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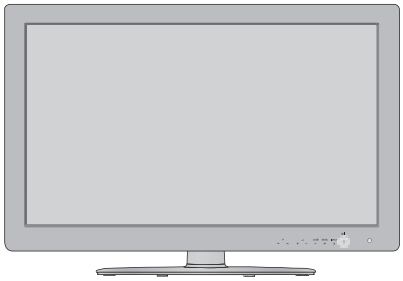
LCD TV
SERVICE MANUAL

CHASSIS : LC01D

MODEL : 42LE4500 42LE4500-CA

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



P/NO : MFL62863009 (1008-REV00) Printed in China

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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 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 TV receiver is blown, replace it with the specified.

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

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

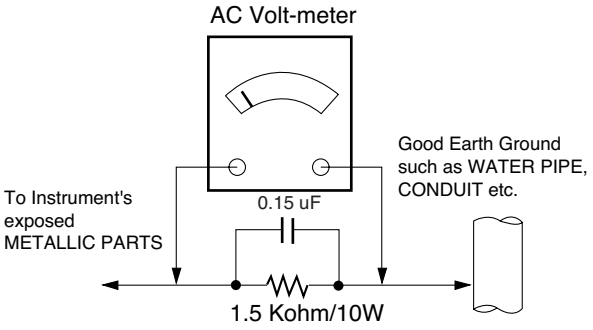
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

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 1 MΩ and 5.2 MΩ.
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 1.5 K / 10 watt resistor in parallel with a 0.15 uF 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 0.5 mA.
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



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω
*Base on Adjustment standard

SPECIFICATION

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

1. Application range

This specification is applied to the LCD TV used LC01D chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

1) Temperature: 25 ºC ± 5 ºC(77 ºF ± 9 ºF), CST: 40 ºC ± 5 ºC
2) Relative Humidity : 65 % ± 10 %
3) Power Voltage: Standard input voltage (AC 100-240 V~ 50 / 60 Hz)
   * Standard Voltage of each products is marked by models.
4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
5) The receiver must be operated for about 5 minutes prior to the adjustment.

3. Test method

1) Performance: LGE TV test method followed
2) Demanded other specification
   - Safety : CE, IEC specification
   - EMC :CE, IEC

4. Module General Specification

NO.	Item	Specification		Remark
1	Display Screen Device	42” wide Color Display Module		Edgel LCD
2	Aspect Ratio	16:9		
3	LCD Module	42”TFT LCD FHD		AUO/LGD: 42LE4500-CA
4	Storage Environment	Temp. : -20 deg ~ 60 deg		
		Humidity : 10 ~ 90 %		
5	Input Voltage	AC 100-240 V~, 50 / 60Hz		
6	Module Size	42LGD(FHD)	973.2(H)×566.2(V)×10.8mm(B)/25.3(D)	
		42AUO(FHD)	973.2(H)×566.2(V)×22.4(D)	

5. LCD Module

No.	Item	Specification		Min.	Typ.	Max.	Remark
1.	Viewing Angle<CR>10>	Right/Left/Up/Down		89			Degree
2.	Luminance	Luminance (cd/m²)			300		
		V riaaon it			-	1.3	MAX/MIN
3.	Contrast Ratio	CR		700	1000		
4.	CIE Color Coordinates	White	WX		0.279		
			WY	Typ	0.292	Typ	
		RED	Xr	- 0.03	0.651	+0.03	
			Yr		0.332		
		Green	Xg		0.308		
			Yg		0.597		
		Blue	Xb		0.149		
			Yb		0.059		

1) Standard Test Condition (The unit has been 'ON')

2) Stable for approximately 30 minutes in a dark environment at 25±2℃

3) The values specified are at approximate distance 50Cm from the LCD surface

4) T_a= 25±2℃, V_{LCD}=12.0V, f_V =60Hz, D_{clk}= 74.25MHz VBR_A=1.65V, EXT V_{BR_B}=100%

6. Component Video Input (Y, C_B/P_B, C_R/P_R)

No.	Specification				Remark
	Resolution	H-freq (kHz)	V-freq (Hz)		
1.	720x480	15.73	60.00	SDTV,DVD 480i	
2.	720x480	15.63	59.94	SDTV,DVD 480i	
3.	720x480	31.47	59.94	480p	
4.	720x480	31.50	60.00	480p	
5.	720x576	15.625	50.00	SDTV,DVD 625 Line	
6.	720x576	31.25	50.00	HDTV 576p	
7.	1280x720	45.00	50.00	HDTV 720p	
8.	1280x720	44.96	59.94	HDTV 720p	
9.	1280x720	45.00	60.00	HDTV 720p	
10.	1920x1080	31.25	50.00	HDTV 1080i	
11.	1920x1080	33.75	60.00	HDTV 1080i	
12.	1920x1080	33.72	59.94	HDTV 1080p	
13.	1920x1080	56.250	50	HDTV 1080p	
14.	1920x1080	67.43/67.5	59.94/60	HDTV 1080p	

7. Component Video Input (Y, CB/PB, CR/PR)

No	Specification				Remark
	Resolution	H-freq(kHz)	V-freq(Hz)		
1.	720x480	15.73	60.00	SDTV,DVD 480i	
2.	720x480	15.63	59.94	SDTV,DVD 480i	
3.	720x480	31.47	59.94	480p	
4.	720x480	31.50	60.00	480p	
5.	720x576	15.625	50.00	SDTV,DVD 625 Line	
6.	720x576	31.25	50.00	HDTV 576p	
7.	1280x720	37.50	50.00	HDTV 720p	
8.	1280x720	44.96	59.94	HDTV 720p	
9.	1280x720	45.00	60.00	HDTV 720p	
10.	1920x1080	28.125	50.00	HDTV 1080i	
11.	1920x1080	33.75	60.00	HDTV 1080i	
12.	1920x1080	33.72	59.94	HDTV 1080i	
13.	1920x1080	56.250	50	HDTV 1080p	
14.	1920x1080	67.43/67.5	59.94/60	HDTV 1080p	

8. RGB Input(PC)

No.	Specification				Proposed	Remarks
	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel Clock(MHz)		
1.	720*400	31.468	70.08	28.321		For only DOS mode
2.	640*480	31.469	59.94	25.17	VESA	Input 848*480 60 Hz, 852*480 60 Hz
3.	800*600	37.879	60.31	40.00	VESA	
4.	1024*768	48.363	60.00	65.00	VESA(XGA)	
5.	1280*768	47.78	59.87	79.5	WXGA	
6.	1360*768	47.72	59.8	84.75	WXGA	
7.	1280*1024	63.595	60.0	108.875	720	DTV standard
8.	1920*1080	66.587	59.93	138.625	WUXGA	FHD model

9. HDMI Input (PC/DTV)

（1） DTV Mode

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1.	720*480	31.469 /31.5	59.94 / 60	27.00/27.03	SDTV 480P	
2.	720*576	31.25	50	54	SDTV 576P	
3.	1280*720	37.500	50	74.25	HDTV 720P	
4.	1280*720	44.96 / 45	59.94 / 60	74.17/ 74.25	HDTV 720P	
5.	1920*1080	33.72 / 33.75	59.94 / 60	74.17/ 74.25	HDTV 1080I	
6.	1920*1080	28.125	50.00	74.25	HDTV 1080I	
7.	1920*1080	26.97 / 27	23.97 / 24	74.17/ 74.25	HDTV 1080P	
8.	1920*1080	33.716 / 33.75	29.976 / 30.00	74.25	HDTV 1080P	
9.	1920*1080	56.250	50	148.5	HDTV 1080P	
10.	1920*1080	67.43 / 67.5	59.94 / 60	148.35/148.50	HDTV 1080P	

（2） PC Mode

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1.	720*400	31.468	70.08	28.321		HDCP
2.	640*480	31.469	59.94	25.17	VESA	HDCP
3.	800*600	37.879	60.31	40.00	VESA	HDCP
4.	1024*768	48.363	60.00	65.00	VESA(XGA)	HDCP
5.	1280*768	47.78	59.87	79.5	WXGA	HDCP
6.	1360*768	47.72	59.8	84.75	WXGA	HDCP
7.	1280*1024	63.595	60.0	108.875	SXGA	HDCP, FHD model
8.	1920*1080	67.5	60	148.5	WUXGA	HDCP, FHD model

ADJUSTMENT INSTRUCTION

1. Application Range

This specification sheet is applied to all of the LCD TV with LC01D chassis.

2. Designation

1) The adjustment is according to the order which is designated and which must be followed, according to the plan which can be changed only on agreeing.
2) Power Adjustment: Free Voltage
3) Magnetic Field Condition: Nil.
4) Input signal Unit: Product Specification Standard
5) Reserve after operation: Above 5 Minutes (Heat Run)
   Temperature : at 25 ºC ± 5 ºC
   Relative humidity : 65 % ± 10 %
   Input voltage : 220 V, 60 Hz
6) Adjustment equipments: Color Analyzer (CA-210 or CA-110), Pattern Generator(MSPG-925L or Equivalent), DDC Adjustment Jig equipment, Service remote control.
7) Push the "IN STOP" key - For memory initialization.

Case1 : Software version up
1. After downloading S/W by USB, TV set will reboot automatically
2. Push "In-stop" key
3. Push "Power on" key
4. Function inspection
5. After function inspection, Push "I n-stop" key.

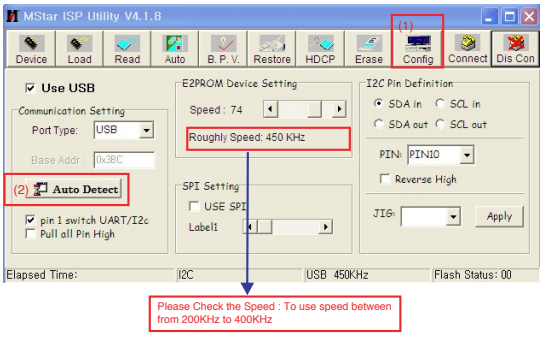
Case2 : Function check at the assembly line
1. When TV set is entering on the assembly line, Push "In-stop" key at first.
2. Push "Power on" key for turning it on.
   -> If you push "Power on" key, TV set will recover channel information by itself.
3. After function inspection, Push "In-stop" key.

3. Main PCB check process

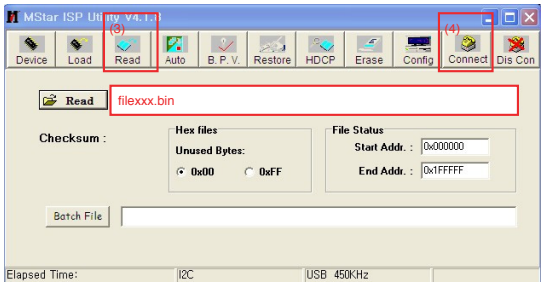
* APC - After Manual-Insert, executing APC

* Boot file Download

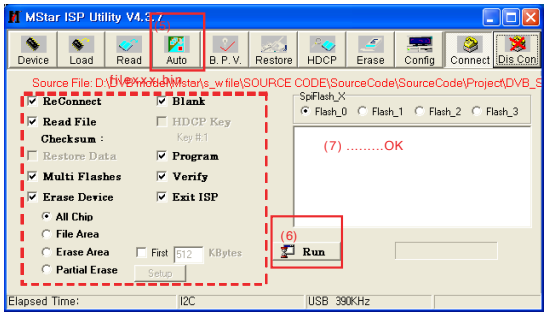
(1) Execute ISP program "Mstar ISP Utility" and then click "Config" tab.
(2) Set as below, and then click "Auto Detect" and check "OK" message.
If "Error" is displayed, Check connection between computer, jig, and set.



(3) Click "Read" tab, and then load download file (XXXX.bin) by clicking "Read".

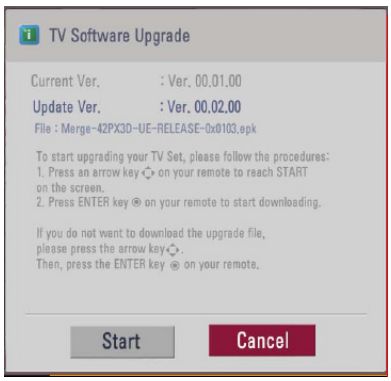


(4) Click "Connect" tab. If "Can't" is displayed, check connection between computer, jig, and set.
(5) Click "Auto" tab and set as below
(6) Click "Run".
(7) After downloading, check "OK" message.

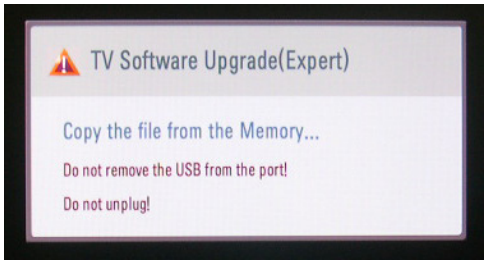


* USB DOWNLOAD(*.epk file download)

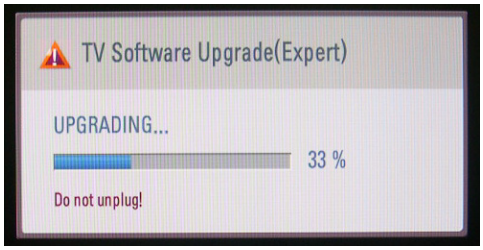
(1) Put the USB Stick to the USB socket.
(2) Automatically detecting update file in USB Stick.
- If version of update file in USB Stick is Lower, it didn't work. But version of update file is Higher, USB data is automatically detecting



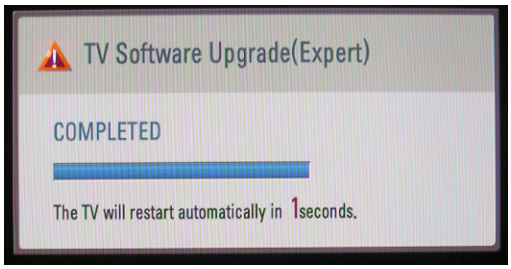
(3) Show the message “Copying files from memory”



(4) Updating is staring.



(5) After updating is complete, the TV will restart automatically.



(6) If TV turns on, check your updated version and Tool option. (refer to the next page about tool option)
* If downloading version is higher than your TV have, TV can lost all channel data. In this case, you have to channel recover. If all channel data is cleared, you didn’t have a DTV/ATV test on production line.

*** After downloading, have to adjust Tool Option again.**

(1) Enter ‘EZ ADJUST’ mode by pushing ‘ADJ’ key.
(2) Select each ‘Tool Option(1~5)’ and push ‘OK’ or ‘►’ key.
(3) Correct the number. (Each model has their number.)

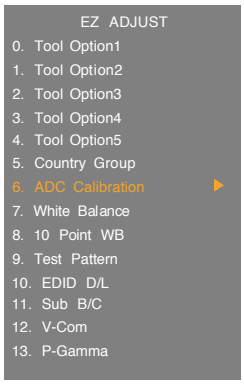
Model	Tool option1	Tool option2	Tool option3	Tool option4	Tool option 5	Remark
42LE4500	24768	19798	56365	14604	40	LGD

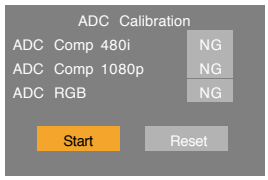
(4) Correction Tool option is complete.

3.1. ADC Process

* You need not connecting RGB(D-sub) cable. Because ADC uses TV internal pattern.

• Enter ‘EZ ADJUST’ mode by pushing ‘ADJ’ key,
• Enter ‘ADC Calibration’ mode by pushing ‘OK’ or “►” key after selecting “6. ADC Calibration”.





<Caution> Turn on Tv by pushing ‘POWER ON’ or ‘P-ONLY’ key.

* ADC Calibration Protocol (RS232)

Item	CMD1	CMD2	Data0		
Adjust ‘Mode In’	A	A	0	0	When transfer the ‘Mode In’, Carry the command.
ADC Adjust	A	D	1	0	Automatically adjustment (The use of a internal pattern)

Adjust Sequence
• aa 00 00 [Enter Adjust Mode]
• xb 00 40 [Component1 Input (480i)]
• ad 00 10 [Adjust 480i Comp1]
• xb 00 60 [RGB Input (1024*768)]
• ad 00 10 [Adjust 1024*768 RGB]
• aa 00 90 End Adjust mode
* Required equipment : factory Service Remote control

3.2. Function Check

(1) Check display and sound
- Check Input and Signal items.
1) TV
2) AV1/2
3) COMPONENT1/2 (480i)
4) RGB (PC : 1024 x 768 @ 60hz)
5) HDMI 1/2/3
6) PC Audio In
* Display and Sound check is executed by remote control.

4.3. White Balance Adjustment

4.3.1 Overview

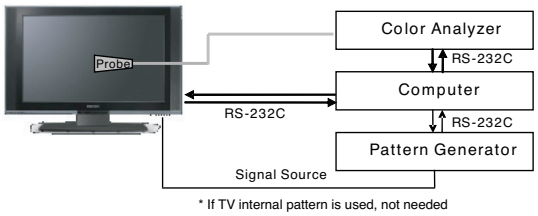
(1) W/B adj. Objective & How-it-works
(2) Objective: To reduce each Panel's W/B deviation
(3) How-it-works : When R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the other two is lowered to find the desired value.
(4) Adj. condition : normal temperature
  1) Surrounding Temperature : 25 ºC ± 5 ºC
  2) Warm-up time: About 5 Min
  3) Surrounding Humidity : 20 % ~ 80 %

4.3.2 Equipment

1) Color Analyzer: CA-210 (LED Module : CH 14)
2) Adj. Computer(During auto adj., RS-232C protocol is needed)
3) Adjust Remocon
4) Video Signal Generator MSPG-925F 720p/216-Gray (Model:217, Pattern:78)
  -> Only when internal pattern is not available

■ Color Analyzer Matrix should be calibrated using CS-1000

4.3.3. Equipment connection MAP



* If TV internal pattern is used, not needed

4.3.4. Adj. Command (Protocol)

<Command Format>

START	6E	A	50	A	LEN	A	03	A	CMD	A	00	A	VAL	A	CS	A	STOP

- LEN: Number of Data Byte to be sent
- CMD: Command
- VAL: FOS Data value
- CS: Checksum of sent data
- A: Acknowledge

Ex) [Send: JA_00_DD] / [Ack: A_00_okDDX]

■ RS-232C Command used during auto-adj.

RS-232C COMMAND [CMD	ID	DATA]	Explanation
wb	00	00	Begin White Balance adj.
wb	00	10	Gain adj.(internal white pattern)
wb	00	1f	Gain adj. completed
wb	00	20	Offset adj.(internal white pattern)
wb	00	2f	Offset adj. completed
wb	00	ff	End White Balance adj.(Internal pattern disappears)

Ex) wb 00 00 -> Begin white balance auto-adj.
wb 00 10 -> Gain adj.
ja 00 ff -> Adj. data
jb 00 c0
...
...
wb 00 1f -> Gain adj. completed
*(wb 00 20(start), wb 00 2f(end)) -> Off-set adj.
wb 00 ff -> End white balance auto-adj.

■ Adj. Map

	ITEM	Command (lower case ASCII)		Data Range (Hex.)		Default (Decimal)	Details
		Cmd 1	Cmd 2	Min	Max		
Cool	R-Gain	j	g	00	C0	TBD	
	G-Gain	j	h	00	C0	TBD	
	B-Gain	j	i	00	C0	TBD	
	R-Cut					TBD	
	G-Cut					TBD	
	B-Cut					TBD	
Medium	R-Gain	j	a	00	C0	TBD	
	G-Gain	j	b	00	C0	TBD	
	B-Gain	j	c	00	C0	TBD	
	R-Cut					TBD	
	G-Cut					TBD	
	B-Cut					TBD	
Warm	R-Gain	j	d	00	C0	TBD	
	G-Gain	j	e	00	C0	TBD	
	B-Gain	j	f	00	C0	TBD	
	R-Cut					TBD	
	G-Cut					TBD	

4.3.5. Adj. method

(1) Auto adj. method

1) Set TV in adj. mode using POWER ON key.
2) Zero calibrate probe then place it on the center of the Display.
3) Connect Cable (RS-232C)
4) Select mode in adj. Program and begin adjustment.
5) When adj. is complete (OK Sing), check adj. status pre mode. (Warm, Medium, Cool)
6) Remove probe and RS-232C cable to complete adj.

■ W/B Adj. must begin as start command “wb 00 00” , and finish as end command “wb 00 ff”, and Adj. offset if need.

(2) Manual adj. method

1) Set TV in Adj. mode using POWER ON
2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10cm of the surface.
3) Press ADJ key -> EZ adjust using adj. R/C -> 7. White-Balance then press the cursor to the right (KEY ►). (When KEY(►) is pressed 216 Gray internal pattern will be displayed)
4) One of R Gain / G Gain / B Gain should be fixed at 192, and the rest will be lowered to meet the desired value.
5) Adj. is performed in COOL, MEDIUM, WARM 3 modes of color temperature.

■ If internal pattern is not available, use RF input. In EZ Adj. menu 7.White Balance, you can select one of 2 Test-pattern: ON, OFF. Default is inner(ON). By selecting OFF, you can adjust using RF signal in 216 Gray pattern.

■ Adj. condition and cautionary items

1) Lighting condition in surrounding area
Surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.
2) Probe location
: Color Analyzer (CA-210) probe should be within 10 cm and perpendicular of the module surface (80° ~ 100°)
3) Aging time
- After Aging Start, Keep the Power ON status during 5 Minutes.
- In case of LCD, Back-light on should be checked using no signal or Full-white pattern.

4.3.6. Reference (White Balance Adj. coordinate and temperature)

■ Luminance : 216 Gray

■ Standard color coordinate and temperature using CS-1000 (over 66cm(26 inch))

Mode	Color Coordination		Temp	ΔUV
	x	y		
COOL	0.269	0.273	13000 K	0.0000
MEDIUM	0.285	0.293	9300 K	0.0000
WARM	0.313	0.329	6500 K	0.0000

■ Standard color coordinate and temperature using CA-210 (CH 9)

Mode	Color Coordination		Temp	ΔUV
	x	y		
COOL	0.269 ± 0.002	0.273 ± 0.002	13000 K	0.0000
MEDIUM	0.285 ± 0.002	0.293 ± 0.002	9300 K	0.0000
WARM	0.313 ± 0.002	0.329 ± 0.002	6500 K	0.0000

■ 10 Point White Balance

On / Off	On / Off
Pattern	Outer(default)
IRE	100
Luminance	130
Red(130.0 nit)	0
Green(130.0 nit)	0
Blue(130.0 nit)	0

■ Color Coordinate Variation by Aging time

GP2	Aing time (Min)	Cool		Medium		Warm	
		x	y	x	y	x	y
		269	273	285	293	313	329
1	0-2	280	291	296	311	319	340
2	3-5	278	288	294	308	317	338
3	6-9	276	285	292	305	315	335
4	10-19	274	282	290	302	313	332
5	20-35	273	279	289	299	312	329
6	36-49	270	276	287	296	310	326
7	50-79	269	273	286	293	308	323
8	Over 80	269	273	285	293	308	323

4.4. DDC EDID Write (RGB 128Byte)

· Connect D-sub Signal Cable to D-Sub Jack.
· Write EDID DATA to EEPROM (24C02) by using DDC2B protocol.
· Check whether written EDID data is correct or not.
* For SVC main Ass'y, EDID have to be downloaded to Insert Process in advance.

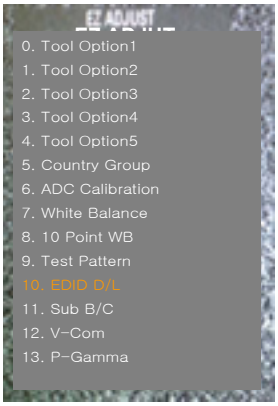
4.5DDC EDID Write (HDMI 256Byte)

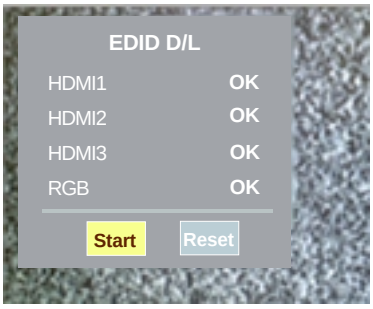
· Connect HDMI Signal Cable to HDMI Jack.
· Write EDID DATA to EEPROM(24C02) by using DDC2B protocol.
· Check whether written EDID data is correct or not.
* For SVC main Ass'y, EDID have to be downloaded to Insert Process in advance.

4.6EDID DATA

1) All Data : HEXA Value
2) Changeable Data :
*: Serial No : Controlled / Data:01
**: Month : Controlled / Data:00
***:Year : Controlled
****:Check sum

- Auto Download





* EDID data and Model option download (RS232)

Item	CMD1	CMD2	Data0		
Enter Download 'Mode In'	A	A	0	0	When transfer the 'Mode In', Carry the command.
EDID data and Model option Download	A	E	00	10	Automatically Download (The use of a internal pattern)

- Manual Download

* Caution
1) Use the proper signal cable for EDID Download
- Analog EDID : Pin3 exists
- Digital EDID : Pin3 exists
2) Nerver connect HDMI & D-sub Cable at the same time.
3) Use the proper cables below for EDID Writing.
4) Download HDMI1, HDMI2 separately because each data is different.

For Analog EDID	For HDMI EDID	
D-sub to D-sub	DVI-D to HDMI or HDMI to HDMI	
		

(1) RGB EDID data : 128 byte

	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	ⓐ		ⓑ			
10	ⓒ		01	03	68	10	09	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	81	80	61	40	45	40	31	40	01	01
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	A0	5A	00	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	ⓓ			
70	ⓓ														00	ⓔ

(2) HDMI EDID data : 256 byte

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	ⓐ		☒			
10	ⓒ		01	03	80	10	09	78	0A	CF	74	A3	54	4C	99	26
20	0F	50	54	A1	08	00	81	80	61	40	45	40	31	40	01	01
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	A0	5A	00	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	ⓓ			
70	ⓓ														01	ⓔ
80	02	03	20	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
90	22	15	01	26	15	07	50	09	57	07	ⓕ					
A0	ⓕ		E3	05	03	01	01	1D	80	18	71	1C	16	20	58	2C
B0	25	00	A0	5A	00	00	00	9E	01	1D	00	80	51	D0	0C	20
C0	40	80	35	00	A0	5A	00	00	00	1E	02	3A	80	18	71	38
D0	2D	40	58	2C	45	00	A0	5A	00	00	00	1E	66	21	50	B0
E0	51	00	1B	30	40	70	36	00	A0	5A	00	00	00	1E	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	ⓔ

Item	Condition	Data(Hex)
Manufacturer ID	GSM	1E6D
Version	Digital : 1	01
Revision	Digital : 3	03

* Detail EDID Options are below (A,B,C,D,E,F)

ⓐ Product ID

MODEL	HEX	EDID Table	DDC Fuction
FHD	0001	01 00	Analog/Digital

ⓑ Serial No: Controlled on production line.

ⓒ Week, Year:Fixed as S/W released day(same as MES data)
ex) Week : 0x02(2), Year 0x13(2009)

ⓓ Model Name(Hex):

MODEL	Model name(HX)
All	00 00 00 FC 00 4C 47 20 54 56 0A 20 20 20 20 20 20 20

ⓔ Checksum:

MODEL	RGB	HDMI1	HDMI2	HDMI3	HDMI4
FHD	0x1d	0xD7, 0x39	0xD7, 0x29	0xd7,0x19	0xd7,0x09
HD	0x94	0x7B, 0xD5	0x7B, 0xC5	Not applied	

ⓕ Vendor Speci ☒c (HDMI)

INPUT	MODEL NAME(HEX)	Remark
HDMI1	65 03 0C 00 10 00 B8 2D	
HDMI2	65 03 0C 00 20 00 B8 2D	
HDMI3	65 03 0C 00 30 00 B8 2D	
HDMI4	65 03 0C 00 40 00 B8 2D	

4.7. Outgoing condition Configuration

Push ′ IN STOP′ key ,then in-stop processing will start.

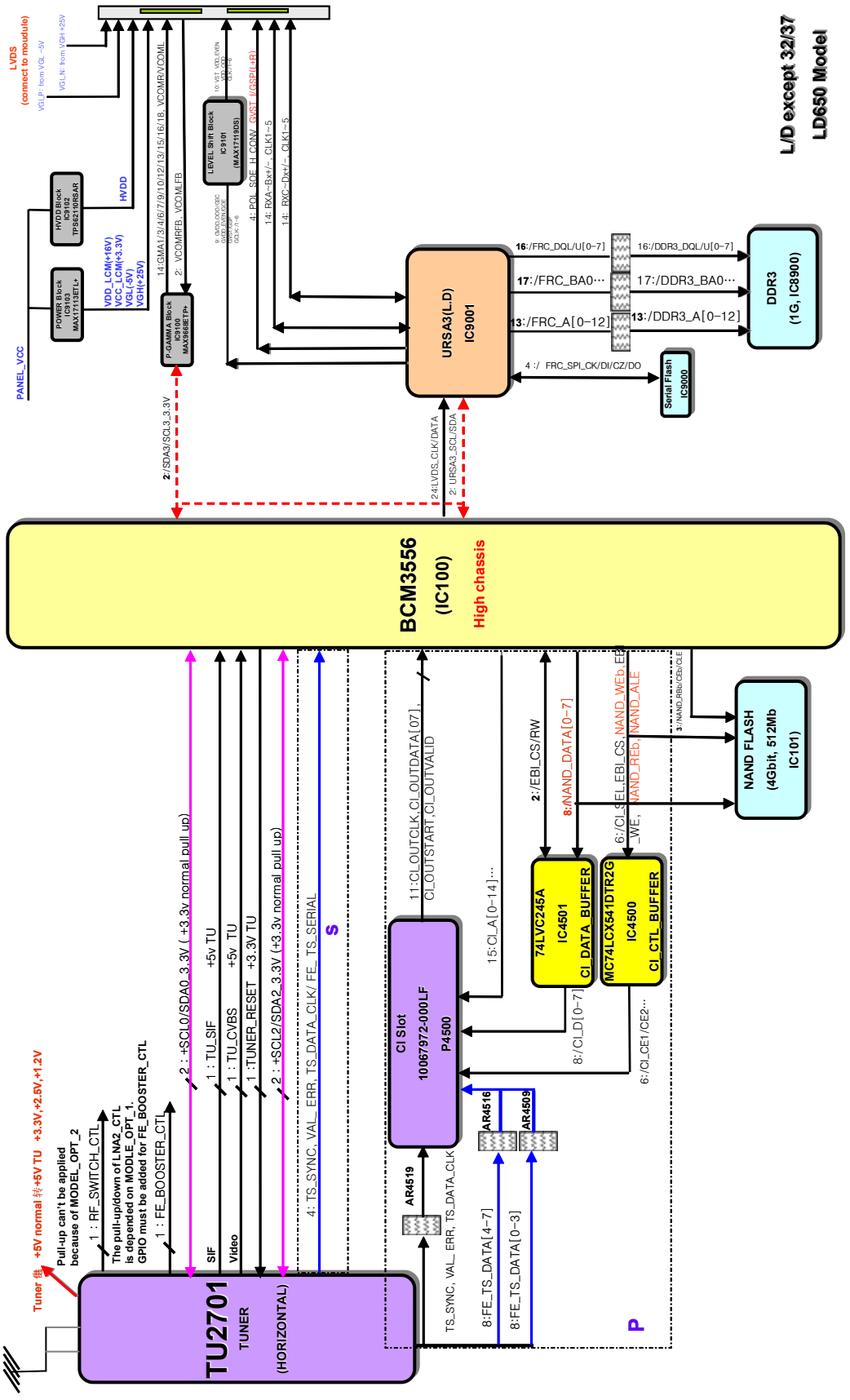
If processing is complete, TV will turn off automatically.

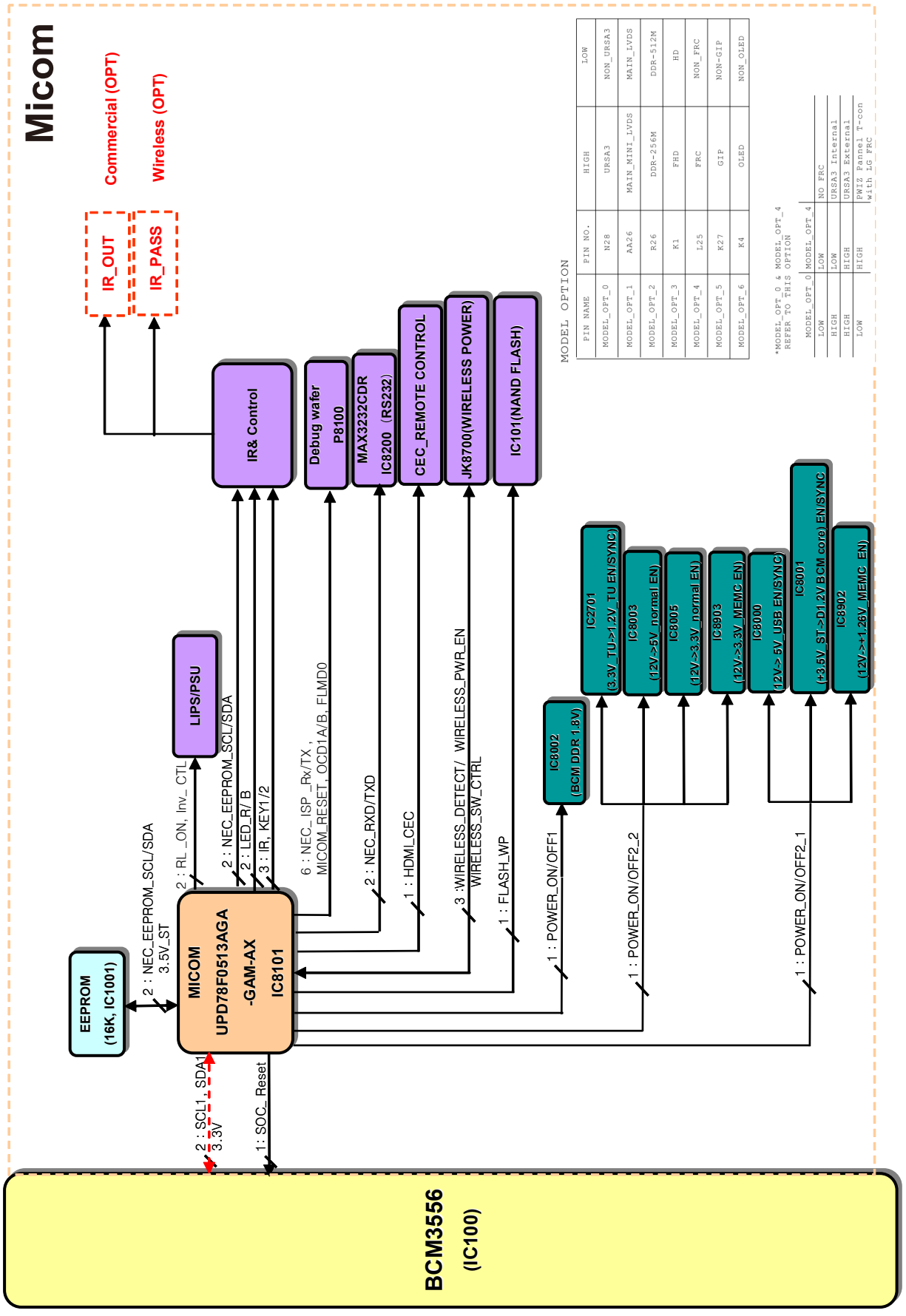
Must not AC power OFF during processing.

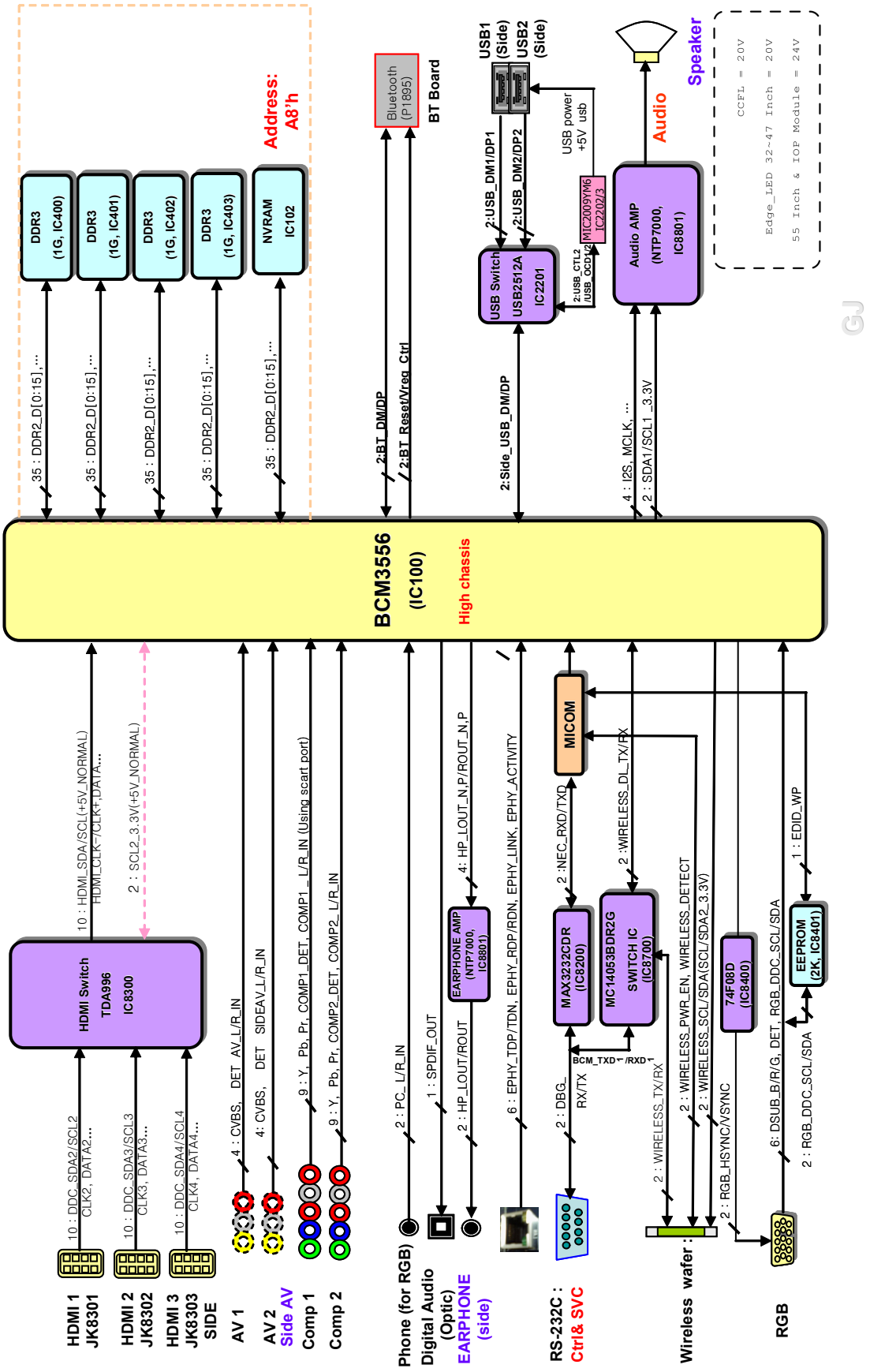
4.8. Internal pressure

Confirm whether is normal or not when between power board's ac block and GND is impacted on 1.5 kV(dc) or 2.2 kV(dc) for one second.

BLCOK DIAGRAM



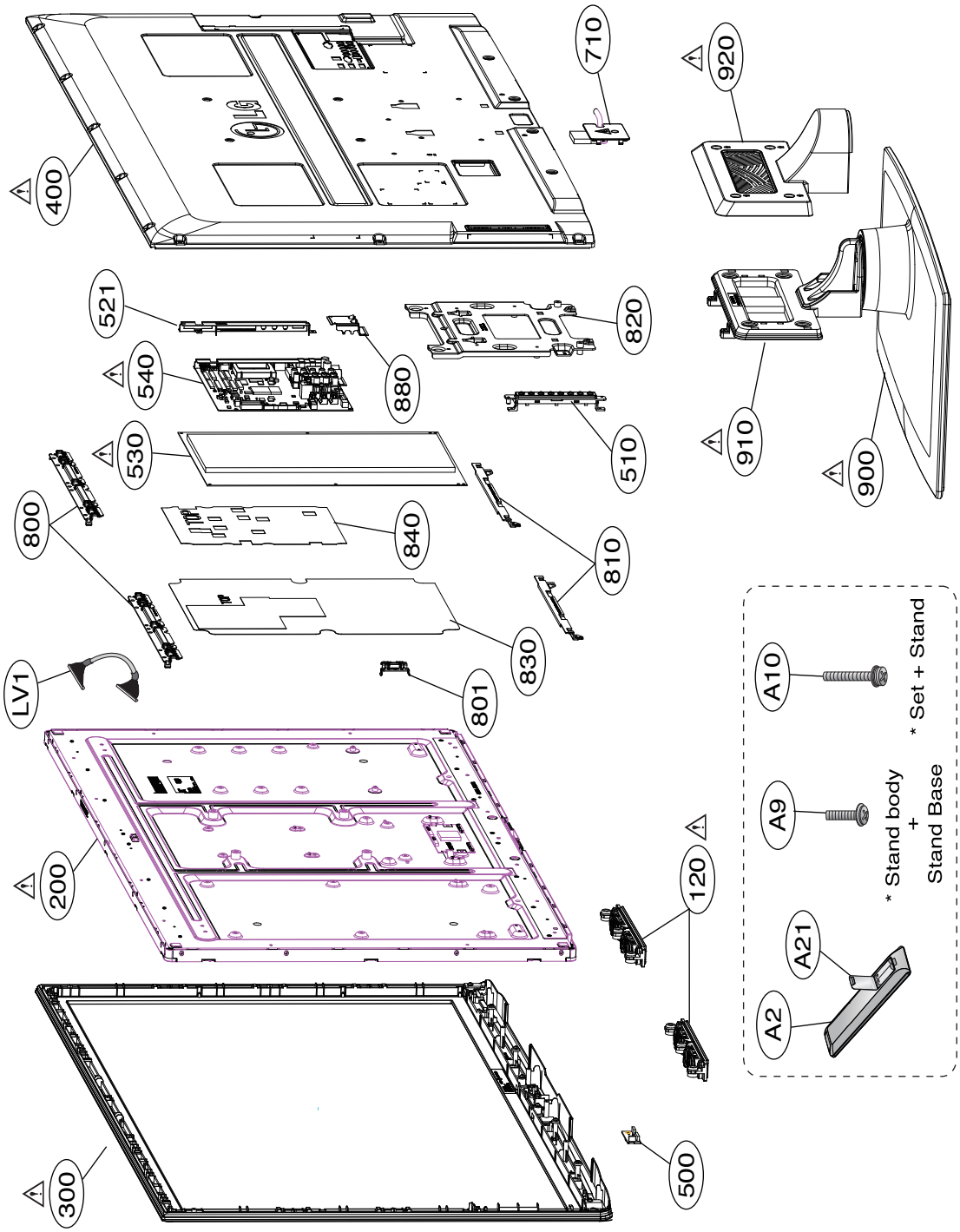




EXPLODED VIEW

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.



NAND FLASH MEMORY

IC102
HY27UF082G2B-TPCB
2GBIT

+3.3V_Normal

/PF_CE0
H : Serial Flash
L : NAND Flash
/PF_CE1
H : 16 bit
L : 8 bit

R107 1K
R109 3.9K
R108 1K OPT
C101 0.1uF
C102 10uF
C103 0.1uF

/F_RB
/PF_OE
/PF_CE0

R105 1K OPT
R104 10K OPT
/PF_CE1
PF_ALE
/PF_WE

+3.5V_ST
R103 0
R101 3.3K OPT
R102 3.3K
R106 4.7K
Q101 KRC103S OPT
/PF_WP

AR101
AR102
22

PCM_A[0-7]
PCM_A[7]
PCM_A[6]
PCM_A[5]
PCM_A[4]
PCM_A[3]
PCM_A[2]
PCM_A[1]
PCM_A[0]

NC_1 NC_2 NC_3 NC_4 NC_5 NC_6 R/B RE CE NC_7 NC_8 VCC_1 VSS_1 NC_9 NC_10 CLE ALE WE WP NC_11 NC_12 NC_13 NC_14 NC_15

NC_29 NC_28 NC_27 NC_26 I/O7 I/O6 I/O5 I/O4 NC_25 NC_24 NC_23 VCC_2 VSS_2 NC_22 NC_21 NC_20 I/O3 I/O2 I/O1 I/O0 NC_19 NC_18 NC_17 NC_16

IC102-*1
HY27US08121B-TPCB
512MBIT

IC102-*2
NAND01GW3B2CN6E
1GBIT

<T3 CHIP Config(AUD_LRCH)>

Boot from SPI flash : 1'b0
Boot from NOR flash : 1'b1

<T3 CHIP Config>
(AUD_SCK, AUD_MASTER_CLK, PWM1, PWM0)

MIPS_no_EJ_NOR8 : 4'h3 (MIPS as host. No EJ PAD. Byte mode NAND flash.)
MIPS_EJ1_NOR8 : 4'h4 (MIPS as host. EJ use PAD1. Byte mode NAND flash.)
MIPS_EJ2_NOR8 : 4'h5 (MIPS as host. EJ use PAD2. Byte mode NAND flash.)
B51_Secure_no scramble : 4'hb (8051 as host. Internal SPI flash secure boot, no scramble)
B51_Sesure_scramble : 4'hc (8051 as host. Internal SPI flash secure boot with scarmble)

+3.3V_Normal
R115 1K OPT
R117 1K OPT
R120 1K OPT
R122 1K OPT
R125 1K OPT
AUD_LRCH
AUD_SCK
AUD_MASTER_CLK
PWM1
PWM0
R118 1K OPT
R119 1K OPT
R121 1K OPT
R124 1K OPT
R126 1K OPT

LGE107D (S7M Divx_Non RM)

IC101

S7M_DIVX & MS10

PCM_D[0-7] → PCM_D[0] U22, PCM_D[1] T21, PCM_D[2] T22, PCM_D[3] AB18, PCM_D[4] AC18, PCM_D[5] AC19, PCM_D[6] AC20, PCM_D[7] AC21
PCM_A[0-14] → PCM_A[0] U21, PCM_A[1] V21, PCM_A[2] Y22, PCM_A[3] AA22, PCM_A[4] R22, PCM_A[5] R21, PCM_A[6] T23, PCM_A[7] T24, PCM_A[8] AA23, PCM_A[9] Y20, PCM_A[10] AB17, PCM_A[11] AA21, PCM_A[12] U23, PCM_A[13] Y23, PCM_A[14] W23

PCM_D0 PCM_D1 PCM_D2 PCM_D3 PCM_D4 PCM_D5 PCM_D6 PCM_D7
PCM_A0 PCM_A1 PCM_A2 PCM_A3 PCM_A4 PCM_A5 PCM_A6 PCM_A7 PCM_A8 PCM_A9 PCM_A10 PCM_A11 PCM_A12 PCM_A13 PCM_A14

/PCM_REG W22 → PCM_REG_N
/PCM_OE AA17, /PCM_WE V22, /PCM_IORD W21, /PCM_IOWR Y21 → PCM_OE_N, PCM_WE_N, PCM_IORD_N, PCM_IOWR_N
+5V_Normal
R132 10K, R133 10K
/PCM_CE AA20, /PCM_IRQA V23, /PCM_CD P23, /PCM_WAIT R23, PCM_RST P22 → PCM_CE_N, PCM_IRQA_N, PCM_CD_N, PCM_WAIT_N, PCM_RESET
C108 0.1uF OPT, C109 0.1uF

AR104, AR103 22
/PF_CE0 AC17, /PF_CE1 AB20, /PF_OE AA18, /PF_WE AB21, PF_ALE AB19, /PF_WP AD17, /F_RB AA19 → PCM_PF_CE0Z, PCM_PF_CE1Z, PCM_PF_OEZ, PCM_PF_WEZ, PCM_PF_ALE, PCM_PF_AD[15], PCM_PF_RBZ

S7_TXD R134 22 M23, S7_RXD R135 22 N23 → UART_TX2/GPIO65, UART_RX2/GPIO64
for SYSTEM/HDCP EEPROM&URSA3
I2C_SDA R136 22 M22, I2C_SCL R137 22 N22 → DDCR_DA/GPIO71, DDCR_CK/GPIO72
RGB_DDC_SDA R138 22 A5, RGB_DDC_SCL R139 22 B5 → DDCA_DA/UART0_TX, DDCA_CK/UART0_RX

TO SCART1
PWM0 K23, PWM1 K22, PWM2 G23, SC_RE2 G22, SC_RE1 G21 → PWM0/GPIO66, PWM1/GPIO67, PWM2/GPIO68, PWM3/GPIO69, PWM4/GPIO70

DSUB_DET C6, MODEL_OPT_3 B6, PCM_5V_CTL C8, /RST_PHY C7, /RST_HUB A6 → SAR0/GPIO31, SAR1/GPIO32, SAR2/GPIO33, SAR3/GPIO34, SAR4/GPIO35

S7M_DIVX & MS10

GPIO143/TCON0 N21 ← 5V_DET_HDMI_1
GPIO145/TCON2 M21 ← 5V_DET_HDMI_2
GPIO147/TCON4 L22 ← 5V_DET_HDMI_4
GPIO149/TCON6 L21 ← 5V_DET_HDMI_3
GPIO151/TCON8 P21 ← SIDEAV_DET

GPIO36/UART3_RX K21 ↔ WIRELESS_DL_RX
GPIO37/UART3_TX L23 ↔ WIRELESS_DL_TX
for WIRELESS READY
GPIO38 K20 ↔ ET_RXER
for ETHERNET PHY
GPIO39 L20 → FRC_RESET
GPIO40 M20 → SC1/COMP1_DET
GPIO41 G20 → ERROR_OUT
GPIO42 G19 → MODEL_OPT_0

M_REMOTE
GPIO50/UART1_RX F20 22 R148 → M_REMOTE_RX
GPIO51/UART1_TX F19 22 R149 → M_REMOTE_TX
M_REMOTE

GPIO6/PM0/INT0 E7 → USB1_OCD
GPIO7/PM1/PM_UART_TX D7 → USB1_CTL
GPIO8/PM2 E11 → HP_DET
GPIO9/PM3 G9 0 R150 → CONTROL_ATTEN
GPIO10/PM4 F9 0 R110 → MODEL_OPT_6
C5 → MODEL_OPT_1
GPIO11/PM5/PM_UART_RX/INT1 E8 33 R146
PM_SPI_CS1/GPIO12/PM6 E9 → /FLASH_WP
PM_SPI_WP1/GPIO13/PM7 F7 → MODEL_OPT_2
PM_SPI_WP2/GPIO14/PM8/INT2 F6 → TUNER_RESET
GPIO15/PM9 D8 → DEMOD_RESET
PM_SPI_CS2/GPIO16/PM10 G12 → AV_CVBS_DET
GPIO17/PM11/INT3 F10
GPIO18/PM12/INT4

PM_SPI_CK/GPIO1 D9 33 R147 → SPI_SCK
GPIO0/PM_SPI_CZ D11 → /SPI_CS
PM_SPI_DI/GPIO2 E10 → SPI_SDI
for SERIAL FLASH
PM_SPI_DO/GPIO3 D10 33 R151 → SPI_SDO

TS0_CLK AA9 ↔ CI_TS_CLK
TS0_VLD AA5 ↔ CI_TS_VAL
TS0_SYNC AA10 ↔ CI_TS_SYNC
from CI SLOT
TS0_D0 AB5 ↔ CI_TS_DATA[0]
TS0_D1 AC4 ↔ CI_TS_DATA[1]
TS0_D2 Y6 ↔ CI_TS_DATA[2]
TS0_D3 AA6 ↔ CI_TS_DATA[3]
TS0_D4 W6 ↔ CI_TS_DATA[4]
TS0_D5 AA7 ↔ CI_TS_DATA[5]
TS0_D6 Y9 ↔ CI_TS_DATA[6]
TS0_D7 AA8 ↔ CI_TS_DATA[7]

TS1_CLK AC5 ↔ FE_TS_CLK
TS1_VLD AC6 ↔ FE_TS_VAL_ERR
TS1_SYNC AB6 ↔ FE_TS_SYNC
Internal demod out /External demod in
TS1_D0 AC10 ↔ FE_TS_DATA[0]
TS1_D1 AB10 ↔ FE_TS_DATA[1]
TS1_D2 AC9 ↔ FE_TS_DATA[2]
TS1_D3 AB9 ↔ FE_TS_DATA[3]
TS1_D4 AC8 ↔ FE_TS_DATA[4]
TS1_D5 AB8 ↔ FE_TS_DATA[5]
TS1_D6 AC7 ↔ FE_TS_DATA[6]
TS1_D7 AB7 ↔ FE_TS_DATA[7]

MPIF_CLK D12
MPIF_CS_N D14 → /PIF_SPI_CS
MPIF_BUSY E14 → R160 1K
MPIF_D0 E12
MPIF_D1 F12
MPIF_D2 D13
MPIF_D3 E13

S7M_DIVX & DD

& MS10 :Region that support MS10(ex:DTV Country)
& DD :Region that support only Dolby Digital(ex:AISA Analog/KOREA)

S7M_NON_DIVX & MS10 | S7M_NON_DIVX & DD | S7T_DIVX & MS10 | S7T_DIVX & DD | S7T_NON_DIVX & MS10 | S7T_NON_DIVX & DD

URSA degug port

UART_FRC_RX
UART_FRC_TX
FRC_SCL
FRC_SDA

HDCP EEPROM

IC103
CAT24WC08W-T
Addr:10101--
+3.3V_Normal
R113 4.7K
A0 A1 A2 VSS VCC WP SCL SDA
C107 0.1uF
R127 4.7K
R128 22
R129 22
I2C_SCL
I2C_SDA

EEPROM

IC104
M24M01-HRMN6TP
A0'h
+3.3V_Normal
C105 0.1uF
R111 22 I2C_SCL
R112 22 I2C_SDA
C104 8pF OPT
C106 8pF OPT

S7_DIVX & MS10 | S7_DIVX & DD | S7_NON_DIVX & MS10 | S7_NON_DIVX & DD

I2C

+3.3V_Normal
R140 1K
R141 1K
R142 3.3K
R143 3.3K
R144 2.2K
R145 2.2K
AMP_SDA
AMP_SCL
I2C_SDA
I2C_SCL
NEC_SDA
NEC_SCL

DIMMING

A_DIM R156 10K PWM0
PWM_DIM R157 100 PWM2
R155 0 OPT
C111 2.2uF
LD650 Scan
SCAN_BLK2 R158 100 SCAN FRC_PWM1
SCAN_BLK1/OPC_OUT R159 100 SCAN FRC_PWM0

THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.3
BLOCK	FLASH/EEPROM/GPIO	SHEET	1

MODEL OPTION

PIN NAME	PIN NO.	HIGH	LOW
MODEL_OPT_0	G19	FRC	NO FRC
MODEL_OPT_4	E18	100/120Hz LVDS	50/60Hz LVDS
MODEL_OPT_1	C5	MINI LVDS	LVDS
MODEL_OPT_2	F7	DDR_512MB	DDR_256MB
MODEL_OPT_3	B6	FHD	HD
MODEL_OPT_5	D18	GIP	NON_GIP
MODEL_OPT_6	F9	OLED	LCD

	OPT_0	OPT_4
NO_FRC	: LOW	LOW
U3_INTERNAL	: HIGH	LOW
U3_EXTERNAL	: HIGH	HIGH
PWIZ TCON with LG FRC	: HIGH	HIGH

RSDS Power OPT

VDDC 1.26V

VDDC : 2026mA

Normal Power 3.3V

Normal 2.5V

DDR3 1.5V

RSDS Power OPT

IC101
LGE107D (S7M Divx_Non RM)

S7M_DIVX

HDMI

DSUB

SCART1_RGB/COMP1

COMP2

CVBS IN/OUT

Close to MSTAR

ANALOG SIF
Close to MSTAR

TU/DEMOD_I2C

B/T USB

SIDE USB

RMII For Ethernet

I2S_I/F

AUDIO IN

AUDIO OUT

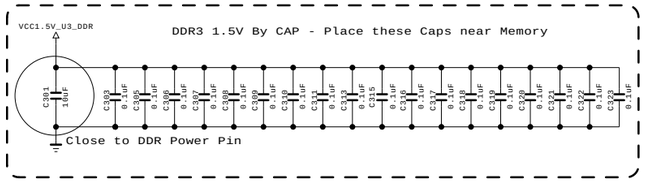
H/P OUT

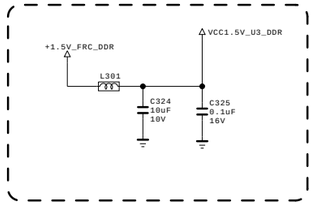
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

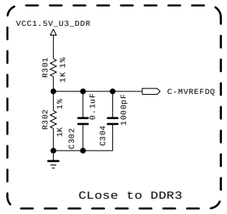
SECRET
LGElectronics

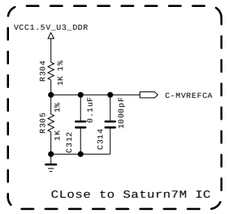
LG ELECTRONICS

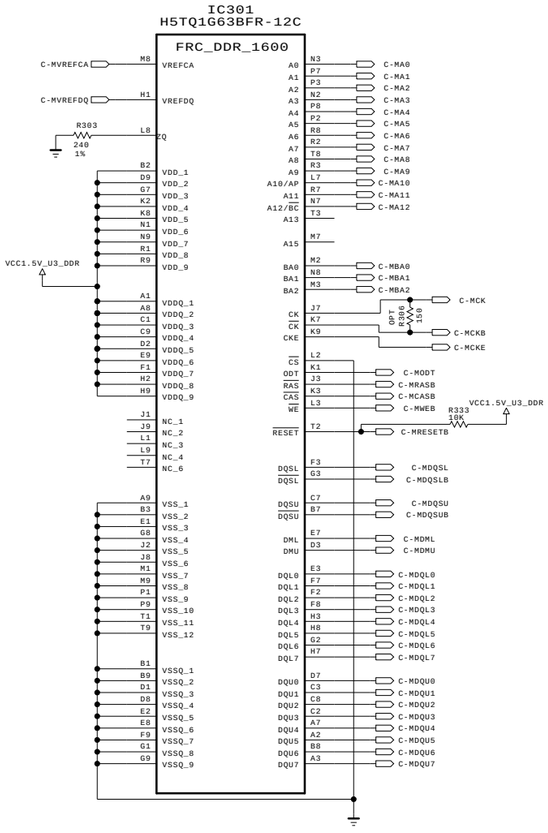
MODEL	GP2_Saturn7M	DATE	Ver. 1.4
BLOCK	MAIN_2	SHEET	2

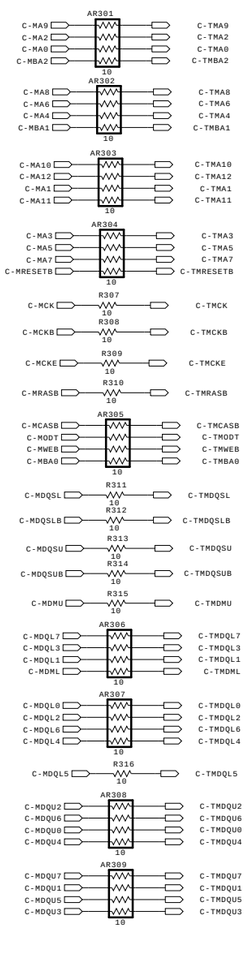


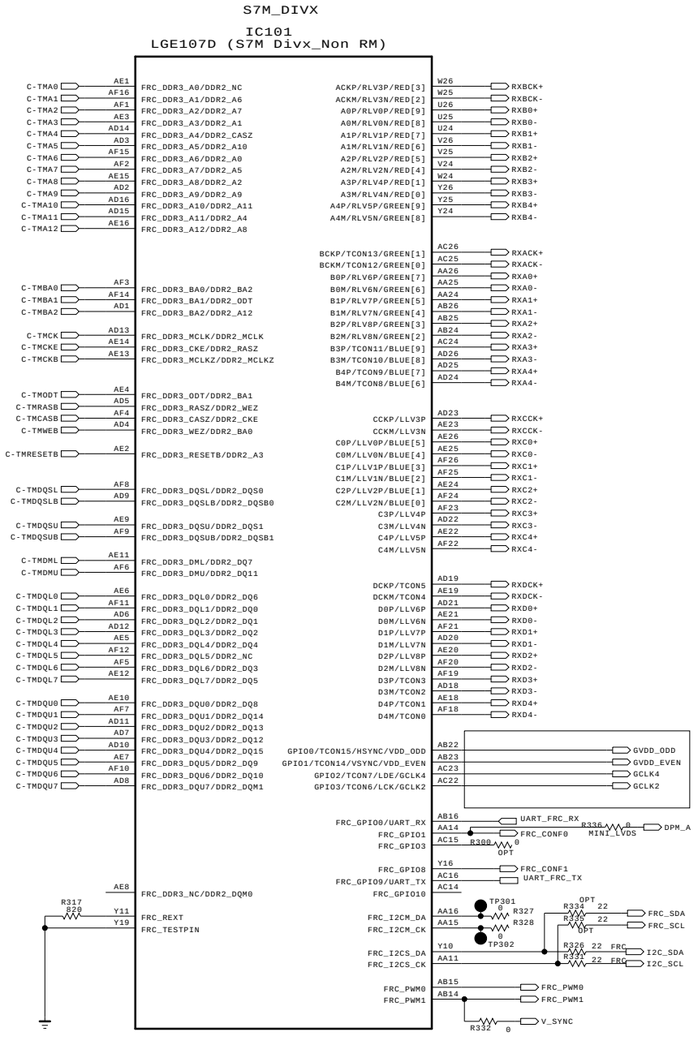


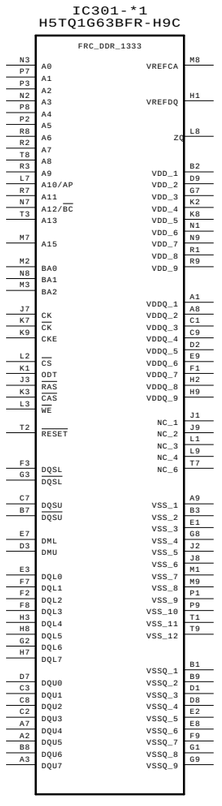


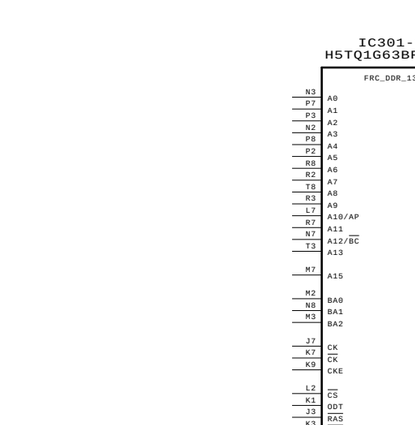












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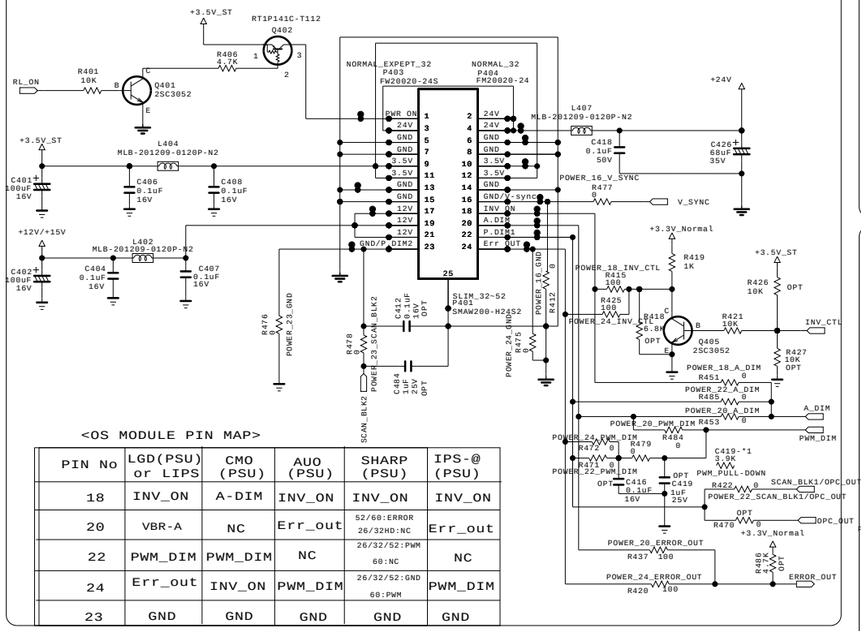
SECRET

LGElectronics

LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.4
BLOCK	DDR3(FRC)	SHEET	3

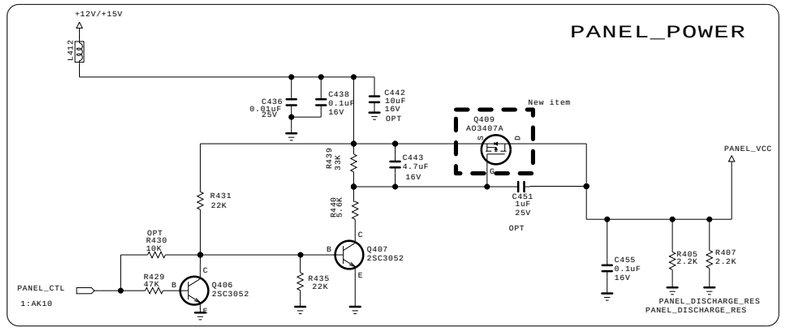
FROM LIPS & POWER B/D



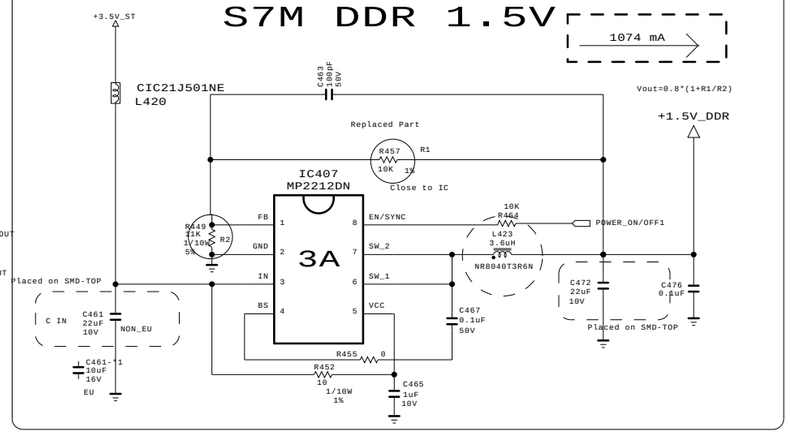
<OS MODULE PIN MAP>

PIN No	LGD(PSU) or LIPS	CMO (PSU)	AUO (PSU)	SHARP (PSU)	IPS-@ (PSU)
18	INV_ON	A-DIM	INV_ON	INV_ON	INV_ON
20	VBR-A	NC	Err_out	52/60:ERROR 26/32HD:NC	Err_out
22	PWM_DIM	PWM_DIM	NC	26/32/52:PWM 60:NC	NC
24	Err_out	INV_ON	PWM_DIM	26/32/52:GND 60:PWM	PWM_DIM
23	GND	GND	GND	GND	GND

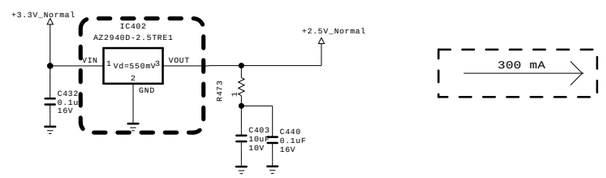
PANEL_POWER



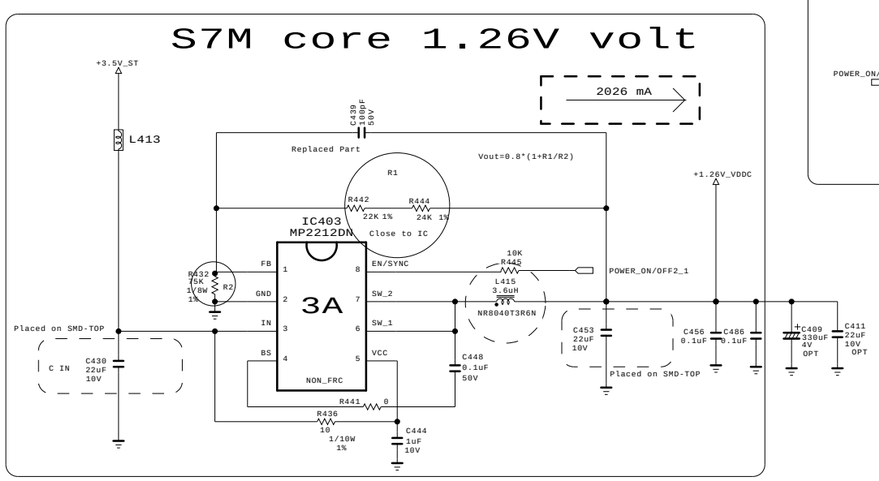
S7M DDR 1.5V



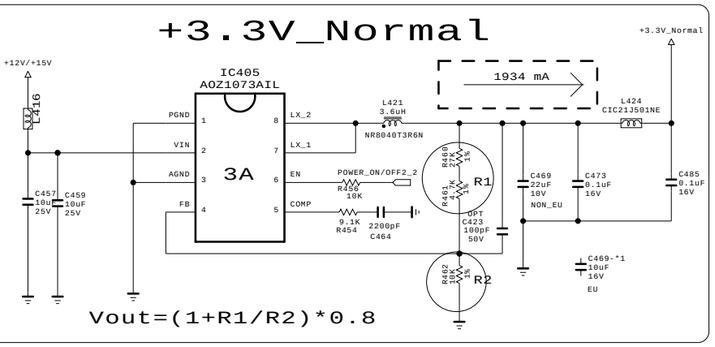
+2.5V/+1.8V



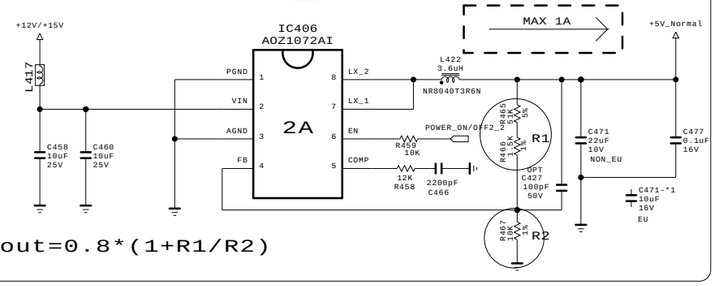
S7M core 1.26V volt



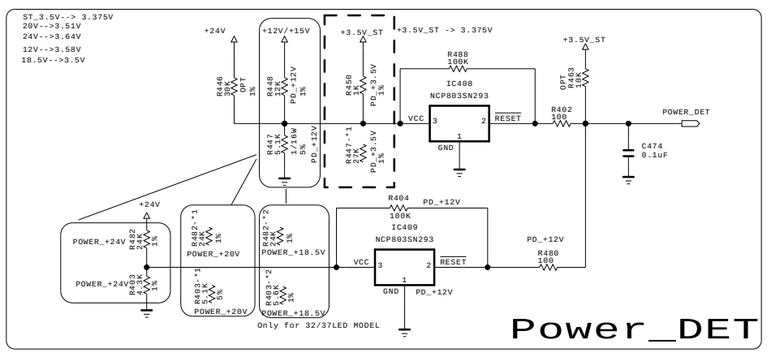
+3.3V_Normal



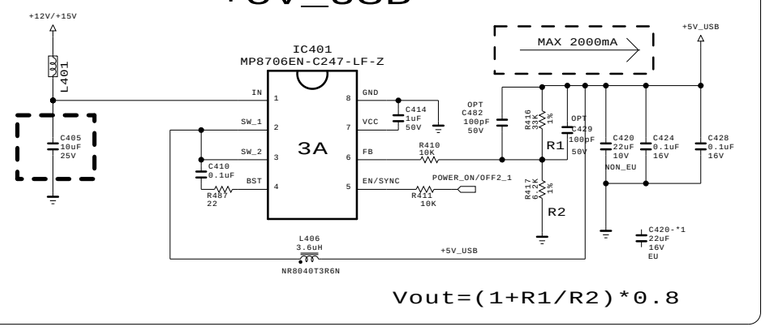
+5V_Normal



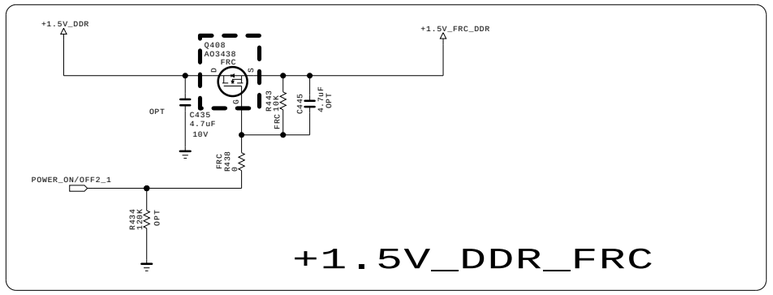
Power_DET



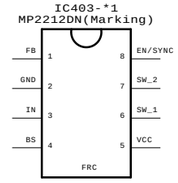
+5V_USB



+1.5V_DDR_FRC



IC403-*1 MP2212DN(Marking)



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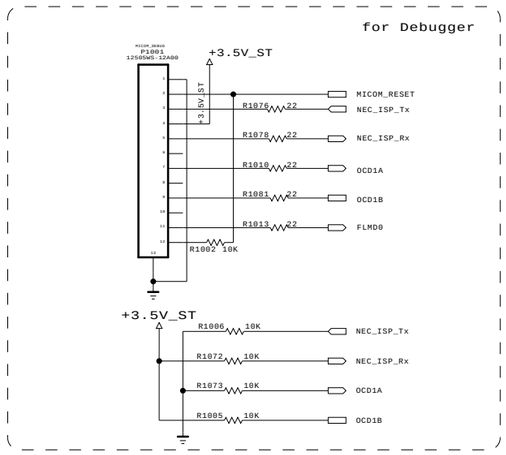
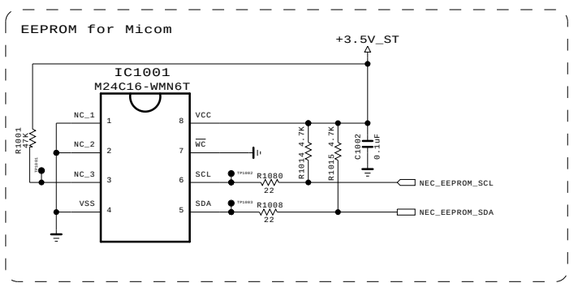
SECRET

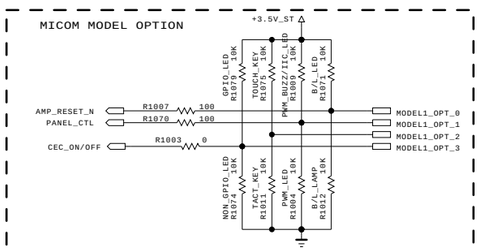
LGElectronics

LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.2
BLOCK	POWER	SHEET	4



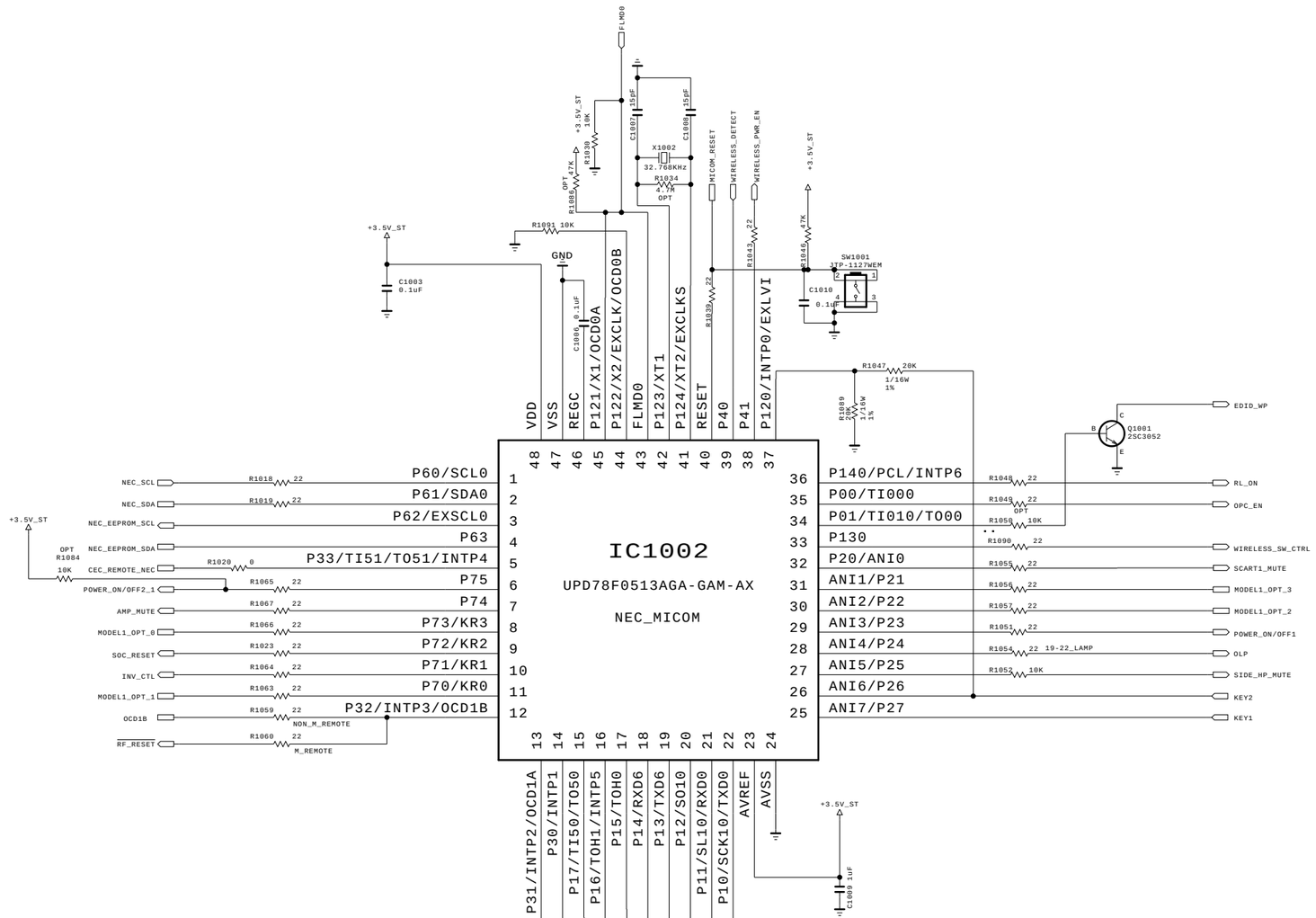




MODEL OPTION

PIN NAME	PIN NO.	HIGH	LOW
MODEL_OPT_0	8	B/L_LED	B/L_LAMP
MODEL_OPT_1	11	PWM_BUZZ/IIC_LED	PWM_LED
MODEL_OPT_2	30	TOUCH_KEY	TACT_KEY
MODEL_OPT_3	31	GPIO_LED	NON_GPIO_LED

MODEL_OPT_0	MODEL_OPT_1	MODEL_OPT_2	MODEL_OPT_3	
LOW	LOW	LOW	LOW	LD350/450/550
HIGH	LOW	HIGH	LOW	19/22/26LE3300(5500)
HIGH	HIGH	HIGH	LOW	32/37/42/47/55LE5300(10)
LOW	HIGH	LOW	LOW	LD420
HIGH	LOW	LOW	HIGH	LE7300
	HIGH		HIGH	TBD



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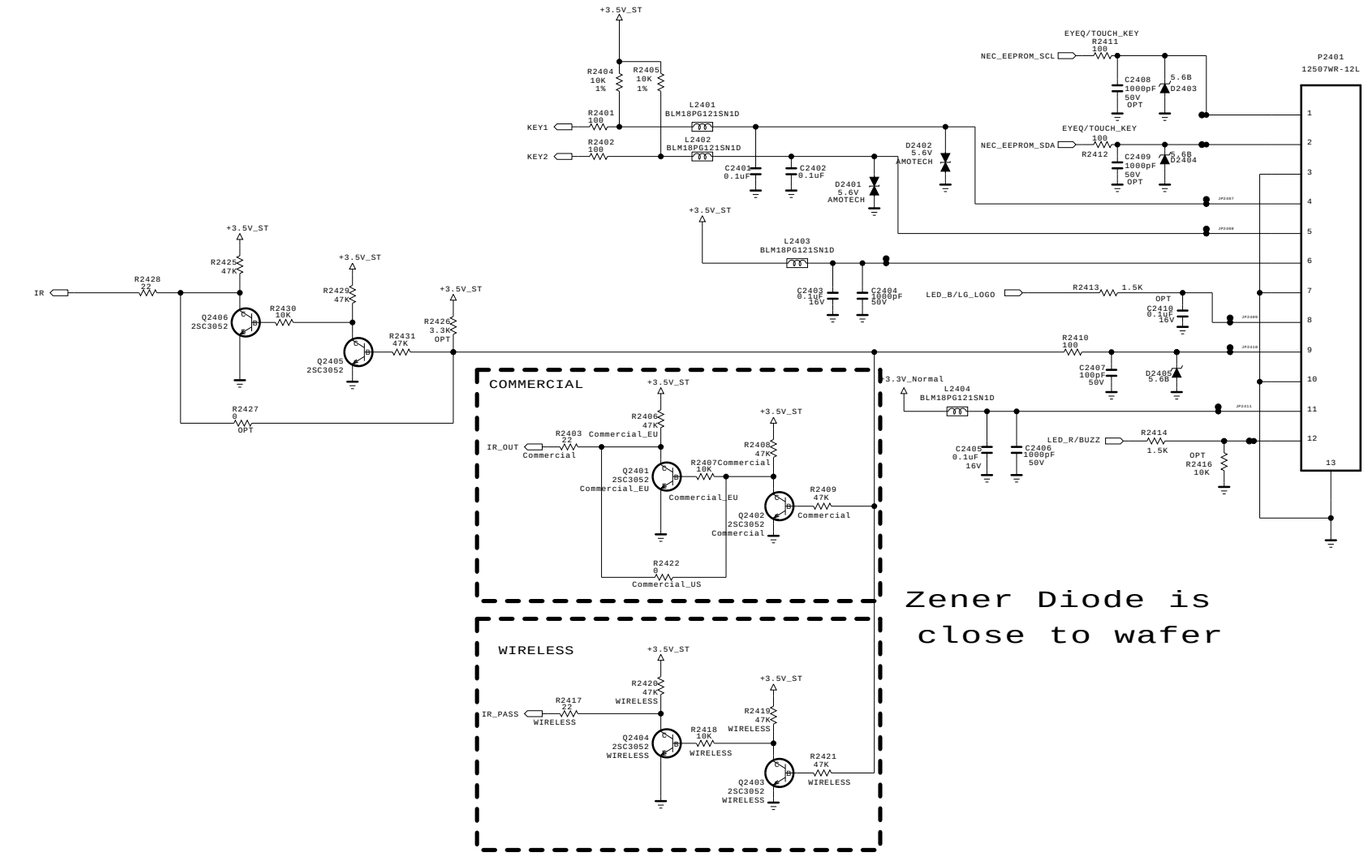
SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.4
BLOCK	MICOM	SHEET	5

CONTROL

IR & LED



Zener Diode is close to wafer

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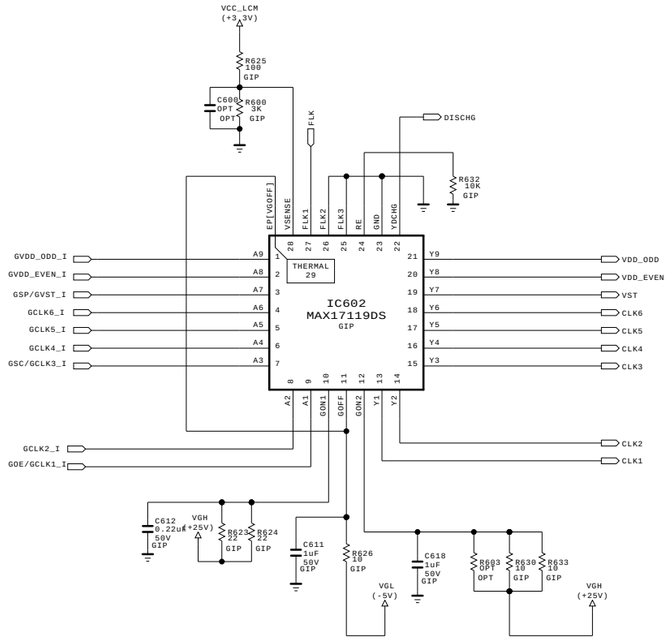
SECRET

LGElectronics

LG ELECTRONICS

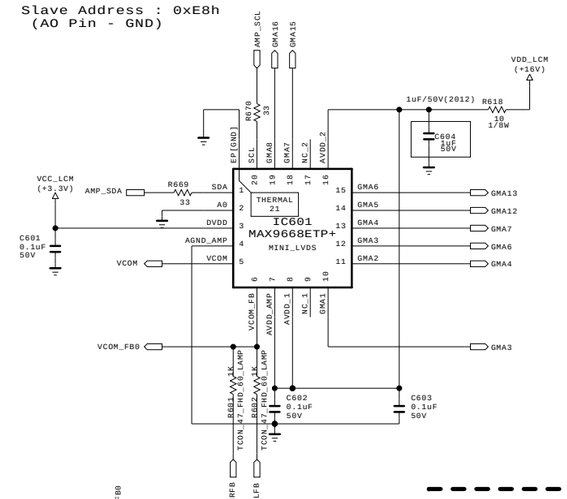
MODEL	GP2_Saturn7M	DATE	Ver. 1.2
BLOCK	IR & LED	SHEET	6

[LEVEL Shift Block]

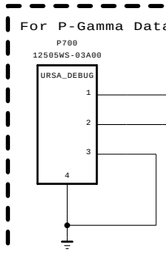


[P-GAMMA Block]

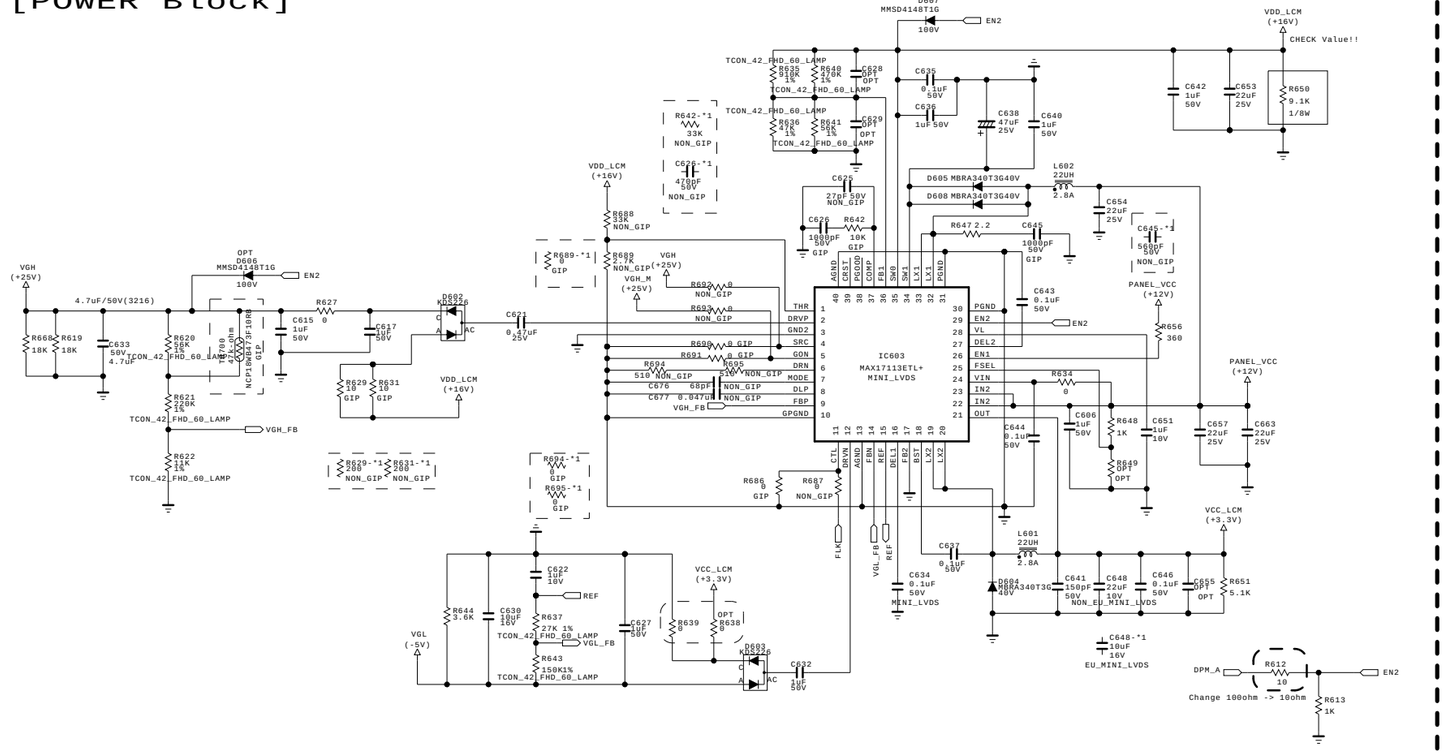
Slave Address : 0xE8h
(AO Pin - GND)



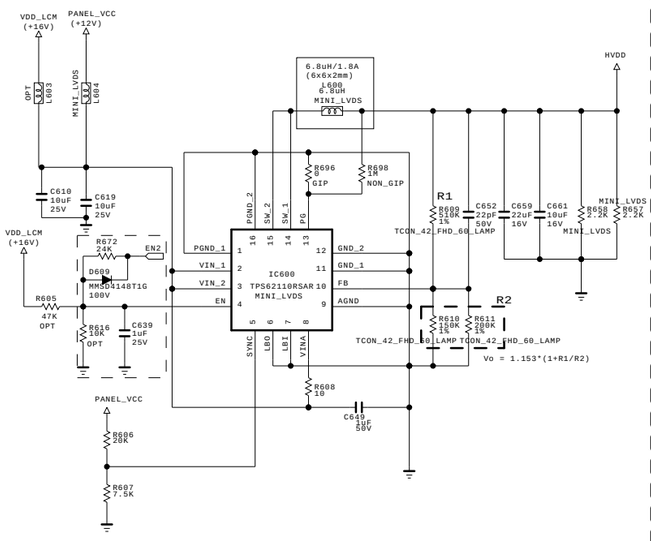
For P-Gamma Data Download

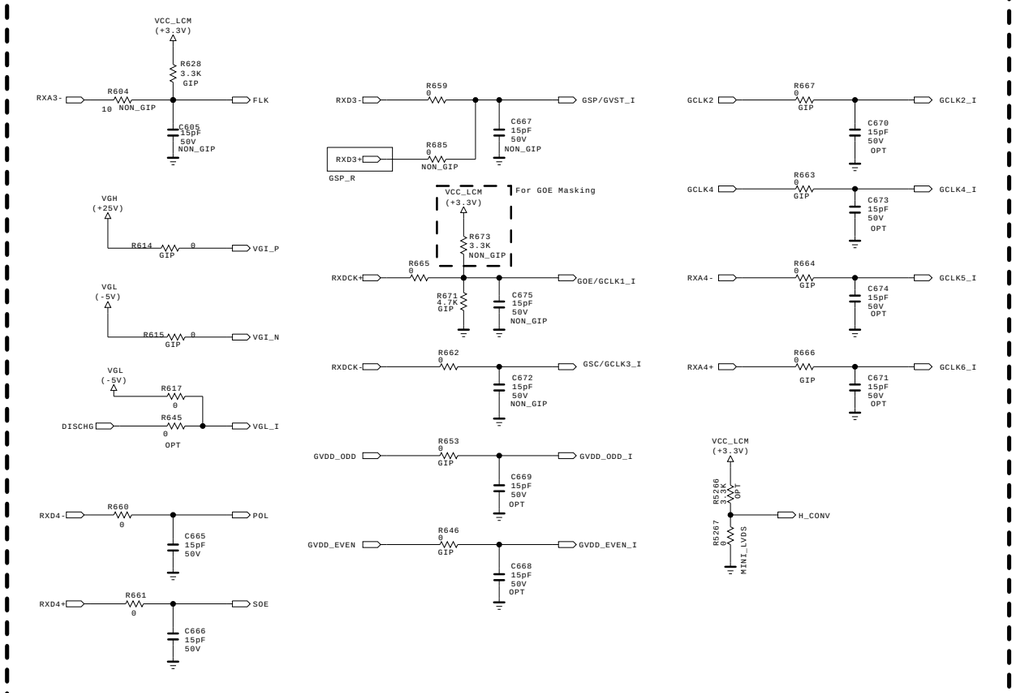


[POWER Block]



[HVDD Block]





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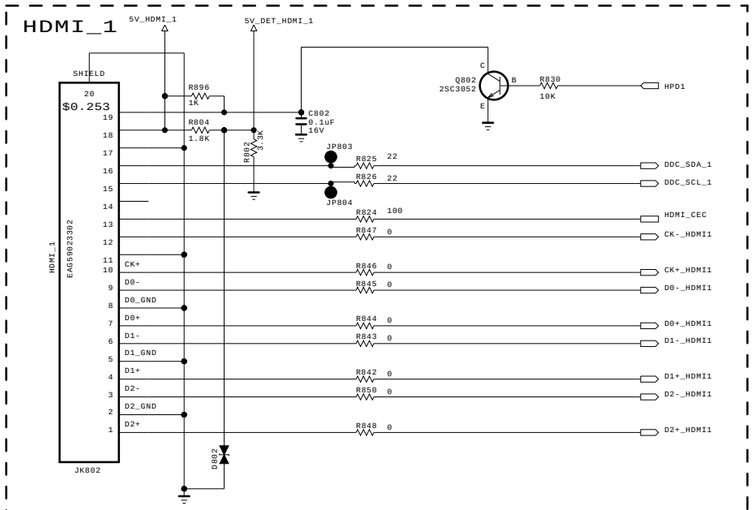
SECRET
LGElectronics

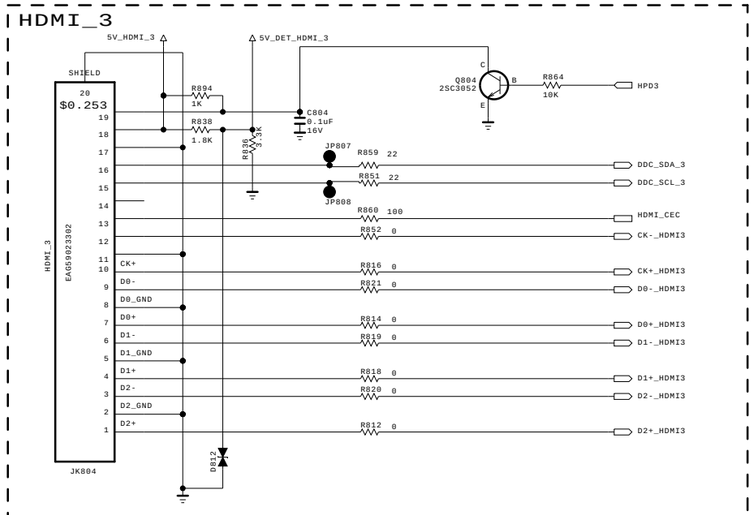
LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 2.1
BLOCK	T-CON	SHEET	7 /

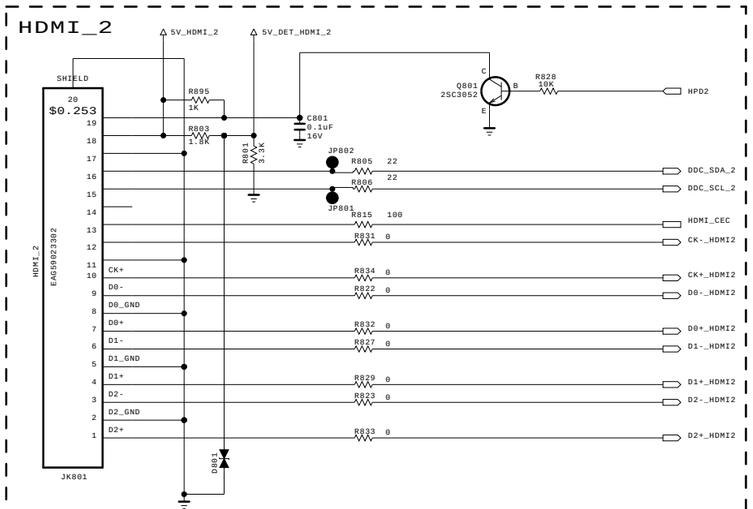
HDMI_1



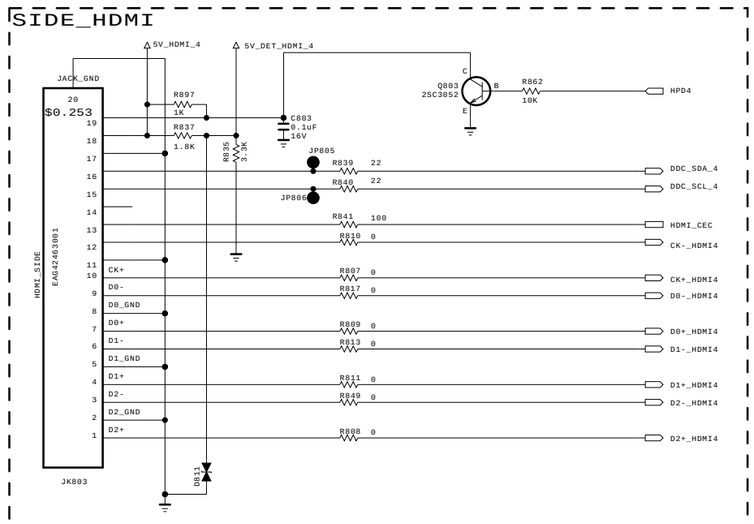
HDMI_3



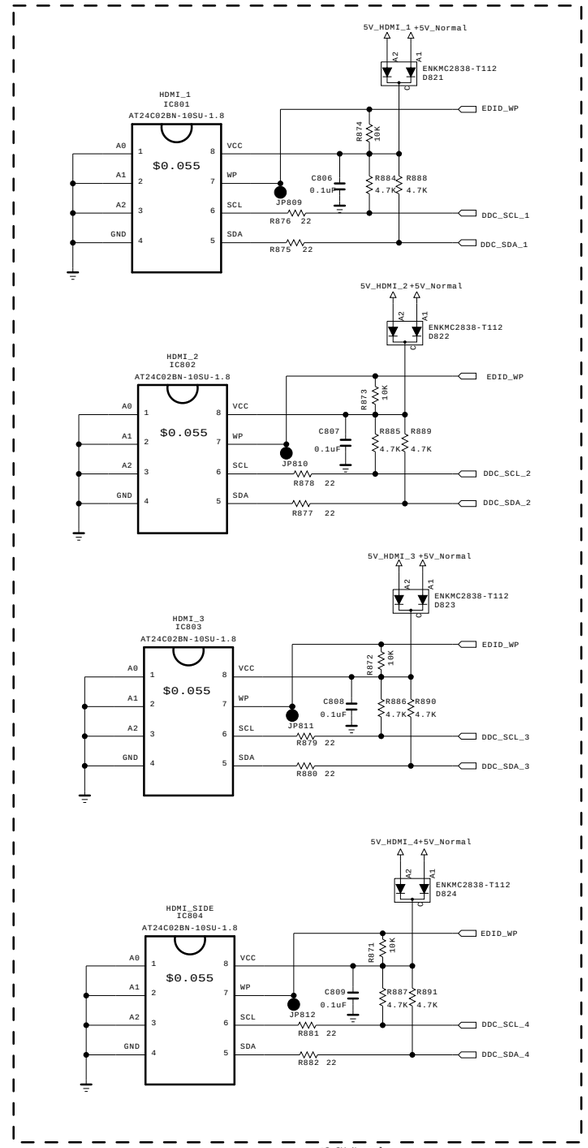
HDMI_2



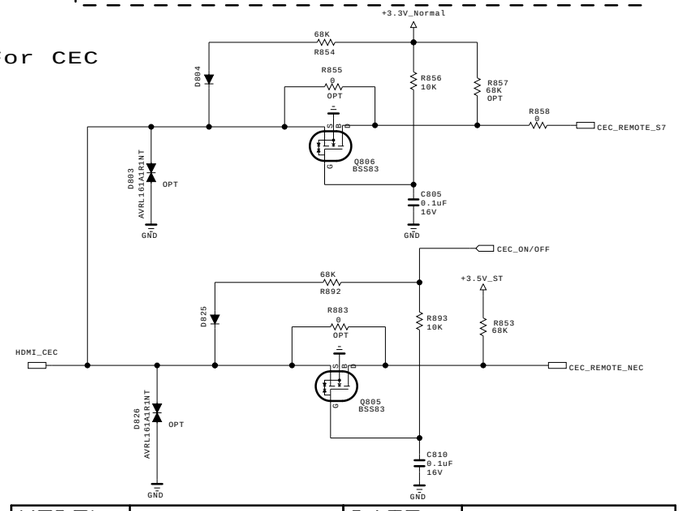
SIDE_HDMI



HDMI EEPROM



For CEC



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SECRET

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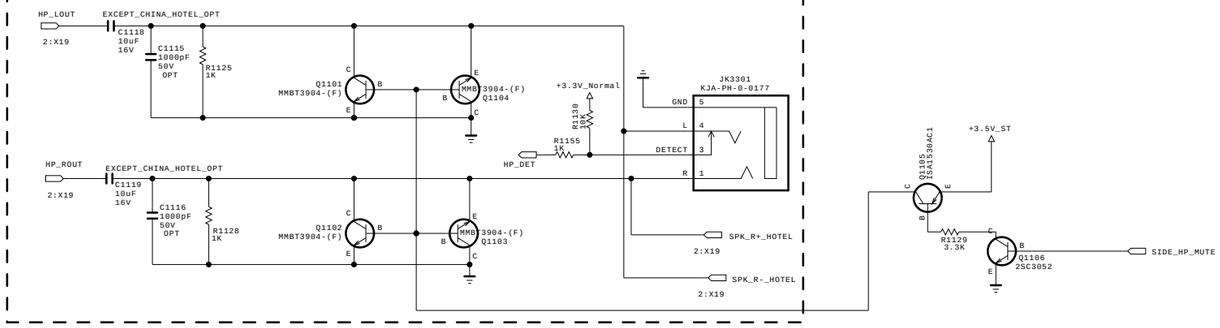
LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.2
BLOCK	HDMI	SHEET	8 /

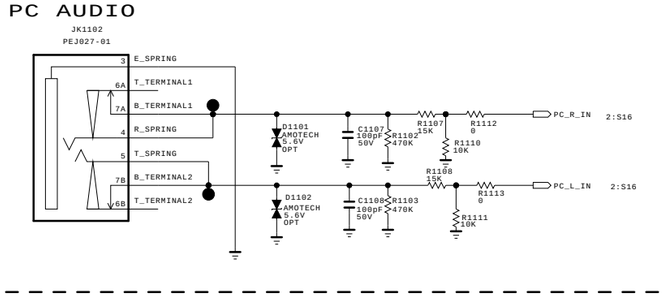
COMMON AREA

New Item Development

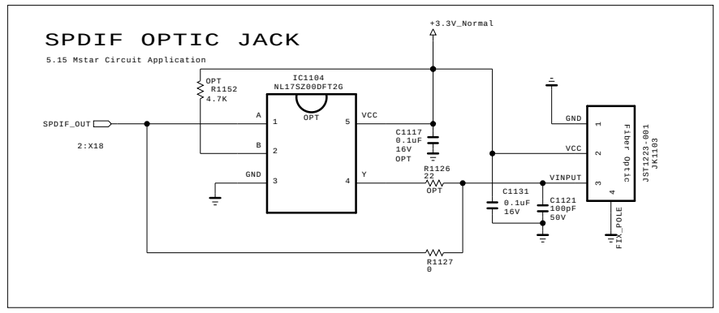
EARPHONE BLOCK



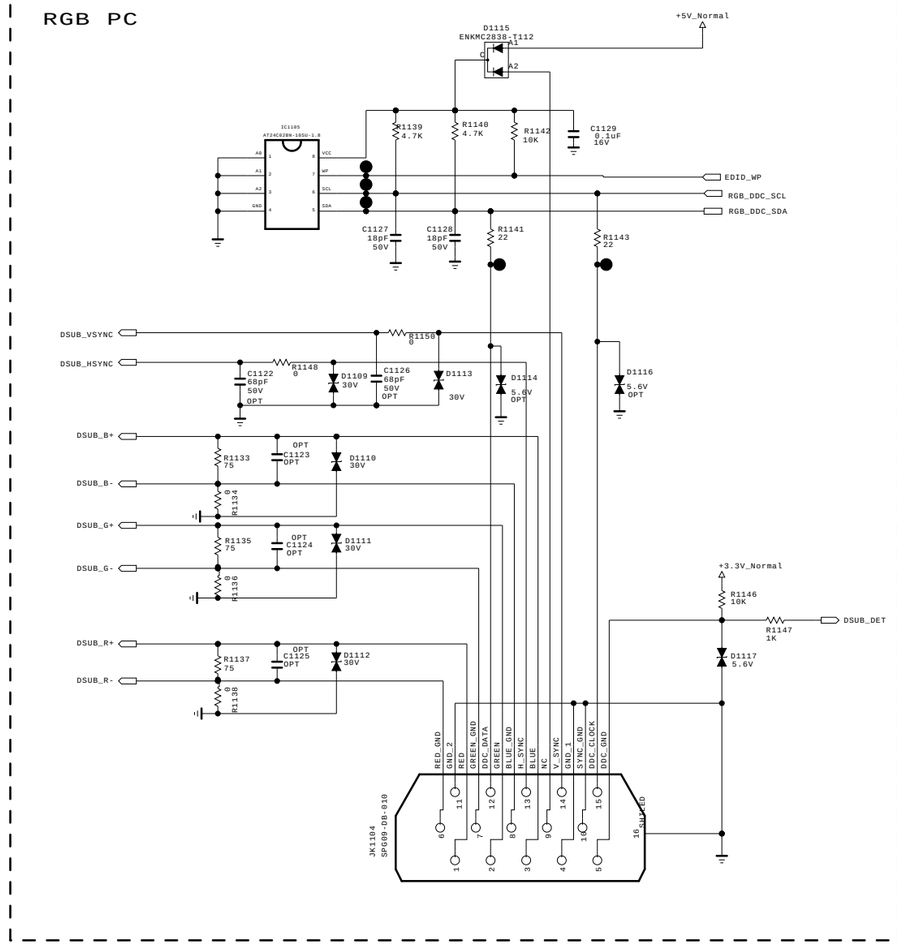
PC AUDIO



SPDIF OPTIC JACK



RGB PC



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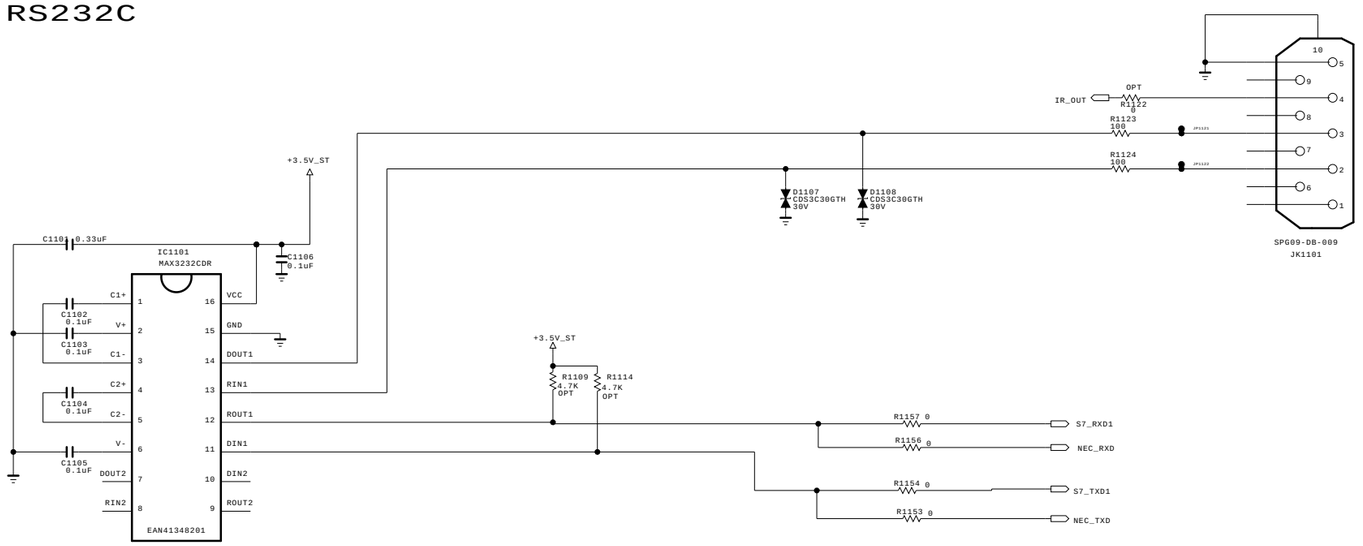
SECRET

LGElectronics

LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.0
BLOCK	COMMON AREA	SHEET	9

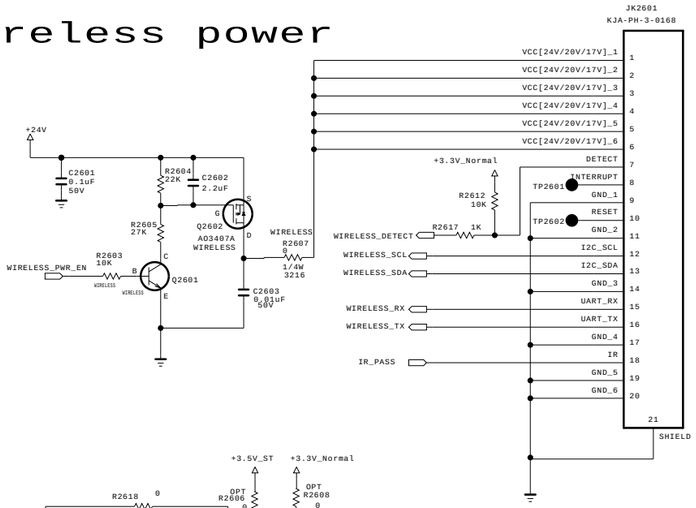
RS232C



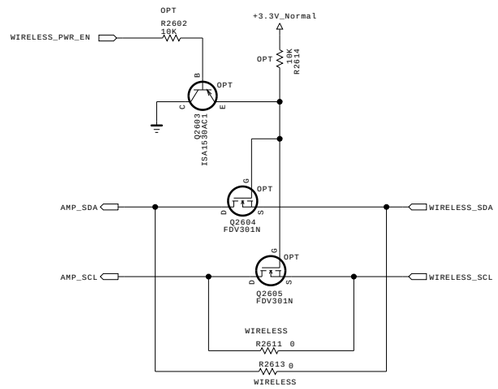
MODEL	GP2_Saturn7M	DATE	Ver. 1.0
BLOCK	RS232C 9PIN	SHEET	10

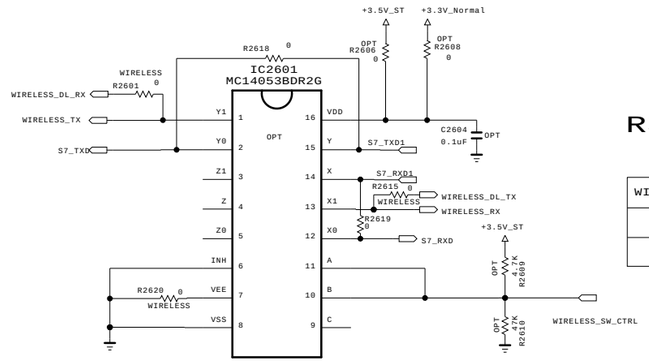
WIRELESS READY MODEL

Wireless power



From wireless_I2C to micom I2C





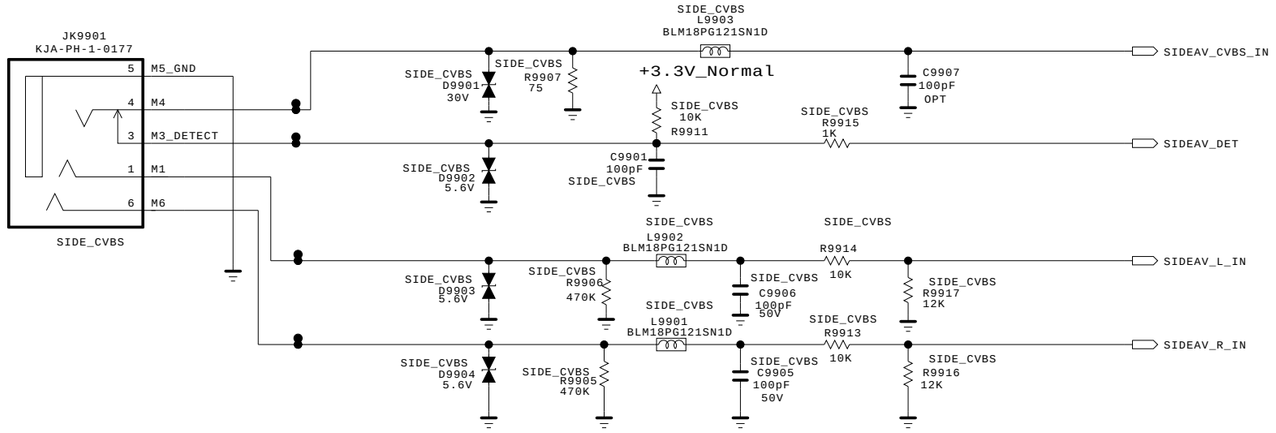
RS232C & Wireless

WIRELESS_SW_CTRL	SELECT PIN	STATUS
HIGH	X1/Y1/Z1	WIRELESS Dongle connect --> WIRELESS RS232
LOW	X0/Y0/Z0	WIRELESS Dongle Dis_con --> S7 RS232

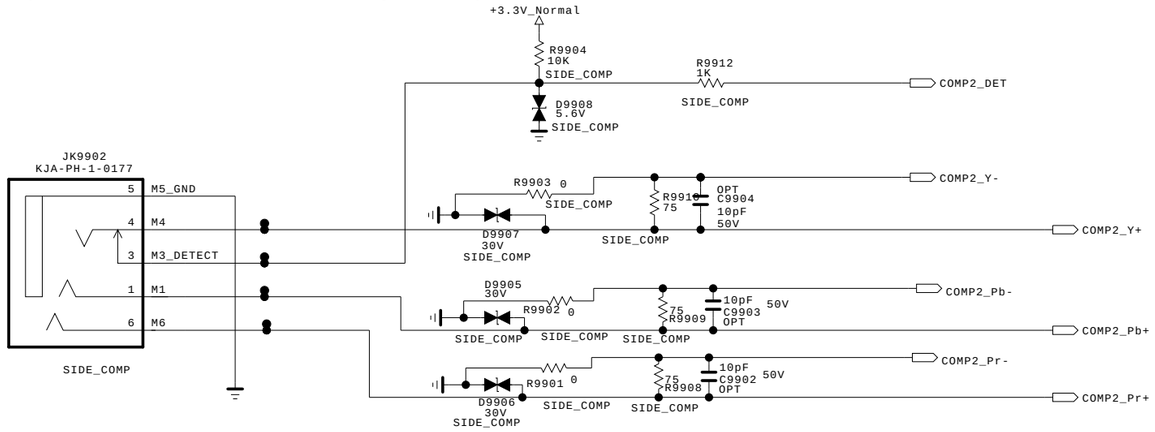
Ver. 1.2 --> 1.3: wireless opt change, 090818, hongsu

MODEL	GP2_Saturn7M	DATE	Ver. 1.3
BLOCK	Wireless ready	SHEET	12

SIDE CVBS PHONE JACK
(New Item Development)



SIDE COMPONENT PHONE JACK
(New Item Developmen)



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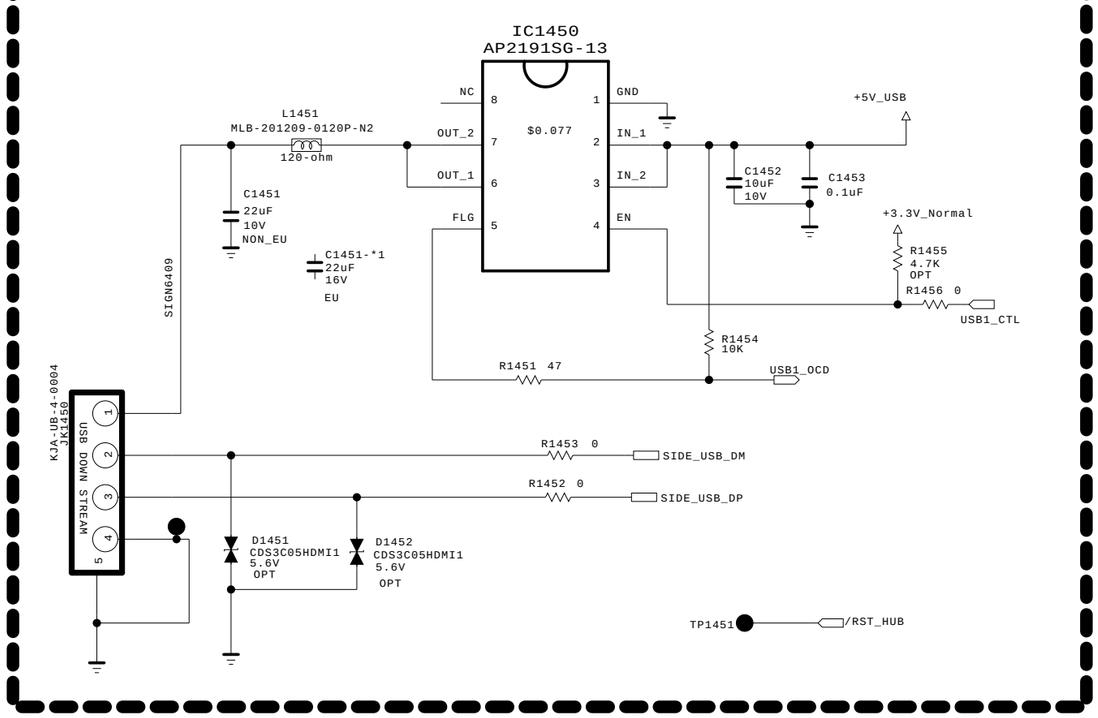
SECRET

LGElectronics

LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 0.0
BLOCK	SIDE_GENDER	SHEET	13

USB_DIODES



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LG ELECTRONICS

MODEL		DATE	
BLOCK		SHEET	/

32_FHD

VGH

R620-*1 22K 1% TCON_32_FHD
R621-*1 220K 1% TCON_32_FHD
R622-*1 11K 1% TCON_32_FHD

VGL

R637-*1 51K 1% TCON_32_FHD
R643-*1 270K 1% TCON_32_FHD

VDD

R635-*1 150K 1% TCON_32_FHD
R640 OPEN
R636-*1 27K 1% TCON_32_FHD
R641-*1 24K 1% TCON_32_FHD

HVDD

R609-*1 510K 1% TCON_32_FHD
R610-*1 150K 1% TCON_32_FHD
R611-*1 200K 1% TCON_32_FHD

VCOM FEED BACK

R601-*1 1K 1% TCON_32_FHD
R602-*1 1K 1% TCON_32_FHD
R652-*1 1K 1% TCON_32_FHD

37_FHD

VGH

R620-*2 47K 1% TCON_37_FHD
R621-*2 220K 1% TCON_37_FHD
R622-*2 12K 1% TCON_37_FHD

VGL

R637-*2 20K 1% TCON_37_FHD
R643-*2 150K 1% TCON_37_FHD

VDD

R635-*2 150K 1% TCON_37_FHD
R640-*2 470K 1% TCON_37_FHD
R636-*2 56K 1% TCON_37_FHD
R641-*2 56K 1% TCON_37_FHD

HVDD

R609-*2 470K 1% TCON_37_FHD
R611 OPEN
R610-*2 91K 1% TCON_37_FHD

VCOM FEED BACK

R601-*2 1K 1% TCON_37_FHD
R602-*2 1K 1% TCON_37_FHD
R652-*2 1.5K 5% TCON_37_FHD

42_FHD_60_LAMP

VGH SHEET7

VGL SHEET7

VDD SHEET7

HVDD SHEET7

VCOM FEED BACK

R601 OPEN
R602-*4 1K 1% TCON_42_FHD_60_LAMP
R652-*4 1K 1% TCON_42_FHD_60_LAMP

42_FHD (Without 60Hz Lamp)

VGH

R620-*3 56K 1% TCON_42_FHD
R621-*3 220K 1% TCON_42_FHD
R622-*3 11K 1% TCON_42_FHD

VGL

R637-*3 27K 1% TCON_42_FHD
R643-*3 150K 1% TCON_42_FHD

VDD

R635-*3 150K 1% TCON_42_FHD
R640 OPEN
R636-*3 75K 1% TCON_42_FHD
R641-*3 15K 1% TCON_42_FHD

HVDD

R609-*3 510K 1% TCON_42_FHD
R610-*3 150K 1% TCON_42_FHD
R611-*3 200K 1% TCON_42_FHD

VCOM FEED BACK

R601 OPEN
R602-*3 1K 1% TCON_42_FHD
R652-*3 1K 1% TCON_42_FHD

47_FHD_60_LAMP

VGH

R620-*4 30K 1% TCON_47_FHD_60_LAMP
R621-*4 220K 1% TCON_47_FHD_60_LAMP
R622-*4 11K 1% TCON_47_FHD_60_LAMP

VGL

R637-*4 51K 1% TCON_47_FHD_60_LAMP
R643-*4 270K 1% TCON_47_FHD_60_LAMP

VDD

R635-*4 180K 1% TCON_47_FHD_60_LAMP
R640 OPEN
R636-*4 68K 1% TCON_47_FHD_60_LAMP
R641-*4 30K 1% TCON_47_FHD_60_LAMP

HVDD

R609-*4 510K 1% TCON_47_FHD_60_LAMP
R610-*4 150K 1% TCON_47_FHD_60_LAMP
R611-*4 220K 1% TCON_47_FHD_60_LAMP

VCOM FEED BACK SHEET7

47_FHD (Without 60Hz Lamp)

VGH

R620-*5 51K 1% TCON_47_FHD
R621-*5 220K 1% TCON_47_FHD
R622-*5 11K 1% TCON_47_FHD

VGL

R637-*5 51K 1% TCON_47_FHD
R643-*5 270K 1% TCON_47_FHD

VDD

R635-*5 180K 1% TCON_47_FHD
R640 OPEN
R636-*5 75K 1% TCON_47_FHD
R641-*5 20K 1% TCON_47_FHD

HVDD

R609-*5 510K 1% TCON_47_FHD
R610-*5 150K 1% TCON_47_FHD
R611-*5 220K 1% TCON_47_FHD

VCOM FEED BACK

R601-*5 1K 1% TCON_47_FHD
R602-*5 1K 1% TCON_47_FHD
R652-*5 1K 1% TCON_47_FHD

55_FHD

VGH

R620-*6 510K 1% TCON_55_FHD
R621-*6 68K 1% TCON_55_FHD
R622-*6 27K 1% TCON_55_FHD

VGL

R637-*6 27K 1% TCON_55_FHD
R643-*6 150K 1% TCON_55_FHD

VDD

R635-*6 150K 1% TCON_55_FHD
R640 OPEN
R636-*6 75K 1% TCON_55_FHD
R641-*6 15K 1% TCON_55_FHD

HVDD

R609-*6 180K 1% TCON_55_FHD
R610-*6 68K 1% TCON_55_FHD
R611-*6 56K 1% TCON_55_FHD

VCOM FEED BACK

R601 OPEN
R602 OPEN
R652-*6 0 5% TCON_55_FHD

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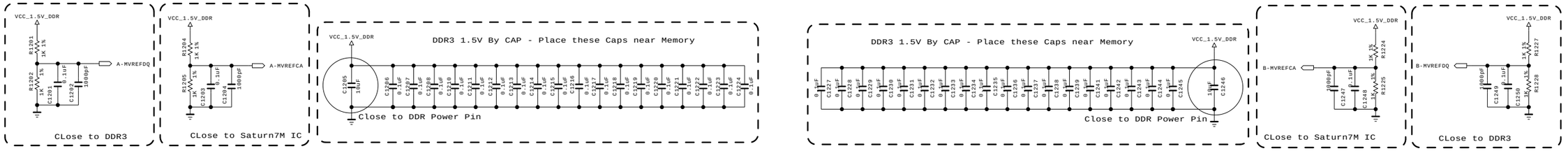

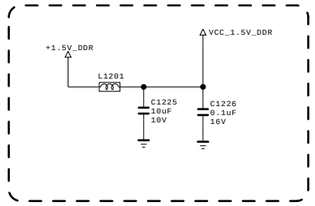

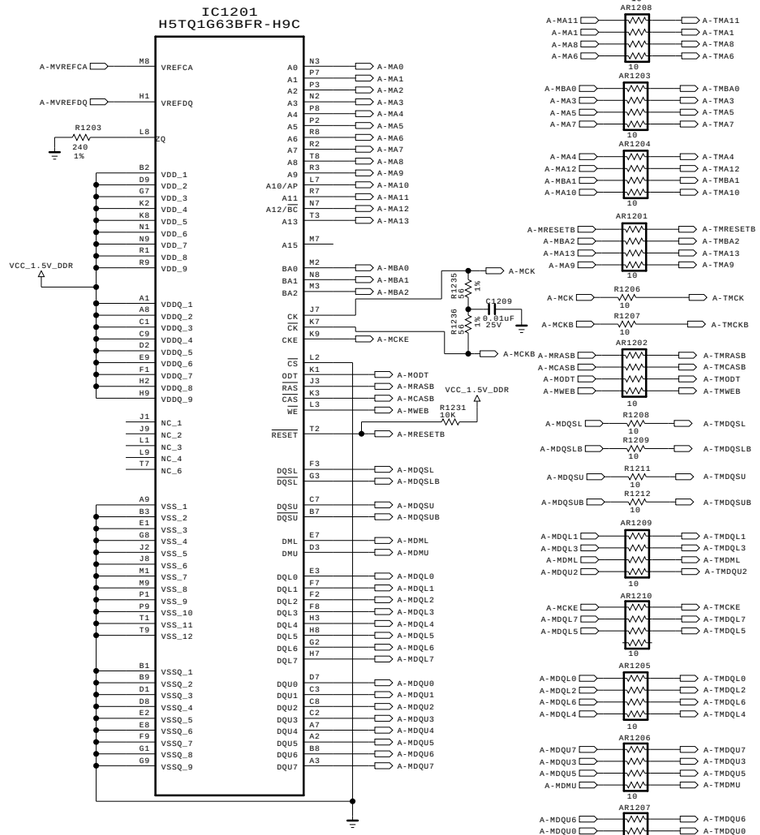

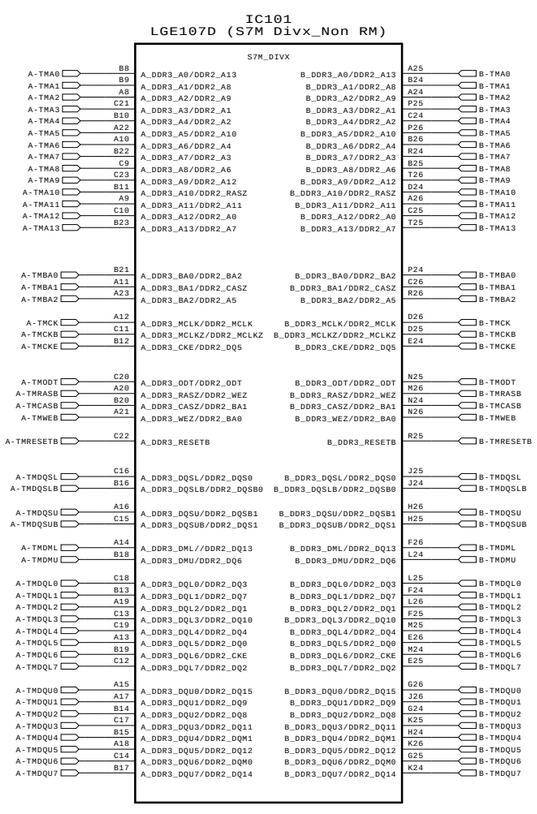

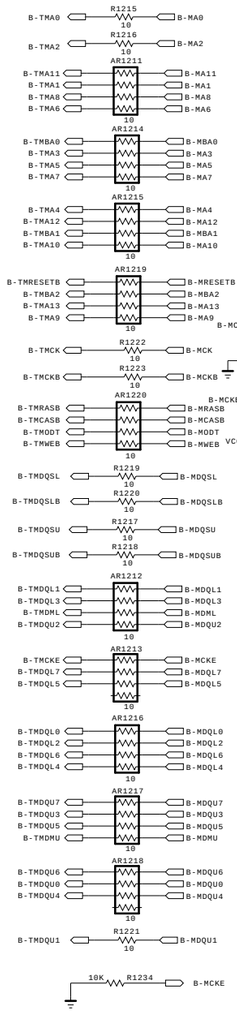

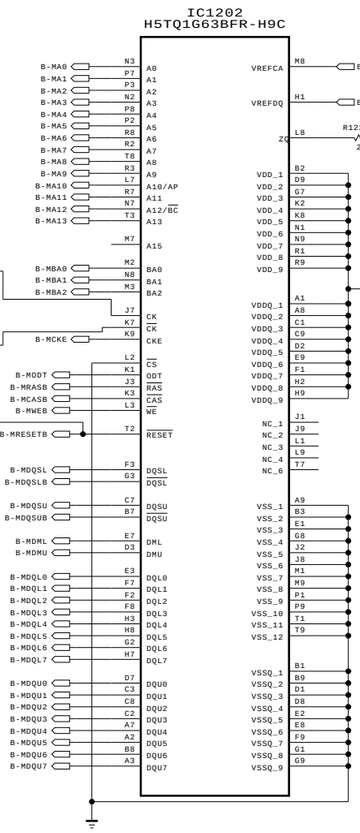

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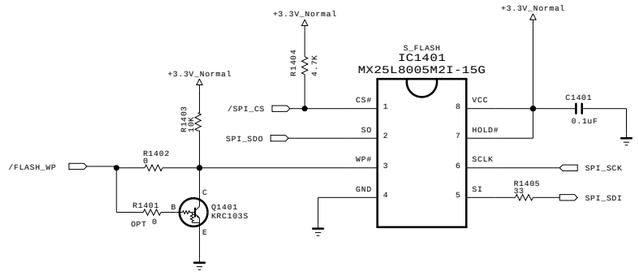
SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.0
BLOCK	DDR3(256MB)	SHEET	21



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SECRET

LGElectronics

LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.2
BLOCK	S-Flash(1MB)	SHEET	23

LGIT CAN NIM_H/N TUNER for EU & CHINA

TU3702
TDTJ-S001D

EU_TUNER

1	ANT_PWR[OPT]
2	BST_CNTL
3	+B
4	NC[RF_AGC]
5	AS
6	SCL
7	SDA
8	NC[IF_TP]
9	SIF
10	NC
11	VIDEO
12	GND
13	1.2V
14	3.3V
15	RESET
16	IF_AGC_CNTL
17	DIF_1
18	DIF_2
19	SHIELD

TU3701
TDFR-C035D

CN_HORIZONTAL_LG3911

1	RF_S/W_CNTL
2	BST_CNTL
3	+B1[+5V]
4	NC[RF_AGC]
5	NC_1
6	SCLT
7	SDAT
8	NC_2
9	SIF
10	NC_3
11	VIDEO
12	GND
13	+B2[12V]
14	+B3[3.3V]
15	RESET
16	NC_4
17	SCL
18	SDA
19	ERR
20	SYNC
21	VALID
22	MCL
23	D0
24	D1
25	D2
26	D3
27	D4
28	D5
29	D6
30	D7
31	SHIELD

RF_SWITCH_CTL
Pull-up can't be applied because of MODEL_OPT_2

close to TUNER
OPT R3762 0 CONTROL_ATTEN

close to TUNER
R3705 0 CHINA_OPT
C3701 0.1uF 16V

+5V_TU
C3703 100pF 50V
C3704 0.1uF 16V

R3707 0 OPT

C3702 0.1uF 16V close to TUNER

+1.2V_TU
C3737 100pF 50V
C3738 0.1uF 16V
C3705 100uF 16V CHINA_OPT

+3.3V_TU
C3707 100pF 50V
C3708 0.1uF 16V

R3704 0 EU_OPT
R3703 0 CHINA_OPT
R3701 0 CHINA_OPT
close to IF line

EU_OPT
R3760 0
R3761 0 EU_OPT

Close to the tuner

IF_N_MSTAR
IF_P_MSTAR

1. should be guarded by ground
2. No via on both of them
3. Signal Width >= 12mils
   Signal to Signal Width = 12mils
   Ground Width >= 24mils

CN_VERTICAL_LG3911
TU3701-*1
TDFR-C055D

CHINA_OPT R3724 0 FE_TS_SYNC
CHINA_OPT R3730 0 FE_TS_VAL_ERR
CHINA_OPT R3731 0 FE_TS_CLK
CHINA_OPT R3725 0 FE_TS_DATA[0]
CHINA_OPT R3727 0 FE_TS_DATA[1]
CHINA_OPT R3728 0 FE_TS_DATA[2]
CHINA_OPT R3729 0 FE_TS_DATA[3]
CHINA_OPT R3726 0 FE_TS_DATA[4]
CHINA_OPT R3721 0 FE_TS_DATA[5]
CHINA_OPT R3722 0 FE_TS_DATA[6]
CHINA_OPT R3723 0 FE_TS_DATA[7]

Close to the CI Slot

BOOSTER : CHINA OPT

+5V_TU
L3701 CHINA_OPT BLM18PG121SN1D
R3734 0
Q3701 ISA1530AC1 CHINA_OPT
CHINA_OPT R3743 10K
R3737 2.2K
Q3702 2SC3052 CHINA_OPT
R3745 10K CHINA_OPT
FE_BOOSTER_CTL
LNA2_CTL
C3709 0.01uF 25V CHINA_OPT

The pull-up/down of LNA2_CTL is depended on MODLE_OPT_1.
GPIO must be added for FE_BOOSTER_CTL

OPTION : RF AGC

C3728 0.1uF 16V OPT
C3731 10uF 16V OPT
Q3704 2SC3052 OPT
R3754 10K OPT
FE_AGC_SPEED_CTL
IF_AGC_SEL

GPIO must be added.

+3.3V_TU
R3740 1.2K
R3741 1.2K
33 R3735 TU_SCL
33 R3736 TU_SDA
C3711 18pF 50V
C3713 18pF 50V

+5V_TU
R3755 470
R3758 82
TU_SIF
R3753 4.7K
Q3705 ISA1530AC1

+5V_TU
R3751 220
R3752 220
TU_CVBS
R3749 0
R3750 1K OPT
Q3703 ISA1530AC1

+3.3V_TU
R3732 100
R3733 100K
C3710 0.1uF 16V
TUNER_RESET

IF_AGC_MAIN
should be guarded by ground

+3.3V_TU
R3742 4.7K CHINA_OPT
R3744 4.7K CHINA_OPT
R3738 100 CHINA_OPT
R3739 100 CHINA_OPT
DEMOD_SCL
DEMOD_SDA
C3712 22pF 50V CHINA_OPT
C3714 22pF 50V CHINA_OPT
C3715 22pF 50V OPT
C3716 22pF 50V OPT

DEMOD_RESET
This was being applied to the only china demod, so this has to be deleted in both main and ISDB sheet.

SEMTEK VOUT : 1.248V
BCD VOUT : 1.215V

IC3701
AP2132MP-2.5TRG1 [EP]

+3.3V_TU
C3732 10uF 10V
C3717 0.1uF
R3708 BCD 10K
R3709 10K SEMTEK
R3710 10K BCD
OPT C3734 0.1uF
+5V_Normal
BCD 5.6 500 L3704
OPT C3733 0.1uF

PG EN VIN VCTRL
GND ADJ VOUT NC
THERMAL 9

+1.2V_TU
SEMTEK R3747 9.1K 5% R2
SEMTEK R3748 5.1K 5% R1
SEMTEK R3756 0 5%
R3747-*1 39K BCD 1%
R3748-*1 20K BCD 1%
R3756-*1 20K BCD 1%
C3729 0.1uF
C3730 10uF 10V

SEMTEK:Vout=0.8*(1+R1/R2)
BCD:Vout=0.6*(1+R1/R2)

IC3701-*1
SC4215ISTRT
NC_1 EN VIN NC_2 SEMTEK GND ADJ VO NC_3

+5V_TU
200mA
L3702 BLM18PG121SN1D
C3719 22uF 10V OPT
C3722 22uF 10V NON_EU
C3724 0.1uF 16V
+5V_Normal
C3726 0.1uF 16V
C3722-*1 22uF 16V EU

+3.3V_TU
60mA
L3703 BLM18PG121SN1D
C3723 22uF 10V NON_EU
C3725 0.1uF 16V
+3.3V_Normal
C3727 0.1uF 16V
C3723-*1 10uF 16V EU

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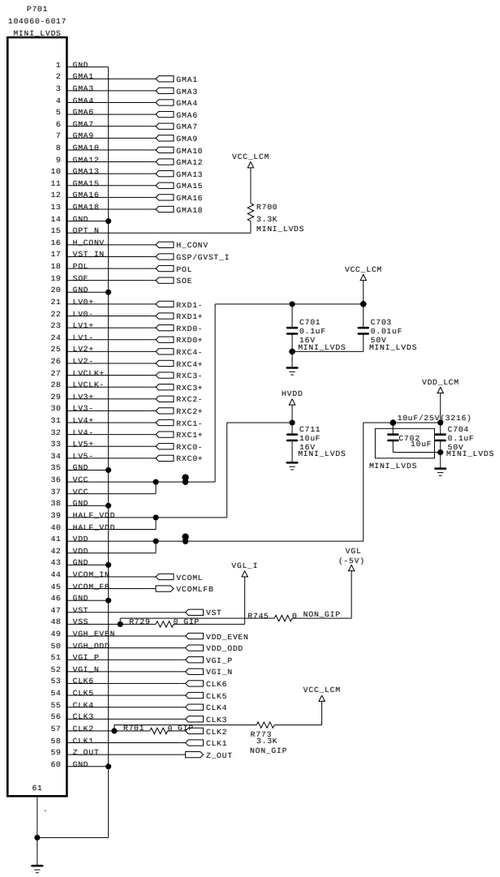
SECRET
LGElectronics

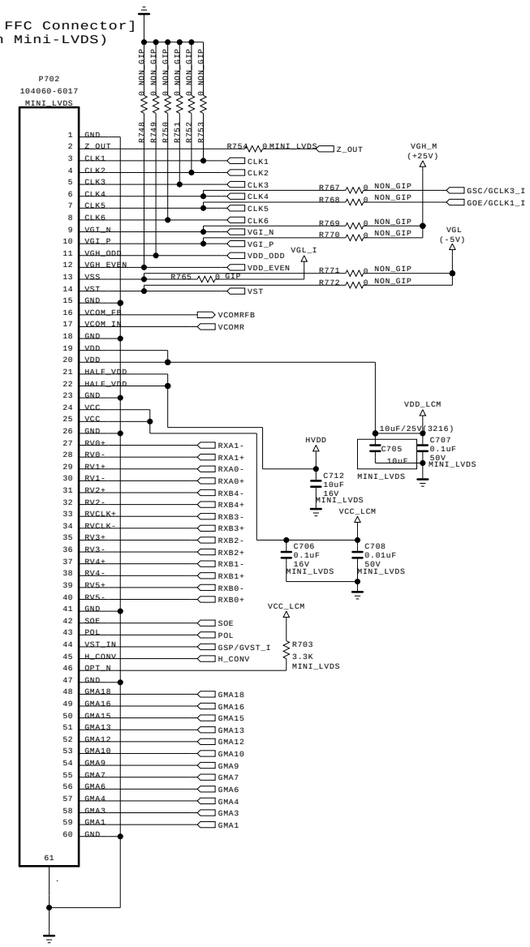
LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	VER 1.0
BLOCK	EU/CHINA CAN TUNER	SHEET	27

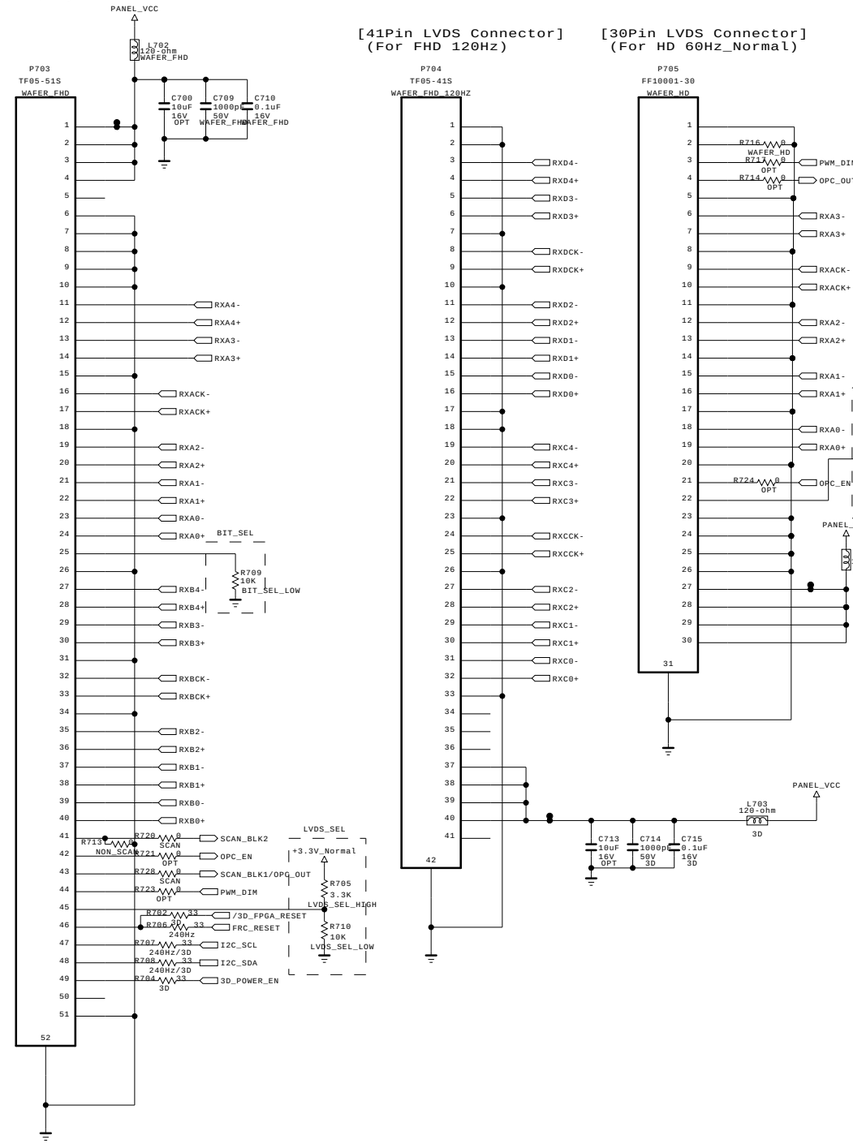
[LEFT FFC Connector]
(60Pin Mini-LVDS)



[Right FFC Connector]
(60Pin Mini-LVDS)



[51Pin LVDS Connector]
(For FHD 60/120Hz)



[41Pin LVDS Connector]
(For FHD 120Hz)

[30Pin LVDS Connector]
(For HD 60Hz_Normal)

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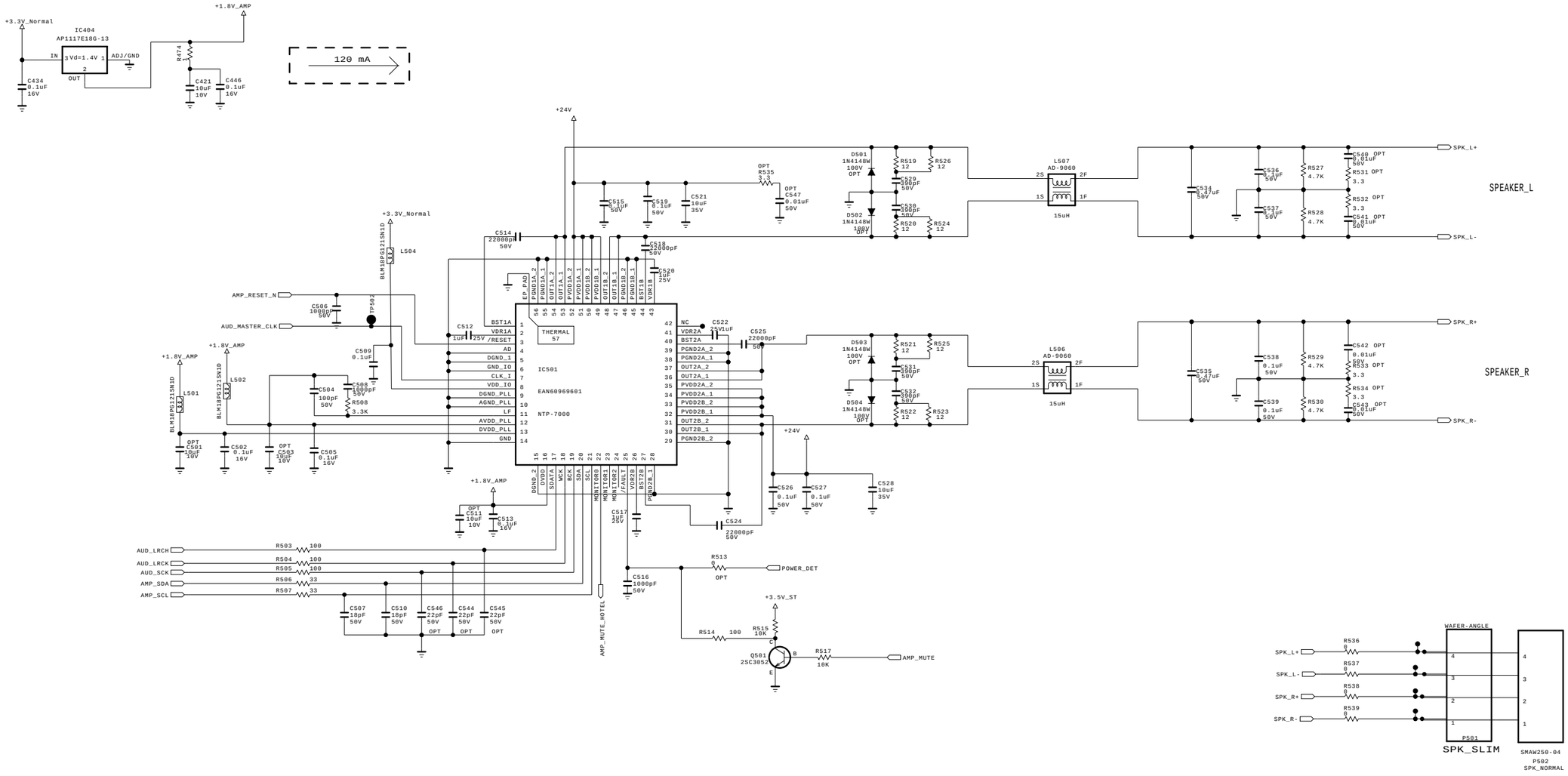
SECRET

LGElectronics

LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.3
BLOCK	LVDS	SHEET	36



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SECRET

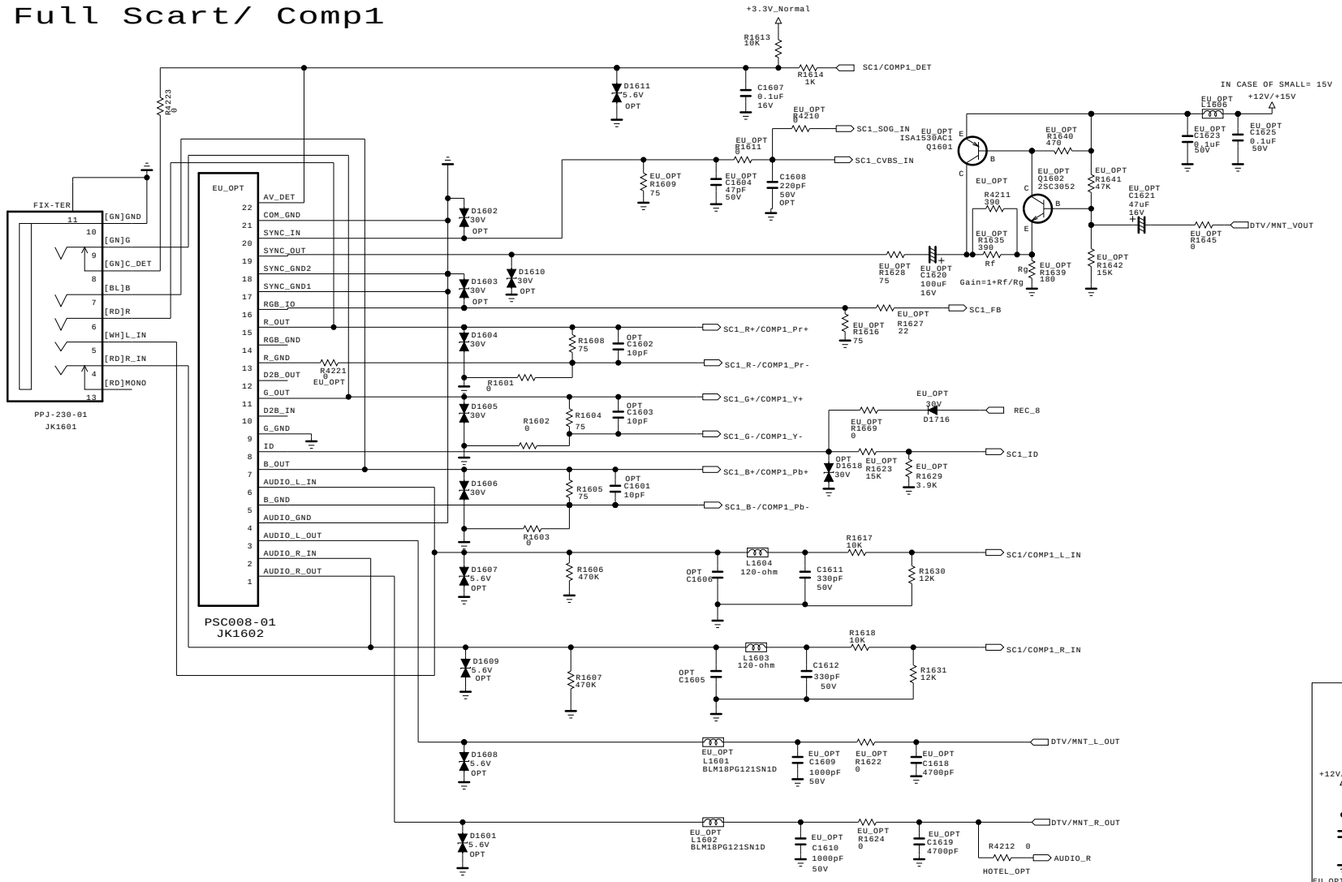
LGElectronics

LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.1
BLOCK	AUDIO[NTP]	SHEET	38

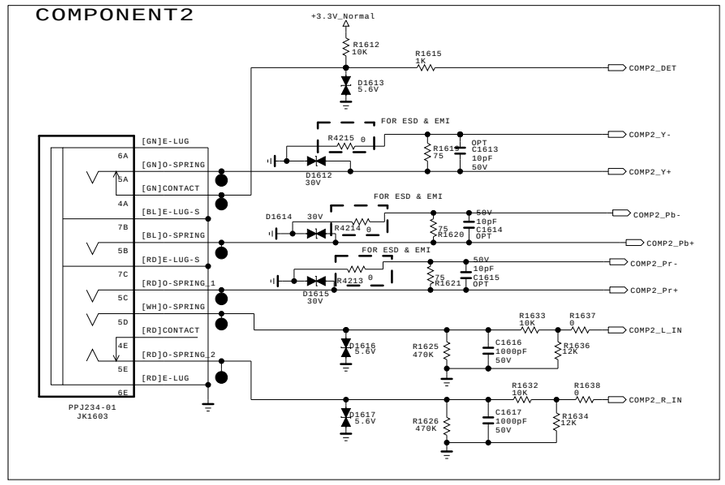
For EU & CHINA

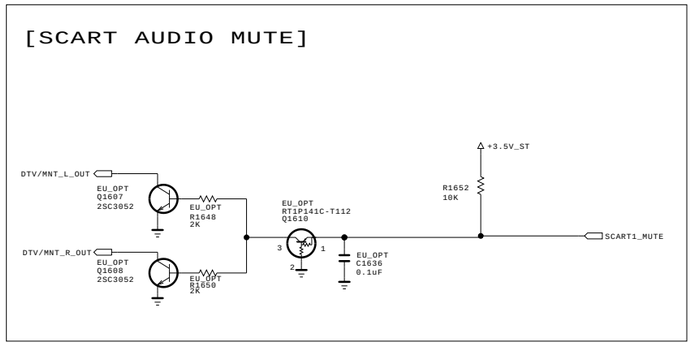
Full Scart/ Comp1

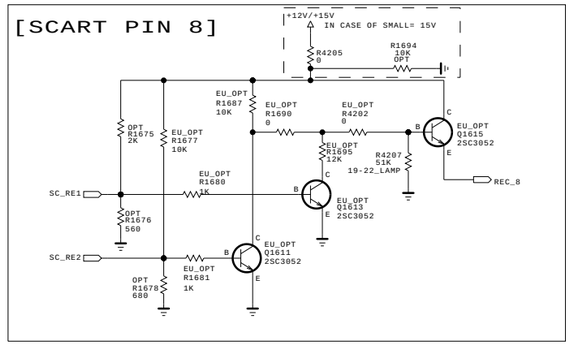


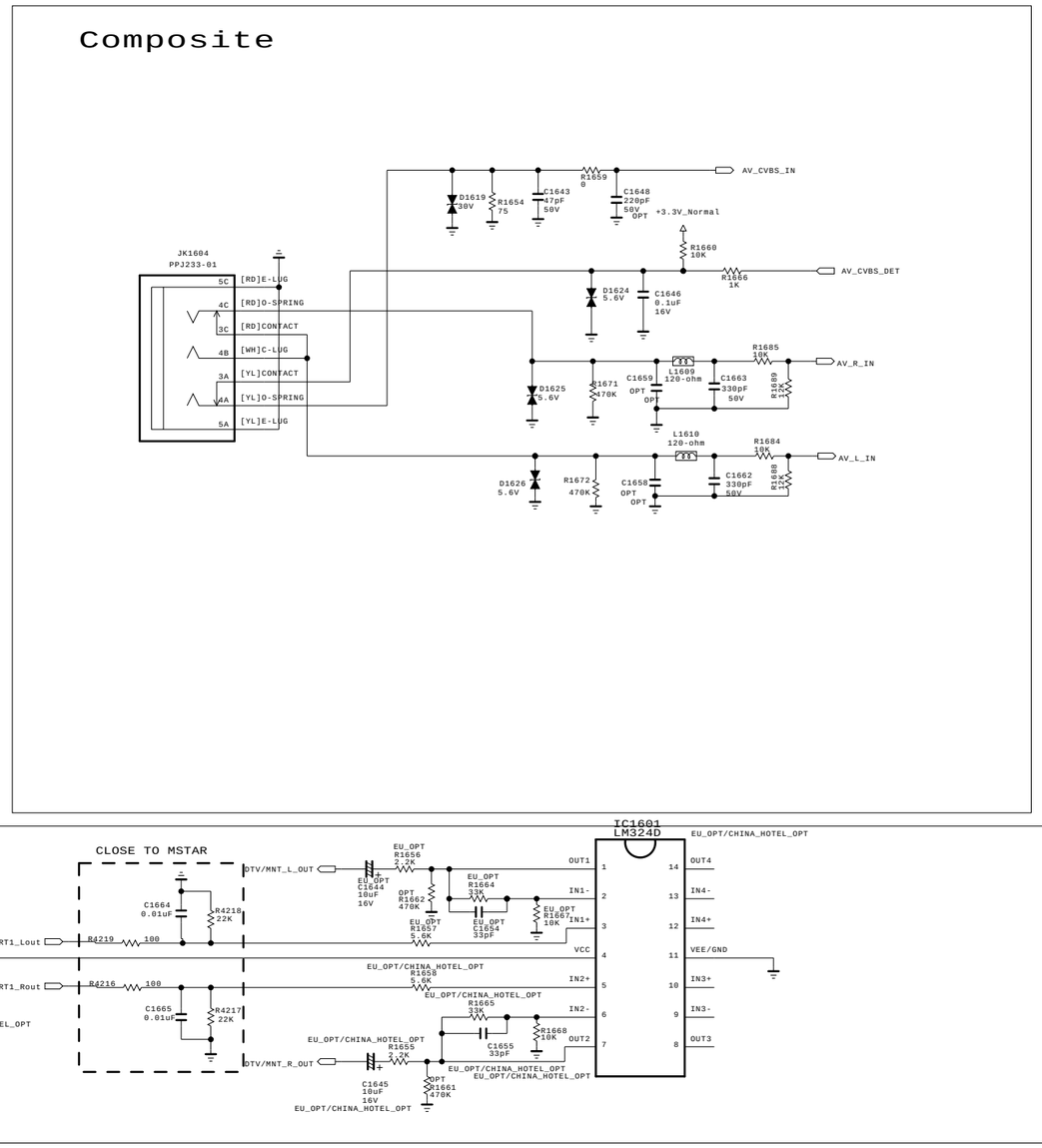
OPTION TABLE

NAME	STATUS
AV_OPT	EU : Not Using China : Using
CHINA_OPT	EU : Not Using China : Using
EU_OPT	EU :Using China:NotUsing









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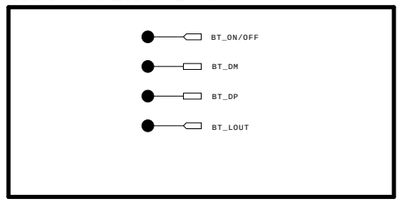
SECRET

LGElectronics

LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.1
BLOCK	SCART/RCA	SHEET	41

NOT USING B/T



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SECRET
LGElectronics

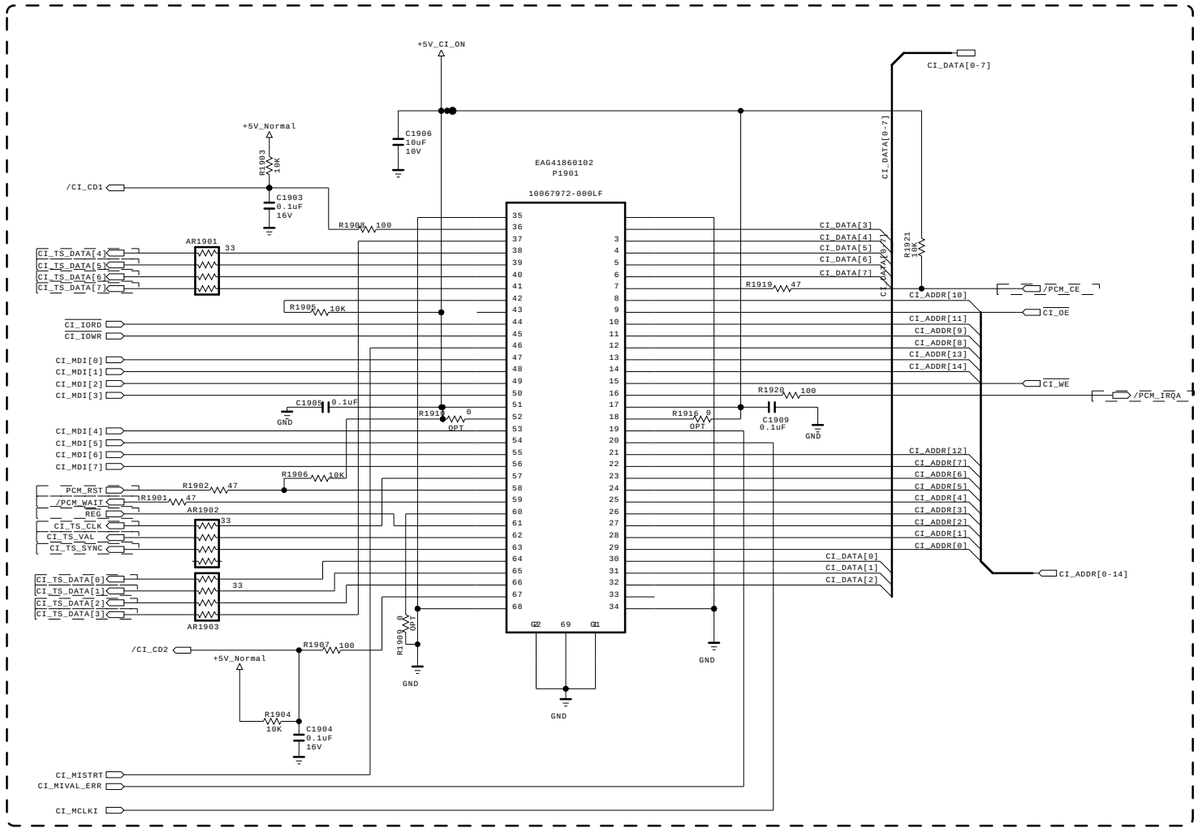
LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.0
BLOCK	NON B/T	SHEET	44

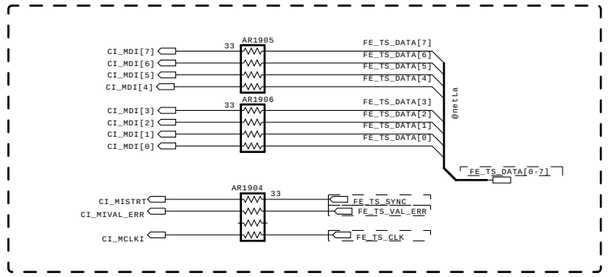
CI Region

* Option name of this page : CI_SLOT
(because of Hong Kong)

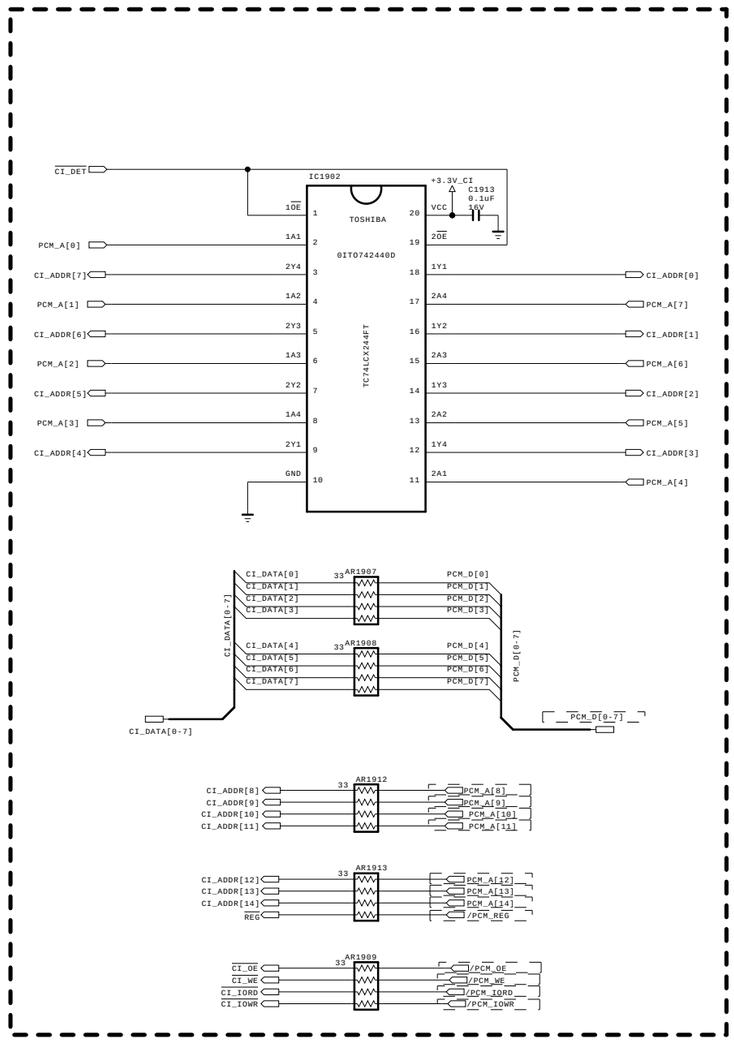
CI SLOT

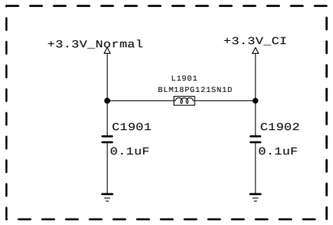


CI TS INPUT

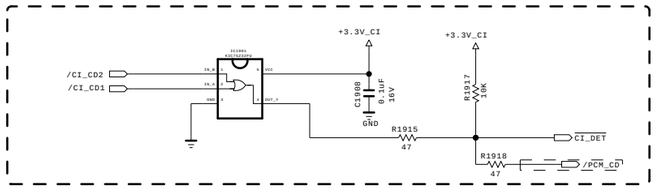


CI HOST I/F

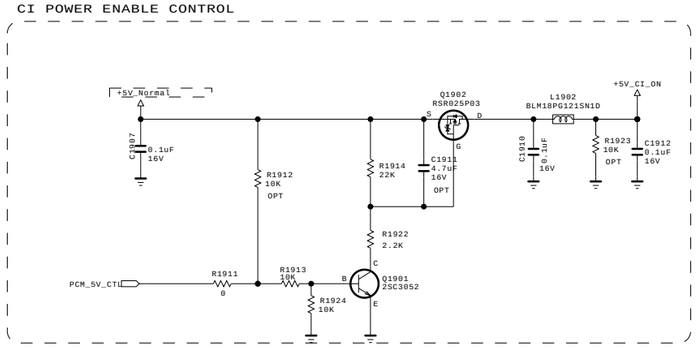




CI DETECT



CI POWER ENABLE CONTROL



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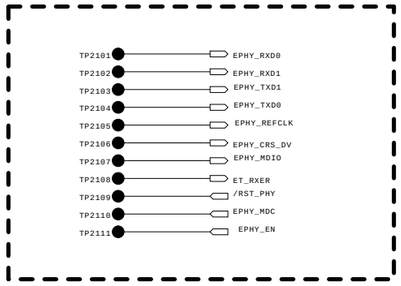
SECRET
LGElectronics

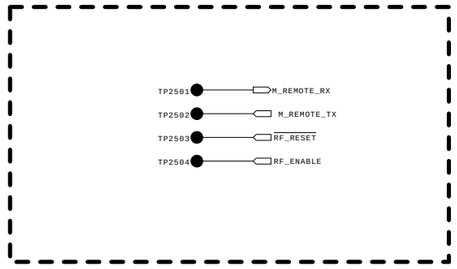
LG ELECTRONICS

MODEL	GP2_Saturn7M	DATE	Ver. 1.0
BLOCK	PCMCI	SHEET	45

NON ETHERNET

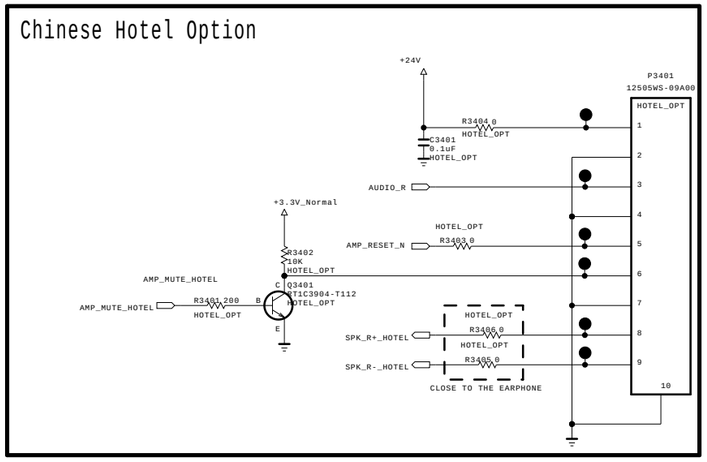


NON Motion Remocon Region

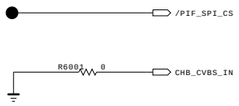


MODEL	GP2_Saturn7M	DATE	Ver. 1.0
BLOCK	NON M REMOCON	SHEET	50

China HOTEL Option



MODEL	GP2_Saturn7M	DATE	Ver. 1.0
BLOCK	CHINA HOTEL	SHEET	51



THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

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MODEL	GP2_Saturn7M	DATE	Ver. 1.0
BLOCK	NON CHB	SHEET	68


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