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Service Manual

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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:
42PFL9509/93	Frame	3122 785 18490
47PFL9509/93		3122 785 18490
52PFL9509/93		3122 785 18490

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

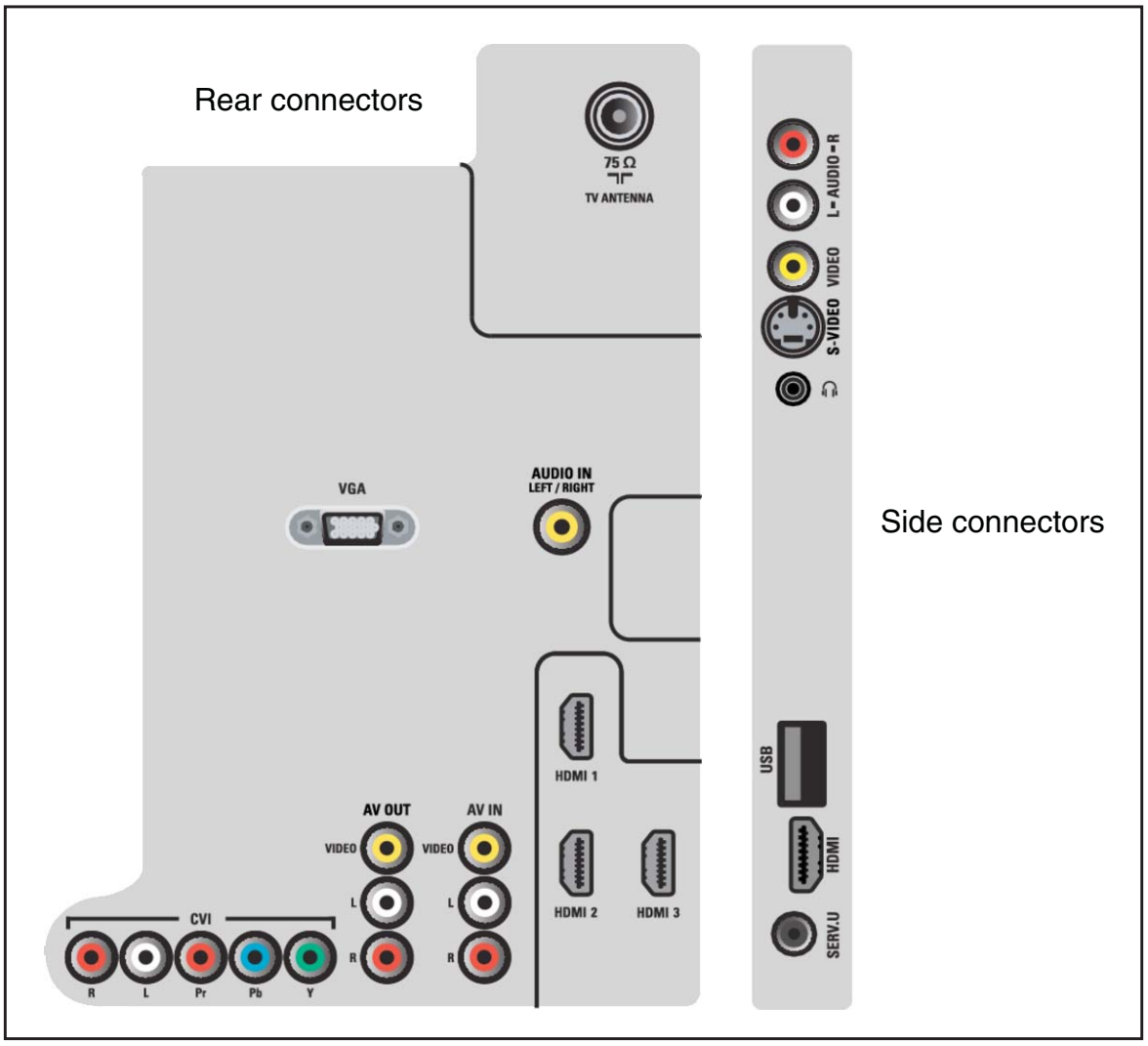

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Figure 2-1 Connection overview

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

Cinch: Audio - In

Rd - Audio R	0.5 V_{RMS} / 10 kΩ	
Wh - Audio L	0.5 V_{RMS} / 10 kΩ	

Cinch: Video CVBS - In

Ye - Video CVBS	1 V_{PP} / 75 Ω	

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	

Head phone (Output)

Bk	- Head phone	32 - 600 Ω / 10 mW	

USB2.0

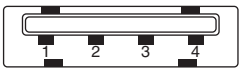

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Figure 2-2 USB (type A)

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

HDMI: Digital Video, Digital Audio - In (see HDMI 1, 2 & 3)

Service Connector (UART)

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

2.3.2 Rear Connections

Aerial - In

-	- IEC-type (EU)	Coax, 75 Ω	

VGA: Video RGB - In

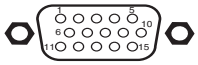

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Figure 2-3 VGA Connector

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	

Mini Jack: Audio - In

Wh	- Audio L	0.5 V_{RMS} / 10 kΩ	
Rd	- Audio R	0.5 V_{RMS} / 10 kΩ	

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

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

Cinch: Video CVBS - Out, Audio - Out

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	

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	

HDMI 1, 2 & 3: Digital Video, Digital Audio - In

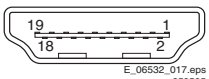

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Figure 2-4 HDMI (type A) connector

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	
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	

2.4 Chassis Overview

Refer to chapter 9. Block Diagrams for PWB/CBA locations.

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.

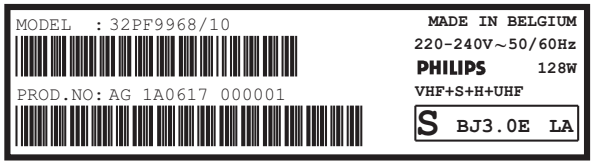

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Figure 3-1 Serial number (example)

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
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
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
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
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
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
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
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
STBY	STand-BY
SVGA	800x600 (4:3)
SVHS	Super Video Home System
SW	Software
SWAN	Spatial temporal Weighted Averaging Noise reduction
SXGA	1280x1024
TFT	Thin Film Transistor
THD	Total Harmonic Distortion
TMDS	Transmission Minimized Differential Signalling
TXT	TeleteXT
TXT-DW	Dual Window with TeleteXT
UI	User Interface
uP	Microprocessor
UXGA	1600x1200 (4:3)
V	V-sync to the module
VESA	Video Electronics Standards Association
VGA	640x480 (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	1280x768 (15:9)
XTAL	Quartz crystal
XGA	1024x768 (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

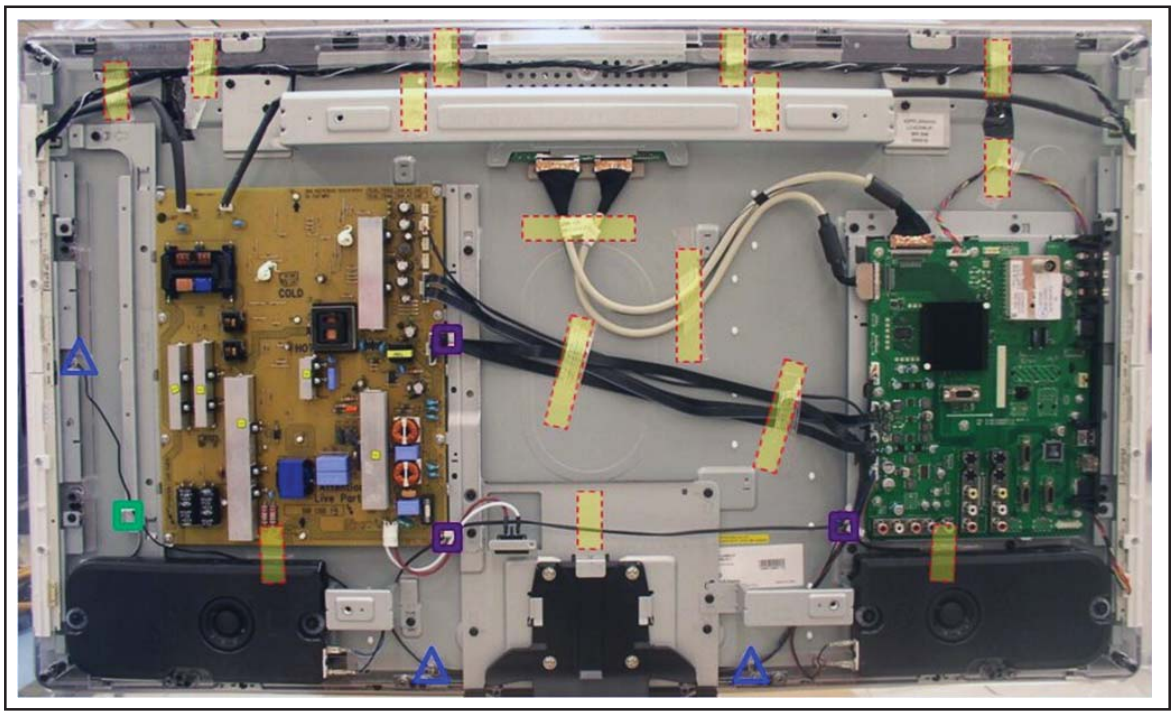

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Figure 4-1 Cable dressing 42" (Frame styling)

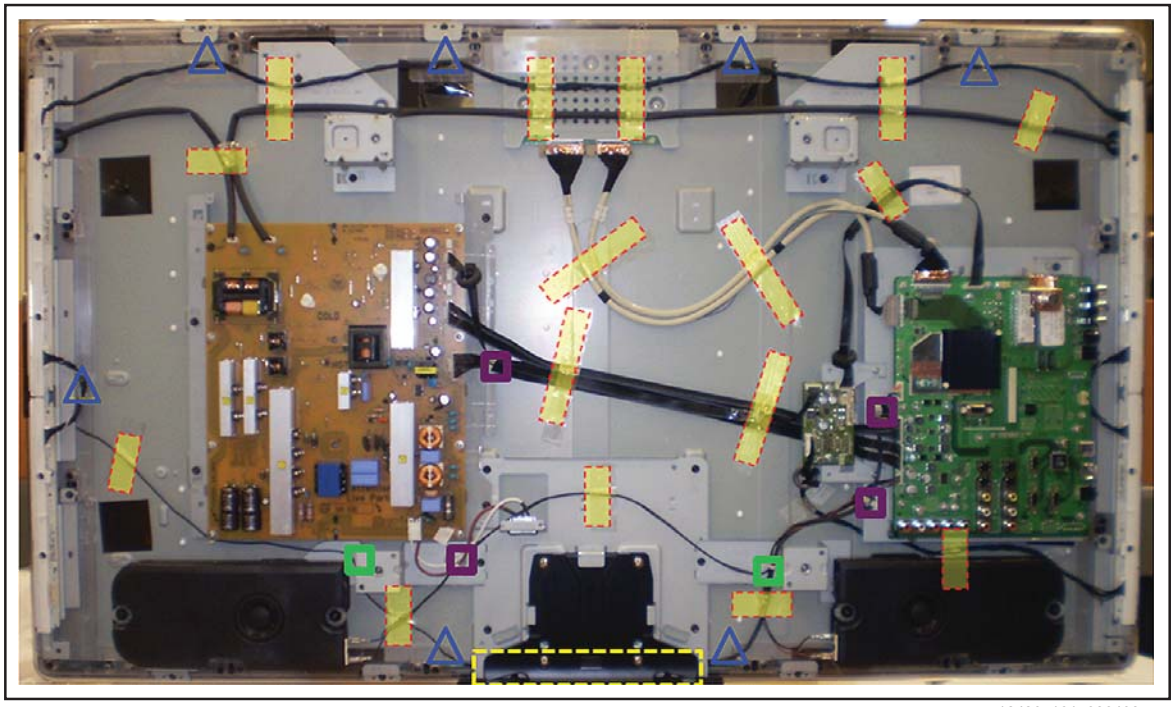

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Figure 4-2 Cable dressing 47" (Frame styling)

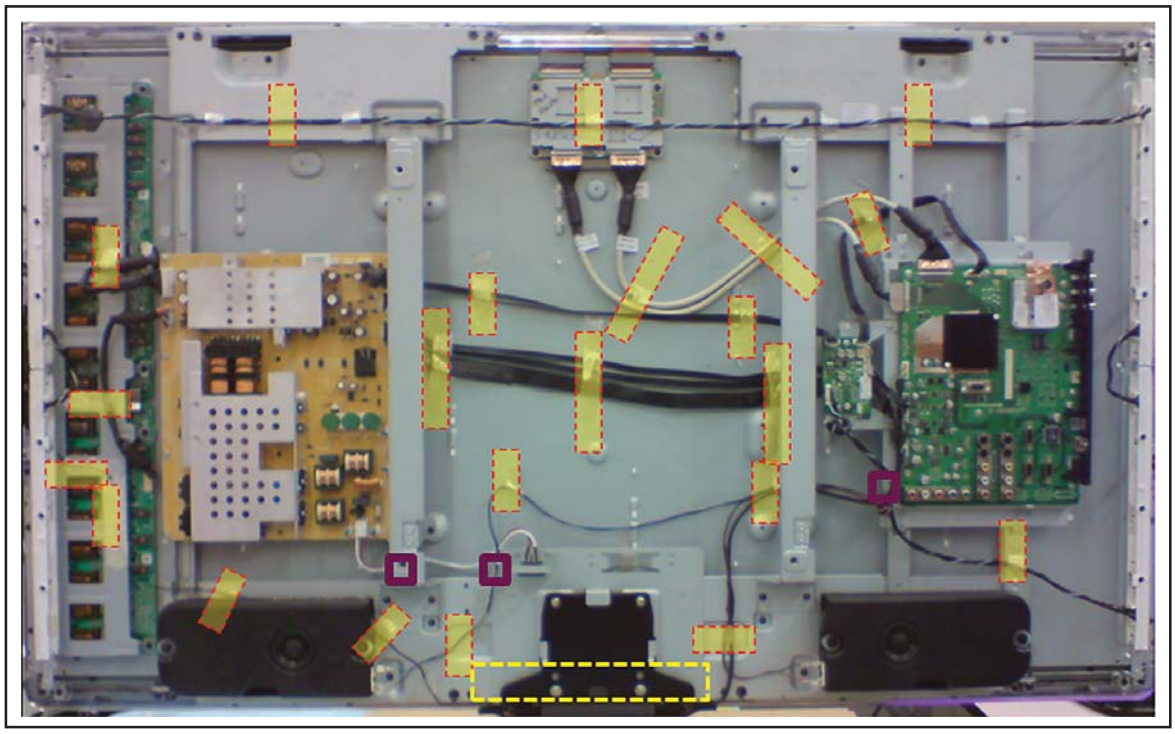

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Figure 4-3 Cable dressing 52" (Frame styling)

4.2 Service Positions

For easy servicing of this set, there are a few possibilities created:

- The buffers from the packaging.
- Foam bars (created for Service).

4.2.1 Foam Bars

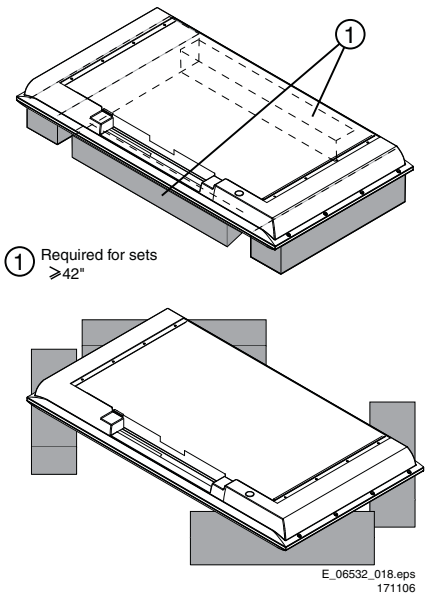

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Figure 4-4 Foam bars

The foam bars (order code 3122 785 90580 for two pieces) can be used for all types and sizes of Flat TVs. See Figure 4-4 for details. Sets with a display of 42" and larger, require **four** foam bars [1]. Ensure that the foam bars are always supporting the cabinet and **never** only the display.

Caution: Failure to follow these guidelines can seriously damage the display!
By laying the TV face down on the (ESD protective) foam bars, a stable situation is created to perform measurements and alignments. By placing a mirror under the TV, you can monitor the screen.

4.3 Assy/Panel Removal

The instructions apply to the Roadrunner styling - with AmbiLight.

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.

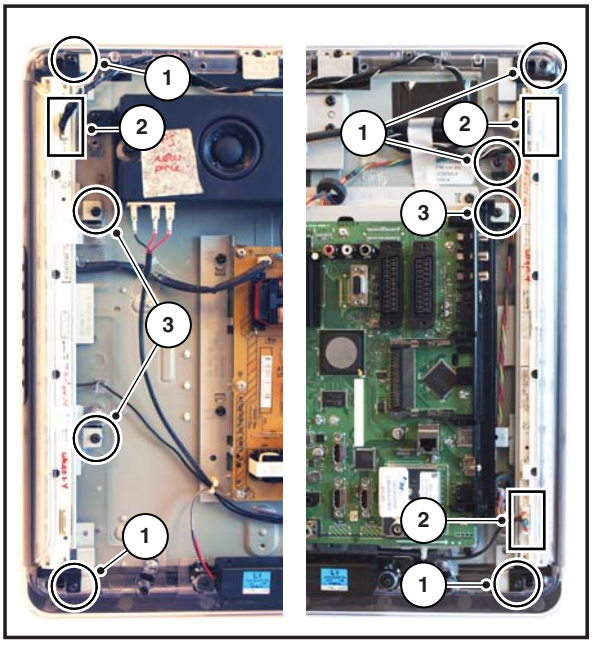
1. Remove all screws of the rear cover.
2. Lift the rear cover from the TV. Make sure that wires and flat coils are not damaged while lifting the rear cover from the set.

4.3.2 Speakers

Each speaker unit is mounted with two screws.
When defective, replace the whole unit.

4.3.3 Ambi Light

Each Ambi Light unit is mounted on a subframe. Refer to Figure 4-5 for details.



18560_408_090401.eps
090402

Figure 4-5 Ambi Light unit

1. Remove the Ambi Light cover [1].
2. Unplug the connector(s) [2].
3. Remove the subframe [3].
4. The PWB can now be taken from the subframe.

When defective, replace the whole unit.

4.3.4 Main Supply Panel

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

When defective, replace the whole unit.

4.3.5 IR & LED Board / Stand Support

For removing the IR & LED board, the stand including support has to be removed
When defective, replace the whole unit.

4.3.6 Small Signal Board (SSB)

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

1. Unplug all connectors.
2. Remove the screws that secure the board.
3. The SSB can now be taken out of the set.

4.3.7 Keyboard Control Panel

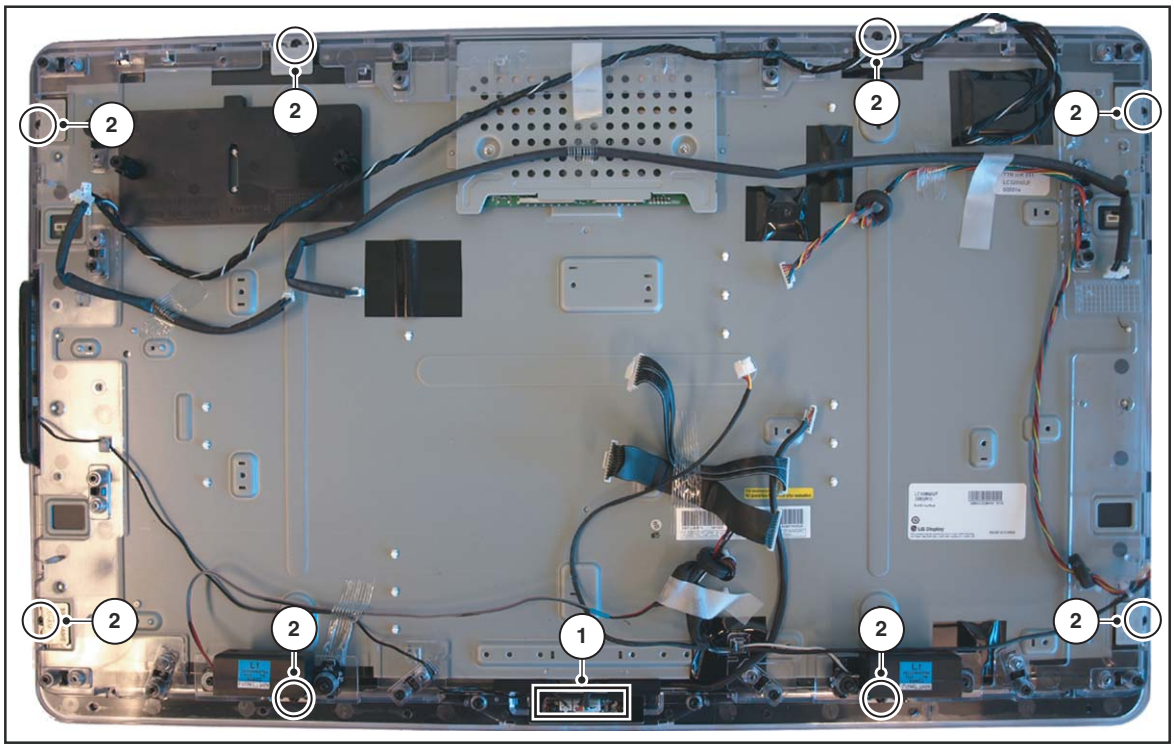
1. Remove the right AmbiLight unit.
2. Remove the connector on the IR/LED board.
3. Release the cable.
4. Release the clip on top of the unit and take the unit out.

When defective, replace the whole unit.

4.3.8 LCD Panel

Refer to Figure 4-6 for details.

1. Remove the AmbiLight units as earlier described.
2. Remove the Top Support.
3. Release the LVDS - and other connectors from the SSB.
4. Remove the subframe of the SSB with the SSB still mounted on it.
5. Release all connectors from the PSU.
6. Remove the subframe of the PSU with the PSU still mounted on it.
7. Remove the stand + stand support as earlier described.
8. Release the connectors [1] on the IR & LED Panel.
9. Remove the clips that secure the flare [2].
10. Remove the flare.
11. Now the LCD Panel can be lifted from the front cabinet.



18490_103_090410.eps
090410

Figure 4-6 LCD Panel - panel removal

4.4 Set Re-assembly

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

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original position. See figure Figure 4-1, Figure 4-2 or Figure 4-3.
- Pay special attention not to damage the EMC foams on the SSB shields. 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, test points are indicated with “Fxxx” or “Ixxx”, in the layout overviews with a “half-moon” sign. 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

Some items are applicable to all Service Modes or are general. These are listed below.

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. Standby 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: “**AAAABCD X.YY**”, where:
- **AAAA** is the chassis name: LC91.
- **B** is the region indication: E= Europe, A= AP/China, U= NAFTA, L= LATAM.
- **C** is the display indication: L= LCD, P= Plasma.
- **D** is the language/feature indication: 1= Standard, H= Full HD.
- **X** is the main version number: this is updated with a major change of specification (incompatible with the previous software version). Numbering will go from 1 - 9 and A - Z.
  - 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** and “**xxx**”, where “xxx” is a 3 digit decimal value of the panel type: see column “Display Code” in Table 6-5 , 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.

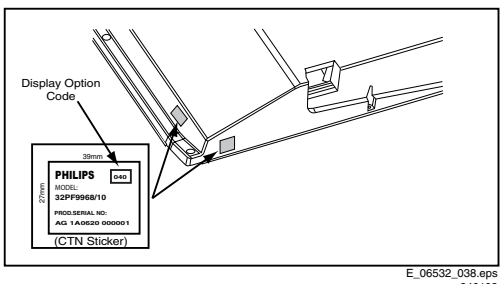


Figure 5-1 Location of Display Option Code sticker

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 frequency of 475.25 MHz).

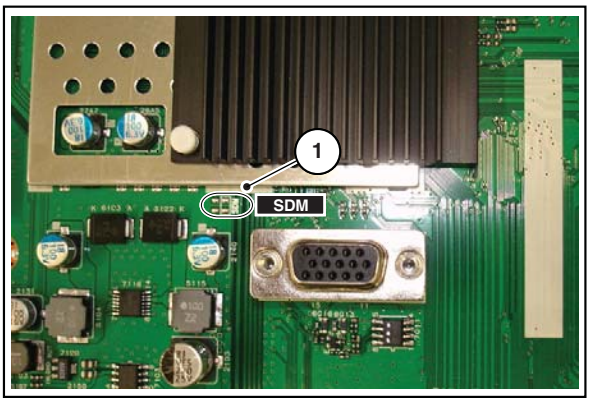
Specifications

- 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 remote control transmitter: “**062596**” directly followed by the **MENU** button (do not allow the display to time out between entries while keying the sequence).
- Short one of the “Service” jumpers on the TV board during cold start (see Figure 5-2). Then press the mains button (remove the short after start-up).
  Caution: Activating SDM by shorting “Service” jumpers will override the DC speaker protection (error 1), the General I2C error (error 4), and the Trident video processor error (error 5). When doing this, the service-technician must know exactly what he is doing, as it could damage the television set.

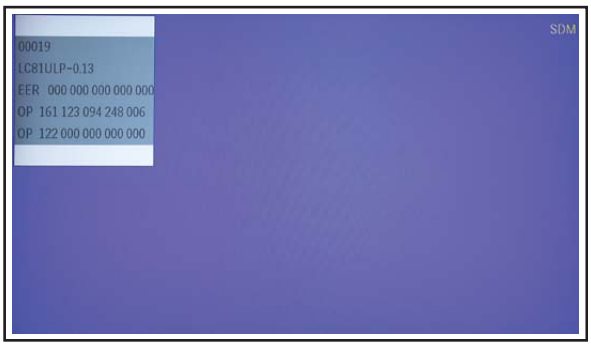


18490_201_090409.eps
090409

Figure 5-2 Service jumper (SSB component side)

On Screen Menu

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



H_17740_030.eps
230108

Figure 5-3 SDM menu

Menu explanation:

- **HHHHH**: Are the operating hours (in decimal).
- **AAAABCD-X.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. See “Options” in the Alignments section for a detailed description. 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, colour, 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 **OSD/ STATUS/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 STANDBY 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 in Factory mode by accident (with “F” displayed on screen), by pressing and hold “VOL-“ and “CH-” together should leave Factory mode.

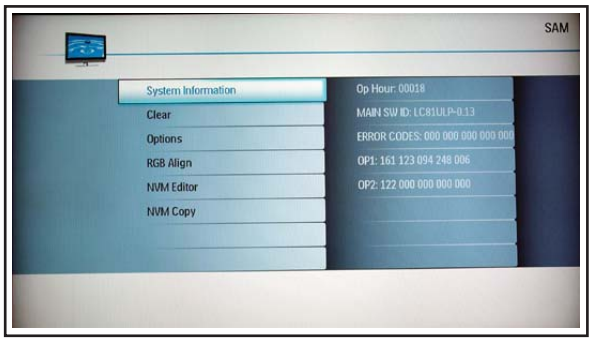
5.2.3 Service Alignment Mode (SAM)

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 **OSD/ STATUS/INFO/i+** button (it depends on region which button is present on the RC). Do not allow the display to time out between entries while keying the sequence.
- Or via ComPair.

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



H_17740_025.eps
230108

Figure 5-4 SAM menu

Menu 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.
   - **ERROR CODES.** 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 6.4 Option Settings in the Alignments section for a detailed description. Ten codes are possible.
2. **Clear.** Erases the contents of the error buffer. Select the CLEAR menu item and press the MENU RIGHT key. The content of the error buffer is cleared.
3. **Options.** To set the option bits. See paragraph 6.4 Option Settings in the "Alignments" chapter for a detailed description.
4. **RGB Align.** To align the White Tone. See White Tone Alignment: for a detailed description.
5. **NVM Editor.** To change the NVM data in the television set. See also paragraph 5.6 Fault Finding and Repair Tips.
6. **NVM Copy.** Gives the possibility to copy/load the NVM file to/from an USB stick. NVM data copied to a USB memory device is named "**NVM_COPY.BIN**". When copied back to a TV, the file first must have the same name.

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 "**OSD/STATUS/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).

Upon entering the Customer Service Mode, the following screen will appear:

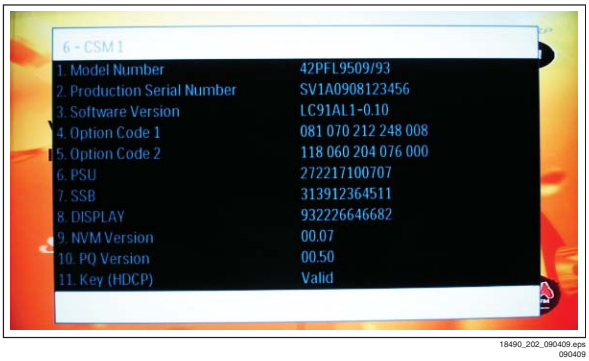


Figure 5-5 CSM menu -1- (example)

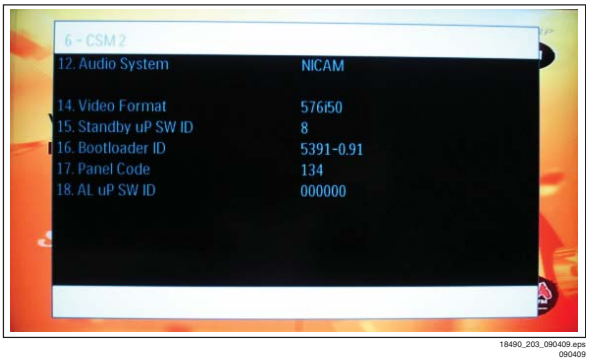


Figure 5-6 CSM menu -2- (example)

Menu Explanation

1. **Model Number.** Type number, e.g. 42PFL9509/93. (*)
2. **Production Serial Number.** Product serial no., e.g. SV1A0908123456 (*). SV= Production centre, 1= BOM code, A= Service version change code, 09= Production year, 08= Production week, 123456= Serial number.
3. **Software Version.** Main software cluster and version is displayed.
4. **Option Code 1.** Option code information (group 1).
5. **Option Code 2.** Option code information (group 2).
6. **PSU**. Indication of the PSU factory ID (= 12nc).
7. **SSB.** Indication of the SSB factory ID (= 12nc). (*)
8. **Display.** Indication of the display ID (=12 nc). (*)
9. **NVM Version.** The NVM software version no.
10. **PQ Version.** PQ (picture quality) data version. This is a subset of the main SW.
11. **Key (HDCP).** Indicates if the HDMI keys (or HDCP keys) are valid or not.
12. **Audio System.** Gives information about the audio system of the selected transmitter.
13. Blank.
14. **Video Format.** Gives information about the video format of the selected transmitter (480p30/720p60/1080i50/1080i60, etc...). Is applicable to both HDMI and CVI sources.
15. **Standby uP SW ID.** Shows the Standby Processor software version.
16. **Bootloader ID.** Shows the Bootloader software ID.
17. **Panel code.** Gives the number of the panel as stored in NVM.
18. **AP uP SW ID.**Shows the AL uP software version.

(*) If an NVM IC is replaced or initialized, these items must be re-written to the NVM. ComPair will foresee in a possibility to do this.

How to Exit

To exit CSM, use one of the following methods:

- Press the MENU button twice 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.

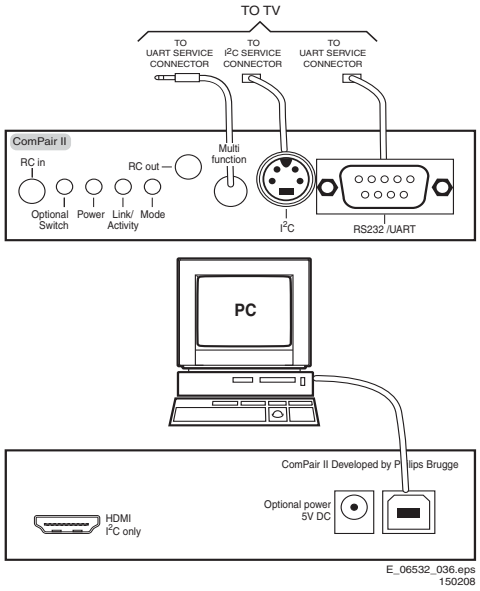


Figure 5-7 ComPair II interface connection

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 website.

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

5.3.2 LVDS Tool

Support of the LVDS Tool has been discontinued.

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 I^2C device.
- General I^2C 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.

Example: In case of a failure of the I2C bus (CAUSE), the error code for a "General I2C failure" and "Protection errors" is displayed. The error codes for the single devices (EFFECT) is not displayed. All error codes are stored in the same error buffer (TV's NVM) except when the NVM itself is defective.

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 LC09M platform, only two boards are present: the SSB and the PSU, meaning only two layer 1 errors are defined (or three in case an additional bolt-on module is added):
- 2: SSB
- 4: PSU
- 6: Bolt-on.

The following layer 2 errors have been assigned:
- 00: no error
- 11: DC protection of speakers, detected by MT539x
- 12: +12V protection error (or 12V failure), detected by standby processor during start-up
- 13: POK line error
- 14: General I^2C bus error when all the devices I^2C devices on the same bus had no response
- 15: I^2C error while communicating with the main EEPROM
- 16: I^2C error while communicating with the PLL/hybrid tuner
- 17: I^2C error while communicating with the HDMI Mux IC ADV3002
- 18: IF demodulator TDA9886
- 19: Reserved

- 21: Digital Bolt-on module communication error (where applicable).

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 colour.

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 Software Protections

Most of the protections and errors use either the stand-by or the micro processor as detection device. Since in these cases, checking of observers, polling of ADCs, and filtering of input values are all heavily software based, these protections are referred to as software protections.
There are several types of software related protections, solving a variety of fault conditions:
- **Protections related to supplies:** check of the 12V.
- **Protections related to breakdown of the safety check mechanism.** E.g. since the protection detections are done by means of software, failing of the software will have to initiate a protection mode since safety cannot be guaranteed any more.

Remark on the Supply Errors
The detection of a supply dip or supply loss during the normal playing of the set does not lead to a protection, but to a cold reboot of the set. If the supply is still missing after the reboot, the TV will go to protection.

Protections during Start-up
During TV start-up, some voltages and IC observers are actively monitored to be able to optimize the start-up speed, and to assure good operation of all components. If these monitors do not respond in a defined way, this indicates a malfunction of the system and leads to a protection.

5.6.2 Hardware Protections

The only real hardware protection in this chassis is (in case of an audio problem) the audio protection circuit that will trigger the uP to switch “off” the TV.

Repair Tip
- It is also possible that you have an audio DC protection because of an interruption in one or both speakers (the DC voltage that is still on the circuit cannot disappear through the speakers).
  Caution: (dis)connecting the speaker wires during the ON state of the TV at high volume can damage the audio amplifier.

5.6.3 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.

Table 5-1 NVM editor overview

	Hex	Dec	Description
Address	0x000A	10	Existing value
Value	0x0000	0	New value
Store	Store?		

5.6.4 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 jumpers on the SSB (keep short circuited).
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 should be into Stand-by, i.e. red LED on.

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.

5.6.5 Display option code

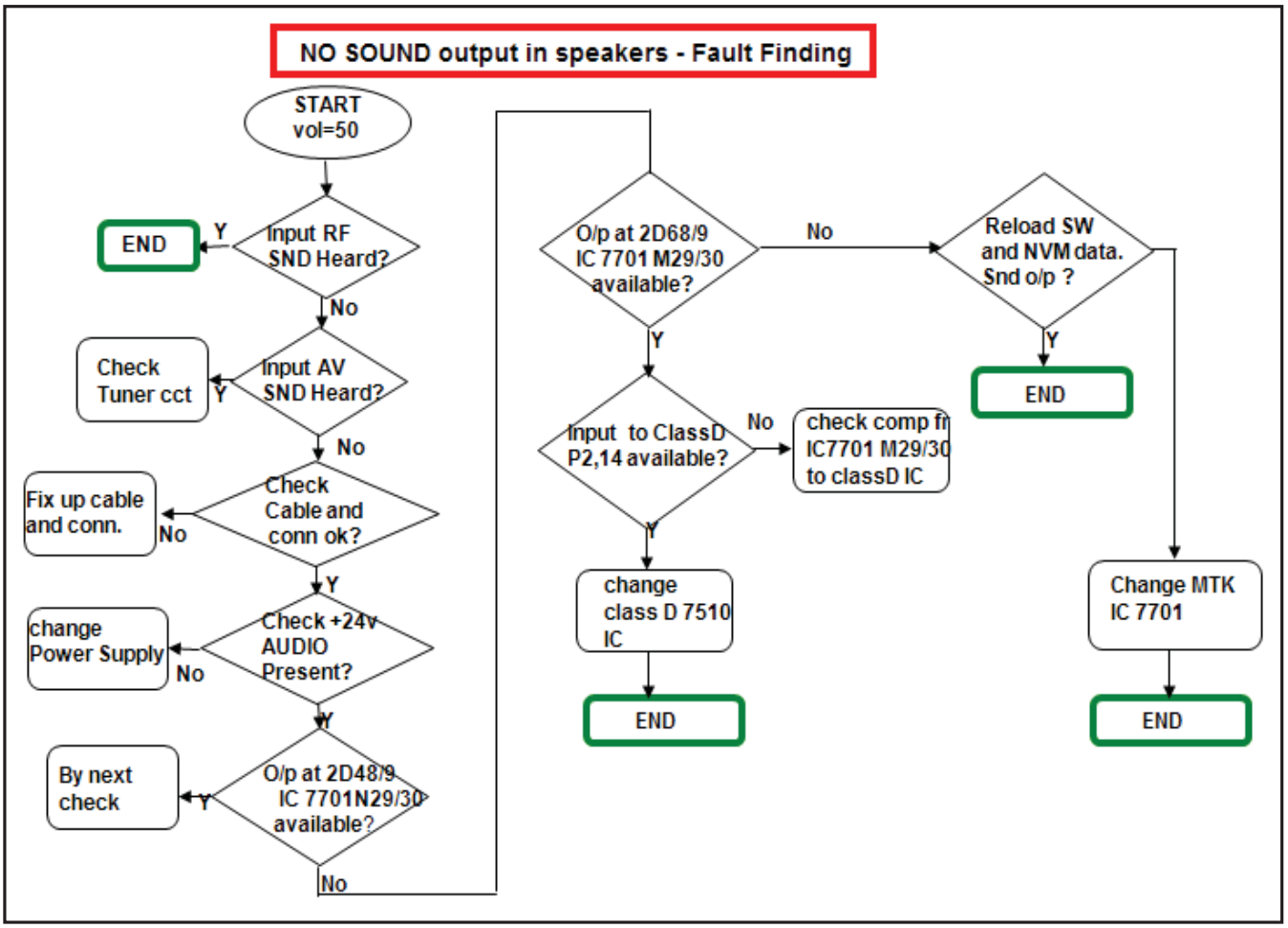
Caution: In case you have replaced the SSB, always check the display option code in SAM, even if you have picture. With a wrong display option code it is possible that you have picture, but that in certain conditions you have unwanted side-effects.

5.6.6 Trouble Shooting Tuner section

When there is no picture in analog RF mode:

1. Check whether picture is present in AV mode. If not, tuner section is okay. Check video processing section.
2. Check if option settings are correct. Tuner profile in OP10: OPA7..OPA5=000 (China region), 010 (AP region).
3. Check if 5 V supply is available at test points F256, F228, F229 and F219, and if 33 V is available at test point F257.
4. Check if the I^2C lines are working correctly (3.3 V).
5. Manually store a known channel and check if there is IF output at tuner pin 11. If not, tuner is faulty.
6. Feed in 105 dBuV at tuner pin 11 and check whether there is CVBS output from IF demodulator IC. If not, IF demodulator might be faulty. Check components in this area.

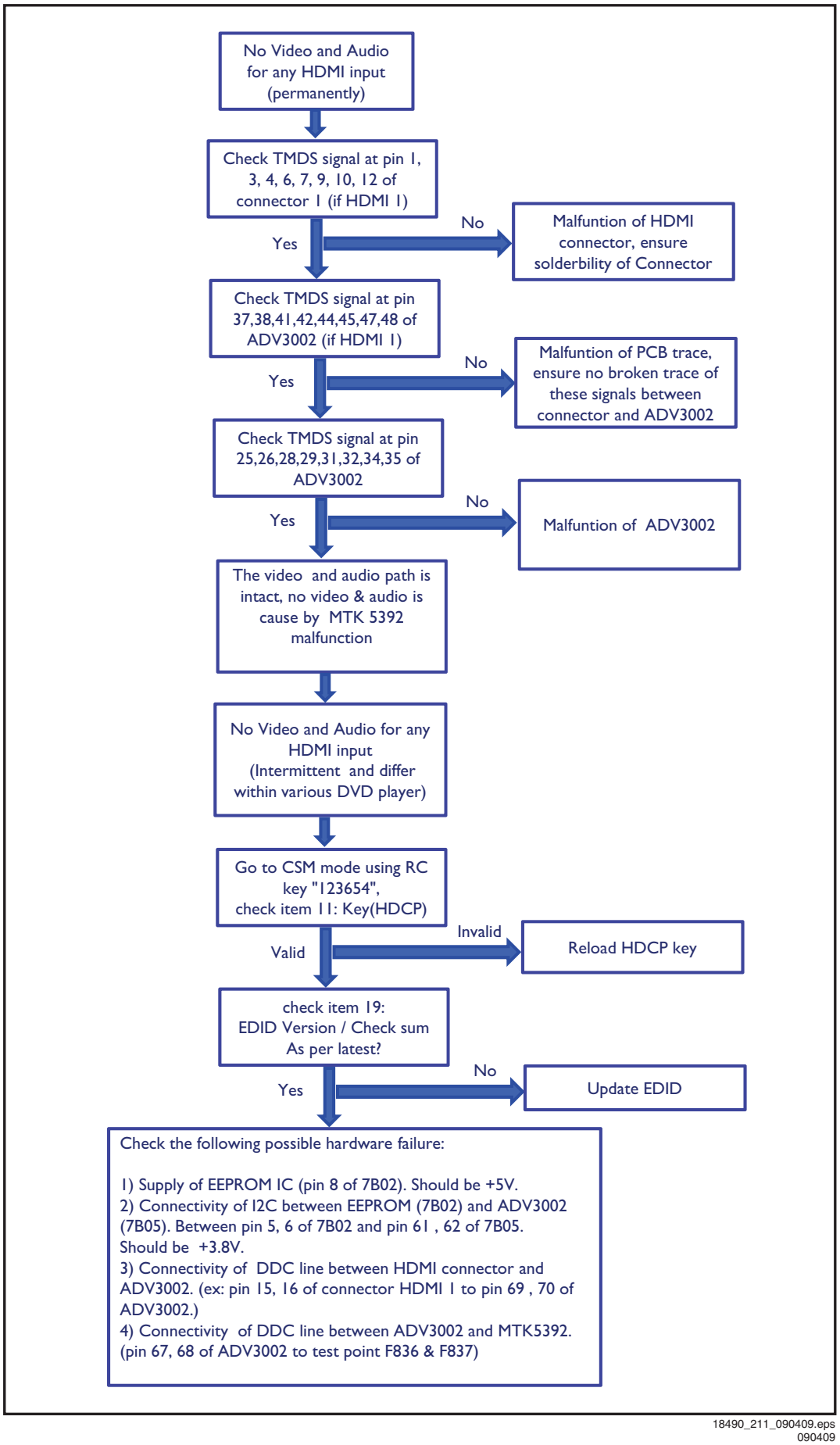
5.6.7 Trouble Shooting Sound section



18490_209_090409.eps
090409

Figure 5-8 Fault finding tree sound section

5.6.8 Trouble Shooting HDMI section



18490_211_090409.eps
090409

Figure 5-9 Fault finding tree HDMI section

5.6.9 Start-up/Shut-down Flowcharts

On the next pages you will find start-up and shut-down flowcharts, which might be helpful during fault finding.

POWER STATES

In this chassis, there are six possible power states as follows:

- Power OFF
- Power ON
- STANDBY
- SEMI-STANDBY
- Special Panel Mode
- PROTECTION

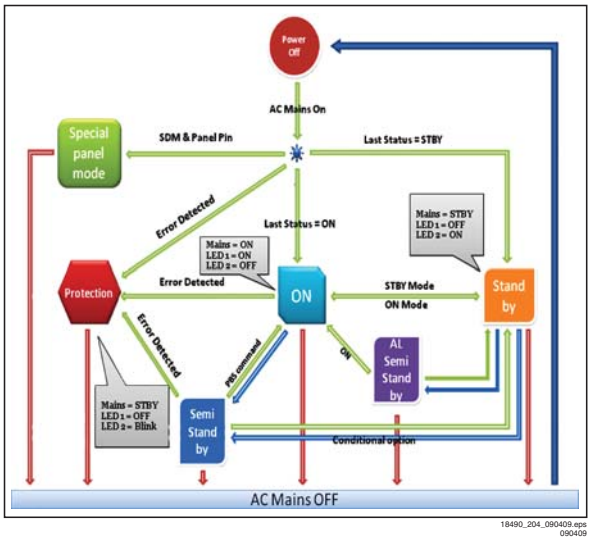


Figure 5-10 Power States

POWER OFF

In “Power OFF” mode, the system is completely switched “off” from AC mains. When AC power is applied, the system checks for last status. Depending on the last standby status stored in the system EEPROM, this mode can then transit to “ON” or “STANDBY” mode.

ON

This is the normal operating mode, indicated by the “on” LED. All the power supply lines are available and depending on the sub-mode, all the circuits in the system may be active. From this mode it shall be possible to transit to “STANDBY” and “PROTECTION” mode, or to “Power OFF” mode if AC mains are switched “off”. The sub-modes are:

- Active Mode (Normal Consumer Mode)
- Service Modes
- Panel Modes
- Factory Modes

STANDBY

The total power consumption of the system in this mode shall be equal or less than 150 mW. This state is indicated by white LED when AC mains is switched “on”. Only the standby controller is operational in this state, where only +3V3stby power supply is available. From this mode it shall be possible to transit to the “ACTIVE” or “Power OFF” mode if AC mains are switched “off”.

SEMI-STANDBY

The semi-standby state is required to perform the following tasks:

- AmbiLight wakeup control
- PBS SemiStandby.

SPECIAL PANEL MODE

The Special Panel Mode is **only** used during manufacturing process to program the system EEPROM. In this mode, the SDA0 and SCL0 ports of MT5392 are set to high impedance after SDM and PANEL pins are both detected as “low” during start-up. This mode can be exited using a power recycle.

PROTECTION

This state is entered when an error has been detected at start-up or in the “ACTIVE” mode. All switched power supply lines are turned “off” with only +3V3stby remaining “on”; similar to “STANDBY” mode. This state is indicated by the blinking red front LED with the blinking sequence denoting the type of error detected.

When the system enters the protection mode due to a critical error, it should be turned “off” and the failure cause needs to be resolved. The system will function normally again after performing a power recycling once all protection causing failures have been resolved.

START-UP SEQUENCE

There are two cases of start-up sequences, namely:

- AC On and
- Standby Wake-up.

See also Figure 5-11.

AC ON

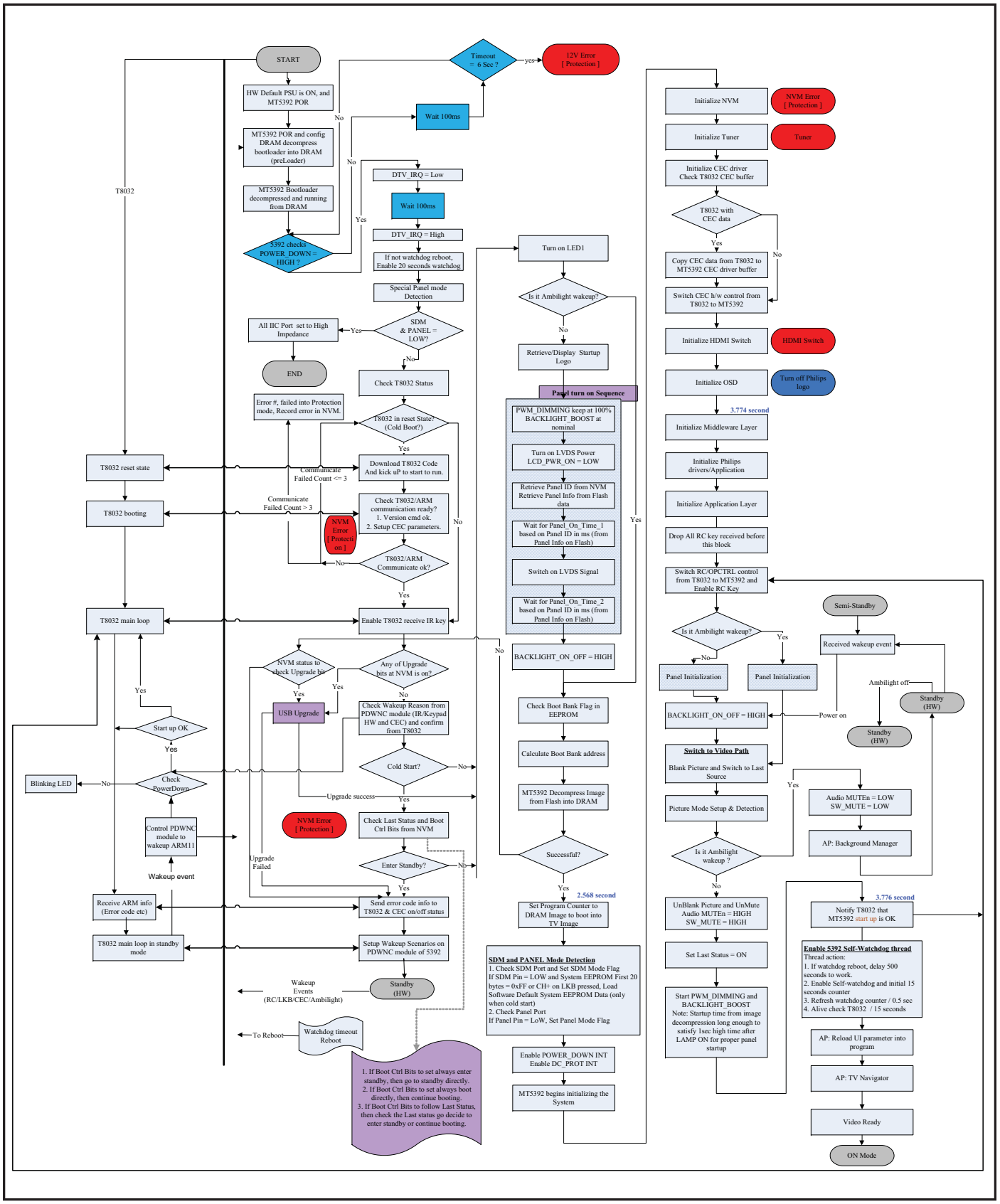
In the case of start-up from AC mains, all PSU voltages start to turn “on” as the hardware default of the active “low” STANDBY (controlled by Standby Controller STANDBY signal) signal to the PSU is pulled “low” with respect to ground.

The MT5392 starts running boot loader once the hardware reset circuit is released. The system will then check the last standby status from the system EEPROM to determine whether to complete the system start-up (load image, turn on the audio, display etc) or proceed to standby and wait for wake-up command from user. The Standby Controller then proceeds to verify the power status of the +12V and sends the system to protection in case of any failures. Special Panel, SDM, and PANEL modes are detected as well.

STANDBY WAKEUP

When the system receives a command to wake-up from standby, the Standby Controller sets the STANDBY signal “low” to turn “on” the switched power, and similarly detects for the presence of +12V. The MT5392 waits for +3V3_SW to be available before loading its image. The significance of this voltage detection is due to the flash is also being powered by the same mentioned voltage.

The following figure shows the start-up flowchart for both “AC On” and “Standby Wake-up”:



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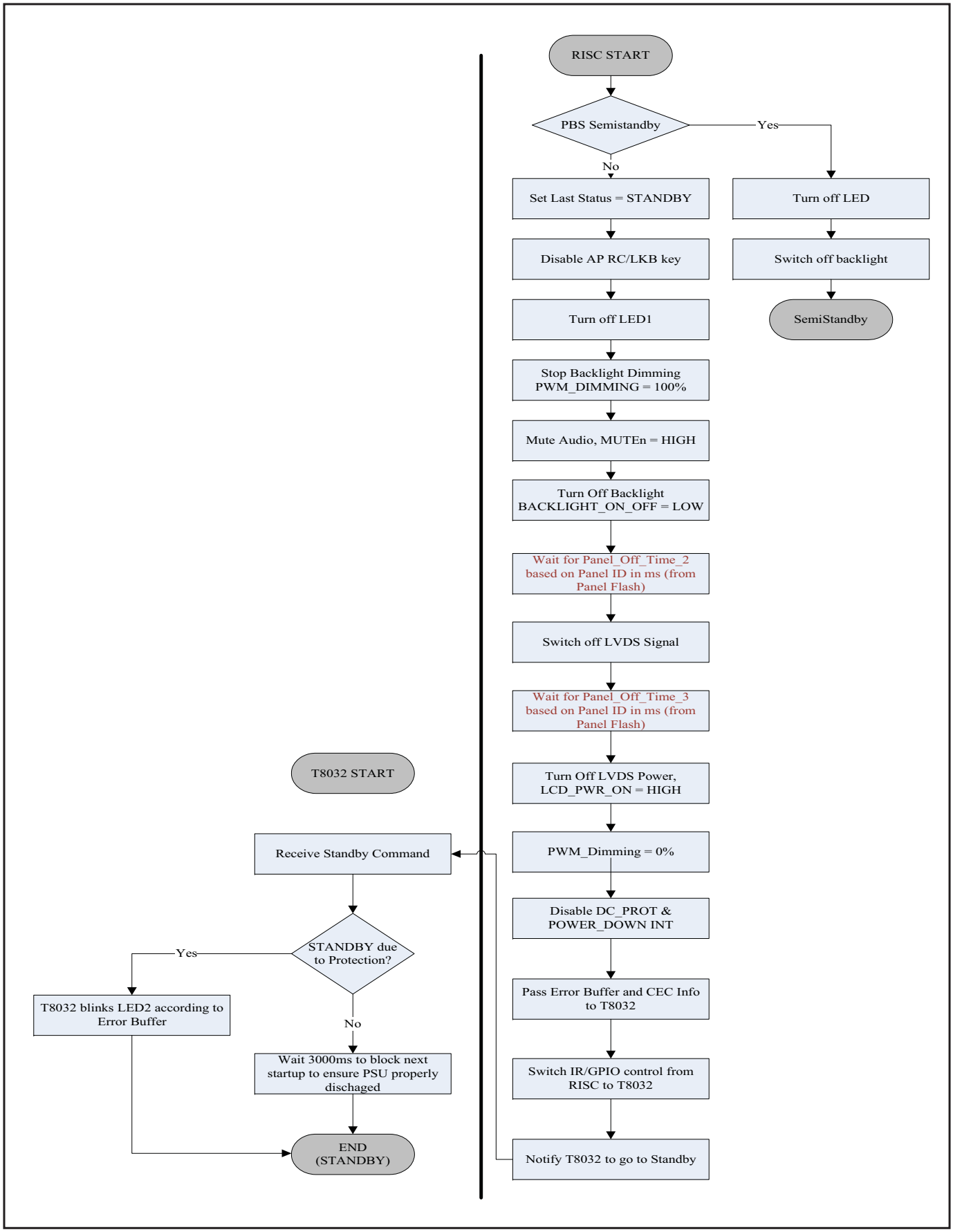
090409

Figure 5-11 Start-up flowchart

STANDBY SEQUENCE

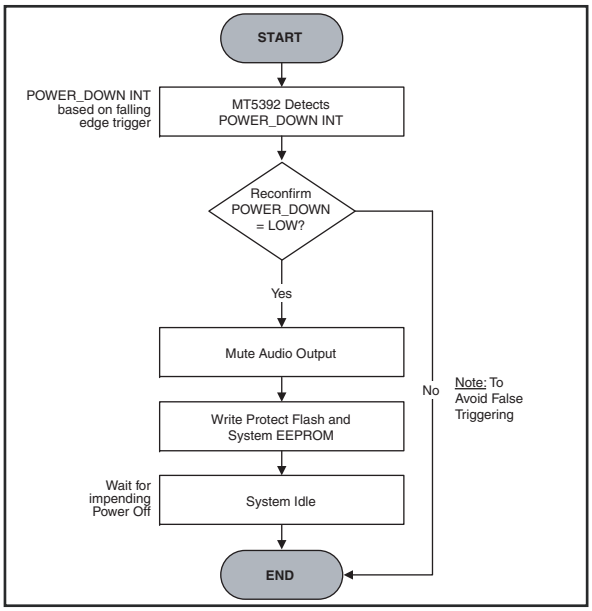
The following flowchart depicts the Standby (plus Semi-Standby condition) sequence:



18490_206_090409.eps
090409

Figure 5-12 Standby flowchart

POWERDOWN SEQUENCE
The following figure shows the power-down sequence flowchart:

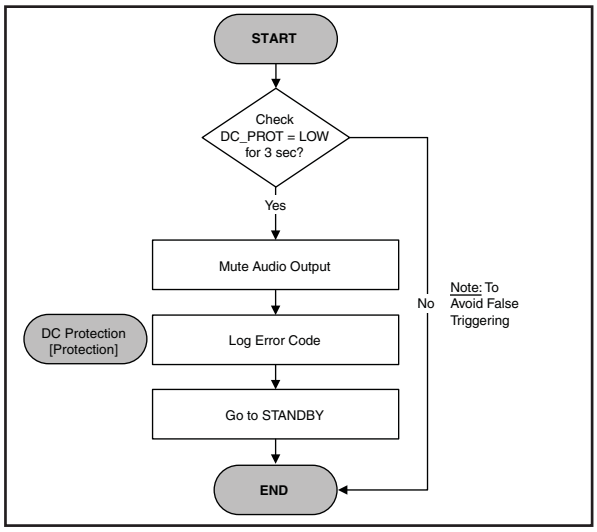


18490_200_090408.eps
090408

Figure 5-13 Power-down flowchart

The power-down condition is detected by the MT5392 POWER_DOWN signal which is an interrupt pin. A “low” level on this line signifies that power-down is detected. The two major activities that occur over this operation is the muting of audio output and write protecting the system flash and EEPROM.

DC PROTECTION
The following figure shows the DC_PROT interrupt flowchart:

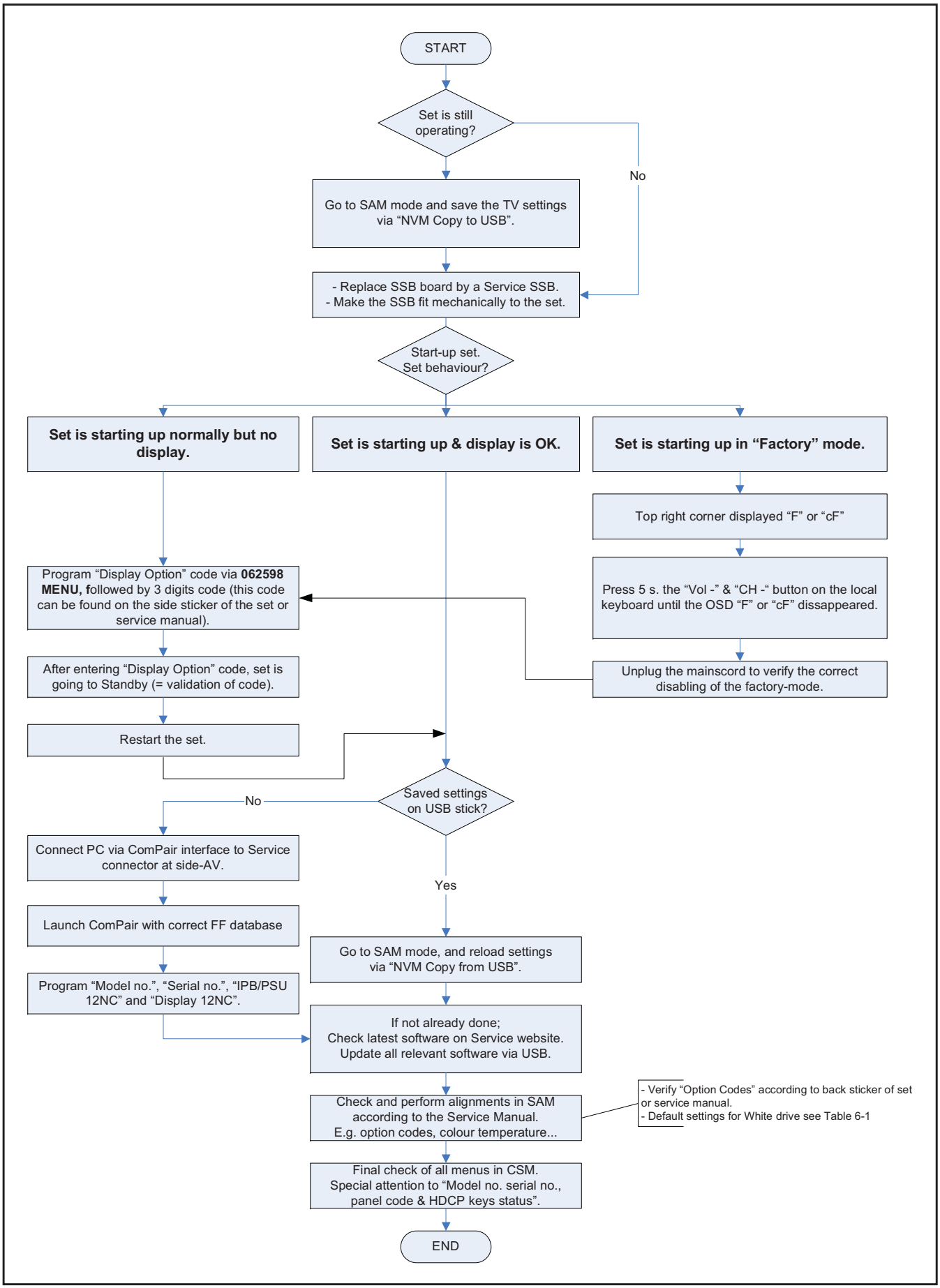


H_17740_037.eps
240108

Figure 5-14 DC Protection flowchart

5.6.10 SSB replacement

Follow the instructions in the flowchart in case a SSB has to be swapped.



18490_207_090409.eps
090409

Figure 5-15 SSB replacement flowchart

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, without the need of an E-JTAG debugger. 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 “autorun.upg” to the root of your USB stick.
2. Insert USB stick in the side I/O while the set is in “On” mode. The set will prompt for software upgrade acknowledge, after which the upgrading will start automatically. As soon as the programming is finished, you have to give a “restart” command, after which the set will restart. 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.

- **Ambi_clustername_version.zip.** Not to be used by Service technicians.
- **Panel_clustername_version.zip.** Not to be used by Service technicians.
- **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.

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	F124	11.40	12.00	12.60	B01_DC-DC
+3V3_STBY	F101	3.20	3.30	3.40	B01_DC-DC
+3V3_SW	F133	3.14	3.3	3.46	B01_DC-DC
+1V2_SW	F131	1.18	1.25	1.31	B01_DC-DC
+5V_SW	F132	4.94	5.2	5.46	B01_DC-DC
+1V8_SW	F125	1.71	1.80	1.89	B01_DC-DC
+1V0_SW	F134	0.99	1.05	1.10	B01_DC-DC
+8V_SW	F122	7.6	8.0	8.4	B01_DC-DC
+5VS	F228	4.75	5	5.25	B02_Tuner_IF
+VDISP	F934	11.40	12.00	12.60	B04D_LVDS
+VTUN	F123	30	33	36	B01_DC-DC
+5V_IF	F229	4.75	5	5.25	B02_Tuner_IF
+5VTUN	F219	4.75	5	5.25	B02_Tuner_IF

6.3 Software Alignments

With the software alignments of the Service Alignment Mode (SAM) the Tuner and RGB settings can be aligned.
To store the data: Use the RC button “Menu” to switch to the main menu and next, switch to “Stand-by” mode.

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 LC9.1A LA chassis comes with the UV1856 analogue tuner. No alignment is necessary, as the AGC alignment is done automatically (standard value: “15”). However in case of problems use the following method (use multimeter and RF generator):
- Apply a vision IF carrier of 38.9 MHz (105 dBuV = 178 mVrms) to injection point A258 (input via 50 ohm coaxial cable terminated with an RC network of series 10nF with 120 ohm to ground).
- Measure voltage on pin 1 of the tuner (test point F250).
- Adjust AGC (via SAM menu: TUNER -> AGC), until voltage on pin 1 is 3.3 +0.5/-1.0 V.
- Store settings and exit SAM.

6.3.2 RGB Alignment

Before alignment, choose “Setup” -> “Picture” and set:
- “Brightness” to “50”.
- “Colour” to “50”.
- “Contrast” to “100”.

White Tone Alignment:
- Activate SAM.
- Select “RGB Align“ and choose a colour temperature.
- Use a 100% white screen as input signal and set the following values:
  - All “White point” values initial to “256”.
  - All “BlackL Offset” values to “0”.

In case you have a colour analyser:
- Measure with a calibrated (phosphor- independent) colour analyser (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 “256”) 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: ± 0.004, dy: ± 0.004.
- Repeat this step for the other colour 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	0.278	0.289	0.314
y	0.278	0.291	0.319

If you do **not** have a colour analyser, 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 42"

Colour Temp.	R	G	B
Cool	246	248	255
Normal	255	236	180
Warm	210	226	255

Table 6-3 Tint settings 47"

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

Table 6-4 Tint settings 52"

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

6.4 Option Settings

6.4.1 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).

6.4.2 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 “Option Codes OP1...OP7” below.

How to Change Options Codes
An option code (or “option byte”) represents eight different options (bits). When you change these numbers directly, you can set all options very quickly. All options are controlled via ten option bytes (OP1... OPA).
Activate SAM and select “Options”. Now you can select the option byte (OP1 to OPA) with the CURSOR UP/ DOWN keys, and enter the new 3 digit (decimal) value. For the correct factory default settings, see Table 6-5 Option code overview. For more detailed information, see Table 6-6 Option codes at bit level (OP1-OP7).. If an option is set (value “1”), it represents a certain decimal value.
When all the correct options (bits) are set, the sum of the decimal values of each Option Byte (OP) will give the option code.

Table 6-5 Option code overview

CTN	Option Code	Display Code
42PFL9509/93	081 070 212 248 008 118 060 192 076 001	183
47PFL9509/93	081 070 212 248 008 118 060 192 076 001	186
52PFL9509/93	081 070 212 248 008 118 060 192 076 001	208

Option Bit Overview
Below find an overview of the Option Codes on **bit** level.

Table 6-6 Option codes at bit level (OP1-OP7)

Option Byte & Bit	Dec. Value	Option Name	Description - will follow in next issue of this manual
Byte OP1			
Bit 7 (MSB)	128	Reserved	
Bit 6	64	OPC_MJC_3	
Bit 5	32	OPC_MJC_2	
Bit 4	16	OPC_MJC	
Bit 3	8	OPC_REGION_SPECIFIC2	
Bit 2	4	OPC_REGION_SPECIFIC	
Bit 1	2	OPC_REGION2	
Bit 0 (LSB)	1	OPC_REGION	
Byte OP2			
Bit 7 (MSB)	128	OPC_AV2_SCART2_2	
Bit 6	64	OPC_AV2_SCART2	
Bit 5	32	Reserved	
Bit 4	16	Reserved	
Bit 3	8	OPC_CI_PLUS (Provision	
Bit 2	4	OPC_LIGHT_SENSOR	
Bit 1	2	OPC_AMBILIGHT_2	
Bit 0 (LSB)	1	OPC_AMBILIGHT	
Byte OP3			
Bit 7 (MSB)	128	OPC_SideHDMI	
Bit 6	64	OPC_SideAV_2	
Bit 5	32	OPC_SideAV	
Bit 4	16	OPC_VGA	
Bit 3	8	Reserved	
Bit 2	4	OPC_HDMI3	
Bit 1	2	OPC_AV3_2	
Bit 0 (LSB)	1	OPC_AV3	
Byte OP4			
Bit 7 (MSB)	128	OPC_SHOP_MODE	
Bit 6	64	OPC_BACKLIGHT_DEEPDIMMING	
Bit 5	32	OPC_BACKLIGHT_BOOST	
Bit 4	16	OPC_BACKLIGHT_DIMMING	
Bit 3	8	OPC_BBD	
Bit 2	4	OPC_DRAM_IC_3	
Bit 1	2	OPC_DRAM_IC_2	
Bit 0 (LSB)	1	OPC_DRAM_IC	
Byte OP5			
Bit 7 (MSB)	128	OPC_DIGITAL_OPTION_2	
Bit 6	64	OPC_DIGITAL_OPTION	
Bit 5	32	Reserved	
Bit 4	16	OPC_ADC (Provision)	
Bit 3	8	OPC_LIP_SYNC	
Bit 2	4	OPC_SURROUND_VDOLBY	
Bit 1	2	Reserved	
Bit 0 (LSB)	1	Reserved	
Byte OP6			
Bit 7 (MSB)	128	Reserved	
Bit 6	64	OPC_VPB_4	
Bit 5	32	OPC_VPB_3	
Bit 4	16	OPC_VPB_2	
Bit 3	8	OPC_VPB	
Bit 2	4	OPC_MP3_PHOTO	
Bit 1	2	OPC_VIEW_FOR_YOU	
Bit 0 (LSB)	1	OPC_VIRGIN_MODE	
Byte OP7			
Bit 7 (MSB)	128	OPD_MHEG (Provision)	
Bit 6	64	Reserved	
Bit 5	32	OPC_PIXELPLUS_LINK	
Bit 4	16	OPC_SYS_AUD_CTRL	
Bit 3	8	OPC_RC_PASSTHROUGH	
Bit 2	4	OPC_CEC	
Bit 1	2	OPC_OAD2 (Provision)	
Bit 0 (LSB)	1	OPC_OAD (Provision)	
Byte OP8			
Bit 7 (MSB)	128	OPC_DEMO_AMBILIGHT	
Bit 6	64	OPC_DEMO_PP_PLUS	
Bit 5	32	Reserved	
Bit 4	16	Reserved	

Option Byte & Bit	Dec. Value	Option Name	Description - will follow in next issue of this manual
Bit 3	8	OPC_TXT2_5	
Bit 2	4	OPC_TXT_CC	
Bit 1	2	OPC_EPG	
Bit 0 (LSB)	1	Reserved	
Byte OP9			
Bit 7 (MSB)	128	Reserved	
Bit 6	64	OPC_SYS_RECVRY	
Bit 5	32	Reserved	
Bit 4	16	Reserved	
Bit 3	8	OPC_SCENEA	
Bit 2	4	OPC_ESTICKER	
Bit 1	2	Reserved	
Bit 0 (LSB)	1	Reserved	
Byte OPA			
Bit 7 (MSB)	128	Tuner Profile_2	
Bit 6	64	Tuner Profile_1	
Bit 5	32	Tuner Profile_0	
Bit 4	16	Cabinet Profile_4	
Bit 3	8	Cabinet Profile_3	
Bit 2	4	Cabinet Profile_2	
Bit 1	2	Cabinet Profile_1	
Bit 0 (LSB)	1	Cabinet Profile_0	

7. Circuit Descriptions, Abbreviation List, and IC Data Sheets

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.

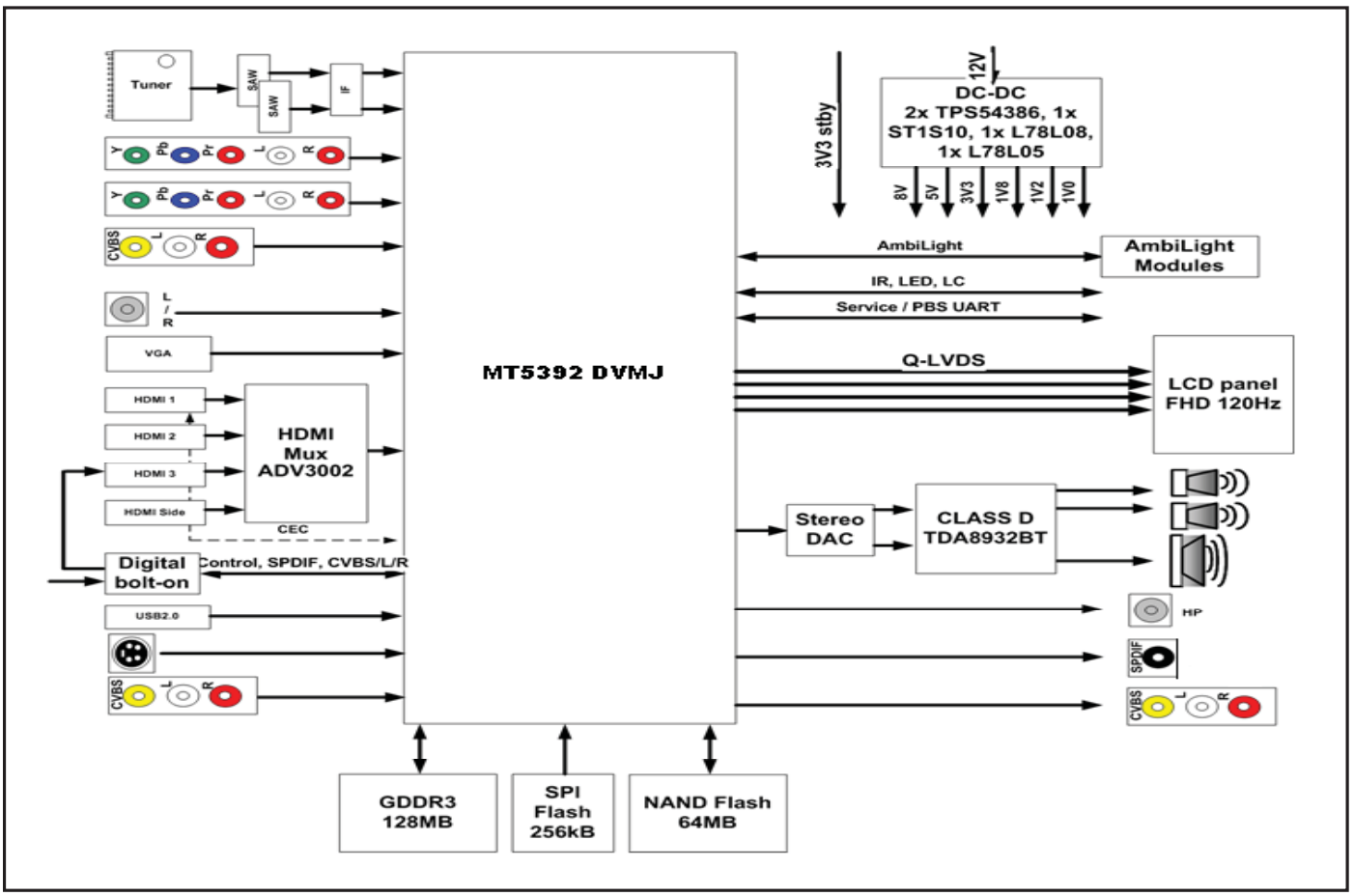
7.1 Introduction

The LC9.1A LA chassis (development name “LC09M”) is an analogue chassis using a Mediatek chipset. It covers screen sizes of 32" to 52" with stylings called “PnS” (xxPFL5xxx), “Frame” (xxPFL7xxx) and “Roadrunner” (xxPFL9xxx).

Main key components are:

- Mediatek MT5392 video processor
- NXP TDA8932BT audio processor
- ADV3002BSTZ01 HDMI switch
- UV1856 tuner and TDA9886 demodulator.

Refer to Figure 7-1 for details.



18490_208_090409.eps
090409

Figure 7-1 LC09M Architecture

7.1.1 SSB Cell Layout

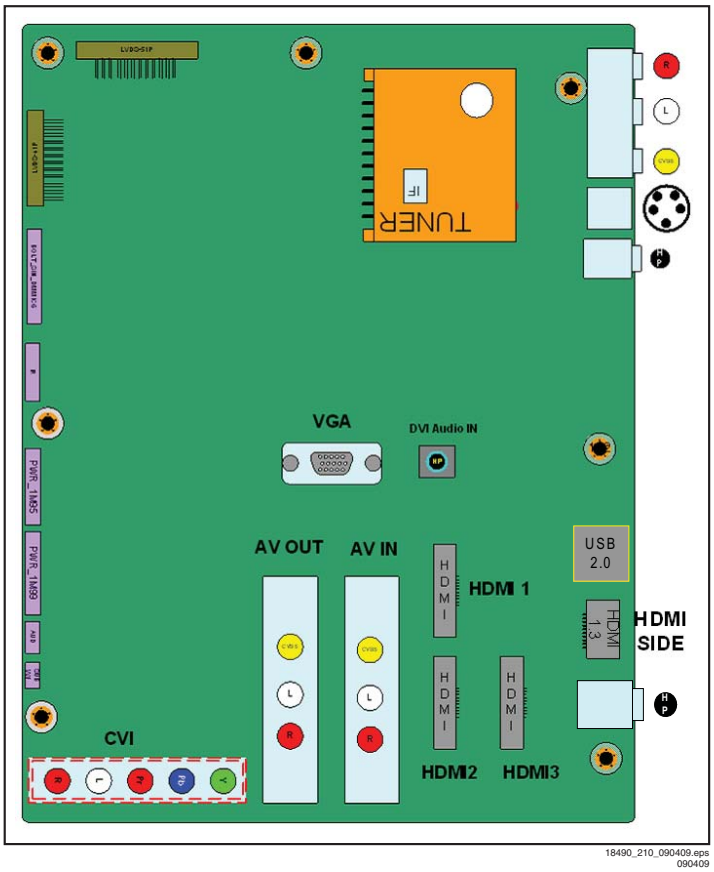


Figure 7-2 SSB cell layout

7.2 LCD 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.

Different PSUs are used in this chassis:

- 42" sets use an “LG” PSU (LGIT PLHL-T814A) Integrated Power Board
- 47" sets use an “LG” PSU (LGIT PLHL-T819A) Integrated Power Board
- 52" sets use an “Delta” PSU (DPS-411AP4A B) Power Supply Unit (without inverter).

Refer to Figure 7-3 and Figure 7-4 for details.

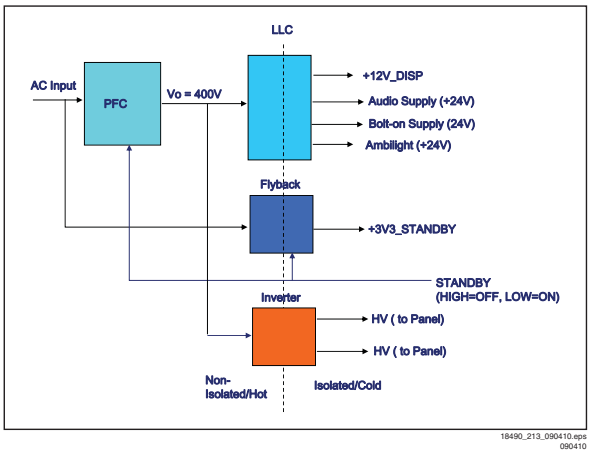


Figure 7-3 42" and 47" IPB block diagram

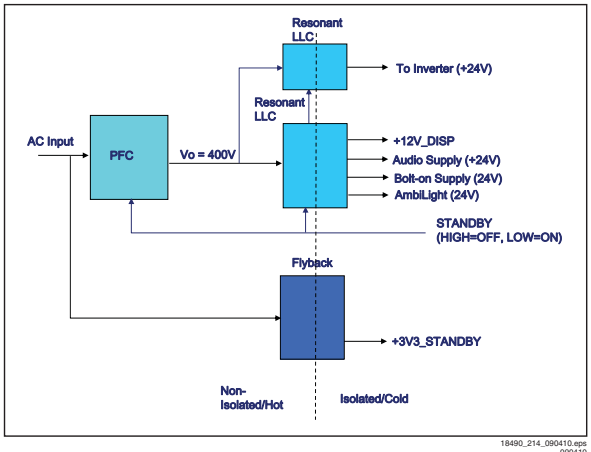


Figure 7-4 52" PSU block diagram

7.3 DC/DC converters

On-board DC-DC converters convert the +12 V coming from the PSU. Refer to Figure 7-5 for details.

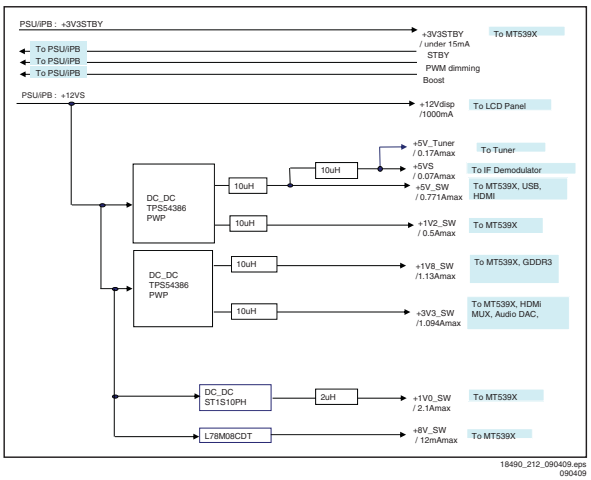


Figure 7-5 DC DC converter block diagram

7.4 Front-End

Key components for the analogue tuner section (AP region) are:

- UV1816E tuner
- K7257 video SAW filter
- K9362 audio SAW filter
- TDA9886T analogue IF demodulator.

For trouble shooting info, refer to paragraph 5.6.6 Trouble Shooting Tuner section.

Table 7-1 Pin assignment analogue tuners

Pin number	Description	DC voltage (V)
1	RF AGC voltage	3.3 - 4.5 (weak or no signal) < 3.3 (strong signal)
2	n.c.	
3	I^2C-bus address select	0
4	SCL	0 to 3.3
5	SDA	0 to 3.3
6	n.c.	
7	supply voltage	5 +0.5/−0.25 V
8	n.c.	
9	fixed tuning voltage	33
10	n.c.	
11	TV IF output	

7.5 Video Processing

The video processing is completely handled by the Mediatek MT5392 video processor which features:

- Noise reduction
- Dynamic skin tone control
- White stretch
- Blue stretch
- Green enhancement
- Auto histogram
- Pixel Plus III / Perfect Pixel
- Active Backlight dimming
- Active contrast.

7.6 Audio Processing

In this chassis, the TDA8932BT Class D Power Amplifier is implemented. For trouble shooting info, refer to paragraph 5.6.7 Trouble Shooting Sound section.

7.7 HDMI

7.7.1 Introduction

Note: Text below is an excerpt from the ”HDMI Specification” that is issued by the HDMI founders (see www.hdmi.org).

The High-Definition Multimedia Interface is developed for transmitting digital signals from audiovisual sources to television sets, projectors and other video displays.
HDMI can carry high quality multi-channel audio data and can carry all standard and high-definition consumer electronics video formats. Content protection technology is available. HDMI can also carry control and status information in both directions.

HDMI is backward compatible with DVI (1.0). Compared with DVI, HDMI offers extra:

- YUV 4:4:4 (3 × 8-bit) or 4:2:2 (up to 2 × 12-bit), where DVI offers only RGB 4:4:4 (3 × 8 bit).
- Digital audio in CD quality (16-bit, 32/44.1/48 kHz), higher quality available (8 channels, 192 kHz).
- Remote control via CEC bus (Consumer Electronics Control): allows user to control all HDMI devices with the TV's remote control and menus.
- Smaller connector (SCART successor).
- Less cables: e.g. from 10 audio/9 video cables to 3 HDMI cables.

7.7.2 Implementation

In this chassis, the main "Mediatek" Video processor MT5392 combines the HDMI functionality together with the 4:1 "Analog Device" HDMI switch ADV3002.

The ADV3002 features:
- 4 HDMI inputs
- 1 HDMI output
- EDID replication
- 5 V combiner.

Refer to Figure 7-6 for the HDMI implementation.

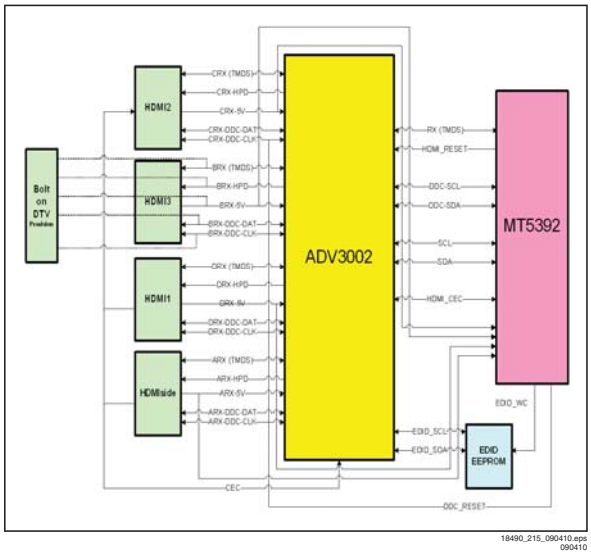


Figure 7-6 HDMI implementation

Refer to 5.6.8 Trouble Shooting HDMI section for repair info.

7.7.3 EDID architecture

The ADV3002 HDMI switch combines the conventional separate EDIDs (for each HDMI port) into one integrated EDID, shared by all HDMI ports.
The EDID data can be copied to a USB stick for further analysis or editing.

7.8 Ambi Light

The Ambi Light architecture in this platform has been entirely renewed. The characteristics are:
- Additional DC/DC board generating 12/16/24 V (optional)
- ARM processor (on DC/DC panel or AL board)
- Low-power LEDs
- SPI interface from ARM to LED drivers
- I^2C upgradeable via USB
- Each AL module has a temperature sensor.

The use of the DC/DC board is optional. In case no DC/DC board is implemented, the ARM processor is located on one of the AL boards.

Refer to Figure 7-7 for the Ambi Light architecture.

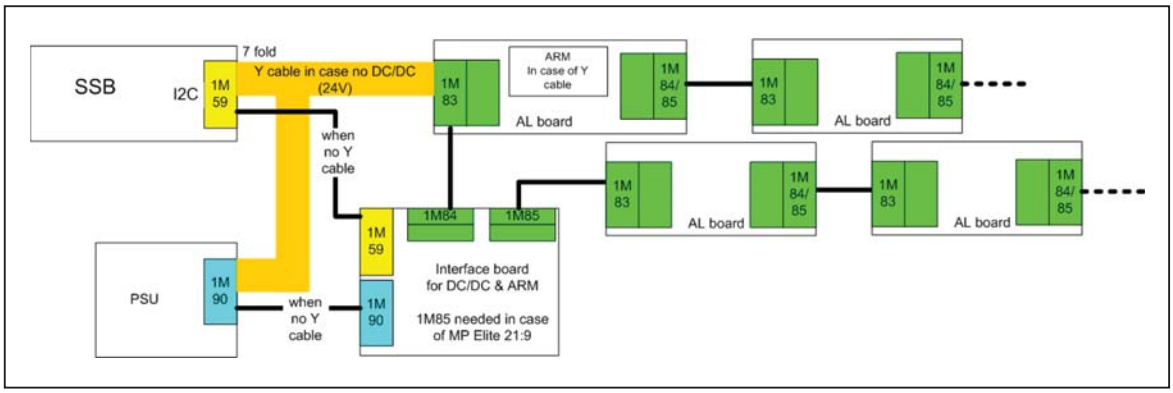
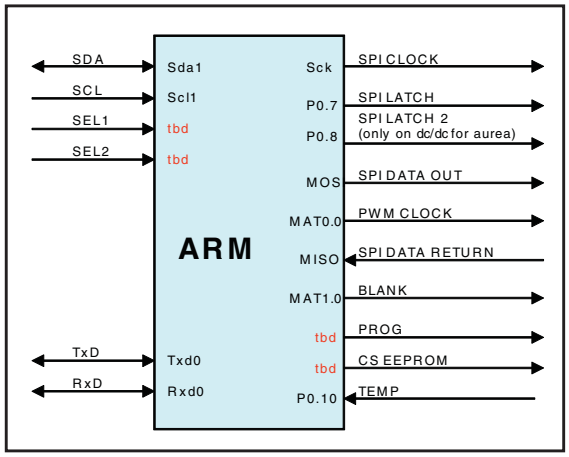


Figure 7-7 Interface between Ambi Light and SSB

7.8.1 ARM controller

Refer to Figure 7-8 below for signal interfacing to and from the ARM controller. The ARM controller is located on the DC/DC board (item no. 7302) or AL panel (item no. 7102).



18310_204_090318.eps
090318

Figure 7-8 ARM controller interface

Data transfer between ARM processor and LED drivers is executed by a Serial Peripheral Interface (SPI) bus interface. The SPI bus is a synchronous serial data link standard that operates in full duplex mode.

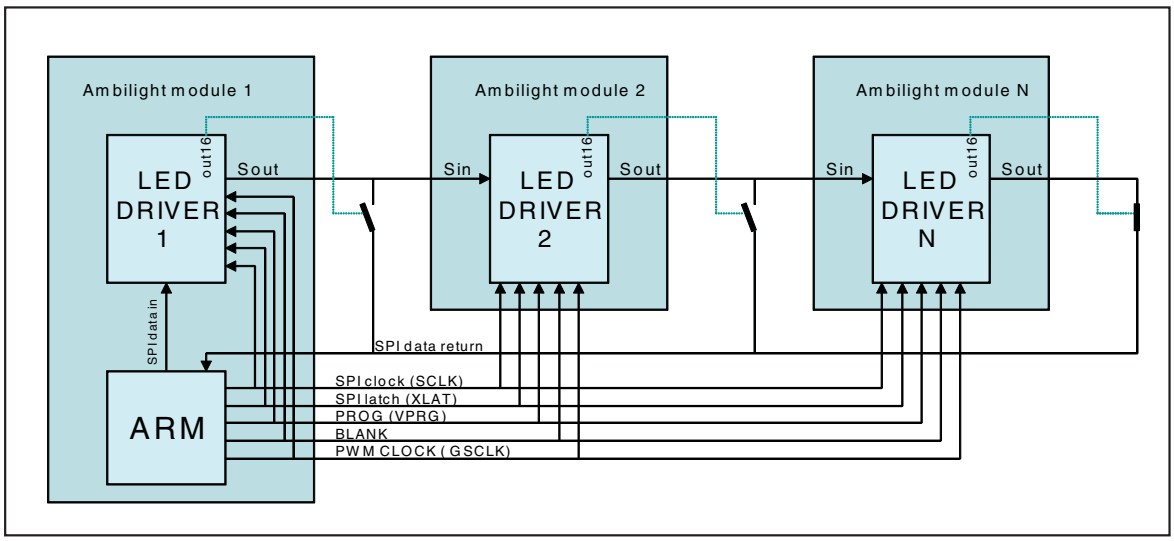
For debugging purposes, the working principle is given below:

- At start-up the controller will read-out matrix data from the EEPROM devices (via SPI DATA RETURN)
- Before operation, the driver current is set via SPI, with driver in DC mode
- During normal operation the controller receives RGB-, configuration-, operation mode- and topology data via I^2C
- The controller converts the I^2C RGB data via the matrixes to SPI LED data
- Via data return the controller receives error data (if applicable).

Also PWM clock and BLANK signals are generated by the controller. The controller can be reprogrammed via I^2C (via USB). The controller can receive matrix values via I^2C, which will be stored in the EEPROM of each AL module via the SPI bus. The temperature sensor in each AL module controls the TEMP line; in case of a too high temperature the controller will reduce the overall brightness.

7.8.2 LED driver communication (via SPI bus)

Refer to Figure 7-9 below for signal interfacing between the ARM controller and the LED drivers on the AL boards, and the LED drivers and the EEPROMs on the AL boards.



18310_205_090318.eps
090318

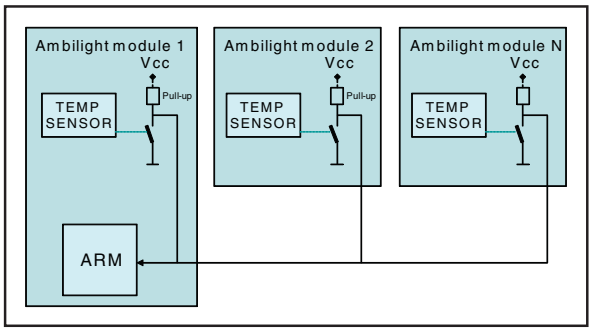
Figure 7-9 SPI communication between ARM controller and LED drivers

The ARM controller communicates with the LED drivers (on each AL module) via an SPI bus. For debugging purposes, the working principle is given below:

- Data from the ARM controller is linked through the drivers, which are connected in cascade
- SPI CLK, SPI LATCH, PROG, BLANK and PWM CLOCK are going directly from the controller to each driver
- SPI DATA RETURN is linked from the last driver to the controller: controller decides which driver returns data.

7.8.3 Temperature Control

Refer to Figure 7-10 for signal interfacing between the ARM controller and the temperature sensor on the AL boards.



18310_206_090318.eps
090318

Figure 7-10 Communication between ARM controller and temperature sensor

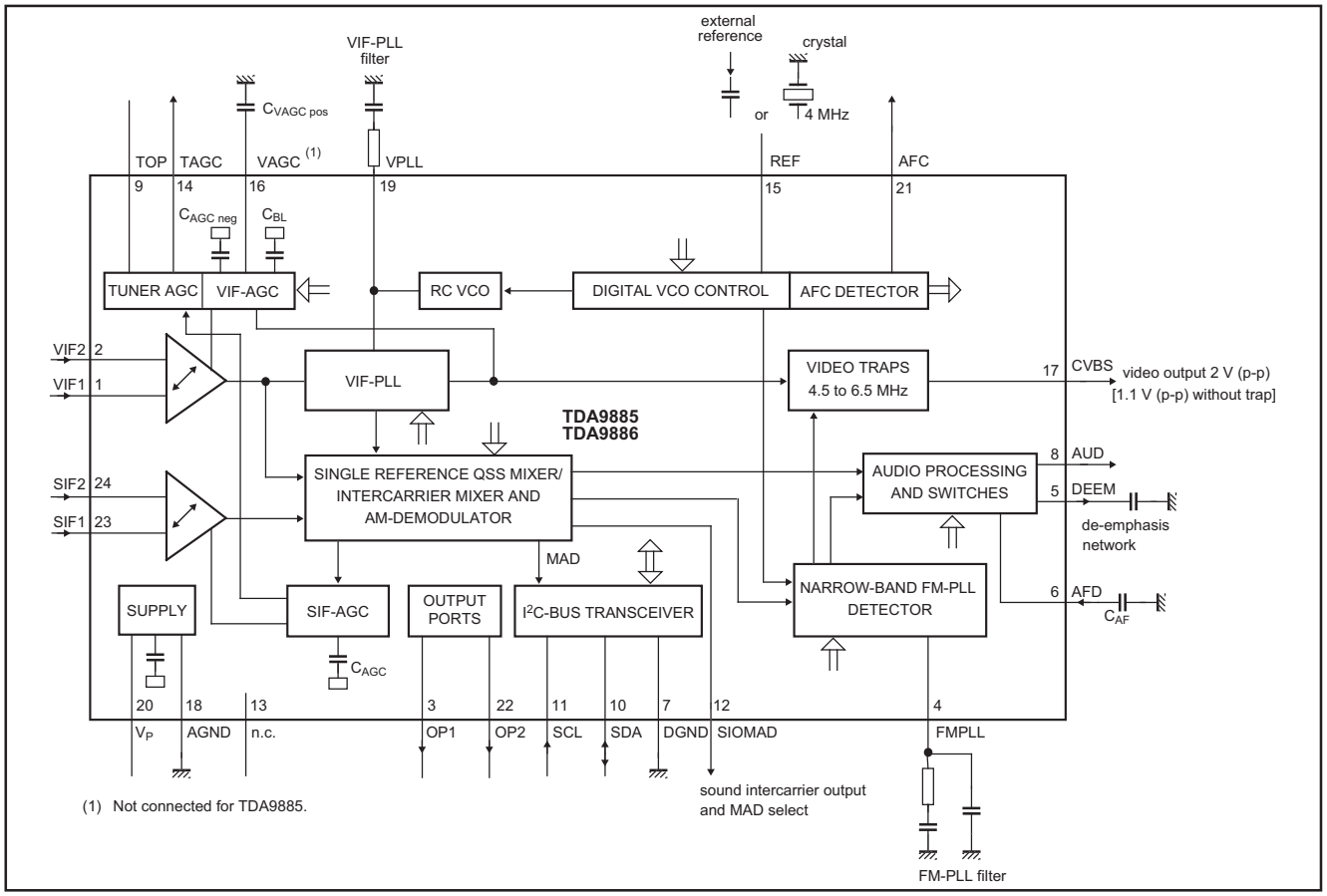
Each AL board is equipped with a temperature sensor. If one of the sensors detects a temperature over the threshold, the TEMP line is pulled LOW which results in brightness reduction.

8. IC Data Sheets

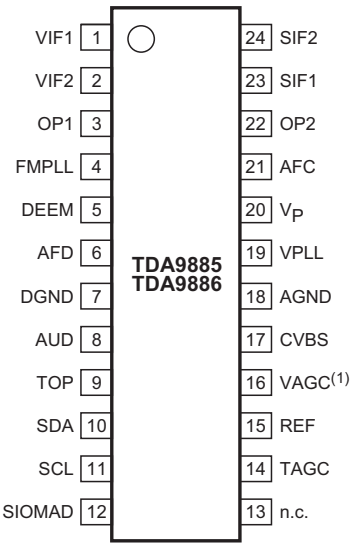
This section shows the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of "memory" and "logic" ICs).

8.1 Diagram B02, Type TDA9886T (IC7113), Demodulator

Block Diagram



Pin Configuration

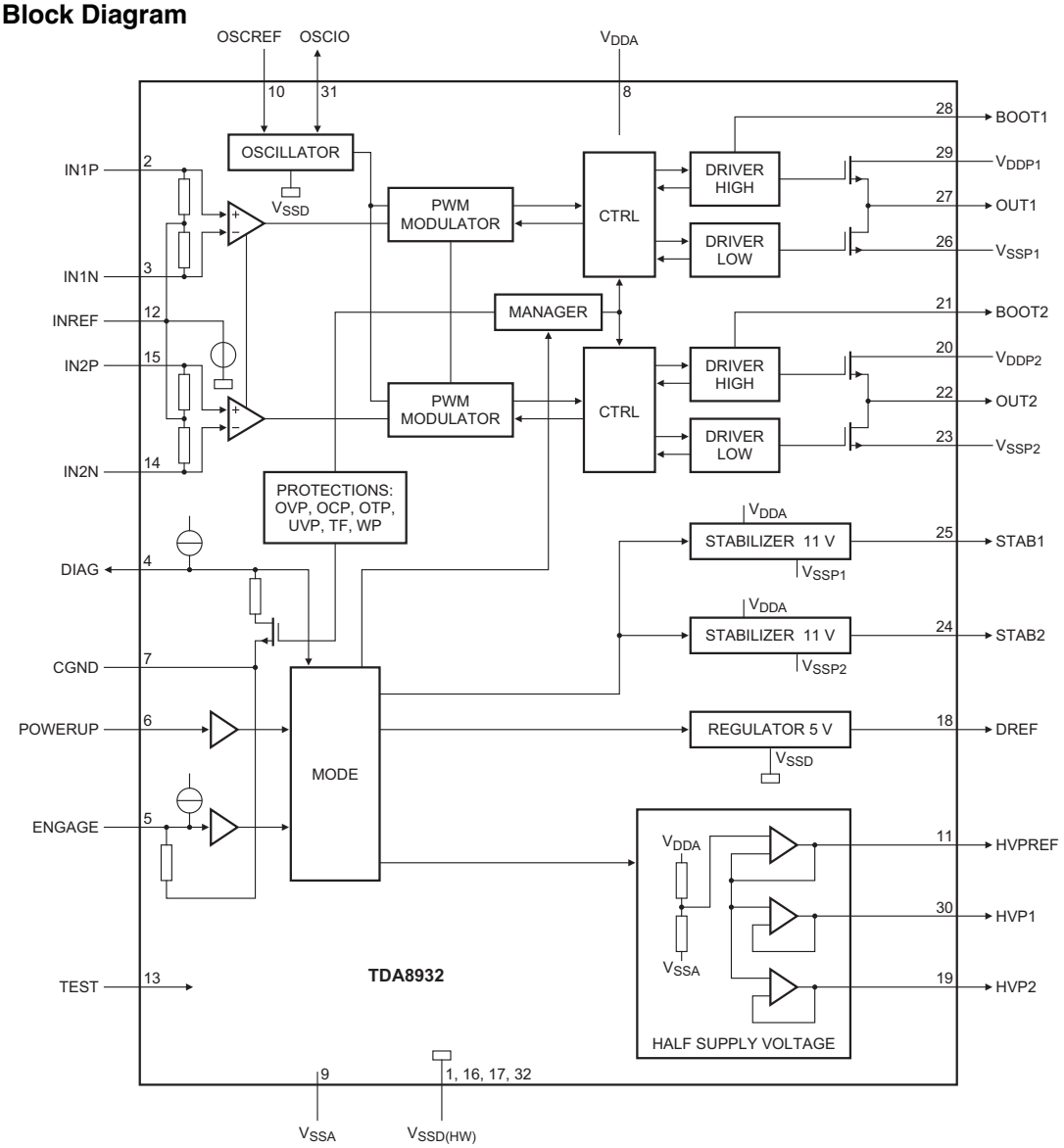


G_16510_059.eps
090325

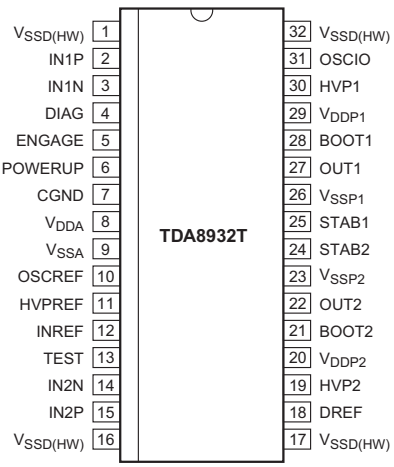
Figure 8-1 Internal block diagram and pin configuration

8.2 Diagram B03, Type TDA8932BT (IC7510), Audio Amplifier

Block Diagram



Pin Configuration



G_16860_045.eps
300107

Figure 8-2 Internal block diagram and pin configuration

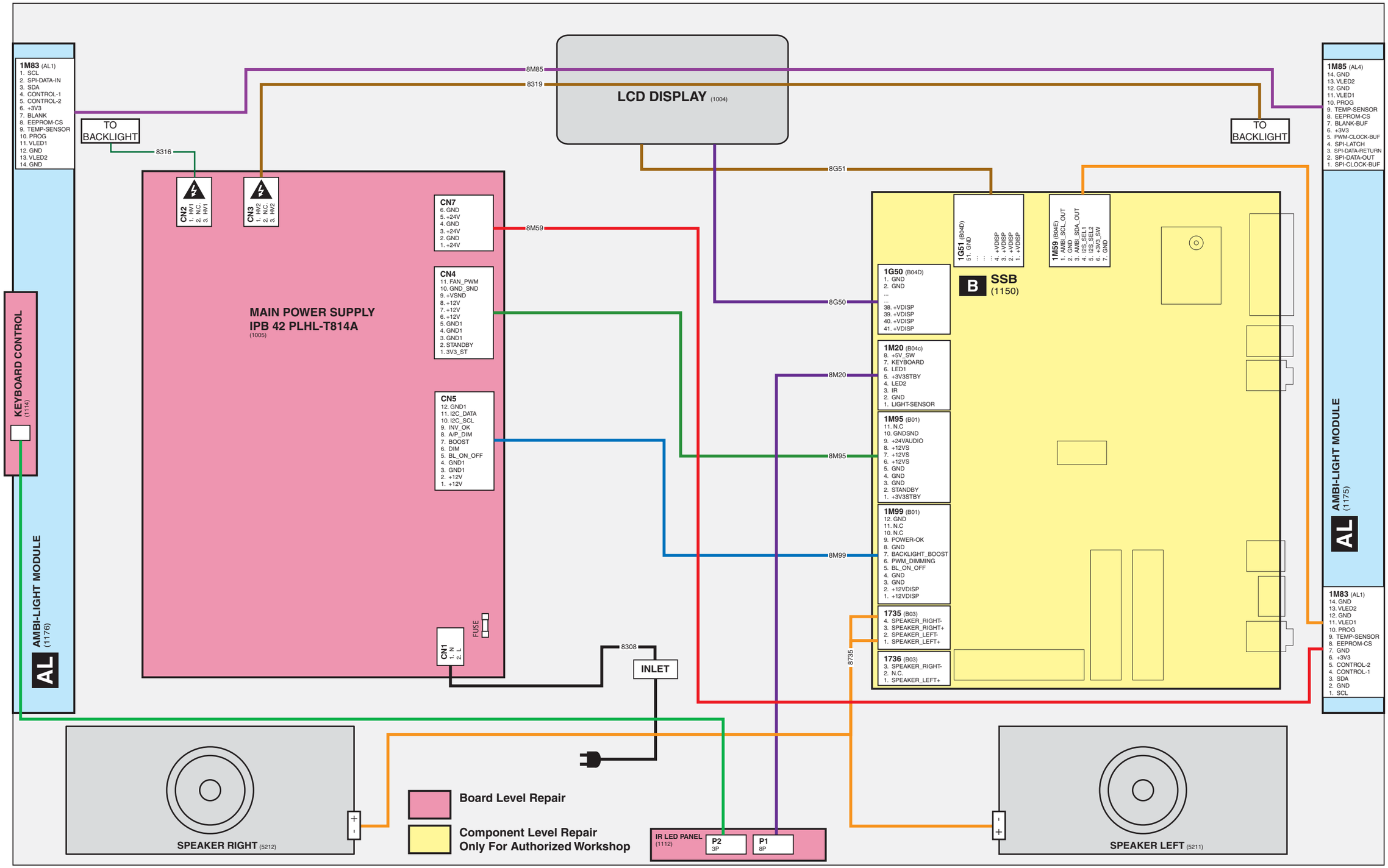
Personal Notes:

10000_012_090121.eps
090121

9. Block Diagrams

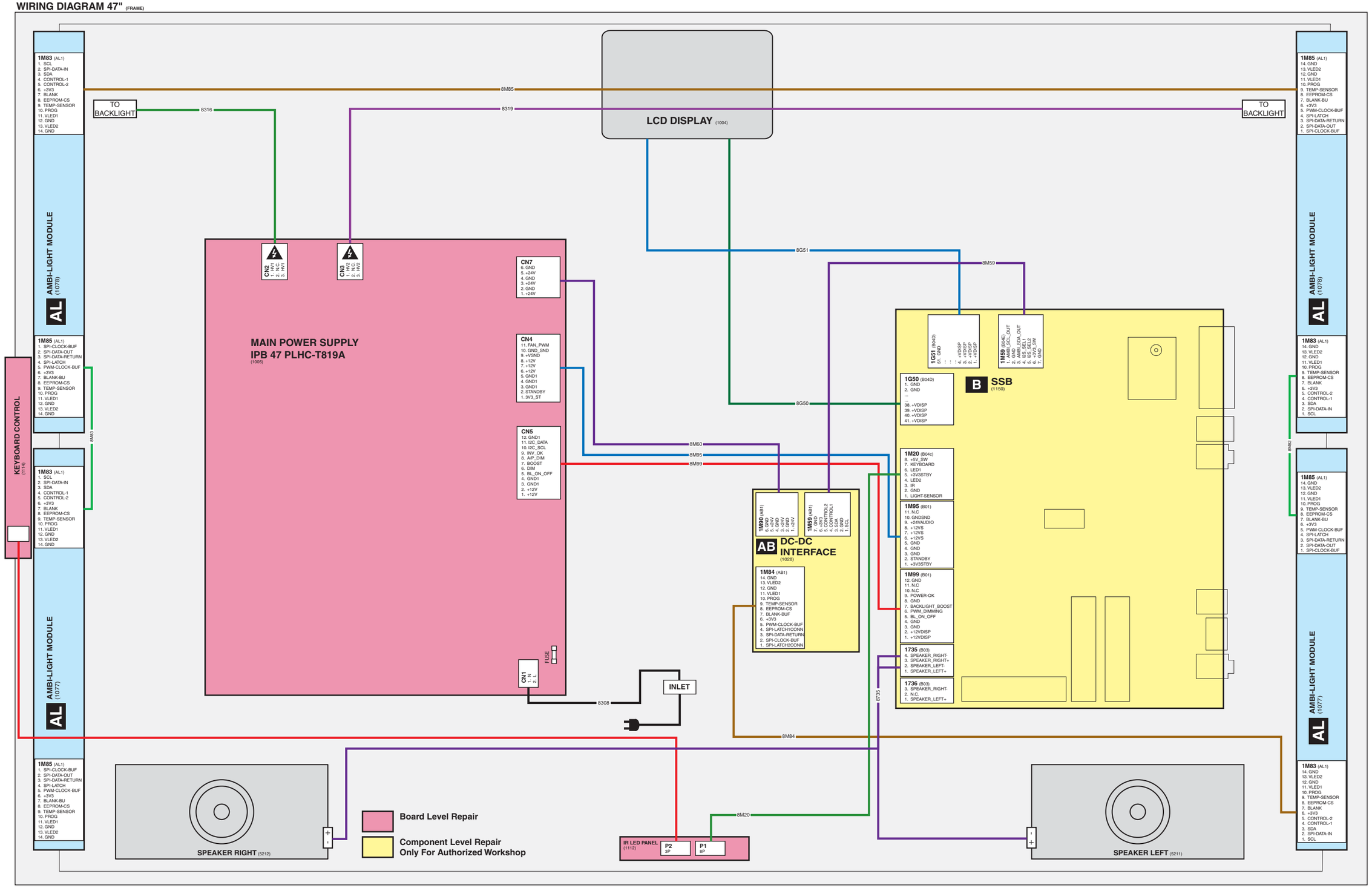
Wiring Diagram 42" (Frame)

WIRING DIAGRAM 42" (FRAME)



Wiring Diagram 47" (Frame)

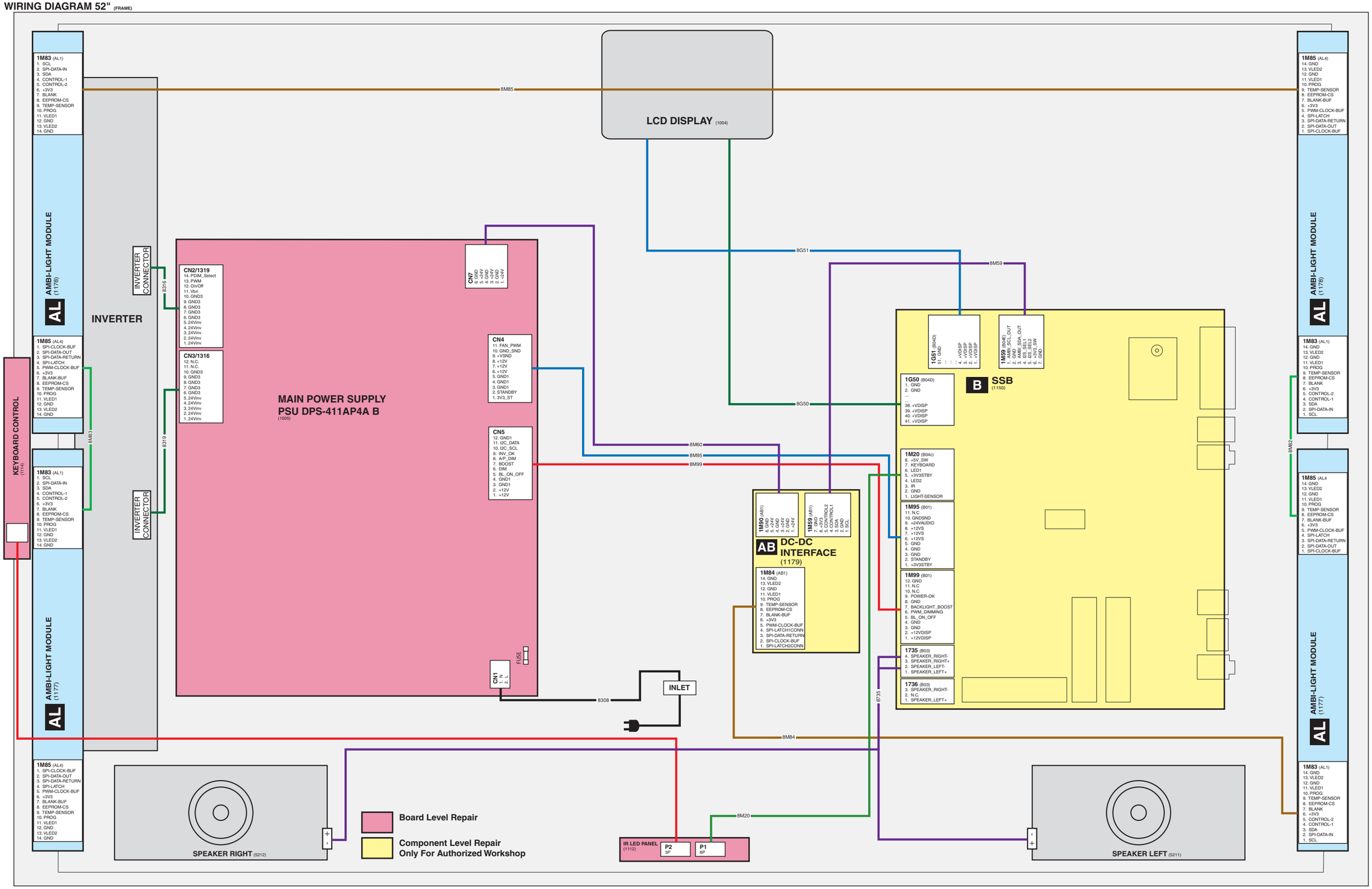
WIRING DIAGRAM 47" (FRAME)



18490_401_090401.eps
090410

Wiring Diagram 52" (Frame)

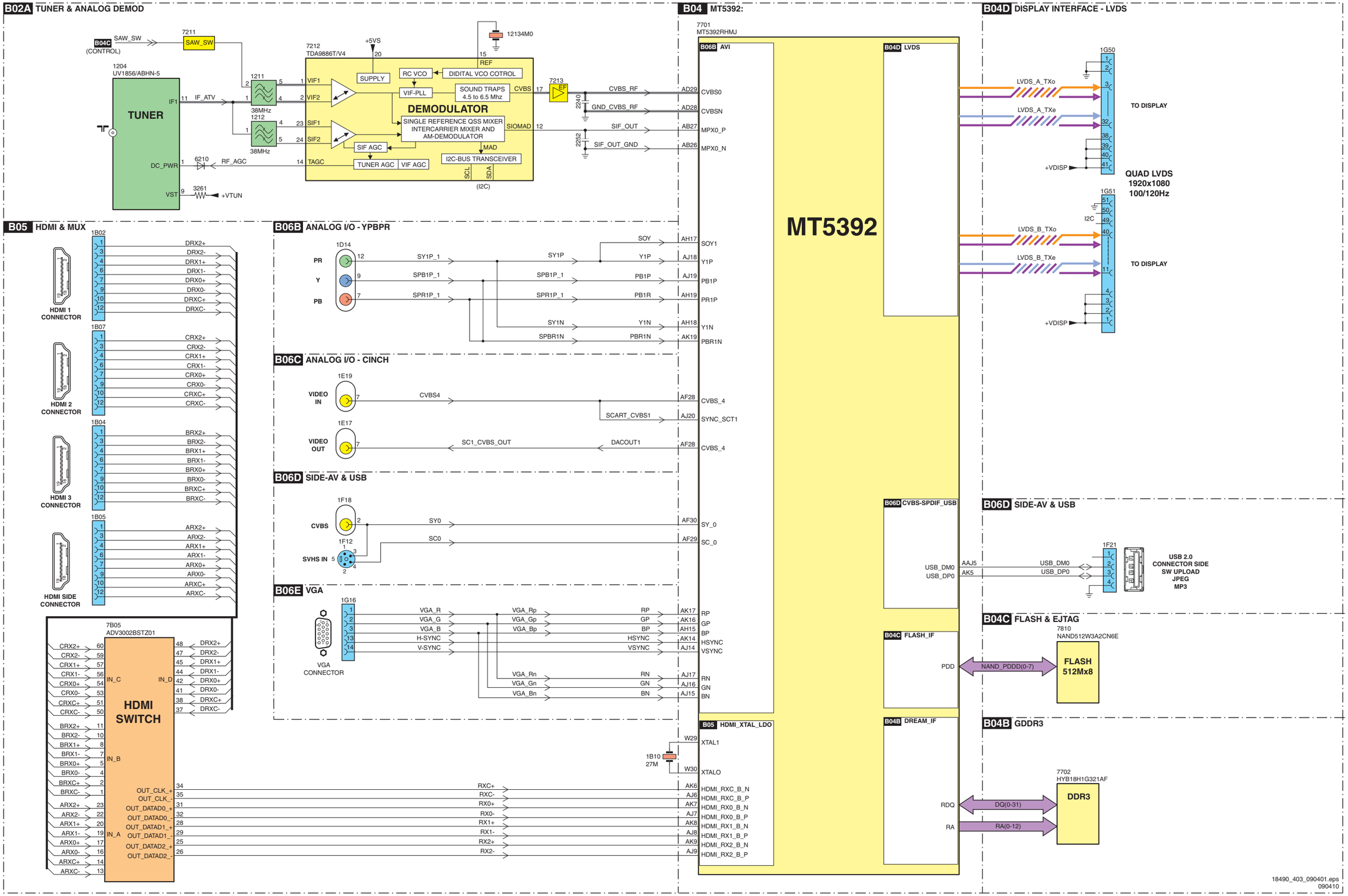
WIRING DIAGRAM 52" (FRAME)



18490_402_090401.eps
090410

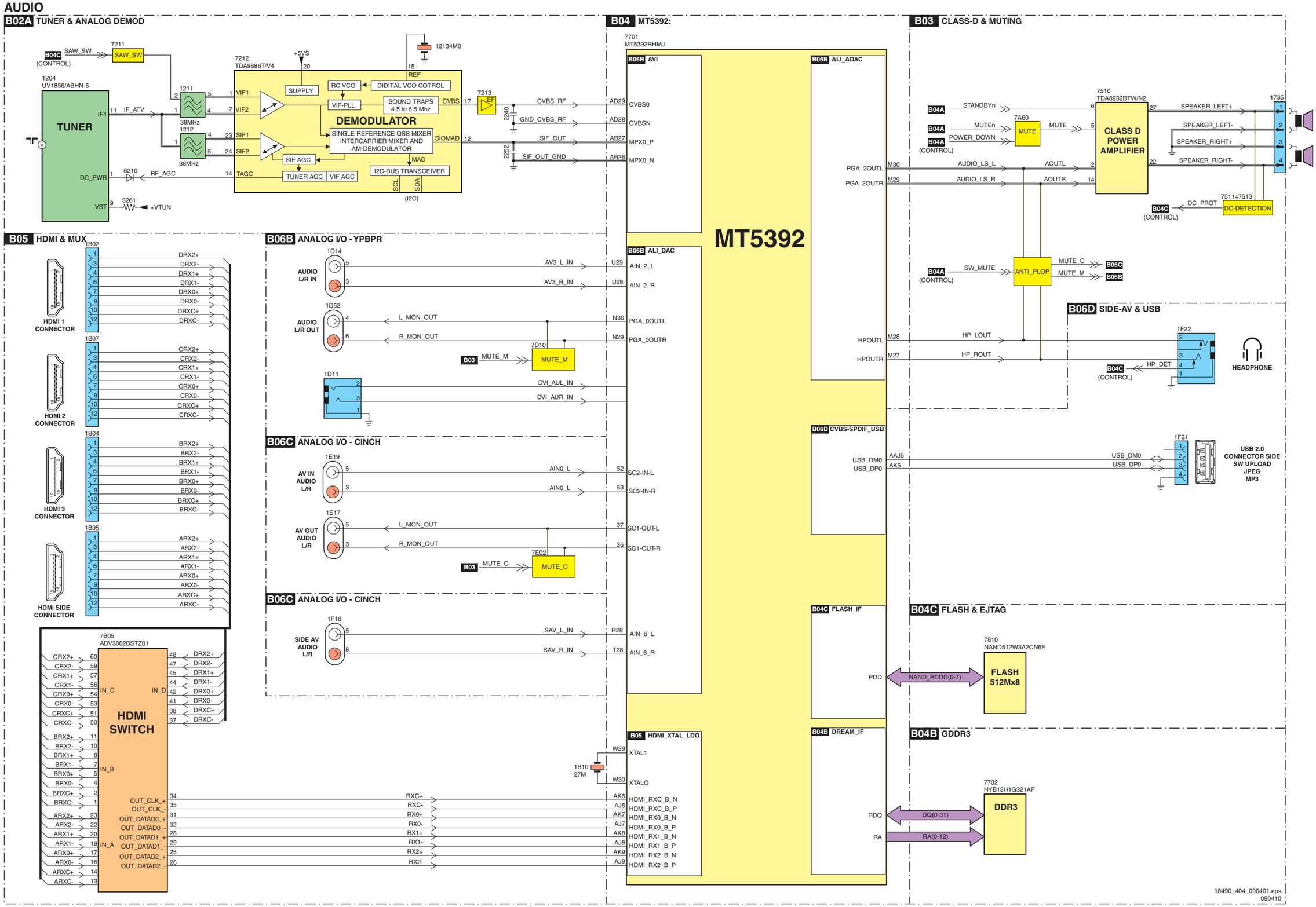
Block Diagram Video

VIDEO



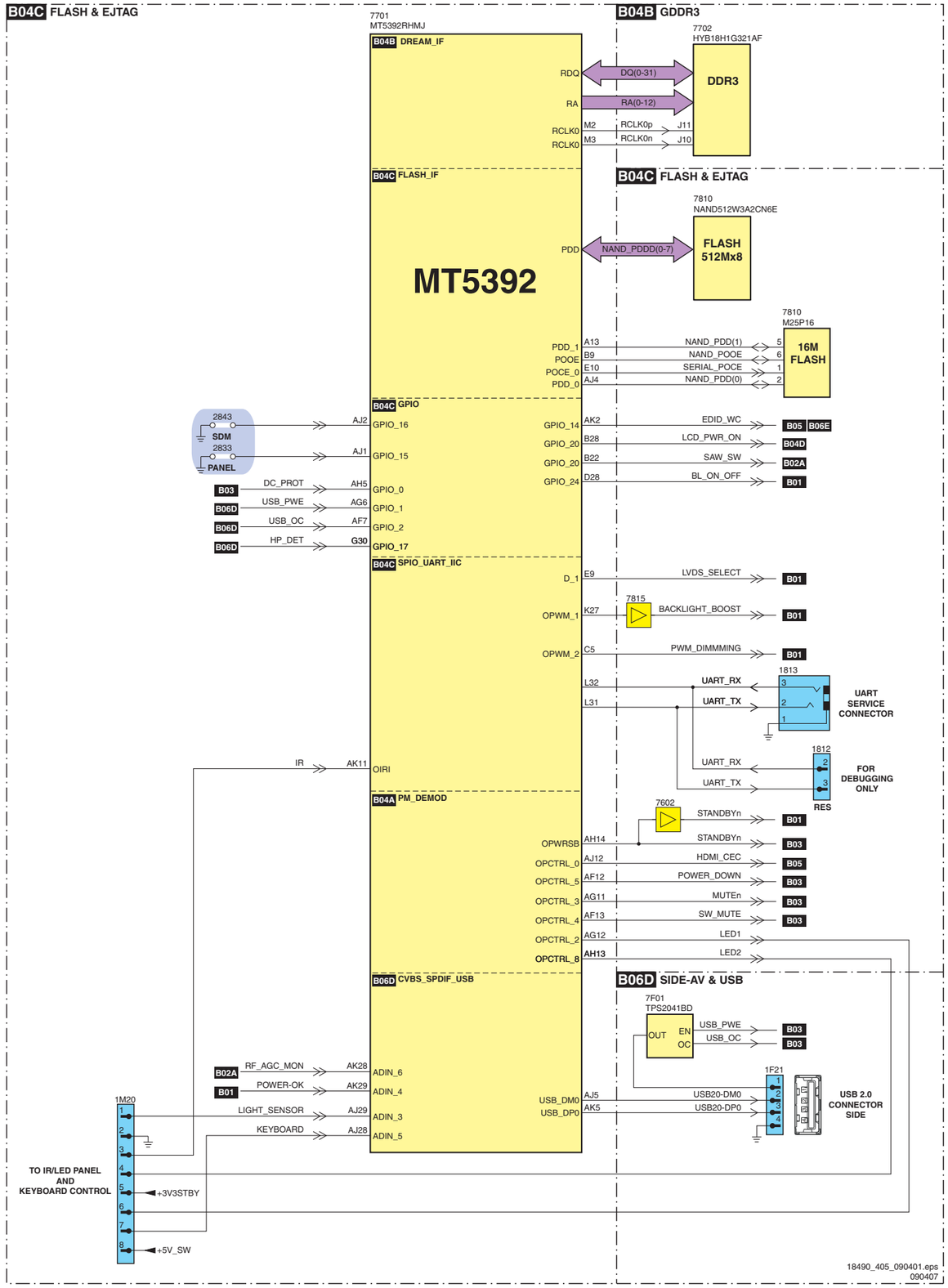
Block Diagram Audio

AUDIO



Block Diagram Control & Clock Signals

CONTROL + CLOCK SIGNALS



Block Diagram I²C

I²C

B04 CONTROLLER

7701
MT5392RHMJ

B04C

SPIO_UART
IIC

GPIO-18 L28 SYS_EEPROM_WE

OSDA0 J30 SDA
OSCL0 J29 SCL

MT539X

OSDA2 AJ10 DDC-SDA
OSCL2 AK10 38A9 DDC-SCL

UA0RX AJ13 3823 UART_RX
UA0TX AK13 38A8 UART_TX

OSDA1 K30 AMBI-SDA
OSCL1 K29 AMBI-SCL

B04C FLASH & EJTAG

+3V3_SW
3831 3830
ERR 14

7812
M24C64
EEPROM
(NVM)
ERR 15

7815

3839 3838

+3V3_SW
389D 389F
38A3 38A4
1818

FOR DEBUGGING ONLY

+3V3STBY
3M09 3M10
3864 3865
1813

UART
SERVICE
CONNECTOR

+3V3STBY
3888 3889
3890 3891
1812

FOR DEBUGGING ONLY

B04E AMBILIGHT

+3V3_SW
3A11 3A10 3A13
5A14 5A16
1M59

TO AMBILIGHT
DRIVERS

5A10 +3V3_SW

B04A MTK POWER

B04A
PM_DEMOD

DATA L28
CLK L29

+3V3_SW
3606 3607
TUNER_SDA
TUNER_SCL

B02A TUNER & ANALOG DEMOD

5214 5215
1204
UV1856/ABHN
MAIN
TUNER
ERR 16

3244 3241
7212
TDA9886T/V4
ANALOG
DEMODULATOR
ERR 18

B05 HDMI & MUX

VDDO_3V3
3B38 3B39
RES

7B05
ADV3002BSTZ
HDMI
MUX
ERR 17

+5V_COMBINED
3B19 3B20

ARX-5V
3B47 3B46
ARX-DDC-DAT
ARX-DDC-CLK
1B05
HDMI
CONNECTOR
SIDE

BRX-5V
3B51 3B50
BRX-DDC-DAT
BRX-DDC-CLK
1B04
HDMI
CONNECTOR 3

CRX-5V
3B53 3B52
CRX-DDC-DAT
CRX-DDC-CLK
1B07
HDMI
CONNECTOR 2

DRX-5V
3B55 3B54
DRX-DDC-DAT
DRX-DDC-CLK
1B02
HDMI
CONNECTOR 1

+5V_COMBINED
3B35 3B34
L28 EDID_SDA
L29 EDID_SCL

B04C EDID_WC 7B07 7

7B02
M24C02
EEPROM
(EDID)

B04D DISPLAY INTERFACE - LVDS

3916 LVDS3_SDA_DISP
3917 LVDS3_SCL_DISP
RES
1G51

B06E VGA

VGA
CONNECTOR
1G16

DC_5V
3G15 3G16
4G12 SDA_VGA
4G11 SCL_VGA

4G14 4G13
RES

7G11
M24C02
EEPROM

B04C EDID_WC 7G12 7

18490_406_090401.eps
090407

Supply Lines Overview
SUPPLY LINES OVERVIEW

MAIN POWER SUPPLY

B01 DC / DC

CN5 / 1M99
- +12V 1 → +12VDISP → B04d
- +12V 2
- GND1 3
- GND1 4
- BL-ON_OFF 5 → BL_ON_OFF → B04C CONTROL
- DIM 6 → PWM_DIMMING → B04C CONTROL
- BOOST 7 → BACKLIGHT_BOOST → B04C CONTROL
- A/P_DIM 8
- INV_OK 9 → POWER-OK → B06D CONTROL
- I2C 10 → N.C.
- I2C 11 → N.C.
- GND1 12

CN4 / 1M95
- 3V3_ST 1 → +3V3STBY → B03,B04a,c, B07
  - 7201 IN OUT COM → +1V2-STANDBY
- STANDBY 2 → STANDBY → B04A CONTROL
- GND1 3
- GND1 4
- GND1 5
- +12V 6 → +12VS → B03,B04a
- +12V 7 → 5100 → 7201 IN OUT COM → +8V_SW → B04a
- +12V 8
  - 7117 TPS54386PWP: 5108 → DCDC Converter → 7 → 5101 → +1V0_SW → B04a; 3 ← SENSE+1V0_MT5392 ← B04a
  - 7117 TPS54386PWP: 1,14 → Non Synchronous Converter → 3 → 5117 → +5V_SW → B02a,B03,B04c, B05,B06e; 12 → 5116 → +3V3_SW → B04a,c,e,B05, B06a,b,d
  - 5103 → +12V_1
  - 7116 TPS54386PWP: 1,14 → Non Synchronous Converter → 3 → 5104 → +1V8_SW → B04a,b; 12 → 5115 → +1V2_SW → B04a,B05
- +VSND 9 → +24VAUDIO → B03
- GND_SND 10 → GNDSND
- N.C. 11 → N.C.

CN7
- +24V 1
- GND 2
- +24V 3
- GND 4
- +24V 5
- GND 6

TO AMBILIGHT MODULE

CN2 / CN3 (TO DISPLAY): HV1, N.C., HV1, HV2, N.C., HV2

B02A TUNER & ANALOG DEMOD
- B01 +5V_SW → +5V_SW
  - 5216 → +5VTUN
  - 5217 → +5VS
  - 5218 → +5V_IF

B03 CLASS-D & MUTING
- B01 +24VAUDIO → +24VAUDIO
  - 3530 → VDDA
  - 5502 → VDD
- B01 +3V3_SW → +3V3_SW
- B01 +3V3STBY → +3V3STBY
- B01 +5V_SW → +5V_SW
- B01 +12VS → +12VS

B04A MTK POWER
- B01 +1V0_SW → +1V0_SW
- SENCE+1V0_MT5392 → B01
- B01 +1V2_SW → +1V2_SW
- B01 +3V3_SW → +3V3_SW
- B01 +3V3STBY → +3V3STBY
- B01 +1V8_SW → +1V8_SW
- B01 +8V_SW → +8V_SW
- B01 +12VS → +12VS

B04B GDDR3
- B01 +1V8_SW → +1V8_SW

B04C FLASH & EJTAG
- B01 +3V3_SW → +3V3_SW
  - 5810 → +3V3_FLASH
- B01 +3V3STBY → +3V3STBY
- B01 +5V_SW → +5V_SW
- 1M20 5 → 5814
- 1M20 8 → 5815
- TO IR/LED PANEL

B04D DISPLAY INTERFACE - LVDS
- B01 +12VDISP → +12VDISP
  - 7910 → +VDISP
  - 5910, 5911, 5912
  - 7911 LCD_PWR_ON

B04E AMBILIGHT
- B01 +3V3_SW → +3V3_SW
  - 5A10 → 1M59 6 → TO AMBI LIGHT

B05 HDMI & MUX
- B01 +3V3_SW → +3V3_SW
  - 5B01 → VDDO_3V3
- B01 +5V_SW → +5V_SW
  - 6B07 → +5V_COMBINED
- B01 +1V2_SW → +1V2_SW
- HDMI SIDE CONNECTOR 1B05 18 → ARX-5V
- HDMI 3 CONNECTOR 1B04 18 → BRX-5V
- HDMI 1 CONNECTOR 1B02 18 → DRX-5V
- HDMI 2 CONNECTOR 1B07 18 → CRX-5V

B06A DIGITAL IO - ETHERNET (PROVISIONAL)
- B01 +3V3_SW → +3V3_SW
  - 5NA1 → +3V3AN
  - 5NA2 → +3V3DN

B06B ANALOG I/O - YPbPr
- B01 +3V3_SW → +3V3_SW

B06D SIDE-AV & USB
- B01 +3V3_SW → +3V3_SW

B06E VGA
- B01 +5V_SW → +5V_SW
  - 6G13 → DC_5V

B07 BDS iTV
- B01 +3V3STBY → +3V3STBY

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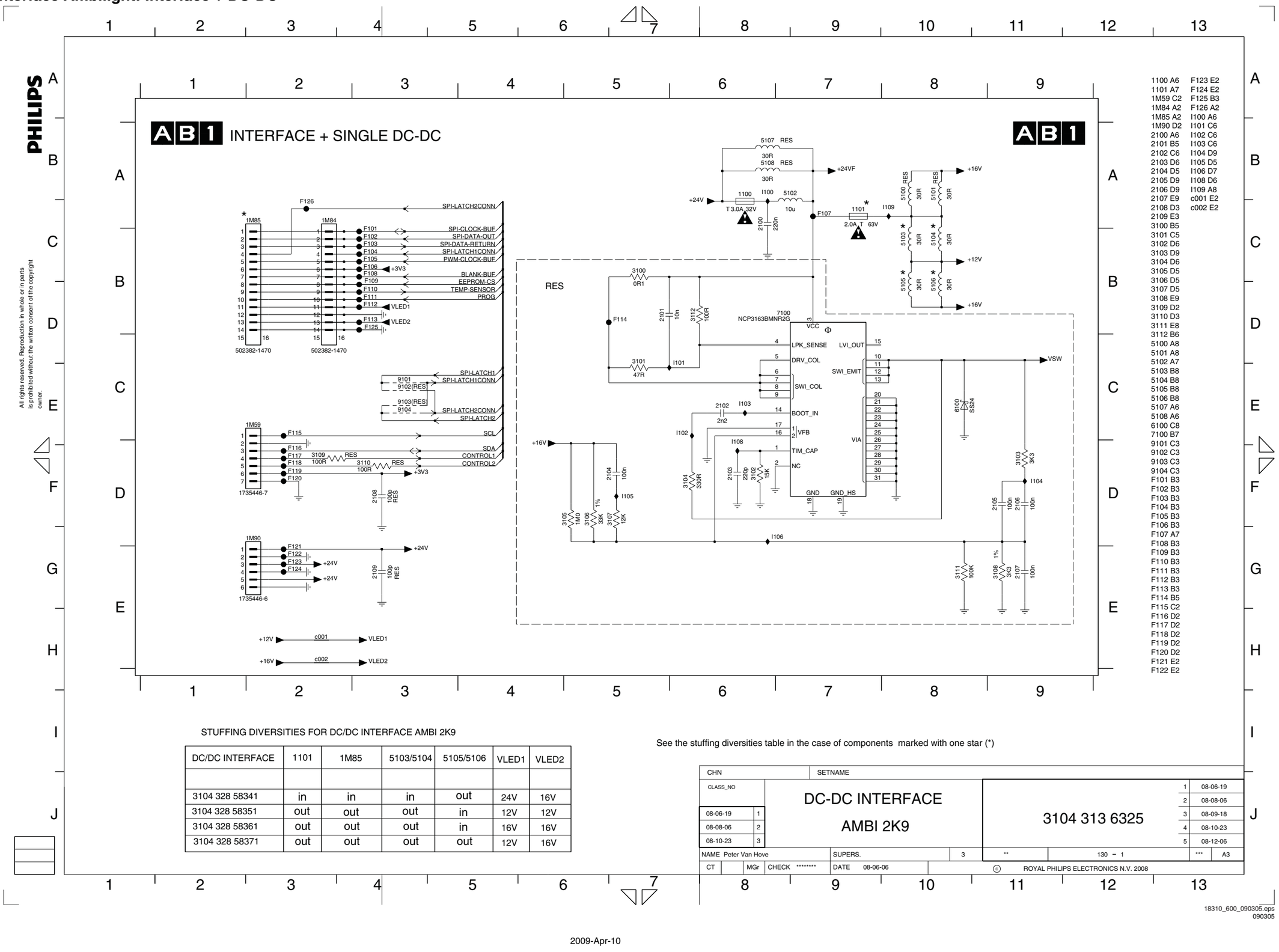
090406

10. Circuit Diagrams and PWB Layouts

Interface Ambilight: Interface + DC-DC



1100 A6 F123 E2
1101 A7 F124 E2
1M59 C2 F125 B3
1M84 A2 F126 A2
1M85 A2 I100 A6
1M90 D2 I101 C6
2100 A6 I102 C6
2101 B5 I103 C6
2102 C6 I104 D9
2103 D6 I105 D5
2104 D5 I106 D7
2105 D9 I108 D6
2106 D9 I109 A8
2107 E9 c001 E2
2108 D3 c002 E2
2109 E3
3100 B5
3101 C5
3102 D6
3103 D9
3104 D6
3105 D5
3106 D5
3107 D5
3108 E9
3109 D2
3110 D3
3111 E8
3112 B6
5100 A8
5101 A8
5102 A7
5103 B8
5104 B8
5105 B8
5106 B8
5107 A6
5108 A6
6100 C8
7100 B7
9101 C3
9102 C3
9103 C3
9104 C3
F101 B3
F102 B3
F103 B3
F104 B3
F105 B3
F106 B3
F107 A7
F108 B3
F109 B3
F110 B3
F111 B3
F112 B3
F113 B3
F114 B5
F115 C2
F116 D2
F117 D2
F118 D2
F119 D2
F120 D2
F121 E2
F122 E2

STUFFING DIVERSITIES FOR DC/DC INTERFACE AMBI 2K9

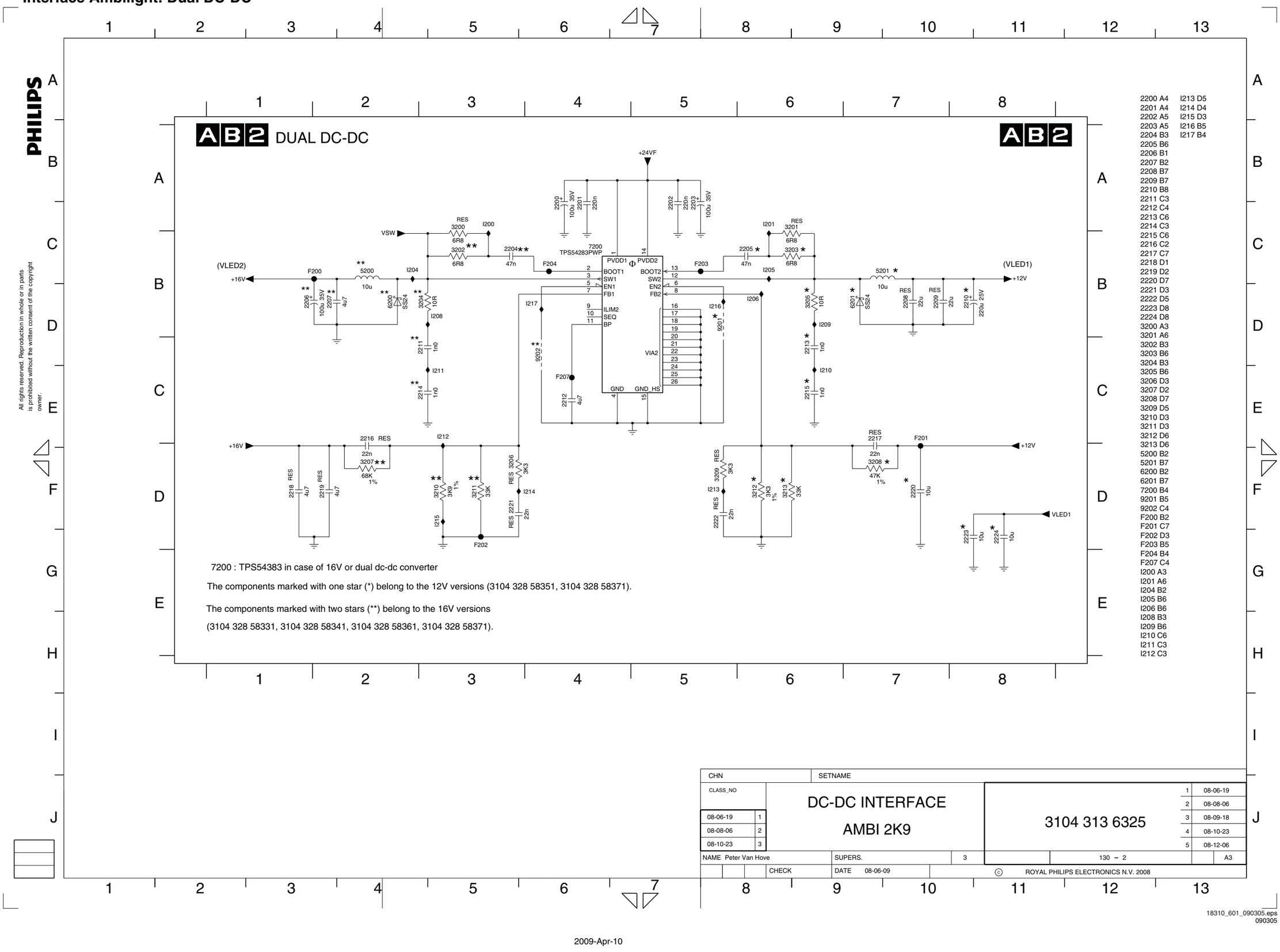
DC/DC INTERFACE	1101	1M85	5103/5104	5105/5106	VLED1	VLED2
3104 328 58341	in	in	in	out	24V	16V
3104 328 58351	out	out	out	in	12V	12V
3104 328 58361	out	out	out	in	16V	16V
3104 328 58371	out	out	out	out	12V	16V

See the stuffing diversities table in the case of components marked with one star (*)

CHN	SETNAME		
CLASS_NO	DC-DC INTERFACE AMBI 2K9	3104 313 6325	1 08-06-19
08-06-19 1			2 08-08-06
08-08-06 2			3 08-09-18
08-10-23 3			4 08-10-23
			5 08-12-06
NAME Peter Van Hove	SUPERS. 3	** 130 – 1	*** A3
CT MGr CHECK ********	DATE 08-06-06	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

18310_600_090305.eps
090305

Interface Ambilight: Dual DC-DC



2200 A4 I213 D5
2201 A4 I214 D4
2202 A5 I215 D3
2203 A5 I216 B5
2204 B3 I217 B4
2205 B6
2206 B1
2207 B2
2208 B7
2209 B7
2210 B8
2211 C3
2212 C4
2213 C6
2214 C3
2215 C6
2216 C2
2217 C7
2218 D1
2219 D2
2220 D7
2221 D3
2222 D5
2223 D8
2224 D8
3200 A3
3201 A6
3202 B3
3203 B6
3204 B3
3205 B6
3206 D3
3207 D2
3208 D7
3209 D5
3210 D3
3211 D3
3212 D6
3213 D6
5200 B2
5201 B7
6200 B2
6201 B7
7200 B4
9201 B5
9202 C4
F200 B2
F201 C7
F202 D3
F203 B5
F204 B4
F207 C4
I200 A3
I201 A6
I204 B2
I205 B6
I206 B6
I208 B3
I209 B6
I210 C6
I211 C3
I212 C3

7200 : TPS54383 in case of 16V or dual dc-dc converter

The components marked with one star (*) belong to the 12V versions (3104 328 58351, 3104 328 58371).

The components marked with two stars (**) belong to the 16V versions
(3104 328 58331, 3104 328 58341, 3104 328 58361, 3104 328 58371).

CHN		SETNAME	
CLASS_NO		DC-DC INTERFACE AMBI 2K9	3104 313 6325
08-06-19	1		
08-08-06	2		
08-10-23	3		
NAME Peter Van Hove		SUPERS.	3
		CHECK	DATE 08-06-09

1	08-06-19
2	08-08-06
3	08-09-18
4	08-10-23
5	08-12-06

130 – 2 A3

18310_601_090305.eps
090305

Interface Ambilight: Microcontroller

AB3 MICROCONTROLLER

AB3

RES

7301 LD2985BM18R

7302 LPC2103FBD48

MICRO-CTRL

7303 NCP303LSN10T1

7300-1 LM393PT

7300-2 LM393PT

B3B-PH-SM4-TBT(LF)

SKHUJBH010

CONTROL1
PWM-CLOCK-BUF
SPI-CLOCK-BUF
SPI-DATA-RETURN
SPI-DATA-OUT
SPI-LATCH1
SPI-LATCH2
PWM-CLOCK-BUF
TEMP-SENSOR
EEPROM-CS
BLANK-BUF
PROG
CONTROL2
SCL
SDA

TEMP-SENSOR

1300 E2
1301 H5
1302 C4
2300 A3
2301 A4
2302 A5
2303 A4
2304 B8
2305 B10
2306 B9
2307 B10
2308 D4
2309 D5
2310 F6
2311 F7
2312 F7
2313 F7
2314 F7
2315 F7
2316 F8
2318 G2
2319 G6
2320 H5
2321 H4
2322 H4
2323 H4
2324 H4
3300-2 D5
3300-3 D7
3300-4 D7
3301-1 D6
3301-2 E5
3301-3 E6
3301-4 D7
3302-1 D7
3302-2 D6
3302-3 E6
3302-4 D6
3303-1 E6
3303-2 D6
3303-3 E6
3304-1 D6
3304-2 D7
3304-3 D7
3304-4 D7
3305-1 E7
3305-2 G8
3305-3 G9
3305-4 G8
3306-1 E8
3306-2 E8
3306-3 E8
3306-4 E8
3307-1 E8
3307-2 F8
3307-4 F8
3308-1 F8
3308-2 F8
3308-4 F8
3309-1 F8
3309-4 F8
3310 A10
3311 A8
3312 A10
3313 B8
3314 B8
3315 B10
3316 B10
3317 B8
3318 C10
3319 C8
3320 C5
3321 C5
3322 D5
3323 D5
3324 D7
3325 D6
3326 D6
3327 D6
3328 E5
3329 E5
3330 E8
3331 E8
3332 E3
3333 F2
3334 G5
3335 G5
3336 G6
3337 G6
3338 E8
3339 F1
7300-1 B9
7300-2 A10
7301 A4
7302 E3
7303 F2
9300 E3
9301 F3
9302 F3
9303 F3
9305 G1
9307 H4
C300 B8
F300 A5
F301 A8
F302 A10
F303 B11
F304 C4
F305 C4
F306 D4
F307 F3
F308 F3
F309 G6
F310 G6
F311 G8
F312 G8
F313 G8
F314 G5
F315 H4
F316 C9
F317 F1
F320 E9
I300 E9
I302 F9
I303 A4
I304 C10
I305 E6
I306 E7
I307 G6
I308 G2
I309 G5
I310 D5
I311 E7
I312 E7
I313 E7
I314 F7
I315 F7
I316 F8
I317 F6
I318 F7
I319 F5
I320 F8
I321 F6
I322 G5

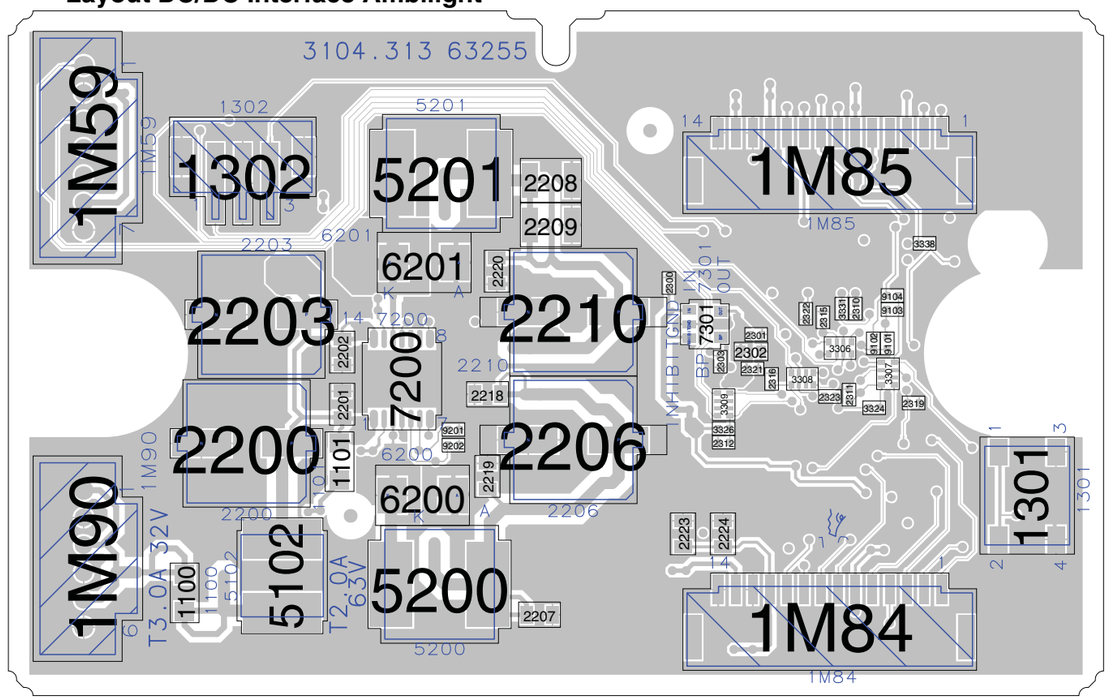
CHN		SETNAME	
CLASS_NO		DC-DC INTERFACE AMBI 2K9	3104 313 6325
08-06-19	1		
08-08-06	2		
08-10-23	3		
NAME Peter Van Hove		SUPERS.	3
		CHECK	DATE 08-06-09

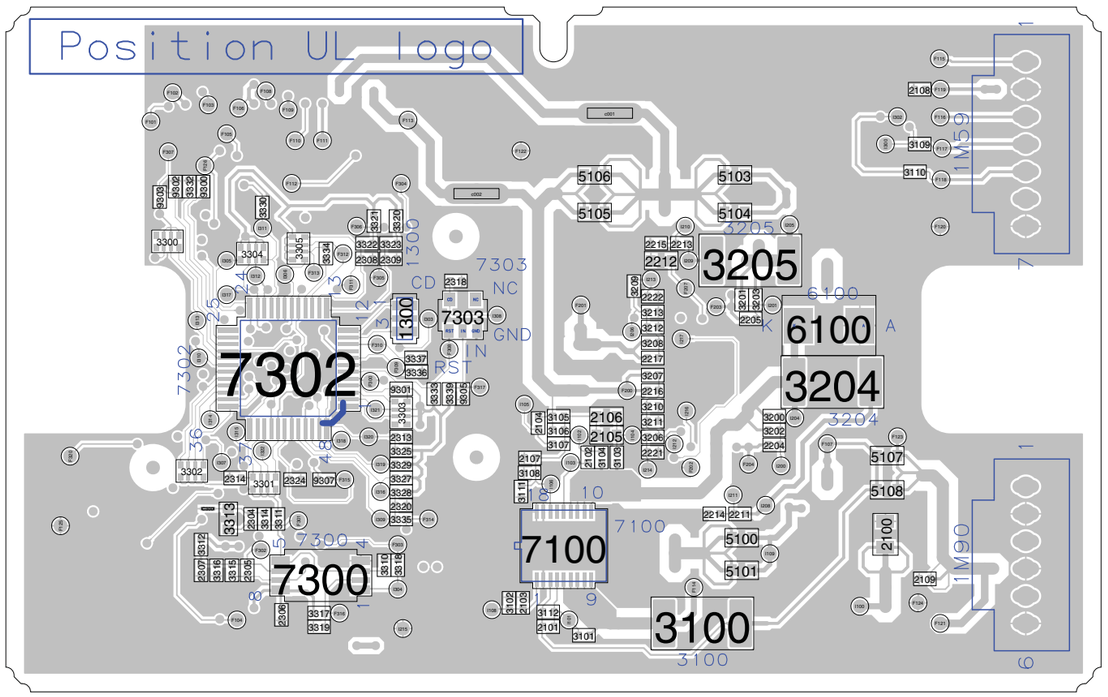
1	08-06-19
2	08-08-06
3	08-09-18
4	08-10-23
5	08-12-06

130 – 3 A2

18310_602_090305.eps
090410

Layout DC/DC Interface Ambilight





31043136325.5

18310_550_090309.eps
090309

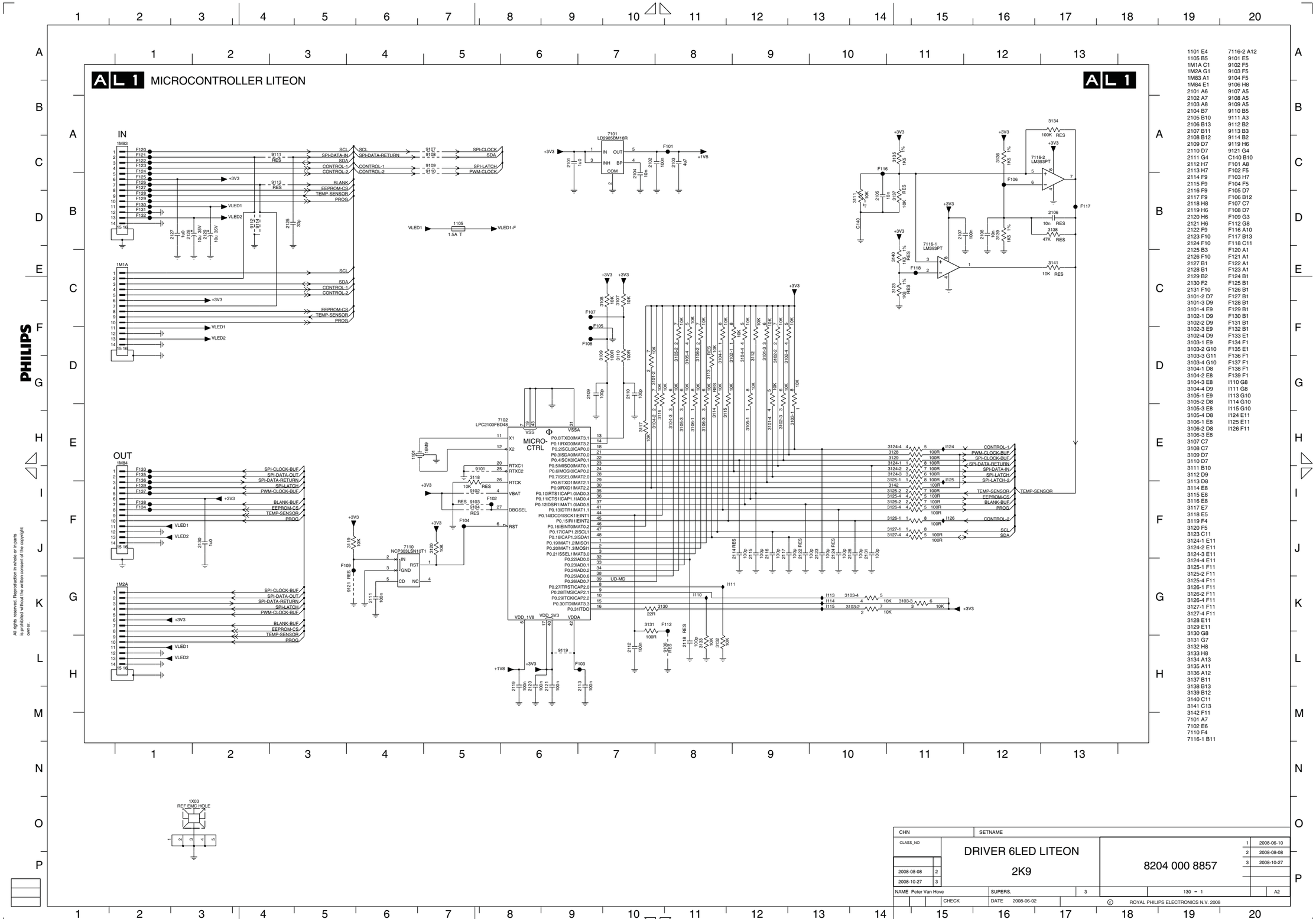
2009-Apr-10

Personal Notes:

10000_012_090121.eps
090121

6 LED Low-Pow: Microcontroller Liteon

AL 1 MICROCONTROLLER LITEON



1101 E4	7116-2 A12		
1105 B5	9101 E5		
1M1A C1	9102 F5		
1M2A G1	9103 F5		
1M83 A1	9104 F5		
1M84 E1	9106 H8		
2101 A6	9107 A5		
2102 A7	9108 A5		
2103 A8	9109 A5		
2104 B7	9110 B5		
2105 B10	9111 A3		
2106 B13	9112 B2		
2107 B11	9113 B3		
2108 B12	9114 B2		
2109 D7	9119 H6		
2110 D7	9121 G4		
2111 G4	C140 B10		
2112 H7	F101 A8		
2113 H7	F102 F5		
2114 F9	F103 H7		
2115 F9	F104 F5		
2116 F9	F105 D7		
2117 F9	F106 B12		
2118 H8	F107 C7		
2119 H6	F108 D7		
2120 H6	F109 G3		
2121 H6	F112 G8		
2122 F9	F116 A10		
2123 F10	F117 B13		
2124 F10	F118 C11		
2125 B3	F120 A1		
2126 F10	F121 A1		
2127 B1	F122 A1		
2128 B1	F123 A1		
2129 B2	F124 B1		
2130 F2	F125 B1		
2131 F10	F126 B1		
3101-2 D7	F127 B1		
3101-3 D9	F128 B1		
3101-4 E9	F129 B1		
3102-1 D9	F130 B1		
3102-2 D9	F131 B1		
3102-3 E9	F132 B1		
3102-4 D9	F133 E1		
3103-1 E9	F134 F1		
3103-2 G10	F135 E1		
3103-3 G11	F136 F1		
3103-4 G10	F137 F1		
3104-1 D8	F138 F1		
3104-2 E8	F139 F1		
3104-3 E8	I110 G8		
3104-4 D9	I111 G8		
3105-1 E9	I113 G10		
3105-2 D8	I114 G10		
3105-3 E8	I115 G10		
3105-4 D8	I124 E11		
3106-1 E8	I125 E11		
3106-2 D8	I126 F11		
3106-3 E8			
3107 C7			
3108 C7			
3109 D7			
3110 D7			
3111 B10			
3112 D9			
3113 D8			
3114 E8			
3115 E8			
3116 E8			
3117 E7			
3118 E5			
3119 F4			
3120 F5			
3123 C11			
3124-1 E11			
3124-2 E11			
3124-3 E11			
3124-4 E11			
3125-1 F11			
3125-4 F11			
3126-1 F11			
3126-2 F11			
3126-4 F11			
3127-1 F11			
3127-4 F11			
3128 E11			
3129 E11			
3130 G8			
3131 G7			
3132 H8			
3133 H8			
3134 A13			
3135 A11			
3136 A12			
3137 B11			
3138 B13			
3139 B12			
3140 C11			
3141 C13			
3142 F11			
7101 A7			
7102 E6			
7110 F4			
7116-1 B11			

CHN	SETNAME		
CLASS_NO	DRIVER 6LED LITEON 2K9	8204 000 8857	1 2008-06-10
2008-08-08 2			2 2008-08-08
2008-10-27 3			3 2008-10-27
NAME Peter Van Hove	SUPERS. 3	130 ~ 1	A2
CHECK	DATE 2008-06-02	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

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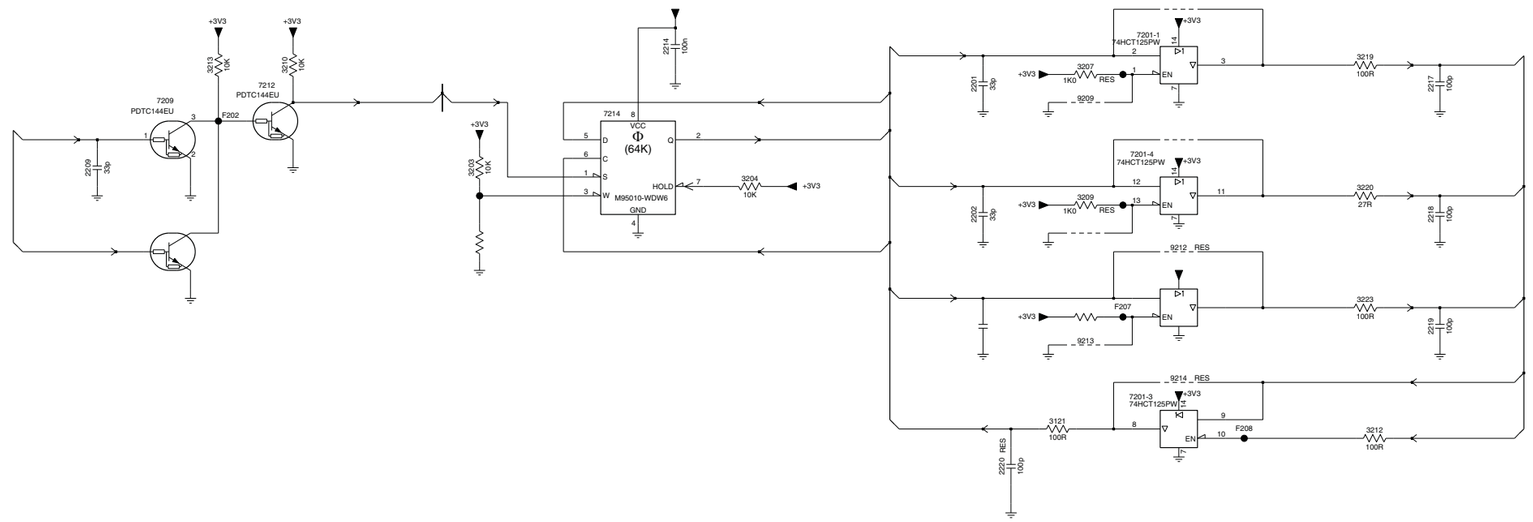
090410

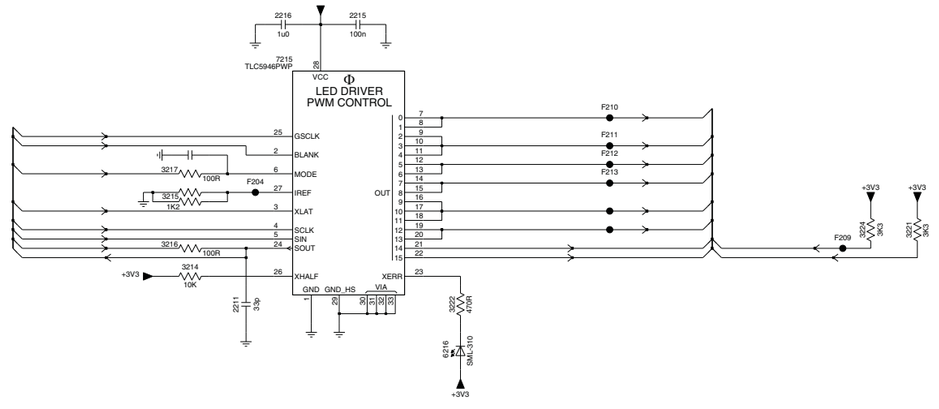
6 LED Low-Pow: Microcontroller Liteon

AL2 MICROCONTROLLER LITEON

AL2

INPUT BUFFER



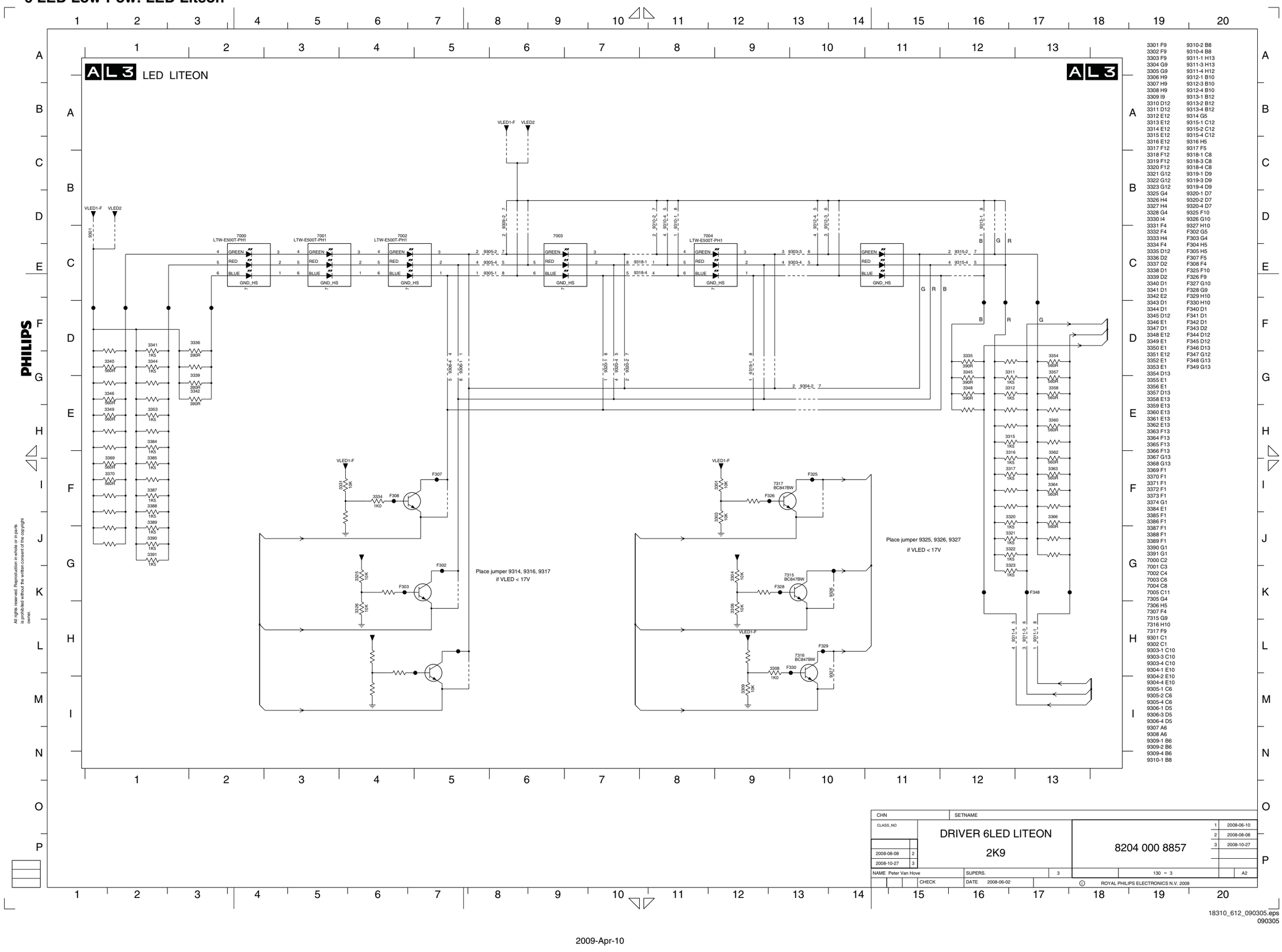


2201 B8
2202 C8
2203 D8
2209 B2
2210 G6
2211 I6
2214 A6
2215 F7
2216 F7
2217 B12
2218 C12
2219 D12
2220 E9
3121 D9
3203 B5
3204 B7
3205 C5
3207 B9
3209 C9
3210 B3
3211 C9
3212 D11
3213 B3
3214 H6
3215 H6
3216 H6
3217 H6
3218 H6
3219 B11
3220 C11
3221 H11
3222 I8
3223 C11
3224 H11
6216 I8
7201-1 A10
7201-2 C10
7201-3 D10
7201-4 B10
7209 B2
7210 C2
7212 B3
7214 B6
7215 G7
9208 A10
9209 B9
9210 B10
9211 C9
9212 C10
9213 D9
9214 D10
F202 B3
F203 C5
F204 H6
F205 B10
F206 C10
F207 C10
F208 D10
F209 H11
F210 G9
F211 G9
F212 G9
F213 H9
F214 H9
F215 H9

2008-08-08	2	DRIVER 6LED LITEON 2K9	8204 000 8857
2008-10-27	3		
NAME		SUPERS.	–
	CHECK	DATE	A2

18310_611_090305.eps
090410

6 LED Low-Pow: LED Liteon



3301 F9 9310-2 B8
3302 F9 9310-4 B8
3303 F9 9311-1 H13
3304 G9 9311-3 H13
3305 G9 9311-4 H12
3306 H9 9312-1 B10
3307 H9 9312-3 B10
3308 H9 9312-4 B10
3309 I9 9313-1 B12
3310 D12 9313-2 B12
3311 D12 9313-4 B12
3312 E12 9314 G5
3313 E12 9315-1 C12
3314 E12 9315-2 C12
3315 E12 9315-4 C12
3316 E12 9316 H5
3317 F12 9317 F5
3318 F12 9318-1 C8
3319 F12 9318-3 C8
3320 F12 9318-4 C8
3321 G12 9319-1 D9
3322 G12 9319-3 D9
3323 G12 9319-4 D9
3325 G4 9320-1 D7
3326 H4 9320-2 D7
3327 H4 9320-4 D7
3328 G4 9325 F10
3330 I4 9326 G10
3331 F4 9327 H10
3332 F4 F302 G5
3333 H4 F303 G4
3334 F4 F304 H5
3335 D12 F305 H5
3336 D2 F307 F5
3337 D2 F308 F4
3338 D1 F325 F10
3339 D2 F326 F9
3340 D1 F327 G10
3341 D1 F328 G9
3342 E2 F329 H10
3343 D1 F330 H10
3344 D1 F340 D1
3345 D12 F341 D1
3346 E1 F342 D1
3347 D1 F343 D2
3348 E12 F344 D12
3349 E1 F345 D12
3350 E1 F346 D13
3351 E12 F347 G12
3352 E1 F348 G13
3353 E1 F349 G13
3354 D13
3355 E1
3356 E1
3357 D13
3358 E13
3359 E13
3360 E13
3361 E13
3362 E13
3363 F13
3364 F13
3365 F13
3366 F13
3367 G13
3368 G13
3369 F1
3370 F1
3371 F1
3372 F1
3373 F1
3374 G1
3384 E1
3385 F1
3386 F1
3387 F1
3388 F1
3389 F1
3390 G1
3391 G1
7000 C2
7001 C3
7002 C4
7003 C5
7004 C8
7005 C11
7305 G4
7306 H5
7307 F4
7315 G9
7316 H10
7317 F9
9301 C1
9302 C1
9303-1 C10
9303-3 C10
9303-4 C10
9304-1 E10
9304-2 E10
9304-4 E10
9305-1 C6
9305-2 C6
9305-4 C6
9306-1 D5
9306-3 D5
9306-4 D5
9307 A6
9308 A6
9309-1 B6
9309-2 B6
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9310-1 B8

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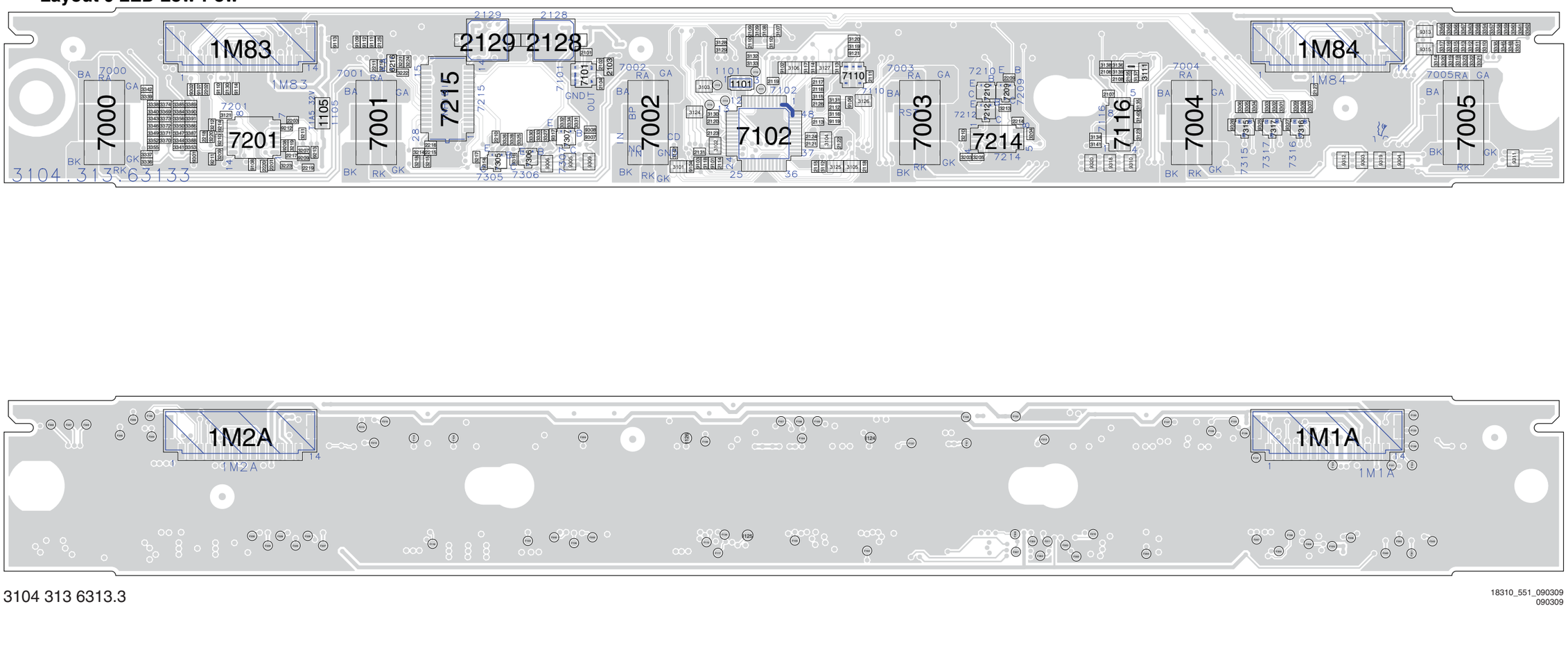
090305

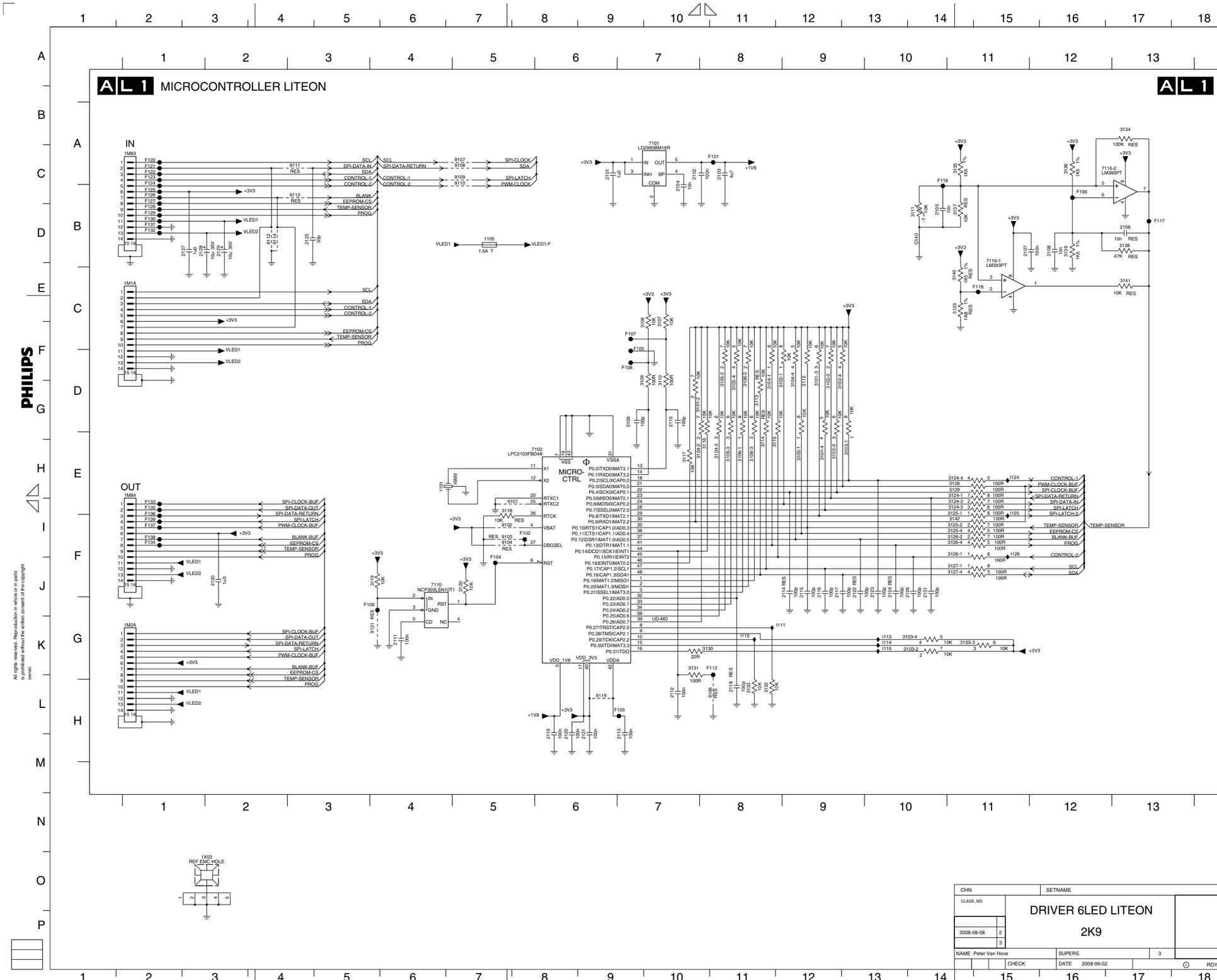
Layout 6 LED Low-Pow



18310_551_090309
090309

8 LED Low-Pow: Microcontroller Liteon

AL 1 MICROCONTROLLER LITEON



1101 E4	7116-2 A12	3106-3 E8	3135 A11
1105 B5	9101 E5	3107 C7	3136 A12
1M1A C1	9102 F5	3108 C7	3137 B11
1M2A G1	9103 F5	3109 D7	3138 B13
1M83 A1	9104 F5	3110 D7	3139 B12
1M84 E1	9106 H8	3111 B10	3140 C11
2101 A6	9107 A5	3112 D9	3141 C13
2102 A7	9108 A5	3113 D8	3142 F11
2103 A8	9109 A5	3114 E8	7101 A7
2104 B7	9110 B5	3115 E8	7102 E6
2105 B10	9111 A3	3116 E8	7110 F4
2106 B13	9112 B2	3117 E7	7116-1 B11
2107 B11	9113 B3	3118 E5	
2108 B12	9114 B2	3119 F4	
2109 D7	9119 H6	3120 F5	
2110 D7	9121 G4	3123 C11	
2111 G4	C140 B10	3124-1 E11	
2112 H7	F101 A8	3124-2 E11	
2113 H7	F102 F5	3124-3 E11	
2114 F9	F103 H7	3124-4 E11	
2115 F9	F104 F5	3125-1 F11	
2116 F9	F105 D7	3125-2 F11	
2117 F9	F106 B12	3125-4 F11	
2118 H8	F107 C7	3126-1 F11	
2119 H6	F108 D7	3126-2 F11	
2120 H6	F109 G3	3126-4 F11	
2121 H6	F112 G8	3127-1 F11	
2122 F9	F116 A10	3127-4 F11	
2123 F10	F117 B13	3128 E11	
2124 F10	F118 C11	3129 E11	
2125 B3	I120 A1	3130 G8	
2126 F10	I121 A1	3131 G7	
2127 B1	I122 A1	3132 H8	
2128 B1	I123 A1	3133 H8	
2129 B2	I124 B1	3134 A13	
2130 F2	I125 B1	3135 A11	
2131 F10	I126 B1	3136 A12	
3101-2 D7	I127 B1	3137 B11	
3101-3 D9	I128 B1	3138 B13	
3101-4 E9	I129 B1	3139 B12	
3102-1 D9	I130 B1	3140 C11	
3102-2 D9	I131 B1	3141 C13	
3102-3 E9	I132 B1	3142 F11	
3102-4 D9	I133 E1	7101 A7	
3103-1 E9	I134 F1	7102 E6	
3103-2 G10	I135 E1	7110 F4	
3103-3 G11	I136 F1	7116-1 B11	
3103-4 G10	I137 F1		
3104-1 D8	I138 F1		
3104-2 E8	I139 F1		
3104-3 E8	I110 G8		
3104-4 D9	I111 G8		
3105-1 E9	I113 G10		
3105-2 D8	I114 G10		
3105-3 E8	I115 G10		
3105-4 D8	I124 E11		
3106-1 E8	I125 E11		
3106-2 D8	I126 F11		

CHN	SETNAME		
CLASS_NO	DRIVER 6LED LITEON 2K9	8204 000 8857	1 2008-06-10
2008-08-08 2			2 2008-08-08
3			3 ??
NAME Peter Van Hove	SUPERS. 3	130 – 1	A2
CHECK	DATE 2008-06-02	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

18560_500_090403.eps
090410

8 LED Low-Pow: Microcontroller Liteon

AL2 MICROCONTROLLER LITEON

AL2

INPUT BUFFER

PHILIPS

2201 B8
2202 C8
2203 D8
2209 B2
2210 G6
2211 I6
2214 A6
2215 F7
2216 F7
2217 B12
2218 C12
2219 D12
2220 E9
3121 D9
3203 B5
3204 B7
3205 C5
3207 B9
3209 C9
3210 B3
3211 C9
3212 D11
3213 B3
3214 H6
3215 H6
3216 H6
3217 H6
3218 H6
3219 B11
3220 C11
3221 H11
3222 I8
3223 C11
3224 H11
6216 I8
7201-1 A10
7201-2 C10
7201-3 D10
7201-4 B10
7209 B2
7210 C2
7212 B3
7214 B6
7215 G7
9208 A10
9209 B9
9210 B10
9211 C9
9212 C10
9213 D9
9214 D10
F202 B3
F203 C5
F204 H6
F205 B10
F206 C10
F207 C10
F208 D10
F209 H11
F210 G9
F211 G9
F212 G9
F213 H9
F214 H9
F215 H9

CHN	SETNAME		
CLASS_NO	DRIVER 6LED LITEON 2K9	8204 000 8857	1 2008-06-10 2 2008-08-08 3 ??
2008-08-08 2 3			
NAME Peter Van Hove	SUPERS. 3	130 ~ 2	A2
CHECK	DATE 2008-06-02	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

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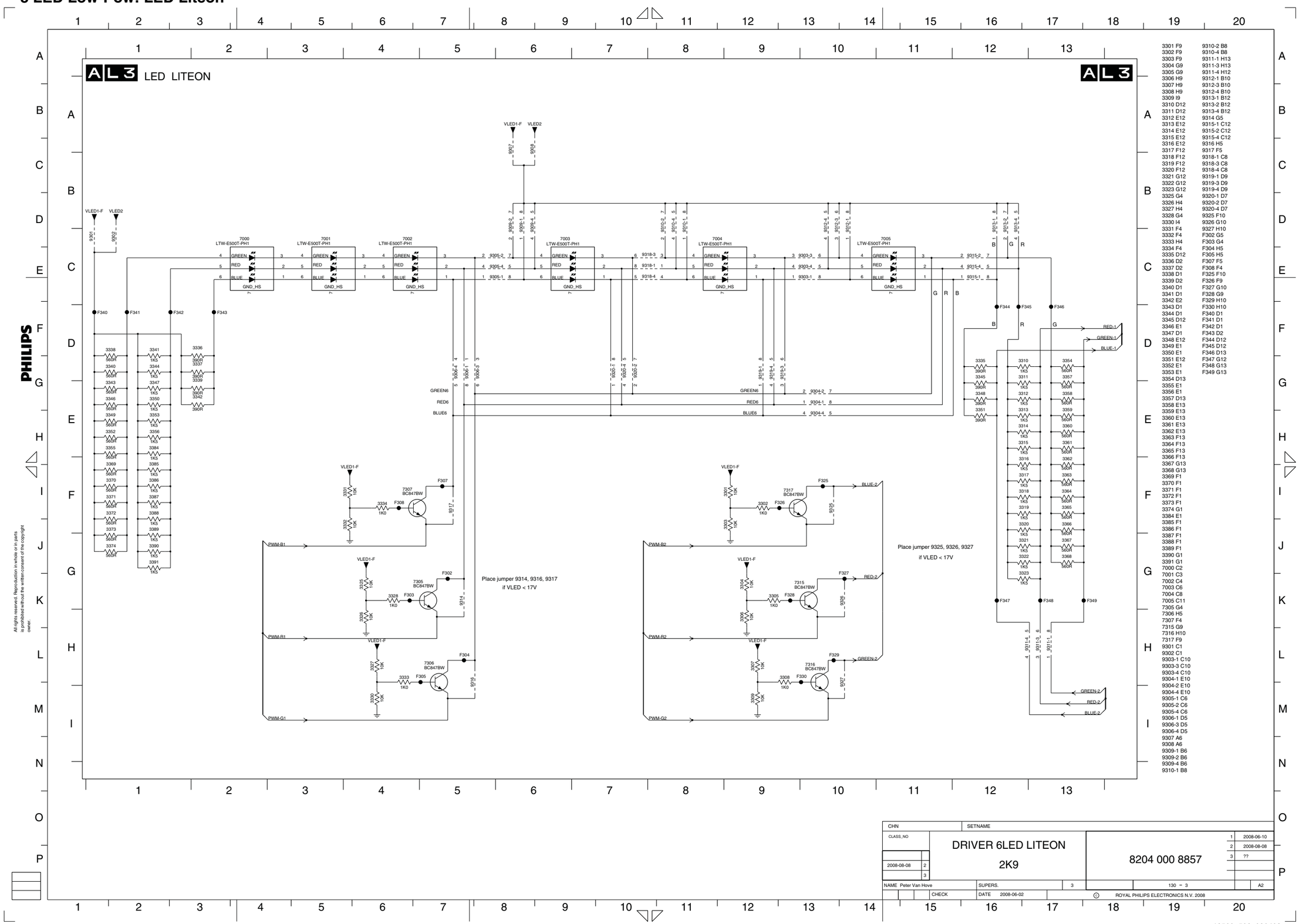
090410

8 LED Low-Pow: LED Liteon



3301 F9
3302 F9
3303 F9
3304 G9
3305 G9
3306 H9
3307 H9
3308 H9
3309 I9
3310 D12
3311 D12
3312 E12
3313 E12
3314 E12
3315 E12
3316 E12
3317 F12
3318 F12
3319 F12
3320 F12
3321 G12
3322 G12
3323 G12
3325 G4
3326 H4
3327 H4
3328 G4
3330 I4
3331 F4
3332 F4
3333 H4
3334 F4
3335 D12
3336 D2
3337 D2
3338 D1
3339 D2
3340 D1
3341 D1
3342 E2
3343 D1
3344 D1
3345 D12
3346 E1
3347 D1
3348 E12
3349 E1
3350 E1
3351 E12
3352 E1
3353 E1
3354 D13
3355 E1
3356 E1
3357 D13
3358 E13
3359 E13
3360 E13
3361 E13
3362 E13
3363 F13
3364 F13
3365 F13
3366 F13
3367 G13
3368 G13
3369 F1
3370 F1
3371 F1
3372 F1
3373 F1
3374 G1
3384 E1
3385 F1
3386 F1
3387 F1
3388 F1
3389 F1
3390 G1
3391 G1
7000 C2
7001 C3
7002 C4
7003 C6
7004 C8
7005 C11
7305 G4
7306 H5
7307 F4
7315 G9
7316 H10
7317 F9
9301 C1
9302 C1
9303-1 C10
9303-3 C10
9303-4 C10
9304-1 E10
9304-2 E10
9304-4 E10
9305-1 C6
9305-2 C6
9305-4 C6
9306-1 D5
9306-3 D5
9306-4 D5
9307 A6
9308 A6
9309-1 B6
9309-2 B6
9309-4 B6
9310-1 B8
9310-2 B8
9310-4 B8
9311-1 H13
9311-3 H13
9311-4 H12
9312-1 B10
9312-3 B10
9312-4 B10
9313-1 B12
9313-2 B12
9313-4 B12
9314 G5
9315-1 C12
9315-2 C12
9315-4 C12
9316 H5
9317 F5
9318-1 C8
9318-3 C8
9318-4 C8
9319-1 D9
9319-3 D9
9319-4 D9
9320-1 D7
9320-2 D7
9320-4 D7
9325 F10
9326 G10
9327 H10
F302 G5
F303 G4
F304 H5
F305 H5
F307 F5
F308 F4
F325 F10
F326 F9
F327 G10
F328 G9
F329 H10
F330 H10
F340 D1
F341 D1
F342 D1
F343 D2
F344 D12
F345 D12
F346 D13
F347 G12
F348 G13
F349 G13

CHN	SETNAME		
CLASS_NO	DRIVER 6LED LITEON 2K9	8204 000 8857	1 2008-06-10
2008-08-08 2			2 2008-08-08
3			3 ??
NAME Peter Van Hove	SUPERS. 3	130 - 3	A2
CHECK	DATE 2008-06-02	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

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090403

8 LED Low-Pow: LED Drive Liteon

AL4 LED DRIVE

AL4

1M3A E2
1M85 D2
3536 E9
3537 E9
3538 E7
3539 E9
3540 E7
3541 E8
3542 E9
3543 E7
3544 E8
3546 E7
3547 E8
3549 F7
3550 E8
3552 F7
3553 F8
3555 F7
3556 F8
3569 F7
3570 F7
3571 G7
3572 G7
3573 G7
3574 G8
3584 F8
3585 F8
3586 F8
3587 G8
3588 G8
3589 G8
3590 G8
3591 G8
7006 A5
7007 A7

7006 LTW-E500T-PH1
7007 LTW-E500T-PH1

GREEN-1
RED-1
BLUE-1
GREEN
RED
BLUE
GND_HS

1M85
1M3A
SPI-CLOCK-BUF
SPI-DATA-OUT
SPI-DATA-RETURN
SPI-LATCH
PWM-CLOCK-BUF
+3V3
BLANK-BUF
EEPROM-CS
TEMP-SENSOR
PROG
VLED1
VLED2

GREEN-2
RED-2
BLUE-2

3538 560R
3540 560R
3543 560R
3546 560R
3549 560R
3552 560R
3555 560R
3569 560R
3570 560R
3571 560R
3572 560R
3573 560R
3574 560R

3541 1K5
3544 1K5
3547 1K5
3550 1K5
3553 1K5
3556 1K5
3584 1K5
3585 1K5
3586 1K5
3587 1K5
3588 1K5
3589 1K5
3590 1K5
3591 1K5

3536 390R
3537 390R
3539 390R
3542 390R

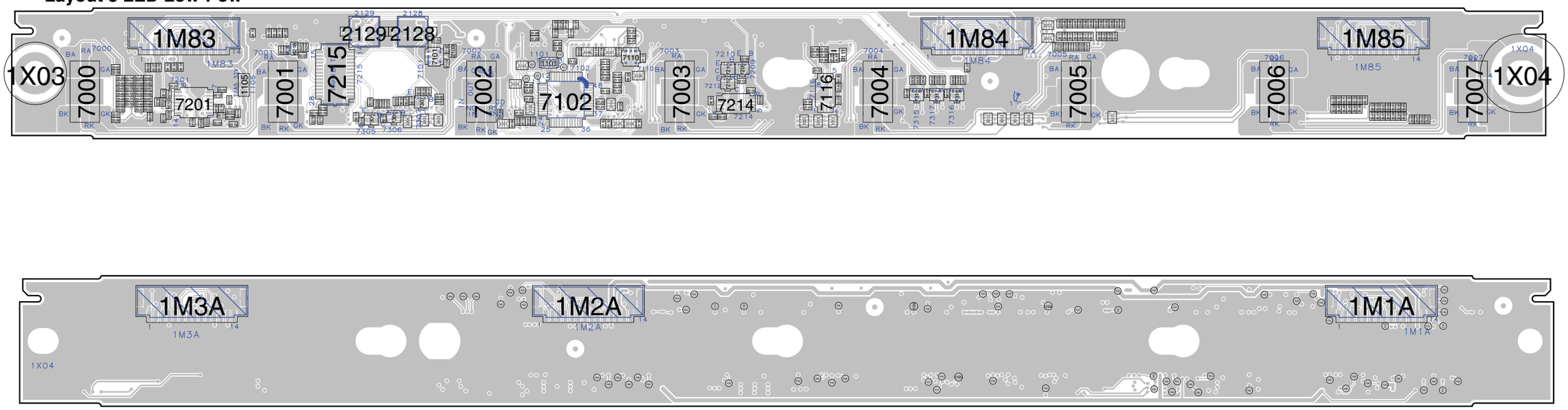
1X04
REF EMC HOLE

CHN		SETNAME	
CLASS_NO		2LED + CONNECTOR 2K9	8204 000 8874
2008-05-23	1		
2008-08-08	2		
2008-10-31	3		
NAME Peter Van Hove		SUPERS. 1	130 - 1 A2
		CHECK DATE 2008-04-20	© ROYAL PHILIPS ELECTRONICS N.V. 2008

1	2008-05-23
2	2008-08-08
3	0

18560_503_090403.eps
090403

Layout 8 LED Low-Pow



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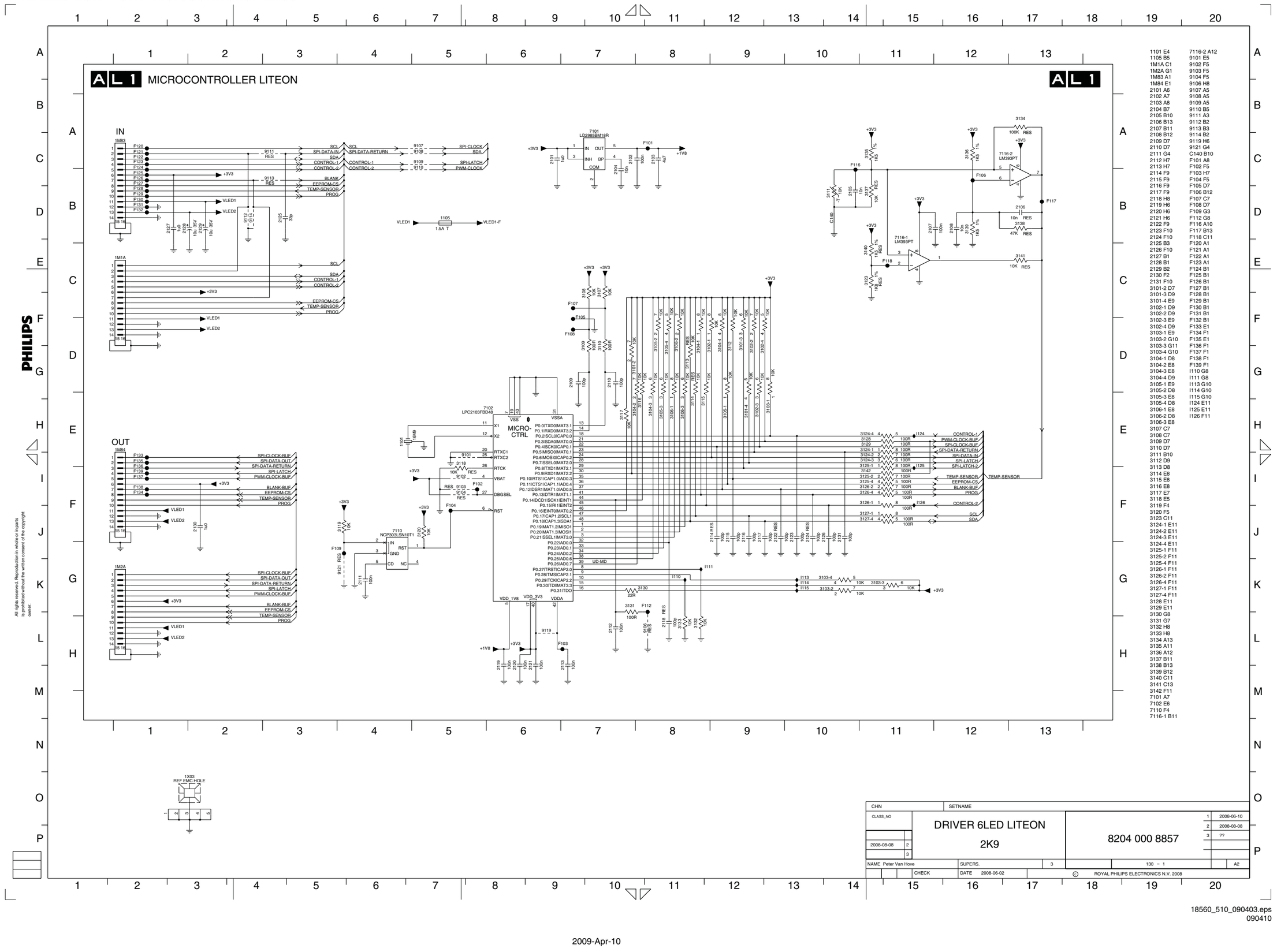
090326

12 LED Low-Pow: Microcontroller Liteon



1101 E4
1105 B5
1M1A C1
1M2A G1
1M83 A1
1M84 E1
2101 A6
2102 A7
2103 A8
2104 B7
2105 B10
2106 B13
2107 B11
2108 B12
2109 D7
2110 D7
2111 G4
2112 H7
2113 H7
2114 F9
2115 F9
2116 F9
2117 F9
2118 H8
2119 H6
2120 H6
2121 H6
2122 F9
2123 F10
2124 F10
2125 B3
2126 F10
2127 B1
2128 B1
2129 B2
2130 F2
2131 F10
3101-2 D7
3101-3 D9
3101-4 E9
3102-1 D9
3102-2 D9
3102-3 E9
3102-4 D9
3103-1 E9
3103-2 G10
3103-3 G11
3103-4 G10
3104-1 D8
3104-2 E8
3104-3 E8
3104-4 D9
3105-1 E9
3105-2 D8
3105-3 E8
3105-4 D8
3106-1 E8
3106-2 D8
3106-3 E8
3107 C7
3108 C7
3109 D7
3110 D7
3111 B10
3112 D9
3113 D8
3114 E8
3115 E8
3116 E8
3117 E7
3118 E5
3119 F4
3120 F5
3123 C11
3124-1 E11
3124-2 E11
3124-3 E11
3124-4 E11
3125-1 F11
3125-2 F11
3125-4 F11
3126-1 F11
3126-2 F11
3126-4 F11
3127-1 F11
3127-4 F11
3128 E11
3129 E11
3130 G8
3131 G7
3132 H8
3133 H8
3134 A13
3135 A11
3136 A12
3137 B11
3138 B13
3139 B12
3140 C11
3141 C13
3142 F11
7101 A7
7102 E6
7110 F4
7116-1 B11
7116-2 A12
9101 E5
9102 F5
9103 F5
9104 F5
9106 H8
9107 A5
9108 A5
9109 A5
9110 B5
9111 A3
9112 B2
9113 B3
9114 B2
9119 H6
9121 G4
C140 B10
F101 A8
F102 F5
F103 H7
F104 F5
F105 D7
F106 B12
F107 C7
F108 D7
F109 G3
F112 G8
F116 A10
F117 B13
F118 C11
F120 A1
F121 A1
F122 A1
F123 A1
F124 B1
F125 B1
F126 B1
F127 B1
F128 B1
F129 B1
F130 B1
F131 B1
F132 B1
F133 E1
F134 F1
F135 E1
F136 F1
F137 F1
F138 F1
F139 F1
I110 G8
I111 G8
I113 G10
I114 G10
I115 G10
I124 E11
I125 E11
I126 F11

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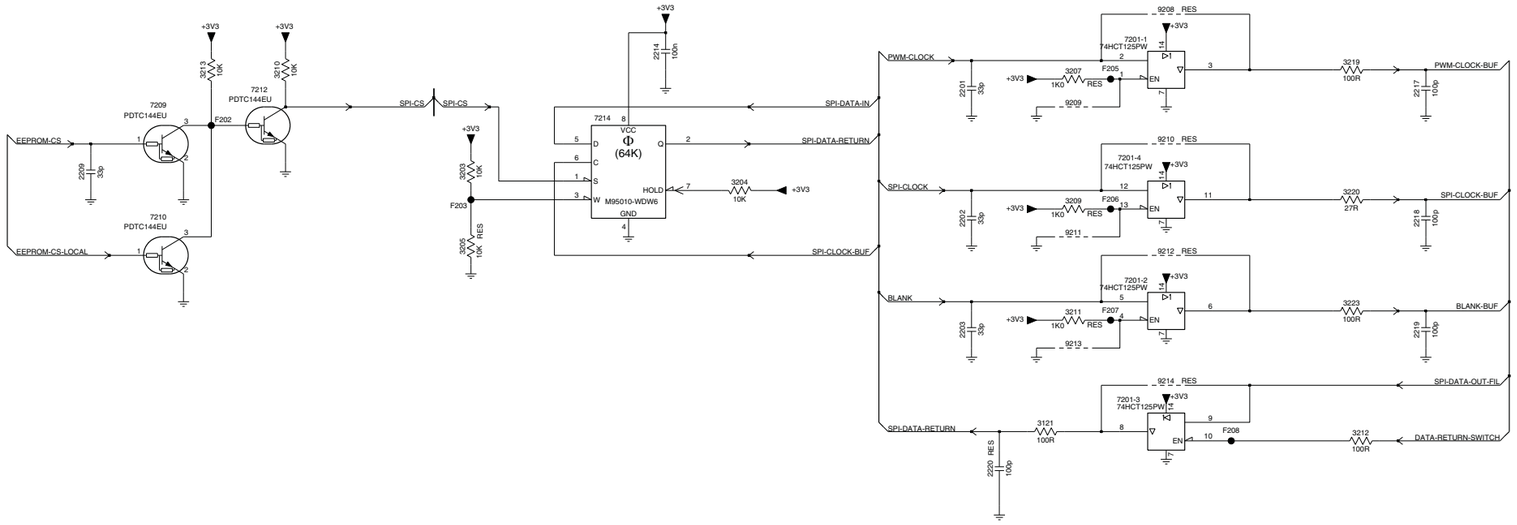
090410

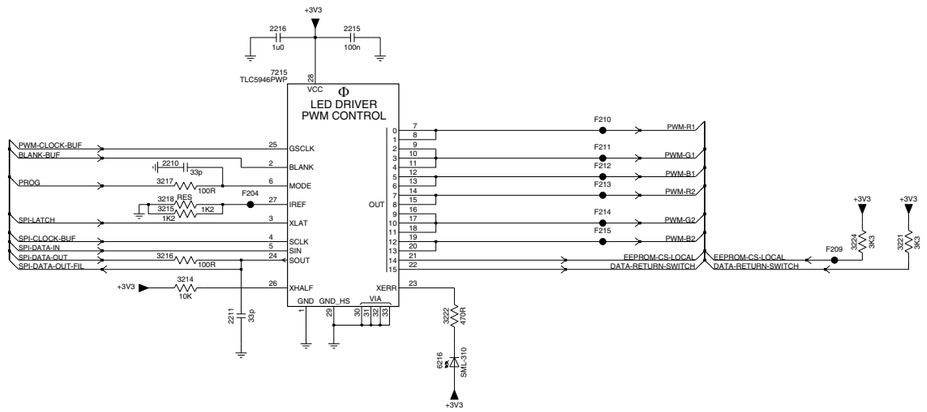
12 LED Low-Pow: Microcontroller Liteon

AL2 MICROCONTROLLER LITEON

AL2

INPUT BUFFER





2201 B8
2202 C8
2203 D8
2209 B2
2210 G6
2211 I6
2214 A6
2215 F7
2216 F7
2217 B12
2218 C12
2219 D12
2220 E9
3121 D9
3203 B5
3204 B7
3205 C5
3207 B9
3209 C9
3210 B3
3211 C9
3212 D11
3213 B3
3214 H6
3215 H6
3216 H6
3217 H6
3218 H6
3219 B11
3220 C11
3221 H11
3222 I8
3223 C11
3224 H11
6216 I8
7201-1 A10
7201-2 C10
7201-3 D10
7201-4 B10
7209 B2
7210 C2
7212 B3
7214 B6
7215 G7
9208 A10
9209 B9
9210 B10
9211 C9
9212 C10
9213 D9
9214 D10
F202 B3
F203 C5
F204 H6
F205 B10
F206 C10
F207 C10
F208 D10
F209 H11
F210 G9
F211 G9
F212 G9
F213 H9
F214 H9
F215 H9

CHN	SETNAME		
CLASS_NO	DRIVER 6LED LITEON 2K9	8204 000 8857	1 2008-06-10
2008-08-08 2			2 2008-08-08
3			3 ??
NAME Peter Van Hove	SUPERS. 3	130 – 2	A2
CHECK	DATE 2008-06-02	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

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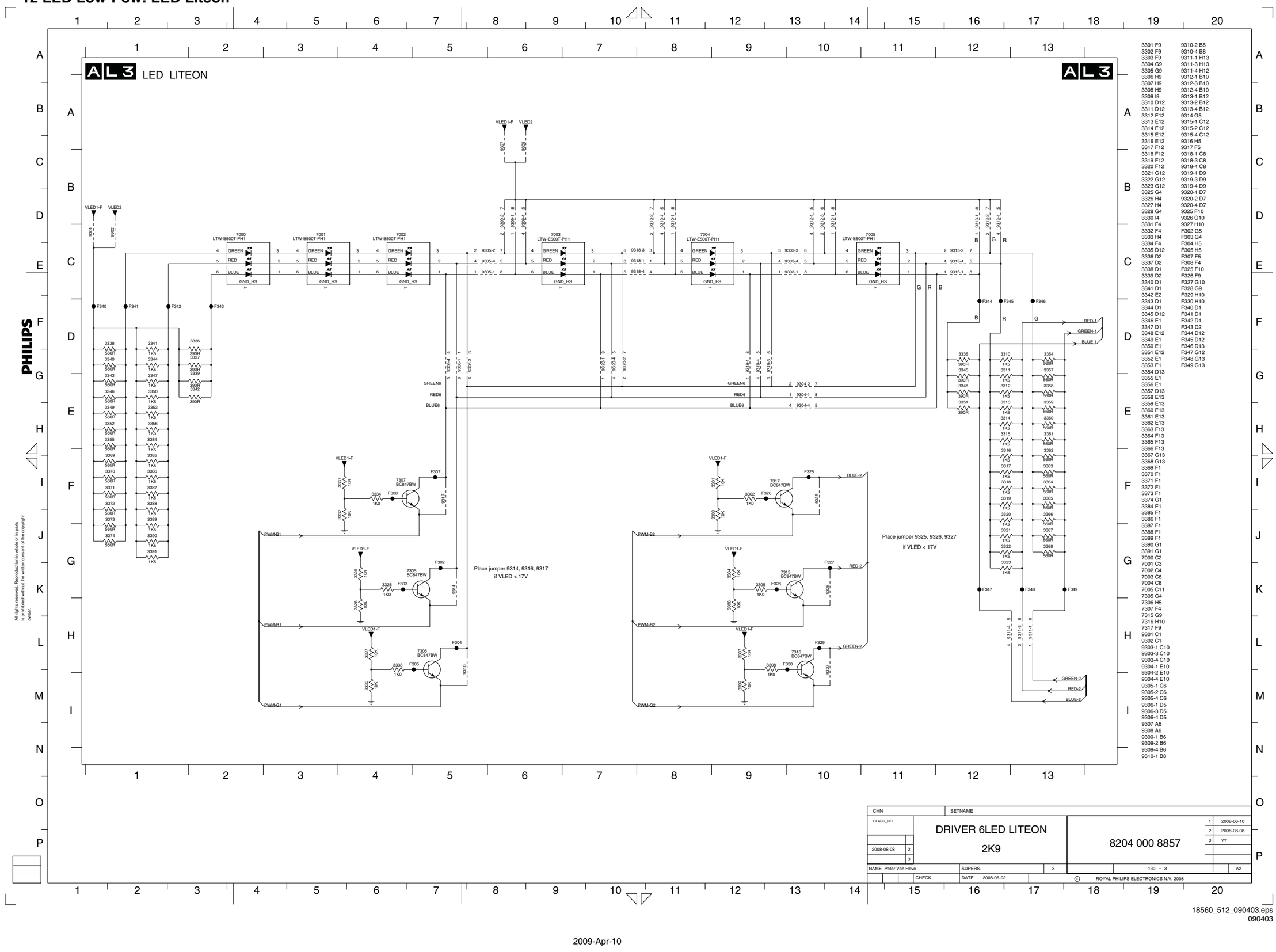
090410

12 LED Low-Pow: LED Liteon



3301 F9
3302 F9
3303 F9
3304 G9
3305 G9
3306 H9
3307 H9
3308 H9
3309 I9
3310 D12
3311 D12
3312 E12
3313 E12
3314 E12
3315 E12
3316 E12
3317 F12
3318 F12
3319 F12
3320 F12
3321 G12
3322 G12
3323 G12
3325 G4
3326 H4
3327 H4
3328 G4
3330 I4
3331 F4
3332 F4
3333 H4
3334 F4
3335 D12
3336 D2
3337 D2
3338 D1
3339 D2
3340 D1
3341 D1
3342 E2
3343 D1
3344 D1
3345 D12
3346 E1
3347 D1
3348 E12
3349 E1
3350 E1
3351 E12
3352 E1
3353 E1
3354 D13
3355 E1
3356 E1
3357 D13
3358 E13
3359 E13
3360 E13
3361 E13
3362 E13
3363 F13
3364 F13
3365 F13
3366 F13
3367 G13
3368 G13
3369 F1
3370 F1
3371 F1
3372 F1
3373 F1
3374 G1
3384 E1
3385 F1
3386 F1
3387 F1
3388 F1
3389 F1
3390 G1
3391 G1
7000 C2
7001 C3
7002 C4
7003 C6
7004 C8
7005 C11
7305 G4
7306 H5
7307 F4
7315 G9
7316 H10
7317 F9
9301 C1
9302 C1
9303-1 C10
9303-3 C10
9303-4 C10
9304-1 E10
9304-2 E10
9304-4 E10
9305-1 C6
9305-2 C6
9305-4 C6
9306-1 D5
9306-3 D5
9306-4 D5
9307 A6
9308 A6
9309-1 B6
9309-2 B6
9309-4 B6
9310-1 B8
9310-2 B8
9310-4 B8
9311-1 H13
9311-3 H13
9311-4 H12
9312-1 B10
9312-3 B10
9312-4 B10
9313-1 B12
9313-2 B12
9313-4 B12
9314 G5
9315-1 C12
9315-2 C12
9315-4 C12
9316 H5
9317 F5
9318-1 C8
9318-3 C8
9318-4 C8
9319-1 D9
9319-3 D9
9319-4 D9
9320-1 D7
9320-2 D7
9320-4 D7
9325 F10
9326 G10
9327 H10
F302 G5
F303 G4
F304 H5
F305 H5
F307 F5
F308 F4
F325 F10
F326 F9
F327 G10
F328 G9
F329 H10
F330 H10
F340 D1
F341 D1
F342 D1
F343 D2
F344 D12
F345 D12
F346 D13
F347 G12
F348 G13
F349 G13

CHN	SETNAME		
CLASS_NO	DRIVER 6LED LITEON 2K9	8204 000 8857	1 2008-06-10
2008-08-08 2			2 2008-08-08
3			3 ??
NAME Peter Van Hove	SUPERS. 3	130 - 3	A2
CHECK	DATE 2008-06-02	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

18560_512_090403.eps
090403

12 LED Low-Pow: LED Drive

AL4 LED DRIVE

AL4

1M3A F2
1M85 D2
3536 E11
3537 E11
3538 E9
3539 F11
3540 F9
3541 E10
3542 F11
3543 F9
3544 F10
3546 F9
3547 F10
3549 F9
3550 F10
3552 F9
3553 F10
3555 G10
3556 F10
3569 G9
3570 G9
3571 G9
3572 G9
3573 H9
3574 H9
3584 G10
3585 G10
3586 G10
3587 G10
3588 G10
3589 H10
3590 H10
3591 H10
7006 B2
7007 B3
7008 B5
7009 B6
7010 B7
7011 B8

7006 LTW-E500T-PH1
7007 LTW-E500T-PH1
7008 LTW-E500T-PH1
7009 LTW-E500T-PH1
7010 LTW-E500T-PH1
7011 LTW-E500T-PH1

GREEN-1
RED-1
BLUE-1
GREEN
RED
BLUE
GND_HS

1M85
SPI-CLOCK-BUF
SPI-DATA-OUT
SPI-DATA-RETURN
SPI-LATCH
PWM-CLOCK-BUF
+3V3
BLANK-BUF
EEPROM-CS
TEMP-SENSOR
PROG
VLED1
VLED2

1M3A
SPI-CLOCK-BUF
SPI-DATA-OUT
SPI-DATA-RETURN
SPI-LATCH
PWM-CLOCK-BUF
+3V3
BLANK-BUF
EEPROM-CS
TEMP-SENSOR
PROG
VLED1
VLED2

1X04
REF EMC HOLE

GREEN-2
RED-2
BLUE-2

3538 560R
3540 560R
3543 560R
3546 560R
3549 560R
3552 560R
3555 560R
3569 560R
3570 560R
3571 560R
3572 560R
3573 560R
3574 560R

3541 1K5
3544 1K5
3547 1K5
3550 1K5
3553 1K5
3556 1K5
3584 1K5
3585 1K5
3586 1K5
3587 1K5
3588 1K5
3589 1K5
3590 1K5
3591 1K5

3536 390R
3537 390R
3539 390R
3542 390R

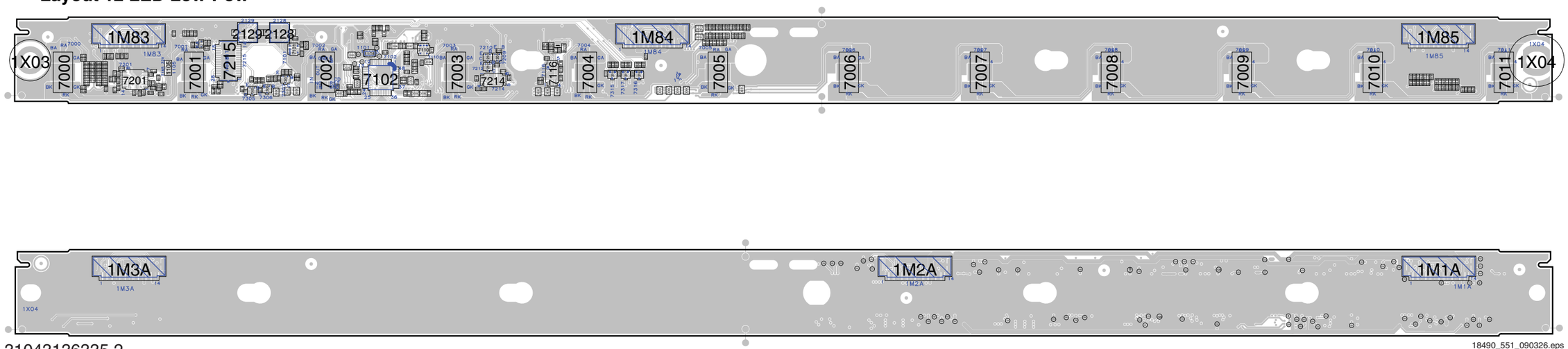
CHN		SETNAME	
CLASS_NO		6 LED + CONNECTOR 2K9 LITEON	8204 000 8898
2008-08-14	2		
2008-10-29	3		
NAME Peter Van Hove		SUPERS.	1
		CHECK	DATE 2008-07-30

2 2008-10-29

130 - 1 A2

18560_513_090403.eps
090403

Layout 12 LED Low-Pow



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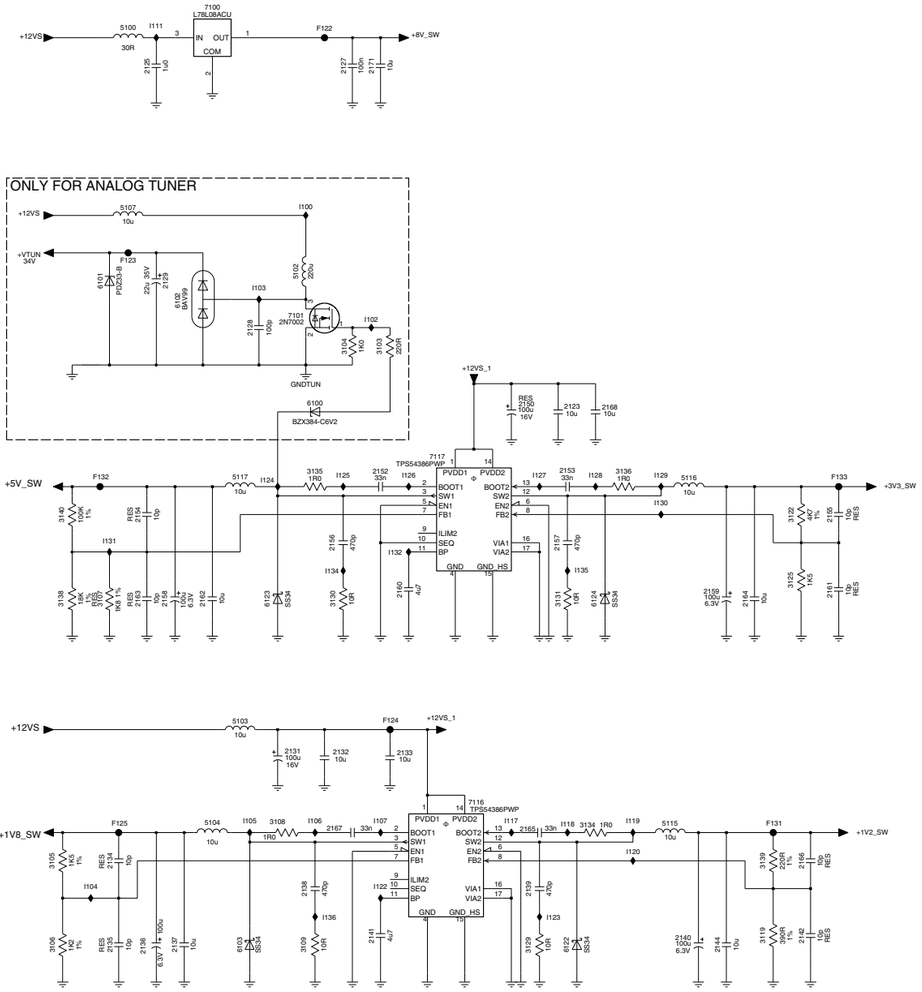
090331

SSB: DC/DC

B Ø 1 DC / DC



1M95 C10	6101 D1	2100 F11
1M99 A10	6102 D2	2101 F12
1X01 I10	6103 I2	2102 F12
1X02 I10	6122 I5	2103 F12
1X03 G11	6123 F2	2104 F13
1X05 G9	6124 F5	2105 F13
1X06 G9	7100 B2	2106 F8
1X07 I11	7101 D3	2107 F9
1X08 G12	7103-1 E10	2108 F9
1X12 G10	7103-2 F10	2109 B11
2100 F11	7116 H4	2110 C11
2101 F12	7117 E4	2111 C12
2102 F12	F100 C11	2112 D11
2103 F12	F101 C11	2113 D11
2104 F13	F102 C11	2114 D11
2105 F13	F103 C11	2115 D12
2106 F8	F104 C11	2116 B11
2107 F9	F105 C11	2118 B11
2108 F9	F106 C11	2119 B11
2109 B11	F107 C11	2120 B12
2110 C11	F108 C11	2121 B12
2111 C12	F109 C11	2122 B12
2112 D11	F110 C11	2123 E5
2113 D11	F111 A11	2124 B11
2114 D11	F112 A11	2125 B2
2115 D12	F113 A11	2127 B3
2116 B11	F114 A11	2128 D2
2118 B11	F115 A11	2129 D2
2119 B11	F116 A11	2131 H3
2120 B12	F117 A11	2132 H3
2121 B12	F118 A11	2133 H3
2122 B12	F119 A11	2134 H1
2123 E5	F120 B11	2135 I1
2124 B11	F122 B3	2136 I1
2125 B2	F123 D1	2137 I2
2127 B3	F124 G3	2138 I3
2128 D2	F125 H1	2139 I4
2129 D2	F126 A11	2140 I6
2131 H3	F131 H6	2141 I3
2132 H3	F132 F1	2142 I7
2133 H3	F133 F7	2144 I6
2134 H1	F134 F11	2150 E4
2135 I1	I100 C3	2152 E3
2136 I1	I102 D3	2153 E5
2137 I2	I103 D2	2154 F1
2138 I3	I104 I1	2155 F7
2139 I4	I105 H2	2156 F3
2140 I6	I106 H3	2157 F5
2141 I3	I107 H3	2158 F2
2142 I7	I108 E9	2159 F6
2144 I6	I109 E10	2160 F3
2150 E4	I110 F11	2161 F7
2152 E3	I111 B2	2162 F1
2153 E5	I117 H4	2163 F1
2154 F1	I118 H5	2164 F6
2155 F7	I119 H5	2165 H4
2156 F3	I120 H5	2166 H7
2157 F5	I122 I3	2167 H3
2158 F2	I123 I5	2168 E5
2159 F6	I124 F2	2169 D11
2160 F3	I125 E3	2171 B3
2161 F7	I126 E3	3100 C12
2162 F1	I127 E4	3101 A11
2163 F1	I128 E5	3102 A11
2164 F6	I129 E5	3103 D3
2165 H4	I130 F5	3104 D3
2166 H7	I131 F1	3105 H1
2167 H3	I132 F3	3106 I1
2168 E5	I134 F3	3107 F1
2169 D11	I135 F5	3108 H2
2171 B3	I136 I3	3109 I3
3100 C12		3119 I6
3101 A11		3122 F6
3102 A11		3125 F6
3103 D3		3129 I4
3104 D3		3130 F3
3105 H1		3131 F5
3106 I1		3134 H5
3107 F1		3135 E3
3108 H2		3136 E5
3109 I3		3138 F1
3119 I6		3139 H6
3122 F6		3140 F1
3125 F6		3171 F12
3129 I4		3172 F11
3130 F3		3173 F11
3131 F5		3199 F11
3134 H5		4100 A11
3135 E3		4101 A11
3136 E5		5100 B1
3138 F1		5101 F10
3139 H6		5102 D3
3140 F1		5103 G2
3171 F12		5104 H2
3172 F11		5107 C1
3173 F11		5108 F8
3199 F11		5115 H5
4100 A11		5116 F6
4101 A11		5117 F2
5100 B1		6100 E3
5101 F10		
5102 D3		
5103 G2		
5104 H2		
5107 C1		
5108 F8		
5115 H5		
5116 F6		
5117 F2		
6100 E3		

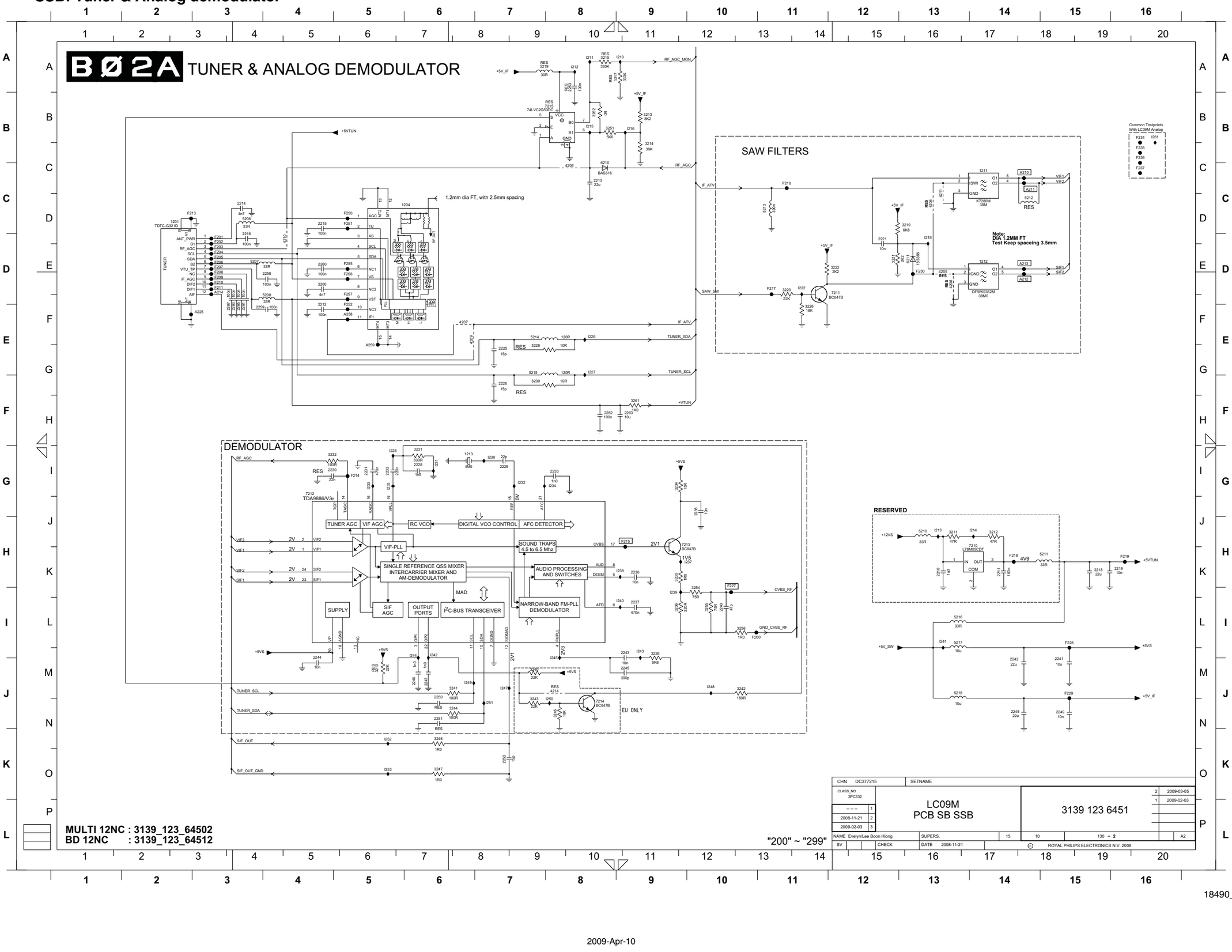
MULTI 12NC : 3139_123_64502
BD 12NC : 3139_123_64512

CHN DC377215		SETNAME			
CLASS_NO 3PC332		LC09M PCB SB SSB		3139 123 6451	
-- -- --	1			2	2009-03-05
2008-11-21	2			1	2009-02-03
2009-02-03	3				
NAME Tee Chor Kimp		SUPERS.	15	10	130 ~ 1
SV		CHECK	DATE 2008-11-21	© ROYAL PHILIPS ELECTRONICS N.V. 2008	A2

18490_500_090402.eps
090402

SSB: Tuner & Analog demodulator

B Ø 2 A TUNER & ANALOG DEMODULATOR



MULTI 12NC : 3139_123_64502
BD 12NC : 3139_123_64512

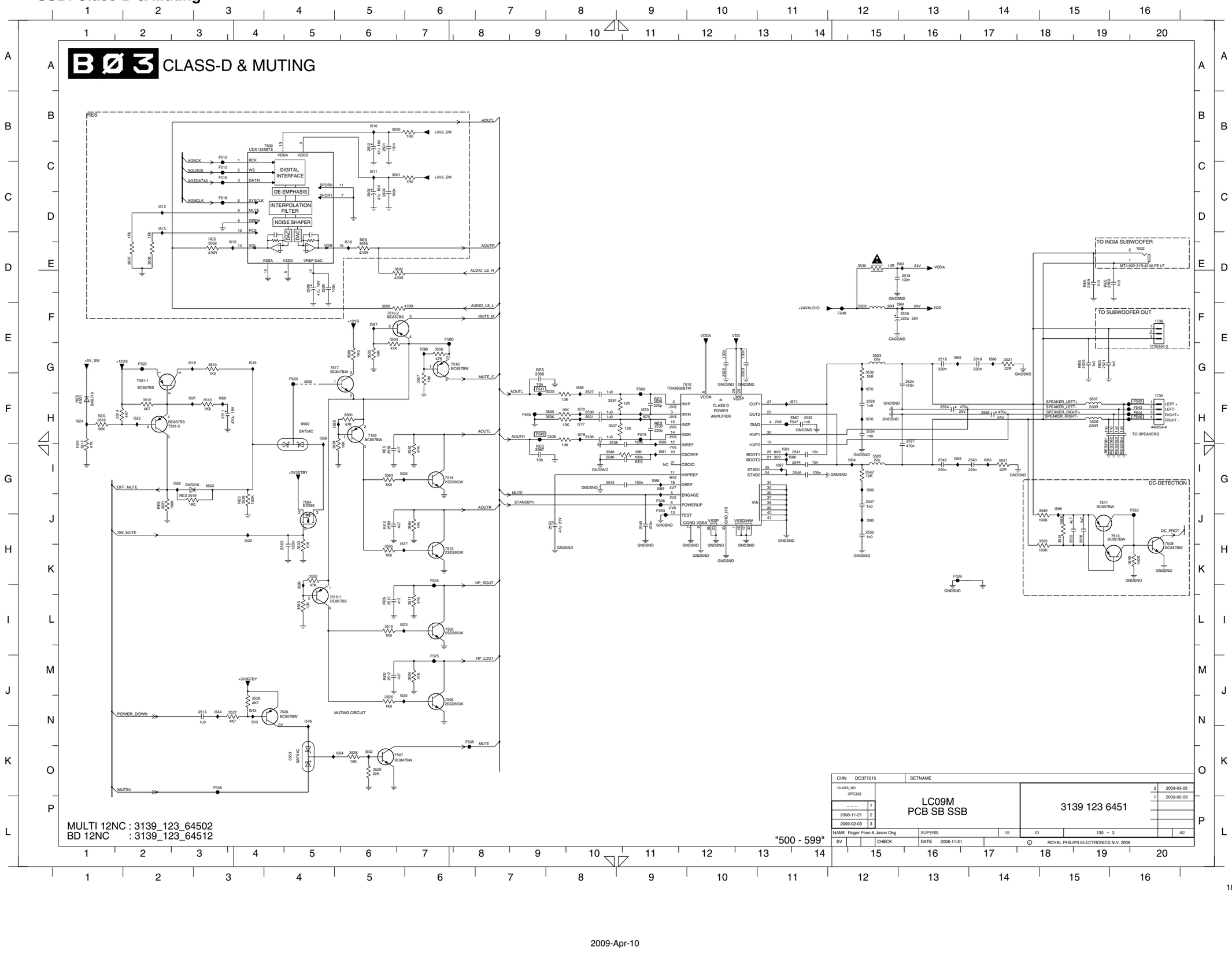
"200" ~ "299"

CHN DC377215	SETNAME		
CLASS_NO 3PC332	LC09M PCB SB SSB	3139 123 6451	2 2009-03-05
-- -- -- 1			1 2009-02-03
2008-11-21 2			
2009-02-03 3			
NAME Evelyn/Lee Boon Hiong	SUPERS. 15	10	130 - 2 A2
SV CHECK	DATE 2008-11-21	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

1201 C2 F229 J15
1204 C6 F230 D13
1211 C14 F234 B16
1212 D14 F235 B16
1213 G6 F236 B16
2210 H13 F237 C16
2211 H14 F250 C5
2212 E4 F251 C5
2213 C8 F252 E5
2214 C3 F255 D5
2215 C4 F256 D5
2216 D3 F257 D5
2218 H15 F260 I10
2219 H16 I210 A9
2221 D12 I211 A8
2225 E7 I212 A8
2226 F7 I213 H13
2228 G6 I214 H14
2229 G7 I215 B8
2230 G4 I216 B9
2231 G5 I218 D13
2232 G5 I222 D11
2233 G8 I226 E8
2235 G10 I227 E8
2236 H9 I228 G5
2237 I9 I230 G7
2240 I10 I231 G6
2241 I15 I232 G7
2242 I14 I233 G5
2243 I9 I234 G8
2244 I4 I235 G5
2245 J9 I237 H10
2246 J6 I238 H9
2247 J6 I239 I9
2248 J14 I240 I9
2249 J15 I241 I13
2250 J6 I242 I6
2251 J6 I243 I9
2252 K7 I244 I6
2253 A8 I245 I8
2258 D4 I247 J7
2259 E3 I248 J10
2260 D4 I249 J6
2261 E3 I250 J8
2262 F8 I251 J7
2263 F9 I252 K5
2265 E3 I253 K5
2266 E3 I261 B16
3267 E3
3268 D4
3210 J5
3211 H13
3212 H14
3213 B9
3214 B9
3215 A8
3217 A9
3219 C13
3221 D12
3222 D12
3223 D11
3226 E11
3228 E7
3230 F7
3231 G6
3232 G4
3234 G9
3235 H9
3236 I9
3238 I9
3240 J7
3241 J6
3242 J10
3243 J7
3244 J6
3245 J8
3246 K6
3247 K6
3251 B8
3254 I10
3255 I10
3256 I10
3261 F9
3262 B8
4204 C13
4205 D13
4206 D13
4207 E6
4208 C8
4209 E6
4210 D4
4211 C13
4214 J8
5206 C3
5207 D3
5208 D4
5210 H13
5211 H15
5212 C14
5213 C11
5214 E7
5215 E7
5216 I13
5217 I13
5218 J13
5219 A7
6210 C8
6211 D13
7210 H14
7211 D12
7212 G4
7213 H9
7214 J8
7215 B8
A210 C14
A211 C14
A212 D14
A213 D14
A214 D3
A225 E3
A258 E5
A259 E5
F201 D3
F202 D3
F203 D3
F204 D3
F205 D3
F206 D3
F207 D3
F208 D3
F209 D3
F210 D3
F211 D3
F213 C2
F214 G5
F215 H9
F216 C11
F217 D11
F218 H14
F219 H16
F227 H10
F228 I15

18490_501_090402.eps
090402

SSB: Class-D & Muting



1502 C16	7519 G6
1735 E16	F512 B3
1736 D16	F515 B3
2500 A5	F516 B3
2501 A5	F518 B3
2502 B5	F522 E2
2503 B5	F523 E4
2508 C4	F524 H6
2509 C4	F525 I6
2510 H5	F535 J6
2511 E3	F536 F9
2512 I5	F538 K3
2513 I3	F539 H13
2515 C13	F540 D12
2516 D13	F541 E7
2518 D13	F542 E16
2519 D14	F543 E16
2520 D15	F544 E16
2521 D15	F545 E7
2522 E10	F546 E16
2523 E10	F547 E11
2524 E13	F548 F7
2527 E8	F550 G16
2528 E12	F569 E9
2529 E9	F579 E9
2530 E8	F580 D6
2531 E8	F593 G9
2532 E11	I510 A5
2533 E9	I511 B5
2534 E12	I512 B2
2536 F8	I513 C2
2537 F13	I515 C3
2539 F8	I516 C5
2540 F8	I518 D2
2541 F11	I519 D3
2542 F13	I521 E2
2543 F14	I522 E2
2544 F11	I523 H5
2545 F8	I524 E1
2546 F11	I525 E4
2547 F12	I526 F5
2549 G9	I527 G5
2550 G8	I530 G3
2552 G12	I535 I5
2553 G15	I543 I3
2554 E13	I544 I3
2555 E14	I546 J4
2556 G15	I552 J5
2559 C15	I554 J5
2560 C16	I559 F4
2561 F15	I560 E3
2562 F16	I562 F2
2563 F16	I563 C13
2564 F16	I564 D13
2565 G4	I565 D13
2566 E7	I566 D14
2567 F7	I568 E8
2568 F5	I570 E12
2569 G5	I571 E11
3500 A5	I572 E8
3501 B5	I573 E9
3502 C5	I575 E9
3507 C2	I576 E12
3508 C2	I577 E8
3509 D5	I578 E8
3510 E3	I580 F9
3511 H6	I581 F9
3512 E2	I582 F11
3513 E3	I583 F13
3514 E1	I584 F12
3515 E1	I585 F14
3516 H5	I586 F11
3517 F1	I587 F11
3519 F2	I588 F9
3520 F3	I589 F9
3521 F2	I590 F12
3523 G4	I595 G12
3524 I6	I596 G15
3525 I5	I597 D5
3526 I3	I598 D6
3527 I3	I599 H4
3528 J5	
3529 J5	
3530 C12	
3531 D14	
3532 E12	
3533 E8	
3534 E8	
3535 E8	
3536 E8	
3537 E8	
3538 F8	
3540 F8	
3541 F14	
3542 F12	
3544 G15	
3548 G16	
3549 G15	
3550 G15	
3552 H4	
3553 H4	
3554 D5	
3555 D5	
3556 D6	
3557 E6	
3558 C3	
3559 C5	
3560 E5	
3561 F5	
3562 F6	
3563 F5	
3564 G6	
3565 G5	
3566 D5	
4502 E4	
5502 D12	
5503 D12	
5505 F12	
5507 E15	
5508 E15	
6500 E4	
6501 E1	
6502 F3	
6503 J4	
7102 F5	
7500 A4	
7501-1 E2	
7501-2 E2	
7503 H6	
7504 F4	
7505 I6	
7506 I4	
7507 J5	
7508 G16	
7510 E10	
7511 F15	
7513 G16	
7515-1 H5	
7515-2 D5	
7516 D6	
7517 E4	
7518 F6	

18490_502_090402.eps
090402

SSB: MTK Power

B Ø 4 A MTK POWER

+1V0_SW
SENSE+1V0_MT5392
+1V8_SW
+1V2_SW
+3V3_SW
+3V3STBY
+8V_SW
+12VS

7701-12 MT5391 Φ DIGITAL POWER
VCCK
VCC2IO
VCC3IO

7701-14 MT5391 Φ POWER & GROUND
AVSS12
AVDD12
AVSS33
AVDD33
AVDD80
AVSS80
DVDD12_VGA
DVSS12_VGA

7701-13 MT5391 Φ DIGITAL GROUND
DVSS

7701-4 MT5391 Φ PM_DEMOD
OPWRSB
OPCTRL
OPWR_5V

F611 F612 F613 F614 F615 F616

5600 30R
5601 30R
5602 30R
5603 30R
5604 30R
5605 30R
5606 30R
5607 30R
5608 30R
5609 30R
5610 30R

7602 BC847BW
7605-1 BC847BS
7605-2 BC847BS
6600 BZX384-C3V3
6601 BZX384-C8V2

STANDBY
STANDBYn
HDMI_CEC
DTV_IRQ
LED1
MUTEn
SW_MUTE
POWER_DOWN
LCD_CLK_SDA
LCD_CLK_SCL
LED2
ARX-5V
BRX-5V
CRX-5V
TUNER_SCL
TUNER_SDA

RES FOR ITV

MULTI 12NC : 3139_123_64502
BD 12NC : 3139_123_64512

"600 - 699"

CHN DC377215	SETNAME		
CLASS_NO 3PC332	LC09M PCB SB SSB	3139 123 6451	2 2009-03-05 / 1 2009-02-03
-- -- -- 1 / 2008-11-21 2 / 2009-02-03 3			
NAME Hwang Zhen	SUPERS. 15	10	130 - 4 A3
SV CHECK	DATE 2008-11-21	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

2600 B8	26A1 A3
2601 B8	26A2 D1
2602 B8	26A3 D1
2603 B8	26A4 E2
2604 B9	26A5 A2
2605 B9	3600 E5
2606 B9	3601 E6
2607 B9	3602 E6
2608 A3	3603 E6
2609 A3	3604 E6
2610 A3	3605 E6
2611 A3	3606 E9
2612 A3	3607 E9
2613 A3	3608 F7
2614 A3	3609 F7
2615 A4	3610 F7
2616 A4	3611 F7
2617 A4	3612 F7
2618 A4	3613 F7
2619 A4	3614 F7
2620 A4	3615 F7
2621 A4	3617 G6
2622 A4	3618 G6
2623 A4	3619 G6
2624 A4	3621 G4
2625 A5	3622 G3
2626 A5	3623 G2
2627 A5	3624 G2
2628 A5	3625 E6
2629 A5	3626 E6
2630 A5	4601 G7
2631 A5	4602 G7
2632 A5	4603 G7
2633 A5	5600 B5
2634 A5	5601 B1
2635 B8	5602 D9
2636 B8	5603 D2
2637 B8	5604 D2
2638 B8	5605 E2
2639 B2	5606 E2
2640 B2	5607 E2
2641 B2	5608 F2
2642 B3	5609 F2
2643 B3	5610 G2
2644 B3	6600 G4
2645 B3	6601 G2
2646 B3	7602 E5
2647 B4	7605-1 G4
2648 B4	7605-2 G3
2649 B4	7701-12 B6
2650 B4	7701-13 B11
2651 B4	7701-14 C4
2652 B4	7701-4 E8
2653 B5	F611 A2
2654 C1	F612 B4
2655 C2	F613 C2
2656 C2	F614 D9
2657 C2	F615 G2
2658 C2	F616 G4
2659 C2	I614 F7
2660 D8	I616 F7
2661 D8	I617 F7
2662 D8	I618 E2
2663 D8	I623 F2
2664 D8	I629 G3
2665 D9	I630 G3
2666 D9	I631 D2
2667 D9	I632 D2
2668 D9	I633 E2
2669 D2	I636 F2
2670 D2	I637 F3
2671 A1	
2672 A1	
2673 A2	
2674 A2	
2675 A2	
2676 A2	
2677 B2	
2678 D2	
2679 D2	
2680 D2	
2681 D1	
2682 D1	
2683 D2	
2684 D2	
2685 D2	
2686 E2	
2687 E2	
2688 E2	
2689 E2	
2690 E2	
2691 F2	
2692 F2	
2693 F1	
2694 F2	
2695 F2	
2696 G2	
2697 G2	
2698 G2	
2699 C8	
26A0 C8	

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090402

SSB: GDDR3

B04B GDDR3

RES FOR EMC

+1V8_SW

F710

7701-5
MT5391
DRAM_IF

7702-1
HYB18H512321BF-14
MAIN

7702-2
HYB18H512321BF-14
POWER

D_RVREF1

D_RVREF2

MULTI 12NC : 3139_123_64502
BD 12NC : 3139_123_64512

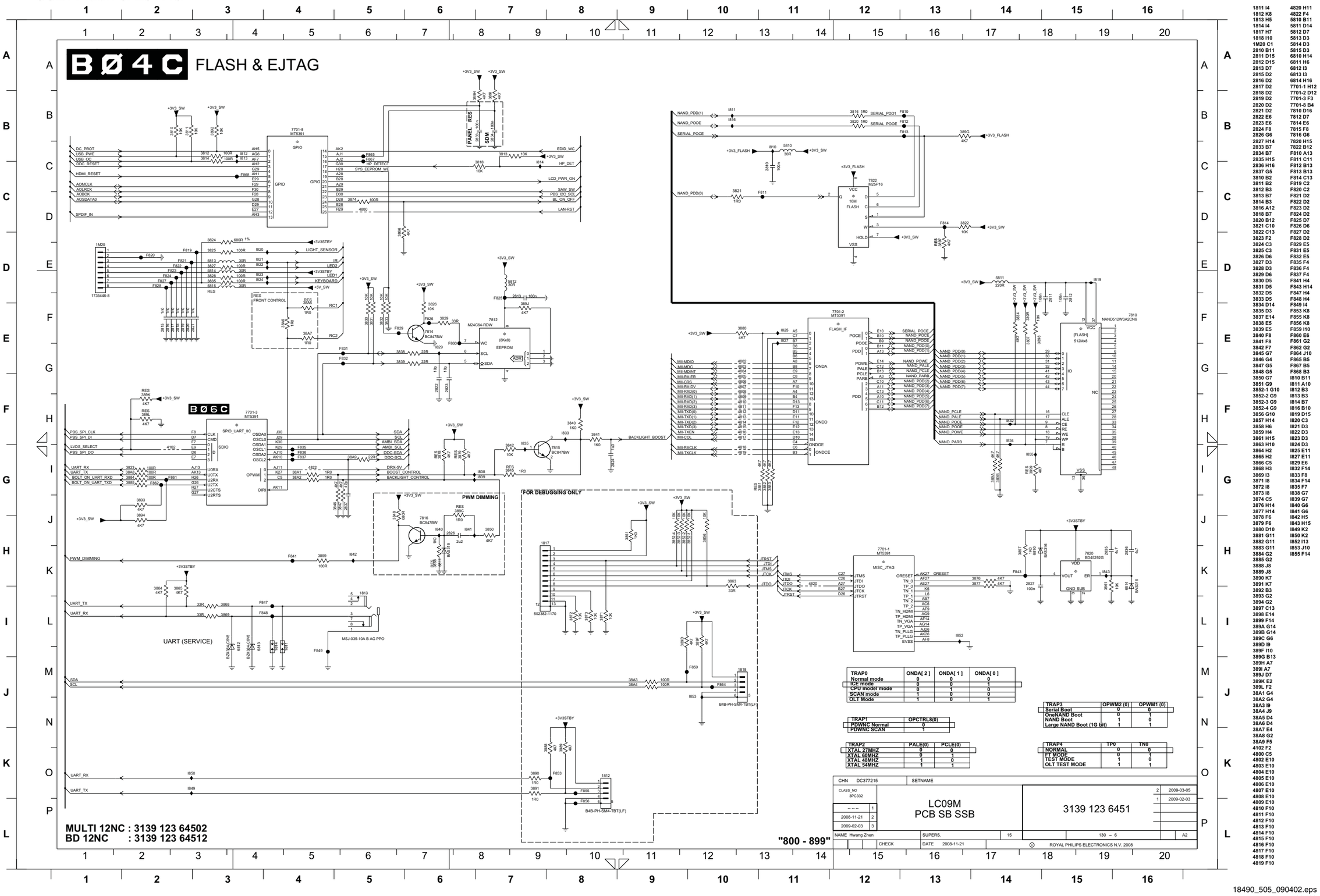
"700 - 799"

CHN DC377215	SETNAME		
CLASS_NO 3PC332	LC09M PCB SB SSB	3139 123 6451	2 2009-03-05 / 1 2009-02-03
-- -- -- 1 / 2008-11-21 2 / 2009-02-03 3			
NAME Hwang Zhen	SUPERS.	15	10 / 130 – 5 / A3
SV / CHECK	DATE 2008-11-21	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

2710 B9
2711 B10
2712 B6
2713 B7
2714 B7
2715 B7
2716 B8
2717 B8
2719 B8
2720 B8
2722 B9
2724 B10
2725 B11
2726 B11
2727 B11
2728 B11
2729 B12
2731 C9
2732 C9
2734 C10
2735 C10
2736 C10
2737 C11
2738 C11
2739 C11
2740 B10
2741 C8
2742 D8
2743 E7
2745 F8
2746 F7
2747 B6
2749 B12
2750 E8
2751 A7
2752 A7
2753 A7
2754 A7
2755 A8
2756 A8
2757 A8
2758 A9
2759 A9
2760 A9
2761 A9
2762 A10
2763 A10
2764 A10
2765 A11
2766 A11
2767 A11
2768 A11
2769 A3
2770 A3
2771 A4
2772 A4
2773 A4
2774 A4
2775 A5
2776 A5
2777 A5
2778 A5
2779 A6
2780 A6
3710 C8
3711 D3
3712 D8
3713 E7
3714 E8
3715 F8
3716 F7
3717 F6
3718 F4
3719 D8
3720 F7
3721 F9
3722 F7
3723 G4
3724 D2
5712 C8
5713 D7
5714 D8
7701-5 C6
7702-1 C3
7702-2 D10
F710 B6
I714 E7

18490_504_090402.eps
090402

SSB: Flash & EJTAG



TRAP0	ONDA[2]	ONDA[1]	ONDA[0]
Normal mode	0	0	0
ICE mode	0	0	1
CPU model mode	0	1	0
SCAN mode	1	0	0
OLT Mode	1	0	1

TRAP1	OPCTRL8(0)
PDWNC Normal	0
PDWNC SCAN	1

TRAP2	PALE(0)	PCLE(0)
XTAL 27MHZ	0	0
XTAL 60MHZ	0	1
XTAL 48MHZ	1	0
XTAL 54MHZ	1	1

TRAP3	OPWM2 (0)	OPWM1 (0)
Serial Boot	0	0
OneNAND Boot	0	1
NAND Boot	1	0
Large NAND Boot (1G bit)	1	1

TRAP4	TP0	TN0
NORMAL	0	0
FT MODE	0	1
TEST MODE	1	0
OLT TEST MODE	1	1

CHN	DC377215	SETNAME	
CLASS_NO	3PC332		
2008-11-21	2		
2009-02-03	3		
NAME	Hwang.Zhen	SUPERS.	15
		CHECK	
		DATE	2008-11-21

2	2009-03-05
1	2009-02-03

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1811 I4	4820 H11
1812 K8	4822 F4
1813 H5	5810 B11
1814 I4	5811 D14
1817 H7	5812 D7
1818 I10	5813 D3
1M20 C1	5814 D3
2810 B11	5815 D3
2811 D15	6810 H14
2812 D15	6811 H6
2813 D7	6812 I3
2815 D2	6813 I3
2816 D2	6814 H16
2817 D2	7701-1 H12
2818 D2	7701-2 D12
2819 D2	7701-3 F3
2820 D2	7701-8 B4
2821 D2	7810 D16
2822 E6	7812 D7
2823 E6	7814 E6
2824 F6	7815 F8
2826 G6	7816 G6
2827 H14	7820 H15
2833 B7	7822 B12
2834 B7	F810 A13
2835 H15	F811 C11
2836 H16	F812 B13
2837 G5	F813 B13
3810 B2	F814 C13
3811 B2	F819 C2
3812 B3	F820 C2
3813 B7	F821 D2
3814 B3	F822 D2
3816 A12	F823 D2
3818 B7	F824 D2
3820 B12	F825 D7
3821 C10	F826 D6
3822 C13	F827 D2
3823 F2	F828 D2
3824 C3	F829 E5
3825 C3	F831 E5
3826 D6	F832 E5
3827 D3	F835 F4
3828 D3	F836 F4
3829 D6	F837 F4
3830 D5	F841 H4
3831 D5	F843 H14
3832 D5	F847 H4
3833 D5	F848 H4
3834 D14	F849 I4
3835 D3	F853 K8
3837 E14	F855 K8
3838 E5	F856 K8
3839 E5	F859 I10
3840 F8	F860 E6
3841 F8	F861 G2
3842 F7	F862 G2
3845 G7	F864 J10
3846 G4	F865 B5
3847 G5	F867 B5
3848 G5	F868 B3
3850 G7	I810 B11
3851 G5	I811 A10
3852-1 G10	I812 B3
3852-2 G9	I813 B3
3852-3 G9	I814 B7
3852-4 G9	I816 B10
3856 G10	I819 D15
3857 H14	I820 C3
3858 H6	I821 D3
3859 H4	I822 D3
3861 H15	I823 D3
3863 H10	I824 D3
3864 H2	I825 E11
3865 H2	I827 E11
3866 C5	I829 E6
3868 H3	I832 F14
3869 I3	I833 F8
3871 I8	I834 F14
3872 I8	I835 F7
3873 I8	I838 G7
3874 C5	I839 G7
3876 H14	I840 G6
3877 H14	I841 G6
3878 F6	I842 H5
3879 F6	I843 H15
3880 D10	I849 K2
3881 G11	I850 K2
3882 G11	I852 I13
3883 G11	I853 J10
3884 G2	I855 F14
3885 G2	
3888 J8	
3889 J8	
3890 K7	
3891 K7	
3892 B3	
3893 G2	
3894 G2	
3897 C13	
3898 E14	
3899 F14	
389A G14	
389B G14	
389C G6	
389D I9	
389F I10	
389G B13	
389H A7	
389I A7	
389J D7	
389K E2	
389L F2	
38A1 G4	
38A2 G4	
38A3 I9	
38A4 J9	
38A5 D4	
38A6 D4	
38A7 E4	
38A8 G2	
38A9 F5	
4102 F2	
4800 C5	
4802 E10	
4803 E10	
4804 E10	
4805 E10	
4806 E10	
4807 E10	
4808 E10	
4809 E10	
4810 F10	
4811 F10	
4812 F10	
4813 F10	
4814 F10	
4815 F10	
4816 F10	
4817 F10	
4818 F10	
4819 F10	

18490_505_090402.eps
090402

SSB: Display interface - LVDS

B Ø 4 D DISPLAY INTERFACE - LVDS

LVDS

LVDS#2

LVDS#1

RESERVED FOR DISPLAY I2C CONTROL

LVDS CONNECTOR

ITEM #	50HZ	100HZ
1G50	YES	NO
1G51	YES	YES

MULTI 12NC : 3139_123_64502
BD 12NC : 3139_123_64512

CHN DC377215		SETNAME	
CLASS_NO 3PC332	LC09M PCB SB SSB	3139 123 6451	2 2009-03-05
-- -- -- 1			1 2009-02-03
2008-11-21 2			
2009-02-03 3			
NAME Kyaw Aung Aung	SUPERS. 15	10	130 ~ 7 A2
SV CHECK	DATE 2008-11-21	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

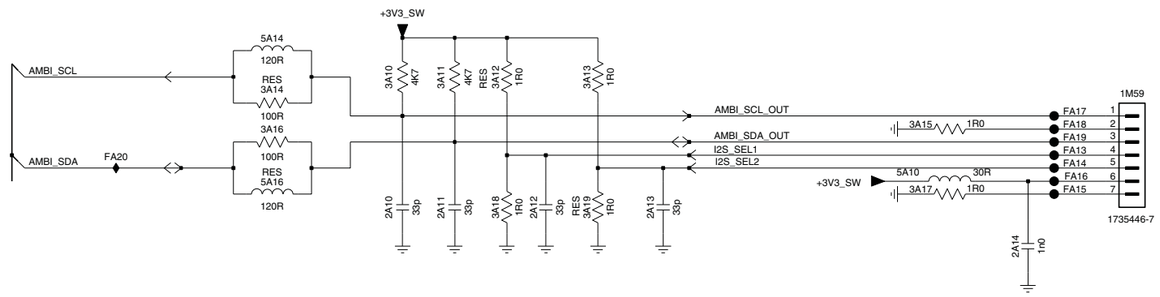
18490_506_090403.eps
090403

SSB: Ambilight

PHILIPS

B Ø 4 E AMBILIGHT

TO DRIVE AMBILIGHT DRIVERS



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2A10 B3
2A11 B3
2A12 B3
2A13 B4
2A14 C6
3A10 B3
3A11 B3
3A12 B3
3A13 B4
3A14 B2
3A15 B5
3A16 B2
3A17 B5
3A18 B3
3A19 B4
5A10 B5
5A14 B2
5A16 B2
FA13 B6
FA14 B6
FA15 B6
FA16 B6
FA17 B6
FA18 B6
FA19 B6
FA20 B1

MULTI 12NC : 3139_123_64502
BD 12NC : 3139_123_64512

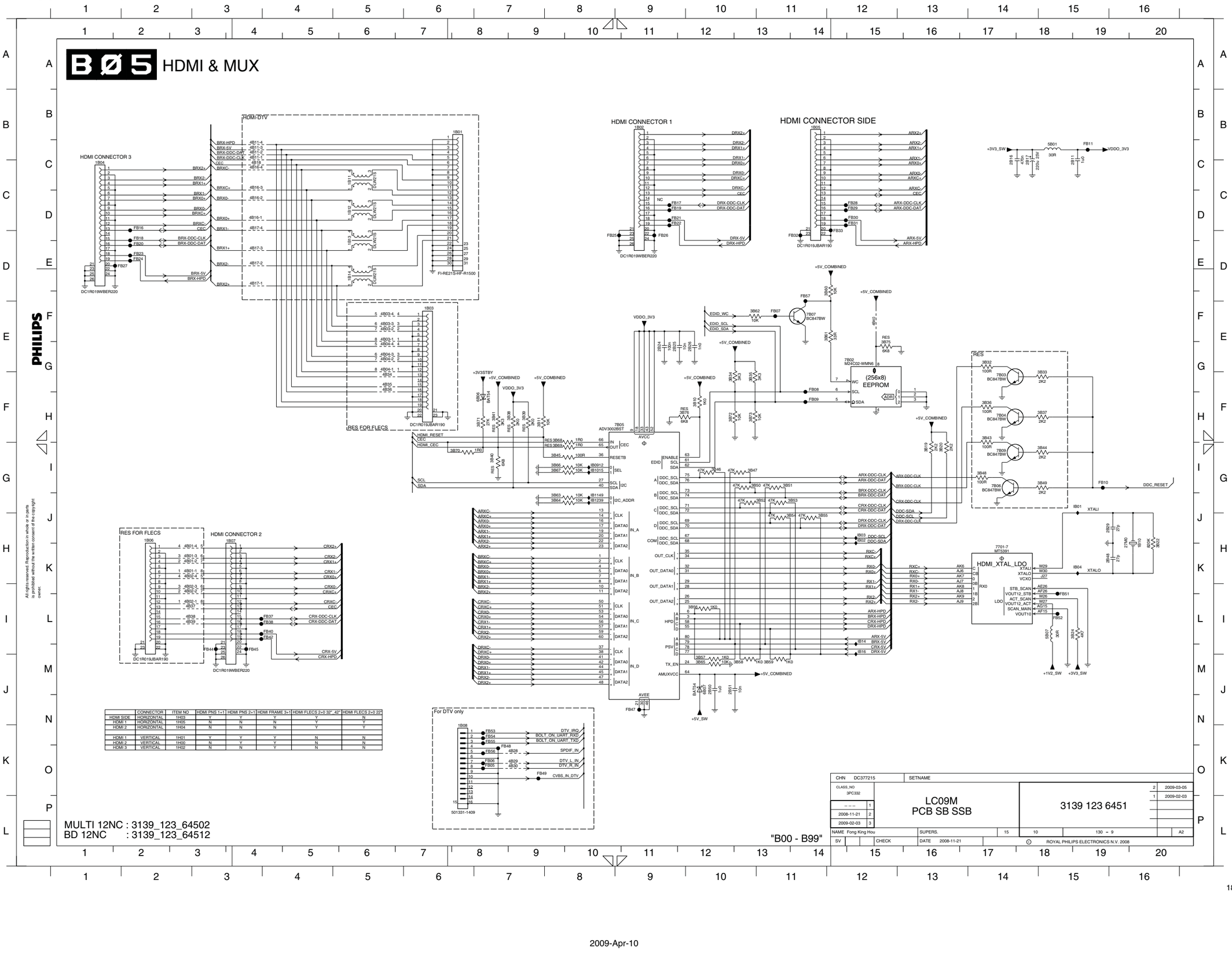
"A00 - A99"

CHN DC377215	SETNAME		
CLASS_NO 3PC332	LC09M PCB SB SSB	3139 123 6451	2 2009-03-05
-- -- -- 1			1 2009-02-03
2008-11-21 2			
2009-02-03 3			
NAME Fong King Hou	SUPERS. 15	10	130 - 8 A3
SV CHECK	DATE 2008-11-21	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

18490_507_090403.eps
090403

SSB: HDMI & MUX

B05 HDMI & MUX



	CONNECTOR	ITEM NO	HDMI PNS 1+1	HDMI PNS 2+1	HDMI FRAME 3+1	HDMI FLECS 2+0 32", 42"	HDMI FLECS 2+0 22"
HDMI SIDE	HORIZONTAL	1H03	Y	Y	Y	Y	N
HDMI 1	HORIZONTAL	1H05	N	N	N	Y	Y
HDMI 2	HORIZONTAL	1H04	N	N	N	Y	Y
HDMI 1	VERTICAL	1H01	Y	Y	Y	N	N
HDMI 2	VERTICAL	1H00	N	Y	Y	N	N
HDMI 3	VERTICAL	1H02	N	N	Y	N	N

MULTI 12NC : 3139_123_64502
BD 12NC : 3139_123_64512

"B00 - B99"

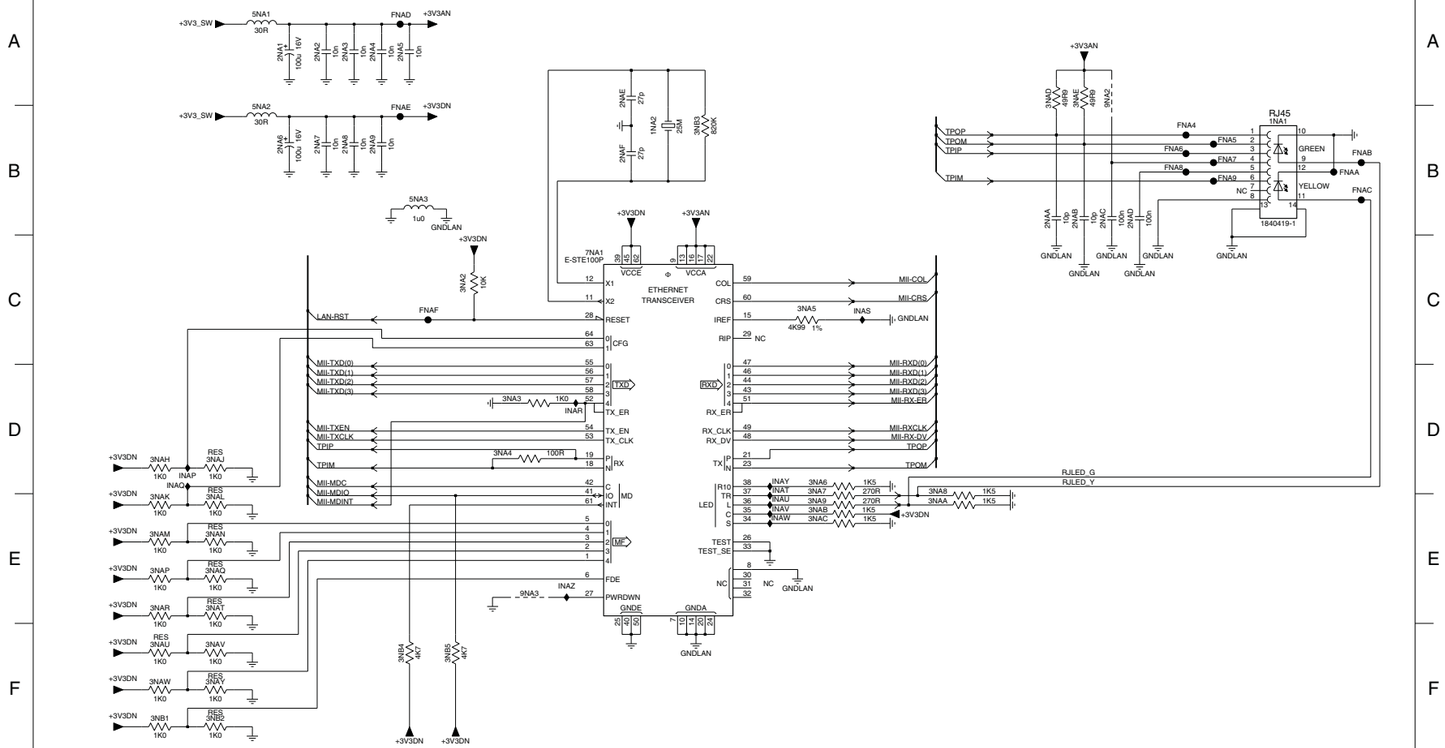
CHN DC377215	SETNAME		
CLASS_NO 3PC332	LC09M PCB SB SSB	3139 123 6451	2 2009-03-05
-- -- -- 1			1 2009-02-03
2008-11-21 2			
2009-02-03 3			
NAME Fong King Hou	SUPERS. 15	10 130 – 9	A2
SV CHECK	DATE 2008-11-21	ROYAL PHILIPS ELECTRONICS N.V. 2008	

1B01 B6
1B02 B9
1B03 D6
1B04 B1
1B05 B11
1B06 H2
1B07 H3
1B08 J6
1B10 H16
1B11 B5
1B12 C5
1B13 C5
1B14 D5
2B11 B15
2B16 B14
2B17 B14
2B24 E9
2B25 E9
2B26 E10
2B29 G16
2B48 H16
2B50 J10
2B51 J10
3B10 F10
3B11 F7
3B19 F13
3B20 F13
3B22 H16
3B24 I15
3B32 E14
3B33 E15
3B34 E10
3B35 E10
3B36 F14
3B37 F15
3B38 F7
3B39 F7
3B40 F7
3B41 F7
3B43 F14
3B44 F15
3B45 F8
3B46 G10
3B47 G10
3B48 G14
3B49 G15
3B50 G10
3B51 G11
3B52 G11
3B53 G11
3B54 G11
3B55 G11
3B56 I10
3B57 I10
3B58 I10
3B59 I11
3B60 D12
3B61 E12
3B62 D10
3B63 G8
3B64 G8
3B65 I10
3B66 G8
3B67 G8
3B68 F8
3B69 F8
3B70 F6
3B71 F7
3B72 F10
3B73 F10
3B75 E12
3B76 F9
4B01-1 H2
4B01-2 H2
4B01-3 H2
4B01-4 H2
4B02-1 I2
4B02-2 I2
4B02-3 I2
4B02-4 H2
4B03-1 E5
4B03-2 E5
4B03-3 E5
4B03-4 D5
4B04-1 E5
4B04-2 E5
4B04-3 E5
4B04-4 E5
4B11-1 B3
4B11-2 B3
4B11-3 B3
4B11-4 B3
4B16-1 C3
4B16-2 C3
4B16-3 C3
4B16-4 B3
4B17-1 D3
4B17-2 D3
4B17-3 C3
4B17-4 C3
4B18 B3
4B28 K7
4B29 K7
4B30 K7
4B34 E5
4B35 E5
4B36 E5
4B37 I2
4B38 I2
4B39 I2
4B40 D12
5B01 B15
5B07 I15
6B06 F7
6B07 J10
7701-7 H14
7B02 E12
7B03 E14
7B04 F14
7B05 F9
7B06 G14
7B07 D11
7B09 F14
FB05 K7
FB06 K7
FB07 D11
FB08 E11
FB09 F11
FB10 G15
FB11 B15
FB16 C2
FB17 C9
FB18 C2
FB19 C9
FB20 C2
FB21 C9
FB22 C9
FB23 D2
FB24 D2
FB25 C8
FB26 C9
FB27 D2
FB28 C12
FB29 C12
FB30 C12
FB31 C12
FB32 C11
FB33 C12
FB37 I4
FB38 I4
FB40 I4
FB42 I4
FB44 I3
FB45 I3
FB47 J9
FB48 K7
FB49 K7
FB51 H15
FB52 I15
FB53 J7
FB54 J7
FB55 J7
FB56 K7
FB57 D11
IB01 G15
IB02 H12
IB03 H12
IB04 H15
IB09 G8
IB10 G8
IB11 G8
IB12 G8
IB14 I12
IB16 I12

18490_508_090406.eps
090406

SSB: Digital I/O - Ethernet (provisional)

B Ø 6 A DIGITAL I/O - ETHERNET (PROVISIONAL)



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2NA2 A2
2NA3 A3
2NA4 A3
2NA5 A3
2NA6 B2
2NA7 B2
2NA8 B3
2NA9 B3
2NAA B8
2NAB B8
2NAC B8
2NAD B9
2NAE A5
2NAF B5
3NA2 C3
3NA3 D4
3NA4 D4
3NA5 C6
3NA6 D6
3NA7 D6
3NA8 D7
3NA9 E6
3NAA E7
3NAB E6
3NAC E6
3NAD A8
3NAE A8
3NAH D1
3NAJ D2
3NAK E1
3NAL E2
3NAM E1
3NAN E2
3NAP E1
3NAQ E2
3NAR E1
3NAT E2
3NAU F1
3NAV F2
3NAW F1
3NAY F2
3NB1 F1
3NB2 F2
3NB3 B5
3NB4 F3
3NB5 F3
5NA1 A2
5NA2 B2
5NA3 B3
7NA1 C5
9NA2 A8
9NA3 E4
FNA4 B9
FNA5 B9
FNA6 B9
FNA7 B9
FNA8 B9
FNA9 B9
FNAA B10
FNAB B10
FNAC B10
FNAD A3
FNAE B3
FNAF C3
INAP D1
INAQ D1
INAR D4
INAS C7
INAT D6
INAU E6
INAV E6
INAW E6
INAY D6

MULTI 12NC : 3139_123_64502
BD 12NC : 3139_123_64512

" XNA0 ~ XNBZ "

CHN DC377215	SETNAME		
CLASS_NO 3PC332	LC09M PCB SB SSB	3139 123 6451	2 2009-03-05
-- -- -- 1			1 2009-02-03
2008-11-21 2			
2009-02-03 3			
NAME Hwang Zhen	SUPERS. 15	10	130 - 10 A2
SV CHECK	DATE 2008-11-21	© ROYAL PHILIPS ELECTRONICS N.V. 2008	

18490_509_090406.eps
090406

SSB: Analog I/O - YPbPr

B Ø 6B ANALOG I/O - YPbPr

1D01 D13 1D03 F13 1D04 C13 1D08 D12 1D11 F1 1D13 F1 1D14 B1 1D15 B2
1D17 G1 1D18 C2 1D19 G13 1D20 D2 1D21 D2 1D22 E12 1D23 D2 1D24 D12
1D25-1 E13 1D25-2 E13 1D25-3 F13 1D10 A6 2D11 B6 2D12 B11 2D13 C3 2D14 B4
2D15 B6 2D16 B12 2D17 B6 2D18 B12 2D19 B12 2D20 C4 2D21 C6 2D22 C4
2D25 D4 2D27 D13 2D28 C12 2D29 D4 2D30 C6 2D31 B11 2D33 F2 2D34 F10
2D35 F10 2D37 G2 2D38 F2 2D39 G2 2D40 D3 2D41 D3 2D46 G8 2D47 G8
2D48 E9 2D49 F9 2D50 B3 2D51 C3 2D52 C4 2D53 D4 2D54 F3 2D55 G3
2D56 E10 2D57 F11 2D58 F10 2D59 F11 2D60 C11 2D61 E7 2D62 E8 2D63 F7
2D64 F8 2D65 G4 2D66 G4 2D67 A11 2D68 F7 2D69 G7 2D70 D12 2D71 D11
2D72 E11 2D73 E11 2D74 E12 3D10 A5 3D11 B4 3D12 B5 3D13 B3 3D14 B5
3D15 B4 3D16 B5 3D17 C3 3D18 C4 3D19 C5 3D20 C3 3D21 C4 3D22 C5
3D23 D11 3D24 D11 3D25 F12 3D26 E10 3D27 F12 3D28 C12 3D29 B11 3D30 F2
3D32 G2 3D33 D4 3D34 D4 3D35 E4 3D36 E4 3D41 G8 3D42 G8 3D43 E10
3D44 F10 3D45 F3 3D46 G3 3D47 E11 3D48 F11 3D49 F10 3D50 D8 3D51 E9
3D52 B4 3D53 B11 3D54 A11 3D55 E11 3D56 E11 3D57 B4 3D58 B4 3D59 C4
4D00 D12 5D00 C13 5D01 B2 5D02 B2 6D14 C2 6D15 G13 6D16 D2 6D17 D2 6D18 D2
6D11 F13 6D12 B2 6D13 G1 7D10-1 E12 7D10-2 F12 7D11 E8 FD12 D11 FD13 B4 FD14 B1
6D22 E12 7701-11 F6 7D10-1 E12 7D10-2 F12 7D11 E8 FD20 C1 FD21 C3 FD22 C1 ID12 C13 ID13 C13
FD15 B1 FD17 B1 FD18 B4 FD19 B1 FD20 C1 FD21 C3 FD22 C1 ID12 C13 ID13 C13
FD24 E13 FD25 F1 FD26 F12 FD27 G1 FD28 E13 FD29 F13 ID29 D4 ID30 E9 ID31 E10
ID14 E11 ID22 C4 ID25 D4 ID26 D4 ID28 D4 ID32 F12 ID34 F2 ID35 F3 ID36 F3 ID37 F9 ID38 F10 ID42 G3 ID43 F12

RU / AP
Near IC
MT5391
AVI
SYNC
ADCIN
MPX0
7701-11
MT5391
ALI_ADAC
AIN
PGA
RESERVE FOR FLEX
SPDIF
MSP-303H-BBB-432-03 NI YELLOW
MSP-303H-BBB-432-03 NI WHITE
MSP-303H-BBB-432-03 NI RED
MTJ-032-21B-43 NI FE LF
MSP-636H2-01
YKB21-5157V

MULTI 12NC : 3139_123_64502
BD 12NC : 3139_123_64512

"D00 - D99"

CHN DC377215	SETNAME		
CLASS_NO 3PC332	LC09M PCB SB SSB	3139 123 6451	2 2009-03-05, 1 2009-02-03
-- -- -- 1, 2008-11-21 2, 2009-02-03 3			
NAME Kyaw Aung Aung	SUPERS. 15	10	130 - 11 A2
SV CHECK	DATE 2008-11-21		

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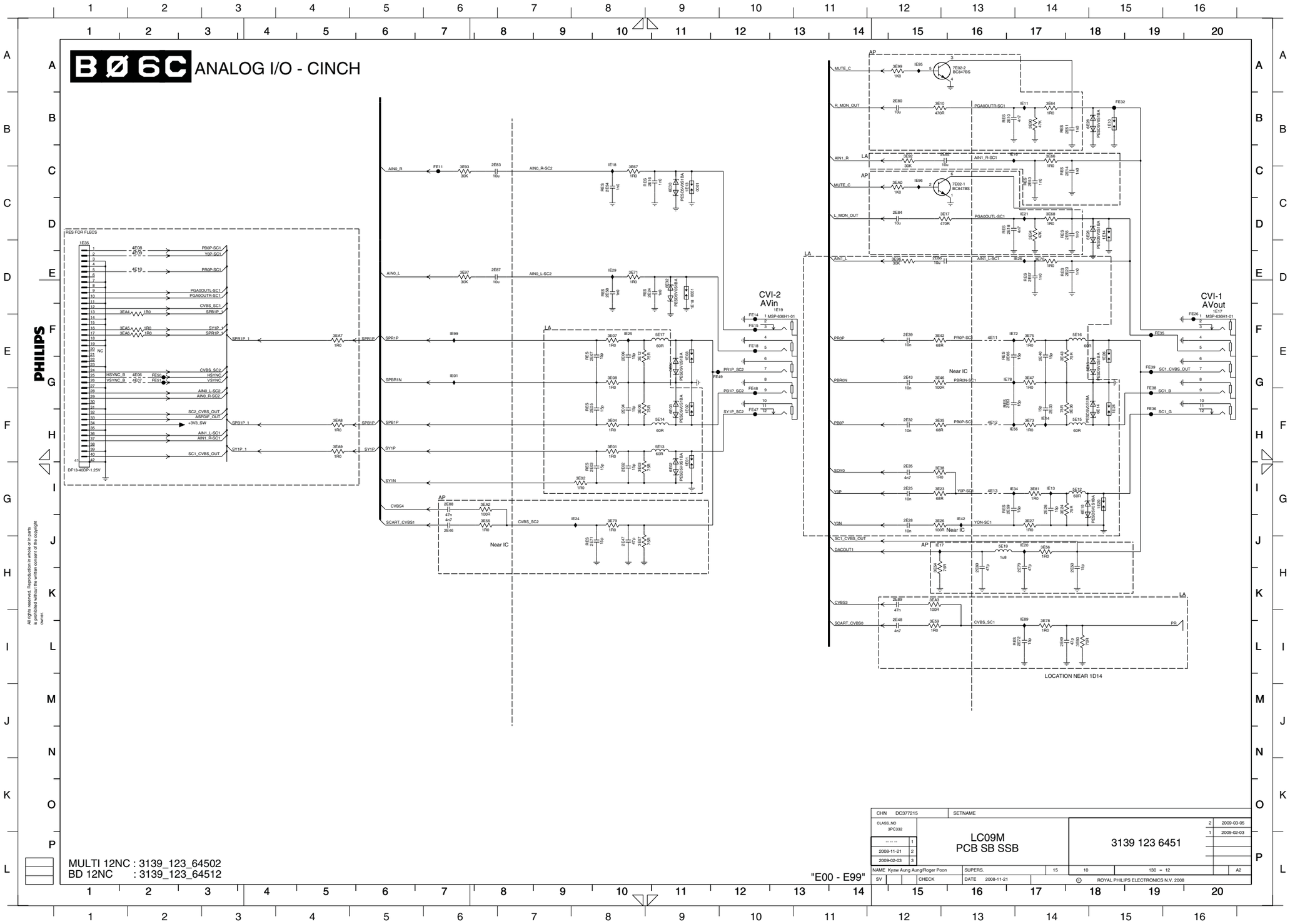
090406

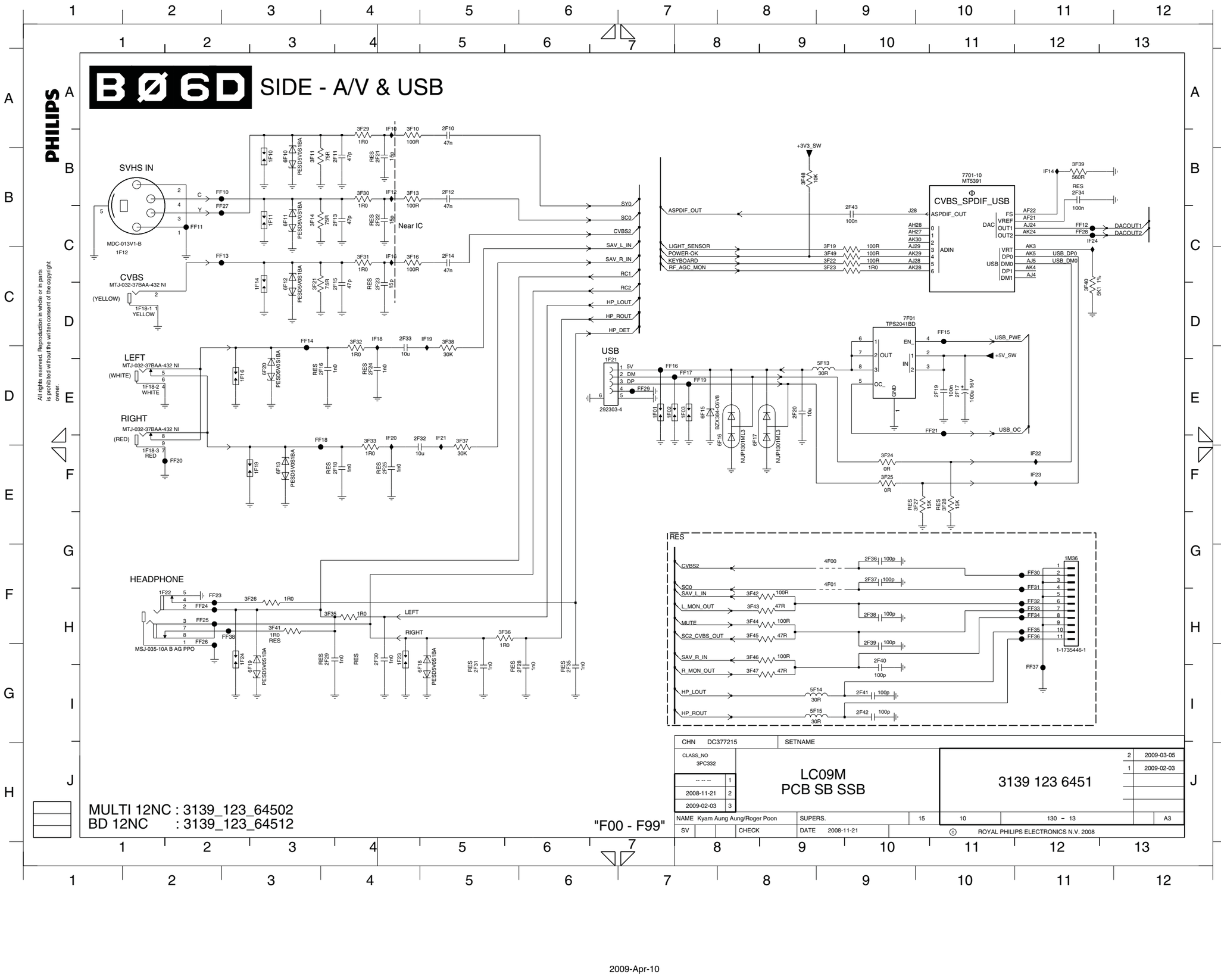
SSB: Analog I/O - Cinch



1E01 F9 FE14 E10
1E02 F9 FE15 E10
1E03 E9 FE18 E10
1E10 B15 FE26 E16
1E13 C9 FE32 B15
1E14 C15 FE35 E15
1E17 D16 FE36 F15
1E18 D9 FE38 F15
1E19 D10 FE39 E15
1E20 G15 FE47 F10
1E24 F15 FE48 F10
1E26 E15 FE49 E9
1E35 D1 FE50 E2
2E02 G8 FE51 E2
2E03 G8 IE01 E6
2E04 F8 IE11 B14
2E05 F8 IE13 G14
2E06 E8 IE14 F14
2E07 E8 IE16 B13
2E10 B13 IE17 H12
2E14 C14 IE18 B8
2E16 C9 IE20 H14
2E18 C13 IE21 C14
2E23 D14 IE24 G8
2E24 D9 IE25 E8
2E25 G12 IE26 D14
2E26 G14 IE29 D8
2E28 G12 IE34 G13
2E32 F12 IE42 G13
2E33 F14 IE56 F13
2E35 G12 IE72 E13
2E39 E12 IE78 E13
2E40 E14 IE89 I14
2E43 E12 IE95 A12
2E46 G6 IE96 C12
2E47 H8 IE99 E6
2E48 I12
2E49 I14
2E50 H14
2E51 B14
2E53 C14
2E54 C8
2E55 C14
2E57 D14
2E58 D8
2E59 G13
2E63 F13
2E65 E13
2E69 H13
2E70 H14
2E71 H8
2E72 I14
2E80 B12
2E82 B13
2E83 B6
2E84 C12
2E86 D12
2E87 D6
2E88 G6
2E89 H12
3E01 F8
3E02 G8
3E03 G8
3E04 F8
3E06 F8
3E07 E8
3E08 E8
3E10 B12
3E12 E8
3E17 C13
3E23 G12
3E24 G14
3E26 G12
3E27 G14
3E35 F12
3E36 F14
3E38 G12
3E42 E12
3E43 E14
3E46 E12
3E47 E14
3E54 H12
3E55 G6
3E56 H14
3E57 H8
3E59 I12
3E60 I14
3E64 B14
3E66 B14
3E67 C8
3E68 C14
3E70 D14
3E71 D8
3E73 F14
3E75 E14
3E78 I14
3E79 G8
3E81 G14
3E90 B14
3E92 B12
3E93 C6
3E94 C14
3E96 D12
3E97 D6
3E99 A12
3EA0 C12
3EA2 G6
3EA3 H12
3EA4 D1
3EA5 E1
3EA6 E1
3EA7 E4
3EA8 F4
3EA9 F4
4E06 E2
4E07 E2
4E08 D2
4E09 D2
4E10 D2
4E11 E13
4E12 F13
4E13 G13
5E12 G14
5E13 F9
5E14 F9
5E15 F14
5E16 E14
5E17 E9
5E19 H13
6E02 G9
6E03 F9
6E04 E9
6E10 G14
6E14 F15
6E16 E15
6E26 C15
6E28 B15
6E30 C9
6E32 D9
7E02-1 C13
7E02-2 A13
FE11 C6

18490_511_090406.eps
090406

SSB: Side - A/V & USB



1F01 D7
1F02 D7
1F03 D7
1F10 A3
1F11 B3
1F12 B2
1F14 C3
1F16 D3
1F18-1 C2
1F18-2 D2
1F18-3 D2
1F19 D3
1F21 D6
1F22 F2
1F23 F4
1F24 F3
1M36 F11
2F10 A5
2F11 A4
2F12 B5
2F13 B4
2F14 B5
2F15 C4
2F16 C4
2F17 D10
2F18 D4
2F19 D10
2F20 D8
2F21 A4
2F22 B4
2F23 C4
2F24 C4
2F25 D4
2F28 F6
2F29 F4
2F30 F4
2F31 F5
2F32 D5
2F33 C4
2F34 B11
2F35 F6
2F36 F9
2F37 F9
2F38 F9
2F39 G9
2F40 G9
2F41 G9
2F42 G9
2F43 B9
3F10 A4
3F11 A3
3F13 B4
3F14 B3
3F16 B4
3F19 C9
3F21 C3
3F22 C9
3F23 C9
3F24 E9
3F25 E9
3F26 F3
3F27 E10
3F28 E10
3F29 A4
3F30 B4
3F31 B4
3F32 C4
3F33 D4
3F35 F4
3F36 F5
3F37 D5
3F38 C5
3F39 B11
3F40 C11
3F41 F3
3F42 F8
3F43 F8
3F44 F8
3F45 F8
3F46 G8
3F47 G8
3F48 B8
3F49 C9
4F00 F9
4F01 F9
5F13 D9
5F14 G9
5F15 G9
6F10 A3
6F11 B3
6F12 C3
6F13 D3
6F15 D7
6F16 D8
6F17 D8
6F18 F5
6F19 F3
6F20 C3
7701-10 B10
7F01 C10
FF10 B3
FF11 B2
FF12 B11
FF13 B3
FF14 C3
FF15 C10
FF16 D7
FF17 D7
FF18 D4
FF19 D7
FF20 D2
FF21 D10
FF23 F2
FF24 F2
FF25 F2
FF26 F2
FF27 B3
FF28 B11
FF29 D7
FF30 F11
FF31 F11
FF32 F11
FF33 F11
FF34 F11
FF35 F11
FF36 F11
FF37 G11
FF38 F3
IF10 A4
IF12 B4
IF14 B11
IF16 B4
IF18 C4
IF19 C5
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IF23 E11
IF24 B11

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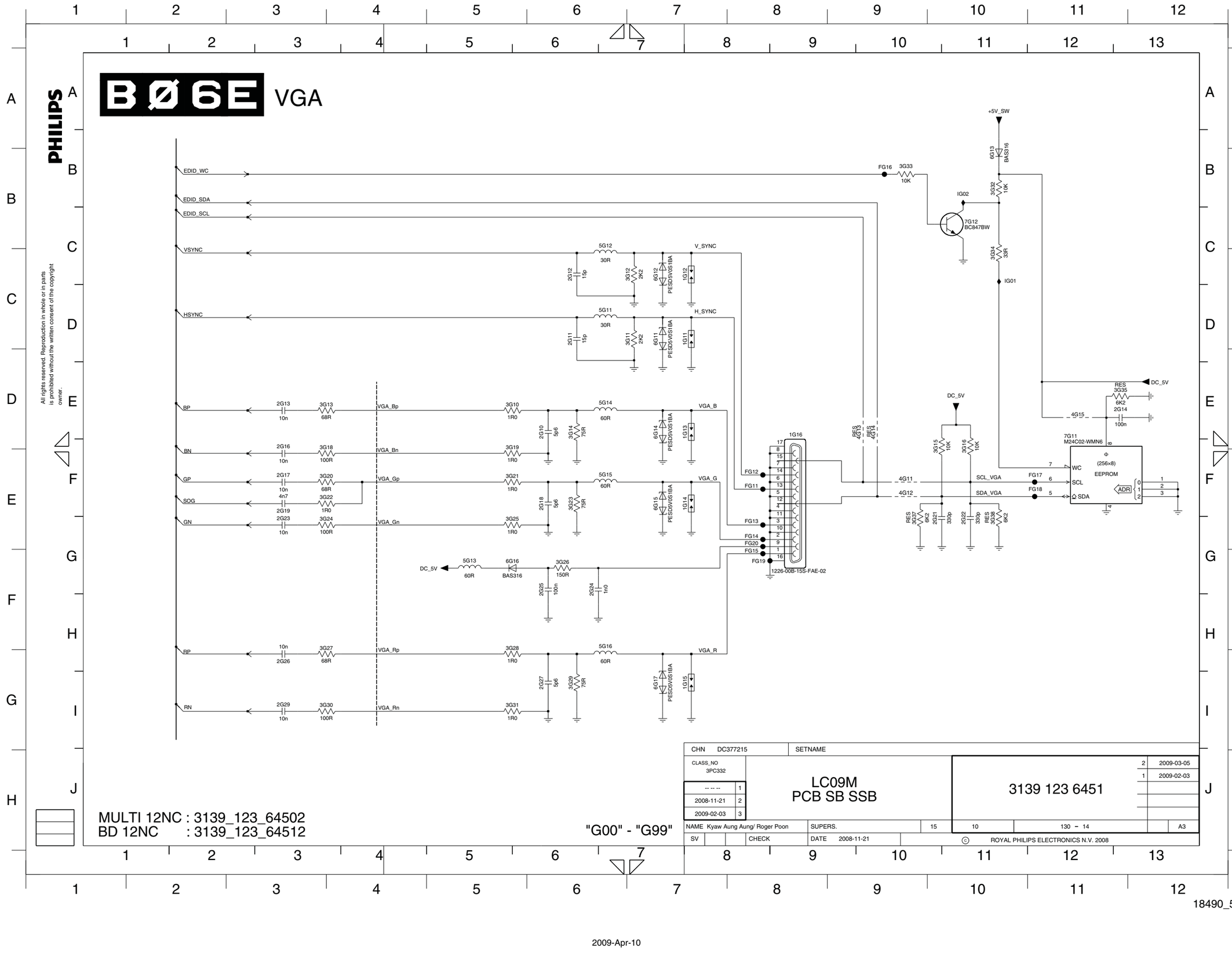
SSB: VGA



CHN DC377215		SETNAME	
CLASS_NO 3PC332		LC09M PCB SB SSB	3139 123 6451
-- -- --	1		2 2009-03-05
2008-11-21	2		1 2009-02-03
2009-02-03	3		
NAME Kyaw Aung Aung/ Roger Poon		SUPERS. 15	10 130 - 14 A3
SV		CHECK	DATE 2008-11-21

MULTI 12NC : 3139_123_64502
BD 12NC : 3139_123_64512

"G00" - "G99"

1G11 C7
1G12 B7
1G13 D7
1G14 E7
1G15 F7
1G16 E8
2G10 D6
2G11 C6
2G12 B6
2G13 D3
2G14 D11
2G16 D3
2G17 D3
2G18 E6
2G19 E3
2G21 E10
2G22 E10
2G23 E3
2G24 F6
2G25 F6
2G26 F3
2G27 F6
2G29 G3
3G10 D5
3G11 C7
3G12 B7
3G13 D4
3G14 D6
3G15 D10
3G16 D10
3G18 D4
3G19 D5
3G20 D4
3G21 D5
3G22 E4
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3G38 E10
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4G12 E9
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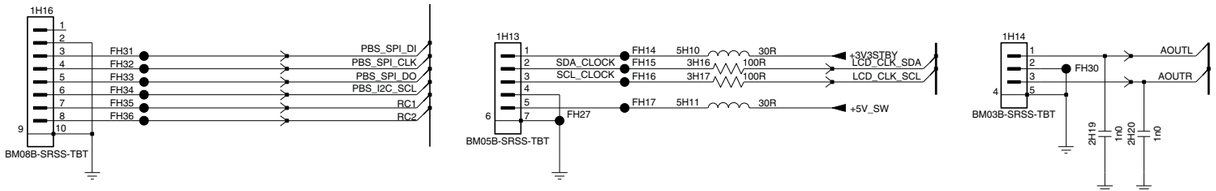
4G14 D9
4G15 D11
5G11 C6
5G12 B6
5G13 E5
5G14 D6
5G15 D6
5G16 F6
6G11 C7
6G12 B7
6G13 A10
6G14 D7
6G15 E7
6G16 E5
6G17 F7
7G11 D11
7G12 B10
FG11 E8
FG12 D8
FG13 E8
FG14 E8
FG15 E8
FG16 A9
FG17 D11
FG18 E11
FG19 E8
FG20 E8
IG01 B10
IG02 B10

18490_513_090406.eps
090406

SSB: BDS iTV

B Ø 7 BDS iTV

PHILIPS



1H11 C1
1H12 C3
1H13 A3
1H14 A6
1H16 A1
2H12 D4
2H13 D5
2H14 D5
2H15 D5
2H19 B7
2H20 B7
2H21 D1
2H22 D2
2H23 D2
2H24 D2
2H25 D2
2H26 D2
2H27 D4
2H28 D4
2H29 D5
3H16 A4
3H17 A4
3H20 D5
3H21 D5
3H22 D5
3H23 D5
3H24 D5
4H10 D6
4H11 D6
4H12 D6
4H13 D6
5H10 A4
5H11 B4
5H12 C5
FH11 D1
FH14 A4
FH15 A4
FH16 A4
FH17 B4
FH18 C4
FH19 C4
FH20 C4
FH21 C4
FH22 D4
FH23 D4
FH24 D4
FH25 D4
FH26 D4
FH27 B4
FH30 A7
FH31 A1
FH32 A1
FH33 A1
FH34 A1
FH35 B1
FH36 B1

MULTI 12NC : 3139_123_64502
BD 12NC : 3139_123_64512

"H00" - "H99"

CHN DC377215		SETNAME	
CLASS_NO 3PC332		LC09M PCB SB SSB	3139 123 6451
-- -- --	1		2 2009-03-05
2008-11-21	2		1 2009-02-03
2009-02-03	3		
NAME Alexi Jebakumar		SUPERS.	15 / 10 / 130 – 15 / A3
SV / CHECK		DATE 2008-11-21	© ROYAL PHILIPS ELECTRONICS N.V. 2008

18490_514_090406.eps
090406

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.
Some of the PWB schematics will use SRP while others will still use the manual 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:

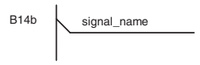
1.2.1. Power Supply Lines

All power supply lines are available in the supply line overview (see chapter 6). In the schematics (see chapter 7) 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:

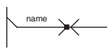
Power supply line.

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
090121

Personal Notes:

SSB: SRP List

Netname	Diagram
+12VDISP	B01 (1×)
+12VDISP	B04D (1×)
+12VS	B01 (5×)
+12VS	B02A (1×)
+12VS	B03 (2×)
+12VS	B04A (1×)
+12VS_1	B01 (2×)
+1V0_SW	B01 (1×)
+1V0_SW	B04A (1×)
+1V2_SW	B01 (1×)
+1V2_SW	B05 (1×)
+1V8_SW	B01 (1×)
+1V8_SW	B04A (1×)
+1V8_SW	B04B (5×)
+24VAUDIO	B01 (1×)
+24VAUDIO	B03 (1×)
+3V3_FLASH	B04C (3×)
+3V3_SW	B01 (1×)
+3V3_SW	B03 (2×)
+3V3_SW	B04A (1×)
+3V3_SW	B04C (24×)
+3V3_SW	B04E (2×)
+3V3_SW	B05 (2×)
+3V3_SW	B06A (2×)
+3V3_SW	B06B (1×)
+3V3_SW	B06C (1×)
+3V3_SW	B06D (1×)
+3V3AN	B06A (3×)
+3V3DN	B06A (14×)
+3V3STBY	B01 (1×)
+3V3STBY	B03 (2×)
+3V3STBY	B04A (9×)
+3V3STBY	B04C (5×)
+3V3STBY	B05 (1×)
+5V_COMBINED	B05 (8×)
+5V_IF	B02A (5×)
+5V_SW	B01 (1×)
+5V_SW	B02A (1×)
+5V_SW	B03 (1×)
+5V_SW	B04C (1×)
+5V_SW	B04D (1×)
+5V_SW	B05 (1×)
+5V_SW	B06D (1×)
+5V_SW	B06E (1×)
+5VS	B02A (5×)
+5VTUN	B02A (2×)
+8V_SW	B01 (1×)
+VDISP	B04D (3×)
+VTUN	B01 (1×)
5V	B06D (1×)
AIN0_L	B06B (1×)
AIN0_L	B06C (1×)
AIN0_L-SC2	B06C (1×)
AIN0_R	B06B (1×)
AIN0_R	B06C (1×)
AIN0_R-SC2	B06C (1×)
AIN1_L	B06B (1×)
AIN1_L	B06C (1×)
AIN1_L-SC1	B06C (1×)
AIN1_R	B06B (1×)
AIN1_R	B06C (1×)
AIN1_R-SC1	B06C (1×)
AMBI_SCL	B04C (1×)
AMBI_SCL	B04E (1×)
AMBI_SCL	B07 (1×)
AMBI_SCL_OUT	B04E (1×)
AMBI_SDA	B04C (1×)
AMBI_SDA	B04E (1×)
AMBI_SDA	B07 (1×)
AMBI_SDA_OUT	B04E (1×)
AOBCK	B03 (1×)
AOBCK	B04C (1×)
AOLRCK	B03 (1×)
AOLRCK	B04C (1×)
AOMCLK	B03 (1×)
AOMCLK	B04C (1×)
AOSDATA0	B03 (1×)
AOSDATA0	B04C (1×)
AOUTL	B03 (3×)
AOUTL	B07 (1×)
AOUTR	B03 (3×)
AOUTR	B07 (1×)
ARX0-	B05 (2×)
ARX0+	B05 (2×)
ARX1-	B05 (2×)
ARX1+	B05 (2×)
ARX2-	B05 (2×)
ARX2+	B05 (2×)
ARX-5V	B04A (1×)
ARX-5V	B05 (2×)
ARXC-	B05 (2×)
ARXC+	B05 (2×)
ARX-DDC-CLK	B05 (2×)
ARX-DDC-DAT	B05 (2×)
ARX-HPD	B05 (2×)
ASPDIF_OUT	B06B (1×)
ASPDIF_OUT	B06C (1×)
ASPDIF_OUT	B06D (1×)
AUDIO_LS_L	B03 (1×)
AUDIO_LS_L	B06B (1×)
AUDIO_LS_R	B03 (1×)
AUDIO_LS_R	B06B (1×)
AV3_L_IN	B06B (1×)
AV3_R_IN	B06B (1×)
BACKLIGHT_BOOST	B01 (1×)
BACKLIGHT_BOOST	B04C (1×)
BACKLIGHT_CONTROL	B04C (1×)
BL_ON_OFF	B01 (1×)
BL_ON_OFF	B04C (1×)
BN	B06B (1×)
BN	B06E (1×)
BOLT_ON_UART_RXD	B04C (1×)
BOLT_ON_UART_RXD	B05 (1×)
BOLT_ON_UART_TXD	B04C (1×)
BOLT_ON_UART_TXD	B05 (1×)
BOOST_CONTROL	B04C (1×)
BP	B06B (1×)
BP	B06E (1×)
BRX0-	B05 (2×)
BRX0+	B05 (2×)
BRX1-	B05 (2×)
BRX1+	B05 (2×)
BRX2-	B05 (2×)
BRX2+	B05 (2×)
BRX-5V	B04A (1×)
BRX-5V	B05 (2×)
BRXC-	B05 (2×)
BRXC+	B05 (2×)
BRX-DDC-CLK	B05 (2×)
BRX-DDC-DAT	B05 (2×)
BRX-HPD	B05 (2×)
CEC	B05 (4×)
CRX0-	B05 (2×)
CRX0+	B05 (2×)
CRX1-	B05 (2×)
CRX1+	B05 (2×)
CRX2-	B05 (2×)
CRX2+	B05 (2×)
CRX-5V	B04A (1×)
CRX-5V	B05 (2×)
CRXC-	B05 (2×)
CRXC+	B05 (2×)
CRX-DDC-CLK	B05 (2×)
CRX-DDC-DAT	B05 (2×)
CRX-HPD	B05 (2×)
CVBS_IN_DTV	B05 (1×)
CVBS_IN_DTV	B06B (1×)
CVBS_RF	B02A (1×)
CVBS_RF	B06B (1×)
CVBS_SC1	B06C (1×)
CVBS_SC2	B06C (1×)
CVBS2	B06B (1×)
CVBS2	B06D (2×)
CVBS3	B06B (1×)
CVBS3	B06C (1×)
CVBS4	B06B (1×)
CVBS4	B06C (1×)
DACOUT1	B06C (1×)
DACOUT1	B06D (1×)
DACOUT2	B06B (1×)
DACOUT2	B06D (1×)
DC_5V	B06E (3×)
DC_PROT	B03 (1×)
DC_PROT	B04C (1×)
DDC_RESET	B04C (1×)
DDC_RESET	B05 (1×)
DDC_RESET	B07 (1×)
DDC-SCL	B04C (1×)
DDC-SCL	B05 (2×)
DDC-SDA	B04C (1×)
DDC-SDA	B05 (2×)
DM	B06D (1×)
DP	B06D (1×)
DRX0-	B05 (2×)
DRX0+	B05 (2×)
DRX1-	B05 (2×)
DRX1+	B05 (2×)
DRX2-	B05 (2×)
DRX2+	B05 (2×)
DRX-5V	B04C (1×)
DRX-5V	B05 (2×)
DRXC-	B05 (2×)
DRXC+	B05 (2×)
DRX-DDC-CLK	B05 (2×)
DRX-DDC-DAT	B05 (1×)
DRX-HPD	B05 (2×)
DTV_IRQ	B04A (1×)
DTV_IRQ	B05 (1×)
DTV_L_IN	B05 (1×)
DTV_L_IN	B06B (1×)
DTV_R_IN	B05 (1×)
DTV_R_IN	B06B (1×)
DVI_AUL_IN	B06B (1×)
DVI_AUR_IN	B06B (1×)
EDID_SCL	B05 (1×)
EDID_SCL	B06E (1×)
EDID_SDA	B05 (1×)
EDID_SDA	B06E (1×)
EDID_WC	B04C (1×)
EDID_WC	B05 (1×)
EDID_WC	B06E (1×)
GN	B06B (1×)
GN	B06E (1×)
GND_CVBS_RF	B02A (1×)
GND_CVBS_RF	B06B (1×)
GNDLAN	B06A (10×)
GNDSND	B01 (2×)
GNDSND	B03 (26×)
GNDTUN	B01 (1×)
GP	B06B (1×)
GP	B06E (1×)
HDMI_CEC	B04A (1×)
HDMI_CEC	B05 (1×)
HDMI_RESET	B04C (1×)
HDMI_RESET	B05 (1×)
HP_DET	B04C (1×)
HP_DET	B06D (1×)
HP_DETECT	B04C (1×)
HP_LOUT	B03 (1×)
HP_LOUT	B06B (1×)
HP_LOUT	B06D (2×)
HP_ROUT	B03 (1×)
HP_ROUT	B06B (1×)
HP_ROUT	B06D (2×)
HSYNC	B06B (1×)
HSYNC	B06C (1×)
HSYNC	B06E (1×)
I2S_SEL1	B04E (1×)
I2S_SEL2	B04E (1×)
IF_ATV	B02A (2×)
IR	B04C (1×)
JTCK	B04C (2×)
JTDI	B04C (2×)
JTDO	B04C (2×)
JTMS	B04C (2×)
JTRST	B04C (2×)
KEYBOARD	B04C (1×)
KEYBOARD	B06D (1×)
L_MON_OUT	B06B (2×)
L_MON_OUT	B06C (1×)
L_MON_OUT	B06D (1×)
LAN-RST	B04C (1×)
LAN-RST	B06A (1×)
LCD_CLK_SCL	B04A (1×)
LCD_CLK_SCL	B07 (1×)
LCD_CLK_SDA	B04A (1×)
LCD_CLK_SDA	B07 (1×)
LCD_PWR_ON	B04C (1×)
LCD_PWR_ON	B04D (1×)
LED1	B04A (1×)
LED1	B04C (1×)
LED2	B04A (1×)
LED2	B04C (1×)
LIGHT_SENSOR	B04C (1×)
LIGHT_SENSOR	B06D (1×)
LVDS_A_TXe0n	B04D (2×)
LVDS_A_TXe0p	B04D (2×)
LVDS_A_TXe1n	B04D (2×)
LVDS_A_TXe1p	B04D (2×)
LVDS_A_TXe2n	B04D (2×)
LVDS_A_TXe2p	B04D (2×)
LVDS_A_TXe3n	B04D (2×)
LVDS_A_TXe3p	B04D (2×)
LVDS_A_TXe4n	B04D (2×)
LVDS_A_TXe4p	B04D (2×)
LVDS_A_TXeCLKn	B04D (2×)
LVDS_A_TXeCLKp	B04D (2×)
LVDS_A_TXo0n	B04D (2×)
LVDS_A_TXo0p	B04D (2×)
LVDS_A_TXo1n	B04D (2×)
LVDS_A_TXo1p	B04D (2×)
LVDS_A_TXo2n	B04D (2×)
LVDS_A_TXo2p	B04D (2×)
LVDS_A_TXo3n	B04D (2×)
LVDS_A_TXo3p	B04D (2×)
LVDS_A_TXo4n	B04D (2×)
LVDS_A_TXo4p	B04D (2×)
LVDS_A_TXoCLKn	B04D (2×)
LVDS_A_TXoCLKp	B04D (2×)
LVDS_B_TXe0n	B04D (2×)
LVDS_B_TXe0p	B04D (2×)
LVDS_B_TXe1n	B04D (2×)
LVDS_B_TXe1p	B04D (2×)
LVDS_B_TXe2n	B04D (2×)
LVDS_B_TXe2p	B04D (2×)
LVDS_B_TXe3n	B04D (2×)
LVDS_B_TXe3p	B04D (2×)
LVDS_B_TXe4n	B04D (2×)
LVDS_B_TXe4p	B04D (2×)
LVDS_B_TXeCLKn	B04D (2×)
LVDS_B_TXeCLKp	B04D (2×)
LVDS_B_TXo0n	B04D (2×)
LVDS_B_TXo0p	B04D (2×)
LVDS_B_TXo1n	B04D (2×)
LVDS_B_TXo1p	B04D (2×)
LVDS_B_TXo2n	B04D (2×)
LVDS_B_TXo2p	B04D (2×)
LVDS_B_TXo3n	B04D (2×)
LVDS_B_TXo3p	B04D (2×)
LVDS_B_TXo4n	B04D (2×)
LVDS_B_TXo4p	B04D (2×)
LVDS_B_TXoCLKn	B04D (2×)
LVDS_B_TXoCLKp	B04D (2×)
LVDS_SELECT	B04C (1×)
LVDS_SELECT	B04D (2×)
MII-COL	B04C (1×)
MII-COL	B06A (1×)
MII-CRS	B04C (1×)
MII-CRS	B06A (1×)
MII-MDC	B04C (1×)
MII-MDC	B06A (1×)
MII-MDINT	B04C (1×)
MII-MDINT	B06A (1×)
MII-MDIO	B04C (1×)
MII-MDIO	B06A (1×)
MII-RXCLK	B04C (1×)
MII-RXCLK	B06A (1×)
MII-RXD(0)	B04C (1×)
MII-RXD(0)	B06A (1×)
MII-RXD(1)	B04C (1×)
MII-RXD(1)	B06A (1×)
MII-RXD(2)	B04C (1×)
MII-RXD(2)	B06A (1×)
MII-RXD(3)	B04C (1×)
MII-RXD(3)	B06A (1×)
MII-RX-DV	B04C (1×)
MII-RX-DV	B06A (1×)
MII-RX-ER	B04C (1×)
MII-RX-ER	B06A (1×)
MII-TXCLK	B04C (1×)
MII-TXCLK	B06A (1×)
MII-TXD(0)	B04C (1×)
MII-TXD(0)	B06A (1×)
MII-TXD(1)	B04C (1×)
MII-TXD(1)	B06A (1×)
MII-TXD(2)	B04C (1×)
MII-TXD(2)	B06A (1×)
MII-TXD(3)	B04C (1×)
MII-TXD(3)	B06A (1×)
MII-TXEN	B04C (1×)
MII-TXEN	B06A (1×)
MUTE	B03 (2×)
MUTE	B06D (1×)
MUTE_C	B03 (1×)
MUTE_C	B06C (2×)
MUTE_M	B03 (1×)
MUTE_M	B06B (2×)
MUTEn	B03 (1×)
MUTEn	B04A (1×)
NAND_PALE	B04C (2×)
NAND_PARB	B04C (2×)
NAND_PCLE	B04C (2×)
NAND_PDD(0)	B04C (3×)
NAND_PDD(1)	B04C (3×)
NAND_PDD(2)	B04C (2×)
NAND_PDD(3)	B04C (2×)
NAND_PDD(4)	B04C (2×)
NAND_PDD(5)	B04C (2×)
NAND_PDD(6)	B04C (2×)
NAND_PDD(7)	B04C (2×)
NAND_POCE	B04C (2×)
NAND_POOE	B04C (3×)
NAND_POWE	B04C (2×)
OFF_MUTE	B03 (1×)
OFF_MUTE	B06B (1×)
PB0P	B06B (1×)
PB0P	B06C (1×)
PB0P-SC1	B06C (1×)
PB1P	B06B (1×)
PBR0N	B06B (1×)
PBR0N	B06C (1×)
PBR1N	B06B (1×)
PBS_I2C_SCL	B04C (1×)
PBS_I2C_SCL	B07 (1×)
PBS_SPI_CLK	B04C (1×)
PBS_SPI_CLK	B07 (1×)
PBS_SPI_DI	B04C (1×)
PBS_SPI_DI	B07 (1×)
PBS_SPI_DO	B04C (1×)
PBS_SPI_DO	B07 (1×)
PGA0OUTL-SC1	B06C (1×)
PGA0OUTR-SC1	B06C (1×)
POWER_DOWN	B03 (1×)
POWER_DOWN	B04A (2×)
POWER-OK	B01 (1×)
POWER-OK	B06D (1×)
PR0P	B06B (1×)
PR0P	B06C (1×)
PR0P-SC1	B06C (1×)
PR1P	B06B (1×)
PWM_DIMMING	B01 (1×)
PWM_DIMMING	B04C (1×)
R_MON_OUT	B06B (2×)
R_MON_OUT	B06C (1×)
R_MON_OUT	B06D (1×)
RC1	B04C (1×)
RC1	B06D (1×)
RC1	B07 (2×)
RC2	B04C (1×)
RC2	B06D (1×)
RC2	B07 (1×)
RF_AGC	B02A (2×)
RF_AGC_MON	B02A (1×)
RF_AGC_MON	B06D (1×)
RJLED_G	B06A (1×)
RJLED_Y	B06A (1×)
RN	B06B (1×)
RN	B06E (1×)
RP	B06B (1×)
RP	B06E (1×)
RX0-	B05 (2×)
RX0+	B05 (2×)
RX1-	B05 (2×)
RX1+	B05 (2×)
RX2-	B05 (2×)
RX2+	B05 (2×)
RXC-	B05 (2×)
RXC+	B05 (2×)
S0Y1	B06B (1×)
SAV_L_IN	B06B (1×)
SAV_L_IN	B06D (2×)
SAV_R_IN	B06B (1×)
SAV_R_IN	B06D (2×)
SAW_SW	B02A (1×)
SAW_SW	B04C (1×)
SC0	B06B (1×)
SC0	B06D (2×)
SC1_AOUTL	B07 (1×)
SC1_AOUTR	B07 (1×)
SC1_B	B06C (1×)
SC1_B	B07 (1×)
SC1_CVBS_OUT	B06C (2×)
SC1_CVBS_OUT	B07 (2×)
SC1_FB	B06B (1×)
SC1_FB	B07 (1×)
SC1_G	B06C (1×)
SC1_G	B07 (1×)
SC2_CVBS_OUT	B06B (1×)
SC2_CVBS_OUT	B06C (1×)
SC2_CVBS_OUT	B06D (1×)
SCART_CVBS0	B06B (1×)
SCART_CVBS0	B06C (1×)
SCART_CVBS1	B06B (1×)
SCART_CVBS1	B06C (1×)
SCL	B04C (3×)
SCL	B04D (1×)
SCL	B05 (1×)
SCL	B07 (1×)
SDA	B04C (3×)
SDA	B04D (1×)
SDA	B05 (1×)
SDA	B07 (1×)
SENSE+1V0_MT5392	B01 (1×)
SERIAL_PDD0	B04C (1×)
SERIAL_POCE	B04C (2×)
SIF_OUT	B02A (1×)
SIF_OUT	B06B (1×)
SIF_OUT_GND	B02A (1×)
SIF_OUT_GND	B06B (1×)
SIF1	B02A (2×)
SIF2	B02A (2×)
SOG	B06B (1×)
SOG	B06E (1×)
SOY0	B06B (1×)
SOY0	B06C (1×)
SPB1P	B06B (1×)
SPB1P	B06C (2×)
SPB1P_1	B06B (1×)
SPB1P_1	B06C (2×)
SPBR1N	B06B (1×)
SPBR1N	B06C (1×)
SPDIF_IN	B04C (1×)
SPDIF_IN	B05 (1×)
SPR1P	B06B (1×)
SPR1P	B06C (2×)
SPR1P_1	B06B (1×)
SPR1P_1	B06C (2×)
STANDBY	B01 (1×)
STANDBY	B04A (1×)
STANDBY	B07 (1×)
STANDBYn	B03 (1×)
STANDBYn	B04A (1×)
SW_MUTE	B03 (1×)
SW_MUTE	B04A (1×)
SY0	B06B (1×)
SY0	B06D (1×)
SY1N	B06B (1×)
SY1N	B06C (1×)
SY1P	B06B (1×)
SY1P	B06C (2×)
SY1P_1	B06B (1×)
SY1P_1	B06C (2×)
TPIM	B06A (2×)
TPIP	B06A (2×)
TPOM	B06A (2×)
TPOP	B06A (2×)
TUNER_SCL	B02A (2×)
TUNER_SCL	B04A (1×)
TUNER_SDA	B02A (2×)
TUNER_SDA	B04A (1×)
UART_RX	B04C (3×)
UART_TX	B04C (3×)
USB_OC	B04C (1×)
USB_OC	B06D (1×)
USB_PWE	B04C (1×)
USB_PWE	B06D (1×)
VDD	B03 (2×)
VDDA	B03 (2×)
VDDO_3V3	B05 (3×)
VIF1	B02A (2×)
VIF2	B02A (2×)
VSYNC	B06B (1×)
VSYNC	B06C (1×)
VSYNC	B06E (1×)
Y0N	B06B (1×)
Y0N	B06C (1×)
Y0P	B06B (1×)
Y0P	B06C (1×)
Y0P-SC1	B06C (1×)
Y1N	B06B (1×)
Y1P	B06B (1×)

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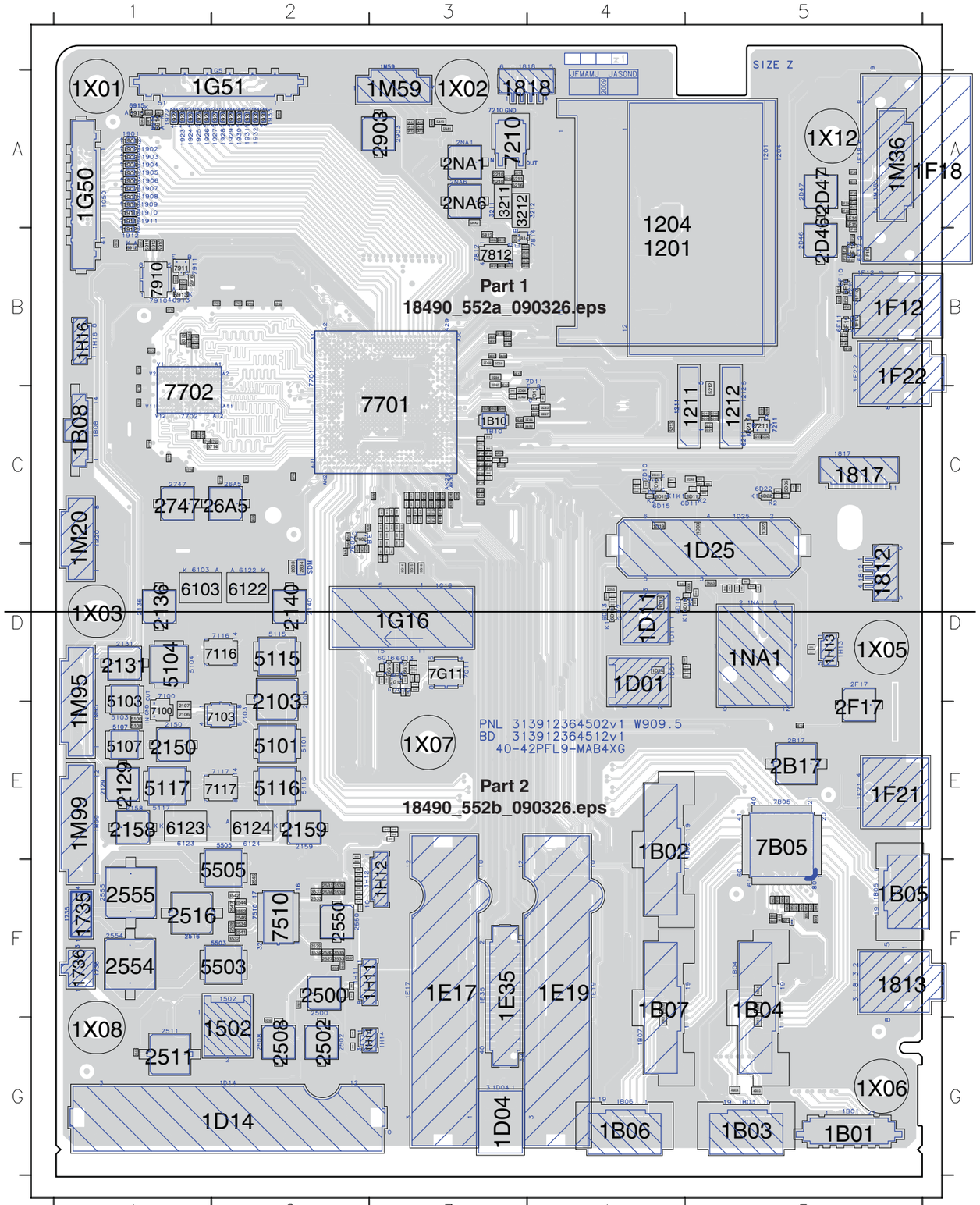
Layout Small Signal Board (Overview top side)



1201	B5	2903	A3	3826	B3	4B17	G5
1204	A4	2904	A2	3829	B3	4F00	C3
1211	C4	2916	B1	3830	B3	4F01	C3
1212	C5	2918	B1	3831	B3	4G15	D3
1502	G2	2A12	A3	3832	B3	4H10	E3
1735	F1	2A13	A3	3833	B3	4H11	E3
1736	F1	2A14	A3	3836	B3	4H12	E3
1812	D5	2B17	F5	3839	B3	4H13	E3
1813	F5	2B29	C3	3893	B3	5100	E1
1817	C5	2B48	C3	3894	B3	5101	E2
1818	A3	2D10	C3	3896	D2	5103	D1
1901	A1	2D11	C3	38A5	D2	5104	D1
1902	A1	2D12	C3	38A6	D2	5107	F1
1903	A1	2D15	C3	38A7	C2	5108	E1
1904	A1	2D16	C3	38A8	C3	5115	D2
1905	A1	2D17	C3	3912	B1	5116	E2
1906	A1	2D18	C3	3913	B1	5117	E1
1907	A1	2D19	C3	3914	B1	5210	A3
1908	A1	2D21	C3	3915	B1	5211	A3
1909	A1	2D27	D4	3916	A1	5212	C5
1910	A1	2D30	C3	3917	A1	5213	C4
1911	A1	2D31	C3	3A12	A3	5216	A3
1912	B1	2D33	D5	3A13	A3	5503	F2
1922	A1	2D34	C5	3A18	A3	5505	F2
1923	A1	2D35	C4	3A19	A3	5712	B1
1924	A1	2D36	D4	3B19	F5	5713	C3
1925	A1	2D38	D5	3B20	F5	5812	C3
1926	A1	2D39	D4	3B22	C3	5910	B1
1927	A2	2D46	B5	3B46	F5	5911	B1
1928	A2	2D47	B5	3B47	F5	5913	B1
1929	A2	2D48	B5	3B50	F5	5A10	A3
1930	A2	2D49	C4	3B51	F5	5D05	C5
1931	A2	2D54	D5	3B52	F5	5F14	A5
1932	A2	2D55	D5	3B53	F5	5G13	A3
1933	A2	2D56	D5	3B54	F5	5G13	D3
1B01	G5	2D57	C5	3B55	F5	5G14	D3
1B02	F4	2D58	C4	3B56	F5	5G15	D3
1B03	F5	2D59	C4	3B57	F5	5G16	D3
1B04	G5	2D60	C4	3B59	F5	5NA1	A3
1B05	F5	2D62	C3	3B68	F5	5NA2	A3
1B06	G4	2D63	C3	3B69	F5	5NA3	D5
1B07	F4	2D64	C3	3B70	F5	6103	D1
1B08	C1	2D67	C3	3B71	F5	6122	D2
1B10	C3	2D68	B3	3D10	C3	6123	F1
1D01	D4	2D69	B3	3D12	C3	6124	F2
1D03	C3	2D71	D4	3D14	C3	6211	C5
1D04	C3	2D72	C5	3D16	C3	6912	B1
1D11	D4	2D73	C5	3D19	C3	6913	B1
1D13	D4	2D74	C5	3D22	C3	6G14	A1
1D14	C2	2E25	C3	3D23	C4	6H15	A1
1D19	C4	2E28	C3	3D24	D4	6B08	F5
1D22	C5	2E32	C3	3D25	C4	6D10	D4
1D24	D4	2E34	C3	3D26	C5	6D11	C5
1D25	D3	2E35	C3	3D27	C4	6D13	D4
1E17	F3	2E43	C3	3D29	C3	6D15	C4
1E19	F4	2E46	C3	3D30	D4	6D22	C5
1E35	F3	2E48	B3	3D32	D4	6F10	B5
1F10	B5	2E80	C3	3D43	C5	6F11	B5
1F11	B5	2E82	C3	3D44	C4	6F12	B5
1F12	B5	2E83	C4	3D45	D4	6G13	D3
1F14	B5	2E84	B3	3D46	D4	6G16	D3
1F16	C3	2E86	C3	3D47	C5	7100	E1
1F21	F5	2E87	C4	3D48	C4	7103	F2
1F22	B5	2E88	C3	3D49	C4	7116	D2
1G16	D3	2E89	C3	3D50	C4	7117	F2
1G50	A1	2F10	C3	3D51	C4	7210	A3
1G51	A2	2F11	B5	3D53	C3	7211	C5
1H11	F2	2F12	C3	3D54	C3	7510	F2
1H12	F3	2F13	B5	3D55	C5	7602	C2
1H13	D5	2F14	C3	3D56	C5	7701	C3
1H14	C2	2F15	B5	3E10	B3	7702	C1
1H16	B1	2F17	D5	3E17	B3	7812	B3
1M20	C1	2F19	B5	3E23	C3	7814	B3
1M36	A5	2F21	B5	3E26	C3	7910	B1
1M59	A3	2F22	B5	3E35	C3	7911	B1
1M95	E1	2F23	B5	3E38	C3	7B05	E5
1M99	E1	2F36	A5	3E42	C3	7D10	C4
1NA1	D5	2F37	A5	3E46	C3	7D11	C4
2103	D2	2F38	A5	3E54	C3	7G11	D3
2106	E1	2F39	A5	3E55	C3	7G12	D3
2107	E1	2F40	A5	3E59	C3	9NA2	D5
2129	E1	2F41	B5	3EG2	C3		
2131	D1	2F42	B5	3EG3	C4		
2136	D1	2F43	B3	3EQ6	C3		
2140	D2	2G10	D3	3EQ7	C4		
2150	E1	2G13	C3	3EA2	C3		
2158	F1	2G14	D3	3EA3	C3		
2159	E2	2G16	C3	3F10	C3		
2210	A3	2G17	C3	3F11	B5		
2211	A3	2G18	D3	3F13	B5		
2219	A3	2G19	C3	3F14	B5		
2221	C5	2G21	D3	3F16	C3		
2500	F2	2G22	D3	3F19	C3		
2501	F2	2G23	D3	3F21	B5		
2502	G2	2G24	D3	3F23	C3		
2508	G2	2G25	D3	3F29	B5		
2509	G2	2G26	C3	3F30	B5		
2511	G2	2G27	C3	3F31	B5		
2516	F1	2G29	C3	3F44	A5		
2527	F2	2H12	F2	3F45	A5		
2528	F2	2H13	F2	3F47	A5		
2529	F2	2H14	F2	3F48	C3		
2530	F2	2H15	F2	3F49	C3		
2531	F2	2H19	G2	3G10	D3		
2533	F2	2H20	F2	3G13	D3		
2534	F2	2H21	F2	3G14	D3		
2536	F2	2H22	F2	3G15	D3		
2541	F2	2H27	F2	3G16	D3		
2544	F2	2H28	F2	3G18	D3		
2545	F2	2H29	F2	3G19	C3		
2546	F2	2NA1	A3	3G20	C3		
2547	F2	2NA6	A3	3G21	C3		
2550	F2	2NAA	D5	3G22	C3		
2552	F2	2NAB	D5	3G23	D3		
2554	F1	2NAC	D5	3G24	C3		
2555	F1	2NAD	D5	3G25	C3		
2566	C2	3211	A3	3G26	D3		
2567	F2	3212	A3	3G27	C3		
2626	C2	3219	C5	3G28	C3		
2645	C2	3221	C5	3G29	C3		
2741	B1	3222	C5	3G30	C3		
2742	B1	3223	C5	3G31	C3		
2745	C1	3226	C5	3G32	D3		
2747	C1	3511	F2	3G33	D3		
2750	C2	3512	F2	3G34	D3		
2753	C1	3533	F2	3G35	D3		
2760	B2	3534	F2	3G37	D3		
2765	B2	3535	F2	3G38	D3		
2769	B2	3536	F2	3H16	D5		
2770	B2	3537	F2	3H17	D5		
2771	B1	3538	F2	3H20	F2		
2772	B1	3542	F2	3H21	F2		
2773	B1	3558	F2	3H22	F2		
2774	C1	3600	D2	3H23	F2		
2775	C1	3601	D2	3H24	F2		
2776	C2	3602	D2	3NAD	D5		
2777	C1	3606	B3	3NAE	D5		
2778	C1	3607	B3	4204	C5		
2779	C2	3608	C2	4205	C5		
2780	C2	3710	B1	4206	C5		
2813	B3	3712	B1	4211	C5		
2822	B3	3714	C1	4B01	G4		
2823	B3	3715	C1	4B02	F4		
2833	D2	3719	B1	4B03	G5		
2834	D2	3721	C1	4B04	G5		
2901	A1	3813	B3	4B11	F5		
2902	A1	3818	B3	4B16	F5		

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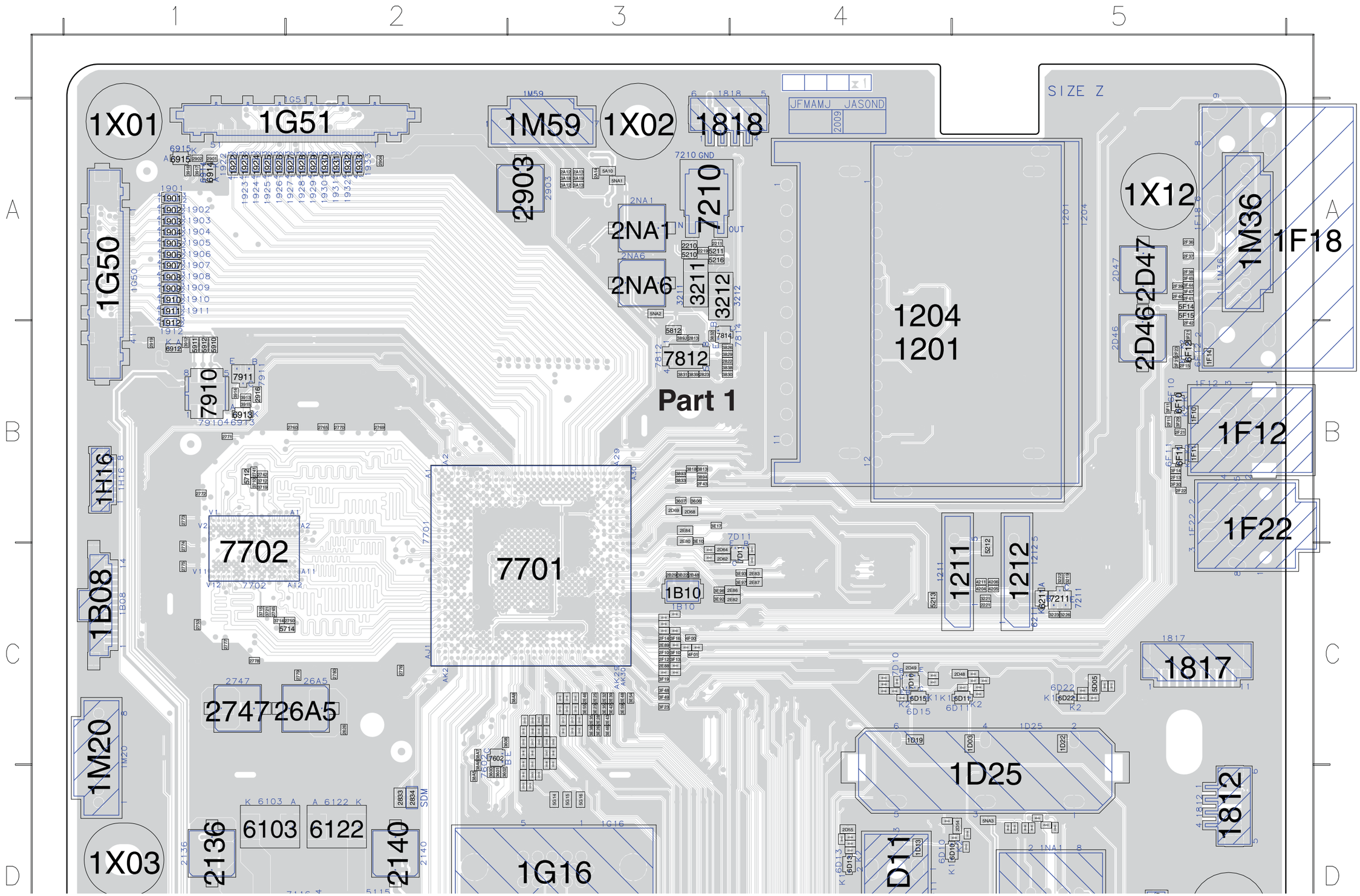
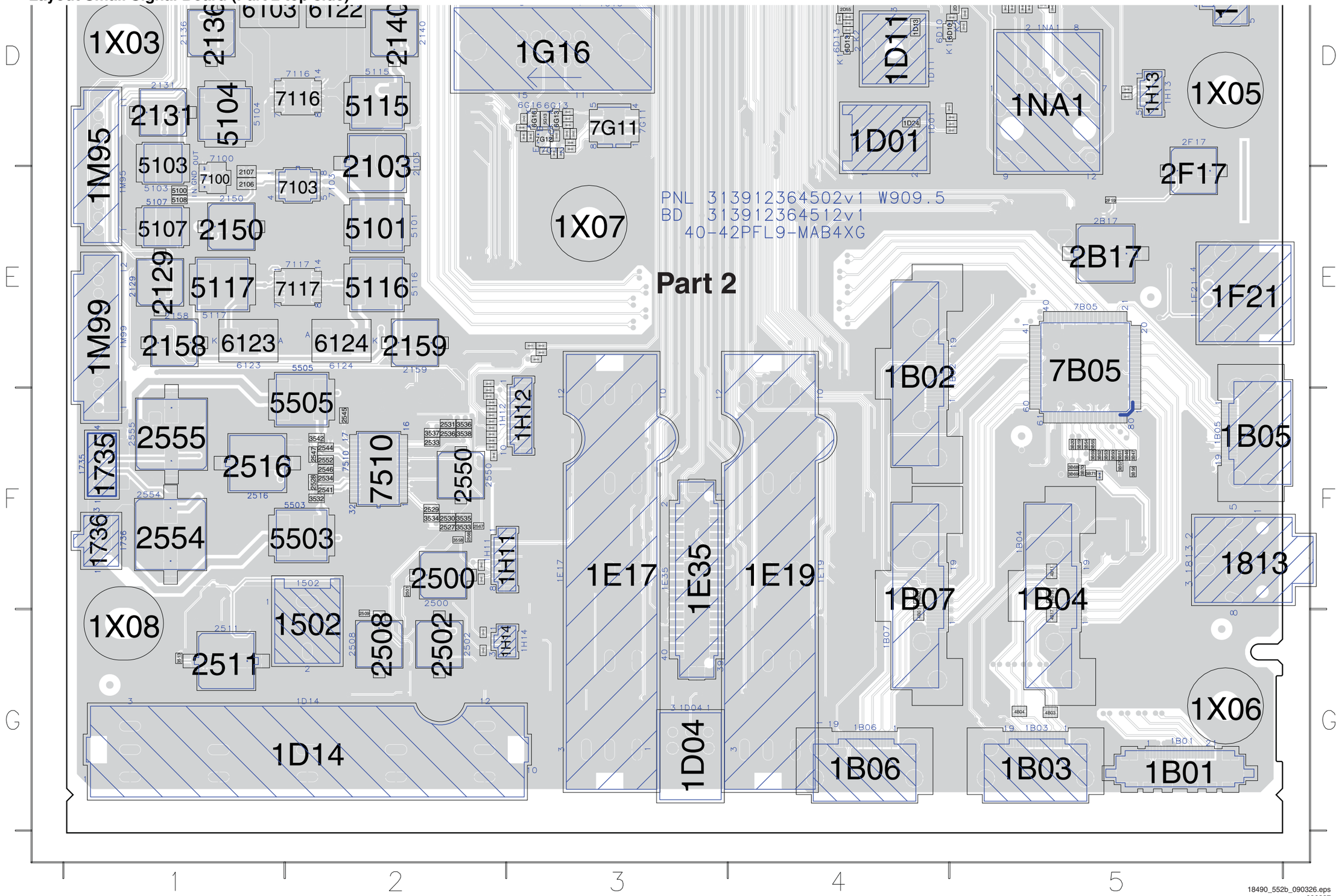
Layout Small Signal Board (Part 1 top side)



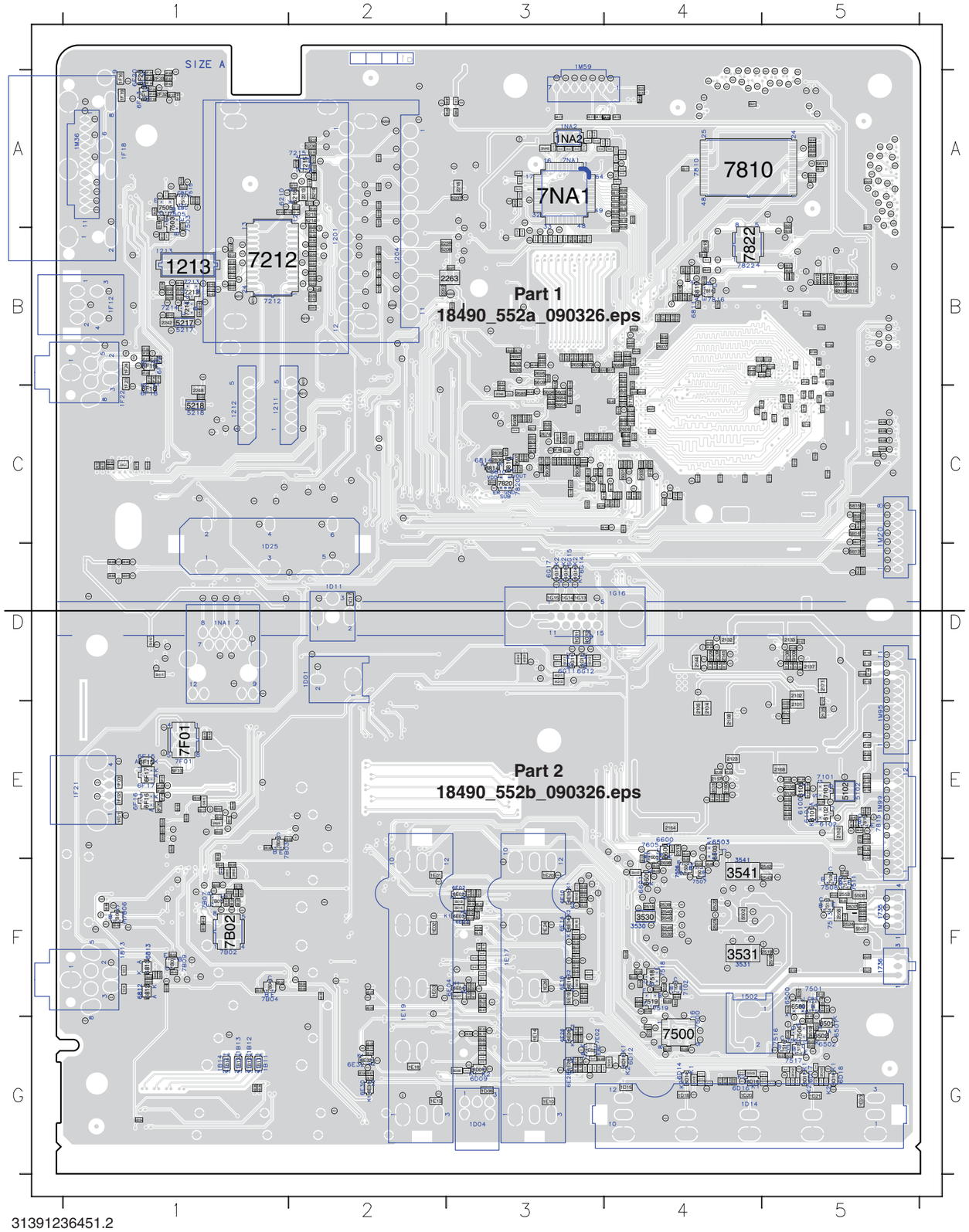
18490_552a_090326.eps
090627

Layout Small Signal Board (Part 2 top side)



18490_552b_090326.eps
090327

Layout Small Signal Board (Overview bottom side)



1213	B1	2549	F4	2754	B4	3217	A2	3888	D1	3NAJ	A4	6813	F1
5217	B1	2550	F5	2755	C4	3228	B2	3889	D1	3NAK	A4	6814	C3
5814	F1	2556	F5	2756	B5	3230	A2	3890	D1	3NAL	A4	6B07	F1
5811	G1	2559	F5	2757	C5	3231	B1	3891	D1	3NAM	A3	6D09	G3
5812	G1	2560	F5	2758	C5	3232	A1	3892	C4	3NAN	A3	6D12	G4
5813	G1	2561	F5	2759	B4	3234	B1	3897	D5	3NAP	A3	6D14	G4
5814	G1	2562	F5	2761	C4	3235	B1	3898	A5	3NAQ	A3	6D16	G4
5008	G3	2563	F5	2762	C5	3236	B1	3899	A5	3NAR	A4	6D17	G5
5015	G4	2564	F5	2763	C5	3238	B2	389A	A5	3NAT	A4	6D18	G5
5017	G2	2565	F5	2764	B5	3240	B2	389B	B5	3NAU	A4	6E02	F3
5018	G4	2566	F4	2765	B5	3241	B2	389C	B4	3NAV	A4	6E03	F3
5020	G4	2569	F4	2767	B5	3242	B1	389D	A3	3NAW	A4	6E04	F3
5021	G5	2600	B4	2768	B5	3243	B1	389F	A2	3NAY	A4	6E10	F3
5023	G5	2601	B4	2810	B4	3244	B2	389G	B4	3NB1	A3	6E14	F3
5501	F1	2602	C4	2811	A4	3245	B2	389H	A4	3NB2	A3	6E16	F3
5502	F2	2603	C4	2812	A5	3246	B2	389I	C4	3NB3	A3	6E26	G3
5503	F2	2604	C4	2815	C5	3247	B2	389K	B4	3NB4	A4	6E28	G3
5504	G2	2605	B4	2819	C5	3254	A1	389L	B4	3NB5	B3	6E30	G2
5505	G2	2607	B4	2817	C5	3254	A1	38A1	B3	4 100	B2	6E32	G2
5514	G3	2607	B4	2818	C5	3255	B1	38A2	B4	4101	F5	6F13	A1
5518	G2	2608	C4	2819	D5	3256	B1	38A3	A3	4102	B4	6F15	F1
5519	G2	2609	B4	2820	D5	3261	B3	38A4	A2	4207	B2	6F16	F1
5241	F3	2610	B4	2821	D5	3262	A2	38A9	C3	4208	A2	6F17	F1
5261	F3	2611	B4	2824	E5	3500	F4	3A10	A4	4209	B2	6F18	C1
5F01	E1	2612	C3	2826	B4	3501	G4	3A11	A3	4210	A2	6F19	B1
5F02	E1	2613	C3	2827	C3	3507	C4	3A14	A4	4214	B1	6F20	A1
5F05	F1	2614	C3	2835	C3	3507	C4	3A15	A4	4502	F5	6G11	D3
5F16	A1	2615	C4	2836	C3	3508	G4	3A16	A4	4601	C4	6G12	D3
5F19	A1	2616	C4	2837	C4	3509	F4	3A17	A3	4602	C4	6G14	D3
5F23	C1	2617	B4	2917	B5	3510	G5	3B10	F1	4603	C4	6G15	D3
5F24	B1	2618	B4	2920	A5	3511	G5	3B11	F1	4800	A3	6G17	D3
G11	D3	2619	B4	2921	A4	3512	F5	3B24	C3	4802	B3	7101	E5
G12	D3	2620	B4	2A10	A4	3514	F5	3B32	F1	4803	B3	7102	F4
G13	D3	2621	B4	2A11	A3	3515	F5	3B33	F1	4804	A4	7213	B1
G14	D3	2622	B4	2A11	E1	3516	B1	3B34	F1	4805	A4	7214	B1
G15	D3	2623	B3	2B16	F1	3517	F5	3B35	F1	4806	A4	7214	B1
1NA2	A3	2624	B4	2B24	F1	3519	G5	3B36	F1	4807	A4	7215	A2
2100	E5	2625	C3	2B25	F1	3520	G5	3B37	F1	4808	B4	7500	G5
2101	E5	2626	C3	2B26	F1	3521	G5	3B38	F1	4809	B4	7501	F5
2102	D5	2628	B4	2B50	F1	3523	G5	3B39	F1	4810	B3	7503	A1
2104	E4	2629	C4	2B51	F1	3524	A1	3B40	F1	4811	B3	7504	G5
2105	E4	2630	B4	2D13	G3	3525	A1	3B41	F1	4812	A4	7505	A1
2108	E4	2631	B4	2D14	G3	3526	F4	3B43	F1	4813	A4	7506	F4
2109	E5	2632	C3	2D20	G4	3527	F4	3B44	F1	4814	A4	7507	F4
2110	E5	2633	C3	2D22	G5	3528	F4	3B45	F1	4815	A4	7508	F5
2111	D5	2634	B4	2D25	G5	3529	F4	3B48	F1	4816	A4	7511	F5
2112	D5	2635	B4	2D28	G5	3530	F4	3B49	F1	4817	A4	7515	F5
2113	D5	2636	C4	2D29	G5	3531	F4	3B58	F1	4818	A4	7515	A1
2114	D5	2637	C4	2D40	G5	3540	F4	3B60	F1	4819	A4	7516	G5
2115	D5	2638	C4	2D41	G5	3544	F4	3B61	F1	4820	B3	7517	G5
2116	D5	2639	C4	2D50	G5	3544	F4	3B62	F1	4822	B3	7518	G5
2118	E5	2640	C4	2D51	G4	3548	F5	3B63	F1	4910	B5	7519	F4
2119	E5	2641	C4	2D52	G5	3549	F5	3B64	F1	4911	B5	7605	E4
2120	E5	2642	C4	2D53	G5	3550	F5	3B65	F1	4912	B5	7810	A4
2122	E5	2643	C4	2D60	G5	3552	A1	3B66	F1	4913	B5	7815	F5
2122	E5	2644	C3	2D65	G5	3553	A1	3B67	F1	4914	B5	7816	B4
2123	E4	2645	C4	2D66	G3	3554	A1	3B72	F1	4915	B5	7820	C3
2124	E5	2646	B3	2D70	G3	3555	A1	3B73	F1	4916	B5	7822	B4
2125	E5	2647	C3	2D71	G5	3556	A1	3B75	F1	4917	B5	7B02	F4
2127	E5	2648	B3	2E03	F3	3557	G5	3B76	F1	4918	B5	7B03	F1
2128	E5	2649	C3	2E04	F3	3559	F4	3D11	G3	4818	F1	7B04	F1
2131	D4	2650	C3	2E05	F3	3560	F4	3D13	G3	4828	C2	7B06	F1
2133	D4	2651	C3	2E06	F3	3561	F4	3D15	G4	4829	C2	7B07	F1
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2137	D5	2654	C3	2E14	G3	3564	F4	3D20	G5	4835	G1	7F01	F1
2138	D5	2655	C4	2E16	G2	3565	F4	3D21	G5	4836	G1	7NA1	A3
2139	D4	2656	C4	2E18	G5	3566	G5	3D28	G3	4837	F2	9NA3	A3
2141	D4	2657	C4	2E23	G3	3603	C3	3D33	G5	4838	F2		
2142	D4	2658	C3	2E24	G2	3604	C3	3D34	G5	4839	F2		
2144	D4	2659	C3	2E26	F3	3605	C4	3D35	G5	4840	F1		
2152	E4	2660	C4	2E33	F3	3606	C3	3D36	G5	4900	C3		
2153	E4	2661	C4	2E40	F3	3610	C3	3D41	B1	4E06	F2		
2154	E5	2662	B3	2E47	F3	3611	C4	3D42	A1	4E07	F2		
2155	E4	2663	B4	2E49	G4	3612	C3	3D52	G3	4E08	F3		
2156	E5	2664	C4	2E50	F3	3613	C3	3D57	G3	4E09	F3		
2157	E4	2665	C4	2E51	G3	3614	C3	3D58	F3	4E10	F3		
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2161	E4	2667	B3	2E54	G2	3617	C3	3E01	F3	4E12	F3		
2162	E5	2668	B4	2E55	G2	3618	C3	3E02	F3	4E13	F3		
2163	E5	2669	C3	2E57	G3	3619	C3	3E03	F3	4G11	D3		
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2166	D4	2672	C3	2E63	F3	3623	E4	3E07	F3	4G14	D3		
2167	D5	2673	B3	2E65	F3	3624	E4	3E08	F3	5102	E5		
2168	E5	2674	B3	2E69	F3	3625	C3	3E12	F3	5206	A2		
2169	D5	2675	B3	2E70	F3	3626	C3	3E24	F3	5207	A3		
2171	D5	2676	B3	2E71	F3	3711	C5	3E27	F3	5208	A2		
2200	B2	2677	C3	2E72	G4	3713	C4	3E36	F3	5214	A2		
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2214	A2	2680	C3	2E20	E5	3718	B4	3E56	F3	5218	C1		
2215	A2	2681	C3	2E24	A1	3720	B4	3E57	F3	5219	A2		
2216	A2	2682	C3	2E25	A1	3722	C4	3E60	G4	5502	F4		
2218	A3	2683	C3	2E28	B1	3723	B4	3E64	G3	5503	F5		
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2226	A2	2685	C3	2E30	B1	3810	F1	3E67	G2	5600	C3		
2228	B1	2686	C3	2E31	B1	3811	F1	3E68	G3	5601	C4		
2229	B1	2687	C3	2E32	A1	3812	C4	3E70	G3	5602	C4		
2230	B1	2688	C3	2E33	A1	3814	C4	3E72	F3	5603	C3		
2231	B1	2689	C3	2E34	C3	3816	B5	3E73	F3	5604	C3		
2232	B1	2690	C3	2E35	B1	3820	A5	3E75	F3	5605	C3		
2233	B1	2691	C3	2E11	D3	3821	B4	3E78	G4	5606	C3		
2235	B2	2692	B3	2H23	F3	3822	B4	3E79	F3	5607	C3		
2236	B2	2693	B3	2H22	F3	3823	C3	3E81	F3	5608	C3		
2237	B2	2694	B3	2H24	F3	3824	C5	3E90	G3	5609	B3		
2240	B1	2695	B3	2H25	F3	3825	D5	3E94	G3	5610	B3		
2241	B1	2696	B3	2H26	F3	3827	C4	3E95	G3	5713	C4		
2242	B1	2697	B3	2NA2	A3	3828	C5	3E40	G3	5810	B4		
2243	B2	2698	F4	2NA3	A3	3834	A5	3EA4	F3	5811	A5		
2244	B1	2699	C4	2NA4	A3	3835	C5	3EA5	F3	5813	D5		
2245	B2	26A0	B3	2NA5	A3	3837	C5	3EA6	F3	5814	C5		
2246	B2	26A1	B3	2NA7	B3	3840	F5	3EA7	F3	5815	C5		
2247	B1	26A2	C3	2NA8	B3	3841	F5	3EA8	F3	5A14	A4		
2248	C1	26A3	C3	2NA9	A4	3842	F5	3EA9	F3	5A16	A4		
2249	C1	26A4	C3	2NAE	A3	3844	F5	3EB2	F3	5B01	E1		
2250	B2	2710	B5	2NAF	A3	3846	C5	3F24	F1	5B07	C3		
2251	B2	2711	C5	3100	F5	3847	B4	3F25	F1	5000	G3		
2252	B2	2712	B5	3101	F5	3848	B5	3F26	B1	5001	G4		
2257	A2	2713	C5	3102	F5	3849	B4	3F27	F1	5002	G4		
2258	A2	2714	C5	3103	F5	3851	C1	3F28	F1	5003	G4		
2259	B2	2715	C5	3104	F5	3852	C1	3F32	A1	5E12	F3		
2260	A2	2716	C4	3105	D5	3856	C1	3F33	A1	5E13	F3		
2261	B2	2717	C5	3107	F5	3857	C3	3F35	B1	5E14	F3		
2262	B2	2719	B4	3109	F5	3858	B4	3F36	B1	5E15	F3		
2263	B3	2720	C5	3108	D5	3859	B5	3F37	A1	5E16	F3		
2265	B2	2722	B4	3109	D5	3861	C3	3F38	A1	5E17	F3		
2266	B2	2724	B4	3122	F4	3863	F1	3F39	A1	5E18	F3		
2267	B2	2725	C4	3122	F4	3864	F1	3F40	C4	5F13	E1		
2503	G4	2726	C4	3125	F4	3865	F1	3F41	B1	5G11	D3		
2510	A1	2727	C4	3129	D4	3866	B3	3F42	A1	5G12	D3		
2511	A1	2728	C5	3130	F5	3867	F1	3F43	A1	5H10	D1		
2512	A1	2729	C5	3131	F5	3869	F1	3F46	B1	5H11	D1		
2515	F4	2731	B5	3134	D4	3871	C1	3G11	D3	5H12	F4		
2518	F5	2732	B5	3135	F5	3872	C1	3G12	D3	6100	E5		
2519	F5	2734	B5	3136	F4	3873	C3	3NA2	A3	6101	E5		
2520	F5	2735	B4	3138	F5	3874	B3	3NA3	A4	6102	E5		
2521	F5	2736	B5	3139	D4	3876	C3	3NA4	A3	6210	A2		
2522	F4	2737	B5	3140	F5	3877	C3	3NA5	A3	6500	F5		
2523	F4	2738	B5	3171	F5	3878	B4	3NA6	B3	6501	G5		
2524	F5	2739	C5	3172	F5	3879	F5	3NA7	B3	6502	G5		
2532	F4	2740	C5	3173	F5	3880	B4	3NA8	B3	6503	F4		
2537	F5	2743	C4	3199	F5	3881	B4	3NA9	B3	6600	F4		
2539	F4	2746	C4	3210	B2	3882	B4	3NAA	B3	6601	F4		
2540	F4	2749	B5	3213	A2	3883	B4	3NAB	B3	6810	C3		
2542	F5	2751	C4	3214	A2	3884	C5	3NAC	B3	6811	B4		
2543	F5	2752	C5	3215	A2	3885	C5	3NAH	A4	6812	F1		

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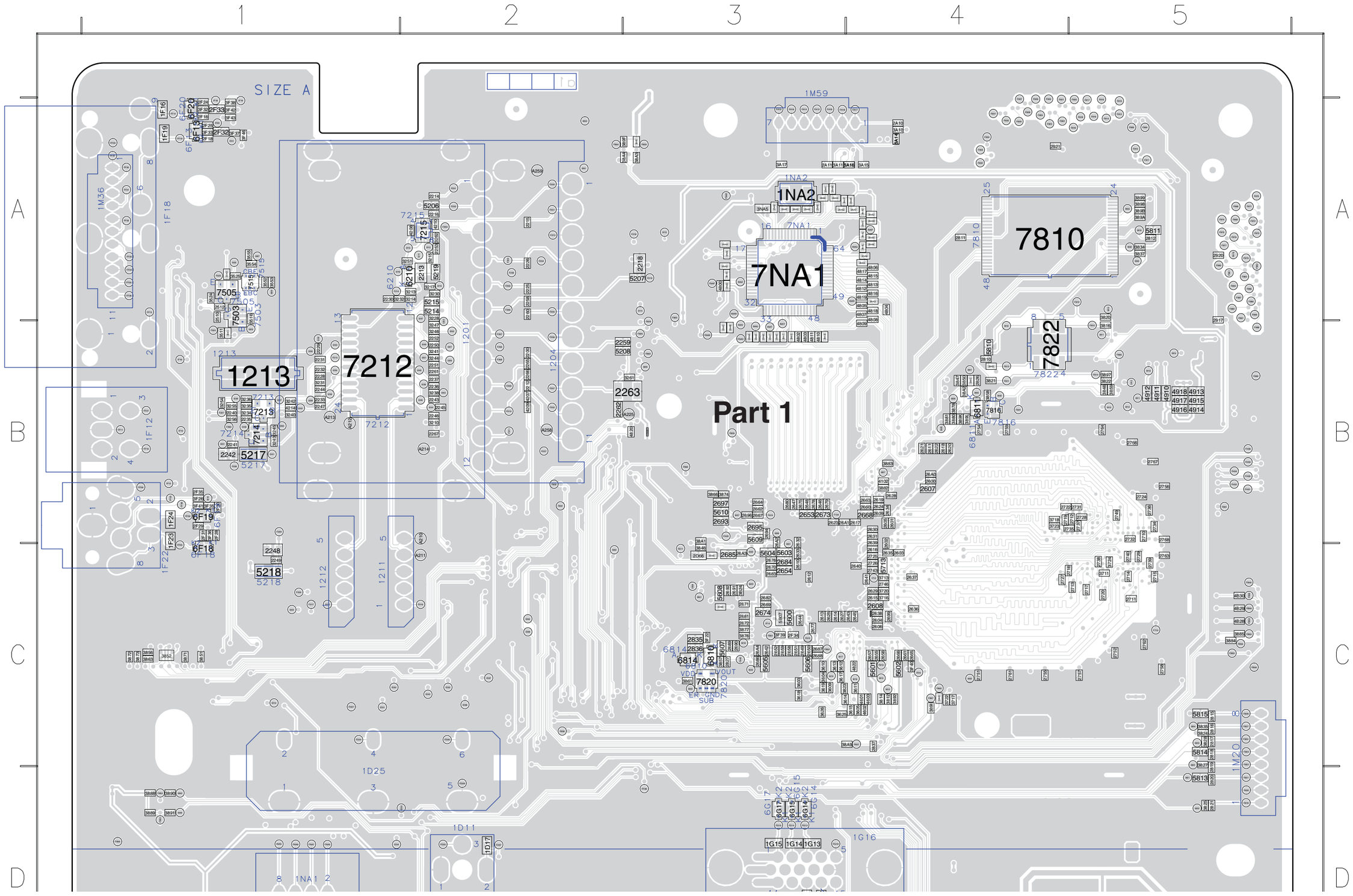
Layout Small Signal Board (Part 1 bottom side)



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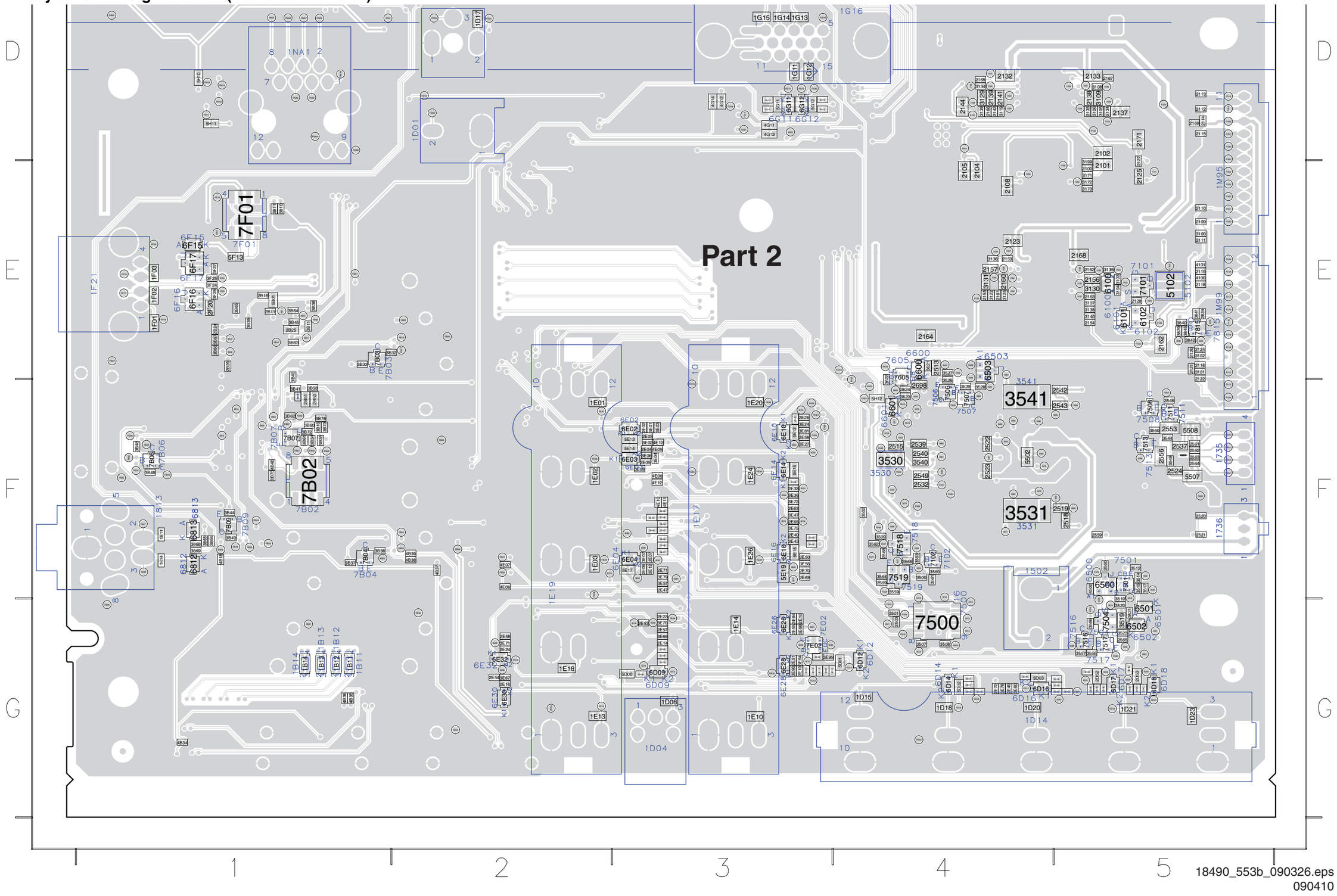
Layout Small Signal Board (Part 2 bottom side)



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