



TFT-LCD TV

Chassis GJA22SEN
Model LE22S86BD

SERVICE Manual

TFT-LCD TV



Fashion Feature

- Luxurious Slim Design
- Supreme Picture Quality
- Supreme Sound Quality
- Supreme Convenience Quality
- Convenience for Users

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LE22S86BDX Service Manual

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Contents

1. Precautions	1-1
1-1 Safety Precautions	1-1
1-2 Servicing Precautions	1-2
1-3 Static Electricity Precautions	1-2
1-4 Installation Precautions.....	1-3
2. Product specifications	2-1
2-1 Fashion Feature.....	2-1
2-2 LE22S86BD Specifications	2-2
2-3 Spec Comparison	2-6
2-4 Option Specification	2-7
3. Alignments and Adjustments	3-1
3-1 Service Instruction	3-1
3-2 How to Access Service Mode	3-2
3-3 Factory Data	3-3
3-4 Service Adjustment.....	3-10
3-5 Software Upgrade	3-13
4. Troubleshooting	4-1
4-1 First Checklist for Troubleshooting	4-1
4-2 Checkpoints by Error Mode	4-2
5. Exploded View and Parts List	5-1
5-1 LE22S86BDX Exploded View	5-1
5-2 LE22S86BDX Parts list.....	5-2
6. Electrical Parts List	6-1
6-1 LE22S86BDX Parts List	6-1
7. Block Diagram	7-1
8. Wiring Diagram	8-1
8-1 Wiring Diagram	8-1
8-2 Main Board Layout	8-2
8-3 PIN characteristic	8-3
8-4 Power Board Layout	8-4
9. Schematic Diagrams	9-1

Contents

10. Operating Instructions and Installation	10-1
10-1 Front	10-1
10-2 Connection Panel	10-2
10-3 Remote control	10-4
10-4 Installing the Stand	10-5
10-5 Installing the Wall Mount Kit	10-5
11. Disassembly and Reassembly	11-1
11-1 Disassembly	11-1
11-2 Reassembly	11-5
12. PCB Diagram	12-1
12-1 22" Main PCB Diagram	12-1
12-2 22" IP SMPS	12-2
13. Circuit Descriptions	13-1
13-1 Block description	13-1
13-2 Main Block	13-3
13-3 SMPS Board	13-4
14. Reference Information	14-1
14-1 Technical Terms	14-1
14-2 Pin Assignments	14-4
14-3 Timing Chart	14-7
14-4 Panel Description	14-11



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3 Alignments and Adjustments

3-1 Service Instruction

1. Usually, a color TV-VCR 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 transform.

3-2 How to Access Service Mode

3-2-1 Entering Factory Mode

1. To enter "Service Mode" Press the remote -control keys in this sequence :

- If you do not have Factory remote - control



- If you have Factory remote - control



- The buttons are active in the service mode.

1. Remote - Control Key : Power, Arrow Up, Arrow Down, Arrow Left
Arrow Right, Menu, Enter, Number Key(0~9)
2. Function - Control Key : Power, CH +, CH -, VOL +, VOL -, Menu, TV/VIDEO(Enter)

3-3 Factory Data

1. Calibration
2. Option Table(Service)
3. White Balance
4. MST 69981
5. Option Block
6. Sound
7. YC Delay
8. Adjust
9. Bus Stop
10. W/B Movie
11. Checksum 0000
12. Reset
13. Spread Spectrum

T-JSM22PEUMD-XXXX (Main Micom Ver.)
 Month / Date / Year / Hour / Min. / Sec.

1. Calibration
 - 1) AV Calibration
 - 2) Comp Calibration
 - 3) PC Calibration
 - 4) HDMI Calibration

2. Option Table(Service)

NO	Item	Range
1	Ready	Off
2	Inch Option	22
3	Panel Vender	AMLCD_TN
4	Panel Type	22AMLCD
5	Model Option	Jasmine
6	Anynet+	Off
7	Auto Power	On
8	Nordic	On
9	LNA Menu	Off
10	TTX On/off	On
11	TTX List	Flof
12	Carrier Mute	Off
13	High Devi	Off
14	Volume Curve	Small
15	HotPlug	On
16	HotPlugCtrl	On
17	HotPlugDelay	12
18	Hotel Option	Off
19	Shop Mode	Off
20	Color Space	On
21	PC Ident	On
22	Language	English
23	Ch Table	Suwon
24	TTX Group	Lang OSD
25	IDTV Country	UK
26	PDP Filter	50"EU MRT
27	PDP Group	C5E_DMA

3 Alignments and Adjustments

3. White Balance

No	item	Value
1	Sub Bright	128
2	Red Offset	
3	Green Offset	128
4	Blue Offset	
5	Sub Contrast	140
6	Red Gain	
7	Green Gain	128
8	Blue Gain	

4. MST 68981

1) ADC Calibration

NO	item	Value
1	CVBS Y Gain	166
2	CVBS Y Offs	136
3	Ana Y Offs	128
4	Ana Pb Offs	128
5	Ana Pr Offs	128
6	Ana Y Gain	128
7	Ana Pb Gain	128
8	Ana Pr Gain	128
9	Out R Offs	61
10	Out G Offs	61
11	Out B Offs	61
12	Out R Gain	112
13	Out G Gain	112
14	Out B Gain	112

2) Calibration Target

2-1) AV ADC Target

NO	item	Value
1	Low	17
2	High	234
3	Delta	3

2-2) Comp ADC Target

NO	item	Value
1	Low	17
2	High	234
3	Delta	3

2-3) PC ADC Target

NO	item	Value
1	Low	1
2	High	254
3	Delta	3

2-4) All RGB Target

NO	item	Value
1	Low	2
2	High	235
3	Delta	1

3) Sharpness

NO	item	Value
1	H1 Gain	36
2	H2 Gain	36
3	H3 Gain	28
4	H4 Gain	28
5	V1 Gain	16
6	V2 Gain	16
7	D1 Gain	32
8	D2 Gain	32
9	Over Shoot2	60
10	Over Shoot3	60
11	Under Shoot2	60
12	Under Shoot3	60
13	Sub Color	60

5. Option Block

1) FRC(Micronas)

2) FRC2X

3) FBE2

3 Alignments and Adjustments

NO	item	value
1	Pattern Select	0
2	BS-On	1
3	B-Slope Gain	80
4	B-Tilt Min	20
5	B-Tilt Max	150
6	B-Tilt Slope	128
7	LFunc-Basis	120
8	HFunc-Basis	130
9	Mean-Offset1	30
10	Mean-Offset2	235
11	Mean Slope	112
12	Input Offset	128
13	Input Gain	128
14	ACR Offset	15
15	ACR Th1	20
16	ACR Th2	120
17	Skin Enable	1
18	Skin Tu	135
19	Skin Tv	135
20	M Skin Tu	128
21	M Skin Tv	128
22	Sub Color	145
23	M-Au-Sub Color	128
24	M-Wi-Sub Color	128
25	MW-Skin-Tu	128
26	MW-Skin-Tv	128

4) PDP Logic

NO	item	Value
1	Pattern Select	0
2	CDC Sw	Off
3	CDC Strenght Th	1
4	BRE Sw	Off
5	FRC Repeat Mode	Off
6	FRC DBG Mark On	0
7	FRC Bypass	Off
8	CDC L Gain	0
9	CDC U Gain	0
10	Panel Type	0
11	Panel Inch	00 SD
12	Panel Ber.	N/A
13	Logic Sw Ver.	00Y00M00D

6. Sound

NO	item	value
1	Saturation Mute	Off
2	FM Prescale	24
3	AM Prescale	20
4	Nicam Prescale	24
5	FM M Prescale	20
6	SC1 Vol	20
7	SC2 Vol	20
8	Audio Delay	On
9	Audio Delay Time	8
10	Ch1 BW	2
11	Ch2 BW	1
12	Num of Check	1
13	Num of Double Check	5
14	Mono Weight	1
15	Stereo Weight	1
16	Dual Weight	1
17	BG M2S Threshold	144
18	DK M2S Threshold	80
19	BG S2M Threshold	176
20	DK S2M Threshold	0
21	FINE VOL	20
22	Detection Threshold	
23	Ext Volume Scale	0
24	Ext Prescale Speaker	0
25	R2E Scart2 Offset	0
26	NTP 3000	
27	NTP Master Volume	14
28	NTP PWM modulation	243
29	NTP DRC Thresh	26
30	NTP Speaker EQ	On

3 Alignments and Adjustments

7. YC Delay

NO	item	Value
1	PAL BG	17
2	PAL DK	17
3	PAL I	17
4	SECAM BG	17
5	SECAM DK	17
6	SECAM L	17
7	NTSC 358	17
8	NTSC 443	17
9	AV PAL	17
10	AV SECAM	17
11	AV NT358	17
12	AV NT443	17
13	AV PAL60	17

8. Adjust

NO	item	value
1	V Mute Time	10
2	Dynamic Contrast	On
3	Dynamic Dimming	Off
4	Dynamic CE	On
5	LNA Plus	
6	Megazine LNA	Off
7	PixelShift Test	Off
8	Debug	Normal
9	ACR	On
10	D-WatchDog	On
11	UART Select	Off
12	FBE Select	FBE2X
13	Tuner	ALPS
14	Tuner TOP Semco	10
15	Tuner TOP Alps	13
16	D.Gamma	22
17	M.Gamma	Off
18	A-WatchDog	Off
19	Hp Detect	High

9. Bus Stop

10. W/B Movie

NO	item	value
1	WB Movie	off
2	Color Mode	Movie
3	Color Tone	Cool1
4	Msub Brigh	128
5	Msub Contr	128
6	W1_RGAIN	157
7	W1_BGAIN	72
8	W1_ROFFS	127
9	W1_BOFFS	129
10	W2_RGAIN	159
11	W2_BGAIN	57
12	W2_ROFFS	128
13	W2_BOFFS	128
14	NO_RGAIN	140
15	NO_BGAIN	91
16	NO_ROFFS	127
17	NO_BOFFS	128
18	C2_RGAIN	115
19	C2_BGAIN	145
20	C2_ROFFS	128
21	C2_BOFFS	128
22	Movie Contr	100
23	Movie Brigh	45
24	Movie Color	55
25	Movie Sharp	75
26	Mv BackLight	10

11. Checksum

12. Reset

13. Spread Spectrum

NO	item	value
1	Spread Spectrum	On
2	Step1	116
3	Step2	0
4	Range1	0
5	Range2	247
6	FBE SSC	5

3 Alignments and Adjustments

3-4 Service Adjustment

3-4-1 White Balance - Calibration

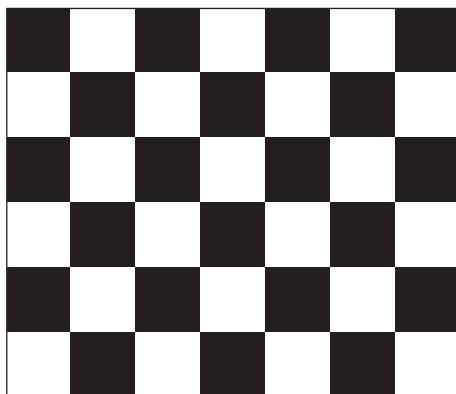
If picture color is wrong, do calibration first.

Equipment : CA210, Patten : chess pattern

Execute calibration in Factory Mode

Source AV : PAL composite, Component : 1280*720/60Hz

PC : 1024*768/60Hz



(chess patten)

3-4-2 White Balance - Adjustment

If picture color is wrong, check White Balance condition.

Equipment : CA210, Patten : Toshiba

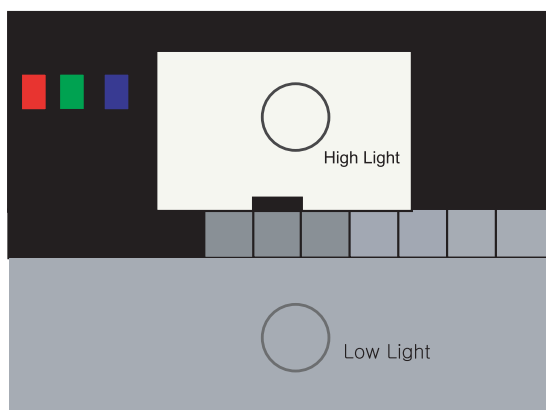
Adjust W/B in Factory Mode

Sub brightness and R/G/B Offset controls low light region

Sub contrast and R/G/B Gain controls high light region

Source AV : PAL composite, Component : 1280*720/60Hz

HDMI[DVI] : 1280*720/60Hz



[Test Pattern : MSPG-945 Series Pattern #16]

*Color temperature

1500K +/-500, -6 ~-20 MPCD

*Color coordinate

H/L : 267/263 +/- 2 35.0 Ft +/- 2.0Ft

L/L : 270/260 +/- 3 1.5 Ft +/- 0.2Ft

Toshiba Patten

3-4-3 Conditions for Measurement

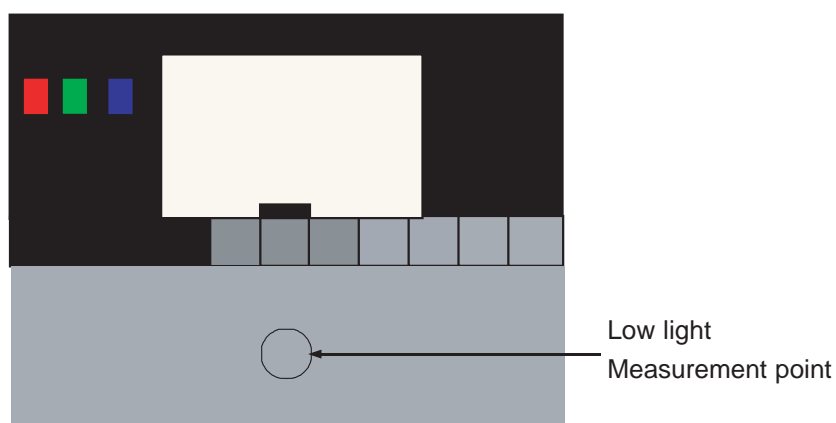
1. On the basis of toshiba ABL pattern : High Light level (57 IRE)
 - INPUT SIGNAL GENERATOR : MSPG-925LTH
 - * Mode NO 2 : 744X484@60 Hz
 - NO 6 : 1280X720@60 Hz
 - NO 21 : 1024X768@60 Hz
 - * Pattern NO 36 : 16 Color Pattern
 - NO 16 : Toshiba ABL Pattern
2. Optical measuring device : CA210 (FL)

Please use the MSPG-925 LTH generator for model LE26M51B/LE32M51B/LE40M51B/LE46M51B.

3-4-4 Method of Adjustment

1. Adjust the white balance of AV, Component and DVI Modes.
 - (AV → Component)
 - a) Set the input to the mode in which the adjustment will be made
(RF → DTV → PC → DVI).
 - * Input signal - VIDEO Mode : Model #2 (744*484 Mode), Pattern #16
 - DTV,DVI Mode : Model #6 (1280*720 Mode), Pattern #16
 - HDMI Mode: Model #6(1280*720 Mode), Pattern #16
 - b) Enter factory color control, confirm the data.
 - c) Adjust the low light. (Refer to table 1, 2 in adjustment position by mode)
 - Adjust sub - Brightness to set the 'Y' value.
 - Adjust red offset ('x') and blue offset ('y') to the color coordinates.

Picture 4-2 Toshiba ABL Pattern



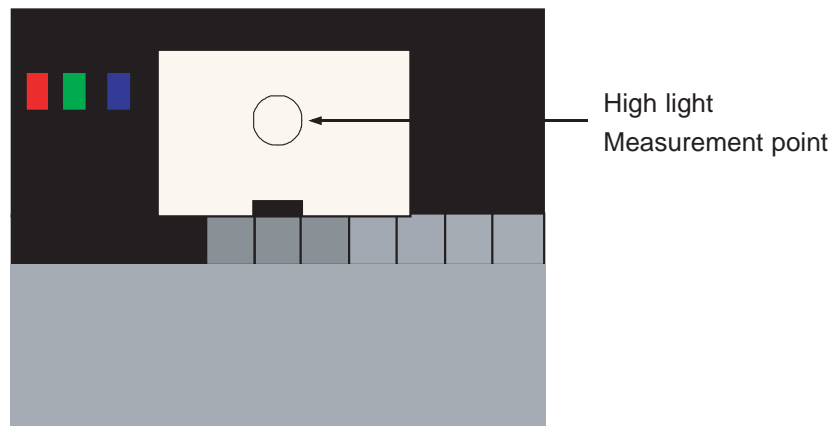
* Do not adjust green offset data.

- d) Adjust the high light. (Refer to table 1, 2 in adjustment position by mode)
 - Adjust red gain ('x') and blue gain ('y') to the color coordinates.
 - * Do not adjust the green gain and sub-contrast (Y) data.

3 Alignments and Adjustments

- d) Adjust the high light. (Refer to table 1, 2 in adjustment position by mode)
- Adjust red gain ('x') and blue gain ('y') to the color coordinates.
 - * Do not adjust the green gain and sub-contrast (Y) data.

Picture 4-3 Toshiba ABL Pattern



3-5 Software Upgrade

3-5-1 How to Update Flash ROM

1. Install the Flash Downloader

Connector Set(D-SUB) and D-SUB cable to execute Program Update.



2. Flash Downloader program update

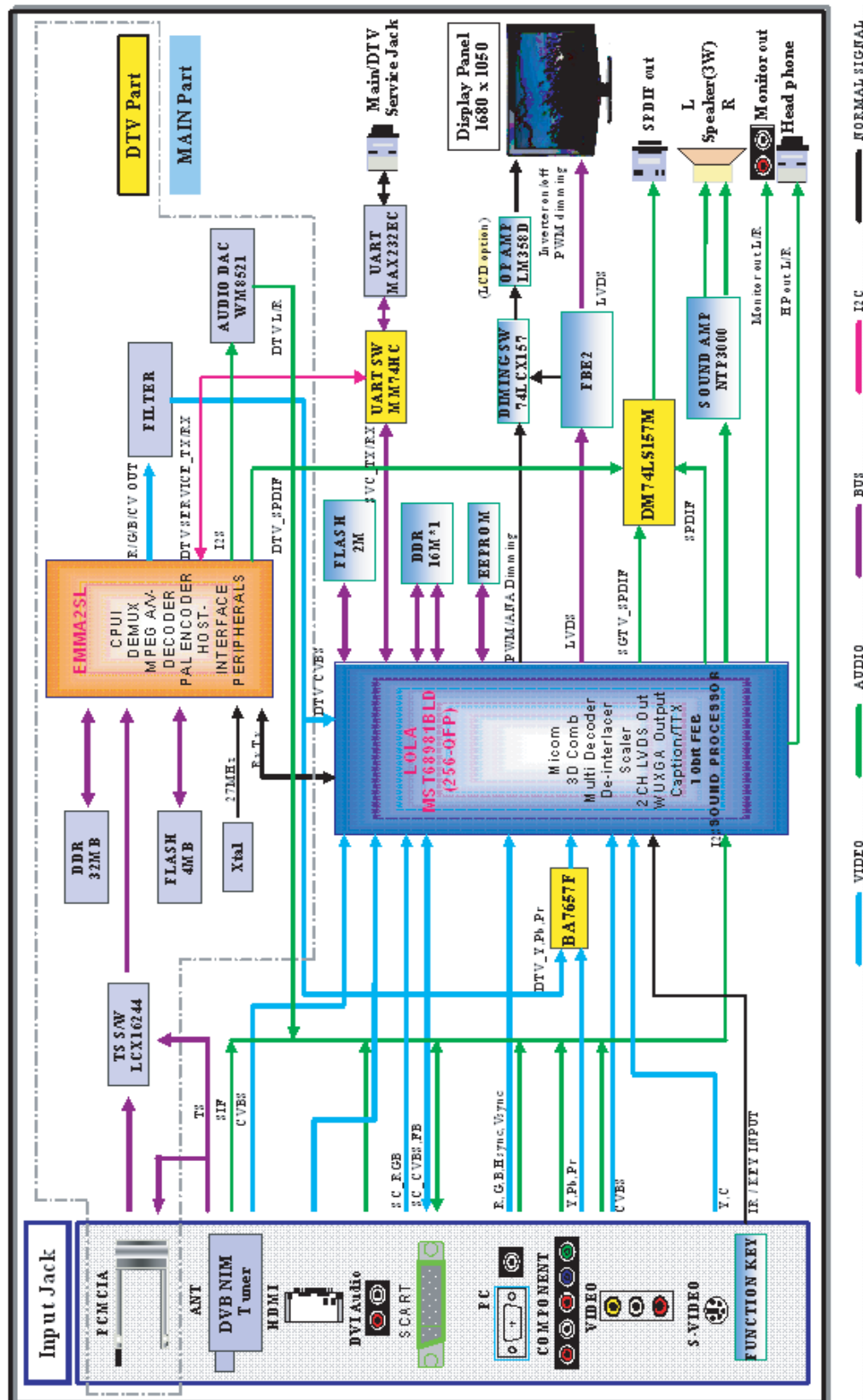
- Turn on the TV Set
- Click "Connect" icon on the MSTAR tool.
- Click "Read", and Choose a new S/W.
- Click "Auto", and "Run"



Memo

7 Block Diagram

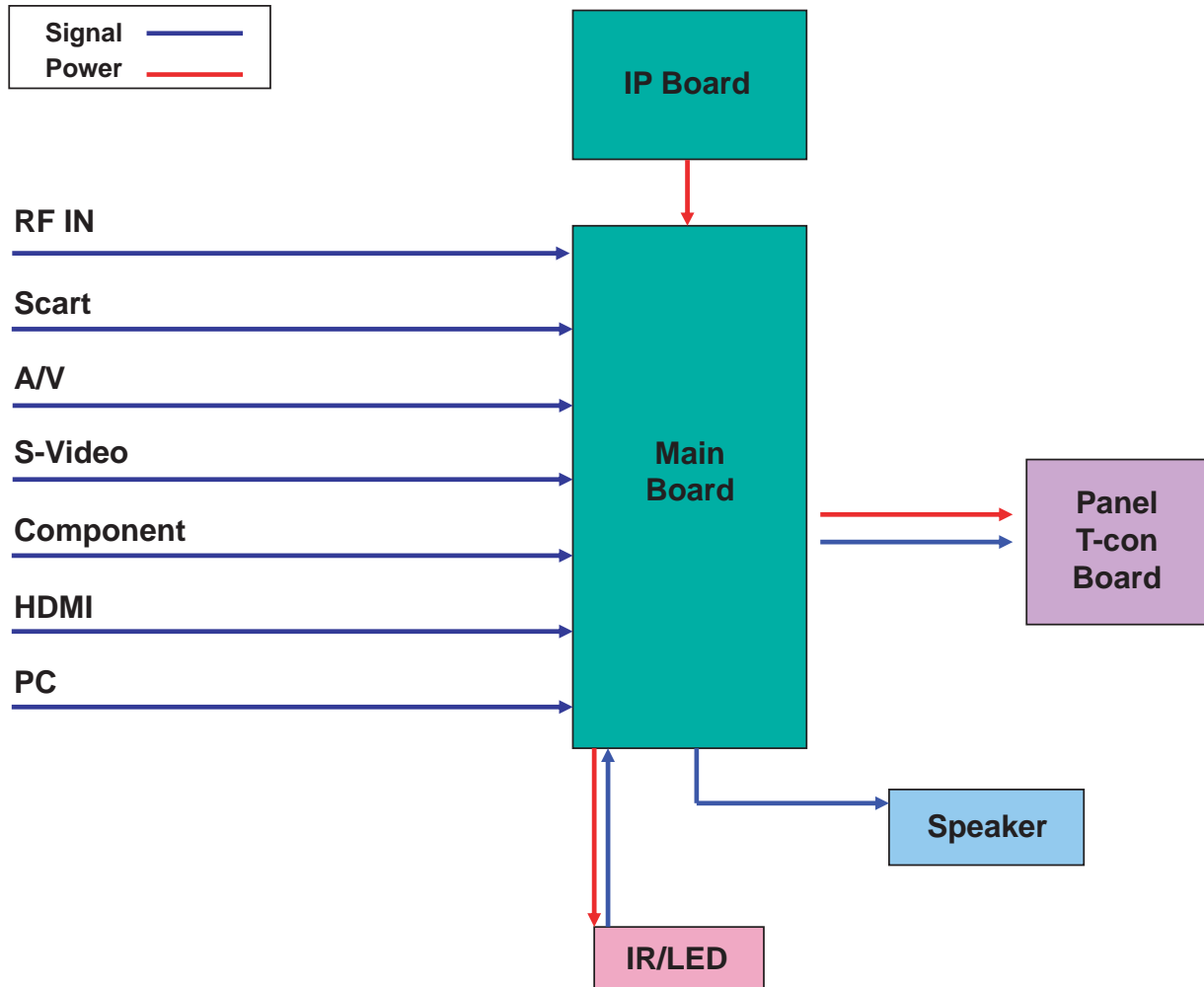
- This Document can not be used without Samsung's authorization



Memo

13 Circuit Descriptions

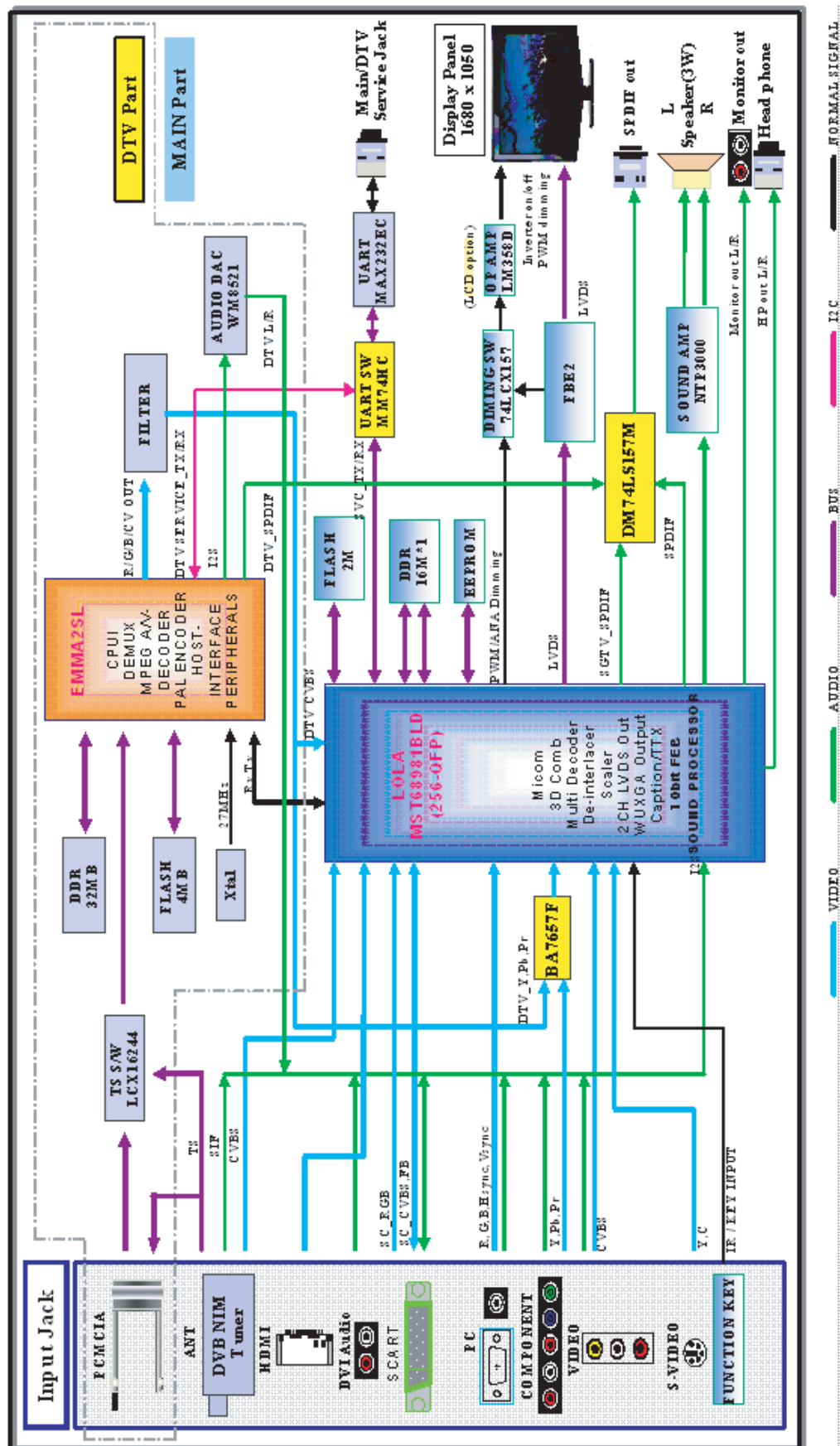
13-1 Block description



Bordeaux consists of three main blocks

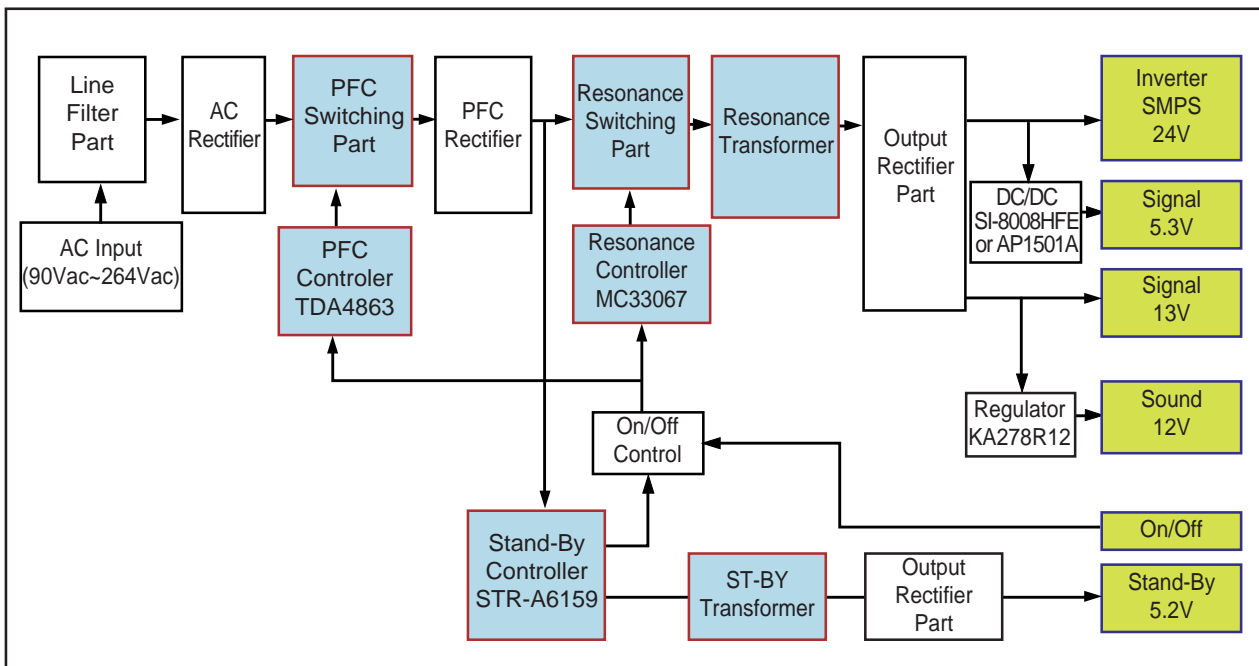
1. Main board : Video signal processing
2. IP board : Power supply & Inverter
3. T-con board : LCD Panel control

13-2 Main Block



13-3 SMPS Board

13-3-1 22" IP Board Circuit Diagram



Memo



11 Disassembly and Reassembly



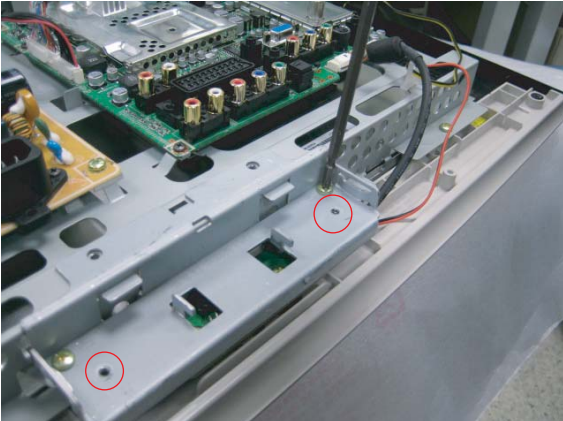
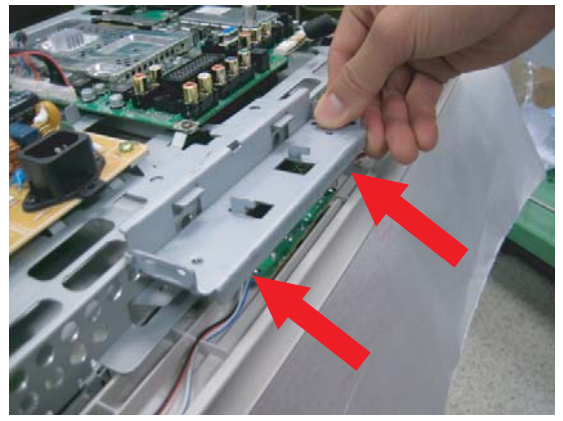
This section of the service manual describes the disassembly and reassembly procedures for the TFT-LCD TV.

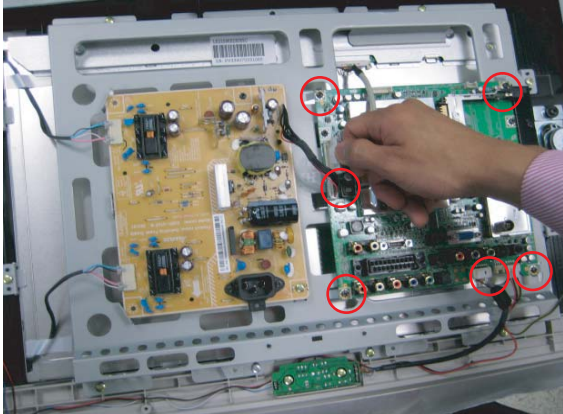
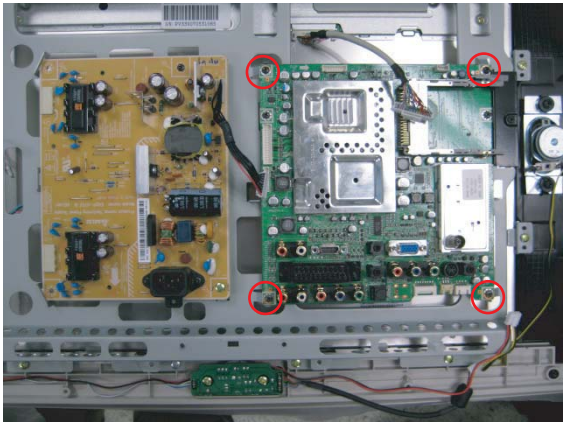
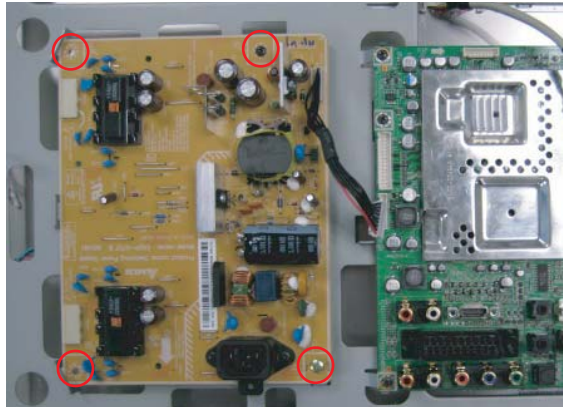
⚠ WARNING : This monitor contains electrostatically sensitive devices. Use caution when handling these components.

11-1 Disassembly

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

Description	Picture Description
1. Place monitor face down on cushioned table. Remove screws from the rear cover. Remove screws from the stand.	 

Description	Picture Description
<p>2. Lift up the rear cover and remove the stand.</p>	
	
<p>3. Remove Screws from the stand BRKT and lift up the stand BRKT.</p>	
	

Description	Picture Description
4. Disonnnect cable from the boards.	
5. Remove screws from the boards and lift up the boards.	
	

Description	Description Picture
<p>6. Remove screws and Lift up the Lcd panel.</p>	 <p>A photograph showing the back of the LCD panel assembly. The panel is mounted on a metal frame. Several screws are visible, and they are all circled in red to indicate they need to be removed. The panel has a barcode and some text on it.</p>
	 <p>A photograph showing a person's hand lifting the LCD panel from the device. A red arrow points upwards, indicating the direction of movement. The panel is being lifted from the bottom edge.</p>
	 <p>A photograph showing the front of the LCD panel. The panel is a standard LCD display with a silver bezel. It has a barcode and some text on the bottom right corner.</p>

11-2 Reassembly

Reassembly procedures are in the reverse order of disassembly procedures.

Memo

6 Electrical Parts List

-You can search for updated part codes through ITSELF web site.

URL : <http://itself.sec.samsung.co.kr/>

6-1 LE22S86BDX Parts List

Level	Loc. No.	Code No.	Description & Specification	Q'ty	SA/SNA
		LE22S86BDX/XEC	LE22S86BD,N40A/22S80-GJA,22,LCD-TV,SPAIN		
0.1	M0001	BN90-01372A	ASSY COVER FRONT;LE22S86BDX/XEC	1	S.N.A
..2	T0003	BN96-05965A	ASSY COVER P-FRONT;22S86,EO,,ABS+PMMA,HB	1	S.A
...3	M0081	6003-001024	SCREW-TAPTITE;RWH,+,-,B,M4,L12,ZPC(WHT),	4	S.A
...3	M0081	6003-001188	SCREW-TAPTITE;BH,+,-,B,M4,L10,ZPC(WHT),S	2	S.N.A
...3	M0081	6003-001188	SCREW-TAPTITE;BH,+,-,B,M4,L10,ZPC(WHT),S	2	S.N.A
...3	T0060	BN61-01655A	SPRING ETC;STS-304 SUS,D8,L12,T0.5	1	S.N.A
...3	CCM1	BN63-02183D	COVER-SHEET;Rhcm,PE Vinyl,T0.05,680mm,20	0.6	S.N.A
...3	M0112	BN63-03796A	COVER-FRONT;22S8,EO,ABS+PMMA,HB,BK23,S/M	1	S.N.A
...3	T0023	BN64-00589A	KNOB POWER;32S81,PC,-,-,-,-,VIOLET,-,-	1	S.N.A
...3	M0145	BN96-03466A	ASSY BOARD P-FUNCTION;SONOMA,SJ06-01-008	1	S.A
...3	M0025	BN96-04634A	ASSY DECORATION P;22S86,-,ABS HB,IV16,BK	1	S.N.A
....4		BN61-03261C	BOSS-TAPE;Tulip,ACRYL,T1.1,W24mm,GRAY,TA	0.5	S.N.A
....4		BN64-00709A	DECORATION-BOTTOM;JASMINE22,ABS HB,IV16,	1	S.N.A
...3	T0175	BN96-06066A	ASSY SPEAKER P;16ohm,4pin,3W,350/750	1	S.A
...3	M0146	BN96-04884G	ASSY BOARD P-POWER & IR;LE22S86BDX,CT500	1	S.A
...3	T0054	BN64-00590A	KNOB-DECORATION;JASMINE 32,ABS,-,-,-,HB,	1	S.N.A
...3	T0059	BN64-00366A	INDICATOR LED;ROME-I,PC,CLEAR,ALL MODEL	1	S.N.A
...3	T0022	BN64-00467E	KNOB CONTROL;37S62,SONOMA26,32,40,ABS,HB	1	S.A
0.1	M0002	BN90-01373A	ASSY COVER REAR;LE22S86BDX/XEC	1	S.N.A
..2	T0081	6002-001294	SCREW-TAPPING;BH,+,-,M4,L16,ZPC(BLK)	9	S.A
..2	M0013	BN96-05966A	ASSY COVER P-REAR;22S86,EO,,HIPS,HB,,BK5	1	S.A
...3	M0081	6003-001188	SCREW-TAPTITE;BH,+,-,B,M4,L10,ZPC(WHT),S	4	S.N.A
...3	T0101	BN61-03346A	BRACKET-WALL;LCD TV,SECC,T1.2	4	S.N.A
...3	M0006	BN63-03806A	COVER-REAR;JASMINE 22,HIPS,HB,BK500;IDTV	1	S.N.A
...3	T0071	BN64-00671A	INLAY-TERMINAL;19R8,PS SHEET,T0.5,-,-,-,	1	S.N.A
...3	T0064	BN65-00002A	CLAMPER CORE;BORDEAUX,PP,V0,BLK	1	S.N.A
0.1	M0216	BN90-01375A	ASSY STAND;LE22S86BDX/XEC	1	S.N.A
..2	M0027	BN96-04745A	ASSY STAND P-BASE;- ,22,23,26S81,-,ABS+PM	1	S.A
...3	T0081	6002-001294	SCREW-TAPPING;BH,+,-,M4,L16,ZPC(BLK)	4	S.A
...3	M0081	6003-001239	SCREW-TAPTITE;FH,+,-,B,M4,L10,ZPC(WHT),S	4	S.A
...3	T0920	BN61-03024A	GUIDE-STAND;JASMINE 26,ABS,-,-,-,BK500,V	1	S.N.A
...3		BN61-03028A	BRACKET-STAND BOTTOM;JASMINE 26",SECC,T1	1	S.N.A
...3	CCM1	BN63-02183D	COVER-SHEET;Rhcm,PE Vinyl,T0.05,680mm,20	0.2	S.N.A
...3	T0004	BN63-03178A	COVER-STAND BASE;JASMINE 26",ABS+PMMA,HB	1	S.N.A
...3	T0132	BN73-00052A	RUBBER FOOT;ARES 17,CR Rubber Gray,T1.5	4	S.N.A
..2	T0524	6902-000561	BAG PE;HDPE+NITRON(DOUBLE),T0.015+T0.5,W	1	S.N.A
0.1	M0106	BN91-01035Z	ASSY LCD-STZ;LS22DPWCSQ/EDC	1	S.N.A
..2	M0215	BN07-00346A	LCD-PANEL;LTM220M1-L01,Doppler,8BIT,493.	1	S.A
0.1	M0017	BN91-01705A	ASSY CHASSIS;LE22S86BDX/*	1	S.N.A
..2	M0014	BN94-01430B	ASSY PCB MAIN-AMLCD;LE22S86BDX/*	1	S.A
...3	T0245	0202-001492	SOLDER-WIRE FLUX;HSE-02 LFM48 SR-34 S,-,	0.25	S.N.A
...3		0202-001557	SOLDER-CREAM;LST57-A,D38-63,42SN/57BI/1A	11	S.N.A
...3	JA3002	3701-001400	CONNECTOR-DSUB;15P,3R,FEMALE,STRAIGHT,Ni	1	S.A
...3	CN906	3707-001081	CONNECTOR-OPTICAL;STRAIGHT,SPDIF	1	S.A
...3	JA9001	3709-001346	CONNECTOR-CARD SLOT;68P,0.27mm,ANGLE,AU1	1	S.A
...3	CN330	3711-000058	HEADER-BOARD TO CABLE;BOX,4P,1R,2.5MM,AN	1	S.A
...3	CN330	3711-003846	HEADER-BOARD TO CABLE;BOX,8P,1R,2mm,ANGL	1	S.A
...3	CN330	3711-004712	HEADER-BOARD TO CABLE;BOX,9P,1R,2mm,STRA	1	S.A
...3	CN330	3711-005606	HEADER-BOARD TO CABLE;BOX,30P,2R,2mm,STR	1	S.A
...3	JA4001	3722-000498	JACK-SCART;21P,-,SN,BLK,NO	1	S.A
...3	JA330	3722-001061	JACK-PHONE;1P,3.6PI,AG,BLK,N	1	S.A
...3	JA330	3722-001061	JACK-PHONE;1P,3.6PI,AG,BLK,N	1	S.A
...3	JA330	3722-001061	JACK-PHONE;1P,3.6PI,AG,BLK,N	1	S.A

6 Electrical Parts List

Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/S.N.A
...3	JA332	3722-001734	JACK-VHS;4P,SN,BLK,STRAIGHT	1	S.A
...3	JA333	3722-002360	JACK-PIN;3P,AU,GRN/BLU/RED,STRAIGHT	1	S.A
...3	JA333	3722-002362	JACK-PIN;2P,Sn,WHT/RED,STRAIGHT	1	S.A
...3	JA333	3722-002362	JACK-PIN;2P,Sn,WHT/RED,STRAIGHT	1	S.A
...3	JA333	3722-002363	JACK-PIN;3P,Sn,YEL/WHT/RED,STRAIGHT	1	S.A
...3	CIS3	BN40-00112A	TUNER;TDHG6-K02A,TDHG6-K02A,PAL Hyper,18	1	S.A
...3	T0603	BN63-02494A	SHIELD-PCB MAIN;MOSEL 40",SPTE,T0.3,EURO	1	S.N.A
...3	HDCP	BN97-00688A	ASSY HDCP;BN46-00018A,PS-42V6S,D73A,GENE	1	S.N.A
...4		BN46-00018A	KEY CODE-CERTIFICATE;(HDCP KEY)PPM42M5S,	1	S.N.A
...3	T0174	BN97-01737B	ASSY SMD;LE22S86BDX/*	1	S.N.A
...4	SUB05	0202-001477	SOLDER-CREAM;LST309-M,-,D20-45##,96.5Sn/	3,571	S.N.A
...4	D8002	0401-000132	DIODE-SWITCHING;BAV99,70V,50mA,SOT-23,TP	1	S.A
...4	D2002	0401-000133	DIODE-SWITCHING;RLS4148,75V,150mA,LL-34,	1	S.A
...4	D2006	0401-000133	DIODE-SWITCHING;RLS4148,75V,150mA,LL-34,	1	S.A
...4	D2007	0401-000133	DIODE-SWITCHING;RLS4148,75V,150mA,LL-34,	1	S.A
...4	D2008	0401-000133	DIODE-SWITCHING;RLS4148,75V,150mA,LL-34,	1	S.A
...4	D2009	0401-000133	DIODE-SWITCHING;RLS4148,75V,150mA,LL-34,	1	S.A
...4	D1003	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3003	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3004	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3006	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3007	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3008	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3009	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3010	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3011	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3012	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3013	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3014	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3015	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3016	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3034	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3035	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3036	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3041	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D4014	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D4021	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D4024	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D4032	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D4033	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D4034	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D4035	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D4036	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A
...4	D3031	0401-001099	DIODE-SWITCHING;1N4148WS,75V,150mA,SOD-3	1	S.A
...4	D3032	0401-001099	DIODE-SWITCHING;1N4148WS,75V,150mA,SOD-3	1	S.A
...4	D3033	0401-001099	DIODE-SWITCHING;1N4148WS,75V,150mA,SOD-3	1	S.A
...4	D8001	0401-001099	DIODE-SWITCHING;1N4148WS,75V,150mA,SOD-3	1	S.A
...4	D0254	0402-000553	DIODE-SCHOTTKY;SS24/B240,40V,2000mA,DO-2	1	S.A
...4	D0254	0402-000553	DIODE-SCHOTTKY;SS24/B240,40V,2000mA,DO-2	1	S.A
...4	D1007	0402-001098	DIODE-RECTIFIER;SK34,40V,3A,SMC,TP	1	S.A
...4	D3022	0403-000258	DIODE-ZENER;BZX84C5V6,5.2-6V,225mW,SOT-2	1	S.A
...4	D1008	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D1009	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D2001	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D2003	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D3005	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D3017	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D3018	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D3019	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D3020	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D3021	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D5001	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D5003	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D5004	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D5005	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A
...4	D5006	0403-000620	DIODE-ZENER;RLZ5.6B,5.45-5.73V,500mW,LL-	1	S.A

Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/S.N.A
....4	D3002	0403-001016	DIODE-ZENER;RLZ6.2B,5.96-6.27V,500mW,LL-	1	S.A
....4	D3001	0403-001052	DIODE-ZENER;RD8.2MB,7.7-8.7V,200mW,SOT-2	1	S.A
....4	D5002	0403-001052	DIODE-ZENER;RD8.2MB,7.7-8.7V,200mW,SOT-2	1	S.A
....4	D4005	0403-001169	DIODE-ZENER;RLZ16C,15.96-16.51V,500MW,LL	1	S.A
....4	D1002	0403-001425	DIODE-ZENER;BZX84C33,31-35V,350mW,SOT-23	1	S.A
....4	D3023	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D3024	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D3025	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D3026	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D3027	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D3028	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D3037	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D3039	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4001	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4002	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4003	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4004	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4009	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4012	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4013	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4015	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4016	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4022	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4023	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4025	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4026	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D4038	0406-001172	DIODE-TVS;CDS3C30GTH,48/-50V,SMD	1	S.A
....4	D3029	0407-000123	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	1	S.A
....4	D3030	0407-000123	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	1	S.A
....4	D9001	0407-000123	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	1	S.A
....4	D9002	0407-000123	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	1	S.A
....4	D9003	0407-000123	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	1	S.A
....4	D9004	0407-000123	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	1	S.A
....4	D9005	0407-000123	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	1	S.A
....4	D9006	0407-000123	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	1	S.A
....4	Q8003	0501-000002	TR-SMALL SIGNAL;KSA812,PNP,150MW,SOT-23,	1	S.A
....4	Q8004	0501-000002	TR-SMALL SIGNAL;KSA812,PNP,150MW,SOT-23,	1	S.A
....4	Q8006	0501-000002	TR-SMALL SIGNAL;KSA812,PNP,150MW,SOT-23,	1	S.A
....4	Q7003	0501-000434	TR-SMALL SIGNAL;KTC3875S-GR,NPN,150mW,SO	1	S.A
....4	Q7010	0501-000434	TR-SMALL SIGNAL;KTC3875S-GR,NPN,150mW,SO	1	S.A
....4	Q8001	0501-000434	TR-SMALL SIGNAL;KTC3875S-GR,NPN,150mW,SO	1	S.A
....4	Q8002	0501-000434	TR-SMALL SIGNAL;KTC3875S-GR,NPN,150mW,SO	1	S.A
....4	Q8005	0501-000434	TR-SMALL SIGNAL;KTC3875S-GR,NPN,150mW,SO	1	S.A
....4	Q5012	0501-000669	TR-SMALL SIGNAL;KTA1505Y,PNP,150mW,SOT-2	1	S.A
....4	Q1002	0501-002080	TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59	1	S.A
....4	Q1003	0501-002080	TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59	1	S.A
....4	Q1004	0501-002080	TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59	1	S.A
....4	Q5011	0501-002080	TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59	1	S.A
....4	Q5013	0501-002080	TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59	1	S.A
....4	Q409	0505-000110	FET-SILICON;2N7002,N,60V,115mA,7.5ohm,0.	1	S.A
....4	Q409	0505-000110	FET-SILICON;2N7002,N,60V,115mA,7.5ohm,0.	1	S.A
....4	Q409	0505-000110	FET-SILICON;2N7002,N,60V,115mA,7.5ohm,0.	1	S.A
....4	Q409	0505-000110	FET-SILICON;2N7002,N,60V,115mA,7.5ohm,0.	1	S.A
....4	Q409	0505-000110	FET-SILICON;2N7002,N,60V,115mA,7.5ohm,0.	1	S.A
....4	Q409	0505-000110	FET-SILICON;2N7002,N,60V,115mA,7.5ohm,0.	1	S.A
....4	Q409	0505-000110	FET-SILICON;2N7002,N,60V,115mA,7.5ohm,0.	1	S.A
....4	Q409	0505-001170	FET-SILICON;SI9933ADY-T1,P,-20V,3.4A,0.0	1	S.A
....4	Q409	0505-002169	FET-SILICON;Si4435BDY-T1-E3,P,-30V,-9.1A	1	S.N.A
....4	IC104	0801-000022	IC-CMOS LOGIC;7S00,NAND GATE,SOP,5P,2.0X	1	S.A
....4	IC104	0801-000022	IC-CMOS LOGIC;7S00,NAND GATE,SOP,5P,2.0X	1	S.A
....4	IC104	0801-002095	IC-CMOS LOGIC;74LCX245,TRANSCEIVER,TSSOP	1	S.A
....4	IC104	0801-002172	IC-CMOS LOGIC;74LCX16244,BUFFER/LINE DRI	1	S.A
....4	IC104	0801-002172	IC-CMOS LOGIC;74LCX16244,BUFFER/LINE DRI	1	S.A
....4	IC104	0801-002172	IC-CMOS LOGIC;74LCX16244,BUFFER/LINE DRI	1	S.A
....4	IC104	0801-002630	IC-CMOS LOGIC;74AHCT1G08,2-INPUT AND GAT	1	S.A
....4	IC104	0802-001007	IC-CMOS LOGIC;74LCX244,BUFFER/LINE DRIVE	1	S.A

6 Electrical Parts List

Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/S.N.A
....4	IC105	0909-001032	IC-REAL TIME CLOCK;PCF8563,SOP,8P,4.9x3.	1	S.A
....4	IC2001	1001-000164	IC-ANALOG MULTIPLEX;74HC4052,CMOS,SOP,16	1	S.A
....4	IC106	1001-001082	IC-VIDEO SWITCH;BA7657F,-,SOP,24P,300MIL	1	S.A
....4	IC6002	1001-001109	IC-ANALOG SWITCH;FST3125M,BUS SWITCH & C	1	S.A
....4	IC107	1002-001482	IC-D/A CONVERTER;WM8521H9GED/R,16bit,SOI	1	S.A
....4	IC110	1006-001076	IC-DRIVER/RECEIVER;MAX232ECWE+T,SOP,16P,	1	S.A
....4	IC112	1103-000129	IC-EEPROM;24C02,2Kbit,256x8Bit,SOP,8P,5x	1	S.A
....4	IC112	1103-000129	IC-EEPROM;24C02,2Kbit,256x8Bit,SOP,8P,5x	1	S.A
....4	IC112	1103-001385	IC-EEPROM;AT24C256,256Kbit,32Kx8,SOP,8P,	1	S.A
....4	IC112	1103-001385	IC-EEPROM;AT24C256,256Kbit,32Kx8,SOP,8P,	1	S.A
....4	IC113	1105-001712	IC-DRAM;HYB25D256163CE,DDR,256Mbit,16Mx1	1	S.A
....4	IC6001	1105-001838	IC-DDR SDRAM;EM6A9160TS0A-5G,DDR SDRAM,1	1	S.A
....4	DU410	1201-000166	IC-OP AMP;LM358,SOP,ST,8P,150MIL,DUAL,10	1	S.A
....4	DU410	1201-000541	IC-OP AMP;062,SOP,8P,153MIL,DUAL,6V/mV,P	1	S.A
....4	T0124	1201-002430	IC-POWER AMP;NTP-3000,QFN,56P,8x8mm,DUAL	1	S.A
....4	T0085	1201-002487	IC-AUDIO AMP;MAX9728A,QFN,12P,3x3mm,DUAL	1	S.A
....4	T0087	1203-001815	IC-POSI.FIXED REG.;78M09,TO-252,3P,-,PLA	1	S.A
....4	T0087	1203-002842	IC-POSI.FIXED REG.;AP1117D-33A,TO-252,3P	1	S.A
....4	T0087	1203-002974	IC-POSI.FIXED REG.;AP1117D-25A,TO-252,3P	1	S.A
....4	T0087	1203-002974	IC-POSI.FIXED REG.;AP1117D-25A,TO-252,3P	1	S.A
....4	IC012	1203-002995	IC-POSI.ADJUST REG.;AP1117D-A,TO-252,3P,	1	S.A
....4	IC012	1203-002995	IC-POSI.ADJUST REG.;AP1117D-A,TO-252,3P,	1	S.A
....4	T0170	1203-003059	IC-SWITCH VOL. REG.;MP1583,SOIC,8P,4.9x3	1	S.A
....4	T0170	1203-003059	IC-SWITCH VOL. REG.;MP1583,SOIC,8P,4.9x3	1	S.A
....4	T0170	1203-003059	IC-SWITCH VOL. REG.;MP1583,SOIC,8P,4.9x3	1	S.A
....4	IC9003	1203-003394	IC-POWER SUPERVISOR;MIC2544-1YM,SOP,8P,4	1	S.A
....4	T0087	1203-003696	IC-POSI.FIXED REG.;NCP1117DT18T5G,DPAK,3	1	S.A
....4	IC5001	1203-004363	IC-VOL. DETECTOR;RT9818C-29PV,SOT-23,3P,	1	S.A
....4	IC1013	1203-004364	IC-VOL. DETECTOR;RT9818C-42PV,SOT-23,3P,	1	S.A
....4	IC2003	1203-004364	IC-VOL. DETECTOR;RT9818C-42PV,SOT-23,3P,	1	S.A
....4	IC7002	1203-004364	IC-VOL. DETECTOR;RT9818C-42PV,SOT-23,3P,	1	S.A
....4	T0087	1203-004816	IC-POSI.FIXED REG.;KIA78D015F,DPAK,3P,6.	1	S.A
....4	IC118	1204-002729	IC-VIDEO PROCESS;S4LF119X01,PBGA,208P,17	1	S.A
....4	IC8006	1204-002798	IC-DECODER;UPD61211F1-104-FN7-A,BGA,208P	1	S.A
....4	IC109	1205-003308	IC-LCD CONTROLLER;SEMP690-LF,LQFP,256P,2	1	S.A
....4	D4006	1405-001185	VARISTOR;24Vdc,1.6x0.8x0.36mm,TP	1	S.A
....4	D4007	1405-001185	VARISTOR;24Vdc,1.6x0.8x0.36mm,TP	1	S.A
....4	D4008	1405-001185	VARISTOR;24Vdc,1.6x0.8x0.36mm,TP	1	S.A
....4	R110	2007-000040	R-CHIP;150ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000052	R-CHIP;10Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000060	R-CHIP;100Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000067	R-CHIP;15Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000067	R-CHIP;15Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	S.A

[illegible]

6 Electrical Parts List

[illegible]

[illegible]

6 Electrical Parts List

[illegible]

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6 Electrical Parts List

[illegible]

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6 Electrical Parts List

[illegible]

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6 Electrical Parts List

[illegible]

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6 Electrical Parts List

[illegible]

[illegible]

6 Electrical Parts List

[illegible]

[illegible]

6 Electrical Parts List

Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/S.N.A
....4	C2059	2402-001128	C-AL,SMD;100##F,20%,16V,-,TP,6.3X5.7mm	1	S.A
....4	C5034	2402-001128	C-AL,SMD;100##F,20%,16V,-,TP,6.3X5.7mm	1	S.A
....4	C5068	2402-001128	C-AL,SMD;100##F,20%,16V,-,TP,6.3X5.7mm	1	S.A
....4	C6001	2402-001128	C-AL,SMD;100##F,20%,16V,-,TP,6.3X5.7mm	1	S.A
....4	C6002	2402-001128	C-AL,SMD;100##F,20%,16V,-,TP,6.3X5.7mm	1	S.A
....4	C6072	2402-001128	C-AL,SMD;100##F,20%,16V,-,TP,6.3X5.7mm	1	S.A
....4	C8002	2402-001128	C-AL,SMD;100##F,20%,16V,-,TP,6.3X5.7mm	1	S.A
....4	C9012	2402-001128	C-AL,SMD;100##F,20%,16V,-,TP,6.3X5.7mm	1	S.A
....4	C9036	2402-001128	C-AL,SMD;100##F,20%,16V,-,TP,6.3X5.7mm	1	S.A
....4	C1050	2402-001129	C-AL,SMD;47UF,20%,16V,WT,TP,6.3X5.2MM	1	S.A
....4	C1103	2402-001129	C-AL,SMD;47UF,20%,16V,WT,TP,6.3X5.2MM	1	S.A
....4	C1119	2402-001129	C-AL,SMD;47UF,20%,16V,WT,TP,6.3X5.2MM	1	S.A
....4	C4011	2402-001129	C-AL,SMD;47UF,20%,16V,WT,TP,6.3X5.2MM	1	S.A
....4	C6012	2402-001129	C-AL,SMD;47UF,20%,16V,WT,TP,6.3X5.2MM	1	S.A
....4	C4041	2402-001155	C-AL,SMD;47UF,20%,16V,WT,TP,6.3X5.2MM	1	S.A
....4	C1037	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C1067	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C1072	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C1074	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C1101	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C1125	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C2065	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C2067	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C2068	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C2073	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C5001	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C5009	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C5012	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C5020	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C5025	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C5028	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C5031	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C5047	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C5108	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C6017	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C6028	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C6075	2402-001178	C-AL,SMD;10uF,20%,16V,WT,TP,4.3x4.3x5.8m	1	S.A
....4	C1013	2402-001183	C-AL,SMD;22UF,20%,16V,WT,TP,5.3X5.3X6MM	1	S.A
....4	C1021	2402-001238	C-AL,SMD;1uF,20%,50V,HR,TP,4.3x4.3x5.2mm	1	S.A
....4	C1080	2402-001273	C-AL,SMD;220uF,20%,35V,WT,REEL,10X10mm	1	S.A
....4	C1107	2402-001273	C-AL,SMD;220uF,20%,35V,WT,REEL,10X10mm	1	S.A
....4	C2003	2402-001273	C-AL,SMD;220uF,20%,35V,WT,REEL,10X10mm	1	S.A
....4	C2038	2402-001273	C-AL,SMD;220uF,20%,35V,WT,REEL,10X10mm	1	S.A
....4	C1055	2409-001051	C-ORGANIC;82UF,20%,6.3V,WT,TP,6.3*5.9MM,	1	S.A
....4	C1068	2409-001051	C-ORGANIC;82UF,20%,6.3V,WT,TP,6.3*5.9MM,	1	S.A
....4	C1105	2409-001051	C-ORGANIC;82UF,20%,6.3V,WT,TP,6.3*5.9MM,	1	S.A
....4	T0052	2703-000398	INDUCTOR-SMD;10uH,10%,3225	1	S.A
....4	T0052	2703-000398	INDUCTOR-SMD;10uH,10%,3225	1	S.A
....4	T0052	2703-000398	INDUCTOR-SMD;10uH,10%,3225	1	S.A
....4	T0052	2703-000398	INDUCTOR-SMD;10uH,10%,3225	1	S.A
....4	T0052	2703-000398	INDUCTOR-SMD;10uH,10%,3225	1	S.A
....4	T0052	2703-000417	INDUCTOR-SMD;220uH,5%,3225	1	S.A
....4	T0052	2703-001334	INDUCTOR-SMD;1.5uH,10%,2012	1	S.A
....4	T0052	2703-001334	INDUCTOR-SMD;1.5uH,10%,2012	1	S.A
....4	T0052	2703-001334	INDUCTOR-SMD;1.5uH,10%,2012	1	S.A
....4	T0052	2703-001334	INDUCTOR-SMD;1.5uH,10%,2012	1	S.A
....4	T0052	2703-001426	INDUCTOR-SMD;680uH,20%,7070	1	S.A
....4	T0052	2703-001717	INDUCTOR-SMD;1.2uH,5%,3225	1	S.A
....4	T0052	2703-001778	INDUCTOR-SMD;3.3uH,20%,3225	1	S.A
....4	T0052	2703-002722	INDUCTOR-SMD;22uH,20%,12x12mm	1	S.A
....4	T0052	2703-002722	INDUCTOR-SMD;22uH,20%,12x12mm	1	S.A
....4	T0052	2703-002722	INDUCTOR-SMD;22uH,20%,12x12mm	1	S.A
....4	L2001	2704-000018	INDUCTOR-SMD-ARRAY;15uH,2000mA,2,0.124oh	1	S.N.A
....4	L2002	2704-000018	INDUCTOR-SMD-ARRAY;15uH,2000mA,2,0.124oh	1	S.N.A
....4	X202	2801-000258	CRYSTAL-SMD;0.032768MHz,20ppm,SMD,12.5pF	1	S.A

Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/S.N.A
....4	X202	2801-003667	CRYSTAL-SMD;14.31818MHz,30ppm,28-AAN,16p	1	S.A
....4	X202	2801-003954	CRYSTAL-SMD;27MHz,30ppm,28-AAN,16pF,50oh	1	S.A
....4	F103	2901-001114	FILTER-EMI SMD;25VDC,2.0ADC,-,100nF,3.2x	1	S.A
....4	T0568	3301-000314	BEAD-SMD;120ohm,1.6x0.8x0.8mm,-,-,-	1	S.N.A
....4	T0568	3301-000314	BEAD-SMD;120ohm,1.6x0.8x0.8mm,-,-,-	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
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....4	T0568	3301-001163	BEAD-SMD;80ohm,2012,TP,-,192ohm/867MHz	1	S.N.A
....4	T0568	3301-001			

6 Electrical Parts List

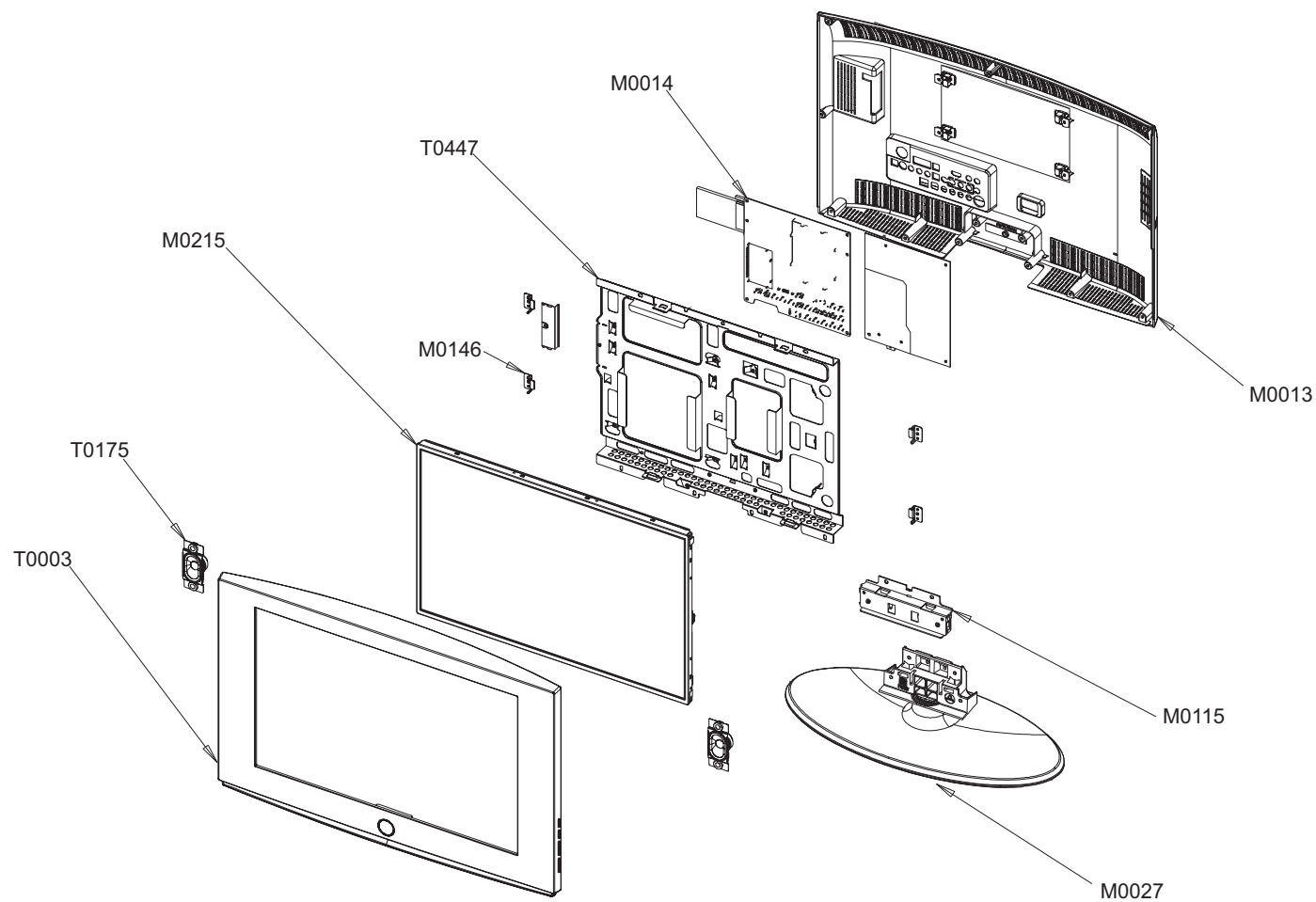
Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/S.N.A
0.1		BN91-01706A	ASSY SHIELD-STN;LE22S86BDX/*	1	S.N.A
..2	M0081	6003-000275	SCREW-TAPTITE;BH,+,-,B,M3,L10,ZPC(BLK),S	3	S.N.A
..2	M0081	6003-001188	SCREW-TAPTITE;BH,+,-,B,M4,L10,ZPC(WHT),S	4	S.N.A
..2	M0081	6003-001188	SCREW-TAPTITE;BH,+,-,B,M4,L10,ZPC(WHT),S	6	S.N.A
..2	M0081	6003-001439	SCREW-TAPTITE;BH,+,-,S,M4,L8,ZPC(WHT),SW	1	S.N.A
..2	M0174	BN44-00152A	IP BOARD;EADP-57CFB,CURIE 22",3.0 ~5.0mA	1	S.A
..2	M0146	BN61-03425A	BRACKET-PANEL SIDE;JASMINE 22,SECC,T1.2	4	S.N.A
..2	T0447	BN96-05967A	ASSY BRACKET P-PANEL;-,22S86,EO,-,-,-,-,	1	S.N.A
...3	M0107	BN61-03426A	BRACKET-PCB;22 JASMINE,SECC,T1.0	1	S.N.A
...3	M0131	AA63-01071A	GASKET;PO24FS,CONDUCTIVE FABRIC,2,15,90,	1	S.N.A
...3	M0131	BN63-03550A	GASKET;BORDEAUX PLUS,Conductive Fabric,1	4	S.N.A
...3		AA60-00091A	SPACER;- ,FELT,150X10,-,-,BLK,T0.35,-,-	1	S.N.A
...3	M0131	BN63-04078A	GASKET;LE22S86BDX/XEC,Conductive Fabric,	1	S.N.A
...3	M0131	BN63-04079A	GASKET;LE22S86BDX/XEC,Conductive Fabrics	1	S.N.A
...3	M0131	BN63-04080A	GASKET;LE22S86BDX/XEC,Conductive Fabrics	1	S.N.A
...3	M0081	6003-000275	SCREW-TAPTITE;BH,+,-,B,M3,L10,ZPC(BLK),S	1	S.N.A
...3	M0114	BN61-02500A	HOLDER-WIRE;NYLON6.6,NATURAL	3	S.N.A
...3	M0107	BN63-03039A	SHIELD-COVER;MURANO40,PCM,T0.5,IDTV	1	S.N.A
...3	M0081	6003-001188	SCREW-TAPTITE;BH,+,-,B,M4,L10,ZPC(WHT),S	2	S.N.A
...3	M0115	BN61-02931A	BRACKET-STAND LINK;JASMINE 26,SECC,T1.6	1	S.A
..2	T0297	BN39-00953C	CABLE FORM CONN.COAX;LE22S86BD,UL1571#30	1	S.A
..2	M0081	6003-000115	SCREW-TAPTITE;BH,+,-,B,M3,L6,ZPC(BLK),SWRC	6	S.A
0.1	M0003	BN92-02862A	ASSY BOX;22S86,EO	1	S.N.A
..2		BN69-02003A	BOX-SET;22S8,CB,A-01,SY-03,A,W678,D574,H	1	S.N.A
0.1	M0113	BN92-02864A	ASSY P/MATERIAL;22S81	1	S.N.A
..2	T0524	6902-000358	BAG PE;HDPE/NITRON,T0.015/T0.5,W900,L700	1	S.N.A
...3	T0107	HA83-00058A	LP-RESIN-EPS;CHEIL SF-301V,WHT	0.001	S.N.A
..2	T0081	HA83-00057B	LP-TAPE-CELLULOSE;HA02-030010,T0.046,W7	1.66	S.N.A
0.1	M0019	BN92-02865A	ASSY LABEL;LE22S86BDX/*	1	S.N.A
0.1	M0045	BN92-02866A	ASSY ACCESSORY;LE22S86BDX/*	1	S.A
..2	T0268	3903-000145	CBF-POWER CORD;DT,EU,FP3/YES,U(IEC C13-R	1	S.A
..2	T0081	6002-001294	SCREW-TAPPING;BH,+,-,M4,L16,ZPC(BLK)	4	S.A
..2		AA68-03575A	MANUAL FLYER-02,REGISTRATION C;XEU,ENG,U	1	S.N.A
..2		AA68-03575B	MANUAL FLYER-02,REGISTRATION C;XEG,GERMA	1	S.N.A
..2		AA68-03575C	MANUAL FLYER-02,REGISTRATION C;XEF,FRENC	1	S.N.A
..2		AA68-03575D	MANUAL FLYER-03,REGISTRATION C;XEC,SPANI	1	S.N.A
..2		AA68-03575E	MANUAL FLYER-04,REGISTRATION C;XET,ITALY	1	S.N.A
..2		AA68-03575F	MANUAL FLYER-02,REGISTRATION C;XEN,DUTCH	1	S.N.A
..2		AA68-03575G	MANUAL FLYER-02,REGISTRATION C;XEP,PORTU	1	S.N.A
..2	T0074	BN59-00611A	REMOCON;JASMINE , LILY,TM87C,SAMSUNG 28p	1	S.A
..2		BN63-01798A	CLOTH-CLEAN;RE40**,CLOTH,180,200,RHCM	1	S.N.A
..2	T0531	BN63-03176B	COVER-BOTTOM;JASMINE 22,23,26,HIPS,-,-,-	1	S.A
..2	T0511	BN68-01182L	MANUAL USERS;COMM,SAMSUNG,E/F/G/D/I/S/P/	1	S.N.A
..2	T0091	HA83-00047A	LP-TAPEACETATE;T0.1MM,W20MM,L200MM	0.1	S.N.A
..2	T0210	AA68-03242K	MANUAL FLYER-01,SAFETY GUIDE;comm,Samsun	1	S.N.A
..2		BN68-00514E	MANUAL FLYER-00,WARRANTY CARD;comm,Samsu	1	S.N.A

5 Exploded View and Parts List

- You can search for updated part codes through ITSELF web site.

URL : <http://itself.sec.samsung.co.kr/>

5-1 LE22S86BDX Exploded View

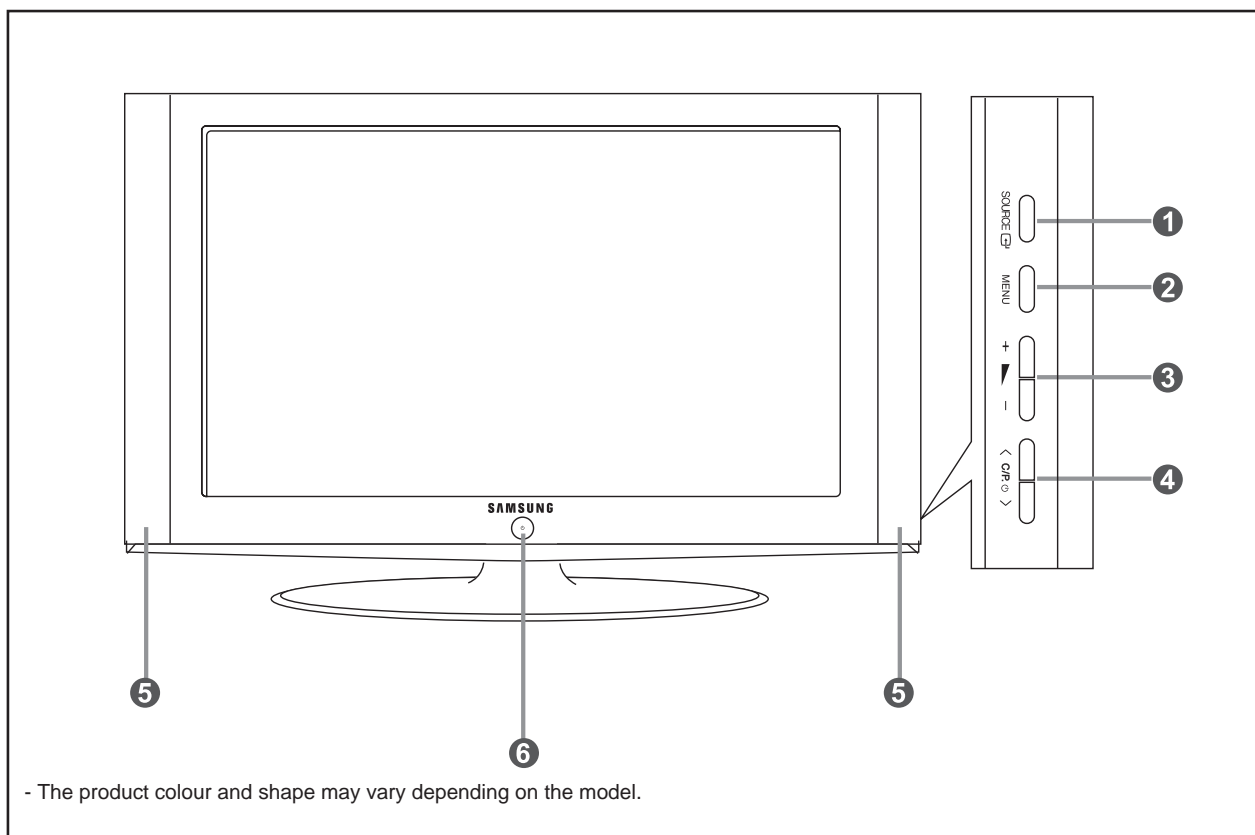


5-2 LE22S86BDX Parts list

Location	Code.No	Item & Specification	Q'ty	SA/SNA	Remark
T0003	BN96-05965A	ASSY COVER P-FRONT;22S86,EO,,ABS+PMMA,HB	1	S.A	
T0175	BN96-06066A	ASSY SPEAKER P;16ohm,4pin,3W,350/750	1	S.A	
M0215	BN07-00346A	LCD-PANEL;LTM220M1-L01,Doppler,8BIT,493.	1	S.A	
T0447	BN96-05967A	ASSY BRACKET P-PANEL;-;22S86,EO,-,-,-,-,-	1	S.N.A	
M0146	BN61-03425A	BRACKET-PANEL SIDE;JASMINE 22,SECC,T1.2	4	S.N.A	
M0115	BN61-02931A	BRACKET-STAND LINK;JASMINE 26,SECC,T1.6	1	S.A	
M0027	BN96-04745A	ASSY STAND P-BASE;-;22,23,26S81,-,-,ABS+PM	1	S.A	
M0013	BN96-05966A	ASSY COVER P-REAR;22S86,EO,,HIPS,HB,,BK5	1	S.A	

10 Operating Instructions and Installation

10-1 Front



1. SOURCE

Toggles between all the available input sources (TV, Ext., AV, S-Video, Component, PC, HDMI, DTV).
In the on-screen menu, use this button as you use the **ENTER/OK** button on the remote control.

2. MENU

Press to see an on-screen menu of your TV's features.
In case of DTV mode, the DTV menu appears.

3. + ▴ -

Press to decrease or increase the volume.
In the on-screen menu, use the + ▴ - buttons as you use the ◀ and ▶ buttons on the remote control.

4. < C/P. ⏻ >

Press to change channels.
In the on-screen menu, use the < C/P. ⏻ > buttons as you use the ▾ and ▴ buttons on the remote control. (Without the Remote Control, you can turn on the TV by using the Channel buttons.)

5. Speakers

6. ⏻ (Power)

Press to turn the TV on and off.

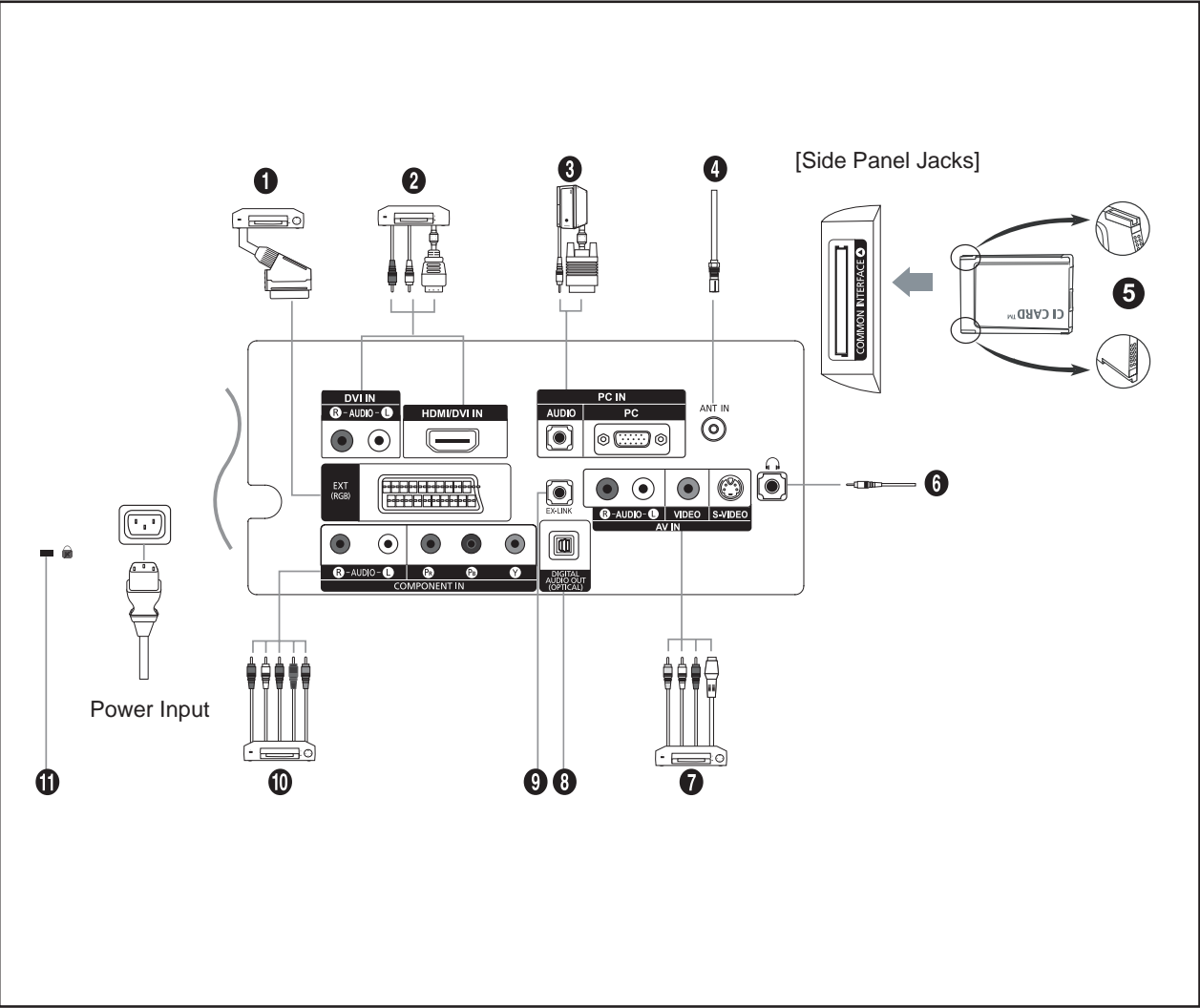
Power Indicator

and turns off when the power is on and lights up in stand-by mode. Remote Control Sensor Aim the remote control towards this spot on the TV.

Remote Control Sensor

Aim the remote control towards this spot on the TV.

10-2 Connection Panel



- Whenever you connect an external device to your TV, make sure that power on the unit is turned off.
- When connecting an external device, match the colour of the connection terminal to the cable.

1. Connecting Set-Top Box, VCR or DVD

Connector	Input			Output
	Video	Audio (L/R)	RGB	Video + Audio (L/R)
EXT 1	O	O	O	Only TV or DTV output is available.

- Inputs or outputs for external devices, such as VCR, DVD, video game device or video disc players.

2. Connecting HDMI

- Supports connections between HDMI-connection-enabled AV devices (Set-Top Boxes, DVD players).
- No additional Audio connection is needed for an HDMI to HDMI connection.
 - ▶ What is HDMI?
 - "High Definition Multimedia interface" allows the transmission of high definition digital video data and multiple channels of digital audio (5.1 channels).
 - The HDMI/DVI terminal supports DVI connection to an extended device with the appropriate cable (not supplied). The difference between HDMI and DVI is that the HDMI device is smaller in size, has the HDCP (High Bandwidth Digital Copy Protection) coding feature installed, and supports multi - channel digital audio.
 - ▶ You should use the DVI-to-HDMI cable or DVI-HDMI Adapter for the connection, and the "R- AUDIO - L" terminal on DVI for sound output.
- When connecting this product via HDMI or DVI to a Set Top Box, DVD Player or Games Console etc, make sure that it has been set to a compatible video output mode as shown in the table below. Failure to observe this may result in picture distortion, image breakup or no picture.

▶ **Supported modes for HDMI/DVI and Component**

	480i	480p	576i	576p	720p	1080i
HDMI/DVI 50Hz	X	X	X	O	O	O
HDMI/DVI 60Hz	X	O	X	X	O	O
Component	O	O	O	O	O	O

3. Connecting Computer

- Connect the D- Sub cable (optional) to "PC (PC IN)" on the rear of your set and the other end to the Video Card of your computer.
- Connect the stereo audio cable (optional) to "AUDIO (PC IN)" on the rear of your set and the other end to "Audio Out" of the sound card on your computer.

4. Connecting an Aerial or Cable Television Network

- To view television channels correctly, a signal must be received by the set from one of the following sources:
- An outdoor aerial / A cable television network / A satellite network

5. Connecting CI (Common Interface) CARD

- When not inserting "CI CARD" in some channels, "Scrambled Signal" is displayed on the screen.
- The pairing information containing a telephone number, CI CARD ID, Host ID and other information will be displayed in about 2~3 minutes. If an error message is displayed, please contact your service provider.
- When the channel information configuration has finished, the message "Updating Completed" is displayed, indicating that the channel list is now updated.

7. Connecting External A/V Devices

- Connect RCA or S-VIDEO cable to an appropriate external A/V device such as VCR, DVD or Camcorder.
- Connect RCA audio cables to "R - AUDIO - L" on the rear of your set and the other ends to corresponding audio out connectors on the A/V device.
- Headphone may be connected to the headphone output (6) on the rear of your set. While the head phone is connected, the sound from the built-in speakers will be disabled.

10 Operating Instructions and Installation

8. DIGITAL AUDIO OUT (OPTICAL)

- Connect to a Digital Audio Component.

9. EX-LINK

- Service connection for qualified service engineer.

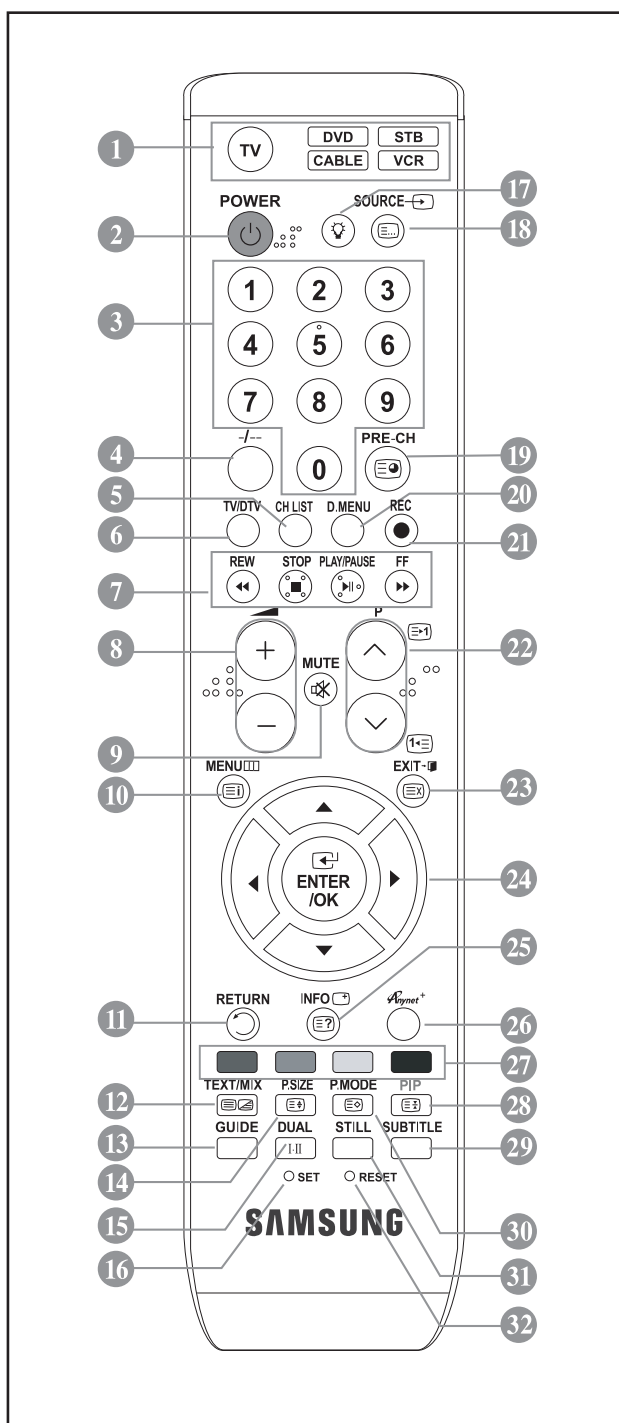
10. Connecting Component Devices (DTV/DVD)

- Connect component video cables (optional) to component connector ("Pr", "Pb", "Y") on the rear of your set and the other ends to corresponding component video out connectors on the DTV or DVD.
- If you wish to connect both the Set-Top Box and DTV (or DVD), you should connect the Set-Top Box to the DTV (or DVD) and connect the DTV (or DVD) to component connector ("Pr", "Pb", "Y") on your set.
- The PR, PB and Y connectors on your component devices (DTV or DVD) are sometimes labeled Y, B-Y and R-Y or Y, Cb and Cr.
- Connect RCA audio cables (optional) to "R - AUDIO - L" on the rear of your set and the other ends to corresponding audio out connectors on the DTV or DVD.
- This LCD TV displays its optimum picture resolution in 720p mode.
- This LCD TV displays its maximum picture resolution in 1 080i mode.

11. Kensington Lock

- The Kensington lock (optional) is a device used to physically fix the system when used in a public place.
- If you want to use a locking device, contact the dealer where you purchased the TV.
- The place of the Kensington Lock may be different depending on its model.

10-3 Remote Control



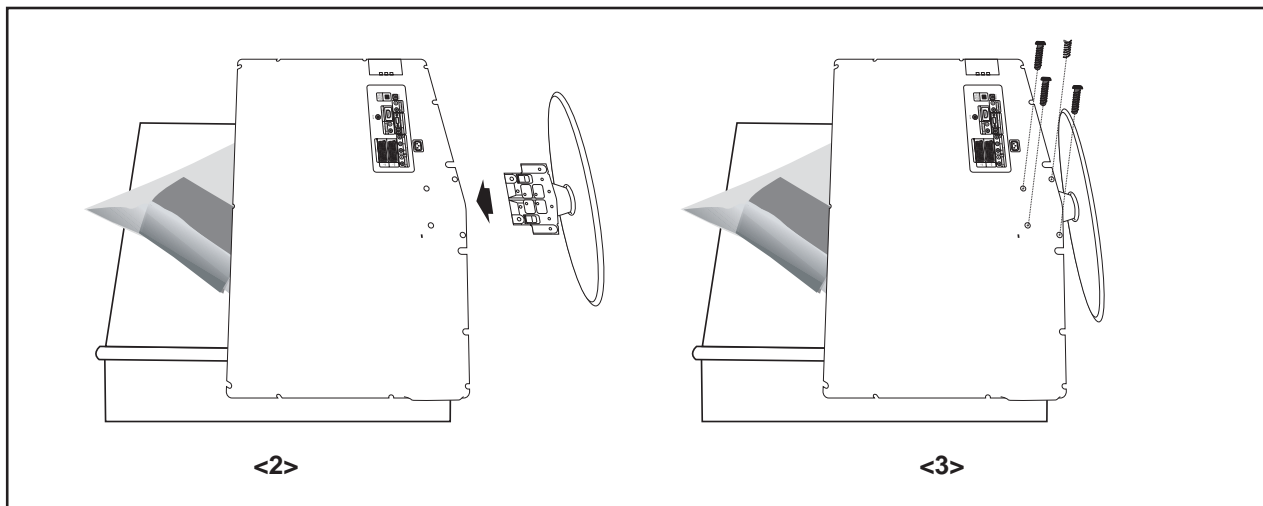
1. Selects a target device to be controlled by the Samsung remote control (TV, DVD, STB, CABLE, VCR)
2. Television Standby button
3. Number buttons for direct channel access
4. One/Two-digit channel selection
5. It display "Channel List" on the screen.
6. Selects the TV mode directly
7. VCR/DVD Functions
Rewind, Stop, Play/Pause, Fast/Forward
8. + Volume increase
- Volume decrease
9. Temporary sound switch-off
10. Menu display and change confirmation
11. Returns to the previous menu
12. SRS TS XT selection
13. Electronic Program Guide (EPG) display
14. Picture size selection
15. Sound effect selection
16. Adjusts 5 separate devices - TV, DVD, STB, CABLE, or VCR.
17. When pressing this button, a number of buttons on the remote control (e.g. Selects a target device, volume, channel and MUTE buttons) light up for a few seconds and then turn off to save power. This function is to conveniently use the remote control at night or when dark.
18. Available source selection
19. Previous channel
20. DTV menu display
21. Records for Live Broadcasting
22. P (Next channel)
P (Previous channel)
23. Exit the OSD
24. Control the cursor in the menu
25. Use to see information on the current broadcast
27. Colour buttons :
Press to add or delete channels and to store channels to the favorite channel list in the "Channel List" menu.
28. Picture-In-Picture On / Off
29. Digital subtitle display
30. Picture effect selection
31. Picture freeze
32. When your remote does not work, change the batteries and press the "RESET" button for 2-3 seconds before use.

Teletext Functions

6. Exit from the teletext display
10. Teletext index
14. Teletext size selection
18. Teletext mode selection (LIST/FLOF)
19. Teletext sub page
22. P (Teletext next page)
P (Teletext previous page)
23. Teletext cancel
25. Teletext reveal
26. Alternately select Teletext, Double, or Mix.
27. Fasttext topic selection
28. Teletext hold
30. Teletext store

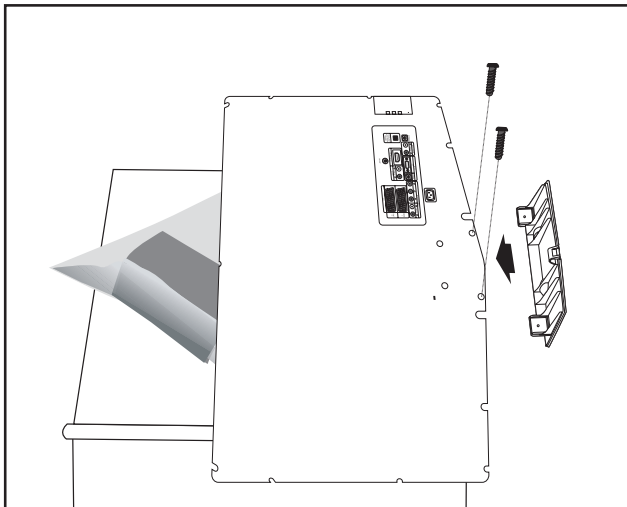
- The performance of the remote control may be affected by bright light.
- This is a special remote control for the visually impaired, and has Braille points on the Power, Channel, STOP, PLAY/PAUSE and Volume buttons.

10-4 Installing the Stand



1. Place the TV fdown on a soft cloth or cushion on a table.
2. Put the stand into the hole at the bottom of the TV.
3. Insert screw into the hole indicated and tighten.

10-5 Installing the Wall Mount Kit



Wall mount items (sold separately) allow you to mount the TV on the wall.

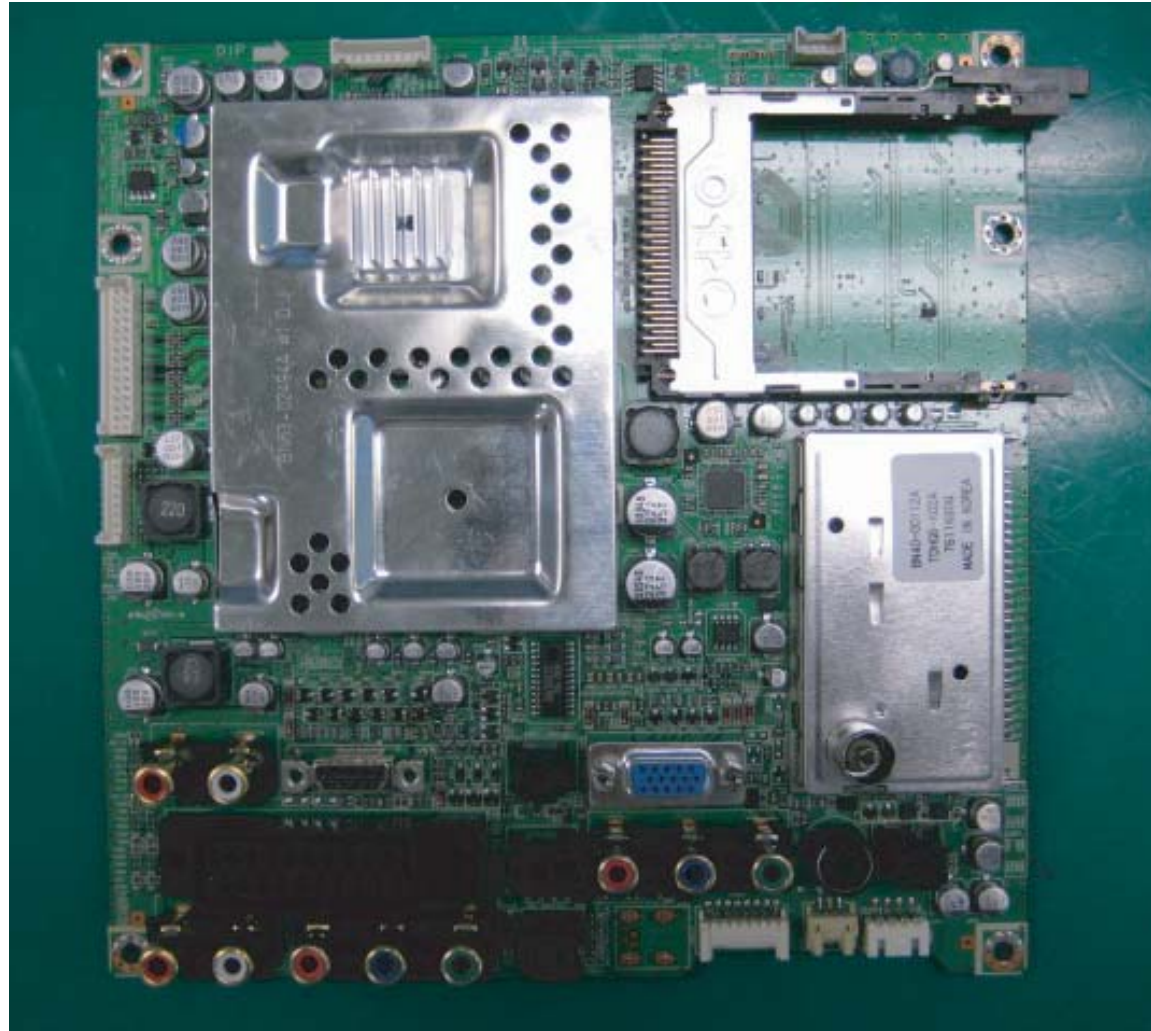
For detailed information on installing the wall mount, see the instructions provided with the Wall Mount items. Contact a technician for assistance when installing the wall mounted bracket.

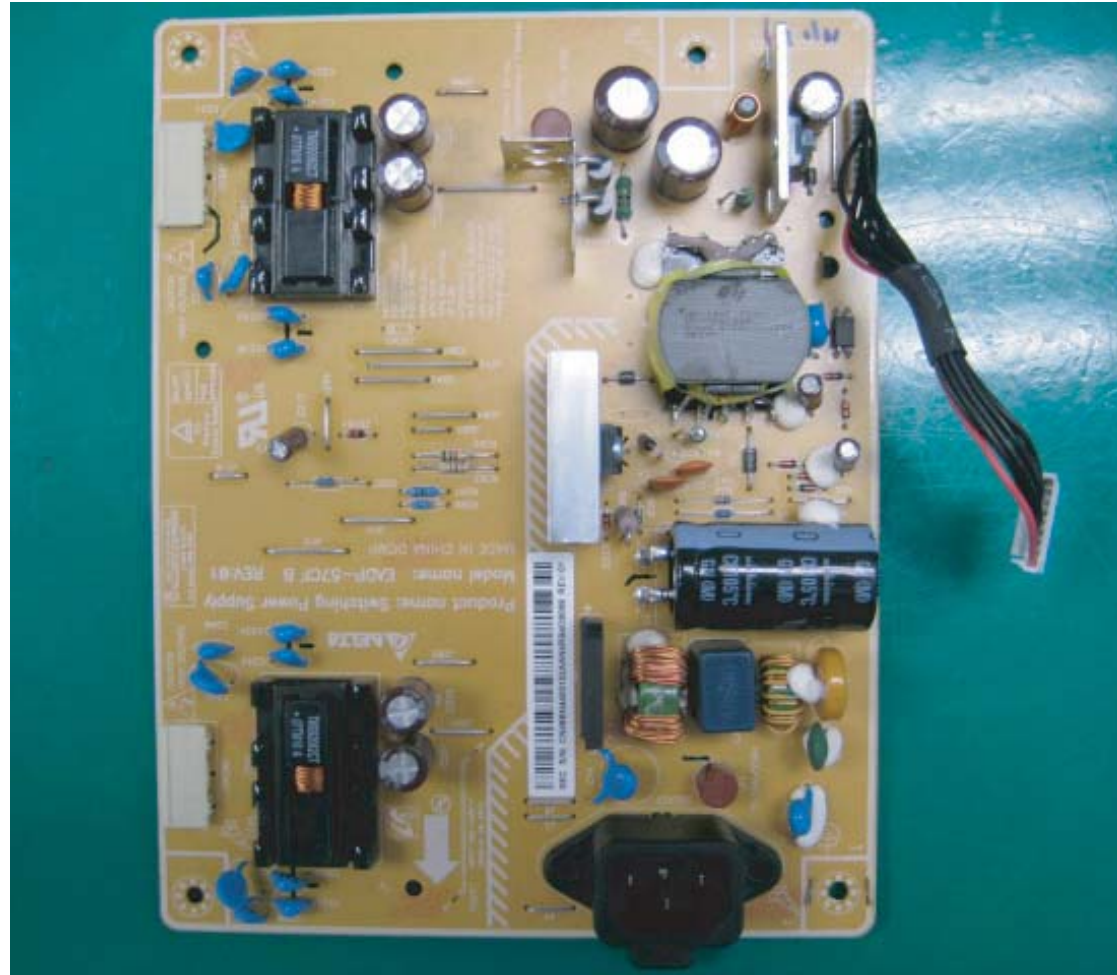
Samsung Electronics is not responsible for any damage to the product or injury to yourself or others if you elect to install the TV on your own.

- ▶ Remove the stand and cover the bottom hole with a cap and fasten with two screws.

12 PCB Diagram

12-1 22" Main PCB Diagram





1 Precautions

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

1-1 Safety Precautions

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 Monitor

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

1-1-3 Fire and Shock Hazard

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

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check (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).

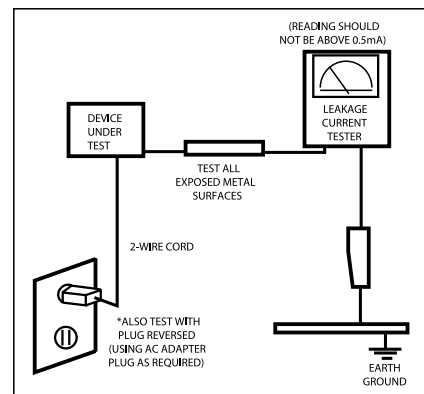


Figure 1-1. Leakage Current Test Circuit

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 \triangle 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 Precautions

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 Static Electricity Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as anti-static can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
Caution: Be sure no power is applied to the chassis or circuit and observe all other safety precautions.
8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

1-4 Installation Precautions

1. For safety reasons, more than two 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 high-voltage cable or the antenna falling over may cause fire or electric shock.
7. When installing the product, leave enough space (10cm) between the product and the wall for ventilation purposes.
A rise in temperature within the product may cause fire.

1 Precautions

Memo

2 Product specifications

2-1 Fashion Feature

Supreme Digital Interface & Networking

-With a built-in HD digital tuner, it supports HD broadcasting with no particular set-top box and provides simple access with a single remote control.

Excellent Picture Quality

-DNIe technology provides life-like clear images.

Dynamic Contrast

-Automatically detects the input visual signal and adjusts to create optimum contrast.

SRS TruSurround XT

-SRS TruSurround XT provides a virtual Dolby surround system.

Convenience

-The TV utilizes the HDMI system to implement perfect digital sound and picture quality.

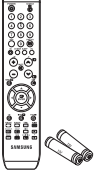

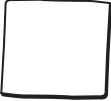

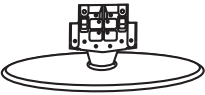
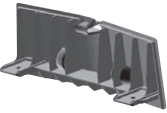
2-2 LE22S86BD Specifications

Item	Description	
LCD Panel	TFT-LCD Panel, RGB Vertical stripe, normaly black, 22-Inch viewable, 0.4215(H)*0.4215(V)mm Pixel Pitch	
Scanning Frequency	Horizontal : 30 kHz ~ 61 kHz (Automatic) / Vertical : 60 Hz ~ 75 Hz (Automatic)	
Display Colors	16.7M colors	
Maximum Resolution	Horizontal : 1680 Pixels Vertical : 1050 Pixels	
Input Video Signal	Analog 0.7 Vp-p \pm 5% positive at 75 Ω , internally terminated	
Input Sync Signal	Type : Seperate H/V Level : TTL level	
Maximum Pixel Clock rate	80 MHz	
Active Display Horizontal/Vertical	473.76mm / 296.1mm	
AC power voltage & Frequency	AC 110 ~ 240V, 50 ~ 60 Hz	
Power Consumption	50W < 1W	
Dimensions(W x D x H) Set	615.5 x 231.9 x 486.5 mm (24.20x9.12x19.92 inches) After installation Stand 615.5 x 81.2 x 403.4 mm (24.20x3.18x17.59 inches) Without stand	
Weight Set(After installation Stand)	7.5Kg (16.53lbs)	
TV System	Tuning	Frequency Synthesize
	System	PAL, SECAM
	Sound	MONO, STEREO, NICAM
Environmental Considerations	Operating Temperature : 50°F ~ 104°F (10°C ~ 40°C) Operating Humidity : 10 % ~ 80 % Storage Temperature : -4°F ~ 113°F (-20°C ~ 45°C) Storage Humidity : 5 % ~ 95 %	
Antenna Input	75 Ω	
Sound Characteristic	-MAX Internal speaker Out : Right : 3W / Left : 3W -BASS Control Range : -8 dB ~ + 8dB -TREBLE Control Range : -8 dB ~ +8 dB -Headphone Out : 10 mW MAX -Output Frequency : RF : 80 Hz ~ 15 kHz AV : 80 Hz ~ 20 kHz	

2-3 Spec Comparison

Model	LE22S86BD	LE23R86BD
Design		
Frequency Horizontal Vertical Display Color	30 ~ 61 kHz 60 ~ 75 Hz 16,777,216 colors	30 ~ 61 kHz 60 ~ 75 Hz 16,777,216 colors
PC Resolution Maximum mode	WXGA, 1680 x 1050 @ 60 Hz	WXGA, 1360 x 768 @ 60 Hz
Input Signal Sync Signal Video Signal	H/V Separate, TTL, P. or N. 0.7 Vp-p @ 75ohm	H/V Separate, TTL, P. or N. 0.7 Vp-p @ 75ohm
Power Consumption Normal Power Saving	50W < 1W	90W < 1W

2-4 Option Specification

Item	Item Name	Code.No	Remark
	Remote Control & Batteries (AAA x 2)	BN59-00611A	
	Power Cord	3903-000145	
	Cleaning Cloth	BN63-001798A	
	Stand Screw x 4	6002-001294	
	Stand	BN90-01375A	
	Cover-Bottom	BN63-03176B	

14 Reference Information

14-1 Technical Terms

- TFT-LCD

(Thin film Transistor Liquid Crystal Display)

ADC(Analog to Digital Converter)

This is a circuit that converts from analog signal to digital signals.

- PLL(Phase Locked Loop)

During progressing ADC, Device makes clock synchronizing HSYNC with Video clock

- Inverter

Device that supply Power to LCD panel lamp. this device generate about 1,500~2,000V.

- AC Adapter

Device that converts AC(90V~240V) to DC(+12V or 14V)

- SMPS(Switching Mode Power Supply)

Switching Mode Power supply. This design technology is used to step up/down the input power by switching on/off

- FRC(Frame Rate Controller)

Technology that change image frame quantity displayed on screen for one second.

Actually TFT-LCD panel require 60 pcs of frame for one second.

so, this technology is needed to convert input image to 60 pcs regardless input frame quantity.

- Image Scaler

Technology that convert various input resolution to other resolution.(ex. 640* 480 to 1024*768)

- Auto Configuration(Auto adjustment)

This is an algorithm to adjust monitor to optimum condition by pushing one key.

- OSD(On Screen Display)

On screen display. customer can control the screen easily with this.

- Image Lock

This means "Fineness adjustment" in LCD Monitor, the features are "Fine" and "Coarse"

- FINE

"Fine" adjustment is used to adjust visibility by control phase difference.

- COARSE

This is a adjustment by tuning with Video colck and PLL clock.

- DVI (Digital Visual Interface)

This provides a high speed digital connection for visual data types that is display technology independent. this interface is primarily focused at providing a connection between a computer and its display device.

- L.V.D.S.(Low Voltage Differential Signaling)

a kind of transmission method for Digital.It can be used from Main PBA to Panel.

- DVI (Digital Visual Interface)

This provides a high speed digital connection for visual data types that is display technology independent. this interface is primarily focused at providing a connection between a computer and its display device.

- T.M.D.S

(Transition minimized Differential Signaling)

a kind of transmission method for Digital.

It can be used from Video card to Main PBA.

- DDC(Display data channel)

It is a communication method between Host Computer and related equipment.

It can make it Plug and Play between PC and Monitor.

- EDID

Extended Display Identification Data PC can recognize the monitor information as Product data, Product name, Display mode, Serial number and Signal source, etc through DDC Line communicating with PC and Monitor.

- Dot Pitch

The image on a monitor is composed of red, green and blue dots. The closer the dots, the higher the resolution. The distance between two dots of the same color is called the 'Dot Pitch'. Unit: mm

- Vertical Frequency

The screen must be redrawn several times per second in order to create and display an image for the user. The frequency of this repetition per second is called Vertical Frequency or Refresh Rate. Unit: Hz

Example: If the same light repeats itself 60 times per second, this is regarded as 60 Hz.

- Horizontal Frequency

The time to scan one line connecting the right edge to the left edge of the screen horizontally is called Horizontal Cycle. The inverse number of the Horizontal Cycle is called Horizontal Frequency. Unit: kHz

- Interlace and Non-Interlace Methods

Showing the horizontal lines of the screen from the top to the bottom in order is called the Non-Interlace method while showing odd lines and then even lines in turn is called the Interlace method.

The Non-Interlace method is used for the majority of monitors to ensure a clear image. The Interlace method is the same as that used in TVs.

- Plug & Play

This is a function that provides the best quality screen for the user by allowing the computer and the monitor to exchange information automatically.

This monitor follows the international standard VESA DDC for the Plug & Play function.

- Resolution

The number of horizontal and vertical dots used to compose the screen image is called 'resolution'.

This number shows the accuracy of the display.

High resolution is good for performing multiple tasks as more image information can be shown on the screen.

Example: If the resolution is 1280 x 1024, this means the screen is composed of 1280 horizontal dots (horizontal resolution) and 1024 vertical lines (vertical resolution).

- BTSC

Broadcast Television System Committee

The stereo broadcasting system that is used in most of the countries that have adopted the NTSC system, including the United States, Canada, Chile, Venezuela and Taiwan. It also refers to the organization that has been organized to promote its development and management.

- EIAJ

Electronic Industries Association of Japan.

- RF Cable

A round signal cable generally used for TV antennas.

- Satellite Broadcasting

Broadcasting service provided via satellite. Enables high picture quality and clear sound throughout the country regardless of the location of the viewer.

- Sound Balance

Balances the levels of the sound coming from each speaker in televisions with two speakers.

- Cable TV

Whereas the terrestrial broadcasting is delivered via frequency signals through the air, cable broadcasting is transmitted via a cable network. In order to view cable TV, one must purchase a cable receiver and hook it up to the cable network.

- CATV

"CATV" refers to the broadcasting service offered at hotels, schools and other buildings through their own broadcasting system, apart from VHF or UHF broadcasting by terrestrial broadcasters. The CATV programs may include movies, entertainment and educational programs. (Different from cable TV.)

CATV can be viewed only within the area in which the CATV service is offered.

- S-Video

Short for "Super Video." S-Video allows up to 800 lines of horizontal resolution, enabling high-quality video.

- VHF/UHF

VHF indicates TV channels 2 to 13, and UHF indicates channels 14 through 69.

- Channel Fine Tuning

This feature allows the viewer to fine-tune the TV channel to obtain the best viewing conditions. The Samsung LCD TV has both automatic and manual channel fine-tuning features to enable the viewer to adjust their desired settings.

- External Device Input

External device input refers to video input from such external video devices as VCRs, camcorders and DVD players, separate from a TV broadcast.

14-2 Pin Assignments

14-2-1 DVI-D

<div>Sync Type</div> <div>Pin No.</div>	24P DVI-D			
1	Rx2-	13	NC	
2	Rx2+	14	DDC Input power (+5V)	
3	GND	15	IDENT-DVI	
4	NC	16	Output Signal (HDCP Control)	
5	NC	17	Rx0-	
6	DDC - SCL	18	Rx0+	
7	DDC - SDA	19	GND	
8	NC	20	NC	
9	Rx1-	21	NC	
10	Rx1+	22	GND	
11	GND	23	RxC+	
12	NC	24	RxC-	

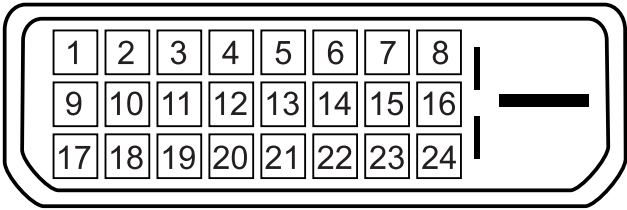


Figure 1.

14-2-2 Component

RCA Green	Y
	GND
RCA Blue	Pb (Cb)
	GND
RCA Red	Pr (Cr)
	GND
RCA White	Audio L
	GND
RCA Red	Audio R
	GND

14-2-4 A/V

RCA Yellow	CVBS
RCA White	Audio L
	GND
RCA Red	Audio R
	GND

14-2-3 S-Video

Pin	Separate
1	GND
2	Y
3	C
4	GND
5	GND

14-2-5 D-SUB

Pin	Separate
1	Red
2	Green
3	Blue
4	GND
5	GND
6	GND Red
7	GND Green
8	GND Blue
9	DDC Input power(+5V)
10	IDENT PC
11	GND
12	DDC Data(SDA)
13	H SYNC
14	V SYNC
15	DDC Clock(SCL)

14-2-6 PC Display mode

Both screen position and size will vary depending on the type of PC monitor and its resolution.

The resolutions in the table are recommended. (All resolutions between the supported limits are supported)

Mode	Resolution	Horizontal Frequency(kHz)	Vertical Frequency(Hz)	Pixel Clock Frequency(MHz)	Sync Polarity (H/V)
IBM	640 x 480	31.469	59.940	25.175	- / -
	720 x 400	31.469	70.087	28.322	- / +
VESA	640 x 480	37.864	72.809	31.500	- / -
	640 x 480	37.500	75.000	31.500	- / -
	800 x 600	37.879	60.317	40.000	+ / +
	800 x 600	48.077	72.188	50.000	+ / +
	800 x 600	46.875	75.000	49.500	+ / +
	1024 x 768	48.364	60.000	65.000	- / -
	1024 x 768	56.476	70.069	75.000	- / -
	1024 x 768	60.023	75.029	78.750	+ / +
	1360 x 768	47.712	60.015	85.800	+ / +

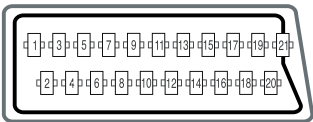
- The interlace mode is not supported.

- The set might operate abnormally if a non-standard video format is selected.

- DVI dose not support PC function.

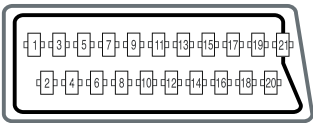
14 Reference Information

14-2-7 Scart 1



Pin	Signal	Pin	Signal
1	Audio output R	12	NC
2	Audio input R	13	Video GND (RGB red)
3	Audio output L	14	GND
4	Audio common GND	15	RGB red input
5	Video GND (RGB blue)	16	Fast Blanking signal (RGB switching)
6	Audio input L	17	Video output GND
7	RGB blue input	18	Video input GND
8	Switching voltage	19	Video output (CVBS out)
9	Video GND (RGB green)	20	Video input (CVBS in)
10	NC	21	Common GND
11	RGB green input		

14-2-8 Scart 2



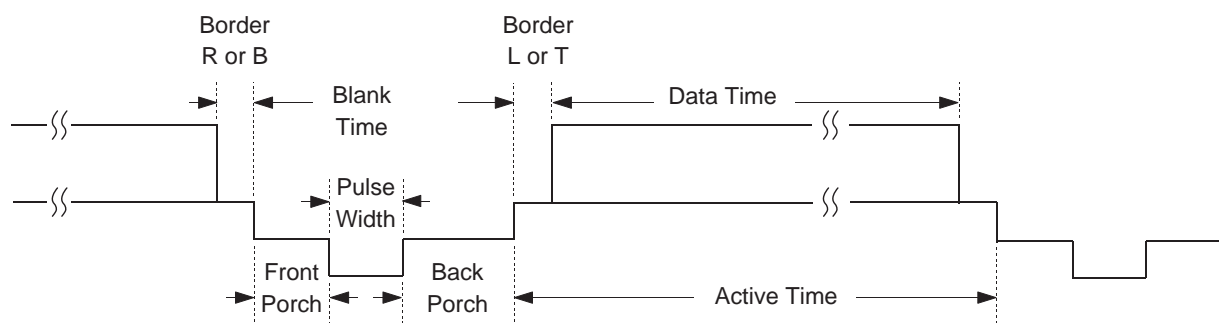
Pin	Signal	Pin	Signal
1	Audio output R	12	NC
2	Audio input R	13	Video GND (RGB red)
3	Audio output L	14	GND
4	Audio common GND	15	RGB red input
5	Video GND (RGB blue)	16	NC
6	Audio input L	17	Video output GND
7	RGB blue input	18	Video input GND
8	Switching voltage	19	Video output (CVBS out)
9	Video GND (RGB green)	20	Video input (CVBS in)
10	NC	21	Common GND
11	RGB green input		

14-3 Timing Chart

This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

14-3-1 LCD Panel Mode1 mode

Timing No.	LTA400W2
Originator	VESA
Mode Name	1366/60Hz
Resolution (H x V)	1366 x 768
HORIZONTAL	
Frequency	47.712kHz
Total time	20.959 μ s
Active time	15.906 μ s
Blank time	5.053 μ s
Border (L / R)	0.000 μ s
Data time	15.906 μ s
Front porch	0.749 μ s
Sync.width	1.702 μ s
Back porch	2.994 μ s
Sync. polarity	Positive
VERTICAL	
Frequency	60.015kHz
Total time	16.662ms
Active time	16.097ms
Blank time	0.566ms
Border (L / R)	0.000ms
Data time	16.097ms
Front porch	0.063ms
Sync.width	0.105ms
Back porch	0.377ms
Sync. polarity	Positive
Dot Clock	85.500MHz
Sync. Type	Separate
Scan Type	N / I



14-3-2 Supported Modes (1)

Timing No.	2	3	11	17	32
Originator	IBM	IBM	VESA	VESA	MAC
Mode Name	VGA2	VGA3	640/72Hz	640/75Hz	640/67Hz
Resolution (H x V)	720 x 400	640 x 480	720 x 400	720 x 400	640 x 480
HORIZONTAL					
Frequency	31.169kHz	31.469kHz	37.861kHz	37.500kHz	37.000kHz
Total time	31.777 μ s	31.778 μ s	26.413 μ s	26.667 μ s	28.571 μ s
Active time	26.058 μ s	26.058 μ s	20.825 μ s	20.317 μ s	21.164 μ s
Blank time	5.720 μ s	5.720 μ s	5.588 μ s	6.350 μ s	7.407 μ s
Border (L / R)	0.318 μ s	0.318 μ s	0.254 μ s	0.000 μ s	0.000 μ s
Data time	25.422 μ s	25.422 μ s	20.317 μ s	20.317 μ s	21.164 μ s
Front porch	0.318 μ s	0.318 μ s	0.508 μ s	0.508 μ s	2.116 μ s
Sync.width	3.813 μ s	3.813 μ s	1.270 μ s	2.032 μ s	2.116 μ s
Back porch	1.589 μ s	1.589 μ s	3.810 μ s	3.810 μ s	3.175 μ s
Sync. polarity	Negative	Negative	Negative	Negative	Negative
VERTICAL					
Frequency	70.087kHz	59.940kHz	72.809kHz	75.000kHz	66.667kHz
Total time	14.268ms	16.683ms	13.735ms	13.333ms	15.000ms
Active time	13.155ms	15.761ms	13.100ms	12.800ms	13.714ms
Blank time	1.113ms	0.922ms	0.635ms	0.533ms	1.286ms
Border (L / R)	0.222ms	0.254ms	0.211ms	0.000ms	0.000ms
Data time	12.711ms	15.253ms	12.678ms	12.800ms	13.714ms
Front porch	0.191ms	0.064ms	0.026ms	0.027ms	0.086ms
Sync.width	0.064ms	0.064ms	0.079ms	0.080ms	0.086ms
Back porch	0.858ms	0.794ms	0.528ms	0.427ms	1.114ms
Sync. polarity	Positive	Negative	Negative	Negative	Negative
Dot Clock	28.322MHz	25.175MHz	31.500MHz	31.500MHz	30.240MHz
Sync. Type	Separate	Separate	Separate	Separate	Separate
Scan Type	N / I	N / I	N / I	N / I	N / I

14-3-3 Supported Modes (2)

Timing No.	13	14	18
Originator	VESA	VESA	VESA
Mode Name	800/60Hz	800/72Hz	800/75Hz
Resolution (H x V)	800 x 600	800 x 600	800 x 600
HORIZONTAL			
Frequency	37.879kHz	48.077kHz	46.875kHz
Total time	26.400 μ s	20.800 μ s	21.333 μ s
Active time	20.000 μ s	16.000 μ s	16.162 μ s
Blank time	6.400 μ s	4.800 μ s	5.171 μ s
Border (L / R)	0.000 μ s	0.000 μ s	0.000 μ s
Data time	20.000 μ s	16.000 μ s	16.162 μ s
Front porch	1.000 μ s	1.120 μ s	0.323 μ s
Sync.width	3.200 μ s	2.400 μ s	1.616 μ s
Back porch	3.200 μ s	1.280 μ s	3.232 μ s
Sync. polarity	Positive	Positive	Positive
VERTICAL			
Frequency	60.317kHz	72.188kHz	75.000kHz
Total time	16.579ms	13.853ms	13.333ms
Active time	15.840ms	12.480ms	12.800ms
Blank time	0.739ms	1.373ms	0.533ms
Border (L / R)	0.000ms	0.000ms	0.000ms
Data time	15.840ms	12.480ms	12.800ms
Front porch	0.026ms	0.770ms	0.021ms
Sync.width	0.106ms	0.125ms	0.064ms
Back porch	0.607ms	0.478ms	0.448ms
Sync. polarity	Positive	Positive	Positive
Dot Clock	40.000MHz	50.000MHz	49.500MHz
Sync. Type	Separate	Separate	Separate
Scan Type	N / I	N / I	N / I

14-3-4 Supported Modes (3)

Timing No.	15	16	19	
Originator	VESA	VESA	VESA	VESA
Mode Name	1024/60Hz	1024/70Hz	1024/75Hz	1360/60Hz
Resolution (H x V)	1024 x 768	1024 x 768	1024 x 768	1360 x 768
HORIZONTAL				
Frequency	48.363kHz	56.476kHz	60.023kHz	47.712kHz
Total time	20.677 μ s	17.707 μ s	16.660 μ s	20.959 μ s
Active time	15.754 μ s	13.653 μ s	13.003 μ s	15.906 μ s
Blank time	4.923 μ s	4.053 μ s	3.777 μ s	5.053 μ s
Border (L / R)	0.000 μ s	0.000 μ s	0.000 μ s	0.000 μ s
Data time	15.754 μ s	13.653 μ s	13.003 μ s	15.906 μ s
Front porch	0.369 μ s	0.320 μ s	0.323 μ s	0.749 μ s
Sync.width	2.092 μ s	1.813 μ s	1.219 μ s	1.702 μ s
Back porch	2.462 μ s	1.920 μ s	2.235 μ s	2.994 μ s
Sync. polarity	Negative	Negative	Positive	Positive
VERTICAL				
Frequency	60.004kHz	70.069kHz	75.029kHz	60.015kHz
Total time	16.666ms	14.272ms	13.328ms	16.662ms
Active time	15.880ms	13.599ms	12.795ms	16.097ms
Blank time	0.786ms	0.672ms	0.533ms	0.566ms
Border (L / R)	0.000ms	0.000ms	0.000ms	0.000ms
Data time	15.880ms	13.599ms	12.795ms	16.097ms
Front porch	0.062ms	0.053ms	0.017ms	0.063ms
Sync.width	0.124ms	0.106ms	0.050ms	0.105ms
Back porch	0.600ms	0.513ms	0.466ms	0.377ms
Sync. polarity	Negative	Negative	Positive	Positive
Dot Clock	65.000MHz	75.000MHz	78.750MHz	85.500MHz
Sync. Type	Separate	Separate	Separate	Separate
Scan Type	N / I	N / I	N / I	N / I

14-4 Panel Description

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
SEC	LT140X1-002	BN07-00004A	SA	BN68-00239H	-
SEC	LT150XS-L01	BN07-00009A	SB		-
SEC	LT150XS-L01-B	BN07-00022A	SC		-
SEC	LTM150XS-L02	BN07-00005A	SD		-
SEC	LT181E2-132	BN07-00001A	SE		-
SEC	LT150XS-T01	BN07-00010A	SF		-
SEC	LTM181E3-132	BN07-00019A	SG		-
SEC	LT170E2-131	BN07-10001D	SH		-
SEC	LT181E2-131	BN07-10001E	SJ		-
SEC	LTM170E4-L01	BN07-00018A	SK		-
SEC	LTM240W1-L01	BN07-00015A	SL		-
SEC	LTM213U3-L01	BN07-00016A	SM		-
SEC	LTM150XH-L01	BN07-00026A	SN		-
SEC	LTM150XH-L03	BN07-00027A	SP		-
SEC	LTM150XS-L01	BN07-00032A	SQ		DELL(ZPD)
SEC	LTM181E4-L01	BN07-00034A	SR		PVA
SEC	LTM170EH-L01	BN07-00036A	SS		TN
SEC	LTM170E5-L01	BN07-00037A	SU		PVA
SEC	LTM150XH-L11	BN07-00041A	SV		-
SEC	LTM213U4-L01	BN07-00039A	SW		PVA
SEC	LTM150XH-L01(ZPD)	BN07-00045A	SX		ZPD
SEC	LTM150XH-L04	BN07-00046A	SY		New panel with high brightness
SEC	LTM170W1-L01	BN07-00047A	SZ		Panel for TV
SEC	LTM150XH-L06	BN07-00053A	EA		Panel for TV/ High luminance for 450cd _ SONY&EOS Team Panel for TV
SEC	LTM153W1-L01	BN07-00054A	EB		Use NIKE MODEL
SEC	LTM170EH-L05	BN07-00055A	EC		Panel EOS proj. for high brightness of 17" EH-L05
SEC	LTM170E5-L03	BN07-00056A	ED		Dell 1702FP pro. E4. EH mechanical Compatible
SEC	LTM190E1-L01	BN07-00057A	EE		DELL 1900 FP
SEC	LTM181E5-L01	BN07-00061A	EF		18" narrow bezel GH18PS
SEC	LTM150XP-L01	BN07-00065A	EG		AMLCD PVA PANEL
SEC	LTM240W1-L02	BN07-00062A	EH		Panel for 15" Wide TV
SEC	LTM170EU-L01	BN07-00071A	EJ		Slim design, TN
SEC	LTM170E5-L04	BN07-00072A	EK		E5-L04 6 bits FRC... for IBM
SEC	LTA220W1-L01	BN07-00074A	EL		Panel for 22" TV
SEC	LTM170E6-L02	BN07-00075A	EM		AMLCD Narrow & slim design 17" PVA mode
SEC	LTM170W1-L01	BN07-00082A	EN		LTM170W1-L01 ZPD panel
SEC	LTM170EH-L01	BN07-00080A	EP		LTM170EH-L01 ZPD panel
SEC	LTM170E5-L01	BN07-00081A	EQ		LTM170E5-L01 ZPD panel
SEC	LTM170EH-L05	BN07-00083A	ER		LTM170EH-L05 ZPD panel
SEC	LTM170E5-L03	BN07-00084A	ES		LTM170E5-L03 ZPD panel
SEC	LTM170EU-L01	BN07-00085A	ET		LTM170EU-L01 ZPD panel
SEC	LTM170E5-L04	BN07-00086A	EU		LTM170E5-L04 ZPD panel
SEC	LTM170E6-L02	BN07-00087A	EV		LTM170E6-L02 ZPD panel
SEC	LTM150XH-L06	BN07-00091A	EW		Color coordinates change for LCD TV
SEC	LTM153W1-L01	BN07-00092A	EX		AMLCD WIDE 15",9/10
SEC	LTM170W1-L01	BN07-00100A	EY		Color Coordinates change code management
SEC	LTM170EH-L05	BN07-00097A	EZ		LTM170E5-L05 Color Coordinates Change Panel Code

14 Reference Information

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
SEC	LTA400W1-L01	BN07-00109A	S1		PANEL of AMLCD 40" TV
SEC	LTM153W1-L01	BN07-00110A	S2		Color coordinates change 0.280/0.290, 10000k & ZPD Panel
SEC	LTM150XH-L06	BN07-00111A	S3		Color coordinates change 0.280/0.290, 10000k & ZPD Panel
SEC	LTM170W1-L01	BN07-00112A	S4		Color coordinates change 0.280/0.290, 10000k & ZPD Panel
SEC	LTM170EH-L05	BN07-00113A	S5		Color coordinates change 0.280/0.290, 10000k & ZPD Panel
SEC	LTM220W1-L01	BN07-00114A	S6		ZPD Panel for AMLCD 22" TV
SEC	LTM150XH-L06	BN07-00117A	S7		ZPD Panel code
SEC	LTM153W1-L01	BN07-00118A	S8		ZPD Panel code
SEC	LTM170WP-L01	BN07-00119A	S9		PVA Panel for NIKE
SEC	LTM213U4-L01	BN07-00039A	E1		21.3" NARROW
SEC	LTA260W1-L01	BN07-00121A	E2		VENUS
SEC	LTA220W1-L01	BN07-00074B	E3		"Panel B-level panel code for 22" TV Panel "
SEC	LTA320W1-L01	BN07-00108A	E4		"Panel for AMLCD 32" TV"
SEC	LTM213U4-L01	BN07-00124A	E5		NARROW BEZEL 21 " PANEL
SEC	LTM170E6-L04	BN07-00129A	E6		"HIGHLAND 17"" LOW PANEL (Panel only for TCO03)"
SEC	LTM190E1-L01	BN07-00088A	E7		LTM190E1-L01 ZPD panel
SEC	M150X4-L06	BN07-00137A	E8		15" Narrow & Slim panel
SEC	LTA170V1	BN07-00139A	E9		"17"" Panel for Muse 4:3 VGA TV"
SEC	LTM190E1-L02	BN07-00128A	E10		"New Panel from AMLCDI, Specification : 6bit Driver IC"
SEC	LTM170EX-L01	BN07-00143A	E11		"Development new Panel from AMLCD"
SEC	LTM170E8-L01	BN07-00144A	E12		"Development new Panel from AMLCD"
SEC	LTM170E6-L04	BN07-00129B	E13		"ZPD panel for AMLCD (Panel only for TCO03)"
SEC	LTA320W1-L02	BN07-00108B	E14		"Creat B-level Panel code for AMLCD 32" TV"
SEC	LTM190E1-L03	BN07-00151A	E15		"Development new 19"" Panel form AMLCD (Panel only for TCO03)"
SEC	LTM240W1-L03	BN07-00134A	E16		"AMLCD 24"" panel development"
SEC	LTM190E1-L02	BN07-00128B	E17		"New Panel from AMLCD, Specification : 6bit Driver IC(ZPD)"
SEC	LTM190E4-L01	BN07-00145A	E18		"AMLCD 24"" new panel development"
SEC	LTM170E8-L01	BN07-00158A	E19		"ZPD code derivation"
SEC	LTM170EX-L01	BN07-00159A	E20		"ZPD code derivation"
SEC	LTM190E1-L03	BN07-00151B	E21		"Creat new panel code for AMLCD 19"" (Panel only for TCO03)"
SEC	LTA460H1-L01	BN07-00157A	E22		"creat panel code for AMLCD 46"" TV "
SEC	LTM170EU-L11	BN07-00160A	E23		"creat new panel code for AMLCD 17"" (Panel only for TCO03)"
SEC	LTM240W1-L03	BN07-00134B	E24		"24"" panel ZPD code derivation"
SEC	LTM190E4-L01	BN07-00145B	E25		"AMLCD 19"" ZPD Panel code derivation"
SEC	LTM240W1-L03	BN07-00134B	E26		"24"" panel ZPD code derivation"
SEC	LTM150XO-L01	BN07-00164A	E27		"AMLCD 15"" XO-L01 new panel development"
SEC	LTM150XO-L01	BN07-00164B	E28		"AMLCD 15"" XO-L01 ZPD code derivation"
SEC	LTM170EU-L11	BN07-00160B	E29		"AMLCD 17"" NEW panel code derivation"
SEC	LTA320W2-L01	BN07-00172A	SPZ		AMLCD 32" NEW panel
SEC	LTM213U4-L01	BN07-00124B	SPZ		21.3" Narrow PANEL ZPD Panel derivation
SEC	LTM170EU-L11	BN07-00189A	STH		AMLCD EU-L11 Pb free panel code derivation
SEC	LTM170EU-L11	BN07-00189B	STZ		AMLCD EU-L11 Pb free panel ZPD code derivation
SEC	LTM240W1-L04	BN07-00188A	SPH		24" A-DCC new panel development
SEC	LTM240W1-L04	BN07-00188B	SPZ		24" A-DCC panel ZPD code derivation
SEC	LTM190EX-L01	BN07-00191A	STH		AMLCD 19" TN new Panel
SEC	LTM190EX-L02	BN07-00191B	STZ		AMLCD 19" TN new Panel ZPD derivation
SEC	LTA230W1-L02	BN07-00184A	SPZ		AMLCD 23" 16:9 new Panel

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
SEC	LTA260W2-L01	BN07-00185A	SPZ		AMLCD 26" 16:9 new Panel
SEC	LTM240M1-L01	BN07-00195A	SPH		24" panel with high brightness deveipment
SEC	LTA400W2-L01	BN07-00186A	SPZ		AMLCD 40" 16:9 new Panel
SEC	LTM150XO-L01	BN07-00197A	STH		AMLCD 15" XO-L01 Pb free panel code
SEC	LTM150XO-L01	BN07-00197B	STZ		AMLCD 15" XO-L01 Pb free panel ZPD code
SEC	LTM170EU-L21	BN07-00202A	STZ		AMLCD EU-L21 ZPD new code derivation
SEC	LTA460W2-L03	BN07-00187A	SPZ		BEETOVEN 46"ZPD new panel
SEC	LTM240M1-L01	BN07-00195B	SPZ		24" igh brightness panel ZPD code derivation
SEC	M170EX-L21	BN07-00206A	STZ		AMLCD LTM170EX-L21 ZPD new code derivation
SEC	LTA460H3-L01	BN07-00200A	SPZ		AMLCD 46" LED BLU panel
SEC	LTM170EU-L15	BN07-00214A	STZ		AMLCD EU-L15 TV high brightness ZPD new code derivation
SEC	LTM170E8-L21	BN07-00218A	SPZ		AMLCD LTM170E8-L21 PVA ZPD new code derivation
SEC	LTM190EX-L21	BN07-00222A	STZ		DISPLAY LCD
SEC	LTM201U1-L01	BN07-00190B	SPZ		AMLCD 20.1" Normal panel ZPD code derivation
SEC	LTM190E4-L21	BN07-00223A	SPZ		HAYDN 17" PZD code PANEL derivation
SEC	LTA570H1-L01	BN07-00196A	SPZ		AMLCD 57" new panel development
SEC	LTM150XO-L21	BN07-00229A	STZ		AMLCD 15" XO-L21 8ms panel code
SEC	LTA260W2-L11	BN07-00239A	SPZ		AMLCD 26" 16:9 7Line new Panel
SEC	LTA400WS-LH1	BN07-00245A	SPZ		AMLCD 40" 16:9 SPVA 90% new Panel
SEC	LTM213U6-L01	BN07-00231A	SPZ		AMLCD 21.3" PVA new Panel Code
SEC	LTA320WS-LH2	BN07-00244A	SPZ		AMLCD 32" 16:9 SPVA 90% new Panel
SEC	LTA400WS-LH1	BN07-00245A	SPZ		AMLCD 40" 16:9 SPVA 90% new Panel
SEC	LTA320WT-L06	BN07-00453A	SPZ		16:9 SMVA 72% New Panel
SEC	LTA400WT-L07	BN07-00451A	SPZ		16:9 SMVA 72% New Panel
CPT	CLAA150XG09	BN07-00141A	PA		"CPT 15"" Monitor new panel development"
CPT	CLAA170EA02	BN07-00148A	PB		"17"" CPT NEW development panel"
CPT	CLAA170EA02	BN07-00148B	PC		"17"" CPT ZPD panel code derivation"
CPT	CLAA150XG09	BN07-00141B	PTZ		"CPT 15"" panel ZPD code derivation (GOYA-PJT)"
CPT	CLAA150XP01	BN07-00173A	PTH		CPT 15" PSWG code derivation
CPT	CLAA150XP01	BN07-00173B	PTZ		CPT 15" PSWG panel ZPD code
CPT	CLAA170EA07	BN07-00174A	PTH		"CPT 17"" PSWG panel code derivation
CPT	CLAA170EA07	BN07-00174B	PTZ		CPT 17"" PSWG type new Panel code""
CPT	CLAA170EA07	BN07-00174B	PTZ		CPT 17" PSWG type new Panel code
CPT	CLAA170EA07Q	BN07-00220A	PTZ		CPT 17" PSWG R/T 8msec code derivation
CPT	CLAA170EA07Q	BN07-00220B	PTH		CPT 17" PSWG R/T 8msec HPD code derivation
CPT	CLAA150XP01F	BN07-00236A	PTZ		CPT 15" PSWG panel ZPD & Lead free code derivation
TOSHIBA	LTM15C419(A)	BN07-00002A	TA		-
TOSHIBA	LTM15C423(B)	BN07-00006A	TB		-
TOSHIBA	LTM18C161	BN07-00008A	TC		-
TOSHIBA	LTM15C443	BN07-00031A	TD		-
TOSHIBA	LTM15C458	BN07-00043A	TE		-
TOSHIBA	LTM15C458S	BN07-00077A	TF		"TSB 15"" high brightness Panel"
TOSHIBA	LTM15C458	BN07-00078A	TG		Toshiba ZPD panel
TOSHIBA	LTM15C458S	BN07-00099A	TH		TSB LTM15C458S (ZPD)
HANNSTAR	HSD150MX41A(A)	BN07-00020A	NA		"TTL type"
HANNSTAR	HSD150MX12	BN07-00030A	NB		"TTL type"
HANNSTAR	HSD170ME13	BN07-00180A	NTH		Hannstar 17" TN new panel development

14 Reference Information

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
HANNSTAR	HSD170ME13	BN07-00180B	NTZ		Hannstar 17" TN new panel development ZPD code derivation
HANNSTAR	HSD190ME12	BN07-00210A	NTZ		Hannstar 19" TN new panel development
HANNSTAR	HSD150MX17-A	BN07-00226A	NTZ		Hannstar 15" slim panel ZPD code derivation
TORISAN	TM150XG-22L03(A)	BN07-00021A	RA		-
TORISAN	TM150XG-26L06	BN07-00042A	RB		-
TORISAN	TM181SX-76N01	BN07-00048A	RC		-
TORISAN	TM150XG-26L06	BN07-00059A	RD		15" XGA TN MODE(ZPD)
TORISAN	TM290WX-71N31	BN07-00063A	RE		"RS24NS (TORISAN 29"" NEW PANEL)"
TORISAN	TM396WX-71N31	BN07-00064A	RF		"RS24NS (TORISAN 40"" NEW PANEL)"
TORISAN	TM150XG-26L09	BN07-00073A	RG		"Panel for 15"" TV"
TORISAN	TM150XG-26L10	BN07-00089A	RH		"L10(change except D/IC) ZPD"
TORISAN	TM150XG-26L10	BN07-00090A	RJ		L10 NORMAL
TORISAN	TM190SX-70N01	BN07-00098A	RK		Torisan 19" Panel
TORISAN	TM181SX-76N01	BN07-00106A	RL		ZPD Panel code
TORISAN	TM190SX-70N01	BN07-00107A	RM		ZPD Panel code
TORISAN	TM290WX-71N31	BN07-00115A	RN		"Color Coordinates change panel for TORISAN 29"" TV"
TORISAN	TM396WX-71N31	BN07-00116A	RP,Q		"Color Coordinates change panel for TORISAN 40"" TV"
TORISAN	TM22OWX-71N31	BN07-00125A	RR		"Development TORISAN 22"" TV PANEL (ZPD)"
TORISAN	TM22OWX-71N31	BN07-00127A	RS		"Development TORISAN 22"" TV PANEL (HPD)"
TORISAN	TM396WX-71N32A	BN07-00150A	RT		120V inverter Exclusive panel
TORISAN	TM190SX-70N02	BN07-00154A	RMH		Torisan 6bit panel code Derivation
TORISAN	TM190SX-70N02	BN07-00154B	RMZ		Torisan 6bit panel code Derivation
TORISAN	TM150XG-A01	BN07-00162A	RTH		Torisan 15" Narrow & Slim panel development
TORISAN	TM150XG-A01	BN07-00162B	RTZ		Torisan 15" N&S panel ZPD code Derivation
SHARP	LQ181E1DG11(A)	BN07-10001C	PA		-
SHARP	LQ150X1LW71	BN07-00067A	PB		SHARP 15" PVA PANEL
SHARP	LQ370T3LZ41	BN07-00216A	FAZ		Rome2
HITACHI	TX38D12VC0CAA(A)	BN07-00003A	HA		-
HITACHI	TX43DVCOCAB	BN07-00060A	HB		17" SXGA PVA MODE
HITACHI	TX43D15VC0CAB	BN07-00101A	HC		ZPD Panel
HITACHI	TX51D11VC0CAB	BN07-00122A	HD		20.1" NARROW
HITACHI	TX54D11VC0CAB	BN07-00123A	HE		21.3" NARROW
HITACHI	TX80D12VC0CAB	BN07-00169A	HIZ		"Development new panel for Hitachi 32"" TV (ZPD)"
HITACHI	TX54D11VC0CAB	BN07-00123B	HIZ		Hitachi 21.3"ZPD panel
IBM	ITSX94S	BN07-00017A	IA		-
UNIPAC	UM170E0	BN07-00028A	UA		Loaded by cisdba
HYUNDAI	HT15X13	BN07-00035A	DA		-
HYUNDAI	HT17E11-200	BN07-00049A	DB		TN MODE
HYUNDAI	HT17E11-300	BN07-00093A	DC		HT17E11-300 ZPD panel
HYUNDAI	HT17E11-400	BN07-00094A	DD		HT17E11-400 normal panel
HYUNDAI	HT17E11-400	BN07-00095A	DE		HT17E11-400 ZPD panel code
HYUNDAI	HT17E12	BN07-00096A	DF		HT17E12 (Narrow & slim Design)
HYUNDAI	HT17E12	BN07-00105A	DG		ZPD Panel code
HYUNDAI	HT15X15-D00	BN07-00146A	DH		"Development for Ares 15"" Hydis TV"
HYUNDAI	HT15X15-D01	BN07-00146B	DJ		"Derivation panel HPD for Ares 15"" Hydis TV "
HYUNDAI	HT17E13-100	BN07-00167A	DTH		"PINEHURST-2(IBM) PJT 17"" HYDIS PANEL Derivation"
HYUNDAI	HT17E13-100	BN07-00167B	DTZ		"PINEHURST-2(IBM) Hydis 17"" ZPD code Derivation"

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
ACER	L170E3	BN07-00044A	AA		TN(ADT)
ACER	M170EN05	BN07-00076A	AB		AU 17" Panel (Narrow & slim design)
ACER	M170EN05	BN07-00102A	AC		ZPD Panel code
ACER	M190EN02	BN07-00170A	AMH		"AU Monitor 19"" new panel development (P19-1S)"
ACER	M190EN02	BN07-00170B	AMZ		"AU 19"" ZPD code derivation (ZPD)"
ACER	M170EN06	BN07-00171A	ATH		"AU Monitor 17"" New panel development "
ACER	T260XW01	BN07-00163A	AMZ		"AU 26"" new panel development (NF26EO)"
ACER	A201SN01	BN07-00177A	ATZ		"AU TV panel 20.1"" TN SVGA new panel development"
ACER	M170EN06	BN07-00171B	ATZ		AU Monitor 17" ZPD code derivation
ACER	T315XW01	BN07-00194A	AMZ		AU 32" new
ACER	M170EG01	BN07-00192A	ATH		AU TN PSWG type new Panel code
ACER	M170EG01	BN07-00192B	ATZ		AU TN PSWG type NEW panel code derivation
ACER	M190EN04	BN07-00203A	ATH		AU Monitor 19" ZPD new Panel code
ACER	T260XW02	BN07-00208A	AMZ		AUO 26" ZPD panel
ACER	M170EG01 V8	BN07-00221A	ATZ		AU TN PSWG type new Panel (8msec) ZPD code derivation
ACER	T260XW02	BN07-00233A	AMZ		AUO 26" Panel new (Cosmetic spec down grade)
ACER	T315XW01	BN07-00234A	AMZ		AUO 32" Grade new (Cosmetic spec down grade)
ACER	M190EN03	BN07-00224A	AMZ		AU Monitor 19" MVA new code derivation
ACER	T315XW01	BN07-00237A	AMZ		LCD TV VE project new
ACER	T315XW01	BN07-00238A	AMZ		LCD TV VE project new
ACER	M201UN02 V3	BN07-00168A	AMZ		
ACER	T400XW01 V1	BN07-00448A	AMZ		16:9 AMVA 72% New Panel
CHIMEI	M170E3-L01	BN07-00050A	CA		TN PANEL
CHIMEI	M150X3-L01	BN07-00051A	CB		COMPATIBLE
CHIMEI	M170E4-L01	BN07-00052A	CC		MVA PANEL
CHIMEI	M150X2-L01	BN07-00066A	CD		CHIMEI 15" PVA PANEL
CHIMEI	M150X3-L01	BN07-00079A	CE		Chimei ZPD panel
CHIMEI	M170E3-L01	BN07-00103A	CF		ZPD Panel code
CHIMEI	M170E4-L01	BN07-00104A	CG		ZPD Panel code
CHIMEI	V296W1-L01	BN07-00120A	CH		MVA
CHIMEI	M170E6-L02	BN07-00126A	CJ		HIGHLAND 17" LOW PANEL
CHIMEI	M190E2-L01	BN07-00131A	CK		GH19AS,BS CHIMEI PANEL
CHIMEI	M150X4-L06	BN07-00137A	CL		15" Narrow & Slim panel
CHIMEI	M170E6-L01	BN07-00133A	CM		"2003-03-11 vendor change"
CHIMEI	M170E6-L01	BN07-00133B	CN		ZPD derivation panel
CHIMEI	V201V1-T01	BN07-00135A	CP		CHIMEI 20.1" panel development
CHIMEI	M170E6-L02	BN07-00126B	CQ		"HIGHLAND 17"" LOW PANEL ZPD derivation panel"
CHIMEI	M170E6-L05	BN07-00152A	CR		"CMO 17"" new panel development code"
CHIMEI	M170E6-L05	BN07-00152B	CS		"CMO 17"" ZPD panel code derivation"
CHIMEI	M150X4-L06	BN07-00137B	CT		Chimei 15" Narrow & Slim panel ZPD derivation
CHIMEI	M170E5-L05	BN07-00165A	CTH		CMO 17" new panel development code (GOYA2-PJT)
CHIMEI	M170E5-L05	BN07-00165B	CTZ		CMO 17" ZPD panel(GOYA2-PJT)
CHIMEI	V230W1-L02	BN07-00209A	CMZ		CMO 23" development
CHIMEI	V320B1-L01	BN07-00207A	CMZ		CMO 32" development
CHIMEI	V270W1-L01	BN07-00136A	CMZ		CHI MEI 27" panel development
NEC	SVA150XG04TB	BN07-00225A	BTZ		SVA NEC 15" panel ZPD code

Memo

9-1 Power_Function Schematic Diagram

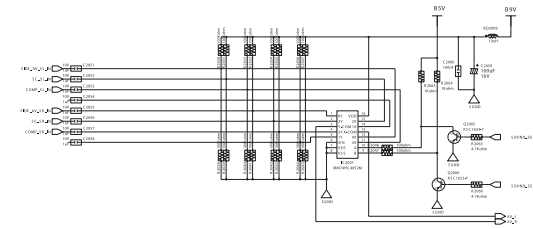
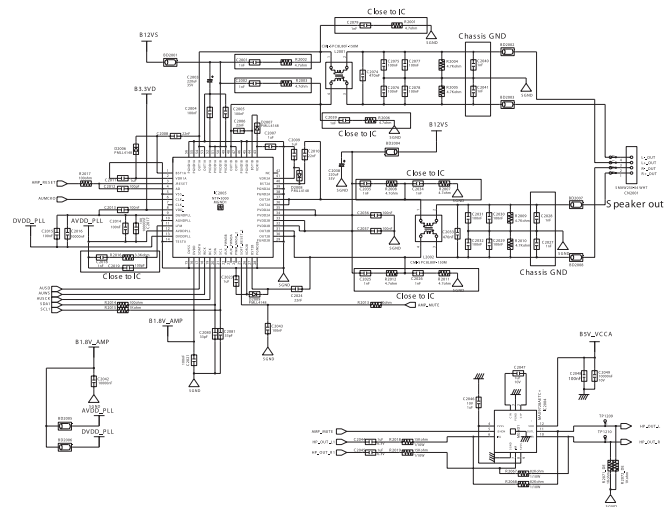


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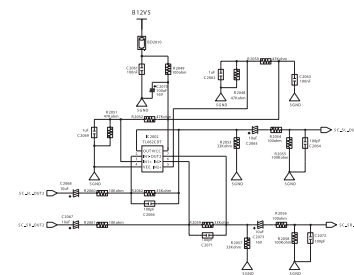
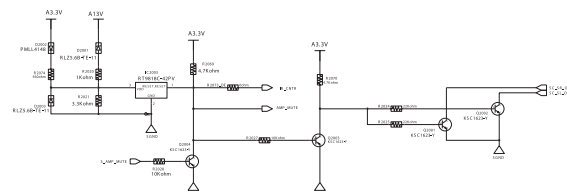
9-2 Sound Processing Schematic Diagram

Reference : 2001~

SOUND AMP



POP NOISE SOLUTION

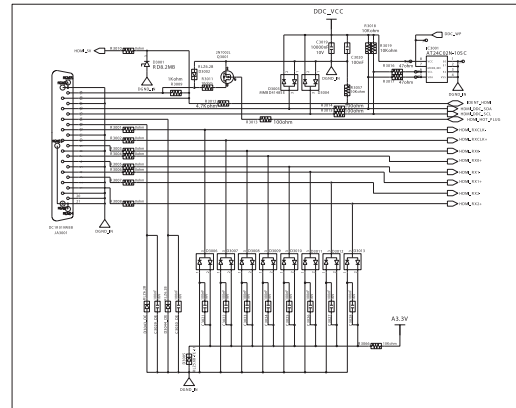


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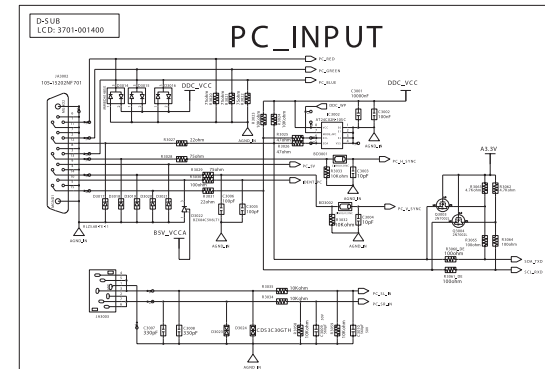
9-3 Input & Output jack I Schematic Diagram

Reference : 3001~

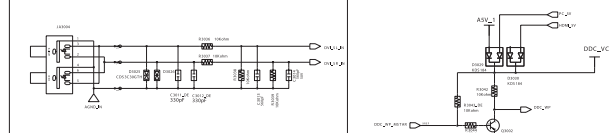
HDMI INPUT



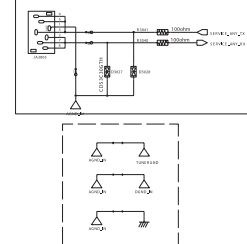
PC_INPUT



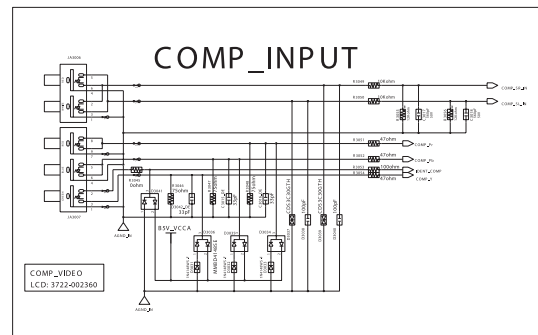
DVI SOUND INPUT



Service_ATV & DTV



COMP_INPUT

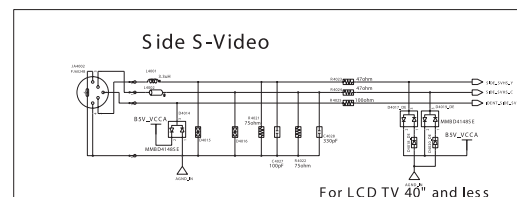
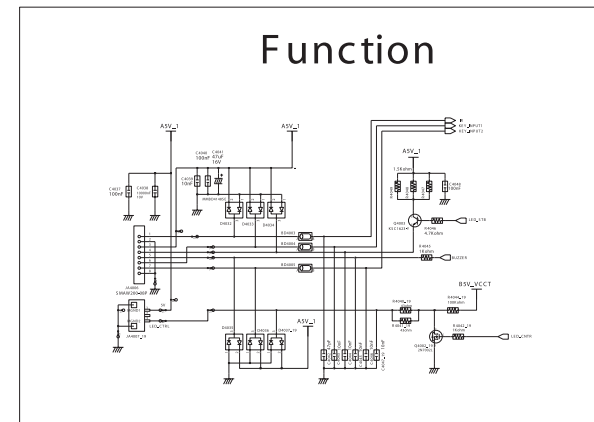
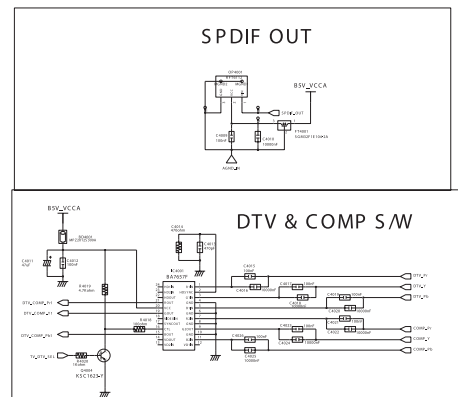
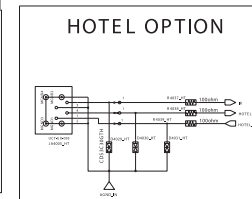
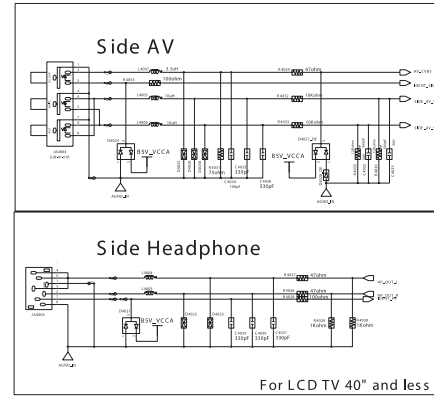
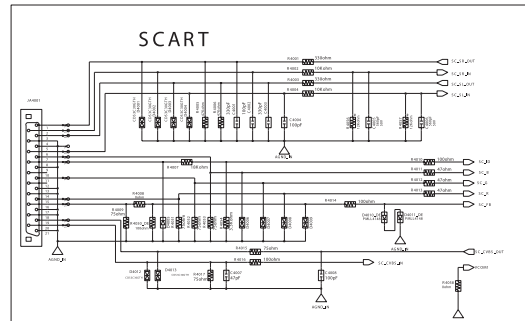


9 Schematic Diagrams

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9-4 Input & Output jack II Schematic Diagram

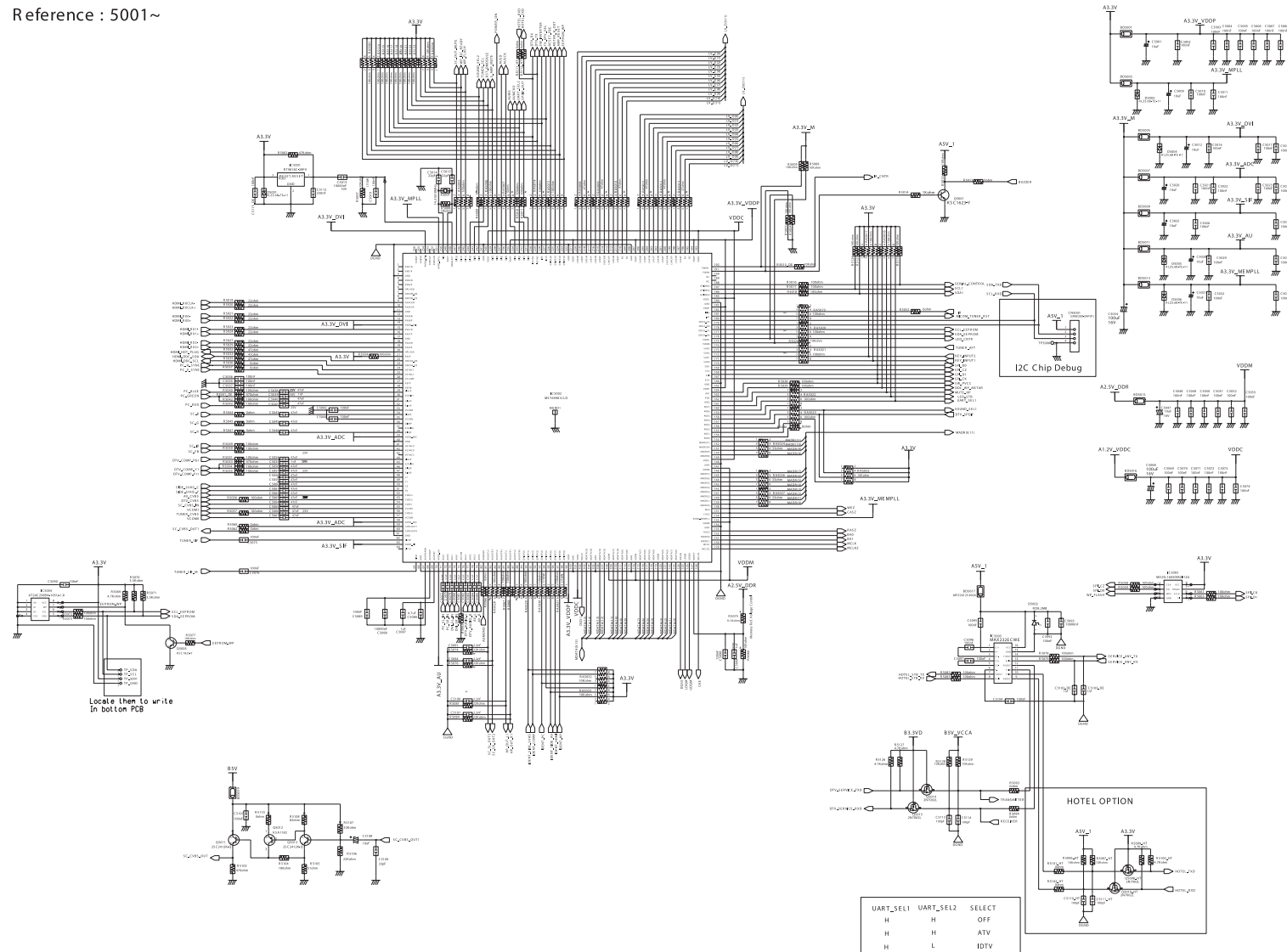
Reference : 4001~



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9-5 MST68980BL Schematic Diagram

Reference : 5001~

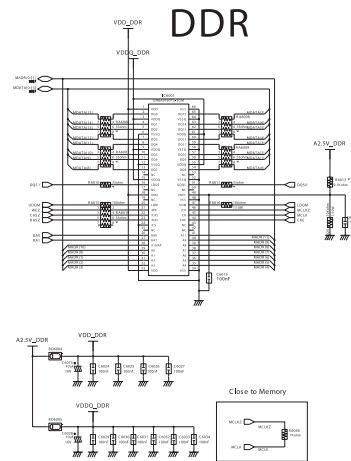


9 Schematic Diagrams

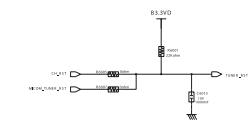
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9-6 DDR & Tuner Schematic Diagram

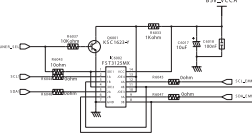
Reference : 6001~



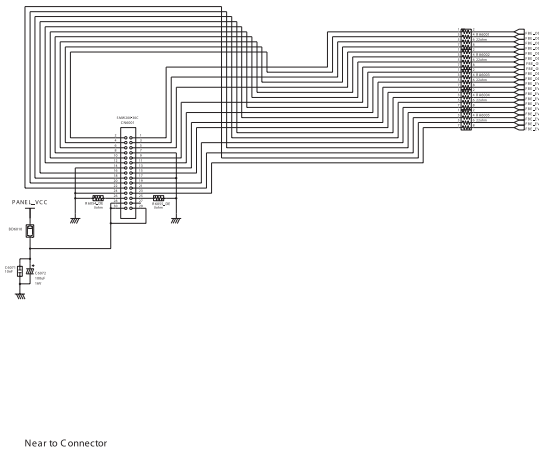
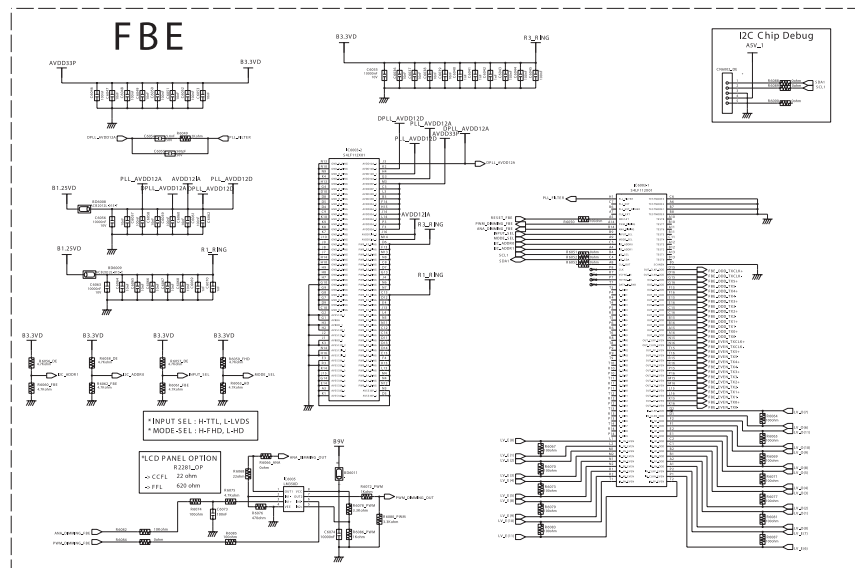
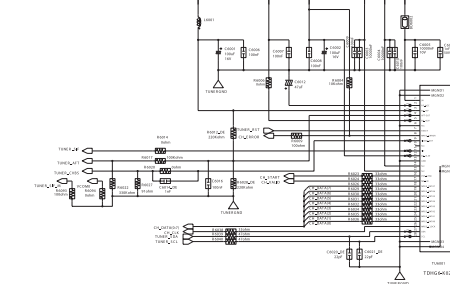
Tuner RST



Tuner IIC



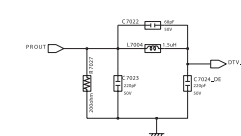
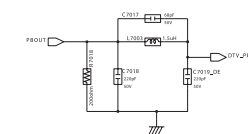
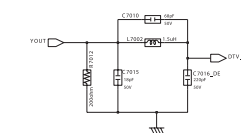
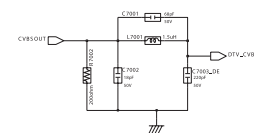
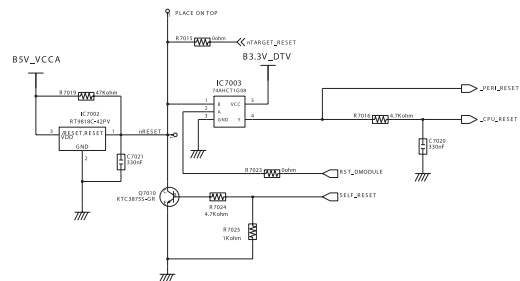
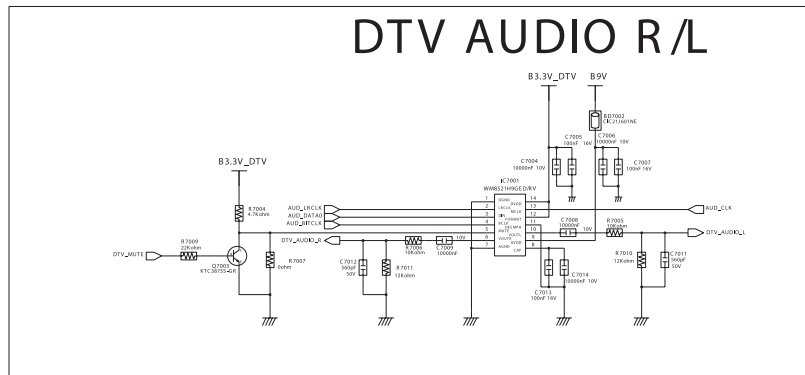
TUNER



-This Document can not be used without Samsung 's authorization.

9-7 DTV Reset & AV out Schematic Diagram

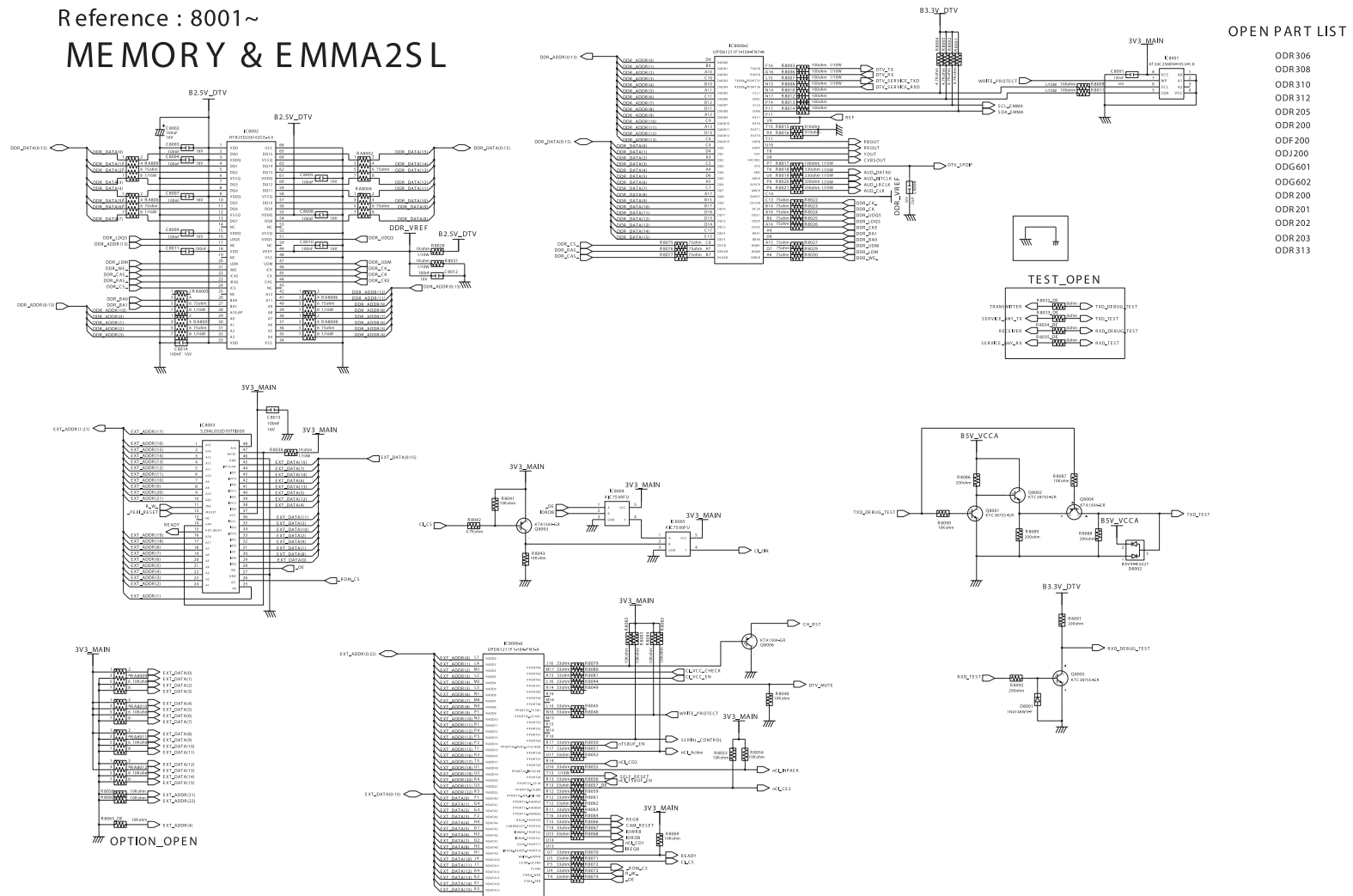
Reference : 7001~



9 Schematic Diagrams

-This Document can not be used without Samsung 's authorization.

9-8 DTV Memory & EMMA2SL Schematic Diagram

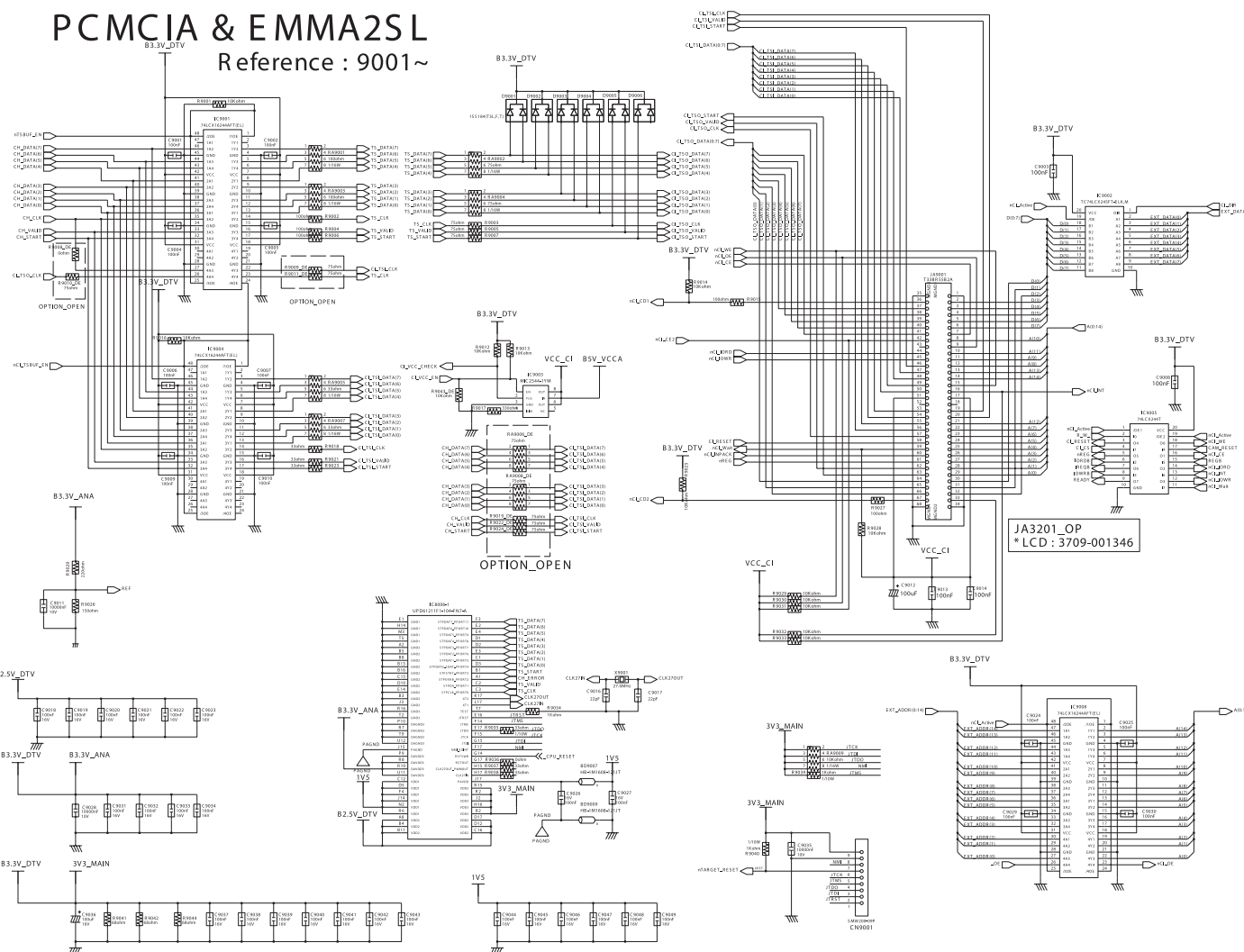


-This Document can not be used without Samsung 's authorization.

9-9 PCMCIA & EMMA2SL Schematic Diagram

PCMCIA & EMMA2SL

Reference : 9001~



OPEN PART LIST

OIC102
ODC105
ODC106
ODC108
ODC109
ODC116
ODR103
ODR134

Memo

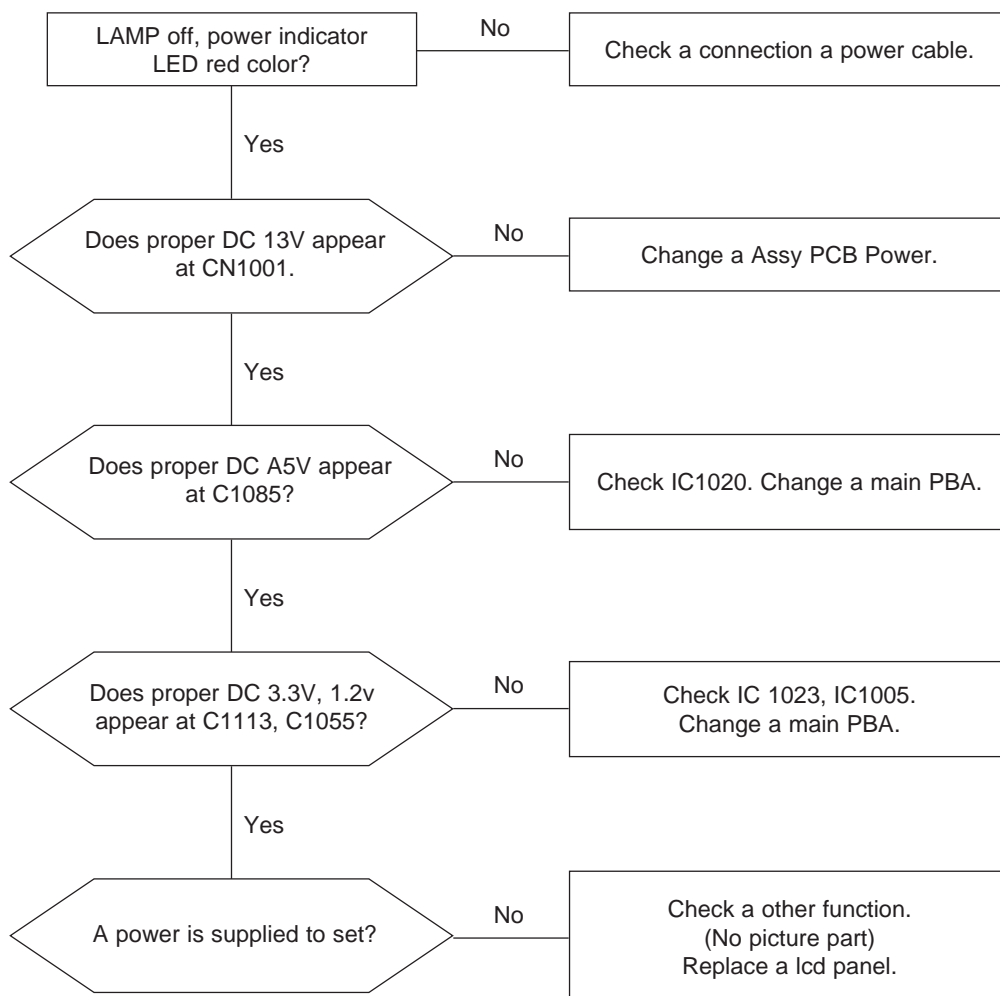
4 Troubleshooting

4-1 First Checklist for Troubleshooting

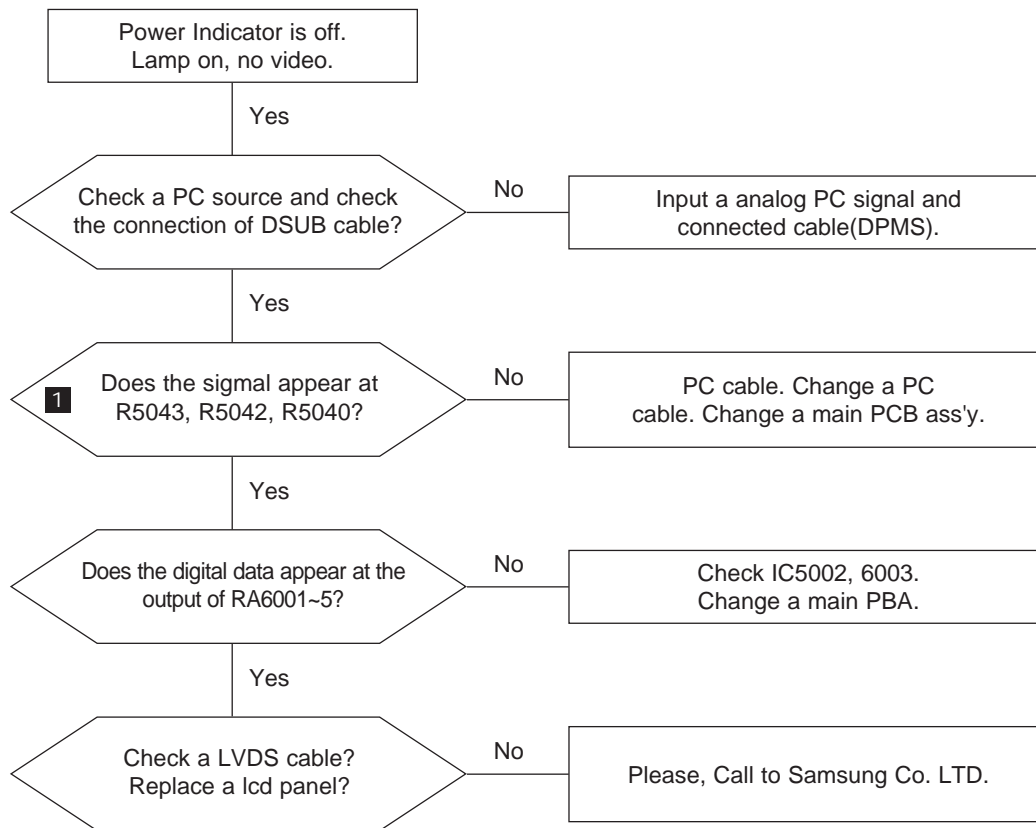
1. Check the various cable connections first.
 - Check to see if there is a burnt or damaged cable.
 - Check to see if there is a disconnected cable connection or a connection is too loose.
 - Check to see if the cables are connected according to the connection diagram.
2. Check the power input to the Main Board.
3. Check the voltage in and out between the IP ↔ Main Board, between the IP ↔ Panel, and between the Main LVDS Boards.

4-2 Checkpoints by Error Mode

4-2-1 No Power

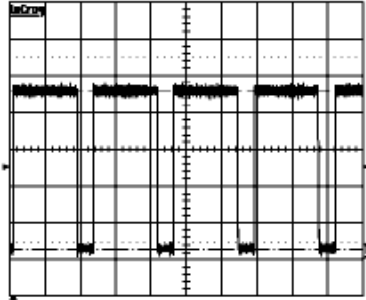


4-2-2 No Video (Analog PC)



WAVEFORMS

1 R,G,B Output Signal of IC5002, 6003

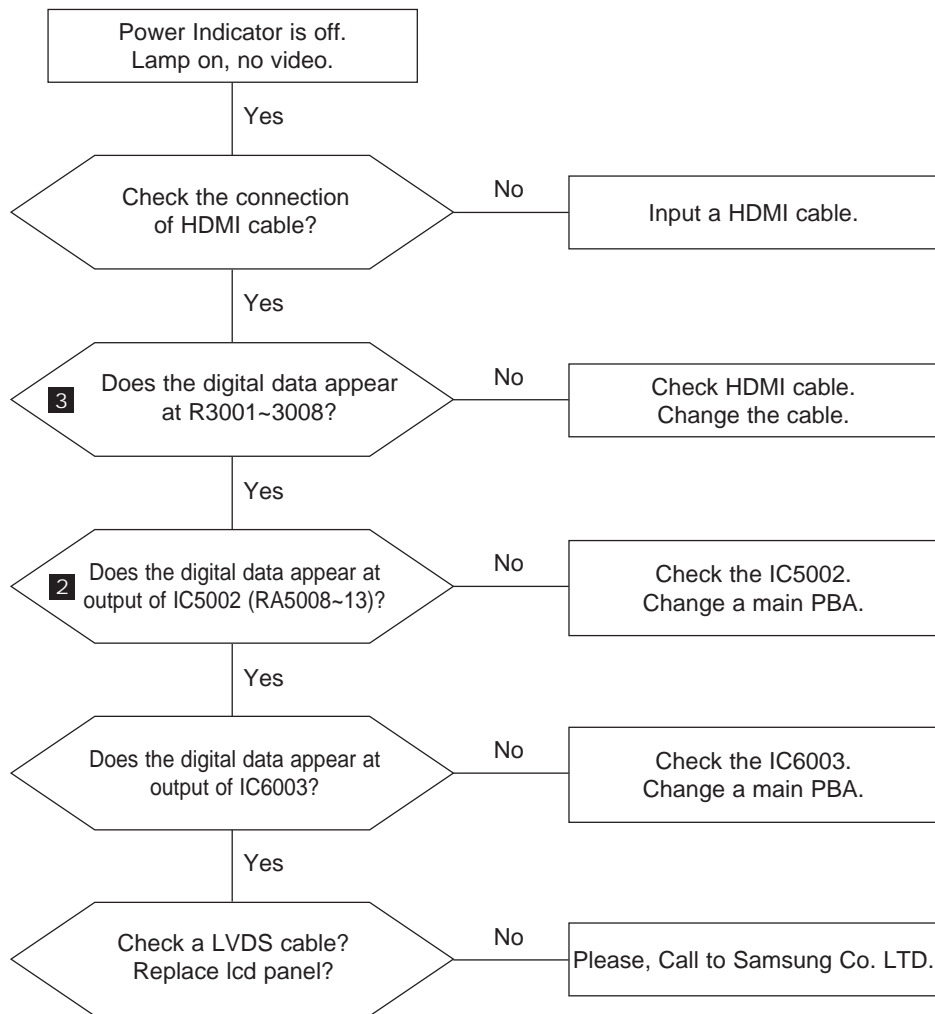
27-Sep-02
1:42:1910 μ s
200mV
652mV10 μ s1 20 mV DC $\frac{1}{2}$
2 1 V DC $\frac{1}{2}$
3 1 V DC $\frac{1}{2}$
4 5 V DC $\frac{1}{2}$ 

1 DC 0.492 V

1 65/s

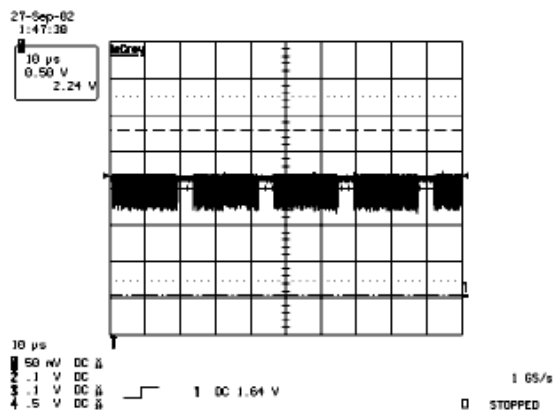
STOPPED

4-2-3 No Video (Digital-HDMI)

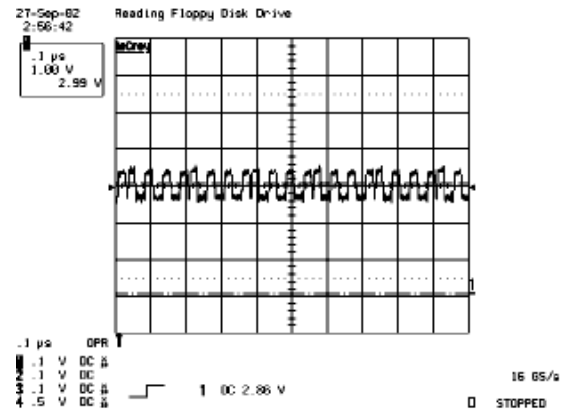


4 Troubleshooting

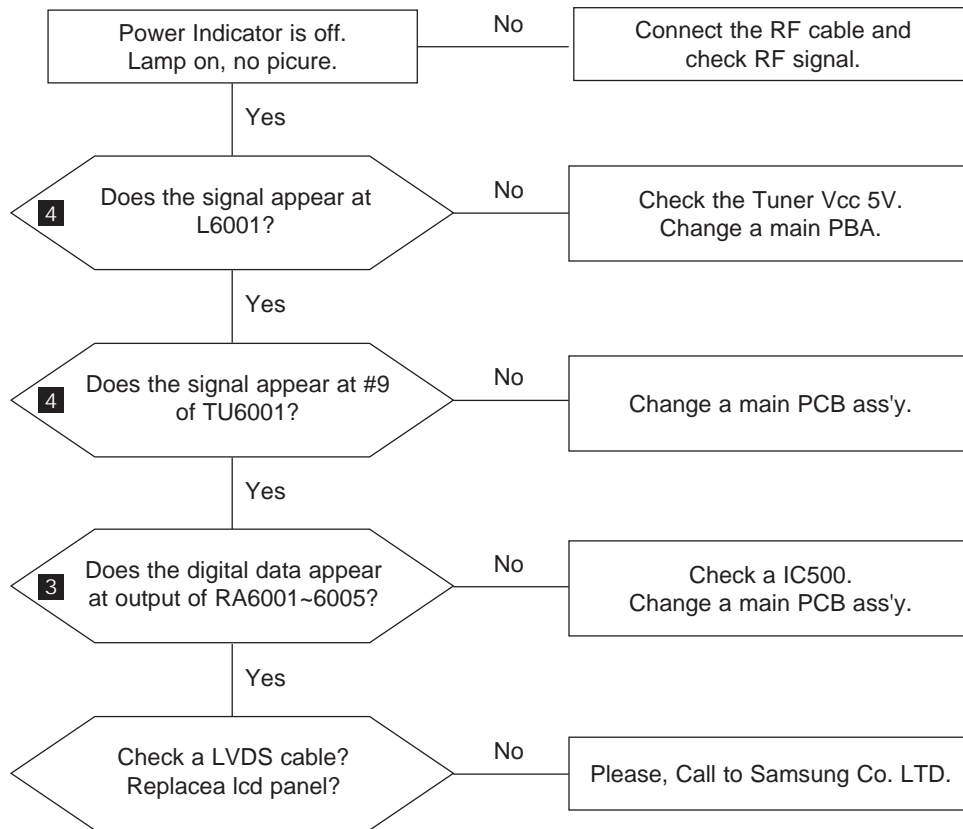
2 Digital Output Data of IC5002, IC6003



3 Signal of HDMI(Data)

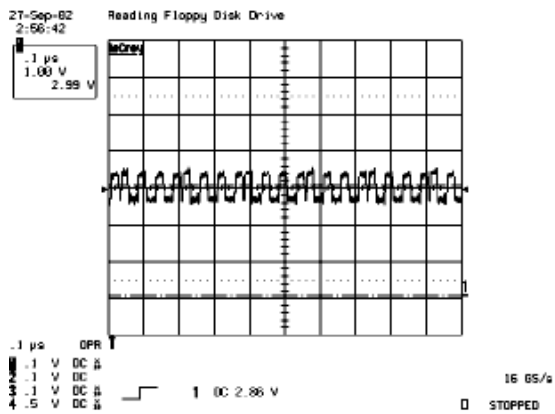


4-2-4 No Picture (Tuner_CVBS)

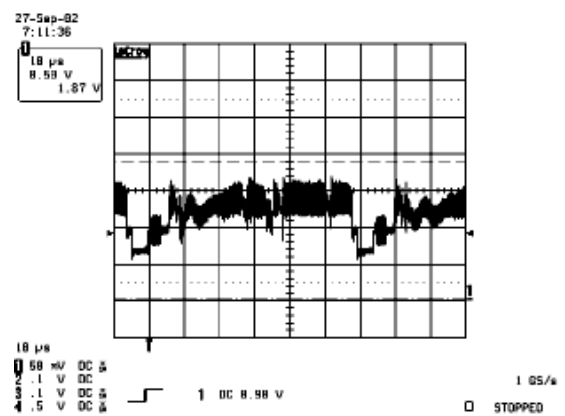


WAVEFORMS

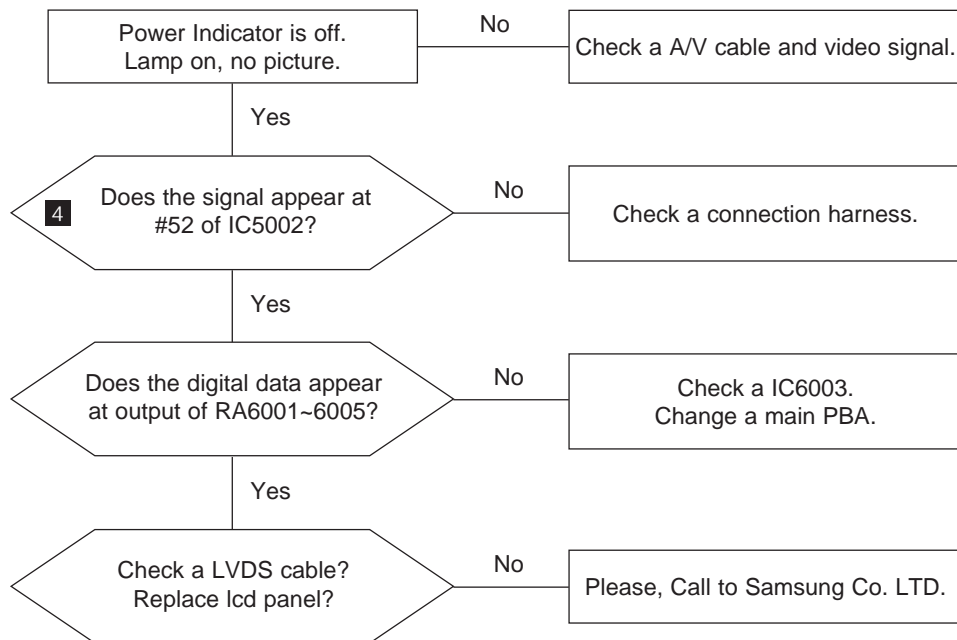
3 CVBS Output Signal



4 Tuner_CVBS Output Signal

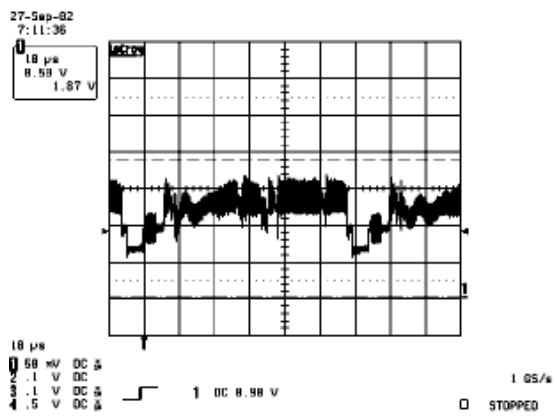


4-2-5 No Picture (Video_CVBS)

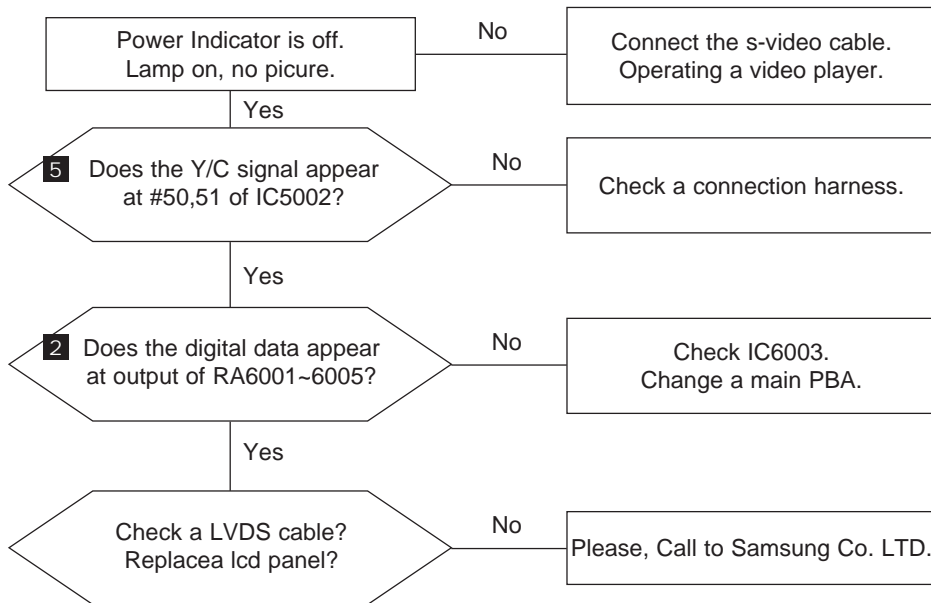


WAVEFORMS

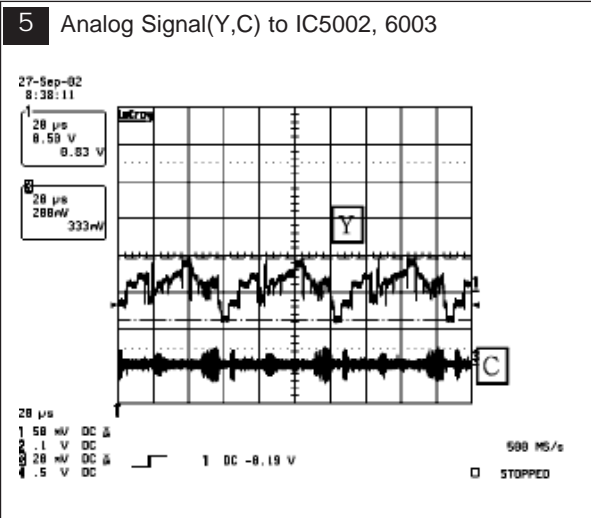
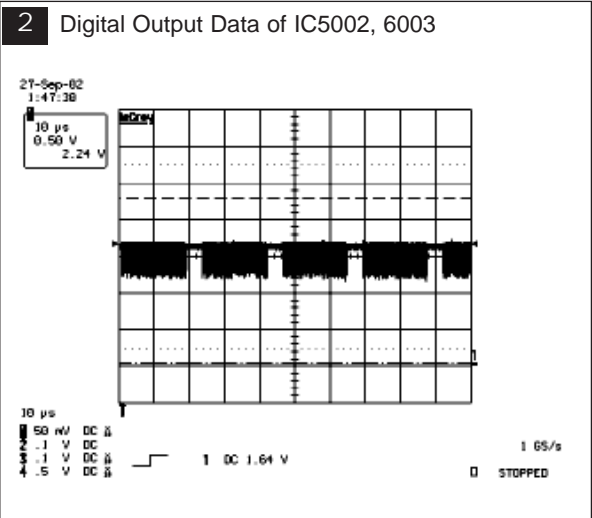
4 CVBS Output Signal



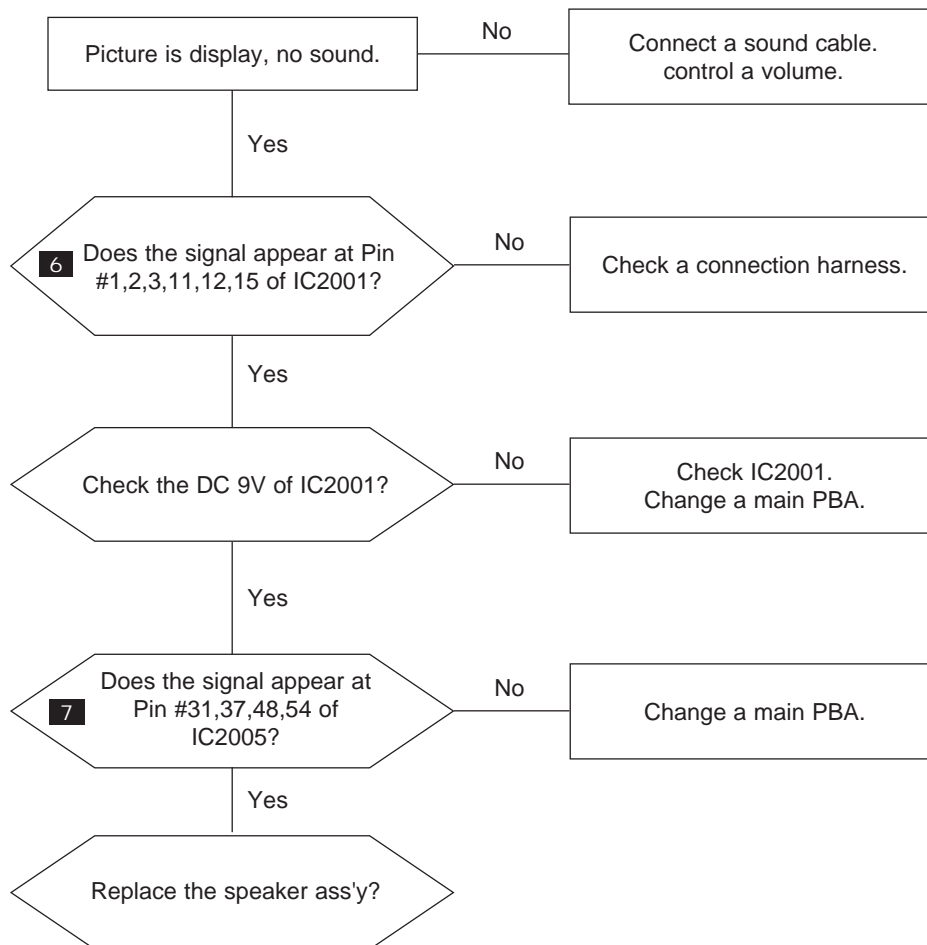
4-2-6 No Picture (S-VIDEO_Y,C)



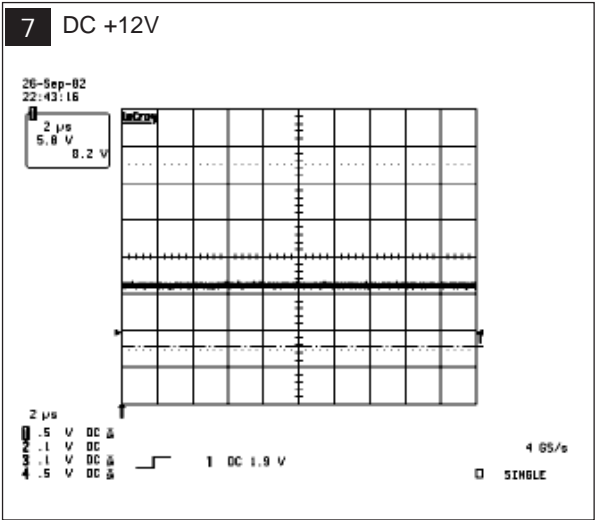
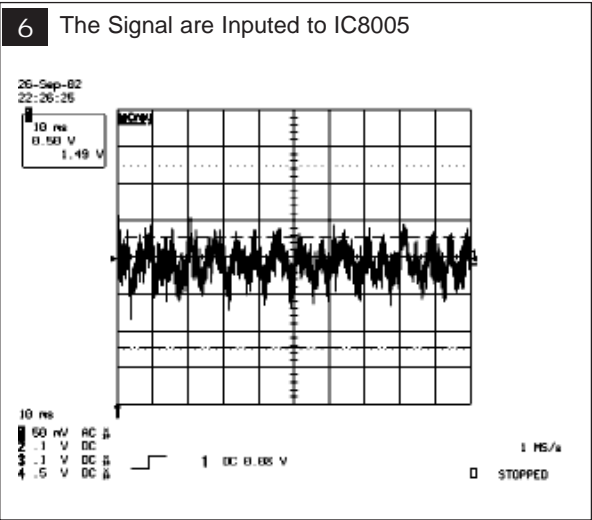
WAVEFORMS



4-2-7 No Sound



WAVEFORMS



8 Wiring Diagram

8-1 Wiring Diagram

CN6001

1	FBE_ODD_TX0-
2	FBE_ODD_TX0+
3	FBE_ODD_TX1-
4	FBE_ODD_TX1+
5	FBE_ODD_TX2-
6	FBE_ODD_TX2+
7	GND
8	FBE_ODD_TXCLK-
9	FBE_ODD_TXCLK+
10	FBE_ODD_TX3-
11	FBE_ODD_TX3+
12	FBE_EVEN_TX0-
13	FBE_EVEN_TX0+
14	GND
15	FBE_EVEN_TX1-
16	FBE_EVEN_TX1+
17	GND
18	FBE_EVEN_TX2-
19	FBE_EVEN_TX2+
20	FBE_EVEN_TXCLK-
21	FBE_EVEN_TXCLK+
22	FBE_EVEN_TX3-
23	FBE_EVEN_TX3+
24	GND
25	GND
26	GND
27	NC
28	PANEL_VCC
29	PANEL_VCC
30	PANEL_VCC

CN1001

1	PWM_DIMMING_OUT
2	GND
3	GND
4	GND
5	A13V
6	A13V
7	A13V
8	B3.3V/D
9	B5V

MAIN BOARD

JA3004

1	GND
2	DVI_SR_IN
3	DVI_SL_IN
4	GND
5	DVI_SL_IN
6	DVI_SR_IN

JA3001

1	RX2-
2	RX2+
3	GND
4	NC
5	NC
6	DDC_SCL
7	DDC_SDA
8	NC
9	RX1-
10	RX1+
11	GND
12	NC
13	NC
14	5V
15	IDENT_DVI
16	HDCP_CTRL
17	RX0-
18	RX0+
19	GND
20	NC
21	NC
22	GND
23	RXC+
24	RXC-

JA3003

1	GND
2	PC_SR_IN
3	PC_SL_IN
4	PC_SL_IN
5	PC_SL_IN
6	PC_SR_IN
7	PC_SR_IN

JA3002

1	PC_RED
2	PC_GREEN
3	PC_BLUE
4	GND
5	GND
6	GND
7	GND
8	GND
9	PC_5V
10	IDENT_PC
11	GND
12	PC_SDA
13	PC_H_SYNC
14	PC_V_SYNC
15	PC_SCL

JA4001

1	SC_SR_OUT
2	SC_SR_IN
3	SC_SL_OUT
4	GND
5	GND
6	SC_SL_IN
7	SC_B
8	SC_ID
9	GND
10	NC
11	SC_G
12	NC
13	GND
14	GND
15	SC_R
16	SC_FB
17	GND
18	GND
19	SC_CVBS_OUT
20	SC_CVBS_IN
21	GND

JA3005

1	GND
2	SERVICE_ANY_TX
3	SERVICE_ANY_RX
4	SERVICE_ANY_TX
5	SERVICE_ANY_TX
6	SERVICE_ANY_RX
7	SERVICE_ANY_RX

JA4004

1	GND
2	IDENT_SIDE_AV
3	AV_CVBS
4	GND
5	SIDE_AV_SR_IN
6	SIDE_AV_SL_IN
7	GND
8	SIDE_AV_SL_IN
9	SIDE_AV_SR_IN

JA4002

1	SIDE_SVHS_C
2	SIDE_SVHS_Y
3	GND
4	GND
5	IDENT_SIDE_SVHS
6	GND

JA4003

1	GND
2	HP_OUT_R
3	HP_OUT_L
4	HP_OUT_L
5	HP_OUT_L
6	GND
7	HP_OUT_R

JA3006

1	GND
2	COMP_SR_IN
3	COMP_SL_IN
4	GND
5	COMP_SL_IN
6	COMP_SR_IN

JA3007

1	GND
2	IDENT_COMP
3	COMP_Y
4	GND
5	COMP_Pb
6	COMP_Pb
7	GND
8	NC
9	COMP_Pr

OP4001

1	SPDIF_OUT
2	B5V
3	GND

JA4006

1	IR
2	GND
3	A5V
4	LED_STB
5	BUZZER
6	KEY_INPUT1
7	KEY_INPUT2
8	GND

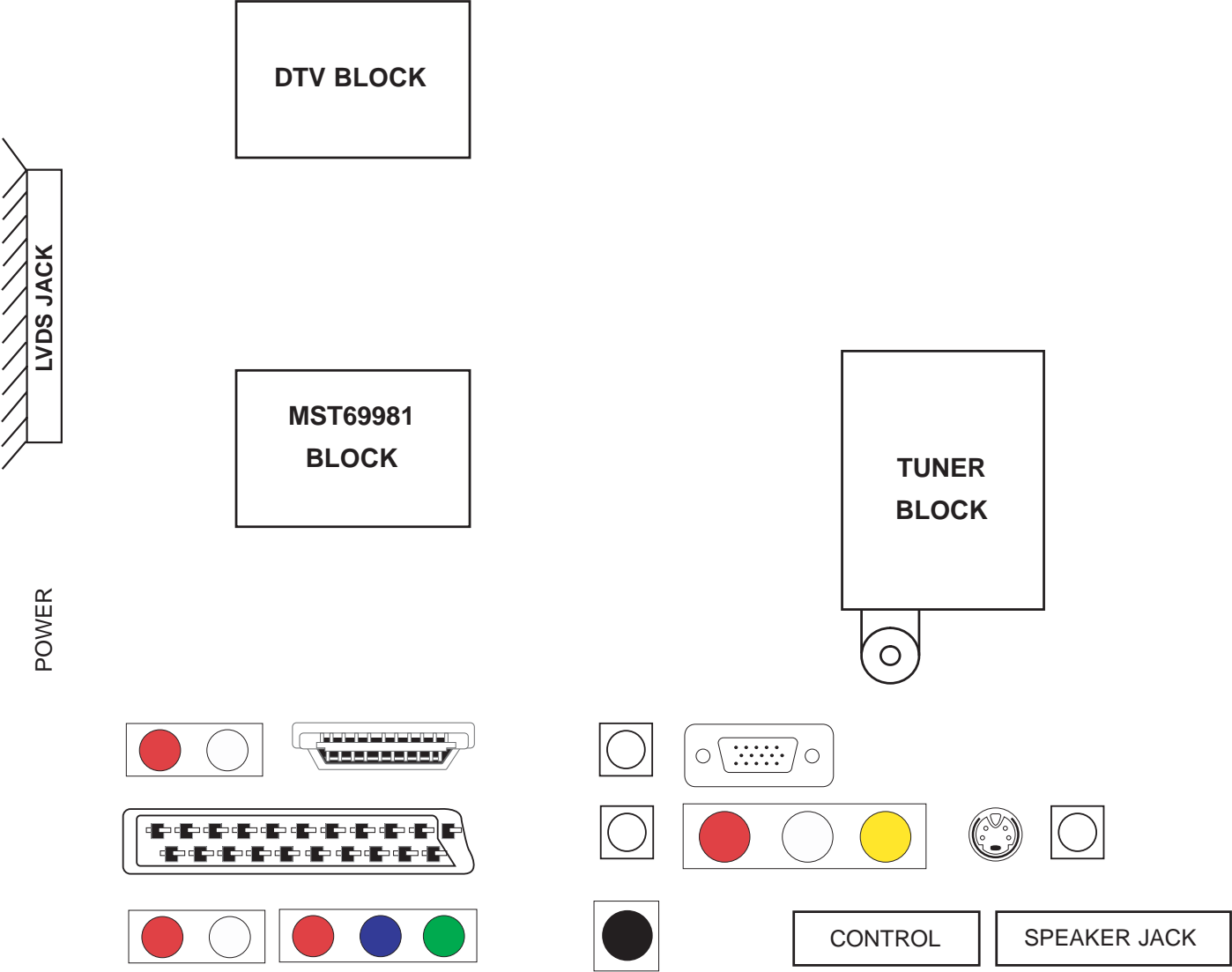
JA4007

1	A5V
2	NC
3	LED_CNTR

CN2001

1	R+OUT
2	R-OUT
3	L+OUT
4	L-OUT

8-2 Main Board Layout



8-3 PIN characteristic

CN1001

PIN	1	2	3	4	5	6	7	8	9
NAME	PWM_DIMMING_OUT	GND	GND	GND	A13V	A13V	A13V	B3.3VD	B5V

CN2001

PIN	1	2	3	4
NAME	R+_OUT	R-_OUT	L+_OUT	L-_OUT

JA4006

PIN	1	2	3	4	5	6	7	8
NAME	IR	GND	A5V	LED_STB	BUZZER	KEY_INPUT1	KEY_INPUT2	GND

JA4007

PIN	1	2	3
NAME	A5V	NC	LED_CNTR

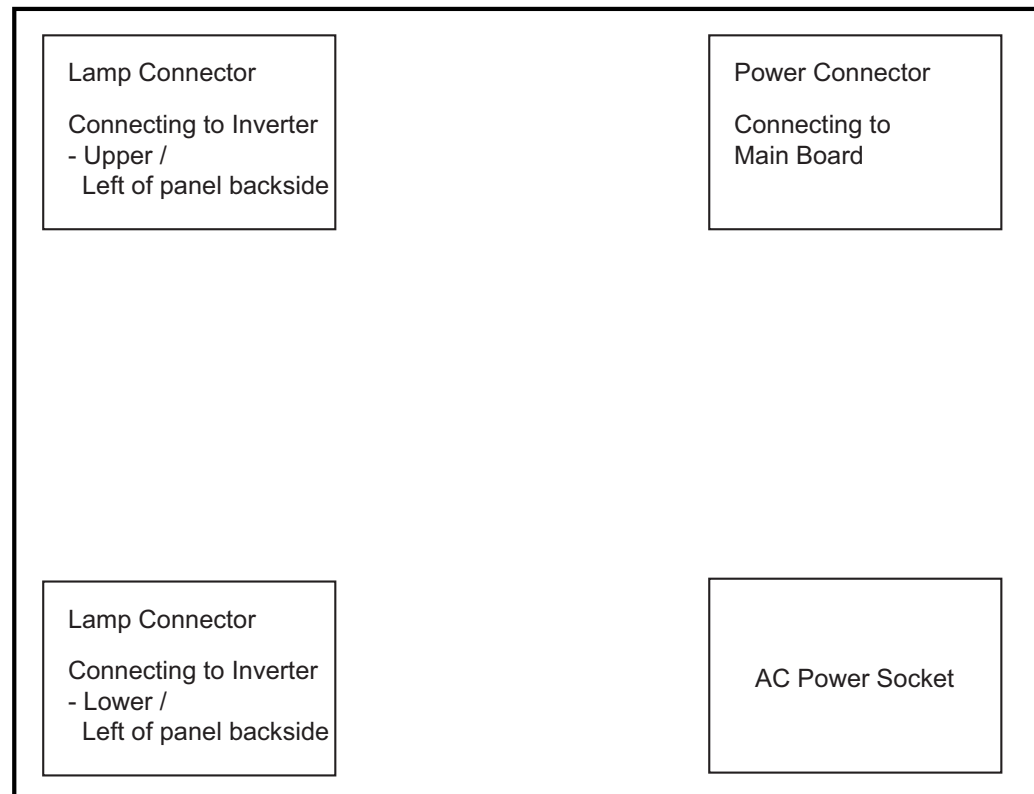
CN6001

PIN	1	2	3	4	5	6	7	8	9	10
NAME	FBE_ODD_TX0-	FBE_ODD_TX0+	FBE_ODD_TX0+	FBE_ODD_TX1+	FBE_ODD_TX2-	FBE_ODD_TX2+	GND	FBE_ODD_TXCLK-	FBE_ODD_TXCLK+	FBE_ODD_TX3-
PIN	11	12	13	14	15	16	17	18	19	20
NAME	FBE_ODD_TX3+	FBE_EVEN_TX0-	FBE_EVEN_TX0+	GND	FBE_EVEN_TX1-	FBE_EVEN_TX1+	GND	FBE_EVEN_TX2-	FBE_EVEN_TX2+	FBE_EVEN_TXCLK-
PIN	21	22	23	24	25	26	27	28	29	30
NAME	FBE_EVEN_TXCLK-	FBE_EVEN_TX3-	FBE_EVEN_TX3+	GND	GND	GND	NC	PANEL_VCC	PANEL_VCC	PANEL_VCC

CN8001-SPEAKER CONNECTOR

PIN	1	2	3	4
NAME	SOUND_L-_OUT	SOUND_L+_OUT	SOUND_R-_OUT	SOUND_R+_OUT

8-4 Power Board Layout



8-5 IP Wiring Diagram

CN101

PIN	1	2	3	4	5	6	7	8	9
NAME	PWM Dimming Control	GND	GND	GND	A13V	A13V	A13V	ANA Dimming Control	CFL Drive Signal

CN201,202

PIN	1	2	3	4
NAME	HOT	COLD	HOT	COLD

Memo