



SERVICE MANUAL

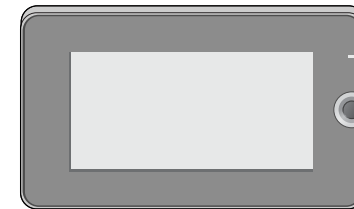
MODEL: DP391B/DP392G

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:

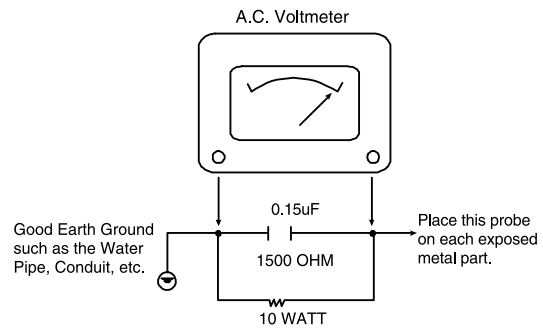
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

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.

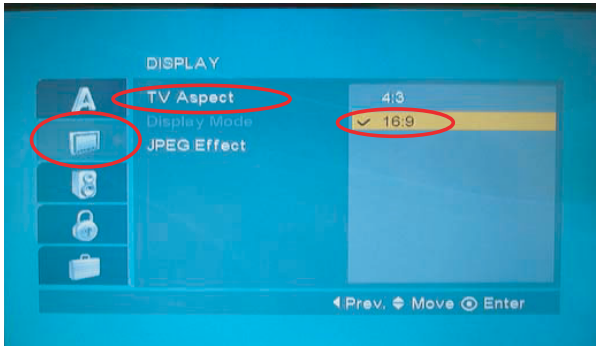
Caution: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

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.)

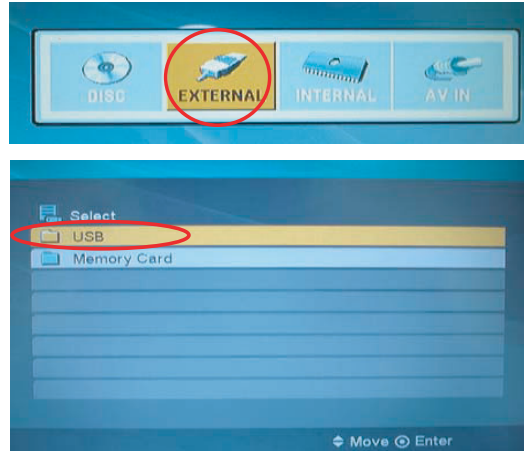
UPGRADING FIRMWARE

Please follow the below process to download a program with disc

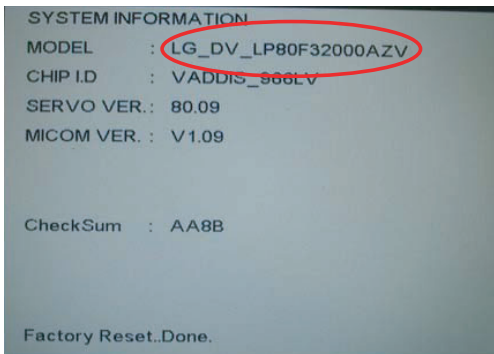
1. Turn on the DVD-player.
(Note. Be sure that there is no disc in DVD-player)
2. Press "SETUP" button on Remote control.
3. Choose a "display" menu by using the cursor button and then choose a "TV Aspect" menu. And choose "16:9" menu.



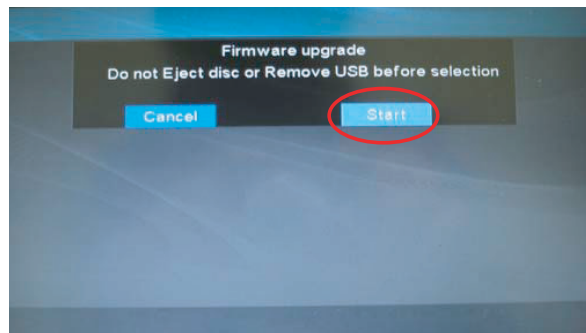
8. Insert the copied USB memory stick to DVD-player.
9. Press the MODE button on the Potable DVD-player.
10. Select External and USB.



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**.



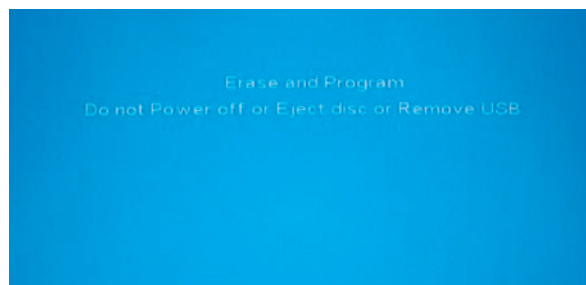
11. If the below picture appears on the screen, Select "Start" and Press "OK" button on Remote controller. **While this menu appears, please don't eject disc or take out USB**



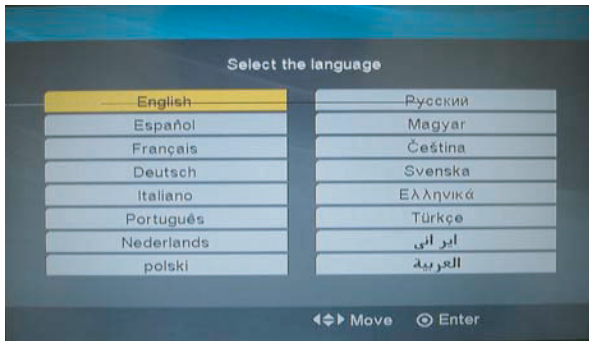
6. Change the program file name of new version to the model name
Ex> New ver. program file -->
LG_DV_LP81F32000AZV_V014.ROM
Model name --> LG_DV_LV80F32000AZV
Change New ver. program file like this -->
LG_DV_LV80F32000AZV.ROM
If you don't change the file name like that, Disc download isn't be worked.

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

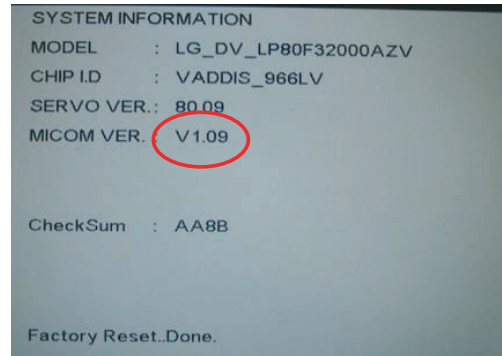
12. After the below picture appears on the screen, New DVD program will download from USB memory stick automatically. Do not take out the USB memory stick.



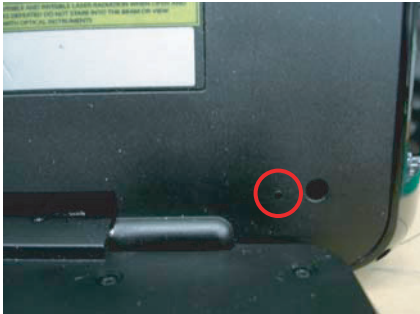
13. After USB download is completed, DVD-player displays below picture automatically.



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



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

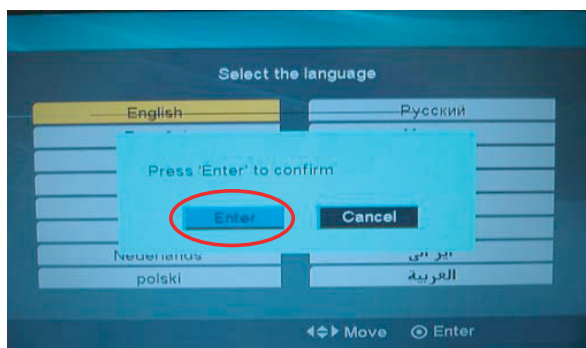


18. Press the Reset button on the DVD-Player.



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

Lined area for writing a memo, consisting of approximately 25 horizontal dashed lines.

SECTION 2

EXPLODED VIEWS

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EXPLODED VIEWS

1. CABINET AND MAIN FRAME SECTION

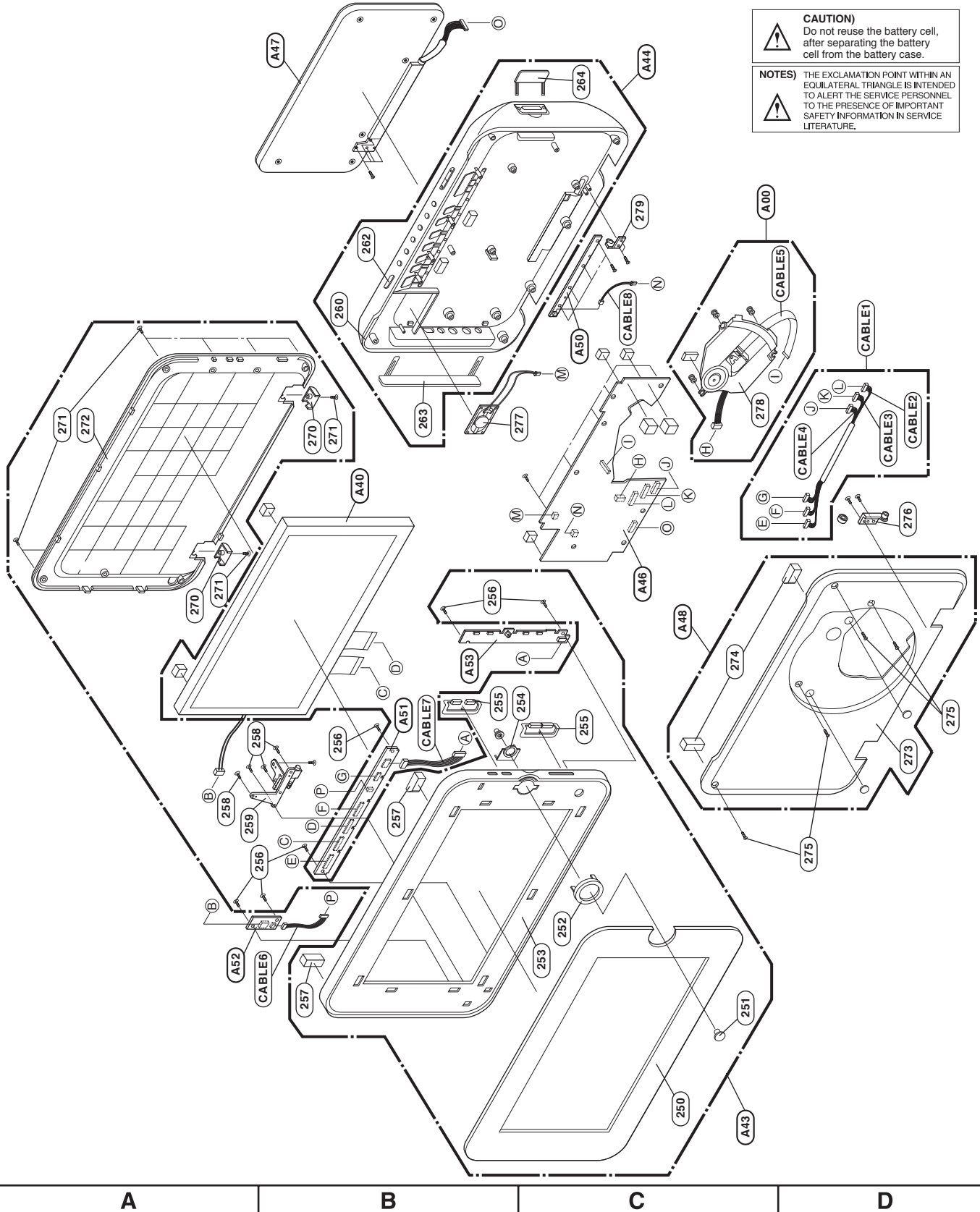
5

4

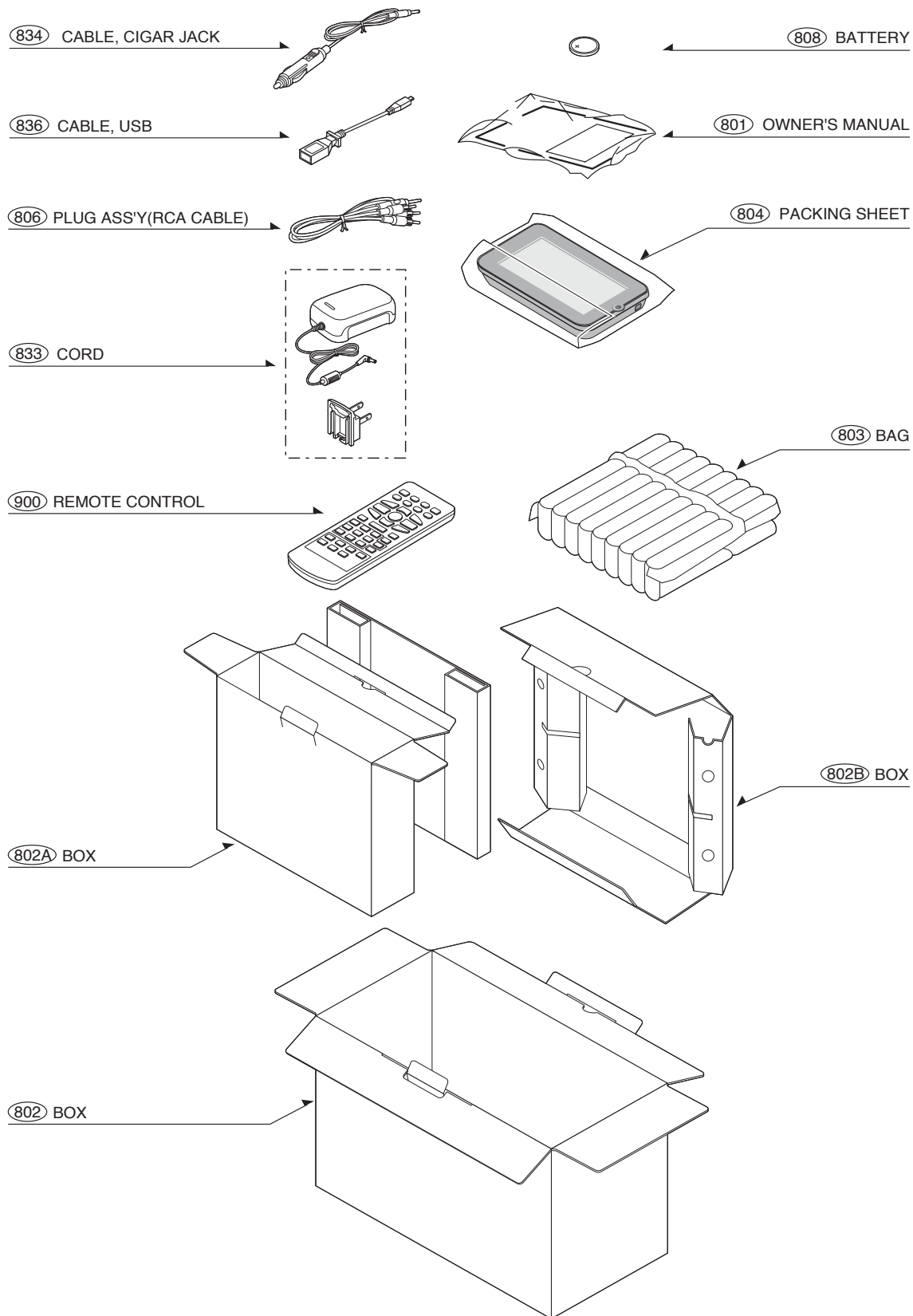
3

2

1



2. PACKING ACCESSORY SECTION



MEMO

A series of horizontal dotted lines for writing.

SECTION 3

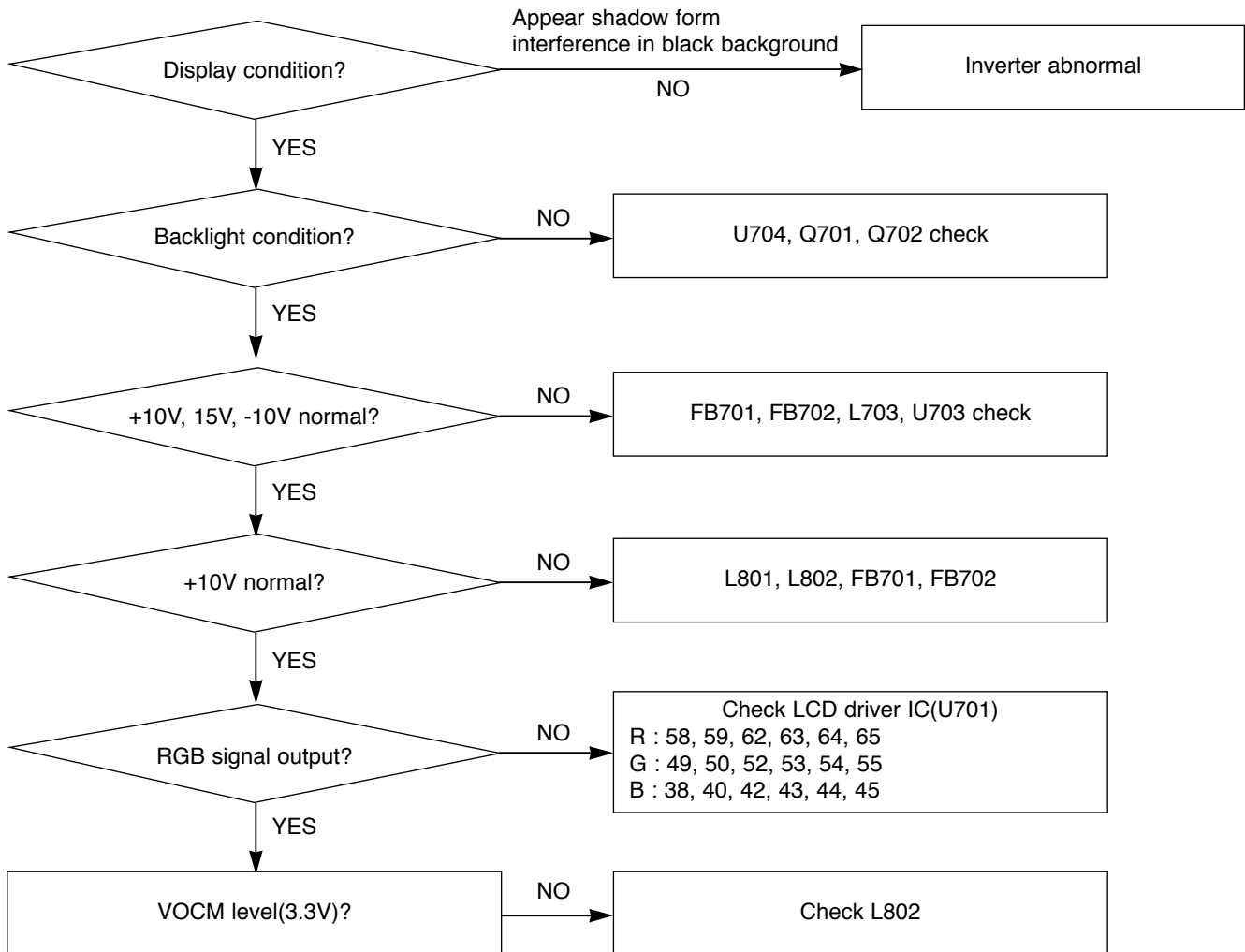
ELECTRICAL

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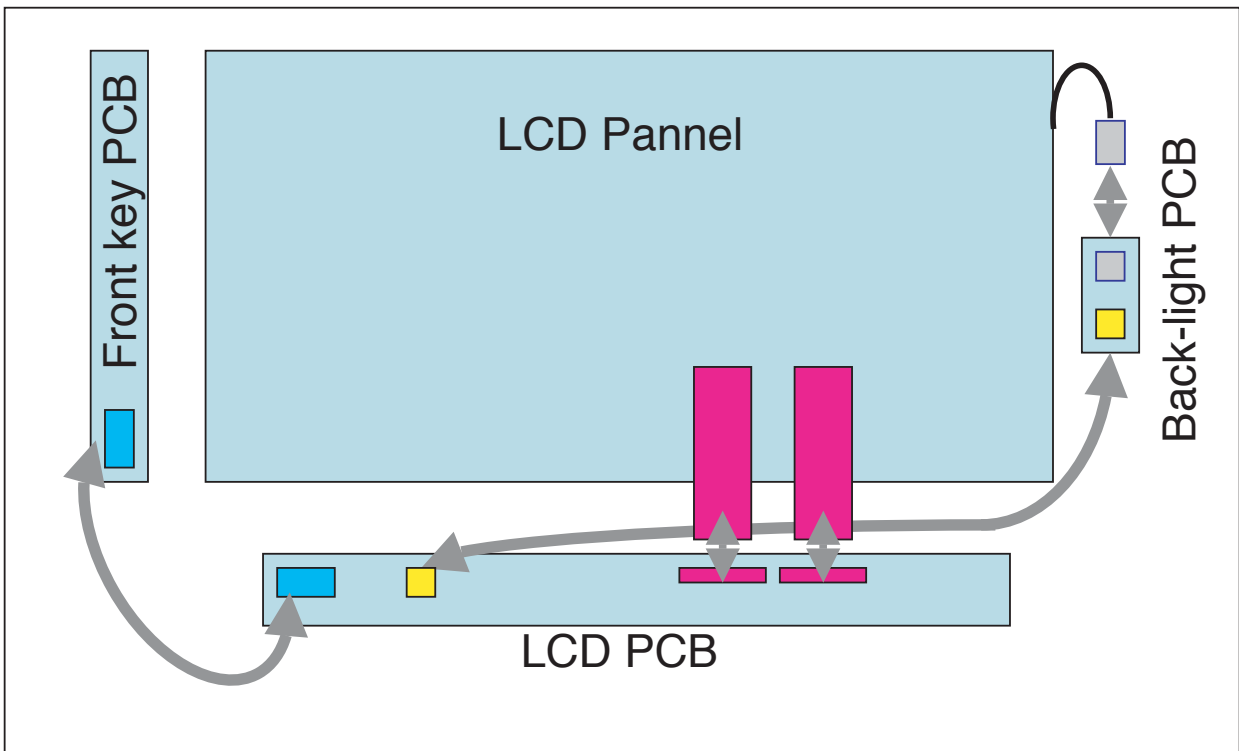
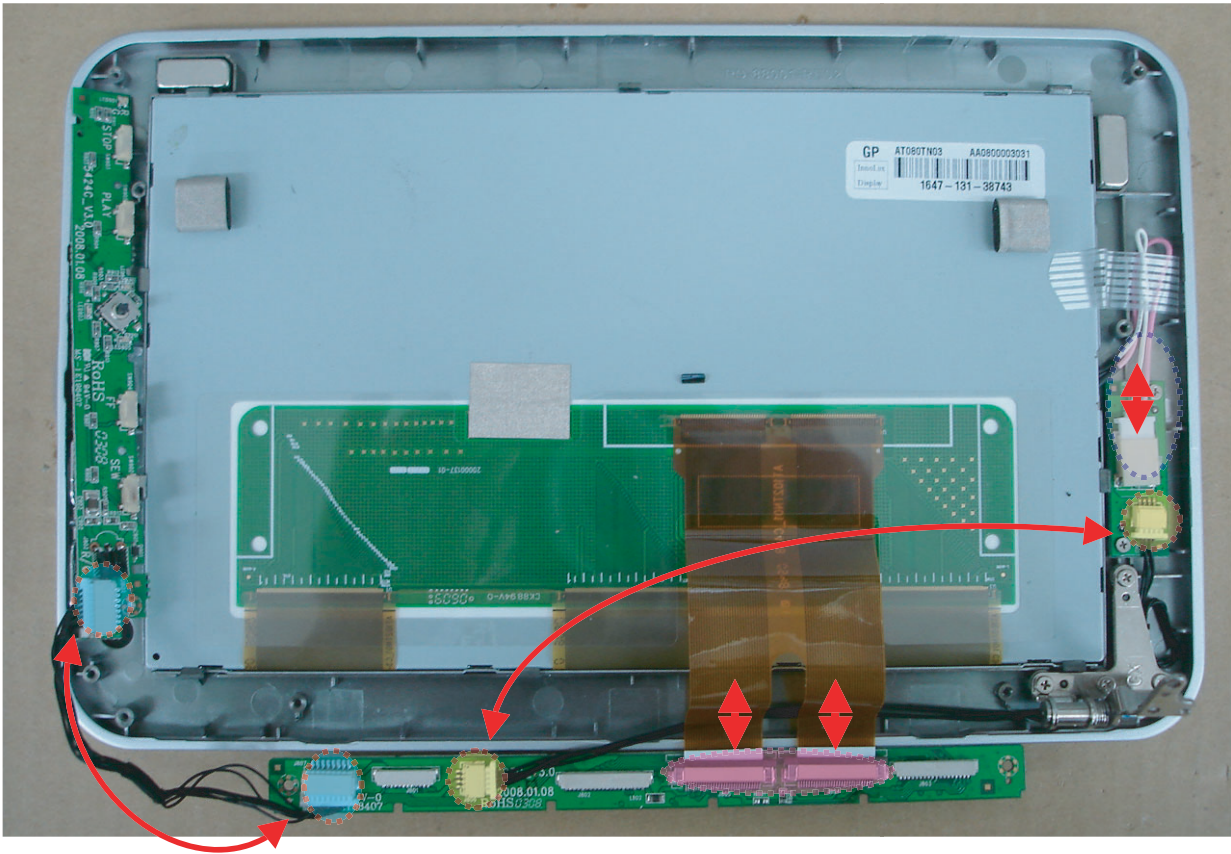
LCD PART

LCD ELECTRICAL TROUBLESHOOTING GUIDE



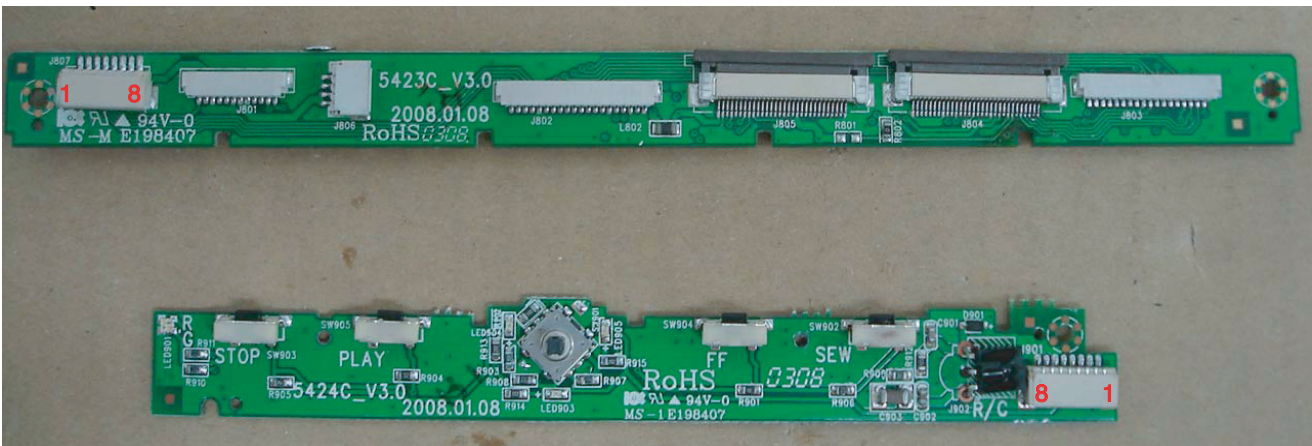
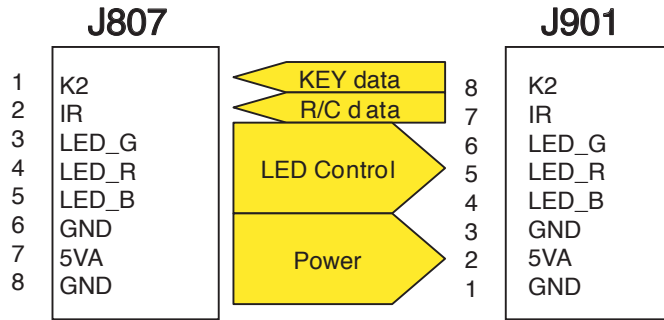
WIRING CONNECTION DIAGRAM

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

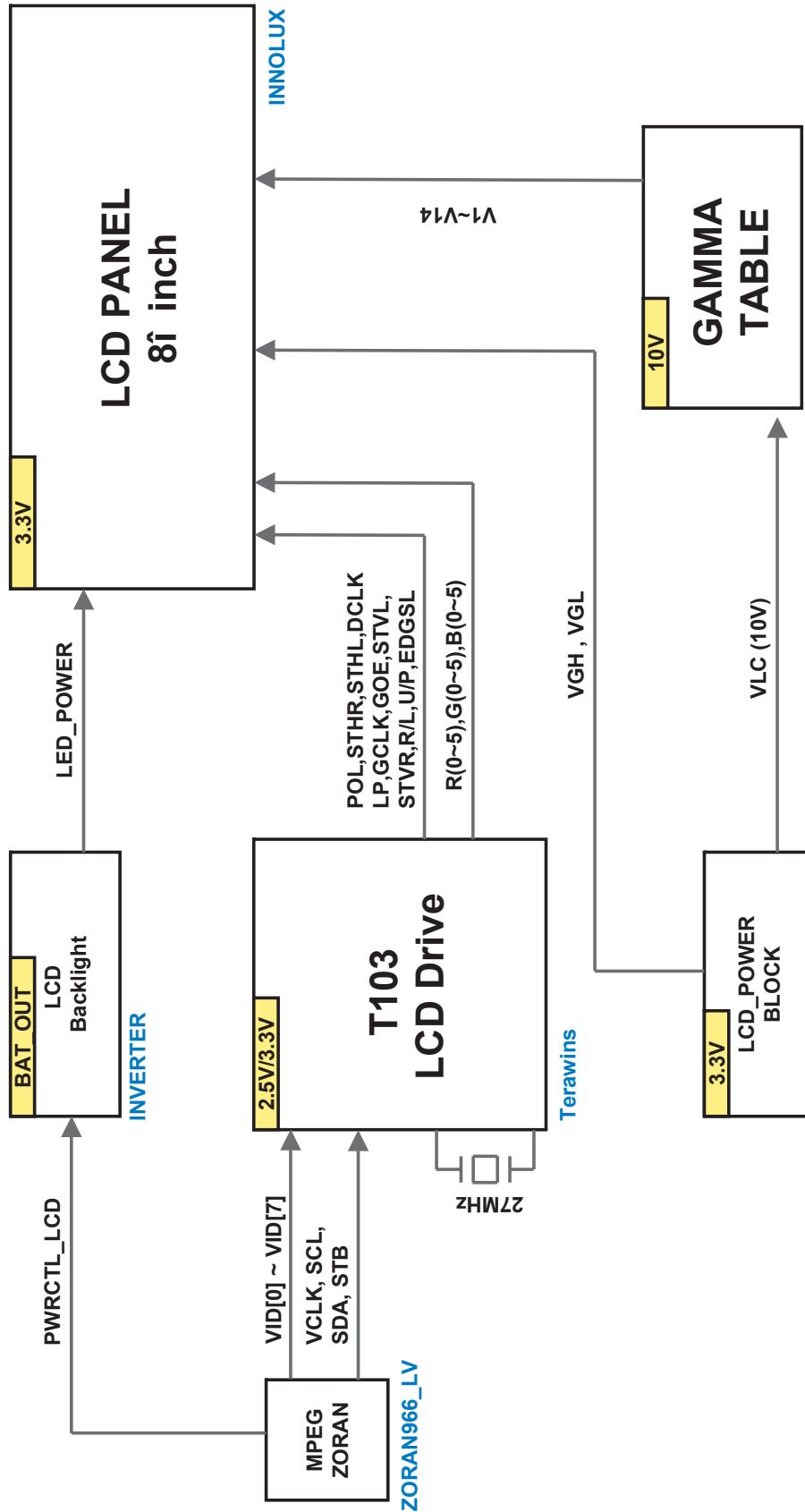


INTERFACE DIAGRAM

LCD PCB <--> KEY PCB INTERFACE



BLOCK DIAGRAM

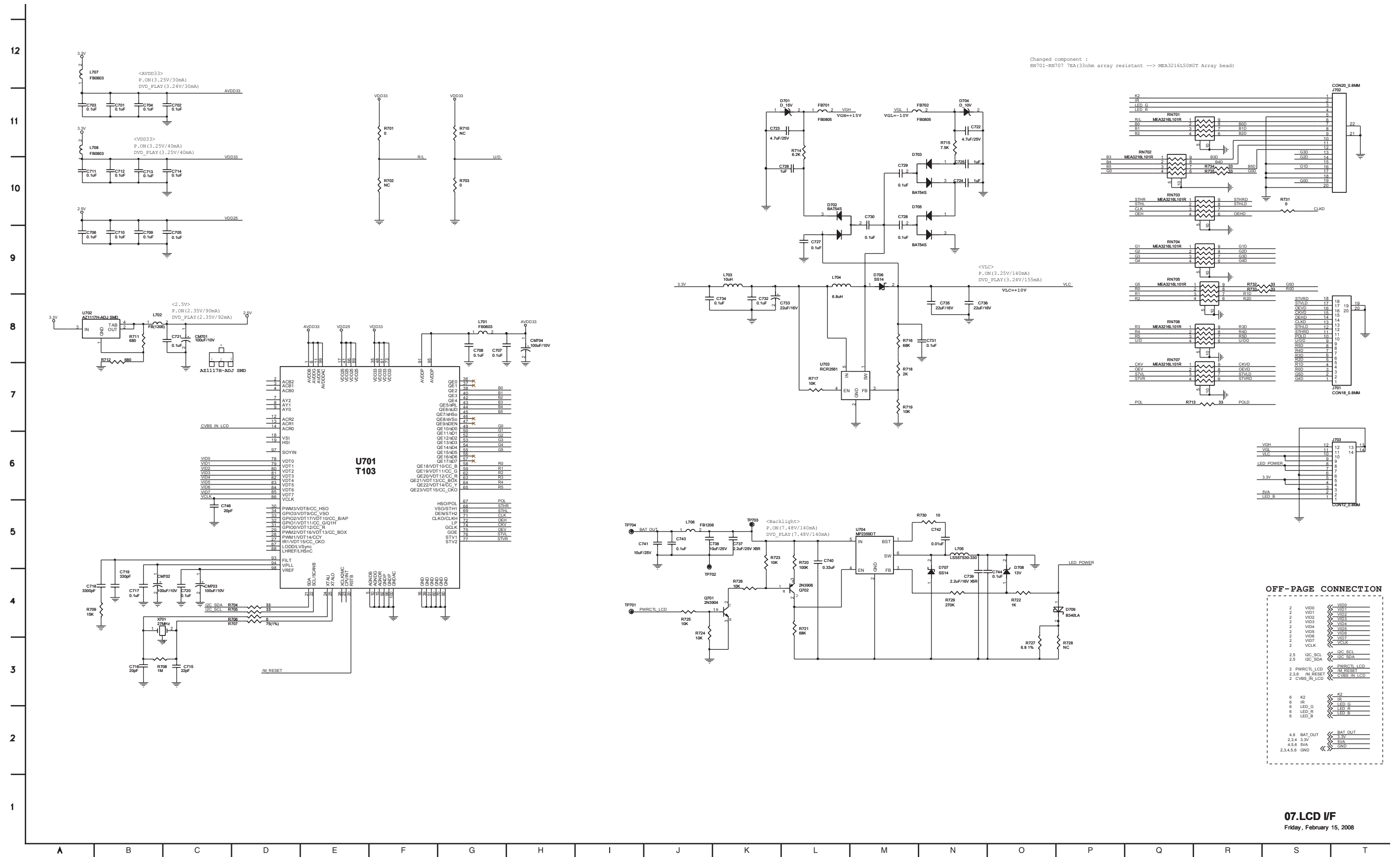


MEMO

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CIRCUIT DIAGRAMS

1. LCD I/F CIRCUIT DIAGRAM



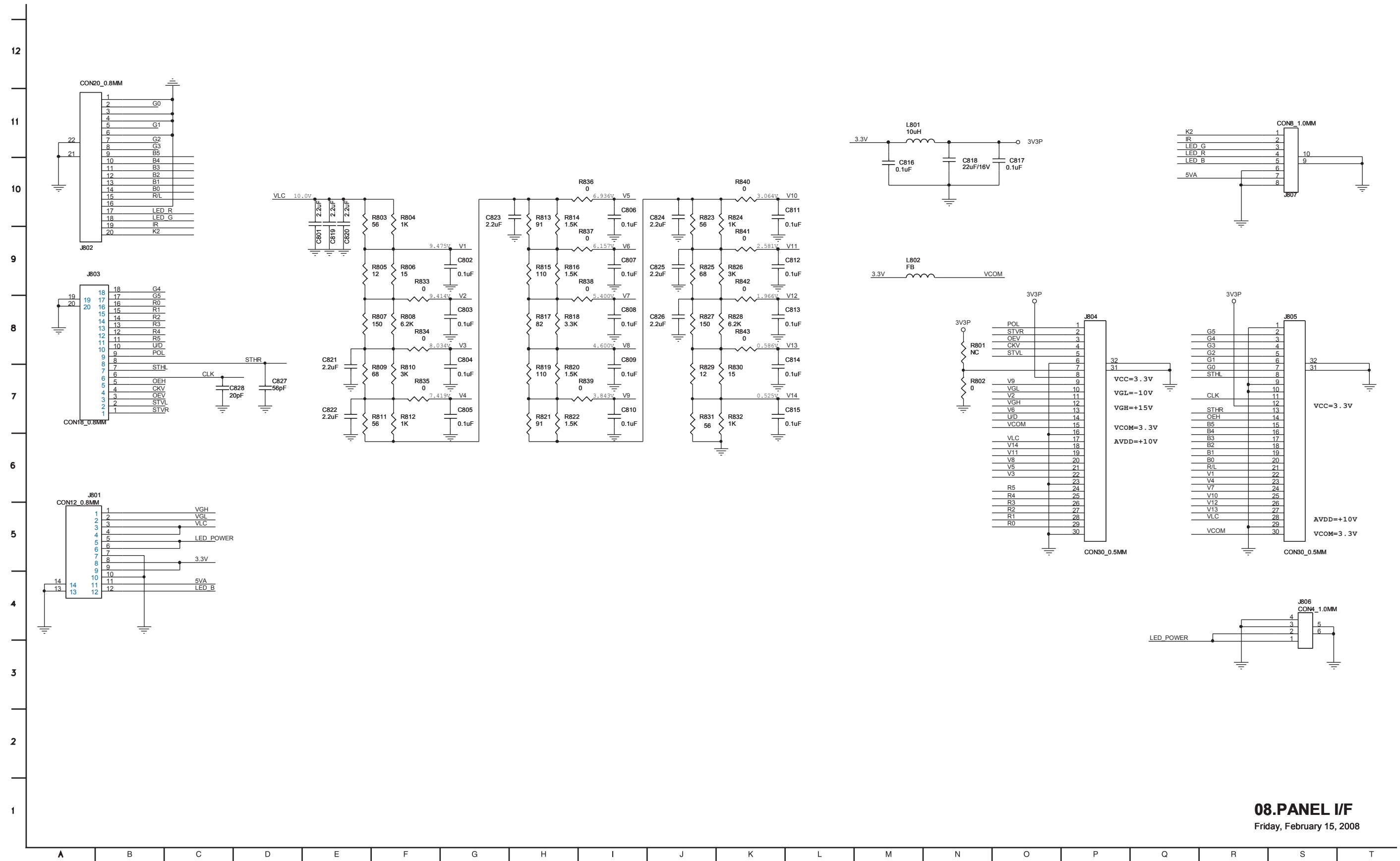
Changed component :
RN701-RN707 7EA(330nm array resistant --> MEA3216L50R0T Array bead)

OFF-PAGE CONNECTION

| | | |
|-----------|-------------|-------------|
| 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 |
| 2.5 | I2C_SCL | I2C_SCL |
| 2.5 | I2C_SDA | I2C_SDA |
| 2 | PWRCTL_LCD | PWRCTL_LCD |
| 2.3.6 | RESET | RESET |
| 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 | 3.3V | 3.3V |
| 4.5.6 | SVA | SVA |
| 2.3.4.5.6 | GND | GND |

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

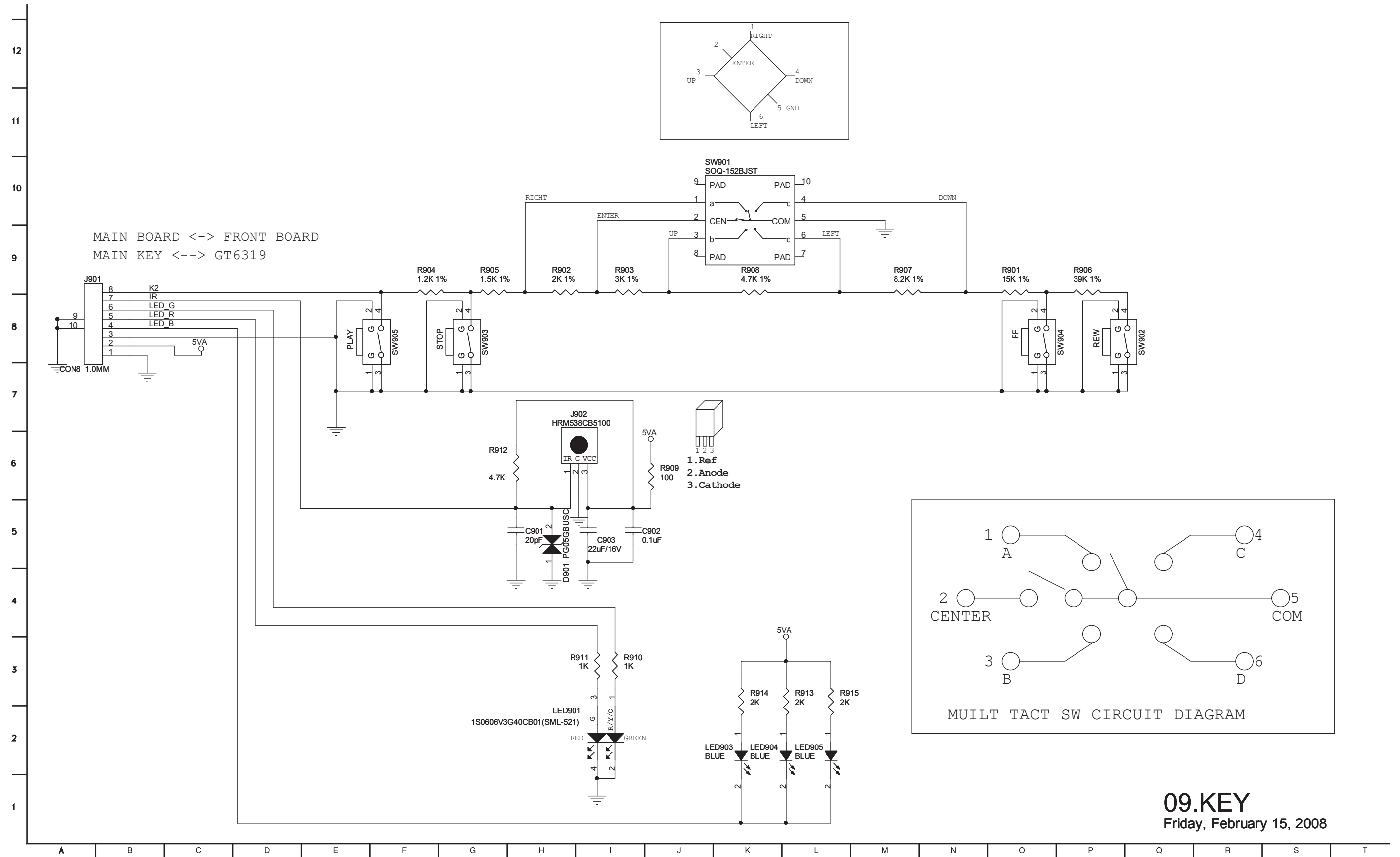
2. PANEL I/F CIRCUIT DIAGRAM



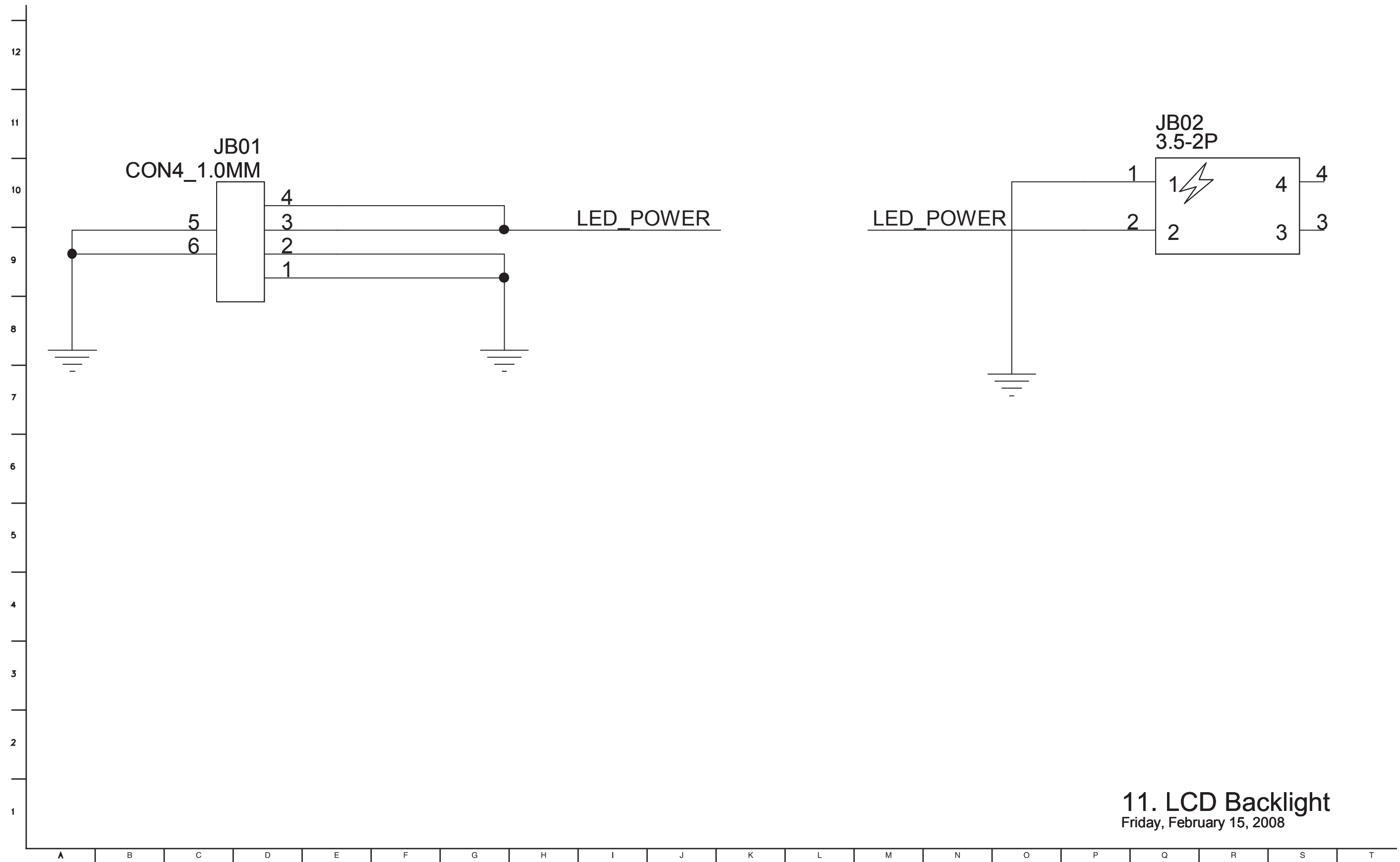
08.PANEL I/F

Friday, February 15, 2008

3. FRONT KEY BOARD CIRCUIT DIAGRAM



4. LCD BACKLIGHT CIRCUIT DIAGRAM

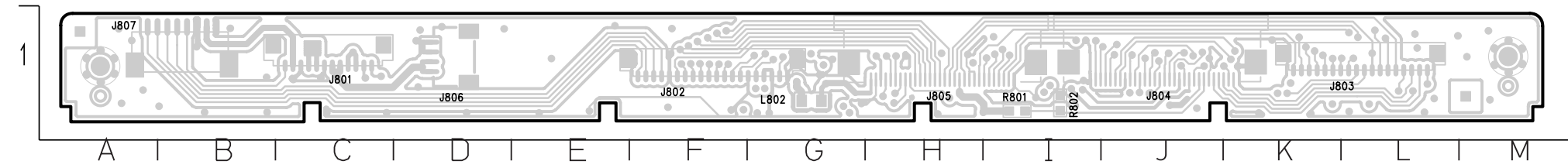


11. LCD Backlight

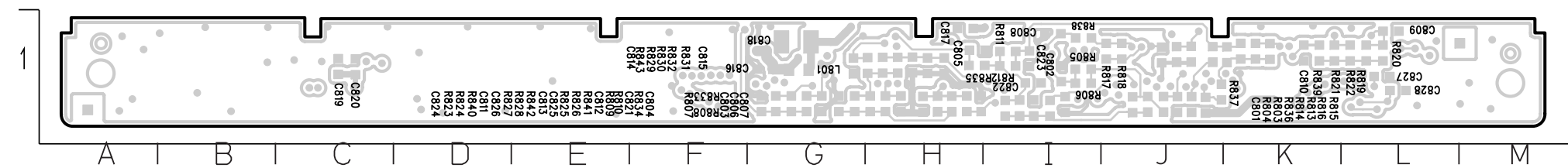
Friday, February 15, 2008

PRINTED CIRCUIT BOARD DIAGRAMS

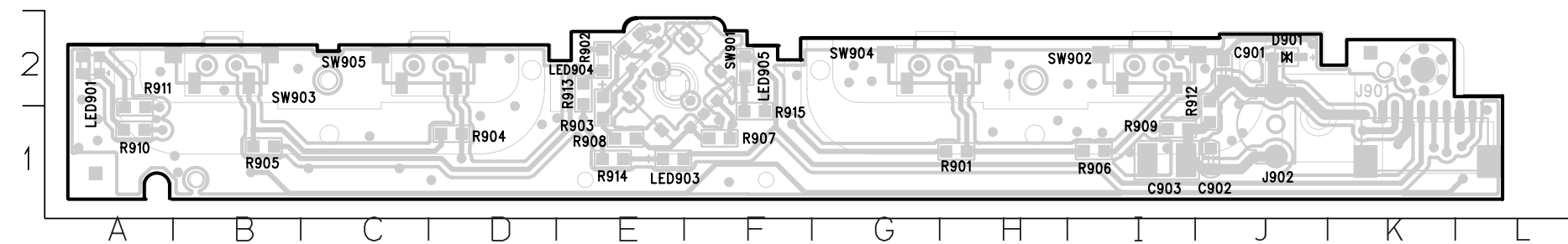
1. LCD P.C.BOARD (TOP VIEW)



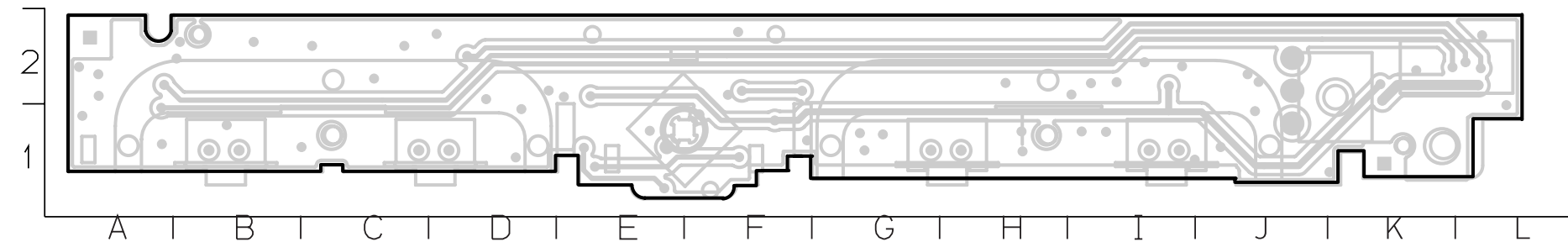
(BOTTOM VIEW)



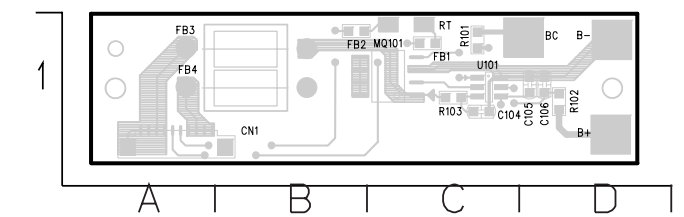
2. FRONT KEY P.C.BOARD (TOP VIEW)



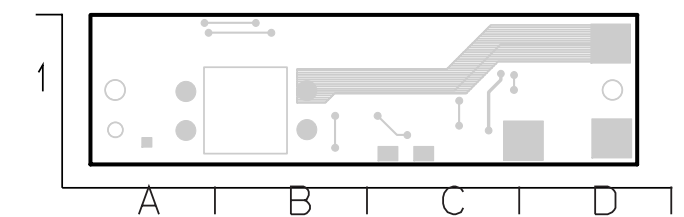
(BOTTOM VIEW)



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



(BOTTOM VIEW)

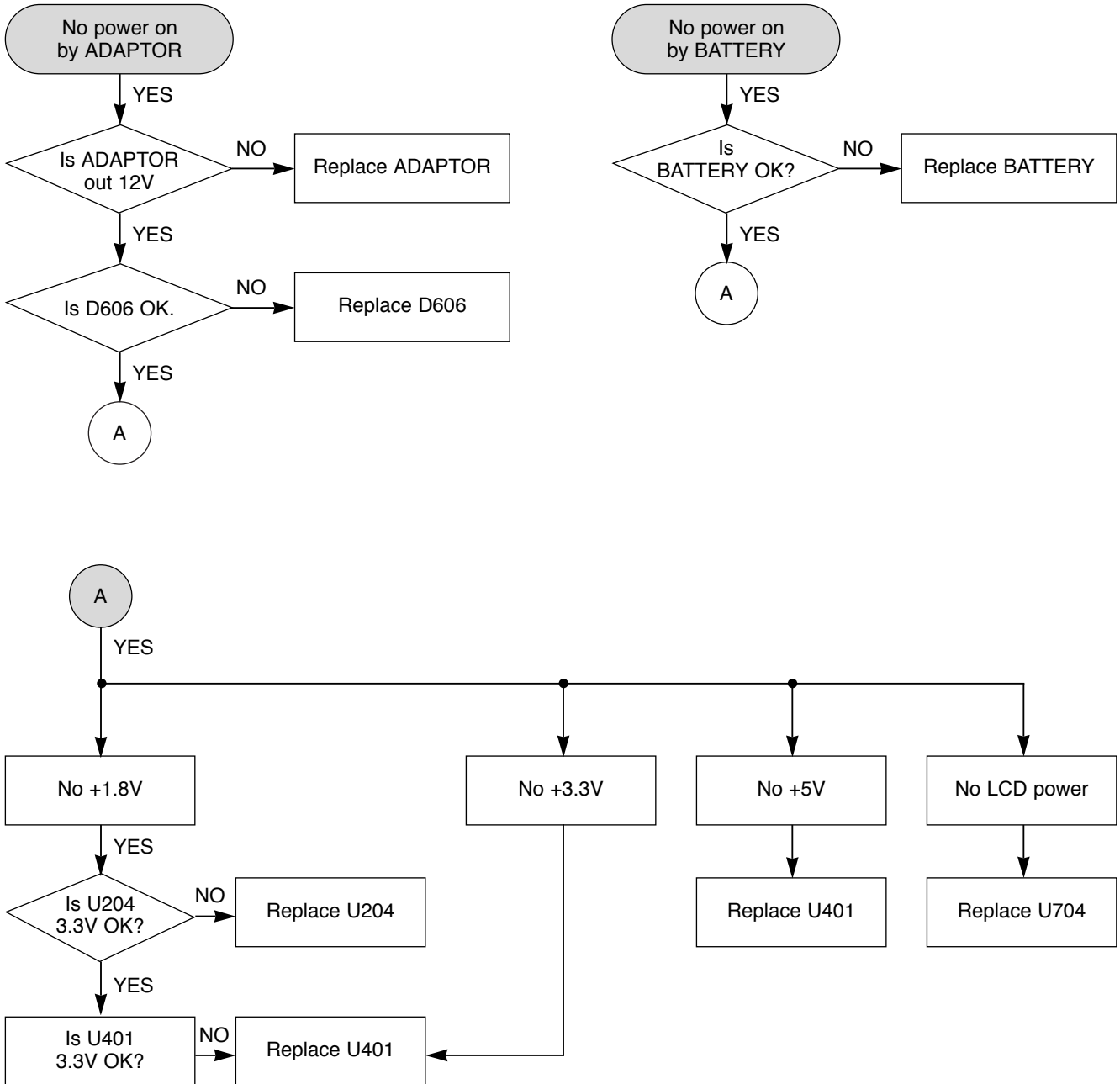


MAIN PART

MAIN ELECTRICAL TROUBLESHOOTING GUIDE

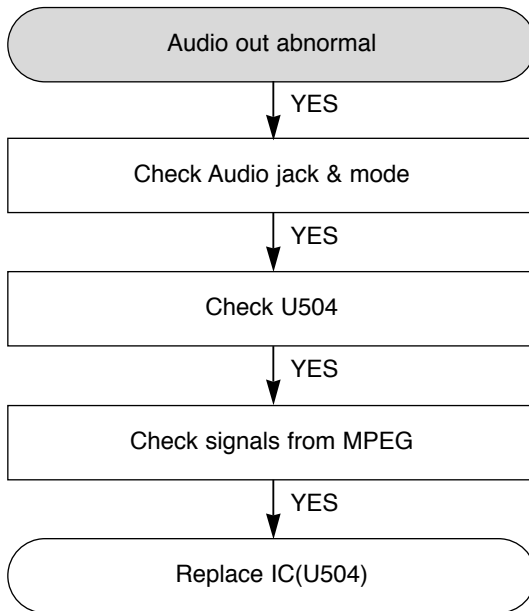
1. POWER (DC-DC CONVERTER) CIRCUIT

A. POWER

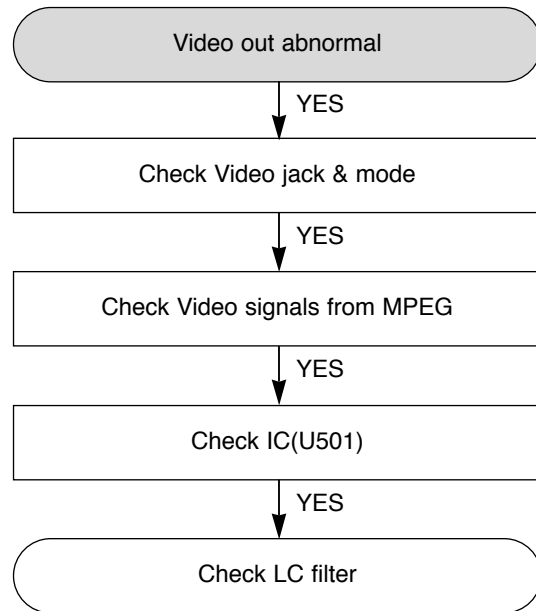


MAIN ELECTRICAL TROUBLESHOOTING GUIDE

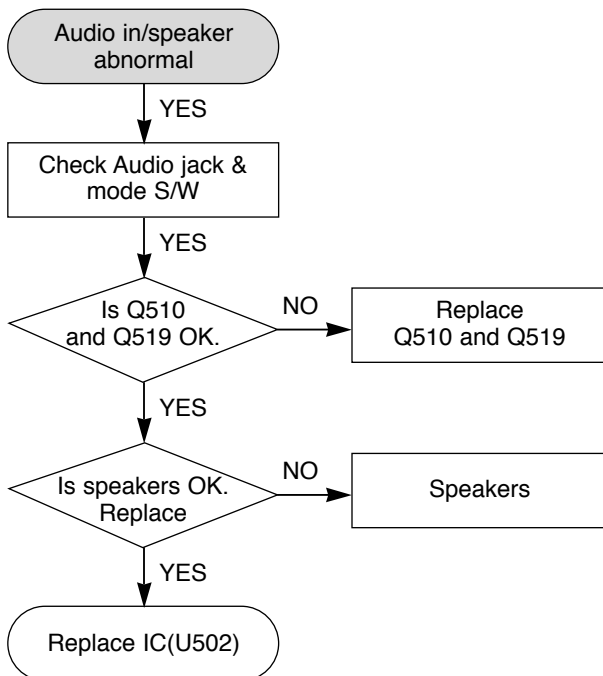
B. AUDIO OUT ABNORMAL



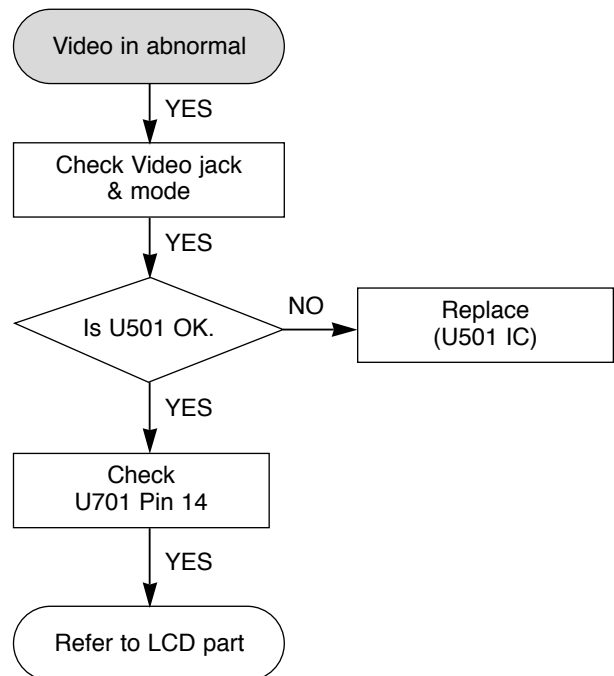
C. VIDEO OUT ABNORMAL



D. AUDIO IN/SPEAKER ABNORMAL

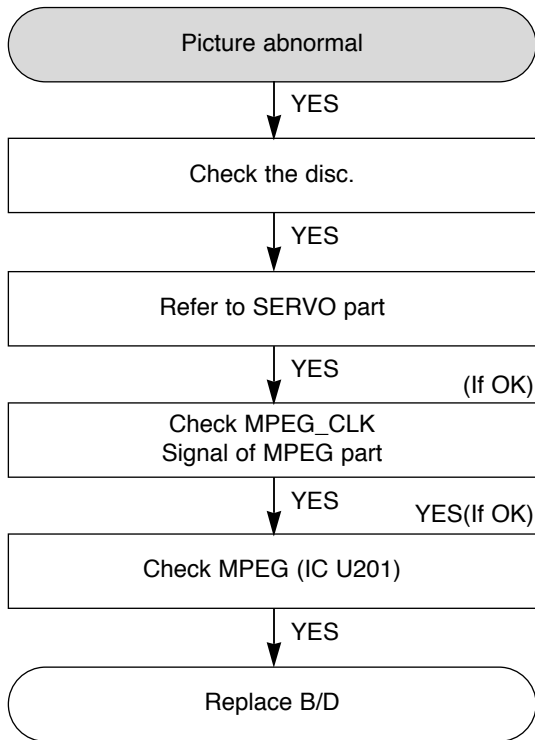


E. VIDEO IN ABNORMAL

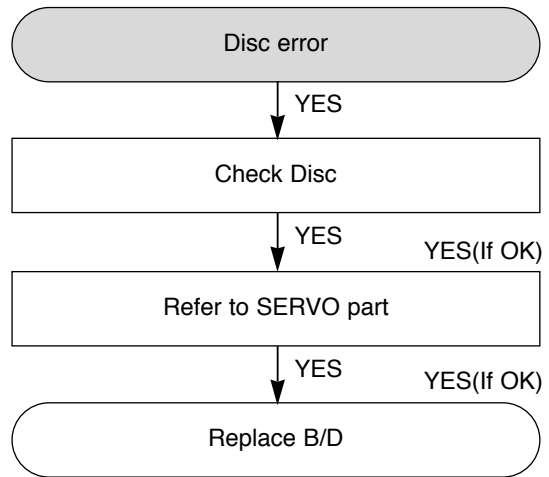


MAIN ELECTRICAL TROUBLESHOOTING GUIDE

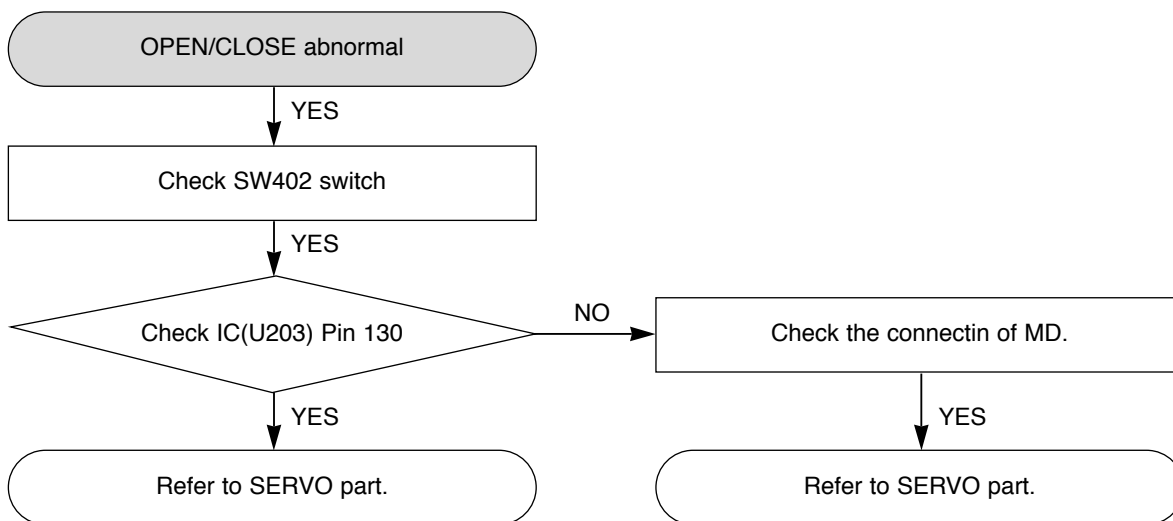
F. PICTURE ABNORMAL



G. DISC ERROR

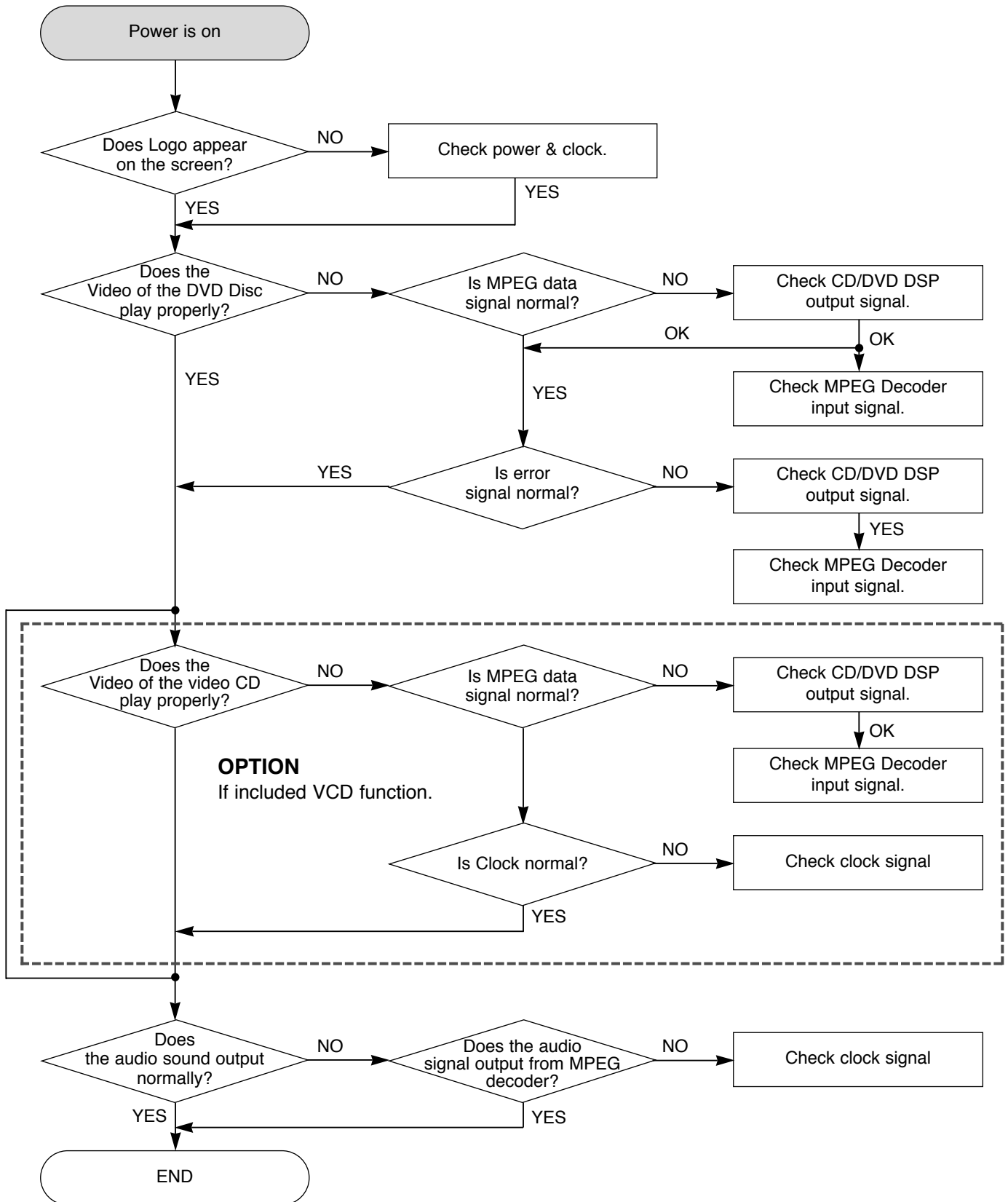


H. OPEN/CLOSE ABNORMAL



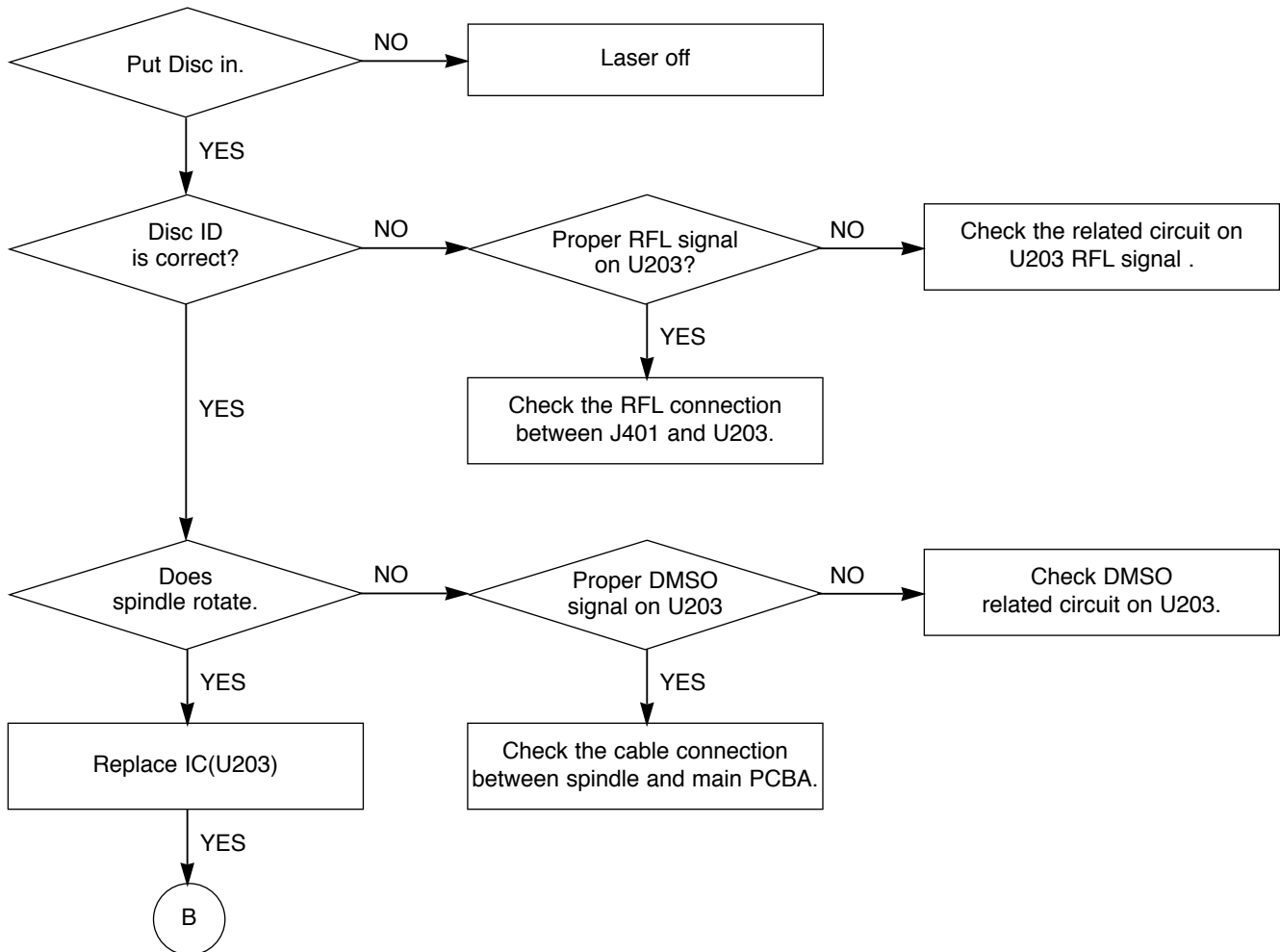
MAIN ELECTRICAL TROUBLESHOOTING GUIDE

2. MPEG CIRCUIT

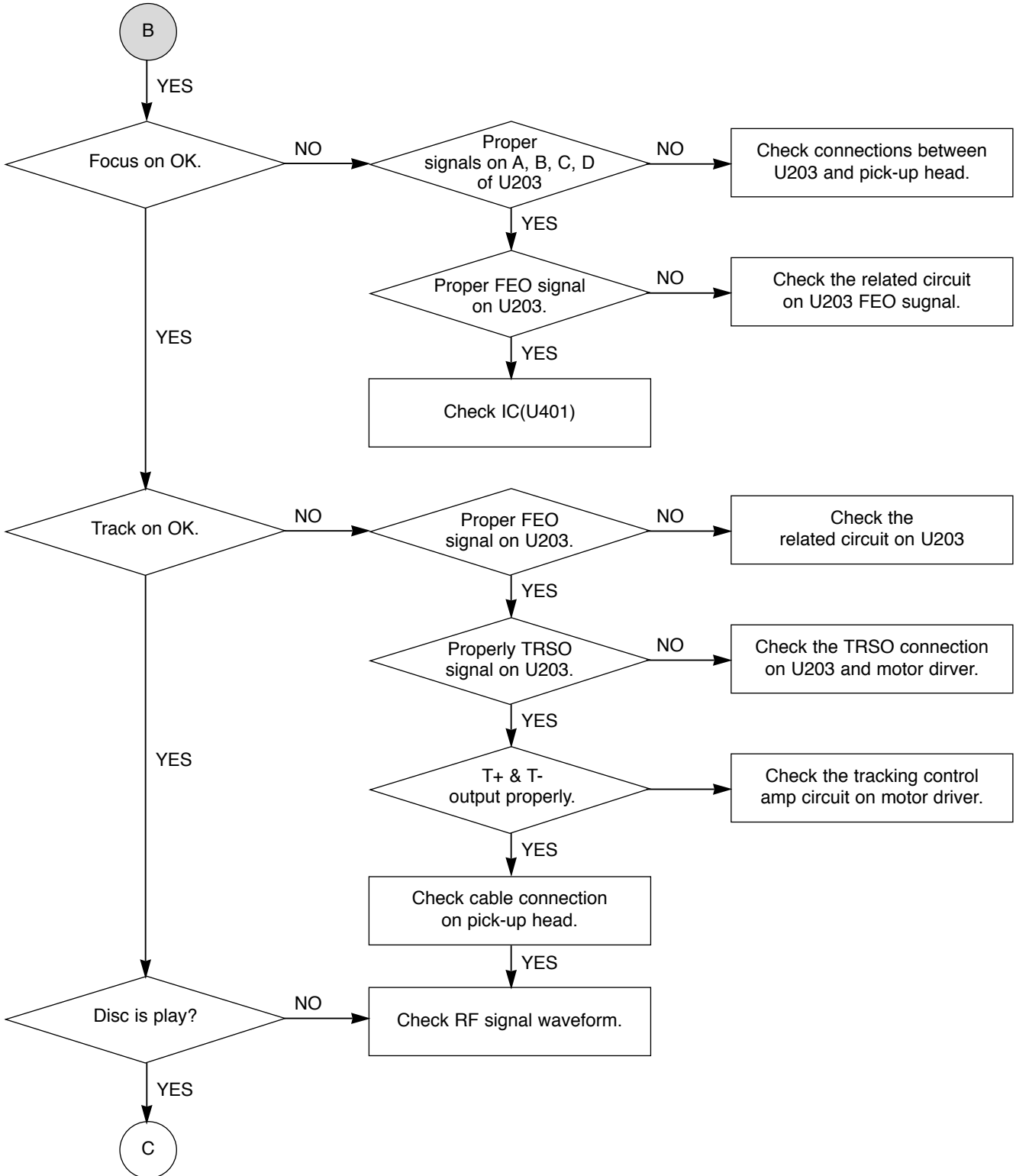


MAIN ELECTRICAL TROUBLESHOOTING GUIDE

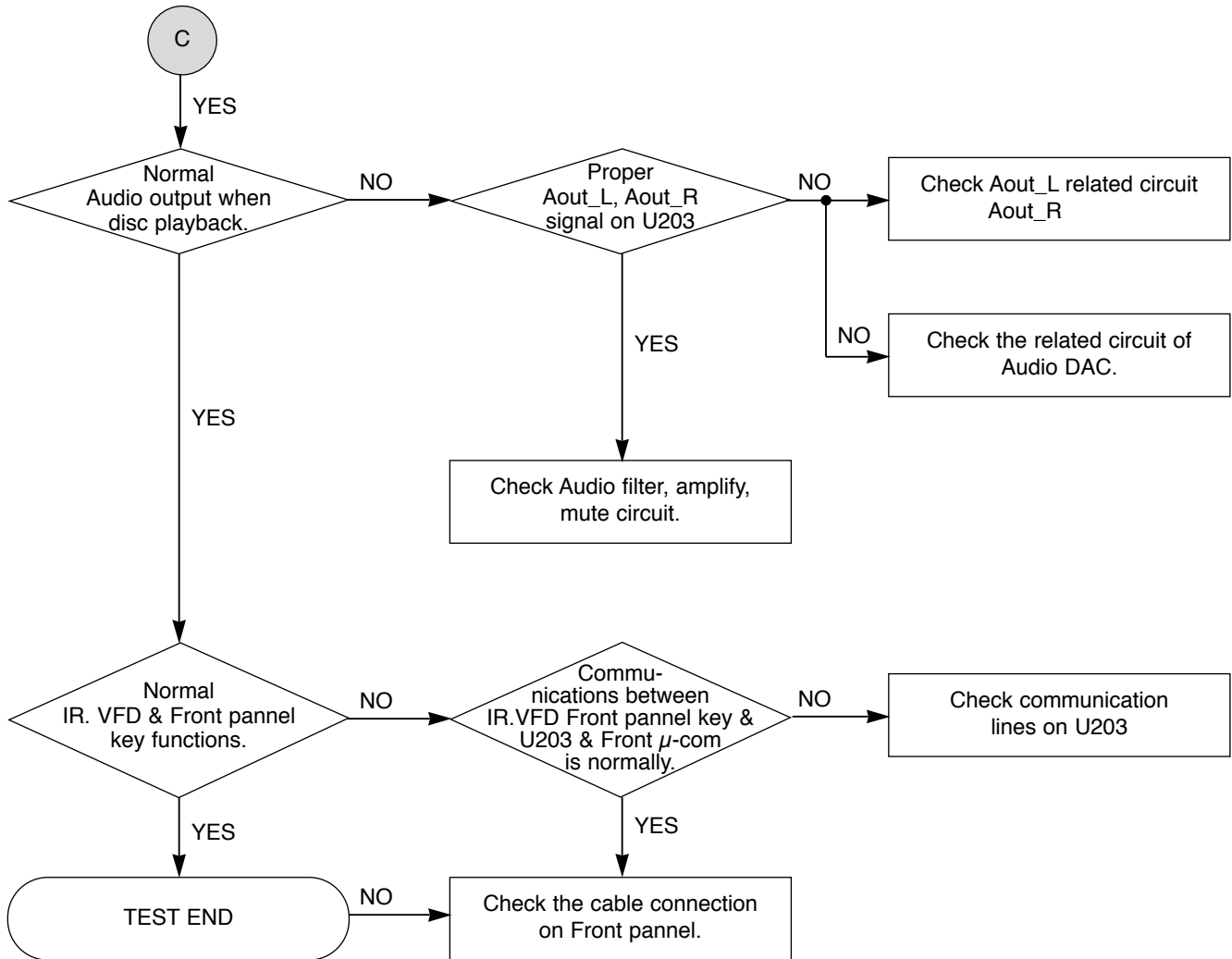
3. RF/SERVO CIRCUIT



MAIN ELECTRICAL TROUBLESHOOTING GUIDE

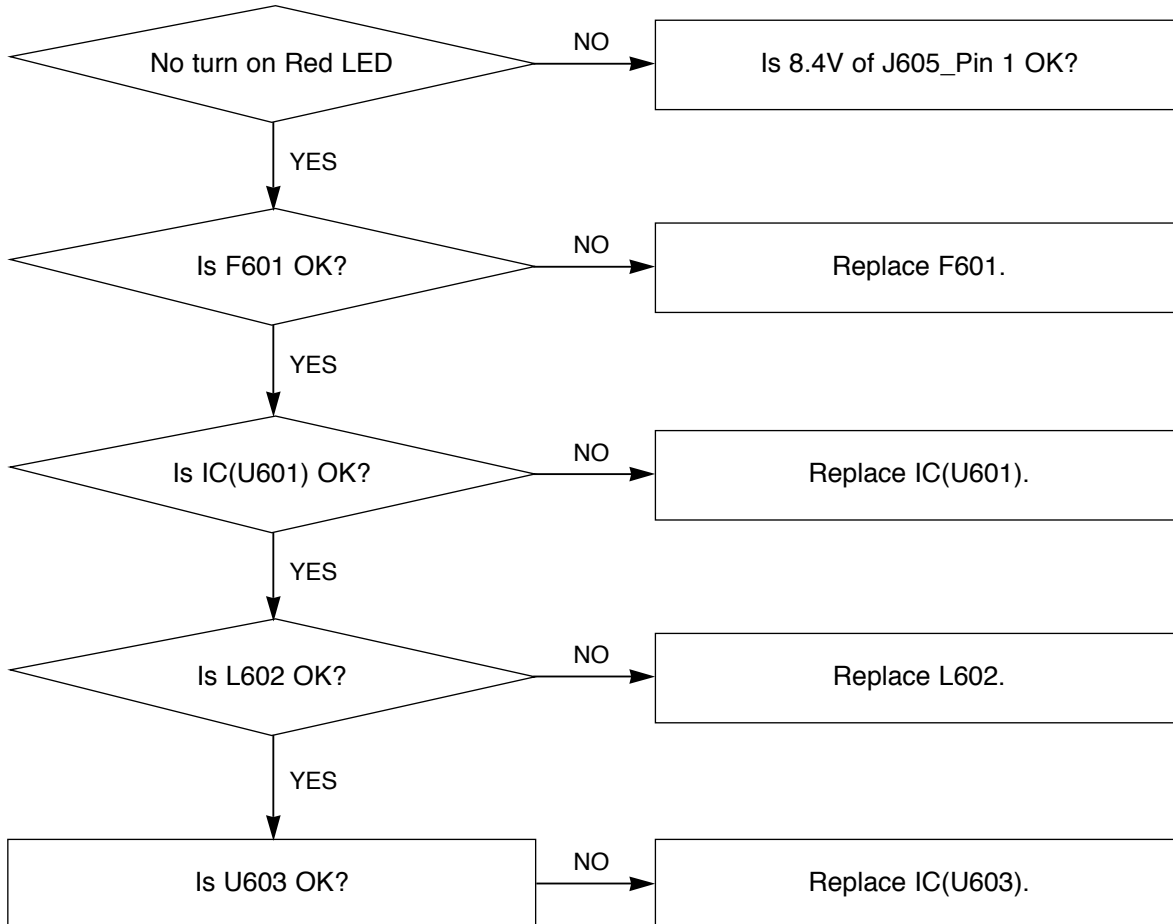


MAIN ELECTRICAL TROUBLESHOOTING GUIDE



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)

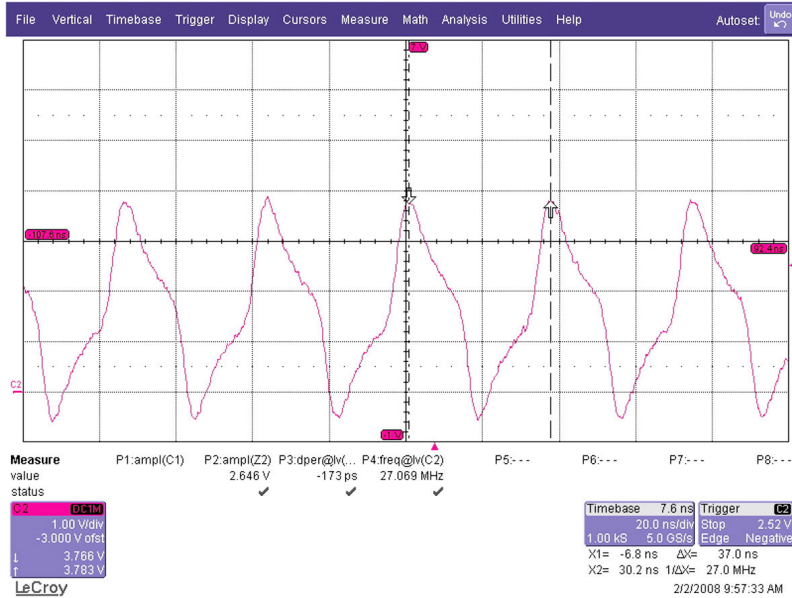


FIG 1-1

2. SDRAM CLOCK

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

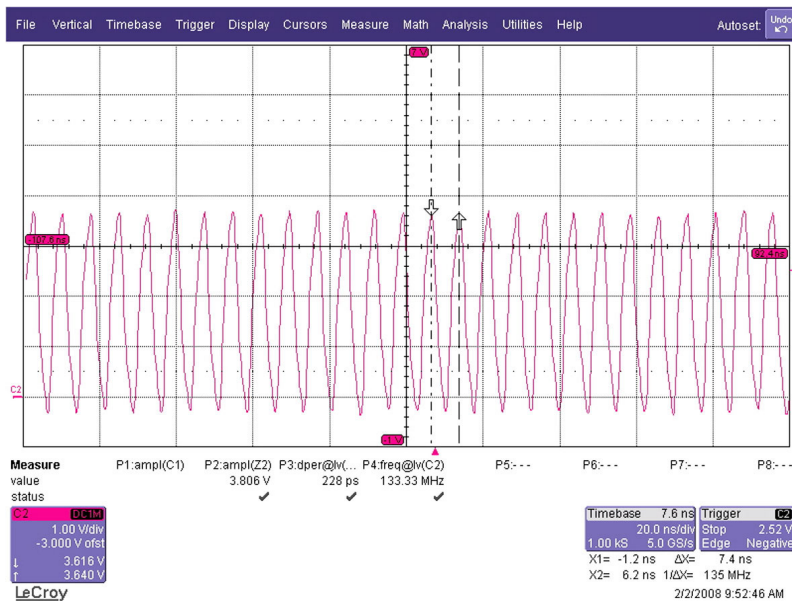


FIG 2-1

3. DISC TYPE JUDGEMENT WAVEFORM

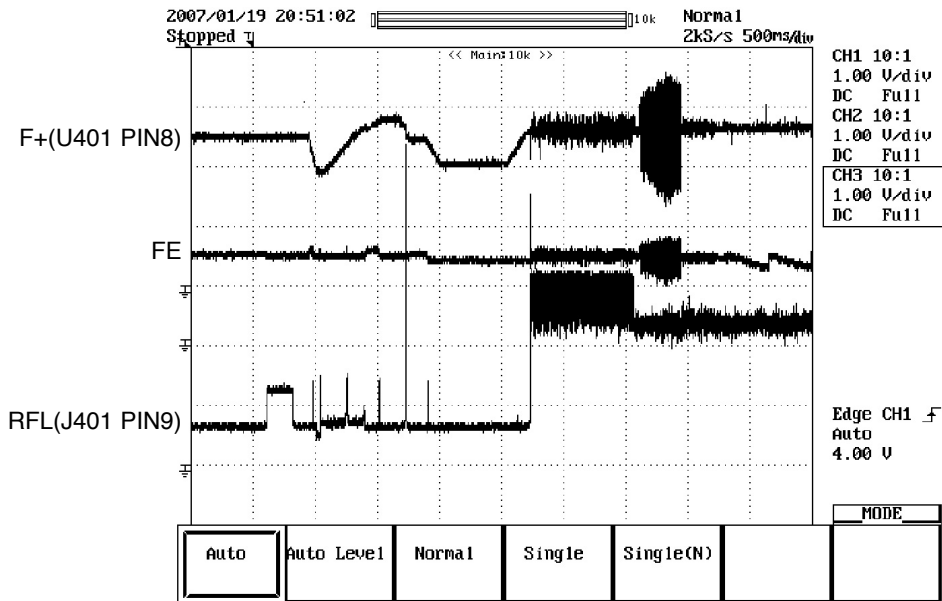


FIG 3-1

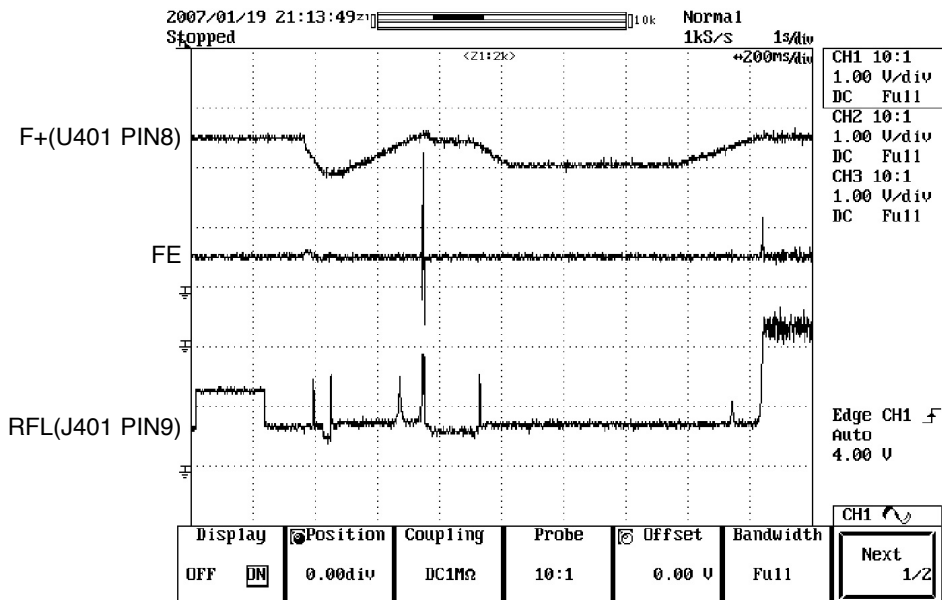


FIG 3-2

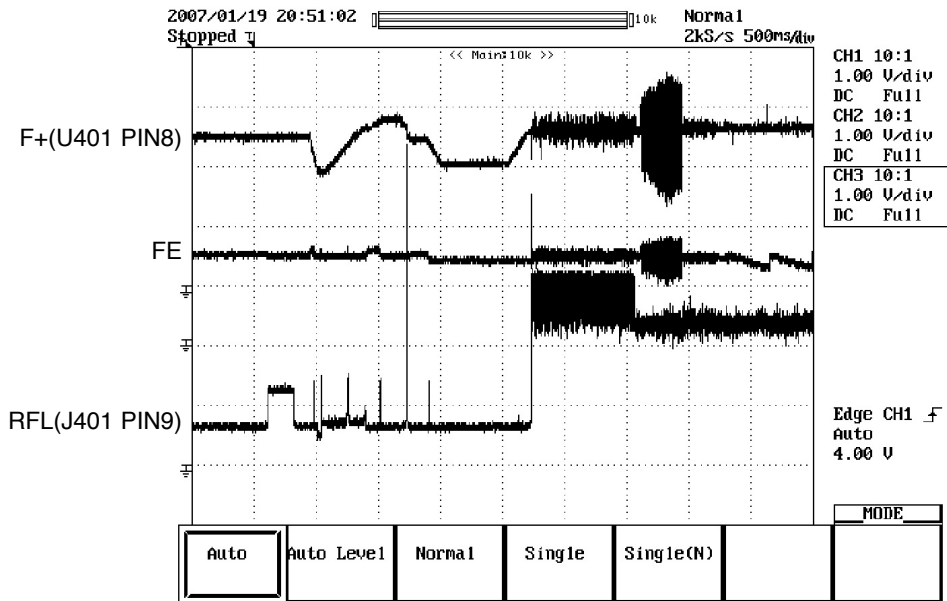


FIG 3-3

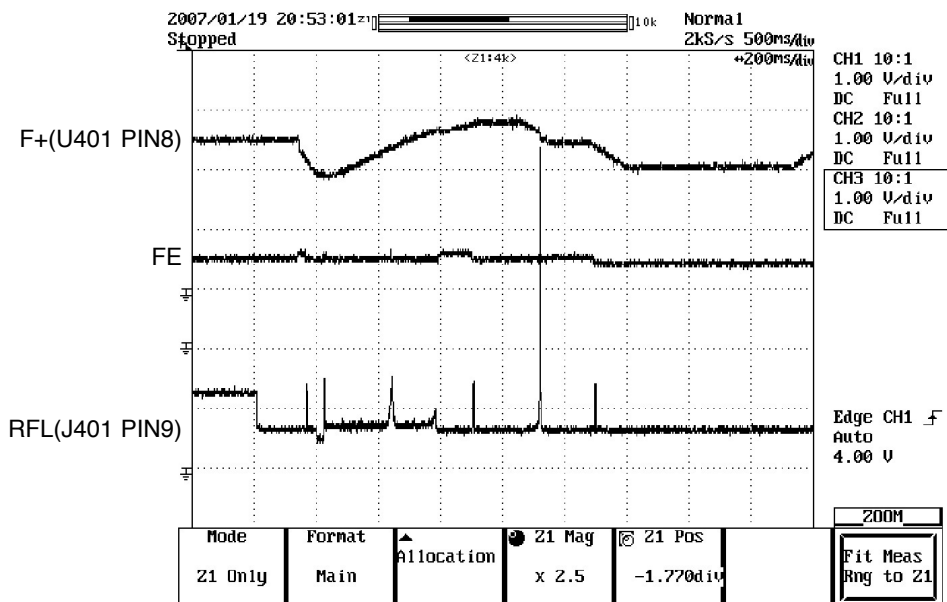


FIG 3-4

4. FOCUS ON WAVEFORM

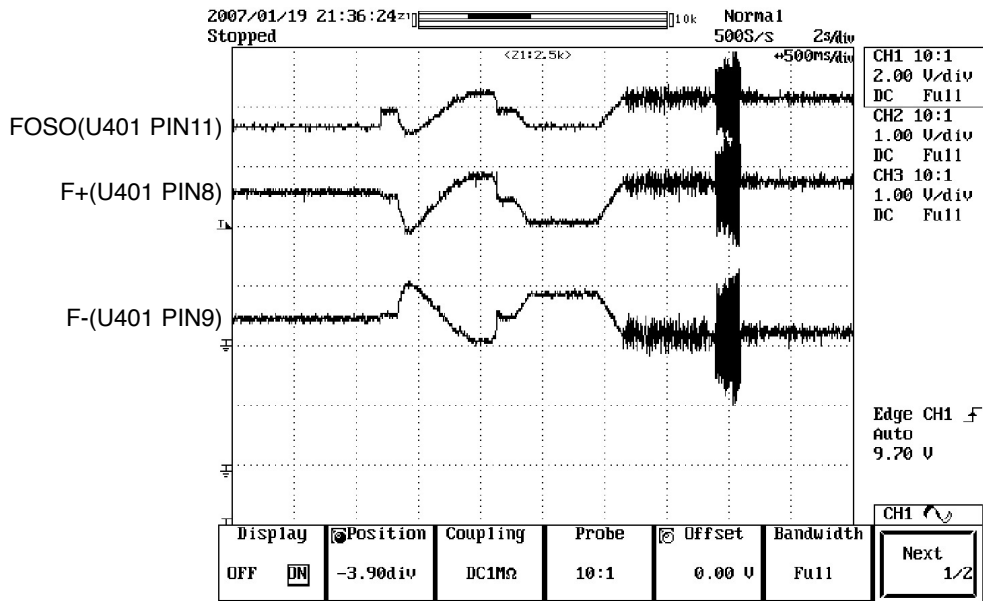


FIG 4-1

5. SPINDLE CONTROL WAVEFORM (NO DISC CONDITION)

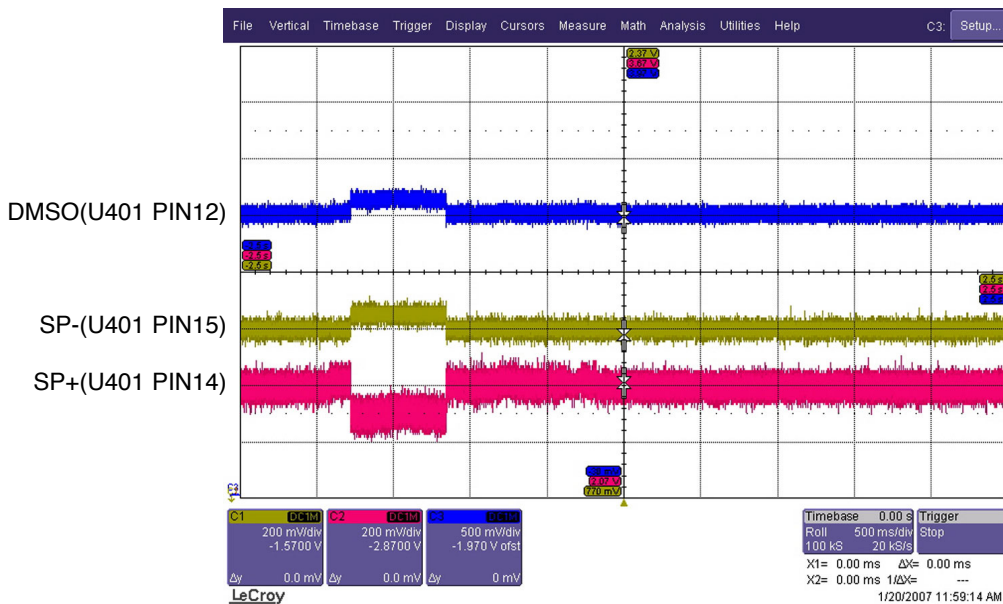


FIG 5-1

6. TRACKING CONTROL RELATED SIGNAL (SYSTEM CHECKING)

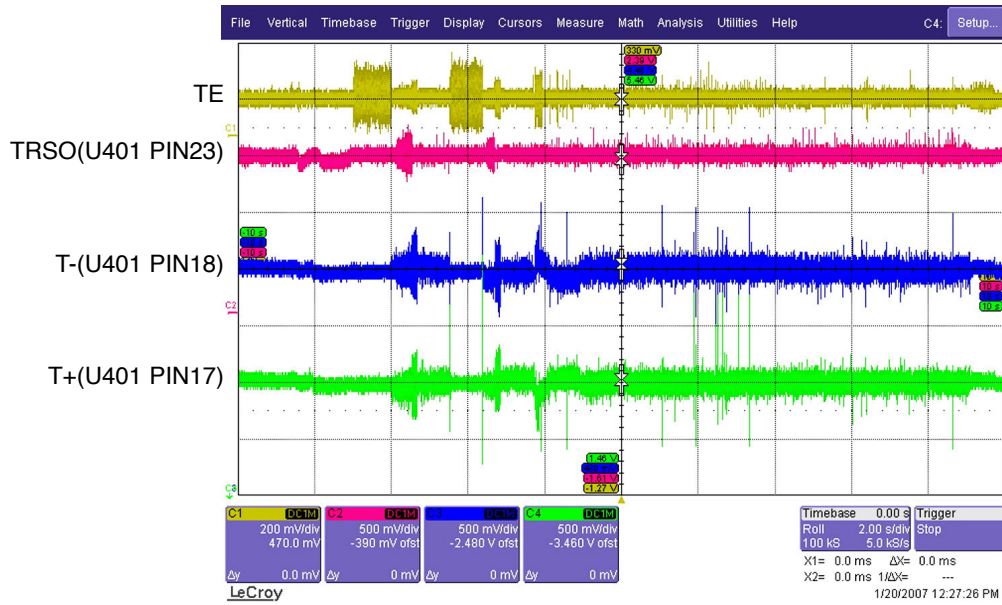


FIG 6-1

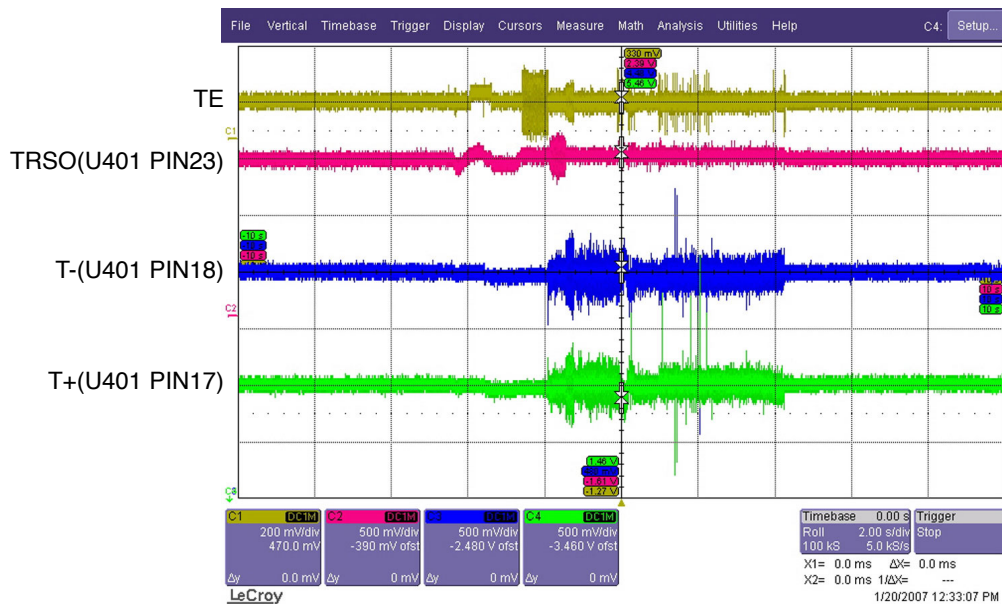


FIG 6-2

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

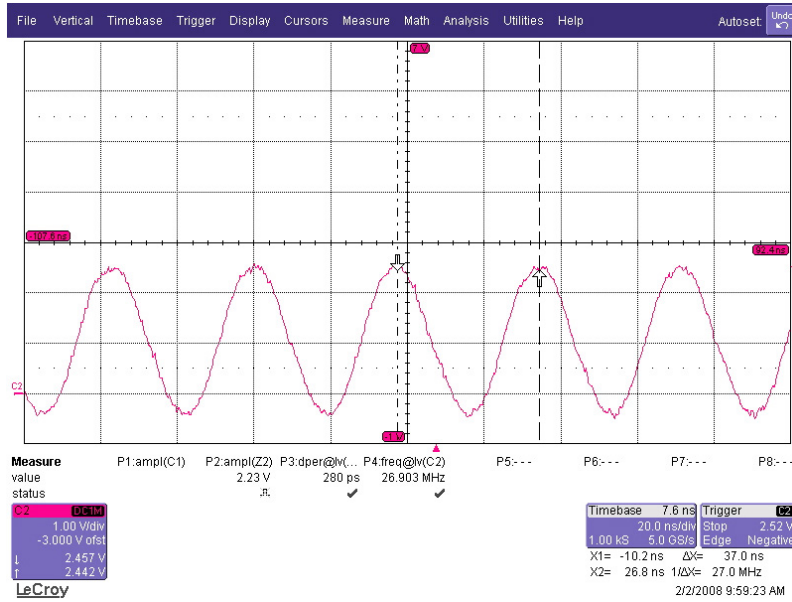


FIG 7-1

8. ZR36966 VIDEO OUTPUT WAVEFORM

1) Full colorbar signal (CVBS)

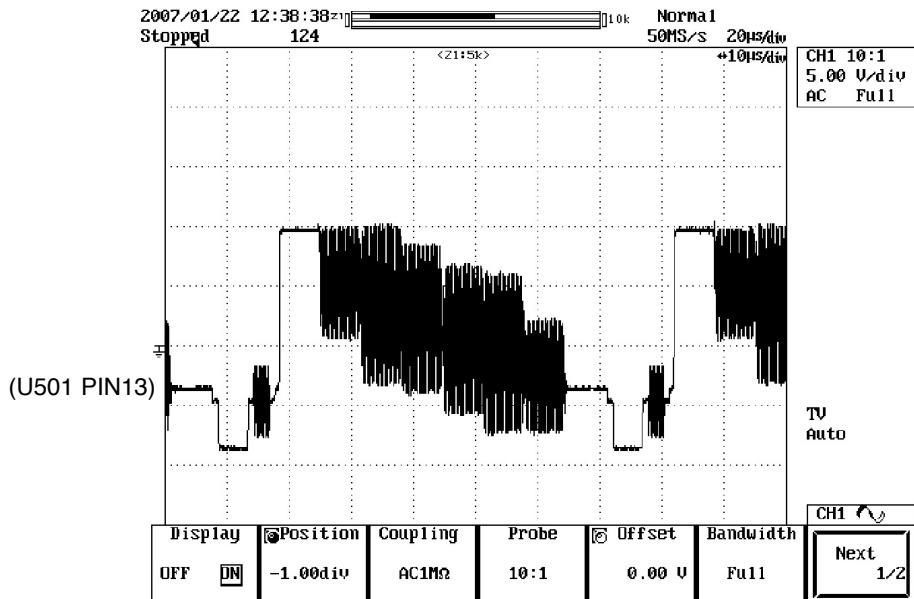


FIG 8-1

9. AUDIO OUTPUT FROM AUDIO DAC

1) Audio L/R

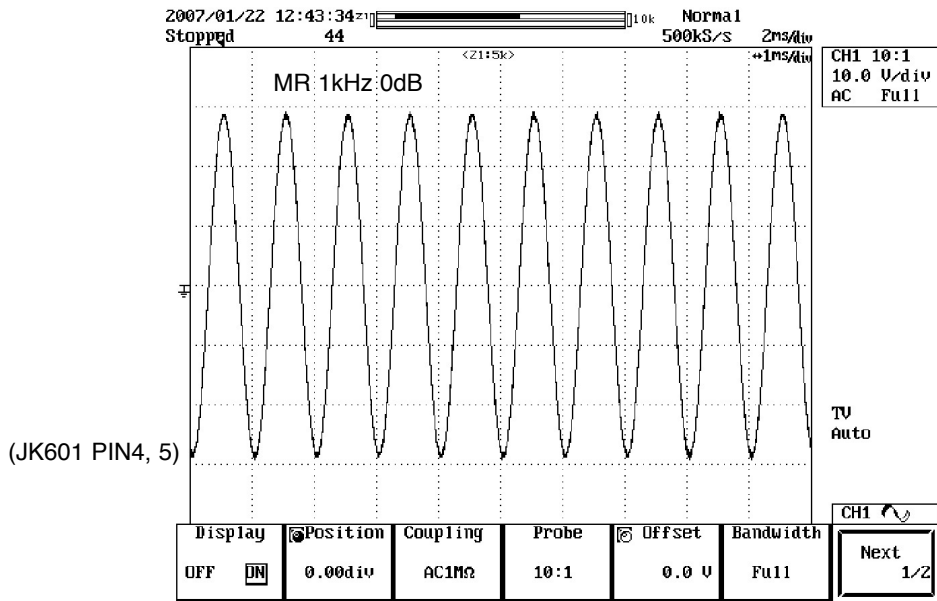


FIG 9-1

2) Audio related Signal

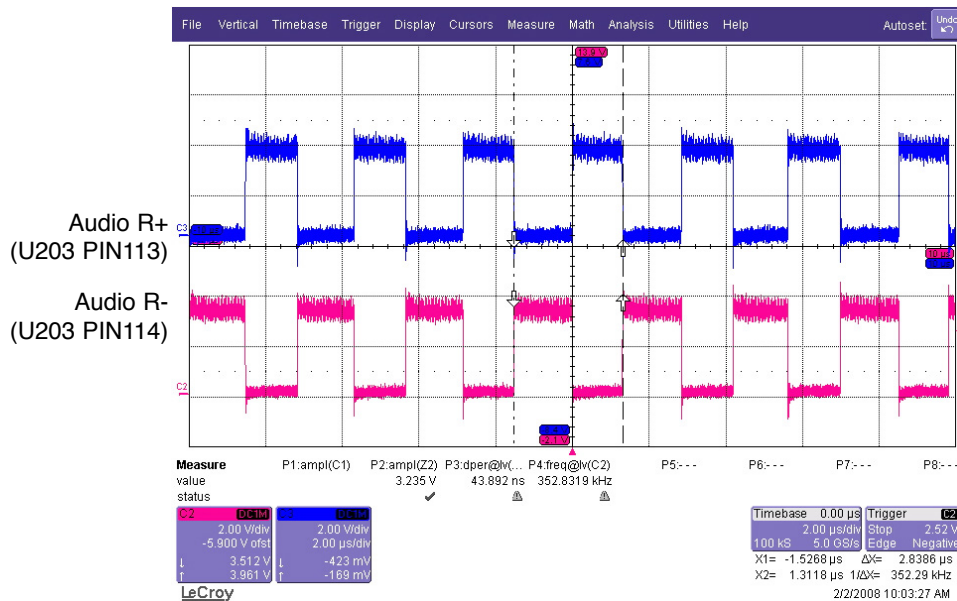
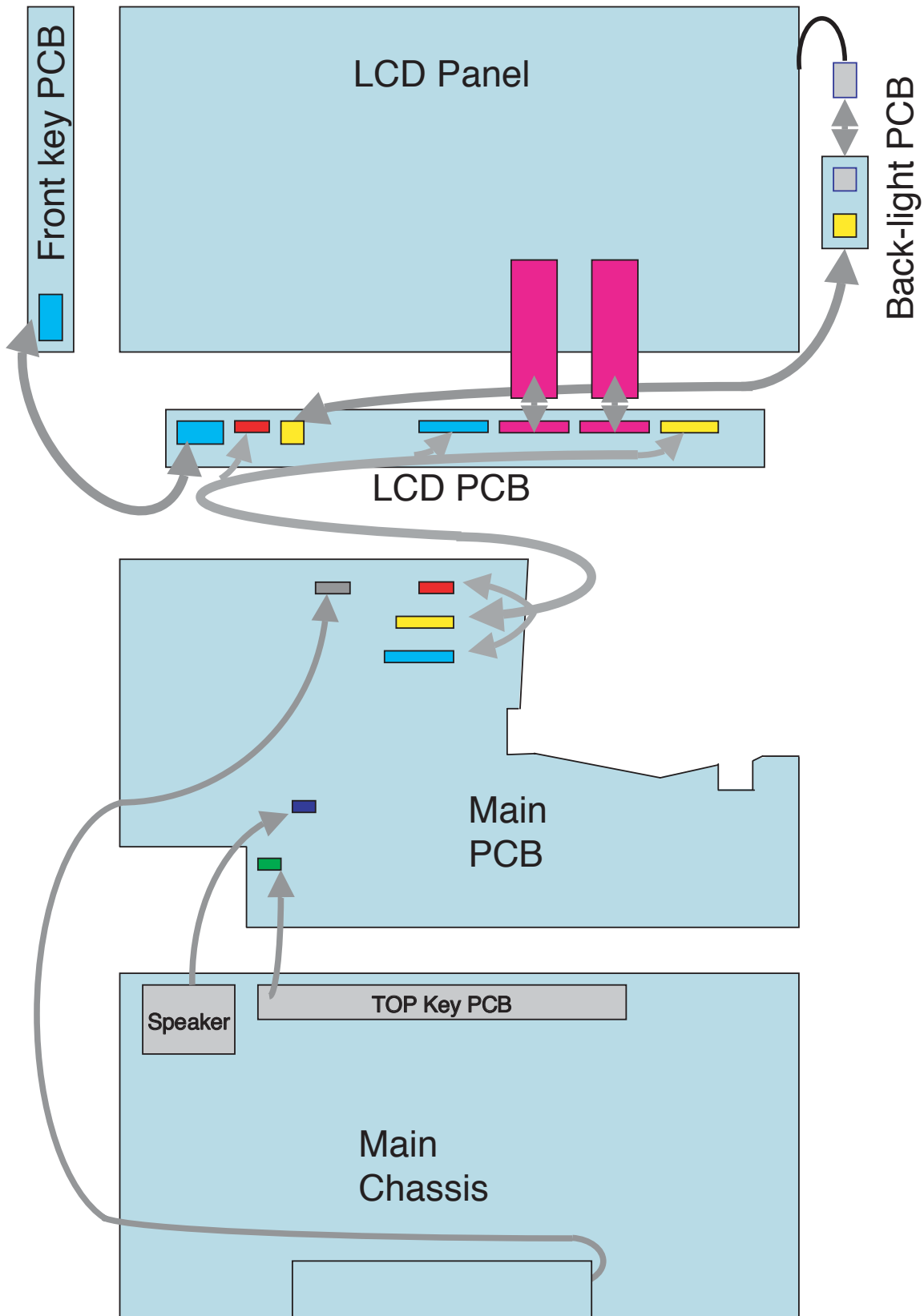


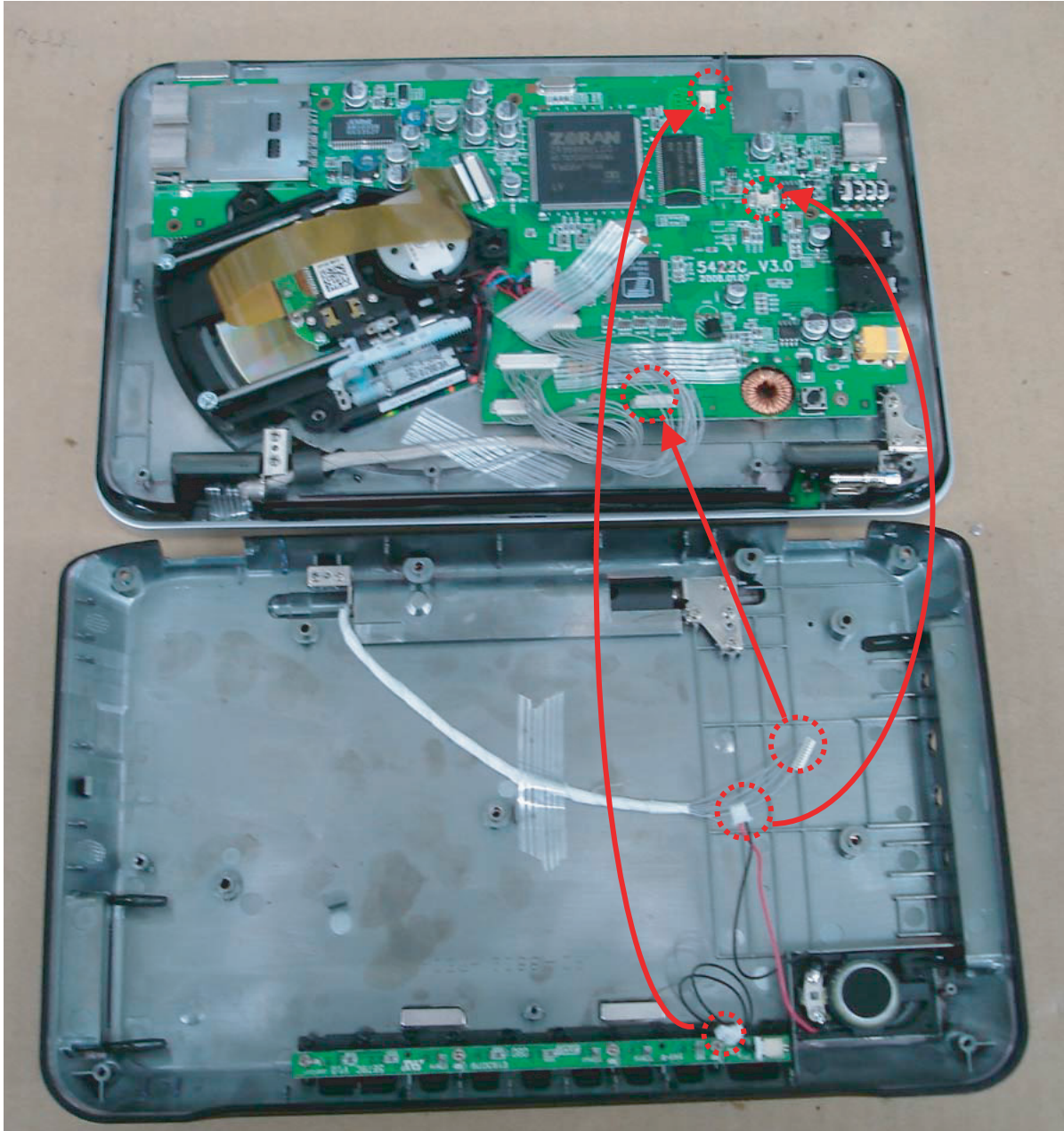
FIG 9-2

WIRING CONNECTION DIAGRAMS

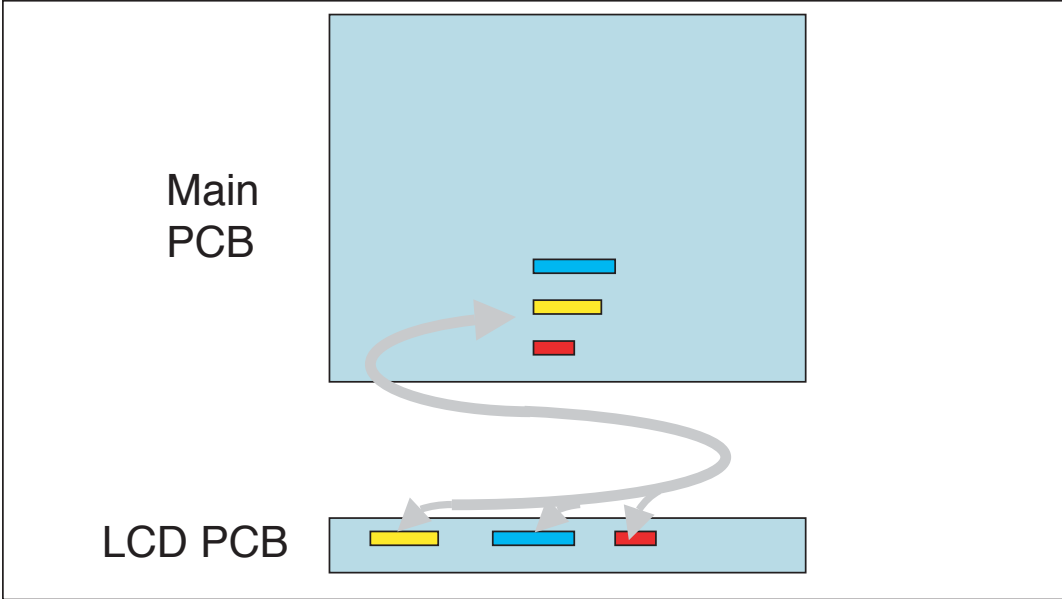
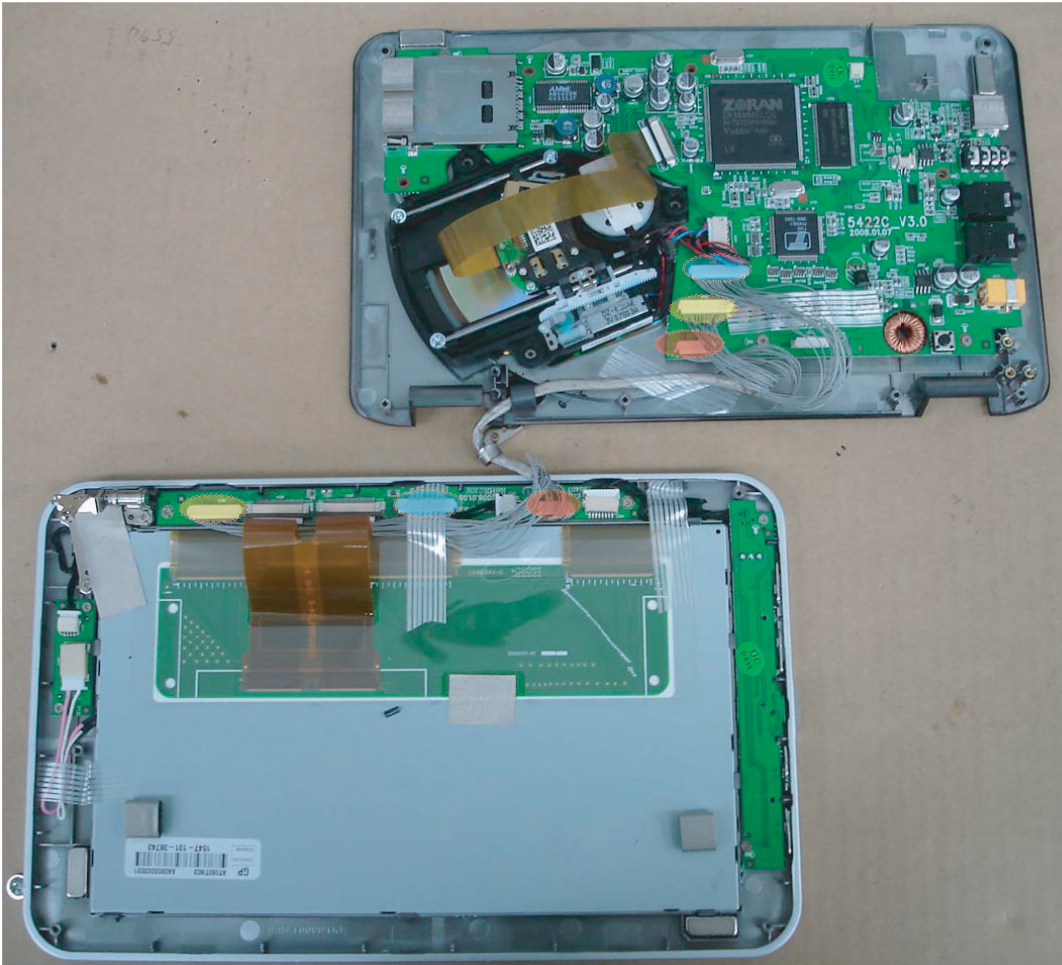
1. OVERALL CONNECTION LAYOUT DIAGRAM



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



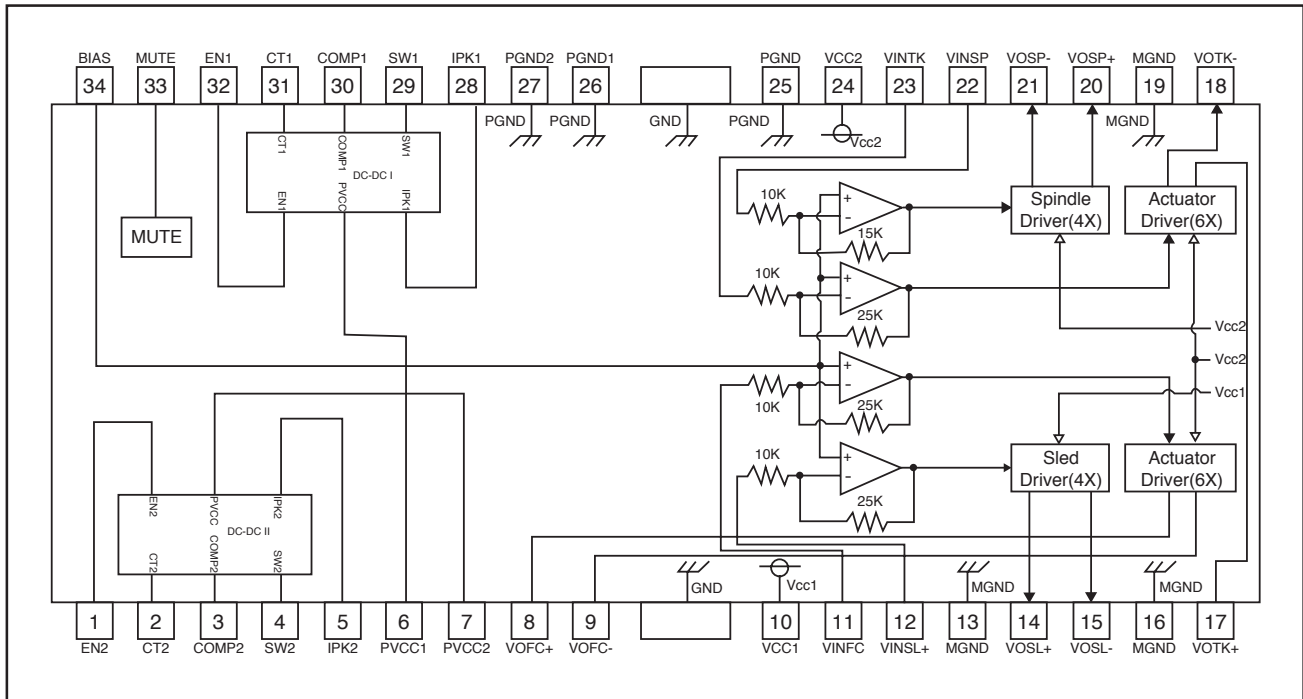
3. WIRING CONNECTION DIAGRAM-2 (MAIN PCB <---> LCD PCB)



INTERNAL BLOCK DIAGRAM OF ICs

1. MOTOR DRIVE IC(AM5898N)

1-1. Block Diagram



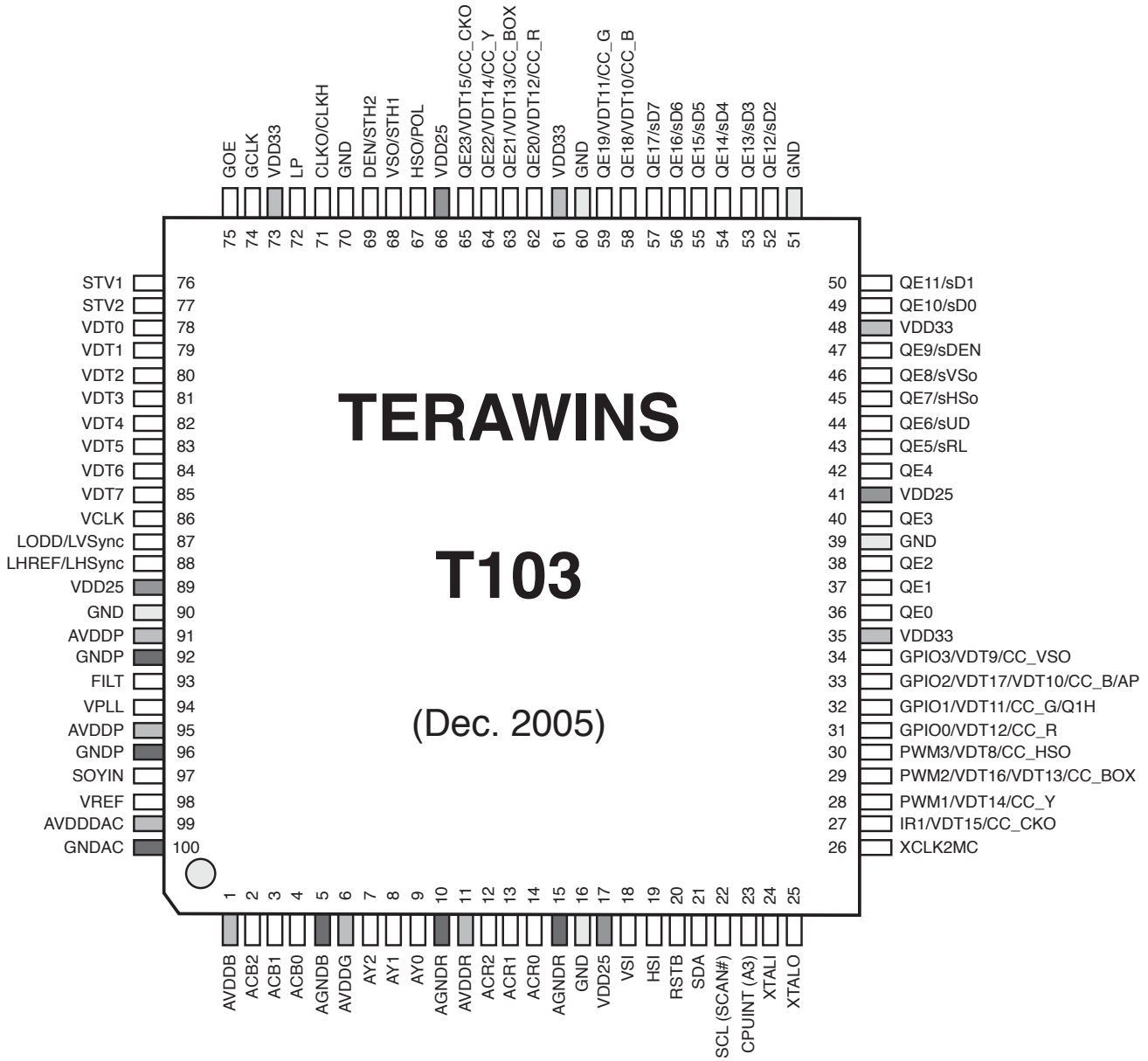
1-2. Pin Description

| 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

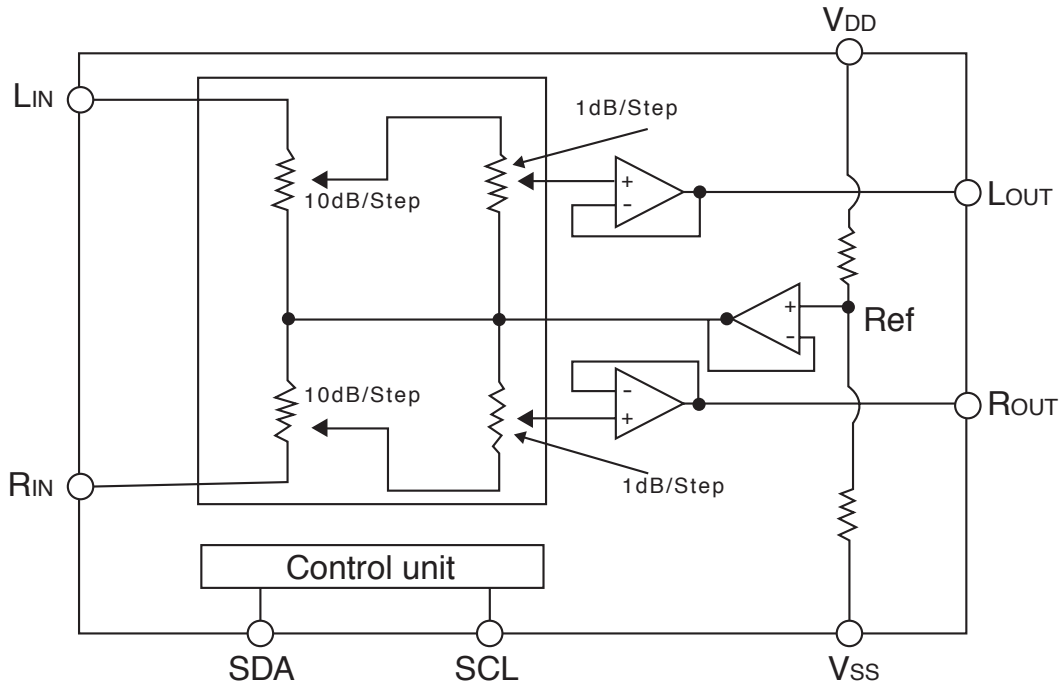
| Symbol | Pin# | Type | Description |
|--|---|----------|--|
| Power Supplies | | | |
| VDD25 | 17, 41, 66, 89 | PWR | +2.5V digital core power supply |
| VD33 | 35, 48, 61, 73 | PWR | +3.3V digital output power supply |
| GND | 16, 39, 51, 60, 70, 90 | GND | Digital ground |
| AVDDB | 1 | PWR | +3.3V 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 |
| TTL Output Interface Signals | | | |
| 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 |
| Timing Controller Interface Signals | | | |
| 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 |
| Serial RGB Output Interface Signals | | | |
| 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 |
|--|------------------------|----------|--|
| Configuration Interface Signals | | | |
| 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 ² C device address. When RSTB goes high, if this pin is high, then default I ² C device address is 50h, else 40h. |
| RSTB | 20 | DI, P/U | Whole chip reset. |
| ADC Interface | | | |
| 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 |
| PLL and Slicer Interface | | | |
| FILT | 93 | AI | PLL filler |
| VPLL | 94 | AI | PLL reference |
| SOYIN | 97 | AI | Sync on Y (of component) input |
| VREF | 98 | AI | Voltage reference |
| ITU-R656 Video-In Interface | | | |
| 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 |
| CCIR-601 8-bits Video-In Interface | | | |
| 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 |
| CCIR-601 16-bits Video-In Interface | | | |
| 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 |
|---|-------------------------|----------|---|
| RGB565 Video-In Interface | | | |
| 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 |
| RGB666 Video-In Interface | | | |
| 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 |
| PLL Reference Clock | | | |
| XTALI | 24 | DI | Output PLL reference clock input and I ² C, timer operating clock |
| XTALO | 25 | DO | Output PLL reference clock output |
| XCLK2MC | 26 | DO | Buffered XTALI for external microprocessor. |
| PWM, GPIO and IR Interface Signals | | | |
| 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 |
| CC/Ext_OSD Mixer Interface Signals | | | |
| 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

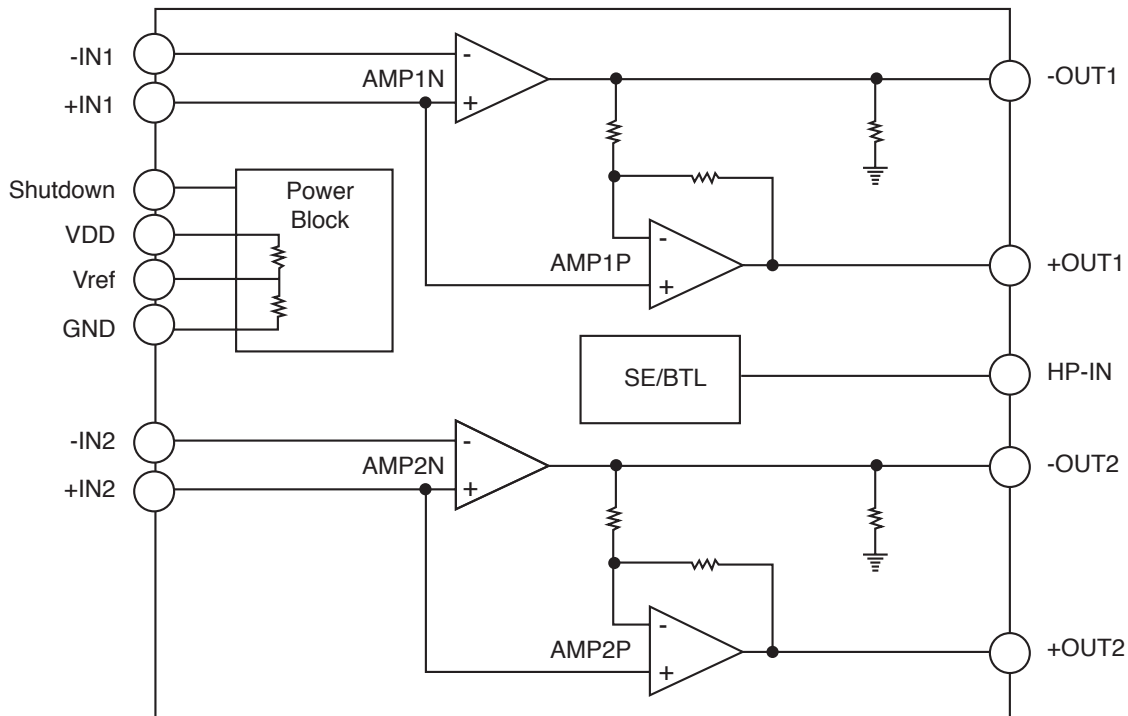


3-2. Pin Description

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

4. SPEAKER AMP IC(PT2303)

4-1. Block Diagram

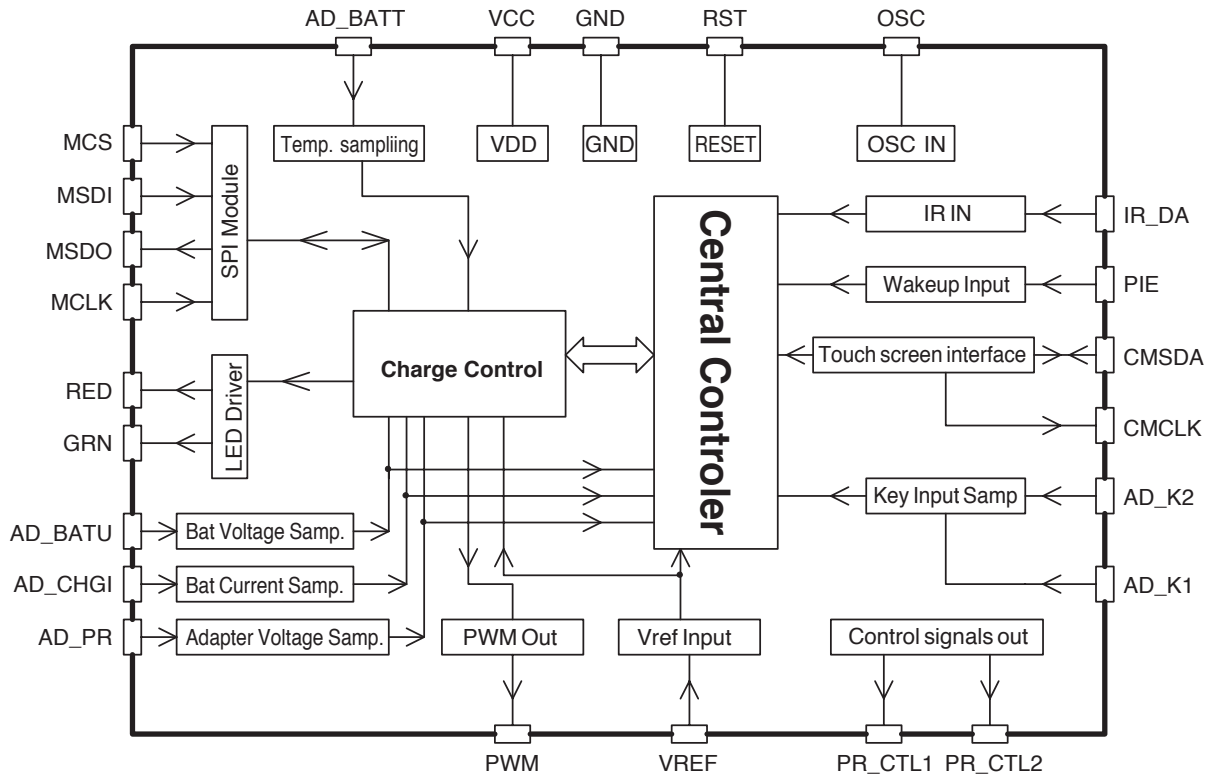


4-2. Pin Description

| 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

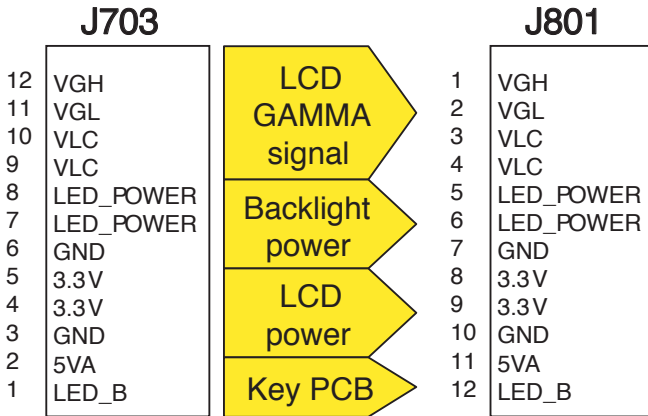
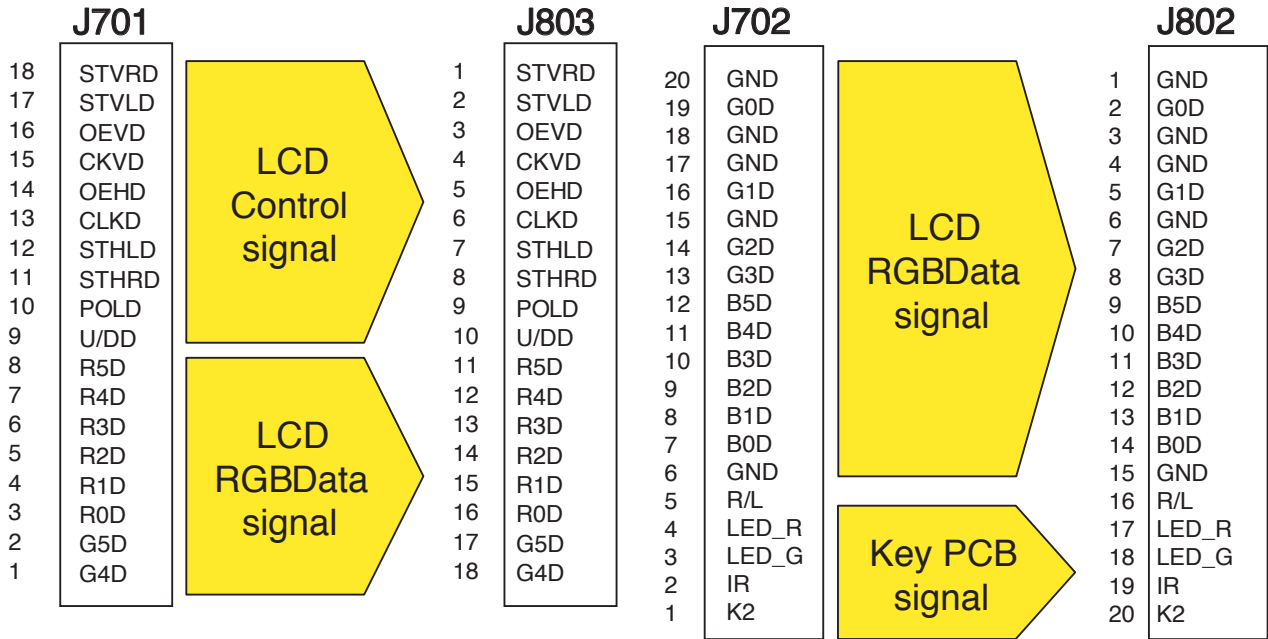


5-2. Pin Description

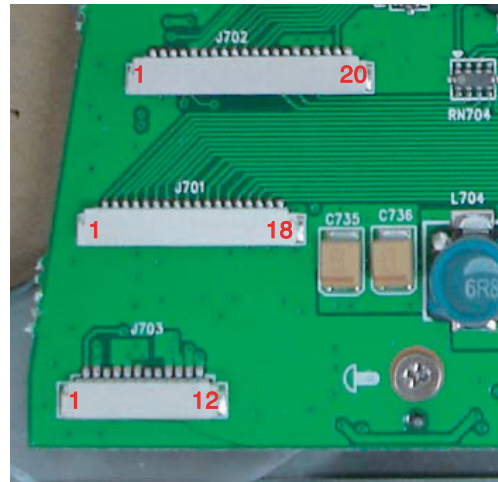
| Pin No. | Designation | Description |
|---------|-------------|--|
| 1 | RED | Red led port |
| 2 | GRN | Green led port |
| 3 | CMSDA | Touch screen interface data line |
| 4 | CMCLK | Touch screen interface clock line |
| 5 | NC | For expansion |
| 6 | MCS | SPI Module CS port |
| 7 | PWM | PWM out |
| 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 | Keyswitch identification port 1 |
| 15 | AD_K2 | Keyswitch 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 \bar{c} 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

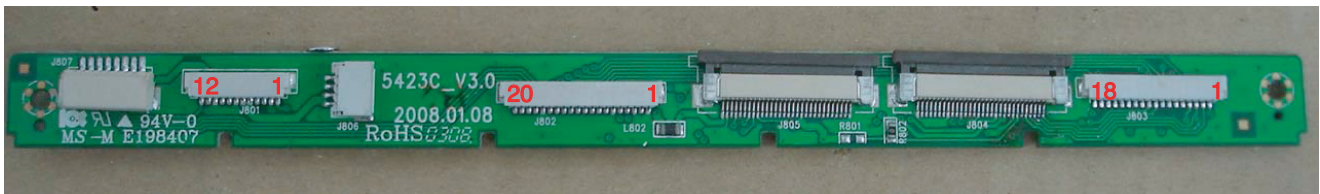
MAIN <--> LCD PCB INTERFACE



Main PCB

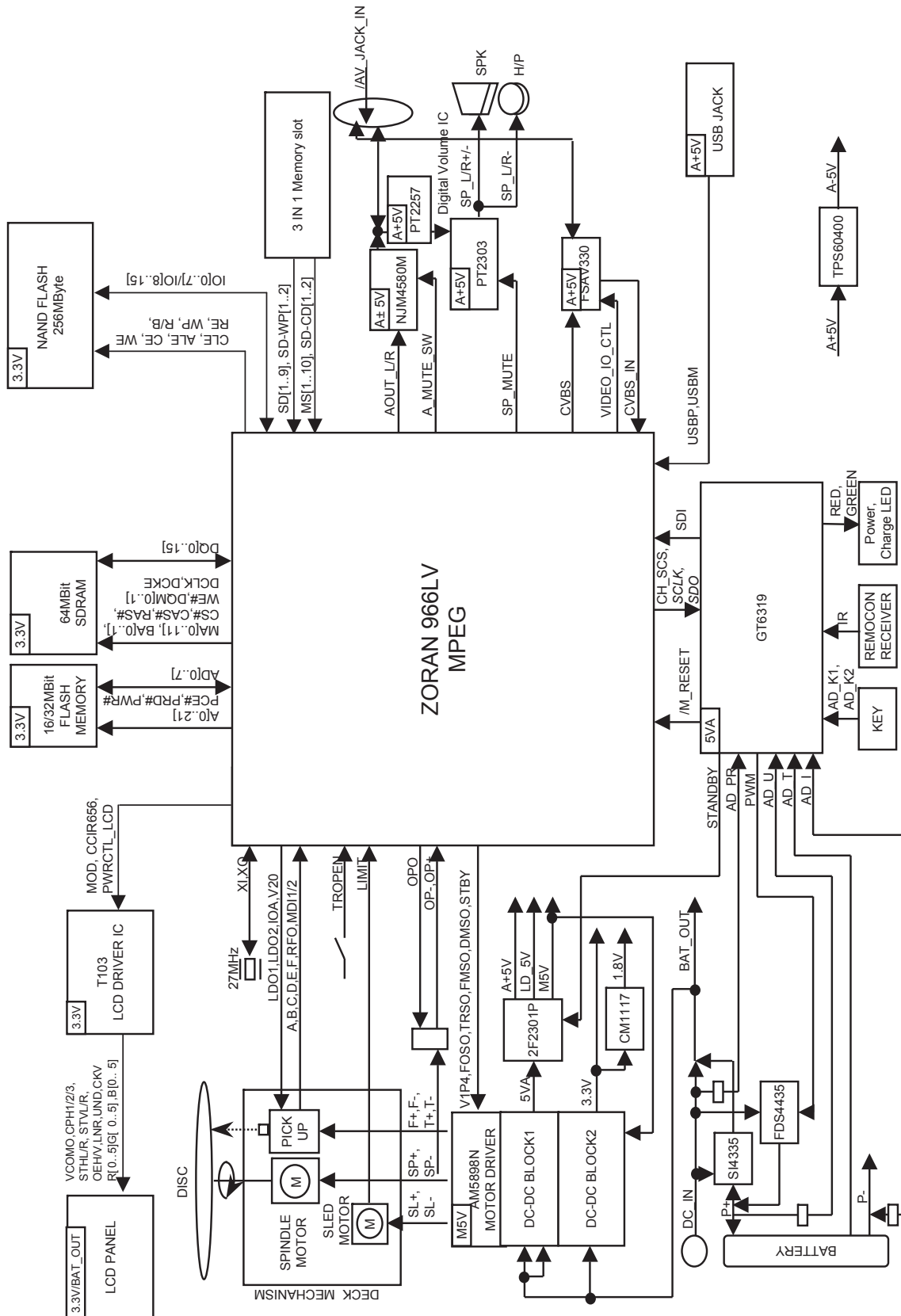


LCD PCB

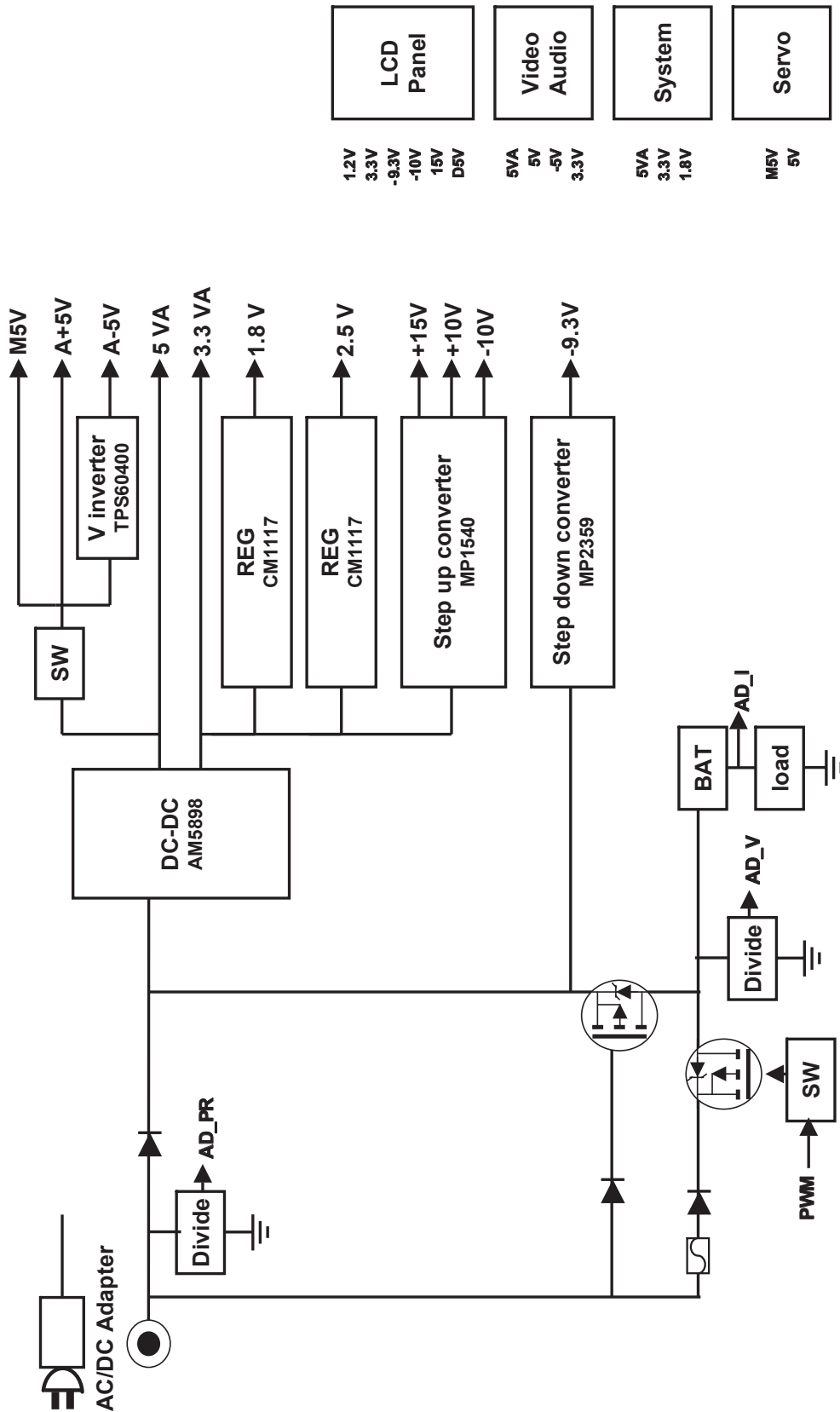


BLOCK DIAGRAMS

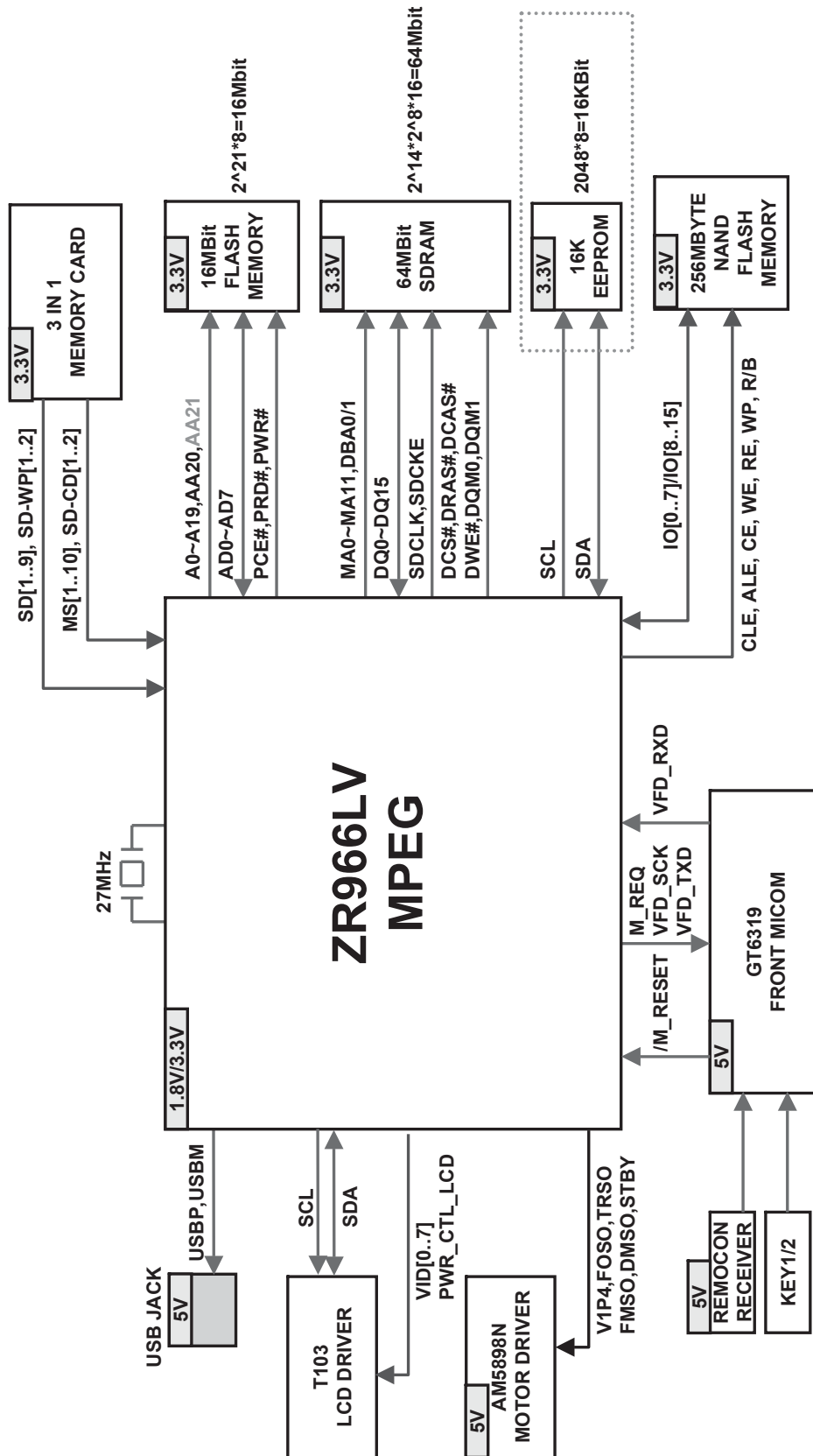
1. OVERALL BLOCK DIAGRAM



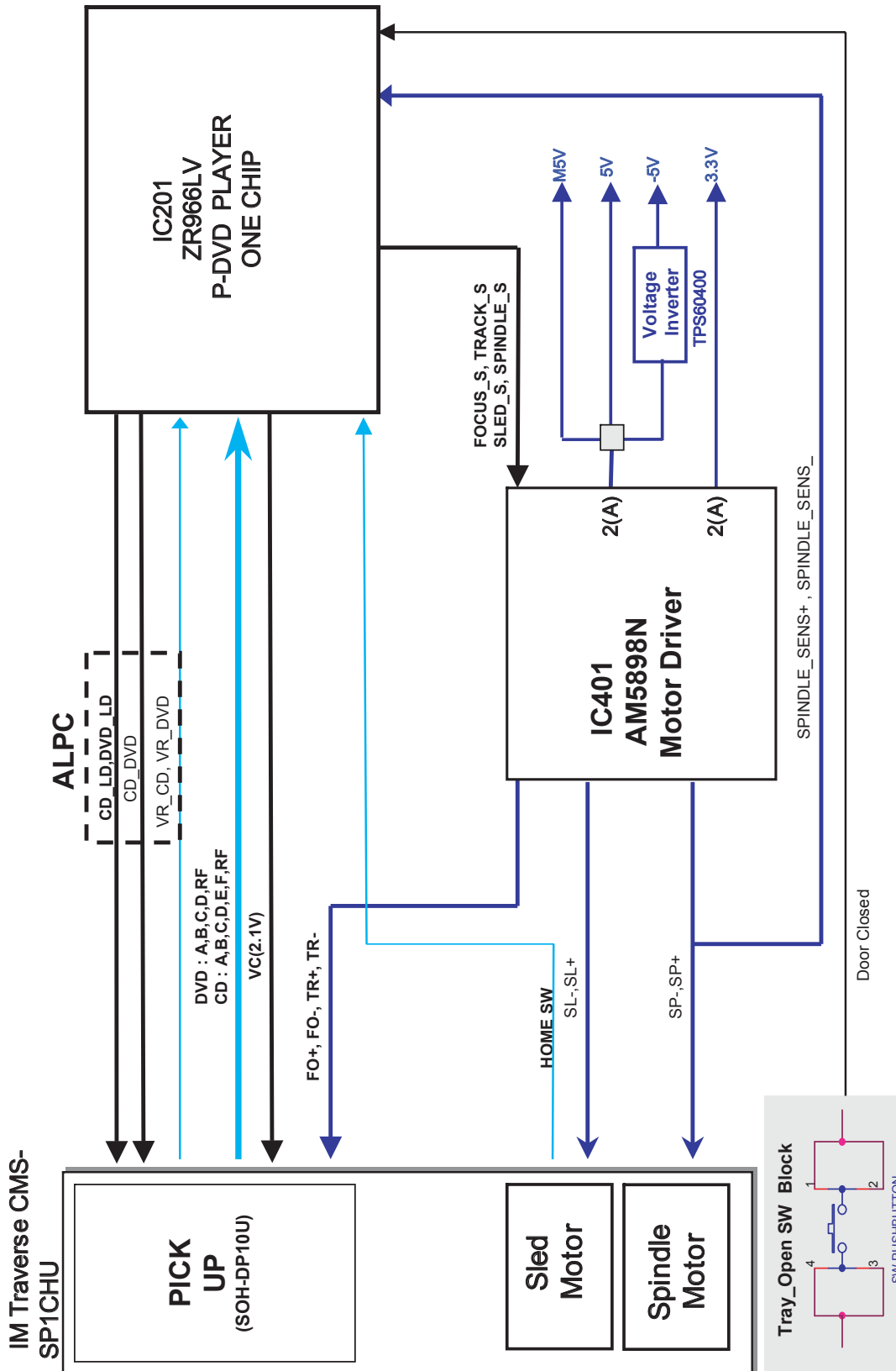
2. POWER BLOCK DIAGRAM



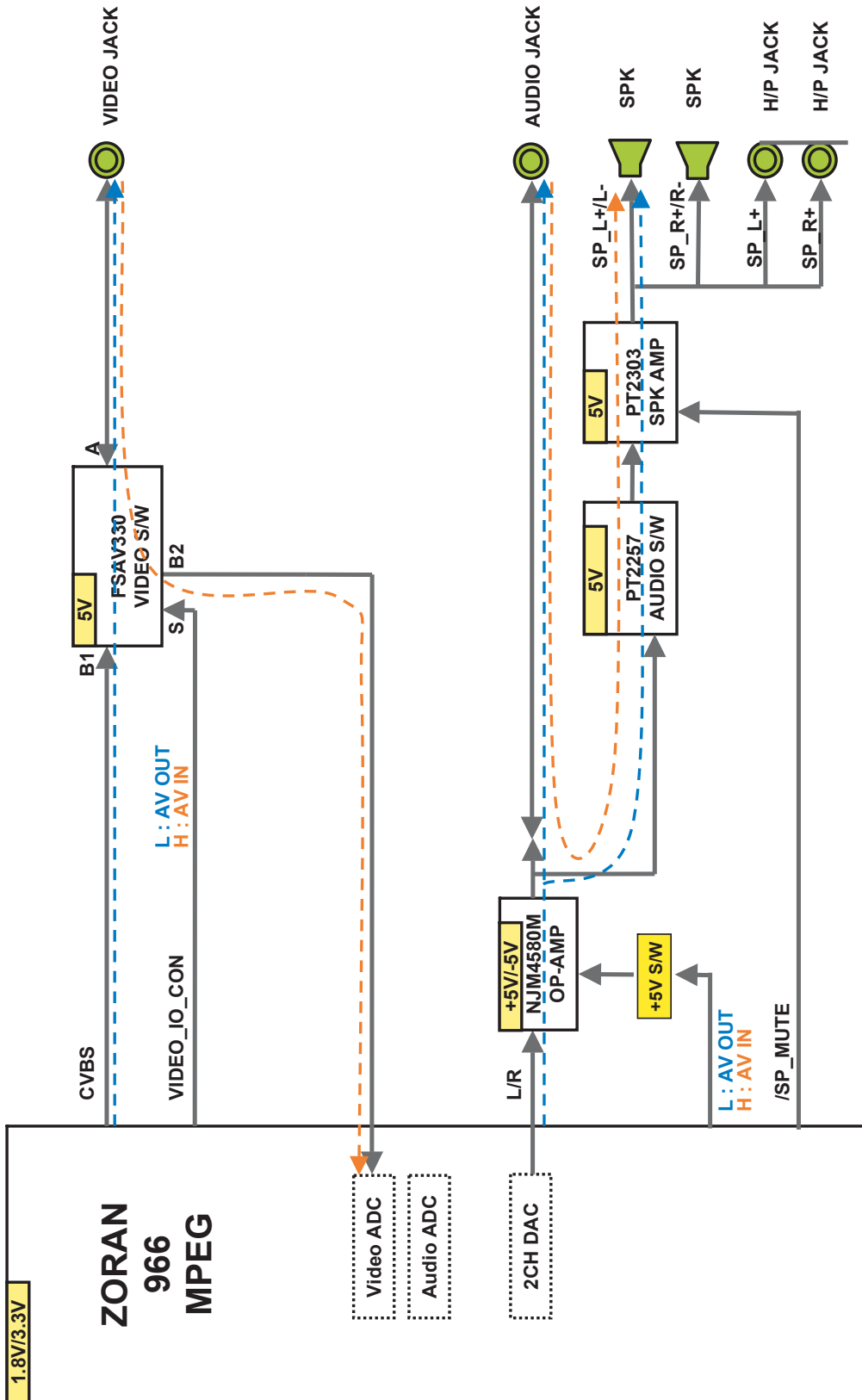
3. MPEG BLOCK DIAGRAM



4. DISC BLOCK DIAGRAM

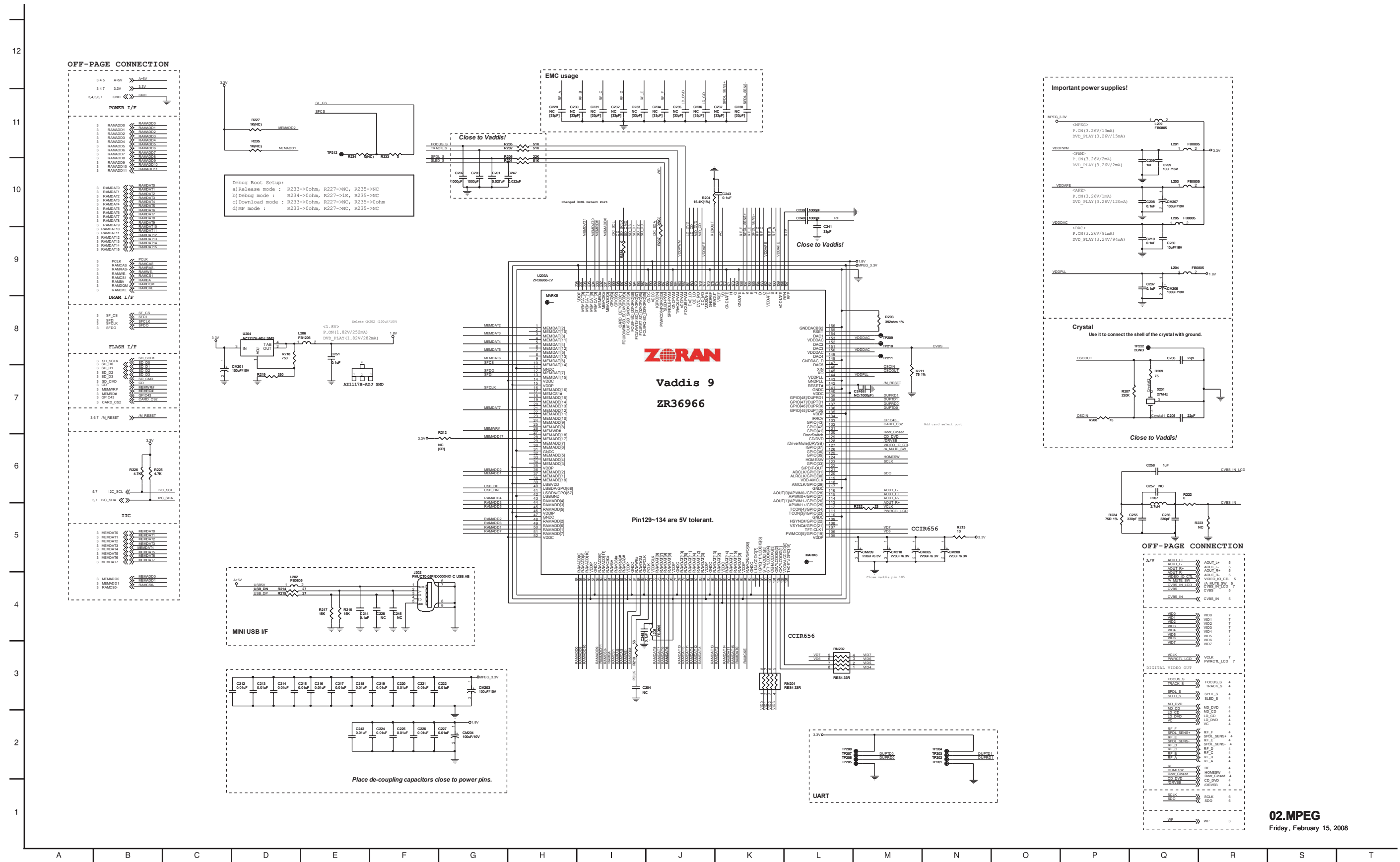


5. AV BLOCK DIAGRAM

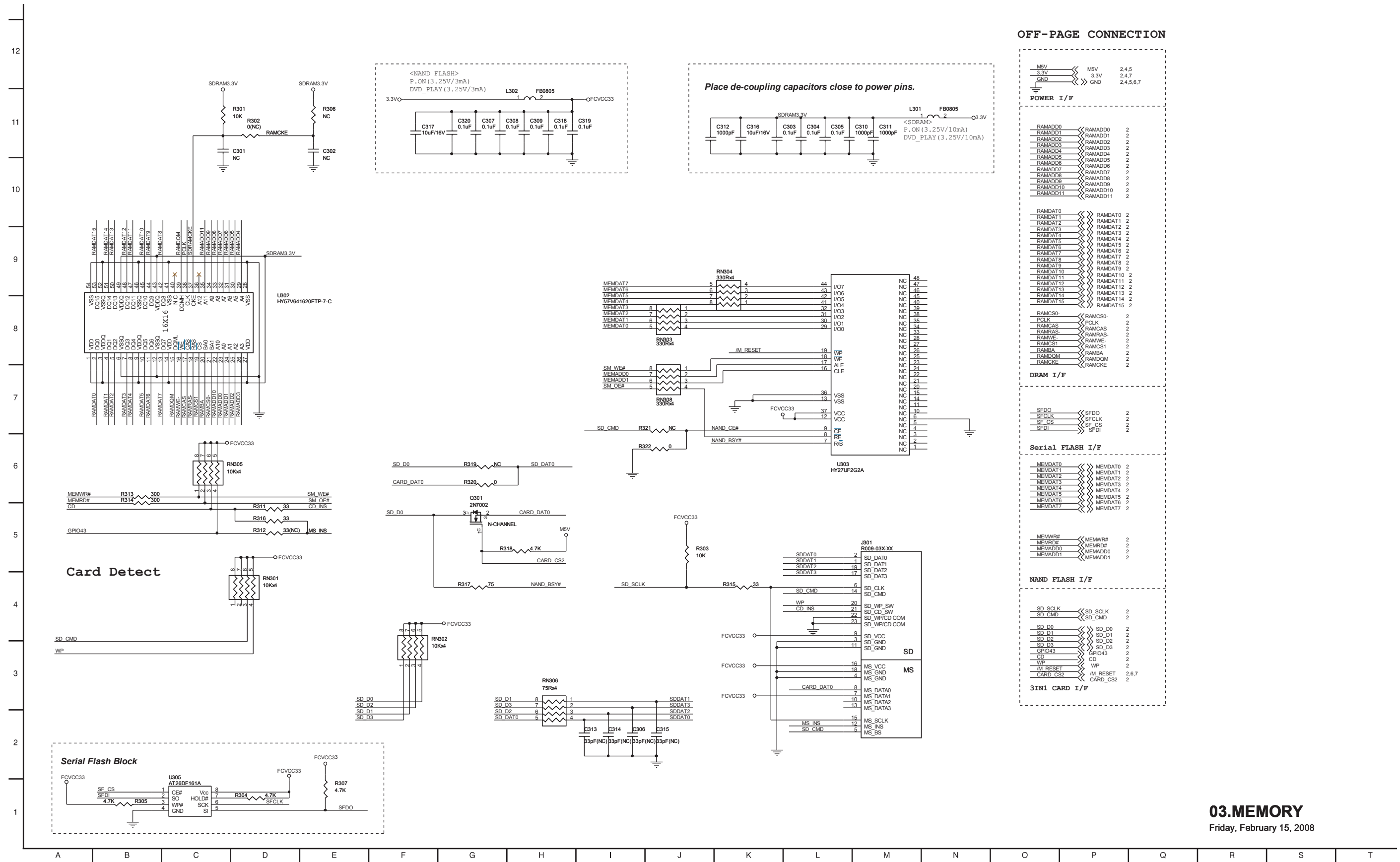


CIRCUIT DIAGRAMS

1. MPEG CIRCUIT DIAGRAM



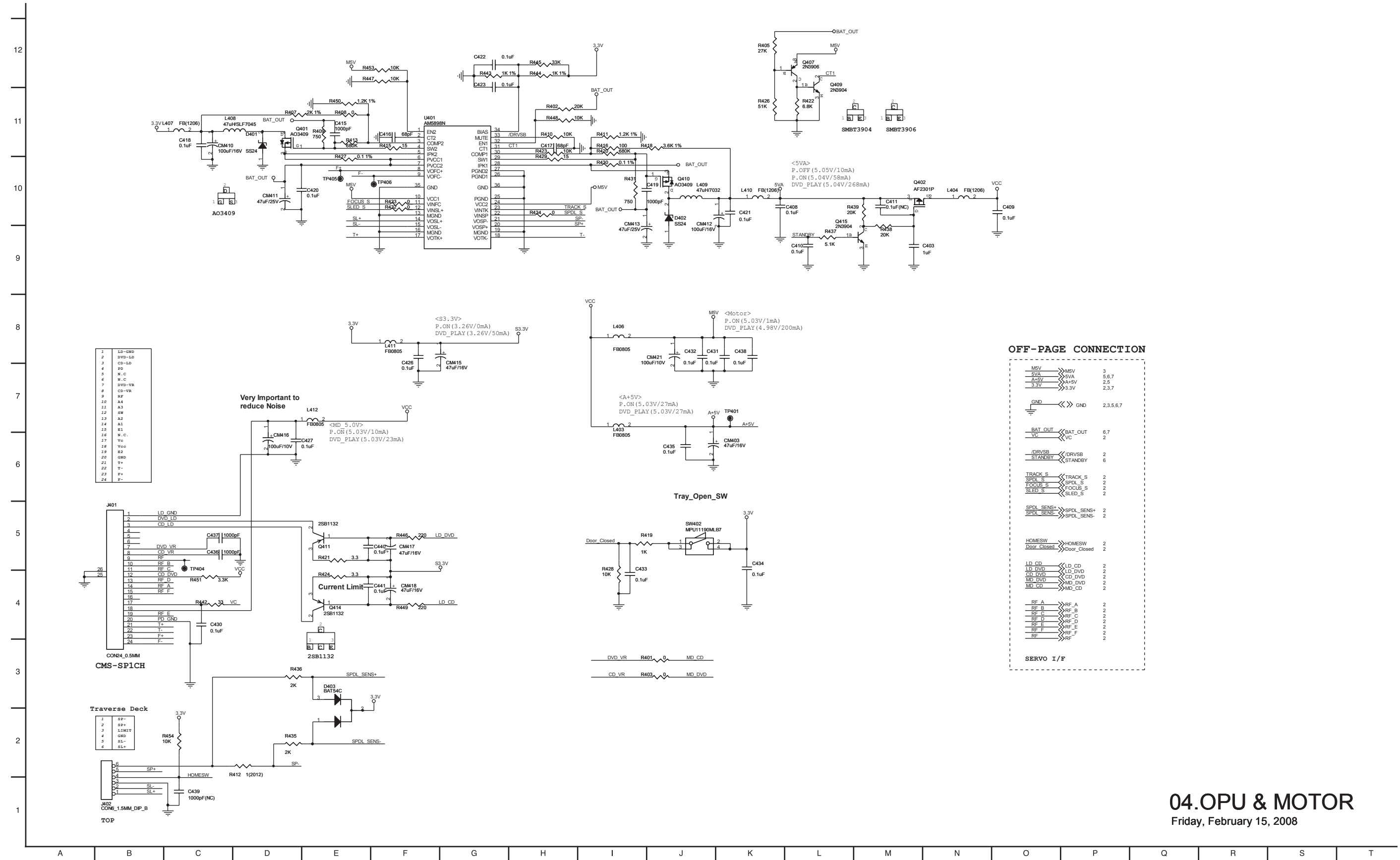
2. MEMORY CIRCUIT DIAGRAM



03.MEMORY

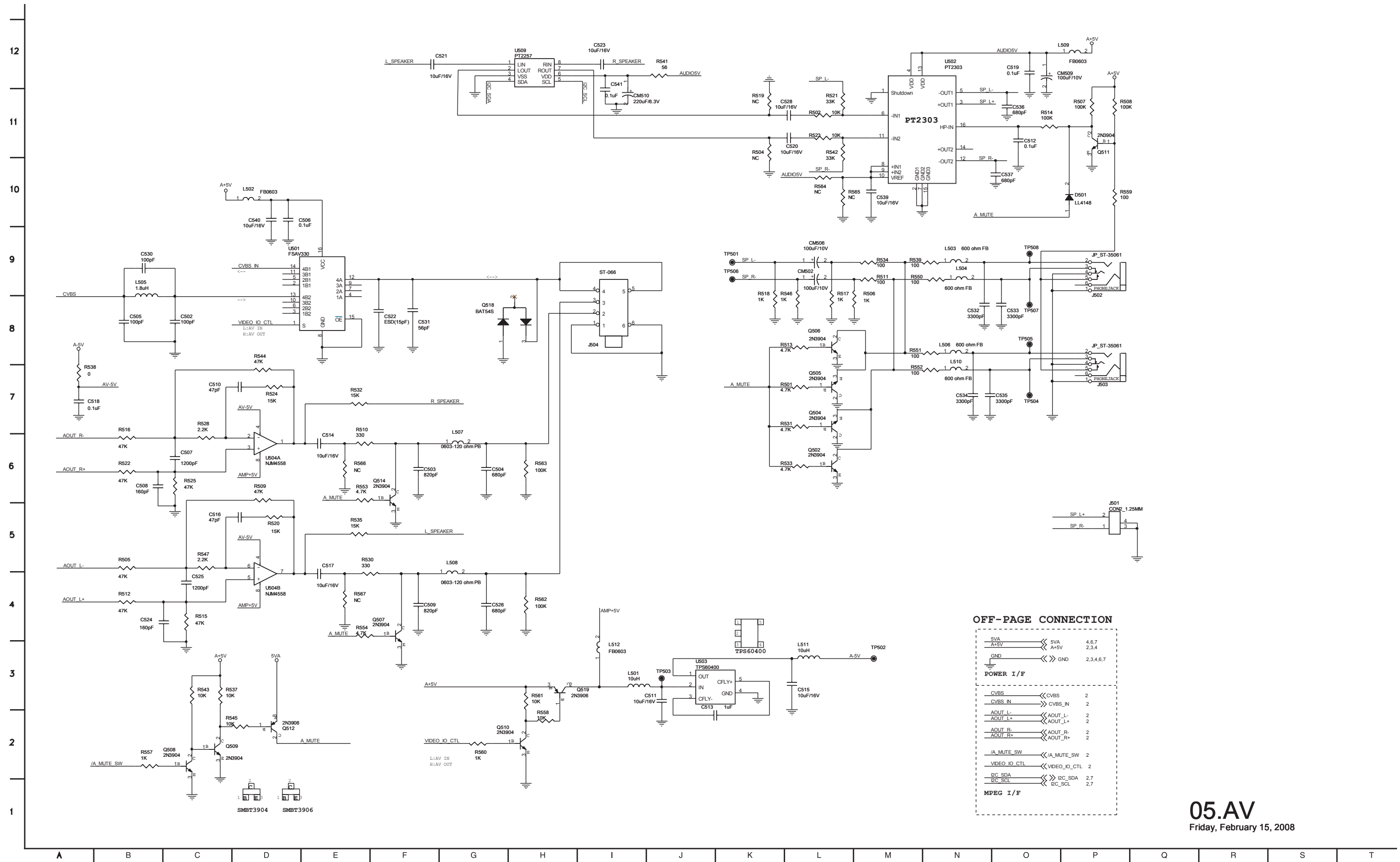
Friday, February 15, 2008

3. OPU & MOTOR CIRCUIT DIAGRAM



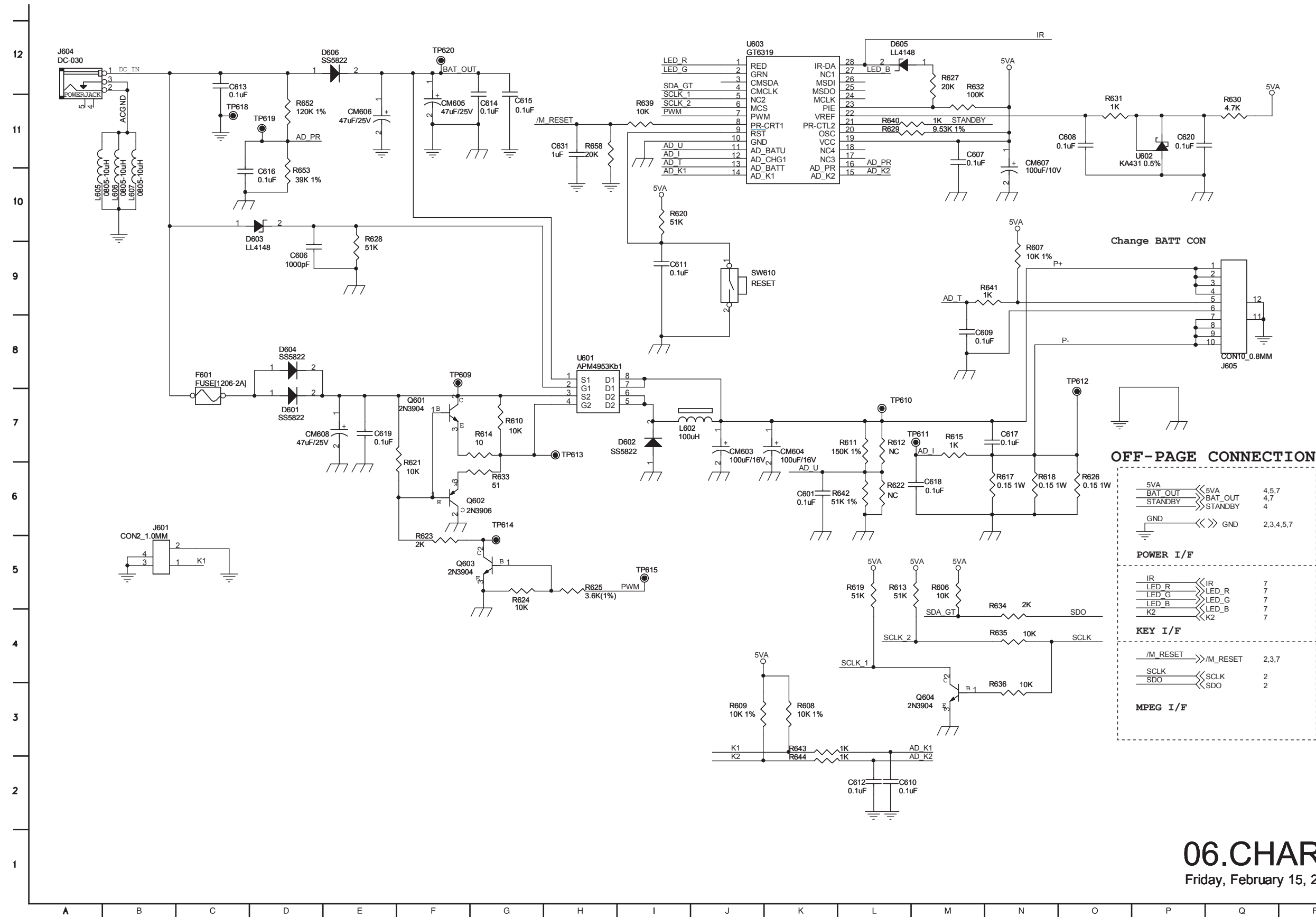
04.OPU & MOTOR
Friday, February 15, 2008

4. AV CIRCUIT DIAGRAM



05.AV
Friday, February 15, 2008

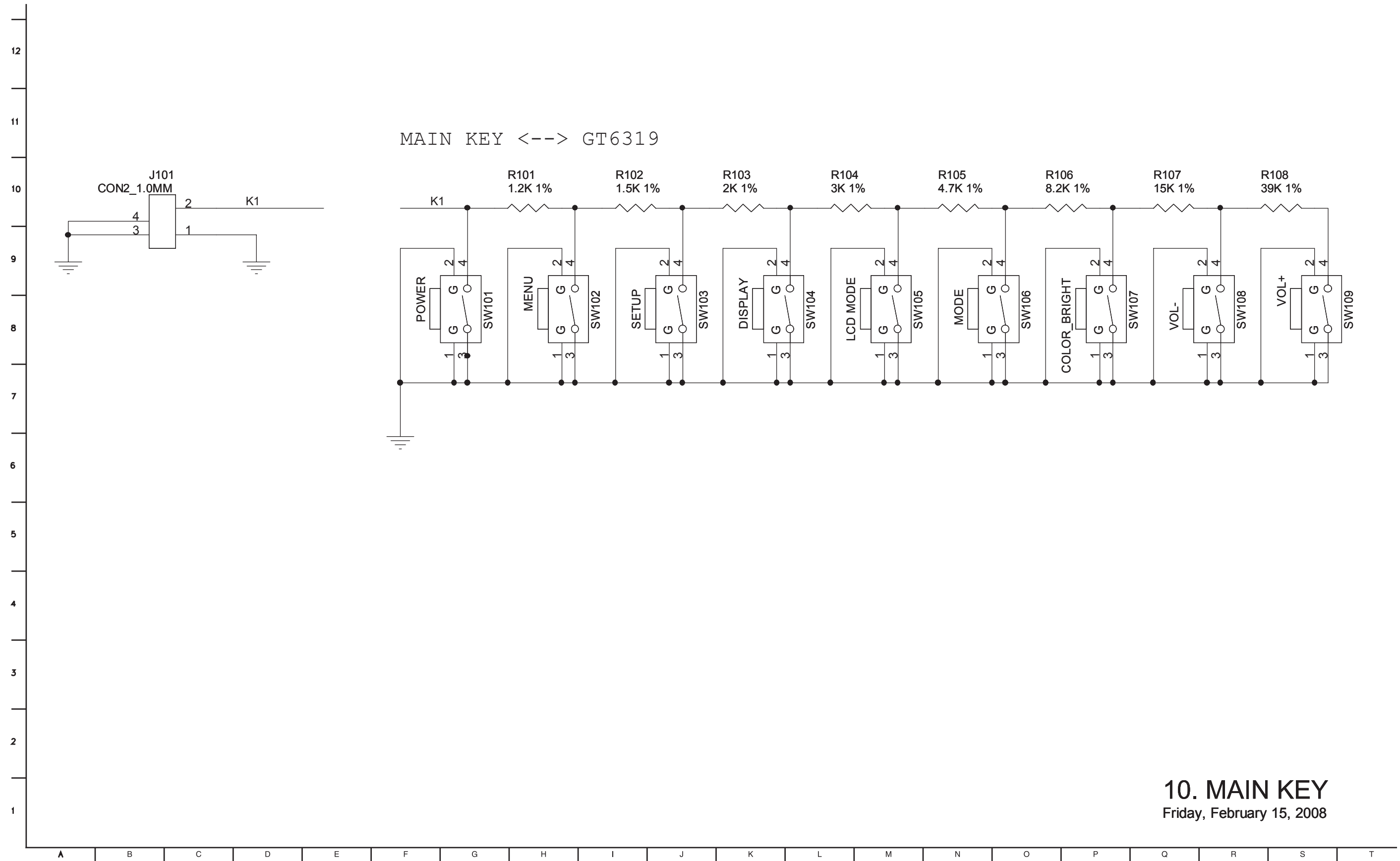
5. CHARGE CIRCUIT DIAGRAM



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 |
|----------------------------------|----------|--|---------|-----------------------|
| U201 (ZR966LV) | | | | |
| 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 |
| U204 (AZ1117HAD) | | | | |
| 2 | OUT | OUTPUT VOLTAGE | 1.88V | 1.7V ~ 1.9V |
| 3 | IN | INPUT VOLATAG | 3.29V | 2.7 V ~ 7V |
| U302 (HY57V641620ETP-7-C) | | | | |
| 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 |
| U303 (HY27UF2G2A) | | | | |
| 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 |
| U305 (AT26DF161A) | | | | |
| 8 | VCC | Device power supply | 3.295V | 2.7V ~ 3.6V |
| U401 (AM5898N) | | | | |
| 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 |
| U501 (FSAV330) | | | | |
| 16 | VCC | supply voltage | 4.96V | 4.0V ~5.5V |
| U502 (PT2303) | | | | |
| 4 | VDD | Supply voltage input | 4.97V | 0V ~ 7V |
| 13 | VDD | Supply voltage input | 4.98V | 0V ~ 7V |
| U503 (TPS60400) | | | | |
| 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 |
|-------------------------|----------|---|---------|-----------------------|
| U504 (TJM4558M) | | | | |
| 4 | AV-5V | supply voltage | -4.8V | +/- 22V |
| 8 | AMP+5V | supply voltage | 4.92V | +/- 22V |
| U509 (PT2257) | | | | |
| 6 | Audio5V | supply voltage | 4.99V | 4V ~ 10V |
| U603 (GT6319) | | | | |
| 19 | VCC | chip power | 5.05V | 4.5V ~ 5.5V |
| U701 (T103) | | | | |
| 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 |
| U702 (AZ1117HAD) | | | | |
| 2 | OUT | OUTPUT VOLTAGE | 2.4V | 2.25V ~ 2.75V |
| 3 | IN | INPUT VOLATAG | 3.29V | 2.7 V ~ 7V |
| U703 (RCR2561) | | | | |
| 5 | VIN | Supply Input Bypass to GND with a 1uF capacitor | 3.23V | 2.5V - - 5.5V |
| U704 (MP2359) | | | | |
| 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 |

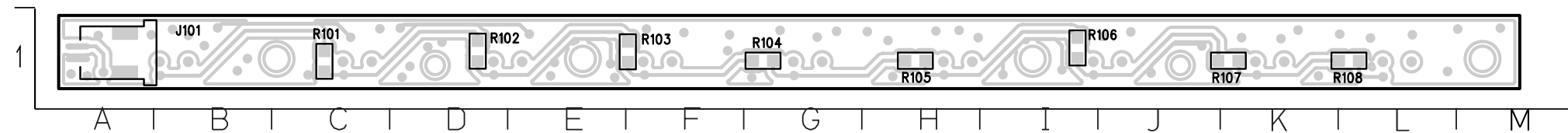
| LOCA. NO. | CAPACITY | + | - |
|-----------|-----------|-------|-------|
| CM418 | 47uF/16V | 3.29V | 2.32V |
| CM421 | 100uF/10V | 4.97V | 0V |
| CM502 | 100uF/10V | 2.4V | 0V |
| CM506 | 100uF/10V | 2.4V | 0V |
| CM509 | 100uF/10V | 4.95V | 0V |
| CM603 | 100uF/16V | 8.3V | 0V |
| CM604 | 100uF/16V | 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

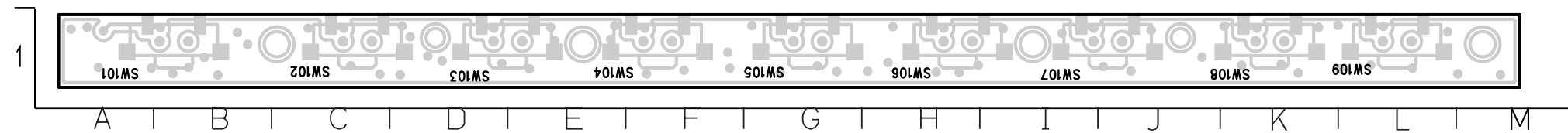
1. MAIN P.C.BOARD (TOP VIEW)



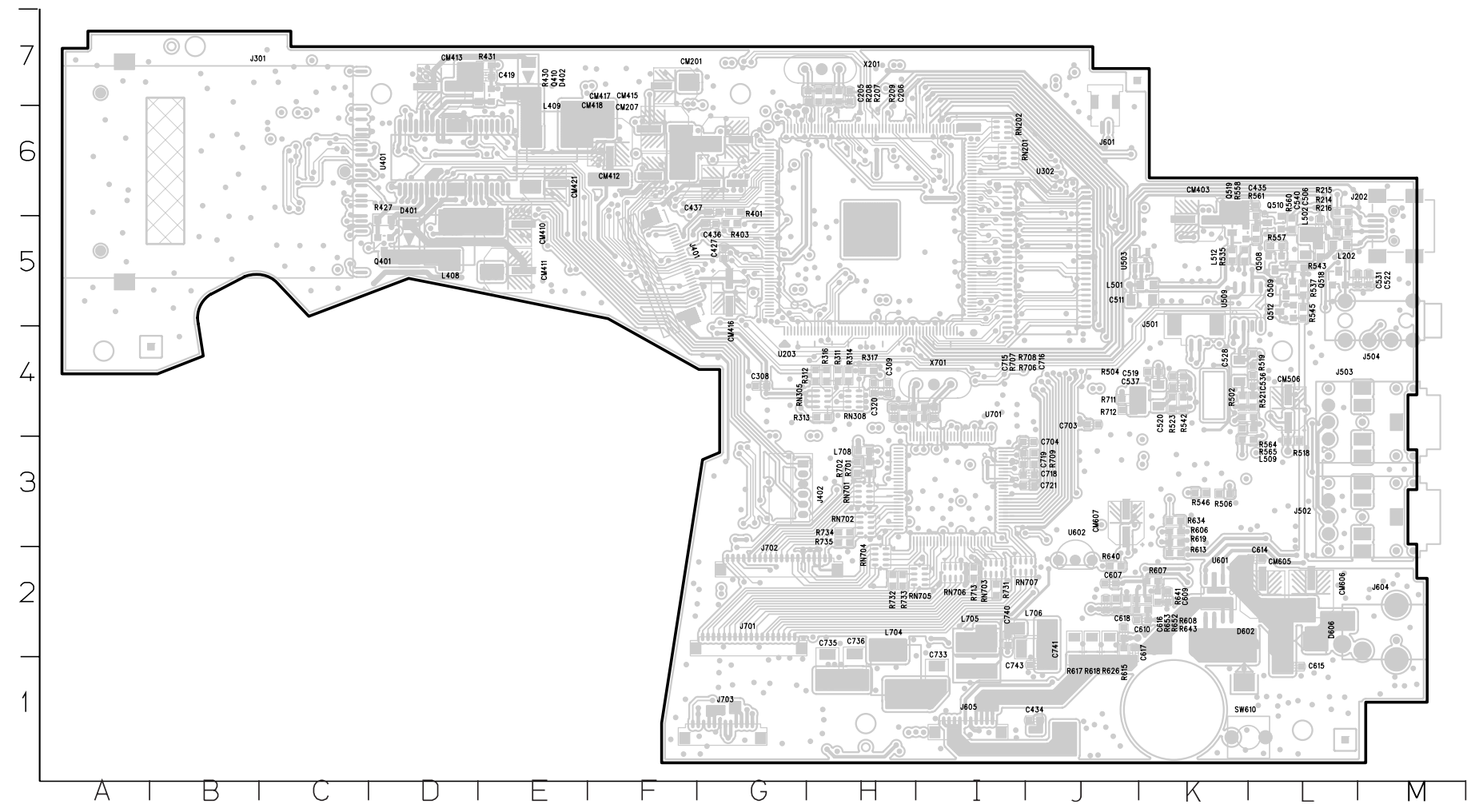
2. MAIN KEY P.C.BOARD (TOP VIEW)



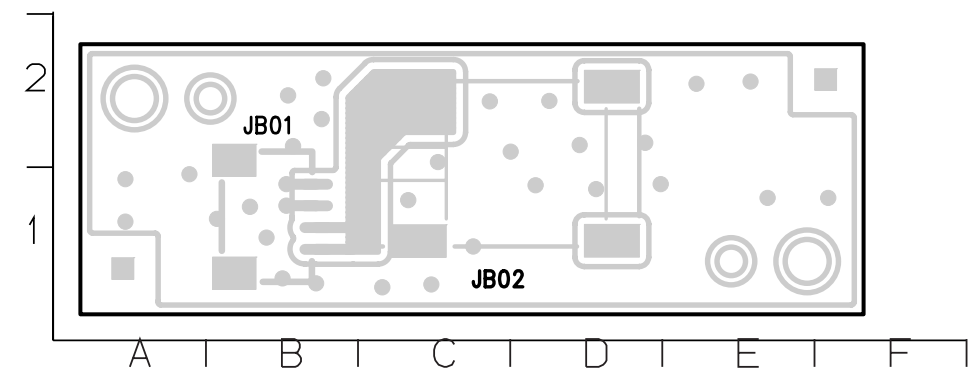
(BOTTOM VIEW)



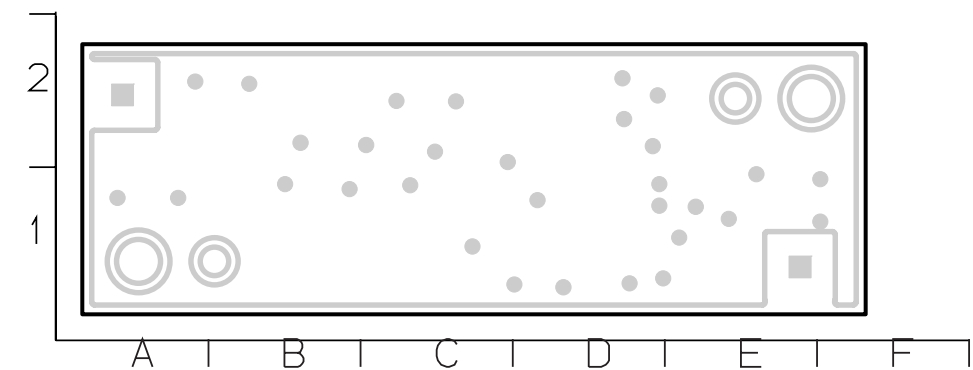
**MAIN P.C.BOARD
(BOTTOM VIEW)**



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



(BOTTOM VIEW)



MEMO

A series of horizontal dotted lines for writing a memo.

MEMO

A series of horizontal dotted lines for writing a memo.