



# LCD-TV

Chassis : N83C

Model : LN19C350D1D  
LN22C350D1D  
LN19C450E1D  
LN22C450E1D

## ***SERVICE*** Manual

### TFT-LCD TV



LN22C450E1D

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3. Disassembly and Reassembly
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### 3. Disassembly and Reassembly

This section of the service manual describes the disassembly and reassembly procedures for the LN22C350D1D LCD TV.

**⚠ WARNING:** This LCD TV contains electrostatically sensitive devices. Use caution when handling these components.


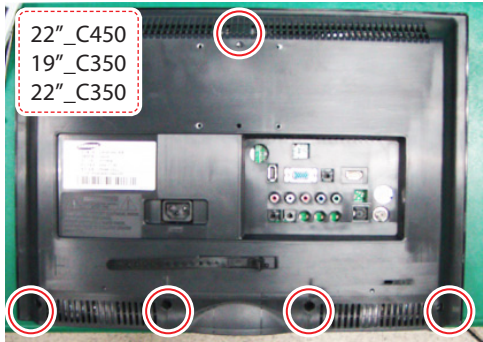

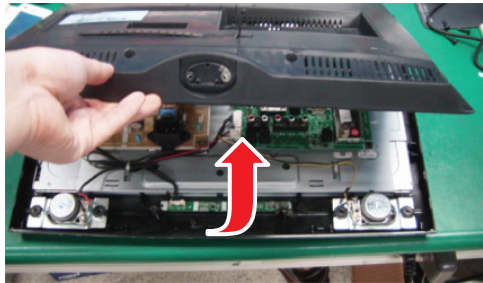
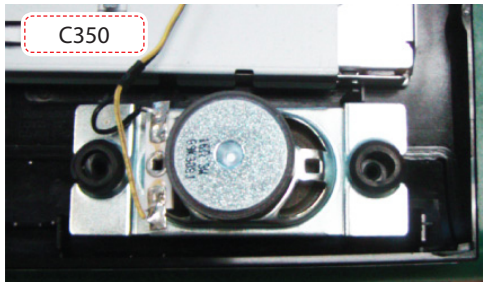

#### 3-1. Disassembly and Reassembly

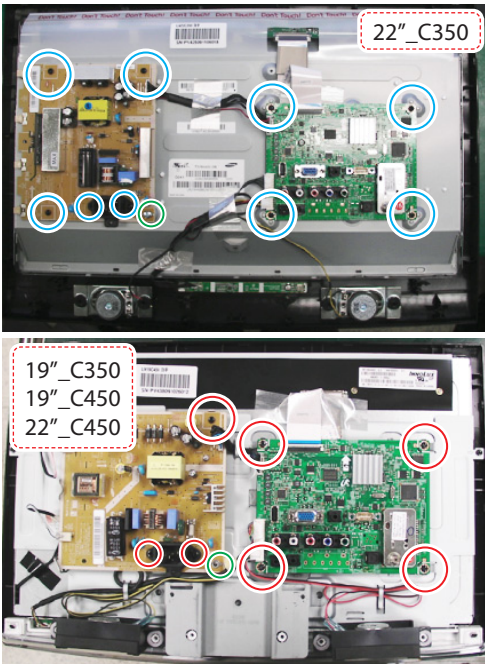





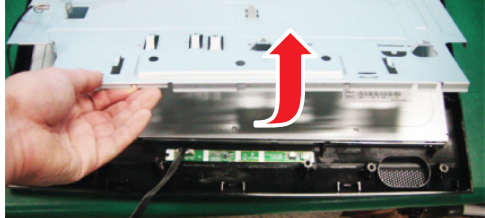
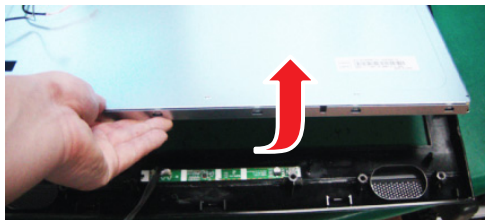
- ⚠ Cautions:**
- 1. Disconnect the LCD TV from the power source before disassembly.
  - 2. Follow these directions carefully; never use metal instruments to pry apart the cabinet.

Description	Picture Description	Screws
1. Place monitor face down on cushioned table. Remove 2 screws (19" _C450 : 4 screws, 22" _C450 : 3 screws) from the stand. Remove stand.		
	 	 6002-001294 (M4 x L16, Tapping)
	 	



3. Disassembly and Reassembly

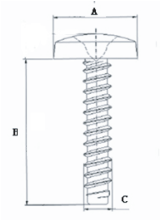
Description	Picture Description	Screws
2. 22"/19"_C350 : Remove the 4 screws of rear-cover. 19"_C450 : Remove the 2 screws of rear-cover. 22"C450 : Remove the 5 screws of rear-cover.	<div>19" _C450</div>  <div>22" _C450 19" _C350 22" _C350</div> 	 6002-001294 (M4 x L16, Tapping)
3. Lift up the rear-cover.		
4. Remove the left and right speaker.	<div>C350</div>  <div>C450</div> 	

Description	Picture Description	Screws
<p>5. Remove the 4 screws of main board and 4 screws (22" C350 : 6 screws) of IP board.</p>		 <p>6003-000269 (M3 x L6, TAPTYPE)</p>  <p>6003-001439 (M4 x L8, TAPTYPE)</p>  <p>6002-001294 (M4 x L16, Tapping)</p>
<p>6. Remove the 2 screws of bracket stand link. (22" C350 no screw)</p>		 <p>6001-000321 (M3 x L10, MACHINE)</p>
<p>7. Lift up the stand link.</p>		
<p>8. Lift up the panel.</p>		

※ Reassembly procedures are in the reverse order of disassembly procedures.

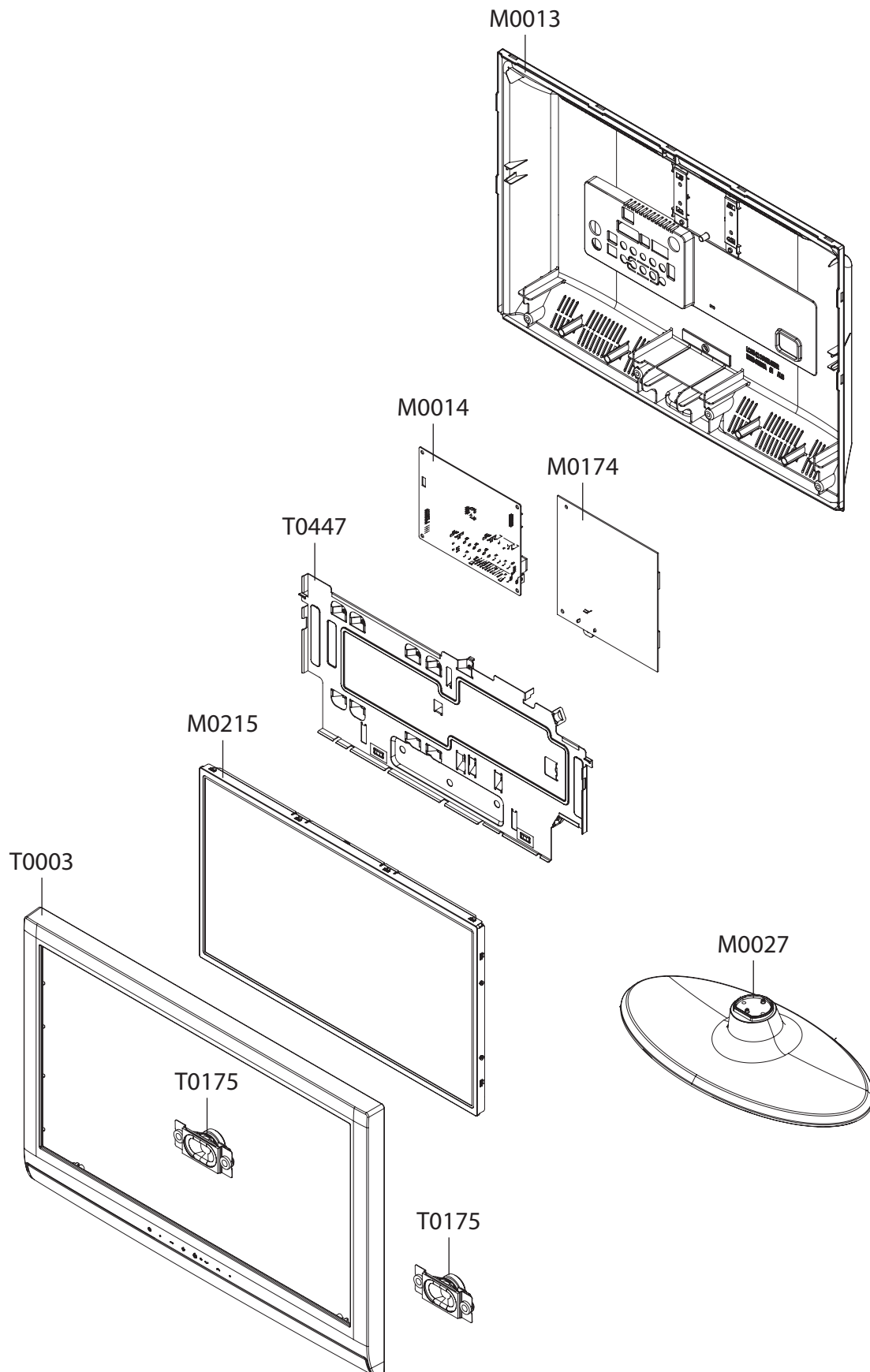
### 3. Disassembly and Reassembly

#### Screw Size

Code No.	A (mm)	B (mm)	C (mm)	Q'ty	
6002-001294	8.3±0.5	16±0.8	3.85~4.0	-	
6003-000275	5.80~6.30	9.2~10.0	2.85~2.95	-	
6003-001439	8.3±0.4	8.0±0.4	3.85~3.93	1(ALL)	

## 5. Exploded View & Part List

### 5-1. LN19C350D1D Exploded View



**5-1-1. LN19C350D1D Parts List**

Location No.	Code No.	Description & Specification	Q'ty	S.A/S.N.A	Remark
T0003	BN96-12856A	ASSY COVER P-FRONT;LC350 19,UO,PC+ABS,V0	1	S.A	
T0175	BN96-13057A	ASSY SPEAKER P;16ohm,4pin,3W,L:260 R:270	1	S.A	
M0215	BN07-00766A	LCD-PANEL;MT185GW01 V2,6bit Hi-FRC,18.5,	1	S.A	
T0447	BN96-13322A	ASSY BRACKET P-PANEL;LC350 19,UO,SECC,T0	1	S.N.A	
M0014	BN94-02632A	ASSY PCB MAIN;LC350,N83C	1	S.A	
M0174	BN44-00328A	IP BOARD-LIPS;PSIV350310A,E19HD_ASM,6.8m	1	S.A	
M0013	BN96-12860A	ASSY COVER P-REAR;LC350 19,UO,HIPS,V0,BK	1	S.A	
M0027	BN96-12868A	ASSY STAND P-BASE;LC350 19,ABS+PMMA,HB,B	1	S.A	

## 5-2. LN19C350D1D Parts List

Service Bom (SA: SERVICE AVAILABLE, SNA: SERVICE NOT AVAILABLE)

Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
			LN19C350D1DXZA			
0.1		BN90-02517A	ASSY COVER FRONT;LC350 19	1	S.N.A	
..2	T0527	AA68-03539A	LABEL BAR CODE;65X40mm,ART PAPER	1	S.N.A	
..2	T0003	BN96-12856A	ASSY COVER P-FRONT;LC350 19,UO,PC+ABS,V0	1	S.A	
...3	CCM1	BN63-02183D	COVER-SHEET;Rhcm,PE Vinyl,T0.04,680mm,20	0.4	S.N.A	
...3	CCM1	BN63-05199J	COVER-SHEET;AMBER,PE,T0.08,W105mm,200M,C	1.73	S.N.A	
...3	M0112	BN63-06673A	COVER-FRONT;LC350 19,UO,PC+ABS,V0,BK0008	1	S.N.A	
...3	C457	BN64-01302A	WINDOW-REMOCON;32LC350,PC,V0,VIOLET	1	S.N.A	
...3	M0125	BN96-13063D	ASSY BOARD P-TOUCH FUNCTION&IR;LN19(22)C	1	S.A	
..2	T0175	BN96-13057A	ASSY SPEAKER P;16ohm,4pin,3W,L:260 R:270	1	S.A	
0.1	M0002	BN90-02521A	ASSY COVER REAR;LC350 19	1	S.N.A	
..2	T0081	6002-001294	SCREW-TAPPING;BH,+,,M4,L16,ZPC(BLK)	4	S.N.A	
..2	M0013	BN96-12860A	ASSY COVER P-REAR;LC350 19,UO,HIPS,V0,BK	1	S.A	
...3	M0113	BN61-01581A	BRACKET-VESA;BI17/19BS,SECC,T1.0	2	S.N.A	
...3	M0006	BN63-06677A	COVER-REAR;LC350 19,UO,HIPS,V0,BK0020	1	S.N.A	
...3	T0139	BN65-00002A	CLAMPER CORE;BORDEAUX,LDPE,BLK	1	S.N.A	
...3	T0071	BN64-01263D	INLAY-TERMINAL;LC350 19/22,UO,PS SHEET,T	1	S.N.A	
0.1	M0216	BN90-02525A	ASSY STAND;LC350 19	1	S.N.A	
..2	M0027	BN96-12868A	ASSY STAND P-BASE;LC350 19,ABS+PMMA,HB,B	1	S.A	
...3	CCM1	BN63-02183C	COVER-SHEET;Rhcm,PE Vinyl,T0.04,200mm,20	0.4	S.N.A	
...3		BN63-06686A	COVER-STAND BASE;LC350 19,ABS+PMMA,HB,BK	1	S.N.A	
...3	M0126	BN73-00052B	RUBBER-FOOT;42Q9,c9,CR Rubber Gray,T3.0	4	S.N.A	
0.1		BN91-04573A	ASSY LCD-INNOLUX;BN07-00766A,TN ZBD	1	S.N.A	
..2	M0215	BN07-00766A	LCD-PANEL;MT185GW01 V2,6bit Hi-FRC,18.5,	1	S.A	
0.1	M0017	BN91-04768A	ASSY CHASSIS;LC350, N83C	1	S.N.A	
..2	M0014	BN94-02632A	ASSY PCB MAIN;LC350,N83C	1	S.A	
...3		0202-001463	SOLDER-WIRE;LFC2-W3.0,-,D3,99.79Sn/0.2Cu	4.923	S.N.A	
...3		0202-001608	SOLDER-WIRE FLUX;LFC7-107,D0.8,99.3Sn/0.	0.025	S.N.A	
...3		0204-002420	SOLVENT;1M-1000,C3H7OH,96	2.75	S.N.A	
...3		0204-002607	FLUX;DF-234U,13%,14KG,Gravity 0.82	1.792	S.N.A	
...3		3701-001480	CONNECTOR-DSUB;15P,3R,FEMALE,STAMPED PIN	1	S.A	
...3		3711-006715	HEADER-BOARD TO CABLE;BOX,4P,1R,2.5mm,AN	1	S.N.A	
...3	CN2	3722-002516	JACK-USB;4P/1C,AU30U,BLK,STRAIGHT,A TYPE	1	S.A	
...3	T0756	AA68-01018A	LABEL-PQS;50mmX,13,WHITE	1	S.N.A	
...3	CIS3	BN40-00140B	TUNER;DTM-6B/13FCS,VSB HALF NIM,191CH,45	1	S.A	
...3		BN97-00707A	ASSY HDCP;BN46-00018A,BR20/21BS_CS,MSTAR	1	S.N.A	
....4		BN46-00018A	KEY CODE-CERTIFICATE;(HDCP KEY)PPM42M5S,	1	S.N.A	
...3	T0174	BN97-04012A	ASSY SMD;LC350, N83C,BN94-02632A	1	S.N.A	
....4		0202-001477	SOLDER-CREAM;LST309-M,D20~45um,96.5Sn/3A	1.423	S.N.A	
....4		0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	5	S.A	
....4	D1	0401-001099	DIODE-SWITCHING;1N4148WS,75V,150mA,SOD-3	4	S.A	
....4	D0254	0402-000553	DIODE-SCHOTTKY;SS24/B240,40V,2000mA,DO-2	1	S.A	
....4		0403-001052	DIODE-ZENER;RD8.2MB,7.7-8.7V,200mW,SOT-2	1	S.A	
....4		0403-001783	DIODE-ZENER;BZB84-C6V2,5.8/6.6V,300mW,SO	8	S.N.A	
....4	D0254	0404-001404	DIODE-SCHOTTKY;BAT721C,40V,200mA,SOT-23,	2	S.A	
....4	T0139	0406-001200	DIODE-TVS;RCLAMP0504F,6/-/-V,150W,SC-70	1	S.A	

## 5. Exploded View &amp; Part List

Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
....4	SD3	0407-000114	DIODE-SWITCHING;KDS184,80V,100mA,SOT-23,	1	S.N.A	
....4	Q101	0501-000445	TR-SMALL SIGNAL;KTC3875S-Y,NPN,150mW,SOT	12	S.A	
....4	Q409	0505-002572	FET-SILICON;AO4801AL,P,-30V,-5.6A,0.075o	2	S.A	
....4	IC112	1103-001310	IC-EEPROM;24LC02B,256X8BIT,SOIC,8P,3.91X	2	S.N.A	
....4	IC112	1103-001471	IC-EEPROM;M24515-HRMN6TP,512Kbit,64Kx8,S	1	S.A	
....4		1105-002049	IC-DDR2 SDRAM;EM68B16CWPA-25H,DDR2 SDRAM	1	S.A	
....4	T0085	1201-002487	IC-AUDIO AMP;MAX9728A,QFN,12P,3x3mm,DUAL	1	S.A	
....4	T0124	1201-002993	IC-POWER AMP;TAS5715,HTQFP,48P,7x7mm,DUA	1	S.A	
....4	T0087	1203-002835	IC-POSIFIXED REG.;KIA7805AF,DPAK,3P,6.6	1	S.A	
....4		1203-004364	IC-VOL. DETECTOR;RT9818C-42PV,SOT-23,3P,	2	S.A	
....4		1203-005559	IC-BACKLIGHT DRIVER;MP3302DJ,TSOT23,5P,2	1	S.A	
....4		1203-006104	IC-DC/DC CONVERTER;MP8707EN,SOIC8E,8P,4.	1	S.A	
....4	T0087	1203-006135	IC-POSIFIXED REG.;AP1117D-33-GZ-13-89,T	2	S.A	
....4	IC012	1203-006138	IC-POSIAJUST REG.;AP1117DGZ-13-89,TO-2	2	S.A	
....4		1204-002818	IC-DEMODULATOR;SSH1411,-,100P,14x14mm,PL	1	S.A	
....4		1204-002980	IC-DECODER;SEMS13-LF,FBGA,377P,21x21mm,P	1	S.N.A	
....4		1205-003735	IC-SWITCH;AP2151WG-7,SOT25,5P,2.9x1.6mm,	1	S.A	
....4		1405-001271	VARISTOR;20Vdc,5A,1.0x0.5x0.6mm,TP	18	S.A	
....4	PR6	2007-000072	R-CHIP;47ohm,5%,1/10W,TP,1608	2	S.N.A	
....4	MR122	2007-000094	R-CHIP;22Kohm,5%,1/10W,TP,1608	6	S.A	
....4	R105	2007-000138	R-CHIP;100ohm,5%,1/16W,TP,1005	13	S.N.A	
....4	AR49	2007-000140	R-CHIP;1Kohm,5%,1/16W,TP,1005	10	S.N.A	
....4	MR306	2007-000141	R-CHIP;2.2Kohm,5%,1/16W,TP,1005	8	S.N.A	
....4	R319	2007-000143	R-CHIP;4.7Kohm,5%,1/16W,TP,1005	17	S.N.A	
....4	R104	2007-000148	R-CHIP;10Kohm,5%,1/16W,TP,1005	25	S.N.A	
....4	R102	2007-000149	R-CHIP;12Kohm,5%,1/16W,TP,1005	2	S.A	
....4	MR36	2007-000153	R-CHIP;22Kohm,5%,1/16W,TP,1005	3	S.N.A	
....4	AR43	2007-000155	R-CHIP;27Kohm,5%,1/16W,TP,1005	1	S.N.A	
....4	R123	2007-000159	R-CHIP;56Kohm,5%,1/16W,TP,1005	1	S.N.A	
....4	DR39	2007-000162	R-CHIP;100Kohm,5%,1/16W,TP,1005	5	S.N.A	
....4	R509	2007-000170	R-CHIP;1Mohm,5%,1/16W,TP,1005	2	S.N.A	
....4	R338	2007-000173	R-CHIP;22ohm,5%,1/16W,TP,1005	7	S.N.A	
....4	UR23	2007-000174	R-CHIP;47ohm,5%,1/16W,TP,1005	10	S.N.A	
....4	PR6	2007-000583	R-CHIP;22Kohm,1%,1/10W,TP,1608	1	S.A	
....4	DR37	2007-000932	R-CHIP;470ohm,5%,1/16W,TP,1005	6	S.N.A	
....4		2007-001285	R-CHIP;5.6ohm,5%,1/16W,TP,1005	2	S.A	
....4	OTR1	2007-001292	R-CHIP;33ohm,5%,1/16W,TP,1005	6	S.N.A	
....4	R326	2007-001325	R-CHIP;3.3Kohm,5%,1/16W,TP,1005	2	S.N.A	
....4		2007-001333	R-CHIP;18Kohm,5%,1/16W,TP,1005	5	S.N.A	
....4	MR316	2007-002796	R-CHIP;510ohm,5%,1/16W,TP,1005	2	S.A	
....4	PR24	2007-002970	R-CHIP;56ohm,5%,1/16W,TP,1005	1	S.A	
....4		2007-007135	R-CHIP;18Kohm,1%,1/16W,TP,1005	1	S.N.A	
....4		2007-007156	R-CHIP;1ohm,5%,1/16W,TP,1005	4	S.N.A	
....4	MR601	2007-007307	R-CHIP;150ohm,1%,1/16W,TP,1005	2	S.N.A	
....4		2007-007312	R-CHIP;20Kohm,1%,1/16W,TP,1005	1	S.A	
....4		2007-007318	R-CHIP;1Kohm,1%,1/16W,TP,1005	4	S.N.A	
....4		2007-007319	R-CHIP;390ohm,1%,1/16W,TP,1005	1	S.N.A	
....4		2007-007334	R-CHIP;200Kohm,1%,1/16W,TP,1005	1	S.N.A	
....4		2007-007573	R-CHIP;330Kohm,1%,1/16W,TP,1005	1	S.C	
....4	R8	2007-007721	R-CHIP;560ohm,1%,1/10W,TP,1608	1	S.A	



Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
....4		2007-007766	R-CHIP;2Kohm,1%,1/16W,TP,1005	1	S.N.A	
....4	MR11	2007-008015	R-CHIP;75ohm,1%,1/16W,TP,1005	8	S.N.A	
....4		2007-008332	R-CHIP;11.5Kohm,1%,1/16W,TP,1005	1	S.A	
....4		2007-008563	R-CHIP;270ohm,1%,1/16W,TP,1005	1	S.A	
....4		2007-008720	R-CHIP;4.7ohm,1%,1/4W,TP,3216	1	S.N.A	
....4	RN9	2011-000002	R-NETWORK;22ohm,5%,1/16W,L,CHIP,8P,TP,32	4	S.A	
....4		2011-000651	R-NETWORK;10ohm,5%,1/16W,L,CHIP,8P,TP,32	2	S.A	
....4	PRN7	2011-001011	R-NETWORK;10Kohm,5%,1/16W,L,CHIP,8P,TP,3	1	S.A	
....4		2011-001449	R-NETWORK;22ohm,5%,1/16W,L,4P,TP,1010	6	S.A	
....4		2011-001506	R-NETWORK;10Kohm,5%,1/16W,L,CHIP,4P,TP,1	2	S.N.A	
....4		2011-001527	R-NETWORK;4.7Kohm,5%,1/16W,L,CHIP,4P,TP,	2	S.N.A	
....4	PC43	2203-000233	C-CER,CHIP;0.1nF,5%,50V,C0G,TP,1005	5	S.A	
....4	MC2	2203-000254	C-CER,CHIP;10nF,10%,16V,X7R,TP,1005	4	S.A	
....4	MC302	2203-000425	C-CER,CHIP;.018nF,5%,50V,C0G,TP,1005	1	S.A	
....4	C254	2203-000438	C-CER,CHIP;1nF,10%,50V,X7R,TP,1005	6	S.A	
....4	C507	2203-000489	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1005	3	S.A	
....4	DC25	2203-000812	C-CER,CHIP;.033nF,5%,50V,C0G,1005	4	S.A	
....4	CK40B	2203-000838	C-CER,CHIP;0.39NF,5%,50V,C0G,TP,1608	1	S.N.A	
....4	C132	2203-000854	C-CER,CHIP;0.039nF,5%,50V,C0G,1005	2	S.A	
....4	AD480	2203-000995	C-CER,CHIP;.047nF,5%,50V,C0G,TP,1005	4	S.A	
....4	HDC5	2203-001072	C-CER,CHIP;0.056nF,5%,50V,NP0,1005	1	S.A	
....4	AD480	2203-001412	C-CER,CHIP;0.03nF,5%,50V,NP0,TP,1005	2	S.N.A	
....4	AD480	2203-001428	C-CER,CHIP;470nF,10%,50V,X7R,TP,2012	2	S.N.A	
....4	AD480	2203-002525	C-CER,CHIP;0.56nF,10%,50V,X7R,TP,1005	4	S.N.A	
....4	C33	2203-002687	C-CER,CHIP;1.2nF,10%,50V,X7R,TP,1005	4	S.A	
....4	AAC1	2203-005249	C-CER,CHIP;100nF,10%,50V,X7R,TP,1608	8	S.N.A	
....4	AD480	2203-005809	C-CER,CHIP;1000nF,10%,16V,X7R,TP,2012	1	S.C	
....4	AD480	2203-005968	C-CER,CHIP;4.7NF,10%,50V,X7R,TP,1005	2	S.N.A	
....4	AD480	2203-006126	C-CER,CHIP;47NF,10%,16V,X7R,TP,1005	12	S.N.A	
....4	PC11	2203-006141	C-CER,CHIP;1000nF,10%,16V,X5R,1608	10	S.N.A	
....4	C102	2203-006158	C-CER,CHIP;100nF,10%,16V,X7R,1005	96	S.N.A	
....4	AD480	2203-006307	C-CER,CHIP;1000nF,10%,25V,X5R,2012	1	S.N.A	
....4	AD480	2203-006336	C-CER,CHIP;10000nF,10%,25V,X5R,3216	2	S.A	
....4	C125	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,TP,2012	28	S.C	
....4	AD480	2203-006427	C-CER,CHIP;4700nF,10%,16V,X5R,TP,2012	1	S.A	
....4	AD480	2203-006460	C-CER,CHIP;2200nF,10%,16V,X5R,1608	4	S.A	
....4	HE4	2203-006474	C-CER,CHIP;22000nF,20%,6.3V,X5R,2012	2	S.A	
....4	HDC11	2203-006562	C-CER,CHIP;1000nF,10%,10V,X5R,TP,1005	1	S.N.A	
....4	AD480	2203-007176	C-CER,CHIP;10000nF,10%,16V,X5R,TP,2012 (	4	S.N.A	
....4	AD480	2203-007270	C-CER,CHIP;10000nF,10%,10V,X5R,TP,1608	5	S.N.A	
....4	T0052	2703-000158	INDUCTOR-SMD;1uH,10%,2012	4	S.A	
....4	VL6	2703-000398	INDUCTOR-SMD;10uH,10%,3225	5	S.A	
....4	T0052	2703-003790	INDUCTOR-SMD;4.7uH,20%,8080	1	S.A	
....4	X202	2801-003773	CRYSTAL-SMD;12MHz,30ppm,28-AAN,20pF,50oh	1	S.A	
....4	X202	2801-004604	CRYSTAL-SMD;24.69MHz,30ppm,27pF,40ohm,TP	1	S.A	
....4	F103	2901-001565	FILTER-EMI SMD;10V,0.1A,2.0x1.0x0.8mm,TP	2	S.A	
....4	T0568	3301-001186	BEAD-SMD;600ohm,3216,2500mA,TP,553ohm/93	4	S.A	
....4	T0568	3301-001236	BEAD-SMD;60ohm,1608	9	S.N.A	
....4	T0568	3301-002039	BEAD-SMD;26ohm,1608,TP	20	S.A	
....4		3701-001591	CONNECTOR-HDMI;19P,2ROW,FEMALE,SMD-S,AU	1	S.N.A	

## 5. Exploded View &amp; Part List

Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
....4	AC510	3708-001150	CONNECTOR-FPC/FFC/PIC;30P,1mm,SMD-A,SN,Y	1	S.A	
....4		3711-005601	HEADER-BOARD TO CABLE;BOX,8P,1R,2mm,SMD-	1	S.N.A	
....4	T0077	BN41-01335A	PCB MAIN;FR-4,4,1.2T,157x122 (157x244)	1	S.N.A	
....4	M0018	BN97-04041A	ASSY MICOM;N83C,2009.11.16,T-SAT4AUSHC-X	1	S.N.A	
....5	IC115	1107-001777	IC-FLASH MEMORY;MX25L6405DMI-12G,64Mbit,	1	S.N.A	
....4	T0527	AA68-01544A	LABEL-LINE;ALL MDL COMMON	2	S.N.A	
....4	R111	2007-000171	R-CHIP;0ohm,5%,1/16W,TP,1005	4	S.N.A	
....4		3711-005940	HEADER-BOARD TO CABLE;BOX,9P,1R,2mm,SMD-	1	S.N.A	
...3	T0066	BP62-00017A	HEAT SINK-ES;SP-50L2HX,A6063S,T2.0,26.2,	1	S.N.A	
...3	T0066	BP62-00047A	HEAT SINK-ES;DLP,A6063S,T2.5,13,13,TAPE	1	S.N.A	
...3	CN906	3707-001096	CONNECTOR-OPTICAL;STRAIGHT W/L,SPDIF	1	S.A	
...3	JA330	3722-003038	JACK-PHONE;7P/1C W/L,SN,BLK	2	S.A	
...3	JA333	3722-003052	JACK-PIN;5P+Shield W/L,NI/SN,GN/BL/RD/WH	1	S.A	
0.1		BN91-04776A	ASSY SHIELD;LN19C350D1DX*	1	S.N.A	
..2	W391	6003-000275	SCREW-TAPTYPE;BH,+,B,M3,L10,ZPC(BLK),SWR	9	S.A	
..2	M0081	6003-001439	SCREW-TAPTYPE;BH,+,S,M4,L8,ZPC(WHT),SWRC	1	S.N.A	
..2	M0174	BN44-00328A	IP BOARD-LIPS;PSIV350310A,E19HD_ASM,6.8m	1	S.A	
..2	T0447	BN96-13322A	ASSY BRACKET P-PANEL;LC350 19,UO,SECC,T0	1	S.N.A	
...3	AB258	BN61-06148B	BRACKET-PANEL;LC450 19",SECC,0.8,INNOLUX	1	S.N.A	
..2	M0230	BN96-12447P	ASSY CABLE P-FFC;LN19C350D1DXZA,FFC,0.3m	1	S.A	
0.1		BN92-05553A	ASSY BOX;LC350 19	1	S.N.A	
..2	T0077	BH68-00329D	LABEL BAR CODE-02;NO CE,NO WT`Y,MPRII,LA	1	S.N.A	
..2	M0120	BH75-10529A	UNIT-HANDLE PACKING;LXA410TLMU,PE,WHITE	1	S.N.A	
...3	M0019	BN72-60001A	LEVER-TOP;LSD210TL,PE-LD,WHITE,TFT_LCD	1	S.N.A	
...3		BN72-60002A	LEVER-BOTTOM;LSD210TL,PE-LD,WHITE,TFT-LC	1	S.N.A	
..2		BN69-04679B	BOX-SET;19LC350,CB,A-01,SW2,YEL,W518,D3	1	S.N.A	
0.1		BN92-05557A	ASSY P/MATERIAL;LC350 19	1	S.N.A	
..2	T0214	0203-001595	TAPE-OPP MASKING;OPP-2,0.075,75,800M,CLR	1.34	S.N.A	
..2	T0524	6902-000241	BAG PE;HDPE/NITRON,T0.5/T0.012,W600,L600	1	S.N.A	
..2		6902-000622	BAG SHEET;HDPE/NITRON,T0.015/T1.0,W1000,	1	S.N.A	
..2		BH69-00418A	BAG WRAPPING;LDPE,762,1828M,SAMEX FACTOR	0.33	S.N.A	
..2		BH69-40321C	PACKING INNER-00,PAD;COMM,CB-SW4/YEL,203	1	S.N.A	
..2		BH69-40353A	PACKING INNER-00,PAD;CQA4147,CB-SW4,748.	1	S.N.A	
..2	T0527	BN68-00129A	LABEL SHIPPING-00;LABEL SHIPPING,ART-PAP	1	S.N.A	
..2		BN69-02240F	PALLET-WOOD;19LB650,WOOD,W1150,D1090,H12	1	S.N.A	
..2	T0246	BN69-04642A	CUSHION-SET;19LC350,EPS,16.7g/l	1	S.N.A	
0.1		BN92-05693A	ASSY LABEL;LN19C350D1DX*,22	1	S.N.A	
..2	CCM1	BN68-01176A	LABEL RATING;W/W,SS,PET POLYESTER,T0.05,	1	S.N.A	
0.1	M0045	BN92-05696A	ASSY ACCESSORY;LN19C350D1DXZA,22	1	S.N.A	
..2	M0045	BN96-13207A	ASSY ACCESSORY-CABLE;LN19/22C350D1DX*	1	S.A	
...3	T0268	3903-000467	CBF-POWER CORD;DT,US,EP3,IEC320 C13-RA,1	1	S.N.A	
...3	T0685	4301-000103	BATTERY-ALKALINE;1.5V,750mAh,LR03,10.5x4	2	S.N.A	
...3	T0524	6902-001107	BAG PE;LDPE,T0.05,W450,L400,TRP,0.3Separ	1	S.N.A	
...3	T0074	BN59-01006A	REMOCON;TM940,SAMSUNG,20PIN SINGLE,39KEY	1	S.A	
...3	T0527	BN68-00513A	LABEL-E,PASS;ALL MODEL,YUPO(110G),50X15,	1	S.N.A	
...3	M0045	BN96-01800C	ASSY ACCESSORY;PEONY/ROSE,-,KO,-,-,Witho	1	S.N.A	
....4	T0081	6002-001294	SCREW-TAPPING;BH,+,M4,L16,ZPC(BLK)	2	S.N.A	
....4		6902-000683	BAG ZIPPER;LDPE,T0.05,W60,L60,TRP,4-PE M	1	S.N.A	
..2		BN96-13240A	ASSY ACCESSORY-MANUAL;LN19C350D1DXZA	1	S.A	
...3	T0524	6902-000018	BAG PE;LDPE,T0.1,W280,L400,CLEAR,8,2,20.	1	S.N.A	

Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
...3		AA68-03242L	MANUAL FLYER-07,SAFETY GUIDE;comm,Samsun	1	S.N.A	
...3	M9889	BN63-01798B	CLOTH-CLEAN;cloth,180,200,sea blue,ToC	1	S.N.A	
...3	T0527	BN68-00513A	LABEL-E,PASS;ALL MODEL,YUPO(110G),50X15,	1	S.N.A	
...3	T0511	BN68-02582A	MANUAL USERS;LC350,SAMSUNG,Eng,USA,W/P 8	1	S.N.A	
...3		BN68-02605A	MANUAL FLYER-QSG;L350,SAMSUNG,Eng,USA,W/	1	S.N.A	
...3		BP68-00263E	MANUAL FLYER-WARRANTY CARD;comm,Samsung,	1	S.N.A	

# 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

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

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

1. When servicing the LCD 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.

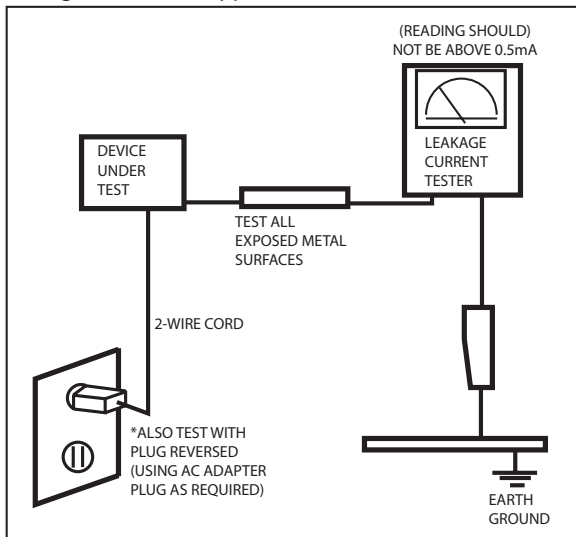
### 1-1-3. Fire and Shock Hazard

Before returning the LCD TV 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 LCD TV.
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 (Figure 1-1):

**WARNING :** Do not use an isolation transformer during this test.

Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, Leakage Current for Appliances), and Underwriters Laboratories (UL Publication UL1410, 59.7).



**Figure 1-1.** Leakage Current Test Circuit

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

## 1-2. Servicing Precautions

**WARNING:** An electrolytic capacitor installed with the wrong polarity might explode.

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

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

### 1-2-1 General Servicing Precautions

1. Always unplug the unit's AC power cord from the AC power source and disconnect the DC Power Jack before attempting to:  
(a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
2. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
3. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
4. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
5. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to 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. Electrostatically Sensitive Devices (ESD) 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 LCD TV.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.  
**Caution:** Be sure no power is applied to the chassis or circuit and observe all other safety precautions.
8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

## 1-4. Installation Precautions

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

## Memo



## 2. Product specifications

### 2-1. Feature & Specifications

Model	LN19C350D1D	
Feature		
<div>▶ Digital-TV, RF, 1-HDMI, 1-Component, 1-A/V, 1-USB2.0, D-SUB</div> <div>▶ Brightness : 250 cd/m²</div> <div>▶ High Contrast Ratio : TBD:1</div> <div>▶ Response Time : 5ms</div>		
Specifications		
Item	Description	
LCD Panel	19inch FHD 60Hz	
Scanning Frequency	Horizontal : 60 kHz ~ 73 kHz (Automatic) Vertical : 50 Hz ~ 76 Hz (Automatic)	
Display Colors	16.7M color	
Maximum resolution	Horizontal : 1366 Pixels Vertical : 768 Pixels	
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	75.4MHz	
Active Display Horizontal/Vertical	16.13 x 9.07 inches (409.8(H) x 230.4(V) mm)	
AC power voltage & Frequency	AC 110V ~ 120V, 60 Hz	
Power Consumption	Under 35W (Under 1W, Stand by)	
Dimensions Set (W x D x H)	18.2 x 6.3 x 14.3 inchs (461.2 x 161.0 x 364.0 mm)_with stand 18.2 x 2.3 x 12.7 inchs (461.2 x 59.5 x 322.2 mm)_without stand	
Weight	8.60 lbs (3.90kg)_with stand 9.04 lbs (4.10kg)_without stand	
TV System	Tunning	Frequency Synthesize (Refer to detailed Frequency Table)
	System	ATSC & Clear QAM
	Sound	NTSC-M, Dolby Digital <sup>+</sup>
Environmental Considerations	Operating Temperature : 32°F ~ 122°F (0°C ~ 50°C) Operating Humidity : 10% ~ 90% Storage temperature : -4°F ~ 140°F (-20°C ~ 60°C) Storage Humidity: 10% ~ 90%	
Audio Spec.	- MAX Internal Audio Output Power : Each 10W(Left/Right) - Equalizer : 5band - Output Frequency : RF : 20 Hz ~ 15.4 kHz AV/Componet/HDMI : 20 Hz ~ 20 kHz	
Note: Dolby Digital <sup>+</sup> , Game Mode, Film Mode, Energy Saving		

Model	LN22C350D1D	
Feature		
<div><div>▶ Digital-TV, RF, 1-HDMI, 1-Component, 1-A/V, 1-USB2.0, D-SUB</div><div>▶ Brightness : 300 cd/m<sup>2</sup></div><div>▶ High Contrast Ratio : TBD:1</div><div>▶ Response Time : 5ms</div></div>		
Specifications		
Item	Description	
LCD Panel	22inch FHD 60Hz	
Scanning Frequency	Horizontal : 60 kHz ~ 73 kHz (Automatic) Vertical : 47 Hz ~ 63 Hz (Automatic)	
Display Colors	16.7M color	
Maximum resolution	Horizontal : 1366 Pixels Vertical : 768Pixels	
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 MHz	
Active Display Horizontal/Vertical	18.96 x 10.73 inches (481.5(H) x 272.5(V) mm	
AC power voltage & Frequency	AC 110V ~ 120V, 60 Hz	
Power Consumption	Under 55 W (Under 1W, Stand by)	
Dimensions Set (W x D x H)	21.1 x 6.8 x 16.6 inchs (535.3 x 171.8 x 420.9 mm)_with stand 21.1 x 3.2 x 14.4 inchs (535.3 x 82.2 x 365.8 mm)_without stand	
Weight	8.60 lbs (3.90kg)_with stand 9.26 lbs (4.20kg)_without stand	
TV System	Tunning	Frequency Synthesize (Refer to detailed Frequency Table)
	System	ATSC & Clear QAM
	Sound	NTSC-M, Dolby Digital <sup>+</sup>
Environmental Considerations	Operating Temperature : 32°F ~ 122°F (0°C ~ 50°C) Operating Humidity : 20% ~ 90% Storage temperature : -4°F ~ 140°F (-20°C ~ 60°C) Storage Humidity: 10% ~ 90%	
Audio Spec.	- MAX Internal Audio Output Power : Each 10W(Left/Right) - Equalizer : 5band - Output Frequency : RF : 20 Hz ~ 15.4 kHz AV/Componet/HDMI : 20 Hz ~ 20 kHz	
<b>Note:</b> Dolby Digital <sup>+</sup> , Game Mode, Film Mode, Energy Saving		

Model	LN19C450E1D	
Feature		
<div><div>▶ Digital-TV, RF, 1-HDMI, 1-Component, 1-A/V, 1-USB2.0, D-SUB</div><div>▶ Brightness : 250 cd/m²</div><div>▶ High Contrast Ratio : TBD:1</div><div>▶ Response Time : 5ms</div></div>		
Specifications		
Item	Description	
LCD Panel	19inch FHD 60Hz	
Scanning Frequency	Horizontal : 60 kHz ~ 73 kHz (Automatic) Vertical : 50 Hz ~ 76 Hz (Automatic)	
Display Colors	16.7M color	
Maximum resolution	Horizontal : 1366 Pixels Vertical : 768 Pixels	
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	75.4 MHz	
Active Display Horizontal/Vertical	16.13 x 9.07 inches (409.8(H) x 230.4(V) mm)	
AC power voltage & Frequency	AC 110V ~ 120V, 60 Hz	
Power Consumption	Under 35W (Under 1W, Stand by)	
Dimensions Set (W x D x H)	18.2 x 7.1 x 13.7 inches (461.3 x 180.2 x 348.1 mm)_with stand 18.2 x 2.3 x 12.2 inches (461.3 x 59.2 x 309.0 mm)_without stand	
Weight	9.92 lbs (4.50kg)_with stand 8.69 lbs (3.94kg)_without stand	
TV System	Tunning	Frequency Synthesize (Refer to detailed Frequency Table)
	System	ATSC & Clear QAM
	Sound	NTSC-M, Dolby Digital <sup>+</sup>
Environmental Considerations	Operating Temperature : 32°F ~ 122°F (0°C ~ 50°C) Operating Humidity : 10% ~ 90% Storage temperature : -4°F ~ 140°F (-20°C ~ 60°C) Storage Humidity: 10% ~ 90%	
Audio Spec.	- MAX Internal Audio Output Power : Each 10W(Left/Right) - Equalizer : 5band - Output Frequency : RF : 20 Hz ~ 15.4 kHz AV/Componet/HDMI : 20 Hz ~ 20 kHz	
Note: Dolby Digital, Game Mode, Film Mode, Energy Saving, Anynet <sup>+</sup>		

Model	LN22C450E1D	
Feature		
<div>▶ Digital-TV, RF, 1-HDMI, 1-Component, 1-A/V, 1-USB2.0, D-SUB</div> <div>▶ Brightness : 400 cd/m<sup>2</sup></div> <div>▶ High Contrast Ratio : TBD:1</div> <div>▶ Response Time : 5ms</div>		
Specifications		
Item	Description	
LCD Panel	22inch FHD 60Hz	
Scanning Frequency	Horizontal : 60 kHz ~ 73 kHz (Automatic) Vertical : 47 Hz ~ 63 Hz (Automatic)	
Display Colors	16.7M color	
Maximum resolution	Horizontal : 1366 Pixels Vertical : 768Pixels	
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 MHz	
Active Display Horizontal/Vertical	18.96 x 10.73 inches (481.5(H) x 272.5(V) mm)	
AC power voltage & Frequency	AC 110V ~ 120V, 60 Hz	
Power Consumption	Under 55W (Under 1W, Stand by)	
Dimensions Set (W x D x H)	21.0 x 6.8 x 15.8 inchs (533.2 x 171.9 x 402.5 mm)_with stand 21.0 x 2.4 x 13.9 inchs (533.2 x 60.8 x 354.1 mm)_without stand	
Weight	11.46 lbs (5.20kg)_with stand 10.38 lbs (4.71kg)_without stand	
TV System	Tunning	Frequency Synthesize (Refer to detailed Frequency Table)
	System	ATSC & Clear QAM
	Sound	NTSC-M, Dolby Digital <sup>+</sup>
Environmental Considerations	Operating Temperature : 32°F ~ 122°F (0°C ~ 50°C) Operating Humidity : 20% ~ 90% Storage temperature : -4°F ~ 140°F (-20°C ~ 60°C) Storage Humidity: 10% ~ 90%	
Audio Spec.	- MAX Internal Audio Output Power : Each 10W(Left/Right) - Equalizer : 5band - Output Frequency : RF : 20 Hz ~ 15.4 kHz AV/Componet/HDMI : 20 Hz ~ 20 kHz	
<b>Note:</b> Dolby Digital, Game Mode, Film Mode, Energy Saving, Anynet <sup>+</sup>		

## ■ CHANNEL FREQUENCY TABLE

1. OUTPUT FREQUENCY : ANALOG fv:45.75MHz, fs:41.25MHz DIGITAL Fc:44MHz

2. TUNING STEP SIZE : FIRST PLL 250KHz SECOND PLL 62.5KHz

OSD	CH NO	AIR		BAND	CH NO			CH NO		CH NO	
		Air-DTV	Air-NTSC			Cable STD	BAND		Cable HRC		Cable IRC
1	1							A-8	72.00	A-8	73.25
2	2	57	55.25	V-L	2	55.25	V-L	2	54.00	2	55.25
3	3	63	61.25	V-L	3	61.25	V-L	3	60.00	3	61.25
4	4	69	67.25	V-L	4	67.25	V-L	4	66.00	4	67.25
5	5	79	77.25	V-L	5	77.25	V-L	A-7	78.00	A-7	79.25
6	6	85	83.25	V-L	6	83.25	V-L	A-6	84.00	A-6	85.25
7	7	177	175.25	V-H	7	175.25	V-H	7	174.00	7	175.25
8	8	183	181.25	V-H	8	181.25	V-H	8	180.00	8	181.25
9	9	189	187.25	V-H	9	187.25	V-H	9	186.00	9	187.25
10	10	195	193.25	V-H	10	193.25	V-H	10	192.00	10	193.25
11	11	201	199.25	V-H	11	199.25	V-H	11	198.00	11	199.25
12	12	207	205.25	V-H	12	205.25	V-H	12	204.00	12	205.25
13	13	213	211.25	V-H	13	211.25	V-H	13	210.00	13	211.25
14	14	473	471.25	UHF	A	121.25	MID	A	120.00	A	121.25
15	15	479	477.25	UHF	B	127.25	MID	B	126.00	B	127.25
16	16	485	483.25	UHF	C	133.25	MID	C	132.00	C	133.25
17	17	491	489.25	UHF	D	139.25	MID	D	138.00	D	139.25
18	18	497	495.25	UHF	E	145.25	MID	E	144.00	E	145.25
19	19	503	501.25	UHF	F	151.25	MID	F	150.00	F	151.25
20	20	509	507.25	UHF	G	157.25	MID	G	156.00	G	157.25
21	21	515	513.25	UHF	H	163.25	MID	H	162.00	H	163.25
22	22	521	519.25	UHF	I	169.25	MID	I	168.00	I	169.25
23	23	527	525.25	UHF	J	175.25	SUPER	J	174.00	J	175.25
24	24	533	531.25	UHF	K	181.25	SUPER	K	180.00	K	181.25
25	25	539	537.25	UHF	L	187.25	SUPER	L	186.00	L	187.25
26	26	545	543.25	UHF	M	193.25	SUPER	M	192.00	M	193.25
27	27	551	549.25	UHF	N	199.25	SUPER	N	198.00	N	199.25
28	28	557	555.25	UHF	O	205.25	SUPER	O	204.00	O	205.25
29	29	563	561.25	UHF	P	211.25	SUPER	P	210.00	P	211.25
30	30	569	567.25	UHF	Q	217.25	SUPER	Q	216.00	Q	217.25
31	31	575	573.25	UHF	R	223.25	SUPER	R	222.00	R	223.25
32	32	581	579.25	UHF	S	229.25	SUPER	S	228.00	S	229.25
33	33	587	585.25	UHF	T	235.25	SUPER	T	234.00	T	235.25
34	34	593	591.25	UHF	U	241.25	SUPER	U	240.00	U	241.25
35	35	599	597.25	UHF	V	247.25	SUPER	V	246.00	V	247.25
36	36	605	603.25	UHF	W	253.25	SUPER	W	252.00	W	253.25
37	37	611	609.25	UHF	AA	259.25	HYPER	AA	258.00	AA	259.25
38	38	617	615.25	UHF	BB	265.25	HYPER	BB	264.00	BB	265.25
39	39	623	621.25	UHF	CC	271.25	HYPER	CC	270.00	CC	271.25
40	40	629	627.25	UHF	DD	277.25	HYPER	DD	276.00	DD	277.25
41	41	635	633.25	UHF	EE	283.25	HYPER	EE	282.00	EE	283.25
42	42	641	639.25	UHF	FF	289.25	HYPER	FF	288.00	FF	289.25
43	43	647	645.25	UHF	GG	295.25	HYPER	GG	294.00	GG	295.25
44	44	653	651.25	UHF	HH	301.25	HYPER	HH	300.00	HH	301.25
45	45	659	657.25	UHF	II	307.25	HYPER	II	306.00	II	307.25
46	46	665	663.25	UHF	JJ	313.25	HYPER	JJ	312.00	JJ	313.25
47	47	671	669.25	UHF	KK	319.25	HYPER	KK	318.00	KK	319.25
48	48	677	675.25	UHF	LL	325.25	HYPER	LL	324.00	LL	325.25
49	49	683	681.25	UHF	MM	331.25	HYPER	MM	330.00	MM	331.25
50	50	689	687.25	UHF	NN	337.25	HYPER	NN	336.00	NN	337.25
51	51	695	693.25	UHF	OO	343.25	HYPER	OO	342.00	OO	343.25
52	52	701	699.25	UHF	PP	349.25	HYPER	PP	348.00	PP	349.25
53	53	707	705.25	UHF	QQ	355.25	HYPER	QQ	354.00	QQ	355.25
54	54	713	711.25	UHF	RR	361.25	HYPER	RR	360.00	RR	361.25
55	55	719	717.25	UHF	SS	367.25	HYPER	SS	366.00	SS	367.25
56	56	725	723.25	UHF	TT	373.25	HYPER	TT	372.00	TT	373.25
57	57	731	729.25	UHF	UU	379.25	HYPER	UU	378.00	UU	379.25
58	58	737	735.25	UHF	VV	385.25	HYPER	VV	384.00	VV	385.25
59	59	743	741.25	UHF	WW	391.25	HYPER	WW	390.00	WW	391.25
60	60	749	747.25	UHF	XX	397.25	HYPER	XX	396.00	XX	397.25
61	61	755	753.25	UHF	YY	403.25	HYPER	YY	402.00	YY	403.25
62	62	761	759.25	UHF	ZZ	409.25	HYPER	ZZ	408.00	ZZ	409.25
63	63	767	765.25	UHF	AAA	415.25	HYPER	AAA	414.00	AAA	415.25
64	64	773	771.25	UHF	BBB	421.25	HYPER	BBB	420.00	BBB	421.25
65	65	779	777.25	UHF	CCC	427.25	ULTRA	CCC	426.00	CCC	427.25
66	66	785	783.25	UHF	DDD	433.25	ULTRA	DDD	432.00	DDD	433.25
67	67	791	789.25	UHF	EEE	439.25	ULTRA	EEE	438.00	EEE	439.25
68	68	797	795.25	UHF	FFF	445.25	ULTRA	FFF	444.00	FFF	445.25
69	69	803	801.25	UHF	GGG	451.25	ULTRA	GGG	450.00	GGG	451.25

## 2. Product specifications

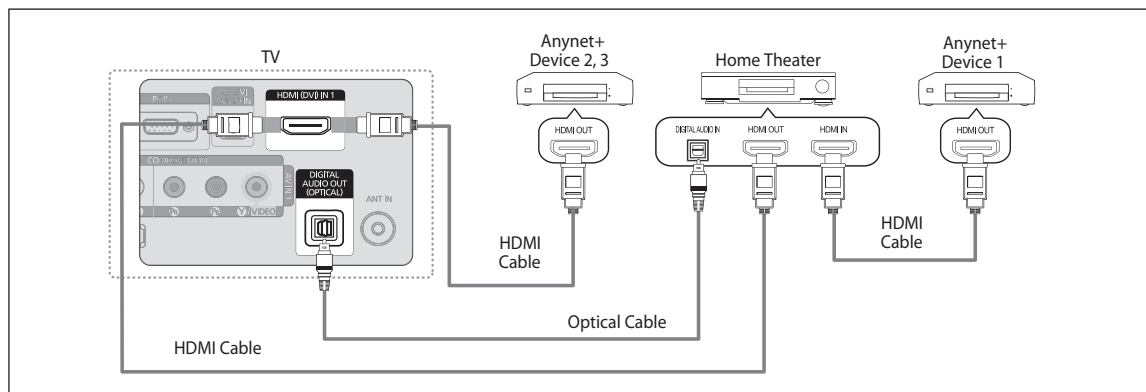
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		Air-DTV	Air-NTSC								
70	70				HHH	499.25	ULTRA	HHH	498.00	HHH	499.25
71	71				III	505.25	ULTRA	III	504.00	III	505.25
72	72				JJJ	511.25	ULTRA	JJJ	510.00	JJJ	511.25
73	73				KKK	517.25	ULTRA	KKK	516.00	KKK	517.25
74	74				LLL	523.25	ULTRA	LLL	522.00	LLL	523.25
75	75				MMM	529.25	ULTRA	MMM	528.00	MMM	529.25
76	76				NNN	535.25	ULTRA	NNN	534.00	NNN	535.25
77	77				000	541.25	ULTRA	000	540.00	000	541.25
78	78				PPP	547.25	ULTRA	PPP	546.00	PPP	547.25
79	79				79	553.25	ULTRA	79	552.00	79	553.25
80	80				80	559.25	ULTRA	80	558.00	80	559.25
81	81				81	565.25	ULTRA	81	564.00	81	565.25
82	82				82	571.25	ULTRA	82	570.00	82	571.25
83	83				83	577.25	ULTRA	83	576.00	83	577.25
84	84				84	583.25	ULTRA	84	582.00	84	583.25
85	85				85	589.25	ULTRA	85	588.00	85	589.25
86	86				86	595.25	ULTRA	86	594.00	86	595.25
87	87				87	601.25	ULTRA	87	600.00	87	601.25
88	88				88	607.25	ULTRA	88	606.00	88	607.25
89	89				89	613.25	ULTRA	89	612.00	89	613.25
90	90				90	619.25	ULTRA	90	618.00	90	619.25
91	91				91	625.25	ULTRA	91	624.00	91	625.25
92	92				92	631.25	ULTRA	92	630.00	92	631.25
93	93				93	637.25	ULTRA	93	636.00	93	637.25
94	94				94	643.25	ULTRA	94	642.00	94	643.25
95	95				A-5	91.25	FM	A-5	90.00	A-5	91.25
96	96				A-4	97.25	FM	A-4	96.00	A-4	97.25
97	97				A-3	103.25	FM	A-3	102.00	A-3	103.25
98	98				A-2	109.25	MID	A-2	108.00	A-2	109.25
99	99				A-1	115.25	MID	A-1	114.00	A-1	115.25
100	100				100	649.25	ULTRA	100	648.00	100	649.25
101	101				101	655.25	ULTRA	101	654.00	101	655.25
102	102				102	661.25	ULTRA	102	660.00	102	661.25
103	103				103	667.25	ULTRA	103	666.00	103	667.25
104	104				104	673.25	ULTRA	104	672.00	104	673.25
105	105				105	679.25	ULTRA	105	678.00	105	679.25
106	106				106	685.25	ULTRA	106	684.00	106	685.25
107	107				107	691.25	ULTRA	107	690.00	107	691.25
108	108				108	697.25	ULTRA	108	696.00	108	697.25
109	109				109	703.25	ULTRA	109	702.00	109	703.25
110	110				110	709.25	ULTRA	110	708.00	110	709.25
111	111				111	715.25	ULTRA	111	714.00	111	715.25
112	112				112	721.25	ULTRA	112	720.00	112	721.25
113	113				113	727.25	ULTRA	113	726.00	113	727.25
114	114				114	733.25	ULTRA	114	732.00	114	733.25
115	115				115	739.25	ULTRA	115	738.00	115	739.25
116	116				116	745.25	ULTRA	116	744.00	116	745.25
.	.				.	.	.	.	.	.	.
.	.				.	.	.	.	.	.	.
125	125				125	799.25	ULTRA	125	798.00	125	799.25
.	.				.	.	.	.	.	.	.
.	.				.	.	.	.	.	.	.

## 2-2. New Features explanation

### ■ What is Anynet+?

Anynet+ is a function that enables you to control all connected Samsung devices that support Anynet+ with your Samsung TV's remote. The Anynet+ system can be used only with Samsung devices that have the Anynet+ feature. To be sure your Samsung device has this feature, check if there is an Anynet+ logo on it.

#### To connect to Home Theater






1. Connect the HDMI IN 1 (DVI) jack on the TV and the HDMI OUT jack of the corresponding Anynet+ device using an HDMI cable.
  2. Connect the HDMI IN jack of the home theater and the HDMI OUT jack of the corresponding Anynet+ device using an HDMI cable.
- Connect the Optical cable between the DIGITAL AUDIO OUT (OPTICAL) jack on your TV and the Digital Audio Input on the Home Theater.
  - When following the connection above, the Optical jack only outputs 2 channel audio. You will only hear sound from the Home Theater's Front Left and Right speakers and the subwoofer. If you want to hear 5.1 channel audio, connect the DIGITAL AUDIO OUT (OPTICAL) jack on the DVD / Satellite Box (ie Anynet Device 1 or 2) directly to the Amplifier or Home Theater, not the TV.
  - Connect only one Home Theater.
  - You can connect an Anynet+ device using the HDMI cable. Some HDMI cables may not support Anynet+ functions.
  - Anynet+ works when the AV device supporting Anynet+ is in the Standby or On status.
  - Anynet+ supports up to 12 AV devices in total. Note that you can connect up to 3 devices of the same type.



## 2-3. Specification

### 2-3-1. Comparison to Old Models

※ O : application, X : non-application

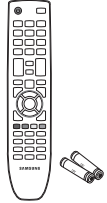
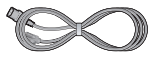
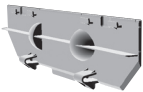
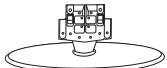
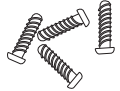
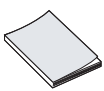

Model	LC4E(LN**C450E1D)	LC3D(LN**C350D1DXZA)	LB3F(LN**B360C5DXZA)
Design			
Display Type	LCD TV	LCD TV	LCD TV
Built-in Tuner	O	O	O
Resolution	1366 x 768	1366 x 768	1366 x 768
LCD Panel	TFT LCD Panel 60Hz	TFT LCD Panel 60Hz	TFT LCD Panel 60Hz
Screen Size	19"/22"	19"/22"	19"/22"
Picture ratio	16 : 9	16 : 9	16 : 9
Dimensions (W x H x D)	22" 21.0 x 6.8 x 15.8 inchs_with stand 19" 18.2 x 7.1 x 13.7 inchs_with stand	22" 21.1 x 6.8 x 16.6 inchs_with stand 19" 18.2 x 6.3 x 14.3 inchs_with stand	19" 18.8 x 14.7 x 7.1 inchs_with stand 22" 22.0 x 17.2 x 8.5 inchs_with stand
Weight	22" 11.46 lbs (5.20kg)_with stand 19" 9.92 lbs (4.50kg)_with stand	22" 8.60 lbs (3.90kg)_with stand 19" 8.60 lbs (3.90kg)_with stand	22" 10.58 lbs_with stand 19" 14.33 lbs_with stand
Brightness	19" 250 nit 22" 400 nit	19" 250 nit 22" 300 nit	19" 250 nit 22" 400 nit
Contrast Ratio	TBD	TBD	800:1
Picture Enhancer	DNle (Saturn4)	DNle (Saturn4)	DNle (Saturn4)
Equalizer	5 Band	5 Band	5 Band
Auto Volume Control	O	O	O
Surround Sound	DNSE & Dolby Digital	DNSE & Dolby Digital	SRS TruSurround HD
Speaker Output	3W + 3W	3W + 3W	3W + 3W
PIP	X	X	X
Double Window	X	X	X
Caption	O	O	O
Entertainment Mode	X	X	X
Game Mode	O	O	O
Energy Saving	O	O	O
Anynet+	O	X	O
Antenna	1(Cable/Air)	1(Cable/Air)	1(Cable/Air)

## 2-3-2. Detail Factory Option

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

Model Name			LN19C350D1D	LN22C350D1D	LN19C450E1D	LN22CE450E1D
Panel	Vendor		INNOLUX	CHILIN	INNOLUX	CMO
	CODE		BN07-00766A	BN07-00744A	BN07-00766A	BN07-00620A
	SPEC		MT185GW01 V2	T216HA01-DB	MT185GW01 V2	V216B1-L01
SMPS		IP Board (SEC)	BN44-00328A	BN44-00366A	BN44-00328A	BN44-00370A
Byte	Item	CHASSIS ASS'Y		BN91-04768A	BN91-04768B	BN91-05016A
		Option Table	PBA(e-Catch)	00110 100	00110 100	00100 10
			Final (Adjustment_spec)	01120 100	05120 100	01100 10
		PBA ASSY CODE		BN94-02632A	BN94-02632B	BN94-02708A
0	FACTORY Reset	-		-	-	-
1	Type	19O6TH0C ~ 32D6AHOC		19O6THOC	22P6TH0C	19O6THOC
2	Model	LC350,450 ~ LB550,460,350		LC350S	LC350S	LC450
3	TUNER	ALPS/SECCustom/Xugang		Xugang	Xugang	Xugang
4	Region	US/KR		US	US	US
5	DDR	SAMSUNG/ETRON		Etron	Etron	Etron
6	Light Effect	ON/OFF		OFF	OFF	OFF
7	Audio Amp	NTP3200/TAS5715		TAS5715	TAS5715	TAS5715
8	Front Color	NONE ~ T-C-GRAY		NONE	NONE	NONE
9	Local set	other/S.Amer		other	other	other
10	Exhibition Mode	ON/OFF		OFF	OFF	OFF

## 2-4. Accessories

Product	Description	Code. No	Remark
	Remote Control & Batteries (AAA x 2)	C350 : BN59-01006A C450 : BN59-00997A	Samsung Electronics Service center
	Power Cord	3903-00467	
	Cover-Bottom	19C450 : BN63-04242A BN63-04254A	
	Stand	19C350 : BN96-12868A 22C350 : BN96-11887A 19C450 : BN96-04794H 22C450 : BN96-12739A	
	Screw (for the stand - M4, L6)	6002-001294	
	Owner's Instructions	C350 : BN68-02582A C450 : BN68-02583A	
	Warranty Card / Registration Card / Safety Guide Manual (Not available in all locations)		

## **4. Troubleshooting**

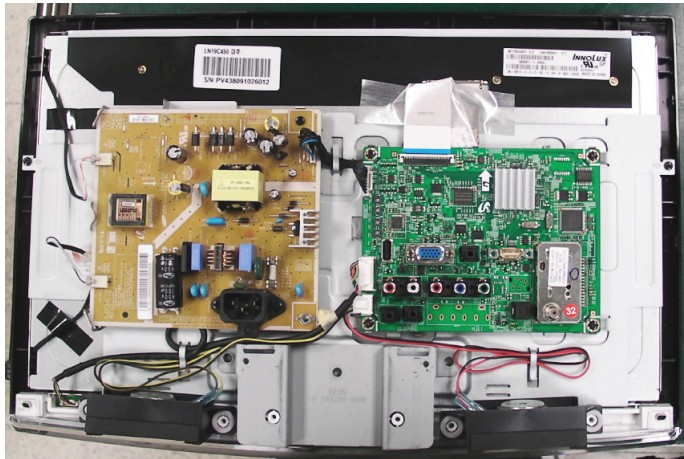
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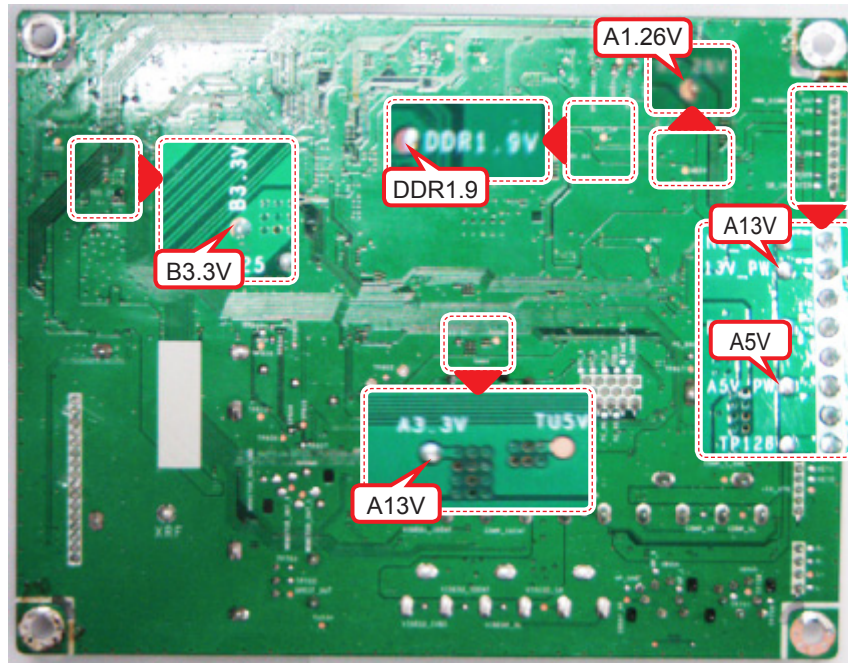
### **4-1. Troubleshooting**

#### **4-1-1. Previous check**

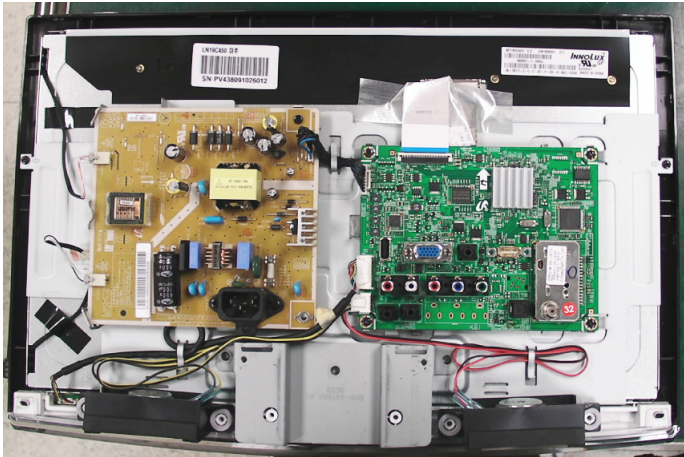
1. Check the various cable connections first.
  - Check to see if there is a burnt or damaged cable.
  - Check to see if there is a disconnected or loose cable connection.
  - Check to see if the cables are connected according to the connection diagram.
2. Check the power input to the Main Board.

**4-1-2. No Power**

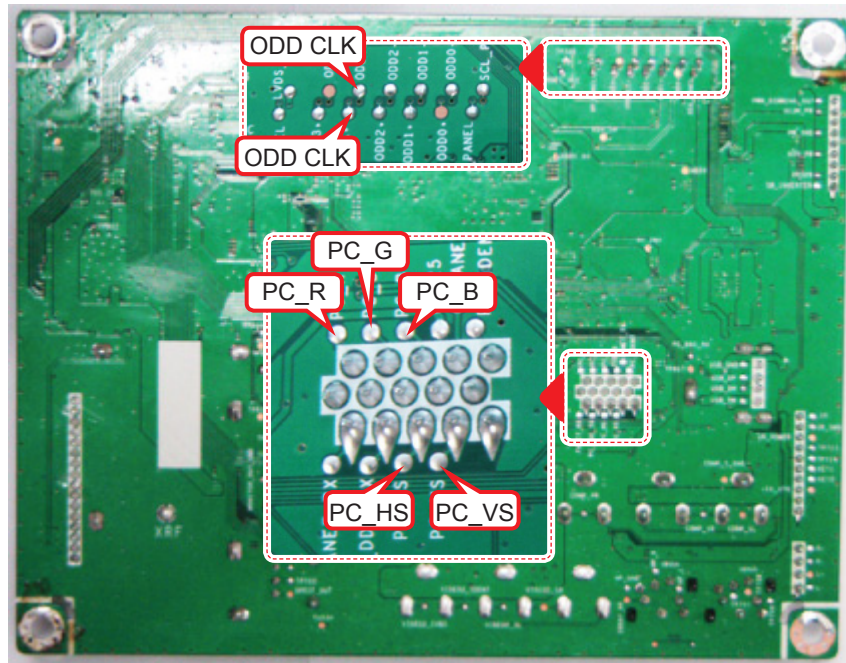
Symptom	<ul style="list-style-type: none"> <li>- The LEDs on the front panel do not work when connecting the power cord.</li> <li>- The SMPS relay does not work when connecting the power cord.</li> <li>- The units appears to be dead.</li> </ul>
Major checkpoints	<p>The IP relay or the LEDs on the front 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:</p> <ul style="list-style-type: none"> <li>- Check the internal cable connection status inside the unit.</li> <li>- Check the fuses of each part.</li> <li>- Check the output voltage of SMPS.</li> <li>- Replace the Main Board.</li> </ul>
Diagnostics	 <pre> graph TD     Q1[Lamp(Backlight) Off, power indicator LED on ?] -- No --&gt; A1[Check a connection power code.]     Q1 -- Yes --&gt; Q2[Does proper Stand-By DC A5V appear at TP - A5V ?]     Q2 -- No --&gt; A2[Change the Main Power Assy. 19" C350 : BN41-00328A 22" C350 : BN41-00366A 19" C450 : BN41-00328A 22" C450 : BN41-00366A]     Q2 -- Yes --&gt; Q3[Does proper Main DC A13V appear at TP - A13V ?]     Q3 -- No --&gt; A2     Q3 -- Yes --&gt; Q4[Does proper DC A3.3V appear at TP - A3.3V ?]     Q4 -- Yes --&gt; Q5[Does proper DC B3.3V, A1.26V DDR1.9V appear at TP - B3.3V, A1.26V, DDR1.9V ?]     Q5 -- No --&gt; A3[Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q5 -- Yes --&gt; Q6[Change the LVDS Cable Lamp(Backlight) on, no video ? (BN96-02854N)]     Q6 --&gt; A4[Check a other function. (No picture part)]           </pre>
Caution	Make sure to disconnect the power before working on the IP board.



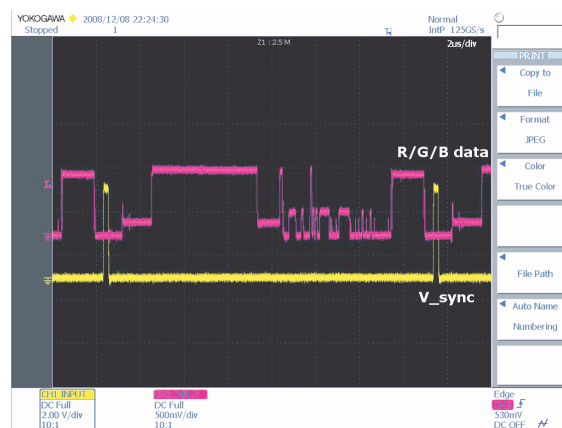
### 4-1-3. No Video (Analog PC signal)

Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the PC source</li> <li>Check the Arsenal, Check the Chelsea.</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     Q1[Power indicator LED is off. Lamp(Backlight) on, no video ?] -- No --&gt; A1[Check a set in the 'Stand-by mode' or 'DPMS mode'.]     Q1 -- Yes --&gt; Q2[Check the PC source and check the connection of D-SUB ?]     Q2 -- No --&gt; A2[Input the analog PC signal properly.]     Q2 -- Yes --&gt; Q3[1 Does the signal appear at TP - PC_R, PC_G, PC_B, PC_HS, PC_VS (R, G, B, H, V) ?]     Q3 -- No --&gt; A3[Check CN804, PC cable. Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q3 -- Yes --&gt; Q4[2 Does the digital data appear at TP_ODDCLK+, TP_ODDCLK- (LVDS Data clk) of LVDS connector ?]     Q4 -- No --&gt; A4[Check IC201. (Saturn4) Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q4 -- Yes --&gt; Q5[Check the LVDS cable? Check the T-Con B'd? Replace the LCD panel?]     Q5 -- No --&gt; A5[Please, Contact Tech support.]           </pre>
Caution	Make sure to disconnect the power before working on the IP board.

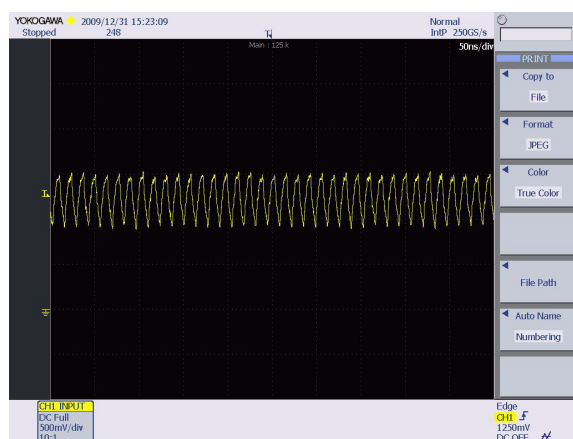




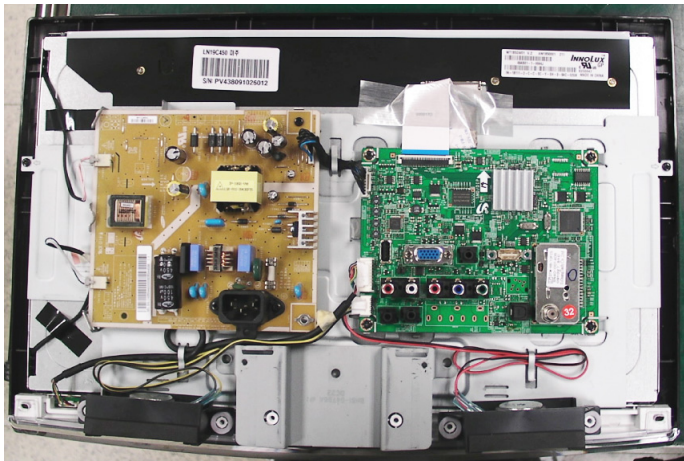
**PC input (V-sink , H-sink , R/G/B)**

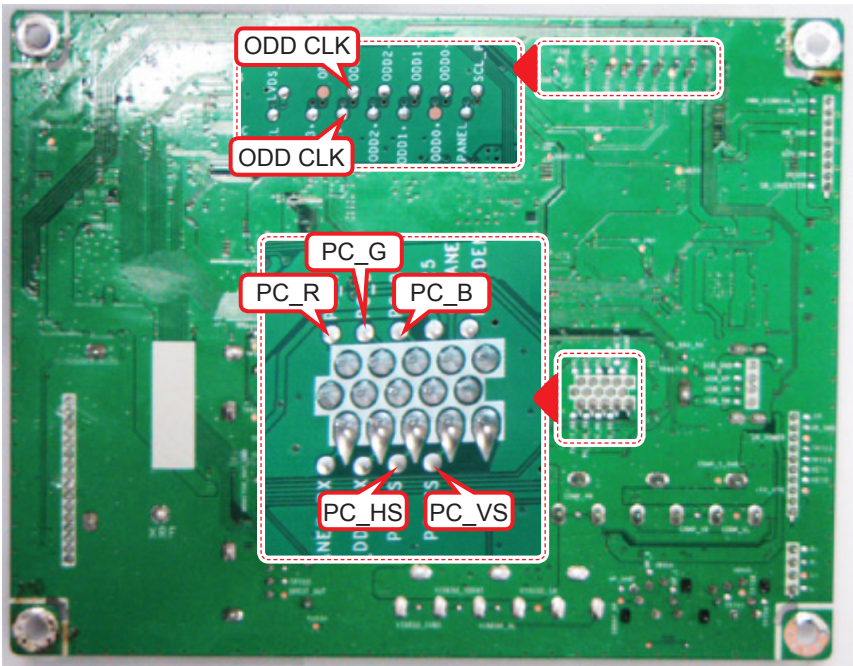
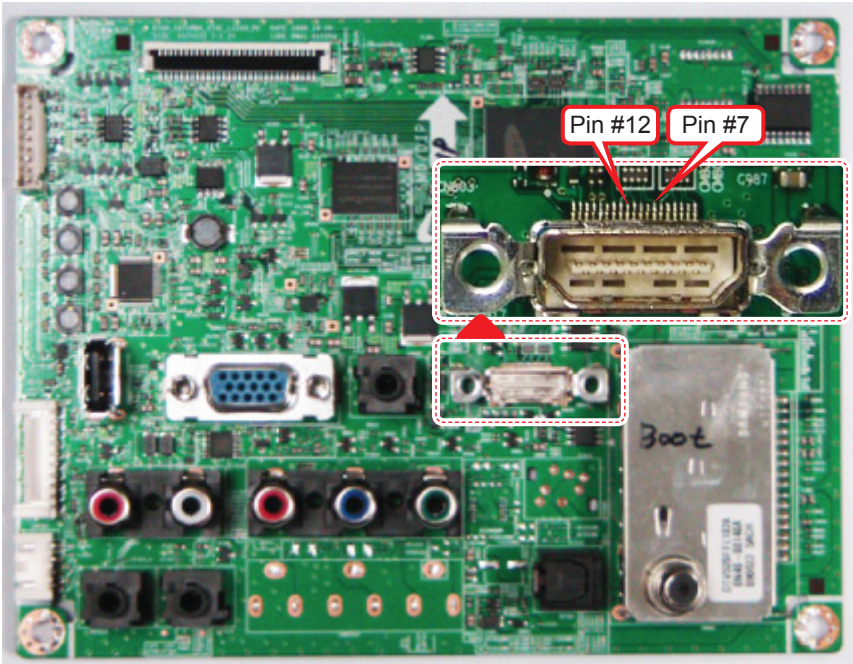


### LVDS output



### 4-1-4. No video (HDMI1 - Digital signal)

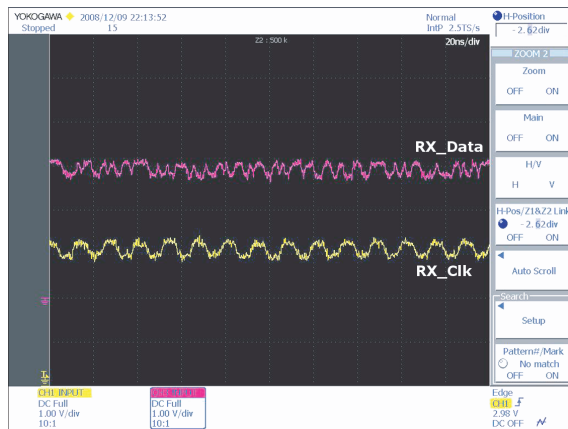
Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the HDMI source.</li> <li>Check the HDMI switch, Check the Chelsea.</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     Q1[Power indicator LED is off. Lamp(Backlight) on, no video ?] -- No --&gt; A1[Check a set in the 'Stand-by mode' or 'DPMS mode'.]     Q1 -- Yes --&gt; Q2[Check the HDMI source and check the connection of HDMI cable ?]     Q2 -- No --&gt; A2[Input the HDMI signal properly.]     Q2 -- Yes --&gt; Q3[Does the signal appear at CN1002 (Pin#12 , #7 )(HDMI1) (HDMI RX_Clk , RX_Data ?)]     Q3 -- No --&gt; A3[Check CN802. Check HDMI cable. Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q3 -- Yes --&gt; Q4[Does the digital data appear at TP_ODDCLK+, TP_ODDCLK- (LVDS Data clk) of LVDS connector ?]     Q4 -- No --&gt; A4[Check IC201. (Saturn4) Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q4 -- Yes --&gt; Q5[Check the LVDS cable? Check the T-Con B'd? Replace the LCD panel?]     Q5 -- No --&gt; A5[Please, Contact Tech support.]   </pre> <p>3 Does the signal appear at CN1002 (Pin#12 , #7 )(HDMI1) (HDMI RX_Clk , RX_Data ?)</p> <p>2 Does the digital data appear at TP_ODDCLK+, TP_ODDCLK- (LVDS Data clk) of LVDS connector ?</p>
Caution	Make sure to disconnect the power before working on the IP board.



## WAVEFORMS

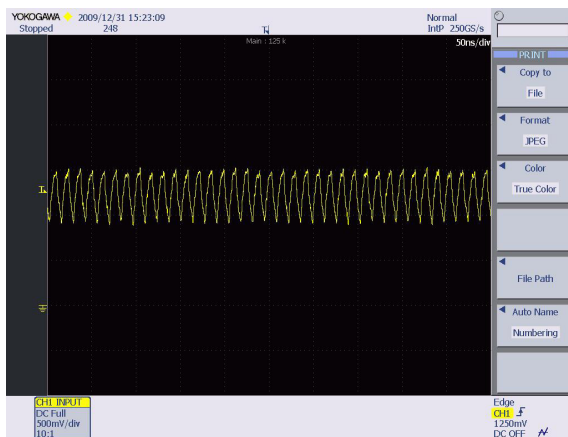
3

HDMI input (RX\_Data, RX\_Clk)



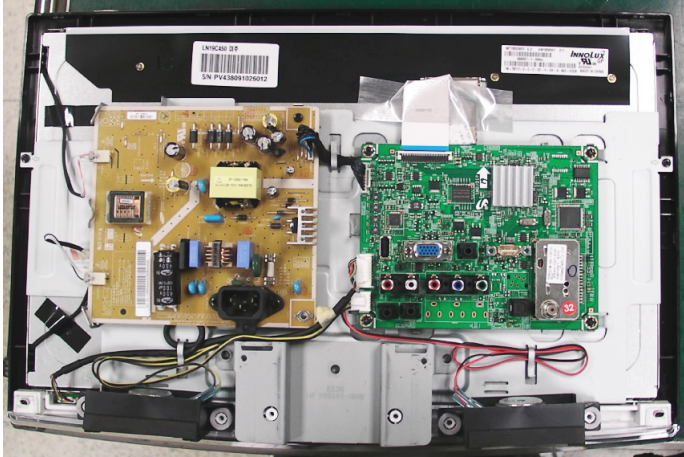
2

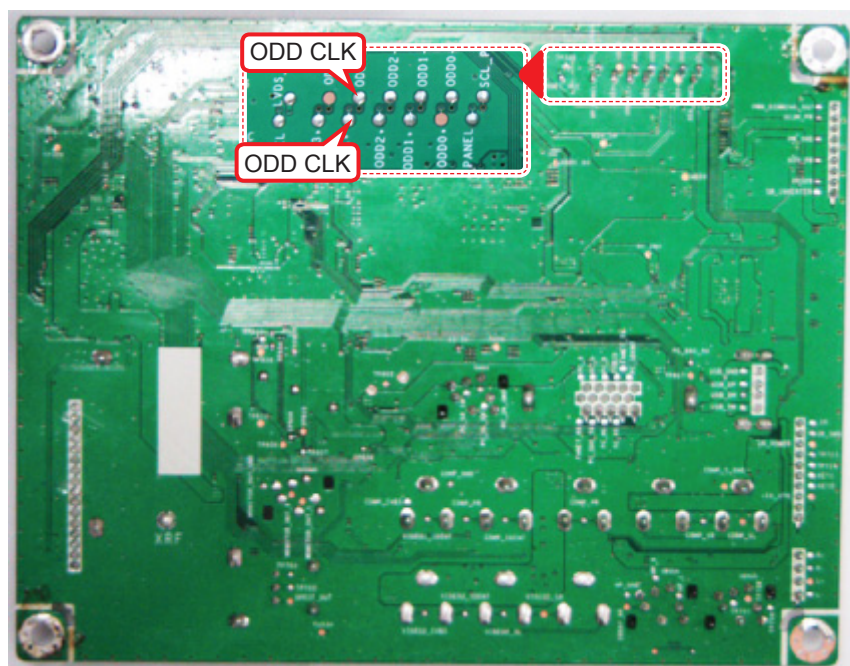
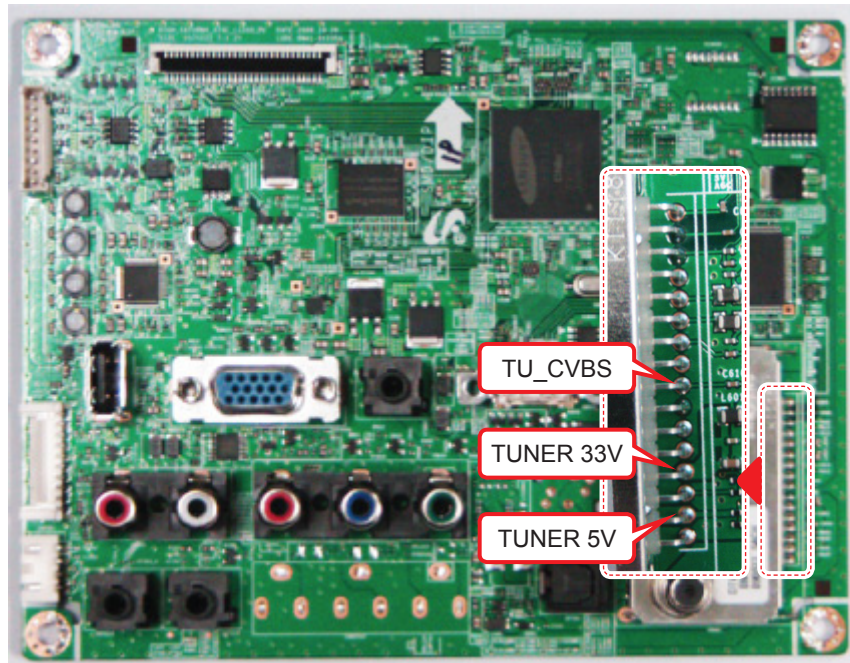
LVDS output





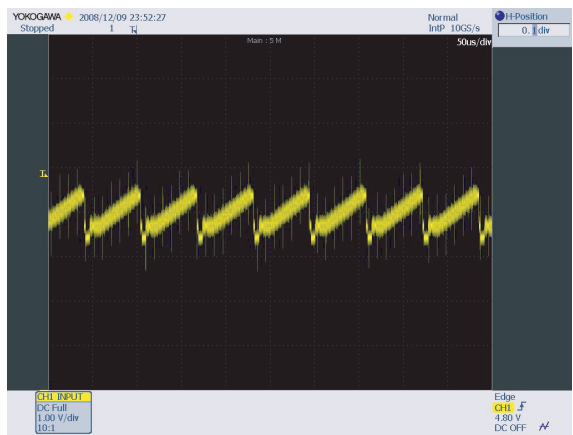
**4-1-5. No Video (Tuner\_CVBS)**

Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the Tuner CVBS source.</li> <li>Check the Tuner, Check the Chelsea.</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     Q1[Power indicator LED is off. Lamp(Backlight) on, no video ?] -- No --&gt; A1[Check a set in the 'Stand-by mode' or 'DPMS mode'.]     Q1 -- Yes --&gt; Q2[Check the RF source and check the connection of RF cable ?]     Q2 -- No --&gt; A2[Input the RF source properly.]     Q2 -- Yes --&gt; Q3[Does the DC B5V_TU_PW, TU33V_PW appear at #2, #4 Pin of Tuner ?]     Q3 -- No --&gt; A3[Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q3 -- Yes --&gt; Q4[4 Does the CVBS data appear at #8 pin of Tuner ?]     Q4 -- No --&gt; A4[Check Tuner. Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q4 -- Yes --&gt; Q5[2 Does the digital data appear at TP_ODDCLK+, TP_ODDCLK- (LVDS Data clk) of LVDS connector ?]     Q5 -- No --&gt; A5[Check IC201. (Saturn4) Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q5 -- Yes --&gt; Q6[Check the LVDS cable? Replace the LCD panel?]     Q6 -- No --&gt; A6[Please, Contact Tech support.]           </pre>
Caution	Make sure to disconnect the power before working on the IP board.

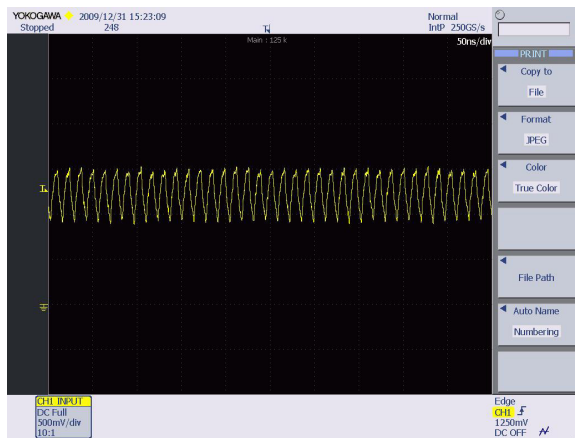


# WAVEFORMS

## 4 CVBS OUT (Grey Bar)

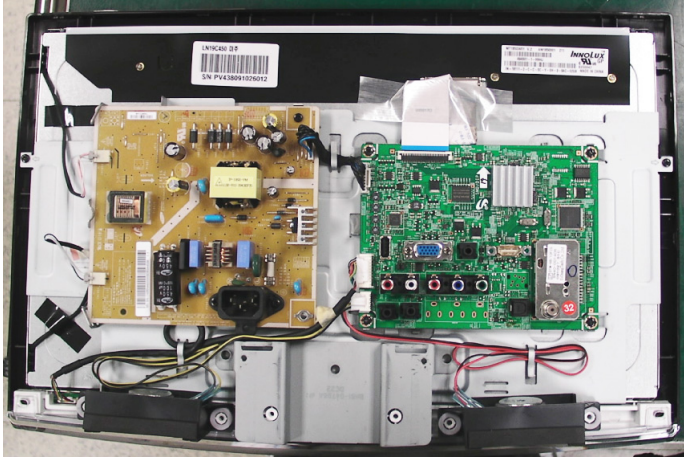


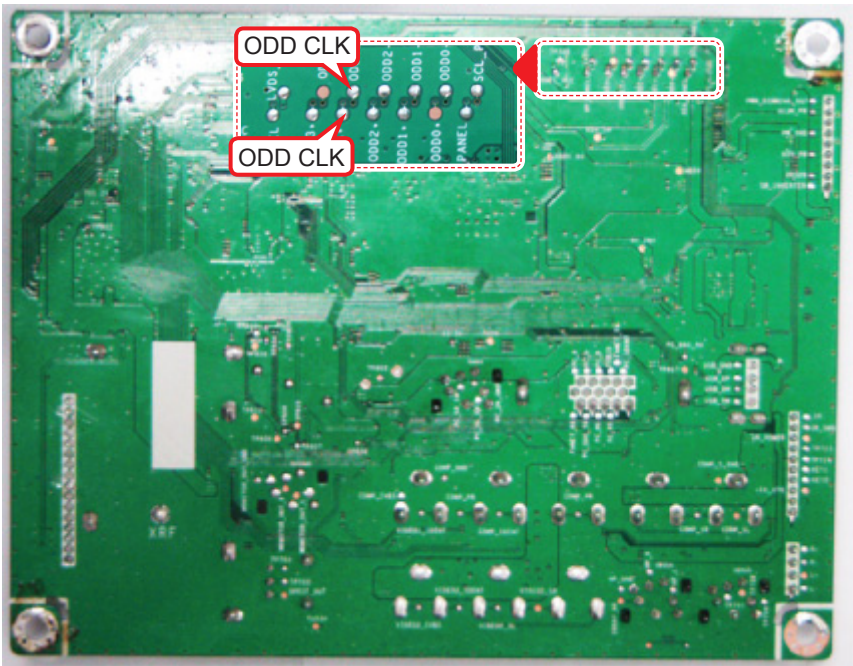
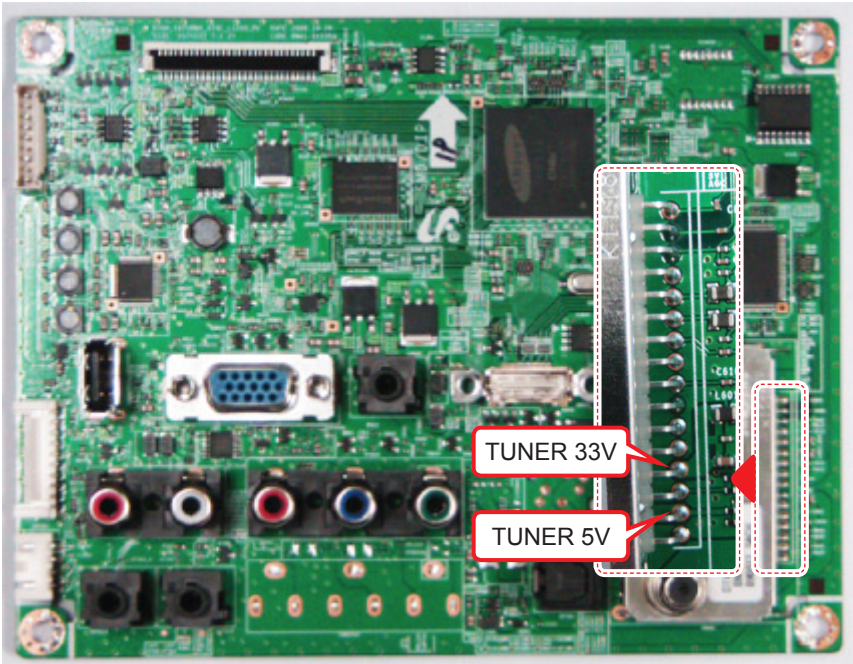
## 2 LVDS output



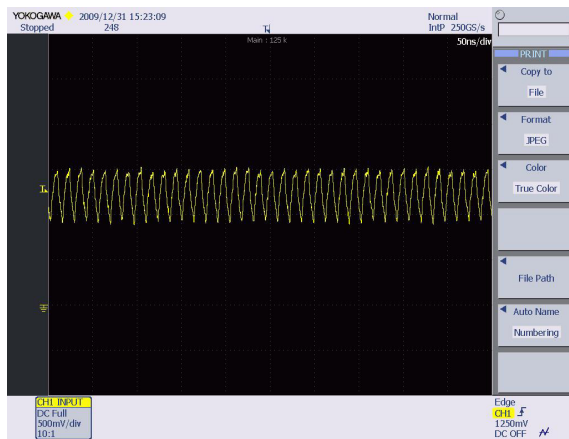


## 4-1-6. No Video (Tuner DTV)

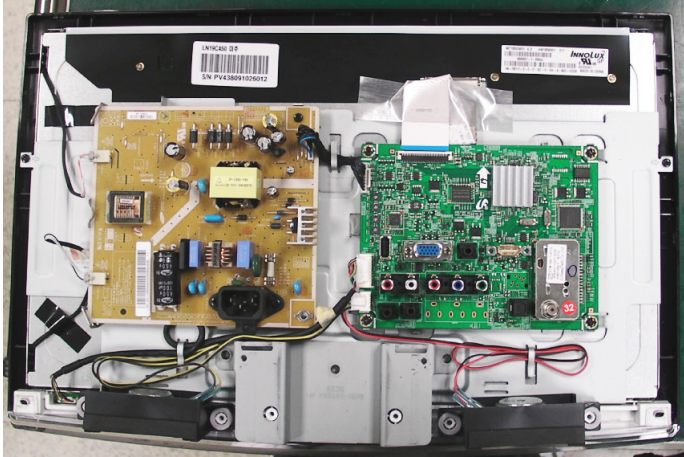
Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the DTV source.</li> <li>Check the Tuner, Check the Chelsea.</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     Q1[Power indicator LED is off. Lamp(Backlight) on, no video ?] -- No --&gt; A1[Check a set in the 'Stand-by mode' or 'DPMS mode'.]     Q1 -- Yes --&gt; Q2[Check the connection of RF cable ?]     Q2 -- No --&gt; A2[Input the RF source properly.]     Q2 -- Yes --&gt; Q3[Check the 'signal strength' in Self Diagnosis menu Strength is enough?]     Q3 -- No --&gt; A3[Check the D-TV source.]     Q3 -- Yes --&gt; Q4[Does the DC B5V_TU_PW, TU33V_PW appear at #2, #4 Pin of Tuner ?]     Q4 -- No --&gt; A4[Change the Main Ass. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q4 -- Yes --&gt; Q5[Does the digital data appear at TP_ODDCLK+, TP_ODDCLK- (LVDS Data clk) of LVDS connector ?]     Q5 -- No --&gt; A5[Check IC201. (Saturn4) Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q5 -- Yes --&gt; Q6[Check the LVDS cable? Check the T-Con B'd? Replace the LCD panel?]     Q6 -- No --&gt; A6[Please, Contact Tech support.]           </pre>
Caution	Make sure to disconnect the power before working on the IP board.



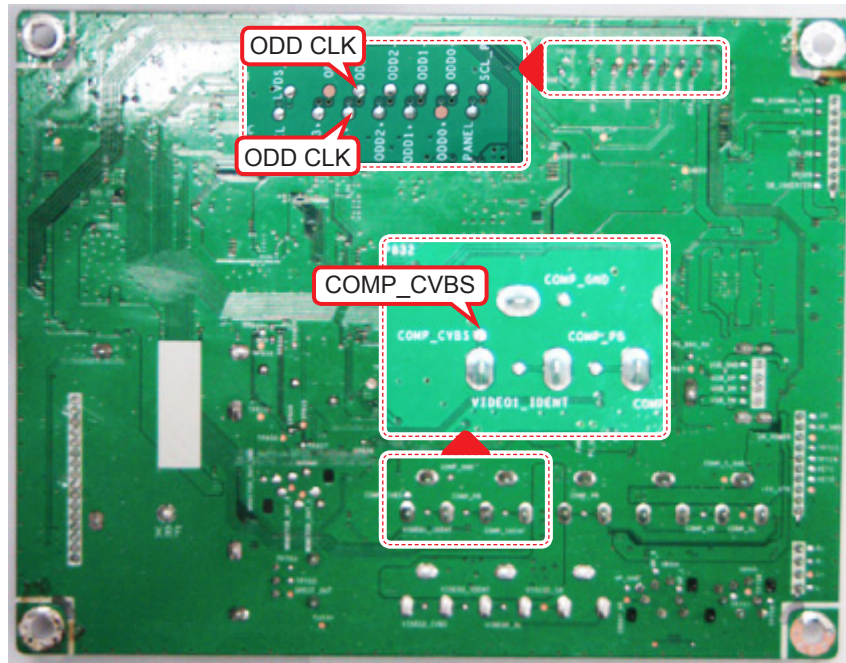
## WAVEFORMS

**2****LVDS output**

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

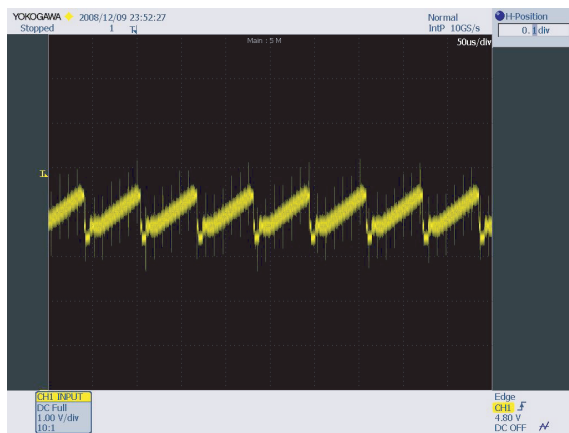
Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the Video CVBS source</li> <li>Check the Chelsea.</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     Q1[Power indicator LED is off. Lamp(Backlight) on, no video ?] -- No --&gt; A1[Check a set in the 'Stand-by mode' or 'DPMS mode'.]     Q1 -- Yes --&gt; Q2[Check the video source and check the connection of video cable?]     Q2 -- No --&gt; A2[Input the video source properly.]     Q2 -- Yes --&gt; Q3[4 Does the CVBS data appear at TP-COMP1_CVBS ?]     Q3 -- No --&gt; A3[Check CN904 . Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q3 -- Yes --&gt; Q4[2 Does the digital data appear at TP_ODDCLK+,TP_ODDCLK- (LVDS Data clk) of LVDS connector ?]     Q4 -- No --&gt; A4[Check IC201. (Saturn4) Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q4 -- Yes --&gt; Q5[Check the LVDS cable? Check the T-Con B'd? Replace the LCD panel?]     Q5 -- No --&gt; A5[Please, Contact Tech support.]           </pre>
Caution	Make sure to disconnect the power before working on the IP board.



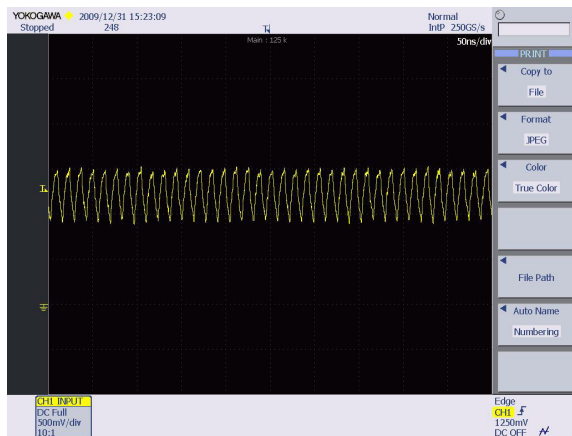


# WAVEFORMS

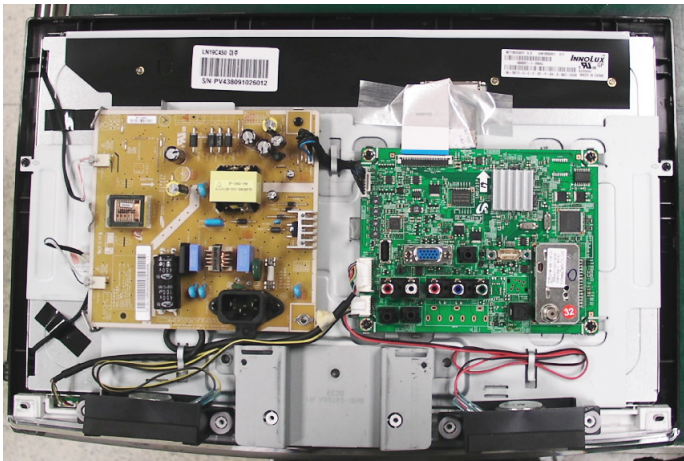
## 4 CVBS OUT (Grey Bar)

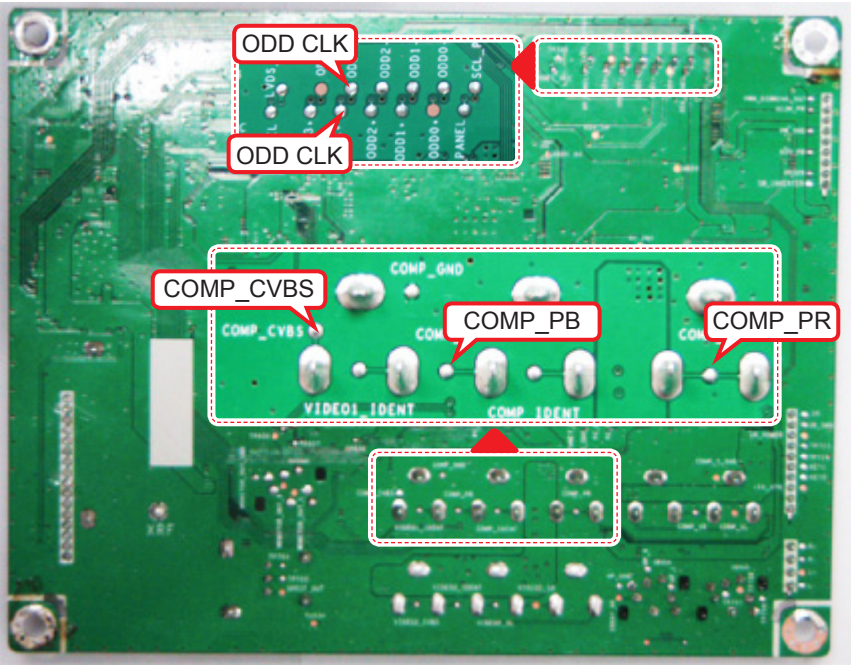


## 2 LVDS output



## 4-1-8. No Video (Component)

Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the Component source</li> <li>Check the chelsea.</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     Q1[Power indicator LED is off. Lamp(Backlight) on, no video ?] -- No --&gt; A1[Check a set in the 'Stand-by mode' or 'DPMS mode'.]     Q1 -- Yes --&gt; Q2[Check the component source and check the connection of component cables(Y,Pb,Pr)?]     Q2 -- No --&gt; A2[Input the component source properly.]     Q2 -- Yes --&gt; Q3[5 Does the component data appear at TP - COMP_CVBS, COMP_PB, COMP_PR ? (Comp / Y, Pb, Pr)]     Q3 -- No --&gt; A3[Check CN904. Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q3 -- Yes --&gt; Q4[2 Does the digital data appear at TP_ODDCLK+, TP_ODDCLK- (LVDS Data clk) of LVDS connector ?]     Q4 -- No --&gt; A4[Check IC201. (Saturn4) Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q4 -- Yes --&gt; Q5[Check the LVDS cable? Check the T-Con B'd? Replace the LCD panel?]     Q5 -- No --&gt; A5[Please, Contact Tech support.]           </pre>
Caution	Make sure to disconnect the power before working on the IP board.

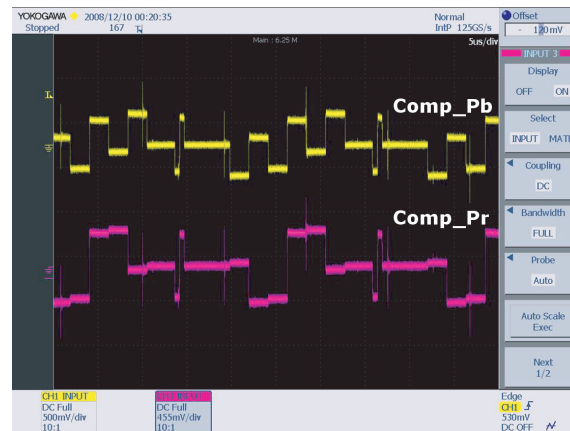
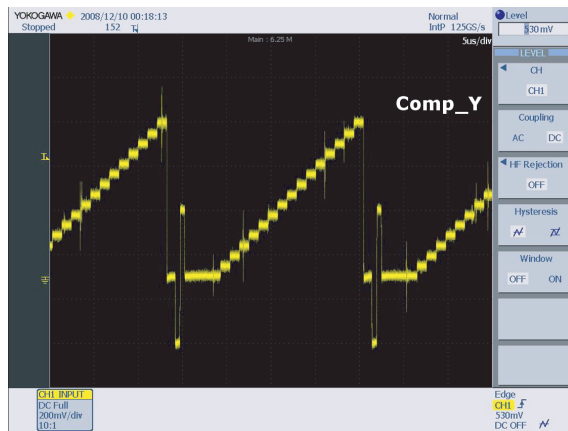




## WAVEFORMS

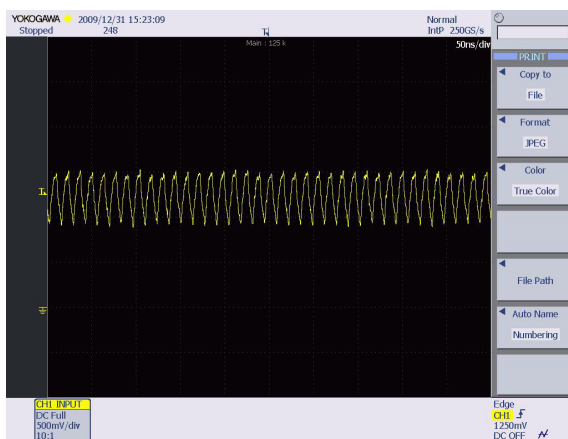
5

Compnent\_Y (Gray scale) / Pb / Pr (Color bar)

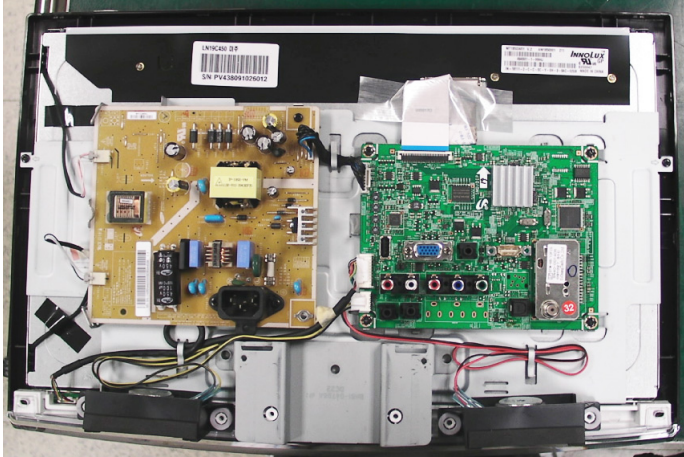


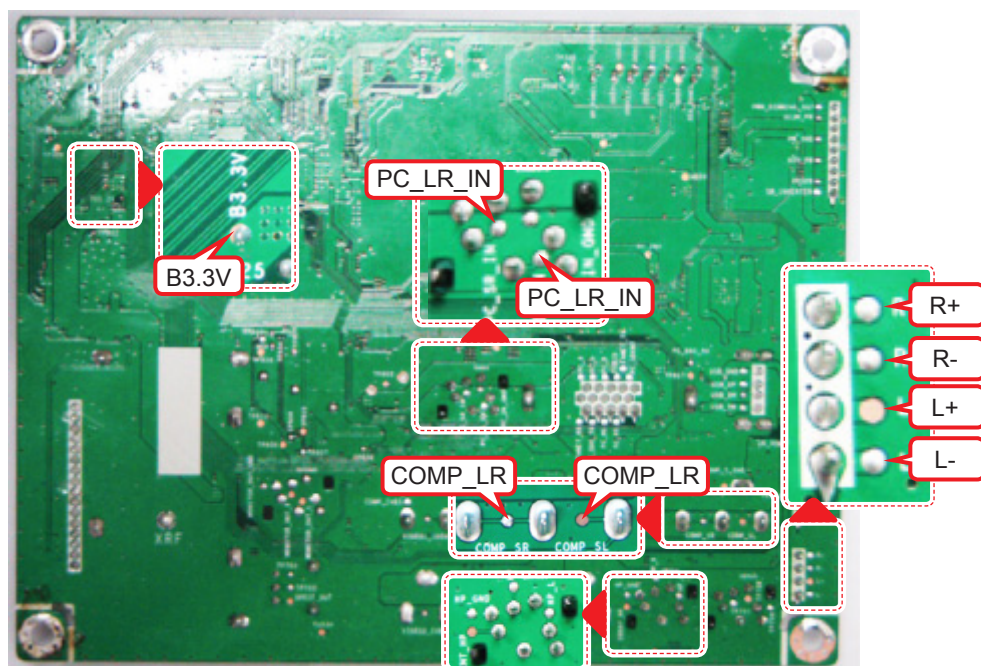
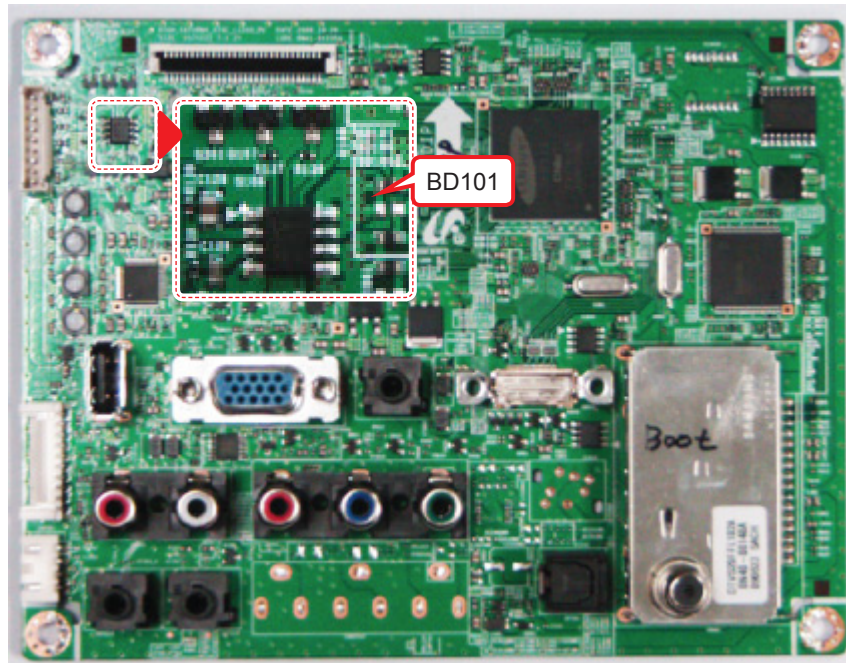
2

LVDS output



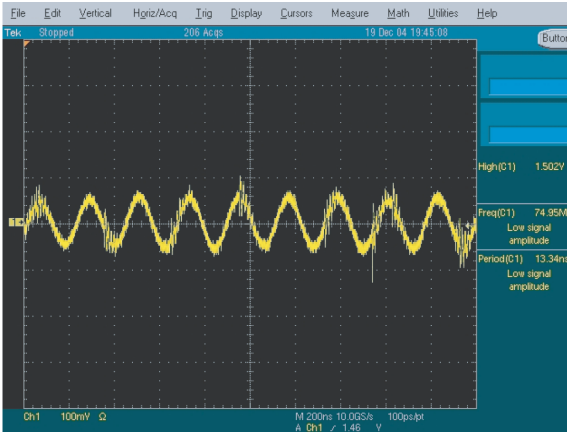
## 4-1-9. No Sound

Symptom	<ul style="list-style-type: none"> <li>Video is normal but there is no sound..</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>When the speaker connectors are disconnected or damaged.</li> <li>When the sound processing part of the Main Board is not functioning.</li> <li>Speaker defect..</li> </ul>
Diagnostics	 <pre> graph TD     Q1[Power indicator LED is off. Lamp(Backlight) on, no video ?] -- No --&gt; A1[Check a set in the 'Stand-by mode' or 'DPMS mode'.]     Q1 -- Yes --&gt; Q2[Does the sound data appear at TP - COMP_SL, COMP_SR (COMP) TP - PC_SR_IN, PC_SL_IN (PC/DVI) TP - HP_R, HP_L (Head Phone) ?]     Q2 -- No --&gt; A2[Check CN904, CN805, CN7016. Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q2 -- Yes --&gt; Q3[Does the DC B3.3V, B12V appear at TP - B3.3V, BD101?]     Q3 -- No --&gt; A3[Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q3 -- Yes --&gt; Q4[Does the sound data appear at - L-, L+, R-, R+ ?]     Q4 -- No --&gt; A4[Check IC201. (Saturn4) Check IC1003. (Sound AMP) Change the Main Assy. 19" C350 : BN94-02708A 22" C350 : BN94-02708B 19" C450 : BN94-02708A 22" C450 : BN94-02708B]     Q4 -- Yes --&gt; Q5[Replace speaker. C350 : BN96-13057A C450 : BN96-12940A]     Q5 -- No --&gt; A5[Please, Contact Tech support.]   </pre> <p>7</p>
Caution	Make sure to disconnect the power before working on the IP board.



WAVEFORMS

7 Speaker out



## **4-2. Alignments and Adjustments**

### **4-2-1. General Alignment Instruction**

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 with Factory Remote-control

1. Turn the power on LCD TV SET.
2. To enter '**Service Mode**' Press the remote -control keys in this sequence



3. If you want exit Factory mode, press '**Factory**' key in Remote-control.

### 4-3-2 Entering Factory Mode with Customer Remote-control

#### 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** → **MUTE** → **1** → **8** → **2** → **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
6. If you want exit Factory mode, Turn the power off LCD TV Set by remote control or Power code.

Option
ADC/WB
Control
Advanced
T-SAT4AUSHC-XXXX
DTP-LP-App-XXXX-XX
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		19O6TH0C, 19A6TH0C, 22P6TH0C, 22D6TH0C, 22I6TH0C, 22A6TH0C, 26P6AH0C, 26I6AH0C, 32P6AH0C, 32O6AH0C
	Model	LC350	
	TUNER	Xugang	
	Region	US	
	DDR	Etron	
	Front color	S-C-GRAY	
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
		HDMI	COMP	PC	AV	
	1st_AV_Gain	127	127	127	127	0 ~ 255
	1st_AV_Offset	139	139	139	139	0 ~ 255
	1st_Comp_Gain	68	68	68	68	0 ~ 255
	1st_Comp_Gain_Cb	68	68	68	68	0 ~ 255
	1st_Comp_Gain_Cr	68	68	68	68	0 ~ 255
	1st_Comp_Offset	127	127	127	127	0 ~ 255
	1st_Comp_Offset_Cb	127	127	127	127	0 ~ 255
	1st_Comp_Offset_Cr	127	127	127	127	0 ~ 255
	1st_PC_R_Gain	96	96	96	96	0 ~ 255
	1st_PC_G_Gain	95	95	95	95	0 ~ 255
	1st_PC_B_Gain	94	94	94	94	0 ~ 255
	1st_PC_R_Offset	127	127	127	127	0 ~ 255
	1st_PC_G_Offset	127	127	127	127	0 ~ 255
	1st_PC_B_Offset	127	127	127	127	0 ~ 255
	2nd_R_Offset	113	113	113	113	0 ~ 255
	2nd_G_Offset	113	113	113	113	0 ~ 255
	2nd_B_Offset	113	113	113	113	0 ~ 255
	2nd_R_Gain	145	145	145	145	0 ~ 255
	2nd_G_Gain	145	145	145	145	0 ~ 255
	2nd_B_Gain	144	144	144	144	0 ~ 255

WB	Factory Name	Mode			
		AV	COMP	HDMI /DTV	PC
	Sub Brightness	128	128	128	128
	R_Offset	124	124	124	124
	G_Offset	128	128	128	128
	B_Offset	128	128	128	128
	Sub Contrast	134	134	134	134
	R_Gain	133	133	133	133
	G_Gain	128	128	128	128
	B_Gain	141	141	141	141
	Movie R Offset	123	123	123	123
	Movie B Offset	127	127	127	127
	Movie R Gain	144	144	144	144
	Movie B Gain	67	67	67	67



<b>Control</b>	<b>Factory Name</b>		
	EDID		
	Sub Option		
	PDP Option		
	Hotel Option		
	Shop Option		
	Sound		
	Test Pattern		

<b>EDID</b>	<b>Factory Name</b>	<b>Data</b>	<b>Range</b>
	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	Failure	Success / Failure
	EDID WRITE HDMI4	Failure	Success / Failure
	EDID VERSION	HDMI 1.3	HDMI 1.2 / HDMI 1.3

<b>Sub Option</b>	<b>Factory Name</b>	<b>Data</b>	<b>Range</b>
	Panel Display Time	XHr	
	Dimm Type	EXT	INT / EXT / INT_NEG / INT_POS / EXT_NEG
	Watchdog	On	On / Off
	LVDS Format	JEIDA	JEDIA / VESA

Hotel Option	Factory Name	Data	Range
	Hotel Mode	Off	On / Off
	Power On Channel	3	
	Power On Band	Air	Air / STD / HRC / IRC
	Power On Source	ATV	ATV/DTV / Comp1 / PC / HDMI1 / HDMI2
	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)		
TEST Pattern	Factory Name	Data	Range
	Mstar Test Pattern	Off	Off
	FBE Test Pattern	Off	Off
	LOGIC Test Pattern	Off	Off
Sound	Factory Name	Data	Range
	Carrier Mute Thr High [H-dev]	0x39	0x39
	Carrier Mute Thr Low [H-dev]	0x26	0x26
	SPEAKER EQ	On	On
	Audio Delay	20mS	20mS

---

<b>Advanced</b>	<b>Factory Name</b>		
	ADJUST		

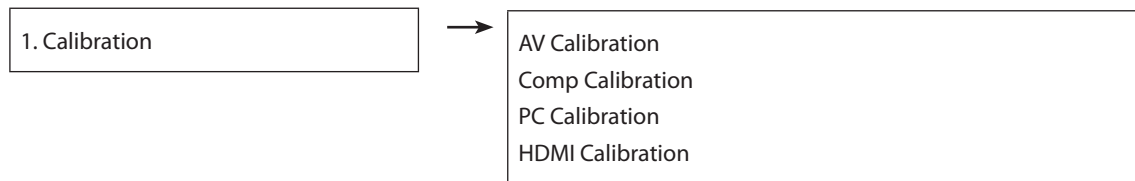
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<b>ADJUST</b>	<b>Factory Name</b>	<b>Data</b>	<b>Range</b>
	Uart Select	Auto Wall	Auto Wall / Debug / MDC / On1 / On2

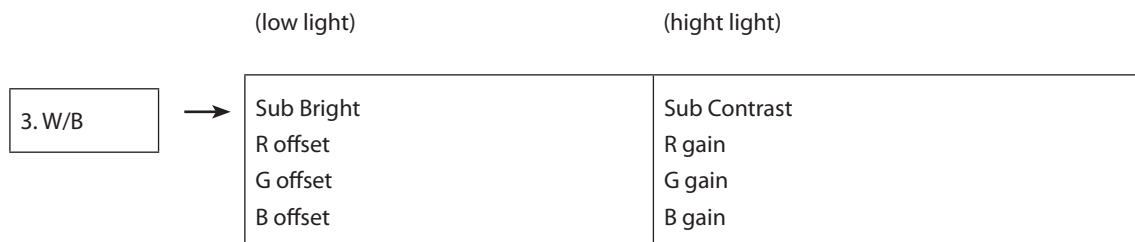
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## 4-4. White Balance - Calibration

### 4-4-1 White Balance -Calibration



### 4-4-2 White Balance - Adjustment



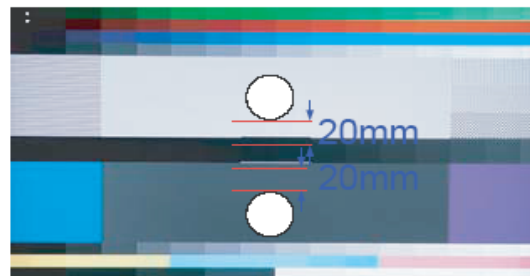
(W/B adjustment Condition refer next page)

## 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 (NTSC) |

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

## • 19C450/C350

P-Mode	Adjustment Coordinate				
		x	y	Y(Luminance)	T(K)+MPCD
CVBS (NTSC)	H/L	280	288	"(Sub_CT:128 Fix) R-Gain : 123 B-Gain : 164"	10,000 (±0)
	L/L	-	-	"(Sub_Brt:128 Fix) R-Offset, B-Offset : 128"	-
COMP (720P)	H/L	280	288	"(Sub_CT:128 Fix) R-Gain : 123 B-Gain : 164"	10,000 (±0)
	L/L	-	-	"(Sub_Brt:128 Fix) R-Offset, B-Offset : 128"	-
COMP (720P)	H/L	280	288	"(Sub_CT:128 Fix) R-Gain : 123 B-Gain : 164"	10,000 (±0)
	L/L	-	-	"(Sub_Brt:128 Fix) R-Offset, B-Offset : 128"	-

## • 22C350

P-Mode	Adjustment Coordinate				
		x	y	Y(Luminance)	T(K)+MPCD
CVBS (NTSC)	H/L	280	288	"(Sub_CT:145 Fix) R-Gain : 130 B-Gain : 135"	10,000 (±0)
	L/L	-	-	"(Sub_Brt:128 Fix) R-Offset, B-Offset : 128"	-
COMP (720P)	H/L	280	288	"(Sub_CT:145 Fix) R-Gain : 130 B-Gain : 135"	10,000 (±0)
	L/L	-	-	"(Sub_Brt:128 Fix) R-Offset, B-Offset : 128"	-
COMP (720P)	H/L	280	288	"(Sub_CT:145 Fix) R-Gain : 130 B-Gain : 135"	10,000 (±0)
	L/L	-	-	"(Sub_Brt:128 Fix) R-Offset, B-Offset : 128"	-

## • 22C450

P-Mode	Adjustment Coordinate				
		x	y	Y(Luminance)	T(K)+MPCD
CVBS (NTSC)	H/L	TBD	TBD	TBD	TBD
	L/L	TBD	TBD	TBD	TBD
COMP (720P)	H/L	TBD	TBD	TBD	TBD
	L/L	TBD	TBD	TBD	TBD
COMP (720P)	H/L	TBD	TBD	TBD	TBD
	L/L	TBD	TBD	TBD	TBD

- 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

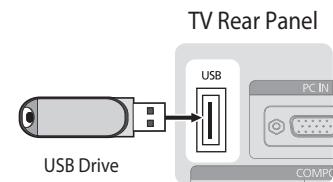
### 4-6-1 USB Download Method

Software Upgrade upgrades can be performed via broadcasting signal or by downloading the new firmware from [samsung.com](http://samsung.com) to a USB memory device.

Current Version is the software already installed in the TV.

**Note** Software is represented as 'Year/Month/Day\_Version'.  
Installing the latest version is recommended.

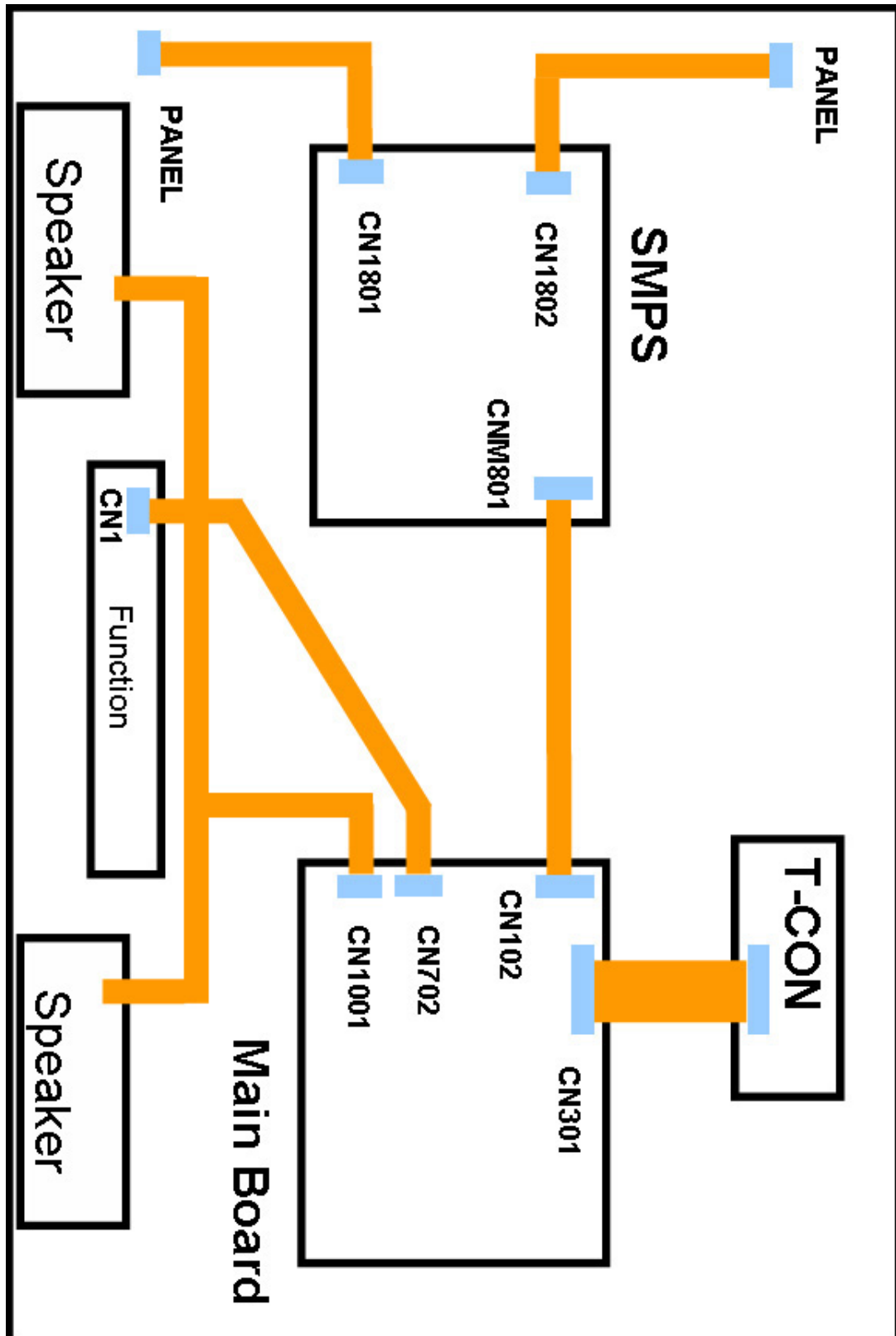
1. Press the **POWER** button to turn the TV on.
2. Connect a USB device containing photo, music and/or movie files to the USB jack on the side of the TV.
3. When the Application selection screen is displayed, press the **ENTER** button to select Media Play (USB).

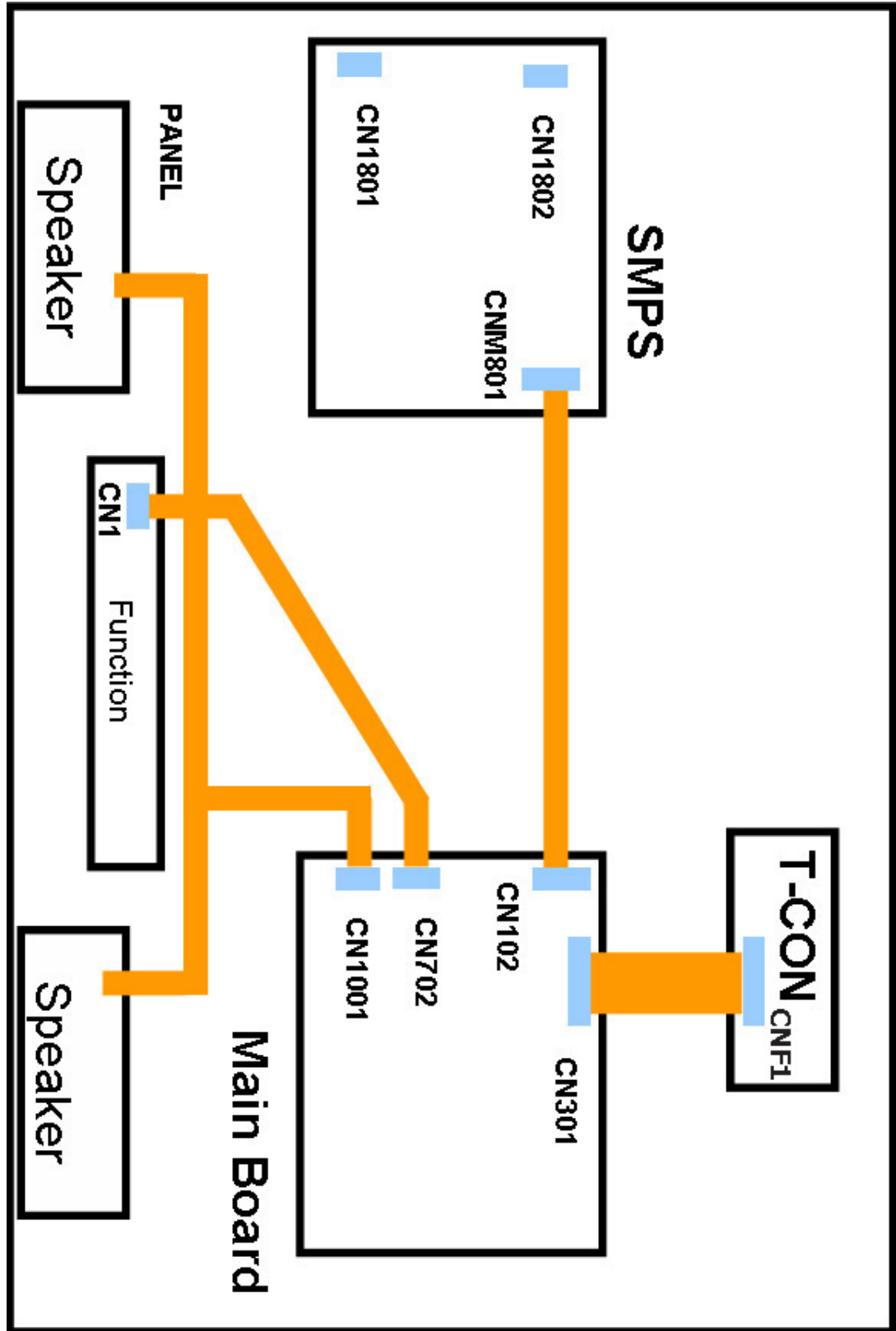


## 6. Wiring Diagram

### 6-1. Wiring Diagram

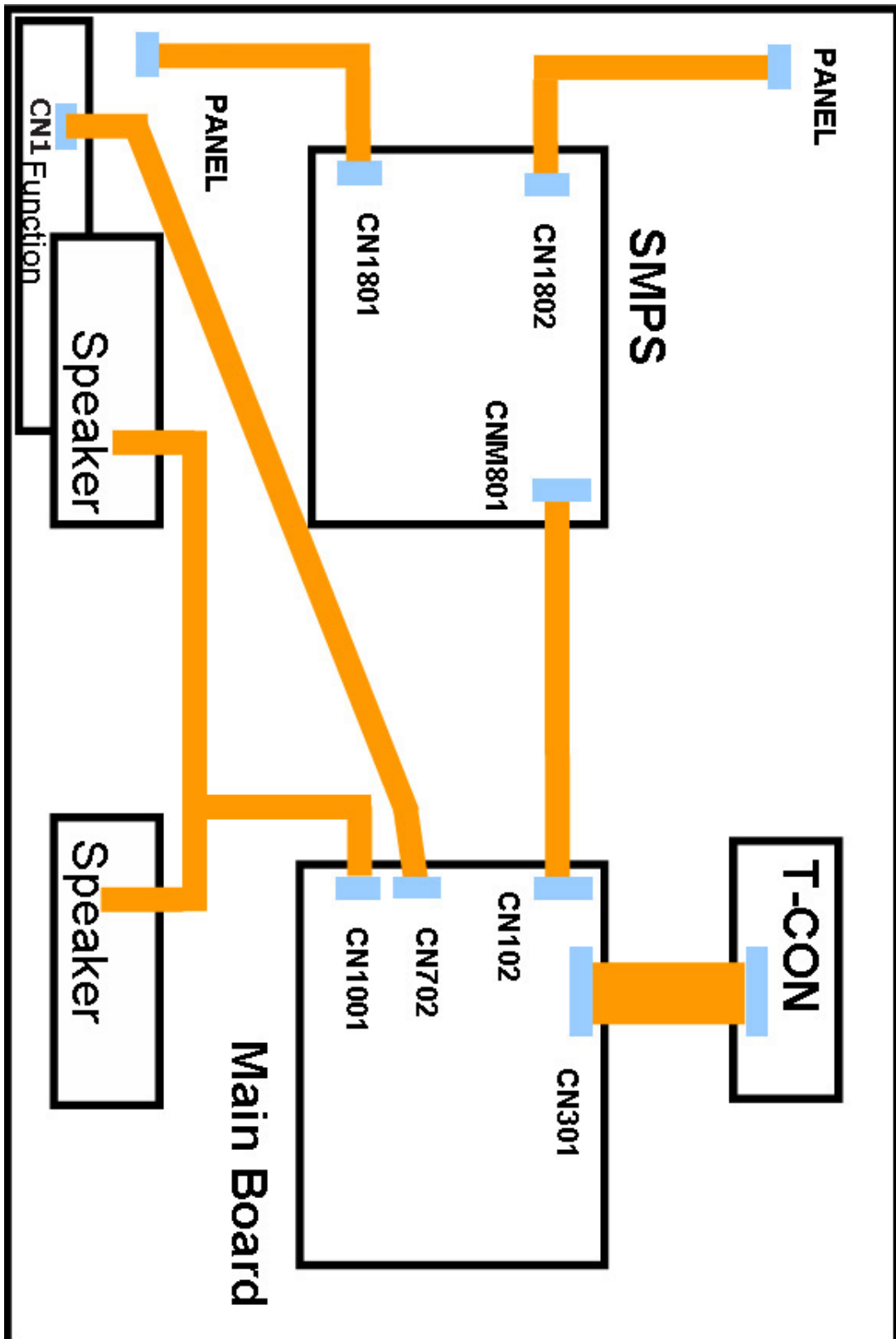
■ C350 : 19" / C450 : 19"







## ■ C450 : 22"



## 6-2. Connector

CN301 (To Panel)			
1	Panel_VCC	16	ODD[CLK]+
2	Panel_VCC	17	ODD[CLK]-
3	Panel_VCC	18	GND
4	Panel_VCC	19	ODD[2]+
5	Panel_VCC	20	ODD[2]-
6	GND	21	GND
7	GND	22	ODD[1]+
8	GND	23	ODD[1]-
9	TCON_WP	24	GND
10	FORMAT	25	ODD[0]+
11	NC	26	ODD[0]-
12	GND	27	GND
13	ODD[3]+	28	SDA_TCON
14	ODD[3]-	29	SCL_TCON
15	GND	30	NC

CN102(to Powr board)			
1	PWM_DIMM	6	A5V
2	A13V	7	A5V
3	GND	8	NC
4	GND	9	SW_INVERTER
5	GND		

CN702(FUNCTION)			
1	IR	5	NC
2	GND	6	KEY_INPUT1
3	POWER	7	KEY_INPUT2
4	NC	8	LED_STB

CN101(SPEAKER)			
1	R+	3	L+
2	R-	4	L-

CN704 (REAR USB)			
1	USB_VCC	3	USB_DP
2	USB_DM	4	GND

CN804 (PC)			
1	PC_RED	9	PC_5V
2	PC_GREEN	10	IDENT_PC
3	PC_BLUE	11	R_FANET
4	T_FANET	12	SDA_DOWN
5	GND	13	PC_HS
6	GND	14	PC_VS
7	GND	15	SCL_DOWN
8	GND		

CN805 (PC/DIV SOUND)			
1	GND	4	NC
2	PC_SR_IN	5	NC
3	PC_SL_IN	6	NC

CN802(HDMI1)			
1	HDMI1_RX2+	11	GND
2	GND	12	HDMI1_RXCLK-
3	HDMI1_RX2-	13	HDMI_CEC
4	HDMI1_RX1+	14	GND
5	GND	15	SCL
6	HDMI1_RX1-	16	SDA
7	HDMI1_RX0+	17	GND
8	GND	18	5V
9	HDMI1_RX0-	19	HPD
10	HDMI1_RXCLK+		

CN904 (COMP1)			
1	GND	6	PB
2	AV IDENT	7	GND
3	CVBS	8	PR
4	GND	9	PR
5	COMP IDENT		

CN901 (COMP SOUND)			
1	GND	4	GND
2	SR	5	SL
3	SL	6	SR

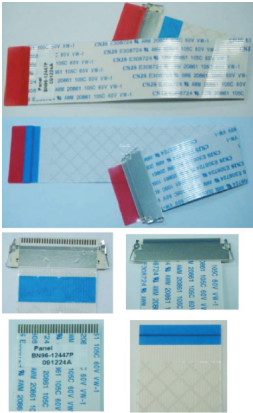

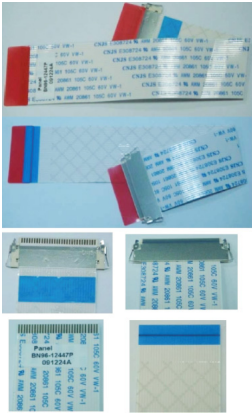

CN703 (HEADPHONE)			
1	GND	5	HP_L
2	HP_R	6	GND
3	HP_L	7	IDENT_HP
4	HP_L		

CN902R			
1	GND	5	T2OUT
2	R2IN	6	R2IN
3	T2OUT	7	R2IN
4	T2OUT		

6-3. Connector Functions

Connector	Function
CN301 <-> T-CON	The LVDS signal transfered from Main Board to Panel.

6-4. Cables

Use	LVDS (Main - TCON)			
	LN19C350D1D	LN22C350D1D	LN19C450E1D	LN22C450E1D
Code	BN96-12447P	BN96-12447U	BN96-12447P	BN96-12447Q
Photo				

## Memo