



# SUHD TV

Chassis : UWQ60

Model : UE49KS9000T

UE55KS9000T

UE65KS9000T

## ***SERVICE*** Manual

### SUHD TV



UE\*\*KS9000T

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

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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.

### 1-1-1. Warnings



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

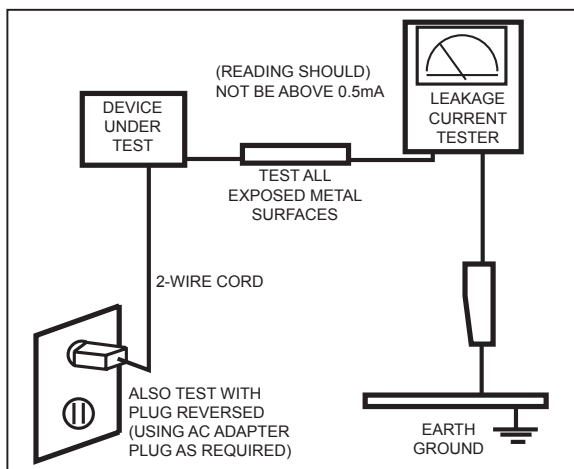
### 1-1-2. Servicing the LED TV

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 resistor/capacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check:




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



An electrolytic capacitor installed with the wrong polarity might explode.



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



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 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 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.



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.

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## 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

### 2-1. Product information

Model	UE**KS9000T		
Front View	<p>* W : Width H : High D : Depth</p>		
Detail View			
Color	Front	SILVER	
	Stand	SILVER	
Dimensions (W x H x D)	49"	Without Stand	1089 x 636.8 x 99 mm
		With Stand	1089 x 717.5 x 354.2 mm
	55"	Without Stand	1226 x 713.2 x 93.3 mm
		With Stand	1226 x 800 x 376 mm
	65"	Without Stand	1443.4 x 835.8 x 109.1 mm
		With Stand	1443.4 x 928.7 x 404.6 mm
Weight	49"	Without Stand	15 kg
		With Stand	17.1 kg
	55"	Without Stand	17.9 kg
		With Stand	20 kg
	65"	Without Stand	26.5 kg
		With Stand	28.8 kg
Internal Memory	8GB		
DDR	LPDDR4, 8GB x 3, 1.25GHz 96bit		

## 2-2. Product specification

### 2-2-1. Specifications

Model	UE49KS9000T	UE55KS9000T	UE65KS9000T
Item	Description		
Screen Size (Diagonal)	49 inches	55 inches	65 inches
Screen Curvature	3000R	4200R	
LCD Panel	SUHD 120Hz		
Scanning Frequency	Horizontal : 270KHz (TYP) Vertical : 120Hz (TYP)		
Display Colors	16.7M (True Display) / 1.07B (Dithered 10bit)		
Display Resolution	3840 x 2160		
Input Signal	Analog 0.7 Vp-p ± 5% positive at 75Ω, internally terminated		
Input Sync Signal	H/V Separate, TTL, P. or N.		
Maximum Pixel Clock Rate	76.5MHz x 4 (Typ 74.25MHz x 4)		
AC Power Voltage & Frequency	AC220-240V 50/60Hz		
Environmental Considerations	Operating Temperature : 50°F ~ 104°F (10°C ~ 40°C) Operating Humidity : 10% ~ 80%, non-condensing Storage Temperature : -4°F ~ 113°F (-20°C ~ 45°C) Storage Humidity : 5% ~ 95%, non-condensing		
Sound (Output)	60 W (Mid : 20W, Woofer : 20W, Twitter : 20W)		
Note : Media Bridge, Allshare, Internet TV, Built-in WiFi, Full Browser, Bluetooth			

## 2-2-2. Detailed Specifications



### NOTE

Design and specifications are subject to change without prior notice.

	Item	UE55KS9000TXZF
General Information	Product	SUHD
	Series	9
	Country	FRANCE
Display	Screen Size	55"
	Screen Size (cm)	138 cm
	Resolution	3,840 × 2,160
	Quantum Dot Display	Yes
	Ultra Black	Yes
	Screen Curvature	4,200R
	10 bit Support	Yes
Video	Picture Engine	SUHD Remastering
	Motion Rate	Supreme Motion
	PQI (Picture Quality Index)	2400
	HDR (High Dynamic Range)	HDR 1000
	Dynamic Contrast Ratio	Mega Contrast
	Micro Dimming	Supreme UHD Dimming
	Precision Black (Local Dimming)	Precision Black
	Quantum Dot Color	Yes
	Active Crystal Color	N/A
	Wide Color Enhancer (Plus)	N/A
	PurColor	N/A
	Auto Depth Enhancer	Yes
	Contrast Enhancer	N/A
	Auto Motion Plus	Yes
	Film Mode	Yes
	Peak Illuminator	Peak Illuminator Pro
Audio	Dolby Digital Plus	Yes
	DTS Codec	Yes
	Sound Output (RMS)	60W
	Speaker Type	4.1CH (Down Firing+Front Firing)
	Woofer	Yes
	Wallmount Sound Mode	Yes
	Multiroom Link	Yes
	TV SoundConnect	Yes
	BT Headset Support	Yes

## 2. Product specifications

Item		UE55KS9000TXZF
Smart TV	Samsung SMART TV	Yes
	Apps	Yes
	Games	Yes
	Cloud Game	Yes
	Billing	Yes
	Automated Content Recognition (ACR)	N/A
	Web Browser	Yes
Smart Interaction	Voice Recognition	Yes
Convergence	TV to Mobile - Mirroring	Yes
	Mobile to TV - Mirroring, DLNA	Yes
	Samsung SMART View	Yes
	Bluetooth Low Energy	Yes
	RVU	N/A
	WiFi Direct	Yes
IoT Service	TV as Hub Support	N/A
	TV as Things Support	N/A
	IoT Client Application	N/A
Tuner/Broadcasting	Digital Broadcasting	DVB-T2CS2X2
	Analog Tuner	Yes
	2 Tuner	Yes
	CI (Common Interface)	CI+(1.3)
	Data Broadcasting	HbbTV 1.5(FR,ES,EE) / HbbTV1.0(CZ,SK,PT,DE,AT,SZ,PL,BE,NL,LU)
Connectivity	HDMI	4
	USB	3
	Component In (Y/Pb/Pr)	N/A
	Composite In (AV)	N/A
	Ethernet (LAN)	1
	Headphone	N/A
	Audio Out (Mini Jack)	N/A
	Digital Audio Out (Optical)	1
	RF In (Terrestrial / Cable input / Satellite input)	1/1(Common Use for Terrestrial)/2
	Ex-Link ( RS-232C )	1
	CI Slot	1
	Scart	N/A
	HDMI A / Return Ch. Support	Yes
	HDMI Quick Switch	Yes
	Wireless LAN Adapter Support	N/A
	Wireless LAN Built-in	Yes

Item		UE55KS9000TXZF
<b>Connectivity</b>	Anynet+ (HDMI-CEC)	Yes
<b>Design</b>	Design	Slim Edge
	Bezel Type	Bezel-less
	Slim Type	Premium Slim
	Front Color	Silver
	Light Effect (Deco)	Yes
	Stand Type	Y Stand
	Swivel (Left/Right)	N/A
<b>Additional Feature</b>	Instant On	Yes
	Processor	Quad-Core
	Accessibility	Voice guide(UK,IE,FR,DE,IT,ES,NL,BE,L U,SE,FI,NO,DK,PL,PT,AT,CH)/ Enlarge/ High contrast
	Digital Clean View	Yes
	One Connect (Jack)	Yes
	Auto Channel Search	Yes
	Auto Power Off	Yes
	BD Wise Plus	N/A
	Caption (Subtitle)	Yes
	Channel List USB-Clone	Yes
	Connect Share™ (HDD)	Yes
	ConnectShare™ (USB 2.0)	Yes
	Embedded POP	Yes
	EPG	Yes
	Extended PVR	Yes
	Game Mode	Yes
	OSD Language	27 European Languages
	Picture-In-Picture	Yes
	BT HID Built-in	Yes
	USB HID Support	Yes
	Time Shift	Yes
	MBR Support	Yes
	Ultra Clean View	Yes
<b>Eco Feature</b>	Eco Sensor	Yes
	Energy Efficiency Class	A+

## 2. Product specifications

Item		UE65KS9000TXZF
General Information	Product	SUHD
	Series	9
	Country	FRANCE
Display	Screen Size	65"
	Screen Size (cm)	163 cm
	Resolution	3,840 × 2,160
	Quantum Dot Display	Yes
	Ultra Black	Yes
	Screen Curvature	4,200R
	10 bit Support	Yes
Video	Picture Engine	SUHD Remastering
	Motion Rate	Supreme Motion
	PQI (Picture Quality Index)	2400
	HDR (High Dynamic Range)	HDR 1000
	Dynamic Contrast Ratio	Mega Contrast
	Micro Dimming	Supreme UHD Dimming
	Precision Black (Local Dimming)	Precision Black
	Quantum Dot Color	Yes
	Active Crystal Color	N/A
	Wide Color Enhancer (Plus)	N/A
	PurColor	N/A
	Auto Depth Enhancer	Yes
	Contrast Enhancer	N/A
	Auto Motion Plus	Yes
	Film Mode	Yes
	Peak Illuminator	Peak Illuminator Pro
Audio	Dolby Digital Plus	Yes
	DTS Codec	Yes
	Sound Output (RMS)	60W
	Speaker Type	4.1CH (Down Firing+Front Firing)
	Woofer	Yes
	Wallmount Sound Mode	Yes
	Multiroom Link	Yes
	TV SoundConnect	Yes
	BT Headset Support	Yes
Smart TV	Samsung SMART TV	Yes
	Apps	Yes
	Games	Yes

Item		UE65KS9000TXZF
Smart TV	Cloud Game	Yes
	Billing	Yes
	Automated Content Recognition (ACR)	N/A
	Web Browser	Yes
Smart Interaction	Voice Recognition	Yes
Convergence	TV to Mobile - Mirroring	Yes
	Mobile to TV - Mirroring, DLNA	Yes
	Samsung SMART View	Yes
	Bluetooth Low Energy	Yes
	RVU	N/A
	WiFi Direct	Yes
IoT Service	TV as Hub Support	N/A
	TV as Things Support	N/A
	IoT Client Application	N/A
Tuner/Broadcasting	Digital Broadcasting	DVB-T2CS2X2
	Analog Tuner	Yes
	2 Tuner	Yes
	CI (Common Interface)	CI+(1.3)
	Data Broadcasting	HbbTV 1.5(FR,ES,EE) / HbbTV1.0(CZ,SK,PT,DE,AT,SZ,PL,BE,NL,LU)
Connectivity	HDMI	4
	USB	3
	Component In (Y/Pb/Pr)	N/A
	Composite In (AV)	N/A
	Ethernet (LAN)	1
	Headphone	N/A
	Audio Out (Mini Jack)	N/A
	Digital Audio Out (Optical)	1
	RF In (Terrestrial / Cable input / Satellite input)	1/1(Common Use for Terrestrial)/2
	Ex-Link ( RS-232C )	1
	CI Slot	1
	Scart	N/A
	HDMI A / Return Ch. Support	Yes
	HDMI Quick Switch	Yes
	Wireless LAN Adapter Support	N/A
	Wireless LAN Built-in	Yes
	Anynet+ (HDMI-CEC)	Yes
Design	Design	Slim Edge
	Bezel Type	Bezel-less

## 2. Product specifications

Item		UE65KS9000TXZF
Design	Slim Type	Premium Slim
	Front Color	Silver
	Light Effect (Deco)	Yes
	Stand Type	Y Stand
	Swivel (Left/Right)	N/A
Additional Feature	Instant On	Yes
	Processor	Quad-Core
	Accessibility	Voice guide(UK,IE,FR,DE,IT,ES,NL,BE,L U,SE,FI,NO,DK,PL,PT,AT,CH)/ Enlarge/ High contrast
	Digital Clean View	Yes
	One Connect (Jack)	Yes
	Auto Channel Search	Yes
	Auto Power Off	Yes
	BD Wise Plus	N/A
	Caption (Subtitle)	Yes
	Channel List USB-Clone	Yes
	Connect Share™ (HDD)	Yes
	ConnectShare™ (USB 2.0)	Yes
	Embedded POP	Yes
	EPG	Yes
	Extended PVR	Yes
	Game Mode	Yes
	OSD Language	27 European Languages
	Picture-In-Picture	Yes
	BT HID Built-in	Yes
	USB HID Support	Yes
	Time Shift	Yes
	MBR Support	Yes
	Ultra Clean View	Yes
Eco Feature	Eco Sensor	Yes
	Energy Efficiency Class	A+



## 2-3. Accessories



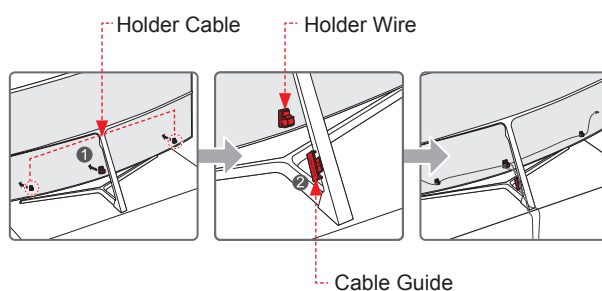
### NOTE

- 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.

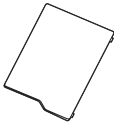
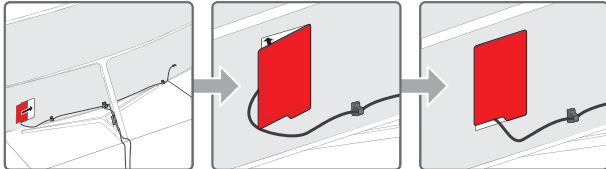
Product	Code. No	Product	Code. No
• Samsung Smart Control	BN59-01242A	• User Manual	BN68-07861C
• Batteries (AA x 2)	4301-000101	• Regulatory Guide	BN68-04972E
• Power Cord	3903-000950	• Warranty Card (Not available in some locations)	BN68-00514K
• Cleaning Cloth	BN63-01798B		

Image	Product	Code. No
	• One Connect	55" : BN91-17814C 65" : BN91-17868A
	• One Connect Cable	55" : BN39-02248A 65" : BN39-02210A
	• Wall Mount Adapter	BN96-40106A
	• Cable Guide	BN96-40150A
	• Holder Wire (1EA) / Holder Cable (2EA)	BN65-00017A / BN61-14021A

- **Arranging the cables with the cable guide**



2. Product specifications

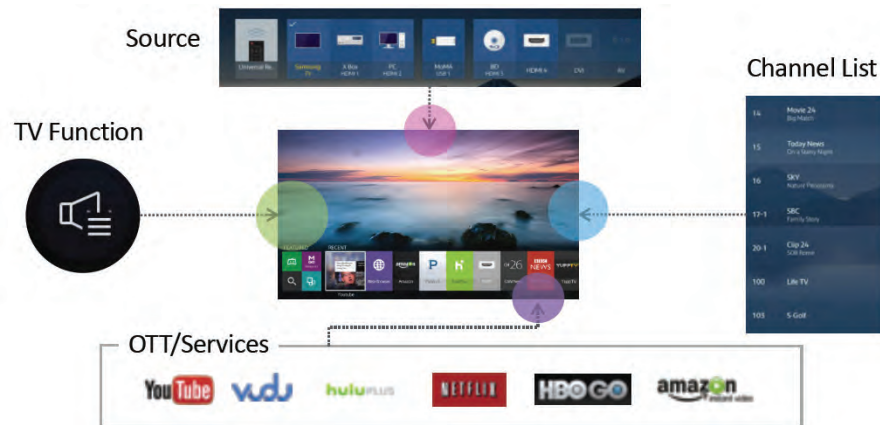
Image	Product	Code. No
	<ul style="list-style-type: none"><li>Cover Terminal</li></ul>	55" : BN96-40102A 65" : BN96-40103A
<ul style="list-style-type: none"><li><b>Covering the ports with the Cover Terminal</b></li></ul> <div></div>		

## 2-4. Viewing the Functions

### 2-4-1. 2016' Smart Hub

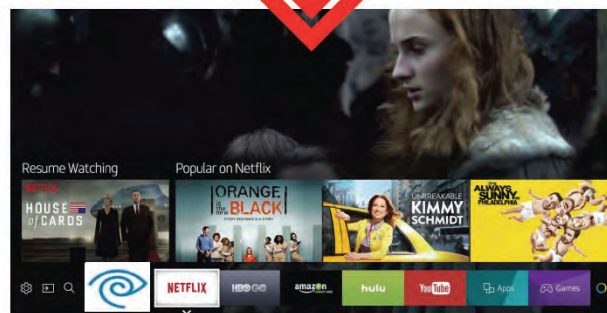
#### ■ Content, source, function, channel list

2015'Y



[Content, source, function, channel list'on four sides]

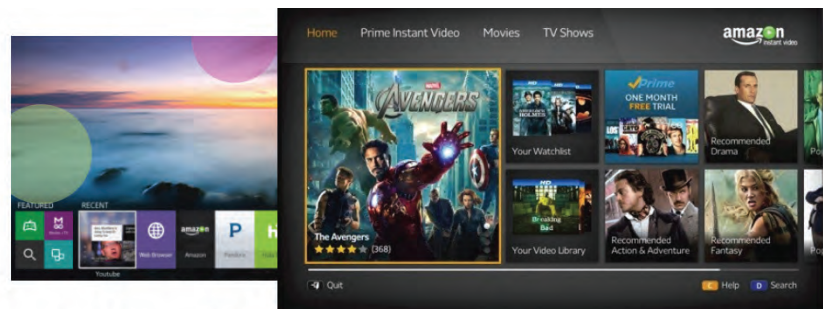
2016'Y



[Select any of the four from the bottom of the'screen]

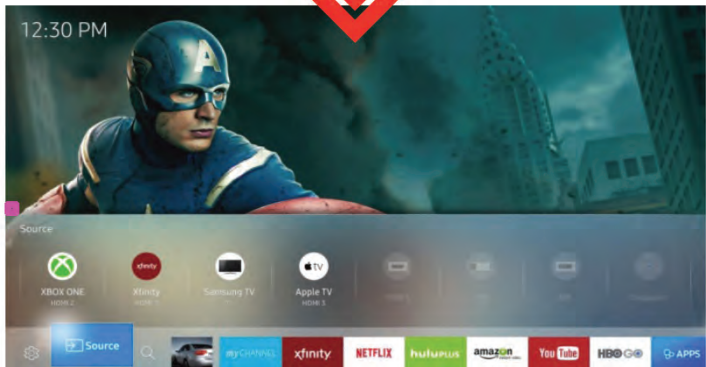
■ Selection method for the Contents

2015'Y



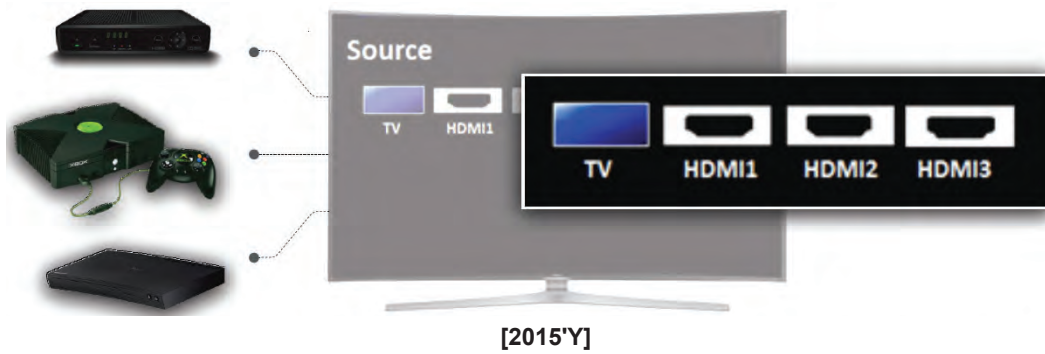
[Select App & Contents]

2016'Y

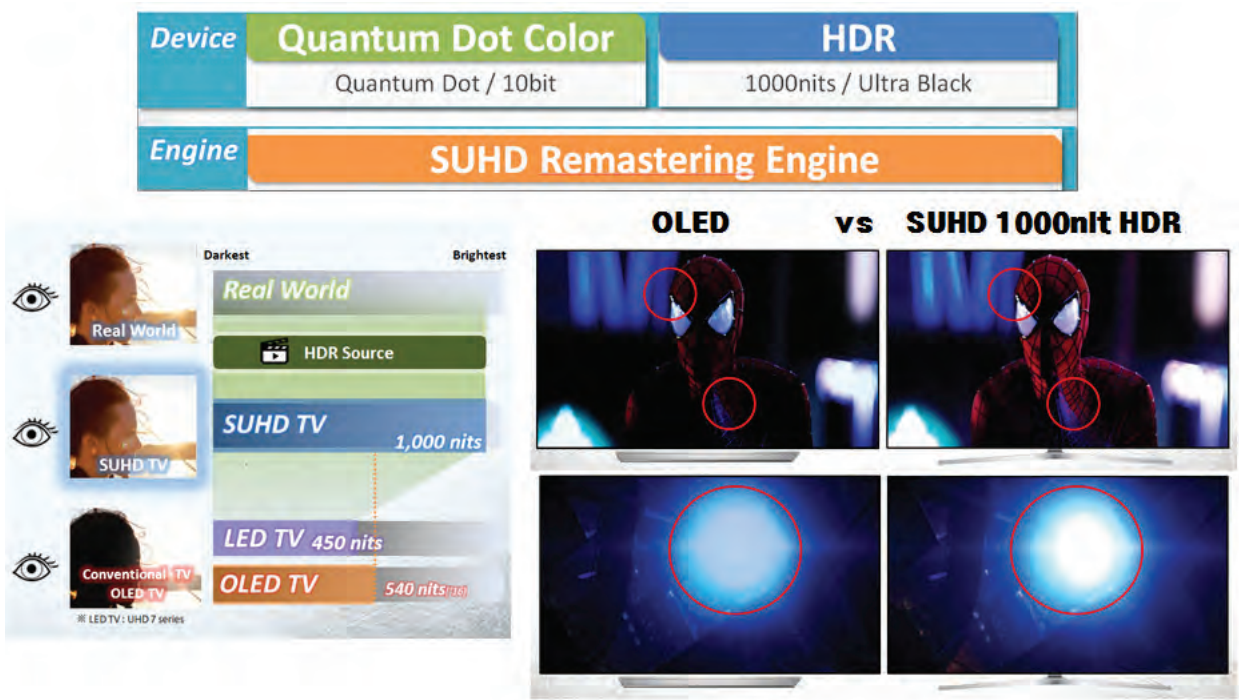


[Select Contents from the Launcher Screen]

## ■ Auto Detection



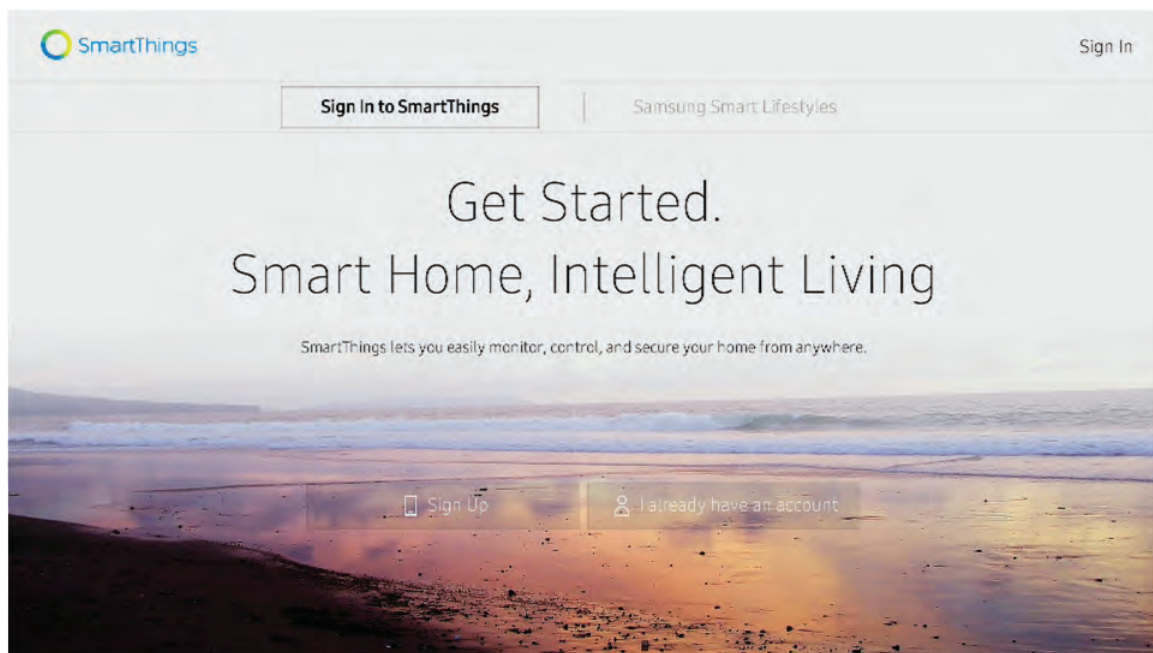
2-4-2. Picture



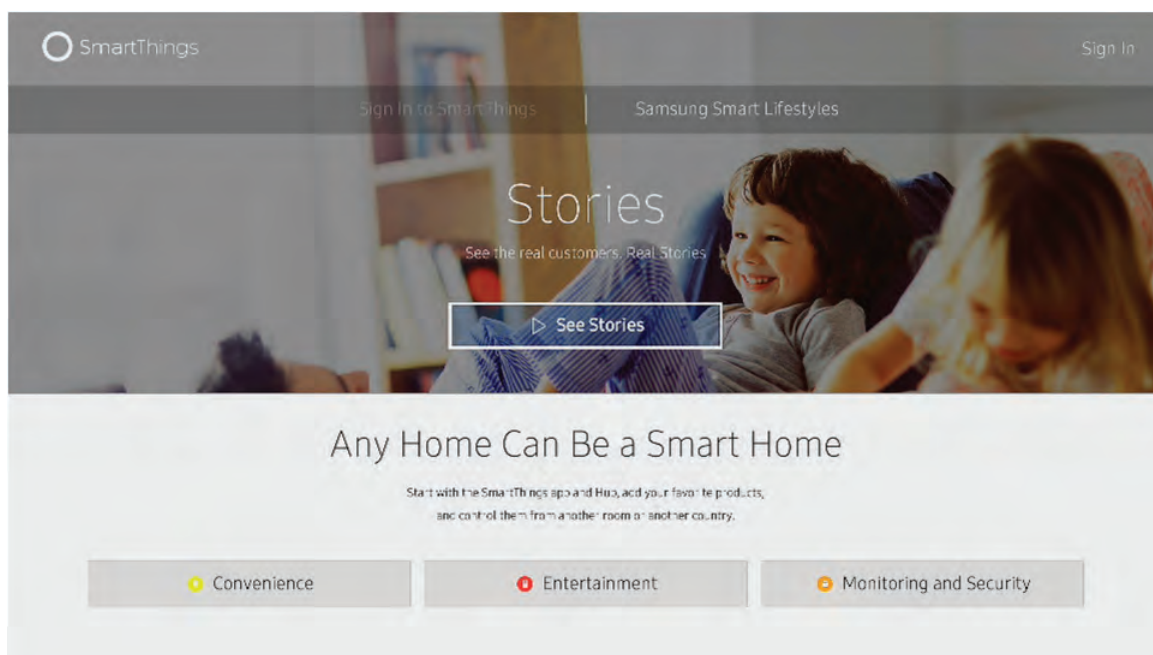


## 2-4-3. Smart Things

### ■ Smart Things



[Smart Things Sign in]



[Smart Things first screen]



NOTE



[Dongle]

- IoT Dongle required.

## 2-4-4. Viewing the Panel

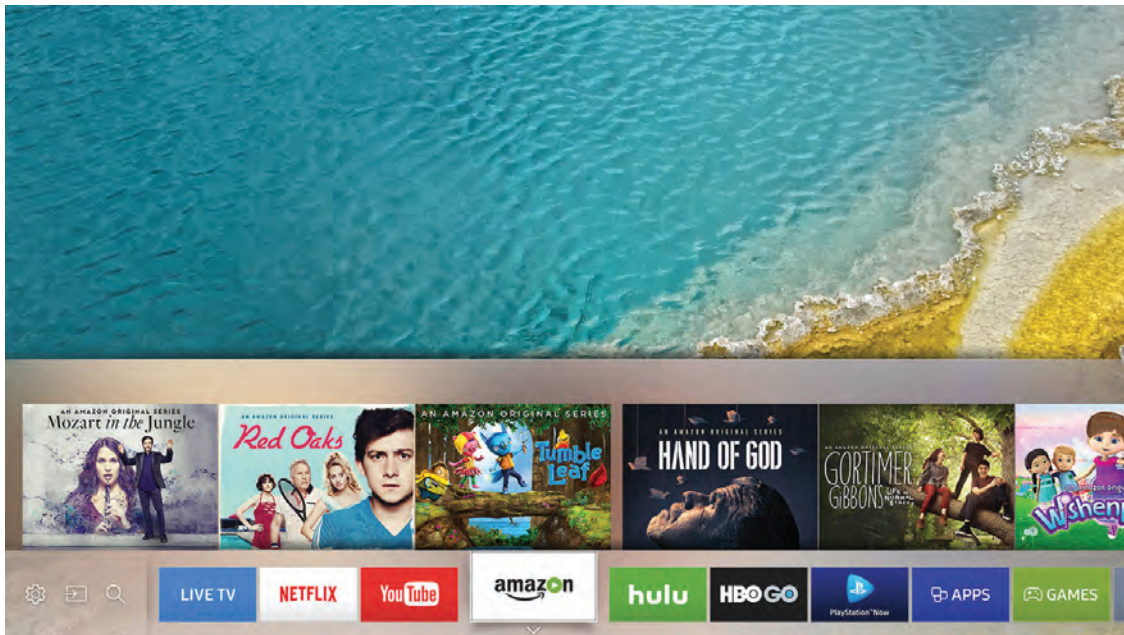



### NOTE

- The image on your TV may differ from the image above depending on your model and geographical area.

### ■ Smart Hub

View descriptions of Smart Hub's basic functions.



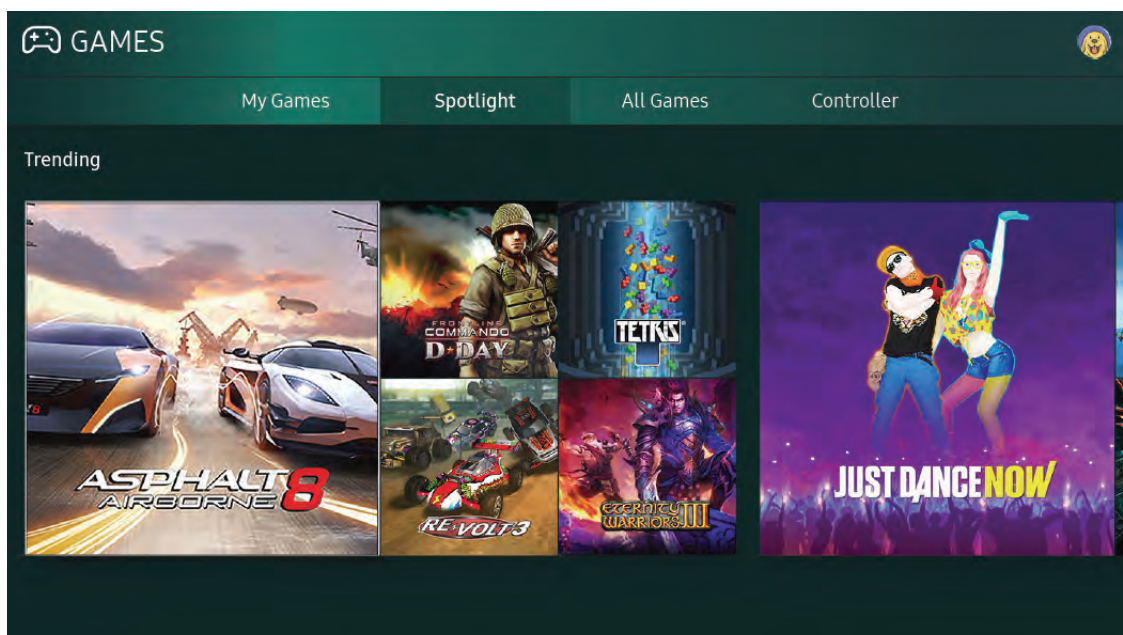
After pressing the  button on your remote control, you can surf the web and download apps with Smart Hub.

- Some of the **Smart Hub** services are paid services. To use a paid service, you must have an account with the service provider or a Samsung account. For more information, refer to "Using a Samsung account."
- To use Smart Hub, the TV must be connected to the Internet.
- Some **Smart Hub** features may not be available depending on the service provider, language, or region.
- Smart Hub service outages can be caused by disruptions in your Internet service.
- You can view the entire text of the **Terms & Policy** document by navigating to **Support > Terms & Policy**. If you want to stop using **Smart Hub**, you can cancel the agreement.



## ■ GAMES

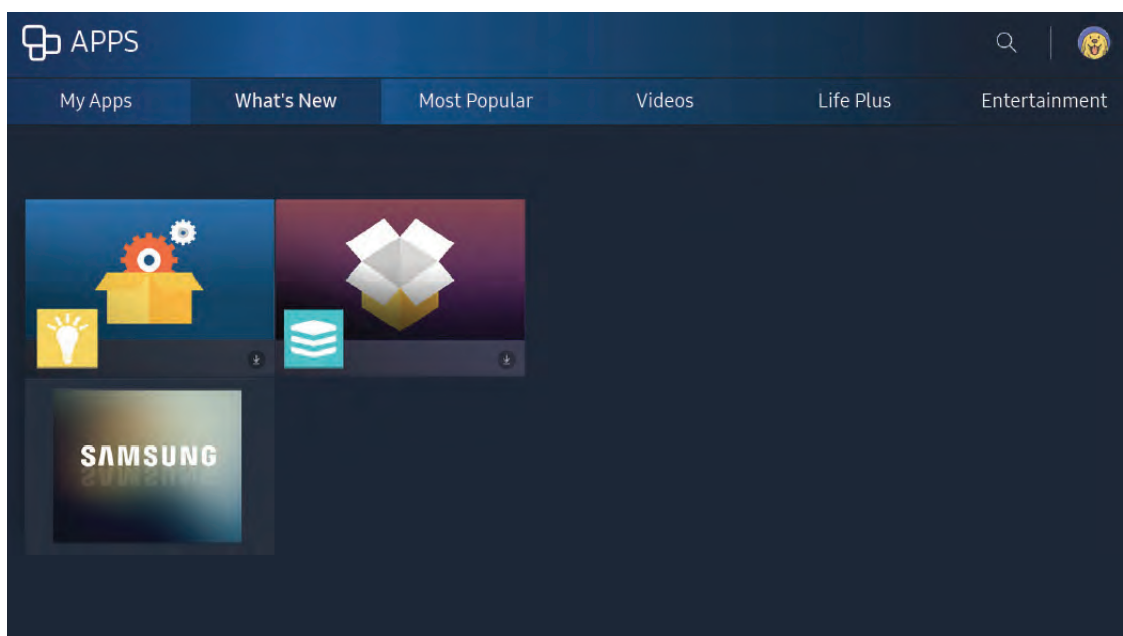
Enjoy games provided with Smart Hub.



You can install or run games. The installed games are stored in My Games.

## ■ APPS

Download and run various apps from Smart Hub.

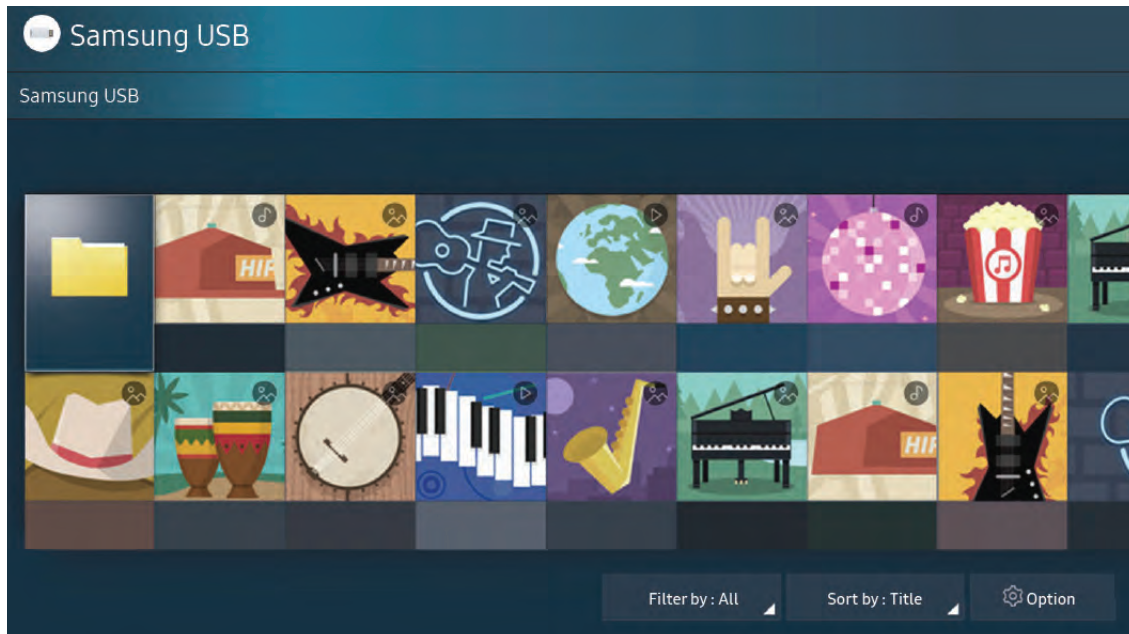


You can enjoy a wide range of content including news, sports, weather, and games by installing the corresponding apps on your TV.

- To use this feature, the TV must be connected to the Internet.
- When Smart Hub is launched for the first time, the default apps are automatically installed. The default apps may differ with the geographical area.

### ■ Pictures/Video/Music

Play media content stored on your TV, USB devices, smartphones, cameras, PCs, etc.



You can play media content saved on storage devices, such as USB devices, mobile devices, and cameras, on the TV.

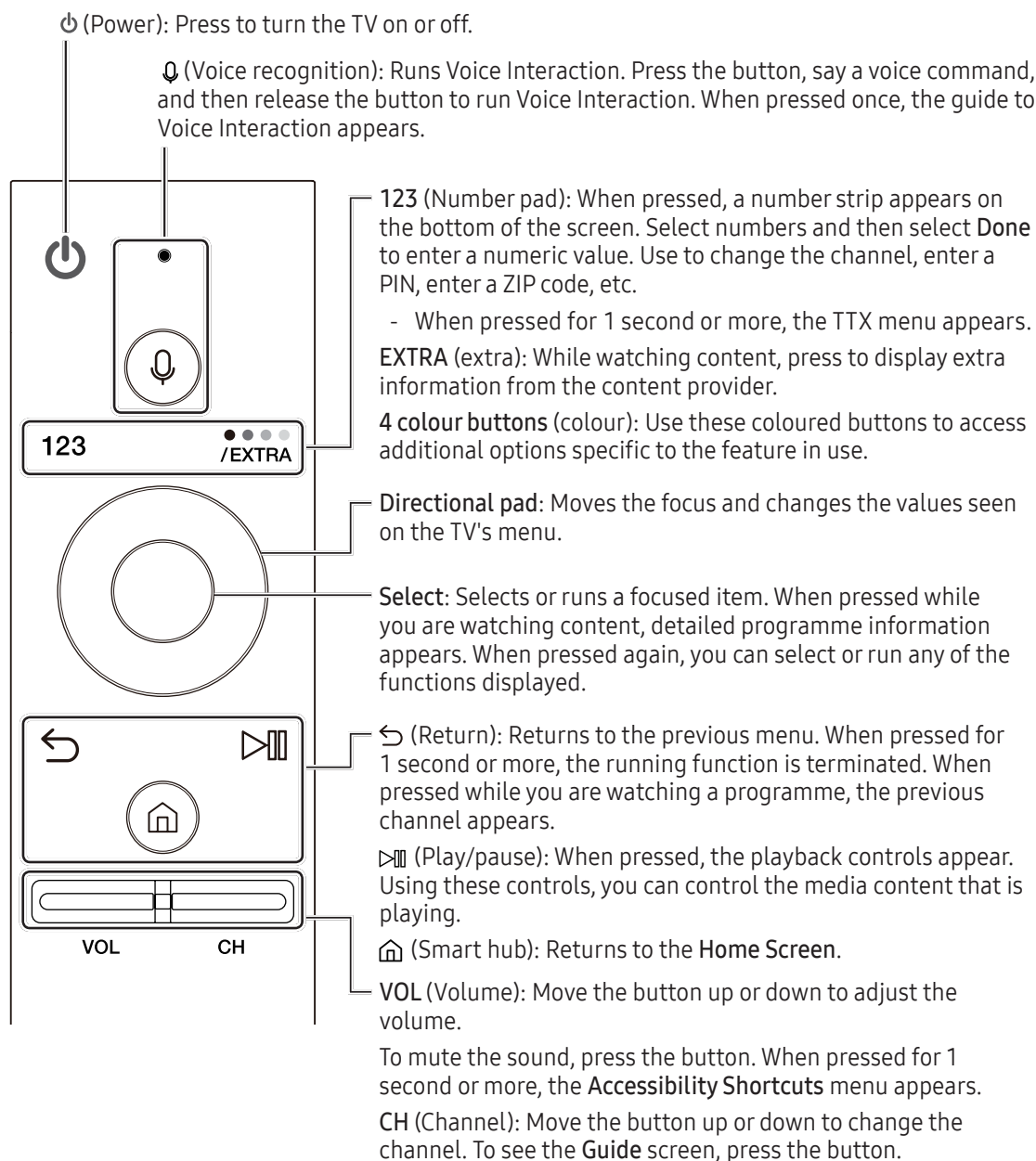
- You cannot play media content if the content or the storage device is not supported by the TV. For more information, refer to "Read Before Playing Photo, Video, or Music Files."
- Backup important files before connecting a USB device. Samsung is not responsible for damaged or lost files.
- To connect the TV to a computer, refer to "Connecting a Computer."
- To connect the TV to a mobile device, refer to "Connecting a Mobile Device."

## 2-4-5. The Samsung Smart Control

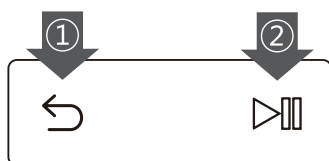


### NOTE

- Colours and shape may vary depending on the model.
- For more information about Samsung Smart Control, see the e-Manual.
  - Chapter : **Remote Control and Peripherals** > **About the Samsung Smart Control**



## ■ Pairing the TV to the Samsung Smart Control



When you turn on the TV for the first time, the Samsung Smart Control pairs to the TV automatically. If the Samsung Smart Control does not pair to the TV automatically, point it at the remote control sensor of the TV, and then press and hold the buttons labeled ❶ and ❶ in the figure on the left simultaneously for 3 seconds or more.

- The Samsung Smart Control can only be paired to one TV at a time.

## 2-4-6. Using Voice Interaction

Access and run certain menu options and functions using voice commands.

### ■ Running Voice Interaction

Press and hold the  button, say a command, and then release the  button. The TV recognizes the voice command.

- If the command is not recognized, try again with correct pronunciation.



## 2-4-7. Supported Resolutions for UHD Input Signals

Check the supported resolution for UHD input signals.

- Resolution: 3840 x 2160p, 4096 x 2160p



### NOTE

An HDMI connection with **HDMI UHD Color** set to Off supports up to UHD 50P/60P 4:2:0 input signals, while an HDMI connection with **HDMI UHD Color** set to On supports up to UHD 50P/60P 4:4:4 and 4:2:2 input signals.

### ■ If HDMI UHD Color is set to Off

Frame rate (fps)	Color Depth / Chroma Sampling	RGB 4:4:4	YCbCr 4:4:4	YCbCr 4:2:2	YCbCr 4:2:0
50 / 60	8 bit	-	-	-	O

### ■ If HDMI UHD Color is set to On

Frame rate (fps)	Color Depth / Chroma Sampling	RGB 4:4:4	YCbCr 4:4:4	YCbCr 4:2:2	YCbCr 4:2:0
50 / 60	8 bit	O	O	O	O
	10 bit	-	-	O	O
	12 bit	-	-	O	O



### NOTE

For the SUHD models, each HDMI connection can be individually optimized for **HDMI UHD Color**.  
For the UHD models, make sure to connect to the HDMI IN 1 port of the TV.

## 2-4-8. Supported Formats

### ■ Supported external subtitles

Name	Format
MPEG-4 Timed text	.txt
SAMI	.smi
SubRip	.srt
SubViewer	.sub
Micro DVD	.sub or .txt
SubStation Alpha	.ssa
Advanced SubStation Alpha	.ass
Powerdivx	.psb
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	Supports up to 10 Pro 5.1 channels. WMA lossless audio is not supported. Supports up to the M2 profile.
*.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	

## ■ Supported video codecs

File format	Container	Video codecs	Resolution	Frame rate (fps)	Bitrate (Mbps)	Audio codecs		
*.avi *.mkv *.asf *.wmv *.mp4 *.mov *.3gp *.vro *.mpg *.mpeg *.ts *.tp *.trp *.mov *.flv *.vob *.svi *.m2ts *.mts *.divx	AVI MKV ASF MP4 3GP MOV FLV VRO VOB PS TS SVAF	H.264 BP/MP/HP	4096 x 2160	4096X2160: 30 3840X2160: 60	60	Dolby Digital LPCM ADPCM(IMA, MS) AAC HE-AAC WMA Dolby Digital Plus MPEG(MP3) DTS(Core, LBR) G.711(A-Law, μ-Law)		
		HEVC (H.265 - Main, Main10, Main4:2:2 10)		60	80			
		Motion JPEG		30	80			
		MVC	1920 x 1080	60	60		20	
		DivX 3.11 / 4 / 5 / 6						
		MPEG4 SP/ASP		60				
		Window Media Video v9(VC1)						
		MPEG2						
		MPEG1						
		Microsoft MPEG-4 v1, v2, v3						
		Window Media Video v7(WMV1) ,v8(WMV2)						
		H.263 Sorrenson						
		VP6						30
*.webm	WebM	VP8	1920 x 1080	60	20	Vorbis		
		VP9	4096 x 2160	4096 x 2160: 30 3840 x 2160: 60	40			

### ■ 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.

### ■ Video decoders

- H.264 FHD is supported up to Level 4.1. FMO/ASO/RS are not supported.
- H.264 UHD is supported up to Level 5.1.
- HEVC FHD is supported up to Level 4.1, and HEVC UHD is supported up to Level 5.1.
- VC1 AP L4 is not supported.
- All video codecs excluding WMV v7, v8, MSMPEG4 v3, MVC, and VP6:
  - Below 1280x720: 60 frame max
  - Above 1280x720: 30 frame max
- GMC 2 or above is not supported.
- Supports SVAFF Top/Bottom, Side by Side, and Left/Right view sequence type (2ES) only.
- Supports BD MVC specs only.

### ■ Audio decoders

- WMA 10 Pro supports up to 5.1 channels. Supports up to the M2 profile. WMA lossless audio is not supported.
- QCELP and AMR NB/WB are not supported.
- Vorbis is supported for up to 2 channels.
- Dolby Digital Plus is supported for up to 5.1 channels.
- The DTS LBR codec is only available for MKV / MP4 /TS containers.
- The supported sample rates are 8, 11.025, 12, 16, 22.05, 24, 32, 44.1, and 48 KHz, and differ by the codec.



### 3. Disassembly and Reassembly

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





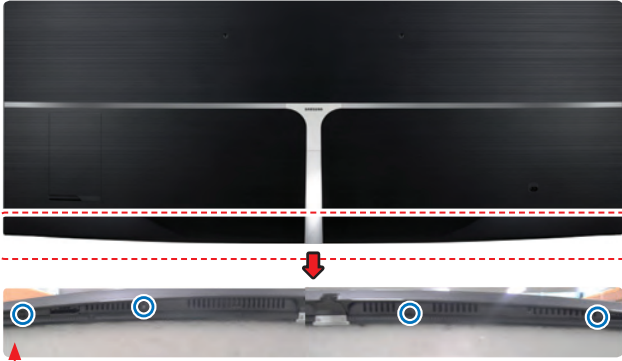
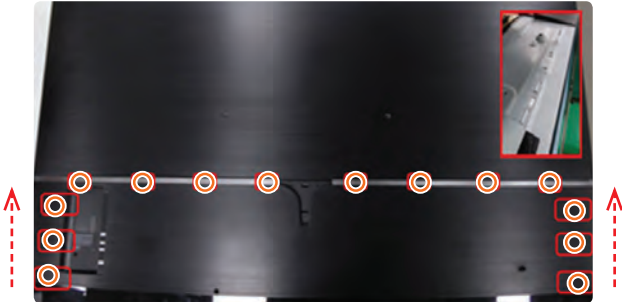

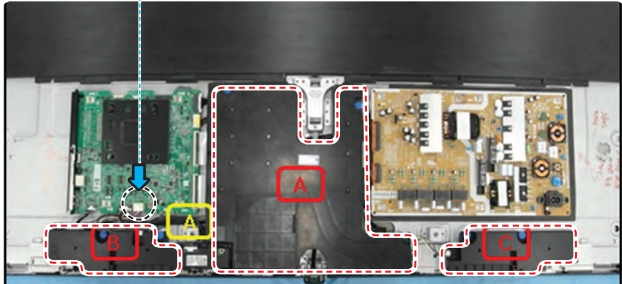

This LED TV contains electrostatically sensitive devices. Use caution when handling these components.

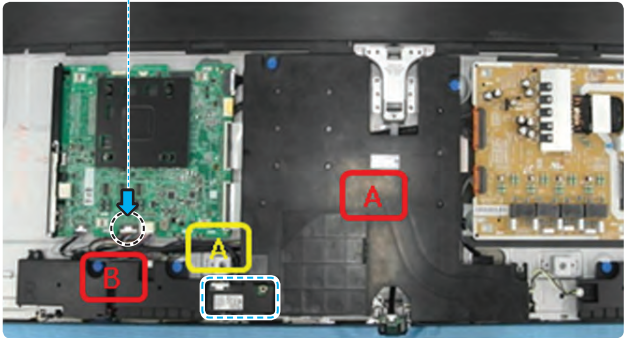
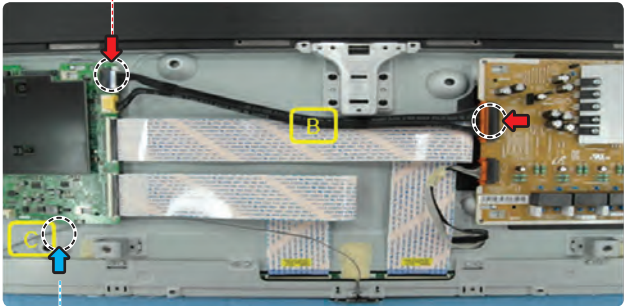
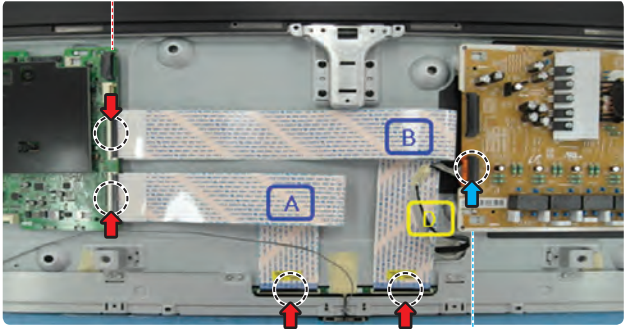

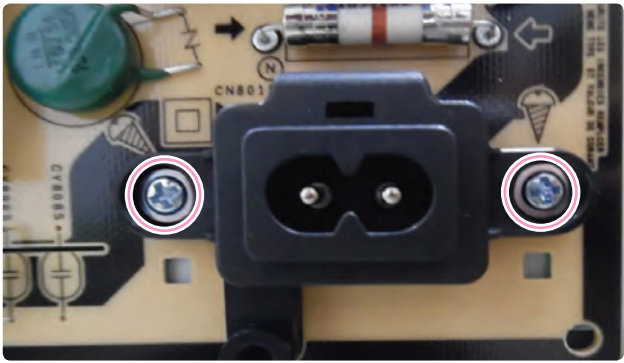
#### 3-1. Disassembly and Reassembly




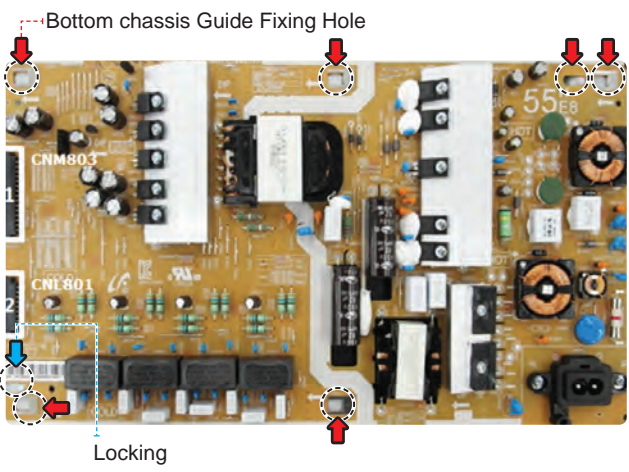

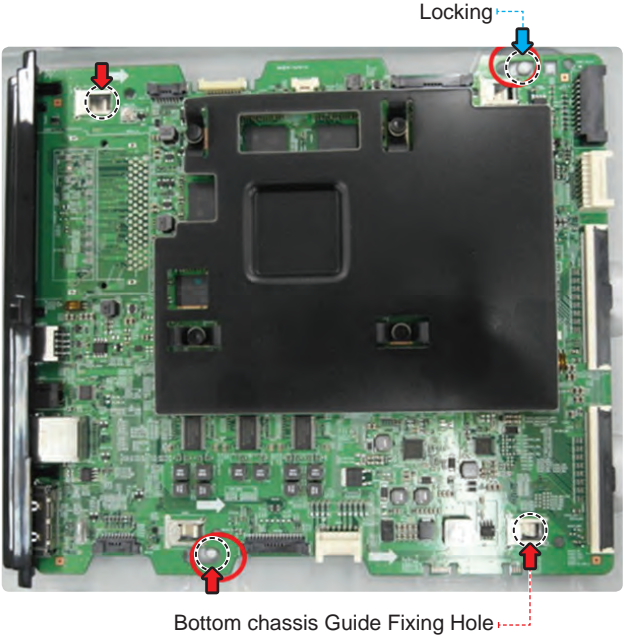

1. Disconnect the LED TV from the power source before disassembly.
2. Follow these directions carefully; never use metal instruments to pry apart the cabinet.
3. If there is no additional coment, it is same for all inches.


Description & Screws	Picture Description
<div>1</div> <div>Place the TV on the Curved Cusion.</div>	
<div>2</div> <div>Remove the COVER-STAND DECORATION and remove screws.</div> <div><div><div>• 49" : 3 EA</div><div>• 55" : 3 EA</div><div>• 65" : 3 EA</div></div><div>Screws</div><div> <b>6003-001880</b> SCREW-TAPTYPE : M4 x L14, ZPC(BLK)</div></div>	
<div>3</div> <div>Remove the ASSY STAND.</div>	

Description & Screws	Picture Description
<p><b>4</b> Remove the screws on ASSY COVER P-REAR BOTTOM located at the bottom side.</p> <ul style="list-style-type: none"> <li>• 49" : 6 EA</li> <li>• 55" : 6 EA</li> <li>• 65" : 6 EA</li> </ul> <p><b>Screws</b></p> <p> <b>6003-001438</b> SCREW-TAPTYPE : M2 x L6, ZPC(BLK)</p>	 <p>ASSY COVER P-REAR BOTTOM</p>
<p><b>5</b> Insert the Samsung Service tool at the indicated positions to release bottom corners of the ASSY COVER REAR.</p>	
<p><b>6</b> Gently lift up the ASSY COVER REAR from the bottom corners to release all mounting clips as indicated by ○.</p>	
<p><b>7</b> After removing the ASSY SPEAKER P-FRONT Cable and remove the ASSY SPEAKER P-FRONT (A/B/C).</p> <ul style="list-style-type: none"> <li>• ➡ Speaker Cable</li> </ul>	<p>Speaker Cable</p> 
<p><b>8</b> After removing the ASSY BOARD P-FUNCTION Cable and remove the IR/FUNCTION.</p> <ul style="list-style-type: none"> <li>• ➡ ASSY BOARD P-FUNCTION Cable</li> </ul>	<p>ASSY BOARD P-FUNCTION Cable</p> 

Description & Screws	Picture Description
<div>9</div> <div>After removing the NETWORK Cable and remove the NETWORK.</div> <div><div>•</div><div>➡ NETWORK Cable</div></div>	<div>NETWORK Cable</div> <div></div>
<div>10</div> <div>Remove the Cables marked.</div> <div><div>•</div><div>➡ Power Cable</div><div>•</div><div>➡ ASSY BOARD P-FUNCTION Cable</div></div> <div><div>•</div><div>➡ USI-T Cable</div><div>•</div><div>➡ BLU Cable</div></div>	<div>Power Cable</div> <div></div> <div>ASSY BOARD P-FUNCTION Cable</div> <div></div> <div>USI-T Cable</div> <div>BLU Cable</div>
<div>11</div> <div>After removing the screws and remove the DC VSS-PD BOARD(SMPS BOARD).</div> <div><div>Screws</div><div><div></div><div>6001-003016 SCREW-MACHINE : M3 x L5, ZPC(WHT)</div></div></div>	<div></div>



Description & Screws	Picture Description
<p>Removing DC VSS-PD BOARD(SMPS BOARD).</p> <ul style="list-style-type: none"><li>Gently lift up (Bottom Left corner) to release the lock (Locking ➡).</li><li>Use both hands to hold (Bottom chassis Guide Fixing Hole ➡) the board and slide to the right to release.</li></ul> <div> <b>NOTE</b> When installing the DC VSS-PD BOARD (SMPS BOARD), verify the board is properly positioned in all 6 mounting slots.</div>	 <p>Bottom chassis Guide Fixing Hole</p> <p>Locking</p>
<p>12 Removing ASSY PCB MAIN BOARD.</p> <ul style="list-style-type: none"><li>Gently lift up (Top Right corner) to release the lock (Locking ➡).</li><li>Use both hands to hold (Bottom chassis Guide Fixing Hole ➡) the board and slide to the left to release the board.</li></ul> <div> <b>NOTE</b> When installing the ASSY PCB MAIN BOARD, verify the board is properly positioned in all 4 mounting slots.</div>	 <p>Locking</p> <p>Bottom chassis Guide Fixing Hole</p>
<p>13 Completed the disassembly.</p>	

 **NOTE**  
Reassembly procedures are in the reverse order of disassembly procedures.

## 4. Troubleshooting

### 4-1. Previous Check

#### ■ Check list for initial operation

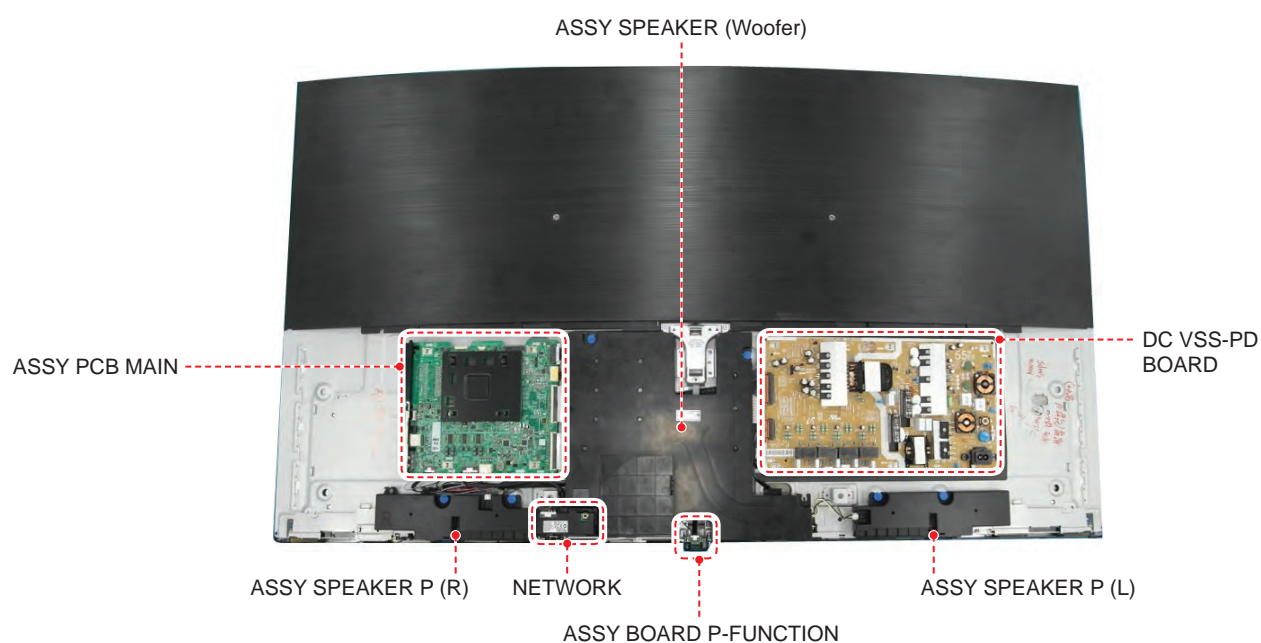
1. Check the various cable connections first.
  - Check to see if there is a burnt or damaged cable.
  - Check to see if there is a disconnected or loose cable connection.
  - Check to see if the cables are connected according to the connection diagram.
2. Check the power input to the Main Board.
3. How to distinguish if the problem is caused by Main Board or T-CON Board.
  - No Video

<b>Symptom</b>	If the problem is No Video but BLU is on and Indication LED is blinking repeatedly and faster than normal booting.
<b>Check Points</b>	<ul style="list-style-type: none"> <li>• Replace the T-CON Board.</li> </ul>

- Distorted Picture :

<b>Check Points</b>	<ul style="list-style-type: none"> <li>• Check the inner patterns.</li> </ul>
---------------------	---

#### ■ Inside View



## 4-2. How to Check Fault Symptom

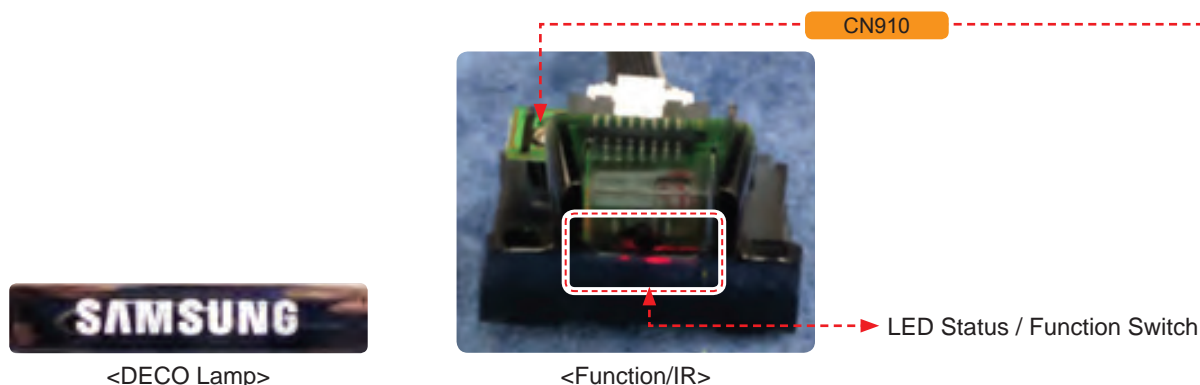
### 4-2-1. Power

#### ■ TV POWER STANDBY

1. TV in Standby
  - √ **Standby LED Indicator**
2. If Not Lit:
  - √ AC 120Vac Line
3. If missing:
  - √ 120Vac Source and Power Cord
4. If OK:
  - √ Resistance on SMPS **Fuse** after first removing AC power cord.
5. If fuses are open replace SMPS.
6. If fuses are OK:
  - √ **Standby: A13V** (Always On) to Main Board. Should all be approx. 9 **VDC**
7. If any missing remove the SMPS connector to Main Board .
  - √ Standby A13V again for 9VDC.
    - If OK replace **Main Board**.
    - If still missing replace **SMPS**.

## ■ FUNCTION/IR Control

CN910 (FUNCTION/IR) ◀			
1	IR 3.3Vdc to 2.5Vdc (Effective DC)	2	GND
3	A3.3V_PW	4	AMP_SCL_I2C 3.3Vdc (effective DC)
5	AMP_SDA_I2C 3.3 Vdc (effective DC)	6	KEY_INPUT1 1.8dc to 0V with command
7	KEY_INPUT2 0V (no operation change)	8	LED_STB_OUT 1.7Vdc STBY
9	A3.3V_PW 3.3V to Deco Lamp	10	LED_CTRL to Deco Lamp 1Vdc (off) 0.5V (On)



1. TV in Standby  
✓ **LED Status**
2. If **LED** is **OFF**  
✓ LED 1.7Vdc (pin 8) and VCC for 3.3Vdc (pin 3)  
• If missing suspect **Function Assy/Cable Assy/Main Assy**.
3. If **LED** is **ON**  
✓ Switch Operation activates on screen display.



<On Screen Selections with Function Control>

- If missing:  
✓ **Key \_Input1 Pin 6** change to 0V with a command.
  - If wrong voltage or no change:  
✓ Switch for stuck or miss-operation.
4. Check **IR** operation with Standard Remote command changes. (3.3V to 2.5V effective DC)
  5. **SDA, SCL** for effective 3.3Vdc (after power on)  
– If missing suspect **Function Assy/Cable Assy/Main Assy**.

## ■ SMPS POWER

### 1. Power TV On.

- ✓ **PS\_ON**. 2Vdc (when off) changes to 3.3Vdc (on)
- May already be On if IoT USB is loaded or TV Smart Things Hub mode is active.

### 2. If voltage error or no change.

- ✓ Jog Function Control Test.

### 3. If OK replace Main Board.

- ✓ All **A13V** supplies to full voltage level **12.7VDC**.

### 4. If any wrong voltage, remove the SMPS connector to Main Board.

- ✓ A13V again for 12.7VDC.

### 5. If OK replace Main Board.

### 6. If still wrong voltage replace SMPS.

- ✓ **OD** (Over Voltage Detect) : 3.3Vdc (Operating Normal)

### 7. If 0V or changing, an SMPS or Panel error exists.

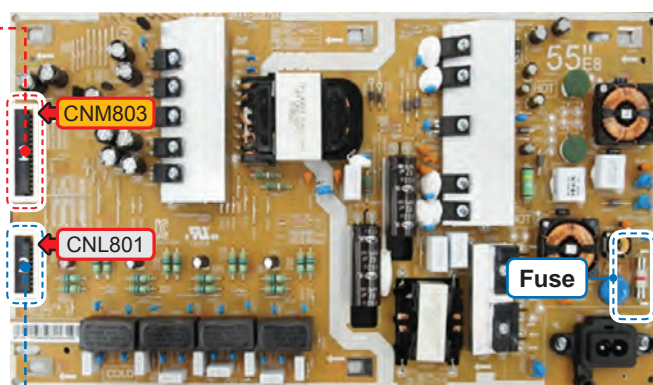
### 8. Perform Backlight Test.

- ✓ **Backlight On/Off** 0V Off to 5Vdc ON.
- ✓ If missing/error replace **Main Board**.

#### 49" / 55" SMPS Front

CNM803					
1	GND	2	GND	3	GND
4	GND	5	Vamp	6	GND
7	Vamp	8	OD_Level	9	Vamp
10	Fail Count	11	A13V	12	OD_ON/OFF
13	A13V	14	BLUEON/OFF	15	A13V
16	PS_ON/OFF	17	A13V	18	GND
19	GND	20	GND	21	PWM8
22	PWM7	23	PWM6	24	PWM5
25	PWM4	26	PWM3	27	GND
28	PWM2	29	PWM1	30	ANA_DIM

CNL801							
1	IF2	2	IF1	3	1+	4	5+
5	1-	6	5-	7	2+	8	6+
9	2-	10	6-	11	3+	12	7+
13	3-	14	7-	15	4+	16	8+
17	4-	18	8-				





## 65" SMPS Front

CNM803					
1	GND	2	GND	3	GND
4	GND	5	Vamp	6	GND
7	Vamp	8	OD_Level	9	Vamp
10	Fail Count	11	A13V	12	OD_ON/OFF
13	A13V	14	BLUEON/OFF	15	A13V
16	PS_ON/OFF	17	A13V	18	GND
19	GND	20	GND		

CNL801							
1	IF2	2	IF1	3	1+	4	7+
5	1-	6	7-	7	2+	8	8+
9	2-	10	8-	11	3+	12	9+
13	3-	14	9-	15	4+	16	10+
17	4-	18	10-	19	5+	20	11+
21	5-	22	11-	23	6+	24	12+
25	6-	26	12-				



CN9003			
1	PWM_DIMMING_OUT12	2	PWM_DIMMING_OUT11
3	PWM_DIMMING_OUT10	4	PWM_DIMMING_OUT9
5	GND	6	GND
7	PWM_DIMMING_OUT8	8	PWM_DIMMING_OUT7
9	PWM_DIMMING_OUT6	10	PWM_DIMMING_OUT5
11	PWM_DIMMING_OUT4	12	PWM_DIMMING_OUT3
13	GND	14	PWM_DIMMING_OUT2
15	PWM_DIMMING_OUT1	16	ANA_DIMMING

## ■ BACKLIGHTS



### 1. Activate Backlights Test:

- Disconnect Lead Cable from Main Board to Power Supply.
- ✓ TV Screen for active backlight LEDs.

### 2. If NO BACKLIGHTS

- ✓ Minus (Control) & Plus pins (Supply) on the Panel Connector voltages to the Panel.
- If no pin voltages replace SMPS.

### 3. If BACKLIGHTS ON BUT PANEL SECTION(S) OFF

- ✓ The Supply Drive + pins. All should measure same.
- If a + pin measures higher voltage, a string(s) of LEDs are likely open.
- Remove Panel connector and verify same open backlight voltage condition. **Replace Panel.**

### 4. If a + pin measures low voltage disconnect connector to panel

- ✓ The Low Plus Pin Voltage again.
- If it stays low the **SMPS** is defective, if it goes high, defective **Panel**.

### For BACKLIGHT DIMMING PROBLEMS:

- Go to **Menu > Picture > Backlight** and vary level (0 – 20)
- If no backlight changes observed:
  - ✓ Panel Connector minus (-) pin voltages and P-DIM voltages (CNL801) while changing backlight level.
- If minus Panel voltages don't change, and P-DIM changes, replace **SMPS**.
- If P-DIM doesn't change replace **Main/T-CON Board**.

**MUTE → 4 → 1 → 9 → EXIT** to test Panel Backlight Sections.

## 4-2-2. Video

### ■ ONE CONNECT MINI



1. If No Video Disconnect OCB Cable.  
✓ "Disconnect Banner" Displayed.
2. If Banner Appears.  
✓ One Connect Box / Cable (defective).
3. If No Banner continue.

## ■ MAIN / T-CON Board

### 1. Main Board Section



Video Operation : **Generated on Main Section.**

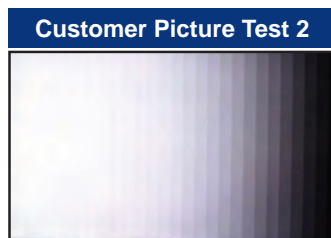
#### 1. If OK:

- ✓ Source & Input Cables.
- ✓ Other inputs.
- ✓ One Connect Cable/Box.

#### 2. If Noisy:

- ✓ T-CON Section Test Patterns.

### 2. PRE FRC of T-CON Section



Video Operation : **Generated at Pre FRC, of T-CON Section.**

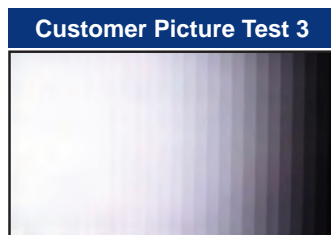
#### 1. If OK:

- ✓ Main Section.

#### 2. If Noisy:

- ✓ Post FRC Pattern.

### 3. POST FRC of T-CON Section



Video Operation : **Generated at Post FRC of T-CON Section.**

#### 1. If OK:

- ✓ Main / T-CON Board (defective).

#### 2. If Noisy:

- ✓ Mute - 369 - Mute.

---

#### 4. T-CON Section



#### NOTE

May not be available for Larger models over 70 inches.

Video Operation : **Generated at T-CON Section.**

**1. If OK:**

- ✓ Main / T-CON Board (defective).

**2. If Noisy:**

- ✓ Main / T-CON Board.

## ■ PANEL

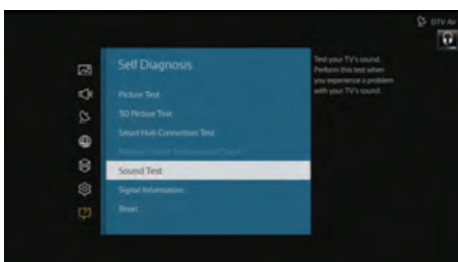


### 1. If Noisy:

- ✓ Panel (defective).

## 4-2-3. Audio

### ■ AUDIO



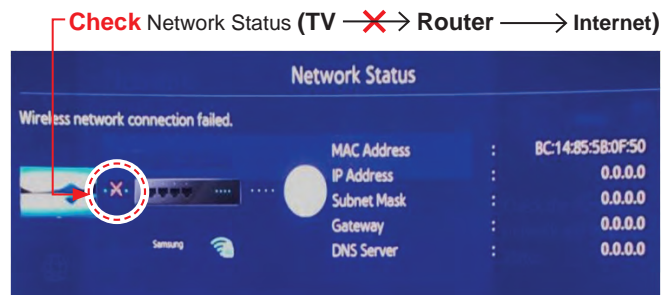
#### Source

- **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 Cable.
- **IF **Sound Test** OK :**
  - ✓ Audio Source & External Cables.
  - ✓ With external Audio Generator (device or App).
  - ✓ Other Inputs.
  - ✓ One Connect Mini.
- **Optical Digital Out Errors**
  - ✓ Red light from Optical Digital Out.
    - If missing replace One Connect Mini
- **No HDMI Audio**
  - ✓ Source / HDMI Cable & One Connect Mini Connectors.
    - 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 One Connect Mini/Main.
    - 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.

## 4-2-4. Network

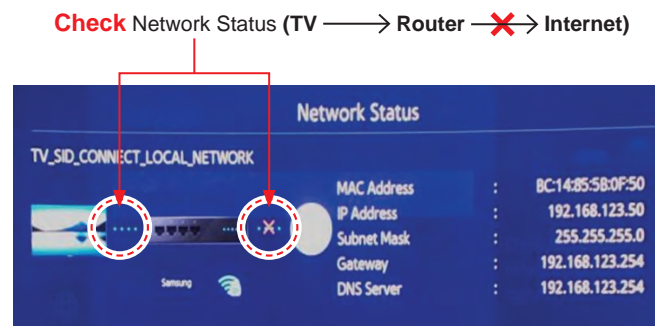


### ■ TV to Router "Failure"



- **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"



- 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.



## 4-2-5. Smart Hub

Go to [Menu](#) > [Support](#) > [Self Diagnosis](#) > [Smart Hub Connection Test](#)



### 1. Network / Gateway

- **If it Fails:**
  - ✓ TV to Router Connection Test in "[Network Trouble shooting](#)"

### 2. 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.

### 3. ISP Blocking

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

### 4. Samsung Server Test

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

### 5. Samsung Apps

- **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 will occur.

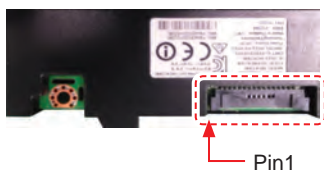
##### **For Netflix Operation/Connection Issues:**

- 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.

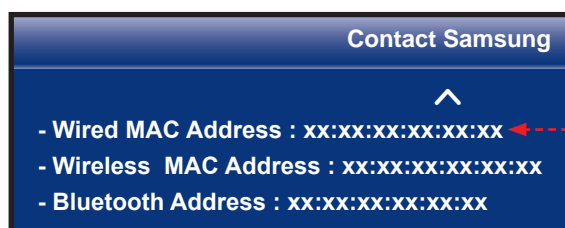
## 4-2-6. Bluetooth / WiFi Module



BT / WIFI			
1	BT_NRESET	2	BT_POWER_DET
3	BT_WAKE	4	-
5	BT_D- _USB	6	BT_D+ _USB
7	-	8	BT_WELCOME
9	WIFI_PHY_ON	10	-
11	WIFI_D+ _USB	12	WIFI_D- _USB
13	-	14	WIFI_5V
15	WIFI_WOL	16	WIFI_NRESET

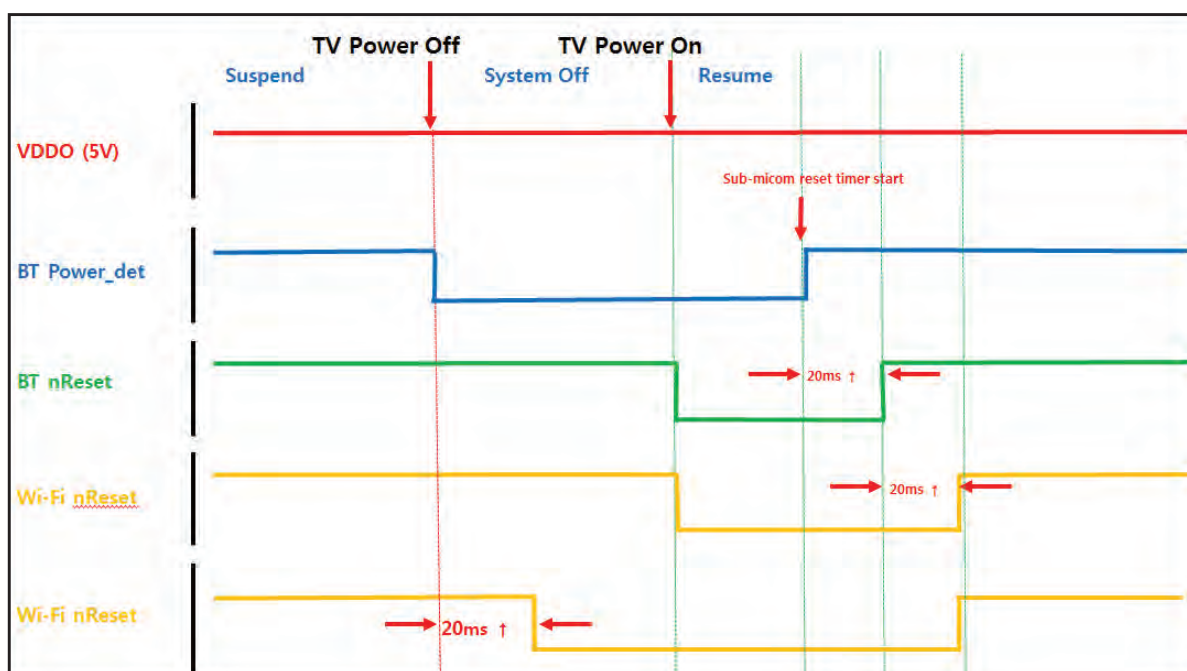
Pins	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>Standby</b>	3.3 Vdc	0	3.3 Vdc	NC	0	0	0	0V	0V	0	3 Vdc	0	0	5 Vdc	3.3 Vdc	3.3 Vdc
<b>Power ON</b>	3.3 Vdc	3.3 Vdc	3.3 Vdc		0.7V eff.dc BT Sig (DM) 4V p-p	2.5V eff.dc BT Sig (DM) 4V p-p	0	0V	3.3 Vdc	0	2.5V eff.dc WIFI Sig (DP) 0.5V p-p	2.5V eff.dc WIFI Sig (DM) 0.5V p-p	0	5 Vdc	3.3 Vdc	3.3 Vdc

Go to [Menu](#) > [Support](#) > [Contact Samsung](#)



Missing or Error : Replace **Main Board**.

- 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.



## 4-3. Factory Mode

### ■ Factory Remote

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

### ■ Samsung IR Remote (Limited Operation)

1. TV Power Standby.
2. Press as follows.
  - Remote Button : **INFO** → **MENU** → **MUTE** → **Power**
- **Option** (must set Option Bytes when replacing Main Board.)
- Option → **Factory Reset** (returns TV to out of box condition. Does not reset Apps.)
- SVC → **Test Patterns**
- SVC → Info → **ER Count** (Important to check for errors.)
  - Resets to 0 with Factory Reset.

#### First Screen Appearing in Factory Mode (SAMPLE)

✓ **Testing Items**

- ✓ Main SW Version
- ✓ Sub SW Version
- ✓ Wired MAC (Status)
- ✓ Wireless MAC (Wi-Fi Module)
- ✓ CO NFO WO. etc.
  - Certificate
  - Netflix
  - Wide Vine
  - etc. Status

## ■ Factory Reset

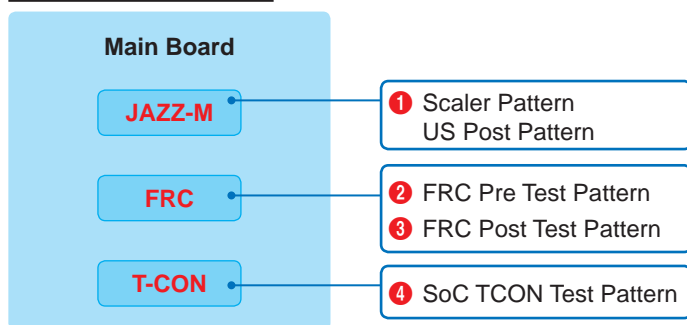
- Ex. SAMPLE Model

Factory Reset	
Type	65L1MU9XK
Local Set	EU_UK
SW Model	UKS9000
BOM Model	9000
TUNER	-
Ch Table	NONE

### 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 each item to change.
4. Soft power TV Off to load.

## ■ SVC > Test Patterns



### Check Test Patterns

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**".

## ■ SVC &gt; Info &gt; ER Count

MAIN : SVC, MODE : CATV, RES : NOSIGNAL

WD Count	0	Serdes Error Count	0
AR Count	0	Serdes Reset Count	0
RS Count	0	Serdes WatchDog On/Off	ON
WIFI NO DETECTION COUNT	0	SMPS FET Fail Detect	0
WIFI DETACHMENT COUNT	0	Vcc Fail Count	0
BT NO DETECTION COUNT	0		
BT DETACHMENT COUNT	0		
BT MGT OPEN FAIL COUNT	0		
BT MGT DISCONNECT COUNT	0		
BT TV AUDIO DROP	0		
BT AUDIO TIMER EXP	0		
Camera ER Count			
FRC3D Emergency Reboot On/Off	ON		
FRC3D ER Count	0		
Fan Error Count	0		

- **WD Count:** Watch Dog (Hardware related issue).
- **AR Count:** Auto Reset (software (i.e. Apps) related).
  - **important Error Count** Status Screen.
- Verify each item listed.

## ■ Factory Mode > Control > EDID

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
----------------	---------

## 4-4. Factory Mode Adjustments

### 4-4-1. 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**".

#### ■ UE55KS9000TXZF

Inches		55"
		FA01
PANEL	Vendor	SDC
	Code	BN95-02587C
	Spec.	CY-XK055FLLV5V/H
SMPS	Vendor	HANSOE
	Code	BN44-00879A
	Spec.	L55E8_KHS
MAIN	ASSY CHASSIS	BN91-17405E
	ASSY PCB MAIN	BN94-10844E
	ASSY PCB MISC (ONE CONNECT MINI)	BN94-10924F
Byte	Item	
0	Factory Reset	-
1	Type	55A1MU9XK
2	Local set	EU_FRANCE
3	SW Model	UKS9000
4	BOM Model	9000
5	Tuner	-
6	Ch table	NONE



## ■ UE65KS9000TXZF

Inches		65"
		AA01
PANEL	Vendor	AUO
	Code	BN95-02594D
	Spec.	CY-XK065FLAV4V/H
SMPS	Vendor	SOLUM
	Code	BN44-00880A
	Spec.	L65E8N_KSM
MAIN	ASSY CHASSIS	BN91-17405F
	ASSY PCB MAIN	BN94-10844F
	ASSY PCB MISC (ONE CONNECT MINI)	BN94-10924F
Byte	Item	
0	Factory Reset	-
1	Type	65L1MU9XK
2	Local set	EU_FRANCE
3	SW Model	UKS9000
4	BOM Model	9000
5	Tuner	-
6	Ch table	NONE

## 4-4-2. Factory Data

### ■ Option

Factory Menu Name		Data	Range
Factory Reset		-	
Type	55"	55A1MU9XK	
	65"	65A1MU9XK	
Local Set		EU_FRANCE	
SW Model		UKS9000	
BOM Model		9000	
TUNER		-	
Ch Table		NONE	
MRT 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	
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		MC8121	
Info Link Server Type		development	
Info Link Country		None	
TTX Group		UserOSD	
Visual Test		Diabie	
OPTION_SWU			

Factory Menu Name	Data	Range
RF Remocon Support	OFF	
CDD mode	...	
DPMS Support	OFF	
T-CON Device	JazzFT	
RM Server Type	Operating	
LMF LEAVE THRESHOLD	160	
LMF TRIM THRESHOLD	120	
LMF TERM THRESHOLD	80	
EOS Click	OFF	
BP PMS Reset	1	
FAnet Thread	2	
CI CPLD Version	1	
ACM_MC	ON	
UNIQUE TRIPLET	ON	
FS_FAV	OFF	
Private Range USE	ON	
SCSA Support	OFF	
OCM Reboot	ON	
SPI Protection		
FKP Server Type	Default	
OCM Support	ON	
Preloading Support	ON	
Multitasking Support	ON	
Browser preloading Support	FULL	
EXT IR Boot Support	OFF	
APP BOOTING SUPPORT	ON	
NagSam Support	OFF	
EWBS Support	OFF	
MVPD MBR Provider	COMCAST	
cloudscan Always Upload	OFF	
FirstScreen Cach Size	300	
Hotel Option		
Hospitality Mode	OFF	
Power On		
Menu OSD		
Operation		
Music Mode		

#### 4. Troubleshooting

Factory Menu Name	Data	Range
External Source		
Eco Solution		
Cloning		
Shop Option		
Exhibition Mode	OFF	
Peak Mode	ON	
Metadata	ON	
Shopmode Picture Reset	ON	
Asia Option		
Unbalance	OFF	
AF Level adjust	0	
TX Power Level	0	
Mono Last Memory	OFF	
H Shaking	0	
SOUND		
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	ON	*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 greater 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)
Carrier2 Amp High ThLD	9	
Carrier2 Amp Low THLD	6	
Amp Volume	0xc4h	
Amp Scale	0x3ch	
Amp EQ Check Sum	0x000057B5	
Subwoofer Support	3	
Woofer Type	0	
Woofer Volume	0xc7h	
Woofer Scale	0x3fh	
Woofer Check sum	0x0000A273	
PEQ Inx	76	
PEQ Test	Ready	
Speaker EQ	ON	
Bottom Checksum	NONE	

Factory Menu Name	Data	Range
Wall Filter Type	3	
SRS Tuning Parm	0	
SPDIF PCM Gain	-9	
AudioDock BT Delay	90	
3D_Glass BT delay	50	
Mic Scale	OFF	
India Sound	0	
Speaker Delay Normal	0	
NTV CU Delay	NORMAL	
Lipsync Inx	1	
Lipsync Checksum	0x4972	
Lipsync USB Test	Ready	
Lipsync BT Checksum	0x0000	
TP volume	0xc4h	
TP Scale	0x6ch	
TP EQ CheckSum	NONE	

## ■ Debug

Factory Menu Name	Data	Range
Spread Spectrum		
LVDS Spread	0	
DDR Spread	0	
Period	0	
Amplitude	0	
HD DDR SSC ON OFF	OFF	
HD DDR SSC Value	0	
FHD DDR SSC ON OFF	OFF	
FHD DDR SSC Value	4	
UHD DDR SSC ON OFF	ON	
UHD DDR SSC Value	0	
P eBus SSC ON/OFF	OFF	
P eBus Value	0	
LVDS SSC ON/OFF	OFF	
LVDS SSC Value	0	
AP Vx1 SSC ON/OFF	ON	
AP Vx1 Value	12	
N Vx1 SSC ON/OFF	ON	

#### 4. Troubleshooting

Factory Menu Name	Data	Range
N Vx1 Value	0	
FRC Vx1 SSC ON/OFF	OFF	
FRC Vx1 SSC Period	0	
FRC Vx1 SSC Modulation	0	
FRC LVDS ON/OFF	ON	
FRC LVDS SSC MFR	3	
FRC LVDS SSC MRR	2	
FRC DDR SSC ON/OFF	ON	
FRC DDR SSC Period	1	
FRC DDR SSC Modulation	2	
ADV7619 Data strength	1	
ADV7619 Clock strength	1	
ADV7619 H_V_DE strength	1	
AP DDR SSC ON/OFF	OFF	
AP DDR SSC Value	0	
AP USIT SSC ON/OFF	ON	
AP USIT SSC Value	13	
OCM Vx1 SSC ON/OFF	OFF	
OCM Vx1 SSC Value	0	
TCON USIT SSC ON/OFF	BYPASS	
DDR Margin		
A CTRL_OFFSET_0_3	0	
A CTRL_OFFSET_D	0	
B CTRL_OFFSET_0_3	0	
B CTRL_OFFSET_D	0	
BT_ON_OFF	ON	
RF Mute Time	600ms	
Tuner Margin	3	European specifications
FRC		
FRC FDISPLAY ON/OFF	OFF	
3D 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	

Factory Menu Name	Data	Range
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		
Panel S/N 4		
MPEG Margin	20	
H.264 Margin	15	
CAM Wait Time	15	
Voice Debug	OFF	
Power Management		
Cert Option	Waiting	
RM_BIST_DTV	0	
RM_BIST_ATV	0	
RM_BIST_CABLE	0	
SerDES Check		
SerDES Tuner	Failure	
HDMI SW	Failure	
HDMI Rx	Failure	
MP	Failure	
Main SerDES	Failure	
Jack SerDES	Failure	
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 OOB MVPD SUPPORT	OFF	
BT DUT	OFF	



#### 4. Troubleshooting

Factory Menu Name	Data	Range
BT Throughput	Failure	
Reproduce Module	ON	
21_9		
L-DETECT STABLE TIME	7	
L-DETECT UNSTABLE TIME	3	
L-DETECT CAPTION THRESHOLD	720	
L-DETECT RAGION THRESHOLD	720	
L-DETECT B-LEVEL THRESHOLD	32	
L-DETECT USB SUPPORT	0	
DB Download		
MRT Option Dump	Failure	
Picture Data Dump	Failure	
VCONF Dump	Failure	
Read Eco Sensor Data	0	
No Signal Power OFF	ON	
Alert Option	ON	
Default HDMI1 Booting	OFF	

#### ■ 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		
DVI/HDMI SOUND	Auto	
HDMI HOT PLUG	Disable	
HOTPLUG SWITCHING	Auto	
HOT PLUG DURATION	800ms	
CLK TERM DURATION	300ms	
HDMI FLT CNT SIG	0ms	
HDMI FLT CND SIG2		
HDMI FLT CNT LOS	0ms	

Factory Menu Name	Data	Range
UNSTABLE BAN CNT	1250ms	
HDMI ROBIN	0	
HDMI Callback	ON	
HDMI CTS Thld	0	
HDMI CTS Cnt1	0	
HDMI EQ	0	
HDMI Write Type	0	
HDMI Switch	0	
DVI SET TIME	0	
H Write	0	
HDMI Sync	0	
HDMI 3D DET	1	
HOT PLUG OFF HOLD TIME	600ms	
HDMI MUTE TIME	0ms	
HDMI NFST UNMUTE TIME	800ms	
HDMI FST UNMUTE TIME	0ms	
REPEA AUDIO PKT	OFF	
HDMI Stable Count	3	
HDMI HDCP EN	OFF	
HDMI HDCP EN FLAG	85	
POWER ON FLT CNT LOS		
HDCP UPDATE SPI	READY	
SPI VERSION	0	
HdmiRx EQ	0	
HDMI TMDS ERR DET	1	
DVB CI		
TS Clock delay TC	0	
TS Clock delay S	0	
CI Control Buf ON	ON	
TS Clock delay CPU	1	
TS Clock delay TC2	0	
TS Clock delay S2	0	
CI Control Buf ON2	1	
TS Clock delay CPU2	0	
Test Pattern		
Scaler Pattern	OFF	
US Post Pattern	OFF	

#### 4. Troubleshooting

Factory Menu Name	Data	Range
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	
Upgrade		
T-CON DATA UPGRADE		
T-CON FW UPGRADE		
T-CON CheckSum		
T-CON2 Usb Download		
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		* Upgarde BT(There is upgrade program in Main-Image)
BT FREEPAIRING		
Function Upgrade		
FRC3D FW UPGRADE		
FRC3D SRP UPGRADE		
FRC3D LD UPGRADE		
FRC2 3D FW UPGRADE		
Camera Upgrade		* Upgarde Camera module(There is upgrade program in Main-Image)
Mic Upgrade		* Upgarde MIC in Camera module(There is upgrade program in Main-Image)
Jump UPGRADE		
IR Blaster Upgrade		
IR Blaster delay time		
NTV CU UPDATE		
UD LDC PROFILE UPGRADE		
Pic Data USB Update		

Factory Menu Name	Data	Range
Audio Data USB Update		
Eco Data USB Update		
CI CPLD Upgrade		
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		
Source Direct On/Off	OFF	
Apps Update		
Auto Power	LAST POWER	
SMCE Control		
Motor Test		
Cube Test		
V APP	OFF	
Picture Direct On/Off	OFF	
SVC Panel	ORIGINAL	
S/N		
Serial number		
Writing S/N		

## ■ ADC/WB

Factory Menu Name	Data	Range
ADC		
AV Calibration		
Comp Calibration		
PC Calibration		
HDMI Calibration		
ADC Result		

#### 4. Troubleshooting

Factory Menu Name	Data	Range
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	
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		

Factory Menu Name	Data	Range
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		
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		

4. Troubleshooting

Factory Menu Name	Data	Range
SPI W2 Boffset		
SPI MGA		
WB Data to SPI		

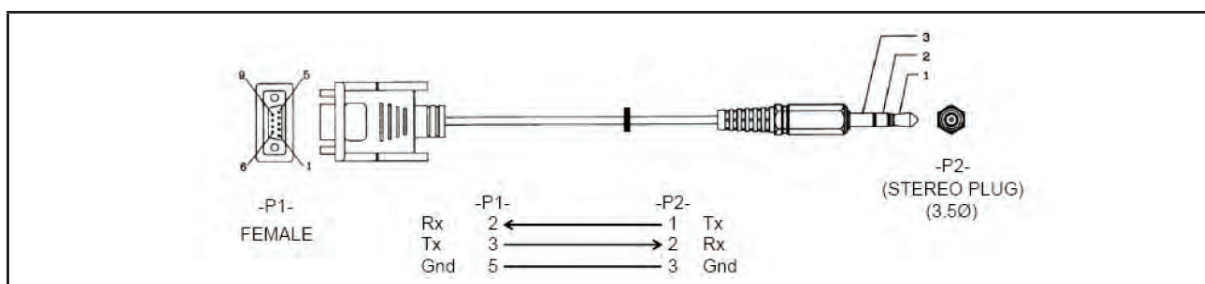
■ Advanced



## 4-5. RS-232C

### • RS232C Control

- Port : COM#(Serial)
- Bit 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

## 4-6. AV Control Tab

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		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	Advanced Settings	Color Space Custom Color	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
		HDMI Black Level	Low				0x01
		Film Mode	Off			0x05	0x00

Control Item				Cmd1	Cmd2	Cmd3	Value
PICTURE	Picture Option	Film Mode	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
	Screen Adjustment	Reset			0x0d	0x00	0x00
	Reset Picture	Reset Picture		0x0d	0x0b	0x00	0x00

Control Item				Cmd1	Cmd2	Cmd3	Value
PICTURE	3D	3D Mode	Off	0x0e	0x0c	0x00	0x00
			2D->3D				0x01
			Side By Side				0x02
			Top Bottom				0x03
			Line By Line				0x04
			Vertical Line				0x05
			Checker BD				0x06
			Frame Sequence				0x07
		3D->2D	Off			0x01	0x00
			On				0x01
		3D View Point				0x02	(-5~5)
		Depth				0x03	(1~10)
		3D Auto View	Off			0x05	0x00
			Message Notice				0x01
			On				0x02
			Auto1				0x03
			Auto2				0x04
		3D Light Control	Low			0x06	0x00
			High				0x01
		L/R Change	L to R			0x07	0x00
			R to L				0x01
		3D Perspective				0x08	value
		Optimize				0x09	value
	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

Control Item				Cmd1	Cmd2	Cmd3	Value
PICTURE	Pip	Size	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	Off			0x02	0x00	0x00
	Virtual Surrond	On					0x01
	SRS TruDialog	Off			0x03	0x00	0x00
	Dialog Clarify	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
	Auto Volume	Normal					0x01
		Night					0x02
	Speaker Select	TV Speaker			0x07	0x00	0x00
		External Speaker					0x01

#### 4. Troubleshooting

Control Item				Cmd1	Cmd2	Cmd3	Value
Sound	Speaker Select	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
	Audio Multi-Output	Off			0x11	0x00	0x00
	Multiroom Link Settings	Multiroom			0x12	0x00	0x00
	HDMI Audio Input Format	Bitstream			0x13	0x00	0x00
		PCM					0x01
	Audio Format	PCM			0x14	0x00	0x00
		Dolby Digital					0x01
		DTS					0x02
		DTS Neo 2:5					0x03
		AAC/HEAAC					0x04
	Dolby Digital Comp	RF			0x15	0x00	0x01
	HD Audio	Off			0x16	0x00	0x00
		On					0x01
KEY	Key Generation			0x0d	0x00	0x00	*Refer for Table
OSD	Show/Hide Control	Show		0x0e	0x00	0x00	0x00
		Hide					0x01
Get Status	Power (On/Off)			0xf0	0x00	0x00	0x00
Get Status	Volume(0~100)			0xf0	0x01	0x00	0x00
	Mute (On/Off)			0xf0	0x02	0x00	0x00
	Channel Number			0xf0	0x03	0x00	0x00



Control Item		Cmd1	Cmd2	Cmd3	Value
Get Status	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)

## 4-7. Updating the TV's Software

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

- [Settings](#) → [Support](#) → [Software Update](#)

### ■ Updating the TV's software to the latest version

- [Settings](#) → [Support](#) → [Software Update](#) → [Update now](#)

You can update your TV's software by downloading the update from the Internet directly to your TV or copying the update from a USB device that contains it to your TV.

- Updating from the Internet requires an active Internet connection.
- 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.



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.

### ■ Updating the TV automatically

- [Settings](#) → [Support](#) → [Software Update](#) → [Auto Update](#)

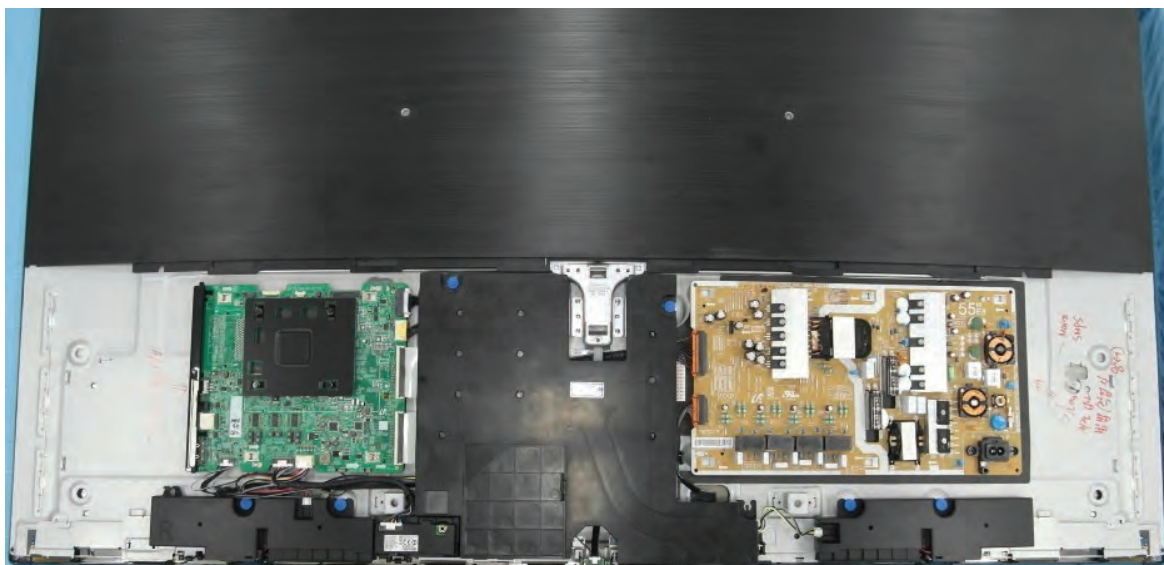
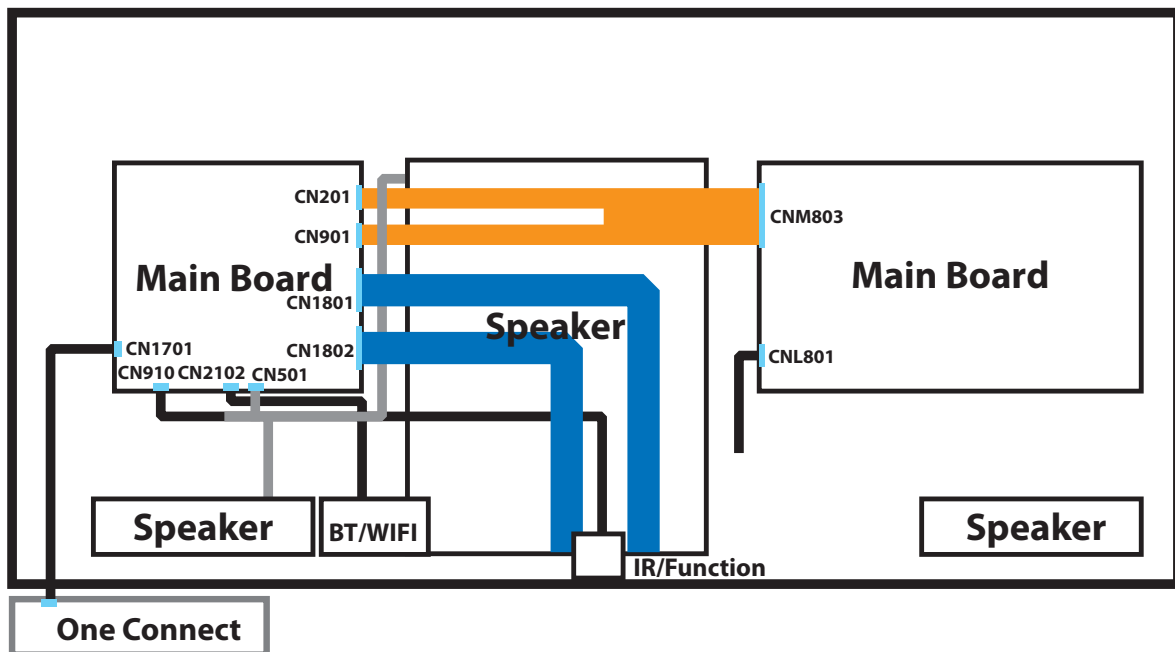
If the TV is connected to the Internet, you can have the TV's software update itself automatically while you are watching the TV. When the background update is completed, it is applied the next time the TV is turned on.

- This function may take a longer time if another network function is running concurrently.
- This function requires an Internet connection.
- If you agree to the Smart Hub terms and conditions, [Auto Update](#) is set to **On** automatically. If you do not want the TV's software to update itself automatically, set [Auto Update](#) to **Off**.

## 5. Wiring Diagram

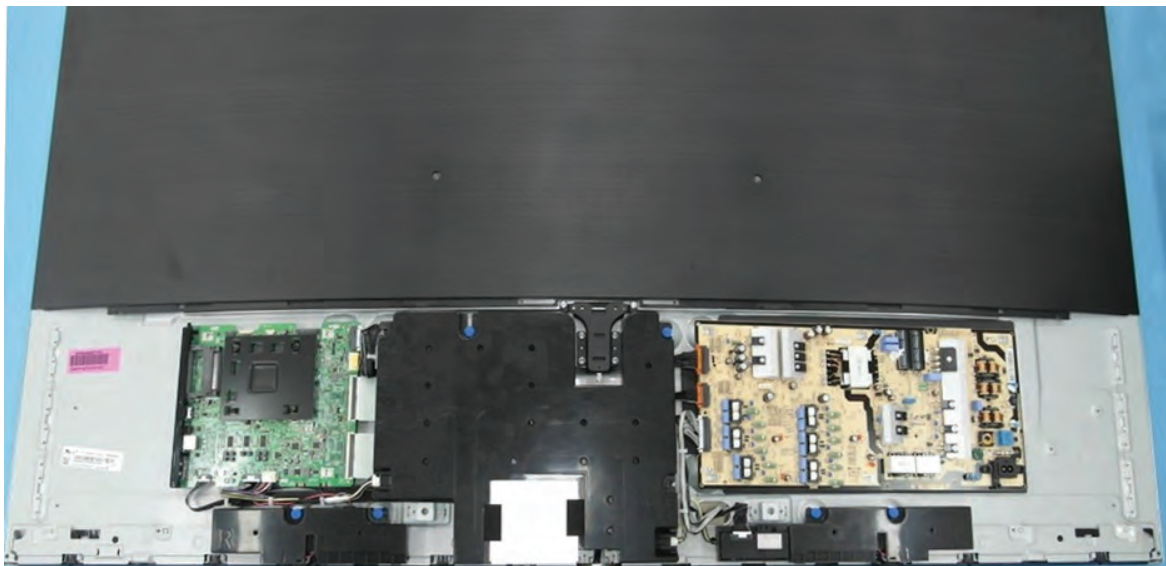
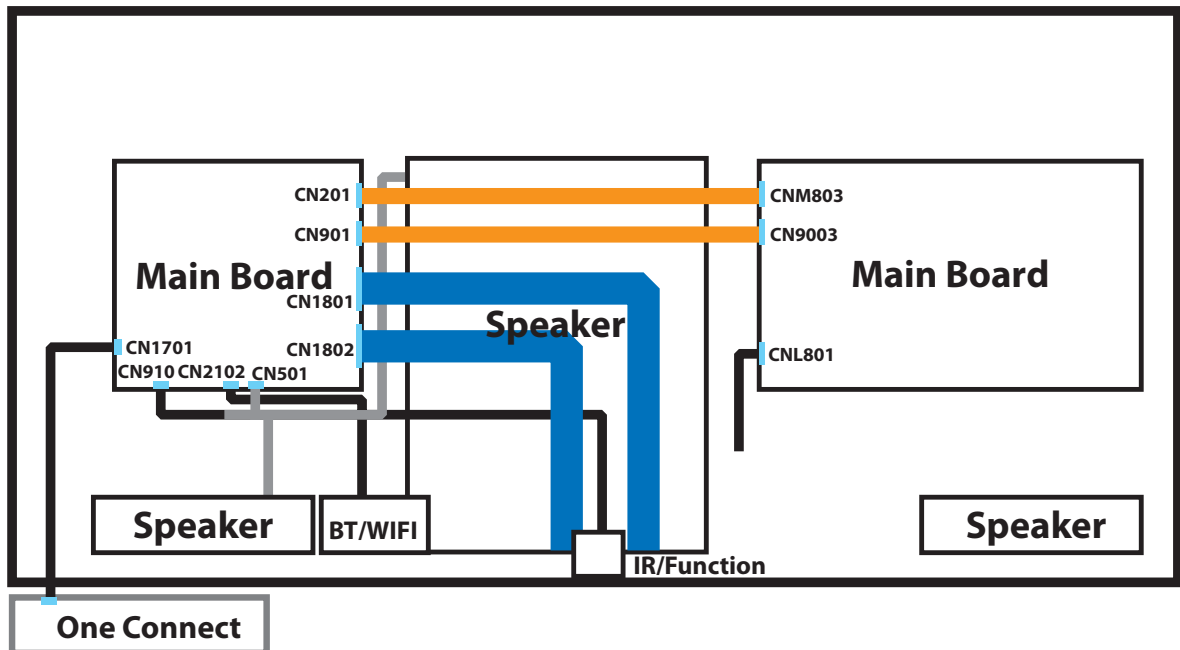
### 5-1. Wiring Diagram

■ 49 / 55 inches



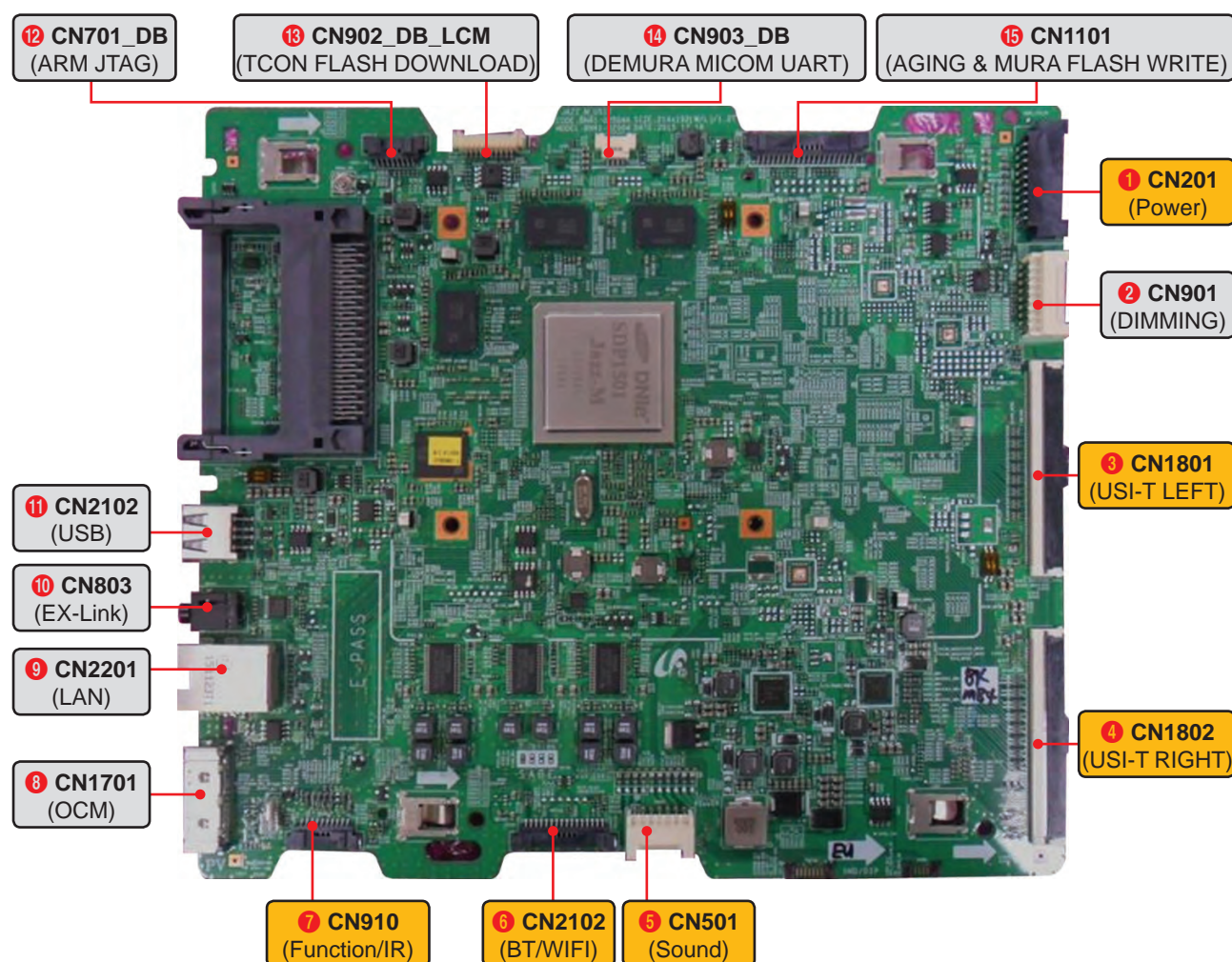
## 5. Wiring Diagram

### ■ 65 inches



## 5-2. Connector

### 5-2-1. Main Board



#### ■ Main Board Pin Map

1 CN201 (POWER)				2 CN901 (DIMMING)			
1	GND	2	GND	1	PWM_DIMMING_OUT1	2	ANA_DIMMING
3	A13V	4	GND	3	GND	4	PWM_DIMMING_OUT2
5	A13V	6	Power ON/OFF	5	PWM_DIMMING_OUT3	6	PWM_DIMMING_OUT4
7	A13V	8	BLU ON/OFF	7	PWM_DIMMING_OUT5	8	PWM_DIMMING_OUT6
9	A13V	10	OVD ON/OFF	9	PWM_DIMMING_OUT7	10	PWM_DIMMING_OUT8
11	Vamp	12	FAIL COUNT	11	GND	12	GND
13	Vamp	14	OVD LEVEL	13	PWM_DIMMING_OUT9	14	PWM_DIMMING_OUT10
15	Vamp	16	GND	15	PWM_DIMMING_OUT11	16	PWM_DIMMING_OUT12
17	GND	18	GND	17	-	18	-
19	GND	20	GND				

## 5. Wiring Diagram

3 CN1802 (USI-T RIGHT)					
1	FB_TRDY_E	2	GND	3	AVDD_17V_PW
5	AVDD_17V_PW	6	AVDD_17V_PW	7	U_H_CELL
9	HAVDD_8.5V_PW	10	L_H_CELL	11	L_L_CELL
13	VCCA_1.9V_PW	14	PI_DSF_MONITOR	15	PORTNUM
17	-	18	-	19	-
21	SFC1	22	GND	23	JM_USIT_TX_CH8_A+
25	GND	26	JM_USIT_TX_CH8_B+	27	JM_USIT_TX_CH8_B-
29	JM_USIT_TX_CH9_A+	30	JM_USIT_TX_CH9_A-	31	GND
33	JM_USIT_TX_CH9_B-	34	GND	35	JM_USIT_TX_CH10_A+
37	GND	38	JM_USIT_TX_CH10_B+	39	JM_USIT_TX_CH10_B-
41	JM_USIT_TX_CH11_A+	42	JM_USIT_TX_CH11_A-	43	GND
45	JM_USIT_TX_CH11_B-	46	GND	47	JM_USIT_TX_CH12_A+
49	GND	50	JM_USIT_TX_CH12_B+	51	JM_USIT_TX_CH12_B-
53	JM_USIT_TX_CH13_A+	54	JM_USIT_TX_CH13_A-	55	GND
57	JM_USIT_TX_CH13_B-	58	GND	59	JM_USIT_TX_CH14_A+
61	GND	62	JM_USIT_TX_CH13_B+	63	JM_USIT_TX_CH14_B-
65	JM_USIT_TX_CH15_A+	66	JM_USIT_TX_CH13_A-	67	GND
69	JM_USIT_TX_CH15_B-	70	GND	71	SFC2
73	-	74	ASG_MON_R_MB4	75	STVP_MB4
77	CKVB3_MB4	78	CKVB2_MB4	79	CKVB1_MB4
81	CKV3_MB4	82	CKV2_MB4	83	CKV1_MB4
85	VOFF_-11V_PW	86	VSS_-7.5V_PW	87	-
89	FB_VCOM3_CELL	90	VCOM2_CELL	91	VCOM1_CELL
93	PANEL_3.3V_PW	94	PANEL_3.3V_PW	95	FB_TRDY_3
				96	GND

4 CN1801 (USI-T LEFT)					
1	FB_TRDY_1	2	GND	3	PANEL_3.3V_PW
5	FB_VCOM1_2CELL	6	VCOM1_CELL	7	VCOM2_CELL
9	VSS_-7.5V_PW	10	VOFF_-11V_PW	11	-
13	CKV2_MB4	14	CKV3_MB4	15	CKV4_MB4
17	CKVB2_MB4	18	CKVB3_MB4	19	CKVB4_MB4
21	ASG_MON_L_MB4	22	-	23	GND
25	DEMURA_SSPHOLD_SPI	26	DEMURA_SSPWP_SPI	27	DEMURA_SSPRXD_SPI
29	DEMURA_SSPFRM_SPI	30	DEMURA_SSPCLK_SPI	31	GND
33	JM_USIT_TX_CH0_A-	34	GND	35	JM_USIT_TX_CH0_B+
37	GND	38	JM_USIT_TX_CH1_A+	39	JM_USIT_TX_CH1_A-
41	JM_USIT_TX_CH1_B+	42	JM_USIT_TX_CH1_B-	43	GND
45	JM_USIT_TX_CH2_A-	46	GND	47	JM_USIT_TX_CH2_B+
49	GND	50	JM_USIT_TX_CH3_A+	51	JM_USIT_TX_CH3_A-
53	JM_USIT_TX_CH3_B+	54	JM_USIT_TX_CH3_B-	55	GND
57	JM_USIT_TX_CH4_A-	58	GND	59	JM_USIT_TX_CH4_B+
61	GND	62	JM_USIT_TX_CH5_A+	63	JM_USIT_TX_CH5_A-
65	JM_USIT_TX_CH5_B+	66	JM_USIT_TX_CH5_B-	67	GND
69	JM_USIT_TX_CH6_A-	70	GND	71	JM_USIT_TX_CH6_B+
73	GND	74	JM_USIT_TX_CH7_A+	75	JM_USIT_TX_CH7_A-
77	JM_USIT_TX_CH7_B+	78	JM_USIT_TX_CH7_B-	79	GND
81	GND	82	PI_DSF_MONITOR	83	PORTNUM
85	VCCB_1.8V_PW	86	L_L_CELL	87	L_H_CELL
89	U_L_CELL	90	U_H_CELL	91	AVDD_17V_PW
93	AVDD_17V_PW	94	AVDD_17V_PW	95	-
				96	FB_TRDY_2



## 5. Wiring Diagram

5 CN501 (SOUND)			
1	TWT_R+	2	TWT_R-
3	MID_R+	4	MID_R-
5	-	6	-
7	TWT_L+	8	TWT_L-
9	MID_L+	10	MID_L-
11	WF_L+	12	WF_L-
13	-	14	-

6 CN2102 (BT/WIFI)			
1	BT_NRESET	2	BT_POWER_DET
3	BT_WAKE	4	-
5	BT_D-_USB	6	BT_D+_USB
7	-	8	BT_WELCOME
9	WIFI_PHY_ON	10	-
11	WIFI_D+_USB	12	WIFI_D-_USB
13	-	14	WIFI_5V
15	WIFI_WOL	16	WIFI_NRESET

7 CN910 (FUNCTION/IR)			
1	IR	2	GND
3	A3.3V_PW	4	AMP_SCL_12C
5	AMP_SDA_12C	6	KEY_INPUT1
7	KEY_INPUT2	8	LED_STB_OUT
9	A3.3V_PW	10	LED_CTRL

8 CN1701(OCM)			
1	A3.3V_PW	2	TUNER_SDA_12C
3	TUNER_SCL_12C	4	OCM_IDENT
5	JAZZOCM_SDA_12C	6	JAZZOCM_SCL_12C
7	OCM_VBY1_LockN	8	OCM_D+_USB
9	OCM_D-_USB	10	GND
11	OCM_M_RX1-_VBY1	12	OCM_M_RX1+_VBY1
13	GND	14	OCM_M_RX0-_VBY1
15	OCM_M_RXO+_VBY1	16	GND
17	OCM_M_RXCLK-_HDMI	18	OCM_M_RXCLK+_HDMI
19	GND	20	OCM_M_RX0-_HDMI
21	OCM_M_RX0+_HDMI	22	GND
23	OCM_M_RX1-_HDMI	24	OCM_M_RX1+_HDMI
25	GND	26	OCM_M_RX2-_HDMI
27	OCM_M_RX2+_HDMI	28	GND
29	OCM_SDA_12C_DDC	30	OCM_SCL_12C_DDC
31	GND	32	CEC_SIGNAL
33	-	34	Reserved
35	GND	36	SPDIF_OUT
37	OCM_NRESET	38	SPDIF_IN
39	OCM_CLK_RST	40	OCM_13V_PW
41	OCM_13V_PW	42	OCM_13V_PW
43	OCM_13V_PW	44	OCM_13V_PW

9 CN2201 (LAN)			
1	LAN_TXD+_LAN	2	GND
3	LAN_TXD-_LAN	4	LAN_RXD+_LAN
5	GND	6	LAN_RXD-_LAN
7	-	8	LAN_GND

10 CN803 (EX-Link)			
1	GND	2	IC1005_DOUT
3	IC1005_RIN	4	GND
5	GND	6	IC1005_DOUT

11 CN2102 (USB3)			
1	A5V_USB1_PW	2	D-
3	D+	4	GND

12 CN701_DB (ARM JTAG)			
1	B3.3V_PW	2	SUB_AMP_SDA_12C
3	ARM_TDI	4	ARM_TMS
5	ARM_TCK	6	ARM_TDO
7	B3.3V_PW	8	GND



**13 CN902\_DB\_LCM (TCON FLASH DOWNLOAD)**

1	B3.3V_PW	2	TCON_SSPFRM_SPI
3	TCON_SSPRXD_SPI	4	TCON_SSPWP_SPI
5	TCON_SSPCLK_SPI	6	TCON_SSPTXD_SPI
7	GND	8	SYS_NRESET/TCON_SSPHOLD_SPI
9	INT_TCON_SDA_12C	10	INT_TCON_SCL_12C

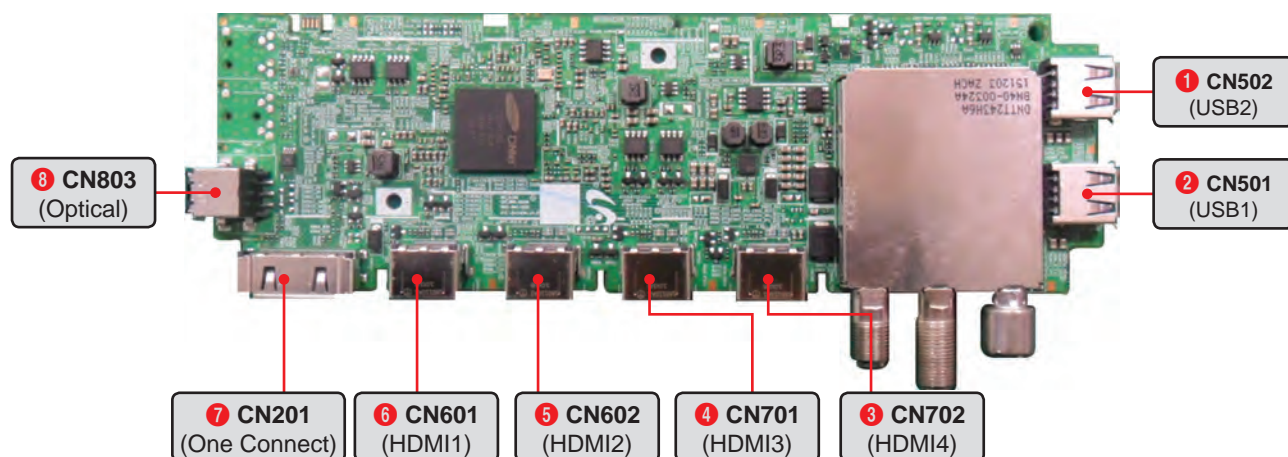
**14 CN903\_DB (DEMURA MICOM UART)**

1	B3.3V_PW	2	DEMC_UART_TXD
3	DEMC_UART_RXD	4	GND

**15 CN1101 (AGING & MURA FLASH WRITE)**

1	A13V_PW	2	A13V_PW
3	A13V_PW	4	GND
5	PI_AGING_EN	6	PI_AGING_EN
7	INT_TCON_SDA_12C	8	INT_TCON_SCL_12C
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	A13V_PW	18	GND
19	PI_LINE_CON0	20	PI_LINE_CON1

## 5-2-2. One Connect Board



## ■ One connect Board Pin Map

1 CN502 (USB2)			
1	USB1_VCC_5V_PW	2	DS1_D-_USB
3	DS1_D+_USB	4	GND

2 CN501 (USB1)			
1	USB1_VCC_5V_PW	2	DS1_D-_USB
3	DS1_D+_USB	4	GND

3 CN702 (HDMI4)			
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+_HDMI
11	GND	12	HDMI4_RX_CLK-_HDMI
13	CEC	14	-
15	HDMI4_SCL_DDC_OUT	16	HDMI4_SDA_DDC_OUT
17	GND	18	HDMI4_5V_PW
19	HDMI4_HOT_PLUG		

4 CN701 (HDMI3)			
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+_HDMI
11	GND	12	HDMI3_RX_CLK-_HDMI
13	CEC	14	-
15	HDMI3_SCL_DDC_OUT	16	HDMI3_SDA_DDC_OUT
17	GND	18	HDMI3_5V_PW
19	HDMI3_HOT_PLUG		

5 CN602 (HDMI2)			
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+_HDMI
11	GND	12	HDMI2_RX_CLK-_HDMI
13	CEC	14	-
15	HDMI2_SCL_DDC_OUT	16	HDMI2_SDA_DDC_OUT
17	GND	18	HDMI2_5V_PW
19	HDMI2_HOT_PLUG		

**6 CN601 (HDMI1)**

1	HDMI1_RX2+_HDMI	2	GND
3	HDMI1_RX2-_HDMI	4	HDMI1_RX+_HDMI
5	GND	6	HDMI1_RX-_HDMI
7	HDMI1_RX0+_HDMI	8	GND
9	HDMI1_RX0-_HDMI	10	HDMI1_RX_CLK+_HDMI
11	GND	12	HDMI1_RX_CLK-_HDMI
13	CEC	14	-
15	HDMI1_SCL_DDC_OUT	16	HDMI1_SDA_DDC_OUT
17	GND	18	HDMI1_5V_PW
19	HDMI1_HOT_PLUG		

**7 CN201 (One Connect)**

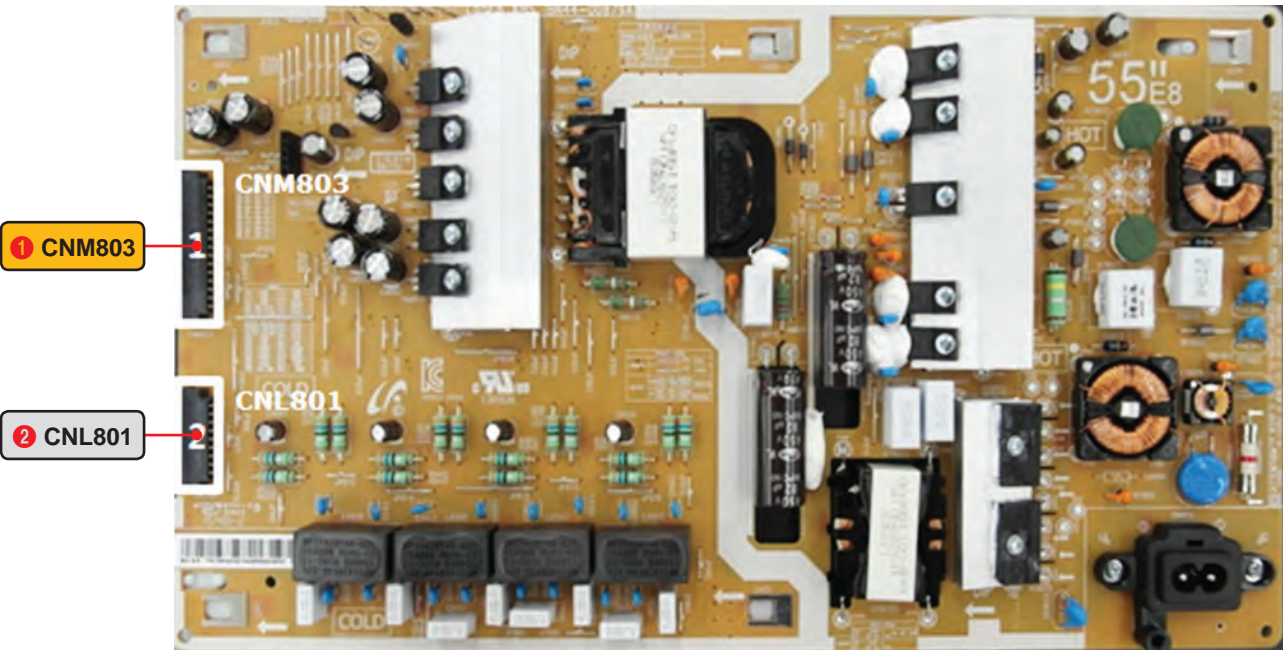
1	A3.3V_PW	2	MAIN_TUNER_SDA_12C
3	MAIN_TUNER_SCL_12C	4	JACK_IDENT
5	OCM_TUNER_SDA_12C	6	OCM_TUNER_SCL_12C
7	OCM_VBY1_LockN	8	UPSTREAM_D+_USB
9	UPSTREAM_D-_USB	10	GND
11	SERDES_B-_VBY1	12	SERDES_B+_VBY1
13	GND	14	SERDES_A-_VBY1
15	SERDES_A+_VBY1	16	GND
17	HDMI_TX_CLK-_HDMI	18	HDMI_TX_CLK+_HDMI
19	GND	20	HDMI_TX_DATA0-_HDMI
21	HDMI_TX_DATA0+_HDMI	22	GND
23	HDMI_TX_DATA1-_HDMI	24	HDMI_TX_DATA1+_HDMI
25	GND	26	HDMI_TX_DATA2-_HDMI
27	HDMI_TX_DATA2+_HDMI	28	GND
29	HDMI_TX_SDA_DDC	30	HDMI_TX_SCL_DDC
31	GND	32	CEC_OUT
33	FEF_HOLD	34	SW_POWER_OUT
35	GND	36	SPDIF_MAIN_OUT
37	OCM_RESET	38	SPDIF_OCM_OUT
39	OCM_CLK_RST	40	OCM_13V_PW
41	OCM_13V_PW	42	OCM_13V_PW
43	OCM_13V_PW	44	OCM_13V_PW

**8 CN803(OPTICAL)**

1	SPDIF_MAIN_OUT	2	GND
3	GND		

5-2-3. SMPS Board

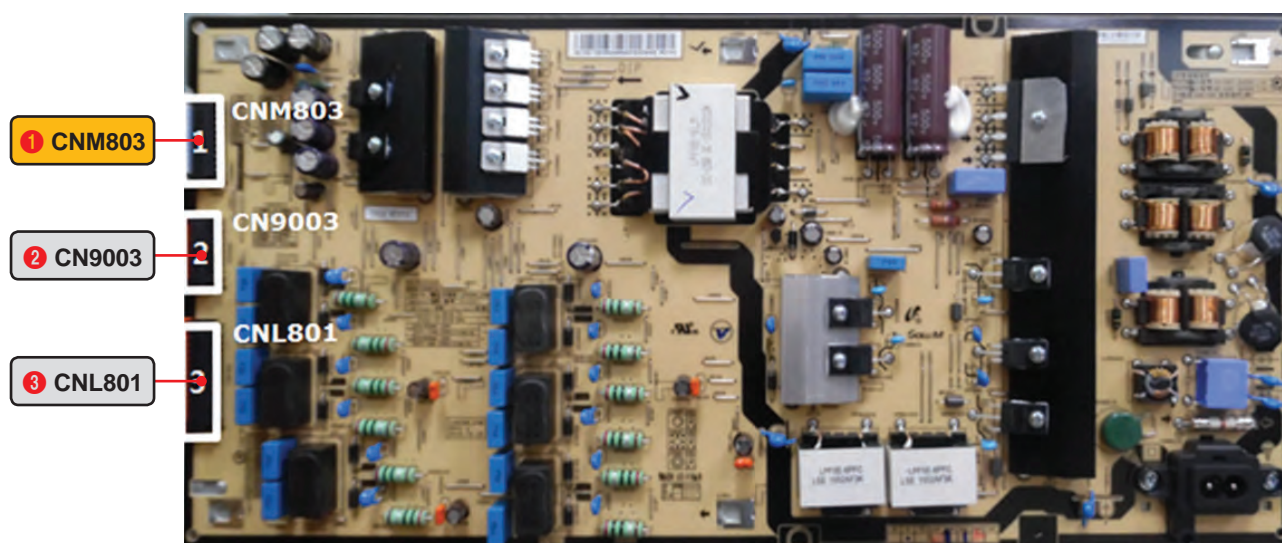
■ 49 / 55 inches



■ SMPS Board Pin Map

1 CNM803				2 CNL801			
1	GND	2	GND	1	IF2	2	IF1
3	GND	4	GND	3	1+	4	5+
5	Vamp	6	GND	5	1-	6	5-
7	Vamp	8	OVD LEVEL	7	2+	8	6+
9	Vamp	10	FAIL COUNT	9	2-	10	6-
11	A13V	12	OVD ON/OFF	11	3+	12	7+
13	A13V	14	BLU ON/OFF	13	3-	14	7-
15	A13V	16	Power ON/OFF	15	4+	16	8+
17	A13V	18	GND	17	4-	18	8-
19	GND	20	GND				
21	PWM_DIMMING_OUT8	22	PWM_DIMMING_OUT7				
23	PWM_DIMMING_OUT6	24	PWM_DIMMING_OUT5				
25	PWM_DIMMING_OUT4	26	PWM_DIMMING_OUT3				
27	GND	28	PWM_DIMMING_OUT2				
29	PWM_DIMMING_OUT1	30	GND				

## ■ 65 inches



## ■ SMPS Board Pin Map

1 CNM803				3 CNL801			
1	GND	2	GND	1	IF2	2	IF1
3	GND	4	GND	3	1+	4	7+
5	Vamp	6	GND	5	1-	6	7-
7	Vamp	8	OVD LEVEL	7	2+	8	8+
9	Vamp	10	FAIL COUNT	9	2-	10	8-
11	A13V	12	OVD ON/OFF	11	3+	12	9+
13	A13V	14	BLU ON/OFF	13	3-	14	9-
15	A13V	16	Power ON/OFF	15	4+	16	10+
17	A13V	18	GND	17	4-	18	10-
19	GND	20	GND	19	5+	20	11+
2 CN9003				21	5-	22	11-
1	PWM_DIMMING_OUT12	2	PWM_DIMMING_OUT11	23	6+	24	12+
3	PWM_DIMMING_OUT10	4	PWM_DIMMING_OUT9	25	6-	26	12-
5	GND	6	GND				
7	PWM_DIMMING_OUT8	8	PWM_DIMMING_OUT7				
9	PWM_DIMMING_OUT6	10	PWM_DIMMING_OUT5				
11	PWM_DIMMING_OUT4	12	PWM_DIMMING_OUT3				
13	GND	14	PWM_DIMMING_OUT2				
15	PWM_DIMMING_OUT1	16	ANA_DIMMING				



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