

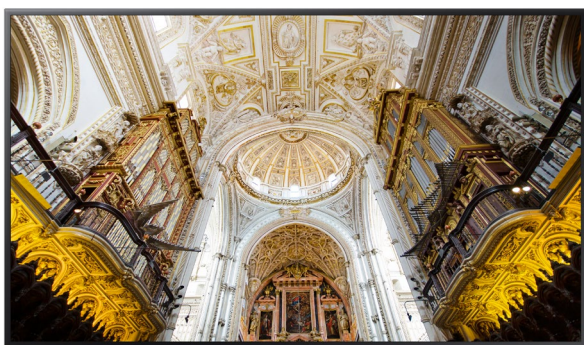
SAMSUNG

LFD Monitor

Chassis	Model
FT90	QB43R / QB49R / QB55R / QB65R / QB75R / QB98R
FS90	QM43R / QM49R / QM55R / QM65R / QM75R

SERVICE Manual

LFD Monitor



Contents

1. Precautions
2. Product specifications
3. Disassembly and Reassembly
4. Troubleshooting
5. Wiring Diagram

Refer to the service manual in the GSPN (see the rear cover) for the more information.

Contents

1. Precautions

1-1. Safety Precautions.....	1-1
1-1-1. Servicing the Product.....	1-1
1-1-2. Fire and Shock Hazard	1-1
1-1-3. Product Safety Notices.....	1-2
1-2. Servicing Precautions	1-3
1-2-1. General Servicing Precautions.....	1-3
1-3. Static Electricity Precautions.....	1-4
1-4. Installation Precautions.....	1-5

2. Product specifications

2-1. Model Comparison.....	2-1
2-2. Feature & Specifications	2-2
2-3. Detail Factory Option	2-8
2-4. Accessories.....	2-10
2-5. What Is Different About the Product.....	2-12
2-5-1. Remote Control (of up to 100 devices) through the Built-in RJ45 and RS-232C Ports.....	2-12
2-5-2. Optimum Picture Quality and Afterimage Burn-in Prevention	2-13
2-5-3. HDCP Operation	2-15

3. Disassembly and Reassemble

3-1. Product Disassembly [43" ~ 75"].....	3-1
3-2. Product Disassembly [98"].....	3-6

4. Troubleshooting

4-1. Previous check.....	4-1
4-2. How to check fault symptom	4-6
4-2-1. When the product is not powered on (43"~75")	4-6
4-2-2. When the product is not powered on (98").....	4-8
4-2-3. When a blank screen is displayed (HDMI-Digital signal)	4-10
4-2-4. When a blank screen is displayed (HDMI-Digital signal) (98").....	4-12
4-2-5. When no sound is output (Speaker) (43"~75")	4-14
4-2-6. When no sound is output (Speaker) (98").....	4-16
4-3. Troubleshooting Guide.....	4-18
4-3-1. Requirements Before Contacting Samsung Customer Service Center	4-18
4-4. Error Examples and Actions.....	4-24
4-5. Factory Mode Adjustments	4-25
4-5-1. Entering the Service Mode.....	4-25
4-5-2. Factory Data.....	4-26
4-5-3. EDID settings	4-53

4-6. Cable.....	4-54
4-6-1. RS-232C cable.....	4-54
4-6-2. LAN cable.....	4-56
4-7. White Balance.....	4-58
4-7-1. Calibration.....	4-58
4-7-2. White Balance Adjustment.....	4-60
4-8. Software Upgrade.....	4-61
4-8-1. How to check the Software Version.....	4-61
4-8-2. How to upgrade Software.....	4-63
4-9. How to get the debug logs - Serial debug.....	4-67
4-9-1. USB Log saving Function guide.....	4-70
4-10. Service Item Code.....	4-73

5. Wiring Diagram

5-1. Wiring Diagram.....	5-1
5-2. Block Diagram.....	5-2
5-3. Board Connection.....	5-3
5-4. Connector Functions.....	5-15
5-5. Cables.....	5-16



GSPN (GLOBAL SERVICE PARTNER NETWORK)

Area	Web Site
Europe, MENA, CIS, Africa	https://gspn1.samsungcsportal.com
E.Asia, W.Asia, China, Japan	https://gspn2.samsungcsportal.com
N.America, S.America	https://gspn3.samsungcsportal.com

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1. Precautions

1-1. Safety Precautions

- Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.



Warning

- For continued safety, do not attempt to modify the circuit board.
- Disconnect the AC power and DC power jack before servicing.

1-1-1. Servicing the Product

- When servicing the Product, Disconnect the AC line cord from the AC outlet.
- It is essential that service technicians have an accurate voltage meter available at all times. Check the calibration of this meter periodically.

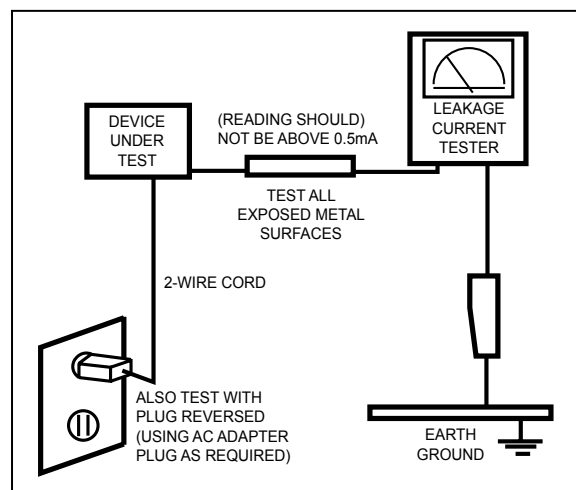
1-1-2. Fire and Shock Hazard

- Before returning the product to the user, perform the following safety checks:
- Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the product.
 - Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor/capacitor networks, mechanical insulators, etc.
 - Leakage Current Hot Check:



Warning

- Do not use an isolation transformer during this test.
- Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, Leakage Current for Appliances), and Underwriters Laboratories (UL Publication UL1410, 59.7).



- With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts.
The current measured should not exceed 0.5 milliamp.
Reverse the power-plug prongs in the AC outlet and repeat the test.

1-1-3. Product Safety Notices

- Some electrical and mechanical parts have special safetyrelated characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by  on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1-2. Servicing Precautions



Warning

- An electrolytic capacitor installed with the wrong polarity might explode.



Caution

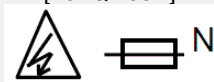
- Before servicing units covered by this service manual, read and follow the Safety Precautions section of this manual.



Note

- If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

[For QM98N]



CAUTION

DOUBLE POLE/NEUTRAL FUSING

1-2-1. General Servicing Precautions

1. Always unplug the unit's AC power cord from the AC power source and disconnect the DC Power Jack before attempting to:
 - (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
2. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
3. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
4. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
5. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of the AC plug. The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
6. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

1-3. Static Electricity Precautions

- Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.
1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the product.
 2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
 3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
 4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
 5. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.
 6. Do not remove a replacement ESD from its protective package until you are ready to install it.
Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
 7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.



Caution

- Be sure no power is applied to the chassis or circuit and observe all other safety precautions.

8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

1-4. Installation Precautions

1. For safety reasons, more than a people are required for carrying the product.
2. Keep the power cord away from any heat emitting devices, as a melted covering may cause fire or electric shock.
3. Do not place the product in areas with poor ventilation such as a bookshelf or closet. The increased internal temperature may cause fire.
4. Bend the external antenna cable when connecting it to the product. This is a measure to protect it from being exposed to moisture. Otherwise, it may cause a fire or electric shock.
5. Make sure to turn the power off and unplug the power cord from the outlet before repositioning the product.
Also check the antenna cable or the external connectors if they are fully unplugged. Damage to the cord may cause fire or electric shock.
6. Keep the antenna far away from any high-voltage cables and install it firmly. Contact with the highvoltage cable or the antenna falling over may cause fire or electric shock.
7. When installing the product, leave enough space (0.4 m) between the product and the wall for ventilation purposes.
A rise in temperature within the product may cause fire.
8. If an equipment is provided with a replaceable battery, and if replacement by an incorrect type could result in an explosion (for example, with some lithium batteries), the following applies:

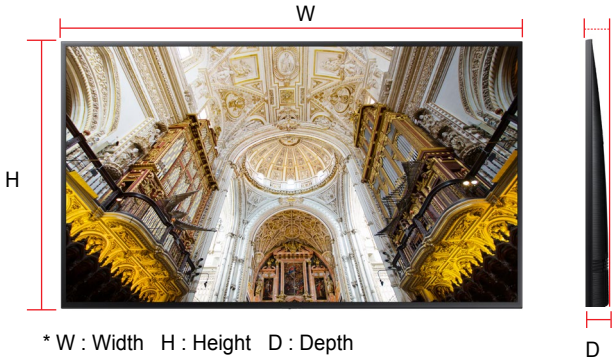


Caution

- Risk of explosion if battery is replaced by an incorrect type dispose of used batteries according to the instructions.
- Do not dispose of batteries in a fire.
- Do not short circuit, disassemble or overheat the batteries.
- Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.
- Do not be exposed to excessive heat such as sunshine, fire or the like.

2. Product specifications

2-1. Model Comparison

Front View	 * W : Width H : Height D : Depth		
Front Color	Black		
Dimensions (W x H x D) (Non-NETWORK) / Weight (Non-NETWORK)	43"	Set	967.5 x 557.7 x 48.3mm / 10.0Kg
		Package	1095 x 676 x 151mm / 13.3Kg
	49"	Set	1099.2 x 631.5 x 46.3mm / 13.5Kg
		Package	1247 x 772 x 152mm / 18.0Kg
	55"	Set	1235.1 x 707.9 x 46.3mm / 18.1Kg
		Package	1402 x 858 x 163mm / 23.6Kg
	65"	Set	1453.9 x 831.0 x 46.3mm / 24.9kg
		Package	1611 x 973 x 185mm / 33.3kg
	75"	Set	1681.1 x 960.1 x 49.7mm / 38.3kg
		Package	1871 x 1127 x 223mm / 49.0kg
	98"	Set	2194.2 x 1249.8 x 75.3mm / 77.1 Kg
		Package	2500 x 1618 x 815mm / 149.4 Kg
Panel Type	LCM / LED		
Feature	QMR / QB98R	HDMI IN 1, HDMI IN 2, HDMI OUT, DP IN	
	QBR	HDMI IN 1, HDMI IN 2	

2-2. Feature & Specifications

Model Name	QM43R / QM49R / QM55R /QM65R / QM75R
Feature	
• 24/7 , IT Standard, Pivot mode support, EMI Class A • 500nit, Edge Type, Non-glare Panel • Tizen Platform with Enhanced Security • Kant-M2e platform • Tizen 4.0	• Connectivity : HDMI2.0(In x2, Out x1), DVI-D(1), DP1.2(1), USB(2), RJ45, RS232C(In/Out), Audio(In/Out) • WiFi • IP5x • W/M : WMN4070SE (43"~55") WMN6575SE(65"~75")

Model Name	QB43R / QB49R / QB55R /QB65R / QB75R
Feature	
• 16/7 , IT Standard, Pivot mode support, EMI Class B • 350nit, Edge Type, Glare Panel • Tizen Platform with Enhanced Security • Kant-M2e platform • Tizen 4.0	• Connectivity : HDMI2.0(In x2), DVI-D(1), USB(2), RJ45, RS232C(In/Out), Audio(In/Out) • WiFi • IP5x • W/M : WMN4070SE (43"~55") WMN6575SE(65"~75")

Model Name	QB98R
Feature	
• 24/7 , IT Standard, Pivot mode support • 350nit, Non-glare Panel • Kant-M2e platform • Tizen 4.0	• Connectivity : HDMI2.0(In x2, Out x1), DVI-D(1), DP1.2(1), USB(2), RJ45, RS232C(In/Out), Audio(In/Out), IR IN • WiFi • W/M : WMN9500SD

■ QMR

Specifications						
Item		QM43R	QM49R	QM55R	QM65R	QM75R
Introduction Area		Worldwide				
Panel	Panel	CY-NR043HGAVYH	CY-NR049HGLVYH	CY-NR055HGLVYH	CY-NR065HGLVYH	CY-NR075HGAVYH
	Vendor	AUO	SDC	SDC	SDC	AUO
	Optimum resolution	3840 x 2160 @60Hz	3840 x 2160 @60Hz	3840 x 2160 @60Hz	3840 x 2160 @60Hz	3840 x 2160 @60Hz
	Display area(mm)	941.184(H)x529.416(V)	1073.78(H)x604.00(V)	1209.6(H)x680.4(V)	1428.48(H)x803.52(V)	1650.24(H)x928.26(V)
	Pixel Pitch(mm)	0.2451(H)x0.2451(V)	0.093(H)x0.279(V)	0.105(H)x0.315(W)	0.124(H)x0.372(W)	0.42975(H)x0.42975(W)
	Display rate	16:9				
	Contrast rate	4000:1	4000:1	4000:1	4700:1	6000:1
	Luminance(cd/m²)	500				
	Response time (ms)	8				
	View angle (H/V)	178/178				
	Glare Panel	Non-glare (Haze=44%)	Non-glare (Haze=25%)	Non-glare (Haze=25%)	Non-glare (Haze=25%)	Non-glare (Haze=44%)
Mecha	Design	Signage New Design				
	Depth	48.3mm	46.3mm	46.3mm	46.3mm	49.7mm
	C/Rear	Signage New Design				
	Stand	STN-L4355F	STN-L4355F	STN-L4355F	-	-
	Wall Mount	WMN4070SE	WMN4070SE	WMN4070SE	WMN4277SE	WMN6575SE
Produce Measurement	Vesa (mm*mm)	200mm * 200mm	200mm * 200mm	200mm * 200mm	400mm * 400mm	400mm * 400mm
	Vesa screw standard	M8, L45 +HOLDER-WALL RING 4EA	M8, L45 +HOLDER-WALL RING 4EA	M8, L45 +HOLDER-WALL RING 4EA	M8, L71 +HOLDER WALL +HOLDER-WALL RING 4EA	M8, L71 +HOLDER WALL +HOLDER-WALL RING 4EA
Elec	Platform	Kant-M2e				
	PC/Video signal input	DVI-D, HDMI(2), DP(1)				
	PC/Video signal output	HDMI(1)				
	Daisy chain	Support(HDMI IN 2, DP IN)				
	Daisy chain spec.	HDCP2.2(4ea) HDCP 1.4(7ea) Without HDCP(9ea)				
	HDMI Ver.	2				
	USB	Support				
	Speaker	Support				
	Media player	Support				
	Network	Support (SBB)				
TCO standard	NONE					
About TV	TV(Tuner)	Not Support				
	PIP/PBP support	Not Support				
Resolution	DVI	1920x1080				
	HDMI/DP	3840x2160				

Specifications						
Item		QM43R	QM49R	QM55R	QM65R	QM75R
Power Consumption	Voltage	AC 100 to 240(60Hz/50Hz)				
	Max Power Consumption	121	132	143	176	220
	Typical power Consumption	76	91	96	125	159
	Rating power Consumption	110	120	130	160	200
	DPMS	≤ 0.5W (DVI, HDMI mode)				
Exterior color	Stand high glossy	Not Support				
	Bezel high glossy	Not Support				
	Product Exterior color	Black				
Pivot		Support				
Tilt/Swivel		Not Support				
Video Wall		NONE				
Special		• 500 nit, 24 / 7 • Remote Control by using RJ45 / RS-232C				

■ QBR

Specifications						
Item		QB43R	QB49R	QB55R	QB65R	QB75R
Introduction Area		Worldwide				
Panel	Panel	CY-NR043HGA VZH	CY-NR049HGLVZH	CY-NR055HGLVZH	CY-NR065HGLVZH	CY-NR075HGLVZH
	Vendor	AUO	SDC	SDC	SDC	SDC
	Optimum resolution	3840 x 2160 @60Hz	3840 x 2160 @60Hz	3840 x 2160 @60Hz	3840 x 2160 @60Hz	3840 x 2160 @60Hz
	Display area(mm)	941.184(H)x529.416(V)	1073.78(H)x604.00(V)	1209.6(H)x680.4(V)	1428.48(H)x803.52(V)	1650.24(H)x928.26(V)
	Pixel Pitch(mm)	0.2451(H)x0.2451(V)	0.093(H)x0.279(V)	0.105(H)x0.315(V)	0.124(H)x0.372(V)	0.42975(H)x0.42975(V)
	Display rate	16:9				
	Contrast rate	5000:1	4700:1	4700:1	4000:1	4000:1
	Luminance(cd/m ²)	350				
	Response time (ms)	8				
	View angle (H/V)	178/178				
	Glare Panel	Glare (Haze=2%)				
Mecha	Design	Signage New Design				
	Depth	48.3mm	46.3mm	46.3mm	46.3mm	49.7mm
	C/Rear	Signage New Design				
	Stand	STN-L4355F	STN-L4355F	STN-L4355F	-	-
	Wall Mount	WMN4070SE	WMN4070SE	WMN4070SE	WMN4277SE	WMN6575SE

Specifications						
Item		QB43R	QB49R	QB55R	QB65R	QB75R
Produce Measurement	Vesa (mm*mm)	200mm * 200mm	200mm * 200mm	200mm * 200mm	400mm * 400mm	400mm * 400mm
	Vesa screw standard	M8, L45 +HOLDER-WALL RING 4EA	M8, L45 +HOLDER-WALL RING 4EA	M8, L45 +HOLDER-WALL RING 4EA	M8, L71 +HOLDER WALL +HOLDER-WALL RING 4EA	M8, L71 +HOLDER WALL +HOLDER-WALL RING 4EA
Elec	Platform	Kant-M2e				
	PC/Video signal input	DVI-D, HDMI(2)				
	PC/Video signal output	Not Support				
	Daisy chain	Not Support				
	Daisy chain spec.	Not Support				
	HDMI Ver.	2				
	USB	Support				
	Speaker	Support				
	Media player	Support				
	Network	Support (SBB)				
	TCO standard	NONE				
About TV	TV(Tuner)	Not Support				
	PIP/PBP support	Not Support				
Resolution	DVI	1920x1080				
	HDMI/DP	3840x2160				
Power Consumption	Voltage	AC 100 to 240 (60Hz/50Hz)				
	Max Power Consumption	121	132	143	176	220
	Typical power Consumption	76	91	96	125	159
	Rating power Consumption	110	120	130	160	200
	DPMS	≤ 0.5W(DVI, HDMI mode)				
Exterior color	Stand high glossy	Not Support				
	Bezelhigh glossy	Not Support				
	Product Exterior color	Black				
Pivot		Support				
Tilt/Swivel		Not Support				
Video Wall		NONE				
Special		50 nit, 16 / 7 - Remote Control by using RJ45 / RS-232C				

QB98R

Specifications		
Item		QB98R
Introduction Area		Worldwide
Panel	Panel	LTi980FN01-A
	Vendor	SDC
	Optimum resolution	3840 x 2160 @60Hz
	Display area(mm)	2158.848(H) x 1214.352(V)
	Pixel Pitch(mm)	0.187 x 0.562
	Display rate	16:09
	Contrast rate	4000:01:00
	Luminance(cd/m ²)	350 nit
	Response time (ms)	6
	View angle (H/V)	178/178
	Glare Panel	Non-glare(Haze=25%)
Mecha	Design	Common with QM98F
	Depth	71.6(w/o handle)
		75.3(with handle)
	C/Rear	Common with QM98F
	Stand	-
	Wall Mount	WMN9500SD
Produce Measurement	Vesa (mm*mm)	900mm * 600mm
	Vesa screw standard	M8, 4EA

Elec	Platform	Kant-M2e
	PC/Video signal input	DVI-D, HDMI(2), DP(1)
	PC/Video signal output	HDMI(1)
	Daisy chain	Support(HDMI IN 2, DP IN)
	Daisy chain spec.	HDCP2.2(4ea) HDCP 1.4(7ea) Without HDCP(9ea)
	HDMI Ver.	2
	USB	Support
	Speaker	Support
	Media player	Support
	Network	Support (SBB)
	TCO standard	NONE
About TV	TV(Tuner)	Not Support
	PIP/PBP support	Not Support
Resolution	DVI HDMI/DP	1920x1080 3840x2160
Power Consumption	Voltage	AC 100 to 240(60Hz/50Hz)
	Max Power Consumption	528
	Typical power Consumption	372
	Rating power Consumption	480
	DPMS	≤ 0.5W(DVI, HDMI mode)
Exterior color	Stand high glossy	Not Support
	Bezel high glossy	Not Support
	Product Exterior color	Black
Pivot		Support
Tilt/Swivel		Not Support
Video Wall		NONE
Special		350 nit, 24 / 7 - Remote Control by using RJ45 / RS-232C

2-3. Detail Factory Option



Note

- If you replace the main board with new one, please change the factory option as well.
The options you must change are "Type".

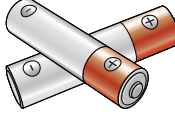
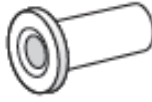
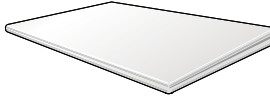
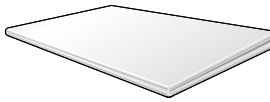
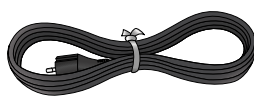
Model Name		QM43R	QM49R	QM55R
Panel	Vendor	AUO	SDC	SDC
	CODE	BN95-05703A	BN95-05704A	BN95-05705A
	PANEL	CY-NR043HGAVYH	CY-NR049HGLVYH	CY-NR055HGLVYH
POWER	Vendor	Dongyang	SOLU M	SOLU M
	Code	BN44-00952B	BN44-00953B	BN44-00953B
1	Factory reset			
2	Type	43L6AUZNR	49A6AUZNR	55A6AUZNR
3	Local set	US, KOR, CHI_DTV, TAIWAN, EU, CIS_RUSSIA, ...		
4	SW Model	LFD QMRN		
5	MagicInfo Support	-		
6	WatchDog	-		

Model Name		QM65R	QM75R
Panel	Vendor	SDC	AUO
	CODE	BN95-05706A	BN95-05707A
	PANEL	CY-NR065HGLVYH	CY-NR075HGAVYH
POWER	Vendor	HANSOE	HANSOE
	Code	BN44-00954B	BN44-01005A
1	Factory reset		
2	Type	65A6AUZNR	75L6AUZNR
3	Local set	EU, US, KOR, TAIWAN...Etc	
4	Tuner	X	
5	MagicInfo Support	Enabled	
6	WatchDog	Enabled	

Model Name		QB43R	QB49R	QB55R
Panel	Vendor	AUO	SDC	SDC
	CODE	BN95-05708A	BN95-05709A	BN95-05710A
	PANEL	CY-NR043HGAVZH	CY-NR049HGLVZH	CY-NR055HGLVZH
POWER	Vendor	Dongyang	SOLU M	SOLU M
	Code	BN44-00952B	BN44-00953B	BN44-00953B
1	Factory reset			
2	Type	43L6AUYNR	49A6AUYNR	55A6AUYNR
3	Local set	US, KOR, CHI_DTV, TAIWAN, EU, CIS_RUSSIA, ...		
4	SW Model	LFD QBRN		
5	MagicInfo Support	-		
6	WatchDog	-		

Model Name		QB65R	QB75R	QB98R
Panel	Vendor	SDC	SDC	SDC
	CODE	BN95-05711A	BN95-05712A	BN07-01557B
	PANEL	CY-NR065HGLVZH	CY-NR075HGLVZH	LT1980FN01-A
POWER	Vendor	HANSOE	HANSOE	SOLU M
	Code	BN44-00954B	BN44-01005A	BN44-000318C
1	Factory reset			
2	Type	65A6AUYNR	75A6AUYNR	98A6AUZER
3	Local set	EU, US, KOR, TAIWAN...Etc...		
4	Tuner	X		
5	MagicInfo Support	Enabled		
6	WatchDog	Enabled		

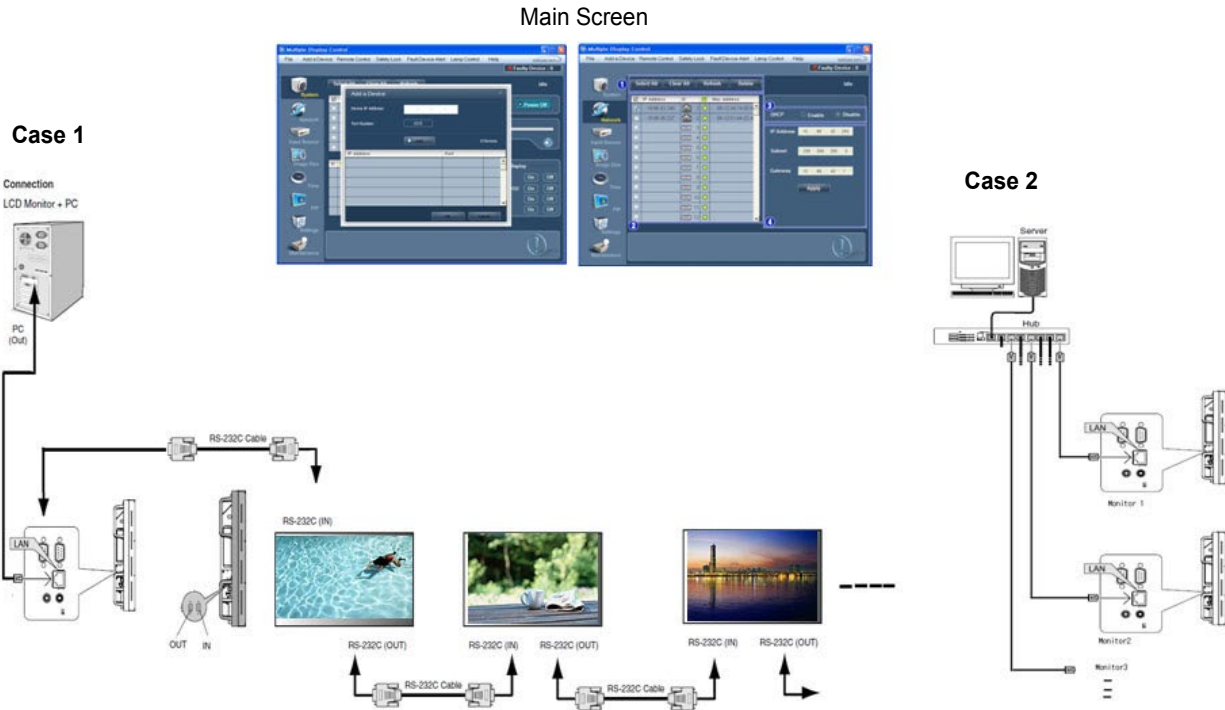
2-4. Accessories

Product	Description	Code. No	Remark
	Batteries	4301-000121(W/W) 4301-001113(TAWAN) 4301-000103(INDIA)	Samsung Electronics Service Center (The part code for some accessories may differ depending on your region.)
	RS232C (IN) adapter	BN39-01545B	
	Remote Control	WW - BN59-01180A UAE - BN59-01180C	
	Holder-Ring	BN96-43169A (Q*49R, Q*55R, Q*65R, Q*75R)	
	Holder-Cable	BN96-40152A (Q*65R, Q*75R, Q*98R)	
	Regulatory guide		
	Quick Setup Guide		
	Power cord	Next Page	

Power cord	43" / 49" / 55 / 65" (2pin/1500mm/Black)	75" (2pin/3000mm/Black)	98" (3pin/3000mm/Black)
America	3903-001117	3903-001132	3903-001116
Europe	3903-001118	3903-001130	3903-001114
United Kingdom	3903-001119	3903-001129	3903-001115
South Korea	3903-001074	3903-001131	3903-001114
Australia	3903-001082	3903-001123	3903-001103
Argentina	3903-001079	3903-001126	3903-001095
Brazil	3903-001081	3903-001124	3903-001101
South Africa	3903-001078	3903-001139	3903-001100
India	3903-001080	3903-001125	3903-001102
Taiwan	3903-001077	3903-001138	3903-001097
Thailand	3903-001076	3903-001127	3903-001104
China	3903-001075	3903-001128	3903-001105
Chile	3903-001118	3903-001130	3903-001098
Israel	3903-001118	3903-001130	3903-001099

2-5. What Is Different About the Product

2-5-1. Remote Control (of up to 100 devices) through the Built-in RJ45 and RS-232C Ports



1. Upon purchase, the monitor is set to the default IP address configured at the factory.
2. Connect a PC to the monitor using a LAN cable. Next, access the monitor and personalize the IP setting.
3. The MDC program shows a list of IPs for the products currently connected and a list of IDs set using the onscreen menu.
4. Each monitor can be controlled individually by using the MDC program.

2-5-2. Optimum Picture Quality and Afterimage Burn-in Prevention

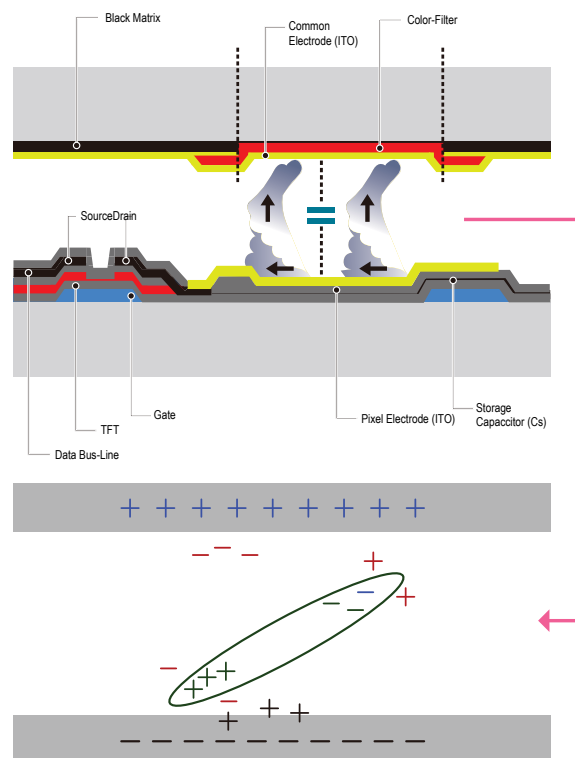
■ Optimum Picture Quality

- Due to the nature of the manufacturing of this product, approximately 1 pixel per million (1ppm) may be brighter or darker on the panel.
This does not affect product performance.
 - The number of sub-pixels by panel type: 24,883,200
- Leaving the screen fixed on a stationary image for an extended period of time may cause afterimage burn-in or defective pixels.
 - Activate power-saving mode or a dynamic screen saver if you will not be using the product for an extended period of time.

■ Prevention of Afterimage Burn-in

What is afterimage burn-in?

- Afterimage burn-in should not occur when the LCD panel is operating normally. Normal operation refers to a continuously changing video pattern. If the LCD panel displays a fixed pattern for an extended period of time a slight voltage difference may occur between the electrodes in pixels that control the liquid crystals.
- Such a voltage difference between electrodes increases with time and makes the liquid crystals thinner.
When this occurs, a previous image can remain on the screen when the pattern changes. To prevent this, the accumulated voltage difference should be reduced.
- Afterimage burn-in should not occur when an LCD panel is operating in proper conditions.

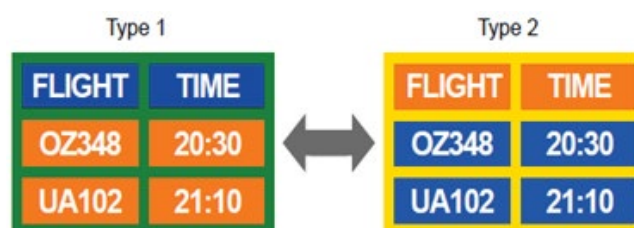


Preventing afterimage burn-in

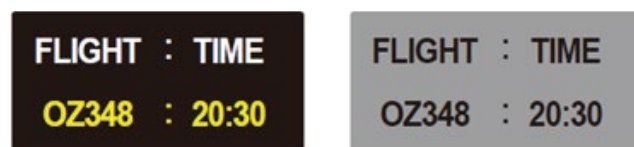
The best way to protect the product from afterimage burn-in is switching the power off or setting the PC or system to run a screen saver when not in use. Also, Warranty service may be limited depending on instruction guide.

- Power Off, Screen Saver, or Power Save Mode
 - Go to Display Properties > Power Supply on your PC and set the product to power off as required.
 - Using a screen saver is recommended.
It is best to use a single-color or moving-image screen saver.

- Regular color Change
 - Use 2 colors
Switch between 2 colors every 30 minutes as shown above.
- Avoid combinations of a text color and background color of contrasting brightness.
(Brightness: refers to the lightness or darkness of a color which varies depending on the amount of light emitted.)



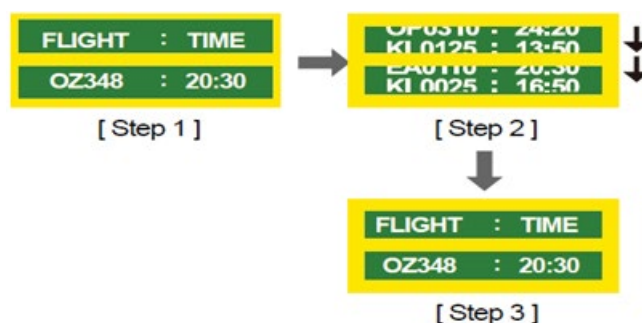
Avoid using grey as it may contribute to afterimage burn-in.
Avoid using colors of contrasting brightness
(black and white; grey).



- Regular Text color Change
 - Use bright colors of similar brightness.
Interval: Change text color and background color every 30 minutes



- Move and change text every 30 minutes as shown below.



- Regularly display a moving image along with a logo.
Interval : Display a moving image along with a logo for 60 seconds after using for 4 hours.

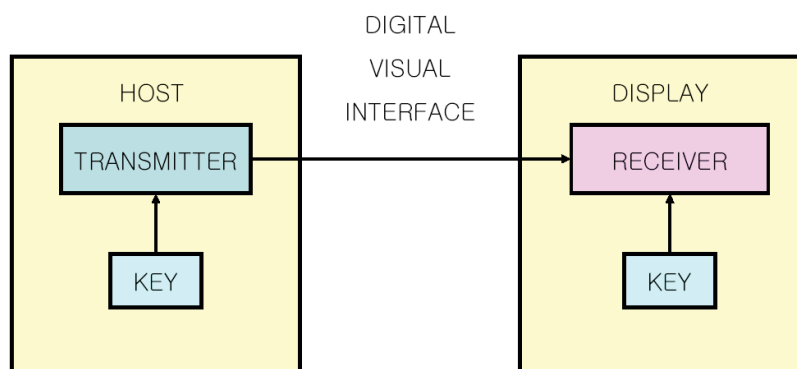
2-5-3. HDCP Operation

What is HDCP?

HDCP refers to an encoding function developed to protect digital content included in HDMI signal transmitted.

Operating Diagram

The operating diagram below shows how the picture is displayed when a device equipped with the HDCP function connects to a monitor that contains an HDCP authentication code. The picture is displayed after an authentication (decoding) process through the HDMI's I2C line.



1. Authentication takes about 2 seconds.
2. A static screen will appear if the authentication fails. If this is the case, try the following:
 - Check the supported resolution.
 - Close and run the software again (for re-authentication).
 - Enter the HDCP key again.
 - Check that the device and graphics card are HDCP certifiable or the content is authorized for use.

3. Disassembly and Reassemble



Warning

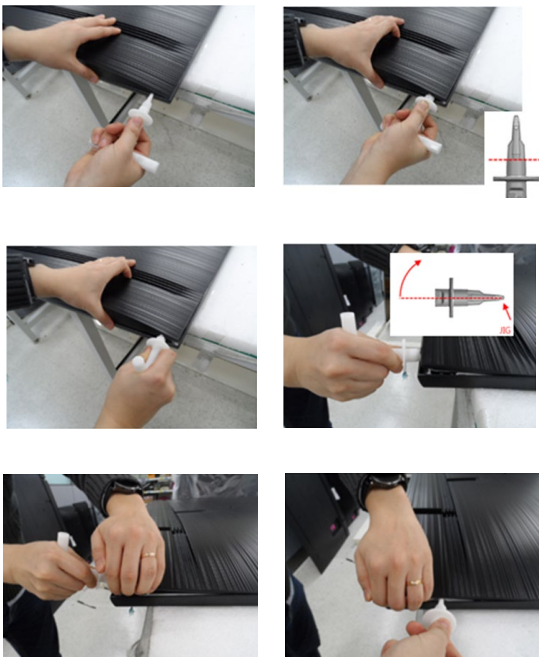
- As this product has parts that are sensitive to static electricity, be careful when handling them.

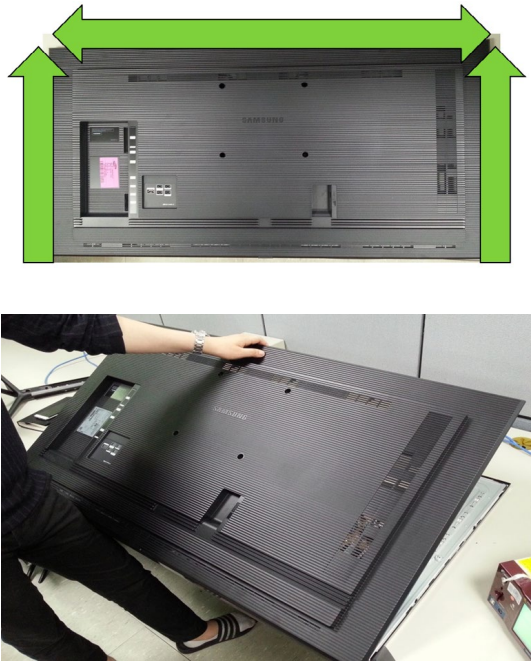
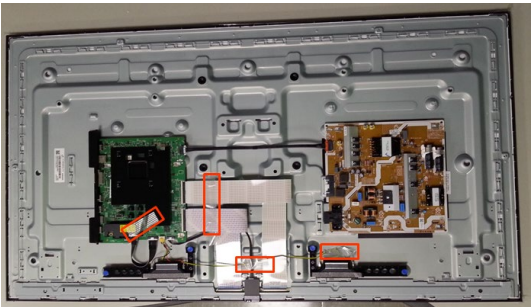


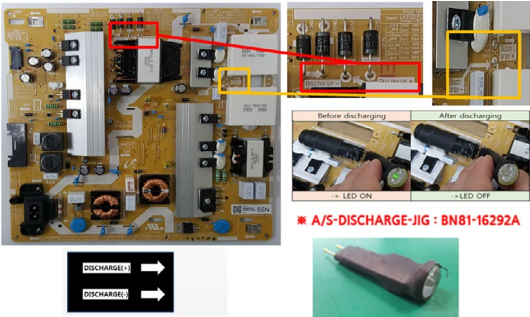
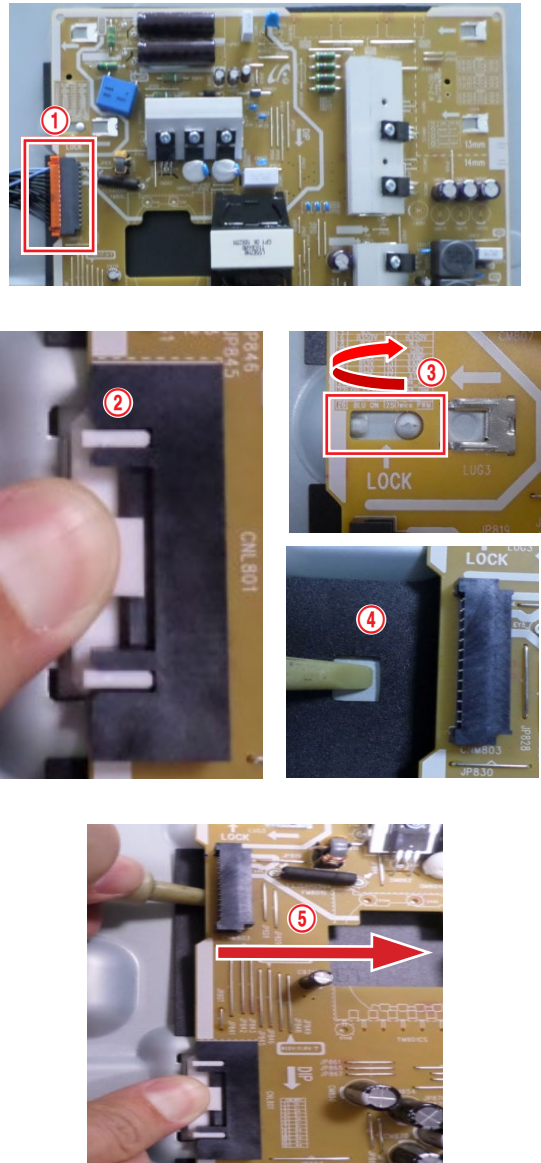
Caution

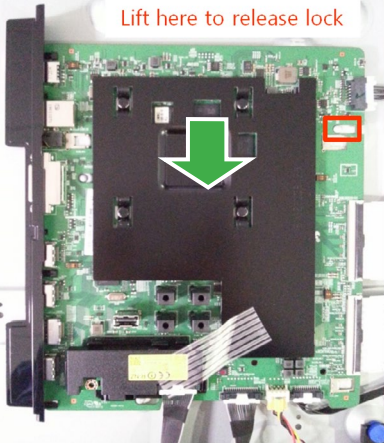
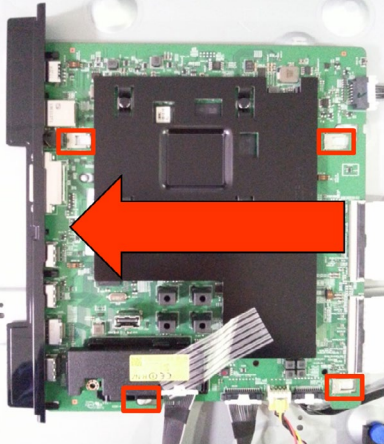
- Disconnect the SMART SIGNAGE from the power source before disassembly.
- Follow these directions carefully
 - Use the Samsung Service tool to disassemble the cabinet
 - * Recommend to use the Samsung Service tool
 - Recommended Torque for Cabinet/Stand screws : 10 ~ 12kgf
 - * A strength of Torque can be changed depending on the situation.

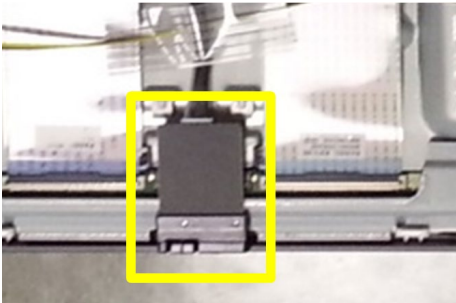
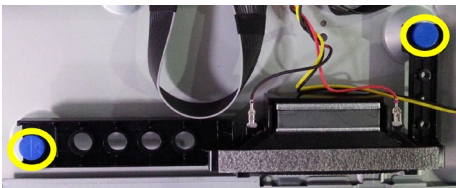
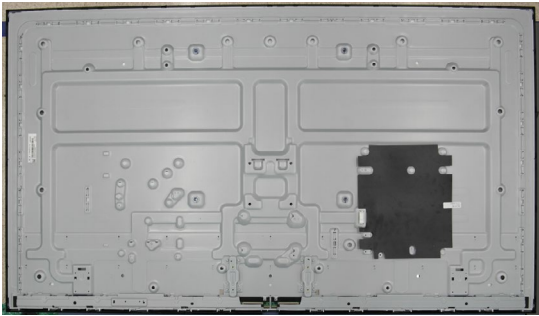
3-1. Product Disassembly [43" ~ 75"]

Description	Picture Description	Screws
1 Carefully position the smart signage so that the screen is facing downwards. Make sure to place the smart signage upon a soft cushion or any material that will prevent damage to the screen.		
2 Removing the 'Rear Cover'. 2-1 Please follow 8 sequence. - Ready to insert open jig adjust jig edge to hole - Insert open jig till red line - Rotate open jig to 90-degree - Lift jig to unlock wire hook on bottom - Insert hand and retain gap - Take out jig and insert in side gap		(Open-Jig)  BN81-14946A  BN81-14946B  BN81-12884A

Description	Picture Description	Screws
• Insert opne jig till red line • Disassemble Hooks of Cover Rear along the side • Insert hand and retain side gap. • Take out jig, and insert in top gap (check the insert point) * When removing top side left / right of rear cover, be careful about hooks.		
2-2 Disassemble all Hooks of Cover Rear along the three side 2-3 Lift top side then pull back to remove the back cover.		
3 Remove the Electric tapes shown on the images. ※ When assembling the smart signage, the electric tapes must be applied on the same locations. Please remember to take a picture of where the tapes were first applied.		

Description	Picture Description	Screws
4 4-1 Discharge Capacitors Before remove SMPS, Must discharge capacitors for your safety. Check discharge point(1st, 2nd block) and then, discharge with discharge-Jig.		
4-2 Remove SMPS ① Remove power connector. ② Push and hold down BLU Connector Tab to release its panel lock connection. ③ Lift to Release the Lock Tab on Upper left side of Board (Step 5 will assist). ④ Locate a notch in insulation sheet (not all models). ⑤ Use Open Tool in notch to help release & smoothly slide SMPS Board to the Right. (While pushing BLU Tab & Releasing Lock Tab)		

Description	Picture Description	Screws
5 Remove the cables from the 'Main Board't	 A photograph of the main board with several cables highlighted by blue rectangular boxes. A white ribbon cable is also visible at the bottom left.	
5-1 Remove Main Board • Use both hands to hold the 'Main Board' and gently lift up 1 point marked. • Slide the board to the Left side to release the board. Then carefully remove the 'TV Board'.	A photograph of the main board with a green arrow pointing upwards to a specific point. A red box highlights a small component on the right side. Text above the arrow reads "Lift here to release lock". A photograph of the main board with a large red arrow pointing to the left. Four red boxes highlight specific points on the board: two on the left edge and two on the right edge.	

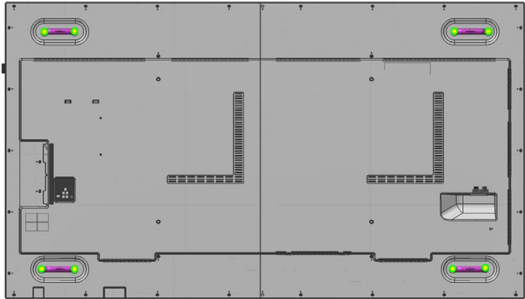
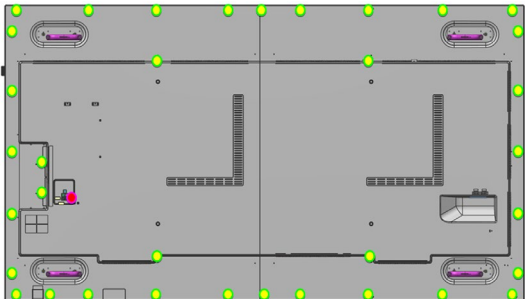
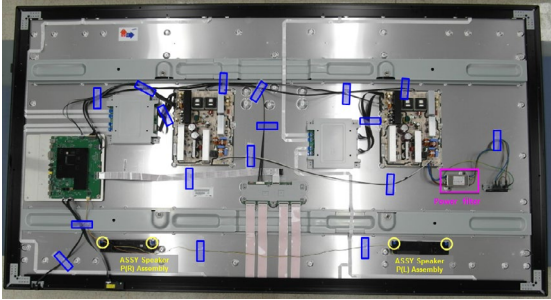
Description	Picture Description	Screws
6 Remove the IR/JOG unit.		
7 Remove the BT/WIFI unit.		
8 Lastly, remove the speakers on both side.		
9 Check all parts are removed as picture below.		

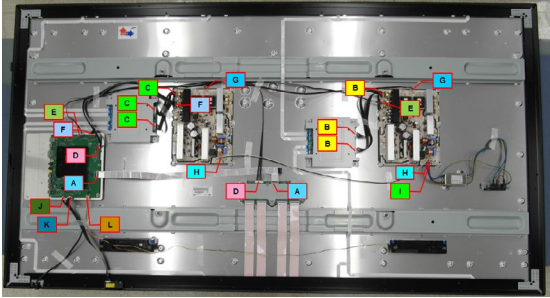
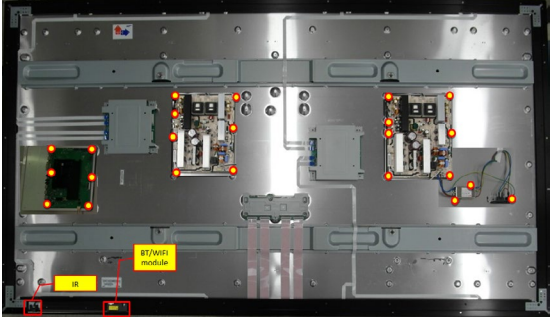
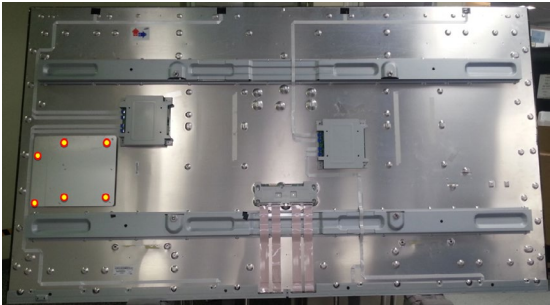
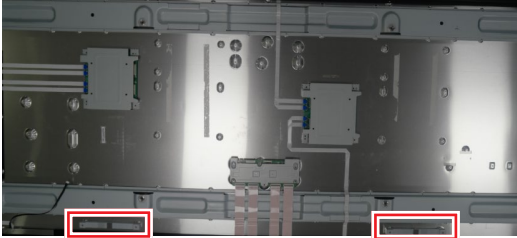
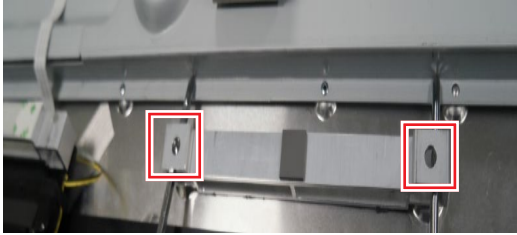


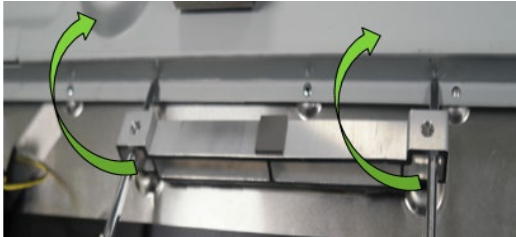
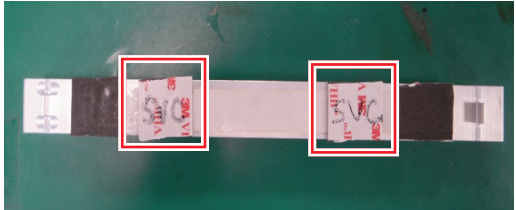
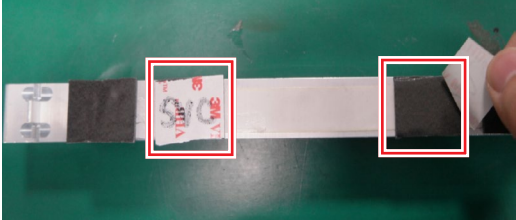
Note

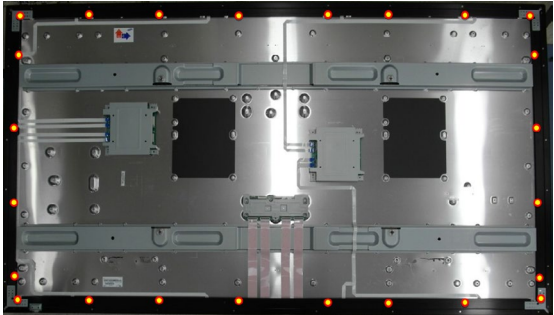
- Reassembly procedures are in the reverse order of disassembly procedures.
- The exterior may differ depending on the product.

3-2. Product Disassembly [98"]

Description	Picture Description	Screws
1 Remove Cover Handle Screws.		
2 Remove Cover screws.		
3 Remove Cover Handle and Rear Cover.		
4 Detach the all cables and Tapes. Remove Speaker.		

Description	Picture Description	Screws
Refer to cable connection		
5 Remove screws which is on mainboard, two SMPs and power filter. Remove IR and BT/WIFI module.	 I like swimming.	
6 Remove screws which is on BRACKET-MAIN.		
7 Remove the speakers bracket from panel. ① Check the two speaker brackets ※ Speaker bracket Code BN96-41753A ② Using two drivers, Insert driver at the each side of Bracket.	 	

Description	Picture Description	Screws
③ Slowly lift up the drivers to the marked direction.		
④ Detach the bracket.		
• Steps of assembling the speaker bracket.		
① Check the bottom of speaker brackets.		
② Remove the Films of marked "SVC".		
③ Put the Guide Frames of bracket to panel holes.		
④ END.		

Description	Picture Description	Screws
8 Remove the marked screws and Detach Frame.		
9 Check all parts are removed as picture below.		



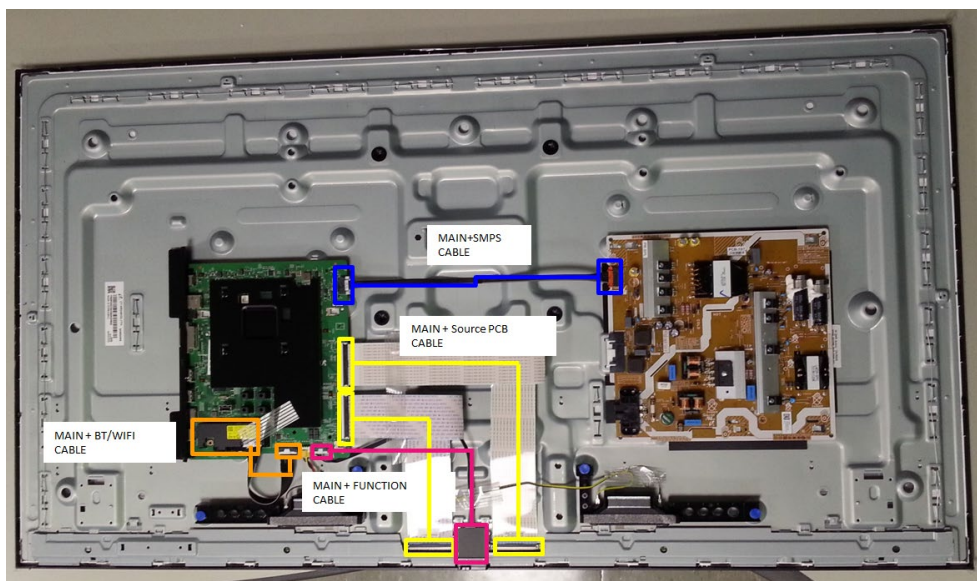
Note

- Reassembly procedures are in the reverse order of disassembly procedures.
- The exterior may differ depending on the product.

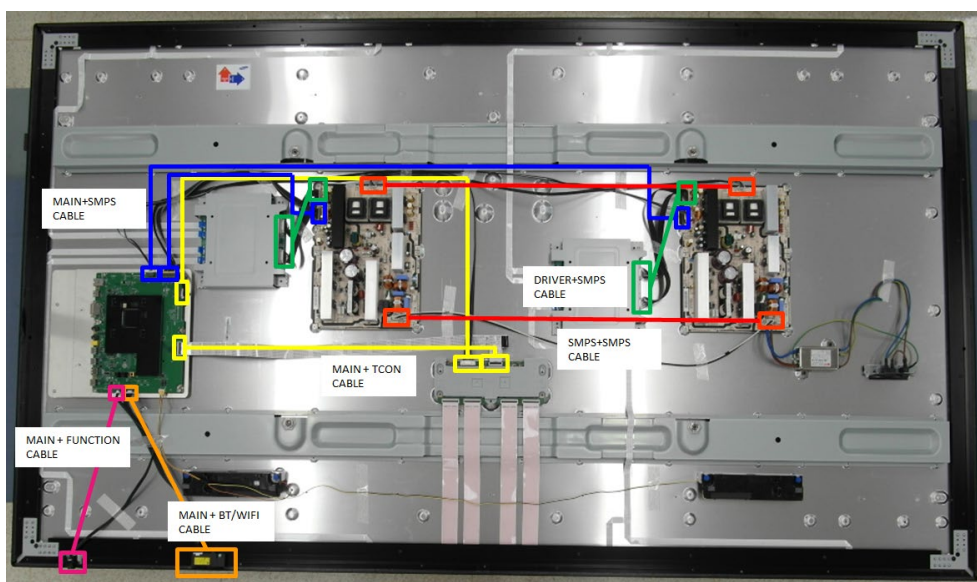
4. Troubleshooting

4-1. Previous check

1. Check the various cable connections first.
 - Check to see if there is a burnt or damaged cable.
 - Check to see if there is a disconnected or loose cable connection.
 - Check to see if the cables are connected according to the connection diagram.
2. Check the power input to the Main Board.



[43", 49", 55", 65", 75"]



[98"]

3. How to distinguish if the problem is caused by Main board or Source PCB.
 - No Video : If the problem is No Video but BLU is on and Indication LED is blinking repeatedly and faster than normal booting, replace the Source PCB.
 - Distorted Picture : Check the inner patterns.

■ For All Mode

GenoaP	Napoli Pre	Napoli post	Piocture	Problem
OK	OK	OK	NG	Main board or Signal Source
NG	OK	OK	NG	Main board
NG	NG	OK	NG	Main board or FRC setting
NG	NG	NG	NG	Main or LVDS cable or T-Con or Panel

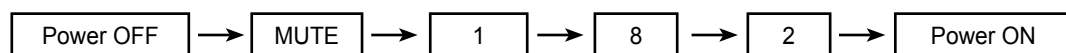
■ Only for HDMI Mode (Additional Check)

HDMI	Picture	Problem
OK	NG	There is no problems after HDMI IC check HDMI source or HDMI jack.
NG	NG	There is no problems before HDMI IC check GenoaS pattern or LVDS cable or T-Con

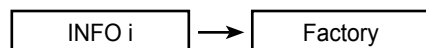
■ How to check inner pattern?

1. Factory mode

Using a standard remote control



Using a factory remote control



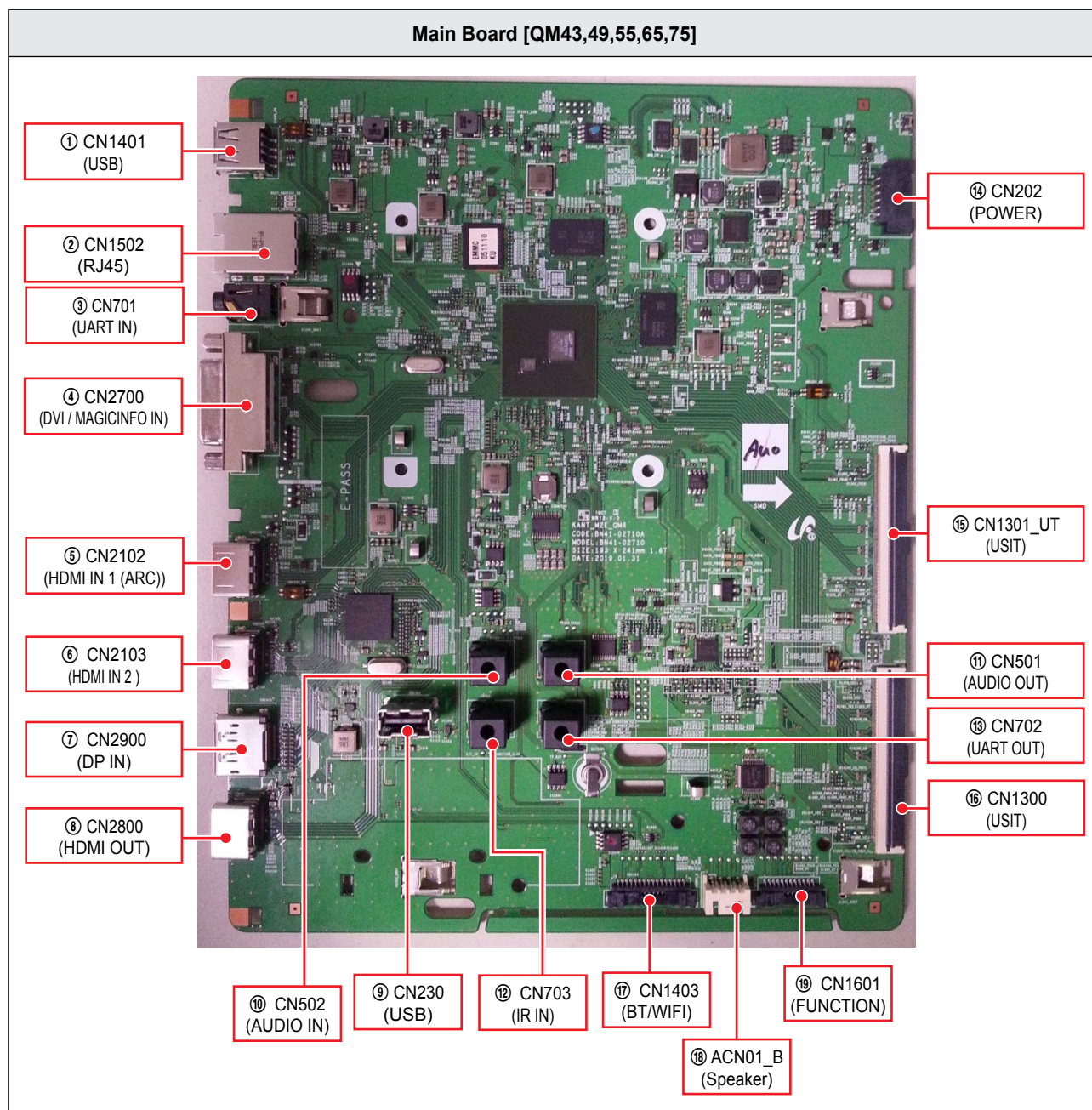
2. Move to 'SVC' menu.

3. Move to 'Test Pattern' menu.

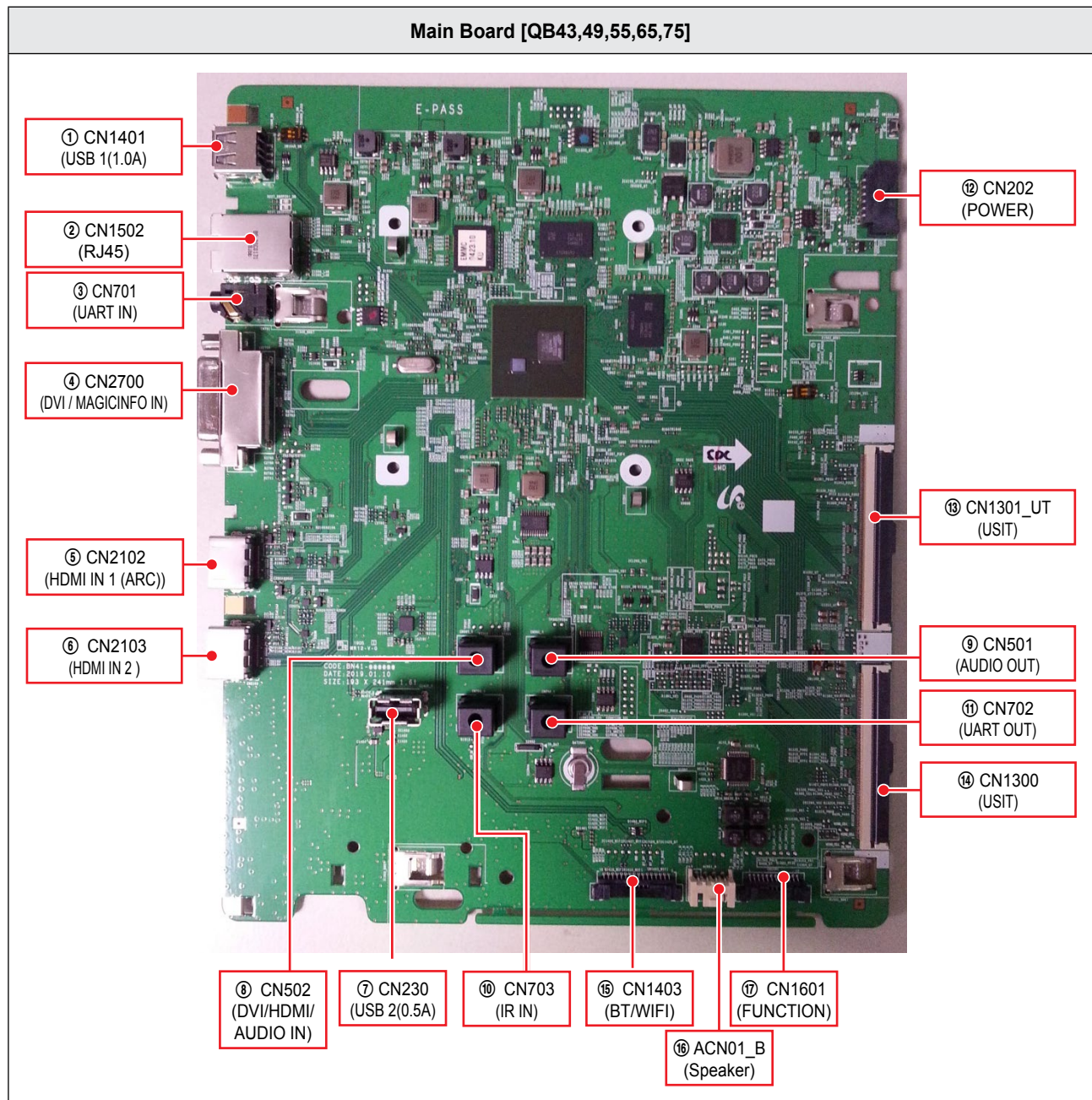
4. Check inner patterns.



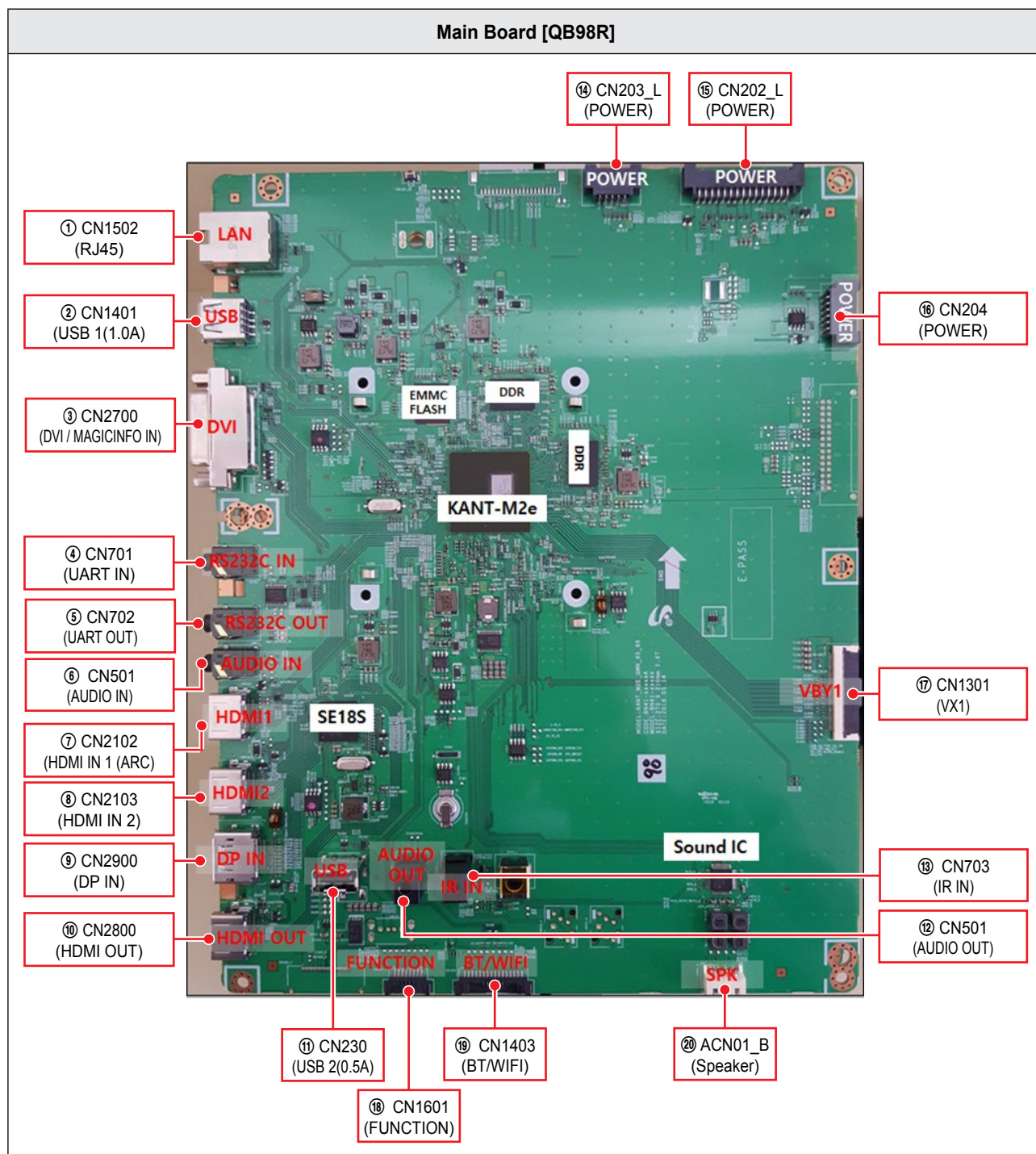
Main Board Layout



■ Main Board Layout



Main Board Layout

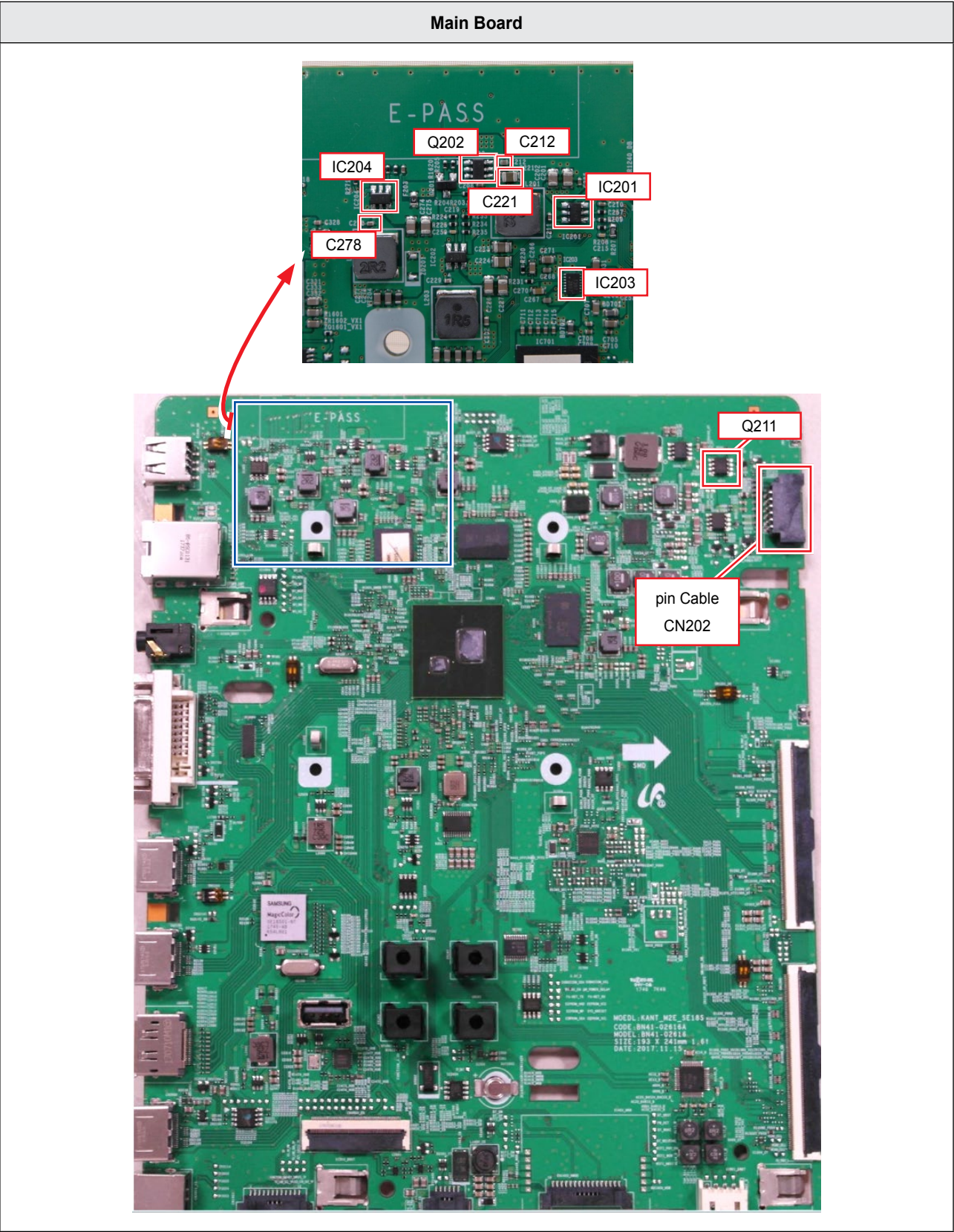


4-2. How to check fault symptom

4-2-1. When the product is not powered on (43"~75")

Symptom	- The LEDs on The front panel do not work when connecting The power cord. - The SMPS relay does not work when connecting The power cord. - The units appears to be dead.
Main check points	The IP relay or the LEDs on the front panel does not work when connecting the power cord if the cables are improperly connected or the Main Board or SMPS is not functioning. In this case, check the following: - Check the internal cable connection status inside the unit. - Check the fuses of each part. - Check the output voltage of SMPS.
Troubleshooting guide	<pre> graph TD Q1[Is the power on?] -- No --> A1[Check power cable (power cord) connections.] Q1 -- Yes --> Q2[Is Backlight turned on when the 12pin cable does not connected?] Q2 -- No --> A2[Change the 12 pin cable. Change Assembly of main power.] Q2 -- Yes --> Q3[Is "Main power input voltage" normal? - Pin 3: A13V (CN202)] Q3 -- No --> A3[Change IC201, IC204 or Main Board.] Q3 -- Yes --> Q4[Does DC A5V and A3.3V normally appear to C221 and C278?] Q4 -- No --> A3 Q4 -- Yes --> Q5[Does DC B5V normally appear to C212?] Q5 -- No --> A4[Change Q202 or Main Board.] Q5 -- Yes --> Q6[Do B3.3V and 1.8V normally appear at pin 9 and pin 14 of IC203 ?] Q6 -- No --> A5[Change IC203 or Main Board.] Q6 -- Yes --> Q7[Is the power applied to pin 6 of Q211 ?] Q7 -- No --> A6[Check the other functions. (No Display part) Change the LCD panel.] </pre>
Precautions	Be sure to disconnect the power and start working.

■ Location of Parts

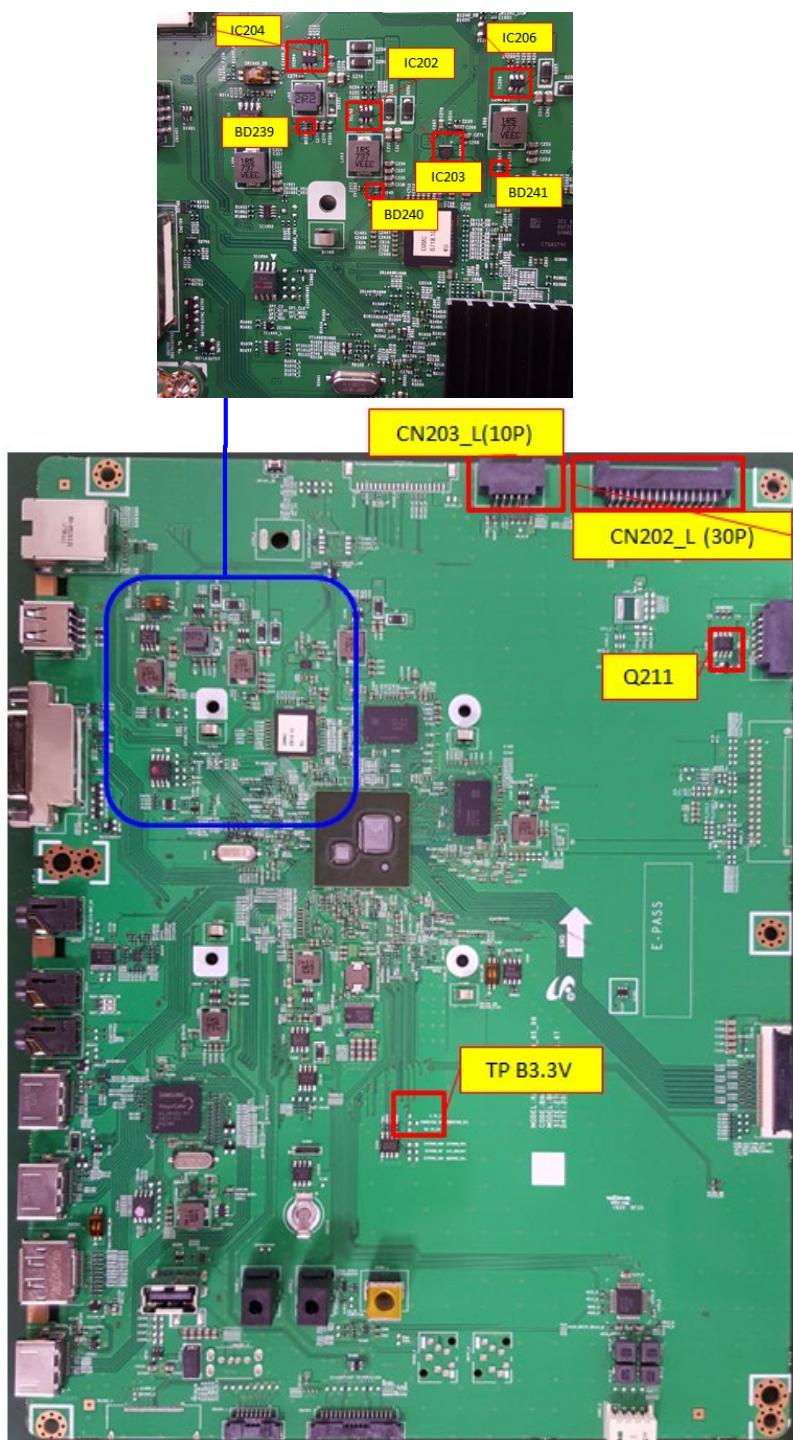


4-2-2. When the product is not powered on (98")

Symptom	- The LEDs on The front panel do not work when connecting The power cord. - The SMPS relay does not work when connecting The power cord. - The units appears to be dead.
Main check points	The IP relay or the LEDs on the front panel does not work when connecting the power cord if the cables are improperly connected or the Main Board or SMPS is not functioning. In this case, check the following: - Check the internal cable connection status inside the unit. - Check the fuses of each part. - Check the output voltage of SMPS.
Troubleshooting guide	<pre> graph TD Q1[Is the power on?] -- No --> A1[Check power cable (power cord) connections.] Q1 -- Yes --> Q2[Is Backlight turned on when the 30pin, 10pin cable does not connected?] Q2 -- No --> A2[Change the 30pin cable, if CN202_L is abnormal. Change the 10pin cable, if CN203_L is abnormal. Change Assembly of main power.] Q2 -- Yes --> Q3[Is "Main power input voltage" normal? Pin 22: B13V (CN202_L) Pin 3: B13V (CN203_L)] Q3 -- No --> A2 Q3 -- Yes --> Q4[Does A3.3V normally appear to BD239? Does A1.8V normally appear to BD240? Does A1.1V normally appear to BD241?] Q4 -- No --> A3[Change IC202, If 1.8V is abnormal. Change IC204, If 3.3V is abnormal. Change IC206, If 1.1V is abnormal. or Change Main Board.] Q4 -- Yes --> Q5[Does DC B3.3V normally appear to TP B3.3?] Q5 -- No --> A4[Change IC203 or Main Board.] Q5 -- Yes --> Q6[Is the power applied to pin 6 of Q211 ?] Q6 -- No --> A5[Check the other functions. (No Display part) Change the LCD panel.] </pre>
Precautions	Be sure to disconnect the power and start working.

■ Location of Parts

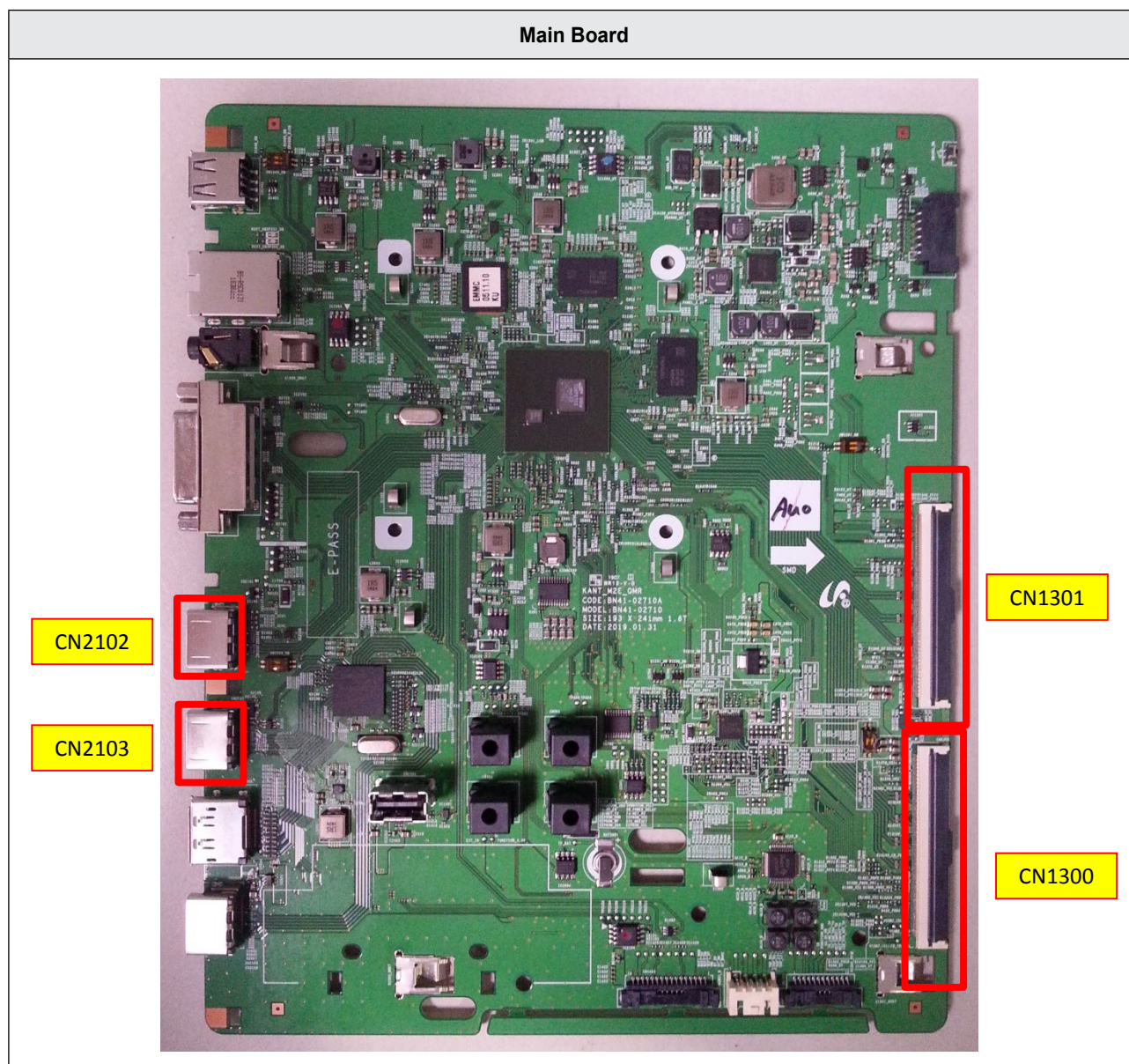
Main Board



4-2-3. When a blank screen is displayed (HDMI-Digital signal)

Symptom	The screen is not displayed when the audio is working.
Main check points	Check the HDMI source. This may happen when the USIT cable connecting the Main Board and the Panel is disconnected.
Troubleshooting guide	<pre> graph TD Q1[Is blank screen display, when power indicator is off & lamp(back light) is on?] -- No --> A1[Check the set at 'Standby Mode'.] Q1 -- Yes --> Q2[Are HDMI input signal and HDMI cable Connection normal?] Q2 -- No --> A2[Change PC cable. Change Main Board.] Q2 -- Yes --> Q3[Does signal appear to pin 1,3,4,6,7,9,10,12(HDMI1~2) of CN2102, CN2103?] Q3 -- No --> A3[Check external device setting. Check HDMI cable. If the problem is continue, change Main Board.] Q3 -- Yes --> Q4[Does digital data appear to pin 47~78 of CN1300 and pin 26~57 of CN1301?] Q4 -- No --> A4[Change IC 901 or Main Board.] Q4 -- Yes --> Q5[Check the USIT cables. Replace the LCD panel.] Q5 -- No --> A5[Ask for technical support.] </pre>
Precautions	Be sure to disconnect the power and start working.

■ Location of Parts

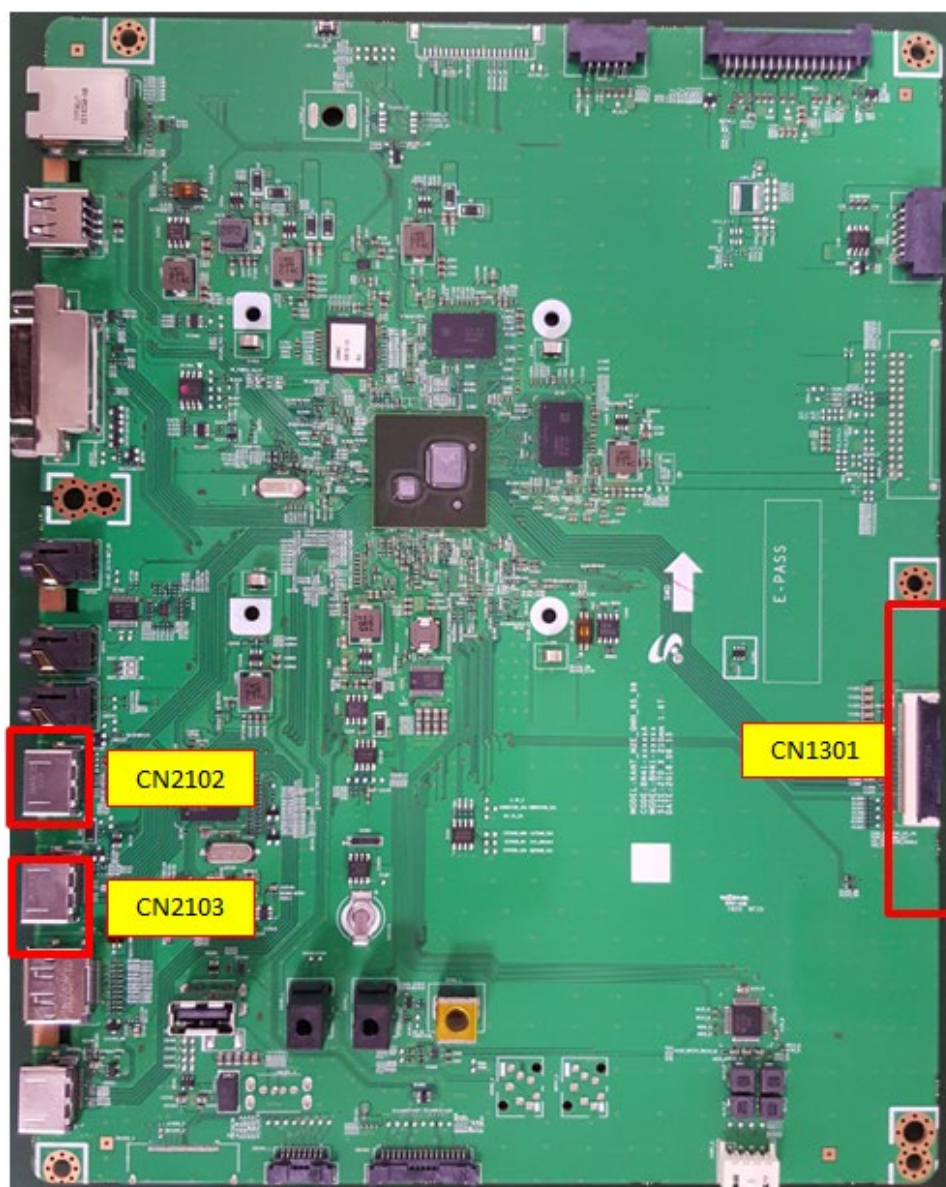


4-2-4. When a blank screen is displayed (HDMI-Digital signal) (98")

Symptom	The screen is not displayed when the audio is working.
Main check points	Check the HDMI source. This may happen when the USIT cable connecting the Main Board and the Panel is disconnected.
Troubleshooting guide	<pre> graph TD Q1[Is blank screen display, when power indicator is off & lamp(back light) is on?] -- No --> A1[Check the set at 'Standby Mode'.] Q1 -- Yes --> Q2[Are HDMI input signal and HDMI cable Connection normal?] Q2 -- No --> A2[Change PC cable. Change Main Board.] Q2 -- Yes --> Q3[Does signal appear to pin 1,3,4,6,7,9,10,12(HDMI1~2) of CN2102, CN2103?] Q3 -- No --> A3[Check external device setting. Check HDMI cable. If the problem is continue, change Main Board.] Q3 -- Yes --> Q4[Does digital data appear to pin 47~78 of CN1300 and pin 26~57 of CN1301?] Q4 -- No --> A4[Change IC 901 or Main Board.] Q4 -- Yes --> Q5[Check the USIT cables. Replace the LCD panel.] Q5 -- No --> A5[Ask for technical support.] </pre>
Precautions	Be sure to disconnect the power and start working.

■ Location of Parts

Main Board

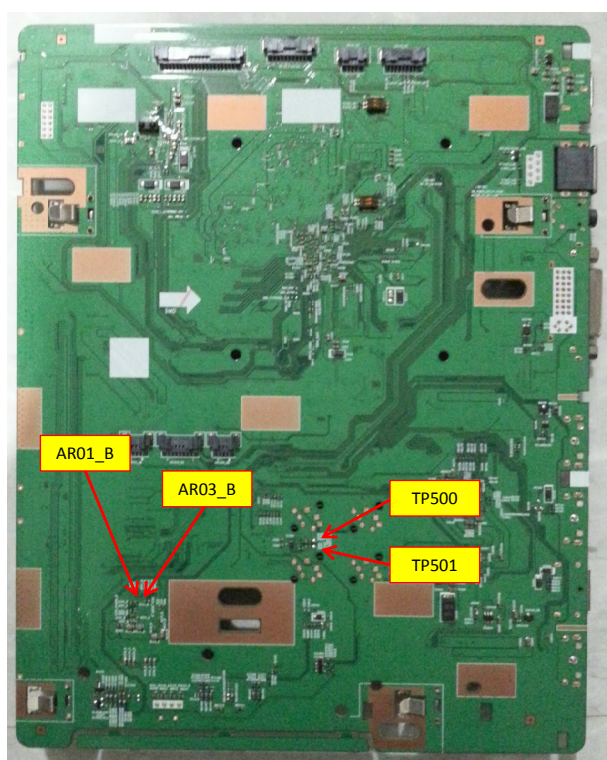
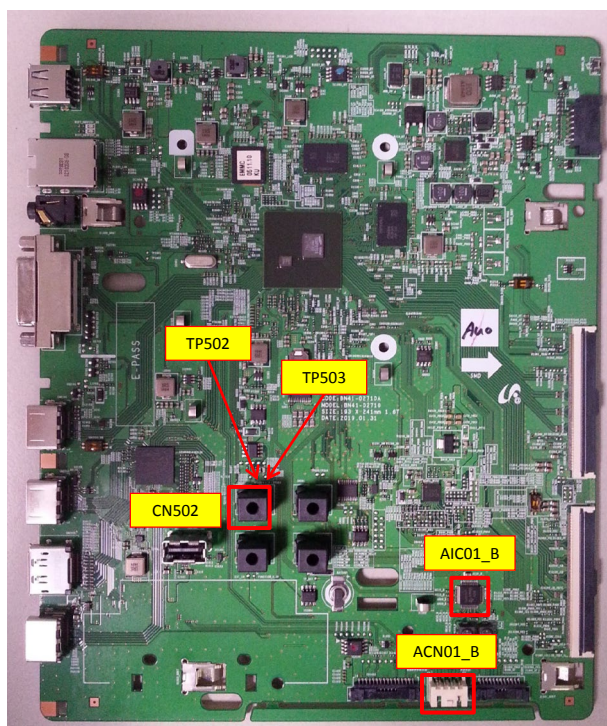


4-2-5. When no sound is output (Speaker) (43"~75")

Symptom	Video is normal but there is no sound.
Main check points	- When the speaker connectors are disconnected or damaged. - When the sound processing part of the Main Board is not functioning.
Troubleshooting guide	<pre> graph TD Q1[Are Input signal and sound cable(PC/HDMI) connection normal?] -- No --> A1[Input normal signal.] Q1 -- Yes --> Q2[Does Input signal appear to Main Board? PC-L : TP502, PC-R : TP503.] Q2 -- No --> A2[Check CN502. If necessary, change Main Board.] Q2 -- Yes --> Q3[Does I2C data appear to AUDIO IC? AR01_B : BCLK / AR03_B : DATA] Q3 -- No --> A3[Change Main Board] Q3 -- Yes --> Q4[1. Are speaker sound data of R+,R-,L+,L- Of ACN01_B(pin1~4) normal? 2. Are Monitor output data of TP500, TP501(HP_OUT_L/R) normal?] Q4 -- No --> A4[Change AIC01_B or Main Board.] Q4 -- Yes --> Q5[Change the Speaker] Q5 -- No --> A5[Ask for technical support.] </pre>
Precautions	Be sure to disconnect the power and start working.

■ Location of Parts

Main Board

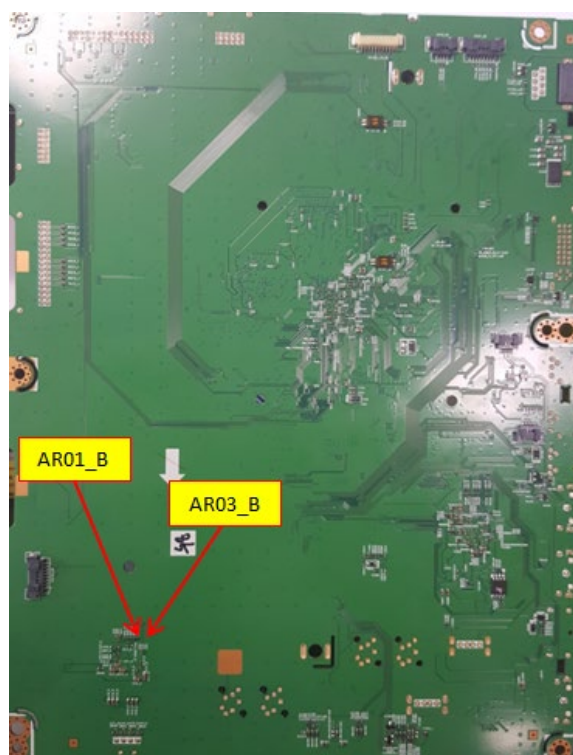
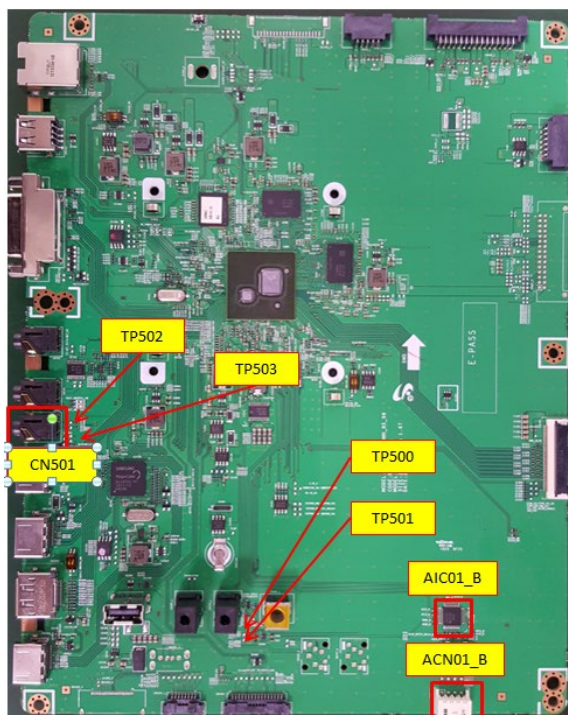


4-2-6. When no sound is output (Speaker) (98")

Symptom	Video is normal but there is no sound.
Main check points	- When the speaker connectors are disconnected or damaged. - When the sound processing part of the Main Board is not functioning.
Troubleshooting guide	<pre> graph TD Q1[Are Input signal and sound cable(PC/HDMI) connection normal?] -- No --> A1[Input normal signal.] Q1 -- Yes --> Q2[Does Input signal appear to Main Board? PC-L : TP502, PC-R : TP503.] Q2 -- No --> A2[Check CN501. If necessary, change Main Board.] Q2 -- Yes --> Q3[Does I2C data appear to AUDIO IC? AR01_B : BCLK / AR03_B : DATA] Q3 -- No --> A3[Change Main Board] Q3 -- Yes --> Q4[1. Are speaker sound data of R+,R-,L+,L- Of ACN01_B(pin1~4) normal? 2. Are Monitor output data of TP500, TP501(HP_OUT_L/R) normal?] Q4 -- No --> A4[Change AIC01_B or Main Board.] Q4 -- Yes --> Q5[Change the Speaker] Q5 -- No --> A5[Ask for technical support.] </pre>
Precautions	Be sure to disconnect the power and start working.

■ Location of Parts

Main Board



4-3. Troubleshooting Guide

4-3-1. Requirements Before Contacting Samsung Customer Service Center

■ Testing the Product

Check if your product is operating normally by using the product test function.

If the screen remains blank while the power LED blinks even when the product is correctly connected to a PC, perform product testing.

1. Power off both the PC and product.
2. Disconnect all the cables from the product.
3. Power on the product.
4. If **No Signal** is displayed, the product is operating normally.

■ Checking the Resolution and Frequency

For modes that exceed the supported resolutions, the message "**Not Optimum Mode**" appears briefly. Set the PC resolution by referring to **Preset Timing Modes**.

■ Check the followings.

Installation issue (PC mode)	
The screen keeps switching on and off.	Check that the cable between the product and the PC is connected correctly.
Blank spaces are found on all four sides of the screen when an HDMI or HDMI-DVI cable is connected to the product and PC.	- The blank spaces found on the screen have nothing to do with the product. - Blank spaces on the screen are caused by the PC or graphics card. To resolve the problem, adjust the screen size in the HDMI or DVI settings for the graphics card. - If the graphics card settings menu does not have an option to adjust the screen size, update the graphics card driver to the latest version. (Please contact the graphics card or computer manufacturer for further details about how to adjust the screen settings.)
Screen issue	
The power LED is off. The screen will not switch on.	Make sure that the power cord is connected.
No Signal is displayed on the screen	- Check that the product is connected correctly with a cable. - Check that the device connected to the product is powered on. - Depending on the type of external device, the screen may not display properly. In this case, connect it with the HDMI Hot Plug function turned On.
Not Optimum Mode is displayed.	- This message is displayed when a signal from the graphics card exceeds the product's maximum resolution and frequency. - Refer to the Standard Signal Mode Table and set the maximum resolution and frequency according to the product specifications.

Screen issue	
The images on the screen look distorted.	Check the cable connection to the product
The screen is not clear. The screen is blurry.	Set the resolution and frequency to the recommended level.
The screen appears unstable and shaky. There are shadows or ghost images left on the screen.	Check that the resolution and frequency of the PC and graphics card are set within a range compatible with the product. Then, change the screen settings if required by referring to 'Preset Timing Modes'.
The screen is too bright. The screen is too dark.	Adjust Brightness and Contrast.
Screen color is inconsistent.	Go to Picture and adjust the Color Space Settings settings.
White does not really look white.	Go to Picture and adjust the White Balance settings.
There is no image on the screen and the power LED blinks every 0.5 to 1 second.	- The product is in power-saving mode. - Press any key on the keyboard or move the mouse to return to the previous screen.
The product will turn off automatically.	- If a PC is connected to the product, check the power status of the PC. - Make sure the power cable is connected properly to the product and power outlet. - If the signal from a connected device is not detected, the product automatically turns off after 10 to 15 minutes.
The screen display does not look normal.	- Encoded video content may cause the display to appear corrupted in scenes featuring fast moving objects such as in a sports event or action video. - Low signal level or low picture quality may cause the display to appear corrupted. This does not mean the product is defective. - A cell phone within a distance of one-meter radius may cause static on analog and digital products.
The brightness and color do not look normal.	- Go to Picture and adjust the screen settings such as Color, Brightness and Sharpness. - Go to System and adjust the Eco Solution settings. - Reset the screen settings to the default settings.
I see red, green, and blue.	- Check the cable connections. - This issue may happen when the panel of the product is defective. Contact a Samsung Service Center to resolve the issue.
The display looks unstable and then freezes.	The screen may freeze when a resolution other than the recommended resolution is used or if the signal is not stable. To resolve the issue, change the PC resolution to the recommended resolution.

Screen issue	
The screen cannot be displayed in full screen.	• A scaled SD (4:3) content file can cause black bars on both sides of an HD channel screen. • A video with an aspect ratio different from the product can cause black bars at the top and bottom of the screen. • Change the screen size setting to full screen on the product or source device.

Sound issue	
There is no sound.	• Check the connection of the audio cable or adjust the volume. • Check the volume.
The volume is too low.	• Adjust the volume. • If the volume is still low after turning it up to the maximum level, adjust the volume on your PC sound card or software program.
Video is available but there is no sound.	• If an HDMI cable is connected, check the audio output settings on the PC. • Go to Sound and change Speaker Selection to Internal Speaker. • If a source device is used. - Make sure the audio cable is properly connected to the audio input port on the product. - Check the audio output settings for the source device. (For example, if an HDMI cable is connected to the monitor, the audio setting for the cable box may need to be changed to HDMI.) • If a DVI-HDMI cable is used, a separate audio cable is required. • If the product has a headphone port, make sure nothing is connected to it. • Reconnect the power cable to the device and then reboot the device.
There is static coming from the speakers.	• Check the cable connection. Make sure a video cable is not connected to an audio input port. • Check the signal strength after connecting a cable. • Low signal level can cause corrupted sound.

Remote control issue	
The remote control does not work.	• Make sure that the batteries are correctly in place (+/-). • Check if the batteries are flat. • Check for power failure. • Make sure that the power cord is connected. • Check for any special lighting or neon signs switched on in the vicinity.

Source device issue			
A beeping sound is heard when my PC is booting.	If a beeping sound is heard when your PC is booting, have your PC serviced.		
Other issue			
The product smells like plastic.	The plastic smell is normal and disappears over time.		
The monitor appears tilted.	Remove and then attach the stand again to the product.		
Audio or video cuts out intermittently.	- Check the cable connection and connect it again if required. - Use a standard cable.		
Small particles are found on the edges of the product.	The particles are part of the product design. The product is not defective.		
When I try to change the PC resolution, a message "The defined resolution is not currently supported." appears.	The message "The defined resolution is not currently supported" appears if the input source resolution exceeds the maximum resolution of the display. To resolve the issue, change the PC resolution to a resolution supported on the display.		
There is no sound from the speakers in HDMI mode when a DVI-HDMI cable is connected.	DVI cables do not transmit sound data. Make sure to connect the audio cable to the correct input jack to enable audio.		
HDMI Black Level is not functioning properly on an HDMI device with YCbCr output.	This function is available only when a source device, such as a DVD player and STB, is connected to the product via an HDMI (RGB signal) cable.		
There is no sound in HDMI mode.	- Displayed picture colors may not look normal. Video or sound may not be available. This can occur if a source device that only supports an older version of the HDMI standard is connected to the product. If these issues occur, connect an audio cable along with the HDMI cable. - Some PC graphics cards may not automatically recognize HDMI signals that do not include sound. In this case, manually select a sound input.		
		Sound input	Screen mode
	DVI PC	Audio In (Stereo ports)	PC settings
HDMI-CEC does not work.	- To use several external devices compatible with the HDMI-CEC feature that are connected to the HDMI1, HDMI2 and HDMI3 ports on the product, turn off the HDMI-CEC features on all the external devices. External devices include Blu-ray and DVD players - Operating an external device when its HDMI-CEC feature is enabled may automatically stop other external devices - To change HDMI-CEC settings, refer to the device user guide or contact the device manufacturer for assistance.		

Other issue	
In power-saving mode, when the input source is DisplayPort , PC display settings cannot be saved.	Go to System → Power Control and set Max. Power Saving to Off. Alternatively, configure the PC display output settings again. Ensure the set is turned on.
When booting the PC with the input source set to DisplayPort , the BIOS and booting screens do not appear.	Boot the PC when the set is turned on or when the input source is not DisplayPort.

Q & A	
How can I change the frequency?	• Set the frequency on your graphics card. - Windows 7 : Go to Control Panel → Appearance and Personalization → Display → Adjust resolution → Advanced Settings → Monitor and adjust the frequency in Monitor Settings. - Windows 8 : Go to Settings → Control Panel → Appearance and Personalization → Display → Adjust resolution → Advanced Settings → Monitor and adjust the frequency in Monitor Settings. - Windows 10 : Go to Settings → System → Display → Advanced display settings → Display adapter properties → Monitor, and adjust Screen refresh rate under Monitor settings.
How can I change the resolution?	- Windows 7 : Go to Control Panel → Appearance and Personalization → Display → Adjust Resolution and adjust the resolution. - Windows 8: Go to Settings → Control Panel → Appearance and Personalization → Display → Adjust Resolution and adjust the resolution. - Windows 10 : Go to Settings → System → Display → Advanced display settings, and adjust the resolution.
How do I set powersaving mode?	- Windows 7 : Set power-saving mode in Control Panel → Appearance and Personalization → Personalize → Screen Saver Settings or BIOS SETUP on the PC. - Windows 8 : Set power-saving mode in Settings → Control Panel → Appearance and Personalization → Personalize → Screen Saver Settings or BIOS SETUP on the PC. - Windows 10 : Set power-saving mode in Settings → Personalization → Lock screen → Screen timeout settings → Power & sleep or BIOS SETUP on the PC.

4-4. Error Examples and Actions

Error Appearance	Symptoms and Actions		Remarks
	Symptom	When you turn on the monitor, regardless of the signal, does not go out screen.	On how to input DDC, refer to the training manual.
	Cause	LVDS Cable contact failure can be caused by.	
	Action	Can replace the LVDS Cable, you can correctly the connection.	
	Symptom	A full white screen is displayed regardless of the signals when turning on the monitor.	Full White pattern is a feature of a TN panel when no video signals are supplied.
	Cause	This error occurs when only lamp power is supplied and the video signals are not input to the panel due to an LVDS cable connection error.	
	Action	Replace the LVDS cable or connect the cable correctly so that the video signals can be supplied to the panel.	
	Symptom	This is the screen of the DVD of the connection at the time of the noise.	
	Cause	Does not contain HDCP Key.	
	Action	HDCP Key Enter.	

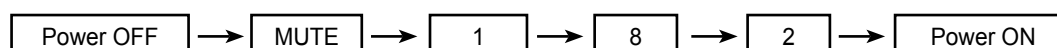
4-5. Factory Mode Adjustments

■ Precautions when Adjusting the Service Menu Settings

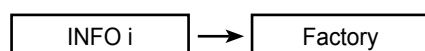
- Check that the equipment used for adjusting the settings is working normally.
- Ensure you have ample space to disassemble the set.
- Prepare a cushioned surface on which to put the set to be disassembled.

4-5-1. Entering the Service Mode

Using a standard remote control



Using a factory remote control



■ Service Mode Menu

Option
Control
Debug
SVC
ADC/WB
Advanced

T-KTM2ELAKUC-0315.10 → Main SW
 T-KTM2ELAKUS-0035_D → Sub Micom
 T-NVT18SWWS-0017 → NOVATEC
 TIZEN-4.0-MAIN2018-KantM2-LFD- RELEASE_2018
 xxxx.x (Debug)
 BT Version: BLUETOOTH-VER-xxxx
 E-Manual: Not Support
 Blaster Version: Not Support
 E-POP Version: ----
 EDID SUCCESS
 HDCP SUCCESS
 CALIB: AV/COMP/PC/HDMI
 Option: 65L6AUZNN,US,0,NONE
 DTCP: Not Supported (X)
 FRC-[KANT-M2 USIT][60Hz][HW:xx/xx]
 DIMMING-[GLOBAL][FF]
 TCON-[KANT-M2] FW[8914] DATA[N65L6U0M20]
 Model: QM65N
 Wired MAC SUCCESS
 Wireless MAC SUCCESS
 Wi-Fi Version: 4.5.30.016.068.fw11
 CO Nf/W/MO D/HXPO AO O S/N/RO SC/SiX WS/DI/UOI(P)
 NS//,1100
 Factory Date Ver: xxxx /Fixed Ver: xxxx
 EERC Version: 58 / WB Ver: 5
 CPLD/LD: NA
 SmartControl: 0
 Board Infor: 2018/01/25/DV/1/BN41-
 Factory Reset In Production: ----
 SID: ?
 Date of purchase: --/--/----

4-5-2. Factory Data

Option		
Factory Memu Name	Data	Range
Factory Reset	-	
Type	43L6AUYNR / 49A6AUYNR / 55A6AUYNR / 65A6AUYNR / 75A6AUYNR / 43L6AUZNR / 49A6AUZNR / 55A6AUZNR / 65A6AUZNR / 75L6AUZNR	43L6AUZNN / 49L6AUZNN / 55L6AUZNN / 65L6AUZNN / 75L6AUZNN / 43L6AUYNN / 49L6AUYNN / 55L6AUYNN / 65L6AUYNN / 75L6AUYNN / 85L6AUZLK / 85L6AUYLK / 55A1AFYEK / 55L6AFYEM / 85L6AUZDN / 98A6AUZEN / 43L6AUYNR / 49A6AUYNR / 55A6AUYNR / 65A6AUYNR / 75A6AUYNR / 43L6AUZNR / 49A6AUZNR / 55A6AUZNR / 65A6AUZNR / 75L6AUZNR
Local Set	US	NONE/US/KOR/CHI_DTV/TAIWAN/BRA_DTV/ CIS_RUSSIA/EU_TURKEY/EU
SW Model	LFD QMRN / LFD QBRN	LFD QMNT/LFD QMNN/LFD QBNT/LFD QBNN/ LFD OHNT/LFD OHNN/LFD OMNT/LFD OMNN/ LFD OMNND/LFD OHNNK/LFD OHNND/LFD OHNNDK/LFD QENT/LFD QENN/LFD VMRNU/ LFD QMRN/LFD QBRN/LFD QBRNN
BOM Model		0~9999
Tuner		Not Detected/S_TC/S_TCS2/S_T2CS2/S_T2C/S_ T2CS2_G/S_T2C_G/D_T2CS2/D_TCS2/D_TC/S_ ISDB/S_T2C_COL/S_DTMB/S_TDA18275A/S_ T2C_KOR/D_T2C/S_T2CS2_AV/error
Ch Table	NONE	NONE/SUWON/SAMEX/TSEC_US/SEHC_US/ BOE_US
MRT OPTION		
Front Color	U-F-NU7B-75/U-F-NU7B-65	
Lvds Format	JEIDA	
OSD Language	US	UNKNOWN/EAST ASIA/IRAN/ISRAEL/MIDDLE ASIA/S_AMERICA/TAIWAN/AFRICA/N_AFRICA/ WEST ASIA/MALAYSIA/KR/US/CIS/TURKEY/ CHINA/HONGKONG/JAPAN/CANADA/ PHILIPPINE/EU/AUSTRALIA/CAUCASUS/ CENTRAL ASIA/MYANMAR/
Region	USA	USA/KOR/CHI/TAIWAN/JAPAN/BRA/PANEURO
PnP Language	ENG_US	ENG_US/SPA_US/FRA_US/EST/FIN/DEU/GRE/ HUN/ITA/LAT/LTU/NOR/POL/POR/ROM/SER/SLK/ SWE/BUL/CRO/CZE/DAN/DUT/SLV/ALB/MKD/ BOS/KOR
Wi-Fi REGION	S	A~Z, AA~AF

Option		
Factory Memu Name	Data	Range
OTN Support	OFF	ON/OFF
OTA Support	OFF	OFF/General
Teletext(TTX)	OFF	ON/OFF
BD Wise Plus		
Extended PVR	OFF	ON/OFF
HV Flip	OFF	OFF/HV FLIP/ H FLIP
Light Effect	OFF	ON/OFF
Network Support	Wi-Fi_int	NONE/wired/Wi-Fi_ext/Wi-Fi_int/Wi-Fi_ext_only/ Wi-Fi_int_only
Eco Sensor	OFF	ON/OFF
BT Support	ON	
BT ADDRESS		
HP LINE	LineOut	Headphone/LineOut
Resolution	UHD	FHD/UHD
Local Dimming	0	
Wi-Fi Vendor	QCA9379	
Voice Recognition	OFF	ON/OFF
MBR Support		
Samsung Smart Control		
Simple IR Remote Control		
Instant On		
Always Instant On Support		
Motion plus		
Sound Mirroring		
IOT Hub Support		
SPDIF Support		
HDR PLUS Support		
OPTION_NUM		
Num of DTV	0	0~2
Num of AV		
Num of COMP		
Num of HDMI	2	0~4
Num of SCART		
Num of USB Port	2	0~3
Num of USB3.0	0	0~3

Option		
Factory Memu Name	Data	Range
Num of RVU	0	0~1
Num Of Display	1	1~2
Num of IPTV		
Num of RUI	0	0~1
Num of PVR	0	0~2
Num of ATV	0	0~3
Num of SVIDEO	0	0~3
Num of D-SUB	0	0~1
Num of DVI	1	0~1
Num of OPTICAL		
Num of MEDIA		
Num Of Tuner	0	0~2
Num of ISP		
Num of HYBRID TV		
Num of CI		
Num of Preloading		
IPv6 Support		
TV Plus Support		
NagSam Support		
EWBS Support		
360 Audio Support		
Decor Mode Support		
Bendable Panel		
802.1x Support	OFF	
Ambient Screen Support	OFF	
Game Mode	0	
MRT SYSTEM INFO		
Production Option		
China HD		
NT Conversion		
Select LCD/PDP		
TV Camera (Included)		
Samsung 3D		
FAN Support		

Option		
Factory Memu Name	Data	Range
Motion Recognition		
21_9 Service		
AUTO STAND Support		
CUBE Support		
Pointer Support		
Accelerator Support		
Type Of PANEL KEY		
5 Way Function Key		
Cable Modulation		
EcoSensor Location		
Screen Mirroring		
Frame TV		
On Timer Support		
Off Timer Support		
PC Mode Dimming Support		
Multi-Screen II		
Power Animation Support		
21_9 Picture Size		
Flickerless		
MVPD Auto Detect Support		
HP Auto Detect Support		
UHDA		
Auto Power		
OCM Support		
Blur Reduction		
Smart Audio Support		
Autovol Support		
Equalizer Band		
DDP Audio Out Support		
Product SYSTEM INFO		
OCF TV Thing Support		
Engineer Option		
Standby led on/off	ON	ON/OFF
Num of Network Stream		
BT_AUDIO_ON_OFF	OFF	ON/OFF

Option		
Factory Memu Name	Data	Range
Config_AV_PATH		
V_EDID TYPE	UHD_3D	
V_HDMI IDENT TYPE	4321	1234/1243/1324/1342/1423/1432/2134/2143/2314/2341/2413/2431/3124/3142/3214/3241/3412/3421/4123/4132/4213/4231/4312/4321
V_HDMI PATH TYPE	DCBA	ABCD/ABDC/ACBD/ADCC/ACDC/ADCB/BACD/BADC/CABD/DABC/CADC/DACB/BCAD/BDAC/CBAD/DCAC/CDAB/DCAB/BCDA/BDCA/CBDA/DCCA/CDCA/DCBA
ARC PORT	HDMI1	NONE/HDMI1/HDMI2/HDMI3/HDMI4
MHL PORT	NONE	NONE/HDMI1/HDMI2/HDMI3/HDMI4
Fast Logo Delay	0	0-30
Panel Init Time	250	0-5000
Tcon Init Time	460	0-5000
Write MAC Address		
Common Source Support		
OVD Support	0	0-3
BENDABLE PEQ Inx	0	0-255
Last BOM model		
Caption Brightness	66	0-100
BLU TYPE		
H BLOCK		
V BLOCK		
High Temp Protect		
Sharp EMC		
MR100		
IOT Hub Reset		
History Tracer Mode		
CPU threshold		
CPU threshold - 1min		
CPU threshold - 3min		
Ramdump Support		
CX CORE		
CX_CORE_IR_BLASTING		
CX_CORE_CABLE_DETECTION		

Option		
Factory Memu Name	Data	Range
CX_CORE_CLK_DETECTION		
IR_SNIFFING_SUPPORTED		
REALTIME PERFORMANCE		
REALTIME PERFORMANCE CHECK		
HRTIMER PERIOD		
HRTIMER EXP VALUE		
HRTIMER EXP ERR COUNT		
USING_PSI_UPDATE		
Subtitle delay time	95	
OCL SMPS TYPE	0	

Control		
Factory Memu Name	Data	Range
EDID		
EDID ON/OFF	OFF	ON/OFF
EDID WRITE ALL	Success	Failure /Success/NONE
EDID WRITE HDMI	Success	Failure /Success/NONE
EDID WRITE PC	...	
HDMI EDID Ver	HDMI 1.2	HDMI 1.2/HDMI 1.3/HDMI 1.4/HDMI 2.0
HDMI EDID Port	Not Support	NONE/HDMI 1/Not Support
EDID WRITE DVI	...	
EDID WRITE PIM	...	
EDID WRITE HDBT	Success	Failure /Success/NONE
EDID WRITE DP	...	
PIM EDID Ver	...	
Sub Option		
RS-232 Jack	UART	Debug/UART/Logic/FANET
EXT Link Support	ON	ON/OFF
Serial Log On/Off		
Serial Log	OFF	ON/OFF
HyperUART	OFF	OFF/1/2/3/4/5/AT-HUB 1/AT-HUB 2/AT-HUB 3/AT-HUB 4/AT-HUB 5
Watchdog	OFF	ON/OFF

Control		
Factory Memu Name	Data	Range
Checksum		
Fast Boot in Production	OFF	ON/OFF
USB Serial		
ECO IC TYPE		
COLOR IC TYPE	RISF315_4	
Info Link Server Type	development	Operating/development/developing
TTX Group	UserOSD	WestEurope/EastEurope/Russian/Greek/Turkey/ Arabic/Farsian/Arab/Hbrw/UserOSD
OPTION_SWU		
OTN Server Type	operating	operating/development
OTN Test Server	OFF	OFF/A~Z ZONE
SWU Reset		
SWU Duration	OFF	ON/OFF
SWU Fail Test	0	0~100
LMF LEAVE THRESHOLD	160	
LMF TRIM THRESHOLD	120	
LMF TERM THRESHOLD	80	
FAnet Thread	2	1/2
CI CPLD Version	1	1~255
ACM_MC	ON	ON/OFF
UNIQUE TRIPLET		
T-CON Device	KANT-M2	
SPI Protection		
Submicom Protection	ON	ON/OFF
FRC Protection		
TCON Protection		
FKP Server Type		
Preloading Support		
Multitasking Support	ON	ON/OFF
Browser Preloading Support	FULL	NONE/GENERAL/FULL
EXT IR Boot Support		
APP BOOTING SUPPORT	ON	ON/OFF
Cloudscan Always Upload		
STB Power Sync Support		
OOM Panic Burst Interval	60	

Control		
Factory Memu Name	Data	Range
OOM Panic Burst Number	8	
Power off interval Reset	0	
APP Boot Support after Reset	0	
Long press Power off Reset	OFF	
Perf Mode	0	
Isolation		
Asia Option		
Mono Last Memory	OFF	ON/OFF
Sound		
High Devi	OFF	ON/OFF
Carrier_Mute	ON	ON/OFF
Pilot Level High Thld	0x20h	0x00h~0xFFh
Pilot Level Low Thld	0x10h	0x00h~0xFFh
Amp Volume	0xc9h	0x00h~0xFFh
Amp Scale	0x35h	0x00h~0xFFh
Amp EQ CheckSum		
Subwoofer Support	0	
Woofer Type	0	
Woofer Volume	0xc7h	0x00h~0xFFh
Woofer Scale	0x3ch	0x00h~0xFFh
Woofer Check sum	NONE	
Woofer DRC Checksum		
PEQ Inx	11	
PEQ Test	Ready	Ready/SET 1~ SET 9
Speaker EQ	ON	ON/OFF
Amp Recovery		
Bottom CheckSum	NONE	
Wall Filter Type	0	
SPDIF PCM Gain	-9	
NTV CU Delay	NORMAL	NORMAL/HDMI/ADC/SPEAKER/MONITOR/PCM_OUT/PCM_MAIN/BT_MAIN/PCM_SUB/BT_SUB/BypassNONE
Lipsync Inx	0	
Lipsync CheckSum	0x145B	
Lipsync USB Test	Ready	Ready/MAIN_SPK/BT_SPK/WFI_SPK/NTV1_SPK/NTV2_SPK/NONE

Control		
Factory Memu Name	Data	Range
Lipsync BT CheckSum	0x0000	
TP Volume	0xC4h	0x00h~0xFFh
TP Scale	0x35h	0x00h~0xFFh
TP EQ CheckSum	NONE	
LFD Option		
Source Ident	ON	ON/OFF
Source Ident Support	Enable	Enable/Auto
PC Ident	Auto	Enable/Auto
DVI Ident	Auto	Enable/Auto
HDMI Ident	Auto	Enable/Auto
DisplayPort Ident	Auto	Enable/Auto
AV Ident	Auto	Enable/Auto
Component Ident	Auto	Enable/Auto
MagicInfo Ident	Auto	Enable/Auto
PIM Ident	Auto	Enable/Auto
HDBT Ident	Enable	Enable/Auto
Video Wall Settings		
HOR_DISP_ACT	1428	
HOR_BEZEL_AVG	11	
VER_DISP_ACT	804	
VER_BEZEL_AVG	11	
Frame Lock Support	OFF	ON/OFF
Frame Delay	OFF	OFF/AUTO/MANUAL
Frame Delay Manual		
Horizontal	1	
Vertical	1	
Screen Position	2	
Reverse Scan	OFF	OFF/AUTO/FORCE
Reverse Info Hidden	OFF	OFF
Always Auto Adj	OFF	ON/OFF
B2B Spec Support		
HKIA Support		
IKUSI Support		
STL Support		

Control		
Factory Memu Name	Data	Range
AccentHealth Support		
S.Select Both Mode	OFF	ON/OFF
SMART Volume	0	0~100
MDC Broadcast Ack	OFF	ON/OFF
Brunswick Support	OFF	ON/OFF
Buffalo Wild Wing Support	OFF	ON/OFF
CRESTRON Support	OFF	ON/OFF
MSSP Support	OFF	ON/OFF
Auto Time-Out Safety Lock	OFF	ON/OFF
VGA Clamp Pulse Setting	0	
Power On Source		
Support	OFF	
Source Type	PC	PC/DVI/DisplayPort/AV/Component/PIM/SBB/HDMI/HDMI2/HDMI3/TV/HDBT
IWB Support	OFF	ON/OFF
Support ACM	OFF	ON/OFF
AMD W7000 DP-DVI CVT	OFF	ON/OFF
Auto Source Switch Duration	10	5~60
Audience Measurement		
AM for Camera	OFF	ON/OFF
AM Mode		
No Signal Color	Black	Black/White/Blue
Internal Speaker	Both	Both/Internal
Config_LFD_Path		
V_HDMI1_PATH	Port1	Port0/Port1/Port2/Port3/Port01/Port12/Port23/SE15HS/PortExtSwi/NONE
V_HDMI2_PATH	Port0	Port0/Port1/Port2/Port3/Port01/Port12/Port23/SE15HS/PortExtSwi/NONE
V_HDMI3_PATH	NONE	Port0/Port1/Port2/Port3/Port01/Port12/Port23/SE15HS/PortExtSwi/NONE
V_HDMI4_PATH	NONE	Port0/Port1/Port2/Port3/Port01/Port12/Port23/SE15HS/PortExtSwi/NONE
V_DVI_PATH	Port2	Port0/Port1/Port2/Port3/Port01/Port12/Port23/SE15HS/PortExtSwi/NONE
V_SBB_PATH	Port2	Port0/Port1/Port2/Port3/Port01/Port12/Port23/SE15HS/PortExtSwi/NONE

Control		
Factory Memu Name	Data	Range
V_DisplayPort_PATH	Port0	Port0/Port1/Port2/Port3/Port01/Port12/Port23/SE15HS/PortExtSwi/NONE
V_PIM_PATH	NONE	Port0/Port1/Port2/Port3/Port01/Port12/Port23/SE15HS/PortExtSwi/NONE
V_HDBT_PATH	NONE	Port0/Port1/Port2/Port3/Port01/Port12/Port23/SE15HS/PortExtSwi/NONE
V_PC_PATH	NONE	Port0/Port1/Port2/Port3/Port01/Port12/Port23/SE15HS/PortExtSwi/NONE
KPI Support	OFF	ON/OFF
DVI-I Port Select	AUTO	AUTO/DVI/D-SUB
FANET ON/OFF	ON	ON/OFF
NTP Support	ON	OFF/ON
PrdInfo Apply to EDID		
Default Loopout Src	HDMI2	
TOUCH Support		
OutDoor Fan		
Outdoor Internal Fan Speed	0	0-100
Fan Control by LuxStep	OFF	OFF/ON
Fan Control Type	Normal	Normal/HeatEx
HeatEx Internal Fan Speed	0	0-100
4G LTE Dongle Support	OFF	OFF/ON
VX1 Split		
HDMI Tx Test		
RDP Support		
Pixel Shift Support		
Internal Speaker Support		
Security Server On		
Weekly Reboot Support	OFF	OFF/ON
Forced LoopOut support		
ARP Interval		
Default Power Button	Power on only	
Gravity Sensor Rotate		
Energe Star Logo	OFF	
UPnP Support	ON	
HPD Forced High	OFF	

Control		
Factory Memu Name	Data	Range
OutBound Traffic		
Outdoor Sensor		
Config Option		
Num of DP	1	0~1
Num of PIM	1	0~1
Num of MagicInfo	0	0~1
Num of FAN	0	0~1
Num of HDBT	0	0~1

Debug		
Factory Memu Name	Data	Range
Spread Spectrum		
MAIN DDR SSC ON OFF	ON	
MAIN DDR SSC Value	8	
MAIN Vx1 SSC ON/OFF	OFF	
MAIN Vx1 SSC Value	1	
TCON-B DDR SSC ON/OFF	ON	
TCON-B DDR SSC Period	0	
TCON-B DDR SSC Modulation	0	
MAIN USIT SSC ON/OFF	BYPASS	
MAIN USIT SSC MF	0	
MAIN USIT SSC MR	0	
OCL Serdes SSC ON OFF	ON	
OCL Serdes SSC Value	0	
TCON-B USIT SSC ON/OFF	2	
TCON-B USIT SSC Period	0	
TCON-B USIT SSC Modulation	0	
RF Mute Time	600ms	0ms~1200ms
Tuner Margin		
FRC		
FRC FDISPLAY ON/OFF	OFF	ON/OFF
PC Mode ON/OFF	OFF	ON/OFF
FRC VX1 RX EQ SETTING	OFF	OFF/3DB 3G/6DB 3G/9DB 3G/3DB 2.5G/6DB 2.5G/9DB 2.5G/
FRC VX1 TX Pre_emphasis setting	0	

Debug		
Factory Memu Name	Data	Range
Netflix OSD Threshold		
TCON		
TCON_TEMP READ		
TEMP LAST		
DCC VERSION		
TCON Demura Bypass		
TCON FDisplay		
Panel Code 1		
Panel Code 2		
Panel Revision		
Panel Manu Week		
Panel S/N 1		
Panel S/N 2		
Panel S/N 3		
Panel S/N 4		
MPEG Margin	20	
H.264 Margin	15	
Voice Debug		
Power Management		
DVFS	ON	ON/OFF
Cert Option	HIDE	Waitng/HIDE/SHOW
RM_BIST_DTV	0	
RM_BIST_ATV	0	
RM_BIST_CABLE	0	
Stress Mode	OFF	
Log Analyzer	OFF	ON/OFF
Error Popup On/Off	OFF	ON/OFF
DeadLock KILL	OFF	ON/OFF
CES Option	OFF	ON/OFF
CES Convergence Option	OFF	ON/OFF
CES ATSC 3_0		
CES OOB MVPD SUPPORT		
BT DUT		
BT EU DUT		
BT Throughput		

Debug		
Factory Memu Name	Data	Range
Reproduce Module	ON	ON/OFF
21_9		
L-DETECT STABLE TIME		
L-DETECT UNSTABLE TIME		
L-DETECT USB SUPPORT		
DB Download		
MRT Option Dump		
Sub Option Dump		
Engineer Option Dump		
Picture Data Dump		
VCONF Dump		
Read Eco Sensor Data		
No Signal Power OFF		
Default HDMI1 Booting		
Run EW	168h	
End EW	43800h	

SVC		
Factory Memu Name	Data	Range
Self Test(for HW)		
Loop Back		
LAN Test		
AV Audio Test		
AV2 Audio Test		
CVBS Test		
CVBS2 Test		
COMP Test		
USB HUB Test		
SPDIF Test		
HDMI Test		
Scart Audio		
Scart Video		
DP In/Out Test		
PIM Interface Test		
TMDS		

SVC		
Factory Memu Name	Data	Range
AUDIO L/R		
DDC(EEPROM)		
UART		
HPD/PS_ON_OFF		
PIM Detect		
PWR STATUS		
DVI/SBB Interface Test		
RS232 Out Test		
Ext-Sensor-Test		
HDMI In/Out Test		
CPU		
DDR		
FLASH		
EEPROM		
Tuner X-TAL		
Tuner1		
HDMI Switch IC		
USB HUB IC		
Wi-Fi		
LVDS		
T-CON/FRC		
T-CON2/FRC2		
TCON Post		
PMIC		
PCB Test		
MOIP		
BT		
EcoSensor		
Voltage		
Chip Test		
Module Test		
ATV CH Inspection		
DTV CH Inspection		
Satellite CH Inspection		
EXT Sound Inspection		

SVC		
Factory Memu Name	Data	Range
Woofer Sound Inspection		
Tweeter Sound Inspection		
TP Sound Inspection		
DP Test		
Aging line test		
HDMI Calibration		
LFD RTC		
Gravity Sensor Test	Ready	
Outdoor Function Test		
Info		
SVC Info		
ER Count		
WD Count	0	0-255
AR Count	0	0-65535
RS Count	0	0-65535
Wi-Fi NO DETECTION COUNT	0	0-255
Wi-Fi DETACHMENT COUNT	0	0-255
BT ER Count		
BT NO DETECTION COUNT		
BT DETACHMENT COUNT		
BT MGT OPEN FAIL COUNT		
BT MGT DISCONNECT COUNT		
BT TV AUDIO DROP		
BT AUDIO TIMER EXP		
Camera ER Count		
FRC3D Emergency Reboot On/Off		
FRC3D ER Count		
TCON PMIC Fault Cont	0	
Fan Error Count	0	0-255
Serdes Error Count	0	0-0

SVC		
Factory Memu Name	Data	Range
Serdes Reset Count	0	0-255
Serdes WatchDog On/Off	ON	ON/OFF
AC Over-Voltage Detect		
Vcc Fail Count		
HDMI No Signal		
Power Ident		
Lock Status		
Clk Detection Count		
TMDS Clk Check		
EDID Verification		
HDCP Start Count		
HDMI Blinking		
Log to USB		
Clk Loss Count		
Sync Unstable Count		
Packet Error Count		
Resolution Unstable Count		
HDMI Color Space		
DVI Format		
Driver Color Space		
Panel Display Time	1Hr	0~1073741824
Factory Entry Number	1	0~255
Factory Execution History		
Factory Reset History		
SPI Flash		
SPI MAC Address		
Data Sync Status		
Data Sync FAIL Count		
SPI Format Count		
OCM Count	0	
Debug Log Down		
Flash Size		
DDR Size		

SVC		
Factory Memu Name	Data	Range
Outdoor Fan Check	OFF	ON/OFF
Outdoor Ext FAN 1	...	OK/NG
Outdoor Ext FAN 2	...	OK/NG
Outdoor Ext FAN 3	...	OK/NG
Outdoor Int FAN 1	...	OK/NG
Reset		
Apps Reset		
SVC Reset		
SPI Flash Reset		
Data Sync Reset		
Factory Data Reset		
OPTION_HDMI		
HOT PLUG DURATION	800ms	0ms~2000ms
HDMI FLT CNT SIG	0ms	0ms~1000ms
HDMI FLT CNT LOS	0ms	0ms~1000ms
HDMI MUTE TIME		
HDMI NFST UNMUTE TIME	600ms	
HdmiRx EQ	0	0-99
HDMI TMDS ERR DET	1	0-1
Auto EQ sweep		
VMD OPT	0	
HDMI Video delay		
DVB CI		
TS Clock delay TC	0	-15~15
TS Clock delay S	0	-15~15
CI Control Buf ON	ON	
TS Clock delay CPU	2	-15~15
Test Pattern		
Scaler Pattern	OFF	OFF/FULL_WHITE/WHITE_BOX/RGB_BOX/RGB_COMPOSITE/8COLOR_BAR/HATCH/V_RAMP/H_RAMP/45D_RAMP/16GRAY/RGB_RAMP/DOT/CHESS/WB/error
US Post Pattern	OFF	OFF/FULL_WHITE/WHITE_BOX/RGB_BOX/RGB_COMPOSITE/8COLOR_BAR/HATCH/V_RAMP/H_RAMP/45D_RAMP/16GRAY/RGB_RAMP/DOT/CHESS/WB/error

SVC		
Factory Memu Name	Data	Range
FRC Pre Pattern	0	
FRC Post Pattern	0	
SOC TCON Pattern	0	
SOC TCON Pattern Level	255	
FRC OSD Pre Pattern		
FRC OSD Post Pattern		
FRC2 Pre Pattern		
FRC2 Post Pattern		
SOC TCON2 Pattern		
SOC TCON2 Pattern Level		
SOC TCON3 Pattern		
SOC TCON3 Pattern Level		
ACM Pattern		
Upgrade		
T-CON DATA UPGRADE		
T-CON FW UPGRADE		
T-CON CheckSum		
T-CON2 DATA UPGRADE		
T-CON2 FW UPGRADE		
T-CON2 CheckSum		
PANEL EEPROM UPGRADE		
PANEL FLASH UPGRADE		
Logic Usb D/L		
SUBMICOM UPGRADE	Ready	
SUBMICOM JP USB UPGRADE	Ready	
BT UPGRADE		
BT FREEPAIRING		
Function Upgrade		
FRC3D FW UPGRADE		
FRC3D SRP UPGRADE		
FRC3D LD UPGRADE		
FRC2 3D FW UPGRADE		
Camera Upgrade		
Mic Upgrade		

SVC		
Factory Memu Name	Data	Range
IR Blaster Upgrade	Failure	
Pic Data USB Update		
Eco Data USB Update		
SC ADK Upgrade		
NOVATEK UPGRADE		
Sub CheckSum		
SubMicom CheckSum		
NOVATEK CheckSum		
MYSTIQUE CheckSum		
Upgrade With Sub	OFF	ON/OFF
VALENS UPGRADE	Ready	
Other Setting		
Delete S/N	Failure	Failure/Wait/Success
IPERF	Stopped	Stopped/Running
Expert		
N/D ADJ		OFF/ON/FIX
CAL Data Backup		
CAL Data Restore		
MICOM POWER OFF	ON	
ATV IF AGC SPEED	0	
Upgrade UHD OSD Test		
Main USB Path		
JackP USB path		
Apps Update		
Picture Direct On/Off		
Source Direct On/Off		
Auto Detection Group		
Motion Sensor		
V APP		
SWI	OFF	
KantS Cutoff PEQ	0	
Source Direct On/Off	OFF	
SVC Panel	ORIGINAL	ORIGINAL/2014 SVC ~ 2022 SVC
S/N		
Serial number		

SVC		
Factory Memu Name	Data	Range
Writing S/N		
OPTION_LFD_EQ		
DP RX EQ		
DP TX EQ		
HDMI RX EQ	0	
HDMI TX EQ	0	
FrontEnd Input Signal Info		
Receiver IC	MAIN	MAIN/SE15HS/MYSTIQUE/Reserved
Sync Lock	Unstable	
hResolution	0	
vResolution	0	
hStart	0	
vStart	0	
hTotal	0	
vTotal	0	
hFreq	0	
vFreq	0	
ProgressScan	Interlace	
H Sync Polarity	Negative	
V sunc Polarity	Negative	
Color Format	RGB444	
Color Depth	8 Bit	
Input Signal Type	Unknown	

ADC/WB		
Factory Memu Name	Data	Range
ADC		
AV Calibration	N/A	
Comp Calibraion	N/A	
PC Calibration	N/A	
HDMI Calibration	N/A	
ADC Target		
1st_AV_Low	64	
1st_AV_High	880	
1st_AV_Delta	2	

ADC/WB		
Factory Memu Name	Data	Range
1st_COMP_Y_Low	64	
1st_COMP_Cb_Low	512	
1st_COMP_Cr_Low	512	
1st_COMP_Y_High	940	
1st_COMP_Cb_High	512	
1st_COMP_Cr_High	512	
1st_COMP_Delta	2	
1st_PC_Low	16	
1st_PC_High	940	
1st_PC_Delta	2	
2nd_ACH_Low	4	
2nd_ACH_High	940	
2nd_PC_Low	4	
2nd_PC_High	940	
2nd_Delta	2	
ADC Result		
1st_Y_GH	...	
1st_Y_GL	...	
1st_Cb_BH	...	
1st_Cb_BL	...	
1st_Cr_RH	...	
1st_Cr_RL	...	
2nd_R_L	128	
2nd_G_L	128	
2nd_B_L	128	
2nd_R_H	69	
2nd_G_H	69	
2nd_B_H	69	
White Balance		
R-Offset	128	
G-Offset	128	
B-Offset	128	
R-Gain	128	
G-Gain	128	
B-Gain	128	

ADC/WB		
Factory Memu Name	Data	Range
WB_W2_R_Offset	128	
WB_W2_B_Offset	128	
WB_W2_R_Gain	154	
WB_W2_B_Gain	98	
WB_N_R_Offset	128	
WB_N_B_Offset	128	
WB_N_R_Gain	128	
WB_N_B_Gain	128	
Line Backlight		
ANA_MIN	0	
BLK_Detect_Lv	0	
Saturation_Max_PC	1028	
Saturation_Max	1098	
Saturation_Min	940	
NUC Adjust	-1	
MGA		
MGA On/OFF	OFF	ON/OFF
R1_Gain	512	
G1_Gain	512	
B1_Gain	512	
R2_Gain	512	
G2_Gain	512	
B2_Gain	512	
R3_Gain	512	
G3_Gain	512	
B3_Gain	512	
R4_Gain	512	
G4_Gain	512	
B4_Gain	512	
R5_Gain	512	
G5_Gain	512	
B5_Gain	512	
R6_Gain	512	
G6_Gain	512	

ADC/WB		
Factory Memu Name	Data	Range
B6_Gain	512	
R7_Gain	512	
G7_Gain	512	
B7_Gain	512	
R8_Gain	512	
G8_Gain	512	
B8_Gain	512	
R9_Gain	512	
G9_Gain	512	
B9_Gain	512	
R10_Gain	512	
G10_Gain	512	
B10_Gain	512	
Color Expert		
Color Expert On/OFF	OFF	ON/OFF
CE_R1_Gain	512	
CE_G1_Gain	512	
CE_B1_Gain	512	
CE_R2_Gain	512	
CE_G2_Gain	512	
CE_B2_Gain	512	
CE_R3_Gain	512	
CE_G3_Gain	512	
CE_B3_Gain	512	
CE_R4_Gain	512	
CE_G4_Gain	512	
CE_B4_Gain	512	
CE_R5_Gain	512	
CE_G5_Gain	512	
CE_B5_Gain	512	
CE_R6_Gain	512	
CE_G6_Gain	512	
CE_B6_Gain	512	
CE_R7_Gain	512	
CE_G7_Gain	512	

ADC/WB		
Factory Memu Name	Data	Range
CE_B7_Gain	512	
CE_R8_Gain	512	
CE_G8_Gain	512	
CE_B8_Gain	512	
CE_R9_Gain	512	
CE_G9_Gain	512	
CE_B9_Gain	512	
CE_R10_Gain	512	
CE_G10_Gain	512	
CE_B10_Gain	512	
SPI White Balance		
SPI White Balance On/OFF		
SPI R-Offset		
SPI G-Offset		
SPI B-Offset		
SPI R-Gain		
SPI G-Gain		
SPI B-Gain		
SPI N Rgain		
SPI N Ggain		
SPI N Bgain		
SPI N Roffset		
SPI N Goffset		
SPI N Boffset		
SPI W2 Rgain		
SPI W2 Bgain		
SPI W2 Roffset		
SPI W2 Boffset		
SPI MGA		
SPI MGA On/OFF		
SPI R1_Gain		
SPI G1_Gain		
SPI B1_Gain		
SPI R2_Gain		
SPI G2_Gain		

ADC/WB		
Factory Memu Name	Data	Range
SPI B2_Gain		
SPI R3_Gain		
SPI G3_Gain		
SPI B3_Gain		
SPI R4_Gain		
SPI G4_Gain		
SPI B4_Gain		
SPI R5_Gain		
SPI G5_Gain		
SPI B5_Gain		
SPI R6_Gain		
SPI G6_Gain		
SPI B6_Gain		
SPI R7_Gain		
SPI G7_Gain		
SPI B7_Gain		
SPI R8_Gain		
SPI G8_Gain		
SPI B8_Gain		
SPI R9_Gain		
SPI G9_Gain		
SPI B9_Gain		
SPI R10_Gain		
SPI G10_Gain		
SPI B10_Gain		
WB Data to SPI		
Graphic		
G_PQ_OFF	OFF	
G_RGAIN	0	
G_GGAIN	0	
G_BGAIN	0	
G_ROffset	0	
G_GOffset	0	
G_BOffset	0	
G_SubGamma	0	

ADC/WB		
Factory Memu Name	Data	Range
G_N_RED	505050	
G_N_GREEN	505050	
G_N_BLUE	505050	
G_N_CYAN	505050	
G_N_MAGENTA	505050	
G_N_YELLOW	505050	
G_A_RED	505050	
G_A_GREEN	505050	
G_A_BLUE	505050	
G_A_CYAN	505050	
G_A_MAGENTA	505050	
G_A_YELLOW	505050	
G_S_RED	505050	
G_S_GREEN	505050	
G_S_BLUE	505050	
G_S_CYAN	505050	
G_S_MAGENTA	505050	
G_S_YELLOW	505050	
GRP_BYPASS	0	
Graphic	60	
Release EERC	132	

Advanced

4-5-3. EDID settings

1. Select "Control" > "EDID"

Option
Control
Debug
SVC
Hidden
ADC/WB
Advanced

EDID
Sub Option
PDP Option
Hotel Option
Shop Option
Asia Option
Sound
LFD Option
Config Option

2. Select "EDID ON/OFF" and push ► button of remocon.
then you can see the change of state "OFF" to "ON".

EDID On/Off	ON
--------------------	-----------

3. Select "EDID WRITE ALL" and push ► button of remocon.

EDID WRITE ALL	Success
-----------------------	----------------

4-6. Cable

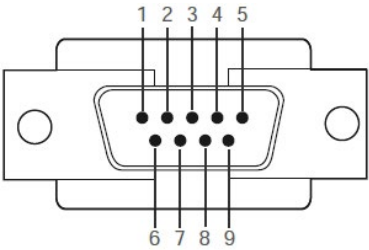
4-6-1. RS-232C cable

■ Cable Specifications

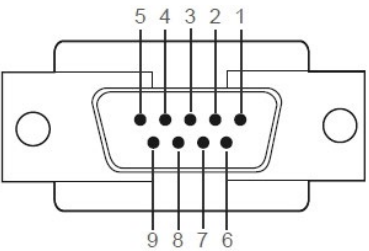
Interface	RS232C (9 pins)
Pin	TxD (No. 2), RxD (No. 3), GND (No. 5)
Bit rate	9600 bps
Data bit	8 bit
Parity	None
Stop bit	1 bit
Flow control	None
Maximum length	15m (only shielded type)

■ Pin Assignments

Pin	Specification
1	Detect data carrier
2	Received data
3	Transmitted data
4	Prepare data terminal
5	Signal ground
6	Prepare data set
7	Send request
8	Clear to send
9	Ring Indicator

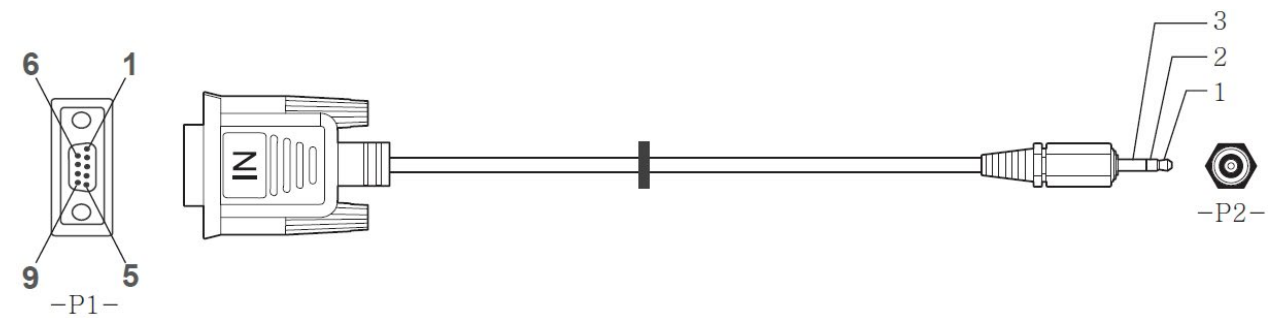


〈Male type〉



〈Female type〉

■ RS-232C cable connector : 9-Pin D-Sub - Stereo Cable

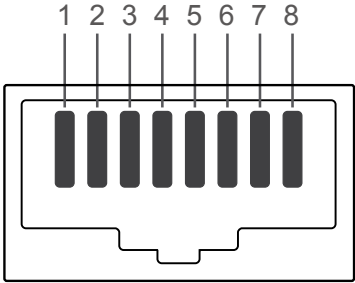


-P1-		-P1-		-P2-		-P2-	
Male type	Rx	3	-----	1	Tx	Stereo	
	Tx	2	-----	2	Rx	Plug	
	GND	5	-----	3	GND	(3.5Ø)	

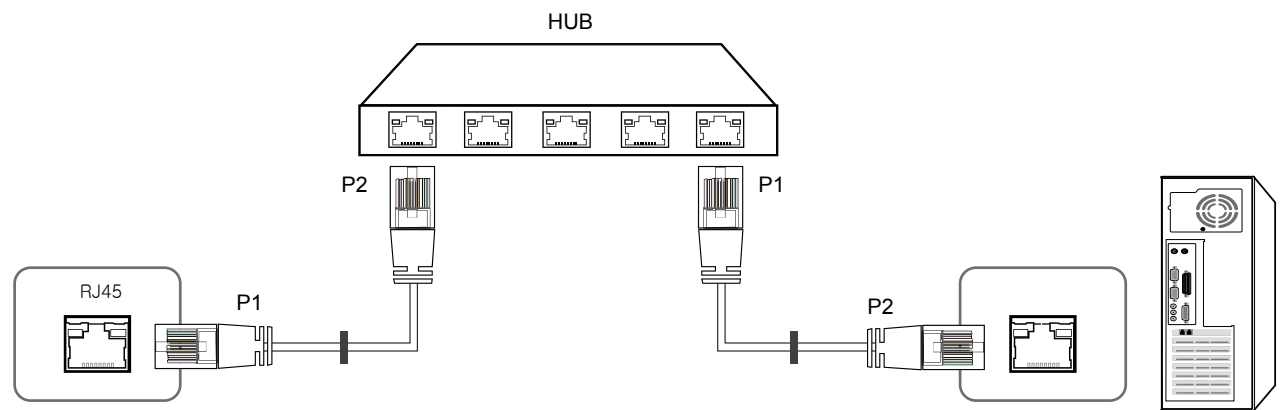
4-6-2. LAN cable

■ Pin Assignments

Pin	Standard colors	Signal
1	White + Orange	TX+
2	Orange	TX-
3	White + Green	RX+
4	Blue	NC
5	White + Blue	NC
6	Green	RX-
7	White + Brown	NC
8	Brown	NC

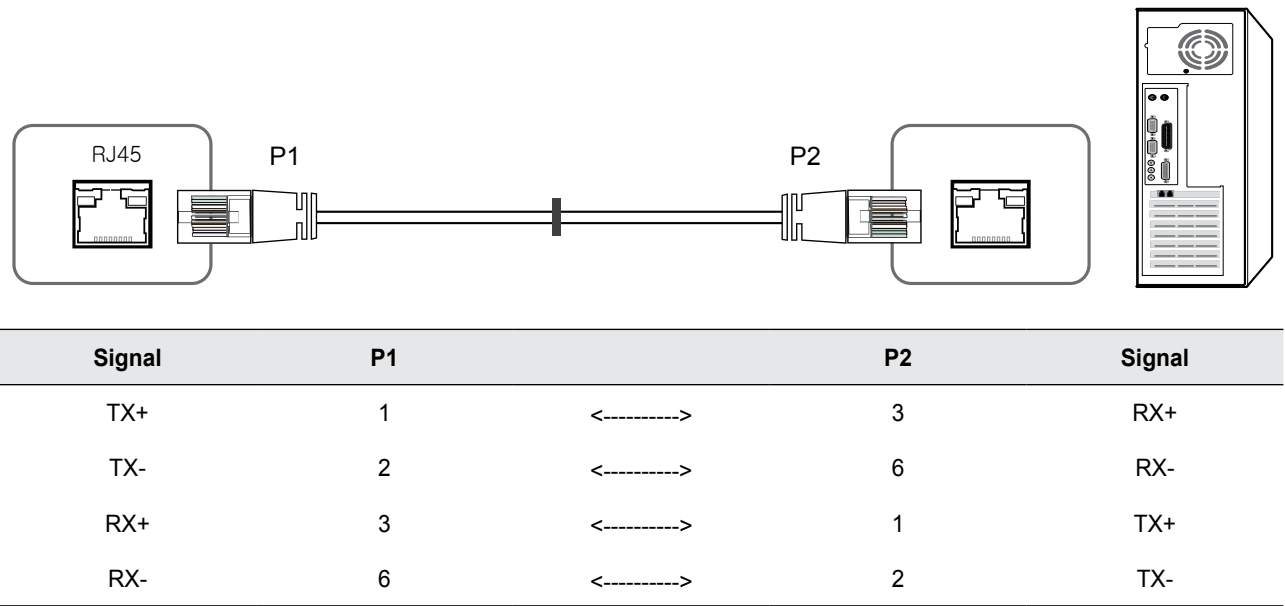


■ Direct LAN Cable (PC to HUB)



Signal	P1		P2	Signal
TX+	1	<----->	1	TX+
TX-	2	<----->	2	TX-
RX+	3	<----->	3	RX+
RX-	6	<----->	6	RX-

■ Cross LAN cable (PC to PC)



4-7. White Balance

4-7-1. Calibration

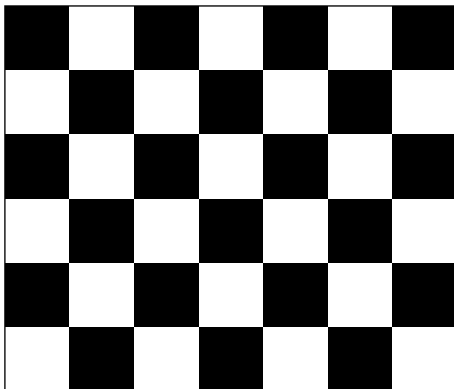


Note

- You must perform Calibration in the Lattice Pattern before adjusting the White Balance.

■ Calibration Specification

Adjust Pattern



(Lattice Pattern)

Adjust Timing

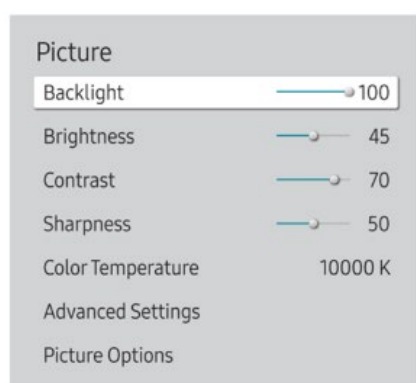
Input mode		Timing
CVBS	NTSC	710 x 484
	PAL	702 x 576
Component		1280 x 720
Dsub		1024 x 768
HDMI		1280 x 720

■ Calibration Method

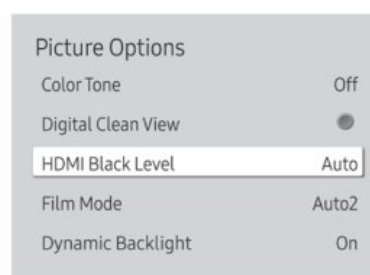
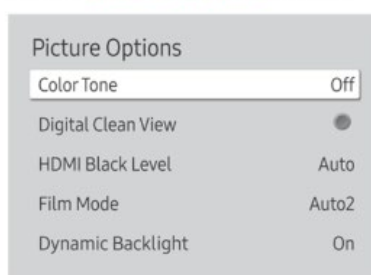
1. Change to a source you wish to calibrate.
2. Change AV, COMPONENT, and HDMI sources to the video mode, and change Dsub source to the text mode.
3. Display them based on the source specific timing and patterns above.
4. In case of HDMI source, adjust it based on the HDMI Black Level specification.
(RGB 0~255 : Normal / RGB 16~235 : Low)
(YUV : Deactivation)

< HDMI Black Level Menu >

MENU  → Picture → ENTER 



MENU  → Picture → Picture Options → ENTER 



5. Perform calibration based on the picture below.
 - Into the Factory Mode.
 - Select "ADC/WB" menu.
 - Select "ADC" menu.

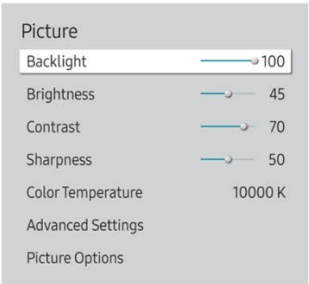
Option	ADC	AV Calibration
Subsetting	ADC Target	Comp Calibration
ADC/WB	ADC Result	PC Calibration
Color Mapping	White Balance	HDMI Calibration
WB Movie	MGA	
	Color Expert	

6. It is complete if SUCCESS is shown.

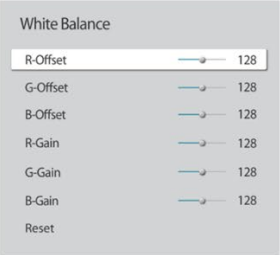
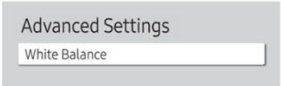
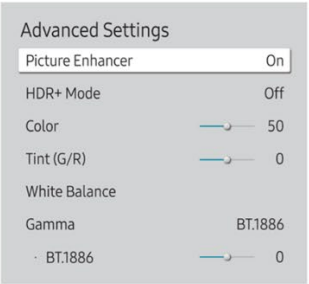
4-7-2. White Balance Adjustment

1. It is possible to adjust the White Balance value User wish to use for each input source being used.
2. It is possible to adjust in accordance with the order below.
 - Display WhitePattern.
 - It is possible to adjust it in the OSD menu below.

MENU  → Picture → ENTER 



MENU  → Picture → Advanced Settings → White Balance → ENTER 

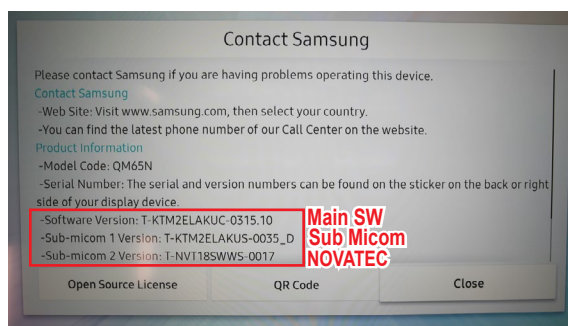
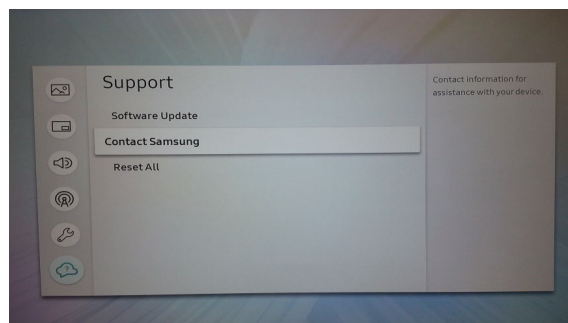


4-8. Software Upgrade

4-8-1. How to check the Software Version

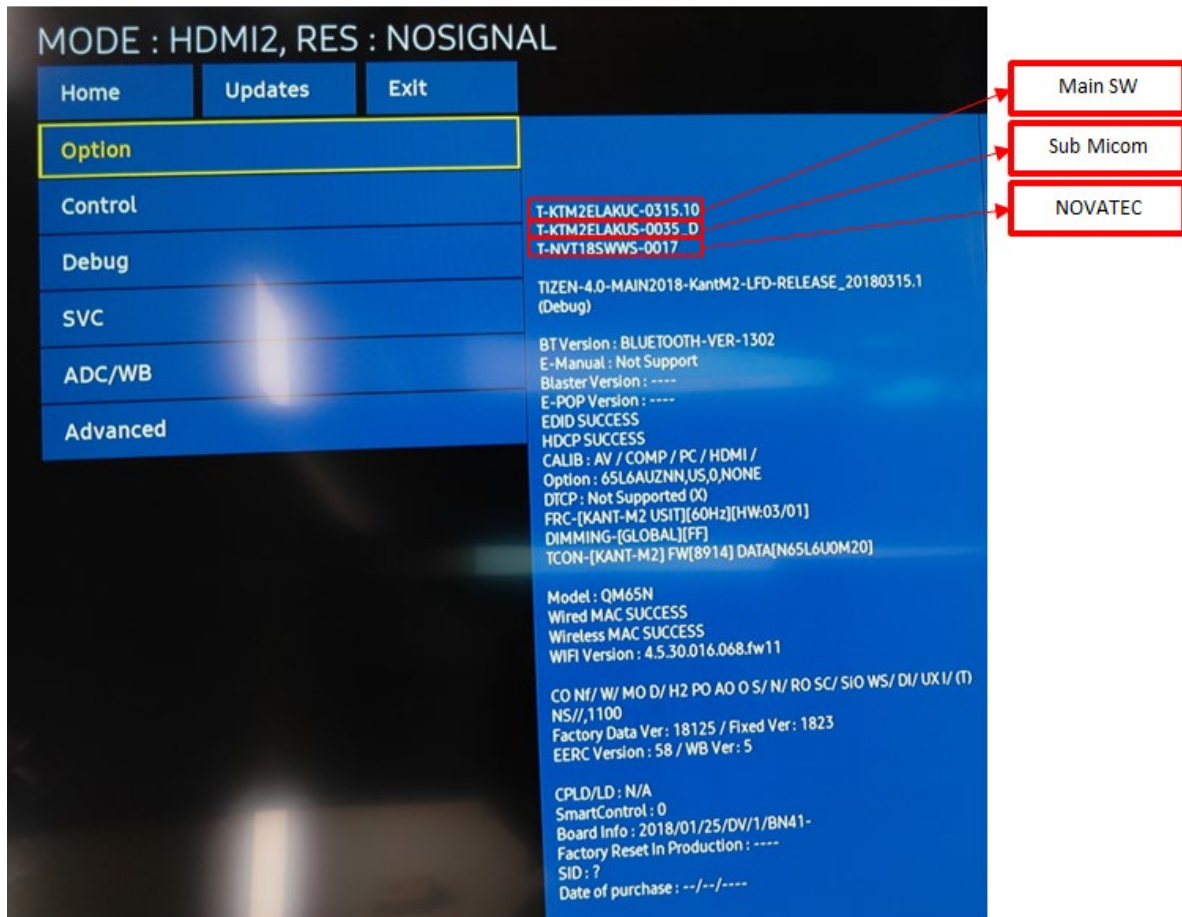
■ Use the OSD Main Menu

1. Click the "MENU" key in the remote controller
2. Select "Support → Contact Samsung" Menu.
3. You can check SW version.



■ Use Service Mode

1. Access the Service Mode.
2. You can check the SW version as you see this picture.



4-8-2. How to upgrade Software

- How to update S/W via USB
[“http://www.samsung.com/sec/support/downloadcenter/”](http://www.samsung.com/sec/support/downloadcenter/) → TV → Professional LFD Displays” Download files from the web site files are saved to connect the USB drive to the monitor.
 Please note that there is no power or USB drive has been removed during the upgrade.
- If the firmware upgrade is completed after the power is turned off, the monitor automatically turns back on.
 After the upgrade is completed, please check the firmware version.
 (New version number is higher than the previous version.)
- If the software update screen and sound settings are reset.
 Your settings so that you can easily reset after the update, we recommend placing a note of it.

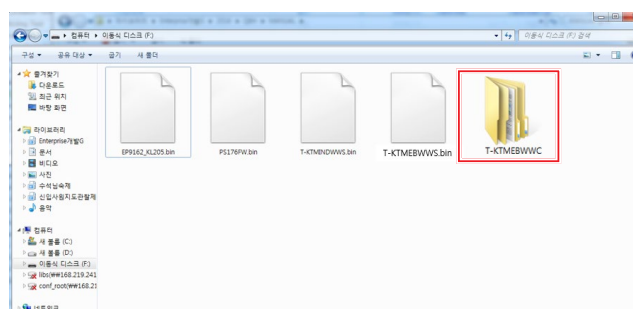


Warning

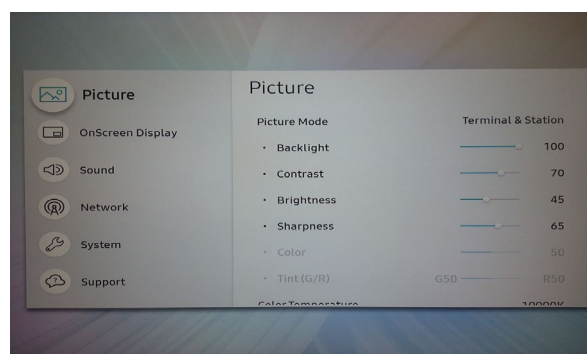
- You must update them in the order shown in the manual.
 - FW Update Sequence : Main Micom → Sub micom → Novatek

■ Main SW (Main-Micom) Upgrade

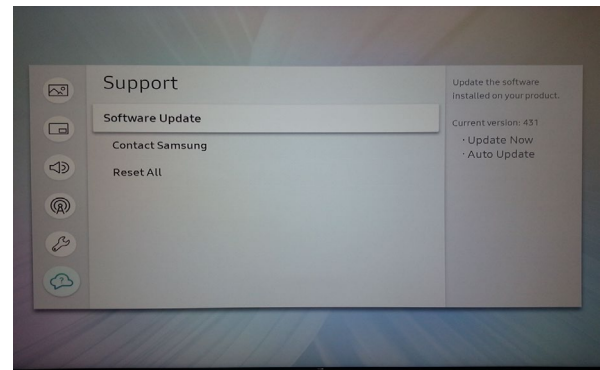
- After copying the downloaded firmware file to USB, change the folder name as 'T-KTM2ELAKUC'.



1. Press the menu button at remote control.



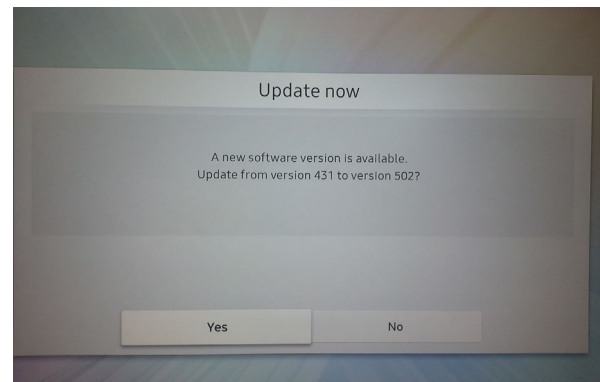
2. Select Support → Software Update



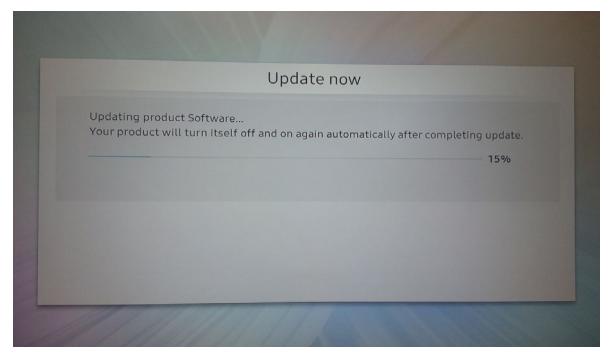
3. If you select Software Update, the Following screen will be output. Select YES Button.



4. If you select YES Button, the Following screen will be output. Select YES Button again.

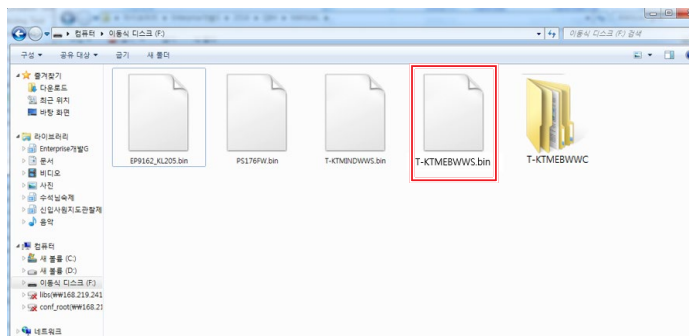


5. Main S/W Update start

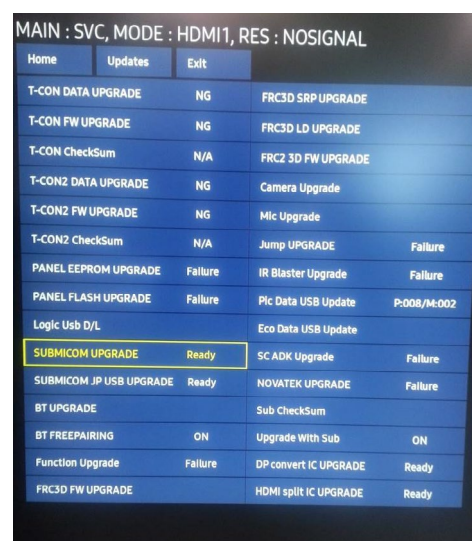
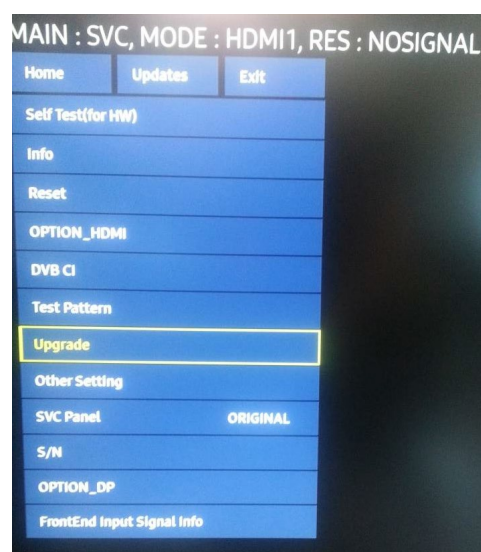


■ SUB MICOM Upgrade

- After Main S/W update,
Store the SW program named
“KM2MICOM_TV_SS.bin” in a USB memory stick.

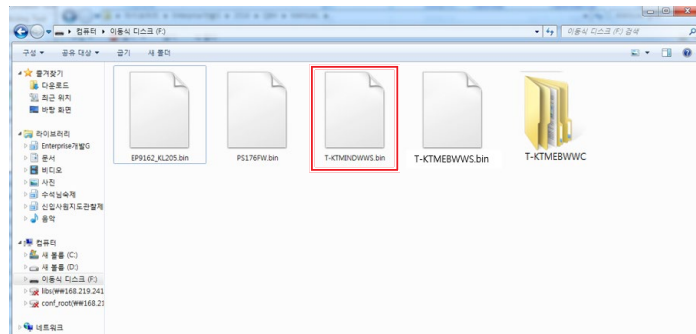


- And go to factory mode and
press SVC → Upgrade → SUBMICOM UPGRADE.
- After Update, it will be reboot.

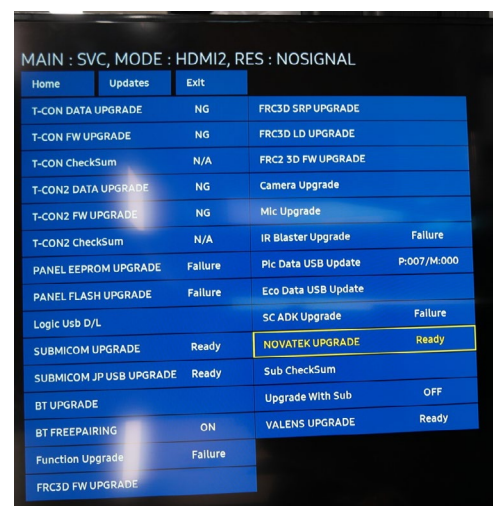
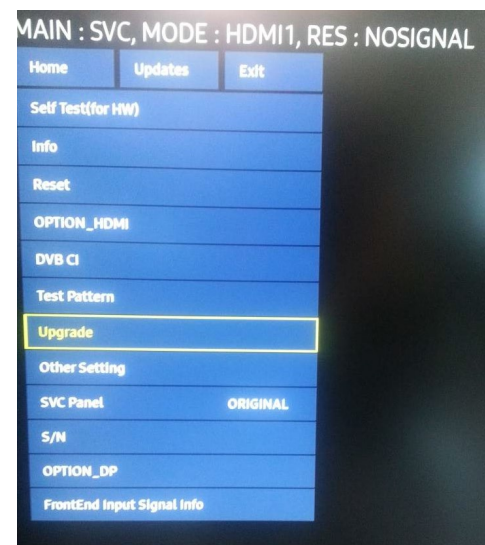


■ NOVATEC Upgrade

- After Main S/W update,
Store the SW program named
“NT68409.bin” in a USB memory stick.



- And go to factory mode and
press SVC → Upgrade → NOVATEC UPGRADE.
- After Update, it will be reboot.



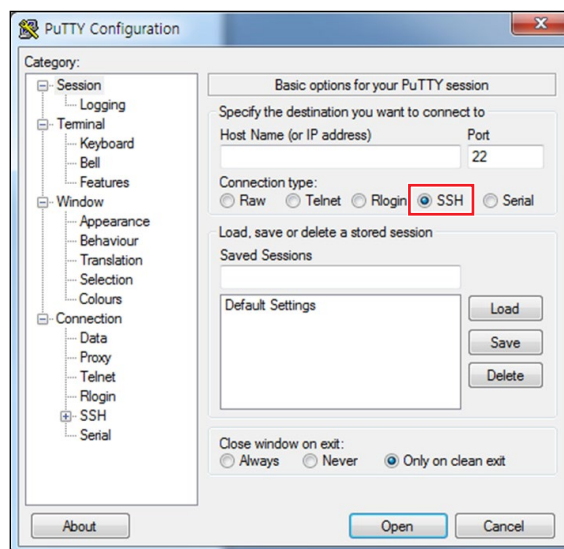
Warning

- Don't turn off the TV until the upgrade is completed.

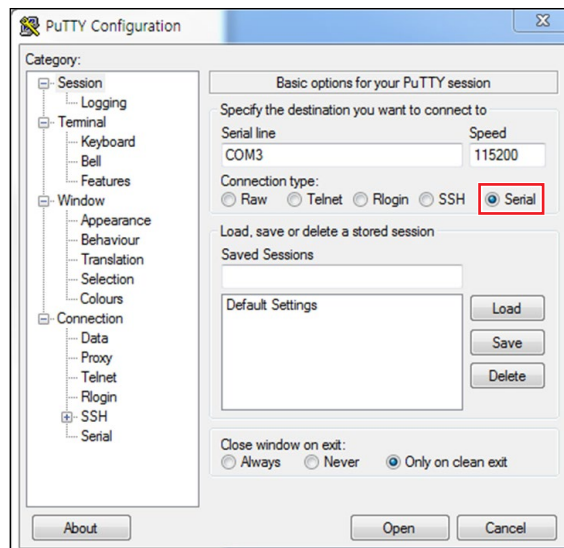
4-9. How to get the debug logs - Serial debug

■ Setup The Serial Tool

- Execute the Putty program
 - Up zip the "putty.zip" file.
 - Execute the "Putty.exe" file : Now you can use the serial tool with your PC.
- Default Setting



1. Select Connection Type to Serial
2. Serial Line : Check your PC's configuration
 - Select the correct serial line.
3. Change the Speed from "9600" to "115200"



■ Precondition For The Extraction.

Change Values

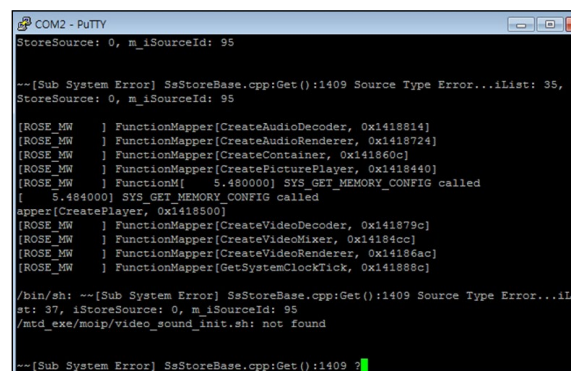
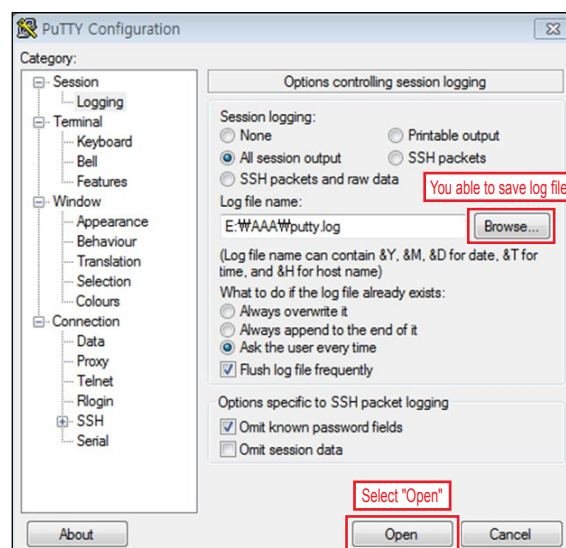
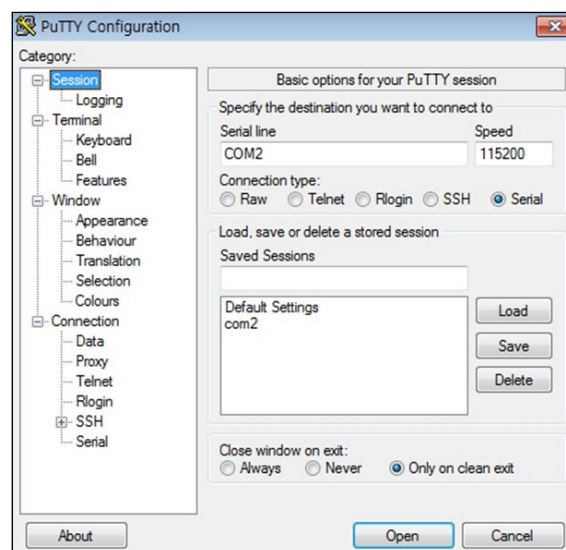
- After power on LFD
 - Factory > Control > Sub Option > RS-232 Jack > Debug
 - Factory > Control > Sub Option > Serial Log On/Off > ON
 - Factory > Control > Sub Option > Watchdog > OFF
 - Turn the power Off and On.

■ How To Get The Debug Logs.

1. Plug in serial cable from PC to LFD jack named "serial cable in"
2. By using any serial debugging tool, connect to LFD.
 - Baud rate : 115200 bps

■ How To Save The Logs (Putty.exe)

- Execute "Putty.exe"
 - Speed : 115200
 - Serial Line : Com Port
- If you input correctly then you can see message's display.



4-9-1. USB Log saving Function guide

■ Summary

This document describe method about encrypting printed log from set, saving that by usb memory, decoding encryption log file for help you to analyze defects generated Smart Signage.

Stored Content

1. Debug log through serial out
2. Final stored Log and Kernel Log in case of abnormal termination like assert
3. Ascertainable portion information when you enter the Factory Mode
 - WatchDoc On/Off
 - WatchDoc Count
 - AR Count

Encryption

All of the saved files in USB are encryption saved file.

If you want to see a file contents, you need to decode that.

You can use the Decryption tool for decoding encryption file. After using the decryption tool,you can check log contents

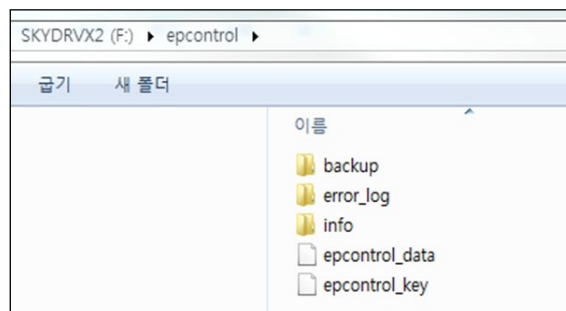
■ Log Storage Method

Execution Sequence

1. **Copy epcontrol_info** file to USB root
 (Warning) If you send epcontrol_info by mySingle, it can change the file name from epcontrol_info to epcontrol_infonull. In this case, you have to change file name – epcontrol_info- and then copy to USB.
2. When you plug the USB in set, it starts saving log automatically
 - 1) If Factory Option is set as follow, TV set can reboot for revitalizing to print Log.
 (When you plug the USB in set, it can reboot once. After rebooting, it can reboot again pass by 30 seconds. Total twice reboot).
 (Warning) Do not plug the usb into set if set should not be rebooted.
 - RS-232 Jack : UART
 - Serial Log On/Off : OFF
 - 2) When you make a progress development step, put a option like this :
 RS-232 Jack : Debug, Serial Log On/Off : ON
 it can execute log storage function without rebooting even if you plug the USB.

1. The epcontrol folder is generated in root of USB memory, and created the file as follow.

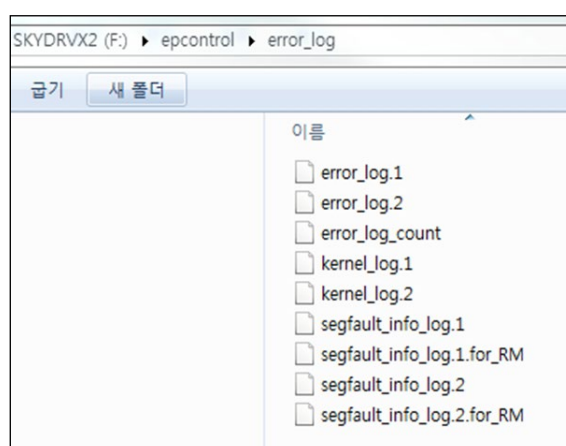
- 1) **epcontrol_key** : Key file for using decoding.
- 2) **epcontrol_data** : Encrypted Log Data



[Example of epcontrol folder contents by saving log]

- 3) **error_log** : This is a folder that saves error_log and kernel_log by abnormal termination.

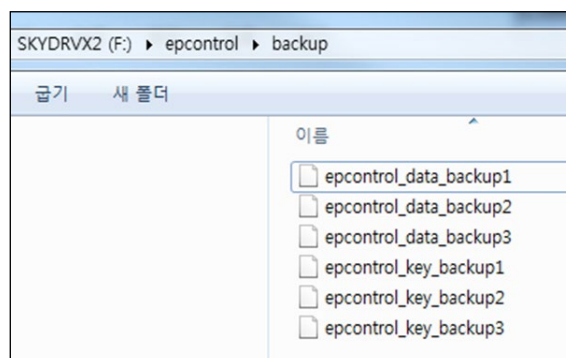
- If abnormal termination is generated, the files are saved by increasing number like this – error_log.1 ~ error_log.10.
- You can check the last saved log by opening error_log_count. It will be recorded with the final log number.
- (Reference) If the set is dead by saving log in USB, error_log and kernel_log is saved not in USB but in set. If you want to save a file from set to USB, reboot the set first and then you can check the log file in error_log folder when log storage function is executed.
- In the case of needing log folder saved problem before rebooting, you have to make a back-up.
- All of the files in error_log folder is needed to decode by using epcontrol_key



[Example of error_log folder]

- 4) **backup** : back up file in epcontrol_key and epcontrol_data is saved.

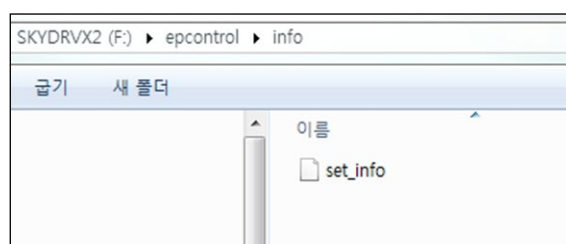
- If the saved files in the old days are existed when storing log is started, files move to backup folder.
- Like epcontrol_key_backup1, epcontrol_data_backup1, key and data file is saved, data file can be decoded by using key file of same number key file.



[Example of backup folder]

- 5) **info** : save set_info file.

- Save WatchDog On/Off, WatchDoc Count, AR Count information in Factory mode



[Example of info folder]

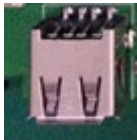
1. Saving Log is stopped by removing USB memory.
 - 1) In case of changing Factory option for printing Log, the tv set will be rebooted and set default value about Factory option when removing USB.
 - (Reference) When you remove the USB in time of executing Log storage function, the tv set is rebooted and set a Factory Option to original value after turning on in 30 seconds.
2. And then, check that epcontrol_key, epcontrol_data are saved in USB memory by PC.
3. Decode file by using decoding tool and analyze log file.

Log Extraction Guide

1. Not dead tv set but general reproduce test
 - 1) Copy epcontrol_info file to root folder in USB memory, put it into TV set
 - If you extract a log of a certain component, make a command into epcontrol_info file. (ref. 2.2 Make a Scrip)
 - 2) After rebooting twice, do reproduction test
 - 3) Remove USB memory from TV set, Check the epcontrol folder and file generation by PC
2. If you want to extract error_log, kernel_log stored in the dead set
 - 1) Copy epcontrol_info file to root folder in USB memory, put into TV set
 - 3) After rebooting twice, remove USB memory in 30 seconds.
 - 3) Check whether the file is extracted in epcontrol/error_log.
3. In the event that set is dead when you store USB Log
 - 1) If the tv set is dead when you execute USB storage function, reboot tv set under putting the USB in tv set for extracting error_log and kernel_log. (These are saved when tv set is dead)
 - When the tv set is dead, USB Log Storage Function is not work, so it is possible to not record some log generated from dead tv set into epcontrol_data file.
 - Kernel log generated at this time is saved into tv set. When the log storage function work well after rebooting set, it is extracted.
 - 2) After rebooting twice, remove USB memory in 30 seconds.
 - 3) Check wheter the file is extracted in epcontrol/error_log.

4-10. Service Item Code

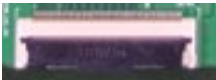
■ 43" ~ 75"

Item		Loc. No.	Code No.	View
JACK-USB	USB 1 (1.0A)	CN1401	3722-003457	
	USB 2 (0.5A)	CN2301	3722-003248	
JACK-MODULAR	RJ45	CN1502_LAN	3722-003199	
JACK-PHONE	RS232C IN	CN701	3722-003216	
CONNECTOR-DVI	DVI/MAGICINFO IN	CN2700	3701-001787	
CONNECTOR-HDMI	HDMI IN 1 (ARC)	CN2102	3701-001967	
	HDMI IN 2	CN2103	3701-001967	
	HDMI OUT (Only QMR)	CN2800	3701-001967	
CONNECTOR-DP	DP IN (Only QMR)	CN2900	3701-001670	
CONNECTOR-HEADER	WIFI	CN1403	3711-009090	

Item		Loc. No.	Code No.	View
HEADER-BOARD TO CABLE	SPEAKER	ACN01_B	3711-008131	
HEADER-BOARD TO CABLE	FUNCTION	CN1601	3711-007803	
CONNECTOR-FPC/FFC/PIC	USIT (96P)	CN1300	3708-003241	
	USIT (96P)	CN1301_UT	3708-003241	
HEADER-BOARD TO CABLE	POWER	CN202	3711-008859	
JACK-PHONE	AUDIO OUT	CN501	3722-003667	
	AUDIO IN	CN502		
	RS232C OUT	CN702		
	IR IN	CN703		

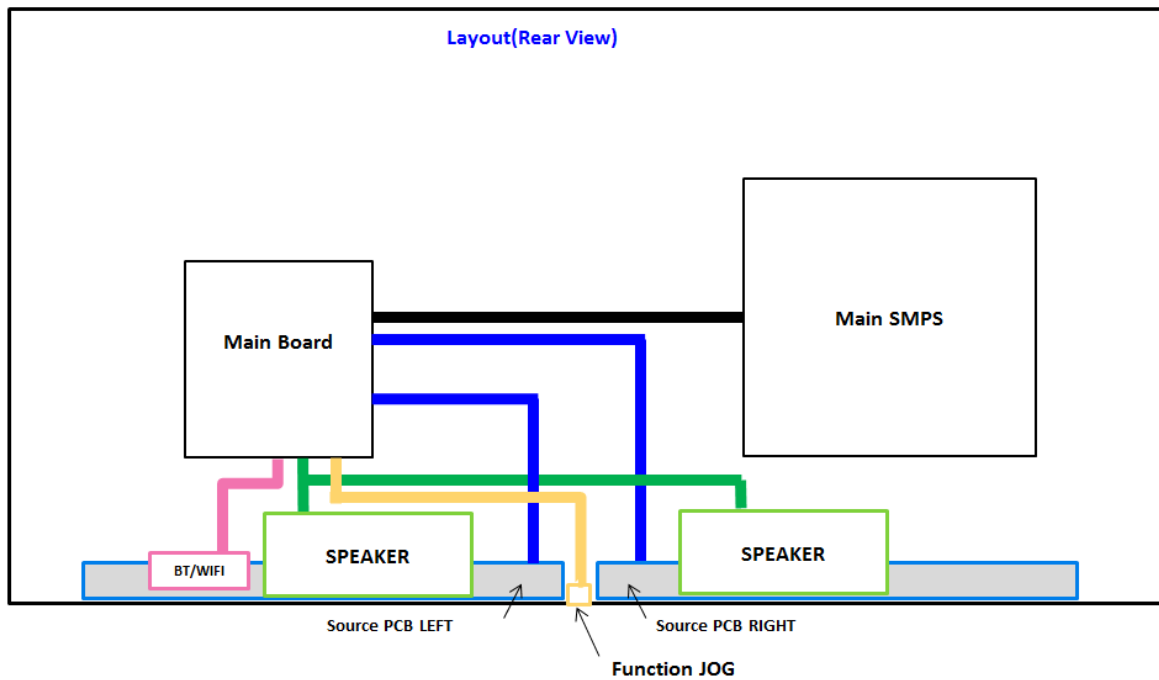
■ QB98R

Item		Loc. No.	Code No.	View
JACK-USB	USB1(1.0A)	CN1401	3722-003457	
	USB2(0.5A)_85"	CN2301_S	3722-003248	
	USB2(0.5A)_98"	CN2302_L		
JACK-MODULAR	RJ45	CN1502_LAN	3722-003199	
JACK-PHONE	RS232C IN	CN704	3722-003216	
	RS232C OUT	CN705		
	AUDIO IN	CN501	3722-004127	
	AUDIO OUT	CN502_S	3722-003667	
		CN503_L		
	IR IN	CN707_S		
		CN706_L		
CONNECTOR-DVI	DVI/MAGICINFO IN	CN2700	3701-001787	
CONNECTOR-HDMI	HDMI IN 1 (ARC)	CN2102	3701-001967	
	HDMI IN 2	CN2103		
	HDMI OUT	CN2800		

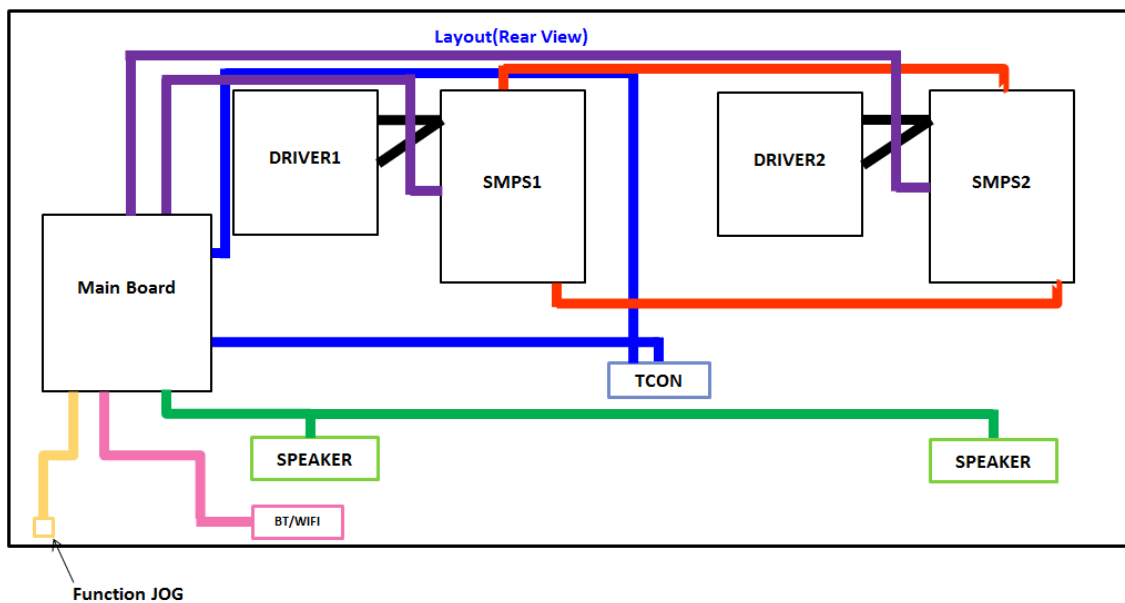
Item		Loc. No.	Code No.	View
CONNECTOR-DP	DP IN	CN2900	3701-001670	
CONNECTOR-HEADER	WIFI	CN1403	3711-009090	
HEADER-BOARD TO CABLE	SPEAKER	ACN01_B	3711-008131	
HEADER-BOARD TO CABLE	FUNCTION_98"	CN1601_L	3711-007776	
CONNECTOR-FPC/ FFC/PIC	VX1(51P)	CN1301	3708-003073	
HEADER-BOARD TO CABLE	POWER_98"	CN202_L	3711-008739	
		CN203_L	3711-008634	
		CN204_L	3711-008859	

5. Wiring Diagram

5-1. Wiring Diagrama

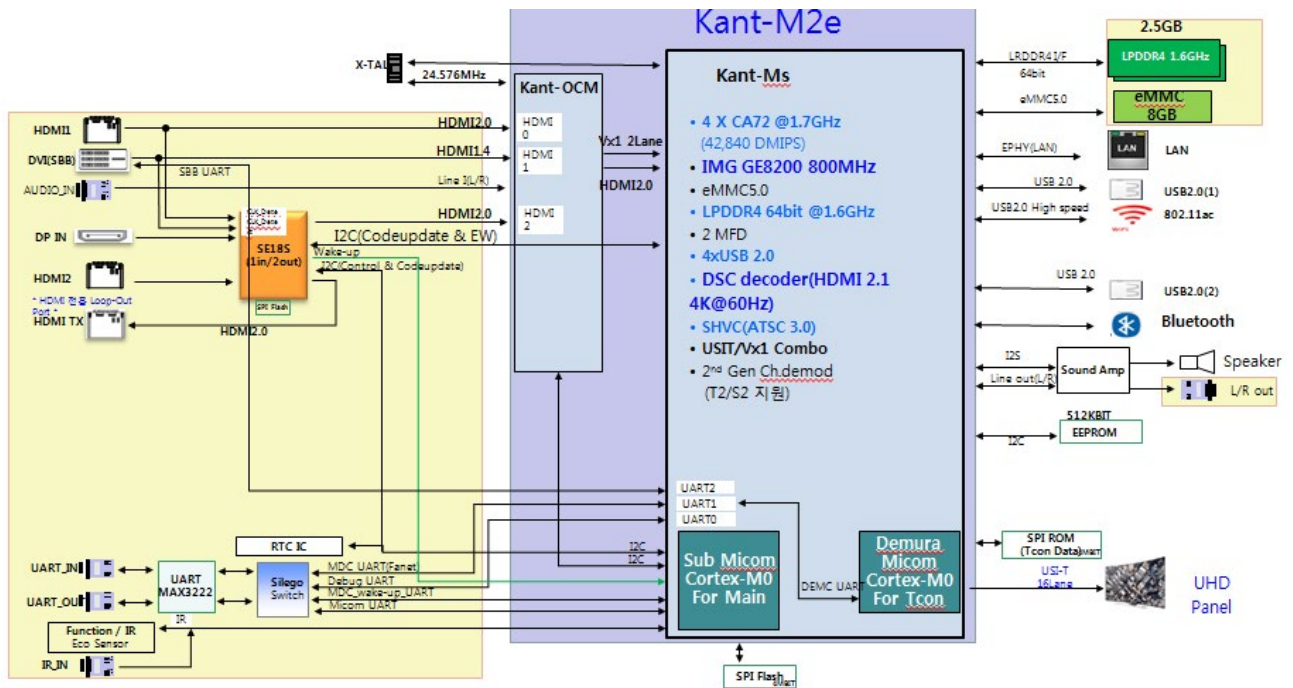


[43" ~ 75"]



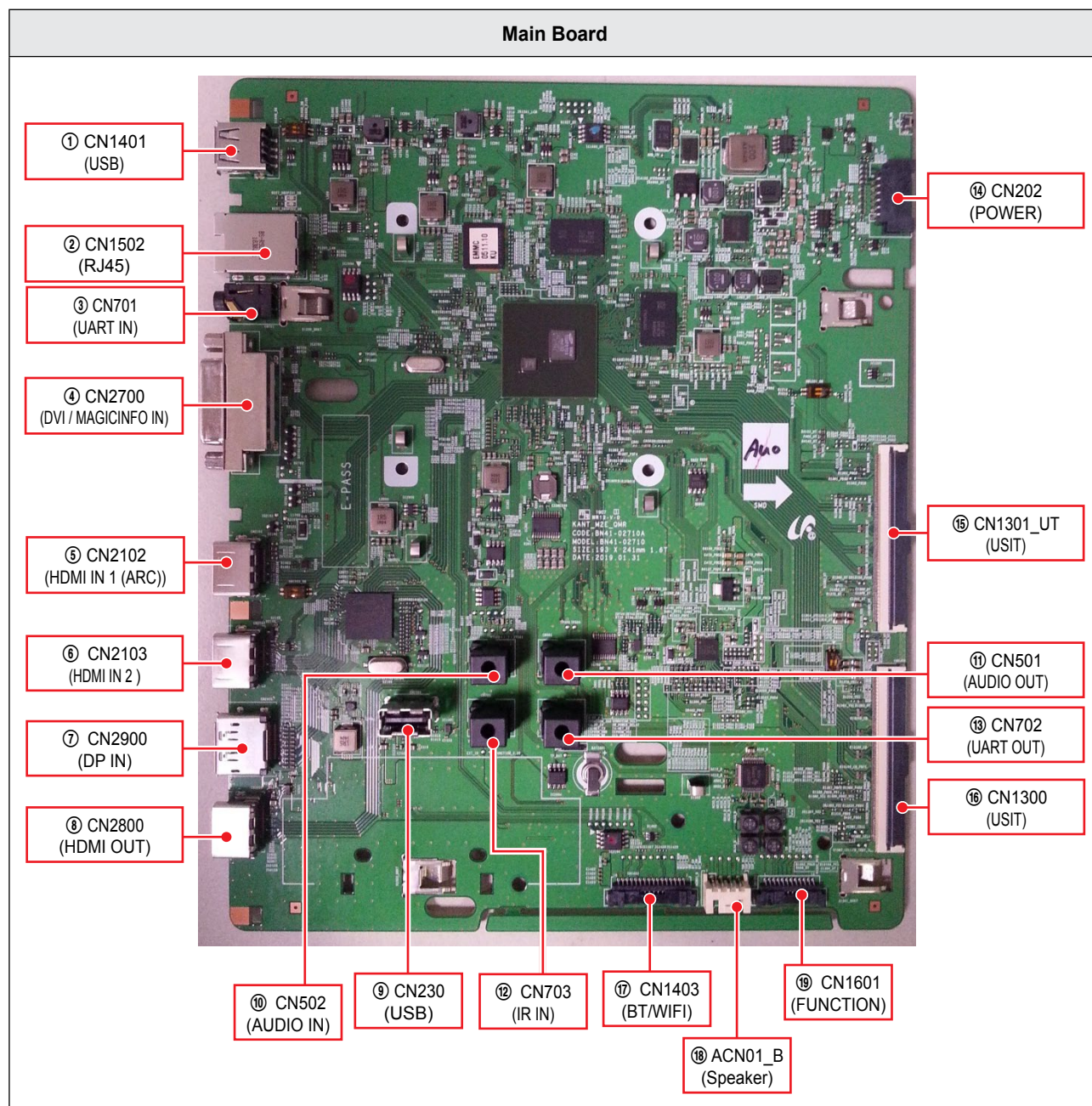
[98"]

5-2. Block Diagram

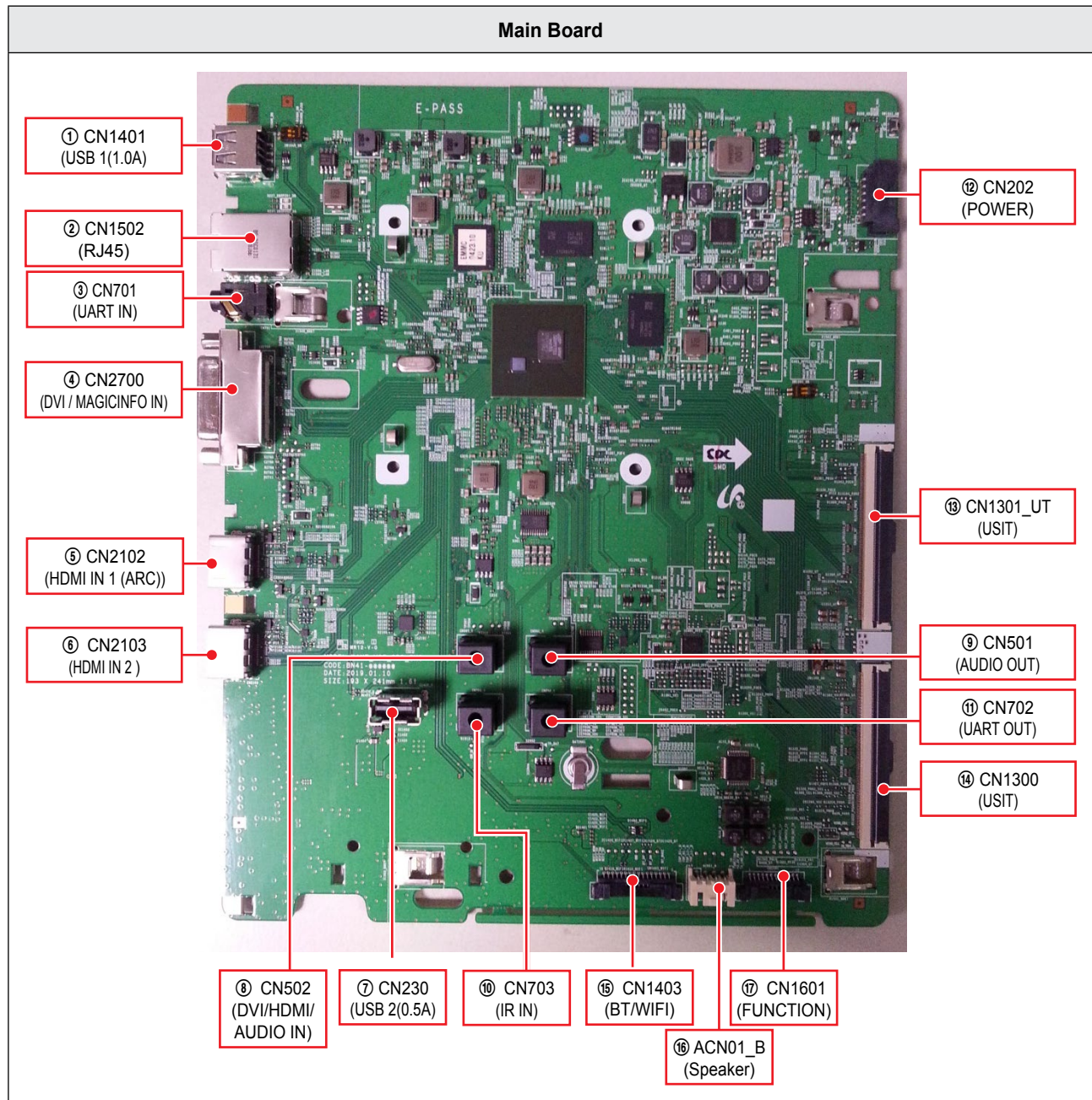


5-3. Board Connection

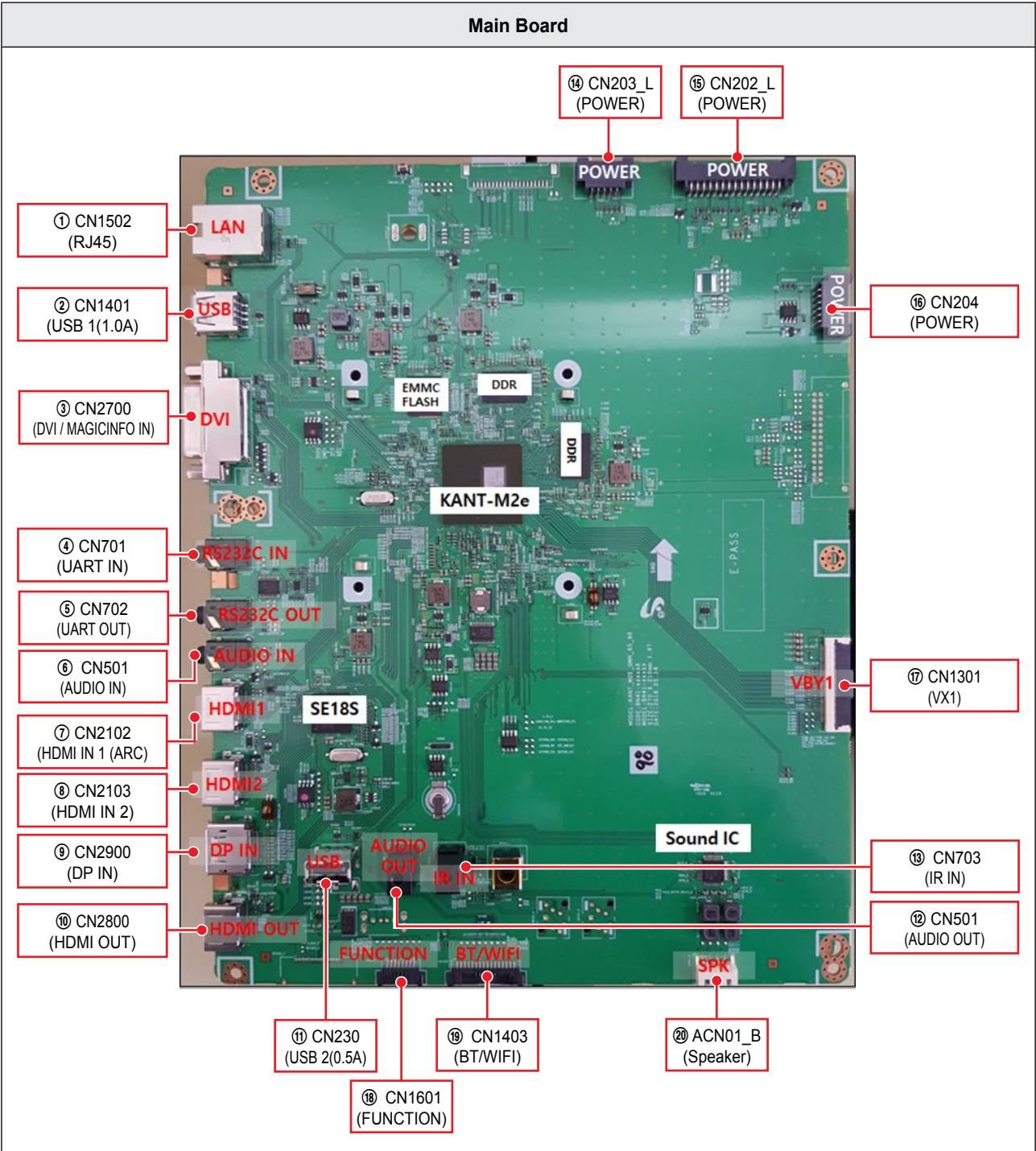
■ QM43R ~ QM75R



■ QB43R ~ QB75R



■ QB98R



43" ~ 75"

① CN1401 (USB1)			
1	5V	3	JACK1_D+
2	JACK1_D-	4	DGND

② CN1502 (LAN)			
1	TX+	5	DGND
2	DGND	6	RX-
3	TX-	7	-
4	RX+	8	LAN_GND

③ CN701 (RS232C IN)			
1	DGND	5	-
2	T1OUT	6	-
3	-	7	DGND
4	R1IN		

④ CN2700 (DVI/Magicinfo IN)			
1	RX2-	16	DVI_HPD
2	RX2+	17	RX0-
3	DGND	18	RX0+
4	-	19	DGND
5	-	20	NW_DET
6	SCL_DDC	21	-
7	SDA_DDC	22	DGND
8	-	23	RXC+
9	RX1-	24	RXC-
10	RX1+	25	-
11	DGND	26	-
12	TXD_DVI_NW	27	-
13	RXD_DVI_NW	28	-
14	5V	29	-
15	DVI_INS_DET		

⑤ CN2102 (HDMI 1)			
1	RX2+	11	DGND
2	DGND	12	RX_CLK-
3	RX2-	13	CEC
4	TRX1+	14	ARC_SINGLE
5	DGND	15	SCL_DDC
6	RX1-	16	SDA_DDC
7	RX0+	17	INS_DET
8	DGND	18	5V
9	RX0-	19	HPD
10	RX_CLK+		

⑥ CN2103 (HDMI 2)			
1	RX2+	11	DGND
2	DGND	12	RX_CLK-
3	RX2-	13	CEC
4	TRX1+	14	ARC_SINGLE
5	DGND	15	SCL_DDC
6	RX1-	16	SDA_DDC
7	RX0+	17	INS_DET
8	DGND	18	5V
9	RX0-	19	HPD
10	RX_CLK+		

⑦ CN2900 (DP in) - Only QMR)

1	LANE3-	11	DGND
2	DGND	12	LANE0+
3	LANE3+	13	DGND
4	LANE2-	14	DGND
5	DNGD	15	AUX+
6	LANE2+	16	VC_DET
7	LANE1-	17	AUX-
8	DGND	18	HPD
9	LANE1+	19	DGND
10	LANE0-	20	3.3V

⑧ CN2800 (HDMI out) - Only QMR)

1	TX2+	11	DGND
2	DGND	12	TX_CLK-
3	TX2-	13	CEC
4	TX1+	14	-
5	DGND	15	TX_SCL_DDC
6	TX1-	16	TX_SDA_DDC
7	TX0+	17	DGND
8	DGND	18	5V
9	TX0-	19	TX_HPD
10	TX_CLK+	20	

⑨ CN2301 (USB2)

1	5V	3	JACK1_D-
2	JACK2_D+	4	DGND

⑩ CN502 (DVI/HDMI/AUDIO IN)

1	DGND	5	-
2	AUDIO_SL_IN	6	DGND
3	AUDIO_SR_IN	7	DGND
4	-		

⑪ CN1001 (AUDIO IN/OUT)

1	DGND	5	-
2	HP_OUT_L_POP	6	DGND
3	HP_OUT_R_POP	7	DGND
4	-		

⑫ CN703 (IR IN)

1	DGND	5	3.3V
2	EXT_IR	6	DGND
3	3.3V	7	DGND
4	EXT_IR		-

⑬ CN1104 (RC232 OUT)

1	DGND	5	T2OUT
2	R2IN	6	DGND
3	T2OUT	7	DGND
4	R2IN		

⑭ CN202 (POWER)

1	DGND	7	13V
2	DGND	8	PWM_DIMMING
3	13V	9	13V
4	DGND	10	OVD_ONOFF_LD_SDA
5	13V	11	SMPS_FET_FALL_DETECT
6	3.3V	12	ANA_DIMMING

⑮ CN1301_UT (PANEL)							
1	FB_TRDY_2	25	DGND	49	DGND	73	ST_GOA
2	-	26	TX_CH8_A+	50	TX_CH12_A+	74	LC1_VGP1_GOA
3	17V	27	TX_CH8_A-	51	TX_CH12_A-	75	STVP1_GOA
4	17V	28	DGND	52	DGND	76	CKVB4_GOA
5	17V	29	-	53	-	77	CKVB3_GOA
6	17V	30	-	54	-	78	CKVB2_GOA
7	UH_CELL	31	DGND	55	DGND	79	CKVB1_GOA
8	UL_CELL	32	TX_CH9_A+	56	TX_CH13_A+	80	CKV4_GOA
9	8.5V	33	TX_CH9_A-	57	TX_CH13_A-	81	CKV3_GOA
10	LH_CELL	34	DGND	58	DGND	82	CKV2_GOA
11	LL_CELL	35	-	59	-	83	CKV1_GOA
12	1.8V	36	-	60	-	84	VGHD_30V
13	1.9V	37	DGND	61	DGND	85	VOFF_-11V
14	PI_DSF_MON	38	TX_CH10_A+	62	TX_CH14_A+	86	VSS_OUT2_CELL
15	PORTNUM	39	TX_CH10_A-	63	TX_CH14_A-	87	-
16	DGND	40	DGND	64	DGND	88	VCOM3_CELL
17	-	41	-	65	-	89	FB_VCOM3_CELL
18	-	42	-	66	-	90	VCOM2_CELL
19	-	43	DGND	67	DGND	91	VCOM1_CELL
20	DGND	44	TX_CH11_A+	68	TX_CH15_A+	92	BLINK_O
21	SFC1	45	TX_CH11_A-	69	TX_CH15_A-	93	3.3V
22	DGND	46	DGND	70	DGND	94	3.3V
23	-	47	-	71	SFC2	95	FB_TRDY_3
24	-	48	-	72	DGND	96	FB_TRDY_3

⑩ CN1300 (PANEL)							
1	FB_TRDY_1	25	DEMURA_SSPHOLD_SPI	49	DGND	73	DGND
2	-	26	DEMURA_SSPWP_SPI	50	-	74	-
3	3.3V	27	DEMURA_SSPRXD_SPI	51	-	75	-
4	3.3V	28	DEMURA_SSPTXD_SPI	52	DGND	76	DGND
5	FB_VCOM1_2_CELL	29	DEMURA_SSPRFRM_SPI	53	TX_CH3_A+	77	TX_CH7_A+
6	VCOM1_CELL	30	SFC2	54	TX_CH3_A-	78	TX_CH7_A-
7	VCOM2_CELL	31	DGND	55	DGND	79	DGND
8	VCOM3_CELL	32	-	56	-	80	SFC1
9	VSS_OUT1_CELL	33	-	57	-	81	DGND
10	VOFF_-11V	34	DGND	58	DGND	82	PI_DSF_MON
11	VGHD_30V	35	TX_CH0_A+	59	TX_CH4_A+	83	PORTNUM
12	CKV1_GOA	36	TX_CH0_A-	60	TX_CH4_A-	84	1.9V
13	CKV2_GOA	37	DGND	61	DGND	85	1.8V
14	CKV3_GOA	38	-	62	-	86	LL_CELL
15	CKV4_GOA	39	-	63	-	87	LH_CELL
16	CKVB1_GOA	40	DGND	64	DGND	88	8.5V
17	CKVB2_GOA	41	TX_CH1_A+	65	TX_CH5_A+	89	UL_CELL
18	CKVB3_GOA	42	TX_CH1_A-	66	TX_CH5_A-	90	UH_CELL
19	CKVB4_GOA	43	DGND	67	DGND	91	17V
20	STVP1_GOA	44	-	68	-	92	17V
21	LC1_VGP1_GOA	45	-	69	-	93	17V
22	ST_GOA	46	DGND	70	DGND	94	17V
23	DEMURA_SSPFRM_SPI	47	TX_CH2_A+	71	TX_CH6_A+	95	13V
24	CEMURA_SSPCLK_SPI	48	TX_CH2_A-	72	TX_CH6_A-	96	FB_TRDY_2

⑰ CN1403 (BT/WIFI)			
1	BT_NRESET	9	WIFI_PHY_ON
2	BT_POWER_DET	10	DGND
3	BT_WAKE	11	D+_USB_WIFI
4	DGND	12	D-_USB_WIFI
5	D-_USB_BT	13	DGND
6	D+_USB_BT	14	5V
7	DGND	15	WIFI_WOW
8	BT_WELCOME	16	WIFI_NRESET

⑱ ACN01_B (SPEAKER)			
1	R1+	3	L1+
2	R1-	4	L1-

⑲ CN1601 (FUNCTION)			
1	IN_IR	7	KEY_INPUT2
2	DGND	8	LED_STB_OUT
3	3.3V	9	-
4	TU_LNB_SCL_I2C	10	-
5	TU_LNB_SDA_I2C	11	DGND
6	KEY_INPUT1	12	-

■ 98"

① CN1401 (USB1)

1	5V	3	JACK1_D+
2	JACK1_D-	4	DGND

② CN1502 (LAN)

1	TX+	5	DGND
2	DGND	6	RX-
3	TX-	7	-
4	RX+	8	LAN_GND

③ CN703 (RS232C IN)

1	DGND	5	-
2	T1OUT	6	-
3	-	7	DGND
4	R1IN		

④ CN2700 (DVI/Magicinfo IN)

1	RX2-	16	DVI_HPD
2	RX2+	17	RX0-
3	DGND	18	RX0+
4	-	19	DGND
5	-	20	NW_DET
6	SCL_DDC	21	-
7	SDA_DDC	22	DGND
8	-	23	RXC+
9	RX1-	24	RXC-
10	RX1+	25	-
11	DGND	26	-
12	TXD_DVI_NW	27	-
13	RXD_DVI_NW	28	-
14	5V	29	-
15	DVI_INS_DET		

⑤ CN2102 (HDMI 1)

1	RX2+	11	DGND
2	DGND	12	RX_CLK-
3	RX2-	13	CEC
4	TRX1+	14	ARC_SINGLE
5	DGND	15	SCL_DDC
6	RX1-	16	SDA_DDC
7	RX0+	17	INS_DET
8	DGND	18	5V
9	RX0-	19	HPD
10	RX_CLK+		

⑥ CN2103 (HDMI 2)

1	RX2+	11	DGND
2	DGND	12	RX_CLK-
3	RX2-	13	CEC
4	TRX1+	14	ARC_SINGLE
5	DGND	15	SCL_DDC
6	RX1-	16	SDA_DDC
7	RX0+	17	INS_DET
8	DGND	18	5V
9	RX0-	19	HPD
10	RX_CLK+		

⑦ CN2900 (DP in)			
1	LANE3-	11	DGND
2	DGND	12	LANE0+
3	LANE3+	13	DGND
4	LANE2-	14	DGND
5	DNGD	15	AUX+
6	LANE2+	16	VC_DET
7	LANE1-	17	AUX-
8	DGND	18	HPD
9	LANE1+	19	DGND
10	LANE0-	20	3.3V

⑧ CN2800 (HDMI out)			
1	TX2+	11	DGND
2	DGND	12	TX_CLK-
3	TX2-	13	CEC
4	TX1+	14	-
5	DGND	15	TX_SCL_DDC
6	TX1-	16	TX_SDA_DDC
7	TX0+	17	DGND
8	DGND	18	5V
9	TX0-	19	TX_HPD
10	TX_CLK+	20	

⑨ CN2301_S (USB2) [QM85N] CN2302_L (USB2) [QM98N]			
1	5V	3	JACK1_D-
2	JACK2_D+	4	DGND

⑩ CN501 (DVI/HDMI/AUDIO IN)			
1	DGND	5	-
2	AUDIO_SL_IN	6	DGND
3	AUDIO_SR_IN	7	DGND
4	-		

⑪ CN502_S (AUDIO IN/OUT) [QM85N] CN503_L (AUDIO IN/OUT) [QM98N]			
1	DGND	5	-
2	HP_OUT_L_POP	6	DGND
3	HP_OUT_R_POP	7	DGND
4	-		

⑫ CN707_S (IR IN) [QM85N] CN706_L (IR IN) [QM98N]			
1	DGND	5	3.3V
2	EXT_IR	6	DGND
3	3.3V	7	DGND
4	EXT_IR		-

CN705 (RC232 OUT)			
1	DGND	5	-
2	R2IN	6	-
3	T2OUT	7	-
4	-		

CN1403 (BT/WIFI)			
1	BT_NRESET	9	WIFI_PHY_ON
2	BT_POWER_DET	10	DGND
3	BT_WAKE	11	D+_USB_WIFI
4	DGND	12	D-_USB_WIFI
5	D-_USB_BT	13	DGND
6	D+_USB_BT	14	5V
7	DGND	15	WIFI_WOW
8	BT_WELCOME	16	WIFI_NRESET

ACN01_B (SPEAKER)			
1	R1+	3	L1+
2	R1-	4	L1-

CN1602_S (FUNCTION) [QM85N]			
1	IR_IN	14	-
2	-	15	LED_STB_OUT
3	-	16	-
4	-	17	-
5	3.3V	18	-
6	-	19	-
7	TU_LNB_SCL_I2C	20	-
8	DGND	21	DGND
9	TU_LNB_SDA_I2C	22	-
10	-	23	-
11	KEY_INPUT1	24	-
12	-	25	-
13	KEY_INPUT2	26	-

CN1601_L (FUNCTION) [QM98N]			
1	IR_IN	5	TU_LNB_SDA_I2C
2	DGND	6	KEY_INPUT1
3	3.3V	7	KEY_INPUT2
4	TU_LNB_SCL_I2C	8	LED_STB_OUT

CN201_S (POWER) [QM85N]			
1	DGND	16	18V
2	PD_CTRL	17	DGND
3	5V	18	18V
4	5V	19	OVD_ONOFF_LD_SDA_I2C
5	DGND	20	5V
6	DGND	21	OVD_LEVEL_LD_SCL_I2C
7	DGND	22	DGND
8	DGND	23	PWM_DIMMING_OUT1
9	13V	24	PWM_DIMMING_OUT1
10	13V	25	PWM_DIMMING_OUT1
11	13V	26	PWM_DIMMING_OUT1
12	13V	27	PWM_DIMMING_OUT1
13	13V	28	PWM_DIMMING_OUT1
14	13V	29	PWM_DIMMING_OUT1
15	18V	30	PWM_DIMMING_OUT1

CN202_L (POWER) [QM98N]			
1	-	16	5V
2	PD_CTRL	17	DGND
3	DGND	18	DGND
4	5V	19	DGND
5	DGND	20	13V
6	DGND	21	13V
7	18V	22	13V
8	18V	23	ANA_DIMMING
9	DGND	24	SW_INVERTER
10	DGND	25	DGND
11	DGND	26	PWM_DIMMING_OUT1
12	DGND	27	-
13	5V	28	-
14	5V	29	-
15	5V	30	-

CN203_L (POWER) [QM98N]			
1	DGND	6	-
2	DGND	7	13V
3	13V	8	-
4	DGND	9	5V
5	13V	10	-

CN204_L (PANEL) [QM98N]			
1	DGND	7	DGND
2	13V	8	13V
3	DGND	9	DGND
4	13V	10	13V
5	DGND	11	DGND
6	13V	12	13V

CN1301 (PANEL)			
1	-	27	TX2-_VBY1
2	FRC_SDA_I2C	28	DGND
3	AGING_EN	29	TX1+_VBY1
4	FRC_SCL_I2C	30	TX1-_VBY1
5	PWM_UFT	31	DGND
6	EXT_TCON_ PMIC_SDA_I2C	32	TX0+_VBY1
7	TCON_I2C_EN	33	TX0-_VBY1
8	EXT_TCON_ PMIC_SCL_I2C	34	DGND
9	DGND	35	VBY1_TX_LOCKN
10	DGND	36	HTPDN_TX_VBY1
11	TX7+_VBY1	37	DGND
12	TX7-_VBY1	38	DGND
13	DGND	39	DGND
14	TX6+_VBY1	40	DGND
15	TX6-_VBY1	41	-
16	DGND	42	13V
17	TX5+_VBY1	43	13V
18	TX5-_VBY1	44	13V
19	DGND	45	13V
20	TX4+_VBY1	46	13V
21	TX4-_VBY1	47	13V
22	DGND	48	13V
23	TX3+_VBY1	49	13V
24	TX3-_VBY1	50	13V
25	DGND	51	13V
26	TX2+_VBY1		

5-4. Connector Functions

[QM43R ~ QM75R / QB43R ~ QB75R]

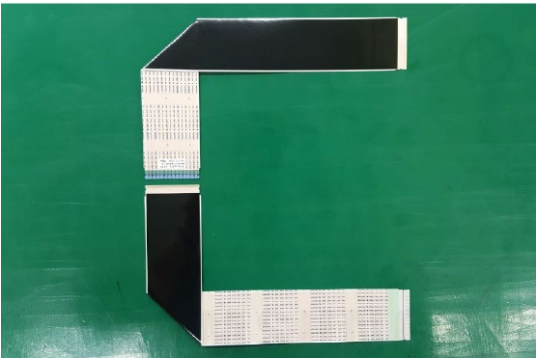
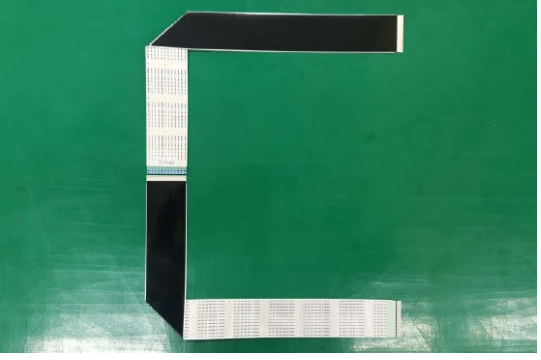
Connector	Functions
CN202 ↔ CNM801	Supply power from SMPS to Main Board.
CN1301_U ↔ USIT_RIGHT	USIT_RIGHT signal transfered from Main Board to Panel.
CN1300 ↔ USIT_LEFT	USIT_LEFT signal transfered from Main Board to Panel.
CN1403 ↔ BT/WIFI	Connect the BT/WIFI
ACN01_B ↔ SPEAKER	Connect the speaker
CN1601 ↔ FUNCTION	Function keys

[QB98R]

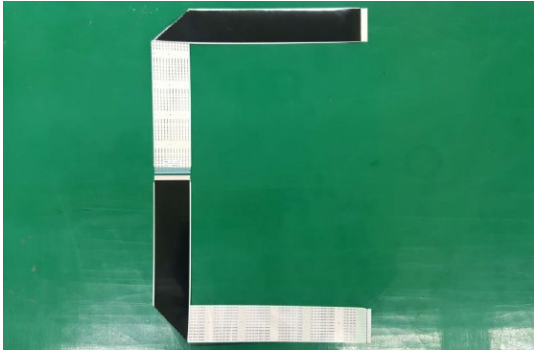
Connector	Functions
CN202_L ↔ CNM801	Supply power from SMPS to Main Board.
CN203_L ↔ CNM801	Supply power from SMPS to Main Board.
CN204_L ↔ CON3	Supply power from TCON to Main Board.
CN1301 ↔ U1	Signal transfered from Main Board to Panel.
CN1403 ↔ BT/WIFI	Connect the BT/WIFI
ACN01_B ↔ SPEAKER	Connect the speaker
CN1601_L ↔ FUNCTION	Function keys

5-5. Cables

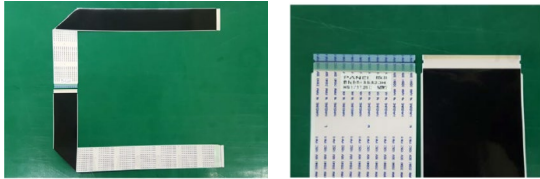
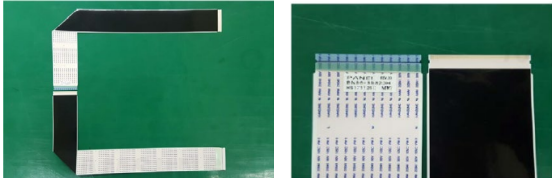
■ QM43R, QB43R

Use	Code	Photo
LEAD CONNECTOR-POWER [Main Board to SMPS]	BN39-02217D	
LEAD CONNECTOR-SUB ASSY [Main Board to Function]	BN39-02231D	
LEAD CONNECTOR-SUB ASSY [Main Board to BT/WIFI Module]	BN39-02219G	
FFC CABLE [Main Board to Panel]	BN96-39820G	
FFC CABLE [Main Board to Panel]	BN96-39821E	

■ QM49R, QM55R, QB49R, QB55R

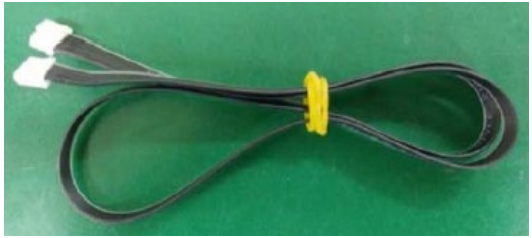
Use	Code	Photo
LEAD CONNECTOR-POWER [Main Board to SMPS]	BN39-02217D	
LEAD CONNECTOR-SUB ASSY [Main Board to Function]	BN39-02231D	
LEAD CONNECTOR-SUB ASSY [Main Board to BT/WIFI Module]	BN39-02219G	
FFC CABLE [Main Board to Panel]	BN96-39821F	
FFC CABLE [Main Board to Panel]	BN96-39820F	

■ QM65R, QM75R, QB65R, QB75R

Use	Code	Photo
LEAD CONNECTOR-POWER [POWER CABLE]	BN39-02217E	
LEAD CONNECTOR-SUB ASSY [BT/WIFI CABLE]	BN39-02219G	
LEAD CONNECTOR-SUB ASSY [FUNCTION CABLE]	BN39-02231C	
FFC CABLE [USIT CABLE_RIGHT]	BN96-39820H	
FFC CABLE [USIT CABLE_LEFT]	BN96-39903C	

■ QM98N

Use	Code	Photo
LEAD CONNECTOR-POWER [Main Board to SMPS]	BN39-02295A	
LEAD CONNECTOR-POWER [Main Board to SMPS]	BN39-02296B	
LEAD CONNECTOR-POWER [Main Board to Panel]	BN39-02324A	
LEAD CONNECTOR-BLU [SMPS to Driver]	BN39-02284A	
LEAD CONNECTOR-BLU [SMPS to Driver]	BN39-02285A	
LEAD CONNECTOR-SUB ASSY [Main Board to BT/WIFI Module]	BN39-02219A	

Use	Code	Photo
LEAD CONNECTOR-SUB ASSY [SMPS to SMPS]	BN39-02283A	
LEAD CONNECTOR-SUB ASSY [Main Board to Function]	BN39-02287A	
LEAD CONNECTOR-SUB ASSY [SMPS to SMPS]	BN39-02323A	
FFC CABLE [Main Board to Panel]	BN96-41912A	