



# LCD-TV

Chassis : N45C

Model : LN19A330J1D

## ***SERVICE***Manual

### TFT-LCD TV



**LN19A330J1D**

### Contents

1. Precautions
2. Product specifications
3. Disassembly and Reassembly
4. Troubleshooting
5. Exploded View & Part List
6. Wiring Diagram
7. Schematic Diagram

# Contents

<b>1. Precautions .....</b>	<b>1-1</b>
1-1. Safety Precautions .....	1-1
1-2. Servicing Precautions.....	1-2
1-3. Electrostatically Sensitive Devices (ESD) Precautions .....	1-2
1-4. Installation Precautions .....	1-3
<b>2. Product specifications .....</b>	<b>2-1</b>
2-1. Feature & Specifications.....	2-1
2-3. Spec Comparison to the Old Models.....	2-4
2-4. Accessories .....	2-5
<b>3. Disassembly and Reassemble .....</b>	<b>3-1</b>
3-1. Disassembly .....	3-1
<b>4. Troubleshooting .....</b>	<b>4-1</b>
4-1. Troubleshooting .....	4-1
4-2. Alignments and Adjustments .....	4-19
4-3. Factory Mode Adjustments .....	4-20
4-4. White Balance - Calibration .....	4-28
4-5. White Ratio (Balance) Adjustment.....	4-30
4-6. Servicing Information.....	4-31
<b>5. Exploded View &amp; Part List .....</b>	<b>5-1</b>
5-1. LN19A330J1D Exploded View.....	5-1
5-3. LN19A330J1D Parts List .....	5-3
<b>6. Wiring Diagram .....</b>	<b>6-1</b>
6-1. Wiring Diagram.....	6-1
6-2. Cables .....	6-3
<b>7. Schematic Diagram .....</b>	<b>7-1</b>
7-1. MSD2248AL Block Diagram .....	7-1
7-2. Slim Half Tuner Block Diagram.....	7-2
7-3. Internal Block Diagram of Scaler(MSD2248AL) .....	7-3
7-2. Schematic Diagrams .....	7-4



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# 1. Precautions

## 1-1. Safety Precautions

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

### 1-1-1. Warnings

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

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

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

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

Before returning the LCD TV to the user, perform the following safety checks:

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

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

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

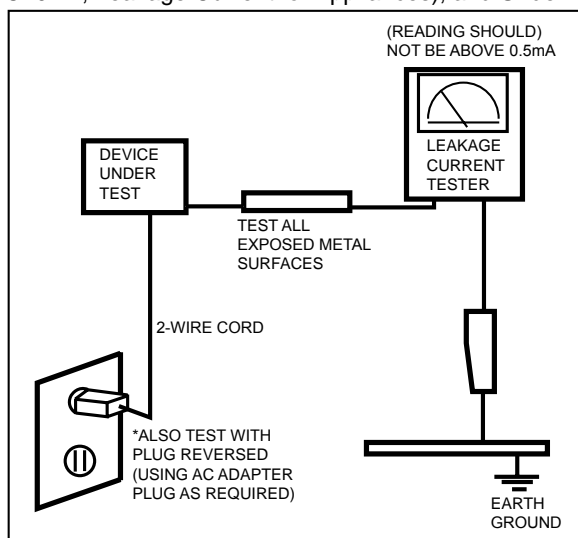


Figure 1-1. Leakage Current Test Circuit

4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

### 1-1-4. Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by  $\triangle$  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.



## 1-2. Servicing Precautions

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

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

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

### 1-2-1 General Servicing Precautions

1. Always unplug the unit's AC power cord from the AC power source and disconnect the DC Power Jack before attempting to:  
(a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
2. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
3. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
4. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
5. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to the blades of the AC plug. The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
6. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

## 1-3. Electrostatically Sensitive Devices (ESD) Precautions

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

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

## 1-4. Installation Precautions

1. For safety reasons, more than 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 highvoltage 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.

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## Memo

Model	LN19A330J1D	
Feature		
<div>▶ Digital-TV, RF, 1-HDMI, 1-Component, 1-A/V, 1-S-Video, D-SUB</div> <div>▶ Brightness : 300cd/m<sup>2</sup></div> <div>▶ Contrast Ratio : 1000:1</div> <div>▶ Response time : 5ms</div>		
Specifications		
Item	Description	
LCD Panel	TFT-LCD panel, RGB vertical stripe, TN mode, Normally white, 19-inch viewable, 0.2835(H) x 0.2835(W) x 3mm pixel pitch	
Scanning Frequency	Horizontal : 30 kHz ~ 80 kHz (Automatic) Vertical : 56 Hz ~ 75 Hz (Automatic)	
Display Colors	16.7 million colors	
Maximum resolution	Horizontal : 1440 Pixels Vertical : 900 Pixels	
Input Signal	Analog 0.7 Vp-p ± 5% positive at 75Ω , internally terminated	
Input Sync Signal	H/V Separate, TTL, P. or N.	
Maximum Pixel Clock rate	310MHz	
Active Display Horizontal/Vertical	16.07 x 10.05 inches(408.24(H) x 255.15(V)mm)	
AC power voltage & Frequency	AC 110V ~ 220V, 60 Hz	
Power Consumption	<245 W ( < 1W, stand by )	
Dimensions Set (W x D x H)	18.78 x 7.09 x 15.24 inches (477.1 x 180.2 x 387 mm)_with stand 18.78 x 2.26 x 13.63 inches (477.1 x 57.5 x 346.1 mm)_without stand	
Weight (Set)	11.24 lbs (5.1kg)	
TV System	Tuning	Frequency Synthesize (Refer to detailed Frequency Table)
	System	ATSC, NTSC5.38
	Sound	NTSC-M, AC-3 Digital
Environmental Considerations	Operating Temperature : 50°F ~ 104°F (10°C ~ 40°C) Operating Humidity : 10% ~ 80%, non-condensing Storage temperature : -13°F ~ 113°F (-25°C ~ 45°C) Storage Humidity : 5% ~ 95%, non-condensing	
Environmental Considerations	- MAX Internal speaker Out : Right => 10W, Left => 10W - BASS Control Range : -8 dB ~ + 8dB - TREBLE Control Range : -8 dB ~ +8 dB - Headphone Out : 10 mW MAX - Output Frequency : RF : 80 Hz ~ 15 kHz A/V : 80 Hz ~ 20 kHz	
Note: Anynet+		

## 2. Product specifications

### CHANNEL FREQUENCY TABLE



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

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


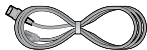




OSD	CH NO	AIR		BAND	CH NO	Cable STD		BAND	CH NO	Cable HRC		CH NO	Cable IRC	
		Air-DTV	Air-NTSC											
1	1								A-8	72.00		A-8	73.25	
2	2	57	55.25	V-L	2	55.25		V-L	2	54.00		2	55.25	
3	3	63	61.25	V-L	3	61.25		V-L	3	60.00		3	61.25	
4	4	69	67.25	V-L	4	67.25		V-L	4	66.00		4	67.25	
5	5	79	77.25	V-L	5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

OSD	CH NO	AIR		BAND	CH NO	Cable STD	BAND	CH NO	Cable HRC	CH NO	Cable IRC
		Air-DTV	Air-NTSC								
70	70				HHH	499.25	ULTRA	HHH	498.00	HHH	499.25
71	71				III	505.25	ULTRA	III	504.00	III	505.25
72	72				JJJ	511.25	ULTRA	JJJ	510.00	JJJ	511.25
73	73				KKK	517.25	ULTRA	KKK	516.00	KKK	517.25
74	74				LLL	523.25	ULTRA	LLL	522.00	LLL	523.25
75	75				MMM	529.25	ULTRA	MMM	528.00	MMM	529.25
76	76				NNN	535.25	ULTRA	NNN	534.00	NNN	535.25
77	77				000	541.25	ULTRA	000	540.00	000	541.25
78	78				PPP	547.25	ULTRA	PPP	546.00	PPP	547.25
79	79				79	553.25	ULTRA	79	552.00	79	553.25
80	80				80	559.25	ULTRA	80	558.00	80	559.25
81	81				81	565.25	ULTRA	81	564.00	81	565.25
82	82				82	571.25	ULTRA	82	570.00	82	571.25
83	83				83	577.25	ULTRA	83	576.00	83	577.25
84	84				84	583.25	ULTRA	84	582.00	84	583.25
85	85				85	589.25	ULTRA	85	588.00	85	589.25
86	86				86	595.25	ULTRA	86	594.00	86	595.25
87	87				87	601.25	ULTRA	87	600.00	87	601.25
88	88				88	607.25	ULTRA	88	606.00	88	607.25
89	89				89	613.25	ULTRA	89	612.00	89	613.25
90	90				90	619.25	ULTRA	90	618.00	90	619.25
91	91				91	625.25	ULTRA	91	624.00	91	625.25
92	92				92	631.25	ULTRA	92	630.00	92	631.25
93	93				93	637.25	ULTRA	93	636.00	93	637.25
94	94				94	643.25	ULTRA	94	642.00	94	643.25
95	95				A-5	91.25	FM	A-5	90.00	A-5	91.25
96	96				A-4	97.25	FM	A-4	96.00	A-4	97.25
97	97				A-3	103.25	FM	A-3	102.00	A-3	103.25
98	98				A-2	109.25	MID	A-2	108.00	A-2	109.25
99	99				A-1	115.25	MID	A-1	114.00	A-1	115.25
100	100				100	649.25	ULTRA	100	648.00	100	649.25
101	101				101	655.25	ULTRA	101	654.00	101	655.25
102	102				102	661.25	ULTRA	102	660.00	102	661.25
103	103				103	667.25	ULTRA	103	666.00	103	667.25
104	104				104	673.25	ULTRA	104	672.00	104	673.25
105	105				105	679.25	ULTRA	105	678.00	105	679.25
106	106				106	685.25	ULTRA	106	684.00	106	685.25
107	107				107	691.25	ULTRA	107	690.00	107	691.25
108	108				108	697.25	ULTRA	108	696.00	108	697.25
109	109				109	703.25	ULTRA	109	702.00	109	703.25
110	110				110	709.25	ULTRA	110	708.00	110	709.25
111	111				111	715.25	ULTRA	111	714.00	111	715.25
112	112				112	721.25	ULTRA	112	720.00	112	721.25
113	113				113	727.25	ULTRA	113	726.00	113	727.25
114	114				114	733.25	ULTRA	114	732.00	114	733.25
115	115				115	739.25	ULTRA	115	738.00	115	739.25
116	116				116	745.25	ULTRA	116	744.00	116	745.25
.	.				.	.	.	.	.	.	.
.	.				.	.	.	.	.	.	.
125	125				125	799.25	ULTRA	125	798.00	125	799.25
.	.				.	.	.	.	.	.	.
.	.				.	.	.	.	.	.	.

## 2-3. Spec Comparison to the Old Models

Model	LN**A450C1D(19"/22"/26"/32"/37"/40")	LNT**42H (23"/26"/32"/40"/46")
Design		
Display Type	LCD TV	LCD TV
Built-in Tuner	O	O
Resolution	19"=>1440 x 900 22"=>1680 x 1050 26"/32"/37"/40"=>1366x768	1366 x 768
LCD Panel	TFT LCD Panel 60Hz	TFT LCD Panel 60Hz
Screen Size	19"/22"/26"/32"/37"/40"	23" / 26" / 32" / 40" / 46"
Picture ratio	16 : 9	16 : 9
Dimensions (W x H x D)	19 18.78 x 7.09 x 15.24 inches_with stand 22 21.96 x 8.5 x 17.83 inches_with stand 26 26.37 x 8.5 x 19.7 inches_with stand 32 31.48 x 11.81 x 25.91 inches_with stand 37 36.08 x 11.81 x 25.91 inches_with stand 40 38.97 x 11.81 x 27.33 inches_with stand	23 26.29 x 9.13 x 17.53 inches_with stand 26 29.28 x 9.15 x 19.94 inches_with stand 32 34.42 x 11.47 x 22.72 inches_with stand 40 42.67 x 11.81 x 27.17 inches_with stand 46 48.04 x 12.83 x 30.55 inches_with stand
Weight	19 11.24 lbs(set) 22 16.09 lbs(set) 26 21.38 lbs(set) 32 28.88 lbs(set) 37 40.34 lbs(set) 40 41 lbs(set)	23 24.25 lbs (set) 26 31.97 lbs (set) 32 41.89 lbs (set) 40 60.63 lbs (set) 46 80.91 lbs (set)
Brightness	500nit (19"=>300nit)	500 nit
Contrast Ratio	8000:1 (19"=>1000:1)	8000:1
Picture Enhacer	DNle(FBE3)	DNle (FBE2)
Equalizer	5 band	5 band
Auto Motion Plus 120Hz	Not available	Not available
Surround Sound	2 Way SRS TruSurround Dolby Digital	2 Way SRS TruSurround Dolby Digital
Speaker Output	5W x 2	5W x 2
Antenna	1 (Cable/Air)	2 (Cable/Air)

## 2-4. Accessories

Product	Description	Code. No	Remark
	Remote Control & Batteries (AAA x 2)	BN59-00599A	Samsung Electronics Service center
	Power Cord	3903-000144	
	Cover-Bottom	BN63-04243A	
	Owner's Instructions	BN63-01395B	
	Cleaning Cloth	BN63-01798A	
	Warranty Card / Registration Card / Safety Guide Manual (Not available in all locations)	6801-001011	



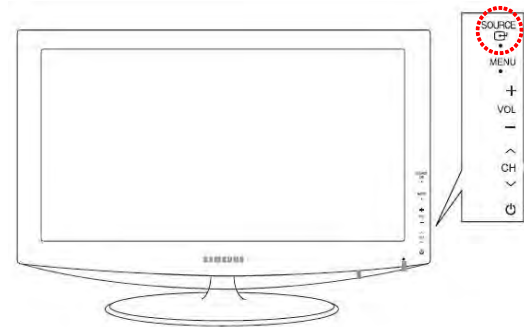
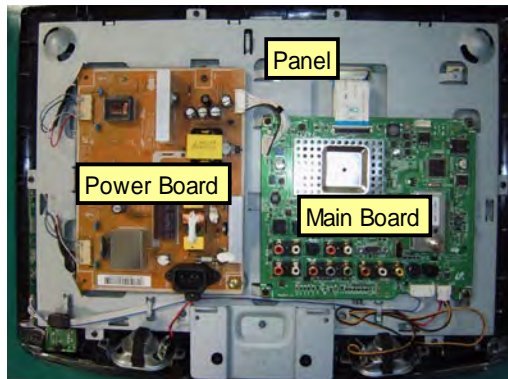
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## 4. Troubleshooting

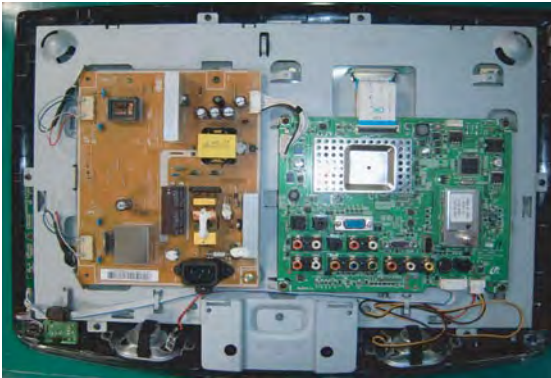
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### 4-1. Troubleshooting


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 or loose cable connection.
  - Check to see if the cables are connected according to the connection diagram.
2. Check the power input to the Main Board.



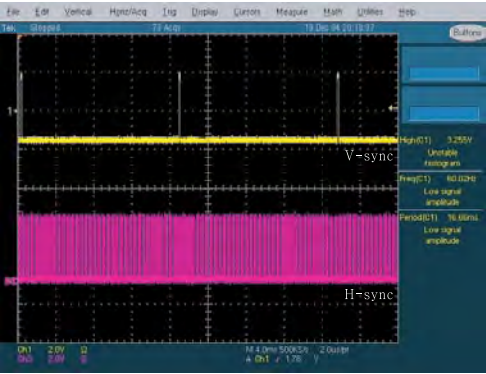
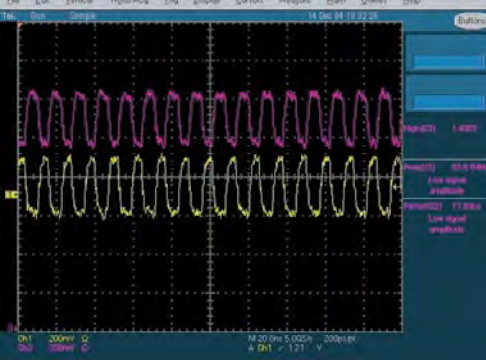
### 4-1-1. No Power

Symptom	<ul style="list-style-type: none"> <li>- The LEDs on the front panel do not work when connecting the power cord.</li> <li>- The SMPS relay does not work when connecting the power cord.</li> <li>- The units appears to be dead.</li> </ul>
Major checkpoints	<p>The IP relay or the LEDs on the front panel does not work when connecting the power cord if the cables are improperly connected or the Main Board or SMPS is not functioning. In this case, check the following:</p> <ul style="list-style-type: none"> <li>- Check the internal cable connection status inside the unit.</li> <li>- Check the fuses of each part.</li> <li>- Check the output voltage of SMPS.</li> <li>- Replace the Main Board.</li> </ul>
Diagnostics	 <pre> graph TD     Q1[Lamp(Backlight) Off, power indicator LED on?] -- No --&gt; A1[Check a connection power cable. P/N : BP39-00028A]     Q1 -- Yes --&gt; Q2[Does proper Stand-By DC A5V appear at C223?]     Q2 -- No --&gt; A2[Change the Main Power assembly 19" =&gt; BN44-00152B 22" =&gt; BN44-00152A]     Q2 -- Yes --&gt; Q3[Does proper Main DC B10V_S, B5V, B13V appear at BD221, C273C C278?]     Q3 -- No --&gt; A2     Q3 -- Yes --&gt; Q4[Does proper Inverter DC 120V appear at CN101 in SMPS?]     Q4 -- No --&gt; A2     Q4 -- Yes --&gt; Q5[Does proper DC A3.3V appear at D206?]     Q5 -- No --&gt; A3[Check IC203 Change the Main Ass'y 19" : BN94-01638A 22" : BN94-01638B]     Q5 -- Yes --&gt; Q6[Does proper DC B3.3V appear at R203?]     Q6 -- No --&gt; A4[Check IC203 Change the Main Ass'y 19" : BN94-01638A 22" : BN94-01638B]     Q6 -- Yes --&gt; Q7[Does proper A1.2V appear at C208?]     Q7 -- No --&gt; A5[Check IC402 Change the Main Ass'y 19" : BN94-01638A 22" : BN94-01638B]   </pre>
Caution	Make sure to disconnect the power before working on the IP board.


## 4-1-2. No Video (Analog PC signal)

Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the PC source</li> <li>Check the MSD2248AL</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     Start[Power Indicator is off. Lamp(Backlight) Off, no video] -- Yes --&gt; Q1{Check the PC source and check the connection of DSUB?}     Q1 -- No --&gt; A1[Input an analog PC signal. Check the connected cable.]     Q1 -- Yes --&gt; Q2{1 Does the signal appear at #w1, #u1, #AB2, #F1, #G1 (R, G, B, H, V) of IC402?}     Q2 -- No --&gt; A2[Check IC601, PC cable. Change the PC cable. Change the main PCB assembly]     Q2 -- Yes --&gt; Q3{2 Does the digital data appear at output of R452, R453, R402, R403, R404?}     Q3 -- No --&gt; A3[Check IC402 Change the main PCB assembly]     Q3 -- Yes --&gt; Q4{3 Does the digital data appear at output of C609 and C610?}     Q4 -- No --&gt; A4[Check IC402 Change the main PCB assembly]     Q4 -- Yes --&gt; Q5{Check the LVDS cable? Replace the LCD panel?}     Q5 -- No --&gt; A5[Please, Contact Tech support]   </pre>
Caution	Make sure to disconnect the power before working on the IP board.

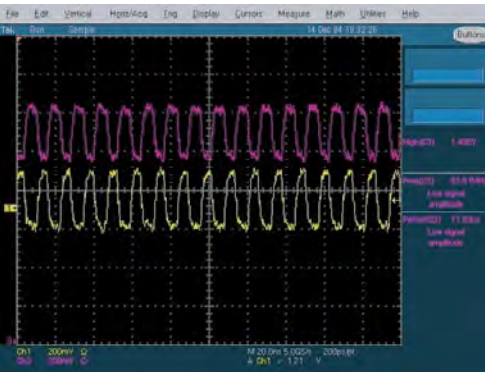
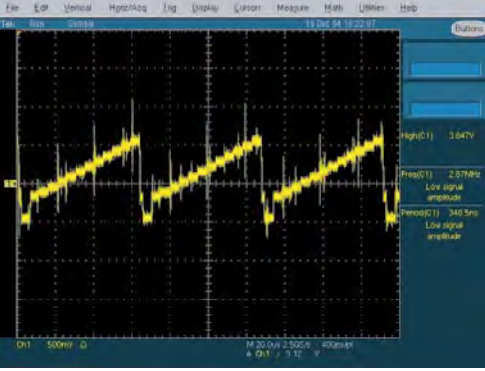
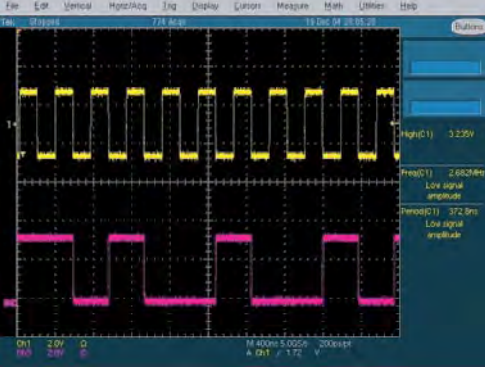
WAVEFORMS

1 2	PC Input (V-Sync, H-Sync)
	
3	LVDS Out (CLK + / -)
	


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

Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the HDMI source</li> <li>Check the MSD2248AL</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     A[Power Indicator is off. Lamp(Backlight) Off, no video] -- Yes --&gt; B[Check the HDMI source and check the connection of HDMI cable?]     B -- No --&gt; C[Input an HDMI signal. Check the connected cable.]     B -- Yes --&gt; D[4 R659, R660(CLK+/-), R661~R666(DATA)?]     D -- No --&gt; E[Check U601, HDMI cable. Change the HDMI cable. Change the main PCB assembly]     D -- Yes --&gt; F[7 Does the digital data appear at output of R452, R453, R402, R403, R404?]     F -- No --&gt; G[Check IC4001 Change the main PCB assembly]     F -- Yes --&gt; H[Check the LVDS cable? Replace the LCD panel?]     H -- No --&gt; I[Please, Contact Tech support]           </pre>
Caution	Make sure to disconnect the power before working on the IP board.

WAVEFORMS

4 5	HDMI Input (CLK + / -)
	
6	Tuner CVBS Out (Pattern: Grey Bar)
	
7	TS DATA Out (Clk, Data [0])
	

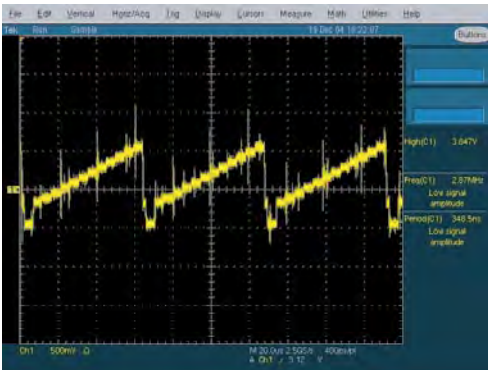
### 4-1-4. No Video (Tuner\_CVBS)

Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the Tuner CVBS source</li> <li>Check the MSD2248AL</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     Start[Power Indicator is off. Lamp(Backlight) Off, no video] -- Yes --&gt; Q1{Check the RF source and check the connection of RF cable?}     Q1 -- No --&gt; A1[Input the RF signal. Check the connected cable.]     Q1 -- Yes --&gt; Q2{8 Does the signal appear at TU501?}     Q2 -- No --&gt; A2[Check TU501 Change the main PCB assembly or tuner.]     Q2 -- Yes --&gt; Q3{6 Does the digital data appear at output of C503, C504, R452, R453, R402, R403, R404?}     Q3 -- No --&gt; A3[Check IC4001 Change the main PCB assembly]     Q3 -- Yes --&gt; Q4{Check the LVDS cable? Replace the LCD panel?}     Q4 -- No --&gt; A4[Please, Contact Tech support]   </pre>
Caution	Make sure to disconnect the power before working on the IP board.

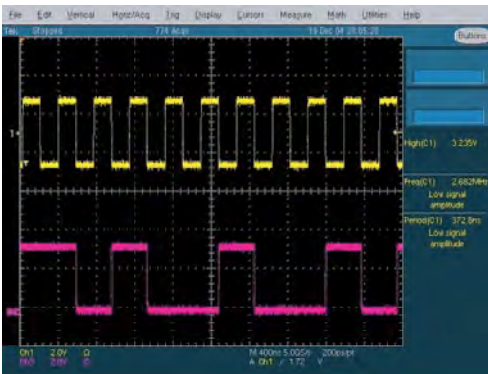


WAVEFORMS

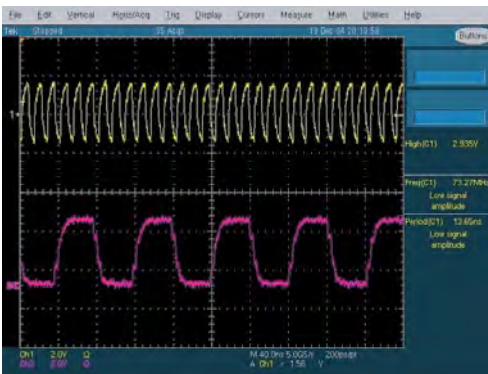
6 Tuner CVBS Out (Pattern: Grey Bar)



7 TS DATA Out (Clk, Data [0])




8 Eagle+ Out (Clk, H-Sync)



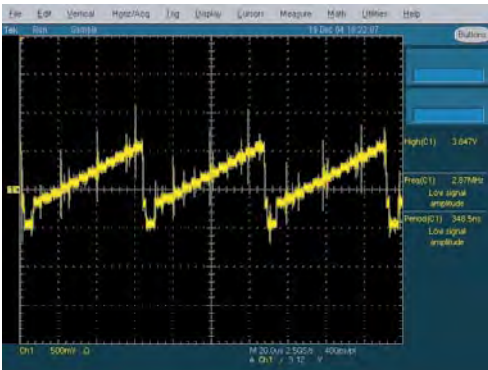


### 4-1-5. No Video (Tuner DTV)

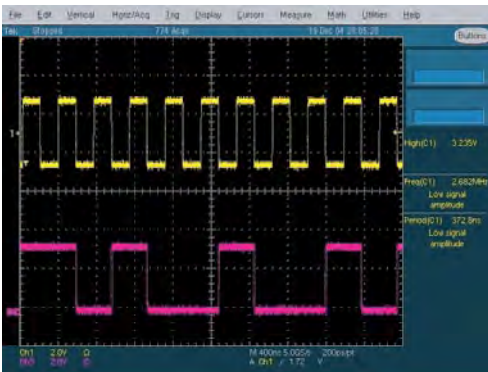
Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the DTV source</li> <li>Check the MSD2248AL</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     Start[Power Indicator is off. Lamp(Backlight) Off, no video] -- Yes --&gt; Q1{Check the RF source and check the connection of RF cable?}     Q1 -- No --&gt; A1[Input the RF signal. Check the connected cable.]     Q1 -- Yes --&gt; Q2{7 Does the digital data appear at C510, C511?}     Q2 -- No --&gt; A2[Check TU501 Change the main PCB assembly or tuner.]     Q2 -- Yes --&gt; Q3{6 Does the digital data appear at output of R522~R529?}     Q3 -- No --&gt; A3[Check IC502 Change the main PCB assembly]     Q3 -- Yes --&gt; Q4{7 Does the digital data appear at output of R452, R453, R402, R403, R404?}     Q4 -- No --&gt; A4[Check IC4001 Change the main PCB assembly]     Q4 -- Yes --&gt; Q5{Check the LVDS cable? Replace the LCD panel?}     Q5 -- No --&gt; A5[Please, Contact Tech support]   </pre>
Caution	Make sure to disconnect the power before working on the IP board.

WAVEFORMS

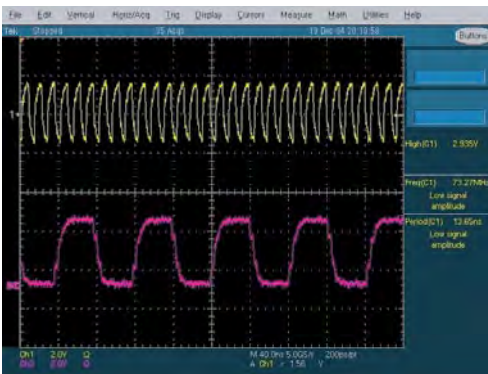
6 Tuner CVBS Out (Pattern: Grey Bar)




7 TS DATA Out (Clk, Data [0])



8 Eagle+ Out (Clk, H-Sync)

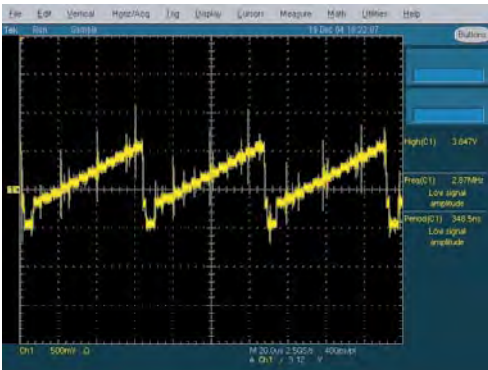


## 4-1-6. No Video (Video CVBS)

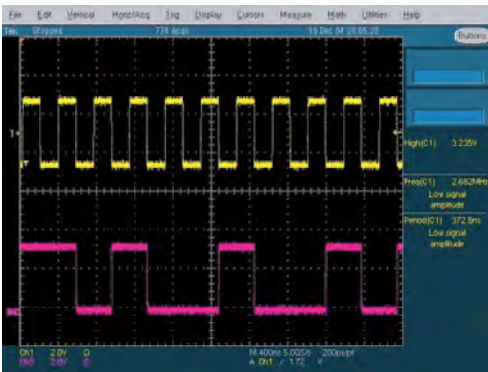
Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the Video CVBS source</li> <li>Check the MSD2248AL</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     Start[Power Indicator is off. Lamp(Backlight) Off, no video] -- Yes --&gt; Q1[Check the video source and check the connection of video cable?]     Q1 -- No --&gt; A1[Input a video signal. Check the connected cable.]     Q1 -- Yes --&gt; Q2[6 Does the signal appear at R626~R629?]     Q2 -- No --&gt; A2[Check CN604 Change the main PCB ass'y or Side-AV Ass'y]     Q2 -- Yes --&gt; Q3[Does the signal appear at R348?]     Q3 -- No --&gt; A3[Check IC4001]     Q3 -- Yes --&gt; Q4[6 Does the digital data appear at output of R522~R529?]     Q4 -- No --&gt; A4[Check IC4001 Change the main PCB assembly]     Q4 -- Yes --&gt; Q5[7 Does the digital data appear at output of R452, R453, R402, R403, R404?]     Q5 -- No --&gt; A5[Check IC4001 Change the main PCB assembly]     Q5 -- Yes --&gt; Q6[Check the LVDS cable? Replace the LCD panel?]     Q6 -- No --&gt; A6[Please, Contact Tech support]           </pre>
Caution	Make sure to disconnect the power before working on the IP board.

WAVEFORMS


6 Tuner CVBS Out (Pattern: Grey Bar)



7 TS DATA Out (Clk, Data [0])

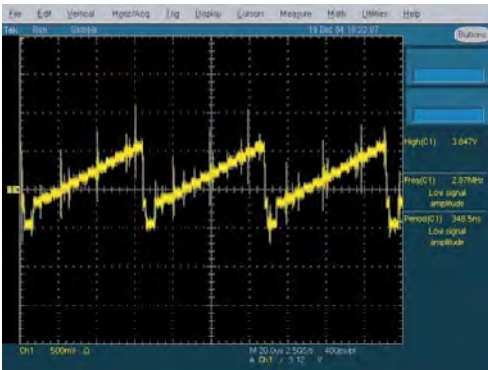


## 4-1-7. No Video (S-Video)

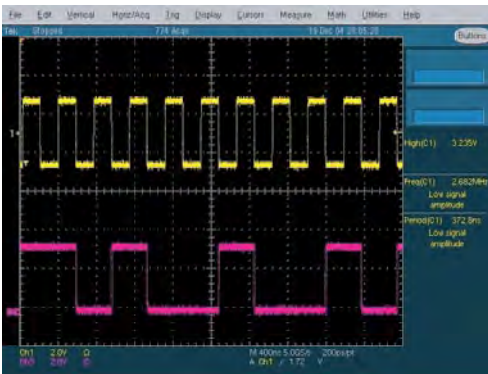
Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the S-Video source</li> <li>Check the MSD2248AL</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     Start[Power Indicator is off. Lamp(Backlight) Off, no video] -- Yes --&gt; Q1{Does the digital data appear at output of R522~R529?}     Q1 -- No --&gt; A1[Input a video signal. Check the connected cable.]     Q1 -- Yes --&gt; Q2{9 Does the signal appear at R452, R453, R402, R403, R404?}     Q2 -- No --&gt; A2[Check CN605 or Side-AV Change the main PCB ass'y or Side-AV assembly]     Q2 -- Yes --&gt; Q3{6 Does the digital data appear at output of R452, R453, R402, R403, R404?}     Q3 -- No --&gt; A3[Check IC4001 Change the main PCB assembly]     Q3 -- Yes --&gt; Q4{7 Does the digital data appear at output of R452, R453, R402, R403, R404?}     Q4 -- No --&gt; A4[Check IC4001 Change the main PCB assembly]     Q4 -- Yes --&gt; Q5{Check the LVDS cable? Replace the LCD panel?}     Q5 -- No --&gt; A5[Please, Contact Tech support]           </pre>
Caution	Make sure to disconnect the power before working on the IP board.

WAVEFORMS

6 Tuner CVBS Out (Pattern: Grey Bar)




7 TS DATA Out (Clk, Data [0])



9 S-VIDEO Input (Y/C)



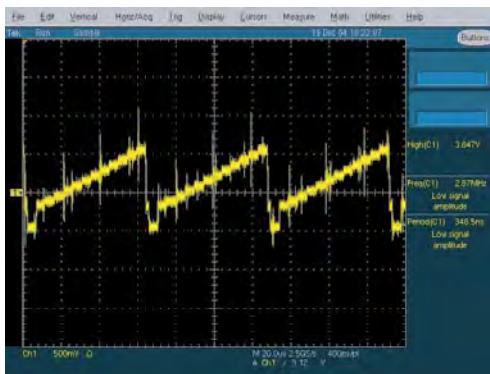
## 4-1-8. No Video (Component)

Symptom	<ul style="list-style-type: none"> <li>Audio is normal but no picture is displayed on the screen.</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>Check the Component source</li> <li>Check the MSD2248AL</li> <li>This may happen when the LVDS cable connecting the Main Board and the Panel is disconnected.</li> </ul>
Diagnostics	 <pre> graph TD     Start[Power Indicator is off. Lamp(Backlight) Off, no video] -- Yes --&gt; Q1[Check component source and check the connection of component cable ?]     Q1 -- No --&gt; A1[Input a component signal. Check the connected cable.]     Q1 -- Yes --&gt; Q2[10 Does the signal appear at R620, R621, R622(Y,Pb,Pr)?]     Q2 -- No --&gt; A2[Check JA602 Change the main PCB ass'y]     Q2 -- Yes --&gt; Q3[6 Does the digital data appear at output of R522~R529?]     Q3 -- No --&gt; A3[Check IC4001 Change the main PCB assembly]     Q3 -- Yes --&gt; Q4[7 Does the digital data appear at output of R452, R453, R402, R403, R404?]     Q4 -- No --&gt; A4[Check IC4001 Change the main PCB assembly]     Q4 -- Yes --&gt; Q5[Check the LVDS cable? Replace the LCD panel?]     Q5 -- No --&gt; A5[Please, Contact Tech support]   </pre>
Caution	Make sure to disconnect the power before working on the IP board.

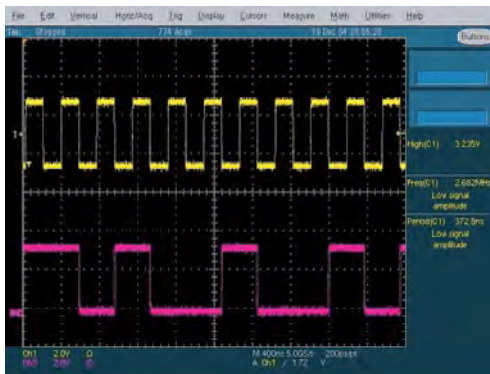


# WAVEFORMS

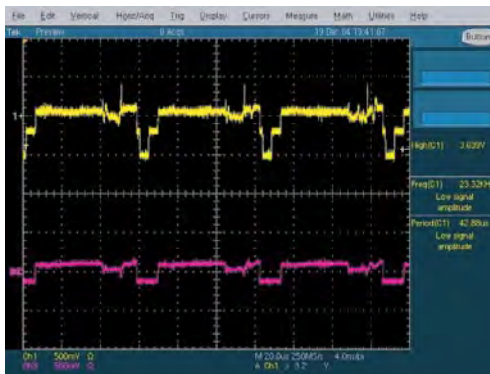
## 6 Tuner CVBS Out (Pattern: Grey Bar)



## 7 TS DATA Out (Clk, Data [0])




## 10 Component Input (Y/Pb)

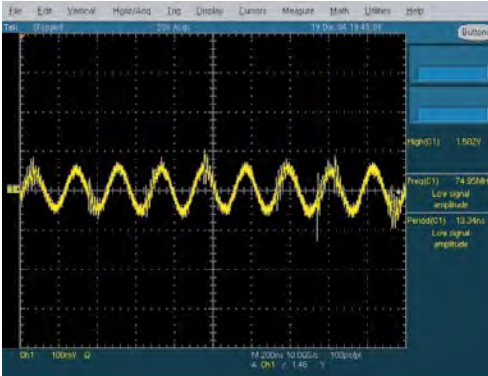
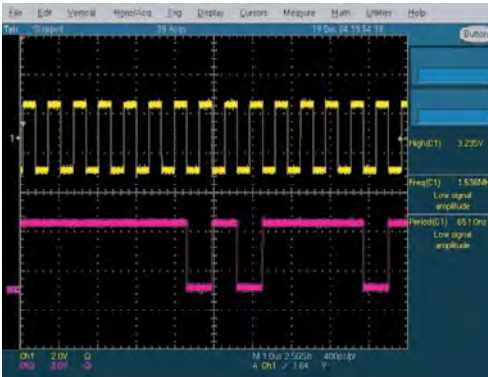
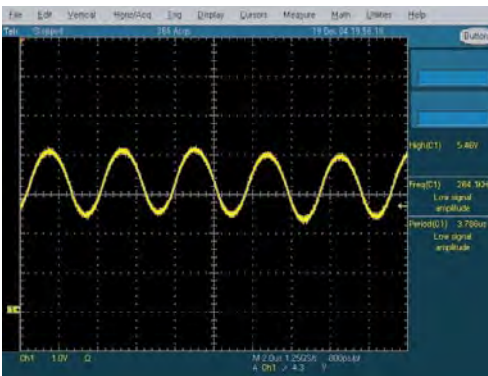




## 4-1-9. No Sound

Symptom	<ul style="list-style-type: none"> <li>Video is normal but there is no sound..</li> </ul>
Major checkpoints	<ul style="list-style-type: none"> <li>When the speaker connectors are disconnected or damaged.</li> <li>When the sound processing part of the Main Board is not functioning.</li> <li>Speaker defect..</li> </ul>
Diagnostics	 <pre> graph TD     A[Lamp(Backlight) Off, no sound.] -- Yes --&gt; B[Check the sound source and check the connection of sound cable?]     B -- No --&gt; C[Input a sound signal. Check the connected cable.]     B -- Yes --&gt; D[Does the signal appear at R607, R608, R628, R629, R669~R672, R686, R687(VIDEO2,COMP,PC,DVI,HP)?]     D -- No --&gt; E[Check IC4001 Change the main PCB ass'y or side-AV assembly]     D -- Yes --&gt; F[Check the LVDS cable? Replace the LCD panel?]     F -- No --&gt; G[Please, Contact Tech support]   </pre> <p>     Lamp(Backlight) Off, no sound.      ↓ Yes      Check the sound source and check the connection of sound cable?      ↓ Yes      Does the signal appear at R607, R608, R628, R629, R669~R672, R686, R687(VIDEO2,COMP,PC,DVI,HP)?      ↓ Yes      Check the LVDS cable?      Replace the LCD panel?      ↓ No      Please, Contact Tech support   </p>
Caution	Make sure to disconnect the power before working on the IP board.

WAVEFORMS

11	Audio Input (Sign Wave)
	
12	12S Input (Clk, Data)
	
13	Audio Amp Out (Sign Wave)
	

## 4-2. Alignments and Adjustments

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

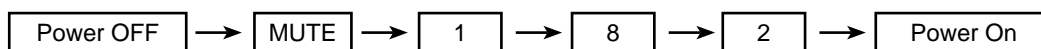
1. Usually, a color LCD-TV needs only slight touch-up adjustment upon installation.  
Check the basic characteristics such as height, horizontal and vertical sync.
2. Use the specified test equipment or its equivalent.
3. Correct impedance matching is essential.
4. Avoid overload. Excessive signal from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

## 4-3. Factory Mode Adjustments

### 4-3-1 Entering Factory Mode

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

- If you do not have Factory remote - control



### 4-3-2 How to Access Service Mode

#### Using the Customer Remote

1. Turn the power off and set to stand-by mode
2. Press the remote buttons in this order; POWER OFF-MUTE-1-8-2-POWER ON to turn the set on.
3. The set turns on and enters service mode. This may take approximately 20 seconds.
4. Press the Power button to exit and store data in memory.  
- If you fail to enter service mode, repeat steps 1 and 2 above.
5. Initial SERVICE MODE DISPLAY State

- The mother page of Factory mode => Blue letter is a real displayed data

ADC	Expert Settings
ADC Target	Expert D-Settings
ADC Value	Expert Gray Scale
Option BYTE	Expert C-Space
ADJUST	Expert Others
W/B	CHECKSUM
W/B Movie	RESET
EPA standard	T-CRLAUSC-00xx
FBE3	0050 6628 00CD 1510
VDEC	Micom / VER. / Month/ Day / Year
Scaler	
Sharpness	
PE	
Sound	
Dynamic Contrast	
PDP Option	

- "T-PEONAUUSC-1000" and "T-PEONASS-1000" are firmware.....  
over version 2000 means Micronas FRC firmware.

1. Buttons operations withn Service Mode

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

## 4-3-3 Factory Data

- The sub\_page of Factory mode

### ADC

Name	Default data
AV Calibration	-
Component Calibration	-
PC Calibration	-
HDMI Calibration	-

### ADC Target

Name	Default data
1st_AV_Low	18
1st_AV_High	220
1st_AV_Delta	1
1st_COMP_Low	16
1st_COMP_High	235
1st_COMP_Delta	1
1st_PC_Low	1
1st_PC_High	235
1st_PC_Delta	1
2nd_AV_Low	1
2nd_AV_High	235
2nd_AV_Delta	1
2nd_COMP_Low	1
2nd_COMP_High	235
2nd_COMP_Delta	1
2nd_PC_Low	1
2nd_PC_High	235
2nd_PC_Delta	1
2nd_HDMI_Low	1
2nd_HDMI_High	235
2nd_HDMI_Delta	1

**ADC Value**

Name	Default data
LUMA_OFFSET	128
LUMA_GAIN	128
RED_CUTOFF	128
GREEN_CUTOFF	128
BLUE_OFFSET	128
RED_GAIN	128
GREEN_GAIN	128
BLUE_GAIN	128
2nd_R offset	128
2nd_G offset	128
2nd_B offset	128
2nd_R gain	128
2nd_G gain	128
2nd_B gain	128

**Option Byte**

Name	Default data
LCD/PDP	LCD
Inch	xx Inch
Panel Option	xxAM
Dimming	INT
Mirror	OFF
AV Number	2
COMP. Number	2
HDMI Number	3
Light Effect	ON
HeadPhone	ON
Anynet+(HDMI-CEC)	ON
Carrier Mute	OFF
Volume Curve	ON
Caption Level	ON
RS 232C	Auto wall
Gamma	0.85
Mute Time[RF]	600mS
CH Memory	SAMEX
Shop Mode	OFF
PC Mode Ident	Auto
HPD Control	OFF
7.5IRE Set	ON
7.5IRE Offset	0
HDMI 1080p	OFF
PANEL ENTER KEY	ON
EER Count	11
Expert ADJ.	OFF

**Adjust**

Name	Default data
Watchdog Enable	ON
Watchdog Count	10sec
Spread Spectrum	OFF
Shop Mode	OFF
DEBUG MODE	DEBUG OFF
LVDS Format	VESA

**White Balance (Available over 26 inches. (With FBE3))**

Name	Default data
Sub Brightness	128
R-Offset	128
G-Offset	128
B-Offset	128
Sub Contrast	128
R-Gain	128
G-Gain	128
B-Gain	128

**White Balance Available 19 & 22 inches.( Without FBE3)**

Name	Default data
Sub Brightness	128
R-Offset	128
G-Offset	128
B-Offset	128
Sub Contrast	128
R-Gain	128
G-Gain	128
B-Gain	128

**White Balance Available only PDP.**

Name	Default data
Sub Brightness	128
R-Offset	128
G-Offset	128
B-Offset	128
Sub Contrast	128
R-Gain	128
G-Gain	128
B-Gain	128

### Adjust

Name	Default data
W/B MOVIE	on
MODE	Dynamic
Color Tone	Cool1
MSub Brightness	128
MSub Contrast	128
W2_Rgain	19
W2_Bgain	-26
W2_Roffset	-1
W2_Boffset	4
W1_Rgain	49
W1_Bgain	-43
W1_Roffset	-4
W1_Boffset	4
NOR_Rgain	7
NOR_Bgain	-11
NOR_Roffset	-2
NOR_Boffset	2
C2_Rgain	-32
C2_Bgain	22
C2_Roffset	5
C2_Boffset	1
Movie Contrast	70
Movie Bright	50
Movie Color	25
Movie Sharpness	45
Movie Tint	0
Movie Backlight	5
Movie Gamma	off

### EPA Standard

Name	Default data
Standard Contrast	80
Standard Brightness	45
Standard Sharpness	50
Standard Color	50
Standard Tint	0
Standard Backlight	7



**FBE3**

Name	Default data
Patt-Sel	0
B-Slope gain	60
B-Tilt min	30
B-Tilt max	110
Lfunc-Basis	75
Hfunc-Basis	80
Mean-Offset1	30
Mean-Offset2	235
Mean-Slope	112
ACR-Offset	10
ACR-Th1	10
ACR-Th2	110
Skin-Enable	ON
Skin-UV	128
Sub color	128
M-Skin-UV	128
M-Sub color	128
Input Format	VESA
Output Format	VESA

**VDEC**

Name	Default data
Saturation	80
CTI_MD	2
CBCRLP_MD	1

**Scaler**

Name	Default data
DNR_off	0
DNR_low	2
DNR_mid	3
DNR_high	4
Y_DELAY_EN	1
YC_STEP	1

### Sharpness

Name	Default data
H1 Gain	10
H2 Gain	8
H3 Gain	8
H4 Gain	8
V1 Gain	28
V2 Gain	8
H overshoot	FF
V overshoot	60
H undershoot	FF
V undershoot	60
Coring TH2	1
Coring TH1	1
Mid_color_level	AC

### PE

Name	Default data
Skin_EN	1
D_Skin	12
M_Skin	12

### Sound

Name	Default data
Carrier Mute	1
High DEV	0
CM_TH_HIGH	2990
CM_TH_LOW	20B0
ST_PILOT_TH_HIGH	D00
ST_PILOT_TH_LOW	600
ST_VAR_TH_HIGH	1800
ST_VAR_TH_LOW	1000
SAP_AMP_TH_HIGH	1
SAP_AMP_TH_LOW	4
SAP_NSR_TH_HIGH	4500
SAP_NSR_TH_LOW	3000
AMP_Volume	29
AMP_Limiter_Attack	9
AMP_Limiter_Release	F
AMP_Post-Scale	5C
AMP_Speaker EQ	0
AV Sync.	0

**Dynamic Contrast**

Name	Default data
Dynamic Contrast	On
Dynamic Dimming	off
Y_MEAN	0

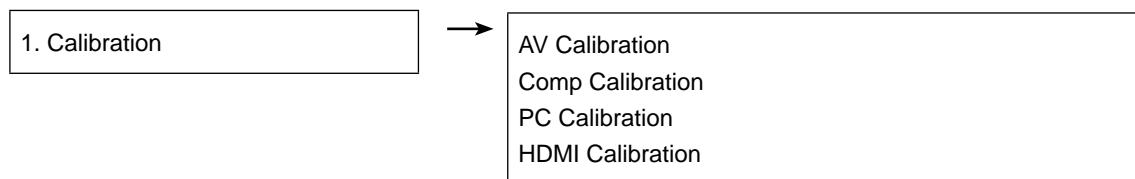
**Checksum**

Name	Default data
Checksum	0x0000
After execute CHECKSUM	
CHECKSUM	
Main : 0xB018	
Back: Press Menu Key	

**Reset**

## 4-4. White Balance - Calibration

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

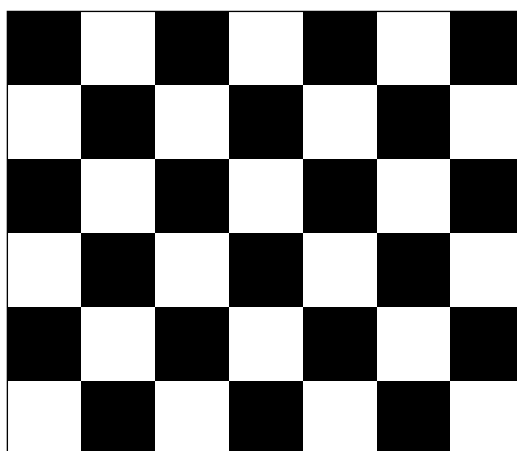


### 4-4-2 Service Adjustment - You must perform Calibration in the Lattice Pattern before adjusting the White Balance.

#### ■ Color Calibration

Adjust spec.

1. Source : HDMI
2. Setting Mode : 1280\*720@60Hz
3. Pattern : Pattern #24 (Chess Pattern)



( Chess Pattern )

4. Use Equipment : CA210 & Master MSPG925 Generator

- Use other equipment only after comparing the result with that of the Master equipment.

Input mode	Calibration	Pattern
CVBS IN (Model_#1)	Perform in NTSC B&W Pattern #24	Lattice
Component IN (Model_#6)	Perform in 720p B&W Pattern #24	Lattice
PC Analog IN (Model_#21)	Perform in VESA XGA (1024x768) B&W Pattern #24	Lattice
HDMI IN	Perform in 720p B&W Pattern #24	Lattice

<Table 1>

---

### ■ Method of Color Calibration (AV)

- 1) Apply the NTSC Lattice (N0. 3) pattern signal to the AV IN 1 port
- 2) Press the Source key to switch to "AV1" mode
- 3) Enter Service mode
- 4) Select the "Calibration" menu
- 5) Select the "AV Calibration" menu.
- 6) In "AV Calibration Off" status, press the "▶" key to perform Calibration.
- 7) When Calibration is complete, it returns to the high-level menu.
- 8) You can see the change of the "AV Calibration" status from Failure to Success.

### ■ Method of Color Calibration (Component)

- 1) Apply the 720p Lattice (N0. 6) pattern signal to the Component IN 1 port
- 2) Press the Source key to switch to "Component1" mode
- 3) Enter Service mode
- 4) Select the "Calibration" menu
- 5) Select the "Comp Calibration" menu.
- 6) In "Comp Calibration Off" status, press the "▶" key to perform Calibration.
- 7) When Calibration is complete, it returns to the high-level menu.
- 8) You can see the change of the "Comp Calibration" status from Failure to Success.

### ■ Method of Color Calibration (PC)

- 1) Apply the VESA XGA Lattice (N0. 21) pattern signal to the PC IN port
- 2) Press the Source key to switch to "PC" mode
- 3) Enter Service mode
- 4) Select the "Calibration" menu
- 5) Select the "PC Calibration" menu.
- 6) In "PC Calibration Off" status, press the "▶" key to perform Calibration.
- 7) When Calibration is complete, it returns to the high-level menu.
- 8) You can see the change of the "PC Calibration" status from Failure to Success.

### ■ Method of Color Calibration (HDMI)

- 1) Apply the 720p Lattice (N0. 6) pattern signal to the HDMI1/DVI IN port
- 2) Press the Source key to switch to "HDMI1" mode
- 3) Enter Service mode
- 4) Select the "Calibration" menu
- 5) Select the "HDMI Calibration" menu.
- 6) In "HDMI Calibration Off" status, press the "▶" key to perform Calibration.
- 7) When Calibration is complete, it returns to the high-level menu.
- 8) You can see the change of the "HDMI Calibration" status from Failure to Success.

### 4-4-3 White Balance - Adjustment

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

(W/B adjustment Condition refer next page)

### 4-5. White Ratio (Balance) Adjustment

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

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



- Calibration and Manual setting for WB adjustment.

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

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

	Adjustment Coordinate				
		x	y	Y(L)	T(K) + MPCD
CVBS (NTSC)	H/L	272	287	- (Sub_CT:132)	11,000 (+10)
	L/L	272	287	12.0cd/m <sup>2</sup> (3.5 Ft)	11,000 (+10)
COMP (720P)	H/L	272	287	- (Sub_CT:132)	11,000 (+10)
	L/L	272	287	12.0cd/m <sup>2</sup> (3.5 Ft)	11,000 (+10)
HDMI (720P)	H/L	272	287	- (Sub_CT:132)	11,000 (+10)
	L/L	272	287	12.0cd/m <sup>2</sup> (3.5 Ft)	11,000 (+10)

#### - Adjustment Specification

White Balance : High light ( $\pm 2$ ), Low light ( $\pm 3$ )

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

## 4-6. Servicing Information

### 4-6-1 USB Download Method

Samsung may offer upgrades for TV's firmware in the future. Please contact the Samsung call center at 1-800-SAMSUNG (7267864) to receive information about downloading upgrades and using a USB drive.

Upgrades will be possible by connecting a USB drive to the USB port located on located on the back of your TV.

1. Insert a USB drive containing the firmware upgrade into the SERVICE port on the rear of the TV.  
Software can not be upgraded through the LAN connection.
2. Press the **MENU** button to display the menu.  
Press the **▲** or **▼** button to select "Setup", then press the **ENTER** button.
3. Press the **▲** or **▼** button to select "SW upgrade", then press the **ENTER** button.
4. Press the **ENTER** button.  
The message "Scanning for USB... It may take up to 30 seconds." is displayed.
5. The message "Upgrade version XXXX to version XXXX The system would be reset after upgrade." is displayed.  
Press the **◀** or **▶** to select the "Yes", then press the **ENTER** button.

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



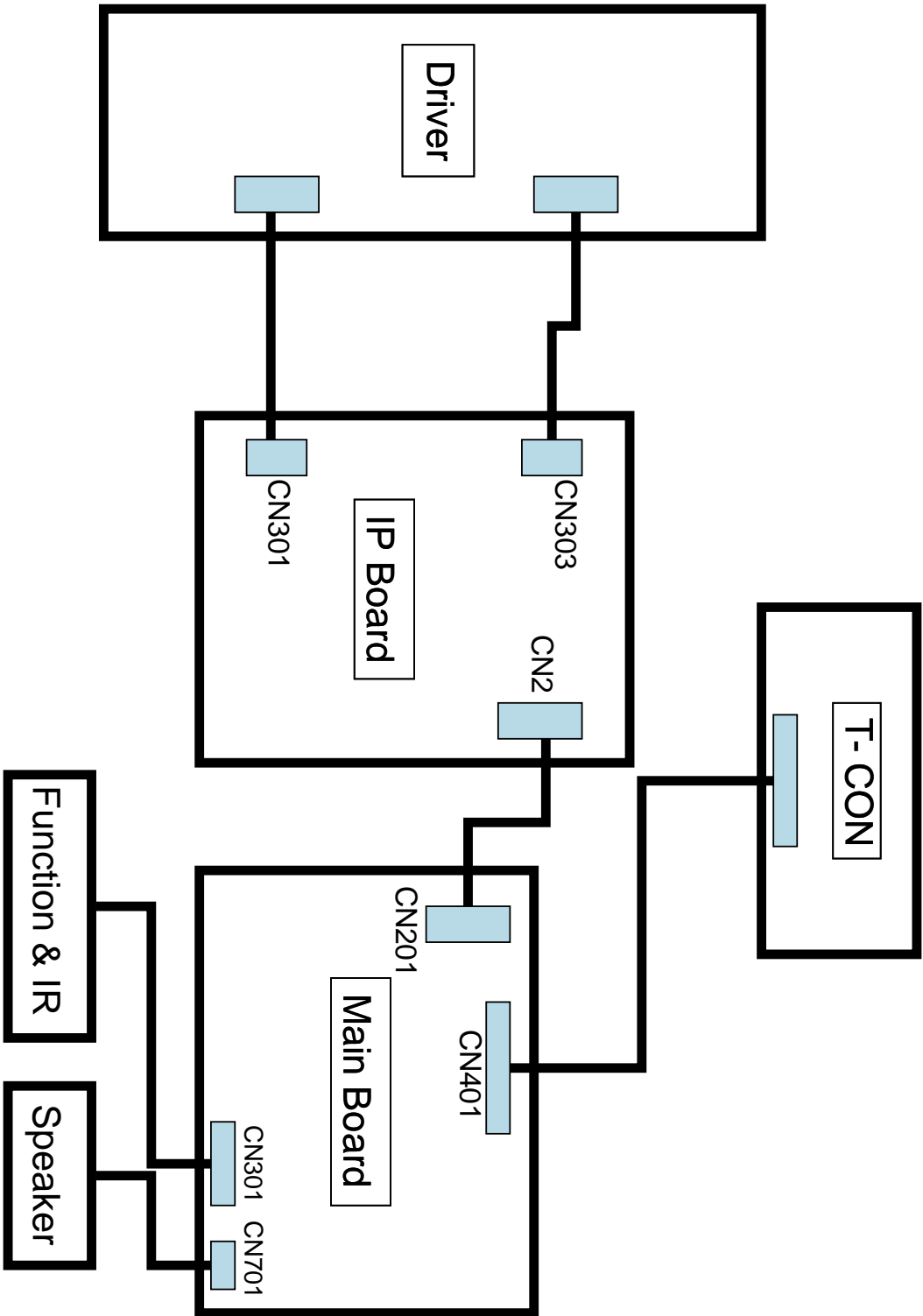
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**Memo**



6. Wiring Diagram

6-1. Wiring Diagram



CN401(to Panel)	
1	5V
2	5V
3	5V
4	N.C.
5	N.C.
6	N.C.
7	GND
8	TX EVEN3+
9	TX EVEN3-
10	TX EVEN CLK+
11	TX EVEN CLK-
12	TX EVEN2+
13	TX EVEN2-
14	GND
15	TX EVEN1+
16	TX EVEN1-
17	GND
18	TX EVEN0+
19	TX EVEN0-
20	TX ODD3+
21	TX ODD3-
22	TX ODD CLK+
23	TX ODD CLK-
24	GND
25	TX ODD2+
26	TX ODD2-
27	TX ODD1+
28	TX ODD1-
29	TX ODD0+
30	TX ODD0-

CN201(to Mainboard)	
1	DIMMING OUT
2	GND
3	GND
4	GND
5	A13V
6	A13V
7	A13V
8	B3.3V
9	B5V

CN606(to DVI sound)	
1	GND
2	DVI SR IN
3	DVI SL IN
4	GND
5	DVI SL IN
6	DVI SR IN

CN602(to Component)	
1	GND
2	COMP IDENT
3	COMP Y
4	GND
5	COMP PB
6	COMP PB
7	GND
8	COMP PR
9	COMP PR

CN603(to Component)	
1	GND
2	COMP SR IN
3	COMP SL IN
4	GND
5	COMP SL IN
6	COMP SR IN

CN604(to AV INPUT)	
1	GND
2	VIDEO IDENT
3	VIDEO CVBS
4	GND
5	VIDEO SR IN
6	VIDEO SL IN
7	GND
8	VIDEO SL IN
9	VIDEO SR IN

U601(HDMI INPIT1)	
1	HDMI RX2+
2	GND
3	HDMI RX2-
4	HDMI RX1+
5	GND
6	HDMI RX1-
7	HDMI RX0+
8	GND
9	HDMI RX0-
10	HDMI RXCLK+
11	GND
12	HDMI RXCLK-
13	N.C.
14	N.C.
15	HDMI DDC SCL
16	HDMI DDC SDA
17	GND
18	HDMI IDENT
19	HDMI 5V
20	GND
21	GND

CN608(USB1)	
1	B5V
2	USB DN
3	USB DP
4	GND

CN605(SIDE SVHS)	
1	SVHS_C
2	SVHS_Y
3	GND
4	GND
5	SVHS IDENT
6	GND

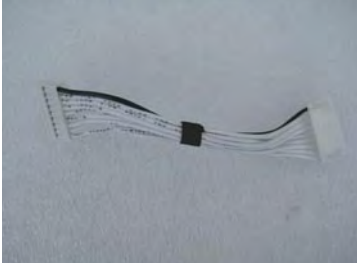

CN607(SOUND OUT)	
1	GND
2	M SL OUT
3	M SL OUT
4	GND
5	M SR OUT
6	M SR OUT

CN601(PC IN)	
1	PC R
2	PC G
3	PC B
4	GND
5	GND
6	GND
7	GND
8	A5V
9	PC 5V
10	PC IDENT
11	GND
12	DDC VCC
13	PC HS
14	PC VS
15	DDC VCC

U602(PC S IN)	
1	GND
2	PC SR IN
3	PC SL IN
4	PC SL IN
5	PC SL IN
6	PC SR IN
7	PC SR IN

U701(HEADPHONE JACK)	
1	GND
2	HP OUT_R
3	HP OUT_L
4	HP OUT_L
5	HP OUT_L
6	GND
7	HP IDENT

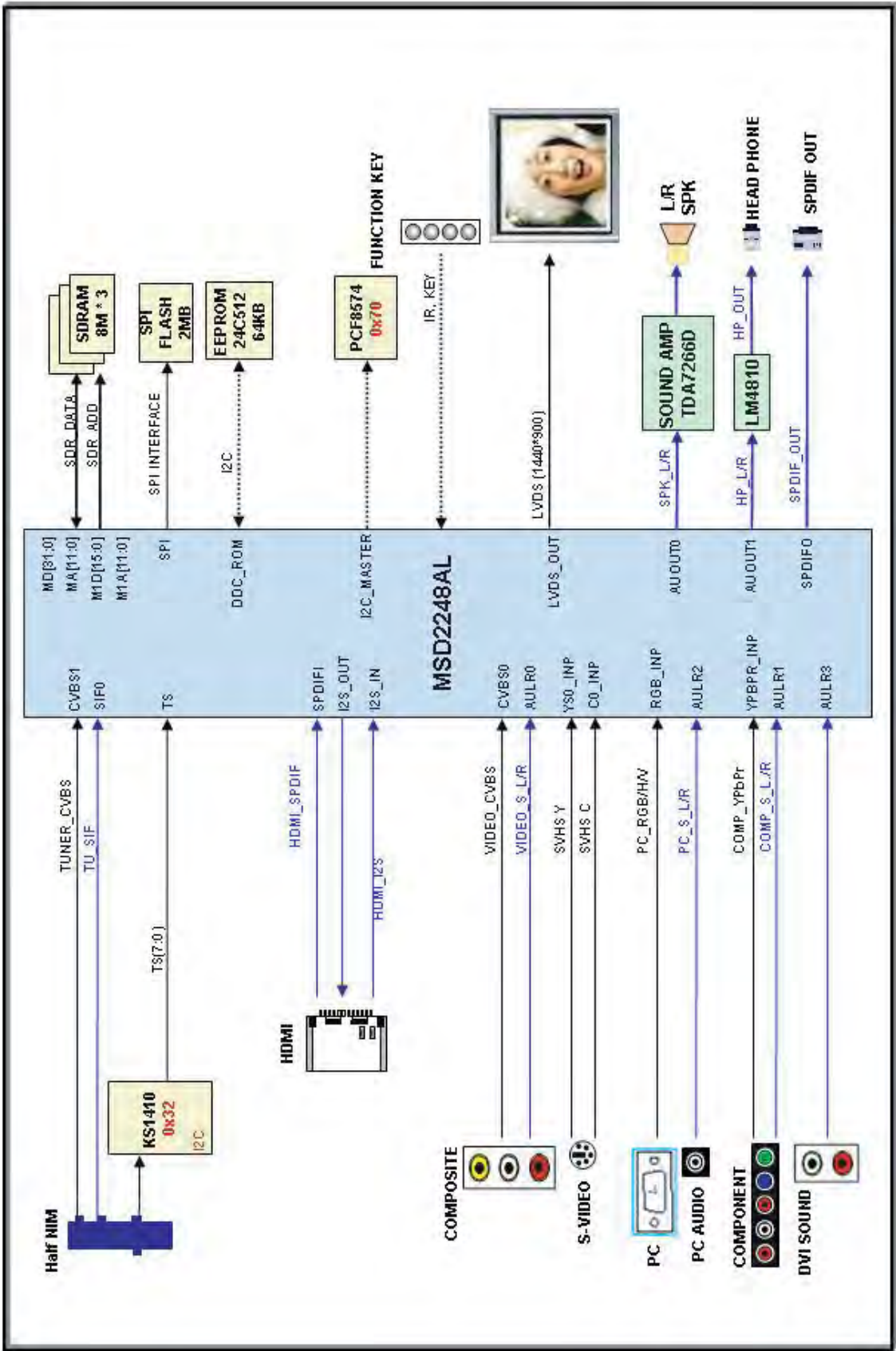
## 6-2. Cables

Code	BP39-00028A (19" POWER CABLE)	BN96-02854Q (19" LVDS CABLE)	
Photo			

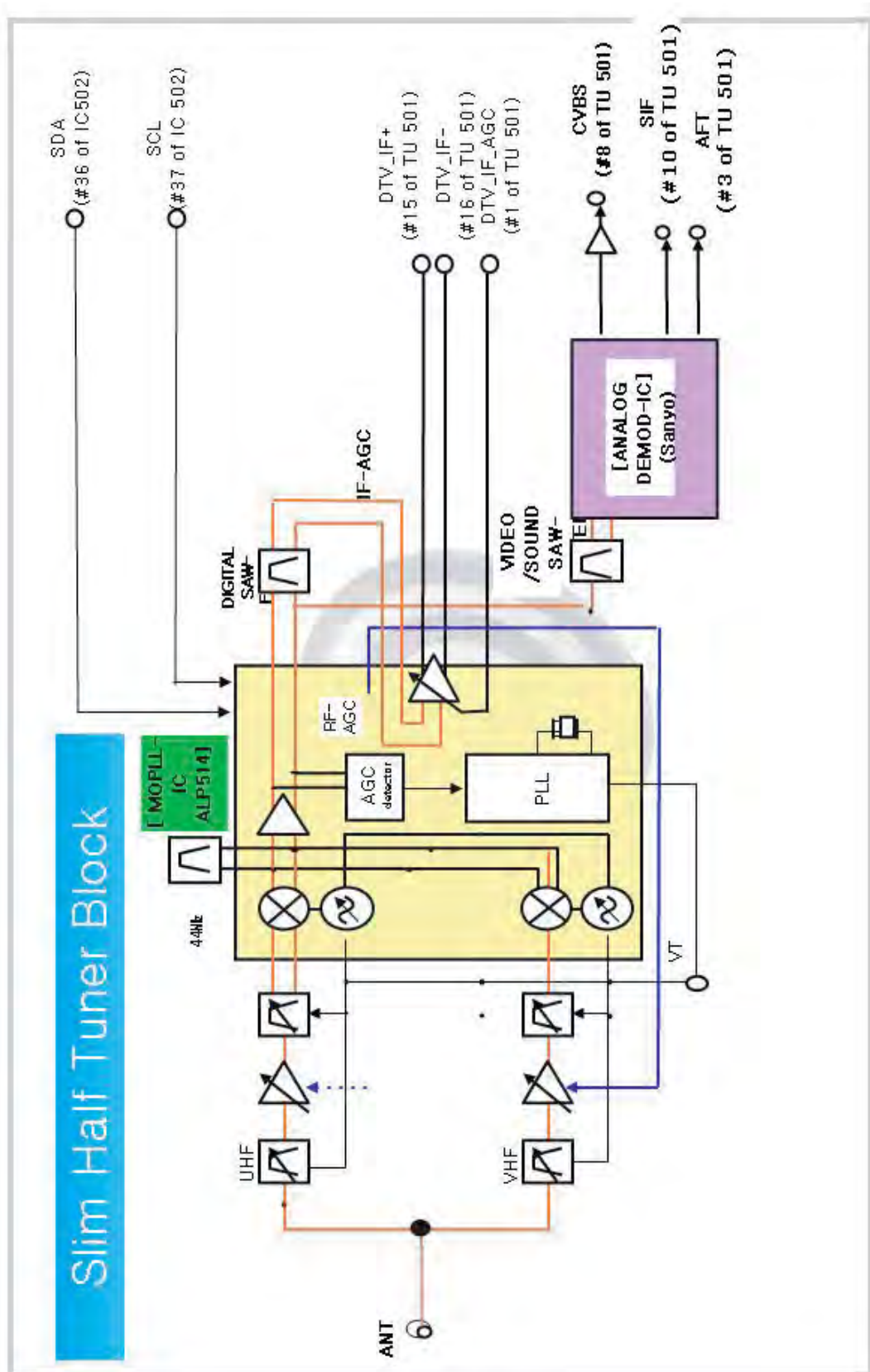
## Memo

7. Schematic Diagram

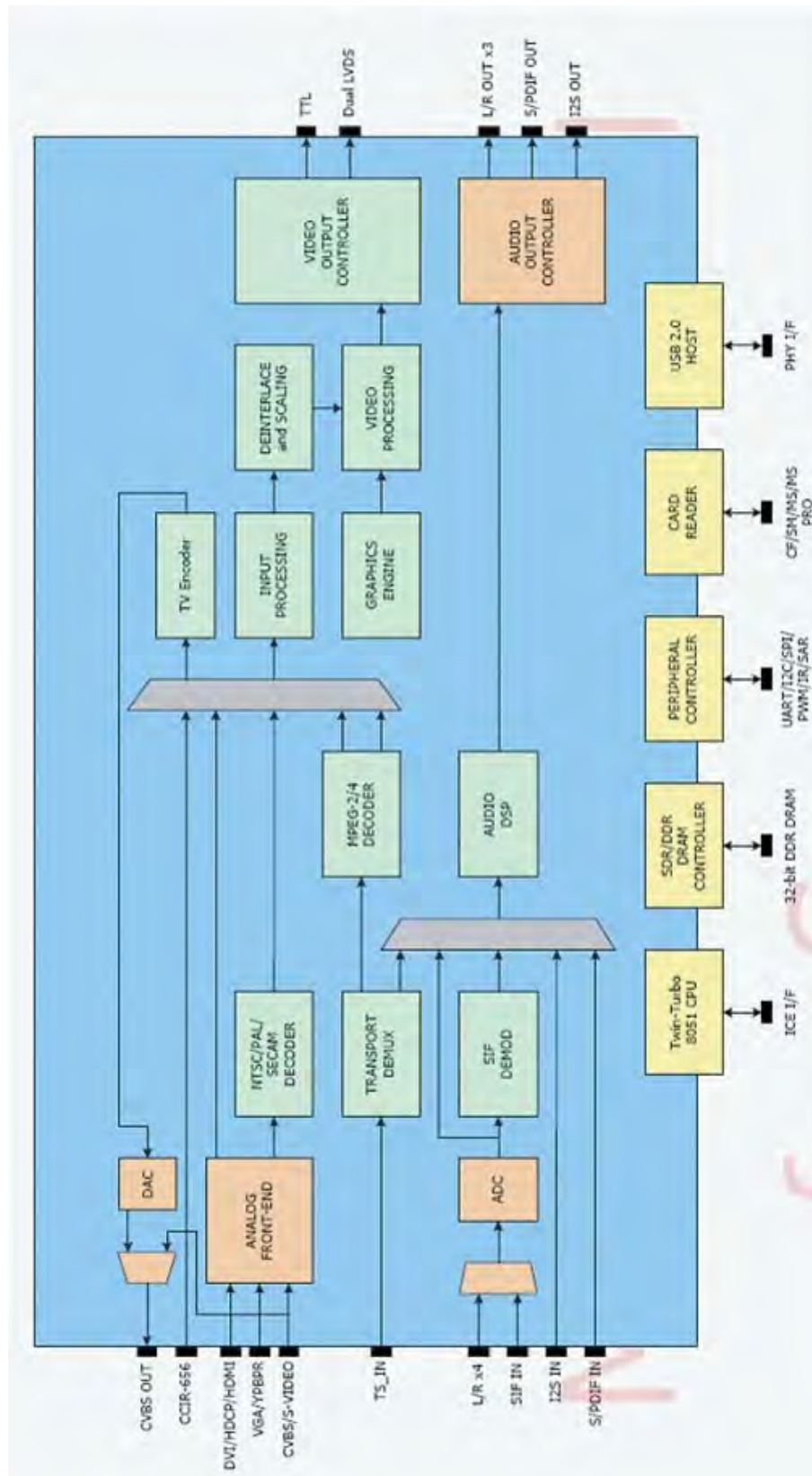
7-1. MSD2248AL Block Diagram



## 7-2. Slim Half Tuner Block Diagram

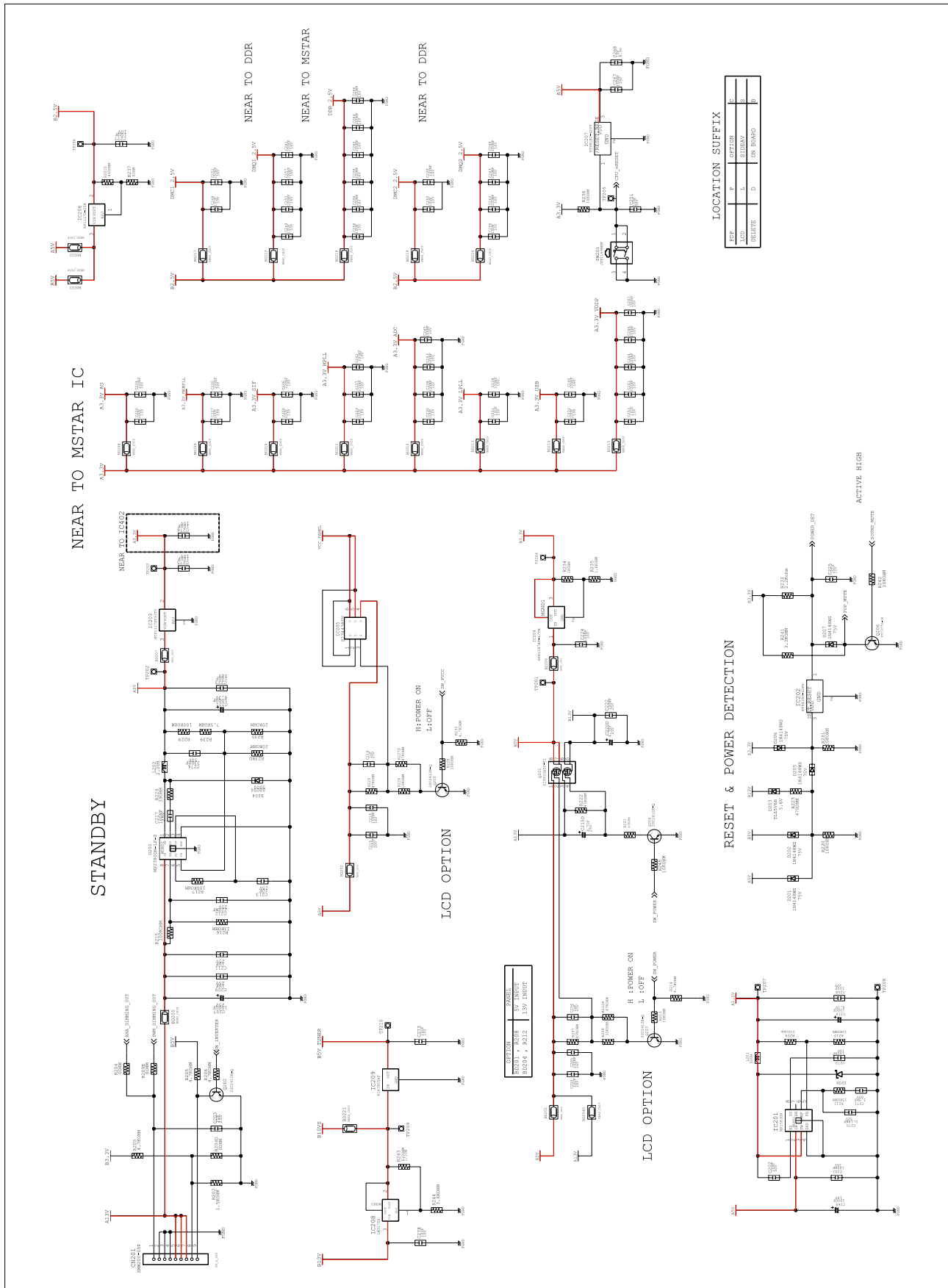


### 7-3. Internal Block Diagram of Scaler(MSD2248AL)



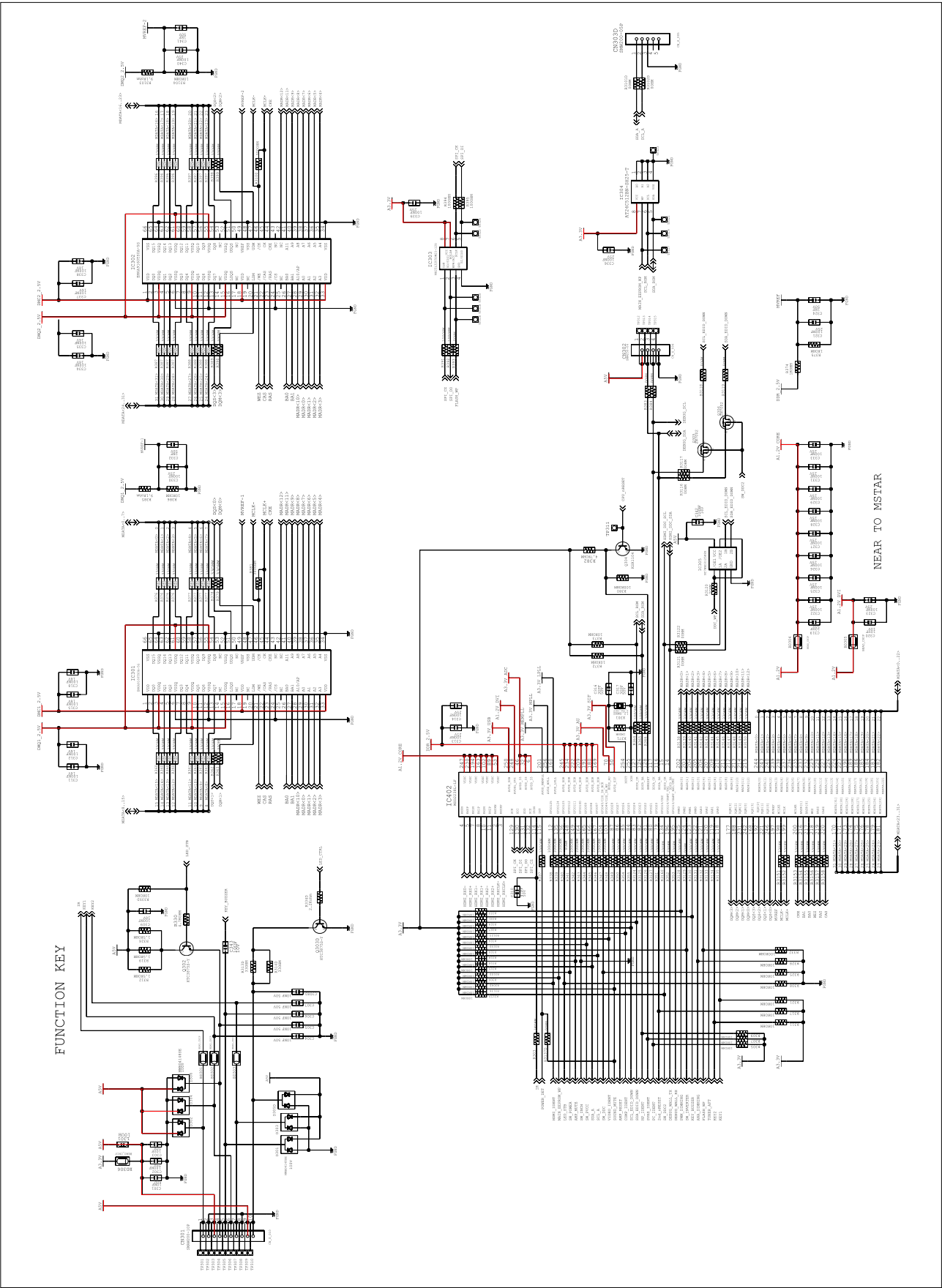
## 7-2. Schematic Diagrams

### 7-2-1. MAIN POWER BLOCK

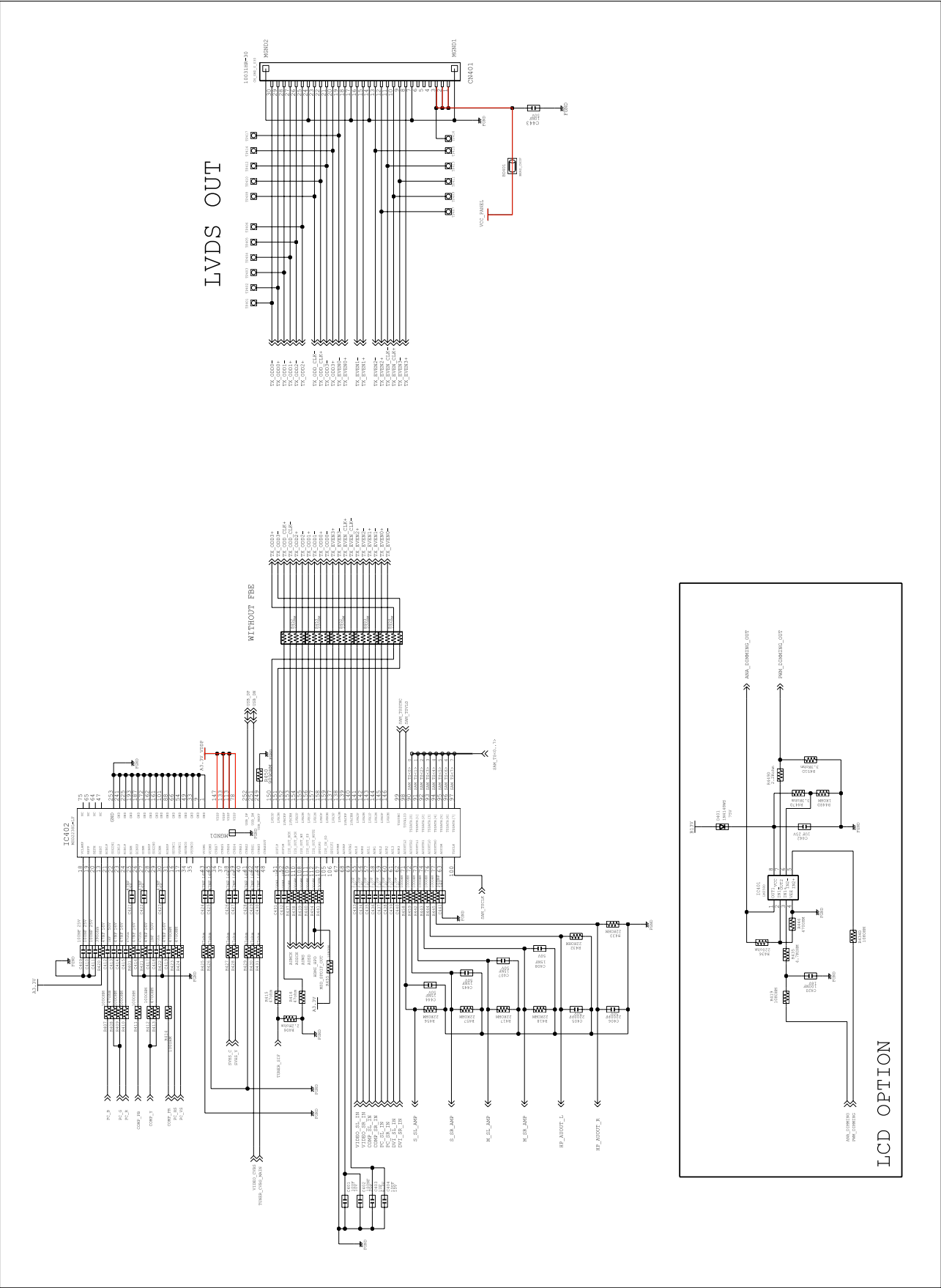




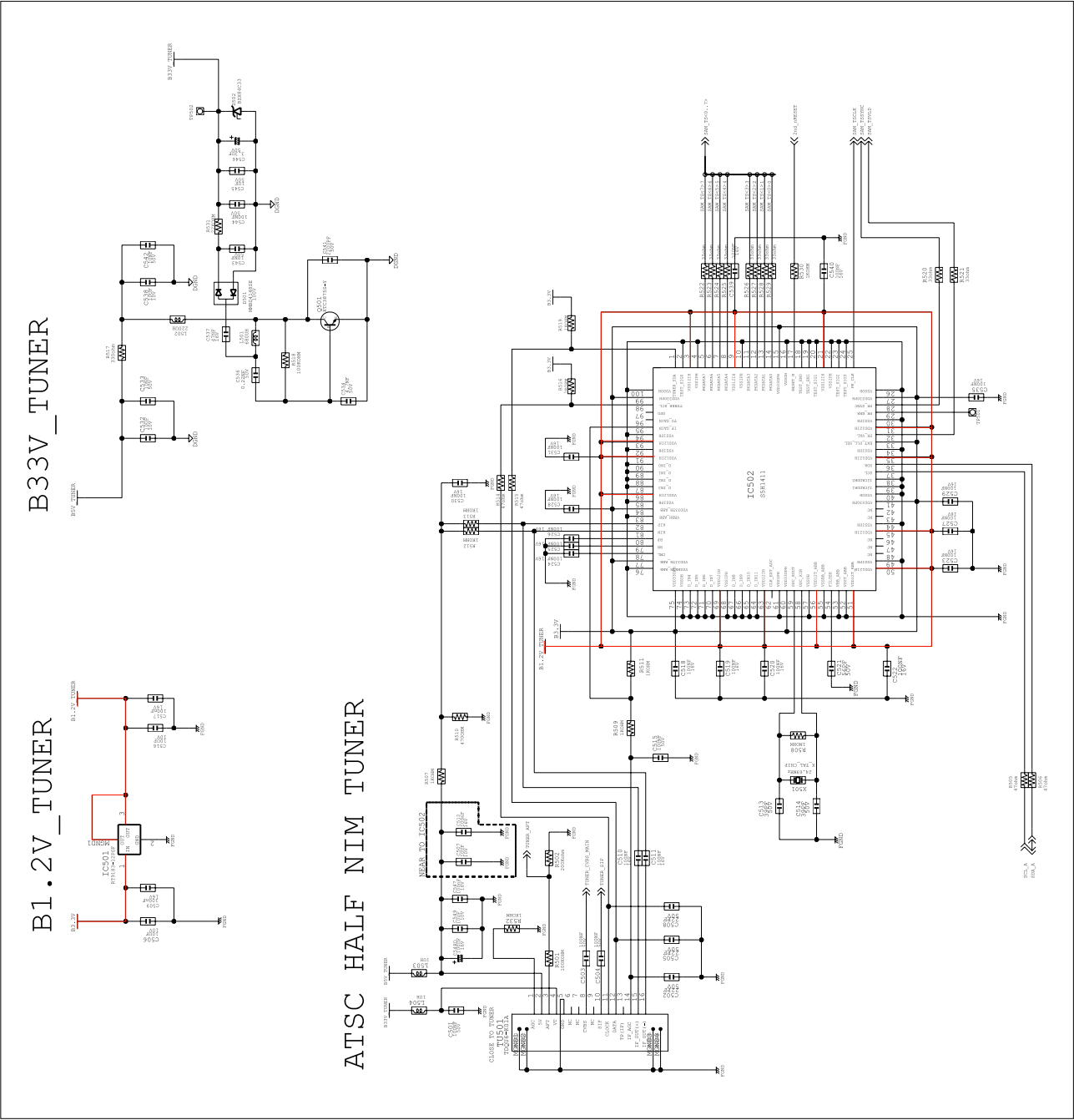
7-2-2.



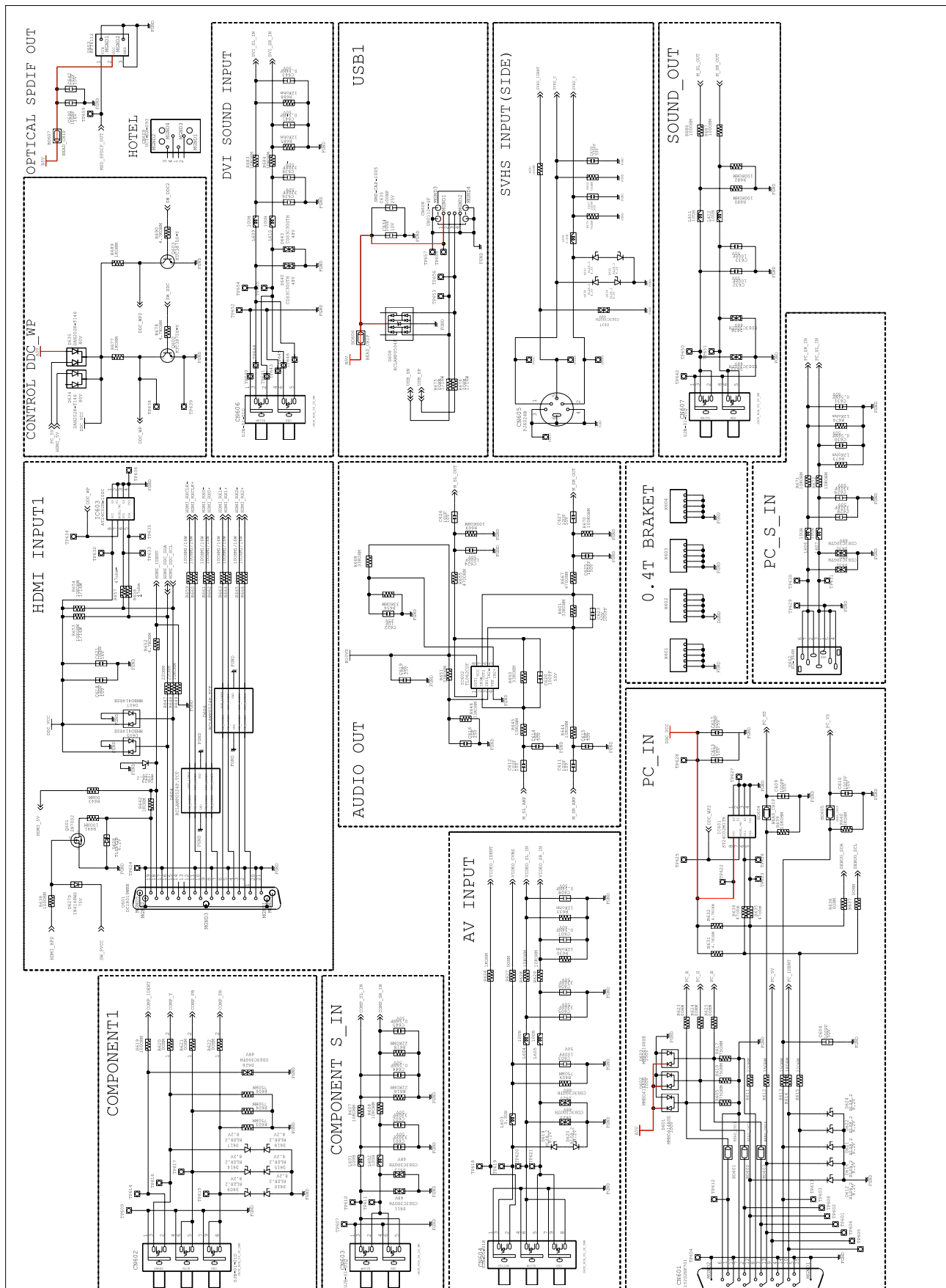
7-2-3.



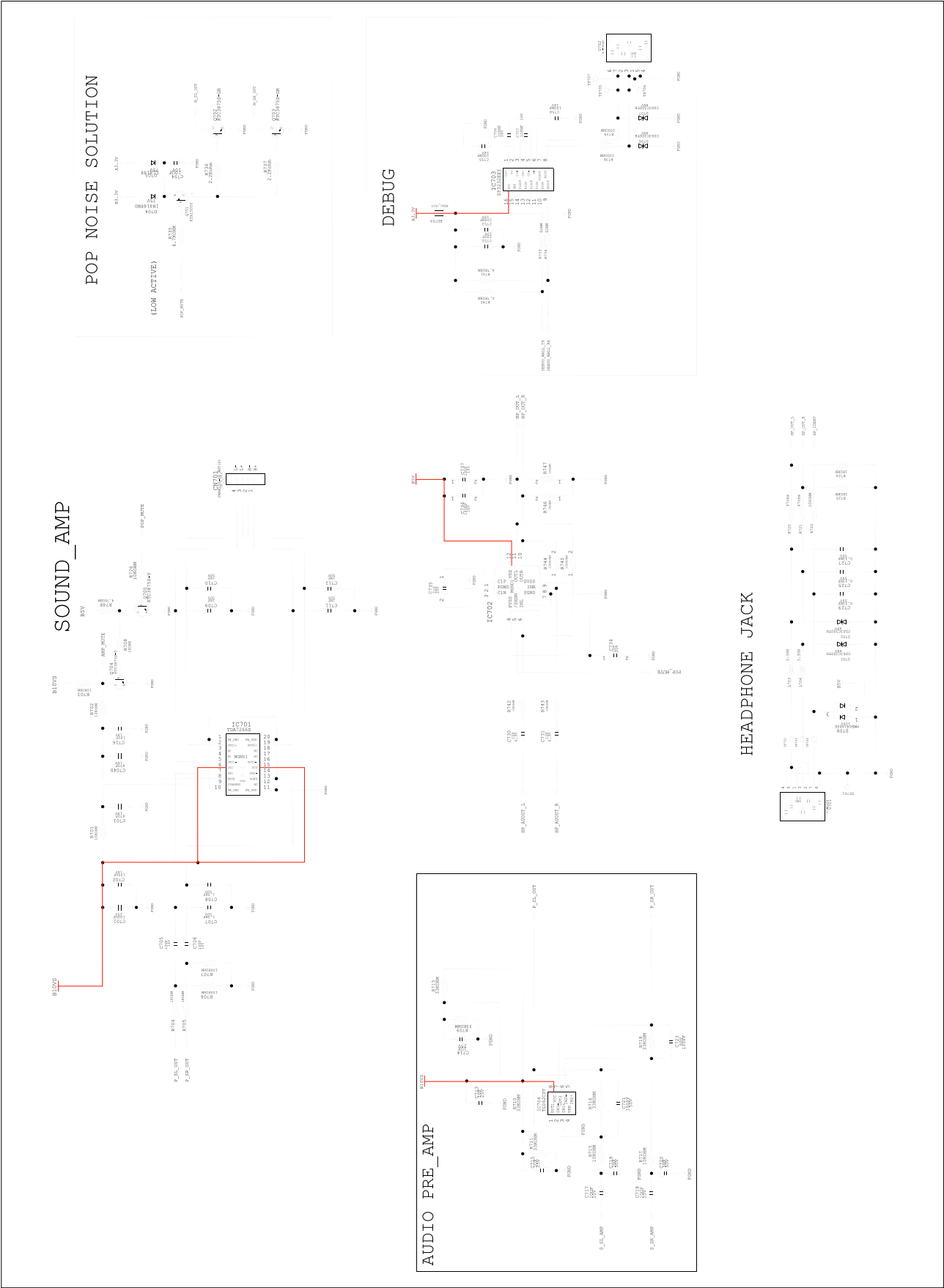
7-2-4.



## 7-2-5.



7-2-6.



## Memo