

Service
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Service Manual

TABLE OF CONTENTS

	Chapter
Technical Specifications	1-2
Safety Instructions	1-4
Location of PCB Boards	2-1
Version Variation	2-2
Measurement Setup	2-3
Service Aids	2-4
Rescue Mode & Repair Instructions.....	3
Disassembly Instructions & Service positions	4
Block & Wiring Diagram	5
Main Board	6
AMP+Powder Board	7
Key+Mic Board	8
VFD Board	9
Jack Board	10
Ipod Board	11
Exploded View.....	12

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Version 1.0



PHILIPS

1. Technical Specification

Amplifier

Rated Output Power	300 W RMS Max Power
Frequency Response	35 Hz - 20 kHz, - 3 dB
Signal to Noise Ratio	> 70 dB

Tuner (FM)

Tuning Range	87.5 - 108 MHz
Tuning grid	100 KHz
Sensitivity - Mono, 50 dB	18 - 22 dBf
S/N Ratio	
Total Harmonic Distortion	> 2.0 %
Signal to Noise Ratio	> 50 dB

Speakers

Speaker Impedance	Treble: 6 ohm Bass: 4 ohm
-------------------	------------------------------

General information

AC power	220 - 240V ~, 50/60Hz
Operation power consumption	44 W

USB direct	Version 2.0/1.1
Dimensions (W x H x D)	704 x 385 x 364 mm
Weight	
- With Packing	16.66 kg
- Main Unit	13.62 kg

2. Safety Instructions, Warnings, Notes, and Abbreviation List

Index of this chapter:

[2.1 Safety Instructions](#)

[2.2 Warnings](#)

[2.3 Notes](#)

[2.4 Abbreviation List](#)

2.1 Safety Instructions

Safety regulations require the following **during** a repair:

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

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

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

2.2 Warnings

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

2.3 Notes

2.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⊥), or hot ground (↕), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode (see chapter 5) with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).

- Where necessary, measure the waveforms and voltages with (⊥) and without (↕) aerial signal. Measure the voltages in the power supply section both in normal operation (⊕) and in stand-by (⊖). These values are indicated by means of the appropriate symbols.

2.3.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kΩ).
- Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 Ω).
- All capacitor values are given in micro-farads ($\mu = \times 10^{-6}$), 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 in the Spare Parts List. Therefore, always check this list when there is any doubt.

2.3.3 BGA (Ball Grid Array) ICs

Introduction

For more information on how to handle BGA devices, visit this URL: www.atyourservice.ce.philips.com (needs subscription, not available for all regions). After login, 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, which is coupled to the 12NC. For an overview of these profiles, visit the website www.atyourservice.ce.philips.com (needs subscription, but is not available for all regions) You will find this and more technical information within the "Magazine", chapter "Repair downloads". For additional questions please contact your local repair help desk.

2.3.4 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 Philips SAC305 with order code 0622 149 00106. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
 - To reach a solder-tip temperature of at least 400°C.
 - To stabilize the adjusted temperature at the solder-tip.
 - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilized at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch "off" unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly to **avoid** mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.

2. Safety Instructions, Warnings, Notes, and Abbreviation List

Index of this chapter:

[2.1 Safety Instructions](#)

[2.2 Warnings](#)

[2.3 Notes](#)

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Safety Instructions, Warnings, Notes, and Abbreviation List

2.3.5 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: KX2B0835000001) indicates the number of the alternative B.O.M. (Bill Of Materials) that has been used for producing the specific AV set. In general, it is possible that the same AV model on the market is produced with e.g. two different types of display, coming from two different suppliers. This will then result in sets which have the same CTN (Commercial Type Number; e.g. MCM394/12) but which have a different B.O.M. number.

Also, it is possible that same model on the market is produced with two production centers, however their partslist is the same. In such case, no alternative B.O.M. will be created.

By looking at the third digit of the serial number, one can identify which B.O.M. is used for the set he is working with. If the third digit of the serial number contains the number "1" (example: KX1B033500001), then the set has been manufactured according to B.O.M. number 1. If the third digit is a "2" (example: KX2B033500001), 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. LM is Arts), 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 2008 week 50). The 6 last digits contain the serial number.

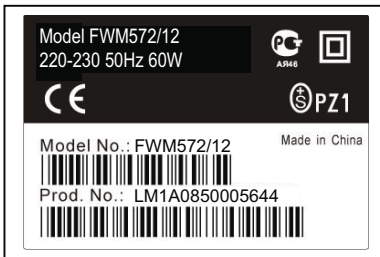


Figure 2-1 Serial number (example)

2.3.6 Module Level Repair (MLR) or Component Level Repair (CLR)

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

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

2.3.7 Practical Service Precautions

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

2.4 Abbreviation List

0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16 : 9 format, 12 = play 4 : 3 format
2DNR	Spatial (2D) Noise Reduction
3DNR	Temporal (3D) Noise Reduction
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
ANR	Automatic Noise Reduction: one of the algorithms of Auto TV
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
COLUMBUS	COLOR LUMinance Baseband Universal Sub-system
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"

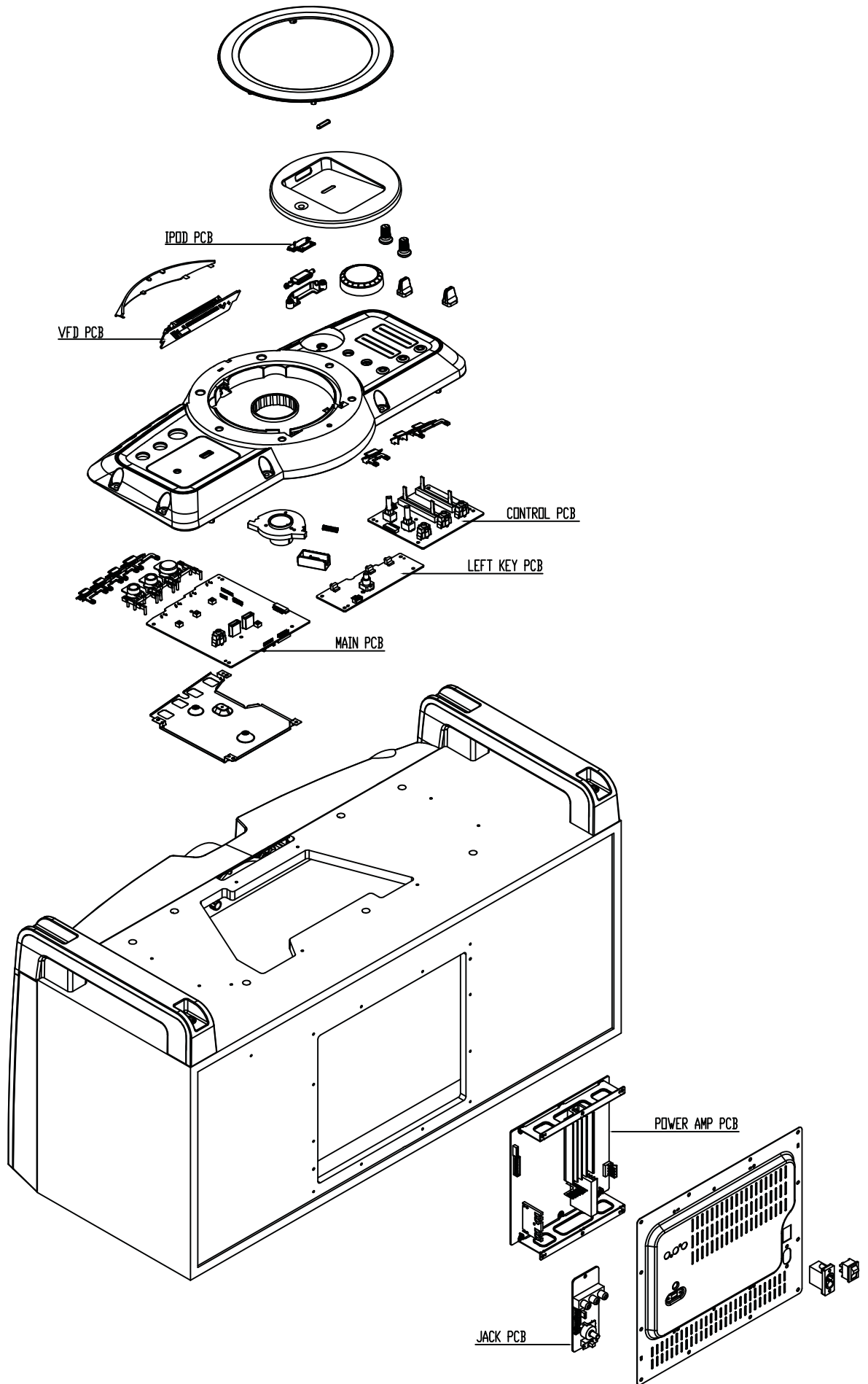
Safety Instructions, Warnings, Notes, and Abbreviation List

D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz		lines. The fields are written in "pairs", causing line flicker.
DFI	Dynamic Frame Insertion	IR	Infra Red
DFU	Directions For Use: owner's manual	IRQ	Interrupt Request
DMR	Digital Media Reader: card reader	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.
DMSD	Digital Multi Standard Decoding		Uncompressed digital component or digital composite signals can be used.
DNM	Digital Natural Motion		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.
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	ITV	Institutional TeleVision; TV sets for hotels, hospitals etc.
DVB-C	Digital Video Broadcast - Cable	JOP	Jaguar Output Processor
DVB-T	Digital Video Broadcast - Terrestrial	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
DVD	Digital Versatile Disc		Latin America
DVI(-d)	Digital Visual Interface (d= digital only)		Liquid Crystal Display
E-DDC	Enhanced Display Data Channel (VESA standard for communication channel and display). Using E-DDC, the video source can read the EDID information from the display.	LATAM	Light Emitting Diode
EDID	Extended Display Identification Data (VESA standard)	LCD	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
EEPROM	Electrically Erasable and Programmable Read Only Memory	LED	Local REGression approximation noise reduction
EMI	Electro Magnetic Interference	L/L'	LG.Philips LCD (supplier)
EPLD	Erasable Programmable Logic Device	LORE	Loudspeaker
EU	Europe	LPL	Low Voltage Differential Signalling
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)	LS	Mega bits per second
FBL	Fast BLanking: DC signal accompanying RGB signals	LVDS	Monochrome TV system. Sound carrier distance is 4.5 MHz
FDS	Full Dual Screen (same as FDW)	Mbps	Microprocessor without Interlocked Pipeline-Stages; A RISC-based microprocessor
FDW	Full Dual Window (same as FDS)	M/N	MOP
FLASH	FLASH memory		MOSFET
FM	Field Memory or Frequency Modulation		Metal Oxide Silicon Field Effect Transistor, switching device
FPGA	Field-Programmable Gate Array		MPEG
FTV	Flat TeleVision		MPIF
Gb/s	Giga bits per second		MUTE
G-TXT	Green TeleteXT		NC
H	H_sync to the module		NICAM
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	NTC	Negative Temperature Coefficient, non-linear resistor
HP	HeadPhone	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)
I	Monochrome TV system. Sound carrier distance is 6.0 MHz		Non-Volatile Memory: IC containing TV related data such as alignments
I ² C	Inter IC bus		Open Circuit
I ² D	Inter IC Data bus		On Screen Display
I ² S	Inter IC Sound bus		On screen display Teletext and Control; also called Artistic (SAA5800)
IF	Intermediate Frequency		Project 50: communication protocol between TV and peripherals
Interlaced	Scan mode where two fields are used to form one frame. Each field contains half the number of the total amount of		Phase Alternating Line. Color system mainly used in West Europe (color carrier= 4.433619 MHz) and South America (color carrier PAL M=

Safety Instructions, Warnings, Notes, and Abbreviation List

	3.575612 MHz and PAL N= 3.582056 MHz)	V	V-sync to the module
PCB	Printed Circuit Board (same as "PWB")	VCR	Video Cassette Recorder
PCM	Pulse Code Modulation	VESA	Video Electronics Standards Association
PDP	Plasma Display Panel	VGA	640x480 (4:3)
PFC	Power Factor Corrector (or Pre-conditioner)	VL	Variable Level out: processed audio output toward external amplifier
PIP	Picture In Picture	VSB	Vestigial Side Band; modulation method
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency	WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
POR	Power On Reset, signal to reset the uP		1280x768 (15:9)
Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.	WXGA	Quartz crystal
		XTAL	1024x768 (4:3)
PTC	Positive Temperature Coefficient, non-linear resistor	Y	Luminance signal
		Y/C	Luminance (Y) and Chrominance (C) signal
PWB	Printed Wiring Board (same as "PCB")	YPbPr	Component video. Luminance and scaled color difference signals (B-Y and R-Y)
PWM	Pulse Width Modulation		Component video
QRC	Quasi Resonant Converter	YUV	
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		
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 ² C		
SCL-F	CLock Signal on Fast I ² C bus		
SD	Standard Definition		
SDA	Serial Data I ² C		
SDA-F	DAta Signal on Fast I ² C bus		
SDI	Serial Digital Interface, see "ITU-656"		
SDRAM	Synchronous DRAM		
SECAM	SEquence 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		
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)		

PCB Location View



VERSION VARIATION:

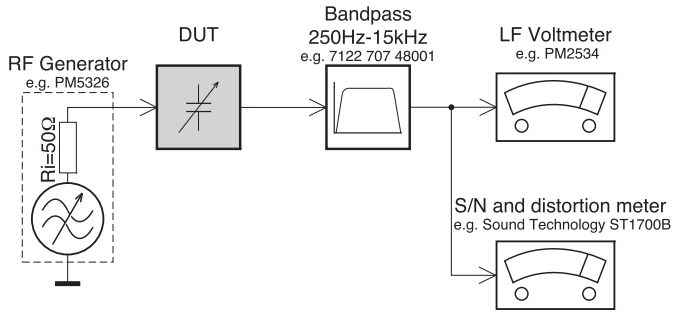
Features	Type/Version	FWP3100D
		/05/55
Voltage : 110~240V		X
Output Powder (L/R) : 300W		X

SERVICE SCENARIO MATRIX :

Board in used	Type/Version	FWP3100D
		/05/55
Main Board		MLR+CLR
AMP+Power Board		MLR+CLR
KEY +MIC Board		MLR
VFD Board		MLR
Jack Board		MLR
IPod Board		MLR

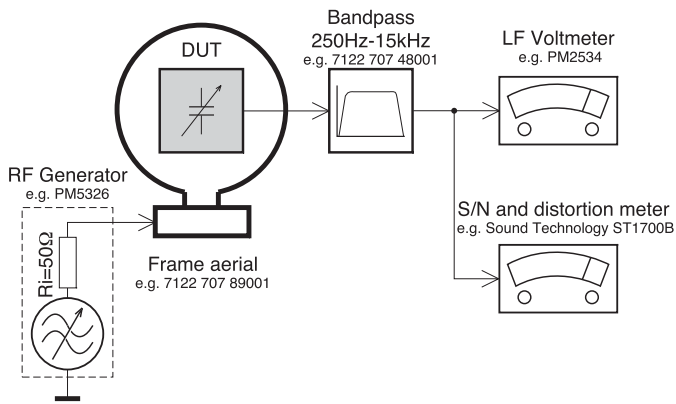
Measurement Setup

Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilotone (19kHz, 38kHz).

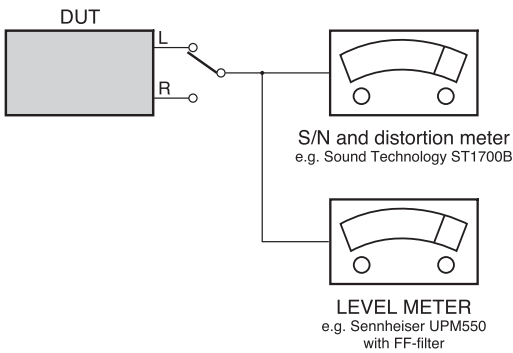
Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage. Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

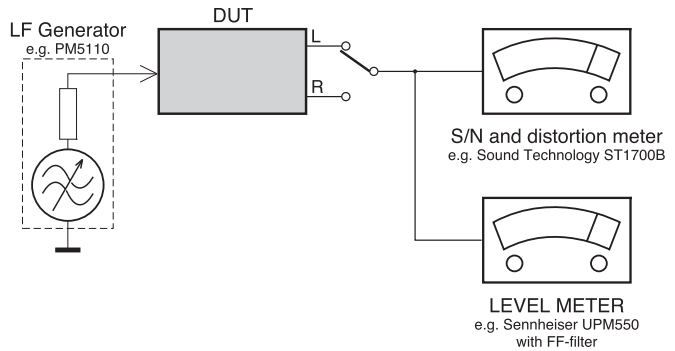
CD

Use Audio Signal Disc SBC429 4822 397 30184 (replaces test disc 3)



Recorder

Use Universal Test Cassette **Cr02** SBC419 4822 397 30069 or Universal Test Cassette **Fe** SBC420 4822 397 30071



SERVICE AIDS

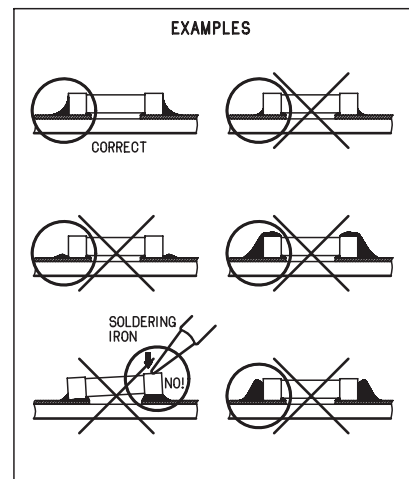
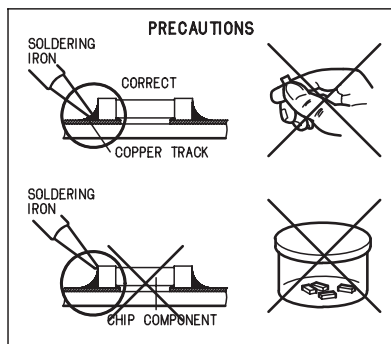
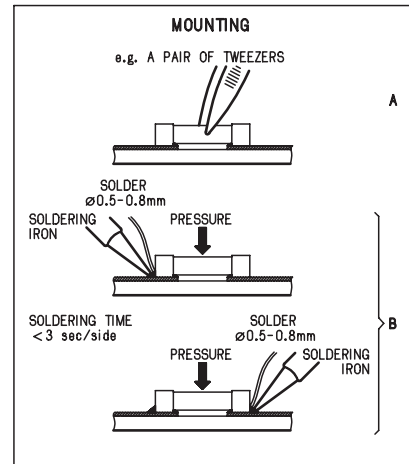
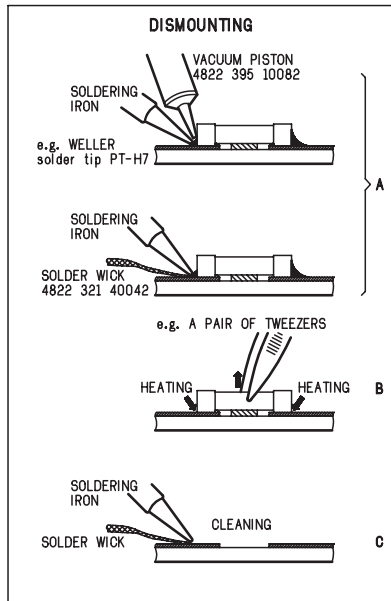
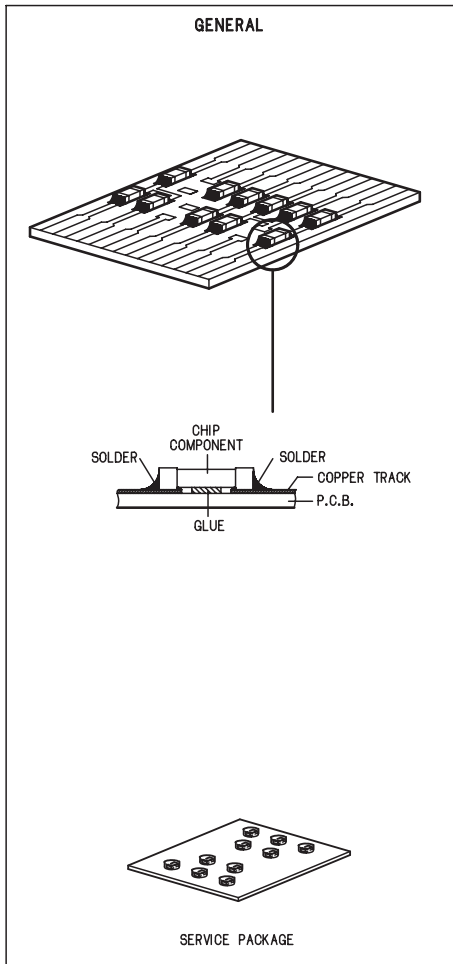
Service Tools:

- Universal Torx driver holder4822 395 91019
- Torx bit T10 150mm4822 395 50456
- Torx driver set T6-T204822 395 50145
- Torx driver T10 extended4822 395 50423

Compact Disc:

- SBC426/426A Test disc 5 + 5A4822 397 30096
- SBC442 Audio Burn-in test disc 1kHz4822 397 30155
- SBC429 Audio Signals disc4822 397 30184
- Dolby Pro-logic Test Disc4822 395 10216

HANDLING CHIP COMPONENTS



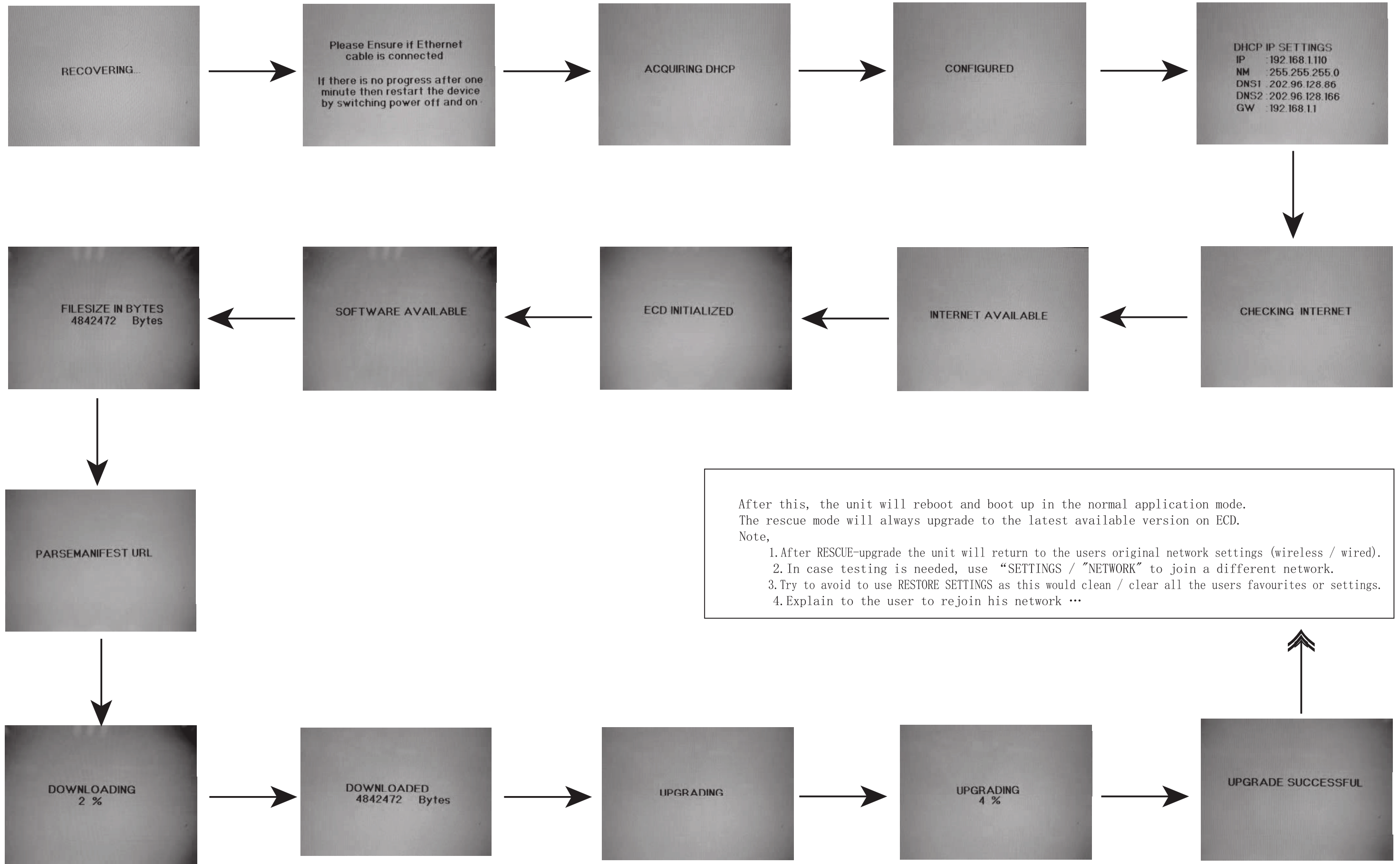
Rescue Mode

The FWP3100D/05/55 will enter the rescue mode in case the user has unplugged the power during programming of the FLASH.

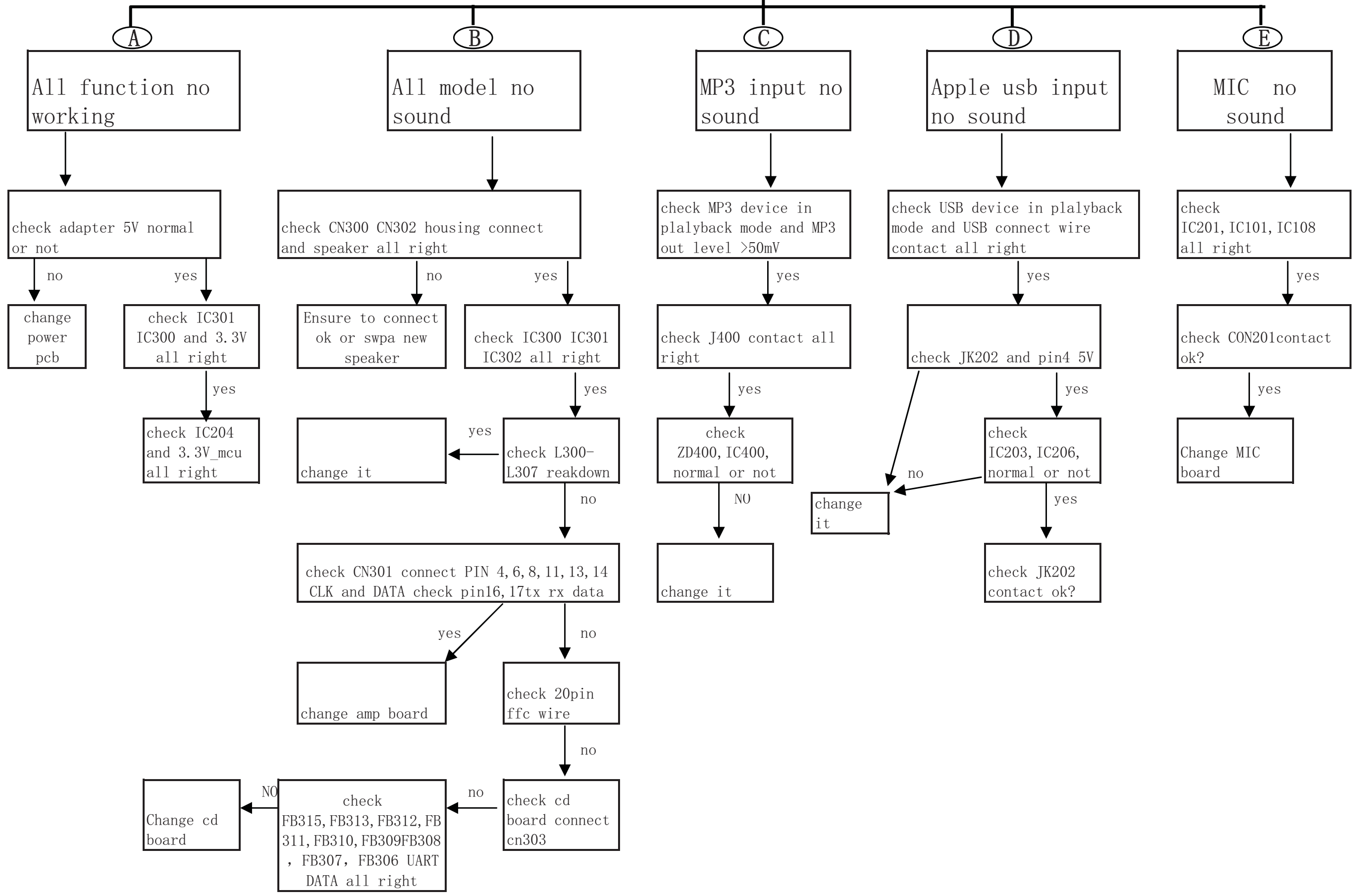
To get the unit back to working, one has to connect the FWP3100D/05/55 unit via a LAN-cable (CAT5) to the internet.

To get best results, connect the the LAN-cable directly to the one of the HUB-outputs of an access point (which has a DHCP enabled).

The following screens will be seen during recovery ...



main unit repair manual



DISASSEMBLY INSTRUCTIONS

4.1 Dismantling of Main Unit

- 1) Upward the apparatus as shown in figure1
- 2) Loosen 8 screws "A" open Top cover as shown figure3
- 3) Disconnect the wires in the cabinet as shown in B

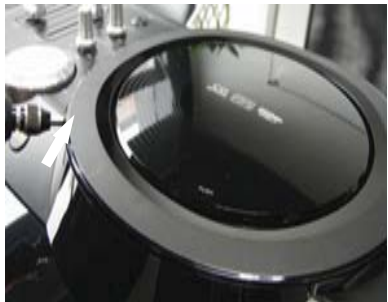


Figure 1

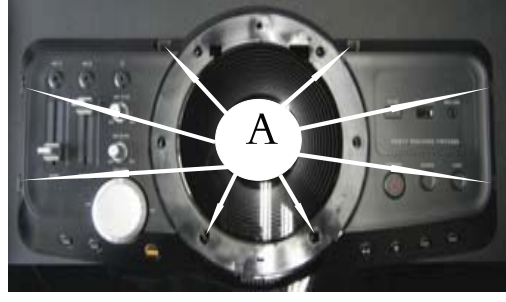


Figure2



Figure3

Dismantling of Main Board

- 1) Keep flat the Top cover ASS'Y as shown in figure 4
- 2) Loosen 6 screws "C" as shown in figure5 to detach Main Board



Figure 4

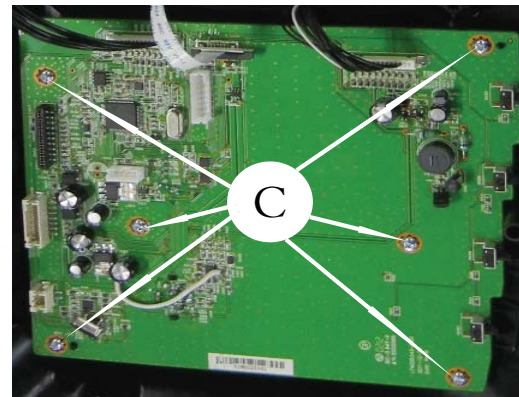


Figure5

Dismantling of MIC Board & VFD Board

- 1) Loosen 4 screws "D" detach MIC Board & loosen 5 screws "E" detach KEY Board as shown in figure6
- 1) Loosen 2 screws "F" detach KEY Board as shown in figure7

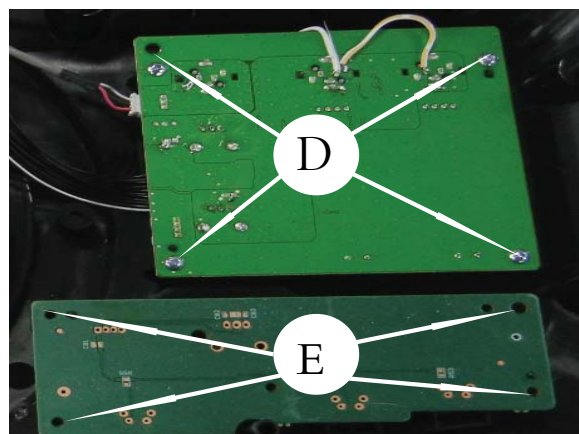


Figure6

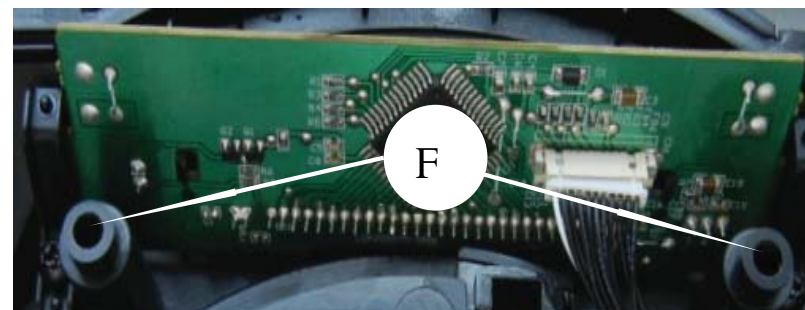


Figure7

Dismantling of Back Panel Ass'y

- 1) Loosen 12 screws "G" as shown in figure8
- 2) Disconnect the wires to draw out the Back Panel as shown in figure9

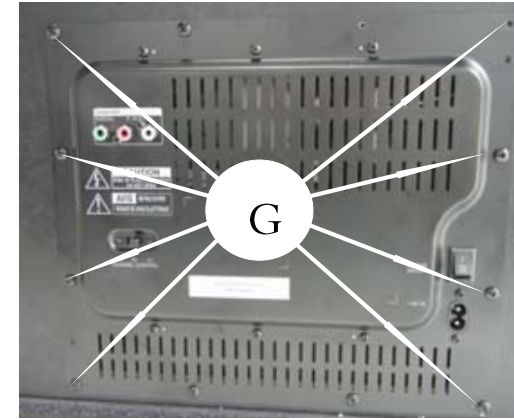


Figure8



Figure9

Dismantling of AMP+Power Board & Jack Board

- 2) Loosen 6 screws "H" as shown in figure10 to detach Remote Board
- 2) Loosen 4 screws "I" as shown in figure11 to detach Jack Board in figure12

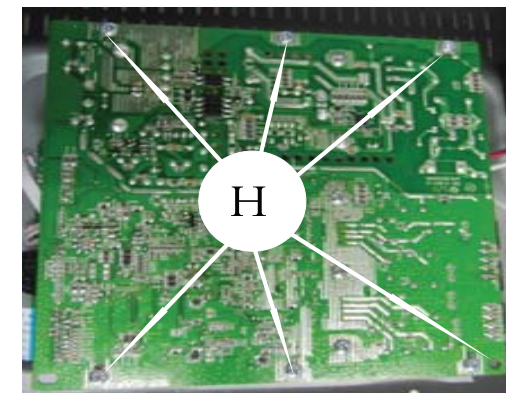


Figure 10

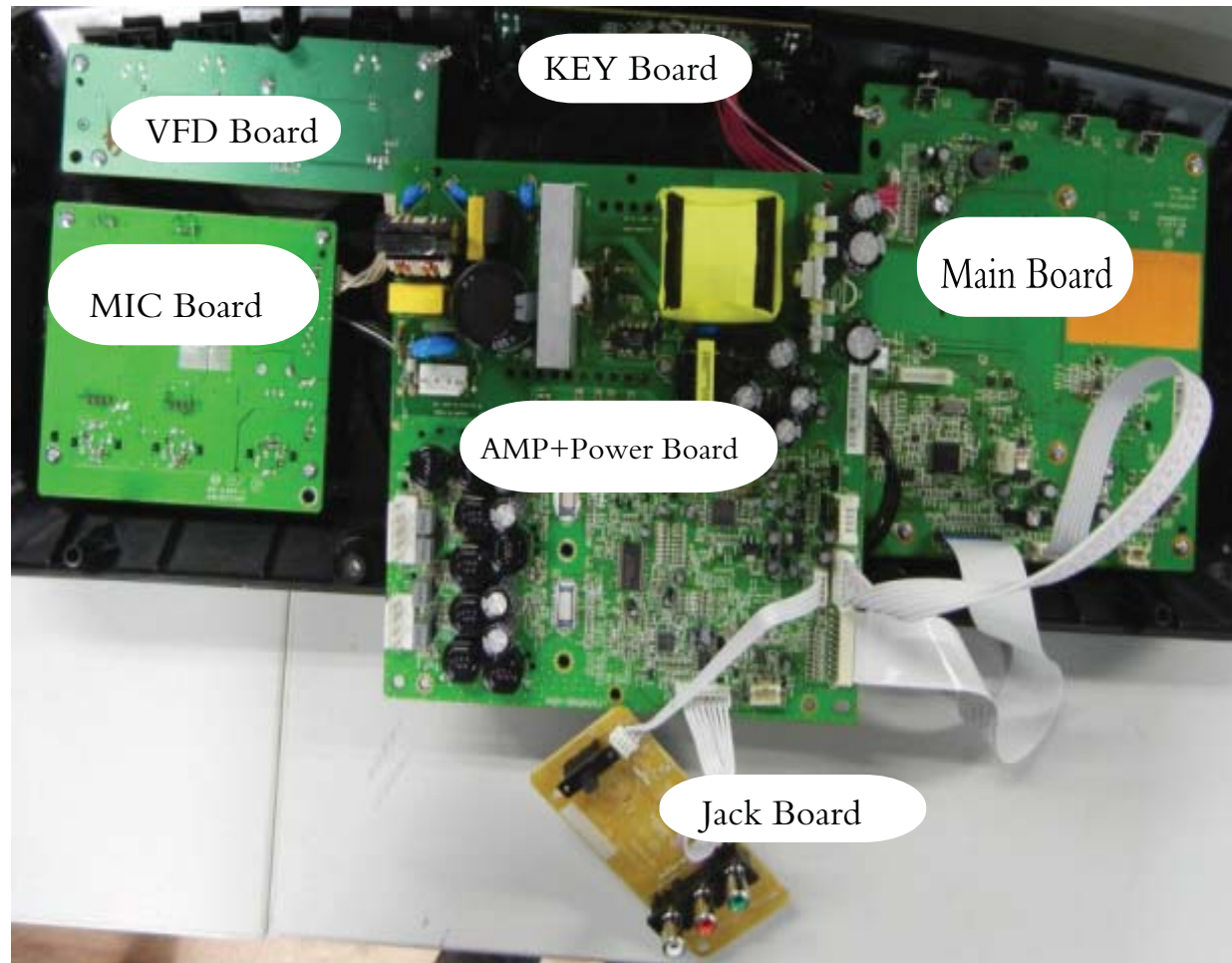


Figure 11



Figure 11

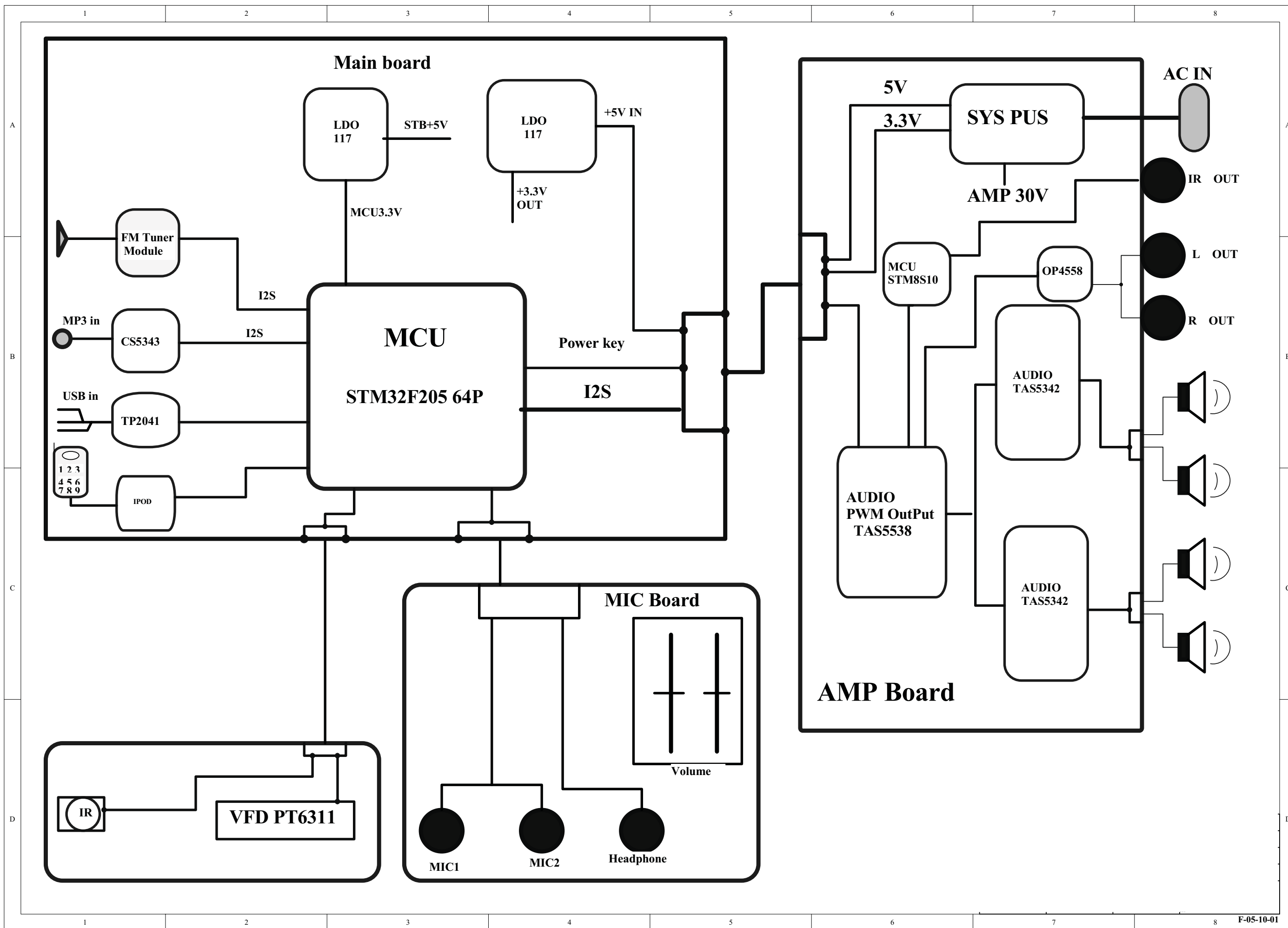
Note: Refer to the wiring Diagram for the correct cable connection between boards.

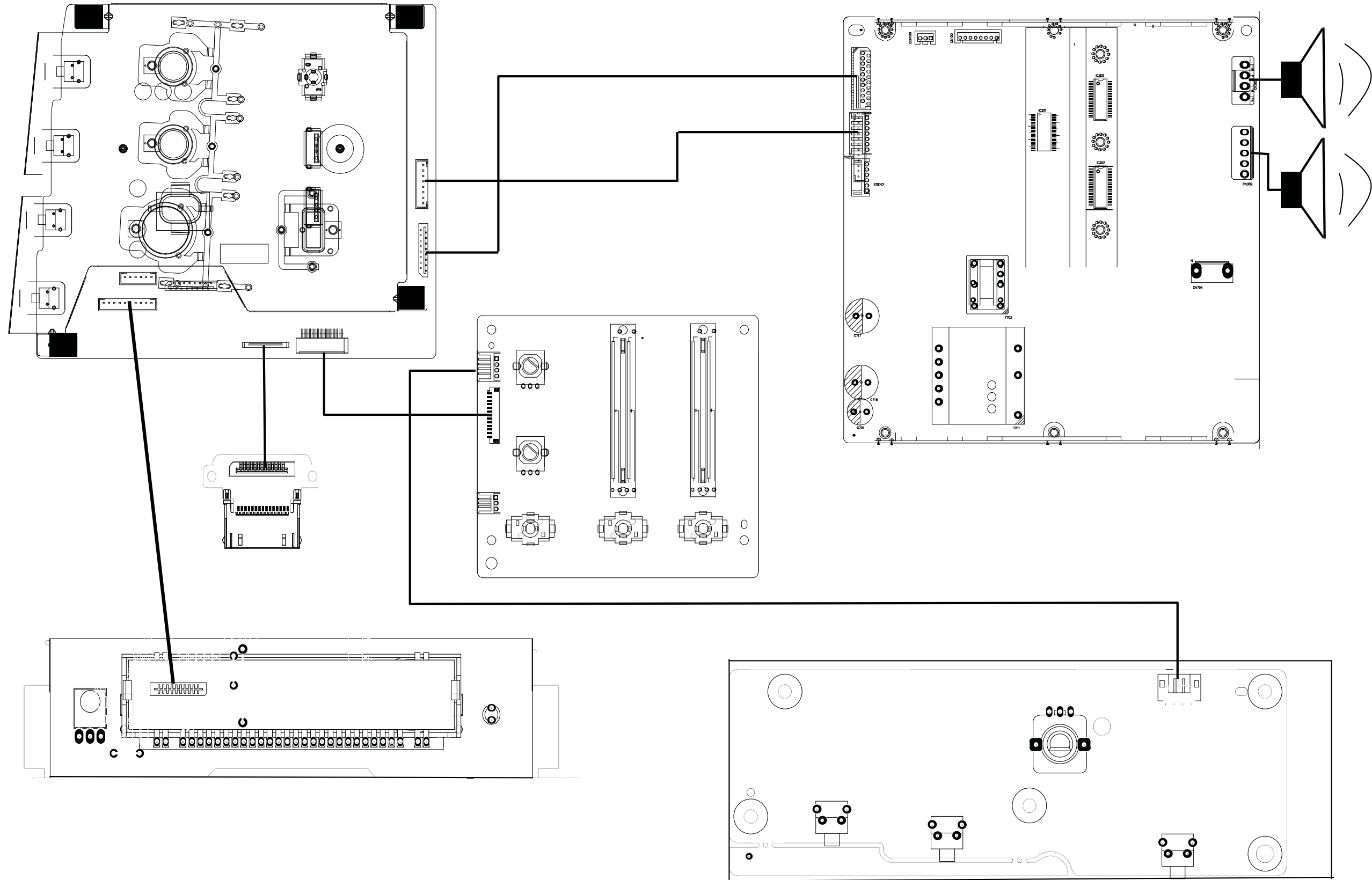


Service Position

Main Board, AMP+Power Board, KEY Board, MIC Board, Jack Board, VFD Board

Note: In some service positions the components or copper patterns of one board may risk touching its neighbouring pc boards or metallic parts. To prevent such short-circuit use a piece of hard paper or other insulating material between them.





Main Board

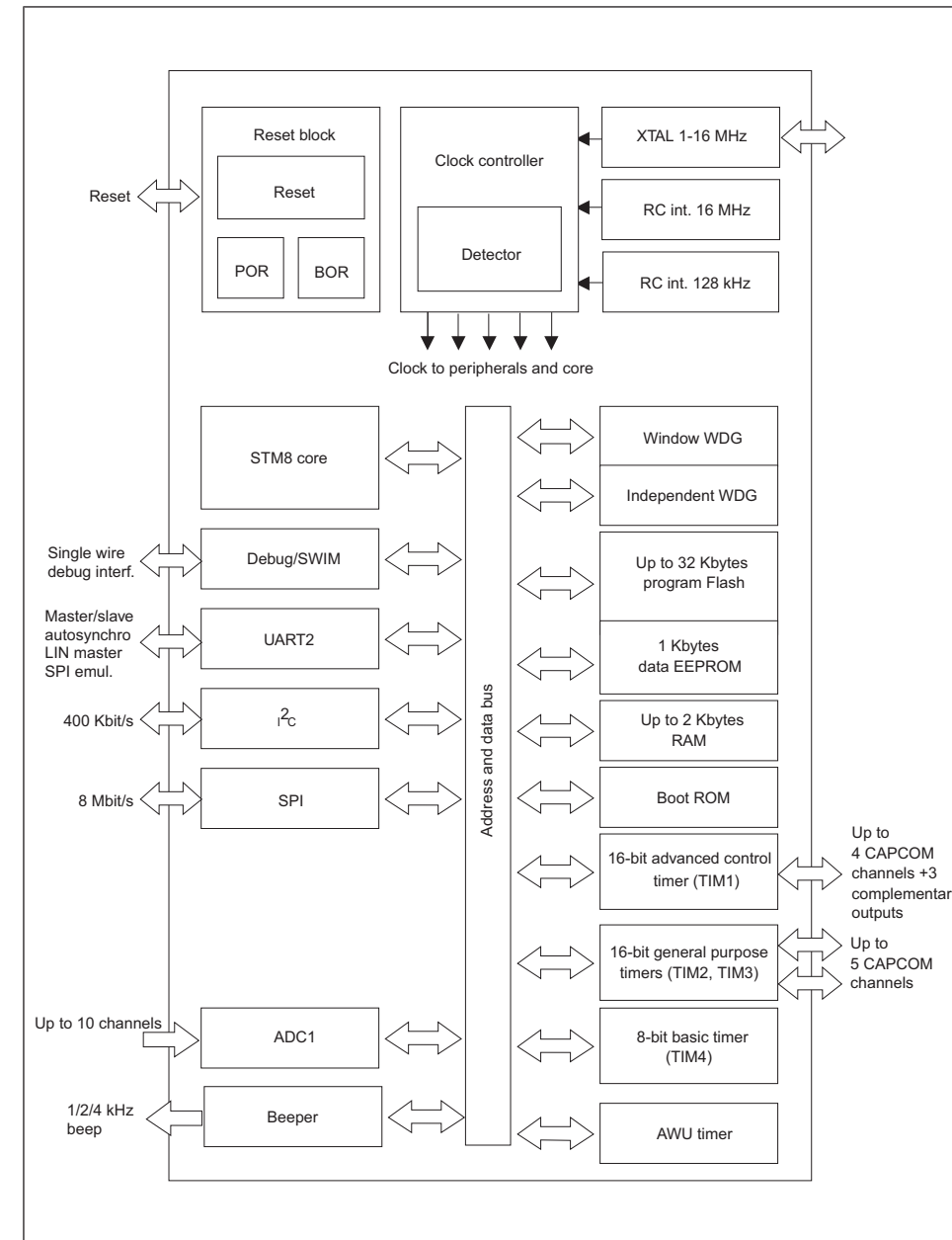
TABLE OF CONTENTS

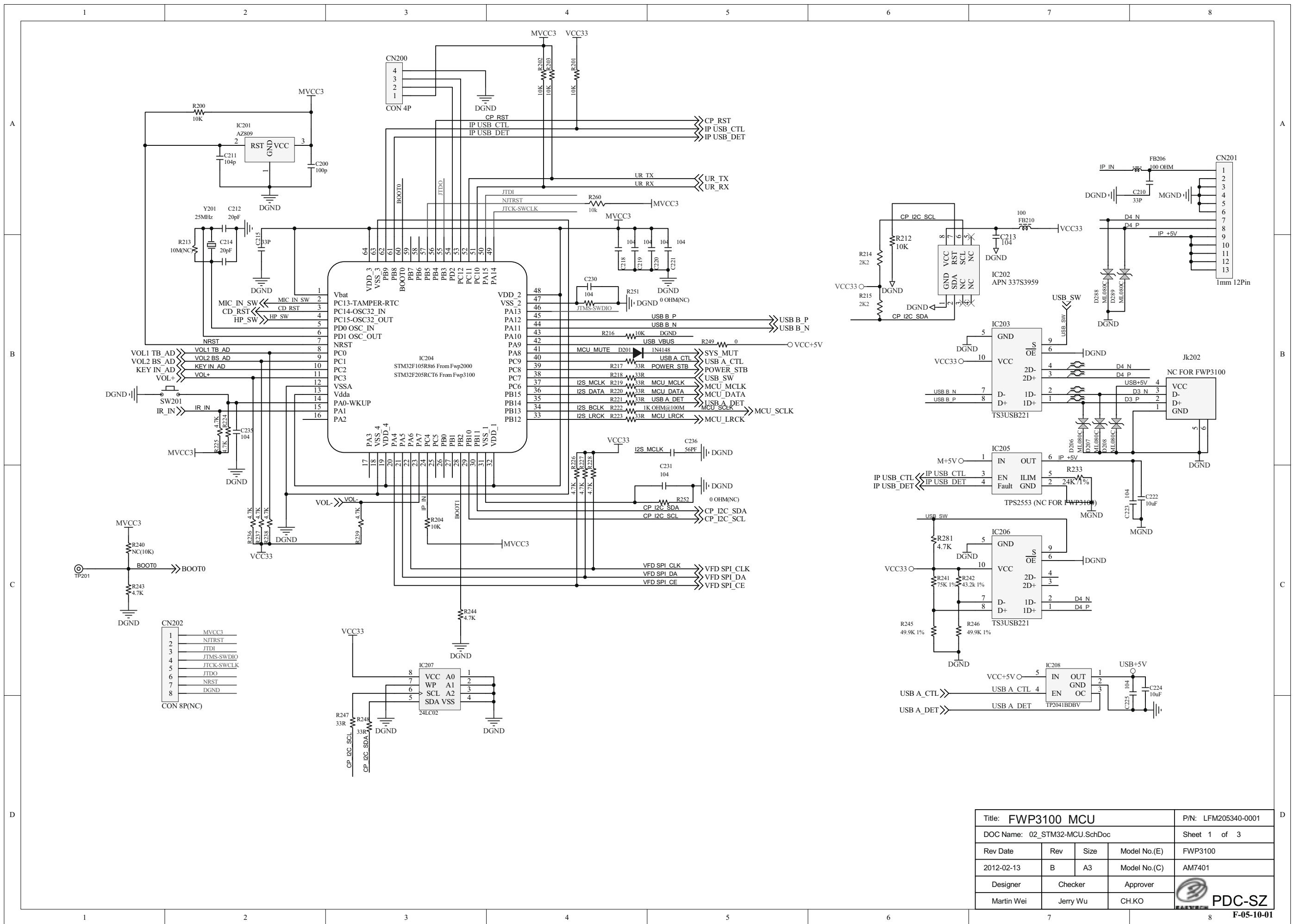
Circuit Diagram..... 6-2


PCB Layout Top View 6-5

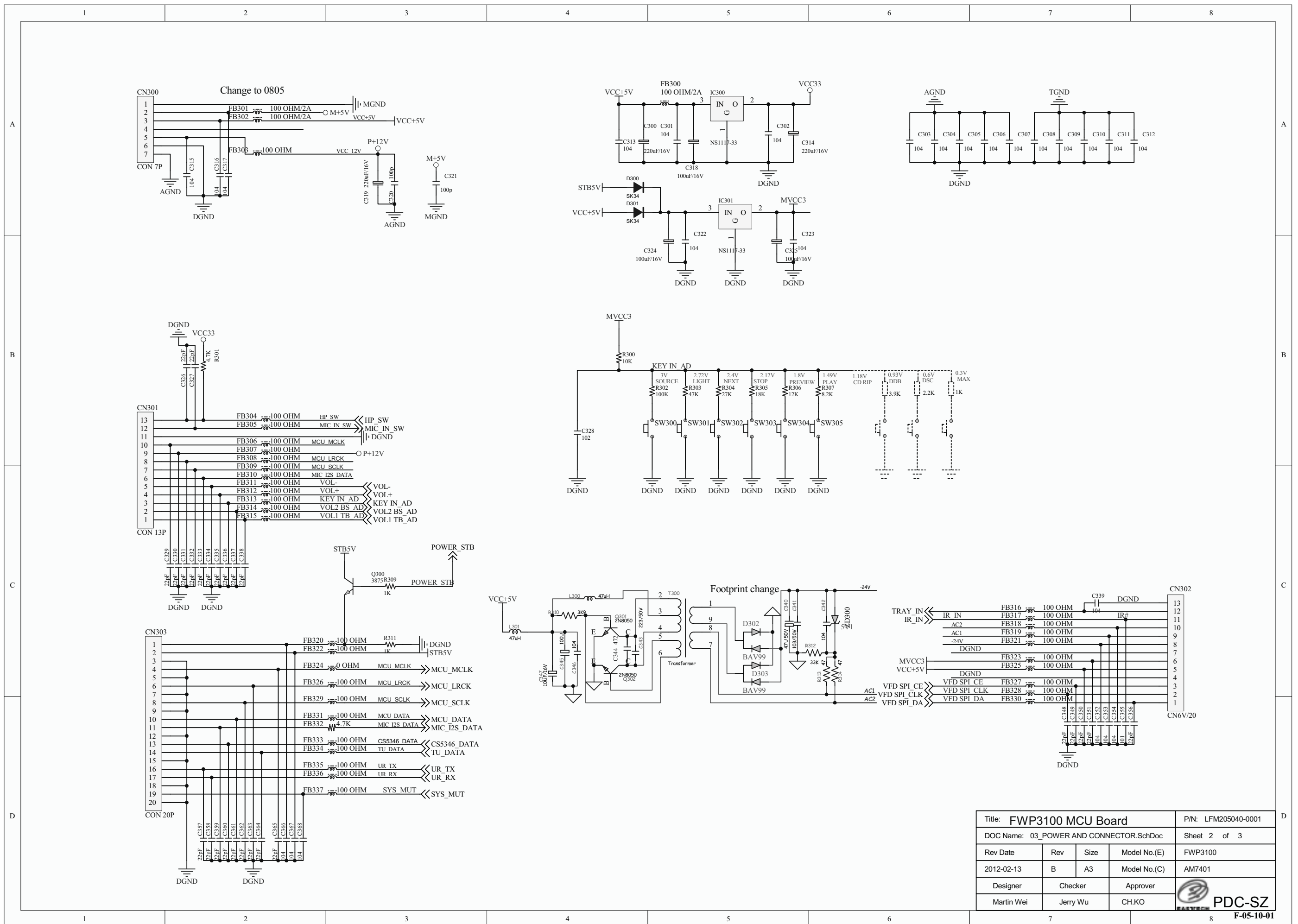
PCB Layout Bottom View..... 6-6

STM8S105XX DIAGRAM

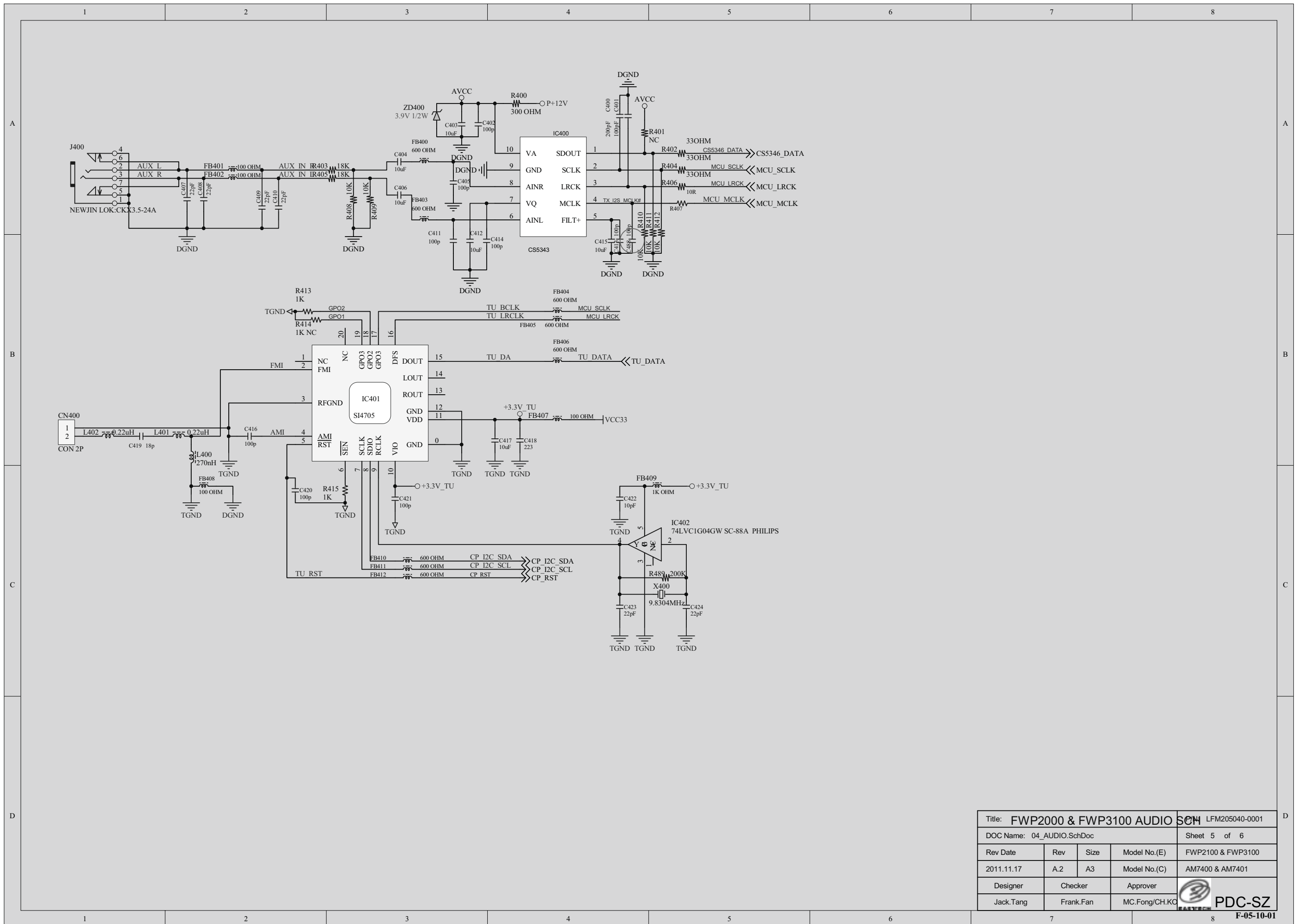





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Rev Date	Rev	Size	Model No.(E)	FWP3100	
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Designer	Checker	Approver			
Martin Wei	Jerry Wu	CH.KO			

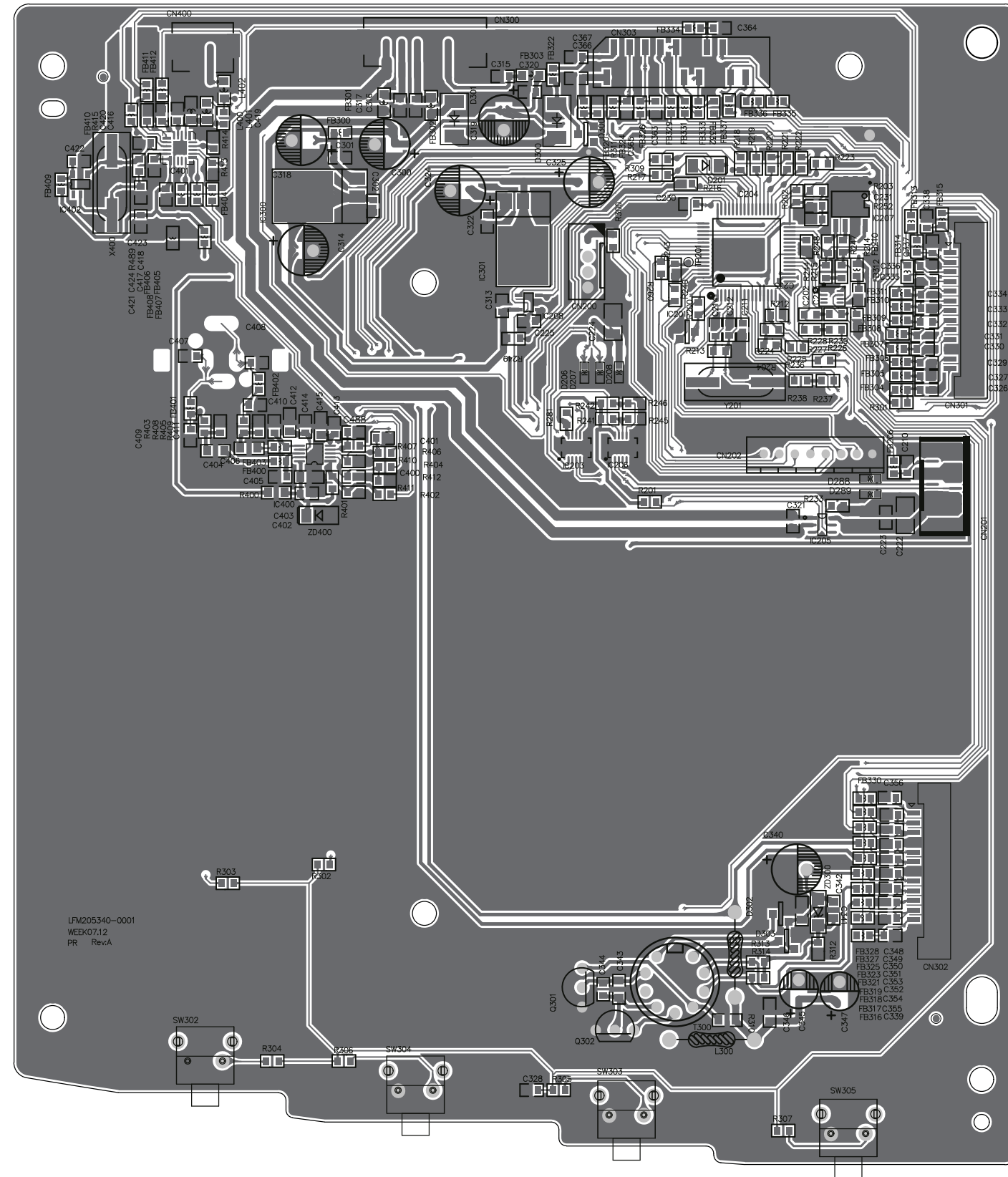


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Designer	Checker	Approver			
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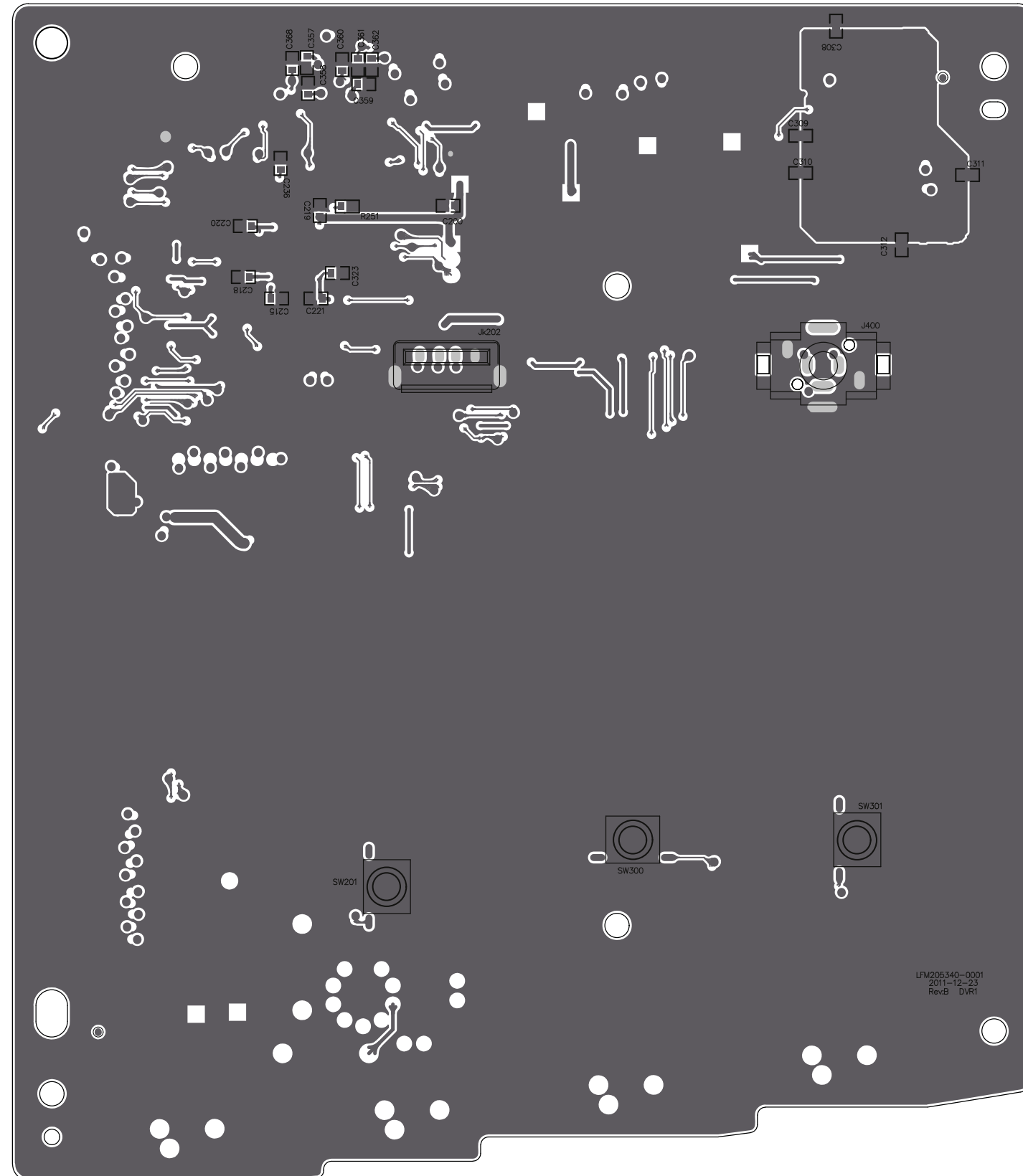


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Rev Date	Rev	Size	Model No.(E)	FWP2100 & FWP3100
2011.11.17	A.2	A3	Model No.(C)	AM7400 & AM7401
Designer	Checker	Approver		
Jack.Tang	Frank.Fan	MC.Fong/CH.KG		

PCB Layout View



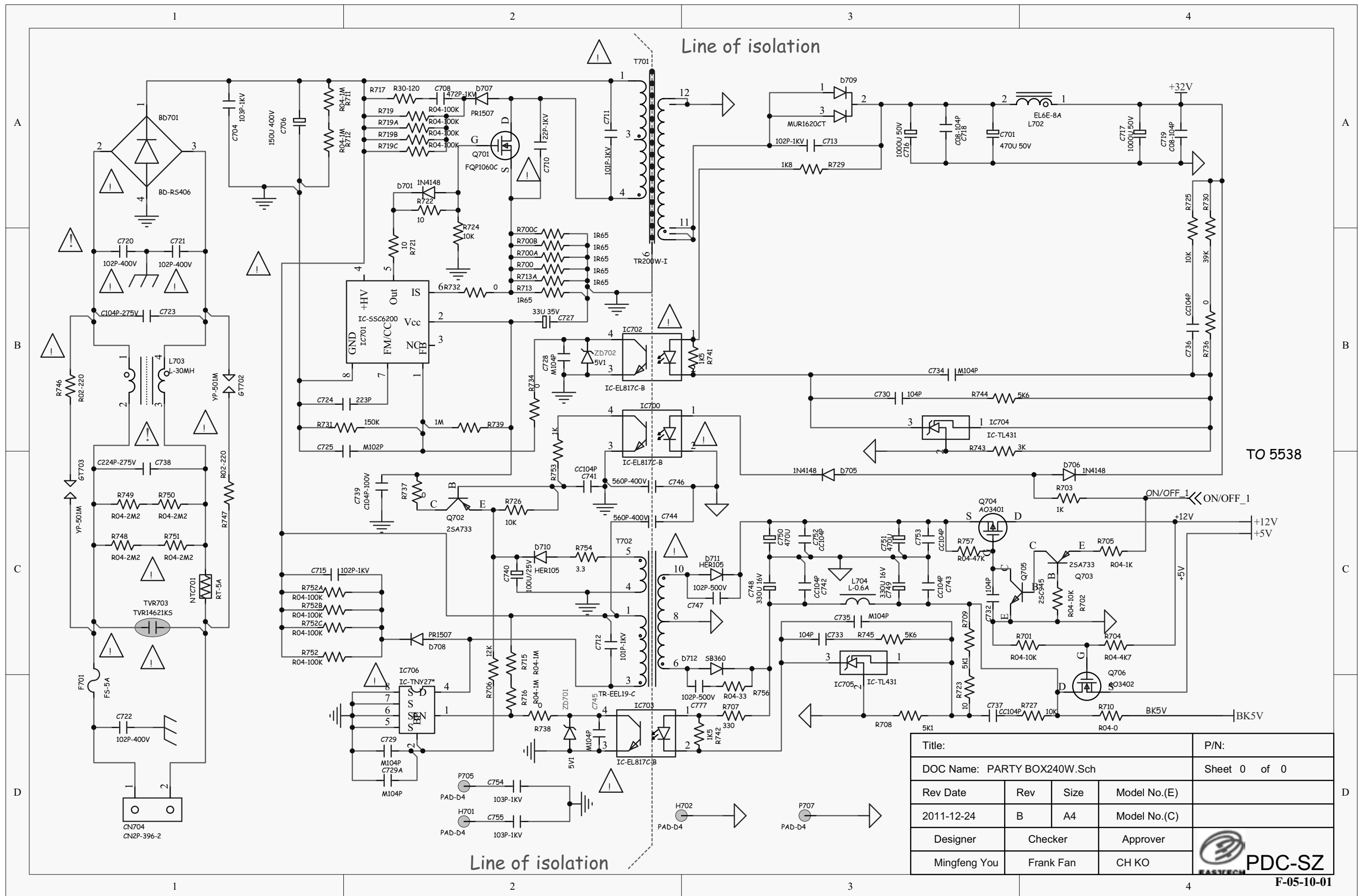
PCB Layout View



AMP+Power Board

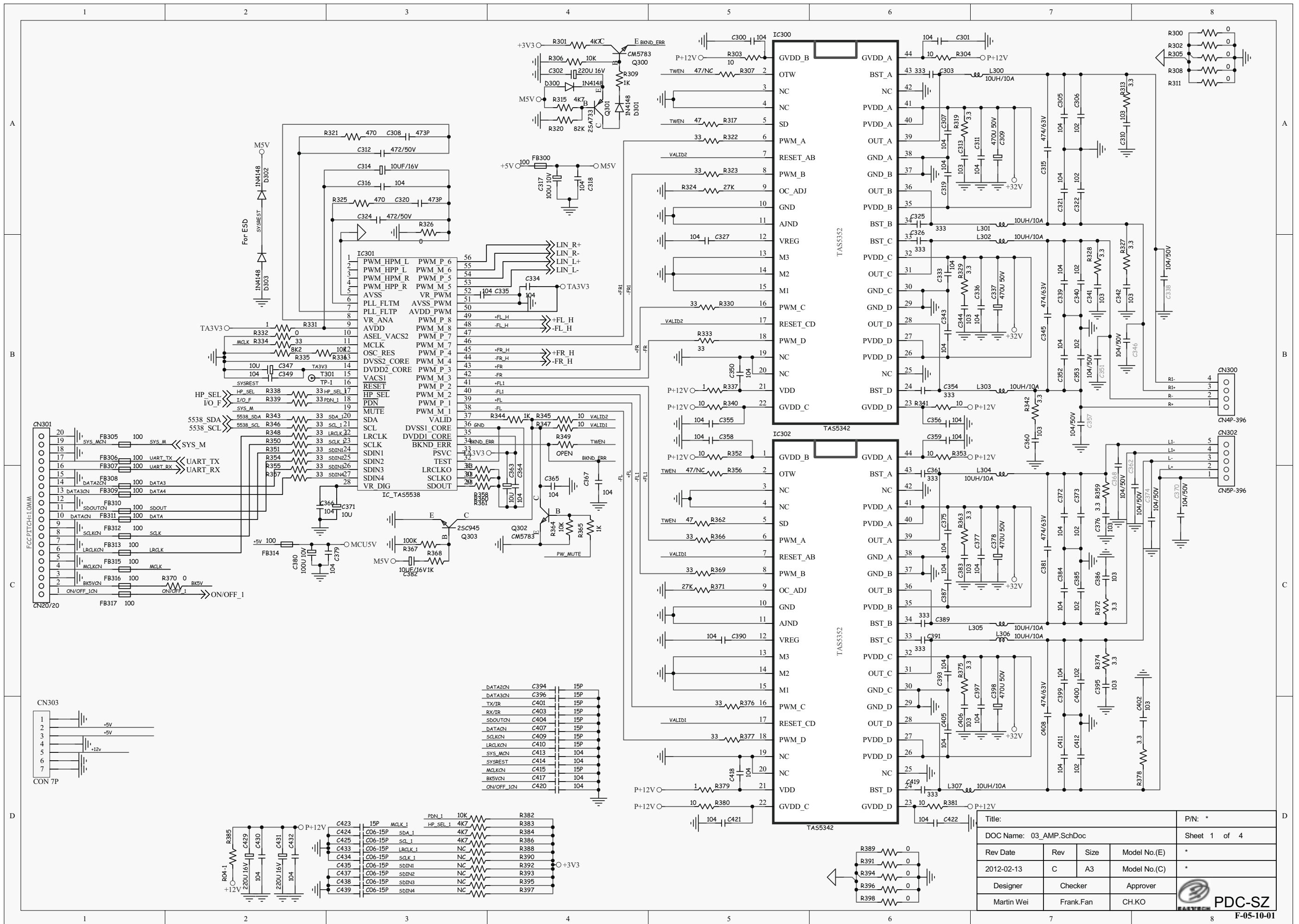
TABLE OF CONTENTS

Circuit Diagram	7-2
PCB Layout View	7-6
PCB Layout View	7-7



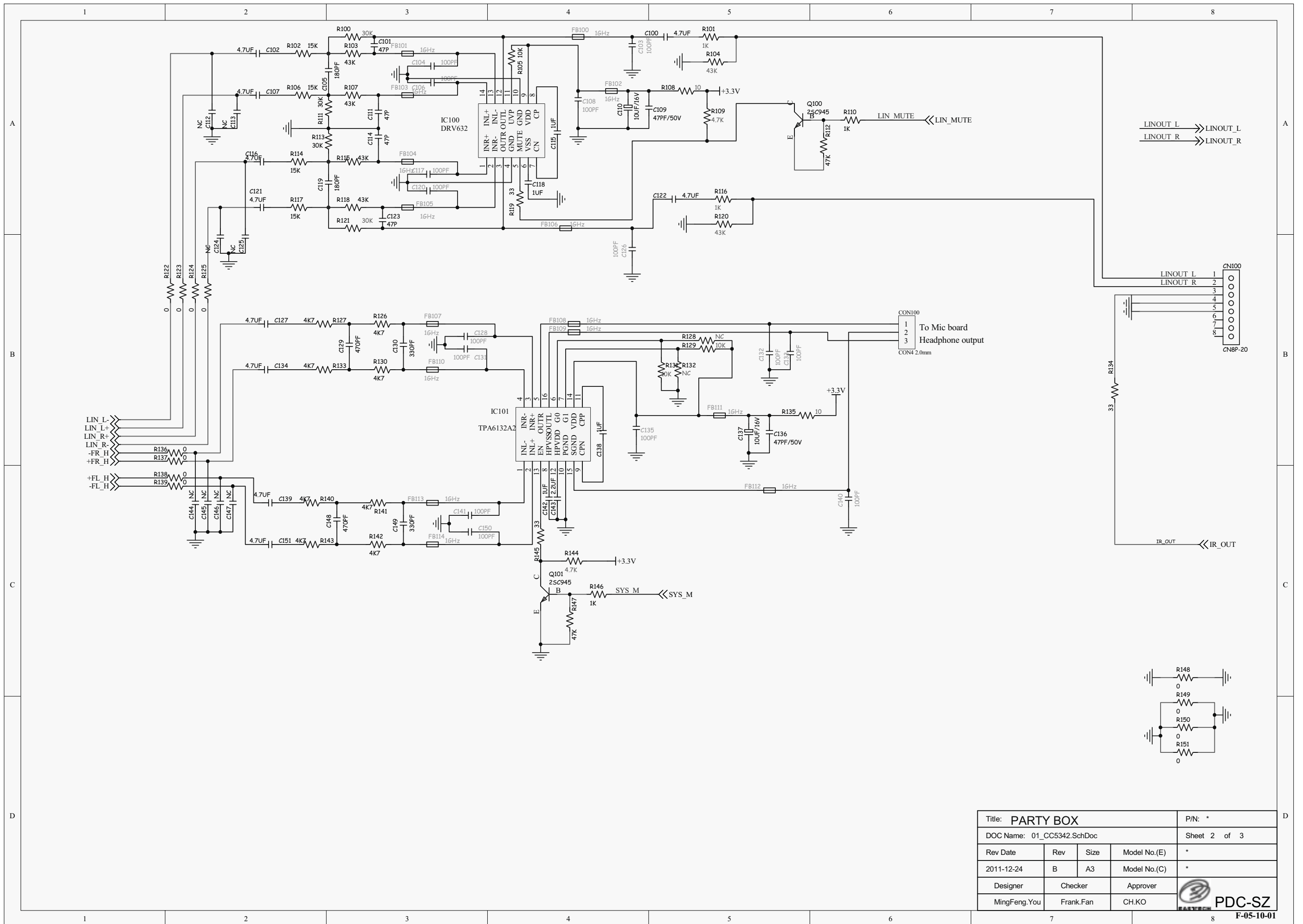
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Designer	Checker	Approver	
Mingfeng You	Frank Fan	CH KO	




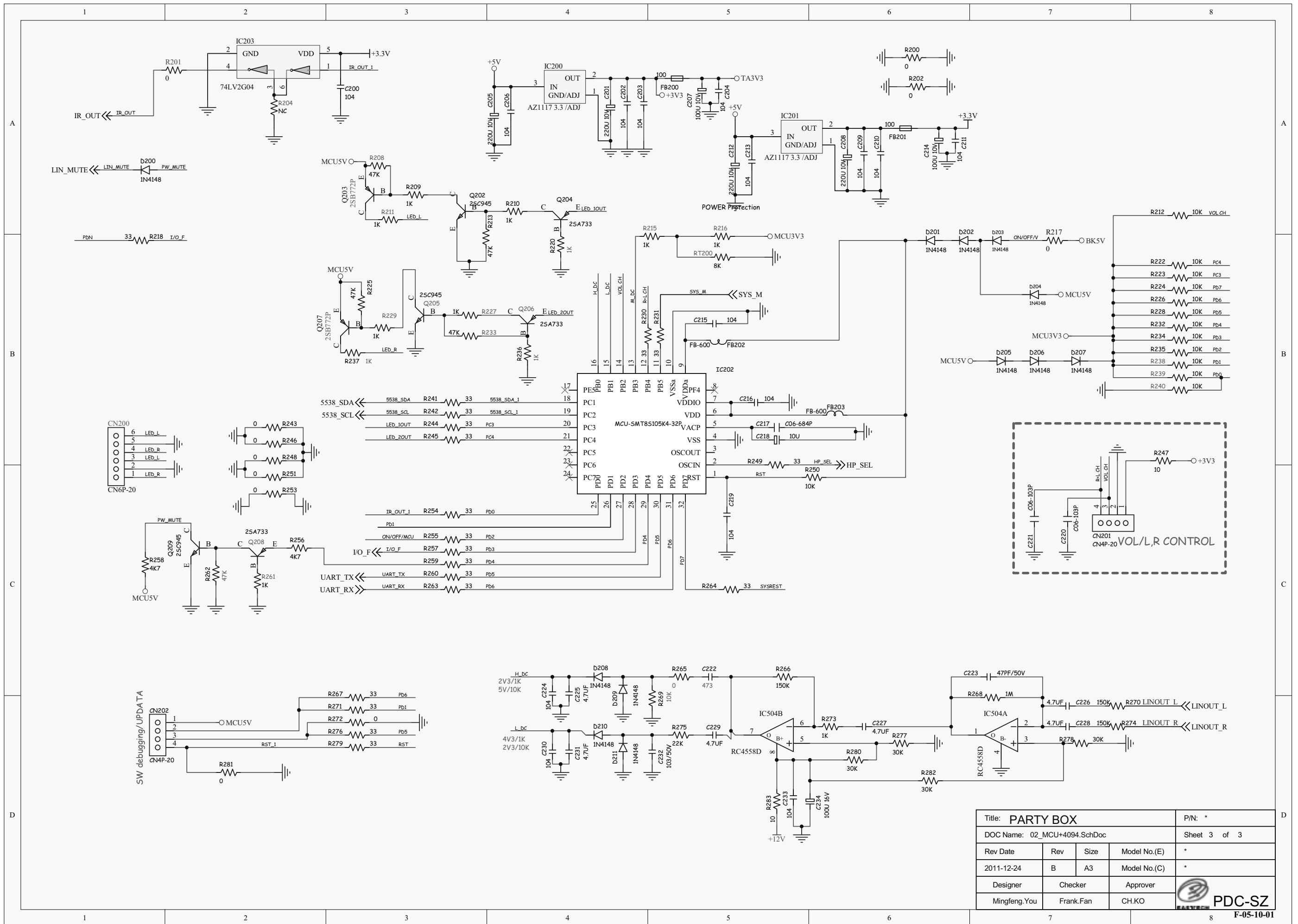


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Designer	Checker	Approver	
Martin Wei	Frank.Fan	CH.KO	



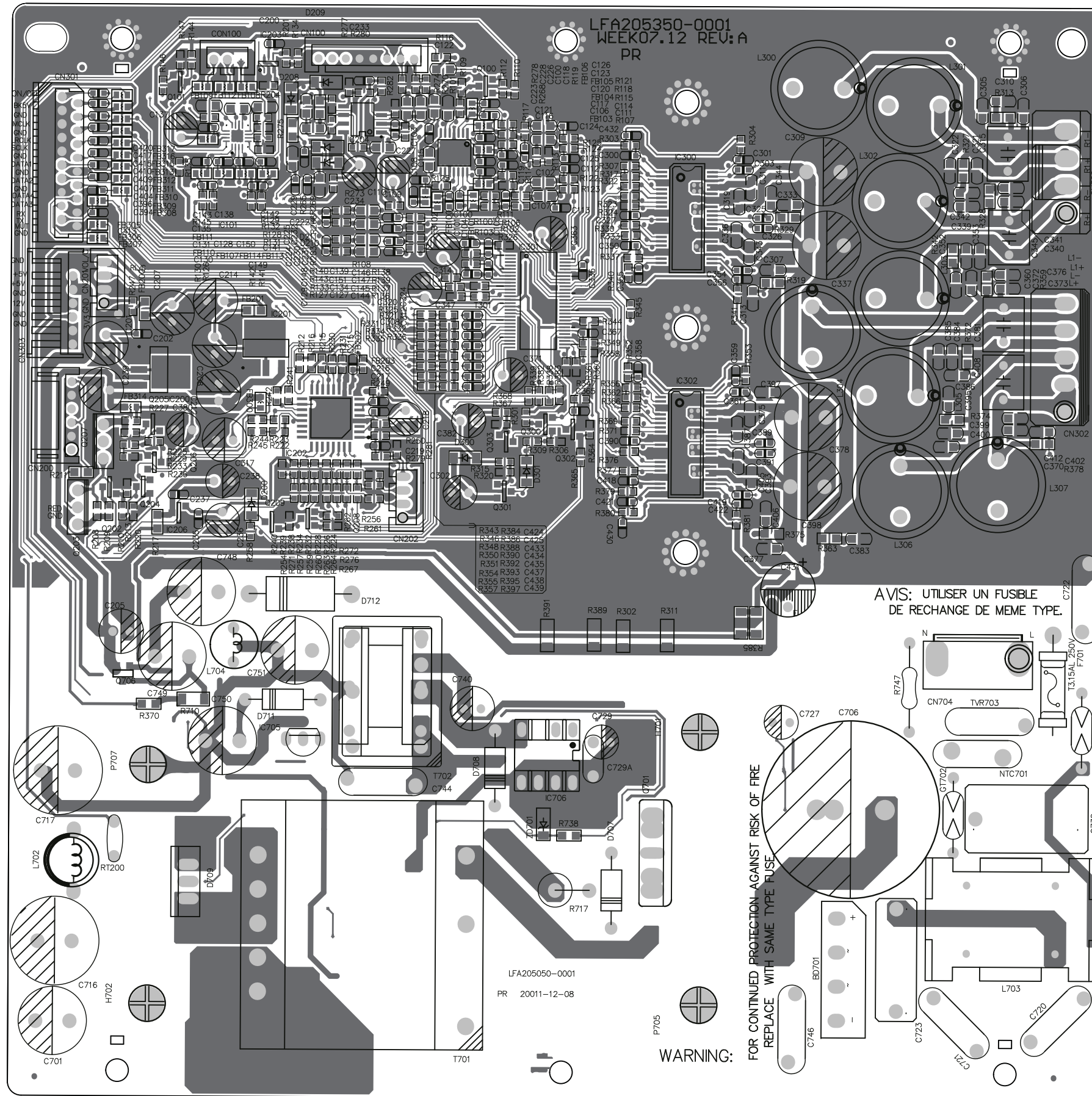


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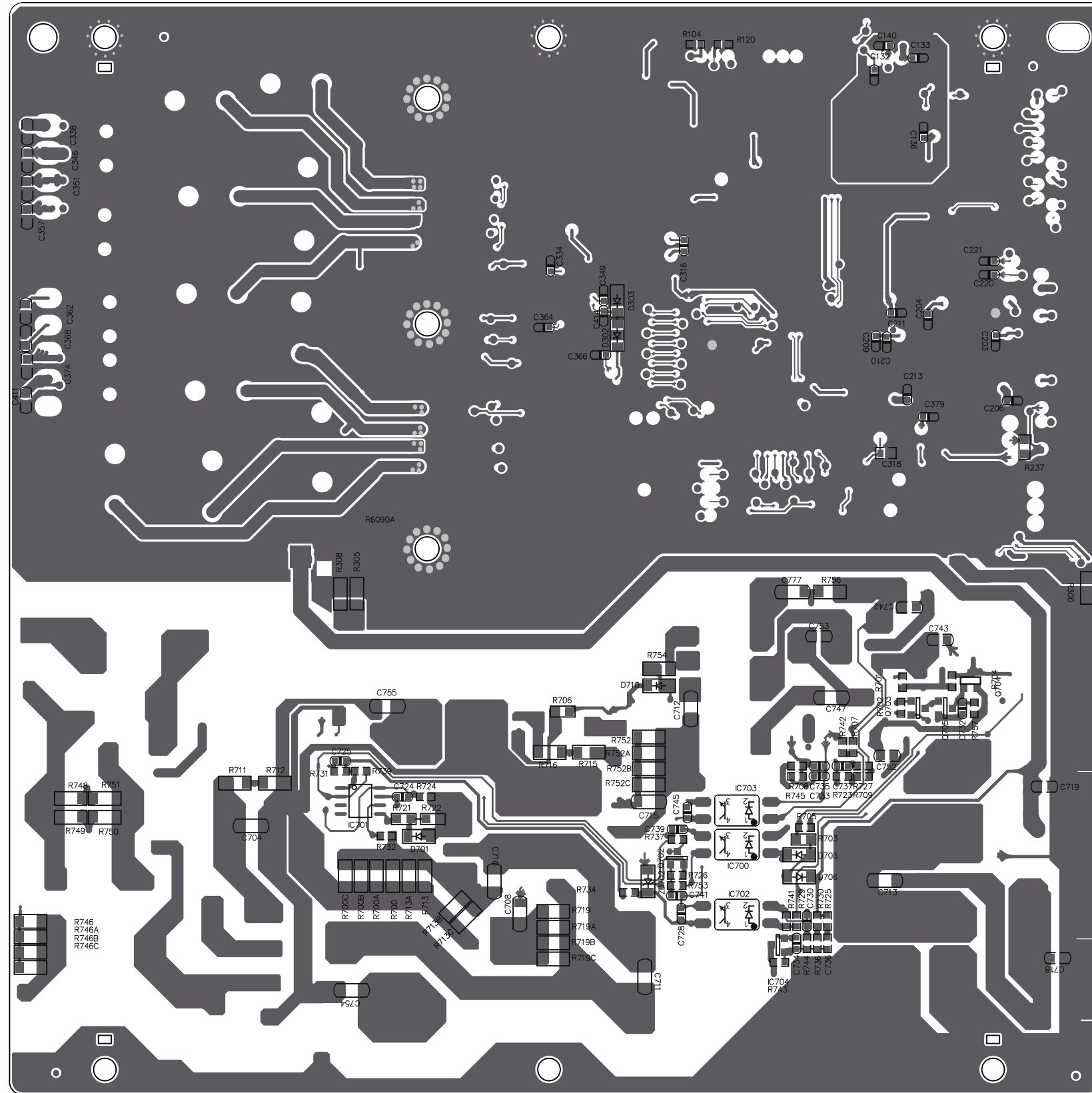


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Mingfeng.You	Frank.Fan	CH.KO		

PCB Layout View



PCB Layout View



MIC+KEY Board

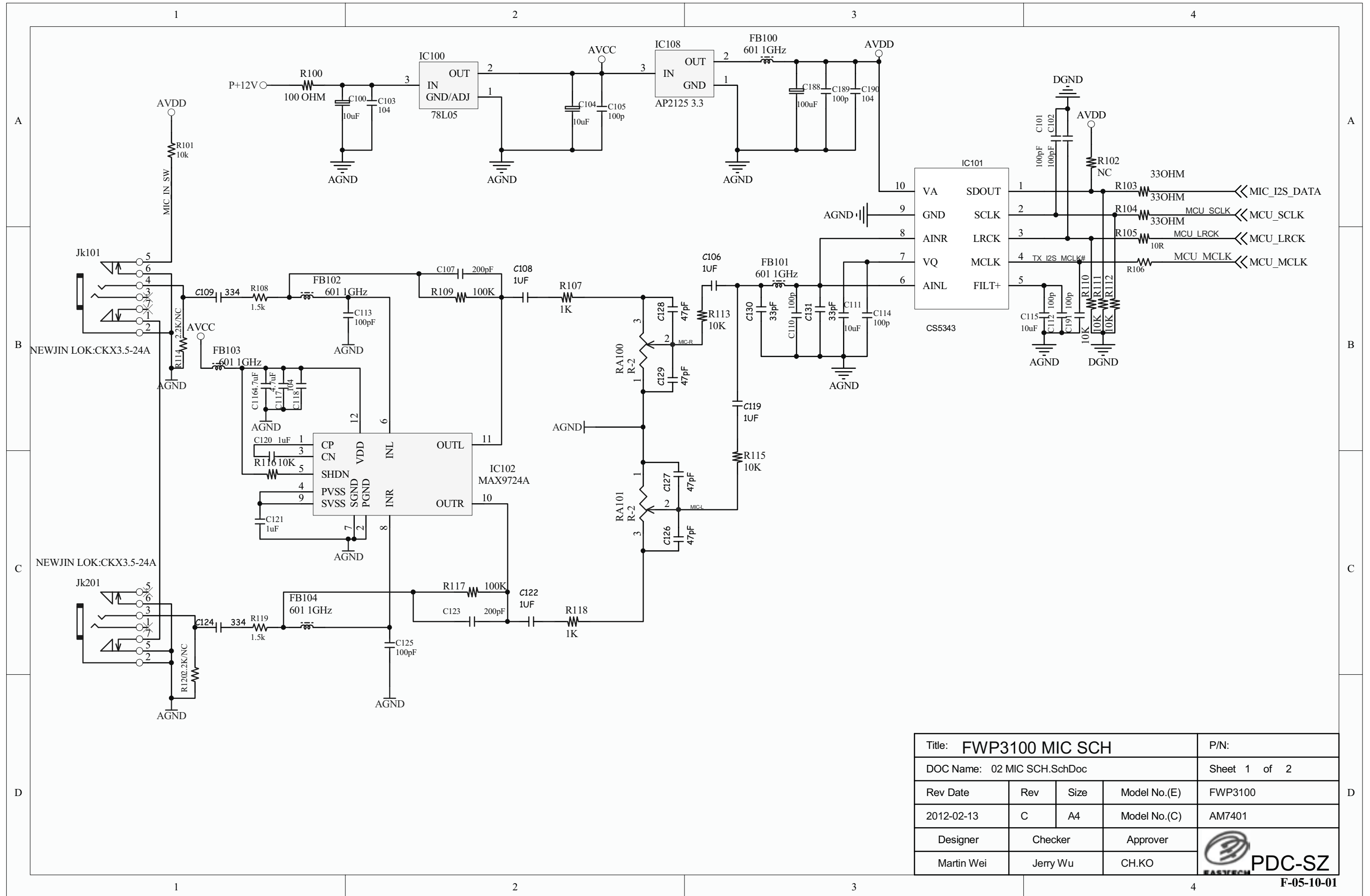
TABLE OF CONTENTS


Circuit Diagram	8-2
PCB Top Layout View	8-4
PCB Bottom Layout View.....	8-5

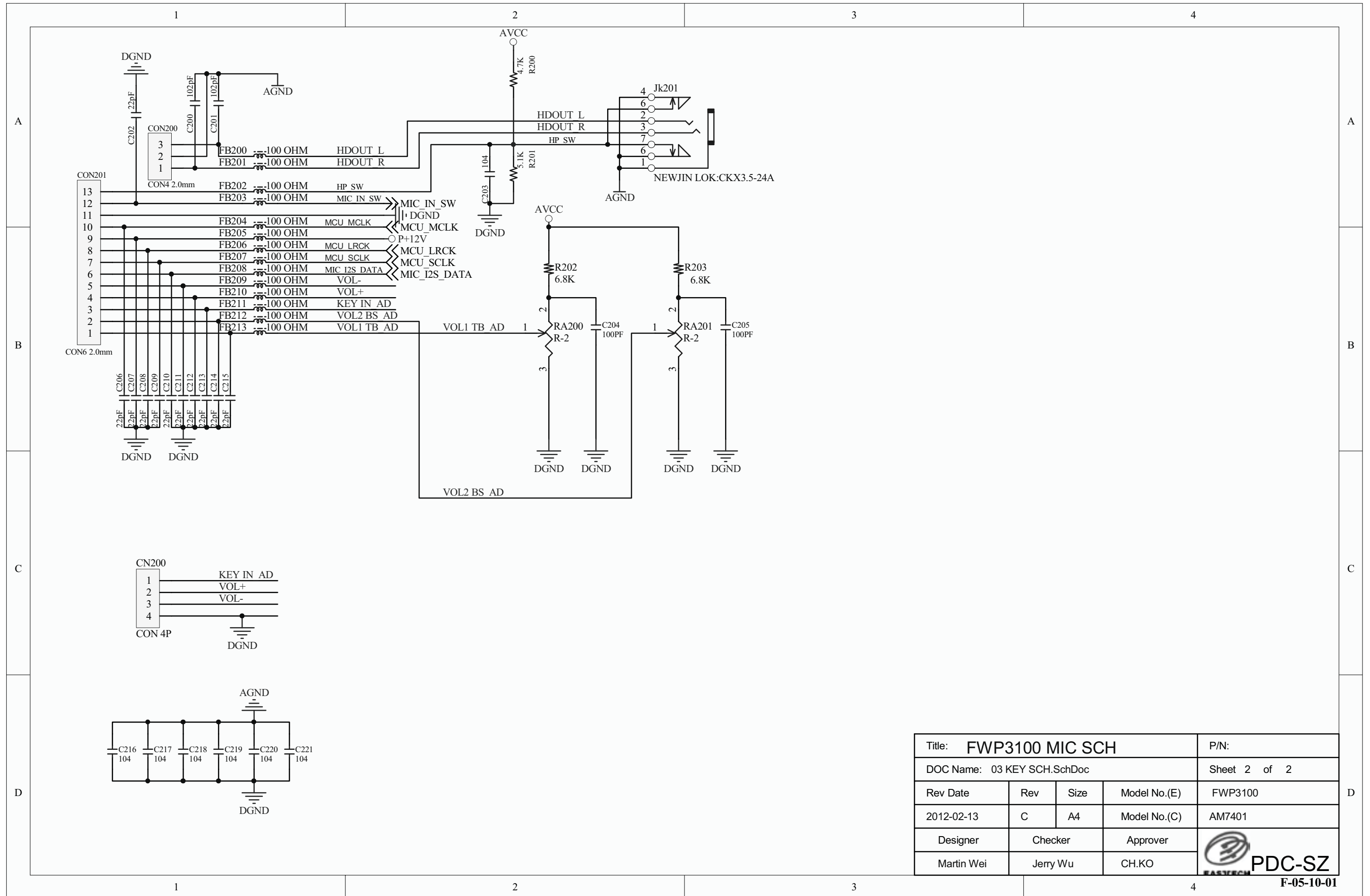
Circuit Diagram - Part 1


8-2

8-2



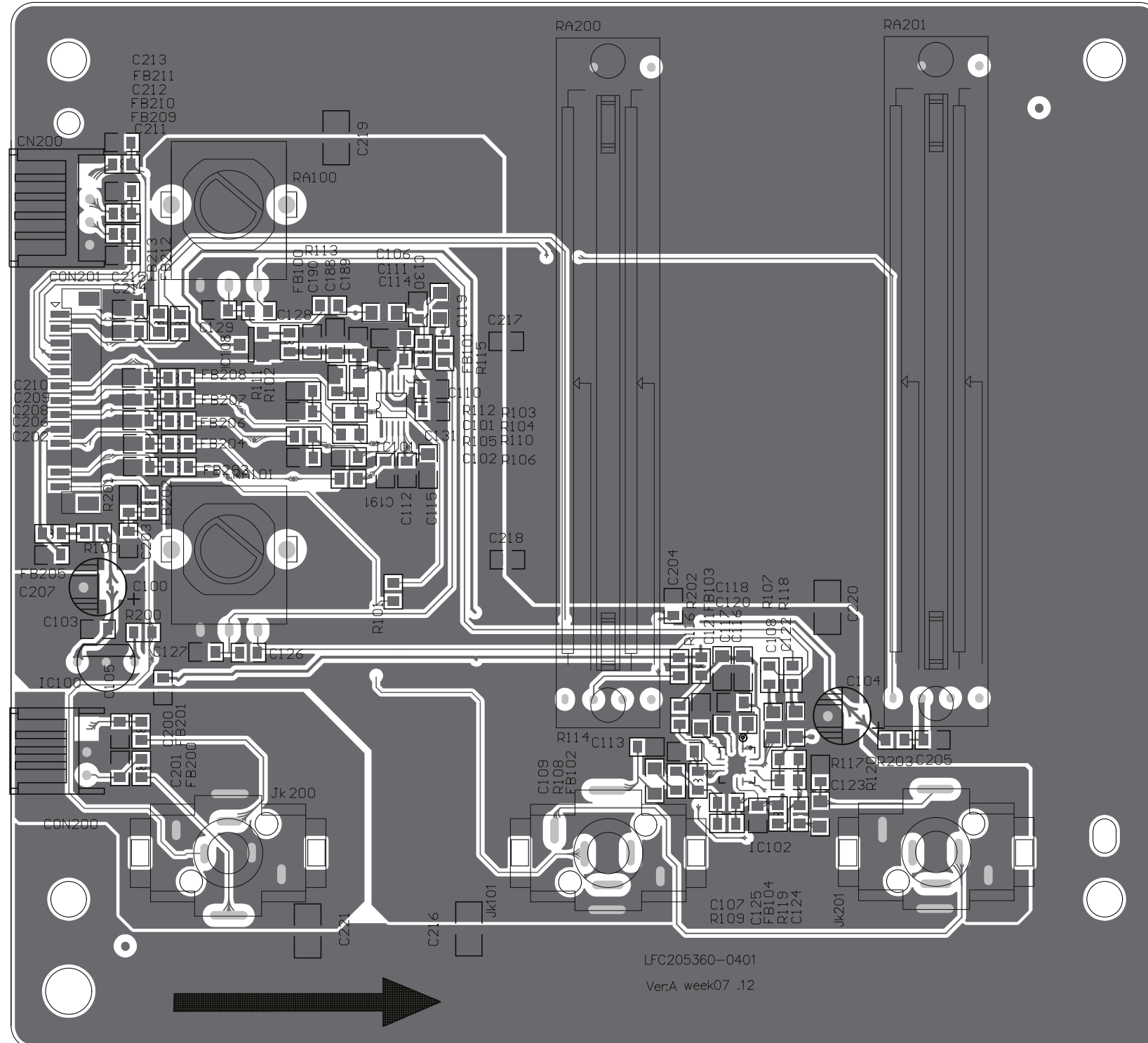
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Designer	Checker	Approver		 PDC-SZ <small>EASTTECH</small>
Martin Wei	Jerry Wu	CH.KO		



Title: FWP3100 MIC SCH				P/N:
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Martin Wei	Jerry Wu	CH.KO		



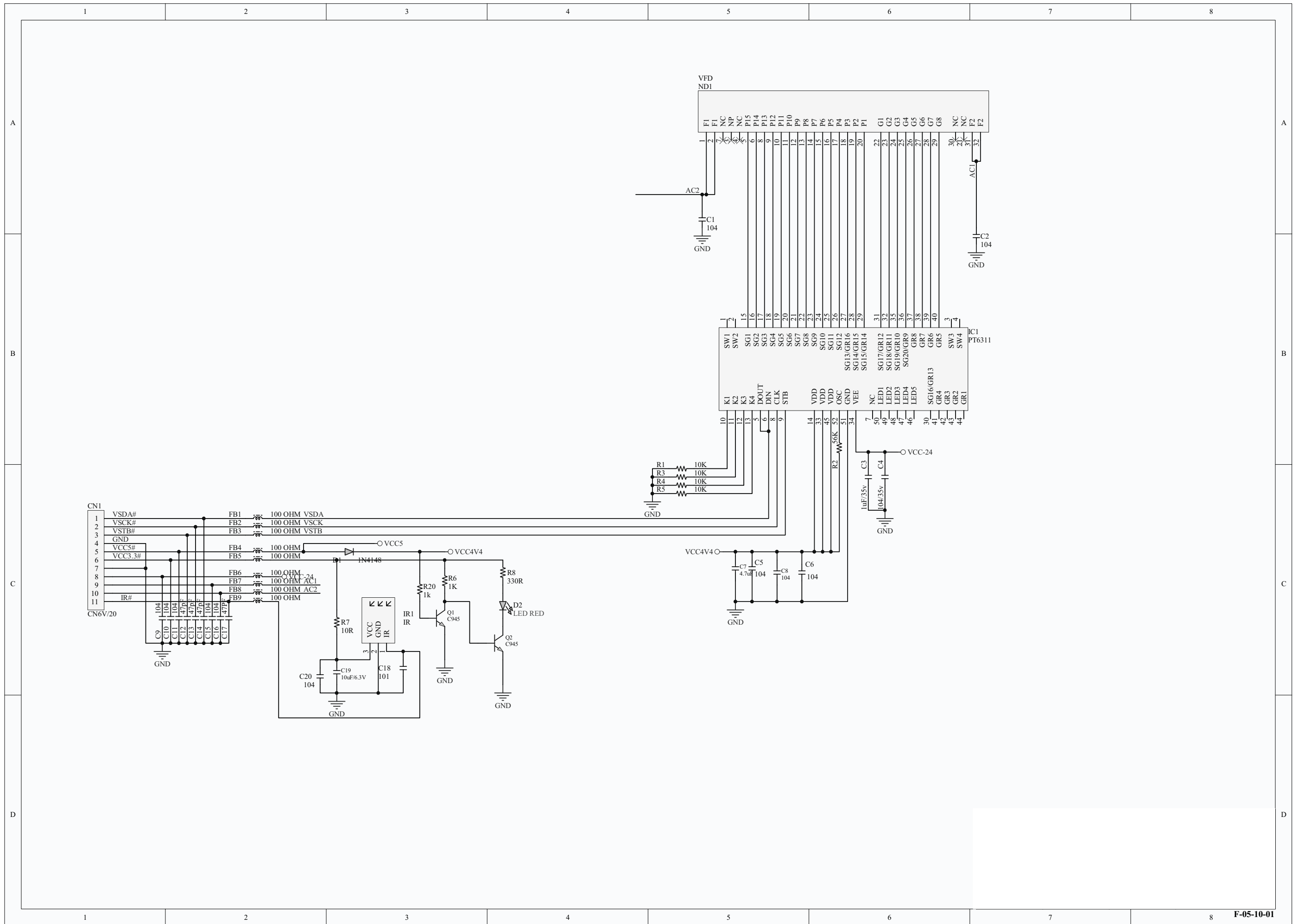
PCB Layout Views



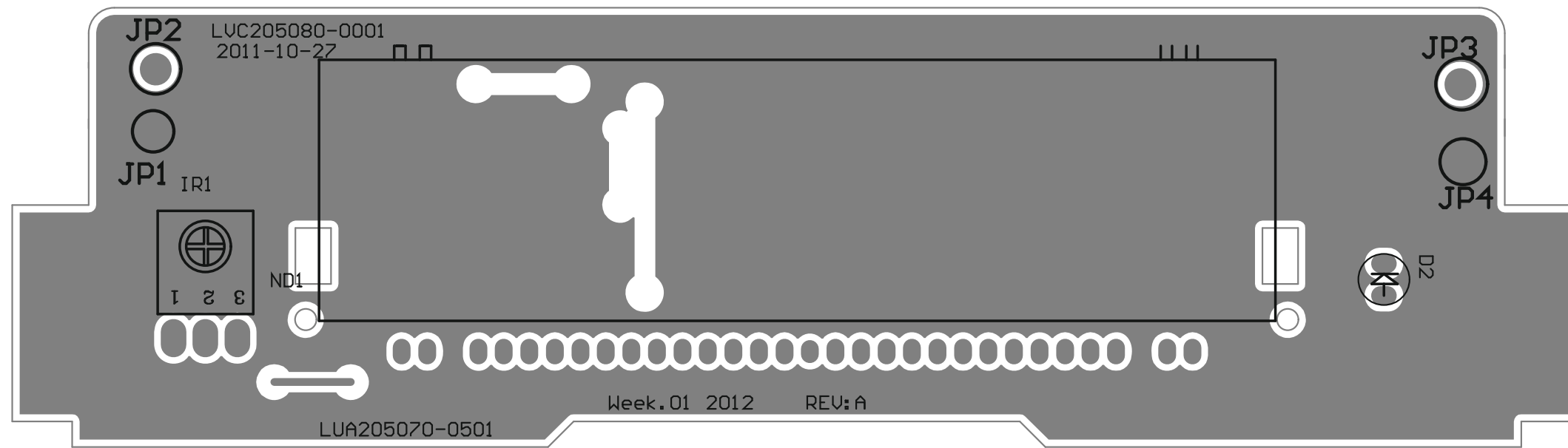
VFD Board

TABLE OF CONTENTS

Circuit Diagram	9-2
PCB Layout View	9-3



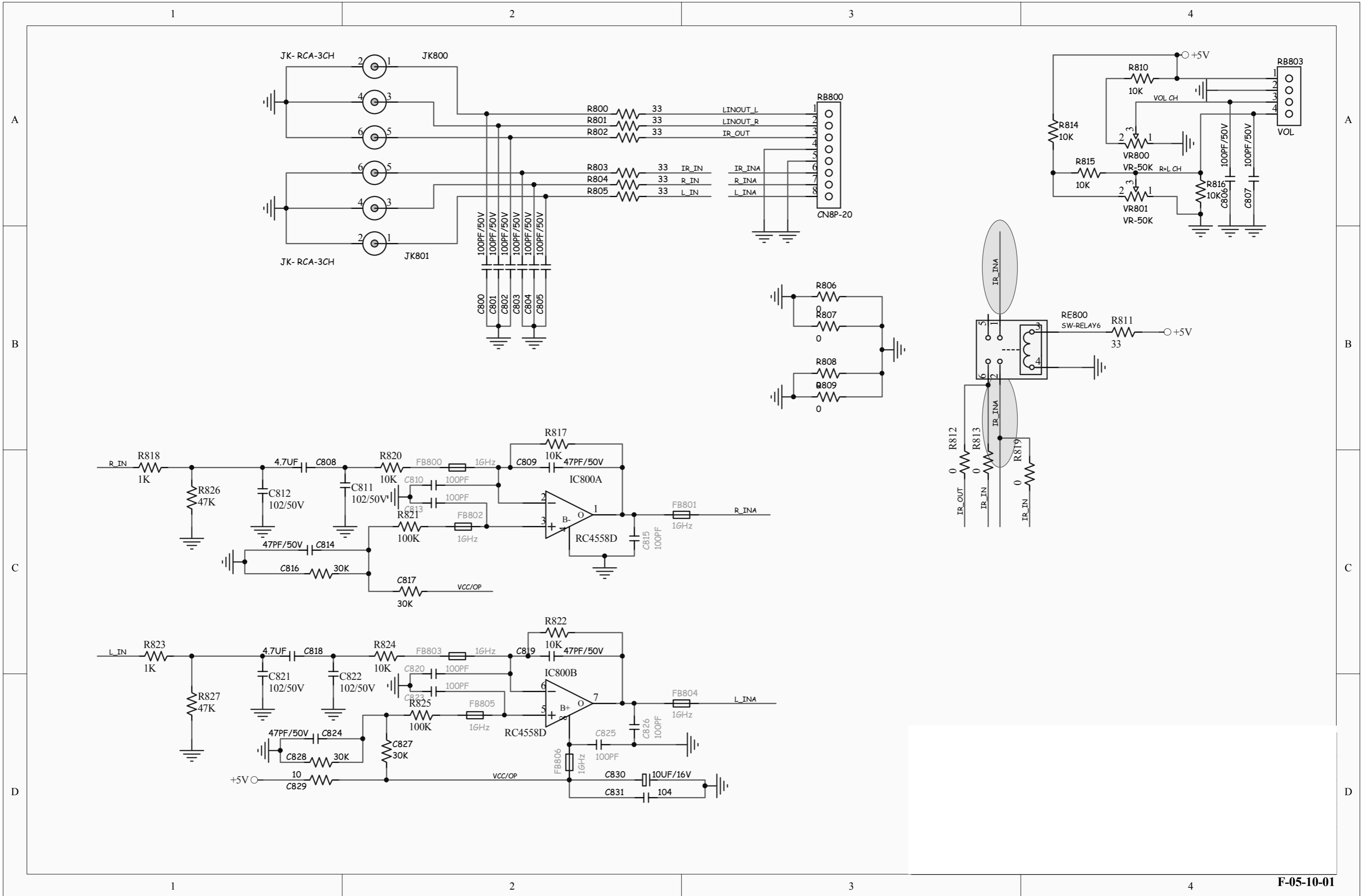
PCB Layout View



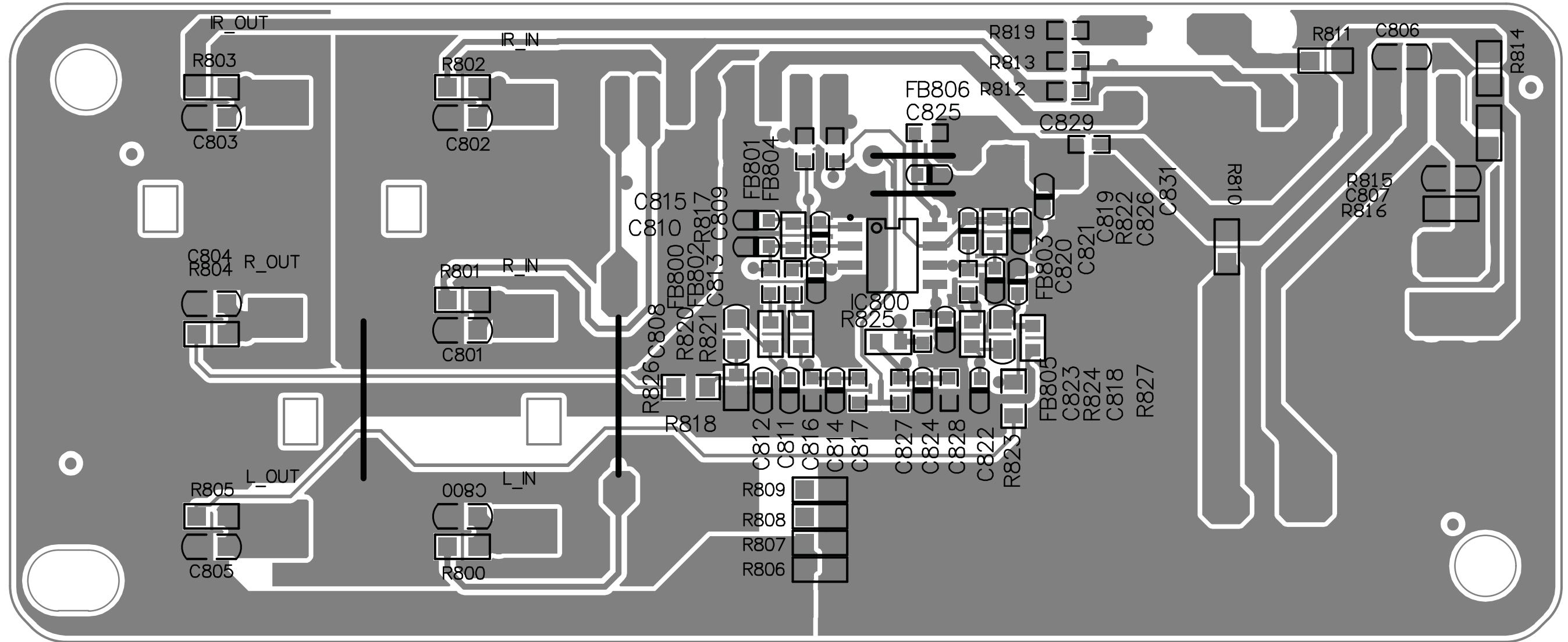
Jack Board

TABLE OF CONTENTS

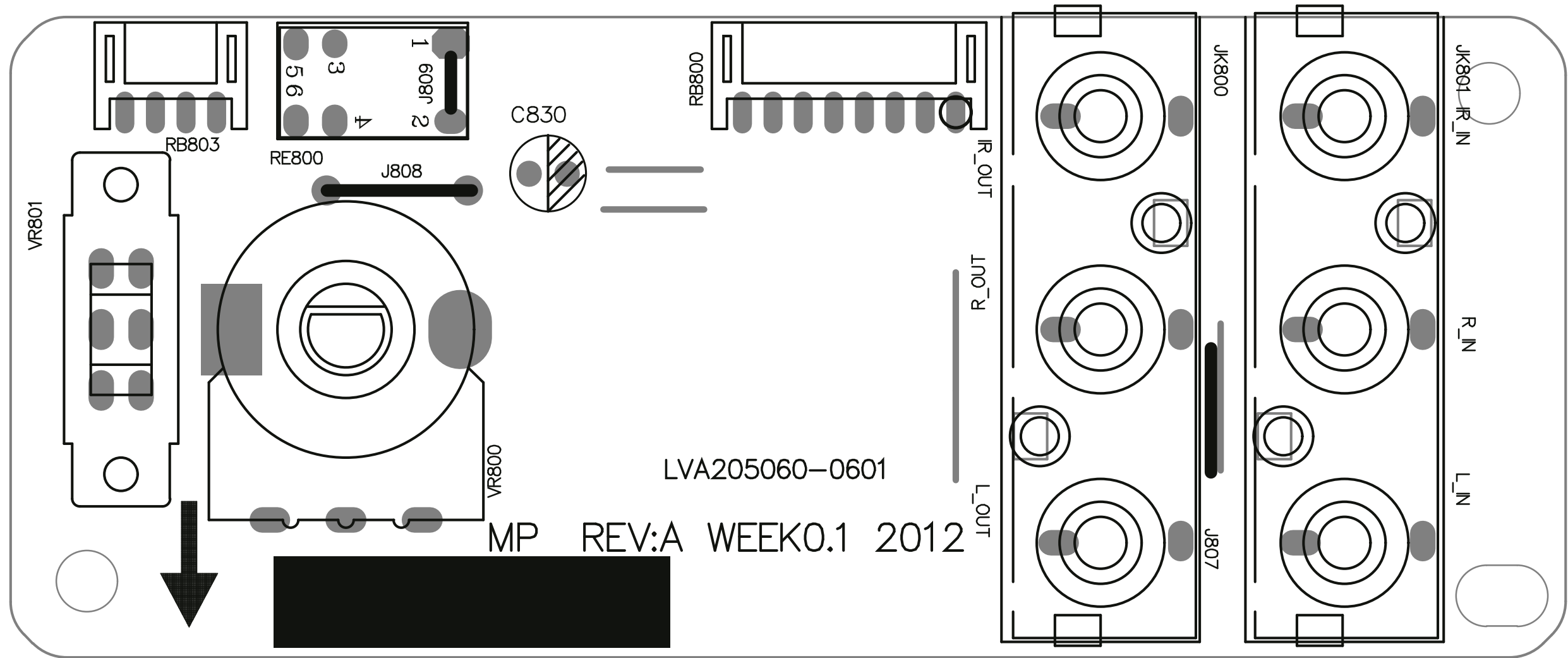
Circuit Diagram	10-2
PCB Layout View	10-3
PCB Layout View	10-4



PCB Layout Top View



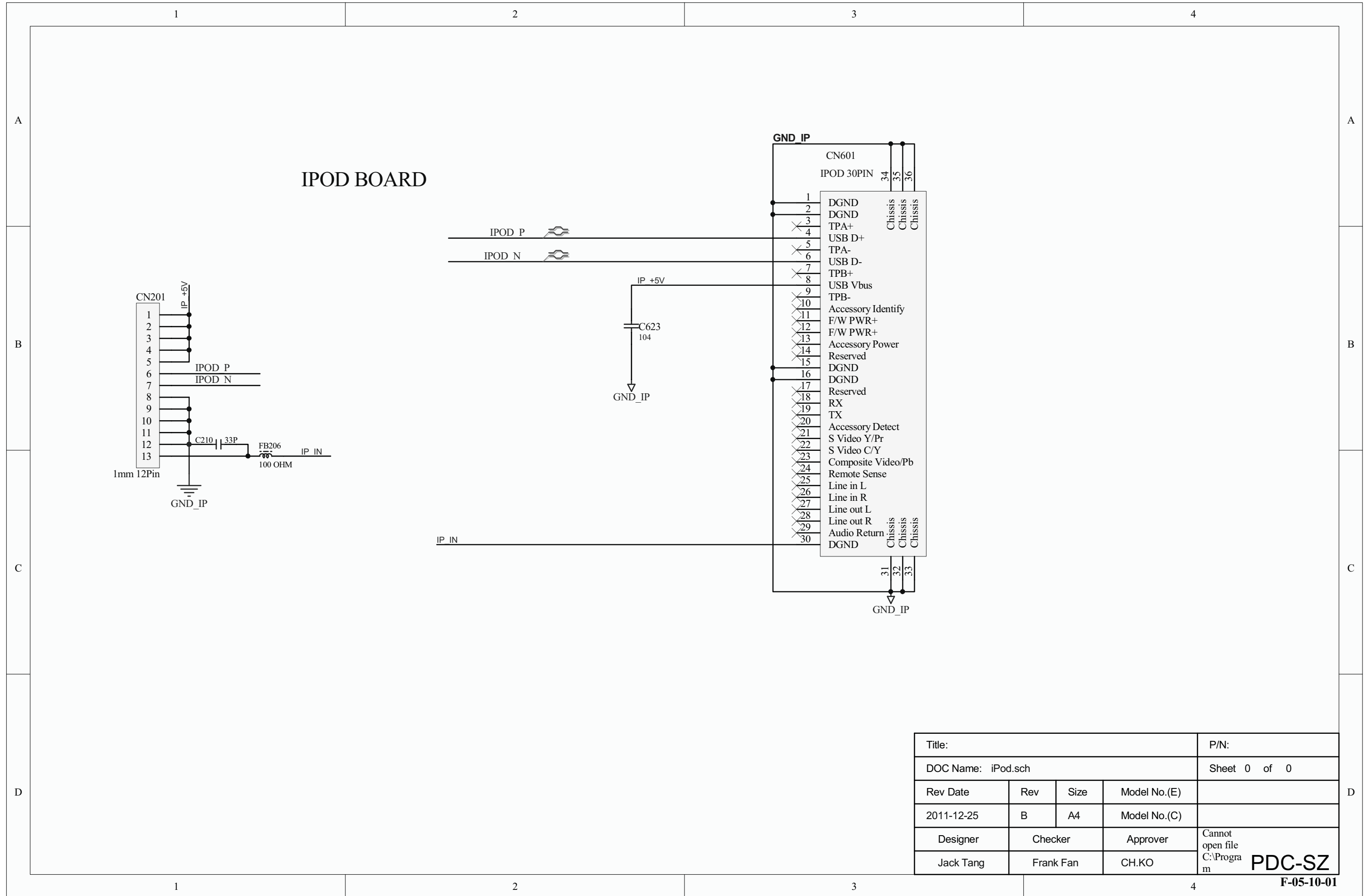
PCB Layout View



Ipod Board

TABLE OF CONTENTS

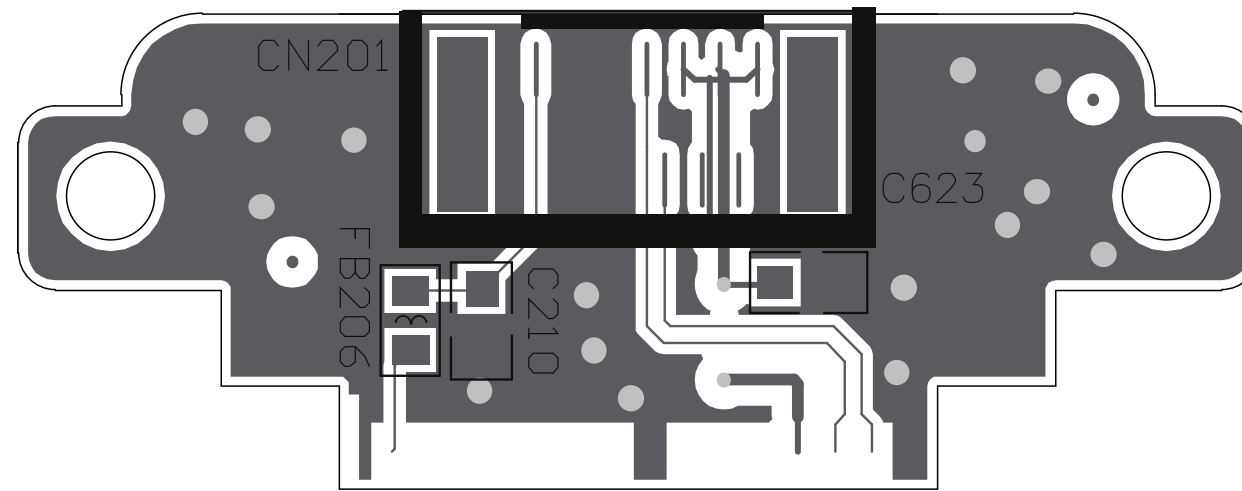
Circuit Diagram	10-2
PCB Layout View	10-3



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Designer	Checker	Approver		Cannot open file C:\Program
Jack Tang	Frank Fan	CH.KO		

PDC-SZ

PCB Layout View



FWP3100D/05/55 Explode View

