



TFT-LCD TV

Chassis GJA20SEU

Model LE20S81BX

SERVICE Manual

TFT-LCD TV



Fashion Feature

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

Copyright

© 2007 by Samsung Electronics Co., Ltd.

All rights reserved.

This manual may not, in whole or in part, be copied, photocopied, reproduced, translated, or converted to any electronic or machine readable form without prior written permission of Samsung Electronics Co., Ltd.

LE26S81BX/LE32S81BX/LE37S81BX/LE40S81BX /
LE46S81BX Service Manual

First edition June 2007.

Printed in Korea.

Trademarks

Samsung is the registered trademark of Samsung Electronics Co., Ltd.

LE26S81BX/LE32S81BX/LE37S81BX/LE40S81BX /
LE46S81BX and Macmaster Cable Adapter are
trademarks of Samsung Electronics Co., Ltd.

Macintosh and Power Macintosh are trademarks of
Apple Computer, Inc.

All other trademarks are the property of their respective
owners.

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 LE26S81BX Specifications	2-2
2-3 LE32S81BX Specifications	2-3
2-4 LE37S81BX Specifications	2-4
2-5 LE40S81BX Specifications	2-5
2-6 LE46S81BX Specifications	2-6
2-7 Spec Comparison	2-6
2-8 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	3-12
3-5 Software Upgrade	3-15
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 LE26S81BX Exploded View	5-1
5-2 LE26S81BX Parts list	5-2
5-3 LE32S81BX Exploded View	5-3
5-4 LE32S81BX Parts list	5-4
5-5 LE37S81BX Exploded View	5-5
5-6 LE37S81BX Parts list	5-6
5-7 LE40S81BX Exploded View	5-7
5-8 LE40S81BX Parts list	5-8
6. Electrical Parts List	6-1
6-1 LE26S81BX Parts List	6-1
6-2 LE32S81BX Parts List	6-22
6-3 LE37S81BX Parts List	6-38
6-4 LE40S81BX Parts List	6-55
7. Block Diagram	7-1

Contents

8. Wiring Diagram	8-1
8-1 LE26S81BX / LE32S81BX / LE37S81BX / LE40S81BX / LE46S81BX Wiring Diagram	8-1
8-2 Main Board Layout	8-2
8-3 PIN characteristic	8-3
8-4 Power Board Layout	8-6
9. Schematic Diagrams	9-1
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
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



GSPN(Global Service Partner Network)

Area	Web Site
North America	http://service.samsungportal.com
Latin America	http://latin.samsungportal.com
CIS	http://cis.samsungportal.com
Europe	http://europe.samsungportal.com
China	http://china.samsungportal.com
Asia	http://asia.samsungportal.com
Mideast & Africa	http://mea.samsungportal.com

This Service Manual is a property of Samsung Electronics Co.,Ltd.

Any unauthorized use of Manual can be punished under applicable International and/or domestic law.

©2007 Samsung Electronics Co.,Ltd.
All rights reserved.

Printed in Korea
P/N : BN82-00245A-00

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 :

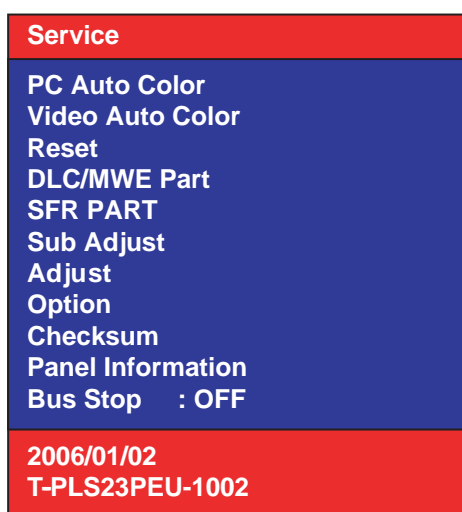
- If you do not have Factory remote - control



- If you have Factory remote - control



3-3 Factory Data



-. OSD which the basic adjustment is added.

PC Auto Color

Video Auto Color

Reset

DLC/MWE Part

SFR PART

Sub Adjust

Adjust

Option

Checksum

Panel Information

Bus Stop : OFF

*. 2005/06/23: MCU firmware date.

*. T-PLUS25NUS-0906: MCU firmware version information

(this information must be appended due to a compatibility problem report.)

1) Reset: Factory reset

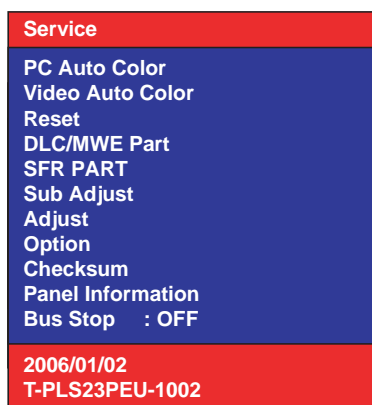
2) Bus Stop: The communication Line ON / OFF

Move to the (-) / (+) key, select the 'Enter' key.

3) Auto adjustment

4) PC Auto Color/ Video Auto Color :in case that color of all screen is wrong, excute the PC Auto color at 16 gray pattern(refer to attach left 16gray pattern)

5) Checksum: MCU firmware checksum information
(this information must be appended due to a compatibility problem report.)



DLC/MWE Part		
NVRAM Reset		
DLC-	0-10	0
MWE-	0-1	1
Demo	0-1	0
Brightness+	0-255	100
Contrast+	0-255	113
Sharpness+	-10-10	1
Hue+	0-100	50
Saturation+	0-255	125
R Offset		46
G Offset		50
B Offset		56
R Gain		58
G Gain		50
B Gain		51

6) Dynamic Luma Adjustment

" - " : RF, AV, S_Video -> all store

" + " : RF, AV, S_Video -> apart store

SFR Part		
DCXO Sel.		0
DCXO Tune		64
OVMAAPT	0-1	1
OVMTNR	0-3	2
IF Demod	0-63	38
F FI	0-1	0
R0:77	R1:71	R2:81
R3:18	R4:0	R5:1F

7) Special Function Register

Sub Adjust		
R Blk Lvl+	0-63	28
G Blk Lvl+	0-63	20
Peak Frq/DLY+	0-3	0
Peak+	0-63	40
Soft Clp Lvl-	0-3	0
W Limit-	0-15	8
R White Pnt+	0-63	37
G White Pnt+	0-63	31
B White Pnt+	0-63	31
AGC T-O-	0-63	23

3 Alignments and Adjustments

UOC Adjust									
BKS-	0-1								1
WSx-	0-3								2
	0	0	0	0	0	20	20	2	
0	20	20	20	20	20	20	20	2	
0	20	20	20	19	26			

8) UOC Adjustment

BKS : Black stretch

Wsx : White stretch

Adjust									
R Offset									20
G Offset									20
B Offset									20
R Gain									20
G Gain									20
B Gain									20
Sclr Coring+	0-255	35							
	0	0	0	FF	DD	BD			

Service									
Suwon + America									
Samex + America									
.....									
.....									
.....									
Help Menu	:	On							
Auto-Auto	:	Off							

9) Option: Spread Step / Spread Span (for EMI test)

Service									
Monitor	:	3 Hr							
Panel Cycle	:	249							
		Time Ch. No							
Panel	:	3 Hr	0						
Upper Lamp	:	3 Hr	0						
Lower Lamp	:	3 Hr	0						

10) Panel Information

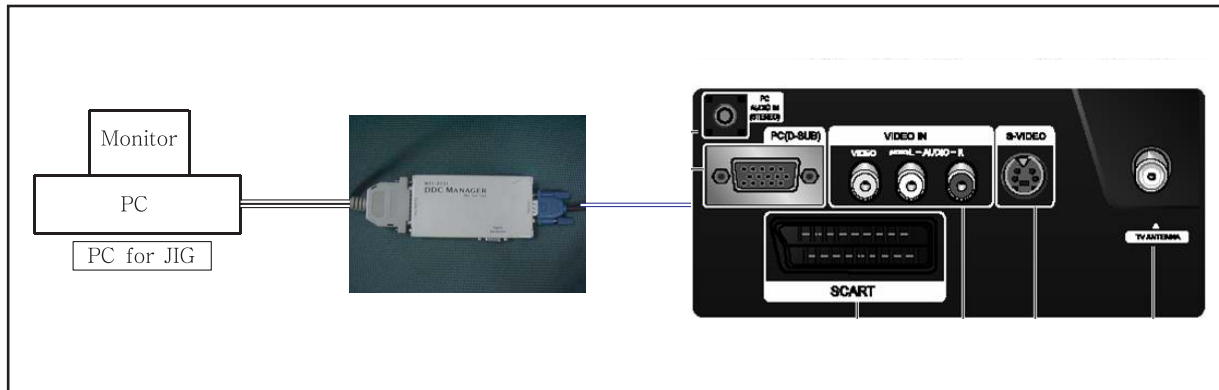
various function are included in information.

- Monitor On Time : Power On Time
- Panel Cycle : Panel On/off time (Power off, Mode change, DPMS on/off ...)
- Panel : Panel on Time
(when the panel is changed , select the Reset)
- Lower lamp : Lower lamp on time
(when the Lower lamp is changed , select the Reset)
- Upper lamp : Upper Lamp on time
(when the Upper Lamp is changed , select the Reset)

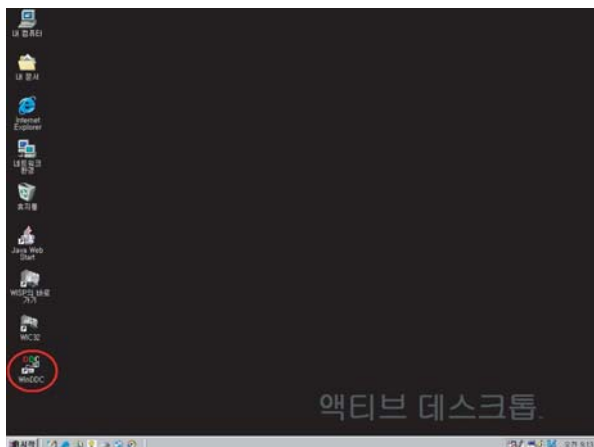
3-4 Service Adjustment

3-4-1 EDID input method

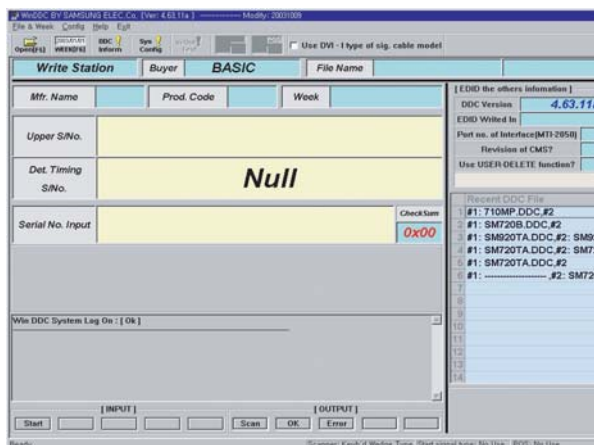
- SAMSUNG LCD TV support the DDC control JIG.
- You can see the connection between PC and LCD TV.



3-4-2 EDID input method (Windows Program)

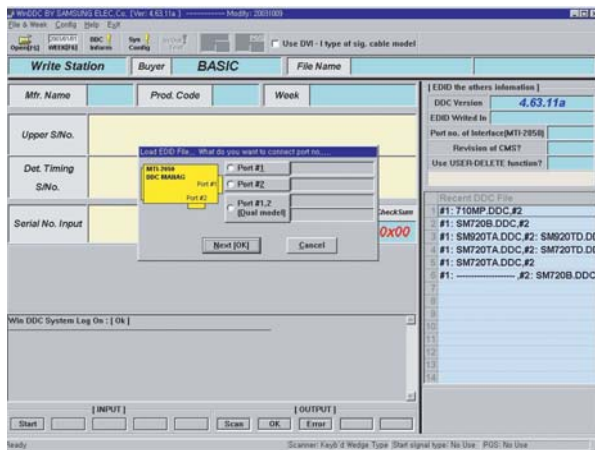


1. Execute "WinDDC.EXE"

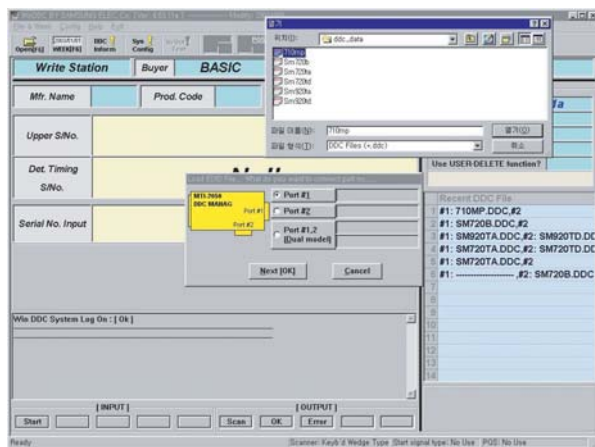


2. Click "Open[F5]"

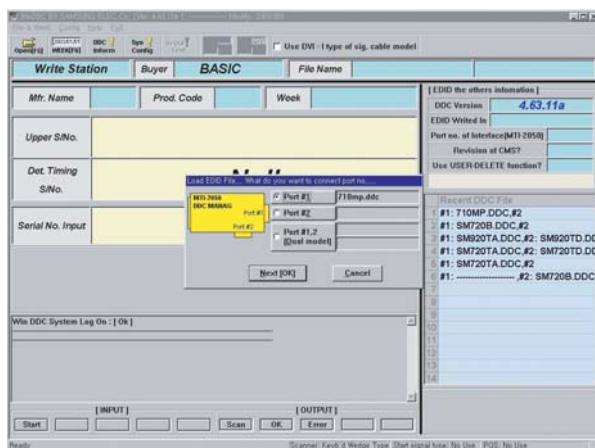
3 Alignments and Adjustments



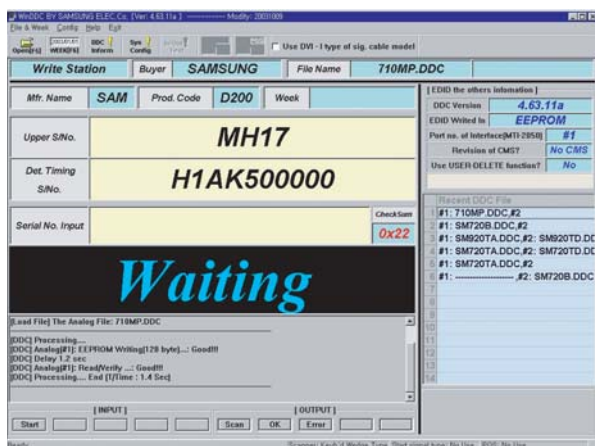
3. Select Connected Port#1 and Click Next OK.



4. Select Connected Port#1 and Click Next OK.
Find file name : VC20



5. Click Next (OK) button.



6. Select enter button (on Key-Board) After Monitor S/N input.

8. Check "DDC OK".



3-4-3 Micom (TDA15001H) Program Upgrade



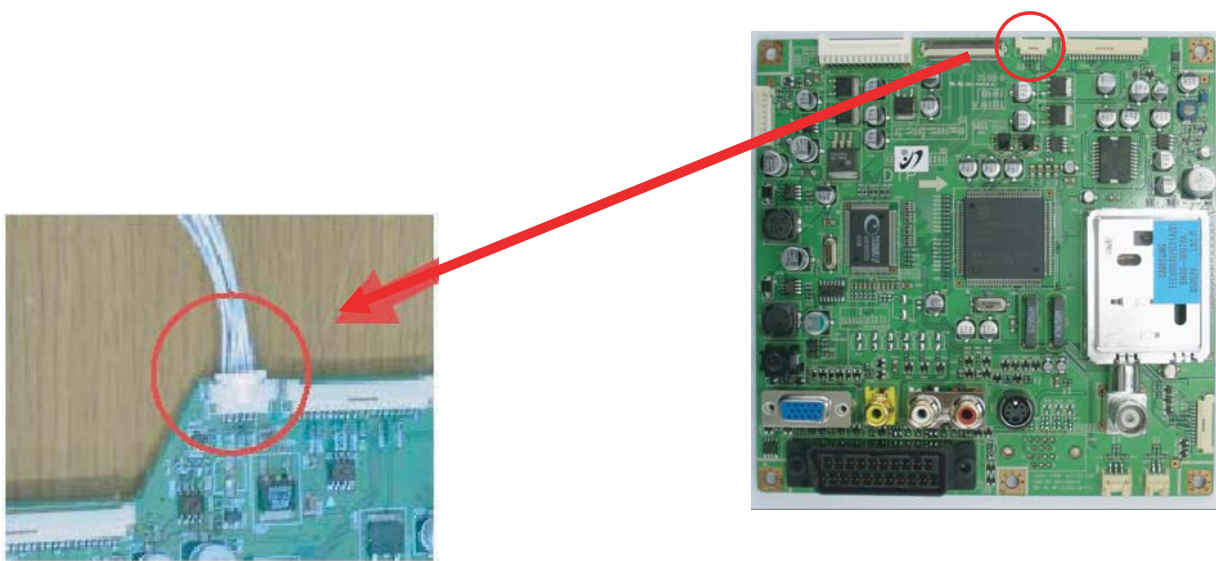
1. Program Upgrade Jig



2. Connect the parallel Port

3 Alignments and Adjustments

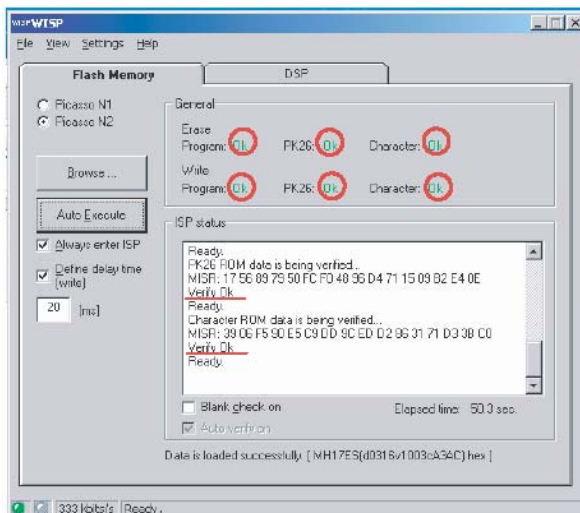
3. Connect Jig to CN905 on PCB Ass'y



4. Click " WISP " Icon on Computer

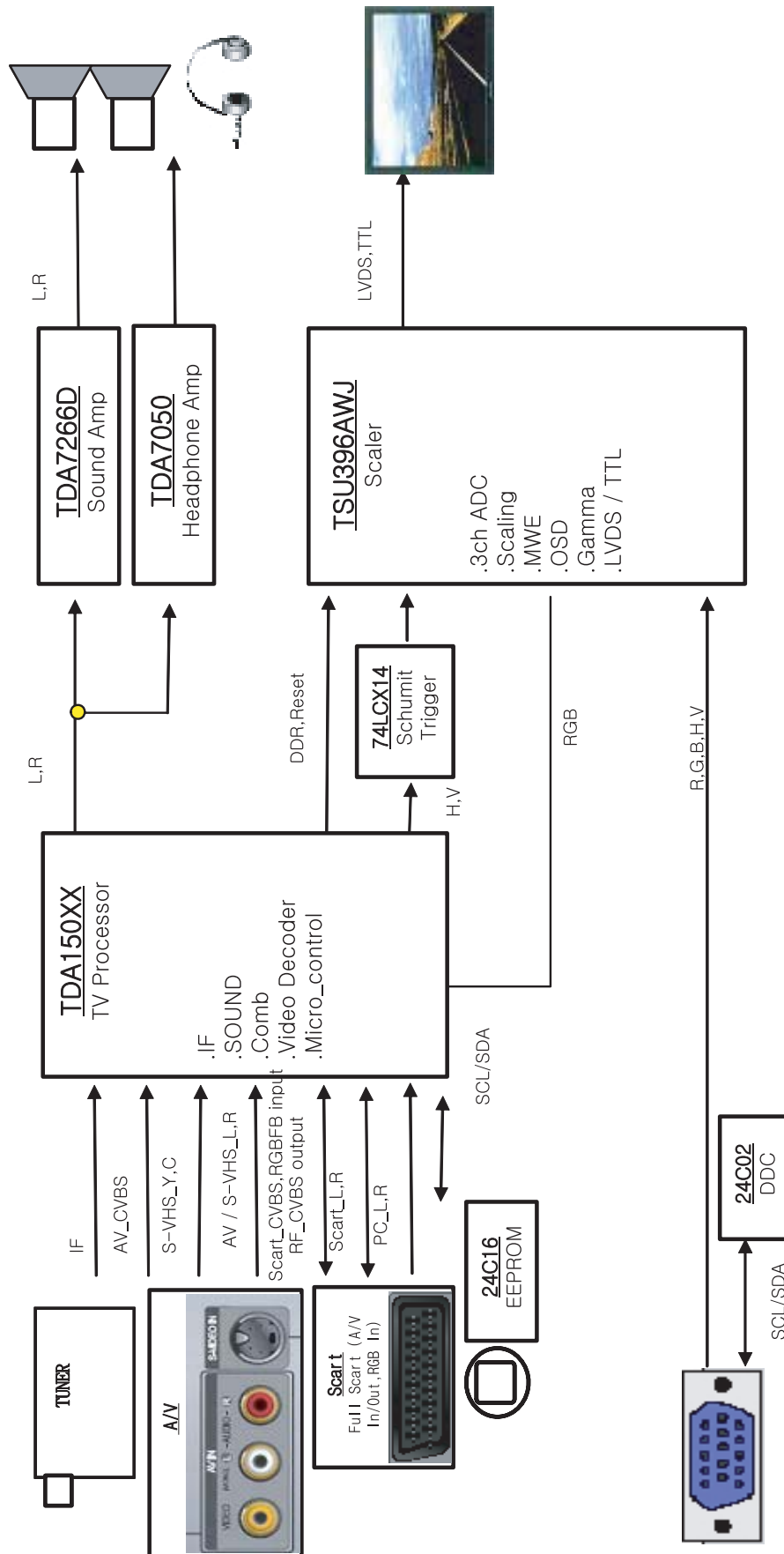


5. Check "Automatic mode on".



6. Click "Browser" button : Select the Code , Click "Auto Execute" button Check Erase and Write OK In "General" window and check Verify OK in "ISP status" window.

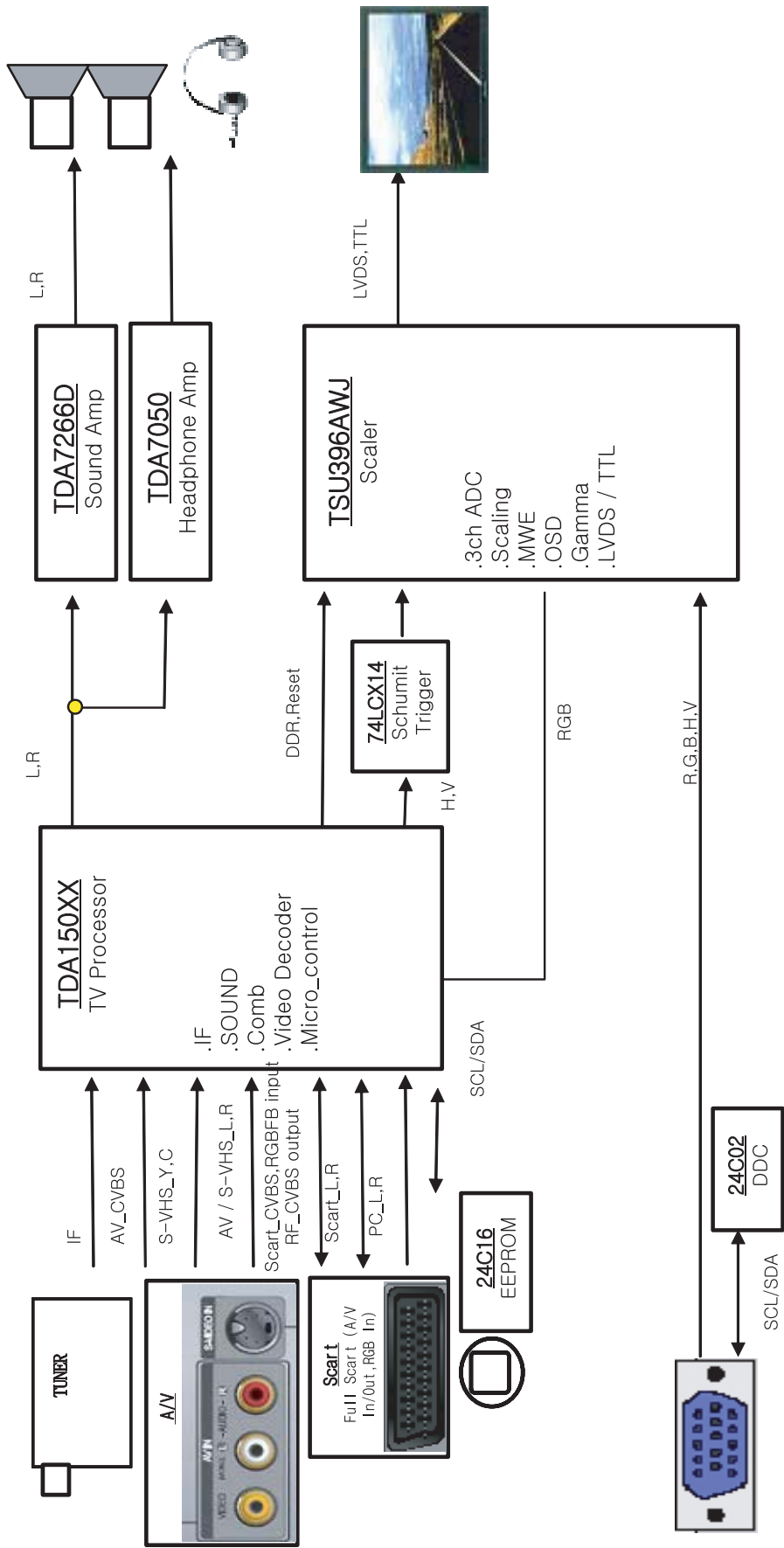
7 Block Diagram



Memo

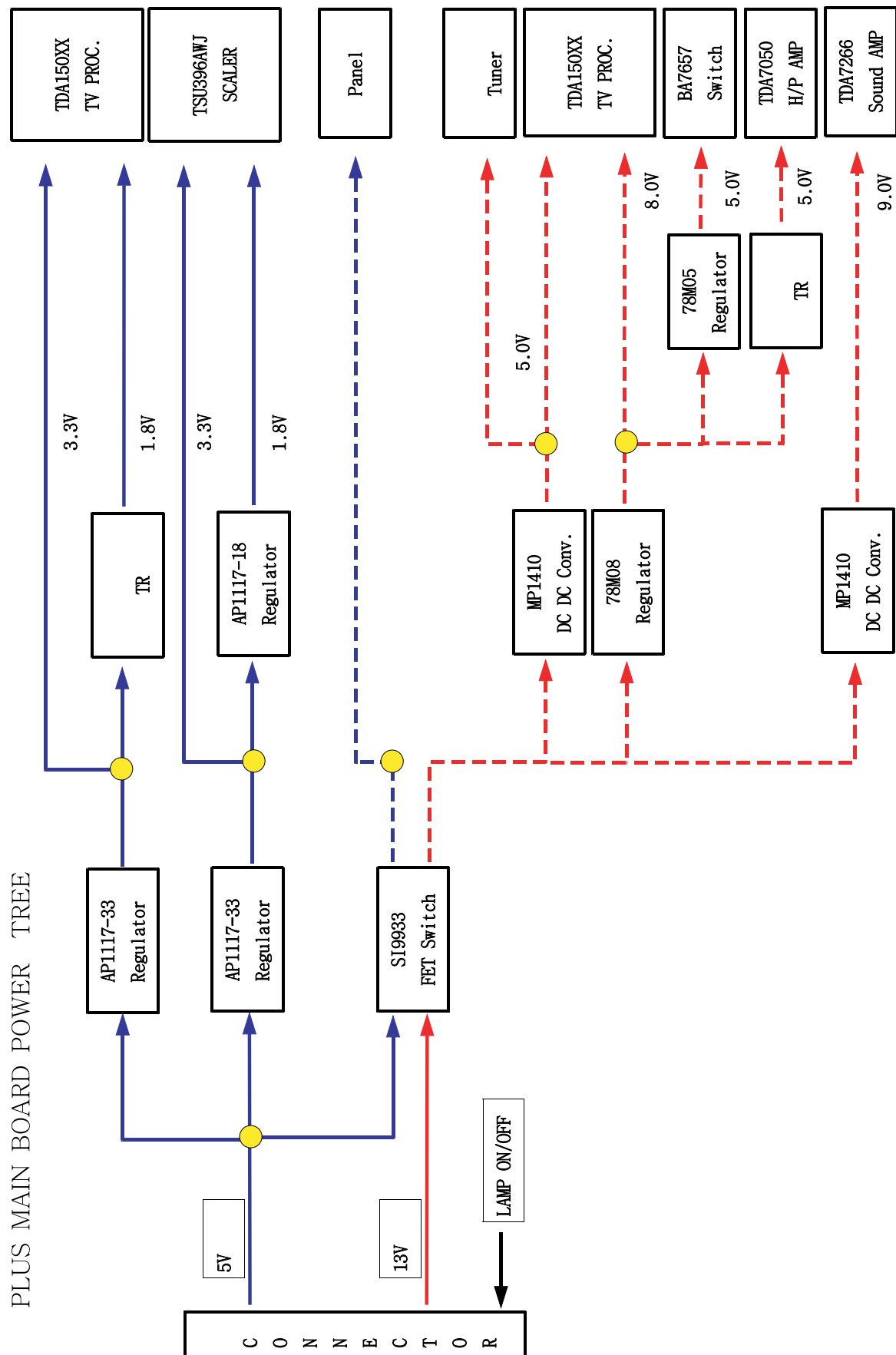
13 Circuit Descriptions

13-1 Overall Block Structure

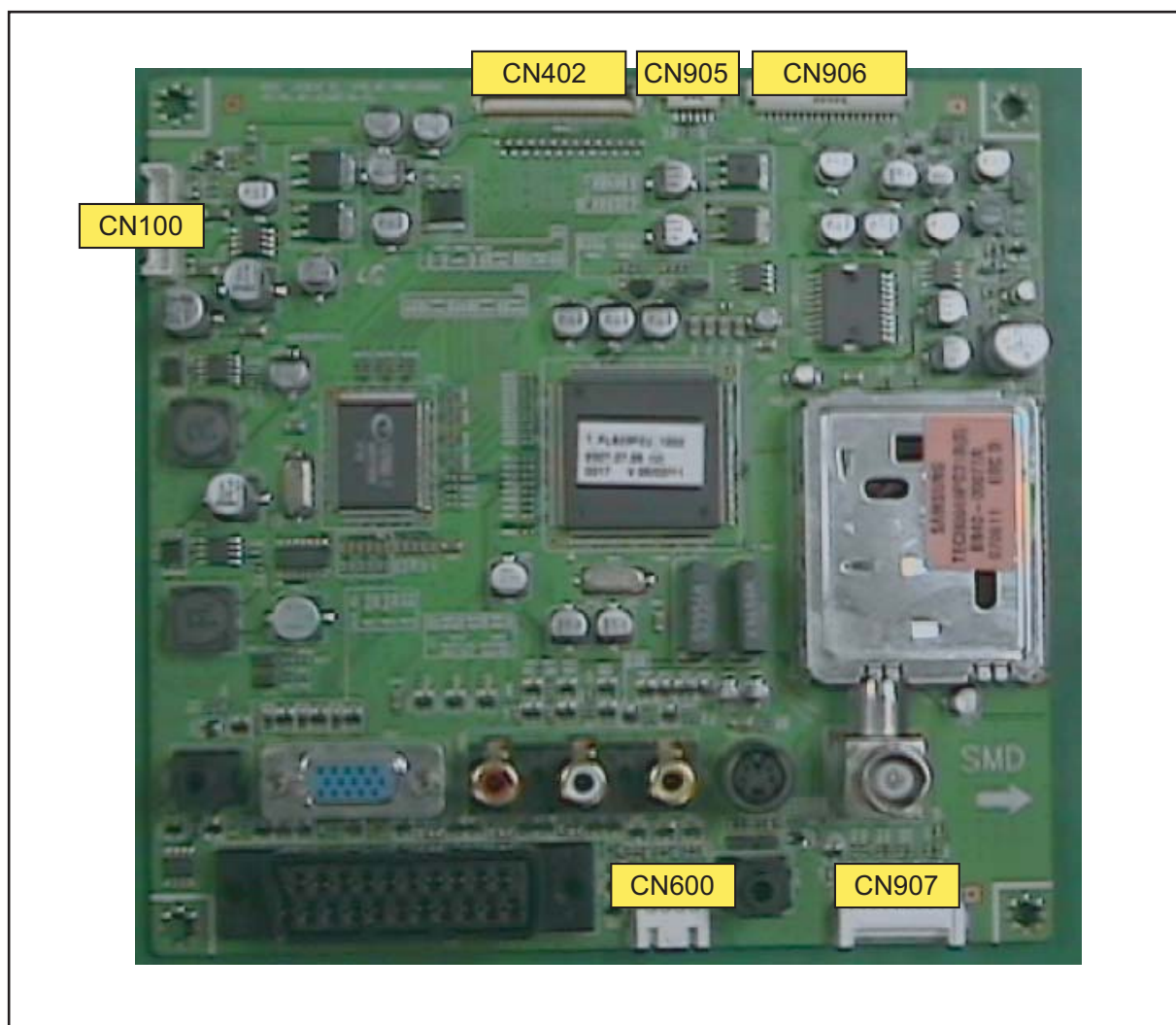


13-2 Partial Block Description

13-2-1 MAIN BOARD POWER TREE



13-2-2 WIRING DIAGRAM



- CN100(9P) : To IP Board
CN402(50P) : To 20" Panel
CN905(5P) : To Program Download Jig
CN906(20P) : To Scart
CN600(3P) : Speaker
CN907(12P) : To Function Board

13 Circuit Descriptions

CN402

20 Inch Panel TTL Interface

Pin No.	Main B'D	PANEL	Pin No.	Main B'D	PANEL
1	NC	NC	26	R1	R0
2	NC	NC	27	R2	GND
3	GND	NC	28	R3	G7
4	GND	GND	29	GND	G6
5	B0	GND	30	R4	G5
6	B1	5.0V	31	R5	G4
7	B2	5.0V	32	R6	GND
8	B3	5.0V	33	R7	G3
9	GND	5.0V	34	GND	G2
10	B4	GND	35	DCLK	G1
11	B5	HSYNC/NC	36	GND	G0
12	B6	VSYNC/NC	37	DE	GND
13	B7	GND	38	GND	B7
14	GND	DE	39	VSYNC/NC	B6
15	G0	GND	40	HSYNC/NC	B5
16	G1	DCLK	41	GND	B4
17	G2	GND	42	5.0V	GND
18	G3	R7	43	5.0V	B3
19	GND	R6	44	5.0V	B2
20	G4	R5	45	5.0V	B1
21	G5	R4	46	GND	B0
22	G6	GND	47	GND	GND
23	G7	R3	48	NC	GND
24	GND	R2	49	NC	NC
25	R0	R1	50	NC	NC

CN100

Inverter Power Interface

Pin No.	Main B'D	IP B'D
1	+13V	BL_EN
2	+13V	BL_BRT
3	GND	+5V
4	GND	+5V
5	GND	GND
6	+5V	GND
7	+5V	GND
8	BL_BRT	+13V
9	BL_EN	+13V

CN907

Function Board Interface

Pin No.	Main B'D	Function
1	KEY2	LED_GRN
2	KEY1	LED_RED
3	GND	NC
4	HP_R	3.3V
5	HP_L	IR
6	HP_IDENT	GND
7	GND	HP_IDENT
8	IR	HP_L
9	3.3V	HP_R
10	NC	GND
11	LED_RED	KEY1
12	LED_GRN	KEY2



11 Disassembly and Reassembly

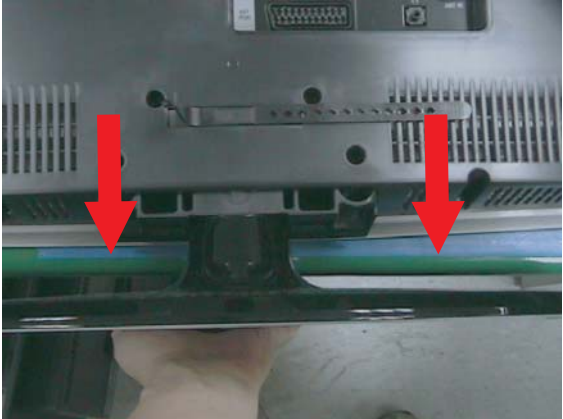


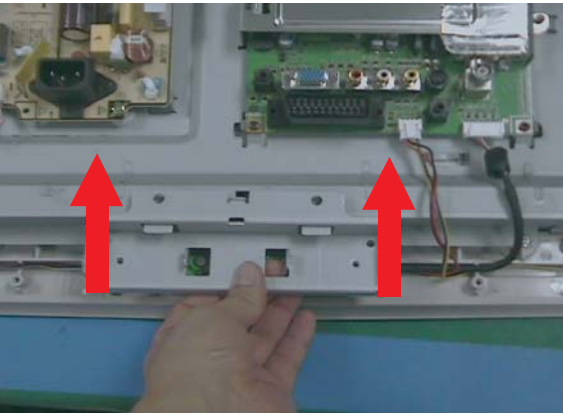
This section of the service manual describes the disassembly and reassembly procedures for the TFT-LCD TV.

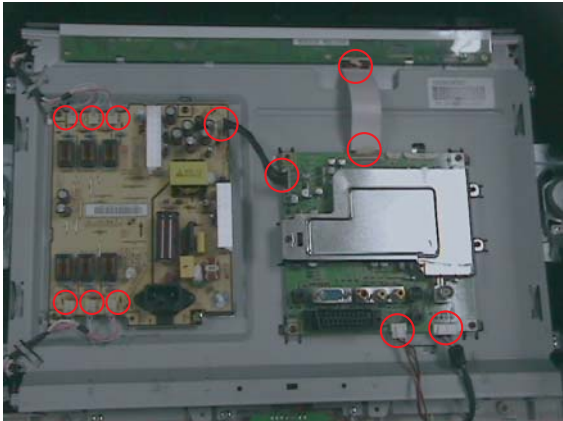
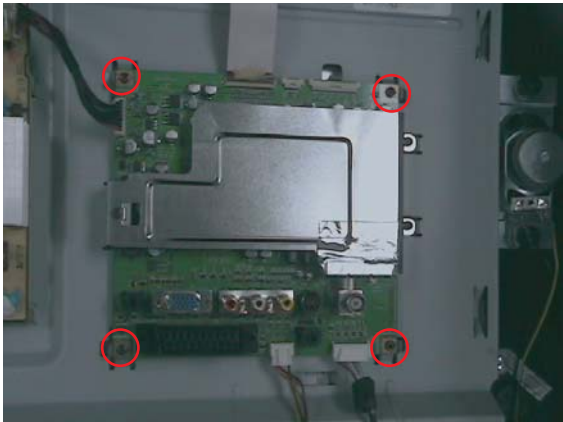
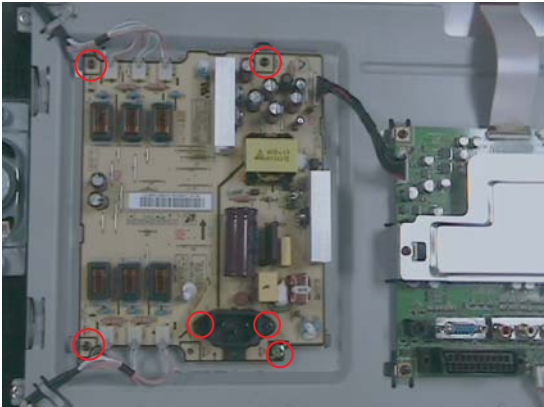
⚠ WARNING : This monitor contains electrostatically sensitive devices. Use caution when handling these components.

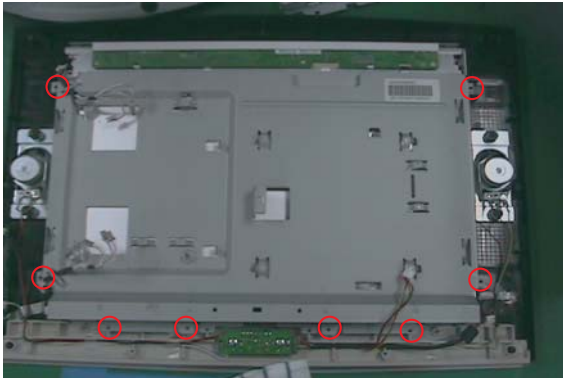
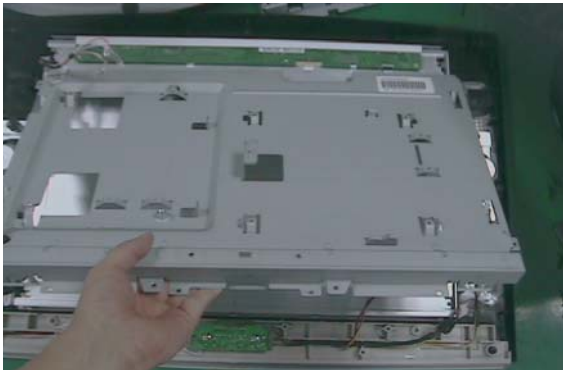
11-1 Disassembly


- ⚠ 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
2. Lift up the rear cover and remove the stand.	
	
3. Remove Screws from the stand BRKT and lift up the stand BRKT.	
	

Description	Picture Description
<p>4. Disconnect cable from the boards.</p>	
<p>5. Remove screws from the boards and lift up the boards.</p>	
	

Description	Description Picture
<p>6. Remove screws.</p>	
<p>7. Lift up the BRKT.</p>	

Description	Description Picture
	

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 LE22S81BX Parts List

Level	Loc. No.	Code No.	Description & Specification	Q'ty	SA/SNA
		LE22S81BX/XEH	LE22S81B,N40B/22S80-GJA,22,LCD-TV,HUNGAR		
0.1	M0001	BN90-01372B	ASSY COVER FRONT;LE22S81BX/XEC	1	S.N.A
..2	T0003	BN96-05965B	ASSY COVER P-FRONT;22S81,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	BN63-03796B	COVER-FRONT;22S81,EO,ABS+PMMA,HB,BK23,S/	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	M0146	BN96-04884G	ASSY BOARD P-POWER & IR;LE22S86BDX,CT500	1	S.A
...3	T0175	BN96-06066A	ASSY SPEAKER P;16ohm,4pin,3W,350/750	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.N.A
0.1	M0002	BN90-01373B	ASSY COVER REAR;LE22S81BX/XEC	1	S.N.A
..2	T0081	6002-001294	SCREW-TAPPING;BH,+, -,M4,L16,ZPC(BLK)	9	S.A
..2	M0013	BN96-05966B	ASSY COVER P-REAR;22S81,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	BN63-03806B	COVER-REAR;22S81,EO,HIPS,HB,BK500,Ready	1	S.N.A
...3	T0071	BN64-00671C	INLAY-TERMINAL;19R81,EO,PS SHEET,T0.5,Re	1	S.N.A
...3	T0064	BN65-00002A	CLAMPER CORE;BORDEAUX,LDPE,-, -,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	BN91-01757A	ASSY CHASSIS;LE22S81BX/*	1	S.N.A
..2	M0014	BN94-01464A	ASSY PCB MAIN-AMLCD;LE22S81BX/*	1	S.A
...3	JA3002	3701-001400	CONNECTOR-DSUB;15P,3R,FEMALE,STRAIGHT,Ni	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	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

6 Electrical Parts List

Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/S.N.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	M0107	BN63-01847A	SHIELD-COVER;ROME,SECC,T0.3,49.5,79.5,HE	1	S.N.A
...3	CN906	3707-001081	CONNECTOR-OPTICAL;STRAIGHT,SPDIF	1	S.A
...3	T0510	BN97-01812A	ASSY SMD-MAIN;BN97-01765A	1	S.N.A
...4	SUB05	0202-001477	SOLDER-CREAM;LST309-M,-,D20-45##,96.5Sn/	2.892	S.N.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	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
...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

Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/S.N.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	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	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	0505-001170	FET-SILICON;SI9933ADY-T1,P,-20V,3.4A,0.0	1	S.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	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	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	1203-002974	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	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	IC118	1204-002729	IC-VIDEO PROCESS;S4LF119X01,PBGA,208P,17	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

6 Electrical Parts List

[illegible]

[illegible]

6 Electrical Parts List

[illegible]

[illegible]

6 Electrical Parts List

[illegible]

Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/S.N.A
....4	R110	2007-000458	R-CHIP;18Kohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000669	R-CHIP;2Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000683	R-CHIP;3.3Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000821	R-CHIP;390ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000882	R-CHIP;4.7ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000882	R-CHIP;4.7ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000882	R-CHIP;4.7ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000882	R-CHIP;4.7ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000882	R-CHIP;4.7ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000882	R-CHIP;4.7ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000882	R-CHIP;4.7ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000882	R-CHIP;4.7ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-000939	R-CHIP;47Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000939	R-CHIP;47Kohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-000950	R-CHIP;47ohm,5%,1/4W,TP,3216	1	S.A
....4	R110	2007-000950	R-CHIP;47ohm,5%,1/4W,TP,3216	1	S.A
....4	R110	2007-000950	R-CHIP;47ohm,5%,1/4W,TP,3216	1	S.A
....4	R110	2007-000950	R-CHIP;47ohm,5%,1/4W,TP,3216	1	S.A
....4	R110	2007-000950	R-CHIP;47ohm,5%,1/4W,TP,3216	1	S.A
....4	R110	2007-000950	R-CHIP;47ohm,5%,1/4W,TP,3216	1	S.A
....4	R110	2007-000950	R-CHIP;47ohm,5%,1/4W,TP,3216	1	S.A
....4	R110	2007-000950	R-CHIP;47ohm,5%,1/4W,TP,3216	1	S.A
....4	R110	2007-001014	R-CHIP;51OHM,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.A
....4	R110	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	S.A
....4	R110	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	S.A
....4	RA5008	2011-000585	R-NETWORK;47ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA5009	2011-000585	R-NETWORK;47ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA5010	2011-000585	R-NETWORK;47ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA5011	2011-000585	R-NETWORK;47ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA5012	2011-000585	R-NETWORK;47ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA5013	2011-000585	R-NETWORK;47ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA5024	2011-000881	R-NETWORK;33ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA5026	2011-000881	R-NETWORK;33ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA5027	2011-000881	R-NETWORK;33ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA6006	2011-000881	R-NETWORK;33ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA6007	2011-000881	R-NETWORK;33ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA6008	2011-000881	R-NETWORK;33ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA6009	2011-000881	R-NETWORK;33ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA6010	2011-000881	R-NETWORK;33ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
....4	RA5007	2011-001001	R-NETWORK;0ohm,5%,1/16W,L,CHIP,8P,TP,3.2	1	S.A
....4	RA5001	2011-001011	R-NETWORK;10Kohm,5%,1/16W,L,CHIP,8P,TP,3	1	S.A
....4	RA5004	2011-001011	R-NETWORK;10Kohm,5%,1/16W,L,CHIP,8P,TP,3	1	S.A
....4	RA5017	2011-001011	R-NETWORK;10Kohm,5%,1/16W,L,CHIP,8P,TP,3	1	S.A
....4	RA5018	2011-001011	R-NETWORK;10Kohm,5%,1/16W,L,CHIP,8P,TP,3	1	S.A
....4	RA5025	2011-001011	R-NETWORK;10Kohm,5%,1/16W,L,CHIP,8P,TP,3	1	S.A

6 Electrical Parts List

[illegible]

[illegible]

6 Electrical Parts List

[illegible]

[illegible]

6 Electrical Parts List

[illegible]

Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/S.N.A
....4	C120	2203-005249	C-CER,CHIP;100nF,10%,50V,X7R,1608	1	S.A
....4	C120	2203-005249	C-CER,CHIP;100nF,10%,50V,X7R,1608	1	S.A
....4	C120	2203-005249	C-CER,CHIP;100nF,10%,50V,X7R,1608	1	S.A
....4	C120	2203-005384	C-CER,CHIP;4700nF,+80-20%,10V,Y5V,2012	1	S.A
....4	C120	2203-005384	C-CER,CHIP;4700nF,+80-20%,10V,Y5V,2012	1	S.A
....4	C120	2203-005384	C-CER,CHIP;4700nF,+80-20%,10V,Y5V,2012	1	S.A
....4	C120	2203-005384	C-CER,CHIP;4700nF,+80-20%,10V,Y5V,2012	1	S.A
....4	C120	2203-005384	C-CER,CHIP;4700nF,+80-20%,10V,Y5V,2012	1	S.A
....4	C120	2203-005384	C-CER,CHIP;4700nF,+80-20%,10V,Y5V,2012	1	S.A
....4	C120	2203-005384	C-CER,CHIP;4700nF,+80-20%,10V,Y5V,2012	1	S.A
....4	C120	2203-005384	C-CER,CHIP;4700nF,+80-20%,10V,Y5V,2012	1	S.A
....4	C120	2203-005384	C-CER,CHIP;4700nF,+80-20%,10V,Y5V,2012	1	S.A
....4	C120	2203-005533	C-CER,CHIP;1000nF,20%,6.3V,X7R,TP,1608	1	S.A
....4	C120	2203-005533	C-CER,CHIP;1000nF,20%,6.3V,X7R,TP,1608	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C120	2203-006361	C-CER,CHIP;10000nF,10%,10V,X5R,2012	1	S.A
....4	C1003	2402-001081	C-AL,SMD;100uF,20%,25V,WT,TP,8.3x8.3x10	1	S.A
....4	C1040	2402-001081	C-AL,SMD;100uF,20%,25V,WT,TP,8.3x8.3x10	1	S.A
....4	C1046	2402-001081	C-AL,SMD;100uF,20%,25V,WT,TP,8.3x8.3x10	1	S.A
....4	C1059	2402-001081	C-AL,SMD;100uF,20%,25V,WT,TP,8.3x8.3x10	1	S.A
....4	C1088	2402-001081	C-AL,SMD;100uF,20%,25V,WT,TP,8.3x8.3x10	1	S.A
....4	C1065	2402-001086	C-AL,SMD;100UF,20%,16V,WT,TP,6.6X6.6X5.3	1	S.A
....4	C1085	2402-001086	C-AL,SMD;100UF,20%,16V,WT,TP,6.6X6.6X5.3	1	S.A
....4	C1113	2402-001086	C-AL,SMD;100UF,20%,16V,WT,TP,6.6X6.6X5.3	1	S.A
....4	C2070	2402-001086	C-AL,SMD;100UF,20%,16V,WT,TP,6.6X6.6X5.3	1	S.A
....4	C1123	2402-001128	C-AL,SMD;100##F,20%,16V,-,TP,6.3X5.7mm	1	S.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	C6072	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	C6081	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	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

6 Electrical Parts List

Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/S.N.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	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	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	2703-000398	INDUCTOR-SMD;10uH,10%,3225	1	S.A
....4	T0052	2703-000417	INDUCTOR-SMD;220uH,5%,3225	1	S.A
....4	T0052	2703-001426	INDUCTOR-SMD;680uH,20%,7070	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
....4	X202	2801-003667	CRYSTAL-SMD;14.31818MHz,30ppm,28-AAN,16p	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	3301-001163	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

Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/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	3301-001176	BEAD-SMD;80ohm,2012,TP,-,-	1	S.N.A
...4	T0568	3301-001236	BEAD-SMD;60ohm,1608,-,-,-	1	S.N.A
...4	T0568	3301-001236	BEAD-SMD;60ohm,1608,-,-,-	1	S.N.A
...4	T0568	3301-001236	BEAD-SMD;60ohm,1608,-,-,-	1	S.N.A
...4	T0568	3301-001324	BEAD-SMD;15ohm,2012,600mA,TP,,,0.1ohm	1	S.A
...4	T0568	3301-001324	BEAD-SMD;15ohm,2012,600mA,TP,,,0.1ohm	1	S.A
...4	T0568	3301-001324	BEAD-SMD;15ohm,2012,600mA,TP,,,0.1ohm	1	S.A
...4	T0568	3301-001404	BEAD-SMD;30ohm,2012,TP,15.9OHM/30MHz	1	S.A
...4	JA3001	3701-001367	CONNECTOR-HDMI;19P,2R,FEMALE,SMD,AU	1	S.A
...4	M0018	BN97-01748B	ASSY MICOM;T-JSM22PEUMD-1005.1.GJA22SEN,	1	S.N.A
....5	IC115	1107-001709	IC-FLASH MEMORY;MX25L1605A,16Mbit,2Mx8,S	1	S.A
...4	T0087	1203-002842	IC-POSIFIXED REG.;AP1117D-33A,TO-252,3P	1	S.A
...4	R110	2007-000124	R-CHIP;2.2Kohm,5%,1/10W,TP,1608	1	S.A
...4	R110	2007-000124	R-CHIP;2.2Kohm,5%,1/10W,TP,1608	1	S.A
...4	RA6001	2011-000686	R-NETWORK;56ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
...4	RA6002	2011-000686	R-NETWORK;56ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
...4	RA6003	2011-000686	R-NETWORK;56ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
...4	RA6004	2011-000686	R-NETWORK;56ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
...4	RA6005	2011-000686	R-NETWORK;56ohm,5%,1/16W,L,CHIP,8P,TP,3.	1	S.A
...4	Q409	0505-002169	FET-SILICON;Si4435BDY-T1-E3,P,-30V,-9.1A	1	S.N.A
...4	T0052	2703-001717	INDUCTOR-SMD;1.2uH,5%,3225	1	S.A
...4	R110	2007-000087	R-CHIP;6.8Kohm,5%,1/10W,TP,1608	1	S.A
...4	R110	2007-000087	R-CHIP;6.8Kohm,5%,1/10W,TP,1608	1	S.A
...4	R110	2007-000093	R-CHIP;20Kohm,5%,1/10W,TP,1608	1	S.A
...4	R110	2007-000093	R-CHIP;20Kohm,5%,1/10W,TP,1608	1	S.A
...4	Q5012	0501-000669	TR-SMALL SIGNAL;KTA1505Y,P,NP,150mW,SOT-2	1	S.A
...4	Q1001	0501-000342	TR-SMALL SIGNAL;KSC1623-Y,NPN,200mW,SOT-	1	S.A
...4	Q1005	0501-000342	TR-SMALL SIGNAL;KSC1623-Y,NPN,200mW,SOT-	1	S.A
...4	Q2001	0501-000342	TR-SMALL SIGNAL;KSC1623-Y,NPN,200mW,SOT-	1	S.A
...4	Q2002	0501-000342	TR-SMALL SIGNAL;KSC1623-Y,NPN,200mW,SOT-	1	S.A
...4	Q2003	0501-000342	TR-SMALL SIGNAL;KSC1623-Y,NPN,200mW,SOT-	1	S.A
...4	Q2004	0501-000342	TR-SMALL SIGNAL;KSC1623-Y,NPN,200mW,SOT-	1	S.A
...4	Q2005	0501-000342	TR-SMALL SIGNAL;KSC1623-Y,NPN,200mW,SOT-	1	S.A
...4	Q2006	0501-000342	TR-SMALL SIGNAL;KSC1623-Y,NPN,200mW,SOT-	1	S.A
...4	Q3002	0501-000342	TR-SMALL SIGNAL;KSC1623-Y,NPN,200mW,SOT-	1	S.A
...4	Q4003	0501-000342	TR-SMALL SIGNAL;KSC1623-Y,NPN,200mW,SOT-	1	S.A
...4	Q5001	0501-000342	TR-SMALL SIGNAL;KSC1623-Y,NPN,200mW,SOT-	1	S.A
...4	Q5005	0501-000342	TR-SMALL SIGNAL;KSC1623-Y,NPN,200mW,SOT-	1	S.A
...4	T0077	BN41-00934B	PCB MAIN;JASMINE READY,FR-4,4,0.0,1.6T,1	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		0202-001557	SOLDER-CREAM;LST57-A,D38-63,42SN/57BI/1A	11	S.N.A
...3	CIS3	BN40-00079A	TUNER;TCPW3001PD32S(H),TCPW3001PD32S(H),	1	S.A
...3	T0245	0202-001608	SOLDER-WIRE FLUX;LFC7-107,D0.8,99.3Sn/0.	0.25	S.N.A
0.1		BN91-01758A	ASSY SHIELD-STN;LE22S81BX/*	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	T0297	BN39-00953D	CABLE FORM CONN.COAX;LE22S86BD,UL1571#30	1	S.A
..2	M0081	6003-000115	SCREW-TAPTITE;BH,+,B,M3,L6,ZPC(BLK),SWRC	4	S.A
..2	T0447	BN96-05967B	ASSY BRACKET P-PANEL;-22S81,EO(Ready),-	1	S.N.A
...3		AA60-00091A	SPACER;-FELT,150X10,-,-,BLK,T0.35,-,-	1	S.N.A
...3	M0131	AA63-01071A	GASKET;PO24FS,CONDUCTIVE FABRIC,2,15,90,	1	S.N.A
...3	M0114	BN61-02500A	HOLDER-WIRE;NYLON6.6,NATURAL	3	S.N.A
...3	M0107	BN61-03426A	BRACKET-PCB;22 JASMINE,SECC,T1.0	1	S.N.A
...3	M0131	BN63-03550A	GASKET;BORDEAUX PLUS,Conductive Fabric,1	4	S.N.A

6 Electrical Parts List

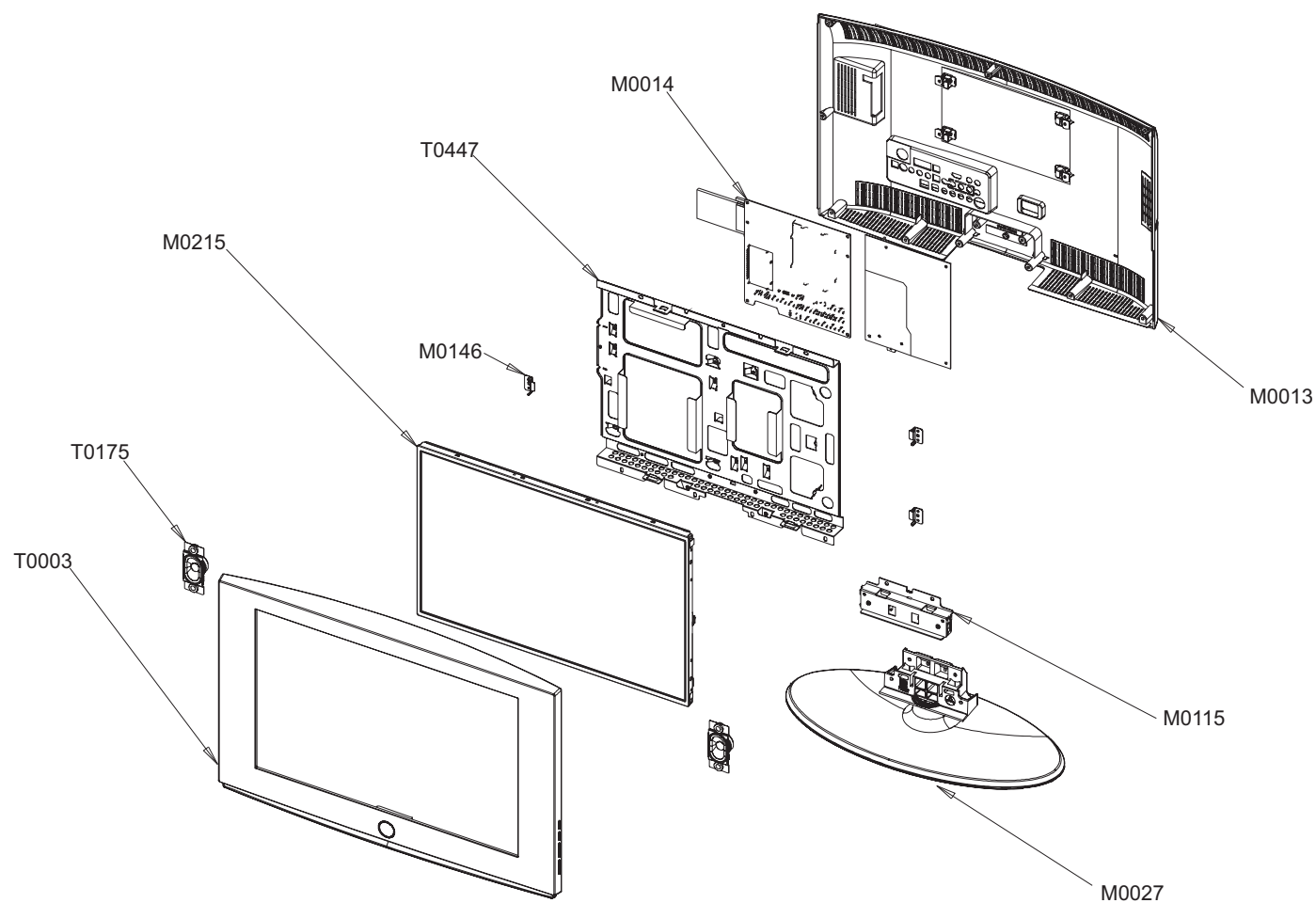
Level	Loc. No.	Code No.	Description & Specification	Q'ty	S.A/S.N.A
...3	M0131	BN63-04078A	GASKET;LE22S86BDX/XEC,Conductive Fabric,	1	S.N.A
...3	M0131	BN63-04079A	GASKET;LE22S86BDX/XEC,Conductive Fabrics	1	S.N.A
...3	M0081	6003-001188	SCREW-TAPTITE;BH,+, -,B,M4,L10,ZPC(WHT),S	2	S.N.A
...3	M0115	BN61-02931A	BRACKET-STAND LINK;JASMINE 26,SECC,T1.6	1	S.A
..2	M0114	BN61-02500A	HOLDER-WIRE;NYLON6.6,NATURAL	2	S.N.A
0.1	M0003	BN92-02862B	ASSY BOX;22S81,EQ(XEH),-,-,-	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	BN92-02908A	ASSY LABEL;LE22S81BX/*	1	S.N.A
0.1	M0045	BN92-02909B	ASSY ACCESSORY;LE22S81BX/XEH	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	T0074	BN59-00609A	REMOCON;JASMINE / LILY,TM86,samsung 24p+	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		BN68-00514E	MANUAL FLYER-00,WARRANTY CARD;comm,Samsu	1	S.N.A
..2	T0511	BN68-01177J	MANUAL USERS;COMM,SAMSUNG,10Language,E,E	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

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 LE22S81BX Exploded View

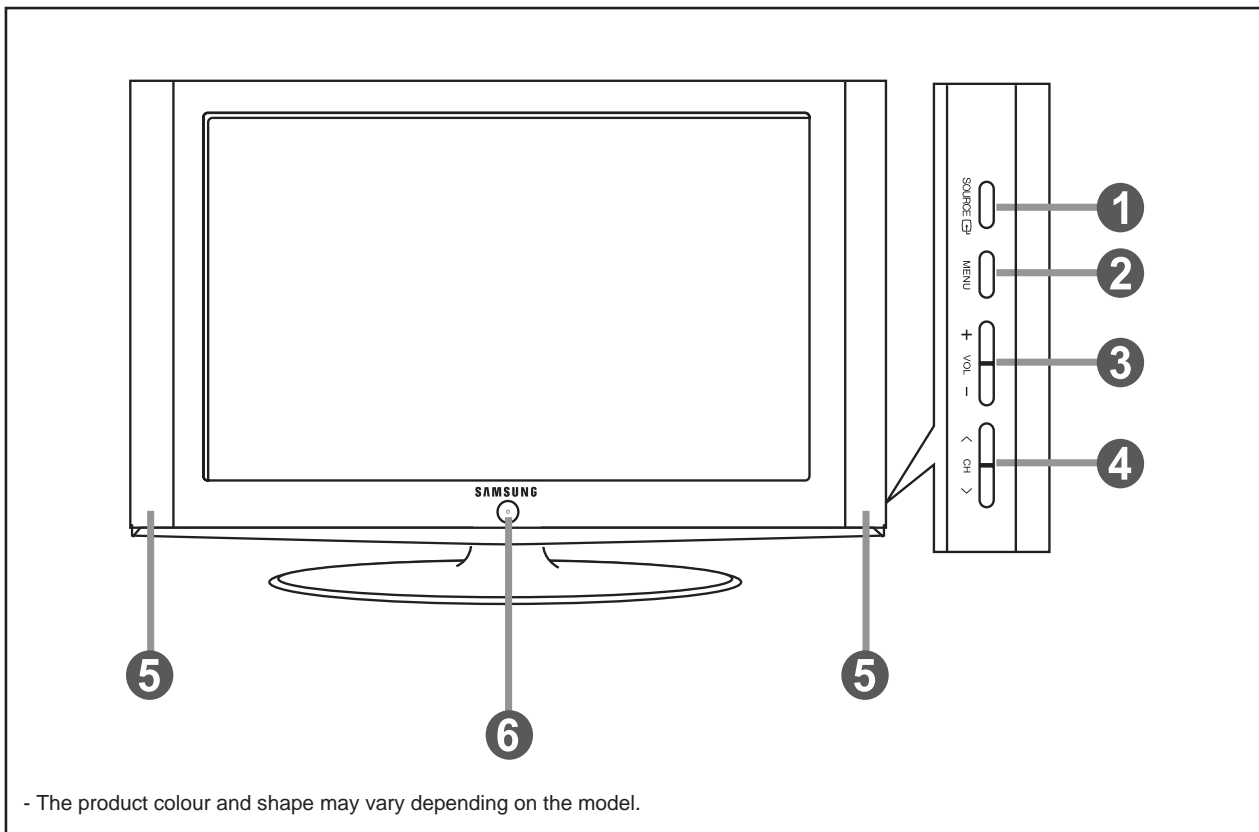


5-2 LE22S81BX Parts list

Location	Code.No	Item & Specification	Q'ty	SA/SNA	Remark
T0003	BN96-05965B	ASSY COVER P-FRONT;22S81,EO,,ABS+PMMA,HB	1	S.A	
T0175	BN96-06066A	ASSY SPEAKER P;16ohm,4pin,3W,350/750	1	S.N.A	
M0215	BN07-00346A	LCD-PANEL;LTM220M1-L01,Doppler,8BIT,493.	1	S.A	
T0447	BN96-05967B	ASSY BRACKET P-PANEL;- ,22S81,EO(Ready),-	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;23,26S81,ABS+PMMA,HB,B	1	S.A	
M0013	BN96-05966B	ASSY COVER P-REAR;22S81,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 - PC).


In the on-screen menu, use this button as you use the **ENTER**  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

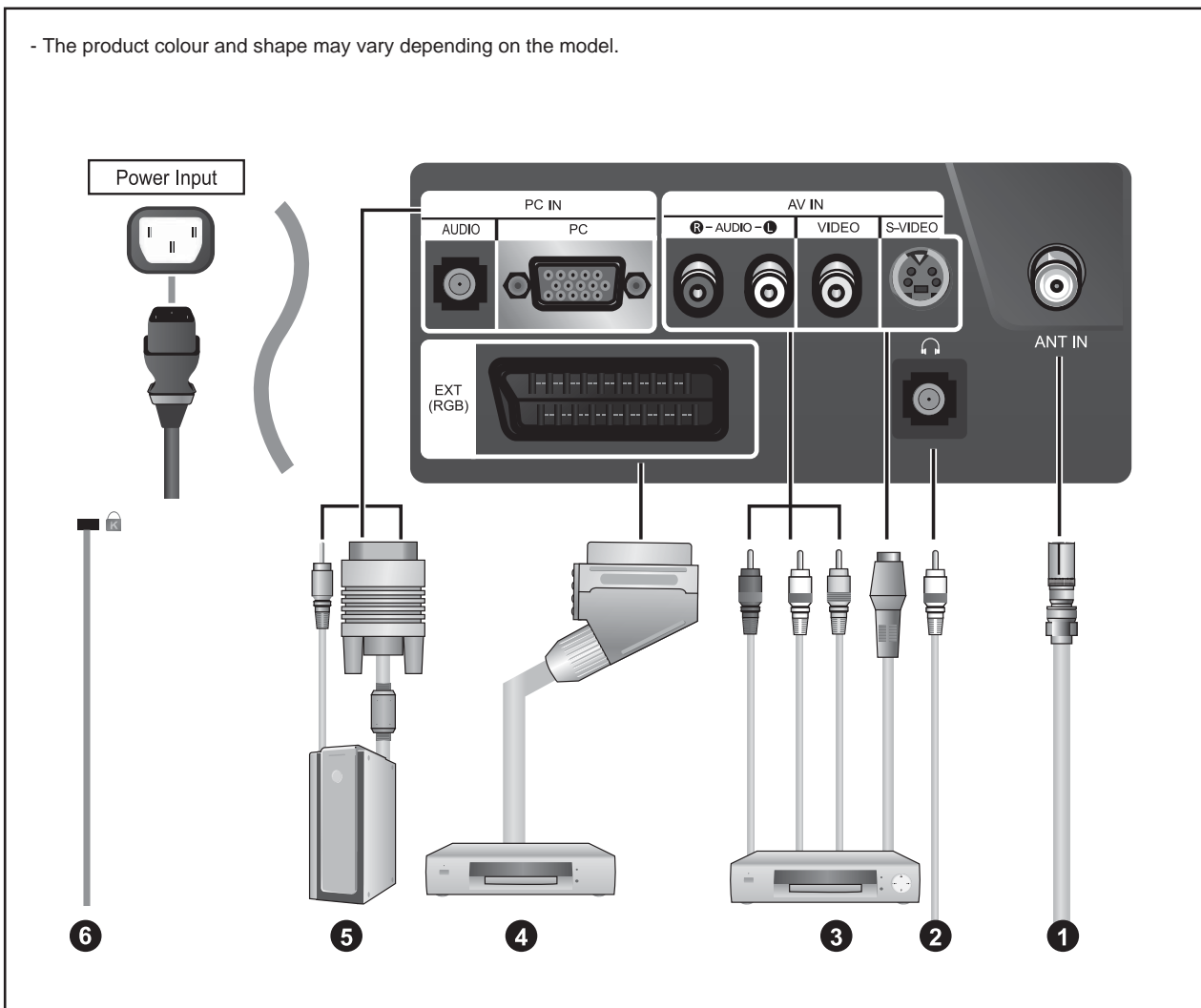
and turns off when the power is on and lights up in stand-by mode. Remote Control Sensor Aim the remote control towards this spot on the TV.

Remote Control Sensor

Aim the remote control towards this spot on the TV.

10-2 Connection Panel

- The product colour and shape may vary depending on the model.



- 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 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

3. Connecting External A/V Devices

- Connect RCA (optional) or S-VIDEO cable (optional) to an appropriate external A/V device such as VCR, DVD or Camcorder.
- Connect RCA audio cables (optional) to "L - AUDIO - R" 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 (2) on the rear of your set.
While the head phone is connected, the sound from the built-in speakers will be disabled.

4. Connecting Set-Top Box, VCR or DVD

- Connect the VCR or DVD SCART cable (optional) to the SCART connector of the VCR or DVD.
- If you wish to connect both the Set-Top Box and VCR (or DVD), you should connect the Set-Top Box to the VCR (or DVD) and connect the VCR (or DVD) to your set.

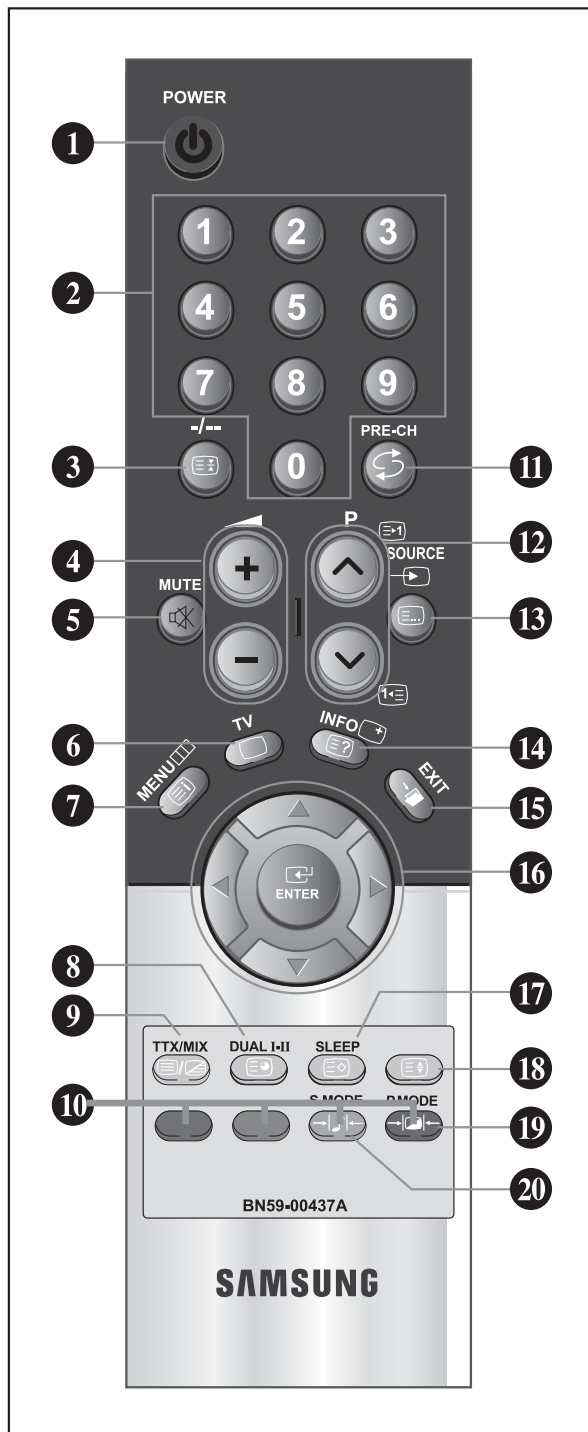
5. Connecting Computer

- 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.

6. 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



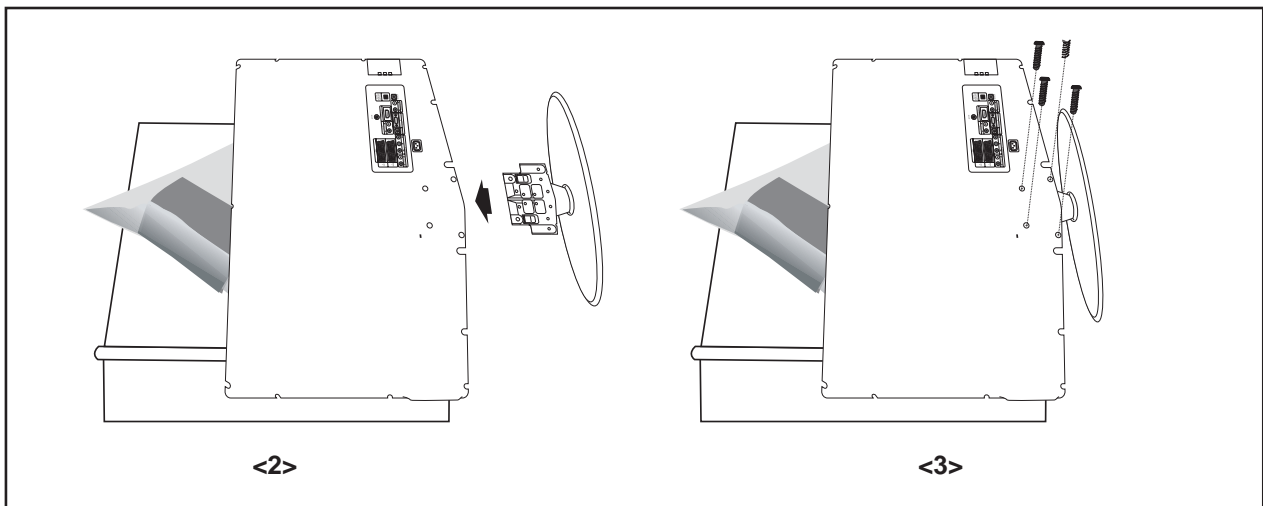
1. Television Standby button
2. Number buttons for direct channel access
3. One/Two-digit channel selection
4. ⊕ Volume increase
⊖ Volume decrease
5. Temporary sound switch-off
6. Selects the TV mode dire
7. Displays the main on-screen menu
8. Sound effect selection
11. Previous channel
12. P ⊙ : Next channel
P ⊙ : Previous channel
13. Available source selection
14. Use to see information on the current broadcast
15. Exit the on-screen menu
16. Control the cursor in the menu
17. Automatic Power-off
19. Picture effect selection
20. Sound mode selection

Teletext Functions

3. Teletext hold
6. Exit from the teletext display
7. Teletext index
8. Teletext sub page
9. Teletext display/mix both teletext information
12. P ⊙ : Teletext next page
P ⊙ : Teletext previous page
13. Teletext mode selection (LIST/FLOF)
14. Teletext reveal
17. Teletext store
18. Teletext size selection

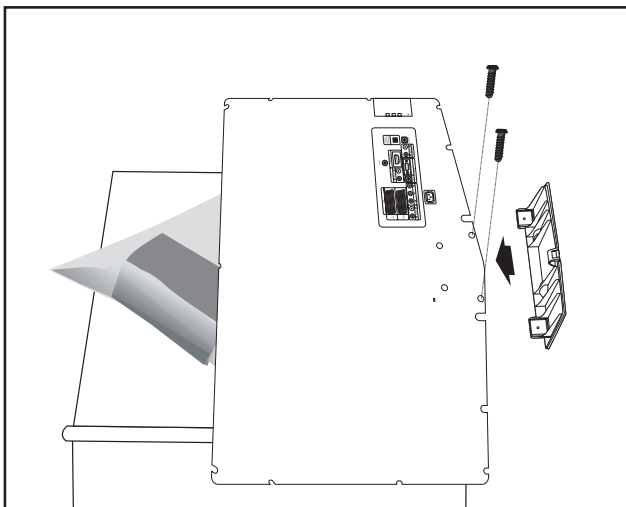
- ▶ The performance of the remote control may be affected by bright light.
- ▶ For details, refer to further instructions.

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.
 - ▶ The stand is installed for models with the screen size of 40 inch and above.

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.

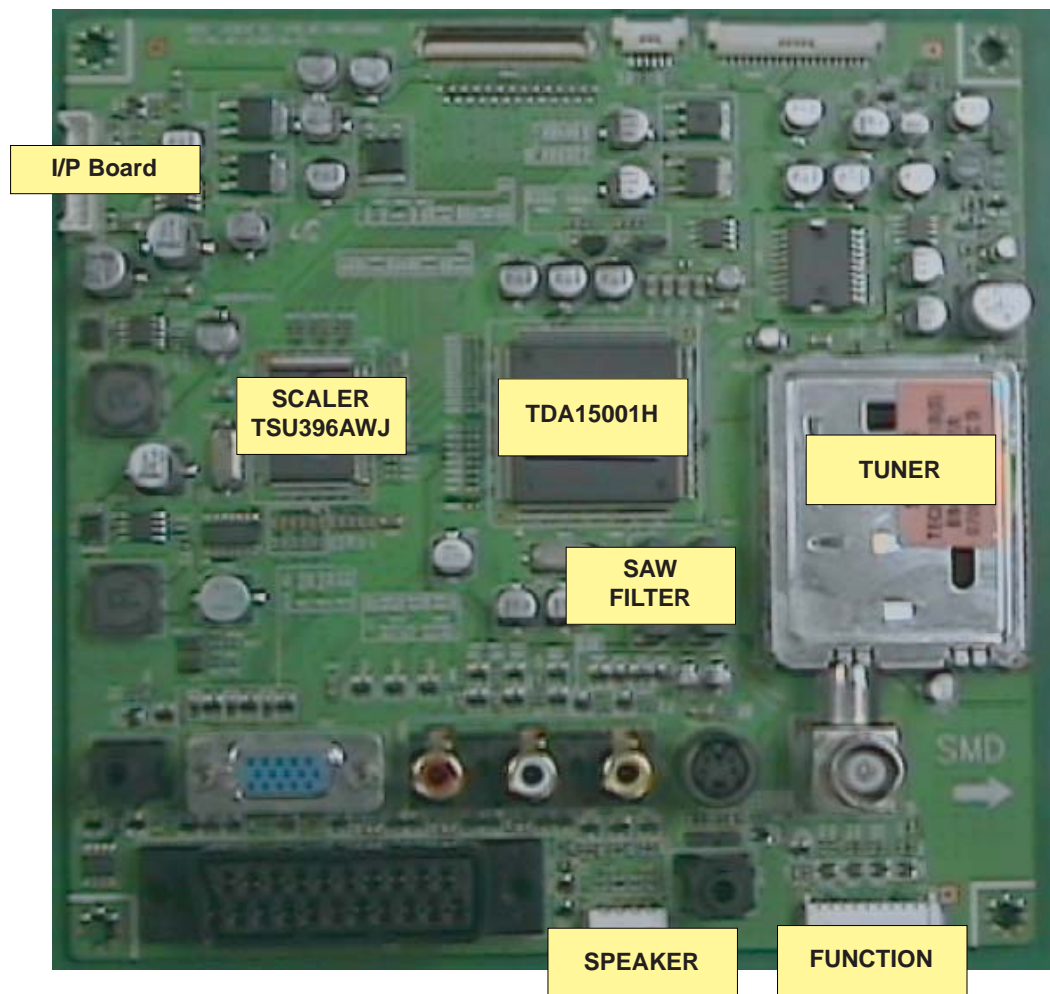
Samsung Electronics is not responsible for any damage to the product or injury to yourself or others if you elect to install the TV on your own.

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

Memo

12 PCB Diagram

12-1 Main PCB Diagram



Memo

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).

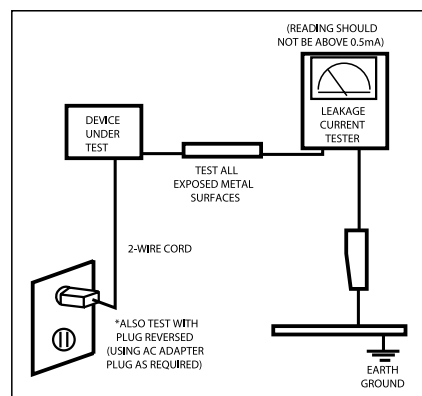


Figure 1-1. Leakage Current Test Circuit

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

- Easy-to-use remote control
- Easy-to-use on-screen menu system
- Automatic timer to turn the TV on and off
- Adjustable picture and sound settings that can be stored in the TV's memory
- Automatic channel tuning for up to 194 channels. (Air : 69 , STD : 125)
- A special filter to reduce or eliminate reception problems
- Fine tuning control for the sharpest picture possible
- A built-in multi-channel sound decoder for stereo and bilingual listening
- Built-in, dual channel speakers
- Headphone jack for private listening

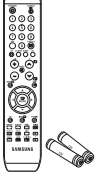

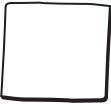

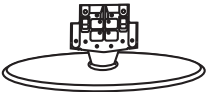
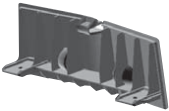
2-2 LE20S81BX Specifications

Item	Description	
LCD Panel	LCD Panel : TFT-LCD Panel, RGB Vertical stripe, normally WHITE, 20-Inch viewable, 0.51(H) x 0.51(V)mm Pixel Pitch	
Scanning Frequency	Horizontal : 28~33 kHz / Vertical : 50~75Hz	
Display Colors	16.2M color	
Maximum Resolution	Horizontal : 640 Pixels Vertical : 480 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	30 MHz	
Active Display Horizontal/Vertical	408 mm / 306 mm	
AC power voltage & Frequencya	AC 220 ~ 240V, 50 ~ 60 Hz	
Power Consumption	55 W < 3W	
Dimensions(W x D x H) Set	573.8 x 70 x 467.8 mm_After installation Stand 573.8 x 70 x 427.9 mm_Without stand	
Weight Set(After installation Stand)	8kg (17.64lbs)	
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 -Headphone Out : 10 mW MAX -Output Frequency : RF : 80 Hz ~ 15 kHz AV : 80 Hz ~ 20 kHz	

2-3 Spec Comparison

Model	LE20S81BX	LE26R51B / LE32R51B / LE40R51B
Design		
Frequency		
Horizontal	28 ~ 33 kHz	30 ~ 61 kHz
Vertical	60 ~ 75 Hz	60 ~ 75 Hz
Display Color	16,194,277 colors	16,777,216 colors
PC Resolution		
Maximum mode	640 x 480 @ 60 Hz	WXGA, 1360 x 768 @ 60 Hz
Input Signal		
Sync Signal	H/V Separate, TTL, P. or N.	H/V Separate, TTL, P. or N.
Video Signal	0.7 Vp-p @ 75ohm	0.7 Vp-p @ 75ohm
Power Consumption		
Normal	55W	140W / 184W / 285W
Power Saving	< 3W	< 1W

2-4 Option Specification

Item	Item Name	Code.No	Remark
	Remote Control & Batteries (AAA x 2)	BN59-00437A	
	Power Cord	3903-000042	
	Cleaning Cloth	BN63-01798A	
	Stand Screw x 4	6002-001294	
	Stand	BN90-01377A	
	Cover-Bottom	BN63-03836A	

14 Reference Information

14-1 Technical Terms

-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 1920 x 1200 , this means the screen is composed of 1920 horizontal dots (horizontal resolution) and 1200 vertical lines (vertical resolution).

-A2

This system uses two carriers to transmit voice data. Countries such as South Korea and Germany use this system.

-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 Scart

No	PIN
1	Sound R out
2	Sound R In
3	Sound L out
4	GND
5	GND
6	Sound L In
7	Cb
8	ID
9	GND
10	NC
11	Y
12	NC
13	GND
14	GND
15	Cr
16	BL In
17	GND
18	GND
19	Video Out
20	Video In
21	GND

14-2-3 A/V

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

14-2-2 S-Video

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

14-2-4 D-SUB

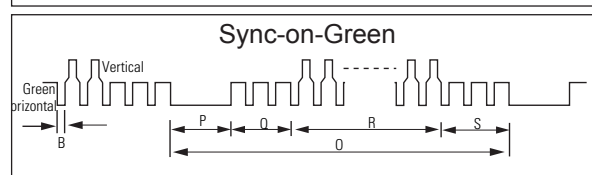
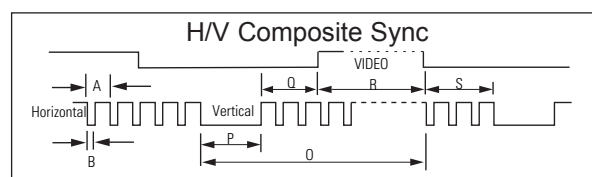
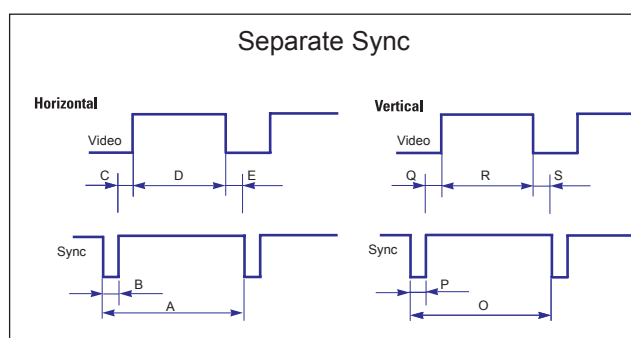
Pin	Separate
1	Red
2	Green
3	Blue
4	GND
5	GND (DDC Return)
6	GND-Red
7	GND-Green
8	GND-Blue
9	No Connection
10	GND-Sync / Self Test
11	GND
12	DDC Data
13	H - Sync
14	V - Sync
15	DDC Clock

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.

Table 2-1 Timing Chart

Mode Timing	IBM		VESA				
	VGA2/ 70 Hz 720 x 400	VGA3/ 60 Hz 640 x 480	640/75 Hz, 60Hz, 72Hz 640 x 480	800/75 Hz, 56Hz, 60Hz, 72Hz 800 x 600	1024/60Hz 1024 x 768	1024/75Hz 1024 x 768	1280/75Hz, 50Hz 1280x1024
fH (KHz)	31.469	31.469	37.500	46.875	48.363	60.023	79.976
A μ sec	31.777	31.778	26.667	21.333	20.677	16.660	12.504
B μ sec	3.813	3.813	2.032	1.616	2.092	1.219	1.067
C μ sec	1.589	1.589	3.810	3.232	2.462	2.235	1.837
D μ sec	26.058	26.058	20.317	16.162	15.754	13.003	9.481
E μ sec	0.318	0.318	0.508	0.323	0.369	0.203	0.119
fV (Hz)	70.087	59.940	75.000	75.000	60.004	75.029	75.025
O msec	14.268	16.683	13.333	13.333	16.666	13.328	13.329
P msec	0.064	0.064	0.080	0.064	0.124	0.050	0.038
Q msec	0.858	0.794	0.427	0.448	0.600	0.466	0.475
R msec	13.155	15.761	12.800	12.800	15.880	12.795	12.804
S msec	0.191	0.064	0.027	0.021	0.062	0.017	0.013
Clock Freq. (MHz)	28.322	25.175	31.500	49.500	75.000	78.750	135.000
Polarity H.Sync	Negative	Negative	Negative	Positive	Negative	Positive	Positive
V.Sync	Positive	Negative	Negative	Positive	Negative	Positive	Positive
Remark	Separate	Separate	Separate	Separate	Separate	Separate	Separate



A : Line time total
C : Back porch
E : Front porch

B : Horizontal sync width
D : Active time

O : Frame time total
Q : Back porch
S : Front porch

P : Vertical sync width
R : Active time

14-4 Preset Timing Modes

If the signal transferred from the computer is the same as the following Preset Timing Modes, the screen will be adjusted automatically. However, if the signal differs, the screen may go blank while the power LED is on. Refer to the video card manual and adjust the screen as follows.

Mode	Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock Frequency (MHz)	Sync Polarity (H/V)
IBM	640 X 350	31.469	70.086	25.175	+ / -
	720 X 400	31.469	70.087	28.322	- / +
	640 X 480	31.469	59.940	25.175	- / -
VESA	640 X 480	35.000	70.000	28.560	- / -
	640 X 480	37.861	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	+ / +
	800 X 600	43.750	70.000	45.500	- / -
	1024 X 768	48.363	60.004	65.000	- / -
	1024 X 768	56.476	70.069	75.000	- / -
	1024 X 768	56.672	72.000	78.434	- / -
	1024 X 768	60.023	75.029	78.750	+ / +
	1360 X 768	47.712	60.015	85.800	+ / +

14 Reference Information

14-5 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
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

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
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
SEC	LTA260W2-L01	BN07-00185A	SPZ		AMLCD 26" 16:9 new Panel
SEC	LTM240M1-L01	BN07-00195A	SPH		24" panel with high brightness development
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

14 Reference Information

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
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	LTM190M2-L01	BN07-00227A	STZ		AMLCD 19" TN Wide new Panel Code
SEC	LTM201UX-L01	BN07-00249A	STZ		AMLCD 20.1" TN new Panel Code
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
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		-

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
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	TM220WX-71N31	BN07-00125A	RR		"Development TORISAN 22" TV PANEL (ZPD)"
TORISAN	TM220WX-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	TX43DVCOAB	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"
HYUNDAI	HT170EX1-100	BN07-00240A	DTZ		17" EX compatible Hydis Slim panel development
ACER	L170E3	BN07-00044A	AA		TN(ADT)
ACER	M170EN05	BN07-00076A	AB		AU 17" Panel (Narrow & slim design)

14 Reference Infomation

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
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	M190EN04 V7	BN07-00248A	ATZ		AU Monitor 19" TN Glare ZPD new code derivation
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

9-1 Power_Function Schematic Diagram



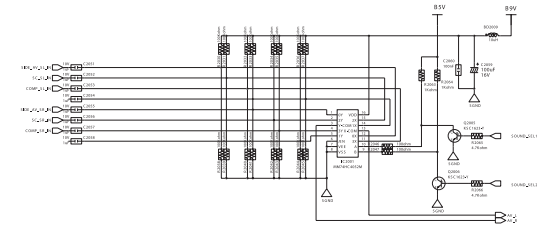
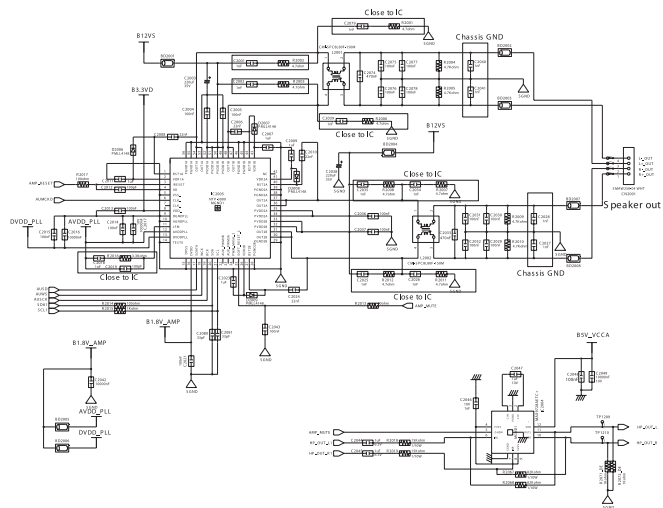
9 Schematic Diagrams

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

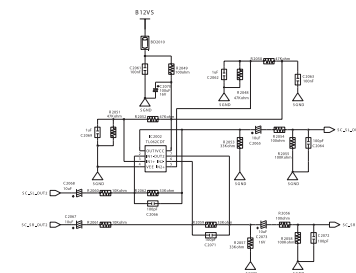
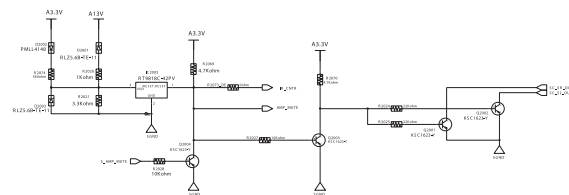
9-2 Sound Processing Schematic Diagram

Reference : 2001~

SOUND AMP



POP NOISE SOLUTION

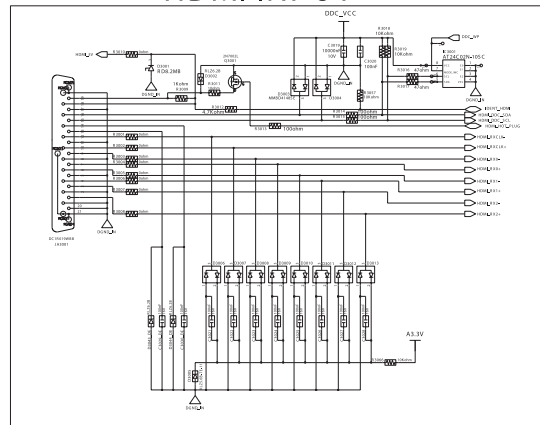


-This Document can not be used without Samsung 's authorization.

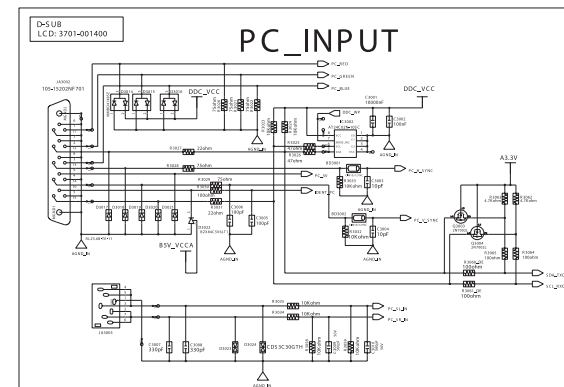
9-3 Input & Output jack I Schematic Diagram

Reference : 3001~

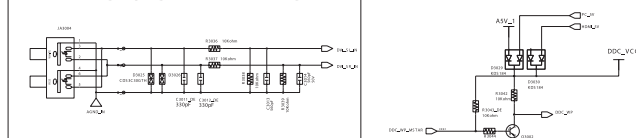
HDMI INPUT



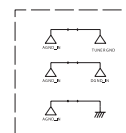
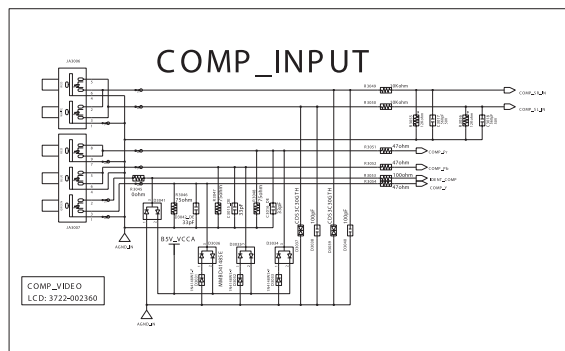
PC_INPUT



DVI SOUND INPUT



COMP_INPUT

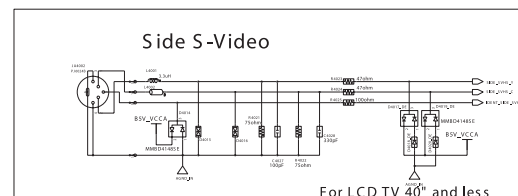
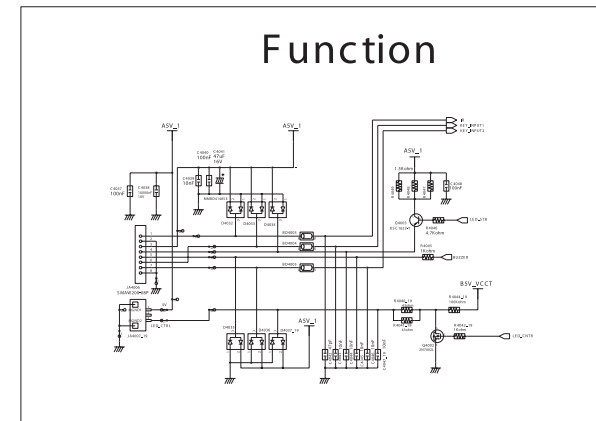
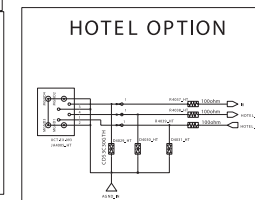
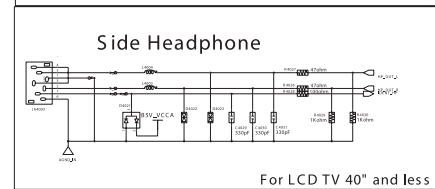
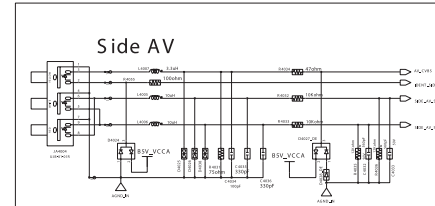
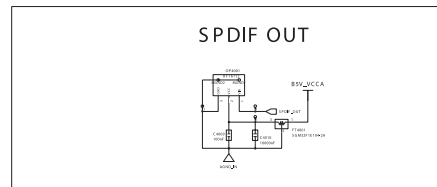
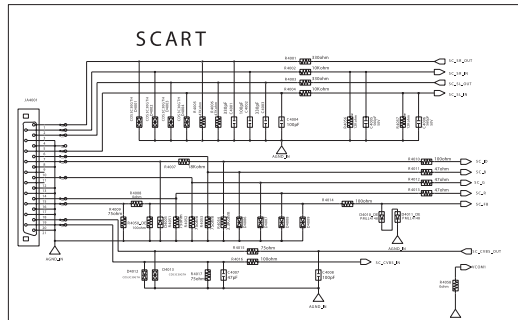


9 Schematic Diagrams

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

9-4 Input & Output jack II Schematic Diagram

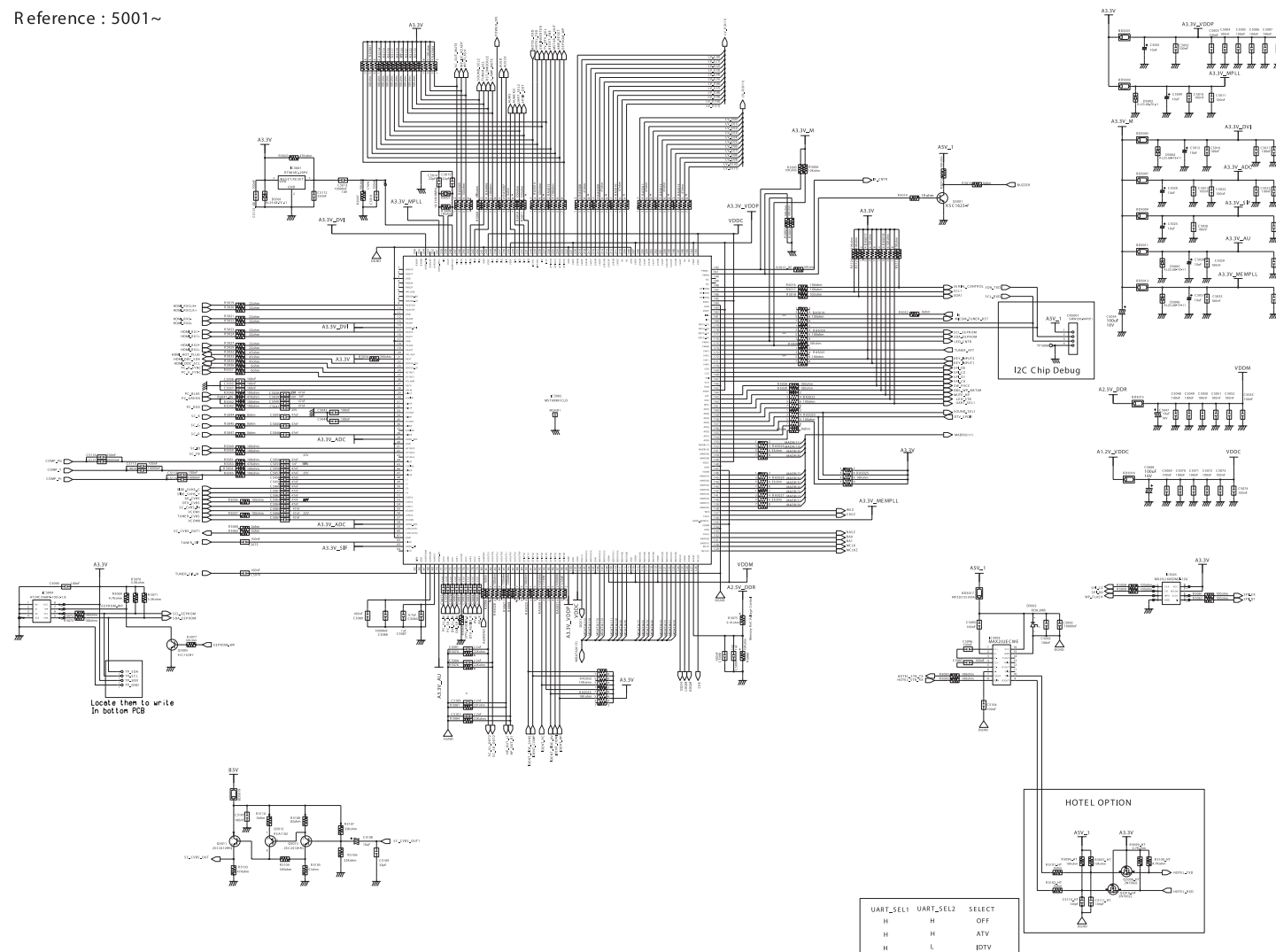
Reference : 4001~



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

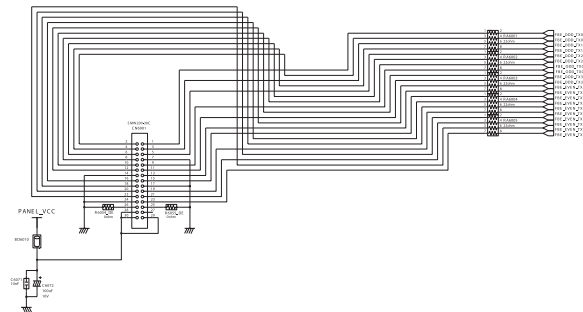
9-5 MST68980BL Schematic Diagram

Reference : 5001~



9-6 DDR & Tuner Schematic Diagram

DDR



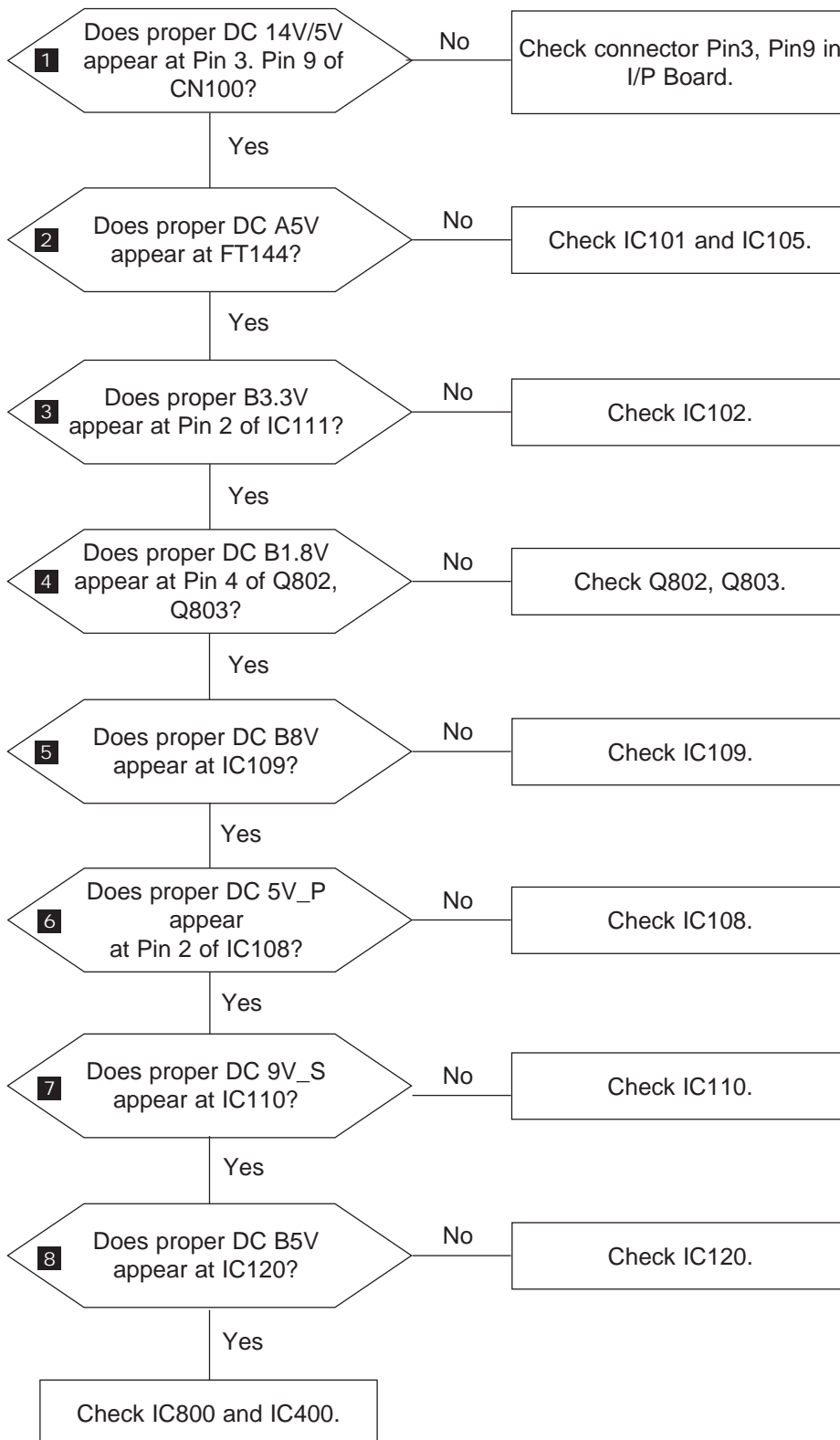
4 Troubleshooting

4-1 First Checklist for Troubleshooting

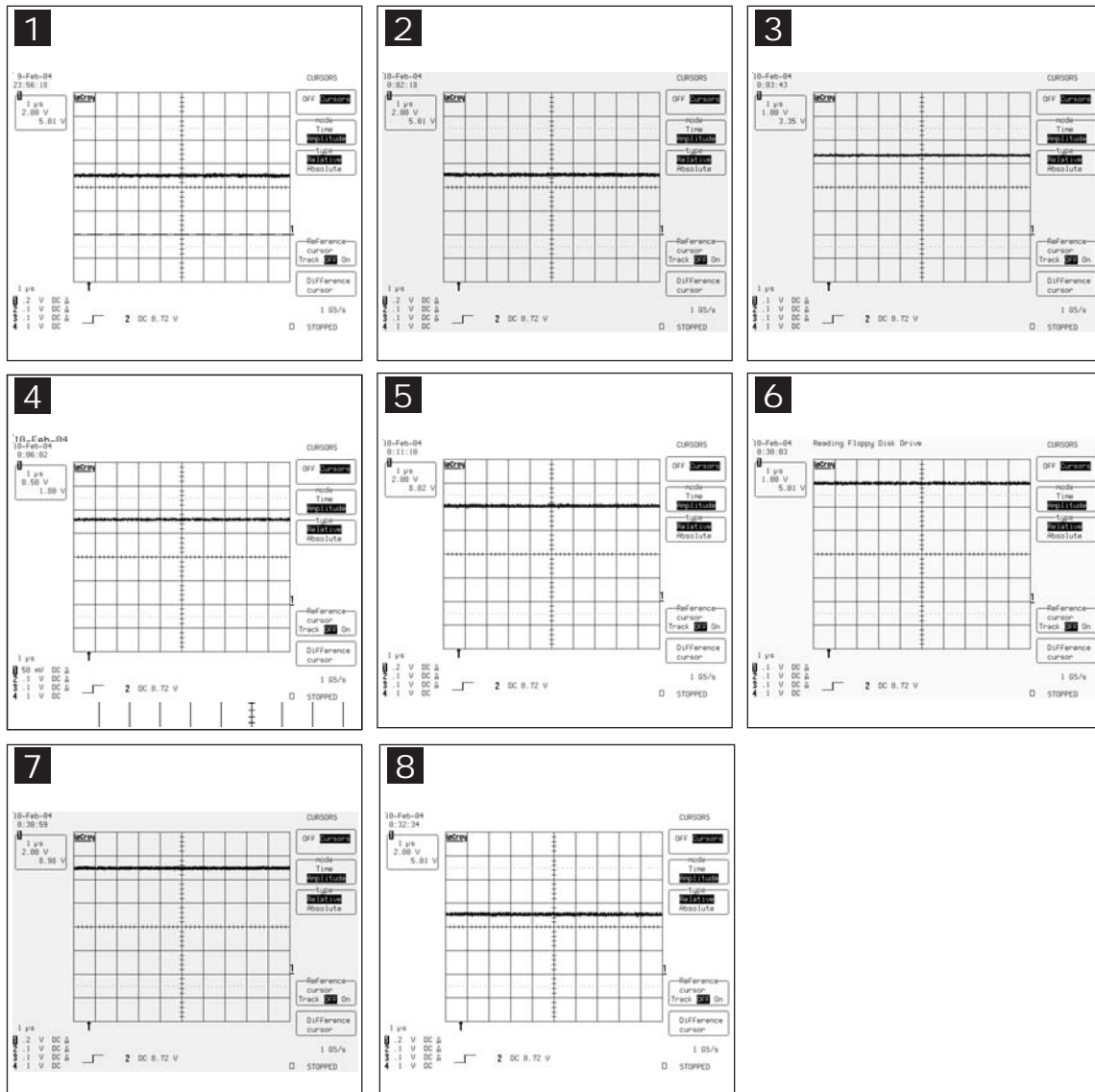
1. Check the various cable connections first.
 - Check to see if there is a burnt or damaged cable.
 - Check to see if there is a disconnected cable connection or a connection is too loose.
 - Check to see if the cables are connected according to the connection diagram.
2. Check the power input to the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

4-2 Checkpoints by Error Mode

4-2-1 No Power

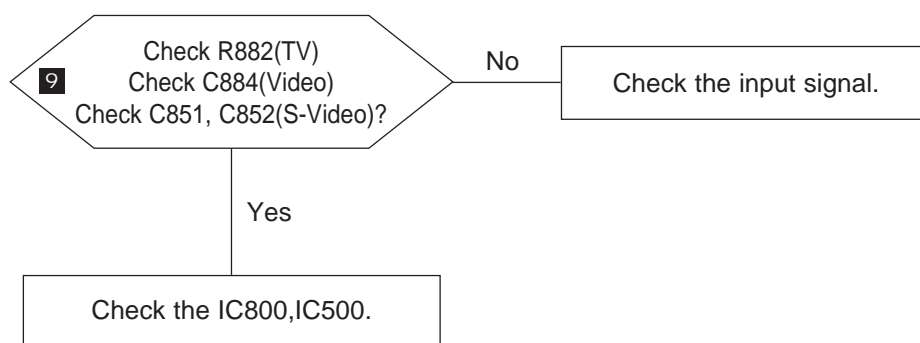


WAVEFORMS

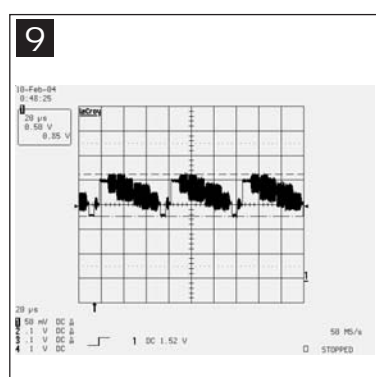


4 Troubleshooting

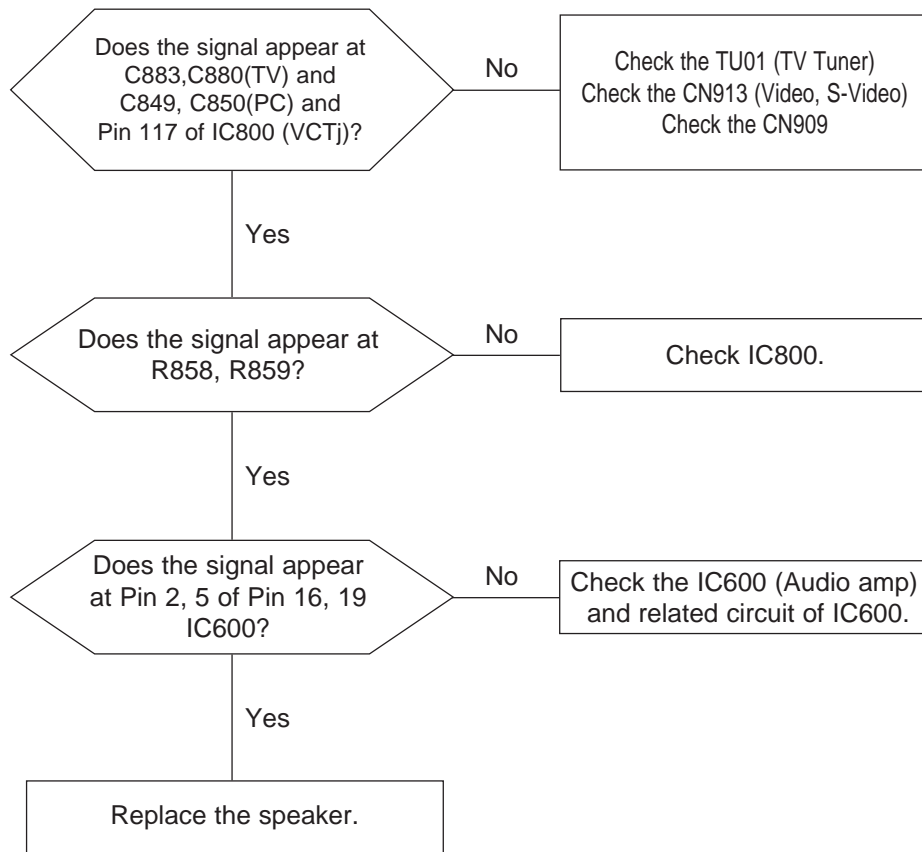
4-2-2 No Picture (TV, Video, S-Video, Component)



WAVEFORMS

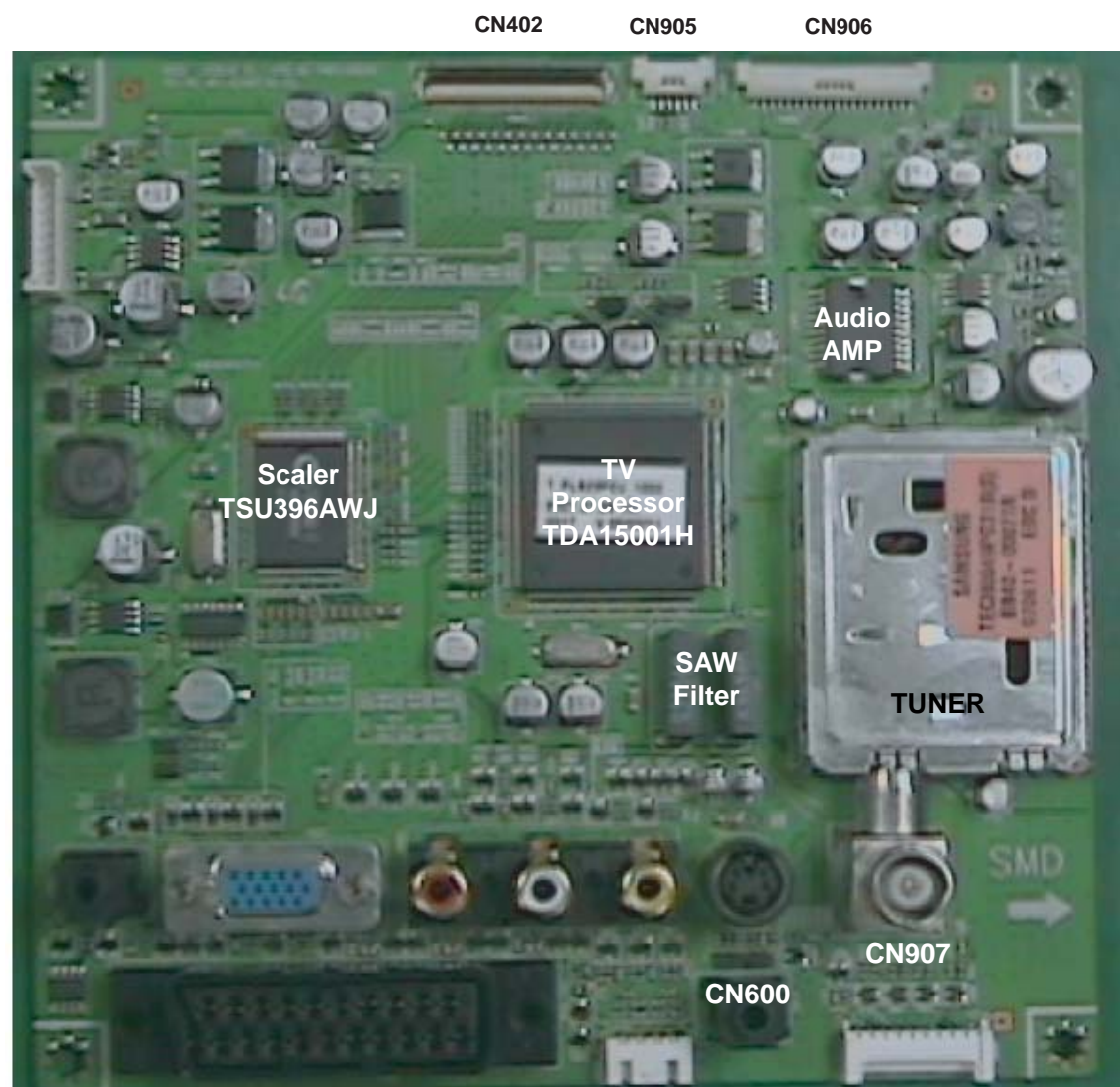


4-2-3 No Sound



Memo

8 Wiring Diagram



CN100(9P) : To IP Board
CN402(50P) : To 20" Panel
CN905(5P) : To Program Download Jig
CN906(20P) : To Scart
CN600(3P) : To Left Speaker
CN601(2P) : To Right Speaker
CN907(12P) : To Function Board

Memo