



SERVICE MANUAL

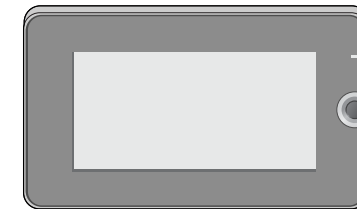
MODEL: DP391B/DP392G

# PORTABLE DVD SERVICE MANUAL

**MODEL: DP391B/DP392G**

**CAUTION**

BEFORE SERVICING THE UNIT, READ THE "SAFETY PRECAUTIONS"  
IN THIS MANUAL.



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# SECTION 1

## SUMMARY

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# PRODUCT SAFETY SERVICING GUIDELINES FOR VIDEO PRODUCTS

## IMPORTANT SAFETY NOTICE

This manual was prepared for use only by properly trained audio-video service technicians.

When servicing this product, under no circumstances should the original design be modified or altered without permission from LG Corporation. All components should be replaced only with types identical to those in the original circuit and their physical location, wiring and lead dress must conform to original layout upon completion of repairs.

Special components are also used to prevent x-radiation, shock and fire hazard.

These components are indicated by the letter "X" included in their component designators and are required to maintain safe performance. No deviations are allowed without prior approval by LG Corporation.

Circuit diagrams may occasionally differ from the actual circuit used. This way, implementation of the latest safety and performance improvement changes into the set are not delayed until the new service literature is printed.

**CAUTION:** Do not attempt to modify this product in any way. Never perform customized installations without manufacturer's approval. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury.

Service work should be performed only after you are thoroughly familiar with these safety checks and servicing guidelines.

## GRAPHIC SYMBOLS



The exclamation point within an equilateral triangle is intended to alert the service personnel to important safety information in the service literature.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the service personnel to the presence of noninsulated "dangerous voltage" that may be of sufficient magnitude to constitute a risk of electric shock.



The pictorial representation of a fuse and its rating within an equilateral triangle is intended to convey to the service personnel the following fuse replacement caution notice:

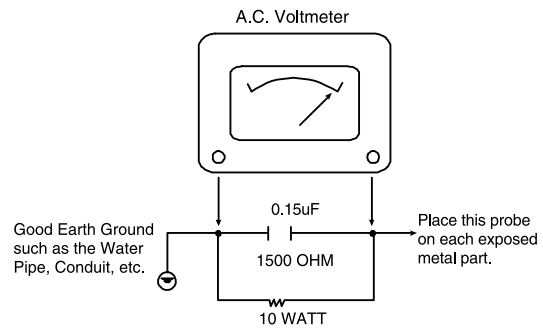
**CAUTION:** FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

## SERVICE INFORMATION

While servicing, use an isolation transformer for protection from AC line shock. After the original service problem has been corrected, make a check of the following:

### FIRE AND SHOCK HAZARD

1. Be sure that all components are positioned to avoid a possibility of adjacent component shorts. This is especially important on items transported to and from the repair shop.
2. Verify that all protective devices such as insulators, barriers, covers, shields, strain reliefs, power supply cords, and other hardware have been reinstalled per the original design. Be sure that the safety purpose of the polarized line plug has not been defeated.
3. Soldering must be inspected to discover possible cold solder joints, solder splashes, or sharp solder points. Be certain to remove all loose foreign particles.
4. Check for physical evidence of damage or deterioration to parts and components, for frayed leads or damaged insulation (including the AC cord), and replace if necessary.
5. No lead or component should touch a high current device or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces must be avoided.
6. After reassembly of the set, always perform an AC leakage test on all exposed metallic parts of the cabinet (the channel selector knobs, antenna terminals, handle and screws) to be sure that set is safe to operate without danger of electrical shock. **DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST.** Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm, 10 watt resistor, paralleled by a .15 mfd 150V AC type capacitor between a known good earth ground water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and .15 mfd capacitor. Reverse the AC plug by using a non-polarized adaptor and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.75 volts RMS. This corresponds to 0.5 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



## TIPS ON PROPER INSTALLATION

1. Never install any receiver in a closed-in recess, cubbyhole, or closely fitting shelf space over, or close to, a heat duct, or in the path of heated air flow.
2. Avoid conditions of high humidity such as: outdoor patio installations where dew is a factor, near steam radiators where steam leakage is a factor, etc.
3. Avoid placement where draperies may obstruct venting. The customer should also avoid the use of decorative scarves or other coverings that might obstruct ventilation.
4. Wall- and shelf-mounted installations using a commercial mounting kit must follow the factory-approved mounting instructions. A product mounted to a shelf or platform must retain its original feet (or the equivalent thickness in spacers) to provide adequate air flow across the bottom. Bolts or screws used for fasteners must not touch any parts or wiring. Perform leakage tests on customized installations.
5. Caution customers against mounting a product on a sloping shelf or in a tilted position, unless the receiver is properly secured.
6. A product on a roll-about cart should be stable in its mounting to the cart. Caution the customer on the hazards of trying to roll a cart with small casters across thresholds or deep pile carpets.
7. Caution customers against using extension cords. Explain that a forest of extensions, sprouting from a single outlet, can lead to disastrous consequences to home and family.

# SERVICING PRECAUTIONS

**CAUTION:** Before servicing the PORTABLE DVD covered by this service data and its supplements and addends, read and follow the SAFETY PRECAUTIONS. **NOTE:** if unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions in this publication, always follow the safety precautions.

Remember Safety First :

## General Servicing Precautions

1. Always unplug the PORTABLE DVD AC power cord from the AC power source before:
  - (1) Removing or reinstalling any component, circuit board, module, or any other assembly.
  - (2) Disconnecting or reconnecting any internal electrical plug or other electrical connection.
  - (3) Connecting a test substitute in parallel with an electrolytic capacitor.  
**Caution:** A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
2. Do not spray chemicals on or near this PORTABLE DVD or any of its assemblies.
3. Unless specified otherwise in this service data, clean electrical contacts by applying an appropriate contact cleaning solution to the contacts with a pipe cleaner, cotton-tipped swab, or comparable soft applicator.  
Unless specified otherwise in this service data, lubrication of contacts is not required.
4. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.
5. Do not apply AC power to this PORTABLE DVD and / or any of its electrical assemblies unless all solid state device heat sinks are correctly installed.
6. Always connect the test instrument ground lead to an appropriate ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

## Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect an insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1Mohm.

**Note 1:** Accessible Conductive Parts include Metal panels, Input terminals, Earphone jacks, etc.

## Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor chip components.

The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate an electrical charge sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

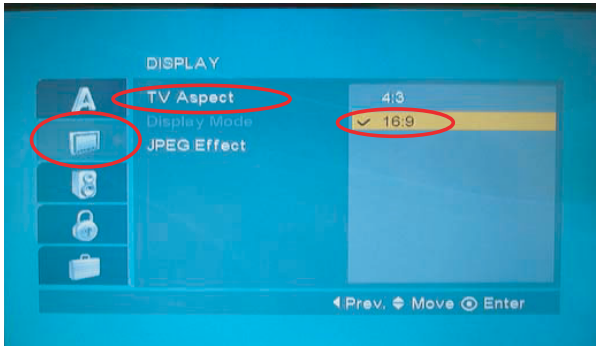
**Caution:** Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Normally harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

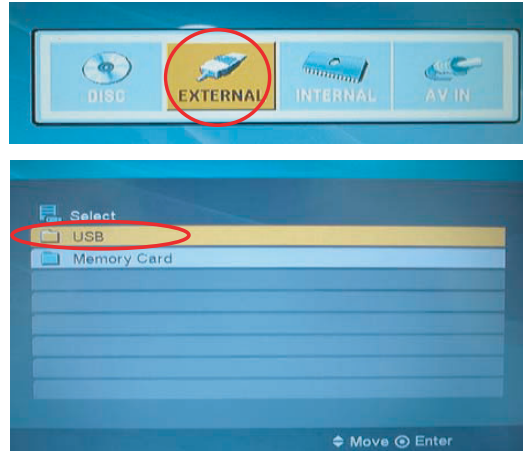
# UPGRADING FIRMWARE

Please follow the below process to download a program with disc

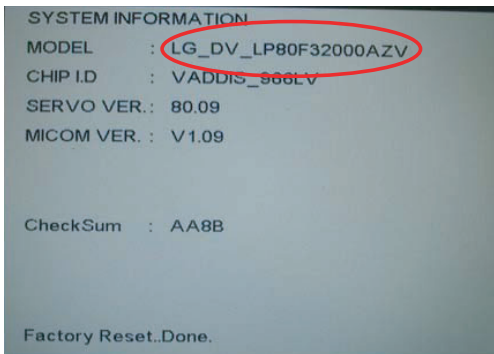
1. Turn on the DVD-player.  
(Note. Be sure that there is no disc in DVD-player)
2. Press "SETUP" button on Remote control.
3. Choose a "display" menu by using the cursor button and then choose a "TV Aspect" menu. And choose "16:9" menu.



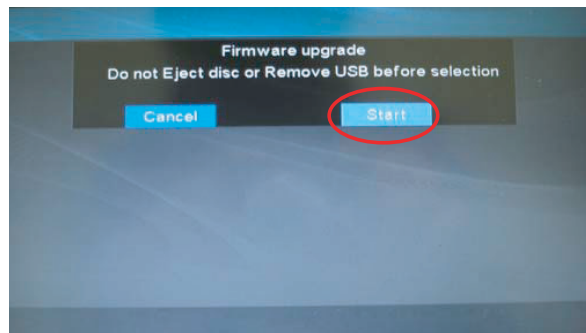
8. Insert the copied USB memory stick to DVD-player.
9. Press the MODE button on the Potable DVD-player.
10. Select External and USB.



4. Press the 1 --> 3 --> 9 --> 7 --> 1 --> 3 --> 9 (numerical button) --> Enter key on remote control to confirm the system information.
5. Remember or write the **model name**.



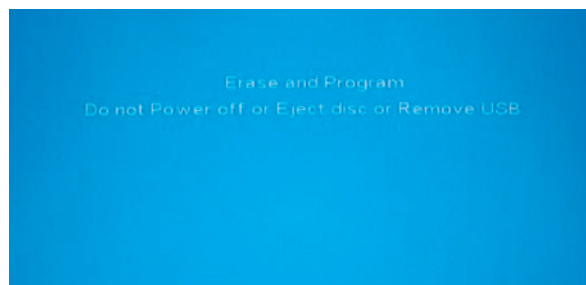
11. If the below picture appears on the screen, Select "Start" and Press "OK" button on Remote controller. **While this menu appears, please don't eject disc or take out USB**



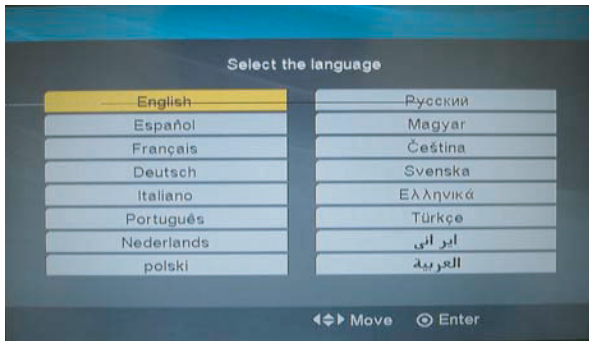
6. Change the program file name of new version to the model name  
Ex> New ver. program file -->  
LG\_DV\_LP81F32000AZV\_V014.ROM  
Model name --> LG\_DV\_LV80F32000AZV  
Change New ver. program file like this -->  
LG\_DV\_LV80F32000AZV.ROM  
If you don't change the file name like that, Disc download isn't be worked.

7. Copy the changed file to a USB memory stick.

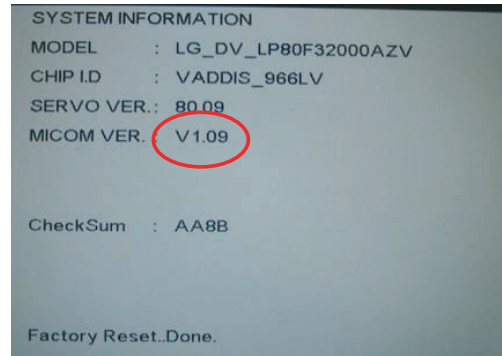
12. After the below picture appears on the screen, New DVD program will download from USB memory stick automatically. Do not take out the USB memory stick.



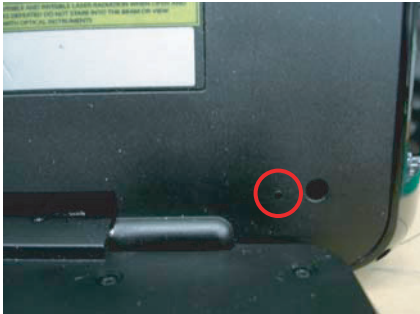
13. After USB download is completed, DVD-player displays below picture automatically.



17. Do it again the process 1, 2, 3, 4 to confirm the version.



14. Press the Reset button on the DVD-Player.

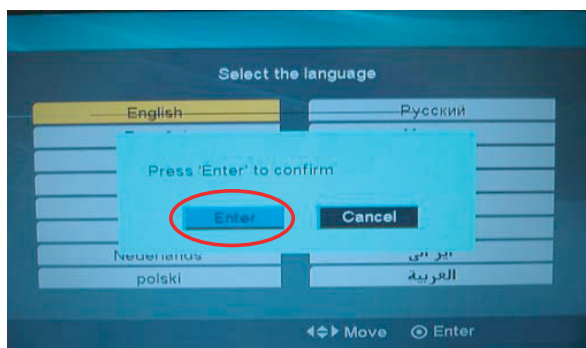


18. Press the Reset button on the DVD-Player.



15. Remove the USB memory stick.

16. Turn on the DVD-player. Select the initial Language and Press "Enter" button.  
Then, Select "Enter" and Press "Enter" button.



# SPECIFICATIONS

## • DVD PLAYER

Power supply	DC 12V (AC adapter terminal), DC 7.5V (Battery)
Power consumption	12W
Weight	980g (without battery pack)
External dimensions(W X D X H)	230 X 145.5 X 39(mm)
Signal system	PAL
Laser	Semiconductor laser and 1 beam / 2LD System
Frequency range (audio)	DVD linear sound:48kHz sampling 4Hz to 20kHz
Signal-to-noise ratio(audio)	More than 80dB
Dynamic range(audio)	More than 80dB
Harmonic distortion(audio)	0.04%
Operating conditions(audio)	Temperature: 41°F to 95°F

## • TERMINALS

DC input	1
Composite Video IN/OUTPUT Audio IN/OUTPUT	1
Earphone output	2
Mini USB input	1
3 in 1 memory slot	1

## • LIQUID CRYSTAL DISPLAY

Panel size	8inches (16:9)
Projection system	TN color transmission
Driving system	TFT active matrix

## • SUPPLIED ACCESSORIES

RCA Audio/Video cable	1
AC Adapter (MPA-630A)	1
Car Adapter (WLD-041)	1
USB Cable	1
Remote control	1
Battery for Remote control (Lithium)	1



# MEMO

Dotted lines for writing content.

# SECTION 2

## EXPLODED VIEWS

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# EXPLODED VIEWS

## 1. CABINET AND MAIN FRAME SECTION

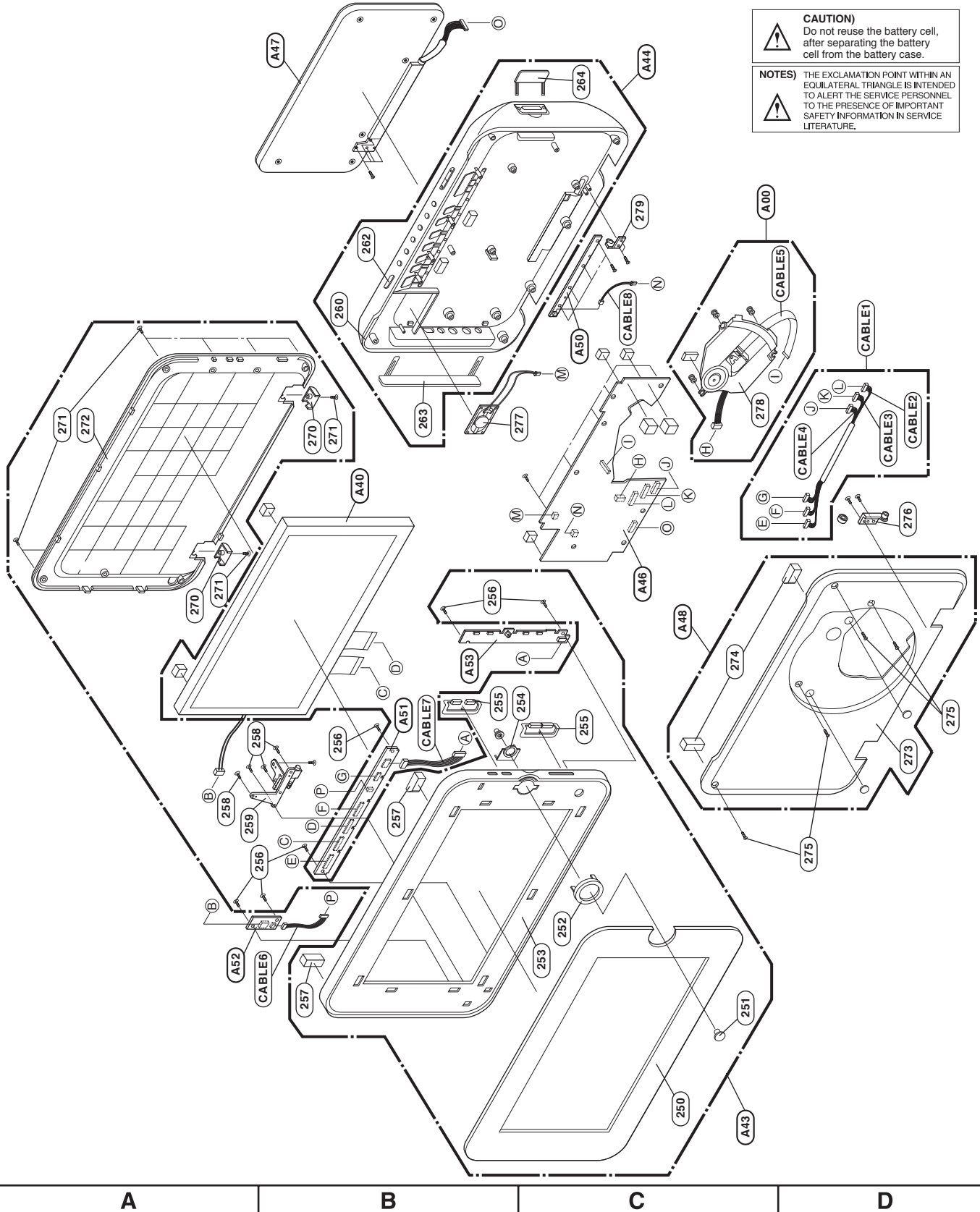
5

4

3

2

1



**CAUTION**  
Do not reuse the battery cell, after separating the battery cell from the battery case.

**NOTES** THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.

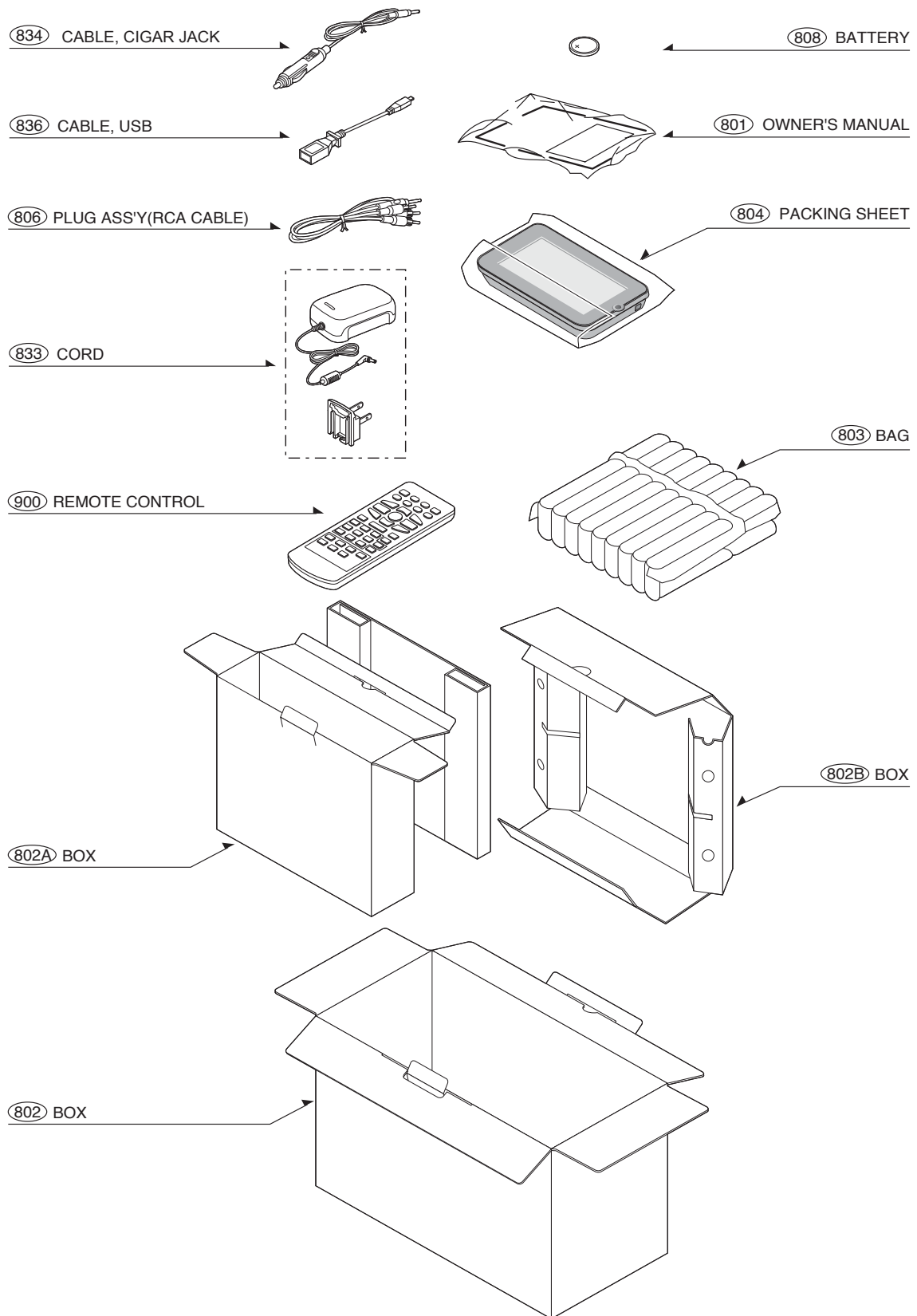
A

B

C

D

## 2. PACKING ACCESSORY SECTION



# MEMO

A series of horizontal dotted lines for writing the memo content.

# SECTION 3

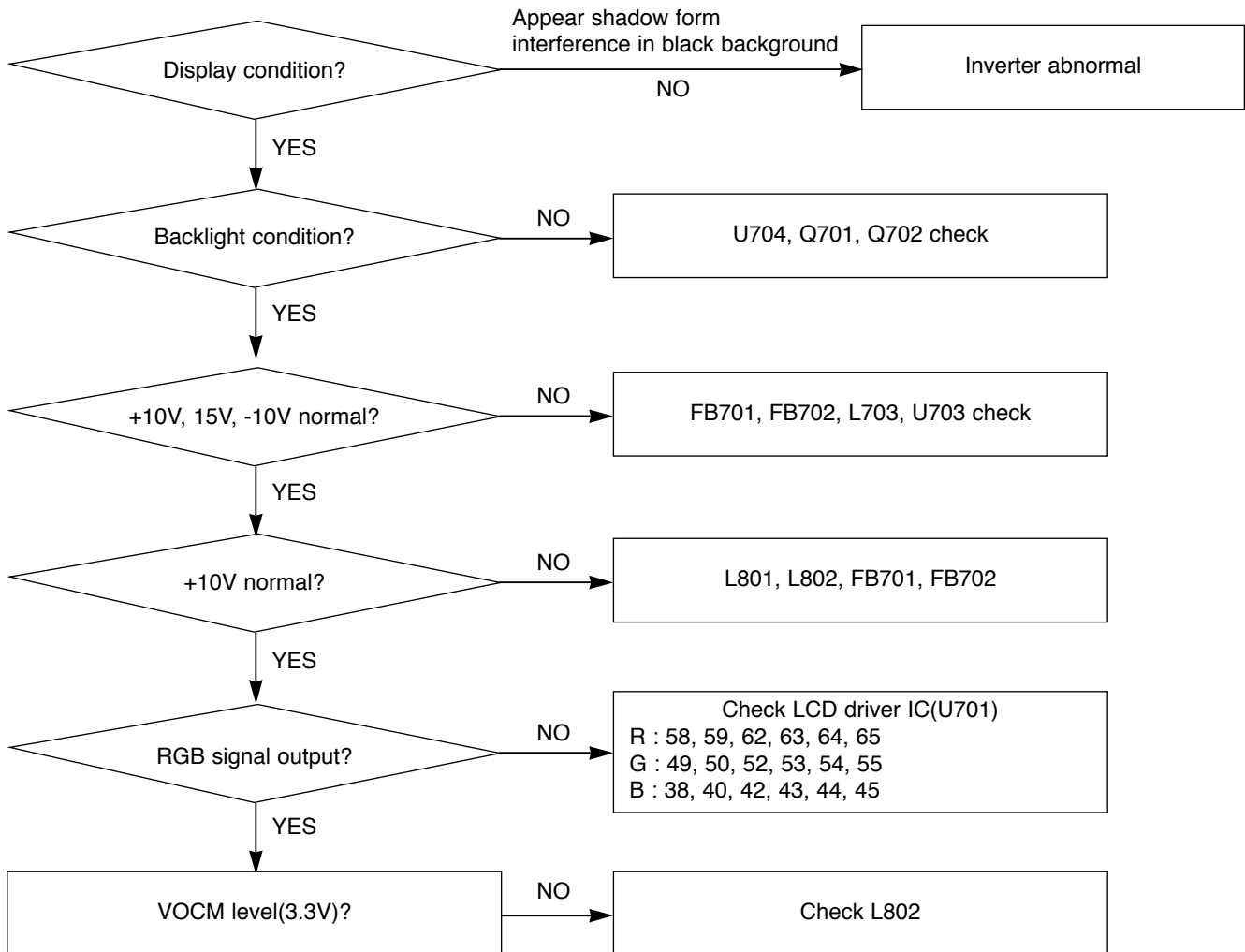
## ELECTRICAL

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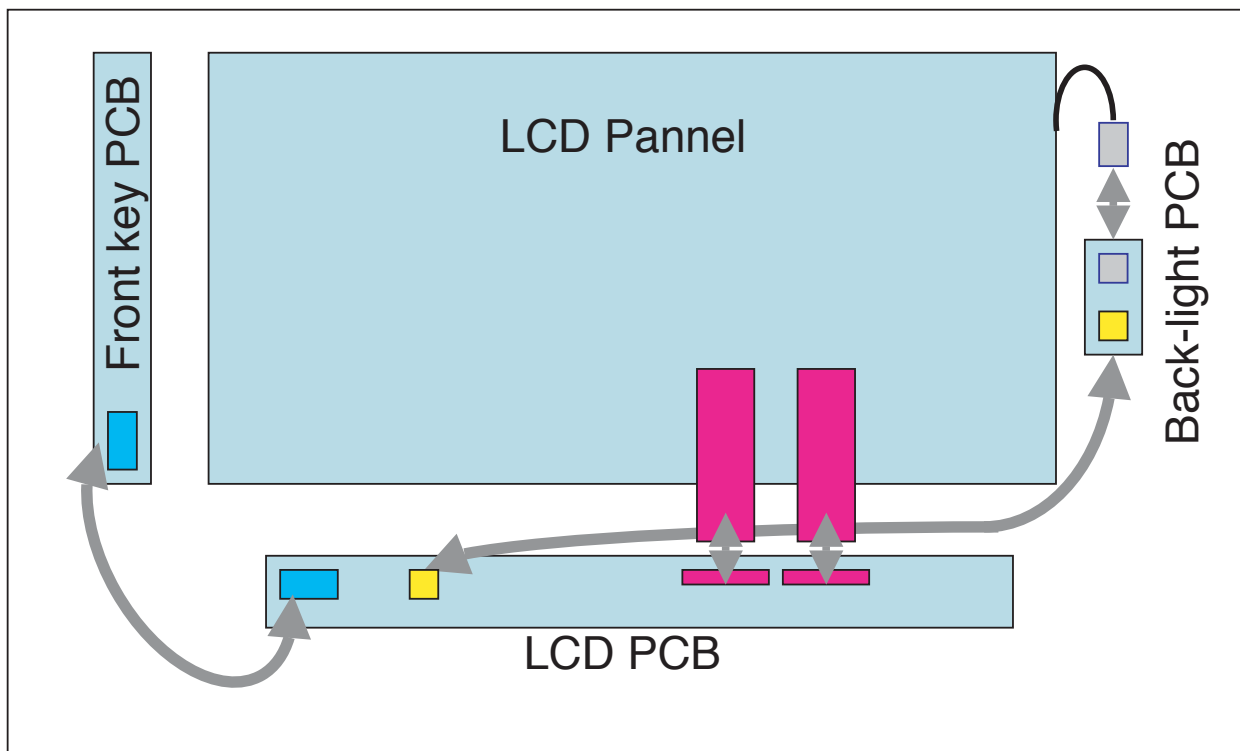
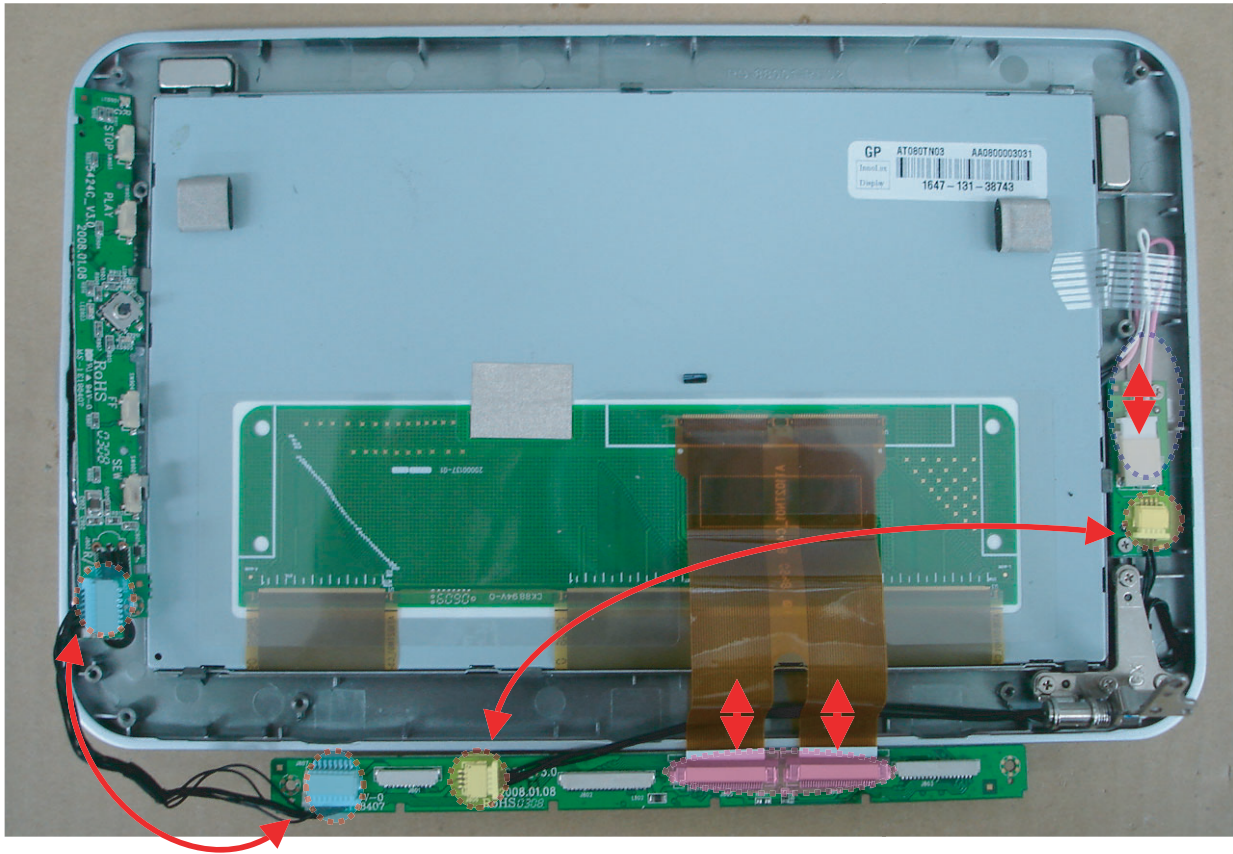
# LCD PART

## LCD ELECTRICAL TROUBLESHOOTING GUIDE



# WIRING CONNECTION DIAGRAM

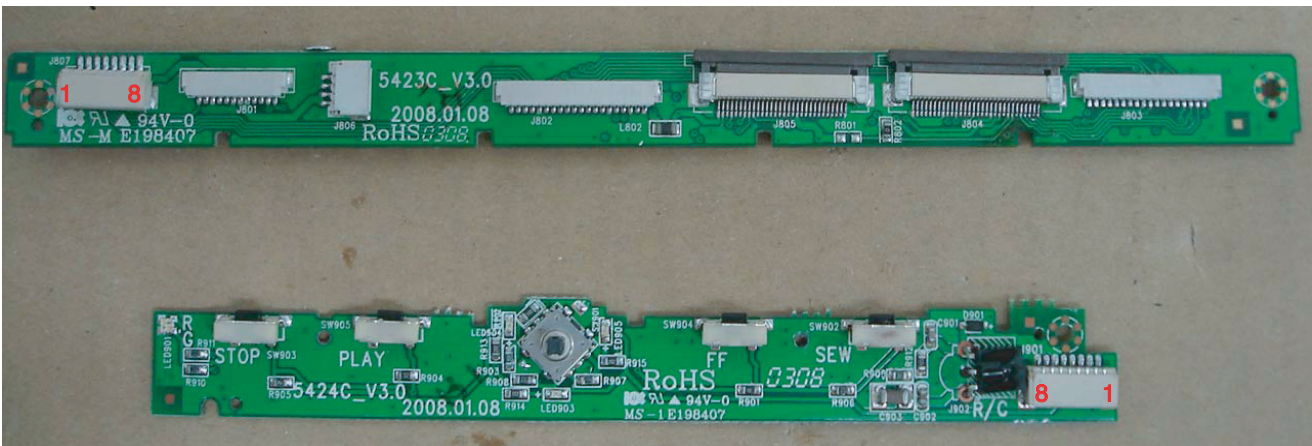
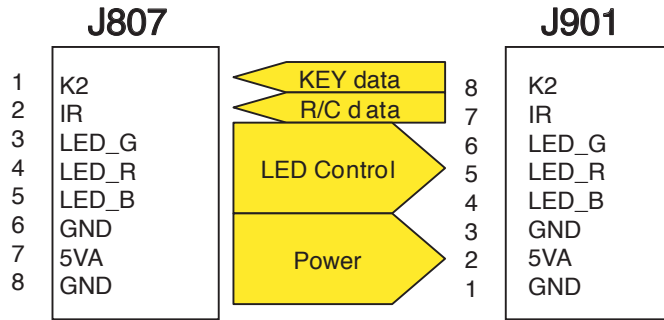
LCD PCB <---> KEY PCB, BACK LIGHT, LCD PANNEL



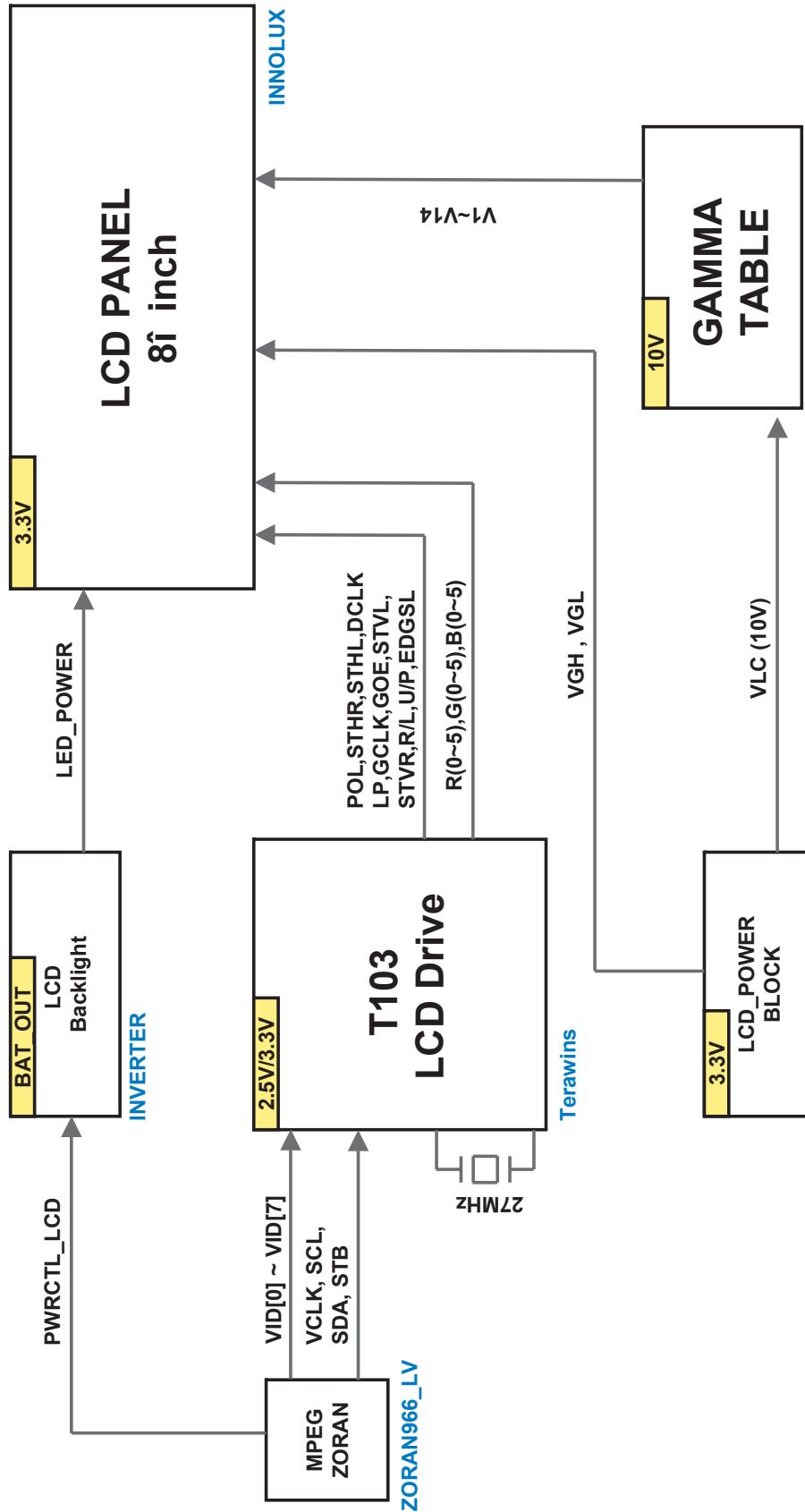


# INTERFACE DIAGRAM

## LCD PCB <--> KEY PCB INTERFACE



# BLOCK DIAGRAM

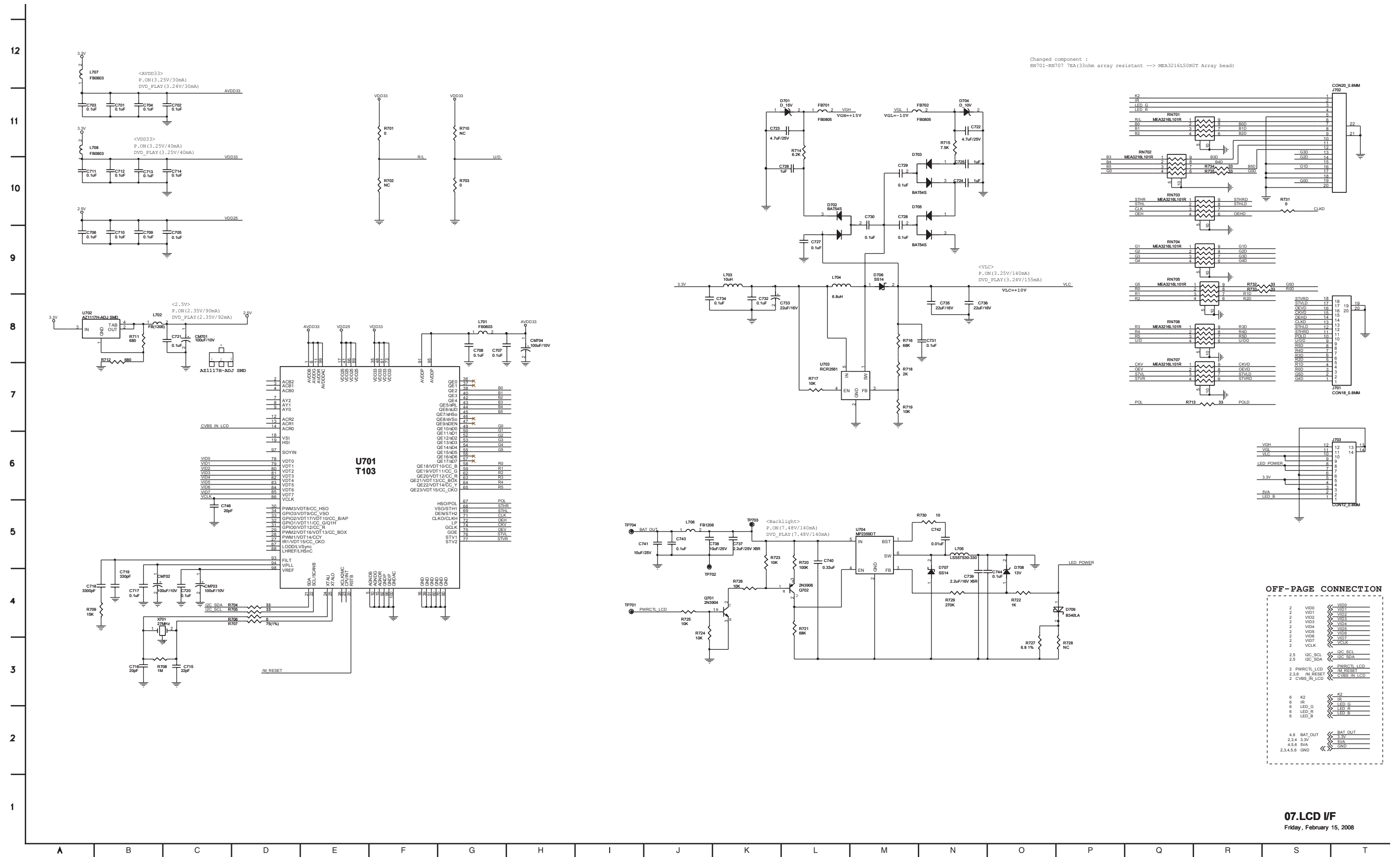


# MEMO

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# CIRCUIT DIAGRAMS

## 1. LCD I/F CIRCUIT DIAGRAM

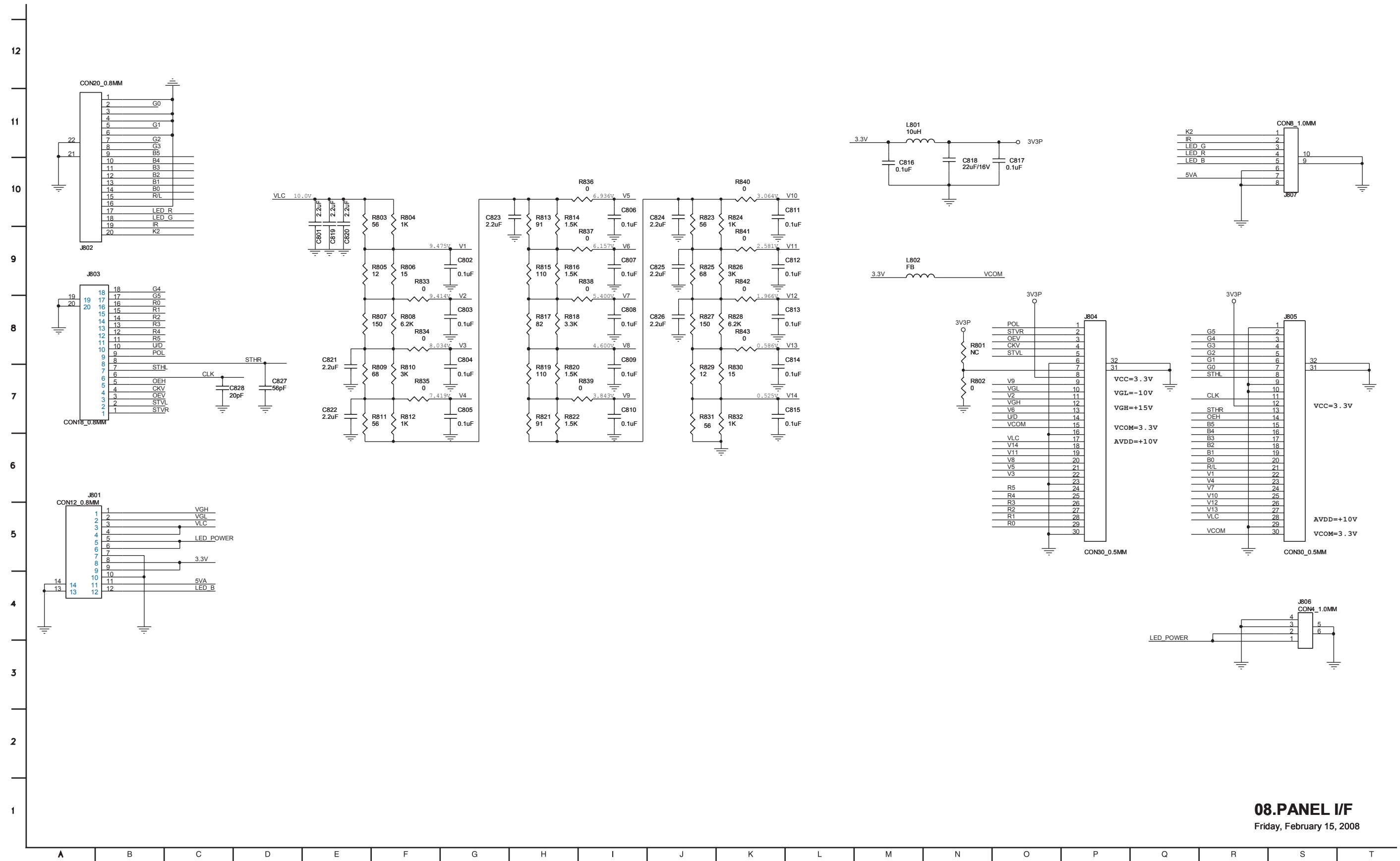


Changed component :  
RN701-RN707 7EA(330m array resistant --> MEA3216L50R0T Array bead)

2	VID0	VID0
2	VID1	VID1
2	VID2	VID2
2	VID3	VID3
2	VID4	VID4
2	VID5	VID5
2	VID6	VID6
2	VID7	VID7
2	VCLK	VCLK
2	VCLK	VCLK
2.5	I2C_SCL	I2C_SCL
2.5	I2C_SDA	I2C_SDA
2	PWRCTL_LCD	PWRCTL_LCD
2.3,6	RES	RES
2	CVBS_IN_LCD	CVBS_IN_LCD
6	K2	K2
6	IR	IR
6	LED_G	LED_G
6	LED_R	LED_R
6	LED_B	LED_B
4,6	BAT_OUT	BAT_OUT
2,3,4	SVA	SVA
2,3,4,5,6	GND	GND

**07.LCD I/F**  
Friday, February 15, 2008

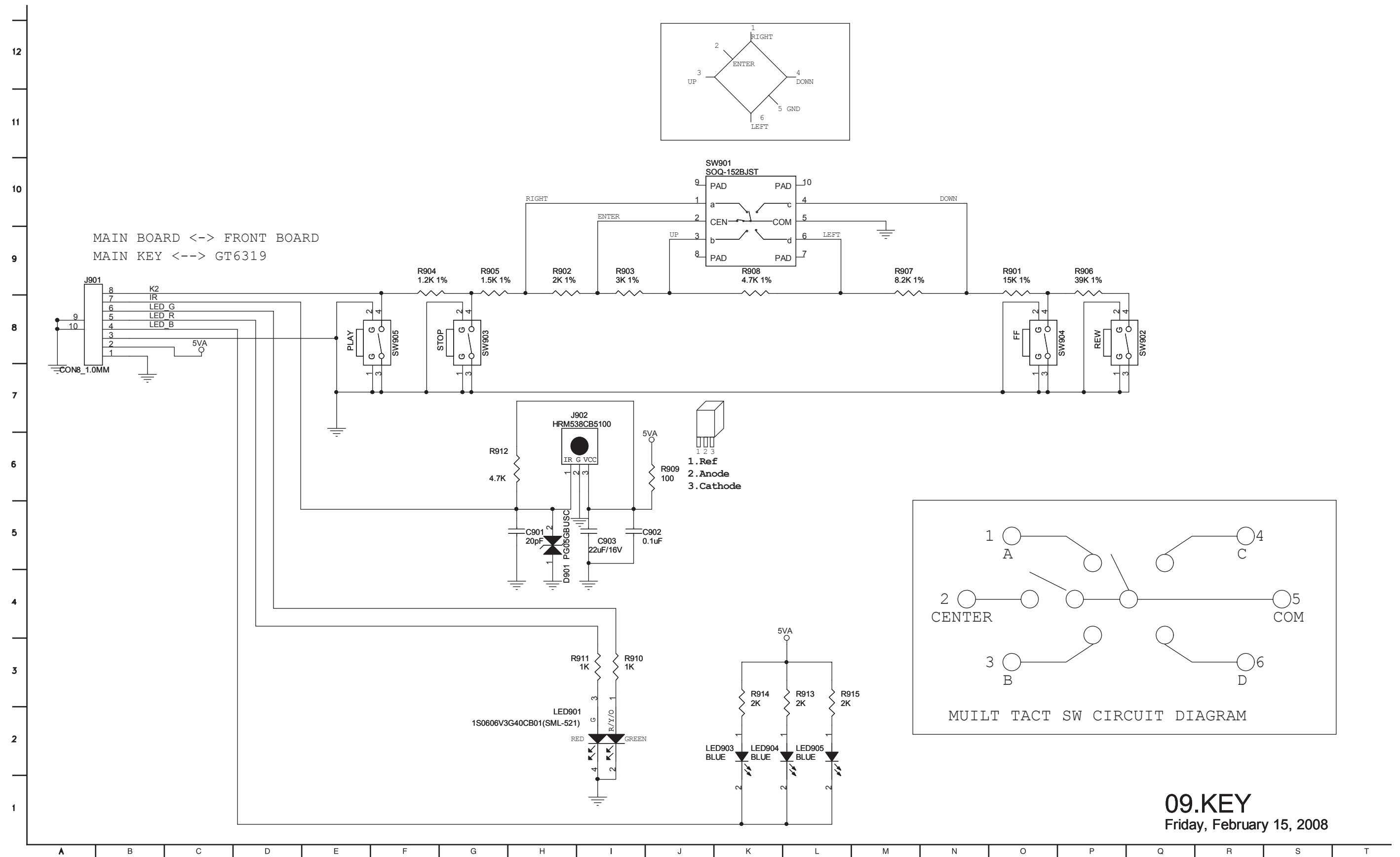
## 2. PANEL I/F CIRCUIT DIAGRAM



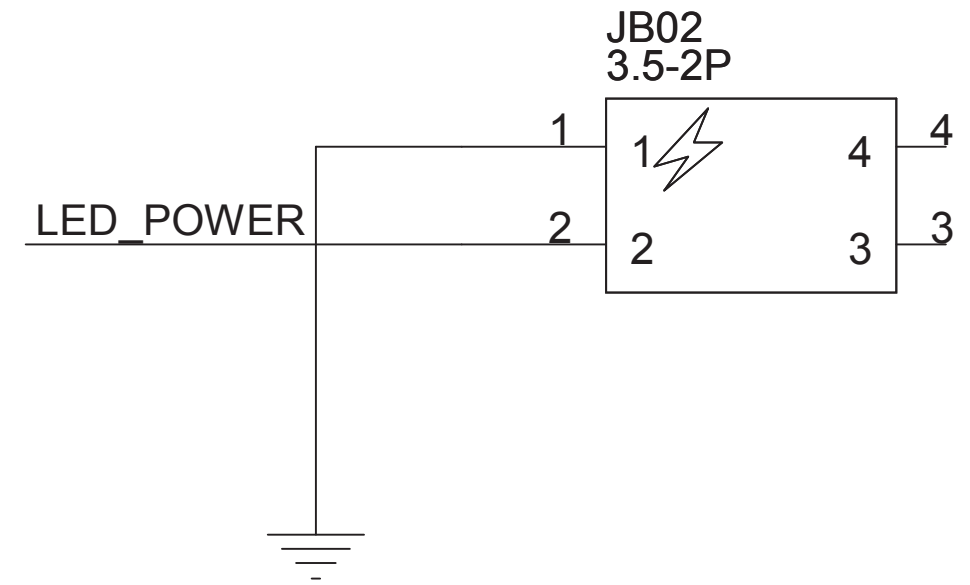
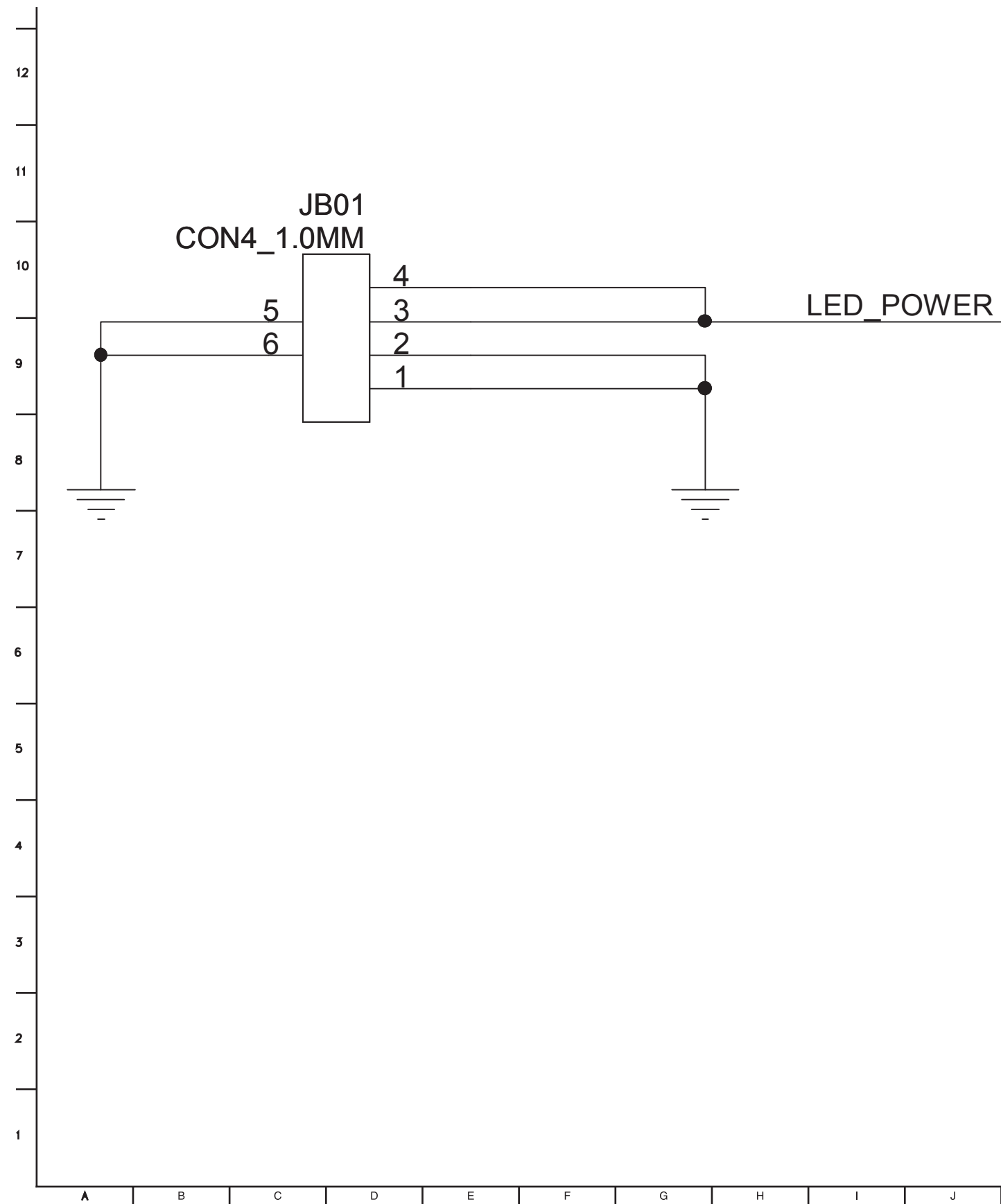
08.PANEL I/F

Friday, February 15, 2008

### 3. FRONT KEY BOARD CIRCUIT DIAGRAM



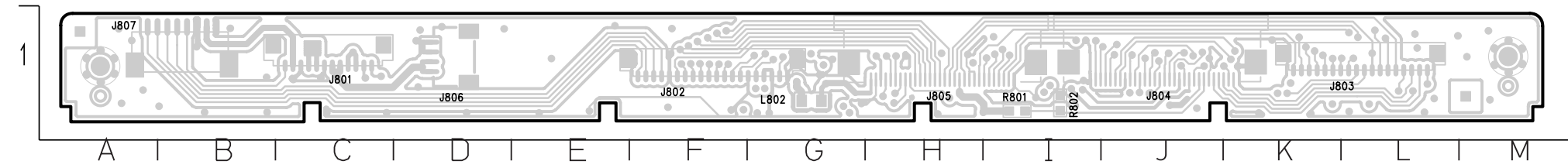
#### 4. LCD BACKLIGHT CIRCUIT DIAGRAM



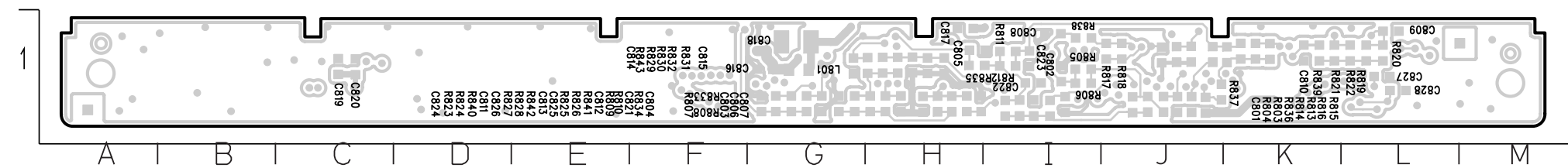
11. LCD Backlight  
Friday, February 15, 2008

# PRINTED CIRCUIT BOARD DIAGRAMS

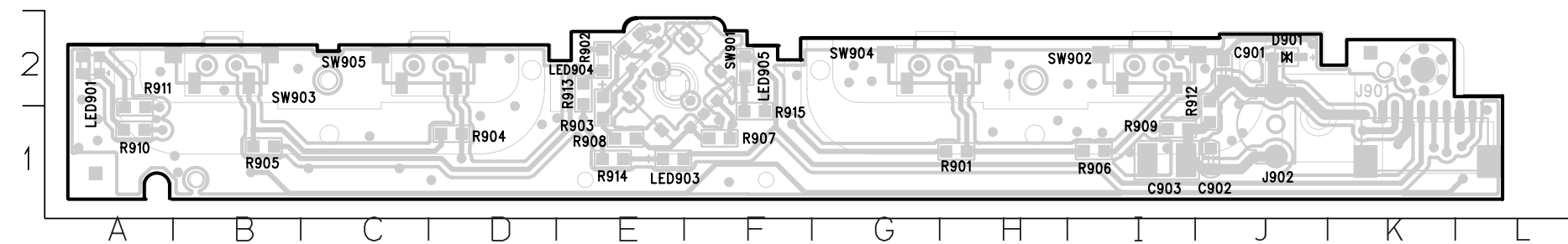
## 1. LCD P.C.BOARD (TOP VIEW)



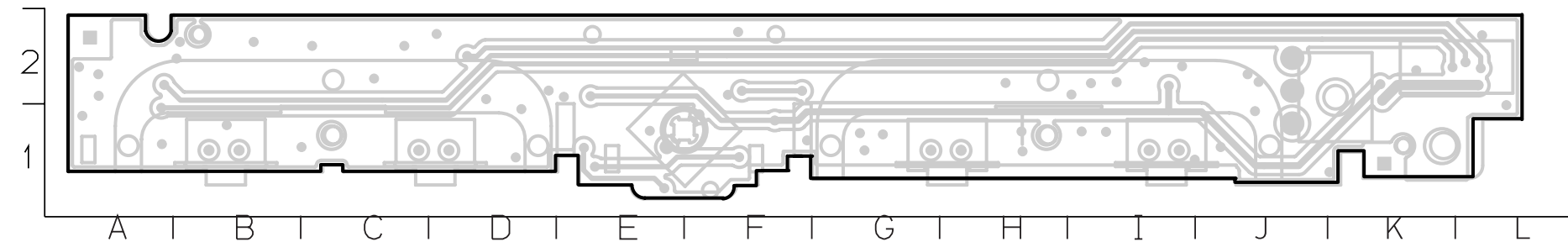
## (BOTTOM VIEW)



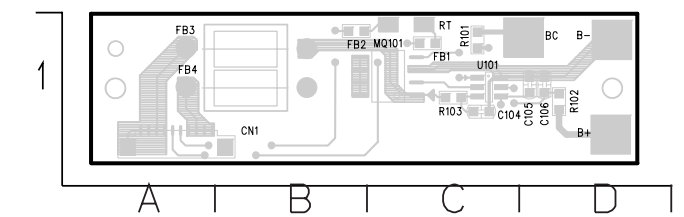
## 2. FRONT KEY P.C.BOARD (TOP VIEW)



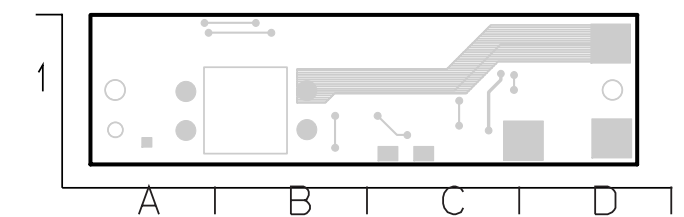
## (BOTTOM VIEW)



## 3. BACK-LIGHT P.C.BOARD (TOP VIEW)



## (BOTTOM VIEW)





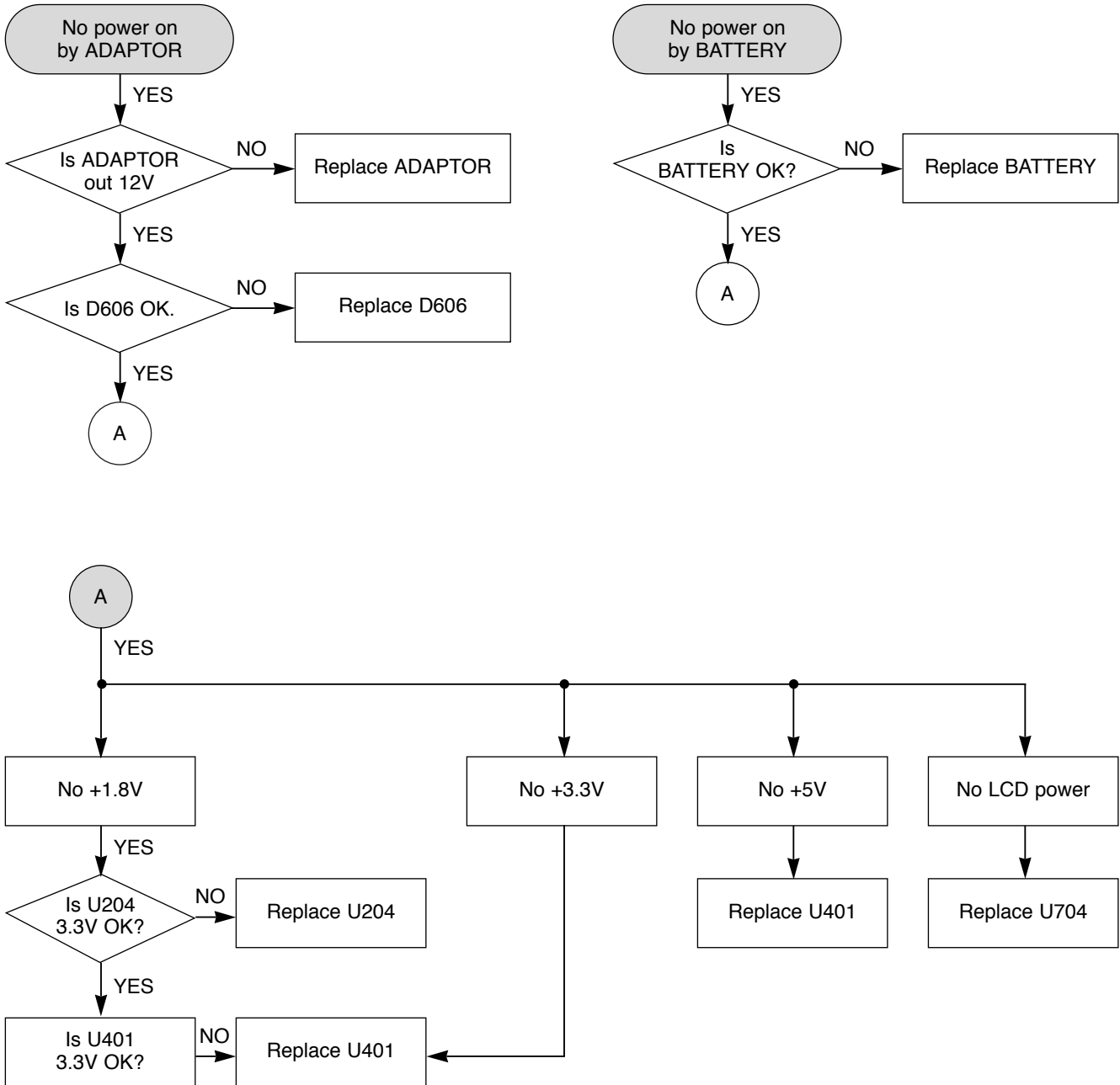


# MAIN PART

## MAIN ELECTRICAL TROUBLESHOOTING GUIDE

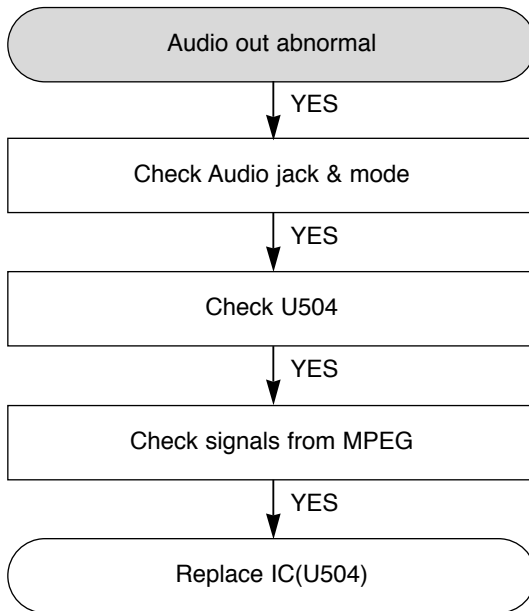
### 1. POWER (DC-DC CONVERTER) CIRCUIT

#### A. POWER

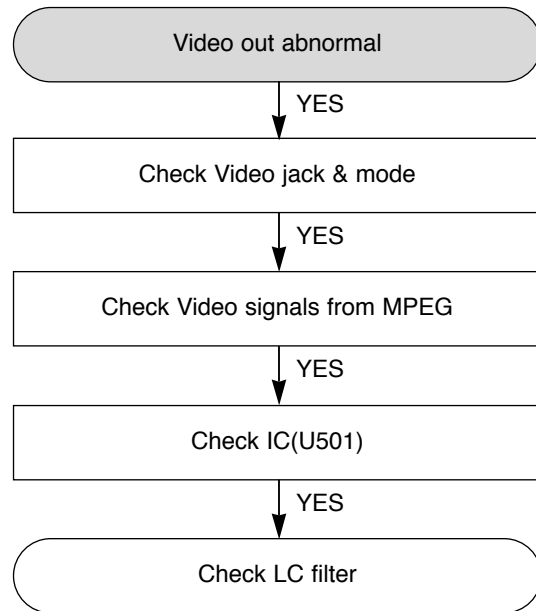


# MAIN ELECTRICAL TROUBLESHOOTING GUIDE

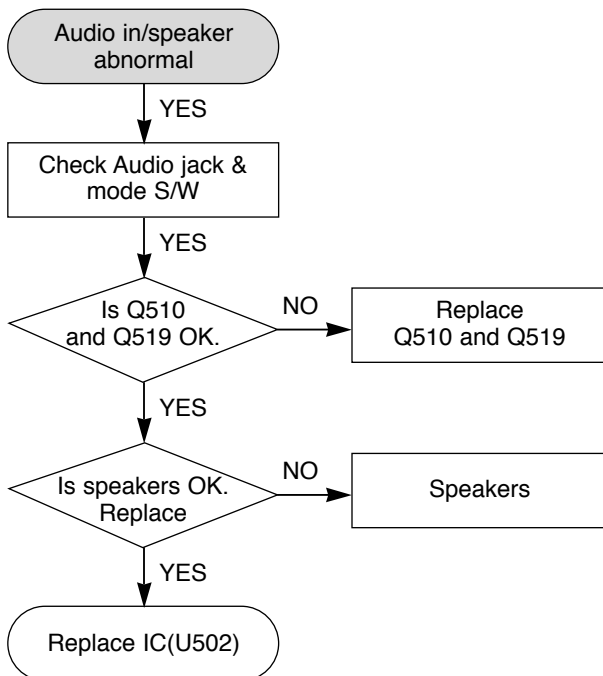
## B. AUDIO OUT ABNORMAL



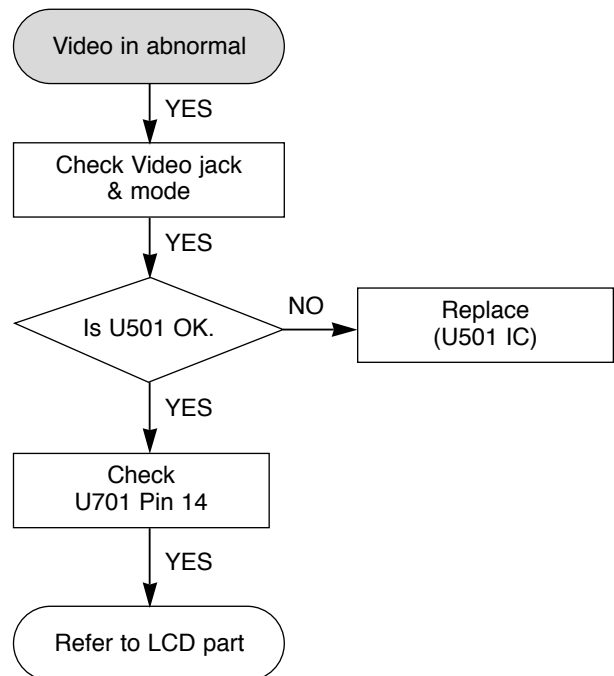
## C. VIDEO OUT ABNORMAL



## D. AUDIO IN/SPEAKER ABNORMAL

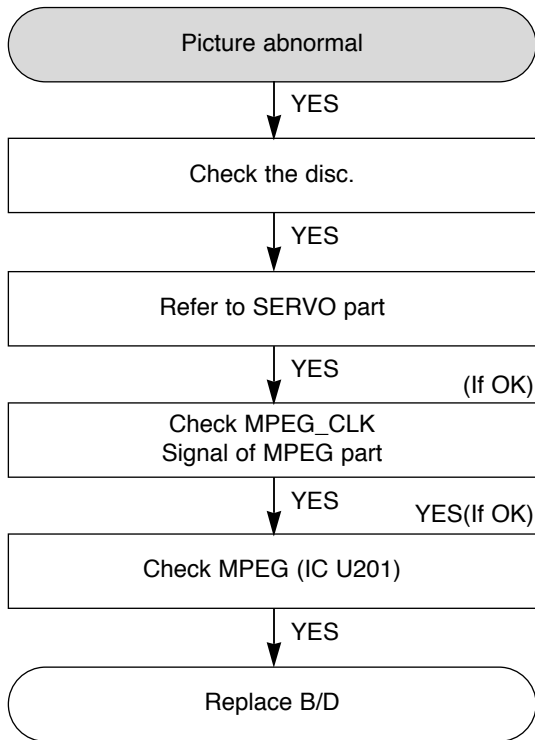


## E. VIDEO IN ABNORMAL

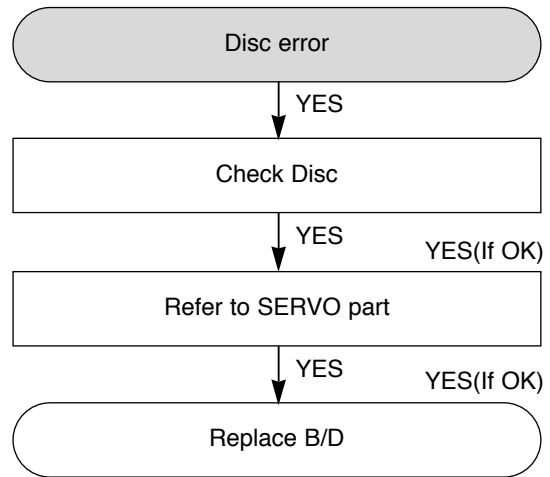


# MAIN ELECTRICAL TROUBLESHOOTING GUIDE

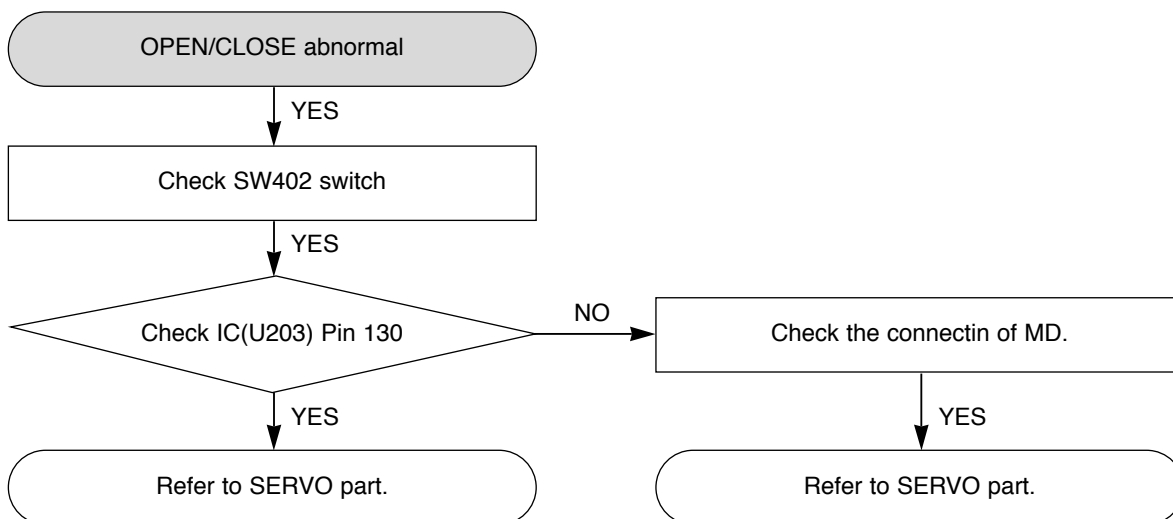
## F. PICTURE ABNORMAL



## G. DISC ERROR

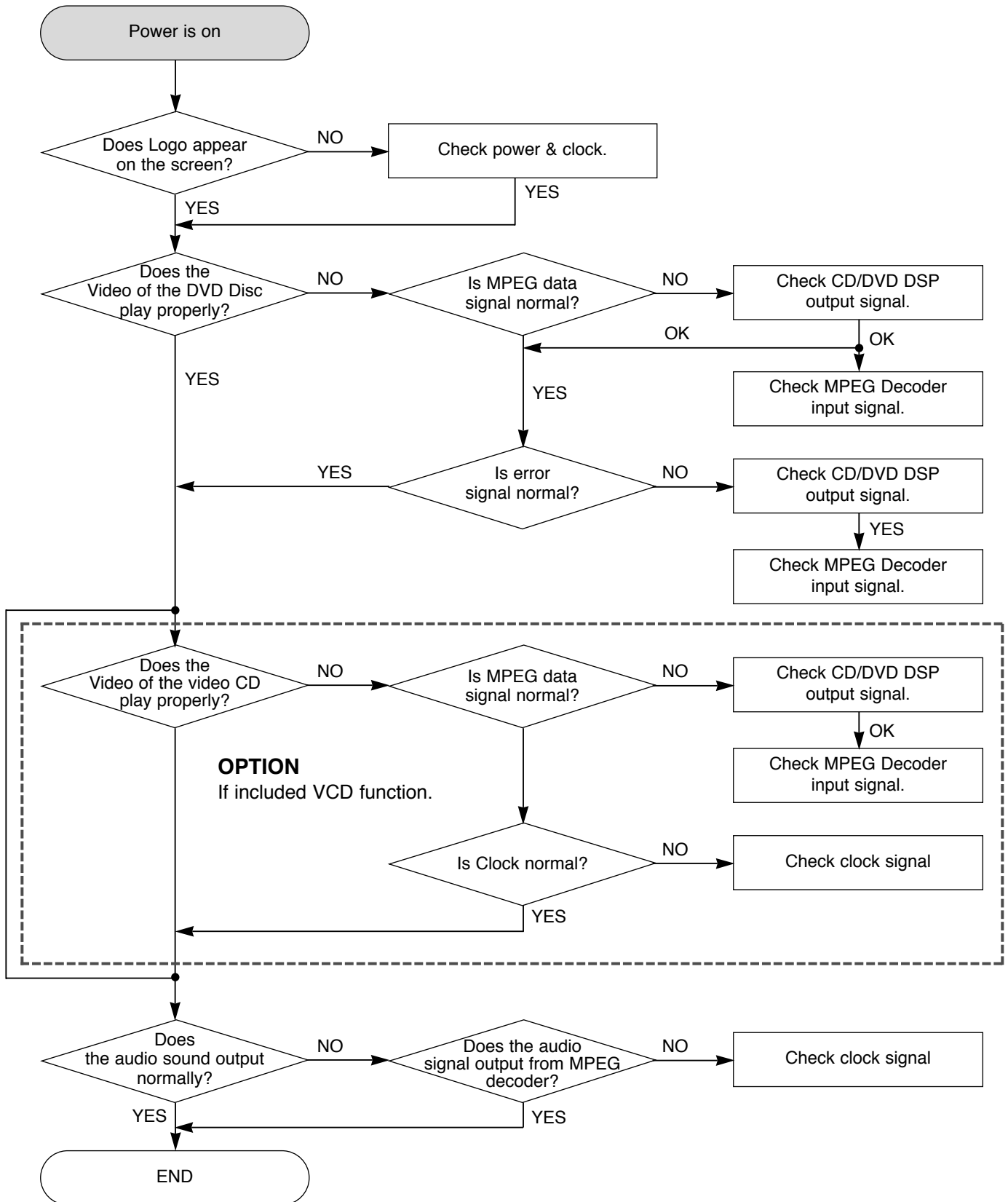


## H. OPEN/CLOSE ABNORMAL



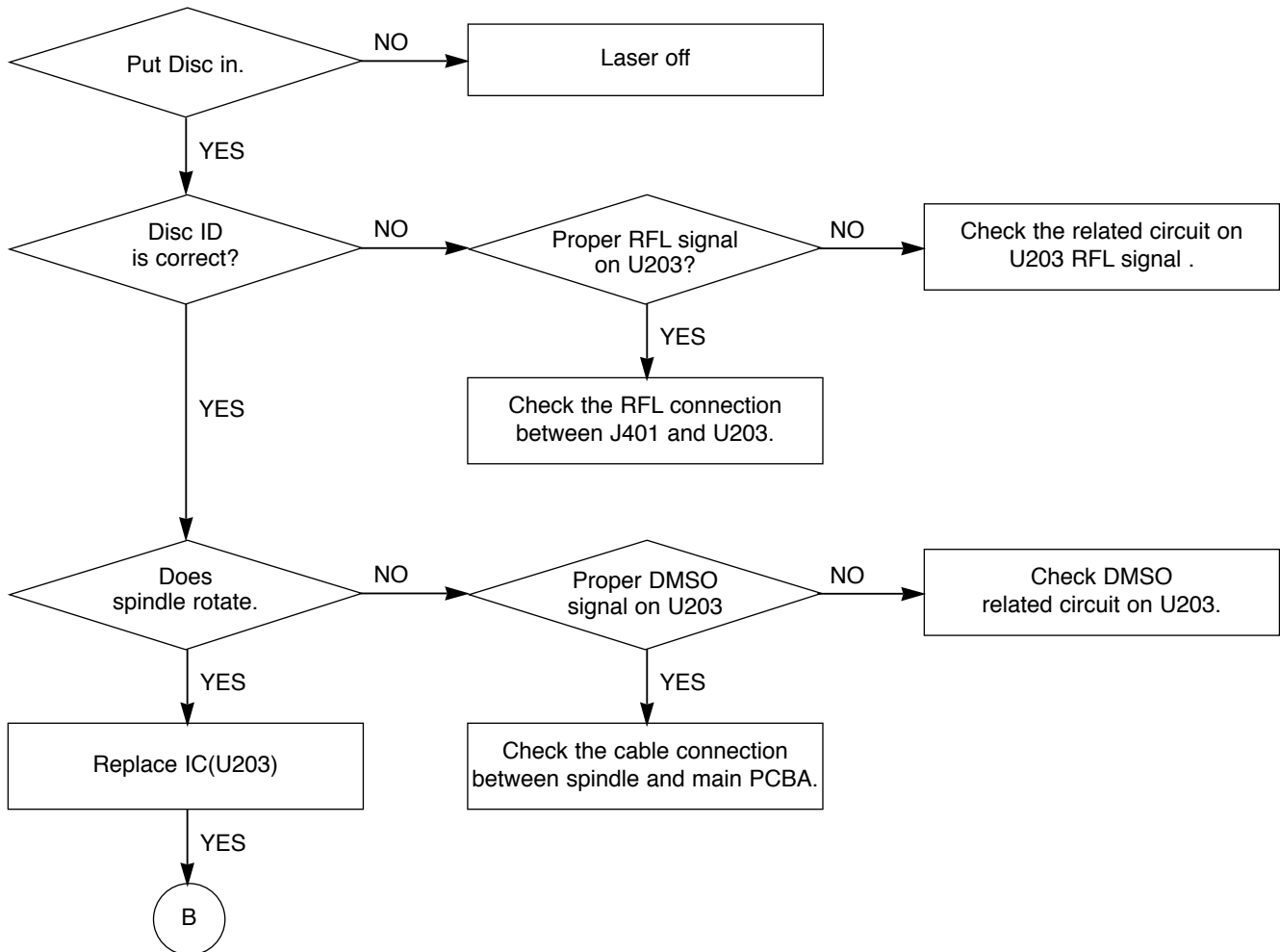
# MAIN ELECTRICAL TROUBLESHOOTING GUIDE

## 2. MPEG CIRCUIT

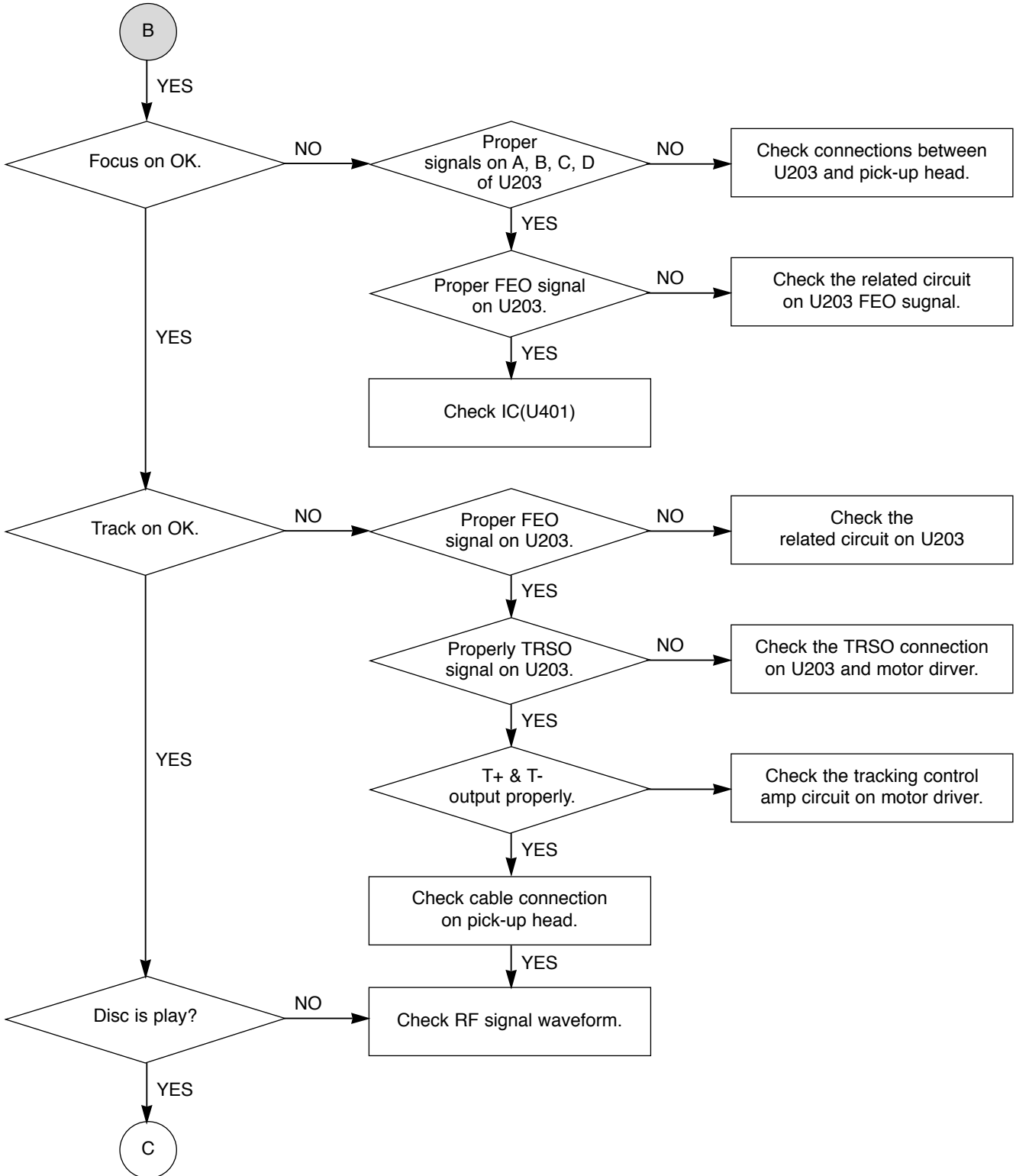


# MAIN ELECTRICAL TROUBLESHOOTING GUIDE

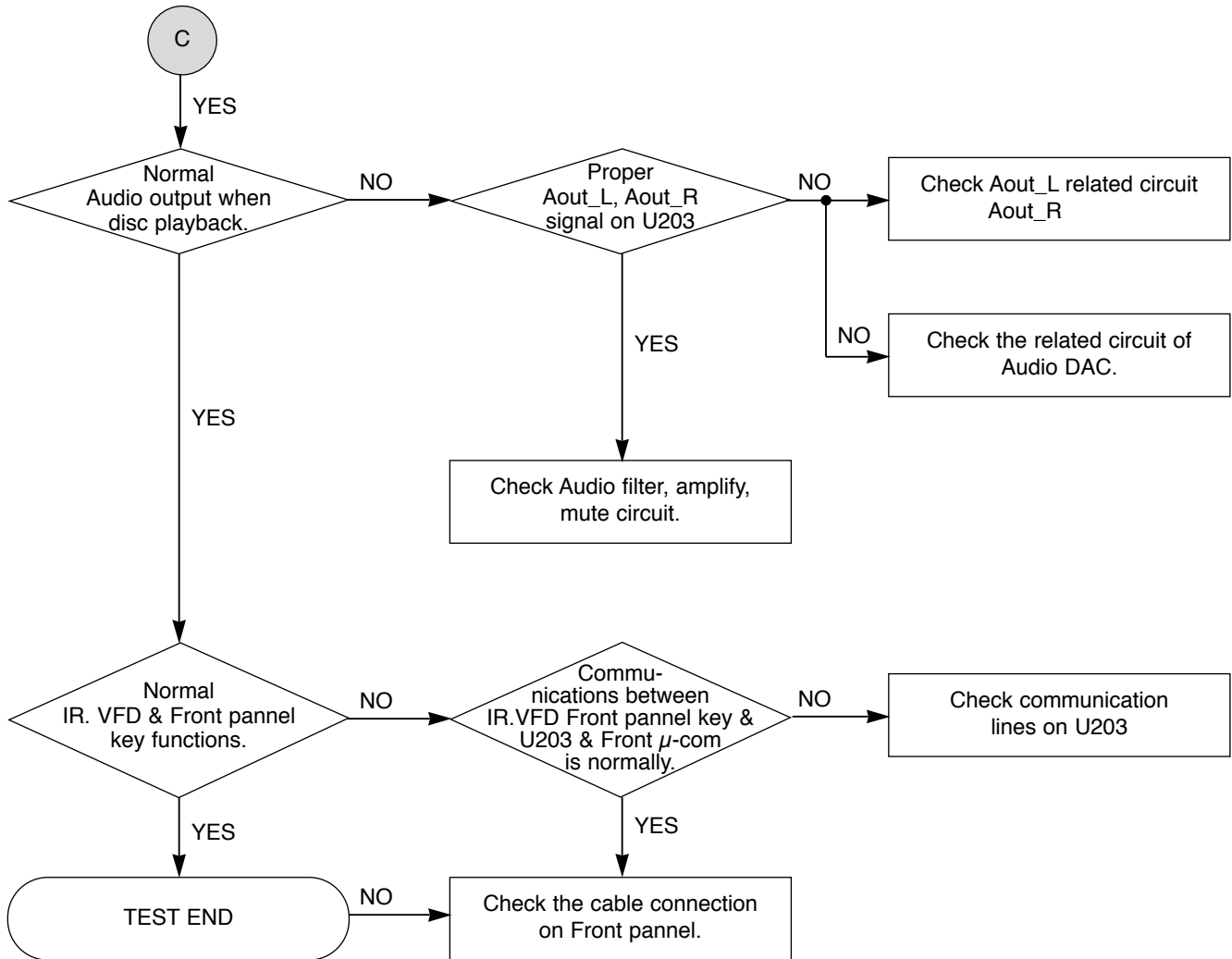
## 3. RF/SERVO CIRCUIT



# MAIN ELECTRICAL TROUBLESHOOTING GUIDE



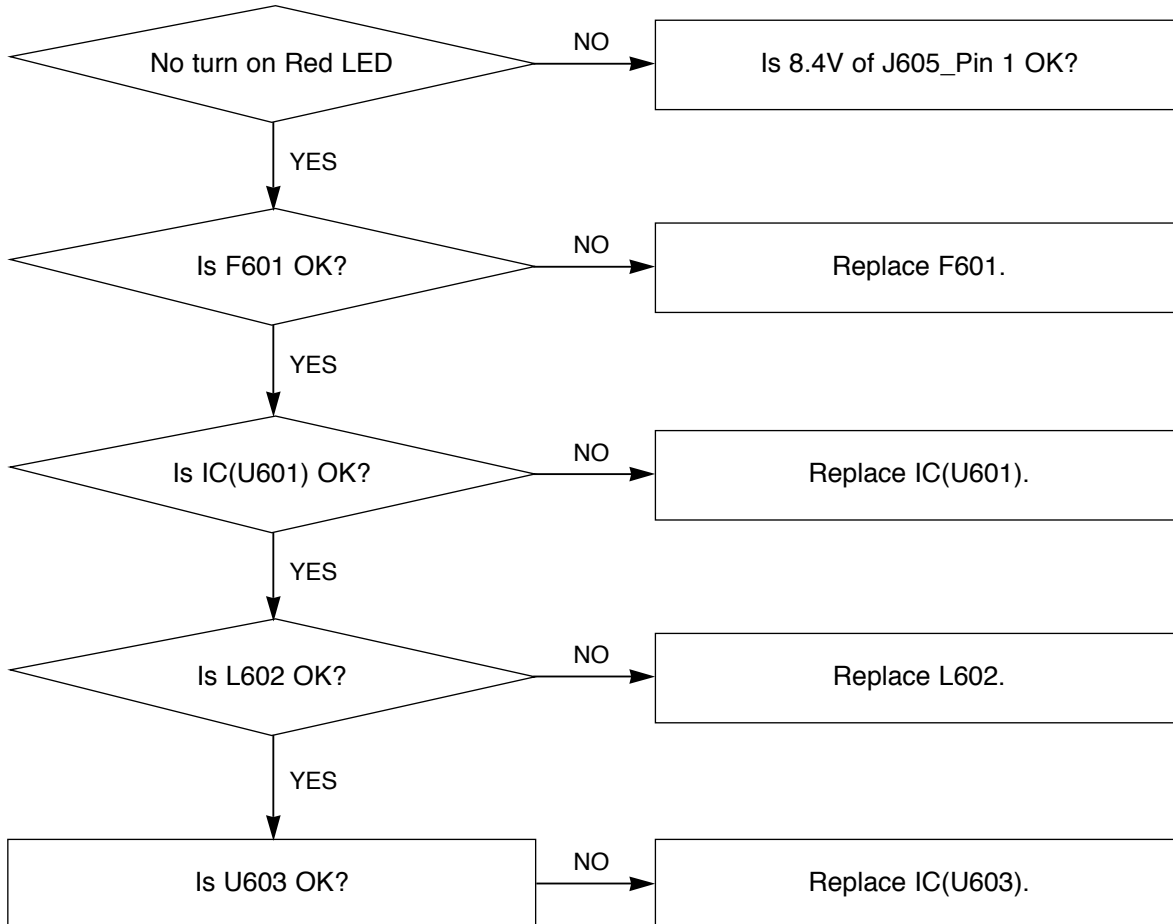
# MAIN ELECTRICAL TROUBLESHOOTING GUIDE





# MAIN ELECTRICAL TROUBLESHOOTING GUIDE

## 4. CHARGEING CIRCUIT



# DETAILS AND WAVEFORMS ON SYSTEM TEST AND DEBUGGING

## 1. SYSTEM 27MHz CLOCK

1) ZR36966 main clock is at 27MHz (X201)

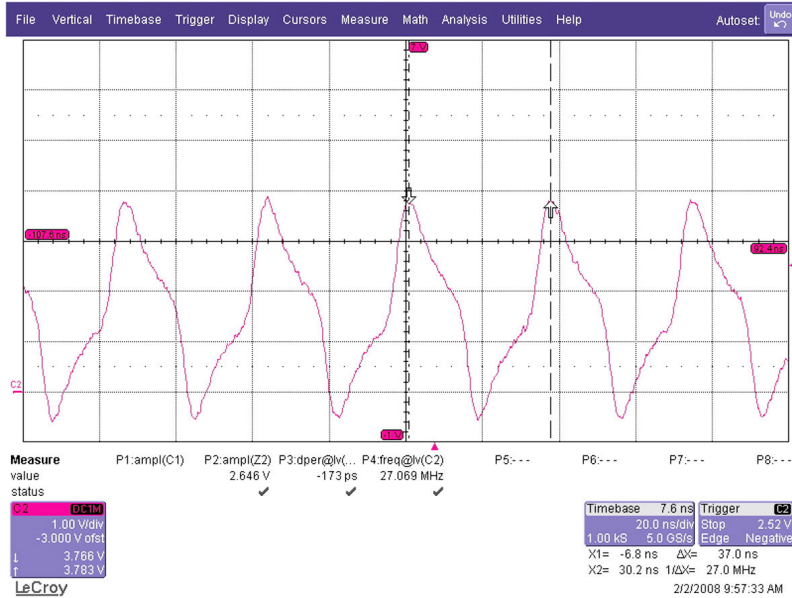


FIG 1-1

## 2. SDRAM CLOCK

1) ZR36966 main clock is at 27MHz (R308)

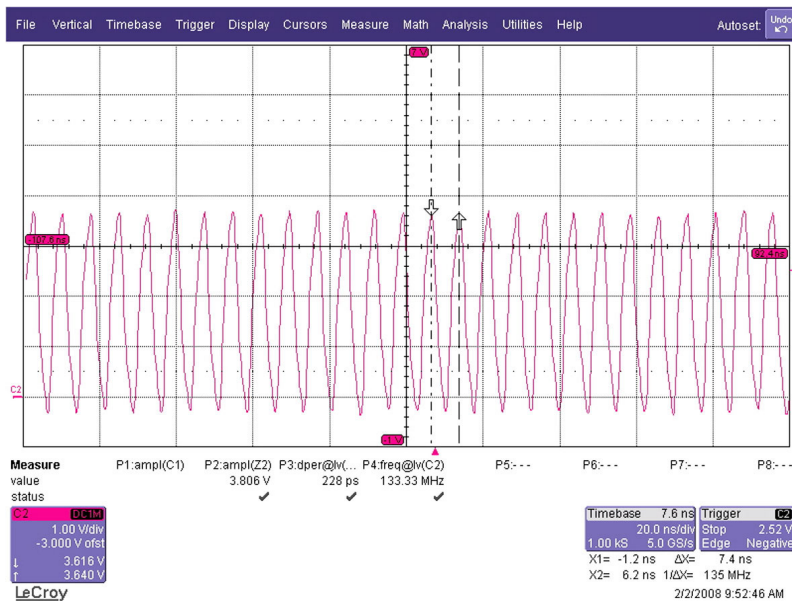


FIG 2-1

### 3. DISC TYPE JUDGEMENT WAVEFORM

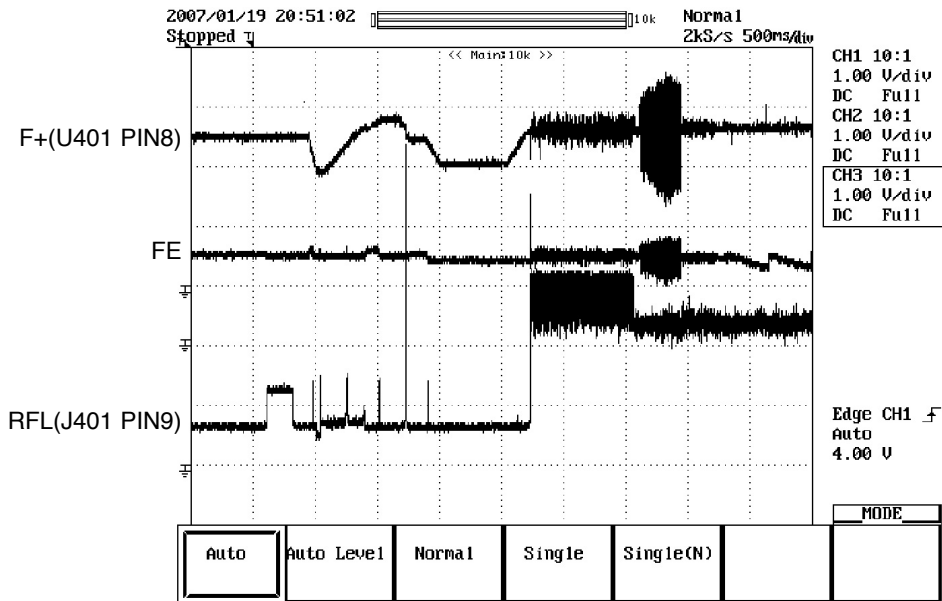


FIG 3-1

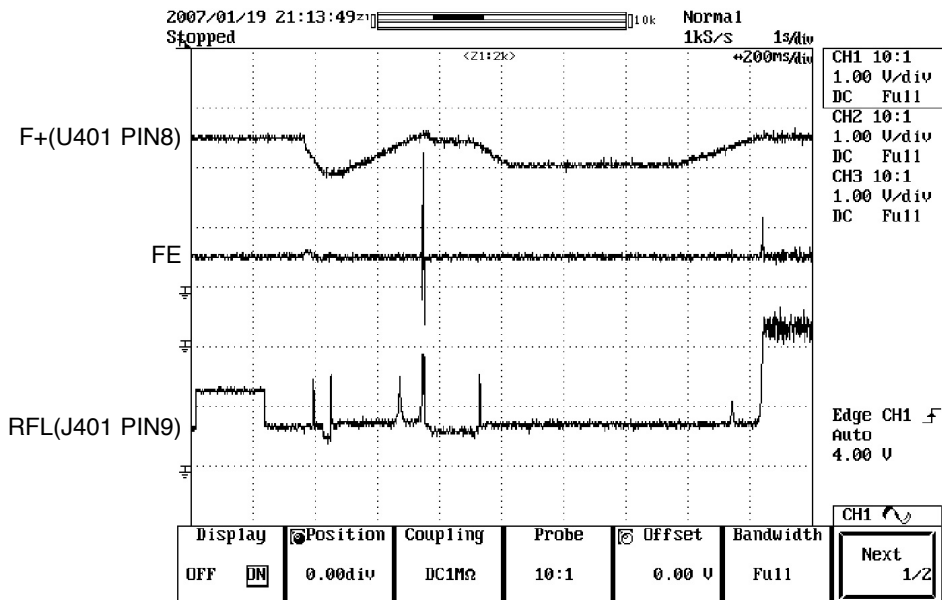


FIG 3-2

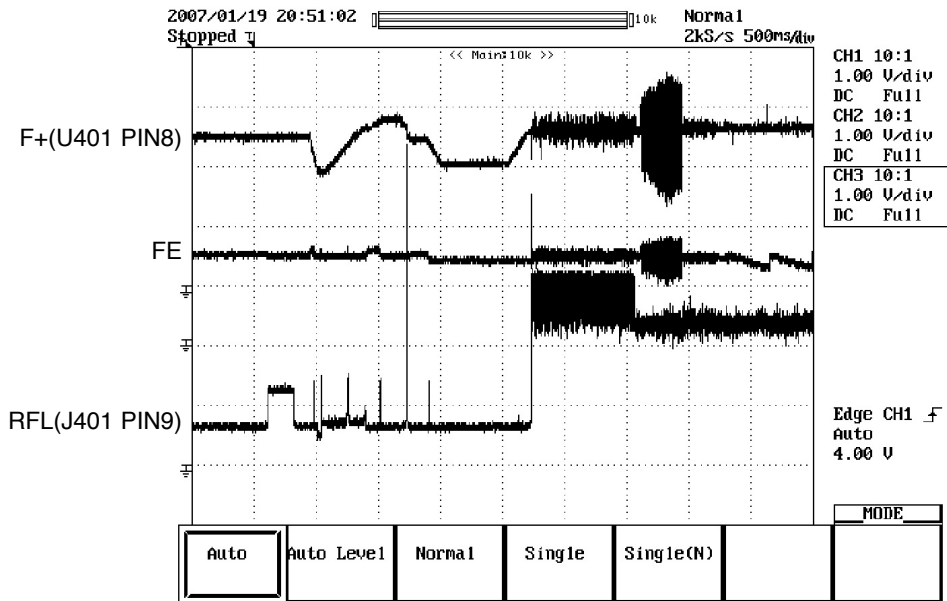


FIG 3-3

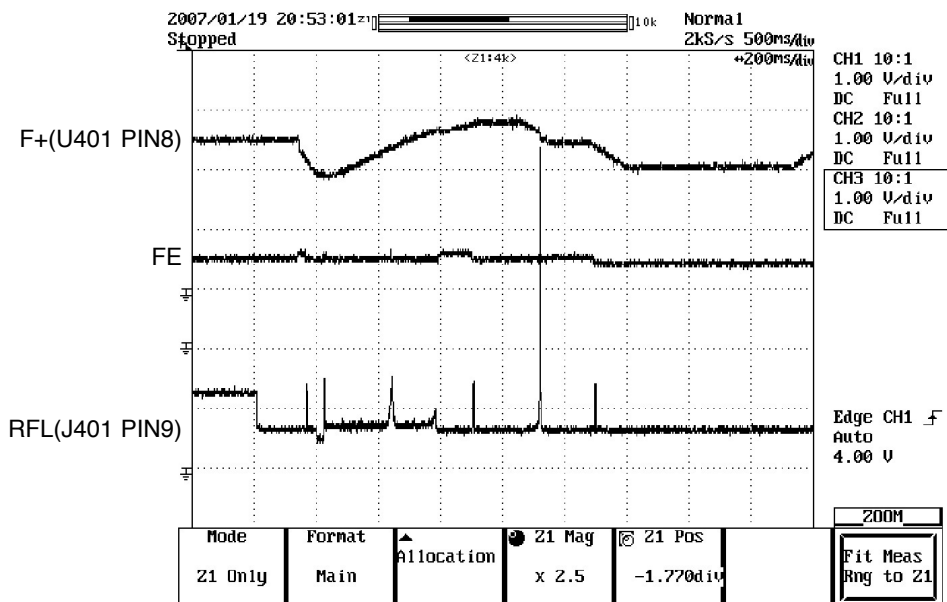


FIG 3-4

## 4. FOCUS ON WAVEFORM

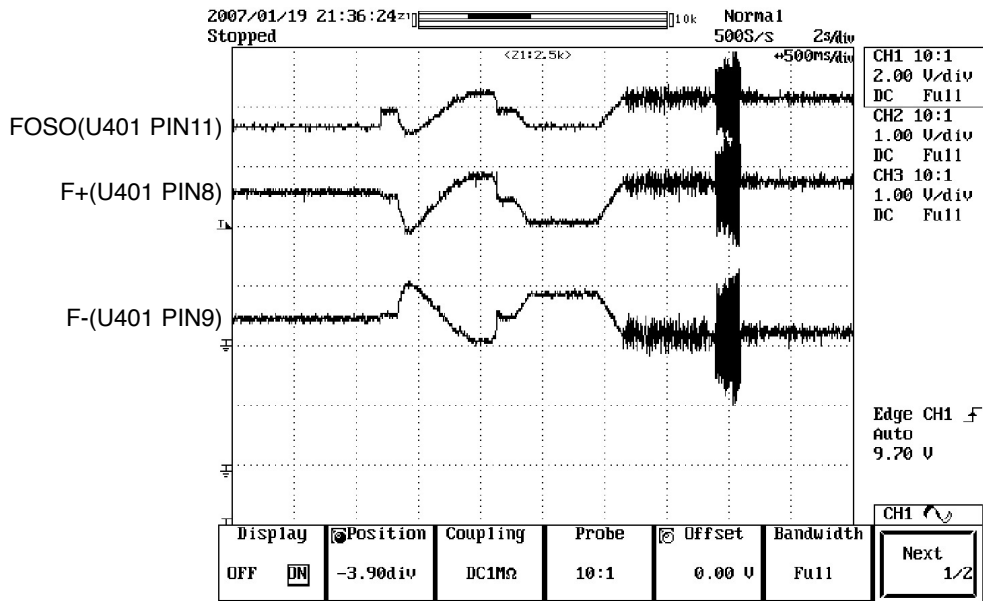


FIG 4-1

## 5. SPINDLE CONTROL WAVEFORM (NO DISC CONDITION)

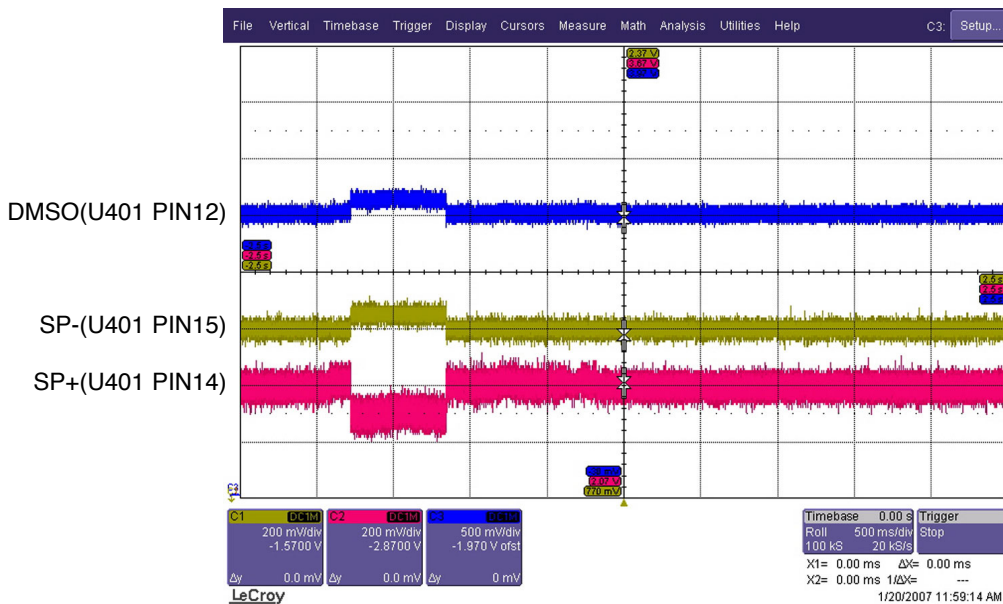


FIG 5-1

## 6. TRACKING CONTROL RELATED SIGNAL (SYSTEM CHECKING)

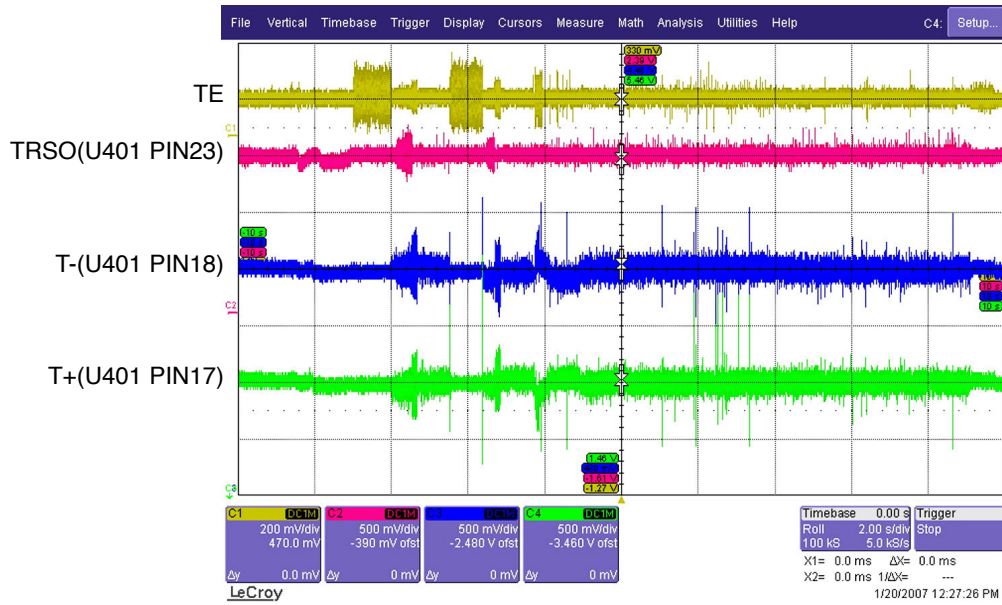


FIG 6-1

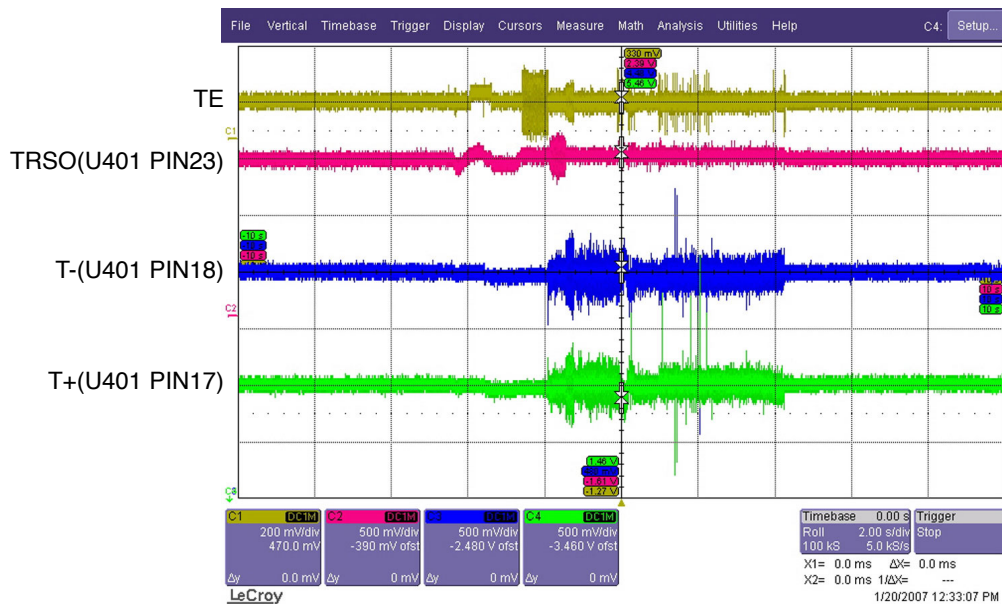


FIG 6-2

## 7. LCD DRIVE IC(U701) SYSTEM CLOCK (27MHz)

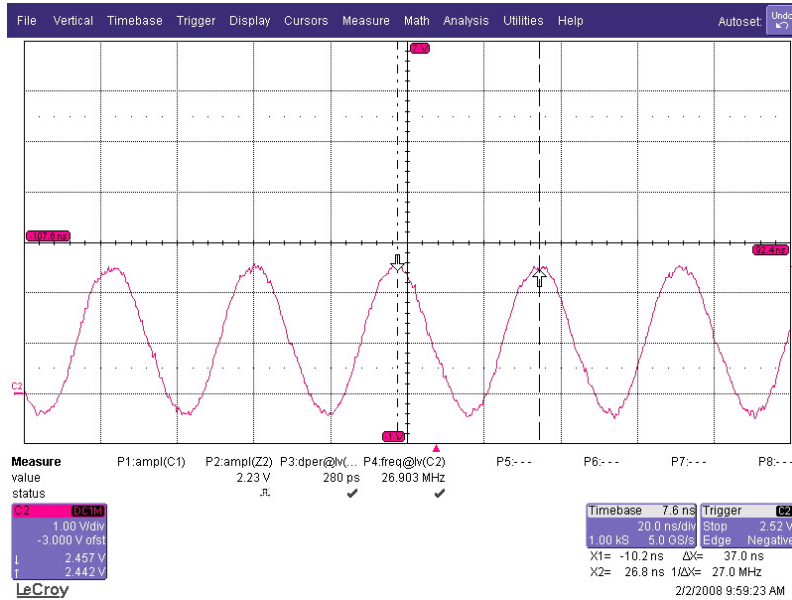


FIG 7-1

## 8. ZR36966 VIDEO OUTPUT WAVEFORM

### 1) Full colorbar signal (CVBS)

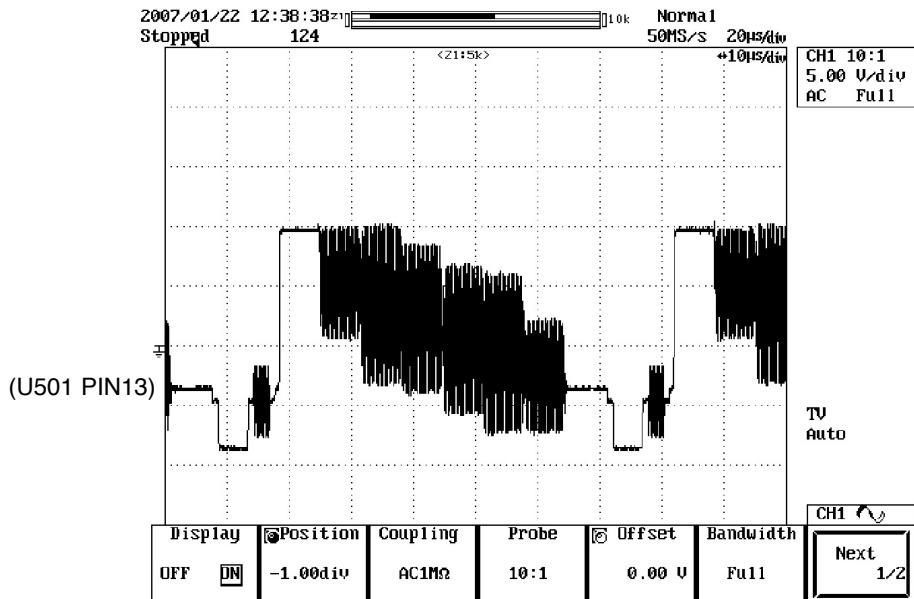


FIG 8-1

## 9. AUDIO OUTPUT FROM AUDIO DAC

### 1) Audio L/R

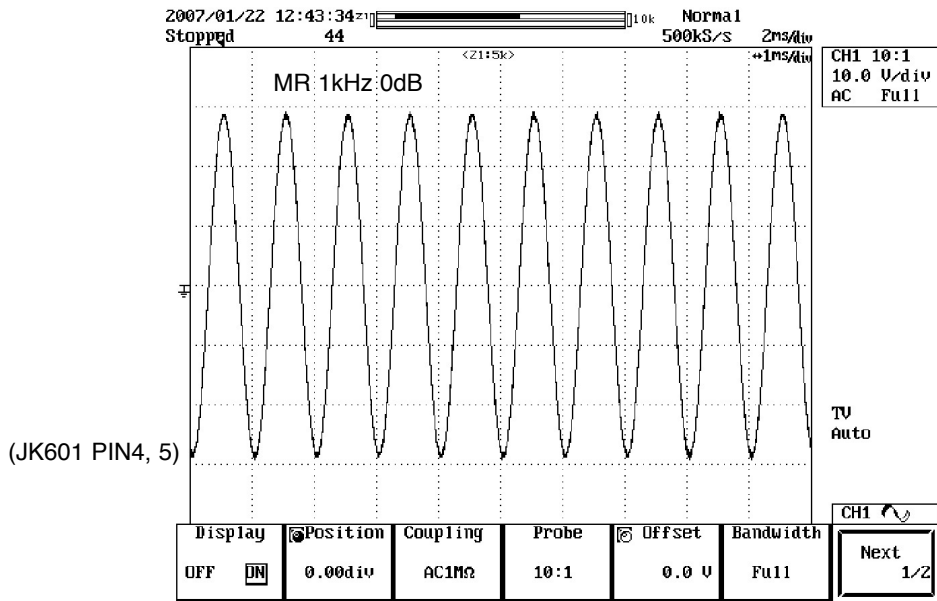


FIG 9-1

### 2) Audio related Signal

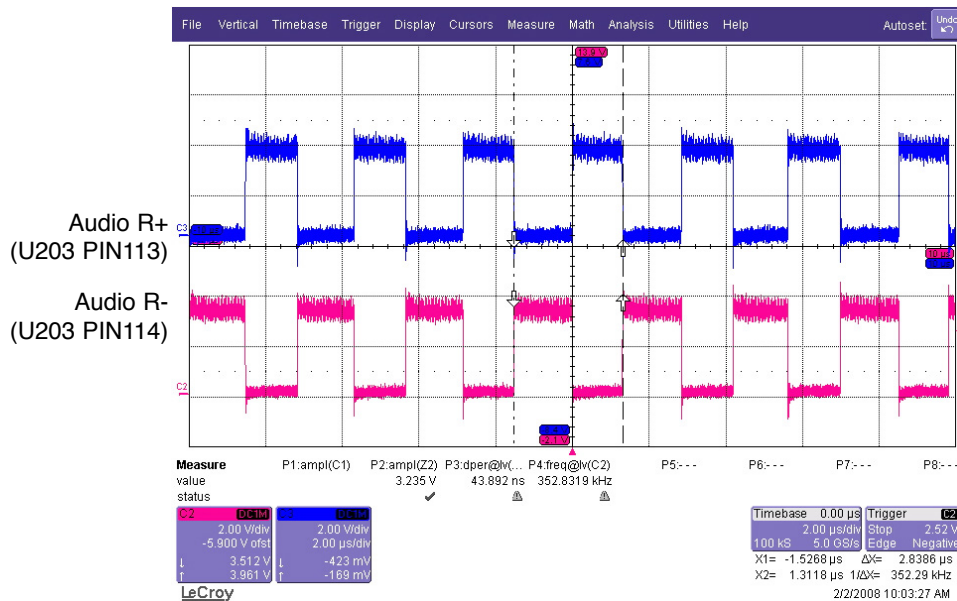
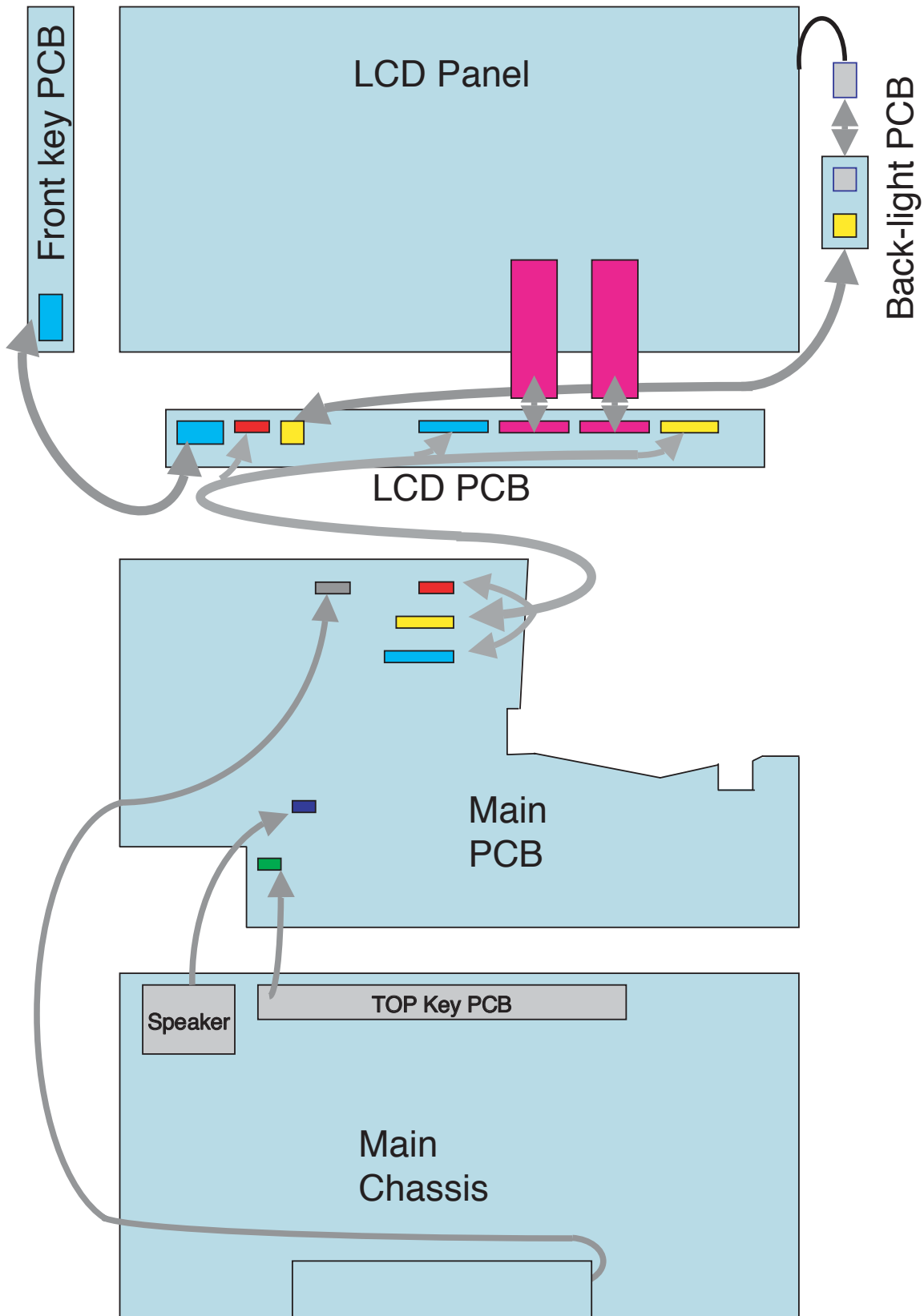


FIG 9-2

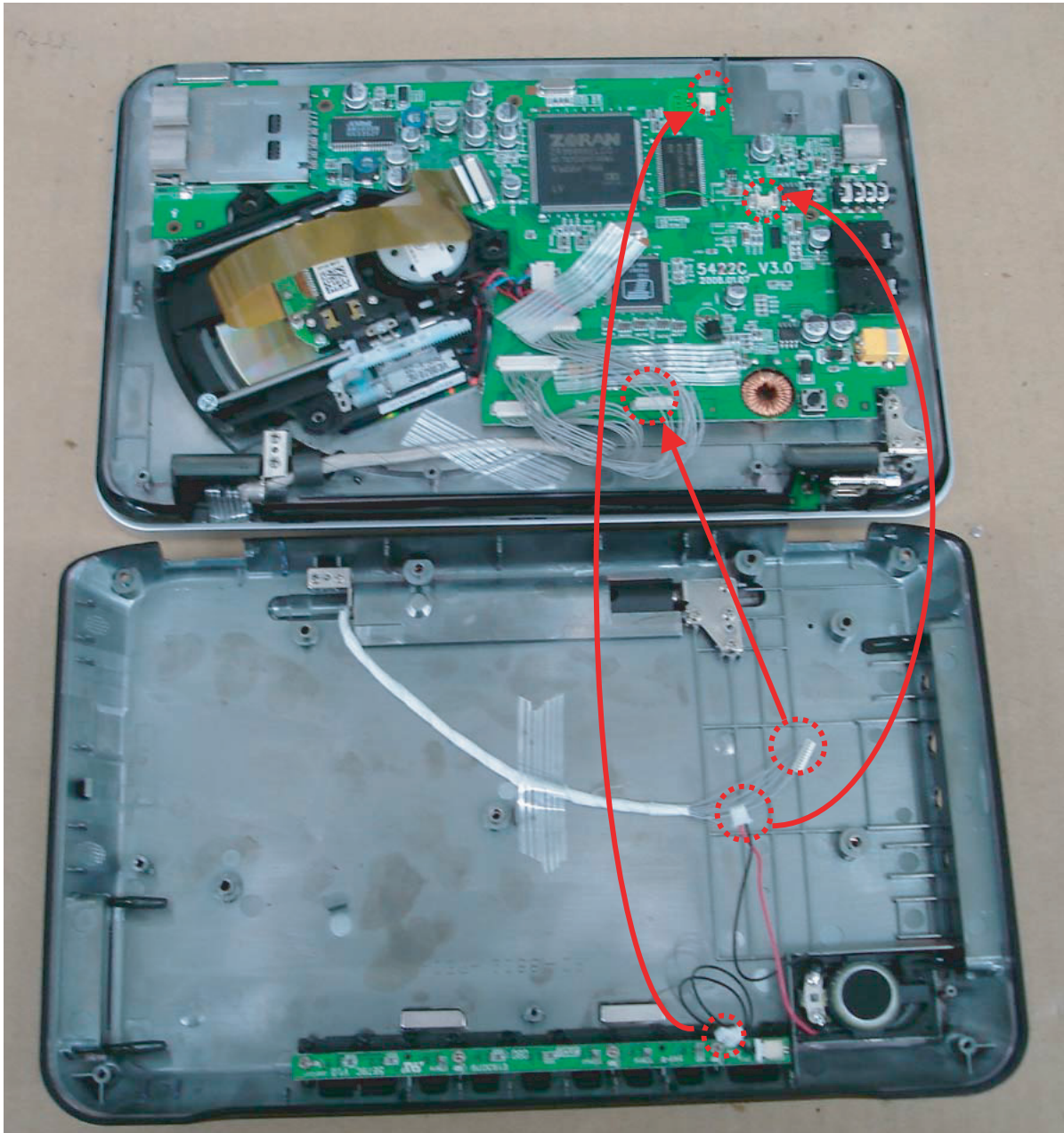


# WIRING CONNECTION DIAGRAMS

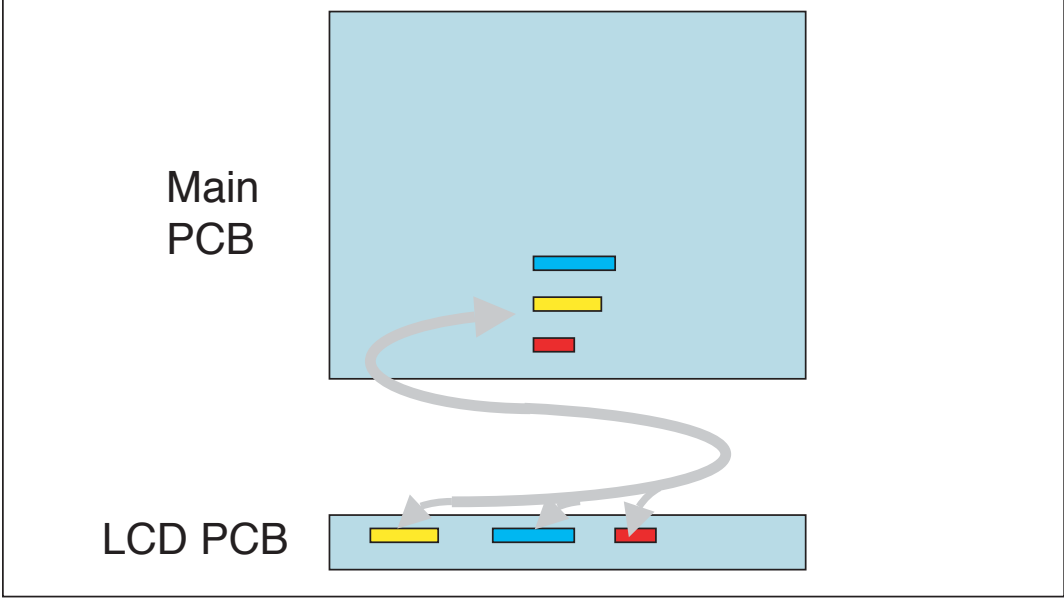
## 1. OVERALL CONNECTION LAYOUT DIAGRAM



## 2. WIRING CONNECTION DIAGRAM-1 (MAIN PCB <--> KEY PCB, Battery, Speaker)



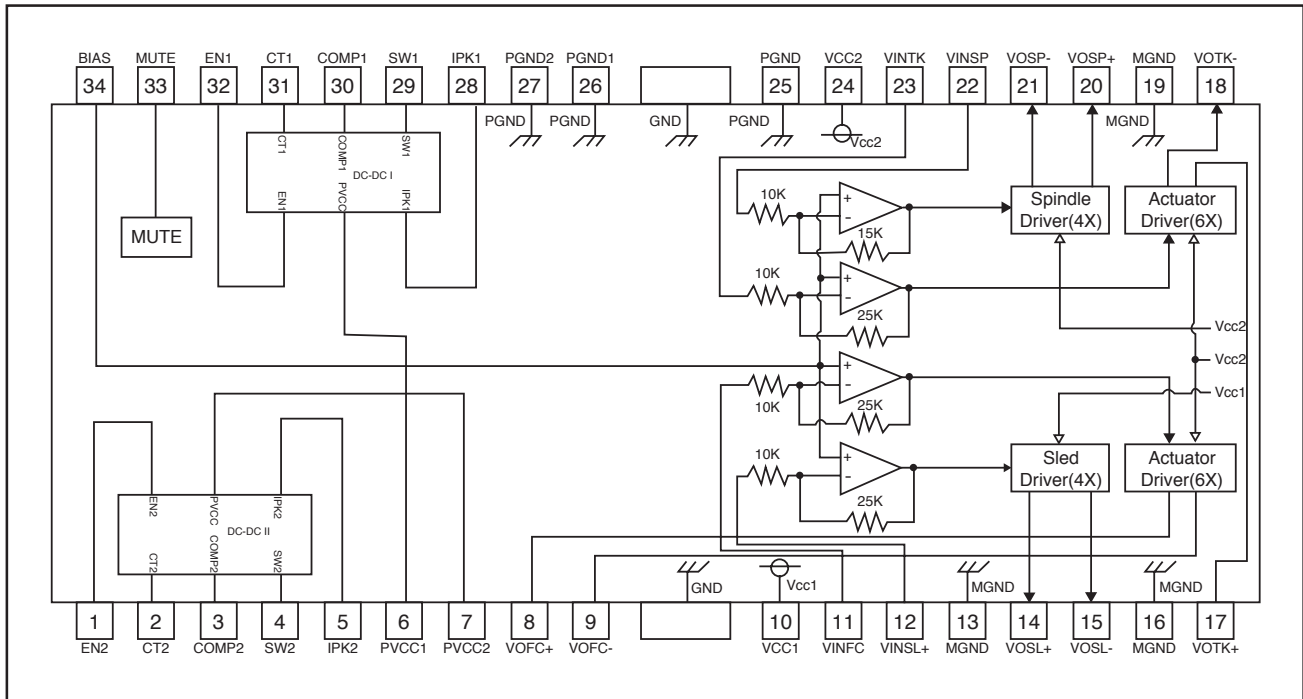
### 3. WIRING CONNECTION DIAGRAM-2 (MAIN PCB <---> LCD PCB)



# INTERNAL BLOCK DIAGRAM OF ICs

## 1. MOTOR DRIVE IC(AM5898N)

### 1-1. Block Diagram



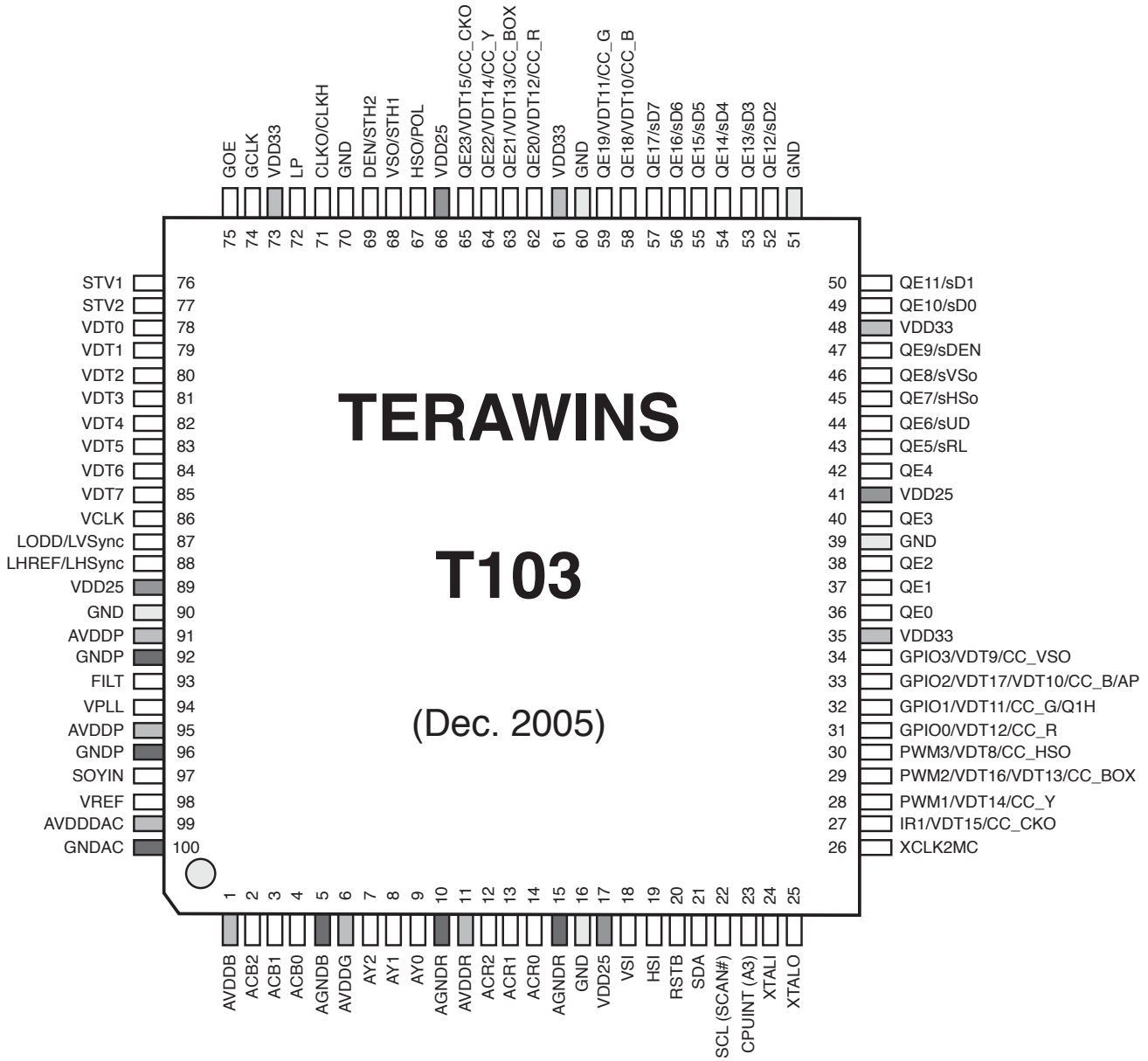
## 1-2. Pin Description

Pin No.	Pin Name	Function
1	EN2	Enable pin for buck converter 2
2	CT2	Timing capacitor input 2
3	COMP2	Comparator inverting input 2
4	SW2	Switching output 2
5	IPK2	Current sense 2
6	PVcc1	Vcc for step down converter 1
7	PVcc2	Vcc for step down conveter 2
8	VOFC+	Focus driver output (+)
9	VOFC-	Focus driver output (-)
10	Vcc1	Vcc for power block of sled
11	VINFC	Input for focus driver
12	VINSL+	Input for the sled driver
13	MGND	Ground for motor driver
14	VOSL+	Sled driver output (+)
15	VOSL-	Sled driver output (-)
16	MGND	Ground for motor driver
17	VOTK+	Tracking driver output (+)
18	VOTK-	Tracking driver output (-)
19	MGND	Ground for motor driver
20	VOSP+	Spindle driver output (+)
21	VOSP-	Spindle driver output (-)
22	VINSP	Input for spindle driver
23	VINTK	Input for tracking driver
24	Vcc2	Vcc for power block of spindle, tracking and focus
25	PGND	Ground for analog ground
26	PGND1	Ground for step down converter 1
27	PGND2	Ground for step down converter 2
28	IPK1	Current sense 1
29	SW1	Switching output 1
30	COMP1	Comparator inverting input 1
31	CT1	Timing capacitor input 1
32	EN1	Enable pin for buck converter 1
33	MUTE	Input for mute control
34	BIAS	Input for reference voltage

Notes) Symbol of + and - (output of drivers) means polarity to input pin.  
 (For example, if voltage of pin10 is high, pin11 is high.)

## 2. LCD DRIVE IC(T103)

### 2-1. Pin Assignment



## 2-2. Pin Description

Symbol	Pin#	Type	Description
<b>Power Supplies</b>			
VDD25	17, 41, 66, 89	PWR	+2.5V digital core power supply
VD33	35, 48, 61, 73	PWR	+3.3V digital output power supply
GND	16, 39, 51, 60, 70, 90	GND	Digital ground
AVDDB	1	PWR	+3.3V analog power supply for ADC channel 2
AVDDG	6	PWR	+3.3V analog power supply for ADC channel 1
AVDDR	11	PWR	+3.3V analog power supply for ADC channel 0
AVDDP	91, 95	PWR	+3.3V analog power supply for PLL
AVDDDAC	99	PWR	+3.3V analog power supply for voltage slicer
AGNDB	5	GND	Anlog ground for ADC channel 2
AGNDG	10	GND	Anlog ground for ADC channel 1
AGNDR	15	GND	Anlog ground for ADC channel 0
GNDP	92, 96	GND	Anlog ground for PLL
GNDAC	100	GND	Anlog ground for voltage slicer
<b>TTL Output Interface Signals</b>			
QE0~QE23	36~38, 40, 42~47, 49, 50 52~59, 62~65	DIO, P/D	TTL Output Data : 1. for 8-bit panel: QE[23:16]=R-channel; QE[15:8]=G-channel; QE[7:0]=B-channel 2. for 6-bit panel: QE[17:12]=R-channel; Qe[11:6]=G-channel; QE[5:0]=B-channel; and the QE[23:18] are reserved for other interfaces
HSO	67	DIO, P/D	Horizontal synchronization output control signal
VSO	68	DIO, P/D	Vertical synchronization output control signal
DEN	69	DIO, P/D	Horizontal output data enable signal
CLKO	71	DIO, P/D	Output dot clock
<b>Timing Controller Interface Signals</b>			
POL	67	DIO, P/D	Source driver start pulse
STH1	68	DIO, P/D	Source driver start pulse
INVO/STH2	69	DIO, P/D	Source driver start pulse
LP	72	DIO, P/D	Latch pulse for column driver
GCLK	74	DIO, P/D	Gate driver clock
GOE	75	DIO, P/D	Gate driver output enable
STV1	76	DIO, P/D	Gate driver start pulse
STV2	77	DIO, P/D	Gate driver start pulse
<b>Serial RGB Output Interface Signals</b>			
sRL	43	DIO, P/D	Right/Left control
sUD	44	DIO, P/D	Up/Down control
sHSo	45	DIO, P/D	sPanel_HSync
sVSo	46	DIO, P/D	sPanel_VSync
sDEN	47	DIO, P/D	sPanel_DEN
sD0~sD7	49~50, 52~57	DIO, P/D	sPanel_Data
CLKO	71	DIO, P/D	sPanel clock

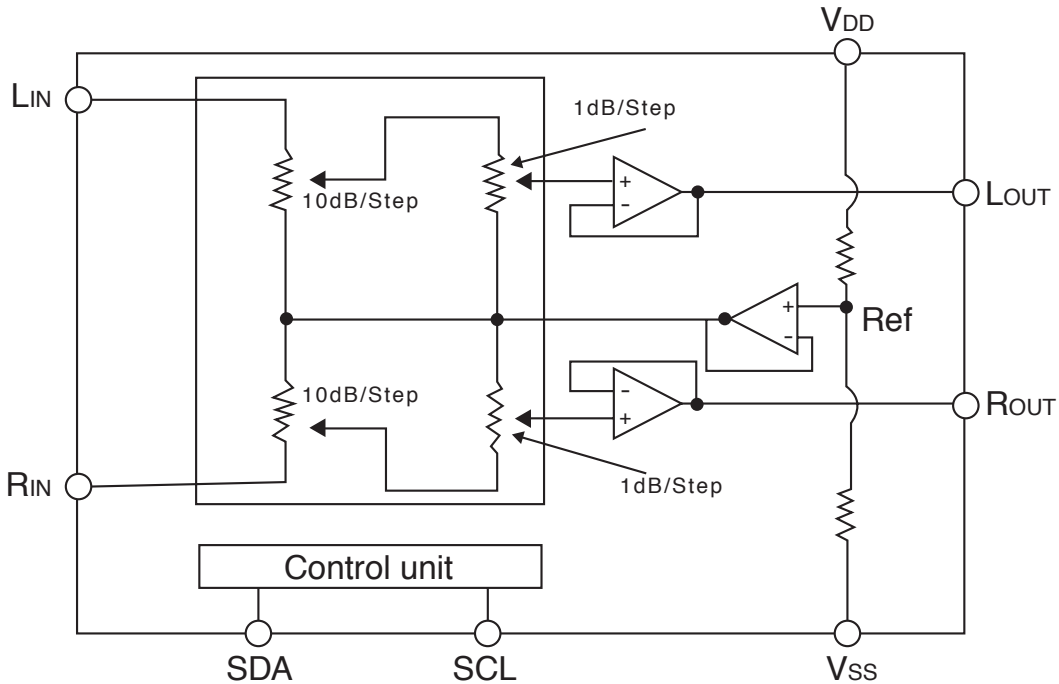
Symbol	Pin#	Type	Description
<b>Configuration Interface Signals</b>			
SCL (SCANB)	22	DI, P/U	2-wire serial bus clock. Power down does not affect SCL. This pin should be high when RSTB asserted for entering scan test mode.
SDA	21	DIO, P/U	2-wire serial bus data. Power down does not affect SDA.
CPUINT (A3)	23	DIO	Internal Interrupt. This pin is a reset strap pin I <sup>2</sup> C device address. When RSTB goes high, if this pin is high, then default I <sup>2</sup> C device address is 50h, else 40h.
RSTB	20	DI, P/U	Whole chip reset.
<b>ADC Interface</b>			
ACB2	2	AI	Analog input 2 of channel 2
ACB1	3	AI	Analog input 1 of channel 2
ACB0	4	AI	Analog input 0 of channel 2
AY2	7	AI	Analog input 2 of channel 1
AY1	8	AI	Analog input 1 of channel 1
AY0	9	AI	Analog input 0 of channel 1
ACR2	12	AI	Analog input 2 of channel 0
ACR1	13	AI	Analog input 1 of channel 0
ACR0	14	AI	Analog input 0 of channel 0
VSI	18	DI	RGB Vertical synchronous input
HSI	19	DI	RGB Horizontal synchronous input
<b>PLL and Slicer Interface</b>			
FILT	93	AI	PLL filler
VPLL	94	AI	PLL reference
SOYIN	97	AI	Sync on Y (of component) input
VREF	98	AI	Voltage reference
<b>ITU-R656 Video-In Interface</b>			
VDT0~7	78~85	DI, P/D	Video data port of ITU-656 or 8-bit 601
VCLK	86	DI, P/D	Video clock of ITU-656 or 8-bit 601
<b>CCIR-601 8-bits Video-In Interface</b>			
VDT0~7	78~85	DI, P/D	Video data port of 8-bit 601
VCLK	86	DI, P/D	Video clock of 8-bit 601
LODD/LVSYNC	87	DI, P/D	ITU-601 Odd or VSync input
LHREF/LHSYNC	88	DI, P/D	ITU-601 HREF(HDE) or HSync input
<b>CCIR-601 16-bits Video-In Interface</b>			
VDT0~7	78~85	DI, P/D	Video data LSB port of 16-bit 601
VDT8~15	30, 34~31, 29~27	DIO, P/D	Video data MSB port of 16-bit 601 when panel is TTL 8 bits
VDT8~15	30, 34, 58~59 62~65	DIO, P/D	Video data MSB port of 16-bit 601 when panel is TTL 6 bits or sPanel
VCLK	86	DI, P/D	Video clock of 16-bit 601
LODD/LVSYNC	87	DI, P/D	ITU-601 Odd or VSync input
LHREF/LHSYNC	88	DI, P/D	ITU-601 HREF(HDE) or HSync input



Symbol	Pin#	Type	Description
<b>RGB565 Video-In Interface</b>			
B0~B4	78~82	DI, P/D	Video data color-B port of RGB565
G0~G4	83~85, 30, 34	DIO, P/D	Video data LSB color-G port of RGB565
G5	33	DIO, P/D	Video data MSB color-G port of RGB565 when panel is TTL 8 bits
G5	58	DIO, P/D	Video data MSB color-G port of RGB565 when panel is TTL 6 bits or sPanel
R0~R4	32~31, 29~27	DIO, P/D	Video data color-R port of RGB565 when panel is TTL 8 bits
R0~R4	59, 62~65	DIO, P/D	Video data color-R port of RGB565 when panel is TTL 6 bits or sPanel
VCLK	86	DI, P/D	Video clock of RGB565
LODD/LVSYNC	87	DI, P/D	RGB565 Odd or VSync input
LHREF/LHSYNC	88	DI, P/D	RGB565 HREF(HDE) or HSync input
<b>RGB666 Video-In Interface</b>			
B0~B4	78~83	DI, P/D	Video data color-B port of RGB666
G0~G5	84~85, 30, 34, 58~59	DIO, P/D	Video data color-G port of RGB666 (allowable only when panel is TTL 6 bits or sPanel)
R0~R5	62~65, 29, 33	DIO, P/D	Video data color-R port of RGB666 when panel is TTL 6 bits or sPanel
VCLK	86	DI, P/D	Video clock of RGB666
LODD/LVSYNC	87	DI, P/D	RGB666 Odd or VSync input
LHREF/LHSYNC	88	DI, P/D	RGB666 HREF(HDE) or HSync input
<b>PLL Reference Clock</b>			
XTALI	24	DI	Output PLL reference clock input and I <sup>2</sup> C, timer operating clock
XTALO	25	DO	Output PLL reference clock output
XCLK2MC	26	DO	Buffered XTALI for external microprocessor.
<b>PWM, GPIO and IR Interface Signals</b>			
PWM1~3	28~30	DIO, P/D	Pulse width modulation 1~3 for backlight control / volume / ...
GPIO0~2	31~33	DIO, P/D	GPIO port 0~2
GPIO3	34	DIO, P/U	GPIO port 3
IRIN	27	DIO, P/U	Infra Red decoder input
<b>CC/Ext_OSD Mixer Interface Signals</b>			
CC_Y/R/G/B, CC_BOX	28, 31~33, 29	DIO, P/D	The input color and the active window (BOX) of closed caption or external OSD Mixer when (panel is TTL 8 bits and digital video input is ITUR656 or CCIR601_8 bits) or (panel is TTL 6 bits and digital video input is CCIR601_16 bits or RGB565)
CC_Y/R/G/B, CC_BOX	64, 62, 59~58, 63	DIO, P/D	The input color and the active window (BOX) of closed caption or external OSD Mixer when panel is TTL 6 bits and or sPanel digital video input is ITUR656 or CCIR601_8 bits
CC_HSO, CC_VSO	30, 34	DIO, P/D	Position reference output for closed caption or external OSD
CC_CKO	27	DIO, P/D	Operation clock output for closed caption or external OSD when panel is TTL 8 bits and digital video input is ITUR656 or CCIR601_8 bits
CC_CKO	65	DIO, P/D	Operation clock output for closed caption or external OSD when (panel is TTL 6 bits or sPanel) and (digital video input is ITUR656 or CCIR601_8 bits)

### 3. VOLUME CONTROLLER IC(PT2257)

#### 3-1. Block Diagram

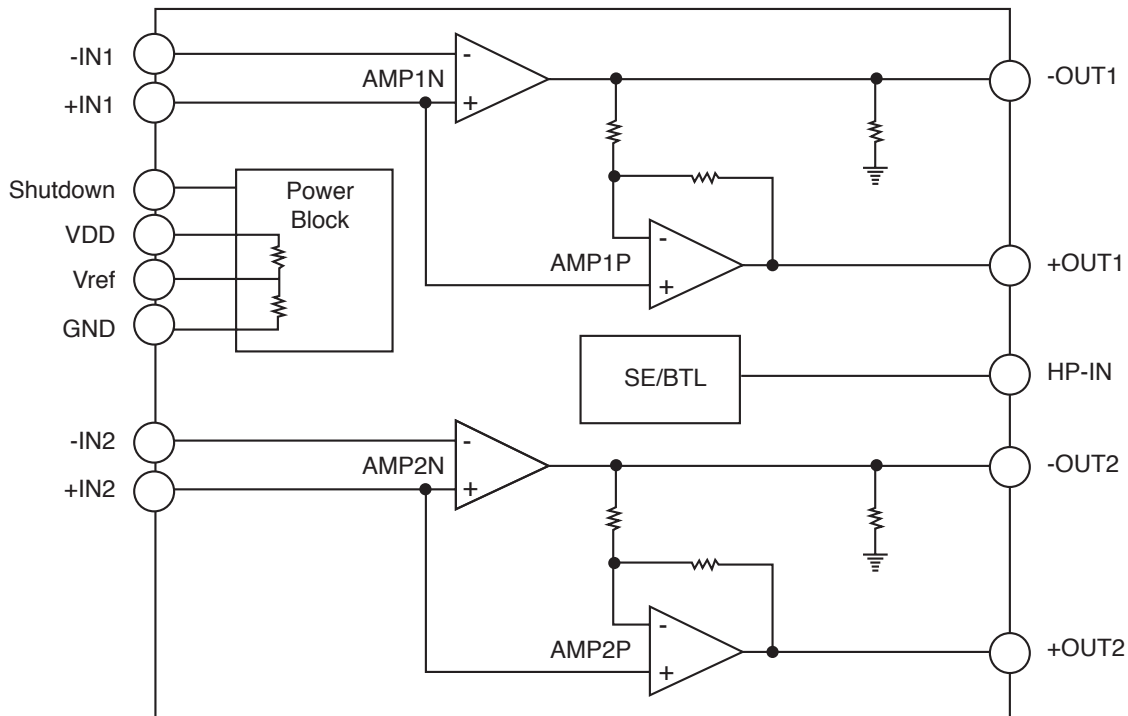


#### 3-2. Pin Description

Pin Name	I/O	Description	Pin No.
L <sub>IN</sub>	I	Left Input Channel Connect a Capacitor to Audio Source	1
L <sub>OUT</sub>	O	Left Output Channel Connect a Capacitor to Audio Output	2
V <sub>SS</sub>	-	Ground	3
SDA	I	I <sup>2</sup> C Data Input	4
SCL	I	I <sup>2</sup> C Clock Input	5
V <sub>DD</sub>	-	Power Supply	6
R <sub>OUT</sub>	O	Right Output Channel Connect a Capacitor to Audio Output	7
R <sub>IN</sub>	I	Right Input Channel Connect a Capacitor to Audio Source	8

## 4. SPEAKER AMP IC(PT2303)

### 4-1. Block Diagram

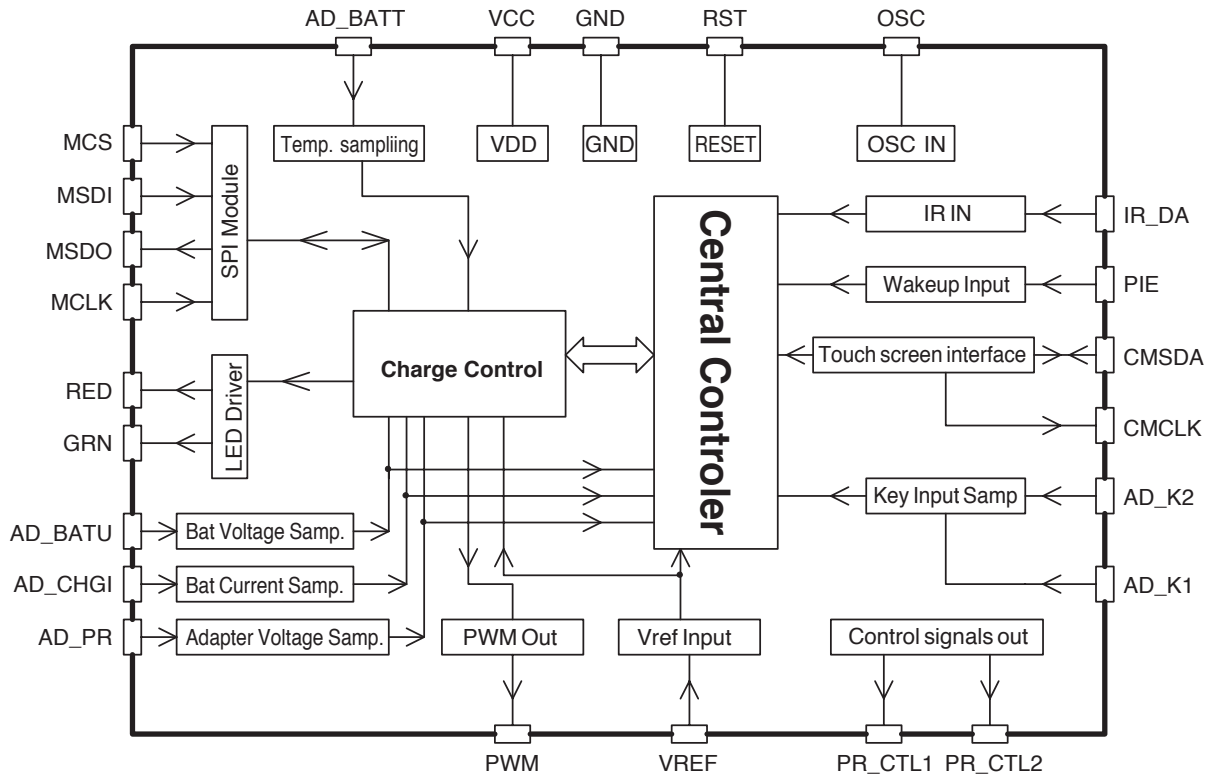


### 4-2. Pin Description

Pin Name	I/O	Description	Pin No.	
			16 Pins	20 Pins
Shutdown	I	Shutdown pin • Entire IC into the shutdown mode when this pin connected to the Vcc.	1	1
GND	-	Ground	2	2
+OUT1	O	Channel 1 output (+)	3	3
VDD	-	Supply voltage input	4	4
-OUT1	O	Channel 1 output (-)	5	5
-IN1	I	Channel 1 input (-)	6	6
GND	-	Ground	7	7
+IN1	I	Channel 1 input (+)	8	8
+IN2	I	Channel 2 input (+)	9	13
Vref	I	Bias reference bypassing	10	14
-IN2	I	Channel 2 input (-)	11	15
-OUT2	O	Channel 2 output (-)	12	16
VDD	-	Supply voltage input	13	17
+OUT2	O	Channel 2 output (+)	14	18
GND	-	Ground	15	19
HP-IN	I	Output mode select, connected to the VDD for SE mode or GND for BTL mode	16	20
NC	-	No Connect	-	9~12

## 5. MICOM IC(GT6319)

### 5-1. Block Diagram

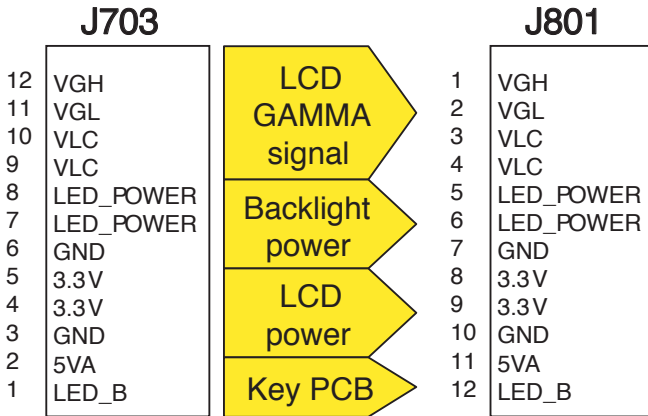
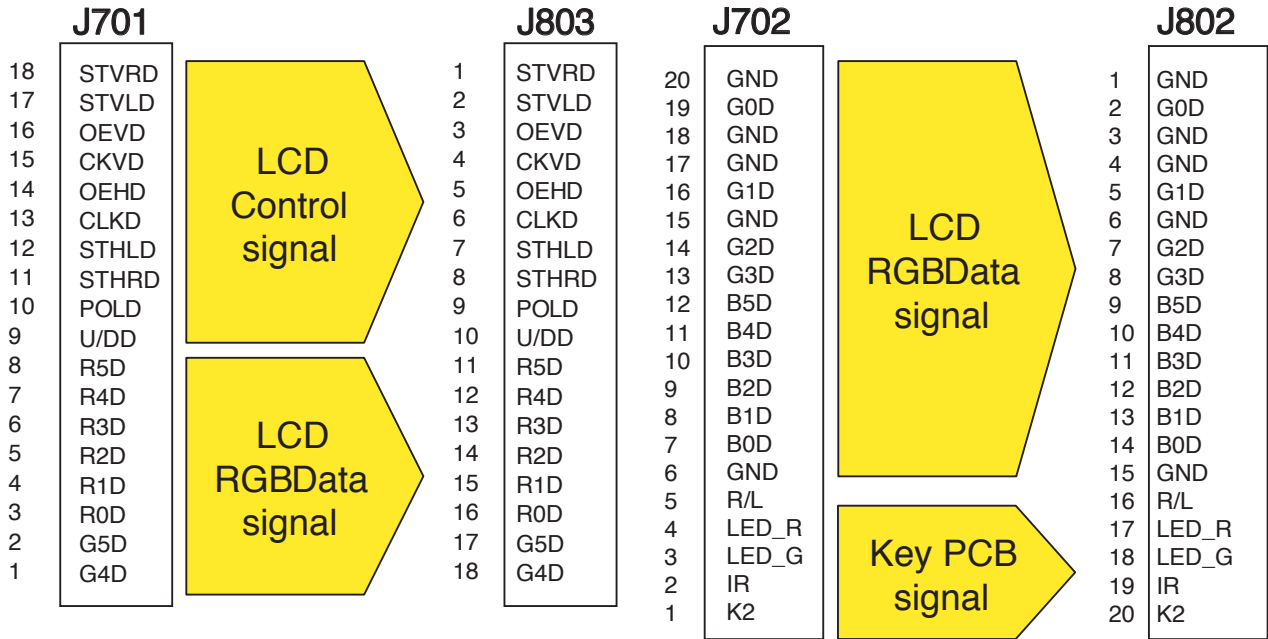


## 5-2. Pin Description

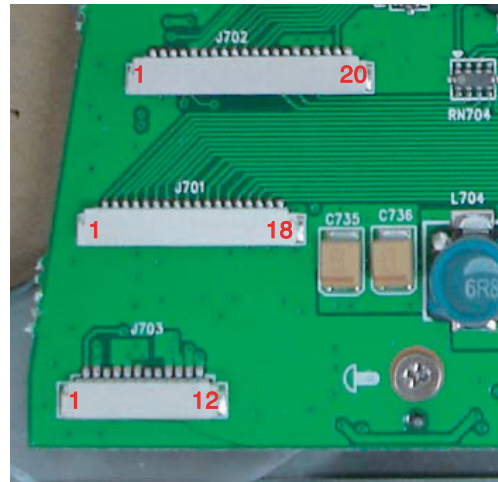
Pin No.	Designation	Description
1	RED	Red led port
2	GRN	Green led port
3	CMSDA	Touch screen interface data line
4	CMCLK	Touch screen interface clock line
5	NC	For expansion
6	MCS	SPI Module CS port
7	PWM	PWM out
8	PR_CTL1	Export control line 1
9	RST	Reset port
10	GND	GND
11	AD_BATU	Battery Voltage sampling port
12	AD_CHGI	Charge current sampling port
13	AD_BATT	Bat temperature sampling port
14	AD_K1	Keypad identification port 1
15	AD_K2	Keypad identification port 2
16	AD_PR	Adapter checking port
17	NC	For expansion
18	NC	For expansion
19	VCC	Chip power
20	OSC	External clock input
21	PR_CTL2	Export control line 2
22	VREF	2.495V Precision reference voltage
23	PIE	Chip sleep awaken port, active falling edge
24	MCLK	SPI Module Clock port
25	MSDO	SPI Module Data out port
26	MSDI	SPI Module Data in port
27	NC	For expansion
28	IR_DA	Infrared input port

# INTERFACE DIAGRAM

## MAIN <--> LCD PCB INTERFACE



Main PCB

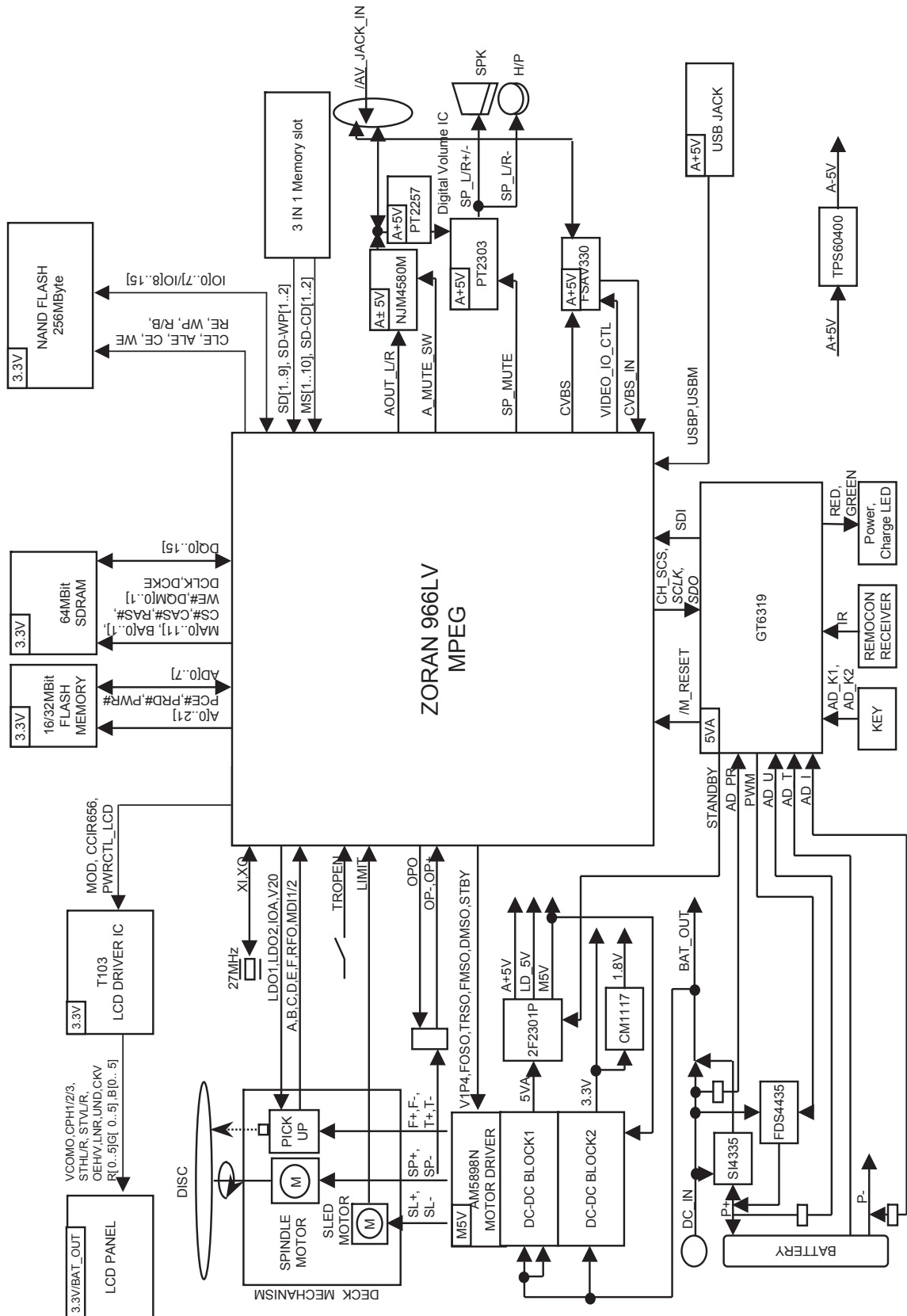


LCD PCB

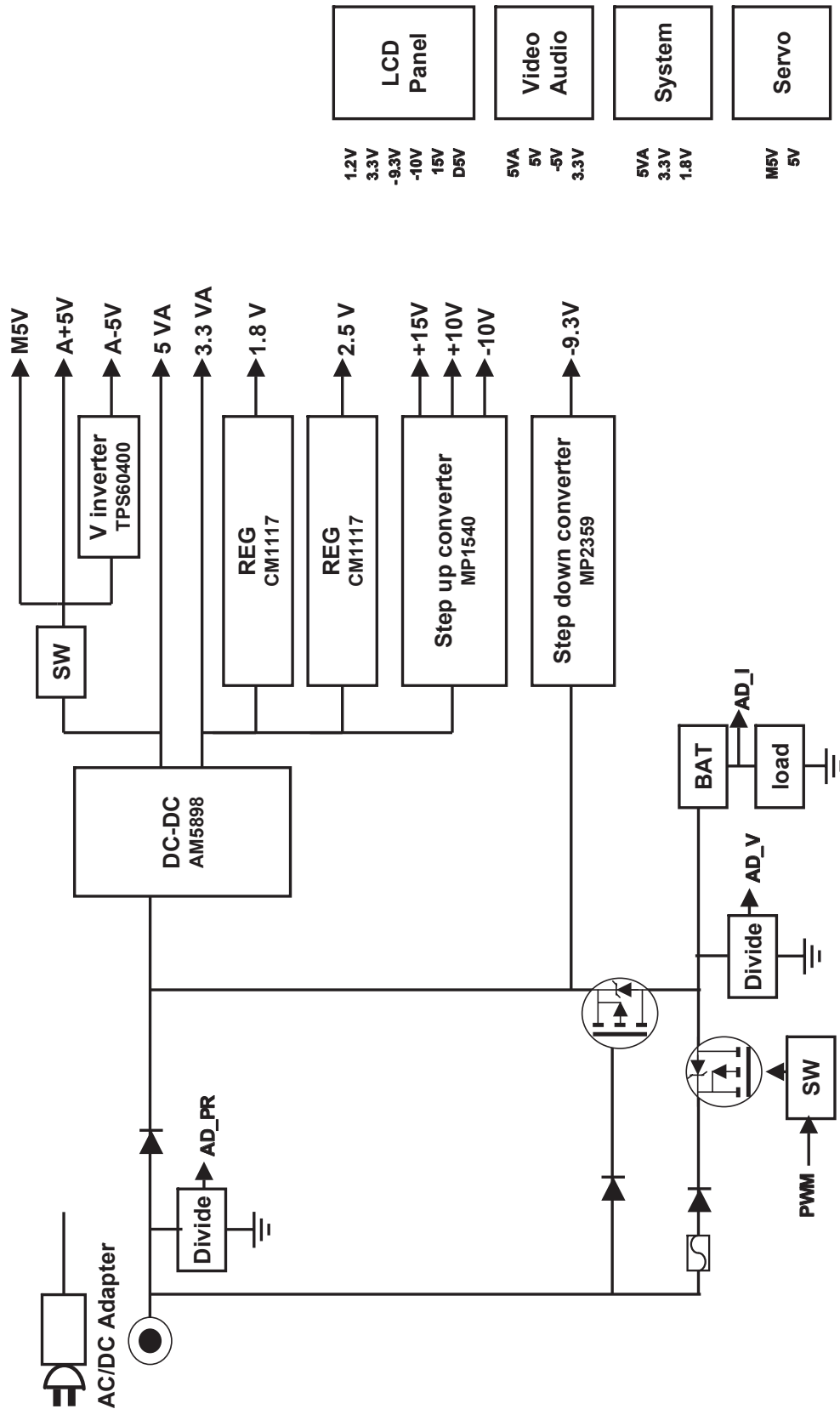


# BLOCK DIAGRAMS

## 1. OVERALL BLOCK DIAGRAM



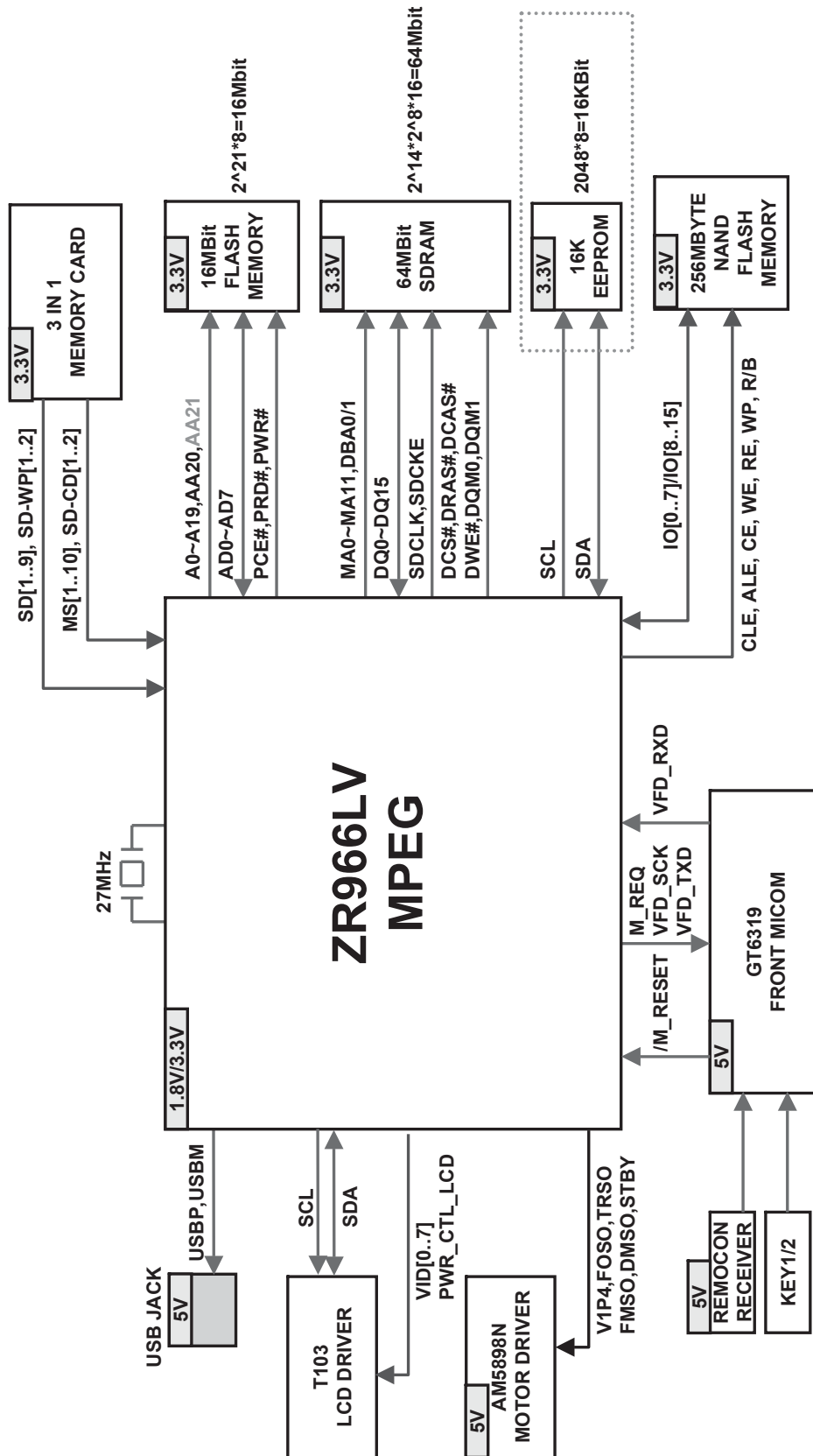
## 2. POWER BLOCK DIAGRAM



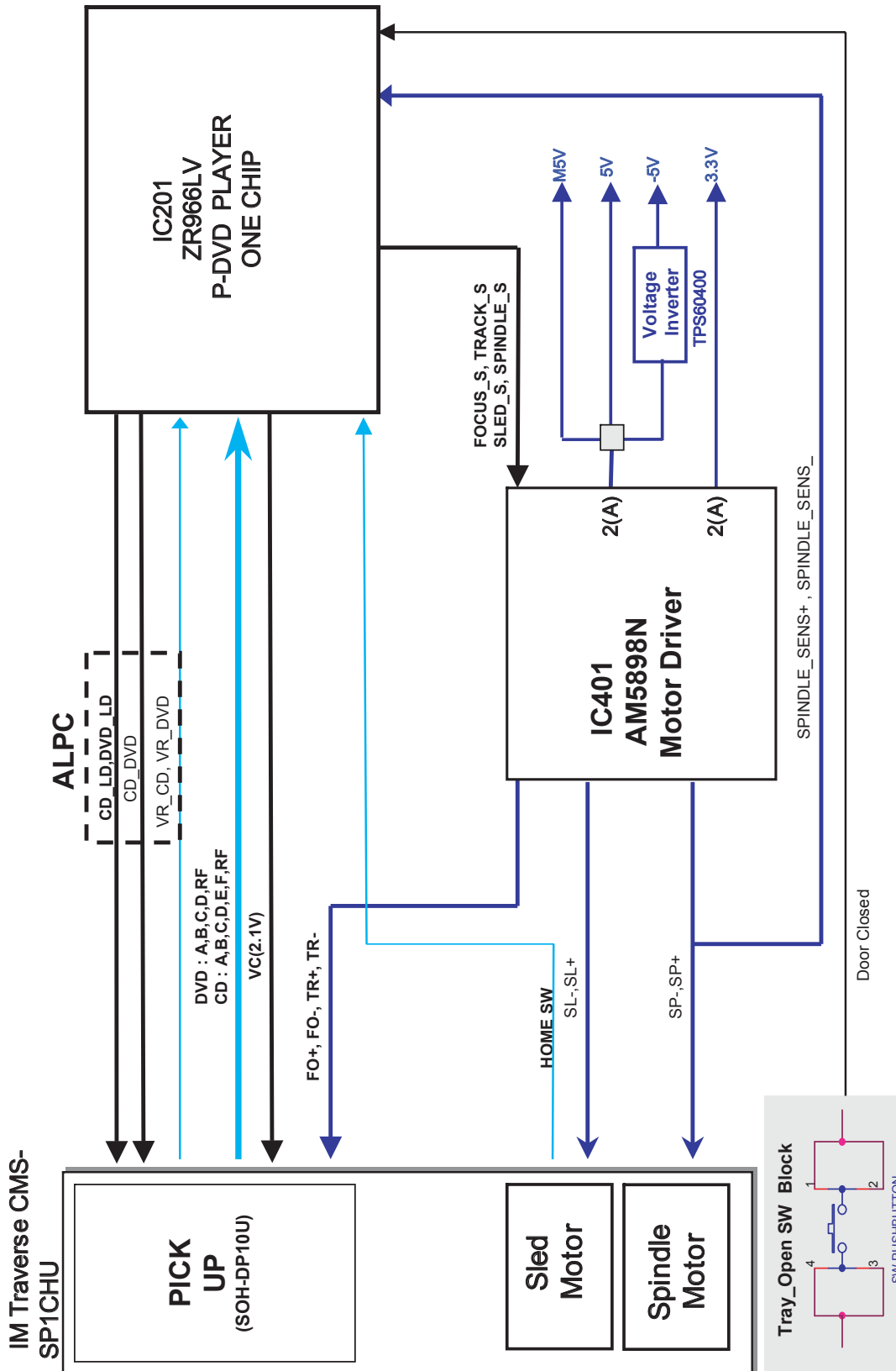
1.2V	3.3V	-9.3V	-10V	15V	D5V	5VA	5V	-5V	3.3V	5VA	3.3V	1.8V	M5V	5V
LCD Panel						Video Audio				System		Servo		



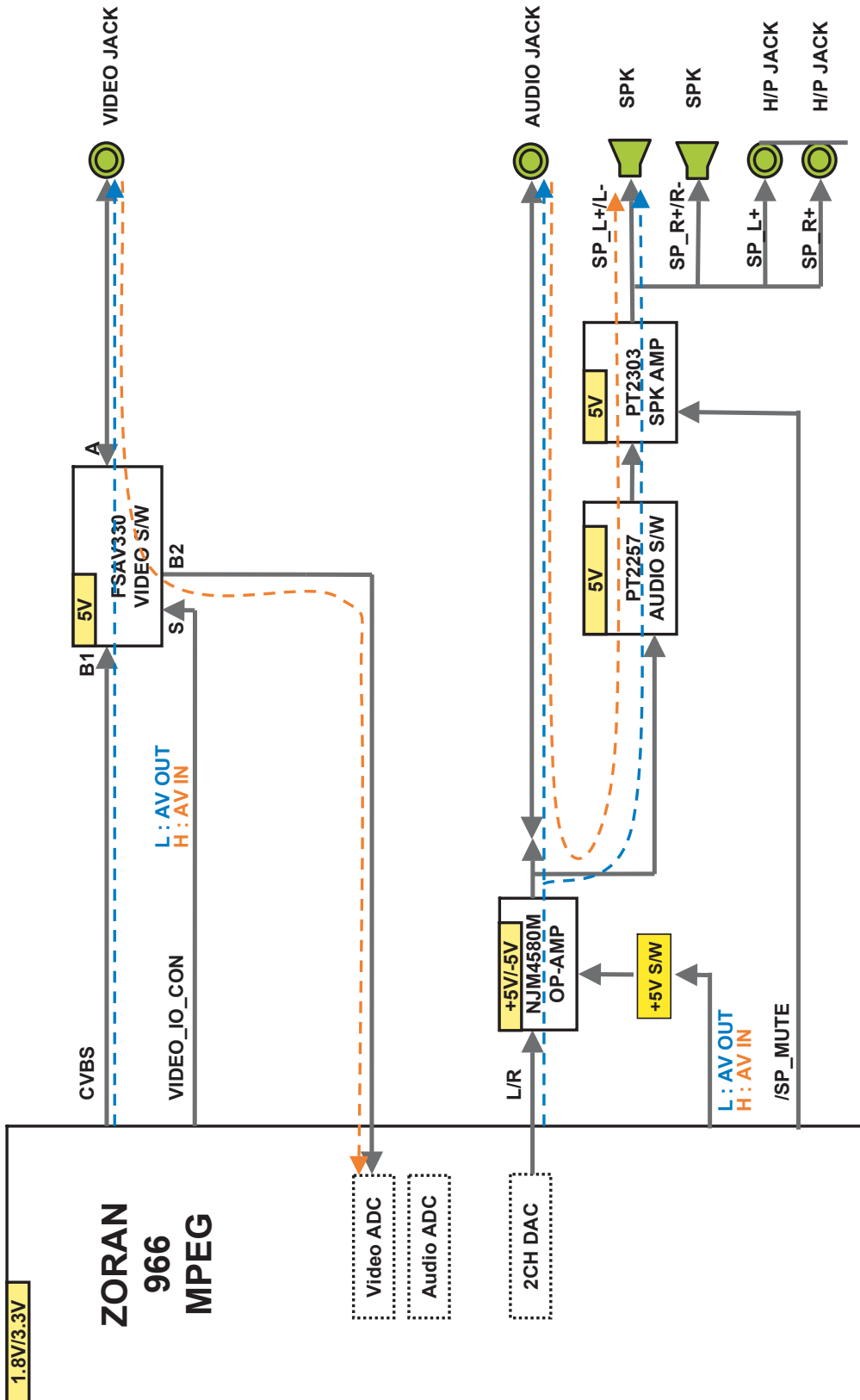
### 3. MPEG BLOCK DIAGRAM



# 4. DISC BLOCK DIAGRAM

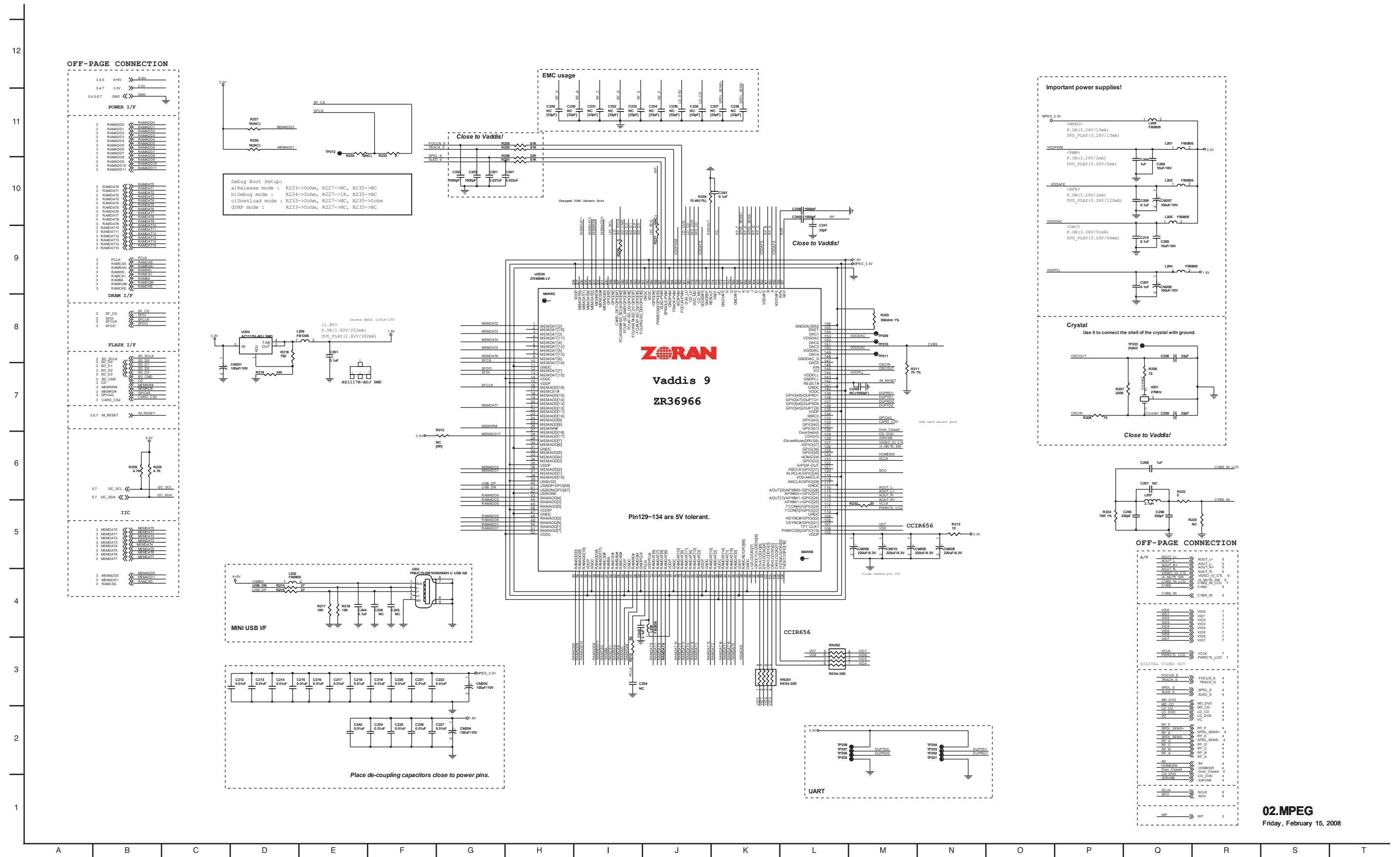


# 5. AV BLOCK DIAGRAM



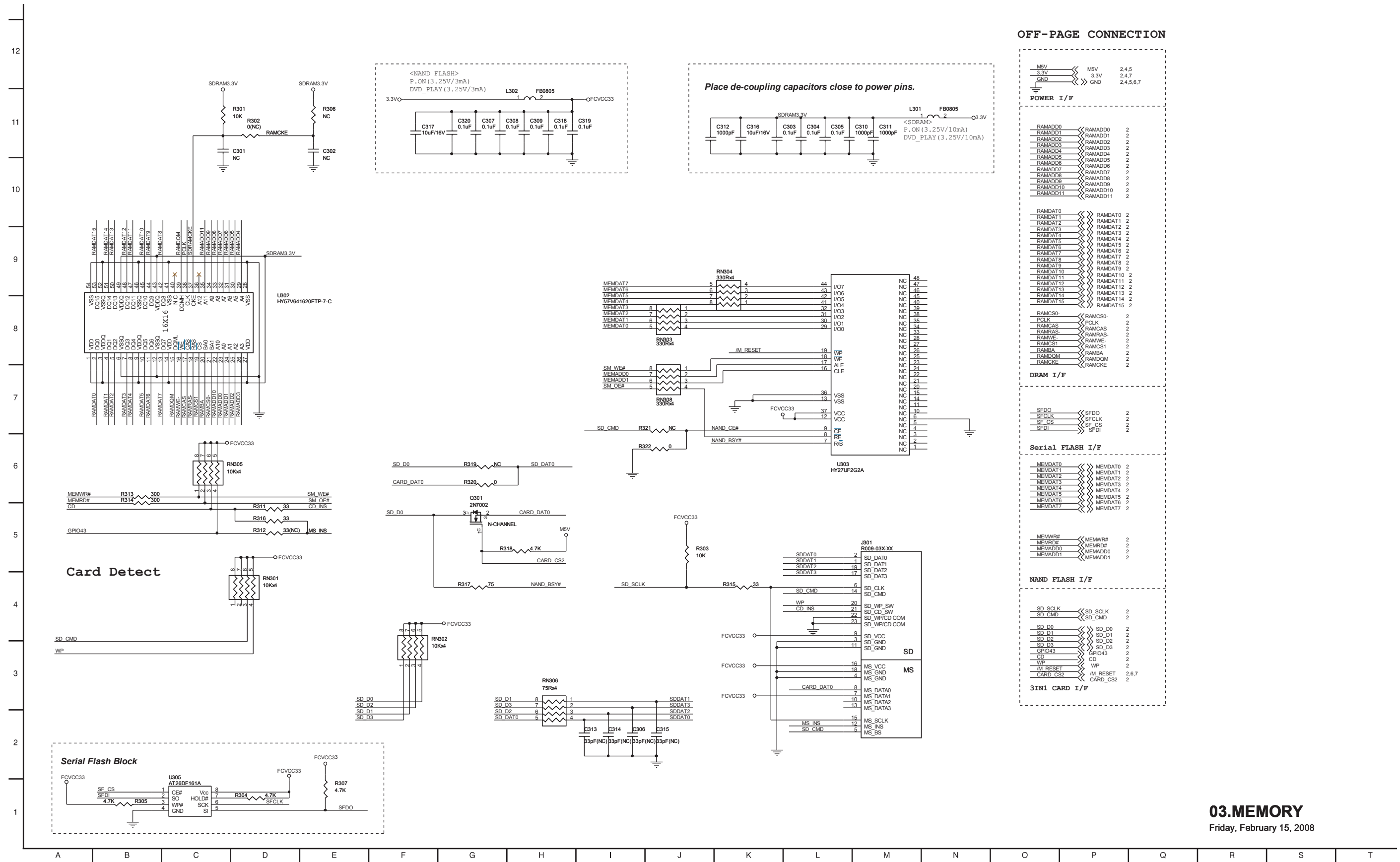
# CIRCUIT DIAGRAMS

## 1. MPEG CIRCUIT DIAGRAM



**02.MPEG**  
Friday, February 15, 2008

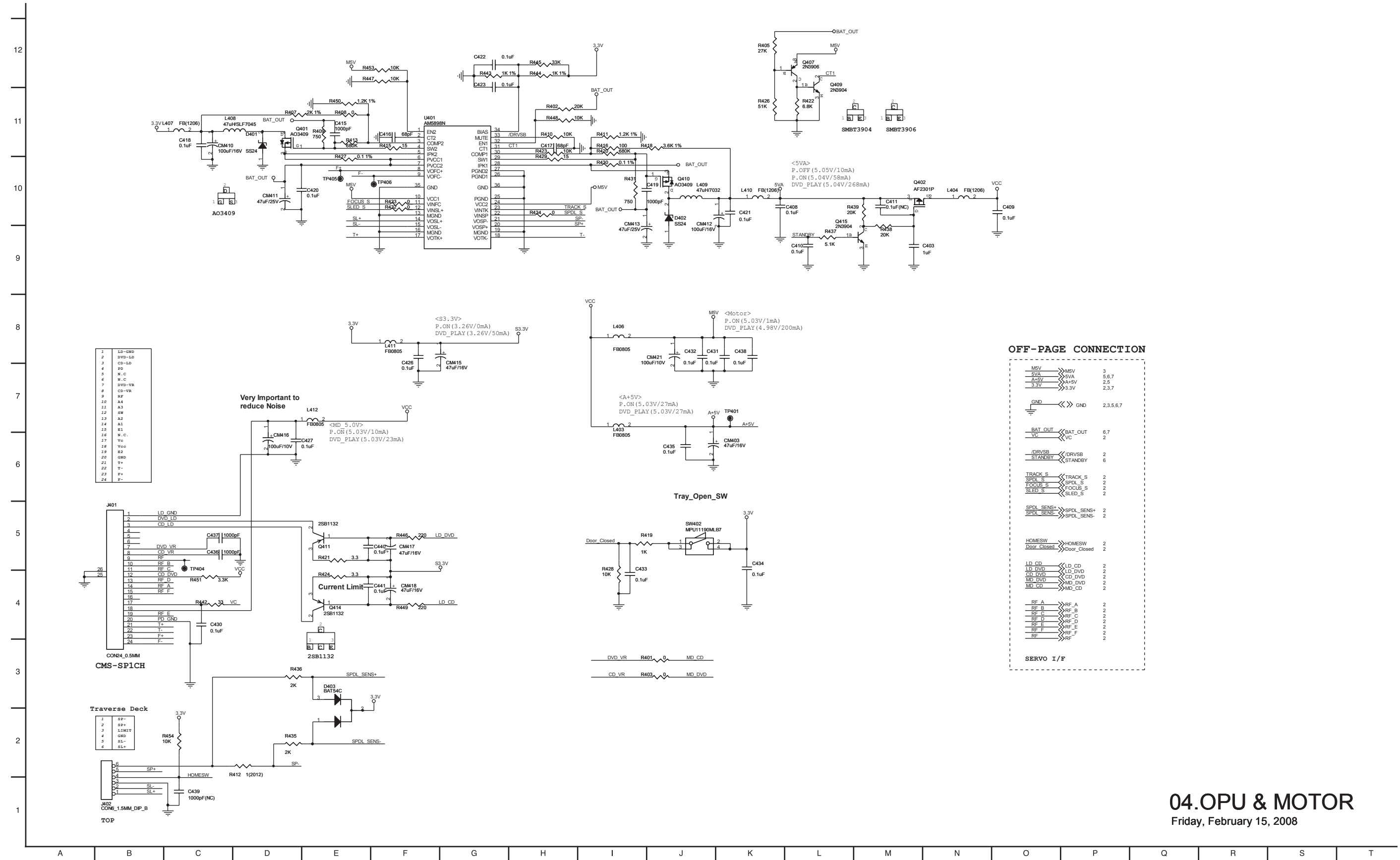
## 2. MEMORY CIRCUIT DIAGRAM



**03.MEMORY**

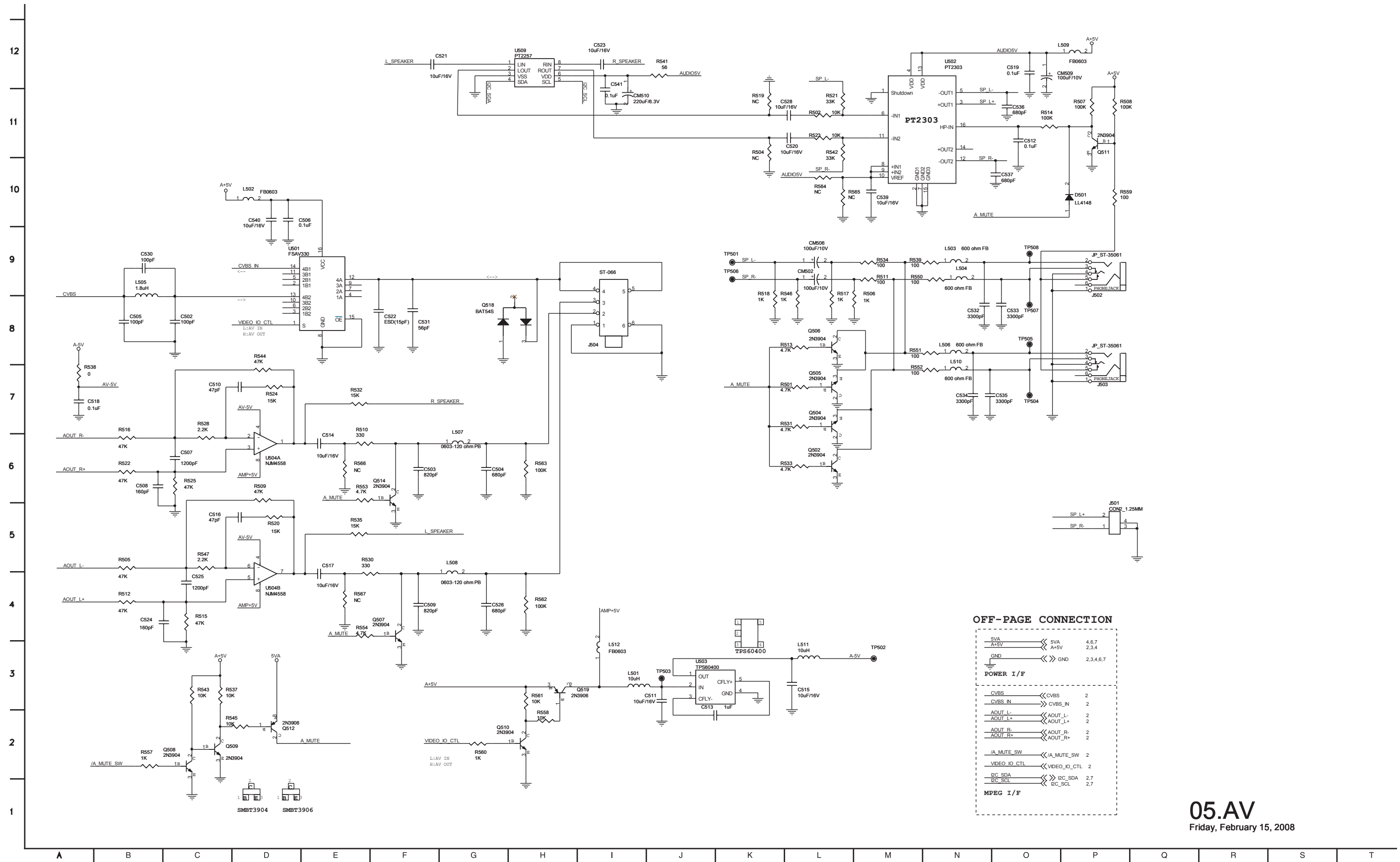
Friday, February 15, 2008

### 3. OPU & MOTOR CIRCUIT DIAGRAM



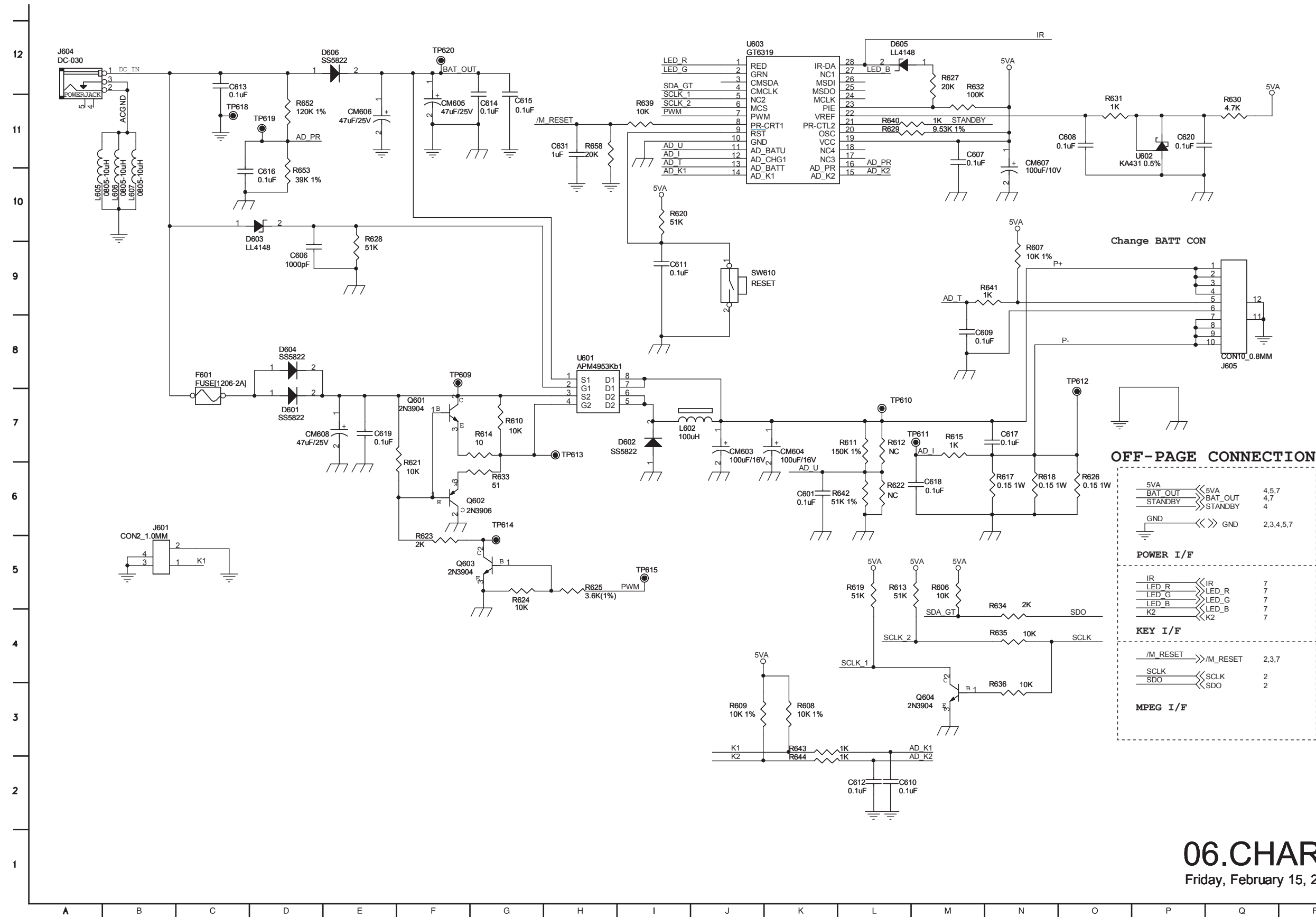
04.OPU & MOTOR  
Friday, February 15, 2008

# 4. AV CIRCUIT DIAGRAM



**05.AV**  
Friday, February 15, 2008

# 5. CHARGE CIRCUIT DIAGRAM

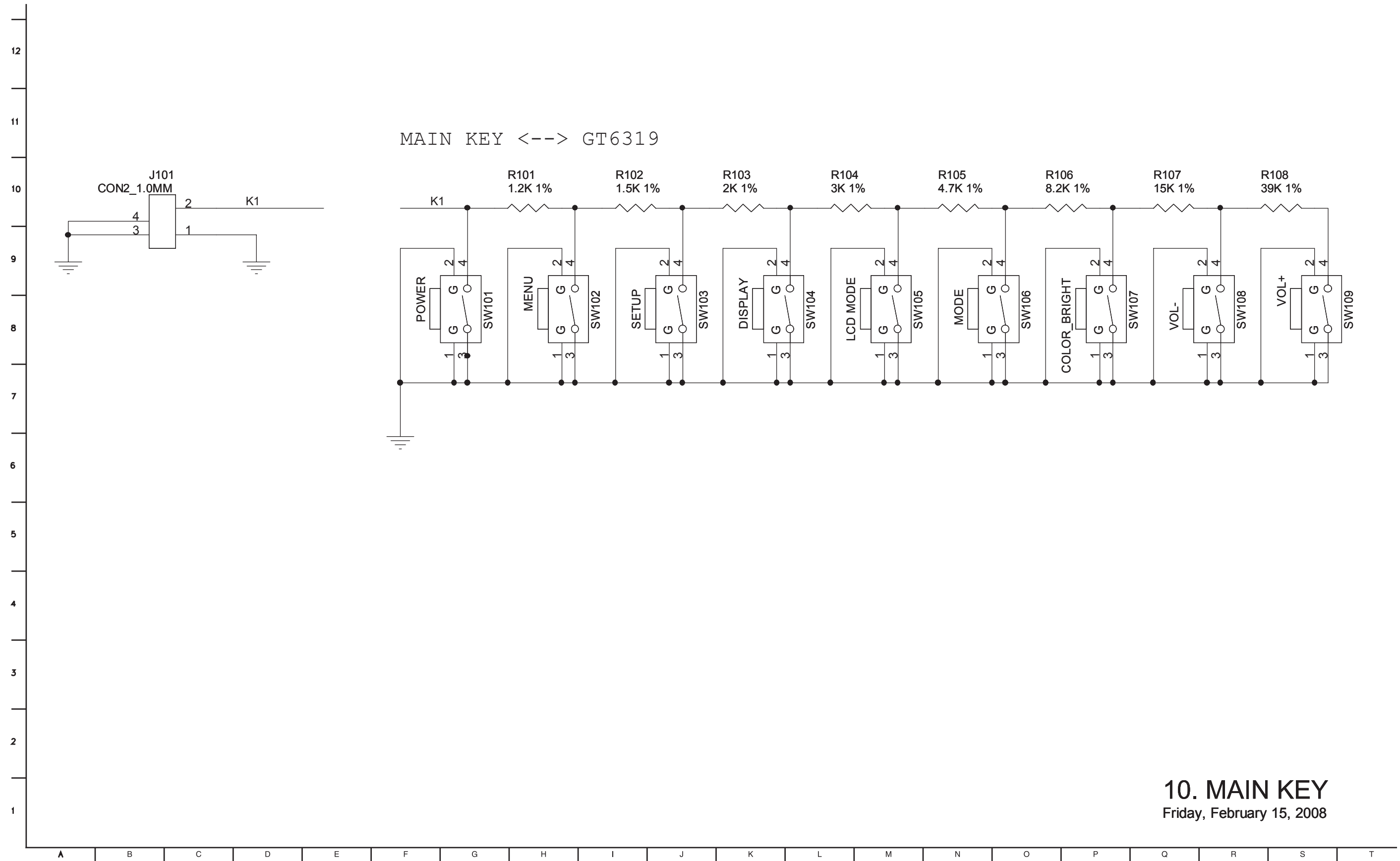


## 06.CHARGE

Friday, February 15, 2008



## 6. MAIN KEY CIRCUIT DIAGRAM



## 10. MAIN KEY

Friday, February 15, 2008

# CIRCUIT VOLTAGE CHART

## 1. IC VOLTAGE CHART

MODE PIN. NO.	PIN NAME	PIN DESCRIPTION	VOLTAGE	SPEC
<b>U201 (ZR966LV)</b>				
14	VDDC	1.8 V Digital core power supply	1.865V	1.7V < Vcc < 1.9V
15	VDDP	3.3 V Digital periphery power supply	3.295V	3.135V < Vpp < 3.465V
35	VDDP	3.3 V Digital periphery power supply	3.295V	3.135V < Vpp < 3.465V
39	VDDUSB	3.3 V USB power supply	3.295V	3.135V < Vpp < 3.465V
46	VDDP	3.3 V Digital periphery power supply	3.295V	3.135V < Vpp < 3.465V
52	VDDC	1.8 V Digital core power supply	1.86V	1.7V < Vcc < 1.9V
56	VDDP	3.3 V Digital periphery power supply	3.295V	3.135V < Vpp < 3.465V
65	VDDP	3.3 V Digital periphery power supply	3.295V	3.135V < Vpp < 3.465V
71	VDDPCLK	3.3 V filtered digital power supply for PCLK	3.295V	3.135V < Vpp < 3.465V
76	VDDP	3.3 V Digital periphery power supply	3.295V	3.135V < Vpp < 3.465V
84	VDDP	3.3 V Digital periphery power supply	3.295V	3.135V < Vpp < 3.465V
88	VDDC	1.8 V Digital core power supply	1.86V	1.7V < Vcc < 1.9V
93	VDDP	3.3 V Digital periphery power supply (208 pin only)	3.295V	3.135V < Vpp < 3.465V
105	VDDP	3.3 V Digital periphery power supply	3.266V	3.135V < Vpp < 3.465V
119	VDDP-A2	3.3 V filtered digital power supply for AMCLK	3.295V	3.135V < Vpp < 3.465V
135	VDDP	3.3 V Digital periphery power supply	3.295V	3.135V < Vpp < 3.465V
140	VDDC	1.8 V Digital core power supply	1.86V	1.7V < Vcc < 1.9V
144	VDDA	1.8 V Power supply for internal PLL circuit	1.86V	1.7V < Vcc < 1.9V
150	VDDDAC	3.3 V Analog power supply for the video DACs	3.295V	3.135V < Vpp < 3.465V
153	VDDDAC	3.3 V Analog power supply for the video DACs	3.296V	3.135V < Vpp < 3.465V
159	VDDAFE	Analog AFE 3.3 V supply	3.291V	3.135V < Vpp < 3.465V
162	VDDAFE	Analog AFE 3.3 V supply	3.29V	3.135V < Vpp < 3.465V
177	VDDSAFE	Analog AFE 3.3 V supply shield	3.29V	3.135V < Vpp < 3.465V
183	VDDPWMS	3.3 V SERVO PWM power supply	3.295V	3.135V < Vpp < 3.465V
190	VDDC	1.8 V Digital core power supply	1.86V	1.7V < Vcc < 1.9V
208	VDDP	3.3 V Digital periphery power supply	3.297V	3.135V < Vpp < 3.465V
<b>U204 (AZ1117HAD)</b>				
2	OUT	OUTPUT VOLTAGE	1.88V	1.7V ~ 1.9V
3	IN	INPUT VOLATAG	3.29V	2.7 V ~ 7V
<b>U302 (HY57V641620ETP-7-C)</b>				
1	VDD	Power supply for internal circuits and input buffers	3.293V	3.0V ~ 3.6V
3	VDDQ	Power supply for outpur buffers	3.295V	3.0V ~ 3.6V
9	VDDQ	Power supply for outpur buffers	3.293V	3.0V ~ 3.6V
14	VDD	Power supply for internal circuits and input buffers	3.294V	3.0V ~ 3.6V
27	VDD	Power supply for internal circuits and input buffers	3.294V	3.0V ~ 3.6V
43	VDDQ	Power supply for outpur buffers	3.294V	3.0V ~ 3.6V
49	VDDQ	Power supply for outpur buffers	3.295V	3.0V ~ 3.6V
<b>U303 (HY27UF2G2A)</b>				
12	VCC	The VCC supplies the power for all the operation	3.29V	2.7V ~ 3.6V
37	VCC	The VCC supplies the power for all the operation	3.29V	2.7V ~ 3.6V
<b>U305 (AT26DF161A)</b>				
8	VCC	Device power supply	3.295V	2.7V ~ 3.6V
<b>U401 (AM5898N)</b>				
6	PVCC1	Vcc for step down converter 1	9.2V	4.5 ~ 16V
7	PVCC2	Vcc for step down converter 2	9.2V	4.5 ~ 16V
10	VCC1	VCC for power block of sled	4.98V	4.3 ~ 13.2V
24	VCC2	VCC for power block of spindle,tracking and focus	4.98V	4.3 ~ 13.2V
<b>U501 (FSAV330)</b>				
16	VCC	supply voltage	4.96V	4.0V ~5.5V
<b>U502 (PT2303)</b>				
4	VDD	Supply voltage input	4.97V	0V ~ 7V
13	VDD	Supply voltage input	4.98V	0V ~ 7V
<b>U503 (TPS60400)</b>				
1	OUT	power supply output with Vo = -Vi	-4.8V	
2	IN	power supply input	4.96V	1.8V ~ 5.25V

MODE PIN. NO.	PIN NAME	PIN DESCRIPTION	VOLTAGE	SPEC
<b>U504 (TJM4558M)</b>				
4	AV-5V	supply voltage	-4.8V	+/- 22V
8	AMP+5V	supply voltage	4.92V	+/- 22V
<b>U509 (PT2257)</b>				
6	Audio5V	supply voltage	4.99V	4V ~ 10V
<b>U603 (GT6319)</b>				
19	VCC	chip power	5.05V	4.5V ~ 5.5V
<b>U701 (T103)</b>				
1	AVDDB	+3.3V analog power supply for ADC channel 2	3.29V	3.0V - 3.3V - 3.6V
6	AVBBG	+3.3V analog power supply for ADC channel 1	3.29V	3.0V - 3.3V - 3.6V
11	AVDDR	+3.3V analog power supply for ADC channel 0	3.29V	3.0V - 3.3V - 3.6V
17	VDD25	+2.5V digital core power supply	2.39V	2.25V - 2.50V - 2.75V
35	VDD33	+3.3V digital output power supply	3.29V	3.0V - 3.3V - 3.6V
41	VDD25	+2.5V digital core power supply	2.39V	2.25V - 2.50V - 2.75V
48	VDD33	+3.3V digital output power supply	3.29V	3.0V - 3.3V - 3.6V
61	VDD33	+3.3V digital output power supply	3.29V	3.0V - 3.3V - 3.6V
66	VDD25	+2.5V digital core power supply	2.39V	2.25V - 2.50V - 2.75V
73	VDD33	+3.3V digital output power supply	3.29V	3.0V - 3.3V - 3.6V
89	VDD25	+2.5V digital core power supply	2.40V	2.25V - 2.50V - 2.75V
91	AVDDP	+3.3V analog power supply for PLL	3.29V	3.0V - 3.3V - 3.6V
95	AVDDP	+3.3V analog power supply for PLL	3.29V	3.0V - 3.3V - 3.6V
99	AVDDDAC	+3.3V analog power supply for Voltage Slicer	3.29V	3.0V - 3.3V - 3.6V
<b>U702 (AZ1117HAD)</b>				
2	OUT	OUTPUT VOLTAGE	2.4V	2.25V ~ 2.75V
3	IN	INPUT VOLATAG	3.29V	2.7 V ~ 7V
<b>U703 (RCR2561)</b>				
5	VIN	Supply Input Bypass to GND with a 1uF capacitor	3.23V	2.5V - - 5.5V
<b>U704 (MP2359)</b>				
5	IN	Supply Voltage. The MP2359 operates from a +4.5V to +24V unregulated input. C1 is needed to prevent large voltage spikes from appearing at the input.	9.15V	4.5V - - 24V

## 2. CAPACITOR VOLTAGE CHART

LOCA. NO.	CAPACITY	+	-
CM201	100uF/10V	3.29V	0V
CM202	100uF/10V	1.87V	0V
CM203	47uF/16V	3.3V	0V
CM204	47uF/16V	1.87V	0V
CM205	220uF/6.3V	3.26V	0V
CM206	100uF/10V	1.86V	0V
CM207	100uF/10V	3.29V	0V
CM403	47uF/16V	4.96V	0V
CM410	100uF/16V	3.33V	0V
CM411	47uF/25V	9.17V	0V
CM412	100uF/16V	5.07V	0V
CM413	47uF/25V	9.21V	0V
CM415	47uF/16V	3.29V	0V
CM416	100uF/10V	5.01V	0V
CM417	47uF/16V	3.29V	3.28V

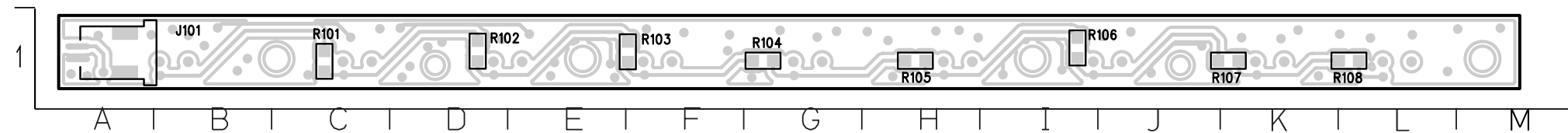
LOCA. NO.	CAPACITY	+	-
CM418	47uF/16V	3.29V	2.32V
CM421	100uF/10V	4.97V	0V
CM502	100uF/10V	2.4V	0V
CM506	100uF/10V	2.4V	0V
CM509	100uF/10V	4.95V	0V
CM603	100uF/16V	8.3V	0V
CM604	100uF/16V	8.3V	0V
CM605	47uF/25V	9.22V	0V
CM606	47uF/25V	9.57V	0V
CM607	100uF/10V	5.05V	0V
CM608	47uF/25V	9.58V	0V
CM701	100uF/10V	2.4V	0V
CM703	100uF/10V	1.29V	0V
CM704	100uF/10V	3.29V	0V

# PRINTED CIRCUIT BOARD DIAGRAMS

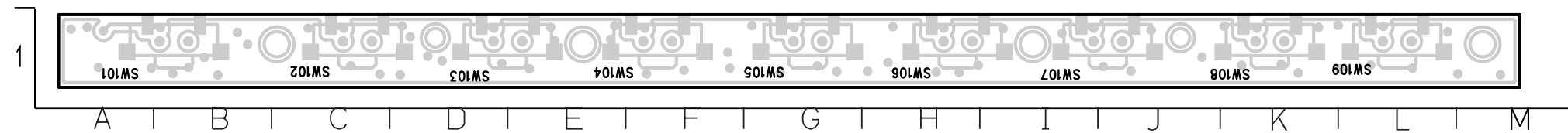
## 1. MAIN P.C.BOARD (TOP VIEW)



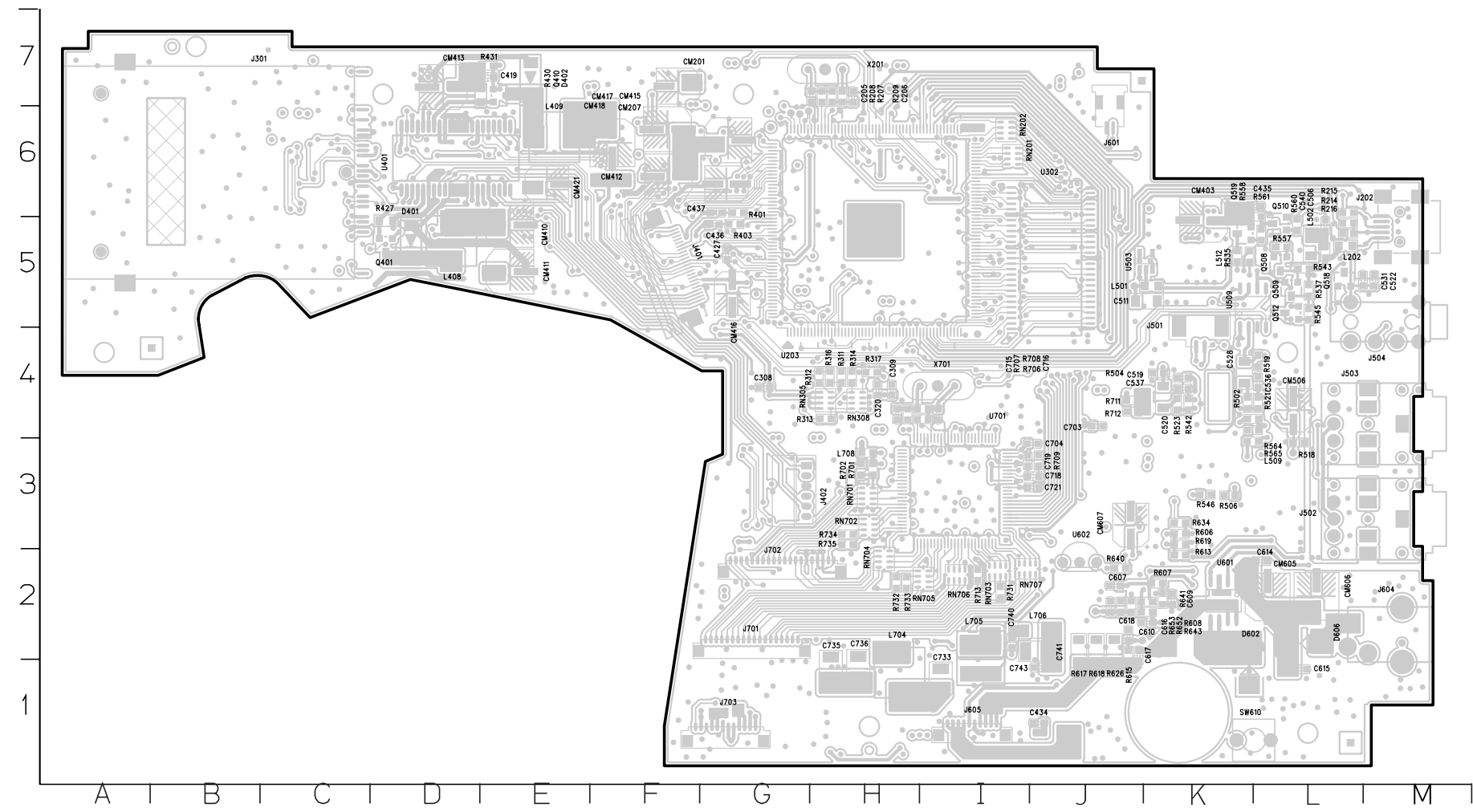
## 2. MAIN KEY P.C.BOARD (TOP VIEW)



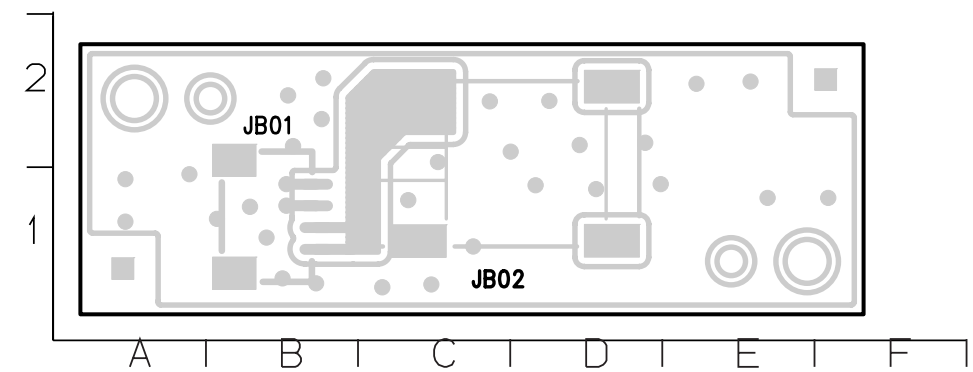
## (BOTTOM VIEW)



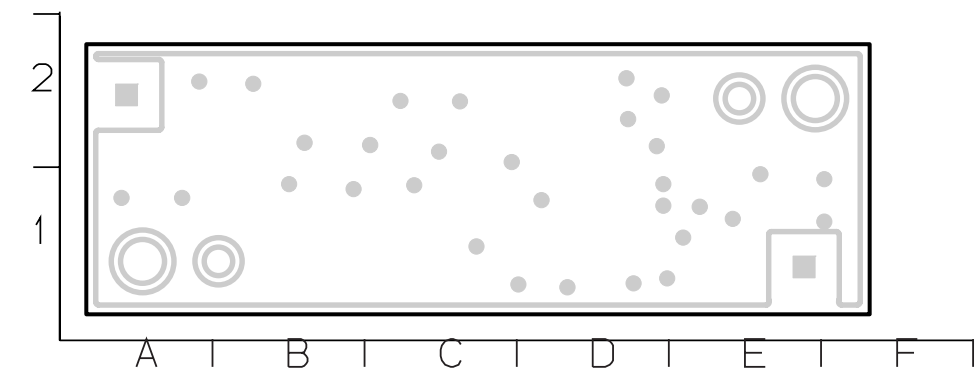
**MAIN P.C.BOARD  
(BOTTOM VIEW)**



**3. MIS P.C.BOARD  
(TOP VIEW)**



**(BOTTOM VIEW)**



# MEMO

Ruled area for writing on page 3-71.

# MEMO

Ruled area for writing on page 3-72.