Internal Use Only

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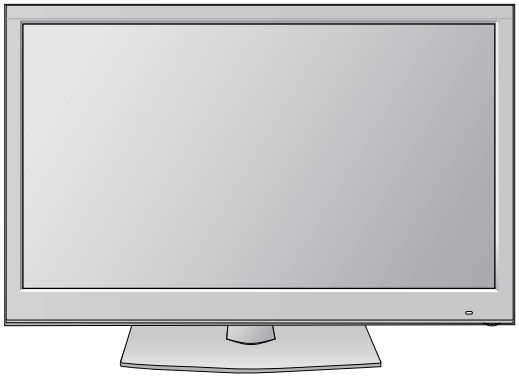
PLASMA TV
SERVICE MANUAL

CHASSIS : PD02A

MODEL : 50PK950/950N/960
50PK950-ZA/50PK950N-ZA
50PK960-ZA

CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



P/NO : MFL62861603(1003-REV00)

Printed in Korea

CONTENTS

SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Exploded View.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer should always be used** during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and it's components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this monitor is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

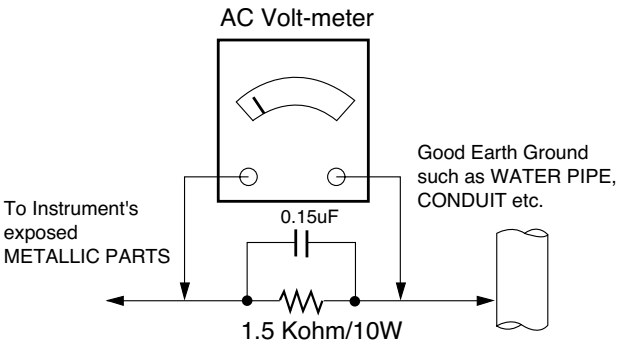
Keep wires away from high voltage or high temperature parts.

Due to high vacuum and large surface area of picture tube, extreme care should be used in **handling the Picture Tube.**
Do not lift the Picture tube by it's Neck.

Leakage Current Cold Check(Antenna Cold Check)
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1MΩ and 5.2MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)
Plug the AC cord directly into the AC outlet.
Do not use a line Isolation Transformer during this check.
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5mA.
In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



SPECIFICATIONS

NOTE : Specifications and others are subject to change without notice for improvement.

■ Application Range

This spec is applied to PDP TV used PD02A Chassis.

Model Name	Market	Brand
50PK950-ZA 50PK950N-ZA 50PK960-ZA	Albania, Austria, Belgium, Bosnia, Bulgaria, Coratia, Czech, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Kazakhstan, Latvia, Lithuania, Luxembourg, Morocco, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, UK	LG

■ Specification

Each part is tested as below without special appointment.

(1) Temperature : 25 °C ± 5 °C (77 °F ± 9 °F), CST : 40 ± 5

(2) Relative Humidity: 65 % ± 10 %

(3) Power Voltage: Standard Input voltage (100 V - 240 V ~, 50 / 60 Hz)

* Standard Voltage of each product is marked by models.

(4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with SBOM.

(5) The receiver must be operated for about 20 minutes prior to the adjustment.

■ Test Method

(1) Performance : LGE TV test method followed.

(2) Demanded other specification

Safety : CE, IEC specification

EMC : CE, IEC

Model Name	Market	Brand
50PK950-ZA 50PK950N-ZA 50PK960-ZA	Albania, Austria, Belgium, Bosnia, Bulgaria, Coratia, Czech, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Kazakhstan, Latvia, Lithuania, Luxembourg, Morocco, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, UK	Safety : IEC/EN60065 EMI : EN55013 EMS : EN55020LG

■ Module Specification

(1) 50” FHD

No	Item	Specification	Remark
1	Display Screen Device	127 cm (50 inch) wide Color Display Module	PDP
2	Aspect Ratio	16:9	
3	PDP Module	PDP50R1####,	
		RGB Closed (Well) Type, Glass Filter (38%)	
		Pixel Format: 1920 horiz. By 1080 ver	
4	Operating Environment	1) Temp. : 0 deg ~ 40 deg	
		2) Humidity : 20 % ~ 80%	LGE SPEC
5	Storage Environment	3) Temp. : -20 deg ~ 60 deg	
		4) Humidity : 10 % ~ 90 %	
6	Input Voltage	AC 100 V ~ 240 V, 50 / 60 Hz	Maker LG

■ Model General Specification

No	Item	Specification	Remarks
1	Market	Albania, Austria, Belgium, Bosnia, Bulgaria, Coratia, Czech, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Kazakhstan, Latvia, Lithuania, Luxembourg, Morocco, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovenia, Spain, Sweden, Slovakia, Switzerland, Turkey, Ukraine, UK	36 Country
2	Broadcasting system	1) PAL/SECAM BG 2) PAL/SECAM DK 3) PAL Ⅰ/Ⅱ 4) SECAM L/L' 5) DVB T 6) DVB C	EU (PAL Market) DVB C (only Sweden, Finland)
3	Receiving system	Analog : Upper Heterodyne Digital : COFDM	
4	Scart Jack (1EA)	PAL, SECAM	Scart 1 Jack is Full scart and support RF-OUT(Analog), MNT-OUT
5	Video Input (1EA)	PAL, SECAM, NTSC	Side AV
6	Component Input (1EA)	Y/Cb/Cr, Y/ Pb/Pr	
7	RGB Input	RGB-PC	Analog (D-Sub 15Pin)
8	HDMI Input (4EA)	HDMI-PC HDMI-DTV	HDMI/DTV,HDMI2, HDMI3, HDMI4
9	Audio Input (3 EA)	RGB/DVI Audio, Component, AV	L/R Input
10	SPDIF Out(1 EA)	SPDIF Out	
11	USB(2EA)	For SVC, S/W Download, X-Studio, DivX	
12	Bluetooth	Bluetooth Phone(JPEG, MP3), Bluetooth Headset(mono, stereo)	Profile : A2DP, BIP, FTP, GAVDP, HSP, OPP
13	Ethernet LAN		

ADJUSTMENT INSTRUCTION

1. Application Range

This spec sheet is applied to all of the PD02A chassis.

2. Specification

(1) Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test instrument.
(2) Adjustment must be done in the correct order.
(3) The adjustment must be performed in the circumstance of 25 °C ± 5 °C of temperature and 65 % ± 10 % of relative humidity if there is no specific designation.
(4) The input voltage of the receiver must keep 100 V ~ 240 V, 50 / 60 Hz.
(5) The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over 15 °C
- In case of keeping module is in the circumstance of 0 °C, it should be placed in the circumstance of above 15 °C for 2 hours
- In case of keeping module is in the circumstance of below -20 °C, it should be placed in the circumstance of above 15 °C for 3 hours,.

● After RGB Full White in HEAT-RUN Mode, the receiver must be operated prior to the adjustment.
● Enter into HEAT-RUN MODE
1) Press the POWER ON KEY on R/C for adjustment.
2) OSD display and screen display PATTERN MODE.
- Set is activated HEAT run without signal generator in this mode.
- Single color pattern (WHITE) of HEAT RUN MODE uses to check panel.
- Caution : If you turn on a still screen more than 20 minutes (Especially digital pattern, cross hatch pattern), an after image may be occur in the black level part of the screen.

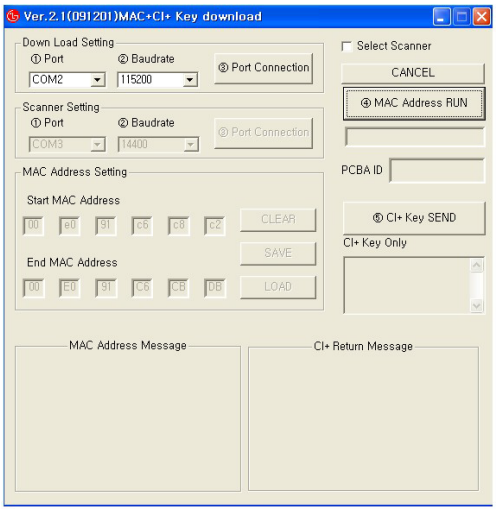
3. PCB Assembly Adjustment Method

* Caution: Using 'power on' button of the control R/C power on TV.

3-1. MAC Address and CI+ Key.

* Connect TV SET and PC which download MAC Address Writing program by RS232C-Cable
(1) Start "MAC+CIKeyl.exe"Program and Click (3) Button to connect TV and PC.
(2) Click (4) to download MAC Address.
(3) Click (5) to download CI+ Key.
(4) When download succeed, you can see "OK" on (6)

* Each Chassis has it' own MAC Address. Please be careful of download.



3-2. Ping TEST

* This test is to check Network operation.
(1) Press "Power on" button of a service R/C.(Baud rate : 115200 bps)
(2) Connect RS232-C Signal Cable.
(3) Connect LAN cable to MAIN PCB Assembly.
(4) When network operates normally, you can see "OK".

3-3. ADC Adjustment

● Auto-control adjustment protocol(RS-232C)

Order	Command	Set response
1. Inter the Adjustment mode	aa 00 00	a 00 OK00x
2. Change the Source	XB 00 40 XB 00 60	b 00 OK40x (Adjust 480i Comp1) (Adjust 1080p Comp1) b 00 OK60x (Adjust 1920*1080 RGB)
3. Start Adjustment	ad 00 10	
4. Return the Response		OKx (Success condition) NGx (Failed condition)
5. Read Adjustment data	(main) ad 00 20 (main) ad 00 30	(main : component1 480i, RGB 1080p) 00000000000000000000000007c007b006dx (main : component1 1080p) 00000007000000000000000007c00830077x
6. Confirm Adjustment	ad 00 99	NG 03 00x (Failed condition) NG 03 01x (Failed condition) NG 03 02x (Failed condition) OK 03 03x (Success condition)
7. End of Adjustment	ad 00 90	d 00 OK90x

(1) Adjustment of RGB
1) Convert to PC in Input-source.
2) Signal equipment displays
Output Voltage: 700 mVp-p
Impress Resolution FHD (1920 x 1080 @ 60Hz)
Model : 225 in Pattern Generator
Pattern : 65 in Pattern Generator
(MSPG-925 SERISE)
3) Adjust by commanding AUTO_COLOR_ADJUST

(2) COMPONENT input ADC
■ Convert to Component in Input-source.
■ Signal equipment displays
Impress Resolution 480i
MODEL : 209 in Pattern Generator(480i Mode)
PATTERN : 65 in Pattern Generator
(MSPG-925 SERISE)
Impress Resolution 1080i
MODEL: 225 in Pattern Generator(1080P Mode)
PATTERN: 65 in Pattern Generator
(MSPG-925 SERISE)

3-4. Insert Tool OPTION

(1) Press ADJ key on R/C to insert Tool OPTION
(2) On the " Tool Option", Insert Tool Option by a number key
(3) Press the ENTER(■)
(4) Press ENTER(■) again.
(5) Select "OK to Download" by using ◄/►(VOL +/-) and press ►(VOL +)

* FOR EU

Model Name	Tool Value 1	Tool Value 2	Tool Value 3	Tool Value 4	Tool Value 5
50PK950-ZA	36864	31279	63112	22892	2866
50PK950N-ZA	36864	31279	63112	22892	2866
50PK960-ZA	37312	31279	63112	22892	2866
60PK950-ZA	49152	31279	63112	22892	2866
60PK950N-ZA	49152	31279	63112	22892	2866
60PK960-ZA	49600	31279	63112	22892	2866
50PK760-ZC	37408	31279	63112	22892	2866
60PK760-ZC	49696	31279	63112	22892	2866

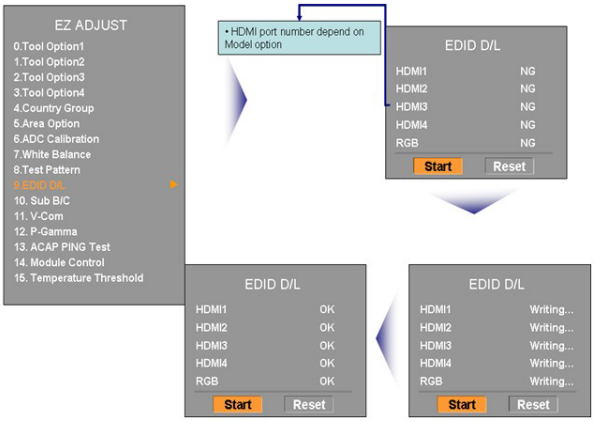
* FOR France

Model Name	Tool Value 1	Tool Value 2	Tool Value 3	Tool Value 4	Tool Value 5
50PK950-ZA	36864	31279	63112	22892	2870
60PK950-ZA	49152	31279	63112	22892	2870
50PK760-ZA	37408	31279	63112	22892	2870
60PK760-ZA	49696	31279	63112	22892	2870

3-5. EDID(The Extended Display Identification Data) download

(1) Press the ADJ KEY on R/C and enter EZ ADJUST.
(2) Select "5.EDID D/L" by using ▲/▼(CH +/-) and press ENTER(■).
(3) Select "Start" and press navigation key(►).
(4) EDID download is executed automatically.
(5) Press EXIT key on R/C

* Caution
- Never connect HDMI & D-sub Cable when the user download EDID .
■ Use the proper cables below for EDID Writing.



* Edid data and Model option download(RS232)

NO	Item	CMD 1	CMD 2	Data 0		
Enter download MODE	Download 'Mode In'	A	E	0	0	When transfer the 'Mode In', Carry the command.
Edid data and Model option download	Download	A	E	*Note1	*Note2	Automatically download (The use of a internal Data)
	Adjust 'Mode Out'	A	E	9	0	
	Adjustment Confirmation	A	E	9	9	To check Download on Assembly line.

* EDID DATA
1) analog RGB

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	14	01	03	08	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	81	80	D1	C0
30	01	01	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
40	35	00	40	84	63	00	00	1A	66	21	50	B0	51	00	1B	30
50	40	70	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	3E
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	04	00	4C	1F	00	90	51	00	1B	30	40	88	17	00
10	40	84	63	00	00	1C	02	3A	80	18	71	38	2D	40	58	2C
20	45	00	40	84	63	00	00	1E	00	00	00	00	00	00	00	00
30	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	46

2) HDMI

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	01	14	01	03	80	A0	5A	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	31	40	45	40	61	40	81	80	D1	C0
30	01	01	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
40	35	00	40	84	63	00	00	1A	66	21	50	B0	51	00	1B	30
50	40	70	36	00	40	84	63	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	C6 ←C/S

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	02	03	26	F1	4E	02	03	11	12	13	04	15	16	05	14	10
10	1F	22	20	26	15	07	50	09	57	07	67	03	0C	00	10	00
20	B8	2D	E3	05	03	01	4C	1F	00	90	51	00	1B	30	40	88
30	17	00	40	84	63	00	00	1C	01	1D	00	72	51	D0	1E	20
40	6E	28	55	00	40	84	63	00	00	1E	01	1D	80	18	71	1C
50	16	20	58	2C	25	00	40	84	63	00	00	9E	02	3A	80	18
60	71	38	2D	40	58	2C	45	00	40	84	63	00	00	1E	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	9B ←C/S

ⓐ Vender ID

INOUT	HEX
HDMI 1	10
HDMI 2	20
HDMI 3	30
HDMI4	40

INPUT	C/S
HDMI 1	C69B
HDMI 2	C68B
HDMI 3	C67B
HDMI4	C66B

3-6. Confirmation

(1) Press 'InStart' Key on Factory SVC Remote Controller. And MUST check ADC & EDID ADJ status is OK.

4. SET assembly adjustment method

* Caution : Each PCB assembly must be checked by check JIG set. (Because power PCB Assembly damages to PDP Module, especially be careful)

4-1. POWER Supply Unit PCB Ass'y Va/Vs Voltage Adjustment

Test equipment : D.M.M 1EA
Connection Diagram for Measuring : refer to fig.4
Adjustment method

(1) Va adjustment
  1) Connect + terminal of D.M.M. to Va pin of P811, connect -terminal to GND pin of P811.
  2) After turning VR502,voltage of D.M.M adjustment as same as Va voltage which on label of panel right/top (deviation; ±0.5V)

(2) Vs adjustment
  1) Connect + terminal of D.M.M. to Vs pin of P811, connect -terminal to GND pin of P811.
  2) After turning VR901, voltage of D.M.M adjustment as same as Vs voltage which on label of panel right/top (deviation ; ±0.5V)

4-2. Download Serial number (RS-232C)

- Press "Power on" key of service R/C. (Baud rate : 115200 bps)
- Connect RS232 Signal Cable to RS-232 Jack.
- Write Serial number by use RS-232.
- Must check the serial number at the Diagnostics of SET UP menu. (Refer to below '6.SET INFORMATION').

4-3. Adjustment of White Balance

Required Equipment

- Remote controller for adjustment
- Color Analyzer (CS-1000, CA-100,100+,CA-210 or same produc: CH 10 (PDP)
  * Please adjust CA-210, CA-100+ by CS-1000 before measuring
- Auto W/B adjustment instrument(only for Auto adjustment)
- 9 Pin D-Sub Jack(RS232C) is connected to the AUTO W/B EQUIPMENT.

Before Adjust of White Balance, Please press POWER ONLY key

Adjust Process will start by execute RS232C Command.

- Color temperature standards according to CSM and Module

CSM	PLASMA
Cool	11000K
Medium	9300K
Warm	6500K

- CS-1000/CA-100+/CA-210(CH 10)
  White balance adjustment coordinates and color temperature.

CSM	Color Coordinate		Temp	±Color Coordinate
	x	y		
Cool	0.276	0.283	11000K	0.002
Medium	0.285	0.293	9300K	0.002
Warm	0.313	0.329	6500K	0.002

* Manual W/B process (using adjusts Remote control)
  Please Adjust in AV 1 MODE, Turn off Energy Saving Mode.

(1) Enter 'PICTURE RESET' on Picture Mode, then turn off Fresh Contrast and Fresh colour in Advanced Control
(2) After enter Service Mode by pushing "ADJ" key,
(3) Enter White Pattern off of service mode, and change off -> on.
(4) Enter "W/B ADJUST" by pushing "►" key at "3. W/B ADJUST".

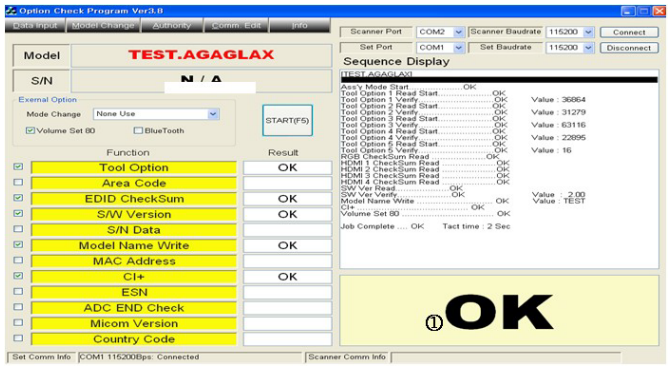
* Gain Max Value is 192. So, Never make any Gain Value over 192 and please fix one Value on 192, between R, G and B.

	Min	Typ	Max
R-GAIN	0	192	192
G-GAIN	0	192	192
B-GAIN	0	192	192

* Auto-control interface and directions
  (1) Adjust in the place where the influx of light like floodlight around is blocked. (Illumination is less than 10ux).
  (2) Measure and adjust after sticking the Color Analyzer (CA-100+, CA210) to the side of the module.
  (3) Aging time
  After aging start, keep the Power on (no suspension of power supply) and heat-run over 5 minutes

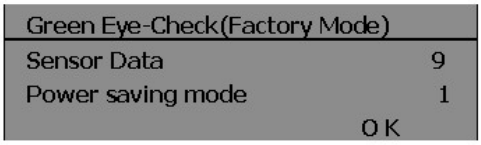
4-4. Serial number download & Model name D/L and Check Tool Option.

(1) Press "Power on" button of a service R/C.(Baud rate : 115200 bps)
(2) Connect RS232-C Signal Cable and start 'Option Check Program Ver3.8'
(3) Scan serial Number and press 'F5' button.
(4) Check 'OK' on program 1) program.
(5) Press 'In start' button on SVC R/C, check Serial Number and Model Name.



4-5. Checking the EYE-Q Operation.

(1) Press the EYE Key on the adjustment remote controller.
(2) Check the Sensor DATA (It must be under 10) and keep the data longer than 1.5s
3) Check 'OK'



(Sensor DATA 0 ~ 4095, Power Saving Mode 0 ~ 12)
* IF you press IN-STAP Button, change Green Eye-check OSD.

4-6. Ping TEST

* This test is to check Network operation.
  (1) Connect LAN cable from Computer to TV Set
  (2) When network operates normally, you can see "OK" on Computer

5. Set Information (Serial No & Model name)

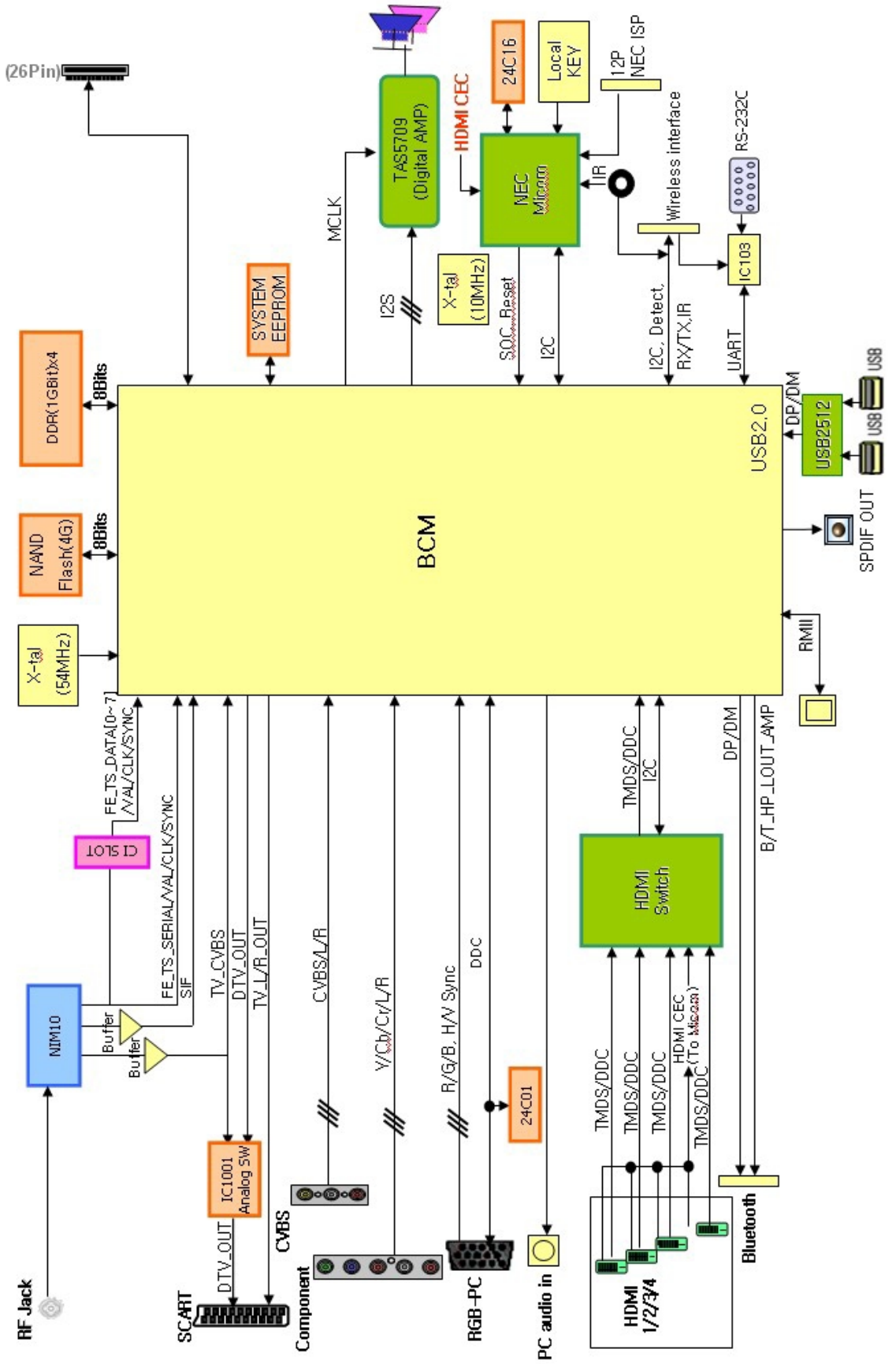
5-1. Check the serial number & Model Name

(1) Push the menu button and press red button on R/C to enter 'Customer Support'menu.
(2) Move to 'signal test' menu. And check Serial No & Model Name
Select the STATION -> Diagnostics -> To set

6. SW Download Guide.

* Before put a *.epk to USB Stick make 'LG_DTV' folder in USB. Then, put *.epk file to 'LG_DTV' folder and Turn on TV
  (1) Put the USB Stick to the USB socket
  (2) Automatically detecting update file in USB Stick
    * If your downloaded program version in USB Stick is Low, it didn't work.
    But your downloaded version is High, USB data is automatically detecting.
  (3) Show the message "Copying files from memory"
  (4) Updating is staring.
  (5) Updating Completed, The TV will restart automatically.
  After turn on TV, Please press 'IN-STOP' button on ADJ Remote-control.
    * IF you don't have ADJ R/C, enter 'Factory Reset' in OPTION MENU.
  (6) When TV turns on, check the Updated version on Diagnostics MENU.

BLOCK DIAGRAM



EXPLODED VIEW

IMPORTANT SAFETY NOTICE

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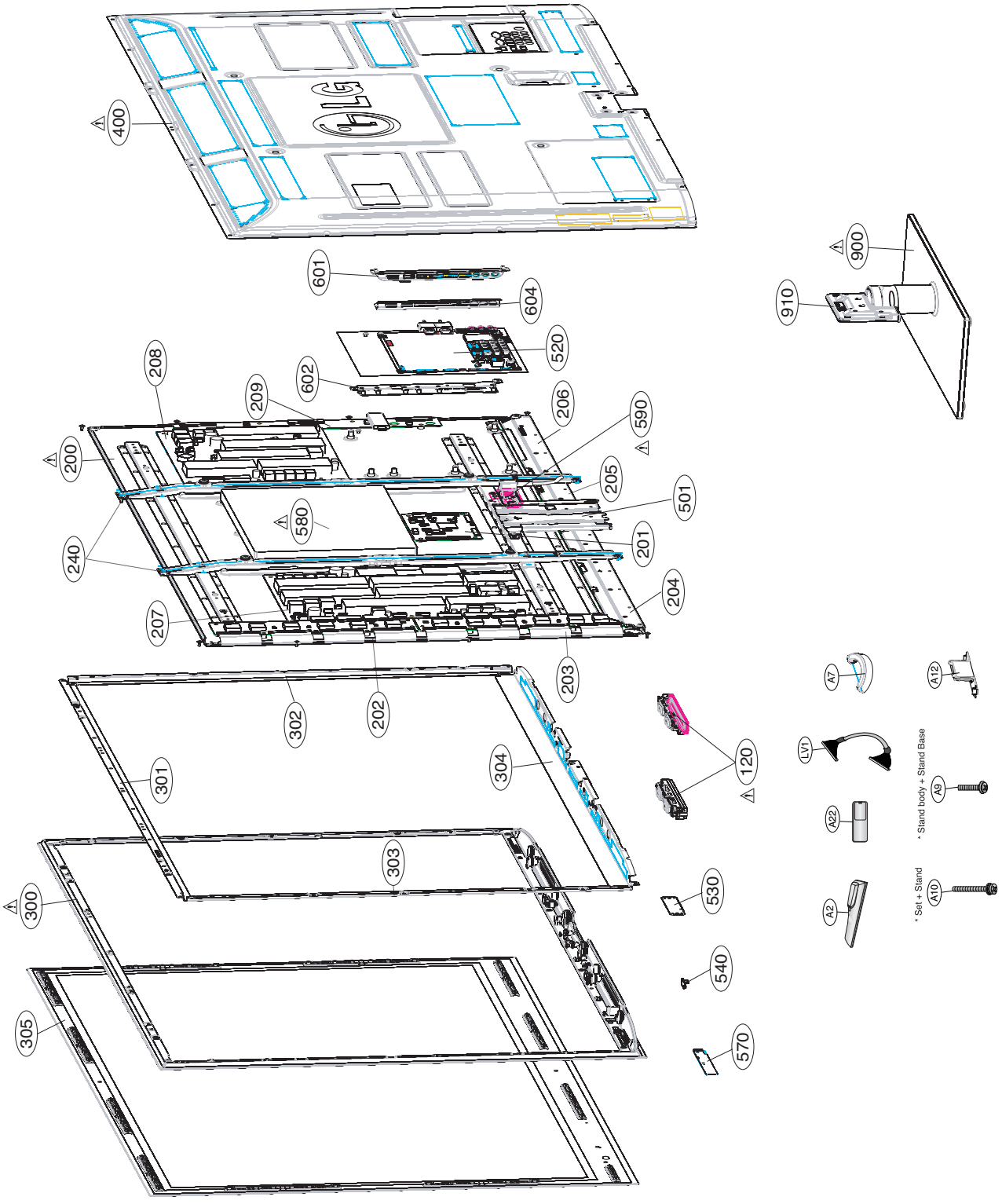
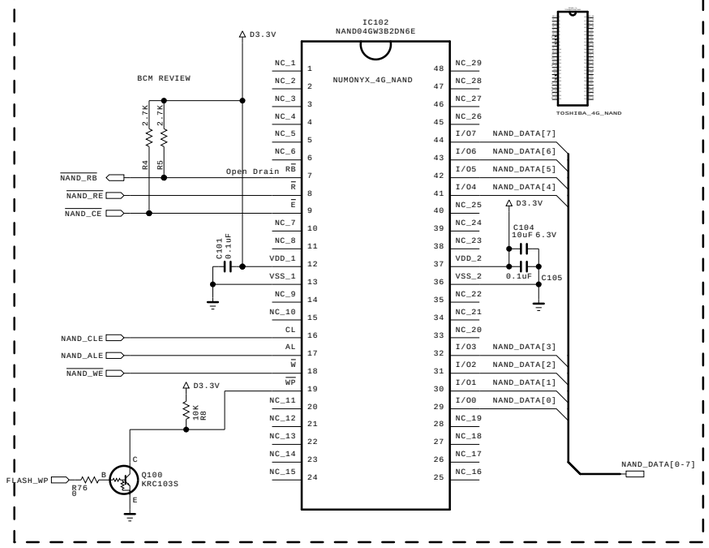
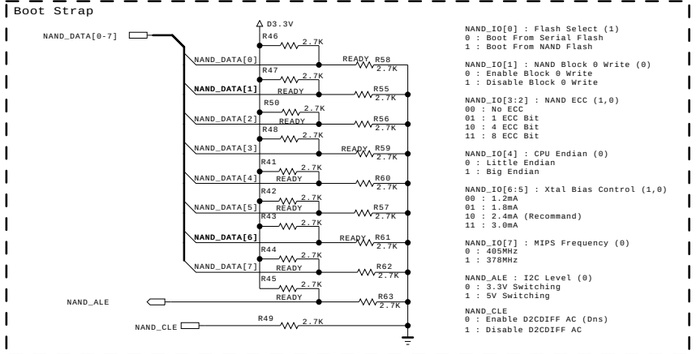


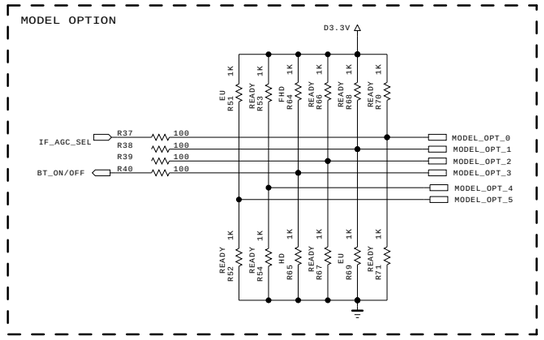
NAND FLASH MEMORY 4G BIT FOR BBTV



Boot Strap



MODEL OPTION



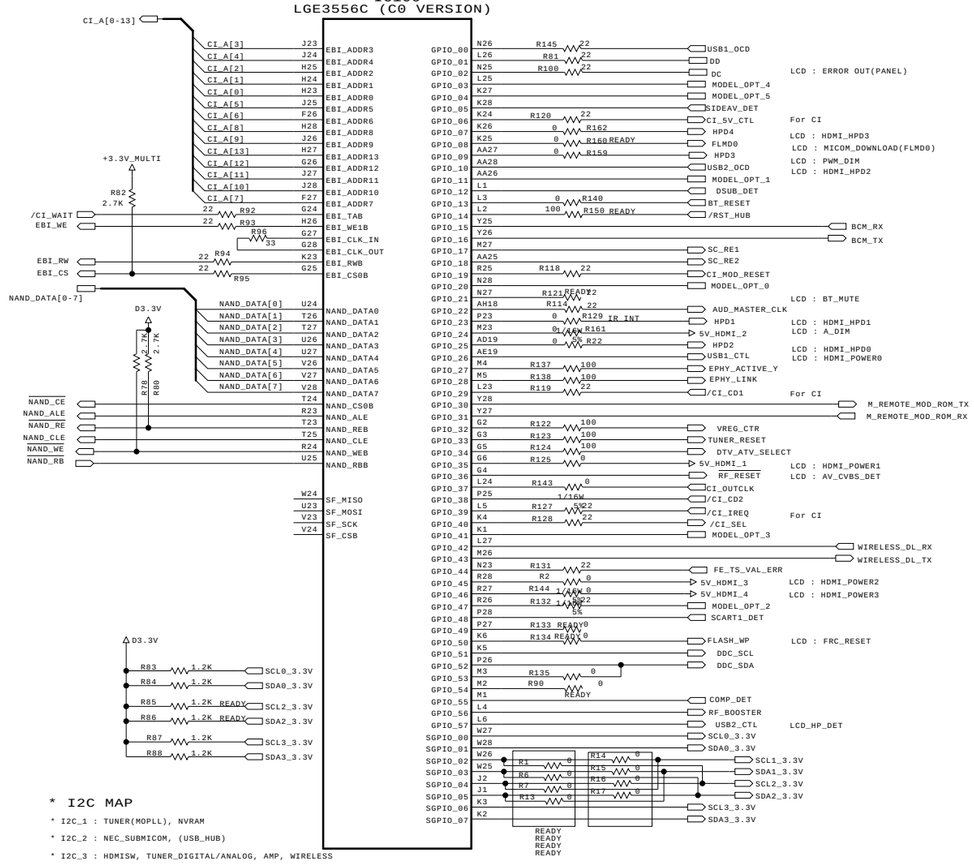
MODEL OPTION

PIN NAME	PIN NO.	HIGH	LOW
MODEL_OPT_0	G19	FRC	NO FRC
MODEL_OPT_1	C5	BRAZIL&AUS	EURO
MODEL_OPT_2	F7	NOT USE	
MODEL_OPT_3	B6	FHD	HD
MODEL_OPT_4	E18	XGA	WXGA
MODEL_OPT_5	D18	EURO&AUS	BRAZIL

PDP CHASSIS OPTION

	BRAZIL	EURO	AUSTRALIA
MODEL_OPT_1	1	0	1
MODEL_OPT_5	0	1	1

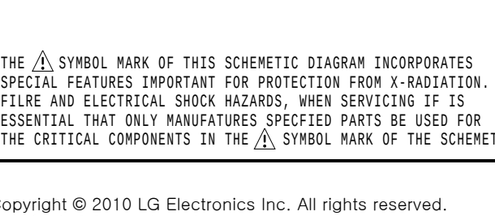
IC100 LGE3556C (C0 VERSION)



* I2C MAP

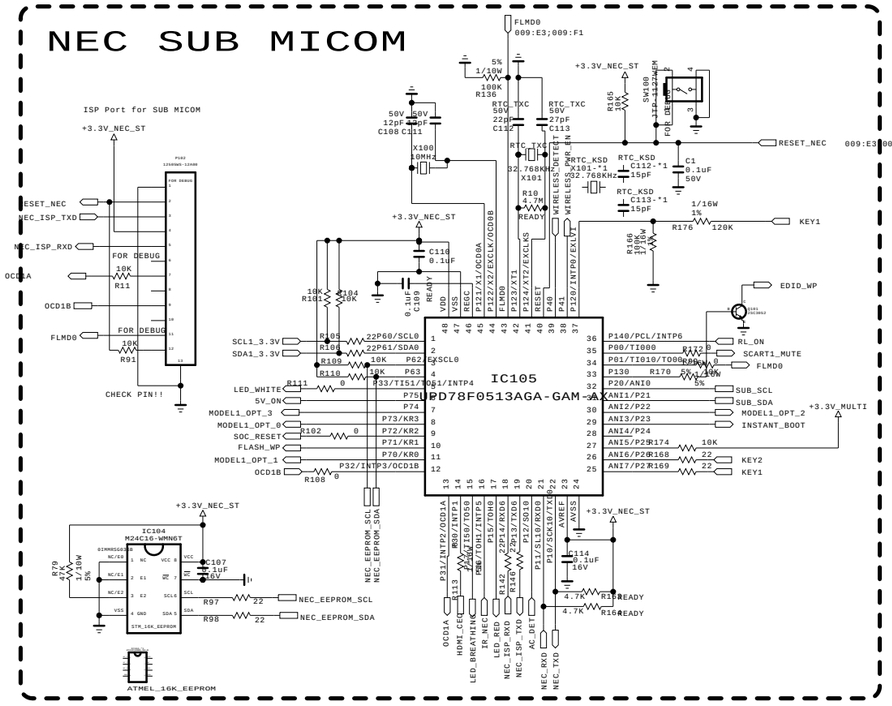
* I2C_1 : TUNER(MOPLL), NVRAM
* I2C_2 : NEC_SUBMICOM, (USB_HUB)
* I2C_3 : HDMISW, TUNER_DIGITAL/ANALOG, AMP, WIRELESS
* I2C_4 : MODULE

SYSTEM EEPROM

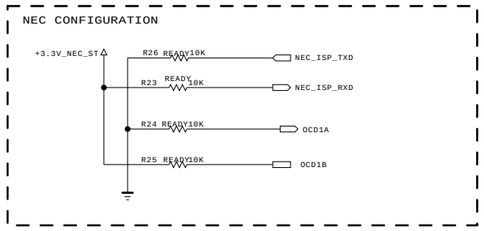


RESET

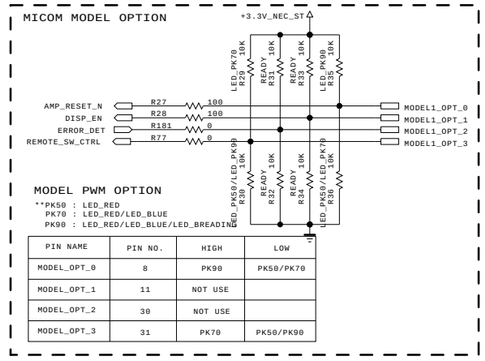
NEC SUB MICOM



NEC CONFIGURATION

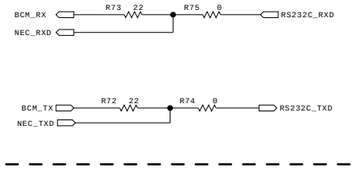


MICOM MODEL OPTION



PIN NAME	PIN NO.	HIGH	LOW
MODEL_OPT_0	8	PK90	PK50/PK70
MODEL_OPT_1	11	NOT USE	
MODEL_OPT_2	30	NOT USE	
MODEL_OPT_3	31	PK70	PK50/PK90

UART BYPASS(WIRED OR)



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SECRET
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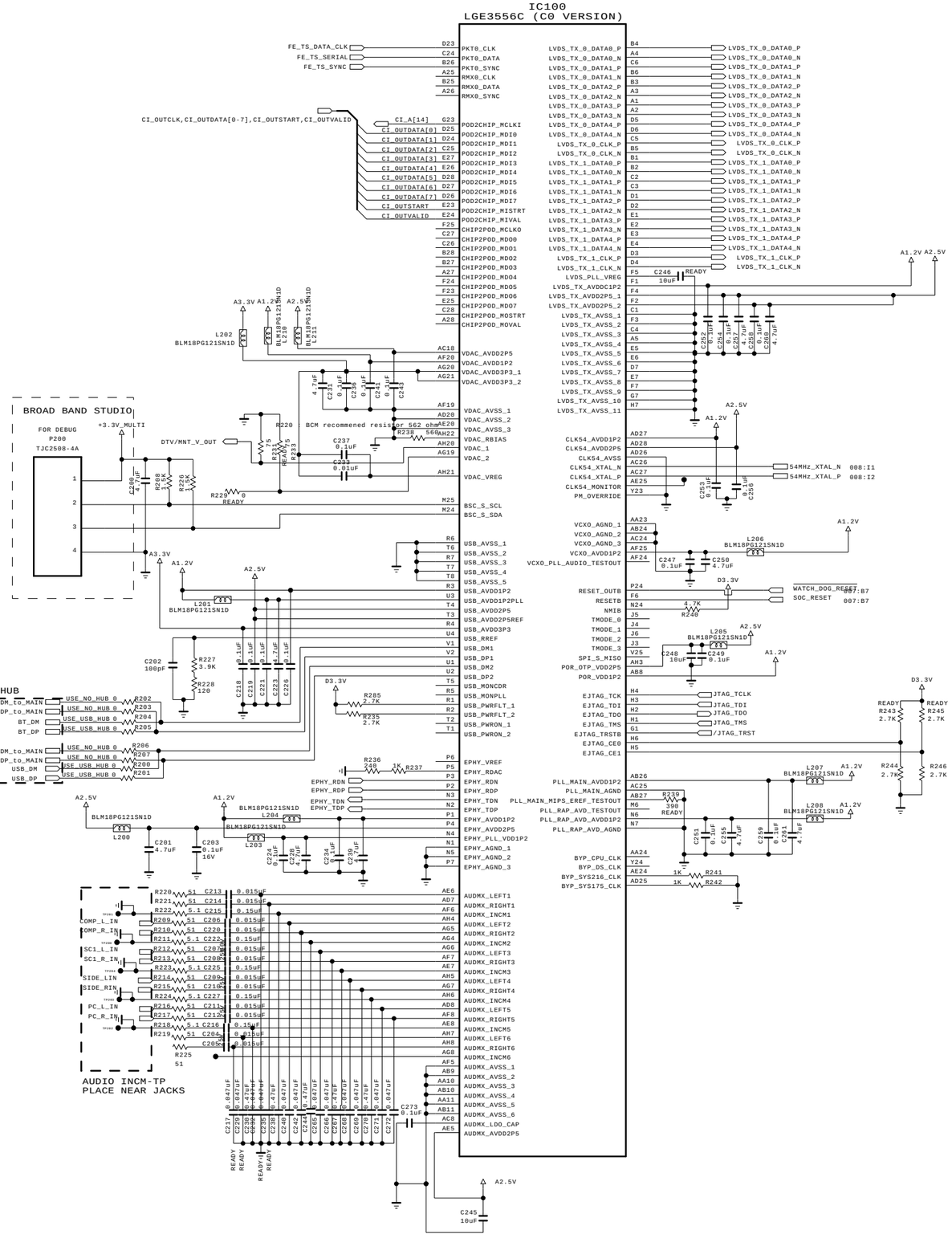
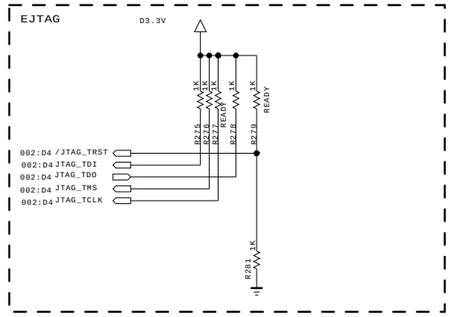
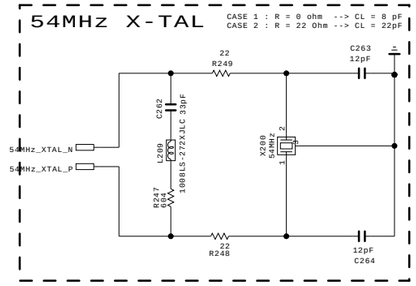
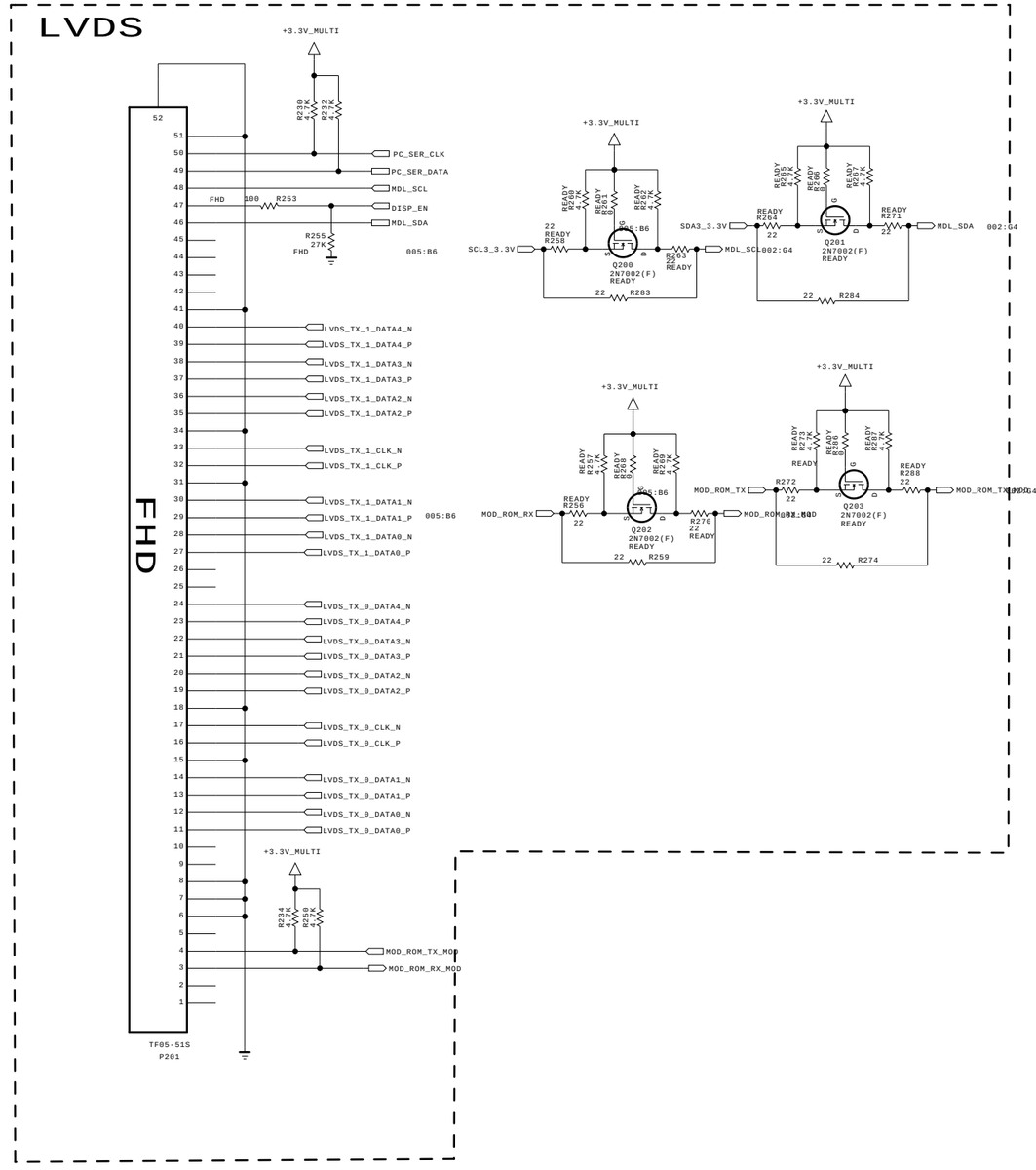
LG ELECTRONICS

MODEL	BCM GPIO & NEC MICOM & FLASH & SYS EEPROM	DATE	10/01/
BLOCK	BCM GPIO/NEC MICOM/FLASH/SYS EEPROM	SHEET	1/13









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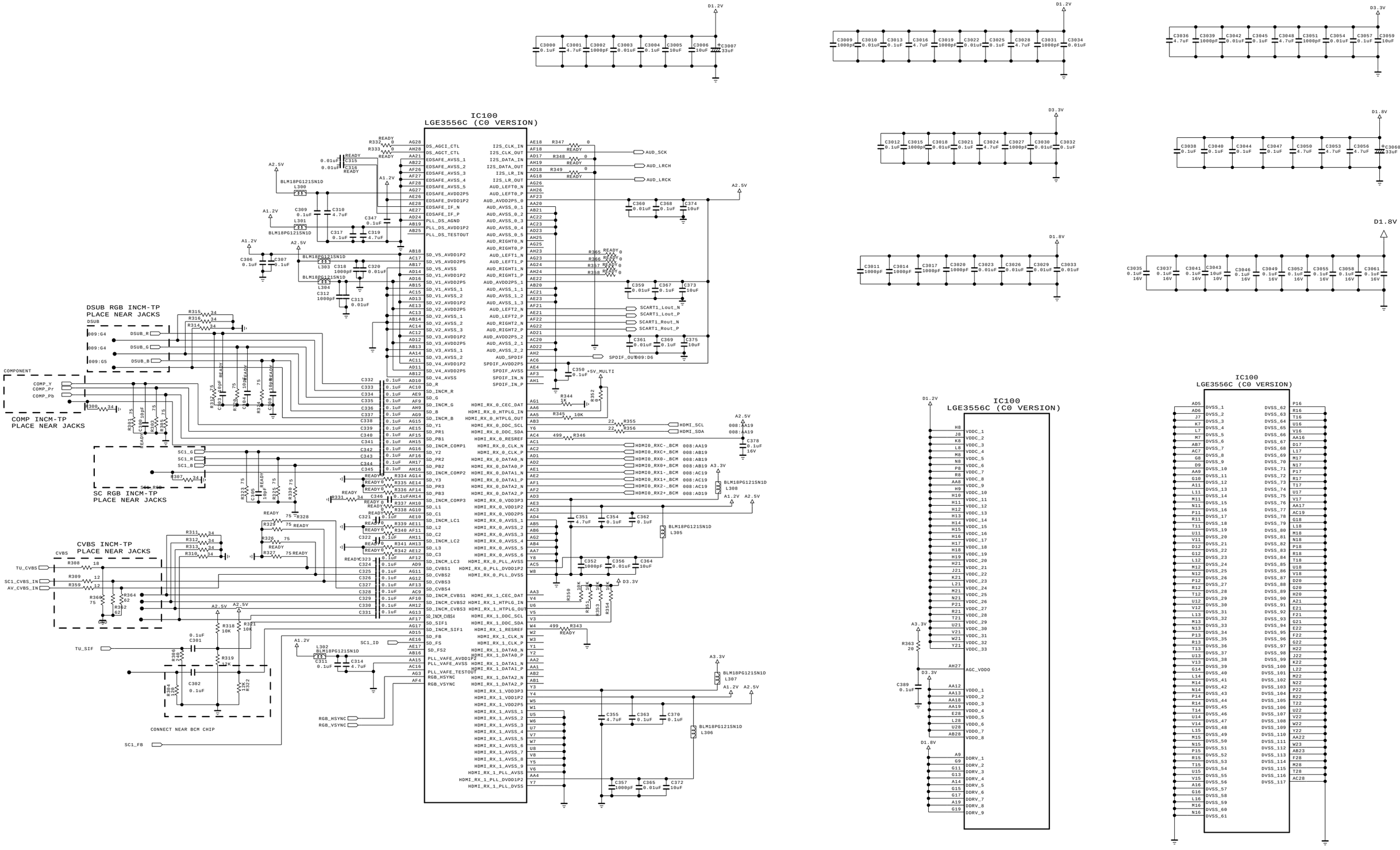
LG ELECTRONICS

MODEL	BCM3556-C0	DATE	10/01/
BLOCK	BCM AUDIO/LVDS	SHEET	2 / 13



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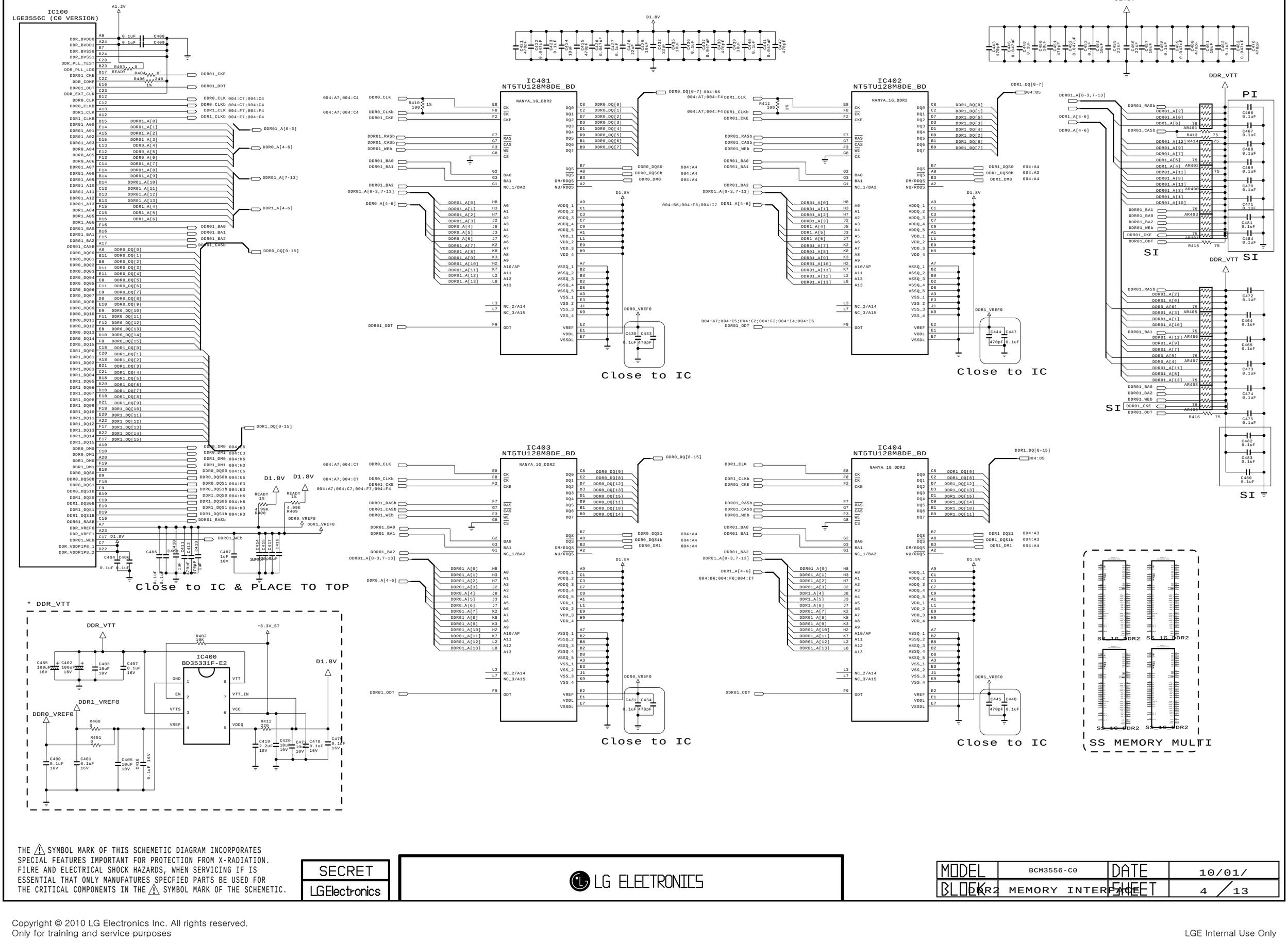
LG ELECTRONICS

MODEL	BCM3556-C0	DATE	10/01/
BLOCK	BCM VIDEO IN/BCM POWER	SHEET	3 / 13



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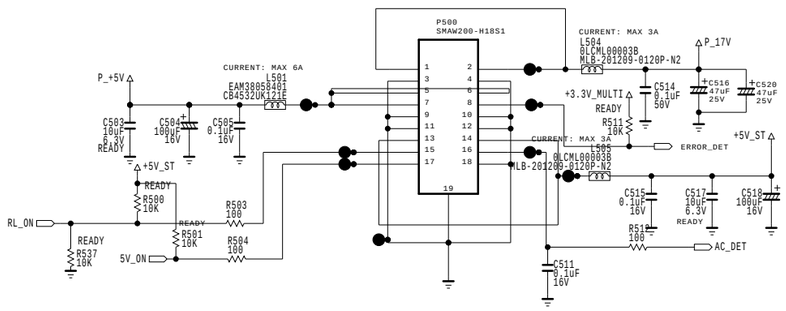
LG ELECTRONICS

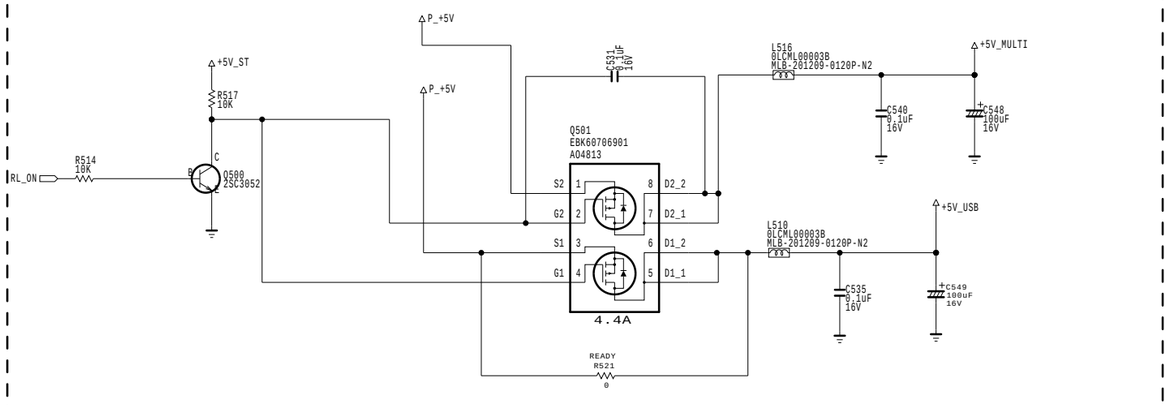
MODEL	BCM3556-C0	DATE	10/01/
BLOCK	DDR2 MEMORY INTERFACE	SHEET	4 / 13

POWER B/D

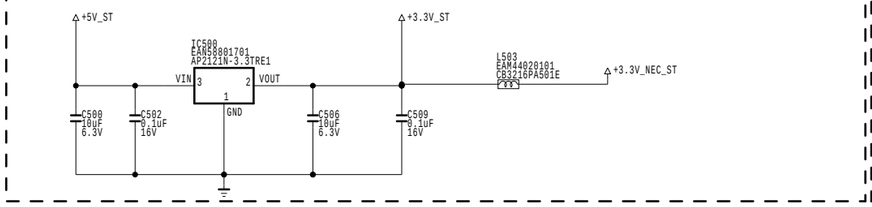
POWER Wafer 24P



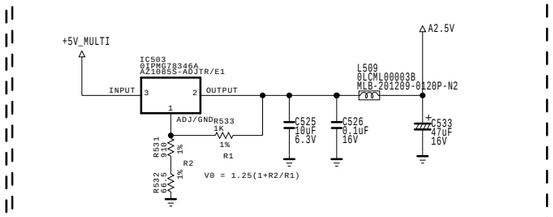
FRC DDR 1.5V & Multi 5V Switch



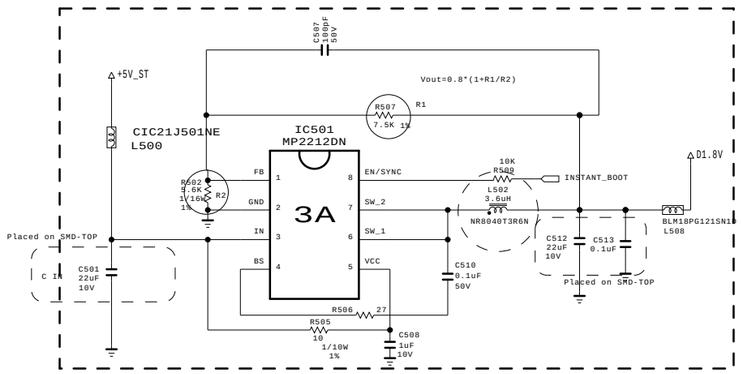
Stand-by (5VST --> +3.3V_ST)



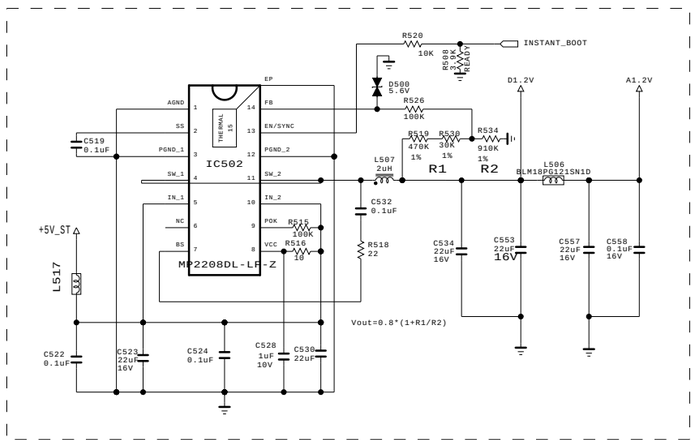
BCM3556 CORE 2.5V



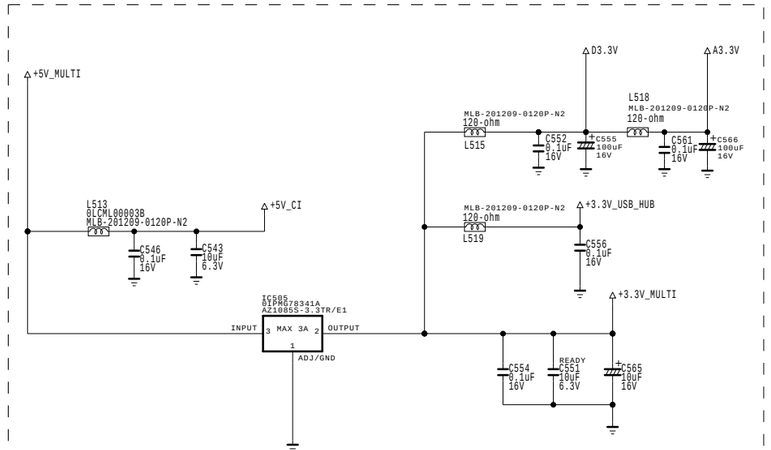
Instant Boot (5V -->1.8V_DDR)



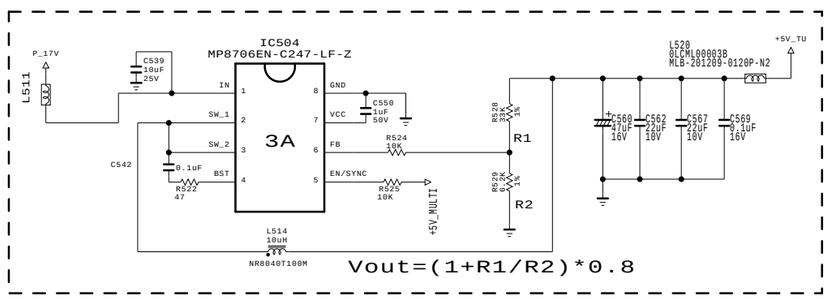
Instant Boot (5V -->BCM3556 CORE 1.2V)



Multi Power(5V -->3.3V)



TUNER 5V



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MODEL	BCM3556-C0	DATE	10/01/
BLOCK	SMPS POWER	SHEET	5 / 13

CAN NIM TUNER for EU

TU601
TDFR-G135D
NIM TUNER

close to TUNER

RF_AGC/W_CNTL
BST_CNTL
+B1[5V]
NC[RF_AGC]
AS
SCL[A_DEMOD]
SDA[A_DEMOD]
NC(IF_TP)
SIF
NC
VIDEO
GND
1.2V
3.3V
RESET
2.5V
SCL[D_DEMOD]
SDA[D_DEMOD]
ERR
SYNC
VALID
MCL
D0
D1
D2
D3
D4
D5
D6
D7
31
SHIELD

C602 0.1uF 16V close to TUNER

R621 0
R601 0 READY
C601 0.1uF 16V
+5V_TU
C610 0.1uF 16V
C609 100uF 16V
C613 100uF 16V

OPTION : RF AGC
C615 0.1uF 16V READY
C619 10uF 10V READY
Q600 2SC3052 READY
R625 10K READY
IF_AGC_SEL

+5V_TU
R642 0
Q601 ISA1530AC1
R644 2.2K
R646 10K
C631 0.01uF 25V
Q603 2SC3052
R648 10K
RF_BOOSTER

+3.3V_TU
R655 4.7K READY
R656 4.7K READY
R629 22
R630 22
SCL0_3.3V
SDA0_3.3V
C623 18pF 50V READY
C625 18pF 50V READY

+5V_TU
R649 470 1/10W
R650 82
TU_SIF
Q604 ISA1530AC1
R647 4.7K

+5V_TU
R643 200 1/8W
R645 200 1/8W
Q602 ISA1530AC1
TU_CVBS
R641 0 READY

+1.2V_TU
+3.3V_TU
C600 100pF 50V
C603 0.1uF 16V
C608 100pF 50V
C611 0.1uF 16V
+2.5V_TU
+3.3V_TU
R622 100
R624 100K
C621 0.1uF 16V
TUNER_RESET

+5V_TU
R651 220 1/8W
R652 220 1/8W
Q605 ISA1530AC1
ATV_OUT
R602 0 READY

+3.3V_TU
R636 4.7K READY
R638 4.7K READY
R631 22
R632 22
SCL2_3.3V
SDA2_3.3V
C628 22pF 50V READY
C630 22pF 50V READY

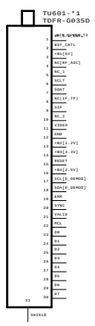
FE_TS_ERR
FE_TS_SYNC
FE_TS_VAL
FE_TS_DATA_CLK
FE_TS_DATA[0-7]
R606 47
R607 47
R608 47
R609 47 FE_TS_DATA[0]
R610 47 FE_TS_DATA[1]
R611 47 FE_TS_DATA[2]
R612 47 FE_TS_DATA[3]
R613 47 FE_TS_DATA[4]
R614 47 FE_TS_DATA[5]
R615 47 FE_TS_DATA[6]
R616 47 FE_TS_DATA[7]
Close to the tuner
R627 47 FE_TS_SERIAL

NIM POWER BLOCK

+3.3V_MULTI
L602 BLM18PG121SN1D
C618 0.1uF 16V
+3.3V_TU
C620 22uF 10V
C699 100uF 16V

IC601 AZ1117H-ADJTRE1(EH11A)
+3.3V_TU
INPUT
ADJ/GND
OUTPUT
C617 0.1uF 16V
R626 1.2K R1
R628 10
R2
A1.2V +1.2V_TU
L603 BLM18PG121SN1D
L600 BLM18PG121SN1D
C627 0.1uF 16V
C629 10uF 10V

NIM OPTION - FOR DEBG
IC600 AZ1117H-ADJTRE1(EH11A)
+3.3V_TU
A2.5V
+2.5V_TU
L609 BLM18PG121SN1D
L601 BLM18PG121SN1D
INPUT
ADJ/GND
OUTPUT
C604 0.1uF 16V FOR DEBUG
R653 120
R654 120
C612 10uF 10V
C614 0.1uF 16V



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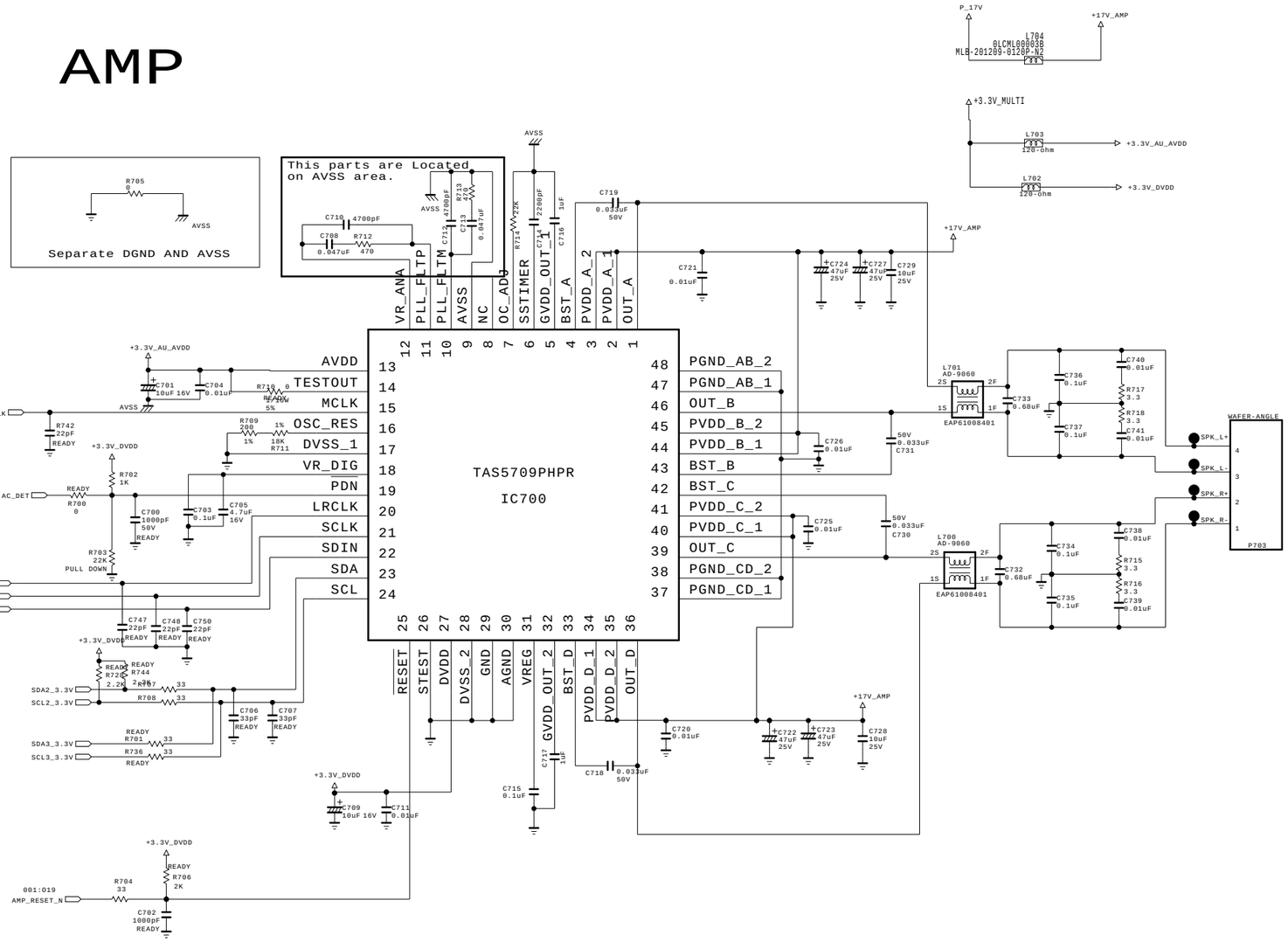
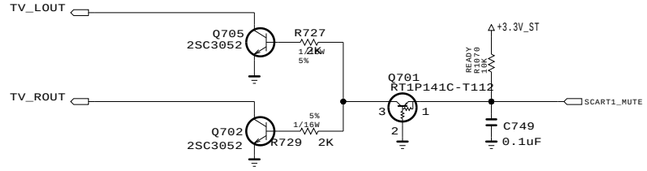
LG ELECTRONICS

MODEL	BCM3556-C0	DATE	10/01/
BLOCK	TUNER	SHEET	11 / 13

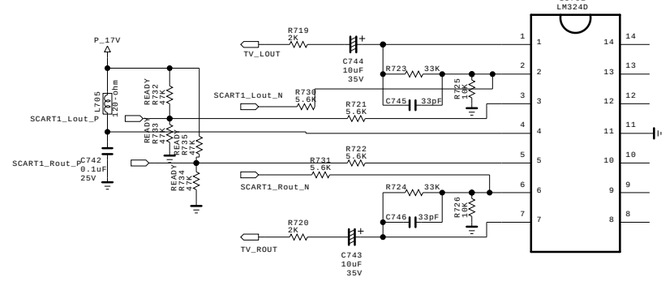
AMP



TV_L/ROUT
MNT/DTV OUT
MUTE Ctrl



Audio Out Amp



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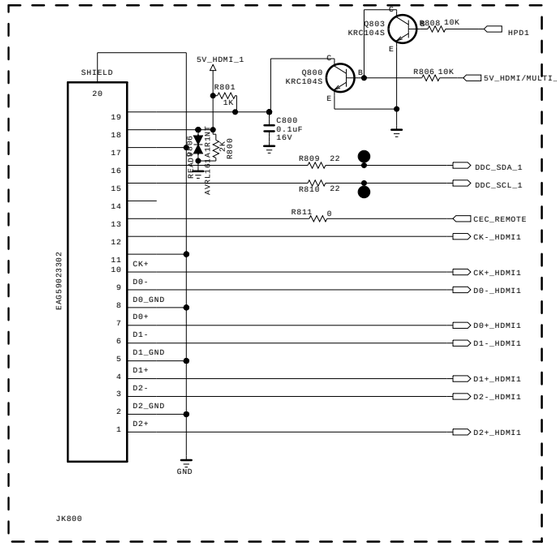
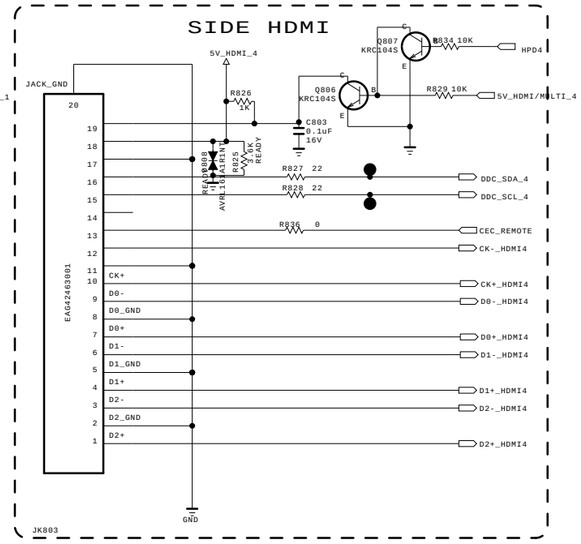
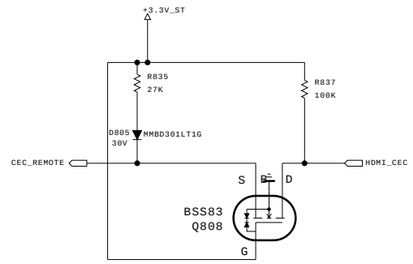
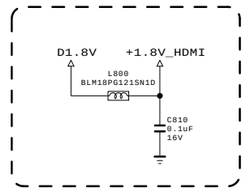
LG ELECTRONICS

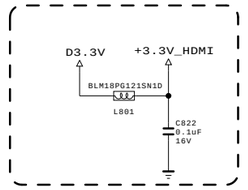
MODEL	BCM3556-C0	DATE	10/01/
BLOCK	AUDIO AMP	SHEET	7 / 13





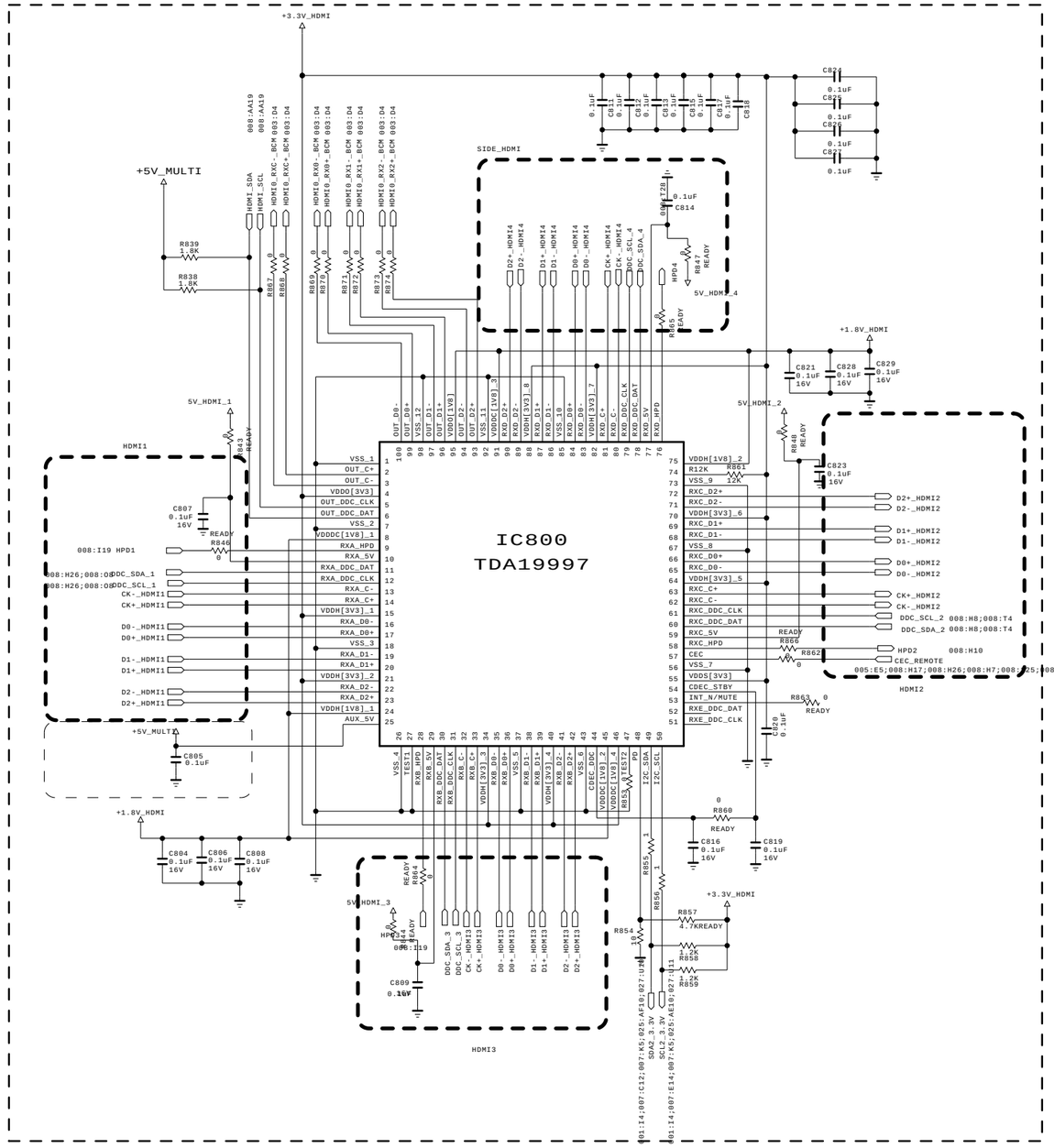


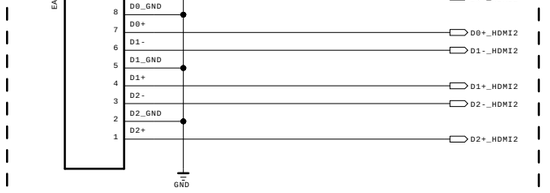


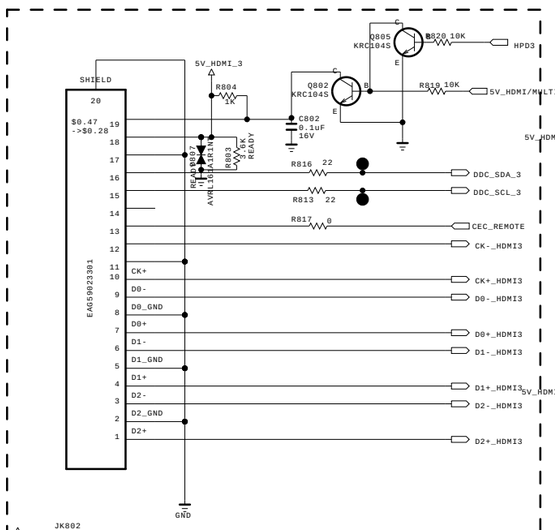


NEED TO CHECK THE CASE OF INSTANT BOOT

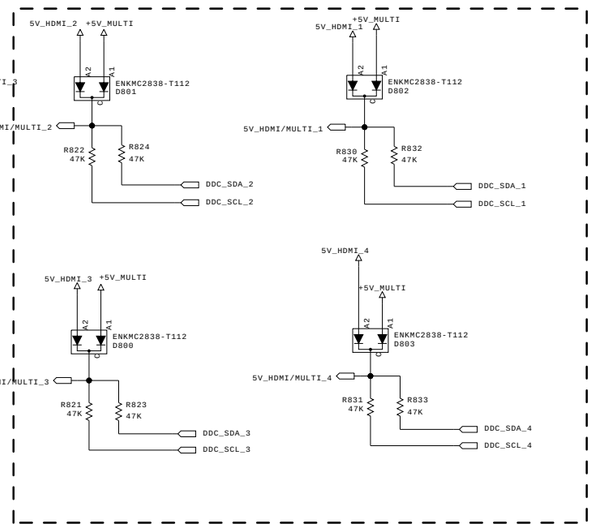
HDMI S/W For Platform







EDID Pull-up



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SECRET

LGElectronics

LG ELECTRONICS

MODEL	BCM3556-C0	DATE	10/01
BLOCK	HDMI	SHEET	6 / 13

HDMI RX/HDMI

LGE Internal Use Only

RGB

P900
SPG09-DB-010

+5V_VGA

C900 0.1uF 16V

READY FOR BEAD
bcm REF circuit

R943 0
R942 0
R944 0

D904 D905 D906 D907 D908

RED_GND
GND_2
RED
GREEN_GND
DDC_DATA
GREEN
BLUE_GND
H_SYNC
BLUE
NC
V_SYNC
GND_1
SYNC_GND
DDC_CLOCK
DDC_GND
SHIELD

GND

DSUB_R
DDC_SDA/UART_TX
DSUB_G
DSUB_DET
DSUB_B
DSUB_HSYNC
DSUB_VSYNC
DDC_SCL/UART_RX

READY C912 4.7pF
READY C913 4.7pF
READY C915 4.7pF

+3.3V_MULTI
R911 10K
R917 1K
READY C914 0.1uF 16V
D909 D910 READY

D917 D918

R915 10
R916 10
C916 12pF
C917 12pF

RGB V/HSYNC BUUFFER

IC903
74F08D

+5V_MULTI
C928 0.1uF

RGB_HSYNC 003:B2
RGB_VSYNC 003:B2

R953 22
R959 22

D0A D0B Q0 D1A D1B Q1 GND
VCC D3B D3A Q3 D2B D2A Q2

READY R960 22
READY R961 22
BCM Reference

DSUB_VSYNC
DSUB_HSYNC

M24C02 COMPARE THE COST

IC901
AT24C02BN-10SU-1.8
STM_2K_EEPROM
RENESAS_2K_EEPROM

+5V_VGA
+5V_MULTI
ENKMC2838-T112
D912

R922 100
R913 10K
R923 2.7K
R924 2.7K
C922 0.1uF
EDID_WP
R929 1
R930 1
R932 22
R934 22

C918 18pF 50V
C919 18pF 50V

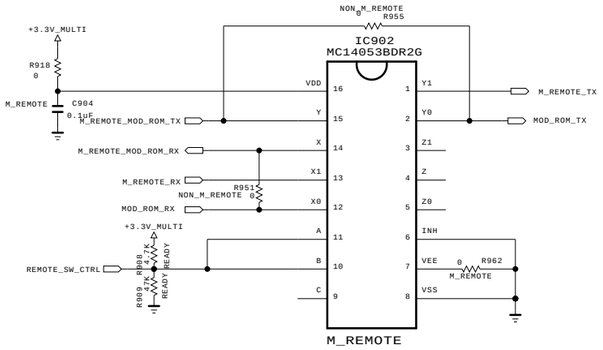
DDC_SCL/UART_RX
DDC_SDA/UART_TX
DDC_SCL
DDC_SDA

ROM DOWNLOAD FOR PDP

R903 10
R902 10
C905 220pF 50V READY
C908 220pF 50V READY
C901 270pF 50V READY
C906 220pF 50V READY
D900 READY
D901 READY

PC_SER_DATA
PC_SER_CLK

M/R UART SWITCH



M_REMOTE & MOD_ROM_DL

WIRELESS_SW_CTRL	SELECT PIN	STATUS
HIGH	X1/Y1/Z1	M_REMOTE CONNECT --> BCM UART
LOW	X0/Y0/Z0	MODULE ROM DL CONNECT --> BCM UART

RS232C

IC900
MAX3232CDR

C902 0.1uF 50V
C907 0.1uF 50V
C909 0.1uF 50V
C910 0.1uF 50V
C911 0.1uF 50V

+3.3V_ST

R900 4.7K
R901 4.7K
R904 100
R905 100

D902 30V
D903 30V

RS232C_TXD
RS232C_RXD

P901
SP609-DB-009

PC AUDIO

JK900
PEJ027-01

E_SPRING
T_TERMINAL1
B_TERMINAL1
R_SPRING
T_SPRING
B_TERMINAL2
T_TERMINAL2

D910 5.6V
D911 5.6V
READY R926 470K
READY R927 470K
R931 0
R933 0
READY R935 12K
READY R936 12K

PC_R_IN
PC_L_IN

FOR PK/J90 - BREATING

LED_PK90
P907
12507WR-03L

+5V_MULTI
LED_PK90
L903
MLB-201209-0120P-N2
R988 10
C929 100uF READY
LED_BREATHING

SUB Board I/F

+3.3V_ST
R914 47K
R925 47K
R928 47K
READY R940 10K
C903 10pF

Q901 2SC3052
Q902 2SC3052
R921 10K

IR_NEC
R910 22
READY R912 0

P906
12507WS-12L

IR
GND
KEY1
KEY2
LED-RED
SCL
SDA
3.3V_ST
3.3V_MULTI
LED-WHITE

R938 10K
R941 10K
R937 10K
R945 22
R946 22
R947 22
C926 10pF
C930 10pF
C931 10pF
C923 10pF READY
C927 0.1uF 16V
C932 0.1uF 16V
C933 10pF
D913
D915 CDS3C05HDMI1 5.6V
D916 CDS3C05HDMI1 5.6V
R906 4.7K READY
R907 4.7K READY
R939 4.7K
L902 READY
L900 MLB-201209-0120P-N2
L901 MLB-201209-0120P-N2

SUB_SCL
SUB_SDA
LED_RED
LED_WHITE

MOTION REMOTE

P902
12507WR-08L

+3.3V_MULTI
L904 120-ohm BLM18PG121SN1D
R952 4.7K READY
R954 4.7K READY
R956 4.7K
R957 4.7K
R958 4.7K
R919 100
R920 100
R948 100
R949 100
R950 100

M_REMOTE_RX
M_REMOTE_TX
RF_RESET
DC
DD

M_REMOTE

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SECRET
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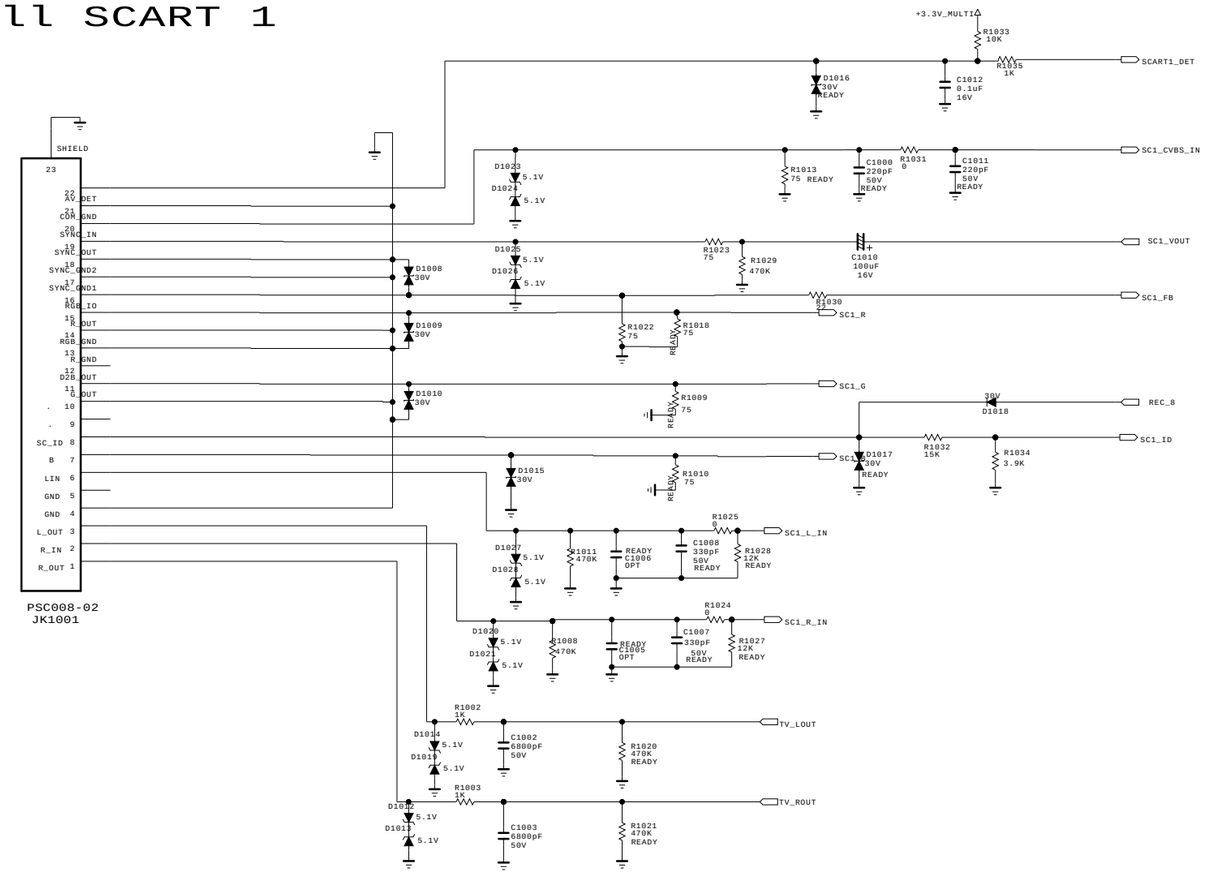
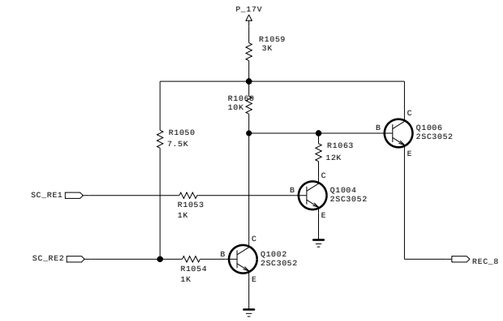
LG ELECTRONICS

MODEL	BCM3556-C0	DATE	10/01/
BLOCK	LVDS/RS232//RGB	SHEET	10 / 13

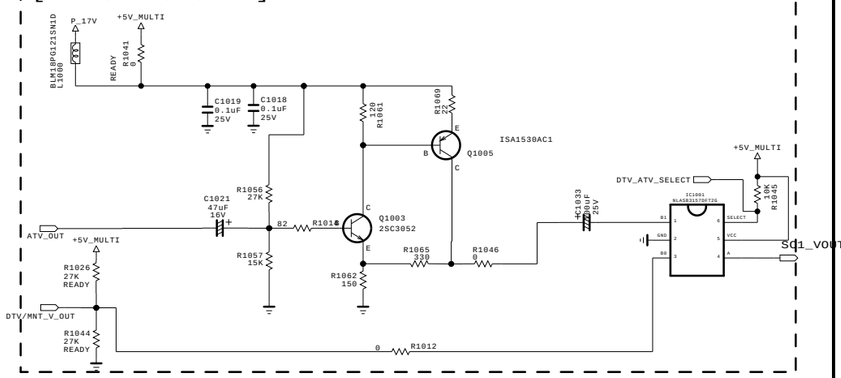
Full SCART 1



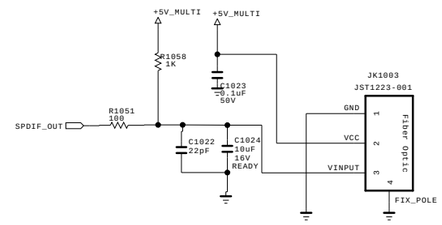
[SCART1 PIN 8]



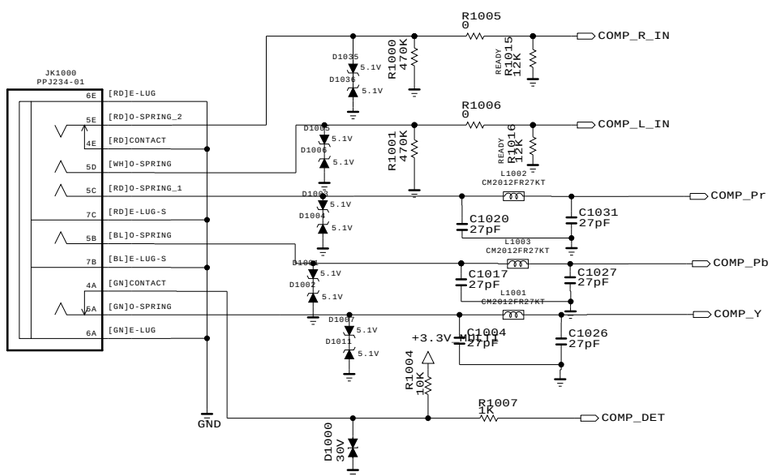
[SCART TV VOUT]



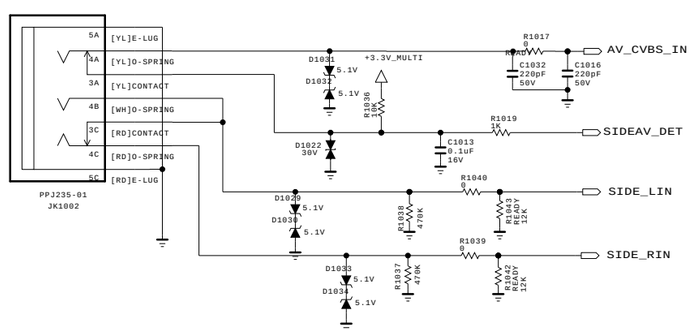
SPDIF



COMPONENT



SIDE CVBS



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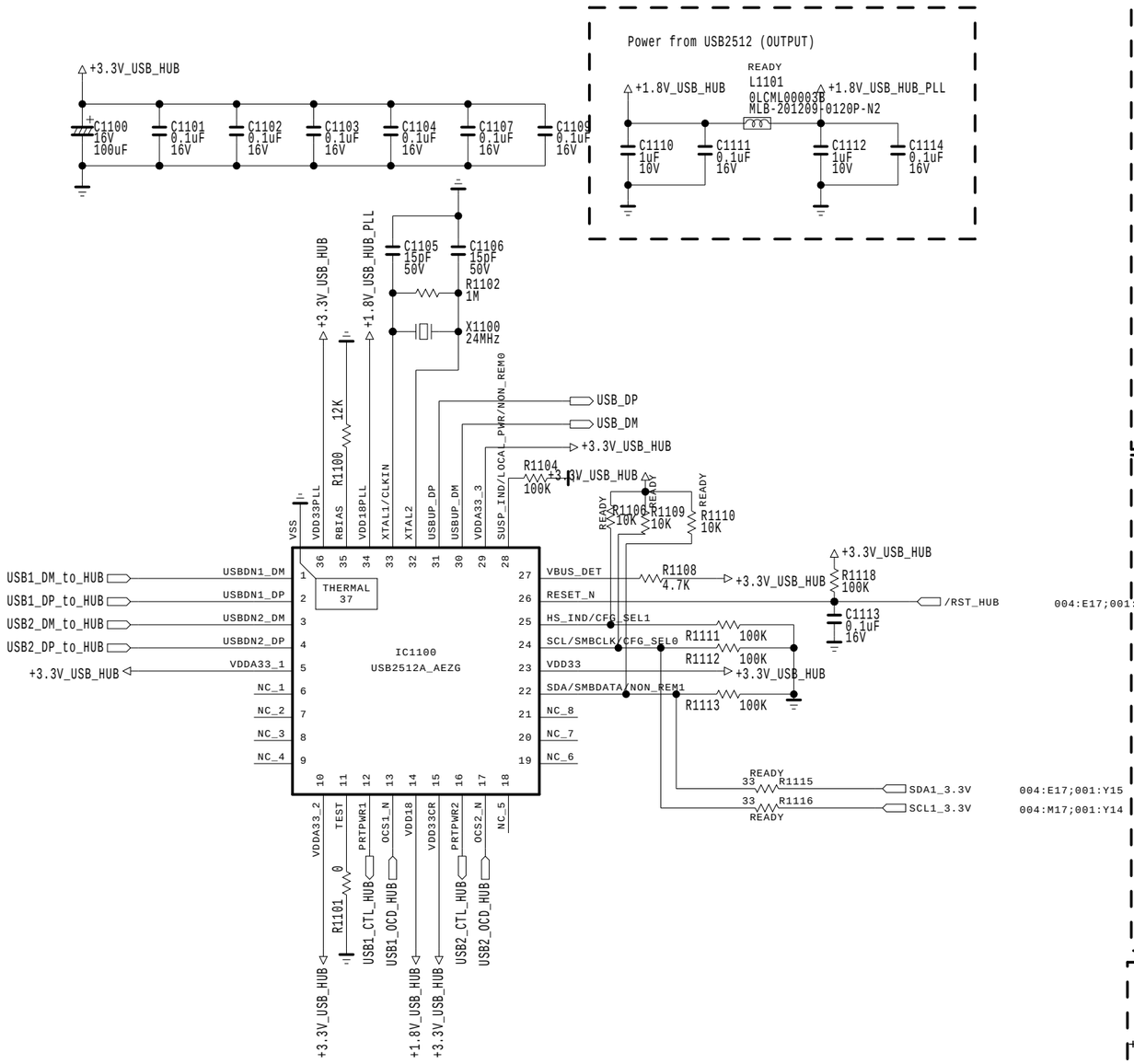
LG ELECTRONICS

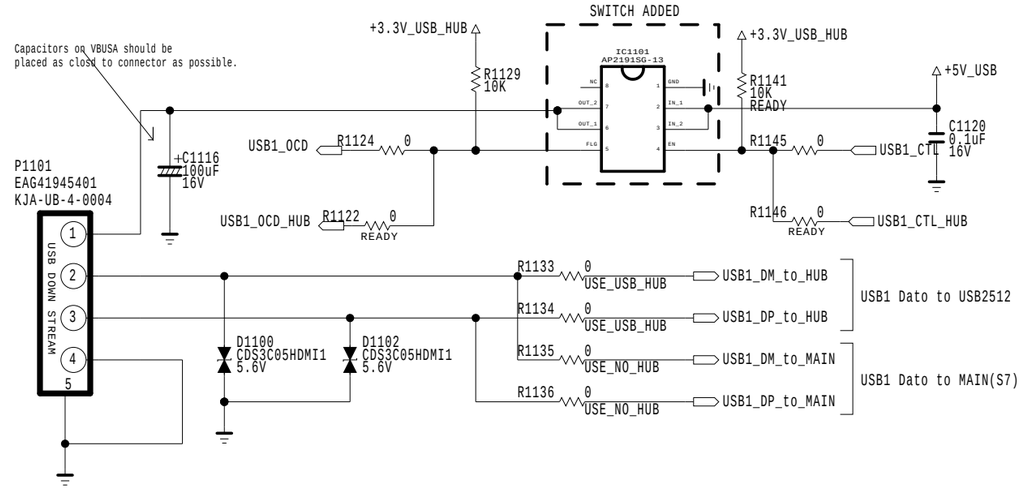
MODEL	BCM3556-C0	DATE	10/01/
BLOCK	JACK	SHEET	9 / 13

LGE Internal Use Only

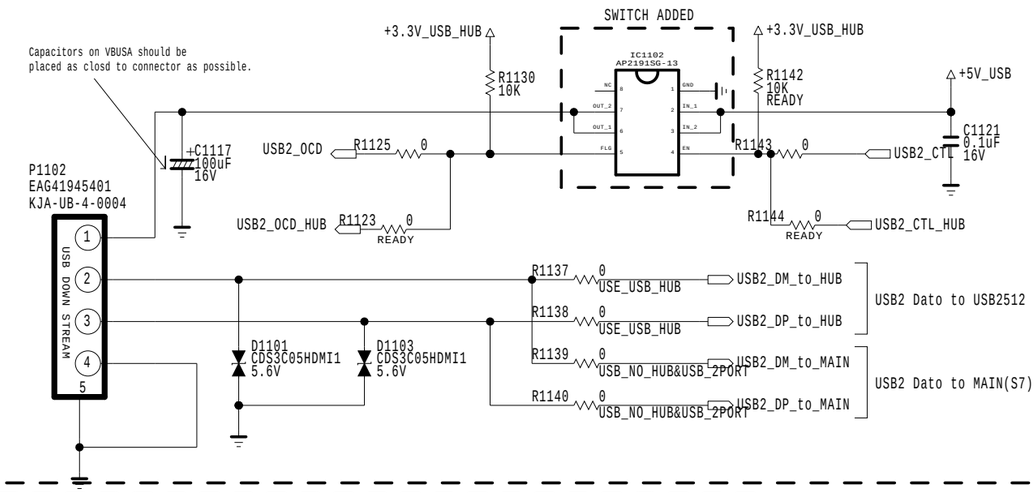
USB HUB



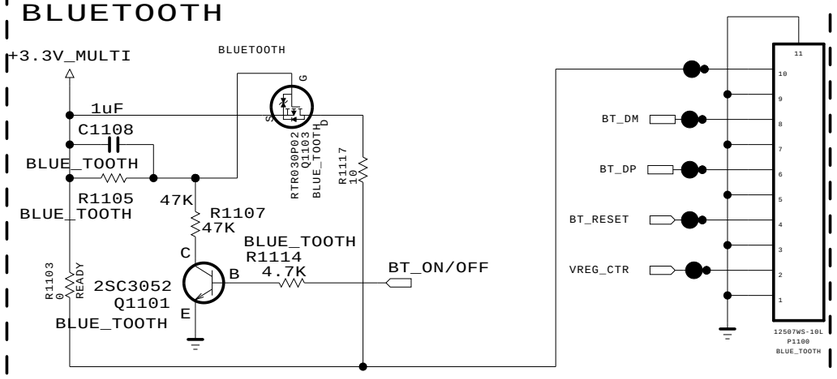
USB1 SIDE UPPER



USB2 SIDE UNDER



BLUETOOTH



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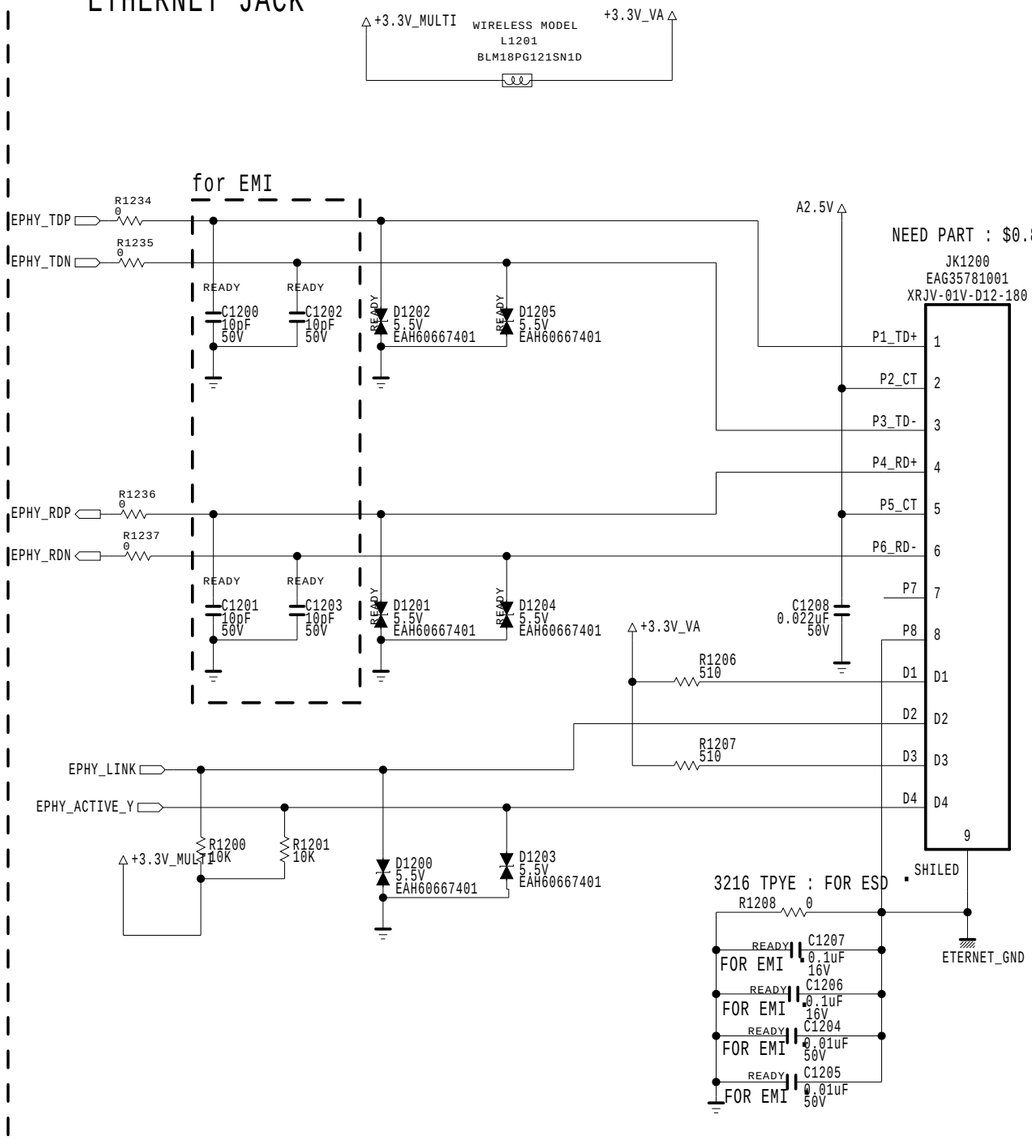
SECRET

LGElectronics

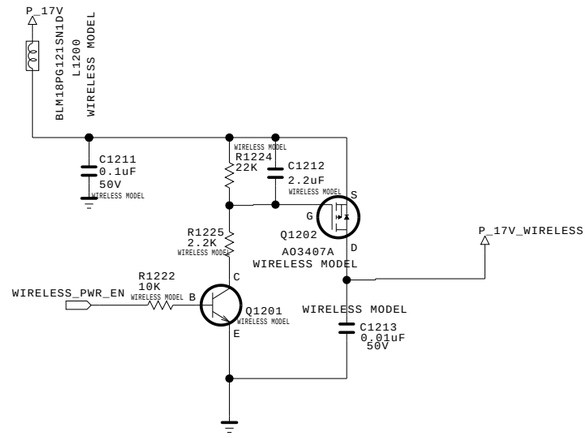
LG ELECTRONICS

MODEL	BCM3556	DATE	10/01
BLOCK	USB HUB	SHEET	13 / 13

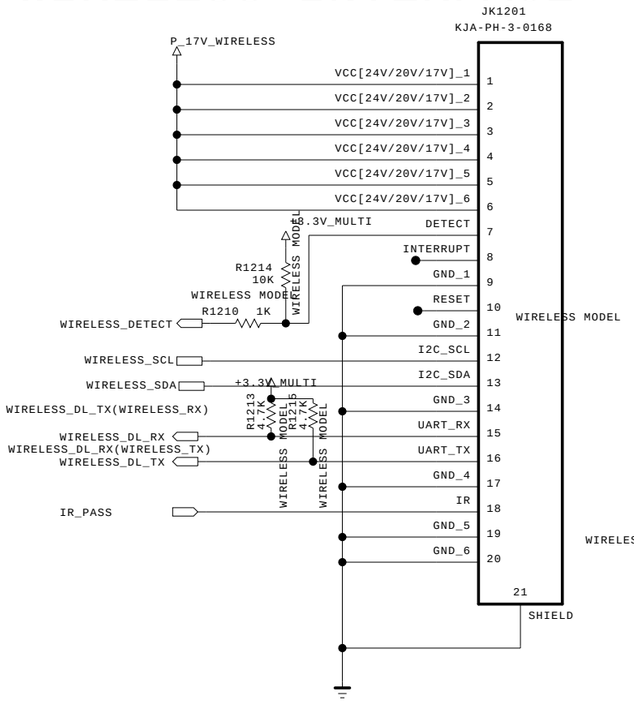
ETHERNET JACK



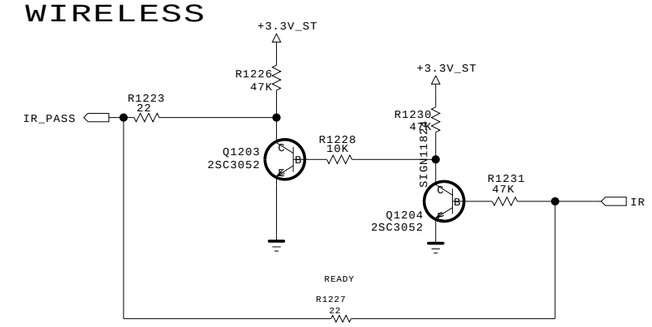
WIRELESS DIP POWER ON/OFF



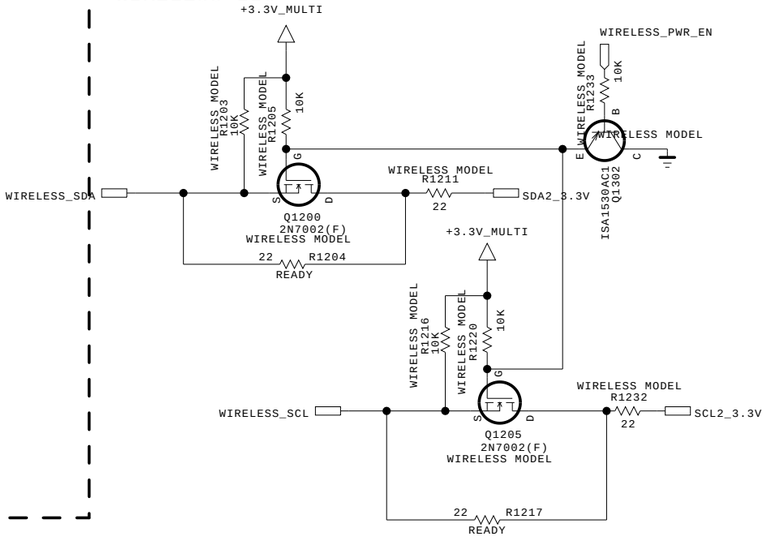
WIRELESS INTERFACE



WIRELESS



WIRELESS IIC



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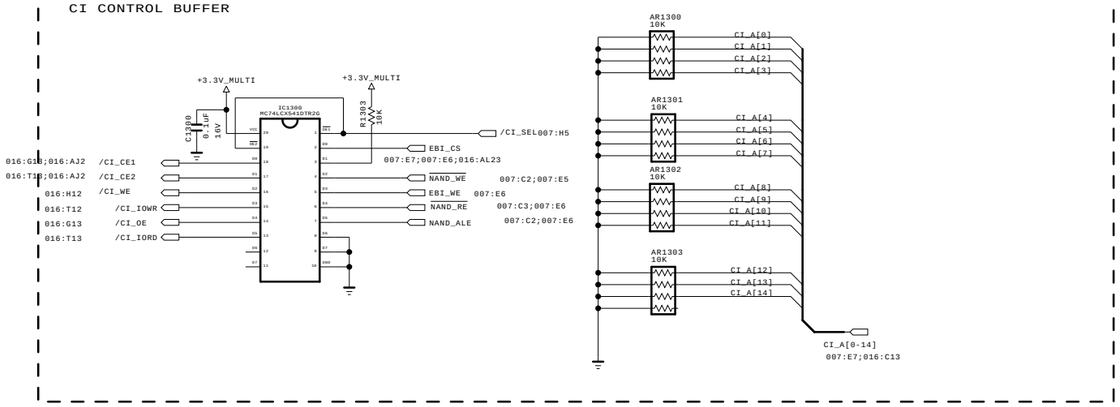
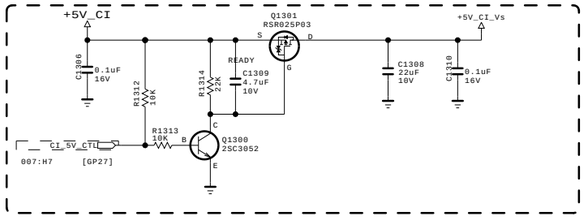
LG ELECTRONICS

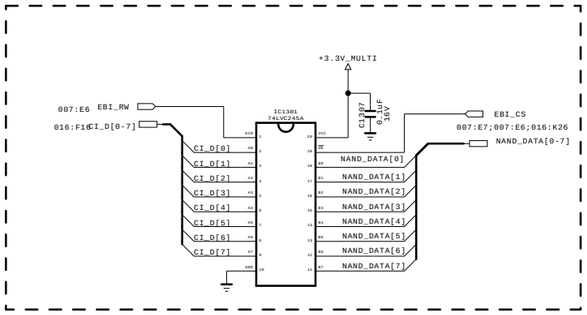
MODEL	BCM3556-C0	DATE	10/01
BLOCK	ETHERNET	SHEET	12 / 13

CI CONTROL BUFFER

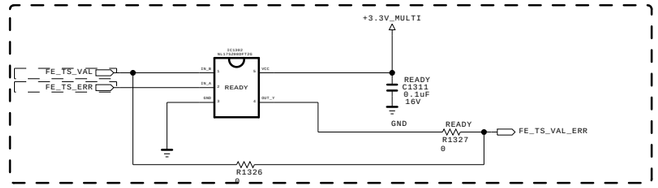


CI POWER ENABLE CONTROL

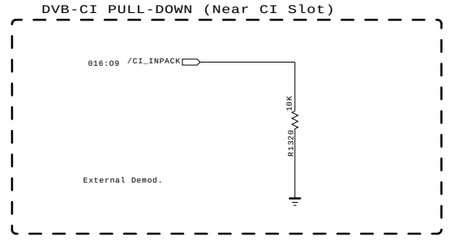




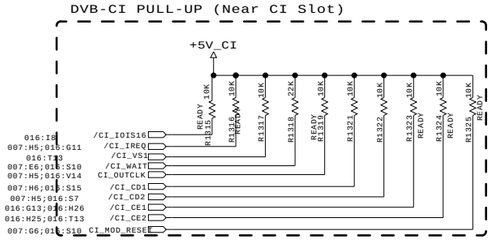
DVB-CI DETECT



DVB-CI PULL-DOWN (Near CI Slot)



DVB-CI PULL-UP (Near CI Slot)



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LG ELECTRONICS

MODEL	BCM3556-C0	DATE	10/01
BLOCK	DVB-CI SLOT	SHEET	5 / 13

DVB-CI_SLOT


LG Electronics Inc.

PDP TV Repair Process Index

- Trouble shooting by worst symptom

No.	Symptom (L)	Symptom (M)	Page	Remark
1	A. Picture Problem	No Picture/Sound OK	1	
2		No Picture/No sound	2	
3		Mal-discharge/Noise/dark picture	3	
4		Picture broken/Freezing	4	
5		Vertical bar/ Horizontal Bar	5	
6	B. Power Problem	No Power (Not turn on)	6	
7		Turn off (Instant, under watching)	7	
8	C. Sound Problem	No sound/ Sound distortion	8	
9	E. General function Problem	Remote control & Local switch checking	9	

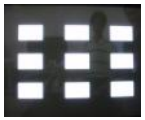
First of all, Check whether there is SVC Bulletin in GCSC System for these model.

Repair Process

PDP TV	Symptom	A. Picture Problem	Making	2010. 2 . 22	전자 - 6-2
		No Picture/Sound OK	Revision		1/9

First of all, Check whether all of cable between board was inserted properly or not.
(Main B/D↔ Power B/D, Power B/D↔ Y-sus B/D,Y-Sus B/D ↔Z-Sus B/D,LVDS Cable,Speaker Cable,IR B/D Cable,,,)

Check Module pattern by using “TILT” key on SVC R/C



<SVC R/C & Pattern>

Normal (Y) → Check Sound → **Sound OK** (Y) → Check LVDS Cable → **Normal** (Y) → Close

Sound OK (N) → Move No Picture/No sound Section

Normal (N) → Replace Main B/D

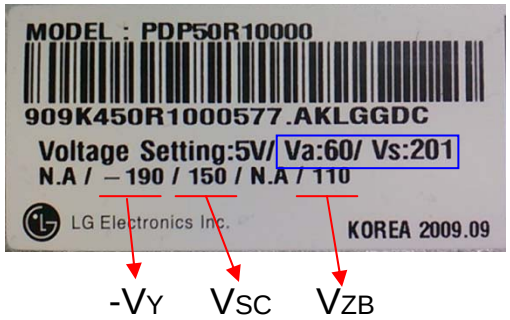
Normal (N) → Check Vs, Va → **Normal** (Y) → Check voltage . -VY . VSC . VZB → **Normal** (Y) → Check B+ Voltage on Power Board / Control Board .Check B+(5V) → **Normal** (Y) → 1.Check Control Board . LED on . Crystal(X101) . 1.8V, 3V, 5V FET . Rom update 2.Replace Control B/D

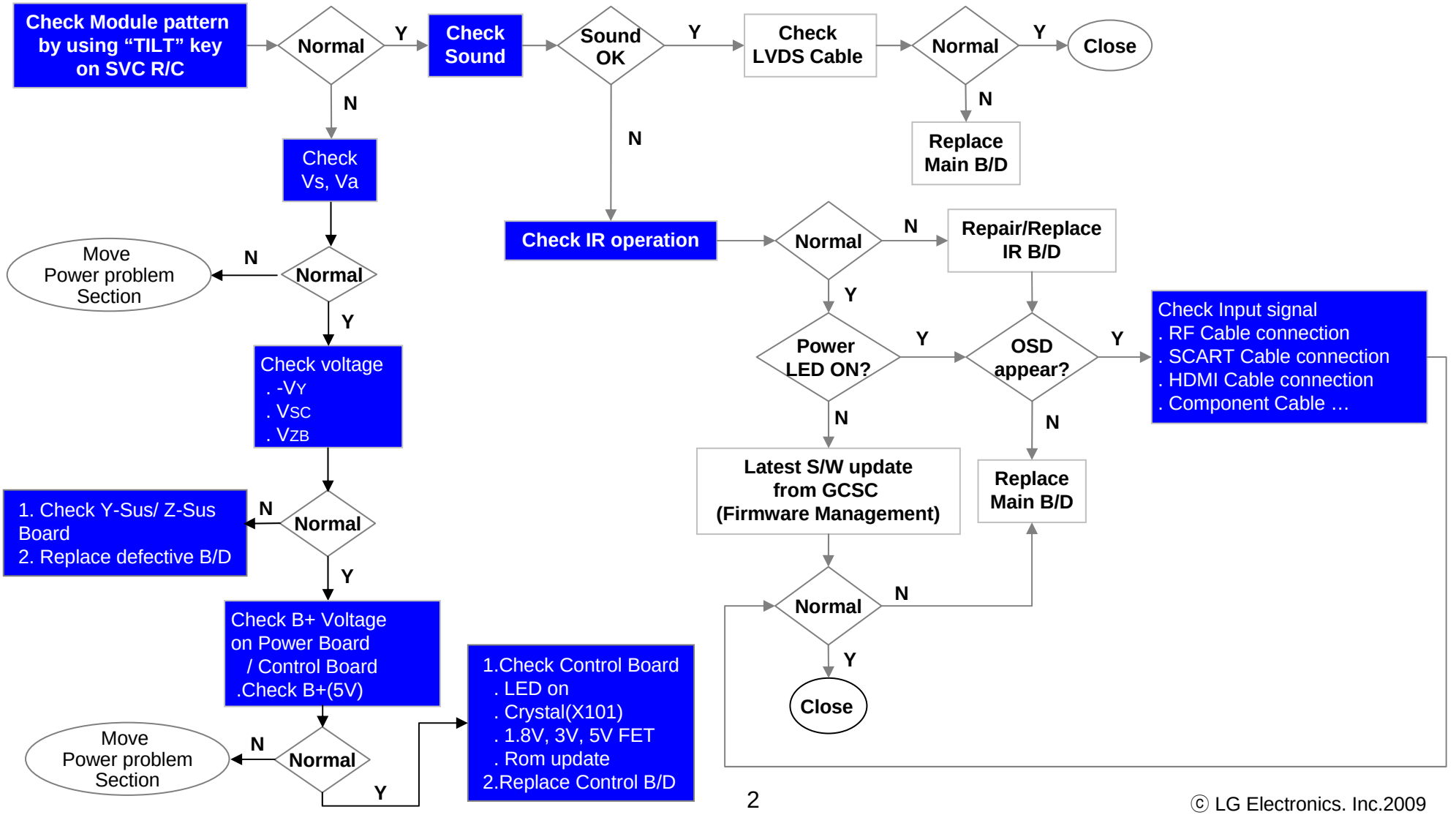
Normal (N) → Move Power problem Section

Normal (N) → 1. Check Y-Sus/ Z-Sus Board 2. Replace defective B/D

Normal (N) → Move Power problem Section

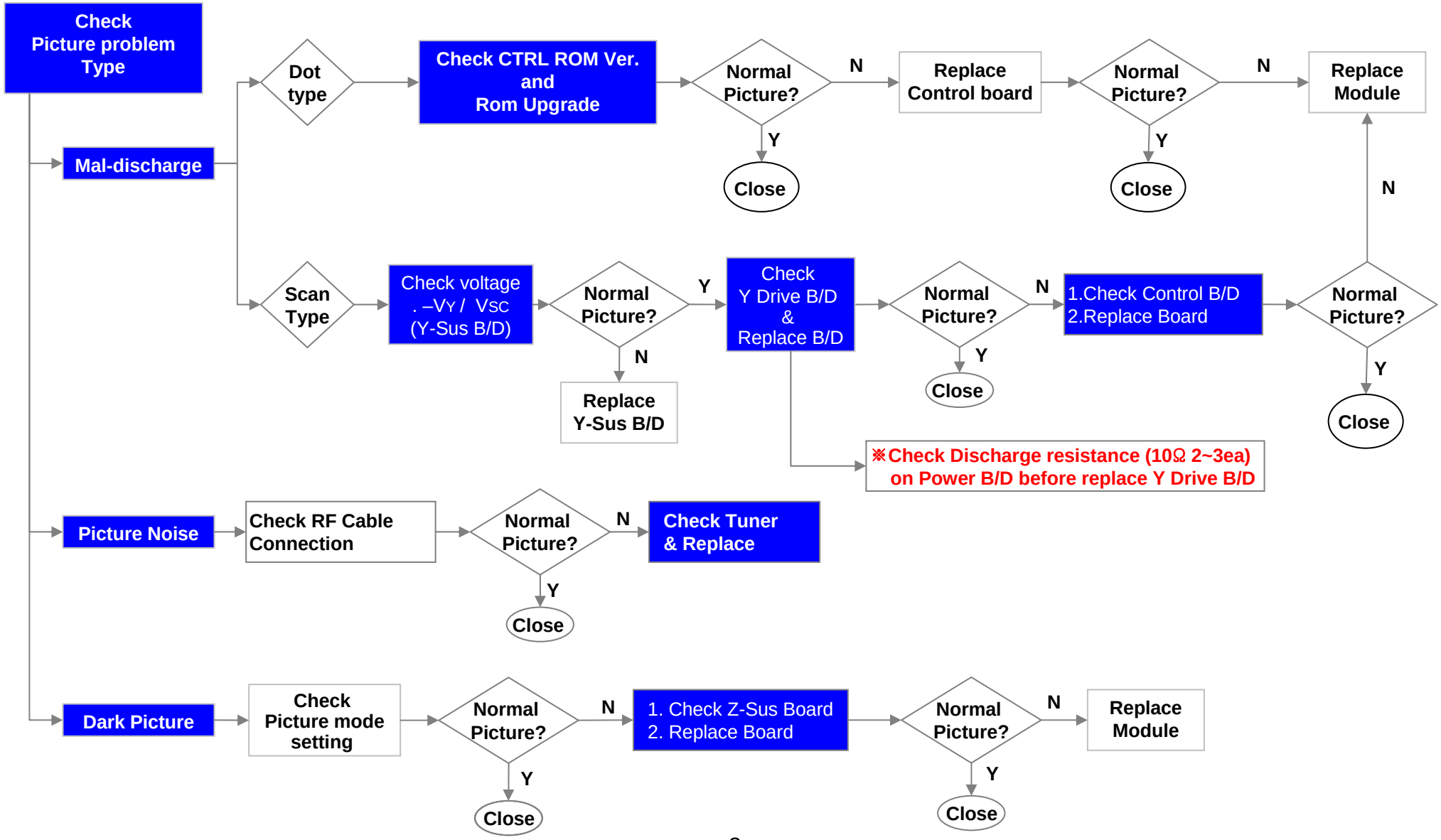
※Refer to the Module label for each voltage



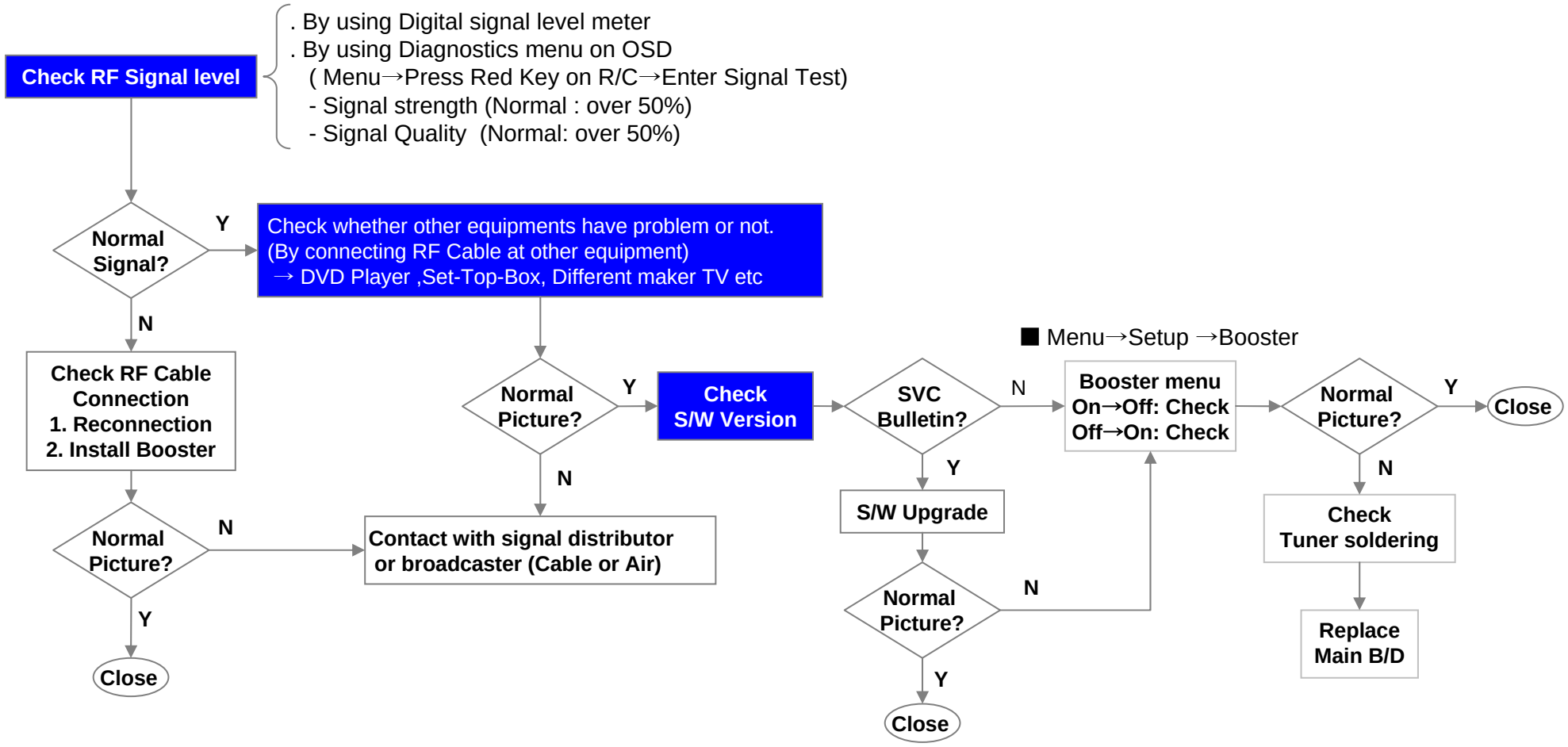


Repair Process

PDP TV	Symptom	A. Picture Problem	Making	2010. 2 . 22	전자 - 6-2
		Mal-discharge/Noise/dark picture	Revision		3/9

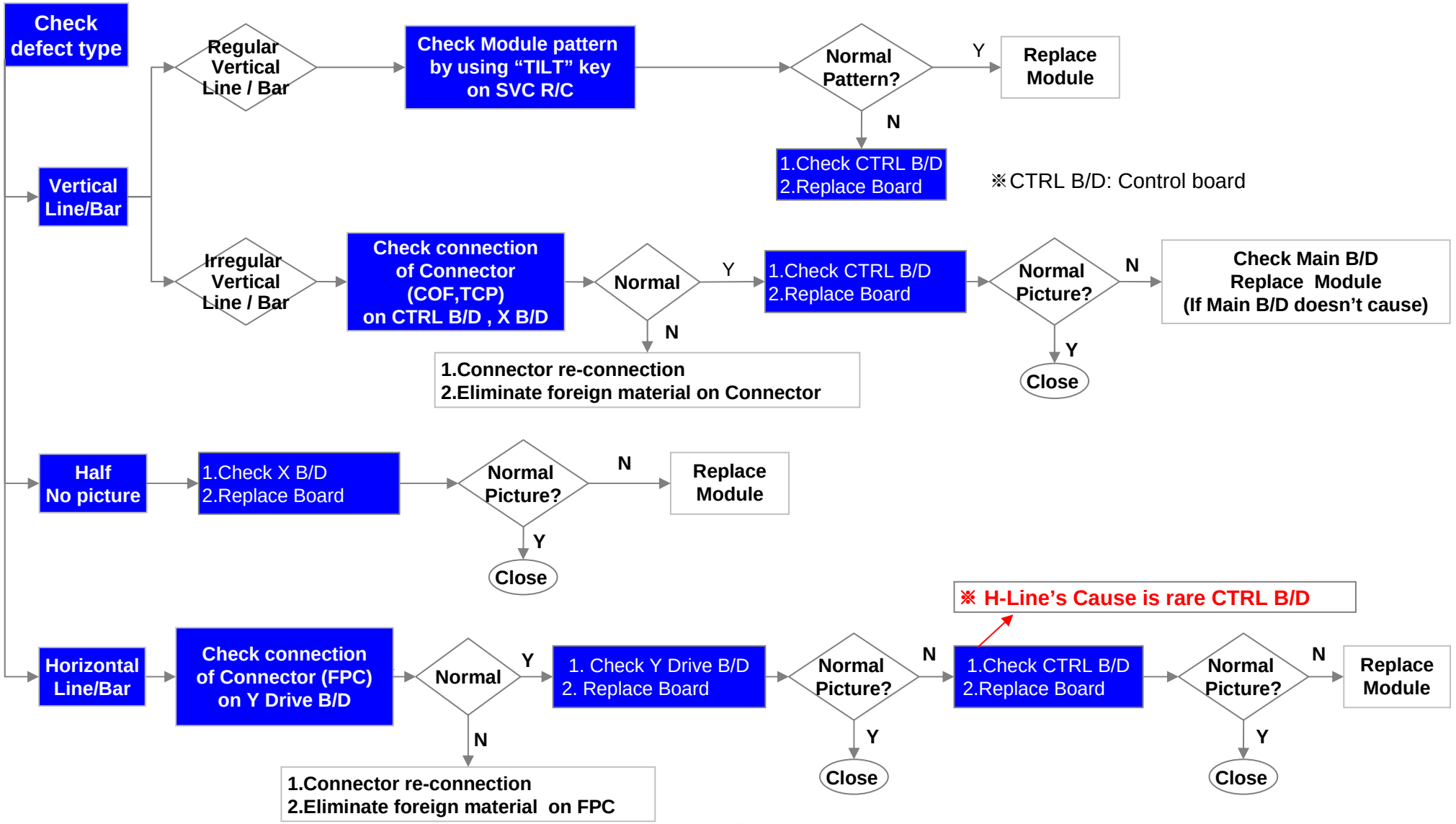


PDP TV	Symptom	A. Picture Problem	Making	2010. 2 . 22	전자 - 6-2
		Picture broken/Freezing	Revision		4/9



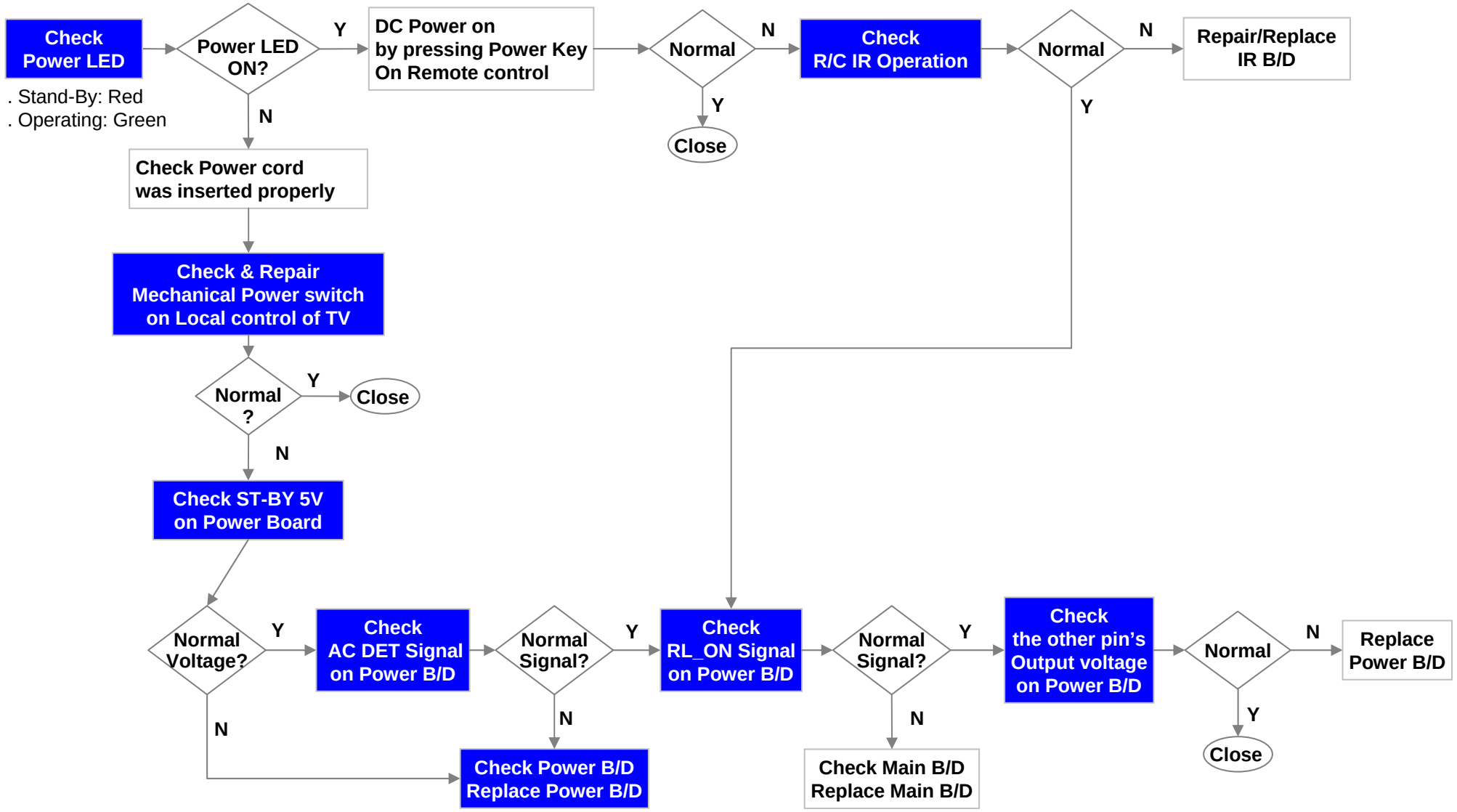
Repair Process

PDP TV	Symptom	A. Picture Problem	Making	2010. 2 . 22	전자 - 6-2
		Vertical bar/ Horizontal Bar	Revision		5/9

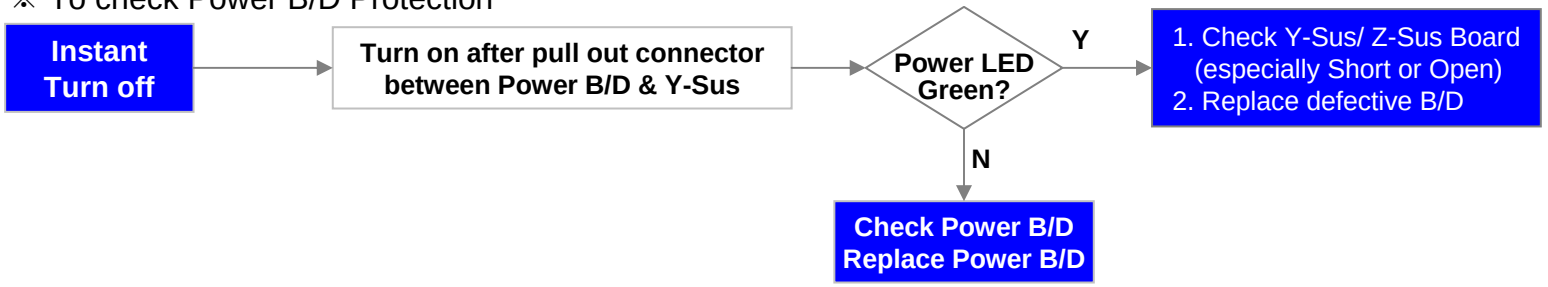


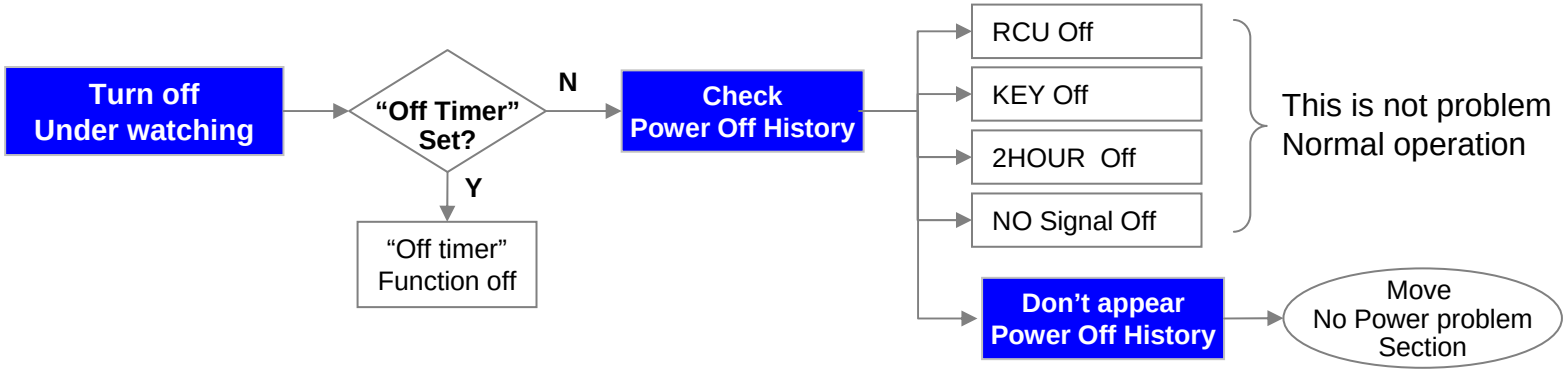
Repair Process

PDP TV	Symptom	B. Power Problem	Making	2010. 2 . 22	전자 - 6-2
		No Power (Not turn on)	Revision		6/9

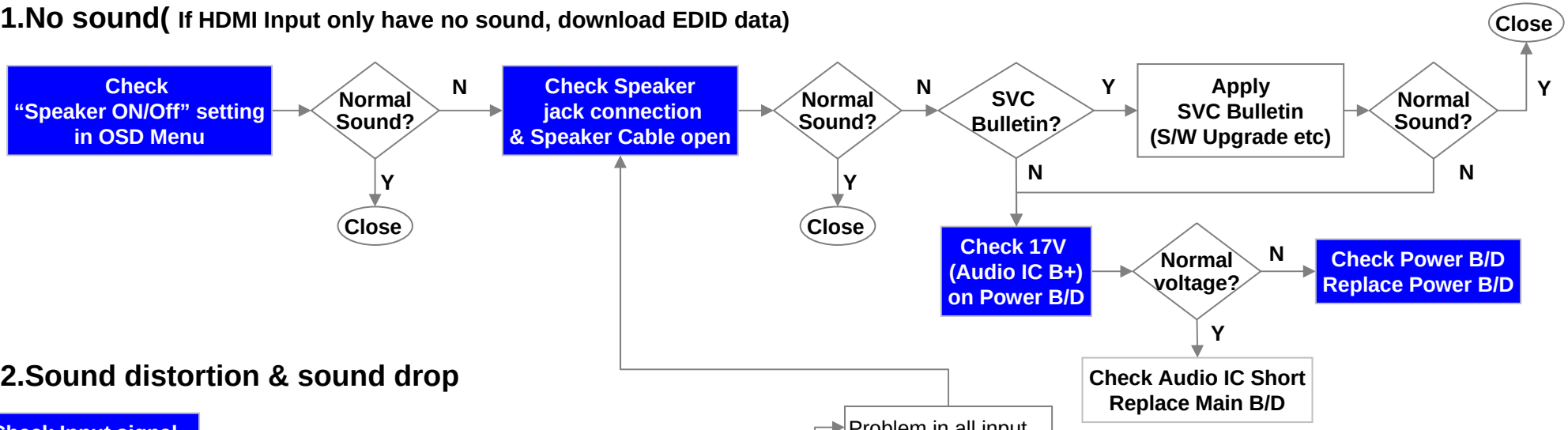


※ To check Power B/D Protection

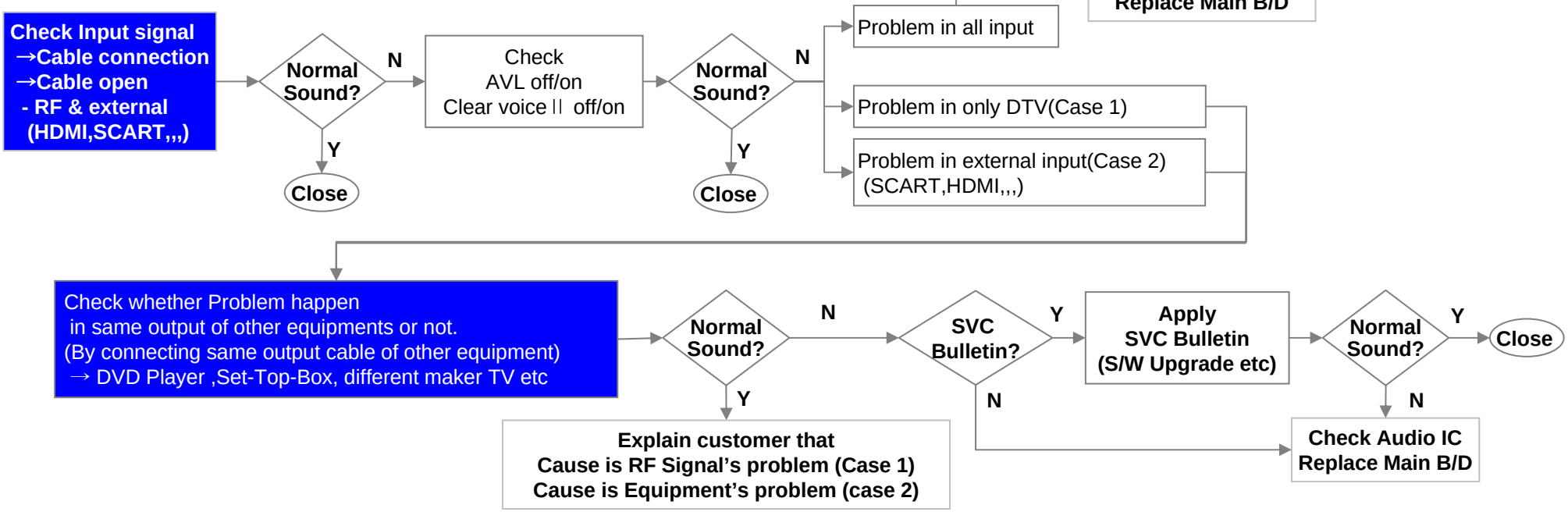




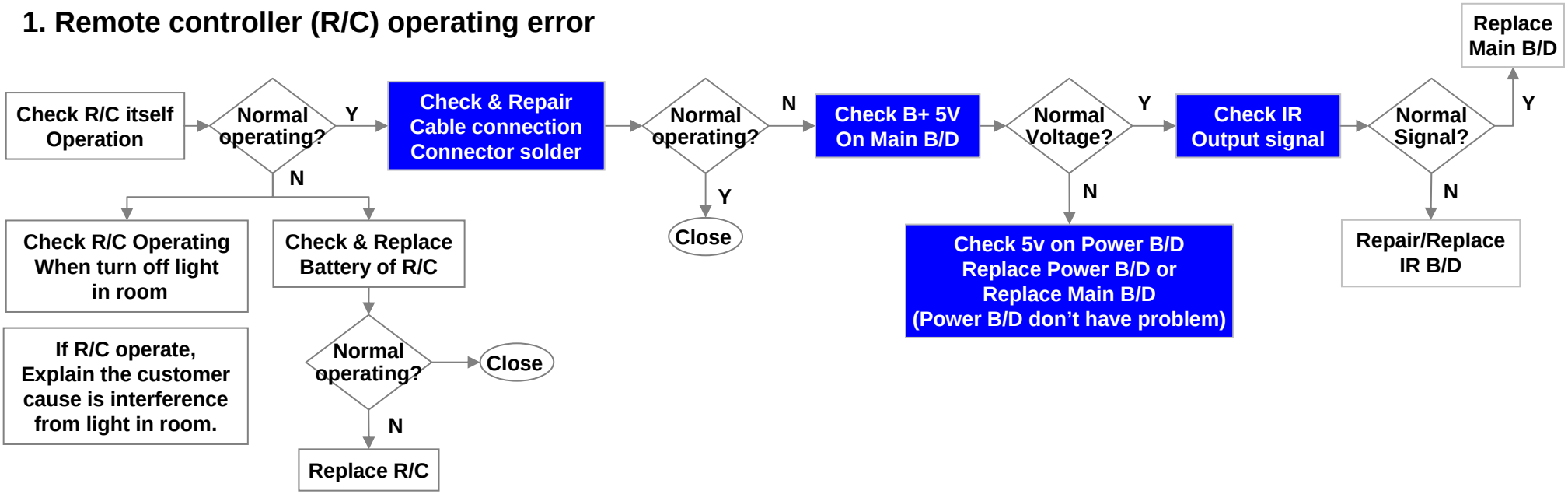
1.No sound(If HDMI Input only have no sound, download EDID data)



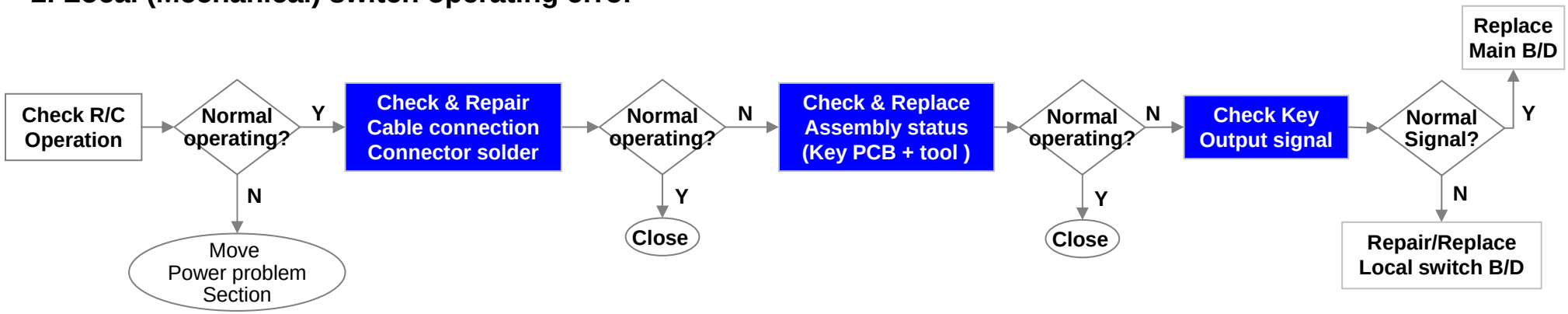
2.Sound distortion & sound drop



1. Remote controller (R/C) operating error



2. Local (Mechanical) switch operating error

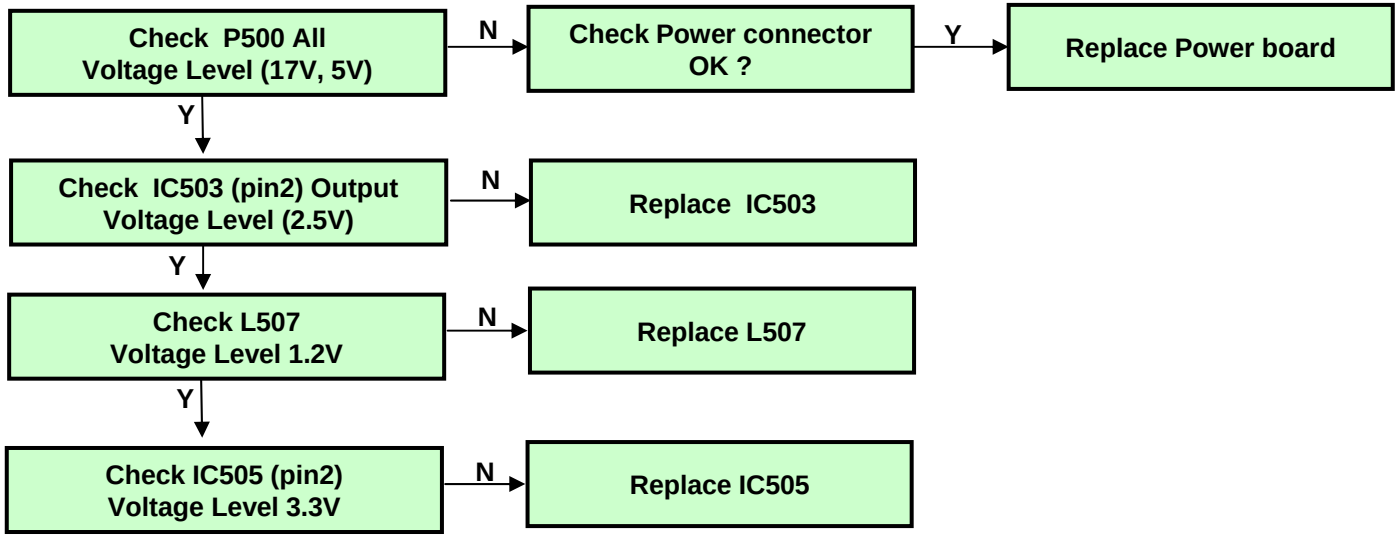


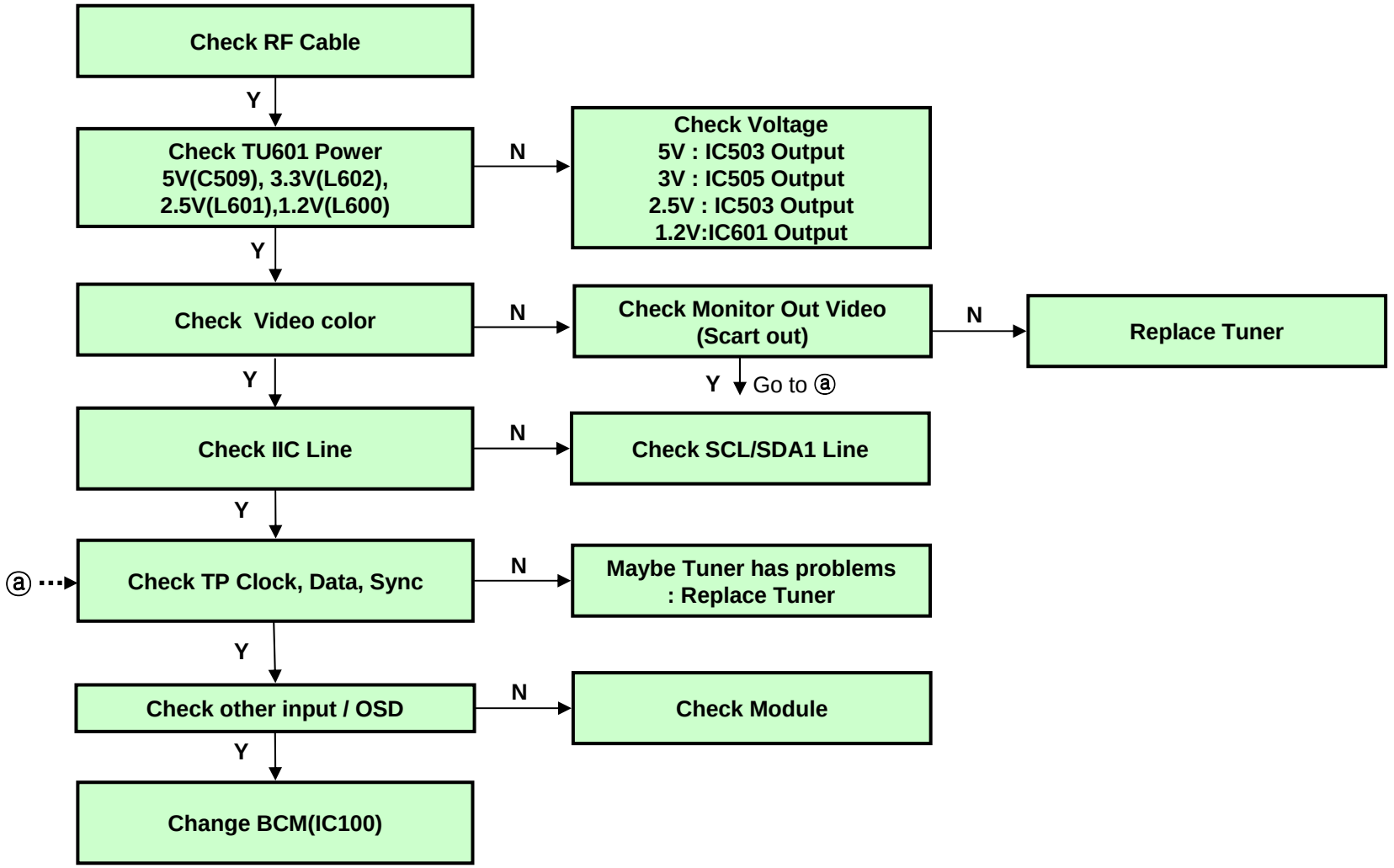
PDP TV Repair Process Index

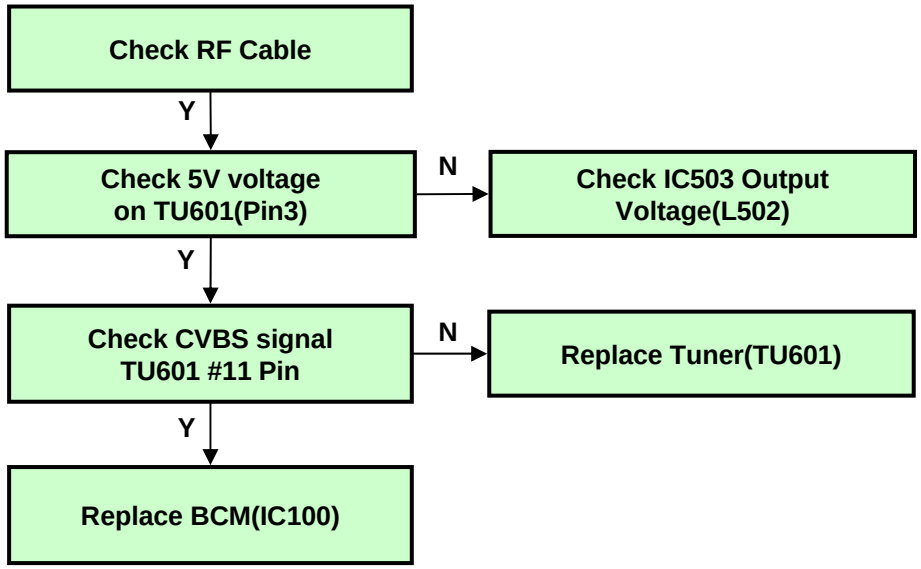
- Trouble shooting by input block (Component level check)

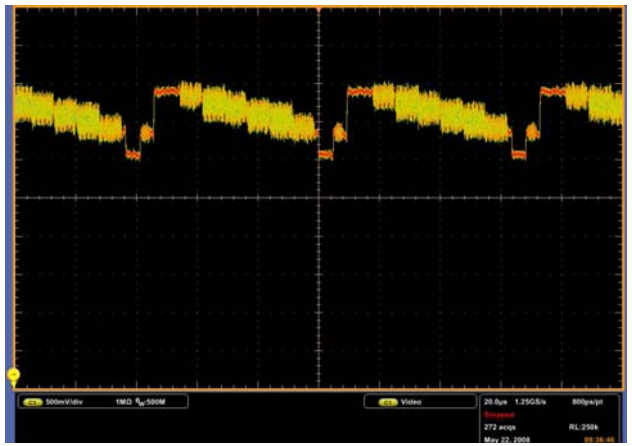
No.	Symptom (L)	Input Block	Page	Remark
1	Power Problem	Power-up Boot fail	1	
2	Video Probelm	Digital TV	2	
3		Analog TV	3	
4		Component	4	
5		RGB(D-SUB)	5	
6		AV(Scart / CVBS)	6	
7		HDMI	7	
8	Audio Problem	All Input	8	
9		Digital TV / HDMI	9	
10		Analog TV	10	
11		Component / AV / RGB	11	
12		Optical Audio	12	
13	No USB	All Input	13	
14	USB Problem	USB Problem	14	
15	Bluetooth Problem	Bluetooth Problem	15	

PDP TV	Symptom	Power-Up Boot Fail	Making	2010. 2 . 22	전자 - 6-2
			Revision		1/15

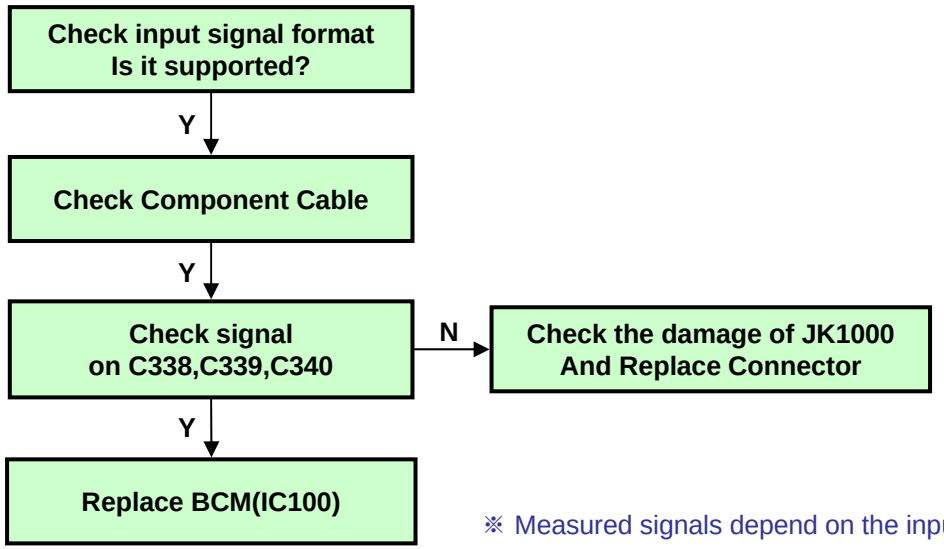




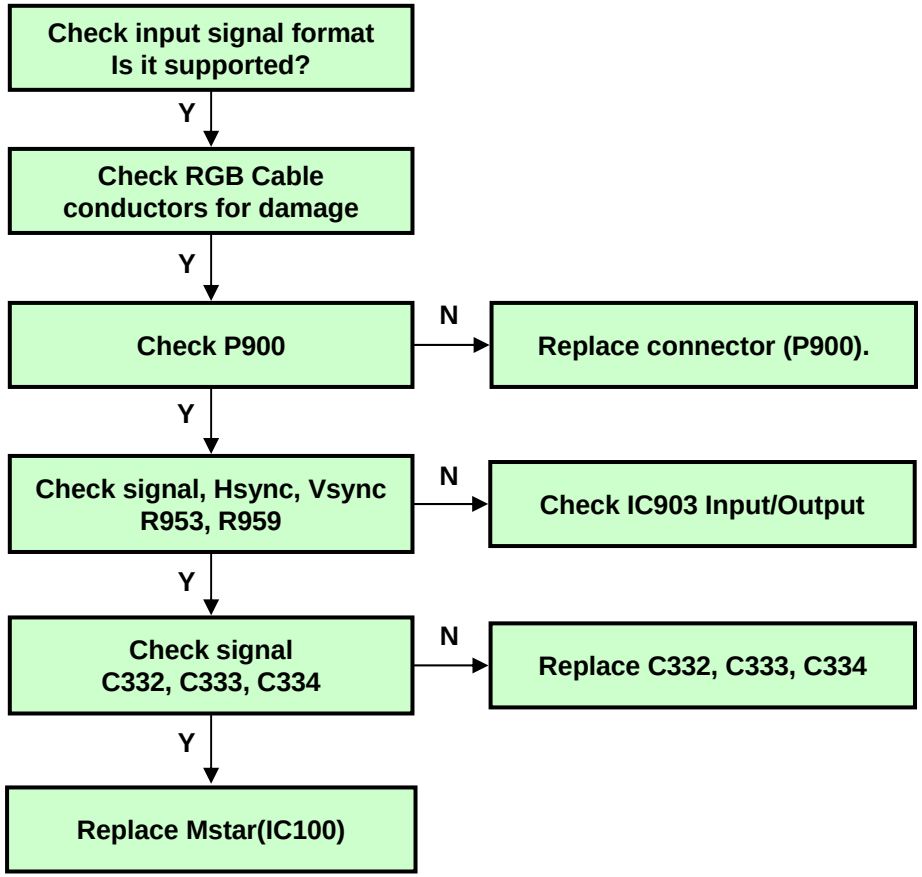




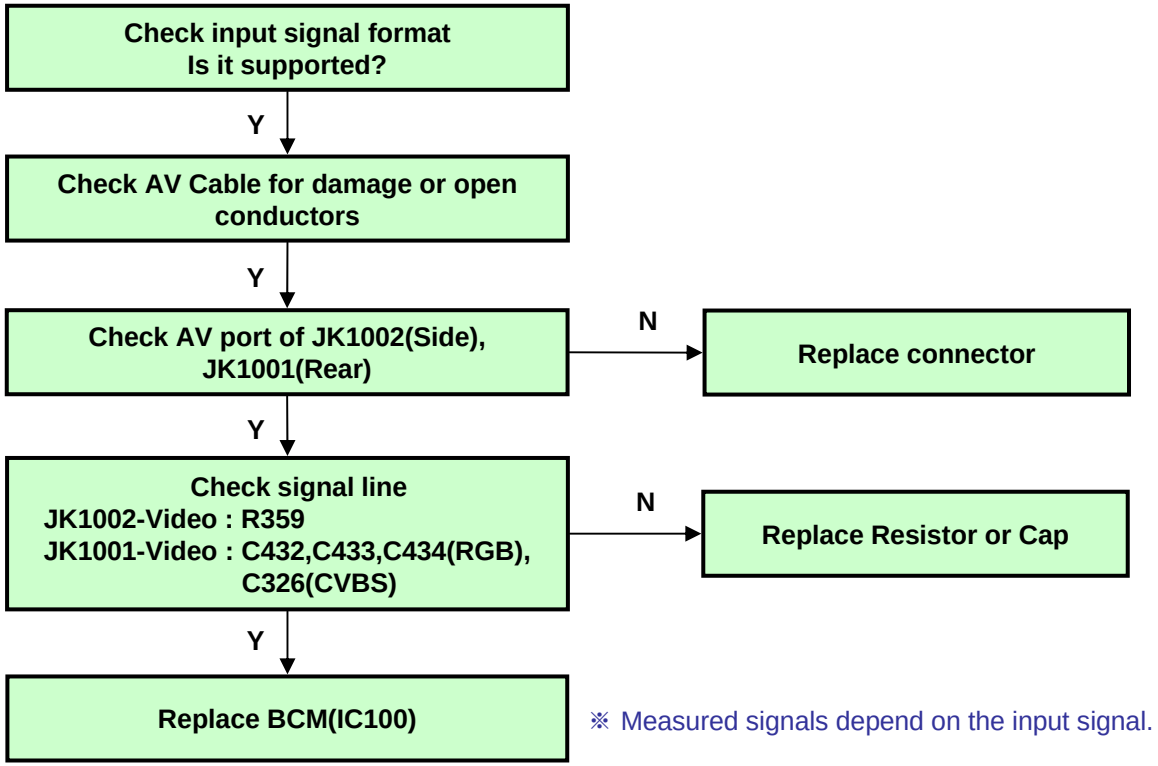
< CVBS waveform – sample >
- Defend on the input signal.



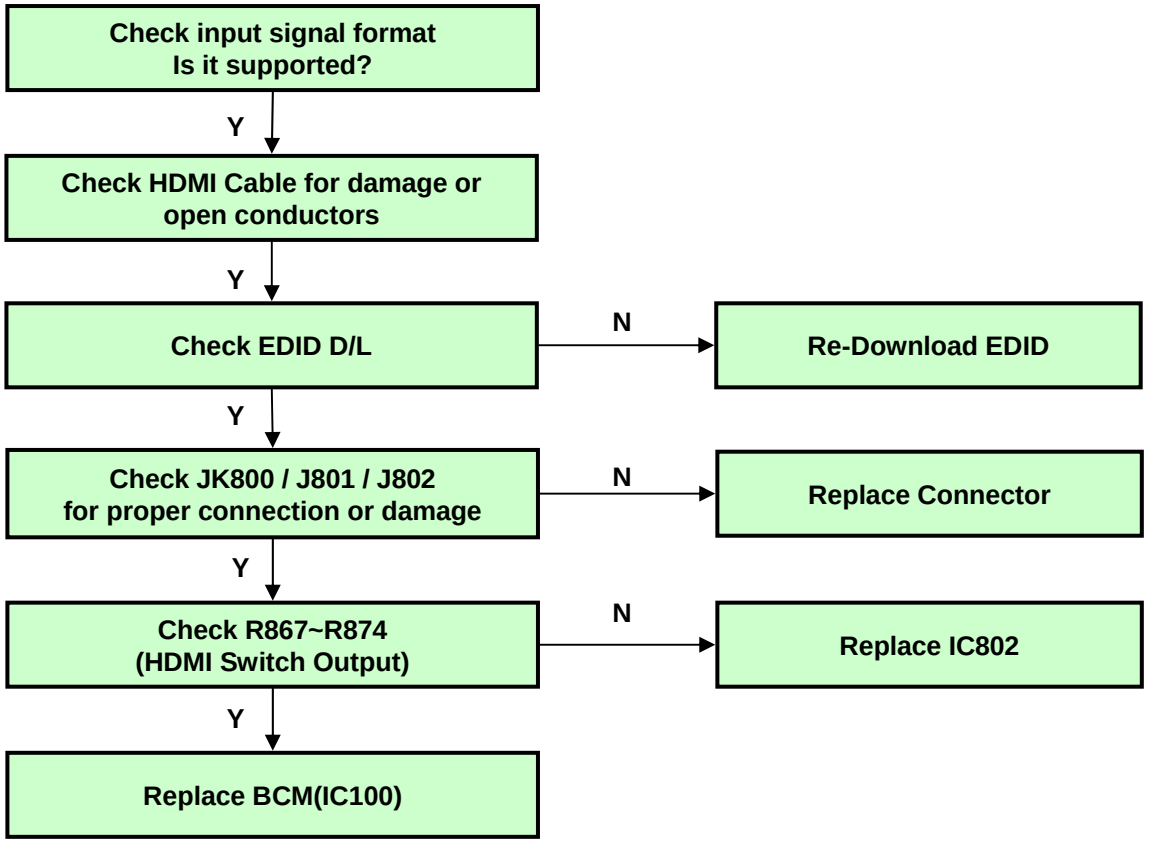
※ Measured signals depend on the input signal.

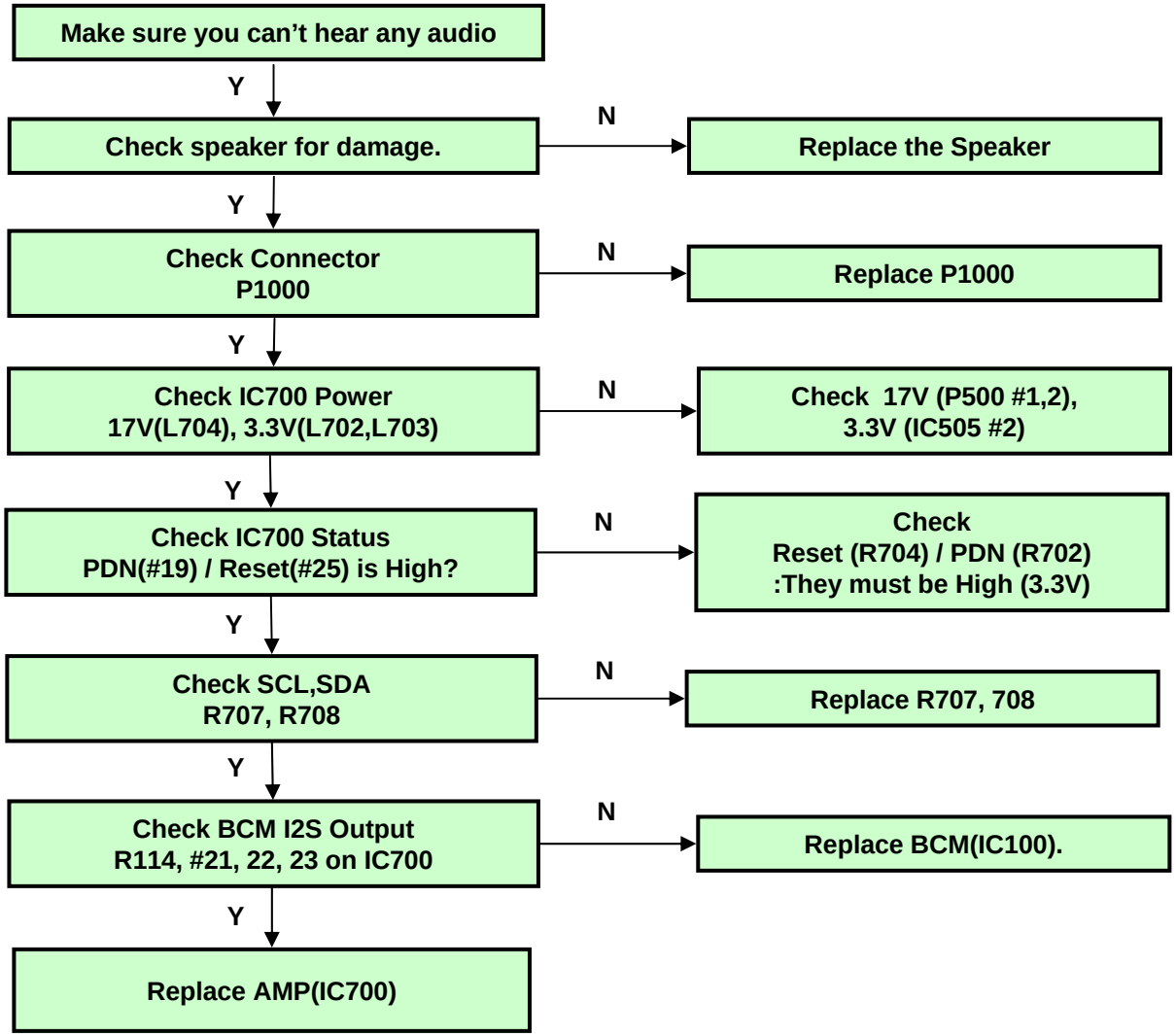


※ Measured signals depend on the input signal.

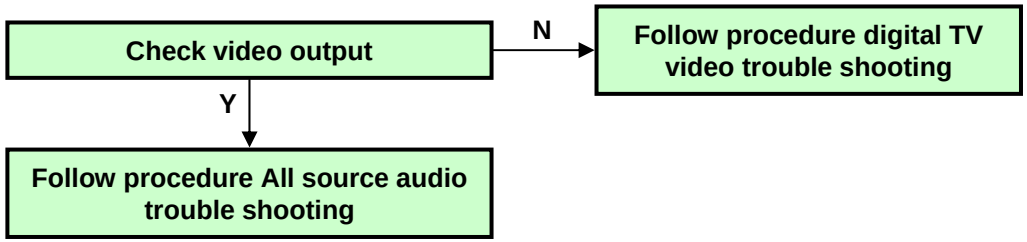


※ Measured signals depend on the input signal.

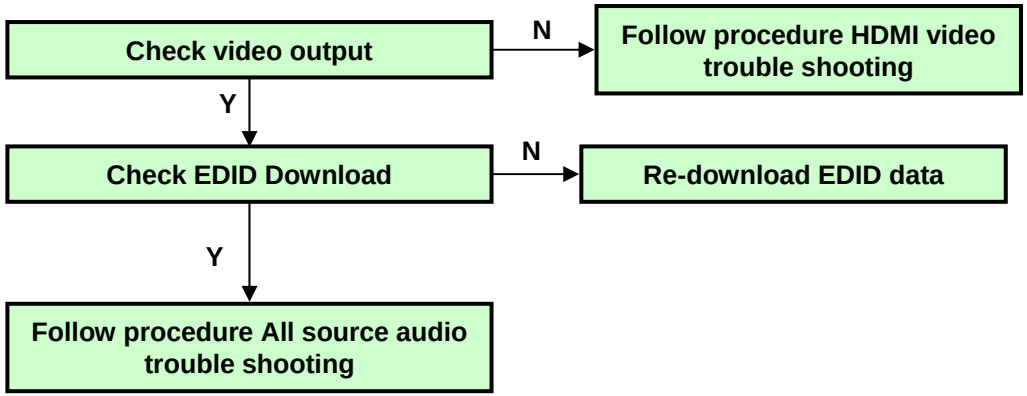


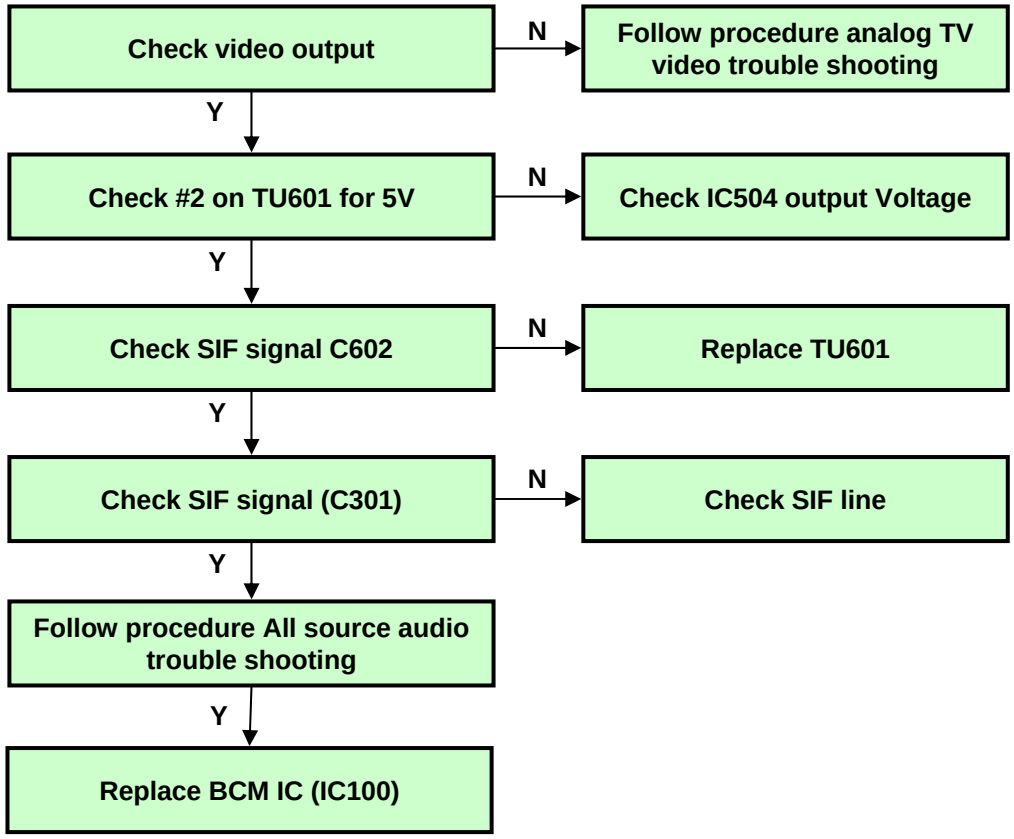


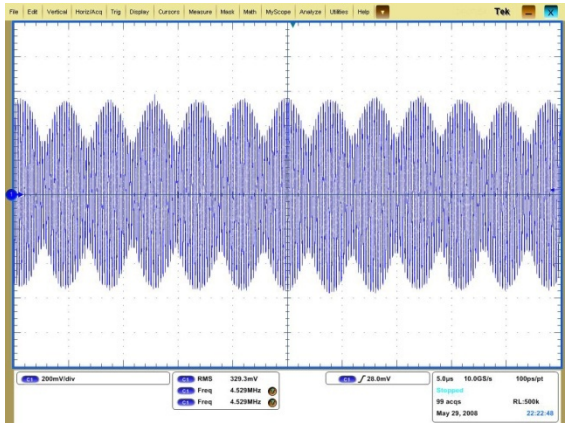
◆ Digital TV



◆ HDMI







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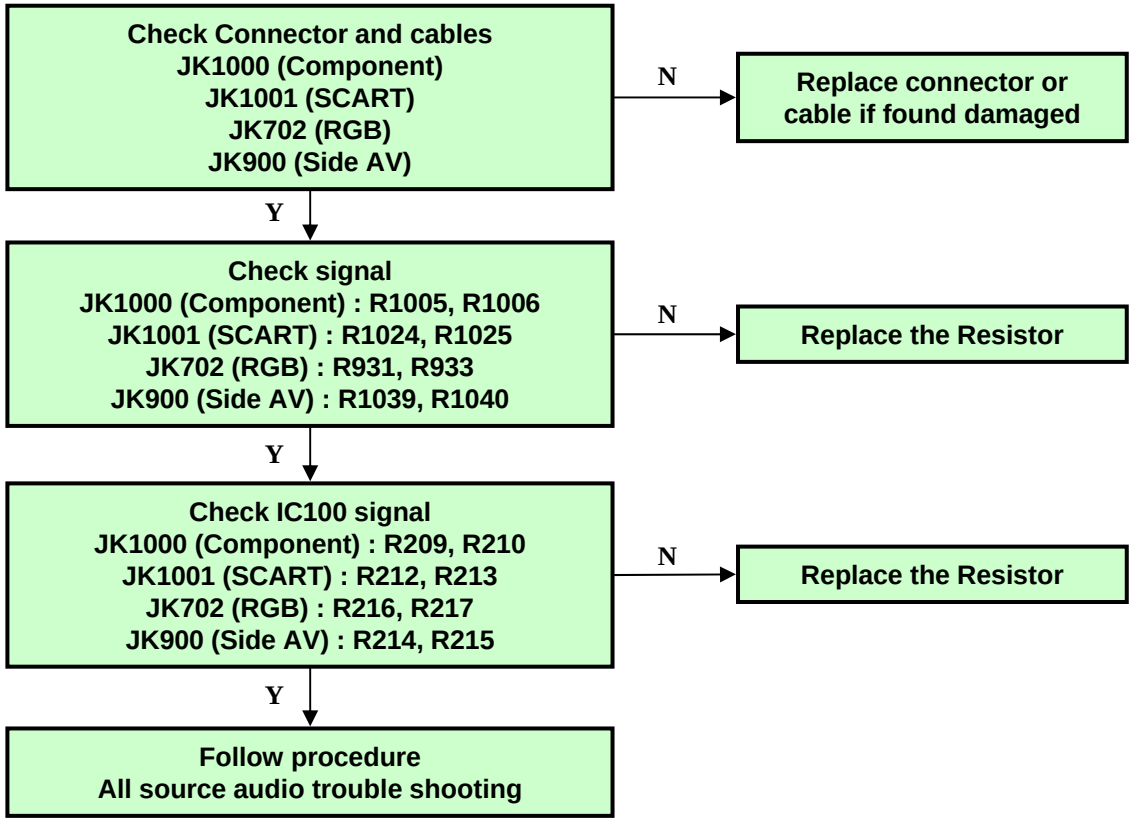

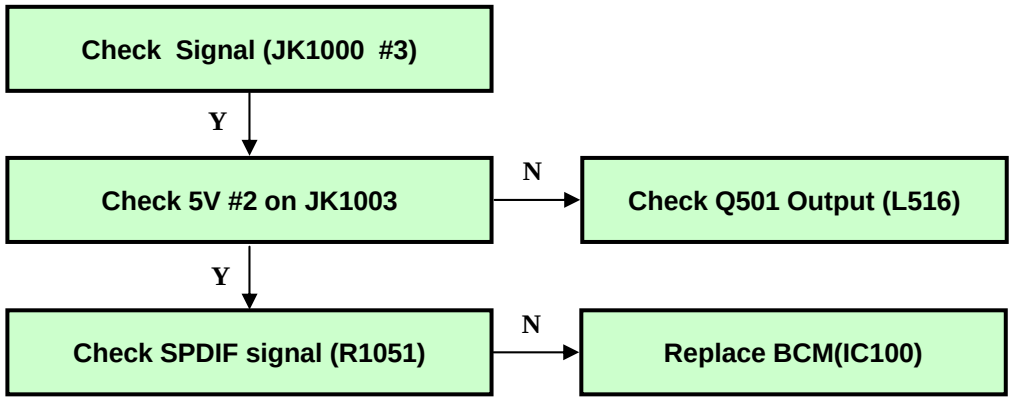

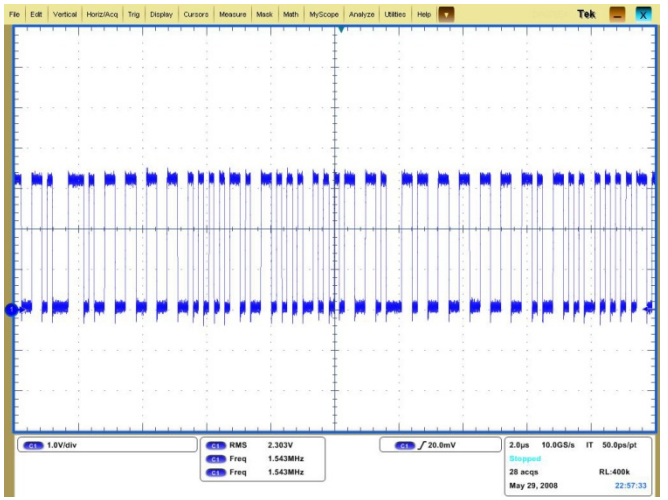

< SPDIF waveform – sample >
- Defend on the input signal.