SAMSUNG

QLED TV

Project : QTQ80D

Chassis : QWH00

Model : QE49Q8* / GQ49Q8*

QE55Q8* / GQ55Q8*

QE65Q8* / GQ65Q8*

QE75Q8* / GQ75Q8*

QE85Q8* / GQ85Q8*

*SERVICE*Manual

QLED TV

QTQ80D

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SAMSUNG

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.

1-1-1. Warnings

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

1-1-2. Servicing the LED TV

1. When servicing the LED TV, Disconnect the AC line cord from the AC outlet.

2. It is essential that service technicians have an accurate voltage meter available at all times. Check the calibration of this meter periodically.

1-1-3. Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. 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 monitor.

2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistorcapacitor networks, mechanical insulators, etc.

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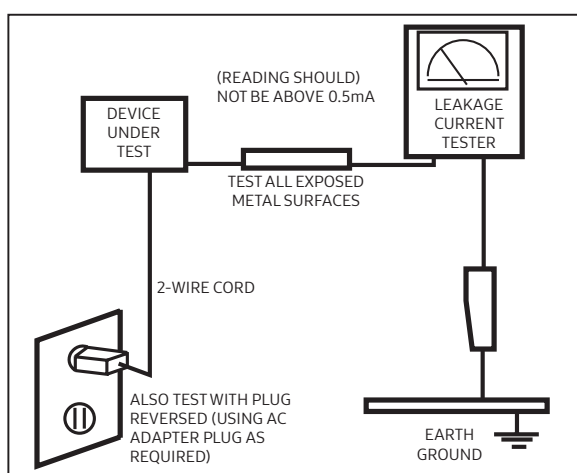
> ⚠️ **WARNING**
>
> Do not use an isolation transformer during this test.
>
> Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, Leakage Current for Appliances), and Underwriters Laboratories (UL Publication UL1410, 59.7).

4. 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.

1-1-4. 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.

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 (500 V) to theblades 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 monitor.

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 (0.4m) 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

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2-1. Product information

Model	QTQ80D		
Front View	* W : Width H : High D : Depth		
Detail View			
Color	Front : Carbon Silver		
Dimensions(W x H x D) / Weight	49"	Without Stand	1094.8 x 634.4 x 54.9 mm / 13.1 kg
		With Stand	1094.8 x 711.4 x 239.8 mm / 17.5 kg
Dimensions(W x H x D) / Weight	55"	Without Stand	1227.6 x 706.7 x 53.9 mm/ 17.9 kg
		With Stand	1227.6 x 783.4 x 255.8 mm/ 21.0 kg
Dimensions(W x H x D) / Weight	65"	Without Stand	1446.5 x 829.8 x 53.9 mm/ 24.1 kg
		With Stand	1446.5 x 905.7 x 289.1 mm/ 27.8 kg
Dimensions(W x H x D) / Weight	75"	Without Stand	1670.6 x 958.7 x 53.9 mm/ 34.4 kg
		With Stand	1670.6 x 1036.2 x 316.8 mm/ 40.3 kg
Dimensions(W x H x D) / Weight	85"	Without Stand	1892.8 x 1083.2 x 54.9 mm/ 43.3 kg
		With Stand	1892.8 x 1163.1 x 338.8 mm/ 50.1 kg

2-2. Product specification

> 📝 **NOTE**
>
> Design and specifications are subject to change without prior notice.

Item	49"	55"	65"
General Information			
Product	QLED	QLED	QLED
Cabinet Basic Code	Q49TD2	Q55TD2	Q65TD3
Series	8	8	8
Platform(TV)	SoC | NIKE-M	SoC | NIKE-M	SoC | NIKE-M
Display			
Inch	49	55	65
Real Inch	48.5	54.6	64.5
Real cm	123	138	163
Resolution	3,840 x 2,160	3,840 x 2,160	3,840 x 2,160
Ultra Black	N/A	N/A	Yes
Video			
Picture Engine	Quantum Processor 4K	Quantum Processor 4K	Quantum Processor 4K
Motion Rate	MR100	MR200	MR200
PQI (Picture Quality Index)	3200	3800	4000
HDR (High Dynamic Range)	Quantum HDR 1000	Quantum HDR 1500	Quantum HDR 1500
HDR10+	Yes	Yes	Yes
HLG (Hybrid Log Gamma)	Yes	Yes	Yes
Contrast	Direct Full Array 8x	Direct Full Array 8x	Direct Full Array 12x
Color	100% Color Volume with Quantum Dot	100% Color Volume with Quantum Dot	100% Color Volume with Quantum Dot
Viewing Angle	N/A	Wide Viewing Angle	Ultra Viewing Angle
Micro Dimming	Supreme UHD Dimming	Supreme UHD Dimming	Supreme UHD Dimming
Local Dimming	Direct Full Array	Direct Full Array	Direct Full Array
Contrast Enhancer	Yes	Yes	Yes
Auto Motion Plus	Yes	Yes	Yes
LED Clear Motion	Yes	Yes	Yes
Film Mode	Yes	Yes	Yes
Picture	HDMI Black Level	HDMI Black Level	HDMI Black Level
Response Time	6ms	6ms	6ms
Viewing Angle (H/V)	89/89	89/89	89/89
Natural Mode Support	Yes	Yes	Yes

Item	49"	55"	65"
Audio			
Dolby Digital Plus	Yes	Yes	Yes
Dialog Enhancement	Yes	Yes	Yes
Sound Output (RMS)	40W	60W	60W
Speaker Type	2.2CH	2.2.2CH	4.2.2CH
Woofer	Yes	Yes	Yes
Main Speaker Output (W)	10W+10W	10W+10W	7W+7W
Woofer Speaker Output (W)	10W+10W	10W+10W	10W+10W
Multiroom Link	Yes	Yes	Yes
Bluetooth Audio	Yes	Yes	Yes
Smart Service			
Smart TV Type	Smart	Smart	Smart
Bixby	US English, Korean, UK English, French, German, Italian, Spanish, India English (features vary by language)	US English, Korean, UK English, French, German, Italian, Spanish, India English (features vary by language)	US English, Korean, UK English, French, German, Italian, Spanish, India English (features vary by language)
Far-Field Voice Interaction	Yes	Yes	Yes
Works With Google Assistant	Yes (GB, FR, DE, IT, ES, AT, DK, IE, NL, NO, SE only)	Yes (GB, FR, DE, IT, ES, AT, DK, IE, NL, NO, SE only)	Yes (GB, FR, DE, IT, ES, AT, DK, IE, NL, NO, SE only)
Works With Alexa	Yes (GB, FR, DE, IT, ES, AT, IE only)	Yes (GB, FR, DE, IT, ES, AT, IE only)	Yes (GB, FR, DE, IT, ES, AT, IE only)
TV Plus	Yes(GB/FR/DE/IT/ES/AT/CH only)	Yes(GB/FR/DE/IT/ES/AT/CH only)	Yes(GB/FR/DE/IT/ES/AT/CH only)
Web Browser	Yes	Yes	Yes
SmartThings App Support	Yes	Yes	Yes
SmartThings	Yes	Yes	Yes
Universal Guide	Yes(GB/FR/DE/IT/ES only)	Yes(GB/FR/DE/IT/ES only)	Yes(GB/FR/DE/IT/ES only)
Gallery	Yes	Yes	Yes
VESA Standard			
Screw Size	M8	M8	M8
Screw depth	26-28	26-28	26-28
VESA Spec	200 x 200	200 x 200	400 x 300
Smart Feature			
TV to Mobile - Mirroring	Yes	Yes	Yes
Mobile to TV - Mirroring, DLNA	Yes	Yes	Yes
360 Video Player	Yes	Yes	Yes

Item	49"	55"	65"
360 Camera Support	Yes	Yes	Yes
Easy Setup	Yes	Yes	Yes
App Casting	Yes	Yes	Yes
Wired TV On - Samsung WOL	Yes	Yes	Yes
Bluetooth Low Energy	Yes	Yes	Yes
WiFi Direct	Yes	Yes	Yes
TV Sound to Mobile	Yes	Yes	Yes
Sound Mirroring	Yes	Yes	Yes
Feature			
Ambient Mode	Ambient Mode+	Ambient Mode+	Ambient Mode+
Instant On	Yes	Yes	Yes
Digital Clean View	Yes	Yes	Yes
Auto Channel Search	Yes	Yes	Yes
Auto Power Off	Yes	Yes	Yes
Caption (Subtitle)	Yes	Yes	Yes
ConnectShare™ (HDD)	Yes	Yes	Yes
ConnectShare™ (USB 2.0)	Yes	Yes	Yes
Embeded POP	Yes	Yes	Yes
EPG	Yes	Yes	Yes
Game Mode	Yes (Auto Game Mode (ALLM), Game Motion Plus, Dynamic Black EQ, Surround Sound, 4K@120Hz (HDMI Port 4))	Yes (Auto Game Mode (ALLM), Game Motion Plus, Dynamic Black EQ, Surround Sound, 4K@120Hz (HDMI Port 4))	Yes (Auto Game Mode (ALLM), Game Motion Plus, Dynamic Black EQ, Surround Sound, 4K@120Hz (HDMI Port 4))
FreeSync	FreeSync	FreeSync Premium	FreeSync Premium
IP Control	Yes	Yes	Yes
OSD Language	27 European Languages + Russian(only when connecting to Network in EE,LV,LT)	27 European Languages + Russian(only when connecting to Network in EE,LV,LT)	27 European Languages + Russian(only when connecting to Network in EE,LV,LT)
BT HID Support	Yes	Yes	Yes
USB HID Support	Yes	Yes	Yes
V-Chip	N/A	N/A	N/A
MBR Support	Yes	Yes	Yes
IPv6 Support	Yes	Yes	Yes

Item	49"	55"	65"
System			
Digital Broadcasting	DVB-TCS2(T2 Ready) x 2	DVB-TCS2(T2 Ready) x 2	DVB-TCS2(T2 Ready) x 2
DTV Sound System	Dolby	Dolby	Dolby
Analog Tuner	Yes	Yes	Yes
Core Component			
DDR SDRAM	Samsung	Samsung	Samsung
Flash Memory	EMMC | 8GB	EMMC | 8GB	EMMC | 8GB
Serial Flash Memory	WINBOND	WINBOND	WINBOND
Connectivity			
HDMI	4	4	4
USB	2	2	2
Ethernet (LAN)	Yes	Yes	Yes
Digital Audio Out (Optical)	1	1	1
RF In (Terrestrial / Cable input / Satellite Input)	1/1(Common Use for Terrestrial)/2	1/1(Common Use for Terrestrial)/2	1/1(Common Use for Terrestrial)/2
Ex-Link (RS-232C)	N/A	N/A	N/A
HDMI A / Return Ch. Support	Yes	Yes	Yes
HDMI Quick Switch	Yes	Yes	Yes

Item	75"	85"
General Information		
Product	QLED	QLED
Cabinet Basic Code	Q75TD2	Q85TD2
Series	8	8
Platform(TV)	SoC | NIKE-M	SoC | NIKE-M
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Inch	75	85
Real Inch	74.5	84.5
Real cm	189	214
Resolution	3,840 x 2,160	3,840 x 2,160
Ultra Black	N/A	N/A
Video		
Picture Engine	Quantum Processor 4K	Quantum Processor 4K
Motion Rate	MR200	MR200
PQI (Picture Quality Index)	3800	3800
HDR (High Dynamic Range)	Quantum HDR 1500	Quantum HDR 1500
HDR10+	Yes	Yes
HLG (Hybrid Log Gamma)	Yes	Yes
Contrast	Direct Full Array 8x	Direct Full Array 8x
Color	100% Color Volume with Quantum Dot	100% Color Volume with Quantum Dot
Viewing Angle	Wide Viewing Angle	Wide Viewing Angle
Micro Dimming	Supreme UHD Dimming	Supreme UHD Dimming
Local Dimming	Direct Full Array	Direct Full Array
Contrast Enhancer	Yes	Yes
Auto Motion Plus	Yes	Yes
LED Clear Motion	Yes	Yes
Film Mode	Yes	Yes
Picture	HDMI Black Level	HDMI Black Level
Response Time	6ms	6ms
Viewing Angle (H/V)	89/89	89/89
Natural Mode Support	Yes	Yes

Item	75"	85"
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Dolby Digital Plus	Yes	Yes
Dialog Enhancement	Yes	Yes
Sound Output (RMS)	60W	60W
Speaker Type	2.2.2CH	2.2.2CH
Woofer	Yes	Yes
Main Speaker Output (W)	10W+10W	10W+10W
Woofer Speaker Output (W)	10W+10W	10W+10W
Multiroom Link	Yes	Yes
Bluetooth Audio	Yes	Yes
Smart Service		
Smart TV Type	Smart	Smart
Bixby	US English, Korean, UK English, French, German, Italian, Spanish, India English (features vary by language)	US English, Korean, UK English, French, German, Italian, Spanish, India English (features vary by language)
Far-Field Voice Interaction	Yes	Yes
Works With Google Assistant	Yes (GB, FR, DE, IT, ES, AT, DK, IE, NL, NO, SE only)	Yes (GB, FR, DE, IT, ES, AT, DK, IE, NL, NO, SE only)
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VESA Spec	400 x 400	600 x 400

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Mobile to TV - Mirroring, DLNA	Yes	Yes
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360 Camera Support	Yes	Yes
Easy Setup	Yes	Yes
App Casting	Yes	Yes
Wired TV On - Samsung WOL	Yes	Yes
Bluetooth Low Energy	Yes	Yes
WiFi Direct	Yes	Yes
TV Sound to Mobile	Yes	Yes
Sound Mirroring	Yes	Yes
Feature		
Ambient Mode	Ambient Mode+	Ambient Mode+
Instant On	Yes	Yes
Digital Clean View	Yes	Yes
Auto Channel Search	Yes	Yes
Auto Power Off	Yes	Yes
Caption (Subtitle)	Yes	Yes
ConnectShare™ (HDD)	Yes	Yes
ConnectShare™ (USB 2.0)	Yes	Yes
Embeded POP	Yes	Yes
EPG	Yes	Yes
Game Mode	Yes (Auto Game Mode (ALLM), Game Motion Plus, Dynamic Black EQ, Surround Sound, 4K@120Hz (HDMI Port 4))	Yes (Auto Game Mode (ALLM), Game Motion Plus, Dynamic Black EQ, Surround Sound, 4K@120Hz (HDMI Port 4))
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IP Control	Yes	Yes
OSD Language	27 European Languages + Russian(only when connecting to Network in EE,LV,LT)	27 European Languages + Russian(only when connecting to Network in EE,LV,LT)
BT HID Support	Yes	Yes
USB HID Support	Yes	Yes
V-Chip	N/A	N/A
MBR Support	Yes	Yes
IPv6 Support	Yes	Yes

Item	75"	85"
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Analog Tuner	Yes	Yes
Core Component		
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Flash Memory	EMMC | 8GB	EMMC | 8GB
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Connectivity		
HDMI	4	4
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Ethernet (LAN)	Yes	Yes
Digital Audio Out (Optical)	1	1
RF In (Terrestrial / Cable input / Satellite Input)	1/1(Common Use for Terrestrial)/2	1/1(Common Use for Terrestrial)/2
Ex-Link (RS-232C)	N/A	N/A
HDMI A / Return Ch. Support	Yes	Yes
HDMI Quick Switch	Yes	Yes

2-3. Accessories

> 📝 **NOTE**
>
> - The items' colors and shapes may vary depending on the model.
> - Cables not included in the package contents can be purchased separately.
> - The part code for some accessories may differ depending on your region.
> - The provided accessories may vary depending on the model.

x 4 (M4 x L14)

x 4 (M4 x L14)

Samsung Smart Remote / Batteries (AA x 2)

User Manual / Regulatory Guide
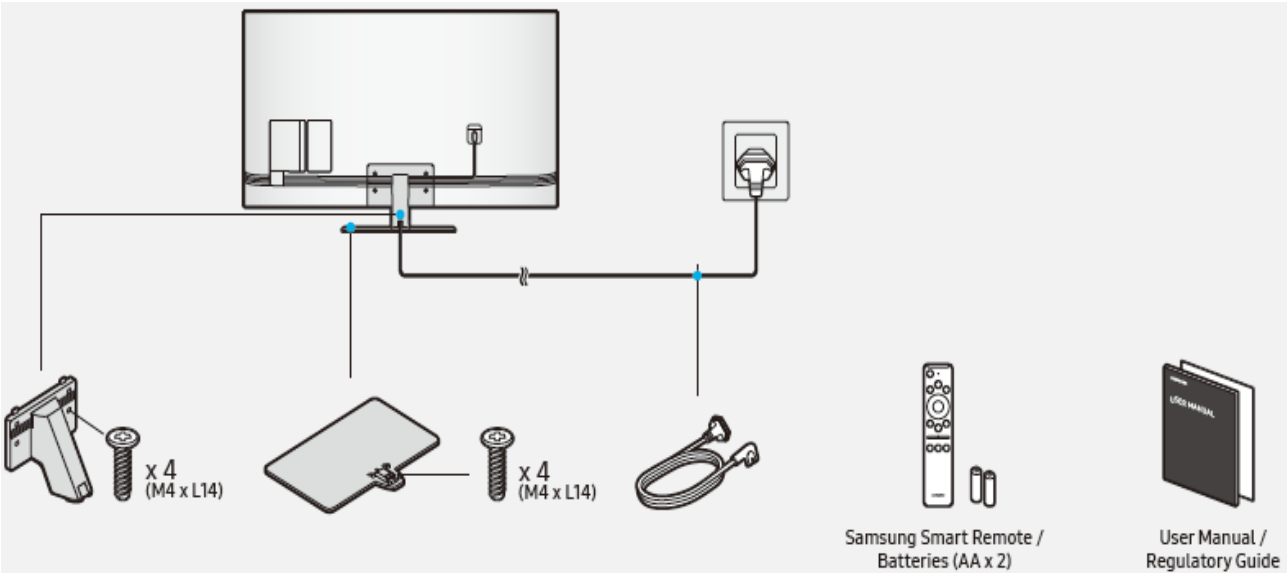
Product	Remark
• Power Cable	
• Batteries (AAA x 2)	
• Regulatory Guide	• Reference Electrical Parts List in Exploded View
• Samsung Smart Remote	
• User Manual	

■ For Wall Mount

- Wall Mount Adapter (4 EA)

2-4. Supported Formats

■ Supported external subtitles

Name	Format
MPEG-4 Timed text	.ttxt
SAMI	.smi
SubRip	.srt
SubViewer	.sub
Micro DVD	.sub or .txt
SubStation Alpha	.ssa
Advanced SubStation Alpha	.ass
SMPTE-TT Text	.xml

■ Supported internal subtitles

Name	Format
Xsub	AVI
SubStation Alpha	MKV
Advanced SubStation Alpha	MKV
SubRip	MKV
VobSub	MKV
MPEG-4 Timed text	MP4
TTML in smooth streaming	MP4
SMPTE-TT Text	MP4
SMPTE-TT PNG	MP4

■ Supported image formats and resolutions

File extension	Format	Resolution
*jpg *jpeg	JPEG	15360 x 8640
*png	PNG	4096 x 4096
*bmp	BMP	4096 x 4096
*mpo	MPO	15360 x 8640

■ Supported music formats and codecs

File extension	Format	Codec	Note
*.mp3	MPEG	MPEG1 Audio Layer 3	
*.m4a *.mpa *.aac	MPEG4	AAC	
*.flac	FLAC	FLAC	Supports up to 2 channels
*.ogg	OGG	Vorbis	Supports up to 2 channels
*.wma	WMA	WMA	WMA is supported up to 10 Pro 5.1 channels, M2 profile. WMA1, WMA lossless / Voice are not supported.
*.wav	wav	wav	
*.mid *.midi	midi	midi	Supports type 0 and type 1. Seek is not supported. Supports USB device only.
*.ape	ape	ape	
*.aif *.aiff	AIFF	AIFF	
*.m4a	ALAC	ALAC	

■ Other Restrictions

- Codecs may not function properly if there is a problem with the content.
- Video content does not play or does not play correctly if there is an error in the content or container.
- Sound or video may not work if they have standard bit rates/frame rates above the TV's compatibility ratings.
- If the Index Table is has an error, the Seek (Jump) function will not work.
- When playing video over a network connection, the video may not play smoothly because of data transmission speeds.
- Some USB/digital camera devices may not be compatible with the TV.
- HEVC codec is only available in MKV / MP4 / TS containers.
- The MVC codec is supported partly.

■ Video decoders

- H.264 UHD is supported up to Level 5.1, and H.264 FHD is supported up to Level 4.1. (TV does not support FMO/ASO/ RS)
- HEVC UHD is supported up to Level 5.1.
- AV1 8K is supported up to Level 6.1.
- VC1 AP L4 is not supported.
- GMC 2 or above is not supported.

■ Audio decoders

- WMA is supported up to 10 Pro 5.1 channels, M2 profile.
- WMA1, WMA lossless / Voice are not supported.
- QCELP and AMR NB/WB are not supported.
- Vorbis is supported for up to 5.1 channels.
- Dolby Digital Plus is supported for up to 5.1 channels.
- The supported sample rates are 8, 11.025, 12, 16, 22.05, 24, 32, 44.1, and 48 KHz, and differ with the codec.
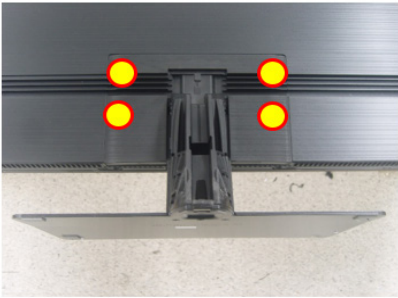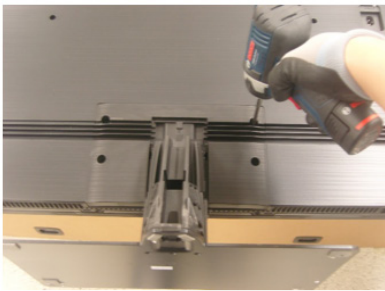
3. Disassembly and Reassemble

This section of the service manual describes the disassembly and reassembly procedures for the product.

⚠️ **CAUTION**	1. Disconnect the product from the power source before disassembly. 2. Follow these directions carefully. 　- Use the Samsung Open Jig and Cushion to remove the Rear Cover. 　　• Open Jig Tool, Protection Cushion (curved models Only) 　- Recommended Torque for Cabinet/Stand screws : 10 ~ 12kgf 　　• A strength of Torque can be changed depending on the situation.

3-1. Disassembly
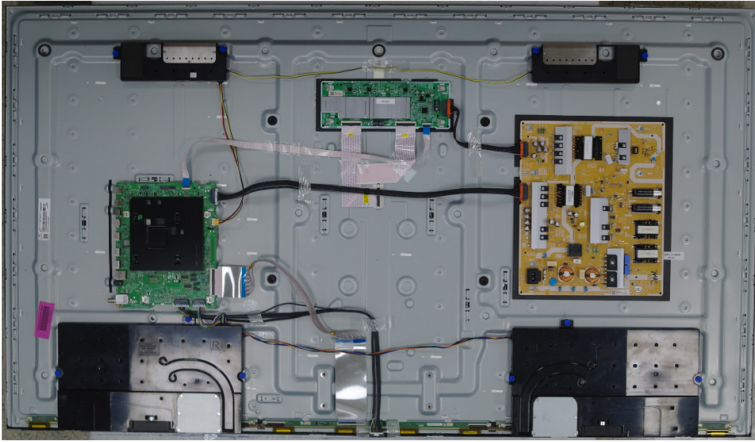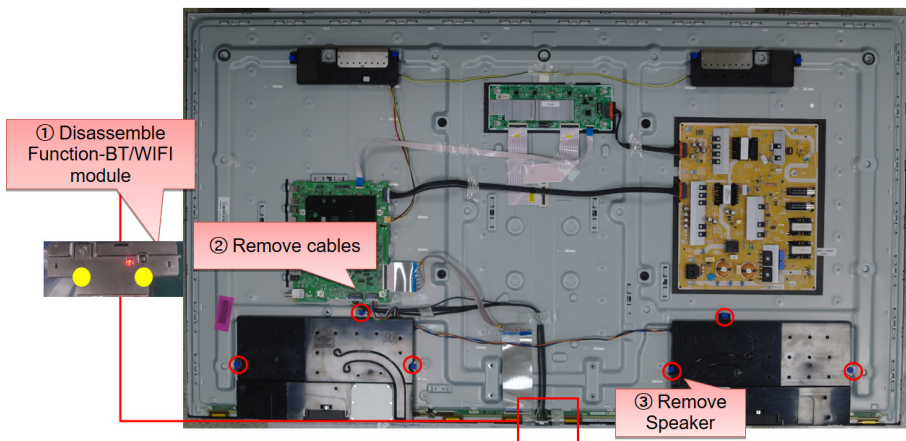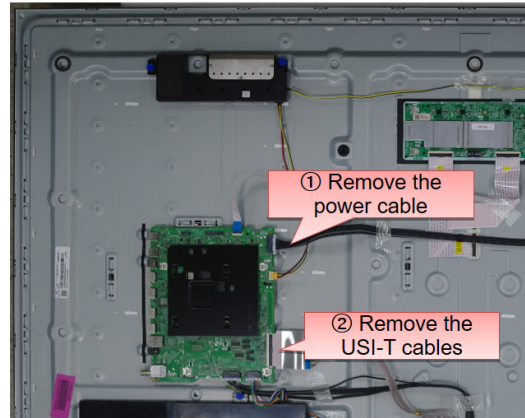
10-10	Carefully position the product so that the screen is facing downwards. Make sure to place the product upon a soft cushion or any material that will prevent damage to the screen.	Remark

2	Loosen 4 screws and detach Center stand.	Remark

3	First, releasing bottom Hook by gently inserting the OPEN Jig. Then,Use Open Jig beginning in tabs at bottom corners. Release all clips as indicated in red on sides and top. Gently lift up the Rear Cover starting at the top being careful of function assembly at the bottom. ✓ Note tabs at center and bottom will also release when lifting off cover.	Remark

3-1	Disconnect AC Power Cord and all cables and place the TV on a cushion or protective surface.	Remark

3-2	Loosen 4 screws and detach Center stand.	Remark

3-3	Disconnect the rear cover • First, releasing bottom Hook by gently inserting the OPEN Jig • Then, releasing the left bottom corner notch, by fully inserting the OPEN Jig. Re-position the Jig just far enough in to release the left slide while clearing the panel.	3-3 Remark

3-4	Repeat the Process on the right side. Two Open Tools are recommended to help hold open the cover. Release both sides then top of cover.	Remark

3-5	Now begin lifting off the Rear Cover starting at the top. ✓ NOTE: Lift up cover while gently rocking side to side until center and bottom tabs release.	Remark
	Jig Direction Jig Direction Jig Direction **Locking Part** Top : 12 point L/R : Each 7 point Center : 2 point Bottom : 8 point Main part : 2Point SMPS part : 1 Point 	
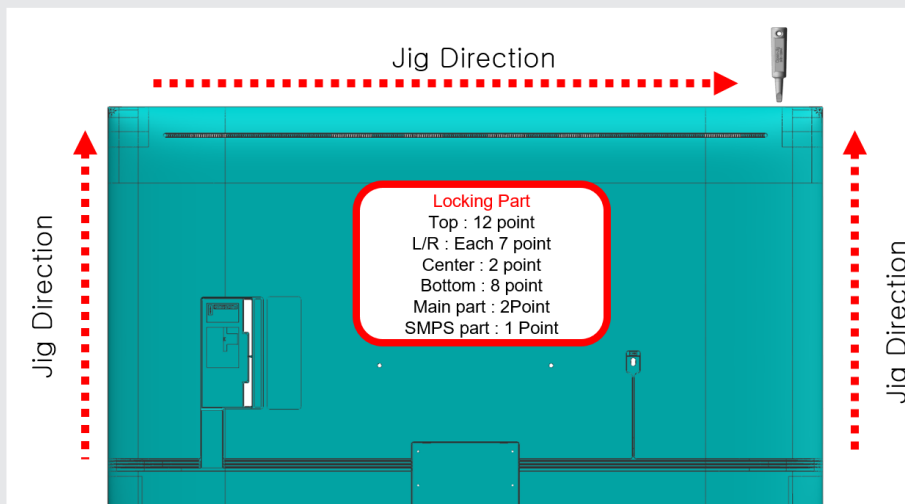
3-6	Remove the Cover and reconnect Power Cord.	Remark

4	Remove the Function-BT/WIFI module and the function module from the Bottom Chassis (1). Remove the speaker and function Cables from the main board(2) then remove the speaker(3).	Remark
	① Disassemble Function-BT/WIFI module ② Remove cables ③ Remove Speaker	

5	Remove the power cable(1) and the USI-T cables(2).	Remark
	① Remove the power cable ② Remove the USI-T cables	

6	Remove the Main Board, LD Board and SMPS Board pushing to the arrow direction.
	• Before Removing SMPS board
	   – You have to discharge the SMPS by using Discharge Tool
	   – If LED ON → LED OFF, Discharge is completed.
	
	Measurement point
	
		Remark
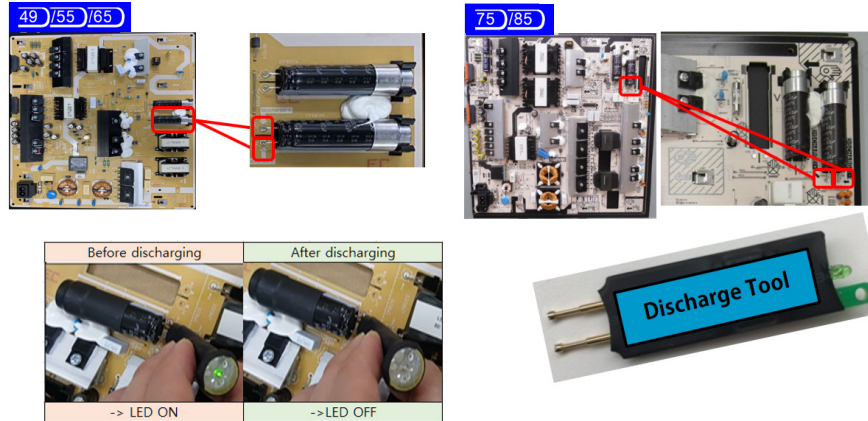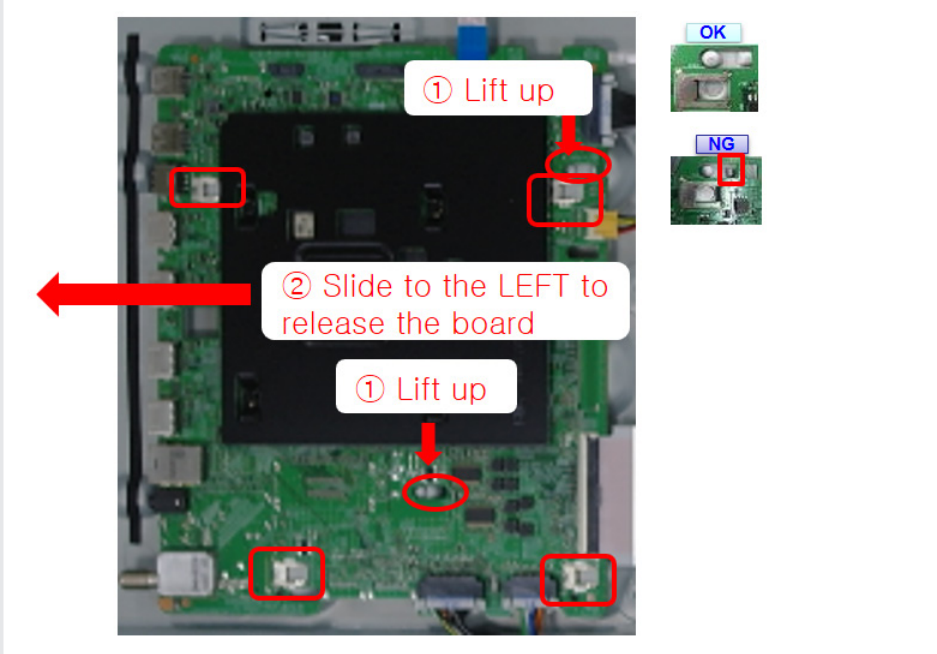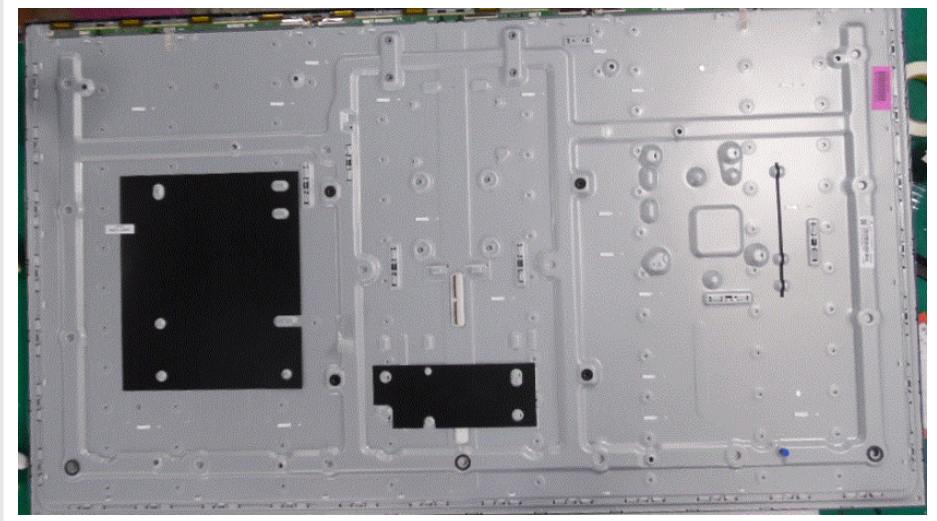
6-1	Removing SMPS board • Remove all connections then Gently lift up (Top Left corner) to release the lock • Slide to the right to release the board ✓ NOTE: When Installing the SMPS Board make sure its properly set in all mounting slots and fully locked into position. 	Remark

6-2	Removing Main board	Remark
	• Remove all connections then Gently lift up (Top Right corner) to release the lock	
	• Use both hands to hold the board and slide to the left to release the board.	
	✓ When installing the Main board, verify the board is properly positioned in all 4 mounting slots and fully locked into position.	

7	Completely Disassembly	Remark

📝 **NOTE**

Reassembly procedures are in the reverse order of disassembly procedures.

4. Troubleshooting

4-1. Function Control Operation Test
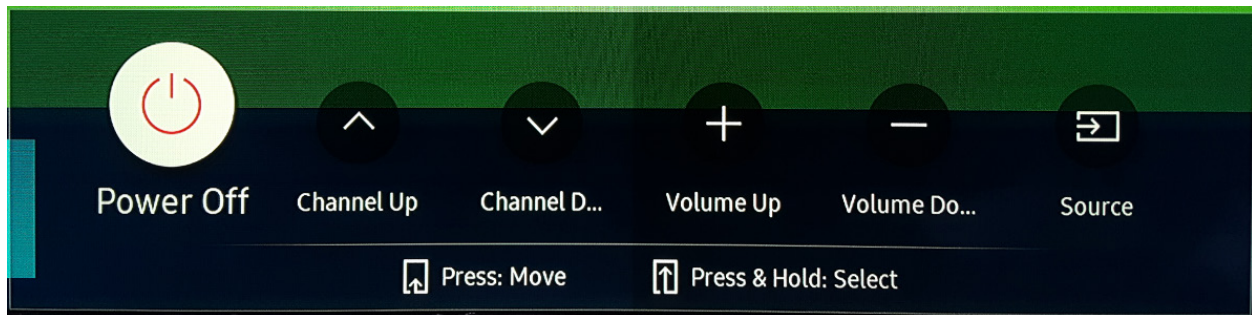
[On Screen Selections with Function Control]

■ FUNCTION/IR Control Test

1. TV in Standby
2. Check LED Status
3. If LED is OFF
✓ Check LED 1.7Vdc (pin 17/14) and VCC for 5Vdc (pin 7/4)
• If missing suspect Function Assy/Cable/Main board.
4. If LED is ON
✓ Check Switch Operation activates on screen display
• If missing:
✓ Check Key _Input1 Pin 11/11 change to 0V with a command.
• If wrong voltage or no change:
✓ Check Switch for stuck or miss-operation.
5. Check IR Pin 10/10 operation with Standard Remote command changes. (5V to 3.3V effective DC)
6. SDA pin 14/17, SCL pin 13/15 for effective 5Vdc (after power on)
• If missing suspect Function Assy/Cable Assy./Main Assy.

Function/IR Test
of **Function /Wi-Fi /BT Module**

Function/Wi-Fi/BT Connector

LED Status/ Function Switch
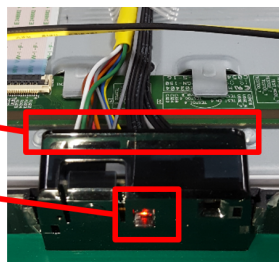
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

Function/Wi-Fi/BT Connector Pins with Main Reference Chart

| 1 | 3 | 5 | 7 | 9 | 2 | 4 | 6 | 8 | 10 | 11 | 13 | 15 | 17 | 19 | 12 | 14 | 16 | 18 | 20 |

Main Board Connector Reference Chart
Function Pins

3. CN151_CM (BT/WIFI/IR Function)			
1	D-_USB_WIFI	2	WIFI_PHY_ON
3	D+_USB_WIFI	4	MODULE_5V_PW
5	DGND	6	WIFI_WOW
7	UART_TX	8	WIFI_NRESET
9	BT_WAKE	10	IR
11	KEY_INPUT1	12	MIC_CLK
13	KEY_INPUT2	14	LED_STB
15	SENSOR_SCL_I2C	16	DGND
17	SENSOR_SDA_I2C	18	IR_OUT_1
19	MIC_DATA	20	IR_OUT_2

4-2. Power

- **49", 55", 65"**

CNM801 (main connector)				CNM802 (LD Board)			
1	GND	2	GND	1	GND	2	GND
3	GND	4	GND	3	Vdrv	4	Vdrv
5	Vamp	6	GND	5	Vdrv	6	Vdrv
7	Vamp	8	OVD_LEVEL	7	Vdrv	8	Vdrv
9	NC	10	ANA-DIM	9	Vdrv	10	Vdrv
11	A13V	12	OD ON/OFF	11	GND	12	GND
13	A13V	14	BLU_ON/OFF	13	B13V	14	FAULT
15	A13V	16	POWER_ON/OFF	15	FB	16	GND
17	A13V	18	GND	17	GND	18	GND
19	GND	20	GND	19	GND	20	GND

- **75", 85"**

CNM801 (main connector)					CNM802 (LD Board)			
1	GND	2	GND		1	GND	2	GND
3	GND	4	GND		3	Vdrv	4	Vdrv
5	Vamp	6	GND		5	Vdrv	6	Vdrv
7	Vamp	8	OVD_LEVEL		7	Vdrv	8	Vdrv
9	NC	10	ANA-DIM		9	Vdrv	10	Vdrv
11	A13V	12	OD ON/OFF		11	GND	12	GND
13	A13V	14	BLU_ON/OFF		13	B13V	14	FAULT
15	A13V	16	POWER_ON/OFF		15	FB	16	GND
17	A13V	18	GND		17	GND	18	GND
19	GND	20	GND		19	GND	20	GND

4-2-1. TV POWER STANDBY TEST

1. Power TV On
   - ✓ POWER ON .2Vdc (when off) changes to 3.3Vdc (on)
     - • Note: Will stay On for short time when powered off.
2. If voltage error or no change:
   - ✓ Jog Function & IR Control Test
3. If OK replace Main Board:
   - ✓ All 13V supplies for approx. 12.7VDC
4. If any wrong voltages, remove SMPS connector to Main Board:
   - ✓ All A13V again for 12.7VDC
   - ✓ All Vamp supplies for approx. 18 VDC
5. If OK replace Main Board:
6. If still wrong voltage replace SMPS:
   - ✓ OVD_LEVEL (Over Voltage Detect) 3.3Vdc : Operating Normal
7. If 0V or changing, an SMPS or Panel error exists. Perform Backlight Test.
   - ✓ Backlight On/Off : OV Off to 4.4Vdc On- If missing or error : Replace Main Board.
8. Backlight ON
   - ✓ Backlight On/Off 0V Off to 3.4Vdc ON (LD Board CN9003A)
   - ✓ Vdrv supplies to LD Board (approx 78V dc with multi meter)
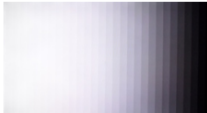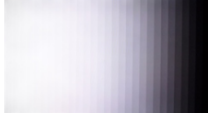
4-2-2. SMPS/PANEL BACKLIGHT TEST

1. **1. Activate Backlig**hts Test : Disconnect Lead Cable from Main to Power supply.
   - ✓ TV Screen for active backlight LEDs.
2. 2. If No BACKLIGHTS
   - ✓ Minus(Control) pins & Plus(Supply) pins voltages on the Panel connector. (with fine test probe on left side of connector only for safety)- If no pin voltages replace SMPS.
3. 3. If BACKLIGHTS ON BUT PANEL SECTION(S) OFF
- • SIMPLE BL ERROR TEST:
   - ✓ Check each panel ribbon configuration.
- • If any have a different number of pins or a different pin or drive configuration do not perform this simple test go to additional backlight test.
- • If each have same number of pins and exact pin configuration.
   - – Verify exact Panel Backlight error location (dark vertical line)
   - – Turn off TV and Remove AC Power
   - – Swap the two adjacent panel ribbons in that area
   - – Reconnect AC Power and turn on the TV
   - ✓ Check location of defect (dark vertical line)
   - – If the defect remained in the same location the panel is defective.
   - – If the defect moved to another location the LD Board is defective (NOTE: In rare cases the Main Board may be defective since it provides Local dim control.
- • BACKLIGHT DIMMING PROBLEMS
   - – Go to Menu > Picture > Expert Settings > Backlight and vary level (0 ~ 50)
   - – If no backlight changes observed :
   - ✓ Panel Connector minus (-) pin voltages and ANA-DIM voltages CNM801 while changing backlight level.
     - – If minus(-) pin voltages don't change, and ANA-DIM changes, replace SMPS
     - – If ANA-DIM doesn't change replace Main Board.
   - ✓ Use : MUTE > 4 > 1 > 9 > EXIT to test Panel Vertical Backlight Sections in normal operation mode.

4-3. Video

4-3-1. Customer Picture Test

■ MAIN/TCON BOARD

Main Section	Pre- FRC	Post FRC	Results	
			Picture Test Do you still see the problem in the test photo? Yes / No / Show Again	Problem
Pass	Pass	Pass	**Picture Test** If the Self Diagnosis Picture Test is OK, your TV may not have a problem. Please follow steps below: - Check your external devices and connections. - Try picture reset by selecting Menu > Picture > Reset Picture. - Update to the latest software version by selecting Menu > Support > Software Update.	Check Signal Source and other inputs
Fail	Pass	Pass	**Picture Test** Test 1 ●Fail / Test 2 ●Pass / Test 3 -	Replace Main/T-CON Board
Fail	Fail	Pass	**Picture Test** Test 1 ●Fail / Test 2 ●Fail / Test 3 ●Pass	Replace Main/T-CON Board
Fail	Fail	Fail	**Picture Test Complete** Test 1 Failed / Test 2 Failed / Test 3 Pass	Replace Main/T-CON Board or Panel

ENTER: Factory mode -> SVC -> Test Pattern
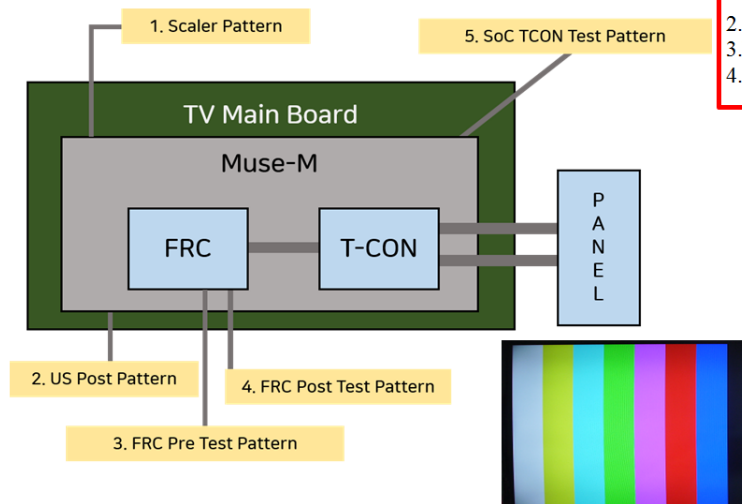
<table>
<tr><td colspan="2">Check Test Patterns</td></tr>
<tr><td>1. Verify "Scaler Pattern" and "US Post Pattern"
2. Verify "FRC Pre Test Pattern"
3. Verify "FRC Post Test Pattern"
4. Verify "SoC TCON Test Pattern"</td></tr>
</table>

1. Scaler Pattern
5. SoC TCON Test Pattern
TV Main Board
Muse-M
FRC
T-CON
PANEL
2. US Post Pattern
4. FRC Post Test Pattern
3. FRC Pre Test Pattern

4-3-2. TROUBLESHOOTING VIDEO PROBLEMS – TV MAIN/T-CON Models

- Pre Scaller & US Post of KANT-M2 Main Section > PRE FRC Main Section > POST FRC Main Section > T-CON Section > PANEL

■ Pre Scaller & US Post of KANT-M2 Main Section

Customer Picture Test 1

Mute > 1 > 4 > 7 > Mute
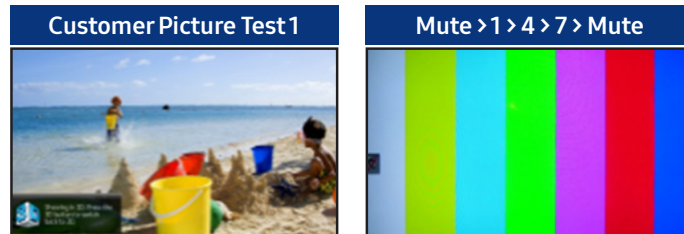
Video Operation

Generated on Main Section.

- **If OK:**
  - ✓ Source & Input Cables
  - ✓ Other inputs
- **If Noisy:**
  - ✓ Pre FRC Section Test Patterns

■ PRE FRC Main Section

Customer Picture Test 2

Video Operation

Generated at Pre FRC Section

- **If OK:**
  - ✓ Replace Main/T-Con Board
- **If Noisy:**
  - ✓ Post FRC Pattern

■ POST FRC Main Section

Customer Picture Test 3

Video Operation

Generated at Pre FRC Section

- ✓ Replace Main/T-Con Board
- **If Noisy:**
  - ✓ Post FRC Pattern
  - ✓ Mute > 3 > 6 > 9 > Mute

■ T-CON Section

Mute > 3 > 6 > 9 > Mute

[May not be available for Larger models over 70 inches.]

Video Operation

Generated at T-CON Section

- **If OK:**
  - ✓ Replace Main/T-CON Board
- **If Noisy:**
  - ✓ Main/ T-CON Board
  - ✓ Panel

■ PANEL

- **If Noisy Video:**
  - ✓ Soc T-CON Pattern in Factory Mode
    - Use type of Noise observed (Bars, single lines, video distortion, etc to help.)
    - If noise is only on one half of screen check / swap panel cables.
    - Verify Defective Panel Cables, TV Main/T-CON Board or Panel.

4-4. Audio

- **Source** ⟩ **Main Board/T-Con** ⟩ **Speakers**

■ AUDIO TEST

- **No TV Sound**
  - ✔ Menu ⟩ Audio ⟩ Speaker Settings set to **TV Speaker**
- **Noisy / Distorted TV Audio**
  - ✔ Customer Menu ⟩ Support ⟩ **Sound Test**

  - – **If Sound Test FAILS : (Missing / Noisy Audio)**
    - ✔ Speakers (compare resistance/quality)
    - • Compare audio level out to speakers with multi meter.
    - ✔ Replace defective Speakers or Main Board or Ca

  - – **If Sound Test OK :**
    - ✔ Audio Source & External Cables
    - ✔ With external Audio Generator (device or App)
    - ✔ Other Inputs
- **Optical Digital Out Errors**
  - ✔ Red light from Optical Digital Out.
    - • If missing replace Main Board
- **No HDMI Audio**
  - ✔ Source / HDMI Cable
    - • Swap with other HDMI Inputs/Sources
    - • Perform EDID Write in Factory Mode (Can restore missing HDMI Audio).
  - ✔ Bulletins and Latest firmware on TV
    - • If not restored replace main board
    - • Check Audio Format PCM/Dolby based on external Receiver
- **ARC Issues**
  - ✔ HDMI Cable is input to the ARC Designated HDMI port
  - ✔ ARC (HDMI Control) is enabled on the external Receiver.
- **Bluetooth Audio "Sound Share" Connection Issues**
  - ✔ Sound Bar is in TV Mode
    - • To Connect, Press & Hold Play Button until Sound Bar pairing mode begins.

4-5. Network

<TV>   <Router>   <Internet>

■ TV to Router "Failure"

✓ **Check** Network Status

Check Network Status **(TV ──✗─> Router ──✗─> Internet)**
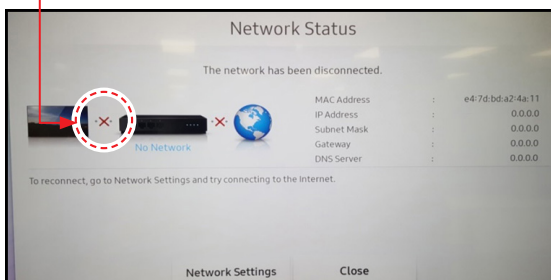
✓ **Wired & Wireless MAC Address** in Customer Support Menu.
  - **No Wired MAC Address**: Replace **Main Board**.
  - **No Wireless MAC Address**:
✓ Module cabling & voltages from Main Board.
  - If operating voltages are OK but signal missing.
    ✓ Replace **WiFi Module** (WiFi/Bluetooth Module).
✓ Proper **security passcode**
✓ **Check** Wi-Fi signal strength at TV (use WiFi Analyzer or similar App).
  - Try another source (Hot spot or Test Router)
✓ **Check** related Bulletins.
✓ **Check** Factory Mode → SVC → Info → WiFi Error Count (replace module for high error counts).

■ Router to Network "Failure"

✓ **Check** Network Status

Check Network Status **(TV ──⟶ Router──✗─>Internet)**

  - Instruct the customer the TV has proper connection to the router and is likely OK.
✓ **Check** other devices using network are OK. If they test OK this does not mean the TV should be working.
  - Try another source (Hotspot) to test/show TV Network operation.

■ Wifi Analyzer App

1. Download free Wi-Fi Analyzer App (Android)

2. **Select Network under test**

3. **Check Signal Strength Meter at both router location and TV location.**
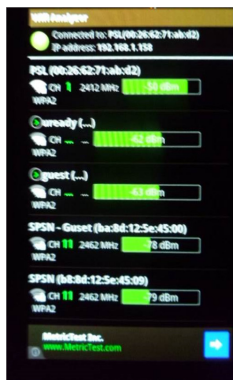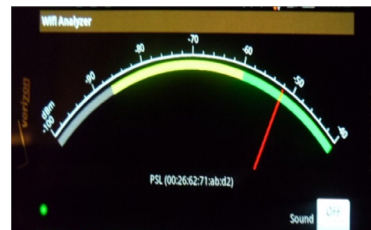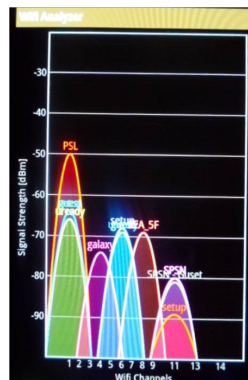
[Wi-Fi Signals]   [Competing]   [Ideal Channel Location]

■ Wired LAN Operation (TV to Router) Test

- **Use an external Router and LAN Cable for testing.**
  (No Internet connection required or used in this example)

External Router And LAN Cable

- **Wired LAN Operation Test**

1. Connect a known good external LAN Cable and Router to the TV for testing,

2. Select Menu / Network / Network Settings / Network Type / Wired / Connect

3. Verify connection: TV to router. The Router to Internet will not connect in this test.

The TV is OK if connection to the Router is verified . Inform the customer to check their LAN Cable and Router.
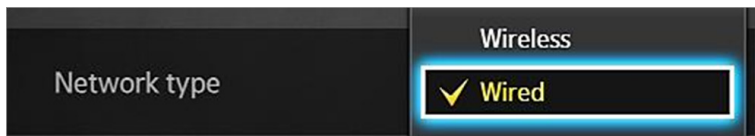
(NOTE: Previous Model Year – On Screen Display Example)

Connected to the wired network, but not the Internet

MAC Address :	fe:0b:15:33:6d:7c
IP Address :	192.168.1.104
Subnet Mask :	255.255.255.0
Gateway :	192.168.1.1
DNS Server :	192.168.1.1

✓ **TV properly connected to Router**

1) Wi-Fi Security Key

2) Distance between the wireless router and TV

3) Go to TV Web Browser / Go to speedof.me / testmy.net
- HD Video Streaming   - 5Mbps and up
- UHD Video Streaming - 25Mbps and up
- Check Latency less than 50ms

4-6. Smart Hub Connection Test

- **Network Test/Gateway Test** › **DNS Test** › **ISP Blocking** › **Samsung Server Test** › **Samsung Apps Test**

<TV>　　　　　　　　　<Router>　　　　　　　　　<Internet>　　　　　　<Samsung Server>

Go to **Menu** › **Support** › **Self Diagnosis** › **Smart Hub Connection Test**

■ Network / Gateway

- **If it Fails:**
  - ✓ TV to Router Connection Test in "**Network Trouble shooting**"

■ DNS Test

- If it Fails:
  - ✓ **DNS** setting in "Network Settings"
- If DNS is set manually:
  - ✓ Settings are correct (may be set to 8.8.8.8 to prevent Netflix issues)
- If it still fails:
  - ✓ DNS Test with setting to Auto Mode
- If it fails both Manual & Auto problem is ISP or Router.

■ ISP Blocking

- If it Fails:
  - ✓ Internet Service Provider is Active.
  - ✓ With DNS setting at 8888.
  - ✓ With Hot Spot.

■ Samsung Server Test

- If it Fails:
  - ✓ Network Status.
- If OK:
  - ✓ Reset Smart Hub.
  - ✓ Terms of Agreement are accepted.

■ Samsung Apps Test

- If it Fails:
  - ✓ **Reset** Smart Hub.
  - ✓ Samsung Apps load correctly.
  - ✓ Perform "**Apps Reset**" in Factory Mode.
  - ✓ Go to Smart Hub and complete Terms of Agreement and set up information.
  - ✓ Samsung Apps load correctly.
  - ✓ Before selecting an App, allow Apps to load or failure wilre-occur.

For Netflix Operation/Connection Issues:

- ✓ **Check** Certificate & Netflix ESN Status in Factory Mode.
  - If Certificate and ESN exists, "**CO**", "**NfO**", change the **DNS** to **8.8.8.8**
  - If Certificate is missing, "**C/**" replace the TV's Main Board.
  - If ESN number is missing: **NF/** do not replace the Main Board.
    - Reset TV Clock and check for correct Time & Date. Netflix relies on correct settings.
    - Reset Smart Hub. / Reset Apps In Factory Mode.

For Streaming Issues:

- Go to TV Web Browser / Go to speedof.me / testmy.net
  - ✓ **Check Speed** for at least 5 Mbps (HD streaming) / 25 Mbps (4K Streaming)
  - ✓ **Check Latency** for less than 50ms

4-7. Bluetooth / WiFi Module

Pin1

pin1   pin20
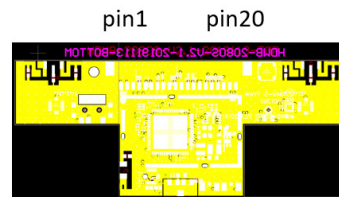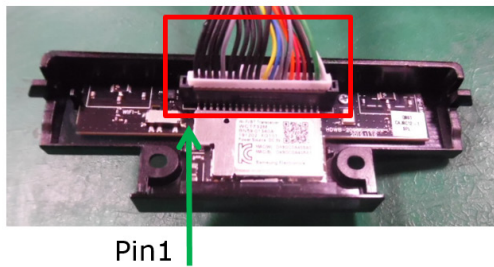
■ Pin Description

CN151_CM (FUNCTION & IR & BT/WIFI)							
1	D-_USB_BTWIFI_CM	2	WIFI_PHY_ON	3	D+_USB_BTWIFI_CM	4	A5V_PW
5	GND	6	WIFI_WOW	7	BT_UART_TXD	8	BTWIFI_NRESET
9	BT_WAKE	10	IR	11	KEY_INPUT1	12	MIC_CLK
13	I.C	14	LED_STB_OUT	15	SEMSOR_SCL_12C	16	GND
17	SEMSOR_SDA_12C	18	IR_OUT_1	19	MIC_DATA	20	IR_OUT_2
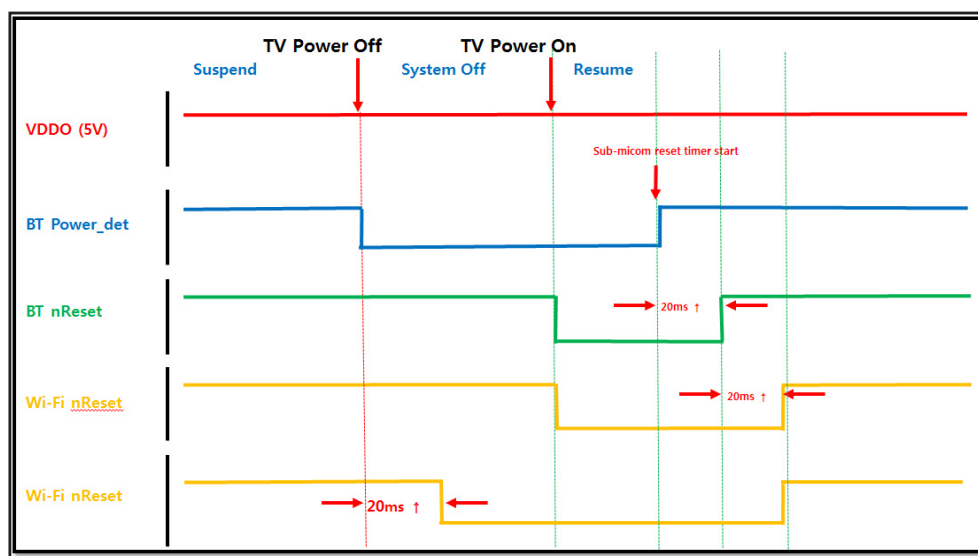
- Go to Menu/Support/Contact Samsung
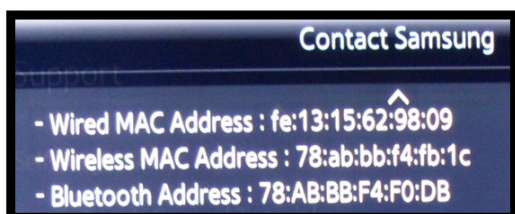
  - ✓ Wired MAC Address (missing or error - replace Main Board)
  - ✓ Wireless MAC Address
  - ✓ Bluetooth Address
- If Bluetooth Address or Wireless MAC Address are missing or errors exist
  - ✓ BT & Wi-Fi Connector Voltages. If Voltages are OK but no BT or Wi-Fi Signals voltage(s), replace defective Module.

4-8. Replacing Main Board

When replacing Main Board, certain values needs to be manually input in Factory menu to complete the replacement.

■ Steps to Replace Main Board

1. Enter Factory Menu (Use Factory Remote only).

   - Power TV on： Select TV Source > Info/Factory > Option

2. Change Each value according to the TV Model.
   - Type, Local Set, SW Model, BOM Model must be set to correct value.

   - Sample Model : QN85Q900RAFXZA

Type

- Check Panel label (located in the back chassis of panel) and choose same Type code from the list.

<Panel Label>
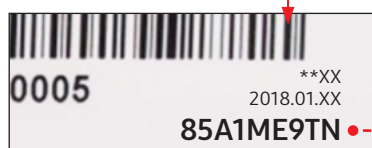
Home	Updates	Exit
Factory Reset		
Type		85A1ME9TN
Local Set		US
SW Model		QTQ80
TUNER		S_T2C
Ch Table		NONE
MRT Option		
Production Option		
Engineer Option		

55A1QU7QN	55L1QU7QN
75L1QU7QN	55A1QU8XN
55L1QU7QN	55A1QU7QN
65A1MU9TN	85A1ME9TN
65A1QU7QN	65L1QU7QN
65A1QU8XN	65L1QU8XN
55A6AU0NN	55L6AU0NN

<Type list in the Factory Menu>

Local Set

- Set according to Local region(country).

SW Model

- Check Label Rating of the TV(located on the Rear Cover).
  - SW Model is digits **after "/" in Version No**.
  - Choose same SW Model code from the list.

<"SW Model" in Label Rating>

<**SW Model** list in the Factory Menu>

4-9. Factory Mode

■ Setting TV into Factory Mode

Factory Remote

1. Power TV ON.
2. Select TV Source.
3. Info → Factory.
4. Use MENU for return.

Samsung IR Remote

1. TV Power Standby.
2. Press as follows.
   - Remote Button

NTSC	MUTE → 1 → 8 → 2 → POWER
PAL	INFO → MENU → MUTE → POWER

AA81-00243A   AA81-00243B

■ Important Items

- **Option** (must set Option Bytes when replacing Main Board.)
- Option → **Factory Reset** (returns TV to out of box condition. Does not reset Apps.)
  - **Factory Reset :** Select Factory Reset

Factory Reset	
Type	65S6AUORT
Writing Type	
Local Set	US
SW Model	QTQ60
Model Code	QN65Q60TFXZA ◄-------- Ex. Sample Model
TUNER	S_T2C
Ch Table	NONE

- SVC → **Test Patterns**
- SVC → Info → **ER Count** (Important to check for errors.)
- Control / EDID (Use to Reset HDMI Operational Errors)

Setting Option Bytes

1. Enter Factory Mode with **Service Remote** (only).
2. Check Option Byte Table located on **GSPN** (Fast Track or Tips).
3. Select **Option**
4. Select each item to change
5. Can Use new Writing Type to enter model (if entered wrong it will not change)
6. Soft power TV Off to load

Performing Factory Reset

1. Enter Factory Mode

2. Select Option / Factory Reset

3. TV will power off.

4. Perform ALL TV Settings (New out of box condition)

First Screen Appearing in Factory Mode

- Ex. Sample Model

Slide Details

- Sample Model : **QN65Q9FNAFXZA**

✓ **Testing Items**

Home	Updates	Exit

Option
Control
Debug
SVC
ADC/WB
Advanced

T-NKLAKUC-XXXX.XX ◄-----✓ Micom Version
T-NLTVTV-XXXX ◄-----✓ Sub Micom _TV

TIZEN-ONEMAIN-NlieL-RELEASE_XXXXXXXX.X ◄-----✓ Tizen

BT Version : **** ◄-----✓ BT Version
E-M : **** ◄-----✓ E-Manual
Blaster Version : **** ◄-----✓ Blaster Version
E-POP Version : **** ◄-----✓ E-Pop Version
EDID SUCCESS ◄-----✓ EDID Success(sratus)
HDCP SUCCESS ◄-----✓ HDCP Success(sratus)
CALIB : AV/COMP/PC/HDMI/
Option :XXXXXXXXX,XX,XXXXXXXXXXXXX,NONE

FRC-[MUSE-MUSIT][120Hz][HW:****] ◄-----✓ FRC
DIMMING-[DIRECT-6X8][XX] ◄-----✓ Dimming
LDFW1 : ----
LDFW2 : ----
TCON-[LIKE-L]FW[107]DATA[T65S6U0M10] ◄-----✓ T-Con

Model : XXXXXXXXXXXX ◄-----✓ Model
Wired MAC SUCCESS ◄-----✓ Wired MAC Success
Wireless MAC SUCCESS ◄-----✓ Wireless MAC Success
WIFI Version : **** ◄-----✓ WiFi Version
CIP: FAIL/CIP ECP:----
CO Nf/ W/HX PO AO O WS/DI/I/MP S/S/N/RO FP/CO/SIO UX(X)
NS//,1100 ◄-----✓ CO Status("O" Operational)
Factory Data Ver : ** / Fixde Ver : **
EERC Version : ** / WB Ver : **
PEQ Version : 34/WB Ver : 2

SmartControl : ****
Board Info : ****/**/**/*/*/BN41-*******
Factory Reset in Production : ----
SID : ----
Date of purchase : --/--/----

■ SVC > Test Patterns

1. Scaler Pattern
5. SoC TCON Test Pattern

TV Main Board

Muse-M

FRC   T-CON

P A N E L

2. US Post Pattern
4. FRC Post Test Pattern
3. FRC Pre Test Pattern

1. Verify "**Scaler Pattern**" and "**US Post Pattern**".
2. Verify "**FRC Pre Test Pattern**".
3. Verify "**FRC Post Test Pattern**".
4. Verify "**SoC TCON Test Pattern**".

Scaler Pattern	OFF
US Post Pattern	OFF
FRC Pre Pattern	0
FRC Post Pattern	0
SOC TCON Pattern	0
SOC TCON Pattern Level	255
FRC OSD Pre Pattern	0
FRC OSD Post Pattern	0
FRC2 Pre Pattern	0
FRC2 Post Pattern	0
SOC TCON2 Pattern	0
SOC TCON2 Pattern Level	255
SOC TCON3 Pattern	0
SOC TCON3 Pattern Level	255

Factory Mode / Control / EDID (Restoring HDMI Inputs)

1. Remove ALL HDMI connections
2. Factory Mode/Control/EDID (Press Enter)

EDID	
Sub Option	

3. Select EDID/OFF to ON (Right Arrow Key)
4. Select EDID WRITE ALL (Enter)

EDID ON/OFF	ON
EDID WRITE ALL	Success

5. Wait to Success (Right Arrow Key)

EDID WRITE ALL	Wait

6. Confirm EDID WRITE ALL Success (Menu Key)

EDID WRITE ALL	Success

■ SVC > Info > ER Count

WD Count	0	FRC3D Emergency Reboot On/Off	ON	7915 DETACHMENT COUNT	0
AR Count	0	FRC3D ER Count	0		
RS Count	0	TCON PMIC Fault Count	0		
RS-FG Count	0	Fan Error Count	0		
RS-Launch Count	0	TV2OC Serdes Reset Count	0		
RS-BG Count	0	OC2TV Serdes Reset Count	0		
WIFI NO DETECTION COUNT	0	AOC Diagnosis			
WIFI DETACHMENT COUNT	0	Serdes History			
BT NO DETECTION COUNT	0	Serdes History Reset			
BT DETACHMENT COUNT	0	Serdes WatchDog On/Off	OFF		
BT MGT OPEN FAIL COUNT	0	Vcc Fail Count	0		
BT MGT DISCONNECT COUNT	0	HDMI No Signal			
BT TV AUDIO DROP	0	HDMI Blinking			
BT AUDIO TIMER EXP	0	HDMI Color Space			
Camera ER Count	0	7915 NO DETECTION COUNT	0		

- ✓ Check each item listed
- ✓ IMPORTANT ITEMS
- ✓ WD Count Watch Dog(Hardware related issue)
- ✓ AR Count: Auto Reset(software (i.e. Apps) related
- ✓ WiFi Count(Check all listed items)
- ✓ BT Count(Check all listed items)
- ✓ Serdes OCB Optical Cable Error)
- ✓ AC-Over Voltage Detect(AC Supply related – New 2018)
- ✓ VCC Fail Count(DC Supply related – New 2018)

■ Factory Mode > Control > EDID

4-23

1. Remove ALL **HDMI** connections.
2. Factory Mode → Control → **EDID**. (→ **Enter** Key)

Option		EDID	
Control		Sub Option	
Debug		Hotel Option	
SVC		Shop Option	
ADC/WB		Asia Option	
Advanced		Sound	

3. Select EDID/OFF to ON. (→ **Right Arrow** Key)

EDID ON/OFF	ON

4. Select EDID WRITE ALL. (→ **Enter** Key)

EDID WRITE ALL	Success

5. Wait to Success. (→ **Right Arrow** Key)

EDID WRITE ALL	Wait

6. Confirm EDID WRITE ALL Success. (→ **Menu** Key)

EDID WRITE ALL	Success

4-10. Factory Mode Adjustments

4-10-1. Entering Factory Mode

1. To enter [**Service Mode**] press the remote-control keys in this sequence :
   - **With Consumer Remote (IR Remote)**

     ✓ Remote Button :

NTSC	POWER OFF ⟶ MUTE ⟶ 1 ⟶ 8 ⟶ 2 ⟶ POWER ON
PAL	POWER OFF ⟶ INFO ⟶ MENU ⟶ MUTE ⟶ POWER ON

   - **With Factory Remote**

     | INFO | ⟶ | FACTORY |

2. The following screen appears.
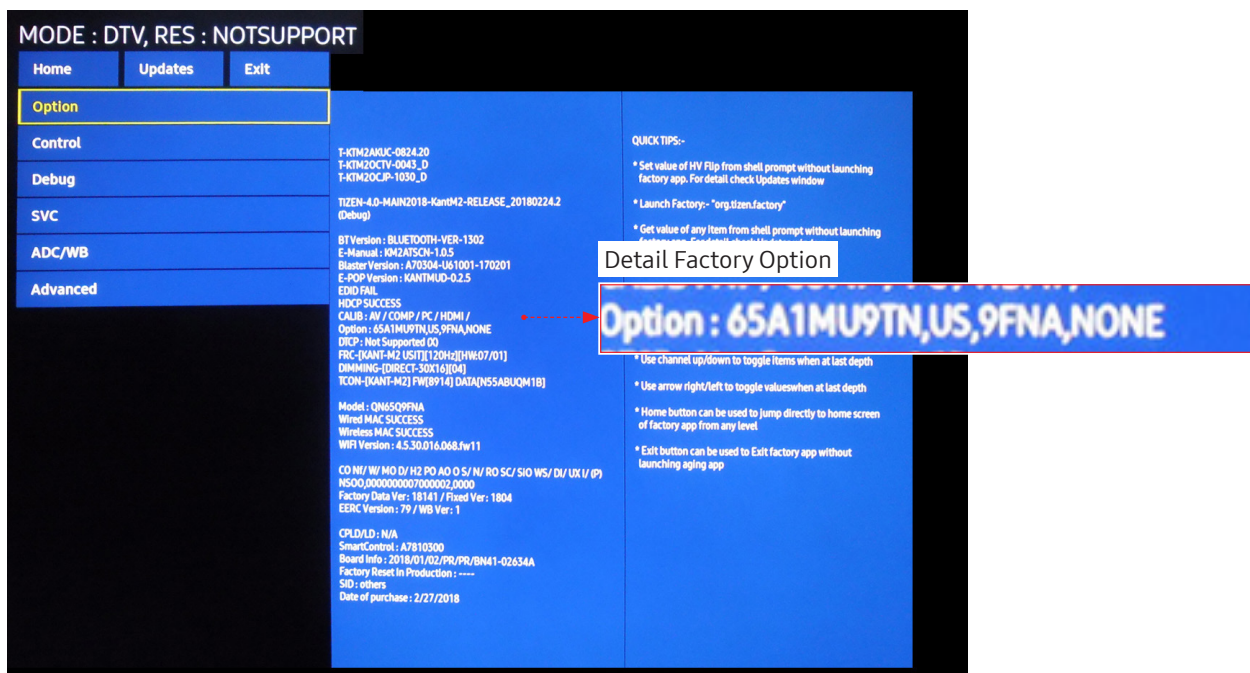
📝 **NOTE**

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

4-10-2. Factory Data

■ Option

Factory Menu Name	Data	Range
Factory Reset	–	
Type		
Local set	EU_GER	
SW Model	QTQ80	
TUNER	D_T2CS2	
Ch table	NONE	
MRT Option		
Engineer Option		
Engineer Option		

■ Control

Factory Menu Name	Data	Range
EDID		
EDID ON/OFF	OFF	
EDID WRITE ALL	...	
EDID WRITE HDMI	...	
EDID WRITE PC	...	
HDMI EDID Ver	...	
HDMI EDID Port	...	
Sub Option		
RS-232 Jack	UART	RS-232 mode setting
EXT Link Support	ON	
Serial Log On/Off	OFF	
Watchdog	ON	
FRC Monitoring	OFF	
Checksum	0x0000	
Fast Boot In Production	ON	
USB Serial	OFF	
ECO IC TYPE	NOT_DETECT	
COLOR IC TYPE	VEML3329	
Info Link Server Type	development	
Info Link Country	None	
TTX Group	UserOSD	
OPTION_SWU		
LMF LEAVE THRESHOLD	160	
LMF TRIM THRESHOLD	120	

Factory Menu Name	Data	Range
LMF TERM THRESHOLD	80	
FAnet Thread	2	
CI CPLD Version	1	
ACM_MC	ON	
UNIQUE TRIPLET	ON	
T-CON Device	NIKE-M	
SPI Protection		
FKP Server Type	Default	
Preloading Support	ON	
Multitasking Support	ON	
Browser preloading Support	FULL	
EXT IR Boot Support	ON	
APP BOOTING SUPPORT	ON	
Cloudscan Always Upload	OFF	
STB Power Sync Support	ON	
OOM Panic Burst Interval	60	
OOM Panic Burst Number	8	
Power off interval Reset	None	
APP Boot Support after Reset	OFF	
Long press Power off Reset	OFF	
Perf Mode	0	
Inhouse App upgrader	OFF	
Hotel Option		
Hospitality Mode	OFF	
Power On		
Menu OSD		
Operation		
Music Mode		
External Source		
Eco Solution		
Cloning		
Shop Option		
Exhibition Mode	OFF	
Peak Mode	ON	
Metadata	ON	
Shopmode Picture Reset	ON	
SOUND		

Factory Menu Name	Data	Range
High Devi	OFF	• *If the broadcast signal is not good, TV will complement the characteristics of the signal (most use when weak signal comes from the growing area countries)
Carrier_Mute	OFF	• *If the noise comes from weakness-electromagnetic field, TV will be set Mute automatically (Only default on in North America)
Pilot Level High Thld	0x20h	• * The High threshold value of stereo signal(If Pilot level is greather than High threshold value, recognize Stereo signal)
Pilot Level Low Thld	0x10h	• * The Low threshold value of stereo signal(If Pilot level is less than Low threshold value, recognize Mono signal)
Amp Volume	0xc4h	
Amp Scale	0x3fh	
Amp EQ Check Sum	0x00007481	
Subwoofer Support	5	
Woofer Type	0	
Woofer Volume	0xc7h	
Woofer Scale	0x3fh	
Woofer Check sum	0x00008B22	
PEQ Inx	73	
PEQ Test	Ready	
Speaker EQ	ON	
Amp Recoverty	ON	
Bottom Checksum	0x00000EA8	
SPDIF PCM Gain	-9	
NTV CU Delay	NORMAL	
Lipsync Inx	4	
Lipsync Checksum	0x133A	
Lipsync USB Test	Ready	
Lipsync BT Checksum	0x0000	
TP volume	0xc4h	
TP Scale	0x35h	
TP EQ CheckSum	NONE	

■ Debug

Factory Menu Name	Data	Range
Spread Spectrum		
MAIN DDR SSC ON OFF	ON	
MAIN DDR SSC Value	0	
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	
Tuner Margin	3	European specifications
FRC		
FRC FDISPLAY ON/OFF	OFF	
PC Mode ON/OFF	OFF	
FRC VX1 RX EQ SETTING	OFF	
FRC VX1 TX Pre_emphasis setting	0	
Netflix OSD Threshold	179	
TCON		
TCON_TEMP READ	34	
TEMP LAST	6000	
DCC VERSION	0x0	
TCON Demura Bypass	OFF	
TCON FDisplay	OFF	
Panel Code 1	********	
Panel Code 2	**	
Panel Revision	***	
Panel Menu Week	****	
Panel S/N 1	********	
Panel S/N 2	**	
Panel S/N 3	[Invalid UTF-8]	
Panel S/N 4	[Invalid UTF-8]	
MPEG Margin	20	
H.264 Margin	15	
Voice Debug	OFF	
Power Management		
Cert Option	Waiting	
RM_BIST_DTV	5	

Factory Menu Name	Data	Range
RM_BIST_ATV	0	
RM_BIST_CABLE	29	
Stress Mode	OFF	
Log Analyzer	ON	
Error Popup On/Off	OFF	
DeadLock KILL	OFF	
CES Option	OFF	
CES Convergence Option	OFF	
CES ATSC 3_0	OFF	
CES OOBE MVPD SUPPORT	OFF	
BT DUT	OFF	
BT EU DUT		
BT Throughput	Failure	
Reproduce Module	ON	
21_9		
L-DETECT STABLE TIME	7	
L-DETECT UNSTABLE TIME	3	
L-DETECT USB SUPPORT	0	
DB Download		
MRT Option Dump	Failure	
Sub Option Dump	Failure	
Engineer Option Dump	Failure	
Picture Data Dump	Failure	
VCONF Dump	Failure	
Read Eco Sensor Data	0	
No Signal Power OFF	ON	
Default HDMI1 Booting	OFF	
Run EW	2h	

■ SVC

Factory Menu Name	Data	Range
Self Test(for HW)		• the Output of test pattern from each IC
Info		
Reset		
Apps Reset		
SVC Reset		
SPI Flash Reset		
Data Sync Reset		
Factory Data Reset		
OPTION_HDMI		
HOT PLUG DURATION	600ms	
HDMI FLT CNT SIG	0ms	
HDMI FLT CNT LOS	0ms	
HDMI MUTE TIME	0ms	

Factory Menu Name	Data	Range
HDMI NFST UNMUTE TIME	500ms	
HdmiRx EQ	0	
HDMI TMDS ERR DET	1	
Auto EQ sweep	READY	
VMD OPT	0	
DVB CI		
TS Clock delay TC	0	
TS Clock delay S	0	
CI Control Buf ON	ON	
TS Clock delay CPU	1	
Test Pattern		
Scaler Pattern	OFF	
US Post Pattern	OFF	
FRC Pre Pattern	0	
FRC Post Pattern	0	
SOC TCON Pattern	0	
SOC TCON Pattern Level	255	
FRC OSD Pre Pattern	0	
FRC OSD Post Pattern	0	
FRC2 Pre Pattern	0	
FRC2 Post Pattern	0	
SOC TCON2 Pattern	0	
SOC TCON2 Pattern Level	255	
SOC TCON3 Pattern	0	
SOC TCON3 Pattern Level	255	
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		• Upgrade Sub-Micom Program
SUBMICOM JP USB UPGRADE		
BT UPGRADE		
BT FREEPAIRING		
Function Upgrade		
FRC3D FW UPGRADE		
FRC3D SRP UPGRADE		
FRC3D LD UPGRADE		
FRC2 3D FW UPGRADE		
Camera Upgade		• Upgarde Camera module(There is upgrade program in Main-Image)
Mic Upgrade		• Upgarde MIC in Camera module(There is upgrade program in Main-Image)

Factory Menu Name	Data	Range
Jump UPGRADE		
IR Blaster Upgrade		
Pic Data USB Update		
Audio Data USB Update		
Eco Data USB Update		
SC ADK Upgrade		
Other Setting		
Delete S/N		
IPERF	Stopped	
Expert		
CAL Data Backup	...	
CAL Data Restore		
MICOM POWER OFF	ON	
NTV CU FW VER	0	
ATV IF AGC SPEED	0	
Upgrade UHD OSD Test	0	
Main USB Path		
JackP USB Path		
Apps Update		
Picture Direct	OFF	
Source Banner Hide	OFF	
Auto Detection Group	0	
V APP	OFF	
SWI	OFF	
KantS Cutoff PEQ	0	
SVC Panel	ORIGINAL	
S/N		
Serial number		
Writing S/N		

■ ADC/WB

Factory Menu Name	Data	Range
ADC		
AV Calibaration		
Comp Calibration		
PC Calibration		
HDMI Calibration		7
ADC Result		
1st_Y_GH	0	
1st_Y_GL	0	
1st_Cb_BH	0	
1st_Cb_BL	0	
1st_Cr_RH	0	
1st_Cr_RL	0	
2nd_R_L	128	

Factory Menu Name	Data	Range	
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		
WB-W2_R_Offset	128		
WB_W2_B_Offset	128		
WB_W2_R_Gain	136		
WB_W2_B_Gain	76		
WB_N_R_Offset	128		
WB_N_B_Offset	128		
WB_N_R_Gain	131		
WB_N_B_Gain	119		
MGA			
MGA On/Off	OFF		
R1_Gain			
G1_Gain			
B1_Gain			
R2_Gain			
G2_Gain			
B2_Gain			
R3_Gain			
G3_Gain			
B3_Gain			
R4_Gain			
G4_Gain			
B4_Gain			
R5_Gain			
G5_Gain			
B5_Gain			
R6_Gain			
G6_Gain			
B6_Gain			
R7_Gain			
G7_Gain			
B7_Gain			
R8_Gain			
G8_Gain			
B8_Gain			

Factory Menu Name	Data	Range
R9_Gain		
G9_Gain		
B9_Gain		
R10_Gain		
G10_Gain		
B10_Gain		
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 Bgain		
SPI N Roffset		
SPI N Boffset		
SPI W2 Rgain		
SPI W2 Bgain		
SPI W2 Roffset		
SPI W2 Boffset		
SPI MGA		
WB Data to SPI		

■ **Advanced**

4-11. RS-232C

- **RS232C Control**
  - Port : COM#(Serial)
  - Baud rate : 115200
  - Data Bit : 8 bit
  - Parity : None
  - Stop Bits : 1
  - Flow Control : None
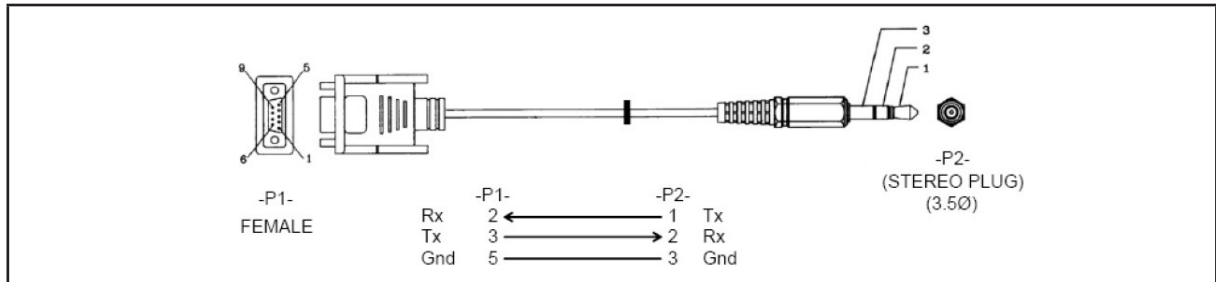
- Description of RS232C

Pin#	Name	Full Name	Pin#	Name	Full Name	Pin#	Name	Full Name
1	CD	Carrier Detect	4	DTR	Data Terminal Ready	7	RTS	Request To Send
2	RxD	Received Data	5	GND	Signal Ground	8	CTS	Clear To Send
3	TxD	Transmitted Data	6	DSR	Data Set Ready	9	RI	Ring Indicator

4-12. AV Control Tabe

Control Item			Cmd1	Cmd2	Cmd3	Value
General	**Power**	Power	0x00	0x00	0x00	0x00
		Off				0x01
		On				0x02
	Volume	Direct	0x01	0x00	0x00	(0~100)
		Up			0x01	0x00
		Down			0x02	0x00
	Mute		0x02	0x00	0x00	0x00
	Ch.	Direct	0x04	-		
		Continuous	Up	0x03	0x00	0x01	0x00
			Down			0x02	0x00
Input	**Source List**	TV	TV	0x0a	0x00	0x00	0x00
		AV	AV1			0x01	0x00
			AV2				0x01
			AV3				0x02
		S-Video	S-Video1			0x02	0x00
			S-Video2				0x01
			S-Video3				0x02
		Component	Component1			0x03	0x00
			Component2				0x01
			Component3				0x02
		PC	PC1			0x04	0x00
			PC2				0x01
			PC3				0x02
		HDMI	HDMI1			0x05	0x00
			HDMI2				0x01
			HDMI3				0x02
			HDMI4				0x03
		DVI	DVI1			0x06	0x00
			DVI2				0x01
			DVI3				0x02
		RVU	RVU			0x07	0x00
PICTURE	**Mode**	Dynamic(Entertain)	0x0b	0x00	0x00	0x00
		Standard				0x01
		Movie				0x02
		Natural				0x03
		CAL-NIGHT				0x04
		CAL-DAY				0x05
		BD Wise				0x06
		Relax				0x07

Control Item				Cmd1	Cmd2	Cmd3	Value
PICTURE	BackLight(CellLight)	0~20			0x01	0x00	(0~20)
	Contrast	0~100			0x02	0x00	(0~100)
	Brightness	0~100			0x03	0x00	(0~100)
	Sharpness	0~100			0x04	0x00	(0~100)
	Color	0~10			0x05	0x00	(0~100)
	Tint	G/R			0x06	0x00	(0~100)
	Advanced Settings	Black Tone	Off		0x07	0x00	0x00
			Dark				0x01
			Darker				0x02
			Darkest				0x03
		Dynamic Contrast	Off			0x01	0x00
			Low				0x01
			Medium				0x02
			HIgh				0x03
		Gamma	-3 ~ 3			0x03	(-3~3)
		RGB Only Mode	Off			0x05	0x00
			Red				0x01
			Green				0x02
			Blue				0x03
		Color Space	Auto			0x06	0x00
			Native				0x01
			Custom				0x02
		White Balance	R-Offset(LCD)			0x07	(-50~50)
		White Balance	G-Offset(LCD)			0x08	(-50~50)
		White Balance	B-Offset(LCD)			0x09	(-50~50)
		White Balance	R-Gain(LCD)			0x0a	(-50~50)
		White Balance	G-Gain(LCD)			0x0b	(-50~50)
		White Balance	B-Gain(LCD)			0x0c	(-50~50)
		White Balance	Reset(LCD)			0x0d	0x00
		Flesh Tone	-15 ~ 15			0x0e	(-15~15)
		xvYCC	Off			0x10	0x00
			On				0x01
		Motion Lighting	Off			0x11	0x00
			On				0x01
		Color Space Custom Color	Red			0x12	0x00
			Green				0x01
			Blue				0x02
			Yellow				0x03

Control Item				Cmd1	Cmd2	Cmd3	Value
PICTURE			Cyan				0x04
			Magenta				0x05
		Color Space Custom Color Red Value	0~100			0x13	0~100
		Color Space Custom Color Green Value	0~100			0x14	0~100
		Color Space Custom Color Blue Value	0~100			0x15	0~100
		Reset				0x16	0x00
		LED Motion Plus	Off	0x0a	0x07		0x00
			On(Normal)				0x01
			Cinema				0x02
			Ticker				0x03
		10p White Balance	Off	0x0e	0x00		0
			On			0x00	1
			Red		0x0f	(1~10)	(-50~50)
			Green		0x10	(1~10)	(-50~50)
			Blue		0x11	(1~10)	(-50~50)
			Reset		0x12	0	(1~10)
			10 Point		0x13	0x00	0x00
			Interval		0x14	0x00	0x00
	Picture Option	Color Tone	Cool	0x0a	0x00		0x00
			Standard				0x01
			Warm1				0x02
			Warm2				0x03
		Digital Noise Filter	Off			0x02	0x00
			Low				0x01
			Medium				0x02
			High				0x03
			Auto				0x04
			Auto Visualization				0x05
		MPEG Noise Filter	Off			0x03	0x00
			Low				0x01
			Medium				0x02
			High				0x03
			Auto				0x04
		HDMI Black Level	Normal			0x04	0x00
			Low				0x01

Control Item				Cmd1	Cmd2	Cmd3	Value
PICTURE		Film Mode	Off			0x05	0x00
			Auto1				0x01
			Auto2				0x02
			Cinema Smooth				0x03
		Auto Motion Plus	Off			0x06	0x00
			Clear				0x01
			Standard				0x02
			Smooth				0x03
			Custom				0x04
		Blur Reduction				0x07	value
		Judder Reduction				0x08	value
		LED Clear Motion				0x09	Off
		Reset				0x10	0x00
		HDMI UHD Color	Off			0x11	0x00
			On				0x01
		Analog Clean View	On			0x12	0x00
			Off				0x01
	Screen Adjustment	Picture Size	16:9	0x0c	0x0a	0x01	0x00
			Zoom1				0x01
			Zoom2				0x02
			Wide Fit				0x03
			4:3				0x04
			Screen Fit				0x05
			Smart View I				0x06
			Smart View II				0x07
			Auto Wide				0x08
			Wide Zoom				0x09
			Zoom				0x0a
		Fit to Screen	Off		0x0b	0x00	0x00
		Zoom	Zoom1		0x0c	0x00	0x00
			Zoom2				0x01
			Zoom3				0x02
			Zoom4				0x03
		Position	Position1			0x01	0x00
			Position2				0x01
			Position3				0x02
			Position4				0x03
		Reset			0x0d	0x00	0x00

Control Item			Cmd1	Cmd2	Cmd3	Value
PICTURE	**Reset Picture**	Reset Picture	0x0d	0x0b	0x00	0x00
	Factory-SVB	Expert-N/D Adj	On	0x0b	0x0d	0x00	0x00
			Off				0x01
			Fix				0x02
	Apply Picture Mode	All Sources	0x0f	0x00	0x00	0x00
		Current Source				0x01
	Pip	Pip	Off	0x11	0x00	0x00	0x00
			On				0x01
		Antenna	Cable			0x01	0x00
			Air				0x01
		Channel	DTV Cable			0x02	0x00
			DTV Terrestrial				0x01
		Size	Size1			0x03	0x00
			Size2				0x01
			Size3				0x02
			Size4				0x03
		Position	Position1			0x04	0x00
			Position2				0x01
			Position3				0x02
			Position4				0x03
		Sound Select	Main			0x05	0x00
			Sub				0x01
	Picture Off		0x12	0x00	0x00	0x00
Sound	**Sound Mode**	Standard	0x0c	0x00	0x00	0x00
		Music				0x01
		Movie				0x02
		Clear Voice				0x03
		Amplify				0x04
	Equalizer	Balance		0x01	0x00	(0~20)
		100hz			0x01	(0~20)
		300hz			0x02	(0~20)
		1khz			0x03	(0~20)
		3khz			0x04	(0~20)
		10khz			0x05	(0~20)
		Reset			0x06	0x00
	SRS TruSurround HD (internalization)	Off		0x02	0x00	0x00
	Virtual Surrond (externalization)	On				0x01

Control Item			Cmd1	Cmd2	Cmd3	Value
Sound	SRS TruDialog (internalization)	Off		0x03	0x00	0x00
	Dialog Clarify (externalization)	On				0x01
	Preferred Language	English		0x04	0x00	0x00
		Spanish				0x01
		French				0x02
		Korean				0x03
		Japanese				0x04
	Multi-Track Sound	Mono		0x05	0x00	0x00
		Stereo				0x01
		SAP				0x02
	Auto Volume	Off		0x06	0x00	0x00
		Normal				0x01
		Night				0x02
	Speaker Select	TV Speaker		0x07	0x00	0x00
		External Speaker				0x01
		Audio Out				0x01
	Sound Select	Main		0x08	0x00	0x00
		Sub				0x01
	Sound Reset	Sound Reset		0x09	0x00	0x00
	3D Audio	Off		0x0a	0x00	0x00
		Low				0x01
		Medium				0x02
		High				0x03
	Auto Stereo	Manual		0x0b	0x00	0x00
		Auto				0x01
	TV Installation Type	Stand		0x0c	0x00	0x00
		Wallmount				0x01
	Audio Delay	Dealy Value (0~250)		0x0d	0x00	0~250 (0x00~0xFA)
	SRS CS Headphone	Off		0x0e	0x00	0x00
	Balance			0x0f	0x00	0x00
	Add New Device	On		0x10	0x00	0x00
		Off				0x01
	Audo Multi-Output	Off		0x11	0x00	0x00
	Multiroom Link Settings	Multiroom		0x12	0x00	0x00
	HDMI Audio Input Format	Bitstream		0x13	0x00	0x00
		PCM				0x01

Control Item			Cmd1	Cmd2	Cmd3	Value
Audio Format		PCM		0x14	0x00	0x00
		Dolby Digital				0x01
		DTS				0x02
		DTS Neo 2:5				0x03
		AAC/HEAAC				0x04
Sound	Dolby Digital Comp	RF		0x15	0x00	0x01
	HD Audio	Off		0x16	0x00	0x00
		On				0x01
KEY	Key Generation		0x0d	0x00	0x00	Refer to next table
OSD	Show/Hide Control	Show	0x0e	0x00	0x00	0x00
		Hide				0x01
Get Status	Power (On/Off)		0xf0	0x00	0x00	0x00
	Volume(0~100)		0xf0	0x01	0x00	0x00
	Mute (On/Off)		0xf0	0x02	0x00	0x00
	Channel Number		0xf0	0x03	0x00	0x00
	Source (TV/AV/.../HDMI/...)		0xf0	0x04	0x00	0x00
	Picture Size		0xf0	0x05	0x00	0x00
	3D (On/Off)		0xf0	0x06	0x00	0x00
	Picture Mode		0xf0	0x07	0x00	0x00
	Sound Mode		0xf0	0x08	0x00	0x00

* Refer for Table

KEY	Value
Up	96 (0x60)
Down	97 (0x61)
Left	101 (0x65)
Right	98 (0x62)
Menu	26 (0x1A)
Enter(OK)	104 (0x68)
EXIT	45 (0x2D)

4-13. Updating the TV's Software

View your TV's software version and update it if necessary.

> ⚠️ **CAUTION** DO NOT turn off the TV's power until the update is complete. The TV will turn off and on automatically after completing the software update. All video and audio settings return to their default settings after a software update.

- ⌂ > ⚙️ **Settings** > **Support** > **Software Update**

▇ Updating through the Internet

- ⌂ > ⚙️ **Settings** > **Support** > **Software Update** > **Update Now**

- Updating from the Internet requires an active Internet connection.

▇ Updating through a USB device

- ⌂ > ⚙️ **Settings** > **Support** > **Software Update** > **Update Now**

After downloading the update file from the Samsung website and storing it on a USB device, connect the USB device to the TV to update.

- To update using a USB flash drive, download the update package from Samsung.com to your computer. Then, save the update package in the USB device's top-level folder. Otherwise, the TV will not be able to locate the update package.

▇ Updating the TV automatically

- ⌂ > ⚙️ **Settings** > **Support** > **Software Update** > **Auto Update**

If the TV is connected to the Internet, you can have the TV update its software automatically while you are watching the TV. When the background update is completed, it is applied the next time the TV is turned on.

If you agree to the Smart Hub terms and conditions, **Auto Update** is set to **On** automatically. If you want this function disabled, use the Select button to turn it off.

- This function may take a longer time if another network function is running concurrently.
- This function requires an Internet connection.

5. Wiring Diagram

5-1. Wiring Diagram

- **Layout**

[49", 55", 65"]

[75", 85"]

- **Wiring Diagram**

[49"]
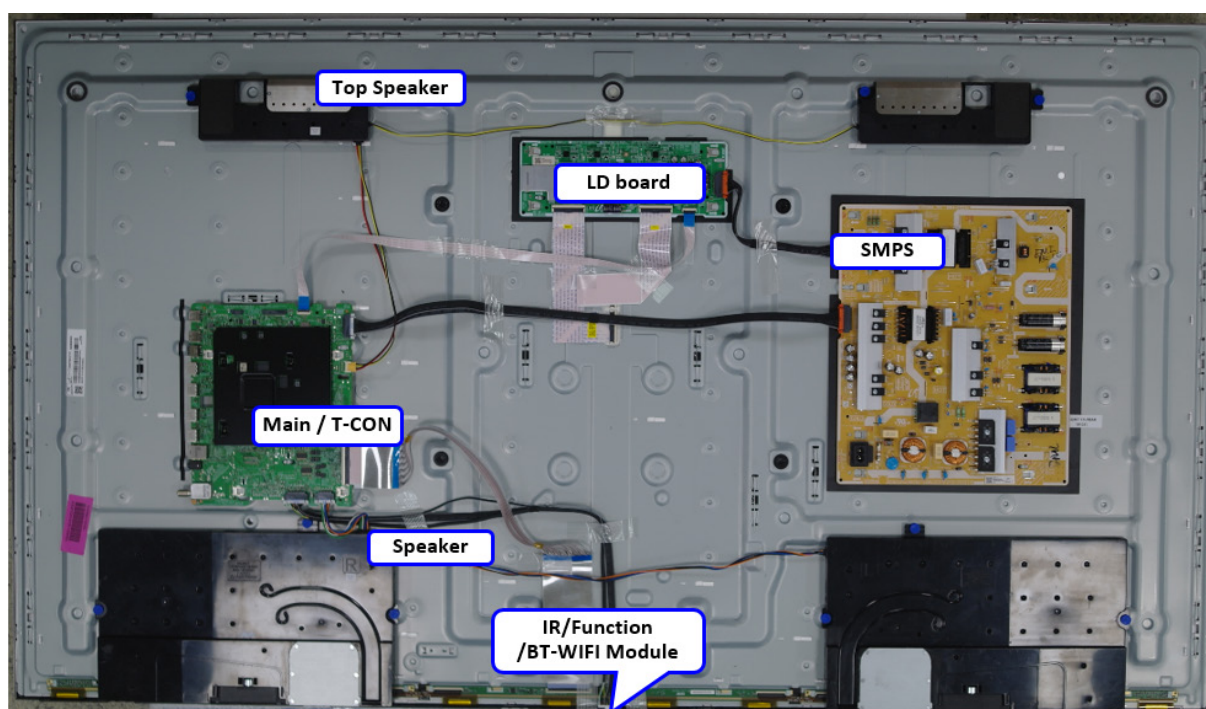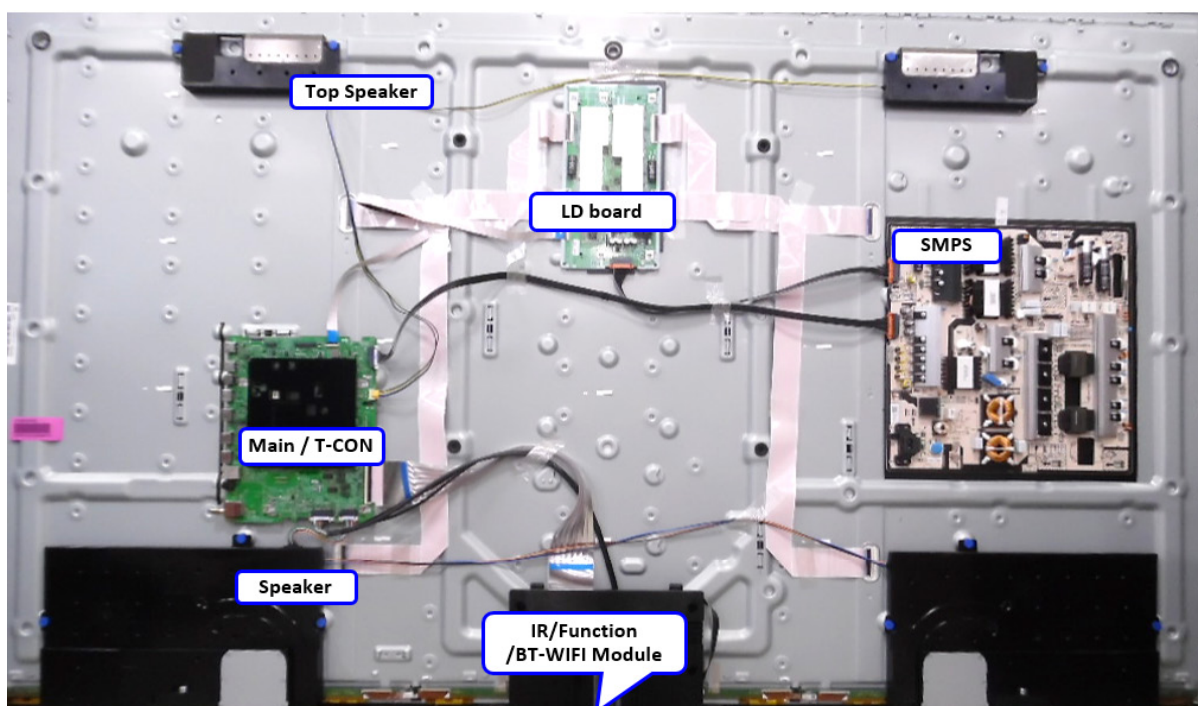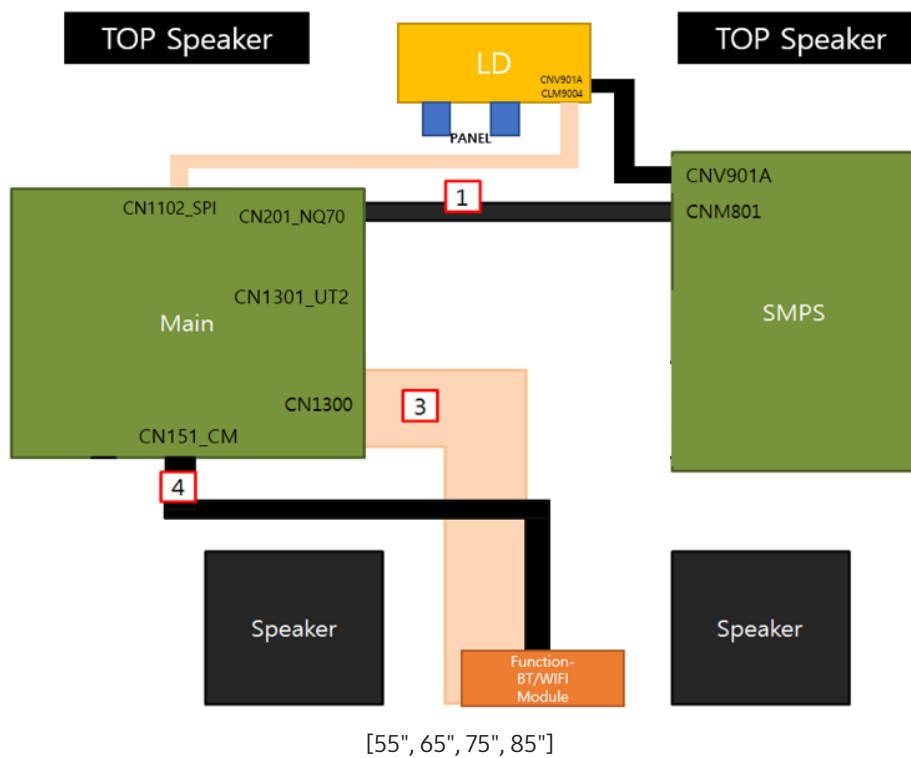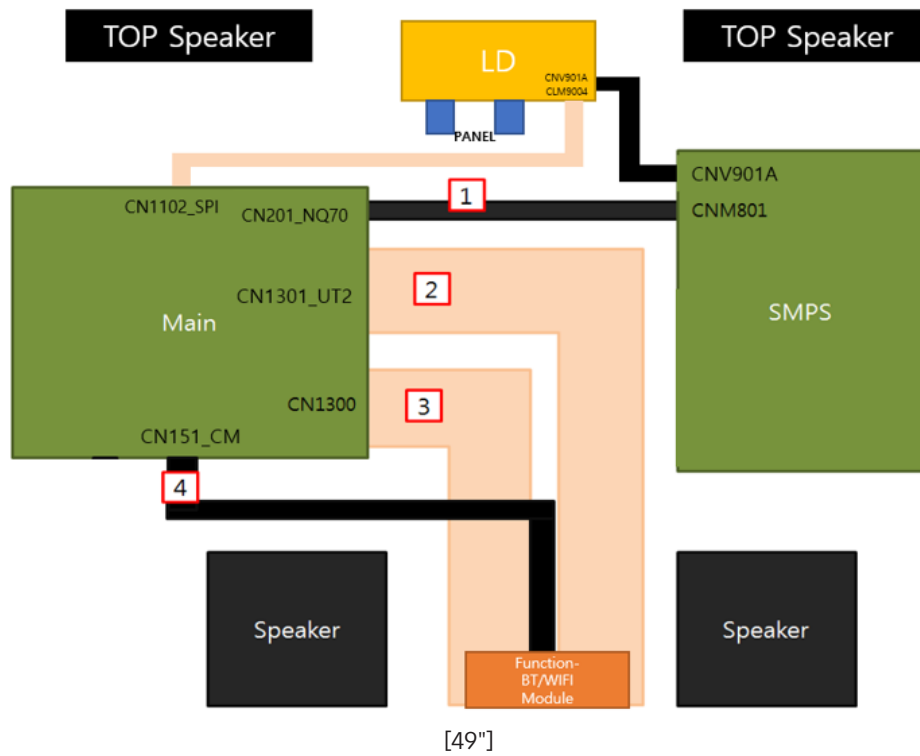
[55", 65", 75", 85"]

■ Cable Infomation

Part Name	Connection	49"	55"	65"	75"	85"
(MAIN - LD)	24P to 24P FFC	100mm	150mm	550mm	400mm	450mm
		BN96-50875C	BN96-50875D	BN96-50875A	BN96-50875B	BN96-50875B
(MAIN - SMPS)	20P to 20P Pitch 2.0↔2.5	350mm	500mm	600mm	750mm	600mm
		BN39-02207L	BN39-02207A	BN39-02207C	BN39-02207K	BN39-02207C
(SMPS - LD)	18P to 18P Pitch 2.5↔2.5	400mm	600mm → 500mm	250mm→ 200mm	400mm	400mm
		BN39-02558A	BN39-02559A	BN39-02557A	BN39-02558A	BN39-02558A
FUNCTION + BT/WIFI	20P to 20P Pitch 2.0↔1.25	450mm		600mm	500mm	500mm
		BN39-02563C		BN39-02563A		BN39-02563B
FFC /L (2.0)	96P to 96P Pitch ↔	350mm	400mm	550mm	550mm	500mm
		BN96-39821F	BN96-39820F	BN96-50626A	BN96-51170A	BN96-39820F
FFC /R	96P to 96P Pitch ↔	450mm				
		BN96-39820F				

5-2. Connector

5-2-1. Main Board
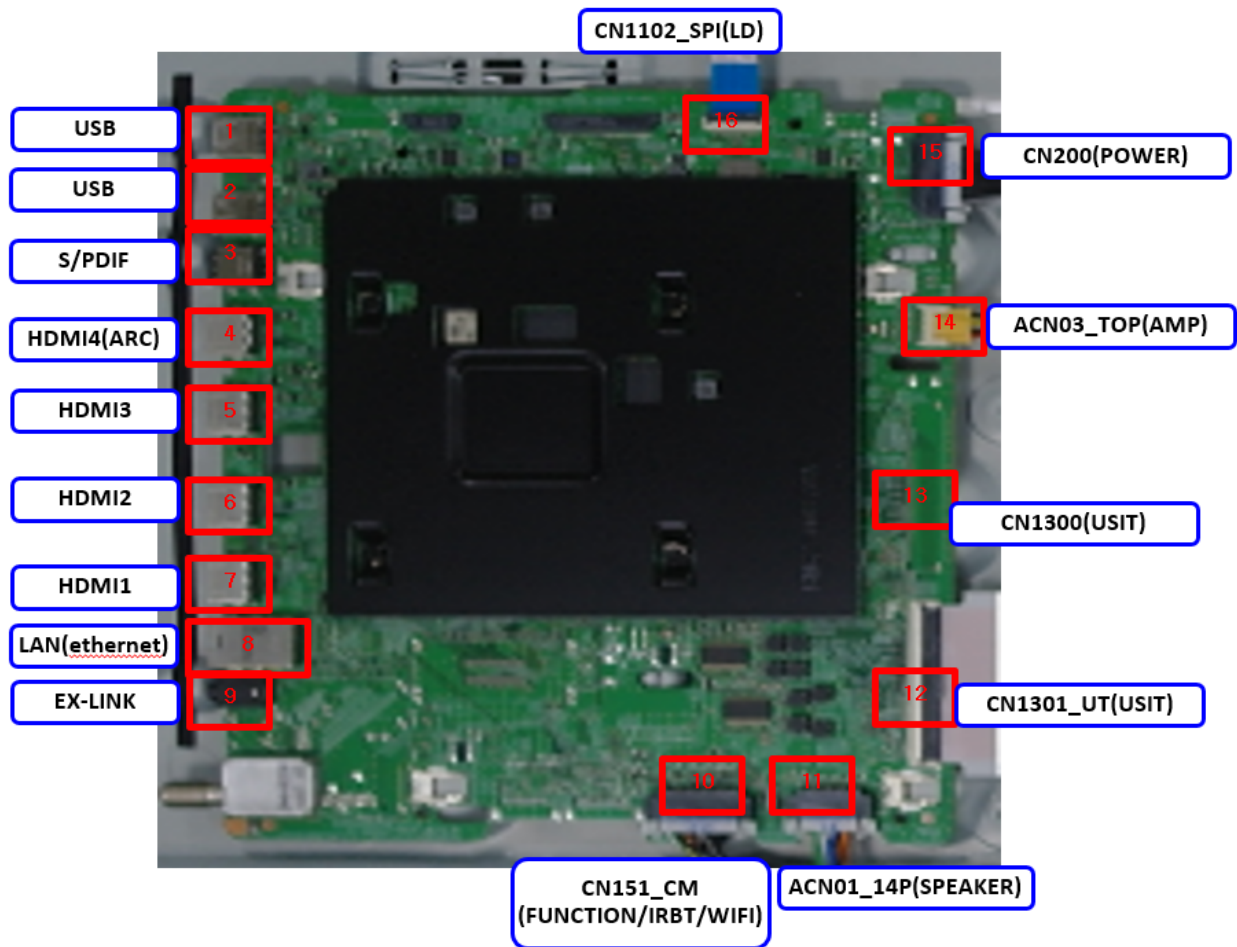
■ Main Board Pin Map

① CN1308 (USB2)

1	USB2_VCC_5V_PW	2	D-
3	D+	4	GND

③ OP1853 (OPTICAL)

1	SPDIF_OUT	2	B5V_PW
3	GND	4	IDENT_SPDIF
5	GND		

② CN1307 (USB1)

1	USB1_VCC_5V_PW	2	D-
3	D+	4	GND

④ CN2002

1	HDMI4_RX2+_HDMI	2	GND	3	HDMI4_RX2-_HDMI	4	HDMI4_RX1+_HDMI
5	GND	6	HDMI4_RX1-_HDMI	7	HDMI4_RX0+_HDMI	8	GND
9	HDMI4_RX0-_HDMI	10	HDMI4_RX_CLK+_IN_HDMI	11	GND	12	HDMI4_RX_CLK-_IN_HDMI
13	CEC	14	ARC_SINGLE	15	HDMI4_SCL_DDC	16	HDMI4_SDA_DDC
17	HDMI4_INS_DET	18	HDMI4_5V_PW	19	HDMI4_HPD		

⑤ CN2001

1	HDMI3_RX2+_HDMI	2	GND	3	HDMI3_RX2-_HDMI	4	HDMI3_RX1+_HDMI
5	GND	6	HDMI3_RX1-_HDMI	7	HDMI3_RX0+_HDMI	8	GND
9	HDMI3_RX0-_HDMI	10	HDMI3_RX_CLK+_IN_HDMI	11	GND	12	HDMI3_RX_CLK-_IN_HDMI
13	CEC	14	GND	15	HDMI3_SCL_DDC	16	HDMI3_SDA_DDC
17	HDMI3_INS_DET	18	HDMI3_5V_PW	19	HDMI3_HPD		

⑥ CN1902

1	HDMI2_RX2+_HDMI	2	GND	3	HDMI2_RX2-_HDMI	4	HDMI2_RX1+_HDMI
5	GND	6	HDMI2_RX1-_HDMI	7	HDMI2_RX0+_HDMI	8	GND
9	HDMI2_RX0-_HDMI	10	HDMI2_RX_CLK+_IN_HDMI	11	GND	12	HDMI2_RX_CLK-_IN_HDMI
13	CEC	14	GND	15	HDMI2_SCL_DDC	16	HDMI2_SDA_DDC
17	HDMI2_INS_DET	18	HDMI2_5V_PW	19	HDMI2_HPD		

⑦ CN1901

1	HDMI1_RX2+_HDMI	2	GND	3	HDMI1_RX2-_HDMI	4	HDMI1_RX1+_HDMI
5	GND	6	HDMI1_RX1-_HDMI	7	HDMI1_RX0+_HDMI	8	GND
9	HDMI1_RX0-_HDMI	10	HDMI1_RX_CLK+_IN_HDMI	11	GND	12	HDMI1_RX_CLK-_IN_HDMI
13	CEC	14	GND	15	HDMI1_SCL_DDC	16	HDMI1_SDA_DDC
17	HDMI1_INS_DET	18	HDMI1_5V_PW	19	HDMI1_HPD		

⑧ CN1401_LAN

1	EPHY_TXP_LAN	2	GND
3	EPHY_TXN_LAN	4	EPHY_RXP_LAN
5	GND	6	EPHY_RXN_LAN
7	N.C.	8	GND

⑨ CN1803 (EX-LINK)

1	GND	2	AV_IN_CVBS
3	COMP_AV_SR_IN	4	N.C.
5	N.C.	6	N.C.
7	COMP_AV_SL_IN		

⑩ CN151_CM (FUNCTION & IR&BT/WIFI)

1	D-_USB_BTWIFI_CM	2	WIFI_PHY_ON
3	D+_USB_BTWIFI_CM	4	A5V_PW
5	GND	6	WIFI_WOW
7	BT_UART_TXD	8	BTWIFI_NRESET
9	BT_WAKE	10	IR
11	KEY_INPUT1	12	MIC_CLK
13	N.C	14	LED_STB_OUT
15	SENSOR_SCL_I2C	16	GND
17	SENSOR_SDA_I2C	18	IR_OUT_1
19	MIC_DATA	20	IR_OUT_2

⑪ ACN01_14P (AMP)

1	TWT_R+	2	TWT_R-
3	MID_R+	4	MID_R-
5	WF_R+	6	WF_R-
7	TWT_L+	8	TWT_L-
9	MID_L+	10	MID_L-
11	WF_L+	12	WF_L-
13	N.C	14	N.C

⑫ CN1300 (USI-T LEFT)

1	FB_TRDY_1	2	GND	3	PANEL_3.3V_PW	4	PANEL_3.3V_PW
5	FB_VCOM1_2_CELL	6	VCOM1_CELL	7	VCOM2_CELL	8	VCOM3_CELL
9	VSS_OUT1_CELL	10	VOFF_-11V_PW	11	VGHD	12	CKV1_GOA
13	CKV2_GOA	14	CKV3_GOA	15	CKV4_GOA	16	CKVB1_GOA
17	CKVB2_GOA	18	CKVB3_GOA	19	CKVB4_GOA	20	STVP1_GOA
21	LC1_VGP1_GOA	22	ST_GOA	23	DEMURA_SSPFRM_SPI	24	DEMURA_SSPCLK_SPI
25	DEMURA_SSPHOLD_SPI	26	DEMURA_SSPWP_SPI	27	DEMURA_SSPRXD_SPI	28	DEMURA_SSPTXD_SPI
29	DEMURA_SSPFRM_SPI	30	SFC2	31	GND	32	TX_CH0_A1+_VX1
33	TX_CH0_1A-_VX1	34	GND	35	TX_CH0_1B+_VX1	36	TX_CH0_1B-_VX1
37	GND	38	TX_CH1_1A+_VX1	39	TX_CH1_1A-__VX1	40	GND
41	TX_CH1_1B+__VX1	42	TX_CH1_1B-__VX1	43	GND	44	TX_CH2_A+_USIT
45	TX_CH2_A-_USIT	46	GND	47	TX_CH2_B+_USIT	48	TX_CH2_B-_USIT
49	GND	50	TX_CH3_A+_USIT	51	TX_CH3_A-_USIT	52	GND
53	TX_CH3_B+_USIT	54	TX_CH3_B-_USIT	55	GND	56	TX_CH4_A+_USIT
57	TX_CH4_A-_USIT	58	GND	59	TX_CH4_B+_USIT	60	TX_CH4_B-_USIT
61	GND	62	TX_CH5_A+_USIT	63	TX_CH5_A-_USIT	64	GND
65	TX_CH5_B+_USIT	66	TX_CH5_B-_USIT	67	GND	68	TX_CH6_A+_USIT
69	TX_CH6_A-_USIT	70	GND	71	TX_CH6_B+_USIT	72	TX_CH6_B-_USIT
73	GND	74	TX_CH7_A+_USIT	75	TX_CH7_A-_USIT	76	GND
77	TX_CH7_B+_USIT	78	TX_CH7_B-_USIT	79	GND	80	SFC1
81	GND	82	PI_DSF_MON	83	PORTNUM	84	VCCA_1.9V_PW
85	VCCB_1.8V_PW	86	LL_CELL	87	LH_CELL	88	HAVDD_8.5V_PW
89	UL_CELL	90	UH_CELL	91	AVDD_17V_PW	92	AVDD_17V_PW
93	AVDD_17V_PW	94	AVDD_17V_PW	95	N.C.	96	FB_TRDY_2

⑬ CN1301_UT2 (USI-T RIGHT)							
1	FB_TRDY_2	2	N.C.	3	AVDD_17V_PW	4	AVDD_17V_PW
5	AVDD_17V_PW	6	AVDD_17V_PW	7	UH_CELL	8	UL_CELL
9	HAVDD_8.5V_PW	10	LH_CELL	11	LL_CELL	12	VCCB_1.8V_PW
13	VCCA_1.9V_PW	14	PI_DSF_MON	15	PORTNUM	16	GND
17	N.C.	18	N.C.	19	N.C.	20	GND
21	SFC1	22	GND	23	TX_CH1_B2+_USIT	24	TX_CH1_B2-_USIT
25	GND	26	TX_CH1_A2+_USIT	27	TX_CH1_A2-_USIT	28	GND
29	TX_CH0_B2+_USIT	30	TX_CH0_B2-_USIT	31	GND	32	TX_CH0_A2+_USIT
33	TX_CH0_A2-_USIT	34	GND	35	TX_CH8_A+_USIT	36	TX_CH8_A-_USIT
37	GND	38	TX_CH8_B+_USIT	39	TX_CH8_B-_USIT	40	GND
41	TX_CH9_A+_USIT	42	TX_CH9_A-_USIT	43	GND	44	TX_CH9_B+_USIT
45	TX_CH9_B-_USIT	46	GND	47	TX_CH10_A+_USIT	48	TX_CH10_A-_USIT
49	GND	50	TX_CH10_B+_USIT	51	TX_CH10_B-_USIT	52	GND
53	TX_CH11_A+_USIT	54	TX_CH11_A-_USIT	55	GND	56	TX_CH11_B+_USIT
57	TX_CH11_B-_USIT	58	GND	59	N.C.	60	N.C.
61	GND	62	N.C.	63	N.C.	64	GND
65	N.C.	66	N.C.	67	GND	68	N.C.
69	N.C.	70	GND	71	SFC2	72	GND
73	ST_GOA	74	LC1_VGP1_GOA	75	STVP1_GOA	76	CKVB4_GOA
77	CKVB3_GOA	78	CKVB2_GOA	79	CKVB1_GOA	80	CKV4_GOA
81	CKV3_GOA	82	CKV2_GOA	83	CKV1_GOA	84	VGHD
85	VOFF_-11V_PW	86	VSS_OUT2_CELL	87	N.C.	88	VCOM3_CELL
89	FB_VCOM3_CELL	90	VCOM2_CELL	91	VCOM1_CELL	92	BLINK_O
93	PANEL_3.3V_PW	94	PANEL_3.3V_PW	95	FB_TRDY_3	96	FB_TRDY_3

⑭ ACN03_TOP (AMP)			
1	MID_R+	2	MID_R-
3	MID_L+	4	MID_L-

⑮ CN200 (POWER)			
1	GND	2	GND
3	GND	4	GND
5	VAMP	6	GND
7	VAMP	8	VAMP
9	GND	10	N.C.
11	A13V_PW	12	N.C.
13	A13V_PW	14	N.C.
15	A13V_PW	16	PS_ON
17	A13V_PW	18	GND
19	GND	20	GND

⑯ CN21101_UT			
1	A13V_PW	2	A13V_PW
3	A13V_PW	4	A13V_PW
5	PI_AGING_EN	6	PI_BUS_ENI
7	INT_TCON_SDA_I2C	8	INT_TCON_SCL_I2C
9	GND	10	DEMURA_SSPRXD_SPI
11	DEMURA_SSPWP_SPI	12	DEMURA_SSPFRM_SPI
13	DEMURA_SSPTXD_SPI	14	DEMURA_SSPCLK_SPI
15	DEMURA_SPI_UPDATE	16	DEMURA_SSPHOLD_SPI
17	N.C	18	A13V_PW
19	PI_LINE_CON0	20	PI_LINE_CON1

5-2-2. LD/SMPS Board

- **SMPS Board & Pin Map (49", 55", 65")**
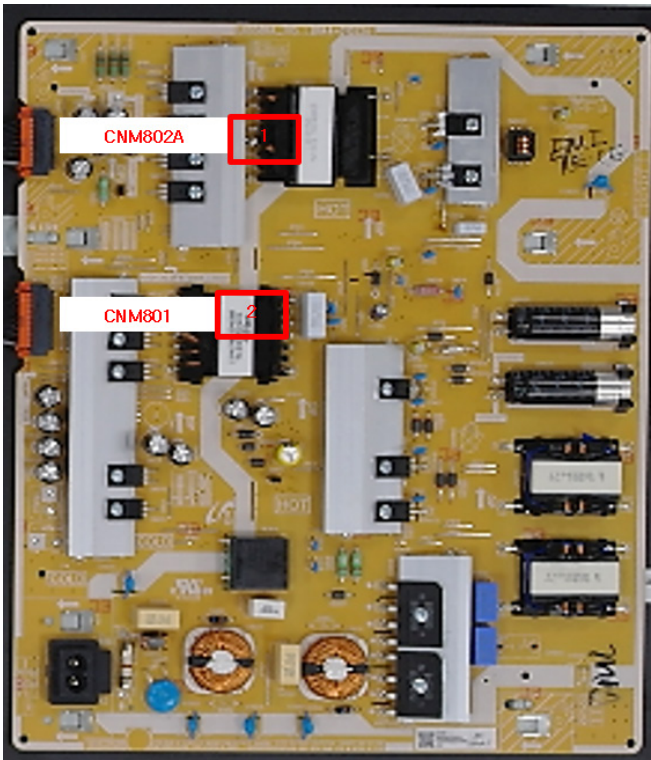
❶ CNM801(mini connector)			
1	GND	2	GND
3	GND	4	GND
5	Vamp	6	GND
7	Vamp	8	Vamp
9	GND	10	NC
11	A13V	12	NC
13	A13V	14	NC
15	A13V	16	POWER_ON/OFF
17	A13V	18	GND
19	GND	20	GND

❷ CNM801(mini connector)			
1	GND	2	GND
3	FB	4	FAULT
5	GND	6	GND
7	Vdrv	8	Vdrv
9	Vdrv	10	Vdrv
11	Vdrv	12	Vdrv
13	GND	14	GND
15	B13V	16	N.C
17	GND	18	GND

- **LD Board & Pin Map (49" 55", 65")**

1 CN9001A (TO MAIN BOARD)

1	GND	2	SEAMLESS	3	GND	4	SCL_LED
5	BLU_ON/OFF	6	TEST_SD	7	SDA_LED	8	GND
9	TEST_LD	10	VSYNC_IN	11	SERIAL_STT	12	SERIAL_UHR
13	SERIAL_DATA	14	GND	15	GND	16	CONTACT

2 CNV901A (TO SMPS)

1	GND	2	GND	3	FB	4	GND
5	B13V	6	FAULT	7	GND	8	GND
9	Vdrv	10	Vdrv	11	Vdrv	12	Vdrv
13	Vdrv	14	Vdrv	15	Vdrv	16	Vdrv
17	GND	18	GND				

3 CN9001 (TO PANEL)

1	LED1(-)	2	LED2(-)	3	LED3(-)	4	LED4(-)
5	LED5(-)	6	LED6(-)	7	LED7(-)	8	LED8(-)
9	LED9(-)	10	LED10(-)	11	LED11(-)	12	LED12(-)
13~21	NC	22~48	Vdrv	49~55	NC	56	LED25(-)
57	LED24(-)	58	LED23(-)	59	LED22(-)	60	LED21(-)
61	LED20(-)	62	LED19(-)	63	LED18(-)	64	LED17(-)
65	LED16(-)	66	LED15(-)	67	LED14(-)	68	LED13(-)

4 CN9002 (TO PANEL)

1	LED26(-)	2	LED27(-)	3	LED28(-)	4	LED29(-)
5	LED30(-)	6	LED31(-)	7	LED32(-)	8	LED33(-)
9	LED34(-)	10	LED35(-)	11	LED36(-)	12	LED37(-)
13~21	NC	22~48	Vdrv	49~55	NC	56	LED50(-)
57	LED49(-)	58	LED48(-)	59	LED47(-)	60	LED46(-)
61	LED45(-)	62	LED44(-)	63	LED43(-)	64	LED42(-)
65	LED41(-)	66	LED40(-)	67	LED39(-)	68	LED38(-)

- **SMPS Board & Pin Map (75", 85")**
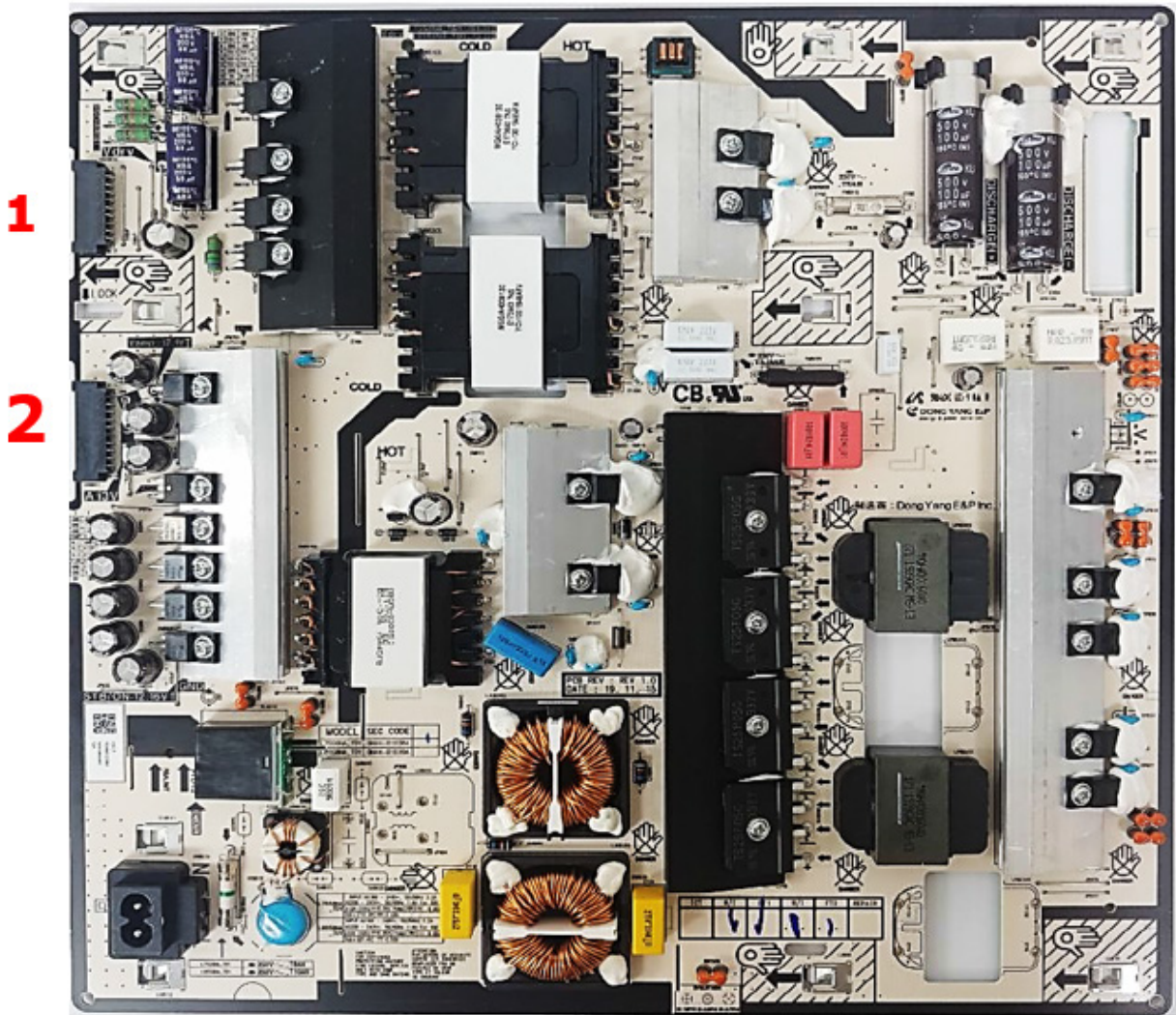
🟠 **CN9001A (TO MAIN BOARD)**							
1	GND	2	GND	3	FB	4	FAULT
5	GND	6	GND	7	Vdrv	8	Vdrv
9	Vdrv	10	Vdrv	11	Vdrv	12	Vdrv
13	GND	14	GND	15	B13V	16	NC
17	GND	18	GND				

🟠 **CNV901A (TO SMPS)**							
1	GND	2	GND	3	GND	4	GND
5	VAMP	6	GND	7	VAMP	8	VAMP
9	GND	10	N.C	11	13V	12	N.C
13	A13V	14	N.C	15	A13V	16	P_ON
17	A13V	18	GND	19	GND	20	GND

- **LD Board & Pin Map (75", 85")**
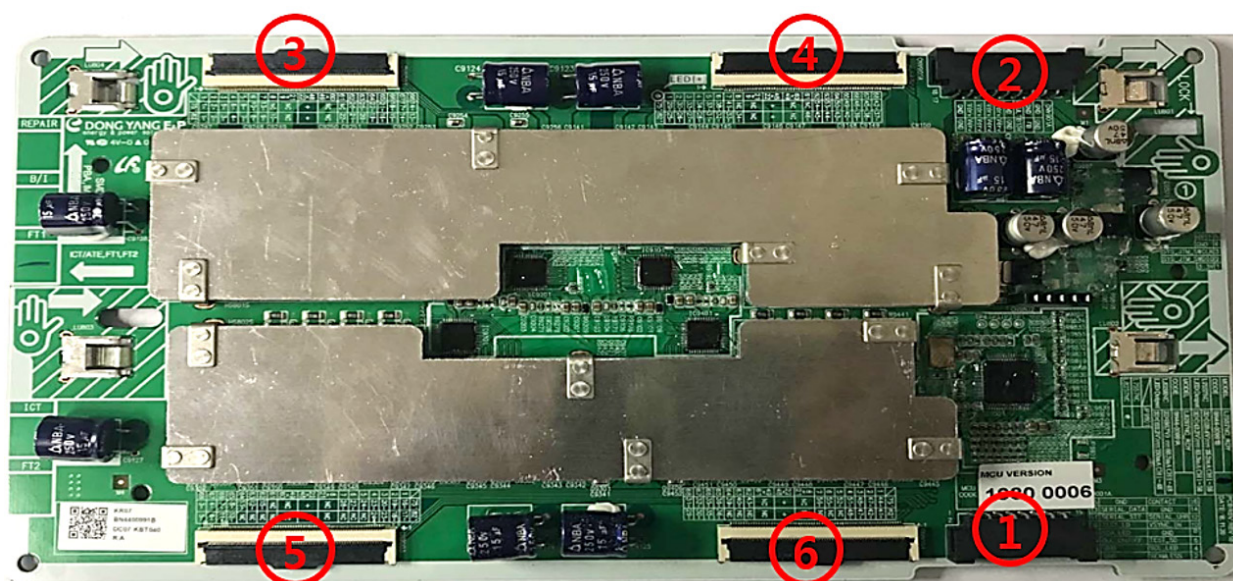
1	**CN9001 (TO MAIN BOARD)**						
1	GND	2	SEAMLESS	3	GND	4	SCL_LED
5	BLU_ON/OFF	6	TEST_SD	7	SDA_LED	8	GND
9	TEST_LD	10	VSYNC_IN	11	SERIAL_STT	12	SERIAL_UHR
13	SERIAL_DATA	14	GND	15	GND	16	CONTACT

2	**CNV901A (TOSMPS)**						
1	GND	2	GND	3	FB	4	GND
5	B13V	6	FAULT	7	GND	8	GND
9	Vdrv	10	Vdrv	11	Vdrv	12	Vdrv
13	Vdrv	14	Vdrv	15	Vdrv	16	Vdrv
17	GND	18	GND				

3	**CN9001 (TO PANEL) 75"**				3	**CN9001 (TO PANEL) 85"**		
1	LED2`_01_S	2	LED2_02_S		1	LED2_01_S	2	LED2_02_S
3	LED2_05_S	4	LED2_06_S		3	LED2_03_S	4	LED2_04_S
5	LED2_09_S	6	LED2_10_S		5	LED2_07_S	6	LED2_08_S
7	LED2_13_S	8	NC		7	LED2_09_S	8	LED2_10_S
9~21	NC	22~48	Vdrv		9~21	NC	22~48	Vdrv
49~60	NC				49~60	NC		
61	NC	62	LED2_26_S		61	LED2_22_S	62	LED2_21_S
63	LED2_25_S	64	LED2_22_S		63	LED2_20_S	64	LED2_19_S
65	LED2_21_S	66	LED2_18_S		65	LED2_16_S	66	LED2_15_S
67	LED2_17_S	68	LED2_14_S		67	LED2_14_S	68	LED2_13_S

④ CN9002 (TO PANEL) 75"			
1	LED1_29_S	2	LED1_30_S
3	LED1_33_S	4	LED1_34_S
5	LED1_37_S	6	LED1_38_S
7	LED1_41_S	8	NC
9~21	NC	22~48	Vdrv
49~60	NC		
61	NC	62	LED1_54_S
63	LED1_53_S	64	LED1_50_S
65	LED1_49_S	66	LED1_46_S
67	LED1_45_S	68	LED1_42_S

④ CN9002 (TO PANEL) 85"			
1	LED1_256_S	2	LED1_26_S
3	LED1_27_S	4	LED1_28_S
5	LED1_31_S	6	LED1_32_S
7	LED1_33_S	8	LED1_34_S
9~21	NC	22~48	Vdrv
49~60	NC		
61	LED1_46_S	62	LED1_46_S
63	LED1_44_S	64	LED1_43_S
65	LED1_40_S	66	LED1_39_S
67	LED1_38_S	68	LED1_37_S

⑤ CN9003 (TO PANEL) 75"			
1	LED3_16_S	2	LED3_19_S
3	LED3_20_S	4	LED3_23_S
5	LED4_24_S	6	LED4_27_S
7	LED4_28_S	8	NC
9~21	NC	22~48	Vdrv
49~60	NC		
61	NC	62	LED4_15_S
63	LED4_12_S	64	LED4_11_S
65	LED3_08_S	66	LED3_07_S
67	LED3_04_S	68	LED3_03_S

⑤ CN9003 (TO PANEL) 85"			
1	LED3_17_S	2	LED3_18_S
3	LED3_23_S	4	LED3_24_S
5	NC	6	NC
7	NC	8	NC
9~21	NC	22~48	Vdrv
49~60	NC		
61	NC	62	NC
63	NC	64	NC
65	LED3_12_S	66	LED3_11_S
67	LED3_06_S	68	LED3_05_S

⑥ CN9004 (TO PANEL) 75"			
1	LED3_44_S	2	LED3_19_S
3	LED3_48_S	4	LED3_23_S
5	LED4_52_S	6	LED4_27_S
7	LED4_56_S	8	NC
9~21	NC	22~48	Vdrv
49~60	NC		
61	NC	62	LED3_
63	LED3_	64	LED3_
65	LED3_	66	LED3_
67	LED3_	68	LED3_

⑥ CN9004 (TO PANEL) 85"			
1	LED2_47_S	2	LED2_30_S
3	LED2_33_S	4	LED2_36_S
5	NC	6	NC
7	NC	8	NC
9~21	NC	22~48	Vdrv
49~60	NC		
61	NC	62	NC
63	NC	64	NC
65	LED2_48_S	66	LED2_45_S
67	LED2_42_S	68	LED2_39_S