TELECOMPONENTS
FM TRANSMITTERS

USER MANUAL

2 - 3KW DS SERIES

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Document structure

This document contains all the technical information relating to the transmitters of Series DS.

In the first part we have all the technical specifications, followed by information for the first installation of the transmitter.

In the middle there is the explanation of the menu and functions of the transmitter, such as color display touch screen.

Finally, follow the wiring diagrams and layouts.

Scope of the document

Purpose of this document is to provide a comprehensive description of the functionalities of the **DS TRANSMITTER** and to provide operating information on the software elements of the system.

DS TRANSMITTER User Manual provides software setup information.

Introduction

The transmitter DS is designed with all the latest technologies, such as high efficiency using the latest generation LDMOS transistor and Power Supply. We used a modern interface and performance using a color display with touch screen, with easy management software and easy to use. Each transmitter DS is equipped with a LAN interface with the possibility of remote control completely transmitter operation. The transmitter DS is equipped with all audio inputs including Audio IP, for a complete audio interface.

Features

- State of the art performance
- LCD color display with touch screen for easy setting and reading parameters
- Extremely low distortion: **THD, IMD & TIM** (Transient Intermodulation Distortion) specified
- Highest stereo performance: **typ. 60 dB**
- L,/R, RDS / SCA, AUX, MPX, AES-EBU XLR & Optical, Audio IP
- Six Memory (frequency, sensitivity, power, etc.) which can be stored different setting. Ready for N+1 system
- Completely broadband
- Remote control for telemetry LAN, RS485
- RF amplifiers using the latest generation of semiconductors **RF Power LDMOS**
- **A**utomatic **P**ower **C**ontrol **(APC)** maintaining stable pre-set RF power 1.5:1 VSWR. Higher VSWR value causes power reduction
- Nominal RF output level 3000W. Continuously adjustable power output
- Built-in RF harmonics filter and true wattmeter
- High spectral purity
- CCIR & FCC compilant

Technical Specifications

GENERAL

Power Output: 3000W, adjustable from front panel.
RF Output Impedance: 50 ohm.
RF Output Connector: "7/8".
Monitor RF: BNC connector.
VSWR: 1,5:1
Frequency Range: 87.5 ÷ 108.00 MHz, only for analog on request
66 ÷ 74 MHz (OIRT), 76 ÷ 90 MHz (JPN) Programmable in 10 kHz steps.
Frequency Stability: ±1 ppm from -5 to 45°C.
External Reference: 10 MHz SMA connector back panel.
Type of Modulation: DS series analog synthesis, Option full digital synthesis.
Off Lock Attenuation: ≥ -80 dBc.
Modulation Capability: ±150 KHz.
Limiter built in
Power Good Detector: adjustable from20÷90% of the power.
Audio Presence Detector: adjustable time from front panel.
External AGC: Automatic, with fine ADJ from front panel.
Modulation Mode: Mono, Stereo, Multiplex, SCA, RDS, Aux.
Preemphasis: Flat/50/75µs selectable from front panel.
Asynchronous AM S/N Ratio: -70 dB.
Synchronous AM S/N Ratio: -65 dB .
RF Harmonics: Exceeds EBU/CCIR/FCC requirements.
RF Spurious: Exceeds EBU/CCIR/FCC requirements.

MONAURAL OPERATION

Audio Input Impedance: 600 ohm - ≥10 Kohm balanced.
Audio Input Level: Digital -12 to +12 dBm, Analog -6 to +12 dBm
Input Connector: XLR female.
Audio Frequency Response: ±0.1 dB, 30 Hz to 15 KHz.
Total Harmonic Distortion + Noise: 0.01% @ 400 Hz.
Intermodulation Distortion: 0.01%, 1 KHz/1.3 KHz, 1:1 ratio.
Transient Intermodulation Distortion: 0.01% 2.96KHz square wave and 14 KHz sine wave.
Distortion: 0.01% 2.96KHz square wave and 14 KHz sine wave.
FM S/N Ratio: -80 dB rms detector,-75 dB below ±75 KHz deviation.

STEREO OPERATION

Audio Input Impedance: 600 ohm - ≥10 Kohm balanced.
Audio Input Level: Digital -12 to +12 dBm, Analog -6 to +12 dBm **Input Connector:** XLR female.
Audio Frequency Response: ±0.1 dB, 30 Hz to 15 KHz.
Total Harmonic Distortion + Noise: 0.01% @ 400 Hz.
Intermodulation Distortion: 0.01%, 1 KHz/1.3 KHz, 1:1 ratio.
Transient Intermodulation Distortion: 0,01% 2.96KHz square wave and 14 KHz sine wave.
FM S/N Ratio: -80 dB rms detector, -75 dB below ±75 KHz deviation.
Stereo Separation: Digital 20 Hz ÷ 15 KHz ≥ -60dB, Analog -45 dB@30Hz ≥ -60dB@ Freq ≥ 100 Hz
Crosstalk attenuation: Digital Main to Sub -70 dB 30 Hz to 15 KHz, Analog ≥ 45 dB@15kHz.
38 KHz Suppression: ≥ -85 dB.
Pilot Frequency: 19 KHz ± 1 Hz
Output Pilot: Digital 1 Vpp. BNC female, analog 2Vpp adjustable from front panel

SIGNAL PROCESSING SECTION (only for Digital)

FM Carrier Generation: NCO-based synthesis
FM Modulation: Fully digital
Stereo Coder: Fully digital, integrated
Input Audio Limiter: Proprietary integrated Soft Limiter
Digital Signal Processing: Real-time internal24-bit digital processing
RDS Generator: Fully integrated
Monitoring Output Signals: Fully digitally generated

MULTIPLEX OPERATION

Composite Input Impedance: 2 Kohm unbalanced.
Composite Input Level: Digital -12 to +12 dBm, Analog -6 to +18 dBm
Input Connector: BNC female.
Composite Amplitude Response: ±0.1 dB, 30 Hz to 100 KHz.
Total Harmonic Distortion + Noise: 0.01% @ 400 Hz.
Intermodulation Distortion: 0.01%, 1 KHz/1.3 KHz, 1:1 ratio.
Transient Intermodulation Distortion: 0.01% 2.96KHz square wave and 14 KHz sine wave.
FM S/N Ratio: -80 dB rms detector, -75 dB below ±75 KHz deviation

AES/EBU OPERATION (optional for Analog)

Input Connector: XLR female, optical TOS-LINK.
Data Format: S/PDF,AES/EBU, IEC958, EIAJCP340/1201.
D/A Converter: 24 bit.
Sampling Frequency: from 32 to 96 KHz.

AUDIO IP (optional)

Lan: Audio IP and Web interface to control and configure
Transport protocol: RTP over UDP;
Protocols: RFE Codec: Alaw,OGG VORBIS, MP3, AAC
SHOUTCAST/ICECAST Codec : TX MP3, RX AAC, AAC+, MP3, OGG (icecast 2.x)

SCA, RDS, AUX OPERATION

Input Impedance: ≥ 2 Kohm.
Input Level: -6 to +12 dBm.
Frequency Response: ±0.1 dB, 50 KHz to 100 KHz.
Input Connector: BNC female.

AUXILIARY CONNECTIONS

RS485: DB9 connector back panel.
CAN BUS (optional): DB9 connector back pane
Telemetry Interface: connector DB25 back panel.
LAN: RJ45 connector back panel
MPX OUT: connector BNC back panel.

OPTIONS

RDS/RBDS Programmable Coder via PC.
OIRT or JPN version.
SNMP
Audio Over IP
AES/EBU (only for Analog)

ELECTRICAL

AC Input Power: 90÷260 VAC 50/60 HZ single phase.
AC Apparent Power Consumption: 4200VA
Cos Φ> 0.98.
Cooling: Forced air.
Acoustic noise:< -56 dBa @ 1 meter.

ENVIRONMENTAL

Operating temperature: -5°C to +50°C.
Max Operating Altitude: 2000 mt.
Relative Humidity Range: 0 to 90%.

PHYSICAL DIMENSION

Mounting: Standard 19" chassis 3 U rack.
Size: W x 483 mm. D x 600 mm. H x 132 mm.
Weight: ~ 25Kg.

Software update

Core micro : Via Web

Installation and Use

Front panel

The front panel has five LEDs that indicate the status of the transmitter, and are:

- ON LED green/yellow
- LOCK LED green
- REMOTE LED yellow
- INTERLOCK LED yellow
- FAULT LED red

There are also four keys for the functions of:

- ON
- REMOTE
- RESET
- BACK

These LEDs and its buttons, integrate the capabilities of the LCD, to understand the status of the transmitter more clearly without access to the navigation menu.

Rear panel Transmitter

On the rear panel connectors are located as follows:

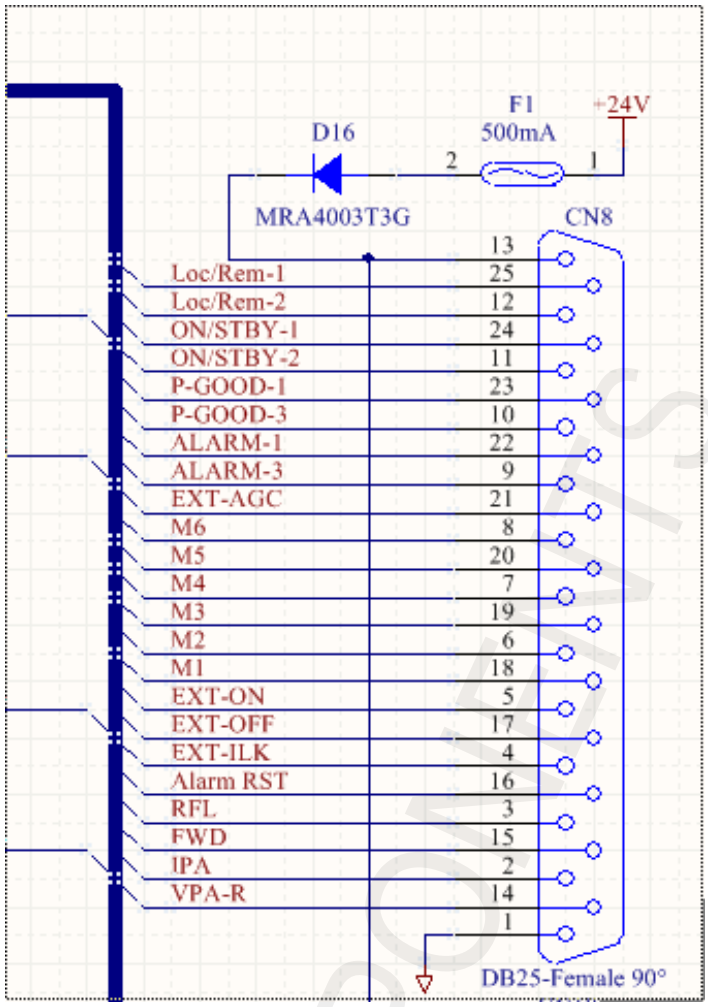
- Input Mains
- RF out 7/8 connector
- L/R audio input XLR connector
- MPX audio input BNC connector
- MPX audio output BNC connector
- AUX input BNC connector
- SCA/RDS input BNC connector
- 19kHz in/out BNC connector
- AES/EBU input XLR/TOS-LINK connector (optional for analog)
- AUDIO IP input RJ45 connector
- 10MHz input SMA connector (optional only for digital)
- 1 PPS input SMA connector (optional only for digital)
- GSM Antenna SMA connector (optional)
- RDS/RS232 DB9 connector (optional)
- TLC/TLS DB25 connector
- RS485 DB9 connector
- LAN RJ45 connector

Rear panel Amplifier

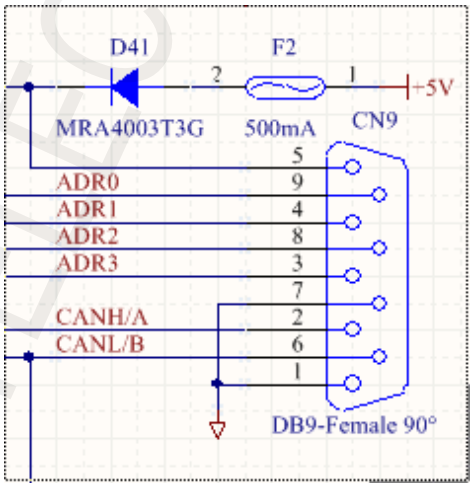
On the rear panel connectors are located as follows:

- Input Mains
- RF out 7/8 connector
- RF in N connector
- GSM Antenna SMA connector (optional)
- TLC/TLS DB25 connector
- RS485 DB9 connector
- LAN RJ45 connector

DB25 (TLC/TLS) Rear connector



DB9 Rear connector



DB25 PinOut

1. GND
2. OUTPUT- Analog IPA
3. OUTPUT- Analog Reflected Power
4. INPUT- optoinsulated -External interlock (settable N.O. o N.C.)
5. INPUT- optoinsulated -Exciter ON (remote control)
6. INPUT- optoinsulated - memory M2
7. INPUT- optoinsulated - memory M4
8. INPUT- optoinsulated - memory M6
9. OUTPUT- Pin 2 rele contact – General alarm
10. OUTPUT- Pin 2 rele contact – Power & Audio good
11. OUTPUT- Pin 2 rele contact - ON/Stand-by
12. OUTPUT- Pin 2 rele contact - Local/Remote
13. OUTPUT +24VDC max 500mA
14. OUTPUT- Analog VPA
15. OUTPUT -Analog Forward Power
16. INPUT- optoinsulated – Alarm reset
17. INPUT- optoinsulated -Exciter OFF (remote control)
18. INPUT- optoinsulated - memory M1
19. INPUT- optoinsulated - memory M3
20. INPUT- optoinsulated - memory M5
21. INPUT- Analogico-External AGC (external directional coupler)
22. OUTPUT- Pin 1 rele contact – General Alarm
23. OUTPUT- Pin 1 rele contact – Power & Audio good
24. OUTPUT- Pin 1 rele contact - ON/Stand-by
25. OUTPUT- Pin 1 rele contact - Local/Remote

The functioning of the relays can be set from the front panel in normal open or normal closed.

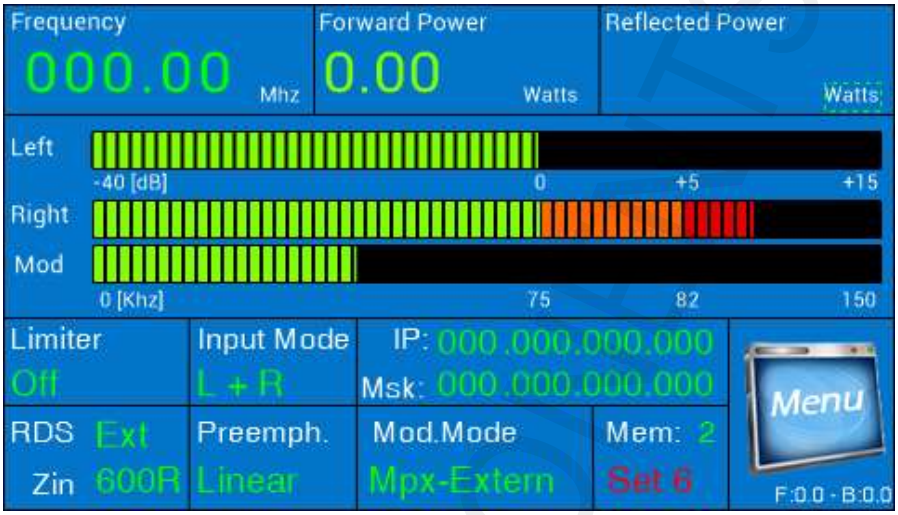
DB9 PinOut

1. GND
2. 485 (optional Canbus)
3. INPUT- optoinsulated -Address 3
4. INPUT- optoinsulated - Address 1
5. OUTPUT +5VDC
6. 485 (optional Canbus)
7. GND
8. INPUT- optoinsulated - Address 2
9. INPUT- optoinsulated - Address 0

Quick Start Transmitter

At first power to make sure that the transmitter is connected to the antenna or a dummy load, adequate power, connect the mains plug and turn on the transmitter. **If you want to turn on the transmitter with the lowest possible power, when the power to keep pressed the BACK ← button simultaneously to the power on button.**

Power-on transmitter display will show the following figure:



The display will show all the necessary information about the setting of the transmitter, such as:

- Frequency
- Forward Power
- Reflected Power
- L/R Modulation
- Deviation Modulation
- Limiter
- Input Mode
- RDS
- Input Impedance
- Preemphasis
- Modulation Mode
- Memory
- IP
- Mask
- Menu

Quick Start Amplifier

At first power to make sure that the amplifier is connected to the antenna or a dummy load, adequate power, connect the mains plug and turn on the transmitter. **If you want to turn on the amplifier with the lowest possible power, when the power to keep pressed the BACK ← button simultaneously to the power on button.**

Power-on transmitter display will show the following figure:

The display will show all the necessary information about the setting of the transmitter, such as:

- Forward Power
- Reflected Power
- Forward Power input
- IPA1; IPA2; IPA3
- VPA
- RF Temperature
- Menu

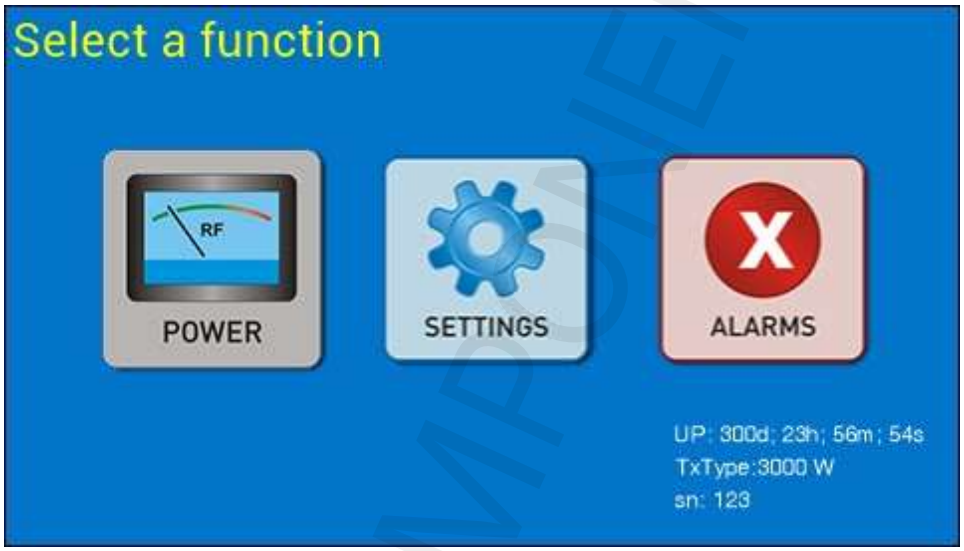
Menu Amplifier

Display and programming of the amplifier is through the LDC display touch screen. From the first screen at power, as previously explained, can be accessed through the menu button to the submenu of the Power, Setting, and Alarm.

Touching a symbol on the display is accessed directly from the menu chosen and you can implement all the changes you want. Each menu is simple and intuitive without the need for any manual so that all changes following what appears on the display. Following are the main screens that allows the display.

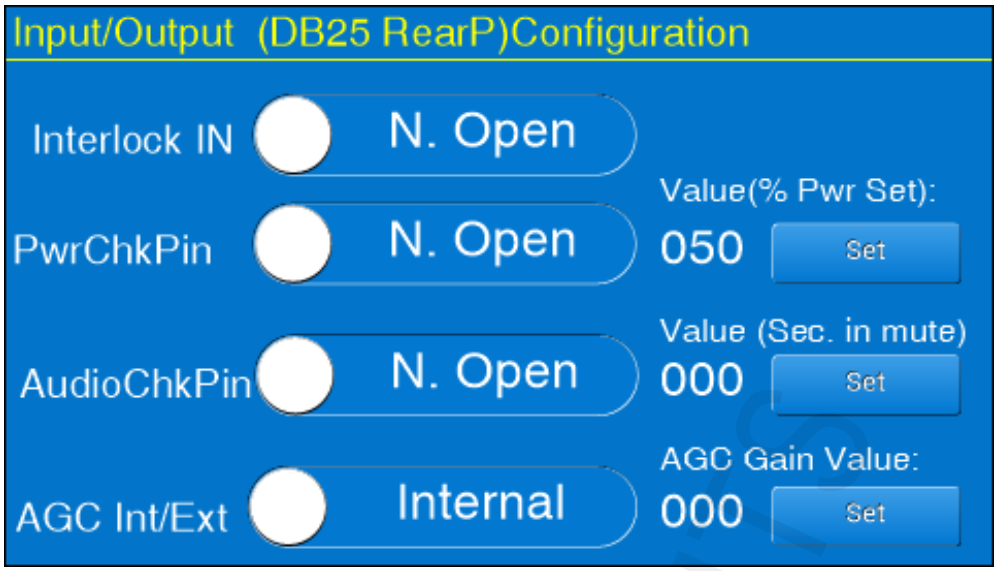
In the settings menu you will find all the possible configurations of the date and time, external interlock, LAN configuration, setting a general machine and all measures concerning the voltages and currents in the transmitter.

MENU

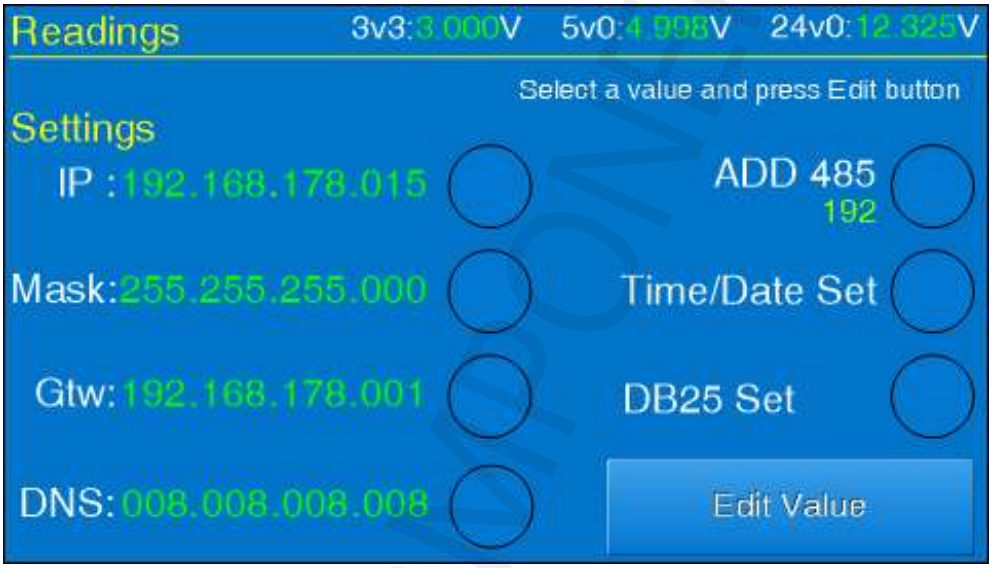


POWER SETTING

DB25 SETTING



LAN CONFIGURATION



LOG EVENT

Menu Transmitter

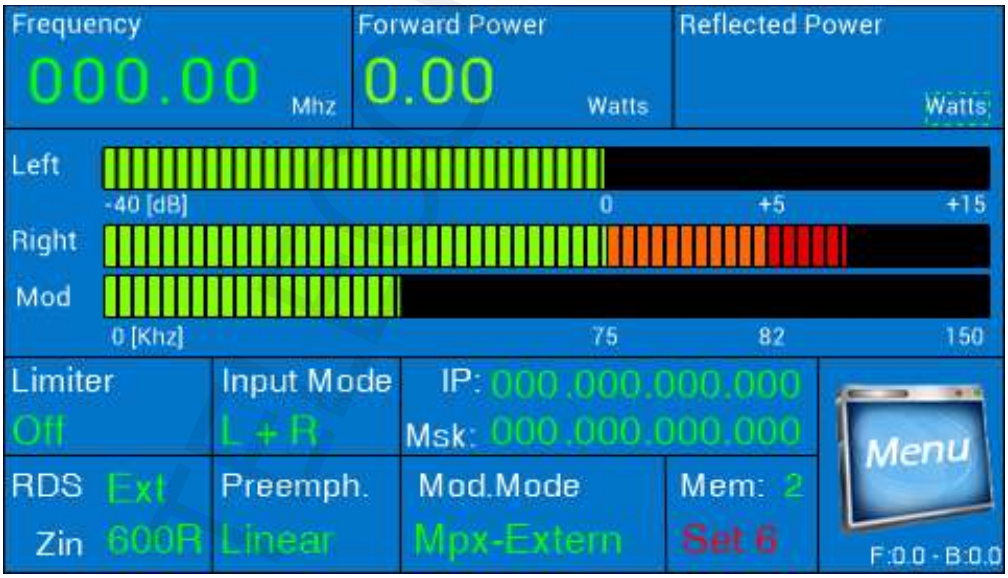
Display and programming of the transmitter is through the LDC display touch screen. From the first screen at power, as previously explained, can be accessed through the menu button to the submenu of the Audio, Frequency, Power, Setting, Memories and Alarm.

Touching a symbol on the display is accessed directly from the menu chosen and you can implement all the changes you want. Each menu is simple and intuitive without the need for any manual so that all changes following what appears on the display. Following are the main screens that allows the display.

That related to memories need an explanation, the transmitter can store six different settings in six memories, these can be called either remotely or locally; This is used in systems n + 1 in the case of transmitters reserve. The storing of data, frequency, power, etc. are possible with the transmitter on the air, without interrupting transmission. When storing the display shows "SETTING MEMORIES", at the end the display will show all the data chosen.

In the settings menu you will find all the possible configurations of the date and time, external interlock, LAN configuration, setting a general machine and all measures concerning the voltages and currents in the transmitter.

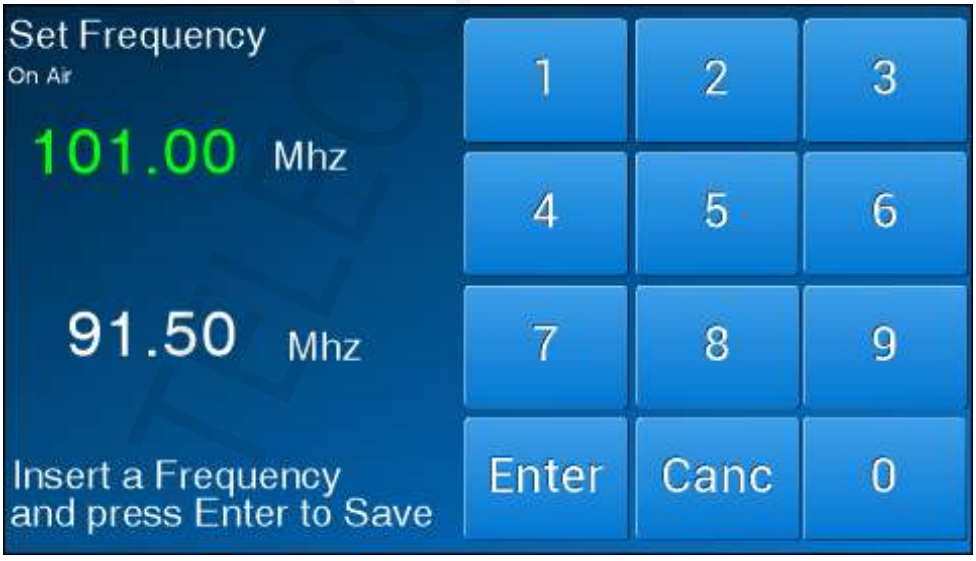
MAIN PAGE



MENU

POWER SETTING

FREQUENCY SETTING



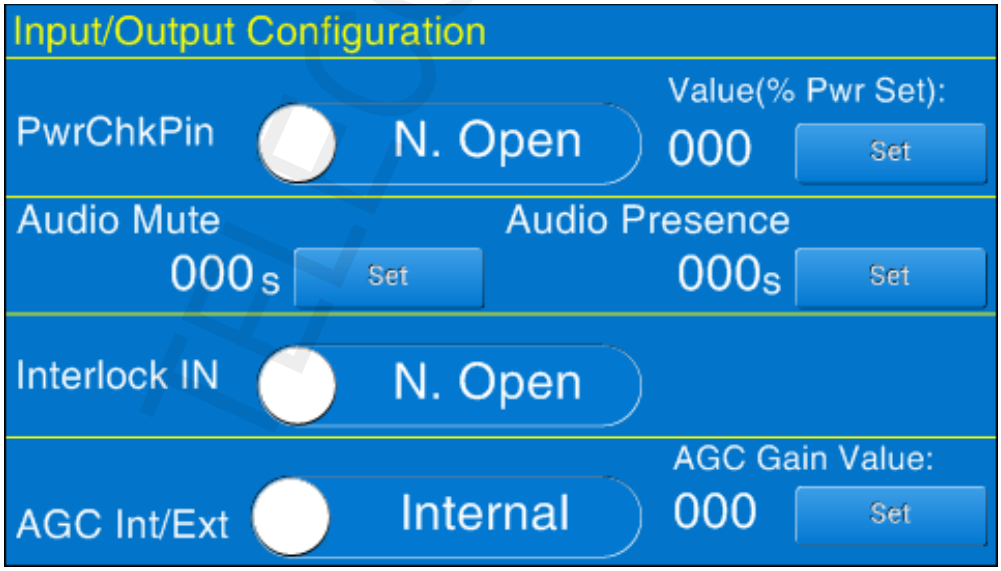
AUDIO SETTING

SETUP INPUT LEVEL

AUDIO LEVEL SETTING

RESERVE AUDIO SETTING

CHANGE OVER AUDIO SETTING



TO ACTIVATE THE CHANGE OVER AUDIO SELECT AUDIO BACKUP, SET THE TIME FOR ACTION "AUDIO MUTE" THIS IS THE TIME NEEDED FOR SWITCHING BETWEEN AUDIO MAIN AND AUDIO RESERVE.

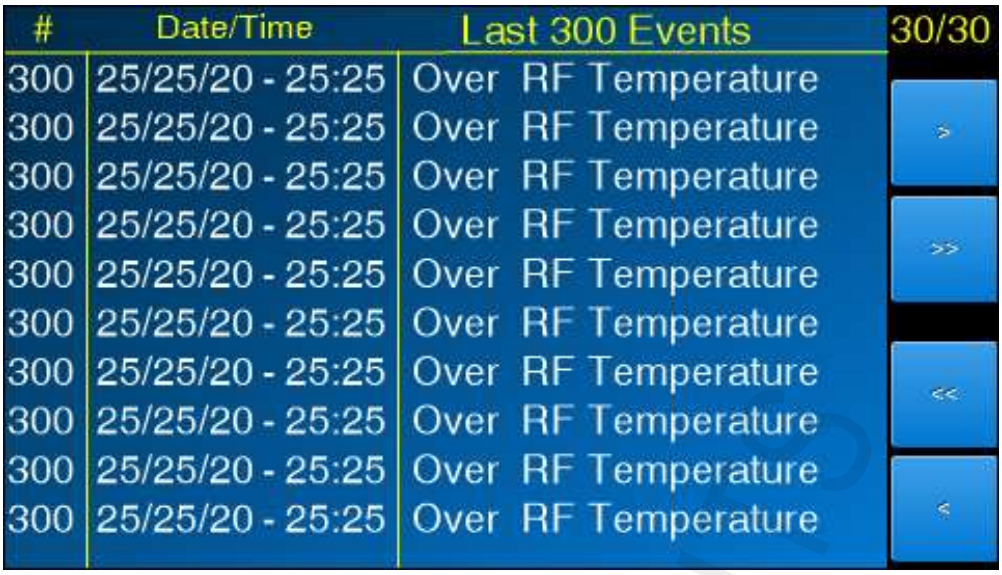
SET "AUDIO PRESENCE" TIME FOR RETURN FROM AUDIO RESERVE, A MAIN AUDIO.

TO ACTIVATE THE CHANGE OVER AUDIO MUST ACTIVATE THE SCREEN "RESERVE AUDIO SETTING".

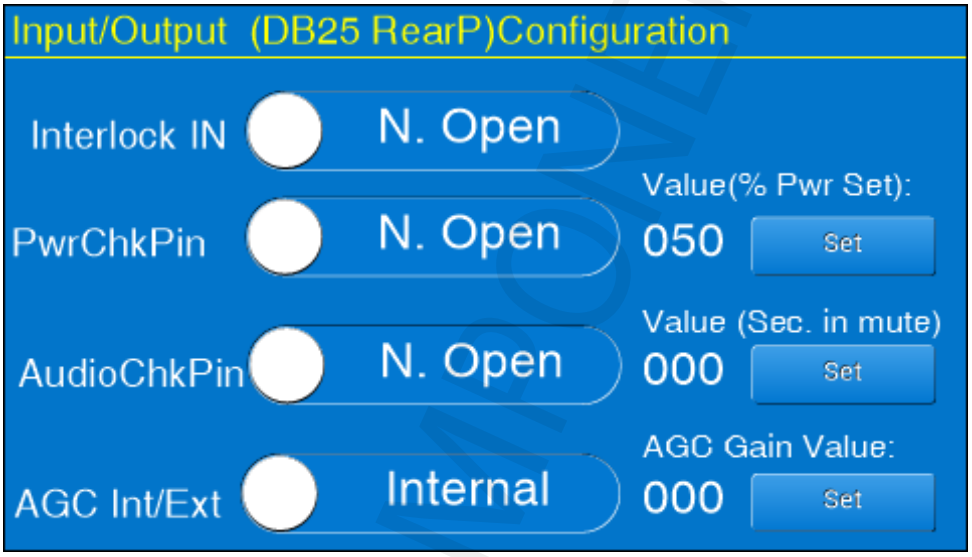
MENU MEMORY SETTING

MEMORY SETTING

LOG EVENT

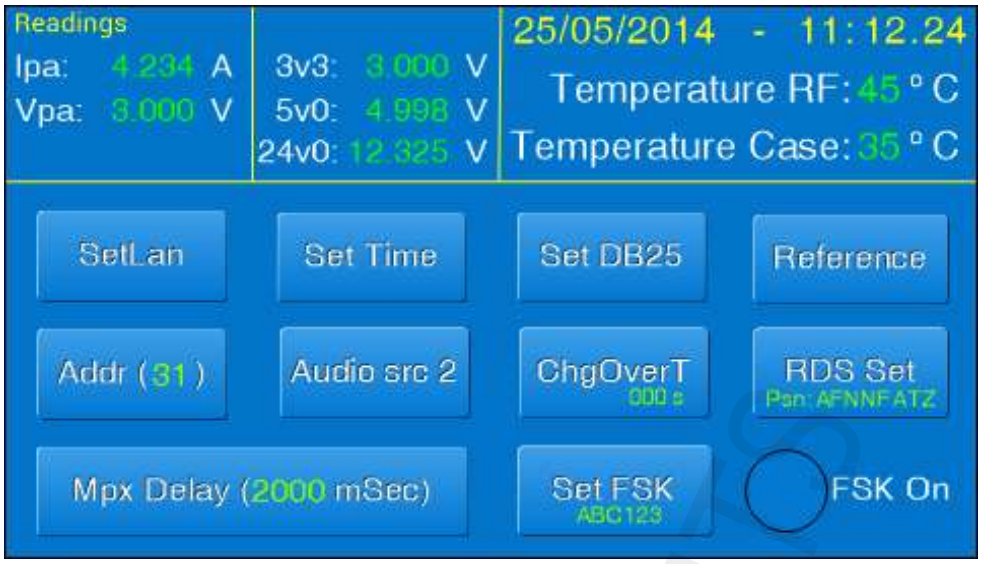


DB25 SETTING

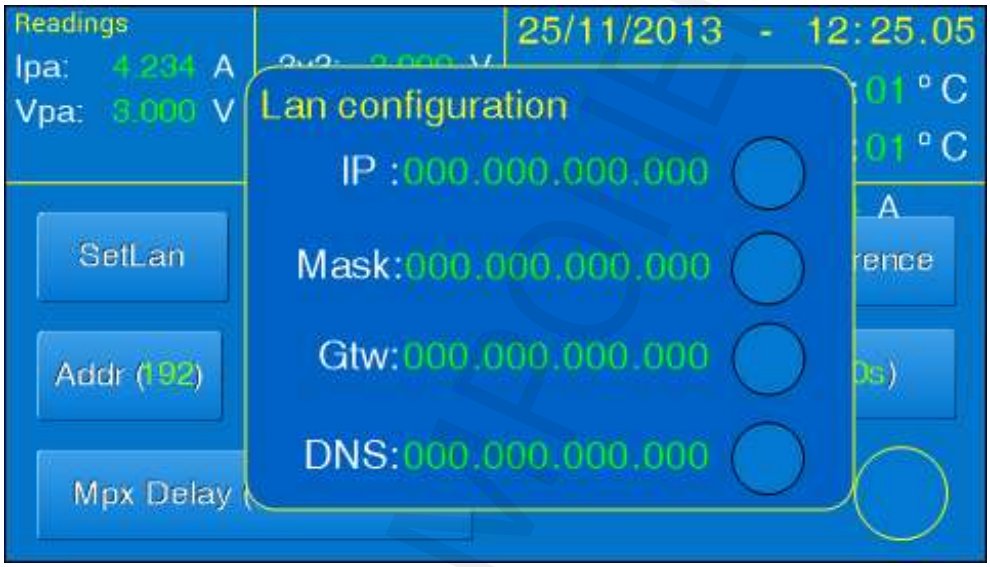


TIME SETTING

GENERAL SETTING AND MEASURE

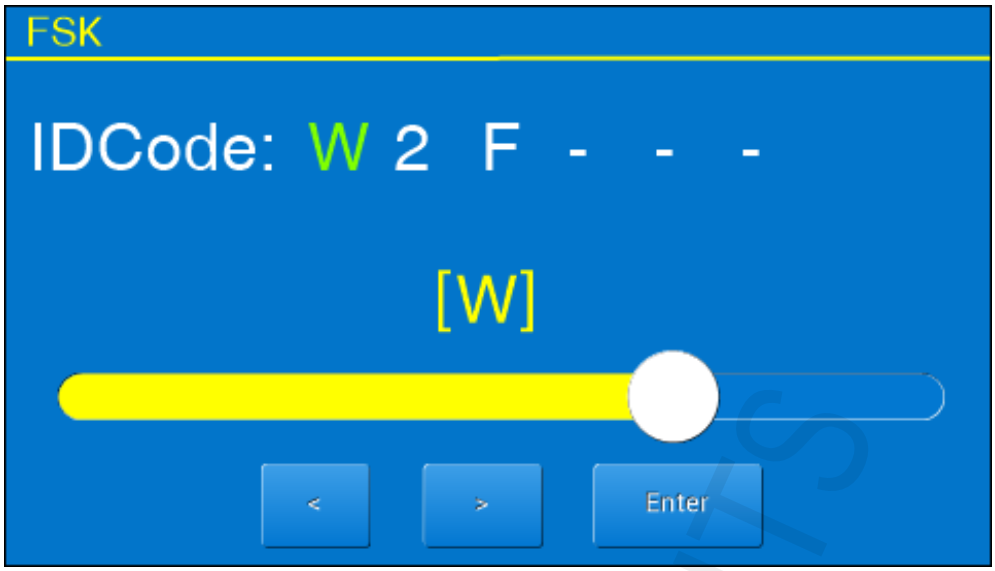


LAN CONFIGURATION

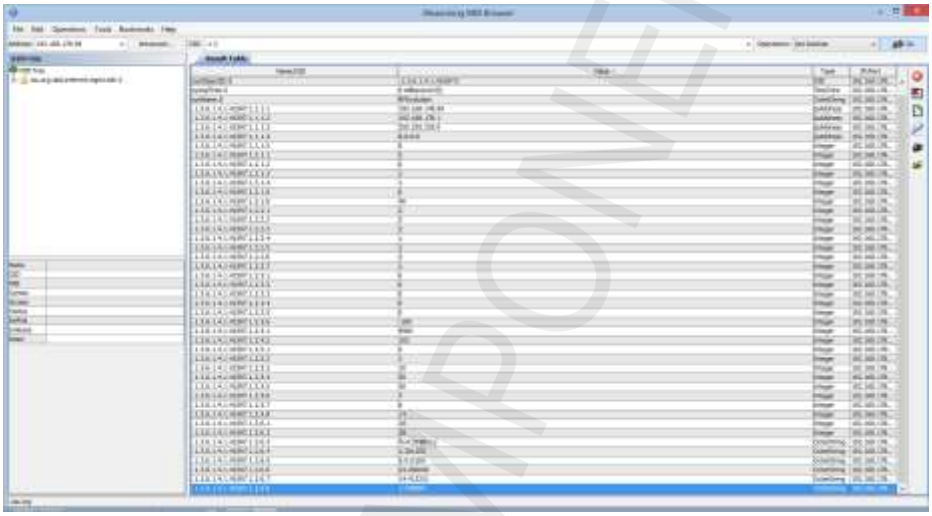


FIRMWARE UPLOAD Via WEB

FSK CODE



SNMP PAGE



WEB SERVER PASSWORD

WEB SERVER PAGE

Schematic Diagrams, and Physical Layout

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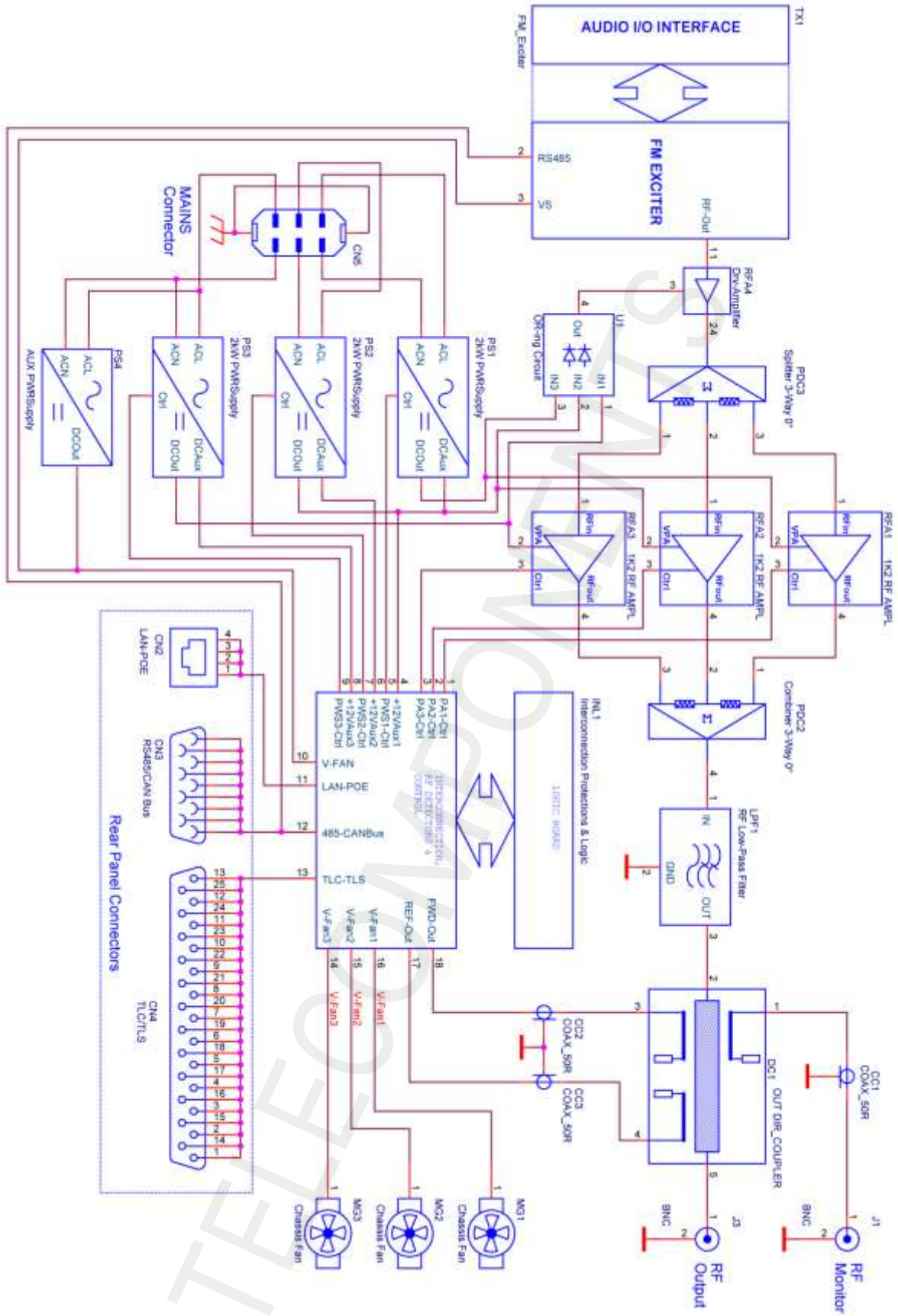
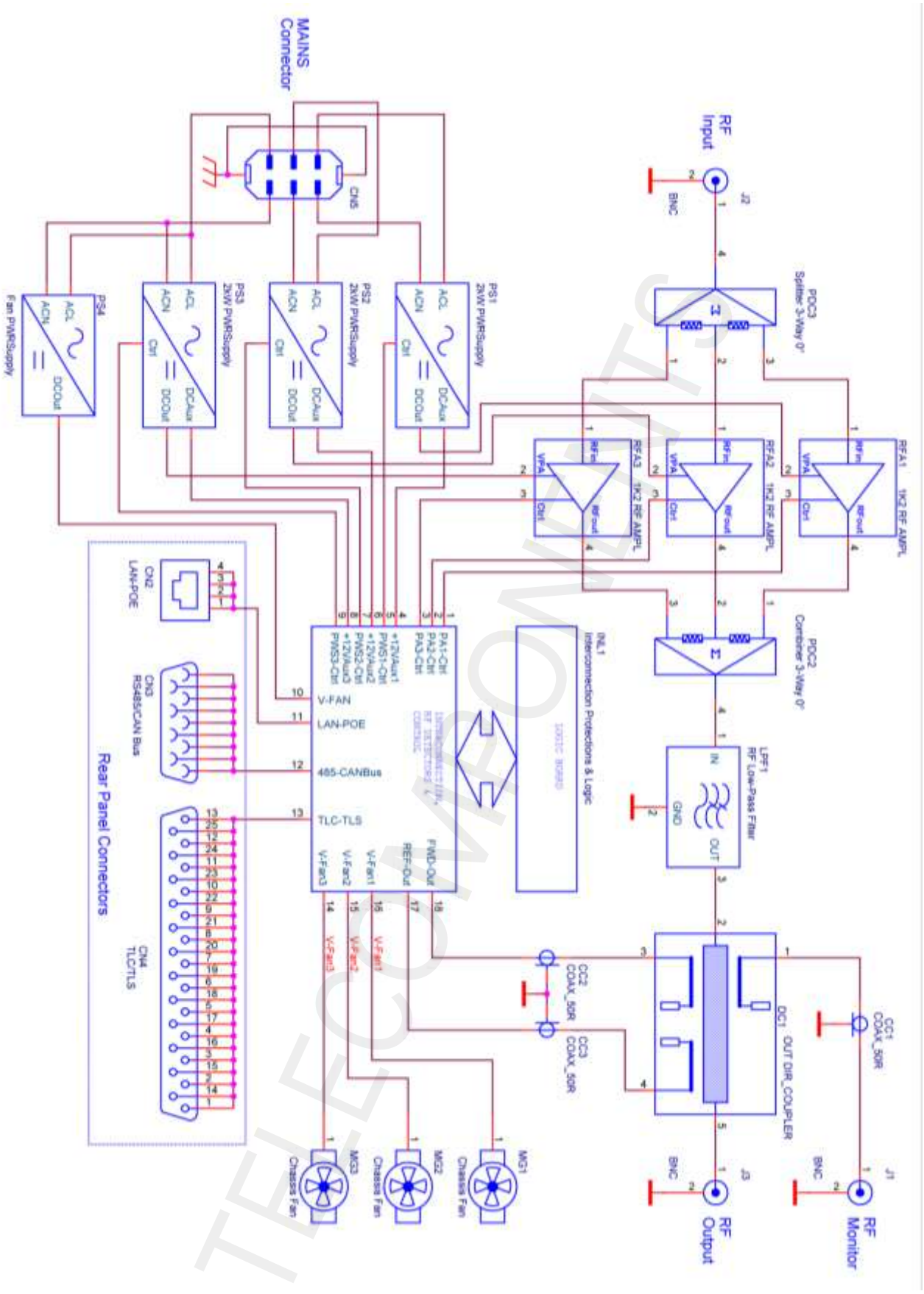
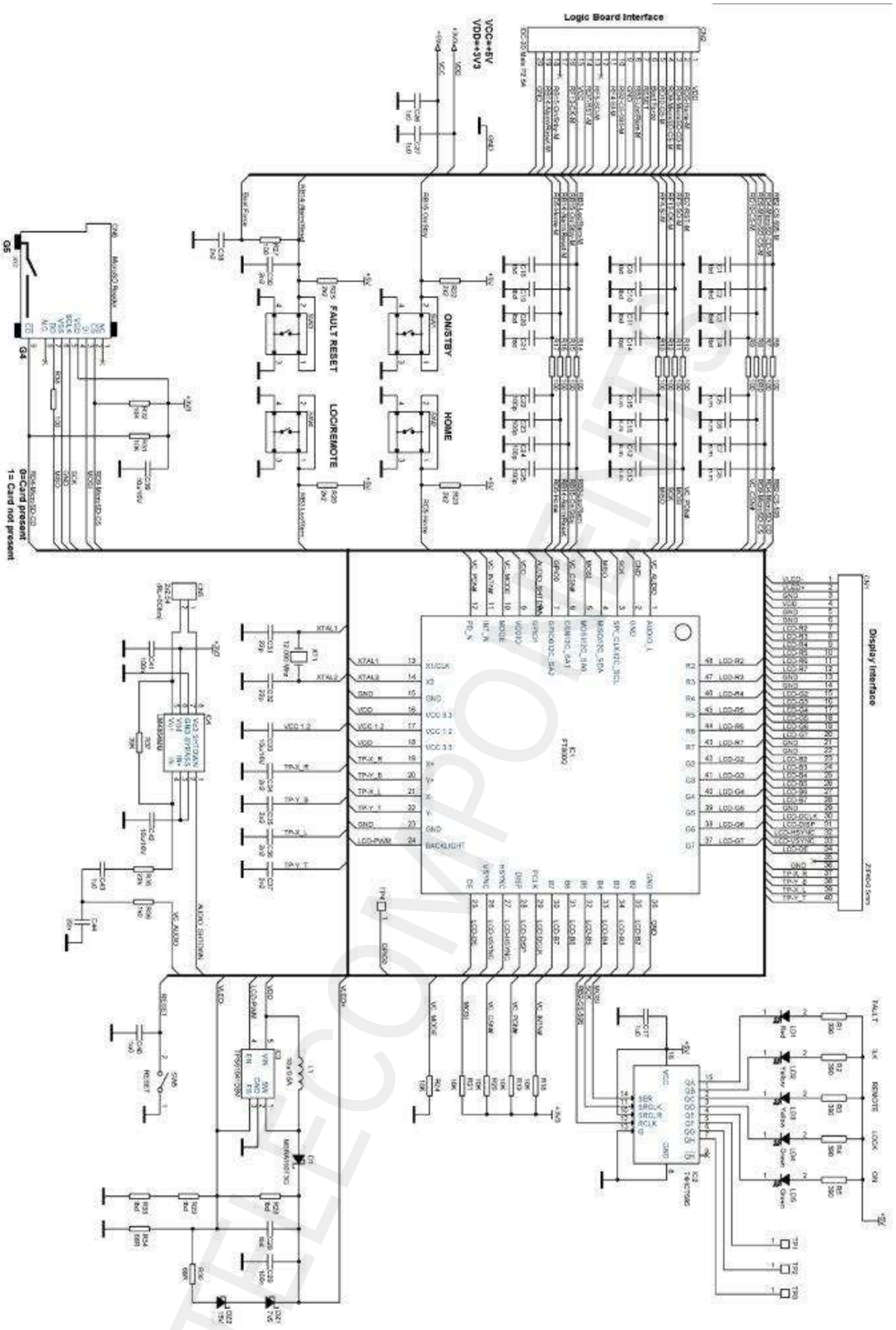
TRANSMITTER BLOCK DIAGRAM



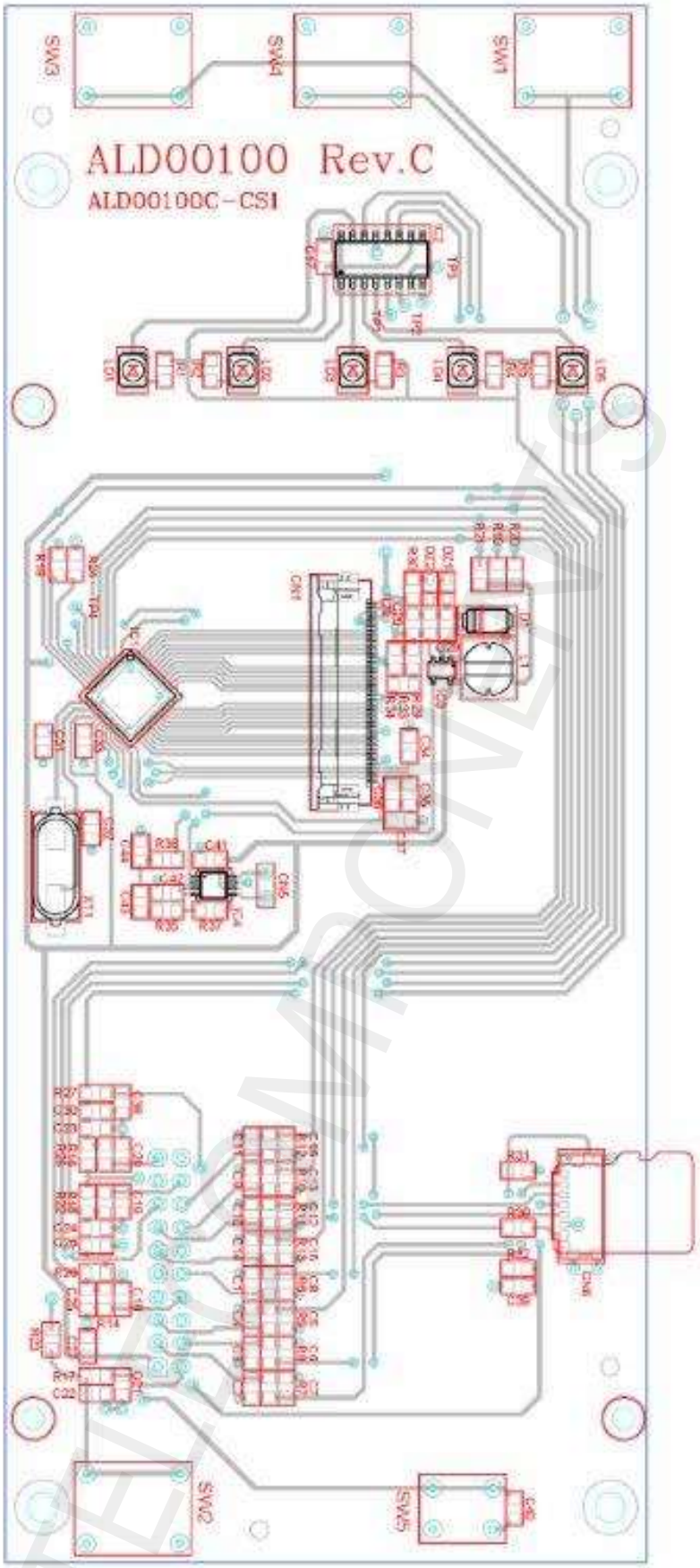
AMPLIFIER BLOCK DIAGRAM



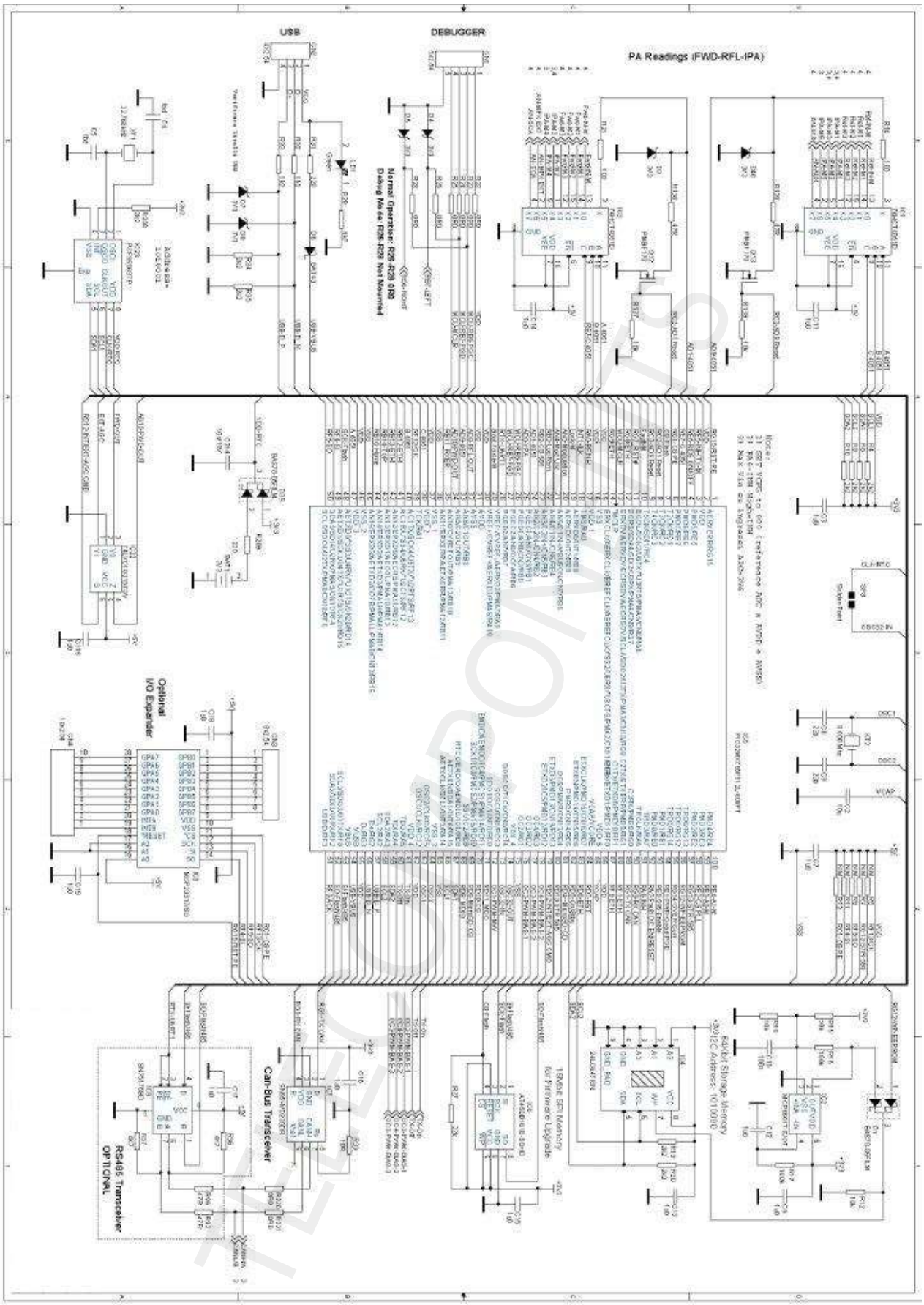
DISPLAY & KEYBOARD



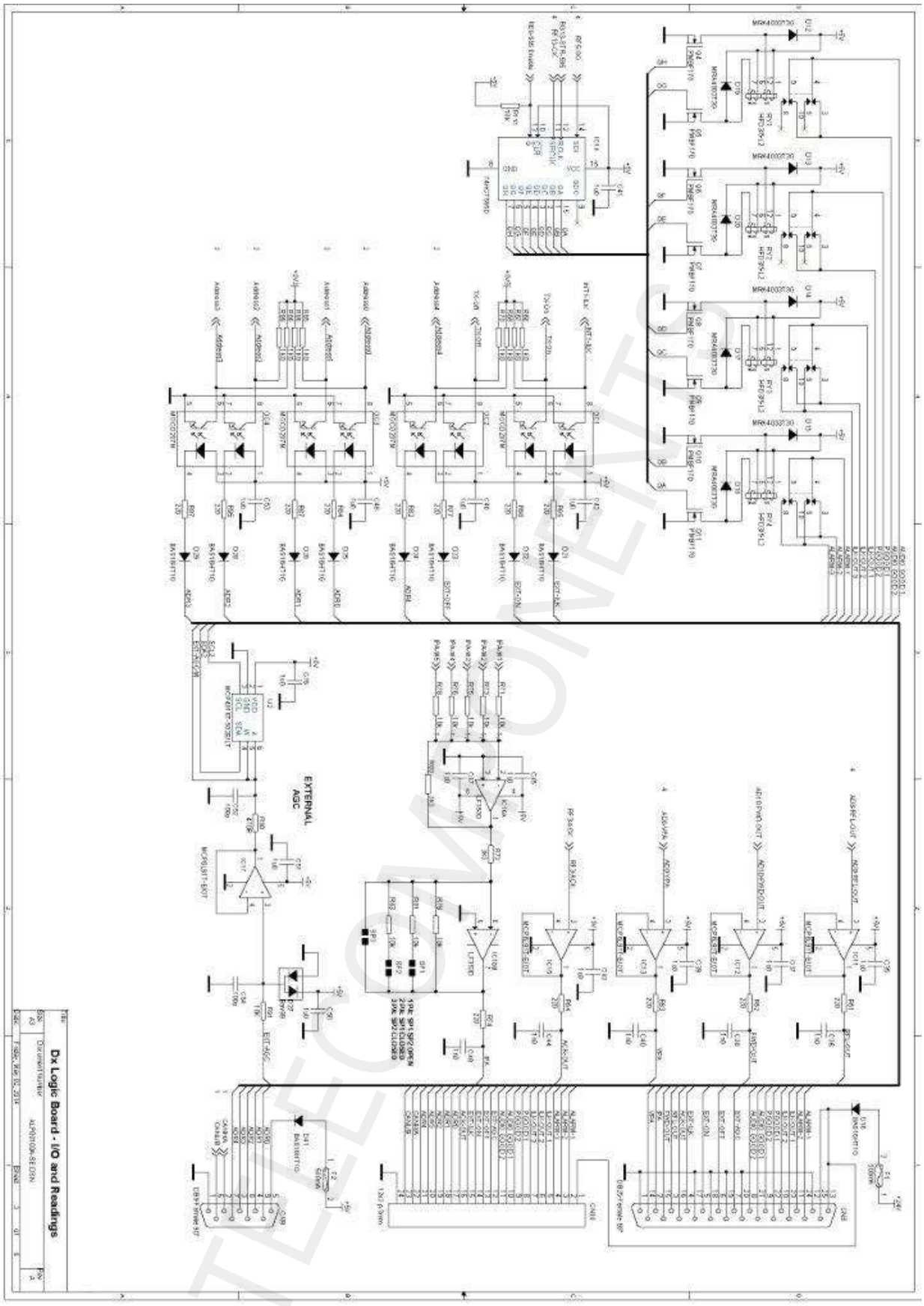
DISPLAY & KEYBOARD



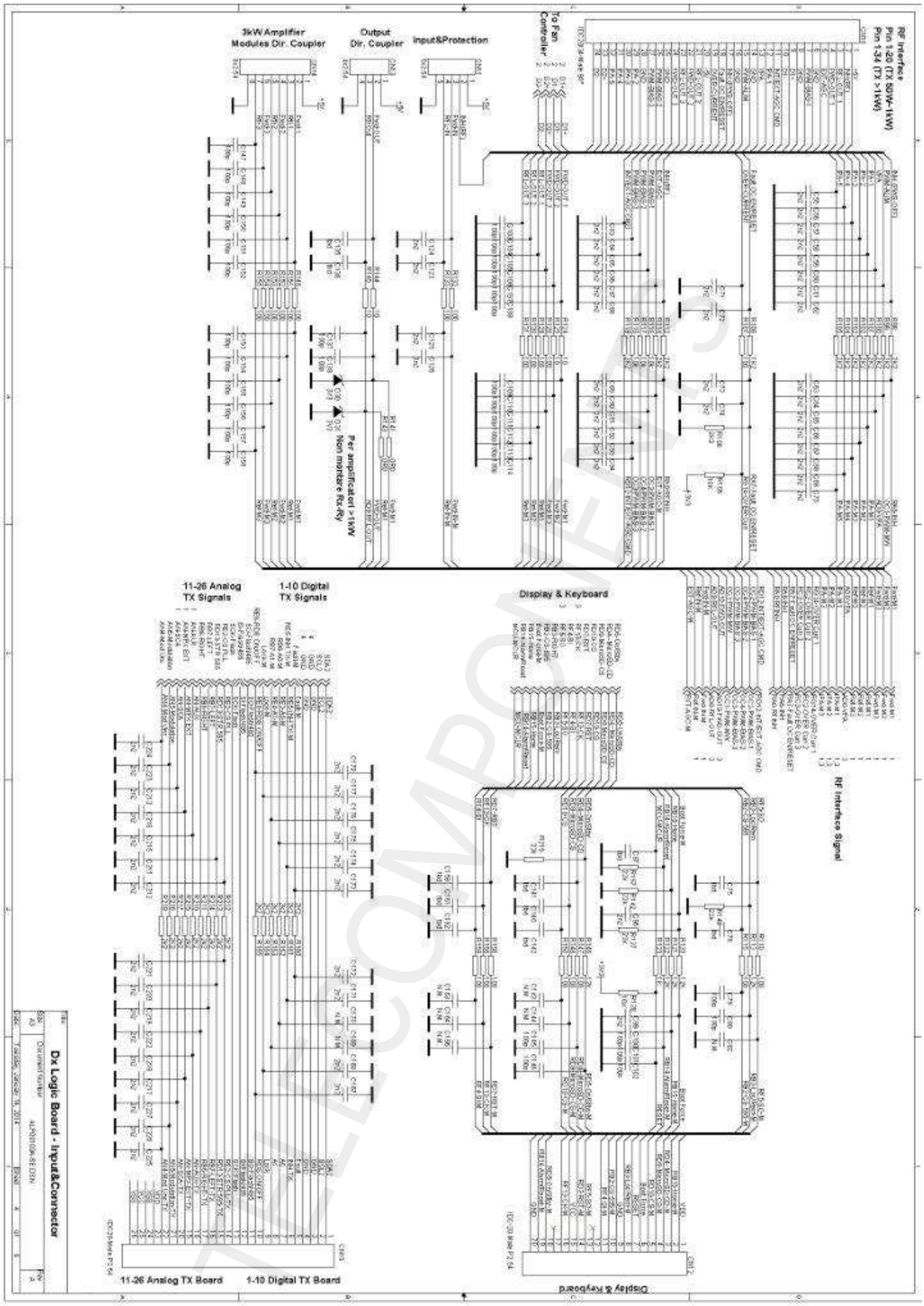
LOGIC & INTERCONNECTION



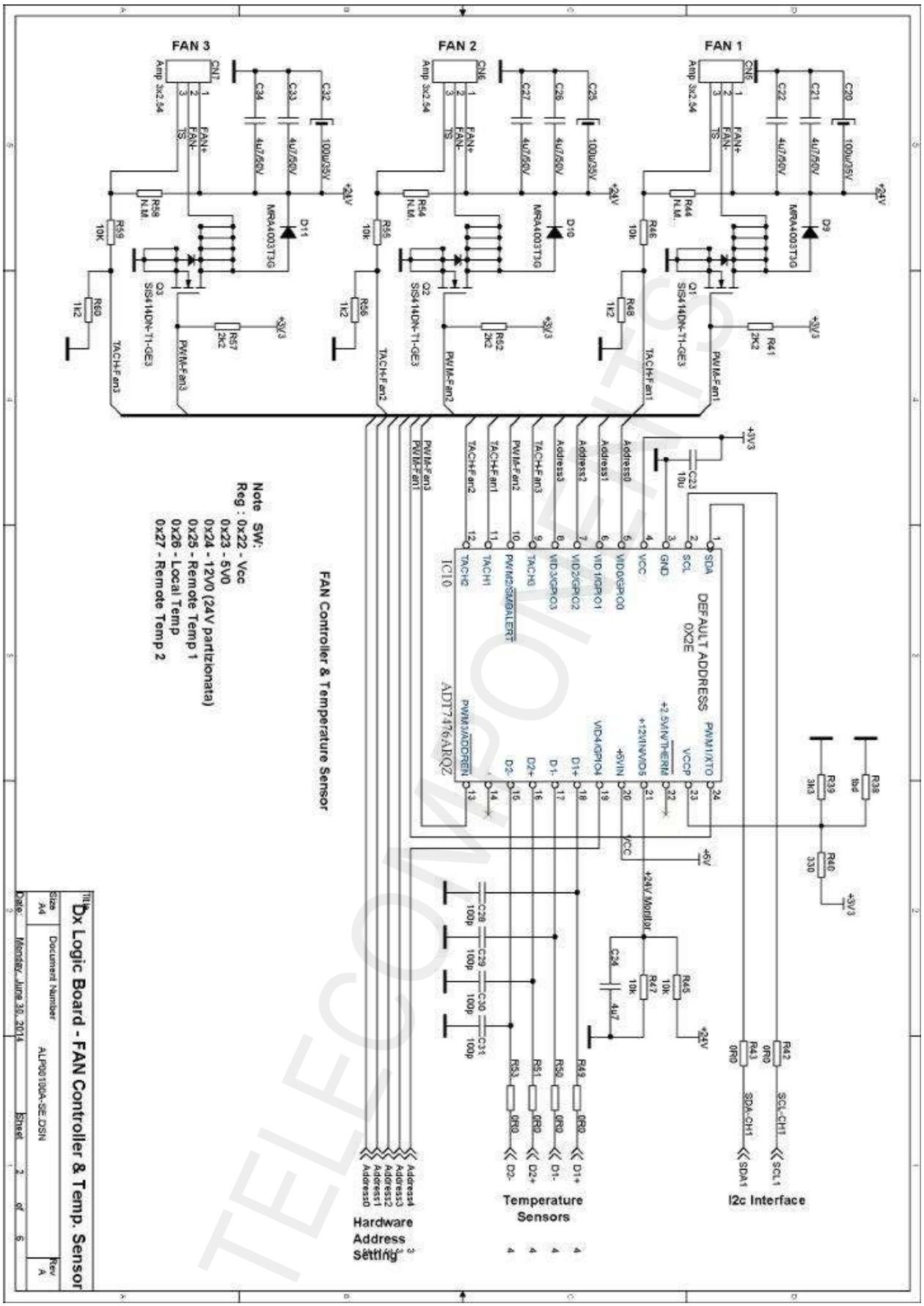
I/O BOARD



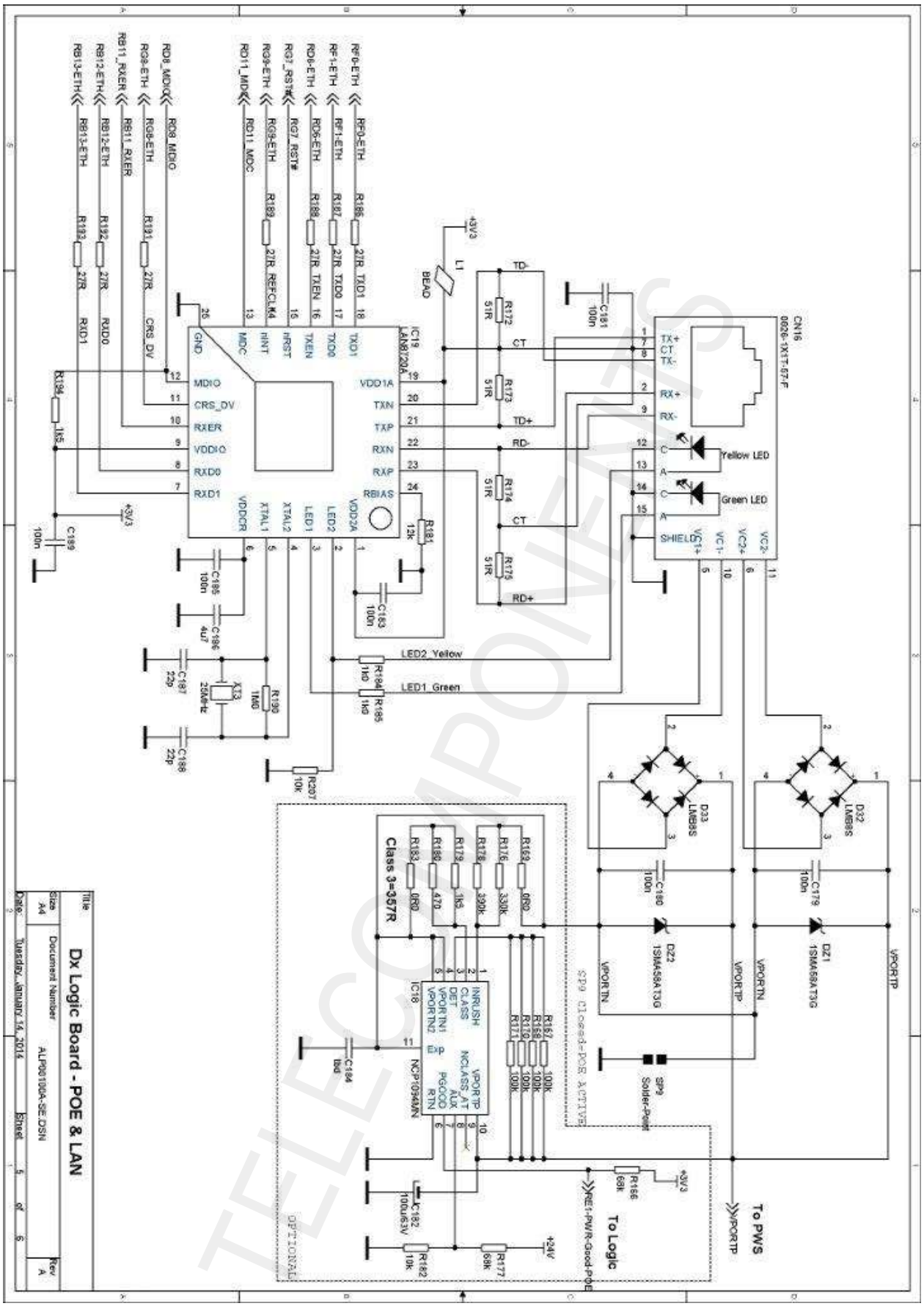
DX LOGIC & INPUT/ CONNECTION



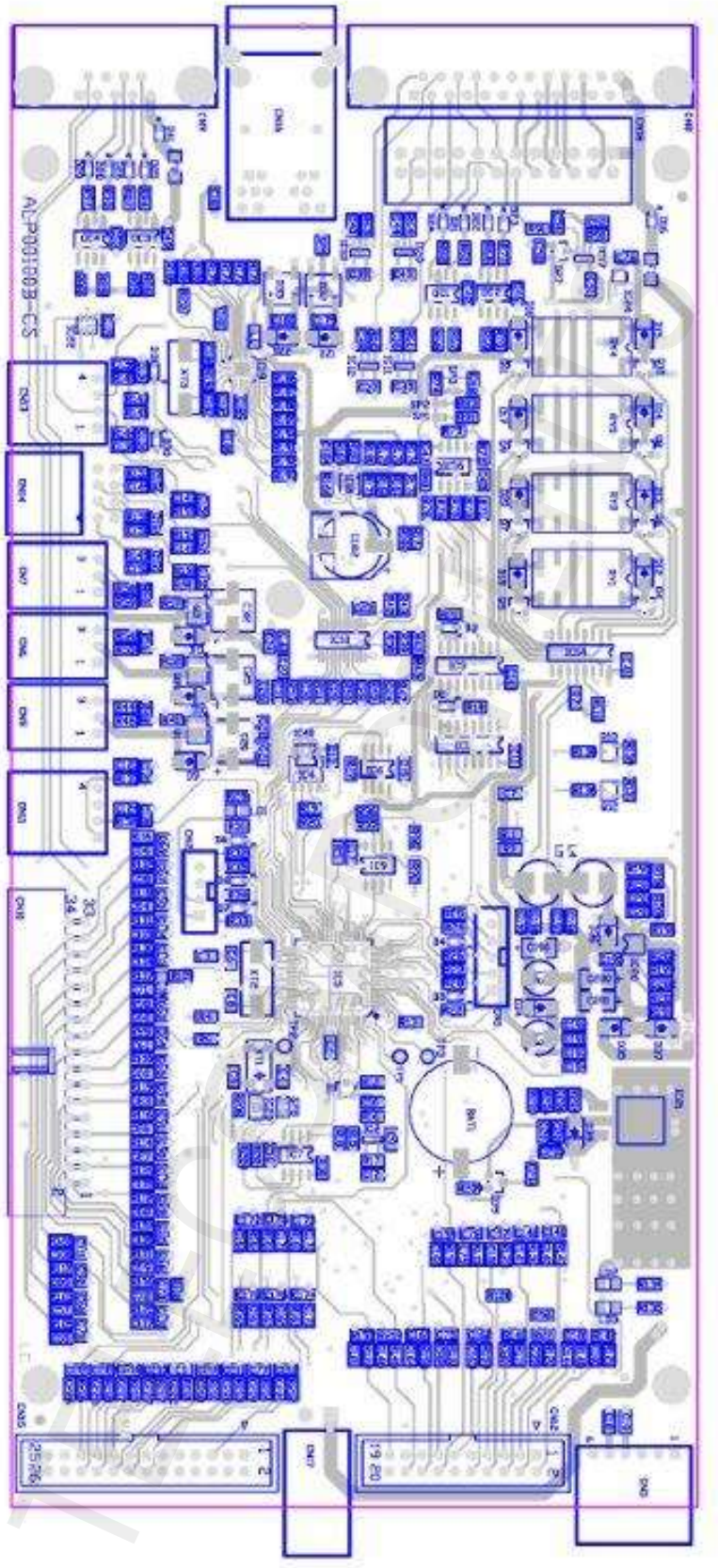
FAN CONTROLLER



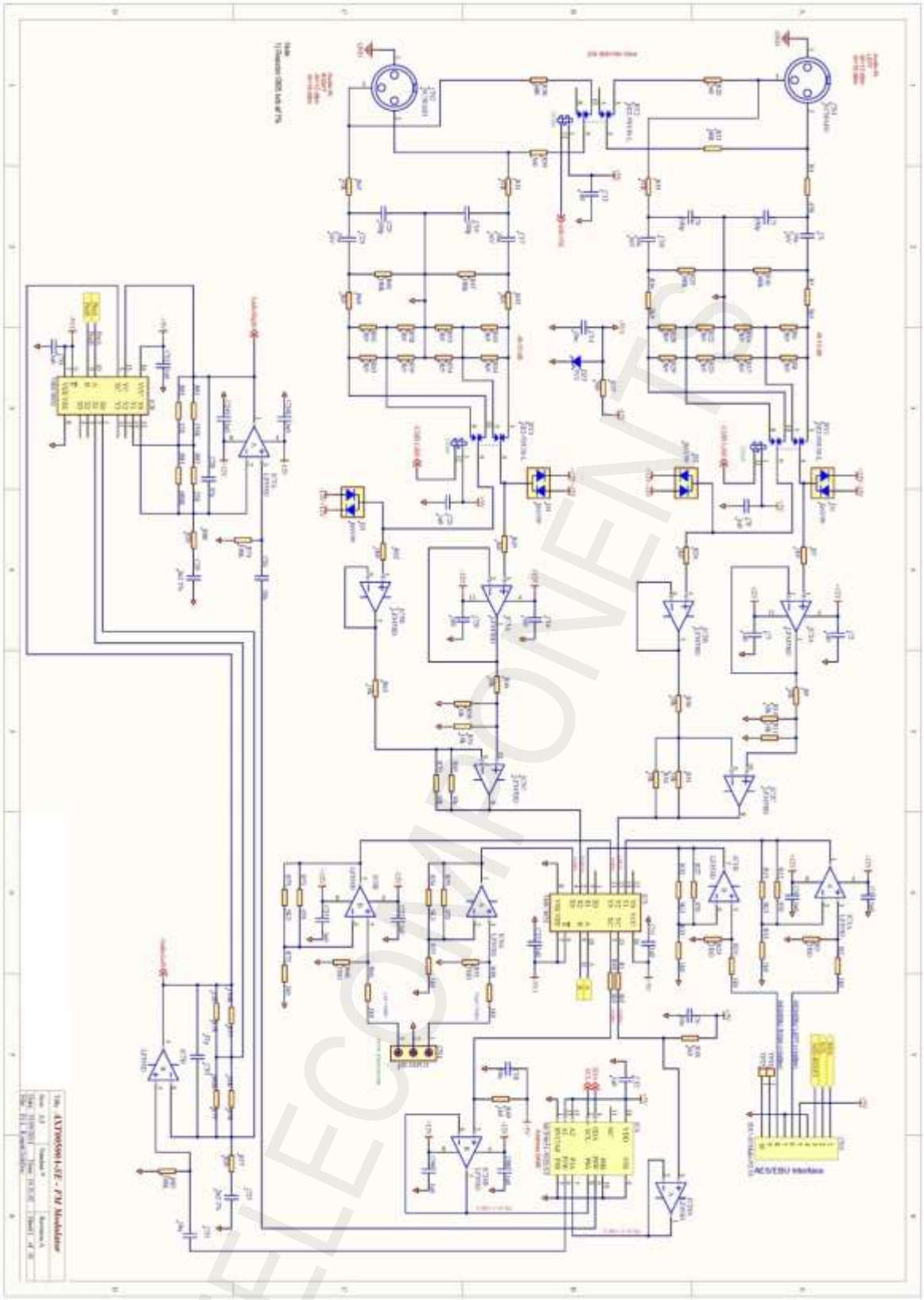
DX LOGIC BOARD – POE & LAN



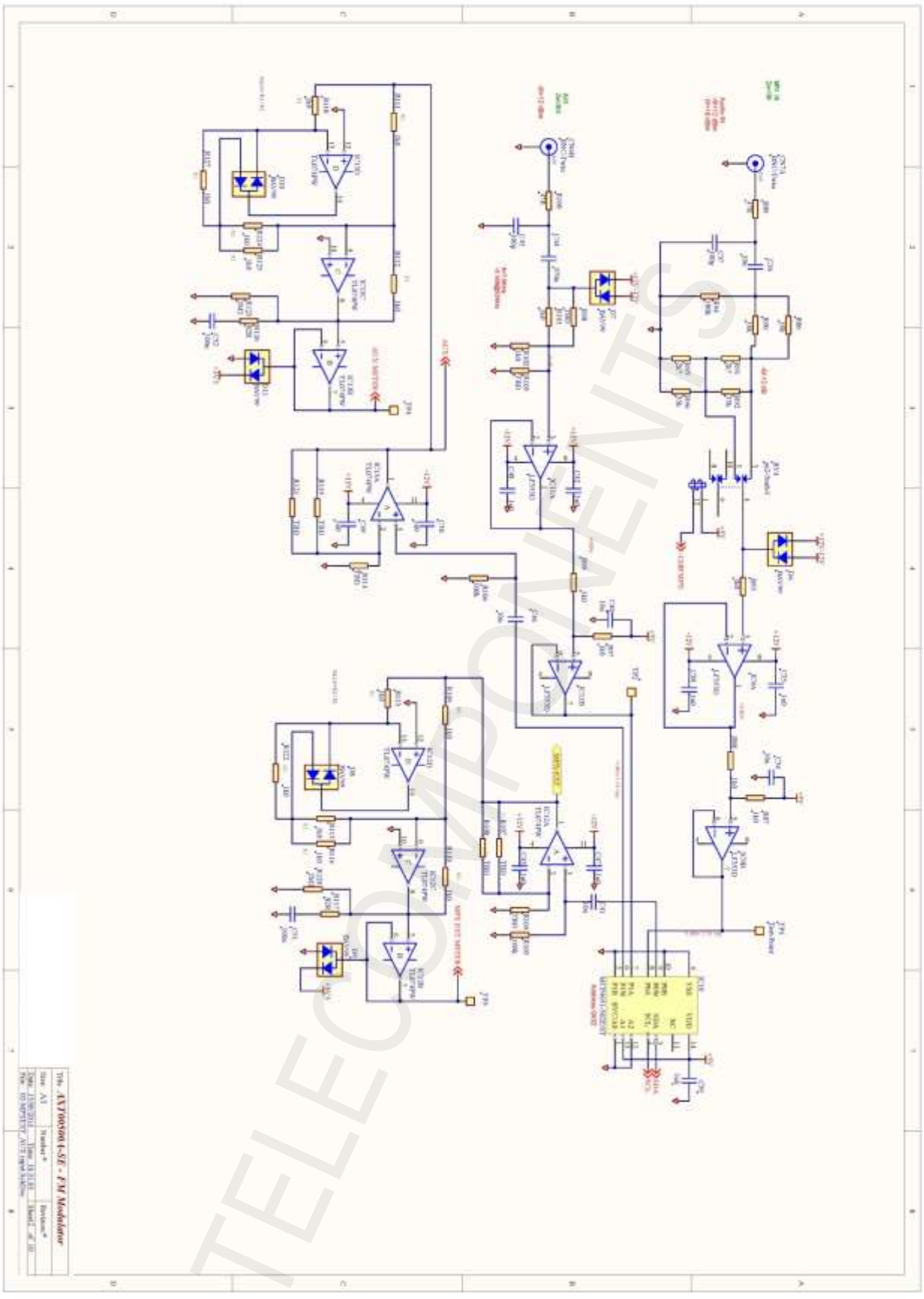
LOGIC & INTERCONNECTION LAYOUT



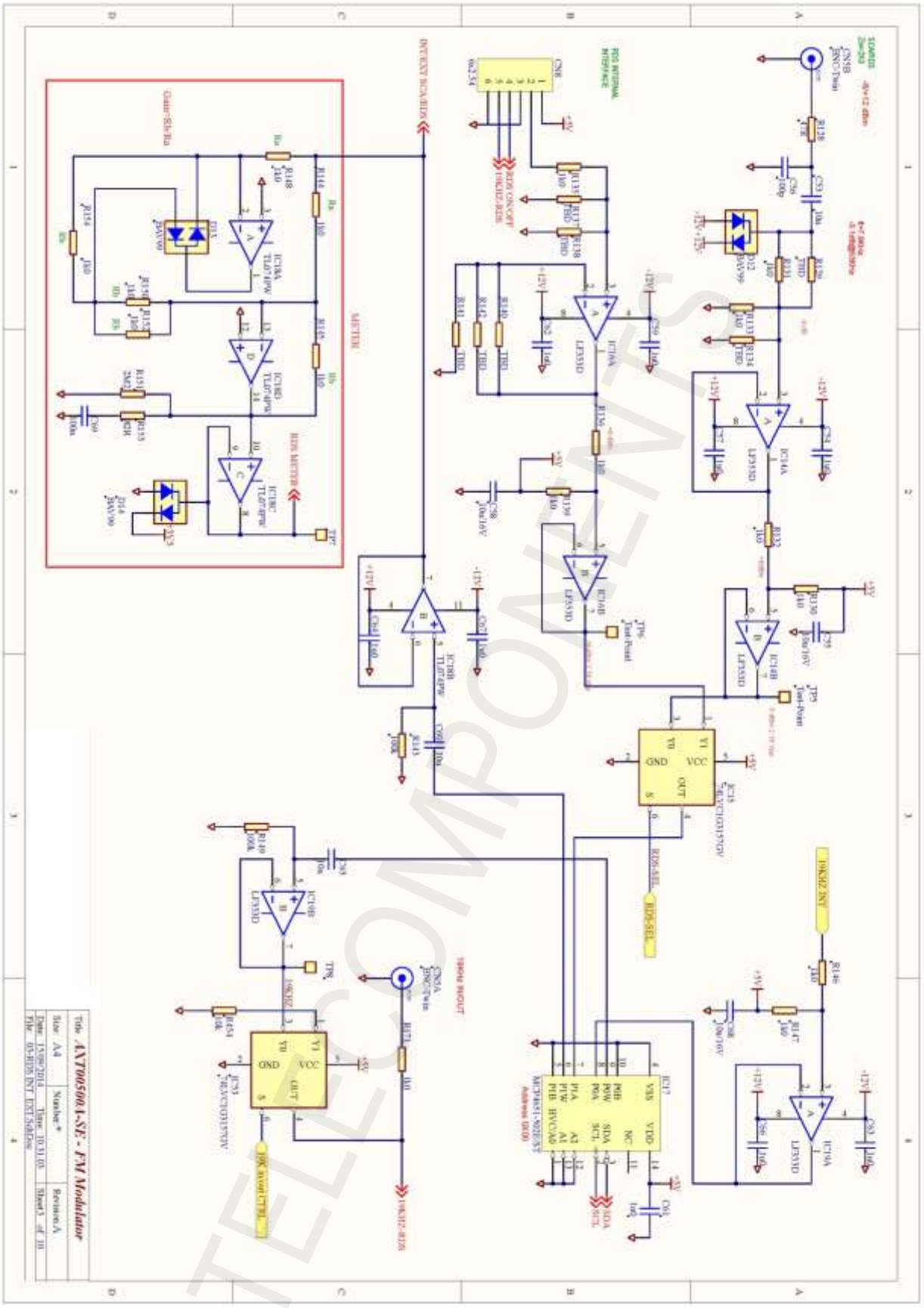
L & R INPUT



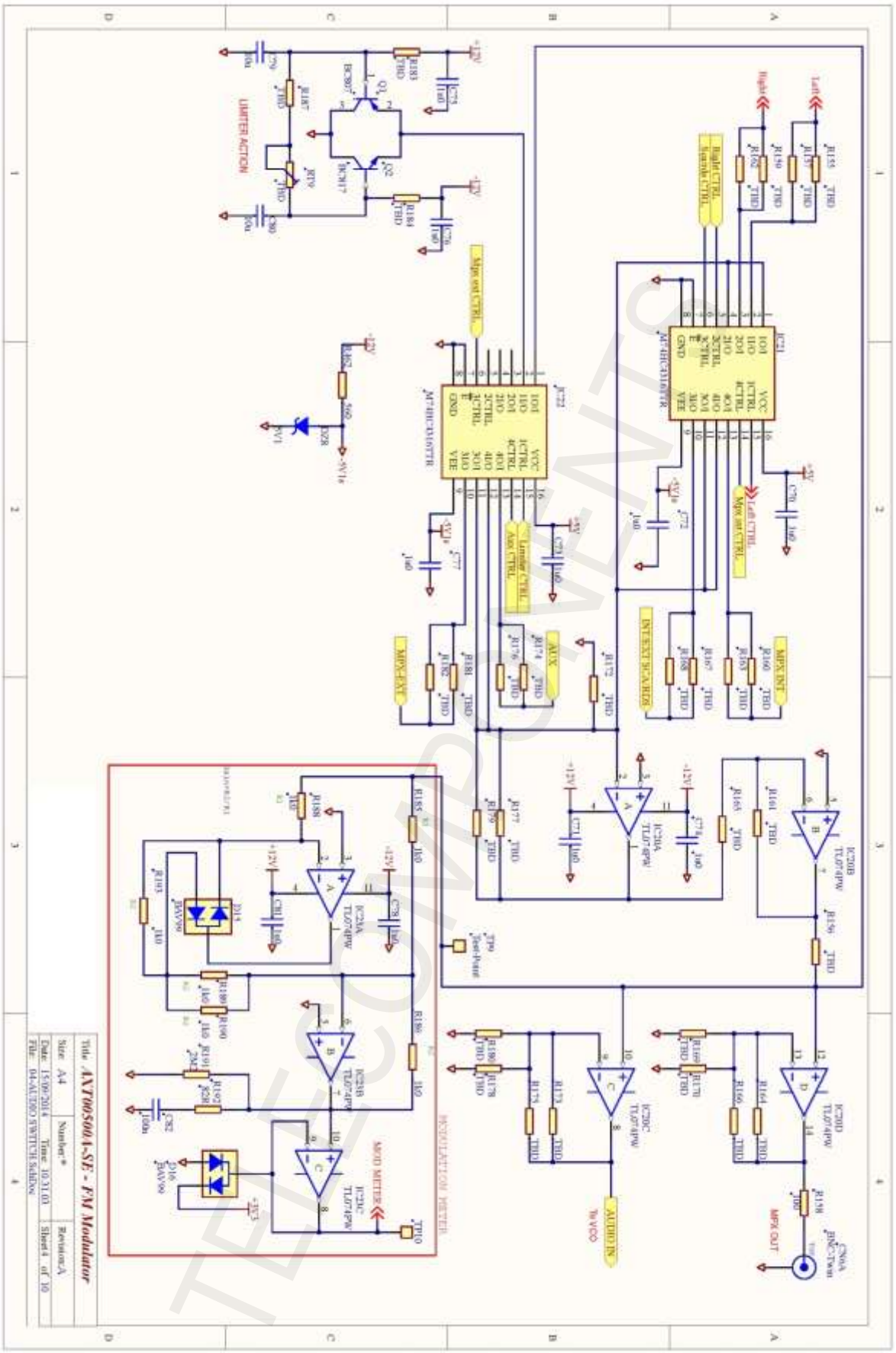
MPX & AUX INPUT



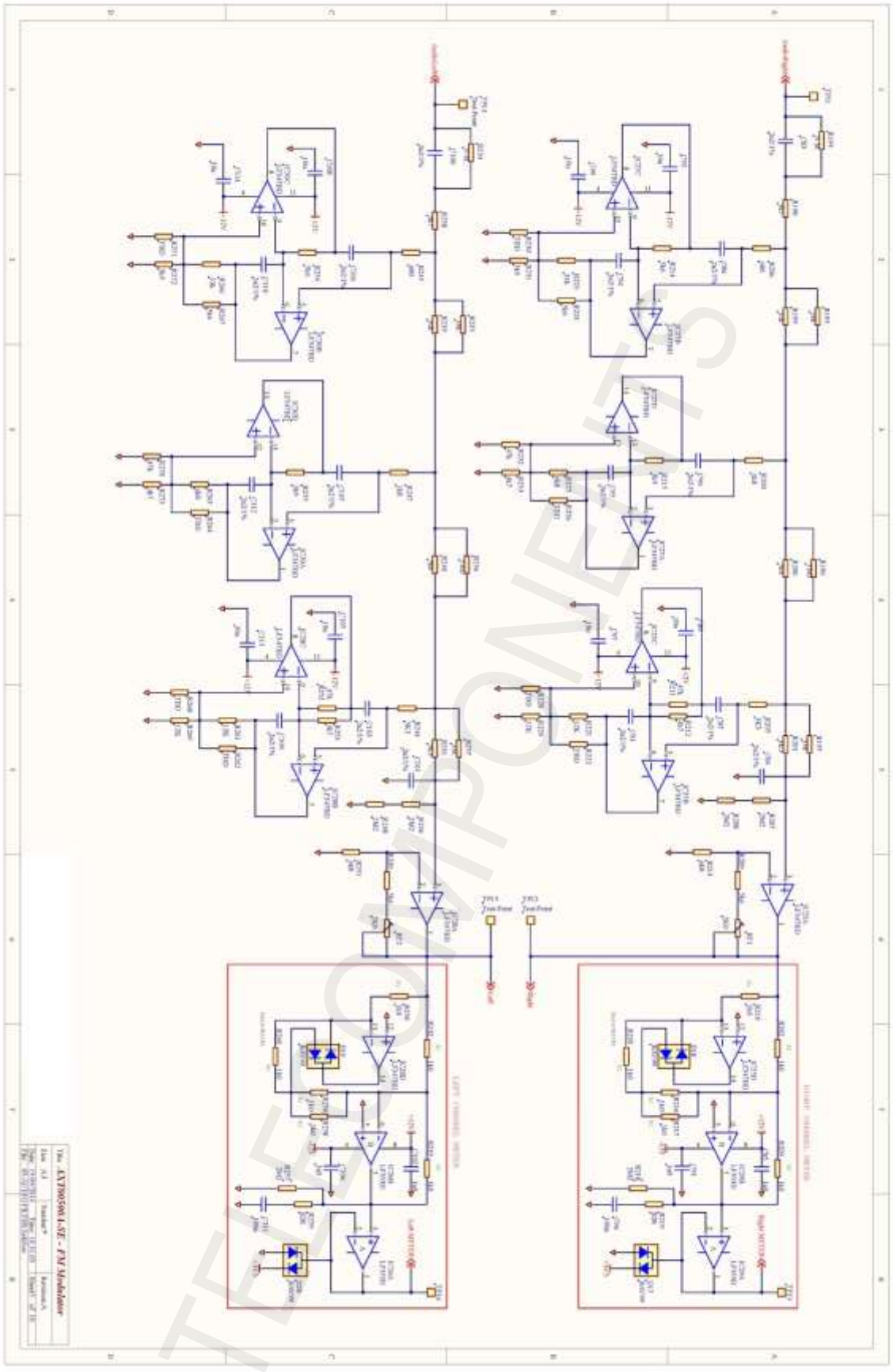
RDS & SCA INPUT



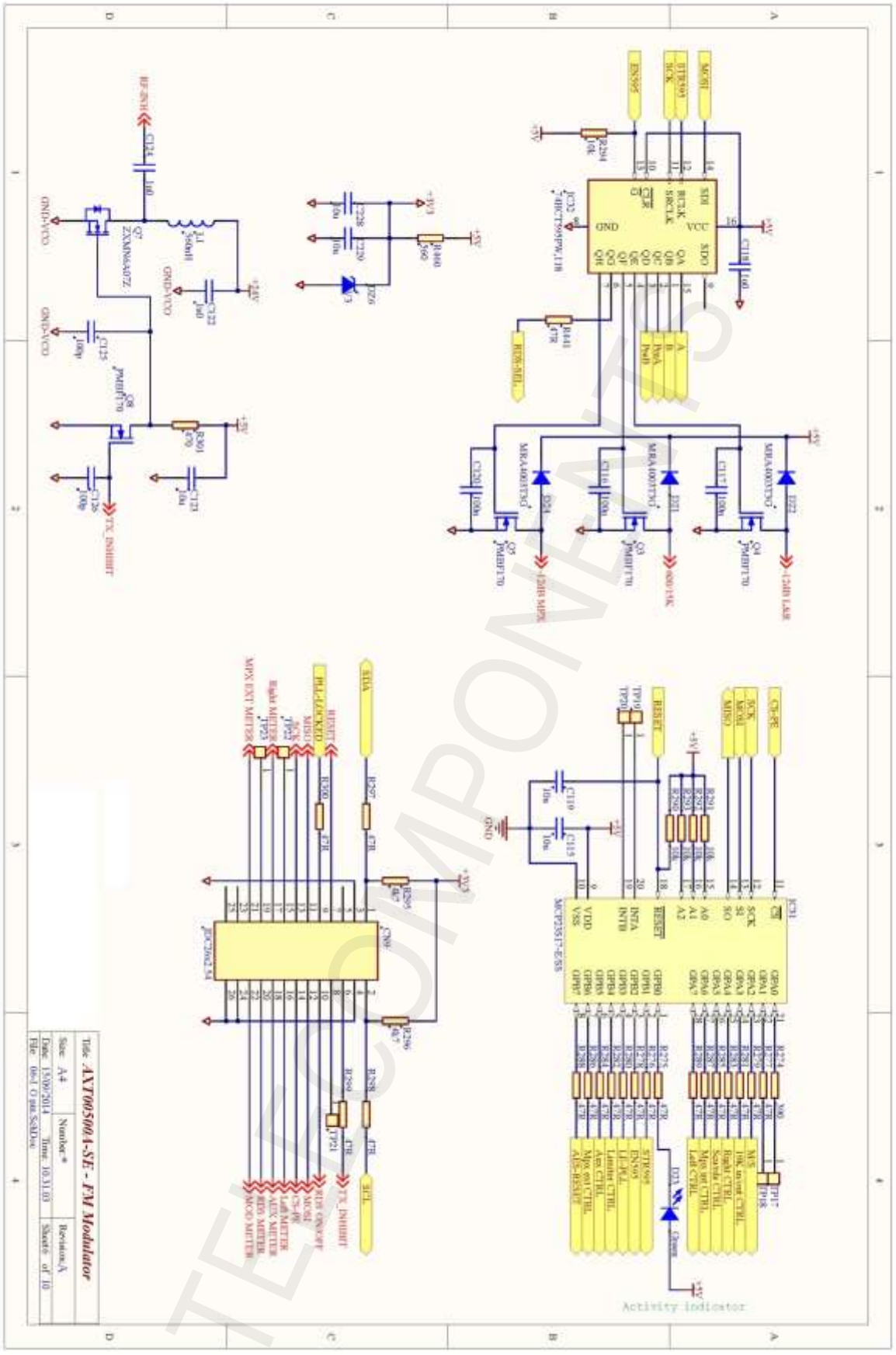
AUDIO CONTROL



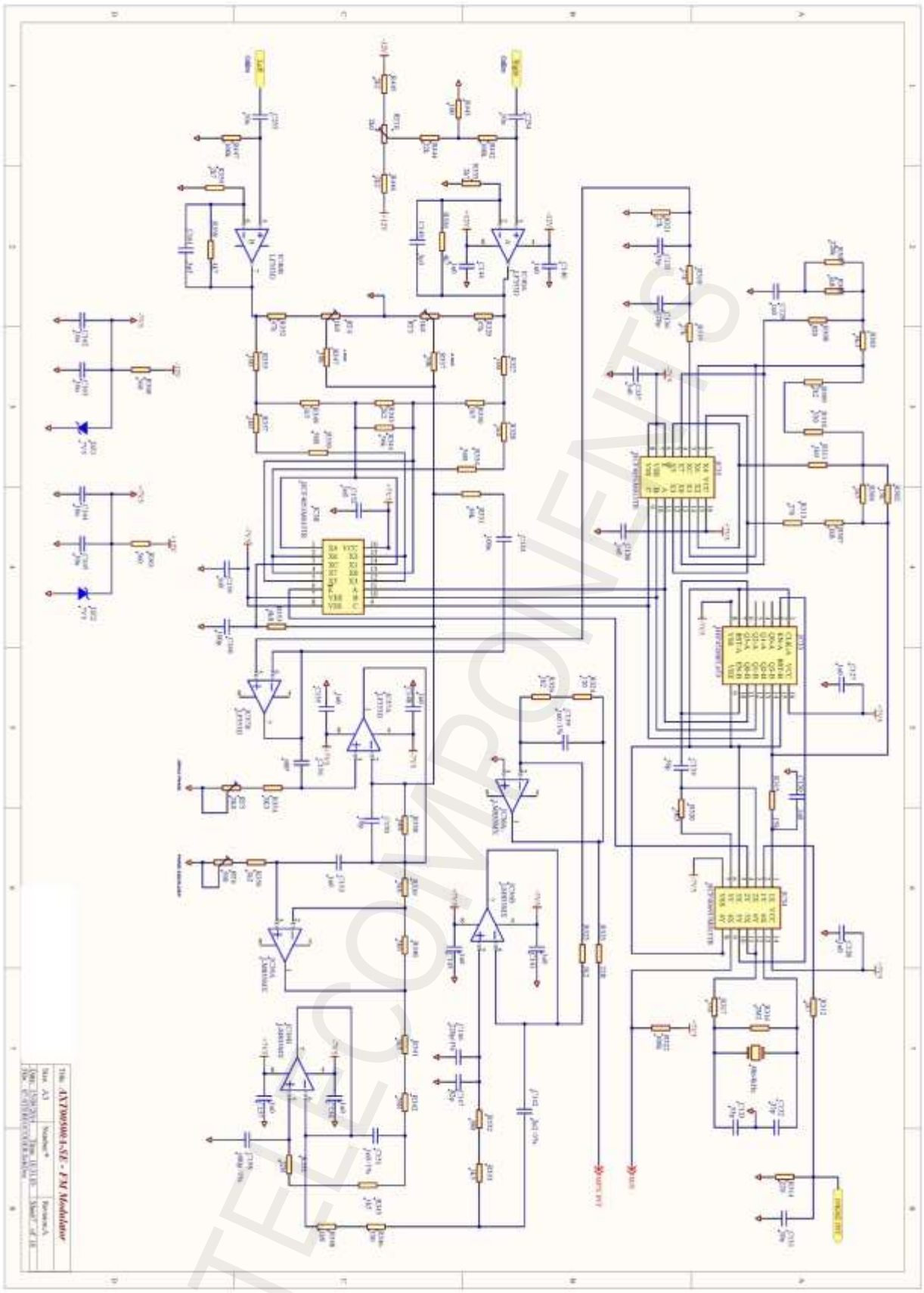
AUDIO FILTER



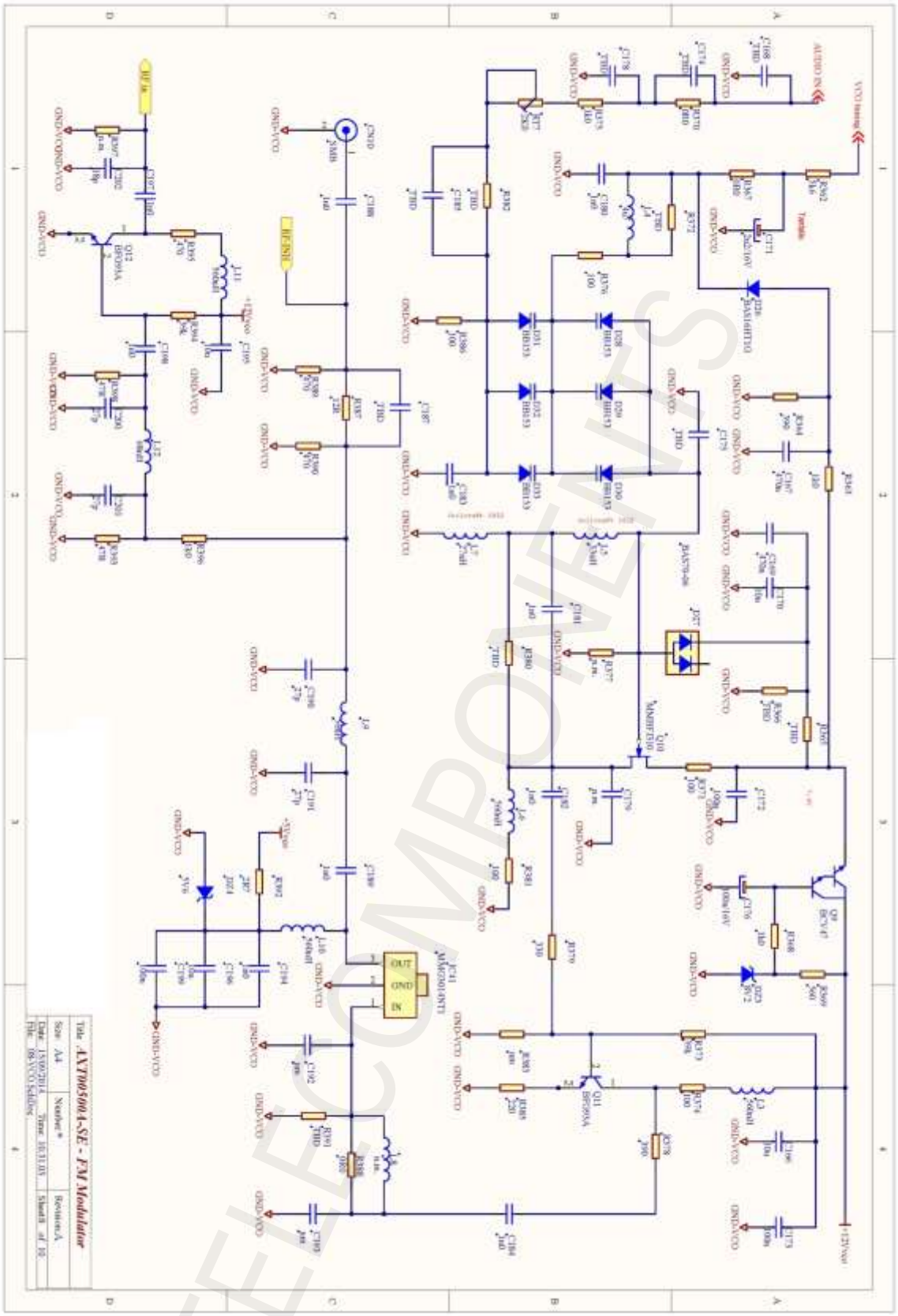
I/O



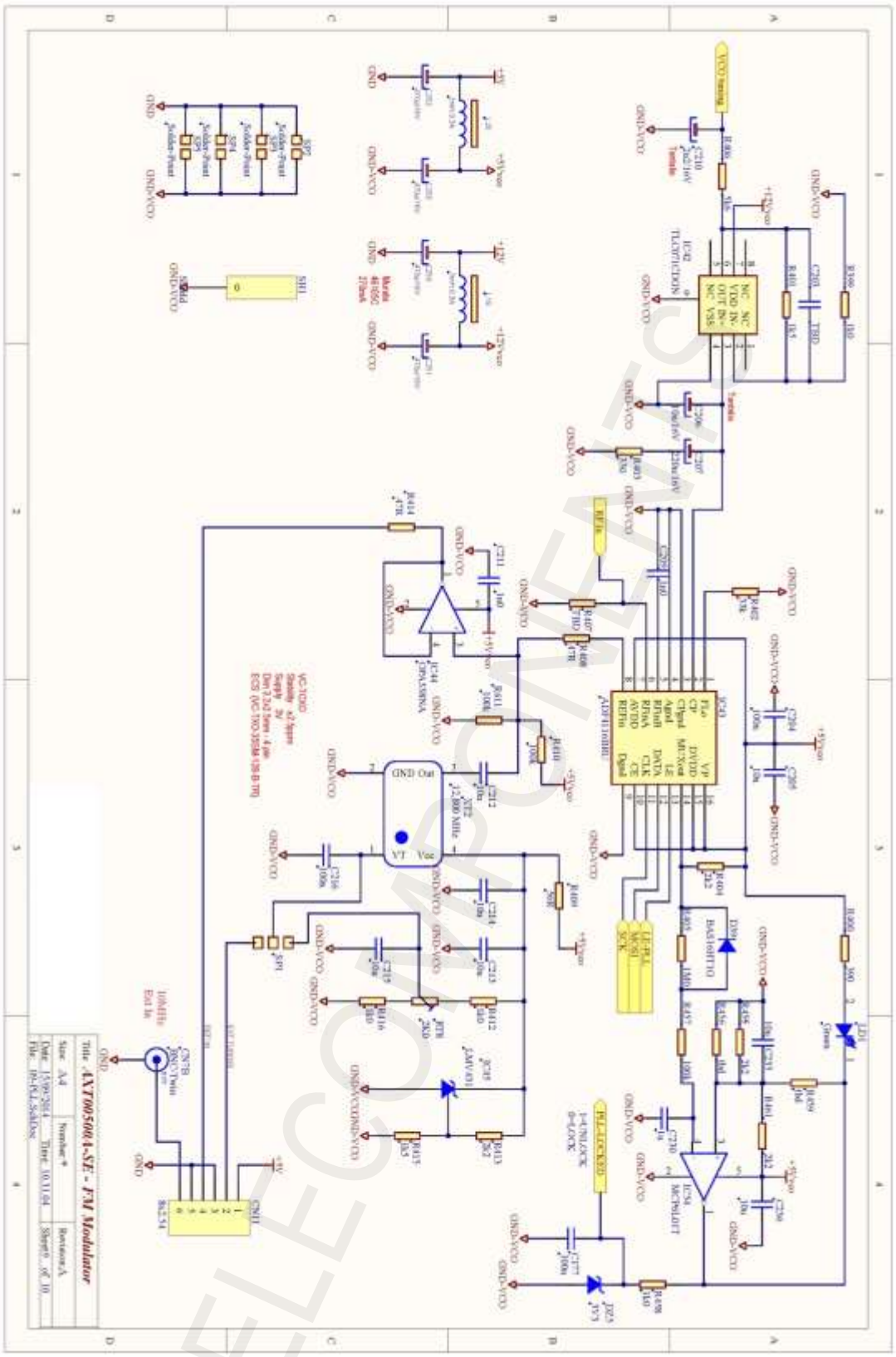
STEREO CODER



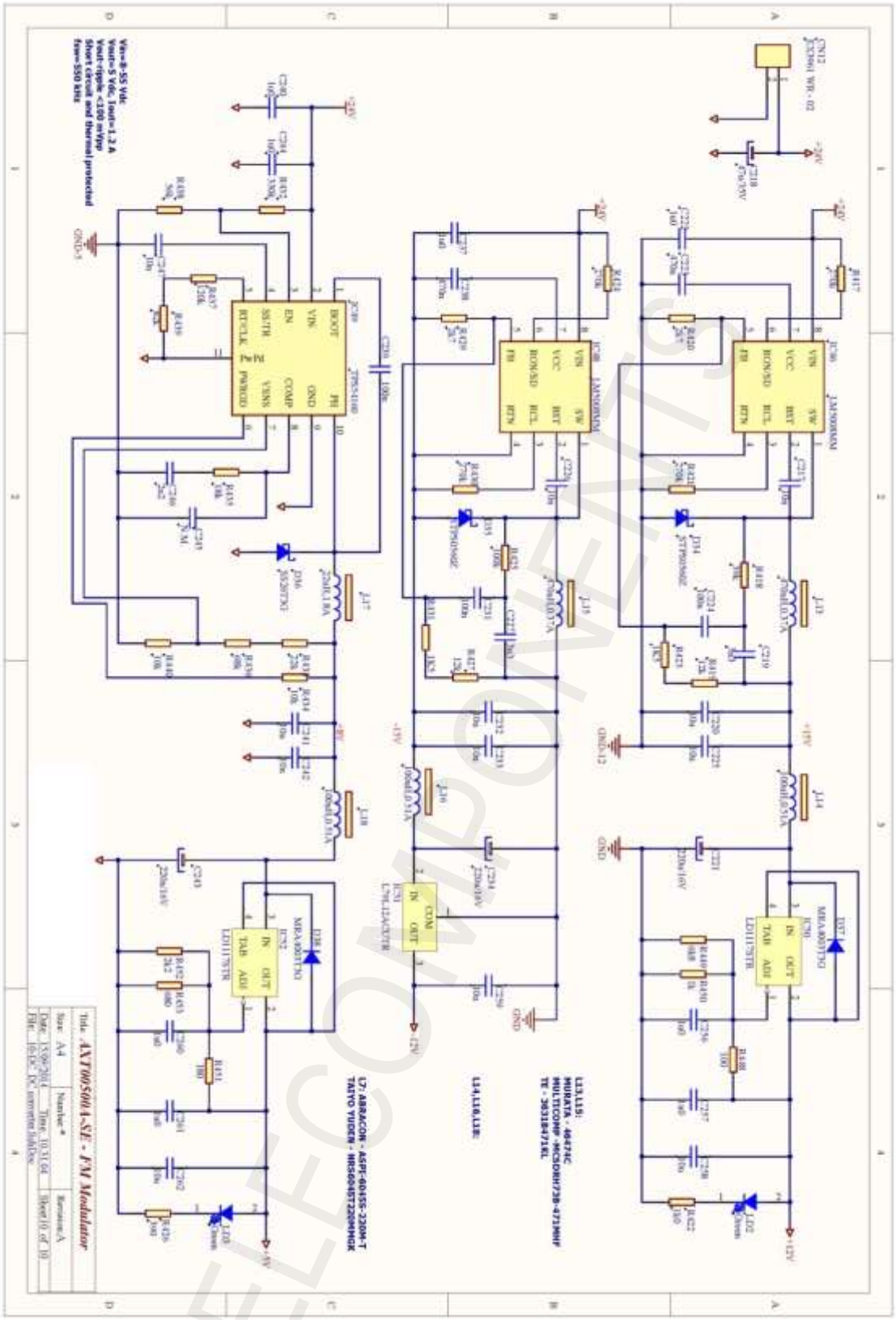
VCO



PLL

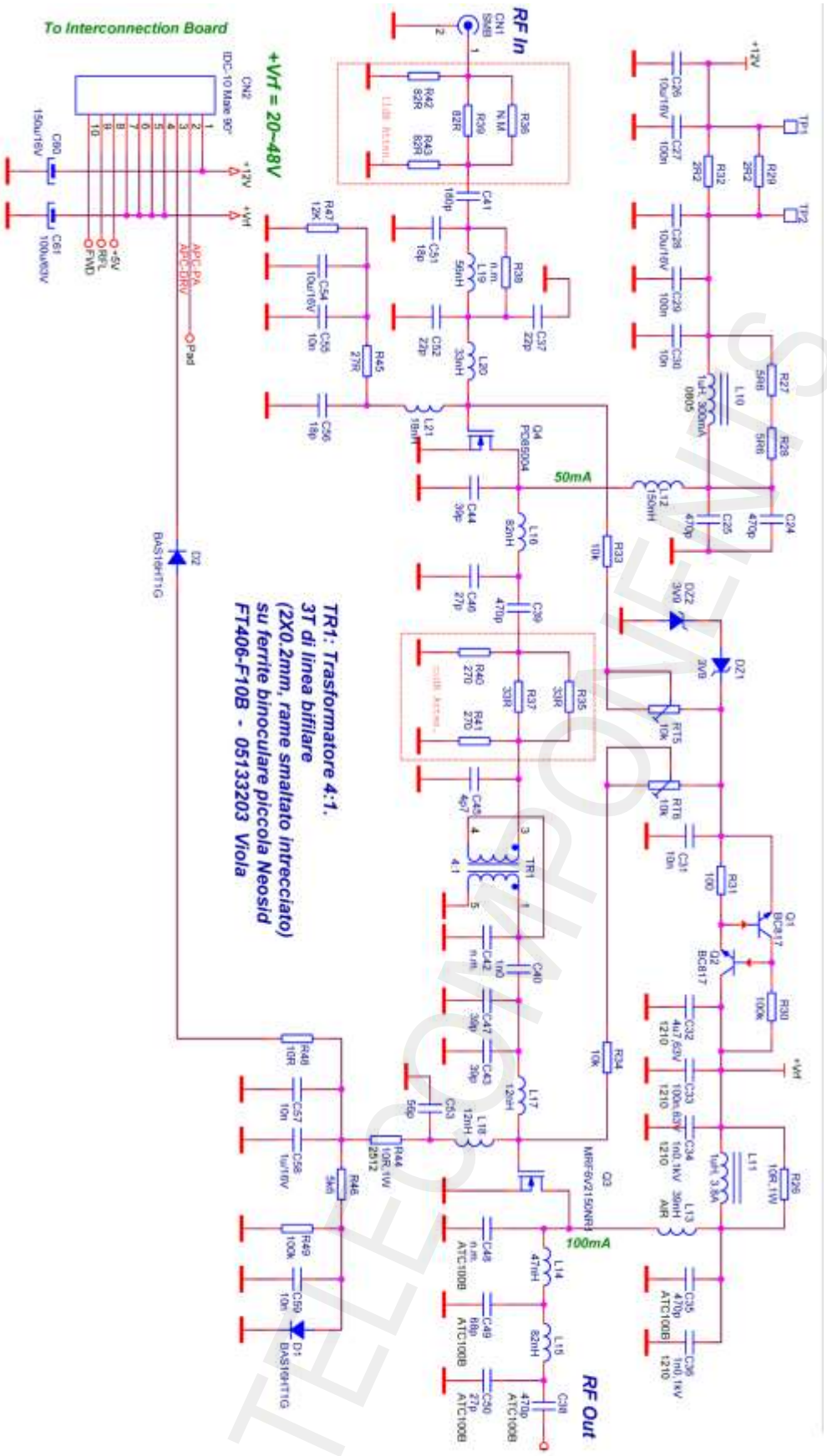


DC-DC CONVERTER



FM MODULATOR LAYOUT

RF DRIVER



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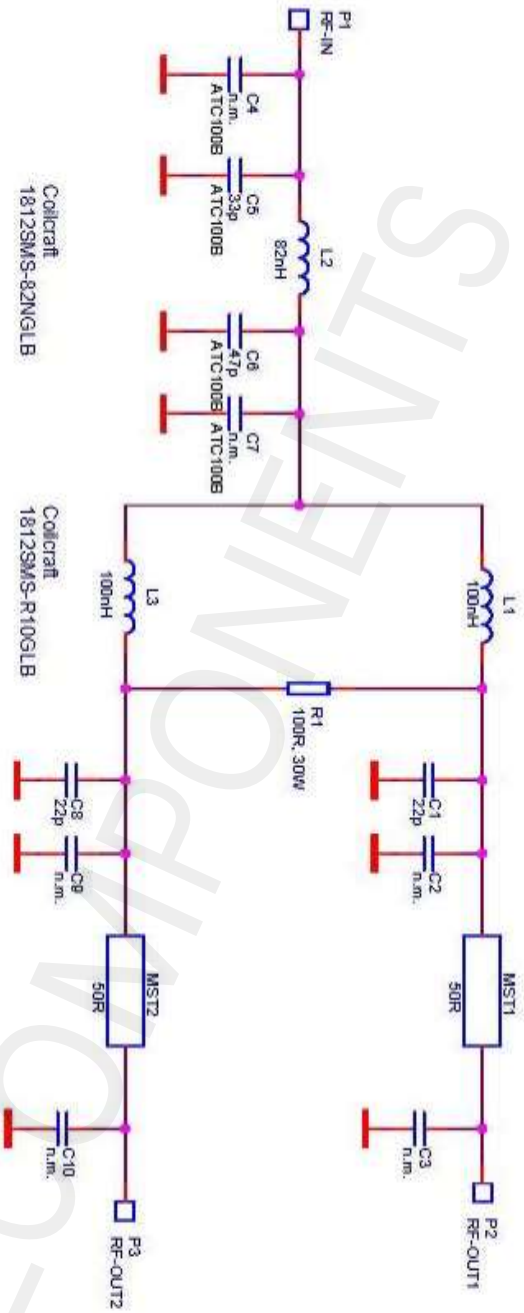
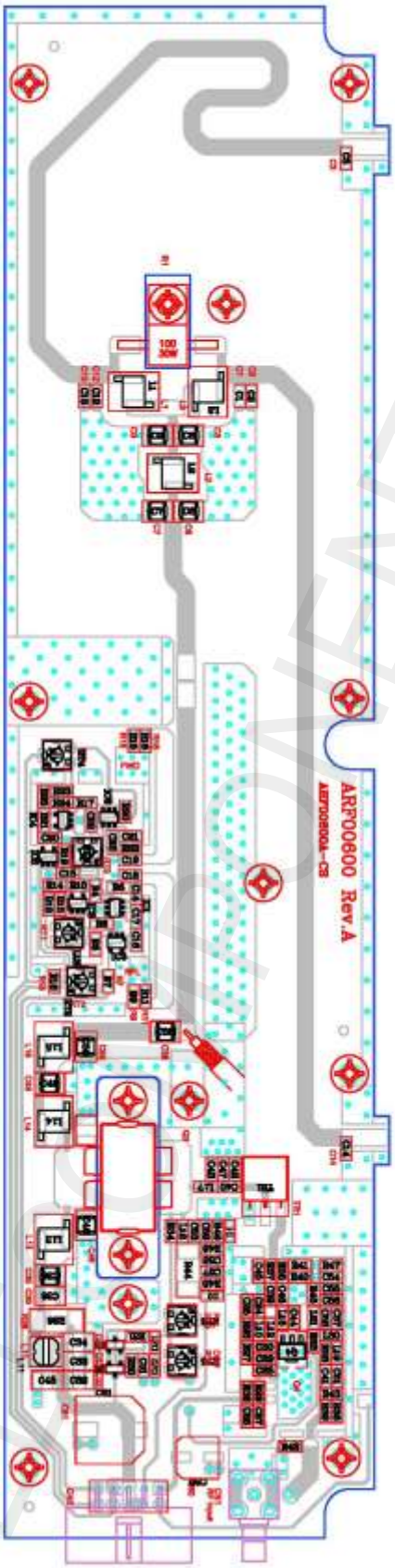
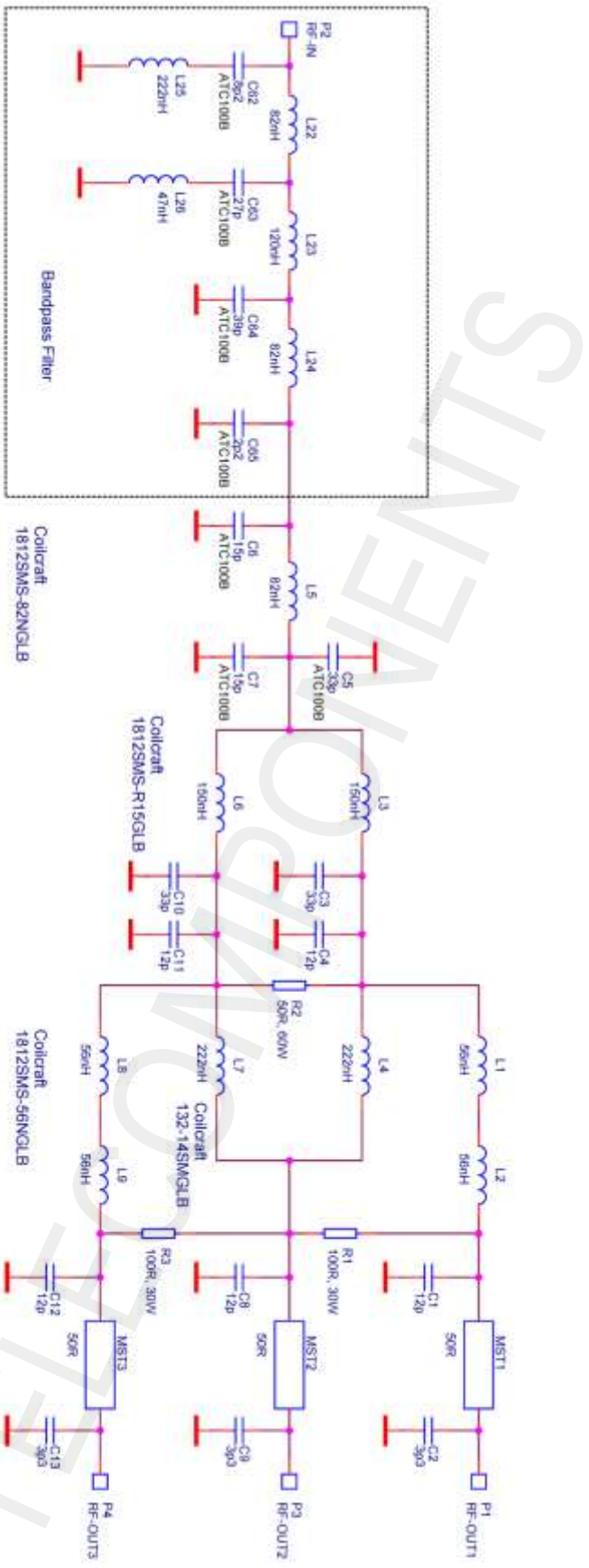
2 WAY SPLITTER



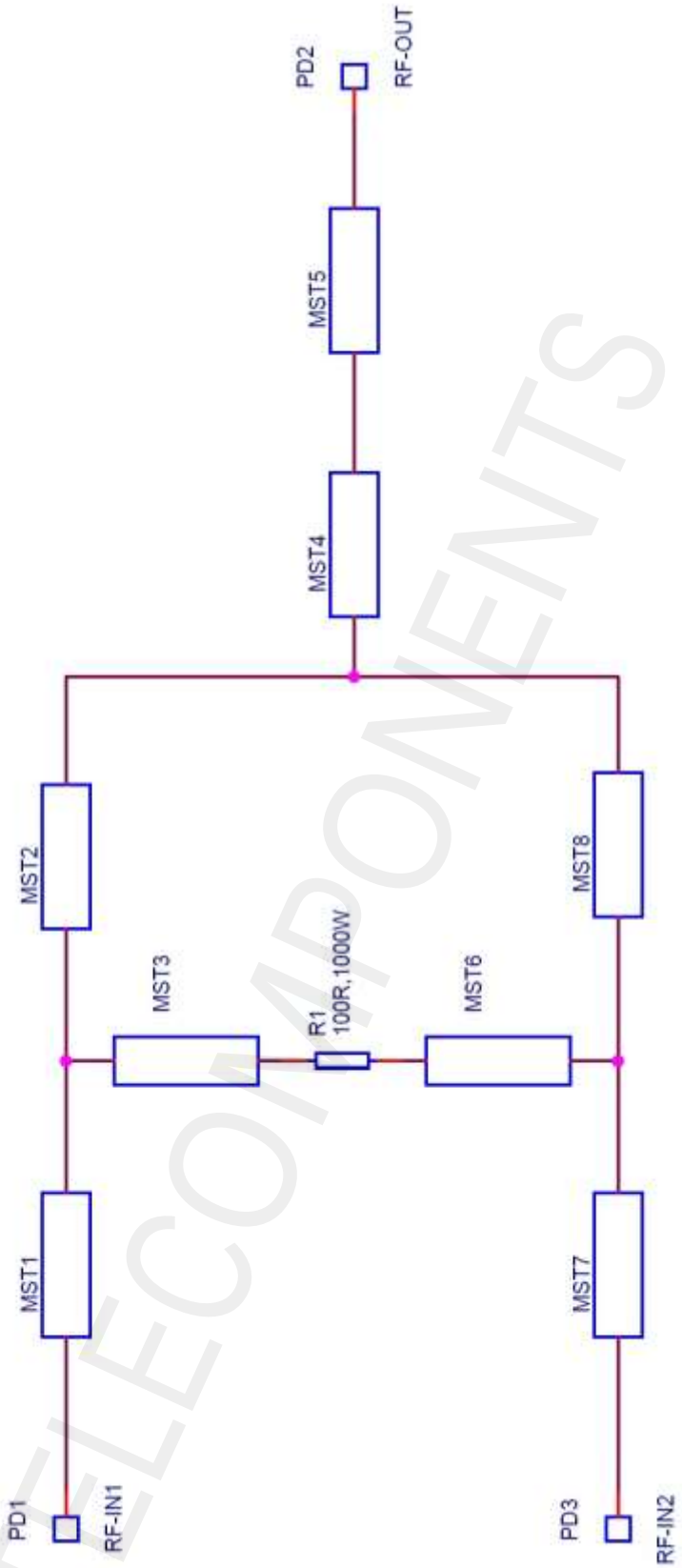
2 WAY SPLITTER LAYOUT



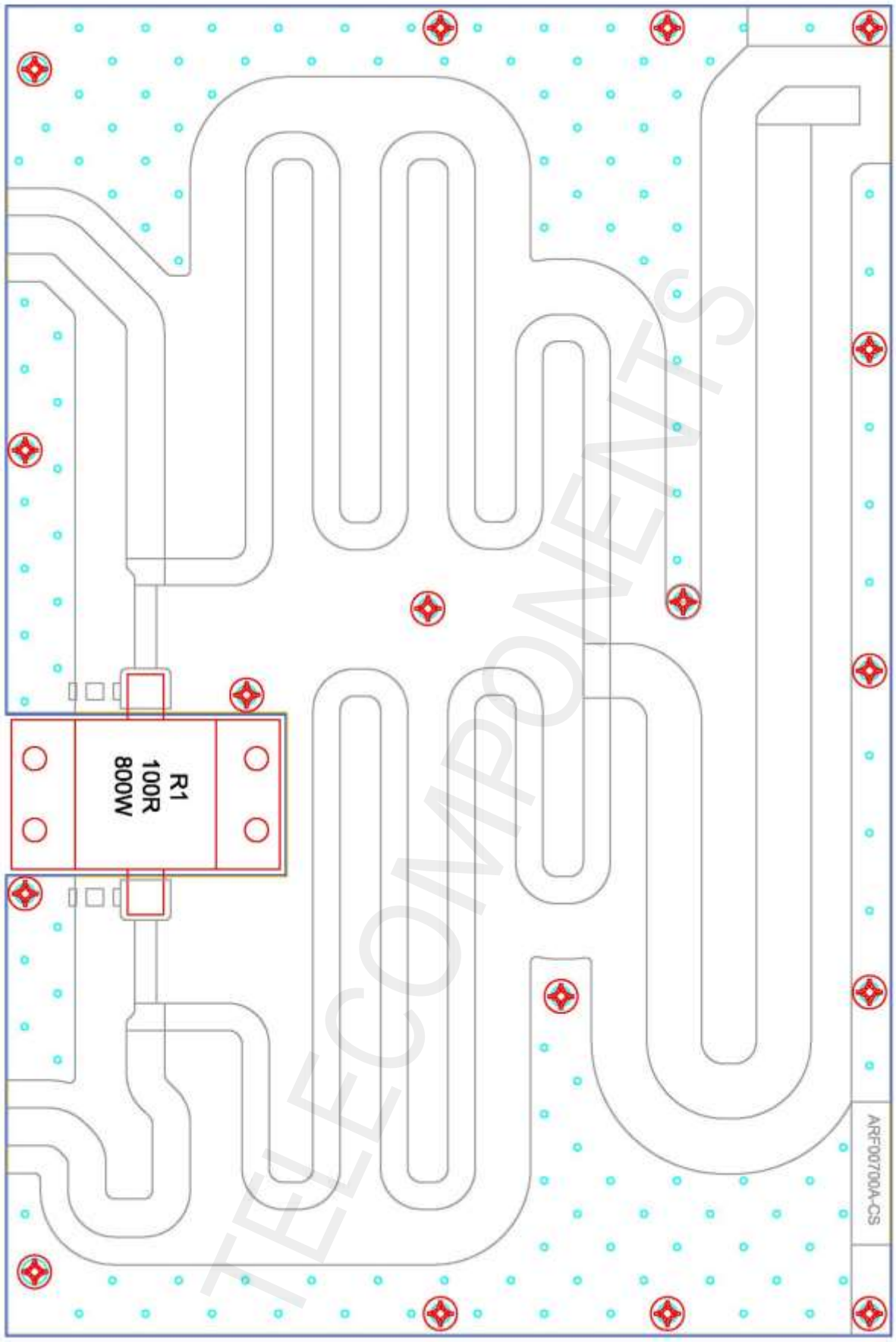
3 WAY SPLITTER



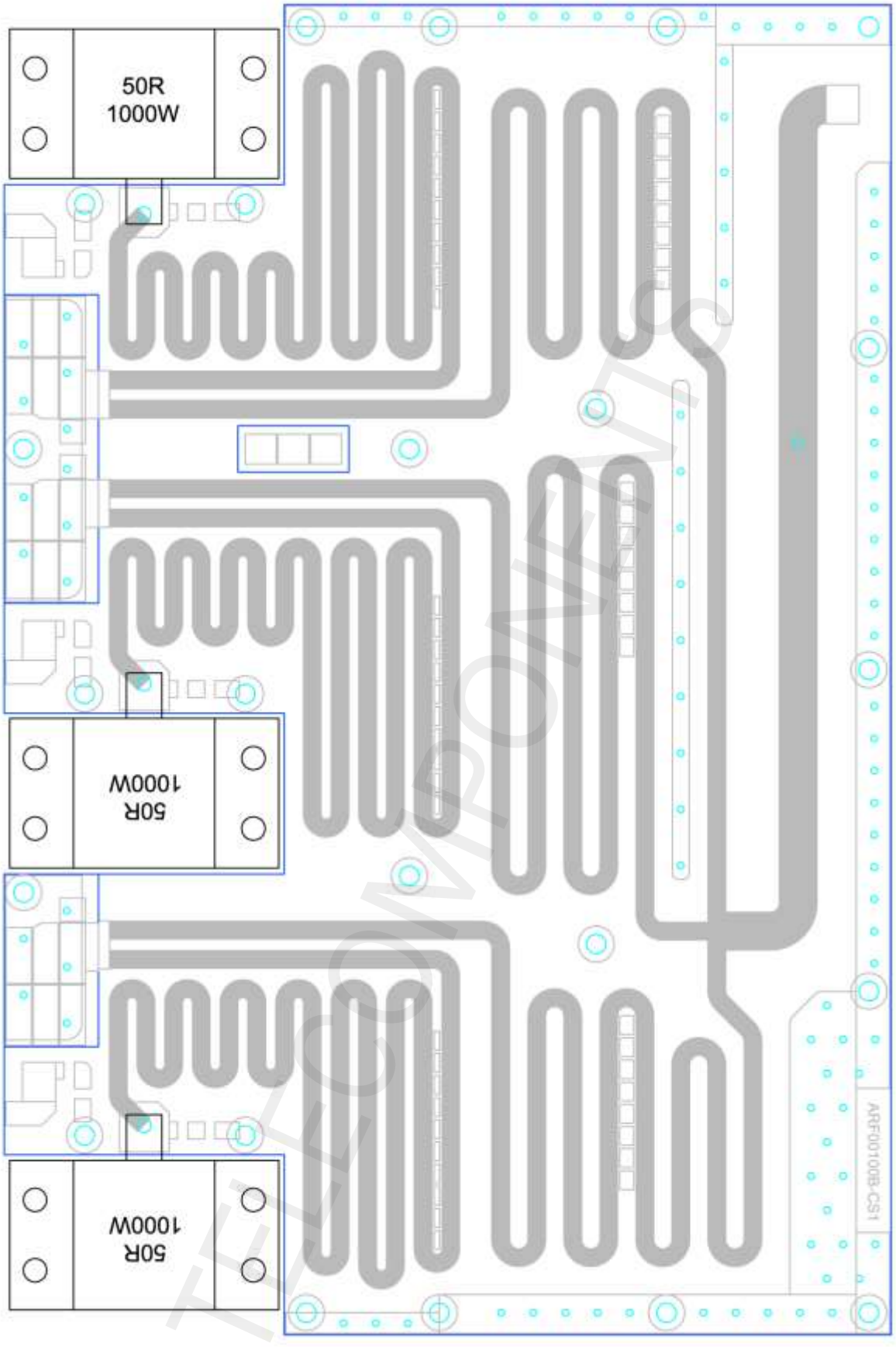
2 WAY COMBINER



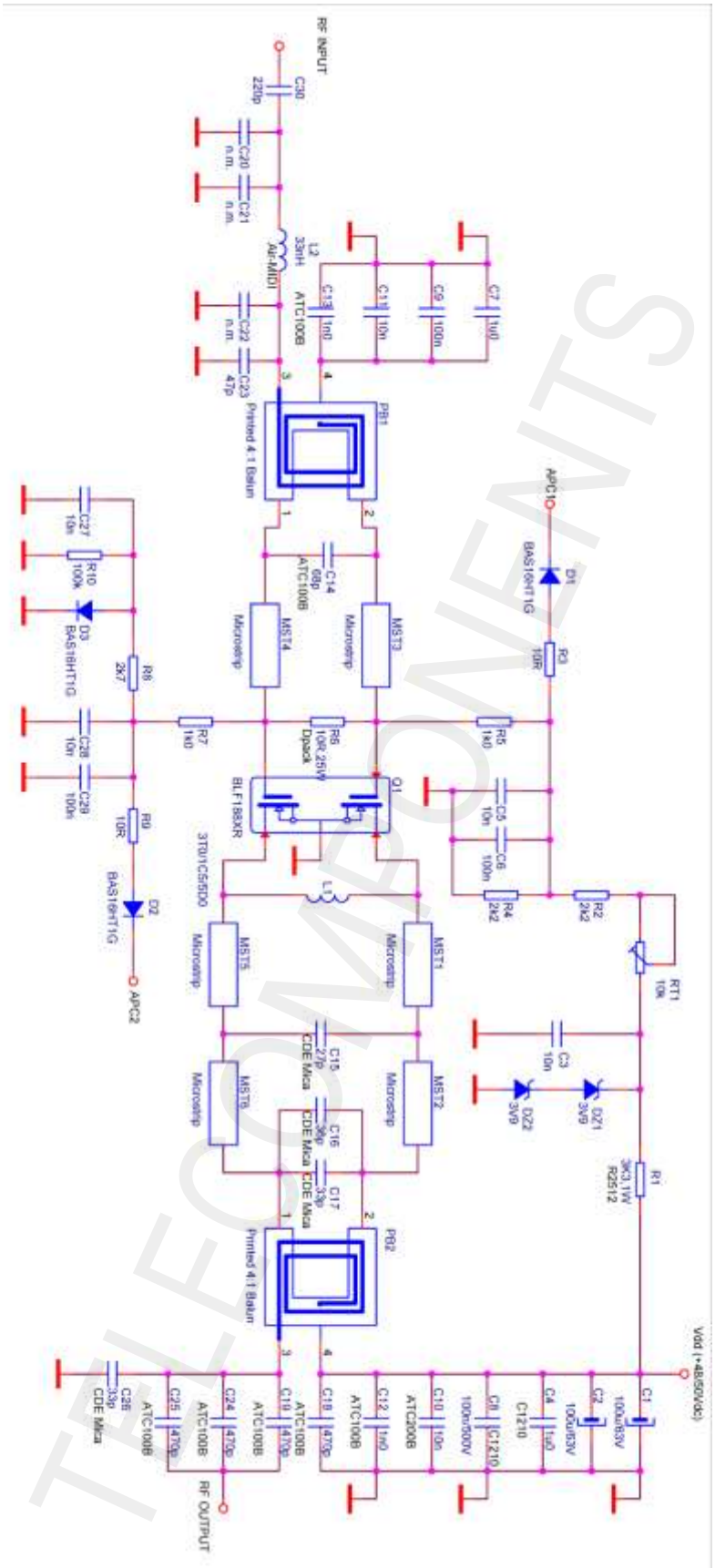
2 WAY COMBINER LAYOUT



3 WAY COMBINER LAYOUT



RF MODULE 1200W



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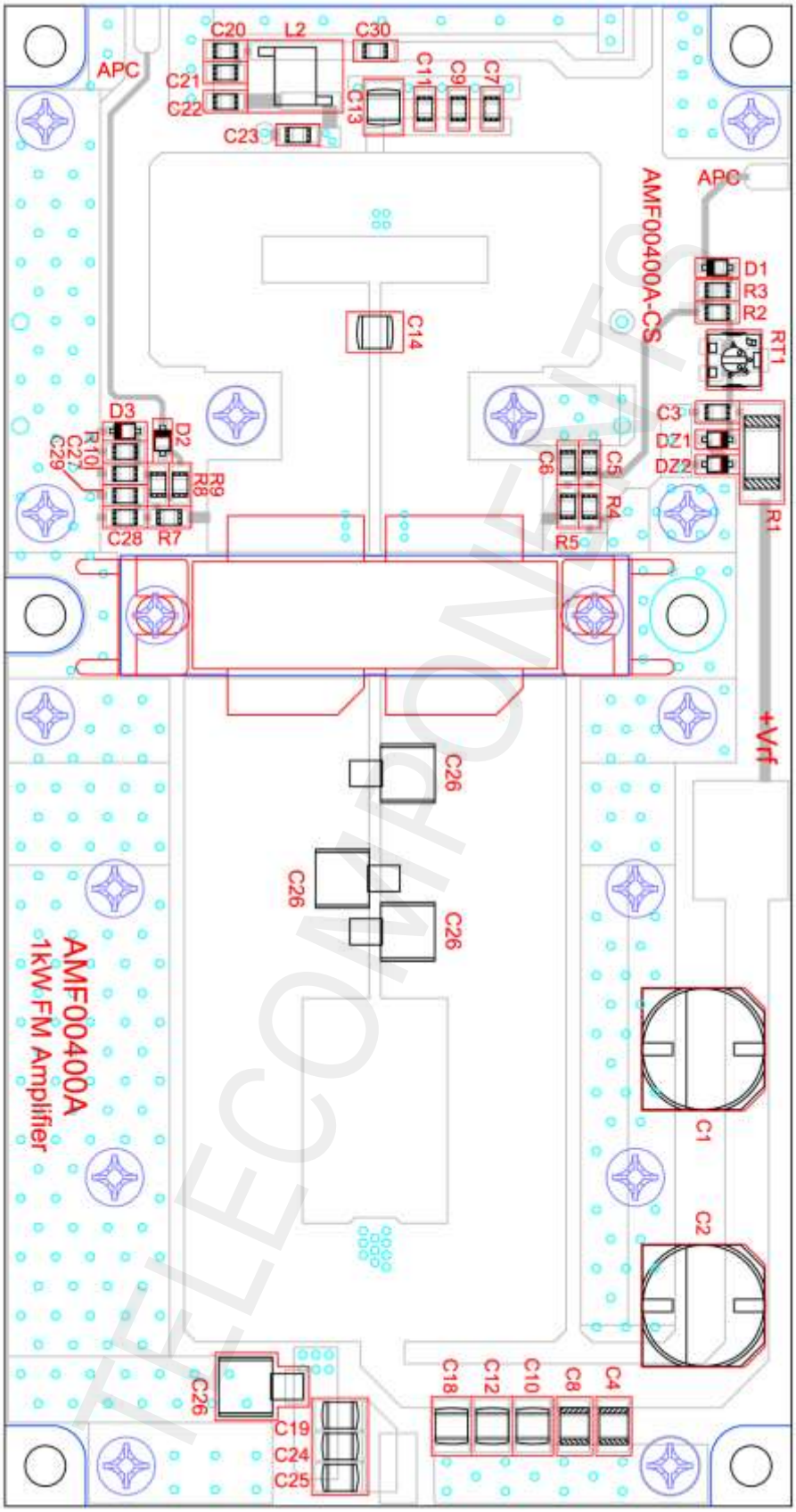
RF MODULE 1200W LAYOUT



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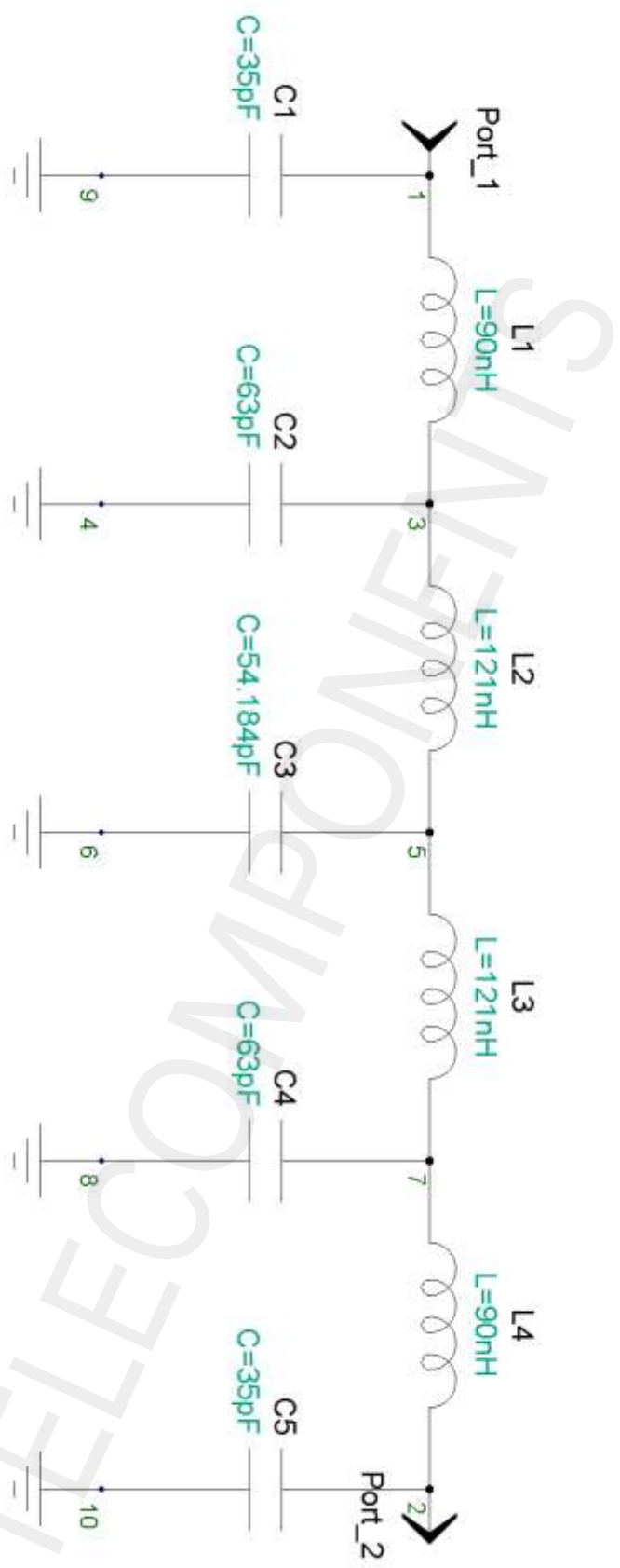
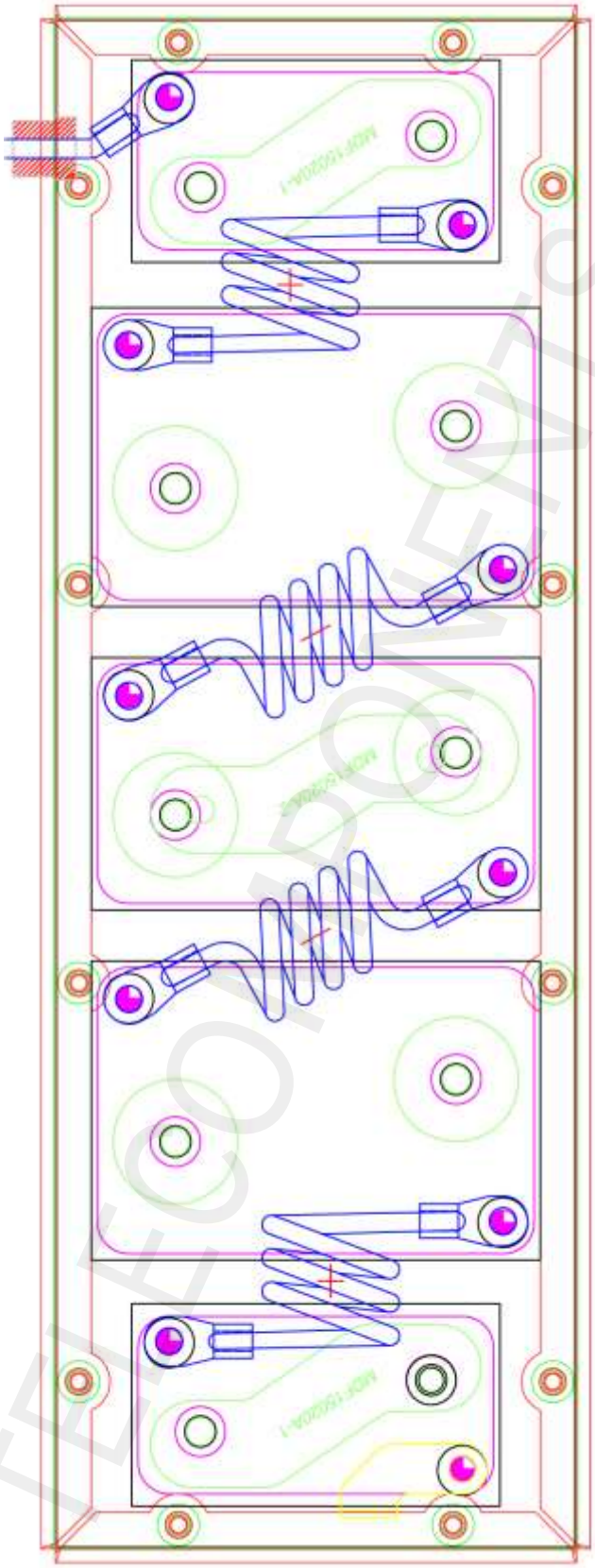
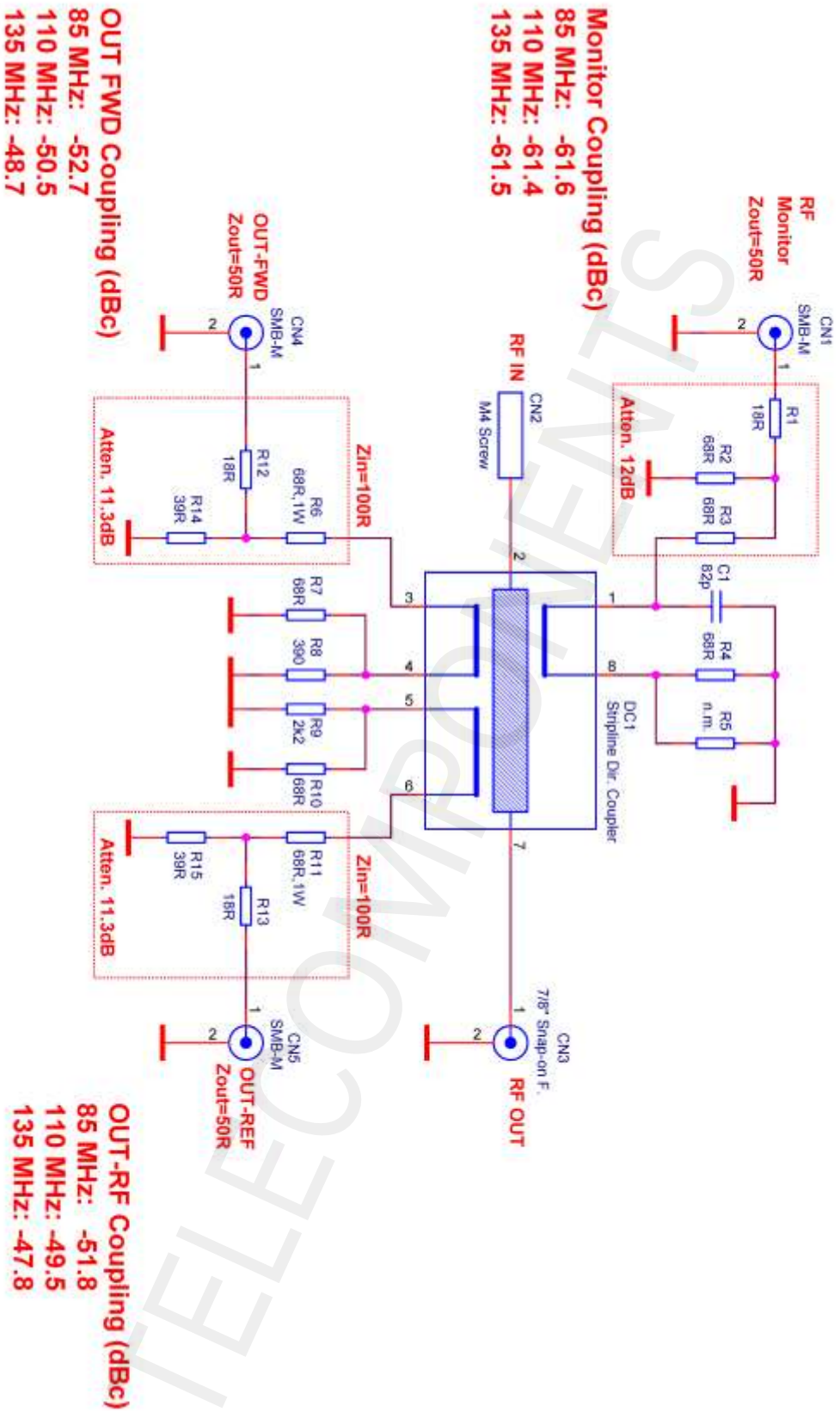
LOW BAND PASS FILTER



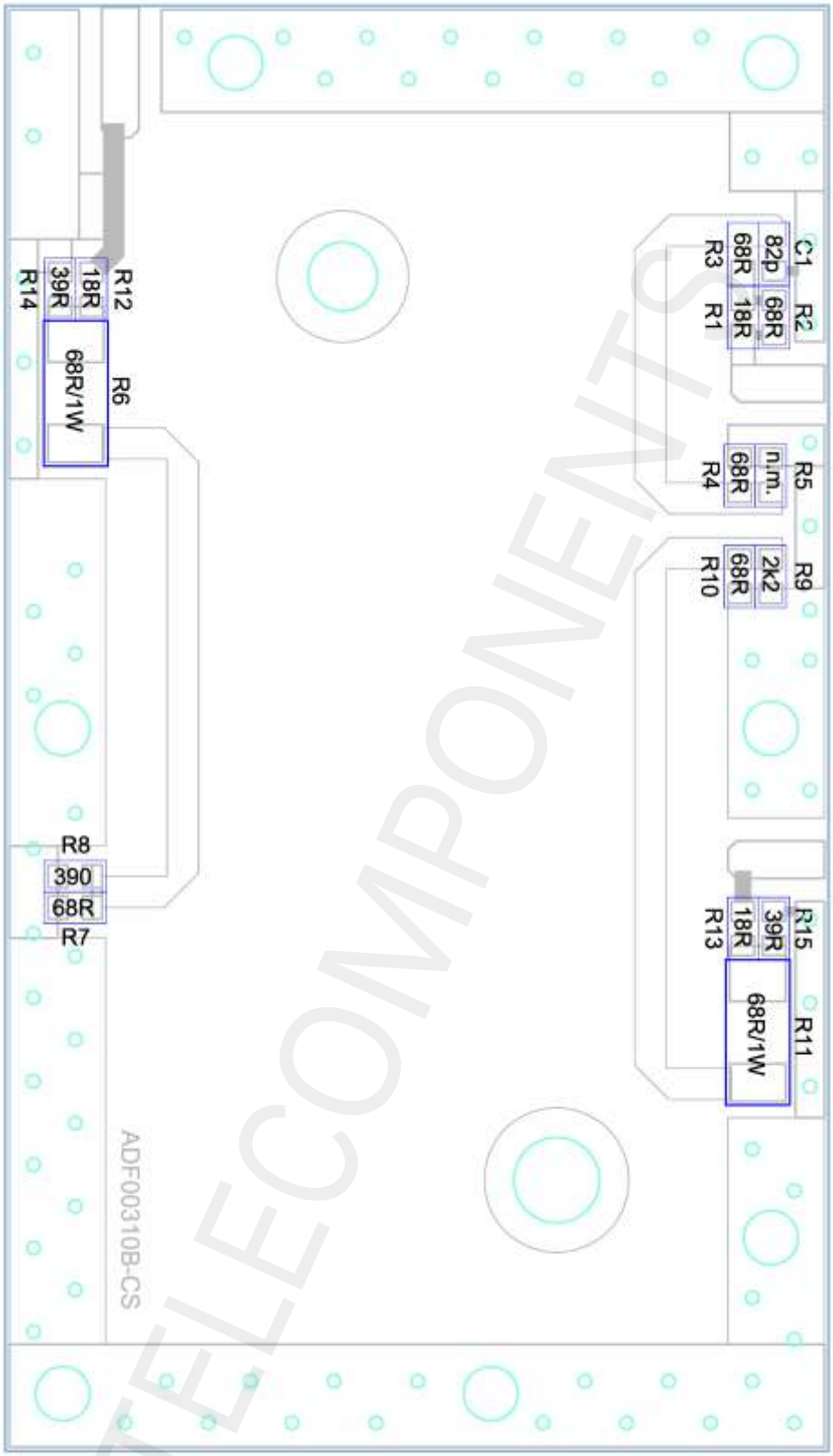
LOW BAND PASS FILTER LAYOUT



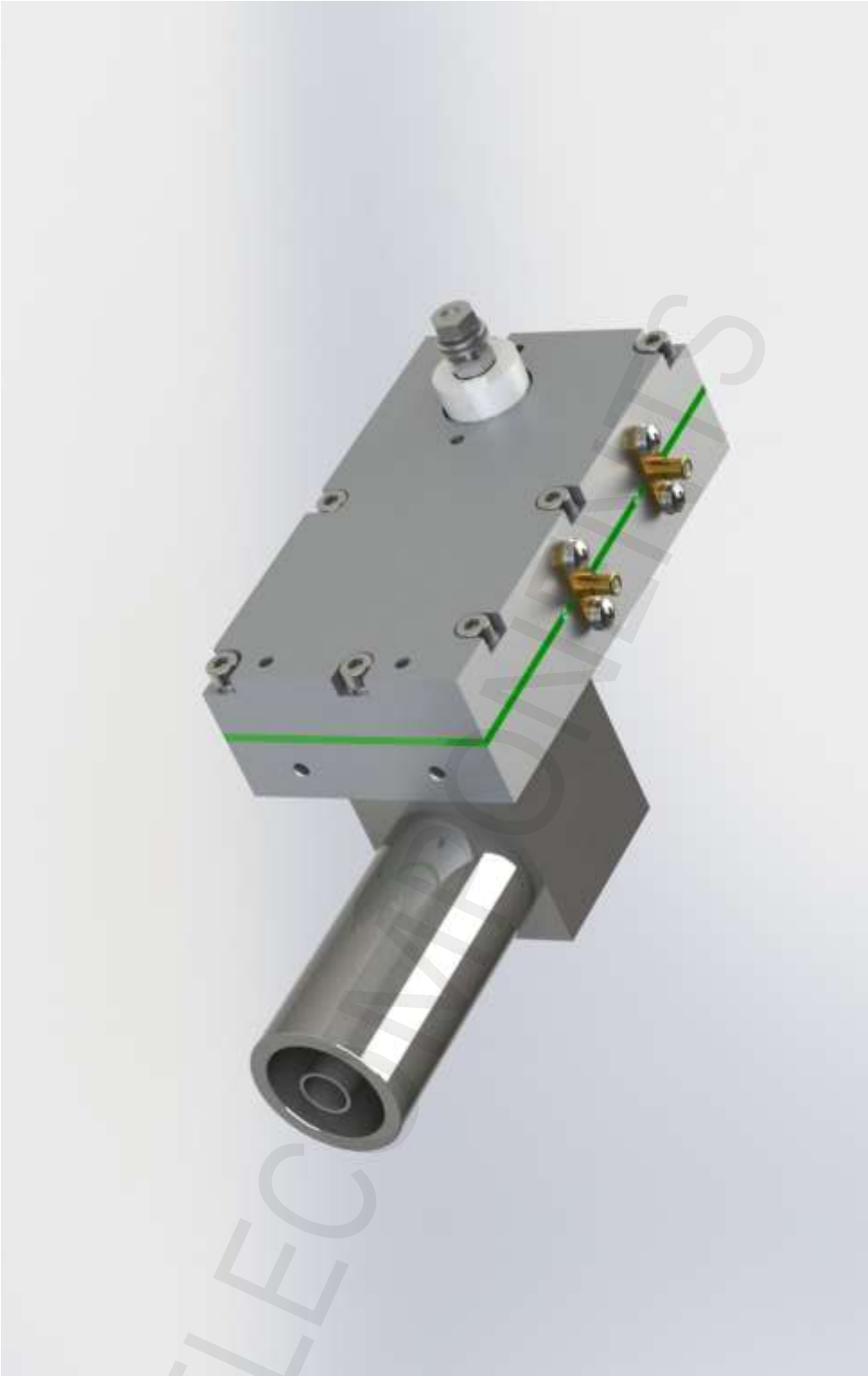
DIRECTIONAL COUPLER



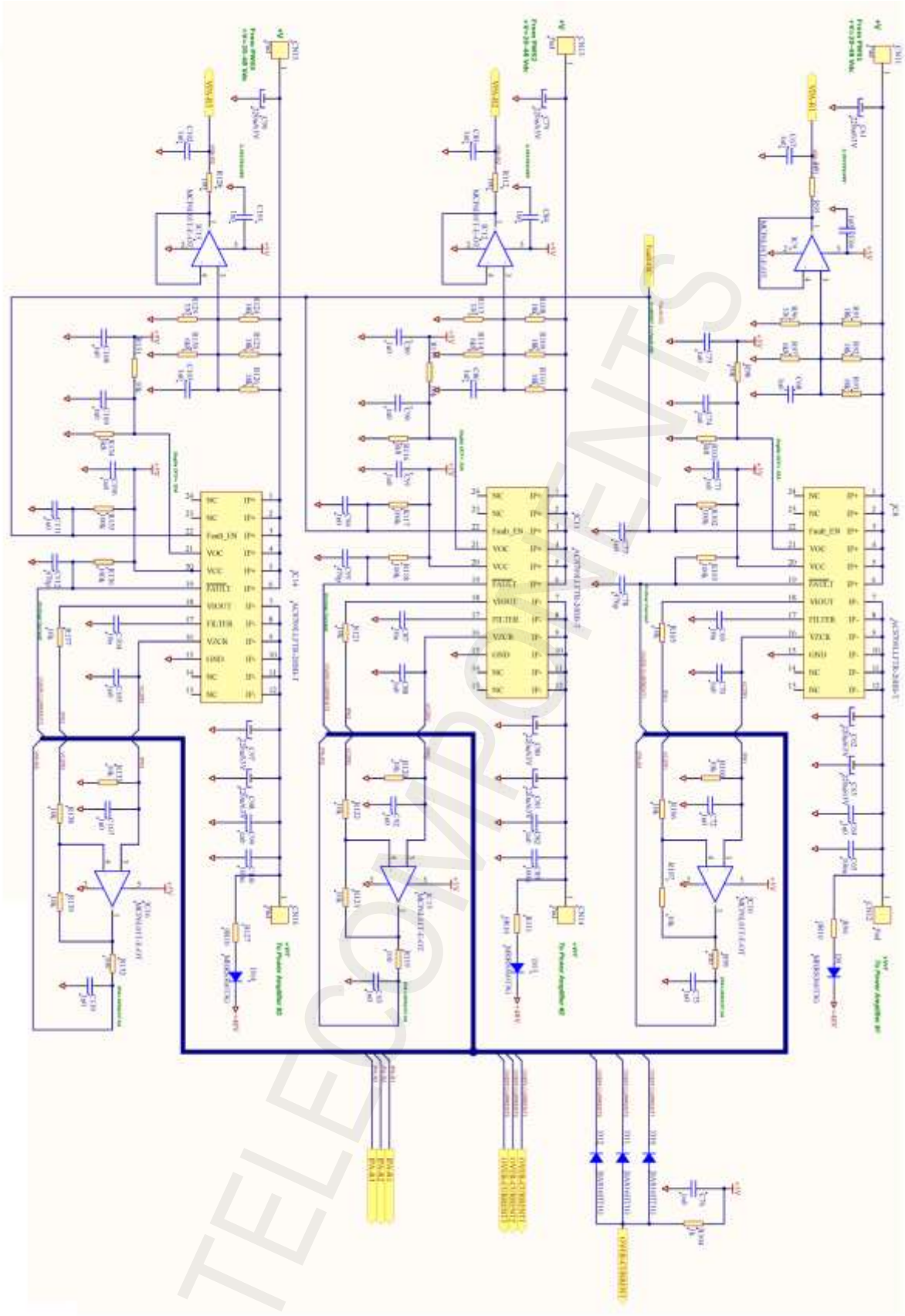
DIRECTIONAL COUPLER LAYOUT



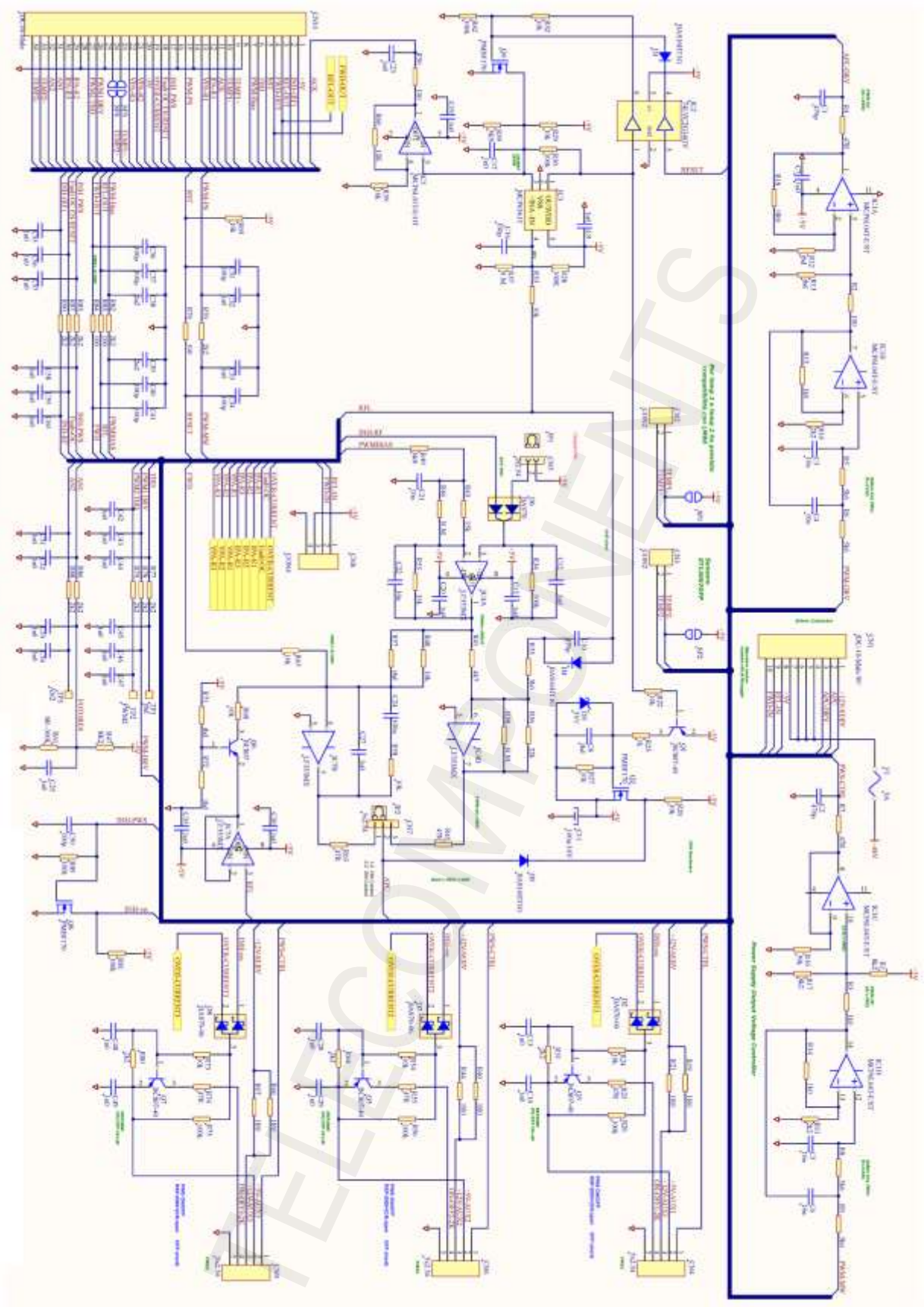
DIRECTIONAL COUPLER



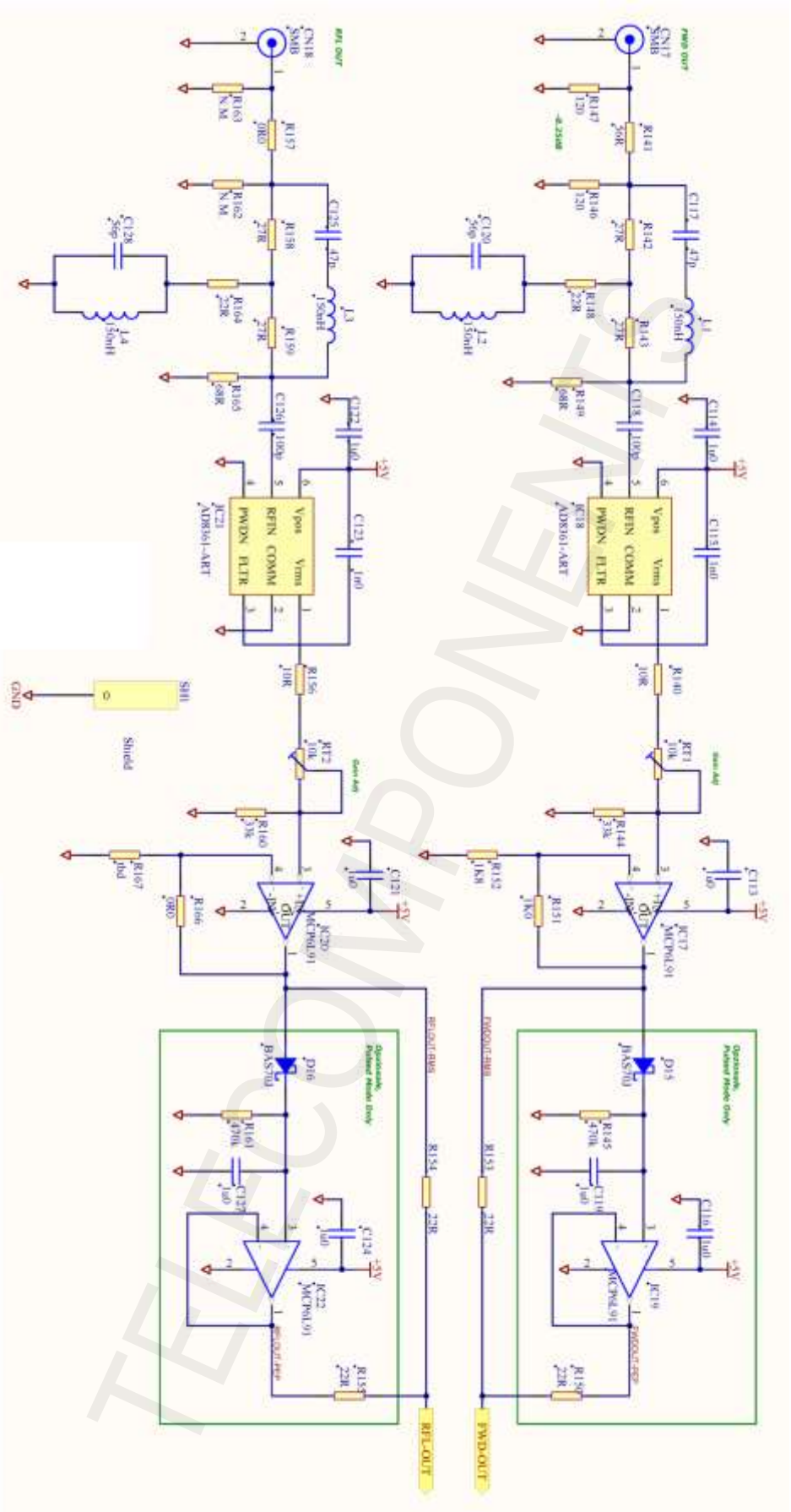
INTERCONNECTION POWER SUPPLY 1



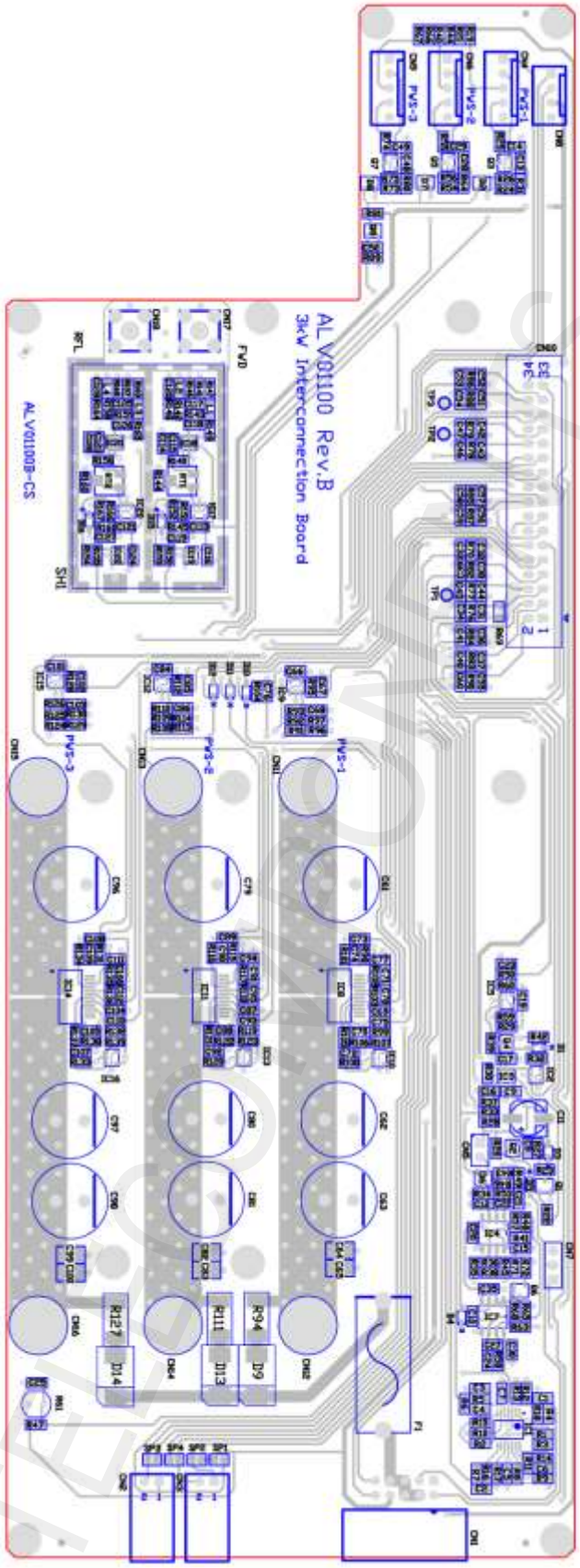
INTERCONNECTION POWER SUPPLY 2



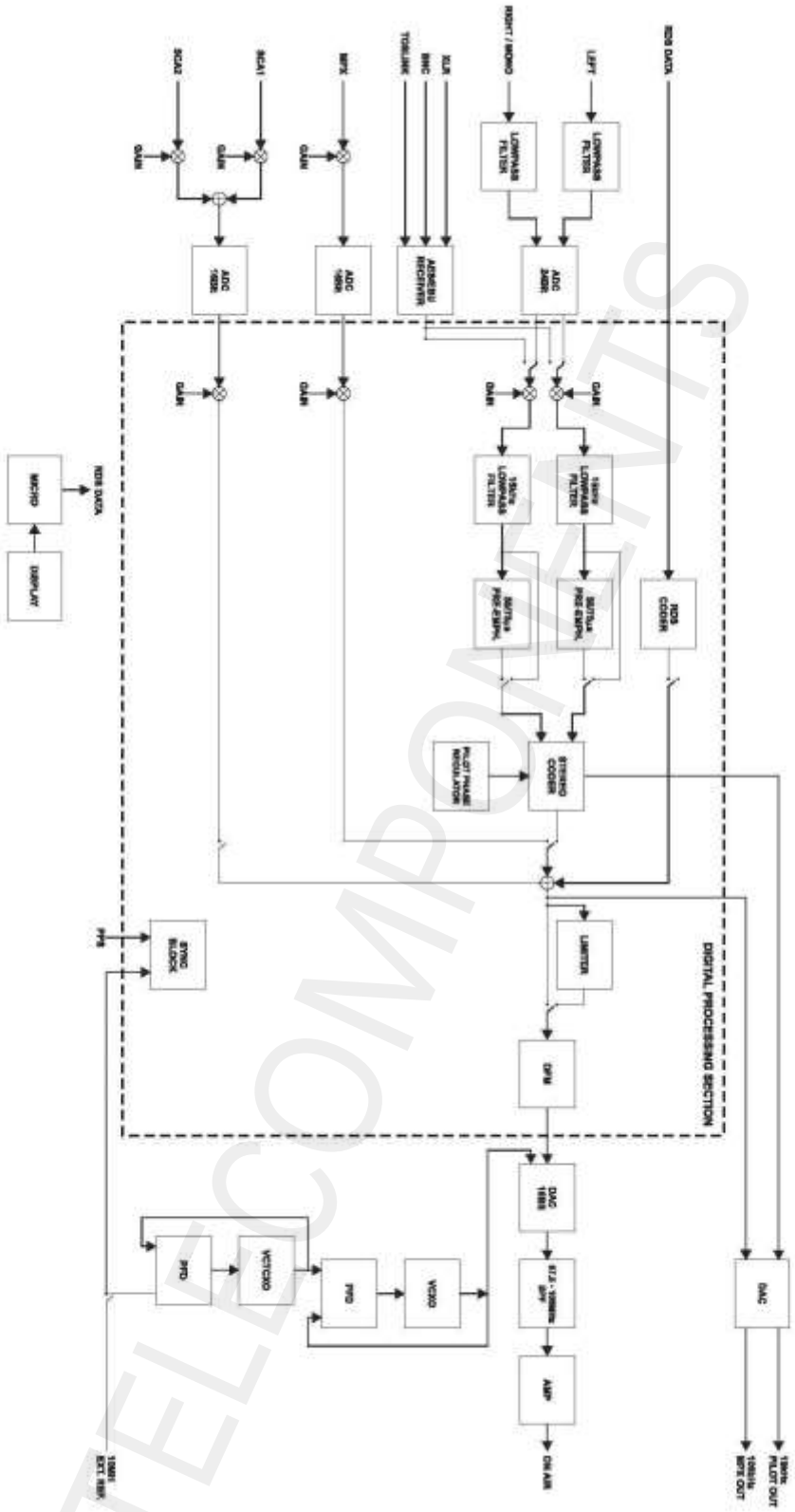
RF DETECTOR



INTERCONNECTION POWER SUPPLY &RF DETECTOR LAYOUT



BLOCK DIAGRAM DIGITAL BOARD



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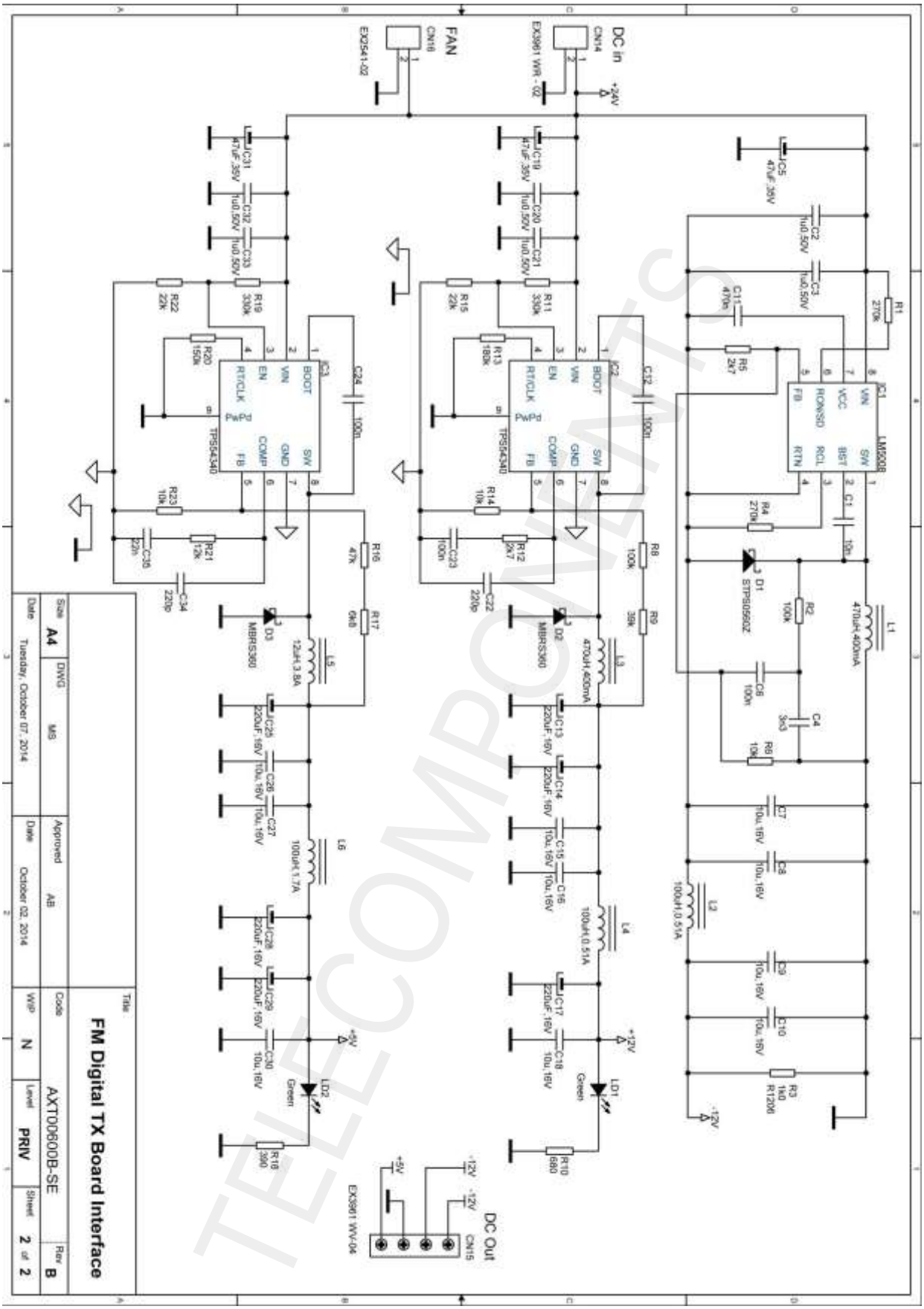
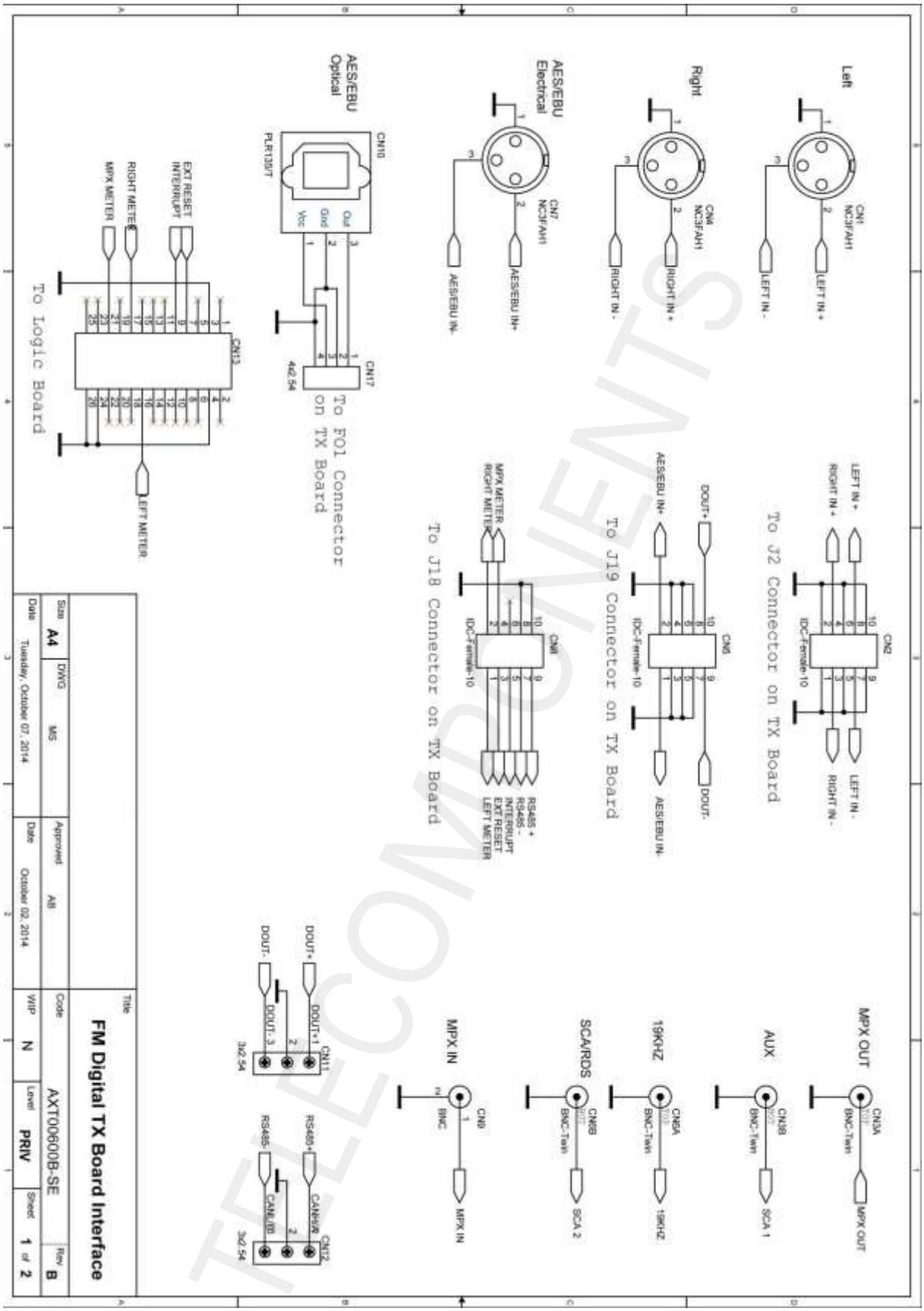
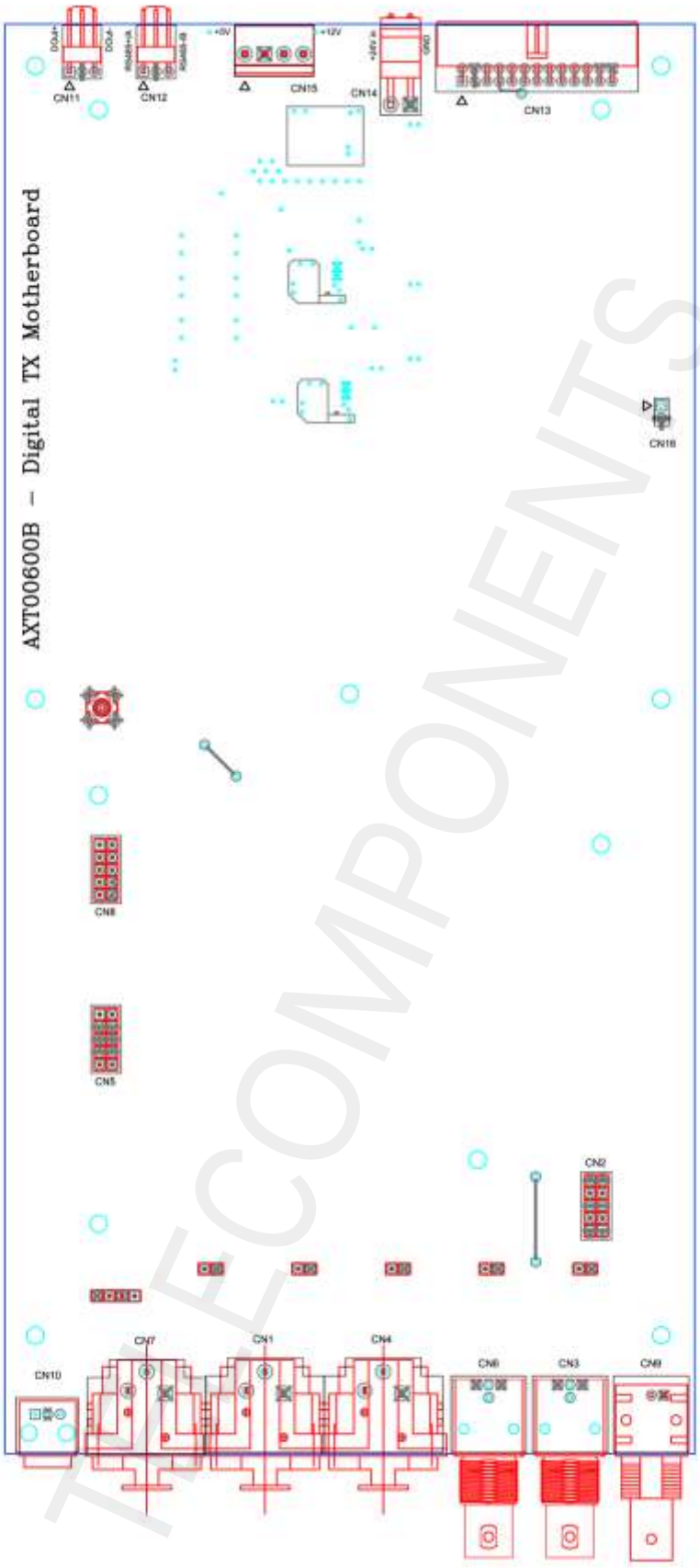
INTERFACE BOARD AND PWS



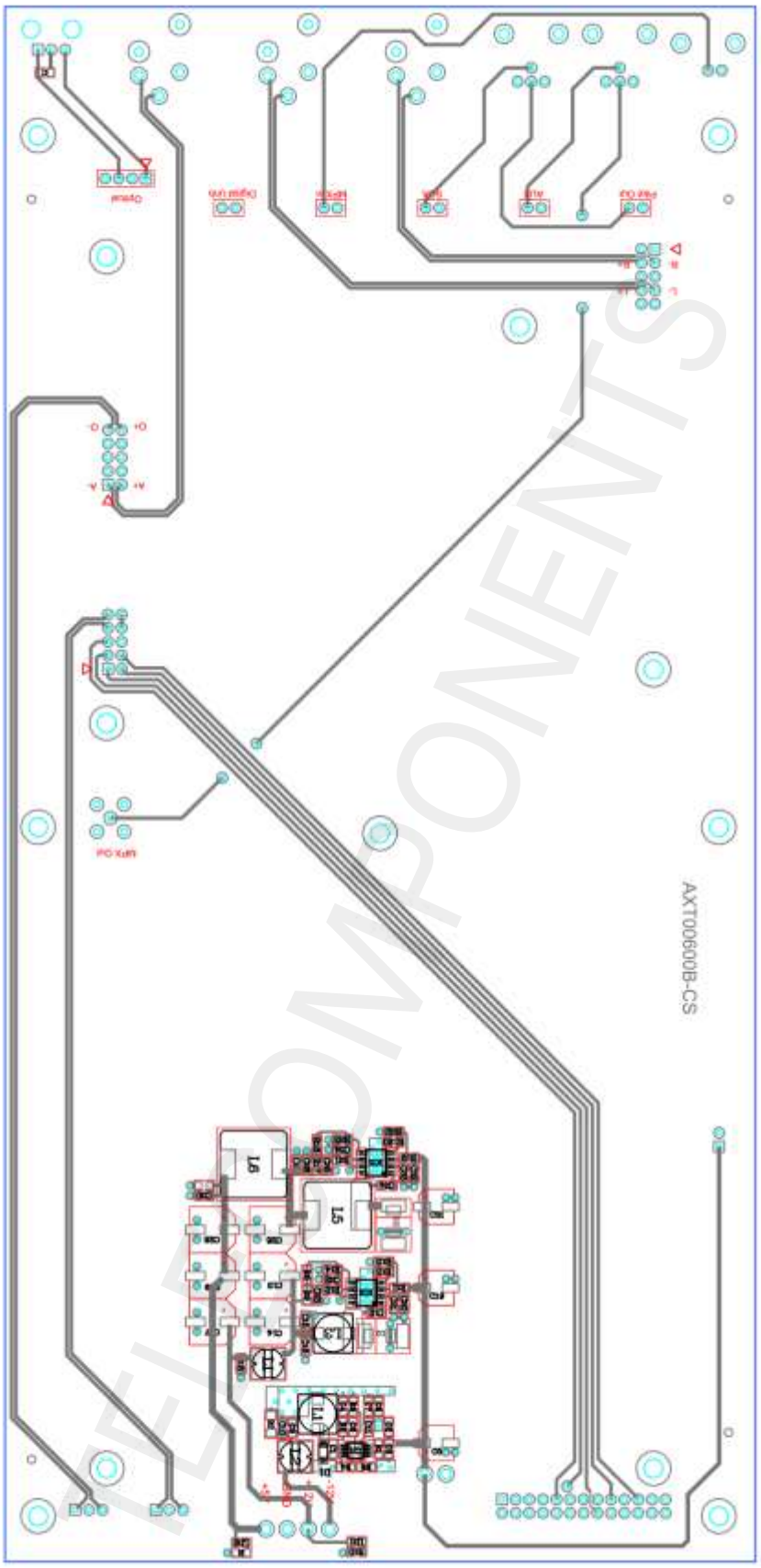
INTERFACE BOARD AND PWS



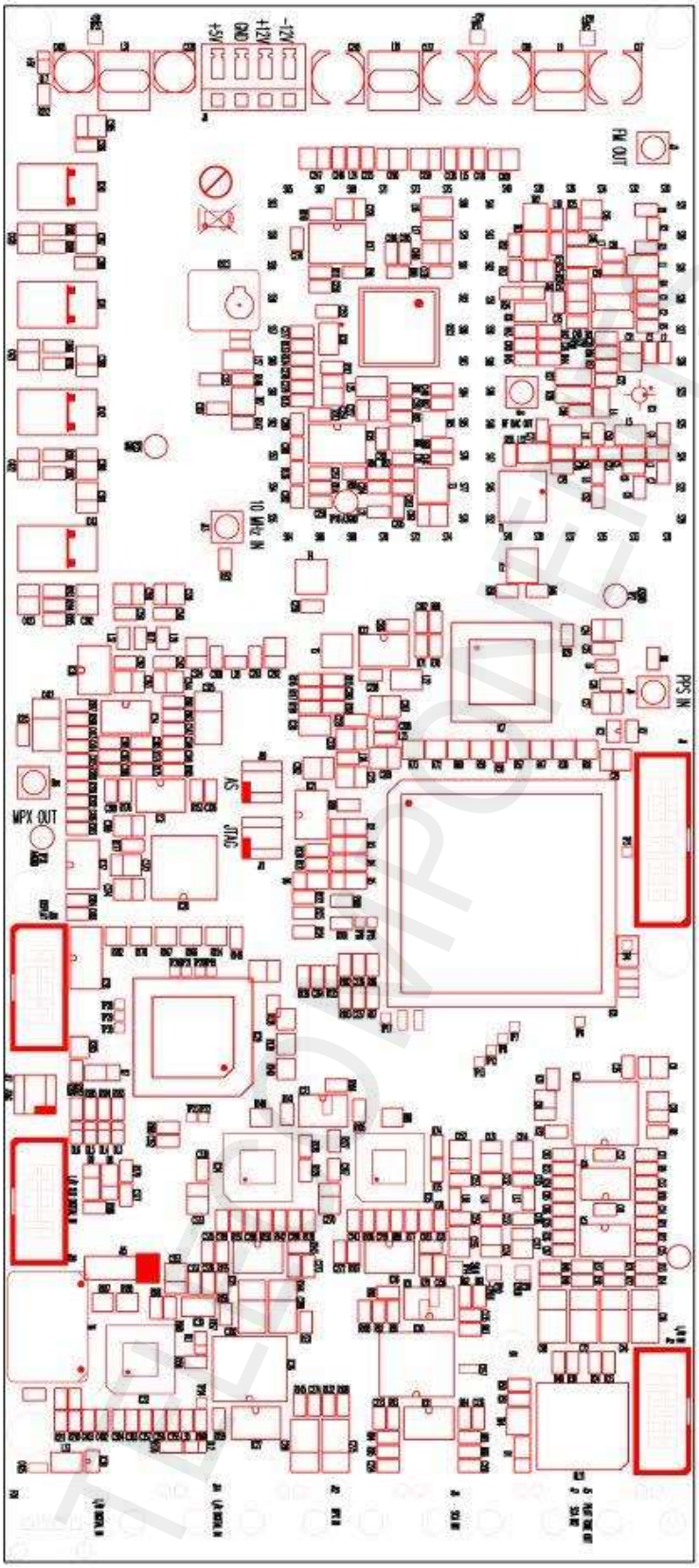
INTERFACE BOARD AND PWS TOP WIEV



INTERFACE BOARD AND PWS BOTTOM WIEV

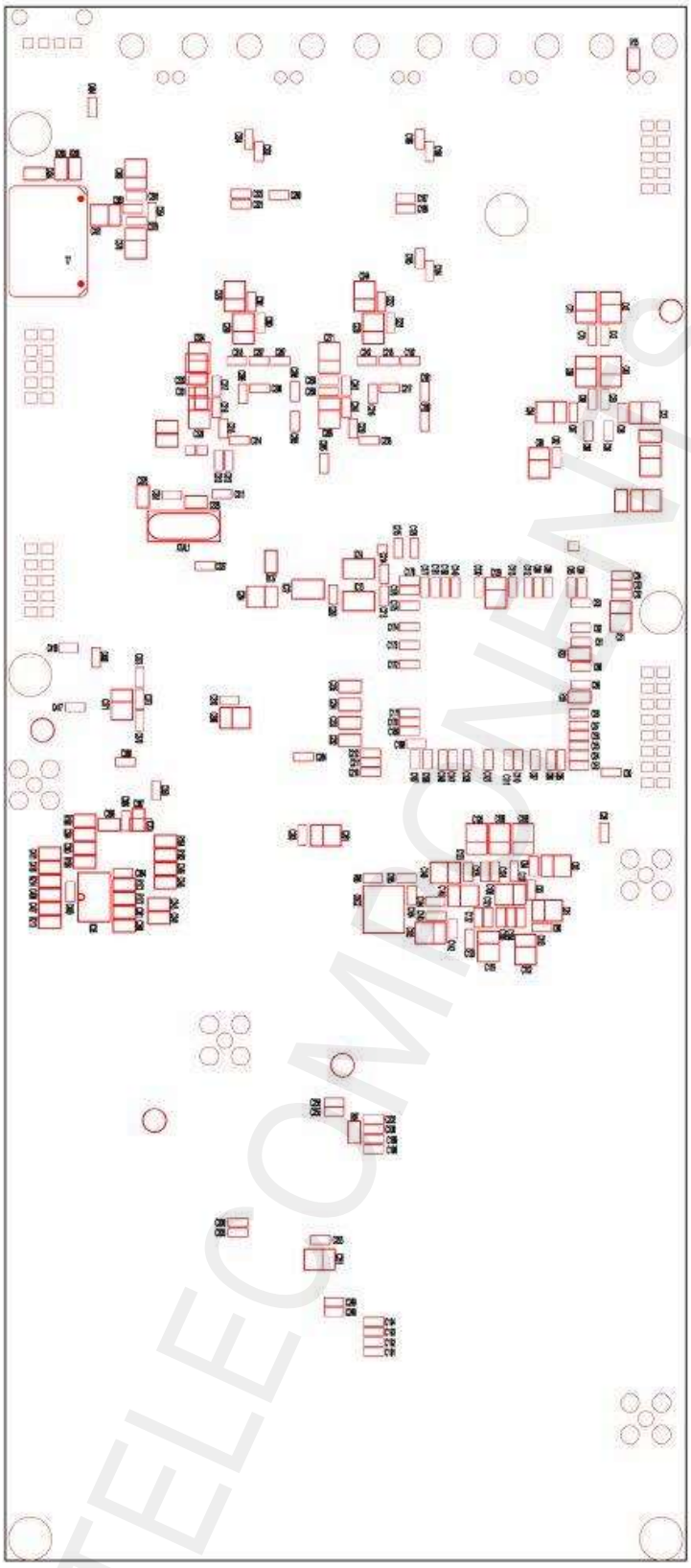


DIGITAL FM MODULATOR TOP WIEV



PN1416CR1 – Top Components Layout

DIGITAL FM MODULATOR BOTTOM WIEV



PN1416CR1 - Bottom Components Layout

POWER SUPPLY

2000W Single Output Power Supply — RSP-2000 series

■ Features :

- Universal AC input / Full range
- Built-in 5V/0.3A, 12V/0.8A auxiliary power
- Built-in active PFC function, PF>0.97
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Forced air cooling by built-in DC fan with fan speed control
- Output voltage can be trimmed between 40~115% of the rated output voltage
- High Power density 21.4W/inch³
- 1U low profile 41mm
- Active current sharing up to 8000W(3+1)
- Built-in remote ON-OFF control
- Built-in remote sense function
- DC OK signal, OTP alarm signal
- 3 years warranty

SPECIFICATION

MODEL		RSP-2000-12	RSP-2000-24	RSP-2000-48
OUTPUT	DC VOLTAGE	12V	24V	48V
	RATED CURRENT	100A	80A	42A
	CURRENT RANGE	0 ~ 100A	0 ~ 80A	0 ~ 42A
	RATED POWER	1200W	1920W	2016W
	RIPPLE & NOISE (max.) Note.2	150mVp-p	200mVp-p	300mVp-p
	VOLTAGE ADJ. RANGE	10.5 ~ 14V	21 ~ 28V	42 ~ 56V
	VOLTAGE TOLERANCE Note.3	±2.0%	±1.0%	±1.0%
	LINE REGULATION	±1.0%	±0.5%	±0.5%
	LOAD REGULATION	±1.0%	±0.5%	±0.5%
	SETUP, RISE TIME	1500ms, 60ms/230VAC at full load		
	HOLD UP TIME (Typ.)	16ms/230VAC at 75% load	10ms/230VAC at full load	
INPUT	VOLTAGE RANGE Note.5	90 ~ 264VAC 127 ~ 370VDC		
	FREQUENCY RANGE	47 ~ 63Hz		
	POWER FACTOR (Typ.)	0.97/230VAC at full load		
	EFFICIENCY (Typ.)	87%	90.5%	92%
	AC CURRENT (Typ.) Note.5	13A/115VAC 7A/230VAC	16A/115VAC 10A/230VAC	16A/115VAC 10A/230VAC
	INRUSH CURRENT (Typ.)	COLD START 50A		
	LEAKAGE CURRENT	<2mA / 240VAC		
PROTECTION	OVERLOAD	105 ~ 125% rated output power		
		Protection type : Constant current limiting, unit will shut down o/p voltage after 5 sec. re-power on to recover		
	OVER VOLTAGE	14.7 ~ 17.5V	29.5 ~ 35V	57.6 ~ 67.2V
		Protection type : Shut down o/p voltage, re-power on to recover		
	OVER TEMPERATURE	80℃ ±5℃ (TSW1) detect on heatsink of power bridge	75℃ ±5℃ (TSW2) detect on heatsink of o/p diode	
		Protection type : Shut down o/p voltage, recovers automatically after temperature goes down		
FUNCTION	AUXILIARY POWER	5V @ 0.3A, 12V @ 0.8A		
	REMOTE ON/OFF CONTROL	By electrical signal or dry contact Power ON:open Power OFF:short, refer to function manual		
	REMOTE SENSE	Compensate voltage drop on the load wiring up to 0.5V, refer to function manual		
	DC OK SIGNAL	The isolated TTL signal out, refer to function manual		
	OUTPUT VOLTAGE TRIM	Adjustment of output voltage, possible between 40 ~ 115% of rated output, refer to function manual		
ENVIRONMENT	WORKING TEMP.	-35 ~ +70℃ (Refer to "Derating Curve")		
	WORKING HUMIDITY	20 ~ 90% RH non-condensing		
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH		
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)		
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes		
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 approved		
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:2KVAC O/P-FG:0.5KVAC		
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH		
	EMC EMISSION	Compliance to EN55022 (CISPR22) Conduction Class B, Radiation Class A ; EN61000-3-2,-3		
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, EN61000-6-2 (EN50082-2), heavy industry level, criteria A		
OTHERS	MTBF	46.3Khrs min. MIL-HDBK-217F (25℃)		
	DIMENSION	295*127*41mm (L*W*H)		
	PACKING	1.95Kg; 6pcs/12.7Kg/1.15CUFT		

NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.
5. Derating may be needed under low input voltages. Please check the derating curve for more details.
6. Under parallel operation ripple of the output voltage may be higher than the SPEC at light load condition. It will go back to normal ripple level once the output load is more than 5%.

SERVICE POWER SUPPLY

150W Single Output Switching Power Supply — RS-150 series

- Features :
- Protections: Short circuit / Overload / Over voltage
- Cooling by free air convection
- LED indicator for power on
- 100% full load burn-in test
- All using 105℃ long life electrolytic capacitors
- Withstand 300VAC surge input for 5 second
- High operating temperature up to 70℃
- Withstand 5G vibration test
- High efficiency, long life and high reliability
- 3 years warranty

SPECIFICATION

MODEL		RS-150-3.3	RS-150-5	RS-150-12	RS-150-15	RS-150-24	RS-150-48
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V	48V
	RATED CURRENT	30A	26A	12.5A	10A	6.5A	3.3A
	CURRENT RANGE	0 ~ 30A	0 ~ 26A	0 ~ 12.5A	0 ~ 10A	0 ~ 6.5A	0 ~ 3.3A
	RATED POWER	99W	130W	150W	150W	156W	158.4W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	80mVp-p	120mVp-p	120mVp-p	120mVp-p	200mVp-p
	VOLTAGE ADJ. RANGE	3.2V ~ 3.5V	4.75 ~ 5.5V	11.4 ~ 13.2V	14.25 ~ 16.5V	22.8 ~ 26.4V	45.6 ~ 52.8V
	VOLTAGE TOLERANCE Note.3	±3.0%	±2.0%	±1.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION Note.4	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION Note.5	±2.0%	±1.0%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	800ms, 20ms/230VAC 1200ms, 30ms/115VAC at full load					
	HOLD UP TIME (Typ.)	28ms/230VAC 20ms/115VAC at full load					
INPUT	VOLTAGE RANGE	88 ~ 132VAC / 176 ~ 264VAC selected by switch 248 ~ 373VDC(Withstand 300VAC surge for 5sec. Without damage)					
	FREQUENCY RANGE	47 ~ 63Hz					
	EFFICIENCY(Typ.)	74%	78%	83%	84%	86%	87%
	AC CURRENT (Typ.)	3A/115VAC 2A/230VAC					
	INRUSH CURRENT (Typ.)	COLD START 40A/230VAC					
	LEAKAGE CURRENT	<2mA / 240VAC					
PROTECTION	OVERLOAD Note.8	110 ~ 150% rated output power					
		Protection type : Hiccup mode, recovers automatically after fault condition is removed					
	OVER VOLTAGE	3.8 ~ 4.45V	5.75 ~ 6.75V	13.8 ~ 16.2V	17.25 ~ 20.25V	27.6 ~ 32.4V	55.2 ~ 64.8V
		Protection type : Hiccup mode, recovers automatically after fault condition is removed					
ENVIRONMENT	WORKING TEMP.	-25 ~ +70℃ (Refer to "Derating Curve")					
	WORKING HUMIDITY	20 ~ 90% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH					
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)					
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, period for 60min. each along X, Y, Z axes					
SAFETY & EMC (Note 6)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 approved					
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC					
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH					
	EMC EMISSION	Compliance to EN55022 (CISPR22) Class B, EN61000-3-2,-3					
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, EN61000-6-2 (EN50082-2), heavy industry level, criteria A					
OTHERS	MTBF	244Khrs min. MIL-HDBK-217F (25℃)					
	DIMENSION	199*98*38mm (L*W*H)					
	PACKING	0.7Kg; 20pcs/15Kg/0.8CUFT					
NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. Line regulation is measured from low line to high line at rated load. 5. Load regulation is measured from 0% to 100% rated load. 6. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on http://www.meanwell.com) 7. Length of set up time is measured at cold first start. Turning ON/OFF the power supply very quickly may lead to increase of the set up time. 8. Extra consideration should be taken when selecting output wiring for 3.3V and 5V models. This is to prevent the protection modes for overload and short circuit from becoming constant power.						

File Name:RS-150-SPEC 2011-06-16