Colour Television

Chassis

LC10.1L

LA

Service
Service
Service

18850_000_100107.eps
100209

Service Manual

Published by JA/JY 1064 BU TV Consumer Care Printed in the Netherlands Subject to modification EN 3122 785 18980
2010-Apr-06

PHILIPS

1. Revision List

Manual xxxx xxx xxxx.0

- First release.

2. Technical Specifications and Connections

Index of this chapter:

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.

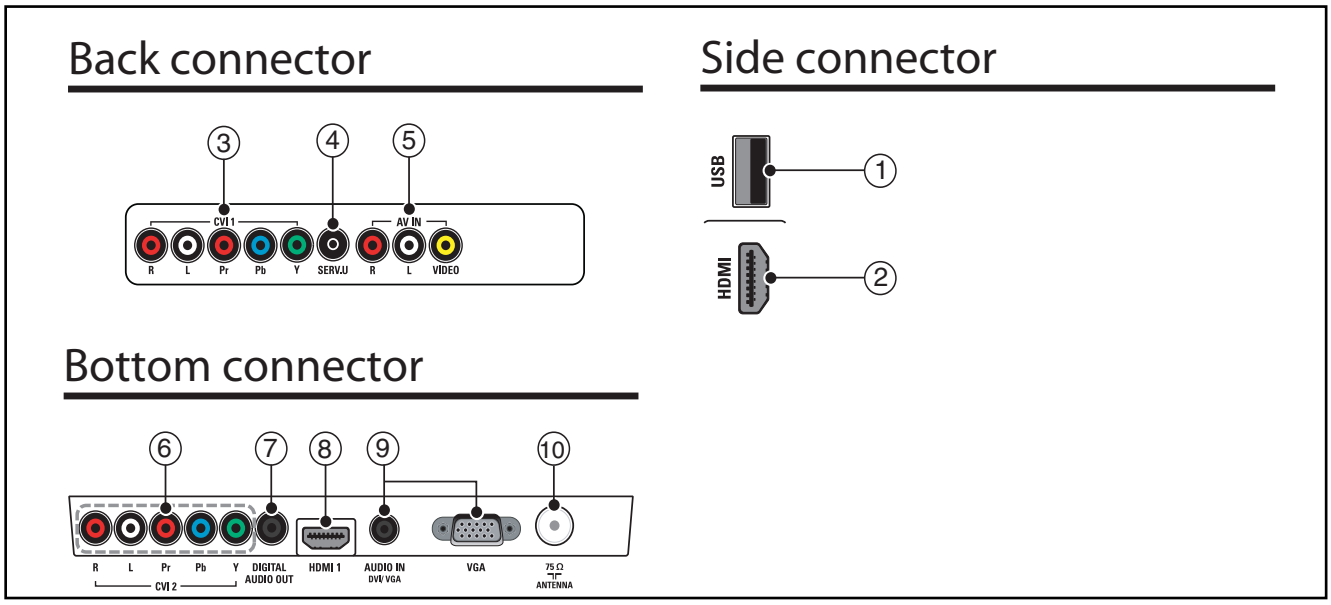
Table 2-1 Described Model numbers

CTN	Styling	Published in:
32PFL3605D/78	Dali	3122 785 18980
40PFL3605D/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

2.3 Connections



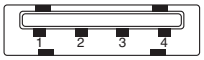
18980_001_100330.eps
100402

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



10000_022_090121.eps
090121

Figure 2-2 USB (type A)

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

2 - HDMI: Digital Video/Audio - In (see HDMI 1)

2.3.2 Back Connections

3 - 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	

4 - Service Connector (UART)

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

5 - AV IN: S-Video (Hosiden): Video Y/C - In

1 - Ground Y	Gnd	
2 - Ground C	Gnd	
3 - Video Y	1 V_{PP} / 75 Ω	
4 - Video C	0.3 V_{PP} / 75 Ω	

5 - 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	

2.3.3 Bottom Connections

6 - 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	

7 - Cinch: Digital Audio - Out

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

8 - HDMI 1: Digital Video, Digital Audio - In

10000_017_090121.eps
090428

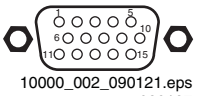
Figure 2-3 HDMI (type A) connector

1 - D2+	Data channel	
2 - Shield	Gnd	
3 - D2-	Data channel	
4 - D1+	Data channel	
5 - Shield	Gnd	
6 - D1-	Data channel	
7 - D0+	Data channel	
8 - Shield	Gnd	
9 - D0-	Data channel	
10 - CLK+	Data channel	
11 - Shield	Gnd	
12 - CLK-	Data channel	
13 - Easylink	Control channel/CEC	
14 - n.c.		
15 - DDC_SCL	DDC clock	
16 - DDC_SDA	DDC data	
17 - Ground	Gnd	
18 - +5V		
19 - HPD	Hot Plug Detect	
20 - Ground	Gnd	

9 - Mini Jack: Audio - In DVI/VGA

Bk - Audio	0.5 V_{RMS} / 10 kΩ	

9 - VGA: Video RGB - In



10000_002_090121.eps
090127

Figure 2-4 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	Gnd	
6 - Ground Red	Gnd	
7 - Ground Green	Gnd	
8 - Ground Blue	Gnd	
9 - +5V_{DC}	+5 V	
10 - Ground Sync	Gnd	
11 - n.c.		
12 - DDC_SDA	DDC data	
13 - H-sync	0 - 5 V	
14 - V-sync	0 - 5 V	
15 - DDC_SCL	DDC clock	

10 - Aerial - In

- F-type	Coax, 75 Ω	

3. Precautions, Notes, and Abbreviation List

Index of this chapter:

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. Of de set ontploft!

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 (⏚), 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.

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.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.

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: AG**2**B0335000001) 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: AG**1**B033500001), then the TV set has been manufactured according to B.O.M. number 1. If the third digit is a "2" (example: AG**2**B0335000001), 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. AG is Bruges), 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 2006 week 17). The 6 last digits contain the serial number.

10000_024_090121.eps
100105

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

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
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
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
DNR	Digital Noise Reduction: noise reduction feature of the set
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 (color carrier= 4.433619 MHz) and South America (color 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. Color system mainly used in France and East Europe. Color 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

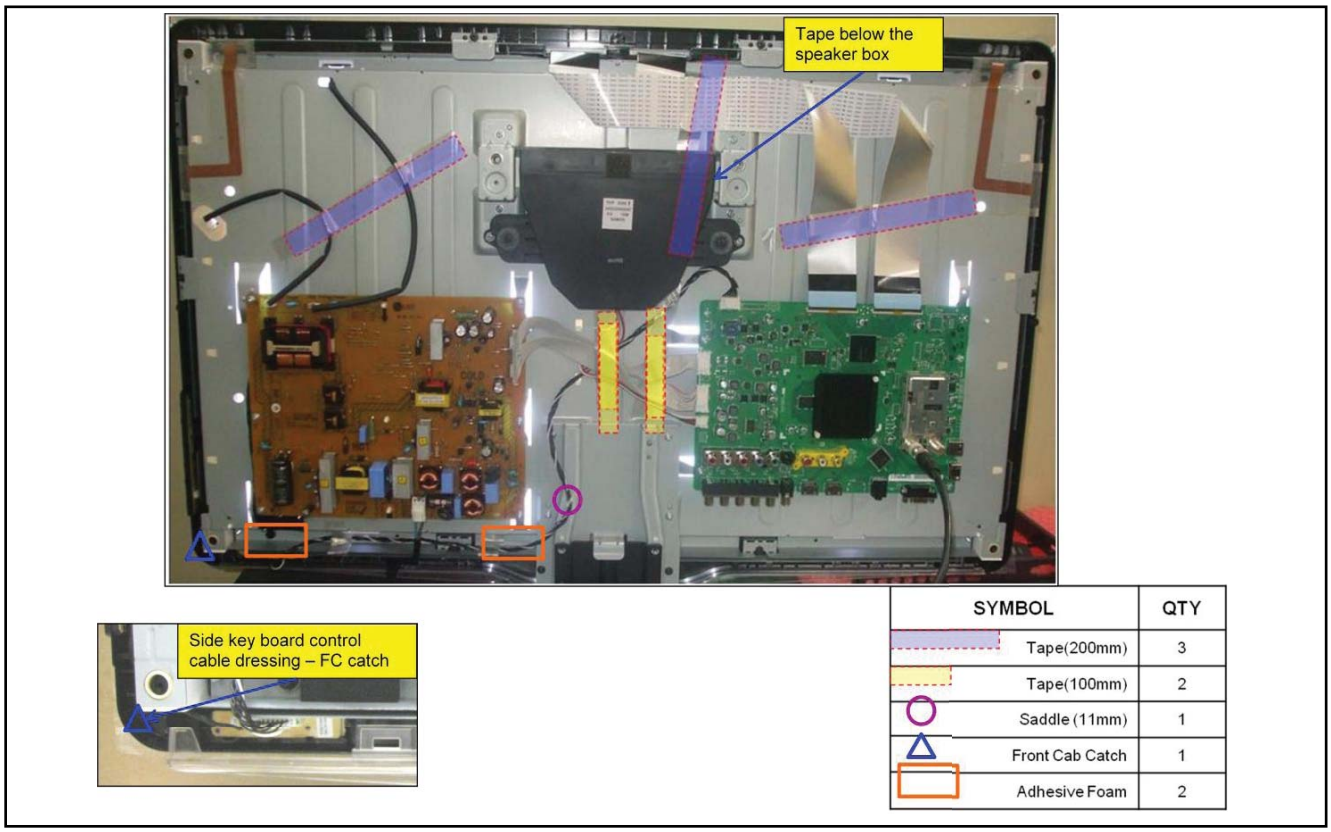
4. Mechanical Instructions

Index of this chapter:

Notes:

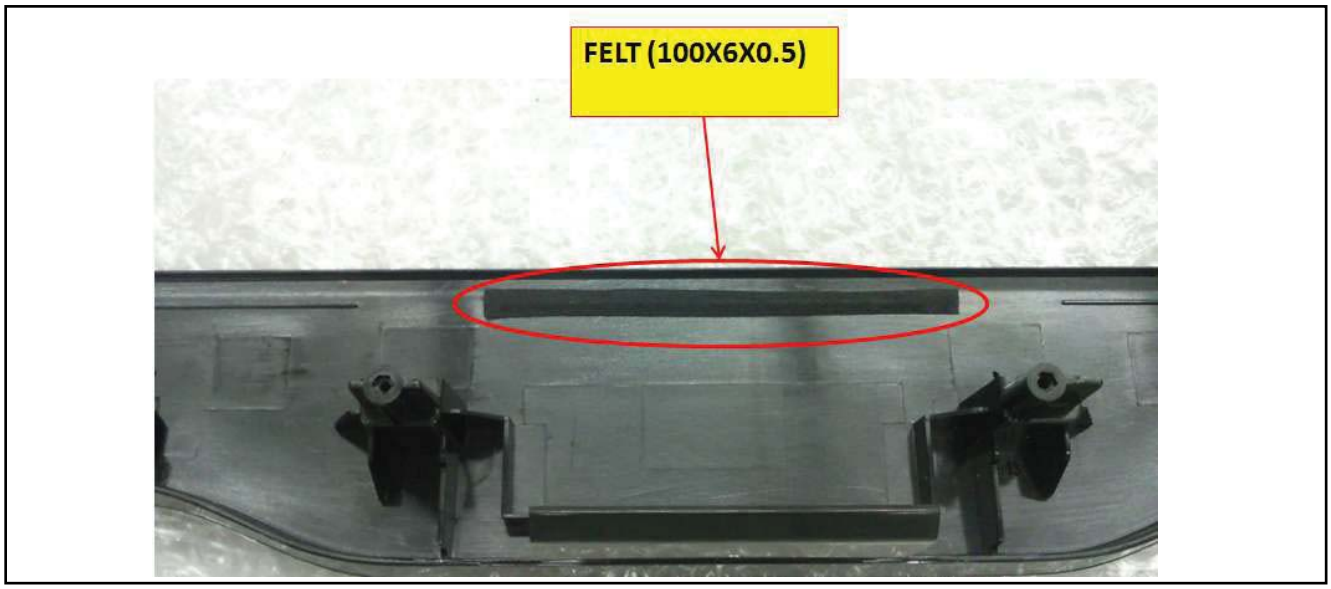
- Figures below can deviate slightly from the actual situation, due to the different set executions.

4.1 Cable Dressing



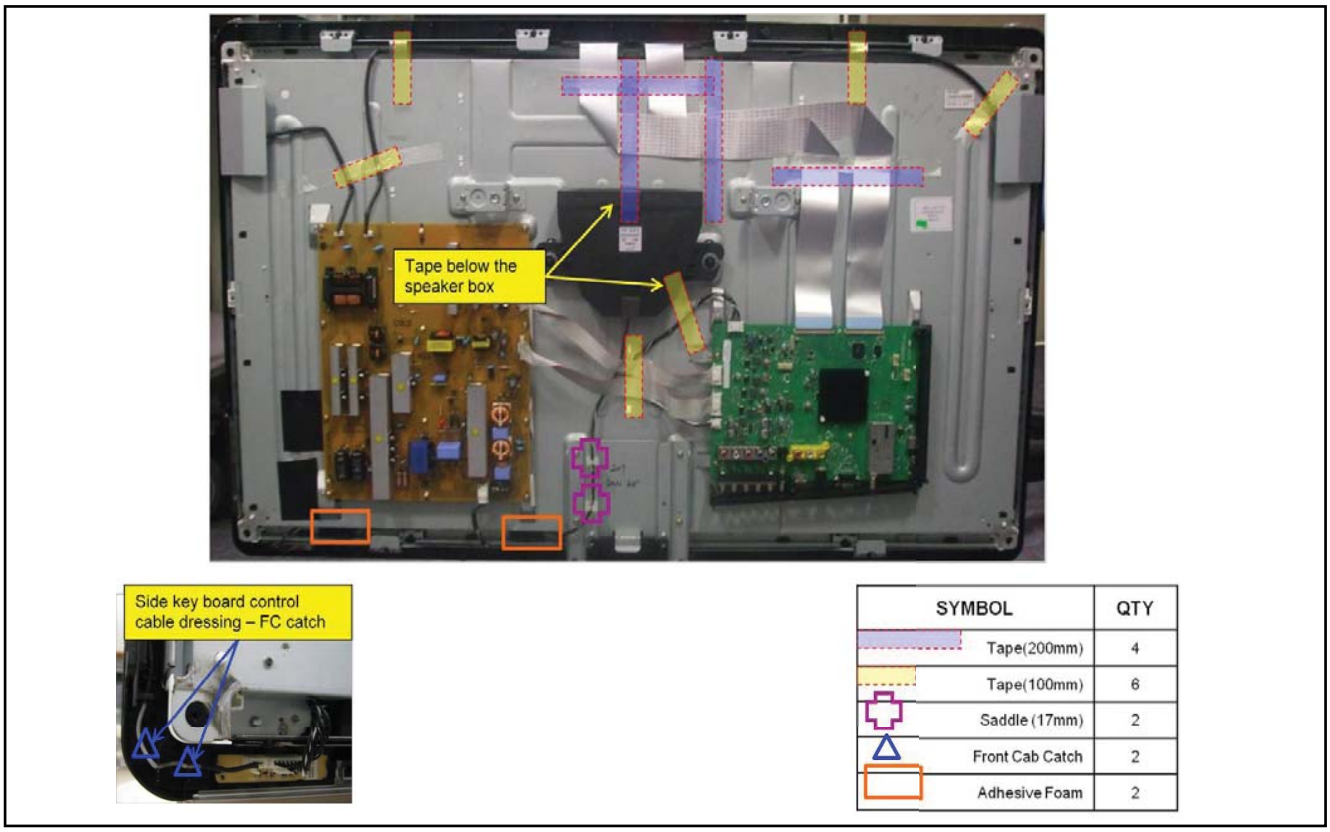
18980_101_100331.eps
100331

Figure 4-1 Cable dressing 32"



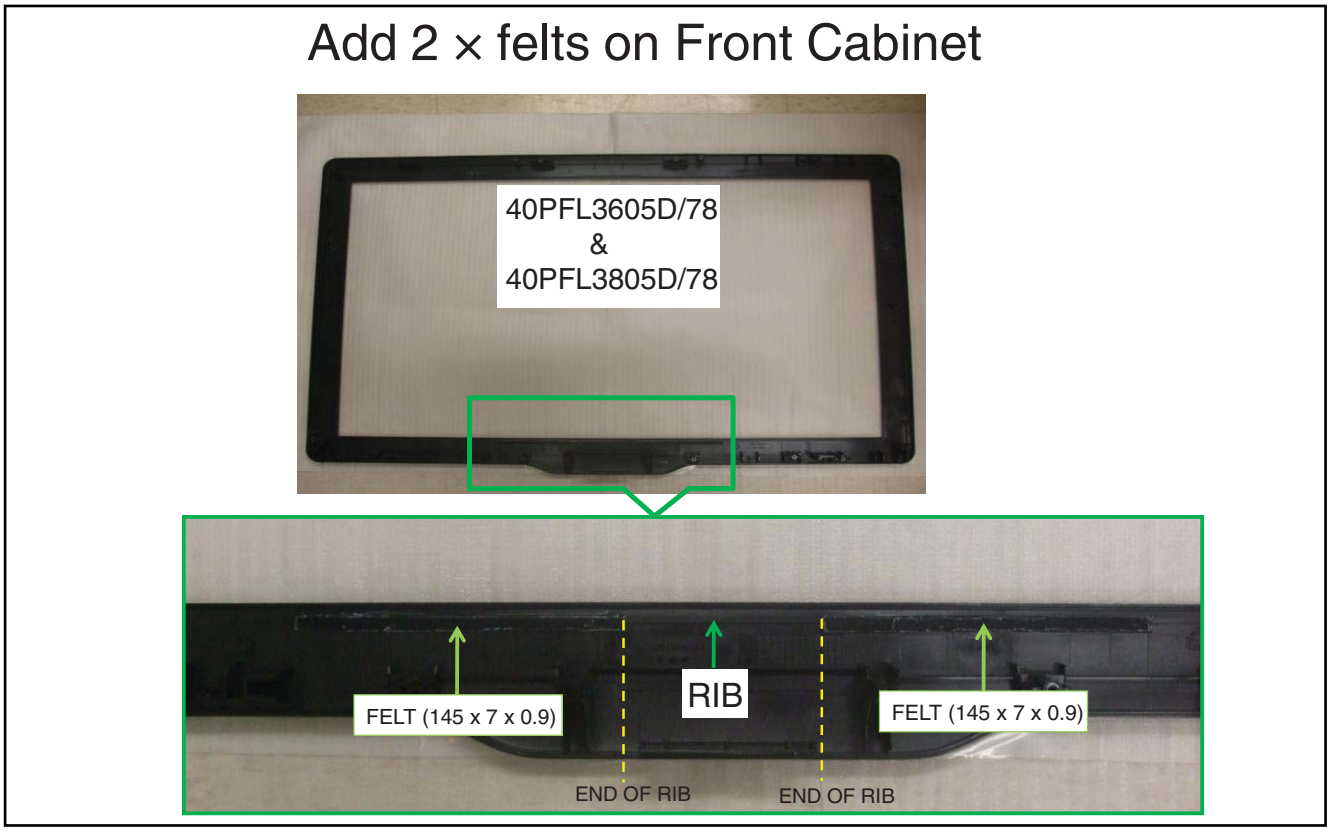
18970_108_100323.eps
100331

Figure 4-2 Adding felt on front cabinet 32"



18980_103_100331.eps
100331

Figure 4-3 Cable dressing 40"



18980_104_100331.eps
100401

Figure 4-4 Adding felt on front cabinet 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.

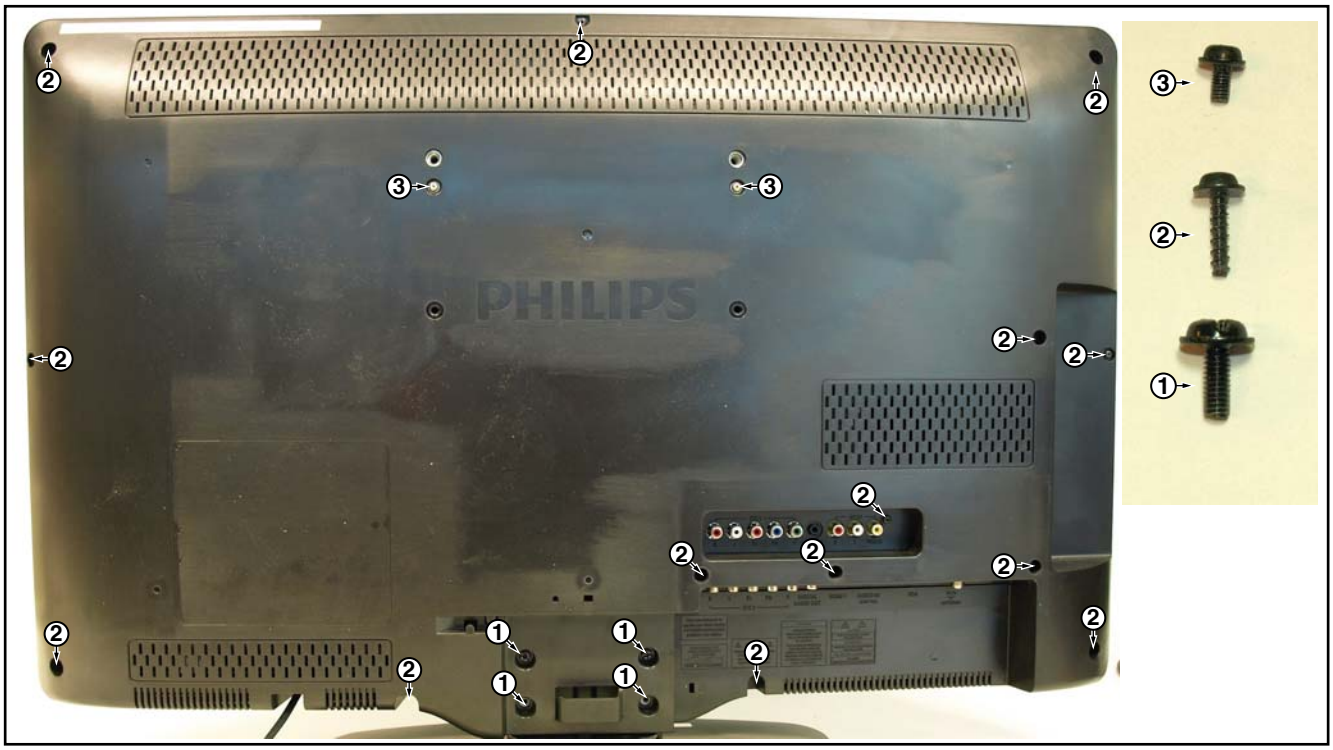
4.3 Assy/Panel Removal

Instructions below apply to the 32PFL3605D/xx, but will be similar for other models.

4.3.1 Rear Cover

Warning: Disconnect the mains power cord before you remove the rear cover.
Note: it is **not** necessary to remove the stand while removing the rear cover.
1. Remove all screws of the rear cover.
2. Lift the rear cover from the TV. Make sure that wires and flat coils are not damaged while lifting the rear cover from the set.

4.3.2 Rear Cover



18980_105_100331.eps
100331

Figure 4-5 Rear cover removal (32")

Warning: Disconnect the mains power cord before removing the rear cover.
See Figure 4-5.
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.

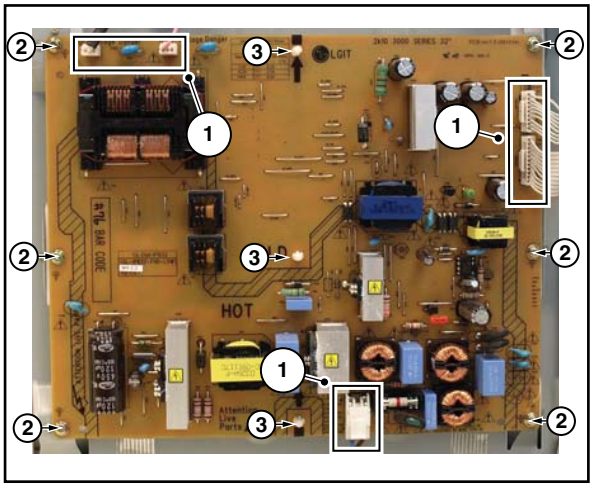
4.3.3 Speakers

Tweeters (when applicable)
Each tweeter unit is mounted with one screw.
When defective, replace the whole unit.

Loudspeaker/subwoofer
The loudspeaker/subwoofer is located in the centre of the set, and is fixed with two screws.
When defective, replace the whole unit.

4.3.4 Main Power Supply

Refer to next figure for details.



18980_106_100331.eps
100331

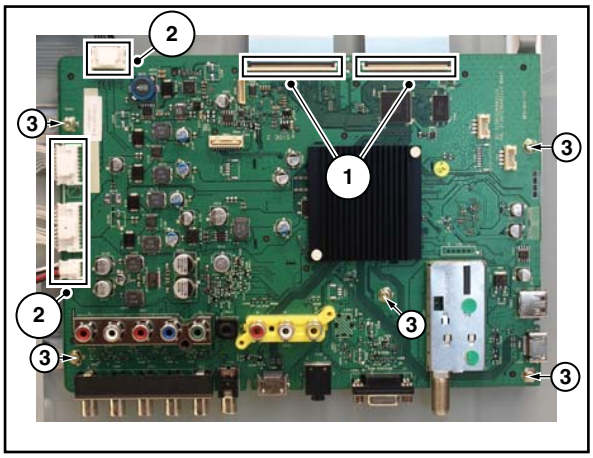
Figure 4-6 Main Power Supply

1. Unplug all connectors [1].
2. Remove the fixation screws [2].
3. Take the board out.

When defective, replace the whole unit.
Be aware to (re)place the spacers [3].

4.3.5 Small Signal Board (SSB)

Refer to next figure for details.



18980_107_100331.eps
100331

Figure 4-7 SSB

1. Unplug all connectors [1] and [2].
2. Remove the fixation screws [3].
3. Take the board out.

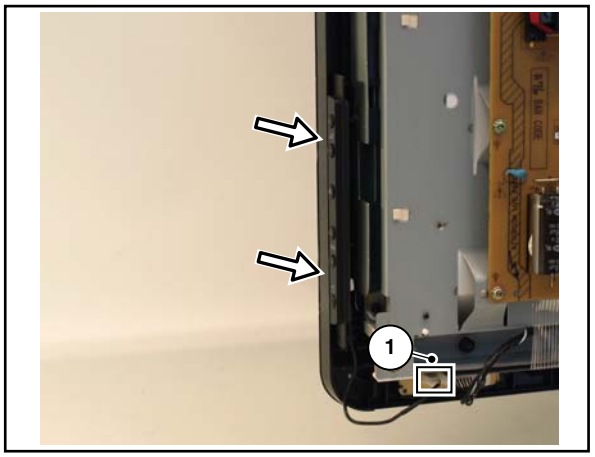
When defective, replace the whole unit.

4.3.6 Local Control Board

Refer to next figure for details.

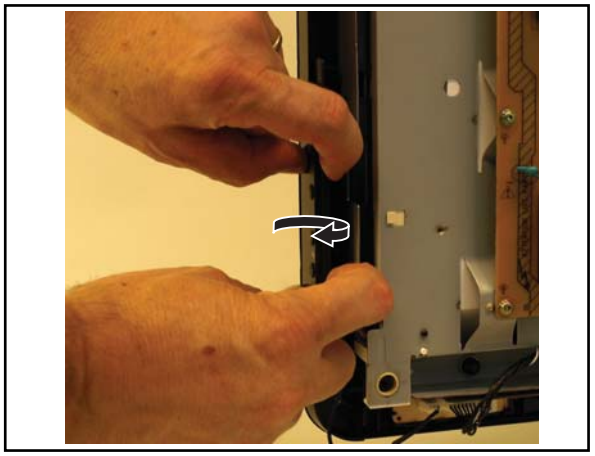
1. Unplug the connector [1] on the IR/LED board that leads to the Local Control board, as it is not unplug-able at the Local Control board itself (soldered connector).
2. Release the cable from its clamps/tape.
3. Put your thumbs against the front bezel [1] while pulling the Local Control board in the direction of the arrow (fig. 2).

When defective, replace the whole unit.



18980_102_100331.eps
100401

Figure 4-8 Keyboard Control Board - 1 -

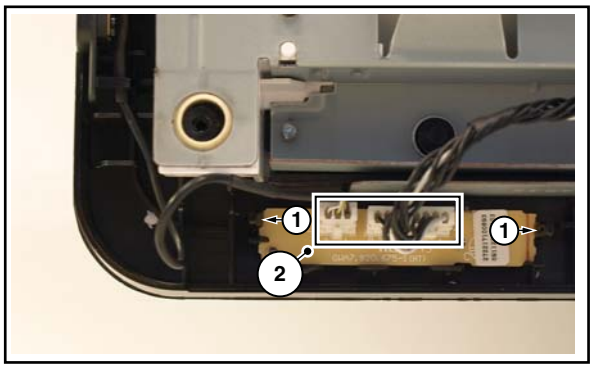


18980_109_100331.eps
100331

Figure 4-9 Keyboard Control Board - 2 -

4.3.7 IR/LED Board

Refer to next figure for details.



18980_108_100331.eps
100331

Figure 4-10 IR/LED Board

1. Push both clips [1] that secure the IR & LED board outwards.
2. Pull the board out.
3. Remove the connectors [2] on the IR/LED board.

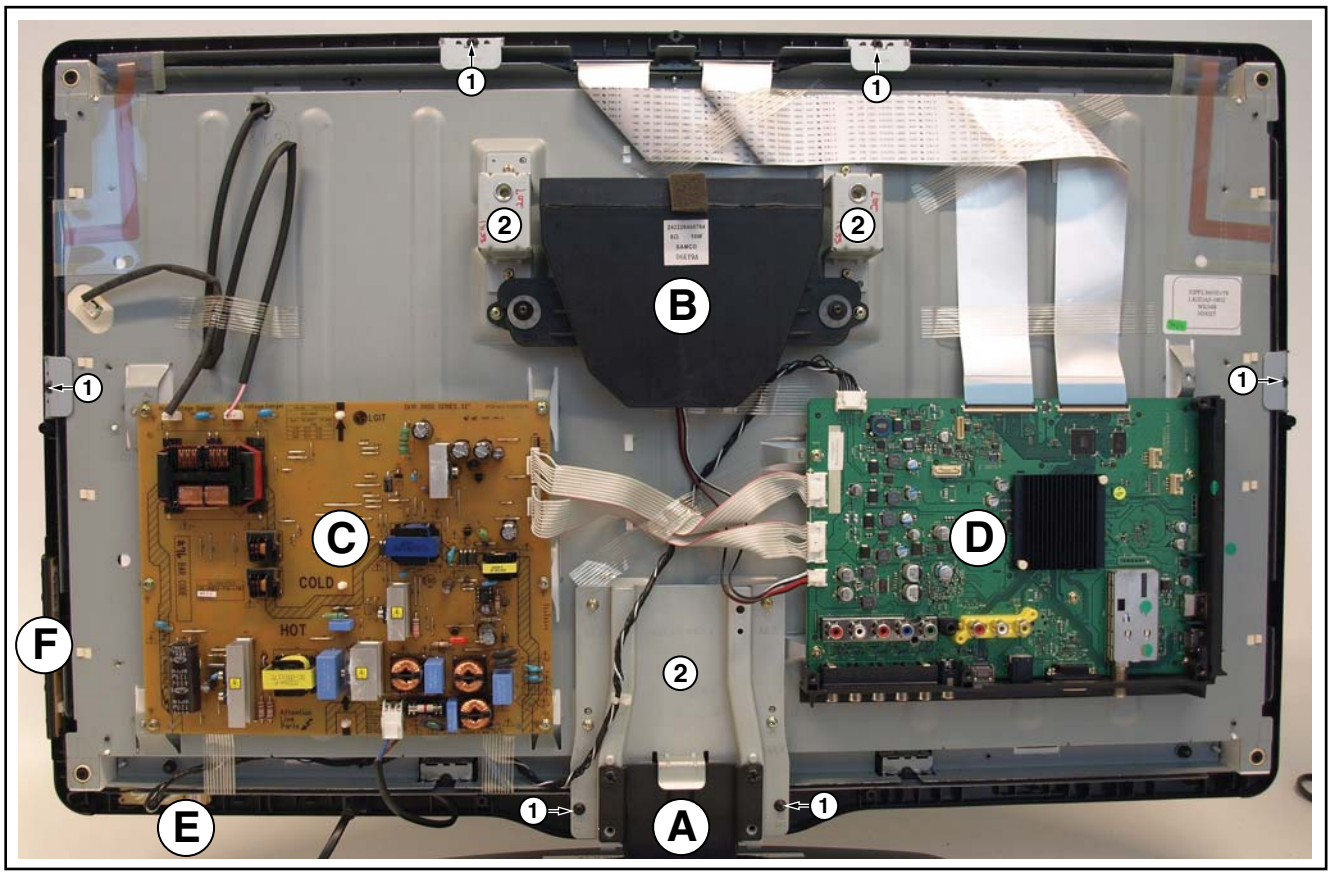
When defective, replace the whole unit.

4.3.8 LCD Panel

Refer to Figure 4-11 for details.

1. Remove the Stand [A].
2. Remove the Speakers/Subwoofer [B] as described earlier.
3. Remove the PSU [C] and SSB [D] as described earlier.
4. Remove the IR/LED board [E] as described earlier.
5. Remove the Local Control board [F] as described earlier.
6. Remove the clamps [1].
7. Remove all metal brackets [2] that do not belong to the LCD display.

Now the LCD Panel can be lifted from the front cabinet.



18980_110_100331.eps
100331

Figure 4-11 LCD Panel removal (based on 32" 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.
- Pay special attention not to damage the EMC foams in the set. Ensure that EMC foams are mounted correctly.

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

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).

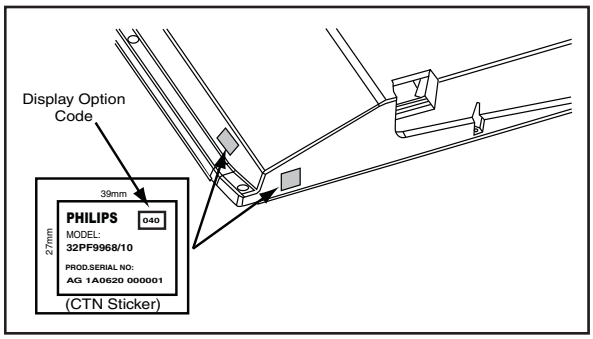
5.2.1 General

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: LC101.
- **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 column “Display Code” in Table 6-4 , or 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).

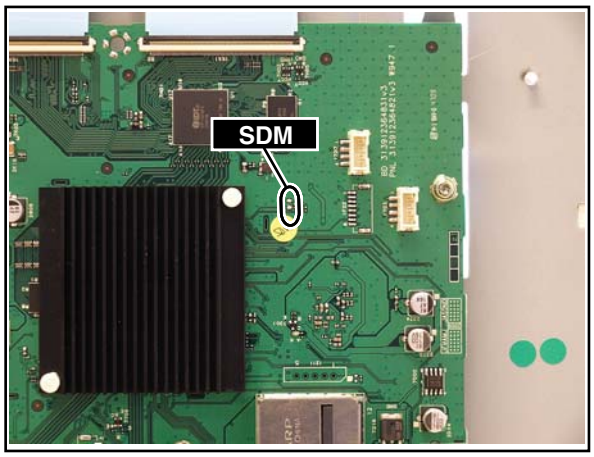
Specifications

- Set linear video and audio settings to 50%, but volume to 25%. Stored user settings are not affected.
- 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 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.



18980_200_100331.eps
100402

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).
- **AAAAAB-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[i+]** 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 Stand-by by pressing the mains button on the remote control transmitter or on the television set.
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-“ and “CH-” simultaneously 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).

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[i+]** 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:

1. **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.

2. **Tuner.**
   - **AGC Adjustment:** See paragraph 6.3.1 for instructions.
   - **Store:** To store the data.
3. **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.
4. **Options.** To set the option bits. See paragraph 6.6 Option Settings in the "Alignments" chapter for a detailed description.
5. **RGB Align.** To align the White Tone. See White Tone Alignment: for a detailed description.
6. **NVM Editor.** To change the NVM data in the television set. See also paragraph 5.6 Fault Finding and Repair Tips.
7. **NVM Copy.** Gives the possibility to copy/load the NVM file to/from an USB stick. See also paragraph 5.7.4 How to Copy NVM Data to/from USB and 5.7.5 How to Copy EDID Data to/from USB.
8. **Initialise NVM.** To initialize a (corrupted) NVM. Be careful, this will erase all settings!
9. **Auto ADC.** Refer to chapter 6. Alignments for detailed information.
10. **EDID Write Enable.** Enables EDID writing.

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[i+]**" 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.

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), by pressing and hold "VOL-" and "CH-" together should leave 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".
- 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

1. **Set Type.** Type number, e.g. 32PFL5605/93. (*)
2. **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.
3. **Installation date.** Indicates the date of the first initialization of the TV. This date is acquired via time extraction.
4. **a - Option Code 1.** Option code information (group 1).
   b - Option Code 2. Option code information (group 2).
5. **SSB.** Indication of the SSB factory ID (= 12nc). (*)
6. **Display.** Indication of the display ID (=12 nc). (*)
7. **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.

Menu Explanation CSM2

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

Menu Explanation CSM3

1. **Signal Quality.** Shows the signal quality (No Signal/Poor/Average/Good).
2. **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.
4. not used
5. not used
6. **HDMI audio format input stream.** Specification of HDMI audio input stream.
7. **HDMI video format input stream.** Specification of HDMI video input stream.

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:

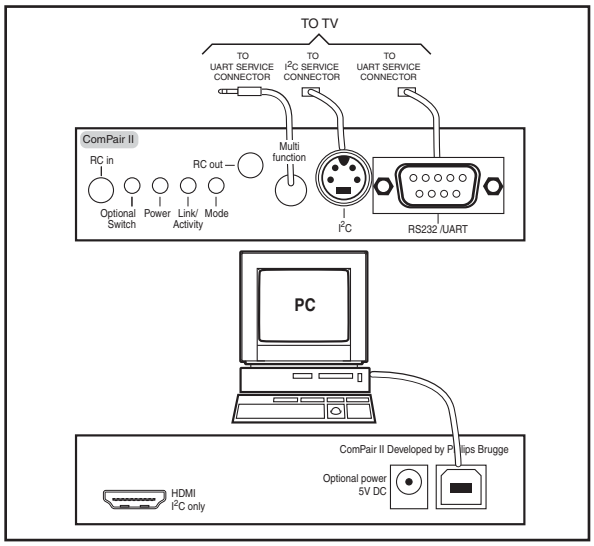
1. ComPair helps you to quickly get an understanding on how to repair the chassis in a short and effective way.
2. ComPair allows very detailed diagnostics and is therefore capable of accurately indicating problem areas. You do not have to know anything about I2C or UART commands yourself, because ComPair 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 an 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.



10000_036_090121.eps
091118

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

Additional cables for VCOM Alignment

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

Note: If you encounter any problems, contact your local support desk.

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 may **never** lead to a deadlock situation. This means that it must always be diagnosable (e.g. error buffer via OSD or blinking LED procedure, ComPair to read from the NVM).
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 3 ways:

- On screen via the SAM/SDM/CSM (if you have a picture). Example:
  - **ERROR: 0 0 0 0 0** : No errors detected
  - **ERROR: 6 0 0 0 0** : Error code 6 is the last and only detected error
  - **ERROR: 9 6 0 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
- 4: PSU/IPB

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
4	IPB	12	+12 missing/low, IPB defective, POWER_DOWN
4	IPB	13	POK line defective
2	SSB	15	EEPROM I2C error on SSB, M24C16
2	SSB	16	Tuner I2C error on SSB
2	SSB	18	IF Demodulator I2C error on SSB, TDA9886

5.4.4 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:
- 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 RC5 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. In case the TV set is in protection or Stand-by: The blinking LED procedure sequence (as in SDM-mode in normal operation) must be triggered by the following RC sequence: “**MUTE**” “**062500**” “**OK**”.
In order to avoid confusion with RC5 signal reception blinking, this blinking procedure is terminated when a RC5 command is received.

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:
1. 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).
2. Short-circuit the SDM pads on the SSB (keep short circuited, see Figure 5-2).
3. Press “P+” or “CH+” on the local keyboard (and keep it pressed).
4. Reconnect the mains supply to the wall outlet.
5. 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.
See also Table 6-4 Option code overview.

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 Content and Usage of the One-Zip Software File

Below you find a content explanation of the One-Zip file, and instructions on how and when to use it. Only files that are relevant for Service are mentioned here!

- **EDID_clustername_version.zip.** Contains the EDID content of the different EDID NVMs. See ComPair for further instructions.
- **FUS_clustername_version.zip.** Contains the “autorun.upg” which is needed to upgrade the TV main software and the software download application.
- **NVM_clustername_version.zip.** Default NVM content. Must be programmed via ComPair.

5.7.4 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 "**NVM_COPY.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: "**NVM_COPY.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).

Important: The file must be located in the **root directory** of the USB stick.

5.7.5 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 "**EDID2USB.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: "**EDID2USB.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 **root directory** of the USB stick.

6. Alignments

Index of this chapter:

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: Ri > 10 Mohm, Ci < 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.

Description	Test Point	Specifications (V)			Diagram
		Min.	Typ.	Max.	
+12VS	F118	11.7	12.3	12.91	B01_DC-DC
+3V3_STBY	F113	3.2	3.3	3.4	B01_DC-DC
+3V3_SW	F133	3.17	3.34	3.5	B01_DC-DC
+1V2_SW	F131	1.18	1.25	1.31	B01_DC-DC
+5V_SW	F132	4.98	5.25	5.51	B01_DC-DC
+1V8_SW	F125	1.74	1.83	1.92	B01_DC-DC
+1V0_SW	F134	0.99	1.05	1.1	B01_DC-DC
+5VS	F235	4.94	5.2	5.46	B02A_Tuner
+2V5_SW	F305	2.38	2.5	2.62	B02B_Demod
+5VTUN_DIGITAL	F236	4.75	5	5.25	B02A_Tuner
VLS_15V6	FJ00	14.82	15.6	16.38	B08B TCON DC/DC
VGL_-6V	FJ14	-6.32	-6.02	-5.72	B08B TCON DC/DC
VCC_3V3	FK13	3.14	3.3	3.47	B08B TCON DC/DC

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.

The LC10.1L LA chassis comes with the VA1E1BF2403 tuner. No alignment is necessary, as the AGC alignment is done automatically (standard value: “0”).

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"

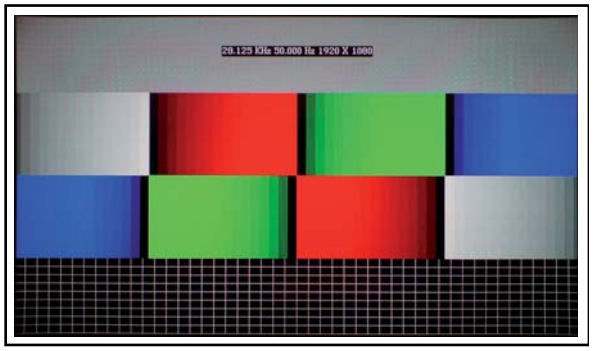
Colour Temp.	R	G	B
Cool	tbf	tbf	tbf
Normal	tbf	tbf	tbf
Warm	tbf	tbf	tbf

Table 6-3 Tint settings 40"

Colour Temp.	R	G	B
Cool	tbf	tbf	tbf
Normal	tbf	tbf	tbf
Warm	tbf	tbf	tbf

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.



18920_200_100317.eps
100317

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-p[1] / 75 ohm to the red cinch connector.
  - Y signal of 0.7 Vb-p[2] / 75 ohm with a sync pulse of 0.3 Vp-p[1] to the green cinch connector.
  - Pb signal of 0.7 Vb-p[1] / 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:
1. Peak-to-Peak
2. 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 650 - 730 mV.
  - Green signal of 650 - 730 mV.
  - Blue signal of 650 - 730 mV.
- 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 I^2C 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 in Table 6-4.

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 Table 6-4 Option code overview.

Table 6-4 Option code overview

CTN	Option Code	Display Code
32PFL3605D/78	002 192 145 248 072 006 060 078 068 001	237
40PFL3605D/78	002 192 145 248 072 006 060 078 068 002	238

7. Circuit Descriptions

Index of this chapter:

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 LC10.1L LA chassis is a digital chassis using a Mediatek chipset. It covers screen sizes of 32" to 40" with a styling called “Dali”.

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 (32x16M, 2 pcs), Hynix.
- Use internal MT5363 Stand-by micro-controller.

Tuner/Frontend configuration:

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

Digital Connectivity:

- 1x USB port with over current protection using power switch.
- 2x HDMI ports (using MT5363 internal mux).

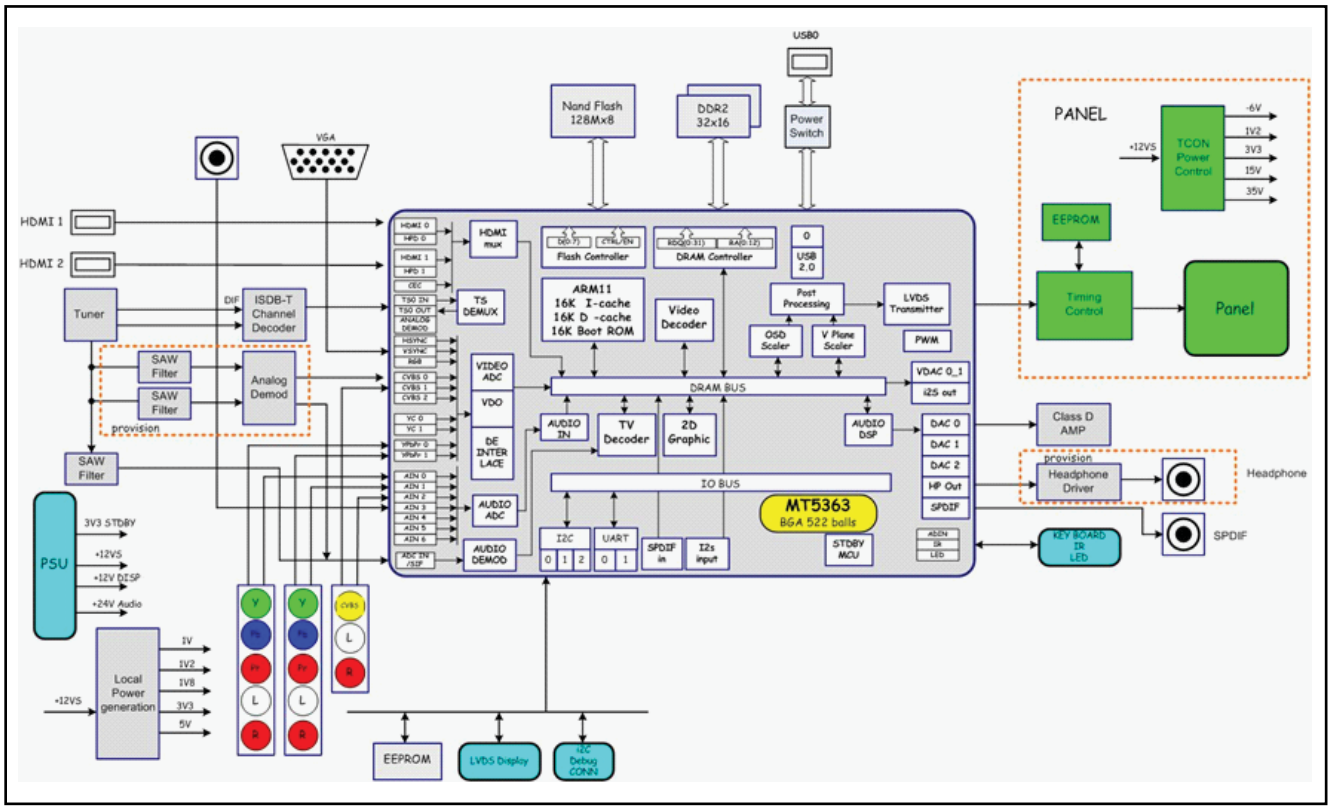
Analog Connectivity:

- 2x YPbPr (component video) + Audio (cinch).
- 1x CVBS (composite) + Audio (cinch).
- 1x VGA (RGB) + Audio (3.5mm stereo jack).

Interfaces for debug and SW upgrade:

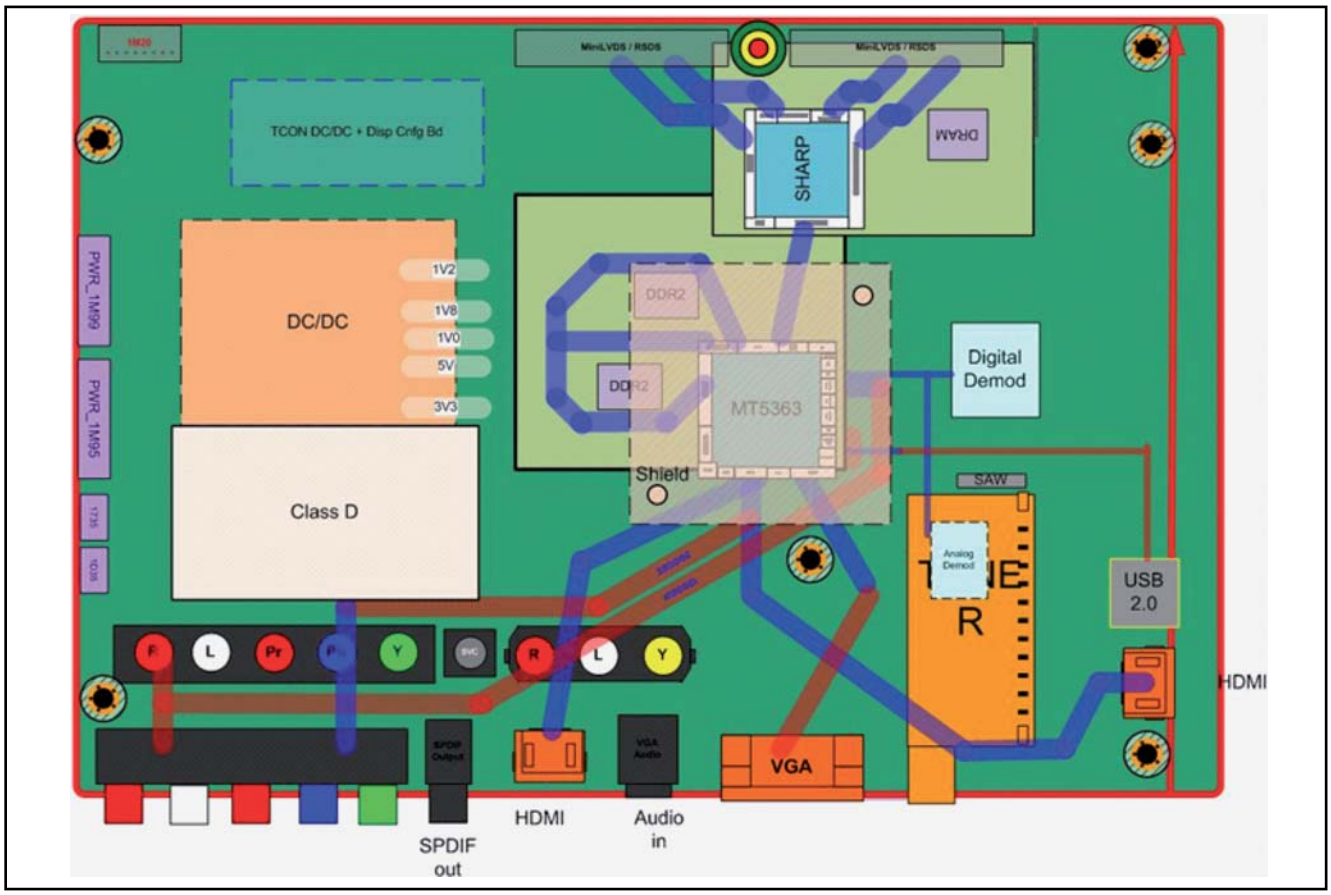
- UART (3.5mm jack).
- USB port.
- JTAG.

Refer to Figure 7-1 for details.



18980_201_100402.eps
100402

Figure 7-1 LC10.1L LA Architecture



18980_202_100402.eps
100402

Figure 7-2 SSB cell layout

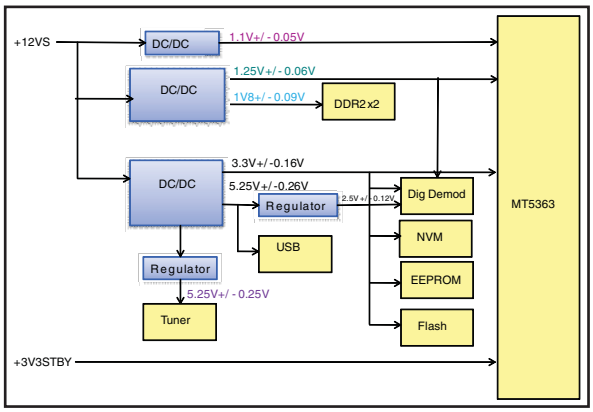
7.2 Power Supply

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 7-3 and Figure 7-4 for details

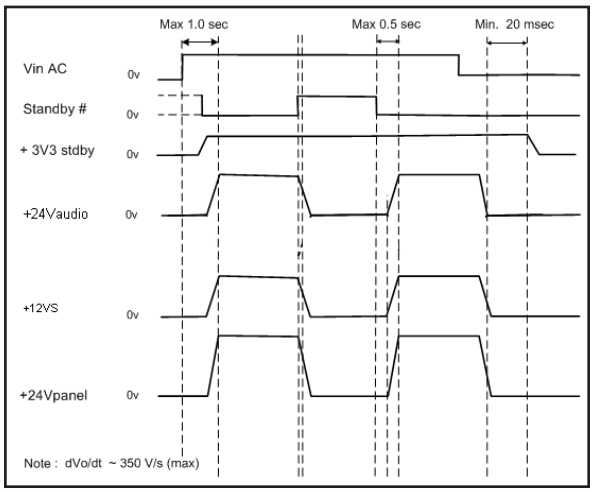
The power supply system consists of stand-by, switched and regulated voltages. The stand-by voltage, +3V3STBY, will be available once AC supply is provided to the system. As for the other voltages, namely switched and regulated voltages, these are available once the STANDBY signal is pulled “low” to 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.



18980_203_100402.eps
100402

Figure 7-3 Power distribution overview



18980_203_100402.eps
100402

Figure 7-4 Power timing overview

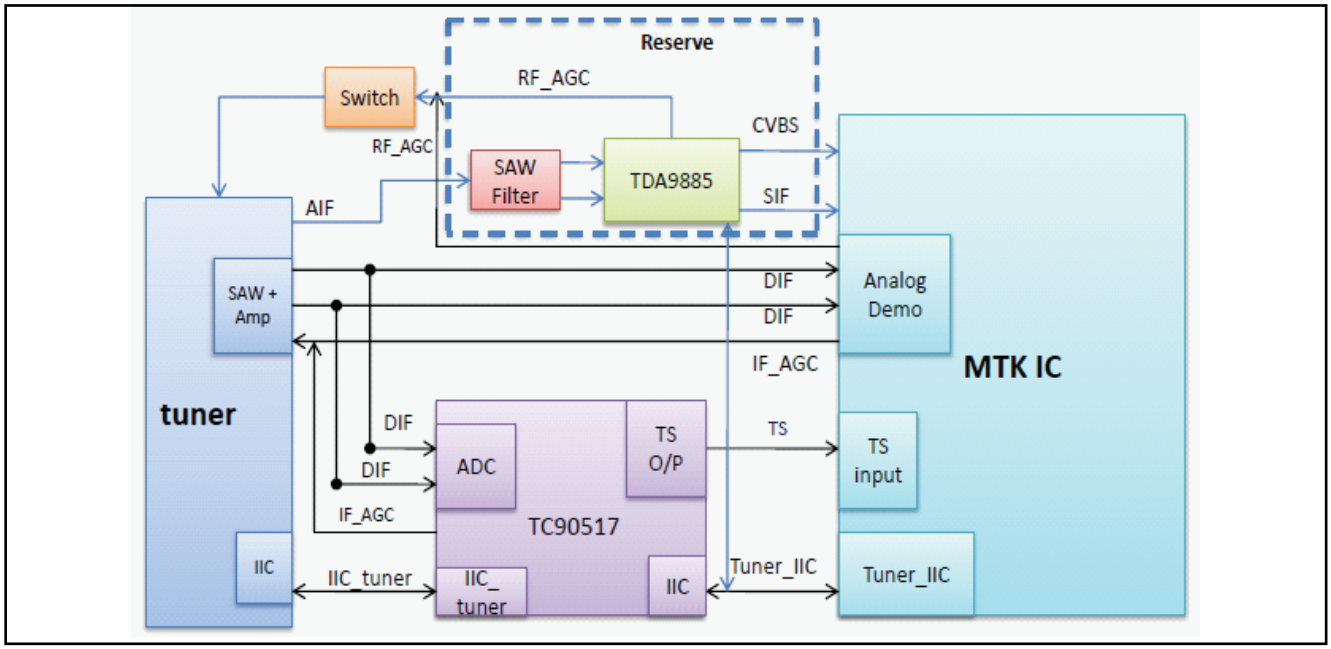
7.3 Video

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 7-5 for details.

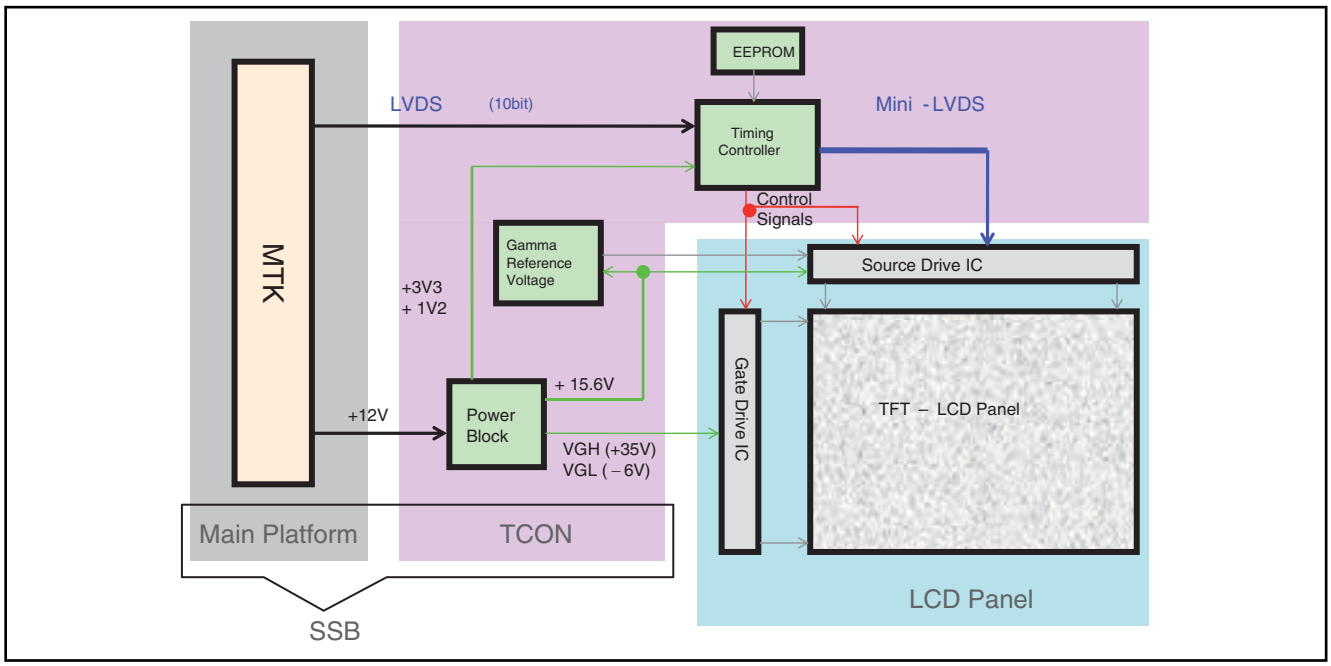


18980_205_100402.eps
100402

Figure 7-5 Front-end functional block diagram

7.3.2 VIDEO: TCON

The Timing Controller (TCON) is integrated in the SSB ("Forward Integration" concept). Refer to Figure 7-6.



18920_209_100318.eps
100319

Figure 7-6 TCON system block diagram

7.4 Audio

In this chassis, audio processing is done by the following key components:

- MT5363 micro-processor for input selection and audio processing,
- TPA3123D2 class-D power amplifier for 2 x 10 W amplification.

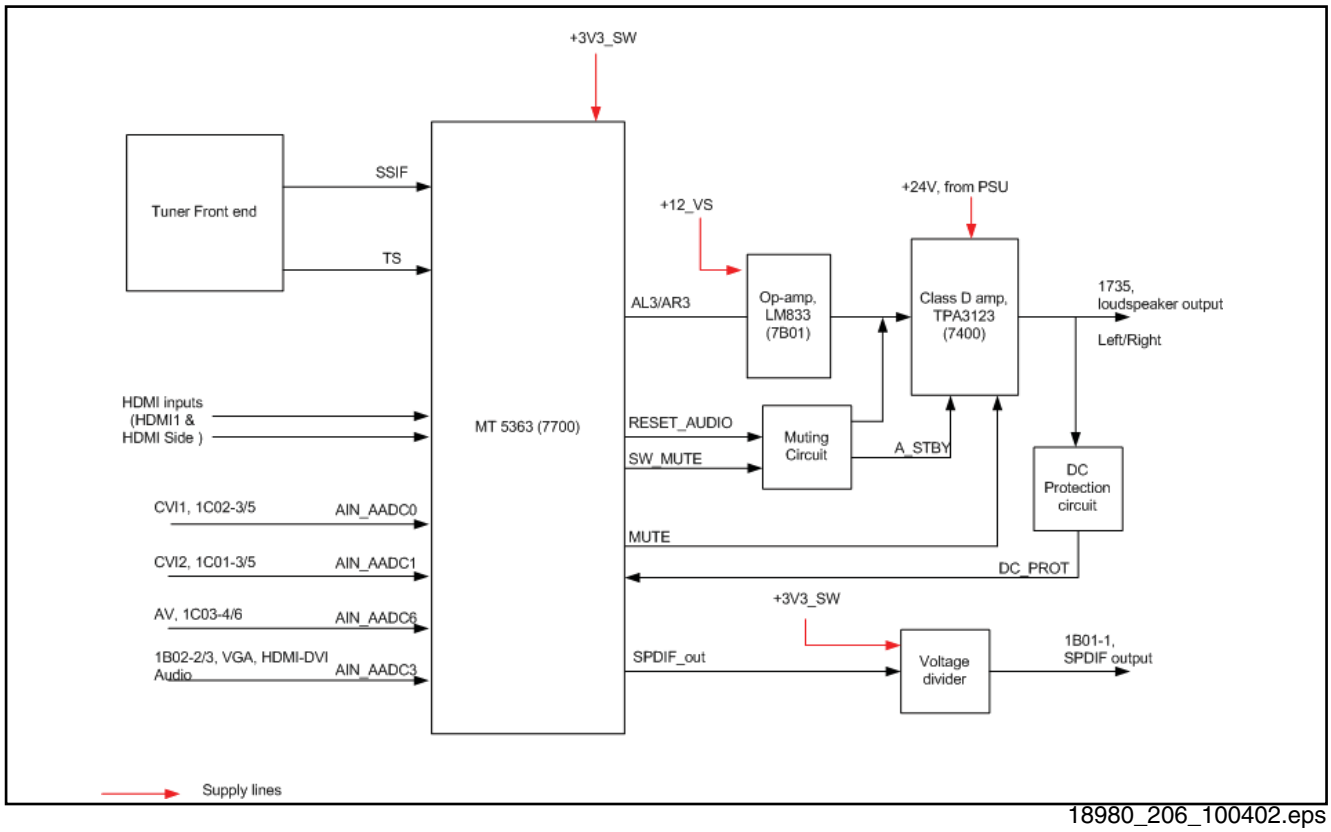
The audio profile (optimal setting per screen size and styling) is stored at Option 10 (bit 0 to bit 4). Profile 1 for 32-inch Dali and profile 2 for 40-inch Dali.

Table 7-1 Microprocessor control lines - 1 -

From uP	At class D	Usage
SW_MUTE	SW_MUTE	Will pull audio signals to LOW upon DC drops, help to eliminate plop sound.
RESET_AUDIO	A_STBY	Control SHUTDOWN pin of class D amplifier: ON/OFF the amplifier
MUTE	MUTE	Corresponding to the MUTE button on Remote Control, to mute/unmute speakers
DC_PROT	DC_PROT	Detecting present of DC at speakers output and feedback to uP. This will trigger TV into protection mode. This is important to protect speakers

Table 7-2 Microprocessor control lines - 2 -

From uP		A_STBY to class D	Class D outputs
SW_MUTE	LOW	-	MUTE
	HIGH	-	Operating (unmute)
RESET_AUDIO	LOW	HIGH	Operating (unmute)
	HIGH	LOW	Class D shutdown (mute)
MUTE	LOW	-	Operating (unmute)
	HIGH	-	MUTE
DC_PROT	LOW	-	DC detected -> set going to protection
	HIGH	-	No DC -> normal operating



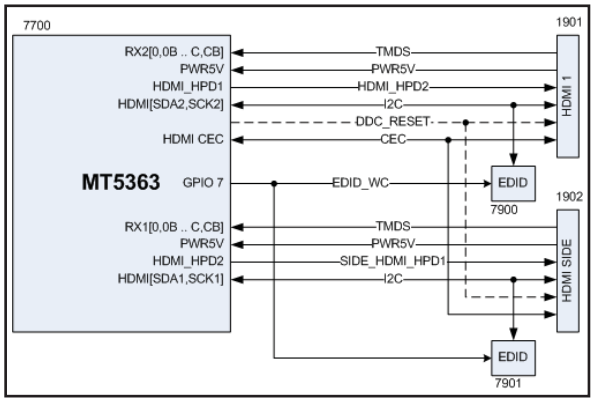
18980_206_100402.eps
100402

Figure 7-7 Audio signal flow

7.5 Inputs

7.5.1 Inputs: HDMI

In this chassis, the main Mediatek MT5363 SoC has an on-chip HDMI multiplexer.
Refer to Figure 7-8 for the implementation.



18980_208_100402.eps
100402

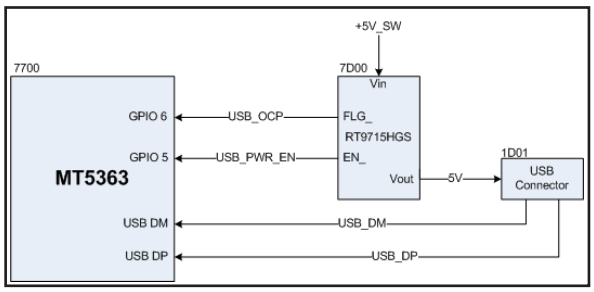
Figure 7-8 HDMI implementation

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 7-9 for the implementation.



18980_207_100402.eps
100402

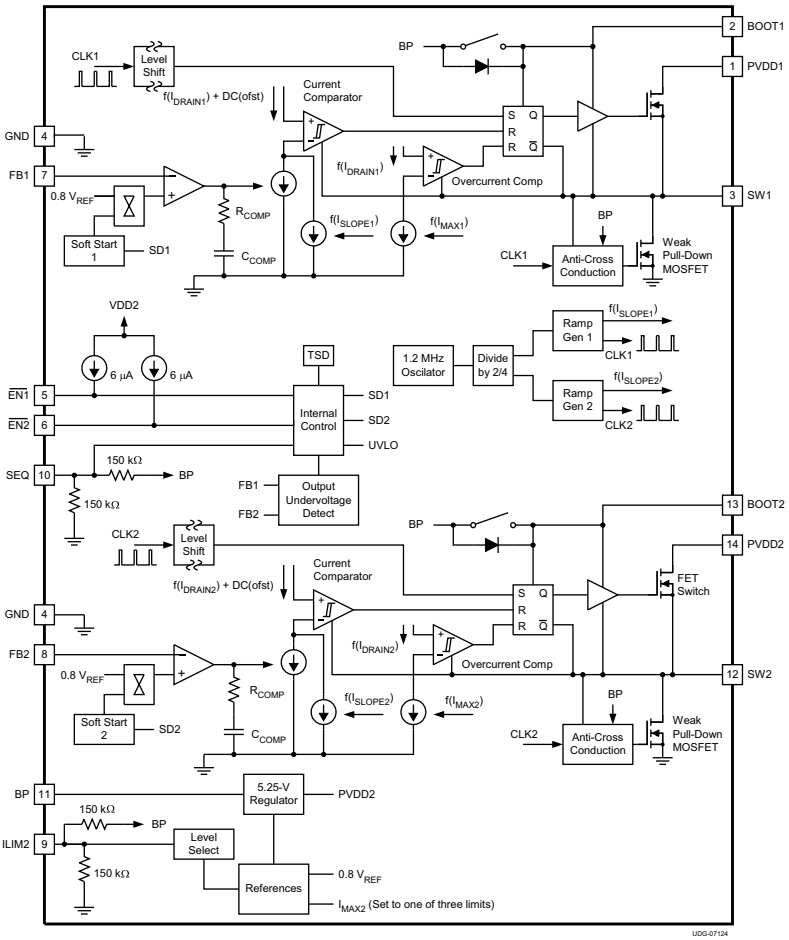
Figure 7-9 USB implementation

8. IC Data Sheets

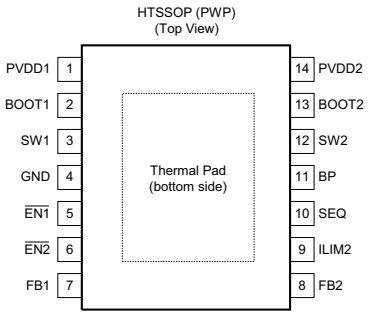
This section shows the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of "memory" and "logic" ICs).

8.1 Diagram B01, Type TPS54386 (IC7116 and 7117)

BLOCK DIAGRAM



PIN CONNECTIONS

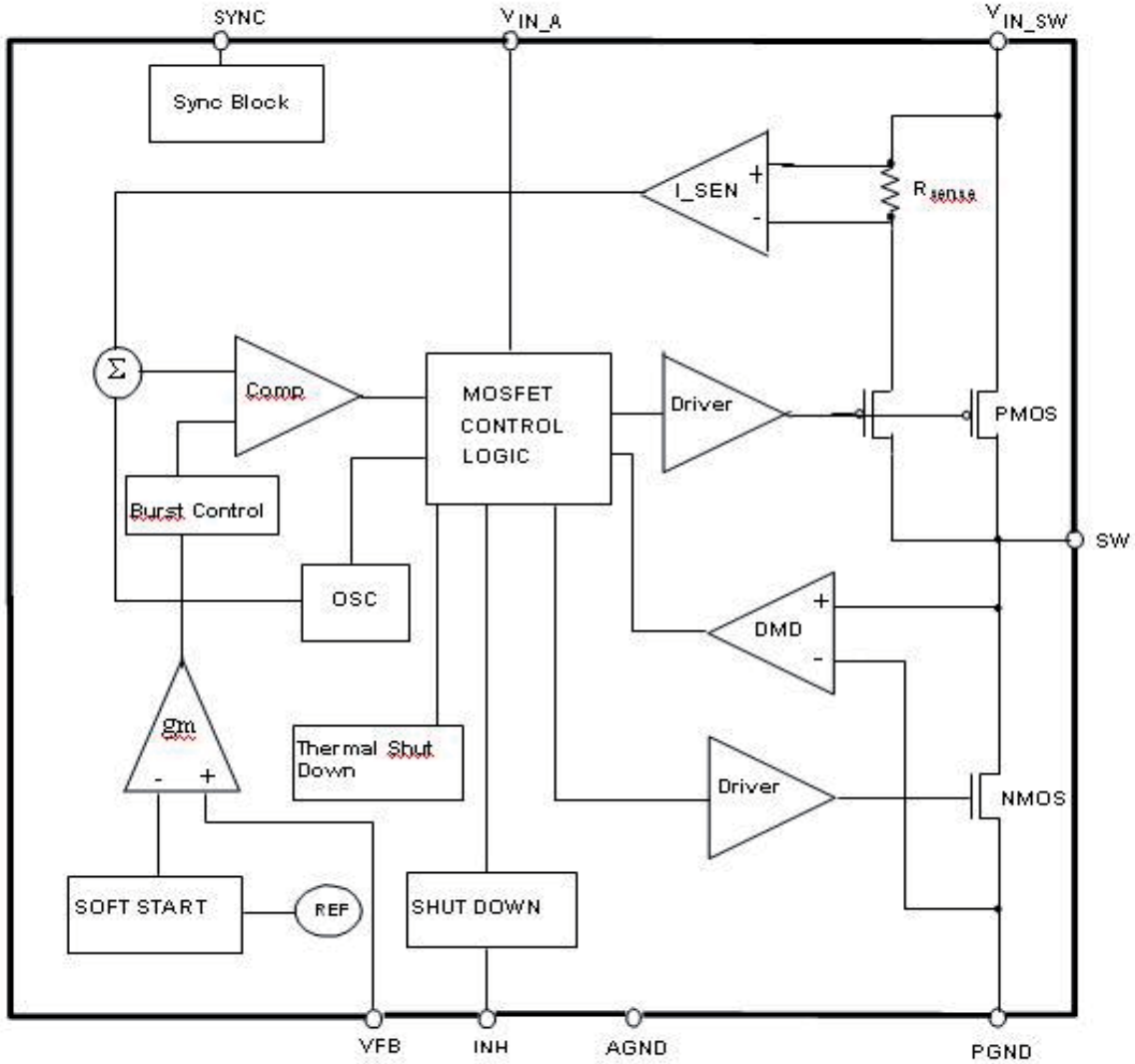


18980_300_100402.eps
100402

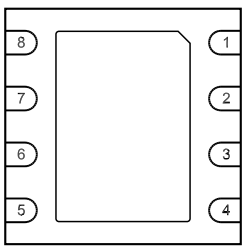
Figure 8-1 Internal block diagram and pin configuration

8.2 Diagram B01 SSB: DC-DC, Type ST1S10PH (IC7107)

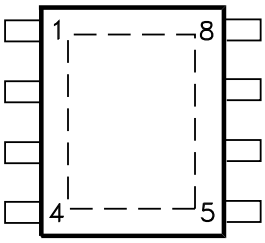
Block diagram



Pinning information



DFN8 (4 × 4)



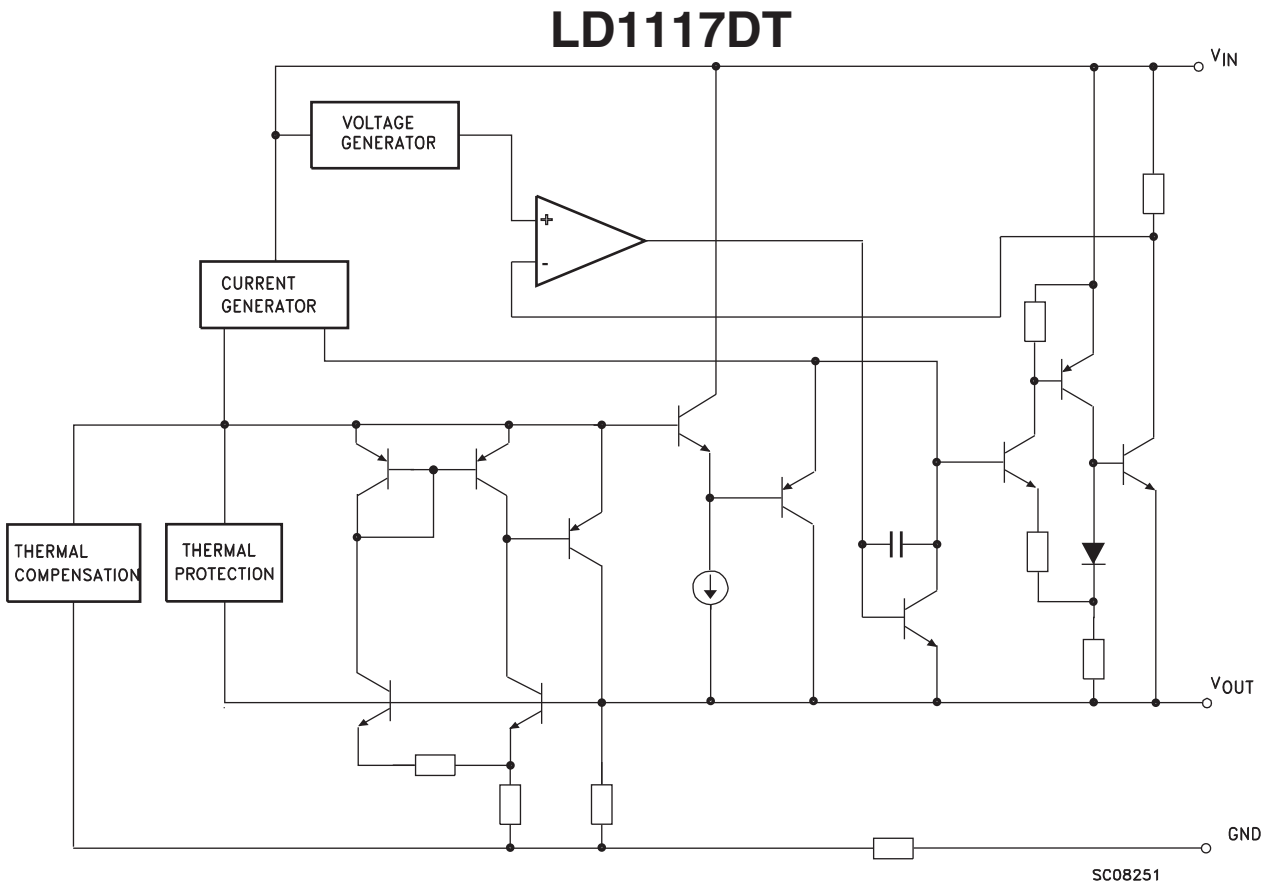
PowerSO-8

I_18010_083.eps
100402

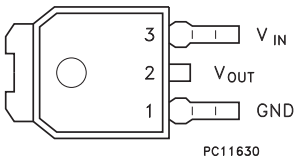
Figure 8-2 Internal block diagram and pin configuration

8.3 Diagram B02B SSB: Digital Demodulator, Type LD1117D (IC7315)

Block diagram



Pinning information



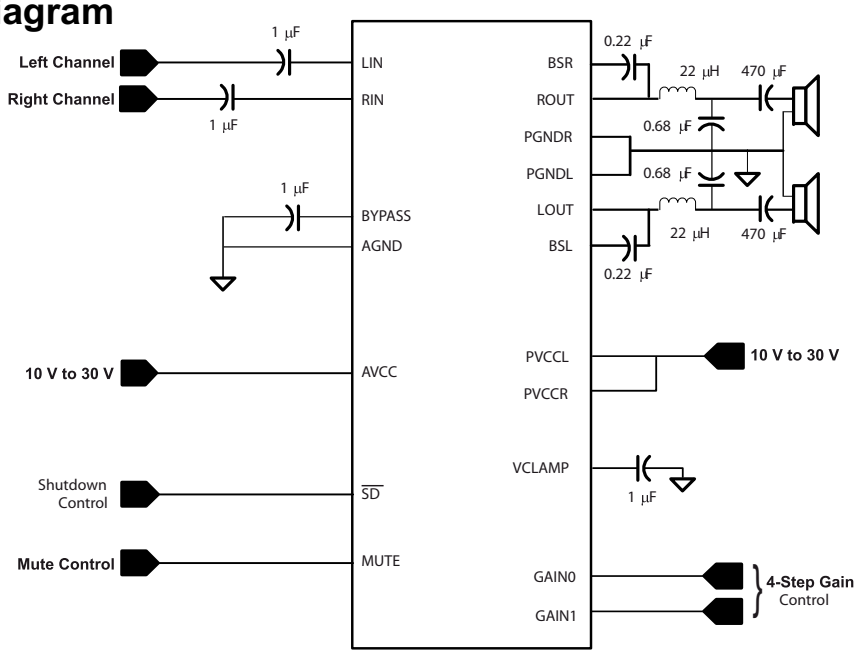
DPAK

F_15710_166.eps
100402

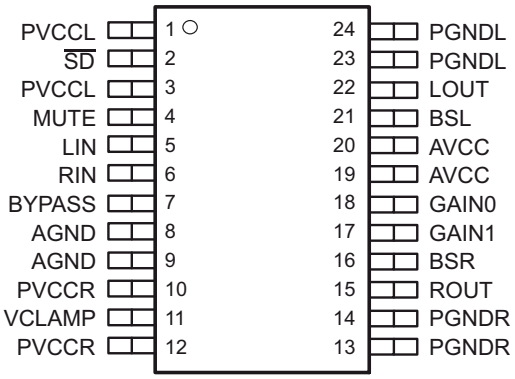
Figure 8-3 Internal block diagram and pin configuration

8.4 Diagram B03 SSB: Class-D & Muting, Type TPA3123 (IC7400)

Block diagram



Pinning information

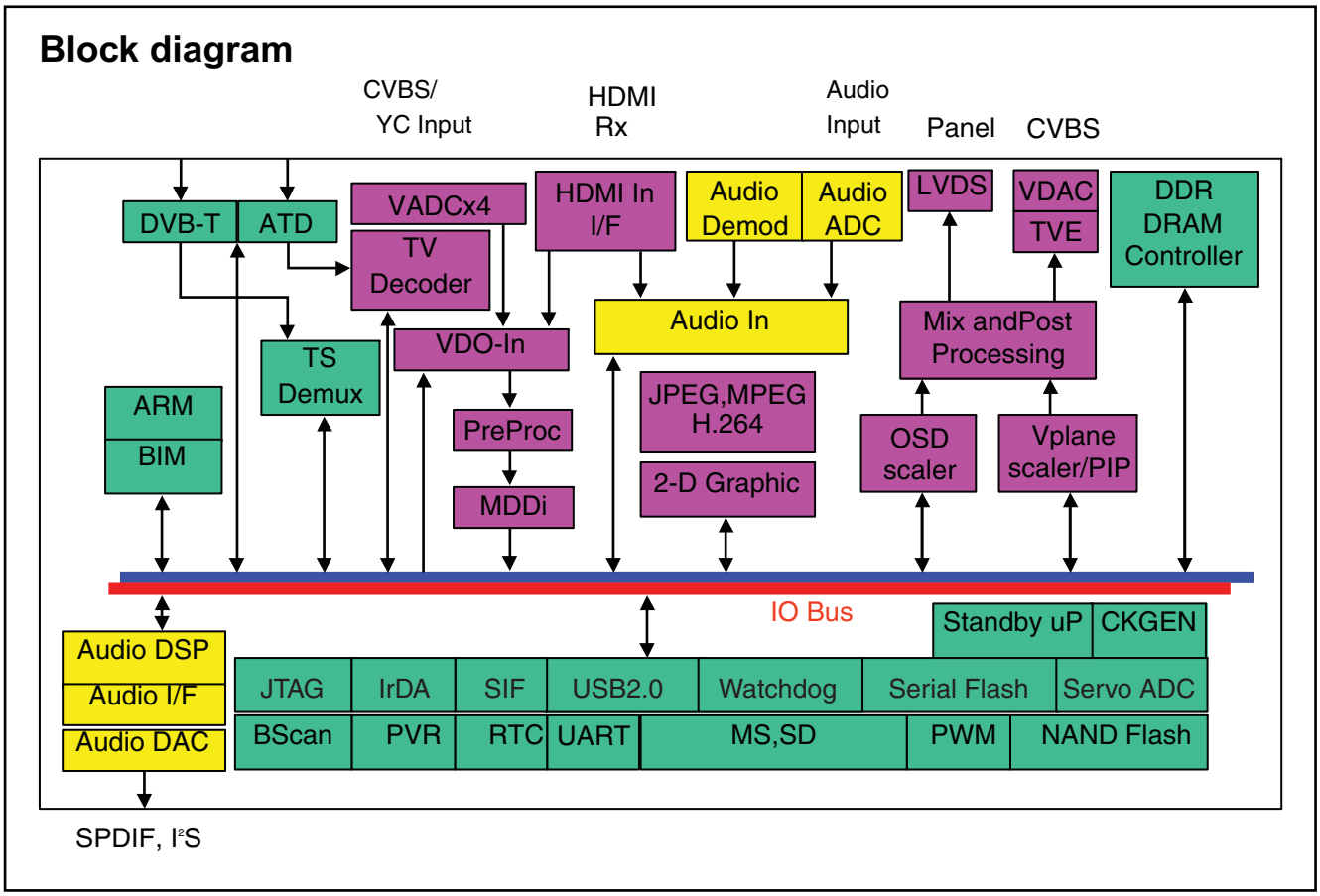


TERMINAL		I/O/P	DESCRIPTION
NAME	24-PIN (PWP)		
$\overline{SD}$	2	I	Shutdown signal for IC (low = disabled, high = operational). TTL logic levels with compliance to AVCC
RIN	6	I	Audio input for right channel
LIN	5	I	Audio input for left channel
GAIN0	18	I	Gain select least-significant bit. TTL logic 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
PVCCL	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 PVCCL 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 PVCCL
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.

18440_302_090303.eps
090318

Figure 8-4 Internal block diagram and pin configuration

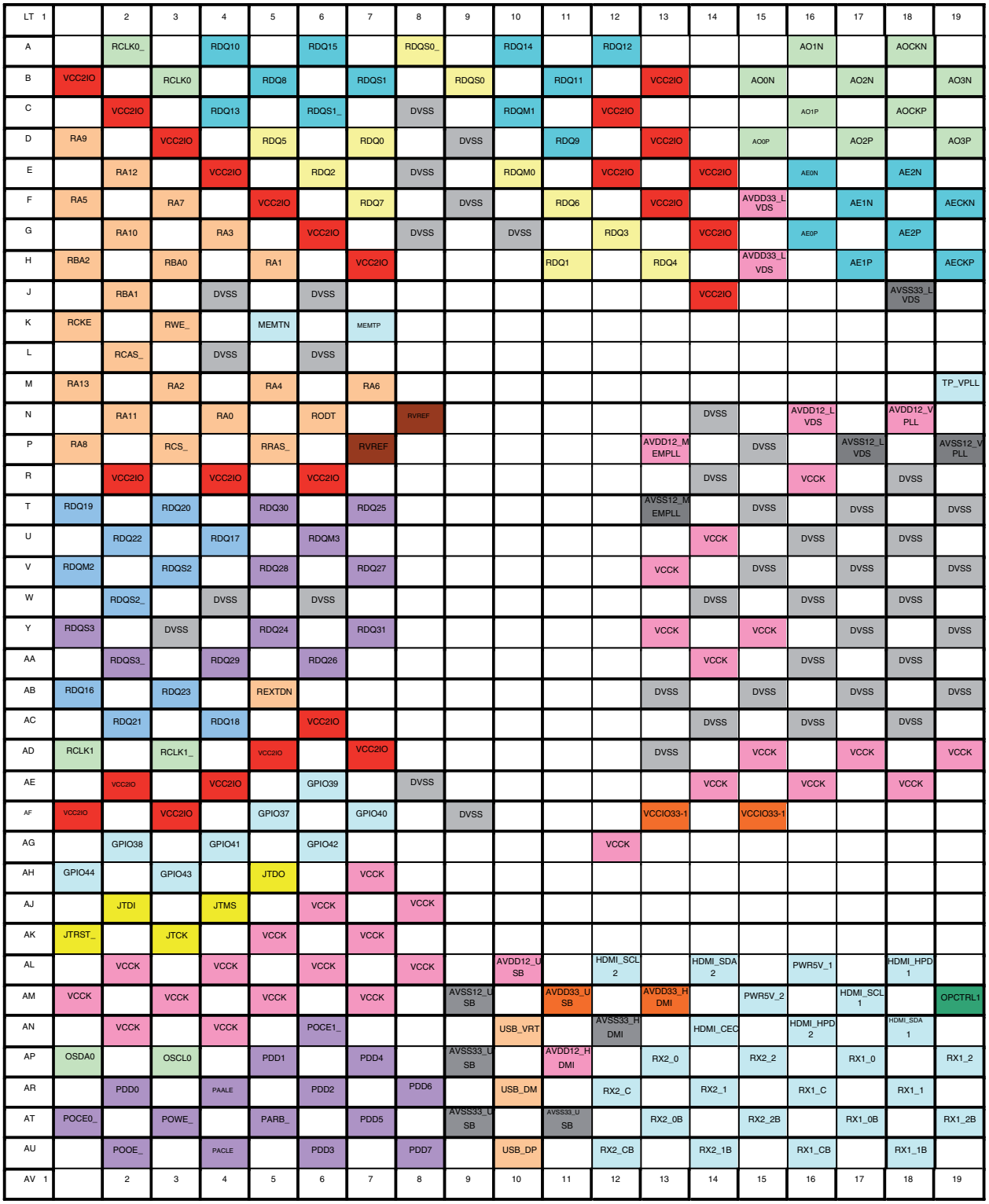
8.5 Diagram B04 SSB: MTK Power, Type MT5363 (IC7700)



18850_300_100107.eps
100222

Figure 8-5 Internal block diagram

Pinning information



LT 1		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
A		RCLK0_		RDQ10		RDQ15		RDQS0_		RDQ14		RDQ12				AO1N		AOCKN	
B	VCC2IO		RCLK0		RDQ8		RDQS1		RDQS0		RDQ11		VCC2IO		AO0N		AO2N		AO3N
C		VCC2IO		RDQ13		RDQS1_		DVSS		RDQM1		VCC2IO				AO1P		AOCKP	
D	RA9		VCC2IO		RDQ5		RDQ0		DVSS		RDQ9		VCC2IO		AO0P		AO2P		AO3P
E		RA12		VCC2IO		RDQ2		DVSS		RDQM0		VCC2IO		VCC2IO		AE0N		AE2N	
F	RA5		RA7		VCC2IO		RDQ7		DVSS		RDQ6		VCC2IO		AVDD33_LVDS		AE1N		AECKN
G		RA10		RA3		VCC2IO		DVSS		DVSS		RDQ3		VCC2IO		AE0P		AE2P	
H	RBA2		RBA0		RA1		VCC2IO				RDQ1		RDQ4		AVDD33_LVDS		AE1P		AECKP
J		RBA1		DVSS		DVSS								VCC2IO				AVSS33_LVDS	
K	RCKE		RWE_		MEMTN		MEMTP												
L		RCAS_		DVSS		DVSS													
M	RA13		RA2		RA4		RA6												TP_VPLL
N		RA11		RA0		RODT		RVREF						DVSS		AVDD12_LVDS		AVDD12_VPLL	
P	RA8		RCS_		RRAS_		RVREF						AVDD12_MEMPLL		DVSS		AVSS12_LVDS		AVSS12_VPLL
R		VCC2IO		VCC2IO		VCC2IO								DVSS		VCCK		DVSS	
T	RDQ19		RDQ20		RDQ30		RDQ25						AVSS12_MEMPLL		DVSS		DVSS		DVSS
U		RDQ22		RDQ17		RDQM3								VCCK		DVSS		DVSS	
V	RDQM2		RDQS2		RDQ28		RDQ27						VCCK		DVSS		DVSS		DVSS
W		RDQS2_		DVSS		DVSS								DVSS		DVSS		DVSS	
Y	RDQS3		DVSS		RDQ24		RDQ31						VCCK		VCCK		DVSS		DVSS
AA		RDQS3_		RDQ29		RDQ26								VCCK		DVSS		DVSS	
AB	RDQ16		RDQ23		REXTDN								DVSS		DVSS		DVSS		DVSS
AC		RDQ21		RDQ18		VCC2IO								DVSS		DVSS		DVSS	
AD	RCLK1		RCLK1_		VCC2IO		VCC2IO						DVSS		VCCK		VCCK		VCCK
AE		VCC2IO		VCC2IO		GPIO39		DVSS						VCCK		VCCK		VCCK	
AF	VCC2IO		VCC2IO		GPIO37		GPIO40		DVSS				VCCIO33-1		VCCIO33-1				
AG		GPIO38		GPIO41		GPIO42						VCCK							
AH	GPIO44		GPIO43		JTDO		VCCK												
AJ		JTDI		JTMS		VCCK		VCCK											
AK	JTRST_		JTCK		VCCK		VCCK												
AL		VCCK		VCCK		VCCK		VCCK		AVDD12_USB		HDMI_SCL2		HDMI_SDA2		PWR5V_1		HDMI_HPD1	
AM	VCCK		VCCK		VCCK		VCCK		AVSS12_USB		AVDD33_USB		AVDD33_HDMI		PWR5V_2		HDMI_SCL1		OPCTRL1
AN		VCCK		VCCK		POCE1_				USB_VRT		AVSS33_HDMI		HDMI_CEC		HDMI_HPD2		HDMI_SDA1	
AP	OSDA0		OSCL0		PDD1		PDD4		AVSS33_USB		AVDD12_HDMI		RX2_0		RX2_2		RX1_0		RX1_2
AR		PDD0		PAALE		PDD2		PDD6		USB_DM		RX2_C		RX2_1		RX1_C		RX1_1	
AT	POCE0_		POWE_		PARB_		PDD5		AVSS33_USB		AVSS33_USB		RX2_0B		RX2_2B		RX1_0B		RX1_2B
AU		POOE_		PACLE		PDD3		PDD7		USB_DP		RX2_CB		RX2_1B		RX1_CB		RX1_1B	
AV 1		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

18850_301_100107.eps
100222

Figure 8-6 Internal block diagram

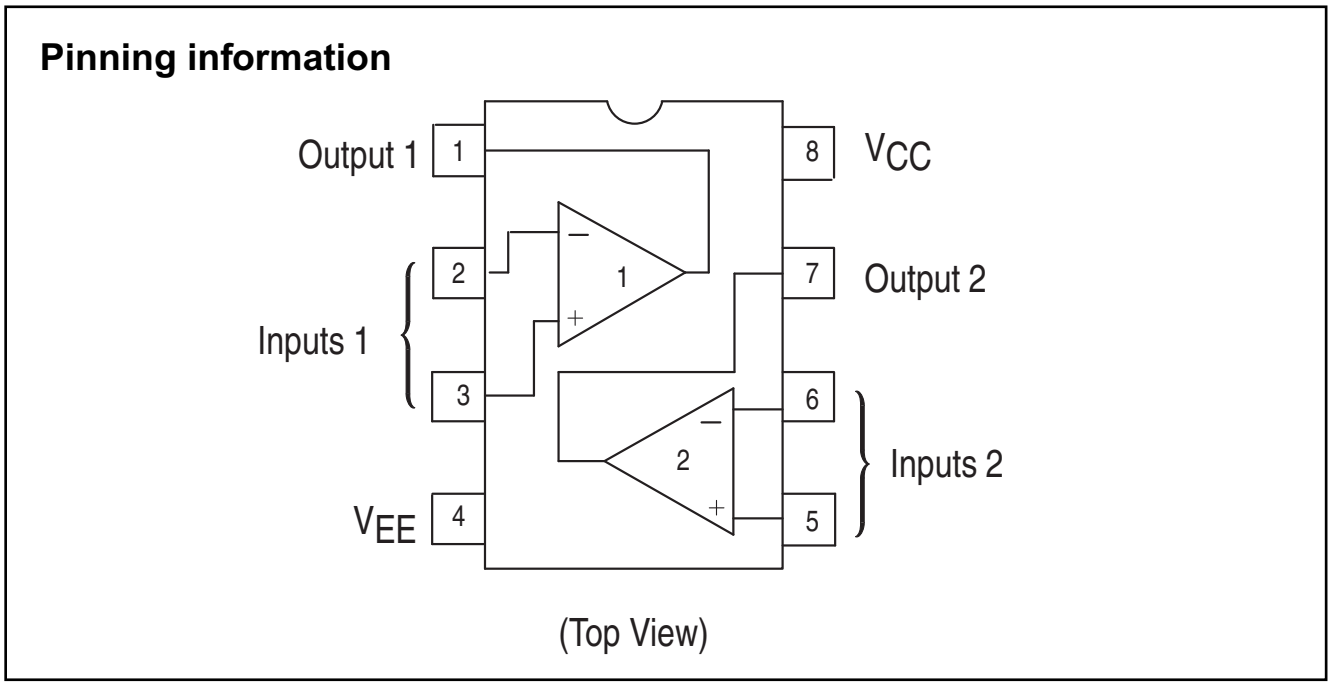
Pinning information

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	RT
AO4N		GPIO35				GPIO21				GPIO3		ETTXD0		ETRXD2		ETRXD0		A
	DVSS		GPIO32		GPIO26		GPIO17		GPIO9		ETTXD3		ETRXCLK		ETRXD1		ETRXDV	B
AO4P		GPIO36		GPIO28		GPIO22		GPIO11		GPIO4		ETTXD1		ETRXD3		ETCRS		C
	DVSS		GPIO34		GPIO27		GPIO18		GPIO10		ETTXEN		ETTXCLK		ETRXER		ETMDIO	D
AE3N		DVSS		GPIO30		GPIO20		GPIO12		GPIO6		ETTXD2		ETTXER		ETMDC		E
	AE4N		GPIO33		GPIO24		GPIO16		GPIO8		ETPHYCLK		CI_MCLKO		CI_MCLKI		CI_MOSTRT	F
AE3P		DVSS		GPIO29		GPIO19		GPIO14		GPIO5		ETCOL		CI_MIVAL		CI_MOVAL		G
	AE4P		VCCIO33		GPIO25		GPIO15		GPIO7		VCCIO33		CI_MISTRT		CI_MDI0		CI_MDO0	H
				GPIO31		GPIO23		GPIO13		VCCIO33		GPIO2		OPWM0		OPWM1		J
											AOSDATA3		ASPDIF		GPIO0		GPIO1	K
										FSRC_WR		ALIN		AOBCK		AOSDATA0		L
											IF_AGC		RF_AGC		AOMCLK		AOLRCK	M
DVSS		VCCK		VCCK								AOSDATA4		TUNER_DATA		TUNER_CLK		N
	DVSS		DVSS		DVSS						OSCL2		OSDA2		AOSDATA1		AOSDATA2	P
DVSS		DVSS		DVSS								OSDA1		OSCL1		U1RX		R
	DVSS		DVSS		VCCK						AVDD33_ADAC1		OPWM2		U1TX		VCXO	T
DVSS		DVSS		DVSS						AVSS33_ADAC1		AL1		AR2		AR3		U
	DVSS		DVSS		VCCK						VCCIO33		AR1		AL2		AL3	V
DVSS		DVSS		VCCK						AVDD33_REF_AADC		VCCIO33		VCCIO33		VCCIO33		W
	DVSS		DVSS		VCCK				AVSS33_REF_AADC		AVDD33_ADC		AVSS33_ADC		AIN5_R_ADC		AIN6_R_ADC	Y
DVSS		DVSS		VCCK						VMID_AADC		AIN4_L_AADC		AIN5_L_AADC		AIN6_L_AADC		AA
	DVSS		DVSS		VCCK						AIN1_L_AADC		AIN4_R_ADC		AIN2_R_ADC		AIN3_R_ADC	AB
DVSS		DVSS		DVSS								AIN1_R_ADC		AIN0_R_ADC		AIN3_L_AADC		AC
	DVSS		DVSS		DVSS								AIN0_L_AADC		AIN2_L_AADC			AD
VCCK		VCCK		DVSS										AVSS33_ADAC0		AR0		AE
									AVDD12_TVDPLL				AVDD33_ADAC0		AVICM		AL0	AF
										AVDD12_APLL		AVDD12_SYSPLL		AVDD33_DEMOD1		AVSS33_DEMOD1		AG
									AVSS12_PLL		AVSS12_PLL		AVDD12_ADCPLL		ADCINN_DEMOD		ADCINP_DEMOD	AH
										AVSS33_DIG				XTALO		XTALI		AJ
									AVSS33_SF		AVDD33_DIG		ADIN1_SRV		AVDD33_XTAL_STB		AVSS33_XTAL	AK
OPWRSB		ORESET_		AVSS33_VGA_STB						AVDD33_SIF		ADIN0_SRV		ADIN3_SRV		ADIN5_SRV		AL
	OPCTRL0		AVDD10_LDO		AVDD12_RGB				FS_VDAC		BYPASS0		AF		ADIN2_SRV		ADIN4_SRV	AM
OPCTRL2		OIRI		AVDD33_VGA_STB		AVSS12_RGB				AVDD33_VDAC		AVDD33_CVBS		MPXP		MPXN		AN
	U0TX		SOG		SOY1		PR1P		PB0P		VDAC_OUT1		SY0		CVBS2P		TUNER_BYPASS	AP
OPCTRL3		HSYNC		COM		COM1		Y0P		AVSS33_VDAC		AVSS33_CVBS		SY1		CVBS0N		AR
	U0RX		BP		RP		PB1P		COM0		VDAC_OUT2		SC0		CVBS3P		CVBS0P	AT
OPCTRL4		VSYNC		GP		Y1P		SOY0		PR0P				SC1		CVBS1P		AU
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	RB

18850_302_100107.eps
100222

Figure 8-7 Internal block diagram

8.6 Diagram B06B SSB: Analog I/O - Audio, Type LM833 (IC7B01)

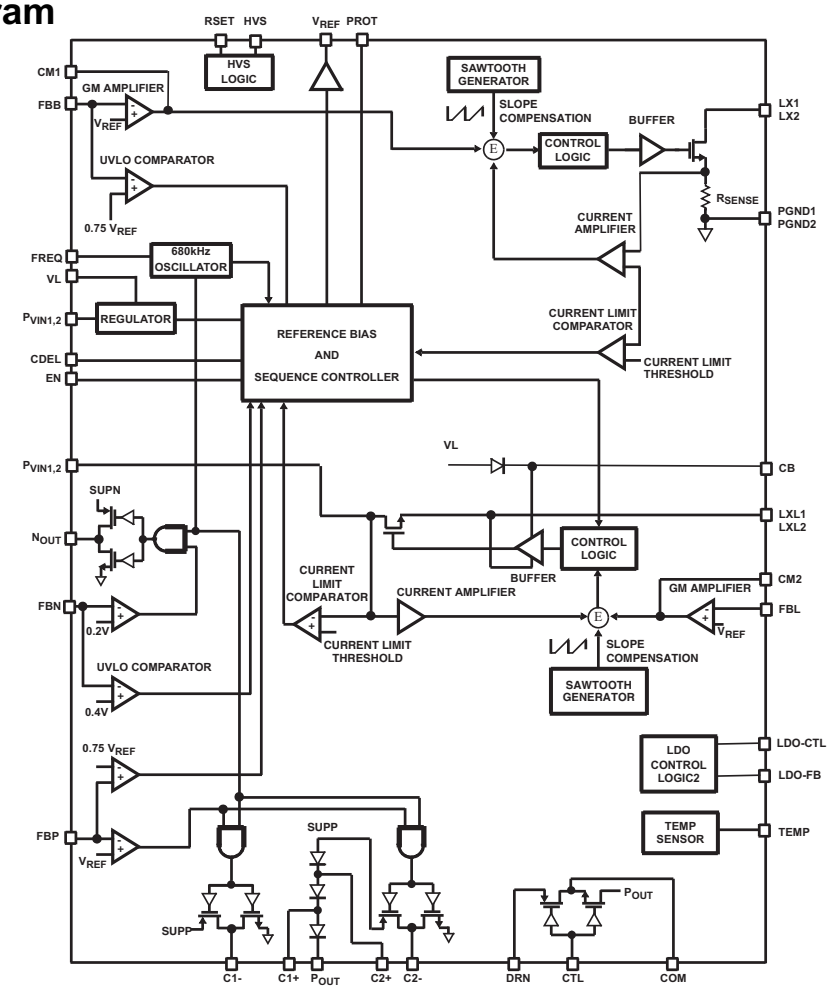


18520_306_090325.eps
100402

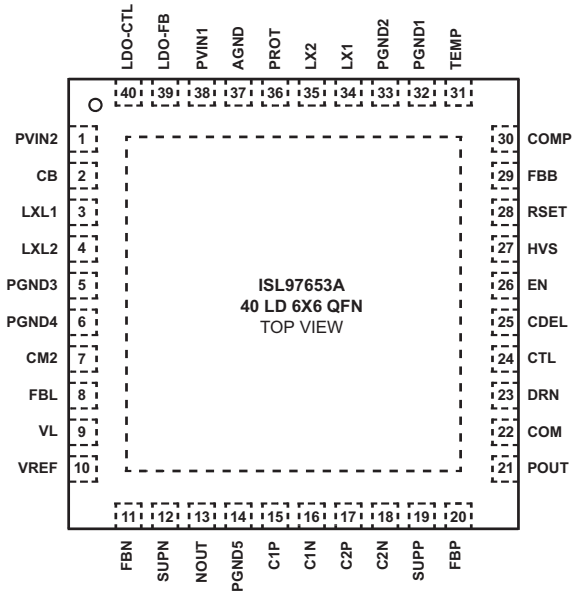
Figure 8-8 Pin configuration

8.7 Diagram B08B SSB: TCON DC/DC, Type ISL97653 (IC7J00)

Block diagram



Pinning information



18770_307_100217.eps
100217

Figure 8-9 Internal block diagram and pin configuration

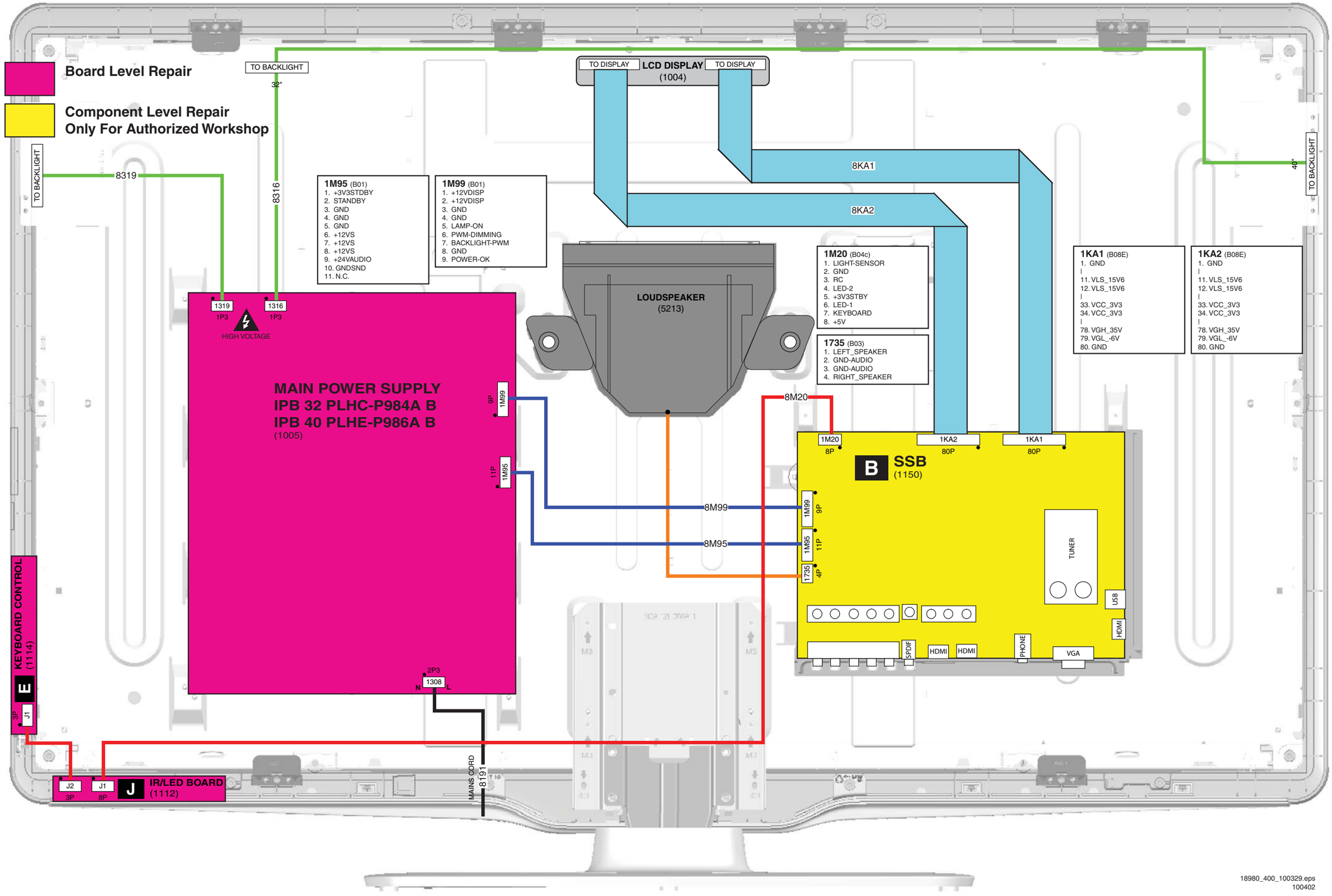
Personal Notes:

10000_012_090121.eps
090121

9. Block Diagrams

Wiring Diagram 32" - 40" (Dali)

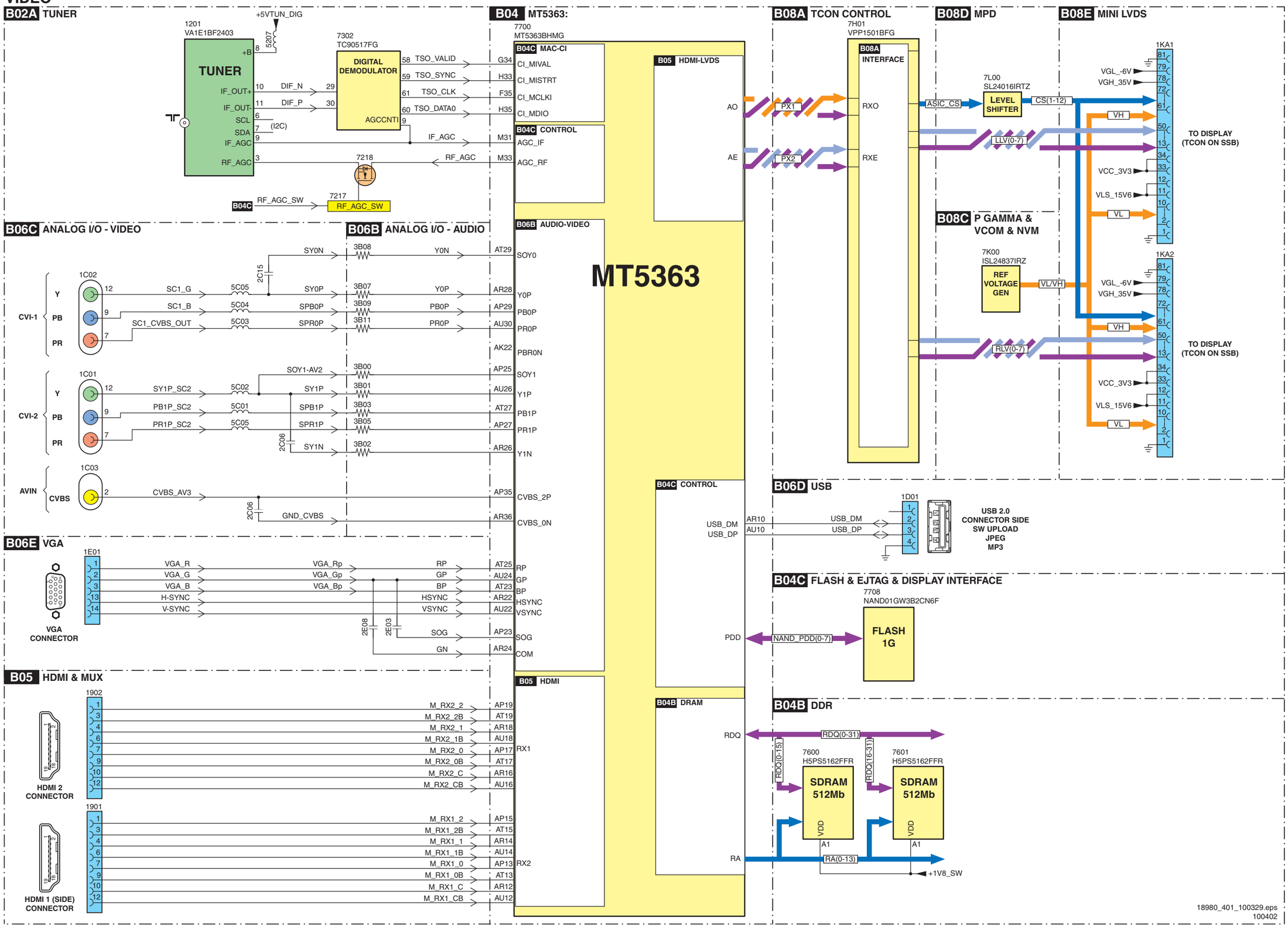
WIRING DIAGRAM 32"- 40" DALI



18980_400_100329.eps
100402

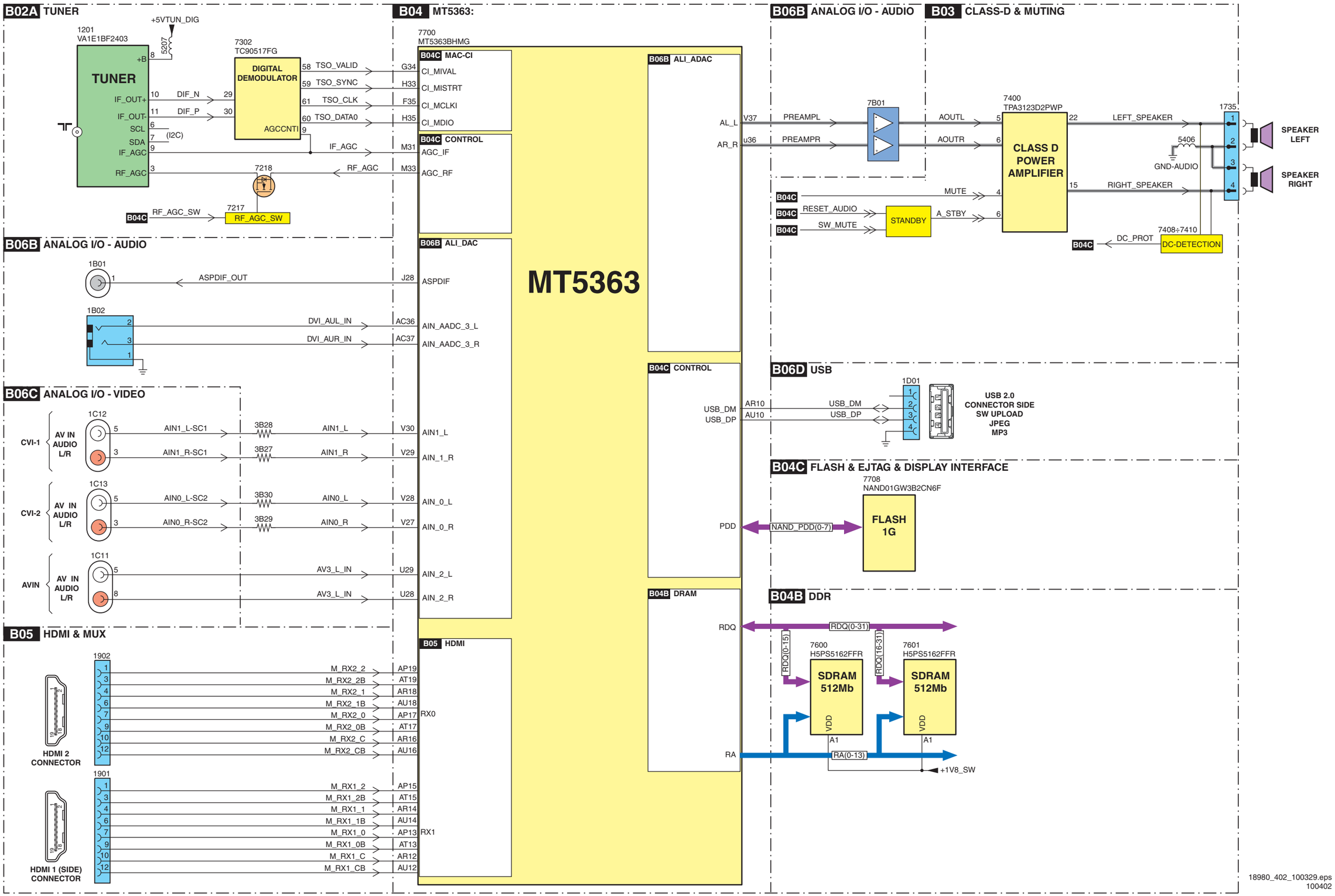
Block Diagram Video

VIDEO



Block Diagram Audio

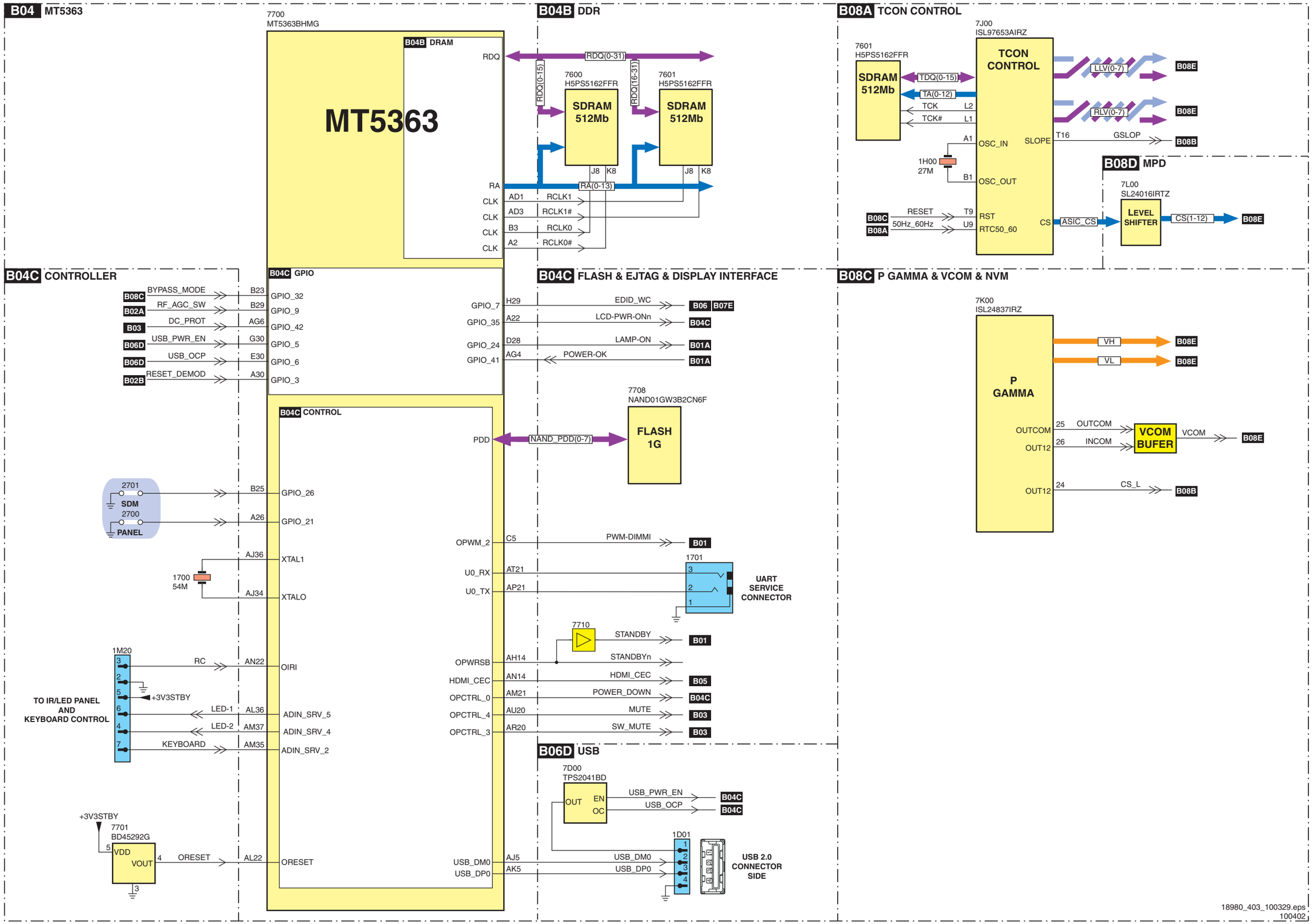
AUDIO



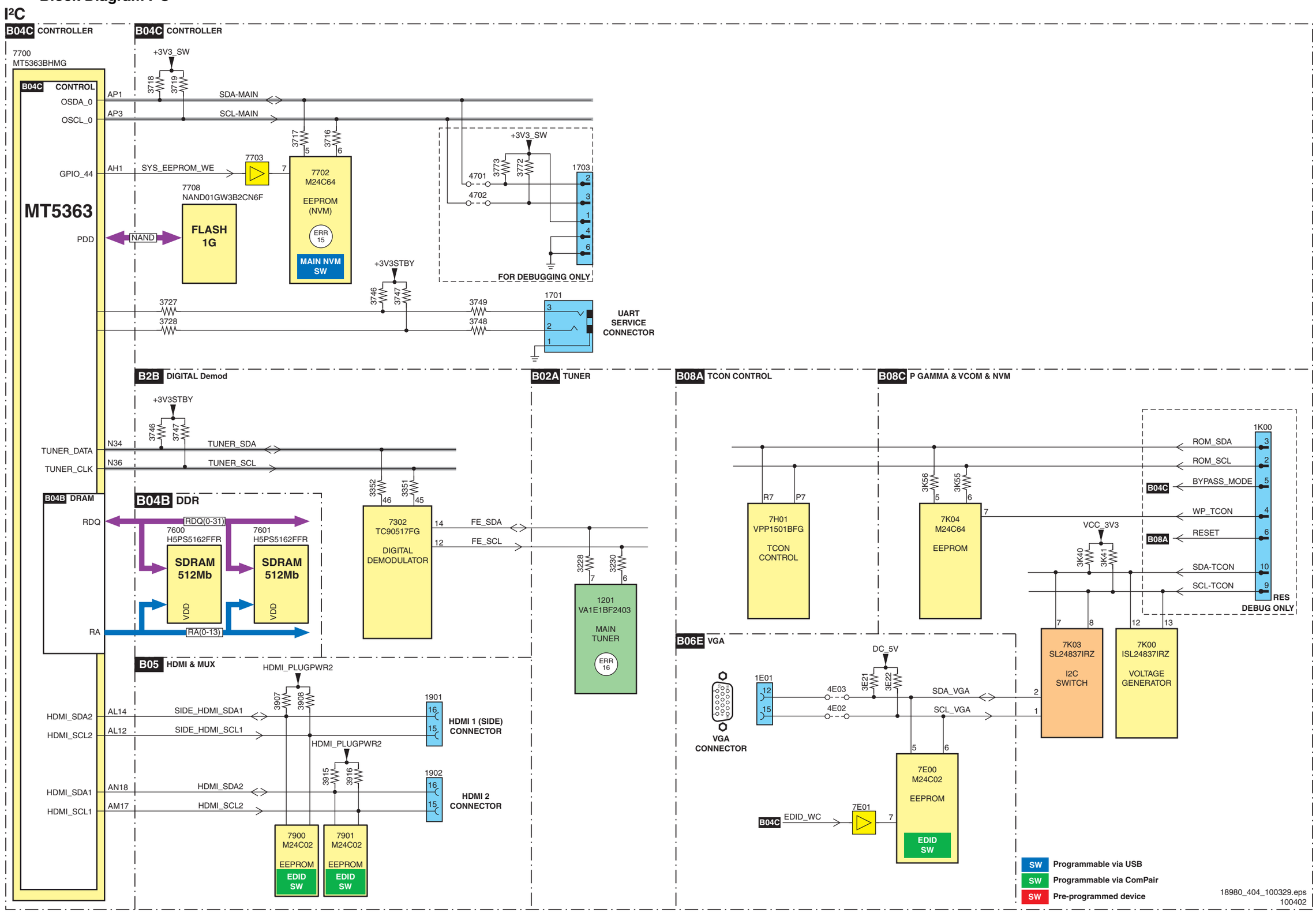
18980_402_100329.eps
100402

Block Diagram Control & Clock Signals

CONTROL + CLOCK SIGNALS

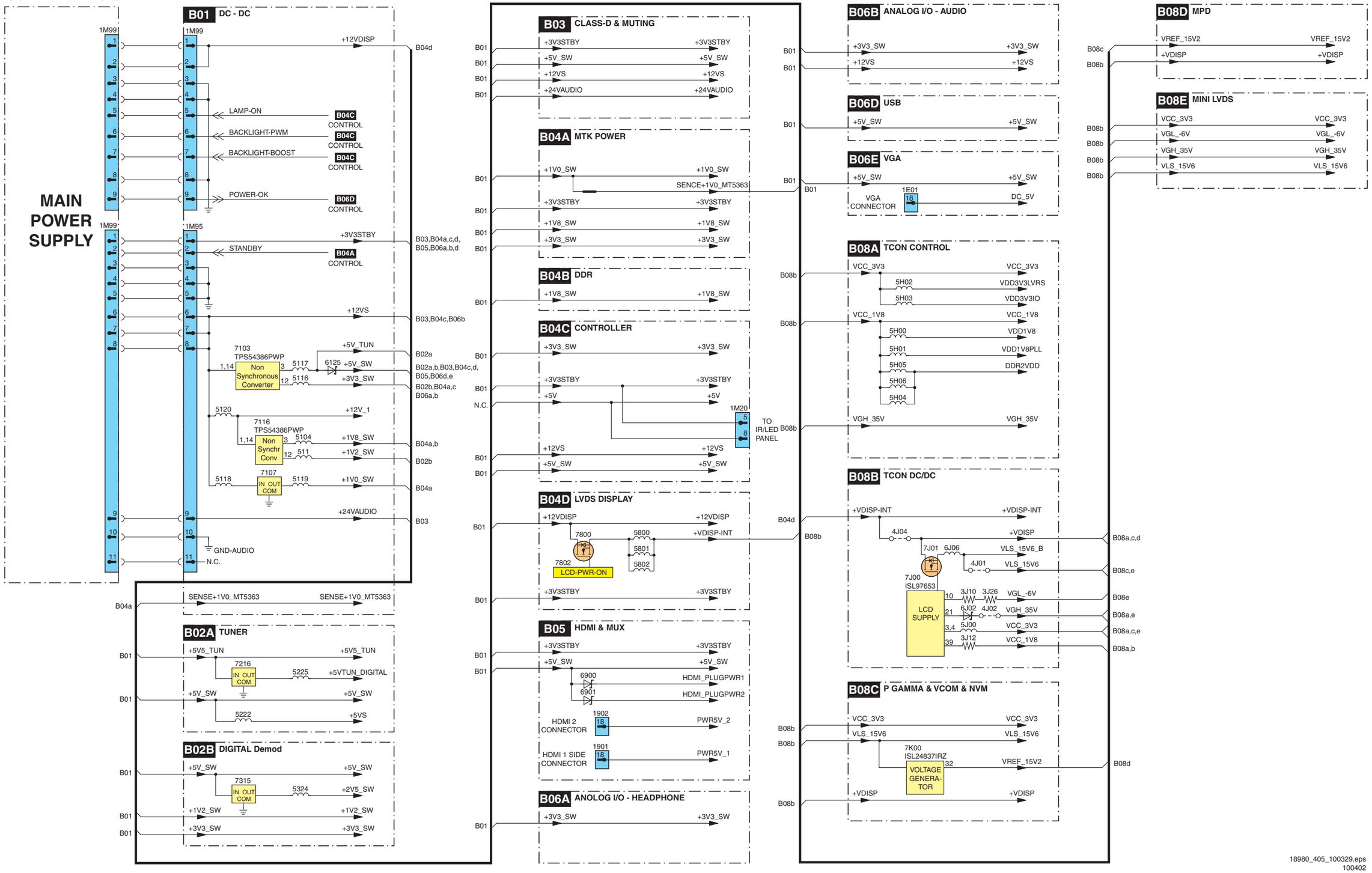


Block Diagram I²C



Supply Lines Overview

SUPPLY LINES OVERVIEW

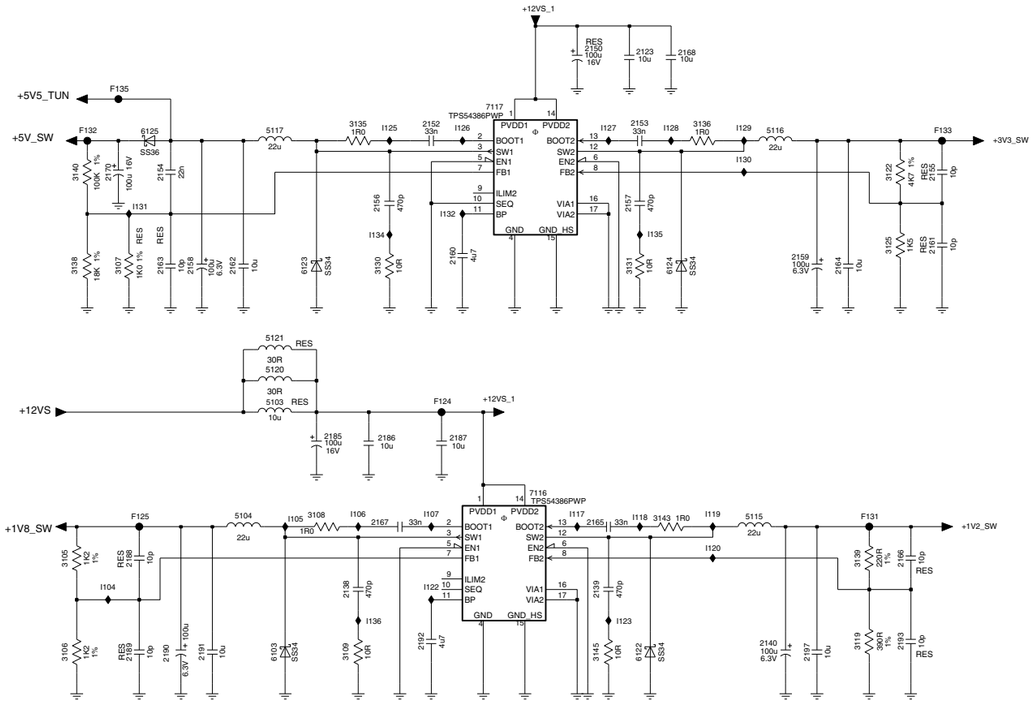


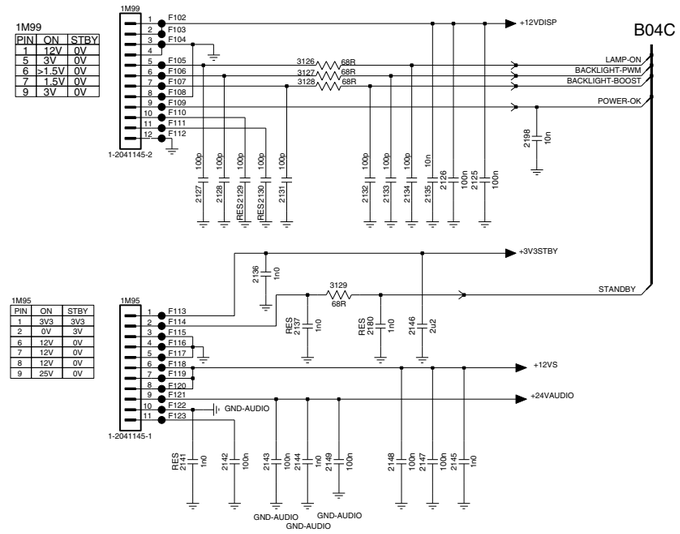
18980_405_100329.eps
100402

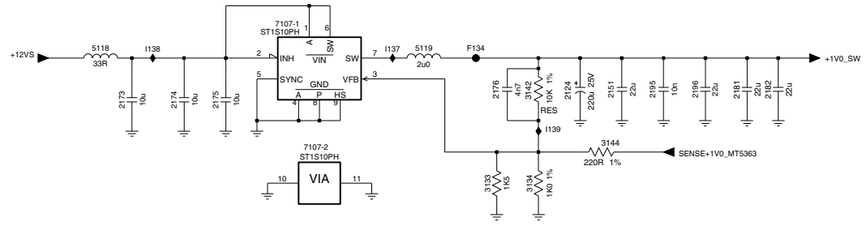
10. Circuit Diagrams and PWB Layouts

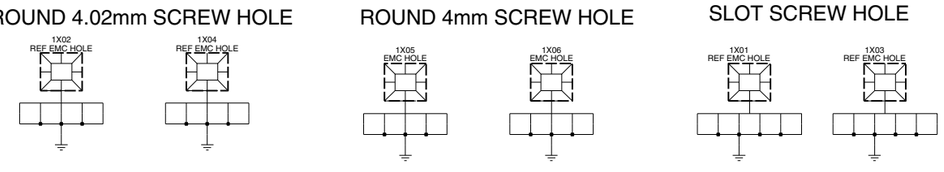
SSB: DC-DC

B01 DC-DC









1M95 C10	2127 B10	2133 B12	2139 F5	2145 D12	2151 F13	2157 C5	2163 D2	2170 C1	2181 F13	2189 F2	2196 F13	3108 E3	3127 B11	3134 F12	3142 F12	5115 E6	5121 D3	7107-1 E10	F104 A10	F110 B10	F116 D10	F122 D10	F133 C7	I107 E4	I123 F5	I130 C6	I137 E11
1M99 A10	2128 B10	2134 B12	2140 F6	2146 C12	2152 C4	2158 D2	2164 D6	2173 F9	2182 F14	2190 F2	2197 F6	3109 F3	3128 B11	3135 C3	3143 E5	5116 C6	6103 F3	7107-2 F11	F105 B10	F111 B10	F117 D10	F123 D10	F134 E12	I117 E5	I125 C3	I131 C2	I138 E9
2123 B5	2129 B11	2135 B12	2141 D10	2147 D12	2153 C5	2159 C6	2165 E5	2174 F10	2185 E3	2191 F2	2198 B13	3119 F6	3129 C11	3136 C5	3144 F13	5117 C3	6122 F5	7116 E4	F106 B10	F112 B10	F118 D10	F124 D4	F135 B1	I118 E5	I126 C4	I132 C4	I139 F12
2124 F12	2130 B11	2136 C11	2142 D10	2148 D12	2154 C2	2160 C4	2166 F7	2175 F10	2186 E3	2192 F4	3105 F1	3122 C7	3130 D3	3138 D1	3145 F5	5118 E9	6123 D3	7117 B4	F107 B10	F113 C10	F119 D10	F125 E2	I104 F1	I119 E6	I127 C5	I134 C3	
2125 B12	2131 B11	2137 C11	2143 D11	2149 D11	2155 C7	2161 C7	2167 E3	2176 F12	2187 E4	2193 F7	3106 F1	3125 C7	3131 D5	3139 F6	5103 D3	5119 E11	6124 D5	F102 A10	F108 B10	F114 C10	F120 D10	F131 E7	I105 E3	I120 E6	I128 C5	I135 C5	
2126 B12	2132 B11	2138 F3	2144 D11	2150 B5	2156 C3	2162 D2	2168 B5	2180 C11	2188 F2	2195 F13	3107 D1	3126 B11	3133 F12	3140 C1	5104 E2	5120 D3	6125 C2	F103 A10	F109 B10	F115 C10	F121 D10	F132 C1	I106 E3	I122 F4	I129 C6	I136 F3	

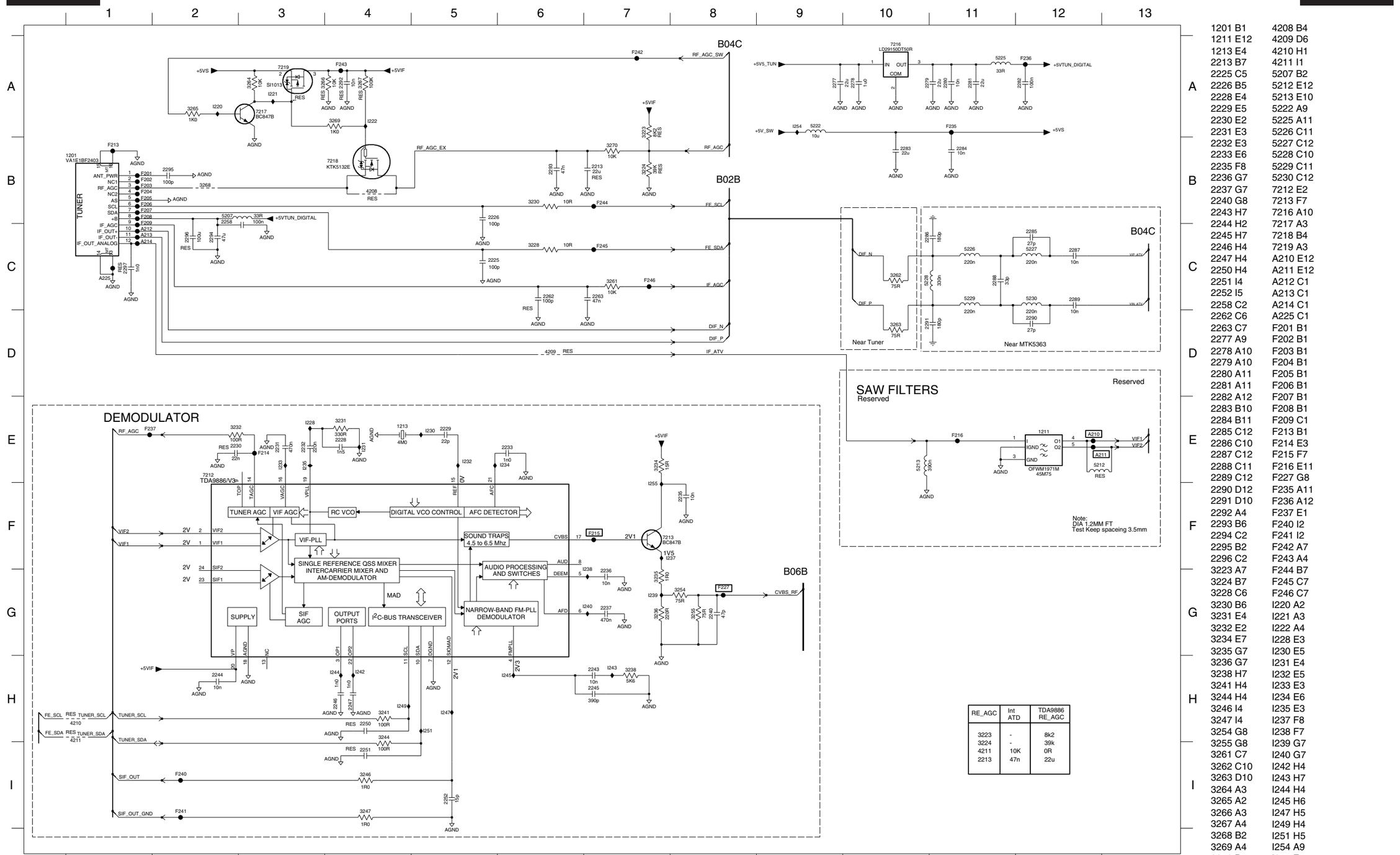
BR-M-50 PCB SB SSB DIGITIAL	3139 123 6483	1 2010-01-22

18980_500_100329.eps
100329

SSB: Tuner

B02A Tuner

B02A



RE_AGC	Int ATD	TDA9886 RE_AGC
3223	-	8k2
3224	-	39k
4211	10K	0R
2213	47n	22u

1201 B1	4208 B4
1211 E12	4209 D6
1213 E4	4210 H1
2213 B7	4211 I1
2225 C5	5207 B2
2226 B5	5212 E12
2228 E4	5213 E10
2229 E5	5222 A9
2230 E2	5225 A11
2231 E3	5226 C11
2232 E3	5227 C12
2233 E6	5228 C10
2235 F8	5229 C11
2236 G7	5230 C12
2237 G7	7212 E2
2240 G8	7213 F7
2243 H7	7216 A10
2244 H2	7217 A3
2245 H7	7218 B4
2246 H4	7219 A3
2247 H4	A210 E12
2250 H4	A211 E12
2251 I4	A212 C1
2252 I5	A213 C1
2258 C2	A214 C1
2262 C6	A225 C1
2263 C7	F201 B1
2277 A9	F202 B1
2278 A10	F203 B1
2279 A10	F204 B1
2280 A11	F205 B1
2281 A11	F206 B1
2282 A12	F207 B1
2283 B10	F208 B1
2284 B11	F209 C1
2285 C12	F213 B1
2286 C10	F214 E3
2287 C12	F215 F7
2288 C11	F216 E11
2289 C12	F227 G8
2290 D12	F235 A11
2291 D10	F236 A12
2292 A4	F237 E1
2293 B6	F240 I2
2294 C2	F241 I2
2295 B2	F242 A7
2296 C2	F243 A4
3223 A7	F244 B7
3224 B7	F245 C7
3228 C6	F246 C7
3230 B6	I220 A2
3231 E4	I221 A3
3232 E2	I222 A4
3234 E7	I228 E3
3235 G7	I230 E5
3236 G7	I231 E4
3238 H7	I232 E5
3241 H4	I233 E3
3244 H4	I234 E6
3246 I4	I235 E3
3247 I4	I237 F8
3254 G8	I238 F7
3255 G8	I239 G7
3261 C7	I240 G7
3262 C10	I242 H4
3263 D10	I243 H7
3264 A3	I244 H4
3265 A2	I245 H6
3266 A3	I247 H5
3267 A4	I249 H4
3268 B2	I251 H5
3269 A4	I254 A9
3270 B7	I255 F7

BR-M-50
PCB SB SSB DIGITIAL

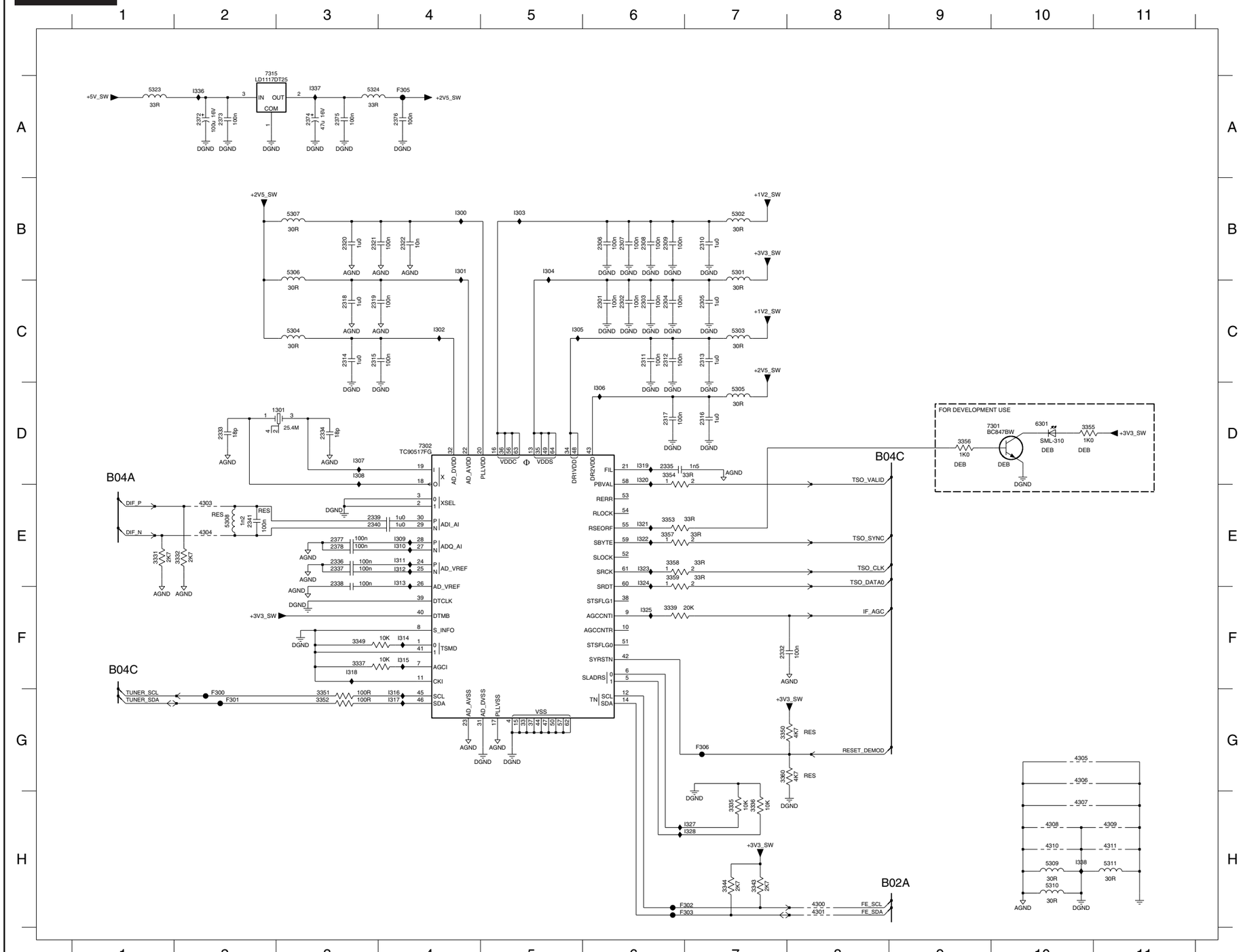
3140 123 6483

1 2010-01-22

18980_501_100329.eps
100329

SSB: Digital Demodulator

B02B Digital Demodulator



1301	D3	4304	E2
2301	C6	4305	G10
2302	C6	4306	G10
2303	C6	4307	H10
2304	C6	4308	H10
2305	C7	4309	H11
2306	B6	4310	H10
2307	B6	4311	H11
2308	B6	5301	B7
2309	B6	5302	B7
2310	B7	5303	C7
2311	C6	5304	C3
2312	C6	5305	D7
2313	C7	5306	B3
2314	C3	5307	B3
2315	C3	5308	E2
2316	D7	5309	H10
2317	D6	5310	H10
2318	C3	5311	H11
2319	C3	5323	A1
2320	B3	5324	A3
2321	B3	6301	D10
2322	B4	7301	D9
2332	F7	7302	D4
2333	D2	7315	A2
2334	D3	F300	G2
2335	D6	F301	G2
2336	E3	F302	H7
2337	E3	F303	H7
2338	E3	F305	A4
2339	E3	F306	G7
2340	E3	I300	B4
2341	E2	I301	B4
2372	A2	I302	C4
2373	A2	I303	B5
2374	A3	I304	B5
2375	A3	I305	C5
2376	A4	I306	D6
2377	E3	I307	D3
2378	E3	I308	D3
3331	E1	I309	E4
3332	E2	I310	E4
3335	H7	I311	E4
3336	H7	I312	E4
3337	F3	I313	E4
3339	F6	I314	F4
3343	H7	I315	F4
3344	H7	I316	G4
3349	F3	I317	G4
3350	G7	I318	F3
3351	G3	I319	D6
3352	G3	I320	D6
3353	E6	I321	E6
3354	D6	I322	E6
3355	D10	I323	E6
3356	D9	I324	E6
3357	E6	I325	F6
3358	E6	I327	H7
3359	E6	I328	H7
3360	G7	I336	A2
4300	H8	I337	A3
4301	H8	I338	H10
4303	E2		

BR-M-50
PCB SB SSB DIGITIAL

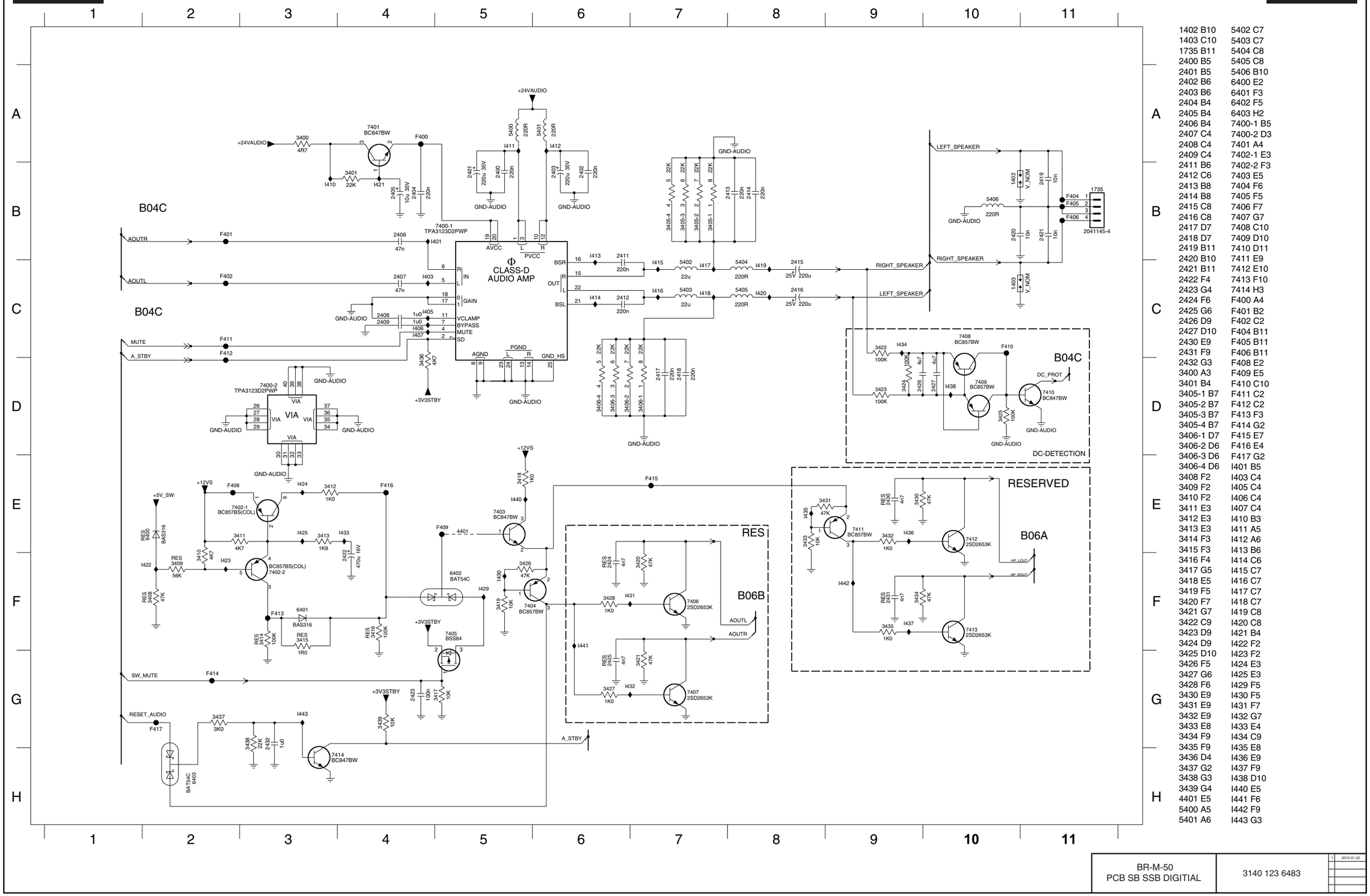
3140 123 6483

1 2010-01-22

18980_502_100329.eps
100329

SSB: Class-D & Muting

B03 Class-D & Muting **B03**



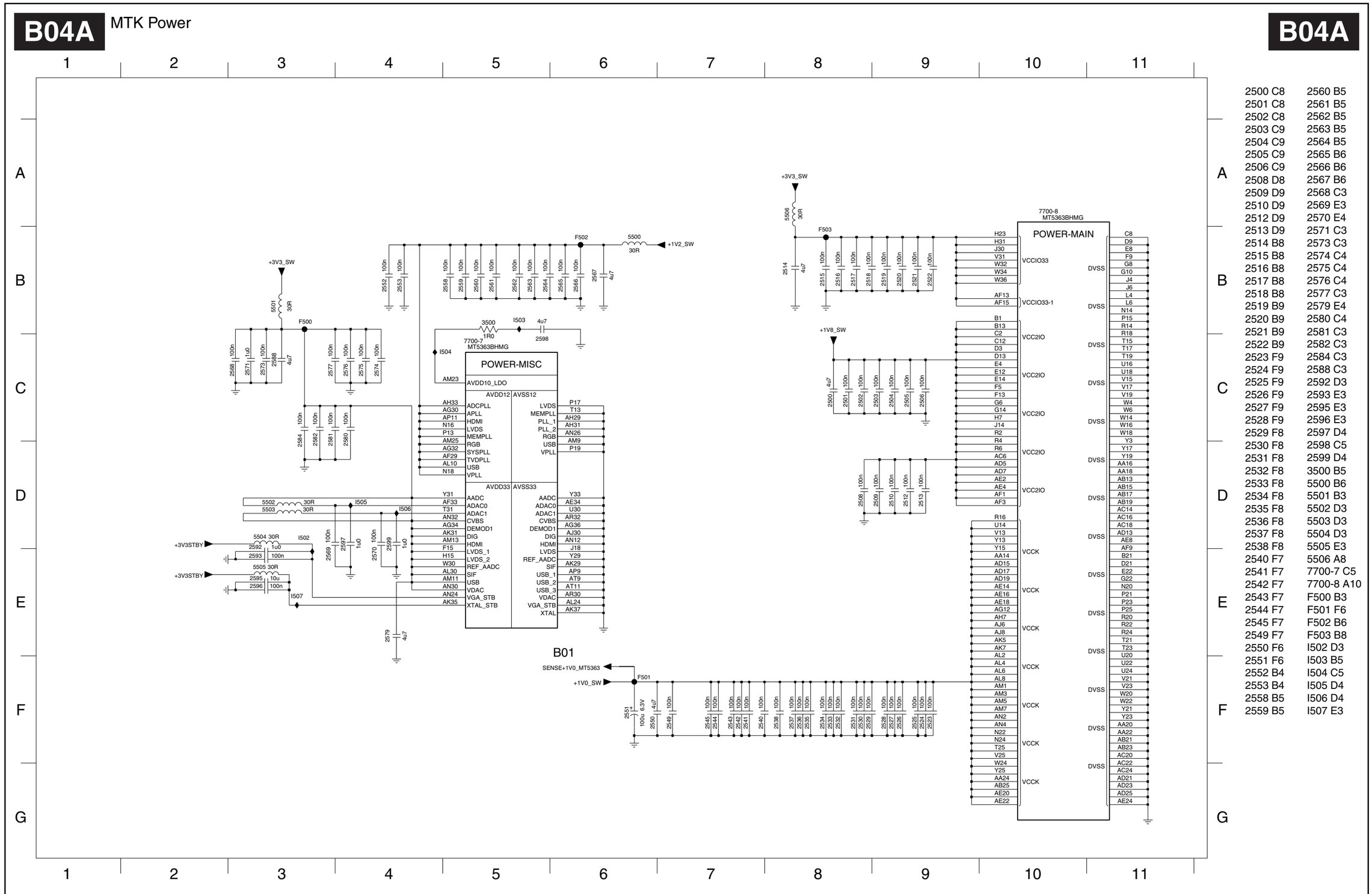
1402	B10	5402	C7
1403	C10	5403	C7
1735	B11	5404	C8
2400	B5	5405	C8
2401	B5	5406	B10
2402	B6	6400	E2
2403	B6	6401	F3
2404	B4	6402	F5
2405	B4	6403	H2
2406	B4	7400-1	B5
2407	C4	7400-2	D3
2408	C4	7401	A4
2409	C4	7402-1	E3
2411	B6	7402-2	F3
2412	C6	7403	E5
2413	B8	7404	F6
2414	B8	7405	F5
2415	C8	7406	F7
2416	C8	7407	G7
2417	D7	7408	C10
2418	D7	7409	D10
2419	B11	7410	D11
2420	B10	7411	E9
2421	B11	7412	E10
2422	F4	7413	F10
2423	G4	7414	H3
2424	F6	F400	A4
2425	G6	F401	B2
2426	D9	F402	C2
2427	D10	F404	B11
2430	E9	F405	B11
2431	F9	F406	B11
2432	G3	F408	E2
3400	A3	F409	E5
3401	B4	F410	C10
3405-1	B7	F411	C2
3405-2	B7	F412	C2
3405-3	B7	F413	F3
3405-4	B7	F414	G2
3406-1	D7	F415	E7
3406-2	D6	F416	E4
3406-3	D6	F417	G2
3406-4	D6	I401	B5
3408	F2	I403	C4
3409	F2	I405	C4
3410	F2	I406	C4
3411	E3	I407	C4
3412	E3	I410	B3
3413	E3	I411	A5
3414	F3	I412	A6
3415	F3	I413	B6
3416	F4	I414	C6
3417	G5	I415	C7
3418	E5	I416	C7
3419	F5	I417	C7
3420	F7	I418	C7
3421	G7	I419	C8
3422	C9	I420	C8
3423	D9	I421	B4
3424	D9	I422	F2
3425	D10	I423	F2
3426	F5	I424	E3
3427	G6	I425	E3
3428	F6	I429	F5
3430	E9	I430	F5
3431	E9	I431	F7
3432	E9	I432	G7
3433	E8	I433	E4
3434	F9	I434	C9
3435	F9	I435	E8
3436	D4	I436	E9
3437	G2	I437	F9
3438	G3	I438	D10
3439	G4	I440	E5
4401	E5	I441	F6
5400	A5	I442	F9
5401	A6	I443	G3

BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_503_100329.eps
100329

SSB: MTK Power

B04A MTK Power **B04A**



2500 C8	2560 B5
2501 C8	2561 B5
2502 C8	2562 B5
2503 C9	2563 B5
2504 C9	2564 B5
2505 C9	2565 B6
2506 C9	2566 B6
2508 D8	2567 B6
2509 D9	2568 C3
2510 D9	2569 E3
2512 D9	2570 E4
2513 D9	2571 C3
2514 B8	2573 C3
2515 B8	2574 C4
2516 B8	2575 C4
2517 B8	2576 C4
2518 B8	2577 C3
2519 B9	2579 E4
2520 B9	2580 C4
2521 B9	2581 C3
2522 B9	2582 C3
2523 F9	2584 C3
2524 F9	2588 C3
2525 F9	2592 D3
2526 F9	2593 E3
2527 F9	2595 E3
2528 F9	2596 E3
2529 F8	2597 D4
2530 F8	2598 C5
2531 F8	2599 D4
2532 F8	3500 B5
2533 F8	5500 B6
2534 F8	5501 B3
2535 F8	5502 D3
2536 F8	5503 D3
2537 F8	5504 D3
2538 F8	5505 E3
2540 F7	5506 A8
2541 F7	7700-7 C5
2542 F7	7700-8 A10
2543 F7	F500 B3
2544 F7	F501 F6
2545 F7	F502 B6
2549 F7	F503 B8
2550 F6	I502 D3
2551 F6	I503 B5
2552 B4	I504 C5
2553 B4	I505 D4
2558 B5	I506 D4
2559 B5	I507 E3

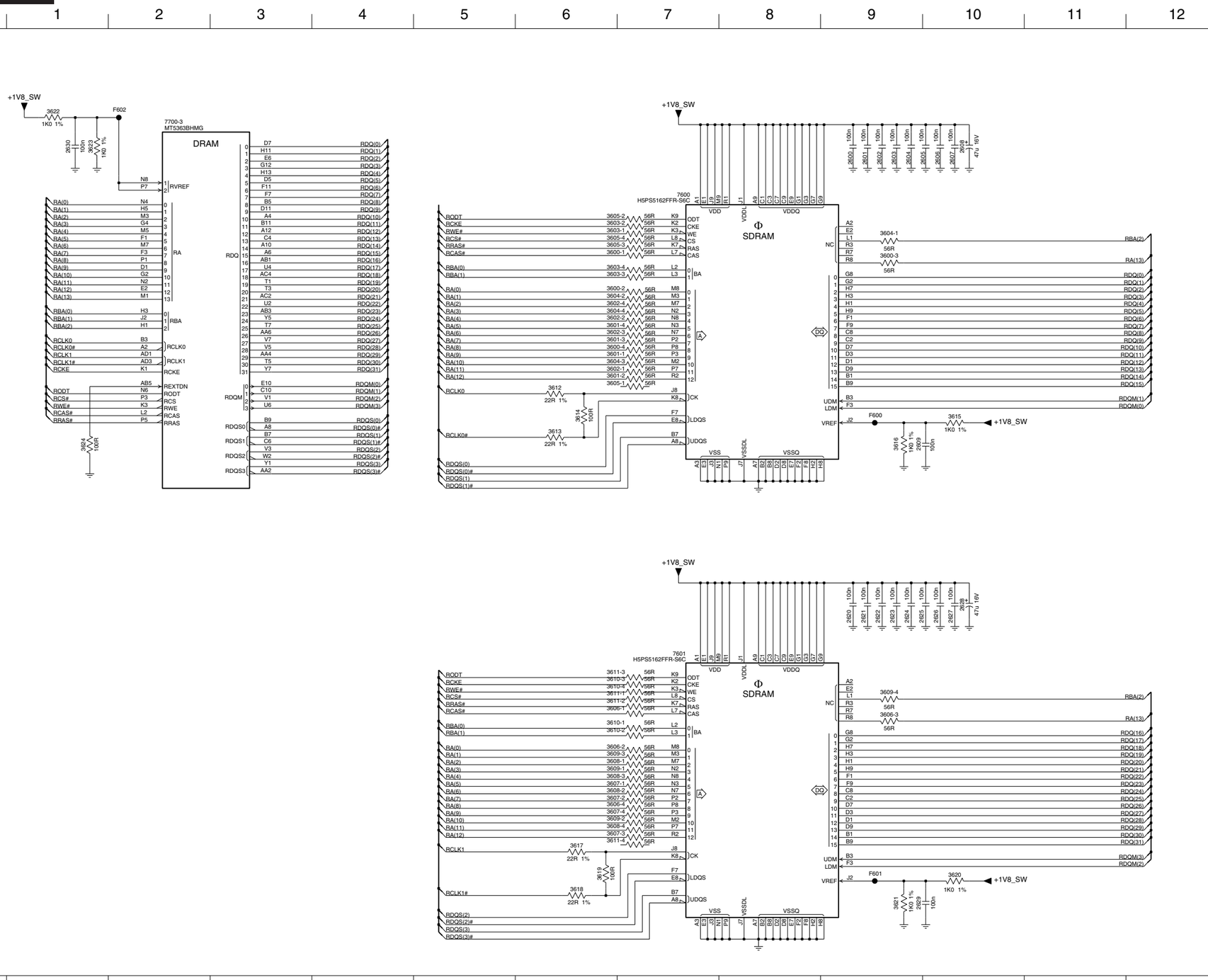
BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_504_100329.eps
100329

SSB: DDR

B04B DDR

B04B



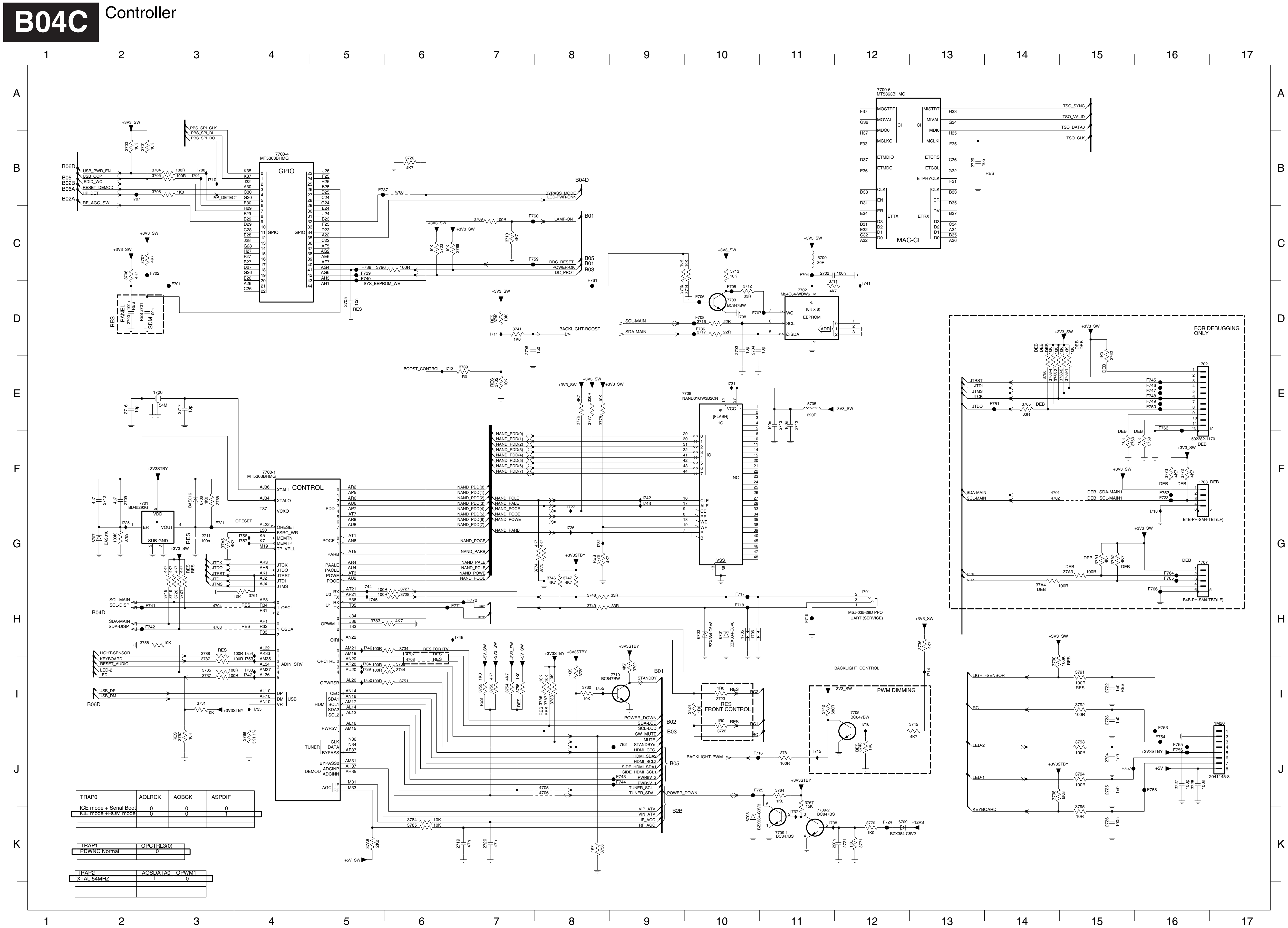
2600 B9
2601 B9
2602 B9
2603 B9
2604 B9
2605 B10
2606 B10
2607 B10
2608 B10
2609 D9
2620 F9
2621 F9
2622 F9
2623 F9
2624 F9
2625 F10
2626 F10
2627 F10
2628 F10
2629 I9
2630 B1
3600-1 C6
3600-2 C6
3600-3 C9
3600-4 C6
3601-1 D6
3601-2 D6
3601-3 C6
3601-4 C6
3602-1 D6
3602-2 C6
3602-3 C6
3602-4 C6
3603-1 B6
3603-2 B6
3603-3 C6
3603-4 C6
3604-1 B9
3604-2 C6
3604-3 D6
3604-4 C6
3605-1 D6
3605-2 B6
3605-3 B6
3605-4 B6
3606-1 G6
3606-2 G6
3606-3 G9
3606-4 H6
3607-1 H6
3607-2 H6
3607-3 H6
3607-4 H6
3608-1 H6
3608-2 H6
3608-3 H6
3608-4 H6
3609-1 H6
3609-2 H6
3609-3 G6
3609-4 G9
3610-1 G6
3610-2 G6
3610-3 G6
3610-4 G6
3611-1 G6
3611-2 G6
3611-3 G6
3611-4 H6
3612 D6
3613 D6
3614 D6
3615 D10
3616 D9
3617 H6
3618 I6
3619 I6
3620 I10
3621 I9
3622 A1
3623 B1
3624 D1
7600 B7
7601 G7
7700-3 A2
F600 D9
F601 I9
F602 A2

BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_505_100329.eps
100329

SSB: Controller

B04C Controller



1700 E2	3793 J15
1701 H12	3794 J15
1702 E16	3795 K15
1703 F16	3796 C5
1705 H10	3798 J14
1706 H10	37A1 G15
1707 G16	37A2 G15
1M20 I17	37A3 G15
2700 D2	37A4 H14
2701 D2	37A5 G3
2702 C11	37A6 I8
2703 D10	37A7 I8
2704 D10	37A8 K5
2705 D5	4700 B6
2706 D7	4701 F14
2709 F2	4702 F14
2710 F2	4703 H3
2711 G3	4704 H3
2712 E11	4705 J8
2713 E11	4706 J8
2716 E2	4707 H6
2717 E3	4708 I6
2719 K7	5700 C11
2720 K7	5705 E11
2721 K12	6700 H10
2722 I15	6701 H10
2723 I15	6706 F3
2724 J15	6707 G2
2725 J15	6708 K10
2726 K15	6709 K12
2727 J16	7700-1 F4
2728 J16	7700-4 B4
2729 B13	7700-6 A12
3700 B2	7701 F2
3701 B2	7702 D11
3702 I9	7703 D10
3703 C6	7705 I12
3704 B2	7708 E10
3705 B2	7709-1 K11
3706 C2	7709-2 K11
3707 C2	7710 I9
3708 B2	F701 D3
3709 C7	F702 C2
3710 C7	F704 C11
3711 D11	F705 D10
3712 D10	F706 D10
3713 C10	F707 D10
3714 D10	F708 D10
3715 D9	F716 J10
3716 D10	F717 H10
3717 D10	F718 H10
3718 H3	F719 H11
3719 H3	F721 G3
3720 H3	F723 F16
3721 H3	F724 K12
3722 I10	F725 J10
3723 I10	F736 D10
3724 I10	F737 B5
3726 B6	F738 C5
3727 H6	F739 C5
3728 H6	F740 C5
3729 I8	F741 H2
3730 I8	F742 H2
3731 I3	F743 J9
3733 I8	F744 J9
3734 H6	F745 E16
3735 I3	F746 E16
3736 H13	F747 E16
3737 I3	F748 E16
3738 I6	F749 E16
3739 E7	F750 E16
3740 D7	F751 E14
3741 D7	F752 F16
3742 I11	F753 I16
3743 J12	F754 J16
3744 I6	F755 J16
3745 I13	F756 J16
3746 G8	F757 J15
3747 G8	F758 J16
3748 H8	F759 C7
3749 H8	F760 C7
3751 I6	F761 D8
3752 I7	F763 E16
3753 I7	F764 G16
3754 I7	F765 G16
3755 I7	F766 H16
3756 K8	F770 H7
3757 J3	F771 H6
3758 H2	I700 B3
3759 F16	I701 B3
3760 F15	I707 B2
3761 H4	I708 D10
3762 D15	I710 B3
3763-1 E15	I711 D7
3763-2 E14	I713 E6
3763-3 E14	I714 I13
3763-4 E14	I715 J11
3764 J11	I716 I12
3765 E14	I718 G16
3767 J11	I725 G2
3768 F3	I726 G8
3769 G2	I727 G8
3770 K12	I731 E10
3771 K12	I732 G8
3772 F16	I733 I4
3773 F16	I734 I5
3774 G8	I735 I4
3775 G8	I737 K11
3776 E8	I738 K11
3777 E8	I739 I5
3778 E8	I741 D12
3779 G8	I742 F9
3780 E14	I743 F9
3781 J11	I744 H5
3782 E7	I745 H5
3783 H5	I746 H5
3784 K6	I747 I4
3785 K6	I749 H6
3786 C6	I750 I5
3787 I3	I752 J9
3788 H3	I753 I4
3789 J4	I754 H4
3790 I14	I755 I8
3791 I15	I756 G4
3792 I15	I757 G4

BR-M-50
PCB SB SSB DIGITIAL

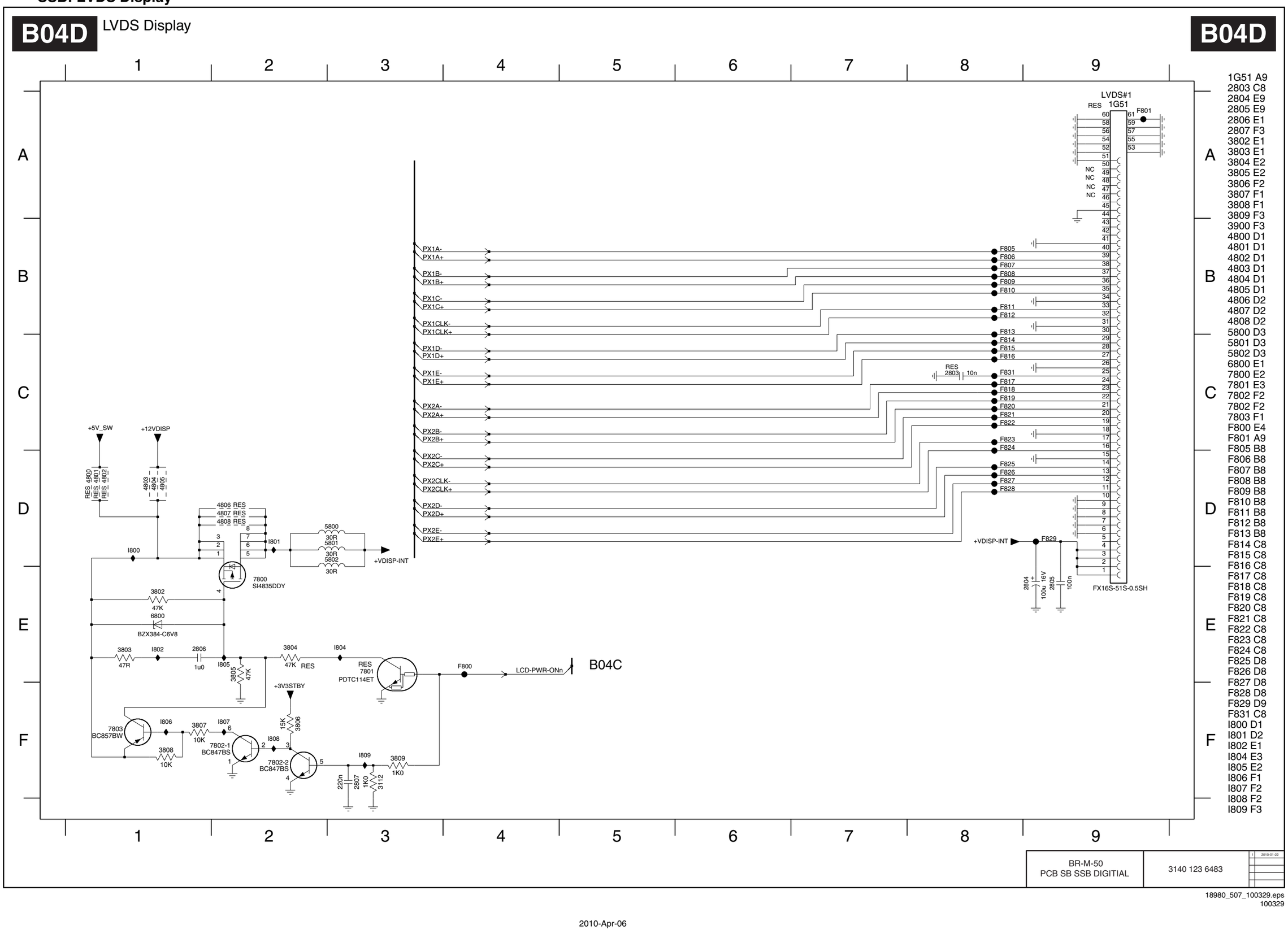
3140 123 6483

1 2010-01-22

18980_506_100329.eps
100329

SSB: LVDS Display

B04D LVDS Display **B04D**



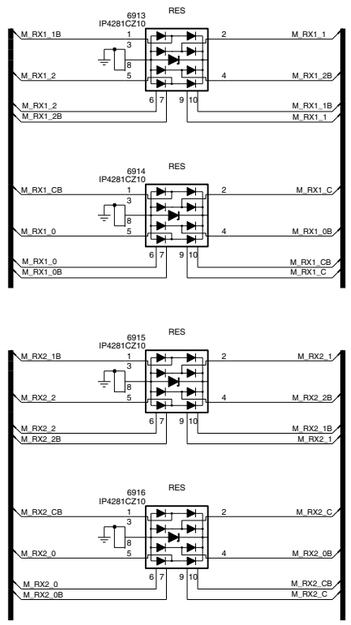
BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

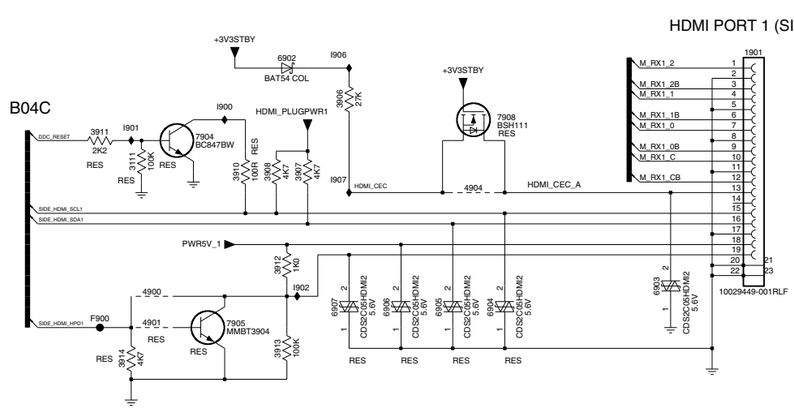
18980_507_100329.eps
100329

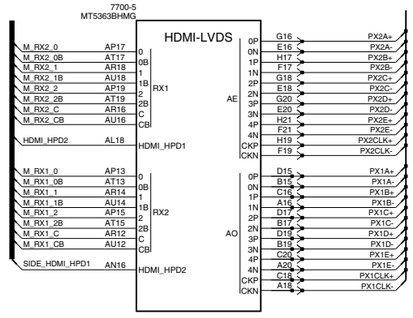
SSB: HDMI & Multiplexer

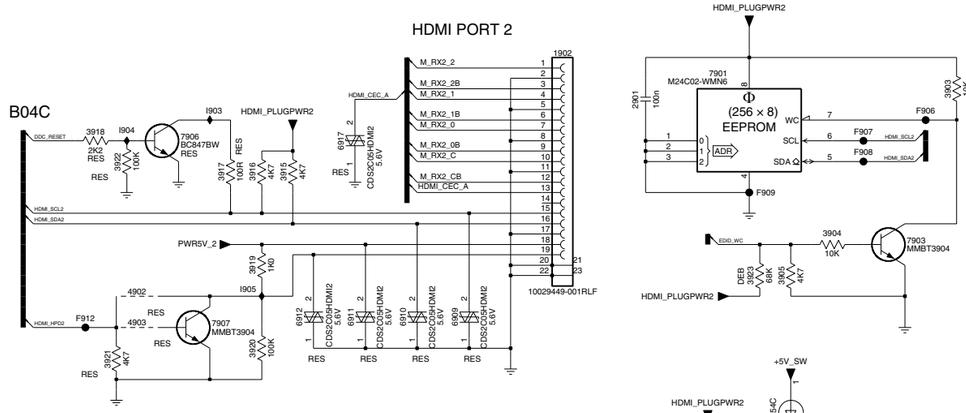
B05 HDMI & Multiplexer

B05









1901 B11
1902 F10
2900 B11
2901 F11
3111 C6
3900 B13
3901 C13
3902 C12
3903 F13
3904 G12
3905 H12
3906 B8
3907 C8
3908 C7
3910 C7
3911 B6
3912 C7
3913 D7
3914 D6
3915 G9
3916 G8
3917 G8
3918 G7
3919 G8
3920 H8
3921 H7
3922 G7
3923 H12
3924 C12
4900 C7
4901 D7
4902 H8
4903 H8
4904 C9
6900 D12
6901 I12
6902 B7
6903 C10
6904 D9
6905 D9
6906 D8
6907 D8
6909 H10
6910 H9
6911 H9
6912 H9
6913 A3
6914 B3
6915 C3
6916 E3
6917 G9
7700-5 F4
7900 B12
7901 F12
7902 C13
7903 G13
7904 B7
7905 D7
7906 G8
7907 H8
7908 B9
F900 D6
F901 B13
F902 B13
F903 C13
F904 C12
F905 C12
F906 F13
F907 G13
F908 G13
F909 G12
F911 I12
F912 H7
F913 D12
I900 B7
I901 B6
I902 C8
I903 F8
I904 G7
I905 H8
I906 B8
I907 C8

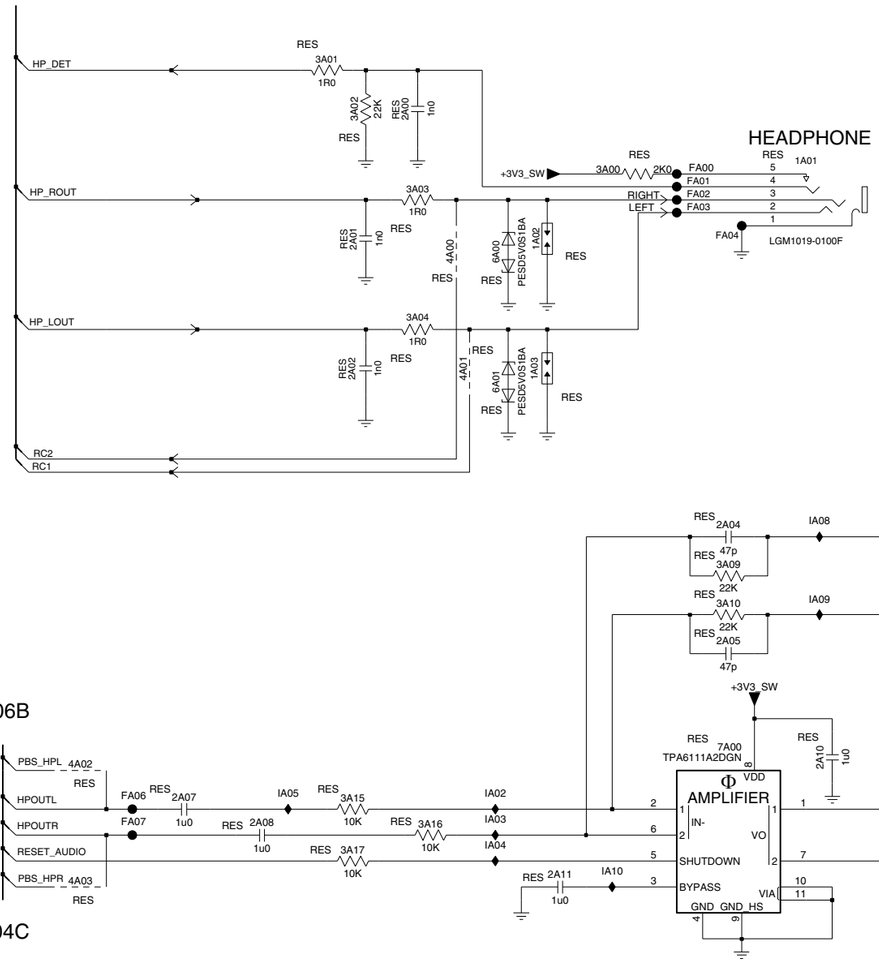
BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_508_100329.eps
100329

SSB: Analog I/O - Headphone

B06A Analog I/O - Headphone

RESERVED



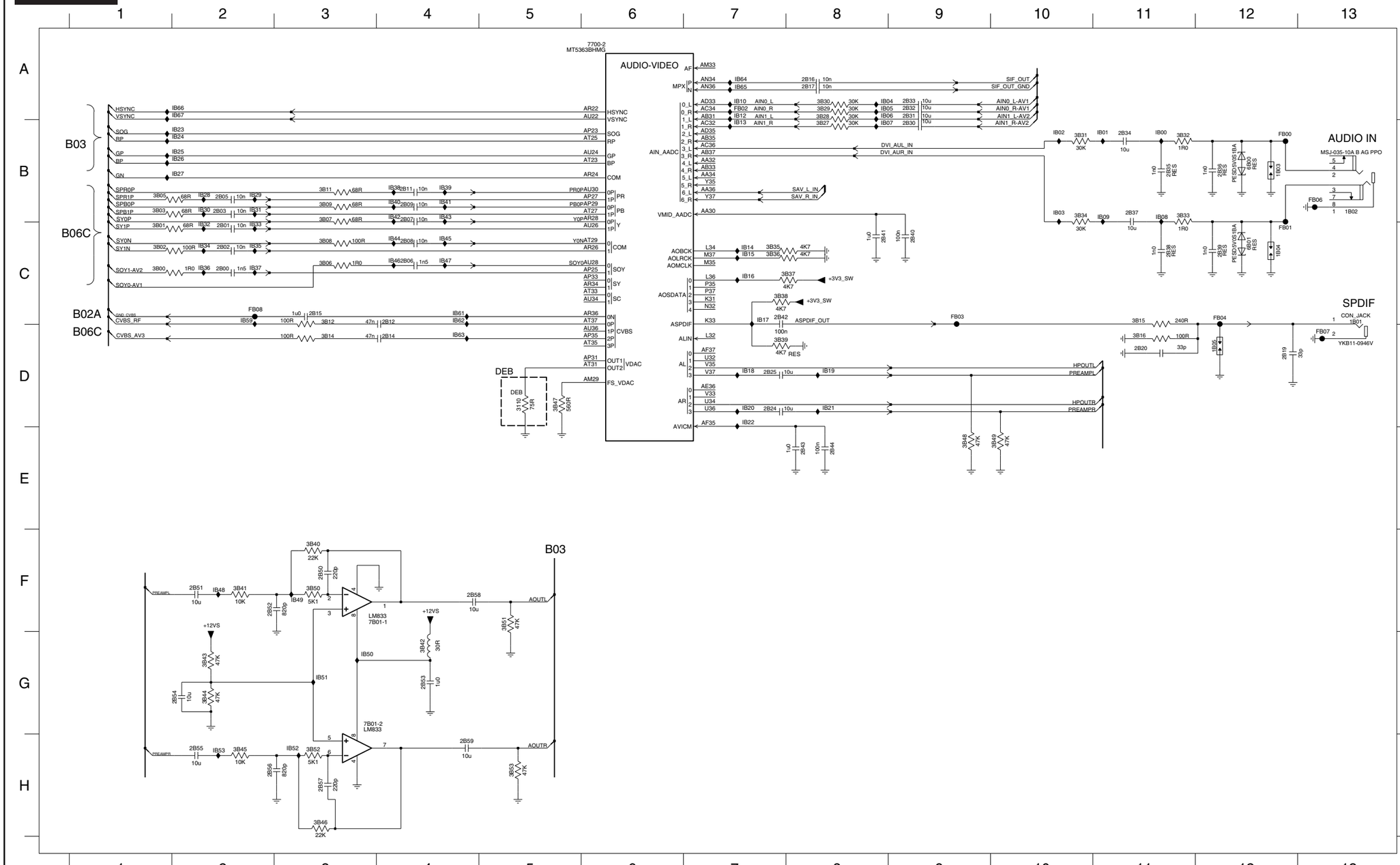
1A01 C7
1A02 C6
1A03 D5
2A00 B5
2A01 C5
2A02 D4
2A04 E7
2A05 E7
2A06 F8
2A07 F4
2A08 F4
2A09 G8
2A10 F7
2A11 G6
3A00 C6
3A01 B4
3A02 B5
3A03 C5
3A04 D5
3A09 E7
3A10 E7
3A11 F9
3A12 F9
3A13 G9
3A14 G9
3A15 F4
3A16 F5
3A17 G4
4A00 C5
4A01 D5
4A02 F3
4A03 G3
6A00 C5
6A01 D5
7A00 F7
FA00 C6
FA01 C6
FA02 C6
FA03 C6
FA04 C7
FA06 F3
FA07 F3
FA08 F10
FA09 G10
IA00 F8
IA01 F8
IA02 F5
IA03 F5
IA04 F5
IA05 F4
IA08 E7
IA09 E7
IA10 G6

BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_509_100329.eps
100329

SSB: Analog I/O - Audio

B06B Analog I/O - Audio



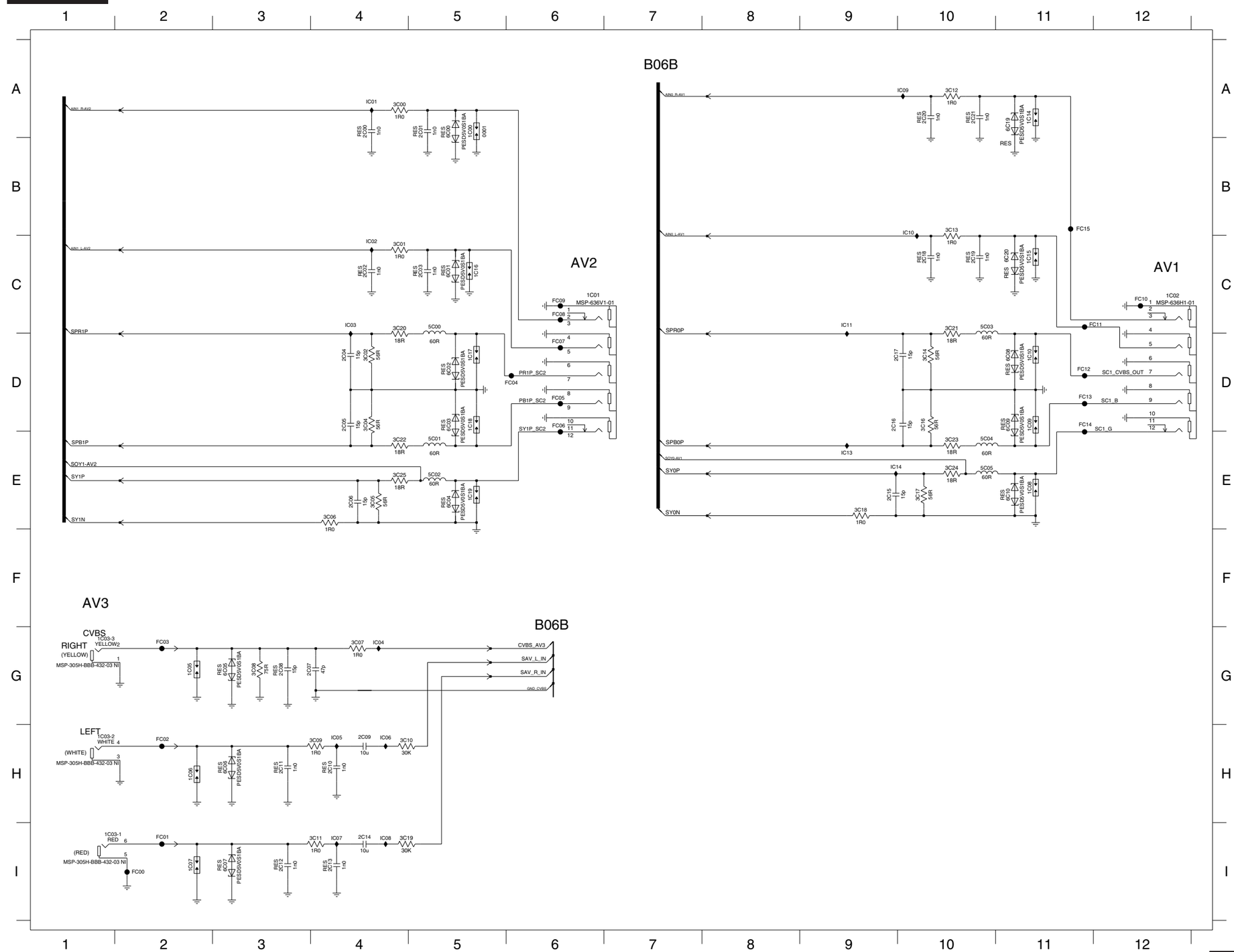
1B01	C13	3B46	H3
1B02	B13	3B47	D5
1B03	B12	3B48	E9
1B04	C12	3B49	E10
1B05	D12	3B50	F3
2B00	C2	3B51	F5
2B01	C2	3B52	H3
2B02	C2	3B53	H5
2B03	B2	6B00	B12
2B05	B2	6B01	C12
2B06	C4	7700-2	A6
2B07	B4	7B01-1	F3
2B08	C4	7B01-2	G3
2B09	B4	FB00	B12
2B11	B4	FB01	C12
2B12	C4	FB02	A7
2B14	D4	FB03	C9
2B15	C3	FB04	C12
2B16	A8	FB06	B13
2B17	A8	FB07	D13
2B19	D12	FB08	C2
2B20	D11	IB00	B11
2B24	D7	IB01	B11
2B25	D7	IB02	B10
2B30	B9	IB03	B10
2B31	A9	IB04	A8
2B32	A9	IB05	A8
2B33	A9	IB06	A8
2B34	B11	IB07	B8
2B35	B11	IB08	B11
2B36	B12	IB09	B11
2B37	B11	IB10	A7
2B38	C11	IB12	A7
2B39	C12	IB13	B7
2B40	C9	IB14	C7
2B41	C8	IB15	C7
2B42	C7	IB16	C7
2B43	E8	IB17	C7
2B44	E8	IB18	D7
2B50	F3	IB19	D8
2B51	F2	IB20	D7
2B52	F2	IB21	D8
2B53	G4	IB22	D7
2B54	G2	IB23	B2
2B55	H2	IB24	B2
2B56	H2	IB25	B2
2B57	H3	IB26	B2
2B58	F4	IB27	B2
2B59	H4	IB28	B2
3110	D5	IB29	B2
3B00	C1	IB30	B2
3B01	C1	IB31	B2
3B02	C1	IB32	C2
3B03	B1	IB33	C2
3B05	B1	IB34	C2
3B06	C3	IB35	C2
3B07	B3	IB36	C2
3B08	C3	IB37	C2
3B09	B3	IB38	B4
3B11	B3	IB39	B4
3B12	C3	IB40	B4
3B14	D3	IB41	B4
3B15	C11	IB42	B4
3B16	D11	IB43	B4
3B27	B8	IB44	C4
3B28	A8	IB45	C4
3B29	A8	IB46	C4
3B30	A8	IB47	C4
3B31	B10	IB48	F2
3B32	B11	IB49	F3
3B33	B11	IB50	G3
3B34	B10	IB51	G3
3B35	C7	IB52	H3
3B36	C7	IB53	H2
3B37	C8	IB59	C2
3B38	C7	IB61	C4
3B39	D7	IB62	C4
3B40	F3	IB63	D4
3B41	F2	IB64	A7
3B42	G4	IB65	A7
3B43	G2	IB66	A2
3B44	G2	IB67	A2
3B45	H2		

BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_510_100329.eps
100329

SSB: Analog I/O - Video

B06C Analog I/O - Video



1C00	A5	3C18	E9
1C01	C6	3C19	I4
1C02	C12	3C20	C4
1C03-1	I1	3C21	C10
1C03-2	H1	3C22	E4
1C03-3	G1	3C23	E10
1C05	G2	3C24	E10
1C06	H2	3C25	E4
1C07	I2	5C00	C5
1C08	E11	5C01	E5
1C09	D11	5C02	E5
1C10	D11	5C03	C10
1C14	A11	5C04	E10
1C15	C11	5C05	E10
1C16	C5	6C00	A5
1C17	D5	6C01	C5
1C18	D5	6C02	D5
1C19	E5	6C03	D5
2C00	A4	6C04	E5
2C01	A5	6C05	G3
2C02	C4	6C06	H3
2C03	C5	6C07	I3
2C04	D4	6C08	D11
2C05	D4	6C09	D11
2C06	E4	6C10	E11
2C07	G4	6C19	A11
2C08	G3	6C20	C11
2C09	H4	FC00	I2
2C10	H4	FC01	I2
2C11	H3	FC02	H2
2C12	I3	FC03	G2
2C13	I4	FC04	D6
2C14	I4	FC05	D6
2C15	E9	FC06	D6
2C16	D9	FC07	D6
2C17	D10	FC08	C6
2C18	C10	FC09	C6
2C19	C10	FC10	C12
2C20	A10	FC11	C12
2C21	A10	FC12	D11
3C00	A4	FC13	D11
3C01	C4	FC14	D11
3C02	D4	FC15	B11
3C04	D4	IC01	A4
3C05	E4	IC02	C4
3C06	E4	IC03	C4
3C07	G4	IC04	G4
3C08	G3	IC05	H4
3C09	H4	IC06	H4
3C10	H4	IC07	I4
3C11	I4	IC08	I4
3C12	A10	IC09	A10
3C13	B10	IC10	B10
3C14	D10	IC11	C9
3C16	D10	IC13	E9
3C17	E10	IC14	E9

BR-M-50
PCB SB SSB DIGITIAL

3140 123 6483

1 2010-01-22

18980_511_100329.eps
100329

SSB: USB

B06D USB

B06D

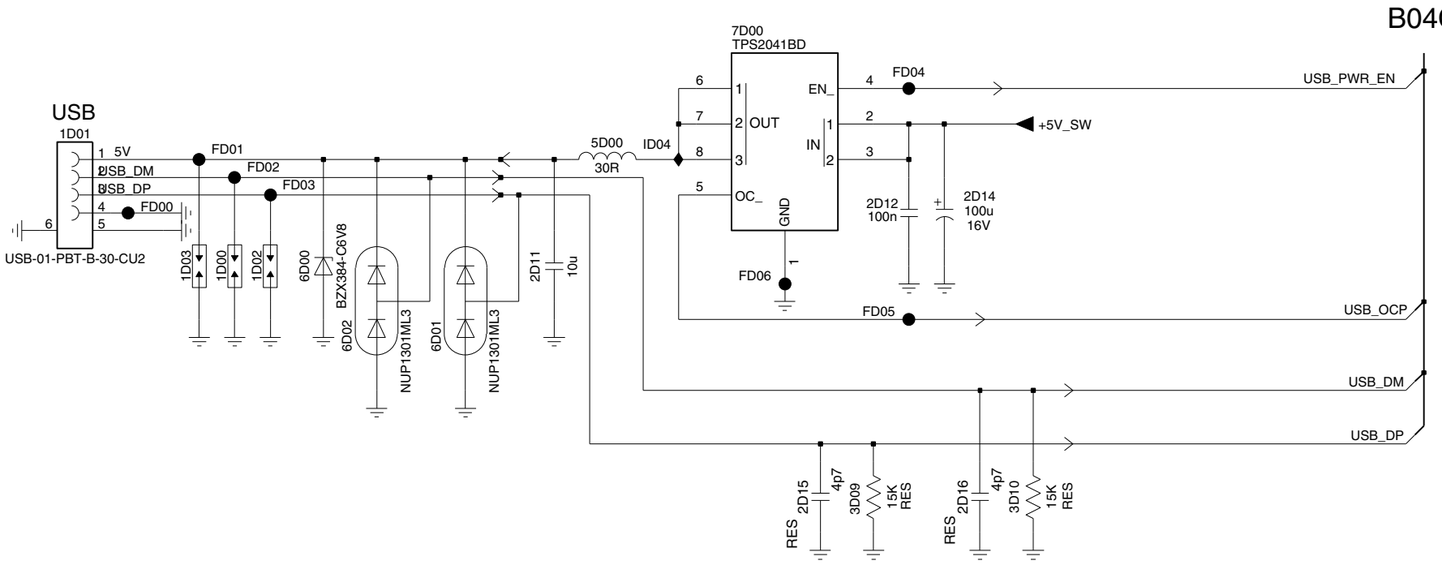
1 2 3 4 5 6 7 8

A

B

C

D



1D00 C3
1D01 C2
1D02 C3
1D03 C3
2D11 C4
2D12 C5
2D14 C6
2D15 D5
2D16 D6
3D09 D5
3D10 D6
5D00 C4
6D00 C3
6D01 C4
6D02 C3
7D00 B5
FD00 C2
FD01 C3
FD02 C3
FD03 C3
FD04 B5
FD05 C5
FD06 C5
ID04 C4

BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_512_100329.eps
100329

SSB: VGA

B06E VGA

B06E

B04C

EDID_WC

B06B

RP, GP, SOG, GN, BP, HSYNC, VSYNC

VGA_Rp, VGA_Gp, VGA_Gn, VGA_Bp, VGA_R, VGA_G, VGA_B, H_SYNC, VSYNC

FE00, FE01, FE02, FE03, FE04, FE05, FE06, FE07, FE08, FE09, FE10, FE11, FE12

IE00, IE01, IE02, IE03, IE04, IE05, IE06

1E01 MDS-15P-V-05-B-8.5-U4-ZN

7E01 BC847BW

7E00 M24C02-WMN6 (256x8) EEPROM

6E06 BAS316

6E05 BAS316

6E00, 6E01, 6E02, 6E03, 6E04 PESD5V0S1BA

SCL_VGA, SDA_VGA

+5V_SW, DC_5V

1E00 C7
1E01 E8
1E02 E7
1E03 F6
1E04 G6
1E05 D7
2E00 C3
2E02 C3
2E03 D3
2E04 D3
2E05 D3
2E07 C5
2E08 D5
2E09 E5
2E10 E5
2E11 E6
2E12 F5
2E13 G5
2E14 E9
2E15 E9
2E16 D11
3E00 C3
3E02 C3
3E03 D3
3E04 D3
3E05 D3
3E10 D5
3E13 E5
3E14 E5
3E15 D5
3E16 C5
3E17 F5
3E18 G5
3E19 E9
3E20 E9
3E21 E9
3E22 E9
3E23 E9
3E24 D11
3E25 B8
3E26 B10
3E27 B7
4E02 E9
4E03 E9
4E04 D10
5E00 C6
5E01 C6
5E02 D6
5E03 E4
5E04 F5
5E05 F5
6E00 C6
6E01 D6
6E02 E6
6E03 F5
6E04 G5
6E05 E5
6E06 A10
7E00 E10
7E01 B9
FE00 B8
FE01 C7
FE02 D7
FE03 E7
FE04 F7
FE05 F7
FE06 F7
FE07 F8
FE08 E10
FE09 E10
FE10 E10
FE11 D10
FE12 E11
IE00 B9
IE01 C3
IE02 C3
IE03 D3
IE04 D3
IE05 D3
IE06 E8

BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483

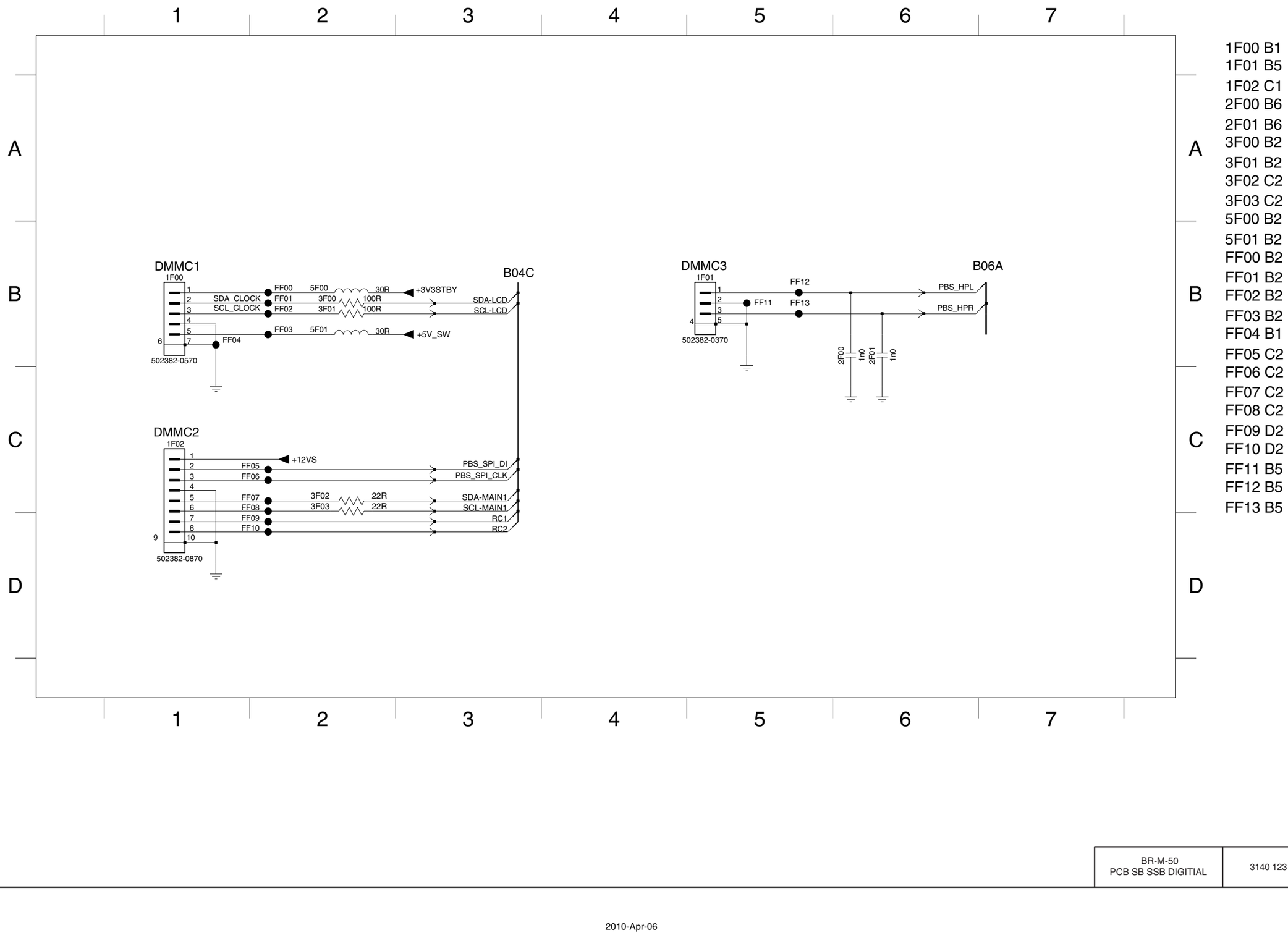
1 2010-01-22

18980_513_100329.eps
100329

SSB: Hospitality

B07 Hospitality

B07



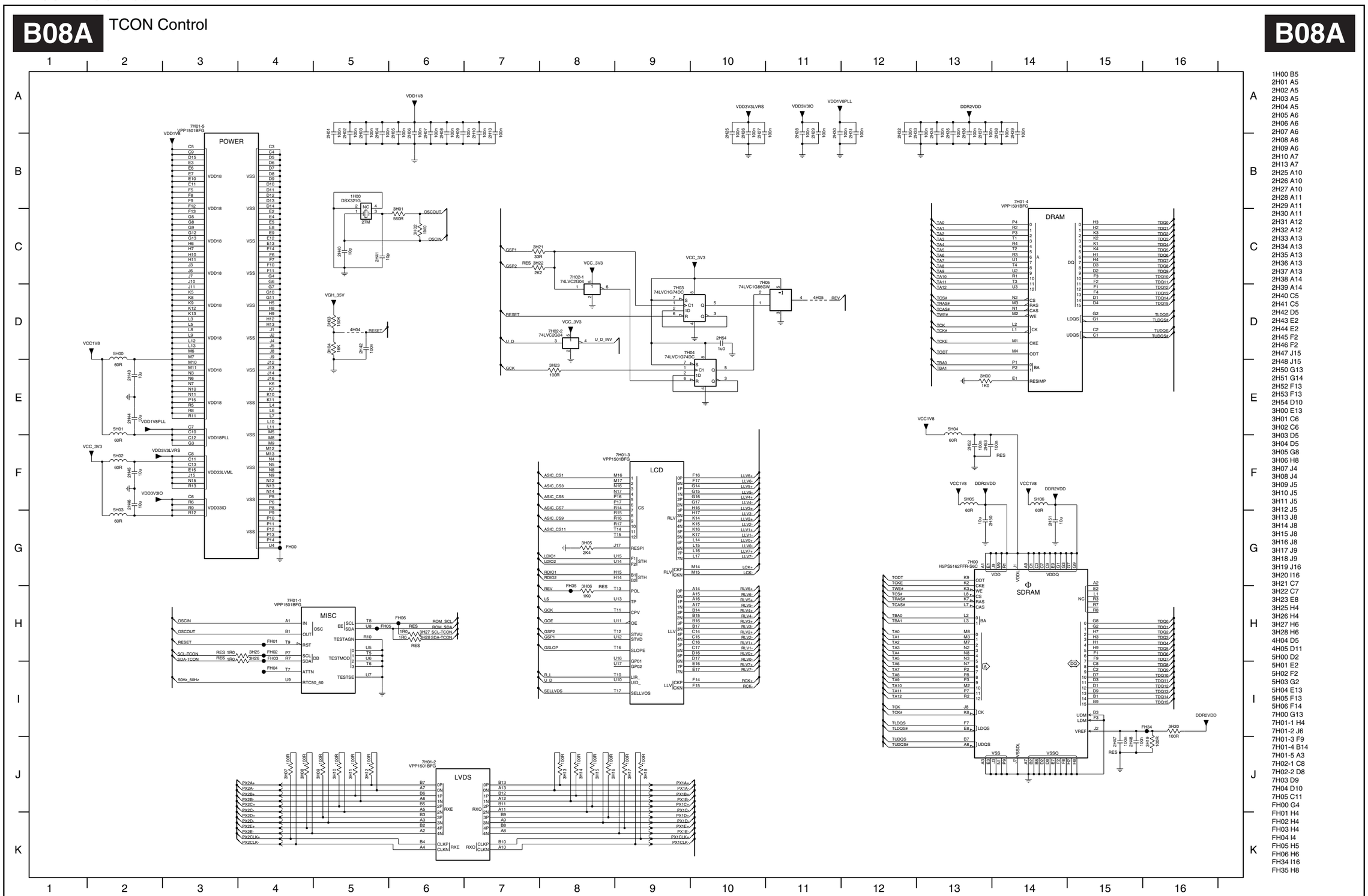
1F00 B1
1F01 B5
1F02 C1
2F00 B6
2F01 B6
3F00 B2
3F01 B2
3F02 C2
3F03 C2
5F00 B2
5F01 B2
FF00 B2
FF01 B2
FF02 B2
FF03 B2
FF04 B1
FF05 C2
FF06 C2
FF07 C2
FF08 C2
FF09 D2
FF10 D2
FF11 B5
FF12 B5
FF13 B5

BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_514_100329.eps
100329

SSB: TCON Control

B08A TCON Control



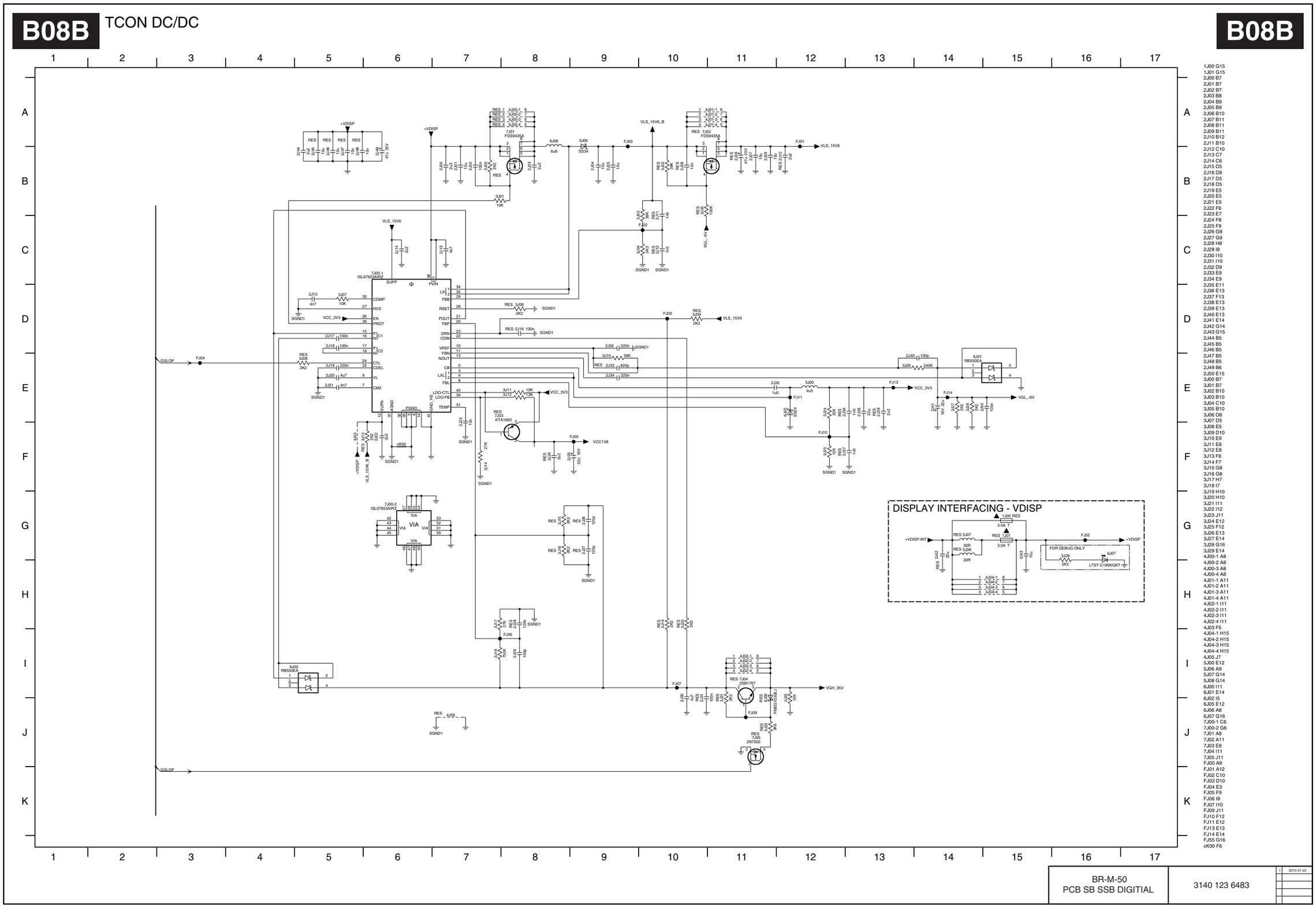
1H00 B5
2H01 A5
2H02 A5
2H03 A5
2H04 A5
2H05 A6
2H06 A6
2H07 A6
2H08 A6
2H09 A6
2H10 A7
2H13 A7
2H25 A10
2H26 A10
2H27 A10
2H28 A11
2H29 A11
2H30 A11
2H31 A12
2H32 A12
2H33 A13
2H34 A13
2H35 A13
2H36 A13
2H37 A13
2H38 A14
2H39 A14
2H40 C5
2H41 C5
2H42 D5
2H43 E2
2H44 E2
2H45 F2
2H46 F2
2H47 J15
2H48 J15
2H50 G13
2H51 G14
2H52 F13
2H53 F13
2H54 D10
3H00 E13
3H01 C6
3H02 C6
3H03 D5
3H04 D5
3H05 G8
3H06 H8
3H07 J4
3H08 J4
3H09 J5
3H10 J5
3H11 J5
3H12 J5
3H13 J8
3H14 J8
3H15 J8
3H16 J8
3H17 J9
3H18 J9
3H19 J16
3H20 I16
3H21 C7
3H22 C7
3H23 E8
3H25 H4
3H26 H4
3H27 H6
3H28 H6
4H04 D5
4H05 D11
5H00 D2
5H01 E2
5H02 F2
5H03 G2
5H04 E13
5H05 F13
5H06 F14
7H00 G13
7H01-1 H4
7H01-2 J6
7H01-3 F9
7H01-4 B14
7H01-5 A3
7H02-1 C8
7H02-2 D8
7H03 D9
7H04 D10
7H05 C11
FH00 G4
FH01 H4
FH02 H4
FH03 H4
FH04 I4
FH05 H5
FH06 H6
FH34 I16
FH35 H8

BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_515_100329.eps
100329

SSB: TCON DC/DC

B08B TCON DC/DC



1J00 G15
1J01 G15
2J00 B7
2J01 B7
2J02 B7
2J03 B8
2J04 B9
2J05 B9
2J06 B10
2J07 B11
2J08 B11
2J09 B11
2J10 B12
2J11 B10
2J12 C10
2J13 C7
2J14 C6
2J15 D5
2J16 D8
2J17 D5
2J18 D5
2J19 E5
2J20 E5
2J21 E5
2J22 F6
2J23 E7
2J24 F8
2J25 F9
2J26 G9
2J27 G9
2J28 H8
2J29 I8
2J30 I10
2J31 I10
2J32 D9
2J33 E9
2J34 E9
2J35 E11
2J36 E13
2J37 F13
2J38 E13
2J39 E13
2J40 E13
2J41 E14
2J42 G14
2J43 G15
2J44 B5
2J45 B5
2J46 B5
2J47 B5
2J48 B5
2J49 B6
2J50 E15
3J00 B7
3J01 B7
3J02 B10
3J03 B10
3J04 C10
3J05 B10
3J06 D8
3J07 D5
3J08 E5
3J09 D10
3J10 E9
3J11 E8
3J12 E8
3J13 F6
3J14 F7
3J15 G8
3J16 G8
3J17 H7
3J18 I7
3J19 H10
3J20 H10
3J21 I11
3J22 I12
3J23 J11
3J24 E12
3J25 F12
3J26 E13
3J27 E14
3J28 G16
3J29 E14
4J00-1 A8
4J00-2 A8
4J00-3 A8
4J00-4 A8
4J01-1 A11
4J01-2 A11
4J01-3 A11
4J01-4 A11
4J02-1 I11
4J02-2 I11
4J02-3 I11
4J02-4 I11
4J03 F5
4J04-1 H15
4J04-2 H15
4J04-3 H15
4J04-4 H15
4J05 J7
5J00 E12
5J06 A9
5J07 G14
5J08 G14
6J00 I11
6J01 E14
6J02 I5
6J05 E12
6J06 A8
6J07 G16
7J00-1 C6
7J00-2 G6
7J01 A8
7J02 A11
7J03 E8
7J04 I11
7J05 J11
FJ00 A9
FJ01 A12
FJ02 C10
FJ03 D10
FJ04 E3
FJ05 F9
FJ06 I8
FJ07 I10
FJ09 J11
FJ10 F12
FJ11 E12
FJ13 E13
FJ14 E14
FJ55 G16
cK00 F6

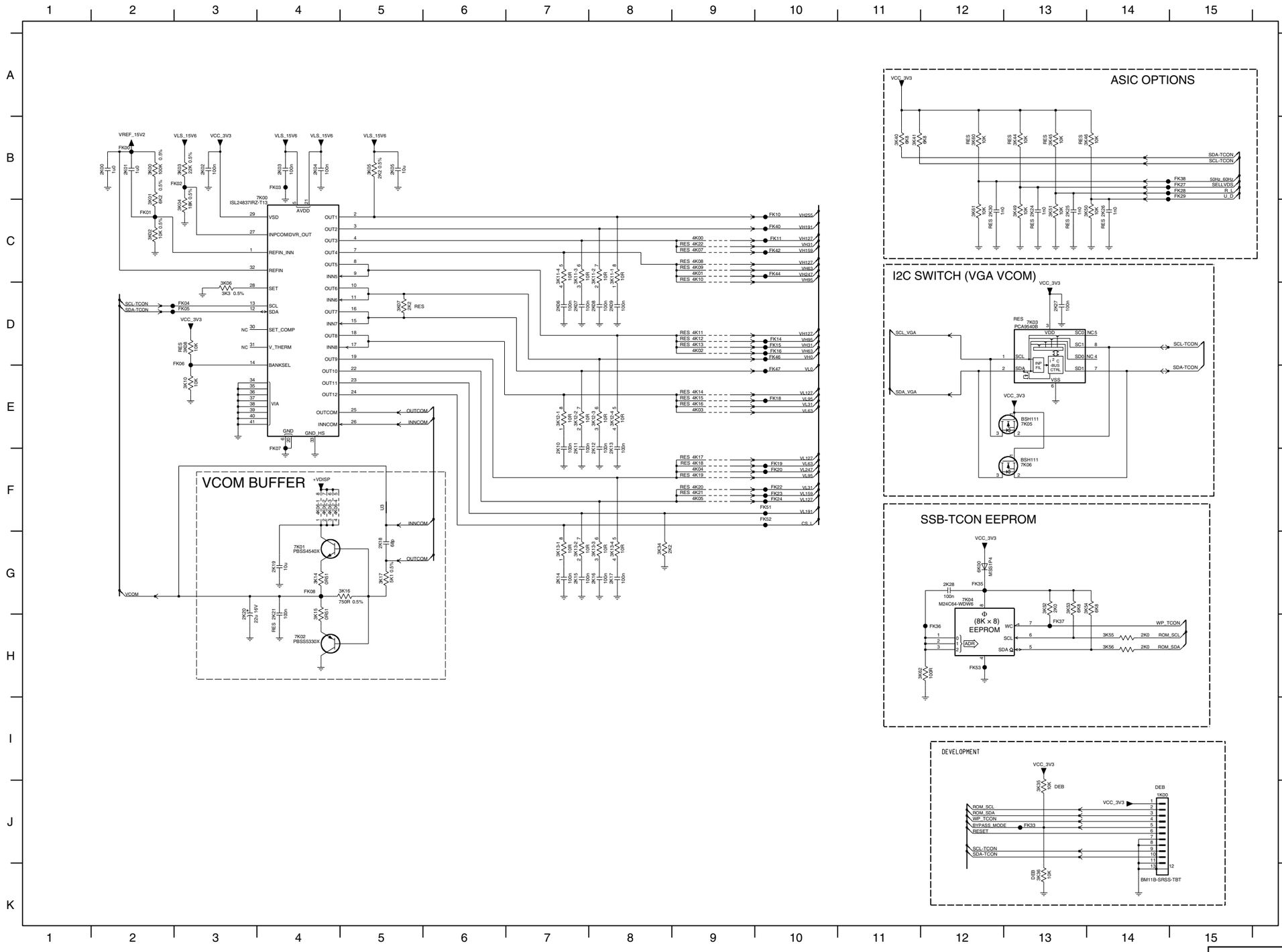
BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_516_100329.eps
100329

SSB: P Gamma, VCOM & NVM

B08C P Gamma, VCOM & NVM

B08C



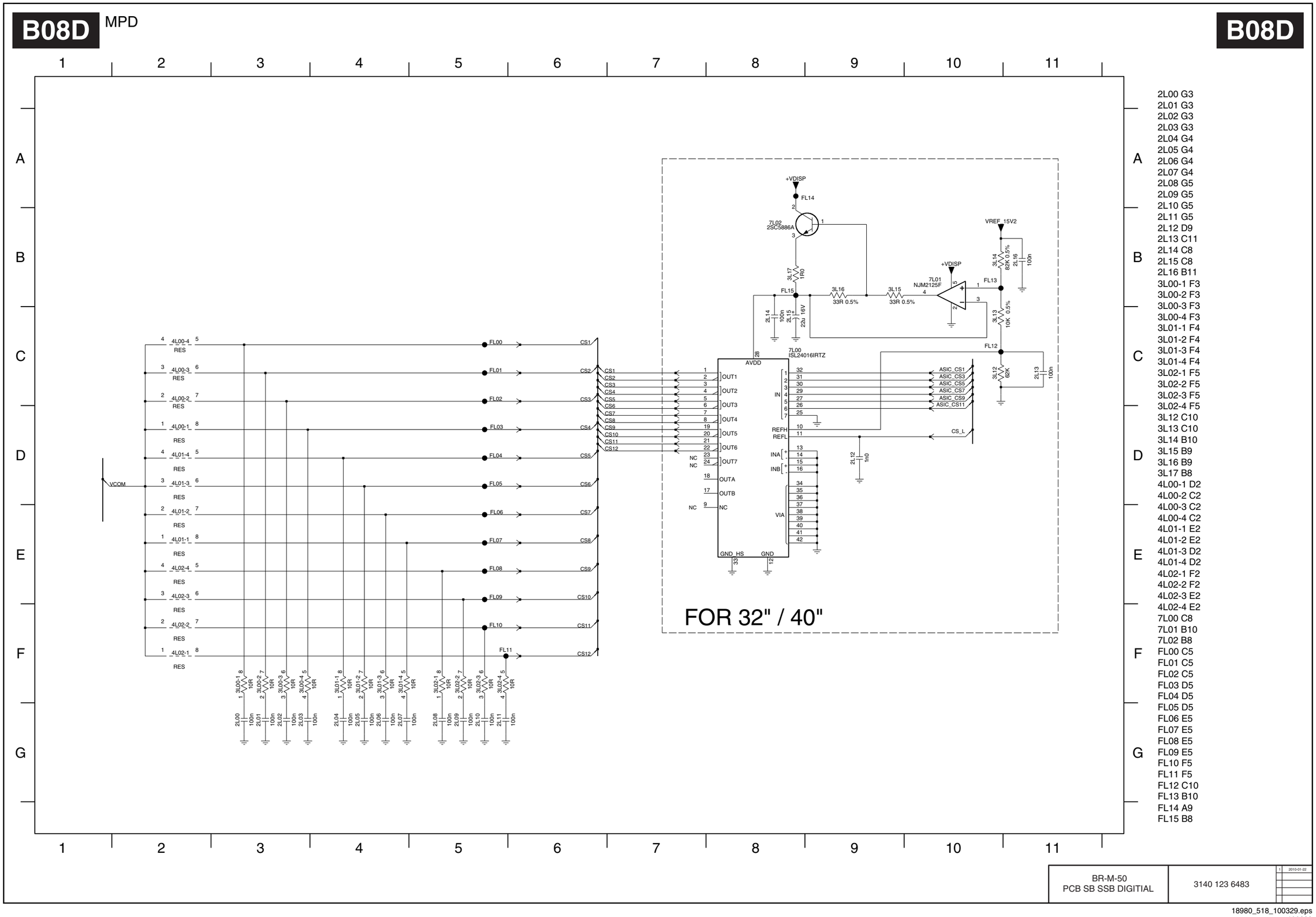
	U3 F5	3K61 C12
	1K00 J14	3K62 H12
A	2K00 B2	4K00 C9
	2K01 B2	4K01 C9
	2K02 B3	4K02 D9
	2K03 B4	4K03 E9
	2K04 B4	4K04 F9
	2K05 B5	4K05 F9
	2K06 D7	4K06-1 F4
	2K07 D7	4K06-2 F4
B	2K08 D8	4K06-3 F4
	2K09 D8	4K06-4 F4
	2K10 E7	4K07 C9
	2K11 E7	4K08 C9
	2K12 E8	4K09 C9
	2K13 E8	4K10 C9
	2K14 G7	4K11 D9
C	2K15 G7	4K12 D9
	2K16 G8	4K13 D9
	2K17 G8	4K14 E9
	2K18 G5	4K15 E9
	2K19 G4	4K16 E9
	2K20 G3	4K17 F9
D	2K21 G4	4K18 F9
	2K24 C13	4K19 F9
	2K25 C13	4K20 F9
	2K26 C14	4K21 F9
	2K27 D13	4K22 C9
	2K28 G12	6K00 G12
	2K30 C12	7K00 B4
	3K00 B2	7K01 G4
E	3K01 B2	7K02 H4
	3K02 C2	7K03 D13
	3K03 B3	7K04 G12
	3K04 C3	7K05 E13
	3K05 B5	7K06 F13
	3K06 D3	FK00 B2
	3K07 D5	FK01 C2
F	3K08 D3	FK02 B3
	3K10 E3	FK03 B4
	3K11-1 C8	FK04 D3
	3K11-2 C8	FK05 D3
	3K11-3 C7	FK06 D3
	3K11-4 C7	FK07 F4
	3K12-1 E7	FK08 G4
G	3K12-2 E7	FK10 C10
	3K12-3 E8	FK11 C10
	3K12-4 E8	FK14 D10
	3K13-1 G7	FK15 D10
	3K13-2 G7	FK16 D10
	3K13-3 G8	FK18 E10
	3K13-4 G8	FK19 F10
H	3K14 G4	FK20 F10
	3K15 G4	FK22 F10
	3K16 G5	FK23 F10
	3K17 G5	FK24 F10
	3K34 G8	FK27 B15
	3K35 J13	FK28 B15
	3K36 K13	FK29 B15
I	3K40 B11	FK33 J13
	3K41 B11	FK35 G12
	3K44 B13	FK36 H12
	3K45 B13	FK37 H13
	3K46 B14	FK38 B15
	3K49 C13	FK40 C10
J	3K50 C14	FK42 C10
	3K51 C13	FK44 C10
	3K52 G13	FK46 D10
	3K53 G13	FK47 E10
	3K54 G14	FK51 F10
	3K55 H14	FK52 F10
	3K56 H14	FK53 H12
	3K60 B12	

BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_517_100329.eps
100329

SSB: MPD

B08D MPD



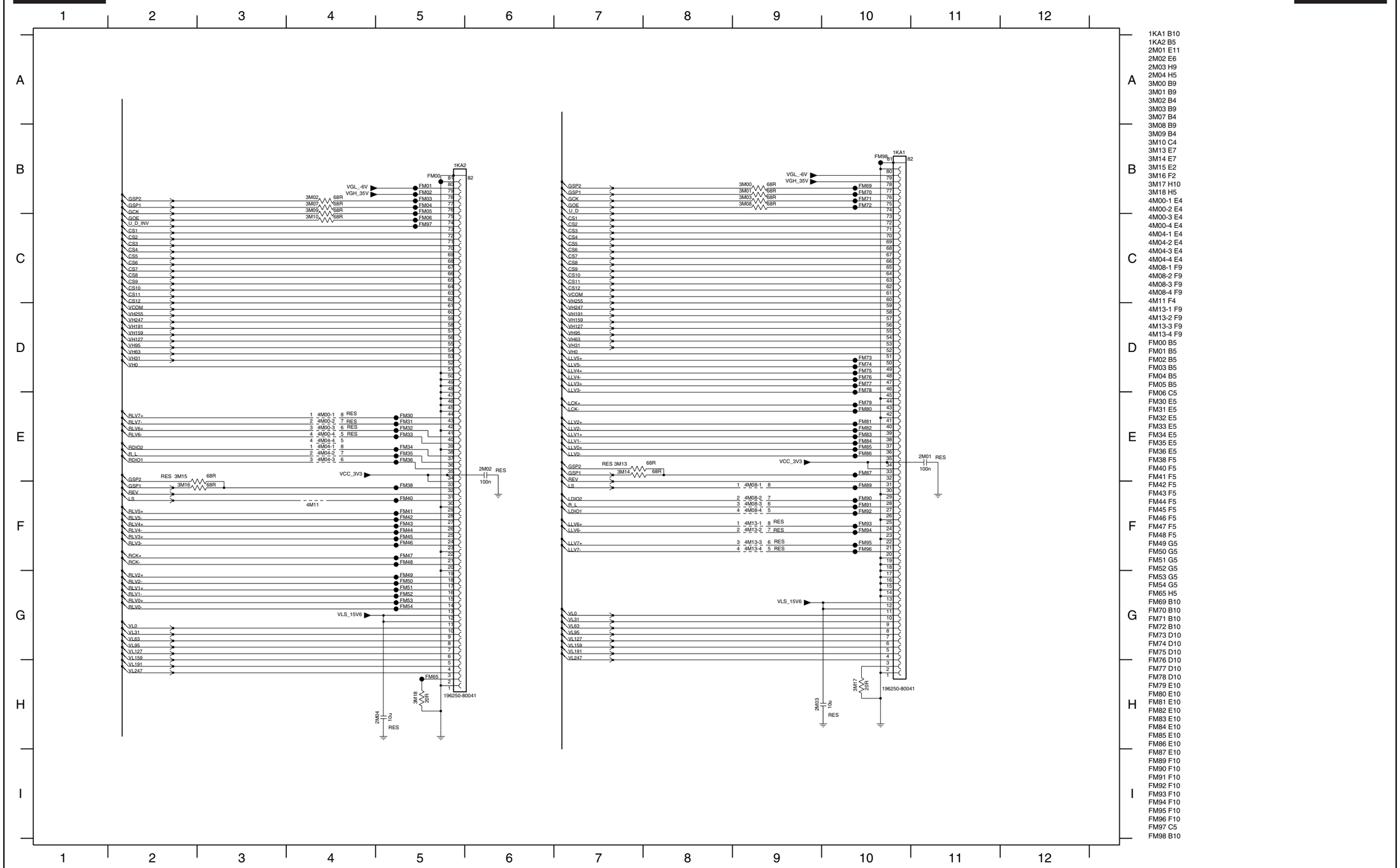
2L00 G3
2L01 G3
2L02 G3
2L03 G3
2L04 G4
2L05 G4
2L06 G4
2L07 G4
2L08 G5
2L09 G5
2L10 G5
2L11 G5
2L12 D9
2L13 C11
2L14 C8
2L15 C8
2L16 B11
3L00-1 F3
3L00-2 F3
3L00-3 F3
3L00-4 F3
3L01-1 F4
3L01-2 F4
3L01-3 F4
3L01-4 F4
3L02-1 F5
3L02-2 F5
3L02-3 F5
3L02-4 F5
3L12 C10
3L13 C10
3L14 B10
3L15 B9
3L16 B9
3L17 B8
4L00-1 D2
4L00-2 C2
4L00-3 C2
4L00-4 C2
4L01-1 E2
4L01-2 E2
4L01-3 D2
4L01-4 D2
4L02-1 F2
4L02-2 F2
4L02-3 E2
4L02-4 E2
7L00 C8
7L01 B10
7L02 B8
FL00 C5
FL01 C5
FL02 C5
FL03 D5
FL04 D5
FL05 D5
FL06 E5
FL07 E5
FL08 E5
FL09 E5
FL10 F5
FL11 F5
FL12 C10
FL13 B10
FL14 A9
FL15 B8

BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_518_100329.eps
100329

SSB: Mini LVDS

B08E Mini LVDS

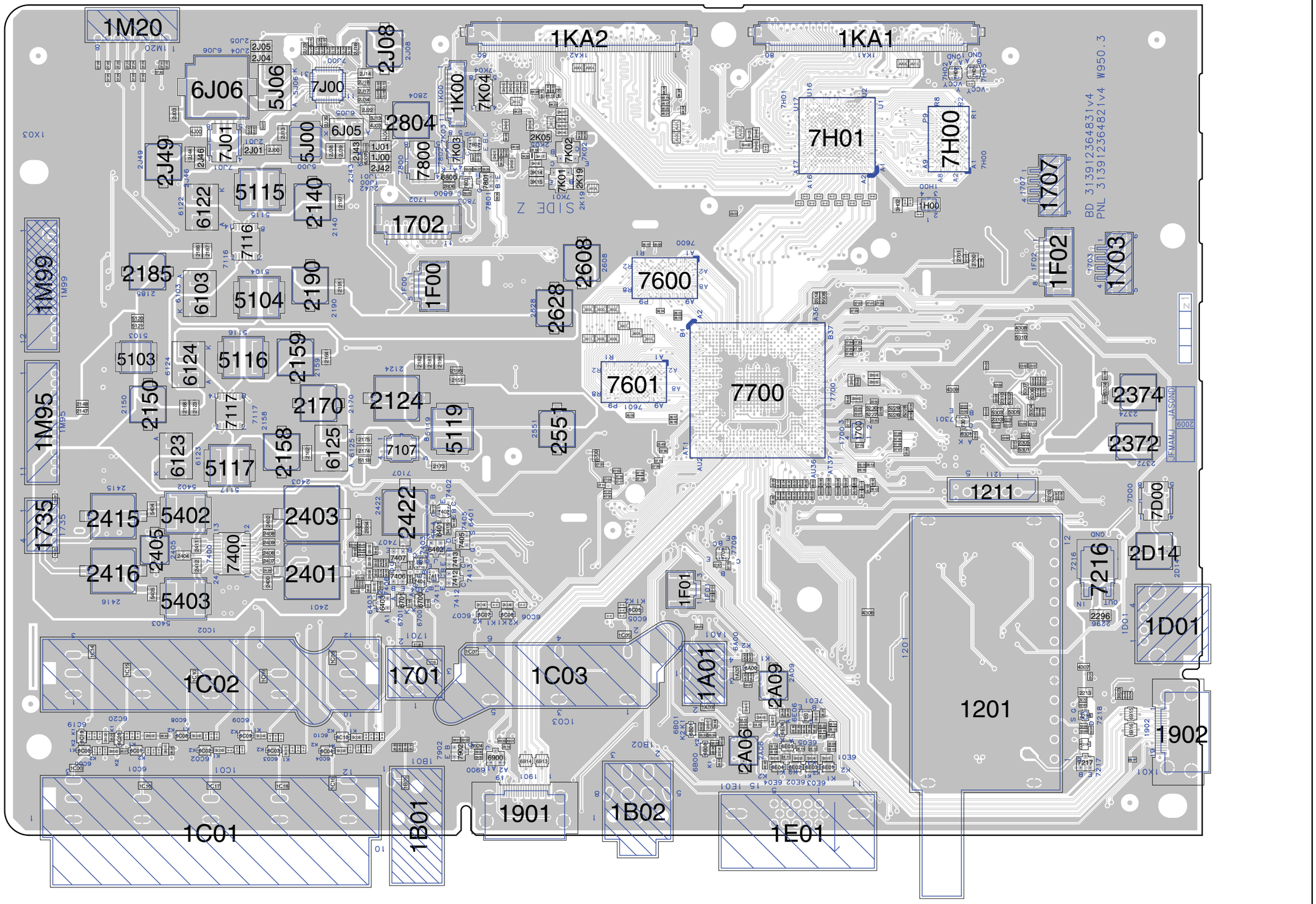


1KA1 B10
1KA2 B5
2M01 E11
2M02 E6
2M03 H9
2M04 H5
3M00 B9
3M01 B9
3M02 B4
3M03 B9
3M07 B4
3M08 B9
3M09 B4
3M10 C4
3M13 E7
3M14 E7
3M15 E2
3M16 F2
3M17 H10
3M18 H5
4M00-1 E4
4M00-2 E4
4M00-3 E4
4M00-4 E4
4M04-1 E4
4M04-2 E4
4M04-3 E4
4M04-4 E4
4M08-1 F9
4M08-2 F9
4M08-3 F9
4M08-4 F9
4M11 F4
4M13-1 F9
4M13-2 F9
4M13-3 F9
4M13-4 F9
FM00 B5
FM01 B5
FM02 B5
FM03 B5
FM04 B5
FM05 B5
FM06 C5
FM30 E5
FM31 E5
FM32 E5
FM33 E5
FM34 E5
FM35 E5
FM36 E5
FM38 F5
FM40 F5
FM41 F5
FM42 F5
FM43 F5
FM44 F5
FM45 F5
FM46 F5
FM47 F5
FM48 F5
FM49 G5
FM50 G5
FM51 G5
FM52 G5
FM53 G5
FM54 G5
FM65 H5
FM69 B10
FM70 B10
FM71 B10
FM72 B10
FM73 D10
FM74 D10
FM75 D10
FM76 D10
FM77 D10
FM78 D10
FM79 E10
FM80 E10
FM81 E10
FM82 E10
FM83 E10
FM84 E10
FM85 E10
FM86 E10
FM87 E10
FM89 F10
FM90 F10
FM91 F10
FM92 F10
FM93 F10
FM94 F10
FM95 F10
FM96 F10
FM97 C5
FM98 B10

BR-M-50 PCB SB SSB DIGITIAL	3140 123 6483	1 2010-01-22

18980_519_100329.eps
100329

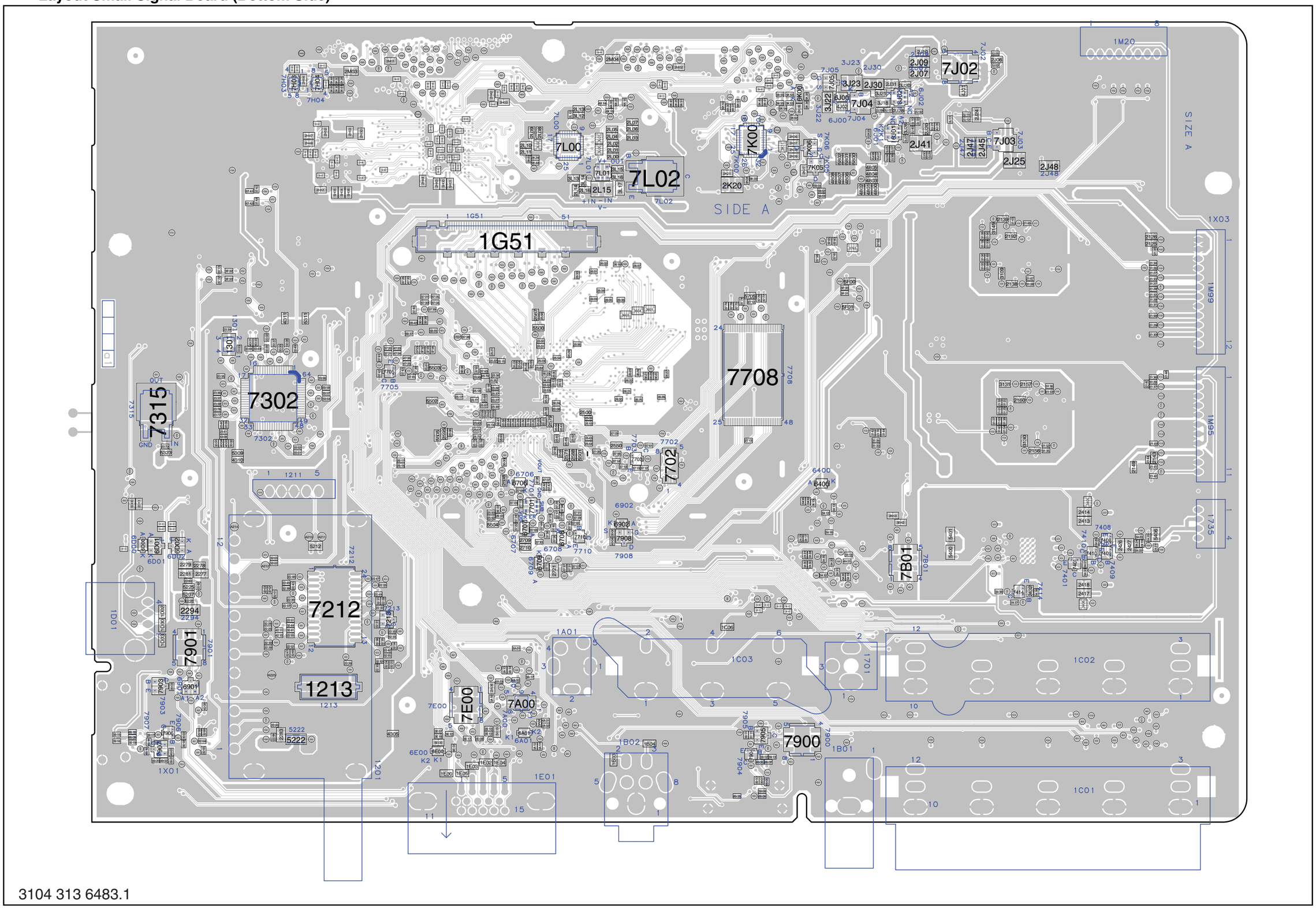
Layout Small Signal Board (Top Side)



3104 313 6483.1

18980_550_100329.eps
100329

Layout Small Signal Board (Bottom Side)



3104 313 6483.1

18980_551_100329.eps
100326

SSB: SRP List Explanation

Example

Net Name	Diagram
+12-15V	AP1 (4x)
+12-15V	AP4 (4x)
+12-15V	AP5 (12x)
+12-15V	AP6 (4x)
+12-15V	AP7 (8x)
+12V	AP1 (4x)
+12V_NF	AP1 (2x)
+12VAL	AP1 (2x)
+25VLP	AP1 (4x)
+25VLP	AP2 (1x)
+3V3-STANDBY	AP5 (3x)
+400V-F	AP1 (2x)
+400V-F	AP2 (2x)
+400V-F	AP3 (2x)
+5V2	AP1 (6x)
+5V2	AP2 (1x)
+5V2-NF	AP1 (1x)
+5V2-NF	AP2 (1x)
+5V-SW	AP1 (6x)
+5V-SW	AP2 (1x)
+8V6	AP1 (3x)
+AUX	AP1 (2x)
+AUX	AP2 (1x)
+DC-F	AP1 (2x)
+DC-F	AP3 (2x)
+SUB-SPEAKER	AP5 (1x)
+SUB-SPEAKER	AP6 (2x)
-12-15V	AP1 (4x)
-12-15V	AP4 (6x)
-12-15V	AP5 (14x)
-12-15V	AP6 (6x)
-12-15V	AP7 (8x)
AL-OFF	AP1 (2x)
AUDIO-L	AP4 (1x)
AUDIO-L	AP5 (1x)
AUDIO-PROT	AP5 (3x)
AUDIO-R	AP4 (1x)
AUDIO-R	AP5 (1x)
AUDIO-SW	AP5 (1x)
AUDIO-SW	AP7 (1x)
BOOST	AP1 (2x)
CPROT	AP4 (2x)
CPROT	AP5 (1x)
CPROT-SW	AP5 (1x)
CPROT-SW	AP6 (2x)
-DC-F	AP1 (2x)
-DC-F	AP3 (2x)
DC-PROT	AP1 (1x)
DC-PROT	AP5 (2x)
DIM-CONTROL	AP1 (2x)
FEEDBACK+SW	AP6 (2x)
FEEDBACK-L	AP4 (2x)
FEEDBACK-R	AP4 (2x)
FEEDBACK-SW	AP6 (2x)
GND-AL	AP1 (2x)
GNDHA	AP1 (40x)
GNDHA	AP2 (20x)
GNDHA	AP3 (2x)
GNDHOT	AP3 (2x)
GND-L	AP1 (2x)
GND-L	AP4 (4x)
GND-L	AP5 (34x)
GND-LL	AP4 (7x)
GND-LL	AP5 (1x)
GND-LR	AP4 (7x)
GND-LR	AP5 (1x)
GND-LSW	AP5 (1x)
GND-LSW	AP6 (15x)
GND-S	AP1 (11x)
GND-SA	AP4 (8x)
GND-SA	AP5 (2x)
GND-SA	AP6 (8x)
GND-SA	AP7 (6x)
GNDscrew	AP3 (2x)
GNDscrew	AP5 (2x)
GND-SSB	AP5 (3x)
GND-SSP	AP1 (51x)
GND-SSP	AP2 (15x)
IN+SW	AP6 (2x)
IN-L	AP4 (2x)
IN-R	AP4 (2x)
IN-SW	AP6 (2x)
INV-MUTE	AP4 (1x)
INV-MUTE	AP5 (1x)
INV-MUTE	AP6 (1x)
LEFT-SPEAKER	AP4 (1x)
LEFT-SPEAKER	AP5 (1x)
MUTE	AP4 (2x)
MUTE	AP5 (1x)
MUTE	AP6 (2x)
ON-OFF	AP1 (3x)
OUT	AP6 (1x)
OUT	AP7 (2x)
OUTN	AP6 (1x)
OUTN	AP7 (1x)
POWER-GOOD	AP1 (2x)
POWER-OK-PLATFORM	AP1 (2x)
RIGHT-SPEAKER	AP4 (1x)
RIGHT-SPEAKER	AP5 (1x)
SOUND-ENABLE	AP5 (3x)
STANDBY	AP1 (5x)
STANDBY	AP2 (1x)
-SUB-SPEAKER	AP5 (1x)
-SUB-SPEAKER	AP6 (2x)
V-CLAMP	AP1 (1x)
V-CLAMP	AP3 (2x)

1.1. Introduction

SRP (Service Reference Protocol) is a software tool that creates a list with all references to signal lines. The list contains references to the signals within all schematics of a PWB. It replaces the text references currently printed next to the signal names in the schematics. These printed references are created manually and are therefore not guaranteed to be 100% correct. In addition, in the current crowded schematics there is often none or very little place for these references.
Either there will be an SRP reference list for a schematic, or there will be printed references in the schematic.

1.2. Non-SRP Schematics

There are several different signals available in a schematic:

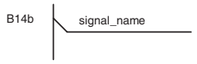
1.2.1. Power Supply Lines

All power supply lines are available in the supply line overview (see chapter 9). In the schematics (see chapter 10) is not indicated where supplies are coming from or going to.
It is however indicated if a supply is incoming (created elsewhere), or outgoing (created or adapted in the current schematic).

Outgoing Incoming

1.2.2. Normal Signals

For normal signals, a schematic reference (e.g. B14b) is placed next to the signals.

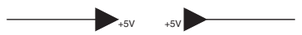


1.2.3. Grounds

For normal and special grounds (e.g. GNDHOT or GND3V3 etc.), nothing is indicated.

1.3. SRP Schematics

SRP is a tool, which automatically creates a list with signal references, indicating on which schematic the signals are used.
A reference is created for all signals indicated with an SRP symbol, these symbols are:

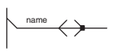


Power supply line.

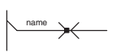
Stand alone signal or switching line (used as less as possible).

Signal line into a wire tree.

Switching line into a wire tree.



Bi-directional line (e.g. SDA) into a wire tree.



Signal line into a wire tree, its direction depends on the circuit (e.g. ingoing for PDP, outgoing for LCD sets).

Remarks:

- When there is a black dot on the “signal direction arrow” it is an SRP symbol, so there will be a reference to the signal name in the SRP list.
- All references to normal grounds (Ground symbols without additional text) are not listed in the reference list, this to keep it concise.
- Signals that are not used in multiple schematics, but only once or several times in the same schematic, are included in the SRP reference list, but only with one reference.

Additional Tip:

When using the PDF service manual file, you can very easily search for signal names and follow the signal over all the schematics. In Adobe PDF reader:

- Select the signal name you want to search for, with the “Select text” tool.
- Copy and paste the signal name in the “Search PDF” tool.
- Search for all occurrences of the signal name.
- Now you can quickly jump between the different occurrences and follow the signal over all schematics. It is advised to “zoom in” to e.g. 150% to see clearly, which text is selected. Then you can zoom out, to get an overview of the complete schematic.

PS. It is recommended to use at least Adobe PDF (reader) version 6.x, due to better search possibilities in this version.

10000_031_090121.eps
100323

Personal Notes:

SSB: SRP List

Netname	Diagram
+12VDISP	B02A (1 ×)
+12VDISP	B05 (1 ×)
+12VS	B02A (3 ×)
+12VS	B04A (2 ×)
+12VS	B04D (1 ×)
+12VS	B06C (2 ×)
+12VS	B08A (1 ×)
+12VS_1	B02A (2 ×)
+1V0_SW	B02A (1 ×)
+1V0_SW	B04B (1 ×)
+1V2_SW	B02A (1 ×)
+1V2_SW	B03 (2 ×)
+1V2_SW	B04B (2 ×)
+1V8_SW	B02A (1 ×)
+1V8_SW	B04B (1 ×)
+1V8_SW	B04C (5 ×)
+24VAUDIO	B02A (1 ×)
+24VAUDIO	B04A (2 ×)
+2V5_SW	B03 (3 ×)
+3V3_SW	B02A (1 ×)
+3V3_SW	B03 (5 ×)
+3V3_SW	B04B (3 ×)
+3V3_SW	B04D (25 ×)
+3V3_SW	B06B (2 ×)
+3V3_SW	B06C (2 ×)
+3V3STBY	B02A (1 ×)
+3V3STBY	B04A (3 ×)
+3V3STBY	B04B (2 ×)
+3V3STBY	B04D (10 ×)
+3V3STBY	B05 (1 ×)
+3V3STBY	B06A (2 ×)
+3V3STBY	B08A (1 ×)
+5V	B04D (1 ×)
+5V_SW	B02A (1 ×)
+5V_SW	B02B (1 ×)
+5V_SW	B03 (1 ×)
+5V_SW	B04A (1 ×)
+5V_SW	B04D (6 ×)
+5V_SW	B05 (1 ×)
+5V_SW	B06A (2 ×)
+5V_SW	B06E (1 ×)
+5V_SW	B07 (1 ×)
+5V_SW	B08A (1 ×)
+5V5_TUN	B02A (1 ×)
+5V5_TUN	B02B (1 ×)
+5VIF	B02B (4 ×)
+5VS	B02B (2 ×)
+5VTUN_DIGITAL	B02B (2 ×)
+VDISP	B08C (4 ×)
+VDISP	B08D (1 ×)
+VDISP	B08E (2 ×)
+VDISP-INT	B05 (2 ×)
+VDISP-INT	B08C (1 ×)
50Hz_60Hz	B08B (1 ×)
50Hz_60Hz	B08D (1 ×)
5V	B06E (1 ×)
A_STBY	B04A (1 ×)
AGND	B02B (46 ×)
AGND	B03 (17 ×)
AIN0_L	B06C (1 ×)
AIN0_L-AV1	B06C (1 ×)
AIN0_L-AV1	B06D (1 ×)
AIN0_R	B06C (1 ×)
AIN0_R-AV1	B06C (1 ×)
AIN0_R-AV1	B06D (1 ×)
AIN1_L	B06C (1 ×)
AIN1_L-AV2	B06C (1 ×)
AIN1_L-AV2	B06D (1 ×)
AIN1_R	B06C (1 ×)
AIN1_R-AV2	B06C (1 ×)
AIN1_R-AV2	B06D (1 ×)
AOUTL	B04A (2 ×)
AOUTL	B06C (1 ×)
AOUTR	B04A (2 ×)
AOUTR	B06C (1 ×)
ASIC_CS1	B08B (1 ×)
ASIC_CS1	B08E (1 ×)
ASIC_CS11	B08B (1 ×)
ASIC_CS11	B08E (1 ×)
ASIC_CS3	B08B (1 ×)
ASIC_CS3	B08E (1 ×)
ASIC_CS5	B08B (1 ×)
ASIC_CS5	B08E (1 ×)
ASIC_CS7	B08B (1 ×)
ASIC_CS7	B08E (1 ×)
ASIC_CS9	B08B (1 ×)
ASIC_CS9	B08E (1 ×)
ASPDIF_OUT	B06C (1 ×)
BACKLIGHT-BOOST	B02A (1 ×)
BACKLIGHT-BOOST	B04D (1 ×)
BACKLIGHT-PWM	B02A (1 ×)
BACKLIGHT-PWM	B04D (2 ×)
BP	B06C (1 ×)
BP	B07 (1 ×)
BYPASS_MODE	B04D (1 ×)
BYPASS_MODE	B08D (1 ×)
CS_L	B08D (1 ×)
CS_L	B08E (1 ×)
CS1	B08E (2 ×)
CS10	B08E (2 ×)
CS11	B08E (2 ×)
CS12	B08E (2 ×)
CS2	B08E (2 ×)
CS3	B08E (2 ×)
CS4	B08E (2 ×)
CS5	B08E (2 ×)
CS6	B08E (2 ×)
CS7	B08E (2 ×)
CS8	B08E (2 ×)
CS9	B08E (2 ×)
CVBS_AV3	B06C (1 ×)
CVBS_AV3	B06D (1 ×)
CVBS_RF	B02B (1 ×)
CVBS_RF	B06C (1 ×)
DC_5V	B07 (4 ×)
DC_PROT	B04A (1 ×)
DC_PROT	B04D (1 ×)
DDC_RESET	B04D (1 ×)
DDC_RESET	B06A (1 ×)
DDR2VDD	B08B (4 ×)
DGND	B03 (32 ×)
DIF_N	B02B (1 ×)
DIF_N	B03 (1 ×)
DIF_P	B02B (1 ×)
DIF_P	B03 (1 ×)
DVI_AUL_IN	B06C (1 ×)
DVI_AUR_IN	B06C (1 ×)
EDID_WC	B04D (1 ×)
EDID_WC	B06A (1 ×)
EDID_WC	B07 (1 ×)
FE_SCL	B02B (1 ×)
FE_SCL	B03 (1 ×)
FE_SDA	B02B (1 ×)
FE_SDA	B03 (1 ×)
GCK	B08B (1 ×)
GN	B06C (1 ×)
GN	B07 (1 ×)
GND_CVBS	B06C (1 ×)
GND_CVBS	B06D (1 ×)
GND-AUDIO	B02A (4 ×)
GND-AUDIO	B04A (13 ×)
GOE	B08B (1 ×)
GP	B06C (1 ×)
GP	B07 (1 ×)
GSLOP	B08B (1 ×)
GSLOP	B08C (2 ×)
GSP1	B08B (1 ×)
GSP2	B08B (1 ×)
HDMI_CEC	B04D (1 ×)
HDMI_CEC	B06A (1 ×)
HDMI_PLUGPWR1	B06A (4 ×)
HDMI_PLUGPWR2	B06A (4 ×)
HP_DET	B04D (1 ×)
HP_DET	B06B (1 ×)
HP_DETECT	B04D (1 ×)
HP_LOUT	B04A (1 ×)
HP_LOUT	B06B (1 ×)
HP_ROUT	B04A (1 ×)
HP_ROUT	B06B (1 ×)
HPOUTL	B06B (1 ×)
HPOUTL	B06C (1 ×)
HPOUTR	B06B (1 ×)
HPOUTR	B06C (1 ×)
HSYNC	B06C (1 ×)
HSYNC	B07 (1 ×)
IF_AGC	B02B (1 ×)
IF_AGC	B03 (1 ×)
IF_AGC	B04D (1 ×)
IF_ATV	B02B (2 ×)
INNCOM	B08D (2 ×)
JTCK	B04D (2 ×)
JTDI	B04D (2 ×)
JTDO	B04D (2 ×)
JTMS	B04D (2 ×)
JTRST	B04D (2 ×)
KEYBOARD	B04D (2 ×)
LAMP-ON	B02A (1 ×)
LAMP-ON	B04D (1 ×)
LCD-PWR-ONn	B04D (1 ×)
LCD-PWR-ONn	B05 (1 ×)
LED-1	B04D (2 ×)
LED-2	B04D (1 ×)
LEFT_SPEAKER	B04A (2 ×)
LIGHT-SENSOR	B04D (2 ×)
LS	B08B (1 ×)
MUTE	B04A (1 ×)
MUTE	B04D (1 ×)
NAND_PALE	B04D (1 ×)
NAND_PARB	B04D (1 ×)
NAND_PCLE	B04D (1 ×)
NAND_PDD(0)	B04D (1 ×)
NAND_PDD(1)	B04D (1 ×)
NAND_PDD(2)	B04D (1 ×)
NAND_PDD(3)	B04D (1 ×)
NAND_PDD(4)	B04D (1 ×)
NAND_PDD(5)	B04D (1 ×)
NAND_PDD(6)	B04D (1 ×)
NAND_PDD(7)	B04D (1 ×)
NAND_POCE	B04D (1 ×)
NAND_POOE	B04D (1 ×)
NAND_POWE	B04D (1 ×)
OUTCOM	B08D (2 ×)
PB0P	B06C (1 ×)
PBS_HPL	B06B (1 ×)
PBS_HPL	B08A (1 ×)
PBS_HPR	B06B (1 ×)
PBS_HPR	B08A (1 ×)
PBS_SPI_CLK	B04D (1 ×)
PBS_SPI_CLK	B08A (1 ×)
PBS_SPI_DI	B04D (1 ×)
PBS_SPI_DI	B08A (1 ×)
POWER_DOWN	B04D (1 ×)
POWER-OK	B02A (1 ×)
POWER-OK	B04D (1 ×)
PR0P	B06C (1 ×)
PREAMPL	B06C (1 ×)
PREAMPR	B06C (1 ×)
PWR5V_1	B06A (1 ×)
PWR5V_2	B06A (1 ×)
PX1A-	B05 (1 ×)
PX1A-	B06A (1 ×)
PX1A-	B08B (1 ×)
PX1A+	B05 (1 ×)
PX1A+	B06A (1 ×)
PX1A+	B08B (1 ×)
PX1B-	B05 (1 ×)
PX1B-	B06A (1 ×)
PX1B-	B08B (1 ×)
PX1B+	B05 (1 ×)
PX1B+	B06A (1 ×)
PX1B+	B08B (1 ×)
PX1C-	B05 (1 ×)
PX1C-	B06A (1 ×)
PX1C-	B08B (1 ×)
PX1C+	B05 (1 ×)
PX1C+	B06A (1 ×)
PX1C+	B08B (1 ×)
PX1CLK-	B05 (1 ×)
PX1CLK-	B06A (1 ×)
PX1CLK-	B08B (1 ×)
PX1CLK+	B05 (1 ×)
PX1CLK+	B06A (1 ×)
PX1CLK+	B08B (1 ×)
PX1D-	B05 (1 ×)
PX1D-	B06A (2 ×)
PX1D-	B08B (1 ×)
PX1D+	B05 (1 ×)
PX1D+	B06A (1 ×)
PX1D+	B08B (1 ×)
PX1E-	B05 (1 ×)
PX1E-	B06A (1 ×)
PX1E-	B08B (1 ×)
PX1E+	B05 (1 ×)
PX1E+	B06A (1 ×)
PX1E+	B08B (1 ×)
PX2A-	B05 (1 ×)
PX2A-	B06A (1 ×)
PX2A-	B08B (1 ×)
PX2A+	B05 (1 ×)
PX2A+	B06A (1 ×)
PX2A+	B08B (1 ×)
PX2B-	B05 (1 ×)
PX2B-	B06A (1 ×)
PX2B-	B08B (1 ×)
PX2B+	B05 (1 ×)
PX2B+	B06A (1 ×)
PX2B+	B08B (1 ×)
PX2C-	B05 (1 ×)
PX2C-	B06A (1 ×)
PX2C-	B08B (1 ×)
PX2C+	B05 (1 ×)
PX2C+	B06A (1 ×)
PX2C+	B08B (1 ×)
PX2CLK-	B05 (1 ×)
PX2CLK-	B06A (1 ×)
PX2CLK-	B08B (1 ×)
PX2CLK+	B05 (1 ×)
PX2CLK+	B06A (1 ×)
PX2CLK+	B08B (1 ×)
PX2D-	B05 (1 ×)
PX2D-	B06A (2 ×)
PX2D-	B08B (1 ×)
PX2D+	B05 (1 ×)
PX2D+	B06A (1 ×)
PX2D+	B08B (1 ×)
PX2E-	B05 (1 ×)
PX2E-	B06A (1 ×)
PX2E-	B08B (1 ×)
PX2E+	B05 (1 ×)
PX2E+	B06A (1 ×)
PX2E+	B08B (1 ×)
R_L	B08B (1 ×)
R_L	B08D (1 ×)
RC	B04D (1 ×)
RC1	B04D (1 ×)
RC1	B06B (1 ×)
RC1	B08A (1 ×)
RC2	B04D (1 ×)
RC2	B06B (1 ×)
RC2	B08A (1 ×)
RESET_DEMOD	B03 (1 ×)
RESET_DEMOD	B04D (1 ×)
REV	B08B (1 ×)
RF_AGC	B02B (2 ×)
RF_AGC	B04D (1 ×)
RF_AGC_SW	B02B (1 ×)
RF_AGC_SW	B04D (1 ×)
RIGHT_SPEAKER	B04A (2 ×)
ROM_SCL	B08B (1 ×)
ROM_SCL	B08D (1 ×)
ROM_SDA	B08B (1 ×)
ROM_SDA	B08D (1 ×)
RP	B06C (1 ×)
RP	B07 (1 ×)
SAV_L_IN	B06C (1 ×)
SAV_L_IN	B06D (1 ×)
SAV_R_IN	B06C (1 ×)
SAV_R_IN	B06D (1 ×)
SCL_VGA	B07 (1 ×)
SCL_VGA	B08D (1 ×)
SCL-DISP	B04D (1 ×)
SCL-LCD	B04D (1 ×)
SCL-LCD	B08A (1 ×)
SCL-MAIN	B04D (4 ×)
SCL-MAIN1	B04D (1 ×)
SCL-MAIN1	B08A (1 ×)
SCL-TCON	B08B (1 ×)
SCL-TCON	B08D (4 ×)
SDA_VGA	B07 (1 ×)
SDA_VGA	B08D (1 ×)
SDA-DISP	B04D (1 ×)
SDA-LCD	B04D (1 ×)
SDA-LCD	B08A (1 ×)
SDA-MAIN	B04D (4 ×)
SDA-MAIN1	B04D (1 ×)
SDA-MAIN1	B08A (1 ×)
SDA-TCON	B08B (1 ×)
SDA-TCON	B08D (4 ×)
SELLVDS	B08B (1 ×)
SELLVDS	B08D (1 ×)
SENSE+1V0_MT5363	B02A (1 ×)
SENSE+1V0_MT5363	B04B (1 ×)
SGND1	B08C (15 ×)
SIF_OUT	B02B (1 ×)
SIF_OUT	B06C (1 ×)
SIF_OUT_GND	B02B (1 ×)
SIF_OUT_GND	B06C (1 ×)
SOG	B06C (1 ×)
SOG	B07 (1 ×)
SOY0	B06C (1 ×)
SPB0P	B06C (1 ×)
SPB0P	B06D (1 ×)
SPB1P	B06C (1 ×)
SPB1P	B06D (1 ×)
SPR0P	B06C (1 ×)
SPR0P	B06D (1 ×)
SPR1P	B06C (1 ×)
SPR1P	B06D (1 ×)
STANDBY	B02A (1 ×)
STANDBY	B04D (1 ×)
STANDBYn	B04D (1 ×)
SW_MUTE	B04A (1 ×)
SW_MUTE	B04D (1 ×)
SY0N	B06C (1 ×)
SY0N	B06D (1 ×)
SY0P	B06C (1 ×)
SY0P	B06D (1 ×)
SY1N	B06C (1 ×)
SY1N	B06D (1 ×)
SY1P	B06C (1 ×)
SY1P	B06D (1 ×)
TSO_CLK	B03 (1 ×)
TSO_CLK	B04D (1 ×)
TSO_DATA0	B03 (1 ×)
TSO_DATA0	B04D (1 ×)
TSO_SYNC	B03 (1 ×)
TSO_SYNC	B04D (1 ×)
TSO_VALID	B03 (1 ×)
TSO_VALID	B04D (1 ×)
TUNER_SCL	B02B (1 ×)
TUNER_SCL	B03 (1 ×)
TUNER_SCL	B04D (1 ×)
TUNER_SDA	B02B (1 ×)
TUNER_SDA	B03 (1 ×)
TUNER_SDA	B04D (1 ×)
U_D	B08B (1 ×)
U_D	B08D (1 ×)
U_D_INV	B08B (1 ×)
UART_RX	B04D (2 ×)
UART_TX	B04D (2 ×)
USB_DM	B04D (1 ×)
USB_DM	B06E (1 ×)
USB_DP	B04D (1 ×)
USB_DP	B06E (1 ×)
USB_OCP	B04D (1 ×)
USB_OCP	B06E (1 ×)
USB_PWR_EN	B04D (1 ×)
USB_PWR_EN	B06E (1 ×)
VCC_3V3	B08B (4 ×)
VCC_3V3	B08C (3 ×)
VCC_3V3	B08D (8 ×)
VCC1V8	B08B (4 ×)
VCC1V8	B08C (1 ×)
VCOM	B08D (1 ×)
VCOM	B08E (1 ×)
VDD1V8	B08B (2 ×)
VDD1V8PLL	B08B (2 ×)
VDD3V3IO	B08B (2 ×)
VDD3V3LVRS	B08B (2 ×)
VGH_35V	B08B (1 ×)
VGH_35V	B08C (1 ×)
VGL_-6V	B08C (2 ×)
VH0	B08D (1 ×)
VH127	B08D (3 ×)
VH159	B08D (1 ×)
VH191	B08D (1 ×)
VH247	B08D (1 ×)
VH255	B08D (1 ×)
VH31	B08D (2 ×)
VH63	B08D (2 ×)
VH95	B08D (2 ×)
VIF1	B02B (2 ×)
VIF2	B02B (2 ×)
VL0	B08D (1 ×)
VL127	B08D (3 ×)
VL159	B08D (1 ×)
VL191	B08D (1 ×)
VL247	B08D (1 ×)
VL31	B08D (2 ×)
VL63	B08D (2 ×)
VL95	B08D (2 ×)
VLS_15V6	B08C (3 ×)
VLS_15V6	B08D (4 ×)
VLS_15V6_B	B08C (2 ×)
VREF_15V2	B08D (1 ×)
VREF_15V2	B08E (1 ×)
VSYNC	B06C (1 ×)
VSYNC	B07 (1 ×)
WP_TCON	B08D (1 ×)
Y0N	B06C (1 ×)
Y0P	B06C (1 ×)

SRP LIST PART 1

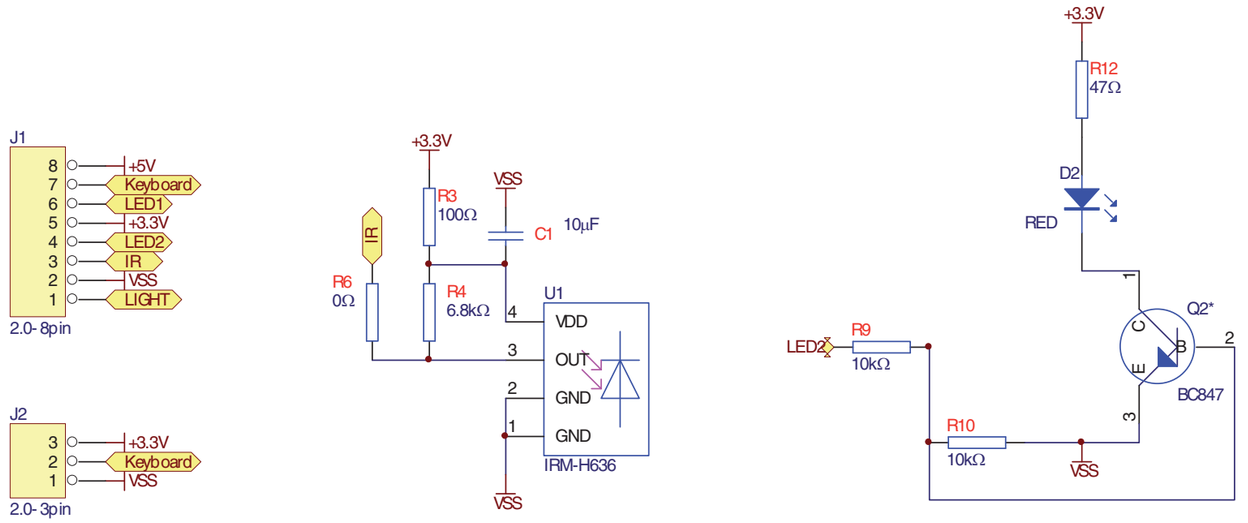
3139 123 6483

1 2010-01-22

18980_520_100329.eps
100329

IR/LED Board

J IR/LED board J

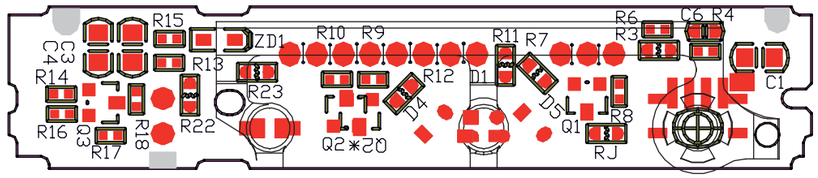


IR/LED	YKJ2035	1 2009-12-09

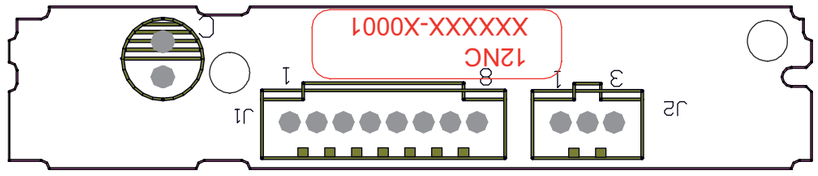
18980_530_100329.eps
100329

Layout IR/LED Board

Layout IR/LED Board (Top Side)



Layout IR/LED Board (Bottom Side)

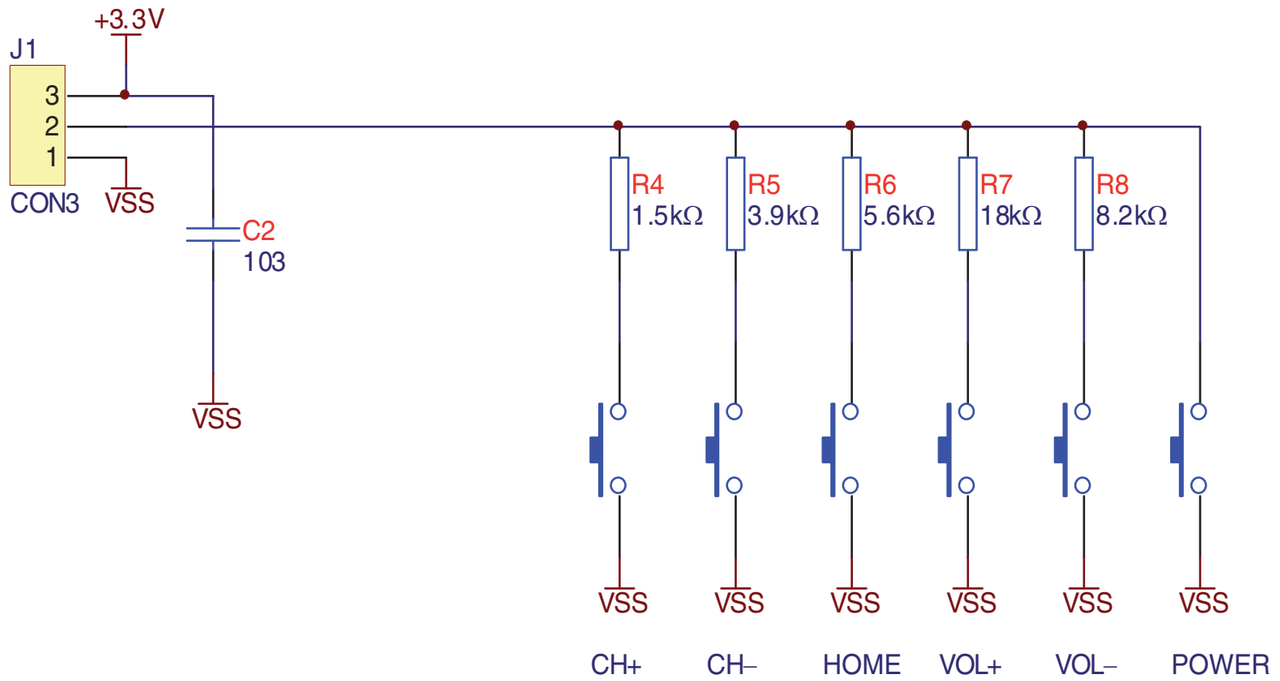


IR/LED	YKJ2035	1 2009-12-09

18970_531_100323.eps
100323

Keyboard Control Board

E Keyboard Control Board E

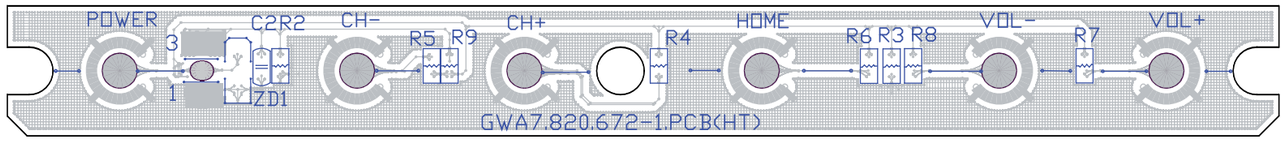


SIDE CONTROL	SF2035/SF2037	1 2009-09-10

18980_540_100329.eps
100329

Layout Keyboard Control Board

Layout Keyboard Control Board



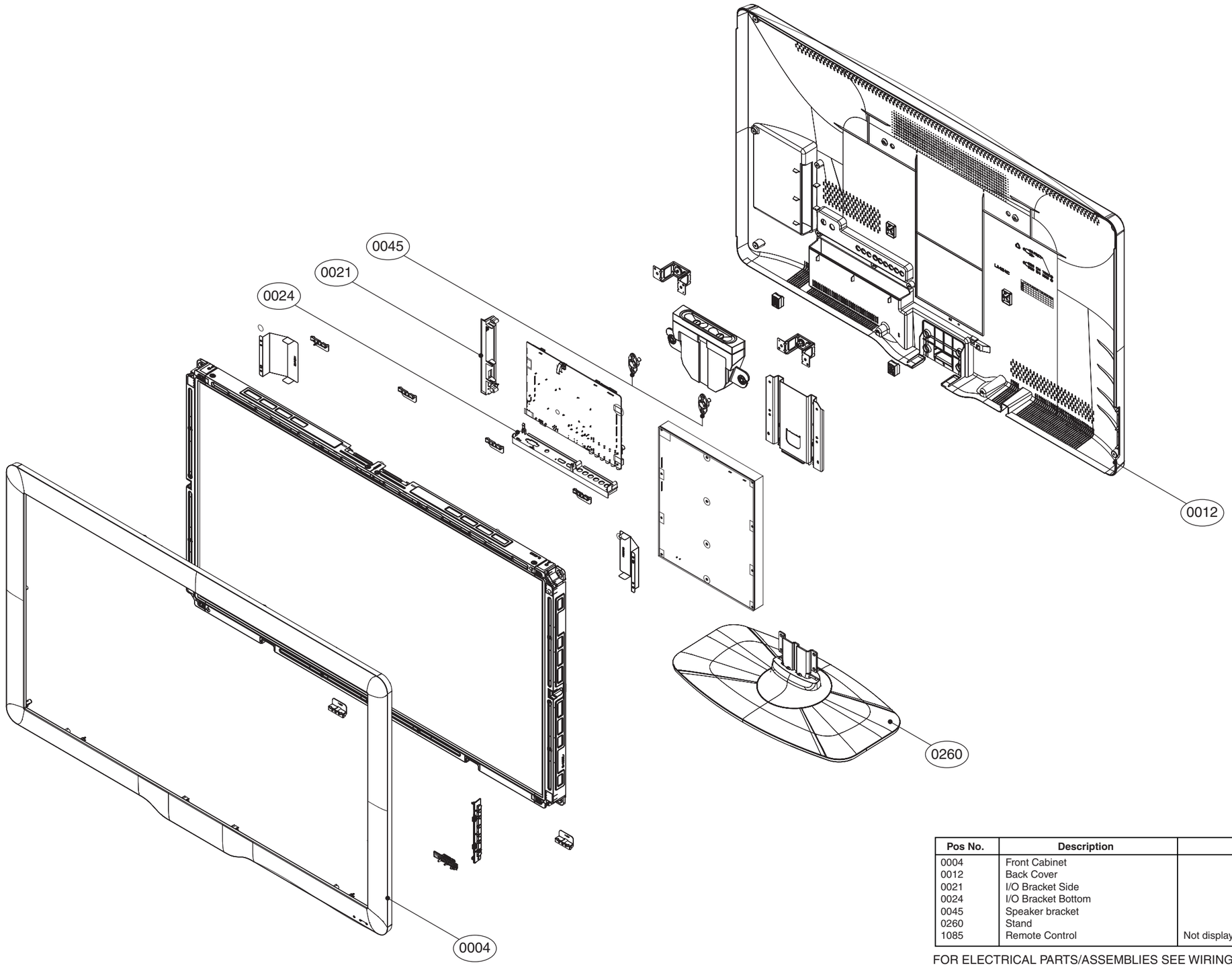
SIDE CONTROL	SF2035/SF2037	1	2009-09-10

18970_541_100323.eps
100323

11. Styling Sheets

Styling Sheet Dali 32" - 40"

DALI 32"- 40"



Pos No.	Description	Remarks
0004	Front Cabinet	
0012	Back Cover	
0021	I/O Bracket Side	
0024	I/O Bracket Bottom	
0045	Speaker bracket	
0260	Stand	
1085	Remote Control	Not displayed

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

18980_800_100329.eps
100329