



**530XBB**

**Glide-13GLK**

# ***SERVICE* Manual**

530XBB



Contents

## **1. High performance notebook computer**

- Intel Gemini Lake platform with LPDDR4 memory
- Intel® HD Graphics 600  
Intel® HD Graphics 605
- Storage Support: eMMC Only ,SSD Only

## **2. Convenient functions**

- For Internal Camera, convenient usage of filming and taking pictures
- Convenient connection with TV as HDMI port is provided
- Bluetooth V4.1
- Easy activation of useful functions with hot keys.

## **3. Prudent design with consideration of practical usage**

- Product design with consideration of practical usage
- Comfortable typing with curved keycaps
- FHD LCD



# Disassembly and Reassembly 530XBB (Glide-13GLK)

Mobile communications Division

# 1. Precaution

## 1.1. General After-Sales Service Precautions

- 1) Do not let customers repair the product themselves.
  - ›There is a danger of injury and the product life time may be shortened.
- 2) Make sure to disconnect the power cord from the wall outlet before repairing the product (especially for after-sales service of electric parts).
  - ›There is a danger of electric shock.
- 3) Do not let customers plug several electric home appliances into a single wall outlet at the same time.
  - ›There is a danger of fire due to overheating.
- 4) Check if the power plug or wall outlet are damaged in any way..
  - ›If a defect is found, repair or replace it immediately.
  - (There is a danger of electric shock or fire)
- 5) Make sure that it is properly grounded. (Check the ground of the wall outlet)
  - ›Electricity leakage may cause electric shock.

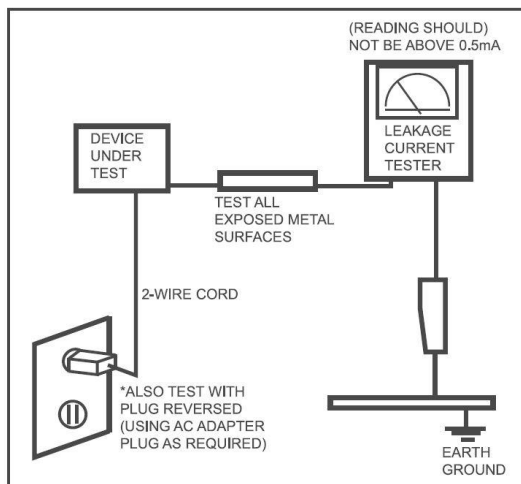


Figure 1.1 Leakage Current Test Circuit

- 6) Do not spray water on to the product to clean it.
  - ›There is a danger of electric shock or fire and it may shorten the lifetime of the product.
- 7) Check the assembly status of the product after the after-sales service..
  - ›The assembly status of the product must be the same as before the after-sales service.
- 8) Unplug the power cord holding the power plug (and not the cord)..
  - ›If the cord is disconnected, it may cause electric shock or fire.
- 9) Repair the product using only authorized parts
- 10) Keep the product away from heating devices such as heaters.
  - ›Exposure to heaters may cause deformation of the product or fire.

# **Operating Instructions and Installation 530XBB (GLIDE-13GLK)**

**\*Mobile Comm. Division Development Group**



# Trouble shooting 530XBB (Glide-13GLK)

Mobile communications Division



# Circuit Analyze 530XBB(Glide-13GLK)

Mobile communications Division

# contents

## 1. Precautions

1) General After-Sales Service Precautions.....	1-1
2) Safety Precautions.....	1-2
3) Ground.....	1-3
4) Static Electricity Precautions.....	1-4

## 2. Introduction and Specification

1) Main feature .....	2-6
2) Spec.....	2-7
3) Comparative Table .....	2-8
4) System view and Function.....	2-10
5) New Technology / ability.....	2-16
6) Hardware .....	2-23
7) Software.....	2-28
8) BIOS setup .....	2-34
9) System Description .....	2-47
10) HW optional component .....	2-61
11) Installation .....	2-68

## 3. Disassembly and Reassembling

1) Disassembly and Reassembly .....	3-2
-------------------------------------	-----

## 4. Troubleshooting

1) General Spec.....	4-2
2) Main Debugging Flowchart .....	4-3
3) H/W & OS trouble shooting .....	4-4
4) Other - RTC Reset.....	4-18
5) System Diagnostics Card.....	4-19
6) Hardware Upgrade.....	4-20

## 5. Exploded view

1) Exploded view .....	5-1
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## 6. BOM

1) Main System.....	6-1
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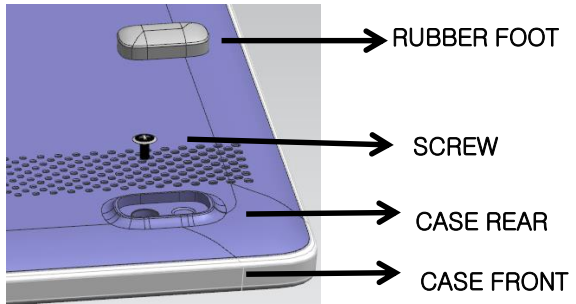
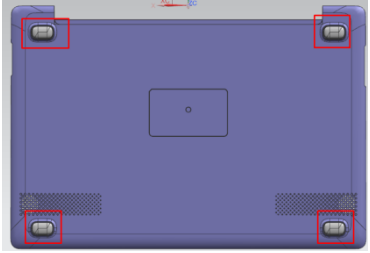
## 7. System Wire Diagram

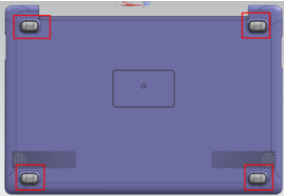



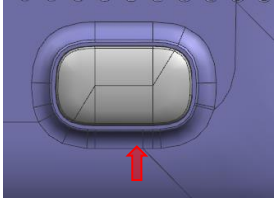
1) Block Diagram.....	7-2
2) system layout.....	7-3
3) Board Component.....	7-6

# Rubber Foot Disassemble

Assembly order is reverse of disassembly

Glide-13 Rubber Foot Disassemble -4EA



1	2	3	4
 <p>Disassembly Guide</p>	 <p>Insert JIG RUBBER FOOT Six O'Clock High (Use plastic Jig)</p>	 <p>Upward RUBBER FOOT</p>	 <p>Tear down RUBBER FOOT</p>
<p>RUBBER FOOT Six O'Clock High</p>  <p>Attention : Use plastic Jig, Metal Jig will make rear scratch</p>			

## 1.2. Safety Precautions

### 1) EMI

This device has been registered regarding EMI for residential use. It can be used in all areas.

### 2) Circuit Test ( Logic Test ) Precautions

The LSI and MSI used in this product are semiconductor integrated circuits based on MOS-FET or CMOS. Since these types of devices are highly susceptible to static electricity or current leakage, an isolation break may be caused. Therefore read and follow the instructions below.

- a) When handling an LSI or MSI, make sure your body is grounded through a few mega-ohms of resistance. In addition, wear gloves and a jacket made of cotton and not of synthetic fibers that easily generate static electricity.
- b) When repairing the product, place a conductive material (e.g. aluminum foil) grounded to the earth on the worktable.
- c) You must use a soldering iron without a leakage current.
- d) Do not touch the pin of an IC and carefully insert the IC into the black plastic package.
- e) When inserting an IC into a PCB, be careful with the direction of the IC. When installing an IC in the wrong direction, it might become damaged.
- f) When carrying an IC, package the IC with conducting material such as aluminum foil or conducting sponge so as to keep the voltage level of each of the terminals the same.
- g) Since the storage temperature of an IC is between -20 ~ +70 degrees, keep it at room temperature, if possible.
- h) Since the storage temperature of an IC is between -20 ~ +70 degrees, keep it at room temperature, if possible.
- i) When soldering an IC, solder it in as short a time as possible so that unnecessary heat is not applied to the device.
- j) Avoid leaving excessive amounts of flux within a custom IC or between the pins when soldering a custom IC.
- k) Take care to not damage the board when installing or separating an Option Board.
- l) Take care to not break the printed circuit pattern on the PCB when separate an IC.

Ver	Date	Contents	작성자	승인자
1.0	2014.11.10	Initial release	lijunje	

## **(1) Tools used for repairing the product**

- System Diagnostics Disk
- MS-DOS Booting Disk
- System Diagnostics Card
- Screwdrivers (+,-)
- Tweezers
- Multi-meter
- Oscilloscope
- Logic Analyzer

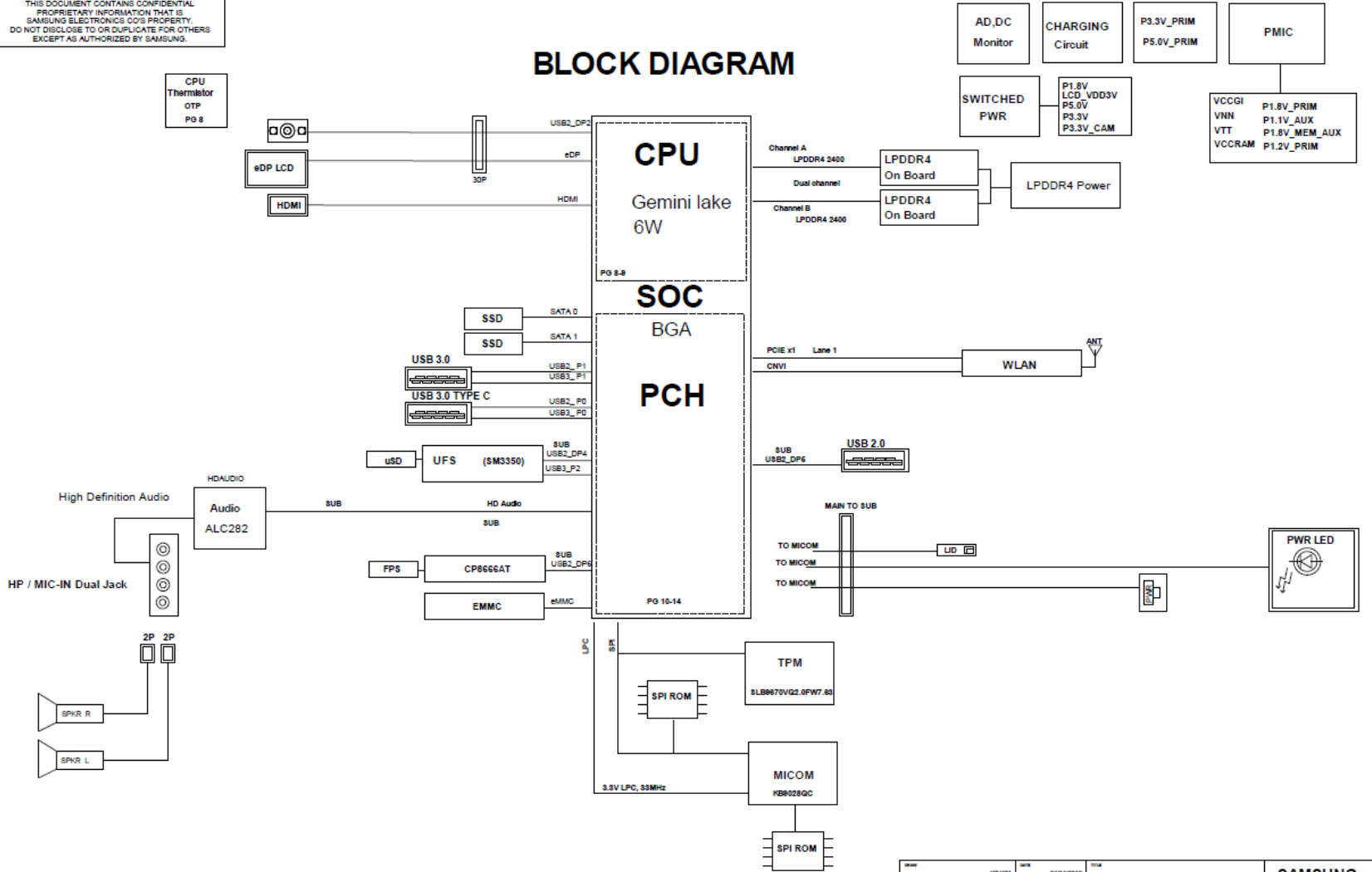
## **(2) Replaceable unit (FRU: Field Replaceable Unit)**

- SSD(2.5 inch,7mmh SATAIII)
- System Upper
- System Lower
- System Front (KBD, Touch Pad)
- System Rear (No label)
- Battery
- Speaker
- Sub Board
- System Fan
- LCD Panel
- Camera Module
- Main Board
- FFC & Cable (Touchpad FFC, Sub FFC, USB Cable, LCD+Camera Cable)

# 1. System Block Diagram

SAMSUNG PROPRIETARY  
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PROPRIETARY INFORMATION THAT IS  
SAMSUNG ELECTRONICS CO'S PROPERTY.  
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS  
EXCEPT AS AUTHORIZED BY SAMSUNG.

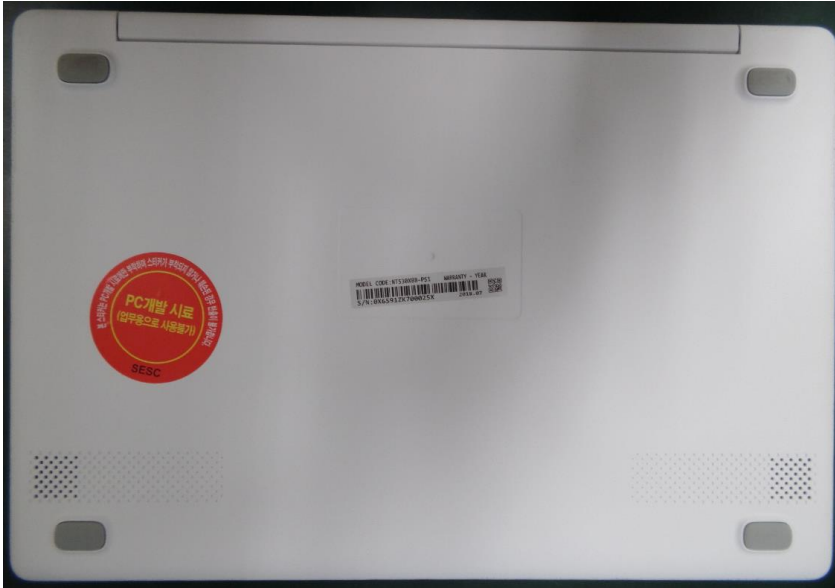
## BLOCK DIAGRAM



DATE	Y2 K2M	DATE	01/11/2012	TITLE	AMN1_1SBDW	SAMSUNG ELECTRONICS
DRWER	WS JUNG	DRW BY	Phob	MAIN		
APPROVAL	MX KIM	REV	1.0	BLOCK DIAGRAM		
MANUAL CODE		DATE				PART NO. BA1-00002A
						1 4/4

❑ Assembly order is reverse of disassembly

## Common



1. Make sure to separate the AC adapter before disassembling the system.
2. Put the Computer on the flat as the picture showing .

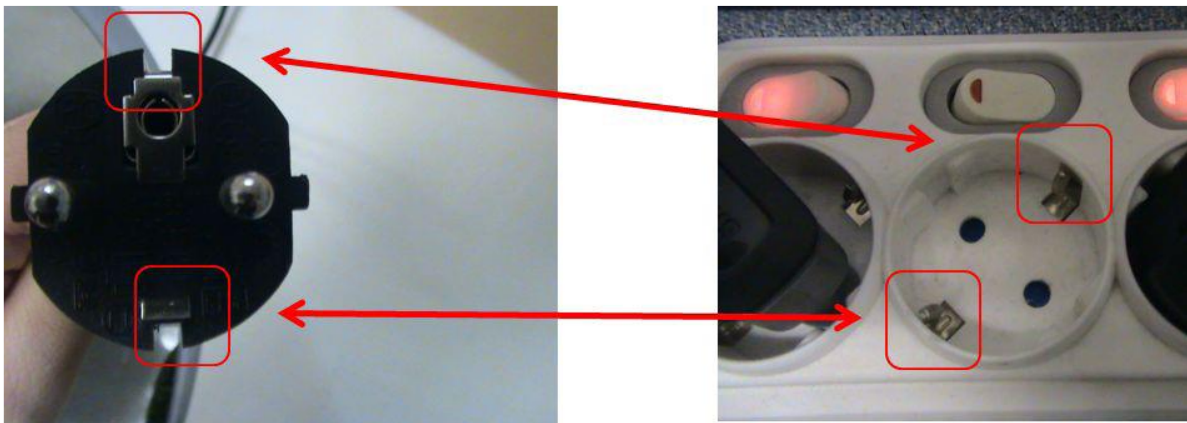
### 1.3. Ground

The product must be grounded to protect it from static electricity and other dangers. When using a multi tap, please use a multi tap with a ground terminal only.

If you use a 220V wall outlet with a ground terminal, you do not need to ground it additionally. Avoid using wall outlets if they are not grounded even if they have a ground terminal.

To ground the product, connect the ground to an exclusive ground terminal or metal water pipe. Connect the ground cable to the ground terminal at the rear of the main body. To ground the product, connect the ground terminal of the product to a metal water pipe, wall outlet or exclusive ground terminal with an electric wire equal to or thicker than #18.

Never ground the product to a PVC water pipe, phone line, TV, radio antenna, aluminum window or gas pipe, because this does not actually ground the product and may be dangerous.



Ground portion of the outlet

Ground portion of the multi-tap

**The red box of each image is earth with overlap when inserting a plug or multiple-tab into the socket.  
Please check that it should be put the outlet completely.**

## 1. Product description and Installation

- Concept
- Spec
- System view and Function
- Enhanced Function (Null)
- Hardware
- Software & Driver LIST
- Software
- Bios Setting
- System Description
- HW optional component
- Installation

## 2. Circuit Analyze

- System Block Diagram
- IC Information
- System Layout
- Board Component

## 3. Disassembly & Assembly

- Main System
- LCD Ass'y

## 4. Trouble shooting

- General Spec
- Debugging Flowchart
- H/W & OS trouble shooting
- H/W upgrade
- BIOS / MICOM Update
- Remark general diagnosis
- Diagnosis Program

## 5. Reference

- Intel cpu performance
- LCD / HDMI Reference
- Caution and Terms

# 2. Main Debugging Flowchart

Confidential

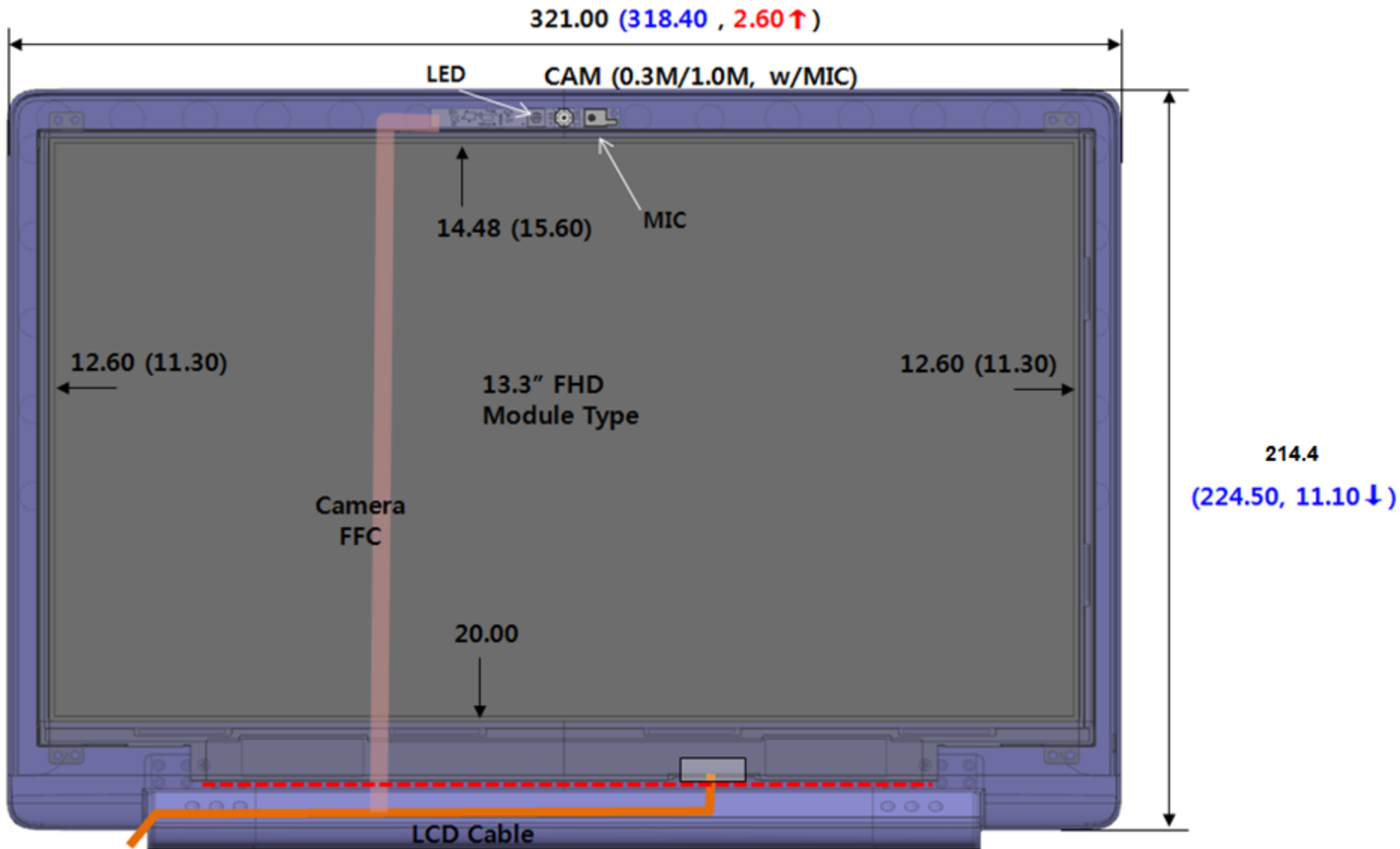
Debugging Flow of Samsung's computer product is universal between products.

Refer to attached Debugging Flowchart for more contents.



Debugging  
Flowchart

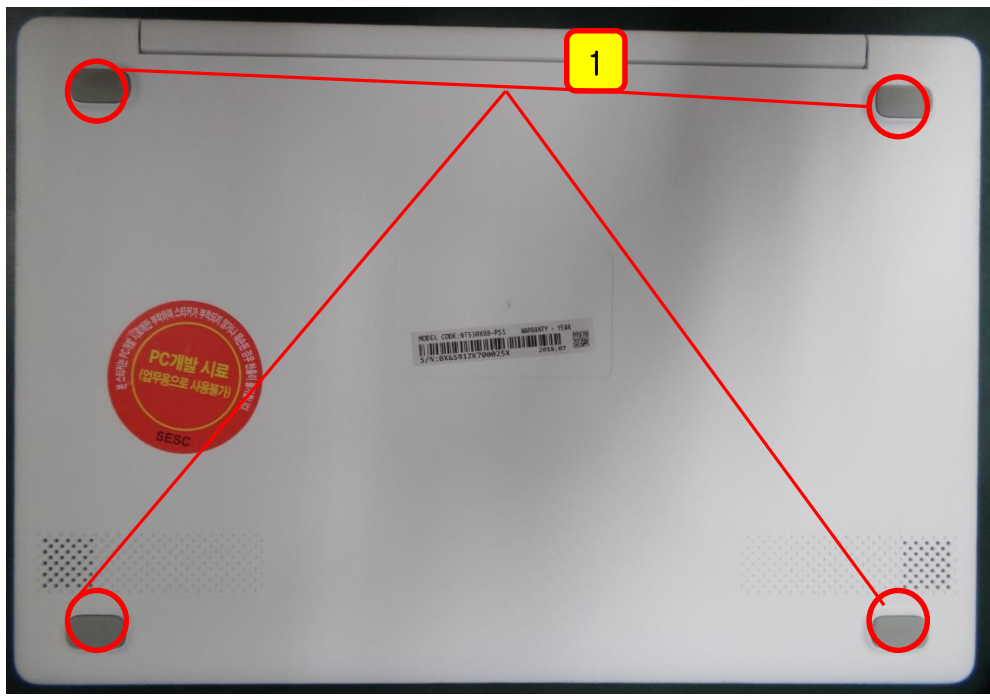
# 3. Glide-13GLK System Layout



# 1. Main System

□ Assembly order is reverse of disassembly

## Common



3. Disassembly the screw on case rear.

**SCREW-MACHINE**  
**(6001-003312) 4PCS**  
**Torque : 2.3 ~ 2.7KgfcM**

## **1.4. Static Electricity Precautions**

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Many parts of the system are susceptible to static electricity. Using an electrostatic discharge (ESD) device is very important for the safety of the user and the user's surroundings. Using an ESD device increases the probability of a successful repair and lowers the expenses for damaged parts.

To prevent static electricity, follow the instructions below.

- 1) Perform the repair in a location without static electricity.
- 2) Touch your hands to a metal water pipe or some metal object connected to the ground to discharge any static Electricity from your body before handling the parts.
- 3) Touch only the edges of the board, if possible.
- 4) Do not touch any parts unless absolutely necessary
- 5) Disassemble the parts on the anti-static-electricity pad.
- 6) When a board is not installed in the system, package the board with an anti-static-electricity packaging.

## Sales Points



### Performance

- \* Intel(R) UHD Graphics 600(CEL CPU)  
Intel(R) UHD Graphics 605(PDC CPU)
- \* Storage Support : SSD only /eMMC only
- \* Max 8GB LPDDR4 Memory at 2400MHz

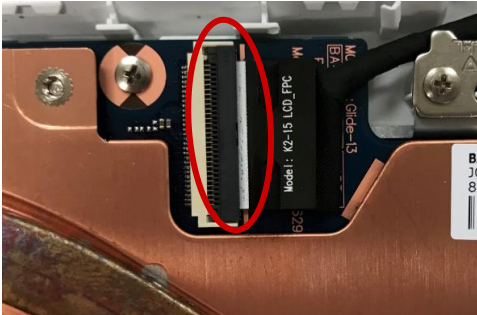
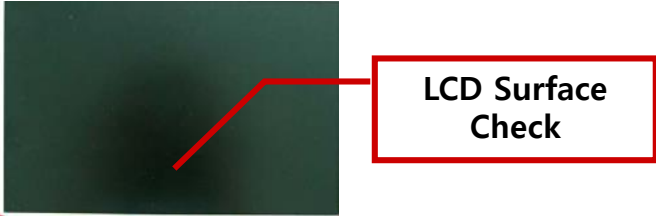
### Accurate & Stable Typing

- Comfortable typing with curved keycaps
- Unique shape design, just like a typewriter.

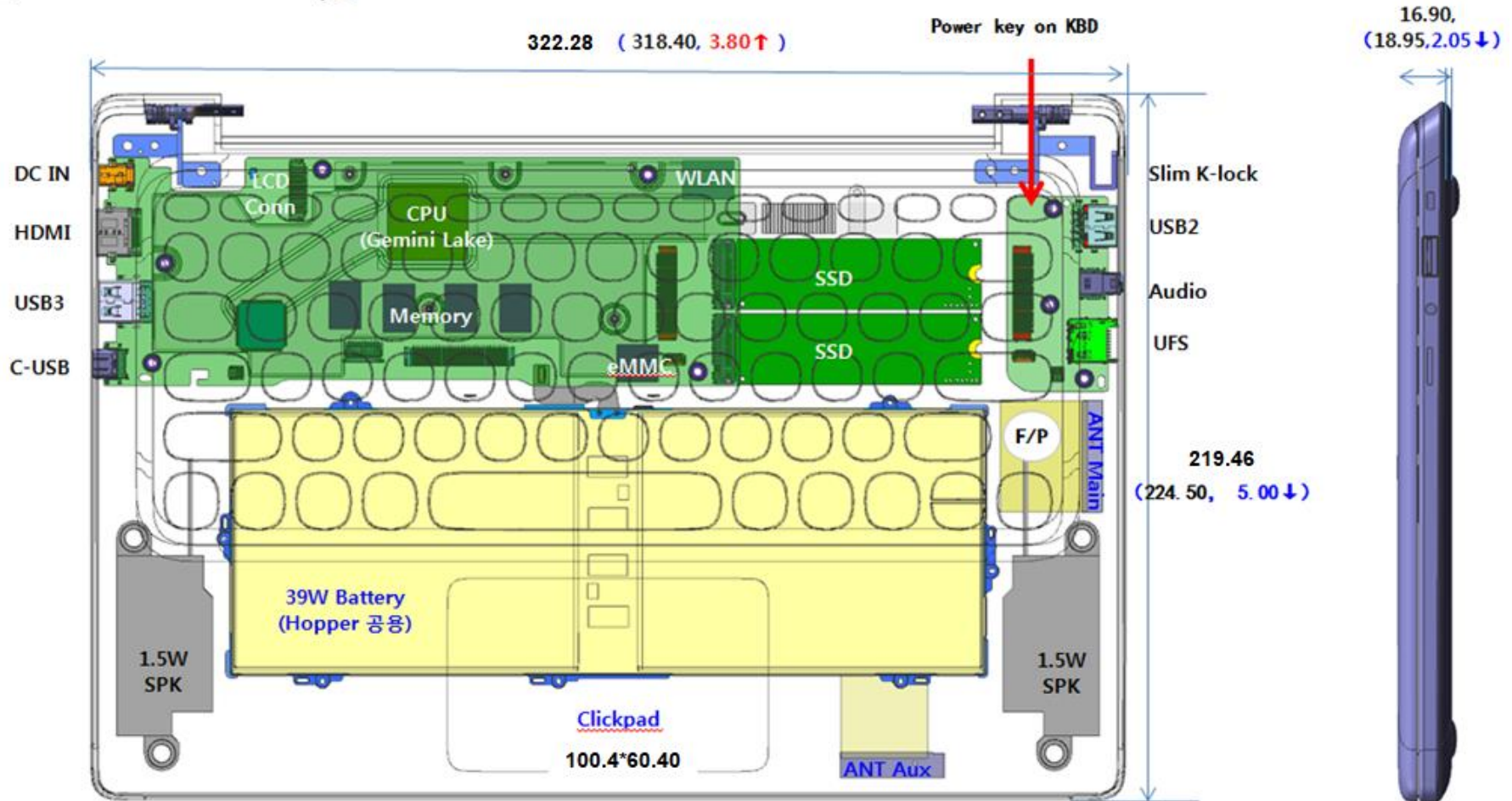
*\* Factory Option*

# 3. H/W & OS trouble shooting (1)

## ❖ Problems related with LCD

#1. The screen is dark or the colors of the screen are distorted.		
1	<p>Check the connection status</p> <ul style="list-style-type: none"> <li>- LCD Cable on Main board side connector</li> <li>→ Make sure Cable is inserted correctly</li> </ul>	
2	<p>Replace the LCD cable</p>	<p>Defectiveness confirmation</p>
3	<p>Check if there is a part of the LCD that is bent or broken due to impact</p> <ul style="list-style-type: none"> <li>→ Replace the LCD Ass'y</li> </ul>	
4	<p>For TSP LCD, Check TSP fail by diagnostic program</p> <ul style="list-style-type: none"> <li>→ Replace the TSP LCD</li> </ul>	

# 4. Glide-13GLK System Layout



□ Assembly order is reverse of disassembly

## Common

4. Remove the case rear as arrow direction
  - Disassemble the Case front and Case rear at the edge first.
  - And then disassemble case rear .





## Performance

Intel Gemini-lake Pentium/Celeron  
Intel(R) UHD Graphics 600(CEL CPU)  
Intel(R) UHD Graphics 605(PDC CPU)

Difference between IGFX for -->	HD 600	HD 605
Graphics Max Dynamic Frequency	750 MHz	800 MHz

## Usability



Fingerprint Sensor  
UFS (Universal Flash Storage)

## Connectivity



Intel 802.11 ac 2x2 + BT5.0

## Design




2018 new design  
13.3" FHD, Wide viewing-angle

*\* Factory Option*

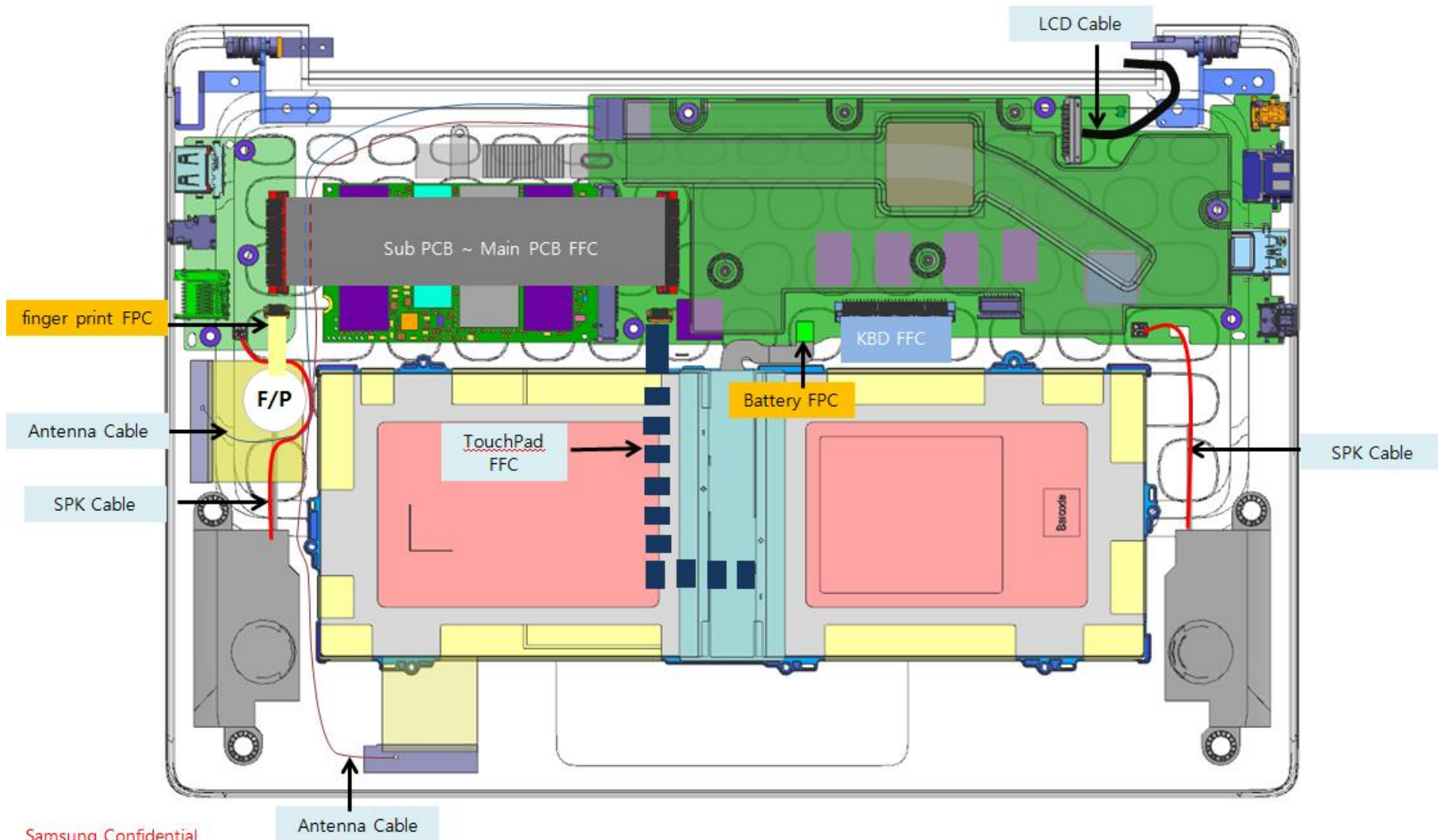
**Customized 13.3" 16:9 Notebook**

# 3. H/W & OS trouble shooting (2)

## ❖ Problems related with LCD

#2. No picture appears on the screen.		
1	<p>Check the connection status</p> <ul style="list-style-type: none"><li>- LCD Module LCD Cable</li><li>- LCD Cable and Main board LCD Connector</li></ul> <p>➔Connect Cable and Connector perfectly</p>	
2	<p>Check if the System LED of the main board is blinking</p>	
3	<p>Check if the Power button can be normally pressed.</p>	
4	<p>➔LCD cable or LCD replace</p>	<p>Check operating or not</p>

# 5. Glide-13GLK System Layout



Samsung Confidential

Antenna Cable

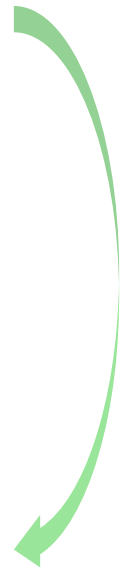
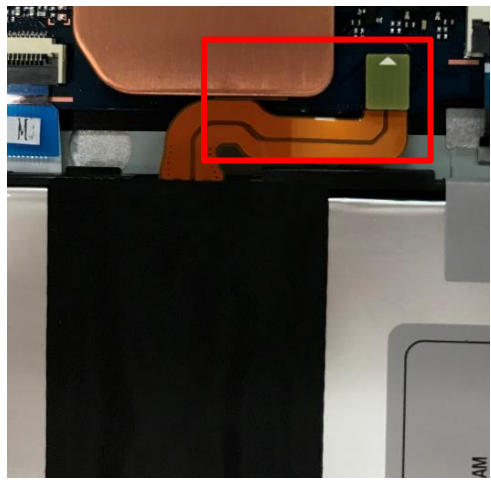
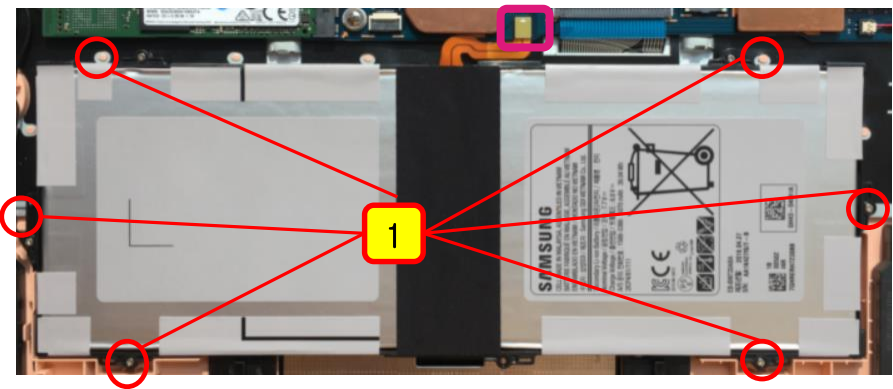
# 1. Main System

□ Assembly order is reverse of disassembly

## Common

- 5. (1) Disassemble screw of battery
- (2) Remove battery cable

SCREW-MACHINE  
(6001-003164) 6 PCS  
Torque : 2.3 ~ 2.7KgfcM



※ First disassemble screw, then disassemble battery cable.

# 1. Main feature 530XBB

\* Cause of not Test, not support Upgrade Spec



**Processors / Chipset**  
**CPU : Non Upgradable**  
 Intel Celeron N4000  
 Intel Pentium Silver N5000

**Memory**  
 2133Hz LPDDR4 4GB/8GB  
 (On Board, Unavailable for Upgrade, 2Ch Support )  
 No Memory Slot

**Expansion**  
 -1xUSB2.0+xUSB3.0 (Chargeble USB Not Support)  
 -1 x HDMI1.2  
 -1x USB-C [Max. 5Gbps(GEN1)  
 -Kensington Lock Port(3mm\*7mm)  
 - UFS , uSD support  
 - VGA Not support



## \* Graphic Solutions

Intel(R) UHD Graphics 600(CEL CPU)  
 Intel(R) UHD Graphics 605(PDC CPU)



## Communications

-Jefferson Peak 2; MOB type  
 -802.11agbn+160Mhz ac MIMO 2x2+ BT5.0 (BT5.0 WIN10 RS4 support)  
 -(On Board, Unavailable for Upgrade)



## Multimedia

-1 Web-camera(0.3M/480P)  
 - Integrated Digital Mic.  
 - High Definition Audio  
 - 2 Stereo Speakers (1.5W\*2)  
 -Headphone/MIC (Combo Type:4poles)



## \* Display(13.3 inch eDP type)

- LED LCD (16:9)  
 FHD(PANDA,1920 x 1080 pixel)  
 - 280nit (Anti-Glare) PLS type  
 - 3 Display Support (LCD,DP,HDMI)  
 - VGA not support



## \* Storage

-1. M.2 SATA3 SSD 128G/256G  
 - 2. eMMC 64G/128G  
 - Dual storage devices is supported(eMMC only model)



**Unavailable to change SSD Type**  
**Available to support initial installed SSD Type(eMMC only model)**

## \* Power Management (common)

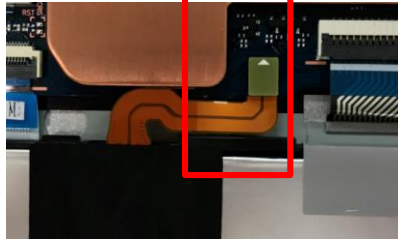
- 2 cell Battery (5070mAh)  
 - 39Wh (Li-ion Prismatic)  
 - 40W Adaptor,3pie



## \* Size /Weight (common)

- 322.2 x 219.5 x 16.9 mm  
 - Weight : 1400g±5%

## ❖ Problems related with Power

#1. The system cannot power on		
1	Check if the adaptor is plugged in.	
2	Check if battery is plugged in correctly.	
4	Change Mainboard	

# 7. Board Component- Top(INT)



1. DC-IN Jack
2. HDMI Connector
3. USB3.0 port
4. Type C port
5. eMMC

# 1. Main System

□ Assembly order is reverse of disassembly

## Common

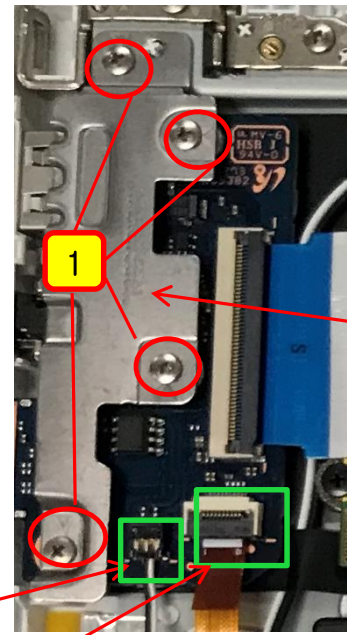
- 6 . (1) Remove screw of USB sub board bracket
- (2) Remove BRACKET-SUB-PORT
- (3) Remove the sub board
- (4) Remove USB FFC
- (5) Remove SPK-R CABLE
- (6) Remove Fingerprint FPC

**SCREW-MACHINE**  
**(6001-003312)** 4 PCS  
Torque : 2.3 ~ 2.7KgfcM

**BRACKET-SUB-PORT**  
**(BA61-03794A)** 1PCS

5. SPK-R CABLE

6. Fingerprint FPC



# 2. SPEC 530XBB

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## \* Factory Option

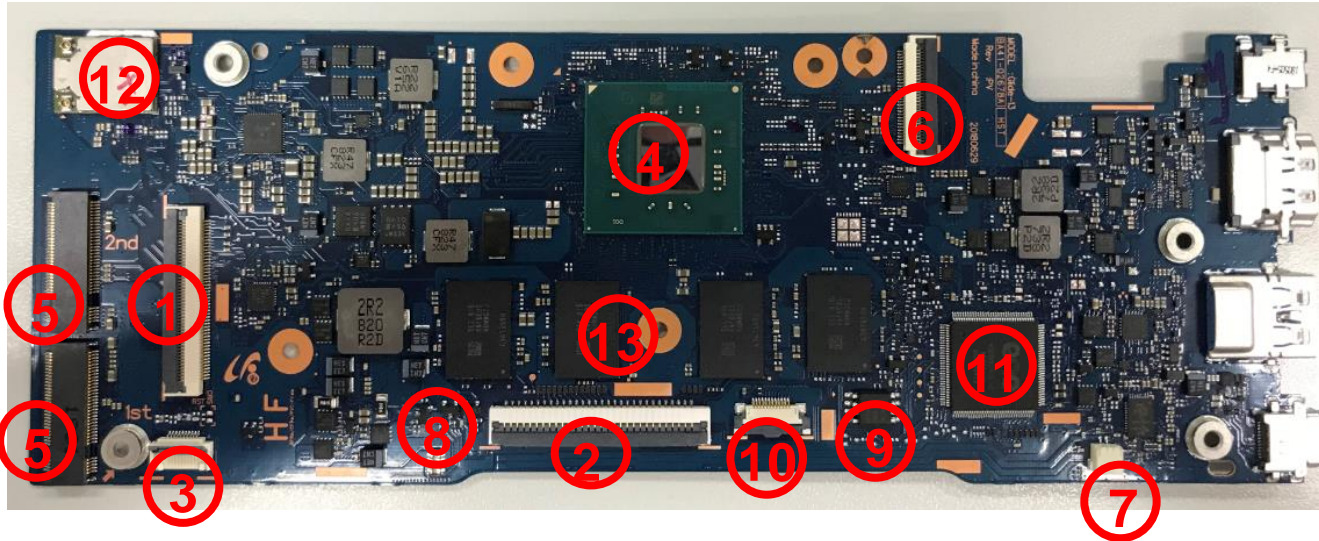
Software	OS*	Linux
		Windows 10 Home Windows 10 Home S
Platform	Processor*(one chip)	Intel Celeron N4000 Intel Pentium Silver N5000
	Chipset	N/A
Memory	System Memory*	LPDDR4 2133MHZ On BD 4G LPDDR4 2133MHZ On BD 8G
Graphics	Graphics Processor*	Intel(R) UHD Graphics 600(CEL CPU) Intel(R) UHD Graphics 605(PDC CPU)
	graphics Memory*	Shared Memory (Internal Graphics)
Display	LCD*	13.3 16:9 FHD LCD (1920 x 1080 pixel); eDP type
Multimedia	Speaker	2 Stereo Speaker (1.5W x 2EA)
	Web-Cam	0.3M 480 pixel ATIV VGA Camera
Storage	SSD/eMMC*	1. M.2 SATA SSD 128G 2. eMMC 64G/128G Dual storage devices is supported (eMMC Only Model, NVMe SSD Not support)
Communication	Wired LAN	None
	Wireless LAN/Bluetooth	Jefferson Peak 2; MOB WLAN(CNVI),802.11agbn+160Mhz ac MIMO 2x2+ BT5.0
	3G comm.(Option)	None
I/O Ports	Card Slot	UFS Slot(UFS 256G,uSD 128G support)
	Others	1x USB3.0 + 1x type-C + 1x USB2.0,HP-out/Mic.-in(Combo type:4 pole). ,HDMI1.2
Security	Security Feature	Kensington Lock Port(3*7mm), BIOS Boot Up / HDD Password
Power	Adapter	40W 3pie Power Adapter
	Battery	Standard battery 2Cell (5070mAh)
Physical	Dimension	322.2 x 219.5 x 16.9 mm
	Weight*	1.4kg

## ❖ Problems related with Power

### #2. the system does not boot or immediately turns off after being turned on.

1	Since this may be a short circuit in the system,	Disconnect the power immediately, disassemble the system and check if there are any conducting alien objects such as a screw inside.
2	Replace Main Board.	*Check if it is out of order.

# 9. Board Component- Bottom



1. USB SUBBOARD Connector
2. KBD Connector
3. TOUCHPAD Connector
4. CPU
5. SSD Connector
6. LCD Connector
7. Speaker Connector(Left)
8. Battery connector
9. BIOS ROM  
(GIGADE/GD25B64CSIGY)
10. Debug connector
11. MICOM
12. WLAN MOB
13. On BD memory

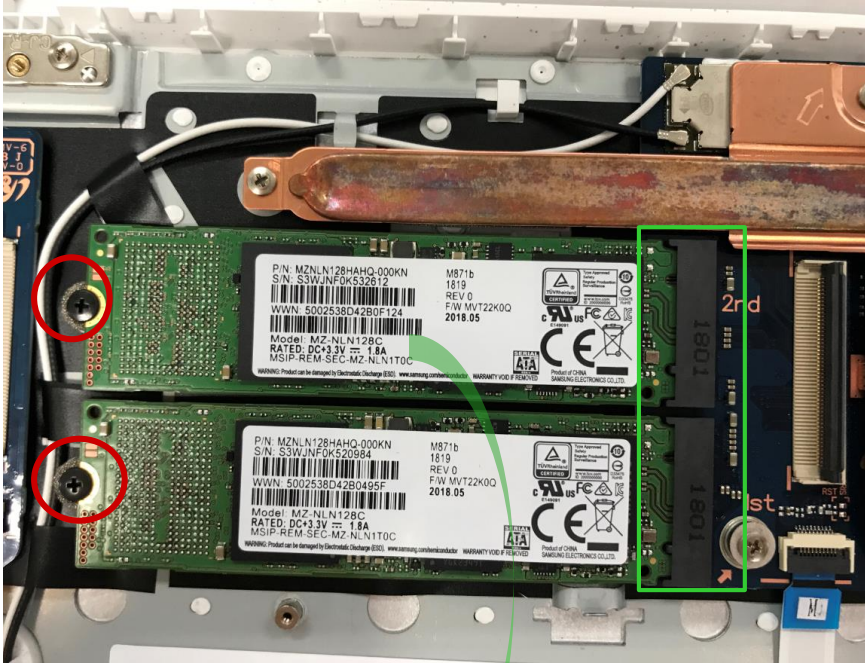
# 1. Main System

□ Assembly order is reverse of disassembly

## Common




- 7. (1) Disassemble SSD screw
- (2) Remove SSD module

**SCREW-MACHINE**  
**(6001-002795) 2 PCS**  
**Torque : 2.3 ~ 2.7Kgfcm**



# 3. Compare 530XBB

**Confidential**

		Acer Swift1		Glide 13"		LG 13U370
Image						
Mobility	X-Y-Z	319.5 x 225 x 14.95mm	>	322.2 x 219.5 x 16.9 mm	>	321.0 x 223 x 19 mm
	Weight	1.3Kg	=	1.4Kg	=	1.3Kg
	Battery	54.8Wh	>	39Wh	=	40Wh
Design	Color	3 Colors	=	3 Colors (Apricot, Charcoal, White)	>	1 colors (Silver)
	Material	A/C Metal		Plastic (Textile pattern)		A/C Metal
Performance	LCD	13.3" FHD IPS	=	13.3" FHD PLS	=	13.3" FHD IPS
	CPU	Intel APL	=	Intel Geminilake	=	Intel APL
	Memory	DDR3L	=	LPDDR4	=	DDR3L
	Storage	Up to 256GB SSD	=	Up to 256GB SSD	=	Up to 512GB SSD
Usability	F/P	Fingerprint (Windows Hello)	=	Fingerprint (Windows Hello)	>	N/A
	WLAN	802.11 ac 2x2	=	802.11 ac 2x2 Jefferson Peak2 (1.7G bps)	>	802.11 ac 1x1
	LAN	None	=	None	=	10/100 (Micro USB dongle)
	CAM	VGA(480p)	=	VGA(480p)	=	VGA(480p)
	Ports	1xType-C, 2xUSB3.0, 1xUSB2.0, HDMI, HP/Mic, SD	<	1xType-C, 1xUSB3.0, 1xUSB2.0, HDMI, HP/Mic UFS(Micro SD)	>	1xUSB3.0, 2xUSB2.0, HDMI, HP/Mic Micro SD, Micro USB
	Keyboard	Backlit(option)	<	Retro keycap	>	Normal

# 3. H/W & OS trouble shooting (5)

## ❖ Problems related with battery

### #3. The system battery is not recharged.

1

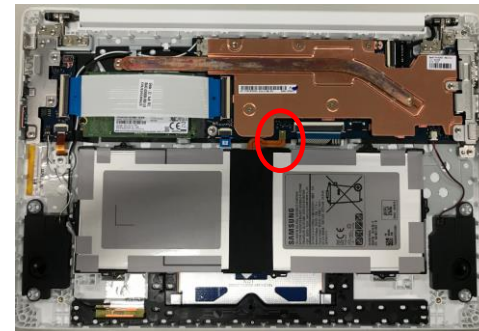
Check if Battery is plugged in correctly  
→ If not, plug in the Battery

2

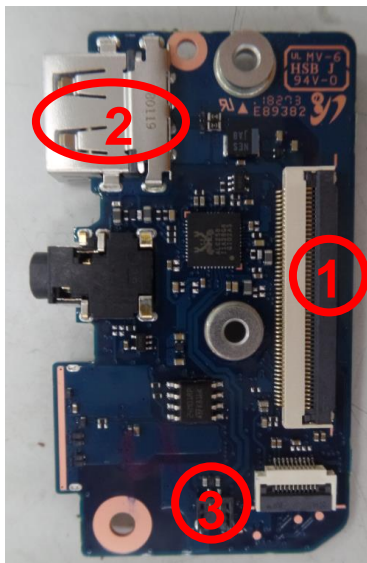
Change battery or Main board

3

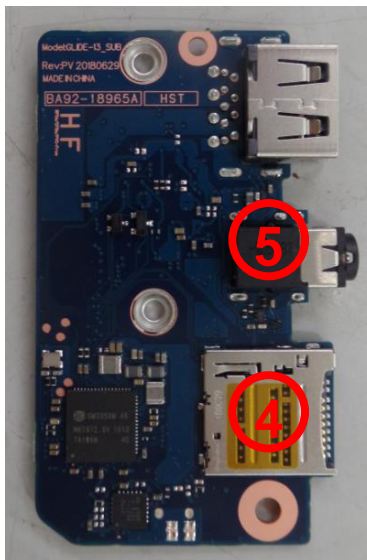
Check Battery fail by diagnostic program  
→ Replace the Battery



# 11. USB\_Sub Board Component



1. USB Sub Board Connector
2. USB 2.0 ports
3. Speaker Connector (Right)
4. UFS Slot
5. Mic/HP Connector



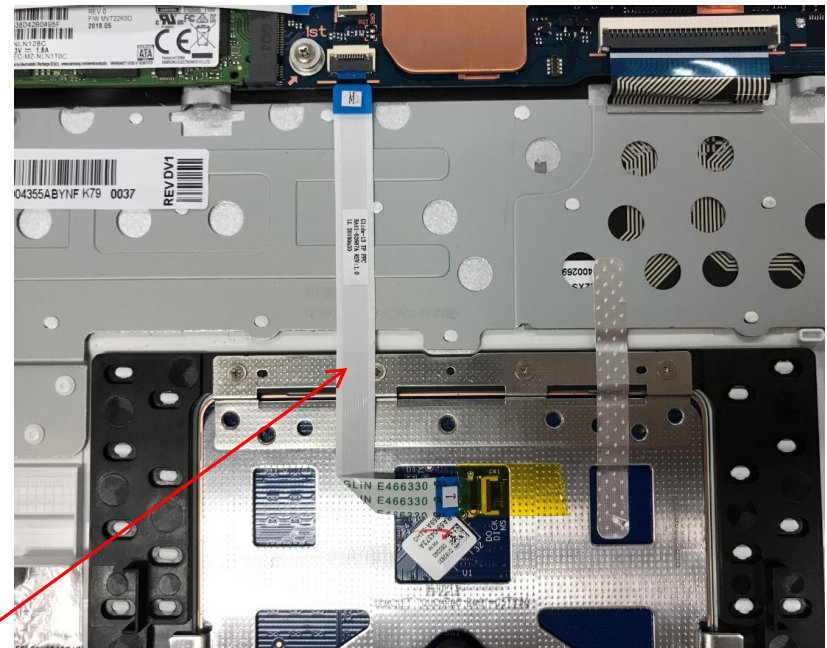
# 1. Main System

Confidential

□ Assembly order is reverse of disassembly

## Common

8. Remove FFC of T/P sub board cable



Touchpad FFC

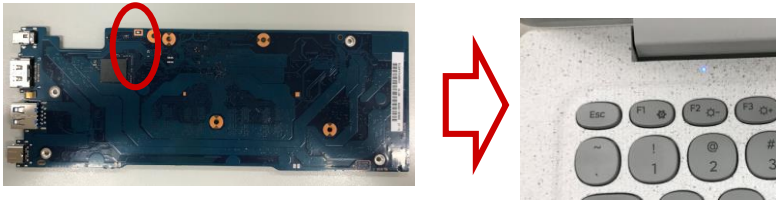
**※Caution※**

- If the customer turn on the power first, set the system time and date that is initialized  
(Reason : The laptop does not have RTC Battery)
- Also, in case that the user attach battery(not RTC battery) again after detaching it, should set the time and date

# 3. H/W & OS trouble shooting (6)

## ❖ Problems related with Storage

#4. The system can power on, but cannot boot into Windows		
1	If the ' <b>Operating system not found</b> ' message appears during the booting process - Check if SSD/HDD is recognized by CMOS,	<ol style="list-style-type: none"> <li>1. If SSD is recognized, Format the SSD and reinstall the operating System.</li> <li>2. If SSD is not recognized, Reassemble SSD from main board</li> </ol>
2	Check Battery SSD by diagnostic program → Replace the SSD	

#5. The system can power on, but LED on power button does not lit up.		
1	Check if there is any material blocking the LED	
2	Change Main board	

# 1. Main System

Confidential

□ Assembly order is reverse of disassembly

## Common

9. (1) Remove WLAN antenna

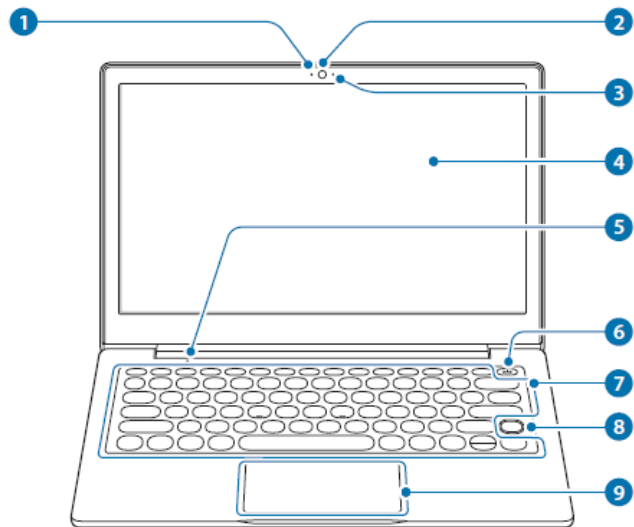
1. WLAN antenna





# 4. System view and Function (1)


Confidential

Front view



Number/Name	Description
1 Camera indicator light	<ul style="list-style-type: none"><li>This indicates the camera operating status.</li></ul>
2 Camera	<ul style="list-style-type: none"><li>Using this camera, you can take still pictures and record video.</li></ul>
3 Microphone	<ul style="list-style-type: none"><li>You can use the built-in microphone.</li></ul>
4 LCD	<ul style="list-style-type: none"><li>The screen's images are displayed here.</li></ul>
5 Operating status LED	<ul style="list-style-type: none"><li>Shows the operating status of the computer.<ul style="list-style-type: none"><li>– <b>Blue:</b> Turned on</li></ul></li></ul>
6 Power button 	<ul style="list-style-type: none"><li>Turns the computer on and off.</li></ul>
7 Keyboard	<ul style="list-style-type: none"><li>Enter text or control computer functions.</li></ul>
8 Fingerprint recognition sensor 	<ul style="list-style-type: none"><li>Scans a fingerprint to unlock the screen.</li></ul>
9 Touchpad	<ul style="list-style-type: none"><li>Moves the cursor and selects options.</li><li>Functions as a mouse.</li></ul>

## ❖ Problems related with USB function

The system does not recognize USB devices		
1	Make sure the USB device receives enough power (some USB devices need external power source)	
2	Control Panel -> Device management -> USB2.0 / 3.0 driver checking	
3	Replace main board	



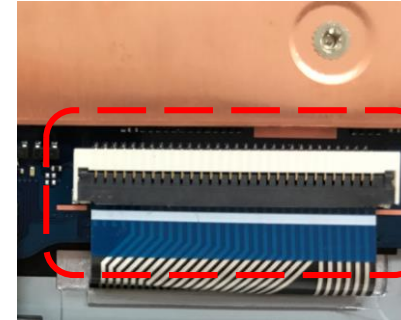
# 1. Main System

□ Assembly order is reverse of disassembly

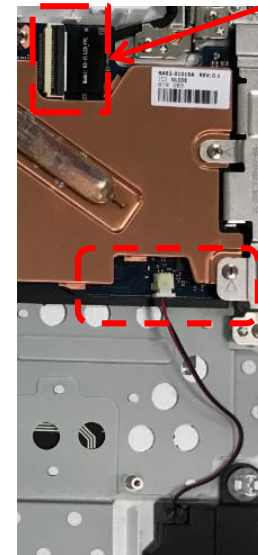
## Common

- 10. (1) Remove KBD Membrane
- (2) Remove SPK-L CABLE
- (3) Remove LCD Cable

1. KBD FFC Membrane

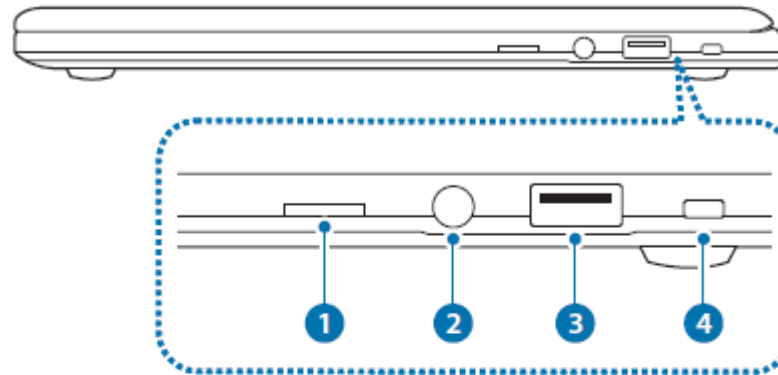


4. LCD CABLE




3. SPK-L CABLE

## Right view



Number/Name	Description
① Memory card slot (optional)	<ul style="list-style-type: none"><li>• Insert a memory card into the slot.</li></ul>
② Earpiece/Headset jack	<ul style="list-style-type: none"><li>• Connect an earpiece or a headset to the computer to listen to audio.</li></ul>
③ USB 2.0 port	<ul style="list-style-type: none"><li>• Connect various peripheral devices, such as a mouse, camera, or keyboard.</li></ul>
④ Slim security slot	<ul style="list-style-type: none"><li>• Secure the computer by connecting an optional lock and cable to it.</li></ul>

## ❖ Problems related with TP

TP function is abnormal, or does not work	
1	Control Panel -> Device management -> I2C HID device check
2	Make sure TP FFC & PCB is connected 
3	Change FFC & front Ass'y
4	Please check T/P Ass'y trouble shooting. Fail -> change T/P Ass'y.

# 1. Main System

□ Assembly order is reverse of disassembly

## Common

11. (1) Remove the screws of BRACKET-MAIN-PORT & main board

SCREW-MACHIN

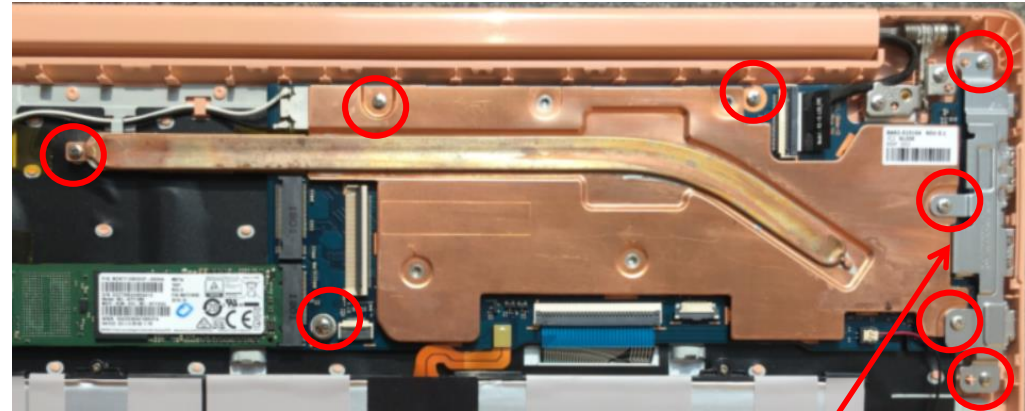
(6001-003312) 8 PCS

Torque : 2.3 ~ 2.7KgfcM

(2) Remove BRACKET-MAIN-PORT

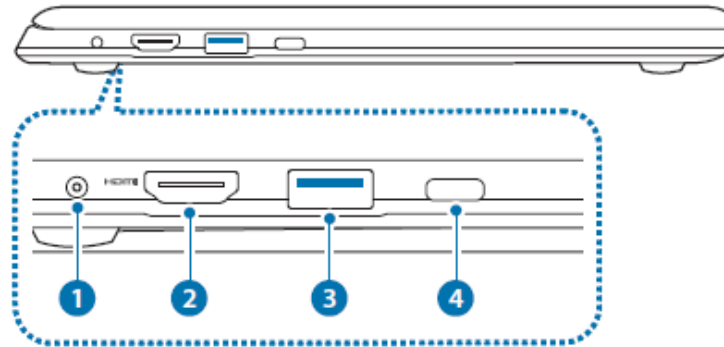
BRACKET-MAIN-PORT

(BA61-03793A) 1 PCS




2. BRACKET-MAIN-PORT

## Left view



Number/Name	Description
1 DC jack	<ul style="list-style-type: none"><li>This jack connects to the AC adapter to supply power to the computer.</li></ul>
2 HDMI port <b>HDMI</b>	<ul style="list-style-type: none"><li>Used to connect an HDMI cable to an external device.</li></ul>
3 USB 3.0 port	<ul style="list-style-type: none"><li>Connect various peripheral devices, such as a mouse, camera, or keyboard.</li></ul>
4 USB-C™ port (optional)	<ul style="list-style-type: none"><li>Connect and charge a USB-C™ device, or connect to an external display device.</li></ul>

## ❖ Problems related with KBD

KBD function is abnormal, or does not work		
1	Try checking KBD driver in control panel	
2	Check lighting of Caps Lock, TPAD, Fn Lock	
3	Check KBD FFC connection	
4	Check Keyboard fail by diagnostic program ➔ Replace the Keyboard	



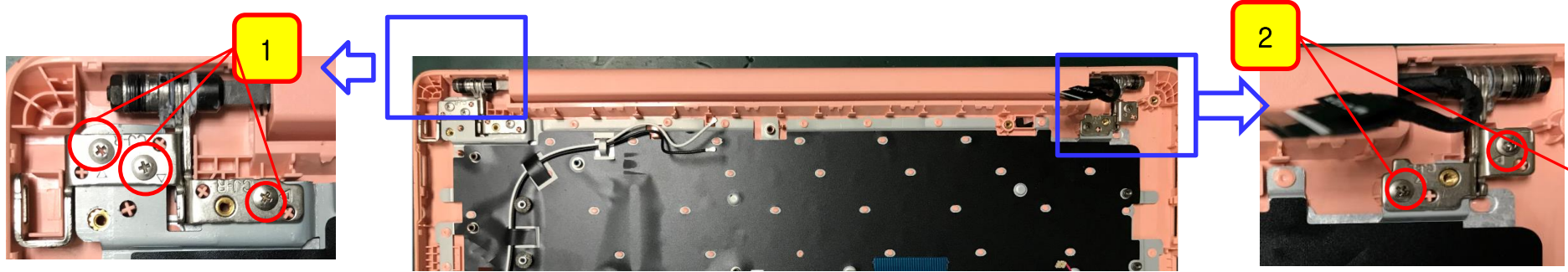
# 1. Main System

□ Assembly order is reverse of disassembly

## Common

### 12. Remove SCREW-MACHINE

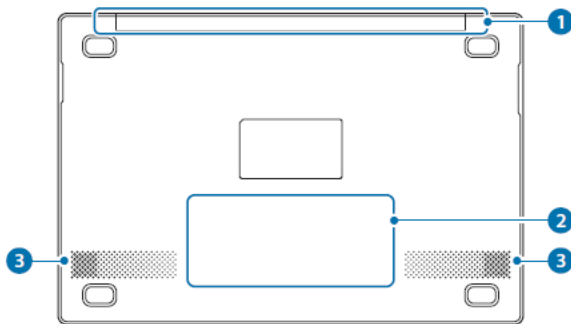
SCREW-MACHINE  
(6001-003312) 5 PCS  
Torque : 2.3 ~ 2.7Kgfc



# 4. System view and Function (4)

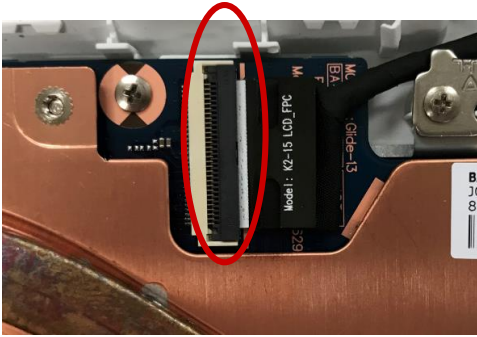
Confidential

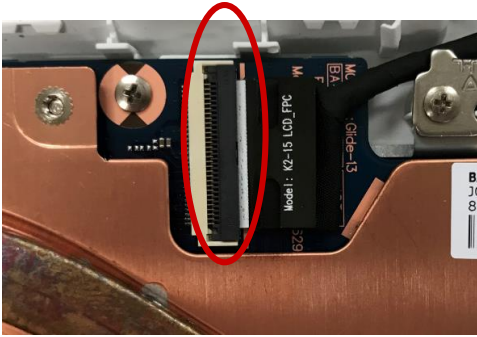
Bottom view



Number/Name	Description
1 Fan vents	<ul style="list-style-type: none"><li>• The internal heat of the computer is emitted through these holes.</li><li>• If the vents are blocked the computer may overheat. Avoid blocking the vents as this may be dangerous.</li></ul>
2 Internal battery	<ul style="list-style-type: none"><li>• Provides power to the computer when not connected to an AC adapter.</li><li>• To remove or replace the internal battery, take it to a Samsung Service Center. You will be charged for this service.</li></ul>
3 Speaker	<ul style="list-style-type: none"><li>• Sound is emitted from the speakers.</li></ul>

## ❖ Problems related with camera

Camera function is abnormal, or does not work		
1	Check device manager and make sure camera driver (under imaging devices) is loaded correctly	
2	Check LCD cable connection	
3	Check Camera fail by diagnostic program → Replace the Camera module or Camera cable or LCD Assy.	

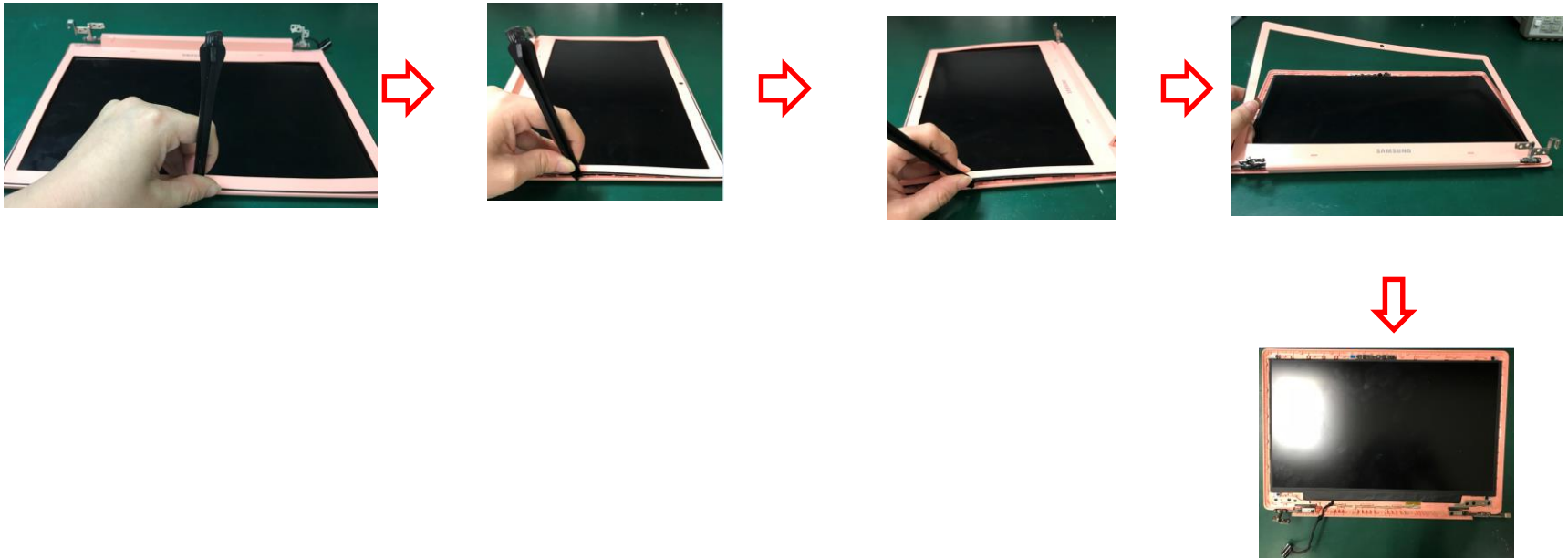


# 2. LCD Assembly

□ Assembly order is reverse of disassembly

## Common

1. Use Jig to disassemble CASE-LOWER.



# 4. System view and Function (5)

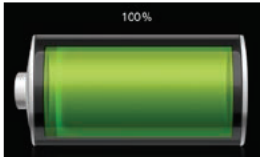
## Battery status

Move the cursor over the battery icon on the taskbar to view the current battery charge.



## Viewing the current battery charge when the computer is turned off

Connect or disconnect the AC adapter from the computer to view the current battery charge when the computer is turned off.



## Battery usage time

Batteries are replaceable items and over time the battery's capacity to hold a charge and its power level is reduced. If a battery can only hold its charge for half of the time that it could when new, it is recommended to purchase a new, replacement battery.

### Checking battery life instruction messages

When the battery has expired, an instruction message may appear on the screen. To prevent the computer from losing data and to use the computer safely, follow the on-screen instructions.

### When battery expiration is imminent

Batteries are consumable parts and the remaining battery life is currently low. Continued use may result in charge or discharge failures. Whether or not batteries can be used is determined based on safety evaluations. Please replace it with a new battery (genuine) to prevent data loss and ensure safe usage.

## Saving battery power

On the taskbar, select  → **Battery saver**.

**Battery saver mode is activated.**



Battery saver mode is disabled when the AC adapter is connected.

### When the battery has expired


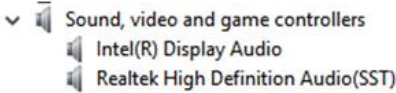

Batteries are consumable parts and the current battery cannot be used as the battery life has expired. Please replace it with a new battery (genuine) to prevent data loss and ensure safe usage. Whether or not batteries can be used is determined based on safety evaluations. To prevent data loss while replacing batteries, please be sure to save your work first.



Instruction messages related to battery life are displayed properly when the Samsung Settings application is installed on your computer. The messages may vary depending on the model and software version.

# 3. H/W & OS trouble shooting (11)

Confidential

#1. There is no sound from the speaker. (Insert the figure of the audio jacks so that the reader can check via the figure.)		
1	Check if the sound is muted after booting up Windows.	
2	Control panel confirmation. → Speaker Setting.	
3	Check the connection status of the speaker cable and check if the speaker is out of order.	
4	Check if there is a magnetic object near the speaker.	
5	Check Speaker fail by diagnostic program → Replace the Speaker	* If there is still no function, change main + sub board

# 2. LCD Assembly

□ Assembly order is reverse of disassembly

## Common

### 2. Remove LCD

(1) First remove Screw machine (LCD+UPPER)

SCREW-MACHINE  
**(6001-002795)** 4 PCS  
 Torque : 2.3 ~ 2.7KgfcM

(2) Remove the LCD Panel.

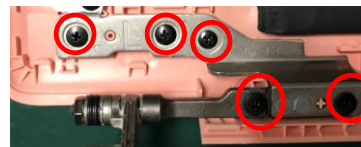


### 3 : Remove HINGE

(1) First remove Screw machine (HINGE+UPPER)

SCREW-MACHINE  
**(6001-002795)** 10 PCS  
 Torque : 2.3 ~ 2.7KgfcM

(2) Remove HINGE.

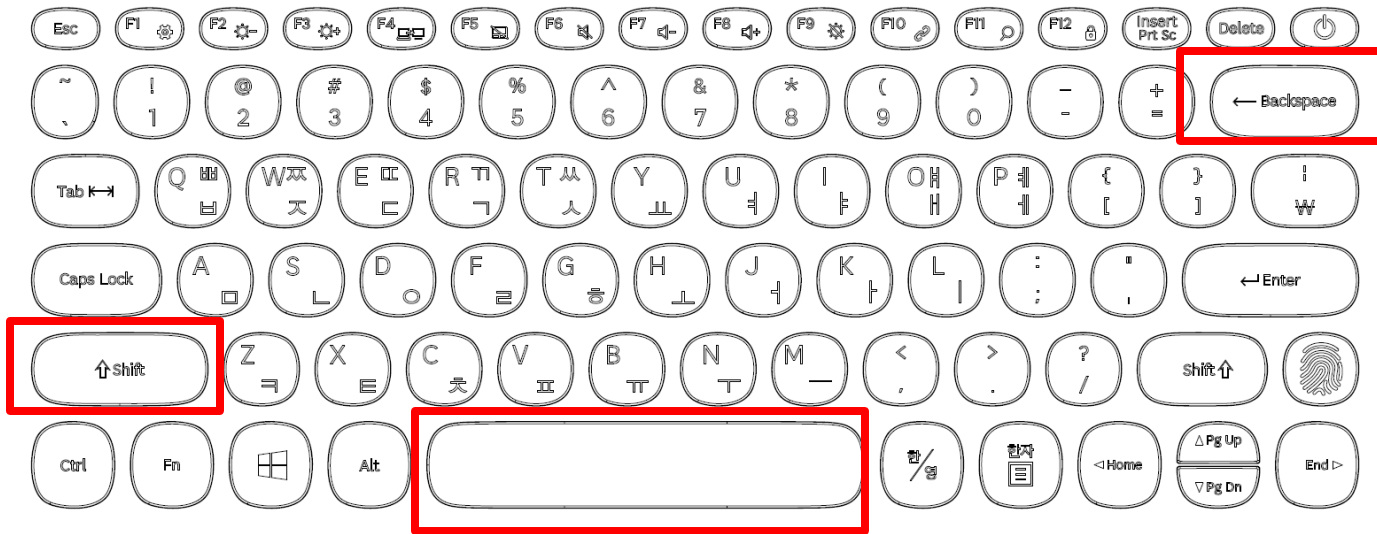


# 4. System view and Function (KBD)

Confidential

[13.0"]

Keyboard layout and dimension may be different



US: 3 Keys


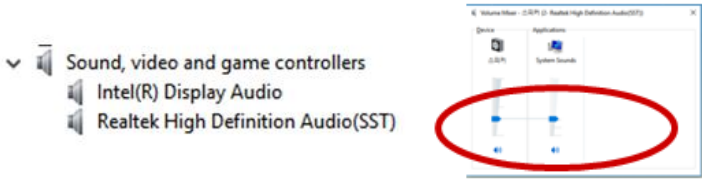

1. Shift (left)
2. Space
3. Backspace

Red Square : Keyboard water sensing paper location

The sensing paper meet water will change to red color

# 3. H/W & OS trouble shooting (12)

## ❖ Problems related to sound

<b>#1. There is no sound from the headphone/mic.                      (Insert the figure of the audio jacks so that the reader can check via the figure.)</b>		
1	Check if the sound is muted after booting up Windows.	
2	Control panel confirmation. → Speaker Setting.	
3	Check main board around audio connector. Check for any short circuit or soldering NG.	
4	Change Speaker or Main board or Sub board	

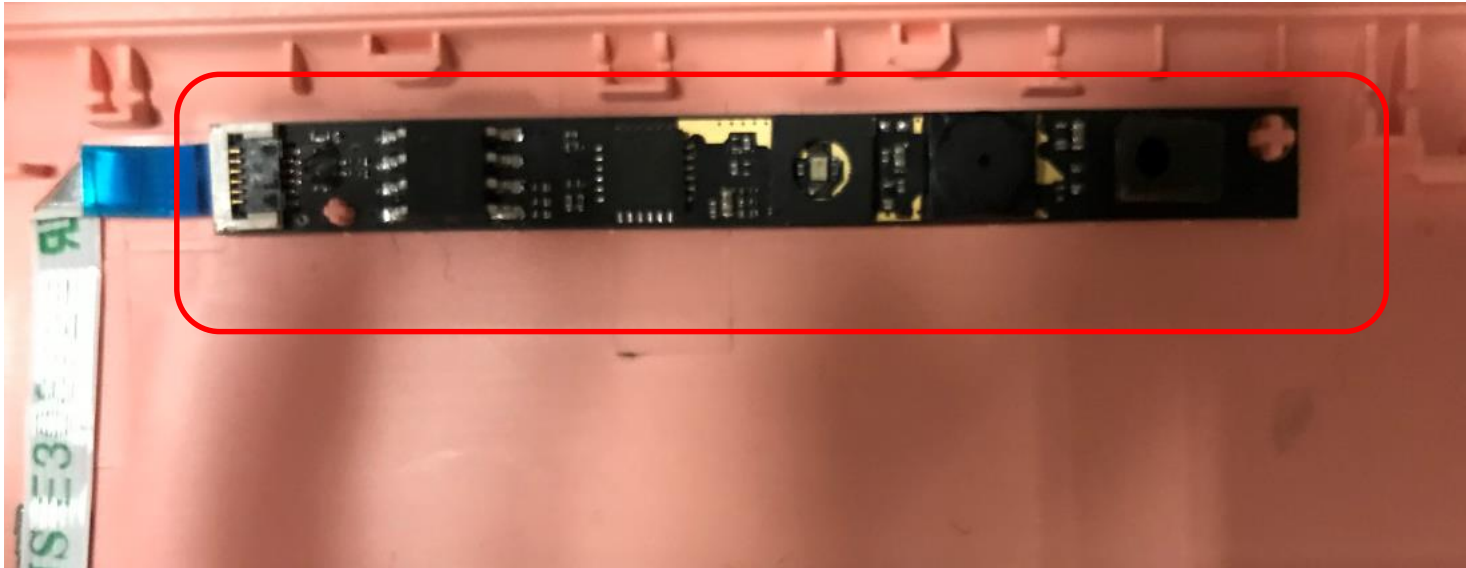
## 2. LCD Assembly

Confidential

□ Assembly order is reverse of disassembly

### Common

3. Remove Camera module



## Keyboard

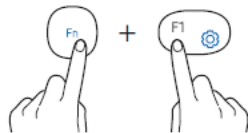
Enter text or access computer functions with the keyboard.



- Images and available features may differ depending on the model and operating system.
- The keyboard layout may differ depending on the country.

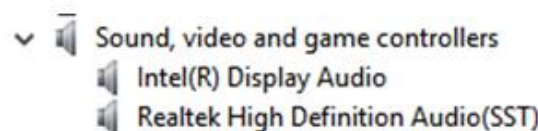
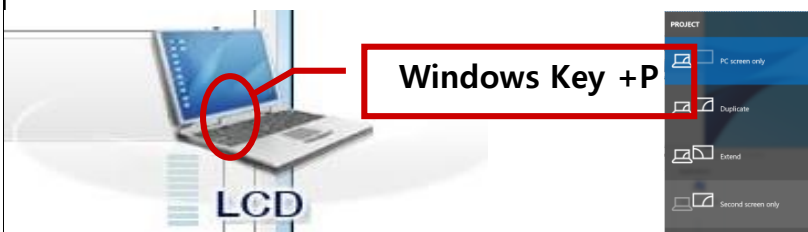
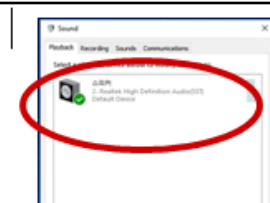
## Using hot keys

Press and hold the Fn key and press a hot key.



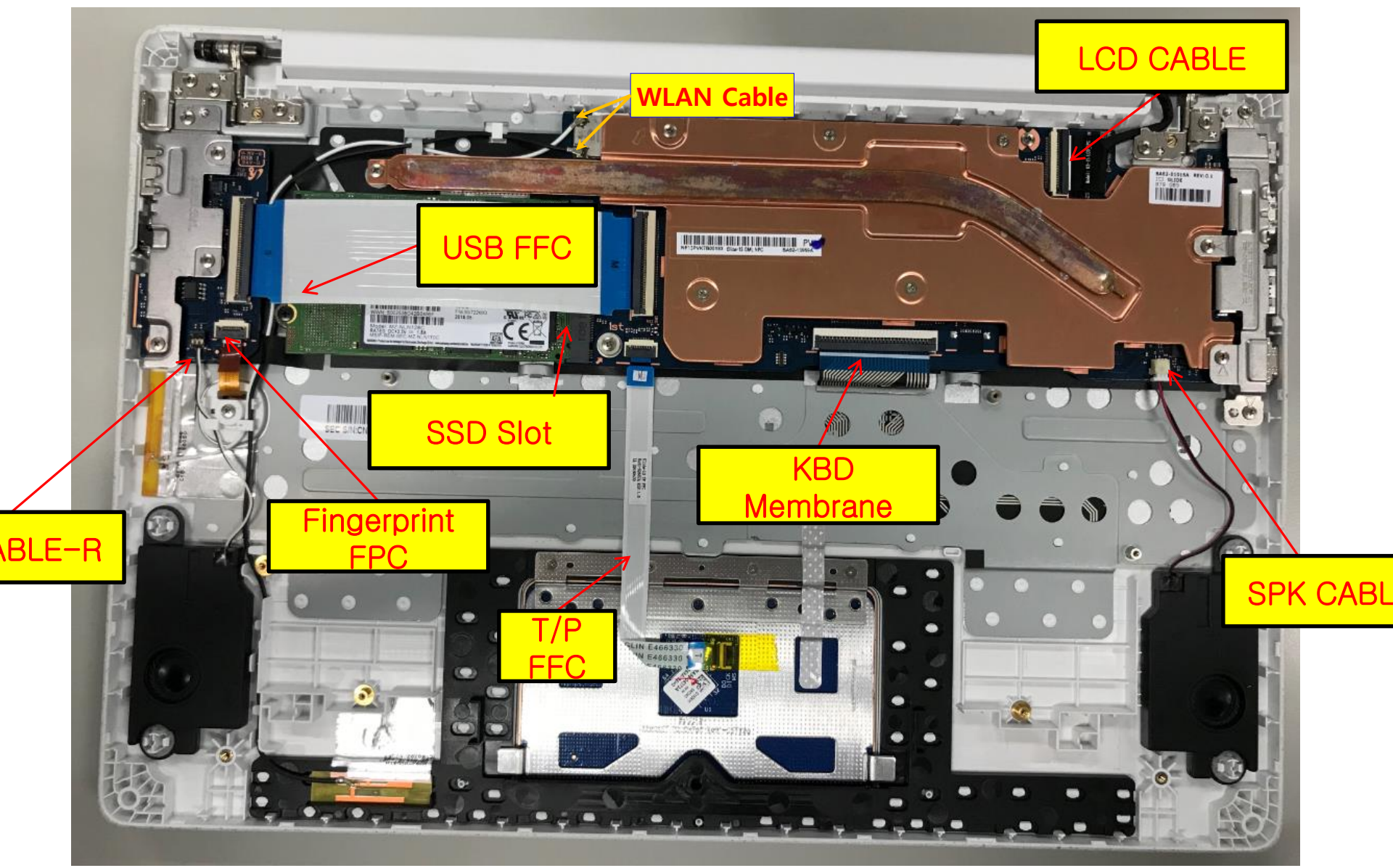
# 3. H/W & OS trouble shooting (13)

## ❖ External video-related issues









HDMI port does not work normally.		
1	System manager confirmation . (Video / Sound / Controller confirmation)  → HDMI driver Re-install.	
2	Check the Display Manager work normally.  → Display Manager program Re-install.	
3	Check the Control panel .  → Check HDMI section enable	
4	Replace Main Board.	*Check whether it is out of order.






# 3. Cable routing

Confidential




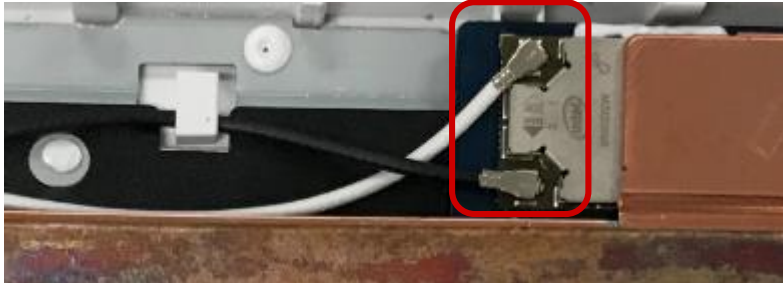
## Hot key functions

Key/Icon	Description
F1 	• <b>Windows Settings:</b> Launch the Windows Settings application.
F2 	• <b>Screen brightness control:</b> Adjust the brightness of the display.
F3 	
F4 	• <b>LCD/External monitor:</b> Switch between the LCD and an external display device when an external display device is connected to the computer.
F5 	• <b>Touchpad:</b> Turn the touchpad function on or off.
F6 	• <b>Mute:</b> Mute or unmute the audio.
F7 	
F8 	• <b>Volume Control:</b> Adjust the volume level.

Key/Icon	Description
F9 	• <b>Screen:</b> Turn the screen on or off.
F10 	• <b>Connect:</b> Connect to an external device, such as a Bluetooth device.
F11 	• <b>Search:</b> Search for applications, files, or settings by typing what you want.
F12 	• <b>Lock:</b> Lock the computer.
Fn + 	• <b>Right-click:</b> Perform the right-click function.

# 3. H/W & OS trouble shooting (14)

## ❖ Problems associated with wireless networks

AP (WLAN) or B / T devices can not connect.		
1	If the driver loaded correctly, check in Device Manager.	When loaded, AP signal is strong confirmation. Make sure that the BT unit power. Or Check the connection to another host. 
2	Wireless antenna connection or check the status of damage.	Change LCD A'ssy
3	Wireless Lan module connection or check the status of damage Main – White Aux - Black	
4	Check wlan module connector damage	
4	Check WLAN module connector damage → Replace the subboard	
5	Check WLAN fail by diagnostic program → Replace the subboard (WLAN module is MoB type, impossible to replace only WLAN module)	

# 3. System view and Function

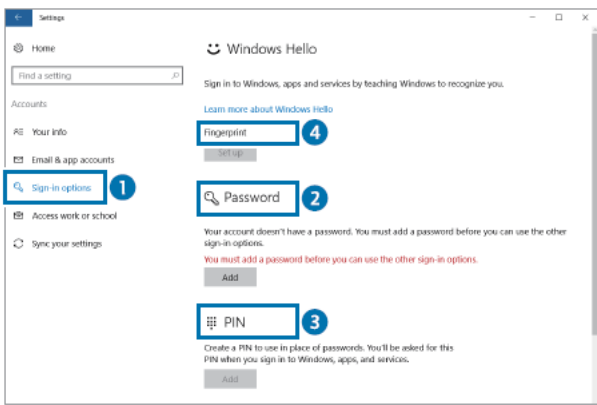
## Fingerprint recognition

You can unlock the screen using your fingerprint rather than entering a password.

## Registering your fingerprint

Create a Password and PIN first to use the fingerprint scan feature.

1 Select the Start button (Windows logo) → Settings → Accounts → Sign-in options.

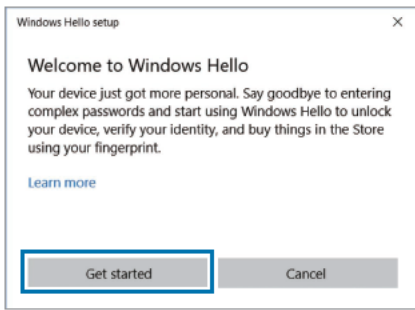


2 Select Add under Password to create a password.

3 Select Add under PIN to create a PIN number.

4 Select Set up under Fingerprint to start the fingerprint registration.

5 Select Get started on the Windows Hello setup window.



# 3. H/W & OS trouble shooting (15)


Confidential

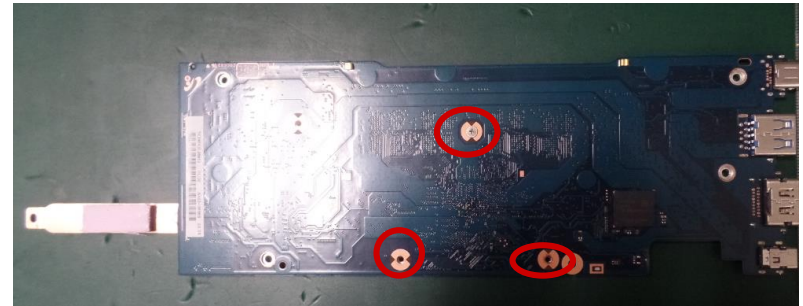
## ❖ Thermal related issue

The system temperature is too high.

1

Check the connection status of Heat sink

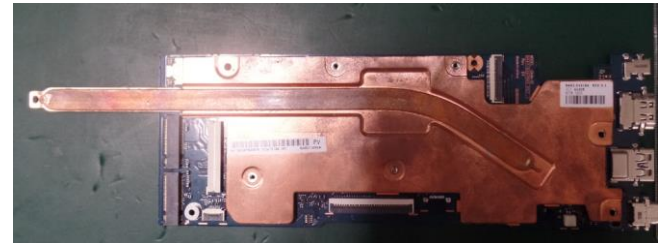
→Screw 3EA 



2

Replace RHE

\*Check if it is bent.



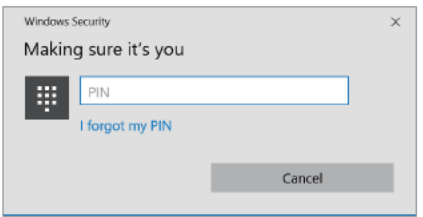
3

Replace Main Board.

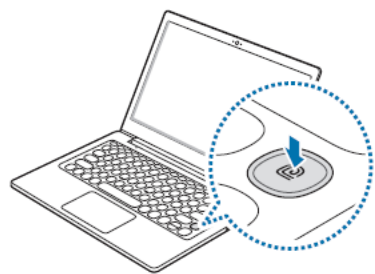
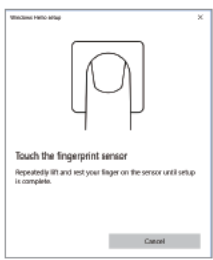
\*Check if it is out of order.


# 3. System view and Function

6 Enter your PIN in the Making sure it's you window.



7 Repeatedly lift and rest your finger on the fingerprint recognition sensor until setup is complete.



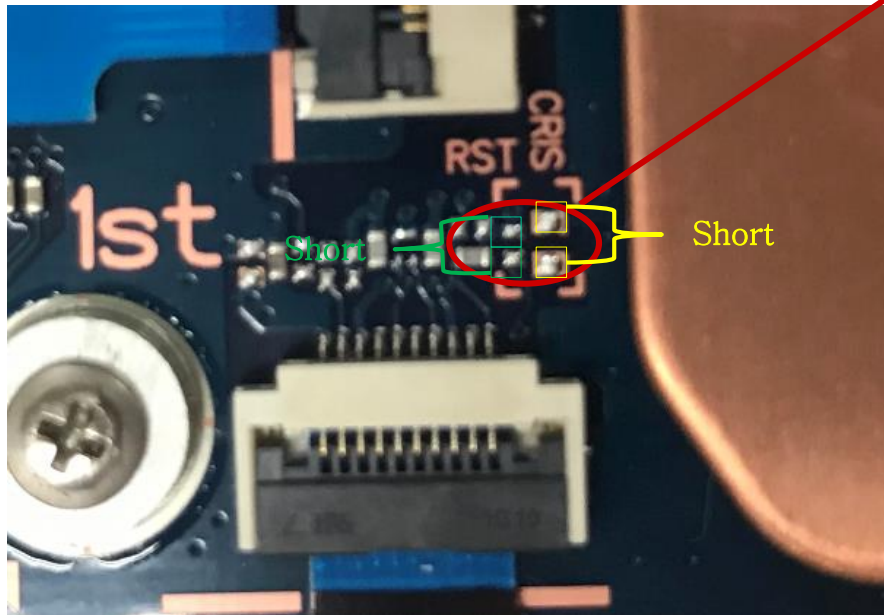
 The fingerprint recognition sensor's location may vary depending on the model.

8 Fingerprint registration is complete. If you want to add another fingerprint, select Add another.

# 4. Other – RTC Reset

## RTC Battery Reset

- The system apart and remove the mainboard and turn it upside down
- Using the tool like as tweezers, connect two nodes for about 20~30sec. Then Bios rom will be reseted.



1

Connect two nodes with tweezers for 20~30 seconds. the password will not be deleted.  
(Chipset Limitation)  
If you forget the password, please contact the ASC

2

Method of use the Key to RTC

1. Shutdown the system
2. Click Fn+F1+Right Arrow+Power button at the same time

# 4. Type-C USB Spec info – 1

**Confidential**

Project	Model	RTS	Type-C USB 3.1 ver	Supply mode	Consume mode
Opera-15	940Z5L	15.10月	Gen2 (10Gbps)	O (5V,12V)	O (20V)
Opera-15 No TSP	930Z5L	16.7月	Gen2 (10Gbps)	O (5V,12V)	O (20V)
Bigbang	DM700C6A	16.10月	Gen1 (5Gbps)	O (5V,12V)	X
Maxeen-15SKL	900X5L	16.1月	Gen1 (5Gbps)	O (5V)	O (20V)
Maxeen-15KBL	900X5M	16.8月	Gen1 (5Gbps)	O (5V)	O (20V)
Prism-13	740U3L	-	Gen1 (5Gbps)	O (5V)	X
Prism-15	740U5L	16.7月	Gen1 (5Gbps)	O (5V)	X
EPIC-13	900X3N	16.12月	Gen1 (5Gbps)	O (5V)	O (5V~20V)
EPIC-13R	900X3T, 900X3U	17.12月	Gen1 (5Gbps)	O (5V)	O (5V~20V)
Glide-13GLK	530XBB	18.09月	Gen1 (5Gbps)	O (5V)	X

□ Assembly order is reverse of disassembly

## □ SSD Upgrade

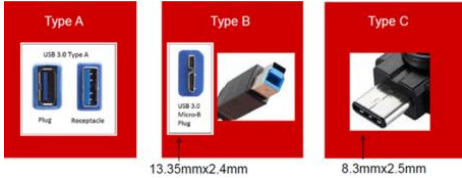


## Common



1. Make sure to separate the AC adapter before disassembling the system.
2. Put the Computer on the flat as the picture showing .

# 4. Type-C USB Spec info – 2

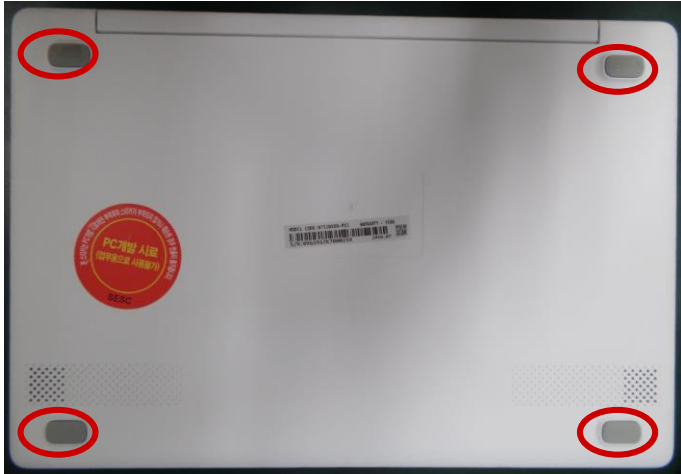
Distinction	Contents										
USB Type-C	<ul style="list-style-type: none"><li>• PD(Power Delivery) : Be supplied Power from other device or Supply Power to other device<ul style="list-style-type: none"><li>– Supply mode (Provider)<ul style="list-style-type: none"><li>. Possible to supply the Power (5V x 2A) to other device</li></ul></li></ul></li> <li>• USB 24pin, Supported Alternate mode, Design of Up and down symmetrical structure(Available connection without any distinction)<ul style="list-style-type: none"><li>– Supported Interface : USB2.0, 3.0, USB 3.1 Gen2<ul style="list-style-type: none"><li>* It is Theoretical speed, so there is a difference according to System condition and device and OS and Cable</li></ul></li></ul></li></ul> <table border="1" data-bbox="461 1011 915 1250"><thead><tr><th>Interface</th><th>Transmission speed</th></tr></thead><tbody><tr><td>USB1.0</td><td>12Mbps</td></tr><tr><td>USB2.0</td><td>480Mbps</td></tr><tr><td>USB3.1 Gen1</td><td>5Gbps</td></tr><tr><td>USB3.1 Gen2</td><td>10Gbps</td></tr></tbody></table> 	Interface	Transmission speed	USB1.0	12Mbps	USB2.0	480Mbps	USB3.1 Gen1	5Gbps	USB3.1 Gen2	10Gbps
Interface	Transmission speed										
USB1.0	12Mbps										
USB2.0	480Mbps										
USB3.1 Gen1	5Gbps										
USB3.1 Gen2	10Gbps										

# 5. Hardware Upgrade(8)

□ Assembly order is reverse of disassembly

## □ SSD Upgrade

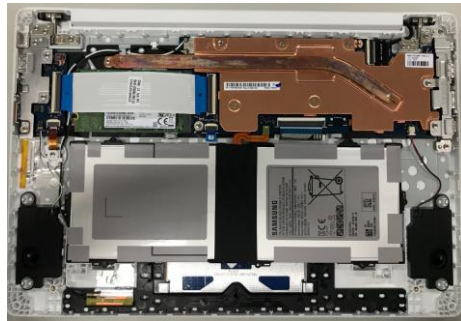
○ : Screw



- (1) Remove the RUBBER FOOT.
- (2) Disassembly the screw on case rear.

**SCREW-MACHINE**  
**(6001-003312) 4 PCS**  
 Torque : 2.3 ~ 2.7KgfcM

- (3) Remove the case rear as arrow direction:
  - Disassemble the Case front and Case rear at the edge first.
  - And then disassemble case rear .



# 5. Battery(Production date confirmation)

Confidential



The production date can be confirmed by Battery S/N  
In case S/N[**AA1K523fST-B**]

4th~7th number is the production date notation code.

4th Code: **K** → 2018 year

5th Code: **5** → May month

6th~7th code: **23** → 23

Year code : 2018-K, 2019-M, 2020-N.

Month code : 1-9, 10-A, 11-B, 12-C

# 5. Hardware Upgrade(9)

Confidential

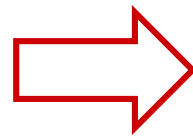
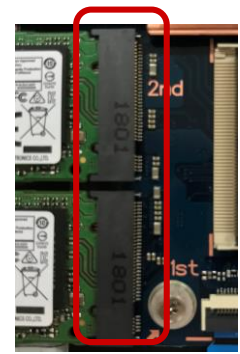
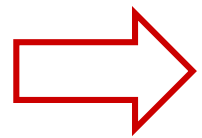
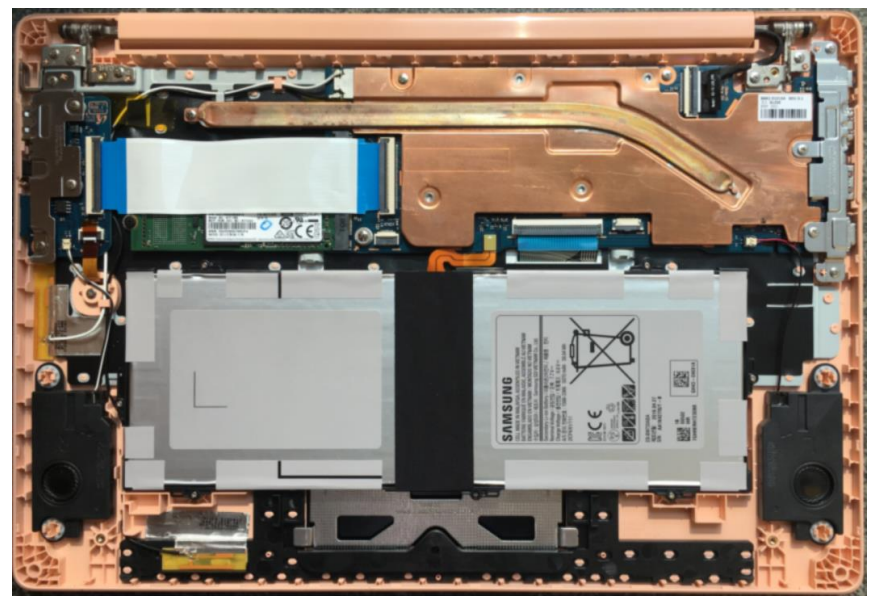
□ Assembly order is reverse of disassembly

○ : Screw

## □ SSD Upgrade

- (4) Disassemble screw of SSD
- (5) Disassemble SSD from main board connector

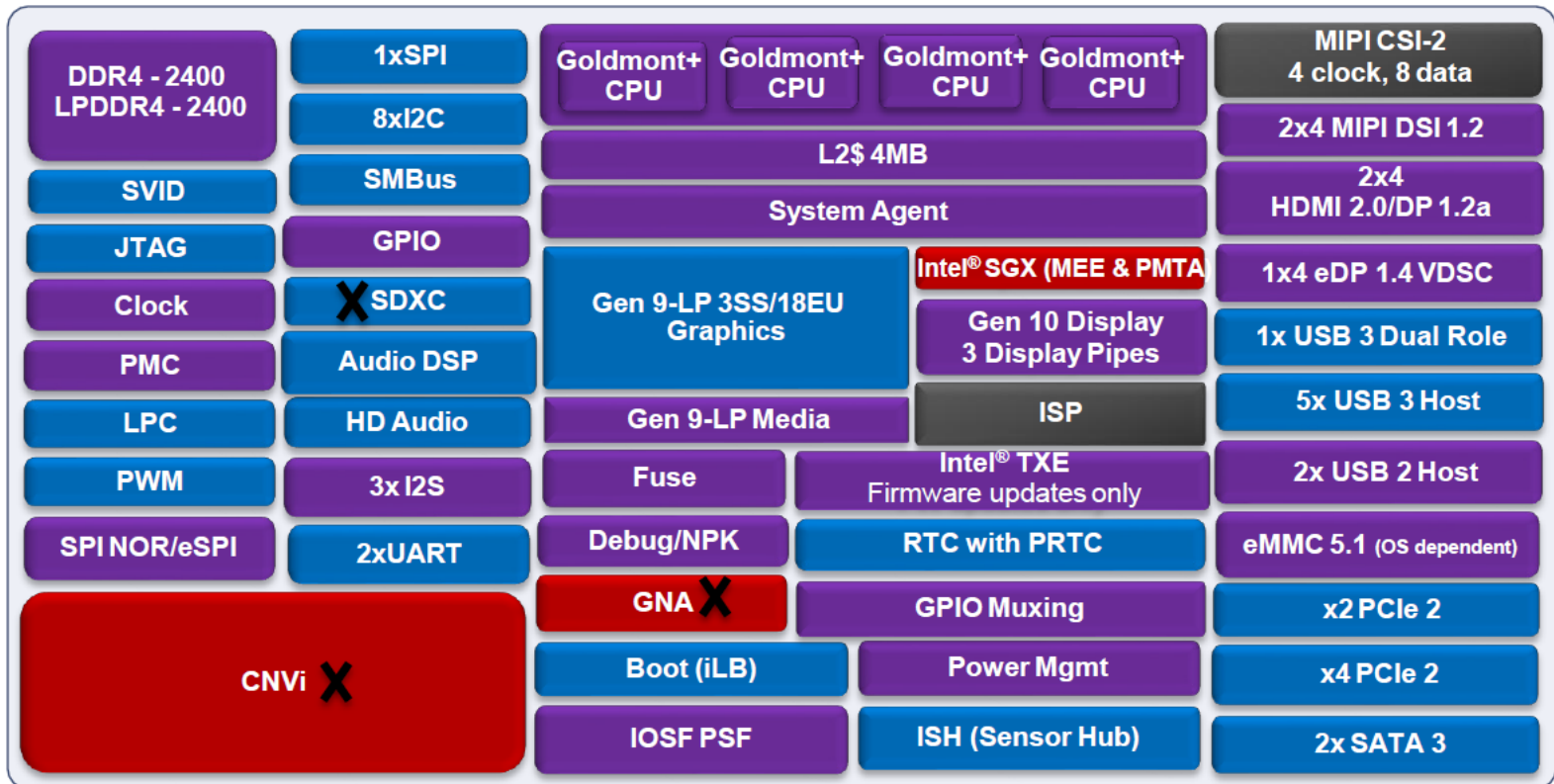
**SCREW-MACHINE**  
**(6001-002795) 2 PCS**  
Torque : 2.3 ~ 2.7KgfcM



# 6. Hardware – New H/W (Processor)

**Confidential**

## Block Diagram



■ New in Gemini Lake

■ Same as Apollo Lake

■ Changed with regard to Apollo Lake

■ Removed from Apollo Lake

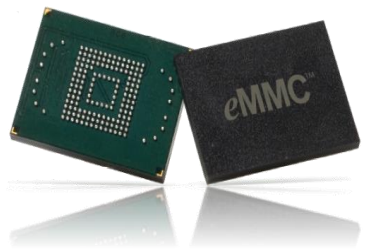
X Not supported

# 5. Hardware Upgrade(10)

□ Assembly order is reverse of disassembly

## □ SSD Upgrade

eMMC



Capa	Vendor	F/F	I/F	Model Name	Code
64GB	Sandisk	153 ball BGA 11.5X13X1.0	eMMC 5.1	SDINBDA4-64-944V	1107-002630
128G	Sandisk	153 ball BGA 11.5X13X1.0	eMMC 5.1	SDINBDA4-128-944V	1107-002610

SSD



Capa	Vendor	F/F	I/F	Model Name	Code
128GB	SAMSUNG	M.2 2280	SATAIII	MZNLN128HAHQ-000KN	BA59-04282A

Notice : list 안에 있는 사양외 기타 사양 미 테스트.

## Gemini Lake Platform Feature Overview

- Gemini Lake 64b Quad Core (4C) SoC
- 14 nm Technology Process
- 25 mm x 24 mm, 1.344 mm Z, Type 3, BGA
- Pitch: 0.546 mm, Pin Count: 1090

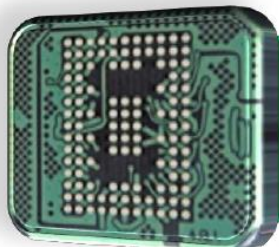


- Low power Gen 9-LP graphics with up to 18 EUs
- Latest APIs including DX12, DX11.3 and OpenGL\* 4.3
- Supports content protection using PAVP 3.0 and HDCP 2.2

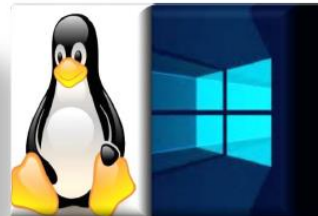
- Three independent displays
- eDP 1.4, MIPI-DSI
- Display Port 1.2a and HDMI 2.0a
- Up to 4kx2k high resolution support



- PCIe 2.0, SATA 3.0, eMMC 5.1 (OS based)
- UART, I2C, ISH
- USB 3.0/2.0, Dual Role
- HD/LP Audio with Integrated DSP










- DDR4 and LPDDR4
- DDR4 mixed memory support
- DDR4 SODIMM support
- Up to 8GB of total system memory



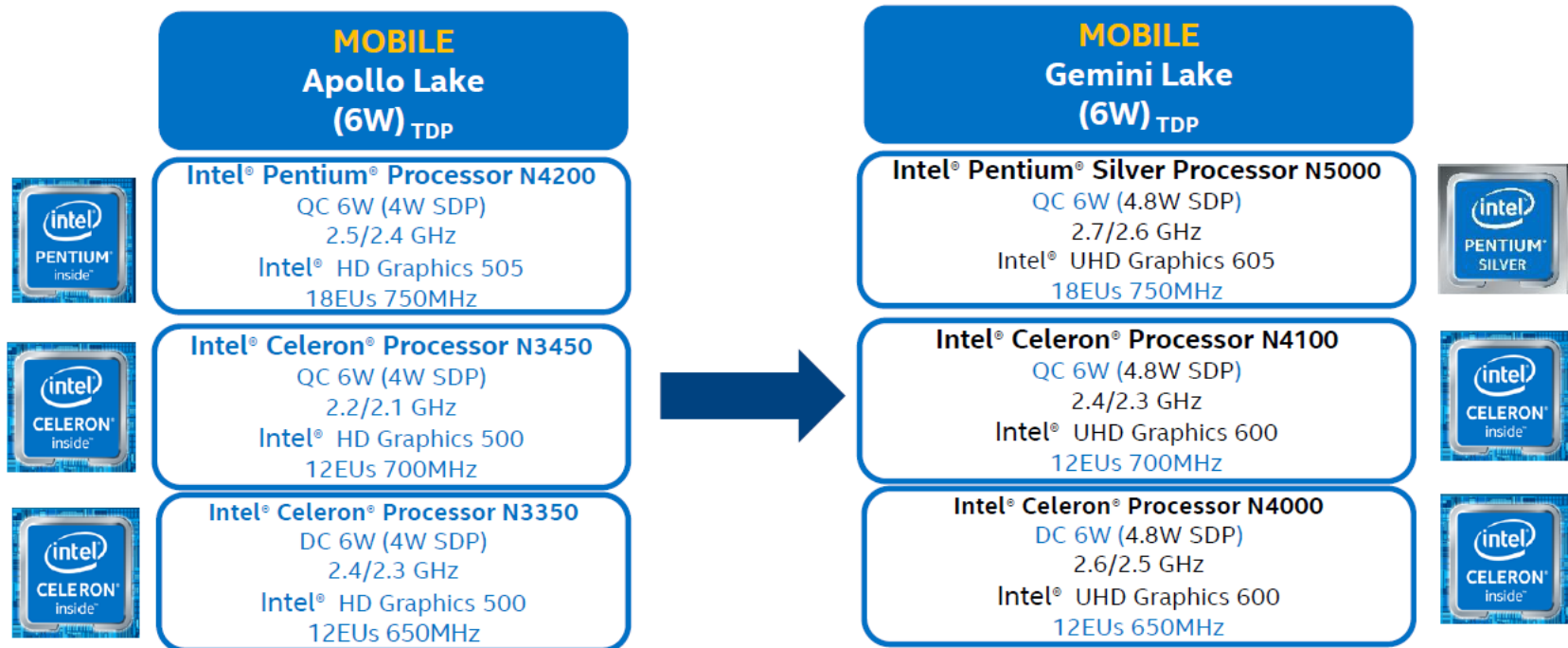
- Windows\* 10 Enterprise Edition (64-bit only)
- Linux\*

# 8. Hardware – New H/W (Processor)

## Gemini Lake Improvements

FEATURES	APOLLO LAKE	GEMINI LAKE	ADVANCEMENTS
 CPU	Goldmont Core, 2M Cache 31x24 Package	New Goldmont Plus Core, 4M Cache 25x24 package	<ul style="list-style-type: none"> <li>✓ Better CPU performance and board area savings</li> </ul>
 Graphics and Display	Gen 9 Graphics Gen 9 Display	Gen 9 Graphics Gen 10 Display	<ul style="list-style-type: none"> <li>✓ Next Gen Display Engine with new features</li> </ul>
 Media	VP9 (8b dec) HEVC (10b dec/8b enc)	VP9 (10b dec/ 8b enc) HEVC (10b enc)	<ul style="list-style-type: none"> <li>✓ Fast and low power media transcode</li> </ul>
 Memory	DDR3L 1867MHz LPDDR4 2400MHz LPDDR3 1867MHz	DDR4 2400MHz LPDDR4 2400MHz	<ul style="list-style-type: none"> <li>✓ Lower BOM Cost Options and memory bandwidth</li> </ul>
 Connectivity	Discrete WiFi/BT Stone Peak/ Sandy Peak	Integrated WiFi/BT w/ Discrete option	<ul style="list-style-type: none"> <li>✓ New features, Board area and BOM savings</li> </ul>
 Storage & I/O	SATA3, USB3/2, PCIe2, Audio DSP, USB Type C, eMMC5.0, SPI	Added eMMC 5.1, eSPI, and 2-port USB-C support	<ul style="list-style-type: none"> <li>✓ Improved I/O options</li> </ul>
 Security	Intel Trusted Execution Engine 3.0	Added Intel® SGX  <small>Indicates new features on GLK platform</small>	<ul style="list-style-type: none"> <li>✓ HW enforced memory area for secure app execution</li> </ul>

## Gemini Lake Mobile SKU Stack



# Software – S/W & Driver LIST (1/3)

**Confidential**

## (1) Driver

소프트웨어 및 드라이버 버전은 최종 출시제품에는 변경될 수 있으니 참고만 하세요

DCH_Realtek HD Audio Driver	6.0.1.8480Logo + iSST: 9.22.0.3565Logo
Canvasbio Fingerprint driver	v2.1.21.858
15.65.4882 legacy type	24.20.100.6137
Intel® Chipset Driver (GeminiLake)	10.1.17673.8084
Intel DPTF driver(GeminiLake)	8.4.11000.6436
Intel Serial I/O driver(GeminiLake)	30.100.1726.2
Intel TXEI drive(GeminiLake)_INF	4.0.0.1249
Win10-Realtek USB LAN Driver	10.24.326.2018-(RS4)
Intel JfP Bluetooth Driver (Win10)	20.70.0.4_INF
Intel WLAN Driver (t64)	20.60.0.7

# 6. Software – S/W & Driver LIST (2/3)

**Confidential**

## (2) S/W

소프트웨어 및 드라이버 버전은 최종 출시제품에는 변경될 수 있으니 참고만 하세요

Peak Time Power Manager	1.0.0.25
Wi-Fi Camera	1.0.11
Samsung PC Cleaner	1.0.14.0
Samsung PC Cleaner Service	1.0.16.0
Samsung Security	1.0.0.29
SamsungUpdate UWA	3.0.22.0
SamsungUpdate Service	3.0.22.0
SamsungUpdate Setting	RS4
Voice Note	1.0.10.0 (except BRs, including RS4)
S Service IE Favorite	1.0.0.0
S Service UWA Client (RS4)	2.2.26
S Service UWA Platform Engine	2.2.2.0
RansomDefender (SW Update Download)	1.0.0.12
RansomDefender Security Center	1.0.11.0
RansomDefender	1.0.0.12
McAfee LiveSafe for Win10 RS4 (SW Update Download)	16.0 R8
McAfee LiveSafe for Win10 RS4 (Pinning_64bit)	1.0.0.5
McAfee LiveSafe for Win10 RS4	16.0 R8
LittleArtist(Win10, certified)	1.1.13
MelOn	1.1.7.0
SecTimeSync(Setup for SWCD)	1.0.2.0(NewSign)
Samsung Theme Basic Setting-x64	1.0.0.0
SamsungTheme_Original	1.0.0.0
olleh tv mobile LIVE	1.2.1.2
BrainPOP ESL	1.3.4.0
Wi-Fi Transfer	2.0.25.0 (including RS4)
New Jumpstart Check tool for Win10	20180418(add RS4 )
Simple Sharing	1.1.20

# 6. Software – S/W & Driver LIST (3/3)

**Confidential**

## (2) S/W

소프트웨어 및 드라이버 버전은 최종 출시제품에는 변경될 수 있으니 참고만 하세요

Samsung system event controller x64	1.0.0.4 Win10 RS4 Logo
Trip Advisor (IE_Favorite_64bit)	1.0.0.7
Netflix_Win10	ADD RS4
Samsung Edu (IE_Favorite_64bit)	1.0.0.4
SurveyIcon (IE_Favorite_64bit)	RS4
Display Profile	4.6 (RS4, UWP Icon2)
Adobe Premiere Pro CC for Samsung (IE_Favorite_64bit)	1.0.0.0
Adobe Creative Cloud All Apps for Samsung (IE_Favorite_64bit)	1.0.0.0
Adobe Acrobat Pro DC for Samsung (IE_Favorite_64bit)	1.0.0.0
Adobe Creative Cloud Photography plan for Samsung (IE_Favorite_64bit)	1.0.0.2
PC Gallery	2.3.18
PC Message	1.0.47 (including RS4)
teamPL	2.0.10
Samsung DPI Configuration	1.0.0.15 (RS4, UWP Icon2)
Amazon	2016.829.2800.0
Samsung Recovery 8 Client	8.0.32.0
Samsung Recovery 8 PE	8.0.28.0
Samsung Recovery 8 Settings	8.0.32.0_64GB_Support
ColorEngine 4.5	4.7.1.1
Samsung Settings 1.0	1.0.28.0
Samsung Settings 1.0 Expansion Pack	1.0.28.0
Samsung Settings OOBE	1.0.2.0(RS4)
Samsung Settings 1.0 Pinning	1.0
HDMSetWinStoreSKU	1.0.4.5
WinRE Reconnect	1.0.0.0
Studio Plus	1.1.3.0 (RS4)
Siwon School(IE_Favorite)	2.0.0.0 (ICO교체)
Samsung Gift	1.1.7.0 (+RS4)
Samsung PC SW EULA for Win10 (Korea Only)	1.0.6.0
iQiYi	4.40.2271

## ※Caution※

- If the customer turn on the power first, set the system time and date that is initialized  
(Reason : The laptop does not have RTC Battery)
- Also, in case that the user attach battery(not RTC battery) again after detaching it, should set the time and date

# BIOS Setup – structure

Confidential

The screenshot shows the Samsung BIOS Configuration screen. At the top, it displays 'Samsung BIOS Configuration' and the time '14:46 Tuesday, April 27'. The interface is divided into several sections:

- Navigation:** A 'SETUP Menu' (home icon) and 'Item Help' (question mark icon) are at the top left. A 'Backward Button' (left arrow) is on the left side of the main menu.
- Main Menu:** A grid of four items: 'SysInfo' (home icon), 'Advanced' (wrench icon), 'Security' (lock icon), and 'Boot' (hard drive icon with a checkmark).
- Configuration List:** A list of settings including 'Boot Device Priority', 'Touch Pad Mouse', 'CSM Support', 'UEFI Boot Support', 'Attempt Secure Boot', and 'Internal LAN'. Two options are checked: 'PXE ROM' and 'Texttext'.
- Value Selection:** A pull-down menu shows 'Off' selected. A 'Slide Button' is used to toggle between 'Off' and 'On' states.
- Charm Bar:** A vertical bar on the right contains icons for 'Help', 'Default', 'Restore', 'Save', and 'Exit'.

Annotations include: 'SETUP Menu', 'Item Help', 'SETUP Items', 'Time & Date', 'Pull down menu', 'Charm Bar', 'Slide Button', 'Backward Button', and 'Title'.






※ no touch function  
※ Battery Life Cycle Extension Function Not Support  
※ TPM is Factory option

## Samsung BIOS Configuration 02:56 Tuesday, July 24

 **SysInfo** <sup>V</sup>
 **Advanced**

 **Security**
 **Boot**

System Time	02:56 PM
System Date	Tuesday, 07/24/2018
SATA Port 1	SAMSUNG MZNLN128HAHQ-000
CPU Vendor	Intel(R)
CPU Type	Pentium® Sliver N5000 CPU
CPU Speed	1.10GHz
CPU VT(VT-x)	Supported
Total Memory	8192 MB (LPDDR4)
BIOS Version	P00REQ
MICOM Version	P00REQ


 **Default**


 **Exit**

Set the Time.






To modify the time, press 'Enter' key to go into the edit mode. 'UP', 'Down', 'Left' and 'Right' keys are used to switch between time elements. And 'Space' key is used to change the value.

## Samsung BIOS Configuration 02:56 Tuesday, July 24

 **SysInfo** <sup>V</sup>
 **Advanced**

 **Security**
 **Boot**

System Time	02:56 PM
System Date	Tuesday, 07/24/2018
Storage Device	SanDisk DA4064 64GB
CPU Vendor	Intel(R)
CPU Type	Pentium® Sliver N5000 CPU
CPU Speed	1.10GHz
CPU VT(VT-x)	Supported
Total Memory	8192 MB (LPDDR4)
BIOS Version	P00REQ
MICOM Version	P00REQ


 **Default**


 **Exit**

Set the Time.

To modify the time, press 'Enter' key to go into the edit mode. 'UP', 'Down', 'Left' and 'Right' keys are used to switch between time elements. And 'Space' key is used to change the value.

- ❑ \* SATA Port 1  
=> HDD model name is displayed in this item for SATA Port 1.
- ❑ \* SATA Port 2  
=> SSD model name is displayed in this item for SATA Port 2
- ❑ Storage Device  
=> eMMC model name is displayed in this item for Storage Device
- ❑ Total Memory  
=> Total Memory size of the system.

\* Factory Option

## Samsung BIOS Configuration 02:56 Tuesday, July 24

 SysInfo

 Advanced <sup>V</sup>

 Security

 Boot






'On' forces the Touch Pad mouse to be enabled.

'Off' forces the Touch Pad mouse to be disabled.

- Touch Pad Mouse On
- Touch Pad S3 Wake-up Off
- USB S3 Wake-up Off

[Smart Battery Calibration >](#)

Purchased Date 2018/07/24

-  Help
-  Default
-  Restore
-  Save
-  Exit

- ❑ Touch Pad Mouse
  - => 'On' forces the Touch Pad mouse to be enabled.
  - => 'Off' forces the Touch Pad mouse to be disabled.
  
- ❑ Touch Pad S3 Wake-up
  - => Select 'On' to support that system can be waked up from ACPI S3 state by Touch Pad activities.
  - => Select 'Off' not to use Touch Pad wake-up capability from ACPI S3 state.
  - \*It doesn't work in Windows 8 or Previous version.
  
- ❑ USB S3 Wake-up
  - => Select 'On' to support that system can be waked up from ACPI S3 state by USB activities.
  - => Select 'Off' not to use USB wake-up capability from ACPI S3 state.
  - \*It doesn't work in WinXP.
  
- ❑ Smart Battery Calibration
  - =>If you select this option, the system battery will be discharged completely for more accurate battery level detection.
  - This option only works with SMART battery.
  
- ❑ Purchase Date
  - => Purchased date is displayed after 10 times boot.

## Samsung BIOS Configuration 02:56 Tuesday, July 24

 SysInfo

 Advanced

 Security <sup>V</sup>

 Boot

Supervisor Password controls access to the setup utility.

Supervisor Password	Clear
User Password	Clear
HDD Password	Clear
2 <sup>nd</sup> HDD Password	Clear

Set Supervisor Password >  
Set User Password >  
Set HDD Password >  
Set 2<sup>nd</sup> HDD Password >

Password On Boot On

Secure Boot Configuration >

TPM Configuration >



Help



Default



Restore



Save



Exit

- ❑ Set Supervisor Password  
=>Supervisor Password controls access to the setup utility.
- ❑ Set User Password  
=> User Password controls access to the system at boot
- ❑ Set HDD Password  
=> After saving the setting, the system must be powered OFF and ON for the password to be set as Enabled or Disabled
- ❑ \* Set 2ndHDD Password  
=> After saving the setting, the system must be powered OFF and ON for the password to be set as Enabled or Disabled
- ❑ Password on Boot  
=> Password On Boot
- ❑ Secure Boot Configuration  
=> This item is the configuration to set secure boot variable.  
Reset to Manufacturing Default  
=>Press [Enter] and select Yes to reset secure boot variables to default .  
Warning! The current boot secure boot variables will be cleared.  
Change to Customized Signatures  
=>Press [Enter] and select Yes to change to customized signatures.  
Warning! PK will be deleted and the platform will be changed to setup mode.  
Secure boot will also be disabled automatically.
- ❑ TPM Configuration(Optional)  
=> TPM Configuration

\* Factory Option

## Samsung BIOS Configuration 02:56 Tuesday, July 24

**SysInfo** **Advanced**  
**Security** **Boot** ▼

Select system boot options.

### Boot Device Priority >

- Secure Boot Control On
- Fast BIOS Mode On
- USB LAN PXE OPROM Off

### **WARNING!!!**

If you select incorrect option, system may not boot to OS correctly.

Secure Boot Control  
Boot Option#1

- CSM OS
- CSM OS
- UEFI OS
- CSM and UEFI

**Help**  
**Default**  
**Restore**  
**Save**  
**Exit**

Samsung BIOS Configuration 02:56 Tuesday, July 24

Samsung BIOS Configuration navigation menu:

- SysInfo (Red button)
- Advanced (Yellow button)
- Security (Light Blue button)
- Boot (Green button, selected with 'V' icon)

Sets the system boot order

### ← Boot Option Priorities

Boot Option #1 Windows Boot Manager V

Navigation menu on the right:

- Help (Question mark icon)
- Default (Laptop icon)
- Restore (Refresh icon)
- Save (Download icon)
- Exit (Exit icon)

- ❑ **Boot Device Priority**  
=> Select system boot options.
- ❑ **Secure Boot**  
=> Secure Boot feature is enabled.  
Win8 default setting. GPT Partition is used by default, CSMless(Do not support DOS) feature applies.  
The ability to encrypt the BIOS using the KEY  
\* is not recommended to modify and change the key.
- ❑ **OS Mode Selection**  
=> Secure Boot [Disable] is set to activate when the item.  
Default value is [Enabled]. so that normally it is disabled.  
UEFI OS / UEFI and Legacy OS / CSM OS that item  
When set to UEFI and Legacy OS / CSM OS items, WIN7 and the previous version of the OS or DOS boot can be
- ❑ **PXE OPROM**  
=> 'On' means that PXE network boot function is loaded, so users can boot to PXE network by changing Boot Device Priority.

※ **Is Windows 8 protected by Secureboot function until which range?**

Protected range by secureboot is from power on to Windows booting.

If Digital sign of System file or any file in BIOS(UEFI) is damaged or changed by Virus or Malware, may not be system booting.

※ **What are the restrictions when protected by SecureBoot?**

There are no restrictions by Secureboot or no big about regular customers

But, System can not be booting, if booting file in booting device are not allowed from UEFI DB.

## □ Fast BIOS Mode

### - ● Fast Bios Mode

- Fast BIOS Mode is technology to reduce the boot up time by skipping the USB check in the POST stage.  
→ DOS mode booting is not supported. (Basic ODD, USB memory devices, etc.)
- The factory default setting is [Disable]. When the purchase date is registered, the setting is automatically changed to [Enable]. Once the setting is changed to [Enable], the default setting in the CMOS is changed to [Enable].

◆ Problem: The system does not boot from a standard ODD or USB device (e.g. CD-ROM drive, memory device, etc). (All models with the Fast BIOS Mode feature have this problem.)

### ◆ Symptom

- The system cannot boot from a standard ODD or USB device (e.g. CD-ROM drive, memory device, etc).
- When the system boots from a brand new HDD (with a clean MBR), the system reboots indefinitely in the POST stage.

### ◆ Cause

- The system boots up faster by skipping the USB check operation.

### ◆ Solution

- The problem is resolved if [Fast BIOS Mode] is set to disabled in the CMOS Setup menu.  
※ The factory default setting is [Disable]. When the purchase date is registered, the setting is changed to [Enable] automatically.



- ❑ Help  
=> It is showing manual.
- ❑ Default  
=> Load Default setting.
- ❑ Restore  
=> Load saving setting in CMOS.
- ❑ Save  
=> Save setting in CMOS.
- ❑ Exit  
=> Reset the system after saving the changes

# 8. System Description

Confidential

## (1) CPU

<b>CPU &amp; Chipset</b>	Intel Celeron N4000 Intel Pentium Silver N5000  ※ CPU upgrade not supported (BGA type)
<b>Manufacturing Process</b>	14nm
<b>Clock</b>	Base Core Frequency: 1.1GHz (Maximum Single Core Burst Frequency to 2.6GHz ) Base Core Frequency: 1.1GHz (Maximum Single Core Burst Frequency to 2.7GHz )
<b>No. of Cores</b>	4 CORE
<b>Cache Size</b>	4MB
<b>Thermal Design Power (TDP)</b>	6W
<b>Supported Memory</b>	LPDDR4, 2133MHz
<b>Graphics Brand</b>	Intel UHD Graphics 600 (N4000) Intel UHD Graphics 605(N5000 )
<b>Package</b>	25x24 FCBGA

## (2) Memory

Memory capacity	On-Board type Max. 8GB
Memory type	4GB, 8GB LPDDR4 Memory at 2133Hz 2 Ch Support
Memory modules	8Gbit SDP memory component x 4ea 16Gbit DDP memory component x 4ea
Sockets	0 (On-board type memory, <b>Unavailable for Upgrade</b> )

## (3) Graphics

<b>Graphics</b>	Intel(R) UHD Graphics 600(CEL CPU) Intel(R) UHD Graphics 605(PDC CPU)
<b>Video memory</b>	① Shared with system memory (Internal Graphics)
<b>Max. resolution for VGA</b>	No Support
<b>Max. resolution for HDMI</b>	Support v1.2 compliant / a resolution of 1920x1080 pixels with 32-bit color at 60 Hz (640x480, 720x480, 720x576, 800x600, 1024x768, 1152x864, 1280x600, 1280x720, 1280x768, 1280x800, 1280x960, 1280x1024, 1360x768, 1366x768, 1400x1050, 1440x900, 1600x900, 1680x1050, 1600x1200, 1920x1080, 2560*1440) [Ext. monitor resolutions supported by EDID information] *Do not Support 4K resolution
<b>Max. Resolution for eDP</b>	<b>FHD:</b> Supports Embedded Display Port (eDP) for direct connection to internal notebook panels with maximum resolution of (1920x1080, 1680x1050, 1600x900, 1440x900, 1400x1050, 1366x768, 1360x768, 1280x768, 1280x720, 1280x600, 1024x768, 800x600, 640x480)

## (4) Display

LCD	13.3 16:9 FHD LCD (1920 x 1080 pixel); eDP type
Vendor / Series	PANDA FFS series
Color Gamut	70.8%(Typ.) ;
Viewing angle	Horizontal 89°/89° ,Vertical 89°/89°
Open Range	147°
Pixel Pitch	0.153 (H) X 0.153 (V) mm
LCD Viewable Area	293.76(H) x 165.24(V) (13.3" diagonal)
LCD Resolution	FHD (1920 x 1080)
Brightness	280 cd/m2 (Typ.)
Response time	25ms (Typ.)

## (5) Audio - Sound

Codec	REALTEK
Chipset	ALC256
Conversion	Built-in high performance 16/20/24-bit ADC & 16/20/24-bit DAC
Sound effect	Sound alive effect
Internal interfaces	Embedded stereo speakers, Internal Digital MIC
Speaker power rating	2 Speakers x 1.5 Watt with enclosure each
External interfaces	Headphone/Mic Combo, Not Support S/PDIF
Controls	Keyboard volume control

## (6) Audio - Microphone

Type	Integrated Digital microphones
Sensitivity	-26dBFS
SNR	64.5dB(A)
Noise suppression	Supported

# 8. System Description 7

Confidential

## (7-1) EMMC

Hard disk drive	
Vendor	Sandisk
Type	eMMC5.1, 11.5x13mm (153 balls)
Speed	HS400 Max
Average Access time	N/A
Supports	Command-Queue
Capacity	64GB( typical) / 128G

## (7-2) SSD

Solid State Drive	
Vendor	SAMSUNG/Sandisk
Type	NGFF type , M.2 2280 . SATAIII , TLC(NVMe SSD not support)
Speed	SATA 6.0 Gbps
Average Access time	N/A
SEQRead/Write speed	Sequential Read up to 550 MB/s Sequential Write up to 500 MB/s
Supports	NCQ, S.M.A.R.T, DIPM, DEVSLP
Capacity	128GB

## (8) Network communication

Wireless LAN	Jefferson Peak 2; MOB type
Module	802.11agbn+160Mhz ac MIMO 2x2+ BT5.0
Type	WLAN(CNVI), BT5.0
Chipset	Intel 9560
Max.Link Speed	Wi-Fi Rx/Tx Throughput 1220Mbps (Link Speed is only standard value, Actually value will decided by each environment)
Antenna	Dual Antenna Support : WLAN/BT(TX/RX)

## (9) ) I/O Interface

PC Card Slot	None
Express Card Slots	micro SD card(micro SD, micro SDHC, micro SDXC) , UFS card
USB Port	1x USB3.0 port + 1x TYPE-C port + 1x USB2.0 port
VGA Port	None
Audio Jacks	1 x 3.5mm Combo(4pole, HeadPhone-out, MIC-in)
LAN	None
HDMI	1x HDMI1.2
Dock	None
Security	None
Power	1x DC-in jack(3pie) for AC adapter

## (10) Input device

Keyboard (13.0')	Yes
Amount of keys	80 (KOR, US)
Feature	Travel length :1.5mm, height :3.7 mm, Pitch : 19.05mm
Fast function keys (EZ BLU)	F1 (Easy settings), F6 (Sound ON/OFF)

## (11) Multimedia

Integrated digital camera	SKINGC KNC-V16F
Model name(common)	Web Camera
Image sensor	VGA CMOS Color Image Sensor
Still Image Capture Resolution	640*480, 352*288,320*240
Video Capture Resolution	640*480, 352*288,320*240
Frame Rate	30fps @ VGA, 24MHz MCLK
Output Video Format	mp4 , wmv , avi ,mpg.
Interface	USB 2.0(High speed)
UVC Support	Supported

## (12) Power and Power management - battery

Standard battery	39Wh (5070mAh)
Model code	EB-BW720ABA
Details of cell	2cells
Battery capacity	5070mAh
Voltage	7.7V DC
Battery rating	39.04Wh
Color	black
Dimension	237.88x 85.44 x 4.06 mm (L x W x H)
Weight	168g±8.4g
Recharge time	2 hours 30 minutes

# 8. System Description 13

## (13) Power and Power management – AC adapter

AC Adapter	
Model Code	AD-4019A
Output Power	40W
Dimension	(W39.7*L98.07.1*H27)mm $\pm$ 0.5mm
Weight (AC Adapter)	180g $\pm$ 15g
Worldwide Compatibility	Auto-sensing 100 - 240VAC
Line Frequency	50 Hz / 60Hz
Adapter Rating - Input	100 VAC ~ 240 VAC, 1.0 A
Adapter Rating - Output	19.0 VDC, 2.1 A

# 8. System Description 14

Confidential

## (14) System demension

Dimensions (W X D X H)	322.2 x 219.5 x 16.9 mm(L x W x H)
Weight	1400g±5%
Condition	Full System with 2 cells Battery
Package dimensions (W X D X H)	W460*L285*H63 mm (Pizza type )
Condition	Full system with 2 cells battery , adapter

# 9. HW optional component (1)

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ENG

- The items included in the package may vary depending on your selection of the optional items. The appearance, color and locations of the port in the pictures may differ from those of your computer. The items marked as optional may not be provided or may be provided in different locations.



①



②



③

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① **Computer**

Ordinateur / Computer / Ordenador (computador) / Computer

---

② **AC Adapter**

Adaptateur CA / Wechselstromadapter / Adaptador CA/CC (Fuente de alimentación) / Adattatore CA

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③ **Power Cable**

Cordon d'alimentation / Netzkabel / Cable de alimentación / Cavo di alimentazione

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# 9. HW optional component (2)

**Confidential**

	Picture	ITEM	CODE	Q'ty	Ver
M A N U A L		AC Adapter	BA44-00295A 40W	1	
		Powercord	3903-000444(KOR) 3903-000445(CHN) 3903-000446(SHK)	1	

# 9. HW optional component (3)

**Confidential**

	Picture	ITEM	CODE	수량	Ver
M A N U A L		Quick guide	BA68-12472A (KOR) BA68-12472E (BRA) BA68-12472B (ENG/CHT-HK) BA68-12472C (CHS) BA68-12473A (KOR Linux)		1.0

# 9. HW optional component (4)

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\*Optional component

530XBB has the following optional components to add or replace.  
The type of component can be added later.

- SSD
- LCD

# 9. HW optional component (6)

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## SSD



Capa	Vendor	F/F	I/F	Model Name	Code
128GB	SAMSUNG	M.2 2280	SATAIII	MZNLN128HAHQ-000KN	BA59-04282A

Notice : Other storage Disks have not adopt to test till now .

# 9. HW optional component (8)

Confidential

## LCD



BA59-04163A

PANDA

LM133LF4L01


13.3FHD,280nit,Anti-Glare,FFS,Stripe,16.7M(8bit),2.8,3.3 V,eDP

# 10. Installation(1)

## Powering your device

### Charging the battery on an airplane

Power outlets may vary by airplane. Choose the connection method that fits your circumstances.

 The power plug and auto adapter figures may differ from the actual products.

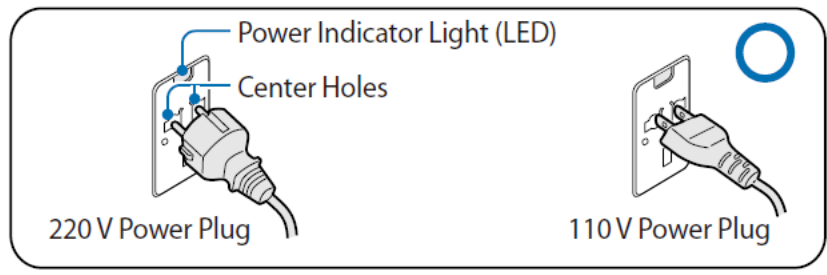
### Using an AC power plug

Insert the power plug pins into the center of the power outlet.

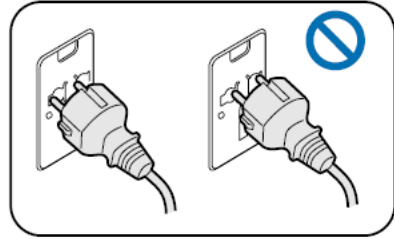
- If the pins are not inserted into the centers of the holes, they will not be fully connected. In this case, reconnect the power plug.

- You must insert the power plug when the power indicator light (LED) is lit green. If the plug is connected properly, the power indicator light remains green.

Otherwise, the power indicator light turns off. In this case, disconnect the plug, verify that the power indicator light is green and then reconnect the power plug.



Good Example O

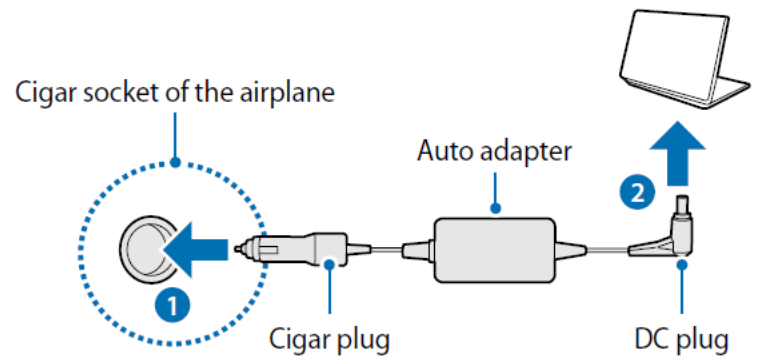


Wrong Example X

## Using an auto adapter

When a 12 VDC power supply is available a cigarette lighter socket will be provided. Use the optional auto adapter to use the 12 VDC power supply.

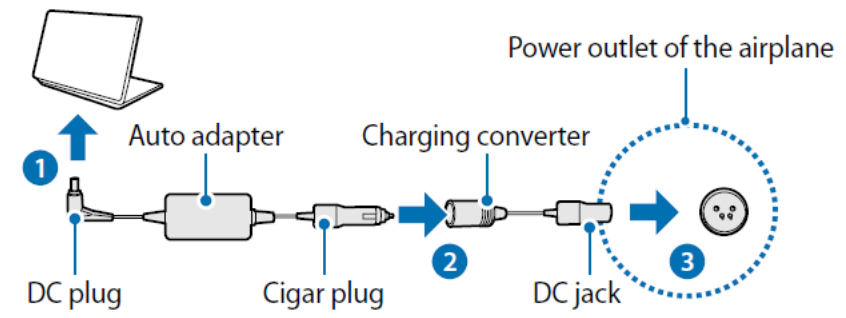
- 1 Insert the cigarette lighter socket of the auto adapter into the cigarette lighter socket.
- 2 Connect the DC plug of the auto adapter to the power input port of the computer.



## Using an airplane charging converter

Depending on the type of airplane you are traveling on, use the auto adapter and charging converter. Insert the airplane power input jack into the airplane's power outlet.

- 1 Connect the auto adapter's DC plug to the computer.
- 2 Connect the airplane charging converter (optional) to the auto adapter (optional).
- 3 Insert the airplane power input jack into the power outlet.



## Safety precautions

For your safety and security and to prevent damage, carefully read the following safety instructions. This 'Safety precautions' relate to computer use. Some of the content may be not applicable to your computer.



- Since this is commonly applied to Samsung Computers, some pictures may differ from actual products.
- The product mentioned in this guide refers to all items supplied with the computer including the battery, the AC adapter, and all other Samsung-provided accessories.



### Warning

Failure to follow the instructions marked with this symbol may result in physical injury or fatality.

## Power related

### Handle the power cord with care.

- Do not touch with wet hands.
- Do not use a damaged power cord.
- Do not overload a multi-outlet or an extension cord beyond the specified voltage/current capacity.
- Firmly insert the power cable into the AC adapter.
- Do not unplug the power cord by pulling on the cable.
- Unplug the wall-mount AC adapter (integrated plug and power adapter) from the wall outlet while holding the body and pulling it in the direction of the arrow.

Failure to do so may result in electric shock or fire.

### Connect the power cord to the AC adapter firmly.

An improper connection may result in a fire.

### Use the approved adapter or cable included in the product box.

If you use the unapproved adapter or cable, it cause the damage or malfunction of the computer.

# 10. Installation(4)

Use only properly earthed electric sockets or extension cords.

Unearthed electric sockets or extension cords may cause electric shock. Any connection to unearthed electric sockets or extension cords may produce an electric field from a current leak.

If water or other substances enters the product, disconnect the power cable and contact a Samsung Service Center. For notebook computers that are supplied with an optional removable battery, disconnect the battery.

Failure to do so may result in electric shock or fire due to the malfunction of the inner part.

Do not let dust accumulate on the power cord or the electric socket. Regularly wipe the power cord and the electric socket with a dry cloth.

Failure to do so may result in electric shock or fire.

Do not bend or damage the power cable or the AC adapter with a heavy or sharp-edged object.

A damaged cable or cord may result in electric shock or fire.

Keep the battery, AC adapter, and the power cord away from infants, children, and pets.

Failure to do so may result in electric shock or damage.

## Battery usage related

Use manufacturer-approved batteries, chargers, accessories, and supplies.

- Using generic batteries or chargers may shorten the life of your product or cause the computer to malfunction. They may also cause a fire or cause the battery to explode.
- Use only Samsung-approved battery and charger specifically designed for your device. Incompatible battery and charger can cause serious injuries or damage to your device.
- Samsung cannot be responsible for the user's safety when using accessories or supplies that are not approved by Samsung.

Take care not to allow metal objects such as a key or clip to touch the battery terminal (metal parts).

This may cause excessive current and result in fire, burns, or damage to the battery.

If the computer or the computer battery leaks, emits strange odors, or swells, immediately stop using the computer and contact a Samsung Service Center.

Failure to do so may result in an explosion or fire.

Replace a run-down battery with a new, Samsung-approved battery.

Dispose of worn-out batteries properly.

- There is a danger of fire or explosion.
- The battery disposal method may differ depending on your country and region. Dispose of the used battery in an appropriate way.

When removing the real time clock (RTC) battery, keep it away from infants and children.

If a child swallows the battery, the child may suffocate. If this happens, immediately contact a doctor.

Do not throw or disassemble the battery and do not put it into water.

There is a danger of injury, fire or explosion.

Charge the battery according to the instructions in the manual.

Failure to do so may cause an explosion or fire.

## Usage related

Do not use the computer on heated floors or electric pads, or on beds, blankets, or cushions that block the ventilation of the computer.

A blocked vent causes the computer to overheat, resulting in an explosion, fire, burns, or computer malfunction.

Do not use the computer in hot or humid locations, such as a bathroom, sauna, or inside a car during summer.

Failure to do so may result in computer malfunction or electric shock.

The computer can be used in locations with an ambient temperature of 10 °C to 35 °C and a relative humidity of 20 % to 80 %RH.

To avoid suffocation, keep the plastic bag away from infants and children.

Putting a plastic bag over the head may result in suffocation.

Never heat the computer (or the battery) or put the computer (or the battery) into a fire or microwaves.

Failure to do so may result in an explosion or fire.

Before cleaning the computer, disconnect all the cables that are connected to the computer. For notebook computers that are supplied with an optional removable battery, disconnect the battery.

Failure to do so may result in electric shock or fire.

Keep the computer away from water or liquid.

Water or liquid entering the computer may short-circuit the computer, resulting in electric shock or fire.

If the computer is dropped or broken, disconnect the power cord and contact a Samsung Service Center. For notebook computers that are supplied with an optional removable battery, disconnect the battery.

Using a broken computer may result in electric shock or fire.

Do not touch the computer's surface or the vents for extended periods while the computer is on.

Contact with the vent or the surface for extended periods may result in low-temperature burns, such as redness on the skin.

Do not carry your device in your back pockets.

- The device may be damaged, explode, or result in a fire if too much pressure is applied to it.
- You may be injured if you are bumped or fall.



## Caution

Failure to follow instructions marked with this symbol may result in minor physical injury or damage to the computer.

### Installation related

Do not block the ports (holes), vents, etc. of the product and do not insert objects.

Damage to a component within the computer may cause electric shock or fire.

When using the computer on its side, ensure the vents are clear and facing upwards.

Failure to do so, may cause the internal temperature of the computer to rise and the computer to malfunction or halt.

Keep the computer's vents at least 15 cm away from walls and other objects.

Failure to do so may result in physical injury.

**Do not place or use the computer on slanted or vibrating surfaces.**

Failure to do so may result in computer malfunction or damage.

**Do not place heavy objects on the product.**

This may cause a problem with the computer. In addition, the object may fall and cause injury or damage the computer.

**Properly shut down, disconnect and secure the computer cables before moving it.**

Failure to do so may damage the computer or cause someone to trip over a loose cable.

## Usage related

**Do not use the pen for unintended purposes, such as poking the body like eyes or ears and do not put it in your mouth.**

Doing so may result in physical injury.

**Do not place a candle, light cigar, etc. over or on the product.**

There is a danger of fire.

**Make sure to have the product tested by a safety service engineer after repairing the product.**

Using a repaired product without testing it for safety may cause an electric shock or fire.

**In case of lightning, immediately turn the system off, disconnect the power cord from the wall outlet and phone line from modem.**

There is a danger of electric shock or fire.

**Connect only permitted devices to the connectors or ports of the computer.**

Failure to do so may result in an electric shock or fire.

**Close the LCD panel only after checking if the notebook computer is turned off.**

The temperature may rise and it may cause deformation of the product.

**Do not press the eject button while the CD-ROM drive is in operation.**

You might lose data and the disc might be suddenly ejected and could cause an injury.

**Do not drop or hit the computer against anything.**

Failure to do so may result in physical injury or computer malfunction.

**When handling computer parts, follow the instructions on the manual supplied with the parts.**

Failure to do so may result in damage to the product.

**If the product emits smoke or there is a burning smell, disconnect the power plug from the wall outlet and contact a Samsung Service Center immediately. For notebook computers that are supplied with an optional removable battery, disconnect the battery.**

There is a danger of fire.

**Do not store your device near or in heaters, microwaves, hot cooking equipment, or high pressure containers.**

- The battery may leak.
- Your device may overheat and cause a fire.

**Do not use damaged or illegally modified CDs.**

There is a danger of damaging the product or personal injury.

**Do not insert the fingers into the ports (holes), card slot, or vents.**

There is a danger of injury or electric shock.

**Use recommended computer cleansing solutions when cleaning the product and only use the computer when it is completely dry.**

Failure to do so may result in electric shock or fire.

**You should not use a paper clip to perform an emergency disc ejection while the disc is in motion. Make sure to use the emergency disc eject method only when the Optical Disc Drive has stopped.**

There is a danger of injury.

**Do not place your face close to the Optical Disc Drive tray when it is operating.**

There is a danger of injury due to an abrupt ejection.

**Do not use the product if it is cracked or broken.**

Broken glass or acrylic could cause injury to your hands and face. Take the device to a Samsung Service Center to have it repaired.

**When using wireless communication (LAN, Bluetooth, etc.) always follow applicable instructions. For example, airlines and hospitals have strict requirements.**

**Avoid exposing a drive to magnetic fields. Security devices with magnetic fields include airport walk-through devices and security wands. The airport security devices that check carry-on luggage, such as conveyor belts, use X-rays instead of magnetism and will not damage a drive.**

**Keep the computer away from magnetic material.**

- Magnetic materials may cause computer malfunction or cause the battery to discharge.
- To avoid damaging the computer or magnetic stripe cards, such as credit cards, keep magnetic stripe cards away from the computer.

**Do not use your computer in a hospital or on an aircraft that can be interfered with by radio frequency.**

- Avoid using your computer within a 15 cm range of a pacemaker, if possible, as your computer can interfere with the pacemaker.
- To minimize possible interference with a pacemaker, use your computer only on the side of your body that is opposite the pacemaker.
- If you use medical equipment, contact the equipment manufacturer before using your computer to determine whether or not the equipment will be affected by radio frequencies emitted by the computer.
- When in a hospital, turn off your computer and follow all hospital regulations. Radio frequencies emitted from the computer may affect medical equipment.

## **Upgrade Related**

**Do not attempt to upgrade the computer, unless you are qualified. Otherwise, contact a Samsung Service Center or an authorized technician.**

**Follow the specified instructions contained in the manual for user maintenance. Do not disassemble any other parts by yourself.**

Failure to do so may result in computer malfunction, electric shock, or fire.

**Take care when touching the product or parts.**

The computer may be damaged or you may be injured.

**Do not disassemble the power supply unit in any circumstances.**

Failure to do so may result in electric shock, fire, or an explosion.

**Shut down the computer and disconnect all cables before disassembling the computer. For notebook computers that are supplied with an optional removable battery, disconnect the battery.**

Failure to do so may cause electric shock.

**Make sure to close the computer cover before connecting the power after a reassembly.**

There is a danger of electric shock if your body touches an internal part.

**Never disassemble or repair the product by yourself.**

There is a danger of accident. Use authorized Samsung Service Center.

**To connect a device that is not manufactured or authorized by Samsung, enquire at a Samsung Service Center before connecting the device.**

There is a danger of damaging the product.

## **Storage and movement related**

**Do not store the computer in an enclosed space, such as a computer bag, while it is running.**

Failure to do so may result in fire. Completely shut down the computer before putting the computer into an enclosed space.

**When carrying the notebook computer with other items, such as the adapter, mouse, books etc., take care not to press anything against the notebook computer.**

If a heavy object is pressed against the notebook computer, a white spot or stain may appear on the LCD.

**Do not operate or look at the computer while driving a vehicle.**

There is a danger of a traffic accident. Please concentrate on driving.

**For long periods of inactivity or storage, discharge the battery and separate it from the computer (for external or removable battery types).**

## Cautions on preventing data loss (hard disk management)

Take care not to damage the data on a storage device.

- Subjecting the device to physical impacts may result in data loss.
- The data may be lost when the computer is turned off or reset by a power failure while the storage device is operating.
- The data may be lost and irrecoverable due to a computer virus.
- The data may be lost if the power is turned off while running an application.
- Samsung is not liable for any loss of data on the storage device.

To prevent data loss due to damage to the hard disk drive, please back up the data frequently.

## LCD bad pixels

Samsung observes strict specifications regarding the quality and reliability of the LCD. However, there is a small chance that a few pixels may be bad. A large number of bad pixels can cause problems with the display, but a small number of bad pixels does not generally affect computer performance.

Samsung's quality standards for bad pixels are as follows:

- **Bright dot:** 2 or fewer
- **Black dot:** 4 or fewer
- **Combination (bright and dark):** 4 or fewer

**Clean the LCD screen with a soft cloth dampened with computer cleansing detergent.**

Do not use excessive force. Doing so may damage the LCD screen.