

Service
Service
Service

L11M1.1L
LA



Service Manual

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1. Revision List

- Manual xxxx xxx xxxx.0
- First release.

2. Technical Specifications and Connections

Index of this chapter:

- [2.1 Technical Specifications](#)
- [2.2 Directions for Use](#)
- [2.3 Connections](#)

Notes:

- Figures can deviate due to the different set executions.
- Specifications are indicative (subject to change).

2.1 Technical Specifications

For on-line product support please use the links in [Table 2-1](#). Here is product information available, as well as getting started, user manuals, frequently asked questions and software & drivers.

2.3 Connections

Table 2-1 Described Model numbers

CTN	Styling	Published in:
32PFL3606D/78	Thriller	3122 785 19130
40PFL3606D/78		

2.2 Directions for Use

You can download this information from the following websites:
<http://www.philips.com/support>
<http://www.p4c.philips.com>

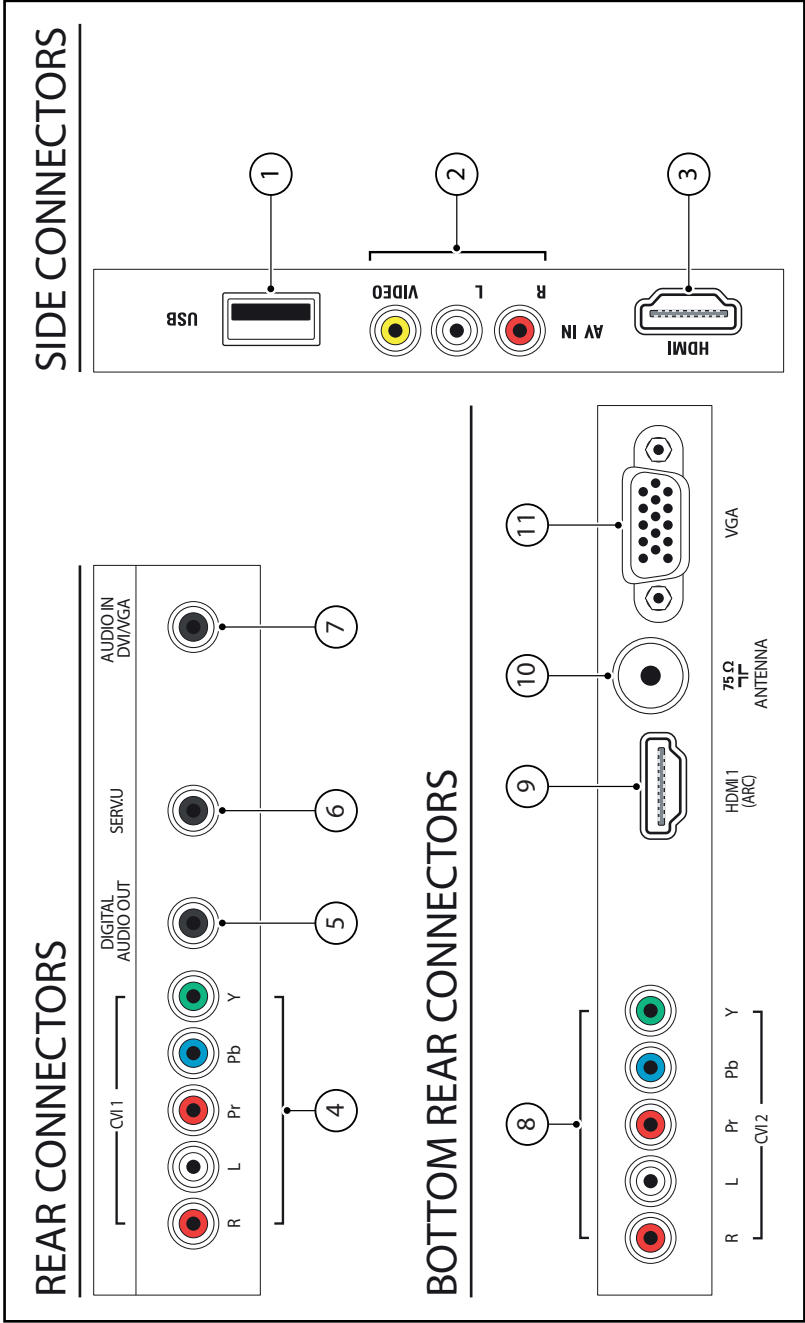


Figure 2-1 Connection overview

Note: The following connector colour abbreviations are used (according to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, Ye= Yellow.

2.3.1 Side Connections

1 - USB2.0



Figure 2-2 USB (type A)

- 1 - +5V
- 2 - Data (-)
- 3 - Data (+)
- 4 - Ground



Gnd

2 - AV IN: Cinch: Video CVBS - In, Audio - In

- Ye - Video CVBS 1 V_{PP} / 75 ohm
- Wh - Audio L 0.5 V_{RMS} / 10 kohm
- Rd - Audio R 0.5 V_{RMS} / 10 kohm



3 - HDMI: Digital Video, Digital Audio - In

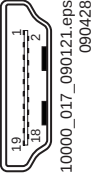
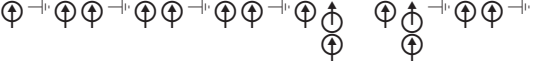


Figure 2-3 HDMI (type A) connector

- 1 - D2+
- 2 - Shield
- 3 - D2-
- 4 - D1+
- 5 - Shield
- 6 - D1-
- 7 - D0+
- 8 - Shield
- 9 - D0-
- 10 - CLK+
- 11 - Shield
- 12 - CLK-
- 13 - Easylink
- 14 - n.c.
- 15 - DDC_SCL
- 16 - DDC_SDA
- 17 - Ground
- 18 - +5V
- 19 - HPD
- 20 - Ground



2.3.2 Rear Connections

4 - CVI-1: Cinch: Video YPbPr - In, Audio - In

- Wh - Audio - L 0.5 V_{RMS} / 10 kΩ
- Rd - Audio - R 0.5 V_{RMS} / 10 kΩ
- Rd - Video Pr 0.7 V_{PP} / 75 Ω
- Bu - Video Pb 0.7 V_{PP} / 75 Ω
- Gn - Video Y 1 V_{PP} / 75 Ω



5 - Cinch: Digital Audio - Out

- Bk - Coaxial 0.4 - 0.6V_{PP} / 75 ohm



6 - Service Connector (UART)

- 1 - Ground
- 2 - UART_TX Transmit
- 3 - UART_RX Receive



7 - Mini Jack: Audio - In DVI/VGA

- Bk - Audio 0.5 V_{RMS} / 10 kΩ



2.3.3 Bottom Connections

8 - CVI-2: Cinch: Video YPbPr - In, Audio - In

- Wh - Audio - L 0.5 V_{RMS} / 10 kΩ
- Rd - Audio - R 0.5 V_{RMS} / 10 kΩ
- Rd - Video Pr 0.7 V_{PP} / 75 Ω
- Bu - Video Pb 0.7 V_{PP} / 75 Ω
- Gn - Video Y 1 V_{PP} / 75 Ω



9 - HDMI1: Digital Video, Digital Audio - In

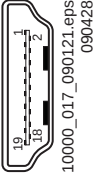
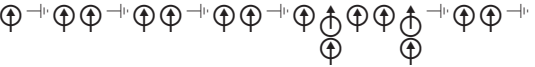


Figure 2-4 HDMI (type A) connector

- 1 - D2+
- 2 - Shield
- 3 - D2-
- 4 - D1+
- 5 - Shield
- 6 - D1-
- 7 - D0+
- 8 - Shield
- 9 - D0-
- 10 - CLK+
- 11 - Shield
- 12 - CLK-
- 13 - Easylink
- 14 - ARC
- 15 - DDC_SCL
- 16 - DDC_SDA
- 17 - Ground
- 18 - +5V
- 19 - HPD
- 20 - Ground



10 - Aerial - In

- - F-type Coax, 75 Ω



11 - VGA: Video RGB - In

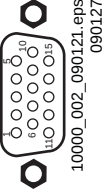
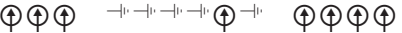


Figure 2-5 VGA Connector

- 1 - Video Red 0.7 V_{PP} / 75 Ω
- 2 - Video Green 0.7 V_{PP} / 75 Ω
- 3 - Video Blue 0.7 V_{PP} / 75 Ω
- 4 - n.c.
- 5 - Ground
- 6 - Ground Red
- 7 - Ground Green
- 8 - Ground Blue
- 9 - +5V_{DC}
- 10 - Ground Sync
- 11 - n.c.
- 12 - DDC_SDA
- 13 - H-sync 0 - 5 V
- 14 - V-sync 0 - 5 V
- 15 - DDC_SCL



3. Precautions, Notes, and Abbreviation List

Index of this chapter:

[3.1 Safety Instructions](#)

[3.2 Warnings](#)

[3.3 Notes](#)

[3.4 Abbreviation List](#)

3.1 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.

3.2 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.

3.3 Notes

3.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground ($\perp$), or hot ground ($\rightarrow$), 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 $\neg$ and without $\neg$ aerial signal. Measure the voltages in the power supply section both in normal operation ($\textcircled{0}$) and in stand-by ($\textcircled{b}$). These values are indicated by means of the appropriate symbols.

3.3.2 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 ($\mu = \times 10^{-6}$), nano-farads ($n = \times 10^{-9}$), or pico-farads ($p = \times 10^{-12}$).
- 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.

3.3.3 Spare Parts

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

3.3.4 BGA (Ball Grid Array) ICs

Introduction

For more information on how to handle BGA devices, visit this URL: <http://www.atvourservice-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.

3.3.5 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.

3.3.6 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)

3.3.7 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!

3.3.8 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.

3.4 Abbreviation List

O/6/12	SCART switch control signal on AM board. 0 = loop through (AUX to TV), 6 = play 16 : 9 format, 12 = play 4 : 3 format
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 controls 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		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.
DFI	Dynamic Frame Insertion		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.
DFU	Directions For Use: owner's manual		Institutional TeleVision; TV sets for hotels, hospitals etc.
DMR	Digital Media Reader: card reader	iTV	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
DMSD	Digital Multi Standard Decoding	LS	Latin America
DNM	Digital Natural Motion		Liquid Crystal Display
DNR	Digital Noise Reduction: noise reduction feature of the set		Light Emitting Diode
DRAM	Dynamic RAM		Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
DRM	Digital Rights Management		L' is all bands except for Band I
DSP	Digital Signal Processing		L' is all bands except for Band I
DST	Dealer Service Tool: special remote control designed for service technicians		L' is all bands except for Band I
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		L' is all bands except for Band I
DVB-C	Digital Video Broadcast - Cable	LATAM	L' is all bands except for Band I
DVB-T	Digital Video Broadcast - Terrestrial	LCD	L' is all bands except for Band I
DVD	Digital Versatile Disc	LED	L' is all bands except for Band I
DVI(-d)	Digital Visual Interface (d= digital only)	L/L'	L' is all bands except for Band I
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.	LPL	L' is all bands except for Band I
EDID	Extended Display Identification Data (VESA standard)	LS	L' is all bands except for Band I
EEPROM	Electrically Erasable and Programmable Read Only Memory	LVDS	L' is all bands except for Band I
EMI	Electro Magnetic Interference	Mbps	L' is all bands except for Band I
EPG	Electronic Program Guide	M/N	L' is all bands except for Band I
EPLD	Erasable Programmable Logic Device	MHEG	L' is all bands except for Band I
EU	Europe		L' is all bands except for Band I
EXT	EXternal (source), entering the set by SCART or by cinches (jacks)		L' is all bands except for Band I
FDS	Full Dual Screen (same as FDW)		L' is all bands except for Band I
FDW	Full Dual Window (same as FDS)		L' is all bands except for Band I
FLASH	FLASH memory		L' is all bands except for Band I
FM	Field Memory or Frequency Modulation		L' is all bands except for Band I
FPGA	Field-Programmable Gate Array		L' is all bands except for Band I
FTV	Flat TeleVision		L' is all bands except for Band I
Gb/s	Giga bits per second		L' is all bands except for Band I
G-TXT	Green Teletext		L' is all bands except for Band I
H	H_sync to the module		L' is all bands except for Band I
HD	High Definition		L' is all bands except for Band I
HDD	Hard Disk Drive		L' is all bands except for Band I
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.		L' is all bands except for Band I
HDMI	High Definition Multimedia Interface		L' is all bands except for Band I
HP	HeadPhone		L' is all bands except for Band I
I	Monochrome TV system. Sound carrier distance is 6.0 MHz		L' is all bands except for Band I
I ² C	Inter IC bus		L' is all bands except for Band I
I ² D	Inter IC Data bus		L' is all bands except for Band I
I ² S	Inter IC Sound bus		L' is all bands except for Band I
IF	Intermediate Frequency		L' is all bands except for Band I
IR	Infra Red		L' is all bands except for Band I
IRQ	Interrupt Request		L' is all bands except for Band I
ITU-656	The ITU Radio communication Sector (ITU-R) is a standards body		L' is all bands except for Band I

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) Printed Circuit Board (same as "PCB") Pulse Code Modulation Plasma Display Panel Power Factor Corrector (or Pre-conditioner) Picture In Picture Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency Point Of Deployment: a removable CAM module, implementing the CA system for a host (e.g. a TV-set) Power On Reset, signal to reset the uP Power Supply for Direct view LED backlight with 2D-dimming Power Supply with integrated LED drivers Power Supply with integrated LED drivers with added Scanning functionality Positive Temperature Coefficient, non-linear resistor Printed Wiring Board (same as "PCB") Pulse Width Modulation Quasi Resonant Converter Quality Temporal Noise Reduction Quality Video Composition Processor Random Access Memory Red, Green, and Blue. The primary color signals for TV. By mixing levels of R, G, and B, all colors (Y/C) are reproduced. Remote Control Signal protocol from the remote control receiver RESET signal Read Only Memory Reduced Swing Differential Signalling data interface Red Teletext Service Alignment Mode Short Circuit Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs Serial Clock I ² C Clock Signal on Fast I ² C bus Standard Definition Serial Data I ² C Data Signal on Fast I ² C bus Serial Digital Interface, see "ITU-656" Synchronous DRAM SEquence Couleur Avec Mémoire. Colour system mainly used in France and East Europe. Colour carriers = 4.406250 MHz and 4.250000 MHz Sound Intermediate Frequency Switched Mode Power Supply System on Chip Sync On Green Self Oscillating Power Supply Serial Peripheral Interface bus; a 4-wire synchronous serial data link standard Sony Philips Digital InterFace Static RAM Service Reference Protocol Small Signal Board	SSC STB STBY SVGA SVHS SW SWAN SXGA TFT THD TMDS TS TXT TXT-DW UI uP UXGA V VESA VGA VL VSB WYSIWYR WXGA XTAL XGA Y Y/C YPbPr YUV	Spread Spectrum Clocking, used to reduce the effects of EMI Set Top Box STand-BY 800 × 600 (4:3) Super Video Home System Software Spatial temporal Weighted Averaging Noise reduction 1280 × 1024 Thin Film Transistor Total Harmonic Distortion Transmission Minimized Differential Signalling Transport Stream Teletext Dual Window with Teletext User Interface Microprocessor 1600 × 1200 (4:3) V-sync to the module Video Electronics Standards Association 640 × 480 (4:3) Variable Level out: processed audio output toward external amplifier Vestigial Side Band; modulation method What You See Is What You Record: record selection that follows main picture and sound 1280 × 768 (15:9) Quartz crystal 1024 × 768 (4:3) Luminance signal Luminance (Y) and Chrominance (C) signal Component video. Luminance and scaled color difference signals (B-Y and R-Y) Component video
PCB			
PCM			
PDP			
PFC			
PIP			
PLL			
POD			
POR			
PSDL			
PSL			
PSLS			
PTC			
PWB			
PWM			
QRC			
QTNR			
QVCP			
RAM			
RGB			
RC			
RC5 / RC6			
RESET			
ROM			
RSDS			
R-TXT			
SAM			
S/C			
SCART			
SCL			
SCL-F			
SD			
SDA			
SDA-F			
SDI			
SDRAM			
SECAM			
SIF			
SMPS			
SoC			
SOG			
SOPS			
SPI			
S/PDIF			
SRAM			
SRP			
SSB			

4. Mechanical Instructions

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- [4.1 Cable Dressing](#)
- [4.2 Service Positions](#)
- [4.3 Assy/Panel Removal](#)
- [4.4 Set Re-assembly](#)

Notes:

- Figures below can deviate slightly from the actual situation, due to the different set executions.

4.1 Cable Dressing



19130_002_110421.ens
110421

Figure 4-1 Cable dressing 32"

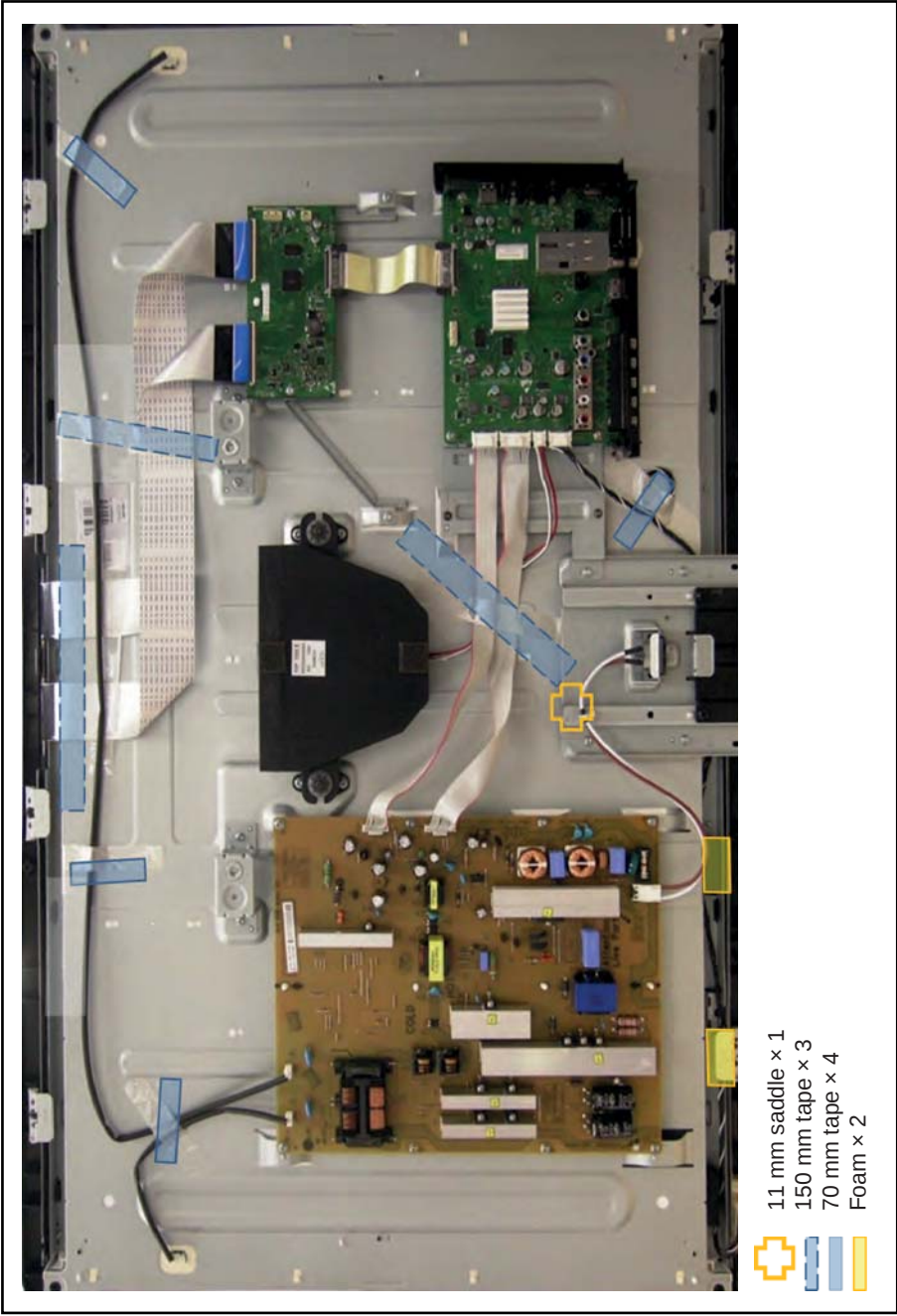


Figure 4-2 Cable dressing 40"

4.2 Service Positions

For easy servicing of a TV set, the set should be put face down on a soft flat surface, foam buffers or other specific workshop tools. Ensure that a stable situation is created to perform

measurements and alignments. When using foam bars take care that these always support the cabinet and **never** only the display. **Caution:** Failure to follow these guidelines can seriously damage the display!
Ensure that ESD safe measures are taken.

4.3 Assy/Panel Removal

Instructions below apply to the 40PFL3606D/78, but will be similar for other models.

4.3.1 Rear Cover



19130_004_110426.eps
110426

Figure 4-3 Rear cover removal (40")

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

See [Figure 4-3](#).

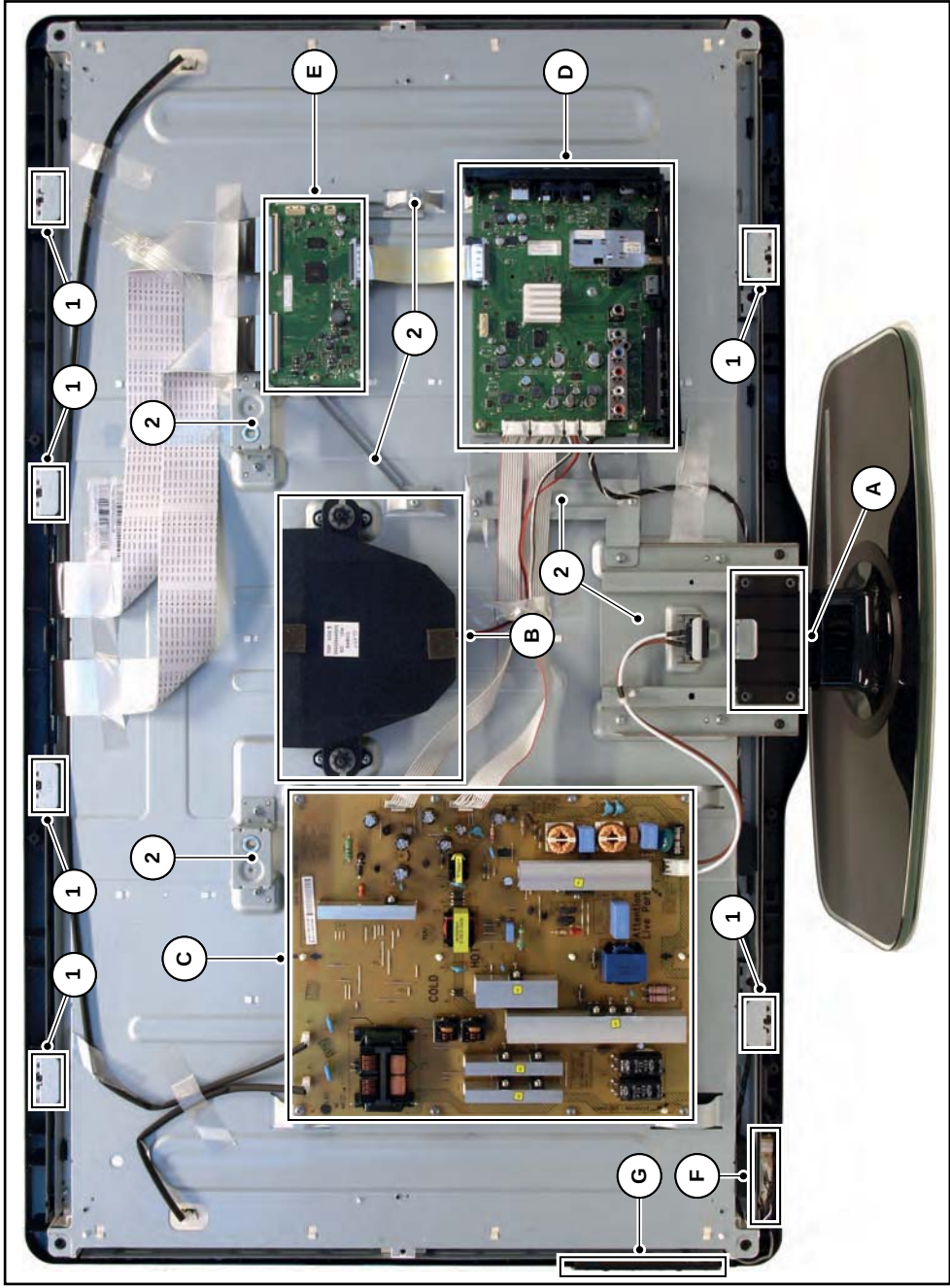
1. Remove fixation screws [2] and [3] that secure the rear cover. It is not necessary to remove the stand first [1].
2. Lift the rear cover from the TV. Make sure that wires and flat foils are not damaged while lifting the rear cover from the set.

4.3.2 LCD Panel

Refer to [Figure 4-4](#) for details.

1. Remove the Stand [A].
2. Remove the Speakers/Subwoofer [B].
3. Remove the PSU [C], SSB [D] and TCON (E).

4. Remove the IR/LED board [F].
5. Remove the Local Control board [G].
6. Remove the clamps [1].
7. Remove all metal subframes [2] that do not belong to the LCD display.



19130_006_110426.eps
110426

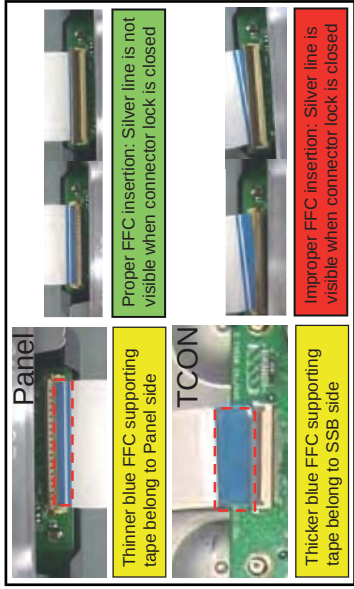
Figure 4-4 LCD Panel removal (based on 40" model)

4.4 Set Re-assembly

To re-assemble the whole set, execute all processes in reverse order.

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original position. See [Figure 4-5](#)
- Pay special attention not to damage the EMC foams in the set. Ensure that EMC foams are mounted correctly.



19130_007_110426.eps
110426

Figure 4-5 Flat Foil Cable (FFC) precautions

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

- [5.1 Test Points](#)
- [5.2 Service Modes](#)
- [5.3 Service Tools](#)
- [5.4 Error Codes](#)
- [5.5 The Blinking LED Procedure](#)
- [5.6 Fault Finding and Repair Tips](#)
- [5.7 Software Upgrading](#)

5.1 Test Points

In the chassis schematics and layout overviews, the test points are mentioned. In the schematics and layouts, test points are indicated with "Fxxx" or "Ixxx".

As most signals are digital, it will be difficult to measure waveforms with a standard oscilloscope. Several key ICs are capable of generating test patterns, which can be controlled via ComPair. In this way it is possible to determine which part is defective.

Perform measurements under the following conditions:

- Service Default Mode.
- Video: Colour bar signal.
- Audio: 3 kHz left, 1 kHz right.

5.2 Service Modes

The Service Mode feature is split into four parts:

- Service Default Mode (SDM).
- Service Alignment Mode (SAM).
- Customer Service Mode (CSM).
- Computer Aided Repair Mode (ComPair).

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

- A pre-defined situation to ensure measurements can be made under uniform conditions (SDM).
- Activates the blinking LED procedure for error identification when no picture is available (SDM).
- The possibility to overrule software protections when SDM is entered via the Service pins.
- Make alignments (e.g. White Tone), (de)select options, enter options codes, reset the error buffer (SAM).
- Display information ("SDM" or "SAM" indication in upper right corner of screen, error buffer, software version, operating hours, options and option codes, sub menus).

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. In CSM mode, "CSM", is displayed in the top right corner of the screen. 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.

ComPair Mode is used for communication between a computer and a TV on I2C /UART level and can be used by a Service engineer to quickly diagnose the TV set by reading out error codes, read and write in NVMs, communicate with ICs and the uP (PWM, registers, etc.), and by making use of a fault finding database. It will also be possible to up and download the software of the TV set via I2C with help of ComPair. To do this, ComPair has to be connected to the TV set via the ComPair connector, which will be accessible through the rear of the set (without removing the rear cover).

5.2.1 General

Next items are applicable to all Service Modes or are general.

Life Timer

During the life time cycle of the TV set, a timer is kept (called "Op. Hour"). It counts the normal operation hours (not the Stand-by hours). The actual value of the timer is displayed in SDM and SAM in a decimal value. Every two soft-resets increase the hour by +1. Stand-by hours are not counted.

Software Identification, Version, and Cluster

The software ID, version, and cluster will be shown in the main menu display of SDM, SAM, and CSM.

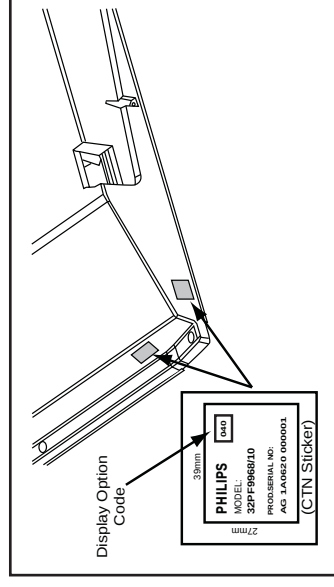
The screen will show: "AAAAAB-XX.YY", where:

- AAAAA is the chassis name: L11M11.
- B is the region indication: E= Europe, A= AP/China, U= NAFTA, L= LATAM.
- XX is the main version number: this is updated with a major change of specification (incompatible with the previous software version). Numbering will go from 01 - 99 and AA - ZZ.
 - if the main version number changes, the new version number is written in the NVM.
 - if the main version number changes, the default settings are loaded.
- YY is the sub version number: this is updated with a minor change (backwards compatible with the previous versions) Numbering will go from 00 - 99.
 - if the sub version number changes, the new version number is written in the NVM.
 - if the NVM is fresh, the software identification, version, and cluster will be written to NVM.

Display Option Code Selection

When after an SSB or display exchange, the display option code is not set properly, it will result in a TV with "no display". Therefore, **it is required** to set this display option code after such a repair.

To do so, press the following key sequence on a standard RC transmitter: "**062598**" directly followed by **MENU/HOME** and "**xxx**", where "xxx" is a 3 digit decimal value of the panel type, see sticker on the side/bottom of the cabinet. When the value is accepted and stored in NVM, the set will switch to Stand-by, to indicate that the process has been completed.



10000_038_090121.eps
090819

Figure 5-1 Location of Display Option Code sticker

During this algorithm, the NVM-content must be filtered, because several items in the NVM are TV-related and not SSB-related (e.g. Model and Prod. S/N). Therefore, "Model" and "Prod. S/N" data is changed into "See Type Plate". In case a call centre or consumer reads "See Type Plate" in CSM mode, he needs to look to the side/bottom sticker to identify the set, for further actions.

5.2.2 Service Default Mode (SDM)

Purpose

Set the TV in SDM mode in order to be able to create a pre-defined setting for measurements to be made. In this platform, a simplified SDM is introduced (without protection override and without tuning to a predefined frequency).

Specifications

- Set linear video and audio settings to 50%, but volume to 25%. Stored user settings are not affected.
- Set Smart Picture to "Game".
- Set Smart Sound to "Standard".
- Tune channel to:
 - for analogue SDM: channel 3 (61.25 MHz)
 - for digital SDM: channel 26 (545.143 MHz).
- For digital SDM: set PID default from the stream.
- All service-unfriendly modes (if present) are disabled, since they interfere with diagnosing/repairing a set. These service unfriendly modes are:
 - (Sleep) timer.
 - Blue mute/Wall paper.
 - Auto switch "off" (when there is no "ident" signal).
 - Hotel or hospital mode.
 - Child lock or parental lock (manual or via V-chip).
 - Skipping, blanking of "Not favourite", "Skipped" or "Locked" presets/channels.
 - Automatic storing of Personal Preset or Last Status settings.
 - Automatic user menu time-out (menu switches back/OFF automatically.
 - Auto Volume levelling (AVL).

How to Activate

To activate **analogue** SDM, use **one** of the following methods:

- Press the following key sequence on the RC transmitter: **"062596"** directly followed by the **MENU** button.
- Short one of the "Service" pads on the TV board during cold start (see [Figure 5-2](#)). Then press the mains button (remove the short after start-up).

Caution: When doing this, the service-technician must know exactly what he is doing, as it could damage the television set.

To activate **digital** SDM:

- Press the following sequence on the RC transmitter: **"062593"** directly followed by the **MENU** button.

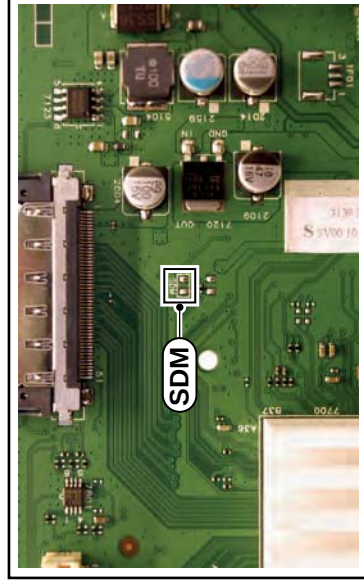


Figure 5-2 Service pads (SSB component side)

On Screen Menu

After activating SDM, the following items are displayed, with "SDM" in the upper right corner of the screen to indicate that the television is in Service Default Mode.

- Menu items and explanation:
- xxxxx: Operating hours (in decimal).
- AAAAAAB-XX.YY**: See paragraph [Software Identification, Version, and Cluster](#) for the SW name definition.

- ERR**: Shows all errors detected since the last time the buffer was erased in format <xxx> <xxx> <xxx> <xxx> <xxx> (five errors possible).
 - OP**: Used to read-out the option bytes. Ten codes (in two rows) are possible.
- How to Navigate**
As this mode is read only, there is not much to navigate. To switch to other modes, use one of the following methods:
- Command MENU from the user remote will enter the normal user menu (brightness, contrast, color, etc...) with "SDM" OSD remaining, and pressing MENU key again will return to the last status of SDM again.
 - To prevent the OSD from interfering with measurements in SDM, command "OSD" or "i+" ("STATUS" or "INFO" for NAFTA and LATAM) from the user remote will toggle the OSD "on/off" with "SDM" OSD remaining always "on".
 - Press the following key sequence on the remote control transmitter: **"062596"** directly followed by the **INFO[+]/OK** button to switch to SAM (do not allow the display to time out between entries while keying the sequence).

How to Exit

Switch the set to Standby by

- pressing the standby button on the remote control transmitter or on the television set, or
 - via a standard RC-transmitter by keying the "00" sequence.
- If you switch the television set "off" by removing the mains (i.e., unplugging the television), the television set will remain in SDM when mains is re-applied, and the error buffer is not cleared. The error buffer will only be cleared when the "clear" command is used in the SAM menu.

Note:

- If the TV is switched "off" by a power interrupt while in SDM, the TV will show up in the last status of SDM menu as soon as the power is supplied again. The error buffer will not be cleared.
- In case the set is accidentally in Factory mode (with an "F" displayed on the screen), pressing and holding "VOL-" button for 5 seconds and then followed by pressing and holding the "CH-" button for another 5 seconds should exit the Factory mode.

5.2.3 Service Alignment Mode (SAM)

Purpose

- To change option settings.
- To display / clear the error code buffer.
- To perform alignments.

Specifications

- Operation hours counter (maximum five digits displayed).
- Software version, error codes, and option settings display.
- Error buffer clearing.
- Option settings.
- Software alignments (White Tone).
- NVM Editor.
- Set screen mode to full screen (all content is visible).
- Set Smart Picture to "Game".

How to Activate

To activate SAM, use one of the following methods:

- Press the following key sequence on the remote control transmitter: **"062596"** directly followed by the **INFO[+]/OK** button. Do not allow the display to time out between entries while keying the sequence.
- Or via ComPair.

After entering SAM, the following items are displayed, with "SAM" in the upper right corner of the screen to indicate that the television is in Service Alignment Mode.

Menu items and explanation:

- System Information.
 - Op Hour:** This represents the life timer. The timer counts normal operation hours, but does not count Stand-by hours.
 - MAIN SW ID:** See paragraph [Software Identification](#), [Version](#), and [Cluster](#) for the SW name definition.
 - ERR:** Shows all errors detected since the last time the buffer was erased. Five errors possible.
 - OP1/OP2:** Used to read-out the option bytes. See paragraph [6.6 Option Settings](#) in the Alignments section for a detailed description. Ten codes are possible.
- Tuner.**
 - AGC Adjustment:** See paragraph [6.3.1](#) for instructions.
 - Store:** To store the data.
- Clear.** Erases the contents of the error buffer. Select this menu item and press the MENU RIGHT key on the remote control. The content of the error buffer is cleared.
- Options.** To set the option bits. See paragraph [6.6 Option Settings](#) in the "Alignments" chapter for a detailed description.
- RGB Align.** To align the White Tone. See [White Tone Alignment](#) for a detailed description.
- NVM Editor.** To change the NVM data in the television set. See also paragraph [5.6 Fault Finding and Repair Tips](#).
- Upload to USB.
- Download from USB.**
- Initialise NVM.** To initialize a (corrupted) NVM. Be careful, this will erase all settings!
- Auto ADC.** Refer to chapter [6. Alignments](#) for detailed information.
- EDID Write Enable.** Enables EDID writing (not applicable to Berline sets).
- Service Data.** Virtual Key board for character input entry.

How to Navigate

- In the SAM menu, select menu items with the UP/DOWN keys on the remote control transmitter. The selected item will be indicated. When not all menu items fit on the screen, use the UP/DOWN keys to display the next / previous menu items.
 - With the LEFT/RIGHT keys, it is possible to:
 - Activate the selected menu item.
 - Change the value of the selected menu item.
 - Activate the selected sub menu.
- When you press the MENU button twice while in top level SAM, the set will switch to the normal user menu (with the SAM mode still active in the background). To return to the SAM menu press the MENU button.
 - The "INFO[+]/OK" key from the user remote will toggle the OSD "on/off" with "SAM" OSD remaining always "on".
- Press the following key sequence on the remote control transmitter: **"062596"** directly followed by the **MENU** button to switch to SDM (do not allow the display to time out between entries while keying the sequence).

How to Store SAM Settings

To store the settings changed in SAM mode (except the OPTIONS and RGB ALIGN settings), leave the top level SAM menu by using the POWER button on the remote control transmitter or the television set. The mentioned exceptions must be stored separately via the STORE button.

How to Exit

Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set, or by keying-in the "00" sequence on a standard RC-transmitter.

Note:

- When the TV is switched "off" by a power interrupt while in SAM, the TV will show up in "normal operation mode" as

soon as the power is supplied again. The error buffer will not be cleared.

- In case the set is in Factory mode by accident (with "F" displayed on screen), pressing and holding "VOL-" button for 5 seconds and then followed by pressing and holding the "CH-" button for another 5 seconds should exit the Factory mode.

5.2.4 Customer Service Mode (CSM)

Purpose

The Customer Service Mode shows error codes and information on the TV's operation settings. A call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set. This helps them to diagnose problems and failures in the TV before making a service call. The CSM is a read-only mode; therefore, modifications are not possible in this mode.

Specifications

- Ignore "Service unfriendly modes".
- Set volume to 25%.
- Set Smart Picture to "Game".
- Set Smart Sound to "Standard".
- Line number for every line (to make CSM language independent).
- Set the screen mode to full screen (all contents on screen is visible).
- After leaving the Customer Service Mode, the original settings are restored.
- Possibility to use "CH+" or "CH-" for channel surfing, or enter the specific channel number on the RC.

How to Activate

To activate CSM, press the following key sequence on a standard remote control transmitter: **"123654"** (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:

Menu Explanation CSM1

- Set Type.** Type number, e.g. 32PFL3605/78. (*)
- Production code.** Product serial no., e.g. BZ1A1008123456 (*). BZ= Production centre, 1= BOM code, A= Service version change code, 10= Production year, 08= Production week, 123456= Serial number.
- Installation date.** Indicates the date of the first initialization of the TV. This date is acquired via time extraction.
- a - Option Code 1.** Option code information (group 1).
- b - Option Code 2.** Option code information (group 2).
- SSB.** Indication of the SSB factory ID (= 12nc). (*)
- Display.** Indication of the display ID (=12 nc). (*)
- PSU.** Indication of the PSU factory ID (= 12nc).

(*) If an NVM IC is replaced or initialized, these items must be re-written to it. CompAir will foresee in a possibility to do this. Also the NVM editor in the SAM menu can be used.

Menu Explanation CSM2

- Current Main SW.** Shows the main software version.
- Standby SW.** Shows the Stand-by software version.
- Panel Code.** Shows the current display code.
- Bootloader ID.** Shows the Bootloader software ID.
- NVM Version.** The NVM software version no.
- Flash ID.** Shows the flash ID.

Menu Explanation CSM3

- Signal Quality.** Shows the signal quality (No Tuned/Poor/Average/Good).
- Child lock.** This is a combined item for locks. If any lock (Preset lock, child lock, lock after, or Parental lock) is active, this item indicates "active".

3. **HDCP Keys.** Indicates if the HDMI keys (or HDCP keys) are valid or not. Not applicable to Berlinale series.
4. not used
5. not used
6. not used
7. not used.

Create a CSM dump on an USB stick

There will be CSM dump to a plugged in USB-stick upon entering CSM-mode. An extended CSM dump will be created when the "OK" button on RC is pressed in CSM while a USB stick is plugged in. A direct CSM flash dump will be created when the buttons "red + 2679" on the remote control are pressed in CSM while a USB stick is plugged in.

How to Exit

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.

5.3 Service Tools

5.3.1 ComPair

Introduction

ComPair (Computer Aided Repair) is a Service tool for Philips Consumer Electronics products. and offers the following:

1. ComPair helps you to quickly get an understanding on how to repair the chassis in a short and effective way.
2. ComPair allows very detailed diagnostics and is therefore capable of accurately indicating problem areas. You do not have to know anything about I2C or UART commands yourself, because ComPair takes care of this.
3. ComPair speeds up the repair time since it can automatically communicate with the chassis (when the up is working) and all repair information is directly available.
4. ComPair features TV software up possibilities.

Specifications

ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The (new) ComPair II interface box is connected **to the PC** via a USB cable. For the TV chassis, the ComPair interface box and the TV communicate via a bi-directional cable via the service connector(s).

How to Connect

This is described in the ComPair chassis fault finding database.

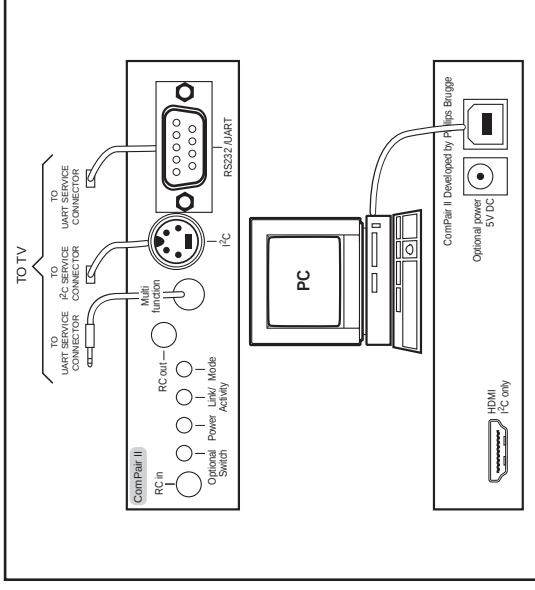


Figure 5-3 ComPair II interface connection

Caution: It is compulsory to connect the TV to the PC as shown in the picture above (with the ComPair interface in between), as the ComPair interface acts as a level shifter. If one connects the TV directly to the PC (via UART), ICs will be blown!

How to Order

ComPair II order codes:

- ComPair II order codes: 3122 785 91020.
- ComPair UART interface cable: 3138 188 75051.
- Program software can be downloaded from the Philips Service web portal.

Note: For this chassis, "Pgammr" and "T-con NVM" programming (VCOM alignment) are added to ComPair.

Additional cables for VCOM Alignment

- ComPair/I²C interface cable: 3122 785 90004.
- ComPair/VGA adapter cable: 9965 100 09269.

5.4 Error Codes

5.4.1 Introduction

Error codes are required to indicate failures in the TV set. In principle a unique error code is available for every:

- Activated (SW) protection.
- Failing I²C device.
- General I²C error.

The last five errors, stored in the NVM, are shown in the Service menu's. This is called the error buffer.

The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, it is displayed at the left side and all other errors shift one position to the right.

An error will be added to the buffer if this error differs from any error in the buffer. The last found error is displayed on the left.

An error with a designated error code **never** leads to a deadlock situation. It must always be diagnosable (e.g. error buffer via OSD or blinking LED or via ComPair).

In case a failure identified by an error code automatically results in other error codes (cause and effect), only the error code of the MAIN failure is displayed.

5.4.2 How to Read the Error Buffer

You can read the error buffer in three ways:

- On screen via the SAM/SDM/CSM (if you have a picture).
Example:
 - ERROR: 0 0 0 0** : No errors detected
 - ERROR: 6 0 0 0** : Error code 6 is the last and only detected error
 - ERROR: 9 6 0 0** : Error code 6 was detected first and error code 9 is the last detected (newest) error
- Via the blinking LED procedure (when you have no picture). See paragraph [5.5 The Blinking LED Procedure](#).
- Via ComPair.

5.4.3 Error codes

The "layer 1" error codes are pointing to the defective board. They are triggered by LED blinking when CSM is activated. In the LC10 platform, only two boards are present: the SSB and the PSU/IPB, meaning only the following layer 1 errors are defined:

- 2: SSB
- 3: IPB/PSU
- 4: Display

Table 5-1 Error code table

Layer-1 error code	Defective board	Layer-2 error code	Defective device
2	SSB	11	Speaker DC protection active on SSB
3	IPB/PSU	16	+12 missing/low, PSU defective
3	IPB/PSU	17	POK line defective
2	SSB	35	EEPROM I2C error on SSB, M24C16
2	SSB	34	Tuner I2C error on SSB
2	SSB	23	HDMI Mux IC I2C error on SSB - Berninale models with Mux only
2	SSB	27	Channel decoder on SSB
4	Display (Inverter)	18	LCD Panel inverter error. INV_STATUS (for 32" sets only)

5.4.3 How to Clear the Error Buffer

The error code buffer is cleared in the following cases:

- By using the CLEAR command in the SAM menu:
- By using the following key sequence on the remote control transmitter: **"062599"** directly followed by the **OK** button.
- If the contents of the error buffer have not changed for 50 hours, the error buffer resets automatically.

Note: If you exit SAM by disconnecting the mains from the television set, the error buffer is not reset.

5.5 The Blinking LED Procedure

5.5.1 Introduction

The software is capable of identifying different kinds of errors. Because it is possible that more than one error can occur over time, an error buffer is available, which is capable of storing the last five errors that occurred. This is useful if the OSD is not working properly.

Errors can also be displayed by the blinking LED procedure. The method is to repeatedly let the front LED pulse with as many pulses as the error code number, followed by a period of 1.5 seconds in which the LED is "off". Then this sequence is repeated.

Example (1): error code 4 will result in four times the sequence LED "on" for 0.25 seconds / LED "off" for 0.25 seconds. After this sequence, the LED will be "off" for 1.5 seconds. Any RC command terminates the sequence. Error code LED blinking is in red color.

Example (2): the content of the error buffer is **"12 9 6 0 0"** After entering SDM, the following occurs:

- 1 long blink of 5 seconds to start the sequence,
- 12 short blinks followed by a pause of 1.5 seconds,
- 9 short blinks followed by a pause of 1.5 seconds,
- 6 short blinks followed by a pause of 1.5 seconds,
- 1 long blink of 1.5 seconds to finish the sequence,
- The sequence starts again with 12 short blinks.

5.5.2 Displaying the Entire Error Buffer

Additionally, the entire error buffer is displayed when Service Mode "SDM" is entered.

5.6 Fault Finding and Repair Tips

Notes:

- It is assumed that the components are mounted correctly with correct values and no bad solder joints.
- Before** any fault finding actions, check if the correct options are set.

5.6.1 NVM Editor

In some cases, it can be convenient if one directly can change the NVM contents. This can be done with the "NVM Editor" in SAM mode. With this option, single bytes can be changed.

Caution:

- Do not change these, without understanding the function of each setting, because incorrect NVM settings may seriously hamper the correct functioning of the TV set!**
- Always write down the existing NVM settings, before changing the settings. This will enable you to return to the original settings, if the new settings turn out to be incorrect.

5.6.2 Load Default NVM Values

It is possible to download default values automatically into the NVM in case a blank NVM is placed or when the NVM first 20 address contents are "FF". After the default values are downloaded, it is possible to start-up and to start aligning the TV set. To initiate a forced default download the following action has to be performed:

- Switch "off" the TV set with the mains cord disconnected from the wall outlet (it does not matter if this is from "Stand-by" or "Off" situation).
- Short-circuit the SDM pads on the SSB (keep short circuited, see [Figure 5-2](#)).
- Press "P+" or "CH+" on the local keyboard (and keep it pressed).
- Reconnect the mains supply to the wall outlet.
- Release the "P+" or "CH+" when the set is started up and has entered SDM.

When the downloading has completed successfully, the set will perform a restart. After this, put the set to Stand-by and remove the short-circuit on the SDM pads.

Alternative method:

It is also possible to upload the default values to the NVM with ComPair in case the SW is changed, the NVM is replaced with a new (empty) one, or when the NVM content is corrupted. After replacing an EEPROM (or with a defective/no EEPROM), default settings should be used to enable the set to start-up and allow the Service Default Mode and Service Alignment Mode to be accessed.

5.6.3 No Picture

When you have no picture, first make sure you have entered the correct display code.
See [Display Option Code Selection](#) for the instructions.

5.6.4 Unstable Picture via HDMI input

Check (via ComPair) if HDMI EDID data is properly programmed.

5.6.5 No Picture via HDMI input

Check if HDCP key is valid. This can be done in CSM.

5.6.6 HDMI CEC Not Functioning

Go to Home/Menu -> Setup -> Installation -> Preference and set the Easylink option to "on". Also check if the connected device is CEC enabled.

5.6.7 TV Will Not Start-up from Stand-by.

Possible Stand-by Controller failure. Reflash the SW.

5.7 Software Upgrading

5.7.1 Introduction

It is possible **for the user** to upgrade the **main** software via the USB port. This allows replacement of a software image in a stand alone set. A description on how to upgrade the main software can be found in the DFU or on the Philips website.

5.7.2 Main Software Upgrade

Automatic Software Upgrade

In "normal" conditions, so when there is no major problem with the TV, the main software and the default software upgrade application can be upgraded with the "autorun.upg" (FUS part in the one-zip file). This can also be done by the consumers themselves, but they will have to get their software from the commercial Philips website or via the Software Update Assistant in the user menu (see DFU). The "autorun.upg" file must be placed in the root of your USB stick.

How to upgrade:

1. Copy the "autorun.upg" file to the root of an USB stick.
2. Insert the USB stick in the side I/O while the set is "on".
The TV will prompt an upgrade message. Press "Update" to continue, after which the upgrading process will start. As soon as the programming is finished, the set must be restarted.

In the "Setup" menu you can check if the latest software is running.

5.7.3 How to Copy NVM Data to/from USB

Write NVM Data to USB

1. Insert the USB stick into the USB slot while in SAM mode.
2. Execute the command "NVM Copy" > "NVM Copy to USB", to copy the NVM data to the USB stick. The NVM filename on the USB stick will be named
"L11M11L_NVM_T2U.BIN" (this takes a couple of seconds).

Write NVM Data to TV

1. First, ensure (via a PC) that the filename on the USB stick has the correct format: "L11M11L_NVM_U2T.BIN".
2. Insert the USB stick into the USB slot while in SAM mode.

3. Execute the command "NVM Copy" > "NVM Copy from USB" to copy the USB data to NVM (this takes about a minute to complete).

To write an NVM mask to the TV, ensure that the mask has the correct format: "L11M11L_NVM_U2T.MAK" (0x00 to write protect, 0xFF to overwrite).

Important: The file must be located in the **"/Repair" directory** of the USB stick.

5.7.4 How to Copy EDID Data to/from USB

Write EDID Data to USB

1. Insert the USB stick into the USB slot while in SAM mode.
2. Execute the command "NVM Copy" > "EDID Copy to USB", to copy the EDID data to the USB stick. The filename on the USB stick will be named
"L11M11L_EDID_T2U.BIN" (this takes a couple of seconds).

Write EDID Data to TV

1. First, ensure (via a PC) that the filename on the USB stick has the correct format: "L11M11L_EDID_U2T.BIN".
2. Insert the USB stick into the USB slot while in SAM mode.
3. Execute the command "NVM Copy" > "EDID Copy from USB" to copy the USB data to EDID (this takes about a minute to complete).

Important: The file must be located in the **"/Repair" directory** of the USB stick.

5.7.5 How to Copy the Channel List to/from USB

Write Channel List Data to USB

1. Insert the USB stick into the USB slot while in SAM mode.
2. Execute the command "Channel list Copy to USB", to copy the channel list data to the USB stick. The filename on the USB stick will be named **"L11M11L_CHTB_T2U.BIN"** (this takes a couple of seconds).

Write Channel List Data to TV

1. First, ensure (via a PC) that the filename on the USB stick has the correct format: "L11M11L_CHTB_U2T.BIN".
2. Insert the USB stick into the USB slot while in SAM mode.
3. Execute the command "Channel list Copy from USB" to copy the USB data to the TV (this takes about a minute to complete).

Important: The file must be located in the **"/Repair" directory** of the USB stick.

6. Alignments

Index of this chapter:

- [6.1 General Alignment Conditions](#)
- [6.2 Hardware Alignments](#)
- [6.3 Software Alignments](#)
- [6.4 ADC gain adjustment](#)
- [6.6 Option Settings](#)

Note: Figures below can deviate slightly from the actual situation, due to the different set executions.

General: The Service Default Mode (SDM) and Service Alignment Mode (SAM) are described in chapter 5. Menu navigation is done with the CURSOR UP, DOWN, LEFT or RIGHT keys of the remote control transmitter.

6.1 General Alignment Conditions

- Perform all electrical adjustments under the following conditions:
- Power supply voltage (depends on region):
 - AP-NTSC: 120 V_{AC} or 230 V_{AC} / 50 Hz (± 10%).
 - AP-PAL-multi: 120 - 230 V_{AC} / 50 Hz (± 10%).
 - EU: 230 V_{AC} / 50 Hz (± 10%).
 - LATAM-NTSC: 120 - 230 V_{AC} / 50 Hz (± 10%).
 - US: 120 V_{AC} / 60 Hz (± 10%).
 - Connect the set to the mains via an isolation transformer with low internal resistance.
 - Allow the set to warm up for approximately 15 minutes.
 - Measure voltages and waveforms in relation to correct ground (e.g. measure audio signals in relation to AUDIO_GND).
 - Caution:** It is not allowed to use heatsinks as ground.
 - Test probe: R_i > 10 Mohm, C_i < 20 pF.
 - Use an isolated trimmer/screwdriver to perform alignments.

6.2 Hardware Alignments

There are no hardware alignments foreseen for this chassis, but below find an overview of the most important DC voltages on the SSB. These can be used for checking proper functioning of the DC/DC converters.

Test Description	Specifications (V)			Diagram
	Point	Min.	Typ.	Max.
+12VS	F118	11.7	12.3	12.91
+3V3_STBY	F113	3.2	3.3	3.4
+3V3_SW	F133	3.17	3.34	3.5
+1V25_SW	F131	1.18	1.25	1.31
+5V_SW	F132	4.98	5.25	5.51
+1V8_SW	F125	1.74	1.83	1.92
+1V1_SW	F101	0.94	1.1	1.15
+5VS	F235	4.94	5.2	5.46
+2V5_SW	F136	2.38	2.5	2.62
+5VTUN_DI	F236	4.75	5	5.25
G1TAL				
VLS_15V6	FJ01	14.82	15.6	16.38
VGH_35V	FM02	34.0	35.0	36.0
VGL_-6V	FJ14	-7.0	-6.0	-5.0
VCC_3V3	FJ13	3.14	3.3	3.47
VCC1V8	FJ05	1.71	1.8	1.89

6.3 Software Alignments

With the software alignments of the Service Alignment Mode (SAM) the Tuner and RGB settings can be aligned.

6.3.1 Tuner Adjustment (RF AGC Take Over Point)

Purpose: To keep the tuner output signal constant as the input signal amplitude varies.

No alignment is necessary, as the AGC alignment is done automatically.

6.3.2 RGB Alignment

Before alignment, set the picture as follows:

Picture Setting	
Dynamic backlight	Off
Dynamic Contrast	Off
Colour Enhancement	Off
Picture Format	Unscaled
Light Sensor	Off
Brightness	50
Colour	0
Contrast	100

White Tone Alignment:

- Activate SAM.
- Select "RGB Align." and choose a color temperature.
- Use a 100% white screen as input signal and set the following values:
 - "Red BL Offset" and "Green BL Offset" to "7" (if present).
 - All "White point" values initial to "127".

In case you have a color analyzer:

- Measure with a calibrated (phosphor- independent) color analyzer (e.g. Minolta CA-210) in the centre of the screen. Consequently, the measurement needs to be done in a dark environment.
- Adjust the correct x,y coordinates (while holding one of the White point registers R, G or B on max. value) by means of decreasing the value of one or two other white points to the correct x,y coordinates (see Table [6-1 White D alignment values](#)). Tolerance: dx: ± 0.002, dy: ± 0.002.
- Repeat this step for the other color Temperatures that need to be aligned.
- When finished return to the SAM root menu and press STANDBY on the RC to store the aligned values to the NVM.

Table 6-1 White D alignment values

Value	Cool (11000 K)	Normal (9000 K)	Warm (6500 K)
x	0.276	0.287	0.313
y	0.282	0.296	0.329

If you do **not** have a color analyzer, you can use the default values. This is the next best solution. The default values are average values coming from production (statistics).

- Set the RED, GREEN and BLUE default values per temperature according to the values in the "Tint settings" table.
- When finished return to the SAM root menu and press STANDBY on the RC to store the aligned values to the NVM.

Table 6-2 Tint settings 32"

Colour Temp.	R	G	B
Cool	t.b.d.	t.b.d.	t.b.d.
Normal	t.b.d.	t.b.d.	t.b.d.
Warm	t.b.d.	t.b.d.	t.b.d.

Table 6-3 Tint settings 40"

Colour Temp.	R	G	B
Cool	t.b.d.	t.b.d.	t.b.d.
Normal	t.b.d.	t.b.d.	t.b.d.
Warm	t.b.d.	t.b.d.	t.b.d.

6.4 ADC gain adjustment

Use a Quantum Data Patters Generator 802BT and apply a "PgcWrgb" image ("dot, cross and color bar mix pattern") according to [Figure 6-1](#).

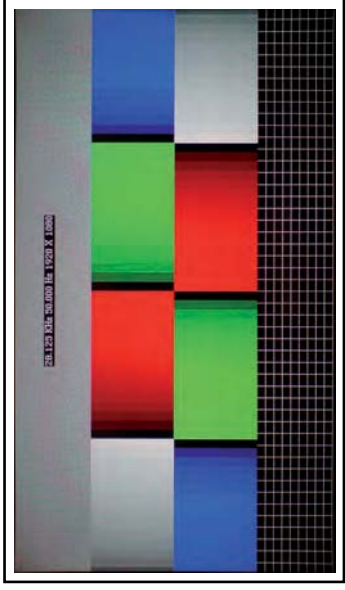


Figure 6-1 "PgcWrgb" pattern

6.4.1 YPbPr

Following instructions result in correct alignment of ADC gain, offset and phase, related to YPbPr input signal. Apply a signal of format "1080i25".

- Apply following signals to the YPbPr input connectors:
 - Pr signal of 0.7 Vp-p¹ / 75 ohm to the red cinch connector.
 - Y signal of 0.7 Vb-p² / 75 ohm with a sync pulse of 0.3 Vp-p¹ to the green cinch connector.
 - Pb signal of 0.7 Vb-p¹ / 75 ohm to the blue cinch connector.
- Select the input source to YPbPr input.
- In SAM, initiate the "Auto ADC" calibration command. Upon appearance of the "Auto ADC Completed" message, the alignment is completed.

Notes:

- Peak-to-Peak
- Black-to-Peak.

6.4.2 PC VGA

Following instructions result in correct alignment of ADC gain, offset and phase, related to PC VGA input signal. Apply a signal of format "DMT1060".

- Apply following signals to the PC VGA input connector:
 - Red signal of 0.7 Vp-p¹ / 75 ohm.
 - Green signal of 0.7 Vp-p¹ / 75 ohm.
 - Blue signal of 0.7 Vp-p¹ / 75 ohm.
- Select the input source to PC VGA input.
- In SAM, initiate the "Auto ADC" calibration command. Upon appearance of the "Auto ADC Completed" message, the alignment is completed.

6.5 TCON Alignment (= VCOM alignment)

New requirement for "TCON on SSB" project:

- The purpose of VCOM alignment is to obtain an equal voltages for both Positive and Negative LC polarity. This is important to avoid "Flicker" and "Image Sticking".
- The P-Gamma + VCOM calibrator IC; ISL24837 is used for VCOM adjustment.
- The adjusted VCOM data will be stored inside on-chip memory and will be automatically recalled during each power-up.

ComPair (see [5.3.1 ComPair](#)) will foresee in a possibility to do this alignment.

6.6 Option Settings

6.6.1 Introduction

The microprocessor communicates with a large number of i²C ICs in the set. To ensure good communication and to make digital diagnosis possible, the microprocessor has to know which ICs to address. The presence/absence of these specific ICs (or functions) is made known by the option codes.

Notes:

- After changing the option(s), save them with the STORE command.
- The new option setting becomes active after the TV is switched "off" and "on" again with the mains switch (the EAROM is then read again).

6.6.2 How To Set Option Codes

When the NVM is replaced, all options will require resetting. To be certain that the factory settings are reproduced exactly, you must set all option numbers. You can find the correct option numbers see sticker on the inside the cabinet.

How to Change Options Codes

An option code (or "option byte") represents eight different options (bits). All options are controlled via ten option bytes (OP#1... OP#10). Activate SAM and select "Options". Now you can select the option byte (OP#1... OP#10) with the CURSOR UP/ DOWN keys, and enter the new 3 digit (decimal) value. For the correct factory default settings, see the sticker inside the set.

7. Circuit Descriptions

Index of this chapter:

- [7.1 Introduction](#)
- [7.2 Power Supply](#)
- [7.3 Video](#)
- [7.3.1 Video: Front-End](#)
- [7.4 Audio](#)
- [7.5 Inputs](#)
- [7.5.1 Inputs: HDMI](#)
- [7.5.2 Inputs: USB](#)

Notes:

- Only **new** circuits (circuits that are not published recently) are described.
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use chapter [9. Block Diagrams](#) and [10. Circuit Diagrams and PWB Layouts](#). Where necessary, you will find a separate drawing for clarification.

7.1 Introduction

The LC11M1.1L LA chassis is a digital chassis using a Mediatek chipset. It covers screen sizes of 32" to 40".

The xxPFL3x06D/xx sets come with the "Thriller" styling, and the xxPFL5x06D/xx come with the "Berlinale" styling.

Main key components are the Mediatek MT5363 integrated "System On Chip" (SoC) that supports multimedia video/audio input, and the integrated TCON (Timing Controller) part for the LCD panel.

System SoC is based on MT5363:

- NAND Flash – 128 Mbyte, NumOnyx/Hynix.
- DDR – 128 Mbyte (32 × 16M, 2 pcs), Hynix.
- Use internal MT5363 Stand-by micro-controller.

Tuner/Frontend configuration:

- Half NIM tuner (VA1E1BF2403) from Sharp.
- Toshiba Channel Decoder (TC90517).

Interfaces for debug and SW upgrade:

- UART (3.5 mm jack).
- USB port.
- JTAG.

Refer to [Figure 7-1](#) for details.

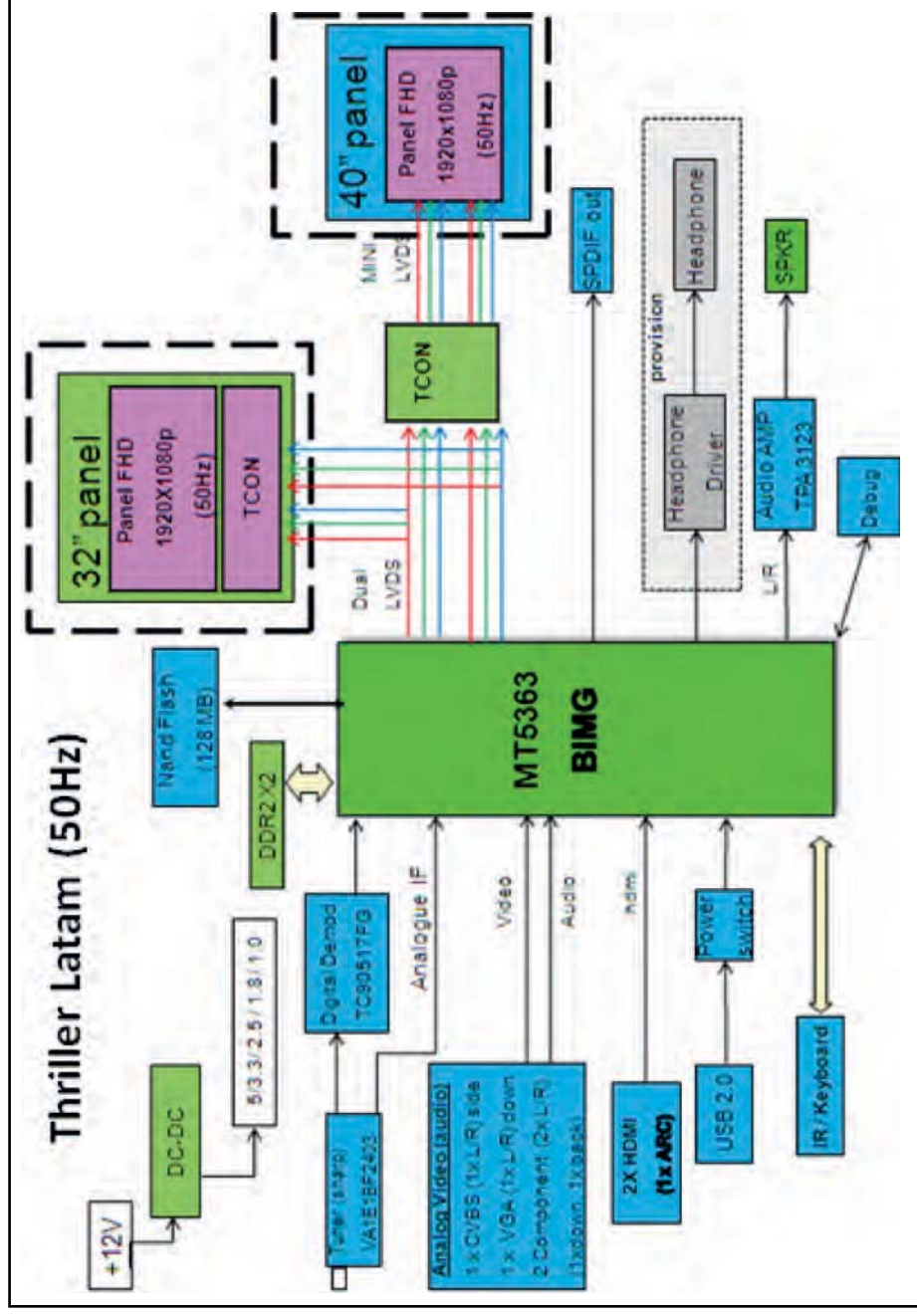
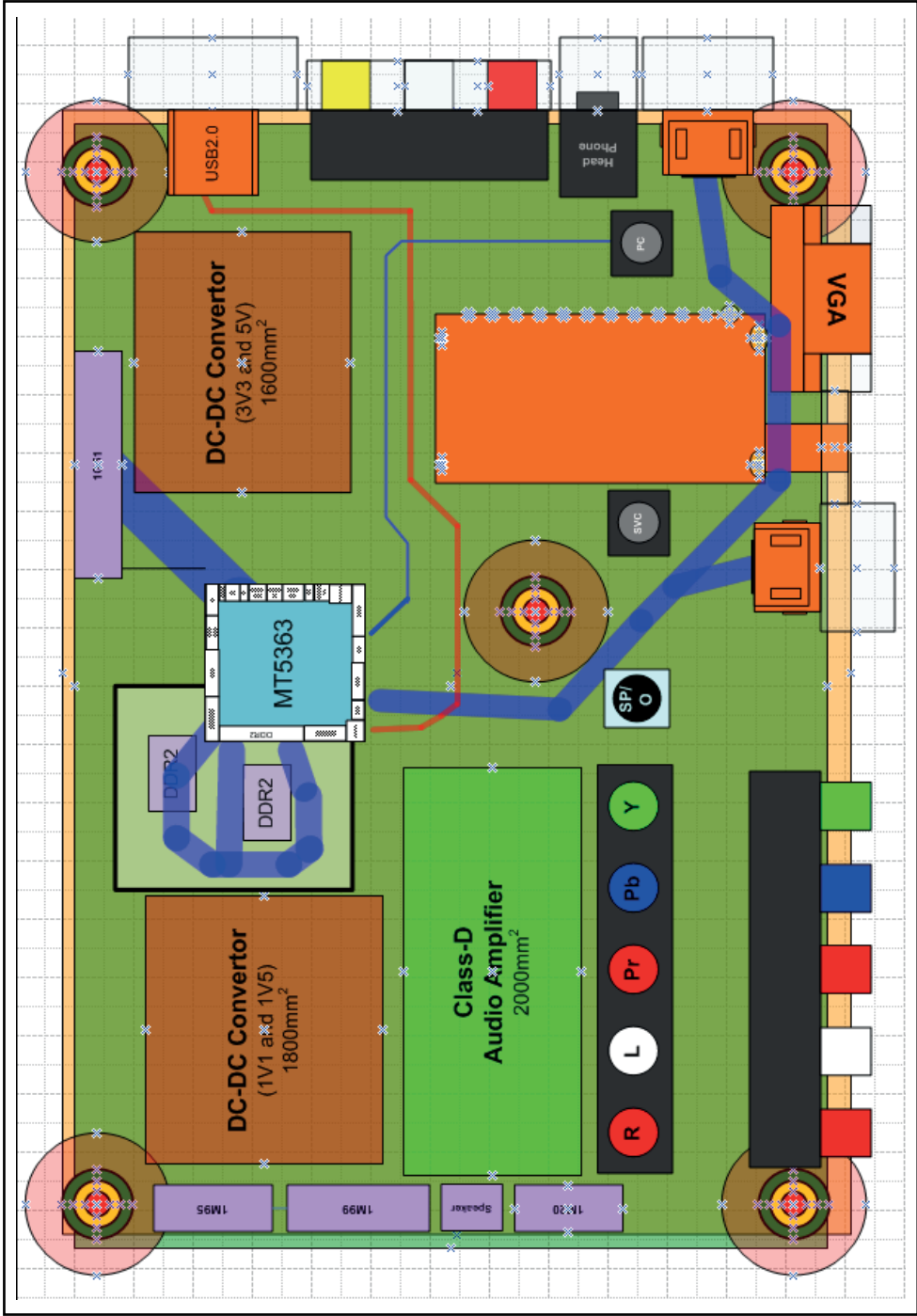
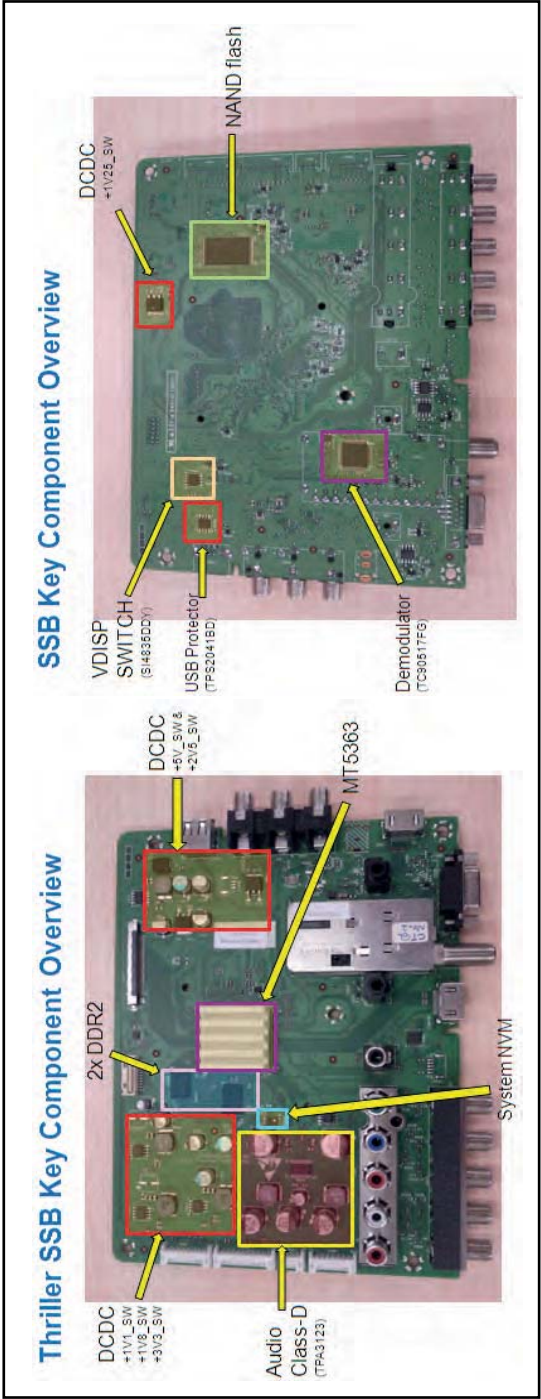


Figure 7-1 L11M1.1L LA Architecture



19130_010_110426.eps
110426

Figure 7-2 SSB cell layout



19130_047_110429.eps
110429

Figure 7-3 SSB key component overview

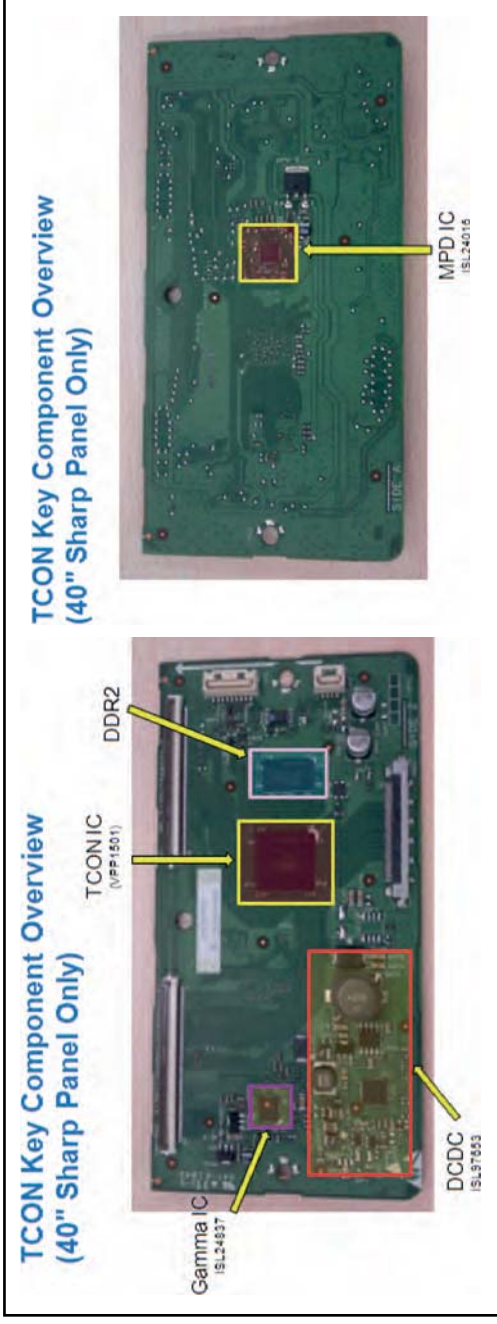
19130_048_110429.eps
110429

Figure 7-4 TCON key component overview

7.2 Power Supply

The Power Supply Unit (PSU) in this chassis is a buy-in and is a black-box for Service. When defective, a new panel must be ordered and the defective panel must be returned for repair, unless the main fuse of the unit is broken. Always replace the fuse with one with the correct specifications! This part is commonly available in the regular market.

Refer to [Figure 7-5](#) and [Figure 7-6](#) for details

The power supply system consists of stand-by, switched and regulated voltages. The stand-by voltage, +3V3STBY, will be available once AC supply is provided to the system. As for the other voltages, namely switched and regulated voltages, these are available once the STANDBY signal is pulled "low" to allow other supplies from the IPB to turn "on". The switched supplies are generated from the main +12VS supply, while the regulated supplies are derived from the switched supplies. There are a number of detection circuits to detect the following supplies: +12VS, +12Vdisp and +3V3_SW. The +12VS is the main supply voltage from the IPB that enables the switched voltages to be generated. The +12Vdisp is the supply to the display timing controller, while the +3V3_SW is powering the microprocessor and its flash memory.

The mains power supply unit distribute the following voltages to the TV system: +3V3STBY, 12VS, +24Vaudio, and +24Vpanel for panel with inverter (or) high voltage (HV) for inverterless panel. Requirement of the High Voltage depend on the specification of the LCD panel.

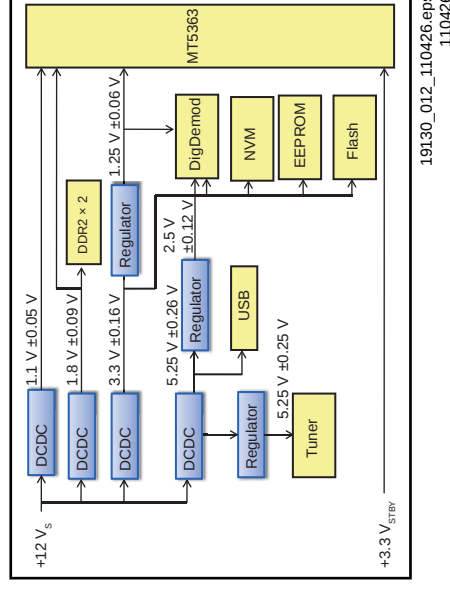
19130_012_110426.eps
110426

Figure 7-5 Power distribution overview

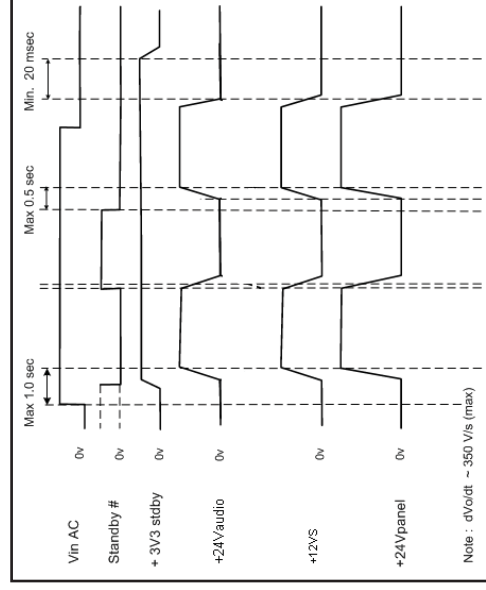
18980_203_100402.eps
100402

Figure 7-6 Power timing overview

7.3 Video

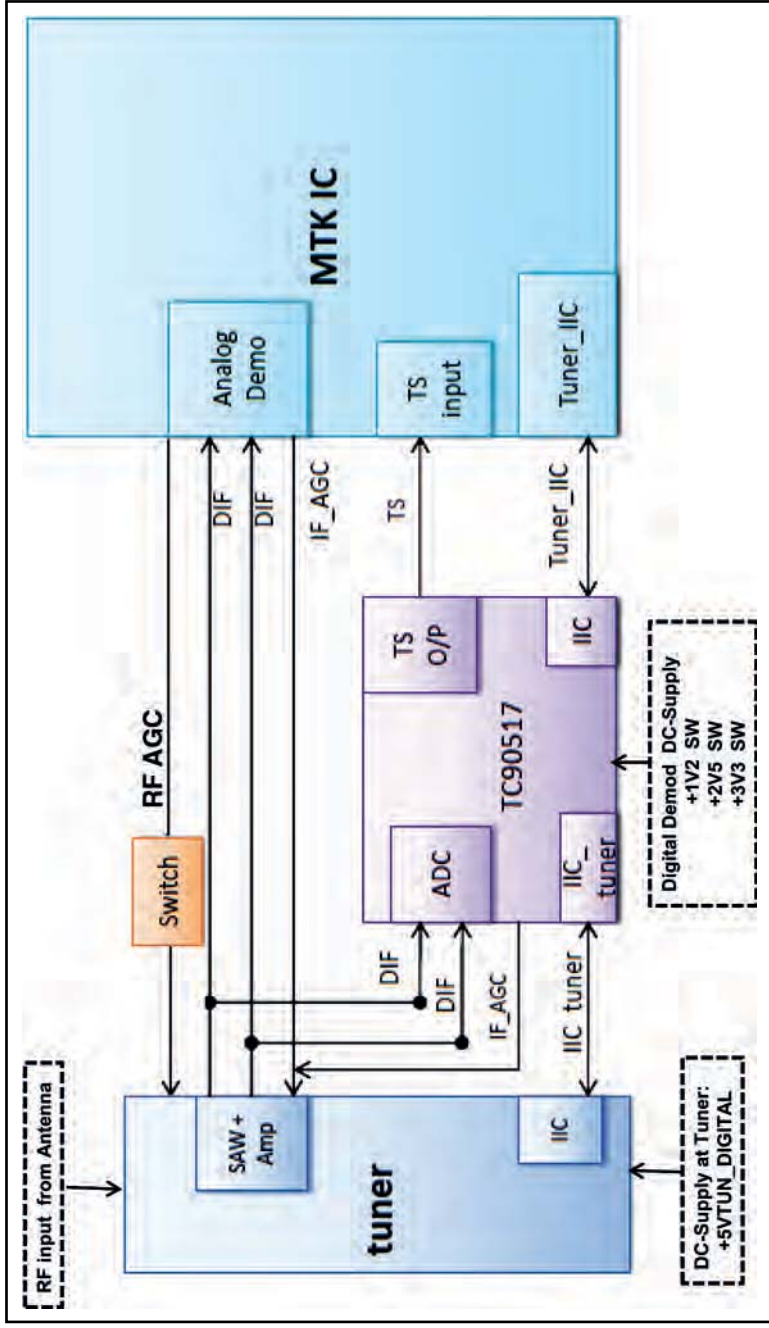
7.3.1 Video: Front-End

Key components for the tuner section are:

- Sharp Half NIM tuner VA1E1BF2403,

- Toshiba channel decoder TC90517 (external ISDB-T channel decoder).
- Analog demodulator (using internal MT5363 analog demodulator - pin AH35 VIP, AH37 VIN).

Refer to [Figure 7-7](#) for details.



19130_013_110426.eps
110426

Figure 7-7 Front-end functional block diagram

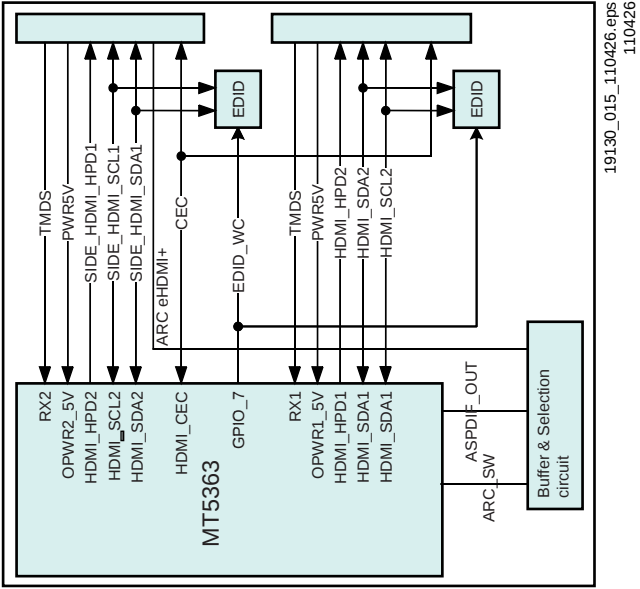


Figure 7-9 HDMI implementation

Signal description:

- TMDS: Signals that contain audio and video information.
- PWR5V: Signal to detect the presence of any HDMI source connected to the TV's HDMI input port.
- SIDE_HDMI_HPD1 and HDMI_HPD2: Signal to initiate reading of the TV EDID data by the source device.
- I2C: The EDID data reading and the HDCP authentication process runs via I2C.
- CEC: Signal direct connected between inputs and uP.
- EDID_WC: Signal used to disable the write protect pin of the EEPROM. When updating, the program will temporarily pull this pin "LOW" before writing new data.

7.5.2 Inputs: USB

In this chassis, the main Mediatek MT5363 SoC has an on-chip USB processor.
Refer to [Figure 7-10](#) for the implementation.

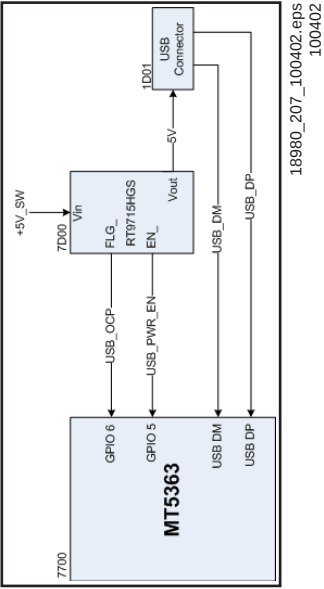


Figure 7-10 USB implementation

8. IC Data Sheets

This section shows the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of "memory" and "logic" ICs).

8.1 Diagram B01, Type TPS54386 (IC7116 and 7117)

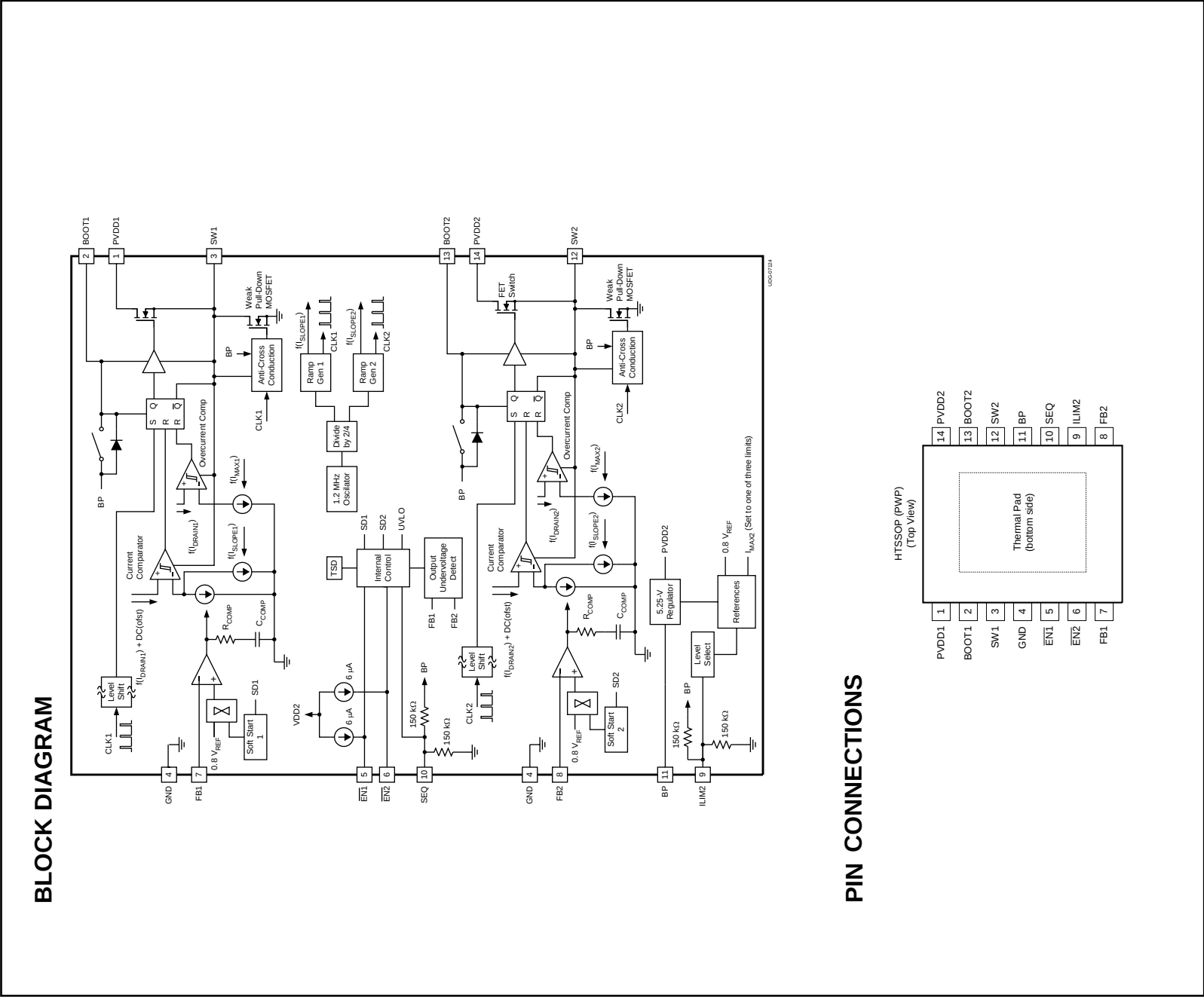
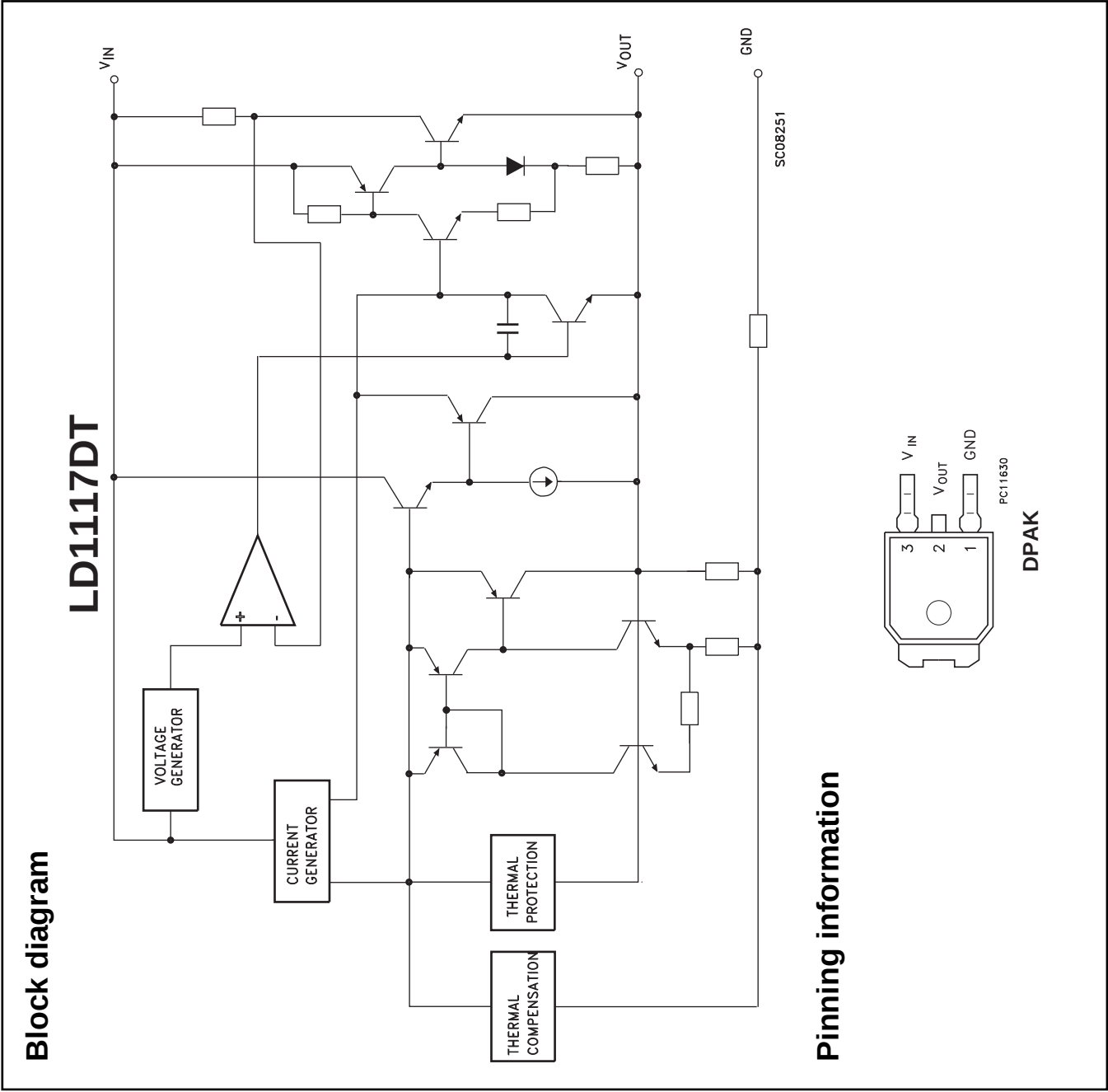


Figure 8-1 Internal block diagram and pin configuration

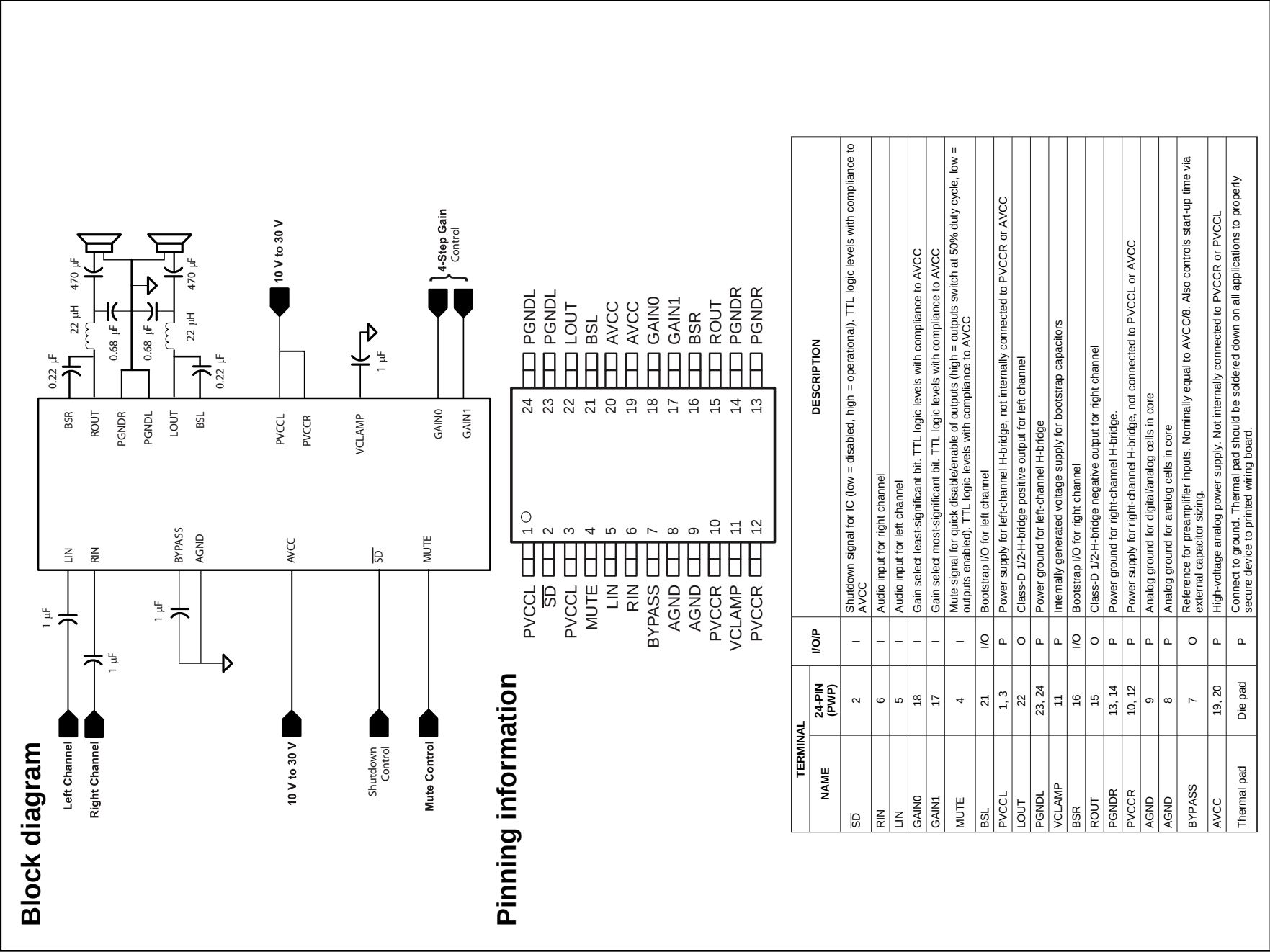
8.2 Diagram B01A [DC-DC](#), Type LD1117D (IC7119)



F_15710_166.eps
100402

Figure 8-2 Internal block diagram and pin configuration

8.3 Diagram B03 [Class-D & muting](#), Type TPA3123 (IC7400)



TERMINAL		I/O/P		DESCRIPTION
NAME	24-PIN (PWP)			
SD	2	I		Shutdown signal for IC (low = disabled, high = operational). TTL logic levels with compliance to AVCC
RIN	6	I		Audio input for right channel
LIN	5	I		Audio input for left channel
GAIN0	18	I		Gain select least-significant bit. TTL logic levels with compliance to AVCC
GAIN1	17	I		Gain select most-significant bit. TTL logic levels with compliance to AVCC
MUTE	4	I		Mute signal for quick disable/enable of outputs (high = outputs switch at 50% duty cycle, low = outputs enabled). TTL logic levels with compliance to AVCC
BSL	21	I/O		Bootstrap I/O for left channel
PVCCCL	1, 3	P		Power supply for left-channel H-bridge, not internally connected to PVCCR or AVCC
LOUT	22	O		Class-D 1/2-H-bridge positive output for left channel
PGNDL	23, 24	P		Power ground for left-channel H-bridge
VCLAMP	11	P		Internally generated voltage supply for bootstrap capacitors
BSR	16	I/O		Bootstrap I/O for right channel
ROUT	15	O		Class-D 1/2-H-bridge negative output for right channel
PGNDR	13, 14	P		Power ground for right-channel H-bridge.
PVCCR	10, 12	P		Power supply for right-channel H-bridge, not connected to PVCCCL or AVCC
AGND	9	P		Analog ground for digital/analog cells in core
AGND	8	P		Analog ground for analog cells in core
BYPASS	7	O		Reference for preamplifier inputs. Nominally equal to AVCC/8. Also controls start-up time via external capacitor sizing.
AVCC	19, 20	P		High-voltage analog power supply. Not internally connected to PVCCR or PVCCCL
Thermal pad	Die pad	P		Connect to ground. Thermal pad should be soldered down on all applications to properly secure device to printed wiring board.

Figure 8-3 Internal block diagram and pin configuration

8.4 Diagram B04 [MT5363 Power](#), Type MT5363 (IC7700)

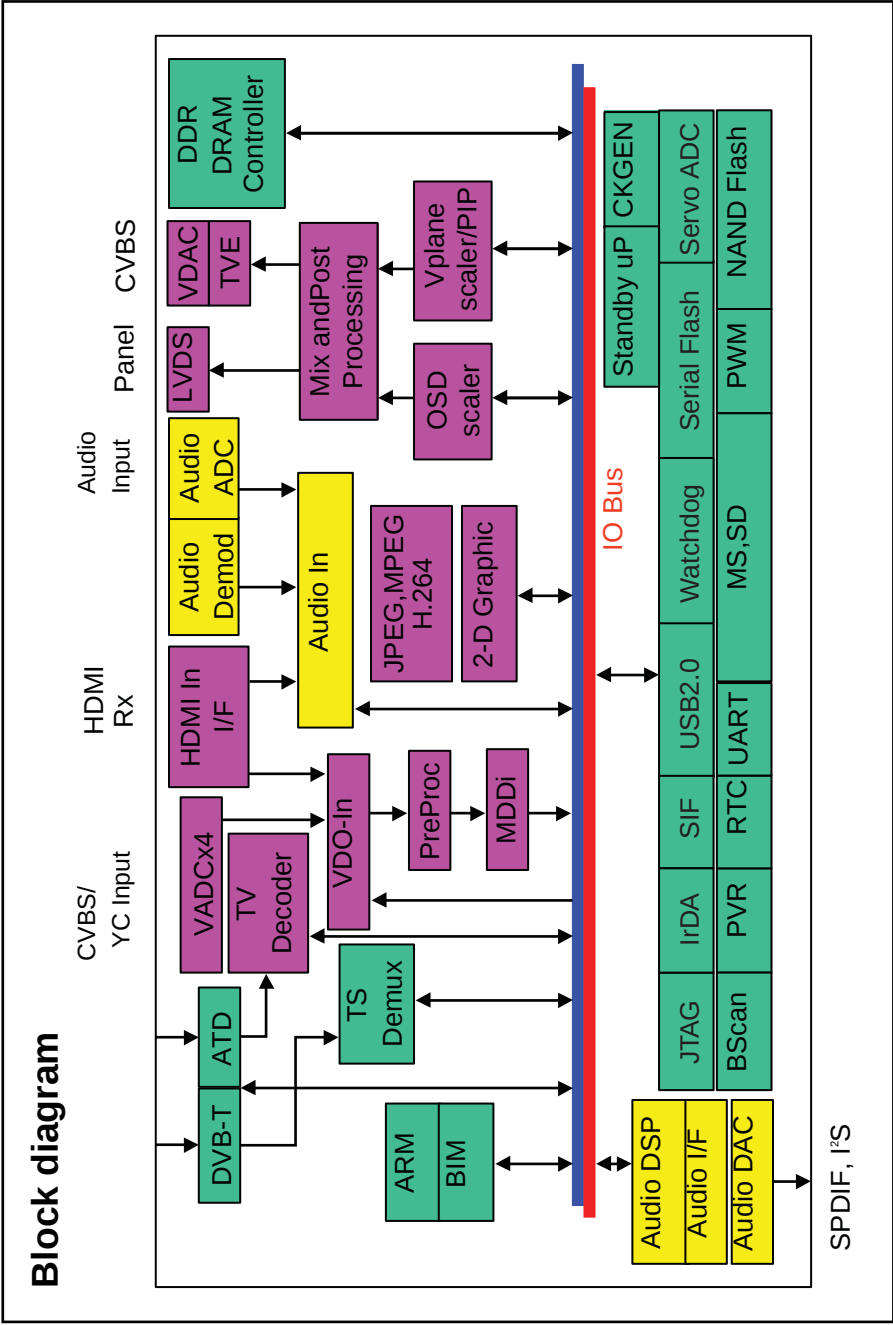


Figure 8-4 Internal block diagram

18850_300_100107.eps
100222

Pinning information

LT 1		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
A				RQ10		RQ15		RQ00		RQ14		RQ12				AQ1N		ACKN	
B	VCC10		RCL10		RQ08		RQ01		RQ00		RQ11		VCC10		AQ0N		AQ2N		AQ3N
C			VCC10			RQ03		DVSS		RQ01		VCC10			AQ0P		ACKP		
D	RA9		VCC10		RQ05		RQ00		DVSS		RQ09		VCC10		AQ0P		AQ2P		AQ3P
E		RA12		VCC10		RQ02		DVSS		RQ00		VCC10		VCC10		AE0N		AE2N	
F	RA5		RA7		VCC10		RQ07		DVSS		RQ06		VCC10		AVDD33_L_VDS		AE1N		AECKN
G		RA10		RA3		VCC10		DVSS		DVSS		RQ03		VCC10		AB0P		AE2P	
H	RBA2		RBA0		RA1		VCC10				RQ01		RQ04		AVDD33_L_VDS		AE1P		AECKP
J		RBA1		DVSS		DVSS								VCC10			AVSS12_L_VDS		
K	RKE		RWE_		MEMTN		MEMTP												
L		RCAS_		DVSS		DVSS													
M	RA13		RA2		RA4		RA6												TP_VPLL
N		RA11		RA0		RODT		RVREF						DVSS		AVDD12_L_VDS		AVDD12_V_PLL	
P	RA6		RCS_		RRAS_								AVDD12_M_EMPLL		DVSS		AVSS12_L_VDS		AVSS12_V_PLL
R		VCC10		VCC10		VCC10								DVSS		VCC10		DVSS	
T	RQ19		RQ20		RQ30		RQ25							AVSS12_M_EMPLL		DVSS		DVSS	
U		RQ22		RQ17		RQ03								VCC10		DVSS		DVSS	
V	RQ02		RQ02				RQ07						VCC10		DVSS		DVSS		DVSS
W		RQ02		DVSS		DVSS								DVSS		DVSS		DVSS	
Y	RQ03		DVSS		RQ24		RQ31						VCC10		DVSS		DVSS		DVSS
AA		RQ03		RQ29		RQ26								VCC10		DVSS		DVSS	
AB	RQ16		RQ23		REXTDN								DVSS		DVSS		DVSS		DVSS
AC		RQ21		RQ18		VCC10									DVSS		DVSS		DVSS
AD	RCL1		RCLK_1		VCC10		VCC10						DVSS		VCC10		VCC10		VCC10
AE		VCC10		VCC10		GPI039		DVSS						VCC10		VCC10		VCC10	
AF	VCC10		VCC10		VCC10		GPI040		DVSS				VCC10		VCC10		VCC10		VCC10
AG		GPI038		GPI041		GPI042							VCC10		VCC10		VCC10		VCC10
AH	GPI044		GPI043		JTDO		VCC10												
AJ		JTDI		JTMS		VCC10		VCC10											
AK	JTRST_		JTCK		VCC10		VCC10												
AL		VCC10		VCC10		VCC10		VCC10		AVDD12_L_SB		HDMI_SCL_2		HDMI_SDA_2		PWRBV_1		HDMI_IPD_1	
AM	VCC10		VCC10		VCC10		VCC10		AVSS12_L_SB		AVDD33_L_SB		AVDD33_H_DMI		PWRBV_2		HDMI_SCL_1		OPCTRL1
AN		VCC10		VCC10		POCEL_			USB_VRT		AVSS13_H_DMI		AVSS13_H_DMI		HDMI_IPD_2		HDMI_SDA_1		
AP	OSDA0		OSCL0		PDD1		PDD4		AVSS13_L_SB		AVDD12_H_DMI		RX2_0		RX2_2		RX1_0		RX1_2
AR		PDD0		PALE		PDD2		PDD6		USB_DM		RX2_C		RX2_1		RX1_C		RX1_1	
AT	POCE0_		POWE_		PARB_		PDD5		AVSS13_L_SB		AVSS13_L_SB		RX2_0B		RX2_2B		RX1_0B		RX1_2B
AU		POCE_		PALE		PDD3		PDD7		USB_DP		RX2_CB		RX2_1B		RX1_CB		RX1_1B	
AV 1																			

Figure 8-5 Internal block diagram

18850_301_100107 eps
100222

[illegible]

Figure 8-6 Internal block diagram

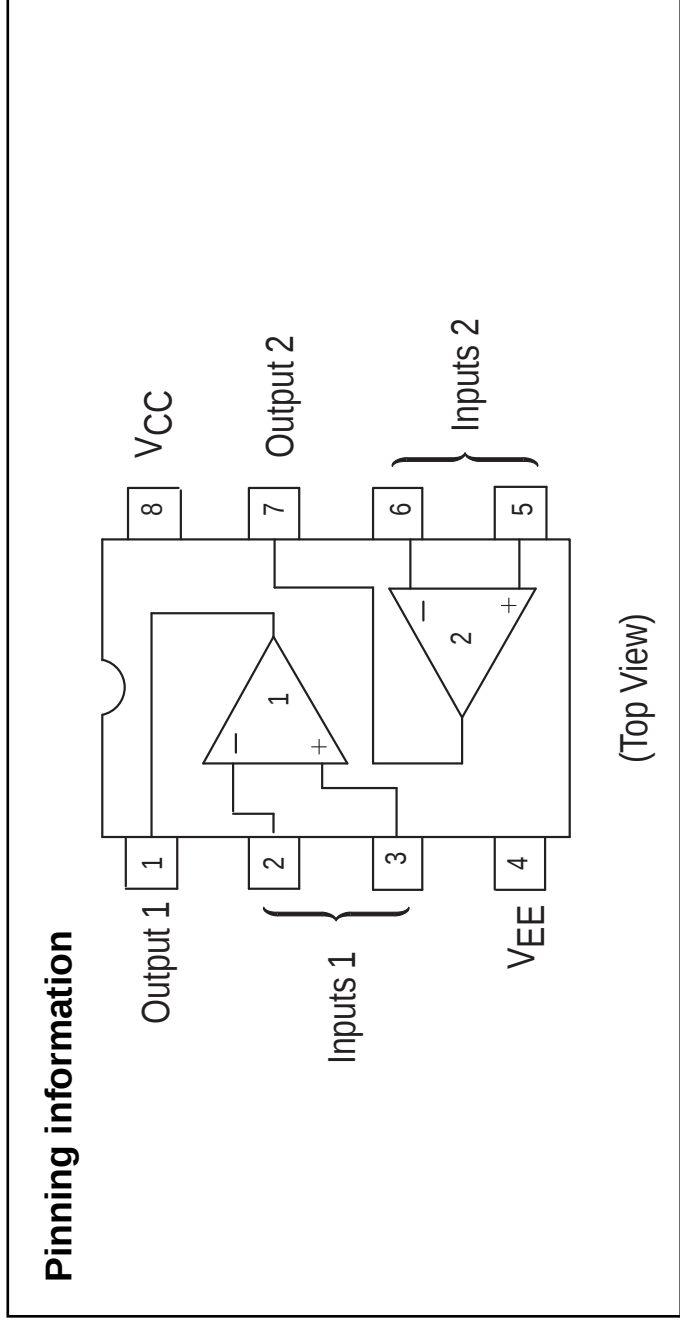
8.5 Diagram B06B [Analog I/O - Audio](#), Type LM833 (IC7B01)

Figure 8-7 Pin configuration

8.6 Diagram T01C [TCONDC/DC](#), Type ISL97653 (IC7J00)

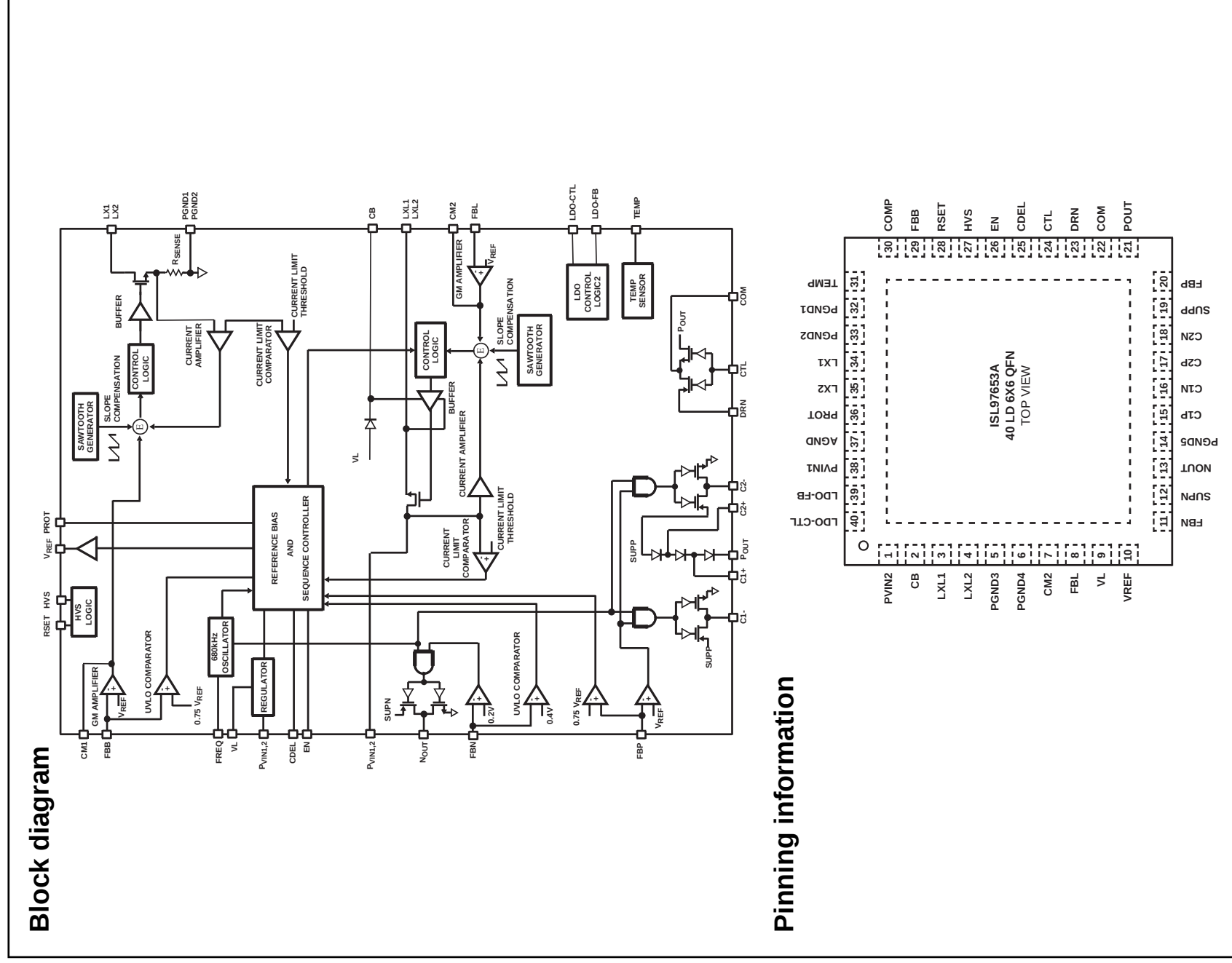
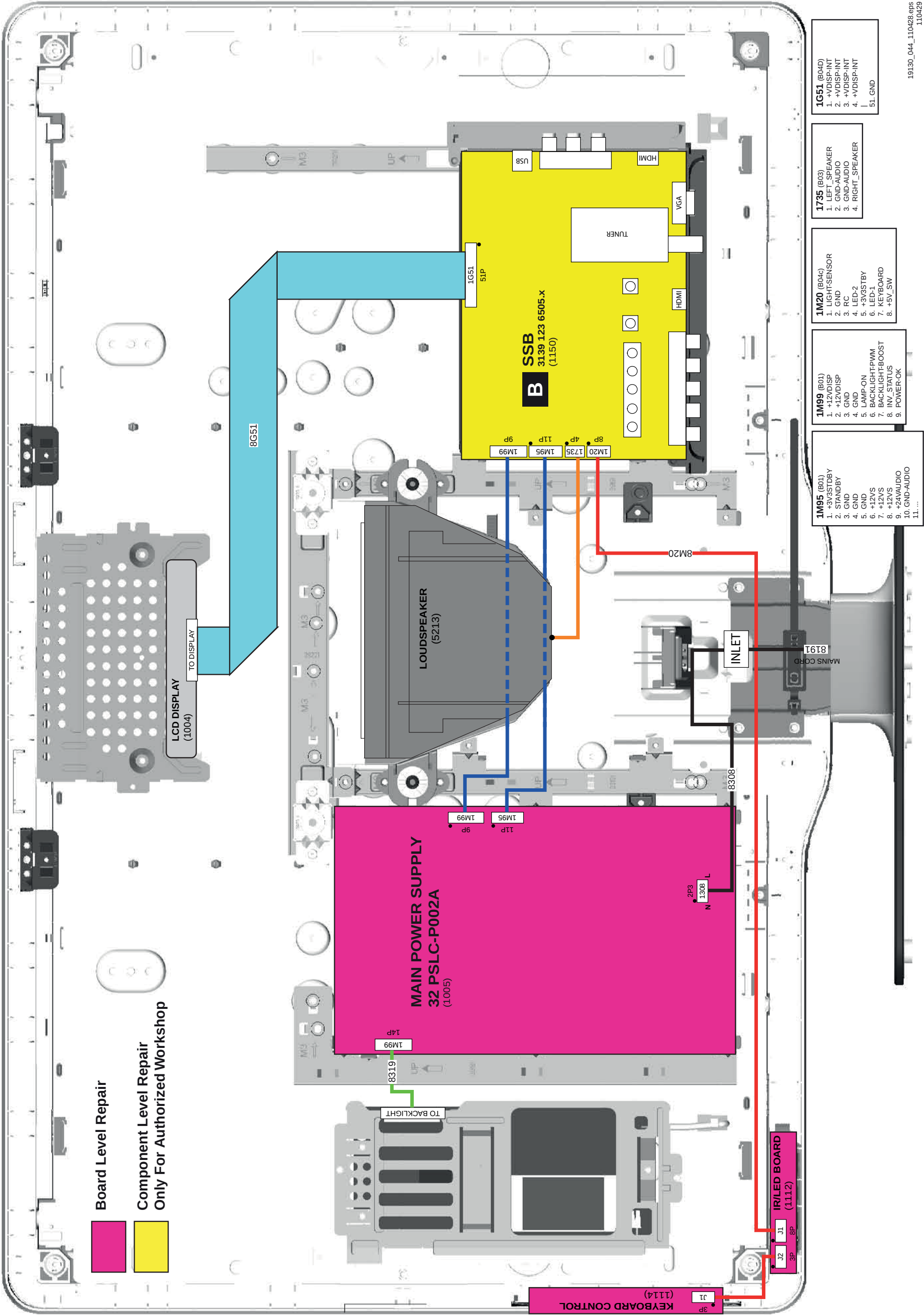


Figure 8-8 Internal block diagram and pin configuration

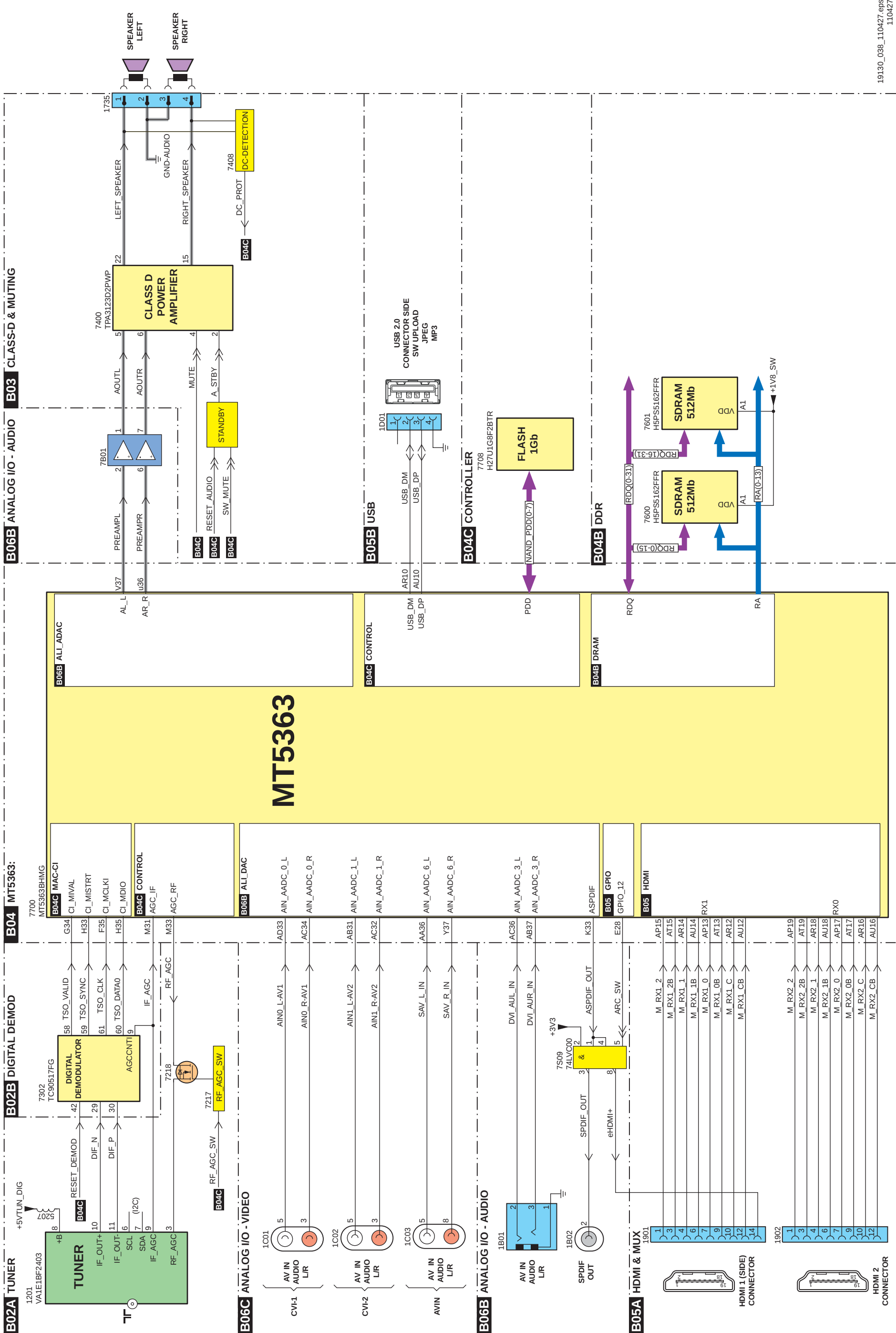
9. Block Diagrams

Wiring Diagram 32" (Thriller)
WIRING DIAGRAM 32" THRILLER

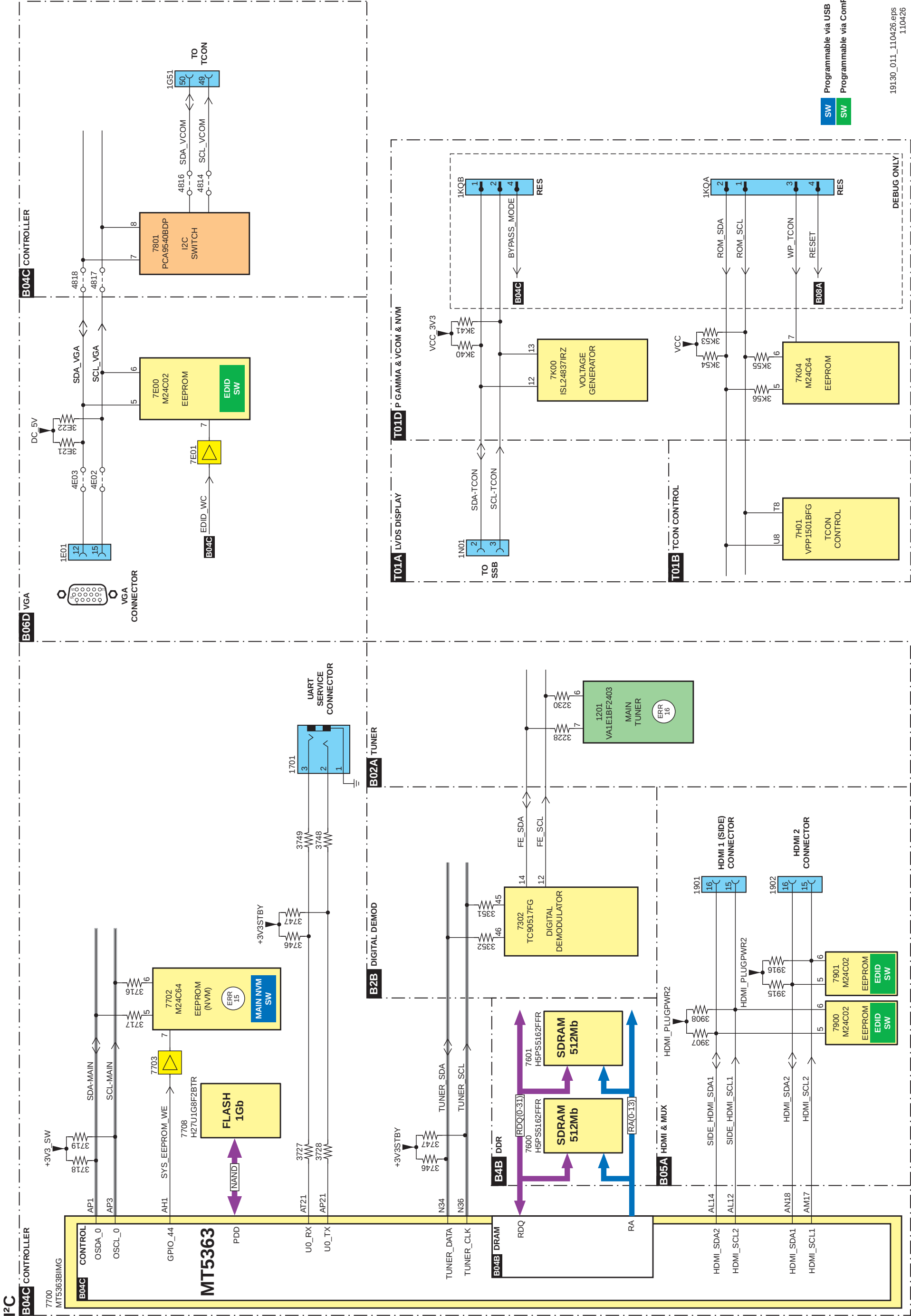


Block Diagram Audio

AUDIO



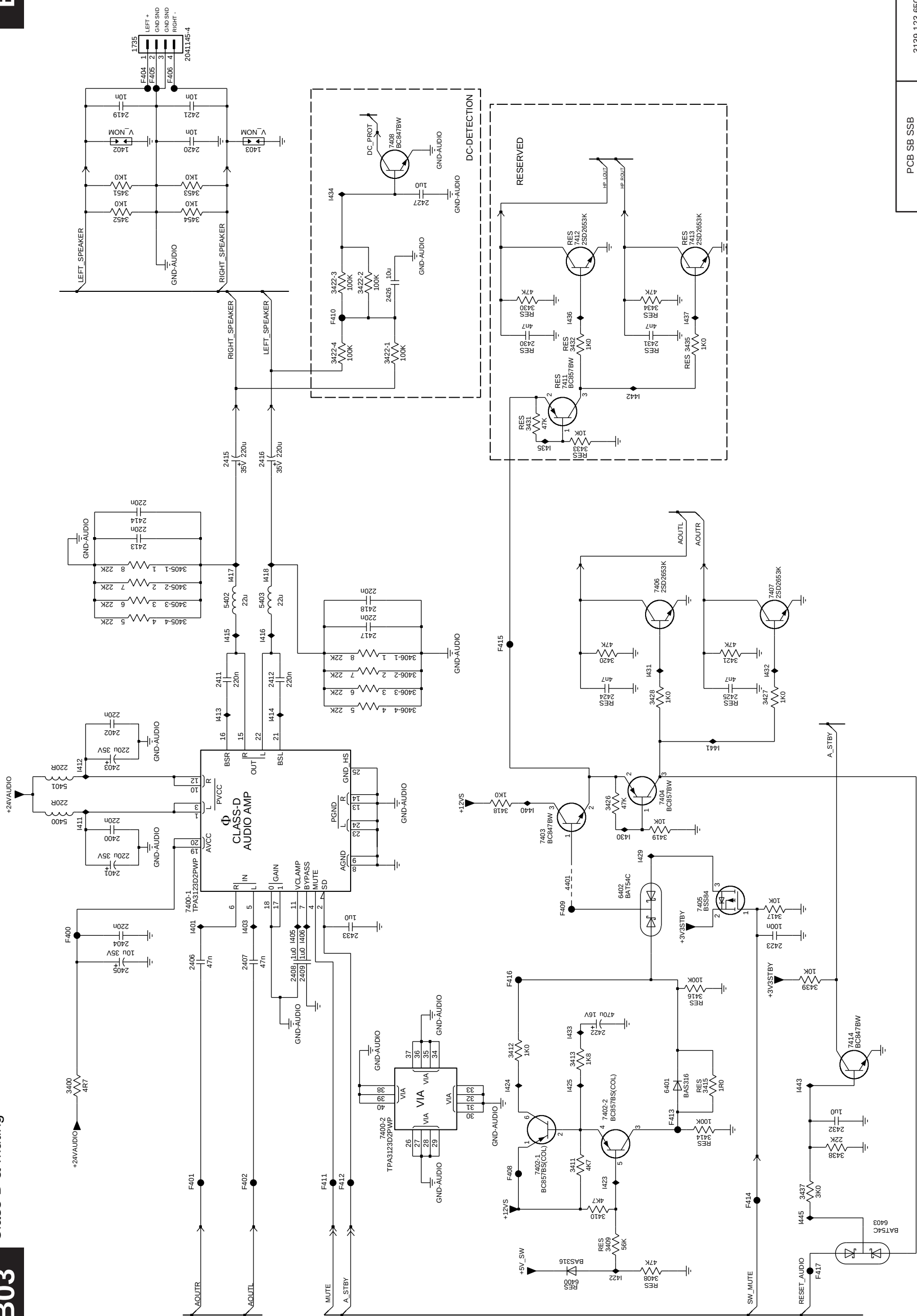
Block Diagram i²C

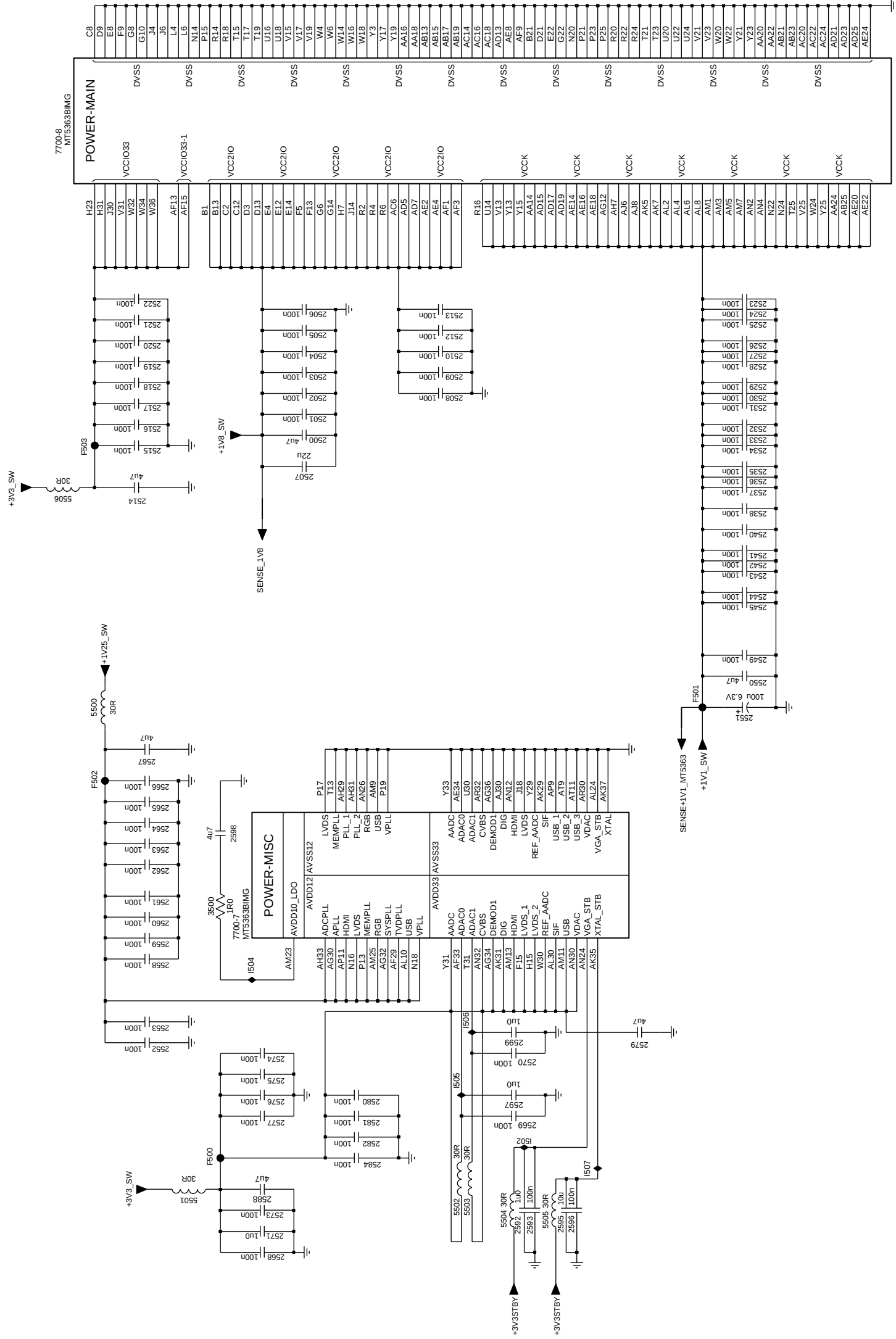


Class-D & muting

B03

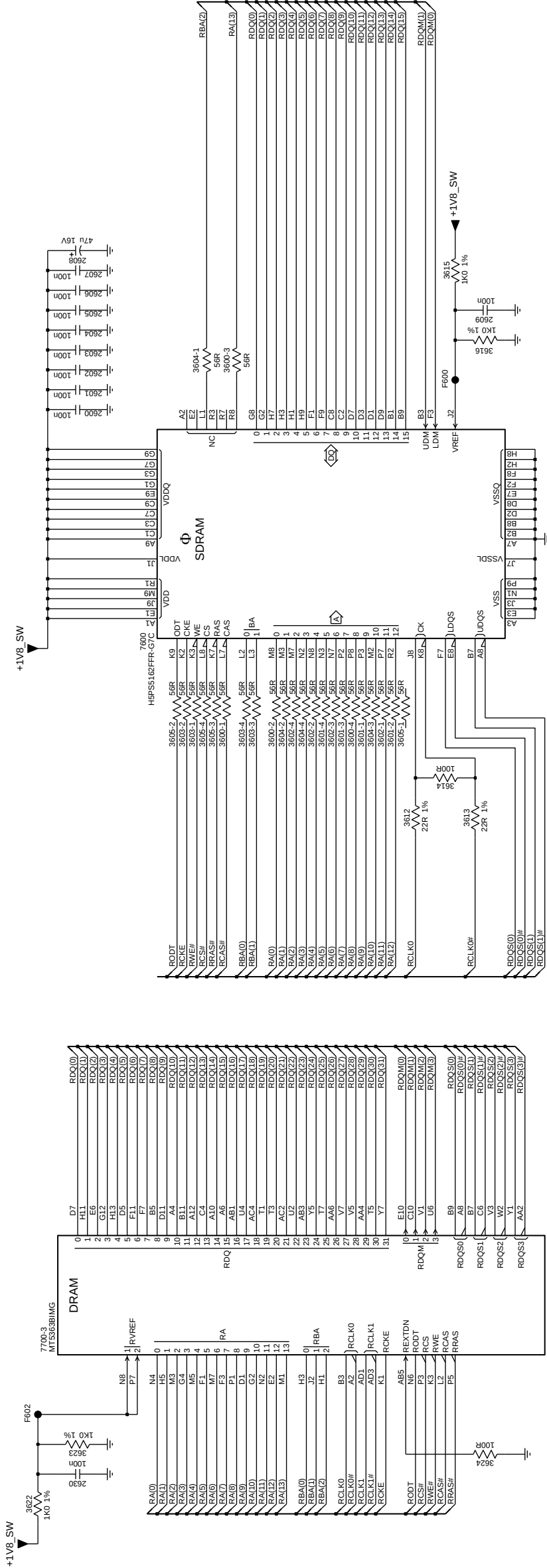
B03



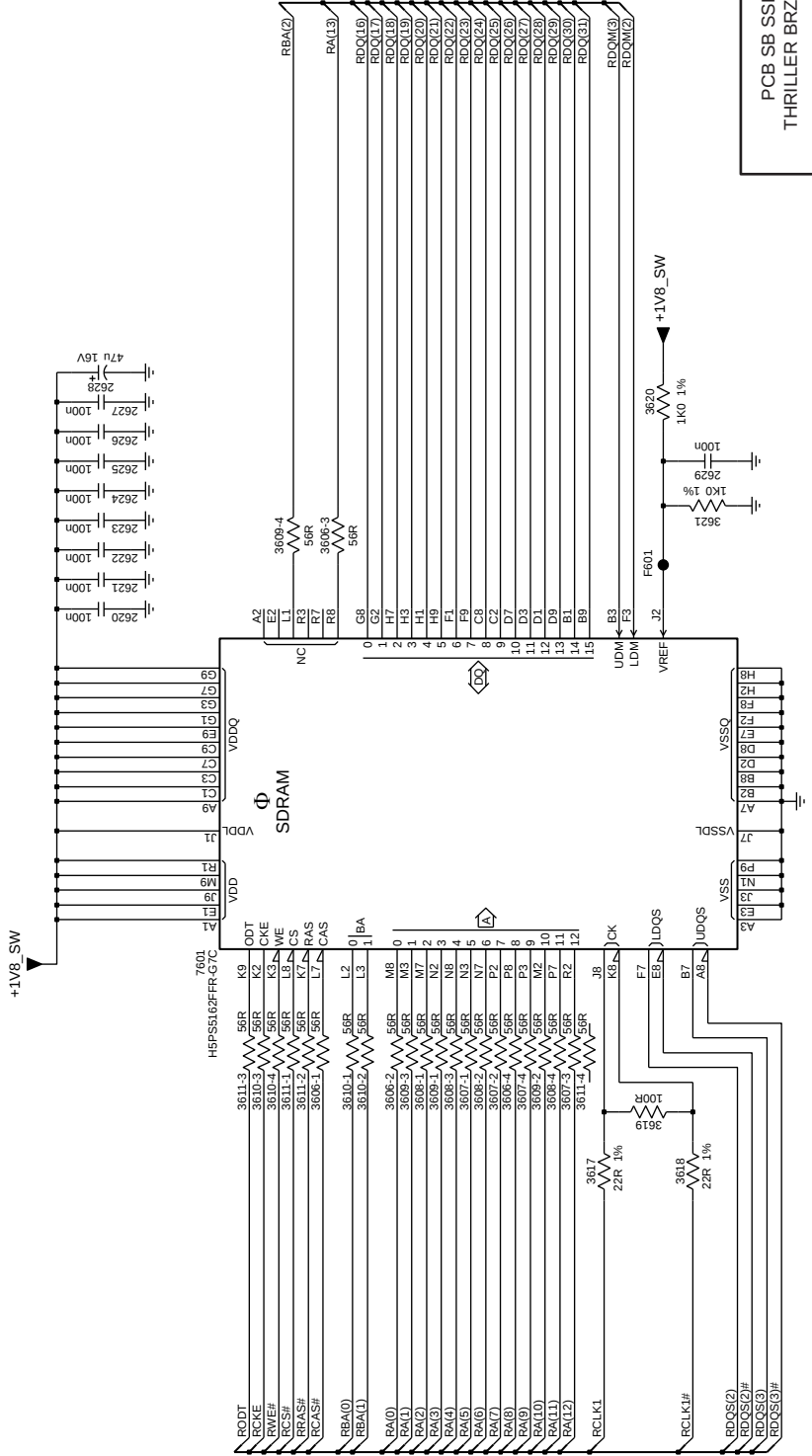


DDR

B04B DDR



B04B



PCB SB SSB THRILLER BRZ DIG		3139 123 6505	
1	2	3	4
1	2	3	4
1	2	3	4

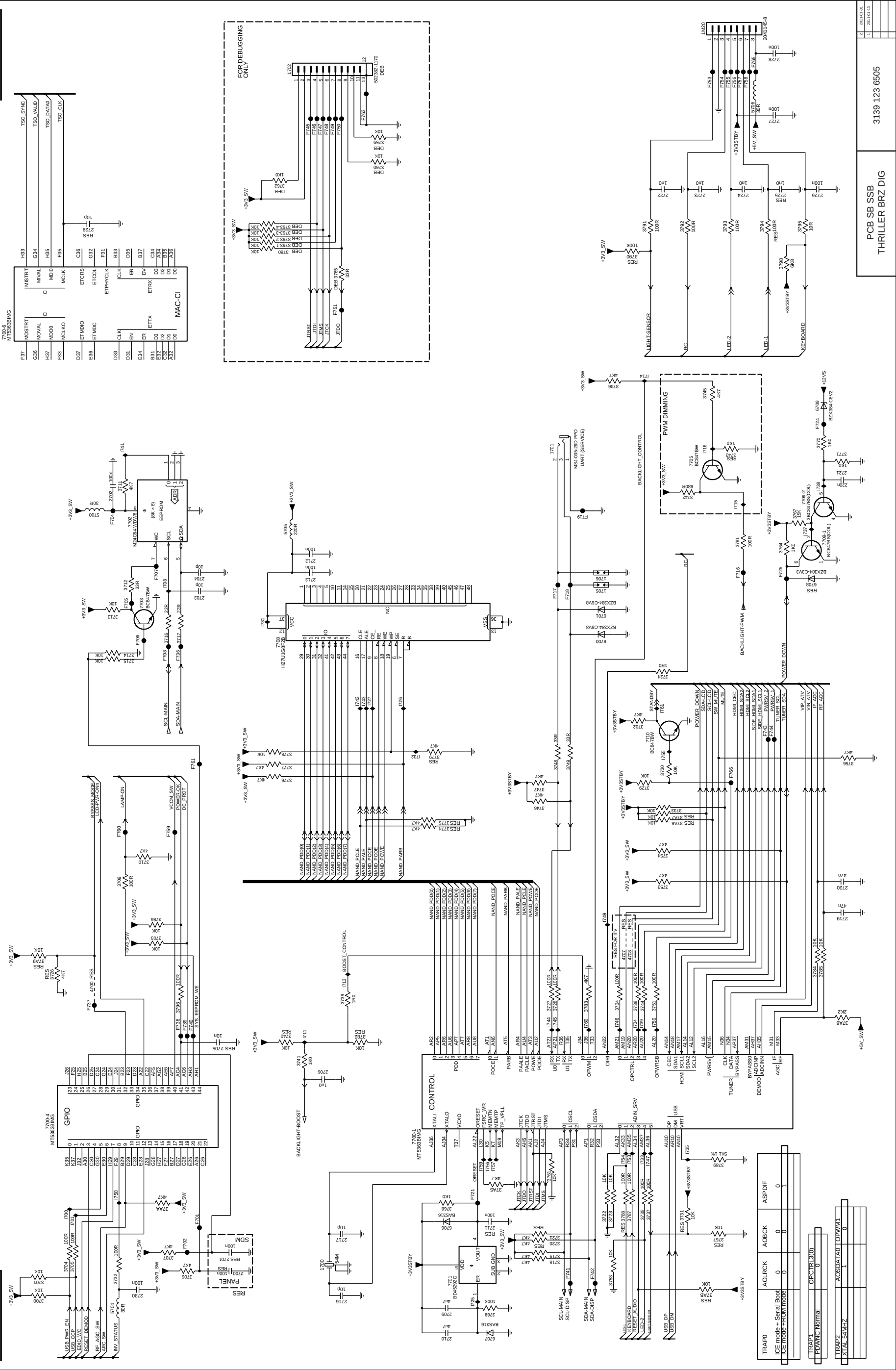
19130_022_110427.eps
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Controller

B04C

Controller

B04C



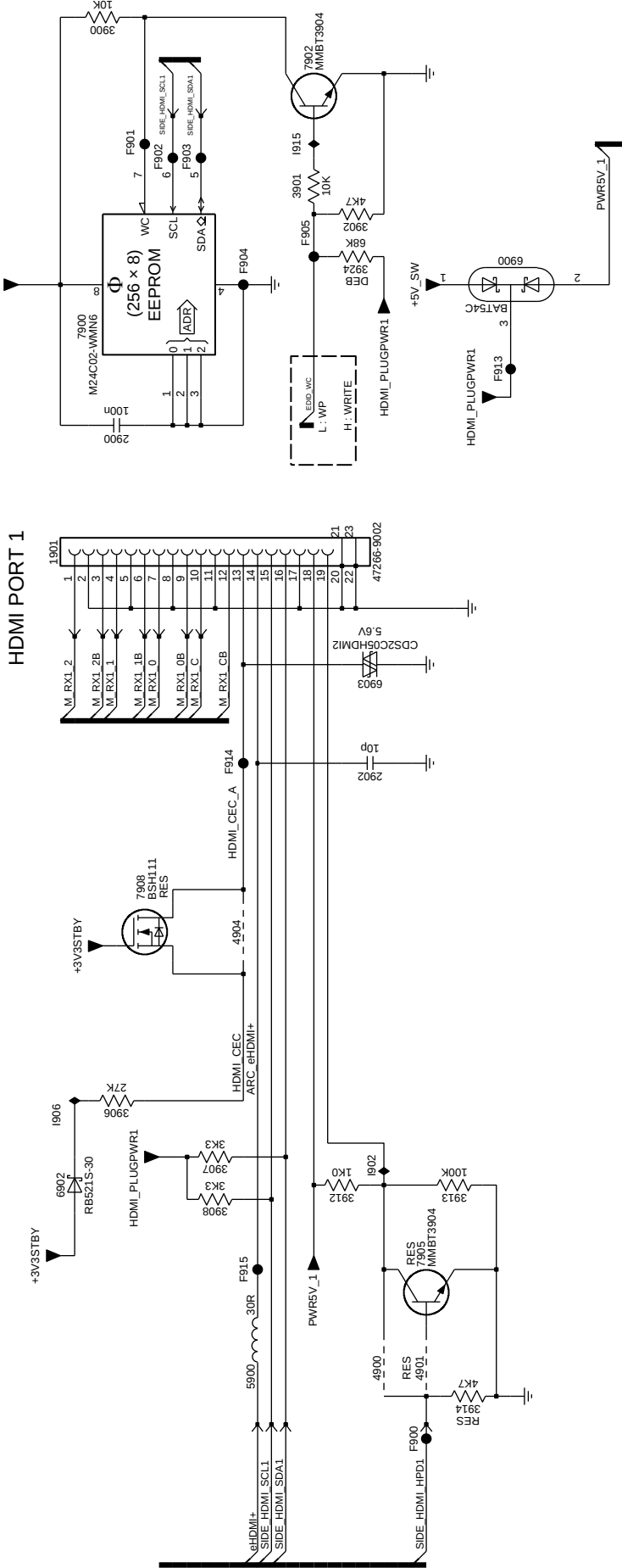
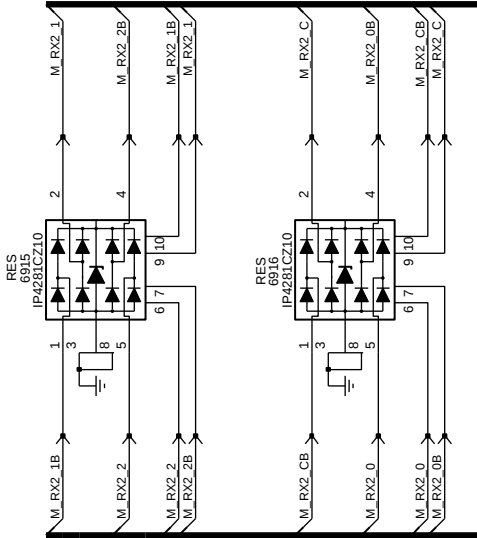
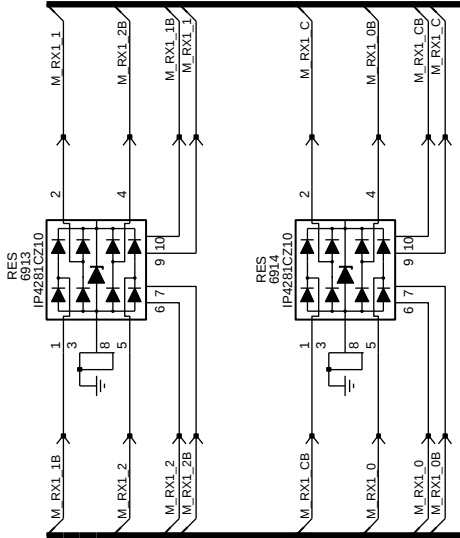
10-5 B05 393912365052

HDMI & Multiplexer

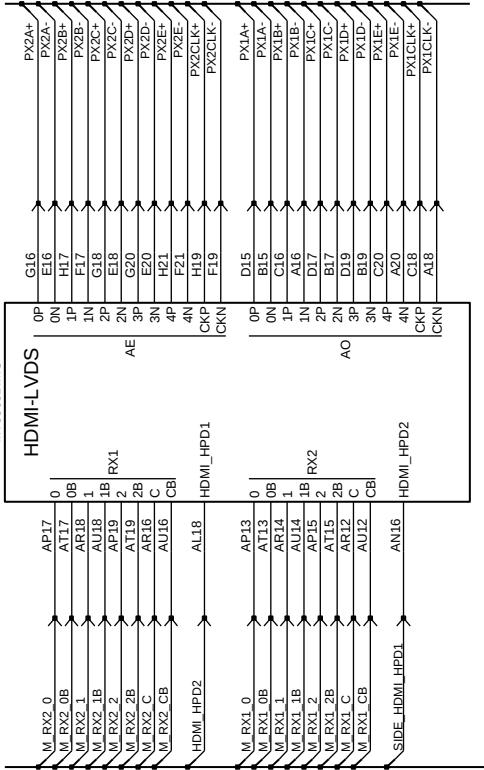
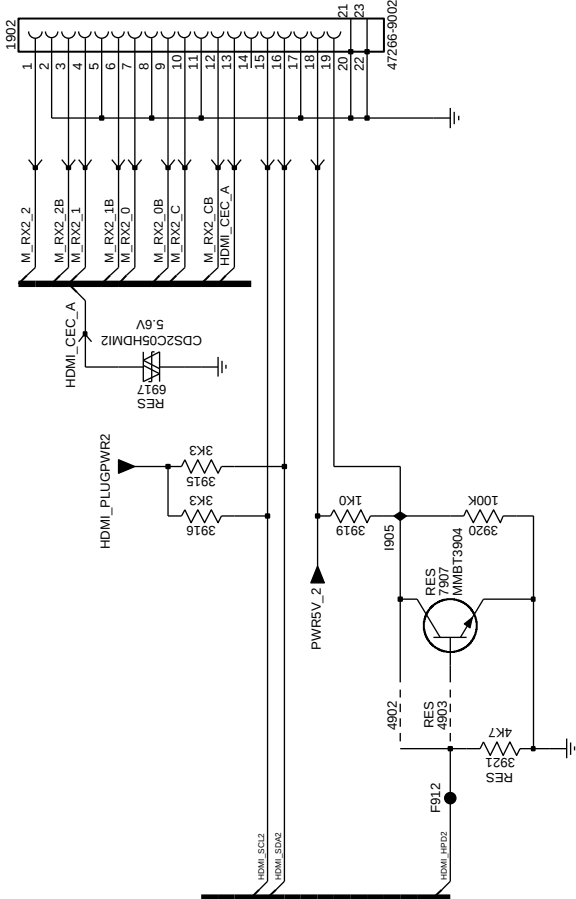
HDMI & Multiplexer

B05A

B05A



HDMI PORT 2 (SIDE)



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99	201.03.12
100	201.03.12

3139 123 6505

THRILLER BRZ DIG

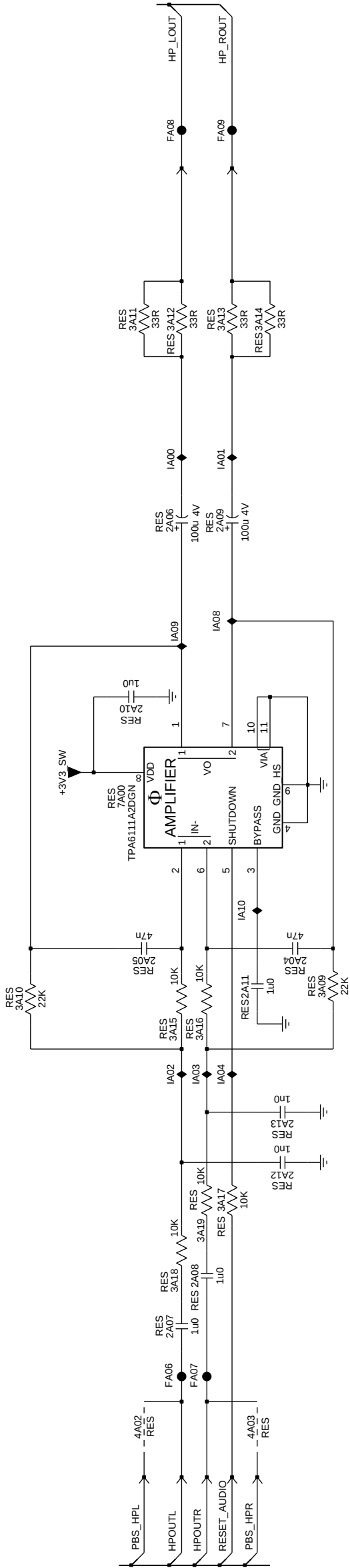
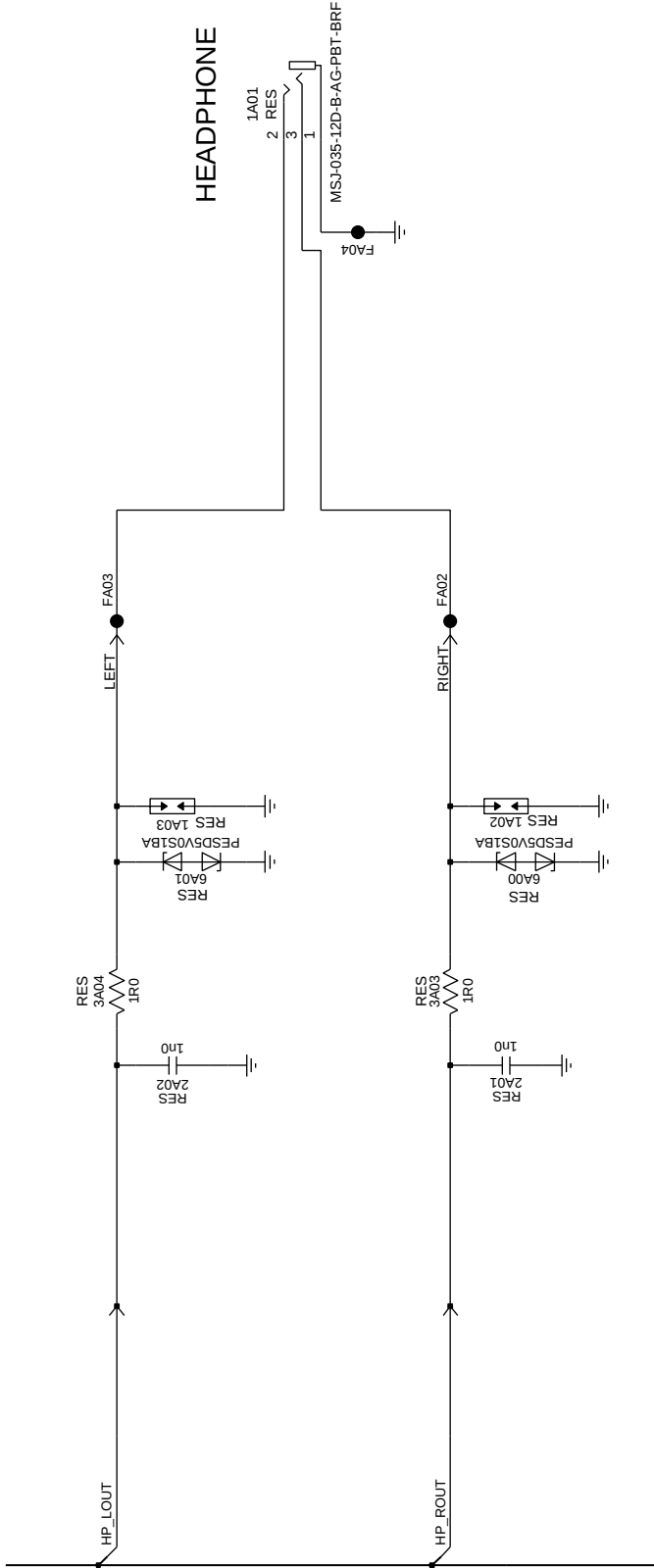
3139 123 6505

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110427

Analog I/O - Headphone

B06A

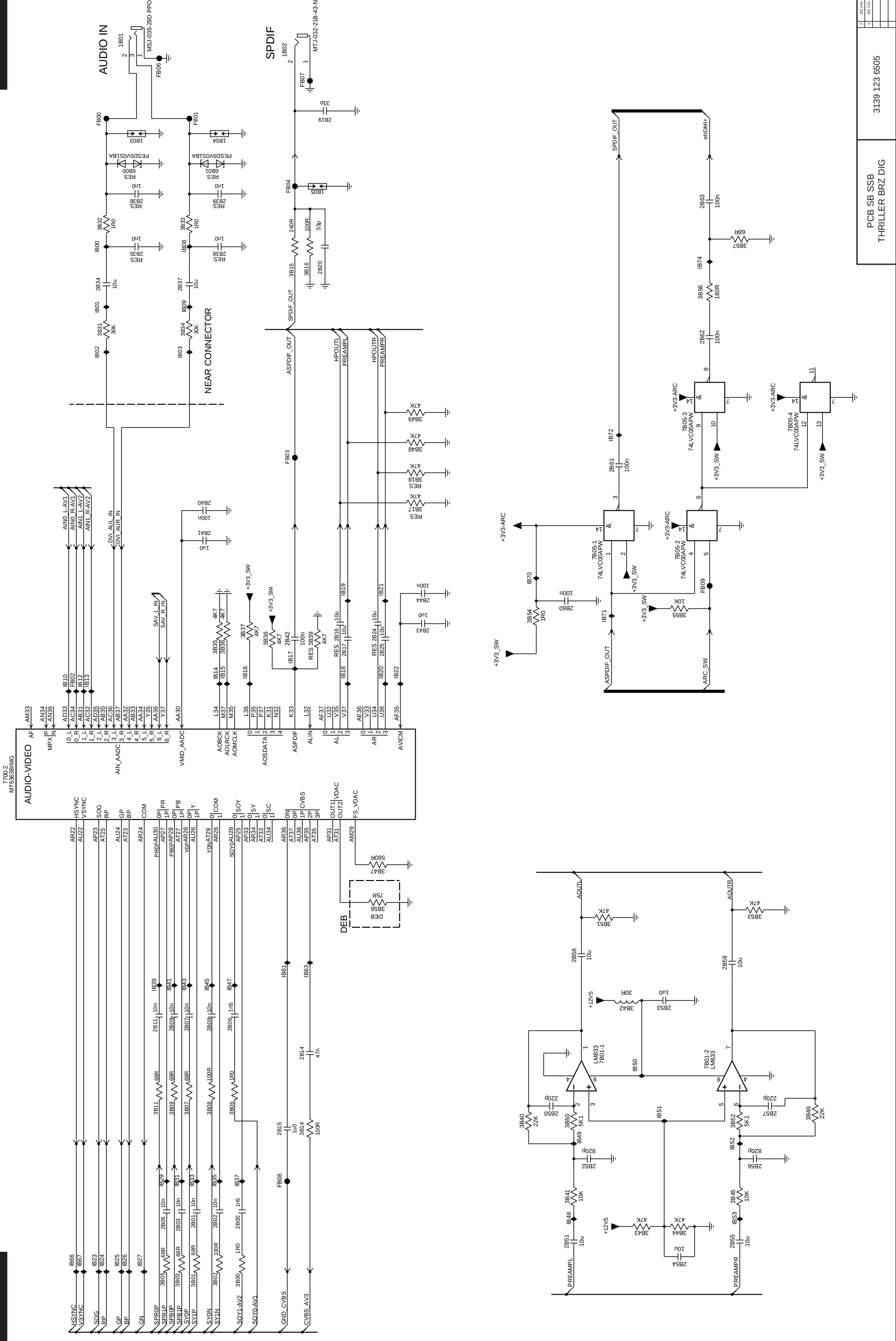
RESERVED



Analog I/O - Audio

Analog I/O - Audio

B06B

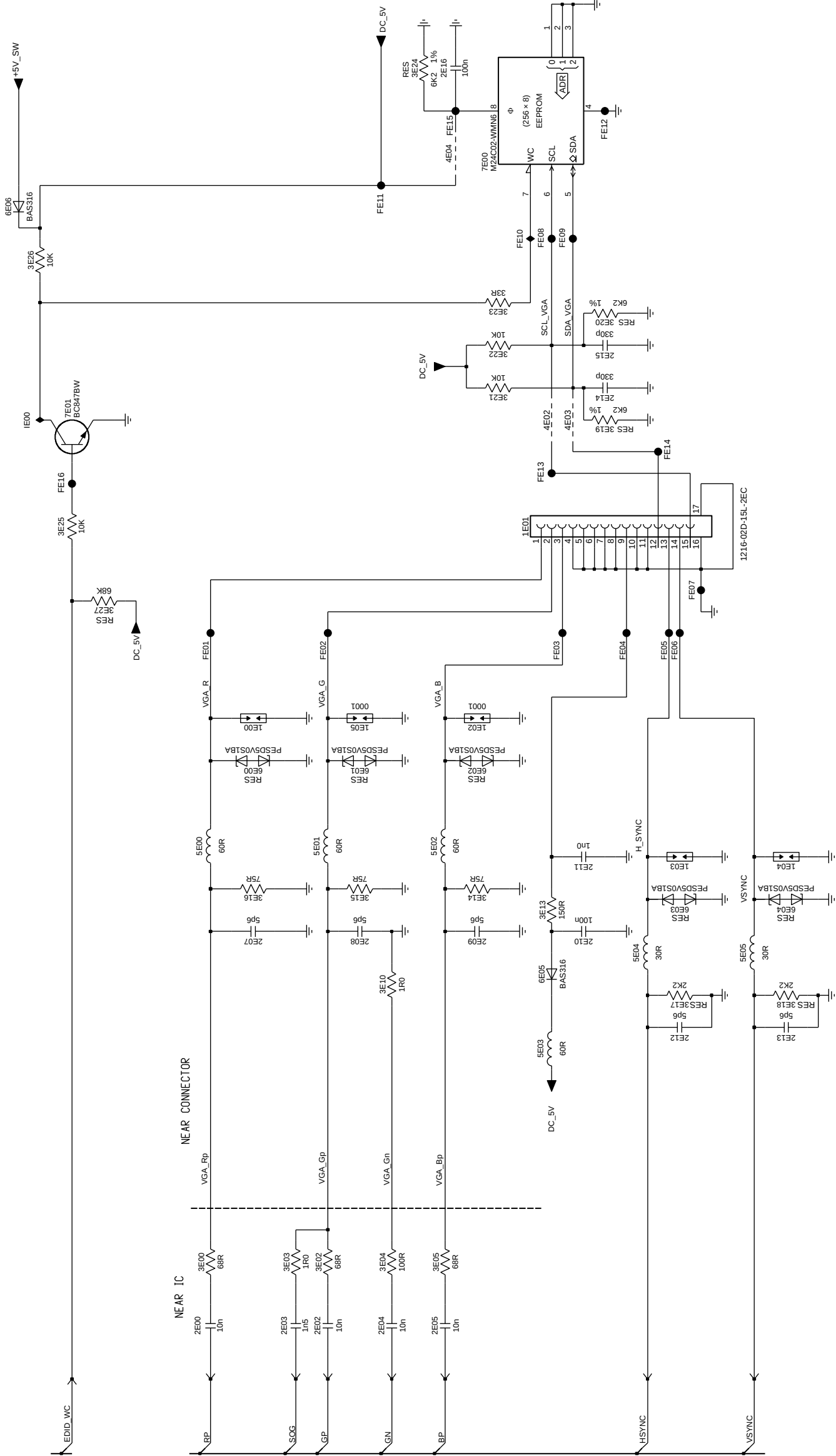


VGA

B06D

VGA

B06D



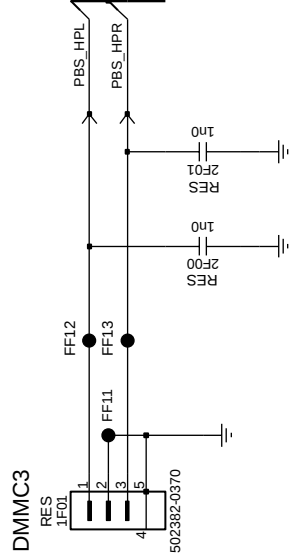
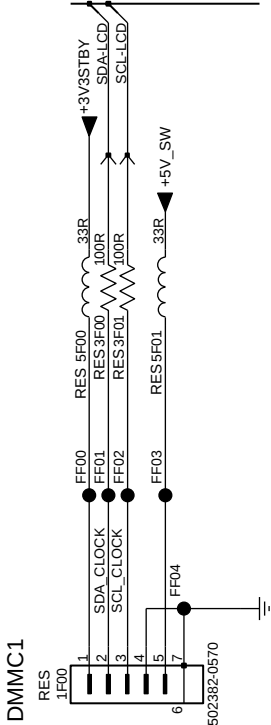
3139 123 6505	PCB SB SSB THRILLER BRZ DIG
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2	2011.04.29

19130_030_110427.eps
110427

10-7 B07 393912365052
Hospitality

B07 Hospitality

B07

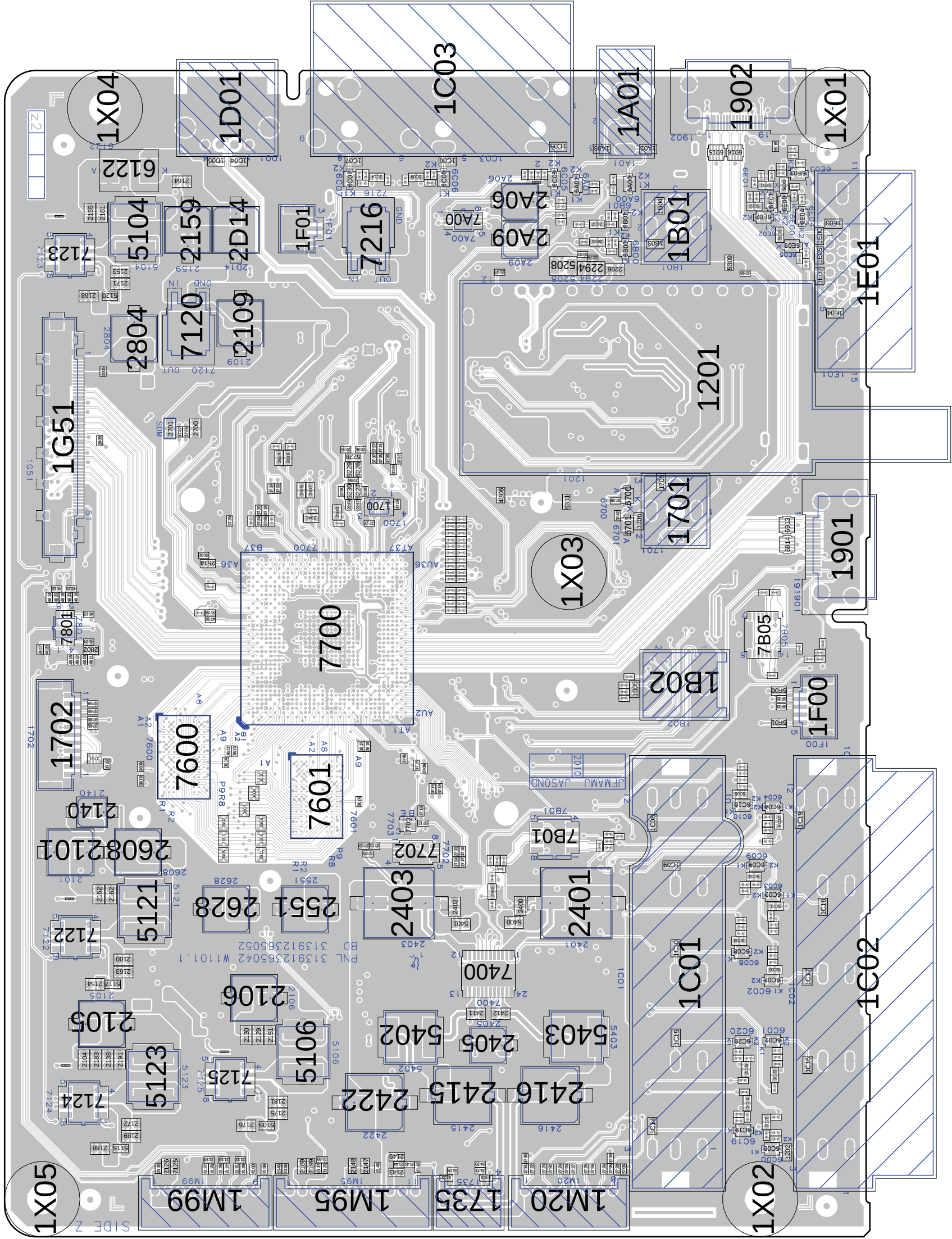


PCB SB SSB THRILLER BRZ DIG		3139 123 6505	2011-04-29
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2	2	2	2

19130_031_110427.eps
110427

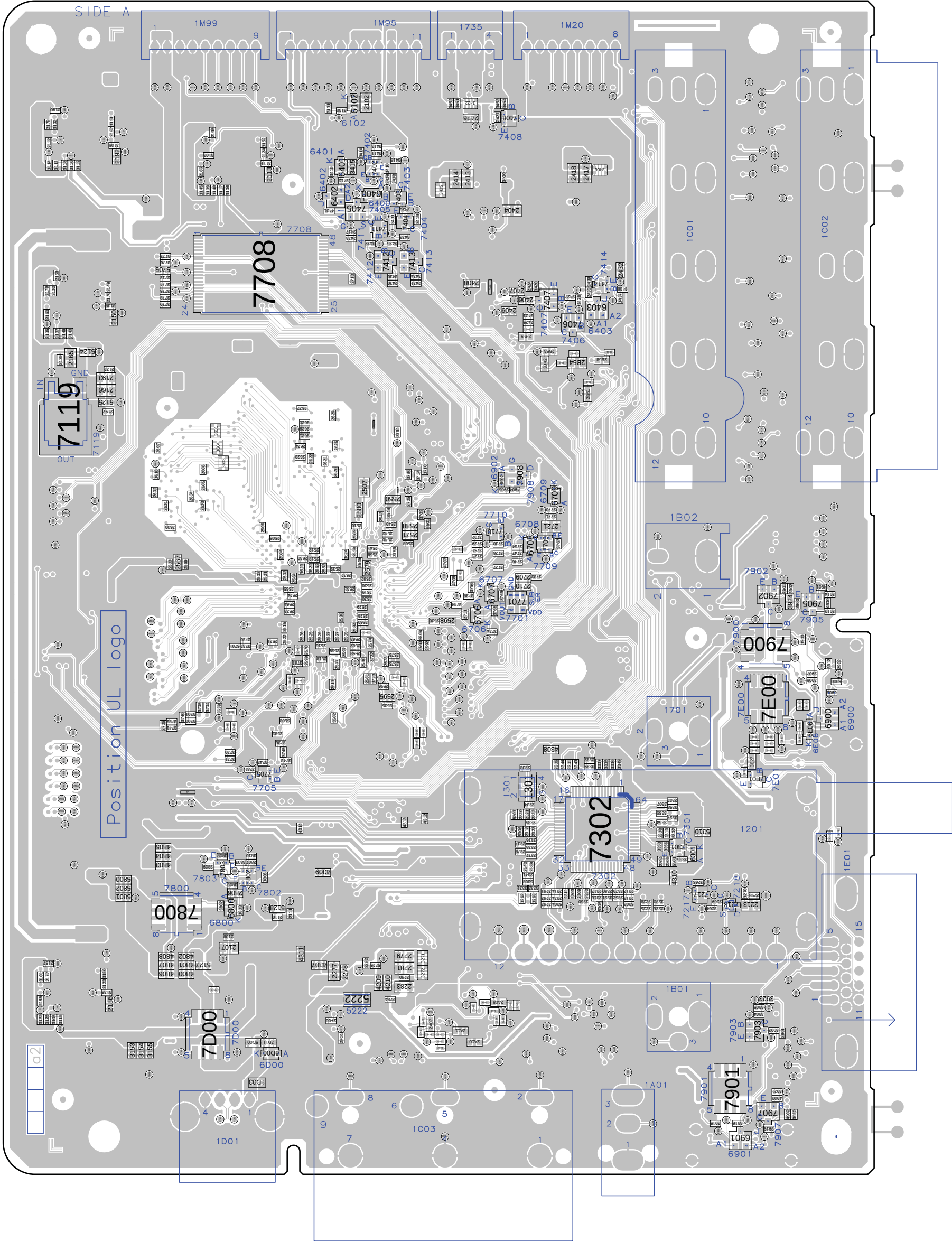
10-8 313912365052 SSB Layout

Overview top side



SSB Layout Top	3139 123 6505

Overview bottom side



SSB Layout Bottom

3139 123 6505

19130_041_110428.eps
110428

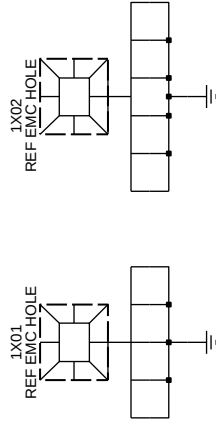
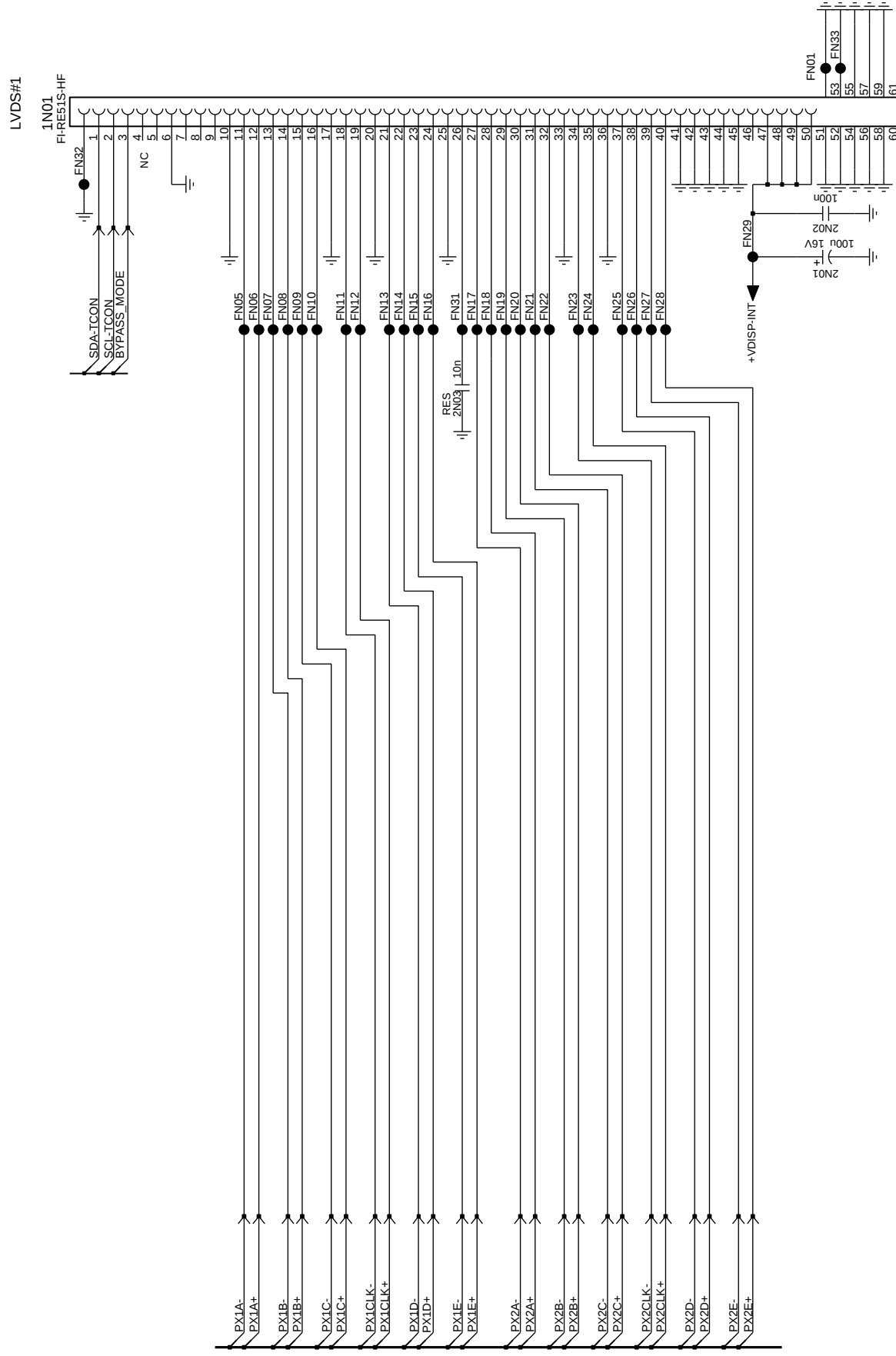
10-9 T01 393912365071

LVDS Display

T01A

LVDS Display

T01A

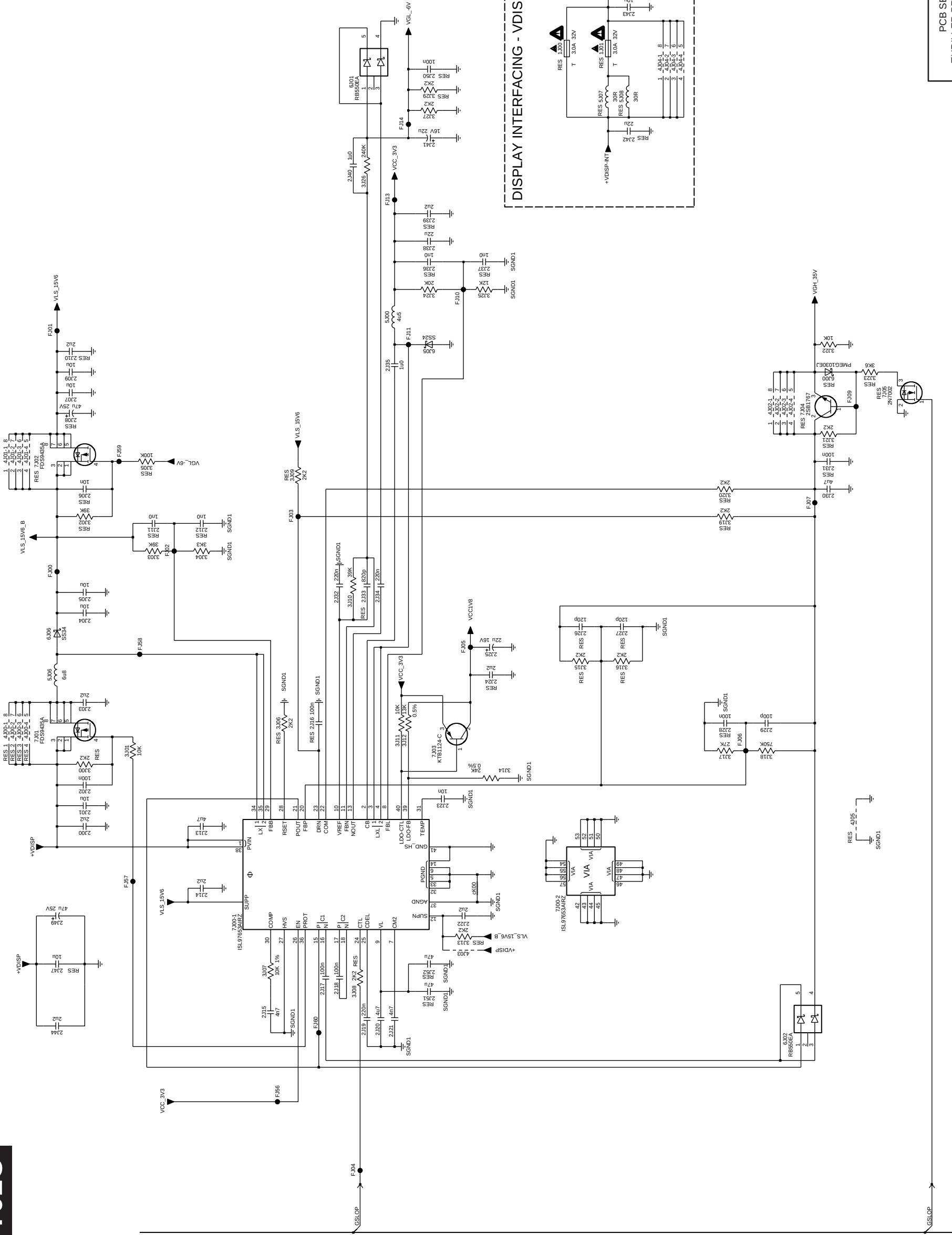


TCON DC/DC

T01C

TCON DC/DC

T01C



PCB SB
THRILLER BRZ TCON

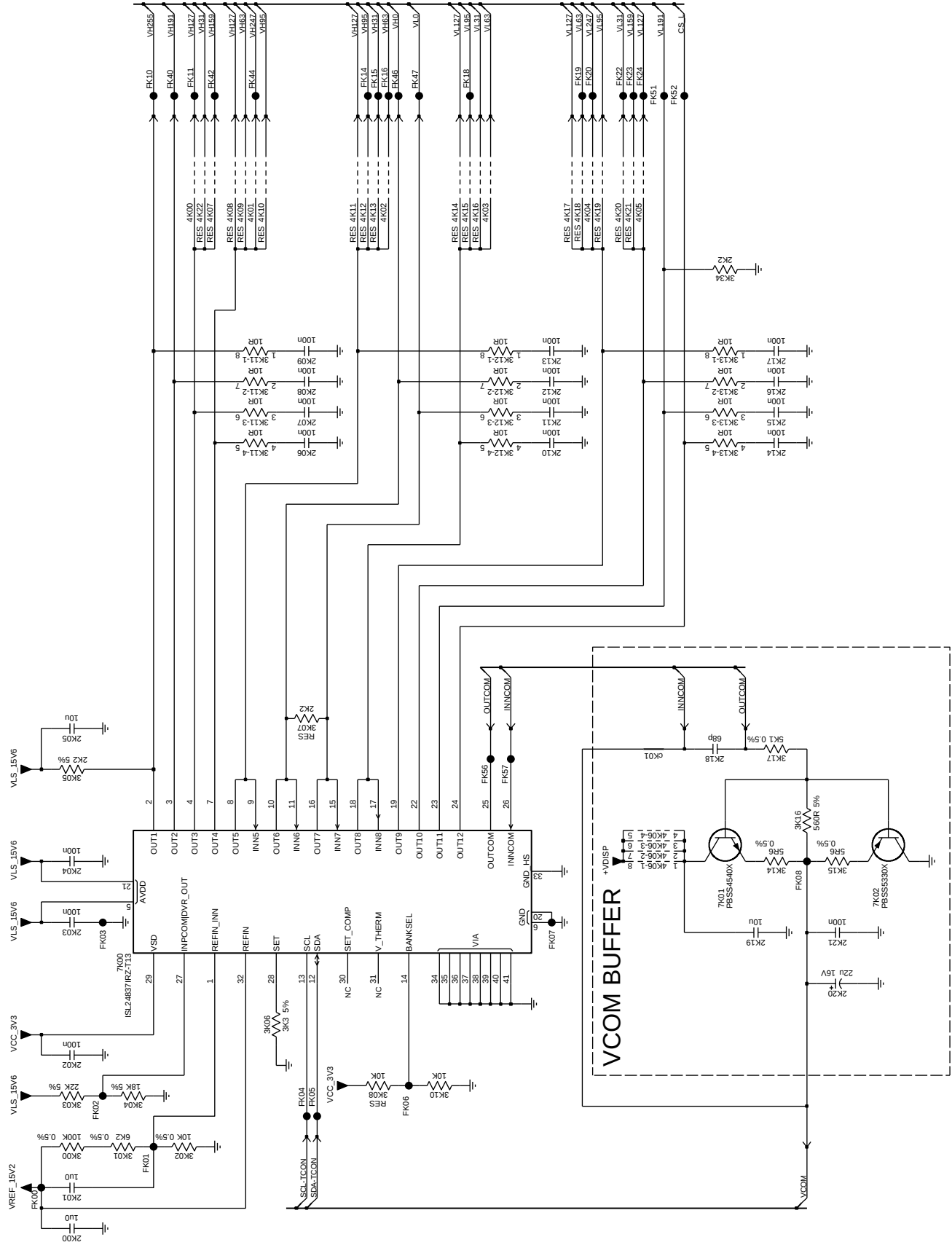
3139 123 6507

P Gamma & Vcom & NVM

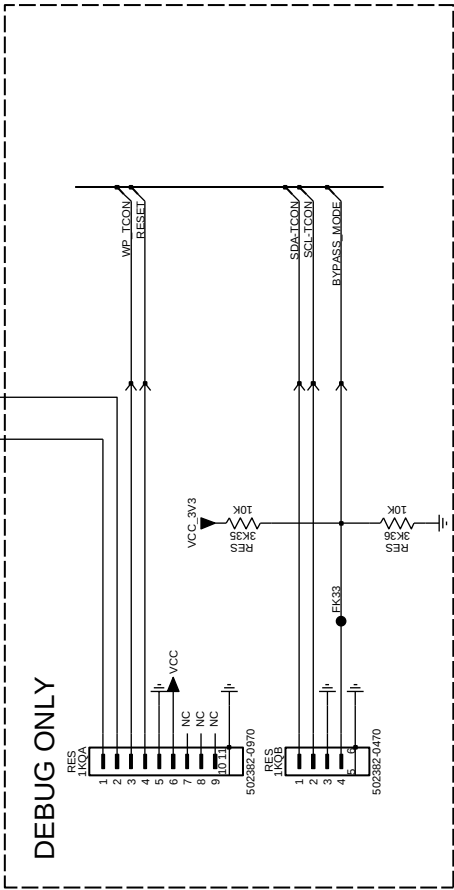
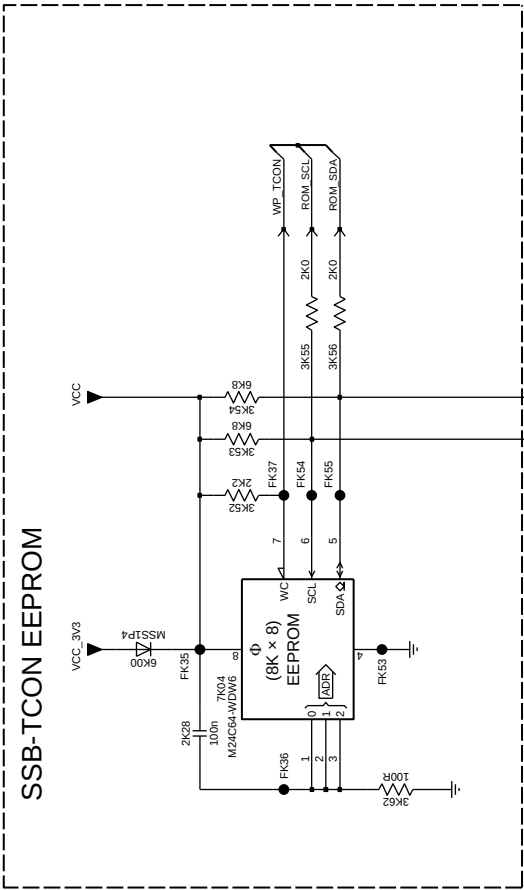
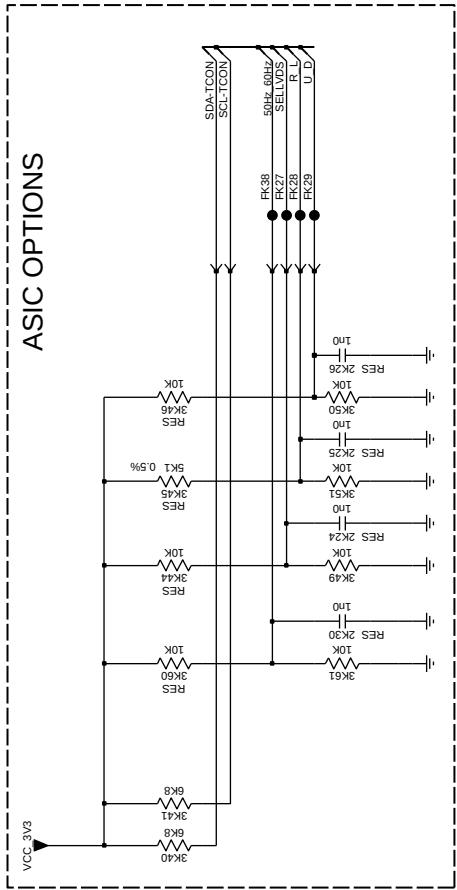
P Gamma & Vcom & NVM

T01D

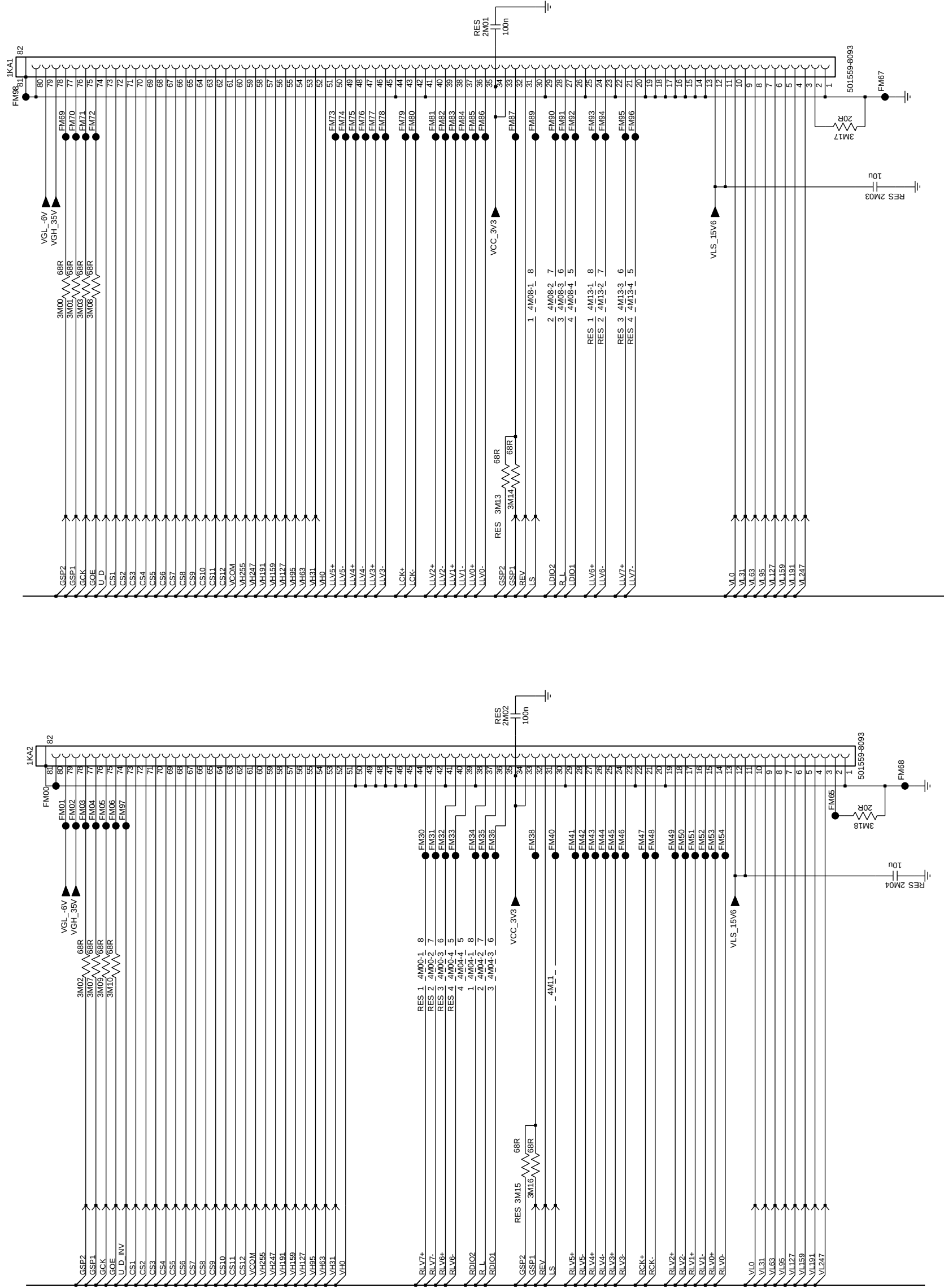
T01D



ITEM NO.	32"	40"
3K45	5K1	-
3K51	-	10K
4K01	-	JUMPER
4K02	-	JUMPER
4K03	-	JUMPER
4K04	-	JUMPER
4K09	JUMPER	-
4K13	JUMPER	-
4K16	JUMPER	-
4K18	JUMPER	-

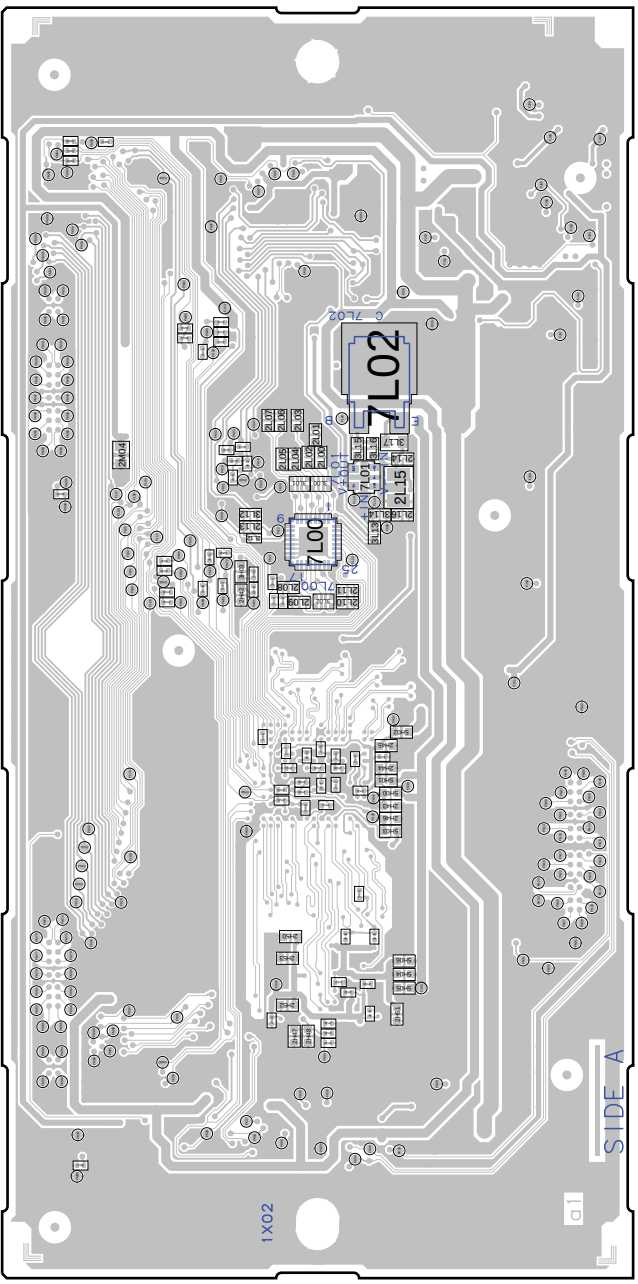
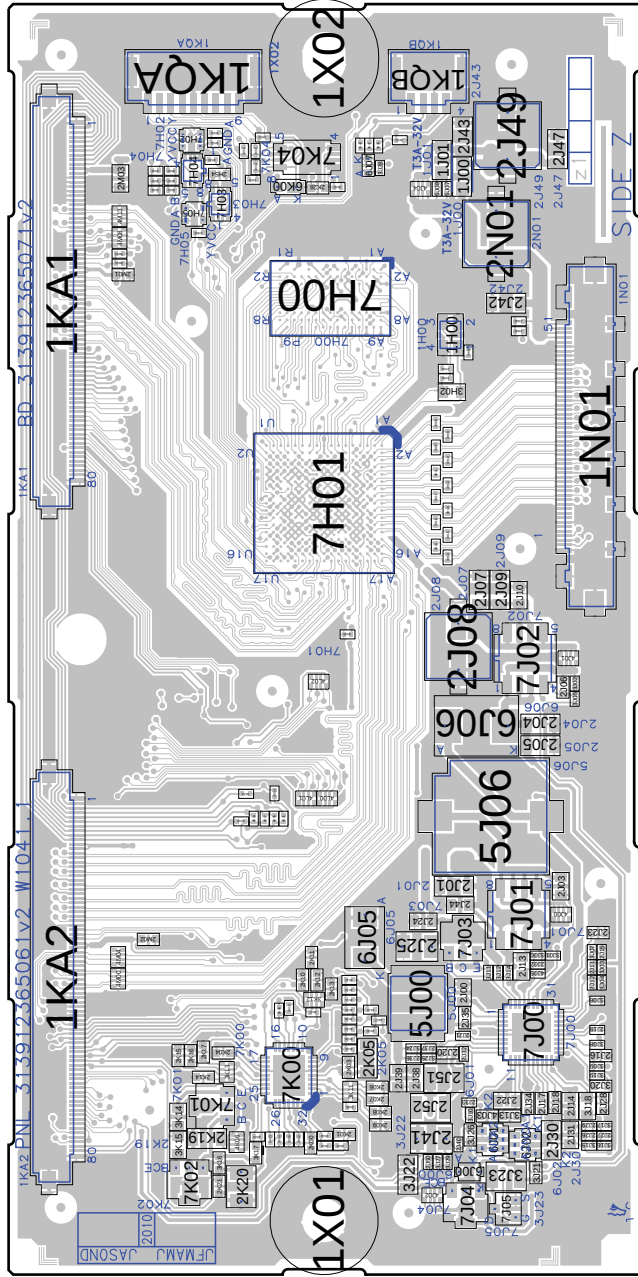


PCB SB	THRILLER BRZ TCON
3139 123 6507	



10-10 313912365071 TCON Layout

Overview top/bottom side

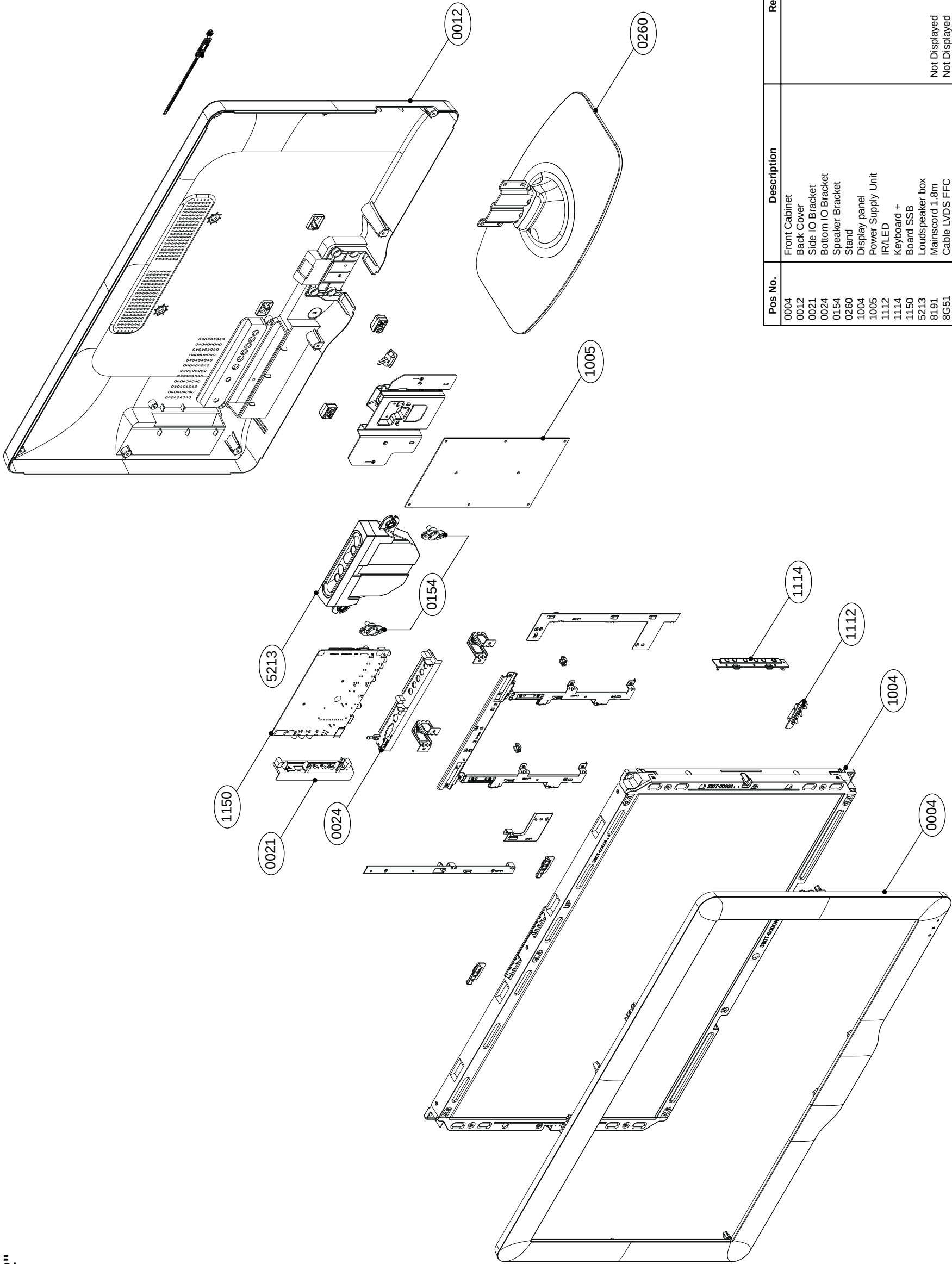


TCOM THRILLER	3139 123 6506	1	2011-04-28

11. Styling Sheets

Styling Sheet Thriller 32"

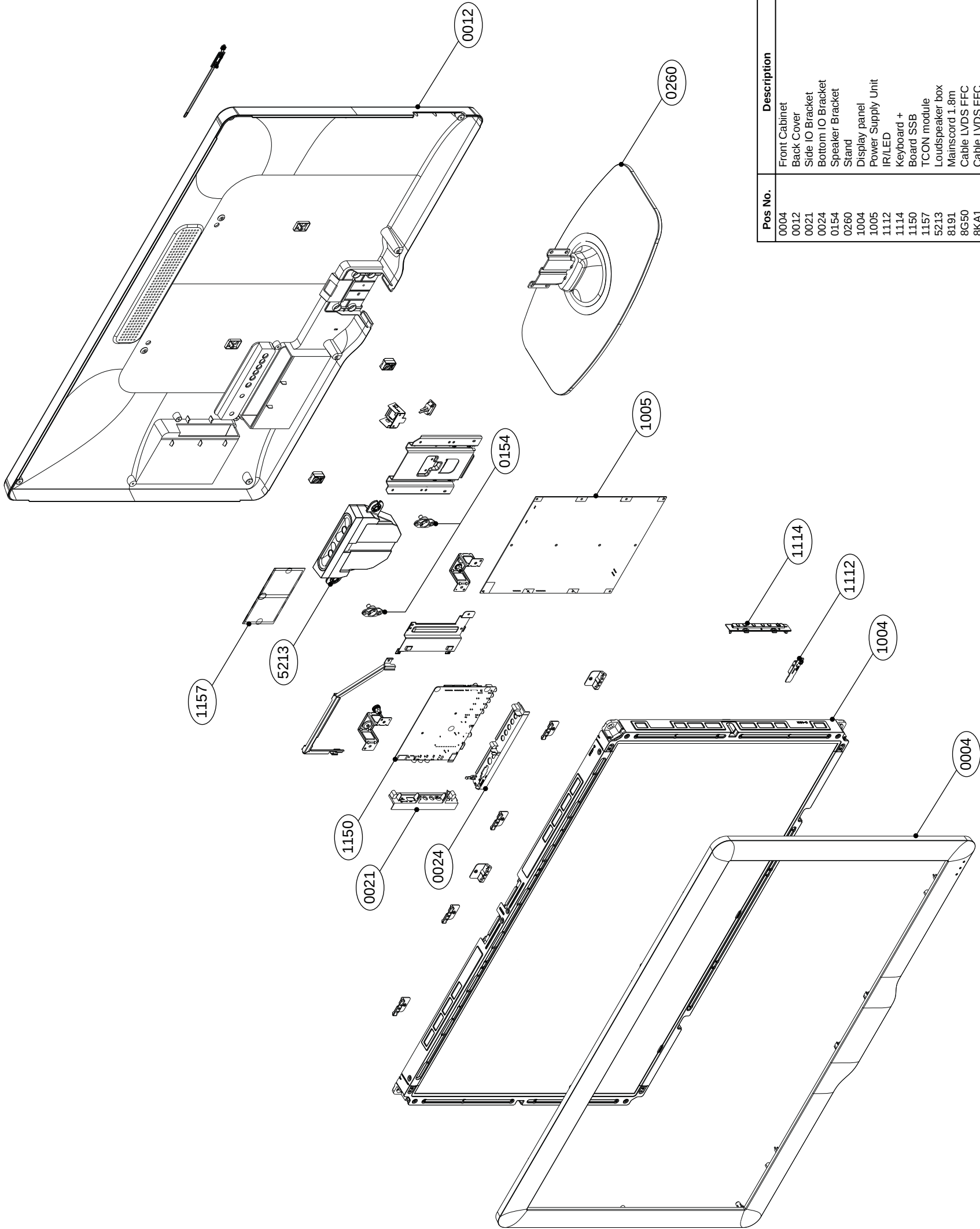
THRILLER 32"



Pos No.	Description	Remarks
0004	Front Cabinet	
0012	Back Cover	
0021	Side IO Bracket	
0024	Bottom IO Bracket	
0154	Speaker Bracket	
0260	Stand	
1004	Display panel	
1005	Power Supply Unit	
1112	IR/LED	
1114	Keyboard +	
1150	Board SSB	
5213	Loudspeaker box	Not Displayed
8191	Mainscord 1.8m	Not Displayed
8G51	Cable LVDS FFC	Not Displayed
1085	Remote Control	

Styling Sheet Thriller 40"

THRILLER 40"



Pos No.	Description	Remarks
0004	Front Cabinet	
0012	Back Cover	
0021	Side IO Bracket	
0024	Bottom IO Bracket	
0154	Speaker Bracket	
0260	Stand	
1004	Display panel	
1005	Power Supply Unit	
1112	IR/LED	
1114	Keyboard +	
1150	Board SSB	
1157	TCON module	
5213	Loudspeaker box	Not Displayed
8191	Mainscord 1.8m	Not Displayed
8G50	Cable LVDS FFC	Not Displayed
8KA1	Cable LVDS FFC	Not Displayed
8KA2	Cable LVDS FFC	Not Displayed
1085	Remote Control	Not Displayed