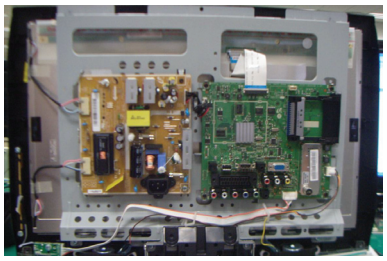
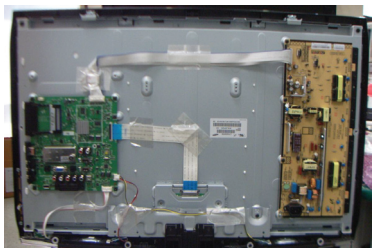
4. Troubleshooting

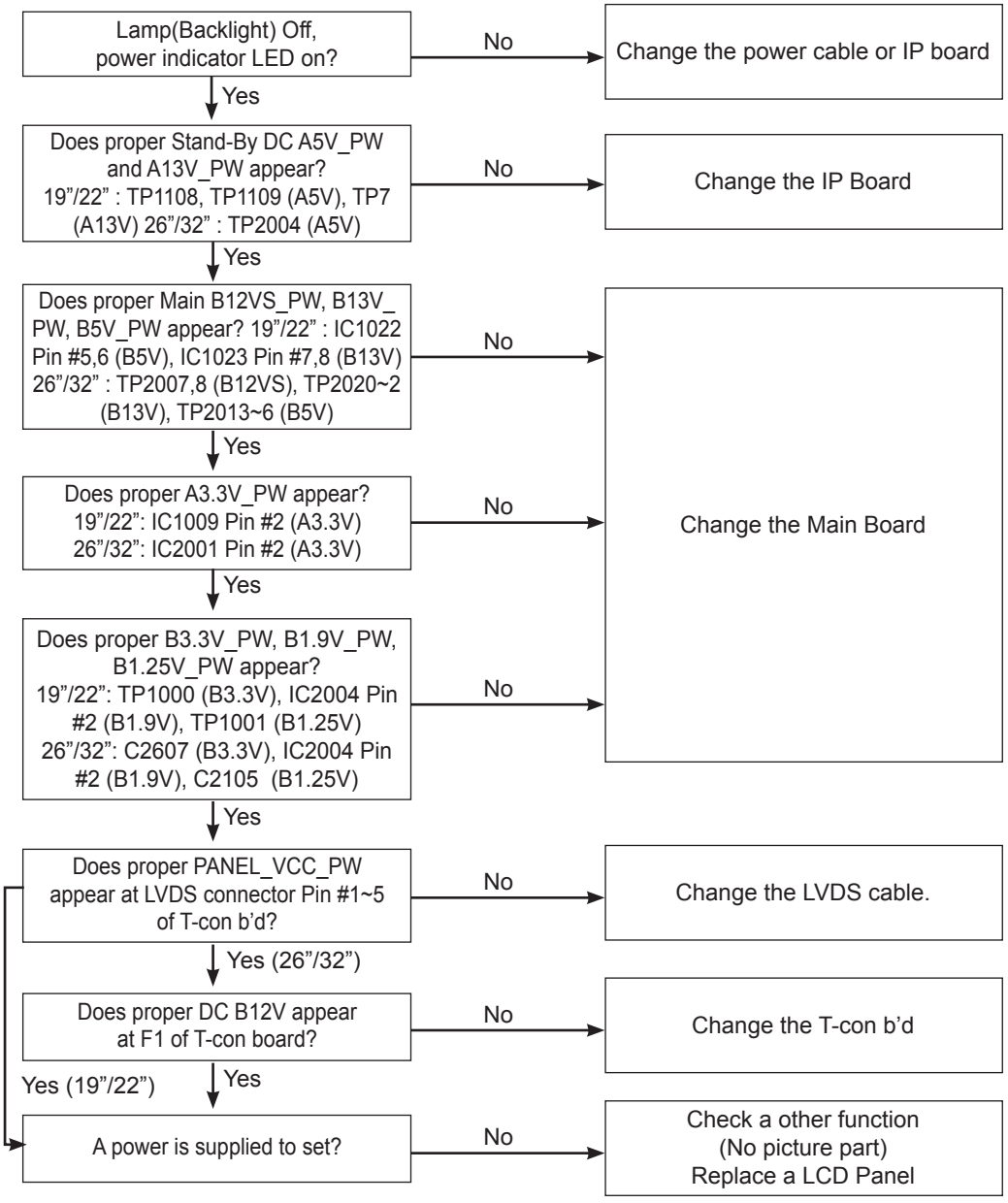
4-1. Troubleshooting

4-1-1. Previous check

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

4-1-2. No Power

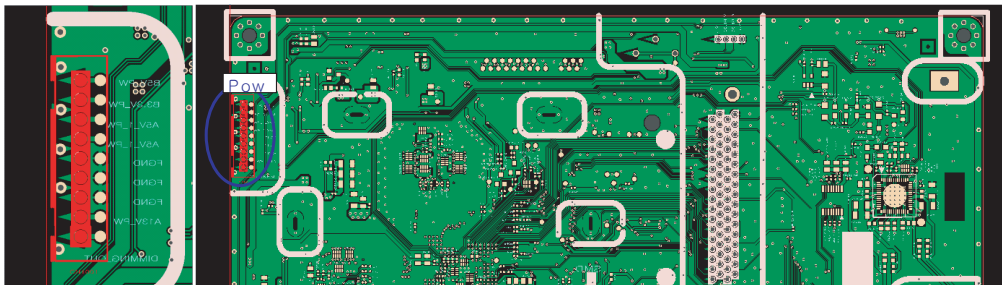
Symptom	– The LEDs on the front panel do not work when connecting the power cord. – The SMPS relay does not work when connecting the power cord. – The units appears to be dead.
Major checkpoints	The IP relay or the LEDs on the front panel does not work when connecting the power cord if the cables are improperly connected or the Main Board or SMPS is not functioning. In this case, check the following: – Check the internal cable connection status inside the unit. – Check the fuses of each part. - Check the output voltage of SMPS. - Replace the Main Board.
Diagnostics	  LE19/22B45*** LE26/32B45***
Caution	Make sure to disconnect the power before working on the IP board.

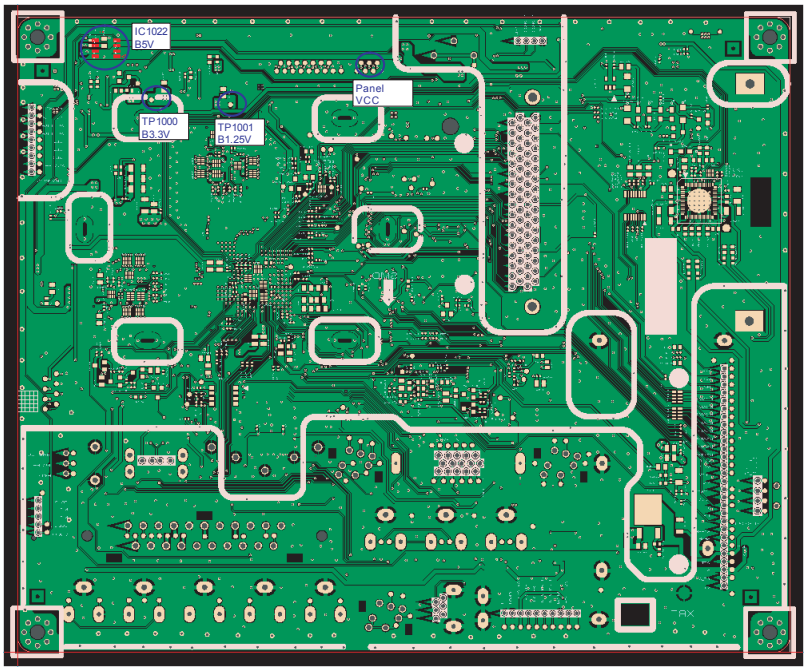


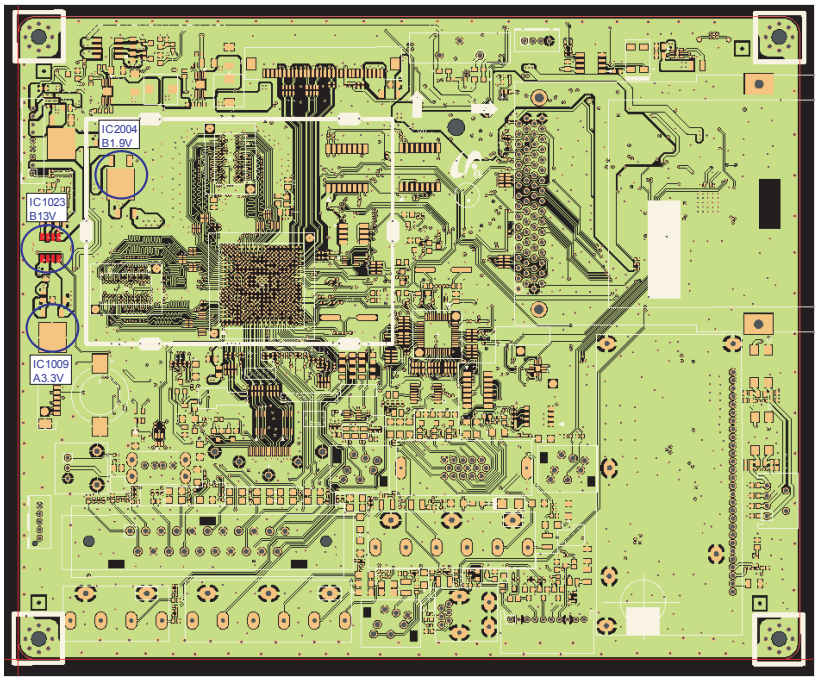
LE19/22B45***

Power CN1001

Pin	1	2	3	4	5	6	7	8	9
	Dimming out	A13V	GND	GND	GND	A5V	A5V	B3.3V	Panel Setting

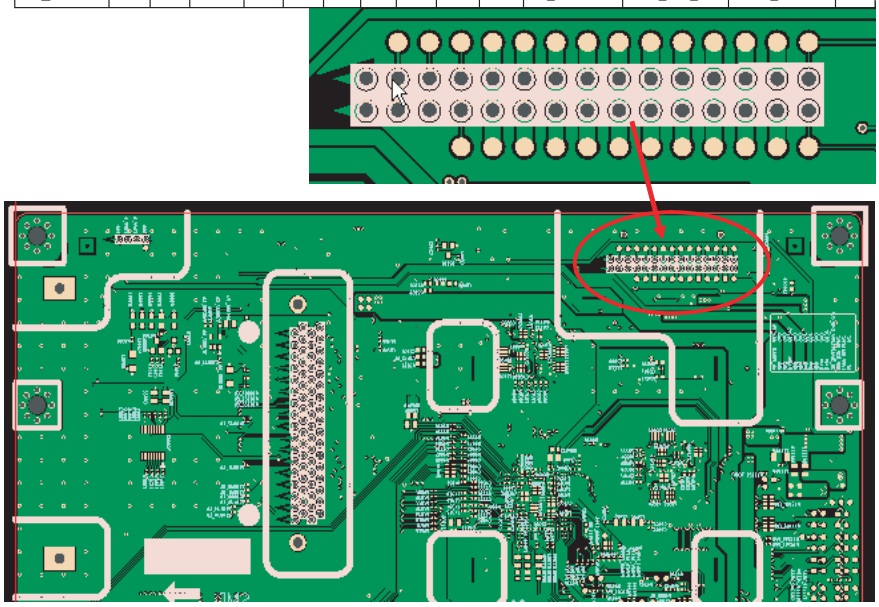


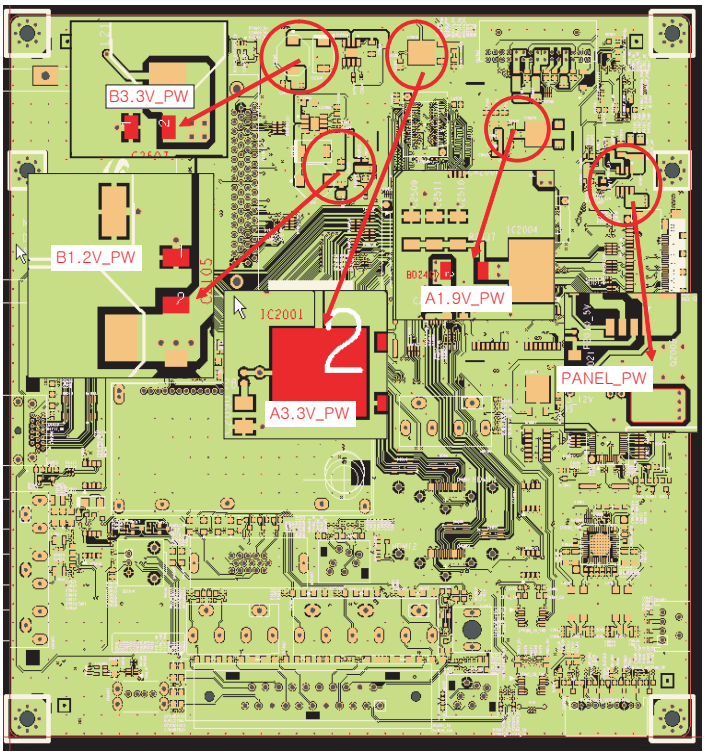


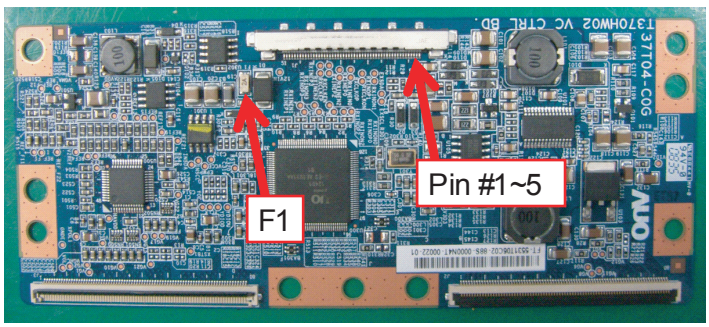


LE26/32B45*

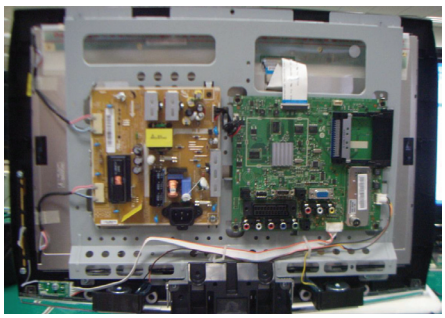
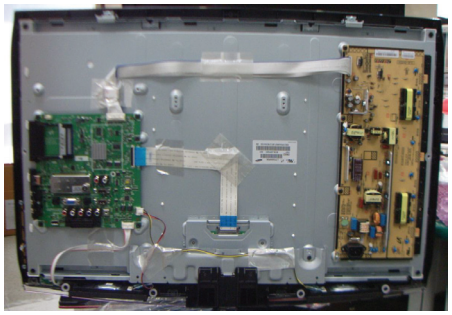
B5V_PW	GND	GND	B12VS	GND	GND	B5V	B5V	GND	GND	B13V	ANA_DIM_OUT	NC	NC	NC
SW_POWER	GND	GND	B12VS	GND	GND	B5V	B5V	GND	B13V	B13V	SW_INVERTER	PWM_DIM_OUT	LAMP_DETECT	NC

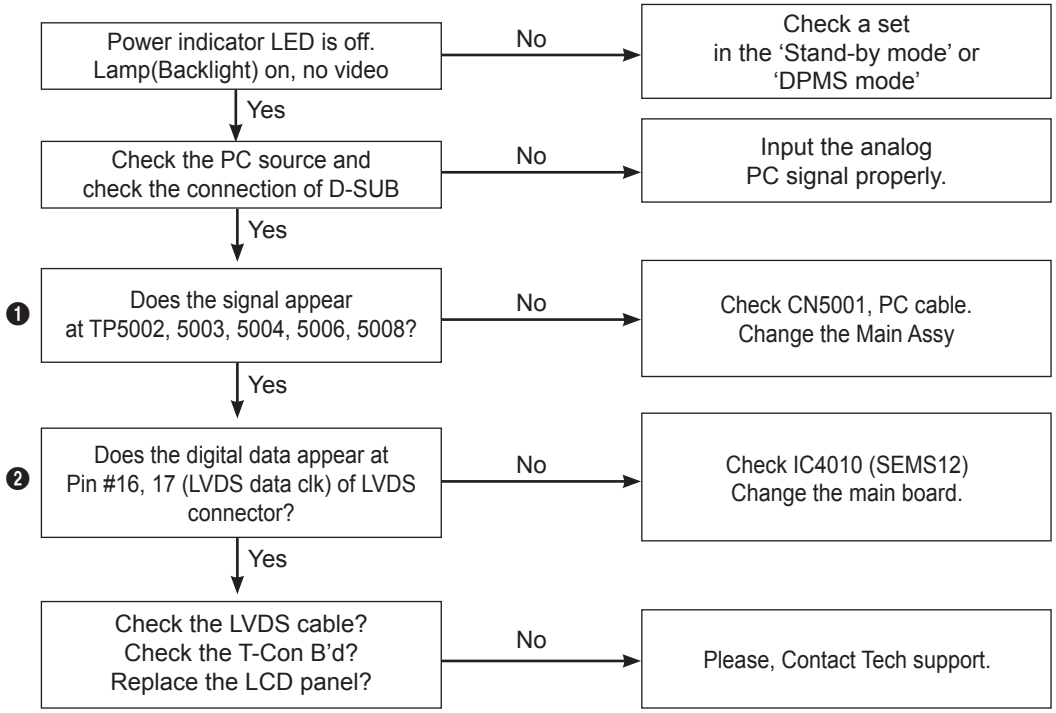




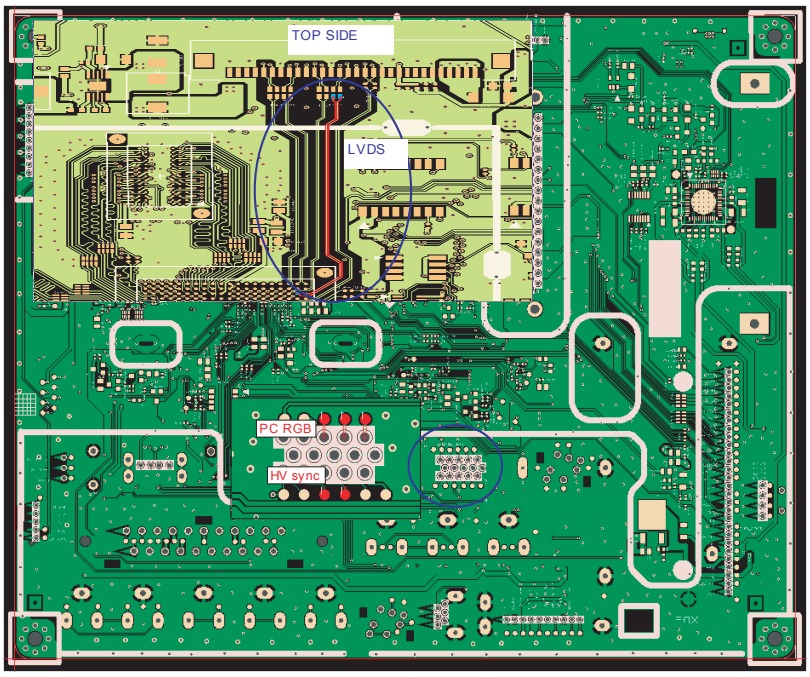


4-1-3. No Video (Analog PC signal)

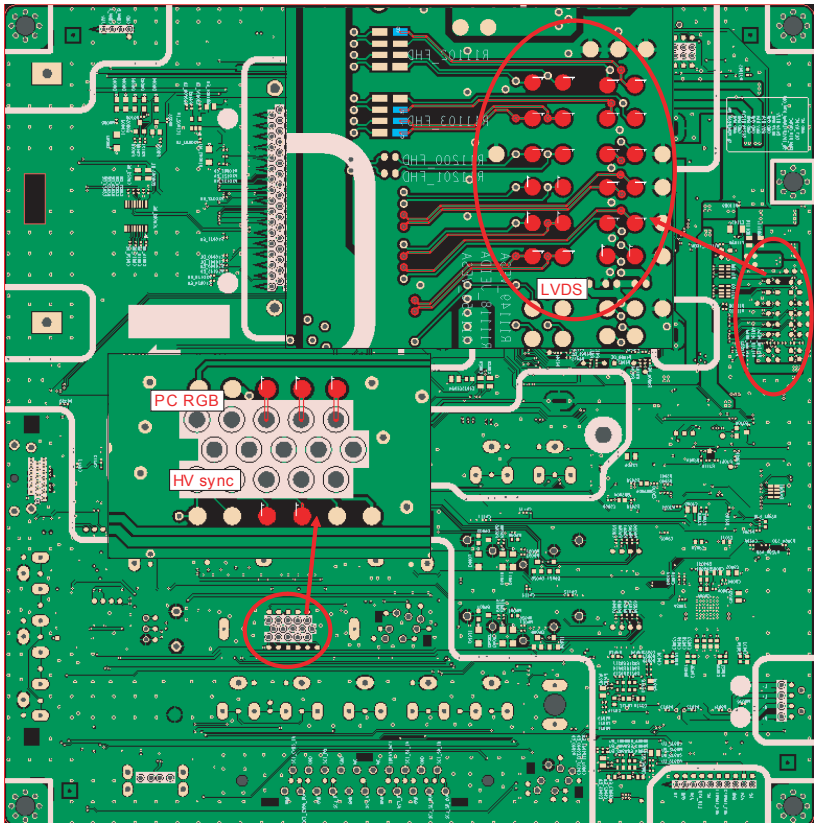
Symptom	– Audio is normal but no picture is displayed on the screen.
Major checkpoints	– Check the PC source – Check the Arsenal, Check the Chelsea. – This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.
Diagnostics	 LE19/22B45***  LE26/32B45***
Caution	Make sure to disconnect the power before working on the IP board.



LE19/22B45*

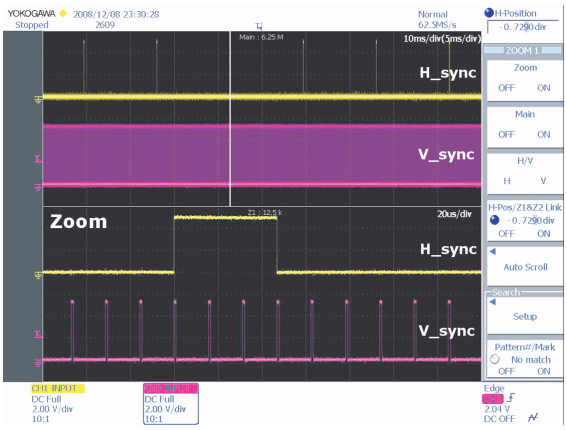


LE26/32B45*

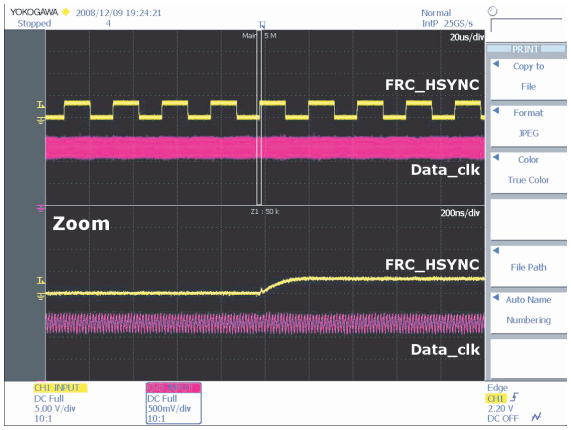


WAVEFORMS

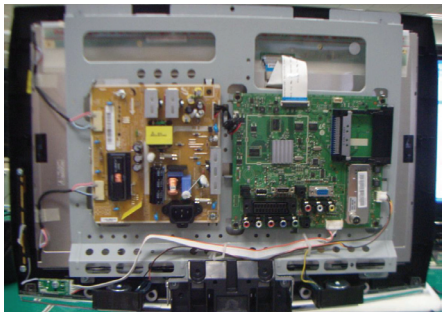
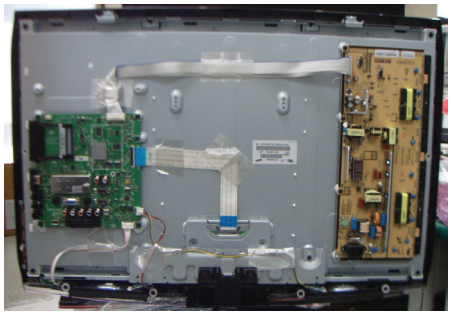
❶	**PC input (V-sink , H-sink , R/G/B)**

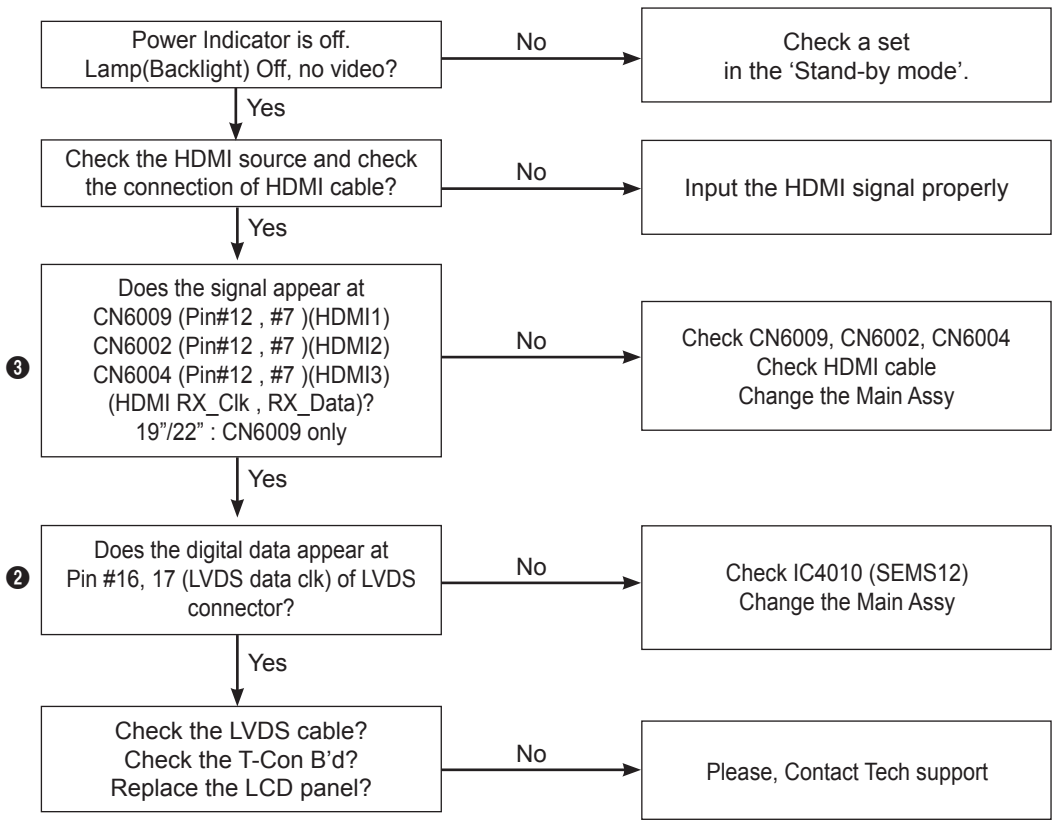


❷	**LVDS output**

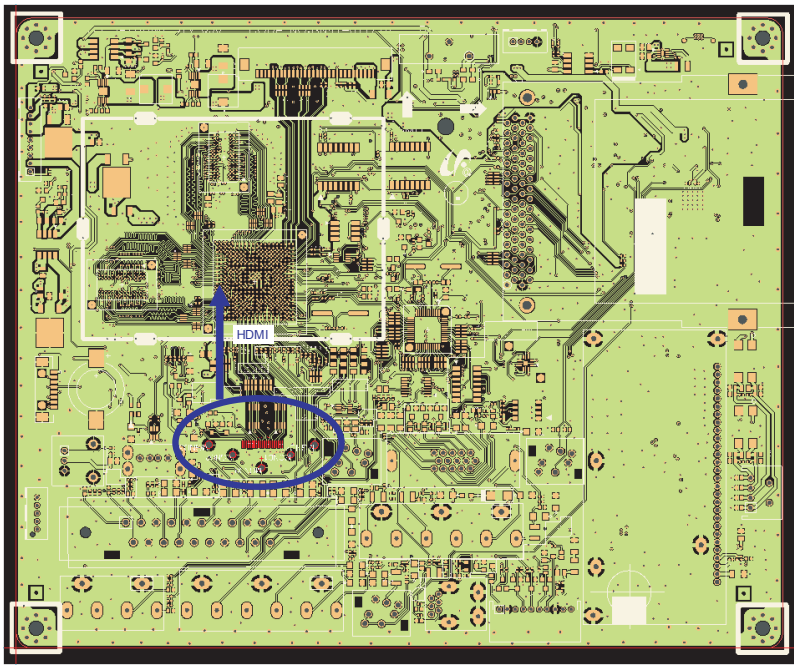


4-1-4. No Video (HDMI 1, 2, 3 - Digital Signal)

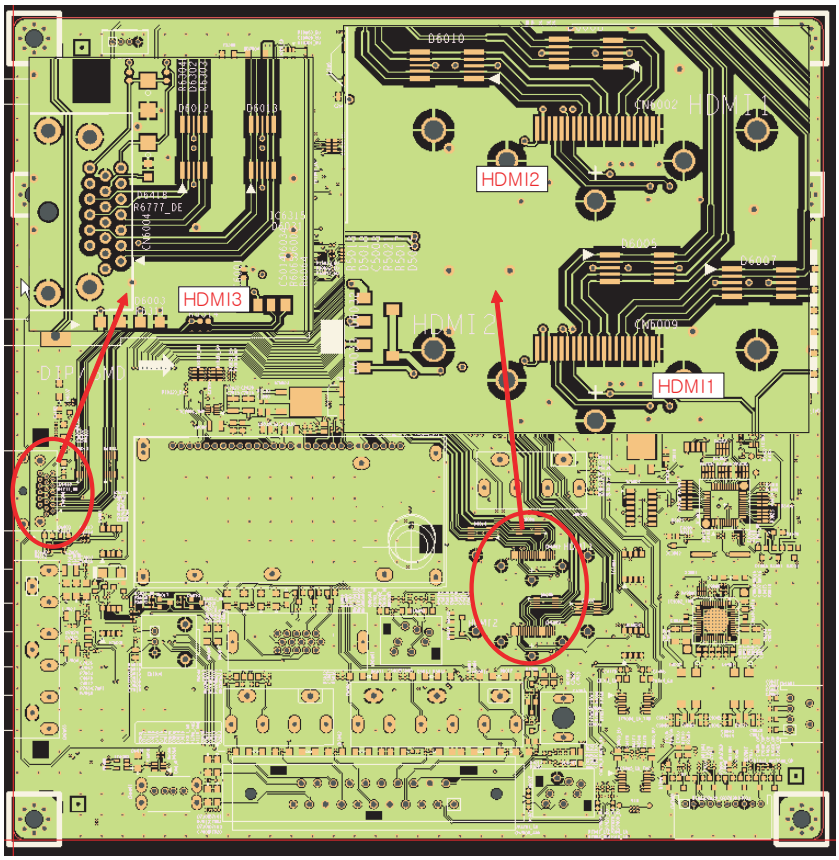
Symptom	– Audio is normal but no picture is displayed on the screen.
Major checkpoints	– Check the HDMI source. – Check the HDMI switch, Check the Chelsea. – This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.
Diagnostics	  LE19/22B45*** LE26/32B45***
Caution	Make sure to disconnect the power before working on the IP board.



LE19/22B45*

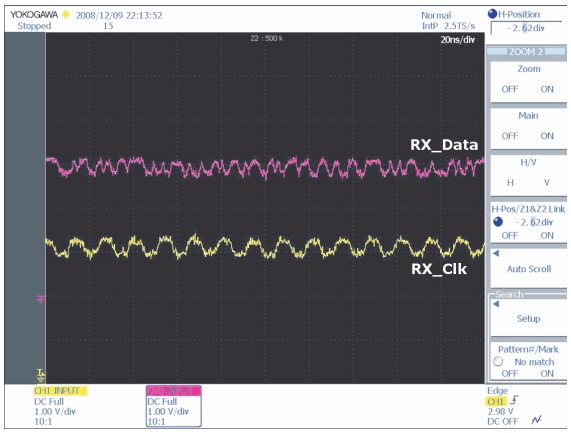


LE26/32B45*

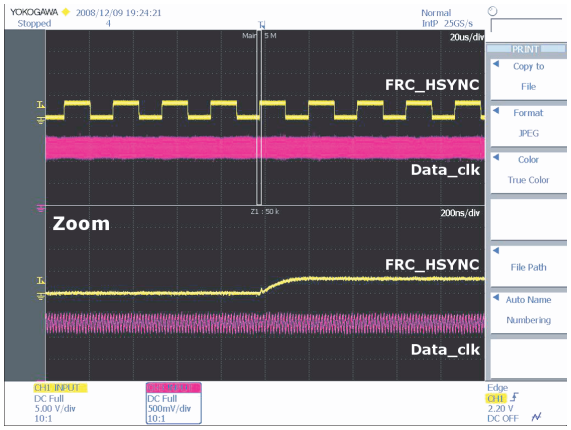


WAVEFORMS

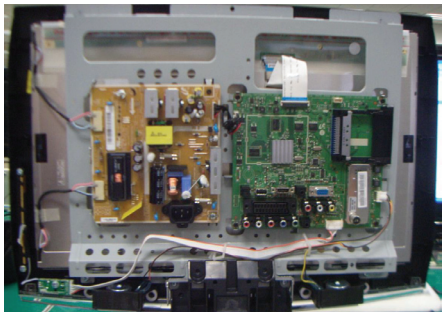
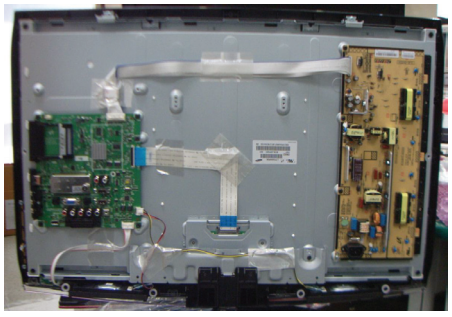
❸	HDMI input (RX_Data, RX_Clk)

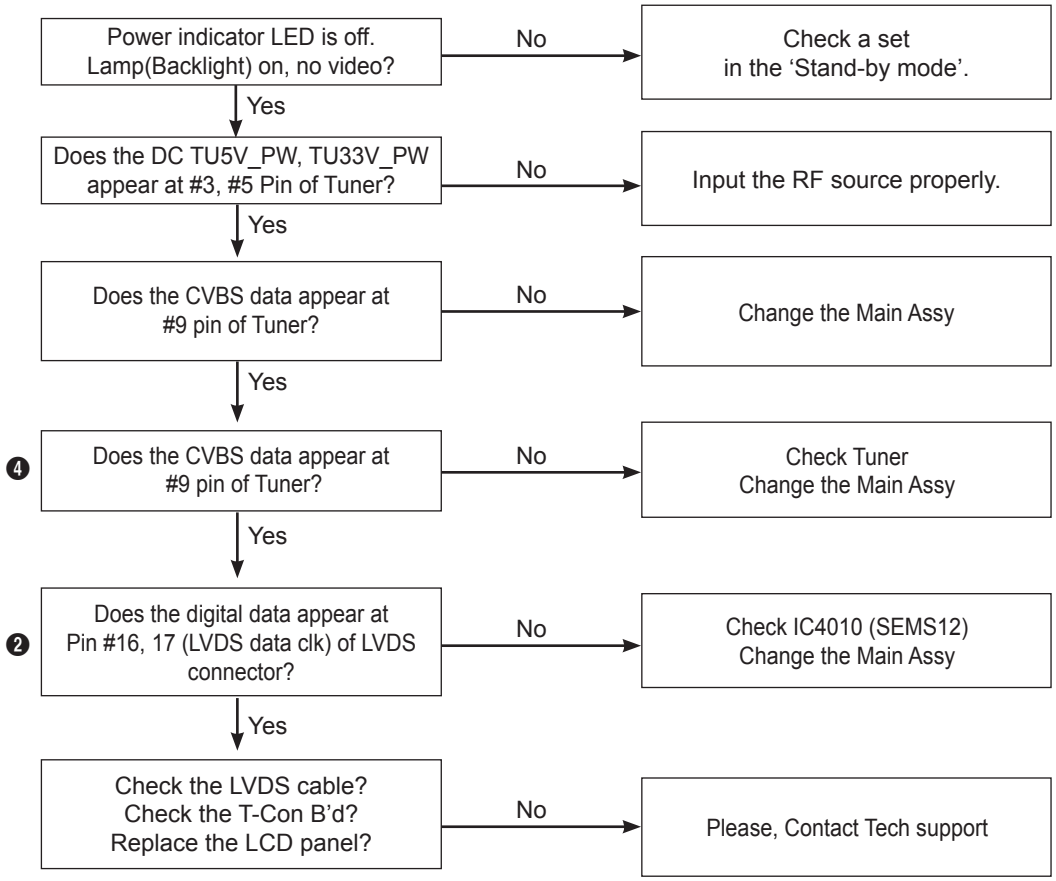


❷	LVDS output

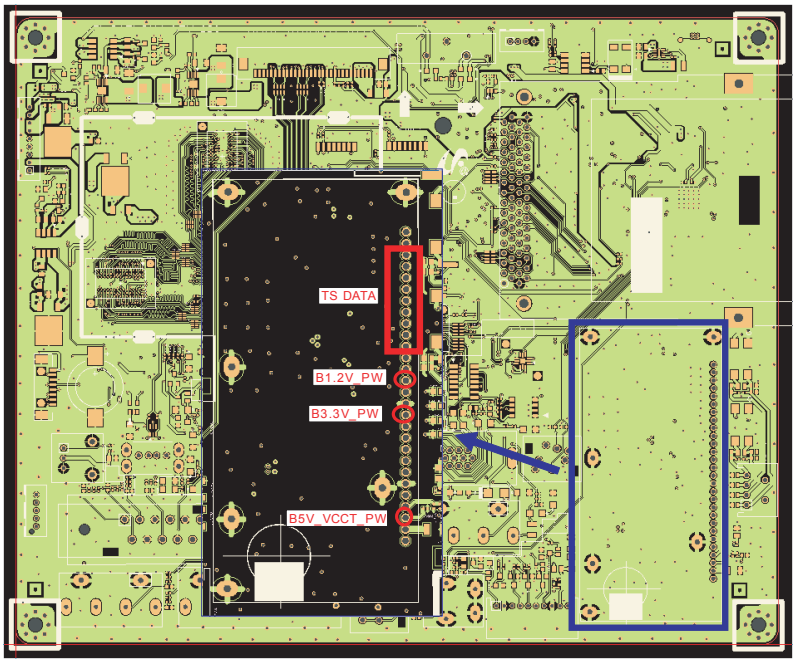


4-1-5. No Video (Tuner_CVBS)

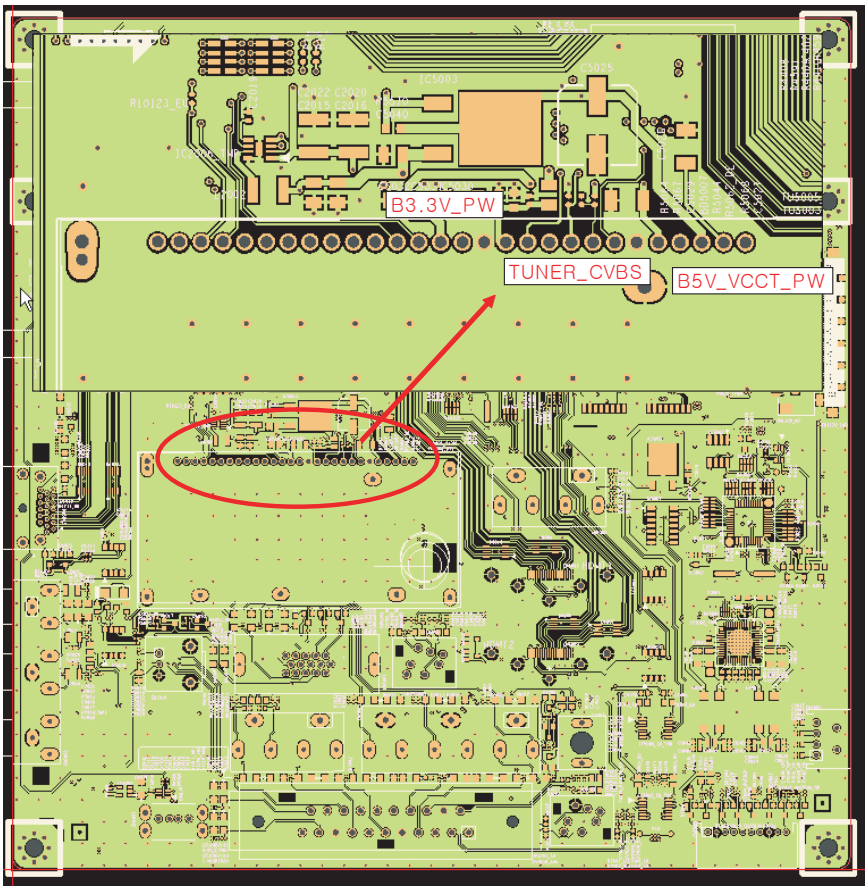
Symptom	– Audio is normal but no picture is displayed on the screen.
Major checkpoints	– Check the Tuner CVBS source. – Check the Tuner, Check the Chelsea. – This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.
Diagnostics	 LE19/22B45***  LE26/32B45***
Caution	Make sure to disconnect the power before working on the IP board.



LE19/22B45*

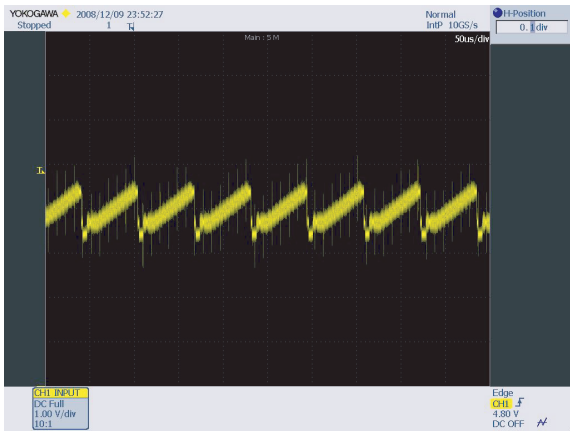


LE26/32B45*

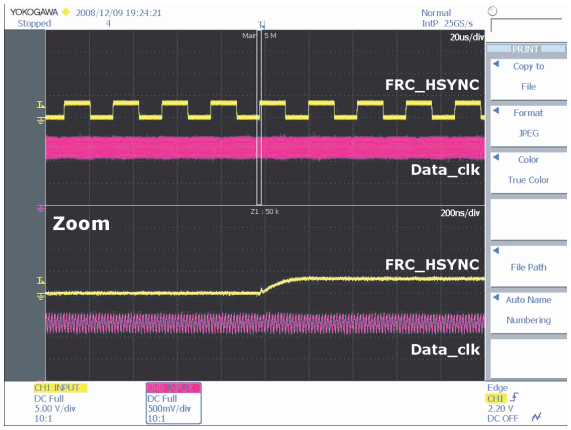


WAVEFORMS

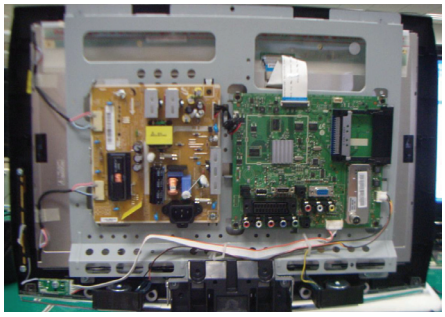
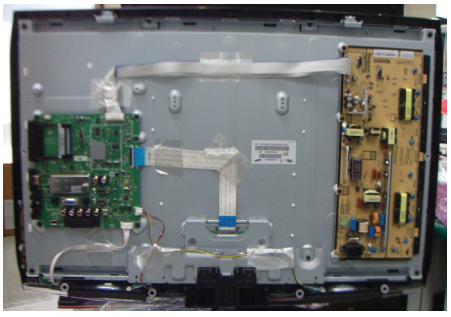
❹	**CVBS OUT (Grey Bar)**

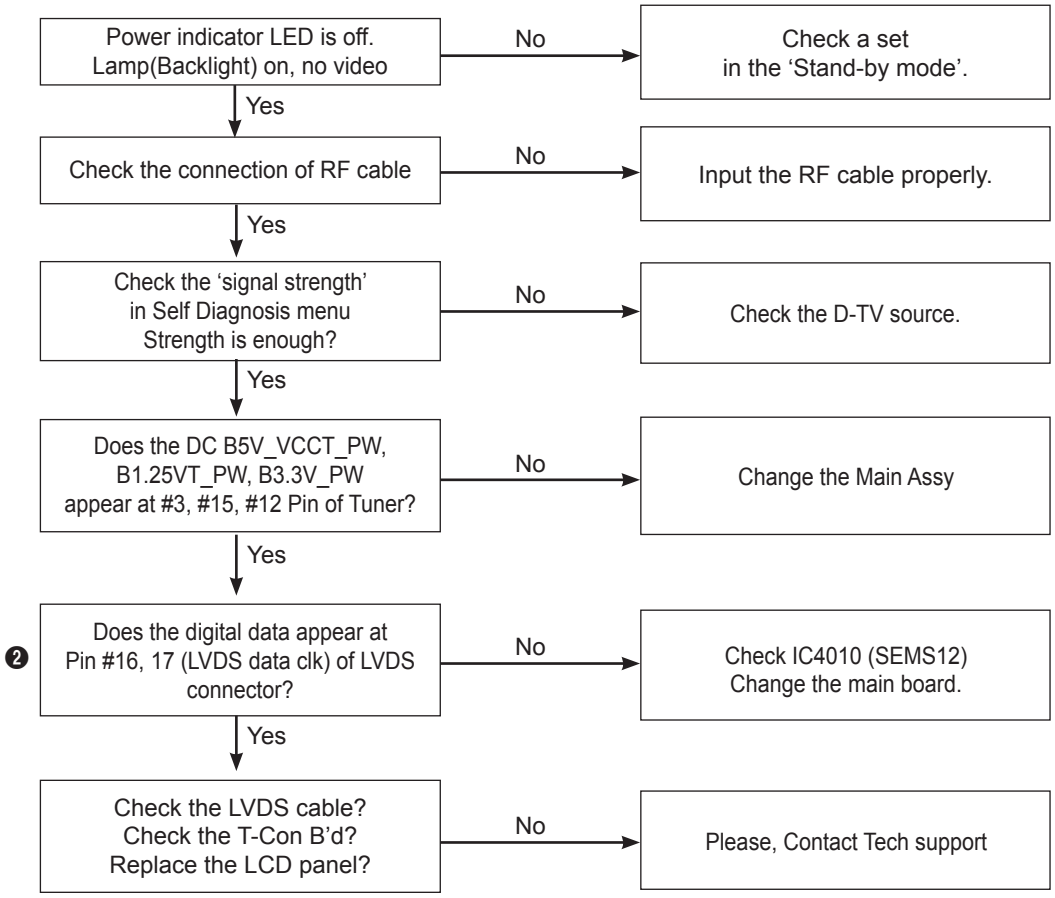


❷	**LVDS output**

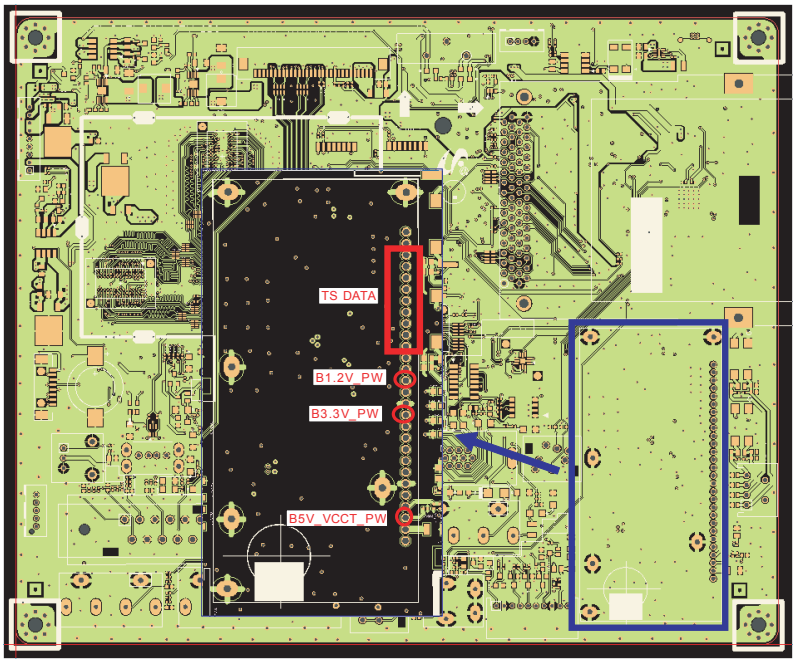


4-1-6. No Video (Tuner DTV)

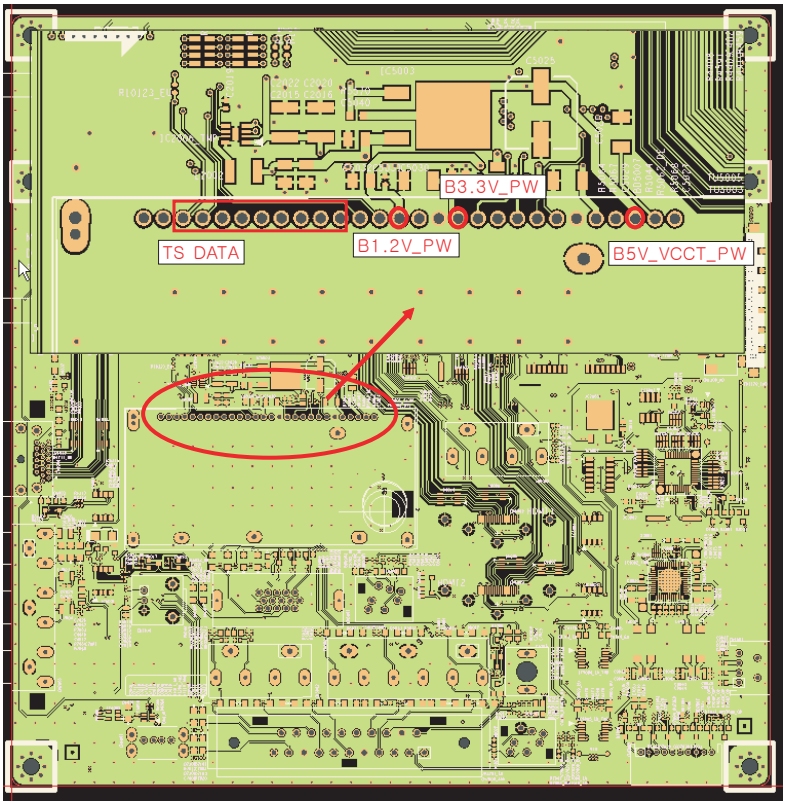
Symptom	– Audio is normal but no picture is displayed on the screen.
Major checkpoints	– Check the DTV source. – Check the Tuner, Check the Chelsea. – This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.
Diagnostics	 LE19/22B45***  LE26/32B45***
Caution	Make sure to disconnect the power before working on the IP board.



LE19/22B45*

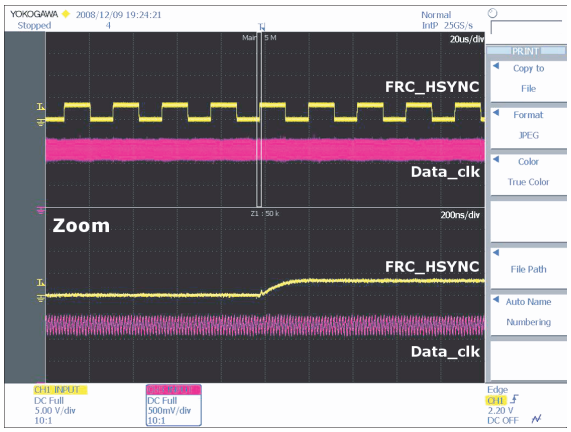


LE26/32B45*

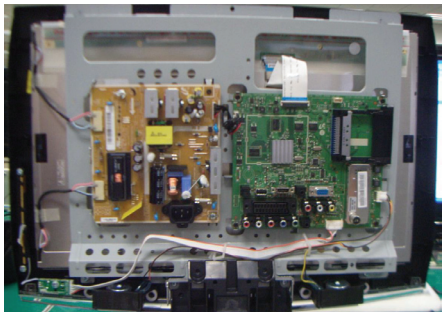
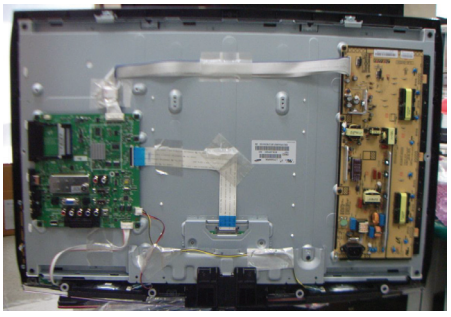


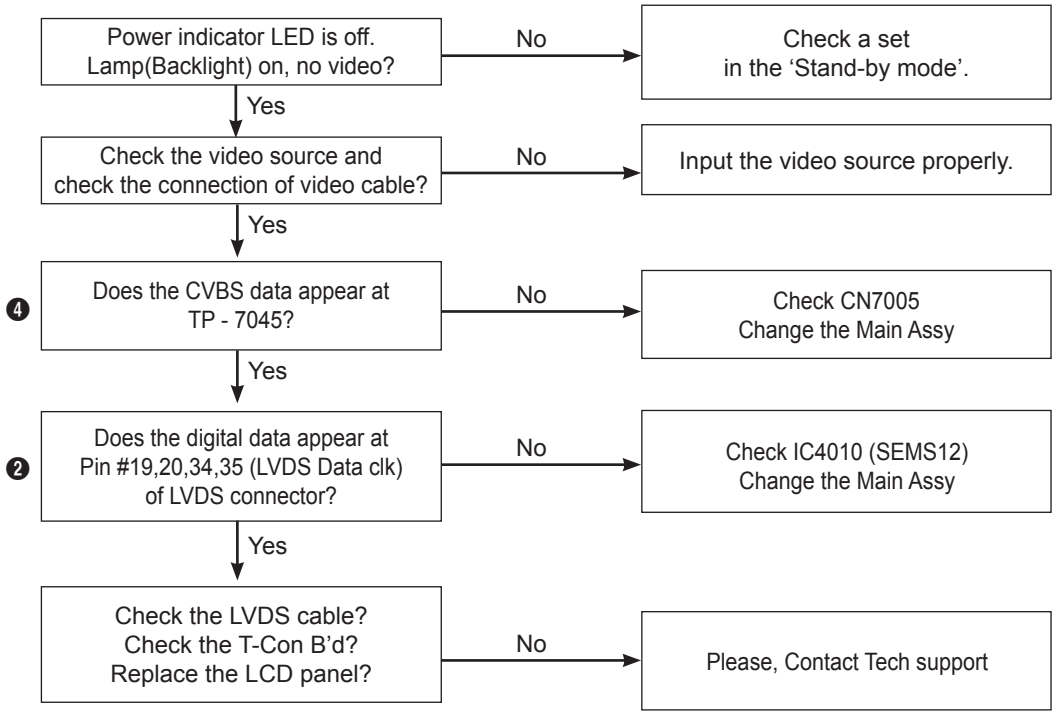
WAVEFORMS

❷	LVDS output

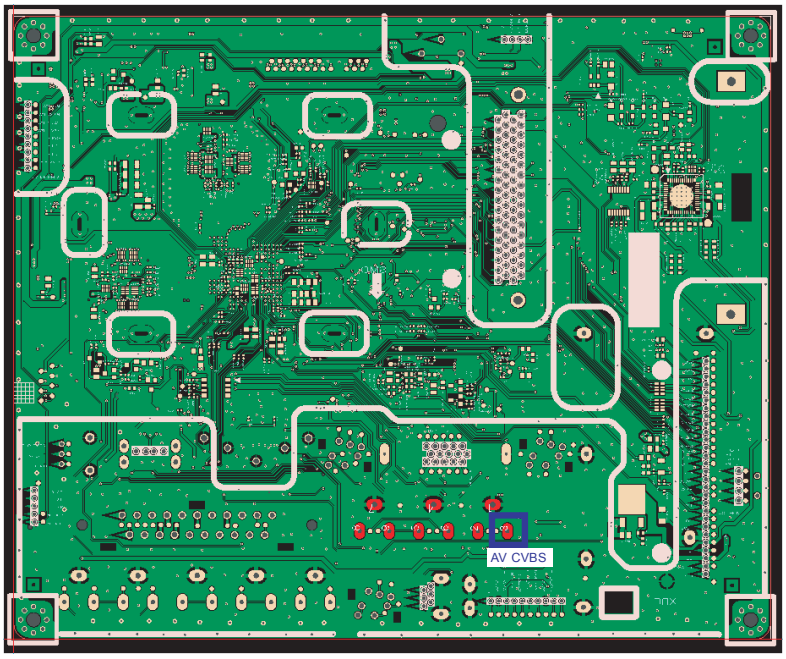


4-1-7. No Video (Video CVBS)

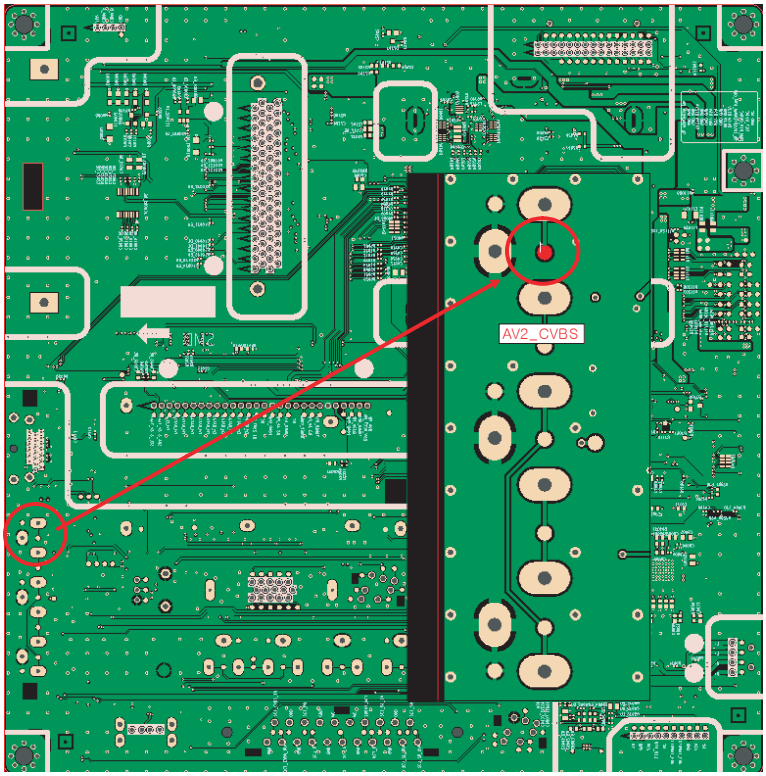
Symptom	– Audio is normal but no picture is displayed on the screen.
Major checkpoints	– Check the Video CVBS source – Check the Chelsea. – This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.
Diagnostics	 LE19/22B45***  LE26/32B45***
Caution	Make sure to disconnect the power before working on the IP board.



LE19/22B45*

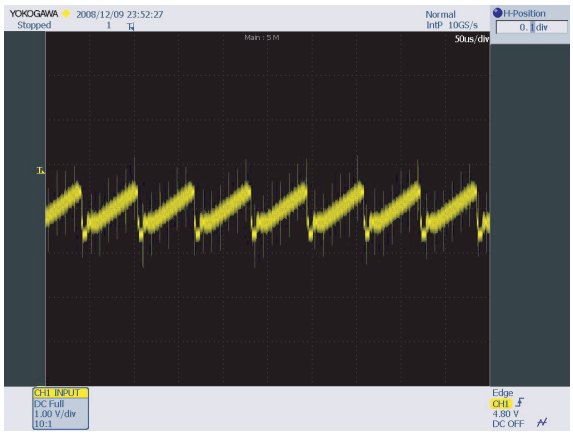


LE26/32B45*

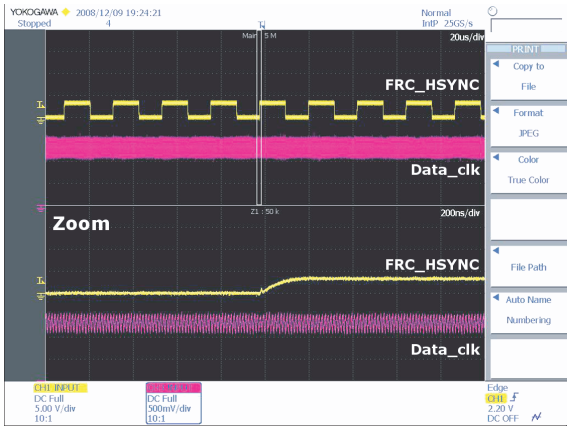


WAVEFORMS

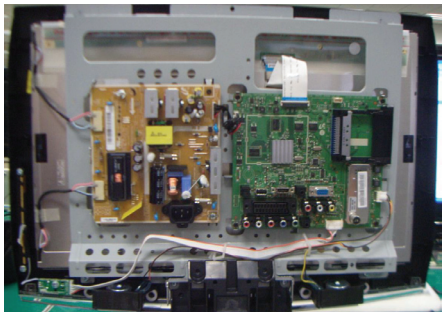
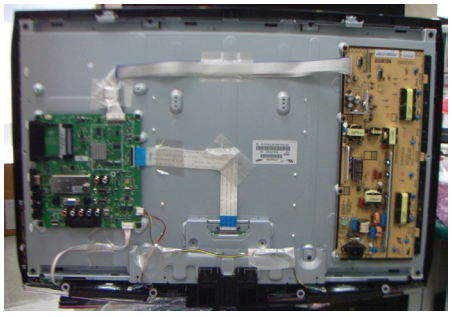
❹	**CVBS OUT (Grey Bar)**

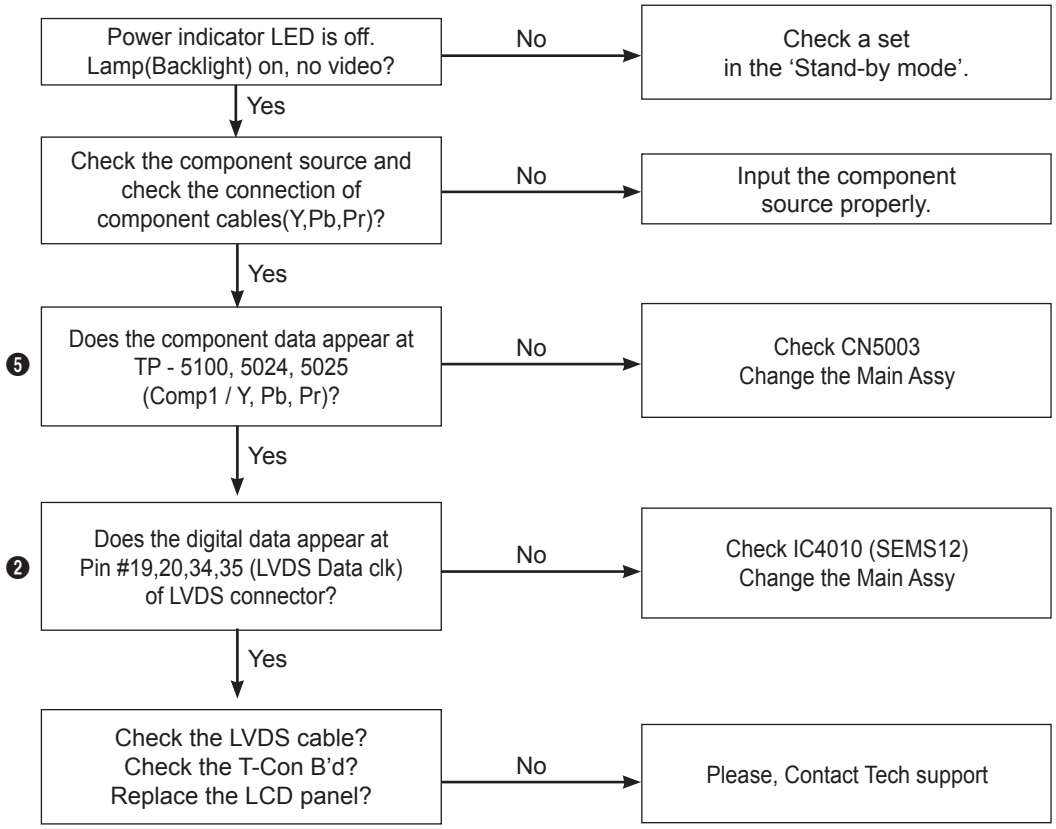


❷	**LVDS output**

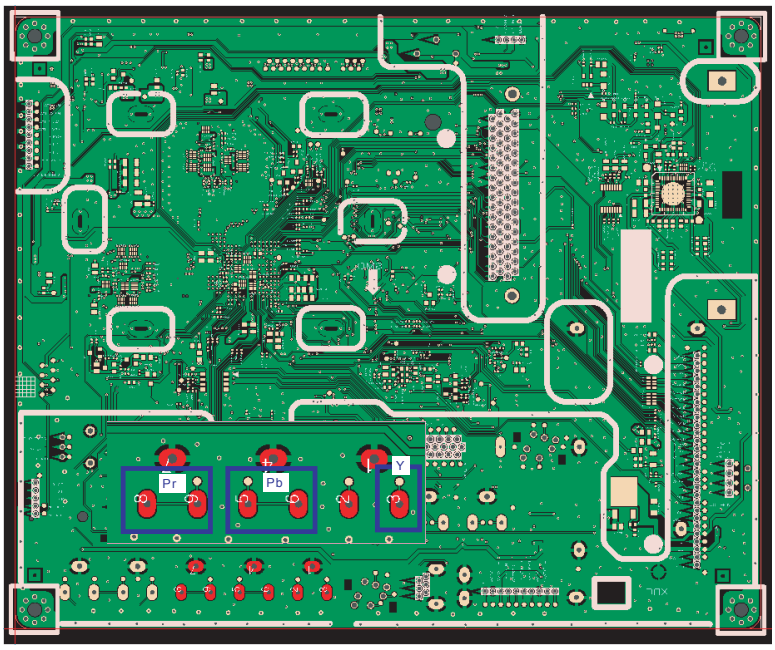


4-1-8. No Video (Component)

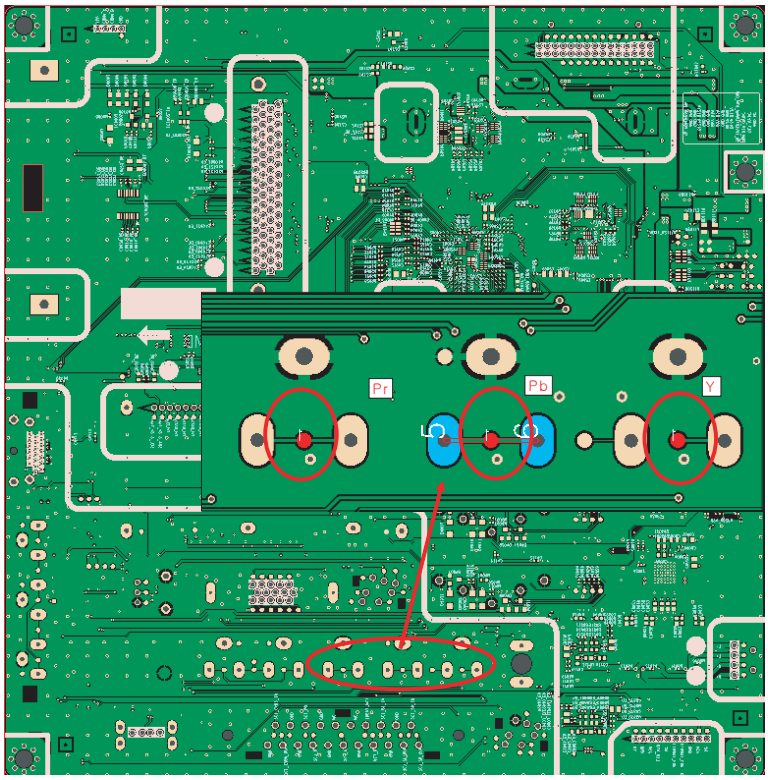
Symptom	– Audio is normal but no picture is displayed on the screen.
Major checkpoints	– Check the Component source – Check the chelsea. – This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.
Diagnostics	 LE19/22B45***  LE26/32B45***
Caution	Make sure to disconnect the power before working on the IP board.



LE19/22B45*

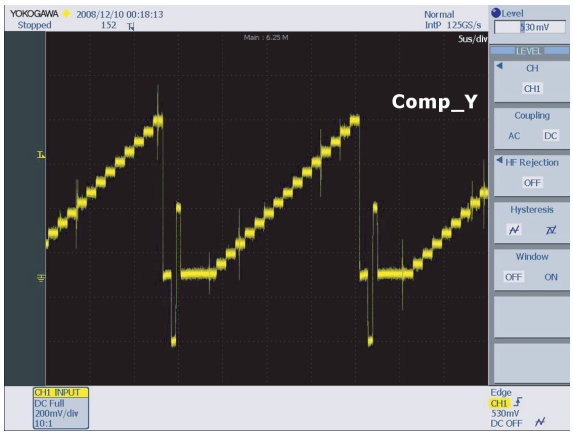


LE26/32B45*

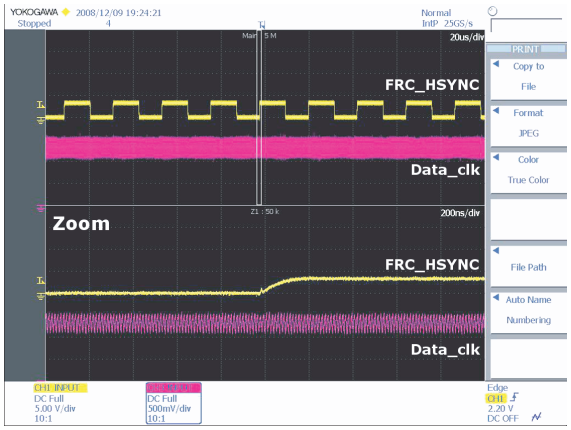


WAVEFORMS

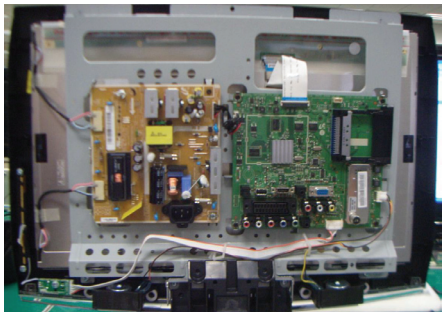
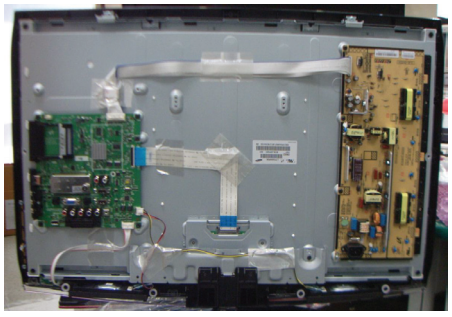
❺	Compnent_Y (Gray scale) / Pb / Pr (Color bar)

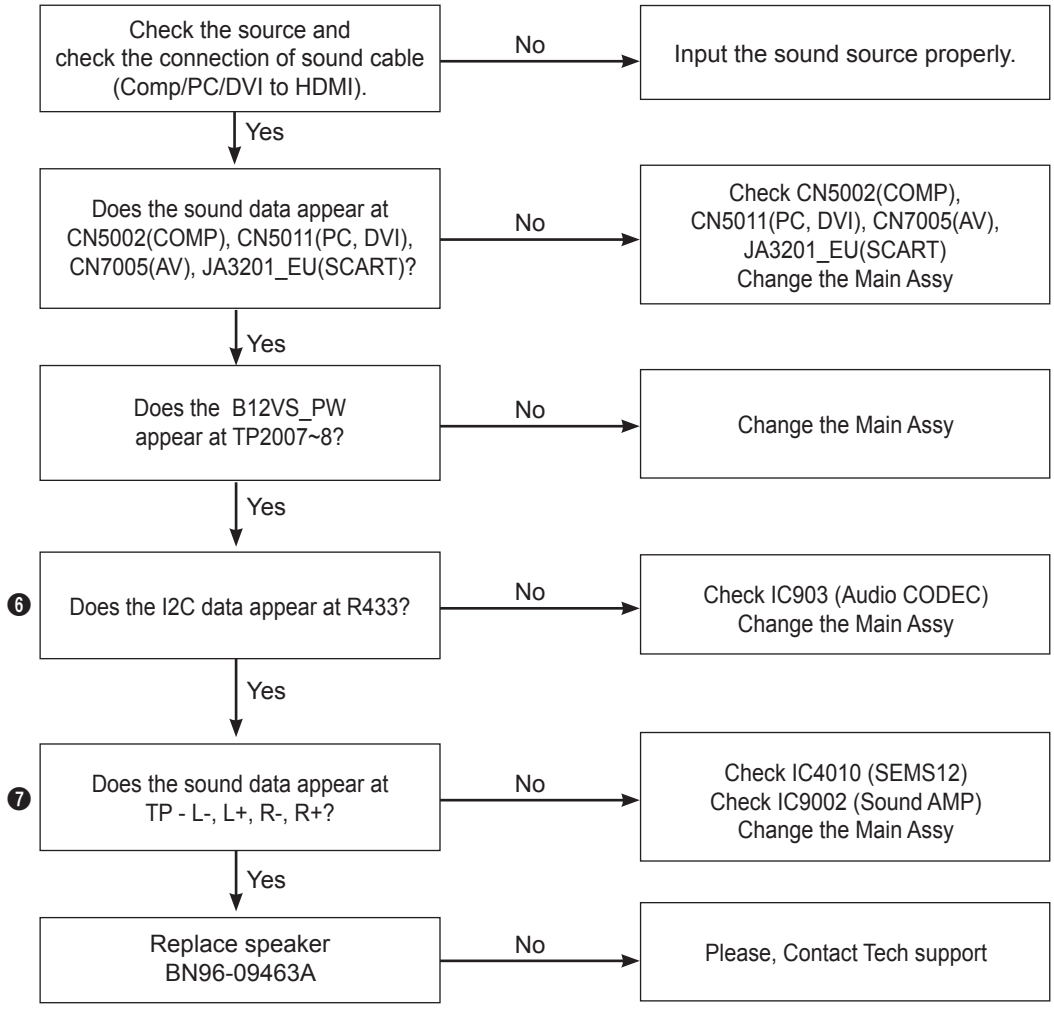


❷	LVDS output

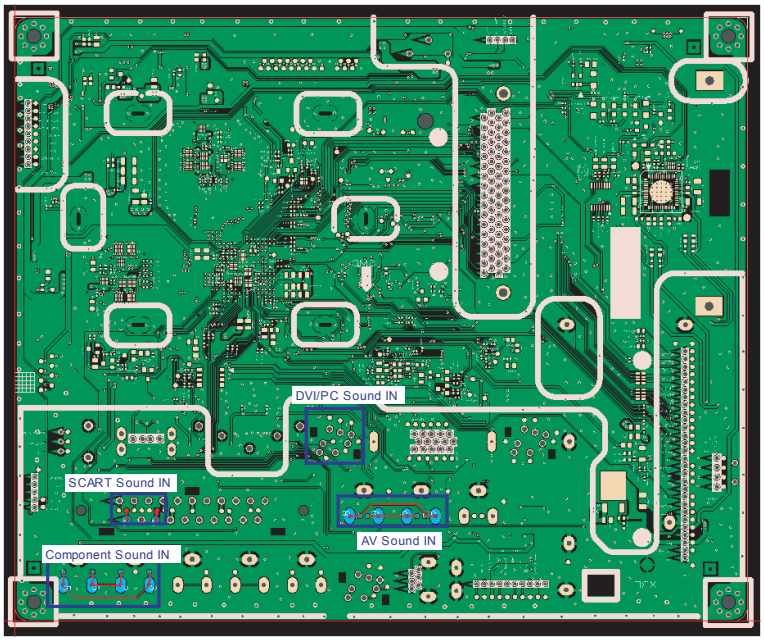


4-1-9. No Sound

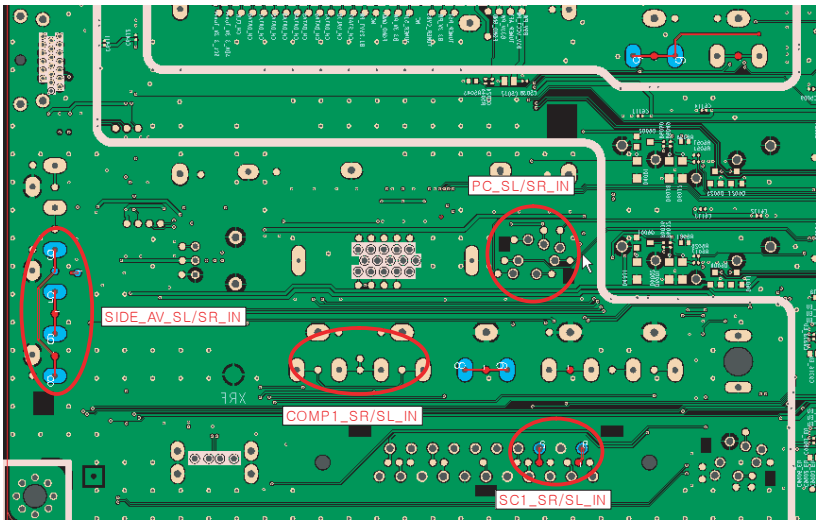
Symptom	– Video is normal but there is no sound..
Major checkpoints	– When the speaker connectors are disconnected or damaged. – When the sound processing part of the Main Board is not functioning. – Speaker defect..
Diagnostics	 LE19/22B45***  LE26/32B45***
Caution	Make sure to disconnect the power before working on the IP board.

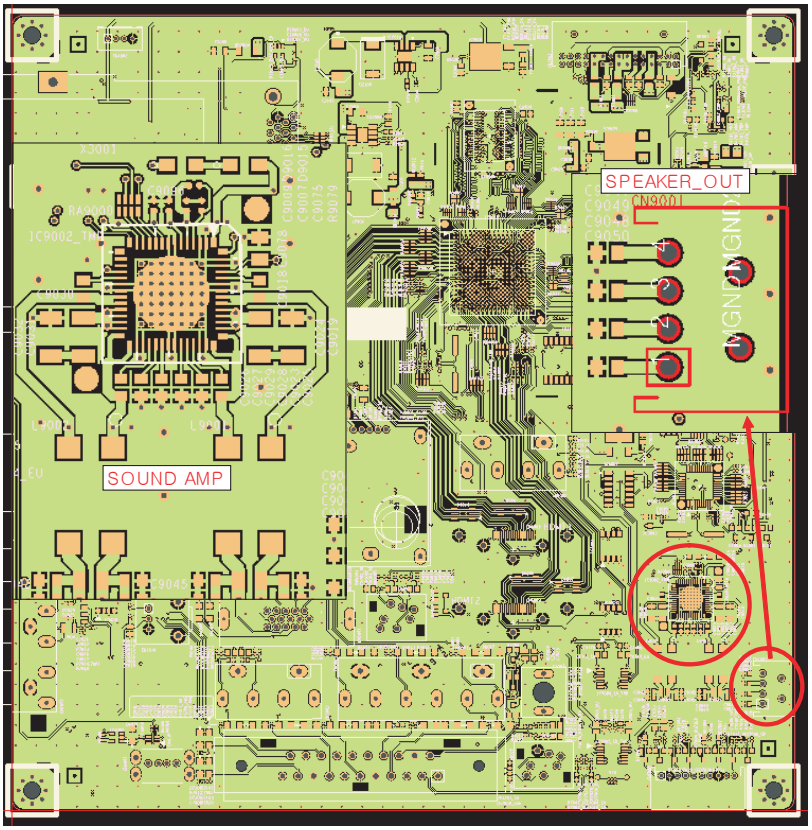


LE19/22B45*



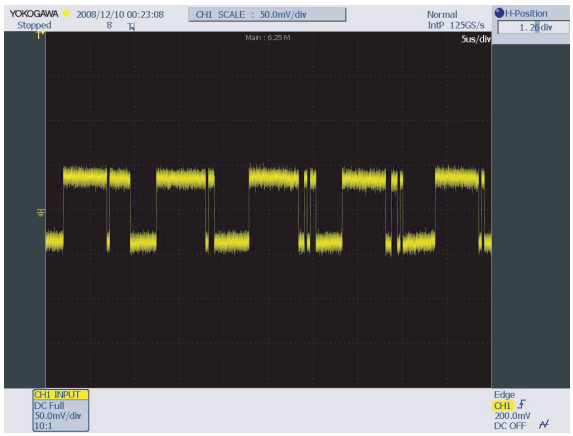
LE26/32B45*


PC_SL/SR_IN
SIDE_AV_SL/SR_IN
COMP1_SR/SL_IN
SC1_SR/SL_IN

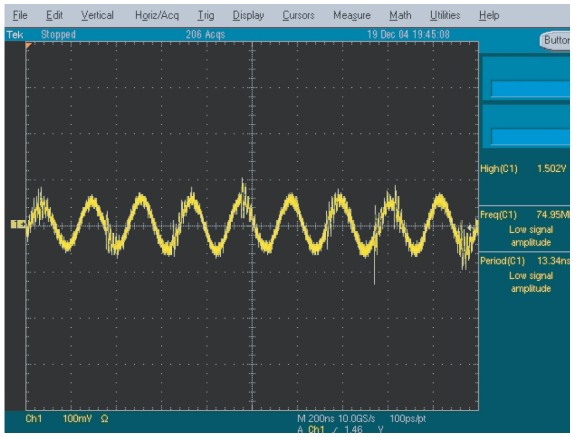

SPEAKER_OUT
CN9001
SOUND AMP

WAVEFORMS

❻	**I2C Data**



❼	**Speaker out**



4-2. Alignments and Adjustments

4-2-1. General Alignment Instuction

1. Usually, a color LCD-TV needs only slight touch-up adjustment upon installation. Check the basic characteristics such as height, horizontal and vertical sync.
2. Use the specified test equipment or its equivalent.
3. Correct impedance matching is essential.
4. Avoid overload. Excessive signal from a sweep generator might overload the front-end of the TV. When inserting signal markers, do not allow the marker generator to distort test result.
5. Connect the TV only to an AC power source with voltage and frequency as specified on the backcover nameplate.
6. Do not attempt to connect or disconnect any wire while the TV is turned on. Make sure that the power cord is disconnected before replacing any parts.
7. To protect against shock hazard, use an isolation transformer.

4-3. Factory Mode Adjustments

4-3-1 Entering Factory Mode

To enter 'Service Mode' Press the remote -control keys in this sequence :

- If you do not have Factory remote - control

Power OFF → INFO → MUTE → Power On

4-3-2 How to Access Service Mode

Using the Customer Remote

1. Turn the power off and set to stand-by mode
2. Press the remote buttons in this order; POWER OFF - INFO - MUTE - POWER ON to turn the set on.
3. The set turns on and enters service mode. This may take approximately 20 seconds.
4. Press the Power button to exit and store data in memory.
   - If you fail to enter service mode, repeat steps 1 and 2 above.
5. Initial SERVICE MODE DISPLAY State

OPTION
ADC/WB
Control
Advanced
Expert
T-CRLPEUC-XXXX T-CRLPEUFC-XXXX T-CRLPEUS-XXXX DTP-LP-XXXX-XX DTP-LP-App-XXXX-XX OPTION : F100 00 ADC : HDMI X COMP X PC X AV X EDID : SUCCESS HDCP : SUCCESS Build Date : XX-XX-XXXX Date Of Purchase : XX/XX/XX

* How to enter the hidden factory mode.
  a. into the factory mode
  b. move the tap to Advanced
  c. key input : 0 + 0 + 0 + 0
  ** hidden menu : Advanced

6. Buttons operations withn Service Mode

Menu	Full Menu Display/Move to Parent Menu
Direction Keys ▲/▼	Item Selection by Moving the Cursor
Direction Keys ◄/►	Data Increase / Decrease for the Selected Item
Source	Cycles through the active input source that are connected to the unit

4-3-3 Factory Data

OPTION	Factory Name	Data	Range
	Factory Reset		
	Type		19D6THOC, 19I6THOC… (PANEL, INCH), 19A6THOC
	Model	LB450	LB530 / LB540 / LB550 / LB460 / LB360 / LB650 / LB530S
	TUNER	AUTO	ALPS
	Region	EU	
	DDR	SAMSUNG	SAMSUNG / Etron
	Light Effect	Off	On / Off
	Ch Table	SUWON	SUWON/SESK/SEH/TTSEC/SDMA/ SERK/SEINSAVIA/SIEL/TSE
	Medialink type		
	Local Set	Other	Others/Russia
	PDP GROUP		

ADC/WB	Factory Name
	ADC
	ADC Tarhet
	ADC RESULT
	WB

ADC	Factory Name	Data	Range
	AV Calibration	Success	Success / Failure
	Comp Calibration	Success	Success / Failure
	PC Calibration	Success	Success / Failure
	HDMI Calibration	Success	Success / Failure

ADC Target	Factory Name	Data	Range
	1st_AV_Low	18	0 ~ 255
	1st_AV_High	220	0 ~ 255
	1st_AV_Delta	1	0 ~ 255
	1st_COMP_Low	16	0 ~ 255
	1st_COMP_High	235	0 ~ 255
	1st_COMP_Delta	1	0 ~ 255
	1st_PC_Low	2	0 ~ 255
	1st_PC_High	253	0 ~ 255
	1st_PC_Delta	1	0 ~ 255
	2nd_Low	1	0 ~ 255
	2nd_High	235	0 ~ 255
	2nd_Delta	1	0 ~ 255

ADC RESULT	Factory Name	Mode				Range
		AV / RF	Component	HDMI / DTV / HDMI-PC	PC	
	1st_AV_Gain	136	134	136	192	0 ~ 255
	1st_AV_Offset	136	134	136	192	0 ~ 255
	1st_Comp_Gain	136	134	136	192	0 ~ 255
	1st_Comp_Gain_Cb	107	67	100	32	0 ~ 255
	1st_Comp_Gain_Cr	107	67	100	32	0 ~ 255
	1st_Comp_Offset	107	67	100	32	0 ~ 255
	1st_Comp_Offset_Cb	136	134	136	192	0 ~ 255
	1st_Comp_Offset_Cr	136	134	136	192	0 ~ 255
	1st_PC_R_Gain	136	134	136	192	0 ~ 255
	1st_PC_G_Gain	107	67	100	32	0 ~ 255
	1st_PC_B_Gain	136	134	136	192	0 ~ 255
	1st_PC_R_Offset	136	134	136	192	0 ~ 255
	1st_PC_G_Offset	136	134	136	192	0 ~ 255
	1st_PC_B_Offset	107	67	100	32	0 ~ 255
	2nd_R_Offset	107	67	100	32	0 ~ 255
	2nd_G_Offset	107	67	100	32	0 ~ 255
	2nd_B_Offset	136	134	136	192	0 ~ 255
	2nd_R_Gain	136	134	136	192	0 ~ 255
	2nd_G_Gain	136	134	136	192	0 ~ 255
	2nd_B_Gain	107	67	100	32	0 ~ 255

WB	Factory Name	Mode			
		AV	Component	HDMI / DTV	PC
	Sub Brightness	128	128	128	128
	R_Offset	512	512	512	512
	G_Offset	512	512	512	512
	B_Offset	512	512	512	512
	Sub Contrast	128	128	128	128
	R_Gain	512	512	512	512
	G_Gain	512	512	512	512
	B_Gain	512	512	512	512
	Movie R Offset	128	128	128	128
	Movie B Offset	512	512	512	512
	Movie R Gain	512	512	512	512
	Movie B Gain	512	512	512	512

Control	Factory Name
	EDID
	Sub Option
	PDP Option
	Hotel Option
	Shop Option
	Sound
	Config Option

EDID	Factory Name	Data	Range
	EDID ON/OFF	Off	On / Off
	EDID WRITE ALL	Success	Success / Failure
	EDID WRITE PC	Success	Success / Failure
	EDID WRITE DVI	Success	Success / Failure
	EDID WRITE HDMI1	Success	Success / Failure
	EDID WRITE HDMI2	Success	Success / Failure
	EDID WRITE HDMI3	Success	Success / Failure
	EDID WRITE HDMI4	Success	Success / Failure
	EDID VERSION	HDMI 1.3	HDMI 1.2 / HDMI 1.3

Sub Option	Factory Name	Data	Range
	Mute Time(VIDEO)	4	0 ~ 10
	ready	Failure	Success / Failure
	TTX LIST	FOLF	FLOF / LIST
	TTX	On	On / Off
	TTX Group	Lang OSD	Lang OSD/ W Europe/E Europe/Russia/Greek/Turkey/Arab/Farsi/ArabHbrw
	Hotplug	On	On / Off
	Hotplugcontrol	On	On / Off
	Spread Spectrum		
	Auto Power	On	On / Off
	DDR		
	Arab	Off	On / Off
	NT Conversion	Off	On / Off
	Mirror	On	On / Off
	HDMI EQ1	Middle	Low / Middle / High / Strong
	HDMI EQ2	Middle	Low / Middle / High / Strong
	HDMI EQ3	Middle	Low / Middle / High / Strong
	HDMI EQ4	Middle	Low / Middle / High / Strong
	EER Count		
	WM Calib		
	Panel Enter Key		
	Panel Display Time	XHr	
	CHECKSUM	0x0000	
	View Log		
	Font Data Viewer		
	Dimm Type	EXT	INT / EXT / INT_NEG / INT_POS / EXT_NEG
	Gamma	Off	Off / 0.85 / 0.88 / 0.90 / 0.93 / 0.95 / 0.98
	Carrier Mute	Off	On / Off
	Anynet+	On	On / Off
	HPD Polarity		
	High Devi	Off	On / Off
	Volum Curve	NT	NT / EU / EA
	HotPlug Delay	9	0 ~ 63
	HP Ident	Low	Low / High
	PC Ident	On	On / Off
	Language	China	
	Info Live		
	Watchdog	On	On / Off
	LVDS Format	JEIDA	JEDIA / VESA
	OSD Resolution	1920*1080	
	Bus Stop		
	OTA Code		
	Panel Auto Setting		
	OTA Duration Test		
	Alternate Del		
	Ignore VCT Version	Off	

Spread Spectrum	Factory Name	Data	Range
	Spread Spectrum	On	On / Off
	Period	60K	40K / 50K / 60K
	Amplitude	2	0 / 0.5 / 1 / 1.5 / 2
	DDR Spread	2% Spread	Off / 1% Spread / 2% Spread

PDP Option	Factory Name	Data	Range
	PIXEL SHIFT TEST	Off	On / off
	LOGIC CONNECT	Off	On / off
	PATTERN SELECT	0	0 ~ 31
	PANEL VERSION		
	PANEL INCH		
	PANEL TYPE		
	PANEL TEMPERATURE		
	LOGIC SW VERSION		
	LOGIC SW CHECKSUM		
	SAPC_Timer	On	On / off
	APC_Speed	Slow	Slow / Fast
	LOGIC USB D/L	Failure	Not Match / Match / Failure

Hotel Option	Factory Name	Data	Range
	Hotel Mode	Off	On / Off
	Power On Channel	3	
	Power On Source	TV	TV / S-Video / Comp1 / PC / HDMI1 / HDMI2 / HDMI4
	Power On Volume	10	
	Min Volume	0	
	Max Volume	100	
	Panel Button Lock	Off	On / Off
	Pic Menu Lock	Off	On / Off
	Music Mode (AV)	Off	On / Off
	Music Mode (PC)	Off	On / Off
	Music Mode (Comp)	Off	On / Off
	Music Mode Backlight	Off	On / Off
	Menu Display	On	On / Off
	Power On Option	Last Option	Standby / Power On / Last Option
	Ch Remap On/Off		
	Program Ch		
	Original Ch/Src		
	Auto PC	Off	On / Off
	Energy Saving	Off	Off / Low / Mid / High / Auto
	Cloning : TV to USB		
	Cloning : USB to TV		
	Welcome Message		

Shop Option	Factory Name	Data	Range
	Shop Mode	Off	On / Off
	USB DEMO ON (SEC)		
	USB DEMO OFF (SEC)		

Sound	Factory Name	Data	Range
	FM Prescale	20	
	AM Prescale	21	
	Nicam Prescale	20	
	A2 M2S Threshold	10	
	A2 S2M Threshold	10	
	A2 PilotPhaseOn	0	
	A2 PilotPhaseOff	0	
	A2 Identon	0	
	A2 Identoff	0	
	A2 Carr1AmpOnThr	16h	
	A2 Carr1AmpOffThr	14h	
	A2 Carrier1SNRonThr	0	
	A2 Carrier1SNRoffThr	0	
	A2 Carr2AmpOnThr	0	
	A2 Carr2AmpOffThr	0	
	A2 Carrier2SNRonThr	0	
	A2 Carrier2SNRoffThr	0	
	Nicam Sig Error On	16h	
	Nicam Sig Error Off	14h	
	Compression mode	RF	
	Dolby Test Mode	OFF	
	DTV Level	0dB	
	Master Vol	1EH	
	PWM Modulation	FEH	
	DRC1 Threshold	12H	
	DRC2 Threshold	12H	
	Speaker EQ	On	
	SC1 Vol	16	
	SC2 Vol	16	
	Audio Delay	60	
	SUB AMP Master Vol		
	SUB AMP PWM Mod		
	SUB DRC Thresh		
	SUB Speaker EQ		

Config Option	Factory Name	Data	Range
	AV Number	2	0 ~ 2
	SVIDEO Number	0	0 ~ 1
	COMP Number	2	0 ~ 2
	HDMI Number	4	0 ~ 4
	SCART Number	0	
	DVI Number	1	0 ~ 1
	HP Number	1	0 ~ 1
	USB PORT		
	LNA SUPPORT	On	On / Off
	MFT OFFSET		

Advanced	Factory Name
	FBE
	WB Movie
	EPA Standard
	ADJUST
	YC_Delay
	SHARPNESS
	PE
	PQ Others
	Color Space
	EEPROM RESET

WB Movie	Factory Name	Data	Range
	WB Movie	Off	On / Off
	Color Mode	---	Dynamic / Standard / Movie
	Color Tone	---	Cool / Normal / Warm1 / Warm2
	Msub Brigh	---	0 ~ 255
	Msub Contr	---	0 ~ 255
	W1_RGAIN	---	0 ~ 255
	W1_BGAIN	---	0 ~ 255
	W1_ROFFS	---	0 ~ 255
	W1_BOFFS	---	0 ~ 255
	W2_RGAIN	---	0 ~ 255
	W2_BGAIN	---	0 ~ 255
	W2_ROFFS	---	0 ~ 255
	W2_BOFFS	---	0 ~ 255
	N_RGAIN	---	0 ~ 255
	N_BGAIN	---	0 ~ 255
	N_ROFFS	---	0 ~ 255
	N_BOFFS	---	0 ~ 255
	Movie Contr	---	3 ~ 100
	Movie Brigh	---	2 ~ 100
	Movie Color	---	1 ~ 100
	Movie Sharp	---	0 ~ 100
	Movie Tint	---	0 ~ 50
	Movie BkLight	---	0 ~ 10
	M.Gamma	---	Off / 0.85 / 0.88 / 0.90 / 0.93 / 0.95 / 0.98 / M1 / M2 / M3 / M4
	M_Sub Gamma	---	-3 ~ +3

EPA Standard	Factory Name	Data	Range
	Std Contr	95	0 ~ 100
	Std Bright	45	0 ~ 100
	Std Sharp	50	0 ~ 100
	Std Color	50	0 ~ 100
	Std Tint	50	0 ~ 100
	Std Backlight	7	0 ~ 10

ADJUST	Factory Name	Data	Range
	Dynamic Dimming	Off	On / Off
	LNA Plus		
	Power Key Protect	Off	On / Off
	Uart Select	Auto Wall	Auto Wall / Debug / MDC / On1 / On2
	Debug Mode	Debug Off	Debug Off / Debug Smart / Debug RunTime
	Back End Mute		
	PDP FRC		
	Visual Test	Disable	Disable / Enable
	Standby Mode Time	45 Min	2 Min / 45 Min
	Delete alt.ver	2 Flash	
	OTA confirm Time	90 Min	2 Min / 90 Min
	OTA limit Time	3 Hour	3 Min / 3 Hour
	Dynamic CE	Off	On / Off
	FWC	Off	On / Off
	1080p 48Hz	On	On / Off
	PWM Max	100	1 ~ 100
	Quick Start		
	DTV LNA	Auto	Auto / On / Off
	HDCP Download	On	On / Off
	Test Pattern	Off	Off / 1 ~ 13

LNA Plus	Factory Name	Data	Range
	RF dB1 Level	3	0 ~ 255
	RF dB2 Level	6	0 ~ 255
	RF dB3 Level	12	0 ~ 255
	RF dB4 Level	31	0 ~ 255

YC_Delay	Factory Name	Data	Range
	PAL BG	1	0 ~ 3
	PAL DK	1	0 ~ 3
	PAL I	1	0 ~ 3
	SECAM BG	4	0 ~ 7
	SECAM DK	4	0 ~ 7
	SECAM I	4	0 ~ 7
	NTSC 358	1	0 ~ 3
	NTSC 443	1	0 ~ 3
	AV PAL	1	0 ~ 3
	AV SECAM	4	0 ~ 7
	AV NT358	1	0 ~ 3
	AV NT443	1	0 ~ 3
	AV PAL60	1	0 ~ 3

SHARPNESS	Factory Name	Data							
		Data	Range	component		HDMI		DTV	
		RF	CVBS	SD	HD (720p)	SD	HD (720p)	SD	HD (720p)
	H1 Gain	25	25	25	20	25	20	25	20
	H2 Gain	12	12	12	8	12	8	12	8
	H3 Gain	10	10	C	8	8	8	C	8
	H4 Gain	8	8	8	8	8	8	8	8
	V1 Gain	20	20	20	20	20	20	20	20
	V2 Gain	12	12	12	8	12	8	12	8
	H overshoot	20	20	20	FF	20	FF	20	FF
	V overshoot	20	20	20	20	20	20	20	20
	H undershoot	20	20	20	FF	20	FF	20	FF
	V undershoot	20	20	20	20	20	20	20	20
	Coring TH2	1	1	1	1	1	1	1	1
	Coring TH1	1	1	1	1	1	1	1	1

SHARPNESS	Data		Range
	Comp/HDMI/ DTV 720p	PC / HDMI PC	
	20	8	0 ~ 3F
	8	8	0 ~ 3F
	8	8	0 ~ 3F
	8	8	0 ~ 3F
	20	8	0 ~ 3F
	8	8	0 ~ 3F
	FF	0	0 ~ FF
	20	0	0 ~ FF
	FF	0	0 ~ FF
	20	0	0 ~ FF
	1	0	0 ~ F
	1	0	0 ~ F

PE	Factory Name	Data							Range
		RF	CVBS	component		HDMI	DTV	PC / HDMI PC	
				SD	HD				
	Skin x	0	0	0	0	0	0	0	0 ~ 11
	Skin y	0	0	0	0	0	0	0	0 ~ 11
	B_slope	A0	A0	A0	A0	A0	A0	80	80~FF
	DLC_ML	60	60	60	60	60	60	60	0~FF
	DLC_MH	70	70	70	70	70	70	70	0~FF
	DLC_H	EB	EB	EB	EB	EB	EB	EB	0~FF
	Skin_SAT	0	0	0	0	0	0	0	0~F
	Skin_HUE	40	40	40	40	40	40	0	0~7F
	M_Skin_HUE	40	40	40	40	40	40	0	0~7F
	M_Skin_x	0	0	0	0	0	0	0	0 ~ 11
	M_Skin_y	0	0	0	0	0	0	0	0 ~ 11
	Mid_color_level	180	180	180	180	180	180	180	0 ~ 255
	M_Mid_color_level	180	180	180	180	180	180	180	0 ~ 255

PQ Others	Factory Name	Data	Range
	7.5 IRE NTSC 7.5 IRE	On 0	On / Off 0 ~ 60

Color Space	Factory Name	RF AV	Comp SD HDMI SD DTV SD	COMP HD HDMI HD DTV HD	RF AV	Comp SD HDMI SD DTV SD	COMP HD HDMI HD DTV HD	PC/ HDMI PC	Range
		Native	Native	Native	Auto	Auto	Auto	-	Color Space
	Red Sat	4	4	4	0	0	0	0	0~F
	Red Hue	40	40	40	40	40	40	40	0~7F
	Green Sat	7	7	7	0	0	0	0	0~F
	Green Hue	7F	7F	7F	40	40	40	40	0~7F
	Blue Sat	A	A	A	0	0	0	0	0~F
	Blue Hue	50	50	50	40	40	40	40	0~7F
	Cyan Sat	A	A	A	0	0	0	0	0~F
	Cyan Hue	50	50	50	40	40	40	40	0~7F
	Magenta Sat	4	4	4	0	0	0	0	0~F
	Magenta Hue	40	40	40	40	40	40	40	0~7F
	Yellow Sat	2	2	2	0	0	0	0	0~F
	Yellow Hue	40	40	40	40	40	40	40	0~7F
	FWC CB	15	15	15	15	15	15	15	0~30
	FWC CR	15	15	15	15	15	15	15	0~30

EEPROM RESET	Factory Name	Data
	EEPROM RESET	Enter - Set off
	NVR All Clear	Off/On

Tuner Status (Read Only)	
	Factory name
	Frequency
	LNA status
	BandWidth
	FFT
	Modulation
	Code Rate
	GI
	Hier Modulation
	Frequency Offset
	AGC
	UCB
	PLL Type
	DEMOD Type
	TPS Lock
	RS Lock

4-4. White Balance - Calibration

4-4-1 White Balance -Calibration

1. Calibration	→	AV Calibration Comp Calibration PC Calibration HDMI Calibration

4-4-2 White Balance - Adjustment

		(low light)	(hight light)
3. W/B	→	Sub Bright R offset G offset B offset	Sub Contrast R gain G gain B gain

(W/B adjustment Condition refer next page)

4-5. White Ratio (Balance) Adjustment

1. You can adjust the white ratio in factory mode (1:Calibration, 3:White-Balance).
2. Since the adjustment value and the data value vary depending on the input source, you have to adjust these in CVBS, Component 1 and HDMI 1 modes.
3. The optimal values for each mode are configured by default. (Refer to Table 1, 2)
   It varies with Panel's size and Specification.

- Equipment : CS-210
- Pattern: MIK K-7256 #92 "Flat W/B Pattern" as standard
- Use other equipment only after comparing the result with that of the Master equipment.
- Set Aging time : 60min

- Calibration and Manual setting for WB adjustment.

HDMI : Calibration at #24 Chessboard Pattern → Manual adjustment #92 pattern (720p)
COMP: Calibration at #24 Chessboard Pattern → Manual adjustment at #92 pattern (720p)
CVBS: Calibration at #24 Chessboard Pattern → Manual adjustment at #92 pattern (PAL)

- If finishing in HDMI mode, adjustment coordinate is almost same in AV/COMP mode.
- White Balance Manual Adjustment

P-Mode		Adjustment Coordinate			
		x	y	Y (Luminance)	T(K) + MPCD
CVBS (PAL)	H/L	272	278	- (Sub_CT:130)	12,000 (±0)
	L/L	272	278	12.6cd/m² (3.7 Ft)	12,000 (±0)
COMP (720P)	H/L	272	278	- (Sub_CT:130)	12,000 (±0)
	L/L	272	278	13.0cd/m² (3.8 Ft)	12,000 (±0)
HDMI (720P)	H/L	272	278	- (Sub_CT:130)	12,000 (±0)
	L/L	272	278	13.0cd/m² (3.8 Ft)	12,000 (±0)

- Adjustment Specification

White Balance : High light (±1), Low light (±3)

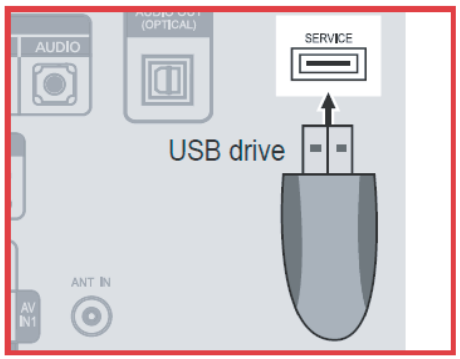
Luminance : High light (Don't care), Low light (±0.2 Ft/L)

4-6. Servicing Information

4-6-1 USB Download Method

Samsung may offer upgrades for TV's firmware in the future. Please contact the Samsung call center at 1-800-SAMSUNG (726-7864) to receive information about downloading upgrades and using a USB drive. Upgrades will be possible by connecting a USB drive to the USB port located on your TV.

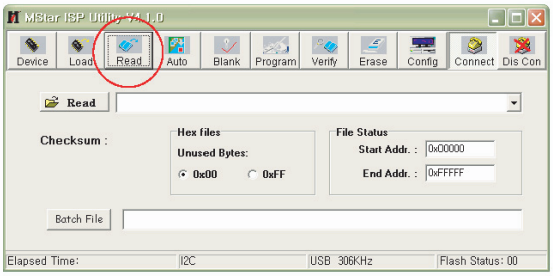
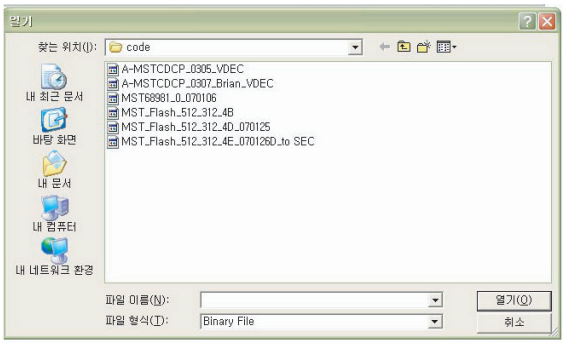
1. Insert a USB drive containing the firmware upgrade into the USB port on the rear of the TV.
2. Press the **MENU** button to display the menu.
   Press the ▲ or ▼ button to select "Support", then press the **ENTER** button.
3. Press the ▲ or ▼ button to select "SW Upgrade", then press the **ENTER** button.
   The message "Scanning for USB. It may take up to 30 seconds." is displayed.
4. The message "Upgrade version XXXX to version XXXX? The system will be reset after upgrade." is displayed.
   Press the ◄ or ► to select the "OK", then press the **ENTER** button.

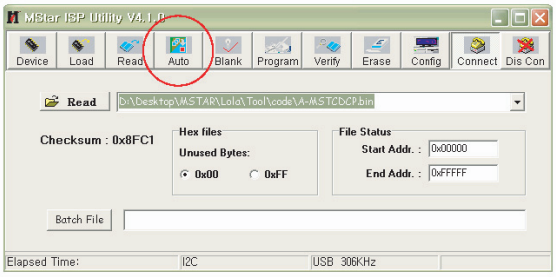
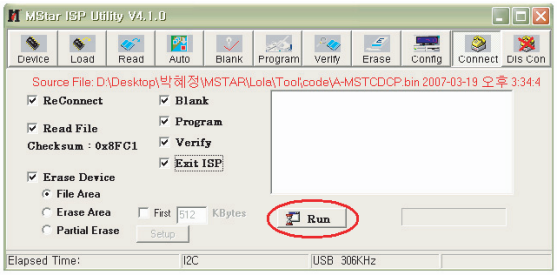
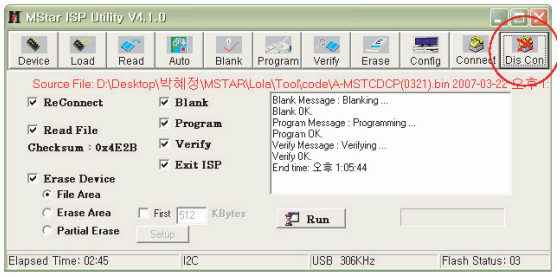


Please be careful to not disconnect the power or remove the USB drive while upgrades are being applied. The TV will turn off and turn on automatically after completing the firmware upgrade. Please check the firmware version after the upgrades are complete. When software is upgraded, video and audio settings you have made will return to their default (factory) settings. We recommend you write down your settings so that you can easily reset them after the upgrade.

4-7. HOW TO UPGRADE WITH JIG

4-7-1. TV Main S/W

Order	Description		ETC.
1	Open the Flash Downloader.		
2	Connect Mstar JIG to the TV Set with D-SUB Cable.		One side is USB cable, the another side is D-Sub cable on the JIG.
3	JIG connection is OK		
4	Select the code		
5	Choose the S/W		

Order	Description		ETC.
6	Select AUTO button		
7	Select RUN button		
8	Check the Verify OK, Select DIS Con Button And disconnect the JIG		

4-8. Mechanical diagram

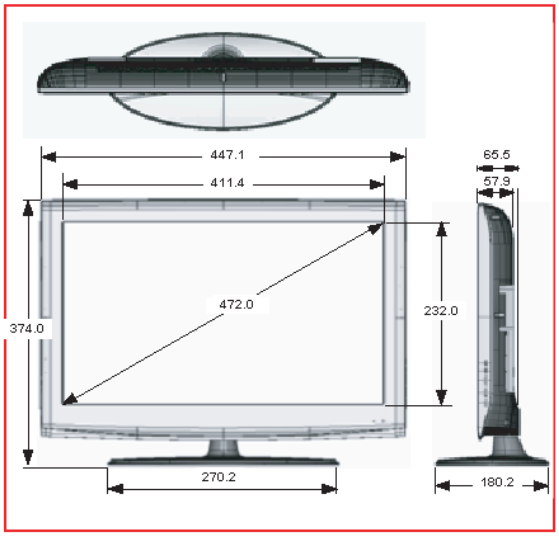
4-8-1. 19LB450

Size (W×D×H) [mm]

Set [mm]
1) Set with Stand : 477.1 x 180.2 x 374.0
2) Set without Stand [mm] : 477.1 x 65.6 x 326.9
3) Opening Size [mm] : 409.8 x 230.4
Package(Outside Dimension) [mm] : 554.0 x 481.0 x 175.0

Weight [kg]

Set with Stand	4.8	kg
Stand(Only)	0.6	kg
Package (with SET)	5.8	kg
Cushion		
With-Stand Type	-	g
Without-Stand Type	-	g



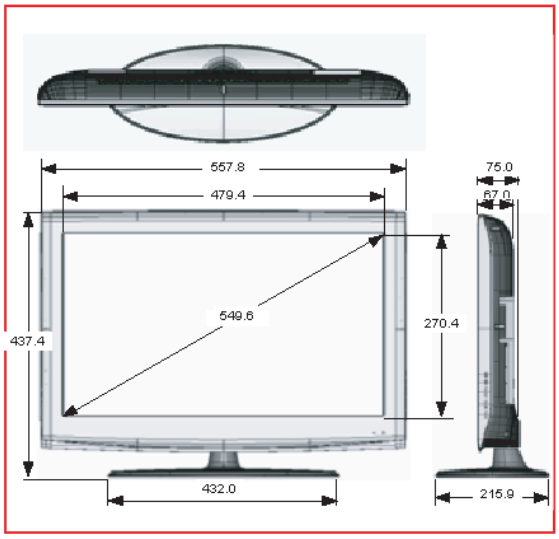
4-8-2. 22LB450

Size (W×D×H) [mm]

Set [mm]
1) Set with Stand : 557.8 x 216.0 x 437.4
2) Set without Stand [mm] : 557.8 x 75.0 x 384.1
3) Opening Size [mm] : 477.4 x 268.4
Package(Outside Dimension) [mm] : 766.0 x 644.0 x 183.0

Weight [kg]

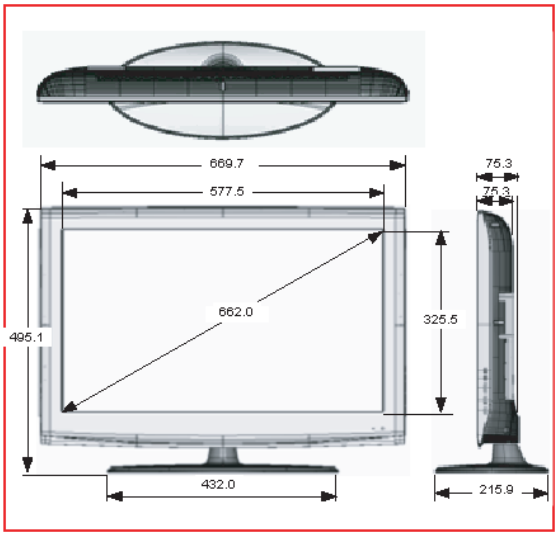
Set with Stand	6.5	kg
Stand(Only)	0.6	kg
Package (with SET)	7.8	kg
Cushion		
With-Stand Type	-	g
Without-Stand Type	-	g



4-8-3. 26LB450

Size (W×D×H) [mm]

Set [mm]
1) Set with Stand : 669.7 x 216.0 x 495.1
2) Set without Stand [mm] : 669.7 x 75.3 x 455.0
3) Opening Size [mm] : 525.8 x 323.7
Package(Outside Dimension) [mm] : 750.0 x 623.0 x 152.0



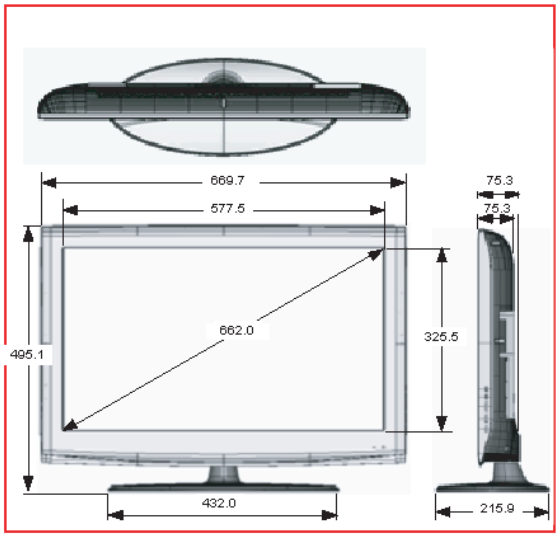
Weight [kg]

Set with Stand	8.4	kg
Stand(Only)	1.4	kg
Package (with SET)	11.8	kg
Cushion		
With-Stand Type	-	g
Without-Stand Type	-	g

4-8-4. 32LB450

Size (W×D×H) [mm]

Set [mm]
1) Set with Stand : 669.7 x 216.0 x 595.1
2) Set without Stand [mm] : 669.7 x 75.3 x 455.0
3) Opening Size [mm] : 697.68 x 392.26
Package(Outside Dimension) [mm] : 750.0 x 623.0 x 152.0

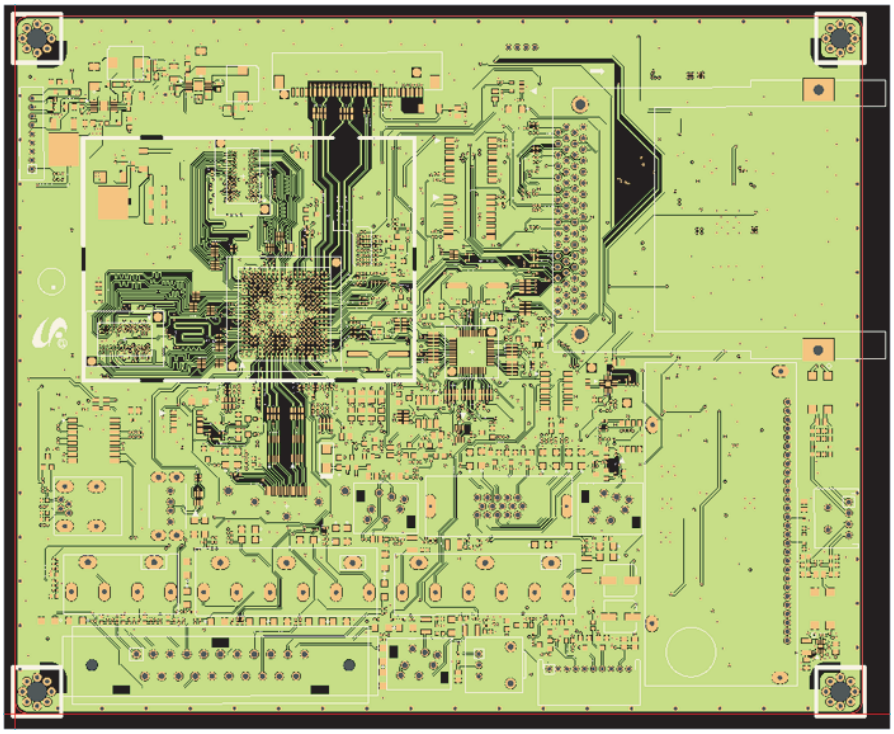


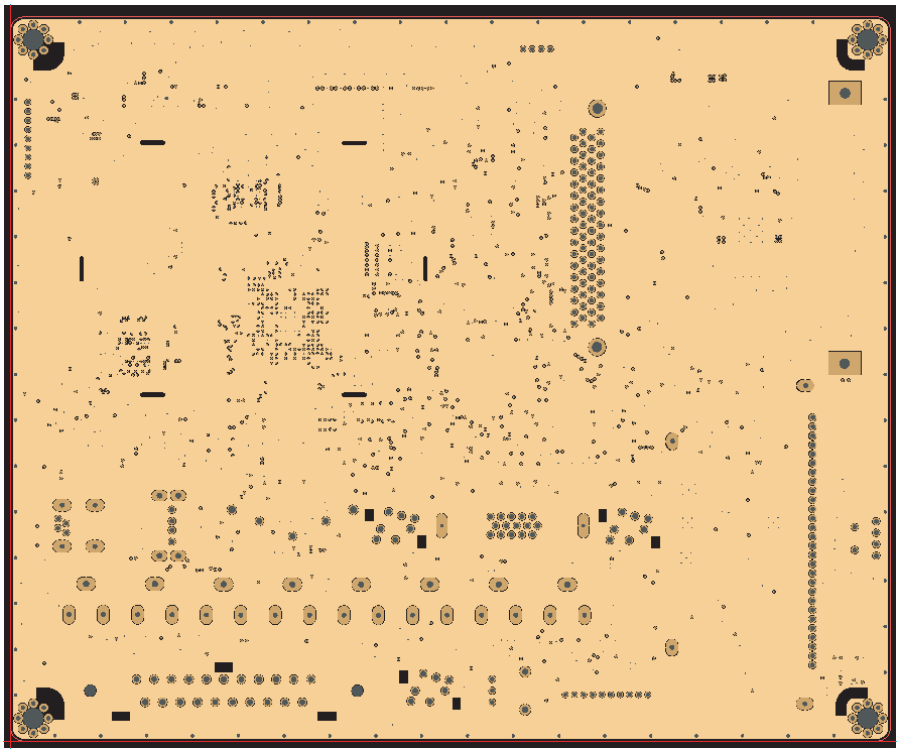
Weight [kg]

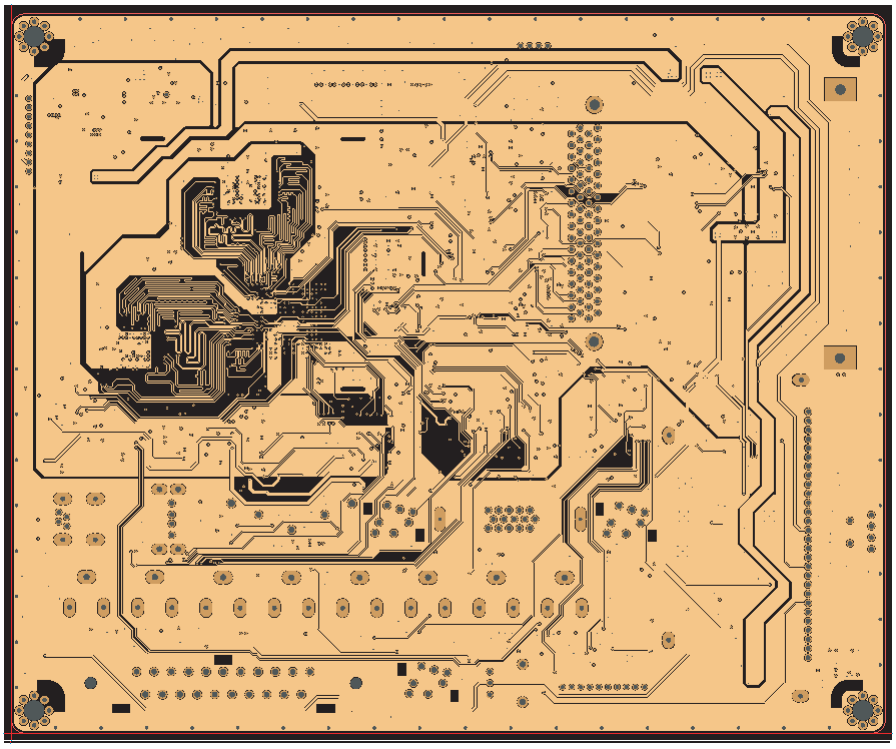
Set with Stand	8.4	kg
Stand(Only)	1.4	kg
Package (with SET)	11.8	kg
Cushion		
With-Stand Type	-	g
Without-Stand Type	-	g

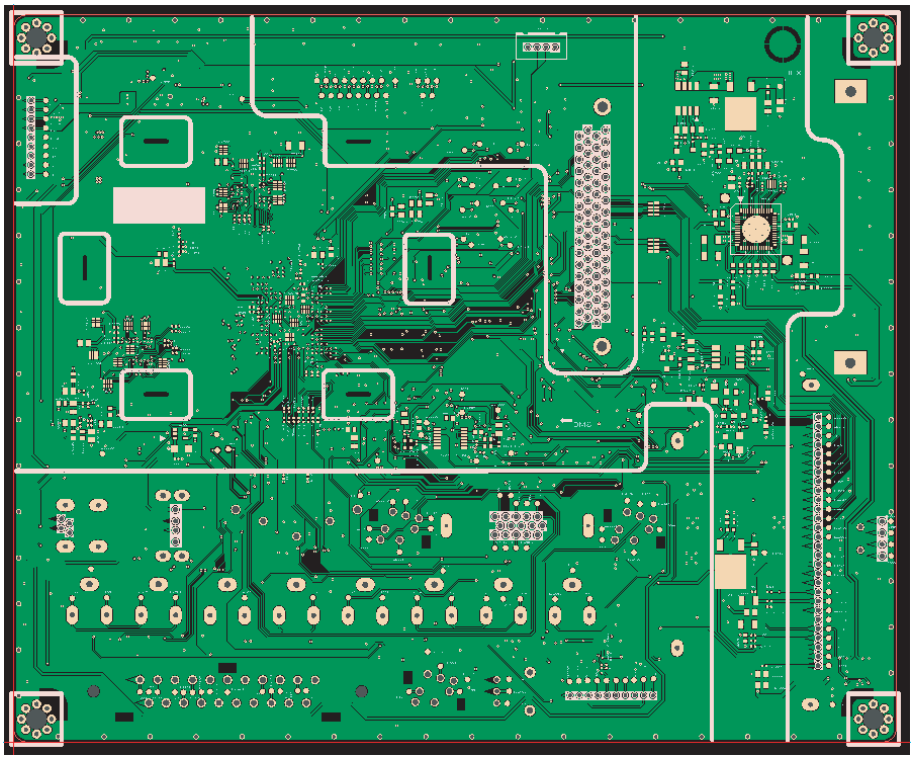
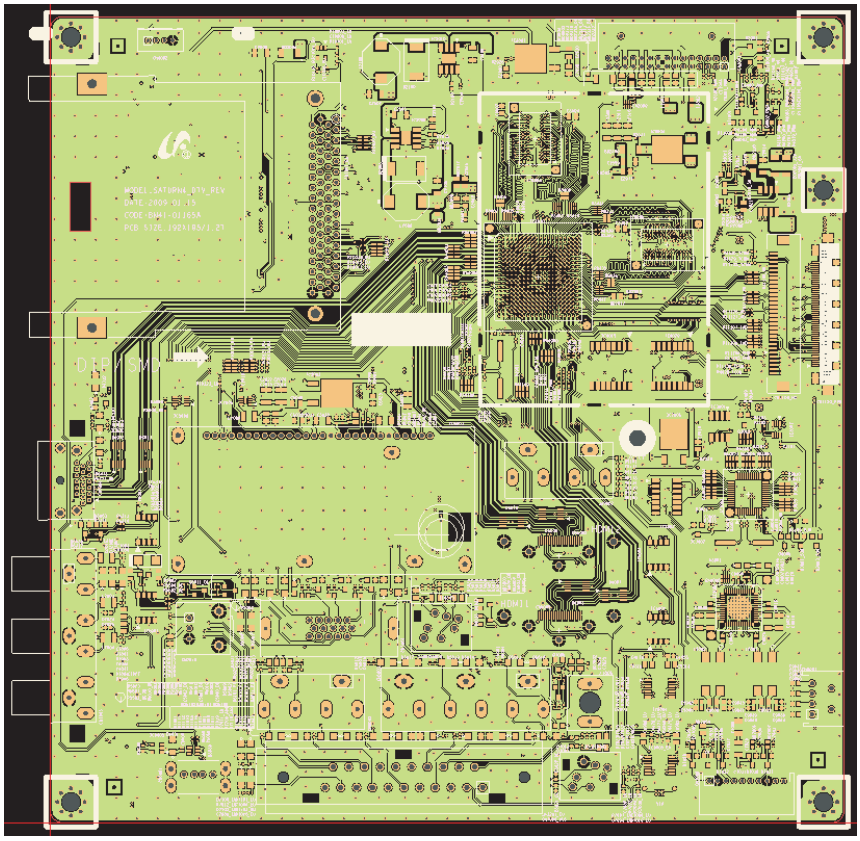
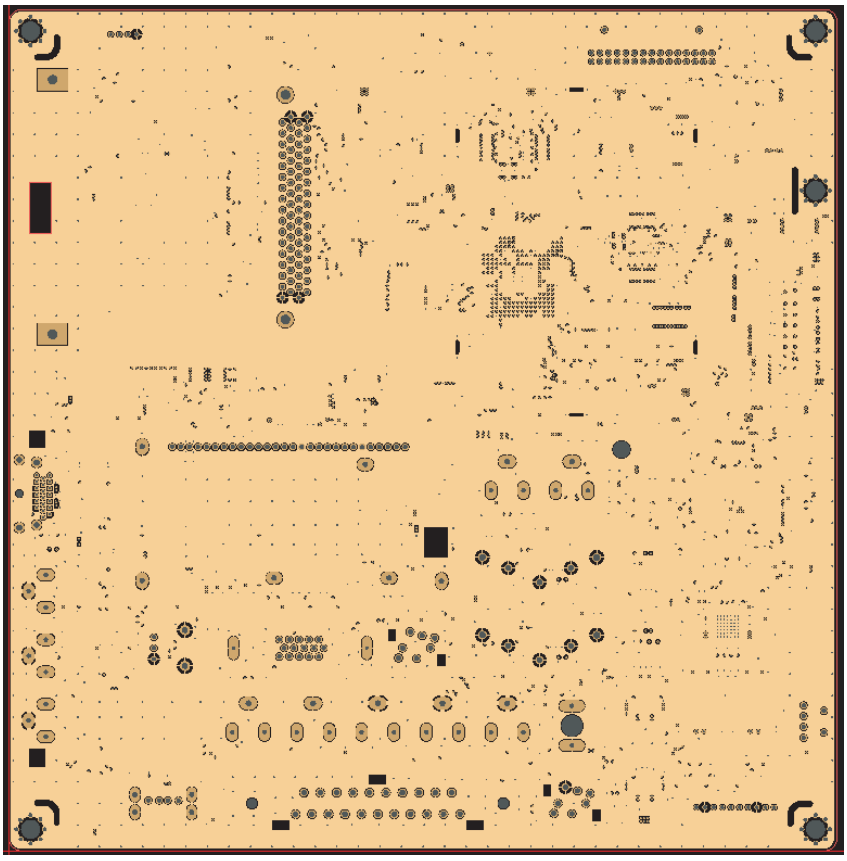
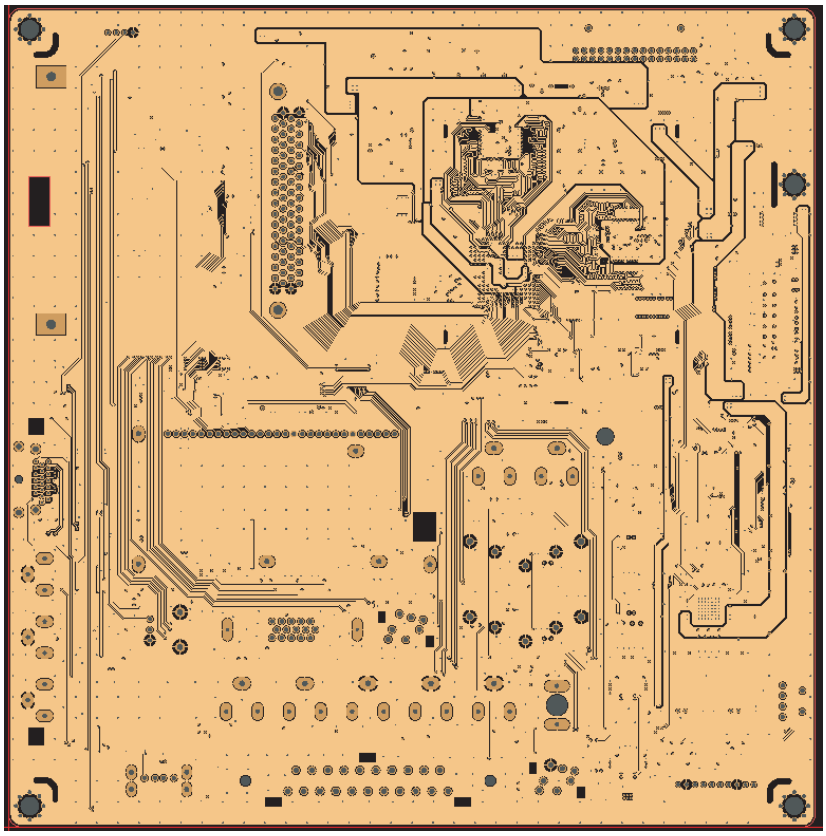
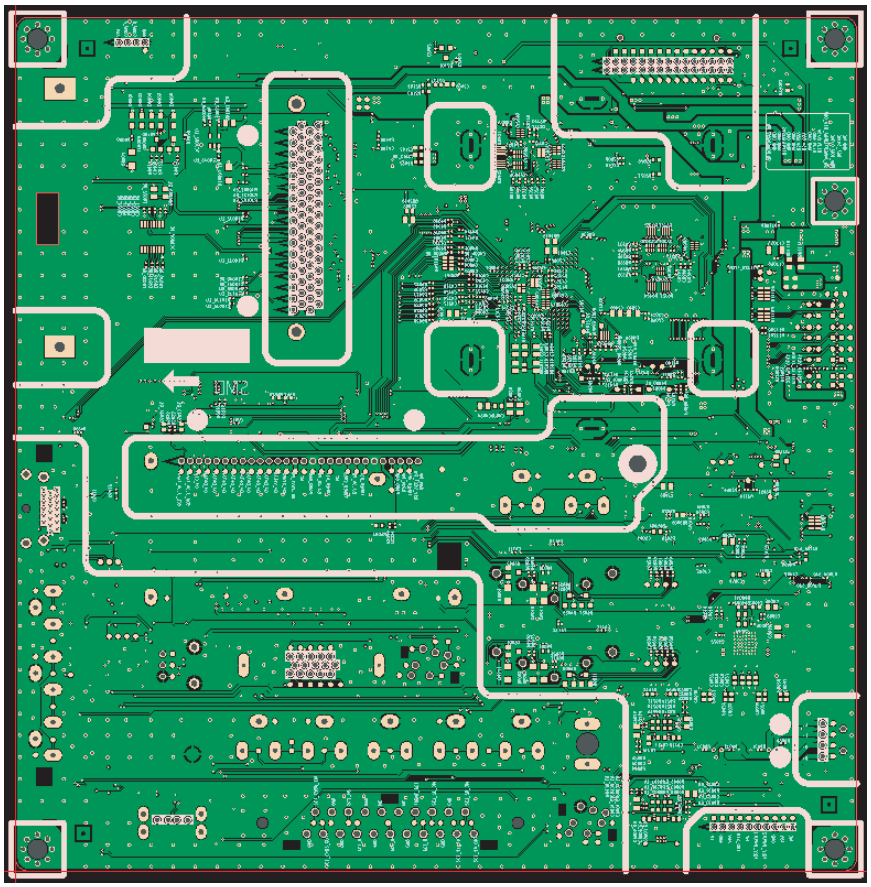
4-9. PCB diagram

4-8-1. 19”/22”









4-8-2. 26”/32”