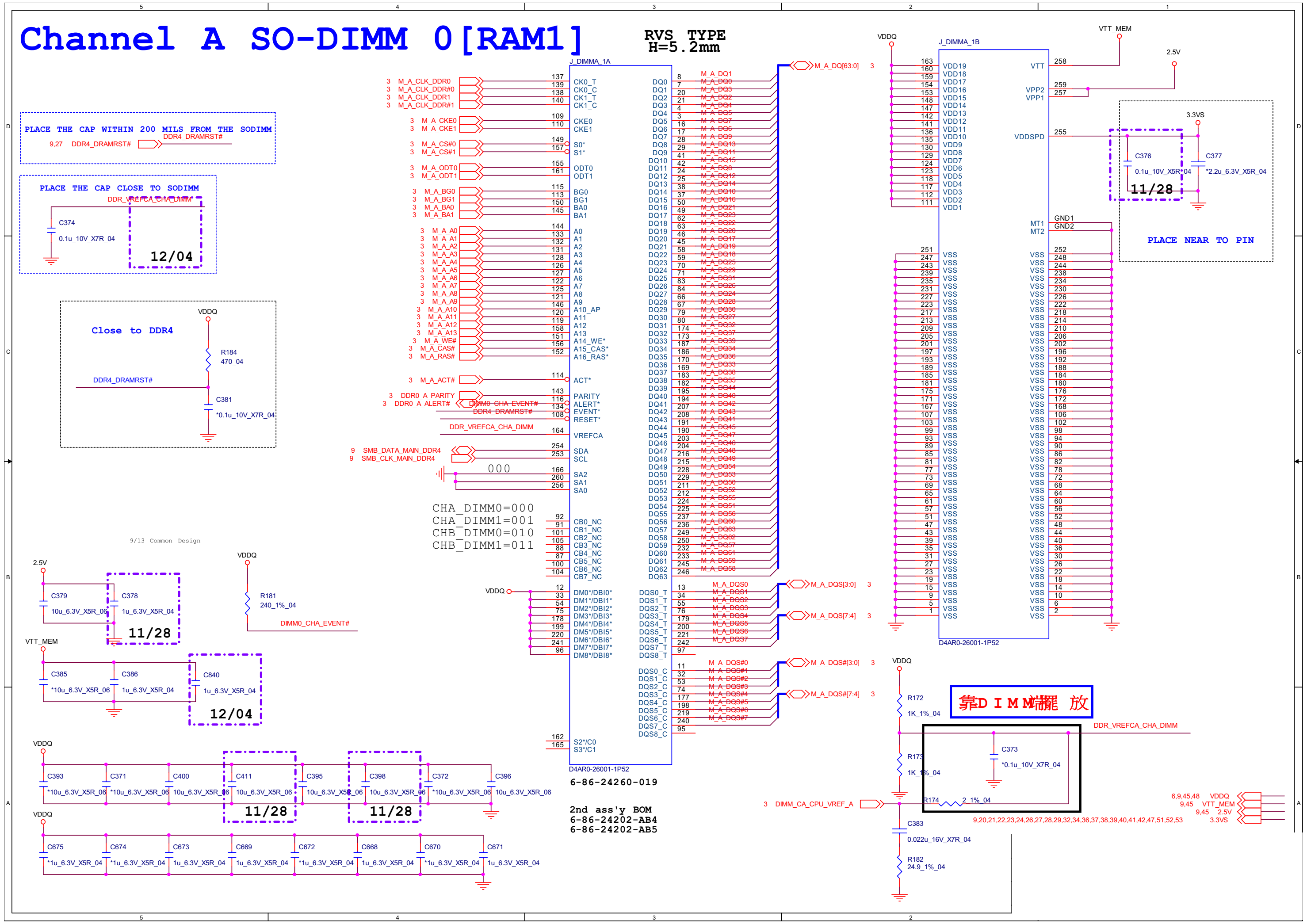
B.Schematic Diagrams

Processor 6/6

Sheet 7 of 60
Processor 6/6


U30F
U30G
U30H
U30K
VCCGT
32A
VCCGT_SENSE
VSSGT_SENSE
PR259
PR260
100_04
PJ39
PJ38
Default
9/27 Power
PLACE CAP IN BACK SIDE
CPU_BACK_VCCGT
PLACE CAP IN BOARD EDGE
CPU_TOP_VCCGT
D02_02/26_A
CFL_H_62_INT_IP_CRB_CFLH

DDR4 CHA SO-DIMM


Channel A SO-DIMM 0[RAM1]
RVS TYPE
H=5.2mm
J_DIMMA_1A
J_DIMMA_1B
PLACE THE CAP WITHIN 200 MILS FROM THE SODIMM
DDR4_DRAMRST#
PLACE THE CAP CLOSE TO SODIMM
DDR_VREFCA_CHA_DIMM
C374
0.1u_10V_X7R_04
12/04
Close to DDR4
VDDQ
R184
470_04
C381
*0.1u_10V_X7R_04
9/13 Common Design
2.5V
C379
10u_6.3V_X5R_06
C378
1u_6.3V_X5R_04
11/28
VTT_MEM
C385
*10u_6.3V_X5R_06
C386
1u_6.3V_X5R_04
C840
1u_6.3V_X5R_04
12/04
R181
240_1%_04
DIMM0_CHA_EVENT#
C393
C371
C400
C411
C395
C398
C372
C396
11/28
11/28
C675
C674
C673
C669
C672
C668
C670
C671
M_A_CLK_DDR0
M_A_CLK_DDR#0
M_A_CLK_DDR1
M_A_CLK_DDR#1
M_A_CKE0
M_A_CKE1
M_A_CS#0
M_A_CS#1
M_A_ODT0
M_A_ODT1
M_A_BG0
M_A_BG1
M_A_BA0
M_A_BA1
M_A_ACT#
DDR0_A_PARITY
DDR0_A_ALERT#
SMB_DATA_MAIN_DDR4
SMB_CLK_MAIN_DDR4
000
CHA_DIMM0=000
CHA_DIMM1=001
CHB_DIMM0=010
CHB_DIMM1=011
M_A_DQ[63:0]
M_A_DQS[3:0]
M_A_DQS[7:4]
M_A_DQS#[3:0]
M_A_DQS#[7:4]
D4AR0-26001-1P52
6-86-24260-019
2nd ass'y BOM
6-86-24202-AB4
6-86-24202-AB5
VTT
VPP2
VPP1
VDDSPD
3.3VS
C376
0.1u_10V_X5R*04
C377
*2.2u_6.3V_X5R_04
11/28
PLACE NEAR TO PIN
GND1
GND2
R172
1K_1%_04
R173
1K_1%_04
C373
*0.1u_10V_X7R_04
R174
2_1%_04
DIMM_CA_CPU_VREF_A
C383
0.022u_16V_X7R_04
R182
24.9_1%_04
靠DIMM擺放
DDR_VREFCA_CHA_DIMM
6,9,45,48 VDDQ
9,45 VTT_MEM
9,45 2.5V
9,20,21,22,23,24,26,27,28,29,32,34,36,37,38,39,40,41,42,47,51,52,53 3.3VS

Sheet 8 of 60
DDR4 CHA SO-DIMM

DDR4 CHB SO-DIMM

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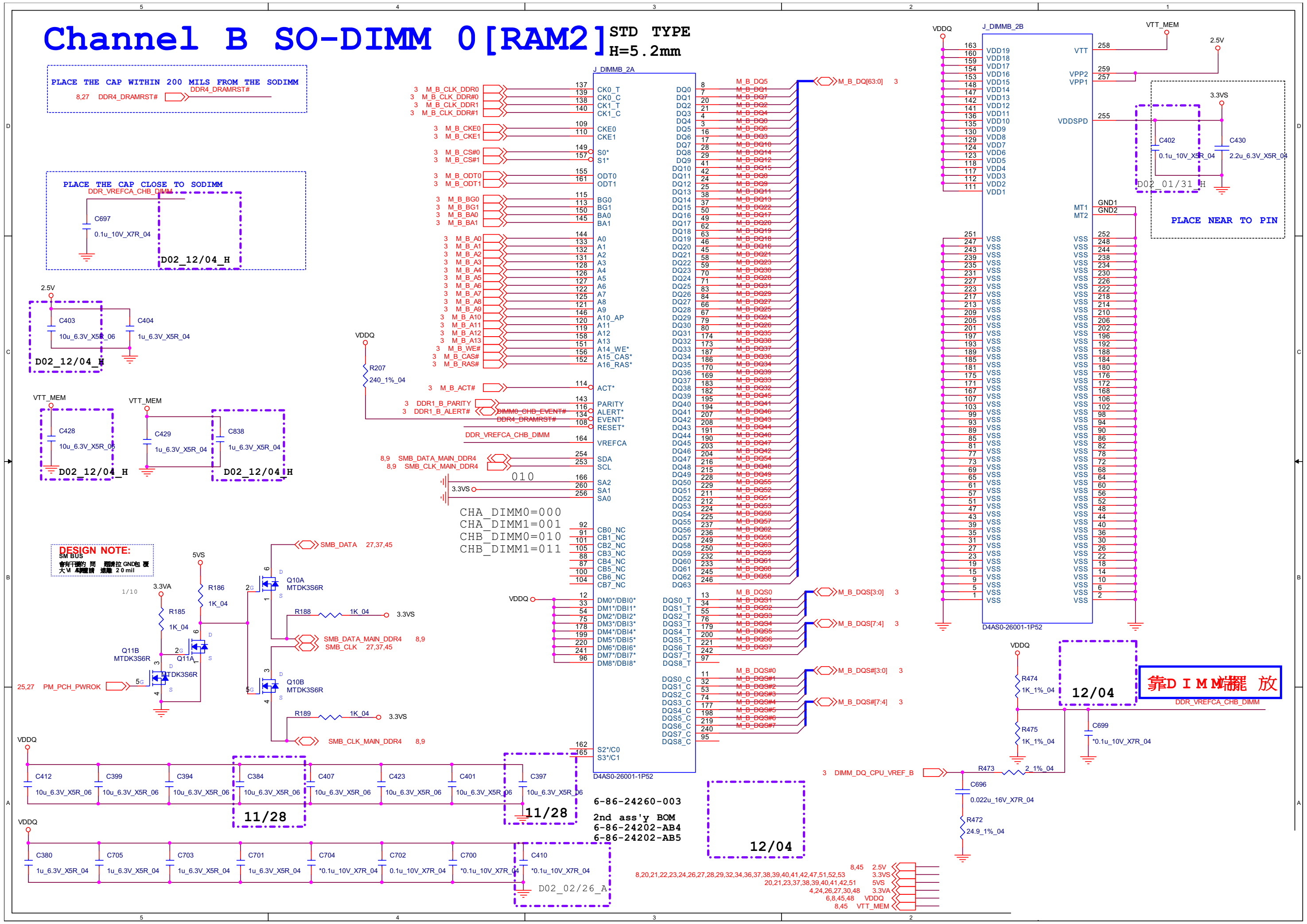
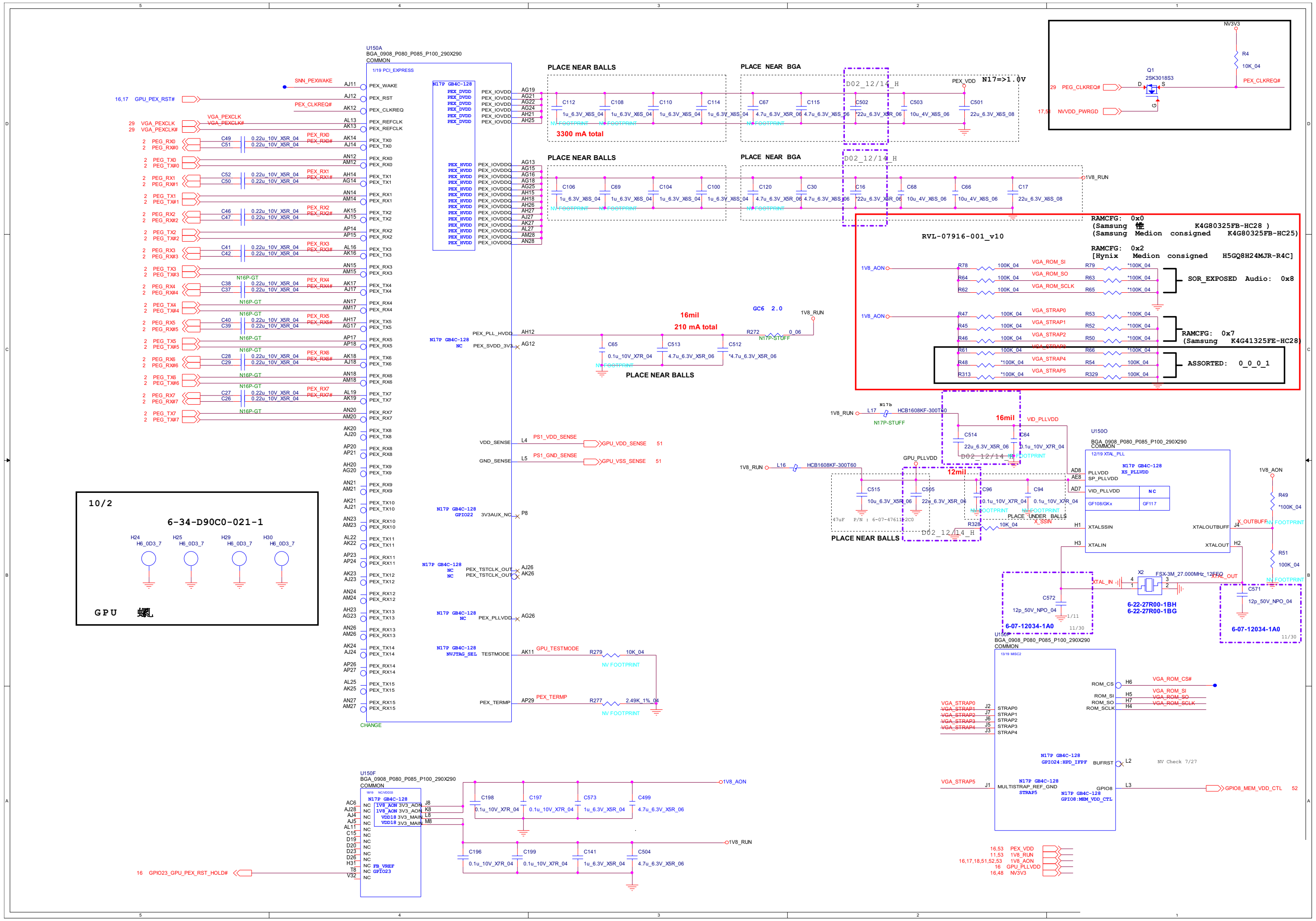
DDR4 CHB SO-
DIMM


Channel B SO-DIMM 0[RAM2]
STD TYPE
H=5.2mm
PLACE THE CAP WITHIN 200 MILS FROM THE SODIMM
DDR4_DRAMRST#
PLACE THE CAP CLOSE TO SODIMM
DDR_VREFCA_CHB_DIMM
C697
0.1u_10V_X7R_04
D02_12/04_H
2.5V
C403
10u_6.3V_X5R_06
C404
1u_6.3V_X5R_04
VTT_MEM
C428
C429
C838
VDDQ
R207
240_1%_04
J_DIMMB_2A
J_DIMMB_2B
M_B_DQ[63:0]
M_B_DQS[3:0]
M_B_DQS[7:4]
M_B_DQS#[3:0]
M_B_DQS#[7:4]
SMB_DATA_MAIN_DDR4
SMB_CLK_MAIN_DDR4
CHA_DIMM0=000
CHA_DIMM1=001
CHB_DIMM0=010
CHB_DIMM1=011
DESIGN NOTE:
SMB_DATA
SMB_CLK
Q10A
MTDK3S6R
Q10B
MTDK3S6R
Q11A
Q11B
MTDK3S6R
R185
R186
R188
R189
3.3VS
3.3VA
5VS
PM_PCH_PWROK
D4AS0-26001-1P52
6-86-24260-003
2nd ass'y BOM
6-86-24202-AB4
6-86-24202-AB5
11/28
12/04
D02_02/26_A
D02_01/31_H
PLACE NEAR TO PIN
VDDSPD
VTT
VPP2
VPP1
C402
0.1u_10V_X5R_04
C430
2.2u_6.3V_X5R_04
R474
1K_1%_04
R475
1K_1%_04
C699
R473
2_1%_04
C696
0.022u_16V_X7R_04
R472
24.9_1%_04
DIMM_DQ_CPU_VREF_B
C412
C399
C394
C384
C407
C423
C401
C397
C380
C705
C703
C701
C704
C702
C700
C410
2.5V
3.3VS
5VS
3.3VA
VDDQ
VTT_MEM

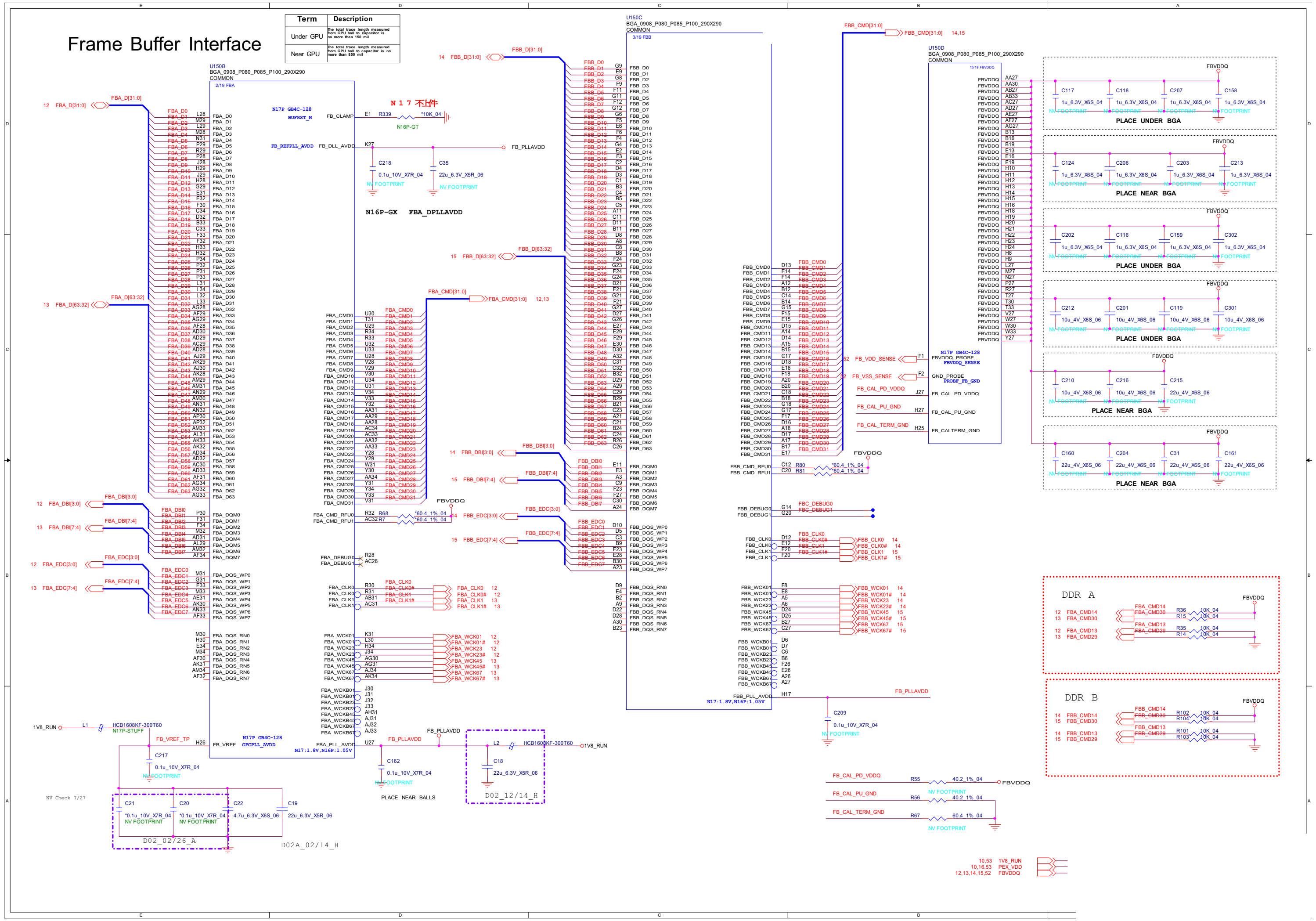
VGA PCI-E Interface


U150A
BGA_0908_P080_P085_P100_290X290
COMMON
PLACE NEAR BALLS
PLACE NEAR BGA
3300 mA total
D02_12/14_H
N17=>1.0V
PEX_VDD
1V8_RUN
1V8_AON
RVL-07916-001_v10
RAMCFG: 0x0
(Samsung K4G80325FB-HC28)
(Samsung Medion consigned K4G80325FB-HC25)
RAMCFG: 0x2
[Hynix Medion consigned H5GQ8H24MJR-R4C]
SOR_EXPOSED Audio: 0x8
RAMCFG: 0x7
(Samsung K4G41325FE-HC28)
ASSORTED: 0_0_0_1
16mil
210 mA total
GC6 2.0
PLACE NEAR BALLS
16mil
12mil
PLACE UNDER BALLS
PLACE NEAR BALLS
U150D
U150E
U150F
6-22-27R00-1BH
6-22-27R00-1BG
6-07-12034-1A0
6-07-12034-1A0
10/2
6-34-D90C0-021-1
H24
H25
H29
H30
GPU
NV3V3
Q1
2SK3018S3
R4
10K_04
PEG_CLKREQ#
NVVDD_PWRGD
PEX_PLL_HVDD
PEX_SVDD_3V3
VDD_SENSE
GND_SENSE
GPU_VDD_SENSE
GPU_VSS_SENSE
3V3AUX_NC
PEX_TSTCLK_OUT
PEX_PLLVDD
TESTMODE
GPU_TESTMODE
PEX_TERMP
PEX_TERM
GPIO8_MEM_VDD_CTL
GPIO23_GPU_PEX_RST_HOLD#
STRAP0
STRAP1
STRAP2
STRAP3
STRAP4
ROM_CS
ROM_SI
ROM_SO
ROM_SCLK
XTALSSIN
XTALIN
XTALOUTBUFF
XTALOUT
FSX-3M_27.000MHz_12PF

Sheet 10 of 60
VGA PCI-E
Interface

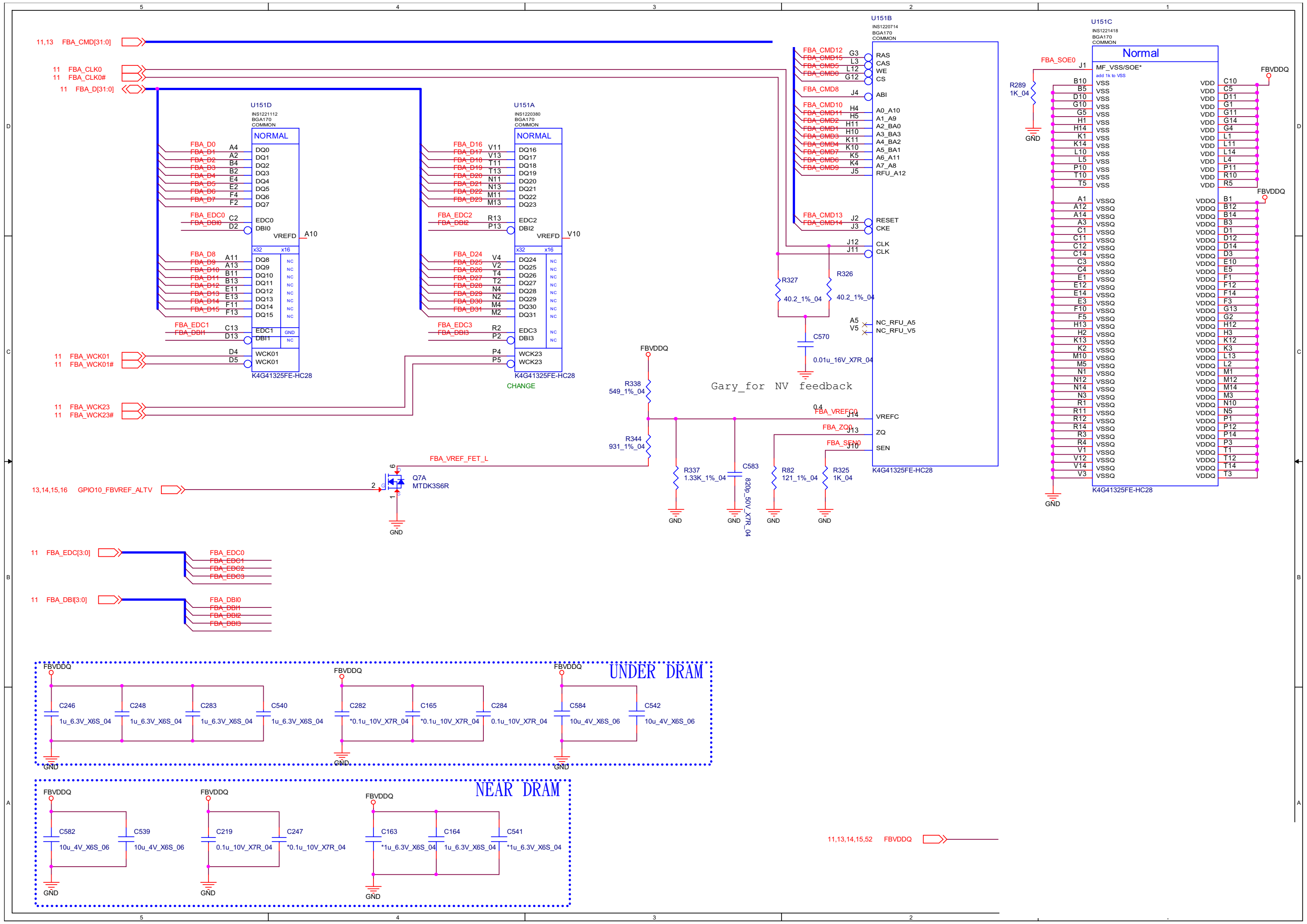
VGA Frame Buffer Interface

Sheet 11 of 60
VGA Frame Buffer
Interface


Frame Buffer Interface
U150B
BGA_0908_P080_P085_P100_290X290
COMMON
U150C
U150D
N17P GB4C-128
BUFRST_N
FB_CLAMP
N 1 7 不上件
N16P-GT
N16P-GX FBA_DPLLAVDD
FB_PLLAVDD
FBVDDQ
PLACE UNDER BGA
PLACE NEAR BGA
PLACE NEAR BALLS
DDR A
DDR B
1V8_RUN
NV FOOTPRINT
D02_02/26_A
D02A_02/14_H
D02_12/14_H
NV Check 7/27

Term	Description
Under GPU	The total trace length measured from GPU ball to capacitor is no more than 150 mil
Near GPU	The total trace length measured from GPU ball to capacitor is no more than 850 mil

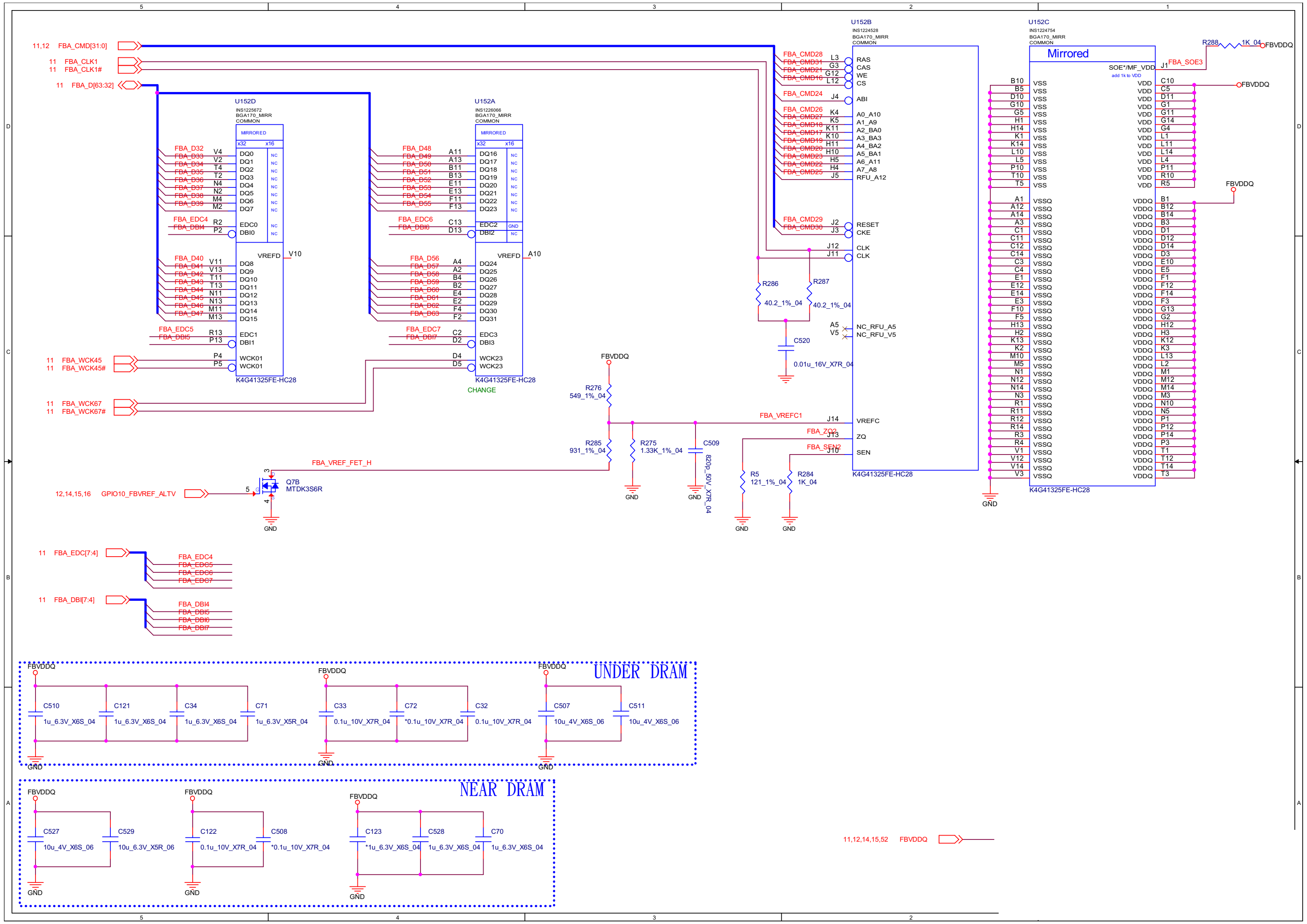
VGA Frame Buffer A


11,13 FBA_CMD[31:0]
11 FBA_CLK0
11 FBA_CLK0#
11 FBA_D[31:0]
U151D
NORMAL
K4G41325FE-HC28
U151A
CHANGE
U151B
RAS
CAS
WE
CS
ABI
A0_A10
A1_A9
A2_BA0
A3_BA3
A4_BA2
A5_BA1
A6_A11
A7_A8
RFU_A12
RESET
CKE
CLK
CLK
NC_RFU_A5
NC_RFU_V5
VREFC
ZQ
SEN
U151C
Normal
MF_VSS/SOE*
FBA_SOE0
R289
1K_04
FBVDDQ
GND
R327
40.2_1%_04
R326
40.2_1%_04
C570
0.01u_16V_X7R_04
R338
549_1%_04
R344
931_1%_04
Gary_for NV feedback
FBA_VREFC0
FBA_ZQ
FBA_SEN
R337
1.33K_1%_04
C583
820p_50V_X7R_04
R82
121_1%_04
R325
1K_04
FBA_VREF_FET_L
Q7A
MTDK3S6R
13,14,15,16 GPIO10_FBVREF_ALTV
11 FBA_WCK01
11 FBA_WCK01#
11 FBA_WCK23
11 FBA_WCK23#
11 FBA_EDC[3:0]
FBA_EDC0
FBA_EDC1
FBA_EDC2
FBA_EDC3
11 FBA_DBI[3:0]
FBA_DBI0
FBA_DBI1
FBA_DBI2
FBA_DBI3
UNDER DRAM
C246 1u_6.3V_X6S_04
C248 1u_6.3V_X6S_04
C283 1u_6.3V_X6S_04
C540 1u_6.3V_X6S_04
C282 *0.1u_10V_X7R_04
C165 *0.1u_10V_X7R_04
C284 0.1u_10V_X7R_04
C584 10u_4V_X6S_06
C542 10u_4V_X6S_06
NEAR DRAM
C582 10u_4V_X6S_06
C539 10u_4V_X6S_06
C219 0.1u_10V_X7R_04
C247 *0.1u_10V_X7R_04
C163 *1u_6.3V_X6S_04
C164 1u_6.3V_X6S_04
C541 *1u_6.3V_X6S_04
11,13,14,15,52 FBVDDQ

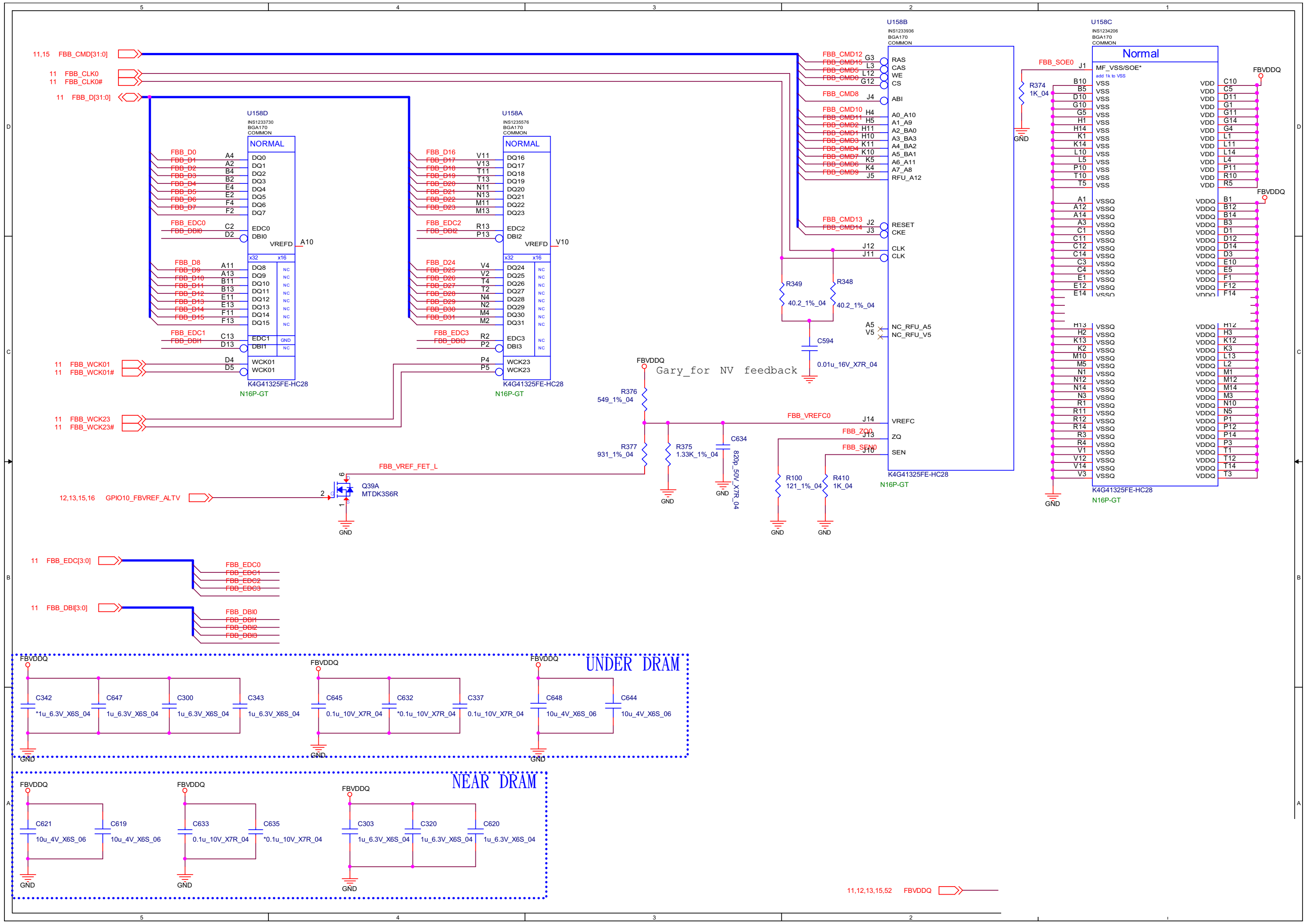
Sheet 12 of 60
VGA Frame Buffer
A

VGA Frame Buffer A

Sheet 13 of 60
VGA Frame Buffer
A


U152B
U152C
U152D
U152A
Mirrored
K4G41325FE-HC28
FBA_CMD[31:0]
FBA_CLK1
FBA_CLK1#
FBA_D[63:32]
FBA_WCK45
FBA_WCK45#
FBA_WCK67
FBA_WCK67#
GPIO10_FBVREF_ALTV
FBA_VREF_FET_H
Q7B
MTDK3S6R
FBA_VREFC1
FBA_ZQ2
FBA_SEN2
FBA_SOE3
R288
1K_04
R286
40.2_1%_04
R287
40.2_1%_04
C520
0.01u_16V_X7R_04
R276
549_1%_04
R285
931_1%_04
R275
1.33K_1%_04
C509
820p_50V_X7R_04
R5
121_1%_04
R284
1K_04
FBA_EDC[7:4]
FBA_DBI[7:4]
CHANGE
FBVDDQ
GND
UNDER DRAM
C510
1u_6.3V_X6S_04
C121
1u_6.3V_X6S_04
C34
1u_6.3V_X6S_04
C71
1u_6.3V_X5R_04
C33
0.1u_10V_X7R_04
C72
*0.1u_10V_X7R_04
C32
0.1u_10V_X7R_04
C507
10u_4V_X6S_06
C511
10u_4V_X6S_06
NEAR DRAM
C527
10u_4V_X6S_06
C529
10u_6.3V_X5R_06
C122
0.1u_10V_X7R_04
C508
*0.1u_10V_X7R_04
C123
*1u_6.3V_X6S_04
C528
1u_6.3V_X6S_04
C70
1u_6.3V_X6S_04
11,12,14,15,52 FBVDDQ

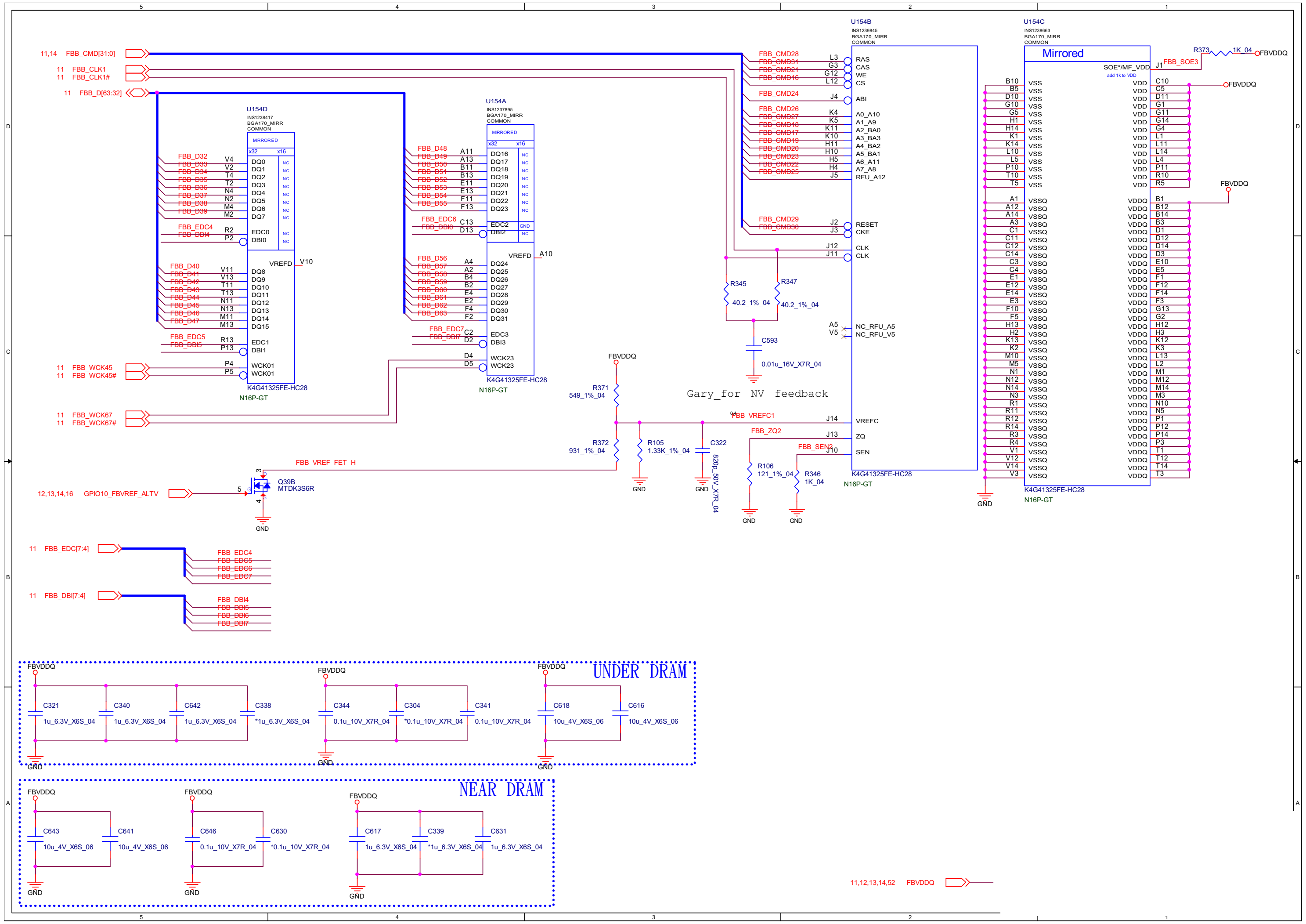
VGA Frame Buffer B


11,15 FBB_CMD[31:0]
11 FBB_CLK0
11 FBB_CLK0#
11 FBB_D[31:0]
U158D
INS1233730
BGA170
COMMON
NORMAL
FBB_D0 A4 DQ0
FBB_D1 A2 DQ1
FBB_D2 B4 DQ2
FBB_D3 B2 DQ3
FBB_D4 E4 DQ4
FBB_D5 E2 DQ5
FBB_D6 F4 DQ6
FBB_D7 F2 DQ7
FBB_EDC0 C2 EDC0
FBB_DBI0 D2 DBI0
VREFD A10
x32 x16
FBB_D8 A11 DQ8
FBB_D9 A13 DQ9
FBB_D10 B11 DQ10
FBB_D11 B13 DQ11
FBB_D12 E11 DQ12
FBB_D13 E13 DQ13
FBB_D14 F11 DQ14
FBB_D15 F13 DQ15
NC
FBB_EDC1 C13 EDC1 GND
FBB_DBI1 D13 DBI1 NC
11 FBB_WCK01 D4 WCK01
11 FBB_WCK01# D5 WCK01
K4G41325FE-HC28
N16P-GT
U158A
INS1235576
BGA170
COMMON
NORMAL
FBB_D16 V11 DQ16
FBB_D17 V13 DQ17
FBB_D18 T11 DQ18
FBB_D19 T13 DQ19
FBB_D20 N11 DQ20
FBB_D21 N13 DQ21
FBB_D22 M11 DQ22
FBB_D23 M13 DQ23
FBB_EDC2 R13 EDC2
FBB_DBI2 P13 DBI2
VREFD V10
x32 x16
FBB_D24 V4 DQ24
FBB_D25 V2 DQ25
FBB_D26 T4 DQ26
FBB_D27 T2 DQ27
FBB_D28 N4 DQ28
FBB_D29 N2 DQ29
FBB_D30 M4 DQ30
FBB_D31 M2 DQ31
FBB_EDC3 R2 EDC3
FBB_DBI3 P2 DBI3
11 FBB_WCK23 P4 WCK23
11 FBB_WCK23# P5 WCK23
K4G41325FE-HC28
N16P-GT
U158B
INS1233936
BGA170
COMMON
FBB_CMD12 G3 RAS
FBB_CMD15 L3 CAS
FBB_CMD5 L12 WE
FBB_CMD0 G12 CS
FBB_CMD8 J4 ABI
FBB_CMD10 H4 A0_A10
FBB_CMD11 H5 A1_A9
FBB_CMD2 H11 A2_BA0
FBB_CMD1 H10 A3_BA3
FBB_CMD3 K11 A4_BA2
FBB_CMD4 K10 A5_BA1
FBB_CMD7 K5 A6_A11
FBB_CMD6 K4 A7_A8
FBB_CMD9 J5 RFU_A12
FBB_CMD13 J2 RESET
FBB_CMD14 J3 CKE
J12 CLK
J11 CLK
R349 40.2_1%_04
R348 40.2_1%_04
C594 0.01u_16V_X7R_04
A5 NC_RFU_A5
V5 NC_RFU_V5
FBVDDQ
Gary_for NV feedback
R376 549_1%_04
FBB_VREFC0 J14 VREFC
FBB_ZQ0 J13 ZQ
FBB_SEN0 J10 SEN
R377 931_1%_04
R375 1.33K_1%_04
C634 820p_50V_X7R_04
R100 121_1%_04
R410 1K_04
K4G41325FE-HC28
N16P-GT
GND
FBB_VREF_FET_L
6
2
1
Q39A MTDK3S6R
12,13,15,16 GPIO10_FBVREF_ALTV
U158C
INS1234206
BGA170
COMMON
Normal
FBB_SOE0 J1 MF_VSS/SOE*
add 1k to VSS
R374 1K_04
B10 B5 D10 G10 G5 H1 H14 K1 K14 L10 L5 P10 T10 T5 VSS
A1 A12 A14 A3 C1 C11 C12 C14 C3 C4 E1 E12 E14 H13 H2 K13 K2 M10 M5 N1 N12 N14 N3 R1 R11 R12 R14 R3 R4 V1 V12 V14 V3 VSSQ
VDD C10 C5 D11 G1 G11 G14 G4 L1 L11 L14 L4 P11 R10 R5
VDDQ B1 B12 B14 B3 D1 D12 D14 D3 E10 E5 F1 F12 F14 H12 H3 K12 K3 L13 L2 M1 M12 M14 M3 N10 N5 P1 P12 P14 P3 T1 T12 T14 T3
FBVDDQ
K4G41325FE-HC28
N16P-GT
11 FBB_EDC[3:0]
FBB_EDC0
FBB_EDC1
FBB_EDC2
FBB_EDC3
11 FBB_DBI[3:0]
FBB_DBI0
FBB_DBI1
FBB_DBI2
FBB_DBI3
UNDER DRAM
C342 *1u_6.3V_X6S_04
C647 1u_6.3V_X6S_04
C300 1u_6.3V_X6S_04
C343 1u_6.3V_X6S_04
C645 0.1u_10V_X7R_04
C632 *0.1u_10V_X7R_04
C337 0.1u_10V_X7R_04
C648 10u_4V_X6S_06
C644 10u_4V_X6S_06
NEAR DRAM
C621 10u_4V_X6S_06
C619 10u_4V_X6S_06
C633 0.1u_10V_X7R_04
C635 *0.1u_10V_X7R_04
C303 1u_6.3V_X6S_04
C320 1u_6.3V_X6S_04
C620 1u_6.3V_X6S_04
11,12,13,15,52 FBVDDQ
5
4
3
2
1
D
C
B
A

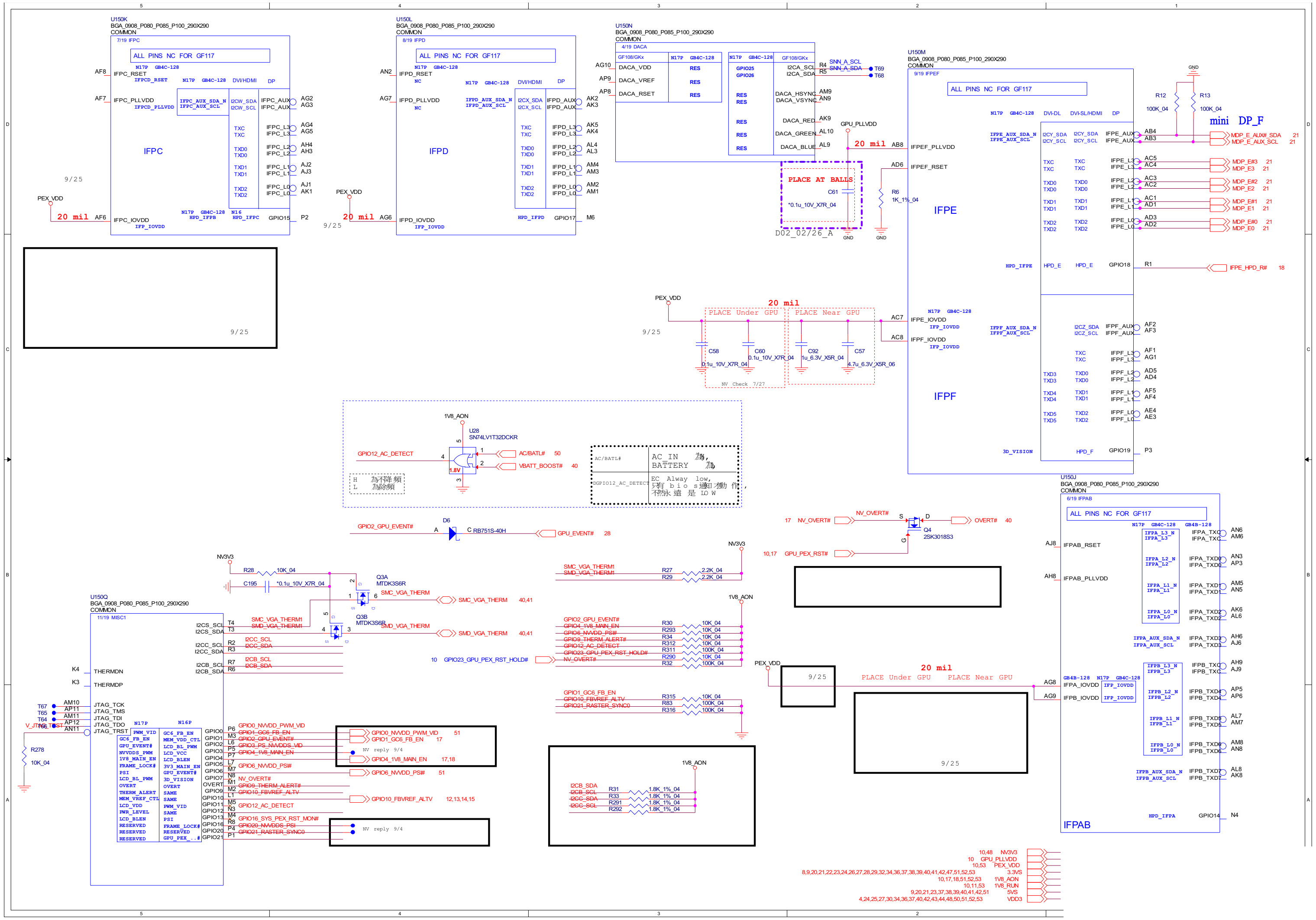
Sheet 14 of 60
VGA Frame Buffer
B

VGA Frame Buffer B

Sheet 15 of 60
VGA Frame Buffer
B


11,14 FBB_CMD[31:0]
11 FBB_CLK1
11 FBB_CLK1#
11 FBB_D[63:32]
U154D
K4G41325FE-HC28
N16P-GT
U154A
K4G41325FE-HC28
N16P-GT
U154B
K4G41325FE-HC28
N16P-GT
U154C
Mirrored
K4G41325FE-HC28
N16P-GT
RAS
CAS
WE
CS
ABI
A0_A10
A1_A9
A2_BA0
A3_BA3
A4_BA2
A5_BA1
A6_A11
A7_A8
RFU_A12
RESET
CKE
CLK
CLK
NC_RFU_A5
NC_RFU_V5
VREFC
ZQ
SEN
R373 1K_04
FBB_SOE3
FBVDDQ
R345 40.2_1%_04
R347 40.2_1%_04
C593 0.01u_16V_X7R_04
Gary_for NV feedback
R371 549_1%_04
R372 931_1%_04
R105 1.33K_1%_04
C322 820p_50V_X7R_04
R106 121_1%_04
R346 1K_04
FBB_VREFC1
FBB_ZQ2
FBB_SEN2
FBB_VREF_FET_H
Q39B MTDK3S6R
12,13,14,16 GPIO10_FBVREF_ALTV
11 FBB_WCK45
11 FBB_WCK45#
11 FBB_WCK67
11 FBB_WCK67#
11 FBB_EDC[7:4]
FBB_EDC4
FBB_EDC5
FBB_EDC6
FBB_EDC7
11 FBB_DBI[7:4]
FBB_DBI4
FBB_DBI5
FBB_DBI6
FBB_DBI7
UNDER DRAM
C321 1u_6.3V_X6S_04
C340 1u_6.3V_X6S_04
C642 1u_6.3V_X6S_04
C338 *1u_6.3V_X6S_04
C344 0.1u_10V_X7R_04
C304 *0.1u_10V_X7R_04
C341 0.1u_10V_X7R_04
C618 10u_4V_X6S_06
C616 10u_4V_X6S_06
NEAR DRAM
C643 10u_4V_X6S_06
C641 10u_4V_X6S_06
C646 0.1u_10V_X7R_04
C630 *0.1u_10V_X7R_04
C617 1u_6.3V_X6S_04
C339 *1u_6.3V_X6S_04
C631 1u_6.3V_X6S_04
11,12,13,14,52 FBVDDQ
GND

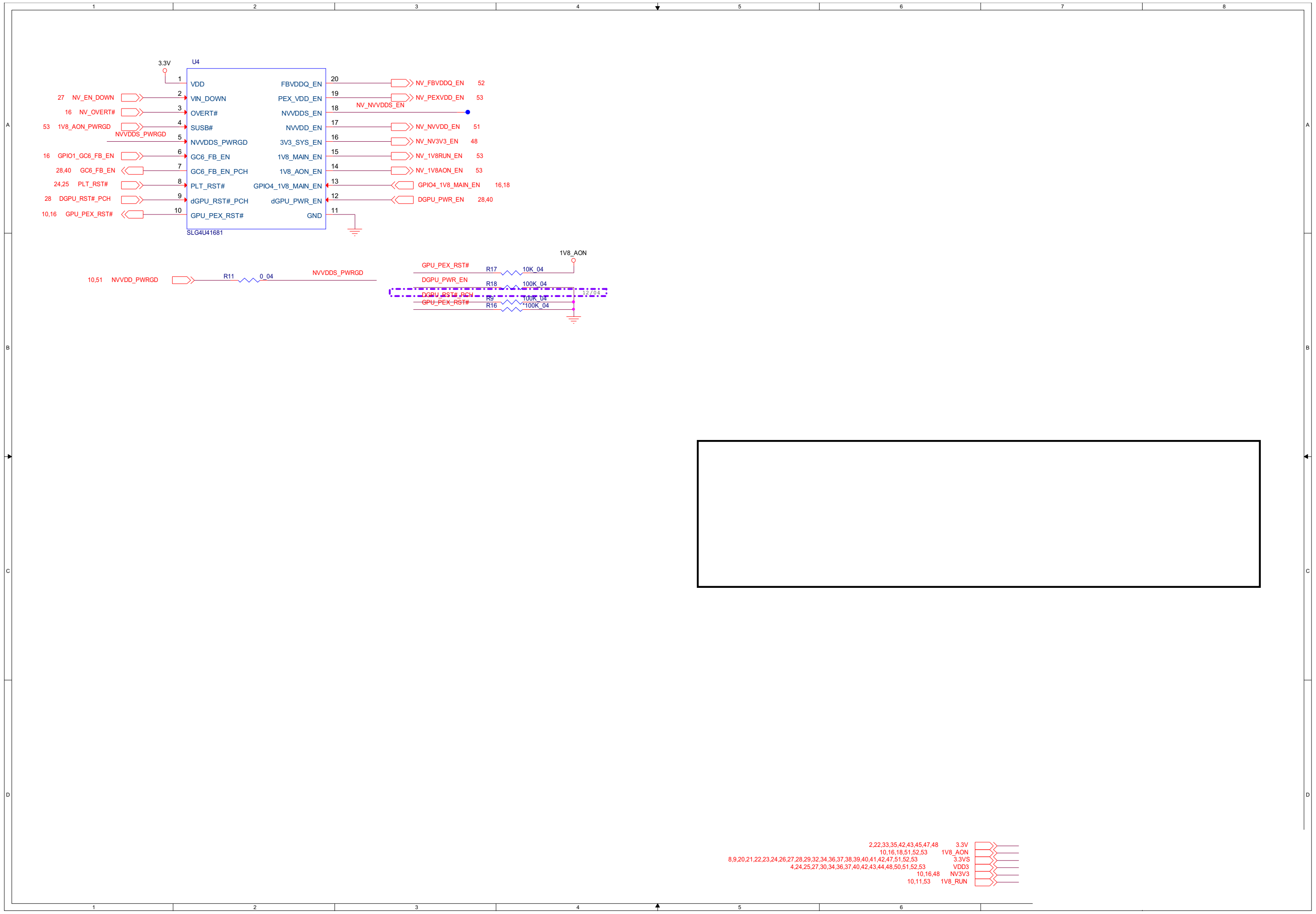
VGA I/O


U150K
BGA_0908_P080_P085_P100_290X290
COMMON
7/19 IFPC
ALL PINS NC FOR GF117
IFPC
IFPC_RSET
IFPC_PLLVDD
IFPC_IOVDD
PEX_VDD
20 mil
9/25
U150L
BGA_0908_P080_P085_P100_290X290
COMMON
8/19 IFPD
ALL PINS NC FOR GF117
IFPD
IFPD_RSET
IFPD_PLLVDD
IFPD_IOVDD
U150N
BGA_0908_P080_P085_P100_290X290
COMMON
4/19 DACA
DACA_VDD
DACA_VREF
DACA_RSET
DACA_HSYNC
DACA_VSYNC
DACA_RED
DACA_GREEN
DACA_BLUE
GPU_PLLVDD
PLACE AT BALLS
C61
*0.1u_10V_X7R_04
D02 02/26 A
R6
1K_1%_04
U150M
BGA_0908_P080_P085_P100_290X290
COMMON
9/19 IFPEF
ALL PINS NC FOR GF117
IFPE
IFPF
IFPEF_PLLVDD
IFPEF_RSET
IFPE_IOVDD
IFPF_IOVDD
R12
100K_04
R13
100K_04
mini DP_F
MDP_E_AUX#_SDA 21
MDP_E_AUX_SCL 21
MDP_E#3 21
MDP_E3 21
MDP_E#2 21
MDP_E2 21
MDP_E#1 21
MDP_E1 21
MDP_E#0 21
MDP_E0 21
IFPE_HPD_R# 18
PEX_VDD
20 mil
PLACE Under GPU
PLACE Near GPU
C58
0.1u_10V_X7R_04
C60
0.1u_10V_X7R_04
C92
1u_6.3V_X5R_04
C57
4.7u_6.3V_X5R_06
1V8_AON
U28
SN74LV1T32DCKR
GPIO12_AC_DETECT
AC/BATL# 50
VBATT_BOOST# 40
AC_IN 為,
BATTERY 為
EC Alway low,
GPIO2_GPU_EVENT#
D6
RB751S-40H
GPU_EVENT# 28
NV_OVERT#
Q4
2SK3018S3
OVERT# 40
GPU_PEX_RST#
NV3V3
R28
10K_04
C195
*0.1u_10V_X7R_04
Q3A
MTDK3S6R
Q3B
MTDK3S6R
SMC_VGA_THERM 40,41
SMD_VGA_THERM 40,41
SMC_VGA_THERM
SMD_VGA_THERM
R27
R29
2.2K_04
U150Q
BGA_0908_P080_P085_P100_290X290
COMMON
11/19 MISC1
THERMDN
THERMDP
JTAG_TCK
JTAG_TMS
JTAG_TDI
JTAG_TDO
JTAG_TRST
R278
10K_04
I2CS_SCL
I2CS_SDA
I2CC_SCL
I2CC_SDA
I2CB_SCL
I2CB_SDA
GPIO0_NVDD_PWM_VID 51
GPIO1_GC6_FB_EN 17
GPIO4_1V8_MAIN_EN 17,18
GPIO6_NVDDD_PSI# 51
GPIO10_FBVREF_ALTV 12,13,14,15
GPIO23_GPU_PEX_RST_HOLD#
U150J
BGA_0908_P080_P085_P100_290X290
COMMON
6/19 IFPAB
ALL PINS NC FOR GF117
IFPAB
IFPAB_RSET
IFPAB_PLLVDD
IFPA_IOVDD
IFPB_IOVDD
GPIO14
NV3V3
GPU_PLLVDD
PEX_VDD
3.3VS
1V8_AON
1V8_RUN
5VS
VDD3

Sheet 16 of 60
VGA I/O

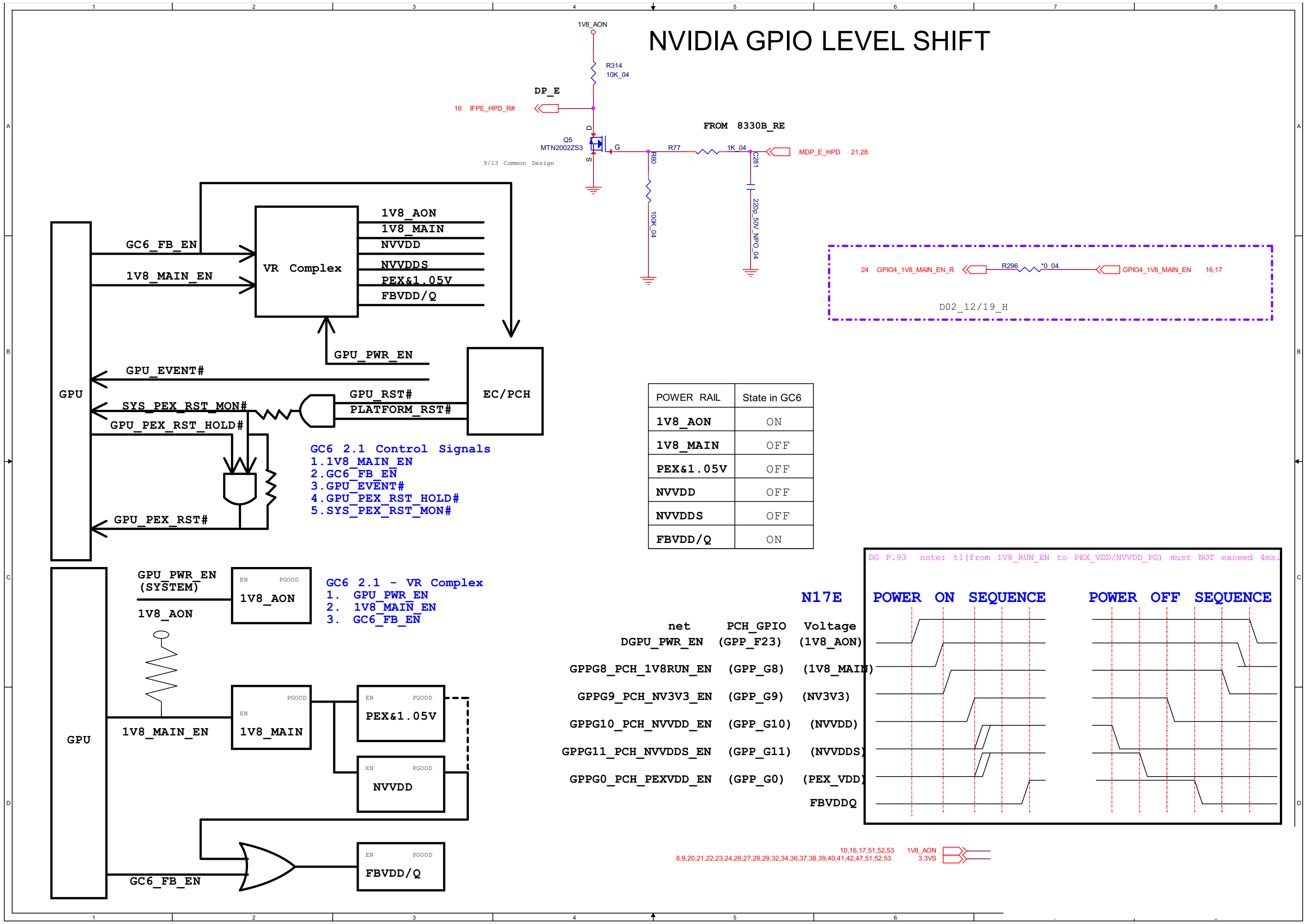
NVIDIA Power Sequence

Sheet 17 of 60
NVIDIA Power Sequence



3.3V
U4
1 VDD
2 VIN_DOWN
3 OVERT#
4 SUSB#
5 NVVDDS_PWRGD
6 GC6_FB_EN
7 GC6_FB_EN_PCH
8 PLT_RST#
9 dGPU_RST#_PCH
10 GPU_PEX_RST#
20 FBVDDQ_EN
19 PEX_VDD_EN
18 NVVDDS_EN
17 NVVDD_EN
16 3V3_SYS_EN
15 1V8_MAIN_EN
14 1V8_AON_EN
13 GPIO4_1V8_MAIN_EN
12 dGPU_PWR_EN
11 GND
SLG4U41681
27 NV_EN_DOWN
16 NV_OVERT#
53 1V8_AON_PWRGD
NVVDDS_PWRGD
16 GPIO1_GC6_FB_EN
28,40 GC6_FB_EN
24,25 PLT_RST#
28 DGPU_RST#_PCH
10,16 GPU_PEX_RST#
NV_FBVDDQ_EN 52
NV_PEXVDD_EN 53
NV_NVVDDS_EN
NV_NVVDD_EN 51
NV_NV3V3_EN 48
NV_1V8RUN_EN 53
NV_1V8AON_EN 53
GPIO4_1V8_MAIN_EN 16,18
DGPU_PWR_EN 28,40
10,51 NVVDD_PWRGD
R11 0_04
NVVDDS_PWRGD
1V8_AON
GPU_PEX_RST# R17 10K_04
DGPU_PWR_EN R18 100K_04
DGPU_RST#_PCH R9 100K_04
GPU_PEX_RST# R16 *100K_04
12/04
2,22,33,35,42,43,45,47,48 3.3V
10,16,18,51,52,53 1V8_AON
8,9,20,21,22,23,24,26,27,28,29,32,34,36,37,38,39,40,41,42,47,51,52,53 3.3VS
4,24,25,27,30,34,36,37,40,42,43,44,48,50,51,52,53 VDD3
10,16,48 NV3V3
10,11,53 1V8_RUN
1 2 3 4 5 6 7 8
A B C D

NVIDIA GPIO Level Shift


NVIDIA GPIO LEVEL SHIFT
1V8_AON
R314
10K_04
DP_E
16 IFPE_HPD_R#
D
Q5
MTN2002ZS3
G
S
9/13 Common Design
FROM 8330B_RE
R60
R77
1K_04
C281
MDP_E_HPD 21,28
100K_04
220p_50V_NPO_04
24 GPIO4_1V8_MAIN_EN_R
R296
*0_04
GPIO4_1V8_MAIN_EN 16,17
D02_12/19_H
GPU
GC6_FB_EN
1V8_MAIN_EN
VR Complex
1V8_AON
1V8_MAIN
NVVDD
NVVDDS
PEX&1.05V
FBVDD/Q
GPU_PWR_EN
EC/PCH
GPU_EVENT#
GPU_RST#
SYS_PEX_RST_MON#
PLATFORM_RST#
GPU_PEX_RST_HOLD#
GPU_PEX_RST#
GC6 2.1 Control Signals
1.1V8_MAIN_EN
2.GC6_FB_EN
3.GPU_EVENT#
4.GPU_PEX_RST_HOLD#
5.SYS_PEX_RST_MON#
GPU
GPU_PWR_EN
(SYSTEM)
EN
PGOOD
1V8_AON
GC6 2.1 - VR Complex
1. GPU_PWR_EN
2. 1V8_MAIN_EN
3. GC6_FB_EN
1V8_AON
1V8_MAIN_EN
1V8_MAIN
PEX&1.05V
NVVDD
GC6_FB_EN
FBVDD/Q
DG P.93 note: t1(from 1V8_RUN_EN to PEX_VDD/NVVDD_PG) must NOT exceed 4ms.
N17E
POWER ON SEQUENCE
POWER OFF SEQUENCE
FBVDDQ
10,16,17,51,52,53 1V8_AON
8,9,20,21,22,23,24,26,27,28,29,32,34,36,37,38,39,40,41,42,47,51,52,53 3.3VS

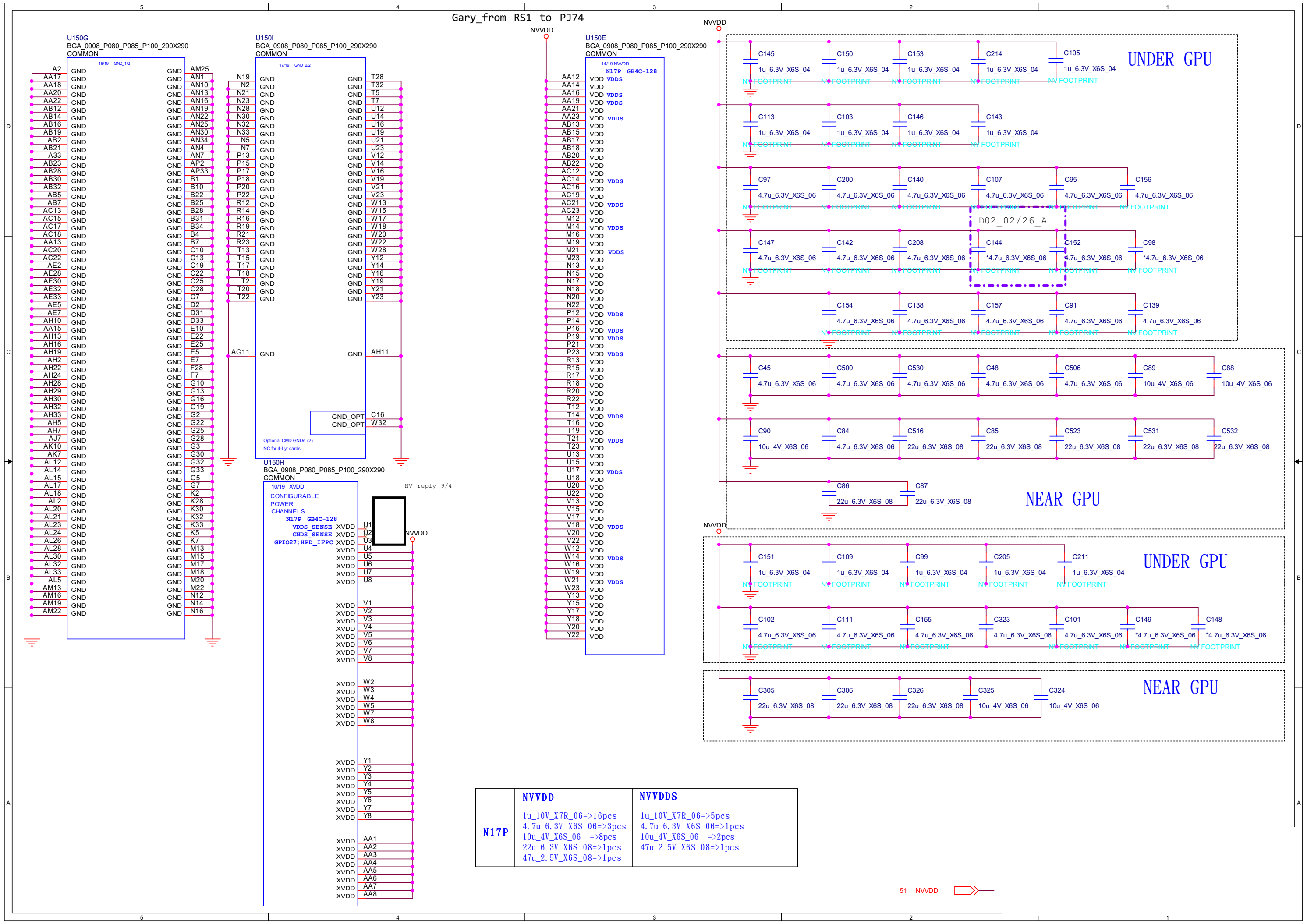
POWER RAIL	State in GC6
1V8_AON	ON
1V8_MAIN	OFF
PEX&1.05V	OFF
NVVDD	OFF
NVVDDS	OFF
FBVDD/Q	ON

net	PCH_GPIO	Voltage
DGPU_PWR_EN	(GPP_F23)	(1V8_AON)
GPPG8_PCH_1V8RUN_EN	(GPP_G8)	(1V8_MAIN)
GPPG9_PCH_NV3V3_EN	(GPP_G9)	(NV3V3)
GPPG10_PCH_NVVDD_EN	(GPP_G10)	(NVVDD)
GPPG11_PCH_NVVDDS_EN	(GPP_G11)	(NVVDDS)
GPPG0_PCH_PEXVDD_EN	(GPP_G0)	(PEX_VDD)

Sheet 18 of 60
NVIDIA GPIO Level
Shift

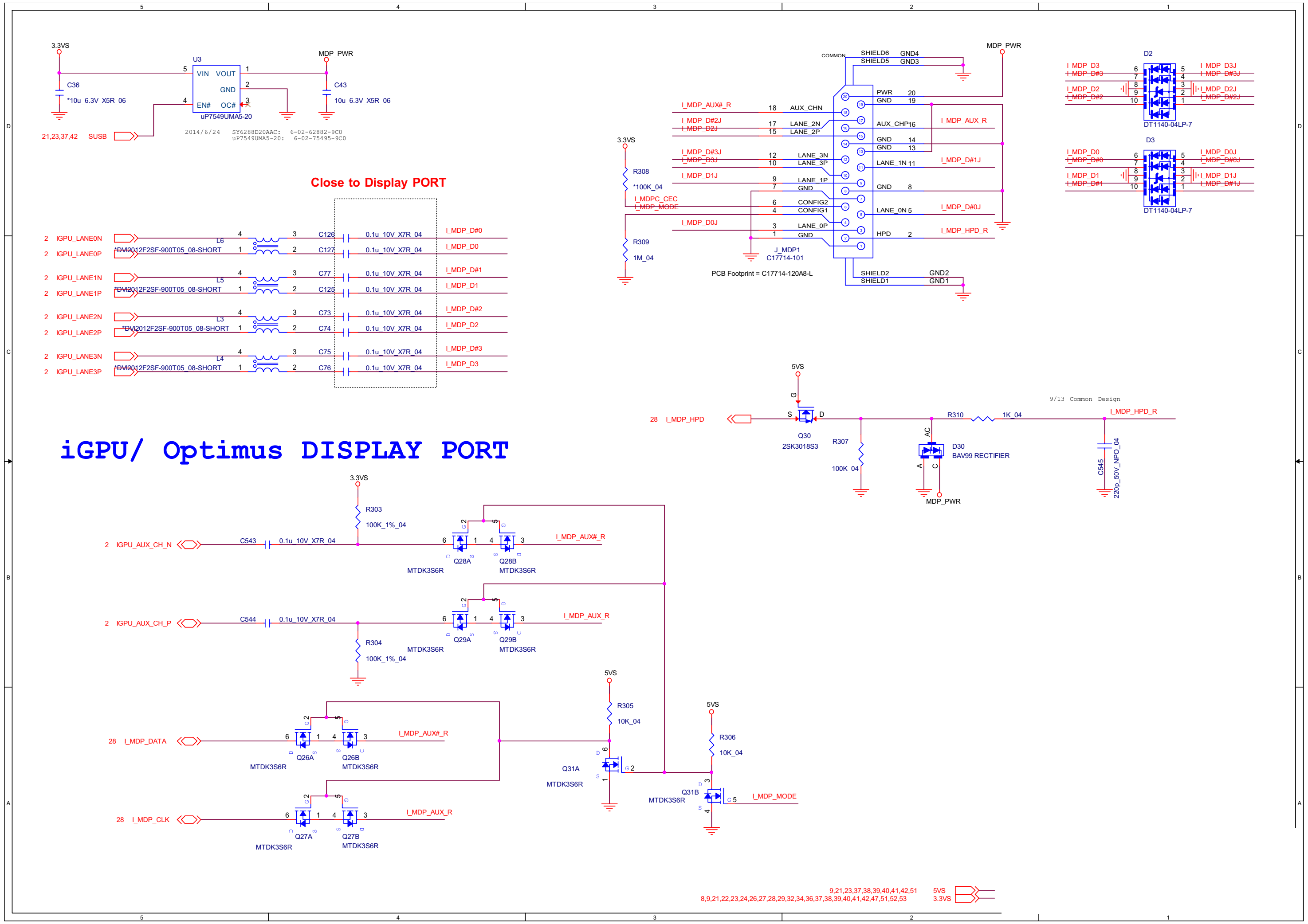
VGA NVVDD Coupling

Sheet 19 of 60
VGA NVVDD
Coupling


Gary_from RS1 to PJ74
U150G
BGA_0908_P080_P085_P100_290X290
COMMON
U150I
BGA_0908_P080_P085_P100_290X290
COMMON
U150E
BGA_0908_P080_P085_P100_290X290
COMMON
N17P GB4C-128
U150H
BGA_0908_P080_P085_P100_290X290
COMMON
CONFIGURABLE
POWER
CHANNELS
N17P GB4C-128
VDDS_SENSE
GNDS_SENSE
GPIO27:HPD_IFPC
NV reply 9/4
Optional CMD GNDs (2)
NC for 4-Lyr cards
GND_OPT
AG11
AH11
C16
W32
NVVDD
GND
VDD
VDDS
XVDD
UNDER GPU
NEAR GPU
D02_02/26_A
C145 C150 C153 C214 C105
1u_6.3V_X6S_04
C113 C103 C146 C143
C97 C200 C140 C107 C95 C156
4.7u_6.3V_X6S_06
C147 C142 C208 C144 C152 C98
*4.7u_6.3V_X6S_06
C154 C138 C157 C91 C139
C45 C500 C530 C48 C506 C89 C88
10u_4V_X6S_06
C90 C84 C516 C85 C523 C531 C532
22u_6.3V_X6S_08
C86 C87
C151 C109 C99 C205 C211
C102 C111 C155 C323 C101 C149 C148
C305 C306 C326 C325 C324
NO FOOTPRINT
51 NVVDD

N17P	NVVDD	NVVDDS
	1u_10V_X7R_06=>16pcs 4.7u_6.3V_X6S_06=>3pcs 10u_4V_X6S_06 =>8pcs 22u_6.3V_X6S_08=>1pcs 47u_2.5V_X6S_08=>1pcs	1u_10V_X7R_06=>5pcs 4.7u_6.3V_X6S_06=>1pcs 10u_4V_X6S_06 =>2pcs 47u_2.5V_X6S_08=>1pcs

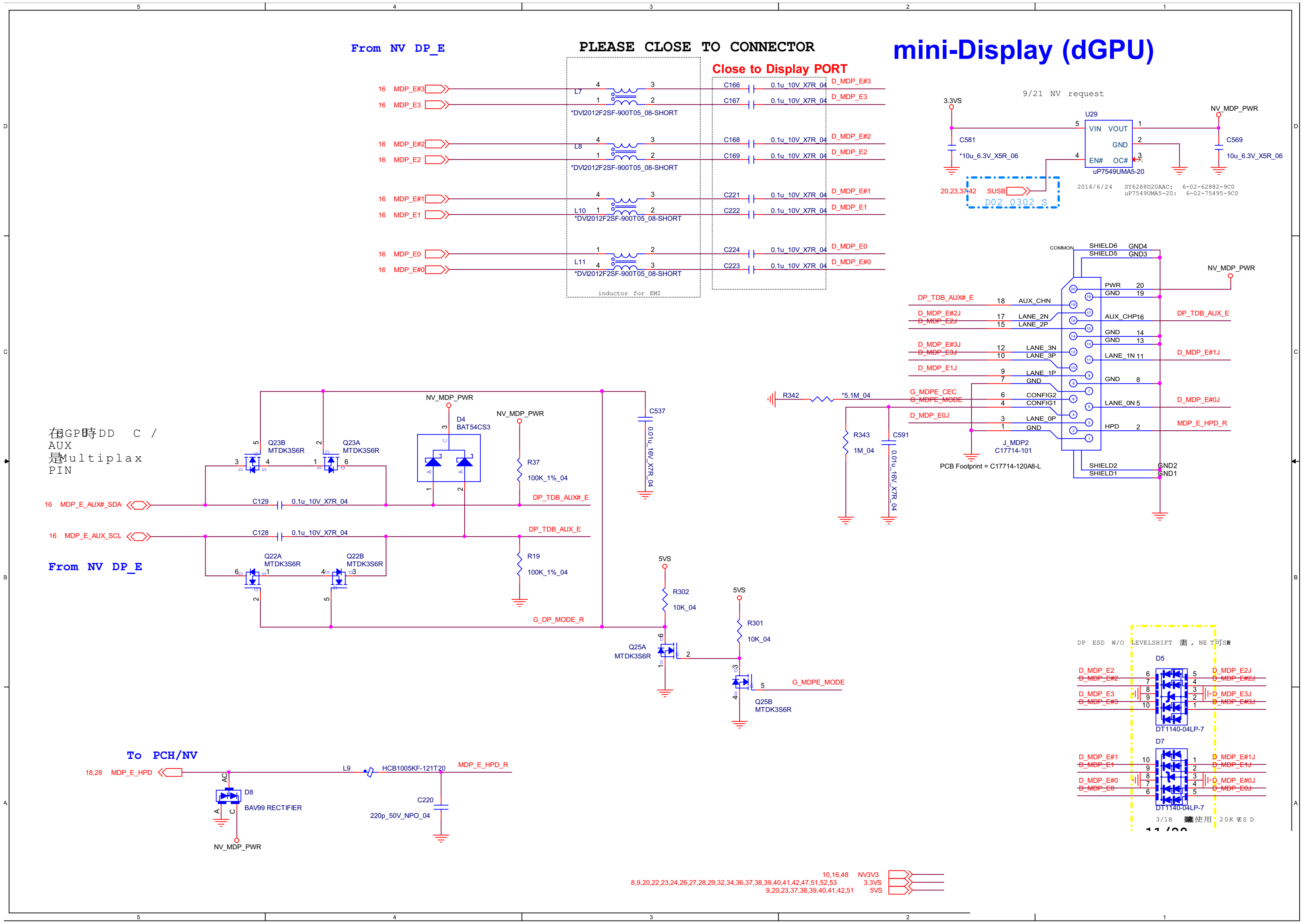
MDP


Close to Display PORT
iGPU/ Optimus DISPLAY PORT
3.3VS
U3
VIN VOUT
GND
EN# OC#
uP7549UMA5-20
C36
*10u_6.3V_X5R_06
C43
10u_6.3V_X5R_06
MDP_PWR
21,23,37,42 SUSB
IGPU_LANE0N
IGPU_LANE0P
IGPU_LANE1N
IGPU_LANE1P
IGPU_LANE2N
IGPU_LANE2P
IGPU_LANE3N
IGPU_LANE3P
L6
L5
L3
L4
*DVI2012F2SF-900T05_08-SHORT
C126
C127
C77
C125
C73
C74
C75
C76
0.1u_10V_X7R_04
I_MDP_D#0
I_MDP_D0
I_MDP_D#1
I_MDP_D1
I_MDP_D#2
I_MDP_D2
I_MDP_D#3
I_MDP_D3
J_MDP1
C17714-101
PCB Footprint = C17714-120A8-L
AUX_CHN
LANE_2N
LANE_2P
LANE_3N
LANE_3P
LANE_1P
CONFIG2
CONFIG1
LANE_0P
AUX_CHP
LANE_1N
LANE_0N
HPD
PWR
SHIELD6
SHIELD5
SHIELD2
SHIELD1
GND4
GND3
GND2
GND1
R308
*100K_04
R309
1M_04
I_MDPC_CEC
I_MDP_MODE
I_MDP_AUX#_R
I_MDP_AUX_R
I_MDP_D#1J
I_MDP_D#0J
I_MDP_HPD_R
D2
D3
DT1140-04LP-7
I_MDP_D3J
I_MDP_D#3J
I_MDP_D2J
I_MDP_D#2J
I_MDP_D0J
I_MDP_D#0J
I_MDP_D1J
I_MDP_D#1J
5VS
Q30
2SK3018S3
28 I_MDP_HPD
R307
100K_04
R310
1K_04
D30
BAV99 RECTIFIER
C545
220p_50V_NPO_04
9/13 Common Design
R303
100K_1%_04
R304
100K_1%_04
2 IGPU_AUX_CH_N
2 IGPU_AUX_CH_P
C543
C544
0.1u_10V_X7R_04
Q28A
Q28B
Q29A
Q29B
Q26A
Q26B
Q27A
Q27B
Q31A
Q31B
MTDK3S6R
28 I_MDP_DATA
28 I_MDP_CLK
R305
10K_04
R306
10K_04
I_MDP_MODE
9,21,23,37,38,39,40,41,42,51 5VS
8,9,21,22,23,24,26,27,28,29,32,34,36,37,38,39,40,41,42,47,51,52,53 3.3VS

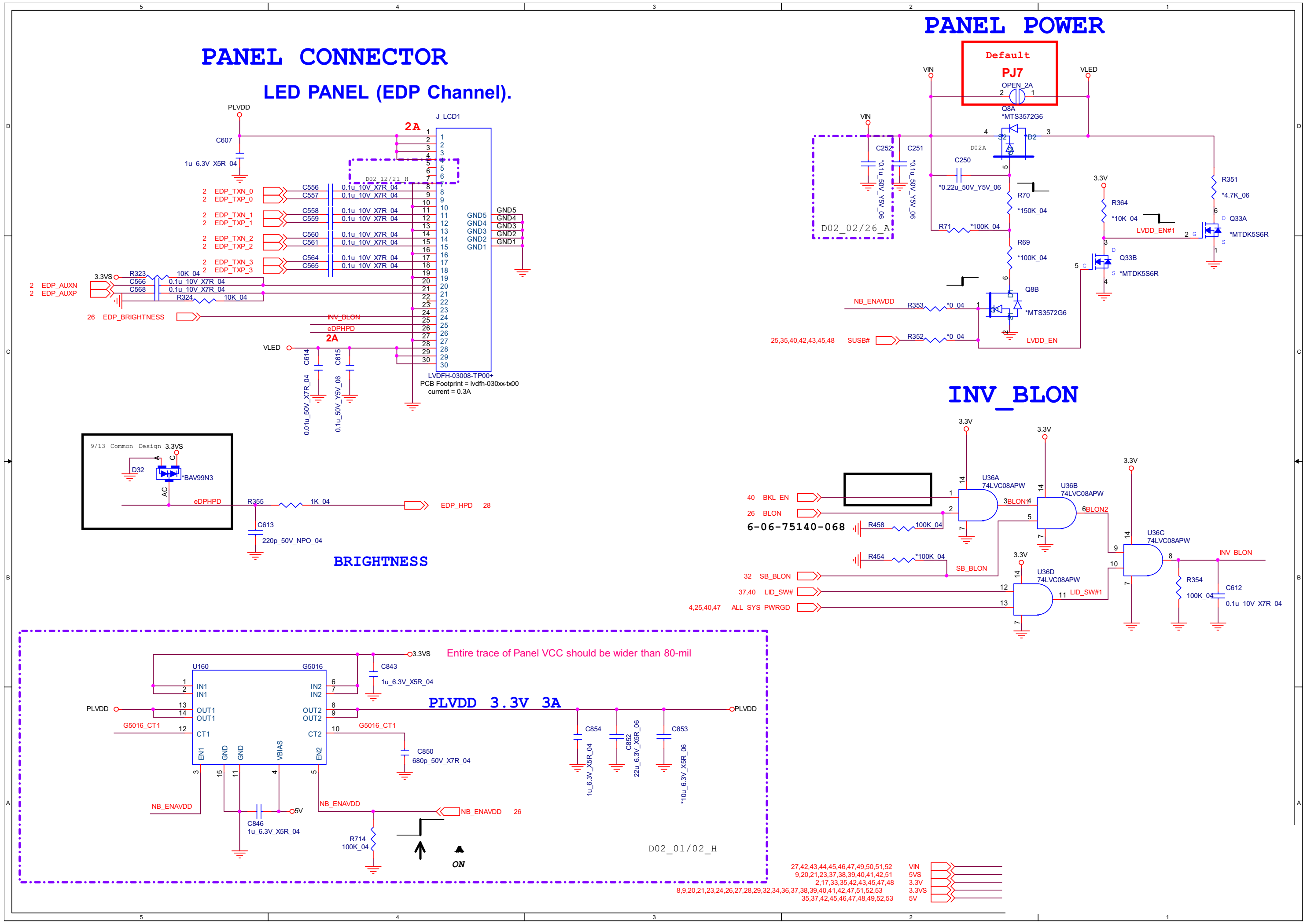
Sheet 20 of 60
MDP

MDP

Sheet 21 of 60
MDP


From NV DP_E
PLEASE CLOSE TO CONNECTOR
Close to Display PORT
mini-Display (dGPU)
MDP_E#3
MDP_E3
MDP_E#2
MDP_E2
MDP_E#1
MDP_E1
MDP_E0
MDP_E#0
L7
L8
L10
L11
*DVI2012F2SF-900T05_08-SHORT
inductor for EMI
C166
C167
C168
C169
C221
C222
C224
C223
0.1u_10V_X7R_04
D_MDP_E#3
D_MDP_E3
D_MDP_E#2
D_MDP_E2
D_MDP_E#1
D_MDP_E1
D_MDP_E0
D_MDP_E#0
9/21 NV request
3.3VS
U29
VIN VOUT
GND
EN# OC#
uP7549UMA5-20
C581
*10u_6.3V_X5R_06
NV_MDP_PWR
C569
10u_6.3V_X5R_06
20,23,37,42 SUSB
D02 0302 S
2014/6/24 SY6288D20AAC: 6-02-62882-9C0
uP7549UMA5-20: 6-02-75495-9C0
COMMON
SHIELD6 GND4
SHIELD5 GND3
PWR 20
GND 19
DP_TDB_AUX#_E
18 AUX_CHN
AUX_CHP16
DP_TDB_AUX_E
D_MDP_E#2J
D_MDP_E2J
17 LANE_2N
15 LANE_2P
GND 14
GND 13
D_MDP_E#3J
D_MDP_E3J
12 LANE_3N
10 LANE_3P
LANE_1N 11
D_MDP_E#1J
D_MDP_E1J
9 LANE_1P
7 GND
GND 8
R342
*5.1M_04
G_MDPE_CEC
G_MDPE_MODE
6 CONFIG2
4 CONFIG1
LANE_0N 5
D_MDP_E#0J
D_MDP_E0J
3 LANE_0P
1 GND
HPD 2
MDP_E_HPD_R
R343
1M_04
C591
0.01u_16V_X7R_04
J_MDP2
C17714-101
PCB Footprint = C17714-120A8-L
SHIELD2 GND2
SHIELD1 GND1
在GPU時DD C / AUX 是Multiplax PIN
NV_MDP_PWR
Q23B MTDK3S6R
Q23A MTDK3S6R
D4 BAT54CS3
R37 100K_1%_04
C537 0.01u_16V_X7R_04
16 MDP_E_AUX#_SDA
C129 0.1u_10V_X7R_04
DP_TDB_AUX#_E
16 MDP_E_AUX_SCL
C128 0.1u_10V_X7R_04
DP_TDB_AUX_E
From NV DP_E
Q22A MTDK3S6R
Q22B MTDK3S6R
R19 100K_1%_04
G_DP_MODE_R
5VS
R302 10K_04
R301 10K_04
Q25A MTDK3S6R
Q25B MTDK3S6R
G_MDPE_MODE
DP ESD W/O LEVELSHIFT 需 , NE T同步
D5
DT1140-04LP-7
D7
D_MDP_E2
D_MDP_E#2
D_MDP_E3
D_MDP_E#3
D_MDP_E2J
D_MDP_E#2J
D_MDP_E3J
D_MDP_E#3J
D_MDP_E#1
D_MDP_E1
D_MDP_E#0
D_MDP_E0
D_MDP_E#1J
D_MDP_E1J
D_MDP_E#0J
D_MDP_E0J
3/18 建議使用 20K ESD
To PCH/NV
18,28 MDP_E_HPD
L9 HCB1005KF-121T20
MDP_E_HPD_R
D8 BAV99 RECTIFIER
C220 220p_50V_NPO_04
NV_MDP_PWR
10,16,48 NV3V3
8,9,20,22,23,24,26,27,28,29,32,34,36,37,38,39,40,41,42,47,51,52,53 3.3VS
9,20,23,37,38,39,40,41,42,51 5VS
5 4 3 2 1
D C B A

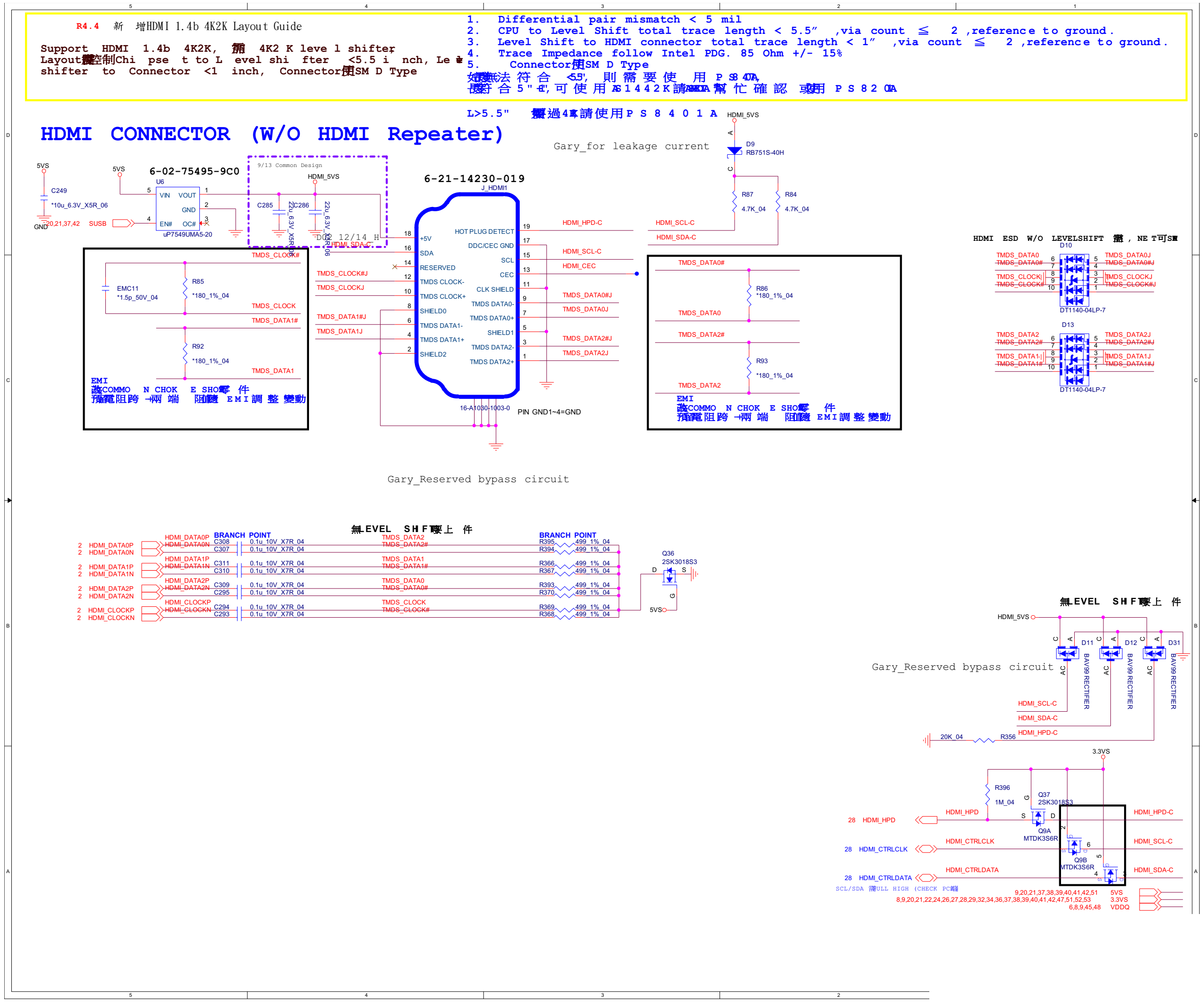
Panel, Inverter


PANEL CONNECTOR
LED PANEL (EDP Channel).
PLVDD
C607
1u_6.3V_X5R_04
J_LCD1
2A
EDP_TXN_0
EDP_TXP_0
EDP_TXN_1
EDP_TXP_1
EDP_TXN_2
EDP_TXP_2
EDP_TXN_3
EDP_TXP_3
EDP_AUXN
EDP_AUXP
EDP_BRIGHTNESS
INV_BLON
eDPHPD
VLED
C614
C615
0.01u_50V_X7R_04
0.1u_50V_Y5V_06
LVDFH-03008-TP00+
PCB Footprint = lvdfh-030xx-tx00
current = 0.3A
9/13 Common Design
3.3VS
D32
BAV99N3
R355
1K_04
EDP_HPD
C613
220p_50V_NPO_04
BRIGHTNESS
PANEL POWER
Default
PJ7
OPEN_2A
VIN
VLED
Q8A
*MTS3572G6
C252
C251
C250
*0.22u_50V_Y5V_06
R70
*150K_04
R71
*100K_04
R69
*100K_04
D02_02/26_A
3.3V
R364
*10K_04
R351
*4.7K_06
Q33A
*MTDK5S6R
Q33B
*MTDK5S6R
LVDD_EN#1
NB_ENAVDD
R353
*0_04
Q8B
*MTS3572G6
SUSB#
R352
*0_04
LVDD_EN
INV_BLON
U36A
74LVC08APW
U36B
74LVC08APW
U36C
74LVC08APW
U36D
74LVC08APW
BKL_EN
BLON
6-06-75140-068
R458
100K_04
R454
*100K_04
SB_BLON
LID_SW#
ALL_SYS_PWRGD
R354
100K_04
C612
0.1u_10V_X7R_04
Entire trace of Panel VCC should be wider than 80-mil
U160
G5016
C843
1u_6.3V_X5R_04
PLVDD 3.3V 3A
C854
C852
C853
C850
680p_50V_X7R_04
C846
1u_6.3V_X5R_04
R714
100K_04
ON
D02_01/02_H
NB_ENAVDD
VIN
5VS
3.3V
3.3VS
5V

Sheet 22 of 60
Panel, Inverter

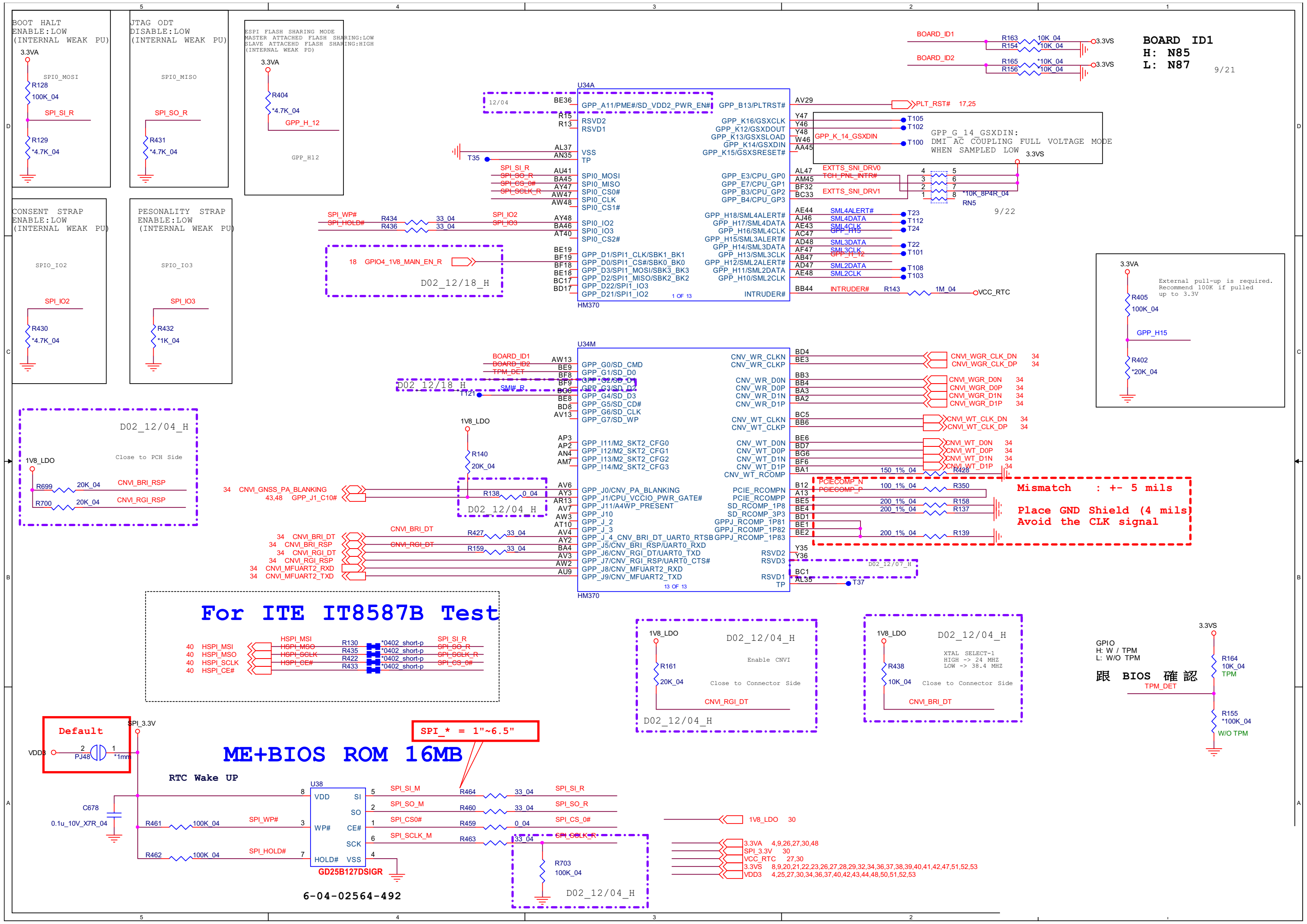
HDMI

Sheet 23 of 60
HDMI



1. Differential pair mismatch < 5 mil
2. CPU to Level Shift trace total trace length < 5.5" ,via count ≦ 2 ,reference to ground.
3. Level Shift to HDMI connector total trace length < 1" ,via count ≦ 2 ,reference to ground.
4. Trace Impedance follow Intel PDG. 85 Ohm +/- 15%
Support HDMI 1.4b 4K2K
HDMI CONNECTOR (W/O HDMI Repeater)
6-02-75495-9C0
6-21-14230-019
Gary_for leakage current
Gary_Reserved bypass circuit
HDMI ESD W/O LEVELSHIFT
PIN GND1~4=GND
HDMI_5VS
HDMI_HPD-C
HDMI_SCL-C
HDMI_SDA-C
HDMI_CEC
TMDS_CLOCK
TMDS_CLOCK#
TMDS_DATA0
TMDS_DATA0#
TMDS_DATA1
TMDS_DATA1#
TMDS_DATA2
TMDS_DATA2#
BRANCH POINT
HDMI_DATA0P
HDMI_DATA0N
HDMI_DATA1P
HDMI_DATA1N
HDMI_DATA2P
HDMI_DATA2N
HDMI_CLOCKP
HDMI_CLOCKN
HDMI_HPD
HDMI_CTRLCLK
HDMI_CTRLDATA
D9 RB751S-40H
R87 4.7K_04
R84 4.7K_04
R85 *180_1%_04
R86 *180_1%_04
R92 *180_1%_04
R93 *180_1%_04
C249 *10u_6.3V_X5R_06
U6 uP7549UMA5-20
D10 DT1140-04LP-7
D13 DT1140-04LP-7
D11 D12 D31 BAV99 RECTIFIER
Q36 2SK3018S3
Q37 2SK3018S3
Q9A MTDK3S6R
Q9B MTDK3S6R
R396 1M_04
R356 20K_04
3.3VS
5VS
VDDQ

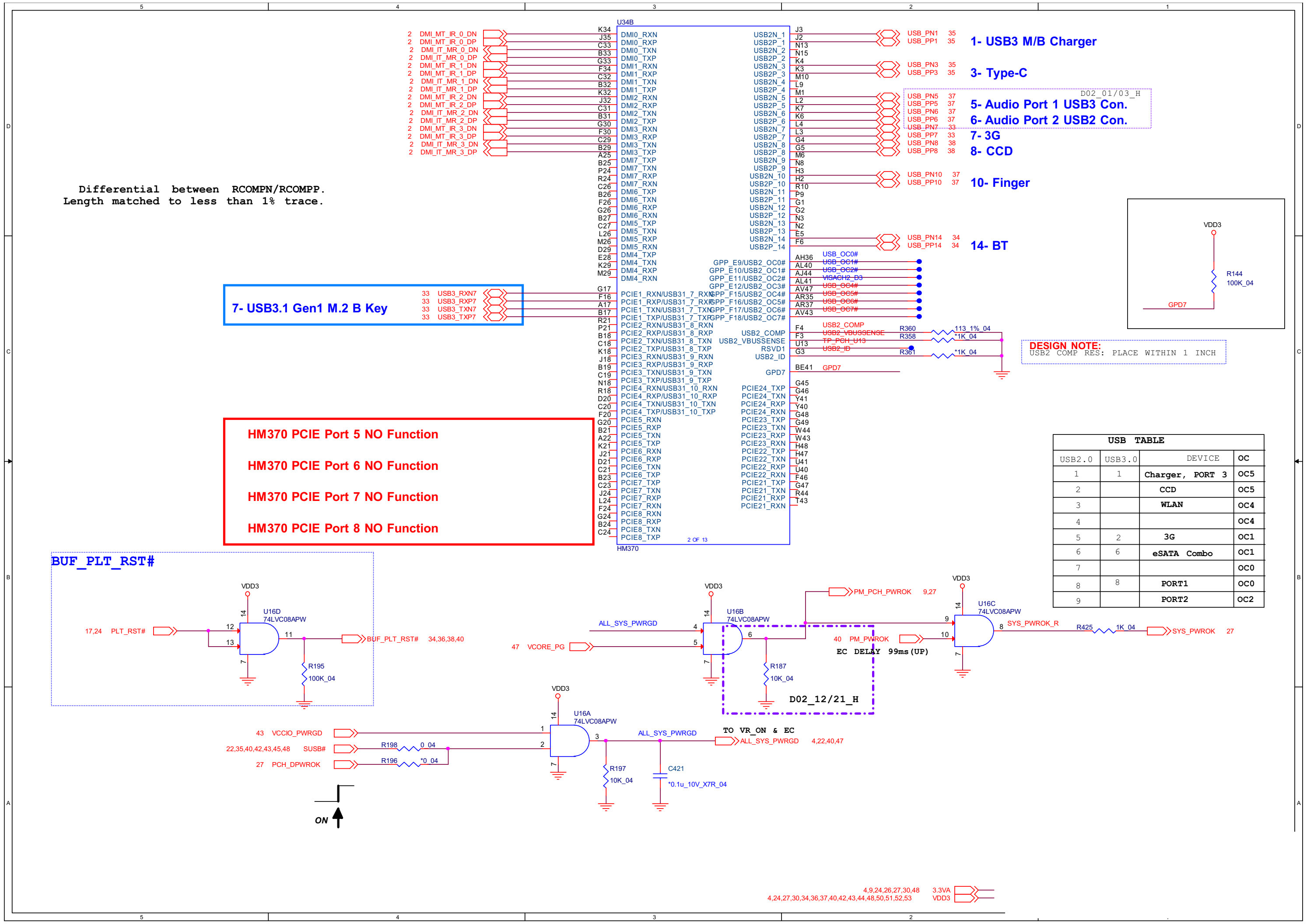
PCH 1/9


BOOT HALT
ENABLE:LOW
(INTERNAL WEAK PU)
JTAG ODT
DISABLE:LOW
(INTERNAL WEAK PU)
ESPI FLASH SHARING MODE
MASTER ATTACHED FLASH SHARING:LOW
SLAVE ATTACHED FLASH SHARING:HIGH
(INTERNAL WEAK PD)
CONSENT STRAP
ENABLE:LOW
(INTERNAL WEAK PU)
PESONALITY STRAP
ENABLE:LOW
(INTERNAL WEAK PU)
3.3VA
SPI0_MOSI
SPI0_MISO
GPP_H12
SPI0_IO2
SPI0_IO3
R128
100K_04
SPI_SI_R
SPI_SO_R
R129
*4.7K_04
R431
R404
*4.7K_04
SPI_IO2
SPI_IO3
R430
R432
*1K_04
U34A
HM370
GPP_A11/PME#/SD_VDD2_PWR_EN#
GPP_B13/PLTRST#
PLT_RST# 17,25
RSVD2
RSVD1
VSS
TP
T35
SPI0_MOSI
SPI0_MISO
SPI0_CS0#
SPI0_CLK
SPI0_CS1#
SPI0_IO2
SPI0_IO3
SPI0_CS2#
GPP_D1/SPI1_CLK/SBK1_BK1
GPP_D0/SPI1_CS#/SBK0_BK0
GPP_D3/SPI1_MOSI/SBK3_BK3
GPP_D2/SPI1_MISO/SBK2_BK2
GPP_D22/SPI1_IO3
GPP_D21/SPI1_IO2
1 OF 13
GPP_K16/GSXCLK
GPP_K12/GSXDOUT
GPP_K13/GSXSLOAD
GPP_K14/GSXDIN
GPP_K15/GSXSRESET#
GPP_E3/CPU_GP0
GPP_E7/CPU_GP1
GPP_B3/CPU_GP2
GPP_B4/CPU_GP3
GPP_H18/SML4ALERT#
GPP_H17/SML4DATA
GPP_H16/SML4CLK
GPP_H15/SML3ALERT#
GPP_H14/SML3DATA
GPP_H13/SML3CLK
GPP_H12/SML2ALERT#
GPP_H11/SML2DATA
GPP_H10/SML2CLK
INTRUDER#
GPP_K_14_GSXDIN
GPP_G_14_GSXDIN:
DMI AC COUPLING FULL VOLTAGE MODE
WHEN SAMPLED LOW
3.3VS
EXTTS_SNI_DRV0
TCH_PNL_INTR#
EXTTS_SNI_DRV1
*10K_8P4R_04
RN5
9/22
SML4ALERT#
SML4DATA
SML4CLK
SML3DATA
SML3CLK
SML2DATA
SML2CLK
R143
1M_04
VCC_RTC
BOARD_ID1
BOARD_ID2
R163
R154
R165
R156
10K_04
*10K_04
BOARD ID1
H: N85
L: N87
9/21
SPI_WP#
SPI_HOLD#
R434
R436
33_04
SPI_IO2
SPI_IO3
18 GPIO4_1V8_MAIN_EN_R
D02_12/18_H
3.3VA
External pull-up is required.
Recommend 100K if pulled
up to 3.3V
R405
100K_04
GPP_H15
R402
*20K_04
U34M
HM370
GPP_G0/SD_CMD
GPP_G1/SD_D0
GPP_G2/SD_D1
GPP_G3/SD_D2
GPP_G4/SD_D3
GPP_G5/SD_CD#
GPP_G6/SD_CLK
GPP_G7/SD_WP
GPP_I11/M2_SKT2_CFG0
GPP_I12/M2_SKT2_CFG1
GPP_I13/M2_SKT2_CFG2
GPP_I14/M2_SKT2_CFG3
GPP_J0/CNV_PA_BLANKING
GPP_J1/CPU_VCCIO_PWR_GATE#
GPP_J11/A4WP_PRESENT
GPP_J10
GPP_J_2
GPP_J_3
GPP_J_4_CNV_BRI_DT_UART0_RTSB
GPP_J5/CNV_BRI_RSP/UART0_RXD
GPP_J6/CNV_RGI_DT/UART0_TXD
GPP_J7/CNV_RGI_RSP/UART0_CTS#
GPP_J8/CNV_MFUART2_RXD
GPP_J9/CNV_MFUART2_TXD
13 OF 13
CNV_WR_CLKN
CNV_WR_CLKP
CNV_WR_D0N
CNV_WR_D0P
CNV_WR_D1N
CNV_WR_D1P
CNV_WT_CLKN
CNV_WT_CLKP
CNV_WT_D0N
CNV_WT_D0P
CNV_WT_D1N
CNV_WT_D1P
CNV_WT_RCOMP
PCIE_RCOMPN
PCIE_RCOMPP
SD_RCOMP_1P8
SD_RCOMP_3P3
GPPJ_RCOMP_1P81
GPPJ_RCOMP_1P82
GPPJ_RCOMP_1P83
RSVD2
RSVD3
RSVD1
TP
T37
CNVI_WGR_CLK_DN 34
CNVI_WGR_CLK_DP 34
CNVI_WGR_D0N 34
CNVI_WGR_D0P 34
CNVI_WGR_D1N 34
CNVI_WGR_D1P 34
CNVI_WT_CLK_DN 34
CNVI_WT_CLK_DP 34
CNVI_WT_D0N 34
CNVI_WT_D0P 34
CNVI_WT_D1N 34
CNVI_WT_D1P 34
150_1%_04
R428
PCIECOMP_N
PCIECOMP_P
100_1%_04
R350
200_1%_04
R158
R137
R139
Mismatch : +- 5 mils
Place GND Shield (4 mils)
Avoid the CLK signal
D02_12/07_H
BOARD_ID1
BOARD_ID2
TPM_DET
SMI#_R
D02_12/18_H
1V8_LDO
R140
20K_04
D02_12/04_H
Close to PCH Side
R699
R700
20K_04
CNVI_BRI_RSP
CNVI_RGI_RSP
34 CNVI_GNSS_PA_BLANKING
43,48 GPP_J1_C10#
R138
0_04
34 CNVI_BRI_DT
34 CNVI_BRI_RSP
34 CNVI_RGI_DT
34 CNVI_RGI_RSP
34 CNVI_MFUART2_RXD
34 CNVI_MFUART2_TXD
CNVI_BRI_DT
CNVI_RGI_DT
R427
R159
33_04
For ITE IT8587B Test
40 HSPI_MSI
40 HSPI_MSO
40 HSPI_SCLK
40 HSPI_CE#
R130
R435
R422
R433
*0402_short-p
SPI_SI_R
SPI_SO_R
SPI_SCLK_R
SPI_CS_0#
Enable CNVI
Close to Connector Side
R161
20K_04
CNVI_RGI_DT
XTAL SELECT-1
HIGH -> 24 MHZ
LOW -> 38.4 MHZ
R438
10K_04
CNVI_BRI_DT
GPIO
H: W / TPM
L: W/O TPM
跟 BIOS 確認
TPM_DET
3.3VS
R164
10K_04
TPM
R155
*100K_04
W/O TPM
Default
SPI_3.3V
VDD3
PJ48
*1mm
SPI_* = 1"~6.5"
ME+BIOS ROM 16MB
RTC Wake UP
C678
0.1u_10V_X7R_04
R461
100K_04
R462
SPI_WP#
SPI_HOLD#
U38
VDD
SI
SO
WP#
CE#
SCK
HOLD#
VSS
GD25B127DSIGR
SPI_SI_M
SPI_SO_M
SPI_CS0#
SPI_SCLK_M
R464
R460
R459
R463
33_04
0_04
SPI_SI_R
SPI_SO_R
SPI_CS_0#
SPI_SCLK_R
R703
100K_04
6-04-02564-492
1V8_LDO 30
3.3VA 4,9,26,27,30,48
SPI_3.3V 30
VCC_RTC 27,30
3.3VS 8,9,20,21,22,23,26,27,28,29,32,34,36,37,38,39,40,41,42,47,51,52,53
VDD3 4,25,27,30,34,36,37,40,42,43,44,48,50,51,52,53

Sheet 24 of 60
PCH 1/9

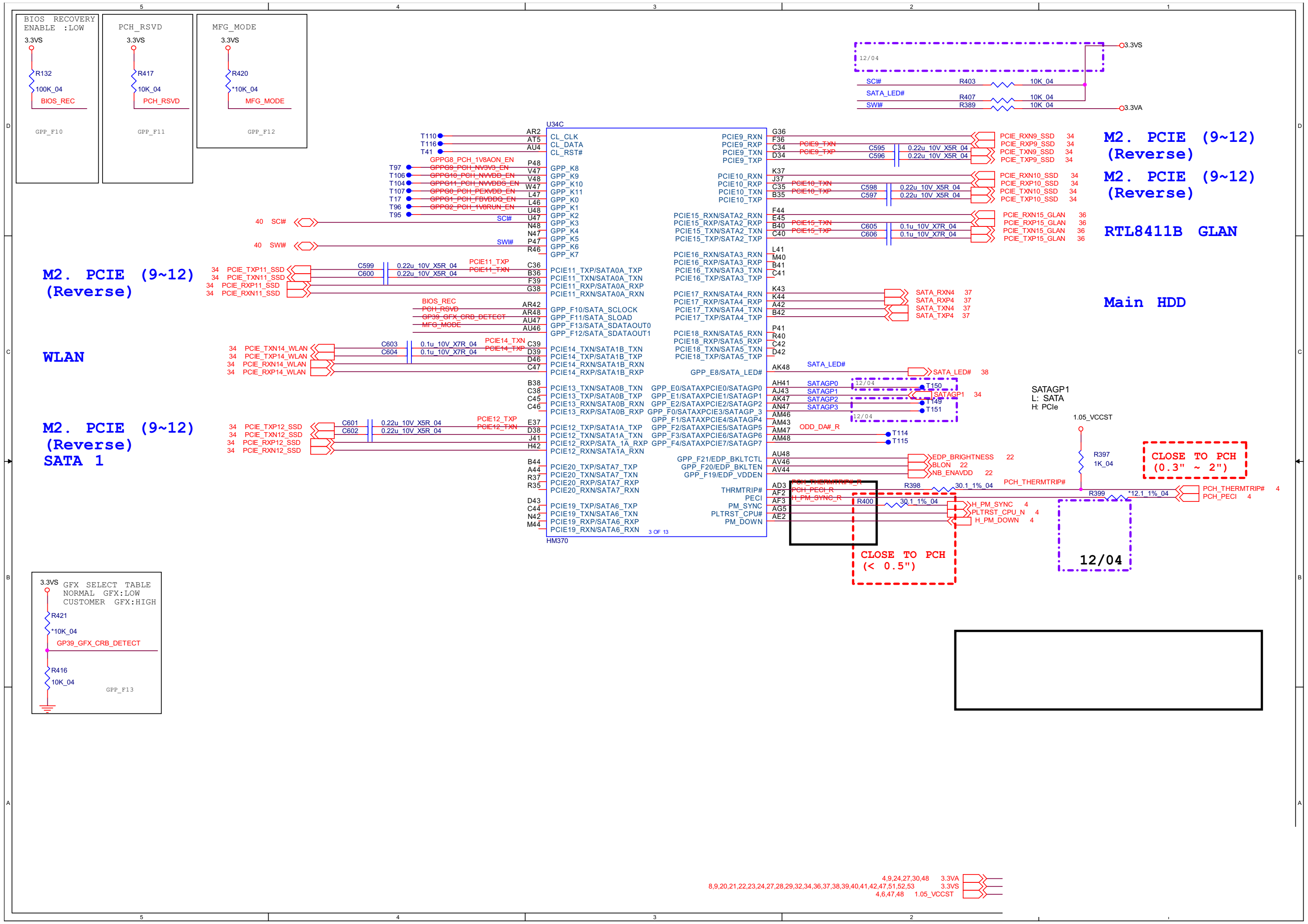
PCH 2/9

Sheet 25 of 60
PCH 2/9


U34B
HM370
2 OF 13
DMI_MT_IR_0_DN
DMI_MT_IR_0_DP
DMI_IT_MR_0_DN
DMI_IT_MR_0_DP
DMI_MT_IR_1_DN
DMI_MT_IR_1_DP
DMI_IT_MR_1_DN
DMI_IT_MR_1_DP
DMI_MT_IR_2_DN
DMI_MT_IR_2_DP
DMI_IT_MR_2_DN
DMI_IT_MR_2_DP
DMI_MT_IR_3_DN
DMI_MT_IR_3_DP
DMI_IT_MR_3_DN
DMI_IT_MR_3_DP
Differential between RCOMPN/RCOMPP.
Length matched to less than 1% trace.
USB_PN1 35
USB_PP1 35
1- USB3 M/B Charger
USB_PN3 35
USB_PP3 35
3- Type-C
D02_01/03_H
USB_PN5 37
USB_PP5 37
USB_PN6 37
USB_PP6 37
5- Audio Port 1 USB3 Con.
6- Audio Port 2 USB2 Con.
USB_PN7 33
USB_PP7 33
7- 3G
USB_PN8 38
USB_PP8 38
8- CCD
USB_PN10 37
USB_PP10 37
10- Finger
USB_PN14 34
USB_PP14 34
14- BT
USB_OC0#
USB_OC1#
USB_OC2#
VISACH2_D3
USB_OC4#
USB_OC5#
USB_OC6#
USB_OC7#
USB2_COMP
USB2_VBUSSENSE
TP_PCH_U13
USB2_ID
R360 113_1%_04
R358 *1K_04
R361 *1K_04
GPD7
VDD3
R144
100K_04
DESIGN NOTE:
USB2 COMP RES: PLACE WITHIN 1 INCH
7- USB3.1 Gen1 M.2 B Key
33 USB3_RXN7
33 USB3_RXP7
33 USB3_TXN7
33 USB3_TXP7
HM370 PCIE Port 5 NO Function
HM370 PCIE Port 6 NO Function
HM370 PCIE Port 7 NO Function
HM370 PCIE Port 8 NO Function
BUF_PLT_RST#
VDD3
U16D
74LVC08APW
17,24 PLT_RST#
BUF_PLT_RST# 34,36,38,40
R195
100K_04
VDD3
U16B
74LVC08APW
ALL_SYS_PWRGD
47 VCORE_PG
R187
10K_04
D02_12/21_H
PM_PCH_PWROK 9,27
40 PM_PWROK
EC DELAY 99ms(UP)
VDD3
U16C
74LVC08APW
SYS_PWROK_R
R425 1K_04
SYS_PWROK 27
VDD3
U16A
74LVC08APW
43 VCCIO_PWRGD
22,35,40,42,43,45,48 SUSB#
27 PCH_DPWROK
R198 0_04
R196 *0_04
ALL_SYS_PWRGD
TO VR_ON & EC
ALL_SYS_PWRGD 4,22,40,47
R197
10K_04
C421
*0.1u_10V_X7R_04
ON
4,9,24,26,27,30,48 3.3VA
4,24,27,30,34,36,37,40,42,43,44,48,50,51,52,53 VDD3

USB TABLE			
USB2.0	USB3.0	DEVICE	OC
1	1	Charger, PORT 3	OC5
2		CCD	OC5
3		WLAN	OC4
4			OC4
5	2	3G	OC1
6	6	eSATA Combo	OC1
7			OC0
8	8	PORT1	OC0
9		PORT2	OC2

PCH 3/9


BIOS RECOVERY ENABLE :LOW
3.3VS
R132
100K_04
BIOS_REC
GPP_F10
PCH_RSVD
R417
10K_04
GPP_F11
MFG_MODE
R420
*10K_04
GPP_F12
U34C
CL_CLK
CL_DATA
CL_RST#
GPP_K8
GPP_K9
GPP_K10
GPP_K11
GPP_K0
GPP_K1
GPP_K2
GPP_K3
GPP_K4
GPP_K5
GPP_K6
GPP_K7
SCI#
SWI#
M2. PCIE (9~12) (Reverse)
PCIE_TXP11_SSD
PCIE_TXN11_SSD
PCIE_RXP11_SSD
PCIE_RXN11_SSD
PCIE11_TXP/SATA0A_TXP
PCIE11_TXN/SATA0A_TXN
PCIE11_RXP/SATA0A_RXP
PCIE11_RXN/SATA0A_RXN
GPP_F10/SATA_SCLOCK
GPP_F11/SATA_SLOAD
GPP_F13/SATA_SDATAOUT0
GPP_F12/SATA_SDATAOUT1
WLAN
PCIE_TXN14_WLAN
PCIE_TXP14_WLAN
PCIE_RXN14_WLAN
PCIE_RXP14_WLAN
PCIE14_TXN/SATA1B_TXN
PCIE14_TXP/SATA1B_TXP
PCIE14_RXN/SATA1B_RXN
PCIE14_RXP/SATA1B_RXP
PCIE13_TXN/SATA0B_TXN
PCIE13_TXP/SATA0B_TXP
PCIE13_RXN/SATA0B_RXN
PCIE13_RXP/SATA0B_RXP
M2. PCIE (9~12) (Reverse) SATA 1
PCIE_TXP12_SSD
PCIE_TXN12_SSD
PCIE_RXP12_SSD
PCIE_RXN12_SSD
PCIE12_TXP/SATA1A_TXP
PCIE12_TXN/SATA1A_TXN
PCIE12_RXP/SATA_1A_RXP
PCIE12_RXN/SATA1A_RXN
PCIE20_TXP/SATA7_TXP
PCIE20_TXN/SATA7_TXN
PCIE20_RXP/SATA7_RXP
PCIE20_RXN/SATA7_RXN
PCIE19_TXP/SATA6_TXP
PCIE19_TXN/SATA6_TXN
PCIE19_RXP/SATA6_RXP
PCIE19_RXN/SATA6_RXN
HM370
3 OF 13
PCIE9_RXN
PCIE9_RXP
PCIE9_TXN
PCIE9_TXP
PCIE10_RXN
PCIE10_RXP
PCIE10_TXN
PCIE10_TXP
PCIE15_RXN/SATA2_RXN
PCIE15_RXP/SATA2_RXP
PCIE15_TXN/SATA2_TXN
PCIE15_TXP/SATA2_TXP
PCIE16_RXN/SATA3_RXN
PCIE16_RXP/SATA3_RXP
PCIE16_TXN/SATA3_TXN
PCIE16_TXP/SATA3_TXP
PCIE17_RXN/SATA4_RXN
PCIE17_RXP/SATA4_RXP
PCIE17_TXN/SATA4_TXN
PCIE17_TXP/SATA4_TXP
PCIE18_RXN/SATA5_RXN
PCIE18_RXP/SATA5_RXP
PCIE18_TXN/SATA5_TXN
PCIE18_TXP/SATA5_TXP
GPP_E8/SATA_LED#
GPP_E0/SATAXPCIE0/SATAGP0
GPP_E1/SATAXPCIE1/SATAGP1
GPP_E2/SATAXPCIE2/SATAGP2
GPP_F0/SATAXPCIE3/SATAGP3
GPP_F1/SATAXPCIE4/SATAGP4
GPP_F2/SATAXPCIE5/SATAGP5
GPP_F3/SATAXPCIE6/SATAGP6
GPP_F4/SATAXPCIE7/SATAGP7
GPP_F21/EDP_BKLTCTL
GPP_F20/EDP_BKLTEN
GPP_F19/EDP_VDDEN
THRMTRIP#
PECI
PM_SYNC
PLTRST_CPU#
PM_DOWN
M2. PCIE (9~12) (Reverse)
PCIE_RXN9_SSD
PCIE_RXP9_SSD
PCIE_TXN9_SSD
PCIE_TXP9_SSD
M2. PCIE (9~12) (Reverse)
PCIE_RXN10_SSD
PCIE_RXP10_SSD
PCIE_TXN10_SSD
PCIE_TXP10_SSD
RTL8411B GLAN
PCIE_RXN15_GLAN
PCIE_RXP15_GLAN
PCIE_TXN15_GLAN
PCIE_TXP15_GLAN
Main HDD
SATA_RXN4
SATA_RXP4
SATA_TXN4
SATA_TXP4
SATA_LED#
SATAGP0
SATAGP1
SATAGP2
SATAGP3
SATAGP1
L: SATA
H: PCIe
ODD_DA#_R
EDP_BRIGHTNESS
BLON
NB_ENAVDD
1.05_VCCST
R397
1K_04
CLOSE TO PCH (0.3" ~ 2")
PCH_THERMTRIP#
PCH_PECI
H_PM_SYNC
PLTRST_CPU_N
H_PM_DOWN
R398
30.1_1%_04
R399
*12.1_1%_04
R400
CLOSE TO PCH (< 0.5")
12/04
R403
R407
R389
10K_04
3.3VS
3.3VA
GFX SELECT TABLE
NORMAL GFX:LOW
CUSTOMER GFX:HIGH
R421
*10K_04
GP39_GFX_CRB_DETECT
R416
10K_04
GPP_F13
1.05_VCCST

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PCH 3/9

PCH 4/9

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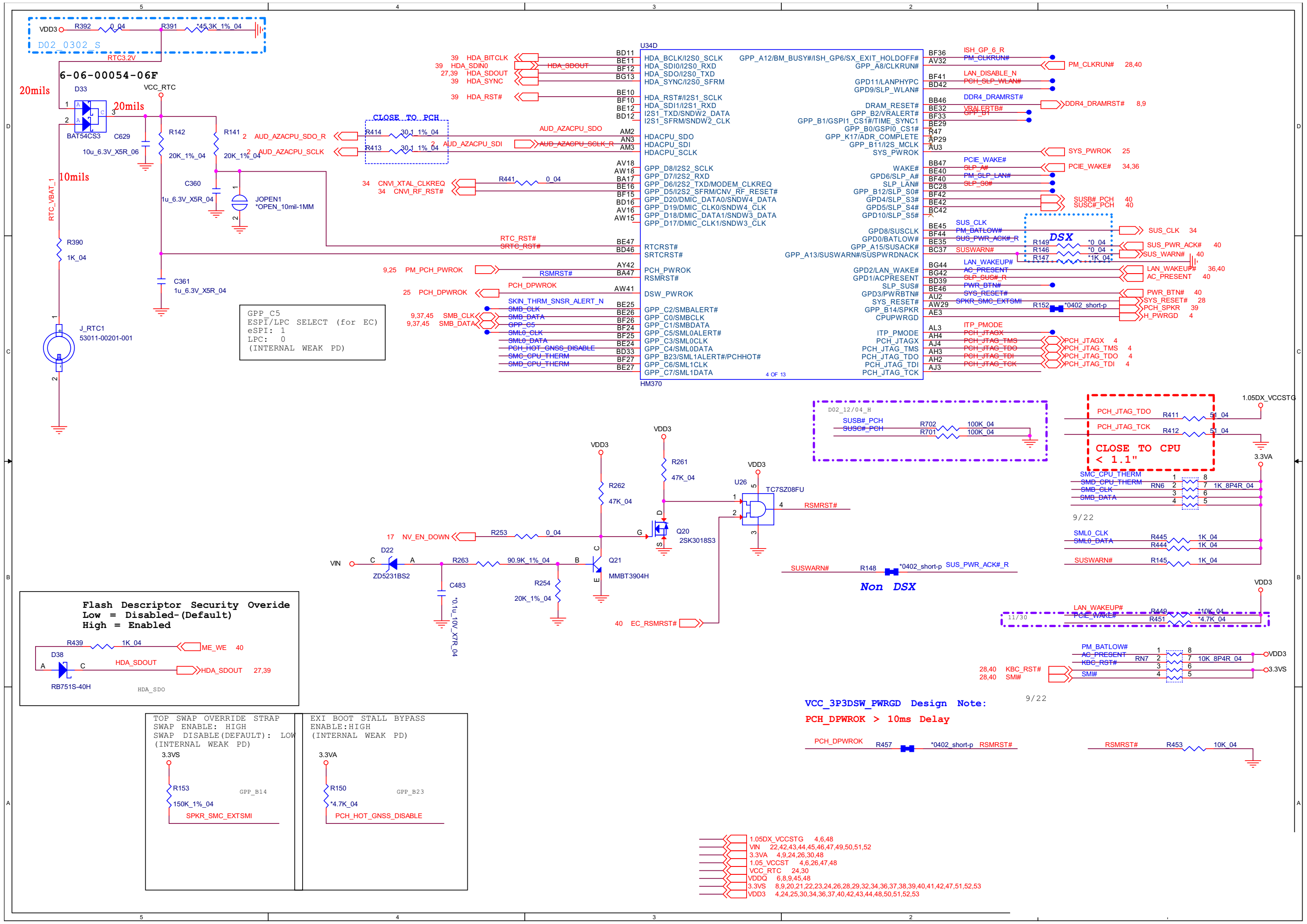
PCH 4/9


U34D
HM370
4 OF 13
D02_0302_S
RTC3.2V
6-06-00054-06F
20mils
10mils
VCC_RTC
D33
BAT54CS3
C629
10u_6.3V_X5R_06
R142
20K_1%_04
R141
20K_1%_04
C360
1u_6.3V_X5R_04
JOPEN1
*OPEN_10mil-1MM
R390
1K_04
RTC_VBAT_1
C361
1u_6.3V_X5R_04
J_RTC1
53011-00201-001
CLOSE TO PCH
R414
R413
33_1%_04
AUD_AZACPU_SDO_R
AUD_AZACPU_SCLK
AUD_AZACPU_SDO
AUD_AZACPU_SDI
AUD_AZACPU_SCLK_R
HDA_BITCLK
HDA_SDIN0
HDA_SDOUT
HDA_SYNC
HDA_RST#
CNVI_XTAL_CLKREQ
CNVI_RF_RST#
R441
0_04
RTC_RST#
SRTC_RST#
PM_PCH_PWROK
RSMRST#
PCH_DPWROK
SKIN_THRM_SNSR_ALERT_N
SMB_CLK
SMB_DATA
GPP_C5
SML0_CLK
SML0_DATA
PCH_HOT_GNSS_DISABLE
SMC_CPU_THERM
SMD_CPU_THERM
GPP_C5
ESPI/LPC SELECT (for EC)
eSPI: 1
LPC: 0
(INTERNAL WEAK PD)
HDA_BCLK/I2S0_SCLK
HDA_SDI0/I2S0_RXD
HDA_SDO/I2S0_TXD
HDA_SYNC/I2S0_SFRM
HDA_RST#/I2S1_SCLK
HDA_SDI1/I2S1_RXD
I2S1_TXD/SNDW2_DATA
I2S1_SFRM/SNDW2_CLK
HDACPU_SDO
HDACPU_SDI
HDACPU_SCLK
RTCRST#
SRTCRST#
PCH_PWROK
RSMRST#
DSW_PWROK
GPP_A12/BM_BUSY#/ISH_GP6/SX_EXIT_HOLDOFF#
GPP_A8/CLKRUN#
GPD11/LANPHYPC
GPD9/SLP_WLAN#
DRAM_RESET#
GPP_B2/VRALERT#
GPP_B1/GSPI1_CS1#/TIME_SYNC1
GPP_B0/GSPI0_CS1#
GPP_K17/ADR_COMPLETE
GPP_B11/I2S_MCLK
SYS_PWROK
WAKE#
GPD6/SLP_A#
SLP_LAN#
GPP_B12/SLP_S0#
GPD4/SLP_S3#
GPD5/SLP_S4#
GPD10/SLP_S5#
GPD8/SUSCLK
GPD0/BATLOW#
GPP_A15/SUSACK#
GPP_A13/SUSWARN#/SUSPWRDNACK
GPD2/LAN_WAKE#
GPD1/ACPRESENT
SLP_SUS#
GPD3/PWRBTN#
SYS_RESET#
GPP_B14/SPKR
CPUPWRGD
ITP_PMODE
PCH_JTAGX
PCH_JTAG_TMS
PCH_JTAG_TDO
PCH_JTAG_TDI
PCH_JTAG_TCK
PM_CLKRUN#
DDR4_DRAMRST#
SYS_PWROK
PCIE_WAKE#
SUSB#_PCH
SUSC#_PCH
SUS_CLK
SUS_PWR_ACK#
SUS_WARN#
LAN_WAKEUP#
AC_PRESENT
PWR_BTN#
SYS_RESET#
PCH_SPKR
H_PWRGD
DSX
R149
R146
R147
*0_04
*1K_04
R152
*0402_short-p
D02_12/04_B
R702
R701
100K_04
PCH_JTAG_TDO
PCH_JTAG_TCK
R411
R412
51_04
1.05DX_VCCSTG
CLOSE TO CPU
< 1.1"
3.3VA
RN6
1K_8P4R_04
9/22
R445
R444
R145
1K_04
SUSWARN#
R148
*0402_short-p
SUS_PWR_ACK#_R
Non DSX
VDD3
R448
R451
*10K_04
*4.7K_04
11/30
PM_BATLOW#
KBC_RST#
SMI#
RN7
10K_8P4R_04
R261
47K_04
R262
47K_04
U26
TC7SZ08FU
RSMRST#
Q20
2SK3018S3
R253
0_04
NV_EN_DOWN
D22
ZD5231BS2
R263
90.9K_1%_04
Q21
MMBT3904H
C483
*0.1u_10V_X7R_04
R254
20K_1%_04
EC_RSMRST#
VIN
Flash Descriptor Security Overide
Low = Disabled-(Default)
High = Enabled
R439
1K_04
ME_WE
D38
RB751S-40H
HDA_SDOUT
HDA_SDO
TOP SWAP OVERRIDE STRAP
SWAP ENABLE: HIGH
SWAP DISABLE(DEFAULT): LOW
(INTERNAL WEAK PD)
R153
150K_1%_04
SPKR_SMC_EXTSMI
GPP_B14
EXI BOOT STALL BYPASS
ENABLE:HIGH
(INTERNAL WEAK PD)
R150
*4.7K_04
PCH_HOT_GNSS_DISABLE
GPP_B23
VCC_3P3DSW_PWRGD Design Note:
PCH_DPWROK > 10ms Delay
R457
R453
10K_04
1.05DX_VCCSTG 4,6,48
VIN 22,42,43,44,45,46,47,49,50,51,52
3.3VA 4,9,24,26,30,48
1.05_VCCST 4,6,26,47,48
VCC_RTC 24,30
VDDQ 6,8,9,45,48
3.3VS 8,9,20,21,22,23,24,26,28,29,32,34,36,37,38,39,40,41,42,47,51,52,53
VDD3 4,24,25,30,34,36,37,40,42,43,44,48,50,51,52,53

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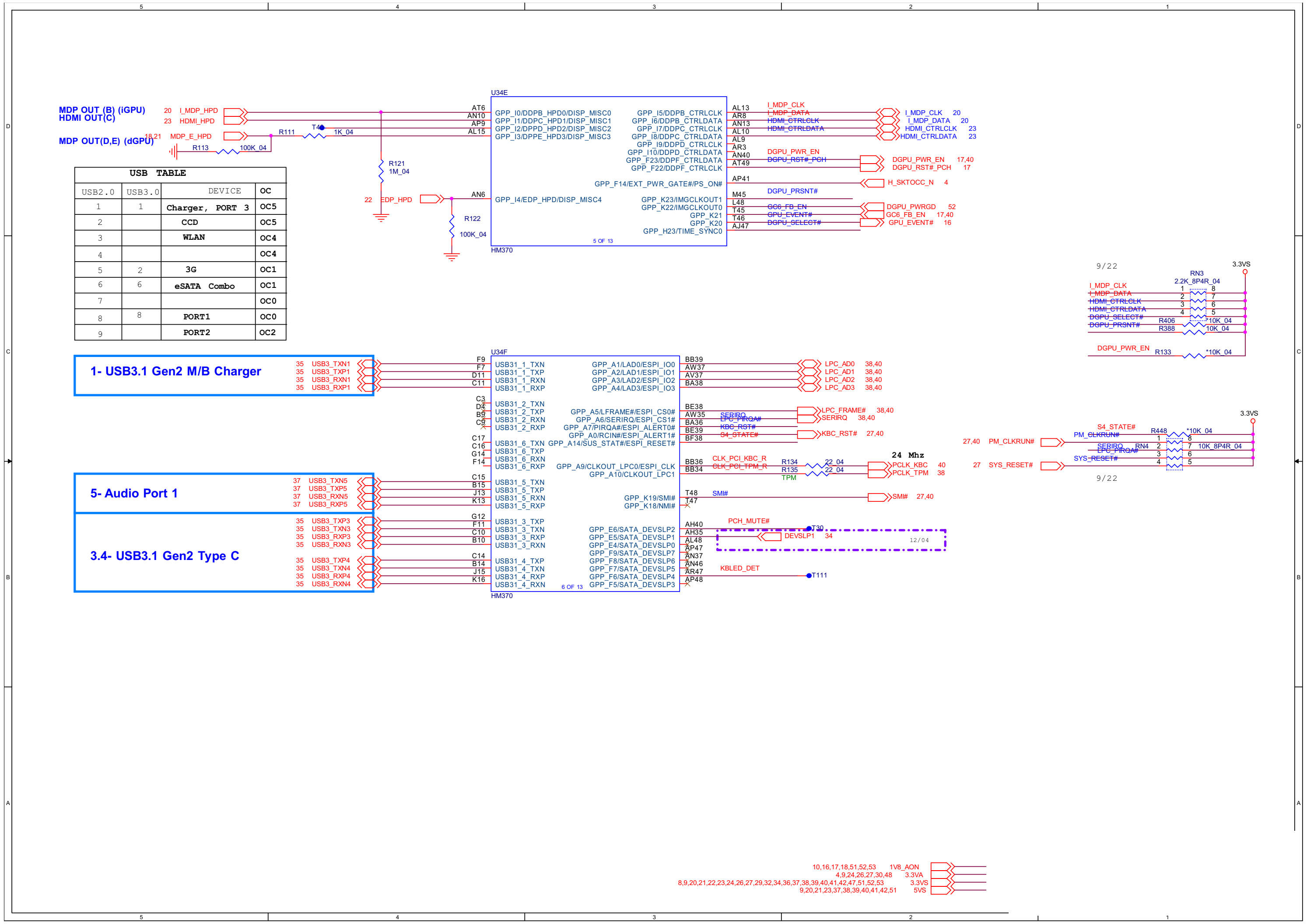
MDP OUT (B) (iGPU)
HDMI OUT(C)
MDP OUT(D,E) (dGPU)
20 I_MDP_HPD
23 HDMI_HPD
18,21 MDP_E_HPD
R111 1K_04
R113 100K_04
T40
R121 1M_04
22 EDP_HPD
R122 100K_04
U34E
HM370
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GPP_I0/DDPB_HPD0/DISP_MISC0
GPP_I1/DDPC_HPD1/DISP_MISC1
GPP_I2/DDPD_HPD2/DISP_MISC2
GPP_I3/DPPE_HPD3/DISP_MISC3
GPP_I4/EDP_HPD/DISP_MISC4
GPP_I5/DDPB_CTRLCLK
GPP_I6/DDPB_CTRLDATA
GPP_I7/DDPC_CTRLCLK
GPP_I8/DDPC_CTRLDATA
GPP_I9/DDPD_CTRLCLK
GPP_I10/DDPD_CTRLDATA
GPP_F23/DDPF_CTRLDATA
GPP_F22/DDPF_CTRLCLK
GPP_F14/EXT_PWR_GATE#/PS_ON#
GPP_K23/IMGCLKOUT1
GPP_K22/IMGCLKOUT0
GPP_K21
GPP_K20
GPP_H23/TIME_SYNC0
I_MDP_CLK 20
I_MDP_DATA 20
HDMI_CTRLCLK 23
HDMI_CTRLDATA 23
DGPU_PWR_EN 17,40
DGPU_RST#_PCH 17
H_SKTOCC_N 4
DGPU_PRSNT#
DGPU_PWRGD 52
GC6_FB_EN 17,40
GPU_EVENT# 16
DGPU_SELECT#
U34F
HM370
6 OF 13
1- USB3.1 Gen2 M/B Charger
5- Audio Port 1
3.4- USB3.1 Gen2 Type C
35 USB3_TXN1
35 USB3_TXP1
35 USB3_RXN1
35 USB3_RXP1
37 USB3_TXN5
37 USB3_TXP5
37 USB3_RXN5
37 USB3_RXP5
35 USB3_TXP3
35 USB3_TXN3
35 USB3_RXP3
35 USB3_RXN3
35 USB3_TXP4
35 USB3_TXN4
35 USB3_RXP4
35 USB3_RXN4
GPP_A1/LAD0/ESPI_IO0
GPP_A2/LAD1/ESPI_IO1
GPP_A3/LAD2/ESPI_IO2
GPP_A4/LAD3/ESPI_IO3
GPP_A5/LFRAME#/ESPI_CS0#
GPP_A6/SERIRQ/ESPI_CS1#
GPP_A7/PIRQA#/ESPI_ALERT0#
GPP_A0/RCIN#/ESPI_ALERT1#
GPP_A14/SUS_STAT#/ESPI_RESET#
GPP_A9/CLKOUT_LPC0/ESPI_CLK
GPP_A10/CLKOUT_LPC1
GPP_K19/SMI#
GPP_K18/NMI#
GPP_E6/SATA_DEVSLP2
GPP_E5/SATA_DEVSLP1
GPP_E4/SATA_DEVSLP0
GPP_F9/SATA_DEVSLP7
GPP_F8/SATA_DEVSLP6
GPP_F7/SATA_DEVSLP5
GPP_F6/SATA_DEVSLP4
GPP_F5/SATA_DEVSLP3
LPC_AD0 38,40
LPC_AD1 38,40
LPC_AD2 38,40
LPC_AD3 38,40
LPC_FRAME# 38,40
SERIRQ 38,40
KBC_RST# 27,40
24 Mhz
R134 22_04
R135 22_04
PCLK_KBC 40
PCLK_TPM 38
SMI# 27,40
PCH_MUTE#
T30
DEVSLP1 34
KBLED_DET
T111
3.3VS
RN3 2.2K_8P4R_04
R406 *10K_04
R388 10K_04
R133 *10K_04
R448 *10K_04
RN4 10K_8P4R_04
27,40 PM_CLKRUN#
27 SYS_RESET#
9/22
10,16,17,18,51,52,53 1V8_AON
4,9,24,26,27,30,48 3.3VA
8,9,20,21,22,23,24,26,27,29,32,34,36,37,38,39,40,41,42,47,51,52,53 3.3VS
9,20,21,23,37,38,39,40,41,42,51 5VS

USB TABLE

USB2.0	USB3.0	DEVICE	OC
1	1	Charger, PORT 3	OC5
2		CCD	OC5
3		WLAN	OC4
4			OC4
5	2	3G	OC1
6	6	eSATA Combo	OC1
7			OC0
8	8	PORT1	OC0
9		PORT2	OC2

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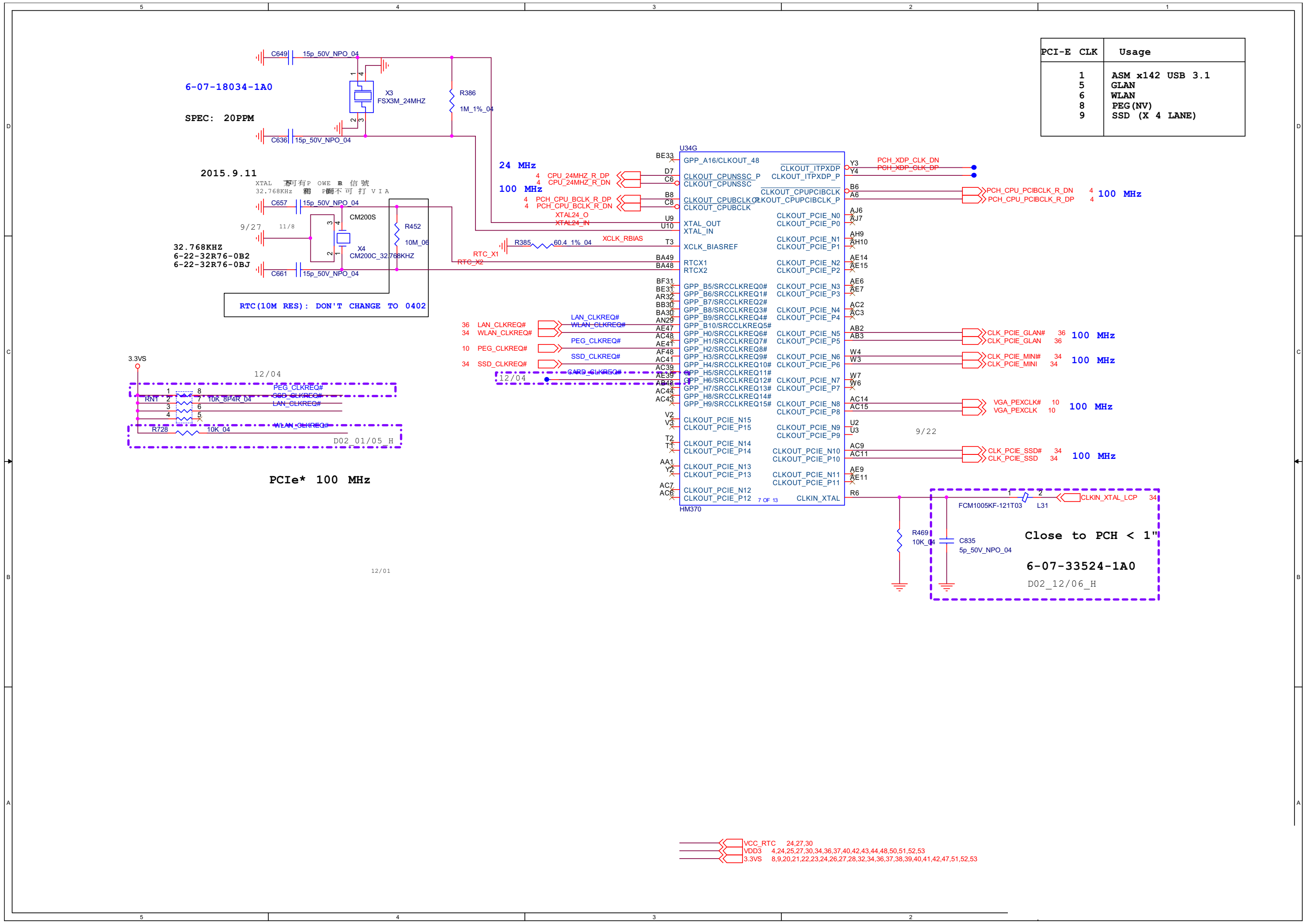
6-07-18034-1A0
SPEC: 20PPM
C649
15p_50V_NPO_04
X3
FSX3M_24MHZ
R386
1M_1%_04
C636
15p_50V_NPO_04
2015.9.11
XTAL 不可有POWER信號
32.768KHz 下面不可打VIA
C657
15p_50V_NPO_04
CM200S
R452
10M_06
9/27
11/8
X4
CM200C_32.768KHZ
32.768KHZ
6-22-32R76-0B2
6-22-32R76-0BJ
C661
15p_50V_NPO_04
RTC(10M RES): DON'T CHANGE TO 0402
24 MHz
4 CPU_24MHZ_R_DP
4 CPU_24MHZ_R_DN
100 MHz
4 PCH_CPU_BCLK_R_DP
4 PCH_CPU_BCLK_R_DN
XTAL24_O
XTAL24_IN
R385
60.4_1%_04
XCLK_RBIAS
RTC_X1
RTC_X2
U34G
GPP_A16/CLKOUT_48
CLKOUT_CPUNSSC_P
CLKOUT_CPUNSSC
CLKOUT_CPUBCLK_P
CLKOUT_CPUBCLK
XTAL_OUT
XTAL_IN
XCLK_BIASREF
RTCX1
RTCX2
GPP_B5/SRCCLKREQ0#
GPP_B6/SRCCLKREQ1#
GPP_B7/SRCCLKREQ2#
GPP_B8/SRCCLKREQ3#
GPP_B9/SRCCLKREQ4#
GPP_B10/SRCCLKREQ5#
GPP_H0/SRCCLKREQ6#
GPP_H1/SRCCLKREQ7#
GPP_H2/SRCCLKREQ8#
GPP_H3/SRCCLKREQ9#
GPP_H4/SRCCLKREQ10#
GPP_H5/SRCCLKREQ11#
GPP_H6/SRCCLKREQ12#
GPP_H7/SRCCLKREQ13#
GPP_H8/SRCCLKREQ14#
GPP_H9/SRCCLKREQ15#
CLKOUT_PCIE_N15
CLKOUT_PCIE_P15
CLKOUT_PCIE_N14
CLKOUT_PCIE_P14
CLKOUT_PCIE_N13
CLKOUT_PCIE_P13
CLKOUT_PCIE_N12
CLKOUT_PCIE_P12
7 OF 13
HM370
CLKOUT_ITPXDP
CLKOUT_ITPXDP_P
CLKOUT_CPUPCIBCLK
CLKOUT_CPUPCIBCLK_P
CLKOUT_PCIE_N0
CLKOUT_PCIE_P0
CLKOUT_PCIE_N1
CLKOUT_PCIE_P1
CLKOUT_PCIE_N2
CLKOUT_PCIE_P2
CLKOUT_PCIE_N3
CLKOUT_PCIE_P3
CLKOUT_PCIE_N4
CLKOUT_PCIE_P4
CLKOUT_PCIE_N5
CLKOUT_PCIE_P5
CLKOUT_PCIE_N6
CLKOUT_PCIE_P6
CLKOUT_PCIE_N7
CLKOUT_PCIE_P7
CLKOUT_PCIE_N8
CLKOUT_PCIE_P8
CLKOUT_PCIE_N9
CLKOUT_PCIE_P9
CLKOUT_PCIE_N10
CLKOUT_PCIE_P10
CLKOUT_PCIE_N11
CLKOUT_PCIE_P11
CLKIN_XTAL
BE33 D7 C6 B8 C8 U9 U10 T3 BA49 BA48 BF31 BE31 AR32 BB30 BA30 AN29 AE47 AC48 AE41 AF48 AC41 AC39 AE39 AB48 AC44 AC43 V2 V3 T2 T1 AA1 Y2 AC7 AC6
Y3 Y4 B6 A6 AJ6 AJ7 AH9 AH10 AE14 AE15 AE6 AE7 AC2 AC3 AB2 AB3 W4 W3 W7 W6 AC14 AC15 U2 U3 AC9 AC11 AE9 AE11 R6
PCH_XDP_CLK_DN
PCH_XDP_CLK_DP
PCH_CPU_PCIBCLK_R_DN 4
PCH_CPU_PCIBCLK_R_DP 4
100 MHz
CLK_PCIE_GLAN# 36
CLK_PCIE_GLAN 36
100 MHz
CLK_PCIE_MINI# 34
CLK_PCIE_MINI 34
100 MHz
VGA_PEXCLK# 10
VGA_PEXCLK 10
100 MHz
9/22
CLK_PCIE_SSD# 34
CLK_PCIE_SSD 34
100 MHz
36 LAN_CLKREQ#
34 WLAN_CLKREQ#
10 PEG_CLKREQ#
34 SSD_CLKREQ#
LAN_CLKREQ#
WLAN_CLKREQ#
PEG_CLKREQ#
SSD_CLKREQ#
CARD_CLKREQ#
12/04
3.3VS
12/04
PEG_CLKREQ#
SSD_CLKREQ#
LAN_CLKREQ#
RN1
10K_8P4R_04
R728
10K_04
WLAN_CLKREQ#
D02_01/05_H
PCIe* 100 MHz
12/01
FCM1005KF-121T03
L31
CLKIN_XTAL_LCP 34
R469
10K_04
C835
5p_50V_NPO_04
Close to PCH < 1"
6-07-33524-1A0
D02_12/06_H
VCC_RTC 24,27,30
VDD3 4,24,25,27,30,34,36,37,40,42,43,44,48,50,51,52,53
3.3VS 8,9,20,21,22,23,24,26,27,28,32,34,36,37,38,39,40,41,42,47,51,52,53
5 4 3 2 1
D C B A

PCI-E CLK	Usage
1	ASM x142 USB 3.1
5	GLAN
6	WLAN
8	PEG(NV)
9	SSD (X 4 LANE)

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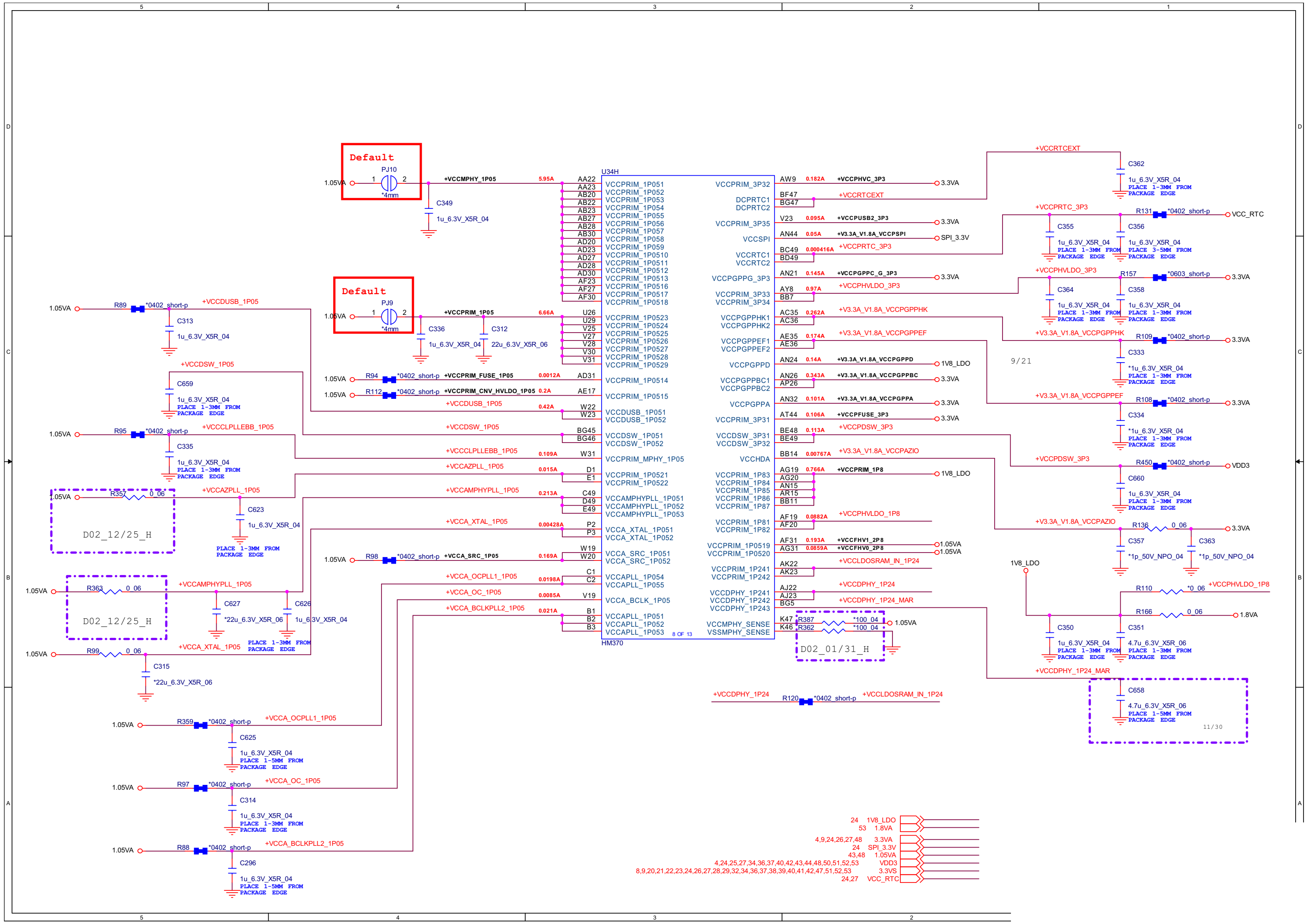
U34H
HM370
8 OF 13
Default
PJ10
*4mm
Default
PJ9
+VCCMPHY_1P05
5.95A
+VCCPRIM_1P05
6.66A
C349
1u_6.3V_X5R_04
C336
C312
22u_6.3V_X5R_06
VCCPRIM_1P051
VCCPRIM_3P32
AW9
+VCCPHVC_3P3
3.3VA
BF47
BG47
+VCCRTCEXT
DCPRTC1
DCPRTC2
VCCPRIM_3P35
+VCCPUSB2_3P3
VCCSPI
+V3.3A_V1.8A_VCCPSPI
SPI_3.3V
VCCRTC1
VCCRTC2
+VCCPRTC_3P3
VCCPGPPG_3P3
+VCCPGPPG_G_3P3
VCCPRIM_3P33
VCCPRIM_3P34
+VCCPHVLDO_3P3
VCCPGPPHK1
VCCPGPPHK2
+V3.3A_V1.8A_VCCPGPPHK
VCCPGPPEF1
VCCPGPPEF2
+V3.3A_V1.8A_VCCPGPPEF
VCCPGPPD
+V3.3A_V1.8A_VCCPGPPD
1V8_LDO
VCCPGPPBC1
VCCPGPPBC2
+V3.3A_V1.8A_VCCPGPPBC
VCCPGPPA
+V3.3A_V1.8A_VCCPGPPA
VCCPRIM_3P31
+VCCPFUSE_3P3
VCCDSW_3P31
VCCDSW_3P32
+VCCPDSW_3P3
VCCHDA
+V3.3A_V1.8A_VCCPAZIO
+VCCPRIM_1P8
+VCCPHVLDO_1P8
+VCCFHV1_2P8
+VCCFHV0_2P8
1.05VA
+VCCLDOSRAM_IN_1P24
+VCCDPHY_1P24
+VCCDPHY_1P24_MAR
VCCMPHY_SENSE
VSSMPHY_SENSE
R387
R362
*100_04
D02_01/31_H
+VCCRTCEXT
C362
+VCCPRTC_3P3
R131
*0402_short-p
VCC_RTC
C355
C356
+VCCPHVLDO_3P3
R157
*0603_short-p
C364
C358
R109
C333
R108
C334
+VCCPDSW_3P3
R450
VDD3
C660
R136
0_06
C357
C363
*1p_50V_NPO_04
R110
R166
1.8VA
C350
C351
4.7u_6.3V_X5R_06
C658
PLACE 1-3MM FROM PACKAGE EDGE
9/21
11/30
R89
+VCCDUSB_1P05
C313
+VCCDSW_1P05
C659
R95
+VCCCLPLLEBB_1P05
C335
R357
+VCCAZPLL_1P05
C623
D02_12/25_H
R363
+VCCAMPHYPLL_1P05
C627
C626
*22u_6.3V_X5R_06
R99
+VCCA_XTAL_1P05
C315
R94
+VCCPRIM_FUSE_1P05
R112
+VCCPRIM_CNV_HVLDO_1P05
R98
+VCCA_SRC_1P05
+VCCA_OCPLL1_1P05
+VCCA_OC_1P05
+VCCA_BCLKPLL2_1P05
R359
C625
R97
C314
R88
C296
PLACE 1-5MM FROM PACKAGE EDGE
R120
24 1V8_LDO
53 1.8VA
4,9,24,26,27,48 3.3VA
24 SPI_3.3V
43,48 1.05VA
4,24,25,27,34,36,37,40,42,43,44,48,50,51,52,53 VDD3
8,9,20,21,22,23,24,26,27,28,29,32,34,36,37,38,39,40,41,42,47,51,52,53 3.3VS
24,27 VCC_RTC

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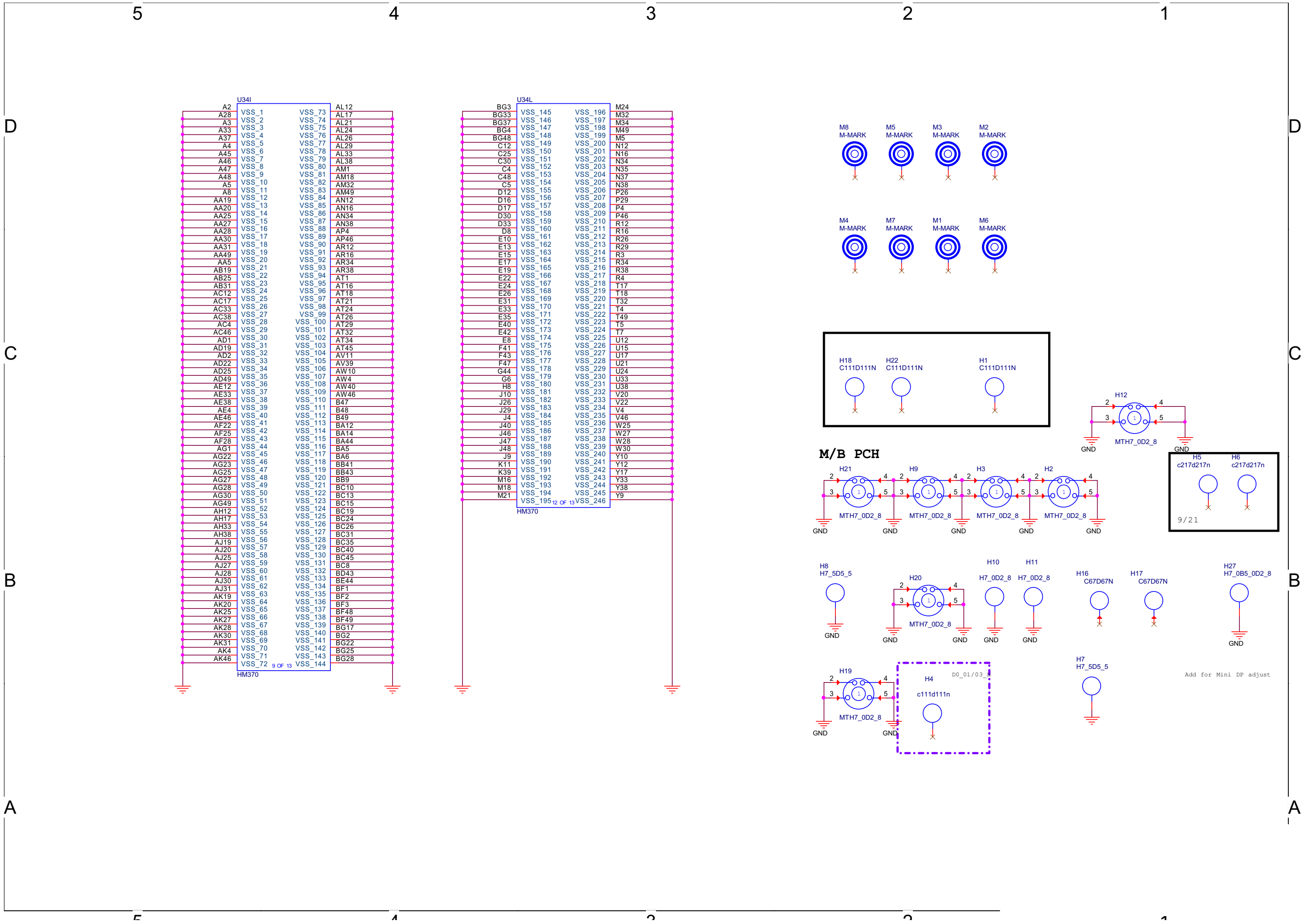
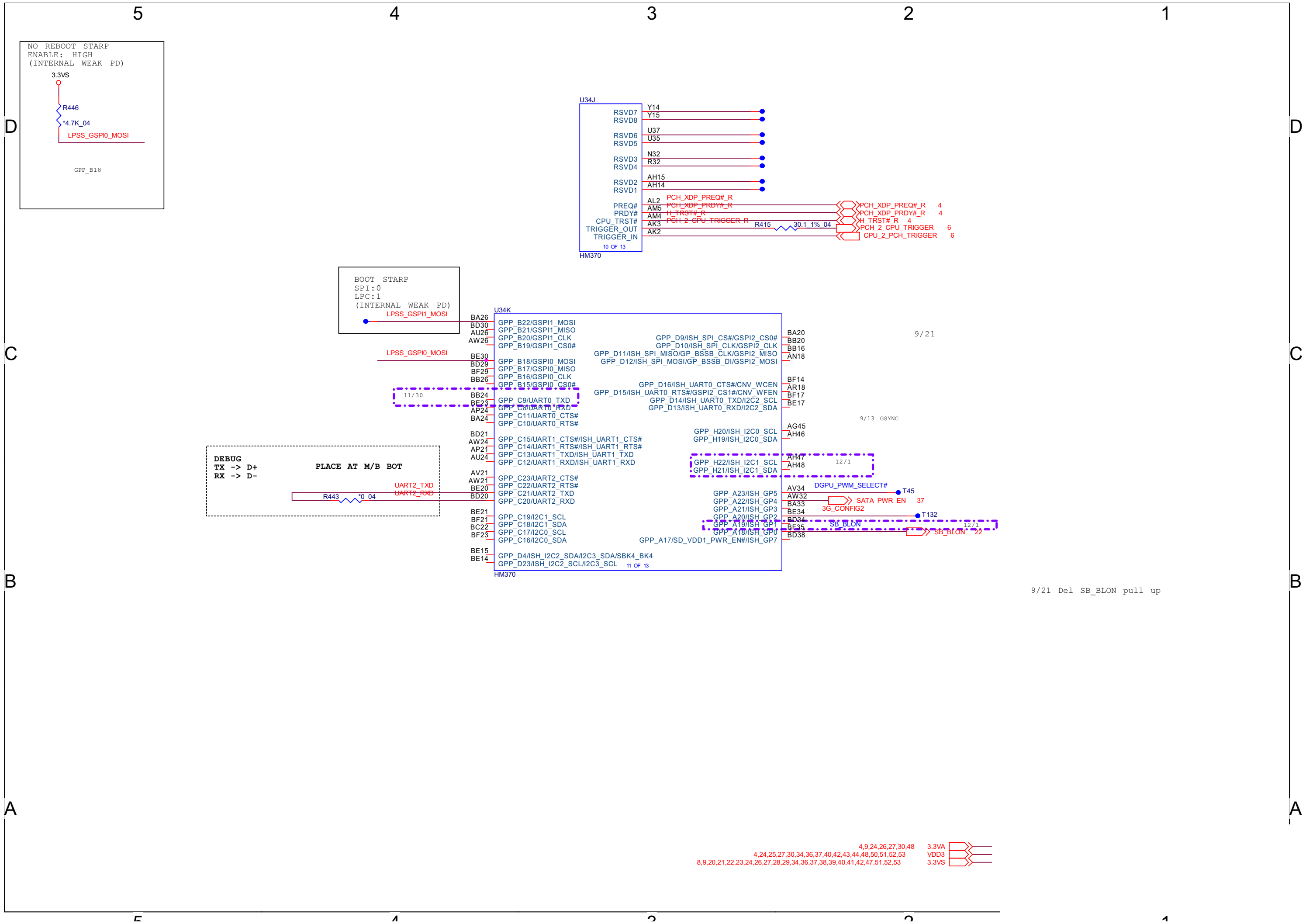
PCH 8/9


5
4
3
2
1
D
C
B
A
U34I
A2 VSS_1
A28 VSS_2
A3 VSS_3
A33 VSS_4
A37 VSS_5
A4 VSS_6
A45 VSS_7
A46 VSS_8
A47 VSS_9
A48 VSS_10
A5 VSS_11
A8 VSS_12
AA19 VSS_13
AA20 VSS_14
AA25 VSS_15
AA27 VSS_16
AA28 VSS_17
AA30 VSS_18
AA31 VSS_19
AA49 VSS_20
AA5 VSS_21
AB19 VSS_22
AB25 VSS_23
AB31 VSS_24
AC12 VSS_25
AC17 VSS_26
AC33 VSS_27
AC38 VSS_28
AC4 VSS_29
AC46 VSS_30
AD1 VSS_31
AD19 VSS_32
AD2 VSS_33
AD22 VSS_34
AD25 VSS_35
AD49 VSS_36
AE12 VSS_37
AE33 VSS_38
AE38 VSS_39
AE4 VSS_40
AE46 VSS_41
AF22 VSS_42
AF25 VSS_43
AF28 VSS_44
AG1 VSS_45
AG22 VSS_46
AG23 VSS_47
AG25 VSS_48
AG27 VSS_49
AG28 VSS_50
AG30 VSS_51
AG49 VSS_52
AH12 VSS_53
AH17 VSS_54
AH33 VSS_55
AH38 VSS_56
AJ19 VSS_57
AJ20 VSS_58
AJ25 VSS_59
AJ27 VSS_60
AJ28 VSS_61
AJ30 VSS_62
AJ31 VSS_63
AK19 VSS_64
AK20 VSS_65
AK25 VSS_66
AK27 VSS_67
AK28 VSS_68
AK30 VSS_69
AK31 VSS_70
AK4 VSS_71
AK46 VSS_72
VSS_73 AL12
VSS_74 AL17
VSS_75 AL21
VSS_76 AL24
VSS_77 AL26
VSS_78 AL29
VSS_79 AL33
VSS_80 AL38
VSS_81 AM1
VSS_82 AM18
VSS_83 AM32
VSS_84 AM49
VSS_85 AN12
VSS_86 AN16
VSS_87 AN34
VSS_88 AN38
VSS_89 AP4
VSS_90 AP46
VSS_91 AR12
VSS_92 AR16
VSS_93 AR34
VSS_94 AR38
VSS_95 AT1
VSS_96 AT16
VSS_97 AT18
VSS_98 AT21
VSS_99 AT24
VSS_100 AT26
VSS_101 AT29
VSS_102 AT32
VSS_103 AT34
VSS_104 AT45
VSS_105 AV11
VSS_106 AV39
VSS_107 AW10
VSS_108 AW4
VSS_109 AW40
VSS_110 AW46
VSS_111 B47
VSS_112 B48
VSS_113 B49
VSS_114 BA12
VSS_115 BA14
VSS_116 BA44
VSS_117 BA5
VSS_118 BA6
VSS_119 BB41
VSS_120 BB43
VSS_121 BB9
VSS_122 BC10
VSS_123 BC13
VSS_124 BC15
VSS_125 BC19
VSS_126 BC24
VSS_127 BC26
VSS_128 BC31
VSS_129 BC35
VSS_130 BC40
VSS_131 BC45
VSS_132 BC8
VSS_133 BD43
VSS_134 BE44
VSS_135 BF1
VSS_136 BF2
VSS_137 BF3
VSS_138 BF48
VSS_139 BF49
VSS_140 BG17
VSS_141 BG2
VSS_142 BG22
VSS_143 BG25
VSS_144 BG28
9 OF 13
HM370
U34L
BG3 VSS_145
BG33 VSS_146
BG37 VSS_147
BG4 VSS_148
BG48 VSS_149
C12 VSS_150
C25 VSS_151
C30 VSS_152
C4 VSS_153
C48 VSS_154
C5 VSS_155
D12 VSS_156
D16 VSS_157
D17 VSS_158
D30 VSS_159
D33 VSS_160
D8 VSS_161
E10 VSS_162
E13 VSS_163
E15 VSS_164
E17 VSS_165
E19 VSS_166
E22 VSS_167
E24 VSS_168
E26 VSS_169
E31 VSS_170
E33 VSS_171
E35 VSS_172
E40 VSS_173
E42 VSS_174
E8 VSS_175
F41 VSS_176
F43 VSS_177
F47 VSS_178
G44 VSS_179
G6 VSS_180
H8 VSS_181
J10 VSS_182
J26 VSS_183
J29 VSS_184
J4 VSS_185
J40 VSS_186
J46 VSS_187
J47 VSS_188
J48 VSS_189
J9 VSS_190
K11 VSS_191
K39 VSS_192
M16 VSS_193
M18 VSS_194
M21 VSS_195
VSS_196 M24
VSS_197 M32
VSS_198 M34
VSS_199 M49
VSS_200 M5
VSS_201 N12
VSS_202 N16
VSS_203 N34
VSS_204 N35
VSS_205 N37
VSS_206 N38
VSS_207 P26
VSS_208 P29
VSS_209 P4
VSS_210 P46
VSS_211 R12
VSS_212 R16
VSS_213 R26
VSS_214 R29
VSS_215 R3
VSS_216 R34
VSS_217 R38
VSS_218 R4
VSS_219 T17
VSS_220 T18
VSS_221 T32
VSS_222 T4
VSS_223 T49
VSS_224 T5
VSS_225 T7
VSS_226 U12
VSS_227 U15
VSS_228 U17
VSS_229 U21
VSS_230 U24
VSS_231 U33
VSS_232 U38
VSS_233 V20
VSS_234 V22
VSS_235 V4
VSS_236 V46
VSS_237 W25
VSS_238 W27
VSS_239 W28
VSS_240 W30
VSS_241 Y10
VSS_242 Y12
VSS_243 Y17
VSS_244 Y33
VSS_245 Y38
VSS_246 Y9
12 OF 13
HM370
M8 M-MARK
M5 M-MARK
M3 M-MARK
M2 M-MARK
M4 M-MARK
M7 M-MARK
M1 M-MARK
M6 M-MARK
H18 C111D111N
H22 C111D111N
H1 C111D111N
H12
MTH7_0D2_8
GND
M/B PCH
H21
H9
H3
H2
MTH7_0D2_8
GND
H5 c217d217n
H6 c217d217n
9/21
H8 H7_5D5_5
H20 MTH7_0D2_8
H10 H7_0D2_8
H11 H7_0D2_8
H16 C67D67N
H17 C67D67N
H27 H7_0B5_0D2_8
GND
H19 MTH7_0D2_8
H4 c111d111n
D0_01/03_
H7 H7_5D5_5
Add for Mini DP adjust

PCH 9/9


5
4
3
2
1
D
C
B
A
NO REBOOT STARP
ENABLE: HIGH
(INTERNAL WEAK PD)
3.3VS
R446
*4.7K_04
LPSS_GSPI0_MOSI
GPP_B18
U34J
RSVD7
RSVD8
RSVD6
RSVD5
RSVD3
RSVD4
RSVD2
RSVD1
PREQ#
PRDY#
CPU_TRST#
TRIGGER_OUT
TRIGGER_IN
10 OF 13
HM370
Y14
Y15
U37
U35
N32
R32
AH15
AH14
AL2
AM5
AM4
AK3
AK2
PCH_XDP_PREQ#_R
PCH_XDP_PRDY#_R
H_TRST#_R
PCH_2_CPU_TRIGGER_R
R415
30.1_1%_04
PCH_XDP_PREQ#_R 4
PCH_XDP_PRDY#_R 4
H_TRST#_R 4
PCH_2_CPU_TRIGGER 6
CPU_2_PCH_TRIGGER 6
BOOT STARP
SPI:0
LPC:1
(INTERNAL WEAK PD)
LPSS_GSPI1_MOSI
LPSS_GSPI0_MOSI
11/30
U34K
BA26
BD30
AU26
AW26
BE30
BD29
BF29
BB26
BB24
BE23
AP24
BA24
BD21
AW24
AP21
AU24
AV21
AW21
BE20
BD20
BE21
BF21
BC22
BF23
BE15
BE14
GPP_B22/GSPI1_MOSI
GPP_B21/GSPI1_MISO
GPP_B20/GSPI1_CLK
GPP_B19/GSPI1_CS0#
GPP_B18/GSPI0_MOSI
GPP_B17/GSPI0_MISO
GPP_B16/GSPI0_CLK
GPP_B15/GSPI0_CS0#
GPP_C9/UART0_TXD
GPP_C8/UART0_RXD
GPP_C11/UART0_CTS#
GPP_C10/UART0_RTS#
GPP_C15/UART1_CTS#/ISH_UART1_CTS#
GPP_C14/UART1_RTS#/ISH_UART1_RTS#
GPP_C13/UART1_TXD/ISH_UART1_TXD
GPP_C12/UART1_RXD/ISH_UART1_RXD
GPP_C23/UART2_CTS#
GPP_C22/UART2_RTS#
GPP_C21/UART2_TXD
GPP_C20/UART2_RXD
GPP_C19/I2C1_SCL
GPP_C18/I2C1_SDA
GPP_C17/I2C0_SCL
GPP_C16/I2C0_SDA
GPP_D4/ISH_I2C2_SDA/I2C3_SDA/SBK4_BK4
GPP_D23/ISH_I2C2_SCL/I2C3_SCL
11 OF 13
HM370
GPP_D9/ISH_SPI_CS#/GSPI2_CS0#
GPP_D10/ISH_SPI_CLK/GSPI2_CLK
GPP_D11/ISH_SPI_MISO/GP_BSSB_CLK/GSPI2_MISO
GPP_D12/ISH_SPI_MOSI/GP_BSSB_DI/GSPI2_MOSI
GPP_D16/ISH_UART0_CTS#/CNV_WCEN
GPP_D15/ISH_UART0_RTS#/GSPI2_CS1#/CNV_WFEN
GPP_D14/ISH_UART0_TXD/I2C2_SCL
GPP_D13/ISH_UART0_RXD/I2C2_SDA
GPP_H20/ISH_I2C0_SCL
GPP_H19/ISH_I2C0_SDA
GPP_H22/ISH_I2C1_SCL
GPP_H21/ISH_I2C1_SDA
GPP_A23/ISH_GP5
GPP_A22/ISH_GP4
GPP_A21/ISH_GP3
GPP_A20/ISH_GP2
GPP_A19/ISH_GP1
GPP_A18/ISH_GP0
GPP_A17/SD_VDD1_PWR_EN#/ISH_GP7
BA20
BB20
BB16
AN18
BF14
AR18
BF17
BE17
AG45
AH46
AH47
AH48
AV34
AW32
BA33
BE34
BD34
BF35
BD38
9/21
9/13 GSYNC
12/1
DGPU_PWM_SELECT#
T45
SATA_PWR_EN 37
3G_CONFIG2
T132
SB_BLON
SB_BLON 22
12/1
DEBUG
TX -> D+
RX -> D-
PLACE AT M/B BOT
UART2_TXD
UART2_RXD
R443
*0_04
9/21 Del SB_BLON pull up
4,9,24,26,27,30,48
4,24,25,27,30,34,36,37,40,42,43,44,48,50,51,52,53
8,9,20,21,22,23,24,26,27,28,29,34,36,37,38,39,40,41,42,47,51,52,53
3.3VA
VDD3
3.3VS

Sheet 32 of 60
PCH 9/9

M.2 3G Card

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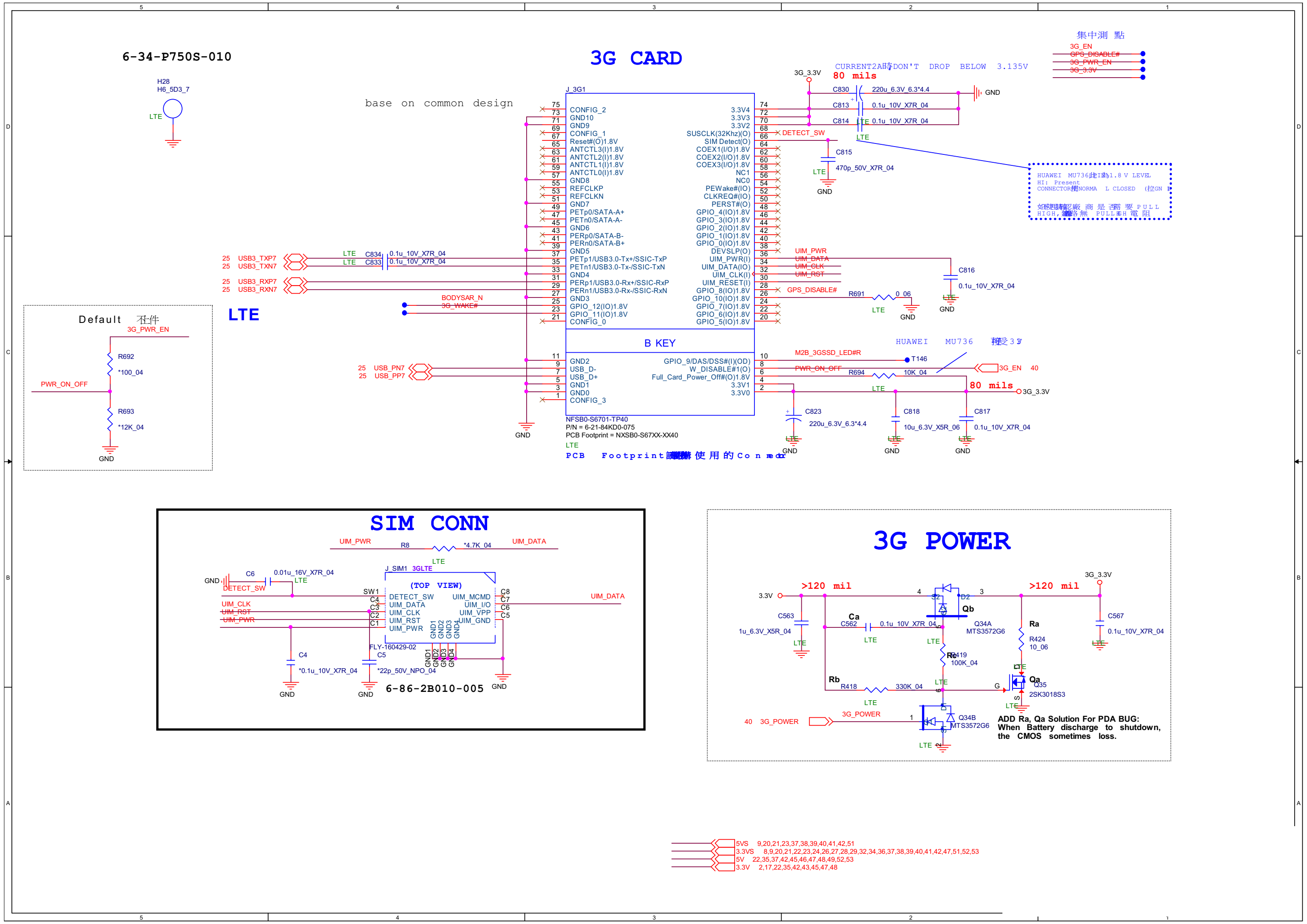
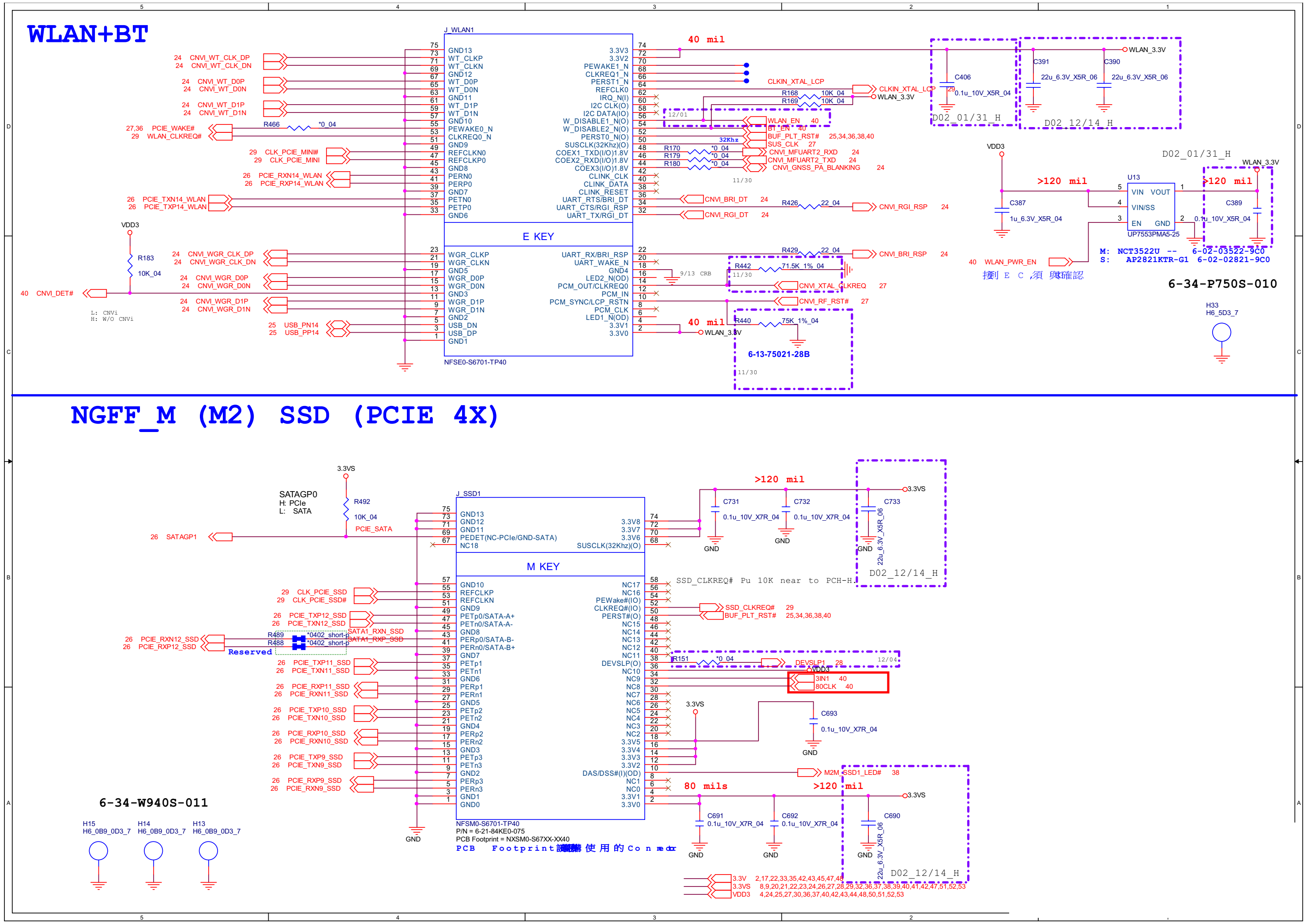
M.2 3G Card


6-34-P750S-010
H28
H6_5D3_7
LTE
base on common design
3G CARD
J_3G1
CONFIG_2
GND10
GND9
CONFIG_1
Reset#(O)1.8V
ANTCTL3(I)1.8V
ANTCTL2(I)1.8V
ANTCTL1(I)1.8V
ANTCTL0(I)1.8V
GND8
REFCLKP
REFCLKN
GND7
PETp0/SATA-A+
PETn0/SATA-A-
GND6
PERp0/SATA-B-
PERn0/SATA-B+
GND5
PETp1/USB3.0-Tx+/SSIC-TxP
PETn1/USB3.0-Tx-/SSIC-TxN
GND4
PERp1/USB3.0-Rx+/SSIC-RxP
PERn1/USB3.0-Rx-/SSIC-RxN
GND3
GPIO_12(IO)1.8V
GPIO_11(IO)1.8V
CONFIG_0
3.3V4
3.3V3
3.3V2
SUSCLK(32Khz)(O)
SIM Detect(O)
COEX1(I/O)1.8V
COEX2(I/O)1.8V
COEX3(I/O)1.8V
NC1
NC0
PEWake#(IO)
CLKREQ#(IO)
PERST#(O)
GPIO_4(IO)1.8V
GPIO_3(IO)1.8V
GPIO_2(IO)1.8V
GPIO_1(IO)1.8V
GPIO_0(IO)1.8V
DEVSLP(O)
UIM_PWR(I)
UIM_DATA(IO)
UIM_CLK(I)
UIM_RESET(I)
GPIO_8(IO)1.8V
GPIO_10(IO)1.8V
GPIO_7(IO)1.8V
GPIO_6(IO)1.8V
GPIO_5(IO)1.8V
B KEY
GND2
USB_D-
USB_D+
GND1
GND0
CONFIG_3
GPIO_9/DAS/DSS#(I)(OD)
W_DISABLE#1(O)
Full_Card_Power_Off#(O)1.8V
3.3V1
3.3V0
NFSB0-S6701-TP40
P/N = 6-21-84KD0-075
PCB Footprint = NXSB0-S67XX-XX40
PCB Footprint 使用的Connector
GND
25 USB3_TXP7
25 USB3_TXN7
25 USB3_RXP7
25 USB3_RXN7
C834 0.1u_10V_X7R_04
C833 0.1u_10V_X7R_04
BODYSAR_N
3G_WAKE#
LTE
25 USB_PN7
25 USB_PP7
Default 狂件
3G_PWR_EN
R692
*100_04
PWR_ON_OFF
R693
*12K_04
3G_3.3V
CURRENT2A時DON'T DROP BELOW 3.135V
80 mils
C830 220u_6.3V_6.3*4.4
C813 0.1u_10V_X7R_04
C814 0.1u_10V_X7R_04
DETECT_SW
C815
470p_50V_X7R_04
集中測 點
3G_EN
GPS_DISABLE#
3G_PWR_EN
3G_3.3V
HUAWEI MU736此IO為1.8 V LEVEL
HI: Present
CONNECTOR使用NORMAL CLOSED (拉GND)
如使用請確認廠商是否需要PULL HIGH,線路無PULL HIGH電阻
UIM_PWR
UIM_DATA
UIM_CLK
UIM_RST
GPS_DISABLE#
R691 0_06
C816
0.1u_10V_X7R_04
HUAWEI MU736 接受3.3V
M2B_3GSSD_LED#R
T146
PWR_ON_OFF
R694 10K_04
3G_EN 40
80 mils
3G_3.3V
C823 220u_6.3V_6.3*4.4
C818 10u_6.3V_X5R_06
C817 0.1u_10V_X7R_04
SIM CONN
UIM_PWR
R8 *4.7K_04
UIM_DATA
C6 0.01u_16V_X7R_04
DETECT_SW
UIM_CLK
UIM_RST
UIM_PWR
J_SIM1 3GLTE
(TOP VIEW)
SW1
C4
C3
C2
C1
DETECT_SW
UIM_DATA
UIM_CLK
UIM_RST
UIM_PWR
UIM_MCMD
UIM_I/O
UIM_VPP
UIM_GND
C8
C7
C6
C5
GND1
GND2
GND3
GND4
FLY-160429-02
C4 *0.1u_10V_X7R_04
C5 *22p_50V_NPO_04
6-86-2B010-005
UIM_DATA
3G POWER
3.3V
>120 mil
>120 mil
3G_3.3V
C563 1u_6.3V_X5R_04
Ca
C562 0.1u_10V_X7R_04
Qb
Q34A MTS3572G6
Ra
R424 10_06
C567 0.1u_10V_X7R_04
Rc R419 100K_04
Rb
R418 330K_04
Qa
Q35 2SK3018S3
40 3G_POWER
3G_POWER
Q34B MTS3572G6
ADD Ra, Qa Solution For PDA BUG:
When Battery discharge to shutdown,
the CMOS sometimes loss.
5VS 9,20,21,23,37,38,39,40,41,42,51
3.3VS 8,9,20,21,22,23,24,26,27,28,29,32,34,36,37,38,39,40,41,42,47,51,52,53
5V 22,35,37,42,45,46,47,48,49,52,53
3.3V 2,17,22,35,42,43,45,47,48

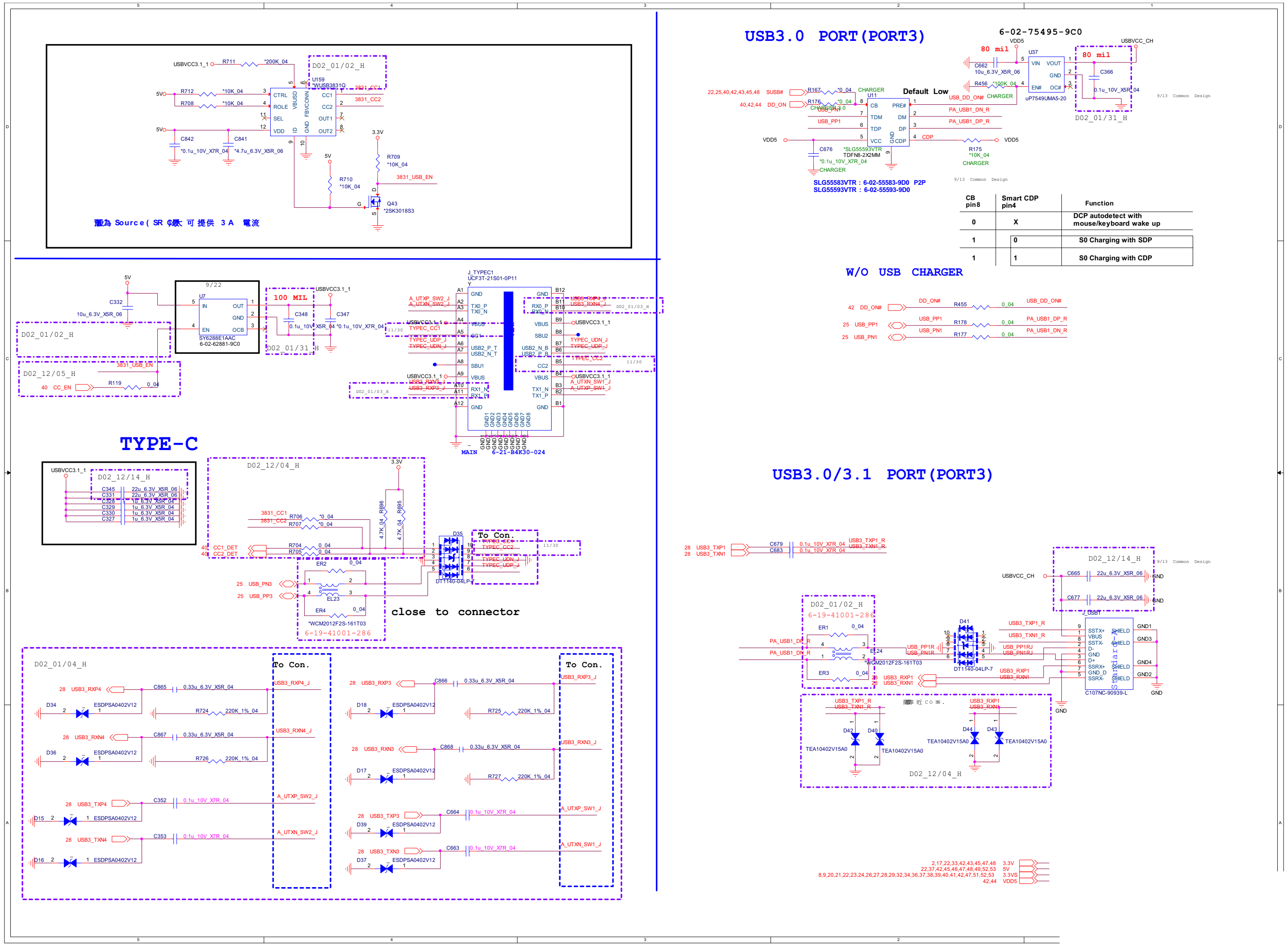
M.2 WLAN+BT, SSD


WLAN+BT
J_WLAN1
E KEY
NFSE0-S6701-TP40
40 mil
>120 mil
CNVI_WT_CLK_DP
CNVI_WT_CLK_DN
CNVI_WT_D0P
CNVI_WT_D0N
CNVI_WT_D1P
CNVI_WT_D1N
PCIE_WAKE#
WLAN_CLKREQ#
CLK_PCIE_MINI#
CLK_PCIE_MINI
PCIE_RXN14_WLAN
PCIE_RXP14_WLAN
PCIE_TXN14_WLAN
PCIE_TXP14_WLAN
CNVI_WGR_CLK_DP
CNVI_WGR_CLK_DN
CNVI_WGR_D0P
CNVI_WGR_D0N
CNVI_WGR_D1P
CNVI_WGR_D1N
CNVI_DET#
USB_PN14
USB_PP14
VDD3
WLAN_3.3V
CLKIN_XTAL_LCP
WLAN_EN
BT_EN
BUF_PLT_RST#
SUS_CLK
CNVI_MFUART2_RXD
CNVI_MFUART2_TXD
CNVI_GNSS_PA_BLANKING
CNVI_BRI_DT
CNVI_RGI_DT
CNVI_RGI_RSP
CNVI_BRI_RSP
CNVI_XTAL_CLKREQ
CNVI_RF_RST#
WLAN_PWR_EN
U13
UP7553PMA5-25
M: NCT3522U -- 6-02-03522-9C0
S: AP2821KTR-G1 6-02-02821-9C0
6-13-75021-28B
D02_01/31_H
D02_12/14_H
6-34-P750S-010
H33
H6_5D3_7
NGFF_M (M2) SSD (PCIE 4X)
J_SSD1
M KEY
SATAGP0
H: PCIe
L: SATA
SATAGP1
PCIE_SATA
CLK_PCIE_SSD
CLK_PCIE_SSD#
PCIE_TXP12_SSD
PCIE_TXN12_SSD
PCIE_RXN12_SSD
PCIE_RXP12_SSD
Reserved
PCIE_TXP11_SSD
PCIE_TXN11_SSD
PCIE_RXP11_SSD
PCIE_RXN11_SSD
PCIE_TXP10_SSD
PCIE_TXN10_SSD
PCIE_RXP10_SSD
PCIE_RXN10_SSD
PCIE_TXP9_SSD
PCIE_TXN9_SSD
PCIE_RXP9_SSD
PCIE_RXN9_SSD
SSD_CLKREQ# Pu 10K near to PCH-H
SSD_CLKREQ#
DEVSLP1
M2M_SSD1_LED#
80 mils
3.3VS
GND
NFSM0-S6701-TP40
P/N = 6-21-84KE0-075
PCB Footprint = NXSM0-S67XX-XX40
6-34-W940S-011
H15
H6_0B9_0D3_7
H14
H6_0B9_0D3_7
H13
H6_0B9_0D3_7

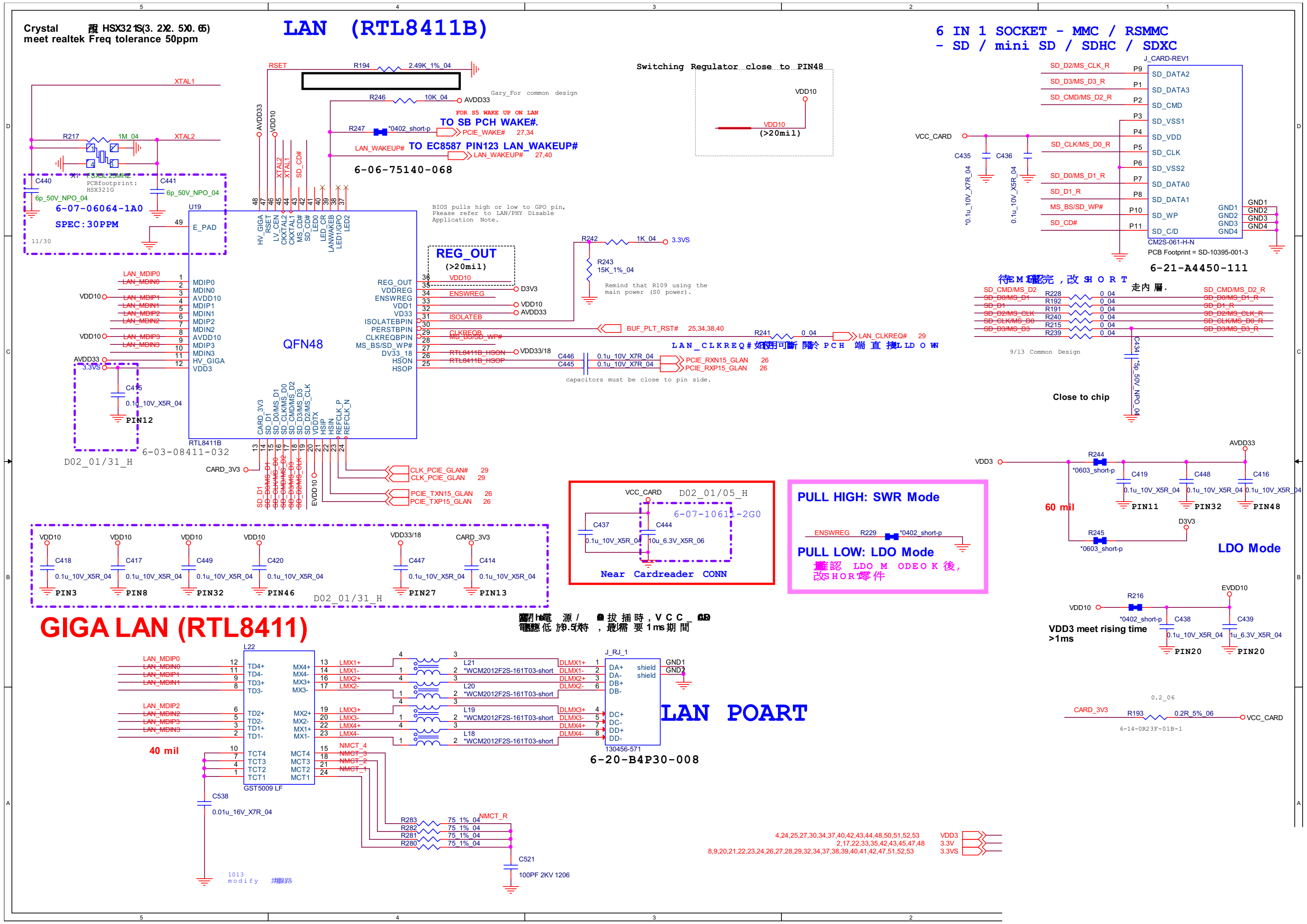
Sheet 34 of 60
M.2 WLAN+BT,
SSD

USB Conn, USB Charger

Sheet 35 of 60
USB Conn,
USB Charger


USB3.0 PORT(PORT3)
6-02-75495-9C0
80 mil
Default Low
SLG55583VTR : 6-02-55583-9D0 P2P
SLG55593VTR : 6-02-55593-9D0
CB pin8
Smart CDP pin4
Function
DCP autodetect with mouse/keyboard wake up
S0 Charging with SDP
S0 Charging with CDP
W/O USB CHARGER
USB3.0/3.1 PORT(PORT3)
TYPE-C
100 MIL
J_TYPEC1
MAIN
6-21-B4K30-024
To Con.
close to connector
D02_01/02_H
D02_12/05_H
D02_12/04_H
D02_12/14_H
D02_01/31_H
D02_01/04_H
6-19-41001-286
USBVCC3.1_1
USBVCC_CH
VDD5
5V
3.3V

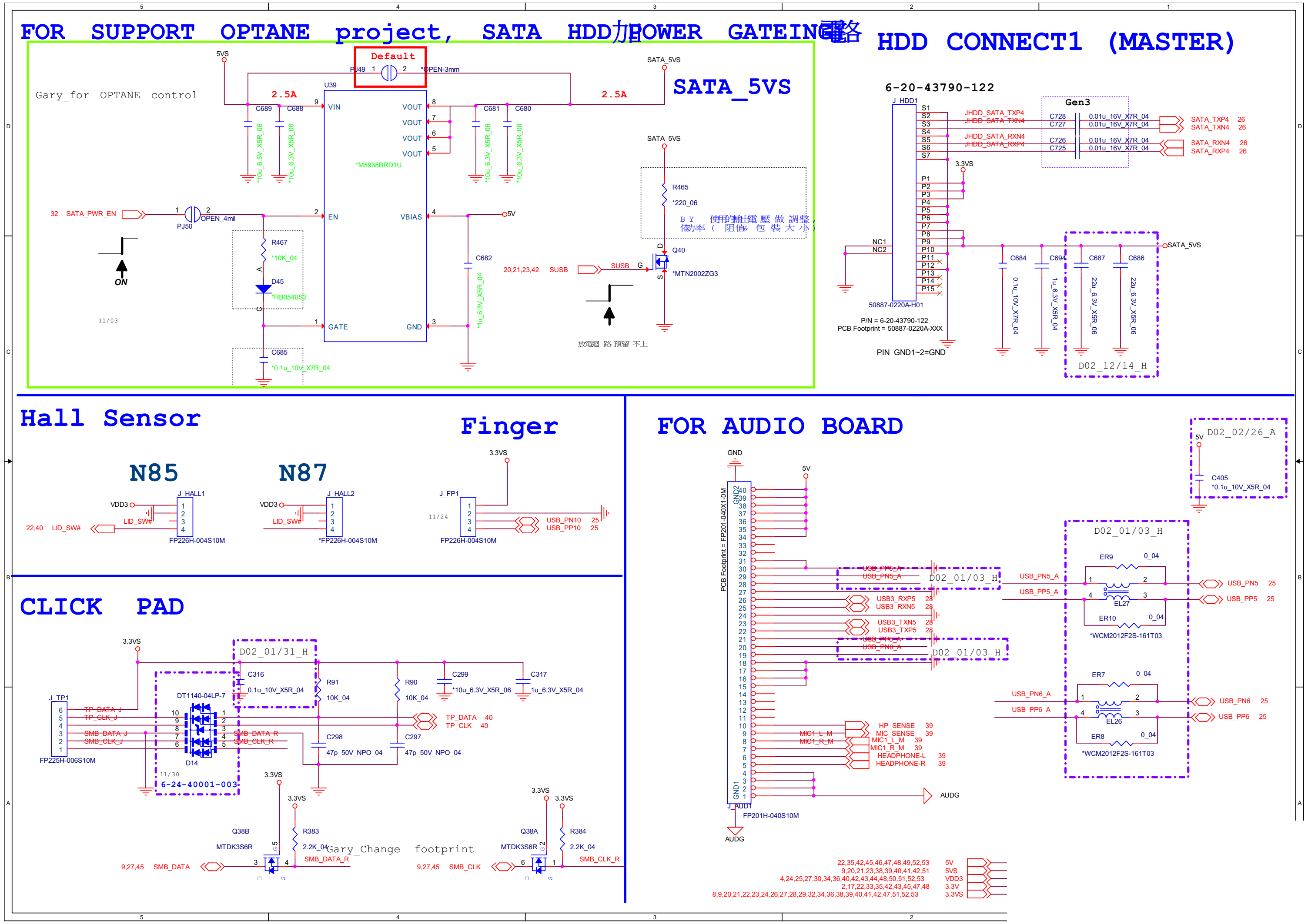
Card Reader / LAN RTL8411B


Crystal
meet realtek Freq tolerance 50ppm
LAN (RTL8411B)
6 IN 1 SOCKET - MMC / RSMMC
- SD / mini SD / SDHC / SDXC
Switching Regulator close to PIN48
TO SB PCH WAKE#.
TO EC8587 PIN123 LAN_WAKEUP#
6-06-75140-068
6-07-06064-1A0
SPEC:30PPM
QFN48
RTL8411B
6-03-08411-032
REG_OUT
(>20mil)
6-21-A4450-111
Close to chip
D02_01/31_H
D02_01/05_H
6-07-10611-2G0
Near Cardreader CONN
PULL HIGH: SWR Mode
PULL LOW: LDO Mode
60 mil
LDO Mode
VDD3 meet rising time
>1ms
GIGA LAN (RTL8411)
LAN POART
6-20-B4P30-008
40 mil
PIN3
PIN8
PIN32
PIN46
PIN27
PIN13
PIN12
PIN11
PIN48
PIN20

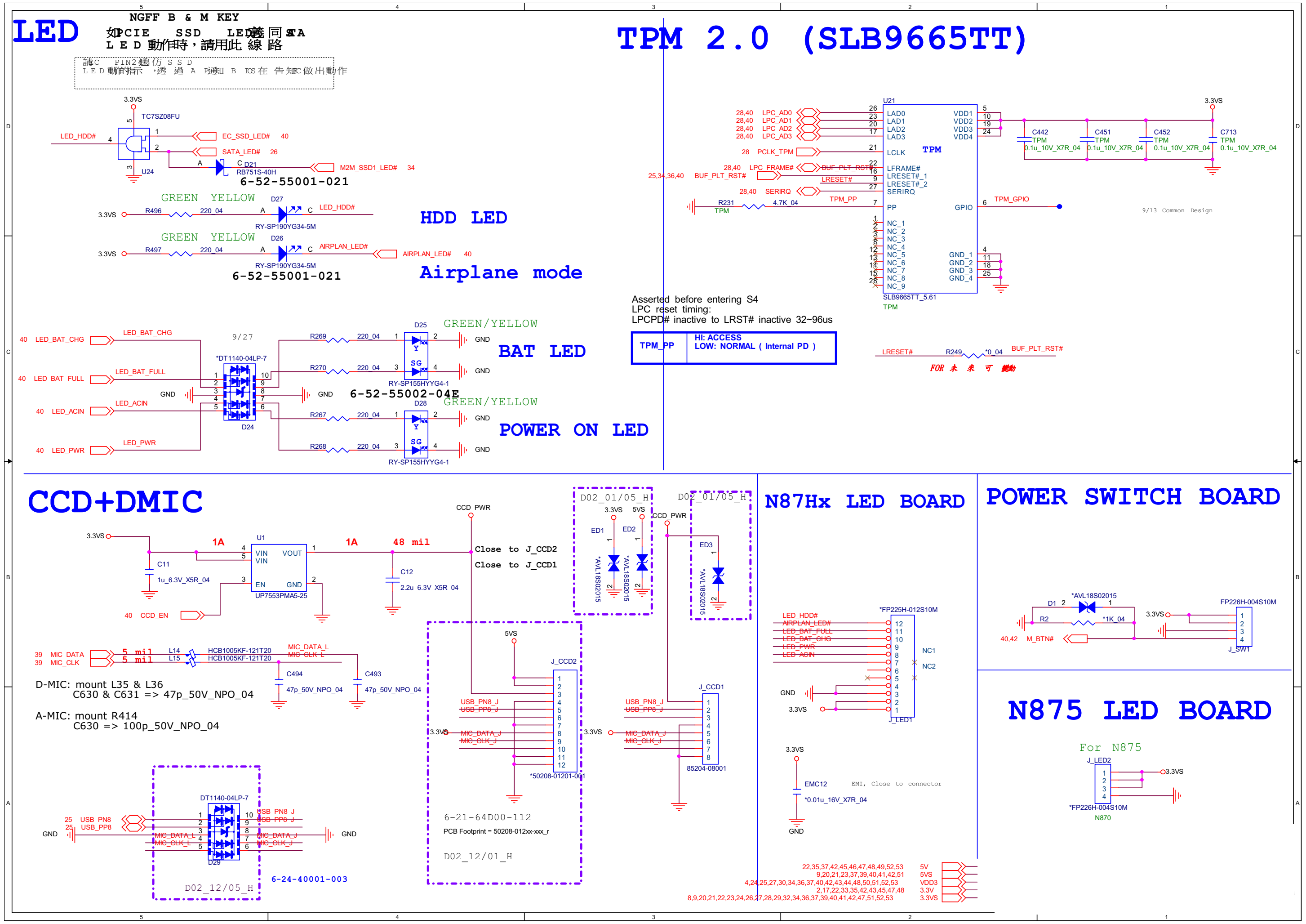
Sheet 36 of 60
Card Reader /
LAN RTL8411B

HDD, Click TP, Audio, Hall Con.

Sheet 37 of 60
HDD, Click TP,
Audio, Hall Con.


FOR SUPPORT OPTANE project, SATA HDD加POWER GATEING電路
Gary_for OPTANE control
Default
2.5A
2.5A
U39
*M5938BRD1U
VIN
EN
GATE
VOUT
VBIAS
GND
SATA_5VS
5VS
PJ49
*OPEN-3mm
PJ50
OPEN_4mil
32 SATA_PWR_EN
ON
11/03
R467
*10K_04
D45
*RB0540S2
C685
*0.1u_10V_X7R_04
C689
C688
C681
C680
C682
*1u_6.3V_X5R_04
5V
R465
*220_06
Q40
*MTN2002ZG3
20,21,23,42 SUSB
SUSB
HDD CONNECT1 (MASTER)
6-20-43790-122
J_HDD1
Gen3
JHDD_SATA_TXP4
JHDD_SATA_TXN4
JHDD_SATA_RXN4
JHDD_SATA_RXP4
C728
C727
C726
C725
0.01u_16V_X7R_04
SATA_TXP4 26
SATA_TXN4 26
SATA_RXN4 26
SATA_RXP4 26
3.3VS
NC1
NC2
50887-0220A-H01
P/N = 6-20-43790-122
PCB Footprint = 50887-0220A-XXX
PIN GND1~2=GND
C684
C694
C687
C686
0.1u_10V_X7R_04
1u_6.3V_X5R_04
22u_6.3V_X5R_06
D02_12/14_H
SATA_5VS
Hall Sensor
N85
N87
J_HALL1
J_HALL2
VDD3
LID_SW#
22,40 LID_SW#
FP226H-004S10M
*FP226H-004S10M
Finger
3.3VS
J_FP1
11/24
USB_PN10 25
USB_PP10 25
FP226H-004S10M
CLICK PAD
3.3VS
J_TP1
TP_DATA_J
TP_CLK_J
SMB_DATA_J
SMB_CLK_J
FP225H-006S10M
DT1140-04LP-7
D14
11/30
6-24-40001-003
D02_01/31_H
C316
0.1u_10V_X5R_04
R91
10K_04
R90
10K_04
C299
*10u_6.3V_X5R_06
C317
1u_6.3V_X5R_04
TP_DATA 40
TP_CLK 40
SMB_DATA_R
SMB_CLK_R
C298
47p_50V_NPO_04
C297
47p_50V_NPO_04
Q38B
Q38A
MTDK3S6R
R383
R384
2.2K_04
Gary_Change footprint
9,27,45 SMB_DATA
9,27,45 SMB_CLK
FOR AUDIO BOARD
D02_02/26_A
C405
*0.1u_10V_X5R_04
GND
5V
PCB Footprint = FP201-040X1-0M
USB_PN5_A
USB_PP5_A
USB3_RXP5 28
USB3_RXN5 28
USB3_TXN5 28
USB3_TXP5 28
USB_PN6_A
USB_PP6_A
D02_01/03_H
HP_SENSE 39
MIC_SENSE 39
MIC1_L_M 39
MIC1_R_M 39
HEADPHONE-L 39
HEADPHONE-R 39
AUDG
J_AUD1
FP201H-040S10M
ER9
ER10
ER7
ER8
0_04
EL27
EL26
*WCM2012F2S-161T03
USB_PN5 25
USB_PP5 25
USB_PN6 25
USB_PP6 25
22,35,42,45,46,47,48,49,52,53 5V
9,20,21,23,38,39,40,41,42,51 5VS
4,24,25,27,30,34,36,40,42,43,44,48,50,51,52,53 VDD3
2,17,22,33,35,42,43,45,47,48 3.3V
8,9,20,21,22,23,24,26,27,28,29,32,34,36,38,39,40,41,42,47,51,52,53 3.3VS

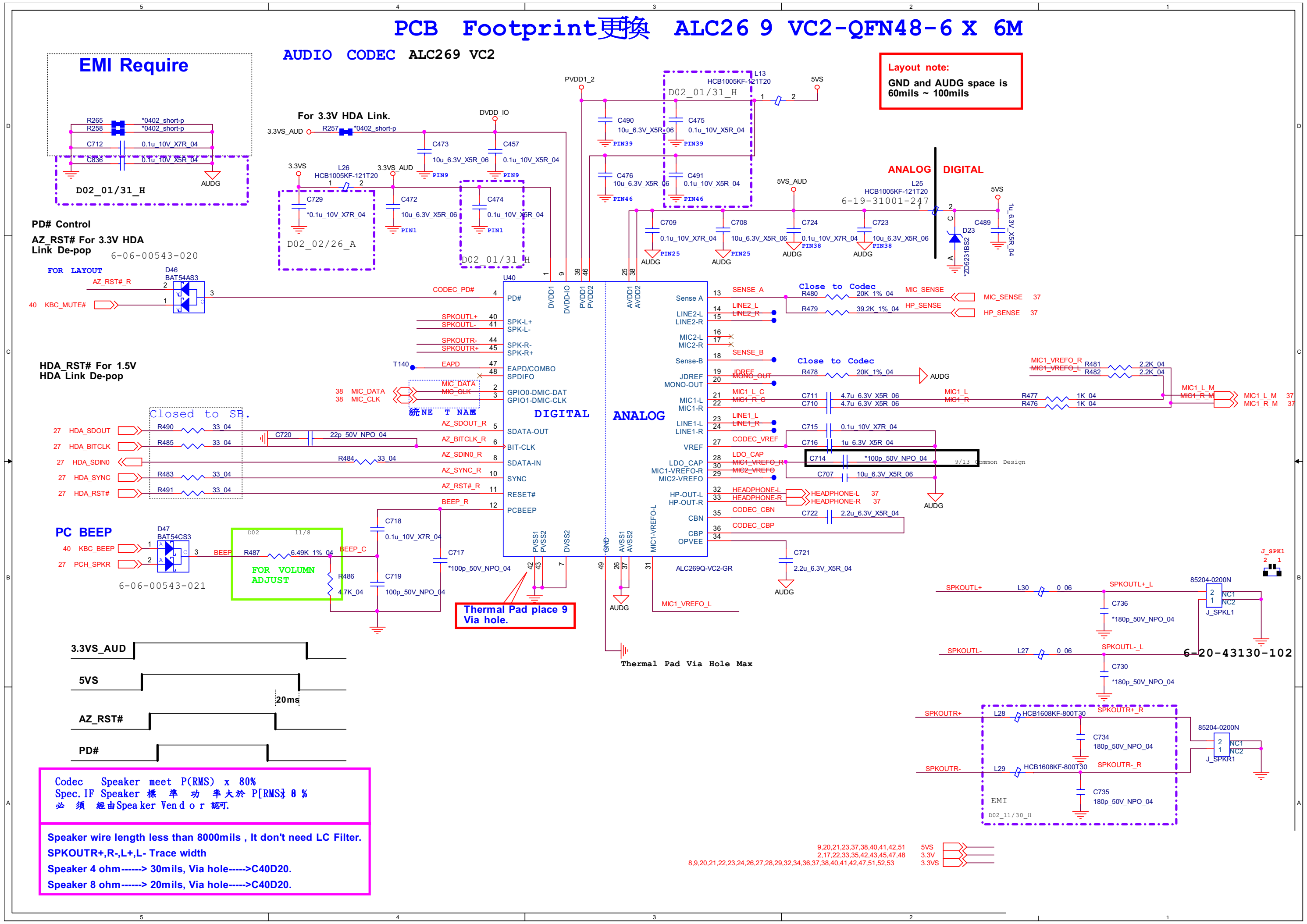
LED, CCD, TPM, Power SW Con.


LED
NGFF B & M KEY
TC7SZ08FU
LED_HDD#
EC_SSD_LED#
SATA_LED#
M2M_SSD1_LED#
RB751S-40H
6-52-55001-021
GREEN YELLOW
HDD LED
Airplane mode
AIRPLAN_LED#
RY-SP190YG34-5M
TPM 2.0 (SLB9665TT)
U21
LAD0
LAD1
LAD2
LAD3
LCLK
LFRAME#
LRESET#_1
LRESET#_2
SERIRQ
PP
GPIO
VDD1
VDD2
VDD3
VDD4
TPM_GPIO
SLB9665TT_5.61
C442
C451
C452
C713
0.1u_10V_X7R_04
9/13 Common Design
Asserted before entering S4
LPC reset timing:
LPCPD# inactive to LRST# inactive 32~96us
TPM_PP
HI: ACCESS
LOW: NORMAL (Internal PD)
LRESET#
R249
BUF_PLT_RST#
LED_BAT_CHG
LED_BAT_FULL
LED_ACIN
LED_PWR
*DT1140-04LP-7
GREEN/YELLOW
BAT LED
POWER ON LED
RY-SP155HYYG4-1
6-52-55002-04E
CCD+DMIC
1A
48 mil
VIN
VOUT
EN
GND
UP7553PMA5-25
CCD_PWR
CCD_EN
Close to J_CCD2
Close to J_CCD1
C11
1u_6.3V_X5R_04
C12
2.2u_6.3V_X5R_04
MIC_DATA
MIC_CLK
HCB1005KF-121T20
C494
C493
47p_50V_NPO_04
D-MIC: mount L35 & L36
C630 & C631 => 47p_50V_NPO_04
A-MIC: mount R414
C630 => 100p_50V_NPO_04
D02_01/05_H
ED1
ED2
ED3
*AVL18S02015
J_CCD2
J_CCD1
*50208-01201-001
85204-08001
6-21-64D00-112
PCB Footprint = 50208-012xx-xxx_r
D02_12/01_H
USB_PN8
USB_PP8
D29
6-24-40001-003
D02_12/05_H
N87Hx LED BOARD
*FP225H-012S10M
J_LED1
NC1
NC2
EMC12
*0.01u_16V_X7R_04
EMI, Close to connector
POWER SWITCH BOARD
D1
R2
*1K_04
M_BTN#
FP226H-004S10M
J_SW1
N875 LED BOARD
For N875
J_LED2
*FP226H-004S10M
N870
5V
5VS
VDD3
3.3V
3.3VS

Sheet 38 of 60
LED, CCD, TPM,
Power SW Con.

Audio Codec ALC269 VC2

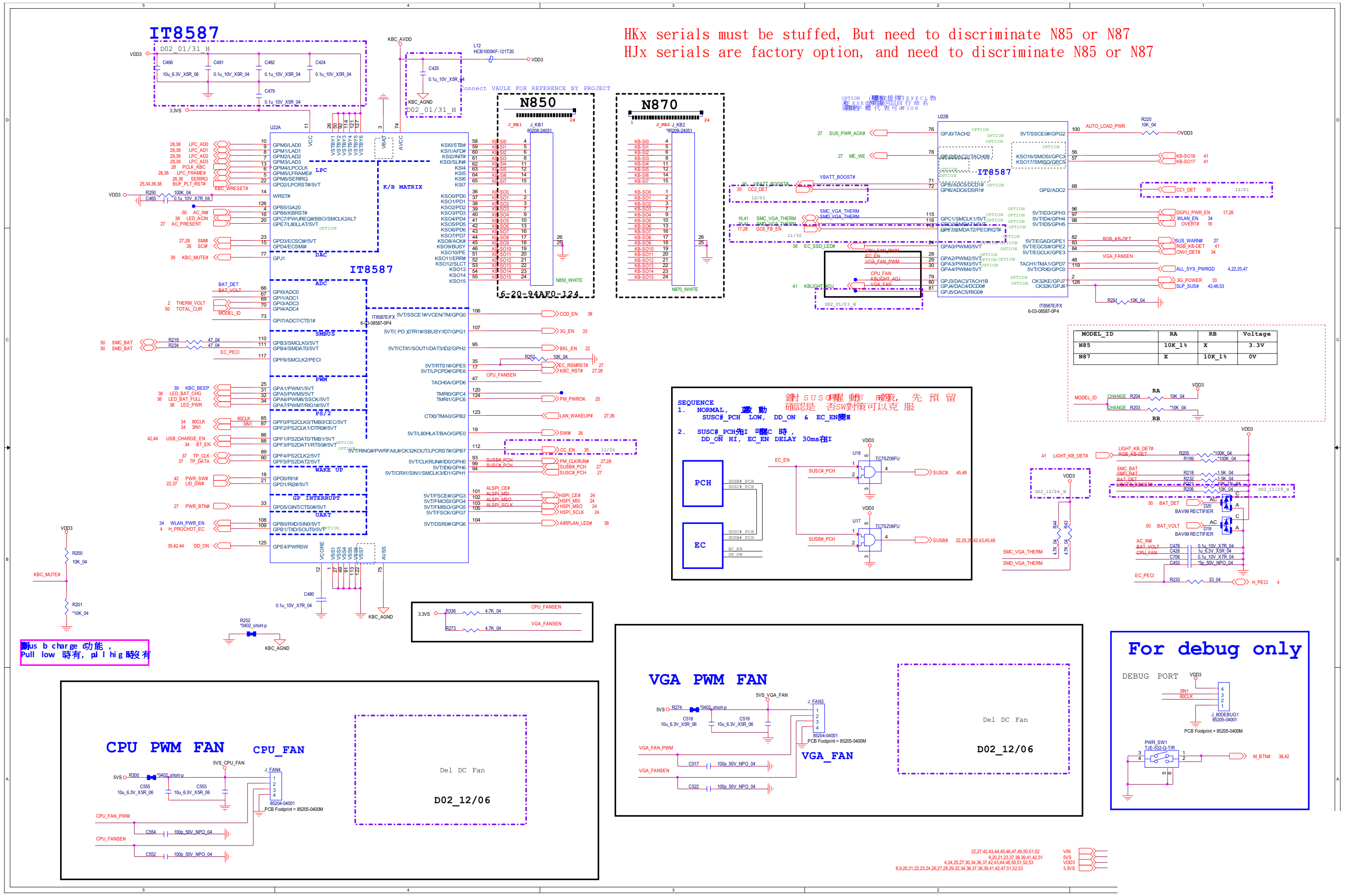
Sheet 39 of 60
Audio Codec
ALC269 VC2


PCB Footprint更換 ALC26 9 VC2-QFN48-6 X 6M
AUDIO CODEC ALC269 VC2
EMI Require
Layout note:
GND and AUDG space is 60mils ~ 100mils
For 3.3V HDA Link.
PD# Control
AZ_RST# For 3.3V HDA Link De-pop
HDA_RST# For 1.5V HDA Link De-pop
FOR LAYOUT
Closed to SB.
DIGITAL
ANALOG
ANALOG DIGITAL
Close to Codec
PC BEEP
FOR VOLUMN ADJUST
Thermal Pad place 9 Via hole.
Thermal Pad Via Hole Max
U40
ALC269Q-VC2-GR
D02_01/31_H
D02_02/26_A
6-06-00543-020
6-06-00543-021
6-19-31001-247
6-20-43130-102
SENSE_A
SENSE_B
MIC_SENSE
HP_SENSE
HEADPHONE-L
HEADPHONE-R
SPKOUTL+
SPKOUTL-
SPKOUTR+
SPKOUTR-
J_SPKL1
J_SPKR1
85204-0200N
KBC_MUTE#
KBC_BEEP
PCH_SPKR
HDA_SDOUT
HDA_BITCLK
HDA_SDIN0
HDA_SYNC
HDA_RST#
MIC_DATA
MIC_CLK
3.3VS_AUD
5VS
AZ_RST#
PD#
20ms
AUDG
5VS_AUD
PVDD1_2
DVDD_IO
CODEC_VREF
CODEC_CBN
CODEC_CBP
MIC1_VREFO_L
MIC1_VREFO_R
MIC1_L_M
MIC1_R_M
EAPD
BEEP_C
9,20,21,23,37,38,40,41,42,51 5VS
2,17,22,33,35,42,43,45,47,48 3.3V
8,9,20,21,22,23,24,26,27,28,29,32,34,36,37,38,40,41,42,47,51,52,53 3.3VS

Codec Speaker meet P(RMS) x 80%
Spec.IF Speaker 標 準 功 率大於 P[RMS]8 %
必 須 經由Spea ker Ven d o r 確可.

Speaker wire length less than 8000mils , It don't need LC Filter.
SPKOUTR+,R-,L+,L- Trace width
Speaker 4 ohm------> 30mils, Via hole----->C40D20.
Speaker 8 ohm------> 20mils, Via hole----->C40D20.

KBC-ITE IT8587

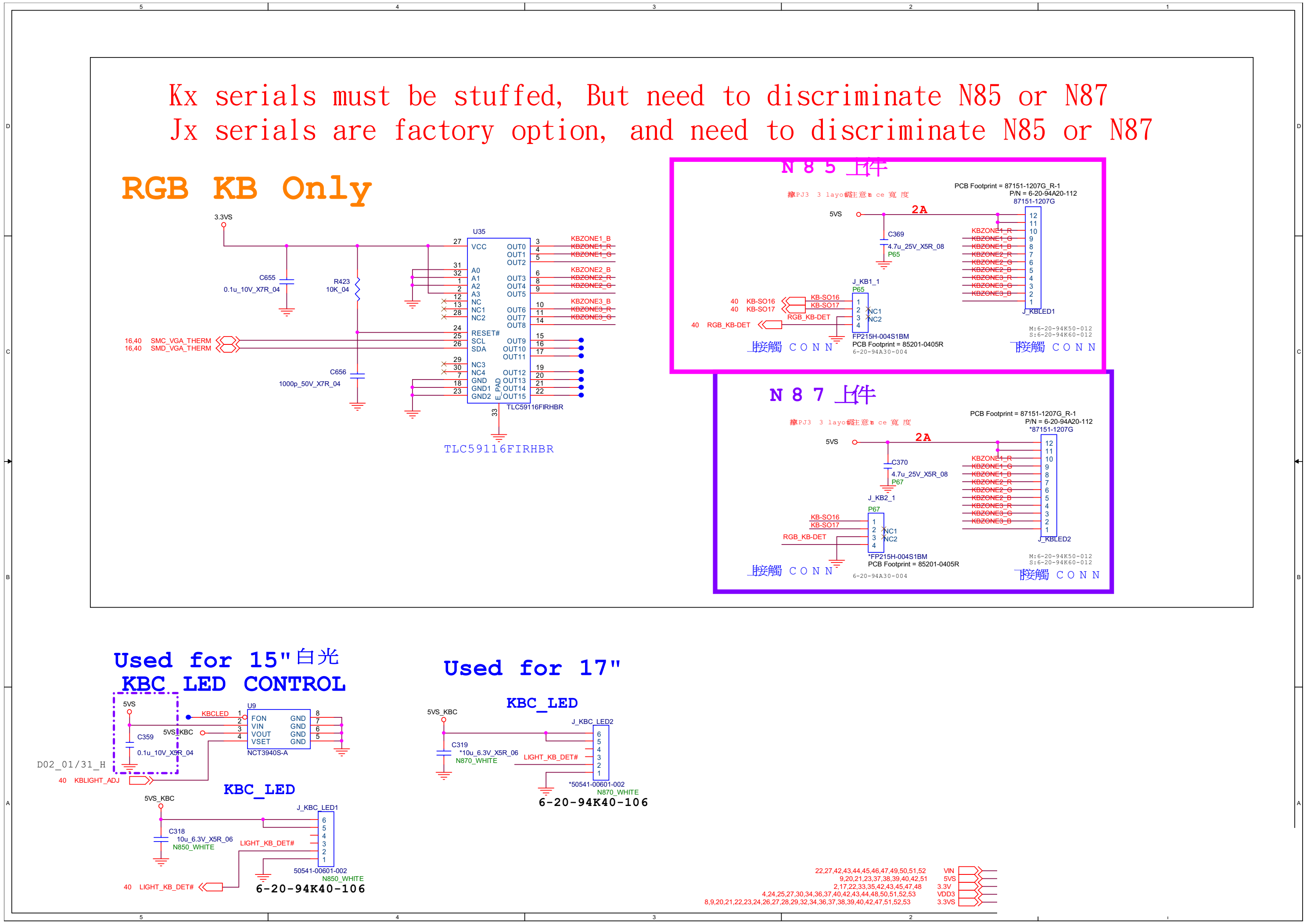

IT8587
D02_01/31_H
KBC_AVDD
HKx serials must be stuffed, But need to discriminate N85 or N87
HJx serials are factory option, and need to discriminate N85 or N87
N850
N870
6-20-94AF0-124
LPC
K/B MATRIX
IT8587
PS/2
PWM
WAKE UP
INTERRUPT
UART
DAC
ADC
SMBUS
MODEL_ID
RA
RB
Voltage
N85
10K_1%
X
3.3V
N87
X
10K_1%
0V
SEQUENCE
PCH
EC
CPU PWM FAN
CPU_FAN
Del DC Fan
D02_12/06
VGA PWM FAN
VGA_FAN
For debug only
DEBUG PORT
PCB Footprint = 85205-0400M

Sheet 40 of 60
KBC-ITE IT8587

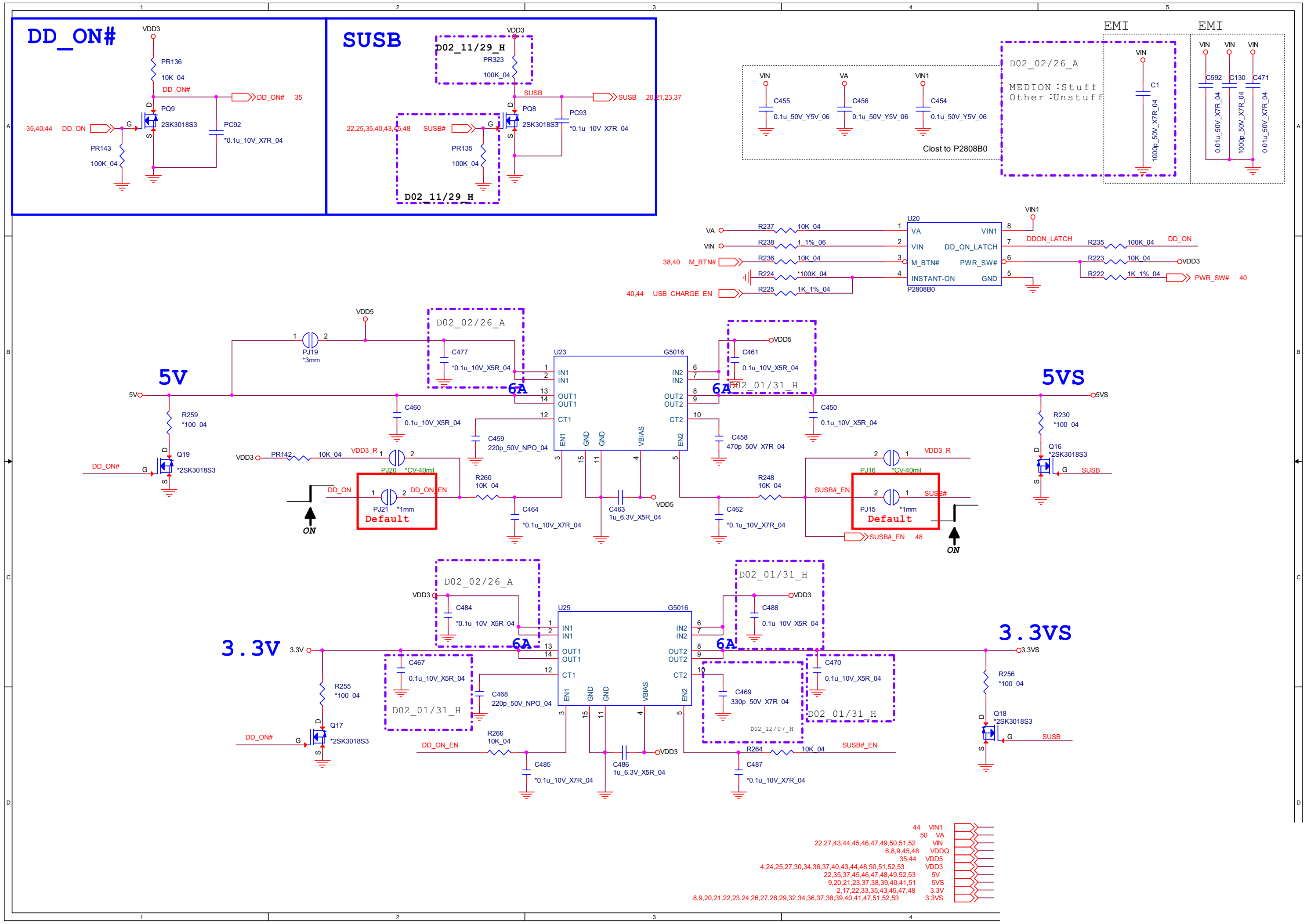
B.Schematic Diagrams

RGB KB Only

Sheet 41 of 60
RGB KB Only


Kx serials must be stuffed, But need to discriminate N85 or N87
Jx serials are factory option, and need to discriminate N85 or N87
RGB KB Only
3.3VS
C655
0.1u_10V_X7R_04
R423
10K_04
C656
1000p_50V_X7R_04
16,40 SMC_VGA_THERM
16,40 SMD_VGA_THERM
U35
VCC
A0
A1
A2
A3
NC
NC1
NC2
RESET#
SCL
SDA
NC3
NC4
GND
GND1
GND2
E_PAD
OUT0
OUT1
OUT2
OUT3
OUT4
OUT5
OUT6
OUT7
OUT8
OUT9
OUT10
OUT11
OUT12
OUT13
OUT14
OUT15
TLC59116FIRHBR
KBZONE1_B
KBZONE1_R
KBZONE1_G
KBZONE2_B
KBZONE2_R
KBZONE2_G
KBZONE3_B
KBZONE3_R
KBZONE3_G
TLC59116FIRHBR
N85 上件
PCB Footprint = 87151-1207G_R-1
P/N = 6-20-94A20-112
87151-1207G
2A
5VS
C369
4.7u_25V_X5R_08
P65
J_KB1_1
P65
40 KB-SO16
40 KB-SO17
40 RGB_KB-DET
KB-SO16
KB-SO17
RGB_KB-DET
NC1
NC2
FP215H-004S1BM
PCB Footprint = 85201-0405R
6-20-94A30-004
J_KBLED1
M:6-20-94K50-012
S:6-20-94K60-012
接觸 CONN
接觸 CONN
N87 上件
PCB Footprint = 87151-1207G_R-1
P/N = 6-20-94A20-112
*87151-1207G
2A
5VS
C370
4.7u_25V_X5R_08
P67
J_KB2_1
P67
KB-SO16
KB-SO17
RGB_KB-DET
NC1
NC2
*FP215H-004S1BM
PCB Footprint = 85201-0405R
6-20-94A30-004
J_KBLED2
M:6-20-94K50-012
S:6-20-94K60-012
接觸 CONN
接觸 CONN
Used for 15"白光
KBC_LED CONTROL
5VS
C359
0.1u_10V_X5R_04
D02_01/31_H
40 KBLIGHT_ADJ
KBCLED
5VS_KBC
U9
FON
VIN
VOUT
VSET
GND
NCT3940S-A
KBC_LED
5VS_KBC
C318
10u_6.3V_X5R_06
N850_WHITE
LIGHT_KB_DET#
40 LIGHT_KB_DET#
J_KBC_LED1
50541-00601-002
N850_WHITE
6-20-94K40-106
Used for 17"
KBC_LED
5VS_KBC
C319
*10u_6.3V_X5R_06
N870_WHITE
LIGHT_KB_DET#
J_KBC_LED2
*50541-00601-002
N870_WHITE
6-20-94K40-106
22,27,42,43,44,45,46,47,49,50,51,52 VIN
9,20,21,23,37,38,39,40,42,51 5VS
2,17,22,33,35,42,43,45,47,48 3.3V
4,24,25,27,30,34,36,37,40,42,43,44,48,50,51,52,53 VDD3
8,9,20,21,22,23,24,26,27,28,29,32,34,36,37,38,39,40,42,47,51,52,53 3.3VS

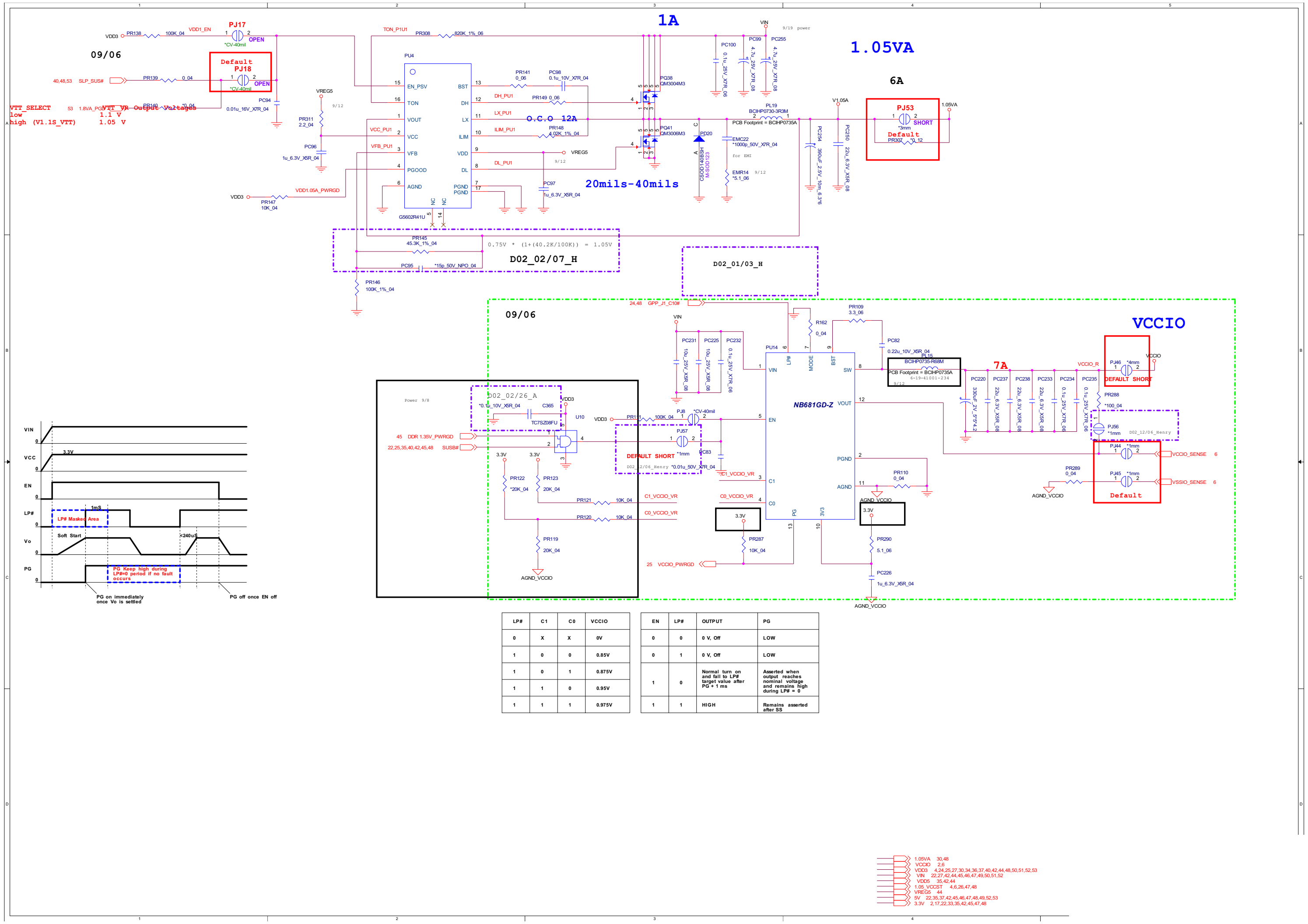
5V, 5VS, 3.3V, 3.3VS, 3.3VA


DD_ON#
SUSB
VDD3
PR136
10K_04
DD_ON#
PQ9
2SK3018S3
PC92
*0.1u_10V_X7R_04
35,40,44
DD_ON
PR143
100K_04
D02_11/29_H
PR323
100K_04
SUSB
PQ8
PC93
*0.1u_10V_X7R_04
20,21,23,37
22,25,35,40,43,45,48
SUSB#
PR135
100K_04
EMI
VIN
VA
VIN1
C455
0.1u_50V_Y5V_06
C456
0.1u_50V_Y5V_06
C454
0.1u_50V_Y5V_06
Clost to P2808B0
D02_02/26_A
MEDION :Stuff
Other :Unstuff
C1
1000p_50V_X7R_04
C592
C130
C471
0.01u_50V_X7R_04
1000p_50V_X7R_04
U20
R237 10K_04
R238 1_1%_06
R236 10K_04
R224 *100K_04
R225 1K_1%_04
38,40 M_BTN#
40,44 USB_CHARGE_EN
VA
VIN
DD_ON_LATCH
M_BTN#
PWR_SW#
INSTANT-ON
GND
P2808B0
DDON_LATCH
R235 100K_04
DD_ON
R223 10K_04
R222 1K_1%_04
PWR_SW# 40
5V
5VS
VDD5
PJ19
*3mm
C477
*0.1u_10V_X5R_04
U23
G5016
IN1
IN2
OUT1
OUT2
CT1
CT2
EN1
EN2
GND
VBIAS
6A
C461
0.1u_10V_X5R_04
D02_01/31_H
C460
0.1u_10V_X5R_04
C459
220p_50V_NPO_04
C458
470p_50V_X7R_04
C450
0.1u_10V_X5R_04
R259
*100_04
Q19
*2SK3018S3
R230
*100_04
Q16
*2SK3018S3
VDD3_R
PR142 10K_04
PJ20 *CV-40mil
PJ16 *CV-40mil
DD_ON_EN
PJ21 *1mm
Default
ON
R260 10K_04
C464
*0.1u_10V_X7R_04
C463
1u_6.3V_X5R_04
R248 10K_04
SUSB#_EN
C462
*0.1u_10V_X7R_04
PJ15 *1mm
SUSB#_EN 48
3.3V
3.3VS
U25
C484
*0.1u_10V_X5R_04
C488
0.1u_10V_X5R_04
C467
0.1u_10V_X5R_04
C468
220p_50V_NPO_04
C469
330p_50V_X7R_04
D02_12/07_H
C470
0.1u_10V_X5R_04
R255
*100_04
Q17
*2SK3018S3
R256
*100_04
Q18
*2SK3018S3
R266 10K_04
C485
*0.1u_10V_X7R_04
C486
1u_6.3V_X5R_04
R264 10K_04
C487
*0.1u_10V_X7R_04
44 VIN1
50 VA
22,27,43,44,45,46,47,49,50,51,52 VIN
6,8,9,45,48 VDDQ
35,44 VDD5
4,24,25,27,30,34,36,37,40,43,44,48,50,51,52,53 VDD3
22,35,37,45,46,47,48,49,52,53 5V
9,20,21,23,37,38,39,40,41,51 5VS
2,17,22,33,35,43,45,47,48 3.3V
8,9,20,21,22,23,24,26,27,28,29,32,34,36,37,38,39,40,41,47,51,52,53 3.3VS

Sheet 42 of 60
5V, 5VS, 3.3V,
3.3VS, 3.3VA

VDD1.0V, VCCIO

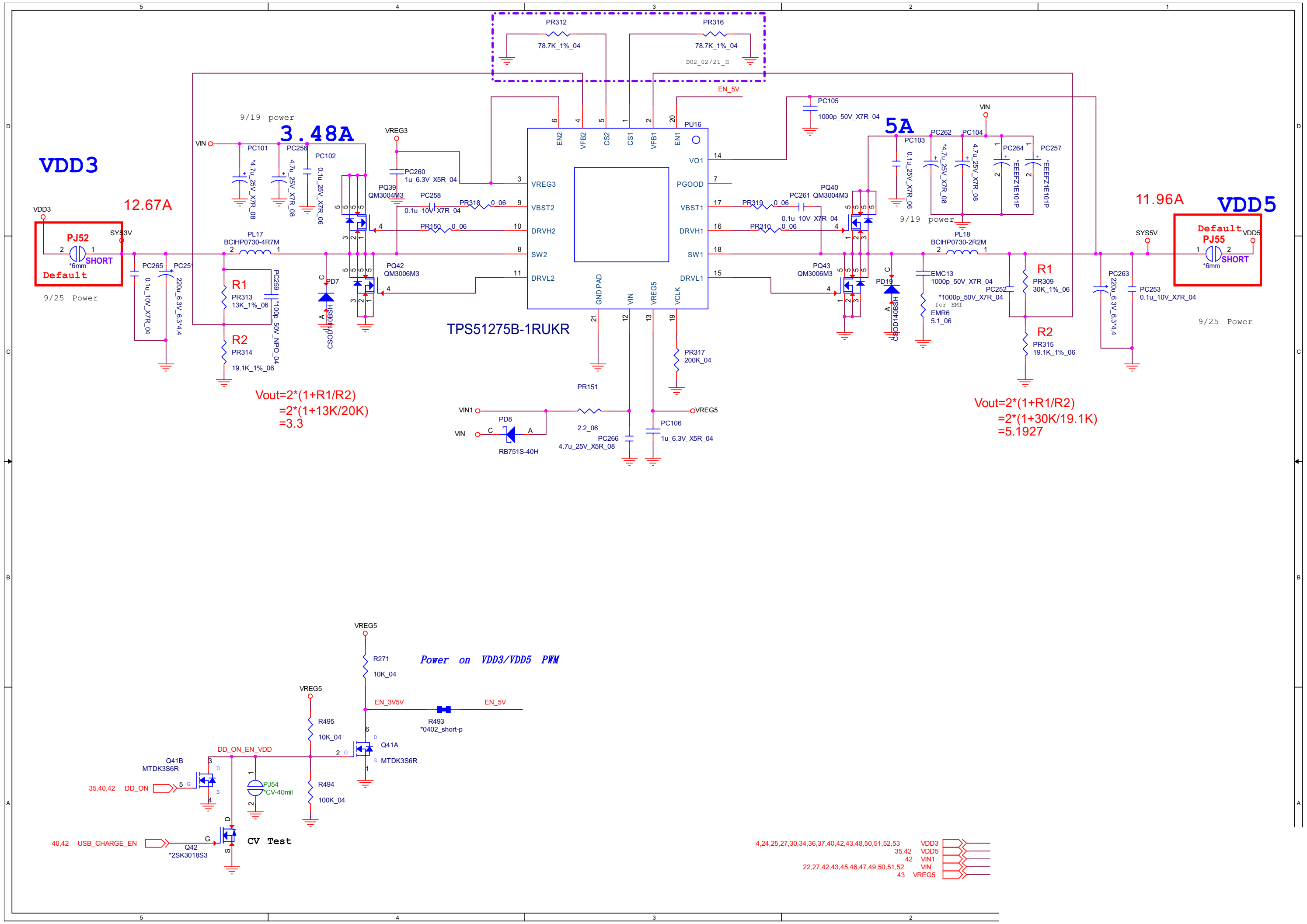
Sheet 43 of 60
VDD1.0V, VCCIO


1A
1.05VA
6A
09/06
PJ17
OPEN
Default
PJ18
VDD3
PR138
100K_04
VDD1_EN
SLP_SUS#
PR139
0_04
VTT_SELECT
low
high (V1.1S_VTT)
VTT_VR Output Voltage
1.1 V
1.05 V
VREG5
PR311
2.2_04
PC94
0.01u_16V_X7R_04
PC96
1u_6.3V_X6R_04
PR147
10K_04
VDD1.05A_PWRGD
TON_PU1
PR308
820K_1%_06
PU4
EN_PSV
TON
VOUT
VCC
VFB
PGOOD
AGND
BST
DH
LX
ILIM
VDD
DL
PGND
G5602R41U
VCC_PU1
VFB_PU1
DH_PU1
LX_PU1
ILIM_PU1
DL_PU1
PR141
0_06
PC98
0.1u_10V_X7R_04
PR149 0_06
PR148
4.02K_1%_04
PC97
1u_6.3V_X6R_04
O.C.P 12A
PQ38
QM3004M3
PQ41
QM3006M3
PD20
PL19
BCIHP0730-3R3M
PCB Footprint = BCIHP0735A
EMC22
*1000p_50V_X7R_04
EMR14
*5.1_06
For EMI
VIN
PC100
PC99
PC255
V1.05A
PC254
PC250
PJ53
SHORT
*3mm
Default
PR302
20mils-40mils
PR145
45.3K_1%_04
PC95
*15p_50V_NPO_04
PR146
100K_1%_04
0.75V * (1+(40.2K/100K)) = 1.05V
D02_02/07_H
D02_01/03_H
VIN
VCC
EN
LP#
Vo
PG
3.3V
1mS
LP# Masked Area
Soft Start
<240uS
PG Keep high during LP#=0 period if no fault occurs
PG on immediately once Vo is settled
PG off once EN off
09/06
D02_02/26_A
C365
TC7SZ08FU
U10
VDD3
DDR 1.35V_PWRGD
SUSB#
3.3V
PR122
*20K_04
PR123
20K_04
PR119
20K_04
AGND_VCCIO
PR121
10K_04
PR120
10K_04
C1_VCCIO_VR
C0_VCCIO_VR
PJ8
*CV-40mil
PJ57
DEFAULT SHORT
PC83
GPP_J1_C108
PC231
PC225
PC232
PU14
NB681GD-Z
VIN
MODE
BST
SW
EN
VOUT
PGND
AGND
C1
C0
PG
3V3
R162
0_04
PR109
3.3_06
PC82
0.22u_10V_X6R_04
PL15
BCIHP0735-R68M
PCB Footprint = BCIHP0735A
7A
PC220
PC237
PC238
PC233
PC234
PC235
VCCIO_R
PJ46
*4mm
DEFAULT SHORT
VCCIO
PR288
*100_04
PJ56
PJ44
PJ45
Default
VCCIO_SENSE
VSSIO_SENSE
PR289
0_04
PR110
0_04
PR287
10K_04
PR290
5.1_06
PC226
1u_6.3V_X6R_04
VCCIO_PWRGD
1.05VA 30,48
VCCIO 2,6
VDD3 4,24,25,27,30,34,36,37,40,42,44,48,50,51,52,53
VIN 22,27,42,44,45,46,47,49,50,51,52
VDD5 35,42,44
1.05_VCCST 4,6,26,47,48
VREG5 44
5V 22,35,37,42,45,46,47,48,49,52,53
3.3V 2,17,22,33,35,42,45,47,48

LP#	C1	C0	VCCIO
0	X	X	0V
1	0	0	0.85V
1	0	1	0.875V
1	1	0	0.95V
1	1	1	0.975V

EN	LP#	OUTPUT	PG
0	0	0 V, Off	LOW
0	1	0 V, Off	LOW
1	0	Normal turn on and fall to LP# target value after PG + 1 ms	Asserted when output reaches nominal voltage and remains high during LP# = 0
1	1	HIGH	Remains asserted after SS

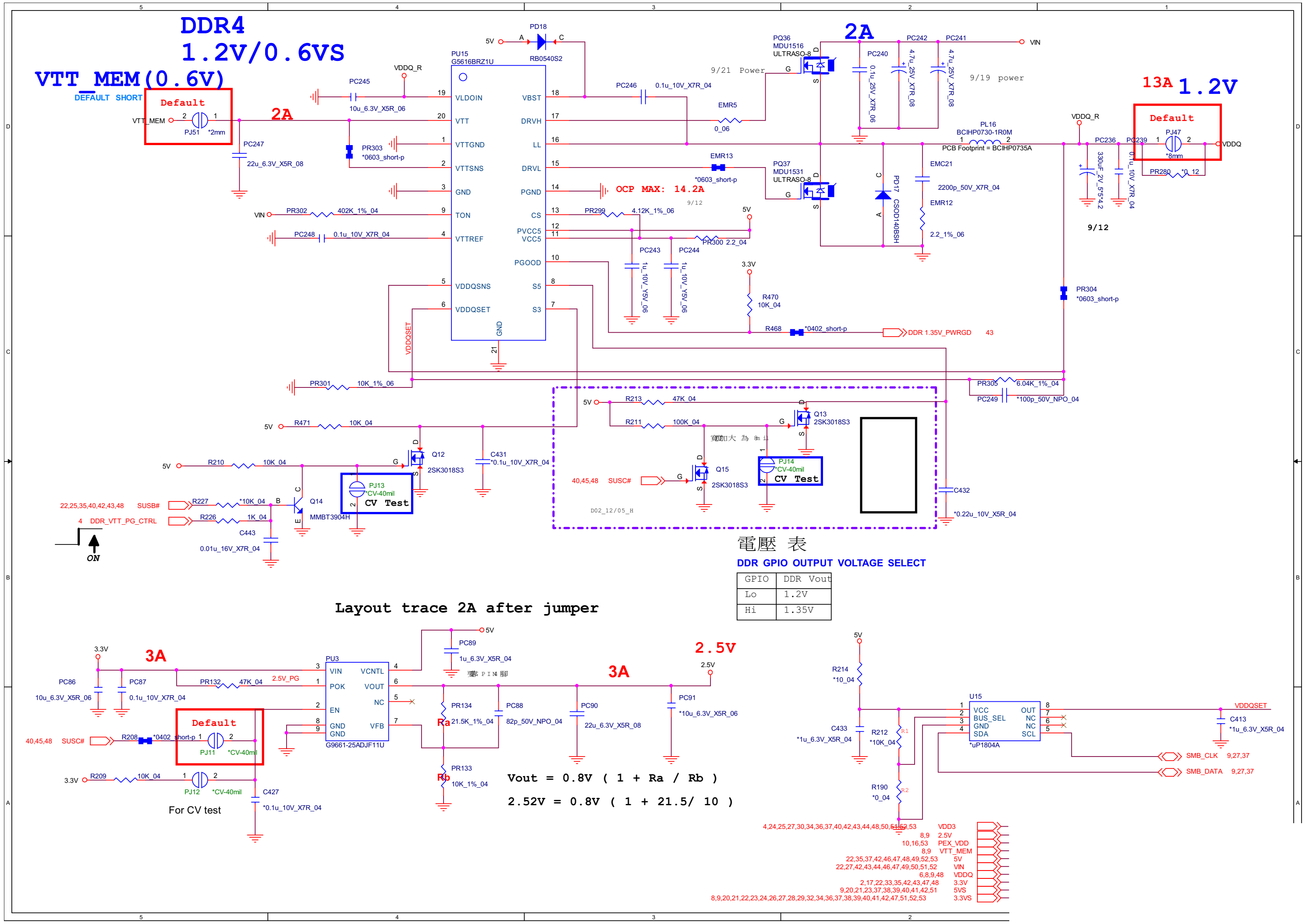
VDD3, VDD5


VDD3
12.67A
3.48A
5A
11.96A
VDD5
PJ52
SHORT
Default
PJ55
9/19 power
9/25 Power
VIN
VREG3
PC101
PC256
PC102
PC260
1u_6.3V_X5R_04
PQ39
QM3004M3
PC258
0.1u_10V_X7R_04
PR318
0_06
PR150
0_06
PL17
BCIHP0730-4R7M
SYS3V
PC265
0.1u_10V_X7R_04
PC251
220u_6.3V
PD7
PQ42
QM3006M3
PC259
1000p_50V_NPO_04
R1
PR313
13K_1%_06
R2
PR314
19.1K_1%_06
PR312
78.7K_1%_04
PR316
78.7K_1%_04
D02_02/21_H
EN_5V
PC105
1000p_50V_X7R_04
PU16
EN2
VFB2
CS2
CS1
VFB1
EN1
VREG3
VBST2
DRVH2
SW2
DRVL2
VO1
PGOOD
VBST1
DRVH1
SW1
DRVL1
GND PAD
VIN
VREG5
VCLK
TPS51275B-1RUKR
PR317
200K_04
PR151
2.2_06
VIN1
PD8
RB751S-40H
PC266
4.7u_25V_X5R_08
PC106
1u_6.3V_X5R_04
VREG5
PC103
PC262
PC104
PC264
PC257
*EEEFZ1E101P
PQ40
PC261
QM3004M3
PR319
0_06
PR310
0_06
PQ43
QM3006M3
PD19
PL18
BCIHP0730-2R2M
EMC13
1000p_50V_X7R_04
PC252
*1000p_50V_X7R_04
for EMI
EMR6
5.1_06
R1
PR309
30K_1%_06
R2
PR315
19.1K_1%_06
SYS5V
PC263
220u_6.3V
PC253
0.1u_10V_X7R_04
Vout=2*(1+R1/R2)
=2*(1+13K/20K)
=3.3
Vout=2*(1+R1/R2)
=2*(1+30K/19.1K)
=5.1927
Power on VDD3/VDD5 PWM
R271
10K_04
EN_3V5V
EN_5V
R493
*0402_short-p
R495
10K_04
Q41A
MTDK3S6R
DD_ON_EN_VDD
Q41B
MTDK3S6R
35,40,42 DD_ON
PJ54
*CV-40mil
R494
100K_04
40,42 USB_CHARGE_EN
Q42
*2SK3018S3
CV Test
4,24,25,27,30,34,36,37,40,42,43,48,50,51,52,53 VDD3
35,42 VDD5
42 VIN1
22,27,42,43,45,46,47,49,50,51,52 VIN
43 VREG5

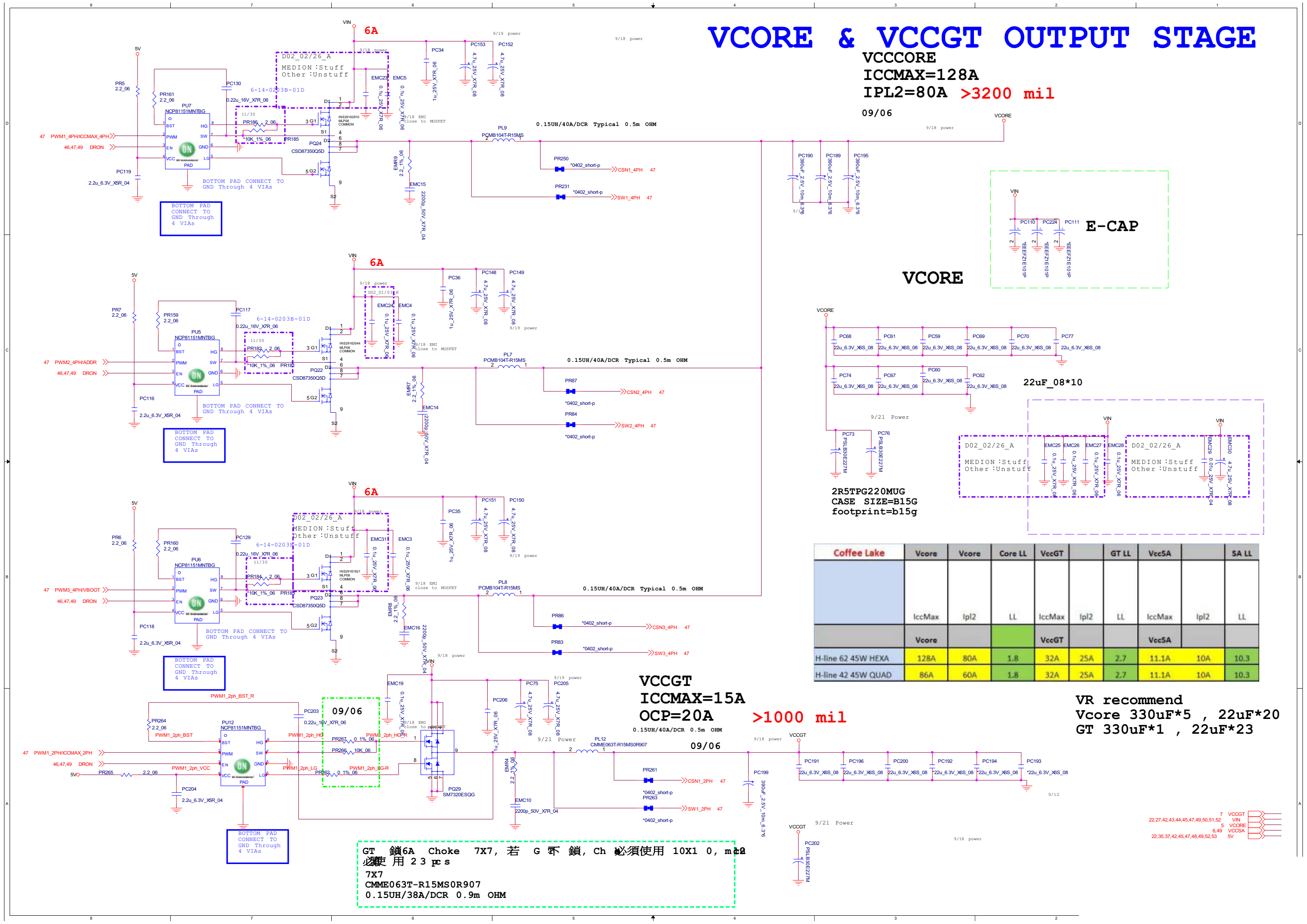
Sheet 44 of 60
VDD3, VDD5

DDR 1.2V / 0.6VS, 2.5V

Sheet 45 of 60
DDR 1.2V / 0.6VS,
2.5V


DDR4
1.2V/0.6VS
VTT_MEM(0.6V)
DEFAULT SHORT
Default
PJ51 *2mm
2A
PU15
G5616BRZ1U
PD18
RB0540S2
VLDOIN
VTT
VTTGND
VTTSNS
GND
TON
VTTREF
VDDQSNS
VDDQSET
VBST
DRVH
LL
DRVL
PGND
CS
PVCC5
VCC5
PGOOD
S5
S3
OCP MAX: 14.2A
PQ36
MDU1516
PQ37
MDU1531
2A
VIN
13A 1.2V
Default
PJ47 *8mm
VDDQ
PL16
BCIHP0730-1R0M
PCB Footprint = BCIHP0735A
PD17 CSOD140BSH
DDR 1.35V_PWRGD
SUSB#
DDR_VTT_PG_CTRL
ON
PJ13 *CV-40mil
CV Test
PJ14 *CV-40mil
CV Test
Q12 2SK3018S3
Q13 2SK3018S3
Q14 MMBT3904H
Q15 2SK3018S3
SUSC#
電壓 表
DDR GPIO OUTPUT VOLTAGE SELECT
GPIO | DDR Vout
Lo | 1.2V
Hi | 1.35V
Layout trace 2A after jumper
3A
PU3
G9661-25ADJF11U
VIN
POK
EN
GND
VCNTL
VOUT
NC
VFB
Default
PJ11 *CV-40mil
PJ12 *CV-40mil
For CV test
2.5V
3A
Ra
Rb
Vout = 0.8V (1 + Ra / Rb)
2.52V = 0.8V (1 + 21.5/ 10)
U15
uP1804A
VCC
BUS_SEL
GND
SDA
OUT
NC
SCL
VDDQSET
SMB_CLK
SMB_DATA
VDD3
2.5V
PEX_VDD
VTT_MEM
5V
VIN
VDDQ
3.3V
5VS
3.3VS

VCore, VCCGT Output Stage

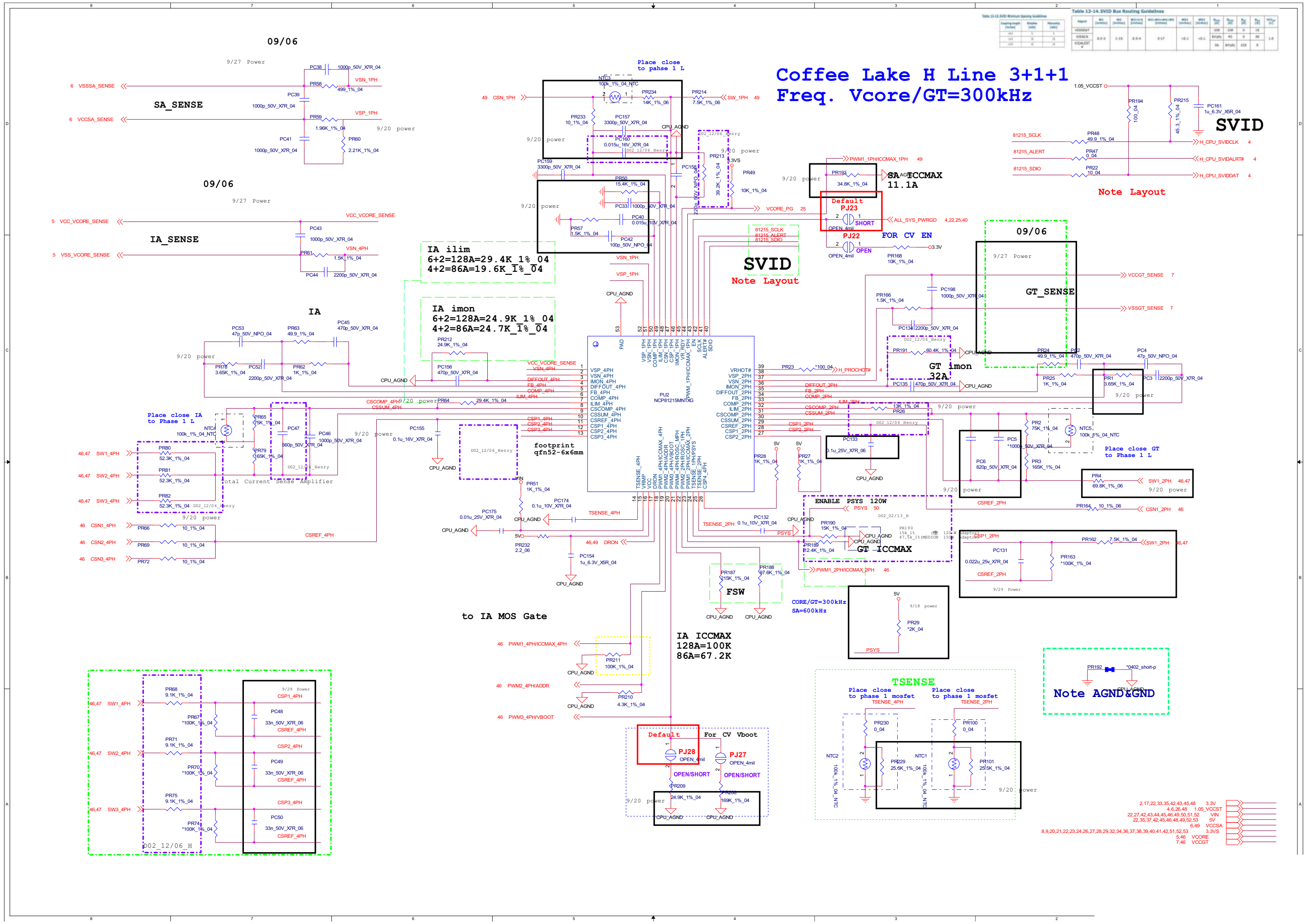

VCORE & VCCGT OUTPUT STAGE
VCCCORE
ICCMAX=128A
IPL2=80A
>3200 mil
09/06
6A
VIN
5V
PU7
NCP81151MNTBG
PU5
PU6
PU12
PQ24
CSD87350Q5D
PQ22
PQ23
PQ29
SM7320ESQG
PL9
PCMB104T-R15MS
PL7
PL8
PL12
CMME063T-R15MS0R907
0.15UH/40A/DCR Typical 0.5m OHM
PWM1_4PH/ICCMAX_4PH
PWM2_4PH/ADDR
PWM3_4PH/VBOOT
PWM1_2PH/ICCMAX_2PH
DRON
CSN1_4PH
SW1_4PH
CSN2_4PH
SW2_4PH
CSN3_4PH
SW3_4PH
CSN1_2PH
SW1_2PH
*0402_short-p
BOTTOM PAD CONNECT TO GND Through 4 VIAs
D02_02/26_A
MEDION :Stuff
Other :Unstuff
6-14-0203B-01D
9/18 EMI close to MOSFET
E-CAP
VCORE
22uF_08*10
9/21 Power
2R5TPG220MUG
CASE SIZE=B15G
footprint=b15g
VCCGT
ICCMAX=15A
OCP=20A
>1000 mil
0.15UH/40A/DCR 0.5m OHM
VR recommend
Vcore 330uF*5 , 22uF*20
GT 330uF*1 , 22uF*23
GT 鎖6A Choke 7X7, 若 G 不 鎖, Ch 必須使用 10X1 0, mlc2 必須使用 2 3 pcs
7X7
CMME063T-R15MS0R907
0.15UH/38A/DCR 0.9m OHM

Coffee Lake	Vcore	Vcore	Core LL	VccGT		GT LL	VccSA		SA LL
	IccMax	Ipl2	LL	IccMax	Ipl2	LL	IccMax	Ipl2	LL
	Vcore			VccGT			VccSA		
H-line 62 45W HEXA	128A	80A	1.8	32A	25A	2.7	11.1A	10A	10.3
H-line 42 45W QUAD	86A	60A	1.8	32A	25A	2.7	11.1A	10A	10.3

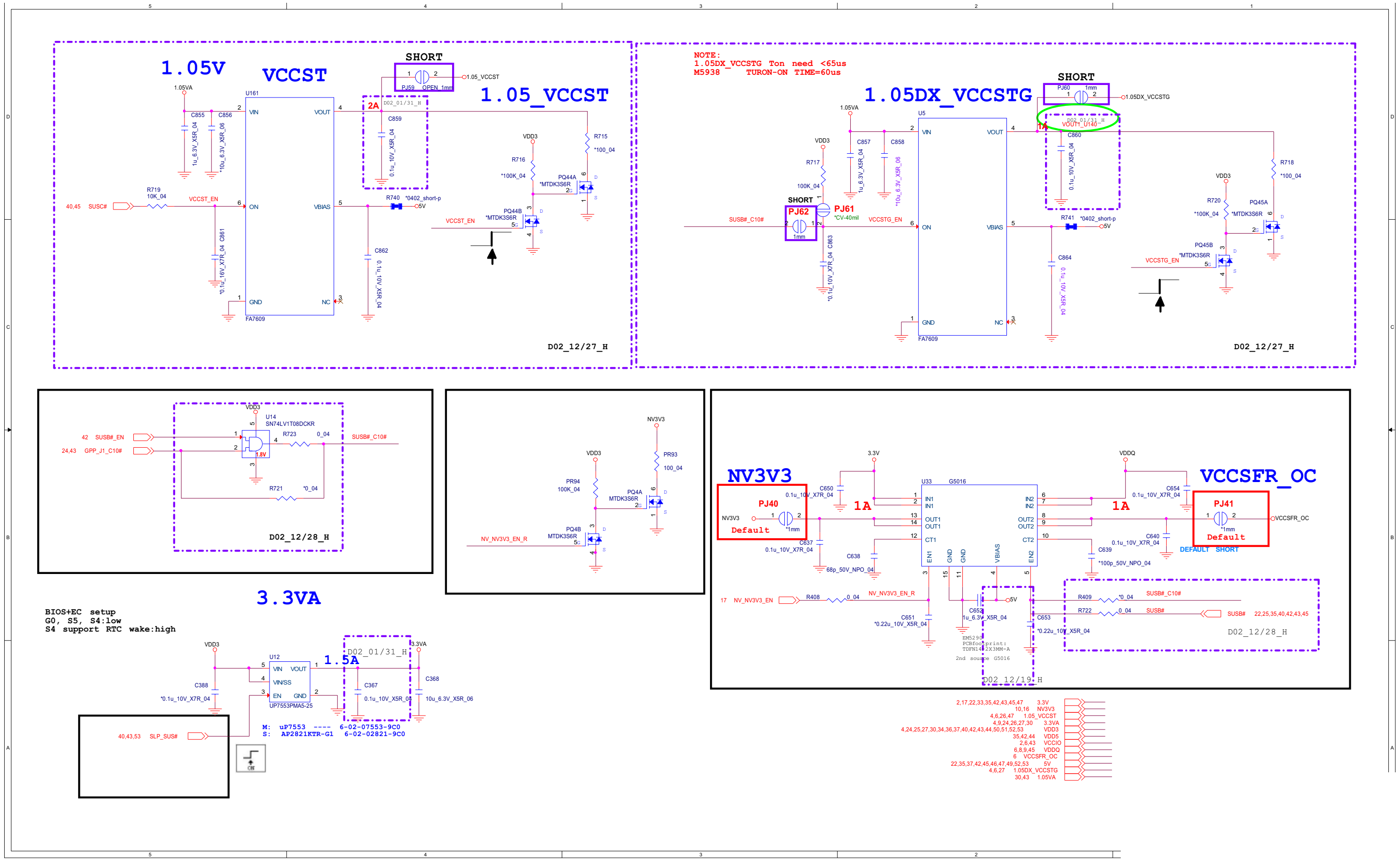
Sheet 46 of 60
VCore, VCCGT
Output Stage

VCC_Core & VCCGT

Sheet 47 of 60
VCC_Core &
VCCGT


09/06
SA_SENSE
09/06
IA_SENSE
IA
IA ilim
6+2=128A=29.4K_1%_04
4+2=86A=19.6K_1%_04
IA imon
6+2=128A=24.9K_1%_04
4+2=86A=24.7K_1%_04
Place close IA to Phase 1 L
Total Current Sense Amplifier
footprint qfn52-6x6mm
to IA MOS Gate
IA ICCMAX
128A=100K
86A=67.2K
Coffee Lake H Line 3+1+1
Freq. Vcore/GT=300kHz
SVID
Note Layout
SA ICCMAX
11.1A
Default
PJ23
SHORT
PJ22
OPEN
FOR CV EN
SVID
Note Layout
09/06
GT_SENSE
GT imon
32A
Place close GT to Phase 1 L
ENABLE PSYS 120W
GT ICCMAX
FSW
CORE/GT=300kHz
SA=600kHz
Default
PJ28
OPEN/SHORT
For CV Vboot
PJ27
OPEN/SHORT
TSENSE
Place close to phase 1 mosfet
Note AGND&GND
NCP81215MNTXG
PU2

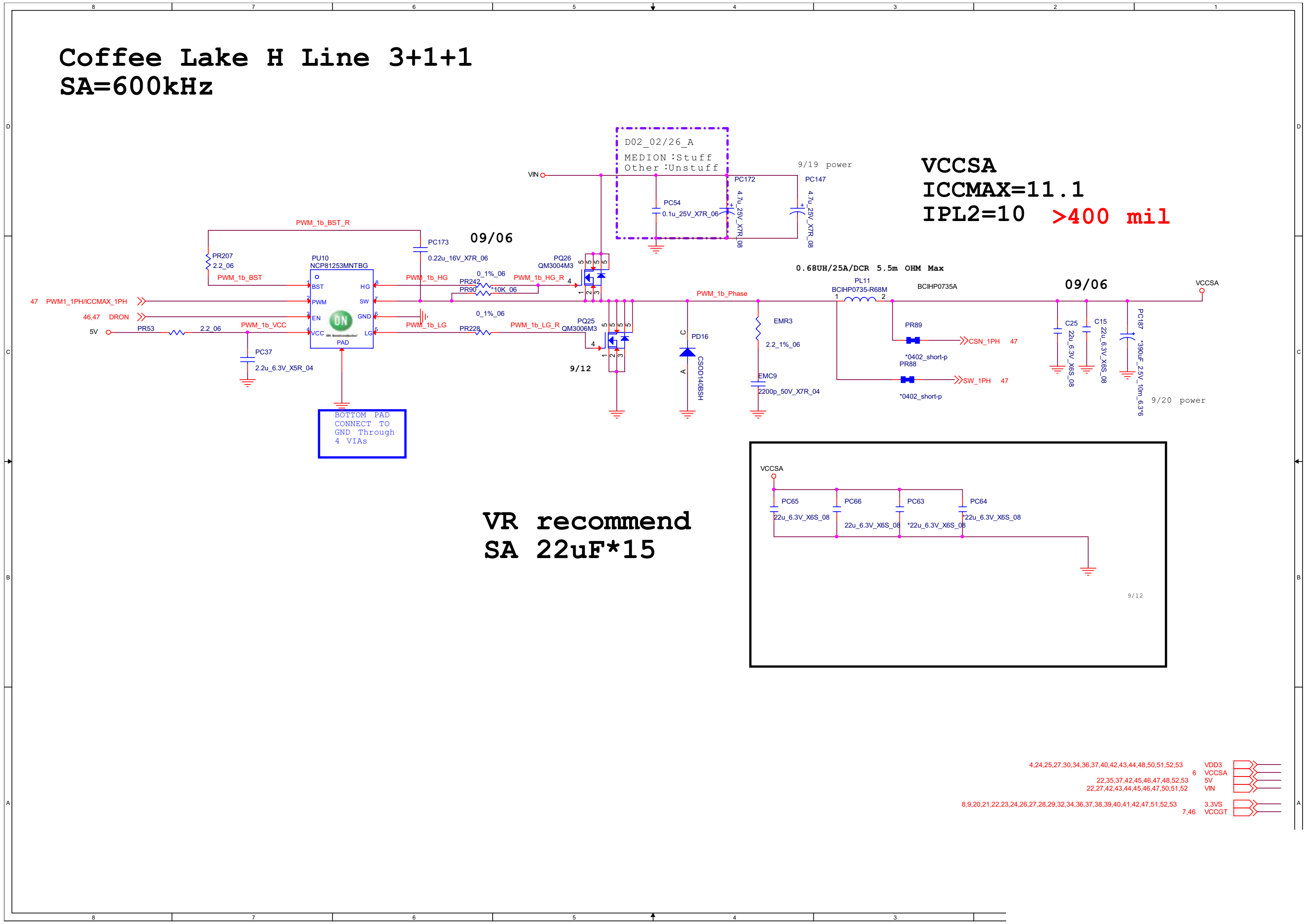
1.0DX_VCCSTG/VCCSFR_OC, 3.3VA


1.05V
VCCST
SHORT
1.05_VCCST
U161
FA7609
2A
NOTE:
1.05DX_VCCSTG Ton need <65us
M5938 TURON-ON TIME=60us
1.05DX_VCCSTG
SHORT
PJ60
1.05DX_VCCSTG
U5
FA7609
PJ62
PJ61
SUSB#_C10#
VCCSTG_EN
VOUT_U140
D02_12/27_H
D02_12/27_H
U14
SN74LV1T08DCKR
SUSB#_EN
GPP_J1_C10#
SUSB#_C10#
D02_12/28_H
NV3V3
VDD3
PR93
PR94
PQ4A
PQ4B
NV_NV3V3_EN_R
NV3V3
PJ40
Default
1A
U33
G5016
1A
VCCSFR_OC
PJ41
Default
DEFAULT SHORT
NV_NV3V3_EN
SUSB#_C10#
SUSB#
D02_12/28_H
D02_12/19_H
3.3VA
BIOS+EC setup
G0, S5, S4:low
S4 support RTC wake:high
U12
UP7553PMA5-25
1.5A
D02_01/31_H
M: uP7553 ---- 6-02-07553-9C0
S: AP2821KTR-G1 6-02-02821-9C0
SLP_SUS#
3.3V
NV3V3
1.05_VCCST
3.3VA
VDD3
VDD5
VCCIO
VDDQ
VCCSFR_OC
5V
1.05DX_VCCSTG
1.05VA

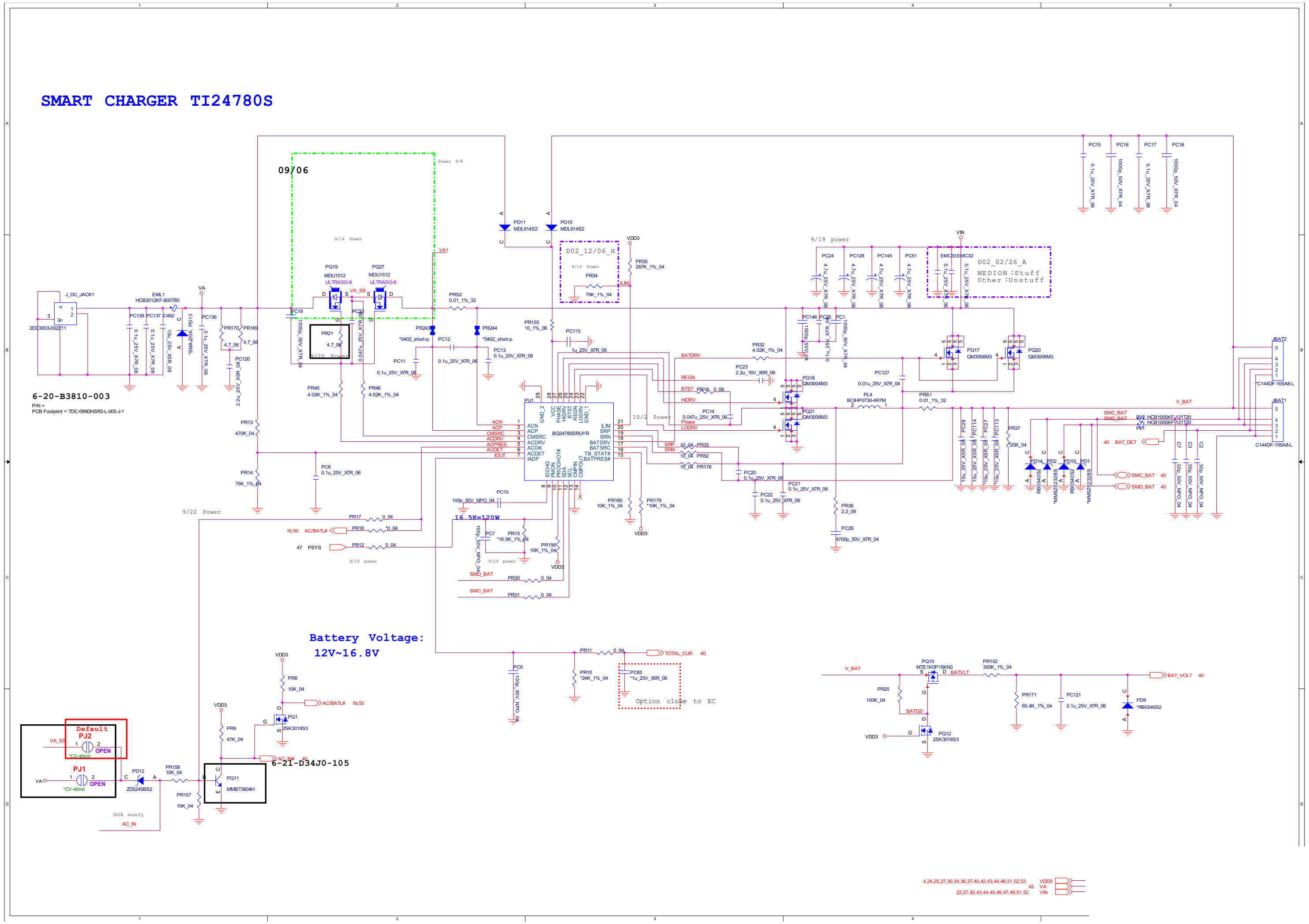
Sheet 48 of 60
1.0DX_VCCSTG/
VCCSFR_OC,
3.3VA

VCCSA

Sheet 49 of 60
VCCSA


Coffee Lake H Line 3+1+1
SA=600kHz
D02_02/26_A
MEDION :Stuff
Other :Unstuff
VIN
PC54
0.1u_25V_X7R_06
PC172
4.7u_25V_X7R_08
PC147
4.7u_25V_X7R_08
9/19 power
VCCSA
ICCMAX=11.1
IPL2=10
>400 mil
PWM_1b_BST_R
PR207
2.2_06
PWM_1b_BST
PC173
0.22u_16V_X7R_06
09/06
PU10
NCP81253MNTBG
BST
PWM
EN
VCC
HG
SW
GND
LG
PAD
47 PWM1_1PH/ICCMAX_1PH
46,47 DRON
5V
PR53
2.2_06
PWM_1b_VCC
PC37
2.2u_6.3V_X5R_04
PWM_1b_HG
PR242
0_1%_06
PR90
*10K_06
PWM_1b_HG_R
PQ26
QM3004M3
PWM_1b_LG
PR228
0_1%_06
PWM_1b_LG_R
PQ25
QM3006M3
9/12
BOTTOM PAD
CONNECT TO
GND Through
4 VIAs
PWM_1b_Phase
PD16
CSOD140BSH
EMR3
2.2_1%_06
EMC9
2200p_50V_X7R_04
0.68UH/25A/DCR 5.5m OHM Max
PL11
BCIHP0735-R68M
BCIHP0735A
PR89
*0402_short-p
CSN_1PH 47
PR88
*0402_short-p
SW_1PH 47
09/06
VCCSA
C25
22u_6.3V_X6S_08
C15
22u_6.3V_X6S_08
PC187
*390uF_2.5V_10m_6.3*6
9/20 power
VR recommend
SA 22uF*15
VCCSA
PC65
22u_6.3V_X6S_08
PC66
22u_6.3V_X6S_08
PC63
*22u_6.3V_X6S_08
PC64
*22u_6.3V_X6S_08
9/12
4,24,25,27,30,34,36,37,40,42,43,44,48,50,51,52,53 VDD3
6 VCCSA
22,35,37,42,45,46,47,48,52,53 5V
22,27,42,43,44,45,46,47,50,51,52 VIN
8,9,20,21,22,23,24,26,27,28,29,32,34,36,37,38,39,40,41,42,47,51,52,53 3.3VS
7,46 VCCGT

AC_In, Charger

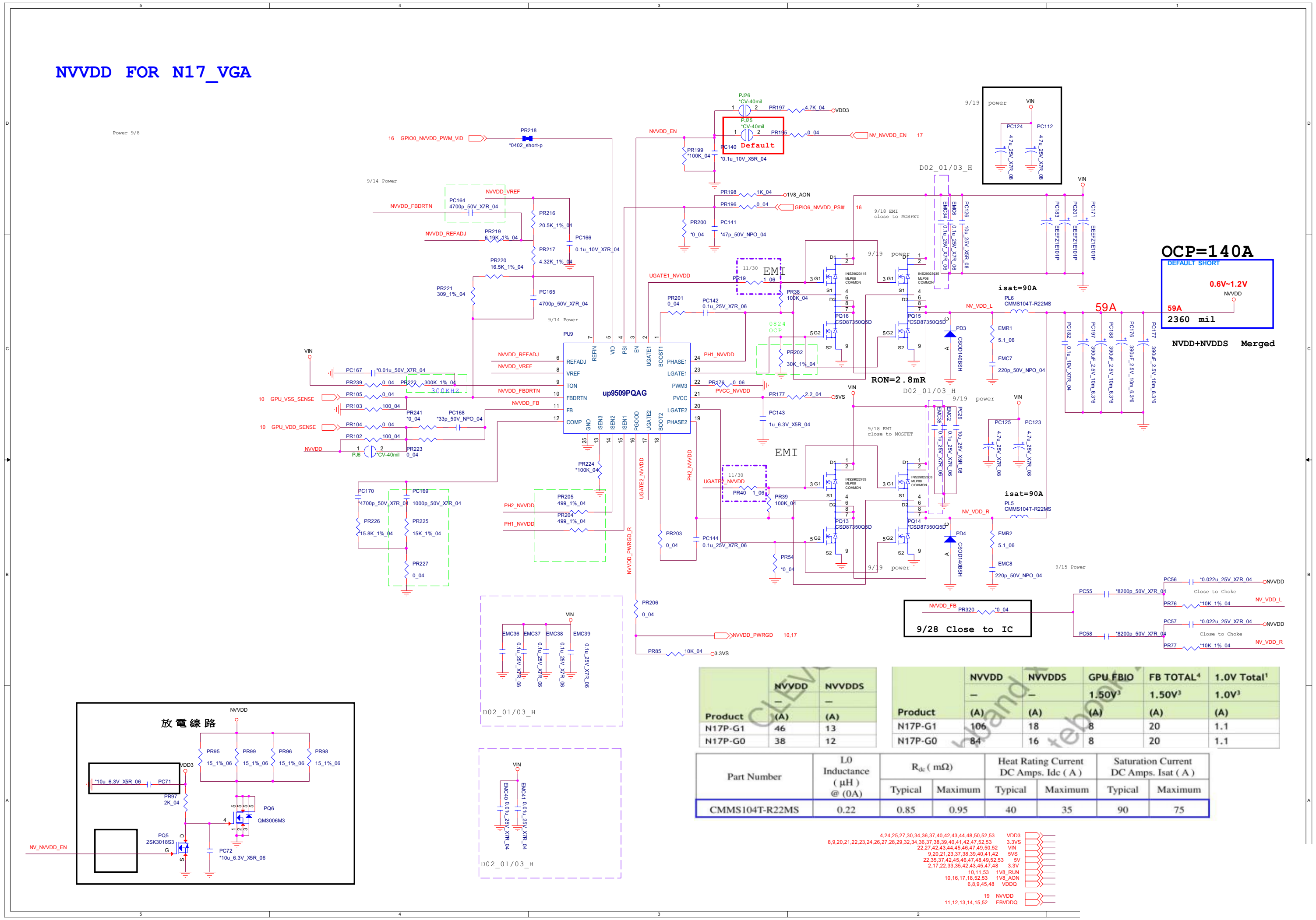

SMART CHARGER TI24780S
09/06
6-20-B3810-003
P/N =
PCB Footprint = TDC-006DHSR2-L-005-J-1
J_DC_JACK1
EML1
HCB2012KF-600T80
PQ19
MDU1512
PQ27
MDU1512
PU1
BQ24780SRUYR
PD11
MDL914S2
PD15
MDL914S2
VDD3
VIN
PQ17
QM3006M3
PQ20
QM3006M3
PQ18
QM3004M3
PQ21
QM3006M3
PL4
BCIHP0730-4R7M
PRS1
0.01_1%_32
PRS2
0.01_1%_32
D02_12/06_H
D02_02/26_A
MEDION:Stuff
Other:Unstuff
BAT2
BAT1
C144DF-105A8-L
V_BAT
SMC_BAT
SMD_BAT
BAT_DET
TOTAL_CUR
16.5K=120W
Battery Voltage:
12V~16.8V
Option close to EC
Default
PJ2
PJ1
OPEN
PQ1
2SK3018S3
PQ11
MMBT3904H
6-21-D34J0-105
AC/BATL#
PSYS
PQ10
MTE1K0P15KN3
PQ12
2SK3018S3
BAT_VOLT
PD9
RB0540S2
VDD3
VA
VIN

Sheet 50 of 60
AC_In, Charger

B.Schematic Diagrams

NVVDD

Sheet 51 of 60
NVVDD

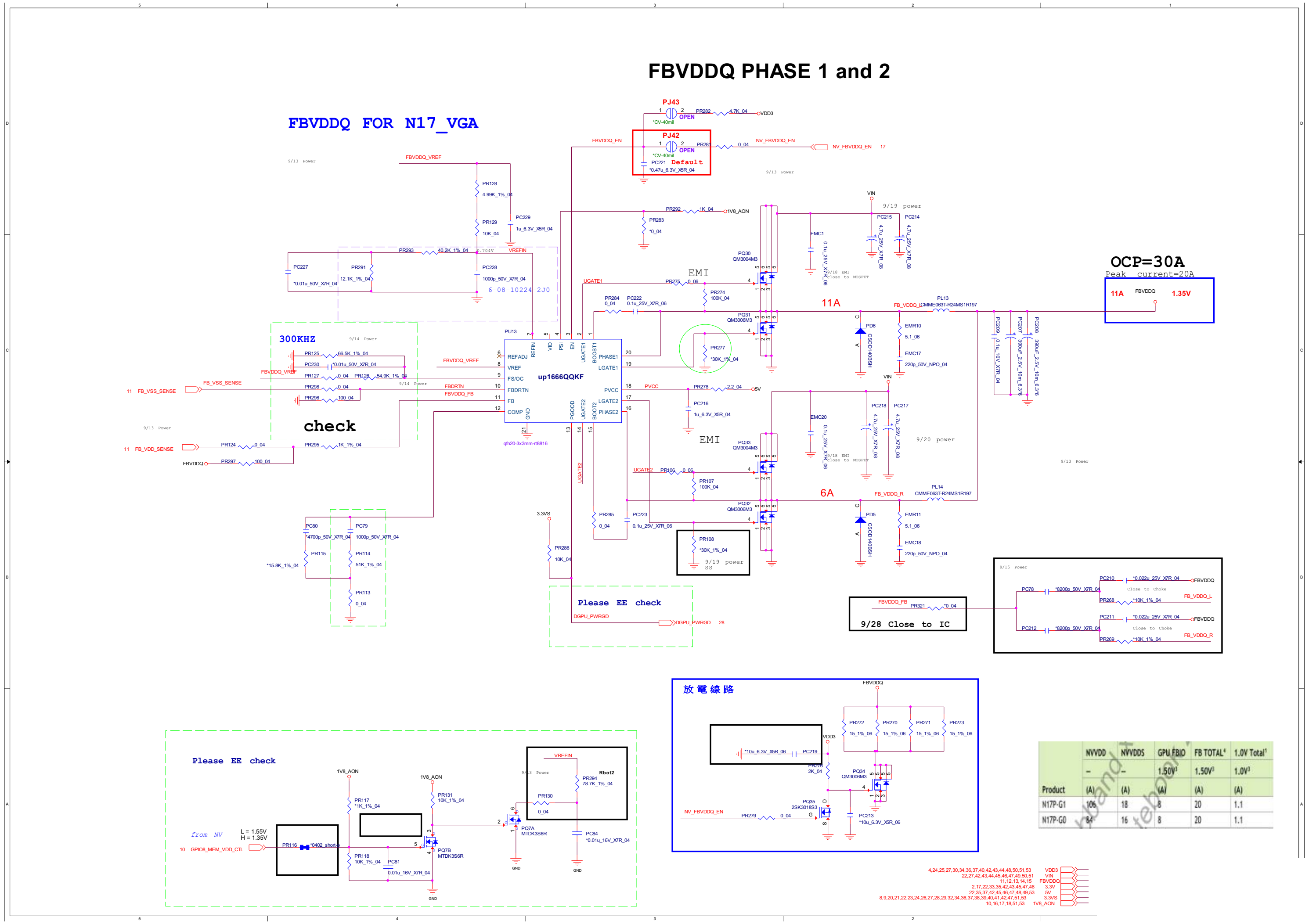

NVVDD FOR N17_VGA
up9509PQAG
PU9
OCP=140A
DEFAULT SHORT
0.6V~1.2V
59A
2360 mil
NVDD+NVDDS Merged
RON=2.8mR
isat=90A
EMI
300KHz
Default
9/28 Close to IC
Close to Choke
放 電 線 路
PQ6
QM3006M3
PQ5
2SK3018S3
PL6
CMMS104T-R22MS
PL5
CMMS104T-R22MS
NV_VDD_L
NV_VDD_R
NVVDD_EN
NVVDD_PWRGD
GPU_VSS_SENSE
GPU_VDD_SENSE
D02_01/03_H
4,24,25,27,30,34,36,37,40,42,43,44,48,50,52,53 VDD3
8,9,20,21,22,23,24,26,27,28,29,32,34,36,37,38,39,40,41,42,47,52,53 3.3VS
22,27,42,43,44,45,46,47,49,50,52 VIN
9,20,21,23,37,38,39,40,41,42 5VS
22,35,37,42,45,46,47,48,49,52,53 5V
2,17,22,33,35,42,43,45,47,48 3.3V
10,11,53 1V8_RUN
10,16,17,18,52,53 1V8_AON
6,8,9,45,48 VDDQ
19 NVVDD
11,12,13,14,15,52 FBVDDQ

Product	NVVDD — (A)	NVVDDS — (A)
N17P-G1	46	13
N17P-G0	38	12

Product	NVVDD — (A)	NVVDDS — (A)	GPU FBIO 1.50V³ (A)	FB TOTAL⁴ 1.50V³ (A)	1.0V Total¹ 1.0V³ (A)
N17P-G1	106	18	8	20	1.1
N17P-G0	84	16	8	20	1.1

Part Number	L0 Inductance (μH) @ (0A)	R_{dc} (mΩ)		Heat Rating Current DC Amps. Idc (A)		Saturation Current DC Amps. Isat (A)	
		Typical	Maximum	Typical	Maximum	Typical	Maximum
CMMS104T-R22MS	0.22	0.85	0.95	40	35	90	75

FBVDDQ

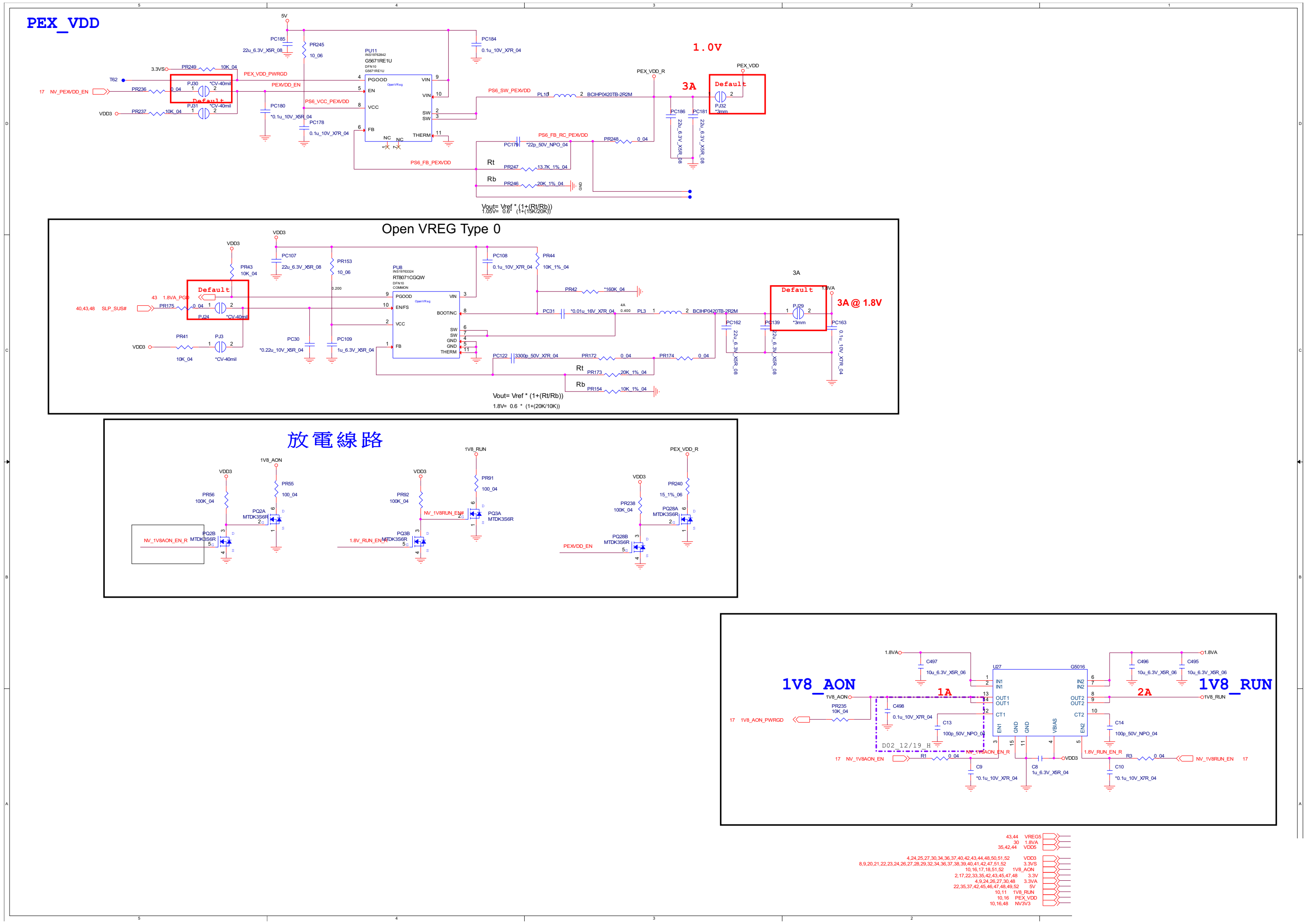

FBVDDQ PHASE 1 and 2
FBVDDQ FOR N17_VGA
PJ43
OPEN
PR282 4.7K_04
VDD3
PJ42
OPEN
Default
FBVDDQ_EN
NV_FBVDDQ_EN
FBVDDQ_VREF
PR128 4.99K_1%_04
PR129 10K_04
PC229 1u_6.3V_X6R_04
PC227 *0.01u_50V_X7R_04
PR291 12.1K_1%_04
PR293 60.2K_1%_04
PC228 1000p_50V_X7R_04
6-08-10224-2J0
300KHZ
check
PU13
up1666QQKF
REFADJ
VREF
FS/OC
FBDRTN
FB
COMP
REFIN
VID
PSI
EN
UGATE1
BOOST1
PHASE1
LGATE1
PVCC
LGATE2
UGATE2
BOOT2
PHASE2
PGOOD
GND
qfn20-3x3mm-r8816
FB_VSS_SENSE
FB_VDD_SENSE
FBVDDQ
VIN
1V8_AON
PR292 1K_04
PR283 *0_04
PQ30 QM3004M3
PQ31 QM3006M3
PQ33 QM3004M3
PQ32 QM3006M3
EMI
EMC1
EMC20
PC215
PC214
PC218
PC217
11A
6A
PL13 CMME063T-R24MS1R197
PL14 CMME063T-R24MS1R197
FB_VDDQ_L
FB_VDDQ_R
PD6
PD5
OCP=30A
Peak current=20A
11A
FBVDDQ
1.35V
PC209
PC207
PC208
9/19 power
9/20 power
9/13 Power
9/14 Power
9/18 EMI Close to MOSFET
PR278 2.2_04
5V
PC216 1u_6.3V_X5R_04
PR285 0_04
PC223 0.1u_25V_X7R_06
PR286 10K_04
3.3VS
PR108 *30K_1%_04
PR277 *30K_1%_04
PC80 *4700p_50V_X7R_04
PC79 1000p_50V_X7R_04
PR115 *15.8K_1%_04
PR114 51K_1%_04
PR113 0_04
Please EE check
DGPU_PWRGD
FBVDDQ_FB
PR321 *0_04
9/28 Close to IC
PC210 *0.022u_25V_X7R_04
PC211 *0.022u_25V_X7R_04
PC78 *8200p_50V_X7R_04
PC212 *8200p_50V_X7R_04
PR268 *10K_1%_04
PR269 *10K_1%_04
Close to Choke
放電線路
PR272 15_1%_06
PR270 15_1%_06
PR271 15_1%_06
PR273 15_1%_06
PC219 *10u_6.3V_X6R_06
PR276 2K_04
PQ34 QM3006M3
PQ35 2SK3018S3
PR279 0_04
PC213 *10u_6.3V_X6R_06
Please EE check
1V8_AON
from NV
L = 1.55V
H = 1.35V
GPIO8_MEM_VDD_CTL
PR116 *0402_short
PR117 *1K_1%_04
PR118 10K_1%_04
PC81 0.01u_16V_X7R_04
PR131 10K_1%_04
PQ7A MTDK3S6R
PQ7B MTDK3S6R
VREFIN
Rbot2
PR294 78.7K_1%_04
PR130 0_04
PC84 *0.01u_16V_X7R_04
GND
VDD3
VIN
FBVDDQ
3.3V
5V
3.3VS
1V8_AON

	NVVDD	NVVDDS	GPU FBIO	FB TOTAL⁴	1.0V Total¹
	–	–	1.50V³	1.50V³	1.0V³
Product	(A)	(A)	(A)	(A)	(A)
N17P-G1	106	18	8	20	1.1
N17P-G0	84	16	8	20	1.1

Sheet 52 of 60
FBVDDQ

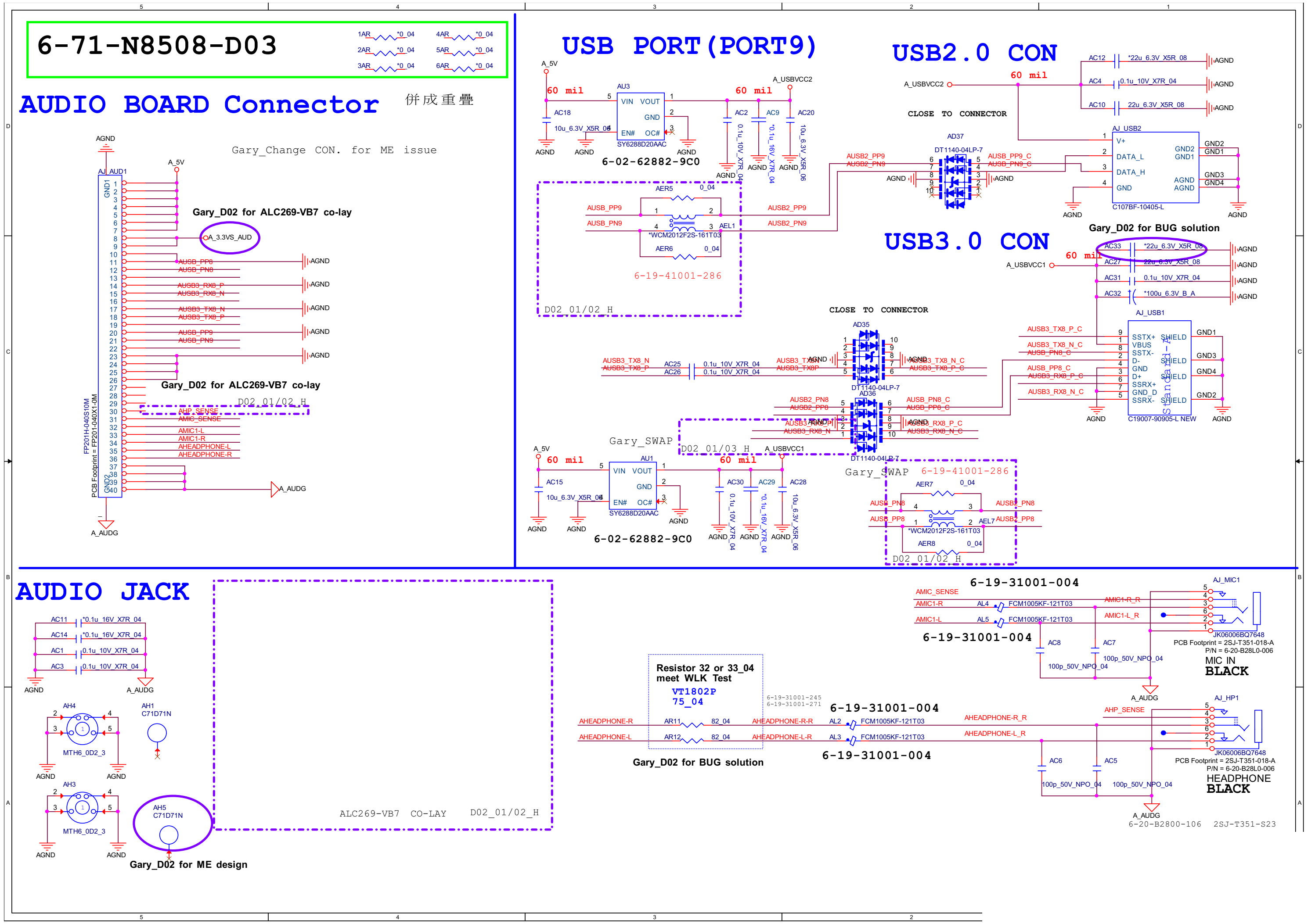
PEX_VDD/3V3/1.8V

Sheet 53 of 60
PEX_VDD/3V3/1.8V



PEX_VDD
5V
PC185
22u_6.3V_X5R_08
PR245
10_06
PC184
0.1u_10V_X7R_04
PU11
G5671RE1U
PGOOD
EN
VCC
FB
VIN
SW
THERM
NC
3.3VS
PR249
10K_04
PEX_VDD_PWRGD
T62
NV_PEXVDD_EN
PR236
PJ30
PJ31
Default
*CV-40mil
VDD3
PR237
10K_04
PEXVDD_EN
PC180
*0.1u_10V_X5R_04
PS6_VCC_PEXVDD
PC178
0.1u_10V_X7R_04
PS6_SW_PEXVDD
PL10
BCIHP0420TB-2R2M
PEX_VDD_R
3A
1.0V
PEX_VDD
PJ32
*3mm
PC186
PC181
22u_6.3V_X5R_08
PS6_FB_RC_PEXVDD
PC179
*22p_50V_NPO_04
PR248
0_04
PS6_FB_PEXVDD
Rt
PR247
13.7K_1%_04
Rb
PR246
20K_1%_04
Vout= Vref * (1+(Rt/Rb))
1.05V= 0.6 * (1+(15K/20K))
Open VREG Type 0
VDD3
PC107
22u_6.3V_X5R_08
PR153
10_06
PU8
RT8071CGQW
PC108
0.1u_10V_X7R_04
PR44
10K_1%_04
PR43
10K_04
43 1.8VA_PG
40,43,48 SLP_SUS#
PR175
PJ24
PJ3
PR41
10K_04
PC30
*0.22u_10V_X5R_04
PC109
1u_6.3V_X5R_04
PGOOD
EN/FS
VCC
FB
VIN
BOOT/NC
SW
GND
THERM
PR42
*160K_04
PC31
*0.01u_16V_X7R_04
PL3
BCIHP0420TB-2R2M
3A
1.8VA
3A @ 1.8V
PJ29
*3mm
PC162
PC139
PC163
PC122
3300p_50V_X7R_04
PR172
0_04
PR174
0_04
Rt
PR173
20K_1%_04
Rb
PR154
10K_1%_04
Vout= Vref * (1+(Rt/Rb))
1.8V= 0.6 * (1+(20K/10K))
放電線路
1V8_AON
VDD3
PR55
100_04
PR56
100K_04
PQ2A
MTDK3S6R
PQ2B
MTDK3S6R
NV_1V8AON_EN_R
1V8_RUN
PR91
100_04
PR92
100K_04
NV_1V8RUN_EN_R
PQ3A
MTDK3S6R
PQ3B
MTDK3S6R
1.8V_RUN_EN_R
PEX_VDD_R
PR240
15_1%_06
PR238
100K_04
PQ28A
MTDK3S6R
PQ28B
MTDK3S6R
PEXVDD_EN
1.8VA
C497
10u_6.3V_X5R_06
U27
G5016
IN1
OUT1
CT1
EN1
GND
VBIAS
EN2
CT2
OUT2
IN2
C496
C495
10u_6.3V_X5R_06
1.8VA
1V8_AON
1A
2A
1V8_RUN
PR235
10K_04
C498
0.1u_10V_X7R_04
C13
100p_50V_NPO_04
17 1V8_AON_PWRGD
D02 12/19 H
NV_1V8AON_EN_R
17 NV_1V8AON_EN
R1
0_04
C9
*0.1u_10V_X7R_04
C8
1u_6.3V_X5R_04
VDD3
C14
100p_50V_NPO_04
1.8V_RUN_EN_R
R3
0_04
NV_1V8RUN_EN 17
C10
*0.1u_10V_X7R_04
43,44 VREG5
30 1.8VA
35,42,44 VDD5
VDD3
3.3VS
1V8_AON
3.3V
3.3VA
5V
1V8_RUN
PEX_VDD
NV3V3

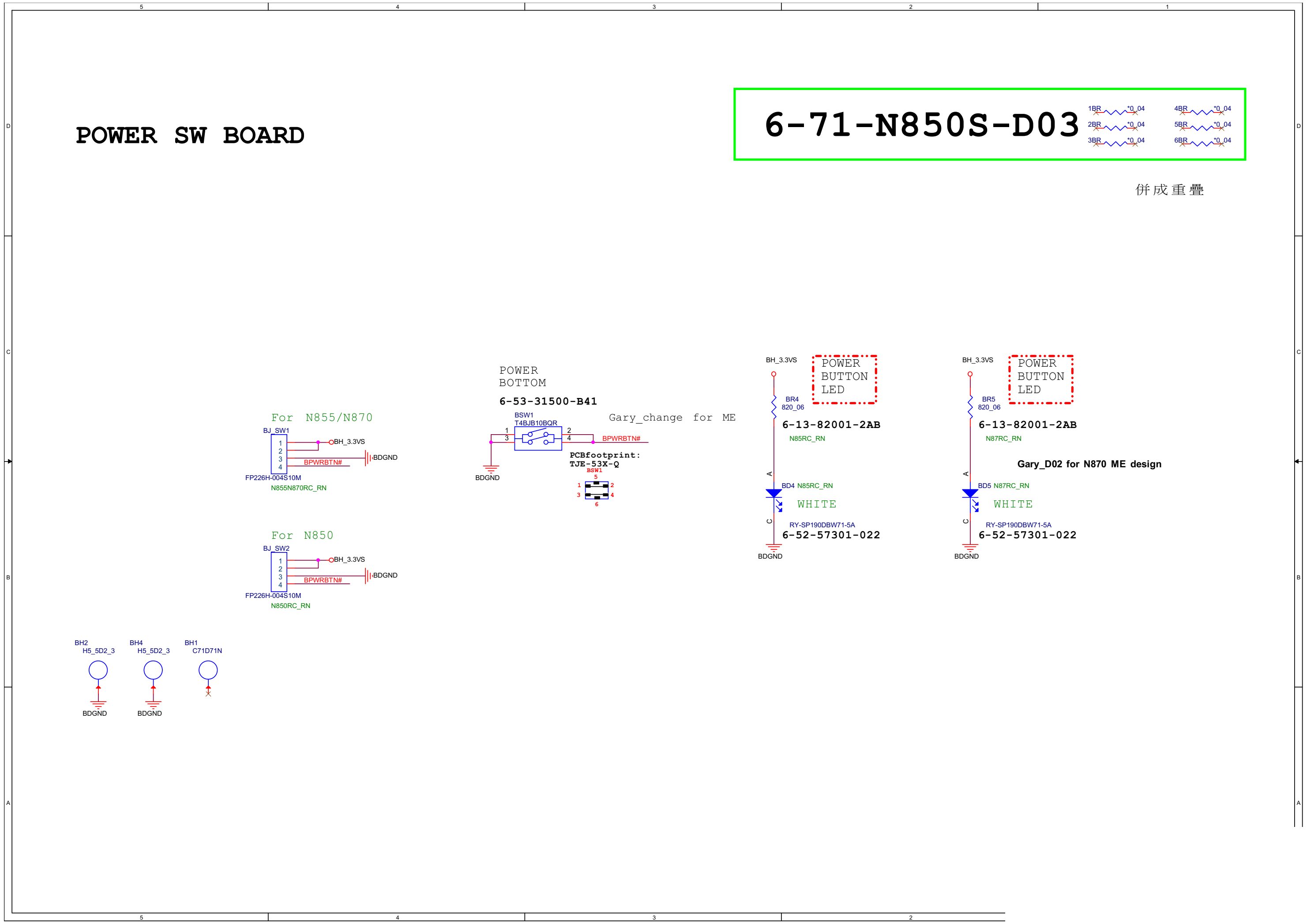
Audio Board


6-71-N8508-D03
AUDIO BOARD Connector
併成重疊
Gary_Change CON. for ME issue
Gary_D02 for ALC269-VB7 co-lay
A_3.3VS_AUD
Gary_D02 for ALC269-VB7 co-lay
D02_01/02_H
AJ_AUD1
A_5V
AGND
A_AUDG
PCB Footprint = FP201-040X1-0M
FP201H-040S10M
AUSB_PP8
AUSB_PN8
AUSB3_RX8_P
AUSB3_RX8_N
AUSB3_TX8_N
AUSB3_TX8_P
AUSB_PP9
AUSB_PN9
AHP_SENSE
AMIC_SENSE
AMIC1-L
AMIC1-R
AHEADPHONE-L
AHEADPHONE-R
USB PORT(PORT9)
60 mil
AU3
SY6288D20AAC
VIN
VOUT
GND
EN#
OC#
AC18
10u_6.3V_X5R_06
A_USBVCC2
AC2
AC9
AC20
0.1u_10V_X7R_04
*0.1u_16V_X7R_04
10u_6.3V_X5R_06
6-02-62882-9C0
AER5
AER6
AEL1
*WCM2012F2S-161T03
0_04
6-19-41001-286
D02_01/02_H
USB2.0 CON
CLOSE TO CONNECTOR
AD37
DT1140-04LP-7
AUSB2_PP9
AUSB2_PN9
AUSB_PP9_C
AUSB_PN9_C
AC12
AC4
AC10
*22u_6.3V_X5R_08
0.1u_10V_X7R_04
22u_6.3V_X5R_08
AJ_USB2
C107BF-10405-L
V+
DATA_L
DATA_H
GND
GND1
GND2
GND3
GND4
Gary_D02 for BUG solution
USB3.0 CON
A_USBVCC1
AC33
AC27
AC31
AC32
*22u_6.3V_X5R_08
22u_6.3V_X5R_08
0.1u_10V_X7R_04
*100u_6.3V_B_A
AJ_USB1
C19007-90905-L NEW
SSTX+
VBUS
SSTX-
D-
GND
D+
SSRX+
GND_D
SSRX-
SHIELD
CLOSE TO CONNECTOR
AD35
AD36
DT1140-04LP-7
AC25
AC26
0.1u_10V_X7R_04
AUSB3_TX8_P_C
AUSB3_TX8_N_C
AUSB_PP8_C
AUSB3_RX8_P_C
AUSB3_RX8_N_C
AUSB_PN8_C
AUSB2_PN8
AUSB2_PP8
Gary_SWAP
D02_01/03_H
AU1
AC15
AC30
AC29
AC28
6-02-62882-9C0
Gary_SWAP
6-19-41001-286
AER7
AER8
AEL7
D02_01/02_H
AUDIO JACK
AC11
AC14
AC1
AC3
*0.1u_16V_X7R_04
0.1u_10V_X7R_04
AH4
AH3
AH1
AH5
C71D71N
MTH6_0D2_3
Gary_D02 for ME design
ALC269-VB7 CO-LAY
D02_01/02_H
Resistor 32 or 33_04
meet WLK Test
VT1802P
75_04
AR11
AR12
82_04
AHEADPHONE-R
AHEADPHONE-L
AHEADPHONE-R-R
AHEADPHONE-L-R
6-19-31001-245
6-19-31001-271
Gary_D02 for BUG solution
6-19-31001-004
AL2
AL3
FCM1005KF-121T03
AHP_SENSE
AC6
AC5
100p_50V_NPO_04
AJ_HP1
JK06006BQ7648
PCB Footprint = 2SJ-T351-018-A
P/N = 6-20-B28L0-006
HEADPHONE
BLACK
6-20-B2800-106
2SJ-T351-S23
6-19-31001-004
AMIC_SENSE
AMIC1-R
AMIC1-L
AL4
AL5
AMIC1-R_R
AMIC1-L_R
AC8
AC7
100p_50V_NPO_04
AJ_MIC1
JK06006BQ7648
PCB Footprint = 2SJ-T351-018-A
P/N = 6-20-B28L0-006
MIC IN
BLACK

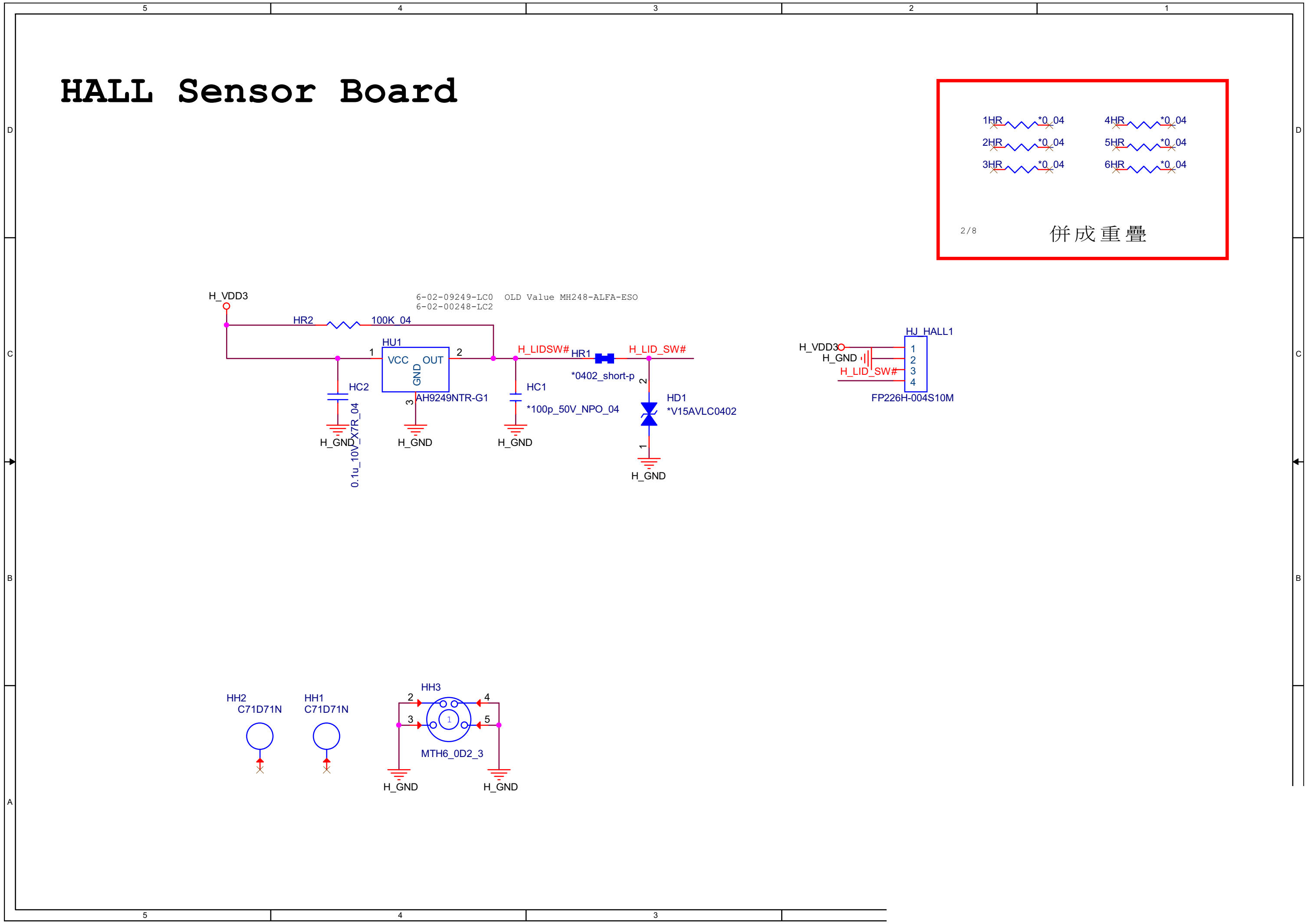
Sheet 54 of 60
Audio Board

Power Switch Board

Sheet 55 of 60
Power Switch
Board


POWER SW BOARD
6-71-N850S-D03
1BR *0_04
2BR *0_04
3BR *0_04
4BR *0_04
5BR *0_04
6BR *0_04
併成重疊
For N855/N870
BJ_SW1
1
2
3
4
BH_3.3VS
BPWRBTN#
BDGND
FP226H-004S10M
N855N870RC_RN
For N850
BJ_SW2
1
2
3
4
BH_3.3VS
BPWRBTN#
BDGND
FP226H-004S10M
N850RC_RN
POWER
BOTTOM
6-53-31500-B41
BSW1
T4BJB10BQR
Gary_change for ME
1
3
2
4
BPWRBTN#
BDGND
PCBfootprint:
TJE-53X-Q
BSW1
5
1
2
3
4
6
BH_3.3VS
POWER
BUTTON
LED
BR4
820_06
6-13-82001-2AB
N85RC_RN
A
BD4 N85RC_RN
WHITE
C
RY-SP190DBW71-5A
6-52-57301-022
BDGND
BH_3.3VS
POWER
BUTTON
LED
BR5
820_06
6-13-82001-2AB
N87RC_RN
Gary_D02 for N870 ME design
A
BD5 N87RC_RN
WHITE
C
RY-SP190DBW71-5A
6-52-57301-022
BDGND
BH2
H5_5D2_3
BDGND
BH4
H5_5D2_3
BDGND
BH1
C71D71N
5
4
3
2
1
D
C
B
A

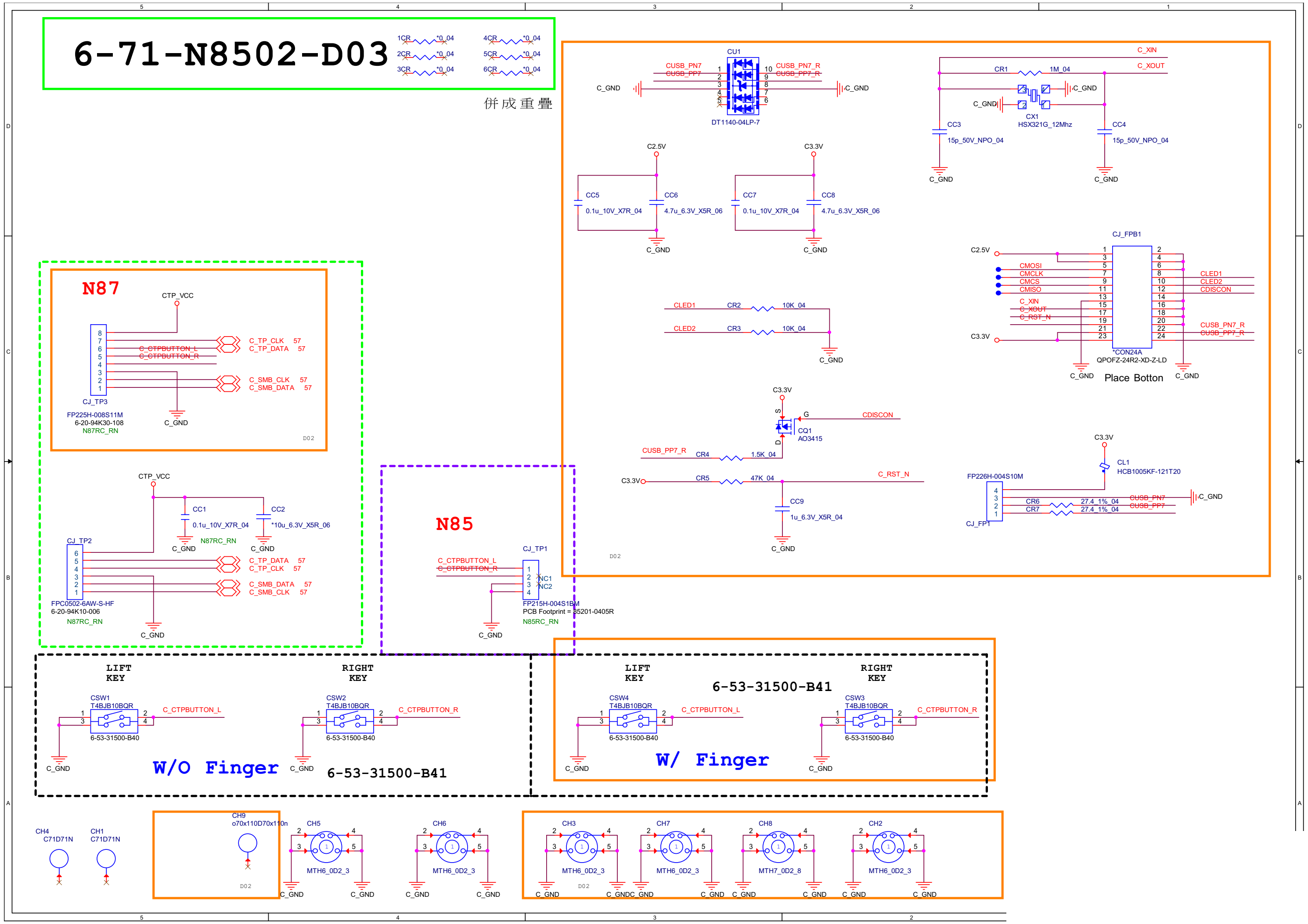
Hall Sensor Board


HALL Sensor Board
1HR *0_04
2HR *0_04
3HR *0_04
4HR *0_04
5HR *0_04
6HR *0_04
2/8
併成重疊
H_VDD3
6-02-09249-LC0 OLD Value MH248-ALFA-ESO
6-02-00248-LC2
HR2
100K_04
HU1
VCC
OUT
GND
1
2
3
AH9249NTR-G1
HC2
0.1u_10V_X7R_04
H_GND
H_LIDSW#
HR1
*0402_short-p
H_LID_SW#
HC1
*100p_50V_NPO_04
HD1
*V15AVLC0402
HJ_HALL1
H_VDD3
H_GND
H_LID_SW#
FP226H-004S10M
HH2
C71D71N
HH1
C71D71N
HH3
MTH6_0D2_3
5
4
3
2
1
D
C
B
A

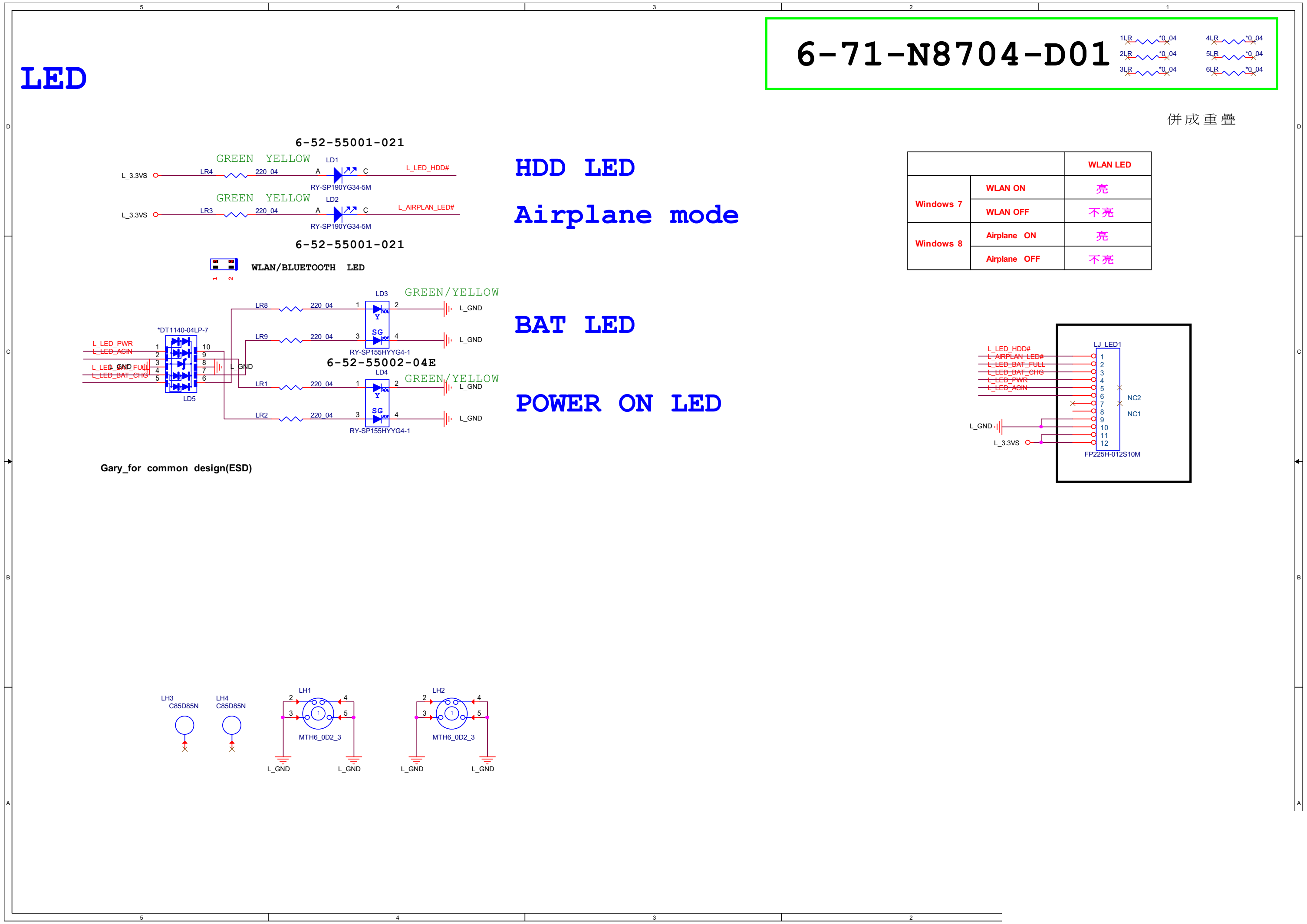
Sheet 56 of 60
Hall Sensor Board

Click Board

Sheet 57 of 60
Click Board


6-71-N8502-D03
1CR *0_04
2CR *0_04
3CR *0_04
4CR *0_04
5CR *0_04
6CR *0_04
併成重疊
N87
CTP_VCC
C_CTPBUTTON_L
C_CTPBUTTON_R
C_TP_CLK 57
C_TP_DATA 57
C_SMB_CLK 57
C_SMB_DATA 57
CJ_TP3
FP225H-008S11M
6-20-94K30-108
N87RC_RN
C_GND
CC1
0.1u_10V_X7R_04
CC2
*10u_6.3V_X5R_06
CJ_TP2
FPC0502-6AW-S-HF
6-20-94K10-006
N87RC_RN
N85
CJ_TP1
NC1
NC2
FP215H-004S1BM
PCB Footprint = 85201-0405R
N85RC_RN
CU1
CUSB_PN7
CUSB_PP7
CUSB_PN7_R
CUSB_PP7_R
DT1140-04LP-7
C_XIN
C_XOUT
CR1
1M_04
CX1
HSX321G_12Mhz
CC3
15p_50V_NPO_04
CC4
15p_50V_NPO_04
C2.5V
C3.3V
CC5
0.1u_10V_X7R_04
CC6
4.7u_6.3V_X5R_06
CC7
0.1u_10V_X7R_04
CC8
4.7u_6.3V_X5R_06
CJ_FPB1
CMOSI
CMCLK
CMCS
CMISO
C_RST_N
CLED1
CLED2
CDISCON
*CON24A
QPOFZ-24R2-XD-Z-LD
Place Botton
CR2
10K_04
CR3
10K_04
CQ1
AO3415
CR4
1.5K_04
CR5
47K_04
CC9
1u_6.3V_X5R_04
CL1
HCB1005KF-121T20
FP226H-004S10M
CJ_FP1
CR6
27.4_1%_04
CR7
27.4_1%_04
D02
LIFT KEY
RIGHT KEY
CSW1
T4BJB10BQR
6-53-31500-B40
CSW2
T4BJB10BQR
6-53-31500-B40
W/O Finger
6-53-31500-B41
LIFT KEY
RIGHT KEY
6-53-31500-B41
CSW4
T4BJB10BQR
6-53-31500-B40
CSW3
T4BJB10BQR
6-53-31500-B40
W/ Finger
CH4
C71D71N
CH1
C71D71N
CH9
o70x110D70x110n
CH5
MTH6_0D2_3
CH6
MTH6_0D2_3
CH3
MTH6_0D2_3
CH7
MTH6_0D2_3
CH8
MTH7_0D2_8
CH2
MTH6_0D2_3

LED Board

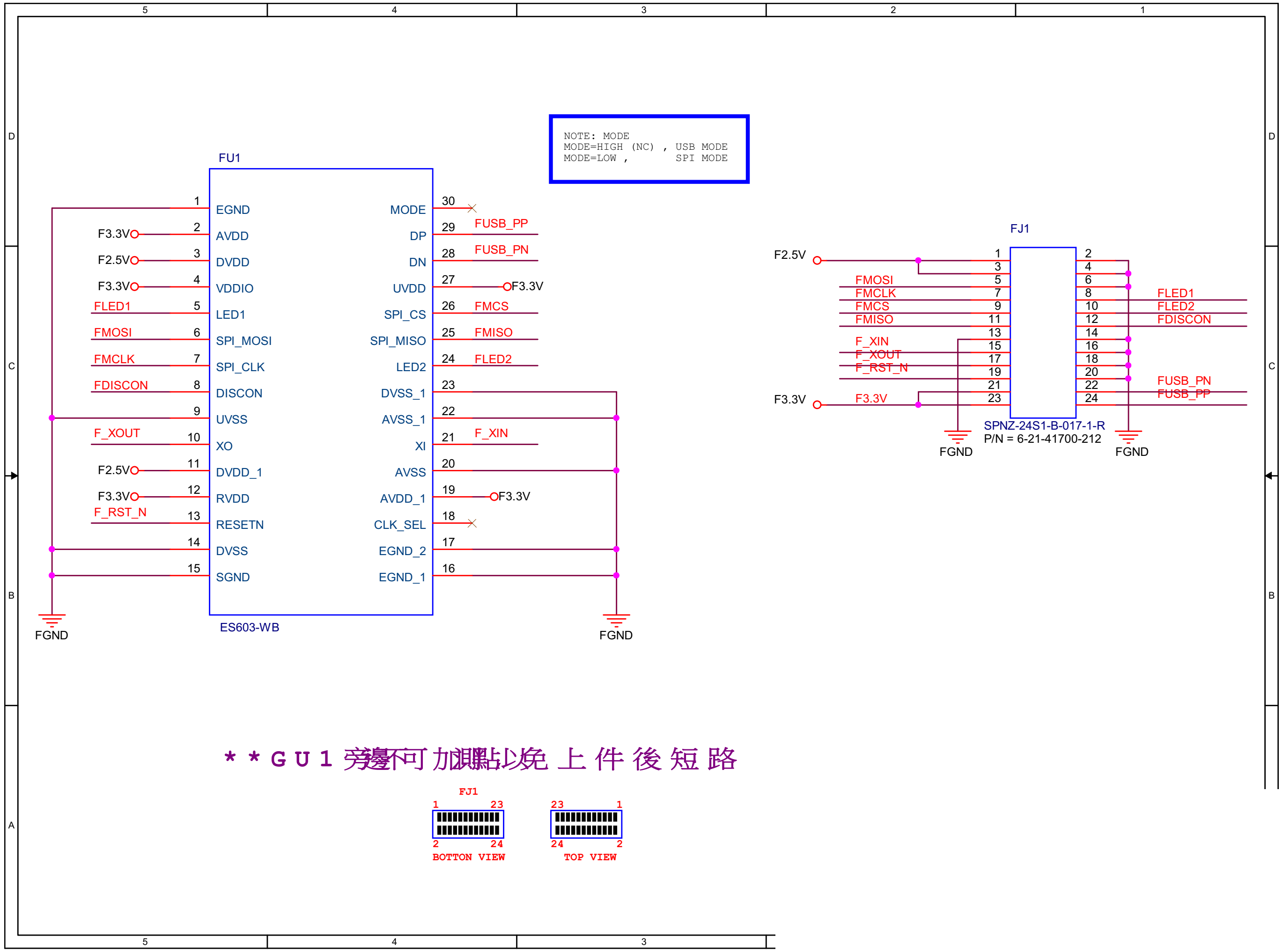

LED
6-71-N8704-D01
1LR *0_04
2LR *0_04
3LR *0_04
4LR *0_04
5LR *0_04
6LR *0_04
併成重疊
6-52-55001-021
GREEN YELLOW
LD1
L_3.3VS
LR4
220_04
A
C
L_LED_HDD#
RY-SP190YG34-5M
GREEN YELLOW
LD2
L_3.3VS
LR3
220_04
A
C
L_AIRPLAN_LED#
RY-SP190YG34-5M
6-52-55001-021
HDD LED
Airplane mode
WLAN/BLUETOOTH LED
GREEN/YELLOW
LD3
LR8
220_04
Y
SG
L_GND
LR9
220_04
L_GND
RY-SP155HYYG4-1
BAT LED
*DT1140-04LP-7
L_LED_PWR
L_LED_ACIN
L_LED_BAT_FULL
L_LED_BAT_CHG
L_GND
LD5
6-52-55002-04E
LD4
GREEN/YELLOW
LR1
220_04
L_GND
LR2
220_04
L_GND
RY-SP155HYYG4-1
POWER ON LED
Gary_for common design(ESD)
LJ_LED1
L_LED_HDD#
L_AIRPLAN_LED#
L_LED_BAT_FULL
L_LED_BAT_CHG
L_LED_PWR
L_LED_ACIN
NC2
NC1
L_GND
L_3.3VS
FP225H-012S10M
LH3
C85D85N
LH4
C85D85N
LH1
MTH6_0D2_3
LH2
MTH6_0D2_3
L_GND
L_GND
L_GND
L_GND

		WLAN LED
Windows 7	WLAN ON	亮
	WLAN OFF	不亮
Windows 8	Airplane ON	亮
	Airplane OFF	不亮

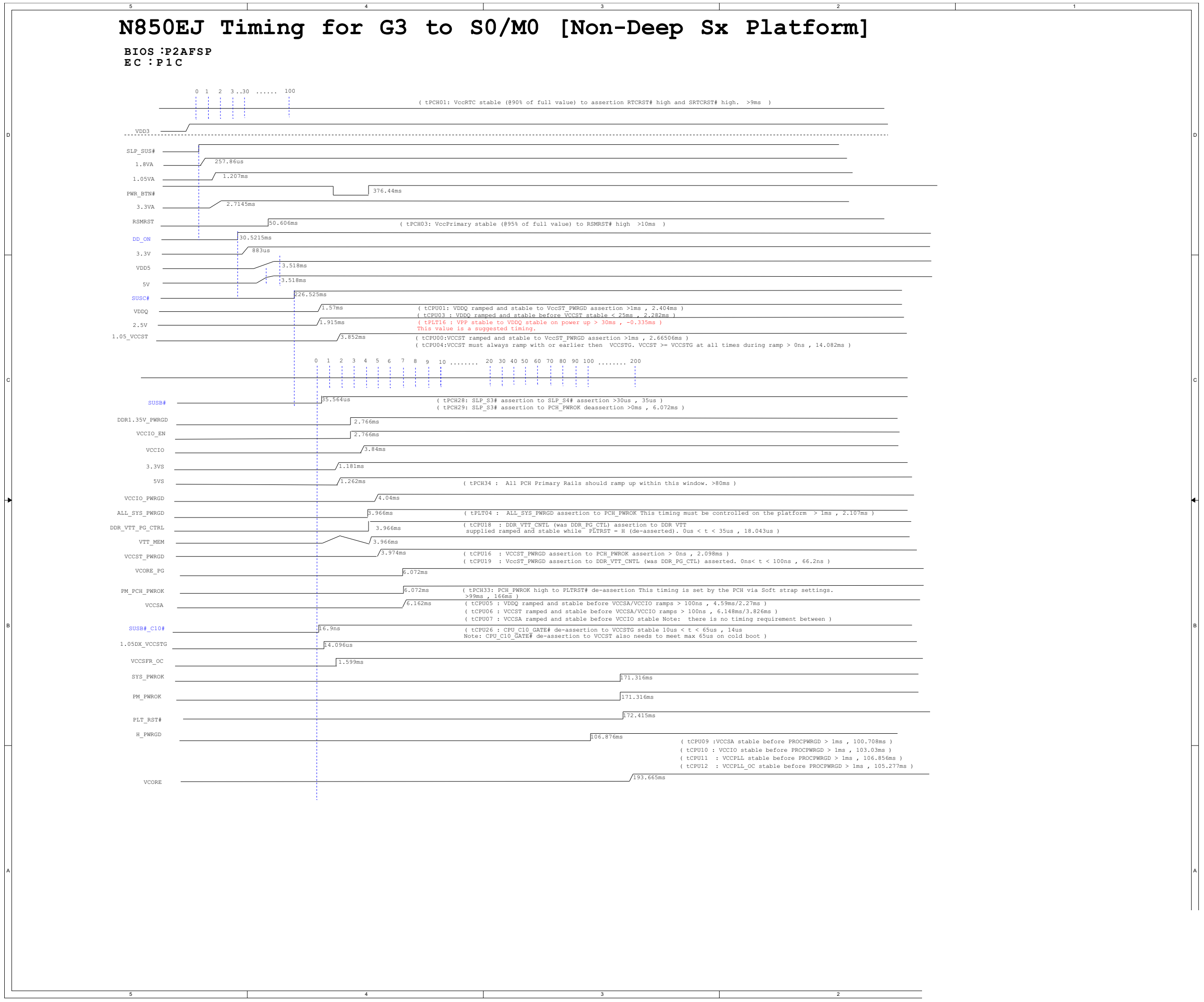
Sheet 58 of 60
LED Board

Finger Print Board

Sheet 59 of 60
FingePrint Board


FU1
ES603-WB
1 EGND
2 AVDD
3 DVDD
4 VDDIO
5 LED1
6 SPI_MOSI
7 SPI_CLK
8 DISCON
9 UVSS
10 XO
11 DVDD_1
12 RVDD
13 RESETN
14 DVSS
15 SGND
30 MODE
29 DP
28 DN
27 UVDD
26 SPI_CS
25 SPI_MISO
24 LED2
23 DVSS_1
22 AVSS_1
21 XI
20 AVSS
19 AVDD_1
18 CLK_SEL
17 EGND_2
16 EGND_1
F3.3V
F2.5V
FLED1
FMOSI
FMCLK
FDISCON
F_XOUT
F_RST_N
FUSB_PP
FUSB_PN
FMCS
FMISO
FLED2
F_XIN
FGND
NOTE: MODE
MODE=HIGH (NC) , USB MODE
MODE=LOW , SPI MODE
FJ1
SPNZ-24S1-B-017-1-R
P/N = 6-21-41700-212
F2.5V
F3.3V
FMOSI
FMCLK
FMCS
FMISO
F_XIN
F_XOUT
F_RST_N
F3.3V
FLED1
FLED2
FDISCON
FUSB_PN
FUSB_PP
FGND
**GU1旁邊不可加測點以免上件後短路
FJ1
1 23
2 24
BOTTON VIEW
23 1
24 2
TOP VIEW
5
4
3
2
1
D
C
B
A

Power Sequence


5
4
3
2
1
D
C
B
A
N850EJ Timing for G3 to S0/M0 [Non-Deep Sx Platform]
BIOS :P2AFSP
EC :P1C
0 1 2 3..30 100
(tPCH01: VccRTC stable (@90% of full value) to assertion RTCRST# high and SRTCRST# high. >9ms)
VDD3
SLP_SUS#
1.8VA
257.86us
1.05VA
1.207ms
PWR_BTN#
376.44ms
3.3VA
2.7145ms
RSMRST
50.606ms
(tPCH03: VccPrimary stable (@95% of full value) to RSMRST# high >10ms)
DD_ON
30.5215ms
3.3V
883us
VDD5
3.518ms
5V
3.518ms
SUSC#
226.525ms
VDDQ
1.57ms
(tCPU01: VDDQ ramped and stable to VccST_PWRGD assertion >1ms , 2.404ms)
(tCPU03 : VDDQ ramped and stable before VCCST stable < 25ms , 2.282ms)
2.5V
1.915ms
(tPLT16 : VPP stable to VDDQ stable on power up > 30ms , -0.335ms)
This value is a suggested timing.
1.05_VCCST
3.852ms
(tCPU00:VCCST ramped and stable to VccST_PWRGD assertion >1ms , 2.66506ms)
(tCPU04:VCCST must always ramp with or earlier then VCCSTG. VCCST >= VCCSTG at all times during ramp > 0ns , 14.082ms)
0 1 2 3 4 5 6 7 8 9 10 .... 20 30 40 50 60 70 80 90 100 200
SUSB#
35.564us
(tPCH28: SLP_S3# assertion to SLP_S4# assertion >30us , 35us)
(tPCH29: SLP_S3# assertion to PCH_PWROK deassertion >0ms , 6.072ms)
DDR1.35V_PWRGD
2.766ms
VCCIO_EN
2.766ms
VCCIO
3.84ms
3.3VS
1.181ms
5VS
1.262ms
(tPCH34 : All PCH Primary Rails should ramp up within this window. >80ms)
VCCIO_PWRGD
4.04ms
ALL_SYS_PWRGD
3.966ms
(tPLT04 : ALL_SYS_PWRGD assertion to PCH_PWROK This timing must be controlled on the platform > 1ms , 2.107ms)
DDR_VTT_PG_CTRL
3.966ms
(tCPU18 : DDR_VTT_CNTL (was DDR_PG_CTL) assertion to DDR VTT supplied ramped and stable while PLTRST = H (de-asserted). 0us < t < 35us , 18.043us)
VTT_MEM
3.966ms
VCCST_PWRGD
3.974ms
(tCPU16 : VCCST_PWRGD assertion to PCH_PWROK assertion > 0ns , 2.098ms)
(tCPU19 : VccST_PWRGD assertion to DDR_VTT_CNTL (was DDR_PG_CTL) asserted. 0ns< t < 100ns , 66.2ns)
VCORE_PG
6.072ms
PM_PCH_PWROK
6.072ms
(tPCH33: PCH_PWROK high to PLTRST# de-assertion This timing is set by the PCH via Soft strap settings. >99ms , 166ms)
VCCSA
6.162ms
(tCPU05 : VDDQ ramped and stable before VCCSA/VCCIO ramps > 100ns , 4.59ms/2.27ms)
(tCPU06 : VCCST ramped and stable before VCCSA/VCCIO ramps > 100ns , 6.148ms/3.826ms)
(tCPU07 : VCCSA ramped and stable before VCCIO stable Note: there is no timing requirement between)
SUSB#_C10#
16.9ns
(tCPU26 : CPU_C10_GATE# de-assertion to VCCSTG stable 10us < t < 65us , 14us
Note: CPU_C10_GATE# de-assertion to VCCST also needs to meet max 65us on cold boot)
1.05DX_VCCSTG
14.096us
VCCSFR_OC
1.599ms
SYS_PWROK
171.316ms
PM_PWROK
171.316ms
PLT_RST#
172.415ms
H_PWRGD
106.876ms
(tCPU09 :VCCSA stable before PROCPWRGD > 1ms , 100.708ms)
(tCPU10 : VCCIO stable before PROCPWRGD > 1ms , 103.03ms)
(tCPU11 : VCCPLL stable before PROCPWRGD > 1ms , 106.856ms)
(tCPU12 : VCCPLL_OC stable before PROCPWRGD > 1ms , 105.277ms)
VCORE
193.665ms

Sheet 60 of 60
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 V1.0X.XX or higher as appropriate for your computer model.

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

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.