Colour Television | Chassis

Service
Service
Service

TPS18.1A
LA

Service Manual

Chassis name	Platform	Model name
TPS18.1A LA	MSD92L	22PFT5403/56
		22PFT5403/98
		22PFT5403S/98
		24PFT4233S/98
		24PFT4233/98

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1. Product information

Product information is subject to change without notice. For detailed product information, please visit www.philips.com/support

Display & Sound

Intrinsic resolution

- 22PFT54x3: 1920 x 1080
- 24PFT4233: 1920 x 1080

Sound power

- 3W x 2

Display resolutions

Video formats

Resolution — Refresh rate:

- 480i - 60 Hz
- 480p - 60 Hz
- 576i - 50 Hz
- 576p - 50 Hz
- 720i - 50 Hz, 60 Hz
- 1080i - 50 Hz, 60 Hz
- 1080p - 50 Hz, 60 Hz

Computer formats

Resolution — Refresh rate:

- 640 x 480 - 60 Hz
- 800 x 600 - 60 Hz
- 1024 x 768 - 60 Hz
- 1360 x 768 - 60 Hz
- 1920 x 1080 - 60 Hz

Connectivity

TV Side

- SERV.U
- USB
- AV IN (CVBS, AUDIO L/R)

TV Rear

- TV Antenna
- AUDIO IN VGA/DVI
- VGA
- HDMI

Multimedia

Supported storage device: USB (only FAT or FAT 32 USB storage devices are supported.)

Compatible multimedia file formats:

- Image: JPEG
- Audio: MP3
- Video: MPEG 2/MPEG 4, H.264
- Document: TXT

Power supply/ tuner/ reception/ transmission

Power supply

- Mains: 110-240V, 50-60Hz
- Standby power consumption: ≤0.5W
- Ambient temperature : 5 to 40 degrees Celsius
- Power consumption:
  - 22PFT54x3: 42W
  - 24PFT4233: 36W

Tuner/ reception/ transmission

- Aerial input: 75ohm coaxial (IEC75)
- TV system: NTSC, SECAM, PAL, DVB-T/T2
- Video Playback: NTSC, SECAM, PAL

2. Precautions, Notes, and Abbreviation List

2.1 Safety Instructions

Safety regulations require the following during a repair:

- Connect the set to the Mains/AC Power via an isolation transformer (> 800 VA).
- Replace safety components, indicated by the symbol ⚠, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the Mains/AC Power lead for external damage.
- Check the strain relief of the Mains/AC Power cord for proper function.
- Check the electrical DC resistance between the Mains/AC Power plug and the secondary side (only for sets that have a Mains/AC Power isolated power supply):
  1. Unplug the Mains/AC Power cord and connect a wire between the two pins of the Mains/AC Power plug.
  2. Set the Mains/AC Power switch to the “on” position (keep the Mains/AC Power cord unplugged!).
  3. Measure the resistance value between the pins of the Mains/AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MΩ and 12 MΩ.
  4. Switch “off” the set, and remove the wire between the two pins of the Mains/AC Power plug.
- Check the cabinet for defects, to prevent touching of any inner parts by the customer.

2.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD ⚠). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched “on”.
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

2.3 Notes

2.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⏚), or hot ground (⏚), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).
- Where necessary, measure the waveforms and voltages with (⊓) and without (⊼) aerial signal. Measure the voltages in the power supply section both in normal operation (⏻) and in stand-by (⏻). These values are indicated by means of the appropriate symbols.

2.3.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kΩ).
- Resistor values with no multiplier may be indicated with either an “E” or an “R” (e.g. 220E or 220R indicates 220 Ω).
- All capacitor values are given in micro-farads (μ = x10^{-6}), nano-farads (n = x10^{-9}), or pico-farads (p = x10^{-12}).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An “asterisk” (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed on the Philips Spare Parts Web Portal.

2.3.3 Spare parts

For the latest spare part overview, consult your Philips Spare Part web portal.

2.3.4 BGA (Ball Grid Array) ICs

Introduction

For more information on how to handle BGA devices, visit this URL: http://www.atyourservice-magazine.com. Select “Magazine”, then go to “Repair downloads”. Here you will find Information on how to deal with BGA-ICs.

BGA Temperature Profiles

For BGA-ICs, you must use the correct temperature-profile. Where applicable and available, this profile is added to the IC Data Sheet information section in this manual.

2.3.5 Lead-free Soldering

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free soldering tin. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
  - To reach a solder-tip temperature of at least 400°C.
  - To stabilize the adjusted temperature at the solder-tip.
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilized at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch “off” unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly to avoid mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.

2.3.6 Alternative BOM identification

It should be noted that on the European Service website, “Alternative BOM” is referred to as “Design variant”.

The third digit in the serial number (example: AG2B0335000001) indicates the number of the alternative B.O.M. (Bill Of Materials) that has been used for producing the specific TV set. In general, it is possible that the same TV model on the market is produced with e.g. two different types of displays, coming from two different suppliers. This will then result in sets which have the same CTN (Commercial Type Number; e.g. 28PW9515/12) but which have a different B.O.M. number.

By looking at the third digit of the serial number, one can identify which B.O.M. is used for the TV set he is working with. If the third digit of the serial number contains the number “1” (example: AG1B033500001), then the TV set has been manufactured according to B.O.M. number 1. If the third digit is a “2” (example: AG2B0335000001), then the set has been produced according to B.O.M. no. 2. This is important for ordering the correct spare parts!

For the third digit, the numbers 1...9 and the characters A...Z can be used, so in total: 9 plus 26= 35 different B.O.M.s can be indicated by the third digit of the serial number.

Identification: The bottom line of a type plate gives a 14-digit serial number. Digits 1 and 2 refer to the production centre (e.g. SN is Lysomice, RJ is Kobierzyce), digit 3 refers to the B.O.M. code, digit 4 refers to the Service version change code, digits 5 and 6 refer to the production year, and digits 7 and 8 refer to production week (in example below it is 2010 week 10 / 2010 week 17). The 6 last digits contain the serial number.

Figure 3-1 Serial number (example)

2.3.7 Board Level Repair (BLR) or Component Level Repair (CLR)

If a board is defective, consult your repair procedure to decide if the board has to be exchanged or if it should be repaired on component level.

If your repair procedure says the board should be exchanged completely, do not solder on the defective board. Otherwise, it cannot be returned to the O.E.M. supplier for back charging!

2.3.8 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages.** While some may not be dangerous in themselves, they can cause unexpected reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage

insulation. It is easy to do, and is a good service precaution.

2.4 Abbreviation List

0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV),6 = play 16 : 9 format, 12 = play 4 : 3 format
DNR	Digital Noise Reduction: noise reduction feature of the set
AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeps the original aspect ratio
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page
ADC	Analogue to Digital Converter
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency
AGC	Automatic Gain Control: algorithm that ontrols the video input of the feature box
AM	Amplitude Modulation
AP	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASF	Auto Screen Fit: algorithm that adapts aspect ratio to remove horizontal black bars without discarding video information
ATSC	Advanced Television Systems Committee, the digital TV standard in the USA
ATV	See Auto TV
Auto TV	A hardware and software control system that measures picture content, and adapts image parameters in a dynamic way
AV	External Audio Video
AVC	Audio Video Controller
AVIP	Audio Video Input Processor
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BDS	Business Display Solutions (iTV)
BLR	Board-Level Repair
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries
B-TXT	Blue TeleteXT
C	Centre channel (audio)
CEC	Consumer Electronics Control bus: remote control bus on HDMI connections
CL	Constant Level: audio output to connect with an external amplifier
CLR	Component Level Repair
ComPair	Computer aided rePair
CP	Connected Planet / Copy Protection
CSM	Customer Service Mode
CTI	Color Transient Improvement: manipulates steepness of chroma transients
CVBS	Composite Video Blanking and Synchronization
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DCM	Data Communication Module. Also referred to as System Card or Smartcard (for iTV).
DDC	See “E-DDC”
D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz
DFI	Dynamic Frame Insertion
DFU	Directions For Use: owner's manual
DMR	Digital Media Reader: card reader
DMSD	Digital Multi Standard Decoding
DNM	Digital Natural Motion
DRAM	Dynamic RAM
DRM	Digital Rights Management
DSP	Digital Signal Processing
DST	Dealer Service Tool: special remote control designed for service technicians
DTCP	Digital Transmission Content Protection; A protocol for protecting digital audio/video content that is traversing a high speed serial bus, such as IEEE-1394
DVB-C	Digital Video Broadcast - Cable
DVB-T	Digital Video Broadcast - Terrestrial
DVD	Digital Versatile Disc
DVI(-d)	Digital Visual Interface (d= digital only)
E-DDC	Enhanced Display Data Channel (VESA standard for communication channel and display). Using E-DDC, the video source can read the EDID information form the display.
EDID	Extended Display Identification Data (VESA standard)
EEPROM	Electrically Erasable and Programmable Read Only Memory
EMI	Electro Magnetic Interference
EPG	Electronic Program Guide

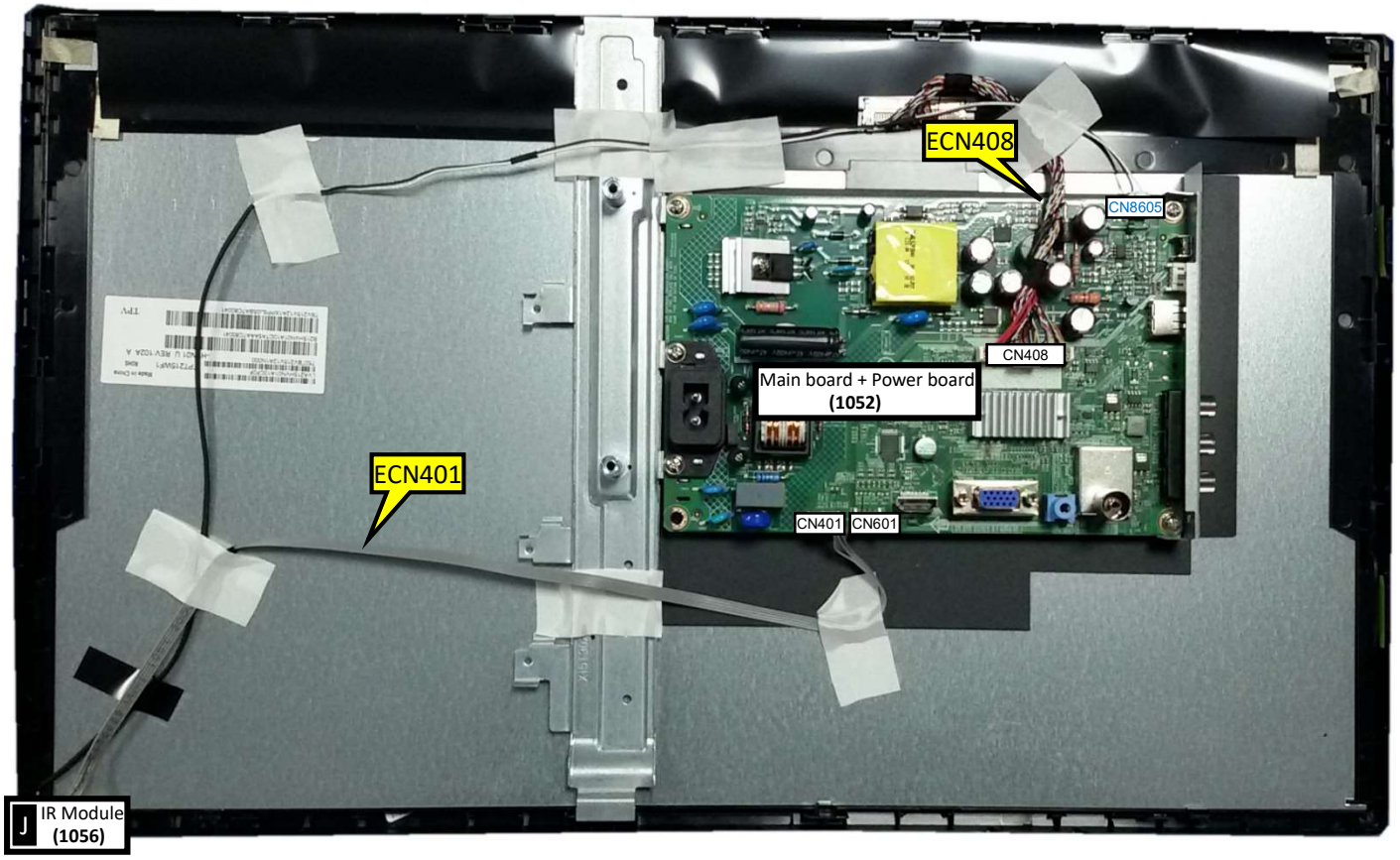
EPLD	Erasable Programmable Logic Device
EU	Europe
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)
FDS	Full Dual Screen (same as FDW)
FDW	Full Dual Window (same as FDS)
FLASH	FLASH memory
FM	Field Memory or Frequency Modulation
FPGA	Field-Programmable Gate Array
FTV	Flat TeleVision
Gb/s	Giga bits per second
G-TXT	Green TeleteXT
H	H_sync to the module
HD	High Definition
HDD	Hard Disk Drive
HDCP	High-bandwidth Digital Content Protection: A “key” encoded into the HDMI/DVI signal that prevents video data piracy. If a source is HDCP coded and connected via HDMI/DVI without the proper HDCP decoding, the picture is put into a “snow vision” mode or changed to a low resolution. For normal content distribution the source and the display device must be enabled for HDCP “software key” decoding.
HDMI	High Definition Multimedia Interface
HP	HeadPhone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz
I^2C	Inter IC bus
I^2D	Inter IC Data bus
I^2S	Inter IC Sound bus
IF	Intermediate Frequency
IR	Infra Red
IRQ	Interrupt Request
ITU-656	The ITU Radio communication Sector (ITU-R) is a standards body subcommittee of the International Telecommunication Union relating to radio communication. ITU-656 (a.k.a. SDI), is a digitized video format used for broadcast grade video. Uncompressed digital component or digital composite signals can be used. The SDI signal is self-synchronizing, uses 8 bit or 10 bit data words, and has a maximum data rate of 270 Mbit/s, with a minimum bandwidth of 135 MHz.
iTV	Institutional TeleVision; TV sets for hotels, hospitals etc.
LS	Last Status; The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according to the customer's preferences
LATAM	Latin America
LCD	Liquid Crystal Display
LED	Light Emitting Diode
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
LPL	LG.Philips LCD (supplier)
LS	Loudspeaker
LVDS	Low Voltage Differential Signalling
Mbps	Mega bits per second
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz
MHEG	Part of a set of international standards related to the presentation of multimedia information, standardised by the Multimedia and Hypermedia Experts Group. It is commonly used as a language to describe interactive television services
MIPS	Microprocessor without Interlocked Pipeline-Stages; A RISC-based microprocessor
MOP	Matrix Output Processor
MOSFET	Metal Oxide Silicon Field Effect Transistor, switching device
MPEG	Motion Pictures Experts Group
MPIF	Multi Platform InterFace
MUTE	MUTE Line
MTV	Mainstream TV: TV-mode with Consumer TV features enabled (iTV)
NC	Not Connected
NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.
NTC	Negative Temperature Coefficient, non-linear resistor
NTSC	National Television Standard Committee. Color system mainly used in North America and Japan. Color carrier NTSC M/N= 3.579545 MHz, NTSC 4.43= 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
NVM	Non-Volatile Memory: IC containing TV related data such as alignments

O/C	Open Circuit
OSD	On Screen Display
OAD	Over the Air Download. Method of software upgrade via RF transmission. Upgrade software is broadcasted in TS with TV channels.
OTC	On screen display Teletext and Control; also called Artistic (SAA5800)
P50	Project 50: communication protocol between TV and peripherals
PAL	Phase Alternating Line. Color system mainly used in West Europe (colour carrier = 4.433619 MHz) and South America (colour carrier PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)
PCB	Printed Circuit Board (same as “PWB”)
PCM	Pulse Code Modulation
PDP	Plasma Display Panel
PFC	Power Factor Corrector (or Pre-conditioner)
PIP	Picture In Picture
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency
POD	Point Of Deployment: a removable CAM module, implementing the CA system for a host (e.g. a TV-set)
POR	Power On Reset, signal to reset the uP
PSDL	Power Supply for Direct view LED backlight with 2D-dimming
PSL	Power Supply with integrated LED drivers
PSLS	Power Supply with integrated LED drivers with added Scanning functionality
PTC	Positive Temperature Coefficient, non-linear resistor
PWB	Printed Wiring Board (same as “PCB”)
PWM	Pulse Width Modulation
QRC	Quasi Resonant Converter
QTNR	Quality Temporal Noise Reduction
QVCP	Quality Video Composition Processor
RAM	Random Access Memory
RGB	Red, Green, and Blue. The primary color signals for TV. By mixing levels of R, G, and B, all colors (Y/C) are reproduced.
RC	Remote Control
RC5 / RC6	Signal protocol from the remote control receiver
RESET	RESET signal
ROM	Read Only Memory
RSDS	Reduced Swing Differential Signalling data interface
R-TXT	Red TeleteXT
SAM	Service Alignment Mode
S/C	Short Circuit
SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs
SCL	Serial Clock I^2C
SCL-F	CLock Signal on Fast I^2C bus
SD	Standard Definition
SDA	Serial Data I^2C
SDA-F	DAta Signal on Fast I^2C bus
SDI	Serial Digital Interface, see “ITU-656”
SDRAM	Synchronous DRAM
SECAM	SEequence Couleur Avec Mémoire. Colour system mainly used in France and East Europe. Colour carriers = 4.406250 MHz and 4.250000 MHz
SIF	Sound Intermediate Frequency
SMPS	Switched Mode Power Supply
SoC	System on Chip
SOG	Sync On Green
SOPS	Self Oscillating Power Supply
SPI	Serial Peripheral Interface bus; a 4-wire synchronous serial data link standard
S/PDIF	Sony Philips Digital InterFace
SRAM	Static RAM
SRP	Service Reference Protocol
SSB	Small Signal Board
SSC	Spread Spectrum Clocking, used to reduce the effects of EMI
STB	Set Top Box
STBY	STand-BY
SVGA	800 × 600 (4:3)
SVHS	Super Video Home System
SW	Software
SWAN	Spatial temporal Weighted Averaging Noise reduction
SXGA	1280 × 1024
TFT	Thin Film Transistor
THD	Total Harmonic Distortion
TMDS	Transmission Minimized Differential Signalling
TS	Transport Stream
TXT	TeleteXT
TXT-DW	Dual Window with TeleteXT
UI	User Interface
uP	Microprocessor
UXGA	1600 × 1200 (4:3)

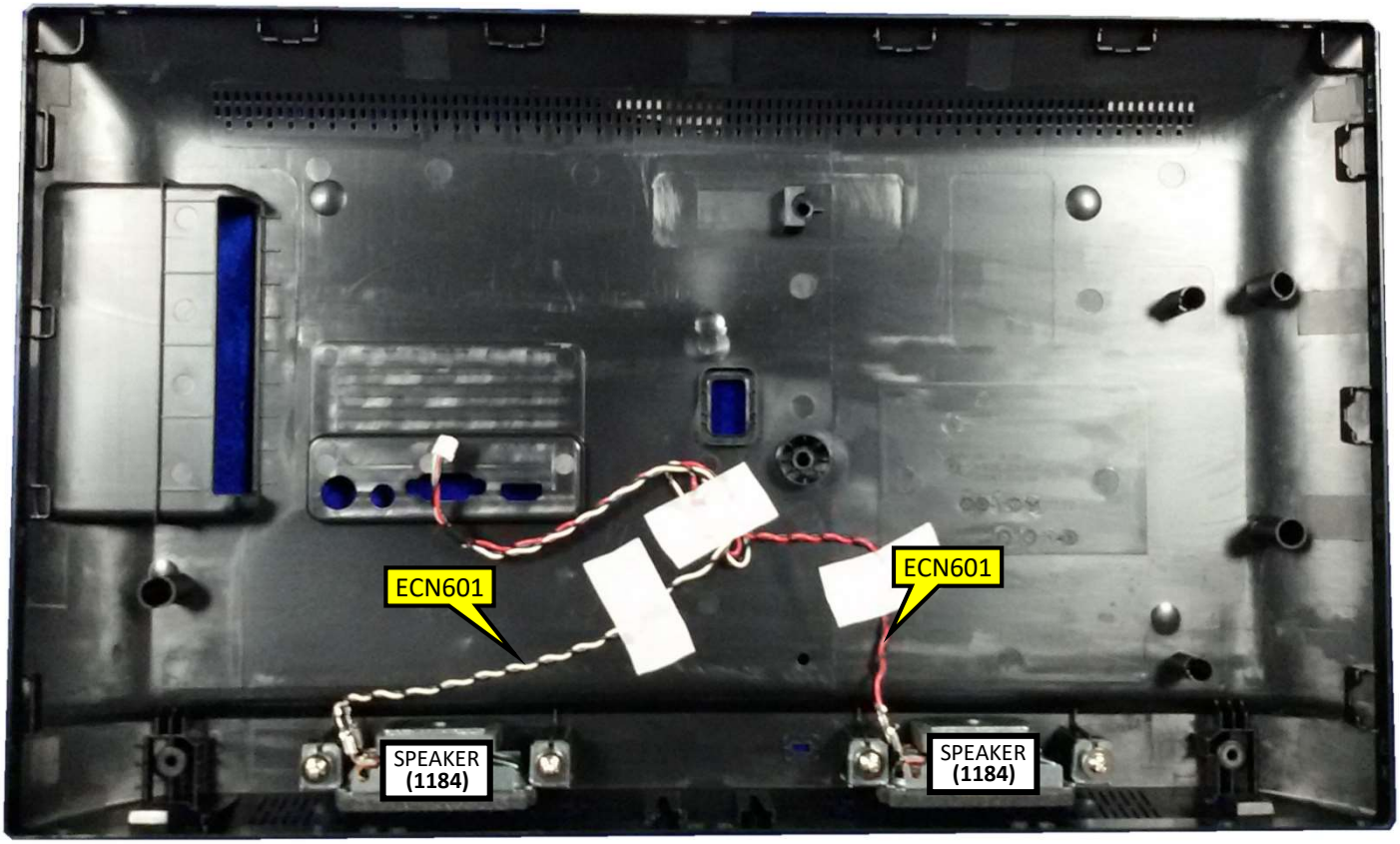
V	V-sync to the module
VESA	Video Electronics Standards Association
VGA	640 × 480 (4:3)
VL	Variable Level out: processed audio output toward external amplifier
VSB	Vestigial Side Band; modulation method
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
WXGA	1280 × 768 (15:9)
XTAL	Quartz crystal
XGA	1024 × 768 (4:3)
Y	Luminance signal
Y/C	Luminance (Y) and Chrominance (C) signal
YPbPr	Component video. Luminance and scaled color difference signals (B-Y and R-Y)
YUV	Component video

3. Mechanical Instructions

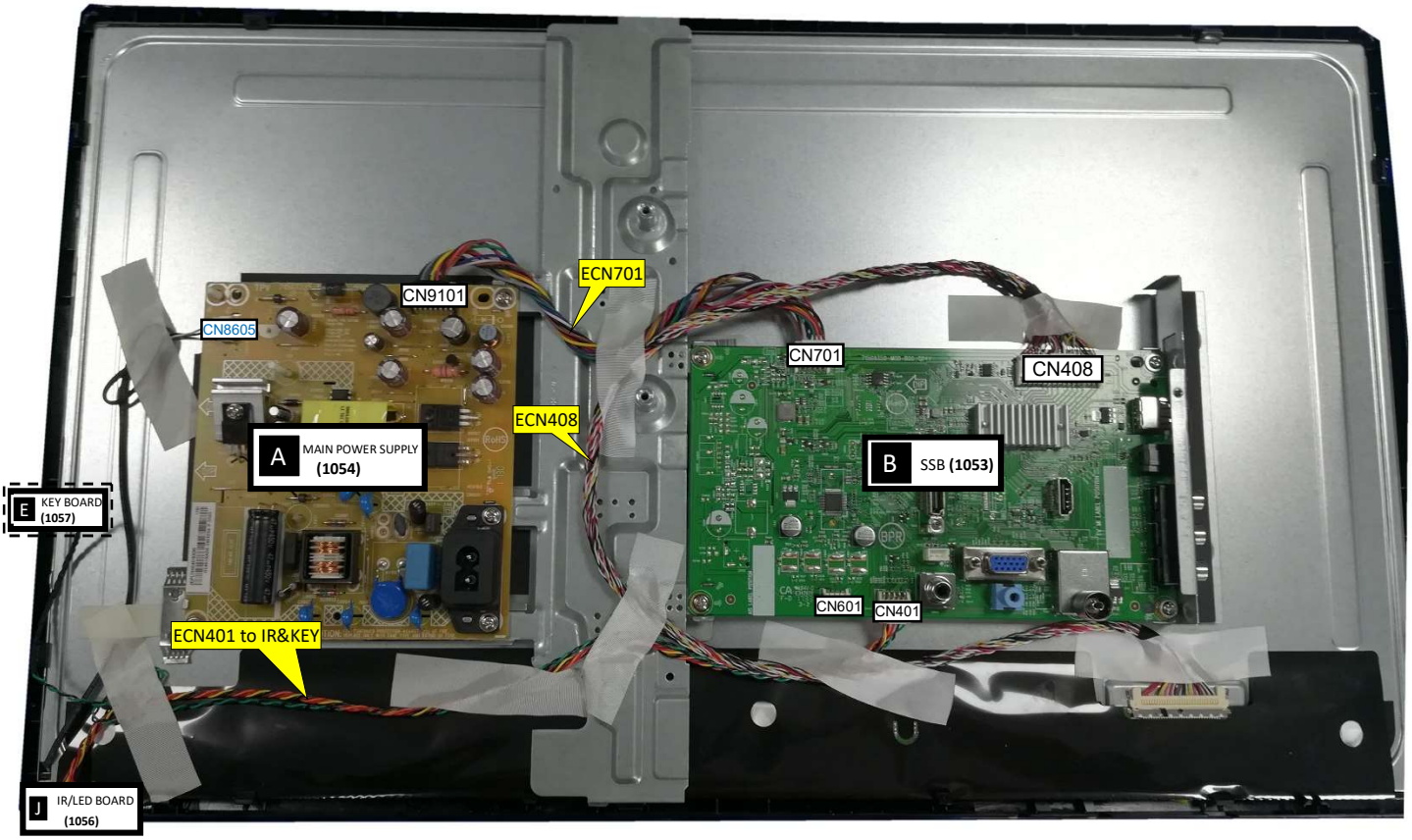
3.1 Cable Dressing



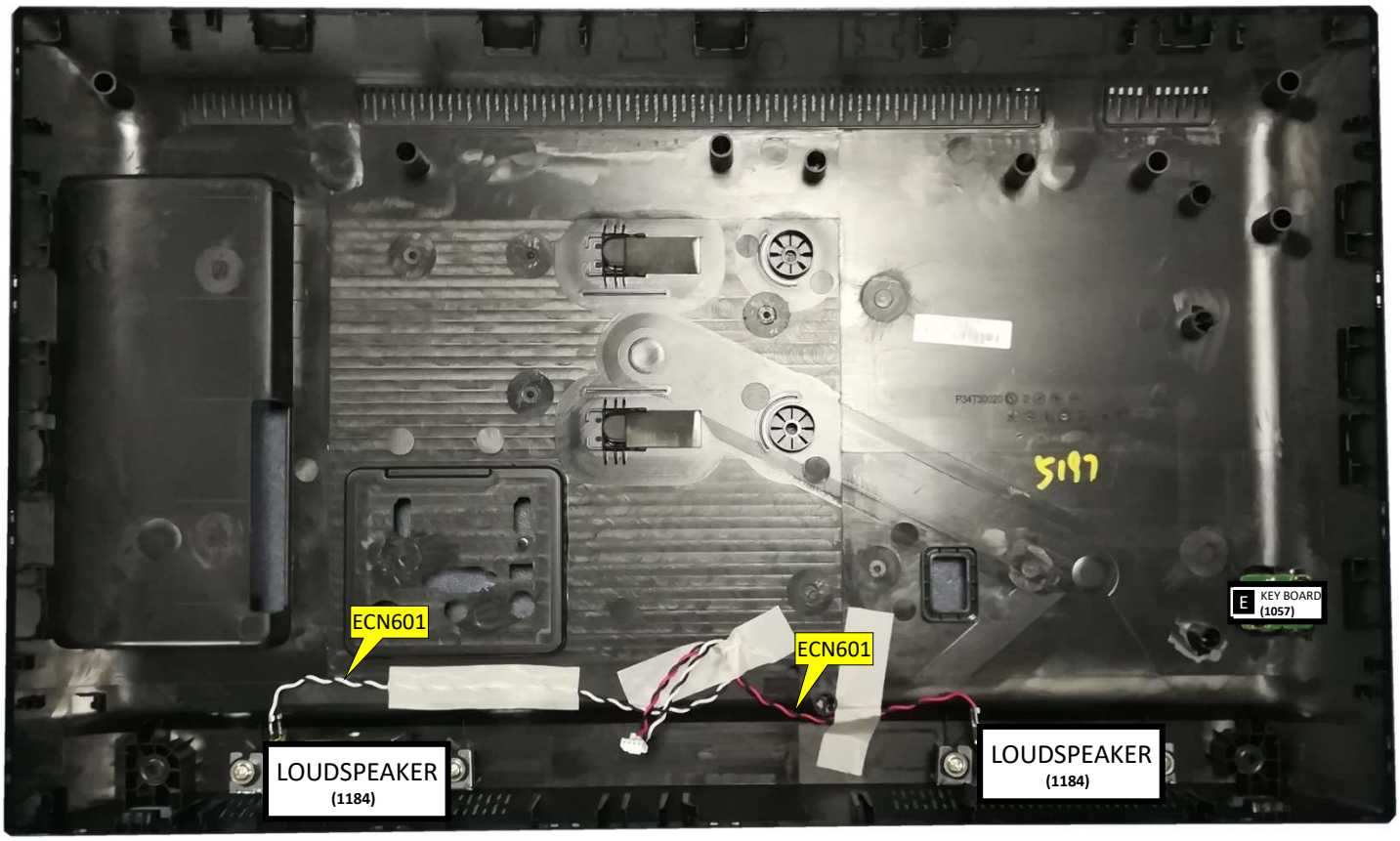
Cable dressing (22" 5403 series)



Back cover overview (22" 5403 series)



Cable dressing (24" 4233 series)



Back cover overview (24" 4233 series)

3.2 Assembly/Panel Removal

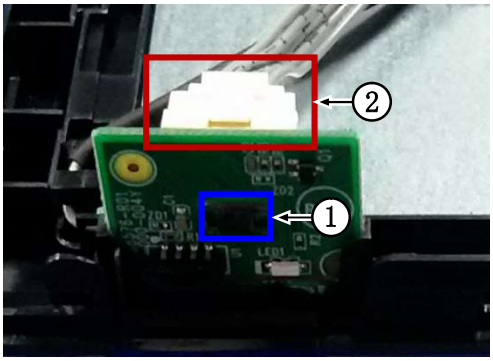
3.2.1 Stand removal

1. Remove the fixation screws [1] that secure the stand
2. Take the stand bracket out from the set.

3.2.2 IR board Control Unit

1. Unplug the connector [2] from the IR board.
2. Press the snap that marked by blue box below backward then take out the IR board.

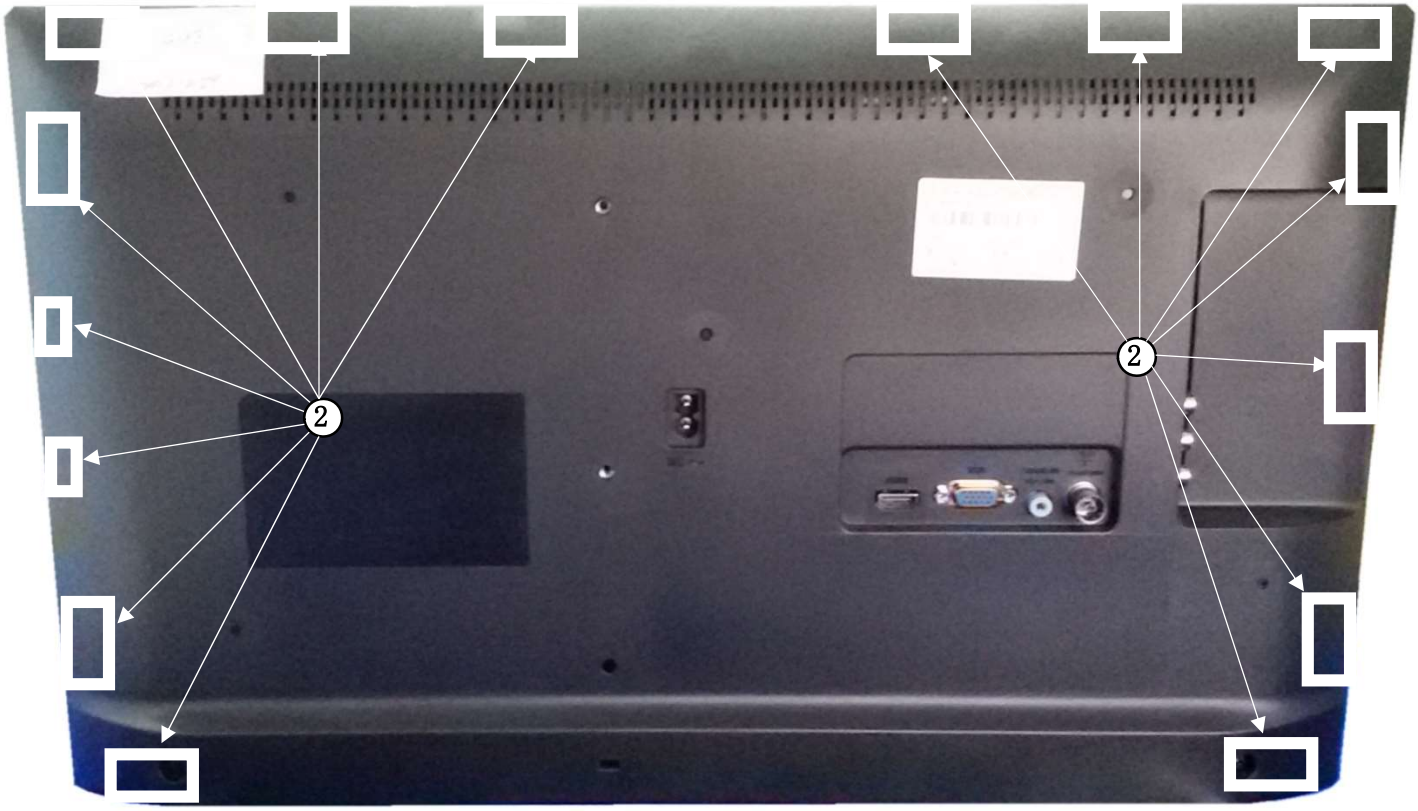
When defective, replace the whole unit.

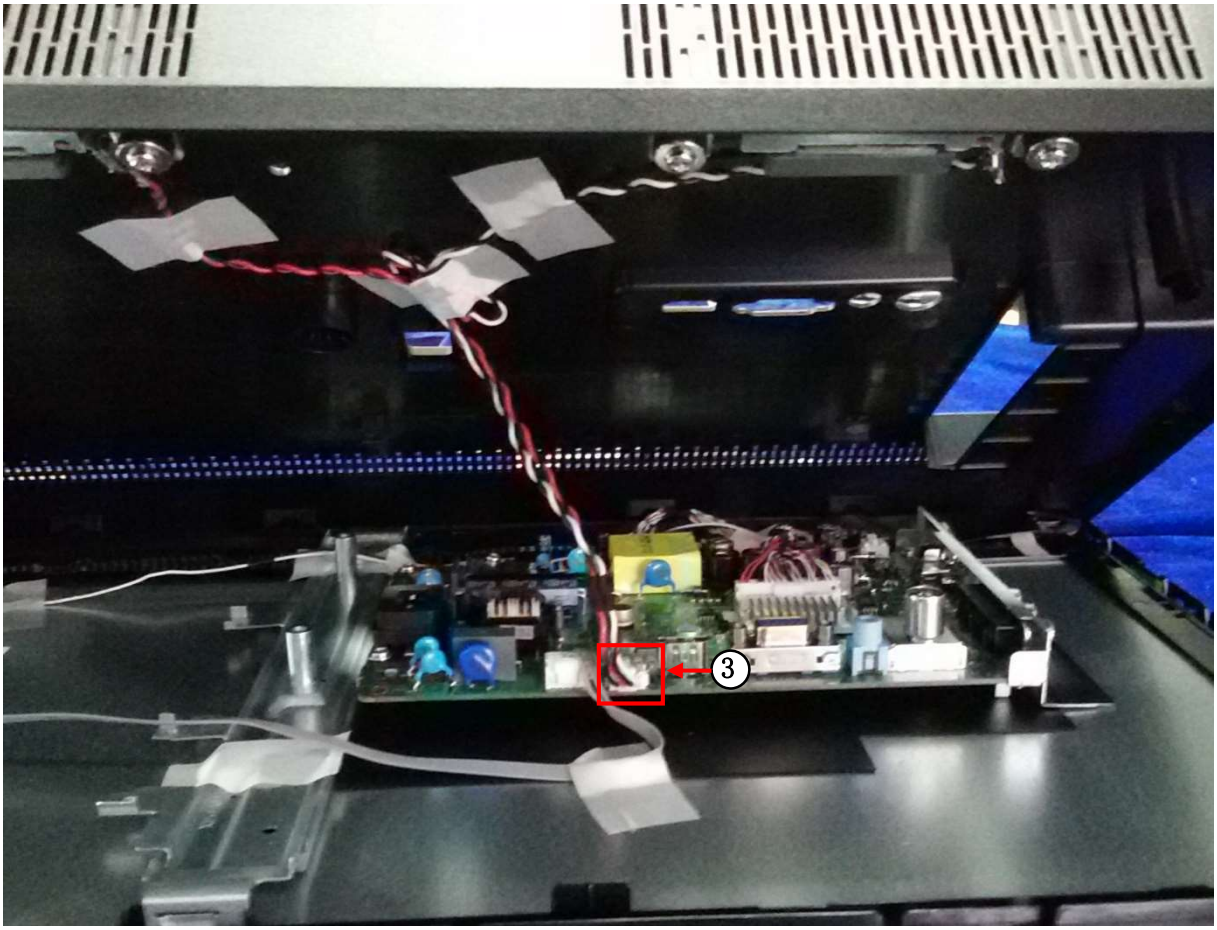


3.2.3 Rear Cover

Warning: Disconnect the mains power cord before removing the rear cover.

1. Releasing the clips carefully at the indicated areas [2] that secure the back cover.
2. Unplug connector [3] carefully, as the speaker is catch on back cover.
3. Gently lift the rear cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.





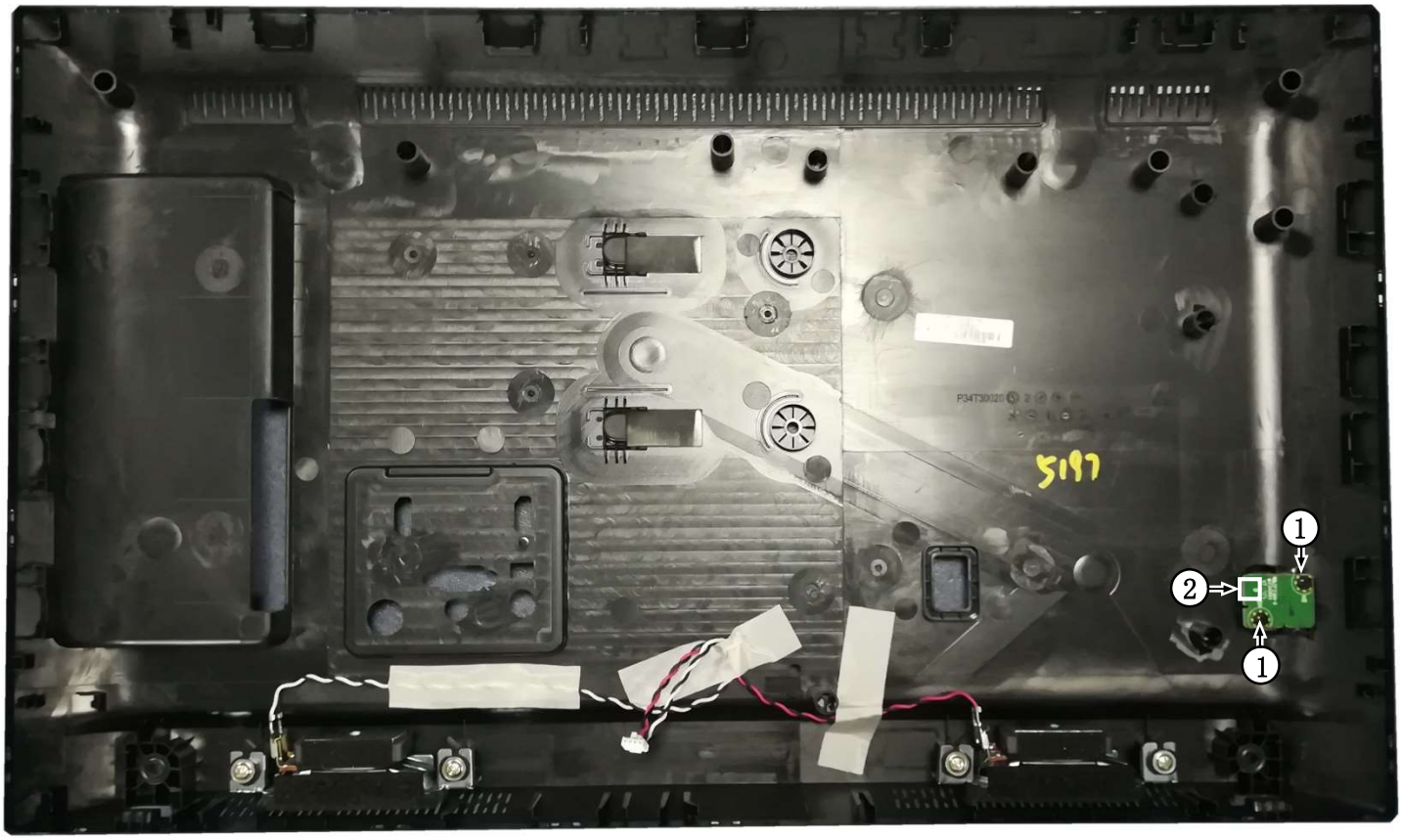
3.2.4 Keyboard Control Unit (For 24” 4233 Series)

1. Release the connector from the SSB Board.

   Caution: be careful, the Keyboard is catch on the Back cover, please be careful to avoid damage the fragile connectors!

2. Remove all the fixation screws[1] and connector [2] from the keyboard control panel and take it out from the Back cover.

When defective, replace the whole unit.

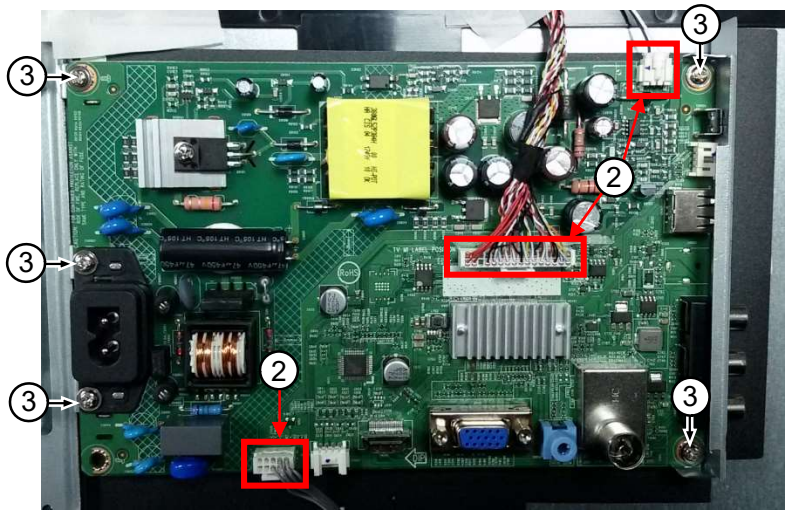


3.2.5 Main + Power Board / Small Signal Board (SSB)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the SSB.

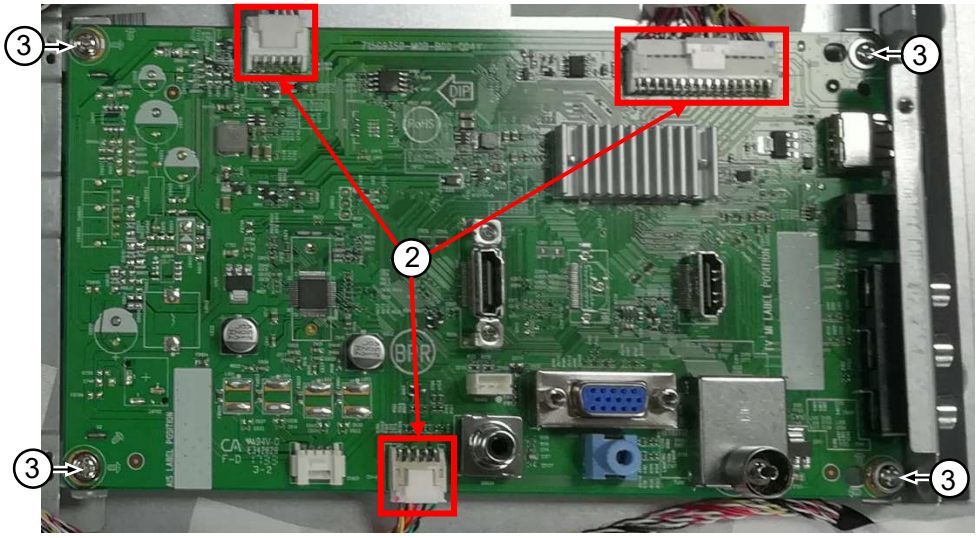
Main + Power Board (For 22” 5403 Series)**:**

1. Unplug all connectors [2] carefully, as these are very fragile connectors!
2. Remove all the fixation screws [3].
3. The Main + Power board can now be shifted from side connector cover, then lifted and taken out of the I/O bracket.



Small Signal Board (For 24” 4233 Series)**:**

1. Unplug all connectors [2] carefully, as these are very fragile connectors!
2. Remove all the fixation screws from the SSB [3].
3. The SSB can now be shifted from side connector cover, then lifted and taken out of the I/O bracket.



3.2.6 Power Supply Unit (PSU)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

1. Gently unplug all connectors from the PSU.
2. Remove all fixation screws from the PSU.
3. The PSU can be taken out of the set now.

3.2.7 Speakers

1. Gently release the tapes that secure the speaker cables.
2. Unplug the speaker connector from the SSB.
3. Take the speakers out.

When defective, replace the both units.

3.2.8 LCD Panel

1. Remove the Main + Power Board / SSB as described earlier.
2. Remove the PSU as described earlier.
3. Remove the keyboard control panel as described earlier.
4. Remove the stand bracket as described earlier.
5. Remove the IR/LED as described earlier.
6. Remove the fixations screws that fix the metal clamps to the front bezel. Take out those clamps.
7. Remove all other metal parts not belonging to the panel.
8. Lift the LCD Panel from the bezel.

When defective, replace the whole unit.

4. Service Modes

4.1 Service Modes

The Service Mode feature is split into following parts:

- Factory Mode.
- Customer Service Mode (CSM).

Factory mode offer features, which can be used by the Service engineer to repair/align a TV set. Some features are:

- Make alignments (e.g. White Tone).
- Display information.

The CSM is a Service Mode that can be enabled by the consumer. The CSM displays diagnosis information, which the customer can forward to the dealer or call centre. The information provided in CSM and the purpose of CSM is to:

- Increase the home repair hit rate.
- Decrease the number of nuisance calls.
- Solved customers' problem without home visit.

Note: For the new model range, a new remote control (RC) is used with some renamed buttons. This has an impact on the activation of the Service modes. For instance the old "MENU" button is now called "HOME" (or is indicated by a "house" icon).

4.2 Factory mode:

Purpose

- To perform extended alignments.

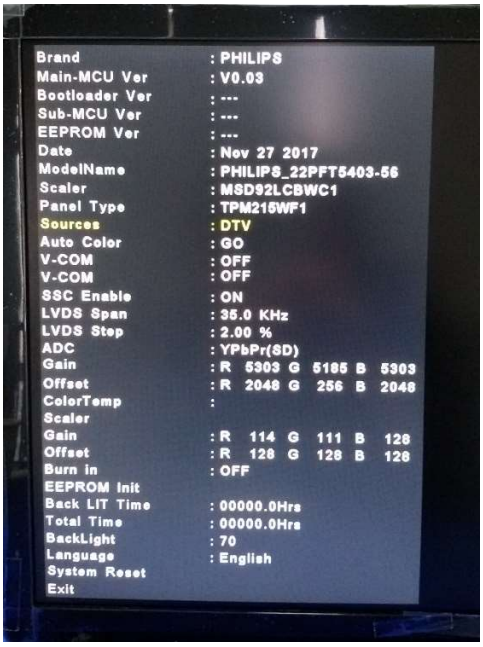
How to Activate the Factory mode

To activate the Factory mode, use the following method:

- Press the following key sequence on the remote control transmitter: from the **"Menu/Home"** press **"1999"**, directly followed by the **"Back/Return"** button. Do not allow the display to time out between entries while keying the sequence.

After entering the Factory mode, we can see many items displayed, use the **UP/DOWN** keys to display the next/previous menu items

Factory mode overview



How to Exit the Factory mode

- Select EXIT from the menu and press the “OK” button.

Note: When the TV is switched “off” by a power interrupt, or normal switch to “stand-by” while in the factory mode, the TV will show up in “normal operation mode” as soon as the power is supplied again.

4.3 Customer Service Mode (CSM)

Purpose

The call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set. This helps the call centre to diagnose problems and failures in the TV set before making a service call.

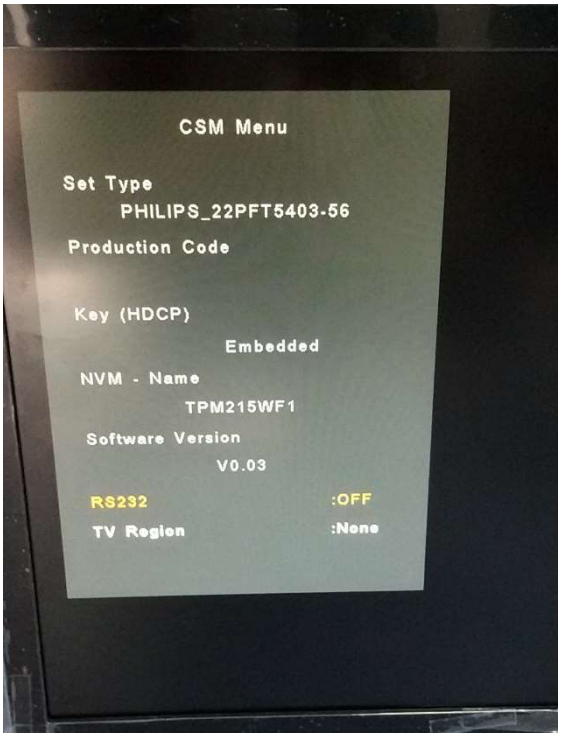
The CSM is a read-only mode, therefore, modifications are not possible in this mode.

How to Activate CSM

To activate CSM, press the following key sequence on a standard remote control transmitter: **“Menu/Home +456987+Back”** (do not allow the display to time out between entries while keying the sequence). After entering the Customer Service Mode, the following items are displayed. Use the **UP/DOWN** keys to display the next/previous menu items.

Note: Activation of the CSM is only possible if there is no (user) menu on the screen!

CSM Overview



How to Navigate

By means of the “CURSOR-DOWN/UP” knob (or the scroll wheel) on the RC-transmitter, can be navigated through the menus.

How to Exit CSM

To exit CSM, use one of the following methods.

- Press the MENU/HOME button on the remote control transmitter.
- Press the POWER button on the remote control transmitter.
- Press the POWER button on the television set.

5. Software Upgrading

5.1 Software Upgrading

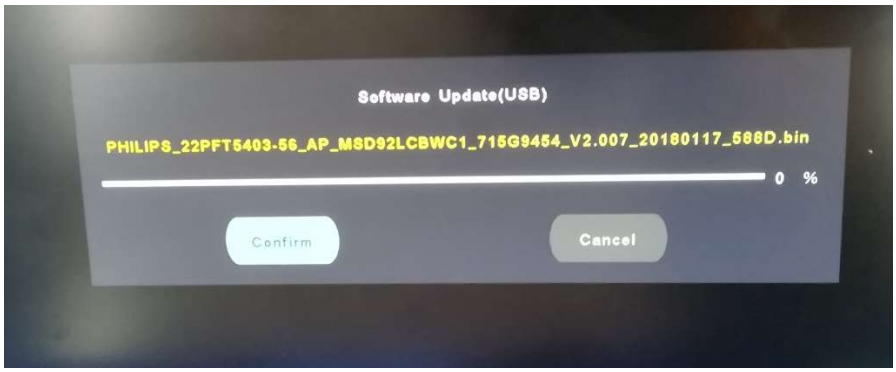
Step 1: Ready for F/W Upgrade

1. Prepare a USB memory (File format: FLAT, Size: 1G~8G).
2. Copy the software to USB flash disk (root directory).
3. Switch off the TV and Insert the USB memory stick that contains the software update files in the TV's USB 2.0 port.

Note the version of this F/W before you change the software file name.

Step 2: F/W Upgrade

1. Power off then power on the TV. The TV will detect the USB memory stick automatically. Then a window jumps out as below:

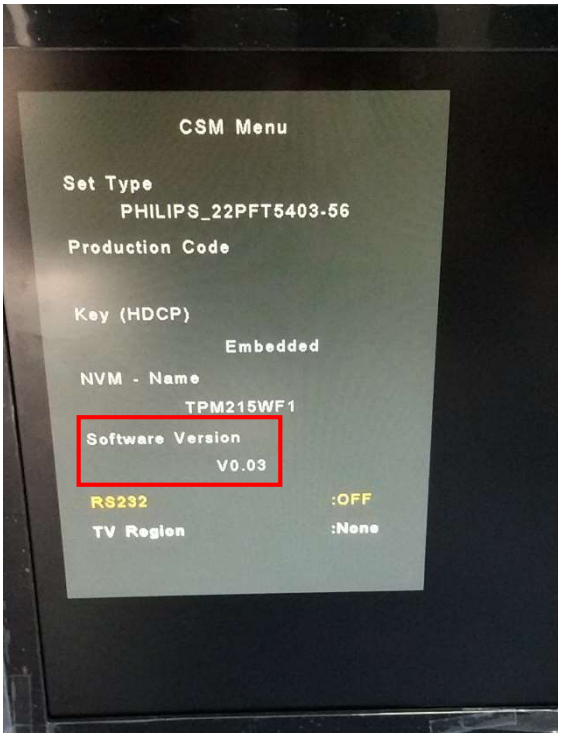


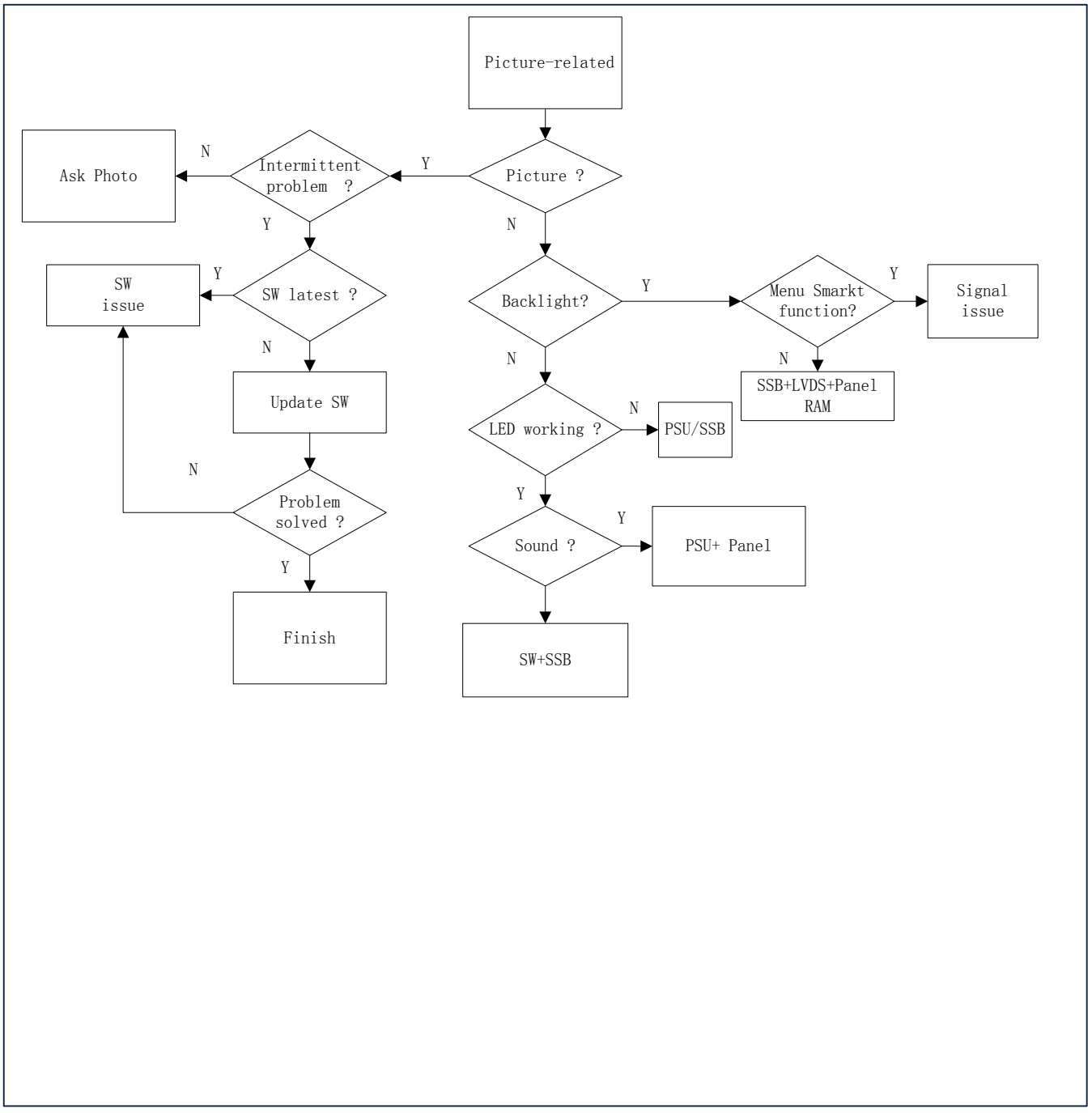
2. Press "Confirm" to start the update.
3. When the TV software is updated, please reboot the TV. Remove your USB flash drive.
4. We can enter in CSM mode to check the current software version.

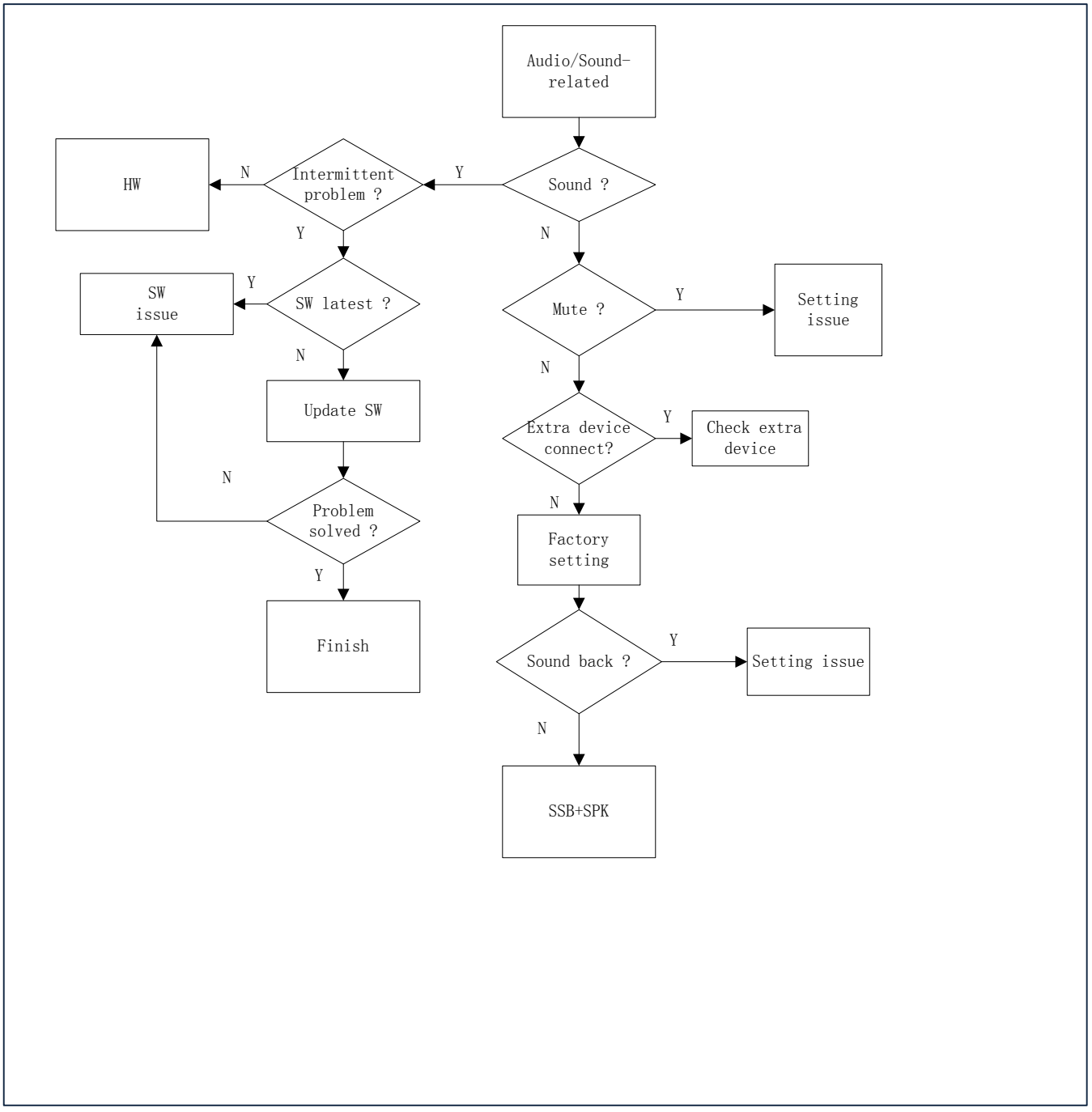
Caution: Please make sure that software upgrade is finished before unplug the USB and AC power!

Step 3: Check the SW version

1. After burning software, restart the TV
2. Press "**Menu/Home +456987+Back**", enter Customer Service Mode to check if the software version is correct.

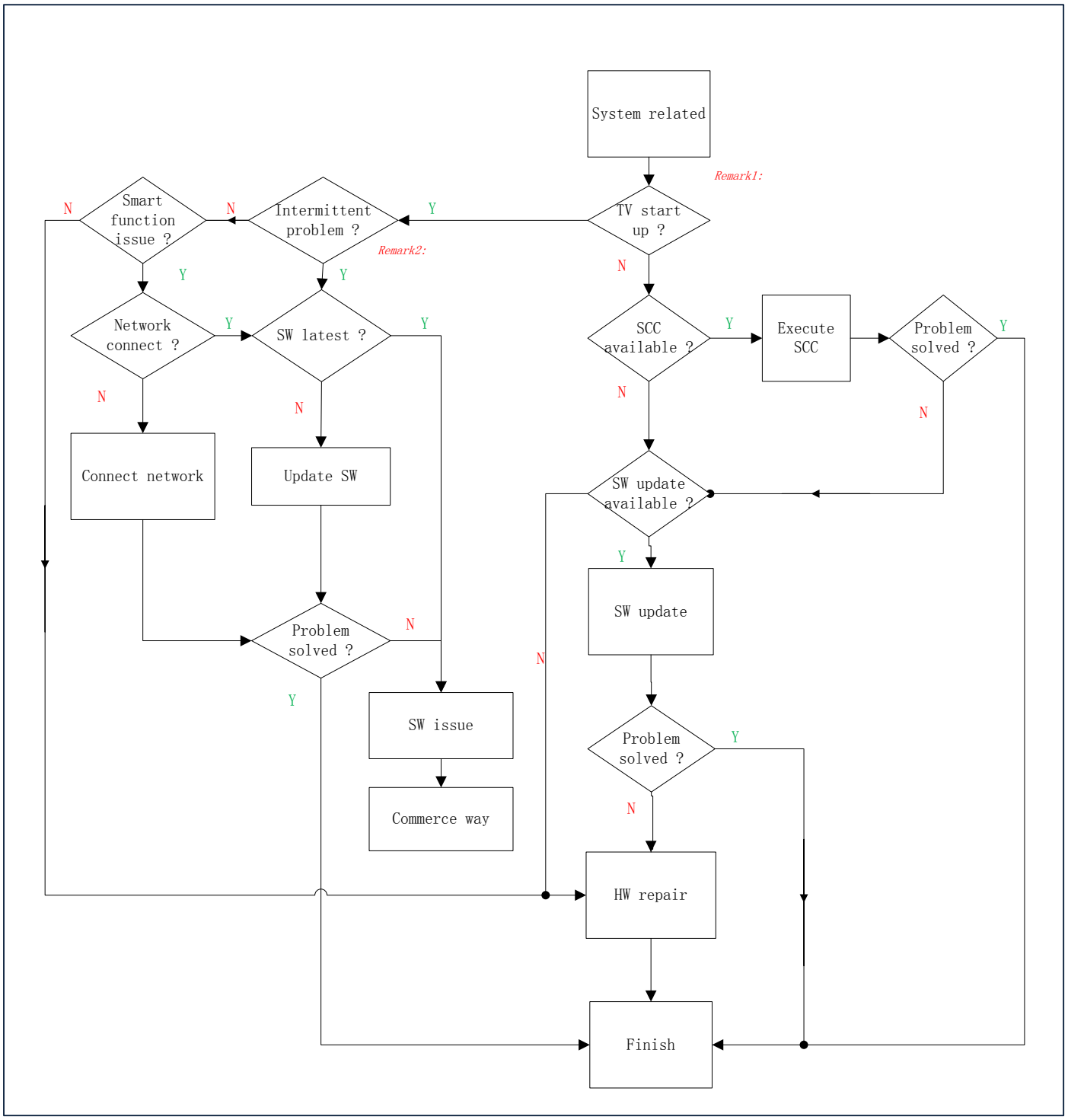



Picture-related
Picture ?
Y
Intermittent problem ?
N
Ask Photo
Y
SW latest ?
Y
SW issue
N
Update SW
N
Problem solved ?
Y
Finish
N
Backlight?
Y
Menu Smarkt function?
Y
Signal issue
N
SSB+LVDS+Panel RAM
N
LED working ?
N
PSU/SSB
Y
Sound ?
Y
PSU+ Panel
SW+SSB


Audio/Sound-related
Sound ?
Y
Intermittent problem ?
N
HW
Y
SW latest ?
Y
SW issue
N
Update SW
Problem solved ?
N
Y
Finish
N
Mute ?
Y
Setting issue
N
Extra device connect?
Y
Check extra device
N
Factory setting
Sound back ?
Y
Setting issue
N
SSB+SPK

Trouble shooting system

2016/12/11



Remark1 : What is System related issue ?

1.Permanent reboots
2.Intermittent reboots
3.No function, no standby LED (set dead)
4.No function, blinking LED
5.Set freezes, intermittently
6.Slow response to user interaction
7.Switches ON by itself
8.Switches Off by itself
9.Stuck in standby mode / unable to start up
10.Stuck on PHILIPS / ANDROID logo
11.CAM not recognized by TV
12.CAM authentication issue
13.Misc CAM issue
14.IP-EPG issues
15.BC-EPG issues
16.PVR issues w/ BC-EPG
17.PVR issues w/ IP-EPG
18.PVR issues / generic
19.EDFU-related issue
20.Features not available in UI / cannot be activated

Remark2 : How to judge intermittent issue ?

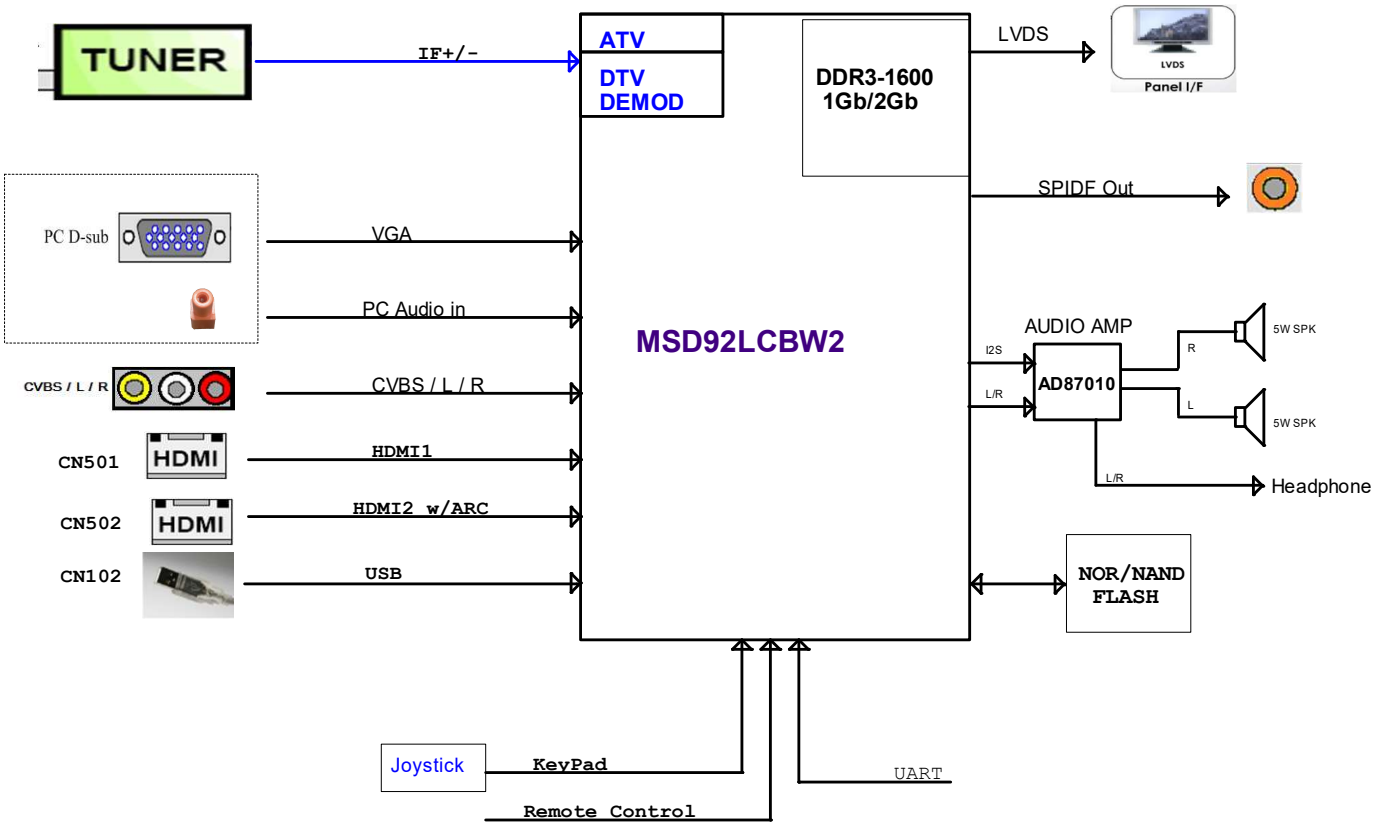
1.When the problem happened can be solved by:
1)AC off AC on
2)DC off DC on
3)RC switch different source

2.The problem intermittent happened

7. Electrical Diagram

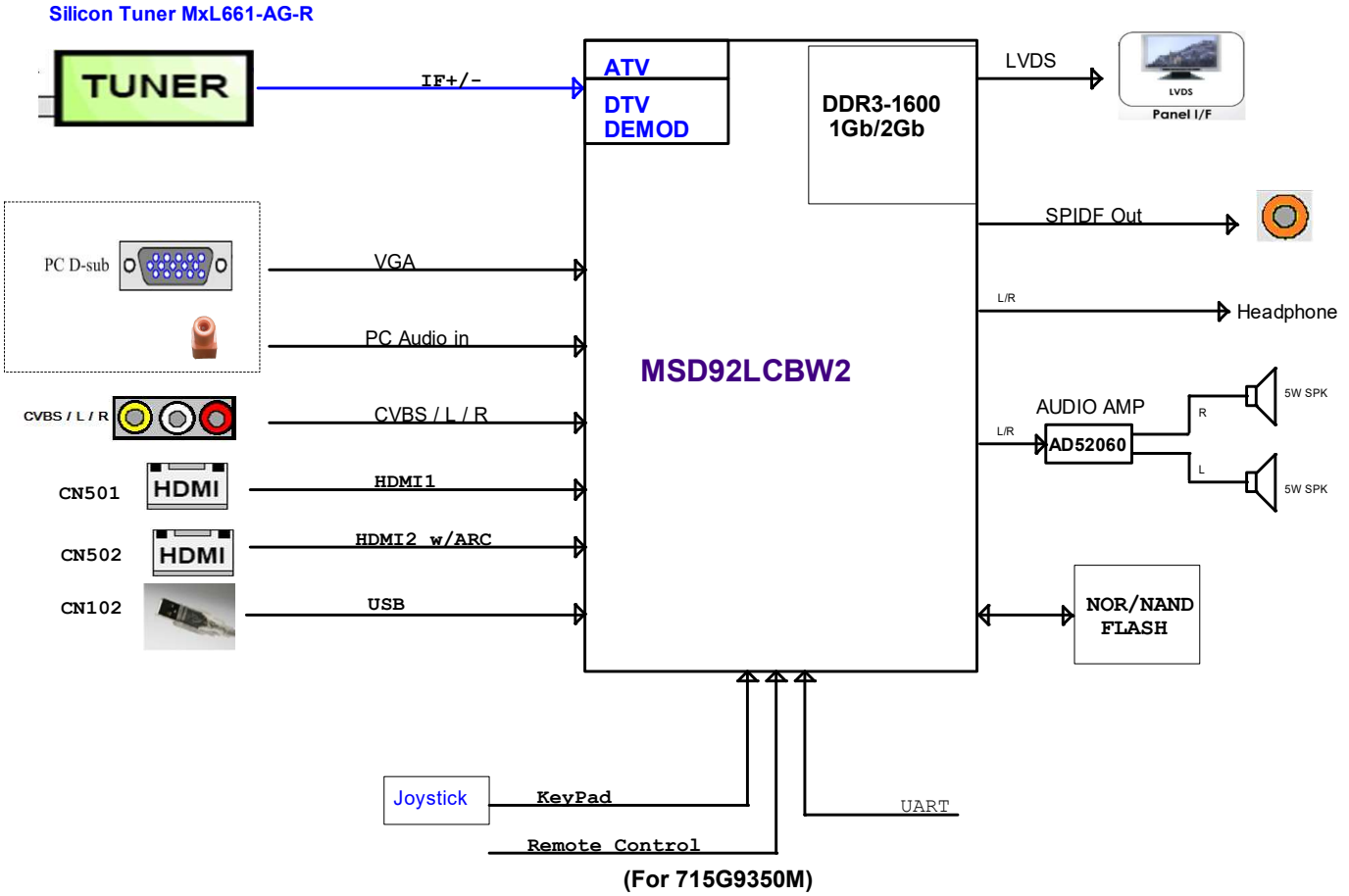
7.1 Block diagram

Silicon Tuner MxL661-AG-R



(For 715G9454C)

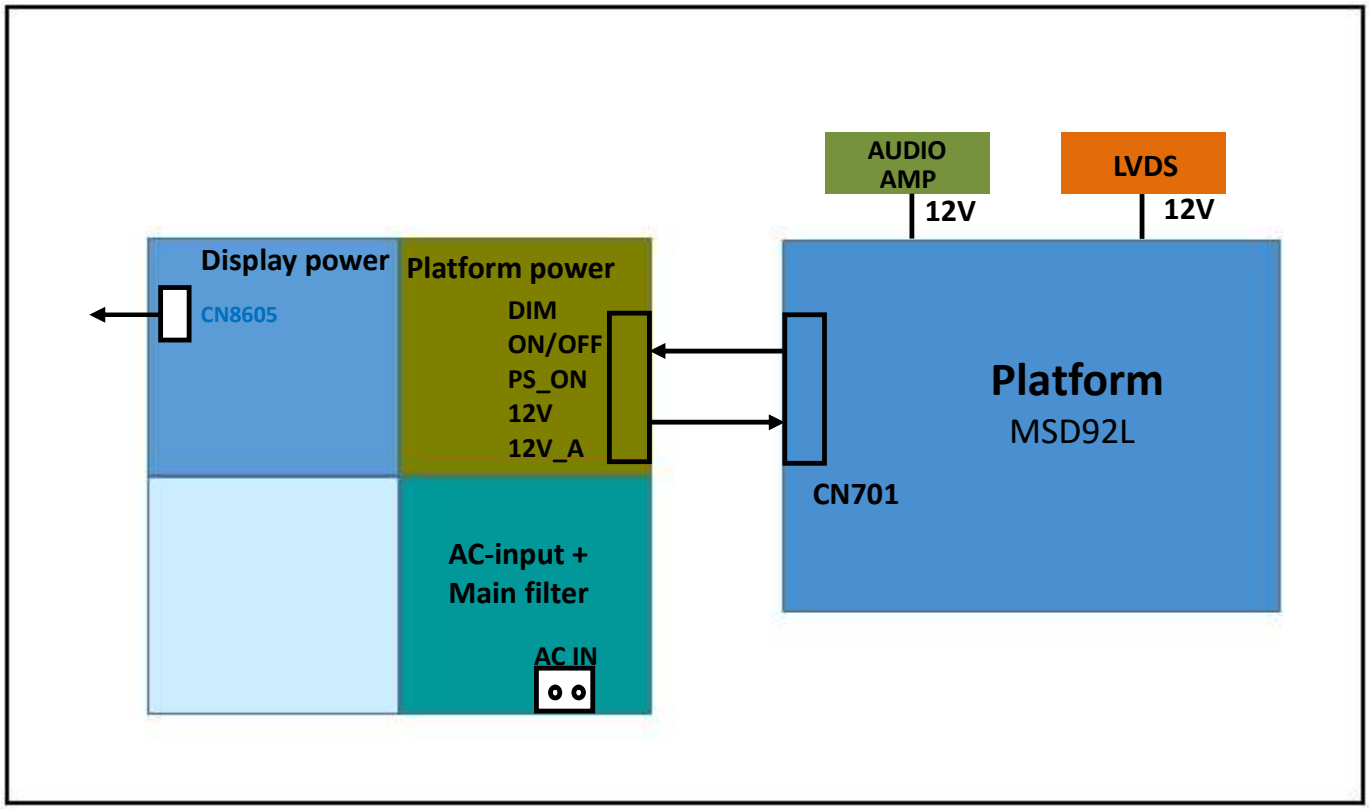
Silicon Tuner MxL661-AG-R



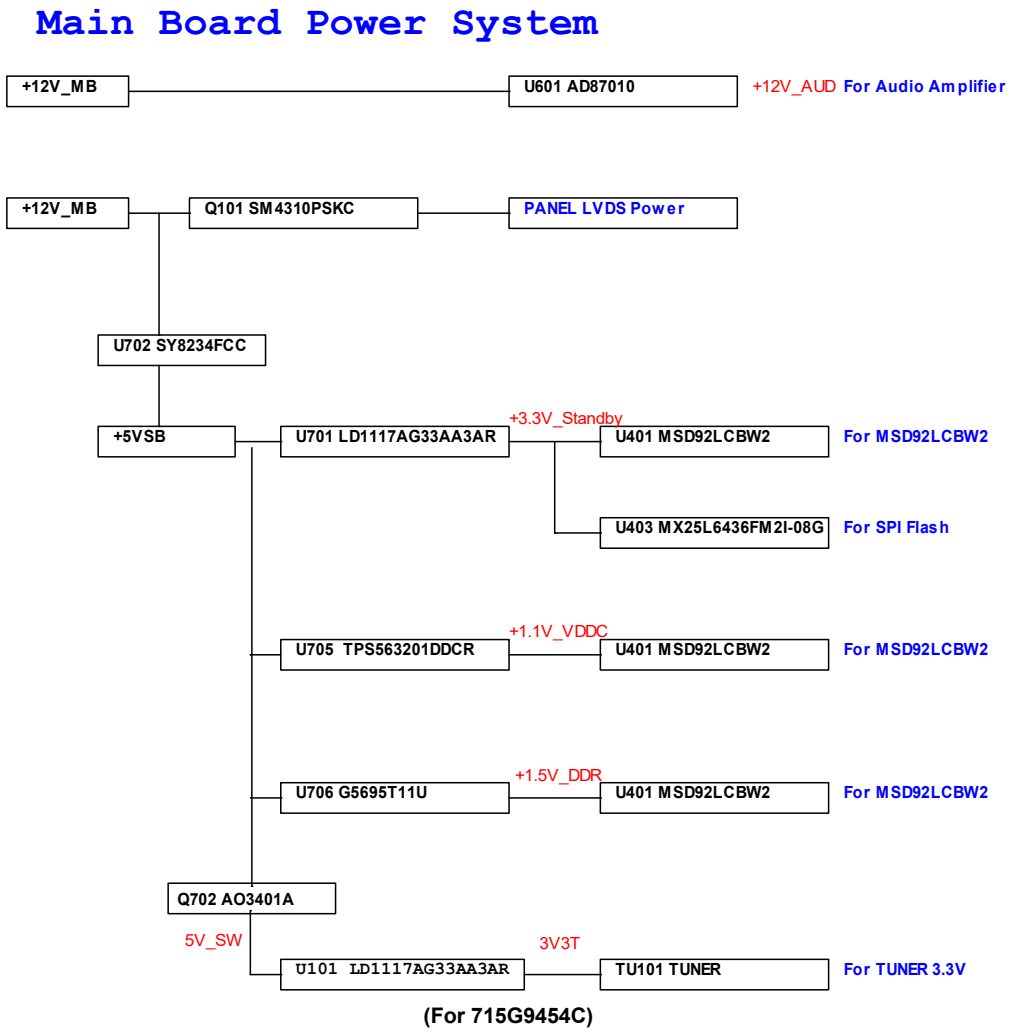
(For 715G9350M)

7.2 Power Supply

Power architecture of this platform.

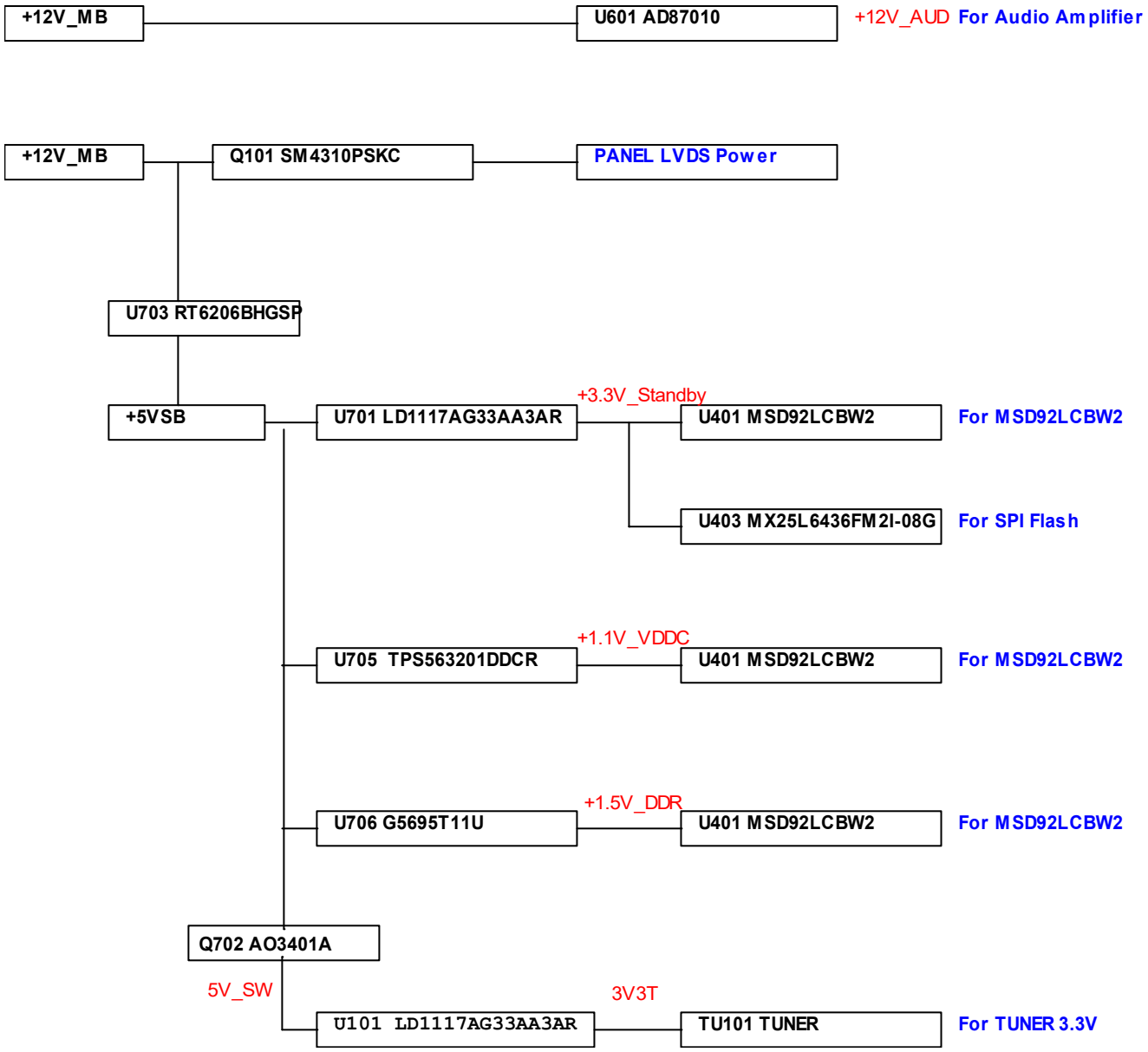


7.3 Power tree



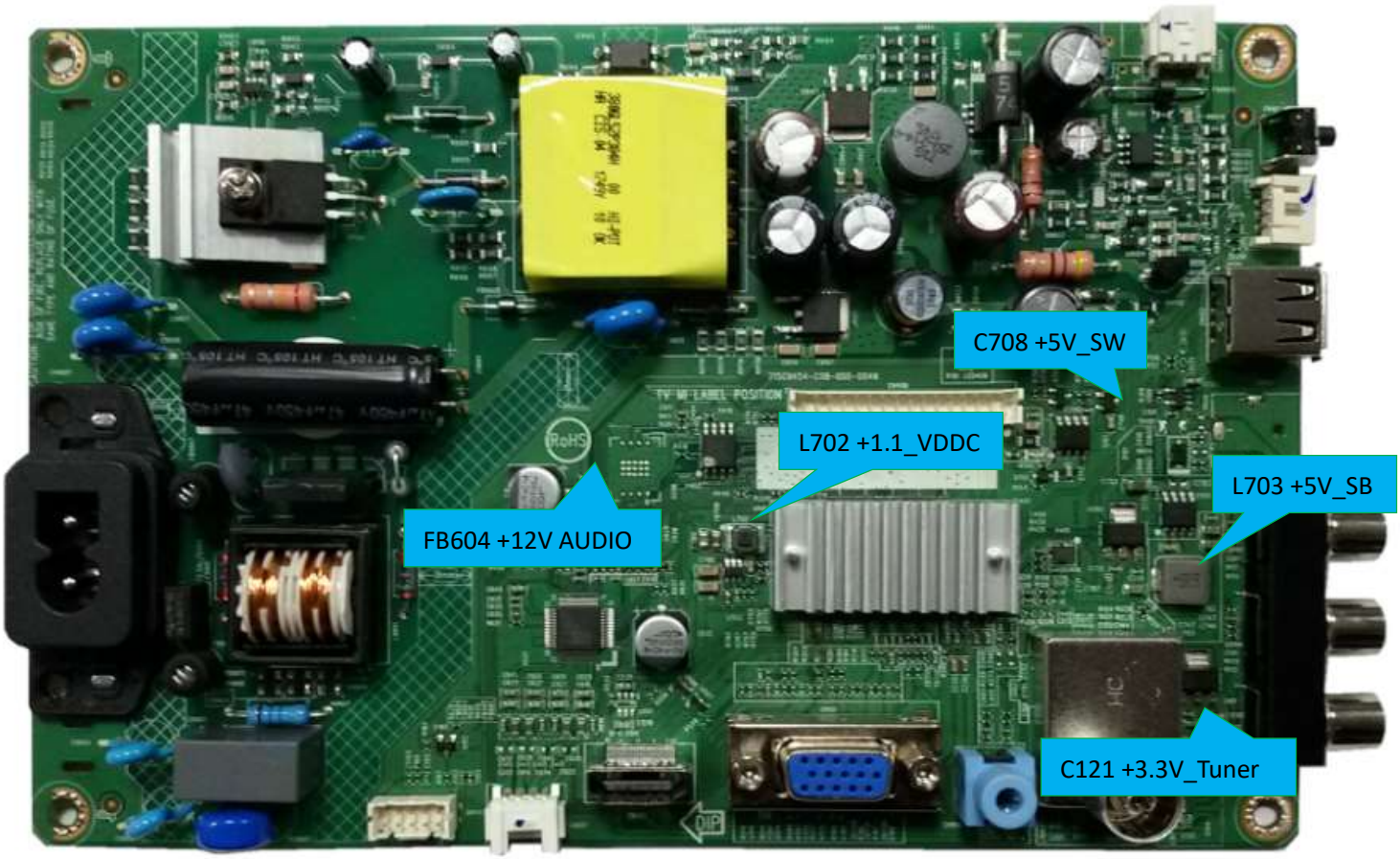
(For 715G9454C)

Main Board Power System

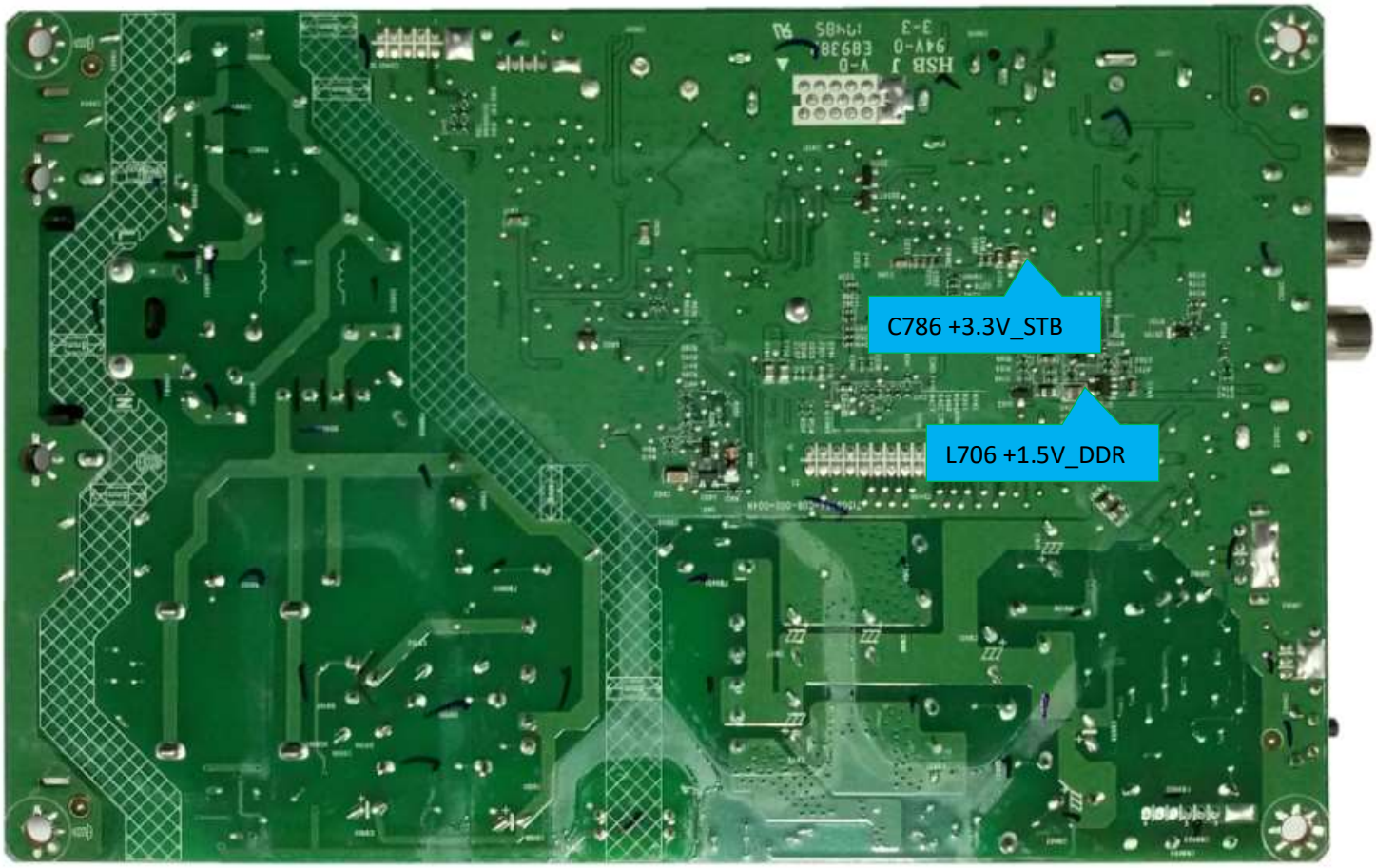


(For 715G9350M)

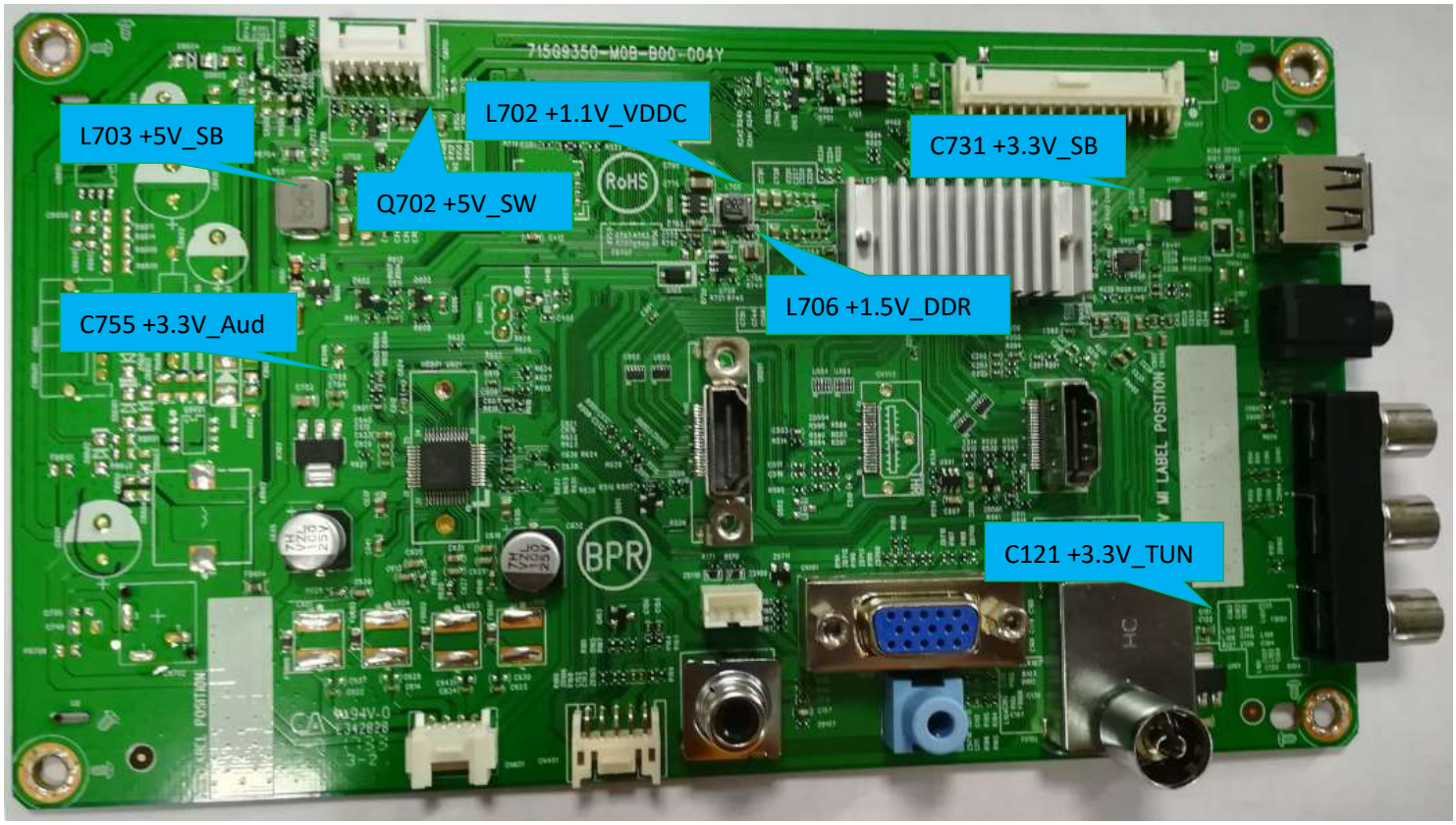
7.4 Power layout SSB



Power SSB Top View (For 715G9454C)



Power SSB Bottom View (For 715G9454C)



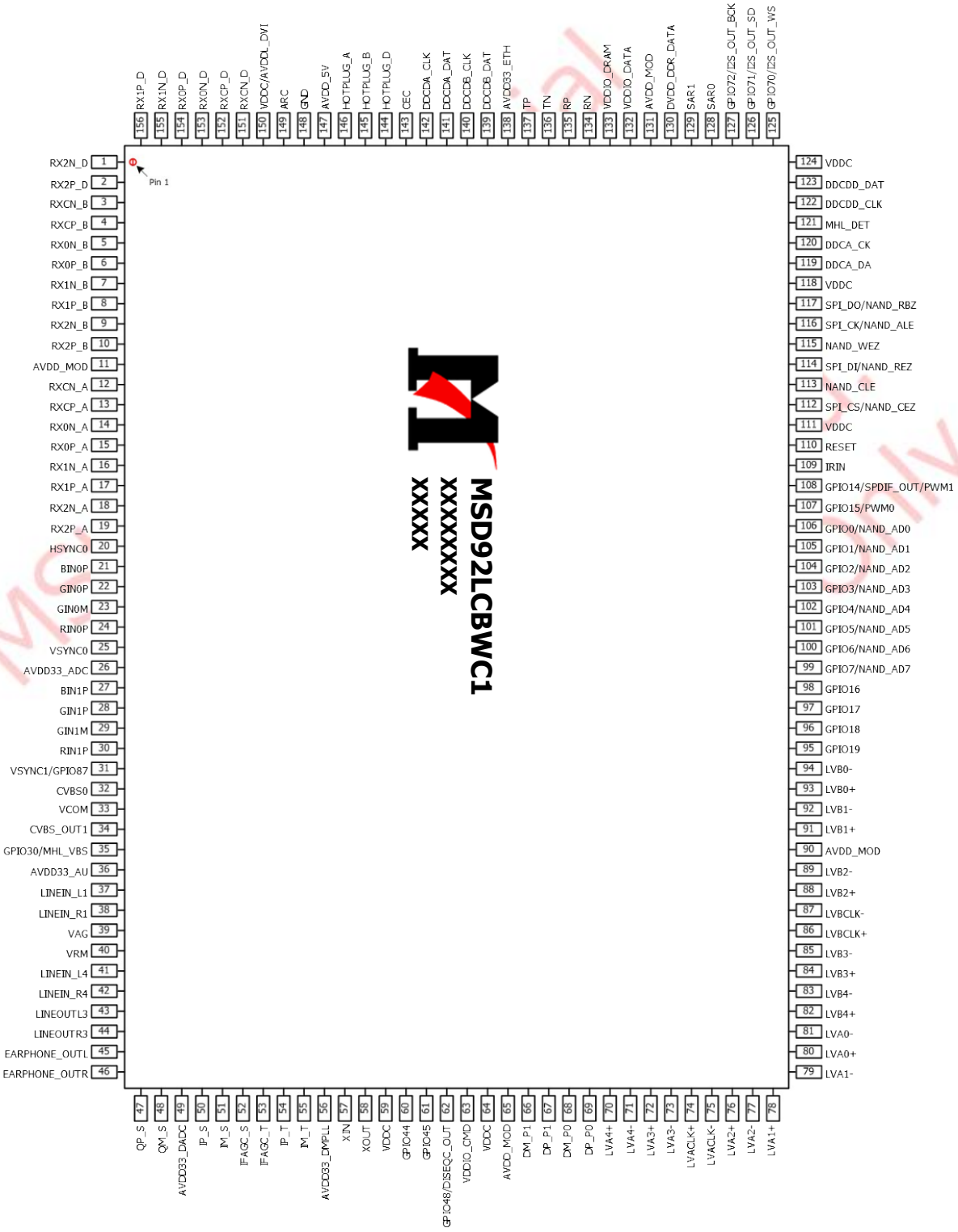
Power SSB Top View (For 715G9350M)

Power SSB Bottom View (For 715G9350M)

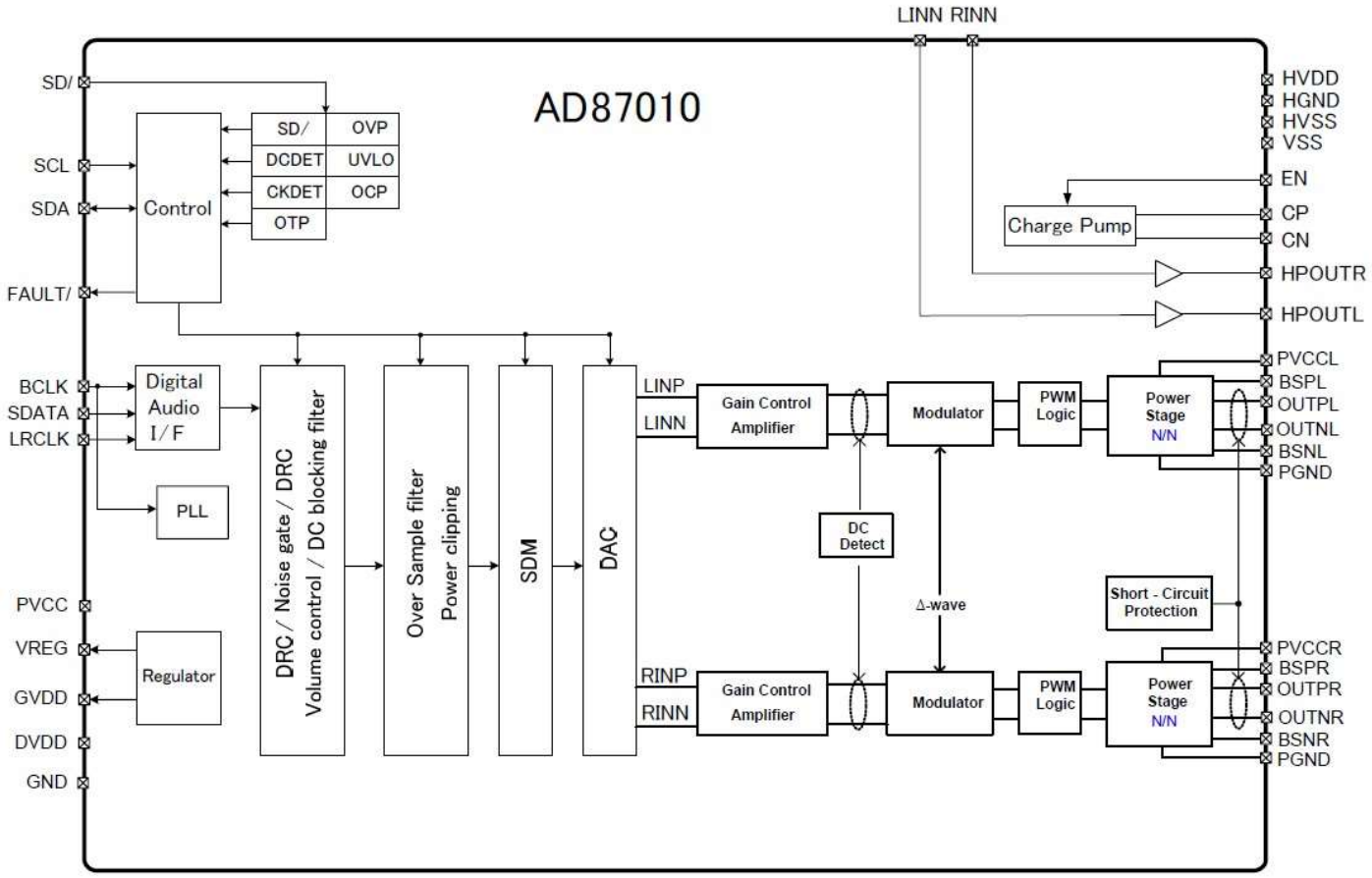
8. IC Data Sheets

8.1 MSD92L (IC U401)

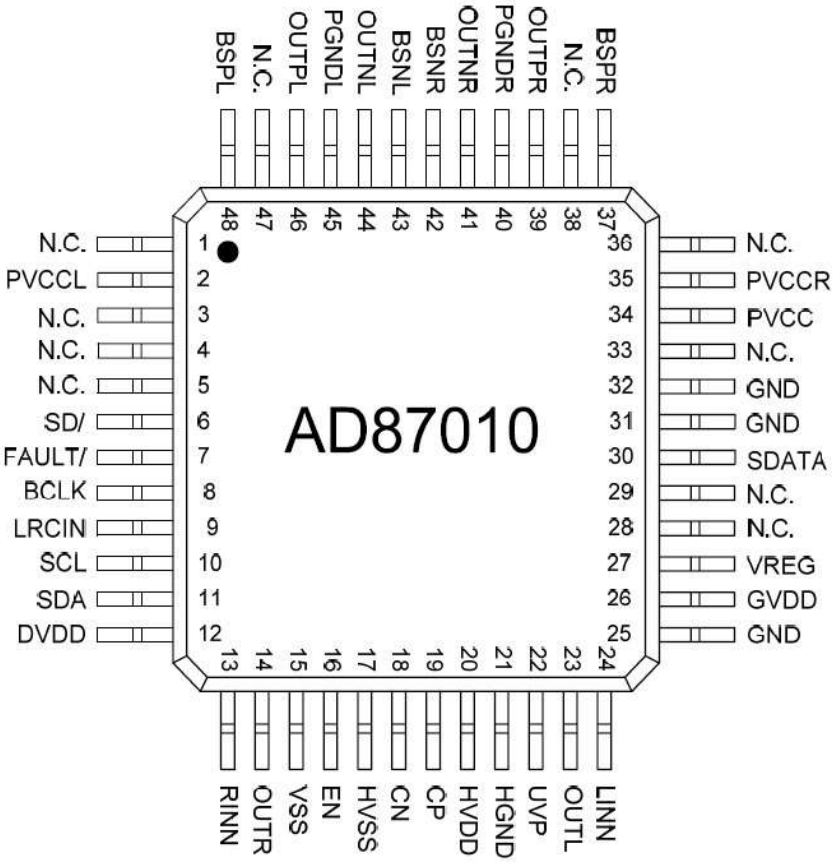
PIN DIAGRAM (MSD92LCBWC1)



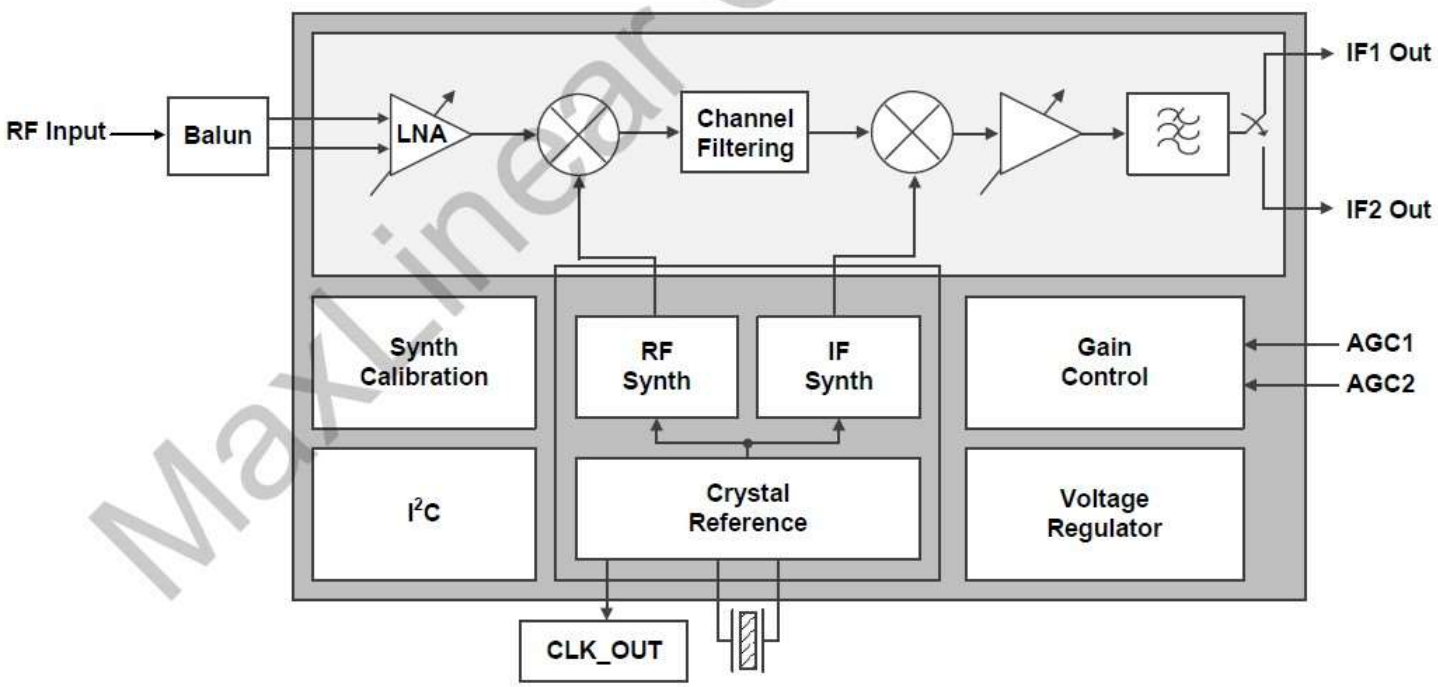
8.2 AD87010-LG48NRY (IC U601)



Pin Assignment (Top View)

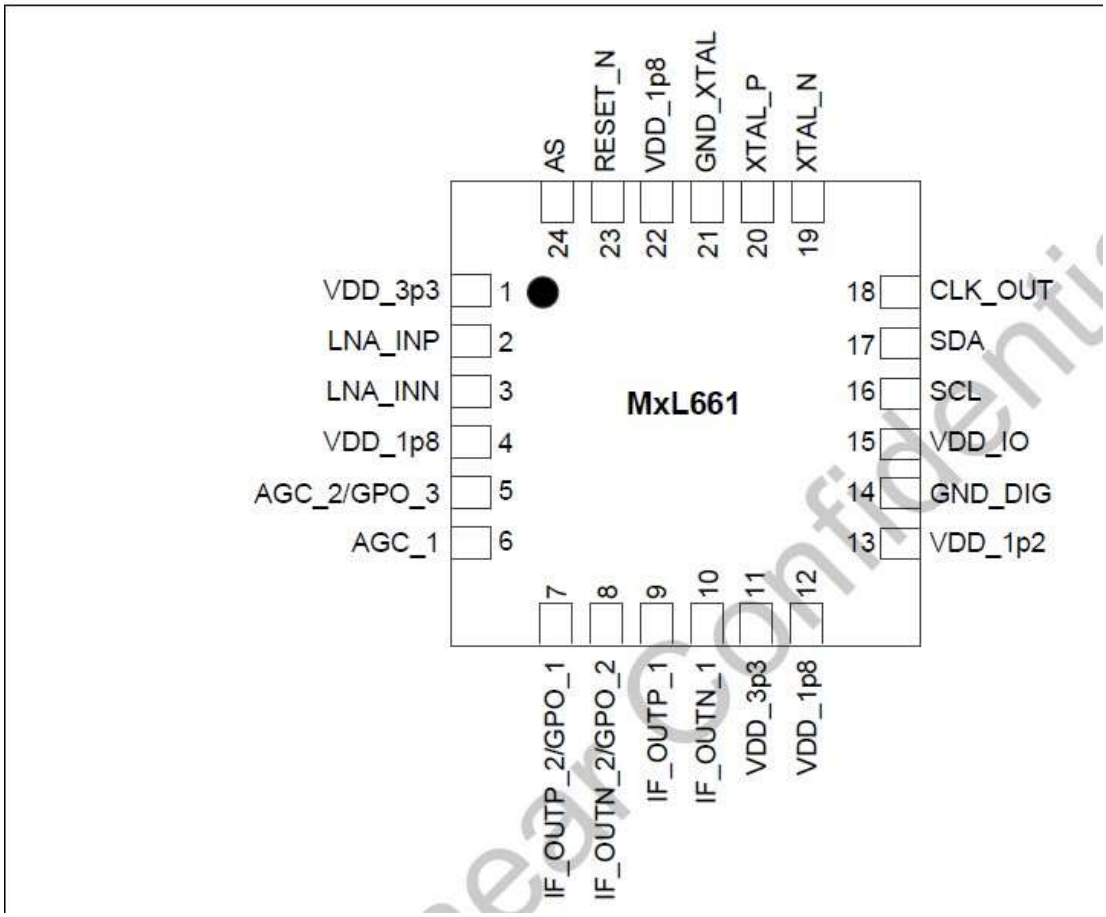


8.3 MxL661-AG-R (IC U102--Tuner)



Pin Information

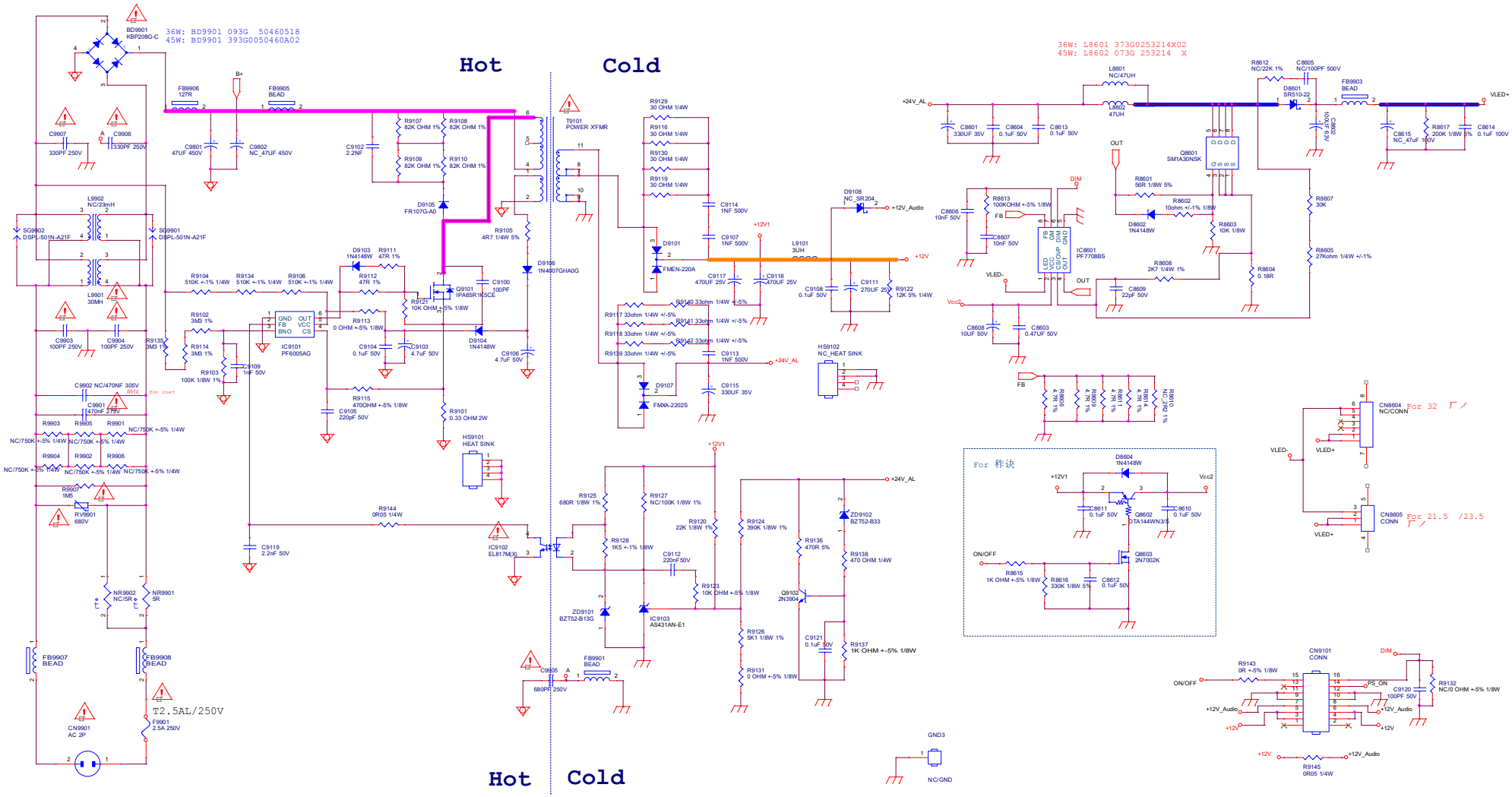
Pin Configuration



9.Circuit Diagrams

9.1 715G7735 PSU (For 24” 4233 Series)

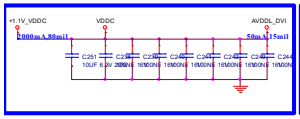
9-1-1 POWER



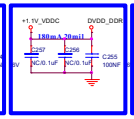
9.2 715G9454 SSB+PSU (For 22” 5403 Series)

9-2-1 MSD92LCBW2

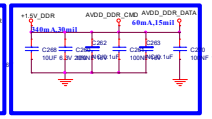
CORE POWER



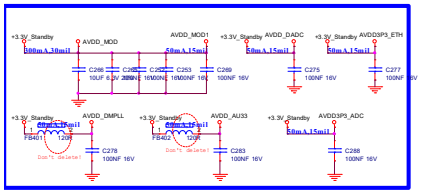
DVDD_DDR POWER



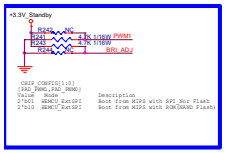
DDR POWER

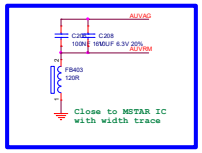


Normal POWER 3.3V

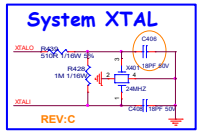


Config

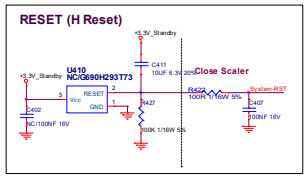




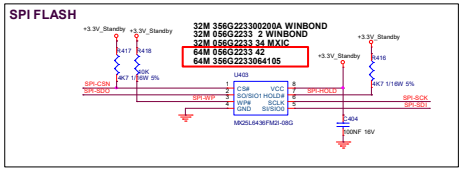
System XTAL

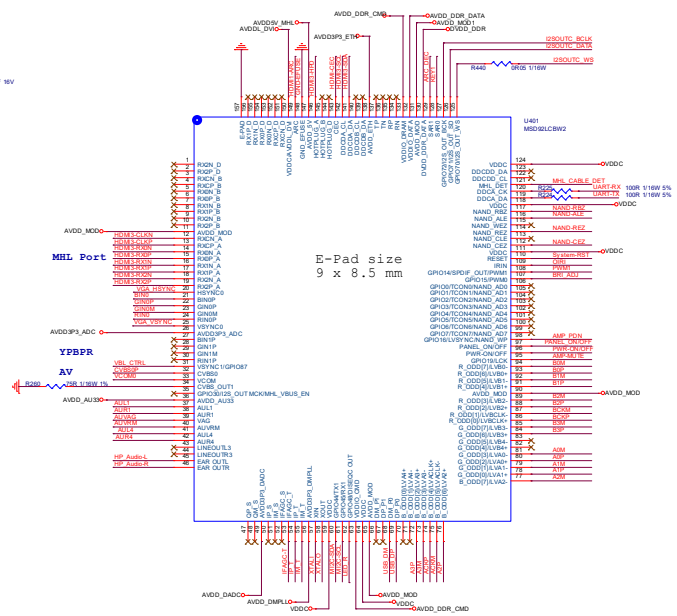


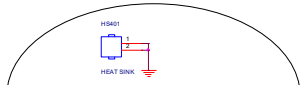
RESET (H Reset)



SPI FLASH





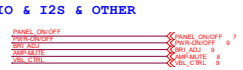


AGC

SPI & NAND

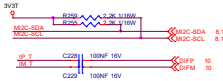
I2S

GPIO & I2S & OTHER

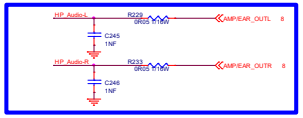


ETH & USB2.0 NET

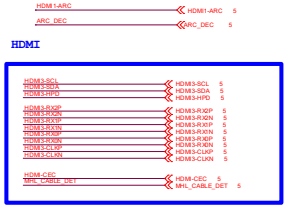
TUNER

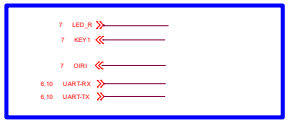


SPK & EARPHONE Out

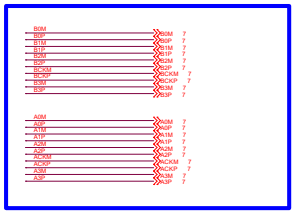


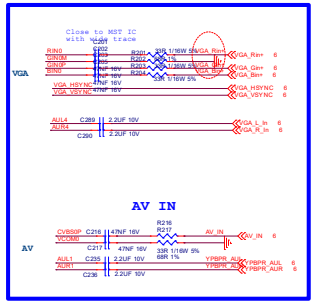
HDMI



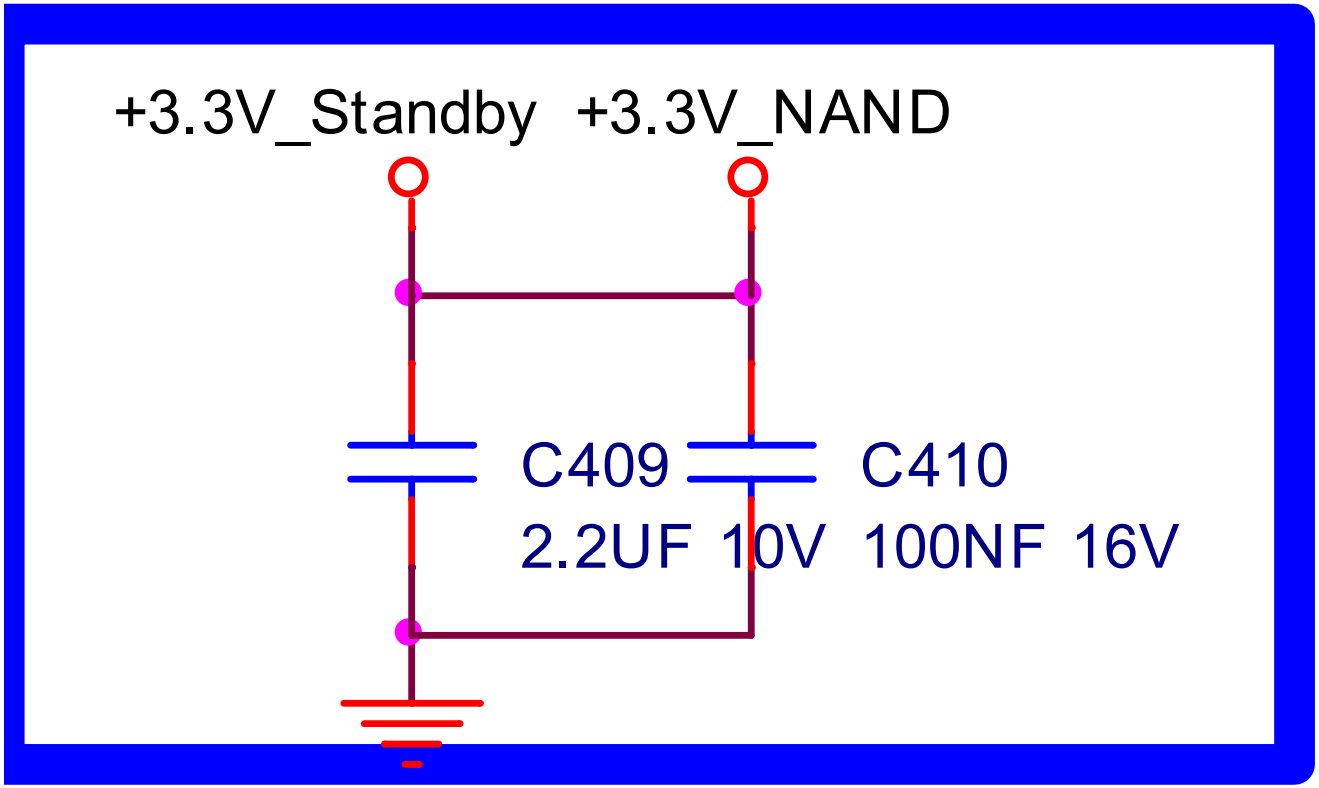


LVDS

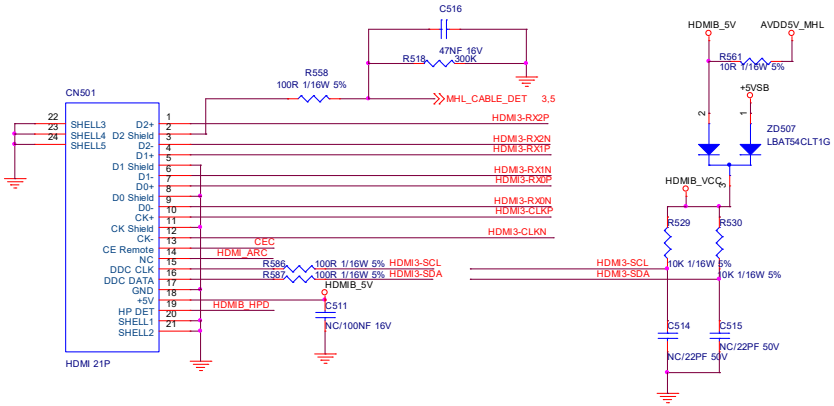


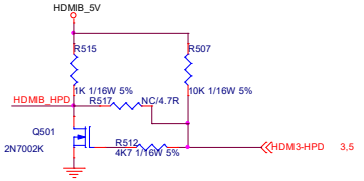


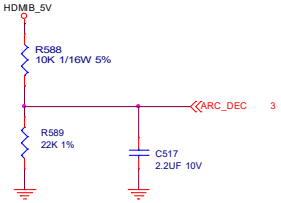
NAND Power

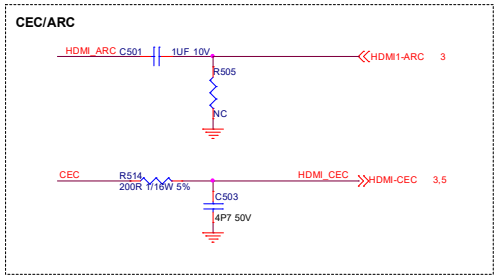


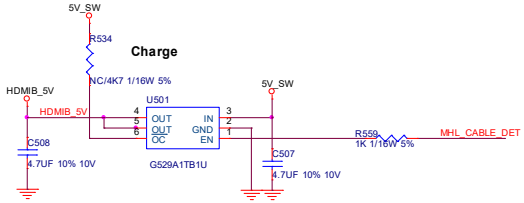
9-2-3 HDMI Inputs

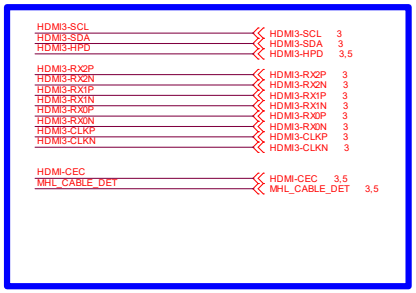






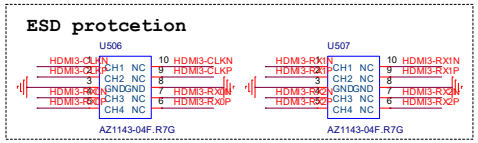






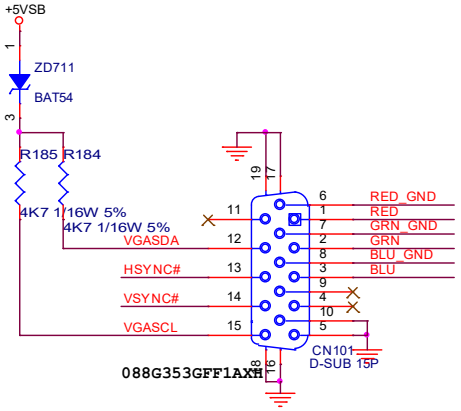
388G340CJBCFAT0001
H=6.2mm

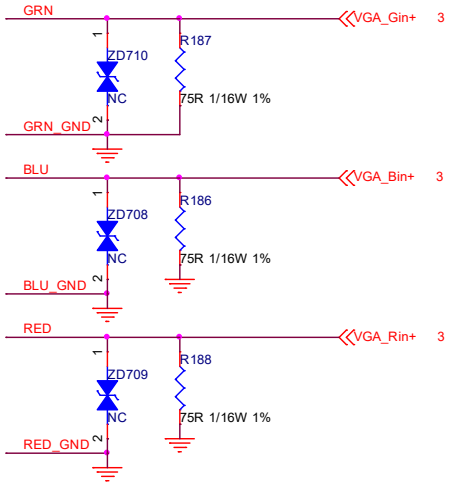
HDMI2/MHL

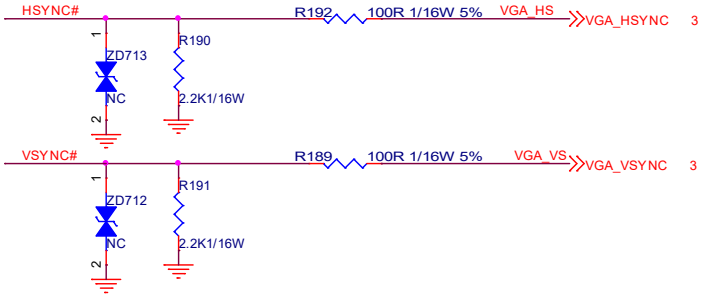


9-2-4 VGA/YPbPr/ AV/SPDIF

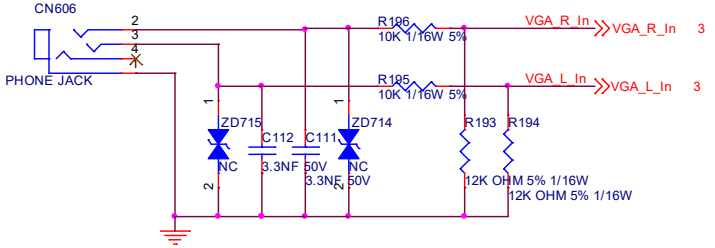
VGA

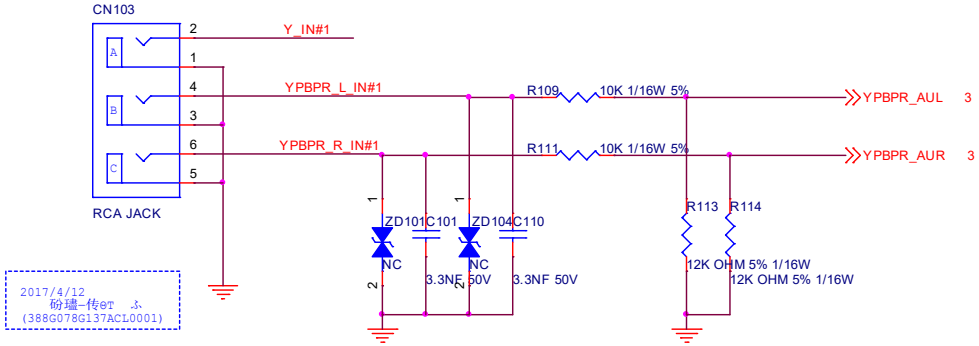




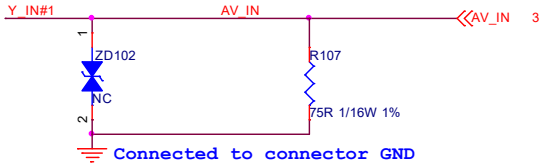


VGA/UART

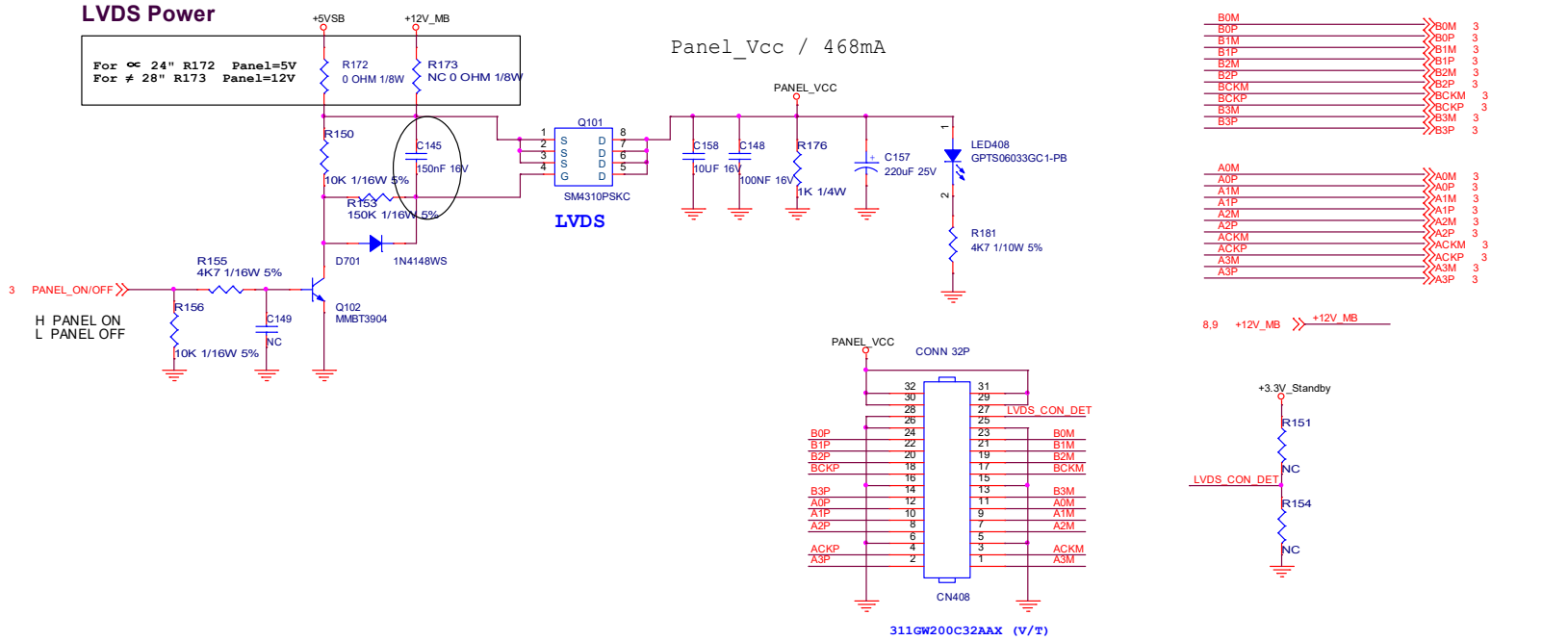


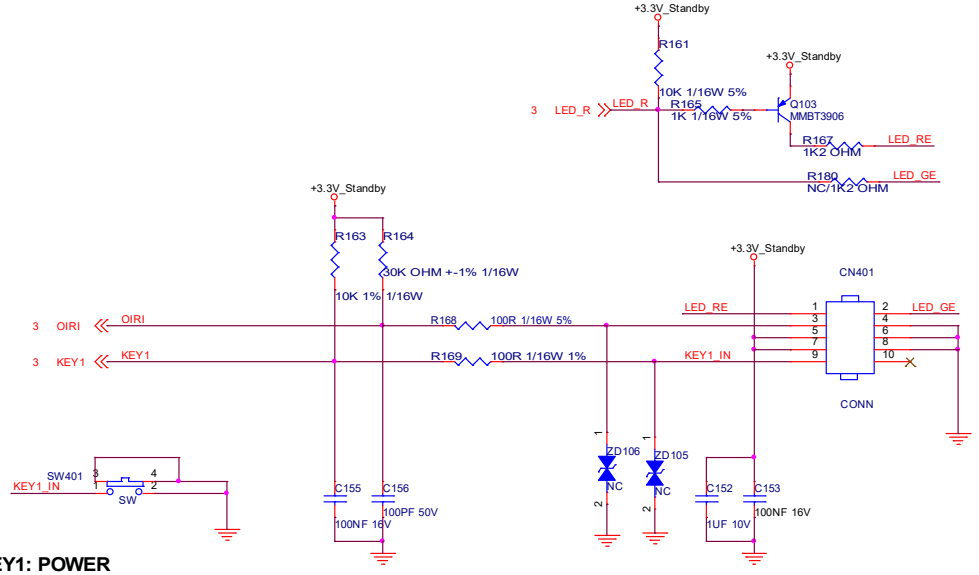


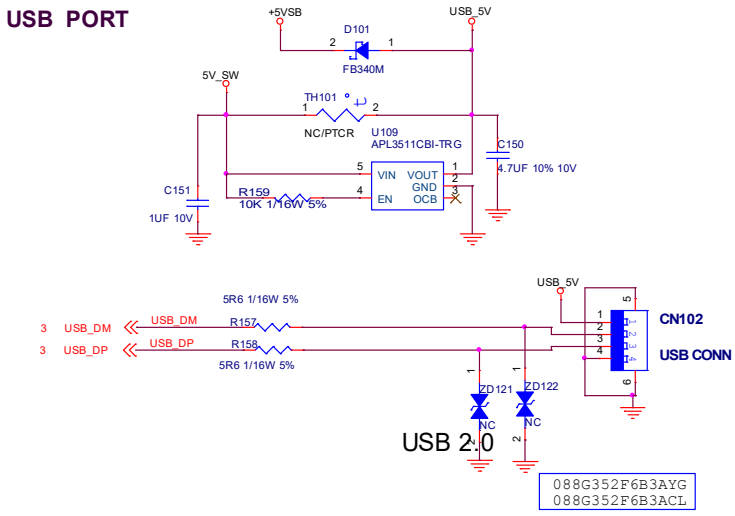
Nearly Connector



9-2-5 LVDS/USB/KEYPAD Output

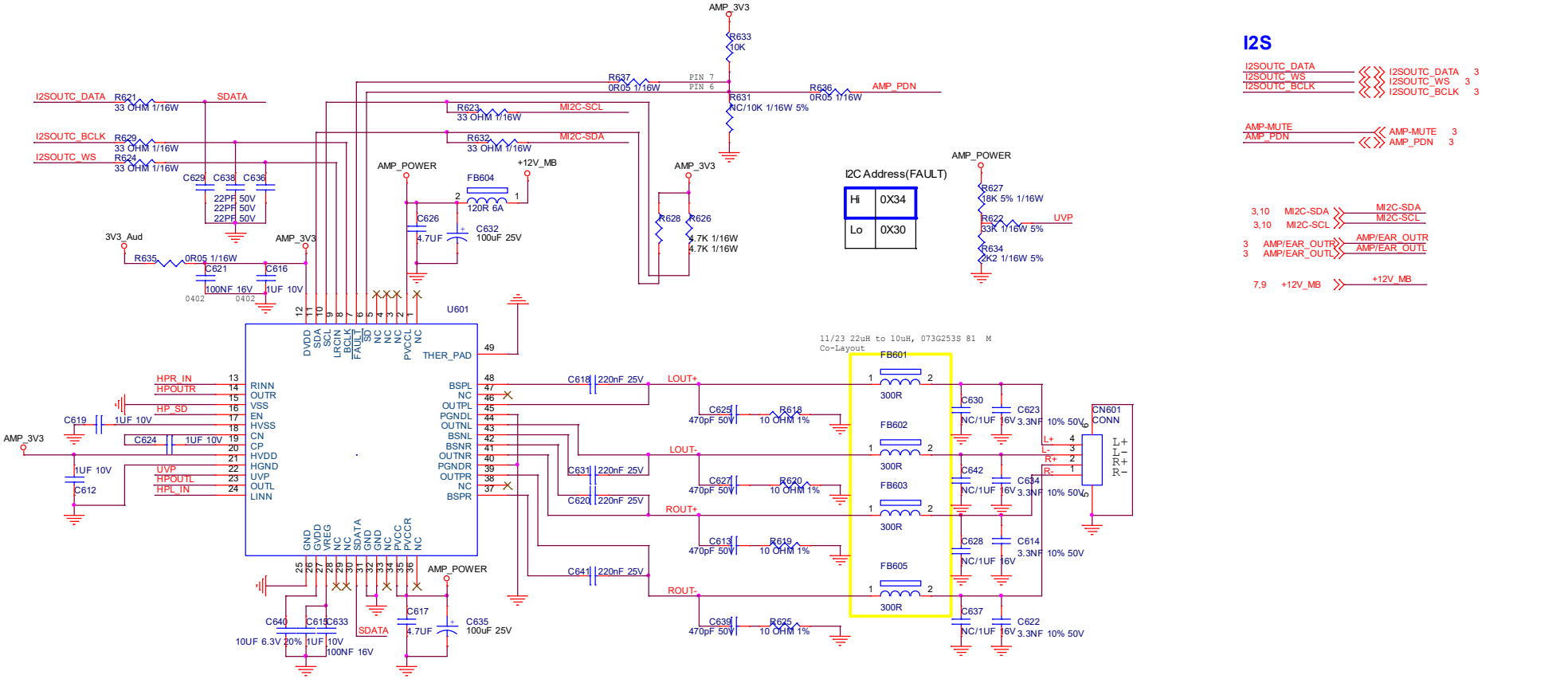






KEY1: POWER
KEY2: Vol+/-, CH+/-, Menu, Input

9-2-6 Audio Amp/Headphone Output



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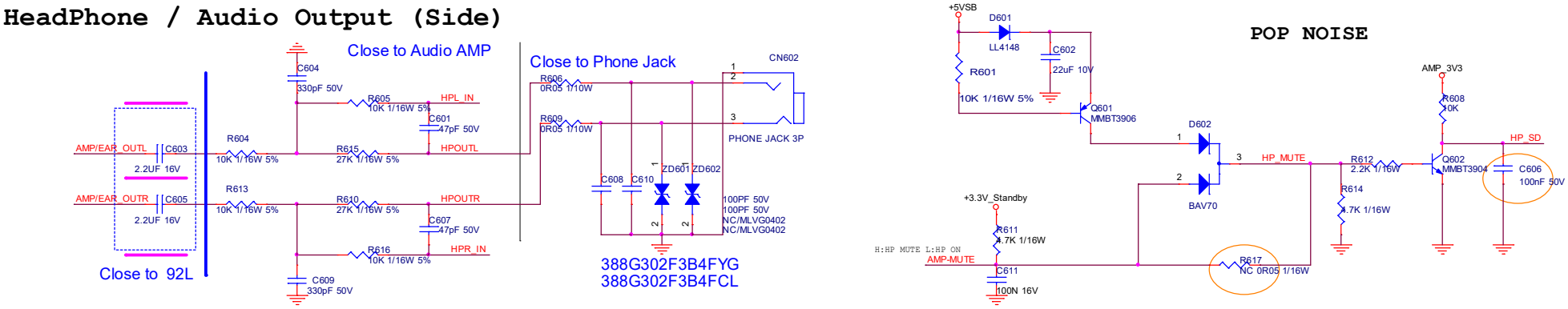
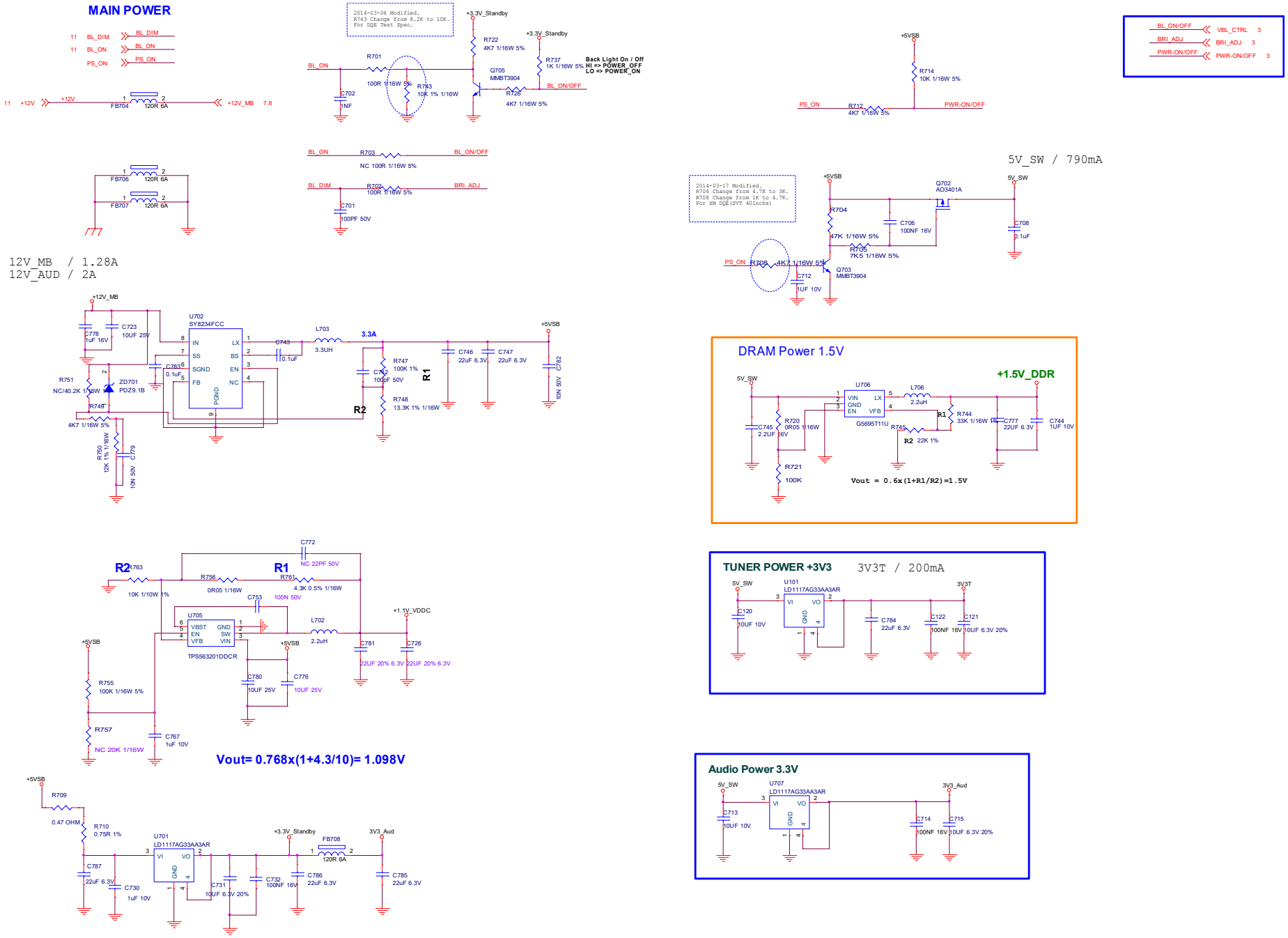
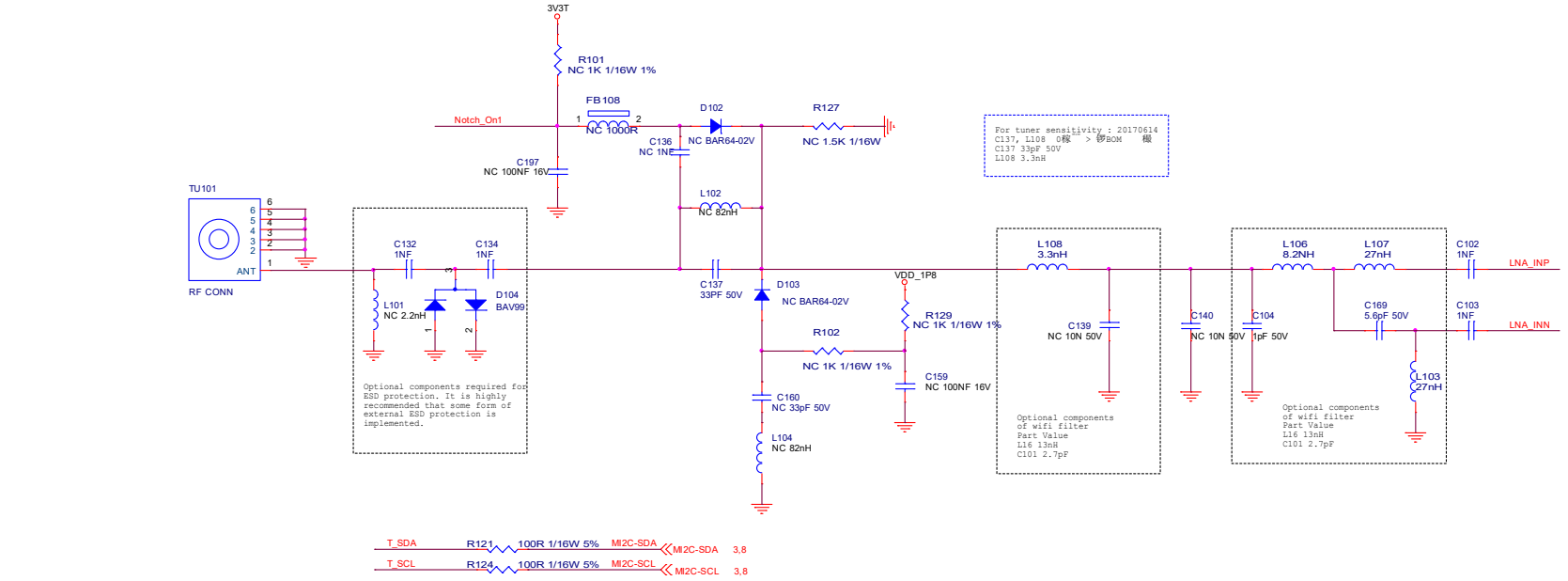
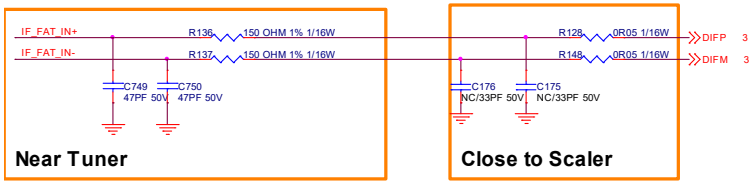


9-2-7 System Power

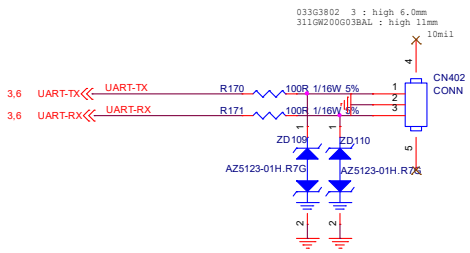


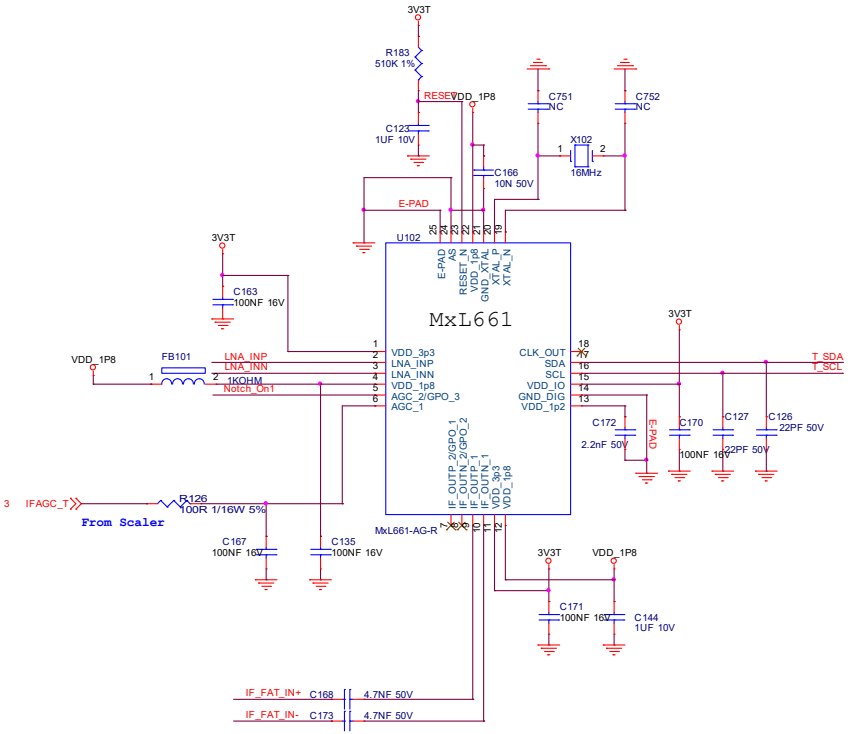
9-2-8 Tuner/Debug





For 715G6689-M0A-001:
C1204,C1214-->NC,R1214,R1234-->0ohm,C129,C118,C175,C176-->NC,R128,R148-->0ohm

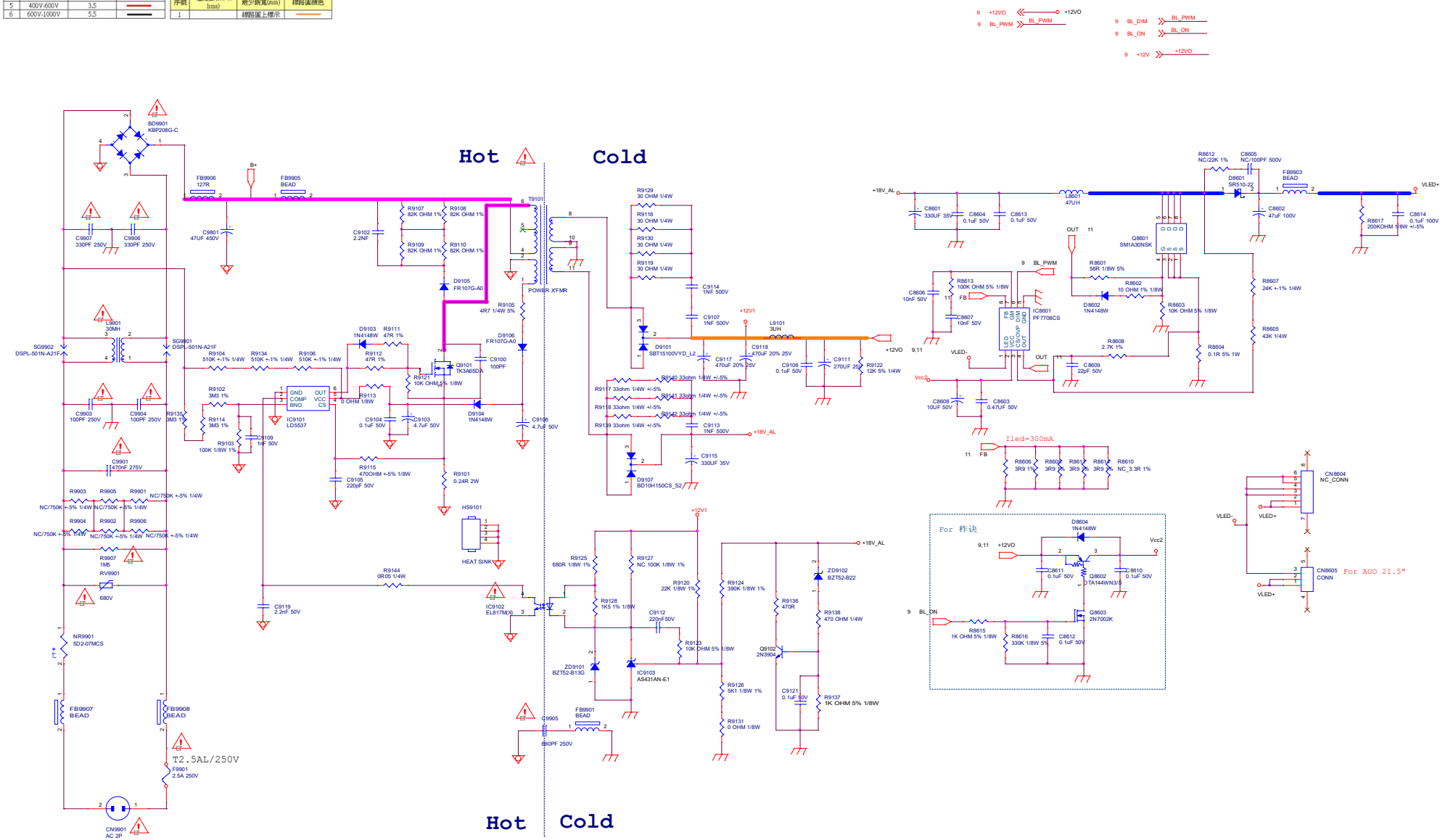




9-2-9 AC Power

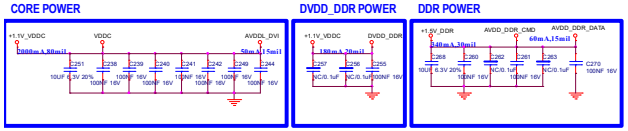
Layout 網路耐壓與沿面間距標準			
序號	電壓值 (Vdc or Vrms)	最少銅箔間距 (mm)	線路圖顏色
1	40V ↓	0.30	無標示
2	40V-100V	0.8	
3	100V-200V	1.5	
4	200V-400V	2.5	
5	400V-600V	3.5	
6	600V-1000V	5.5	

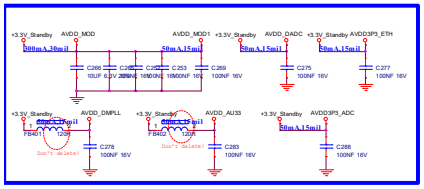
Layout trace 電流與 trace 寬度，1A=最少 1mm 以上寬度 銅厚:1(0z)			
序號	電流值 (Vdc or Irms)	最少銅寬(mm)	線路圖顏色
1		線路圖上標示	

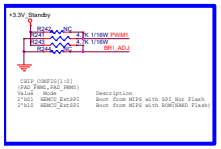


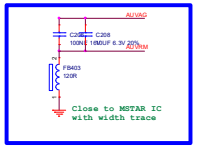
9.3 715G9350 SSB (For 24” 4233 Series)

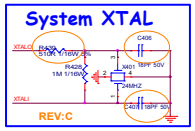
9-3-1 MSD92LCBW2

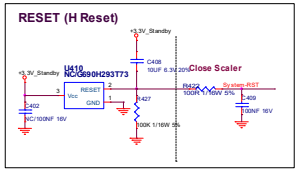


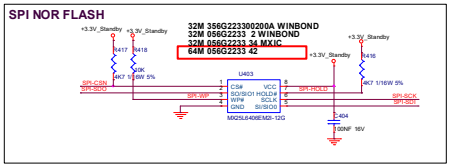


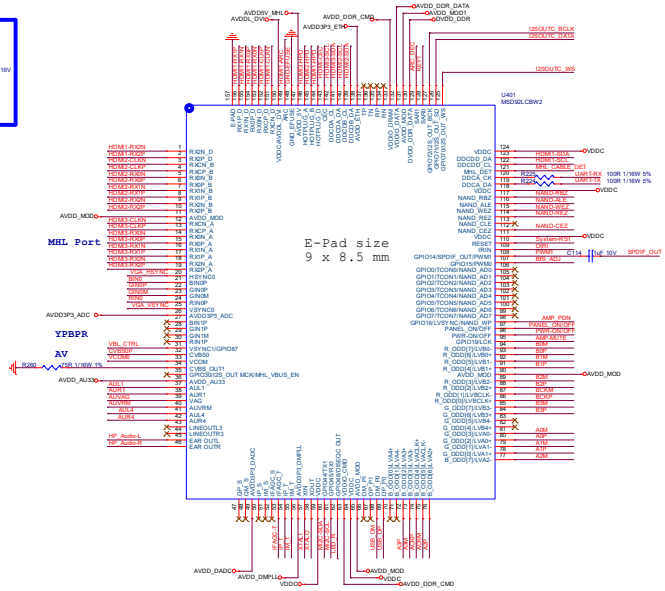


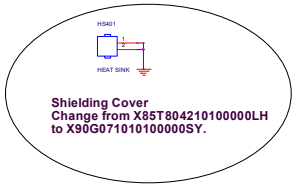


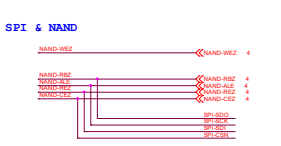


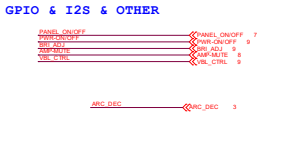


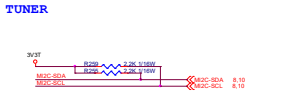


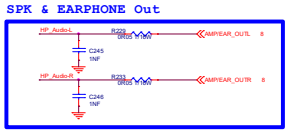


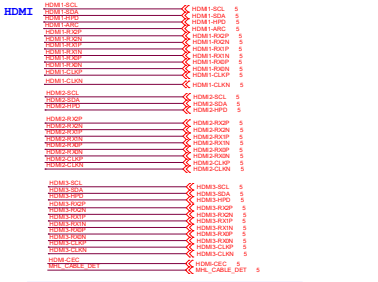


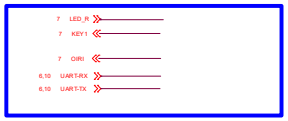


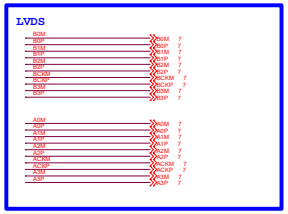


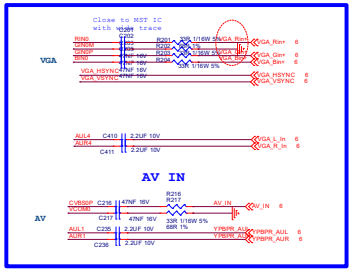




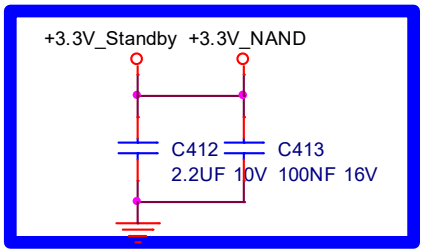






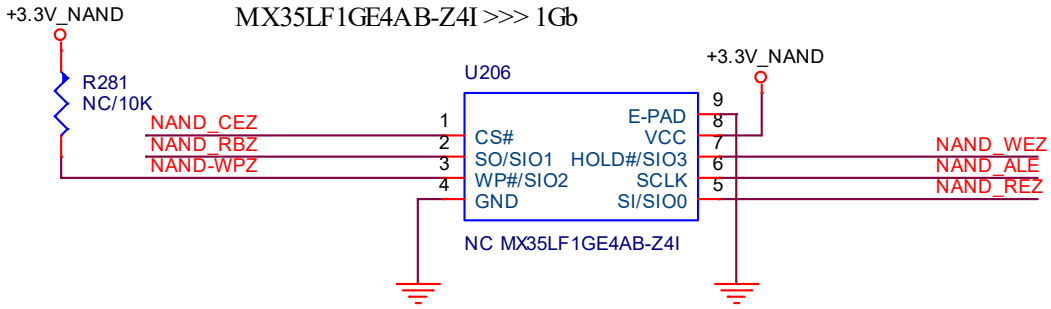


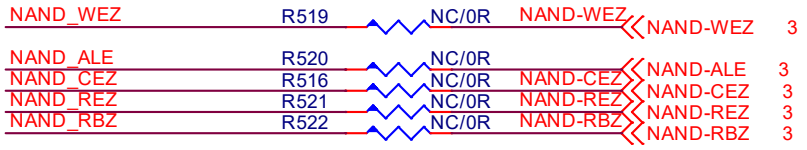
NAND Power



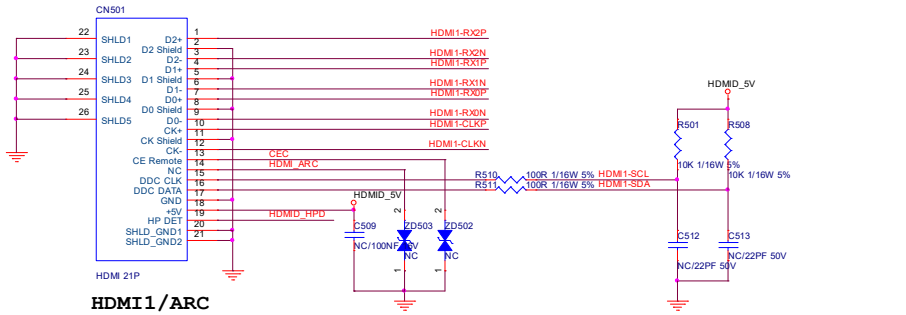
SPI NAND FLASH

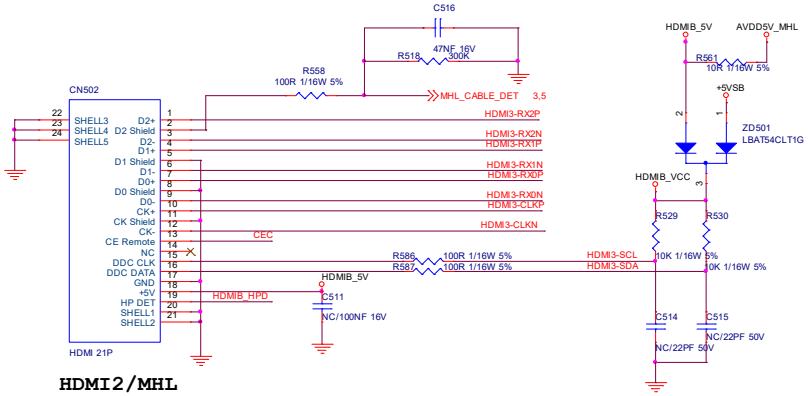
MX35LF1GE4AB-Z4I >>> 1Gb

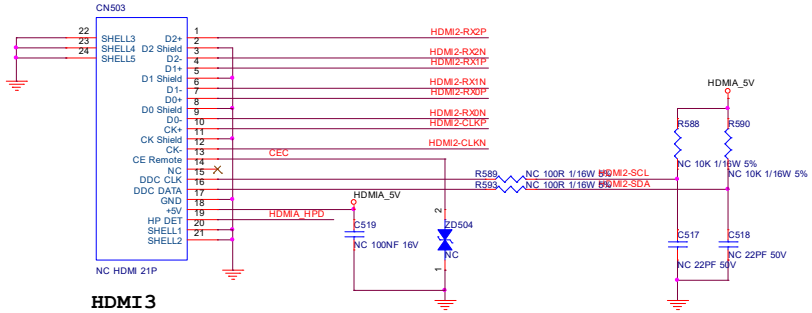


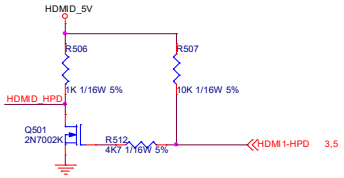


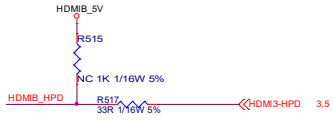
9-3-3 HDMI Inputs

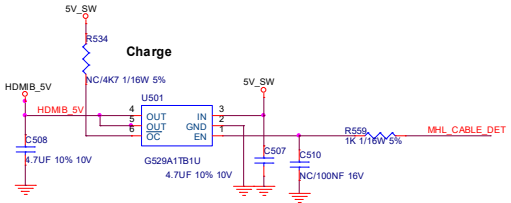


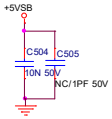


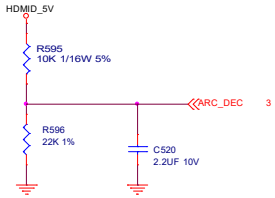


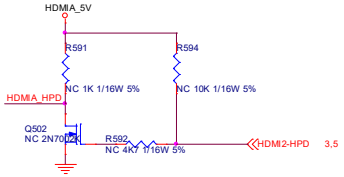


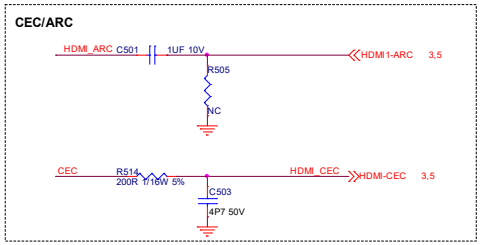


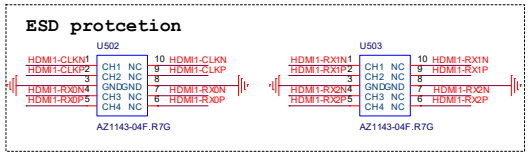


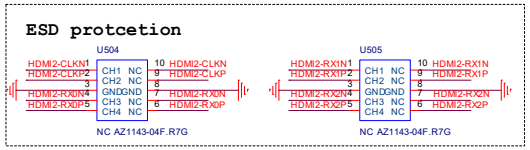






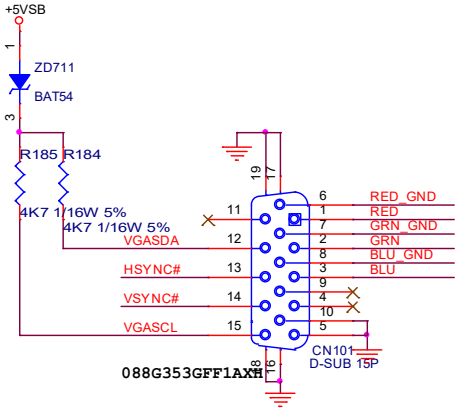


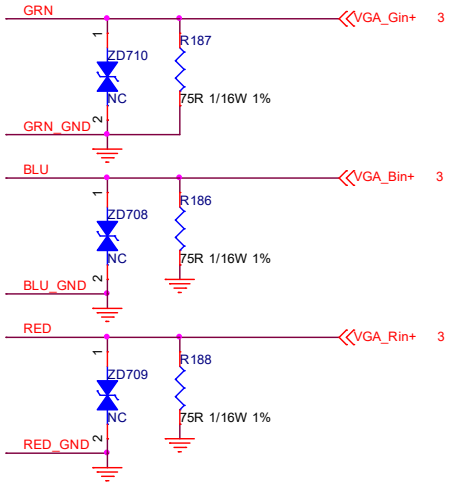


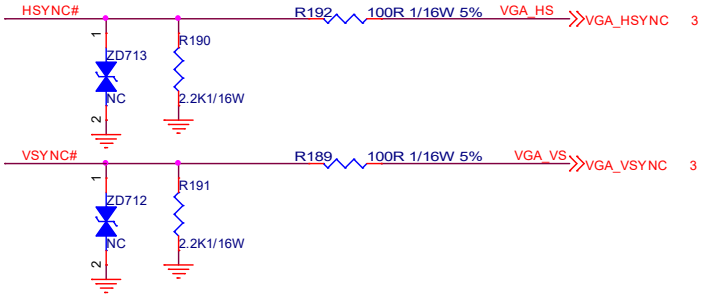


9-3-4 VGA/YPbPr/ AV/SPDIF

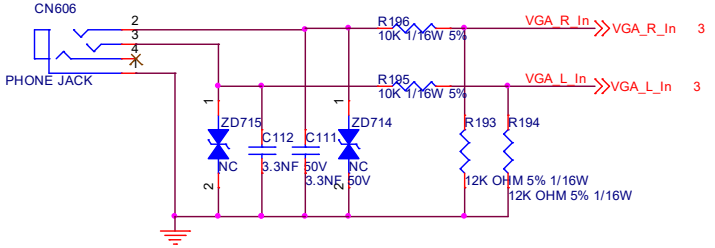
VGA

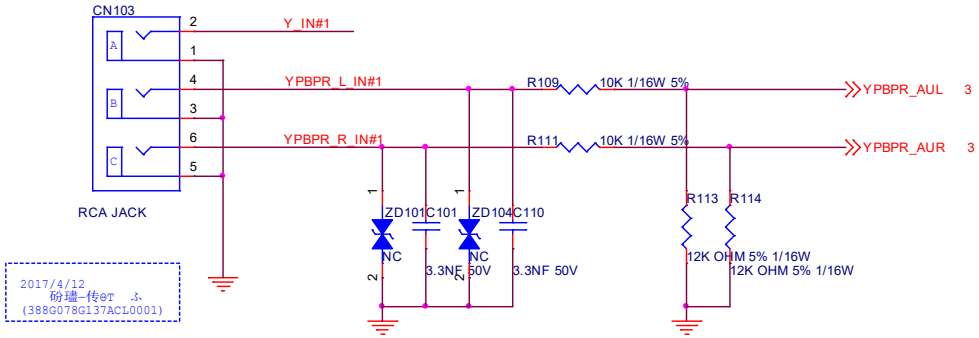




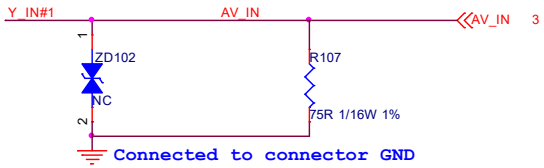


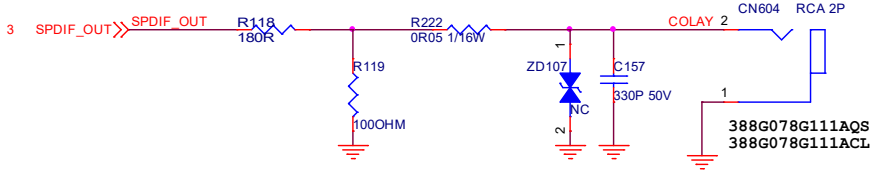
VGA/UART





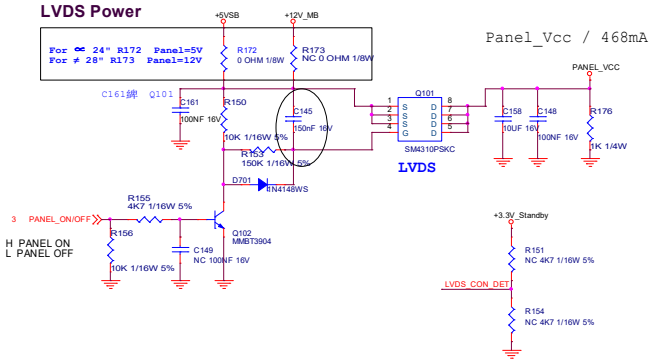
Nearly Connector

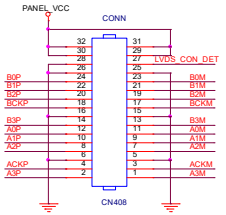




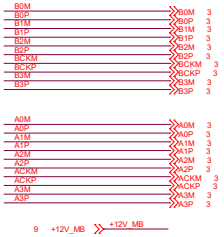
9-3-5 LVDS/USB/KEYPAD Outout

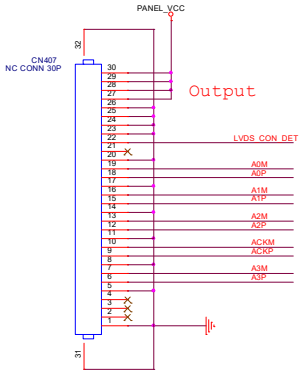
LVDS Power



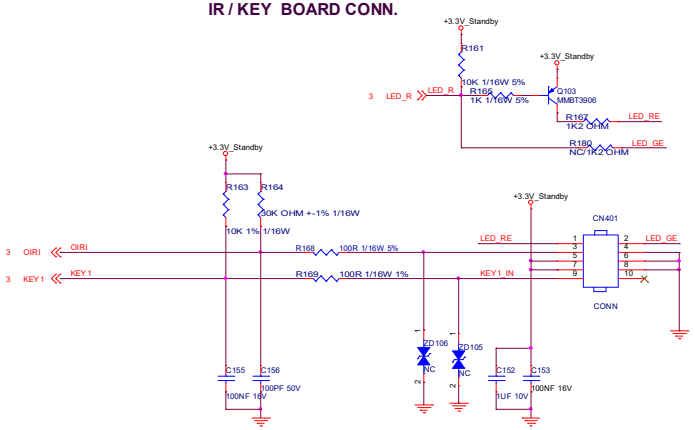


MB to FHD/HD panel define (CS10)
311GW200C32ABX (R/A)



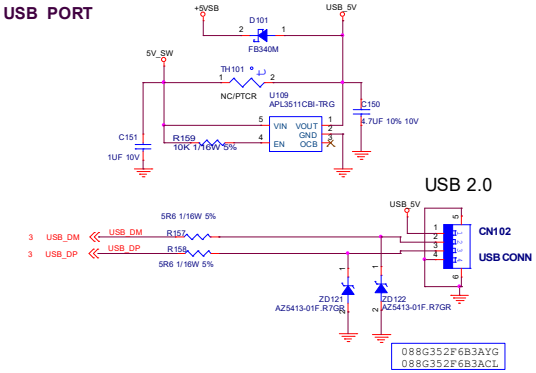


IR / KEY BOARD CONN.

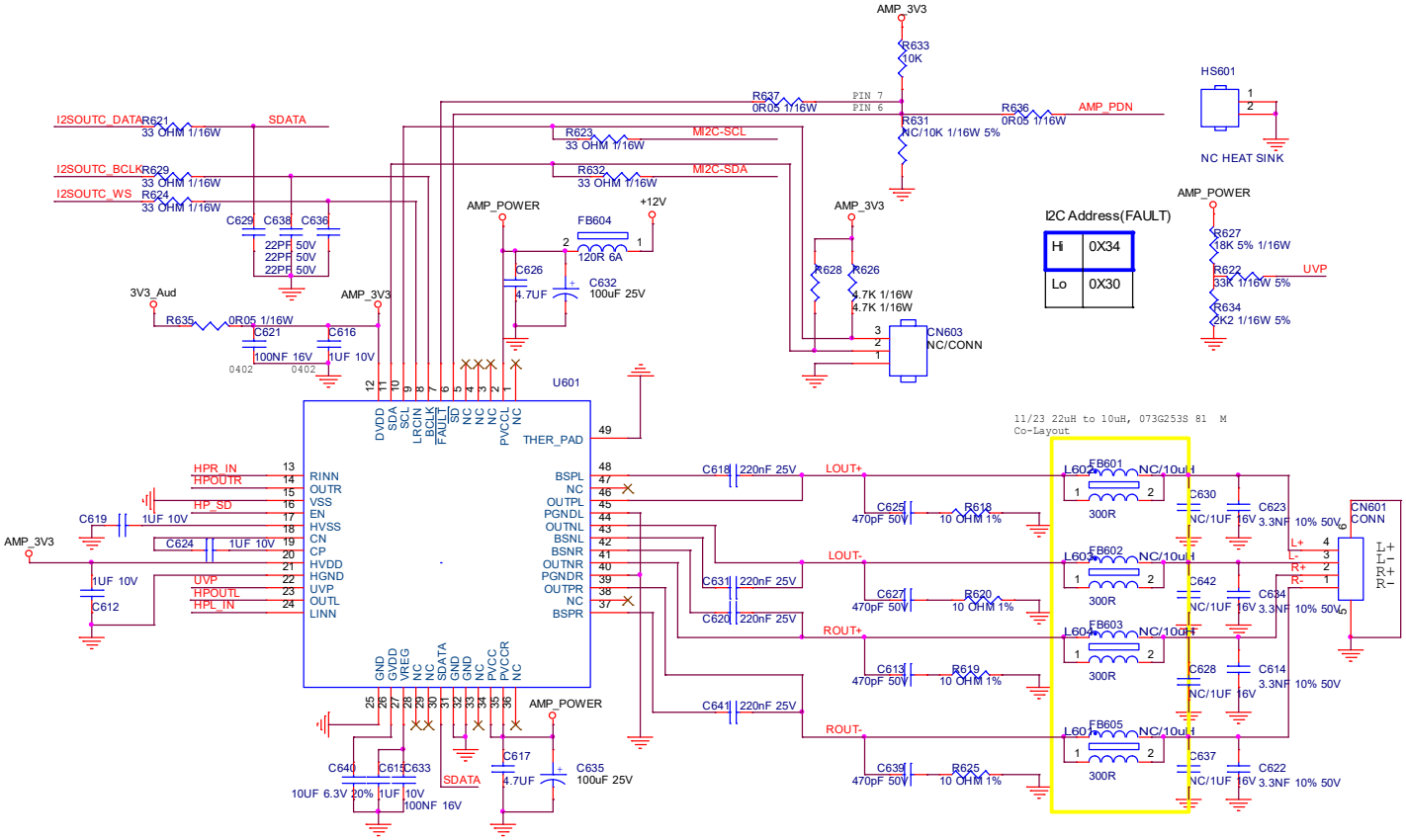


KEY1: POWER
KEY2: Vol+/-, CH+/-, Menu, Input

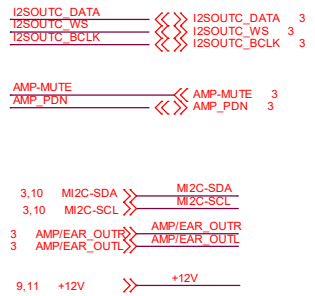
USB PORT



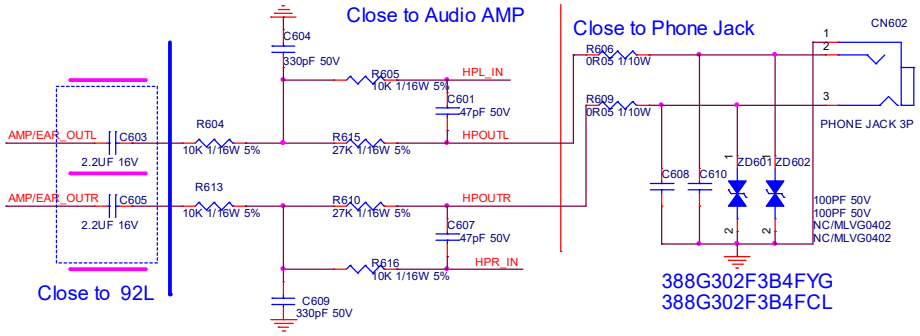
9-3-6 Audio Amp/Headphone Output



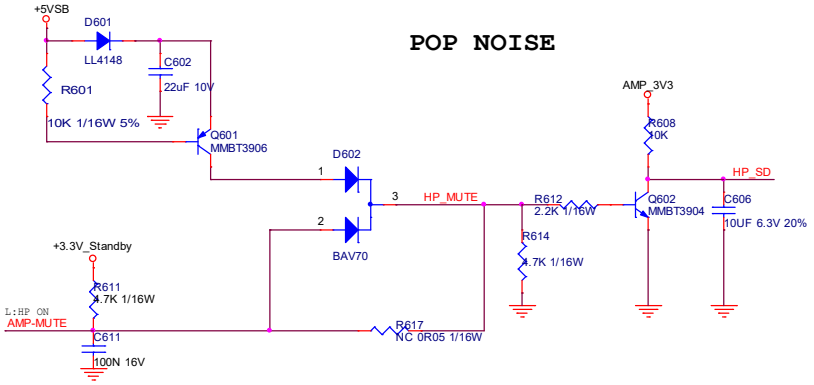
I2S



HeadPhone / Audio Output (Side)

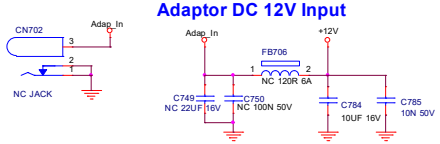


POP NOISE

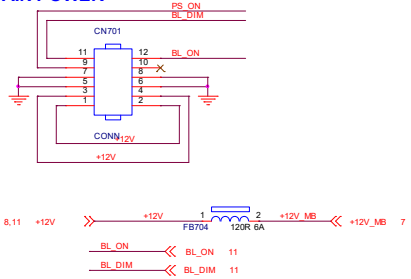


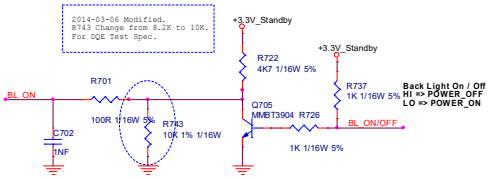
9-3-7 System Power

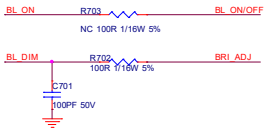
Adaptor DC 12V Input

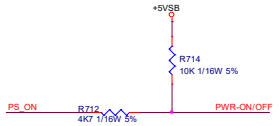


MAIN POWER

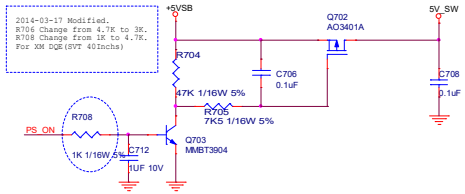






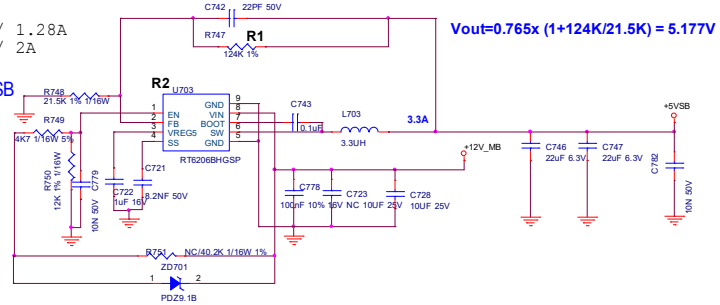


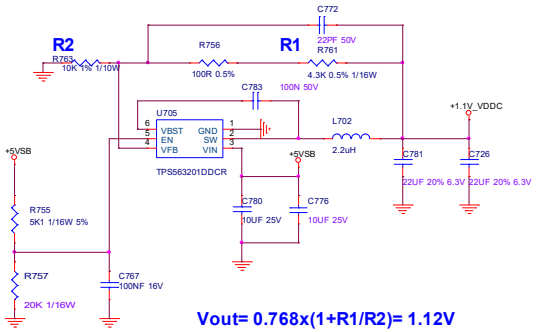
5V_SW / 790mA



12V_MB / 1.28A
12V_AUD / 2A

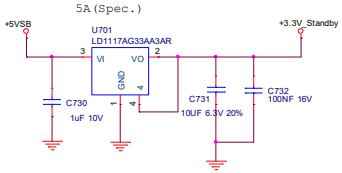
12V TO 5VSB



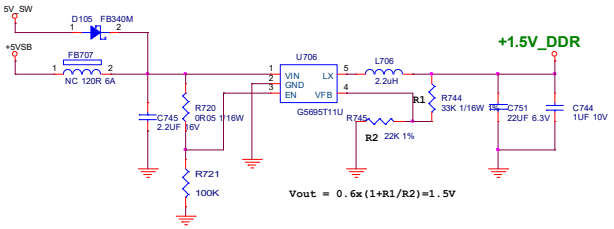


Vout= 0.768x(1+R1/R2)= 1.12V

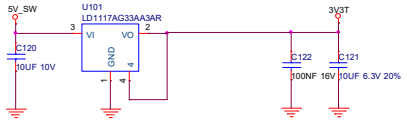
5A(Spec.)



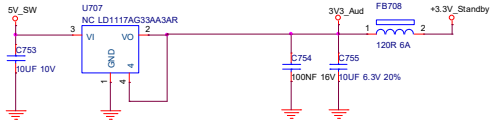
DRAM Power 1.5VAdd Net +5VSB for fast boot function.



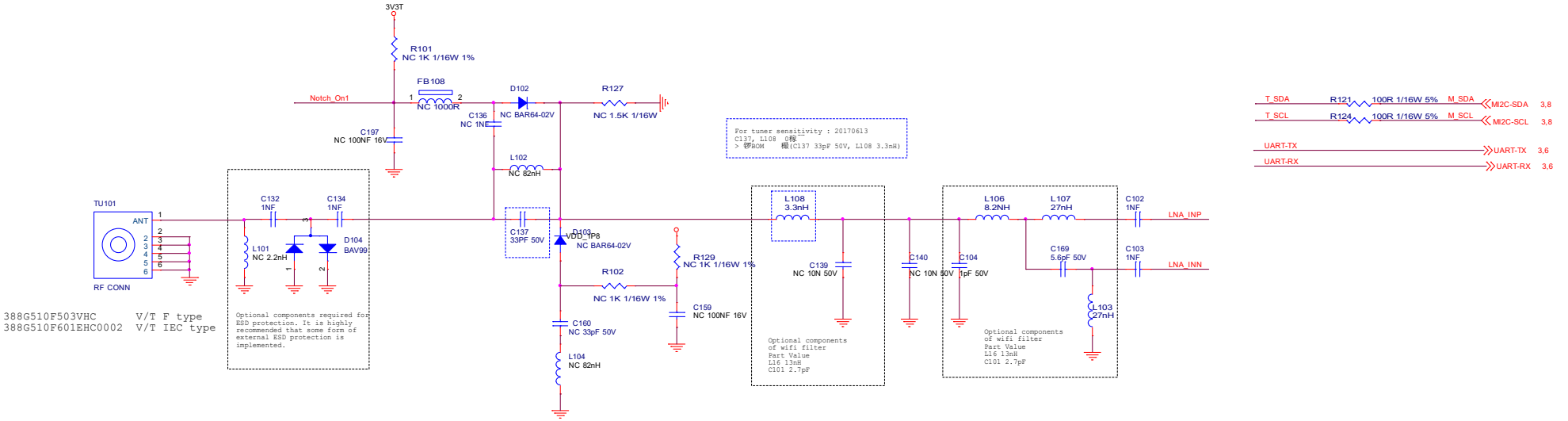
TUNER POWER +3V3 3V3T / 200mA

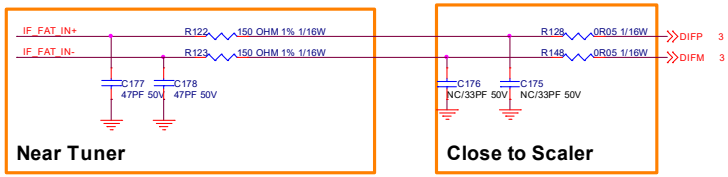


Audio Power 3.3V

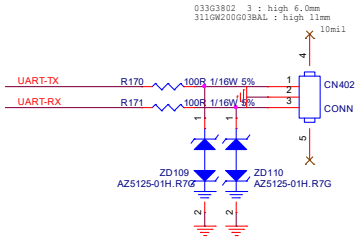


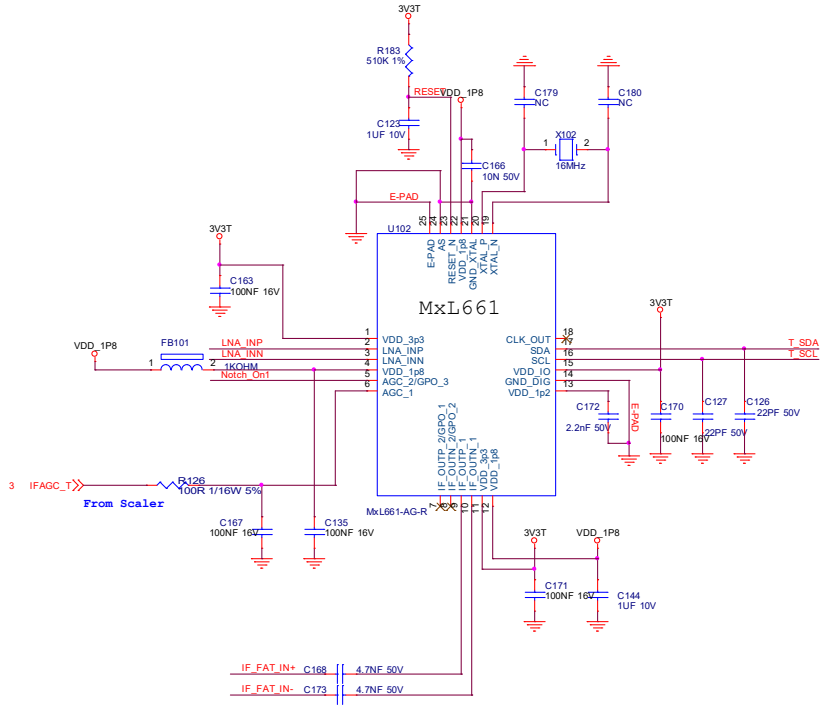
9-3-8 Tuner/Debug



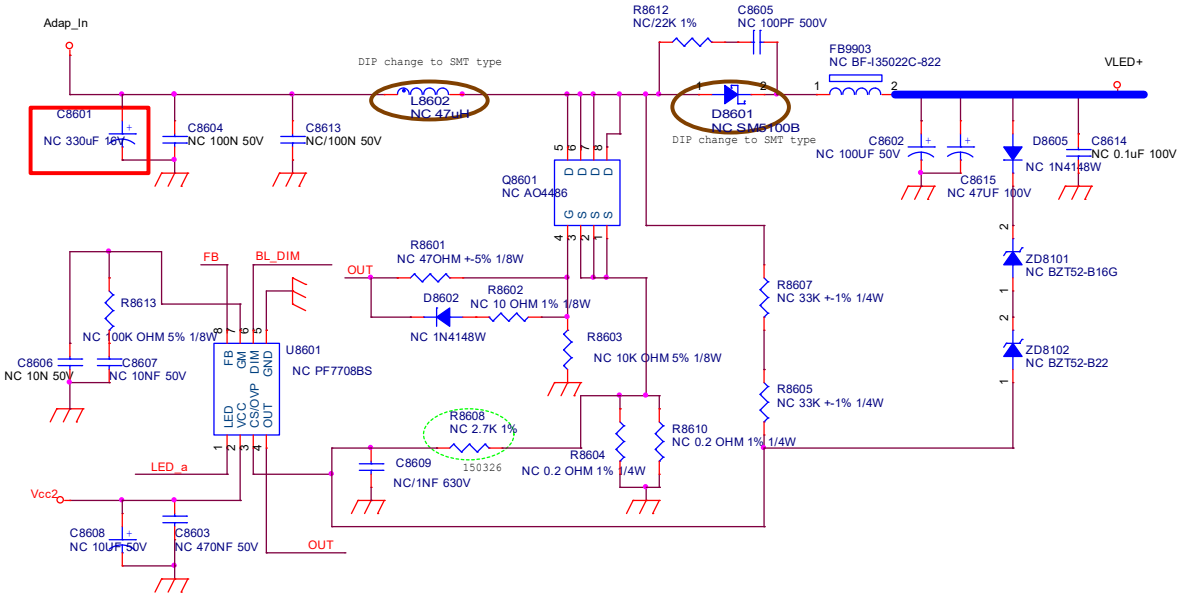


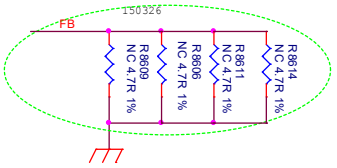
For 715G6689-M0A-001:
C1204,C1214-->NC,R1214,R1234-->0ohm,C129,C118,C175,C176-->NC,R128,R148-->0ohm





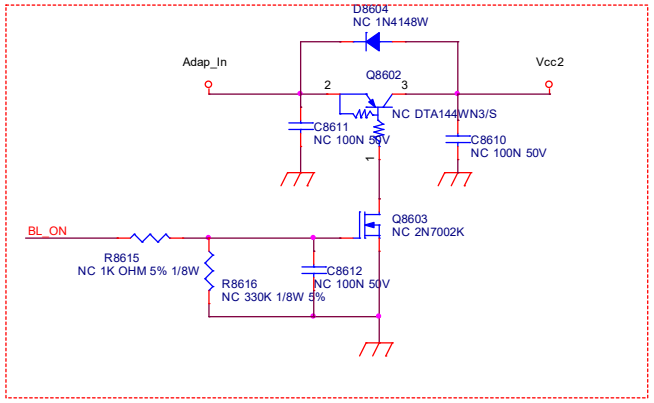
9-3-9 LED Driver



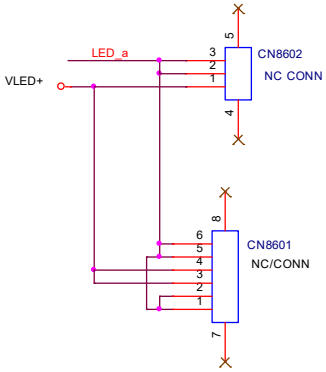


Iled=0.3/Rfb

LB Current 260mA

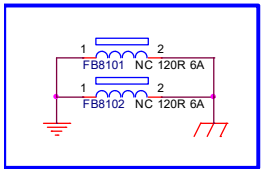


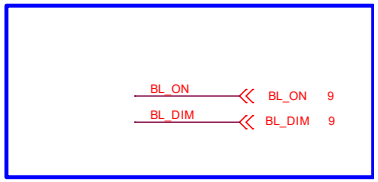
For 柞诀



layout 銅箔耐壓與沿面間距標準			
序號	電壓值 (Vdc or Vrms)	最少銅泊間距 (mm)	線路圖顏色
1	40V ↓	0.30	無標示
2	40V-100V	0.8	
3	100V-200V	1.5	
4	200V-400V	2.5	
5	400V-600V	3.5	
6	600V-1000V	5.5	

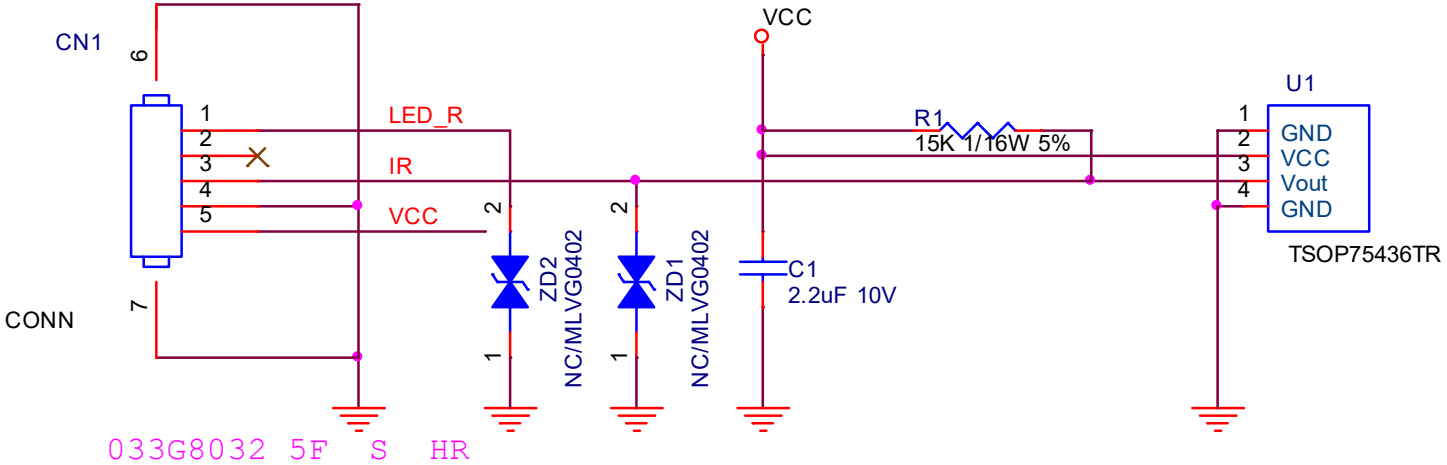
Layout trace 電流與 trace 寬度，1A=最少 1mm 以上寬度 銅厚:1(0z)			
序號	電流值 (Idc or Irms)	最少銅寬(mm)	線路圖顏色
1		線路圖上標示	

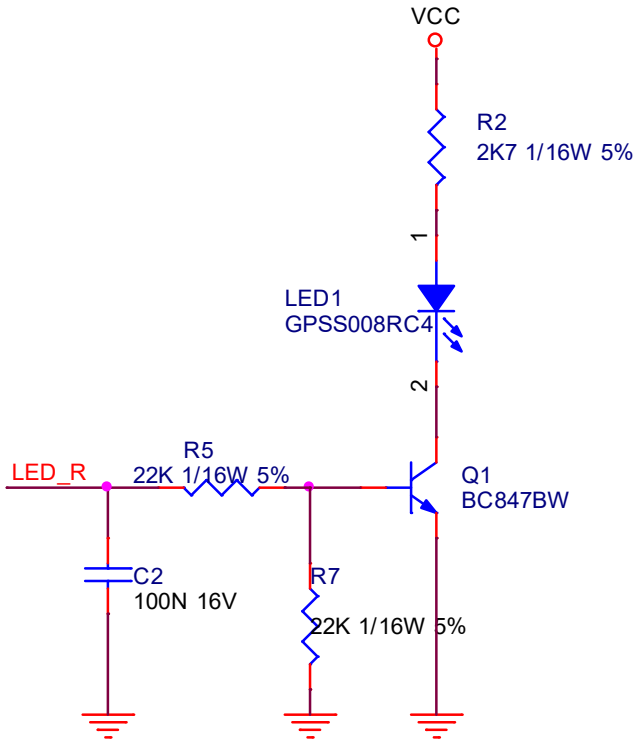




9.4 J 715G8576 IR/LED Panel

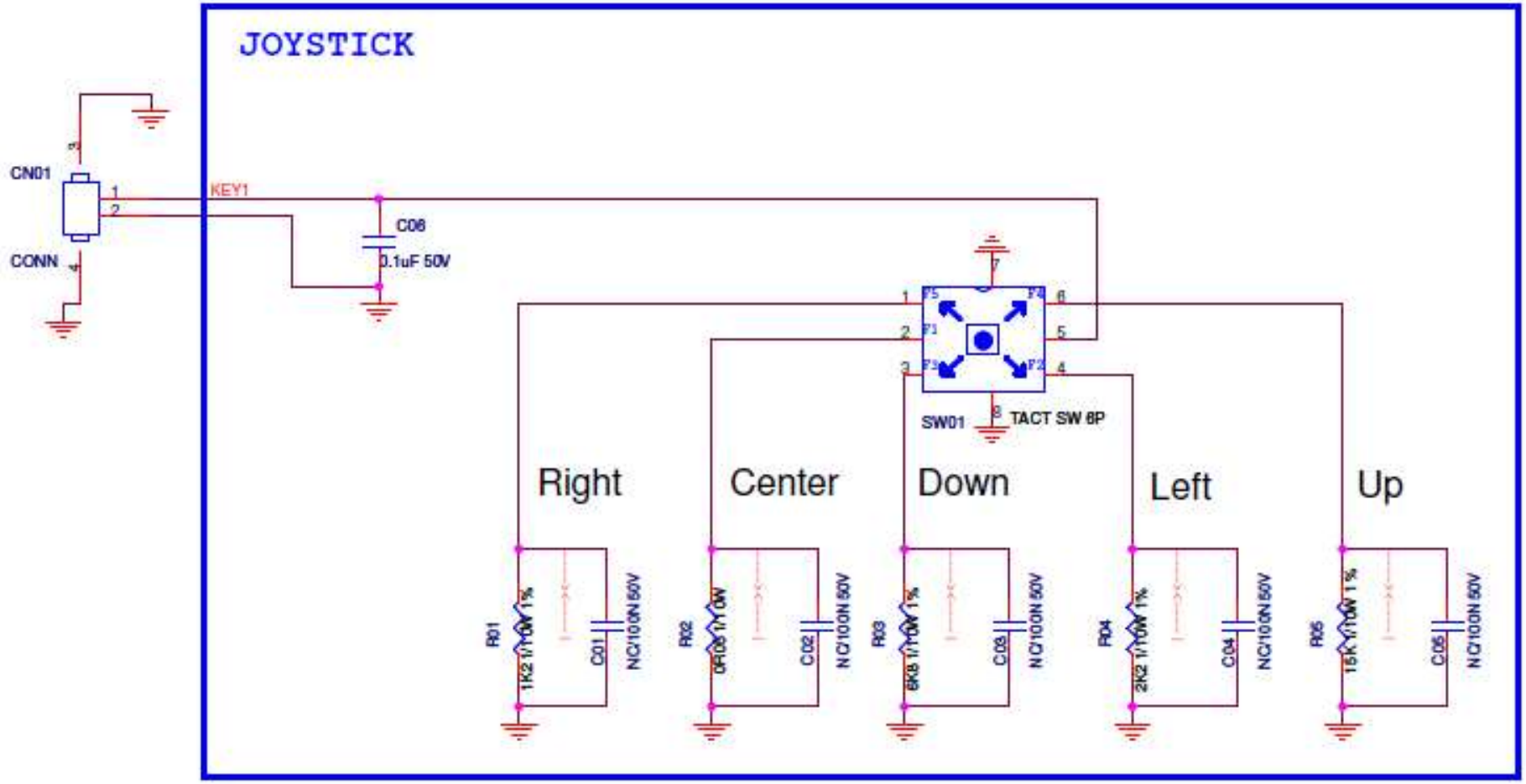
9-4-1 IR LED





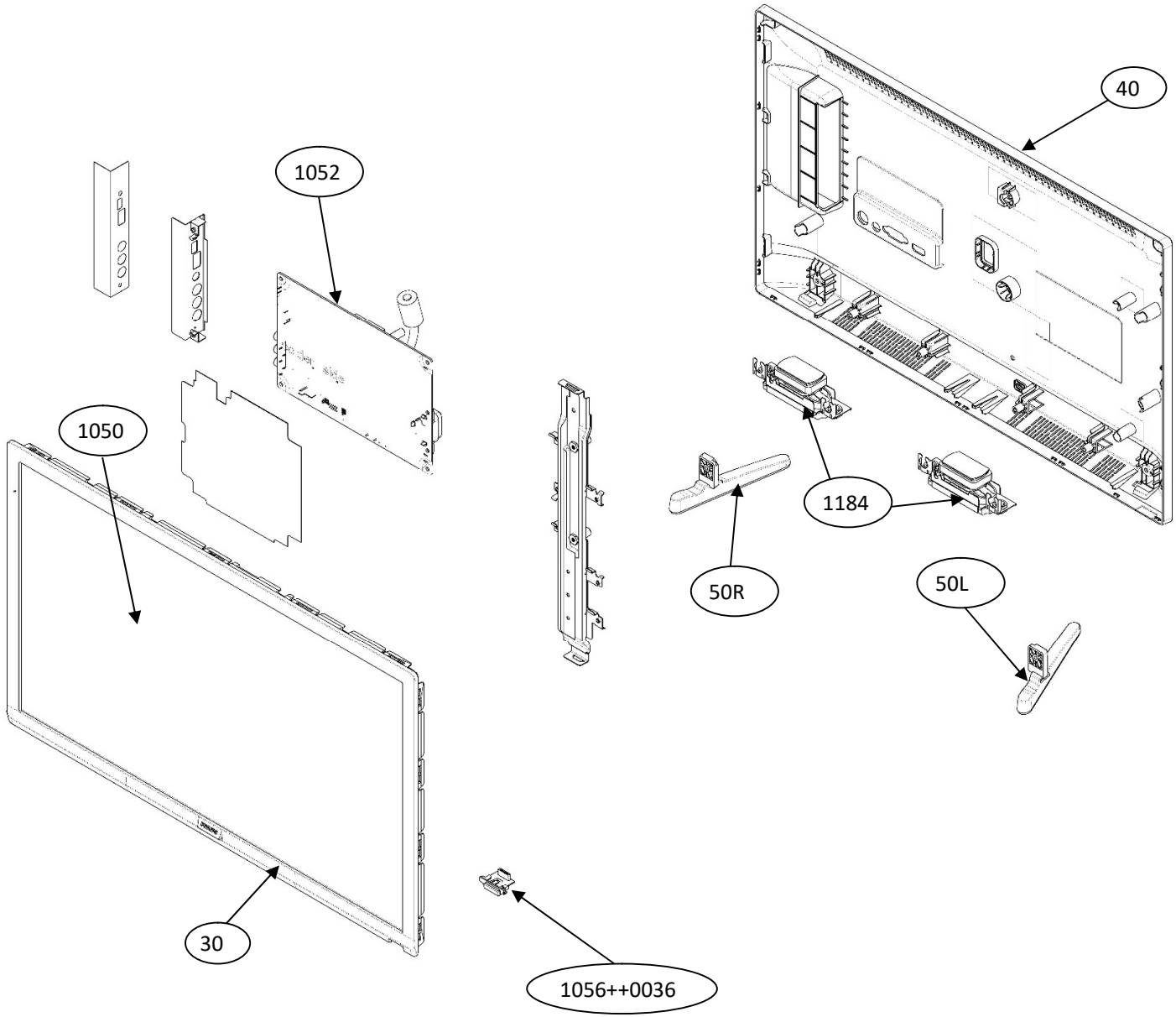
9.5 E 715G7088 Keyboard control panel (For 24” 4233 Series)

9-5-1 Key BOARD



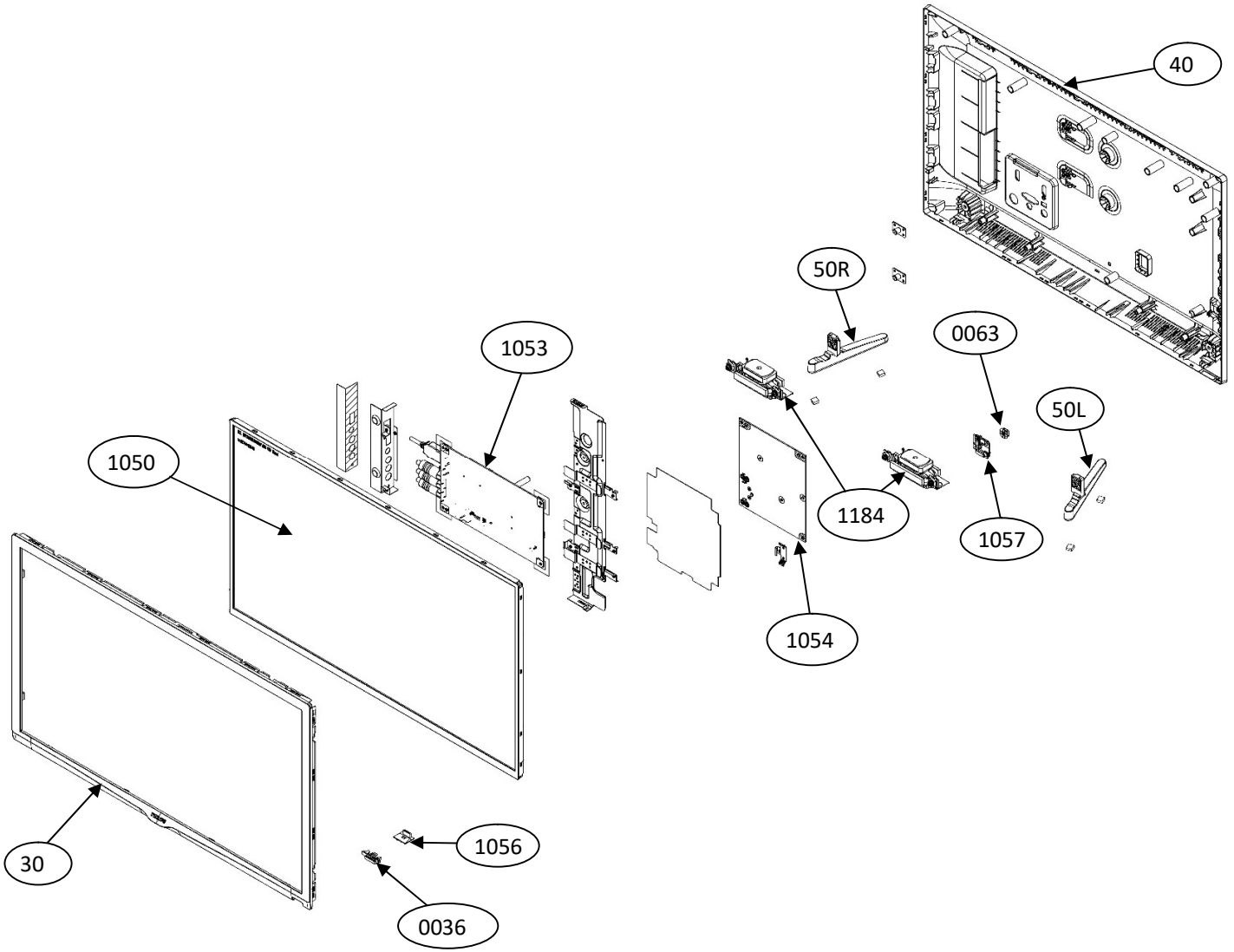
10. Styling Sheets

10.1 5403 series 22"



Pos NO.	Description	Remark
0030	BEZEL(Integrated with panel)	
0036	LENS_IR	
0040	REAR_COVER	
1050	LCD PANEL	
1052	MAIN BOARD+POWER BOARD	
1056	IR BOARD	
1176	REMOTE CONTROL	Not displayed
1184	SPEAKERS	
50L	BASE_LEFT	
50R	BASE_RIGHT	

10.2 4233 series 24”



Pos NO.	Description	Remark
0030	BEZEL(Separate)	
0036	LENS_IR	
0040	REAR_COVER	
0063	KEY_FUNCTION	
1050	LCD PANEL	
1053	PANEL SSB	
1054	ADAPTER BOARD	
1056	IR BOARD	
1057	KEY BOARD	
1176	REMOTE CONTROL	Not displayed
1184	SPEAKERS	
50L	BASE_LEFT	
50R	BASE_RIGHT	