

TX10000U-KLC

User & Technical Manual



Rev. 3.0



EC Declaration of conformity

R.V.R. Elettronica S.p.A. declares that this transmitter is in conformity to the essential requirements and to other relevant regulations settled by the 1999/5/CE directive.

Validity of the EC declaration of conformity.

WARNING: the conformity of this product is not valid if the product is used in conditions not authorized by R.V.R. Elettronica as described in the user manual.

Examples of conditions in which the conformity is not valid (indicative list):

The connection between the exciter and the amplifier (i) indicated in the present document is not done properly;

The components used are different from those used and recommended by R.V.R. Elettronica S.p.A.;

The additional devices used are not suitable and/or are generating signals which are not suitable to those supported by the product;

The product is used in operative conditions different from the normal working conditions for which the product was designed (temperature, humidity, supply voltage, ...);

Any modification on parts of the product without any prior authorization from R.V.R. Elettronica S.p.A..

Limitations for the use of the product in the EEC member countries.

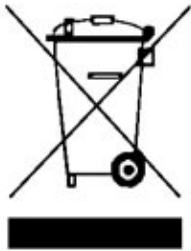
This product is a radio transmitter for FM broadcasting .

It can work on operative frequencies which are not harmonized in the EEC member countries.

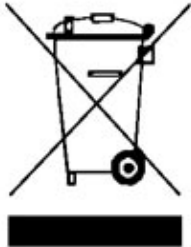
Whoever uses this product, should obtain the authorization from the spectrum local administrative authority before starting using it.

The user is responsible for the configuration of the working frequency, the output power, and for the other characteristics of the installation to which the transmitter described in the present documentation is part of, in order to respect the limitations described in the authorization received by the competent local authority.

Waste Electrical or Electronic Equipment (WEEE)



This symbol indicates that you should not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.



CAUTION

Do not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

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1. Introduction

This manual describes the TX10000U-KLC, a solid-state RF amplifier designed for frequency modulation sound broadcasting, manufactured by **R.V.R. Elettronica S.p.A.** A control system for the exciters is built into the machine so that in order to have a system with redundant exciters, all that needs to be done is to include two exciters in the transmitter such as, for example, the PTX30LCD exciters made by R.V.R. Elettronica S.p.A.

This manual is written as a general guide for those having previous knowledge and experience with this kind of equipment, well conscious of the risks connected with the operation of electrical equipment.

It is not intended to contain a complete statement of all safety rules which should be observed by personnel in using this or other electronic equipment.

The installation, use and maintenance of this piece of equipment involve risks both for the personnel performing them and for the device itself, that shall be used only by trained personnel.

R.V.R. Elettronica S.p.A. doesn't assume responsibility for injury or damage resulting from improper procedures or practices by untrained/unqualified personnel in the handling of this unit.

Please observe all local codes and fire protection standards in the operations of this unit.

WARNING: always disconnect power before opening covers or removing any part of this unit. Use appropriate grounding procedures to short out capacitors and high voltage points before servicing.

WARNING: this device can irradiate radio frequency waves, and if it's not installed following the instructions contained in the manual and local regulations it could generate interferences in radio communications.

In a residential place this equipment can cause hash. In this case can be requested to user to take the necessary measures.

R.V.R. Elettronica S.p.A. reserves the right to modify the design and/or the technical specifications of the product and this manual without notice.

2. Warranty

Any product of R.V.R. Elettronica is covered by a 24 (twenty four) month warranty.

For components like tubes for power amplifiers, the original manufacturer's warranty applies. R.V.R. Elettronica S.p.A. extends to the original end-user purchaser all manufacturers warranties which are transferable and all claims are to be made directly to R.V.R. per indicated procedures.

Warranty shall not include:

- 1 You damn that are verified each other during the consignment of the machine to the R.V.R. for possible reparations;
- 2 Any unauthorized repair/modification;
- 3 Incidental/consequential damages as a result of any defect;
- 4 Nominal non-incidental defects
- 5 Re-shipment costs or insurance of the unit or replacement units/parts

Any damage to the goods must be reported to the carrier in writing on the shipment receipt.

Any discrepancy or damage discovered subsequent to delivery, shall be reported to **R.V.R. Elettronica** within 5 (five) days from delivery date.

To claim your rights under this warranty, you should follow this procedure:

- 1 Contact the dealer or distributor where you purchased the unit. Describe the problem and, so that a possible easy solution can be detected.
- 2 Dealers and Distributors are supplied with all the information about problems that may occur and usually they can repair the unit quicker than what the manufacturer could do. Very often installing errors are discovered by dealers.
- 3 If your dealer cannot help you, contact R.V.R. Elettronica and explain the problem. If it is decided to return the unit to the factory, R.V.R. Elettronica will mail you a regular authorization with all the necessary instructions to send back the goods.
- 4 When you receive the authorization, you can return the unit. Pack it carefully for the shipment, preferably using the original packing and seal the package perfectly. The customer always assumes the risks of loss (i.e., R.V.R. is never responsible for damage or loss), until the package reaches R.V.R. premises. For this reason, we suggest you to insure the goods for the whole value. Shipment must be effected C.I.F. (PREPAID) to the address specified by R.V.R.'s service manager on the authorization
- 5 DO NOT RETURN UNITS WITHOUT OUR AUTHORIZATION AS THEY WILL BE REFUSED
- 6 Be sure to enclose a written technical report where mention all the problems found and a copy of your original invoice establishing the starting date of the warranty.

Replacement and warranty parts may be ordered from the following address. Be sure to include the equipment model and serial number as well as part description and part number.

R.V.R. Elettronica SpA
Via del Fonditore, 2/2c
40138 BOLOGNA
ITALY
Tel. +39 051 6010506
email: info@rvr.it
Web: www.rvr.it

3. First Aid

The personnel employed in the installation, use and maintenance of the device, shall be familiar with theory and practice of first aid..

3.1 Treatment of electrical shocks

3.1.1 If the victim is not responsive

Follow the A-B-C's of basic life support

- Place victim flat on his back on a hard surface
- Open airway: lift up neck, push forehead back (Fig. 3-1).
- Clear out mouth if necessary and observe for breathing
- if not breathing, begin artificial breathing (Figure 3-2): tilt head, pinch nostrils, make airtight seal, four quick full breaths. Remember mouth to mouth resuscitation must be commenced as soon as possible



Figura 3-1



Figura 3-2

- Check carotid pulse (Fig 3-3); if pulse is absent, begin artificial circulation (Fig. 3-4) depressing sternum (Fig. 3-5)



Figura 3-3



Figura 3-4



Figura 3-5

- In case of only one rescuer, 15 compressions alternated to two breaths.
- If there are two rescuers, the rhythm shall be of one brath each 5 compressions.
- Do not interrupt the rhythm of compressions when the second person is giving brath.
- Call for medical assistance as soon as possible.

3.1.2 If victim is responsive

- Keep them warm
- Keep them as quiet as possible
- Loosen their clothing (a reclining position is recommended)
- Call for medical help as soon as possible

3.2 Treatment of electrical Burns

3.2.1 Extensive burned and broken skin

- Cover area with clean sheet or cloth
- Do not break blisters, remove tissue, remove adhered particles of clothing, or apply any salve or ointment.
- Treat victim for shock as required.
- Arrange transportation to a hospital as quickly as possible.
- If arms or legs are affected keep them elevated

If medical help will not be available within an hour and the victim is conscious and not vomiting, give him a weak solution of salt and soda: 1 level teaspoonful of salt and 1/2 level teaspoonful of baking soda to each quart of water (neither hot or cold). Allow victim to sip slowly about 4 ounces (half a glass) over a period of 15 minutes. Discontinue fluid if vomiting occurs.

DO NOT give alcohol

3.2.2 Less severe burns

- Apply cool (not ice cold) compresses using the cleansed available cloth article.
- Do not break blisters, remove tissue, remove adhered particles of clothing, or apply salve or ointment.
- Apply clean dry dressing if necessary.
- Treat victim for shock as required.
- Arrange transportation to a hospital as quickly as possible
- If arms or legs are affected keep them elevated.

4. General Description

The TX10000U-KLC is a RF amplifier for frequency modulation sound broadcasting. It is a fully solid-state apparatus of modern design that uses MOSFET as active components in the FM amplifying modules, and for the cooling it uses of the coolant rather than forced air. This chapter briefly describes the machine's main features.

4.1 Composition

The TX10000U-KLC transmitter is made up of modules inserted in a 19" rack. The main apparatuses are:

- 2 RF amplifier modules at 5 kW nominal
- 1 Control unit called Common control unit (CCU)
- 1 Hybrid coupler -3dB
- 1 Dummy load
- 1 Cart pumps
- 1 External unit (radiator)

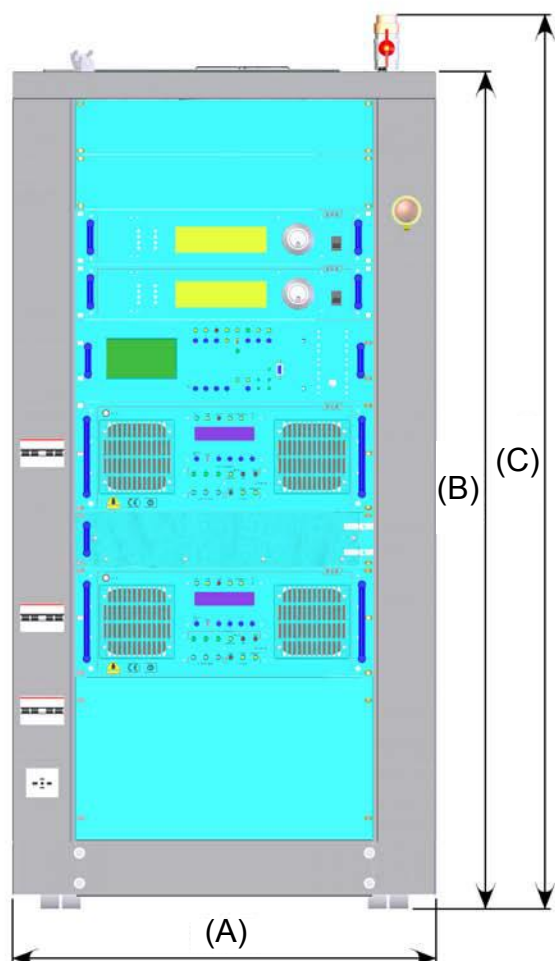
In configuration standard it comes supplied with Rack from 27 unit (you see design).

Other dimensions of the Rack always from 19" but with various heights (32 or 40 unit) are available upon request.

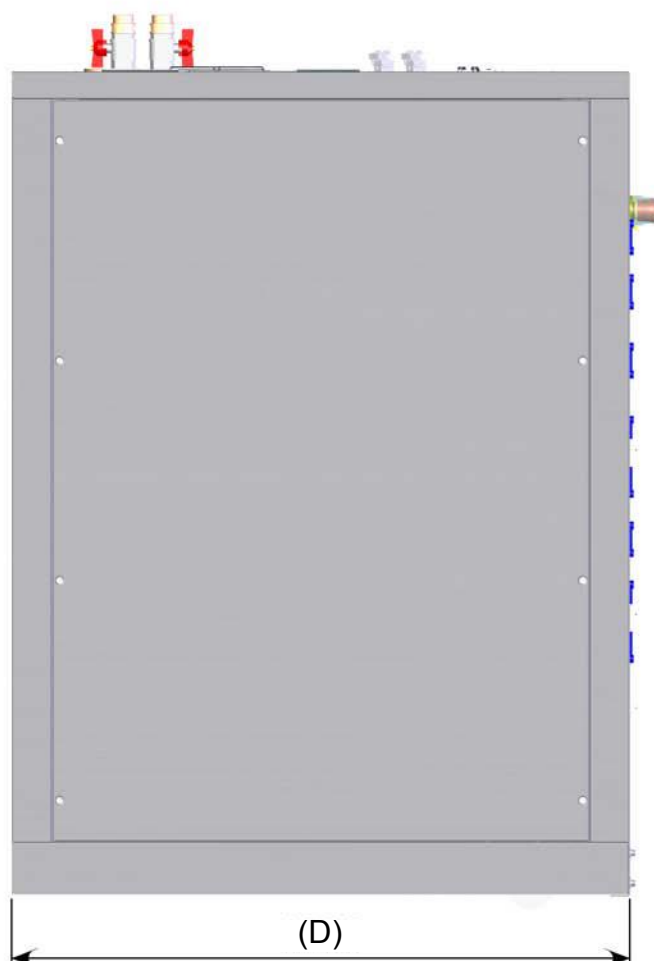
RACK SIZE

	A	B	C	D
27U	685	1355	1446	1000
32U	685	1577	1676	1000
40U	685	1932	2036	1000

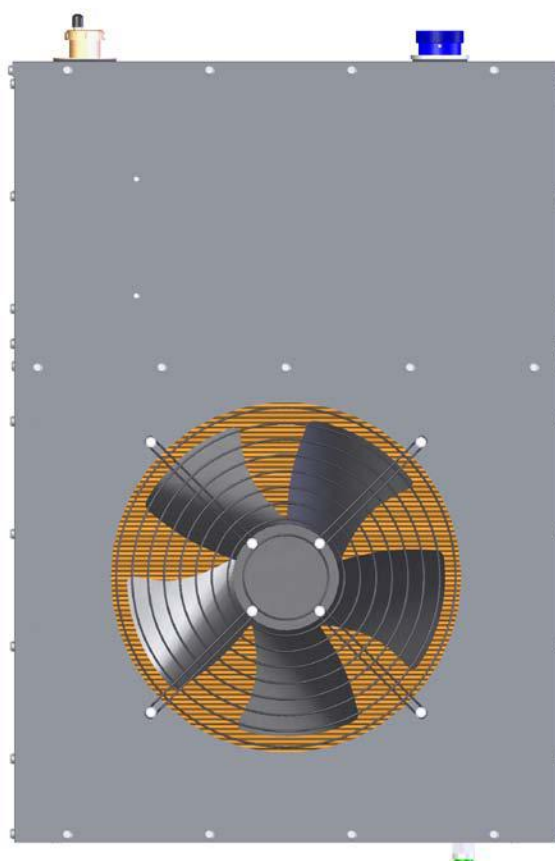
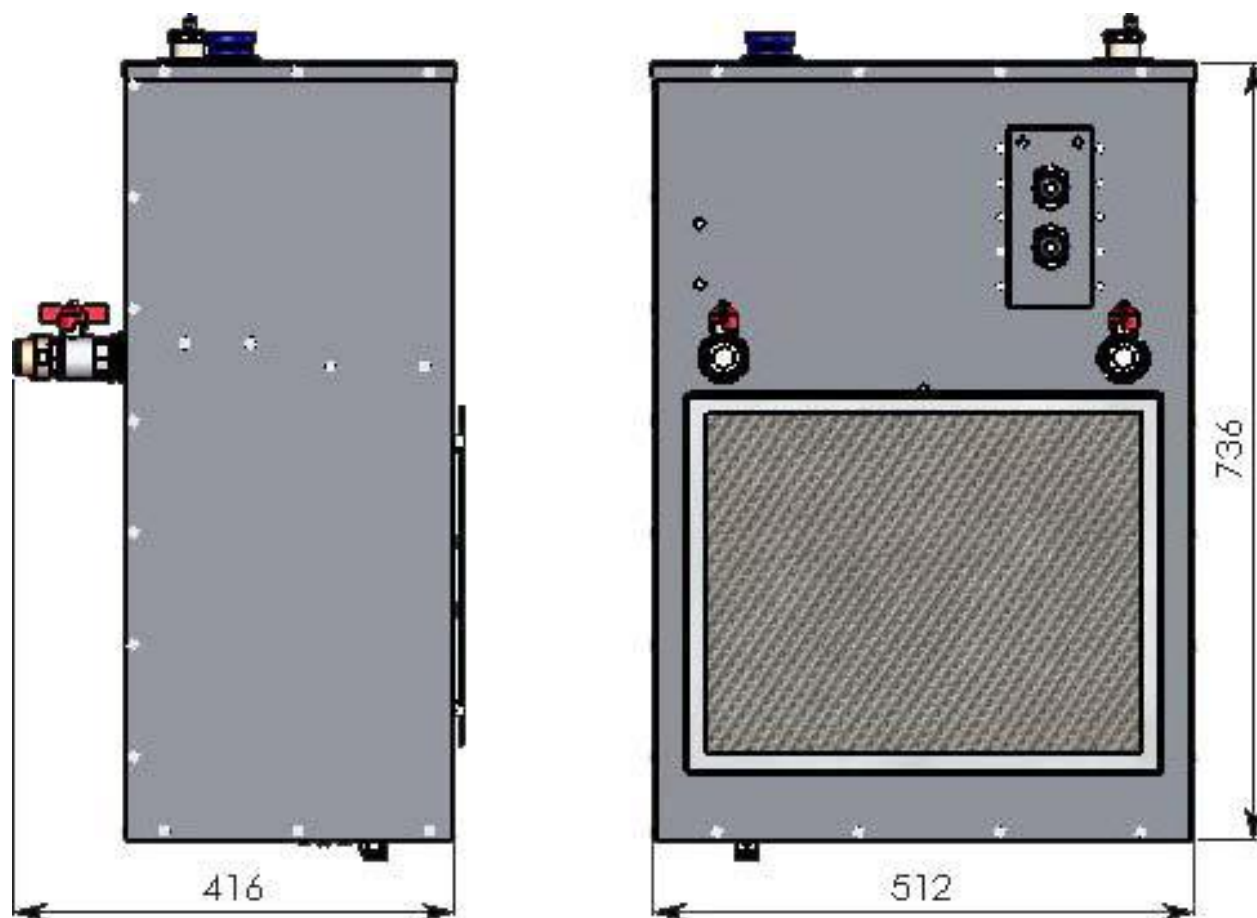
FRONTAL VIEW

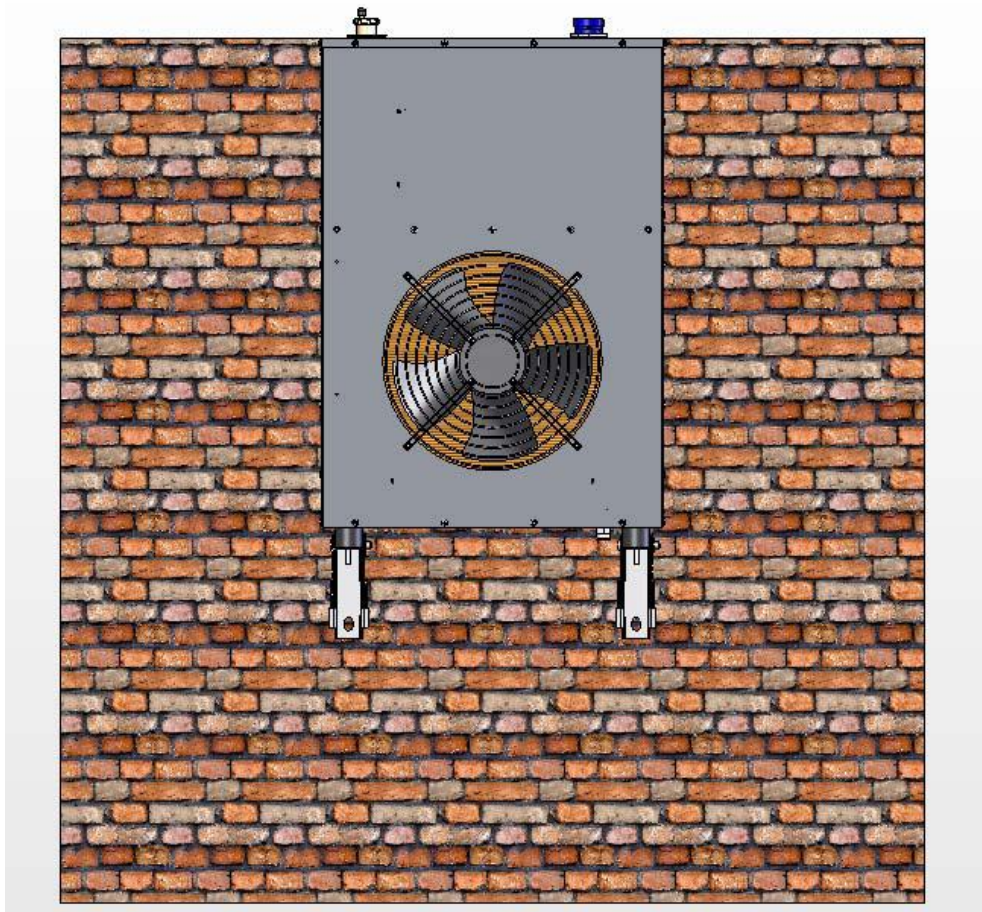
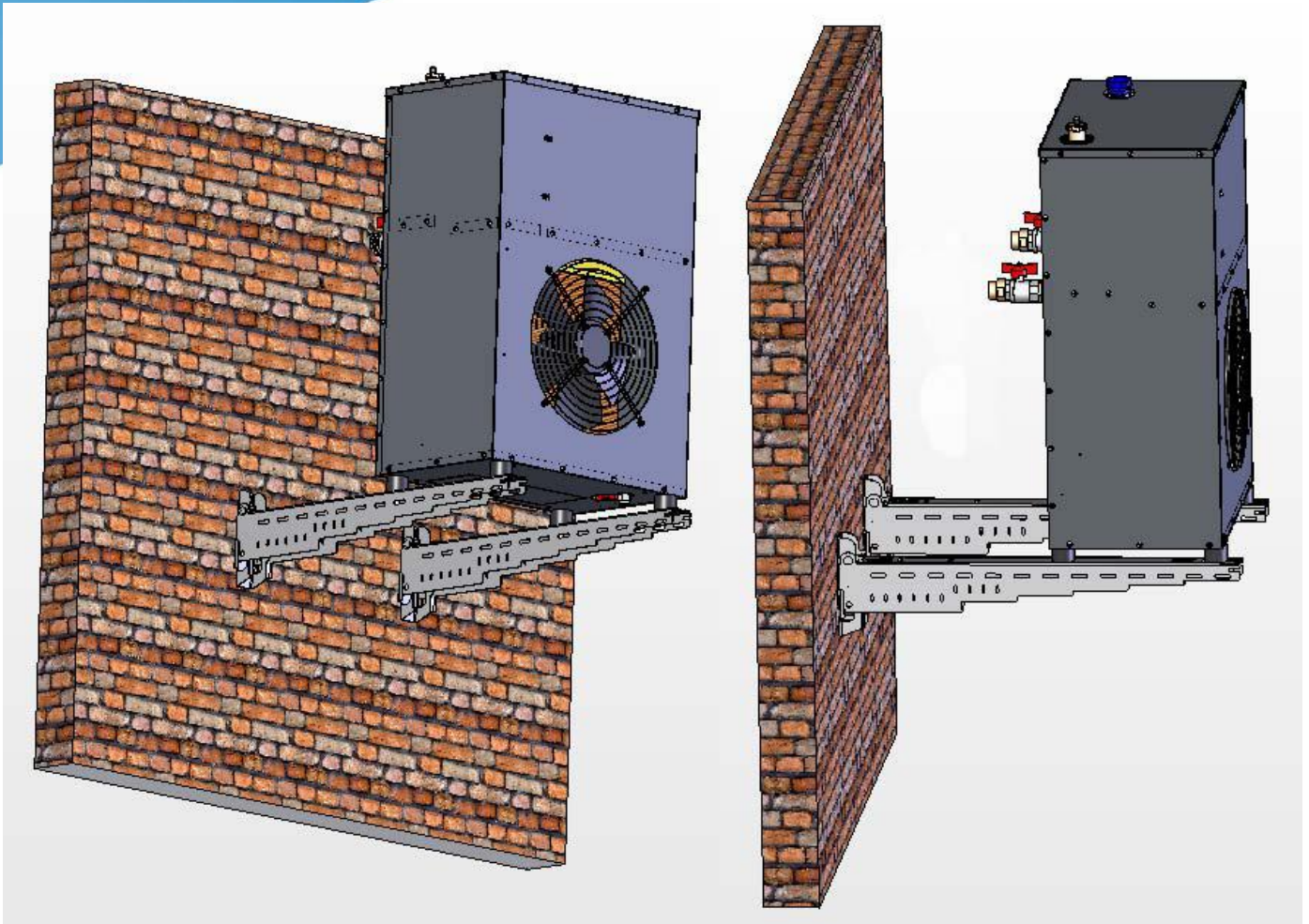


SIDE VIEW



EXTERNAL UNIT





4.2 Technical specifications

Frequency range	87.5 - 108.0 MHz
Nominal RF power	10000 - 10500 W
Power supply voltage	230/400V Threephase, 3F+N
Exciting power	Max. 30 W
Consumption	14,2 Kw
Power factor	0.98
Weight transmitter	380 Kg (rack standard from 27U)*
Weight external unit	42 Kg (empty), 50 Kg (with coolant)

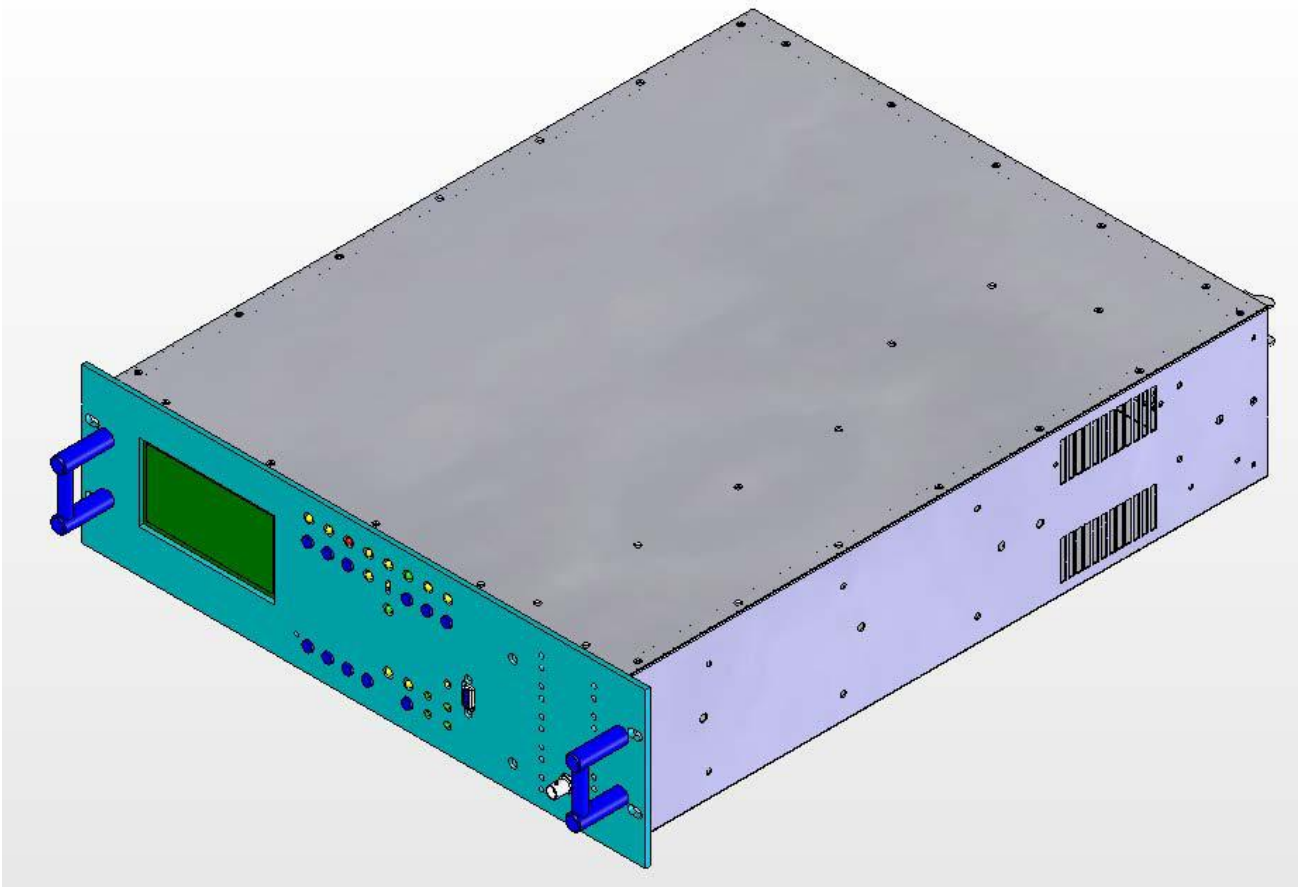
The transmitter it comes supplied with:

- 2 Flexible hydraulic tubes from 1" of length 6 meters for the connection of transmitter and external unit (except various demand for the customer).
- 2 Cables electrical workers of the same length of those hydraulic engineers for the supply and signals of alarm of the external unit.
- 30 liters of coolant in order to fill up the transmitter and the radiator (the apparatus comes supplied without coolant in the circuit).
- 2 brackets for the implantation to the wall of the external unit.

* The value can differ in the event comes demanded the rack from 32 or 40 units

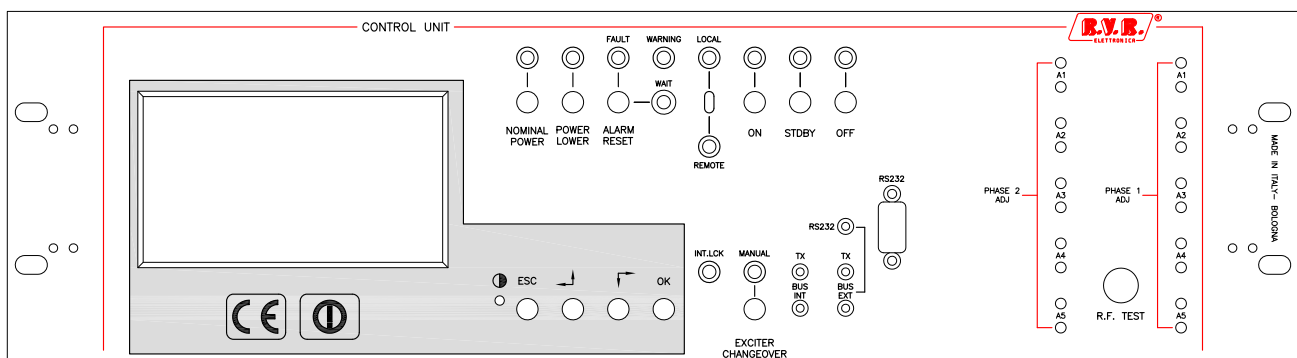
5. Common control unit (CCU)

The operator controls and checks the status of the TX10000U-KLC by means of the common control unit (CCU).

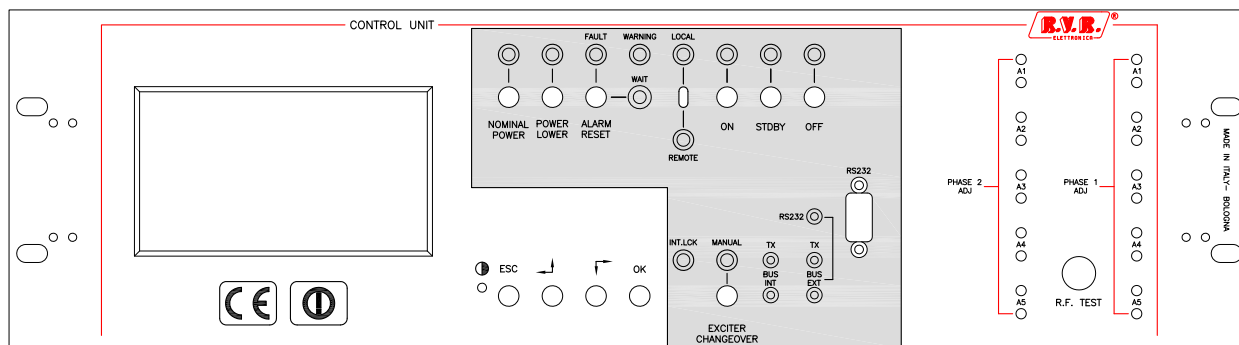


Three control groups are present on this unit:

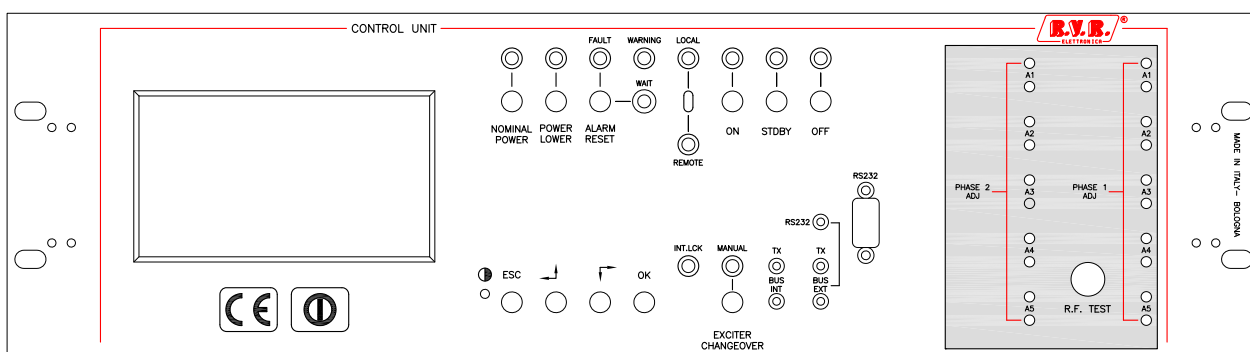
- LCD and scroll buttons



• Buttons, selector switches and LEDs



• Phase ADJ



5.1 LCD Display

The operator uses the control software of the transmitter by means of a series of menus that are displayed on the LCD. Four specific keys are provided for scrolling through the menus, performing the settings and giving the commands:

Pulsante	Descrizione
OK	Click this button to access a sub-menu, to enter the editing mode or to confirm a modified value.
ESC	Click this button to exit from a menu or to cancel the modification of a value.
	Click this button to scroll inside a menu (to the right or down) or to reduce the value of a parameter being modified.
	Click this button to scroll inside a menu (to the left or up) or to increase the value of a parameter being modified.
	Trimmer for the regulation of the contrast of display the LCD

When the operator is not using the various buttons to navigate, the LCD displays the preset screenful that shows the “Output Power” that it indicates the forward and reflected output power (Figure 5-1).

As indicated on the preset screenful, push the ESC button to access at the “Overall Status” menù (Figure 5-2).



Figure 5-1

5.1.1 Overall Status Menù

This menu includes only indications, therefore the user cannot insert any input in its different lines.(Figure 5-2).

Menù Line	Description
Timer (when enabled)	Indication of the start and stop times of the automatic power reduction feature - see “Settings” menù
Control unit	Status of the control unit (Off or On) and indication of the exciter actually connected to the amplifier (Exct.1 or Exct.2)
Cooling	Status of the pumps board
R.F. Combiner	Status of the RF combiner
R.F. Unit - N	Status of the Rf power amplifier number N (1° from the top)
Hours	Timer counting the hours of operation of the transmitter. For example, this indication is useful in order to define when a maintenance operation can be made

By pressing the Esc key as indicated on the last line, you can shift to the exchange screen from which you can have access to the “Select” menù (Figure 5-3).

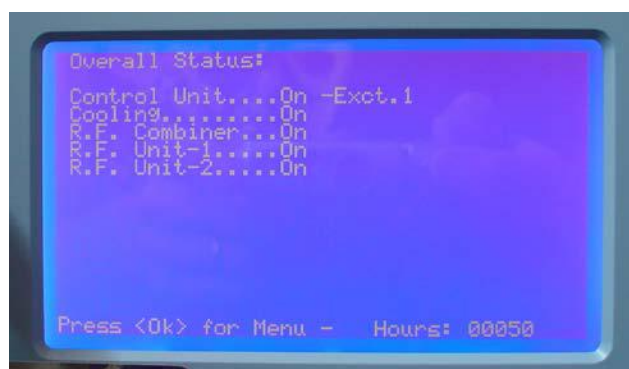


Figure 5-2

Note: All modules RF must be in REMOTE otherwise will come visualized “Time-out”. If from LOCAL it is passed REMOTE, will have to pass approximately 30/40 sec. before being able to visualize the relative state.

5.1.2 Select menù

This is the exchange menu from which you can select the different sub-menus that compose the software.(Figure 5-3).

In order to enter a sub-menu, select the correspondent line with the arrow buttons and press OK key.

Menu Line	Description
Control unit	General status of the TX10000U-KLC
Cooling	Status of the cooling
R.F. Combiner	Status of the RF combiner
R.F. Units	Status of the RF power amplifiers
Alarms	Summary of the occurred alarms
Service	Service menu for the switching on/off of the modules
Settings	Setting of the parameters (i.e. Power levels)
Exciters	Parameters of the exciters (i.e. output power, on air exciter)
Info	Information concerning the configuration of the TX10000U-KLC
Release	Information concerning the hardware and software versions of the modules composing the unit
Modem	Settings related to the optional telemetry system

To return to the predefined menu press key ESC many times.



Figura 5-3

5.1.3 Control Unit menù

Informative menu on the inputs and the outputs of the CCU of the machine.(Figure 5-4).

Menu Line	Description
Ext Intl	Input status "external interlock" (JP4/4 parallel interface)
Aux Intl	Input status "auxiliary interlock" (JP4/5)
Exc1 A.Audio	Input status "audio alarm exciter 1" (JP4/8)
Exc2 A.Audio	Input status "audio alarm exciter 2" (JP4/9)
L.P. Timer	Input status of the modality of automatic reduction of the power

Reserve 2	Input status "Reserve 2" (JP8/3)
Reserve 3	Input status "Reserve 3" (JP8/4)
Reserve 4	Input status "Reserve 4" (JP8/5)
Relay Exc	Exciters exchange relay status (Off = exciter 1 on air)
Exc-1 Mute	Exciter 1 interlock status (Off = RF power enabled)
Exc-2 Mute	Exciter 2 interlock status (Off = RF power enabled)
Audio Alarm	Output Audio Alarm status (JP47/1)
Exc's Mains	Exciters power supply status (On = power supply enabled)
Stand_by (In)	"Stand by" input line status
Stand_by (Out)	"Stand by" output line status from the control unit
Total Eff	Total efficiency of the machine



Figure 5-4

5.1.4 Menù Cooling

informative menu of cooling of the machine (Figure 5-5).

Menu Line	Description
Air	Temperature inside to the machine
Safety	Status of the safety arrest button. On indicates the functioning is enabled, Alr means the unit was arrested through the button
Mains	Status of the main voltage supply. Ok indicates the presence of all phases and that their sequence is corrected, Alr means that it must verify the presence of all phases, their sequence or the fuse of one or more phases, to protection of the threephase control *
C.B. Low	Indicates the state of 1° thermostat of the coolant
C.B. High	Indicates the state of 2° thermostat of the coolant (only in the transmitter TX15000U-KLC or higher)
C.B. Rack	Indicates the state of the thermostat of temperature inside to the machine
H2o Level Min	Indicates the level of the water in the tank of the external unit. Alr means that the water has reached the minimum level
H2o Level Low	Indicates the level of the water in the tank of the external unit. Alr means that the tank is empty and implies the immediate shutdown of the machine

Flux	Indicates if there is a corrected flow of the coolant
H2o Pressure	Indicates if the pressure of the coolant in the circuit is in the range of admitted values. Alr means that the pressure is excessive
Blower-1	It indicates the state of the fan of the external unit
Blower-2	It indicates the state of the 2° fan of the external unit (only in the transmitter TX15000U-KLC or higher)
Blower R	It indicates the state of the fan of aspiration positioned on the top of the machine
Pump-1	Indicates the state of the N°1 pump
Pump-2	Indicates the state of the N°2 pump

Change Pump <Ok>: pressing key OK it is possible manually switch the pump in function at the moment. The minimal time between an exchange and an other is of 120 sec.

The pump is exchanged automatically every time you switch off and subsequently re-switch the CCU. In case you never switch off the CCU, the pump is exchanged automatically every 10 days of normal operation.

The operation of pumps exchange is necessary for the regular functioning of the same.

In case of a fault on pump pressure, and then an interruption of the cooling flow, after 10 seconds is recorded by the machine which starts the operations of exchange pumps.

Note: the delay of 10 seconds is necessary to prevent the record of false positives as a momentary pressure drop due to air bubbles in the cooling system.

The machine will continue to exchange the pumps every two minutes, until the situation that caused the alarm is resolved.

After six minutes the equipment goes in a WAIT condition, and will be reported through the yellow LED on the front, in the meanwhile the machine will continue to exchange pumps every 2 minutes in order to resolve the alarm condition.

If the alarm PRESS intervene, the transmitter should be in conditions of FAULT (transmitter will not transmit more power) and this will be reported through the red LED on the front of the machine. Only the intervention of an operator or a reset by telemetry, can unlock the transmitter. If the problem remains, after 60 sec. return to FAULT.

Note: Please resolve as soon as possible the condition that brought the equipment to the alarm, this to restore the correct operation.

Note: Please resolve as soon as possible replacing the faulty pump.

* The threephase control and the relative fuses are found near the input terminals on the top of the machine.



Figure 5-5

5.1.5 Menù R.F. Combiner

This menu contains the information related to the RF part of the complete transmitter. (Figure 5-6).

Menu Line	Description
Fwd	Overall emitted RF power of the transmitter
Rfl	Reflected RF power of the antenna
Fwd (External)	Forward power of an external transmitter (when configured for this function)
C.B. Kdj 1-10	Temperature sensor of the dummy load. Alr indicates an excessive temperature
C.B. Kdj-M	Temperature sensor of the dummy load (big load) Alr indicates an excessive temperature (only in the transmitter TX20000U-KLC)
Ext.Alarm	External alarm for future protections
S.W.R.	Standing Wave Ratio, calculated by the Control Unit on the basis of the measured forward and reflected power
Main Exc	Output power of the exciter currently on air (the one connected to the input of the RF modules)
Stby Exc	Output power of the exciter currently on the internal dummy load
Blower.Kdj	Status of the output for kdj fan (dummy load)
Blower.C	Status of the output for extraction air fan
PWG1 Fwd.P	Status of the output "PWG1". See the Settings Menu
PWG2 Fwd.P	Status of the output "PWG2". See the Settings Menu
PWG3 Rfl.P	Status of the output "PWG3". See the Settings Menu
PWG4 Rfl.P	Status of the output "PWG4". See the Settings Menu

In the angle low to right of the display the symbol is present  this means that

an ulterior relative page to this menu is available (Figure 5-7), that it is possible to visualize using the key-arrow.

Menu Line	Description
Power: Kdj-1	Foward RF power on dummy load
Temp:	Temperature of the dummy load



Figure 5-6



Figure 5-7

5.1.6 R.F. Units menù

Information menu showing the status of the RF power amplifier modules. (Figure 5-8). It is composed of 2 screens, one for each module, that can be scrolled using the arrow buttons.

Menu Line	Description
Fwd	Measurement of the forward power of the amplifier module
Rfl	Measurement of the reflected power of the amplifier module
Input	Measurement of the driving power at the input of the amplifier module
V.P.A.	Measurement supply voltage of the module (generated from the switching power supply included in each module)
Bias.V	Polarization voltage of the mosfet
Temp	Module temperature
Driver.I	Measurement of the current absorbed by the preamplifier stage
Eff	Efficiency of the amplifier module
Temp (Input)	Temperature alarm
Fuse	Status of the fuses of the RF module
MOS-N (1-8)	Measurement of the current absorbed by the MOS N amplifier module (each RF module contains 8 MOS modules)
RF-Enb	Enabled of power distribution from part of the module



Figure 5-8

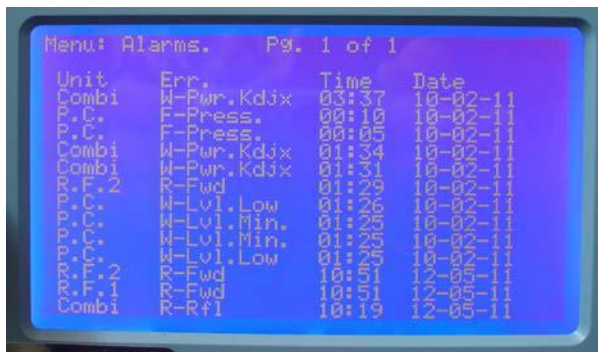
Nota: All modules RF must be in REMOTE otherwise will not see any parameters. If from LOCAL it is passed REMOTE, will have to pass approximately 30/40 sec. before being able to visualize the relative state.

5.1.7 Alarms menù

This screen describes all the registered events which are relevant to determine the probable causes of any dysfunction. The screen is composed of a variable number of pages (up to 10) in function of the number of events occurred (Figure 5-9). The last events in chronological order are shown in the first page and so on. To shift to the different pages, use the arrow buttons

It is not possible to cancel the alarms visualized in this menu if not by personal RVR

Menu Column	Description
Unit	Module of the system which generated the failure
Err	Type of failure and description. For more information see chapter 5.4
Time	Time (hrs and minutes) at which the failure occurred
Date	Date at which the failure occurred



Menu: Alarms. Pg. 1 of 1			
Unit	Err.	Time	Date
Combi	W-Pwr.Kdix	03:37	10-02-11
P.C.	F-Press.	00:10	10-02-11
P.C.	F-Press.	00:05	10-02-11
Combi	W-Pwr.Kdix	01:34	10-02-11
Combi	W-Pwr.Kdix	01:31	10-02-11
RR.F.2	R-Fwd	01:29	10-02-11
RR.F.2	W-Lvl.Low	01:26	10-02-11
RR.F.2	W-Lvl.Min.	01:25	10-02-11
RR.F.2	W-Lvl.Min.	01:25	10-02-11
RR.F.2	W-Lvl.Low	01:25	10-02-11
RR.F.1	R-Fwd	10:05	12-05-11
Combi	R-Rfl	10:19	12-05-11

Figure 5-9

5.1.8 Service menù

This menu is normally used during the maintenance operations. When this screen is visualized, the Control Unit checks the status of the modules of the unit more frequently in order to have a visualization of the different parameters as fast as possible. When this menu is entered, all the secondary functions are interrupted, therefore a possible alarm may not be visualized and registered immediately; when exiting this menu all the alarms which were temporarily put in “stand-by” are registered. If the user sets some modules in OFF modality, these will be automatically reactivated when exiting the menu. This menu is deactivated after 60 minutes if no key is selected. (Figure 5-10).

Menu Line	Description
Fwd	Forward power globally emitted by the amplifier
Unb	Unbalancing power dissipated in the dummy load connected to the combiner
RF Unit1 - On	Fields used to switch ON and OFF the amplifier modules.
Fwd	Forward power generated by the RF module
Rfl	Reflect power from the RF module



Figure 5-10

5.1.9 Settings menù

This menu is used for the settings of the unit. It is therefore the menu which is used more often apart from the possible maintenance operations.(Figure 5-11).

Menu Line	Description
Nominal Pwr	Setting of the level of nominal power, expressed as a percentage of the maximum power level. This is the level that the TX10000U-KLC must reach when the Power Nominal button is pressed, except in case of dysfunction
Low Power	Setting of the reduced power level, expressed as a percentage of the maximum power level. This is the level that the TX10000U-KLC must reach when the Power Lower button is pressed, except in case of dysfunction.
PWG1	Level (Limit) at which the “Power Good” PWG1 is launched. This level is expressed as a percentage of the full-scale to which PWG1 is connected, indicated in the column Assign
PWG2	See PWG1
PWG3	See PWG1
PWG4	See PWG1
Exc' wait time	Delay before assuming the on air exciter is faulty
Talk Address	Address of the unit in the RS485 network
Time	Visualization and setting of the internal clock of the unit
Date	Visualization and setting of the internal calendar of the unit
L.P. Timer	Setting of the automatic power reduction feature: this can be “Auto” (enabled) or “Manual” (disabled). The feature consists in reducing the power to the low power level and then returning to the nominal power at fixed times. The start and stop times are set in this menu selecting “Auto”.
Write Config	Button for the registration of the configurations in each module of the unit.



Figure 5-11

5.1.10 Exciters menù

This menu is used to configure the settings of the exciters (Figure 5-12).

Menu Line	Description
Main Exc	Output power of the exciter currently on air
Stdby Exc	Output power of the exciter currently on the internal dummy load
Main Exciter	Visualization of the “on air” exciter. When positioning the cursor on this line, with the arrow buttons and by pressing Enter, it is possible to operate the switching between the on air exciter and the exciter on dummy load.
Exct.1	Status of the exciter 1. By positioning the cursor on this line with the arrow buttons and by pressing Enter it is possible to switch on and off the exciter.
Exct.2	Same as Exct.1 for the second exciter



Figure 5-12



Nota: the exchange of the eccitatori and the relative cursor are available only if the logic of exchange is set to manual and the yellow LED is lit.

5.1.11 Info menù

This screen informs the user about the configuration of the transmitter. (Figure 5-13).

Menu Line	Description
S.N.	Serial number of the transmitter
Talk Addr.	Address of the RS485 port of the transmitter, it must be obligatorily 3
Baud Rate	Baud rate of the serial port
Software V.	Software version installed in the CCU
Exciter	Number of the exciters in the transmitter: this can be "Single" or "Dual"
Cfg. N+1	Configuration of the transmitter as a N+1 system
External	Checking of the external Fwd, Rfl, Unbal values (Enabled or Disabled)
Reset Safety	Reboot the machine after the intervention of the SAFETY alarm. It must always be "Auto"



Figure 5-13

5.1.12 Release menù

This menu shows the address, the kind of configuration, the software version and the hardware version of all the microprocessor boards of the transmitter. (Figure 5-14).

Menu Line	Description
Control unit	Information on the CCU
Cooling	Information on the pumps board
RF Combiner	Information of the RF combiner
RF Unit 1	Information on module 1
RF Unit 2	Information on module 2



Figure 5-14

5.1.13 Modem menù

This screen informs the user about the configuration of the optional telemetry GSM (Figure 5-14). The parameters on this screen can be displayed only if the selector switch on the CCU is located at a REMOTE location, if it is placed in the LOCAL screen appears as in Figure 5-15

Menu Line	Description
I.D.	Identification of the address of the transmitter, usually 1. In the case of multiple transmitters in N +1 configuration will be given numbers in ascending order, one for each transmitter
Name	Mnemonic name of the station, like place or frequency
S.C.N	Service center number of your mobile operator
Info	Name of service provider
Dial	Normally, ATDT
Phone	Phone numbers that will receive the alert messages
Level	GSM signal level
Status	State Modem
Retry	Number of messages to send. We suggest to set this value to at least 2, in case of problems with the SMS Service Centre.
Type	Modem type, usually GSM



Figure 5-14



Figure 5-15

5.2 Buttons, selector switches and LEDs

The typical machine-control operations are performed using the buttons of the control unit's panel. Specific LEDs correspond to each button and selector switch for indicating the machine's status.(Figure 5-16).



Figure 5-16

The functions performed by the controls are as follows:

Funzione	Descrizione
OFF	Button for turning off the machine. A LED signals that the machine is OFF. In this status, the exciters and the pumps,are off.
STDBY	Button for setting the machine in standby. In this status the transmitter does not emit any power, but is ready to start the transmission: RF modules will be placed in "On" and "Wait: Inhibit" (if the sleep-mode, still able to automatically switch to "Off"), in the case of automatic mode exciters are lit but blocked by interlock. The stand-by is used to test the exciters, in fact in manual modality the operator could arrange them in base to the own requirements; coming from an "On" in manual modality, the system does not touch the interlock. Stand-by status is signalled from a LED. In manual and in stand-by the inhibit of the device doesn't intervene on the interlock of the exciters. This could necessary when the apparatus is in configuration n+1 for verify if the exciters are operational.
ON	Button for turning on the transmitter. The RF modules are placed in a position of On, the pump turns on and the command must be set EXCITER CHANGEOVER automatic.The RF power supply is activated. If the command is set to MANUAL CHANGEOVER EXCITER (led on), exciters will block interlock and have to go through in "exciters menu" of CCU to enable them manually.The exciters should deliver a power of at least 15 W to start the transmitter.

	The power delivered by the RF modules will remain stuck at about 800-900 W for about 10 sec., After which it will begin the regular ramp up and reach the set power.
LOC/REM	Selector switch for setting the transmitter in remote or local mode. In local mode the buttons and the controls via the menus are active. In remote mode the buttons and the controls via the menus are inhibited and the commands may be given only remotely via the parallel interface or via the remote control software.
ALARM RESET	Button to reset the alarm type FAULT or WARNING.
POWER LOWER	Click this button to set the transmitter for supplying the nominal power level. A specific LED signals this setting. The value that corresponds to the nominal level is set by the operator using the menu settings (see 5.1.9)
NOMINAL POWER	Click this button to set the transmitter for supplying the reduced power level. A specific LED signals this setting. The value that corresponds to the reduced level is set by the operator using the menus. (see 5.1.9)
EXCITER CHANGEOVER	Use this button to set the changeover system in manual or automatic mode. The signaling LED turns on when the manual mode is selected. On performing a changeover, the exciter connected to the amplifier is deviated toward the internal dummy load and vice-versa. The operator must use the exciter menu to perform the changeover in manual mode.
LED WARNING	This LED indicates an attention condition (something is not working properly, but the amplifier is still running)
LED FAULT	This LED indicates a fault (the amplifier is blocked, and required the intervention of an operator for the restoration)
LED WAIT	This LED indicates the status of waiting (the amplifier is temporarily disabled, but will be reactivated automatically when the blockage is removed, or after a set period of time depending on the type of protection)
LED INT.LCK	This LED indicates an external inhibition. This check is run on the parallel interface (JP4/4)
LED TX-BUS INT	These LEDs indicate the activity of the serial bus 485 through which the CCU acquires the status every second of the modules
LED RS-232 TX-BUS EXT	These LEDs indicate the communication between the CCU and a PC connected to the RS-232

5.3 Phase ADJ

It's a resonant circuit "LC" with capacitors on the back of the front panel (Figure 5-17). The purpose of this circuit is to reduce the power on the dummy load connected to the dialer, varying the phase of input signal to each RF module 5 Kw.

The calibration of this circuit is done during testing, but the working conditions by connecting the transmitter to the antenna may require a revision, in which case proceed as described:

The section that interests us is the PHASE ADJ 1 A1 and regulations with regard to the first RF module and A2 for the second

- 1) Insert the screwdriver into the 1 st hole, and rotate 180 degrees clockwise (Pull out the screwdriver) and check the value of the power "Unbalanced" in the service menu (note: the contact of the screwdriver with the circuit "LC" to bring information out of the norm, so the readings must be examined in private screwdriver excerpt)
- 2) If you obtained a decrease in the value of unbalanced power, go to the second capacitor at the 2 nd hole and also rotate 180 degrees clockwise.
- 3) If the steps set out in paragraph 1 and 2 are not yet sufficient to pass the capacitors of the second RF module (3 rd and 4 th hole), but this time the rotations of the capacitors will be in the opposite direction to those above or counterclockwise.
- 4) If the operation described in paragraph 1 would result in increased rather than decreased power unbalanced to rotate the cap counter-clockwise 360 degrees (180 ° to return it to its starting position to + 180 ° to correct the phase and proceed with the next points.

Caution: In this case the operation described in step 3 will include a rotation of the capacitors in a clockwise direction (as the second pair of capacitors must move in the opposite direction to the first).

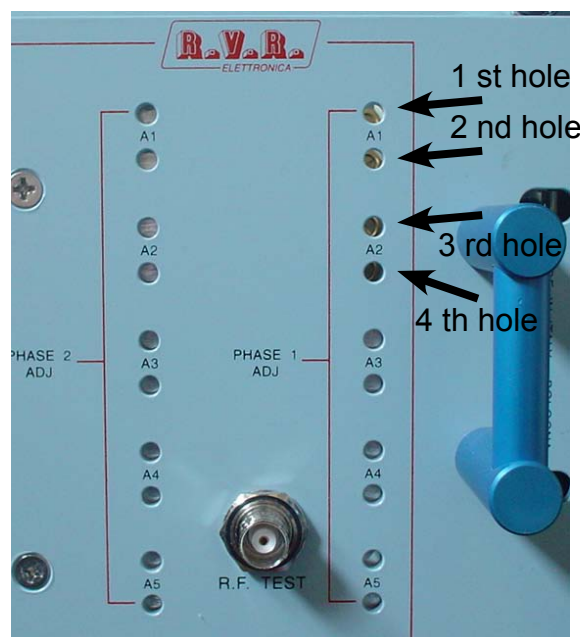


Figure 5-17

5.4 Alarms

The menu Alarms of the control unit reports all the events connected to possible malfunctioning of the equipment or due to external causes.

Each registration contains the reference to the concerned module, the kind of event and its date and hour.

The module that detected the event is indicated by one of the following acronyms:

- C.U. (Control Unit)
- P.C. (Pump Control)
- R.F. 1 (RF module number 1)
- R.F. 2 (RF module number 2)
- Combi (Combiner/Splitter)

The type of event allows to identify the origin and the consequence of the fault. The first letter of the type of event can be one of the following:

- W "Wait" event that causes the temporary block of the piece of equipment that will be removed as soon as the problem is solved.
- R "Retry", event that causes a temporary block of the piece of equipment, that will effect a restart attempt after a fixed lapse of time. (Max. 8 attempts)
- F "Fault", event that causes the block of the equipment and requires the intervention of an operator for the restart.
- E "Error", event that doesn't cause the interruption of the supply of power, but can reduce the functions of the equipment (e.g cannot be done the changeover function of the exciters)

The possible event types are listed in the table below.

Code	Meaning
Control Unit	
-E.Intl	external interlock
-A.Intl	ausiliary interlock
-Audio-1	audio alarm of exciter 1 is active
-Audio-2	audio alarm of exciter 2 is active
-L.P.Tmr.	Low power timer active
-Ris-2	reserve 2 input is active
-Ris-3	reserve 3 input is active
-Ris-4	reserve 4 input is active
-Mute Flt	"Mute fault": the mute commands (i.e. the interlock commands for the exciters) are not working, they are not connected or the connection is wrong
-Xchg Exc	a changeover of the exciters has been performed
-Cfg. N+1	The machine is in Fault status because three changeover attempts havebeen performed (N+1 configuration)
Pump Control	
-Air Tmp	air temperature alarm
-Lvl.Min.	minimum coolant level alarm
-Lvl.Low	Low coolant level alarm
-Flux	flow alarm not present
-O.Tmp.L.	thermostat radiator fan 1 ^ level (not displayed)
-O.Tmp.H.	thermostat radiator fan 2 ^ level (not displayed)

-Mains	the phase sequence is not correct
-Press.	coolant pressure alarm circuit too high
Combiner	
-Kdj-1/10	thermostat intervened resistance unbalance
-Kdj Maxi	thermostat external resistors imbalance intervened (TX20000U-KLC)
-Fwd	forward power above its limit
-Rfl	reflected power above its limit
-O.dvr In	overdrive (main exciter)
-O.dvr Ld	Too much power dissipated on the internal dummy load (stand by exciter)
-S.W.R.	SWR above its limit
-Ext.Alr.	external alarm for future use
-Pwr.Kdjx	high power kdj
-Pwr.Kdjm	high power kdj max (load present in the TX20000U-KLC)
R.F. Unit	
-Fwd	forward power alarm module
-Rfl	reflected power alarm module
-In	alarm input power module
-Tmp.	high temperature alarm
-Drv. I	driver current above its limit
-Mos 1 I	high current alarm mos1
-Mos 2 I	high current alarm mos2
-Mos 3 I	high current alarm mos3
-Mos 4 I	high current alarm mos4
-Mos 5 I	high current alarm mos5
-Mos 6 I	high current alarm mos6
-Mos 7 I	high current alarm mos7
-Mos 8 I	high current alarm mos8
-Eff.	efficiency too low
-Fuse	module's fuse broken
-O.Tmp.	overheating on the module's heatsink
General	
-Derating	equipment into derating
-Replay err.	wrong answer by the module interrogated
-Safety	emergency button pressed
Time-out	the module does not respond
Default Talk Address: 31	default address for configuration
Device not configured	control unit is not configured
Waiting for Retry: xxxx sec.	to reset the pause time, press ok
Start Up in Progress	starting up
Please Wait	please wait.....

5.5 Timing timer CCU

CPU control pumps

Evaluation time pump 120 sec.

It 'the time within which to reach the ok from the box pumps (pressure) for stop the exchange sequence.

Time out signal box pressure pumps. 10 sec.

It 'time in a row that the signal of the box must remain pumps failed to activate a request to exchange pumps.

Programmed exchange pumps Time 10 days

It 'time for a smooth and uninterrupted takes place after which a programmed exchange pumps.

Time out after ventilation 5 min.

It 'time for the pumps and fans continue to work after an off the machine.

Auto self pump 24 hrs.

Is the time that the pump is turned on by default, to equipment into off.

Note: the pumps are alternated every 24 hours.

CPU RF combiner

Timer output unbalanced 1 min.

Is the time it is expected before sending a request for power reduction (derating) after passing to the lower level of the unbalanced power.

Timer output high limit unbalanced. 10 sec.

Is the time it takes to wait before the system goes into protection for excess power unbalanced (high limit exceeded).

CCU

Time out display 15 min.

Is the time after which the display returns to the default menu.

Time out display service 60 min.

Is the time from the service menu, the display returns to the default menu.

Time out on power-up evaluation exciters 120 sec.

Is the time that from the start in power off the exciter is programmed to become active.

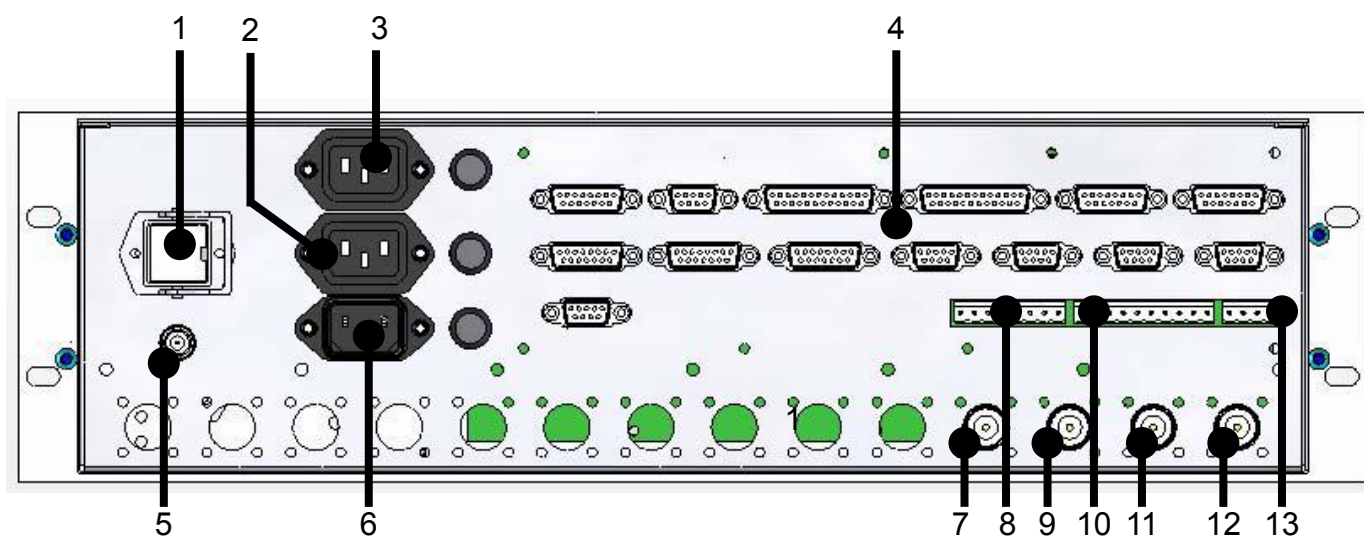
Time-out evaluation exciters 25 sec.

It is the maximum time of exchange within which the programmed exciter must become active.

Derating time 30 min.

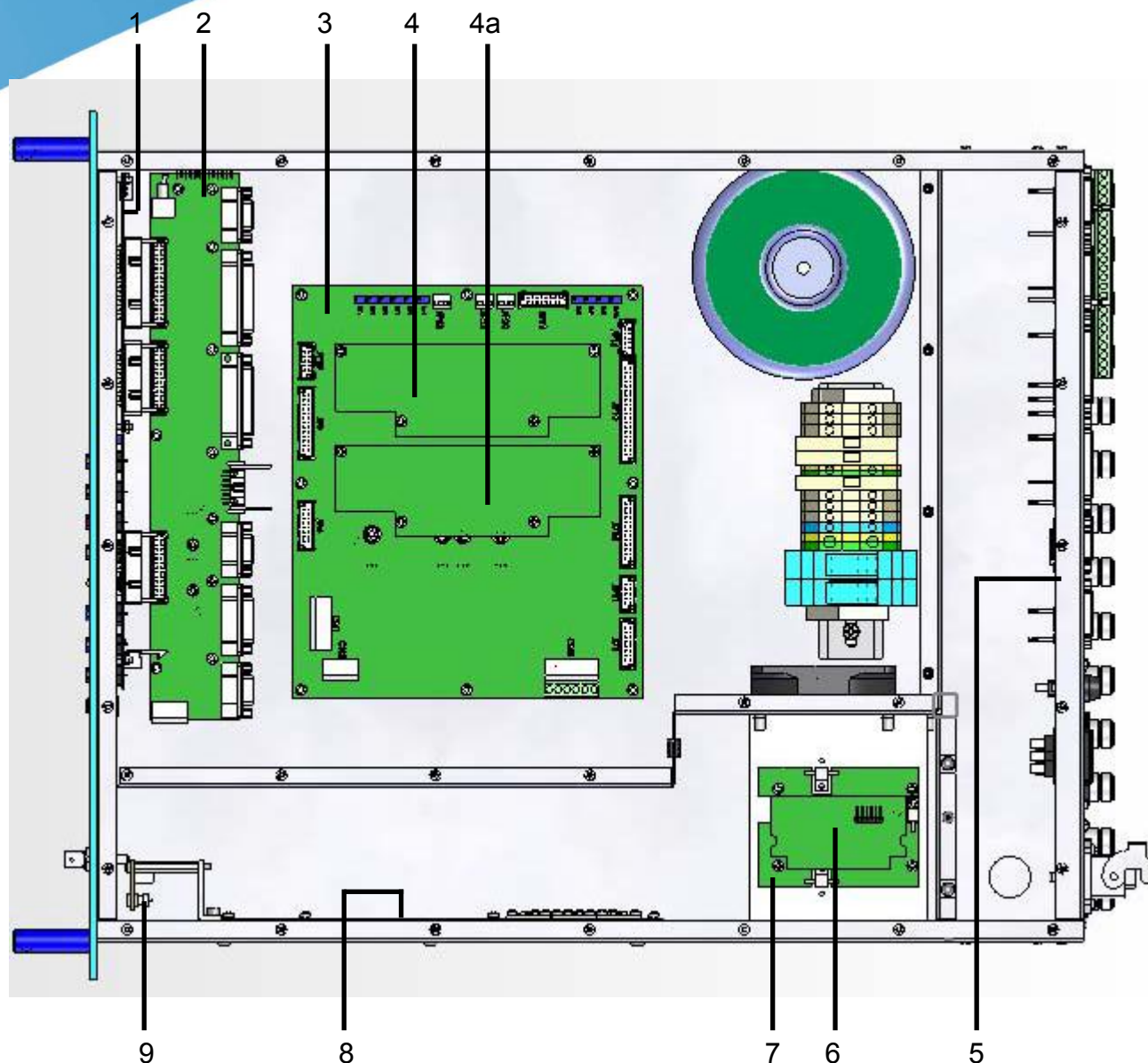
Is the time that the unit remains in power derating after passing to the lower level of the unbalanced power.

5.6 Rear panel



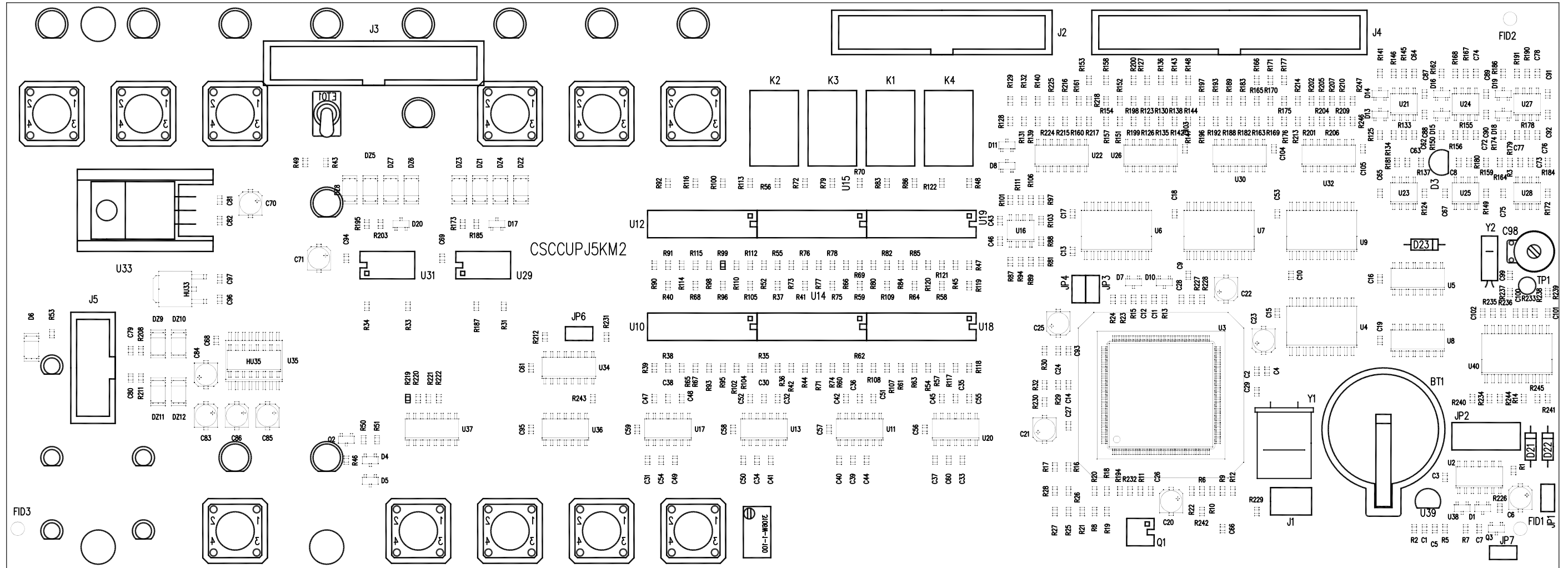
1	IIme connector for power relay board (24 Vac)
2	VDE power PTX-2 and the fuse (10A)
3	VDE power PTX-1 and the fuse (10A)
4	Connectors various control and acquisition (see cap. 6.4)
5	BNC for RF testing
6	VDE power CCU and the fuse (4A)
7	RF output module 2
8	Connector inhibition functions (see cap. 6.3.1)
9	RF output module 1
10	Sensor input signals
11	Input RF exciter 2
12	Input RF exciter 1
13	Input signals liquid levels

6. Wiring diagrams CCU

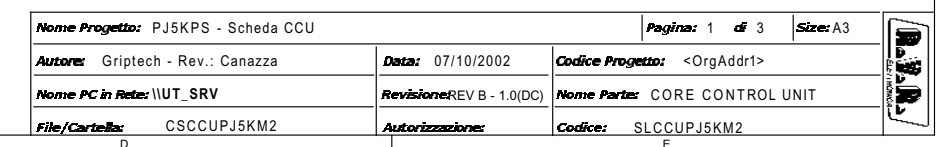


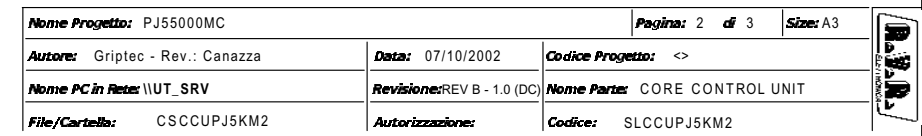
- 1 CCU board (SLCCUPJ5KM2)
- 2 CCU motherboard (SLCCU1PJ5KM2)
- 3 Main interface card (SL127IN1002)
- 4 CPU board - management readings/alarms menu R.F. Combiner (CPUPJ2KMC)
- 4a CPU board - management readings/alarms menu Cooling (CPUPJ2KMC)
- 5 External Con. interface card (SL127IN2001)
- 6 Interface exciter RF Switch (SL127IN3001)
- 7 Exciter RF Switch (SL127SW1002)
- 8 Splitter board (SLSPLTHC3-01)
- 9 Phase shifter (SLPHSHHC3-02)

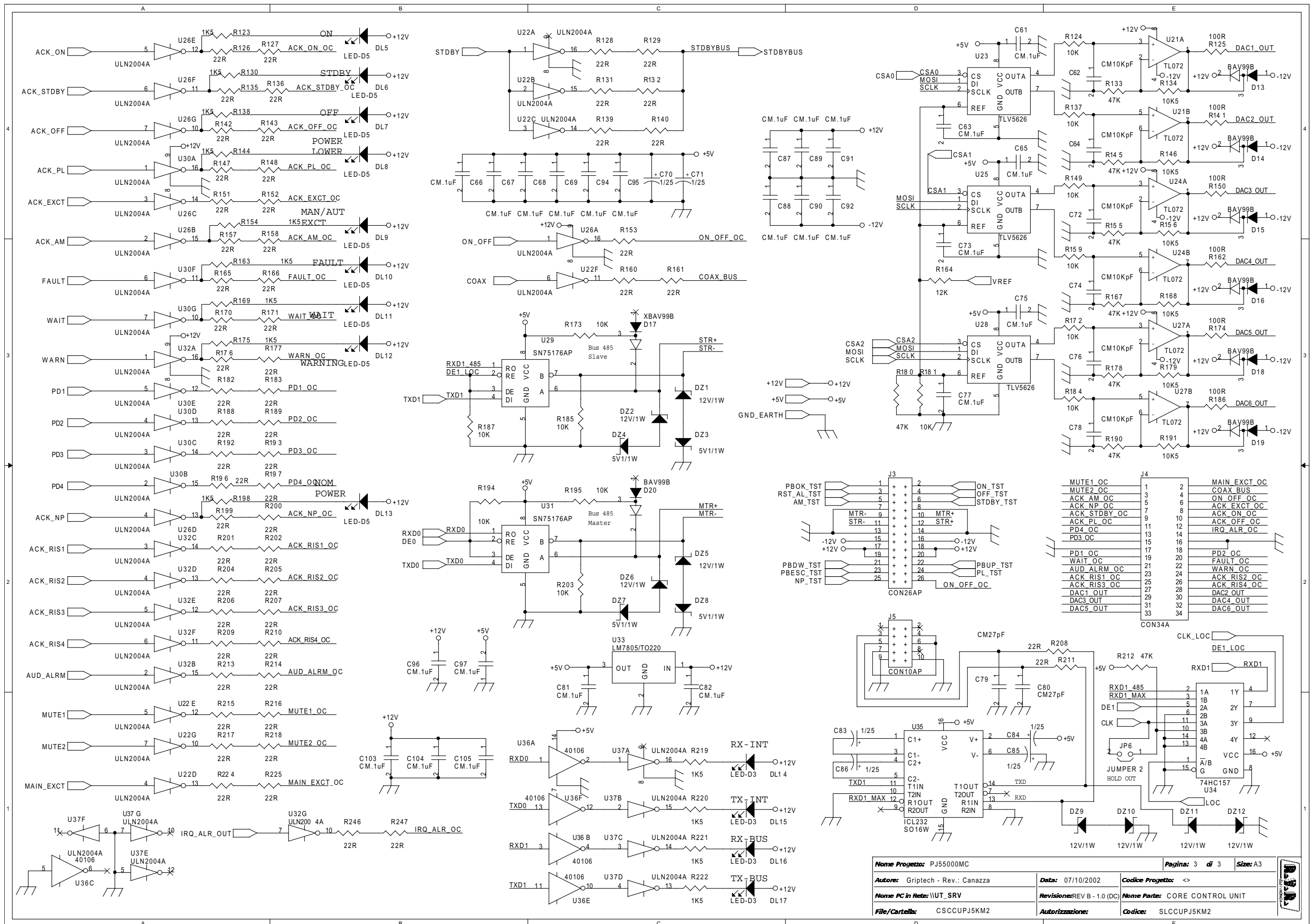
6.1 CCU board (SLCCUPJ5KM2)



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Nome PC in Rete: \\UT_SRV		Revisione: 1.0 (DC)	Nome Parte: Scheda CCU	
File/Cartella: PJ5_CCU_MNT.DWG		Autorizzazione:	Codice: SLCCUPJ5KM2	
Scala: <>	Materiale: <>		Trattamento: <>	Profilo: <>







CORE CONTROL UNIT Revised: Tuesday, March 18, 2014
SLCCUPJ5KM2 Revision: REV B - 1.0(DC)

PJ5KPS - Scheda CCU

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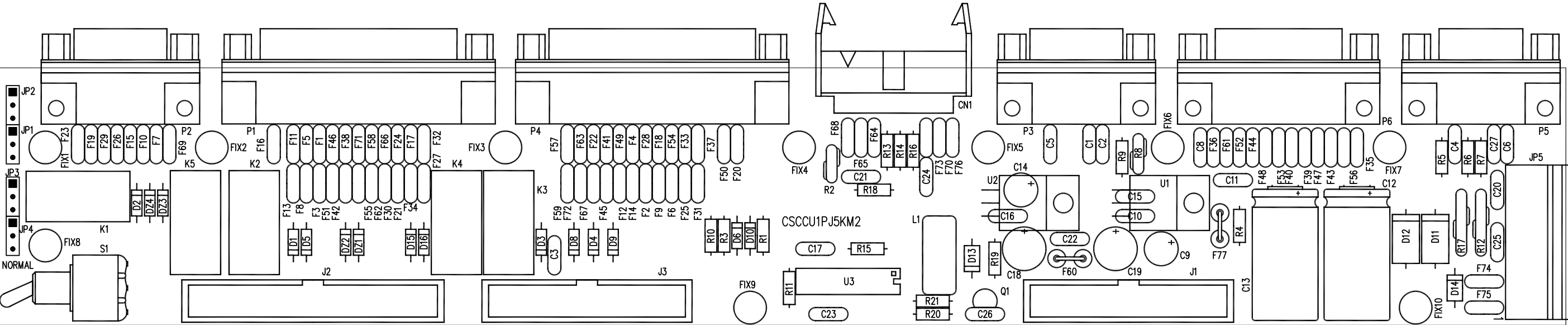
CSCCUPJ5KM2

Griptech - Rev.: Canazza
07/10/2002

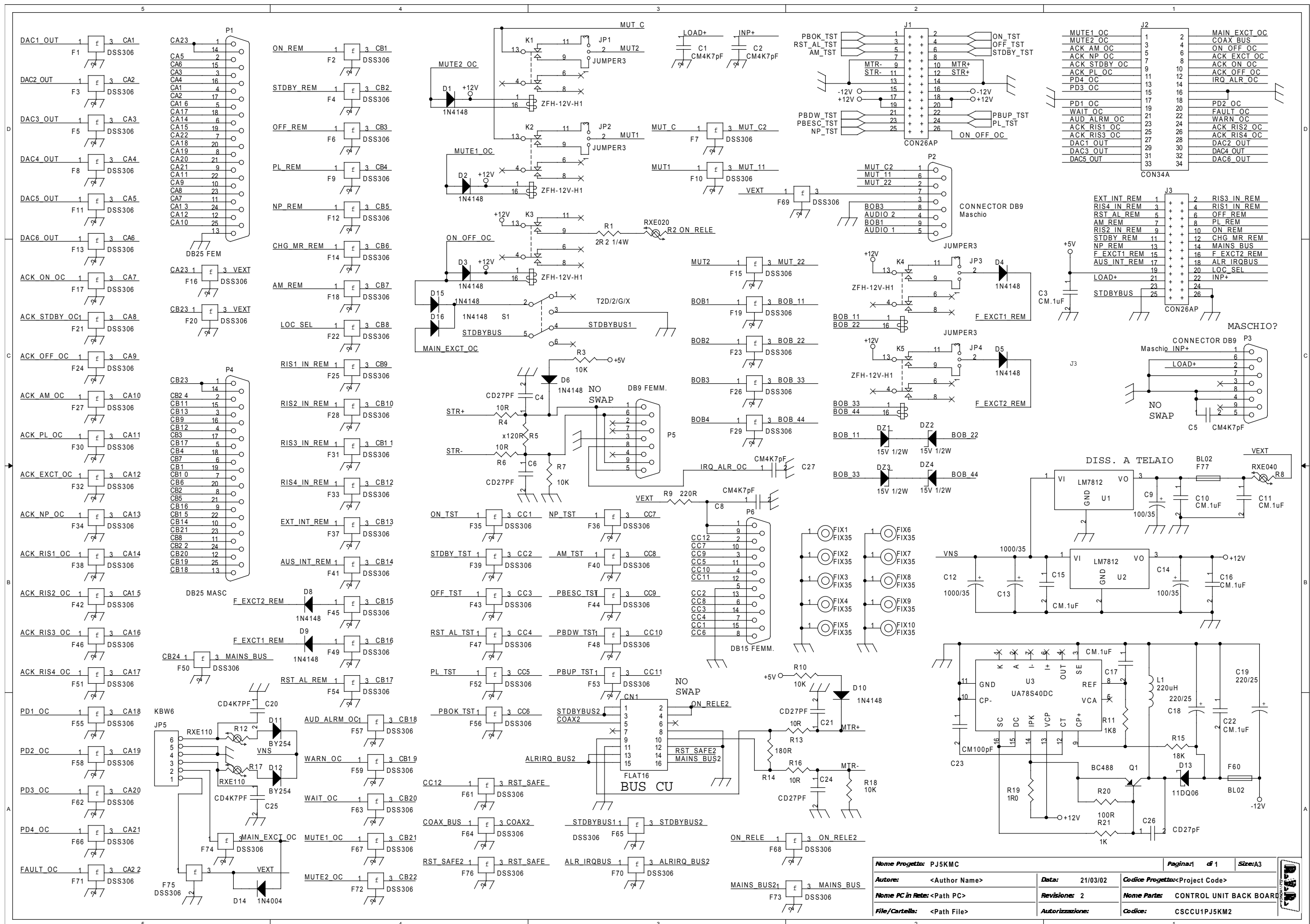
Bill Of Materi Page1

Item	Quantity	Reference	Part																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															</
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6.2 CCU motherboard (SLCCU1PJ5KM2)



Nome Progetto: PJ5KPS - Scheda madre CCU		Pagina: 1 di 1	Size: A3
Autore: Griptech - Rev.: Canazza	Data: 07/10/2002	Codice Progetto: <>	
Nome PC in Rete: \\UT_SRV	Revisione: 1.0 (DC)	Nome Parte: Scheda madre CCU	
File/Cartella: CCU1PJ5K5_1_LY.DWG	Autorizzazione:	Codice: SLCCU1PJ5KM2	
Scala: <>	Materiale: <>	Trattamento: <>	Profilo: <>

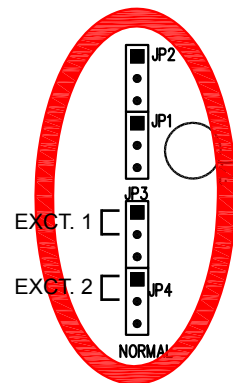
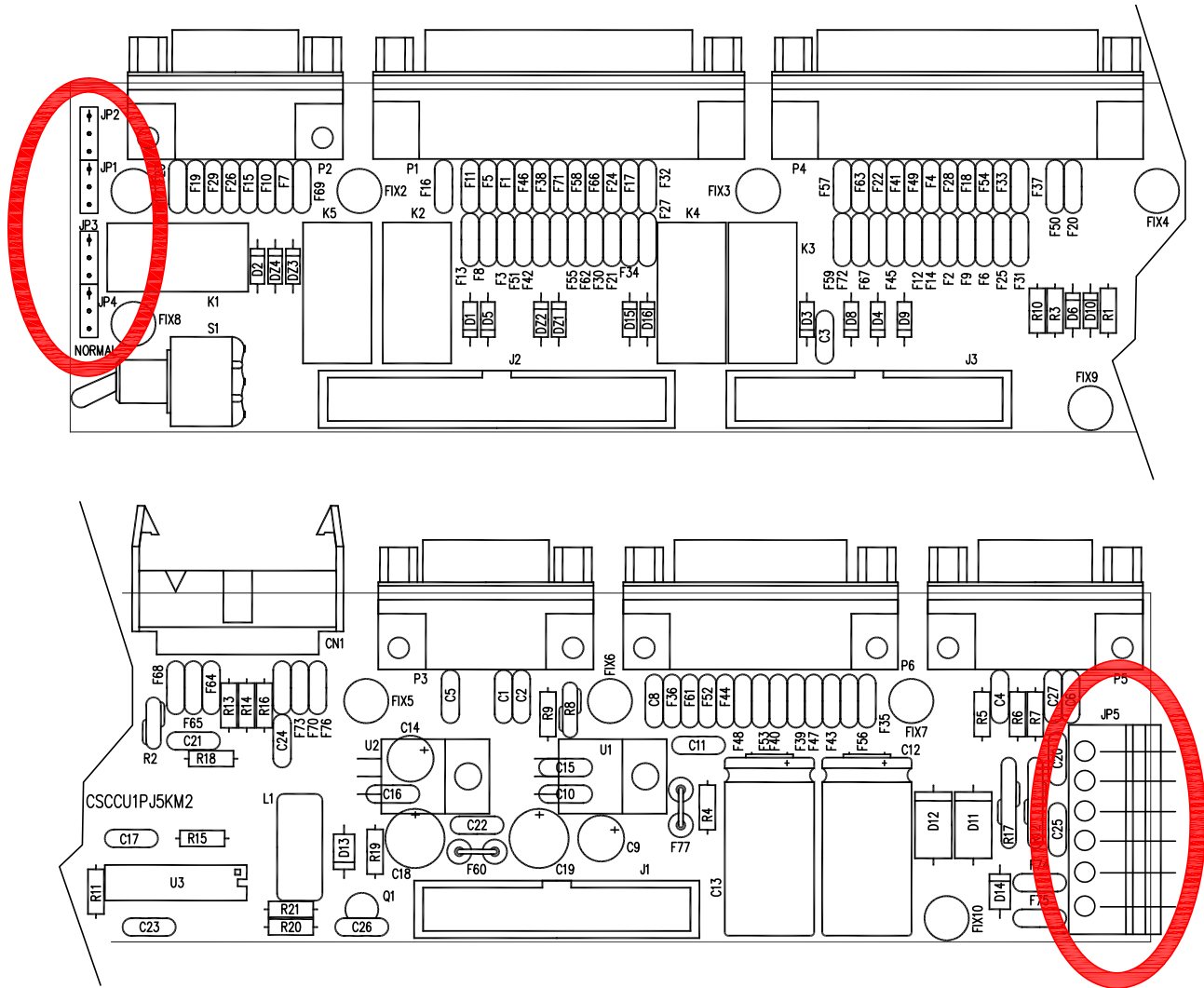


Revised: Tuesday, March 18, 2014
Revision:

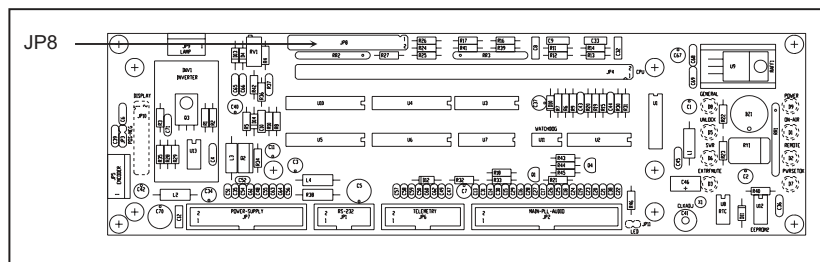
Bill Of Mat Page1

Item	Quantity	Reference	Part			
1	1	CN1	FLAT16	27	1	P5 DB9 FEMM.
2	5	C1,C2,C5,C8,C27	CM4K7pF	28	1	P6 DB15 FEMM.
3	7	C3,C10,C11,C15,C16,C17,C22	CM.1uF	29	1	Q1 BC488
4	5	C4,C6,C21,C24,C26	CD27pF	30	1	R1 2R2 1/4W
5	2	C9,C14	100/35	31	1	R2 RXE020
6	2	C12,C13	1000/35	32	4	R3,R7,R10,R18 10K
7	2	C18,C19	220/25	33	4	R4,R6,R13,R16 10R
8	2	C20,C25	CD4K7PF	34	1	R5 x120R
9	1	C23	CM100pF	35	1	R8 RXE040
10	4	DZ1,DZ2,DZ3,DZ4	15V 1/2W	36	1	R9 220R
11	11	D1,D2,D3,D4,D5,D6,D8,D9,D10,D15,D16	1N4148	37	1	R11 1K8
12	2	D11,D12	BY254	38	2	R12,R17 RXE110
13	1	D13	11DQ06	39	1	R14 180R
14	1	D14	1N4004	40	1	R15 18K
15	10	FIX1,FIX2,FIX3,FIX4,FIX5,FIX6,FIX7,FIX8,FIX9,FIX10	FIX35	41	1	R19 1R0
16	75	F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,F11,F12,F13,F14,F15,F16,F17,F18,F19,F20,F21,F22,F23,F24,F25,F26,F27,F28,F29,F30,F31,F32,F33,F34,F35,F36,F37,F38,F39,F40,F41,F42,F43,F44,F45,F46,F47,F48,F49,F50,F51,F52,F53,F54,F55,F56,F57,F58,F59,F61,F62,F63,F64,F65,F66,F67,F68,F69,F70,F71,F72,F73,F74,F75,F76	DSS306	42	1	R20 100R
17	2	F60,F77	BL02	43	1	R21 1K
18	4	JP1,JP2,JP3,JP4	JUMPER3	44	1	S1 T2D/2/G/X
19	1	JP5	KBW6	45	2	U1,U2 LM7812
20	2	J1,J3	CON26AP	46	1	U3 UA78S40DC
21	1	J2	CON34A			
22	5	K1,K2,K3,K4,K5	ZFH-12V-H1			
23	1	L1	220uH			
24	1	P1	DB25 FEM			
25	2	P2,P3	CONNECTOR DB9			
26	1	P4	DB25 MASC			

6.2.1 Settings



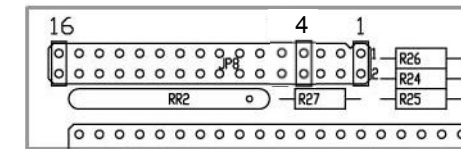
Leaving the jumpers as shown in the figure, the audio alarm is active, that is, when the audio is no longer present at the exciter, at the time of on air, the system automatically switches on the other exciter. Removing the jumpers the audio alarm is disabled. We must also disable the control “ExPwr” on the related modulator, to do this must be removed from the connector JP8 of panel card (located in the front of the PTX-LCD), the “Jump 4” if the modulator mounts the CPU 8-bit, instead you have to remove the “Jump 5” if the modulator is equipped with the 16-bit CPU.



Panel card

Meaning Jump JP8 with 8-bit CPU

JP8 Position of panel card jumpers.

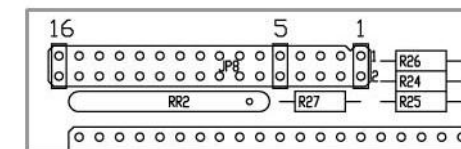


The software denotes jumper positions as follows (1 signifies a closed jumper, 0 open jumper, X any position):

Jump 4	Jump 5	Jump 6	Jump 7	Jump 8	Meaning
0	0	X	X	X	ExPwr, ExSts and ExFrq menu disabled
1	0	X	X	X	ExPwr and ExSts menu enabled, ExFrq menu disabled
0	1	X	X	X	ExPwr and ExSts menu disabled, ExFrq enabled
1	1	X	X	X	ExPwr, ExSts and ExFrq disabled
X	X	0	0	0	Default parameters set in case of exciter reset: CCIR for PLL at 10MHz
X	X	1	0	0	Default parameters set in case of exciter reset: FCC
X	X	0	1	0	Default parameters set in case of exciter reset: OIRT
X	X	1	1	0	Default parameters set in case of exciter reset: Japan
X	X	0	0	1	Default parameters set in case of exciter reset: Italy
X	X	1	0	1	Default parameters set in case of exciter reset: CSI
X	X	0	1	1	Default parameters set in case of exciter reset: China
X	X	1	1	1	Reserved for future applications

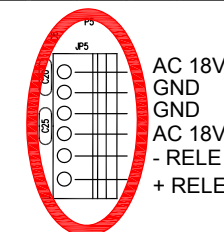
Meaning Jump JP8 with 16-bit CPU

JP8 Position of panel card jumpers.



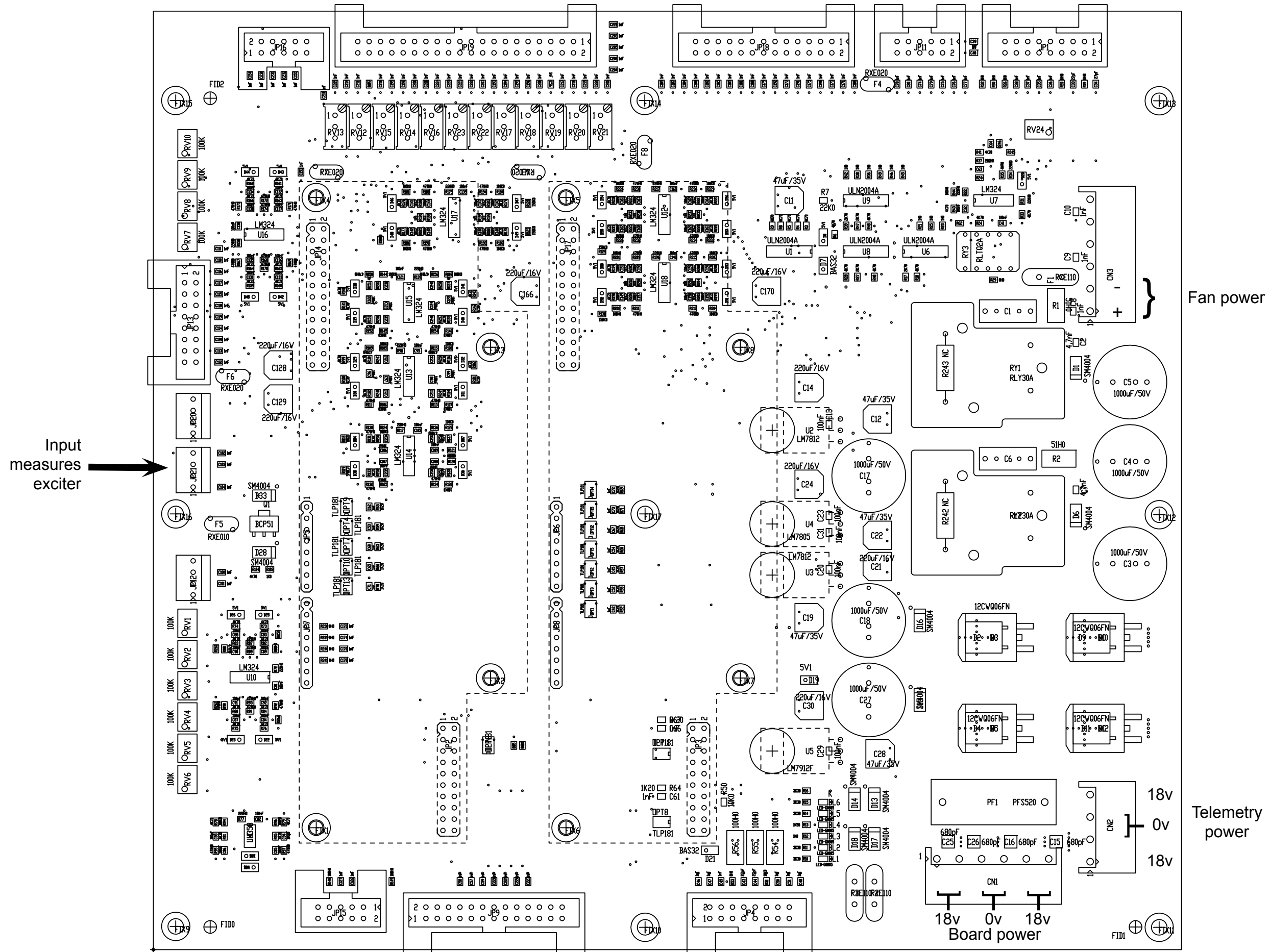
The software denotes jumper positions as follows (1 signifies a closed jumper, 0 open jumper, X any position):

Jump 5	Jump 6	Jump 7	Jump 8	Jump 9	Jump 10	Jump 11	Jump 12	Jump 13	Jump 14	Meaning
0	0	X	X	X	X	X	X	X	X	ExPwr, ExSts and ExFrq menu disabled
1	0	X	X	X	X	X	X	X	X	ExPwr and ExSts menu enabled, ExFrq menu disabled
0	1	X	X	X	X	X	X	X	X	ExPwr and ExSts menu disabled, ExFrq enabled
1	1	X	X	X	X	X	X	X	X	ExPwr, ExSts and ExFrq disabled
X	X	0	0	0	X	X	X	X	X	Default parameters set in case of exciter reset: CCIR for PLL at 10MHz
X	X	1	0	0	X	X	X	X	X	Default parameters set in case of exciter reset: FCC
X	X	0	1	0	X	X	X	X	X	Default parameters set in case of exciter reset: OIRT
X	X	1	1	0	X	X	X	X	X	Default parameters set in case of exciter reset: Japan
X	X	0	0	1	X	X	X	X	X	Default parameters set in case of exciter reset: Italia
X	X	1	0	1	X	X	X	X	X	Default parameters set in case of exciter reset: CSI
X	X	0	1	1	X	X	X	X	X	Reserved for future applications
X	X	1	1	1	X	X	X	X	X	Reserved for future applications
X	X	X	X	X	1	X	X	X	X	MAINS alarm enabling. NOTE: in this case is necessary to move the two jumpers from positions 3-5 and 4-6 to the positions 1-3 and 2-4, of Supply card JP6 jumper(see fig. below)
X	X	X	X	X	X	1	X	X	X	TRDSP optional card presence
X	X	X	X	X	X	X	1	X	X	13 MHz Quartz frequency on PLL card
X	X	X	X	X	X	X	X	1	X	Telemetry optional card presence
X	X	X	X	X	X	X	X	X	1	SFN software version (only for TRDSP)

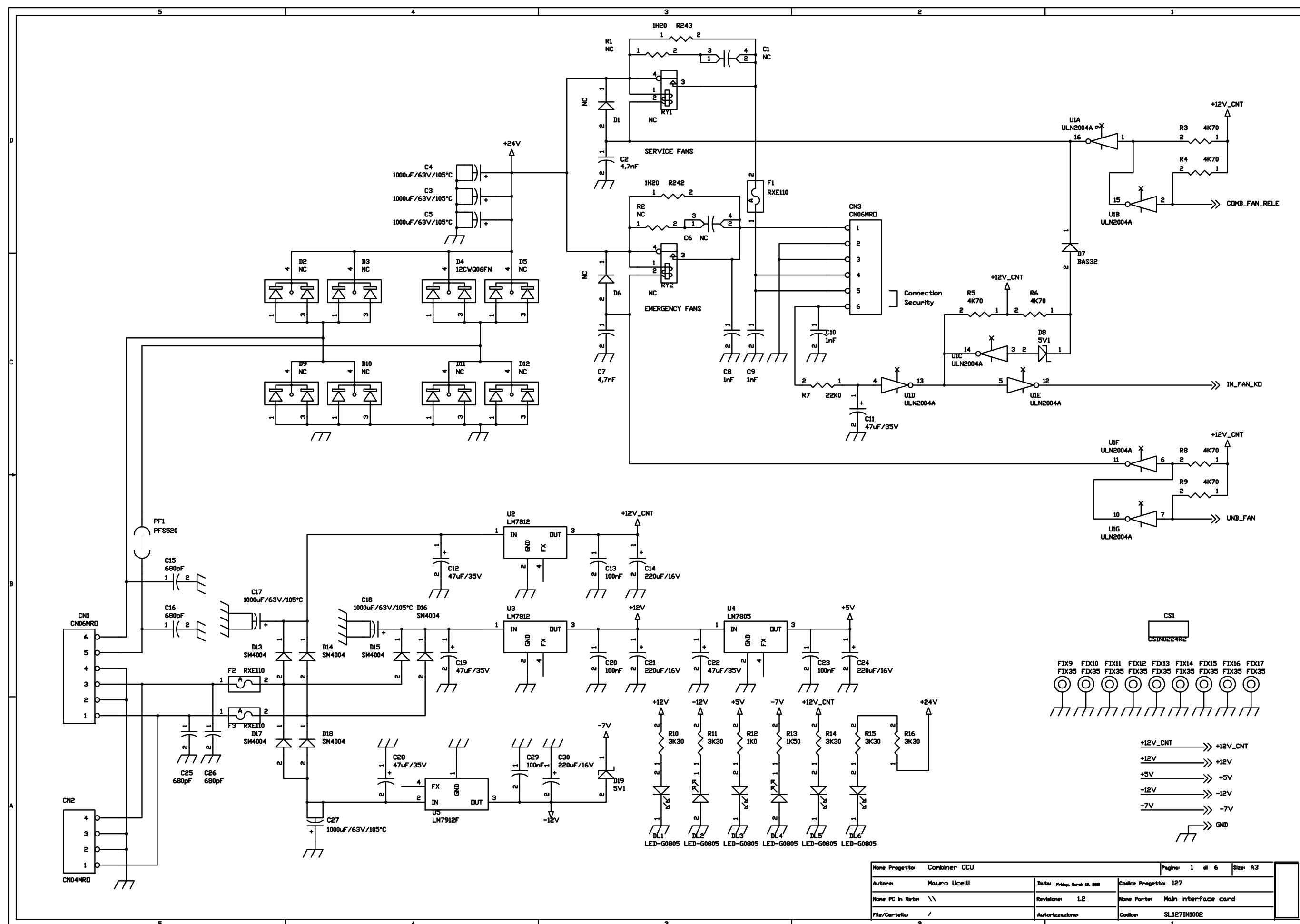


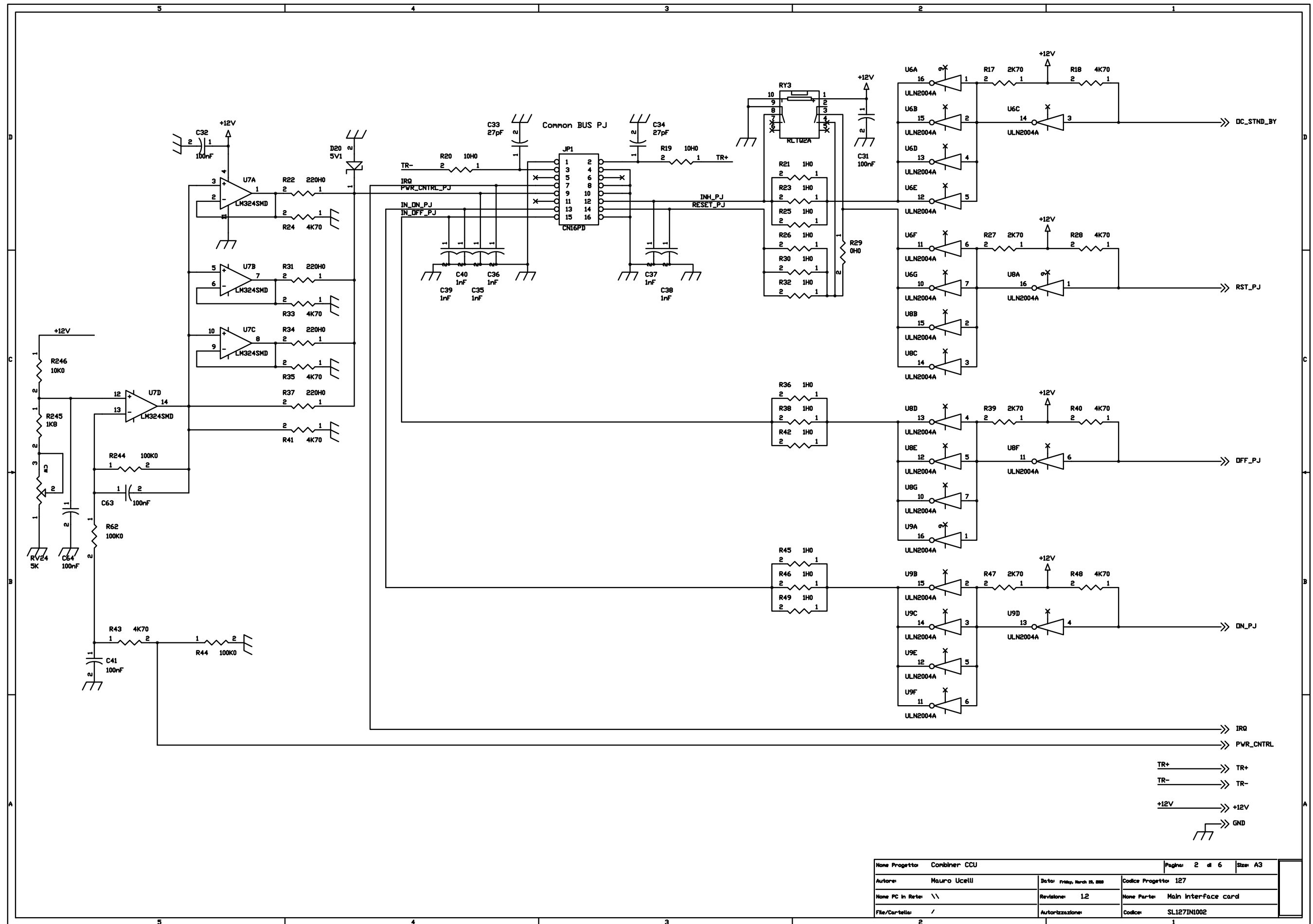
Power supply pinout

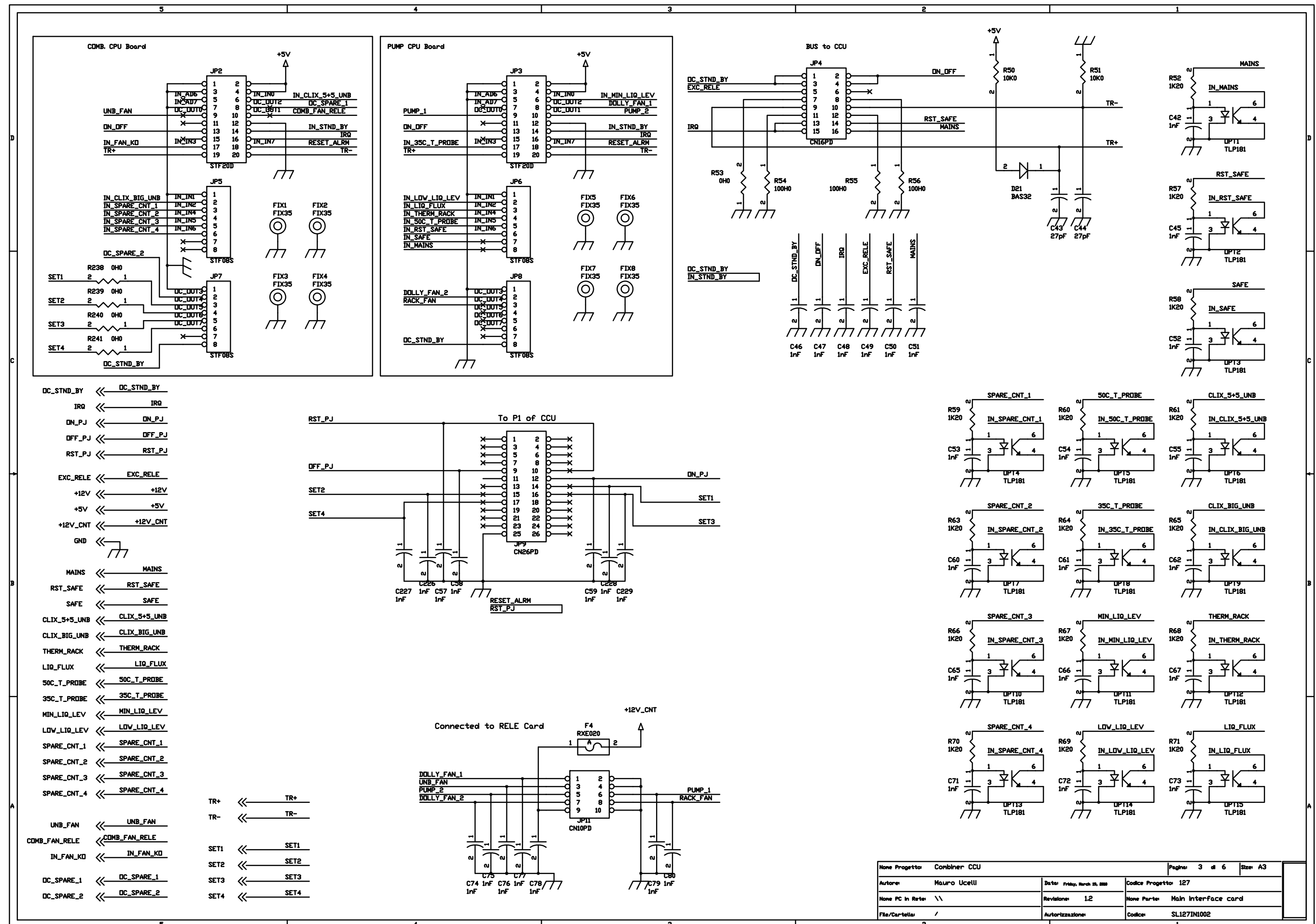
6.3 Main interface card (SL127IN1002)

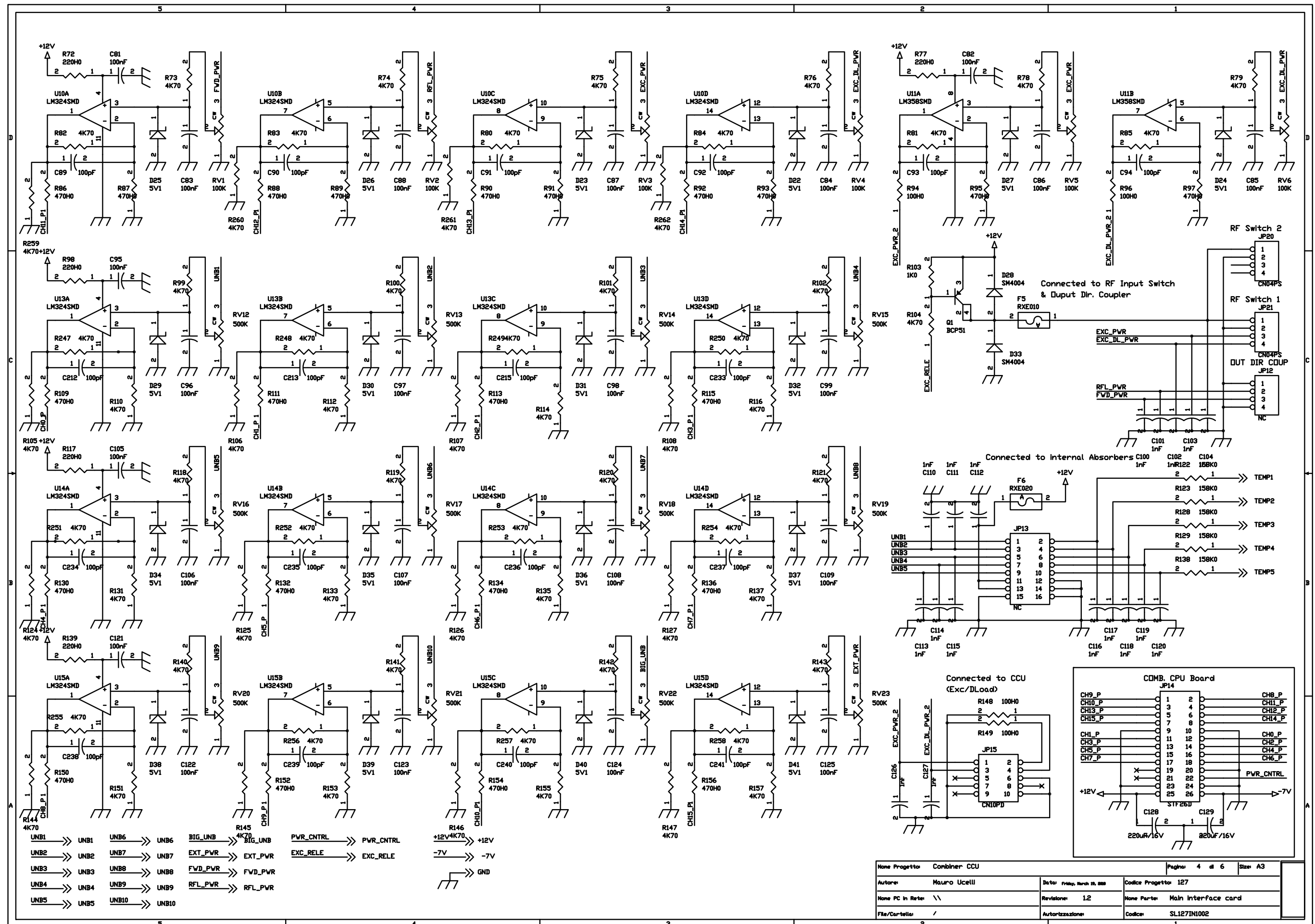


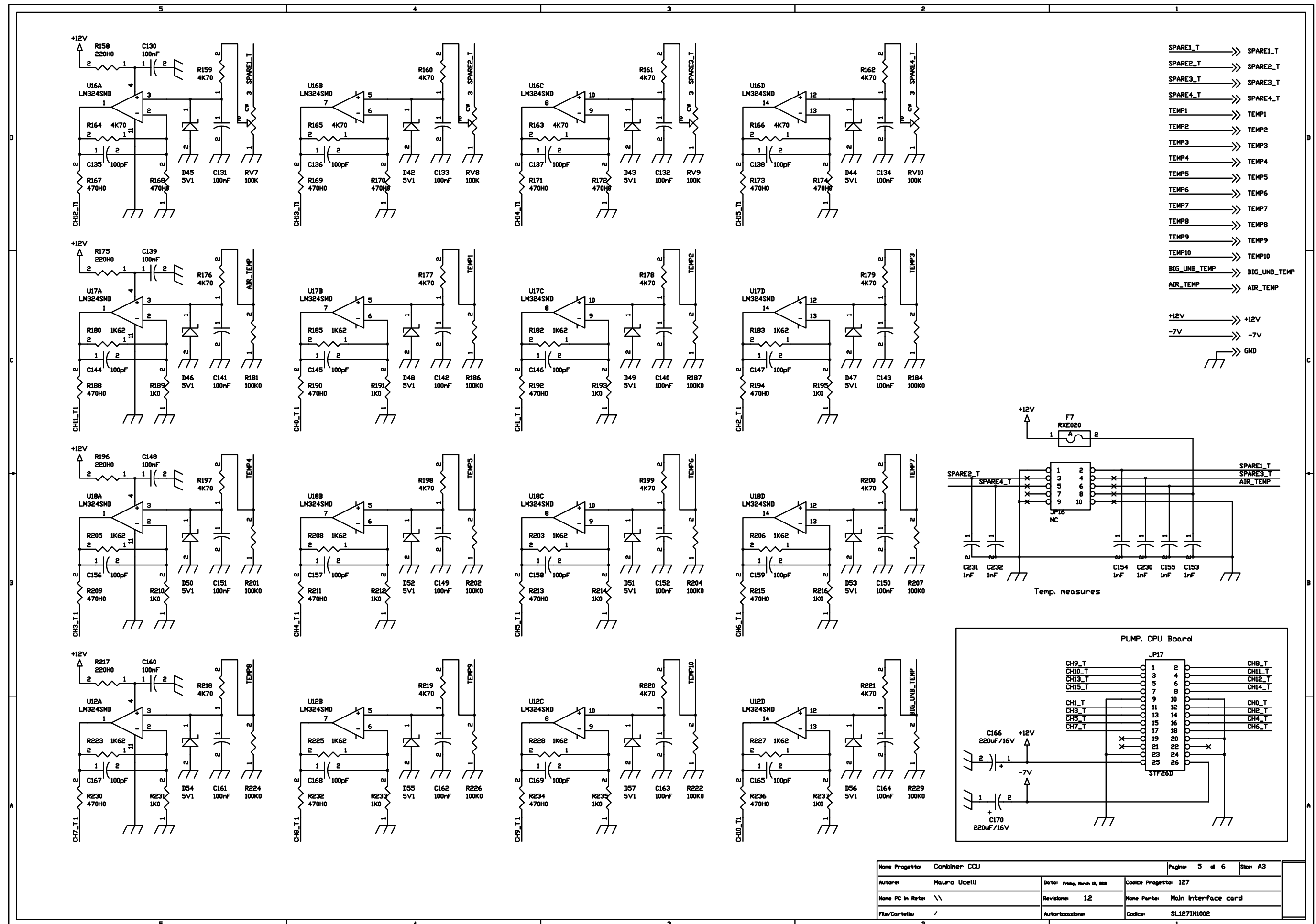
RILASCIATO: 14/5/09	DIS. S.POL. CTR. A2 LATO PIANO DI MONTAGGIO VISTA LATO COMPONENTI	
	MAIN INTERFACE CARD	
REV:	DENUMINAZIONE	
	MAIN INTERFACE CARD	
DIM.SCHEDA: VEDI QUOTE TRATT.: STANDARD COSTRUTTORE	CODICE	
	CSIN0224R2	
MAT.: FR4-74 1.6mm Cu35um VISTA POSITIVA	SCALA 1:1	
	RVR ELETTRONICA S.P.A.	

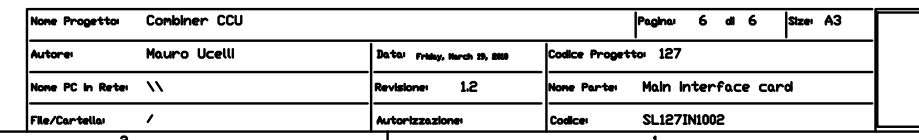












Main interface card Revised: March 19, 2010
SL127IN1002 Revision: 1.2

Combiner CCU
127

Mauro Ucelli

Item	Qty	Reference	Part	Description
1	2	CN1,CN3	CN06MRO	Conn. Phoenix MSTB 90° p. 5mm 6 pin
2	1	CN2	CN04MRO	Conn. Phoenix MSTB 90° p. 5mm 4 pin
3	1	CS1	CSIN0224R2	Circuito stampato
4	2	C1,C6	NC	Cond. Poli. p 5/7.5/10mm
5	2	C2,C7	4,7nF	Cond. SMD 0805
6	6	C3,C4,C5,C17,C18,C27	1000uF/63V/105°C	Cond. Elettr. Dia 16 105°C
7	121	C8,C9,C10,C35,C36,C37, C38,C39,C40,C42,C45,C46, C47,C48,C49,C50,C51,C52, C53,C54,C55,C56,C57,C58, C59,C60,C61,C62,C65,C66, C67,C71,C72,C73,C74,C75, C76,C77,C78,C79,C80,C100, C101,C102,C103,C104,C110, C111,C112,C113,C114,C115, C116,C117,C118,C119,C120, C126,C127,C153,C154,C155, C171,C172,C173,C174,C175, C176,C177,C178,C179,C180, C181,C182,C183,C184,C185, C186,C187,C188,C189,C190, C191,C192,C193,C194,C195, C196,C197,C198,C199,C200, C201,C202,C203,C204,C205, C206,C207,C208,C209,C210, C211,C214,C216,C217,C218, C219,C220,C221,C222,C223, C224,C225,C226,C227,C228, C229,C230,C231,C232	1nF	Cond. SMD 0805
8	5	C11,C12,C19,C22,C28	47uF/35V	Cond. Elett. SMD d. 6.3mm
9	52	C13,C20,C23,C29,C31,C32, C41,C63,C64,C81,C82,C83, C84,C85,C86,C87,C88,C95, C96,C97,C98,C99,C105, C106,C107,C108,C109,C121, C122,C123,C124,C125,C130, C131,C132,C133,C134,C139, C140,C141,C142,C143,C148, C149,C150,C151,C152,C160, C161,C162,C163,C164	100nF	Cond. SMD 0805
10	8	C14,C21,C24,C30,C128, C129,C166,C170	220uF/16V	Cond. Elett. SMD d. 6.3mm
11	4	C15,C16,C25,C26	680pF	Cond. SMD 1212 HQ
12	4	C33,C34,C43,C44	27pF	Cond. SMD 0805
13	34	C89,C90,C91,C92,C93,C94, C135,C136,C137,C138,C144, C145,C146,C147,C156,C157, C158,C159,C165,C167,C168, C169,C212,C213,C215,C233, C234,C235,C236,C237,C238, C239,C240,C241	100pF	Cond. SMD 0805
14	6	DL1,DL2,DL3,DL4,DL5,DL6	LED-G0805	LED Verde SMD 0805

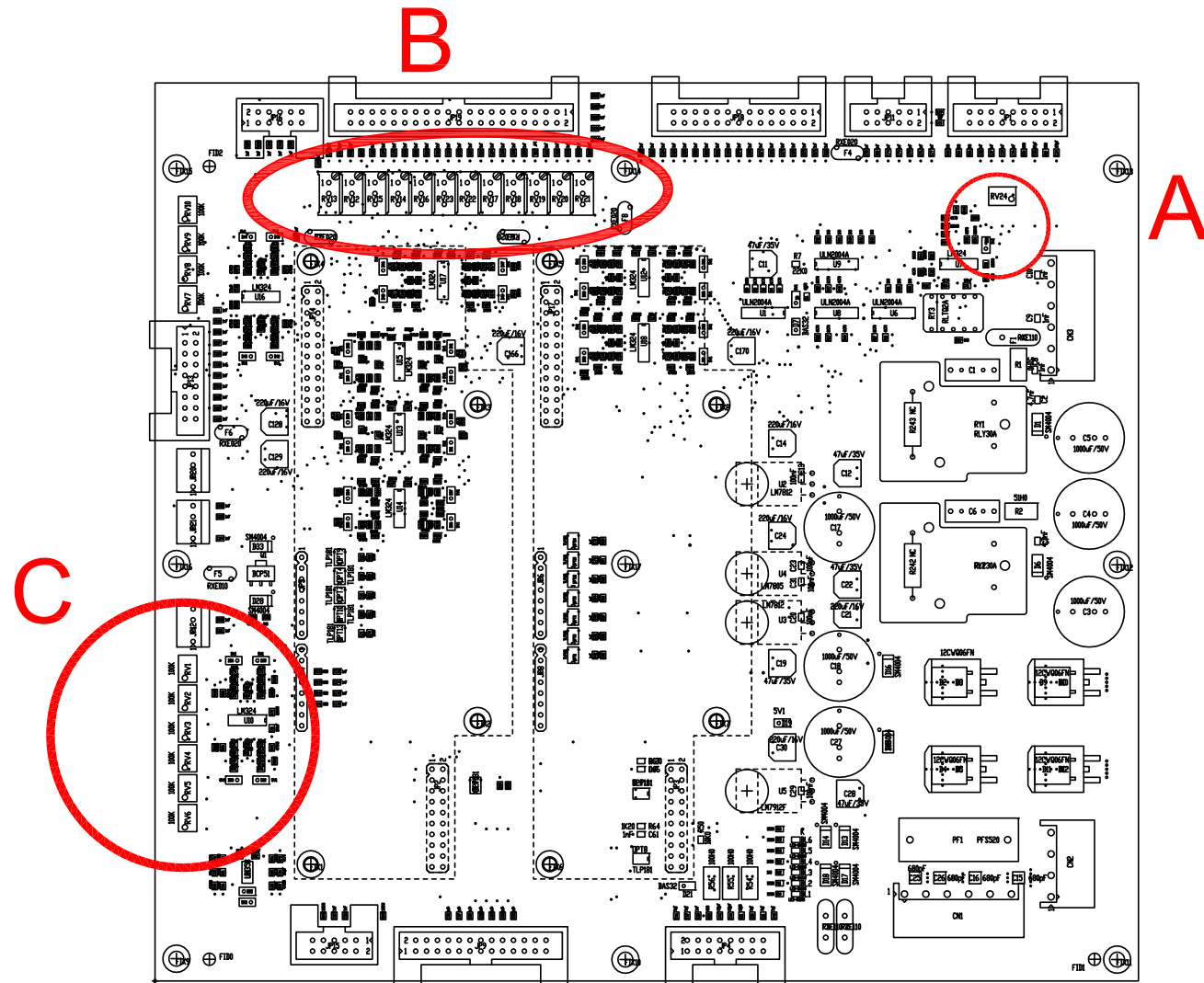
Pagina 1

15	2	D1,D6	NC	MELF SMD Diode	R218,R219,R220,R221,R247, R248,R249,R250,R251,R252, R253,R254,R255,R256,R257, R258,R259,R260,R261,R262		
16	3	D2,D9,D11	NC	Doppio diodo shottky SMD			
17	4	D3,D5,D10,D12	NC	Doppio diodo shottky DMS D2PAK			
18	1	D4	12CWQ06FN	Doppio diodo shottky SMD			
19	2	D7,D21	BAS32	MINIMELF SMD Diode	47	1 R7	22K0 Res. SMD 0805 1%
20	37	D8,D19,D20,D22,D23,D24, D25,D26,D27,D29,D30,D31, D32,D34,D35,D36,D37,D38, D39,D40,D41,D42,D43,D44, D45,D46,D47,D48,D49,D50, D51,D52,D53,D54,D55,D56, D57	5V1	MINIMELF SMD Zener Diode	48	5 R10,R11,R14,R15,R16	3K30 Res. SMD 0805 1%
					49	14 R12,R103,R189,R191,R193, R195,R210,R212,R214,R216, R231,R233,R235,R237	1K0 Res. SMD 0805 1%
					50	1 R13	1K50 Res. SMD 0805 1%
					51	4 R17,R27,R39,R47	2K70 Res. SMD 0805 1%
					52	2 R19,R20	10H0 Res. SMD 0805 1%
21	8	D13,D14,D15,D16,D17,D18, D28,D33	SM4004	MELF SMD Diode	53	12 R21,R23,R25,R26,R30,R32, R36,R38,R42,R45,R46,R49	1H0 Res. SMD 0805 1%
22	17	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6,FIX7,FIX8,FIX9, FIX10,FIX11,FIX12,FIX13, FIX14,FIX15,FIX16,FIX17	FIX35	Foro fissaggio 3.5mm	54	13 R22,R31,R34,R37,R72,R77, R98,R117,R139,R158,R175, R196,R217	220H0 Res. SMD 0805 1%
23	3	F1,F2,F3	RXE110	Fusibile autorip. 13mm	55	6 R29,R53,R238,R239,R240, R241	0H0 Res. SMD 0805 1%
24	5	F4,F6,F7,F8,F9	RXE020	Fusibile autorip. RXE p5mm			
25	1	F5	RXE010	Fusibile autorip. RXE p5mm	56	15 R44,R62,R181,R184,R186, R187,R201,R202,R204,R207, R222,R224,R226,R229,R244	100K0 Res. SMD 0805 1%
26	2	JP1,JP4	CN16PD	Conn.M.C.S.Dritto 16P alette			
27	2	JP2,JP3	STF20D	Strip femmina 10+10 pin			
28	4	JP5,JP6,JP7,JP8	STF08S	Strip femmina 8 pin	57	3 R50,R51,R246	10K0 Res. SMD 0805 1%
29	2	JP9,JP18	CN26PD	Connettore 26 poli Flat cs	58	15 R52,R57,R58,R59,R60,R61, R63,R64,R65,R66,R67,R68, R69,R70,R71	1K20 Res. SMD 0805 1%
30	2	JP11,JP15	CN10PD	Connettore 10 poli Flat cs			
31	1	JP12	NC	Connettore 4 poli Mascon			
32	1	JP13	NC	Conn.M.C.S.Dritto 16P alette	59	3 R54,R55,R56	100H0 Res. SMD 2512 1%
33	2	JP14,JP17	STF26D	Strip femmina 13+13 pin	60	42 R86,R87,R88,R89,R90,R91, R92,R93,R95,R97,R109, R111,R113,R115,R130,R132, R134,R136,R150,R152,R154, R156,R167,R168,R169,R170, R171,R172,R173,R174,R188, R190,R192,R194,R209,R211, R213,R215,R230,R232,R234, R236	470H0 Res. SMD 0805 1%
34	1	JP16	NC	Connettore 10 poli Flat cs			
35	1	JP19	CN40PDA	Conn.M.C.S.Dritto 40P alette			
36	2	JP20,JP21	CN04PS	Connettore 4 poli Mascon			
37	15	OPT1,OPT2,OPT3,OPT4,OPT5, OPT6,OPT7,OPT8,OPT9, OPT10,OPT11,OPT12,OPT13, OPT14,OPT15	TLP181	Optoisolatore SMD SO6			
38	1	PF1	PFS520	Portafusibile 5x20			
39	1	Q1	BCP51	Trans. PNP SOT223	61	4 R94,R96,R148,R149	100H0 Res. SMD 0805 1%
40	10	RV1,RV2,RV3,RV4,RV5,RV6, RV7,RV8,RV9,RV10	100K	Trimmer Rg V 3269W SMD	62	5 R122,R123,R128,R129,R138	158K0 Res. SMD 0805 1%
41	12	RV12,RV13,RV14,RV15,RV16, RV17,RV18,RV19,RV20,RV21, RV22,RV23	500K	Trimmer Rg V 3296W	63	12 R180,R182,R183,R185,R203, R205,R206,R208,R223,R225, R227,R228	1K62 Res. SMD 0805 1%
42	1	RV24	5K	Trimmer Rg V 3269W SMD	64	2 R242,R243	1H20 Res. 2W
43	2	RY1,RY2	NC	Rele' 30A NO	65	1 R245	1K80 Res. SMD 0805 1%
44	1	RY3	RLTQ2A	Rele' TQ2	66	4 U1,U6,U8,U9	ULN2004A Seven Inv. Buffer OC
45	2	R1,R2	NC	Res. SMD 2512 1%	67	2 U2,U3	LM7812 Stabilizzatore TO220
46	100	R3,R4,R5,R6,R8,R9,R18, R24,R28,R33,R35,R40,R41, R43,R48,R73,R74,R75,R76, R78,R79,R80,R81,R82,R83, R84,R85,R99,R100,R101, R102,R104,R105,R106,R107, R108,R110,R112,R114,R116, R118,R119,R120,R121,R124, R125,R126,R127,R131,R133, R135,R137,R140,R141,R142, R143,R144,R145,R146,R147, R151,R153,R155,R157,R159, R160,R161,R162,R163,R164, R165,R166,R176,R177,R178, R179,R197,R198,R199,R200,	4K70	Res. SMD 0805 1%	68	1 U4	LM7805 Stabilizzatore TO220
					69	1 U5	LM7912F Stabilizzatore TO220F Isolato
					70	9 U7,U10,U12,U13,U14,U15, U16,U17,U18	LM324SMD Quad Op. SMD SO14
					71	1 U11	LM358SMD Dual Op. SMD SO8

Pagina 2

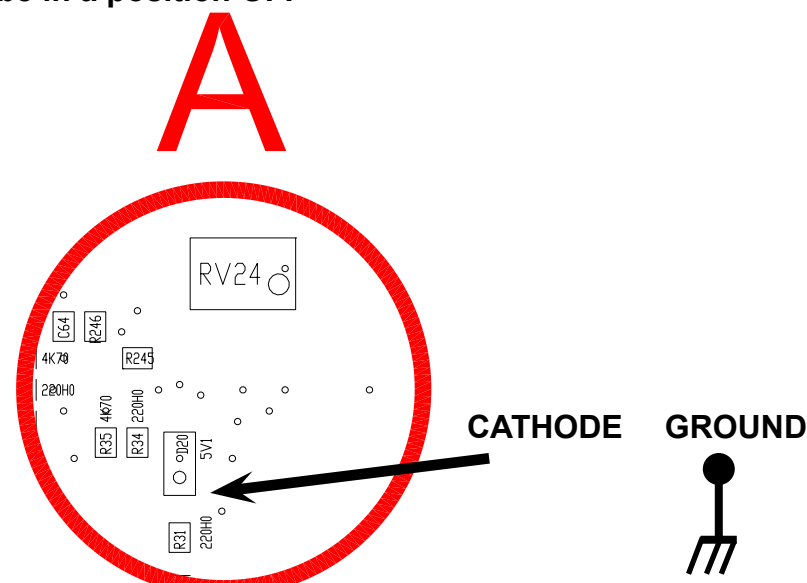
Pagina 3

6.3.1 Foldback voltage calibration

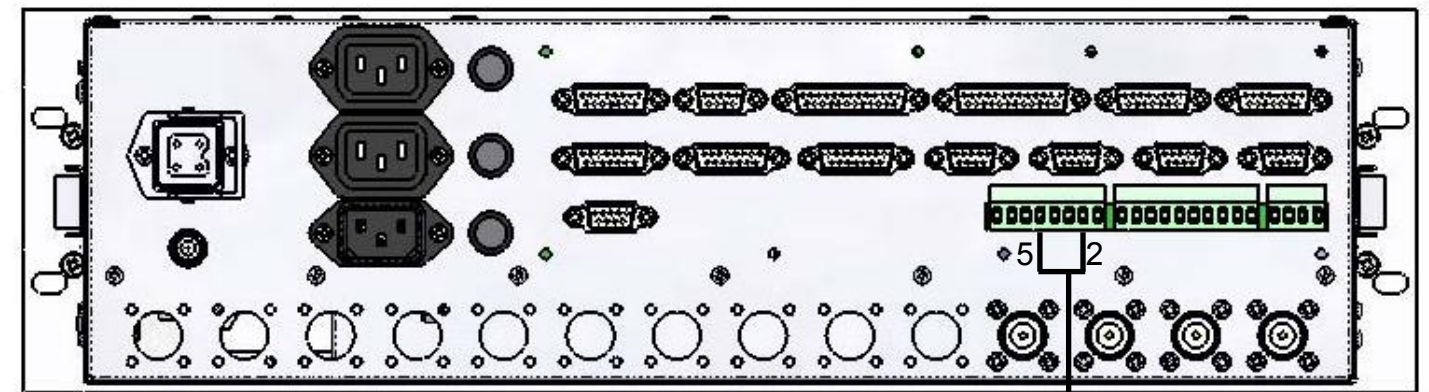


The CCU generates a control voltage that works on the modules to obtain output from the transmitter, the power set in the menu settings (Automatic Gain Control - AGC). Only if you change or CCU during the first switch is set to this voltage, to perform this calibration obtain a tester and go on the diode D20 between the cathode and ground and with the RV24 trimmer adjust the voltage to 4.3 volts

Note: The CCU should be in a position OFF



If you wish to disable this check must make a bridge in the back of the CCU on the green terminal, indicated in the figure, between pins 2 and 5



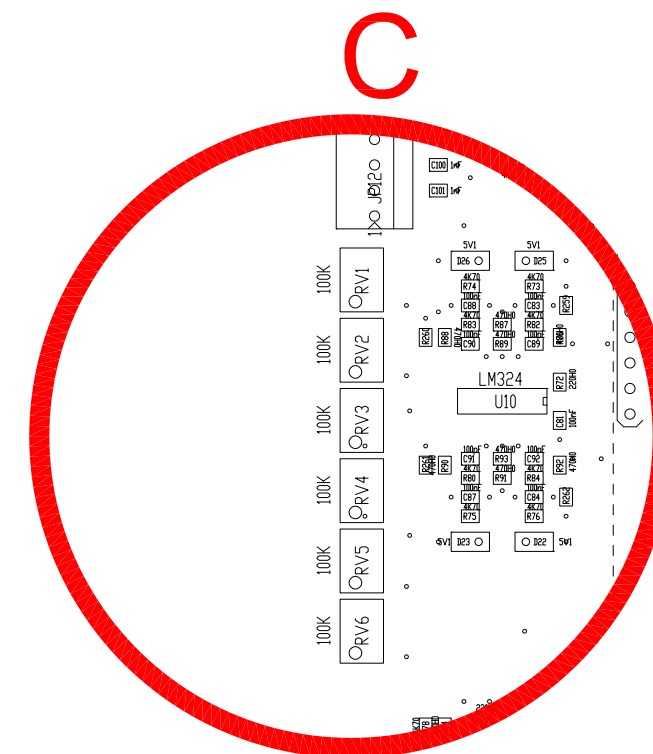
Bridging pins 2 and 5

Note: Pin 1 is always to the right of each green terminal

6.3.2 Calibration reading power

Trimmer Function

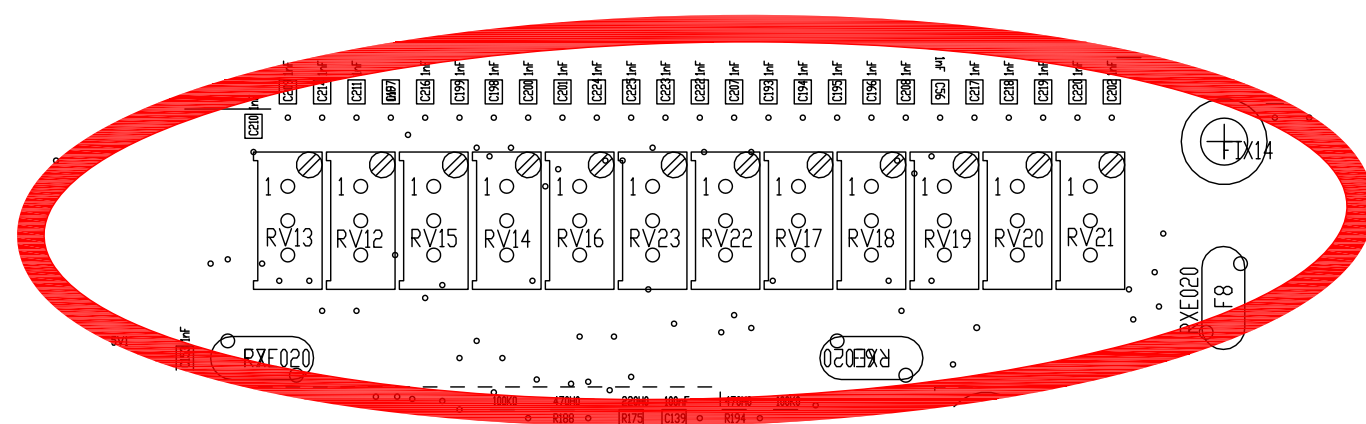
RV1	FWD Power Output
RV2	RFL Power Output
RV3	PTX Power Antenna (menù combiner)
RV4	Power PTX on the dummy load (menù combiner)
RV5	PTX Power Antenna (menù exciter)
RV6	Power PTX on the dummy load (menù exciter)



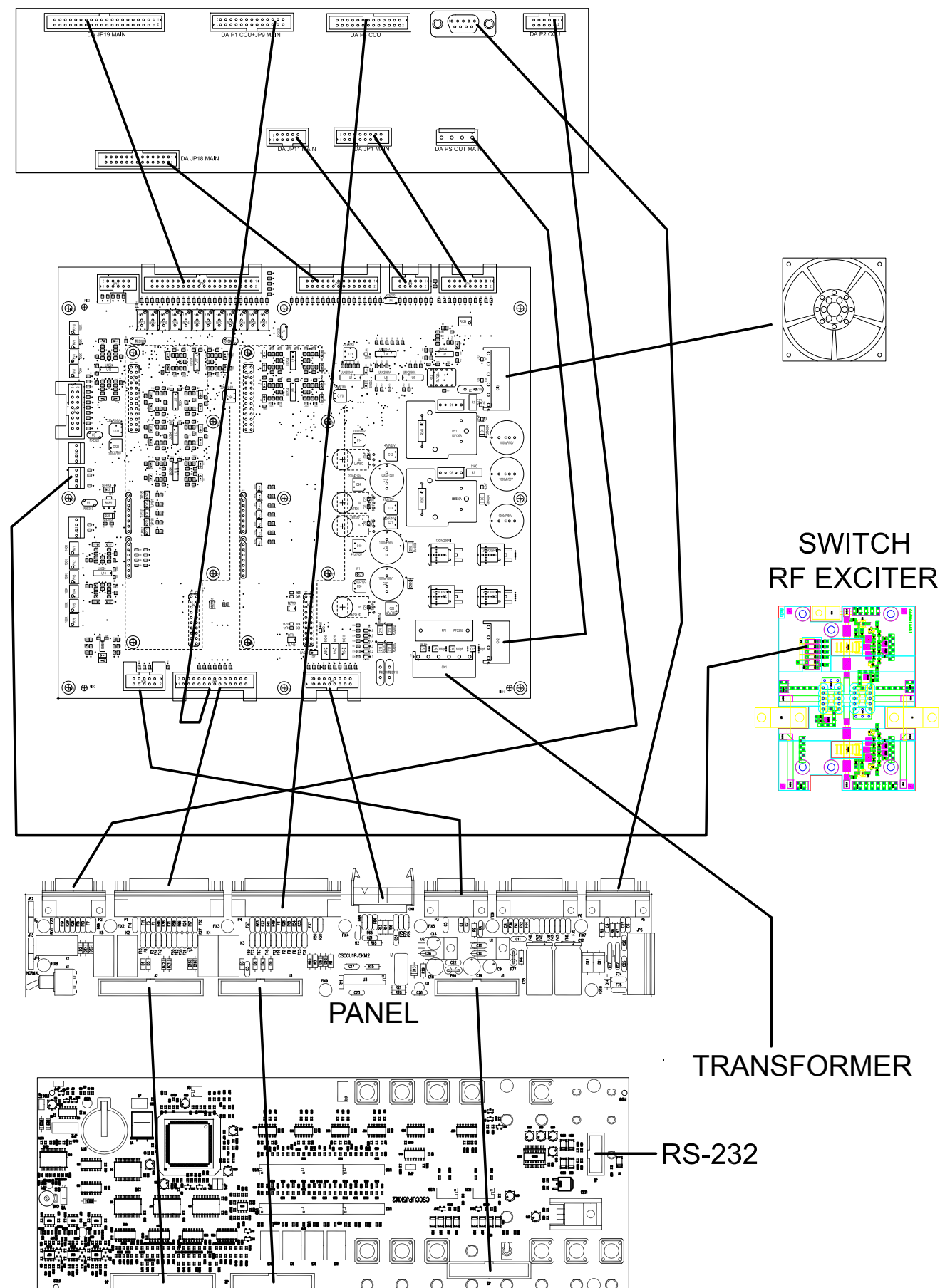
Trimmer Function

RV12	Unbalanced power LOAD 1
RV13	Unbalanced power LOAD 2 (only for transmitter TX15000U-KLC)
RV14	Unbalanced power LOAD 3 (only for transmitter TX15000U-KLC)
RV22	Unbalanced power BIG LOAD (only for transmitter TX20000U-KLC)

B

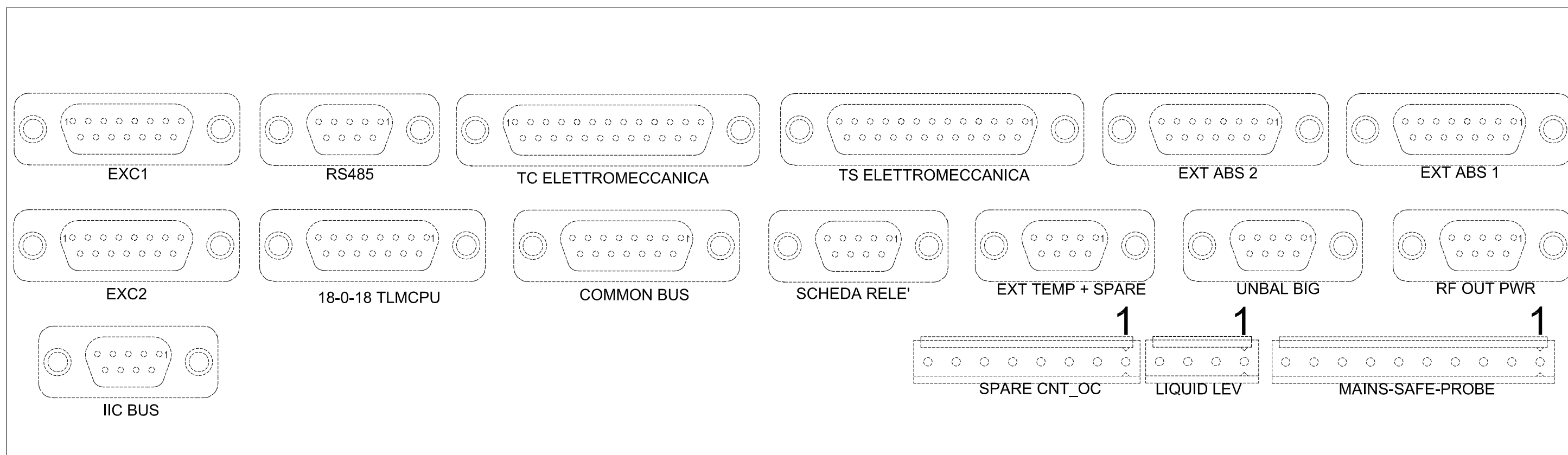


6.3.3 Main card connections



6.4 External Con. interface card (SL127IN2001)

EXTERNAL VIEW



Spare CNT_OC

Pin	Function
1	GND
2	+12 Vcc
3	/
4	/
5	Foldback inhibit
6	/
7	/
8	/

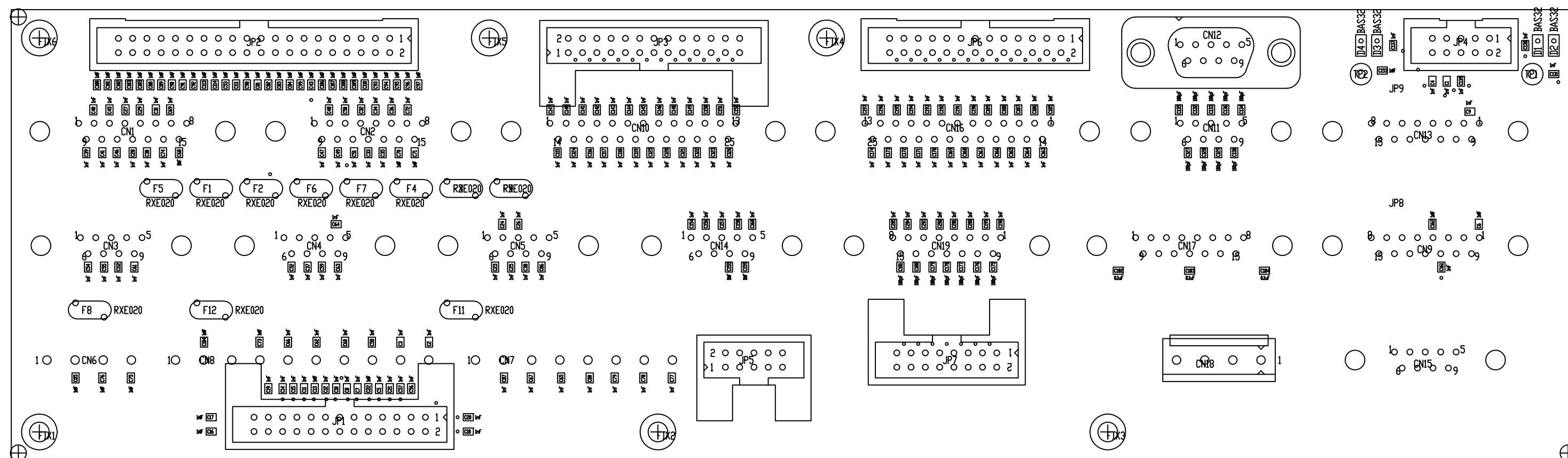
Liquid Level

Pin	Function
1	GND
2	+12 Vcc
3	Liquid Low
4	Liquid Min

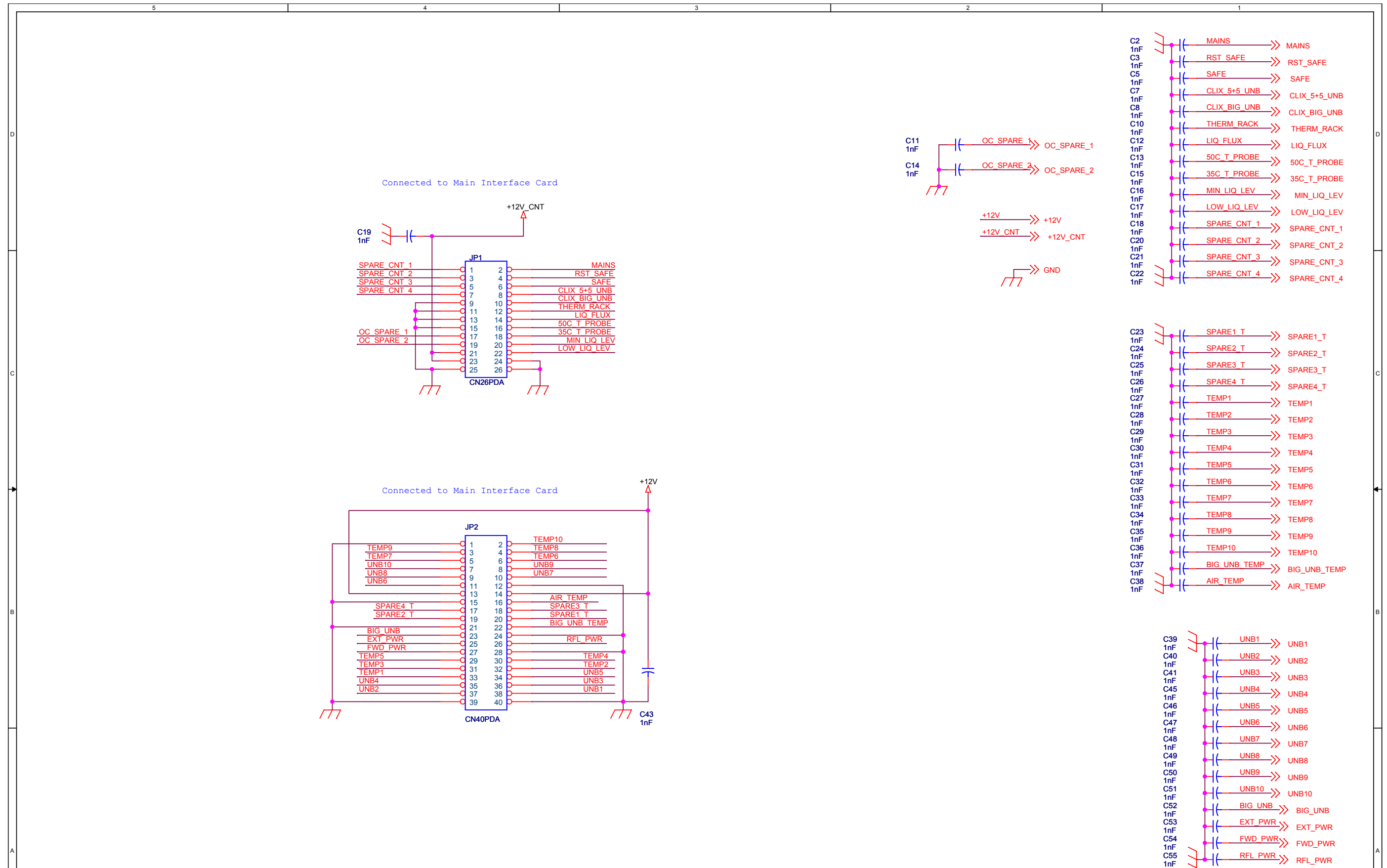
Mains-Safe-Probe

Pin	Function
1	GND
2	+12 Vcc
3	GND
4	Thermostat 35°
5	Thermostat 50°
6	Flux control
7	Thermal rack
8	Safety
9	Pressure switch
10	Mains

INSIDE VIEW

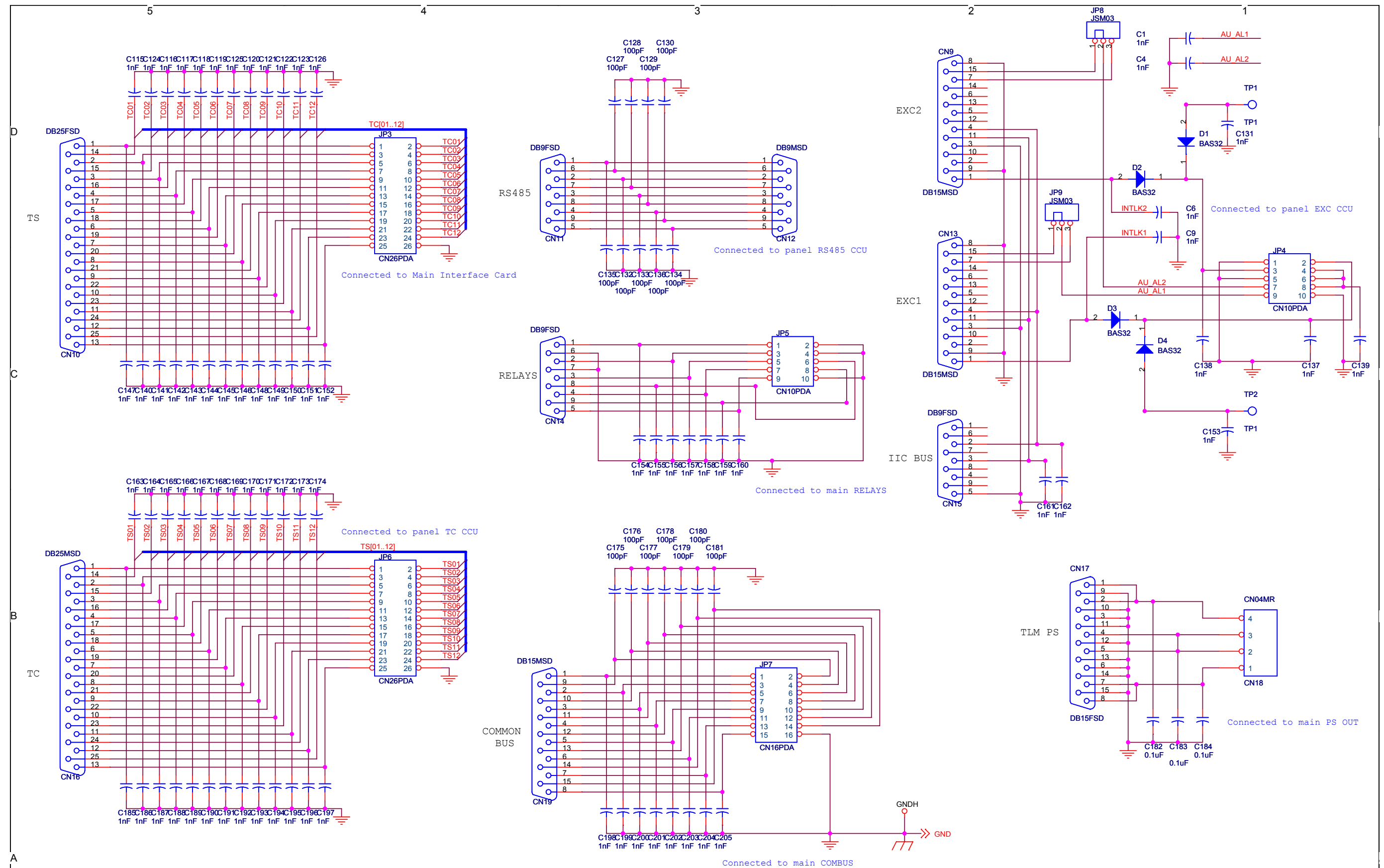


RILASCIO: 30/1/09	DIS. S.POL. CTR. A2 LATO PIANO DI MONTAGGIO VISTA LATO COMPONENTI		
REV:			
DIM.SCHEDA: VEDIQUOTE TRATT.: STANDARD COSTRUTTORE	DENOMINAZIONE EXT CON INTERFACE CARD		
MAT.: FR4-74 1.6mm Cu35um VISTA POSITIVA	CODICE CSIN0225R1	RVR ELETTRONICA S.P.A	SCALA 1:1



Nome Progetto: Combiner CCU		Pagina: 1 di 3	Size: A3
Autore: Mauro Ucelli	Data: Monday, March 23, 2009	Codice Progetto: 127	
Nome PC in Rete: \\	Revisione: 1.0	Nome Parte: External Con. interface card	
File/Cartella: I	Autorizzazione:	Codice: SL127IN2001	





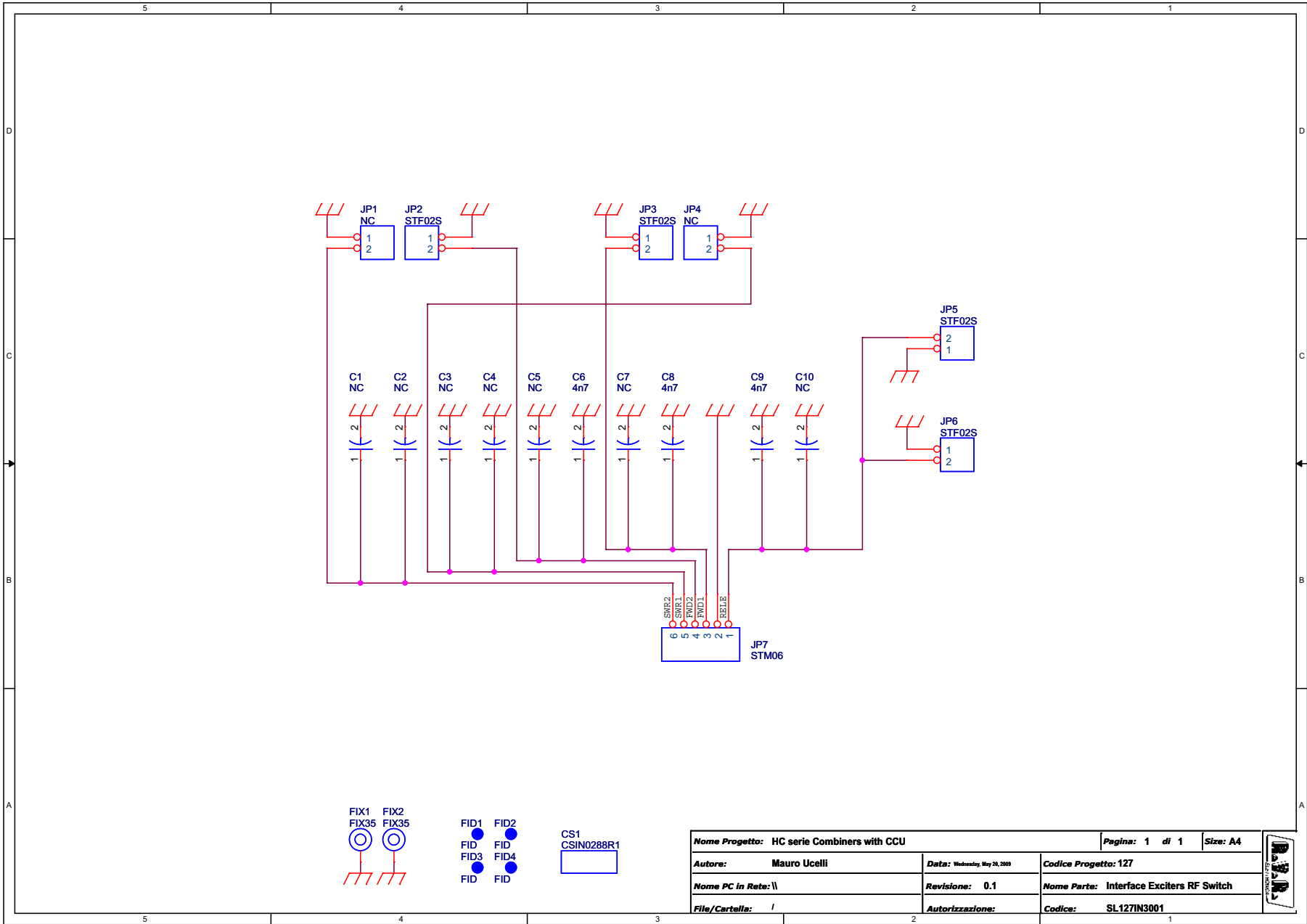
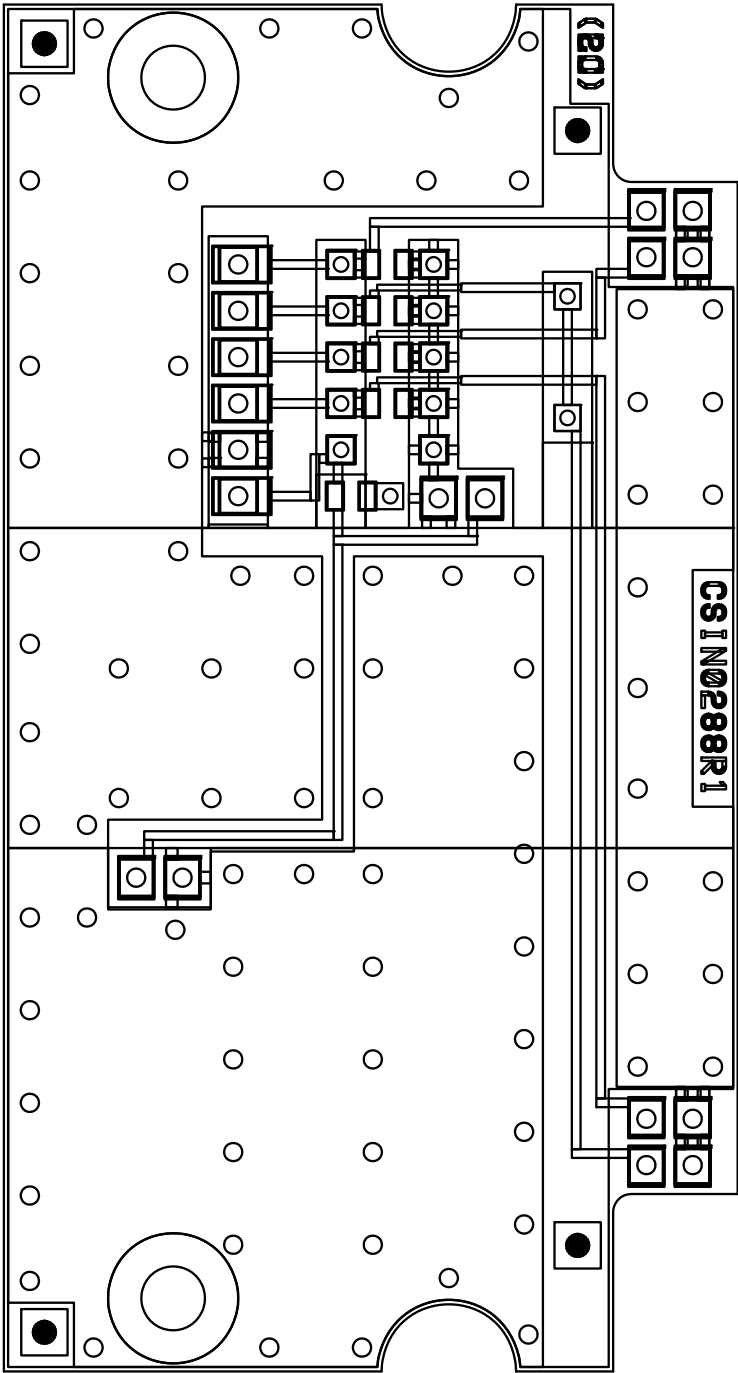
Project Name: HCCCU		Page: 3 of 3	Size: A3
Designer: Tommasi A.	Date: Monday, March 23, 2009	Project Code: RVR127	
File Location: \\	Revision: 1.0	Description: Connessioni esterne	
Folder/File: /	Approval:	Part No.: SL127IN2001	

External Con. interface card Revised: 23/03/2009
SL127IN2001 Revision: 1.0
Combiner CCU
127
Mauro Ucelli

Item	Quantity	Reference	Part	Description
1	3	CN1,CN2,CN17	DB15FSD	Connettore DB15 femm. cs
2	6	CN3,CN4,CN5,CN11,CN14,CN15	DB9FSD	Connettore DB9 femm. cs
3	2	CN6,CN18	CN04MR	Conn. Phoenix MSTB p. 5mm 4 pin
4	1	CN7	CN08MR	Conn. Phoenix MSTB p. 5mm 8 pin
5	1	CN8	CN10MR	Conn. Phoenix MSTB p. 5mm 10 pin
6	3	CN9,CN13,CN19	DB15MSD	Connettore DB15 mas. cs
7	1	CN10	DB25FSD	Connettore DB25 femm. cs
8	1	CN12	DB9MSD	Connettore DB9 mas. cs
9	1	CN16	DB25MSD	Connettore DB25 mas. cs
10	1	CS1	CSIN0225R1	Circuito stampato
11	184	C1,C2,C3,C4,C5,C6,C7,C8,C9,C10,C11,C12,C13,C14,C15,C16,C17,C18,C19,C20,C21,C22,C23,C24,C25,C26,C27,C28,C29,C30,C31,C32,C33,C34,C35,C36,C37,C38,C39,C40,C41,C43,C45,C46,C47,C48,C49,C50,C51,C52,C53,C54,C55,C56,C57,C58,C59,C60,C61,C62,C63,C64,C65,C66,C67,C68,C69,C70,C71,C72,C73,C74,C75,C76,C77,C78,C79,C80,C81,C82,C83,C84,C85,C86,C87,C88,C89,C90,C91,C92,C93,C94,C95,C96,C97,C98,C99,C100,C101,C102,C103,C104,C105,C106,C107,C108,C109,C110,C111,C112,C113,C114,C115,C116,C117,C118,C119,C120,C121,C122,C123,C124,C125,C126,C131,C137,C138,C139,C140,C141,C142,C143,C144,C145,C146,C147,C148,C149,C150,C151,C152,C153,C154,C155,C156,C157,C158,C159,C160,C161,C162,C163,C164,C165,C166,C167,C168,C169,C170,C171,C172,C173,C174,C185,C186,C187,C188,C189,C190,C191,C192,C193,C194,C195,C196,C197,C198,C199,C200,C201,C202,C203,C204,C205	1nF	Cond. SMD 0805
12	16	C127,C128,C129,C130,C132,C133,C134,C135,C136,C175,C176,C177,C178,C179,C180,C181	100pF	Cond. SMD 0805
13	3	C182,C183,C184	0.1uF	Cond. SMD 0805
14	4	D1,D2,D3,D4	BAS32	MINIMELF SMD Diode

15	6	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6	FIX35	Foro fissaggio 3.5mm
16	11	F1,F2,F3,F4,F5,F6,F7,F8,F9,F11,F12	RXE020	Fusibile autorip. RXE p5mm
17	3	JP1,JP3,JP6	CN26PDA	Conn.M.C.S.Dritto 26P alette
18	1	JP2	CN40PDA	Conn.M.C.S.Dritto 40P alette
19	2	JP4,JP5	CN10PDA	Conn.M.C.S.Dritto 10P alette
20	1	JP7	CN16PDA	Connettore 16 poli Flat cs con alette
21	2	JP8,JP9	JSM03	Pad SMD a saldare a 2 pos.
22	2	TP1,TP2	TP1	Test point

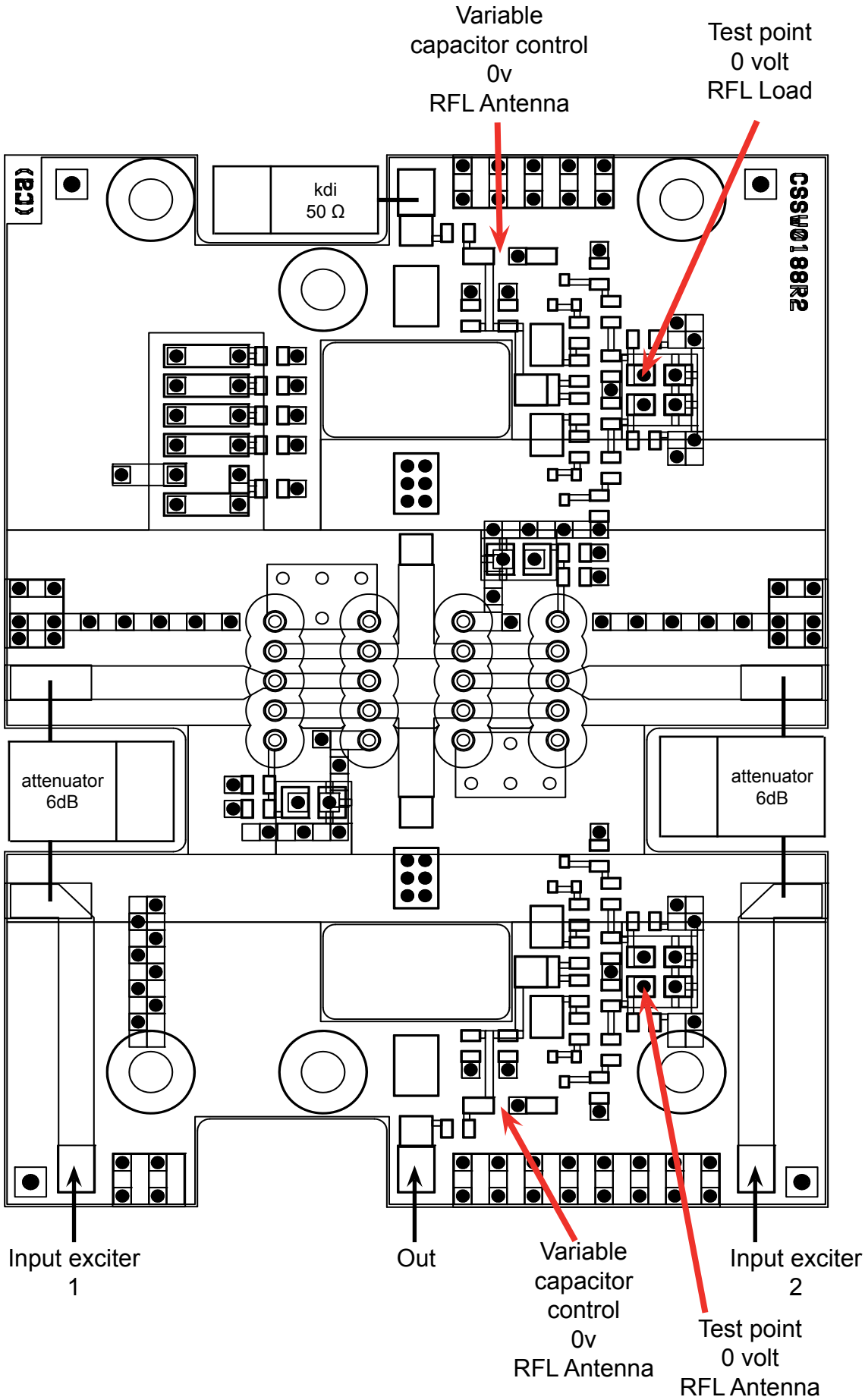
6.5 Interface exciters RF Switch (SL127IN3001)



Interface Exciters RF Switch
SL127IN3001
Revision: 0.1
HC serie Combiners with CCU
127
20/05/09
Mauro Ucelli

Item	Quantity	Reference	Part	Description
1	1	CS1	CSIN0288R1	Circuito stampato
2	5	C1,C3,C5,C7,C10	NC	Cond. SMD 0805
3	2	C2,C4	NC	Cond. ceramico p 5mm
4	3	C6,C8,C9	4n7	Cond. ceramico p 5mm
5	4	FID1,FID2,FID3,FID4	FID	Fiducial CS
6	2	FIX1, FIX2	FIX35	Foro fissaggio 3.5mm
7	2	JP1, JP4	NC	Strip femmina 2 pin
8	4	JP2, JP3, JP5, JP6	STF02S	Strip femmina 2 pin
9	1	JP7	STM06	Conn. (M) 90 gradi 6 pin P. 2.54

6.6 Exciters RF Switch (SL127SW1002)

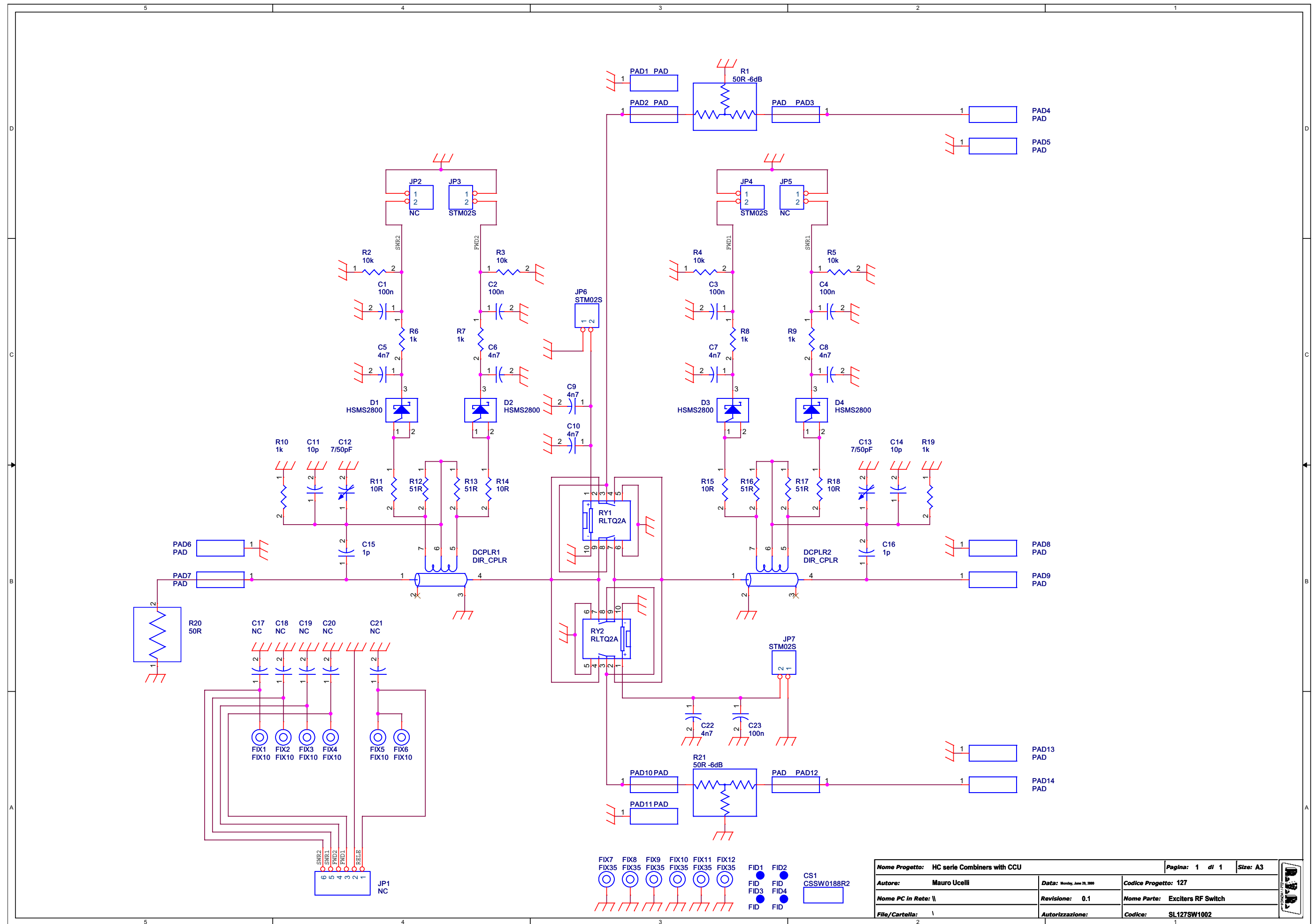


Exciters RF Switch
SL127SW1002

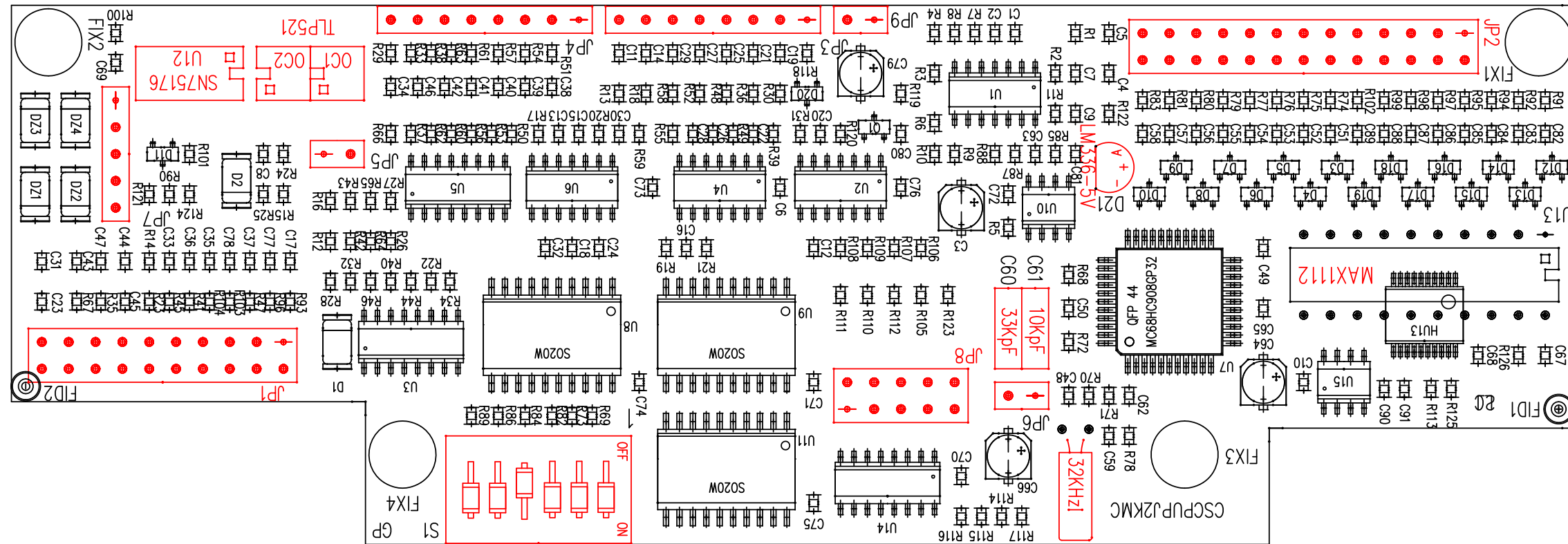
Item	Quantity	Reference	Part	Description
1	1	CS1	CSSW0188R2	Circuito stampato
2	5	C1,C2,C3,C4,C23	100nF	Cond. SMD 0805
3	7	C5,C6,C7,C8,C9,C10,C22	4.7nF	Cond. SMD 0805
4	2	C11,C14	10pF	Cond. SMD 0805 COG
5	2	C12,C13	7/50pF	Comp. var. Murata TZB4B
6	2	C15,C16	1pF	Cond. SMD 0805 COG
7	5	C17,C18,C19,C20,C21	NC	Cond. SMD 0805
8	2	DCPLR1,DCPLR2	DIR_CPLR	Accopp. direz.
9	4	D1,D2,D3,D4	HSMS2800	Diodo Shottky SOT23
10	4	FID1,FID2,FID3,FID4	FID	Fiducial CS
11	6	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6	FIX10	Foro Test Point 1mm
12	6	FIX7,FIX8,FIX9,FIX10, FIX11,FIX12	FIX35	Foro fissaggio 3.5mm
13	1	JP1	NC	Panduit maschio 6 pin
14	2	JP2,JP5	NC	Strip maschio 2 pin
15	4	JP3,JP4,JP6,JP7	STM02S	Strip maschio 2 pin
16	14	PAD1,PAD2,PAD3,PAD4,PAD5, PAD6,PAD7,PAD8,PAD9, PAD10,PAD11,PAD12,PAD13, PAD14	PAD	
17	2	RY1,RY2	RLTQ2A12V	Rele' TQ2
18	2	R1,R21	50R -6dB	RF -6dB 50R Attenuator
19	4	R2,R3,R4,R5	10K0	Res. SMD 0805
20	6	R6,R7,R8,R9,R10,R19	1K0	Res. SMD 0805
21	4	R11,R14,R15,R18	10H0	Res. SMD 0805
22	4	R12,R13,R16,R17	51H0	Res. SMD 0805
23	1	R20	50H	Termin. 1 fix 32-1157



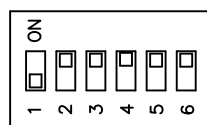
Exciter RF switch



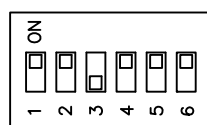
6.7 CPU board (CPUPJ2KMC)



CPU address



Cooling
Address 1



Combiner
Address 4

NOME PARTE: Scheda CPU

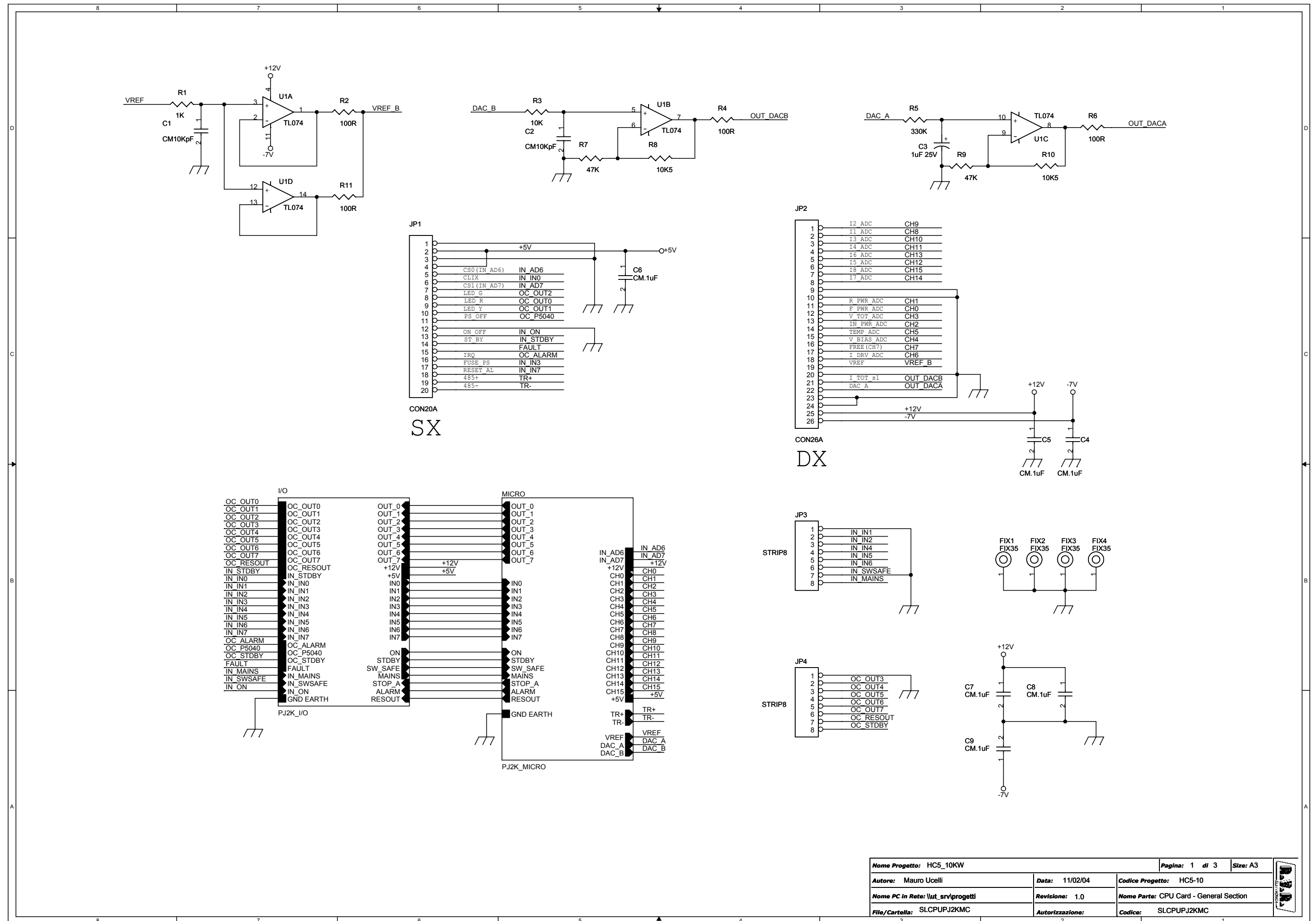
NOME PROGETTO: HC5/10



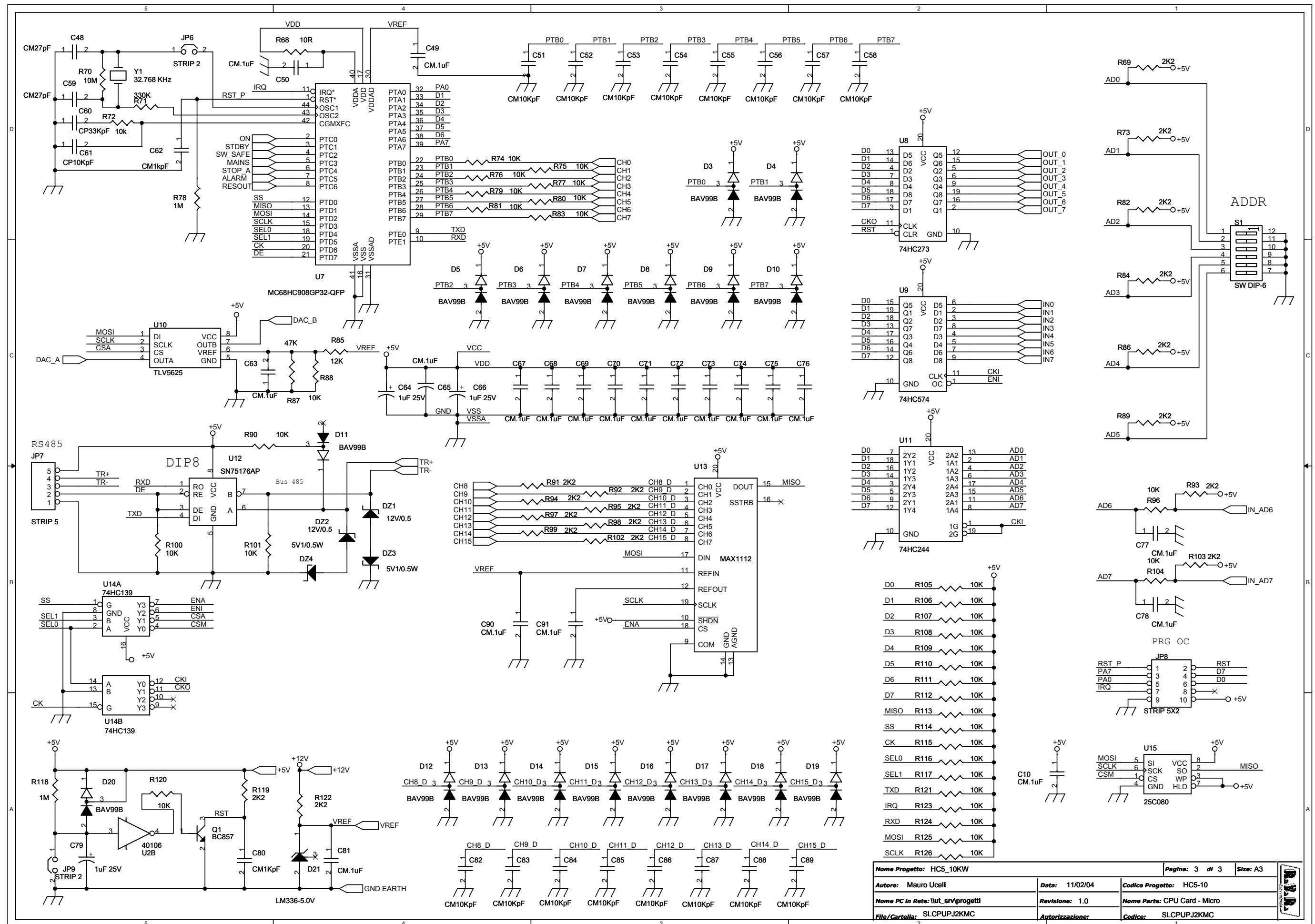
AUTORE:U.T. - Rev.: BERTI J. DATA:11/02/2004 REVISIONE: 1.0 SCALA:1:1 SIZE:A4 PAGINA:1 DI 1

ARCHIVIAZIONE ELETTRONICA:CARTELLA PROGETTI CODICE PROGETTO:014 CODICE DISEGNO:SLCPUPJ2KMC

MATERIALE: / TRATTAMENTO: / PROFILO: / STATO:ESECUTIVO





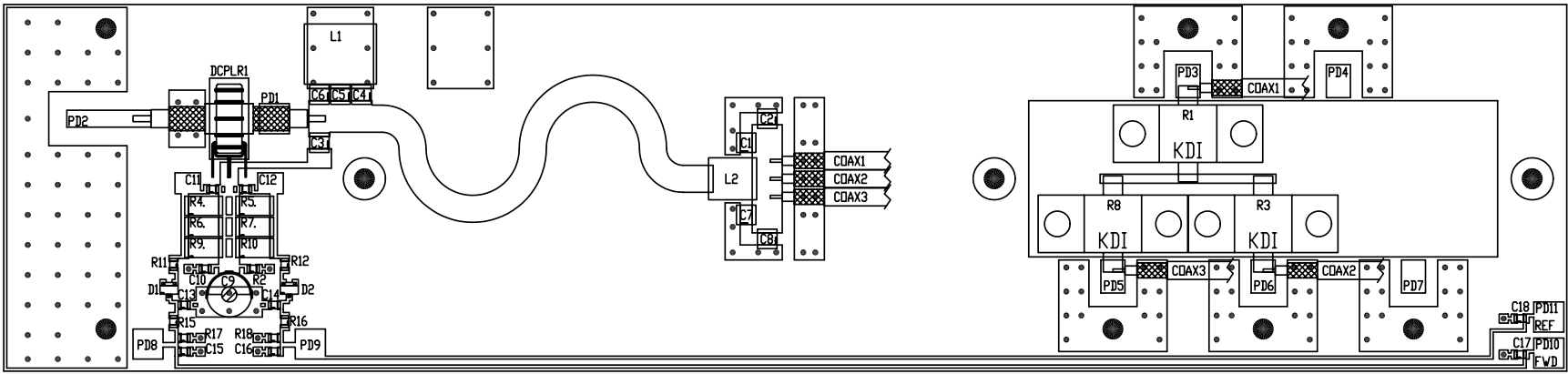


General Revised: Thursday, May 29, 2003
CSCPUPJ2KMC Revision: 1

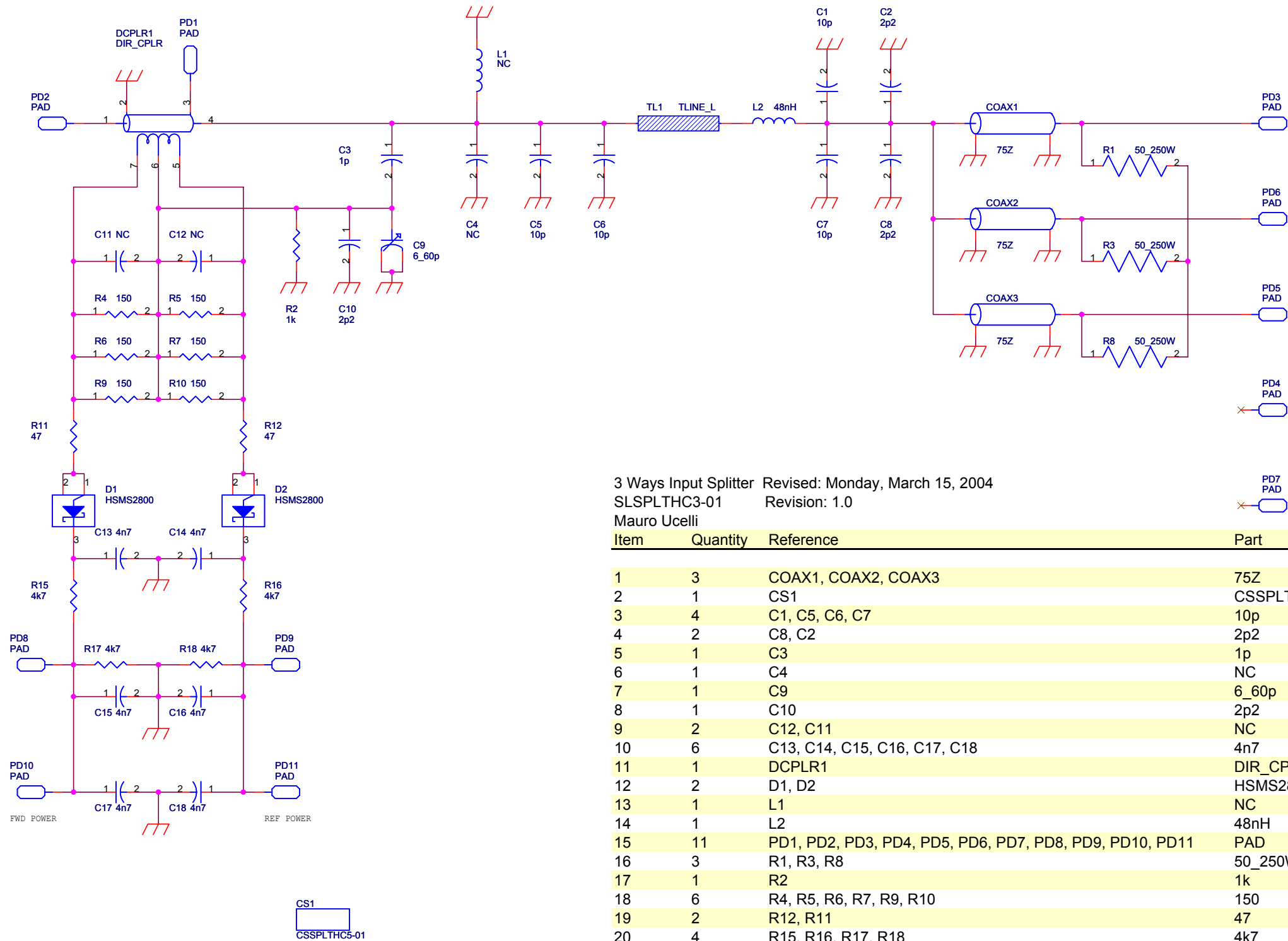
Item	Quantity	Reference	Part
1	18	C1, C2, C51, C52, C53, C54, C55, C56, C57, C58, C82, C83, C84, C85, C86, C87, C88, C89	CM10KpF
2	4	C3, C64, C66, C79	1uF 25V
3	38	C4, C5, C6, C7, C8, C9, C10, C12, C13, C15, C16, C18, C20, C22, C24, C26, C28, C30, C32, C49, C50, C63, C65, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C81, C90, C91	CM.1uF
4	25	C11, C14, C17, C19, C21, C23, C25, C27, C29, C31, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47	CM4K7pF
5	2	C48, C59	CM27pF
6	1	C60	CP33KpF
7	1	C61	CP10KpF
8	2	C62, C80	CM1KpF
9	2	DZ2, DZ1	12V/0.5
10	2	DZ4, DZ3	5V1/0.5W
11	2	D1, D2	1N4004
12	18	D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20	BAV99B
13	1	D21	LM336-5.0V
14	4	FIX1, FIX2, FIX3, FIX4	FIX35
15	1	JP1	CON20A
16	1	JP2	CON26A
17	2	JP4, JP3	STRIP8
18	3	JP5, JP6, JP9	STRIP 2
19	1	JP7	STRIP 5
20	1	JP8	STRIP 5X2
21	2	OC1, OC2	TLP521-1
22	1	Q1	BC857
23	5	R1, R14, R15, R24, R25	1K
24	4	R2, R4, R6, R11	100R
25	35	R3, R72, R74, R75, R76, R77, R79, R80, R81, R83, R88, R90, R96, R100, R101, R104, R105, R106, R107, R108, R109, R110, R111, R112, R113, R114, R115, R116, R117, R120, R121, R123, R124, R125, R126	10K
26	2	R71, R5	330K
27	15	R7, R9, R16, R17, R20, R21, R27, R31, R39, R43, R49, R55, R59, R65, R87	47K
28	2	R8, R10	10K5
29	30	R12, R13, R18, R19, R26, R30, R36, R42, R48, R52, R58, R64, R69, R73, R82, R84, R86, R89, R91, R92, R93, R94, R95, R97, R98, R99, R102, R103, R119, R122	2K2
30	28	R22, R23, R28, R29, R32, R33, R34, R35, R37, R38, R40, R41, R44, R45, R46, R47, R50, R51, R53, R54, R56, R57, R60, R61, R62, R63, R66, R67	22R
31	1	R68	10R
32	1	R70	10M
33	2	R118, R78	1M
34	1	R85	12K
35	1	S1	SW DIP-6
36	1	U1	TL074
37	3	U2, U4, U6	40106
38	2	U5, U3	ULN2004A
39	1	U7	MC68HC908GP32-QFP

Item	Quantity	Reference	Part
40	1	U8	74HC273
41	1	U9	74HC574
42	1	U10	TLV5625
43	1	U11	74HC244
44	1	U12	SN75176AP
45	1	U13	MAX1112
46	1	U14	74HC139
47	1	U15	25C080
48	1	Y1	32.768 KHz

6.8 Splitter board (SLSPLTHC3-01)

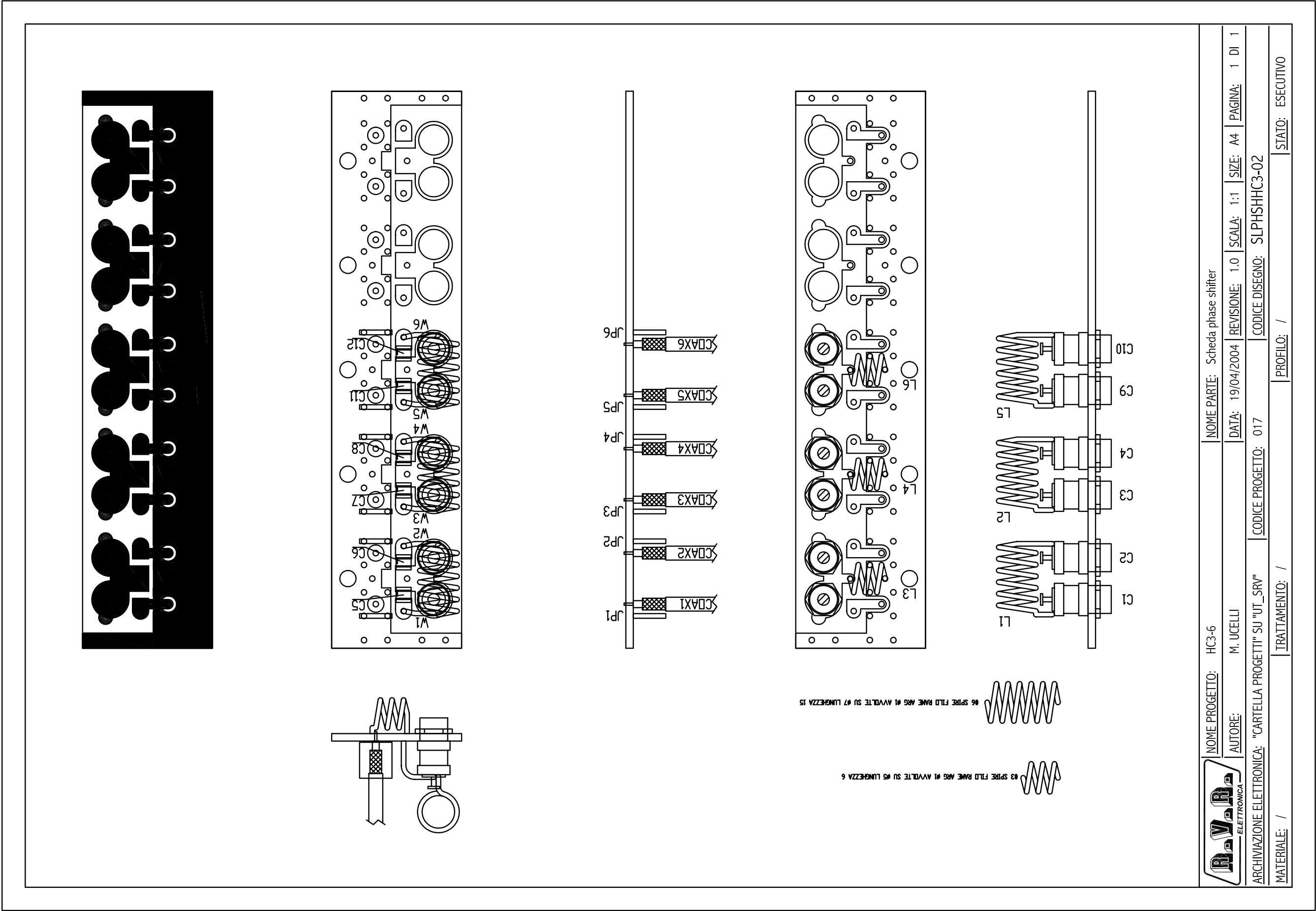


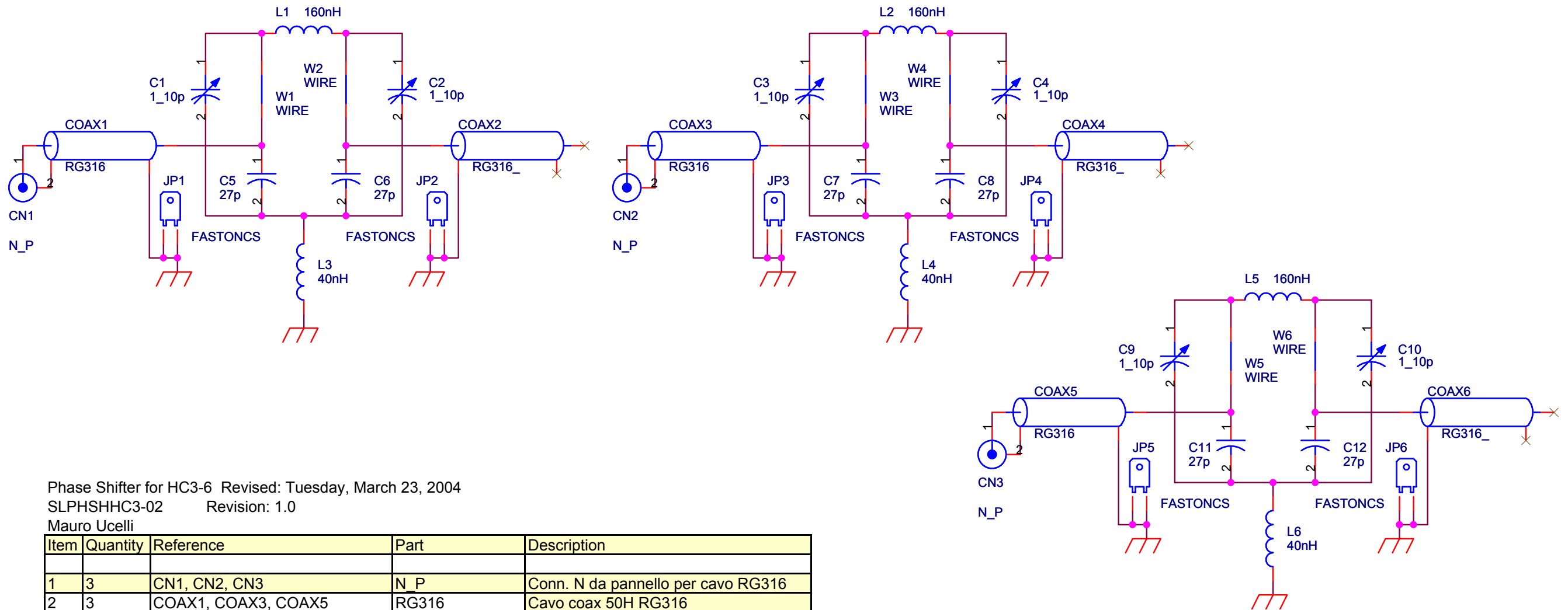
	NOME PROGETTO: HC3-6	NOME PARTE: SCHEDA SPLITTER PER HC3-6			
	AUTORE: M. UCELLI	DATA: 19/04/2004	REVISIONE: 1.0	SCALA: 1:1	SIZE: A3
ARCHIVIAZIONE ELETTRONICA: "CARTELLA PROGETTI" SU "UT_SRV"		CODICE PROGETTO: 017	CODICE DISEGNO: SLSPLTHC3-01		
MATERIALE: /	TRATTAMENTO: /	PROFILO: /	STATO: ESECUTIVO		



Nome Progetto: HC3-6		Pagina: 1 di 1	Size: A3
Autore: Mauro Ucelli	Data: 19/04/04	Codice Progetto: HC3-6	
Nome PC in Rete: \WUT_SRV\Progetti	Revisione: 1.0	Nome Parte: 3 Ways Input Splitter	
File/Cartella:	Autorizzazione:	Codice: SLSPLTHC3-01	

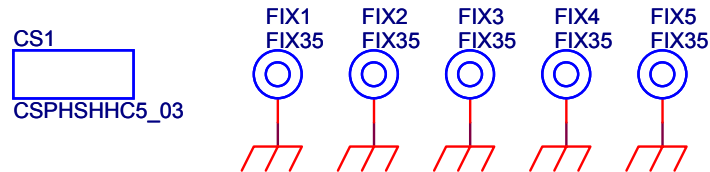
6.9 Phase shifter (SLPHSHHC3-02)





Phase Shifter for HC3-6 Revised: Tuesday, March 23, 2004
SLPHSHHC3-02 Revision: 1.0
Mauro Ucelli

Item	Quantity	Reference	Part	Description
1	3	CN1, CN2, CN3	N_P	Conn. N da pannello per cavo RG316
2	3	COAX1, COAX3, COAX5	RG316	Cavo coax 50H RG316
3	3	COAX2, COAX4, COAX6	RG316_	Cavo coax 50H RG316 (595mm)
4	1	CS1	CSPHSHHC5_03	Circuito stampato
5	6	C1, C2, C3, C4, C9, C10	1_10p	Comp. var. ad aria Tekelek 6mm
6	6	C5, C6, C7, C8, C11, C12	27p	Cond. SMD 1212 HQ
7	5	FIX1, FIX2, FIX3, FIX4, FIX5	FIX35	Foro fissaggio 3.5mm
8	6	JP1, JP2, JP3, JP4, JP5, JP6	FASTONCS	Faston da CS p. 5.08
9	3	L1, L2, L5	160nH	Induttanza cilindrica
10	3	L3, L4, L6	40nH	Induttanza cilindrica
11	6	W1, W2, W3, W4, W5, W6	WIRE	Filo a saldare



Nome Progetto: HC3-6		Pagina: 1 di 1	Size: A4
Autore: Mauro Ucelli	Data: 19/04/04	Codice Progetto: 017	
Nome PC in Rete: \\UT_SRV\Progetti	Revisione: 1.0	Nome Parte: Phase Shifter for HC3-6	
File/Cartella: Esecutivi\Schemi Elettrici\SLPHSHHC3-02	Autorizzazione:	Codice: SLPHSHHC3-02	

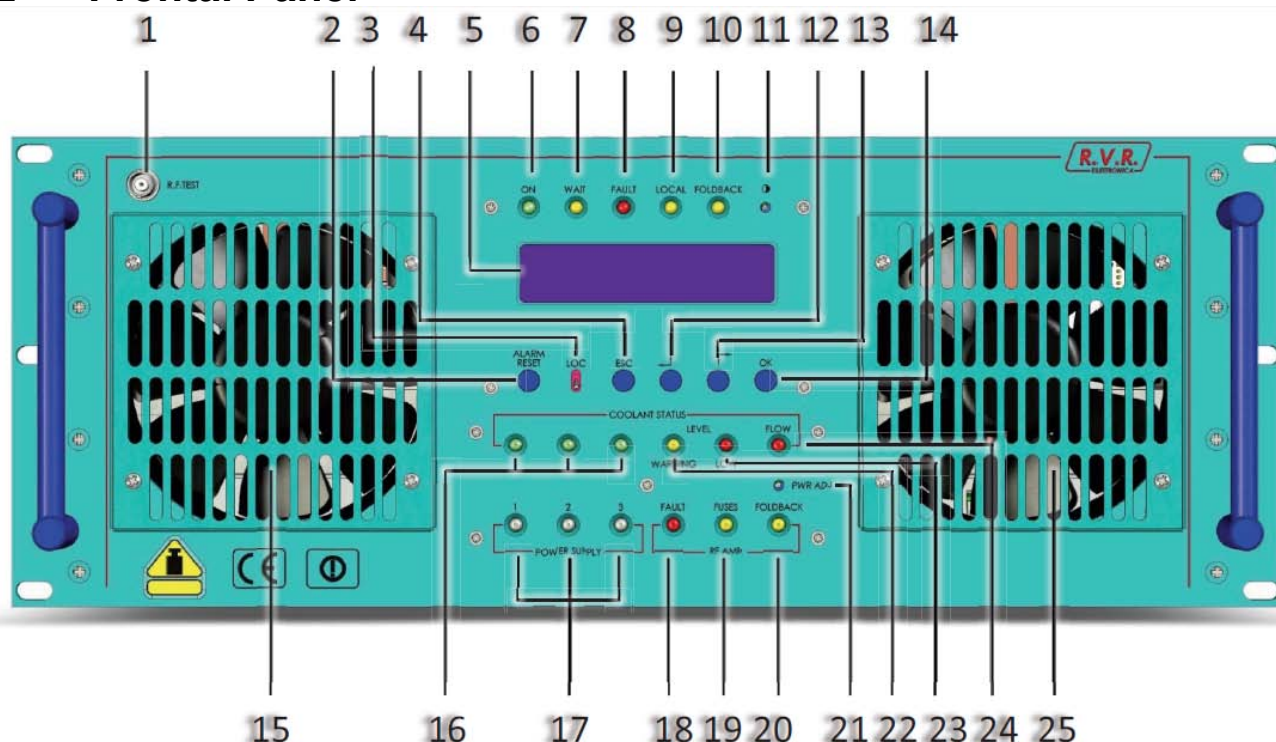
7. PJ5000U-KLC amplifier (alias Barracuda)

7.1 Description

The PJ5000U-KLC is an RF amplifier for frequency modulation sound broadcasting with a max. rated output of 5400W.

It is a fully solid-state apparatus of modern design that use MOSFET as active components in the FM amplifying modules, and for the cooling it uses of the coolant rather than forced air. The amplifier is designed in only 4 units for assembly in a 19" rack., is controlled by a micro-processor-based system.

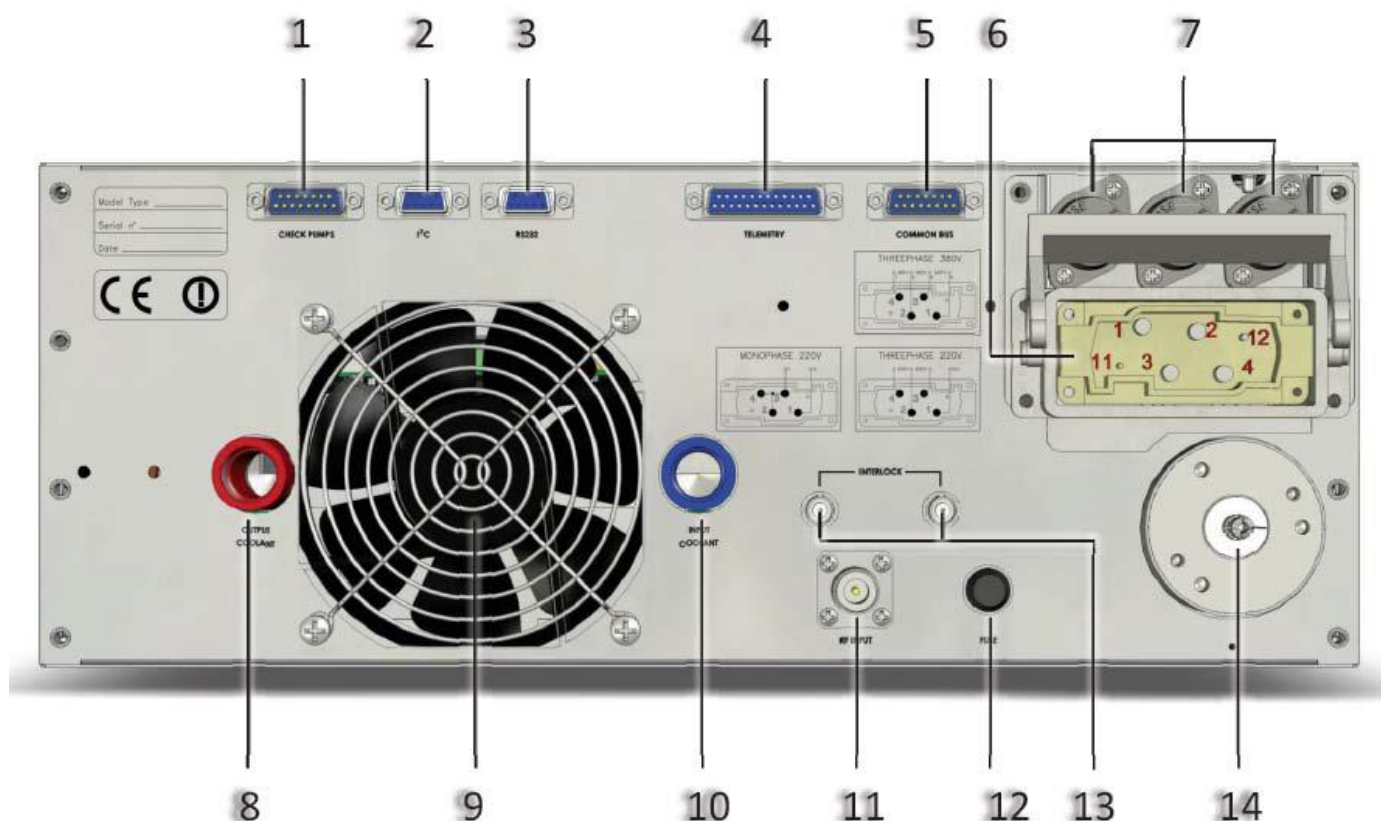
7.2 Frontal Panel



1	RF TEST	BNC connector for RF monitor output. The output level is -60dB referred to the power output in 87.5 - 108 MHz range
2	ALARM RESET	Button used to manually reset the protection system
3	LOC/REM	Switch to select the local or remote control modes
4	ESC	Button used to exit from a menu
5	DISPLAY	LCD Display
6	ON	Green LED. Indicates that the amplifier is in ON condition
7	WAIT	This LED indicates the status of waiting (the amplifier is temporarily disabled, but will be reactivated automatically when the blockage is removed, or after a set period of time depending on the type of protection)
8	FAULT	This LED indicates a fault (the amplifier is blocked, and required the intervention of an operator for the restoration). Requires pressing the button ALARM RESET
9	LOCAL	Yellow LED, indicating that the amplifier is in local control mode
10	FOLDBACK	Yellow LED, indicating that the foldback function is active (automatic reduction of the distributed power, run by the micro board inside the module)

11		Trimmer to regulate the contrast of the LCD display
12		Click this button to scroll inside a menu (to the right or down) or to reduce the value of a parameter being modified.
13		Click this button to scroll inside a menu (to the left or up) or to increase the value of a parameter being modified.
14	OK	Click this button to access a sub-menu, to enter the editing mode or to confirm a modified value.
15-25	AIR FLOW	Grill for the ventilation flow passage
16	COOLANT STATUS A-B-C	The green LED indicates correct operation of pumps (A e B) and external unit fan (C). These LEDs are active only when the module is single and is configured as "Master" that handles the exchange of the pumps and the fan on the external unit (TX5000U-KLC). For configurations TX10000U-KLC or higher, the module is configured as "slave", is the CCU who runs everything and the LEDs indicate: A - no indication, B - internal fans lit, C - no indication
17	POWER SUPPLY 1-2-3	When the LED is yellow indicates the presence of an anomaly in one or more in power supply, the module continues to operate but the power is reduced. When the LED is red indicates that its power supply is broken, the module continues to operate but the power is reduced.
18	FAULT	This red LED indicates a fault (the amplifier is blocked, and required the intervention of an operator for the restoration)
19	FUSES	Yellow LED that indicates the presence of one or more blown fuses on the board fuses, see cap. 8.17
20	FOLDBACK	Yellow LED, indicating that the foldback function is active (automatic reduction of the distributed power, run by the CPU inside the module).
21	RF PWR ADJ	Trimmer adjustment of the output power of a single module, this control operates by varying the VPA pallet mosfet
22	WARNING	Yellow LED, indicates that the coolant level in the tank the external unit has reached the minimum level (only active for transmitter TX5000U-KLC)
23	LOW	Red LED indicates that the tank of the external unit is empty, and requires the immediate stopping of the machine (only active for transmitter TX5000U-KLC)
24	FLOW	Red LED indicates a malfunction due to the absence of coolant flow (only active for transmitter TX5000U-KLC)

7.3 Rear panel



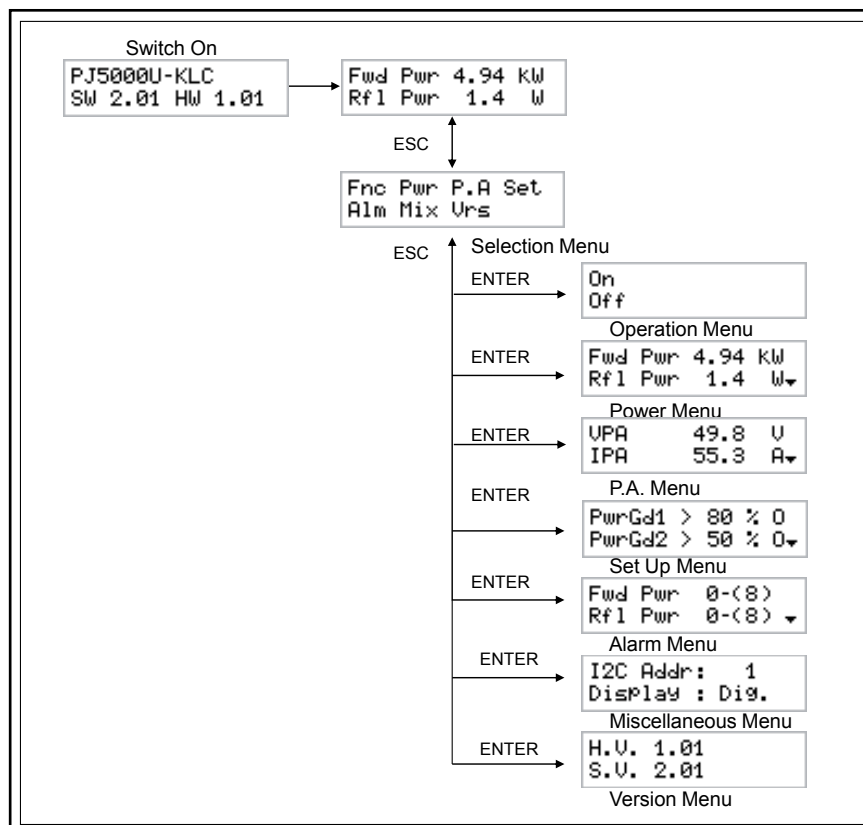
1	PUMPS INTERFACE	DB15 connector for the management of the pump control board (only used in the transmitter TX5000U-KLC)
2	I2C BUS	DB9 connector for I2C bus networking
3	RS232	DB9 connector to interface with external devices or factory programming
4	TELEMETRY	DB25 telemetry connector
5	COMMON BUS	DB15 connector for interfacement with other equipment, for example, the CCU
6	MAINS CONNECTOR	Plug for mains power supply
7	MAINS FUSE	Protection fuses of the power supplies 1,2 and 3
8	OUTPUT COOLANT	Hydraulic connector for the output of liquid cooling (1/2 ")
9	AIR FLOW	Grill for the ventilation flow passage
10	INPUT COOLANT	Hydraulic connector for the input of liquid cooling (1/2 ")
11	RF IN	RF input connector ("N" type)
12	FUSE	Protection fuse for the service section
13	INTERLOCK	BNC connectors to inhibit an external device, as an exciter. In case of fault, the inner connector is shorted to ground
14	RF OUT	RF output connector (7/8" EIA flange)

7.4 Software

This chapter describes the ways in which the microprocessor controls the amplifier and how the user may interact with the software.

The figure in the follow shows the overall software user interface diagram.

Note: the user may issue commands to the equipment only when in LOCAL mode by means of the selector. Otherwise the user may only read the parameters and not change them.



When turned on, the LCD shows the introductory screenful with the equipment's software and hardware versions.

```
PJ5000U-KLC
SW 2.01 HW 1.01
```

A few seconds later the main screenful is displayed indicating the forward and reflected power values. The following figure shows the complete aspect of this screen, as will the next (visible on the display are only two rows at a time, use the UP 'and DOWN' to display all information):

```
Fwd Pwr 4.94 kW
Rfl Pwr 1.4 W
InP Pwr 85 W
SWR Off
```

Press the ESC key to view the selection screenful from which to access all the menus:

Fnc Pwr P.A Set
Alm Mix Urs

To access one of the submenus select its name (which is underlined by a blinking cursor) using the RIGHT or LEFT keys and then press the ENTER key.

Take note that certain parameters, which are measured and shown to the user, might not be available in a few cases. This occurs when, for physical reasons, the measured values are not significant for control software internal use.

When the value of a parameter is not available for the aforesaid reason, symbol “===” appears on the display in lieu of the value.

7.4.1 Operating Menu (Fnc)

On
Off

Turn the power amplifier ON or OFF via this menu..

When the amplifier is turned OFF, the internal conductor of the INTERLOCK connector is set to ground so as to force the connected exciter to a stand-by condition (this takes place only if the exciter features the interlock option, like those produced by RVR, and if the associated connector is connected to the amplifier).

When the amplifier is turned OFF the software program waits 5 minutes for the machine to cool down and then the fans and pumps turn OFF.

7.4.2 Power Menu (Pwr)

This screen, made up of several lines that may be scrolled through using the UP and DOWN keys, displays all the measurements associated with the behaviour of the amplifier's power section:

- Forward Power (Fwd Pwr)
- Reflected Power (Rfl Pwr)
- Input Power (Inp Pwr)
- SWR (Standing Wave Ratio)

Fwd Pwr	4.94	kW
Rfl Pwr	1.4	W
Inp Pwr	85	W
SWR	Off	

7.4.3 Power Amplifier Menu (P.A.)

This screen, consisting of several lines that may be scrolled through by using the UP and DOWN keys, displays all the measurements associated with the RF amplifier of the equipment:

- Voltage (VPA)
- Current (IPA)
- Temperature
- Power Supply Voltage (Mains-percentage variation as compared to the nominal voltage)
- Efficiency

VPA	49.8	V
IPA	55.3	A
Temp.	38.3	°C
Mains	+1	%
Eff.	68.3	%

7.4.4 Warning threshold setting menu (Set)

As mentioned in the introduction the amplifier offers three settable warning thresholds. Each one is compared with the level of one of the machine's operating parameters. The results of the comparison are available on the telemetry connector, on the contacts of the optional external telemetry card and may be read on the display as "O" (open, i.e. false result) or "C" (closed, i.e. real result).

The three settable thresholds (Power Good) refer to the emitted power level. The thresholds are expressed in terms of percentage of full scale of greatness considered.

The limit voltages of the quantities monitored by the warning thresholds for are the follows:

- Forward Power 5000 W
- Forward Power 300 W

Proceed as follows to change the values of the warning thresholds:

- Select the line to be changed (with the UP and DOWN keys)
- Press the ENTER key
- Change the threshold value (UP and DOWN keys)
- Press ENTER to confirm

The figure below shows a configuration example of this menu.

Set	Lmt	St
PwrGd1	> 80 %	C
PwrGd2	> 50 %	0
PwrGd3	> 50 %	0

In this example the alarm thresholds are as follows:

- PwrGd1 4000 W (80% x 5000 W)
- PwrGd2 2500 W (50% x 5000 W)
- PwrGd3 150 W (50% x 300 W)

7.4.5 Alarm Menu (Alm)

This menu provides information about the status of the amplifier's built-in protection system.

It consists of a certain number of lines each of which contains the name of the variable controlled by the protection system and the type of intervention carried out by the system.

Said intervention may be as follows: X - (Y), Wait, or Dis. (Disabled).

The aspect of this menu is as follows:

Fwd Pwr	0-(8)
Rfl Pwr	0-(8)
InP Pwr	0-(8)
U.P.A.	Dis.
I.P.A.	0-(8)
Mains	Wait
SWR	Dis.
Eff.	Dis.
Inhibit	Off
R.F. Alarm	Off
H2O Press.	Off

The task of this menu is essentially to help the technician in identifying the possible causes of any malfunction.

7.4.6 Miscellaneous Menu (Mix)

In this menu the user may:

- set the address in the serial bus connection, type I2C
- set the main menu display mode
- exchange the operation pump

```

Item:
IIC Addr:   1
Display : Dig.
Pump:       <2>
  
```

The network address I2C is very important when the amplifier is connected in an RVR transmission system that envisages the use of this protocol. Do not change it for any reason whatsoever.

The main menu may be displayed either in Digital mode (this is the standard mode) or Analog mode:

```

Rf1 Pwr  1.4 ▴
■■
  
```

In the analog display mode the bar at the bottom shows the instant reflected power level, while the small triangle indicates the 100% of full scale of the bar.

This type of display might be useful when a device to be tuned is connected to the amplifier's output such as a cavity.

WARNING: this procedure for the exchange both manual and automatic pumps occurs only if the module is configured as “master” and is single (TX5000U-KLC). From the transmitter TX10000U-KLC forward all this is handled only by the CCU.

The pump is exchanged automatically every time you switch off and subsequently re-switch on the equipment. In case you never switch off the equipment, the pump is exchanged automatically every 10 days of normal operation.

The operation of pumps exchange is necessary for the regular functioning of the same.

In case of a fault on pump pressure, and then an interruption of the cooling flow, after 10 seconds is recorded by the machine which starts the operations of exchange pumps.

Note: the delay of 10 seconds is necessary to prevent the record of false positives as a momentary pressure drop due to air bubbles in the cooling system.

The machine will continue to exchange the pumps every two minutes, until the situation that caused the alarm is resolved.

After six minutes the equipment goes in a WAIT condition, and will be reported through the red YELLOW on the front, in the meanwhile the machine will continue to exchange pumps every 2 minutes in order to resolve the alarm condition.

Note: Please resolve as soon as possible the condition that brought the equipment to the alarm, this to restore the correct operation. Check the LEDs indicators on the front panel, or check the ALARM menu, to see which alarm condition has brought to the halt of the machine.

In the event that only one of two pumps work correctly, and then exchange pumps can not be done, will be reported into display PUMP FAILED after 3 minutes of the failed attempt.

Note: Please resolve as soon as possible replacing the faulty pump.

7.4.7 Version Menu (Vrs)

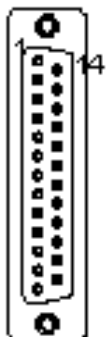
This screenful shows the software version and the hardware version of the equipment.

```
Software Ver.  
LCFPA-000101  
03.03 25-11-09  
Hardware Ver.  
03.12
```

7.5 Connector Description

7.5.1 Telemetry

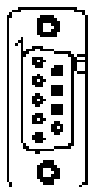
Type: DB25 female



1	Internal SWR	Disable
2	Tensione dell' amplificatore di potenza RF	3,9V x 50V
3	GND	GND
4	Reflected Power	4.3V x 300W
5	Interlock	
6	Check Pumps	
7	GND	GND
8	"On" Command	
9	Set 1	
10	WAIT	
11	Reset alarm	
12	OFF	
13	Interlock	
14	Temperature	3.9V x 100°C
15	RF power amplifier current	3.9V x 200A
16	Forward Power	4.3V x F.S.
17	FAULT	
18	Set 3	
19	Input power	3.9V x 150W
20	"OFF" Command	
21	GND	GND
22	Set 2	
23	LOC	
24	+Vcc	
25	ON	

7.5.2 RS 232

Type: DB9 female



1	NC
2	TX_D
3	RX_D
4	Internally connected with 6
5	GND
6	Internally connected with 4
7	Internally connected with 8
8	Internally connected with 7
9	NC

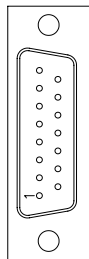
7.5.3 I²C



Type: DB9 female

1	NC	
2	SDA	Serial Data Serial Clock
3	SCL	
4	NC	
5	GND	GND
6	NC	
7	NC	
8	NC	
9	NC	

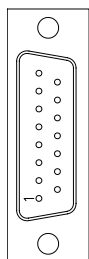
7.5.4 Common Bus



Type: DB15 male

1	GND
2	485+
3	485-
4	GND
5	ON OFF C
6	INP PWR
7	ST BY
8	IRQ
9	GND
10	PWR REG
11	GND
12	NC
13	NC
14	NC
15	NC

7.5.5 Pumps Interface

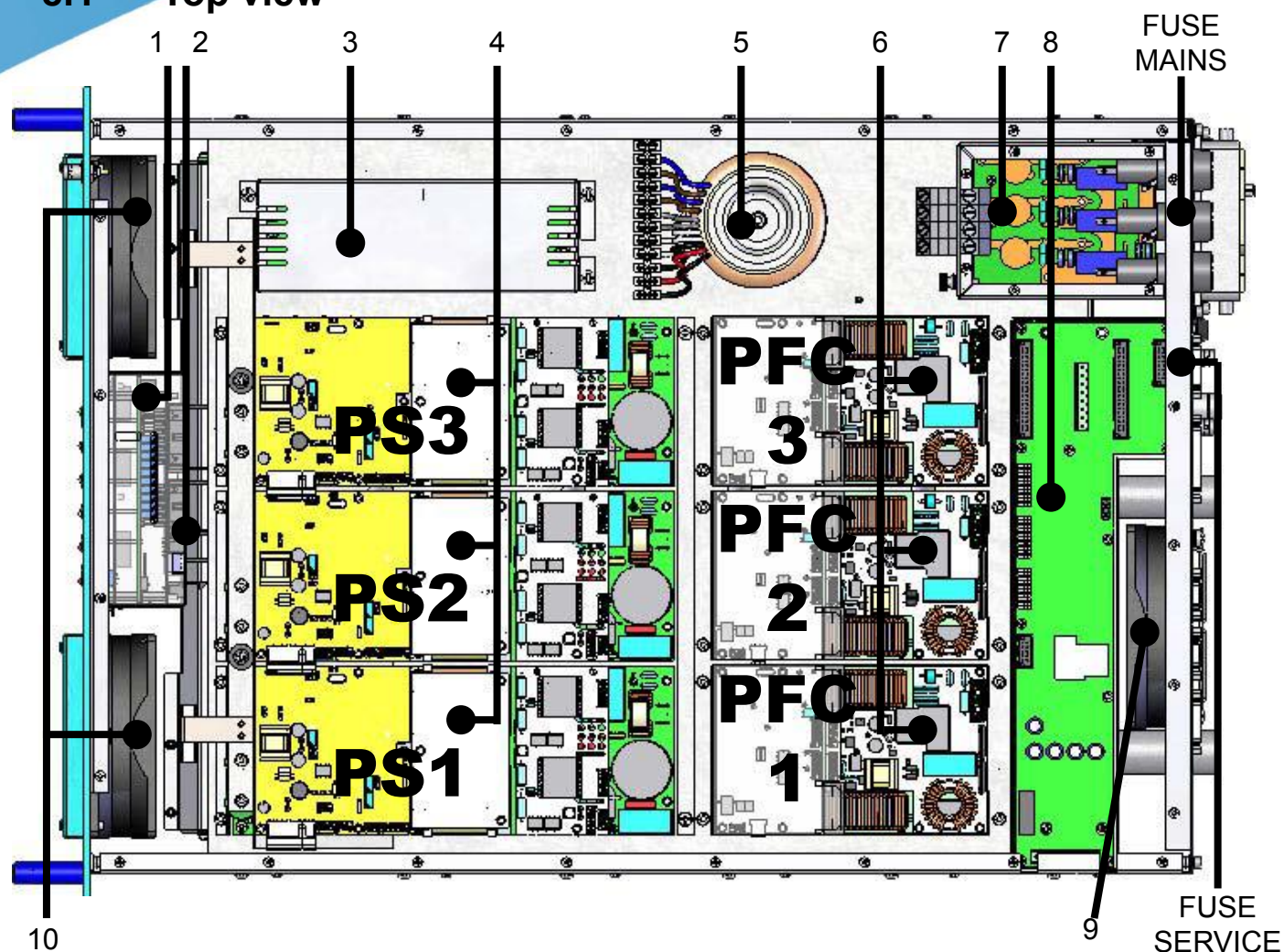


Type: DB15 male

1	NC	
2	ON	Pumps 1 ON/OFF command
3	GND	
4	NC	
5	ON	Pumps 2 ON/OFF command
6	GND	
7	NC	
8	NC	
9	GND	
10	GND	
11	FAN	Radiator fan check
12	H2OWARN	Minimum level of coolant in the tank
13	H2OMIN	Empty tank
14	FLUX	Coolant flow
15	NC	

8. PJ5000U-KLC wiring diagrams

8.1 Top view



1	ProtF board	PROTPJ154
2	Addon board	SL154IN2001
3	Low-Driver Power board	SLDR0066R02V01C
4	Power supply	KPSL4280.LC
5	Services transformer	TRFSERVM5KWH20
6	PFC	KPFCPSL4280.LC
7	Surge protection board	SL046SR1002
8	PS-RF interface board	SLINPSP2K07
9	Rear fan air intake	VTL9GL1224J102
10	Front fans air injection	VTL9G1224J102

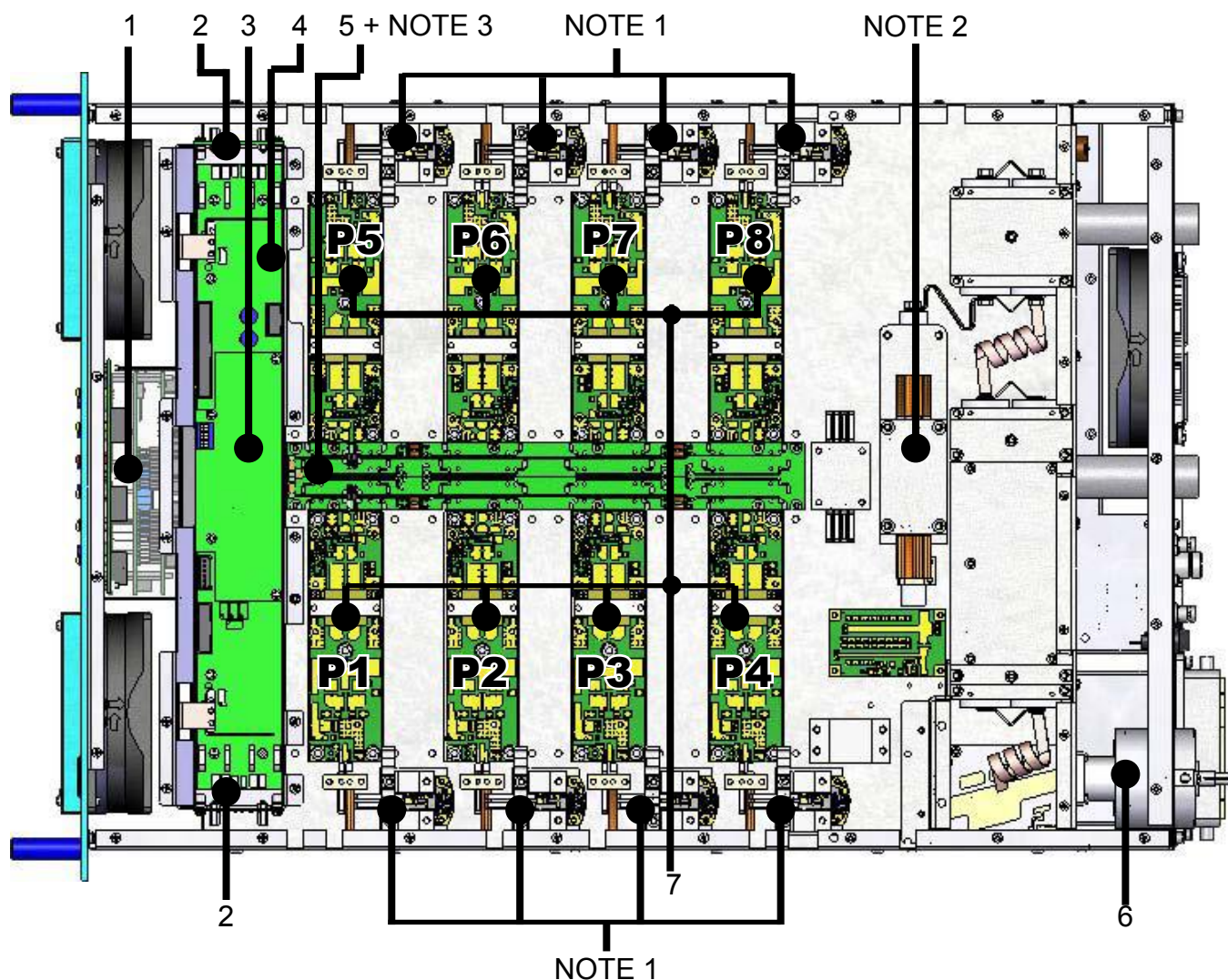
FUSE MAINS

380 V THREEPHASE	3 X 25 A
220 V THREEPHASE	3 X 32 A

FUSE SERVICE

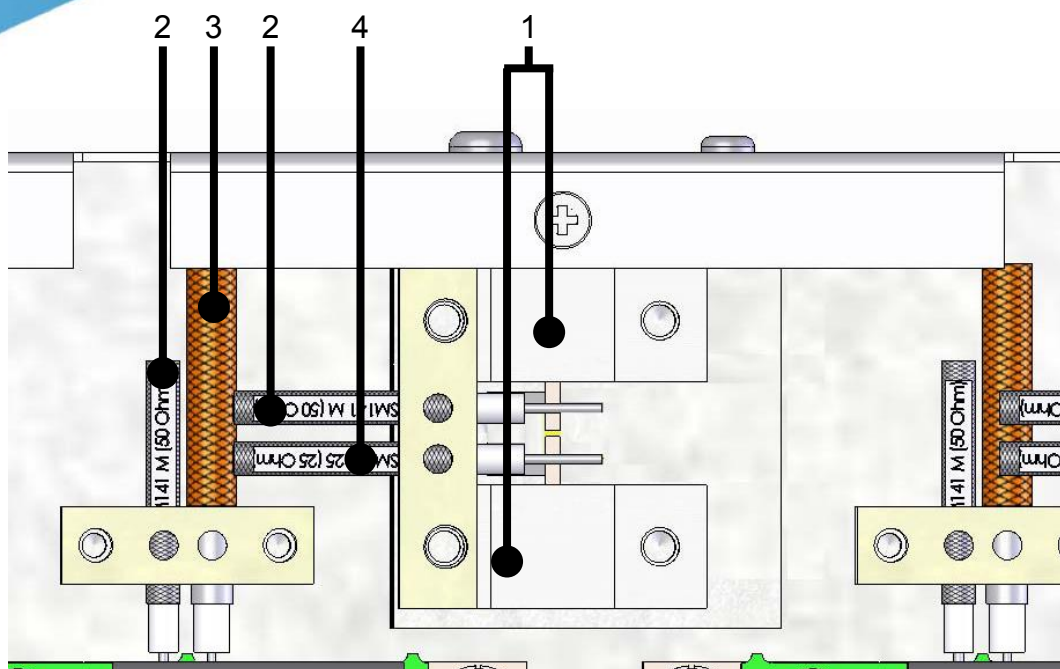
380 V THREEPHASE	1 X 6,3 A
220 V THREEPHASE	1 X 6,3 A

8.2 Bottom view



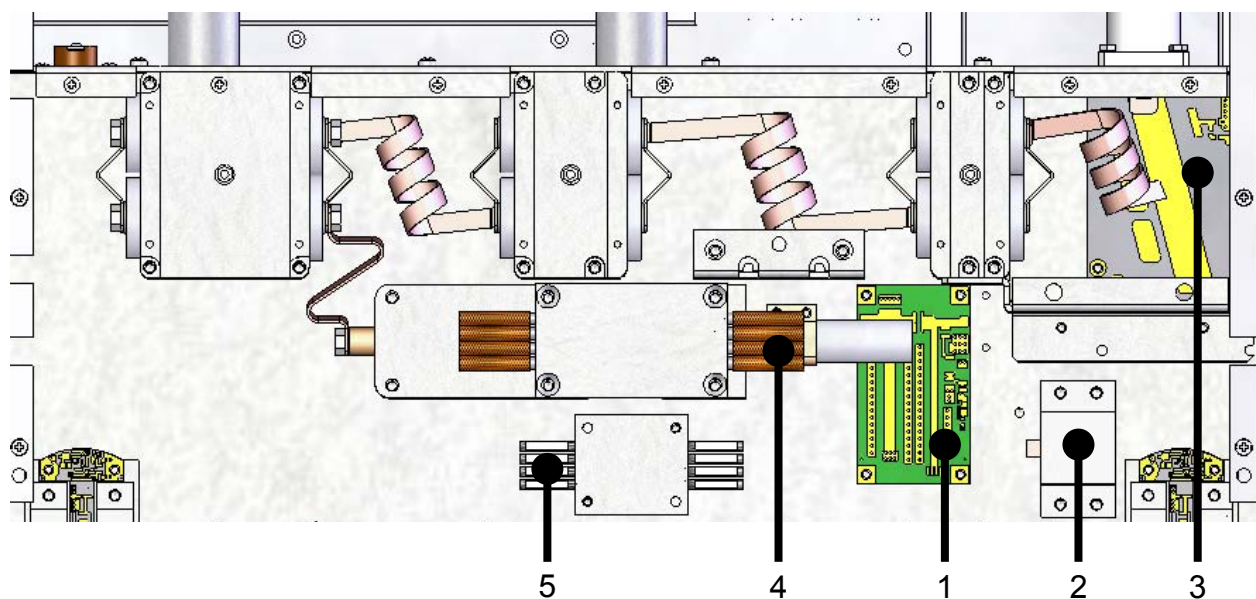
1	LED board	SL154LD1001
2	Pass-Through board	SLFILPSPJ2K1
3	CPU board	CPUPJ2KMC
4	Bias board	SLMTPRTPJ4K1
5	8 way splitter + bias distribution (see NOTE 3)	KKSPJ245A
6	Power Meter FWD e RFL board	SL042MT1501
7	Amplifiers module - pallet mosfet	KKFIN237H

NOTE 1 - COMBINER



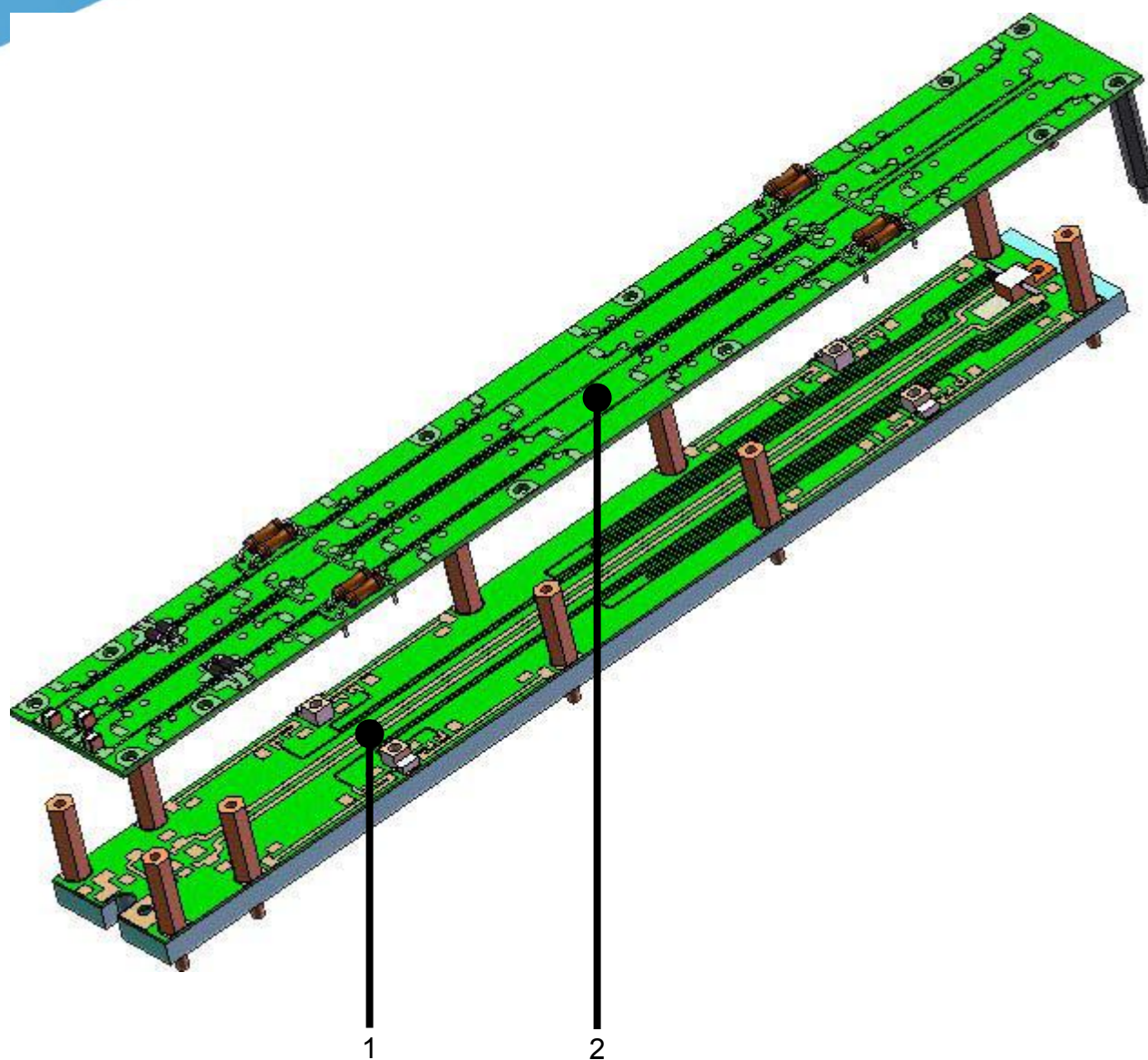
1	KDI resistor 100 Ω 500 W (termination)	RDT500J0100
2	50 Ω conformable cable	CAVSM141-M50
3	RG-302 75 Ω cable	CAVRG302-75
4	25 Ω conformable cable	CAVSM141-25

NOTE 2 - COMBINER/OUT FILTER

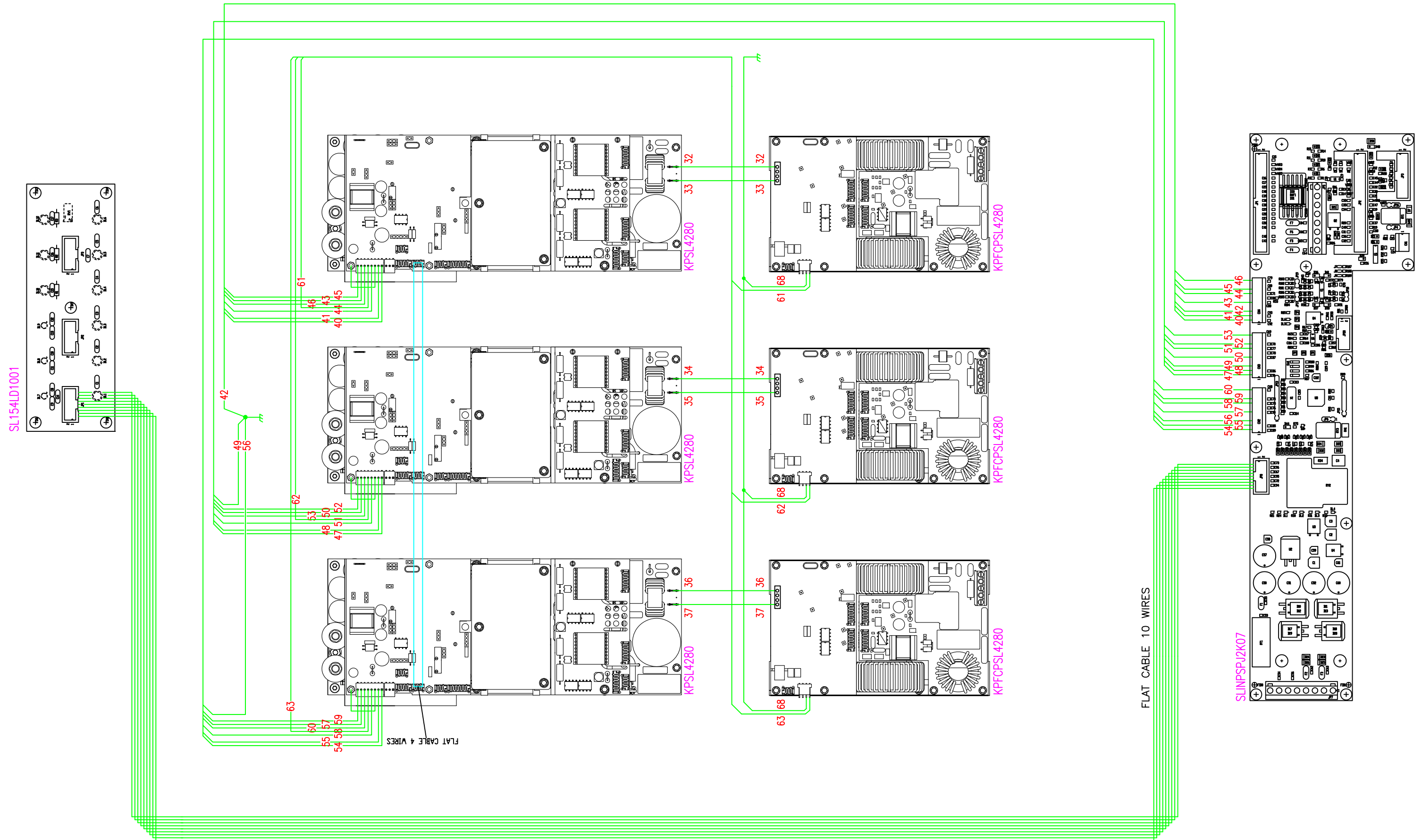


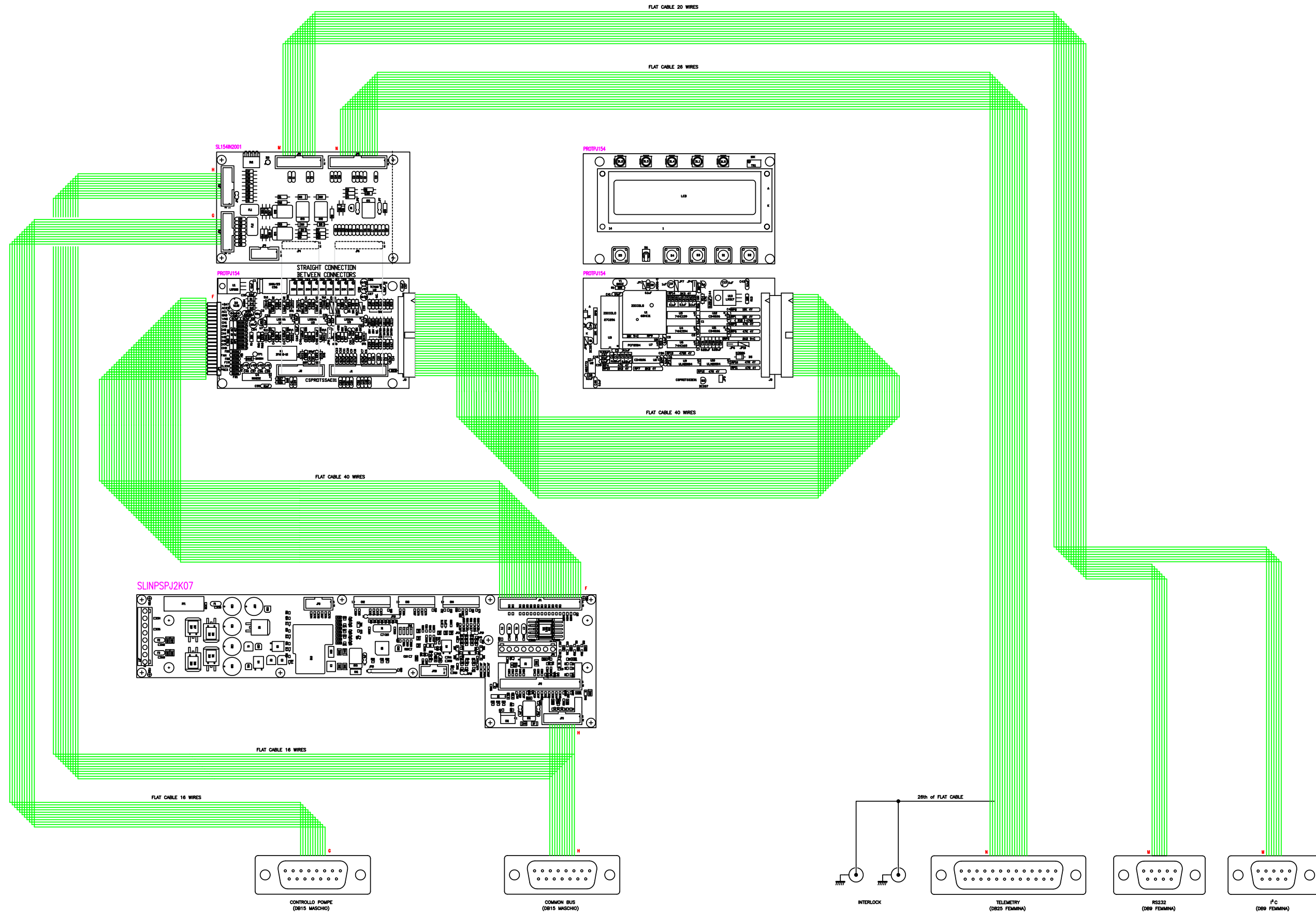
1	Printed circuit board	CSFI0350R1
2	KDI resistor 50 Ω 800 W (termination)	RDT800J0050H
3	Printed circuit board	CSOP0338R2
4	RG-302 75 Ω cable	CAVRG302-75
5	25 Ω comformable cable	CAVSM141-25

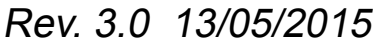
NOTE 3 - SPLITTER + BIAS DISTRIBUTION

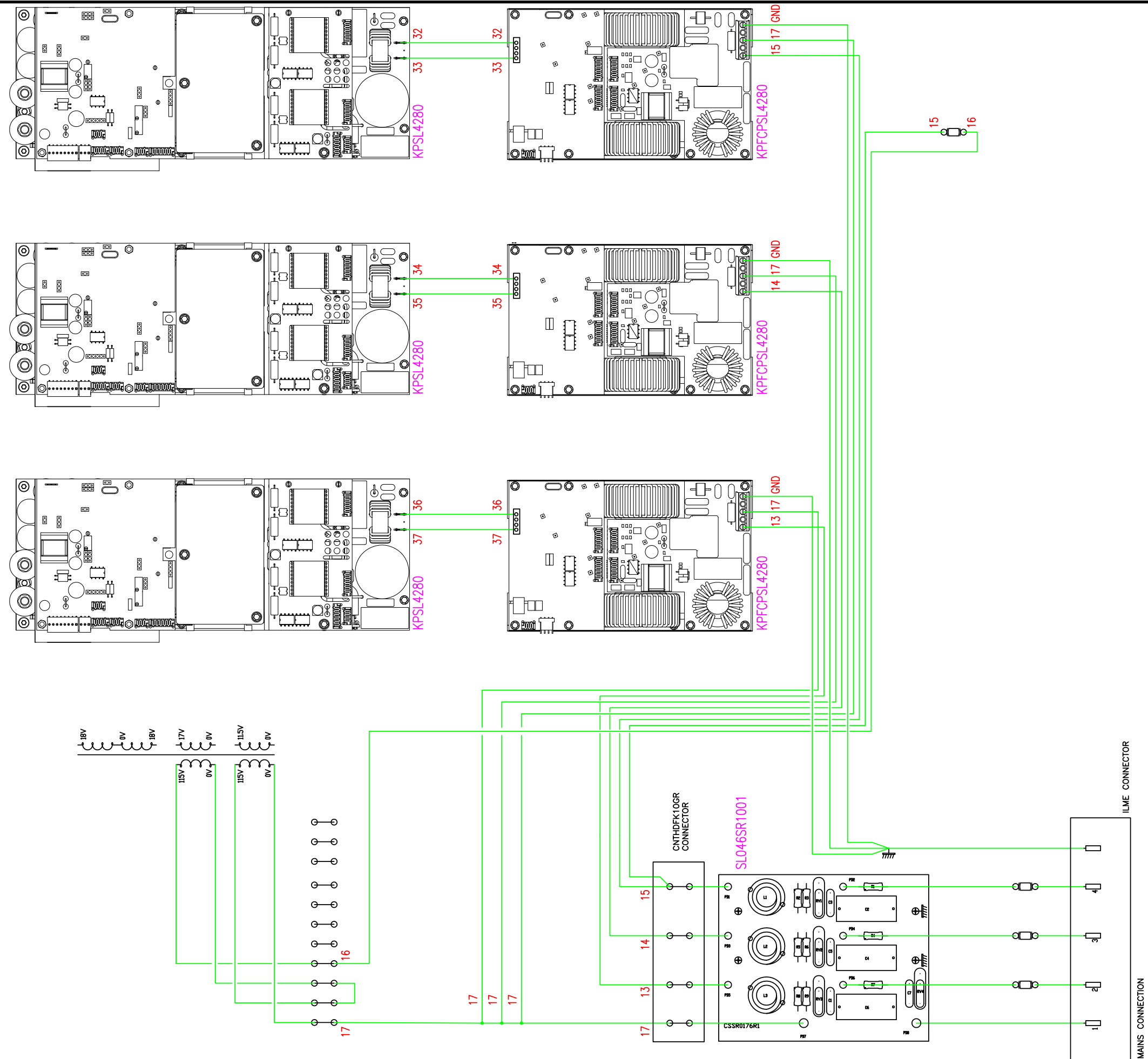


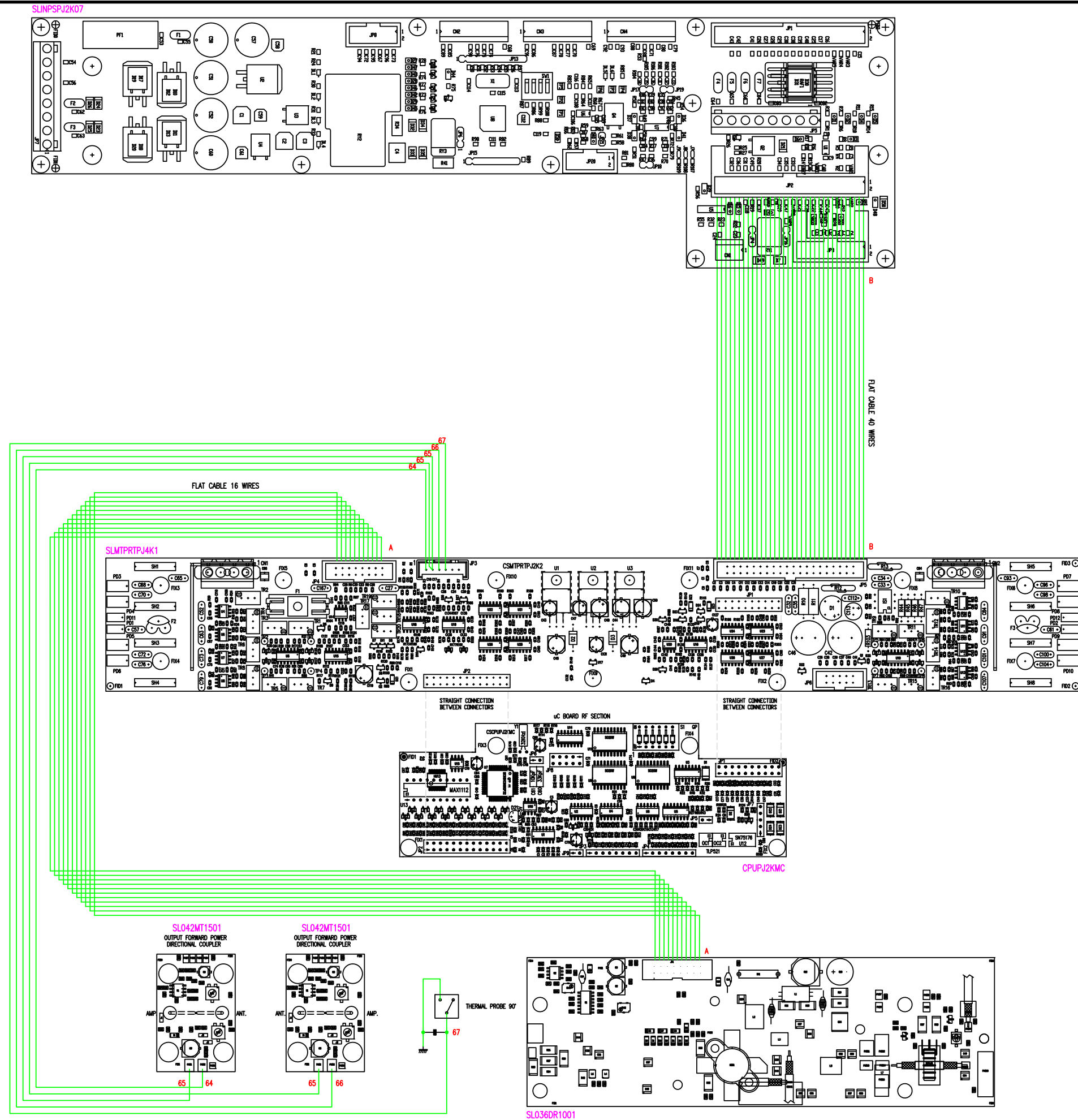
1	8 way splitter	SLSP0387R01V01	} KKSPL245A
2	Bias distribution 8 PA RF	SLIN0388R01V01	



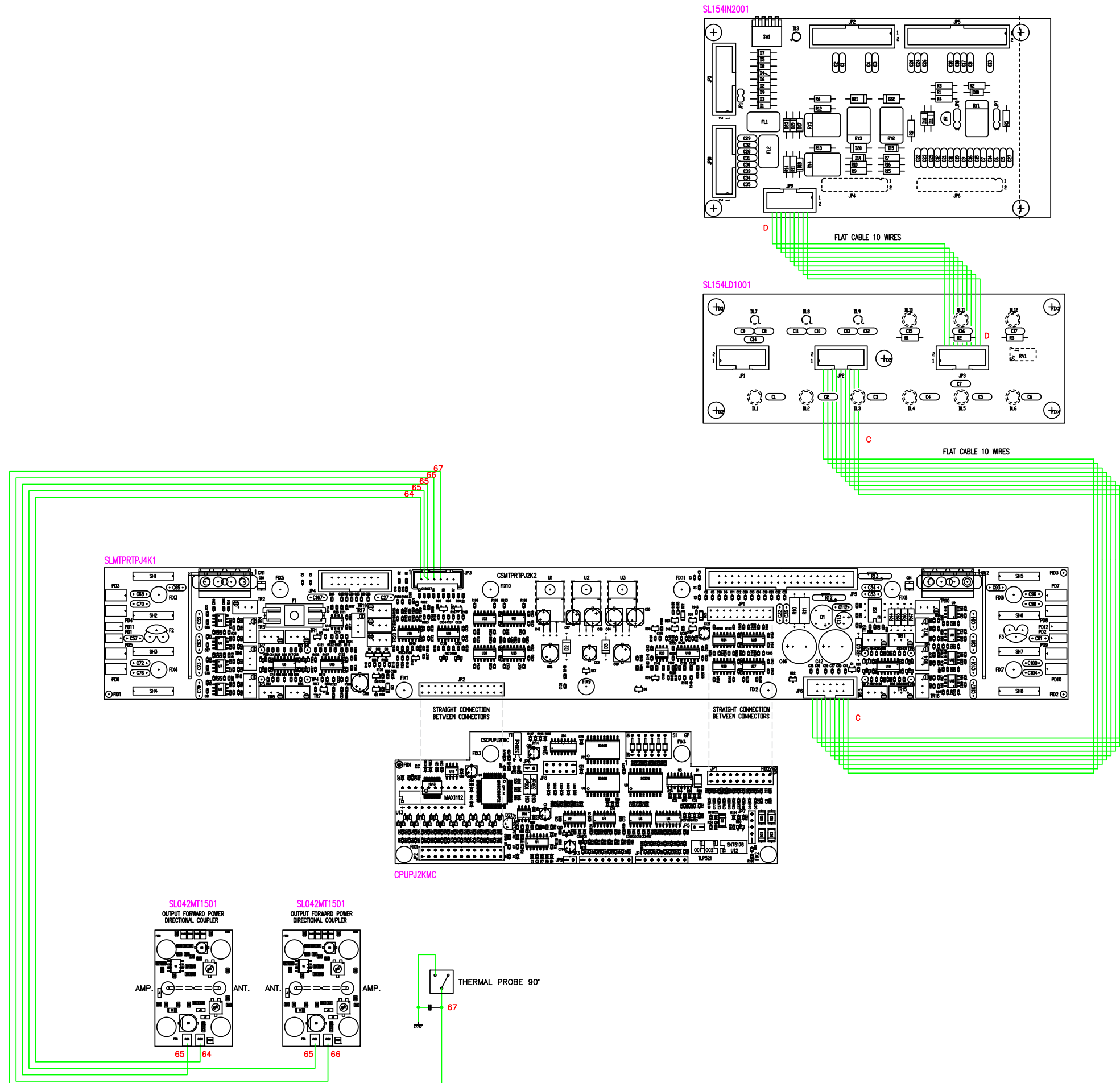


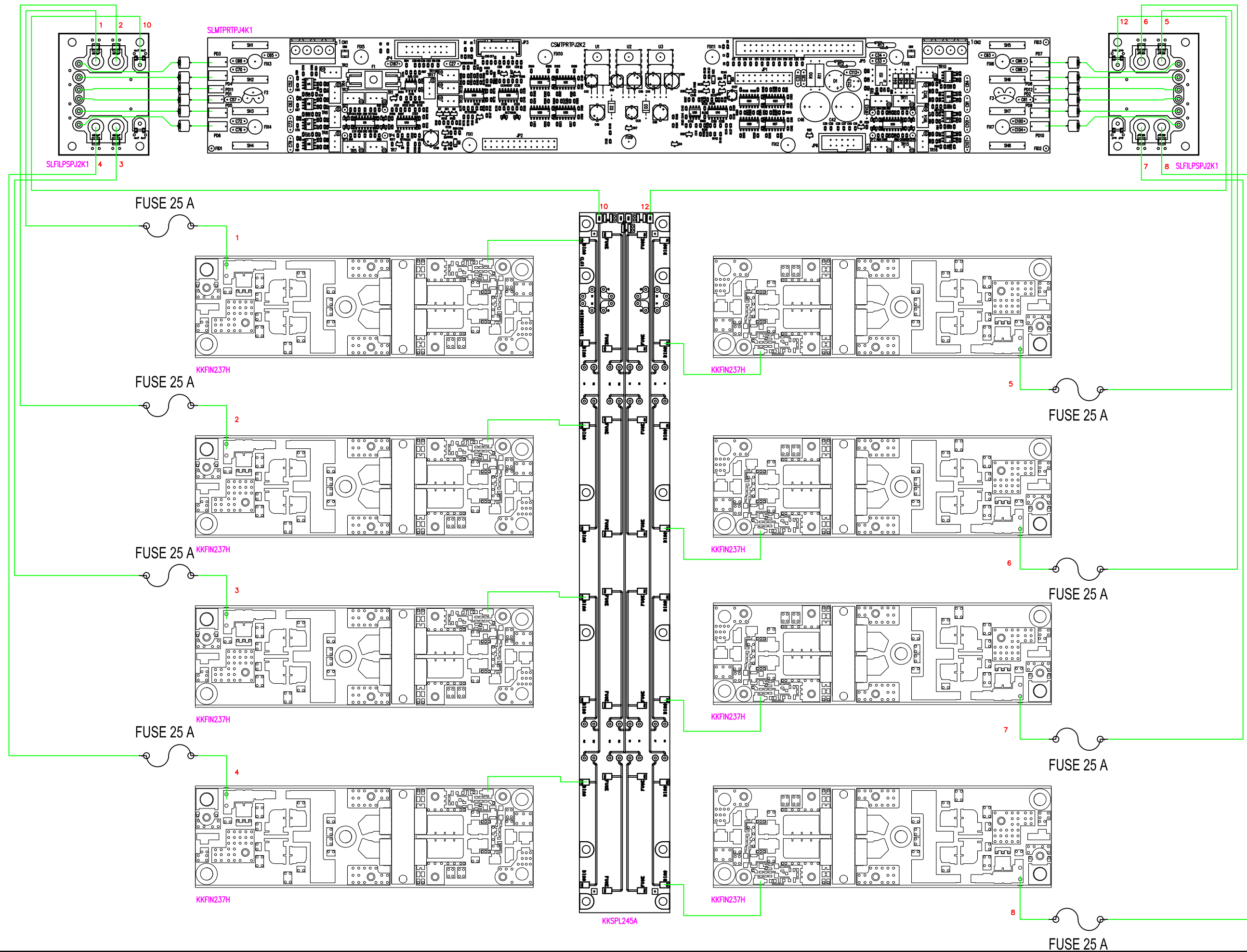






8.4 RF section wiring diagrams





8.5 ProtF board (PROTPJ154)

ARCHIVIAZIONE ELETTRONICA: "CARTELLA PROGETTI" SU "UT_SRW" MATERIALE: FR4-74 1.6mm Cu 35um	TRATTAMENTO: STANDARD COSTRUTTORE	PROFILO: Positivo	STATO: ESECUTIVO



NOME PROGETTO: HC5-10
AUTORE: GP - Rev.: J. Berli

CODICE PROGETTO: 014

DATA: 14/03/2007
REVISIONE: 3.1
SCALA: 1:1
SIZE: A4
PAGINA: 1 DI 1

NOME PARTE: Analogic Section Component Layout

CODICE DISEGNO: PROTPJ-HCLCD

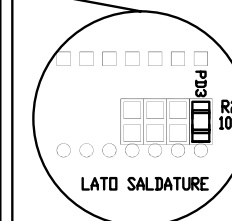
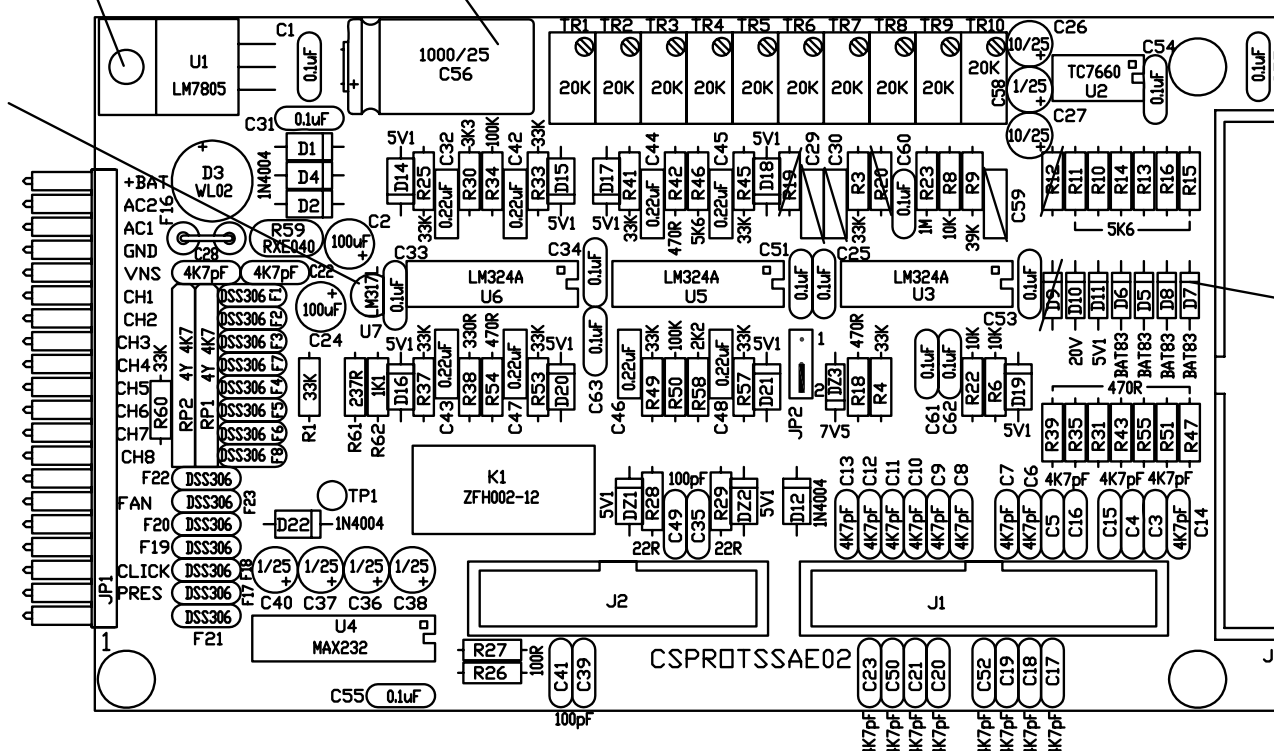
PIANO DI MONTAGGIO CSPROTSSAE02 R3

DARE UN PUNTO CON LA COLLA A CALDO

IL FORO DI FISSAGGIO DEL T0220
DEVE COLLIMARE CON IL FORO C.S.

MONTARE ALTEZZA CONDENSATORI
ELETTROLITICI

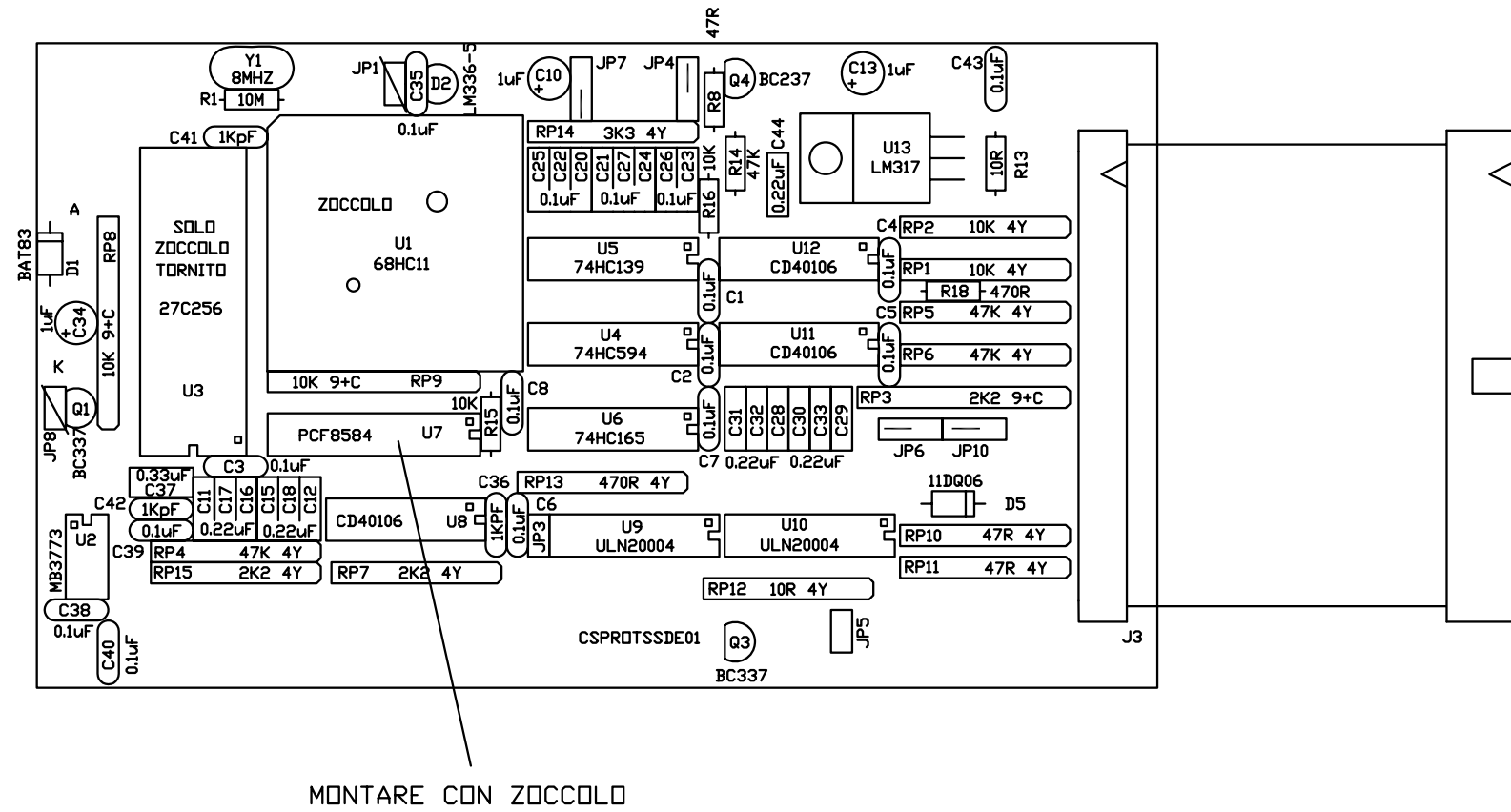
Fwd Pwr
Fwd Rfl
Inp Pwr
Vpa
Ipa
Temp.
Int SWR
Mains
OFFSET
SOGLIA FOLBACK



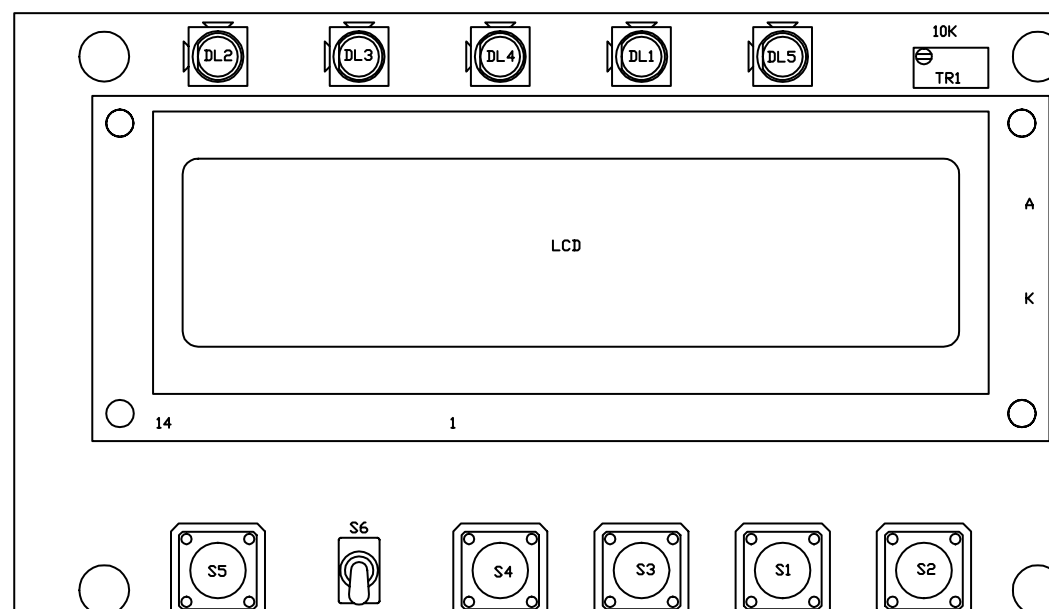
NOTE: REL 3

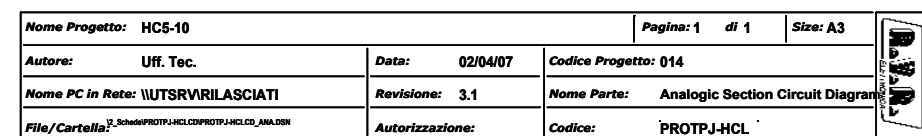
AGGIUNGERE UN RESISTENZA DA 10K SUL LS IN PD3

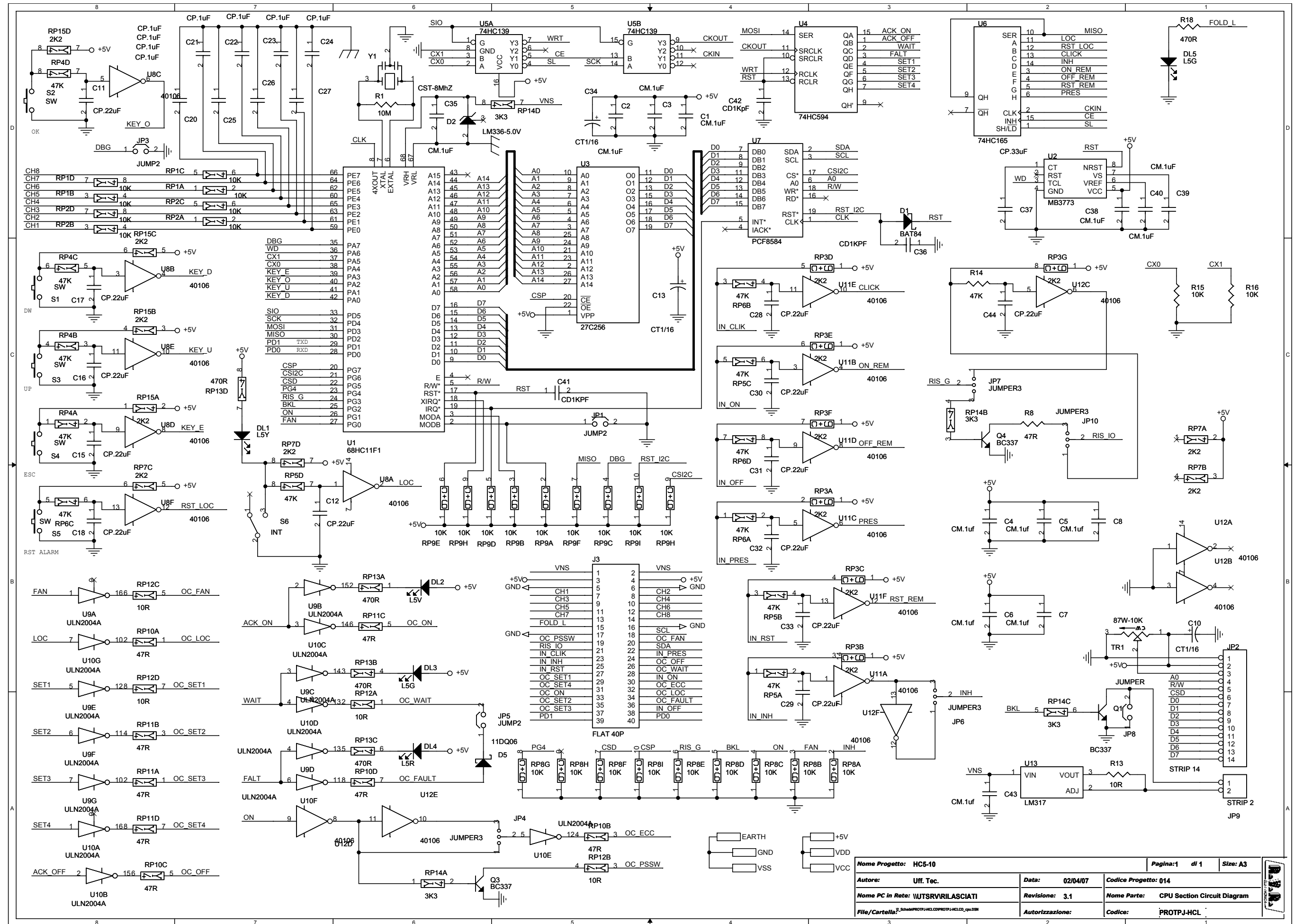
PIANO DI MONTAGGIO LATO SALDATURE



R.V.R. ELETTRONICA	NOME PROGETTO: HCS-10		NOME PARTE: LCD Alarms Card Layout	
	AUTORE:	GP - Rev.: J. Berti	DATA: 30/10/2008	REVISIONE: 1.1
	ARCHIVIAZIONE ELETTRONICA: "CARTELLA PROGETTI" SU "UT_SRV"	CODICE PROGETTO: 014	CODICE DISEGNO: PROTI-HCLCD	SCALA: 1:1
	MATERIALE: FR4-74 1.6mm Cu 35um	TRATTAMENTO: STANDARD COSTRUTTORE	PROFILO: Positivo	STATO: ESECUTIVO







Revised: Thursday, January 08, 2009
Revision:

Item	Quantity	Reference	Part
1	13	C1, C25, C31, C33, C34, C51, C53, C54, C55, C60, C61, C62, C63	CM.1uF
2	2	C2, C24	100/25
3	23	C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C52, C57	CD4K7PF
4	2	C26, C27	CT10/25
5	1	C28	CD4KPF
6	2	C29, C30	CP10KPF
7	8	C32, C42, C43, C44, C45, C46, C47, C48	CP.22uF
8	4	C35, C39, C41, C49	CM100PF
9	4	C36, C37, C38, C40	CT1/16
10	1	C50	CD4K7KPF
11	1	C56	1000/35
12	1	C58	CT1/25
13	1	C59	CP10KPF
14	10	DZ1, DZ2, D14, D15, D16, D17, D18, D19, D20, D21	5V1/0.5
15	1	DZ3	7V5-0.5
16	5	D1, D2, D4, D12, D22	1N4004
17	1	D3	WL02
18	4	D5, D6, D7, D8	BAT83
19	2	D9, R12	XX
20	1	D10	20V-0.5
21	1	D11	5V1-0.5
22	15	F1, F2, F3, F4, F5, F6, F7, F8, F17, F18, F19, F20, F21, F22, F23	DSS306
23	1	F16	BL02
24	1	JP1	MASCON20
25	1	JP2	JUMPER3
26	1	J1	CON26A
27	1	J2	CON20AP
28	1	J3	FLAT 40P
29	1	K1	ZFH-12V
30	4	PD1, PD2, PD3, PD4	LUNENO
31	2	RP1, RP2	4K7
32	12	R1, R3, R4, R25, R33, R37, R41, R45, R49, R53, R57, R60	33K
33	1	R2	10K-SMD
34	3	R6, R8, R22	10K
35	1	R9	39K
36	7	R10, R11, R13, R14, R15, R16, R46	5K6
37	10	R18, R31, R35, R39, R42, R43, R47, R51, R54, R55	470R
38	2	R19, R20	R
39	1	R23	1M
40	2	R26, R27	100R
41	2	R28, R29	22R
42	1	R30	3K3
43	2	R34, R50	100K
44	1	R38	330R
45	1	R58	2K2
46	1	R59	RXE040
47	1	R61	237R
48	1	R62	1K1
49	1	TP1	TP
50	10	TR1, TR2, TR3, TR4, TR5, TR6, TR7, TR8, TR9, TR10	87X-20K
51	1	U1	LM7805
52	1	U2	TC7660
53	3	U3, U5, U6	TS914
54	1	U4	ICL232
55	1	U7	LM317L

Revised: Thursday, January 08, 2009
Revision:

Item	Quantity	Reference	Part
1	13	C1, C2, C3, C4, C5, C6, C7, C8, C35, C38, C39, C40, C43	CM.1uf
2	3	C10, C13, C34	CT1/16
3	13	C11, C12, C15, C16, C17, C18, C28, C29, C30, C31, C32, C33, C44	CP.22uF
4	8	C20, C21, C22, C23, C24, C25, C26, C27	CP.1uF
5	3	C36, C41, C42	CD1KpF
6	1	C37	CP.33uF
7	1	DL1	L5Y
8	1	DL2	L5V
9	2	DL3, DL5	L5G
10	1	DL4	L5R
11	1	D1	BAT84
12	1	D2	LM336-5.0V
13	1	D5	11DQ06
14	3	JP1, JP3, JP5	JUMP2
15	1	JP2	STRIP 14
16	4	JP4, JP6, JP7, JP10	JUMPER3
17	1	JP8	JUMPER
18	1	JP9	STRIP 2
19	1	J3	FLAT 40P
20	3	Q1, Q3, Q4	BC337
21	6	RP1, RP2, RP8, RP9, R15, R16	10K
22	3	RP3, RP7, RP15	2K2
23	4	RP4, RP5, RP6, R14	47K
24	3	R8, RP10, RP11	47R
25	2	RP12, R13	10R
26	2	RP13, R18	470R
27	1	RP14	3K3
28	1	R1	10M
29	5	S1, S2, S3, S4, S5	SW
30	1	S6	INT
31	1	TR1	87W-10K
32	1	U1	68HC11F1
33	1	U2	MB3773
34	1	U3	27C256
35	1	U4	74HC594
36	1	U5	74HC139
37	1	U6	74HC165
38	1	U7	PCF8584
39	3	U8, U11, U12	40106
40	2	U9, U10	ULN2004A
41	1	U13	LM317
42	1	Y1	CST-8MHz

8.5.1 Prot-F foldback calibration

The procedure applies to all equipment that use the PROTF card.

Calibration TR10:

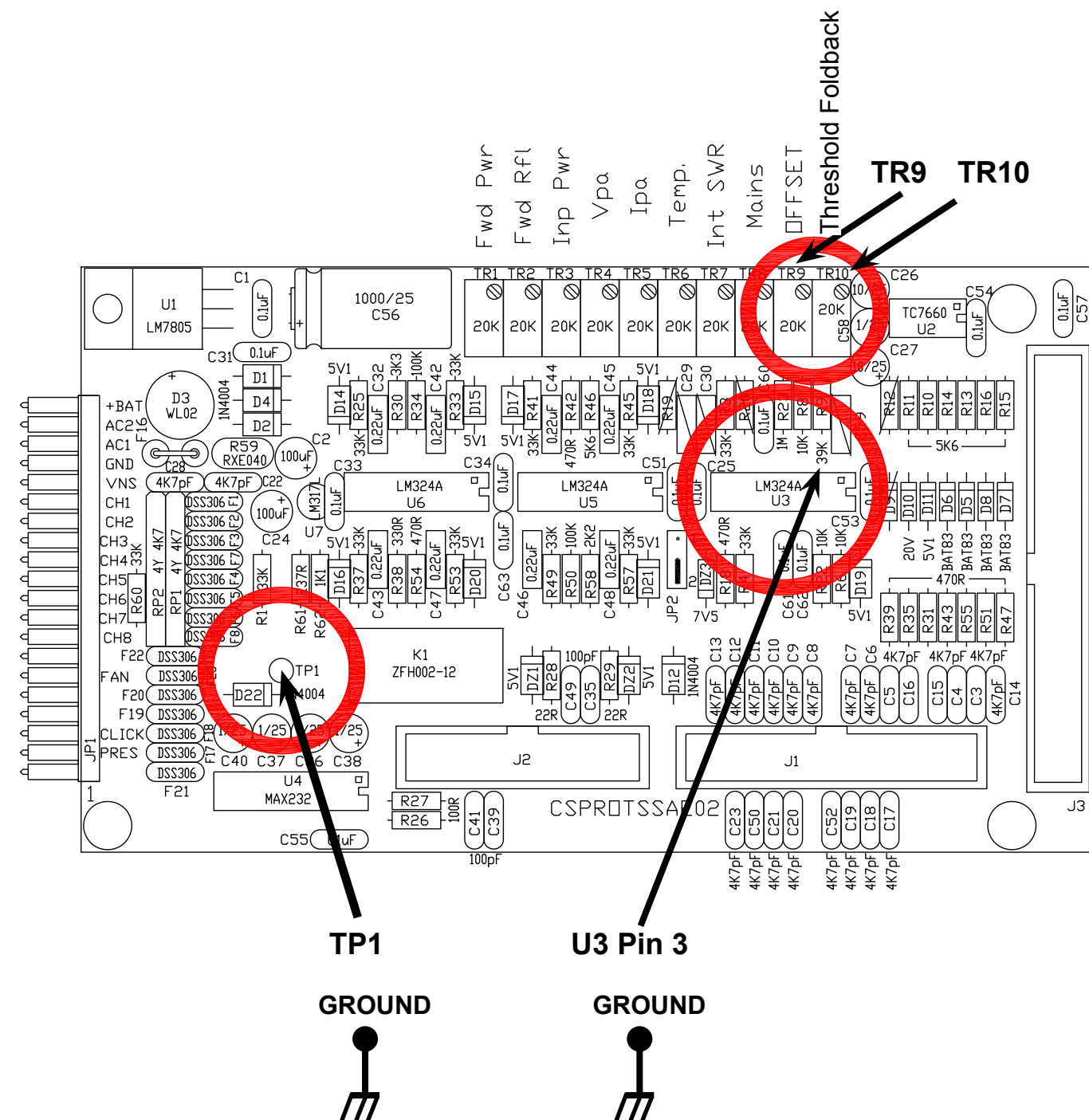
connect the multimeter to pin 3 of U3 (LM324) and measuring a voltage of 3,9V +/- 0,2V.

Calibration TR9:

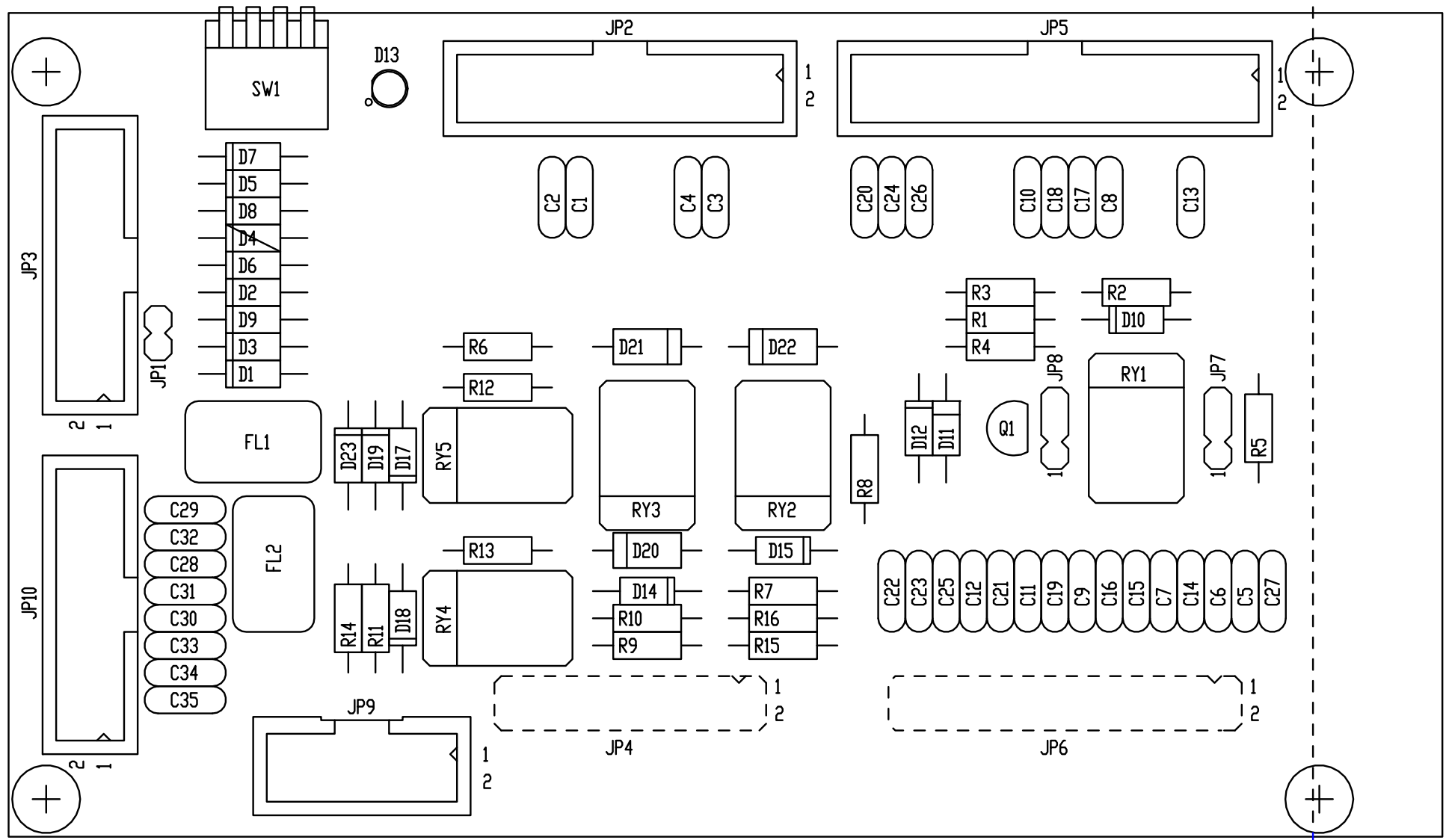
connect the multimeter on test point TP1, and measure a voltage of 0V with tolerance -0V +0,2V

CAUTION:

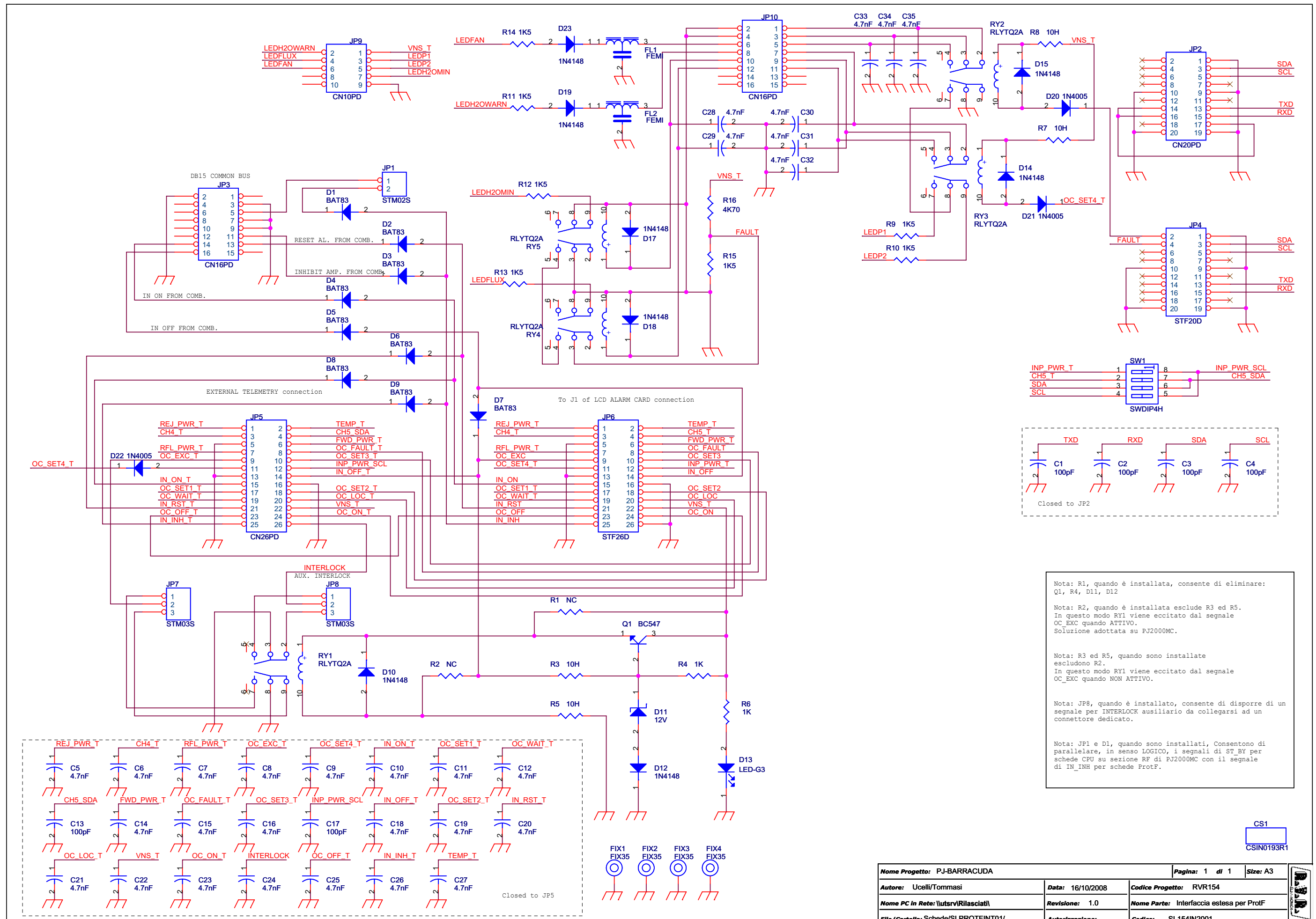
Follow exactly the sequence of calibration trimmer, TR10 first and then TR9.



8.6 Addon board (SL154IN2001)



	NOME PROGETTO: BARRACUDA		NOME PARTE: INTERF. ESTESA PROT	
	AUTORE: A. TOMMASI		DATA: 16/10/2008	
	ARCHIVIAZIONE ELETTRONICA: CARTELLA RILASCIATI		REVISIONE: 1.0	
	MATERIALE: <>		STATO: ESECUTIVO	



Nota: R1, quando è installata, consente di eliminare: Q1, R4, D11, D12

Nota: R2, quando è installata esclude R3 ed R5. In questo modo RY1 viene eccitato dal segnale OC_EXC quando ATTIVO. Soluzione adottata su PJ2000MC.

Nota: R3 ed R5, quando sono installate escludono R2. In questo modo RY1 viene eccitato dal segnale OC_EXC quando NON ATTIVO.

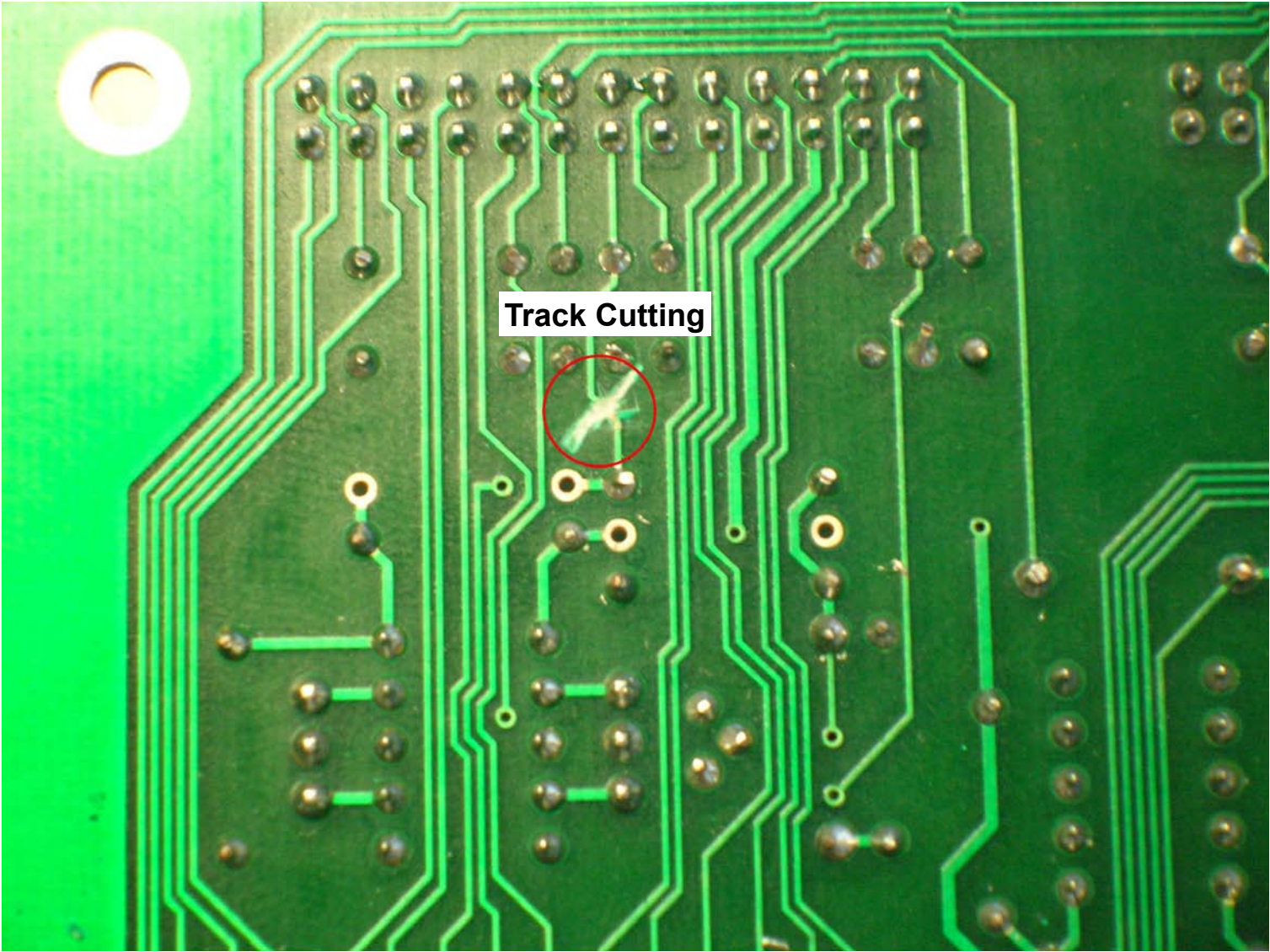
Nota: JP8, quando è installato, consente di disporre di un segnale per INTERLOCK ausiliario da collegarsi ad un connettore dedicato.

Nota: JP1 e D1, quando sono installati, Consentono di parallelare, in senso LOGICO, i segnali di ST_BY per schede CPU su sezione RF di PJ2000MC con il segnale di IN_INH per schede ProtF.

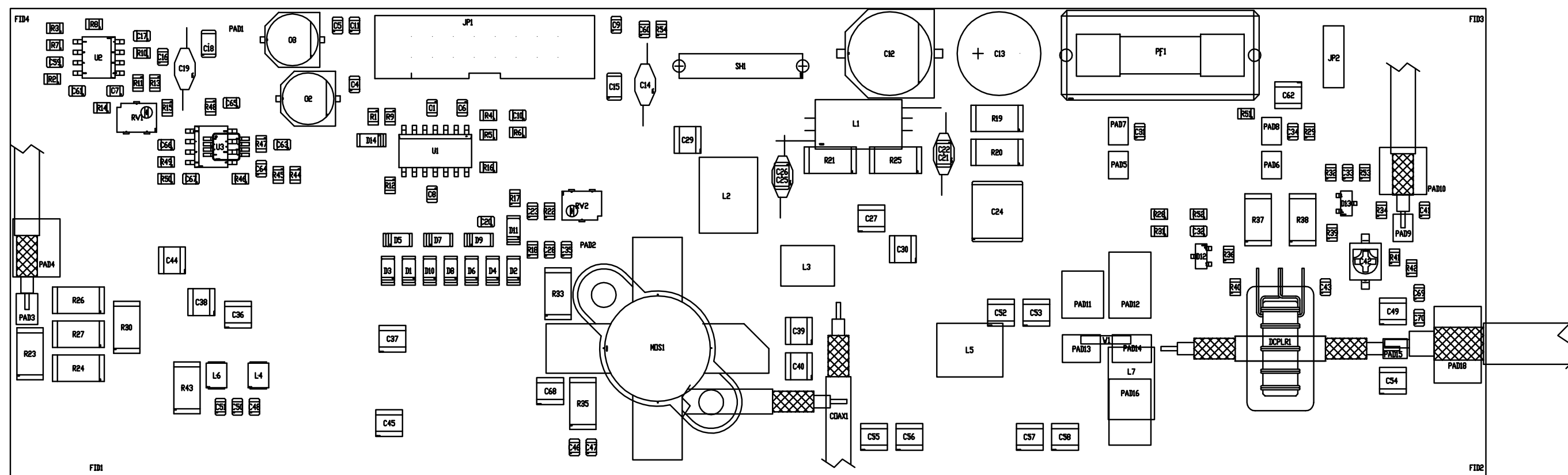
Nome Progetto: PJ-BARRACUDA		Pagina: 1 di 1	Size: A3
Autore: Ucelli/Tommasi	Data: 16/10/2008	Codice Progetto: RVR154	
Nome PC in Rete: \utsv\Rilasciati\	Revisione: 1.0	Nome Parte: Interfaccia estesa per ProtF	
File/Cartella: Schede/SLPROTFINT01/	Autorizzazione:	Codice: SL154IN2001	

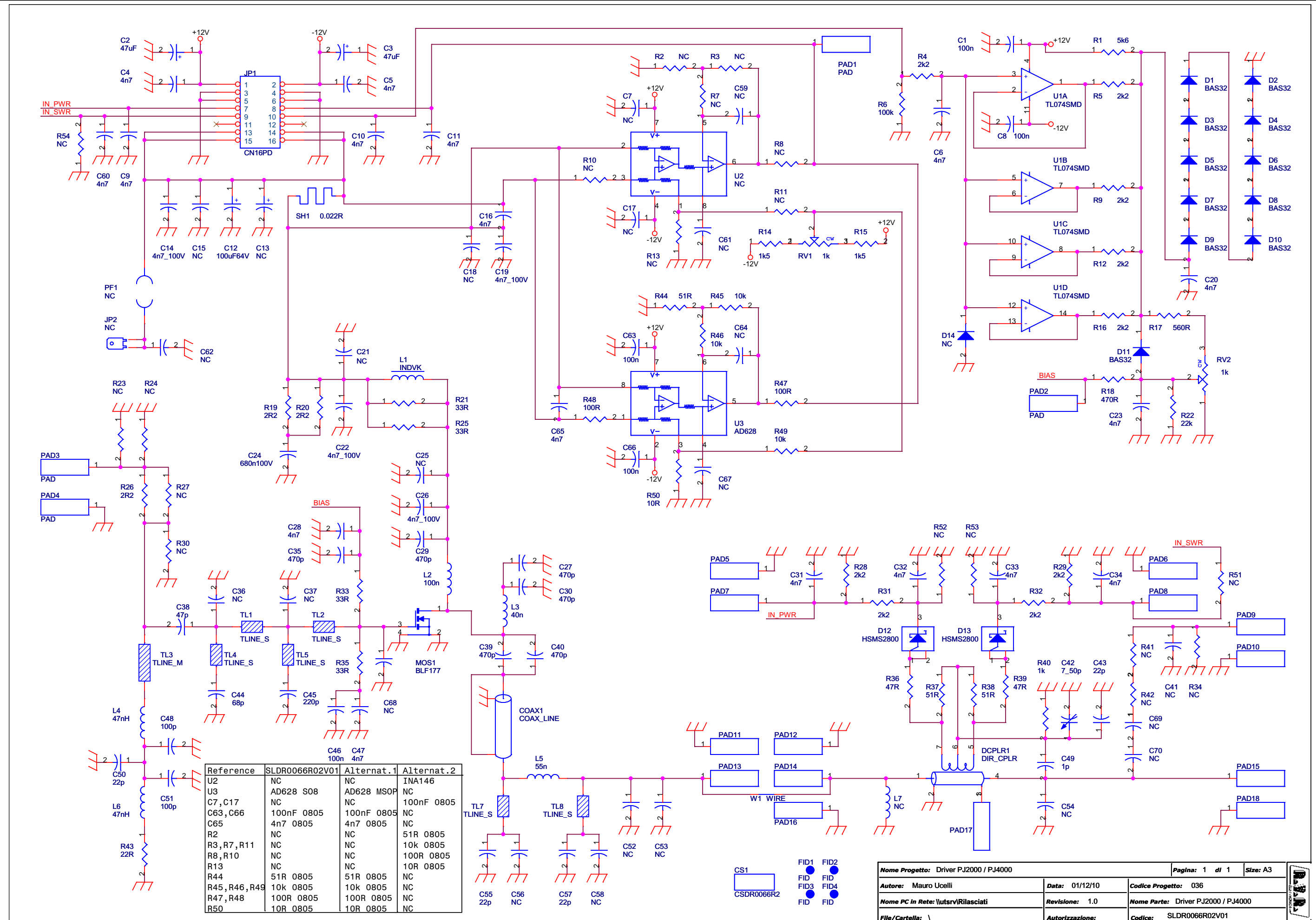
Interfaccia estesa per ProtF Revised: 16/10/2008
 SL154IN2001 Revision: 1.0
 PJ-BARRACUDA
 RVR154
 Ucelli/Tommasi

Item	Quantity	Reference	Part	Description	Code
1	1	CS1	CSIN0193R1	Circuito stampato	CSIN0193R1
2	6	C1,C2,C3,C4,C13,C17	100pF	Cond. ceramico p 5mm	CKM101KC101C
3	29	C5,C6,C7,C8,C9,C10,C11,C12,C14,C15,C16,C18,C19,C20,C21,C22,C23,C24,C25,C26,C27,C28,C29,C30,C31,C32,C33,C34,C35	4.7nF	Cond. ceramico p 5mm	CKM472KC600P
4	9	D1,D2,D3,D4,D5,D6,D7,D8,D9	BAT83	Diodi Hot carrier DO35	DHCBAT83
5	8	D10,D12,D14,D15,D17,D18,D19,D23	1N4148	Diodo in vetro DO35	DIS1N4148
6	1	D11	12V	1/4W Zener Diode	DIZ12V1/2W
7	1	D13	LED-G3	LEDVERDE dia. 3mm a battuta	LEDV03
8	3	D20,D21,D22	1N4005	Diodo plastico DO41	DIS1N4007
9	4	FIX1,FIX2,FIX3,FIX4	FIX35	Foro fissaggio 3.5mm	
10	2	FL1,FL2	FEMI	Filtro EMI Murata DSS310	FEA55Y223500
11	1	JP1	STM02S	Strip maschio 2 pin	CNTSTM40SDA
12	1	JP2	CN20PD	Connettore 20 poli Flat cs	CNTMCS20A
13	2	JP3,JP10	CN16PD	Conn.M.C.S.Dritto 16P alette	CNTMCS16A
14	1	JP4	STF20D	Strip femmina 10+10 pin	CNTSTF10DDB
15	1	JP5	CN26PD	Connettore 26 poli Flat cs	CNTMCS26A
16	1	JP6	STF26D	Strip femmina 13+13 pin	CNTSTF13DDB
17	2	JP7,JP8	STM03S	Strip maschio 3 pin	CNTSTM40SDA
18	1	JP9	CN10PD	Connettore 10 poli Flat cs	CNTMCS10A
19	1	Q1	BC547	Trans. NPN TO92	TRNBC547
20	5	RY1,RY2,RY3,RY4,RY5	RLYTQ2A	Rele' TQ2 12V	RLD2V12V05AM
21	2	R1,R2	NC	Res. 1/4W	
22	4	R3,R5,R7,R8	10H	Res. 1/4W	RSM1/4F0010H
23	2	R4,R6	1K	Res. 1/4W	RSM1/4F0001K
24	7	R9,R10,R11,R12,R13,R14,R15	1K5	Res. 1/4W	RSM1/4F001K5
25	1	R16	4K70	Res. 1/4W	RSM1/4F004K7
26	1	SW1	SWDIP4H	Dip switch 4 vie vert.	DSW4VV



8.7 Low-Power Driver board (SLDR0066R02V01C)

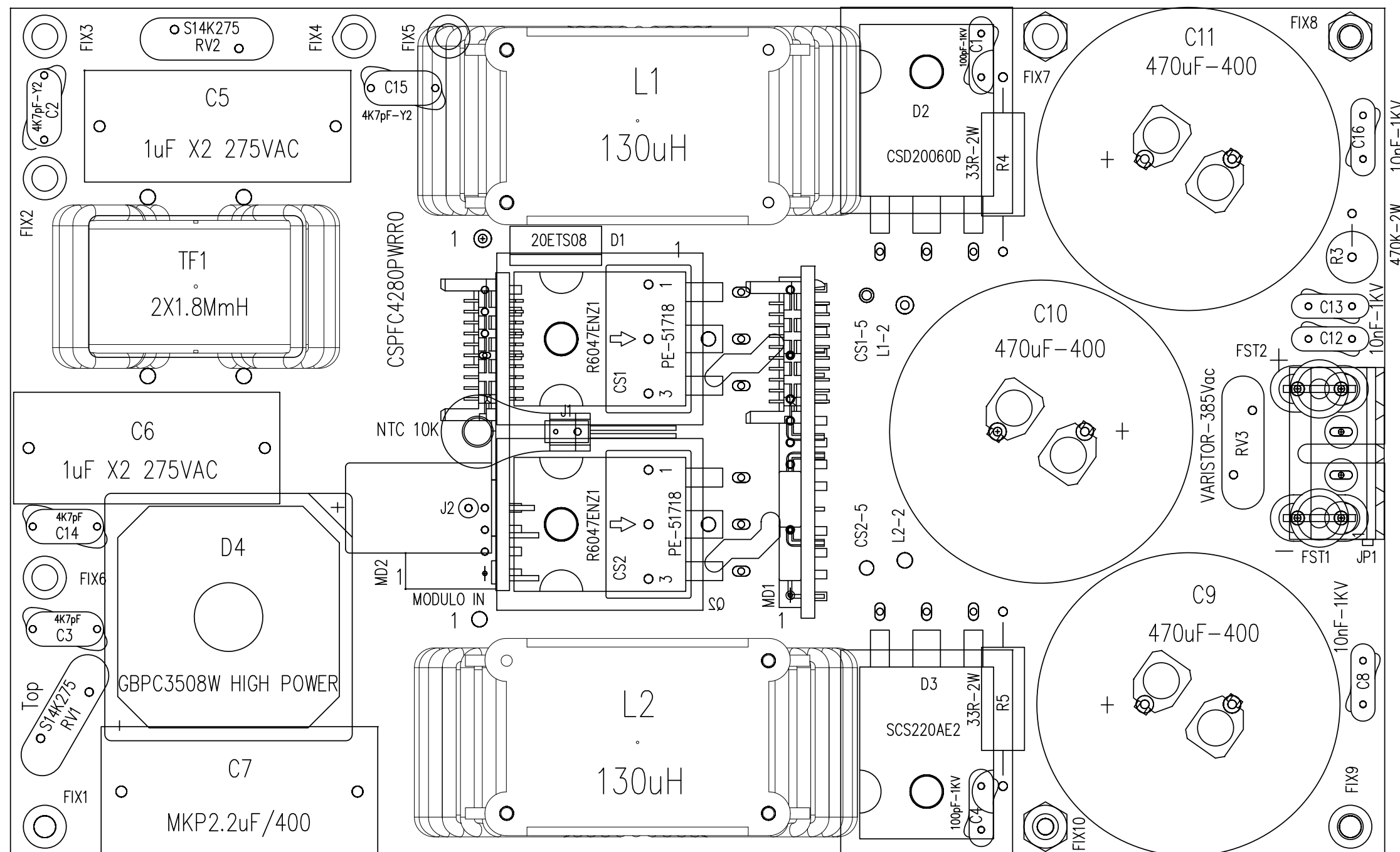




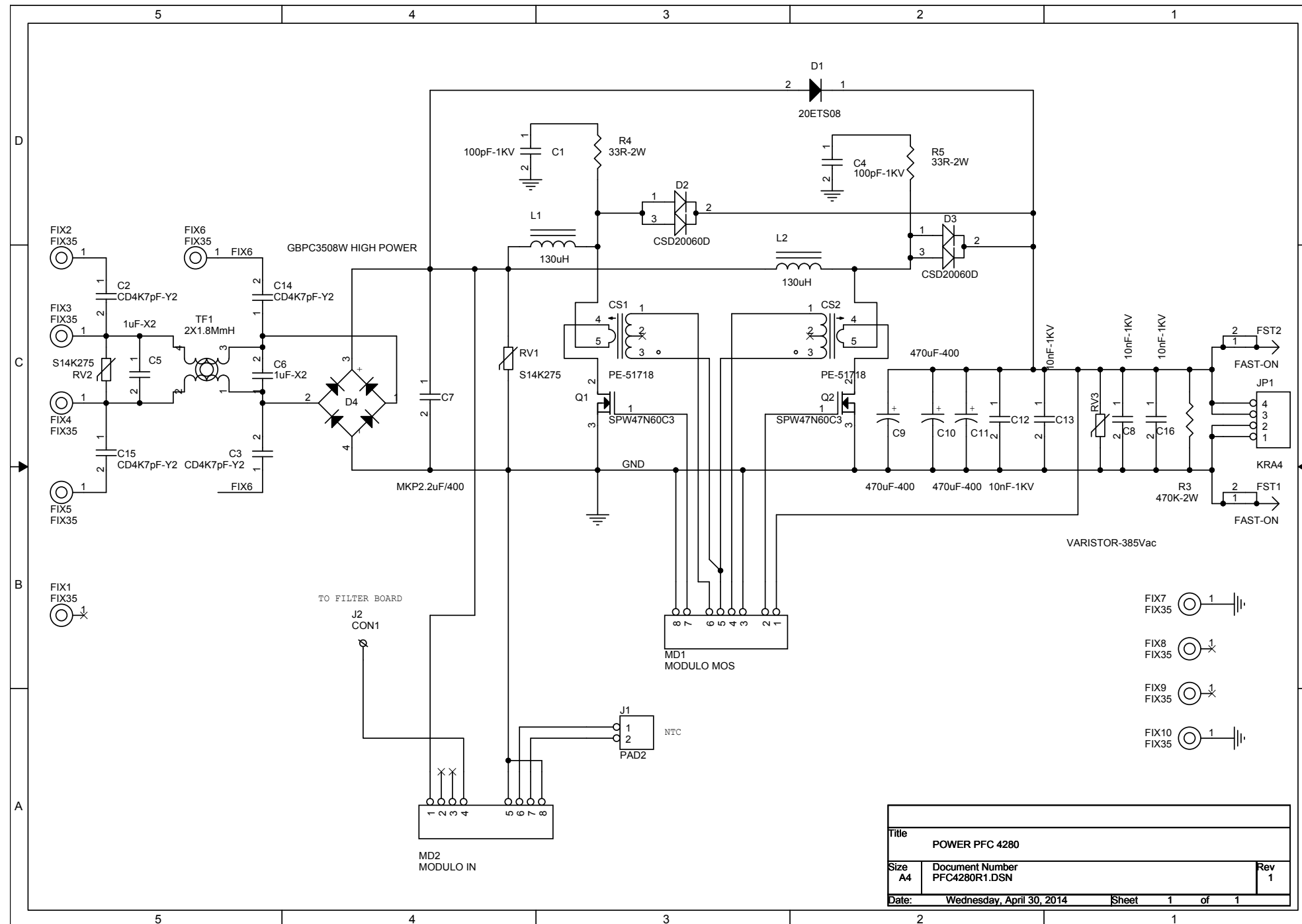
Item	Quan- tity	Reference	Part	Description	Code1
1	1	COAX1	COAX_LINE	Coax 25H taglio 225mm 4 spire su totoide D.24	
2	1	CS1	CSDR0066R2	Circuito stampato	CSDR0066R2
3	5	C1,C8,C46,C63,C66	100n	Cond. SMD 0805	CCC085104KXC
4	2	C2,C3	47uF	Cond. Elett. SMD d. 6.3mm	CES476C160A
5	17	C4,C5,C6,C9,C10,C11,C16, C20,C23,C28,C31,C32,C33, C34,C47,C60,C65	4n7	Cond. SMD 0805	CCC085472KXC
6	2	C7,C17	NC	Cond. SMD 0805	
7	1	C12	100uF64V	Cond. Elett. SMD d. 10mm	CES107DE630
8	1	C13	NC	Cond. Elett. Dia 10 P5.08	
9	4	C14,C19,C22,C26	4n7_100V	Cond. ceramico multistrato p 5mm	CMS472MC101
10	4	C15,C18,C21,C25	NC	Cond. SMD 1206	
11	1	C24	680n100V	Cond. SMD 2824	CPE684K101O
12	5	C27,C29,C30,C39,C40	470p	Cond. SMD 1212 HQ	CHQ471JA201
13	1	C35	470p	Cond. SMD 0805	CCC085471JCC
14	9	C36,C37,C52,C53,C54,C56, C58,C62,C68	NC	Cond. SMD 1212 HQ	
15	1	C38	47p	Cond. SMD 1212 HQ	CHQ470JA501
16	1	C41	NC	Cond. SMD 0805 COG	
17	1	C42	7_50p	Comp. var. Murata TZB4A	CVF500D4,5SM
18	1	C43	22p	Cond. SMD 0805	CCC085220JCC
19	1	C44	68p	Cond. SMD 1212 HQ	CHQ680JA501
20	1	C45	220p	Cond. SMD 1212 HQ	CHQ221JA201
21	2	C48,C51	100p	Cond. SMD 0805 COG	CCC085101JCC
22	1	C49	1p	Cond. SMD 1212 HQ	CHQ010CA501
23	1	C50	22p	Cond. SMD 0805 COG	CCC085220JCC
24	2	C55,C57	22p	Cond. SMD 1212 HQ	CHQ220JA501
25	6	C59,C61,C64,C67,C69,C70	NC		
26	1	DCPLR1	DIR_CPLR	Acc. dir. su toroide	KITFTR1010SP
27	11	D1,D2,D3,D4,D5,D6,D7,D8, D9,D10,D11	BAS32	MINIMELF SMD Diode	DISBAS32MINI
28	2	D12,D13	HSMS2800	Diodo Shottky SOT23	DISHSMS2800
29	1	D14	NC	MINIMELF SMD Diode	
30	4	FID1,FID2,FID3,FID4	FID	Fiducial CS	
31	1	JP1	CN16PD	Connettore 16 poli Flat cs	CNTMCS16A
32	1	JP2	NC	Faston da CS p. 5.08	
33	1	L1	INDVK	Induttanza cilindrica VK200	IMPVK00A
34	1	L2	100n	5 spire filo Rame arg. D. 1mm avvolte su 6mm lungh. 10mm	BOB01020006A
35	1	L3	40n	2 spire filo Rame arg. D. 1mm avvolte su 6mm lungh. 4mm	BOB01020019A
36	2	L4,L6	47nH	Induttanza SMD 3225 (1210)	IMP47NS120
37	1	L5	55n	4 spire filo Rame arg D. 1mm avvolte su 6mm lungh. 14mm	BOB01020005A
38	1	L7	NC	Induttanza cilindrica	
39	1	MOS1	BLF177	Power mosfet RF	TRNBLF177
40	18	PAD1,PAD2,PAD3,PAD4,PAD5, PAD6,PAD7,PAD8,PAD9, PAD10,PAD11,PAD12,PAD13, PAD14,PAD15,PAD16,PAD17, PAD18	PAD		
41	1	PF1	NC	Portafusibile 5x20 10A	
42	2	RV1,RV2	1k	Trimm. multi SMD PVG5 Murata	RVTMLK0001VS
43	1	R1	5k6	Res. SMD 0805	RCH085F005K6
44	14	R2,R3,R7,R8,R10,R11,R13, R34,R41,R42,R51,R52,R53, R54	NC	Res. SMD 0805	RCH085J
45	9	R4,R5,R9,R12,R16,R28,R29, R31,R32	2k2	Res. SMD 0805	RCH085F002K2

46	1	R6	100k	Res. SMD 0805	RCH085F0100K
47	2	R14,R15	1k5	Res. SMD 0805	RCH085F001K5
48	1	R17	560R	Res. SMD 0805	RCH085F0560H
49	1	R18	470R	Res. SMD 0805	RCH085F0470H
50	3	R19,R20,R26	2R2	Res. SMD 2512 1%	RCH252J002H2
51	4	R21,R25,R33,R35	33R	Res. SMD 2512 1%	RCH252J0033H
52	1	R22	22k	Res. SMD 0805	RCH085F0022K
53	4	R23,R24,R27,R30	NC	Res. SMD 2512 1%	
54	2	R36,R39	47R	Res. SMD 0805	RCH085F0047H
55	2	R37,R38	51R	Res. SMD 2512 1%	RCH252J0051H
56	1	R40	1k	Res. SMD 0805	RCH085F0001K
57	1	R43	22R	Res. SMD 2512 1%	RCH252F0022H
58	1	R44	51R	Res. SMD 0805	RCH085F0051H
59	3	R45,R46,R49	10k	Res. SMD 0805	RCH085F0010K
60	2	R47,R48	100R	Res. SMD 0805	RCH085F0100H
61	1	R50	10R	Res. SMD 0805	RCH085F0010H
62	1	SH1	0.022R	Shunt passo 15.2mm fori 2mm	RSH10A0H022
63	6	TL1,TL2,TL4,TL5,TL7,TL8	TLINE_S	Linea strip CS	
64	1	TL3	TLINE_M	Linea strip CS	
65	1	U1	TL074SMD	Quad Op. SMD SO14	CILTL074SMD
66	1	U2	NC	HV Diff. Amp. Adj	
67	1	U3	AD628	HV Diff. Amp. Adj Case SO8	CILAD628SO8
68	1	W1	WIRE	Wire Diam. 1mm lenght 10mm	

8.8 PFC (KPFCPSL4280.LC)

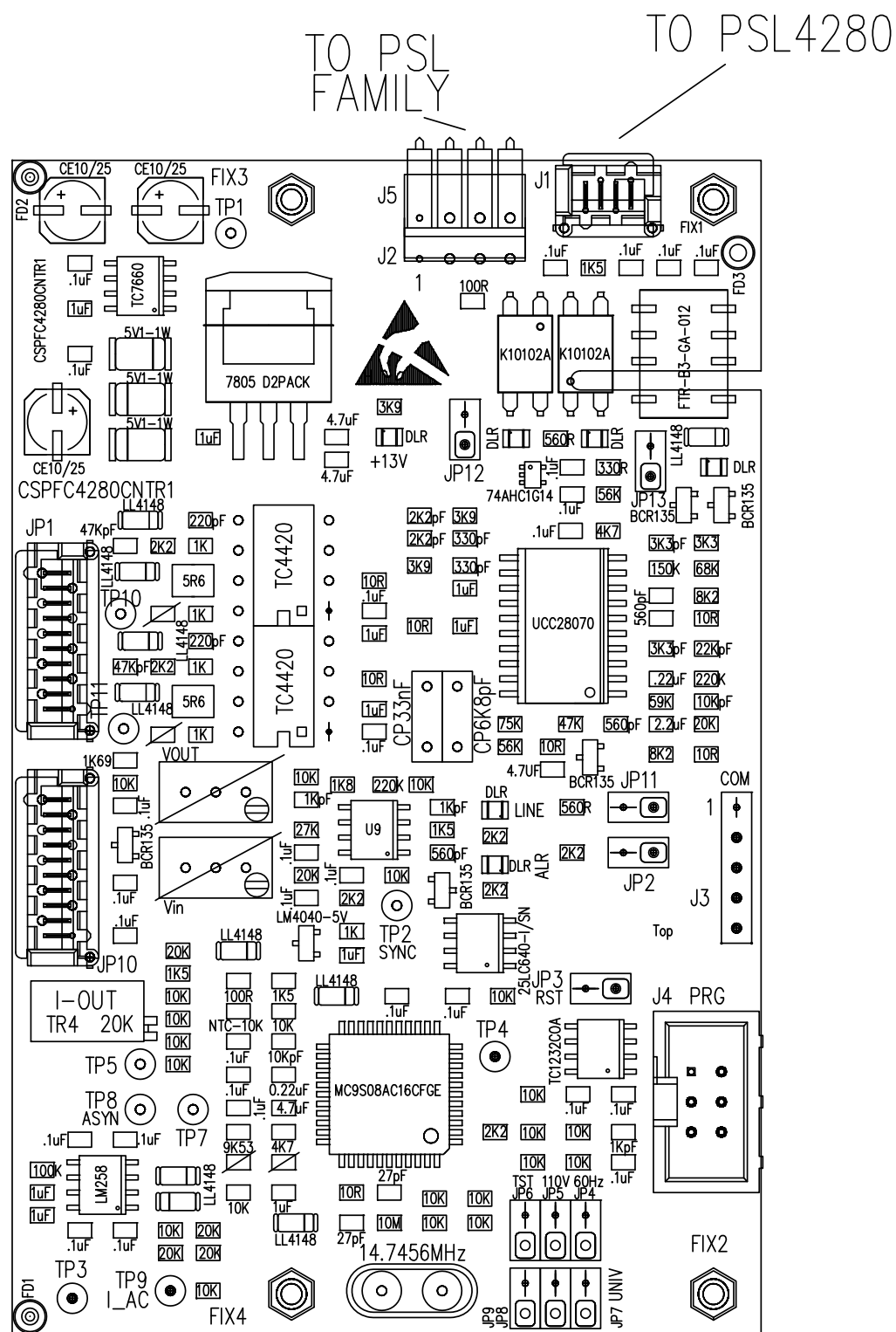


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DATE: 4 MARZO 2014	

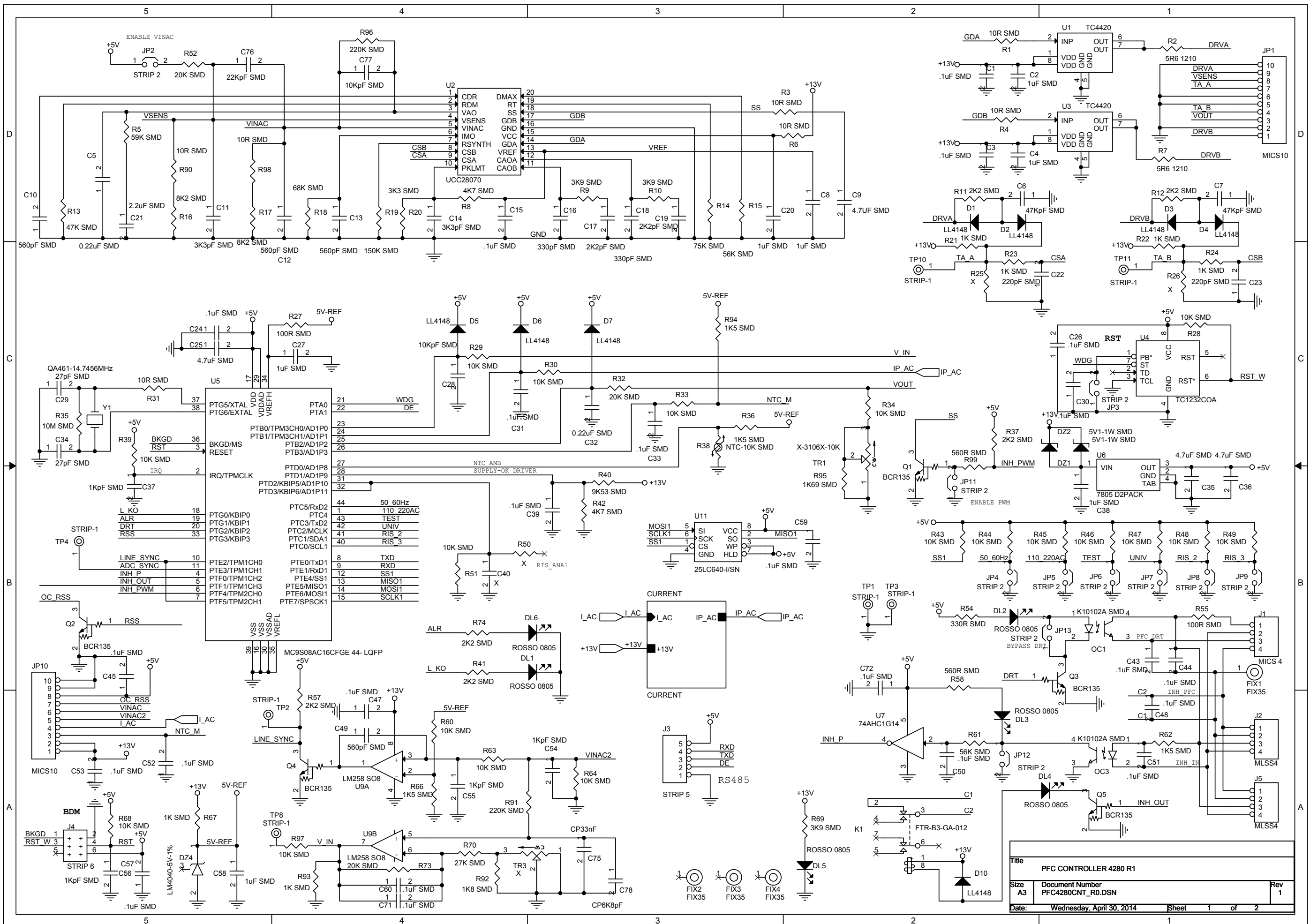


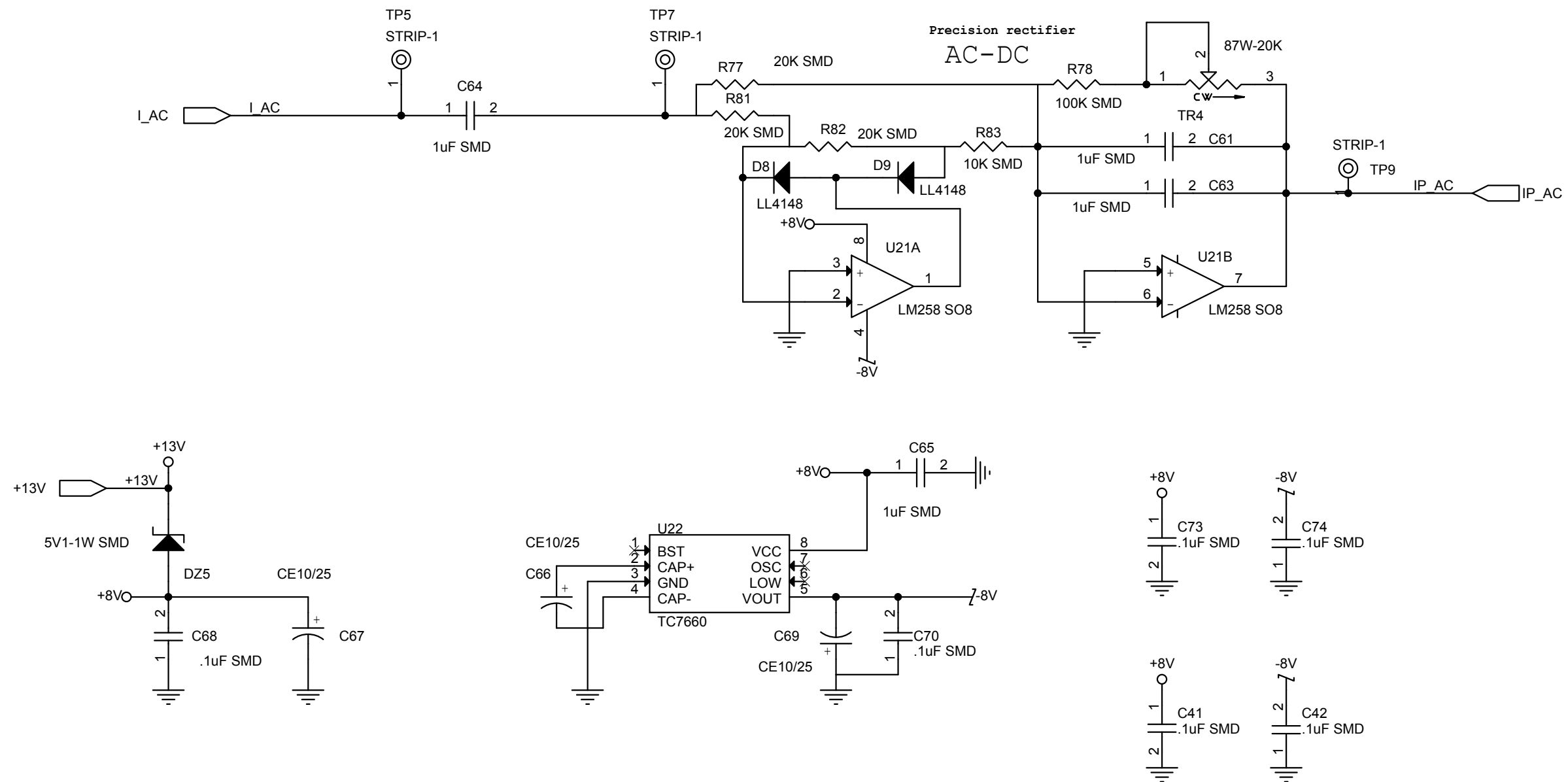
POWER PFC 4280 Revised: Wednesday, April 30, 2014
PFC4280R1.DSN Revision: 1

Item	Qty	Reference	Part
1	2	CS1,CS2	PE-51718
2	2	C1,C4	100pF-1KV
3	4	C2,C3,C14,C15	CD4K7pF-Y2
4	2	C5,C6	1uF-X2
5	1	C7	MKP2.2uF/400
6	4	C8,C12,C13,C16	10nF-1KV
7	3	C9,C10,C11	470uF-400
8	1	D1	20ETS08
9	2	D2,D3	CSD20060D
10	1	D4	GBPC3508W HIGH POWER
11	10	FIX1,FIX2,FIX3,FIX4,FIX5 FIX6,FIX7,FIX8,FIX9, FIX10	FIX35
12	2	FST1,FST2	FAST-ON
13	1	JP1	KRA4
14	1	J1	PAD2
15	1	J2	CON1
16	2	L1,L2	130uH
17	1	MD1	MODULO MOS
18	1	MD2	MODULO IN
19	2	Q1,Q2	SPW47N60C3
20	2	RV1,RV2	S14K275
21	1	RV3	VARISTOR-385Vac
22	1	R3	470K-2W
23	2	R4,R5	33R-2W
24	1	TF1	2X1.8MmH



ARCHIVIO: X:\WORKDWG\	
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DOCUMENT NUMBER PFC4280CNT_R1_MNT. DWG	REV 1
DATE: 28 APRILE 2014	



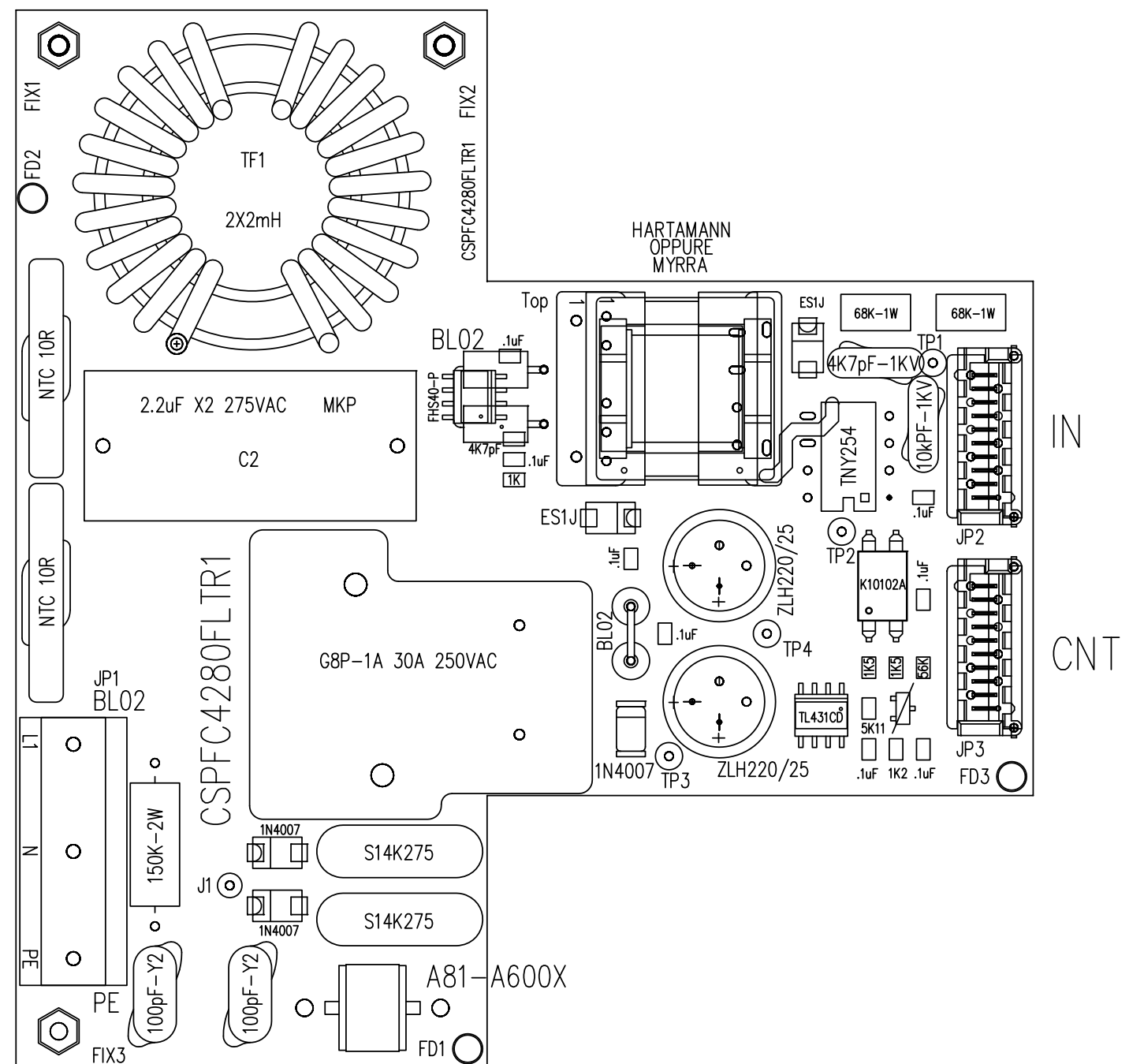
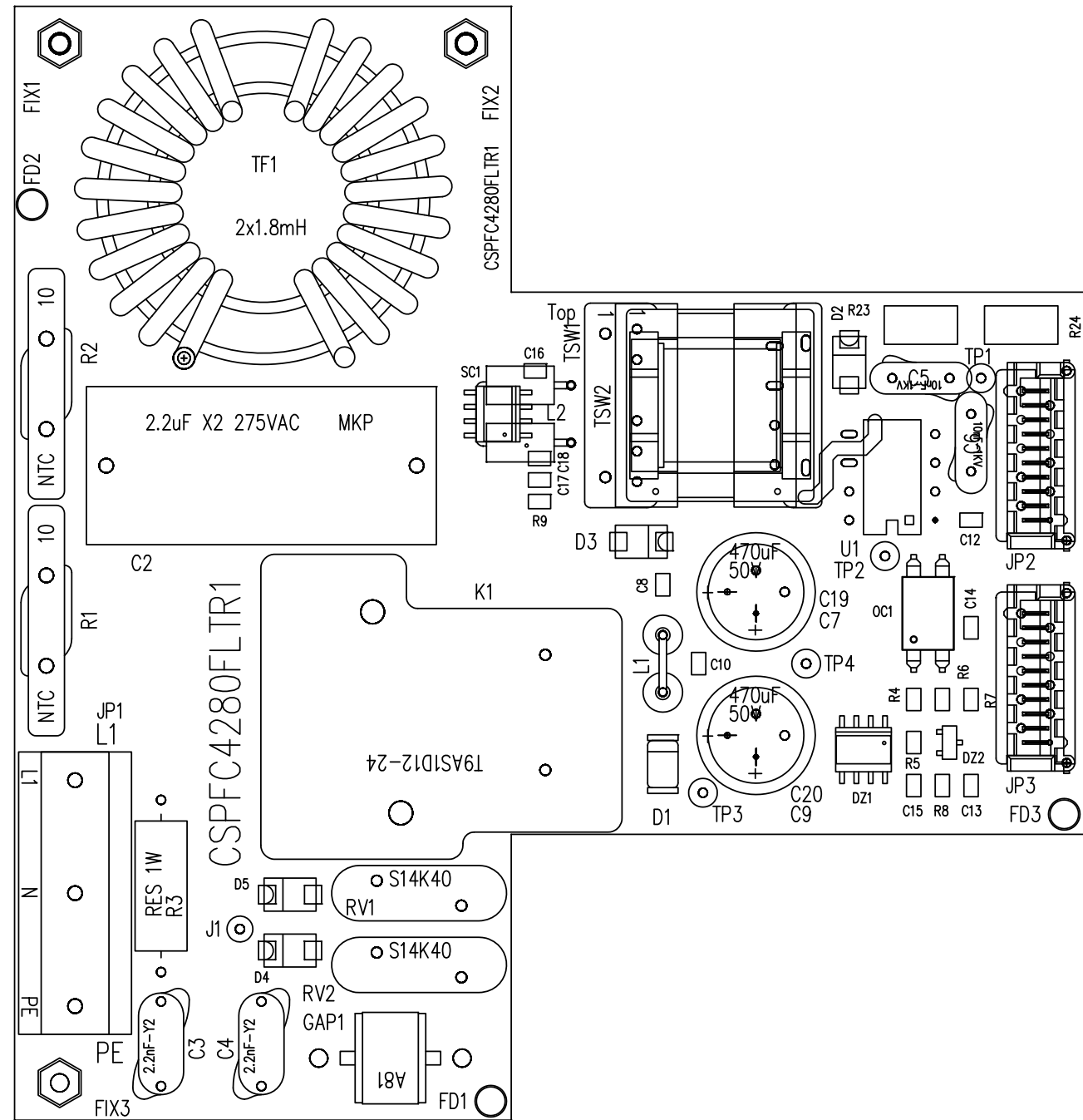


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Precision rectifier		
Size	Document Number	Rev
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Date:	Wednesday, April 30, 2014	Sheet 2 of 2

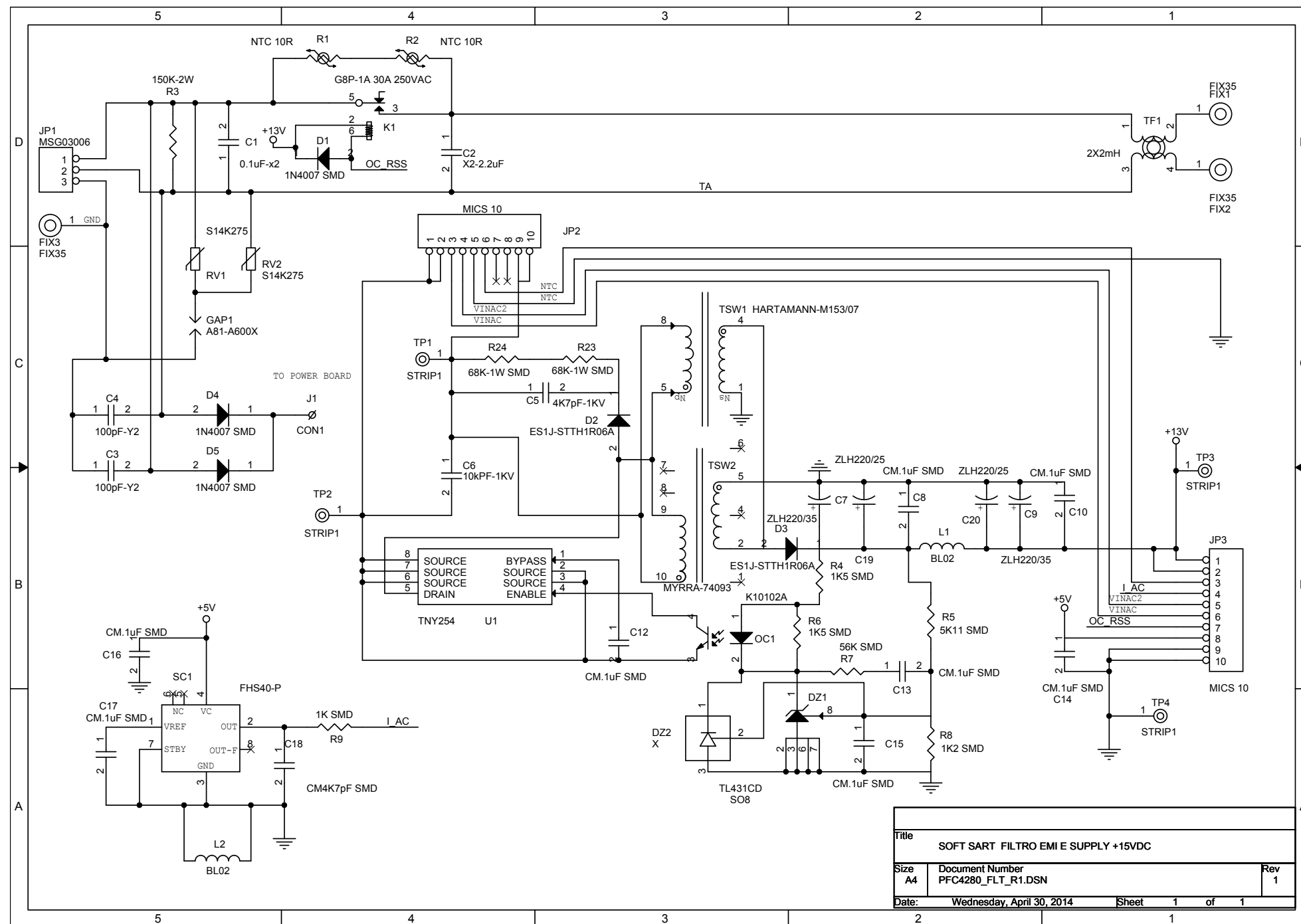
PFC CONTROLLER 4280 R1 Revised: Wednesday, April 30, 2014
PFC4280CNT_R0.DSN Revision: 1

Bill Of Materials Page1

Item	Quantity	Reference	Part			
				42	2 R15,R61	56K SMD
				43	2 R16,R17	8K2 SMD
				44	1 R18	68K SMD
				45	1 R19	150K SMD
				46	1 R20	3K3 SMD
				47	6 R21,R22,R23,R24,R67,R93	1K SMD
				48	2 R27,R55	100R SMD
				49	20 R28,R29,R30,R33,R34,R39, R43,R44,R45,R46,R47,R48, R49,R51,R60,R63,R64,R68, R83,R97	10K SMD
				50	6 R32,R52,R73,R77,R81,R82	20K SMD
				51	1 R35	10M SMD
				52	4 R36,R62,R66,R94	1K5 SMD
				53	1 R38	NTC-10K SMD
				54	1 R40	9K53 SMD
				55	1 R54	330R SMD
				56	2 R58,R99	560R SMD
				57	1 R70	27K SMD
				58	1 R78	100K SMD
				59	2 R91,R96	220K SMD
				60	1 R92	1K8 SMD
				61	1 R95	1K69 SMD
				62	10 TP1,TP2,TP3,TP4,TP5,TP7, TP8,TP9,TP10,TP11	STRIP-1
				63	1 TR1	X-3106X-10K
				64	1 TR4	87W-20K
				65	2 U1,U3	TC4420
				66	1 U2	UCC28070
				67	1 U4	TC1232COA
				68	1 U5	MC9S08AC16CFGE 44- LQFP
				69	1 U6	7805 D2PACK
				70	1 U7	74AHC1G14
				71	2 U9,U21	LM258 SO8
				72	1 U11	25LC640-I/SN
				73	1 U22	TC7660
				74	1 Y1	QA461-14.7456MHz
1	29	C1,C3,C15,C24,C26,C30, C31,C33,C39,C41,C42,C43, C44,C45,C47,C48,C50,C51, C52,C53,C57,C59,C60,C68, C70,C71,C72,C73,C74	.1uF SMD			
2	11	C2,C4,C8,C20,C27,C38,C58, C61,C63,C64,C65	1uF SMD			
3	2	C5,C32	0.22uF SMD			
4	2	C6,C7	47KpF SMD			
5	4	C9,C25,C35,C36	4.7uF SMD			
6	4	C10,C12,C13,C49	560pF SMD			
7	2	C11,C14	3K3pF SMD			
8	2	C16,C18	330pF SMD			
9	2	C17,C19	2K2pF SMD			
10	1	C21	2.2uF SMD			
11	2	C22,C23	220pF SMD			
12	2	C28,C77	10KpF SMD			
13	2	C29,C34	27pF SMD			
14	4	C37,C54,C55,C56	1KpF SMD			
15	5	TR3,R25,R26,C40,R50	X			
16	3	C66,C67,C69	CE10/25			
17	1	C75	CP33nF			
18	1	C76	22KpF SMD			
19	1	C78	CP6K8pF			
20	6	DL1,DL2,DL3,DL4,DL5,DL6	ROSSO 0805			
21	3	DZ1,DZ2,DZ5	5V1-1W SMD			
22	1	DZ4	LM4040-5V-1%			
23	10	D1,D2,D3,D4,D5,D6,D7,D8, D9,D10	LL4148			
24	4	FIX1,FIX2,FIX3,FIX4	FIX35			
25	2	JP1,JP10	MICS10			
26	11	JP2,JP3,JP4,JP5,JP6,JP7, JP8,JP9,JP11,JP12,JP13	STRIP 2			
27	1	J1	MICS 4			
28	2	J2,J5	MLSS4			
29	1	J3	STRIP 5			
30	1	J4	STRIP 6			
31	1	K1	FTR-B3-GA-012			
32	2	OC1,OC3	K10102A SMD			
33	5	Q1,Q2,Q3,Q4,Q5	BCR135			
34	7	R1,R3,R4,R6,R31,R90,R98	10R SMD			
35	2	R2,R7	5R6 1210			
36	1	R5	59K SMD			
37	2	R8,R42	4K7 SMD			
38	3	R9,R10,R69	3K9 SMD			
39	6	R11,R12,R37,R41,R57,R74	2K2 SMD			
40	1	R13	47K SMD			
41	1	R14	75K SMD			



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DOCUMENT NUMBER PFC4280_FLT_R1_MNT. DWG	REV 1
DATE: 4 MARZO2014	



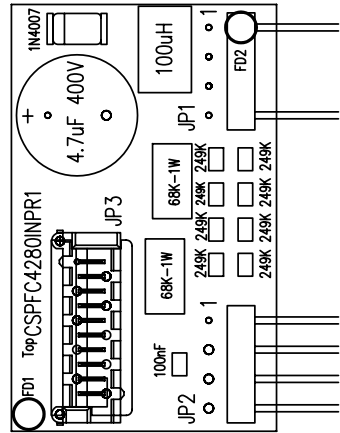
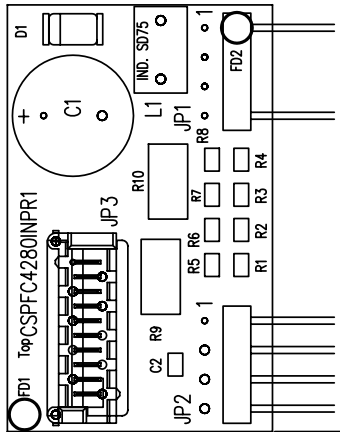
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Revised: Wednesday, April 30, 2014

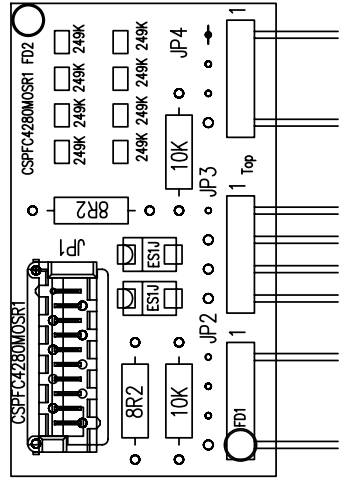
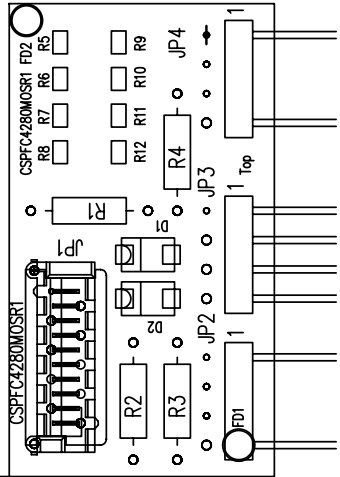
PFC4280_FLT_R1.DSN Revision: 1

Item	Qty	Reference	Part
1	1	C1	0.1uF-x2
2	1	C2	X2-2.2uF
3	2	C3,C4	100pF-Y2
4	1	C5	4K7pF-1KV
5	1	C6	10kPF-1KV
6	2	C7,C9	ZLH220/35
7	8	C8,C10,C12,C13, C14,C15,C16,C17	CM.1uF SMD
8	1	C18	CM4K7pF SMD
9	2	C19,C20	ZLH220/25
10	1	DZ1	TL431CD
11	1	DZ2	X
12	3	D1,D4,D5	1N4007 SMD
13	2	D2,D3	ES1J-STTH1R06A
14	3	FIX1, FIX2, FIX3	FIX35
15	1	GAP1	A81-A600X
16	1	JP1	MSG03006
17	2	JP2, JP3	MICS 10
18	1	J1	CON1
19	1	K1	G8P-1A 30A 250VAC
20	2	L1,L2	BL02
21	1	OC1	K10102A
22	2	RV1,RV2	S14K275
23	2	R1,R2	NTC 10R
24	1	R3	150K-2W
25	2	R4,R6	1K5 SMD
26	1	R5	5K11 SMD
27	1	R7	56K SMD
28	1	R8	1K2 SMD
29	1	R9	1K SMD
30	2	R23,R24	68K-1W SMD
31	1	SC1	FHS40-P
32	1	TF1	2X2mH
33	4	TP1, TP2, TP3, TP4	STRIP1
34	1	TSW1	HARTAMANN-M153/07
35	1	TSW2	MYRRA-74093
36	1	U1	TNY254

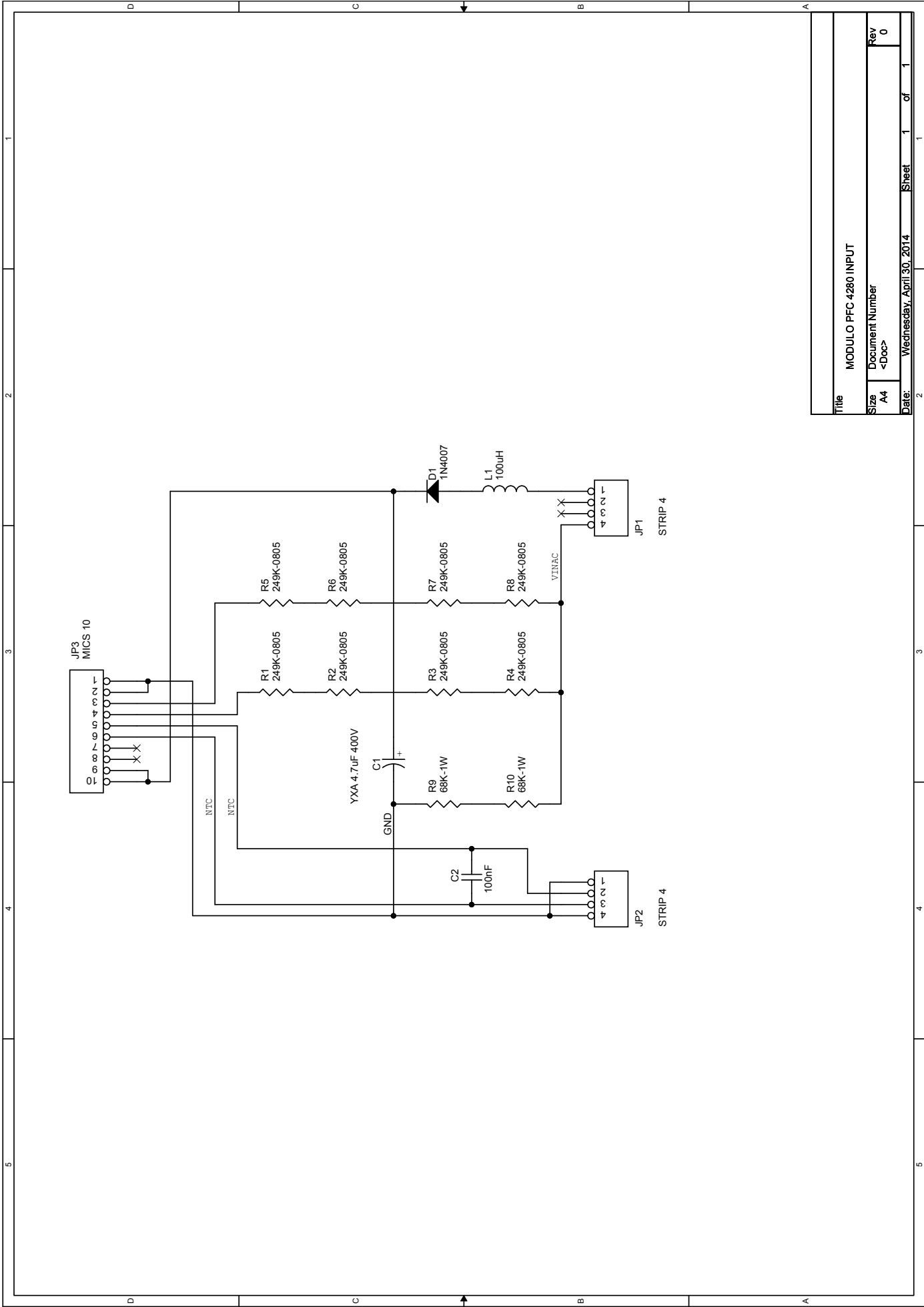
PIANO DI MONTAGGIO INPUT PFC4280R1



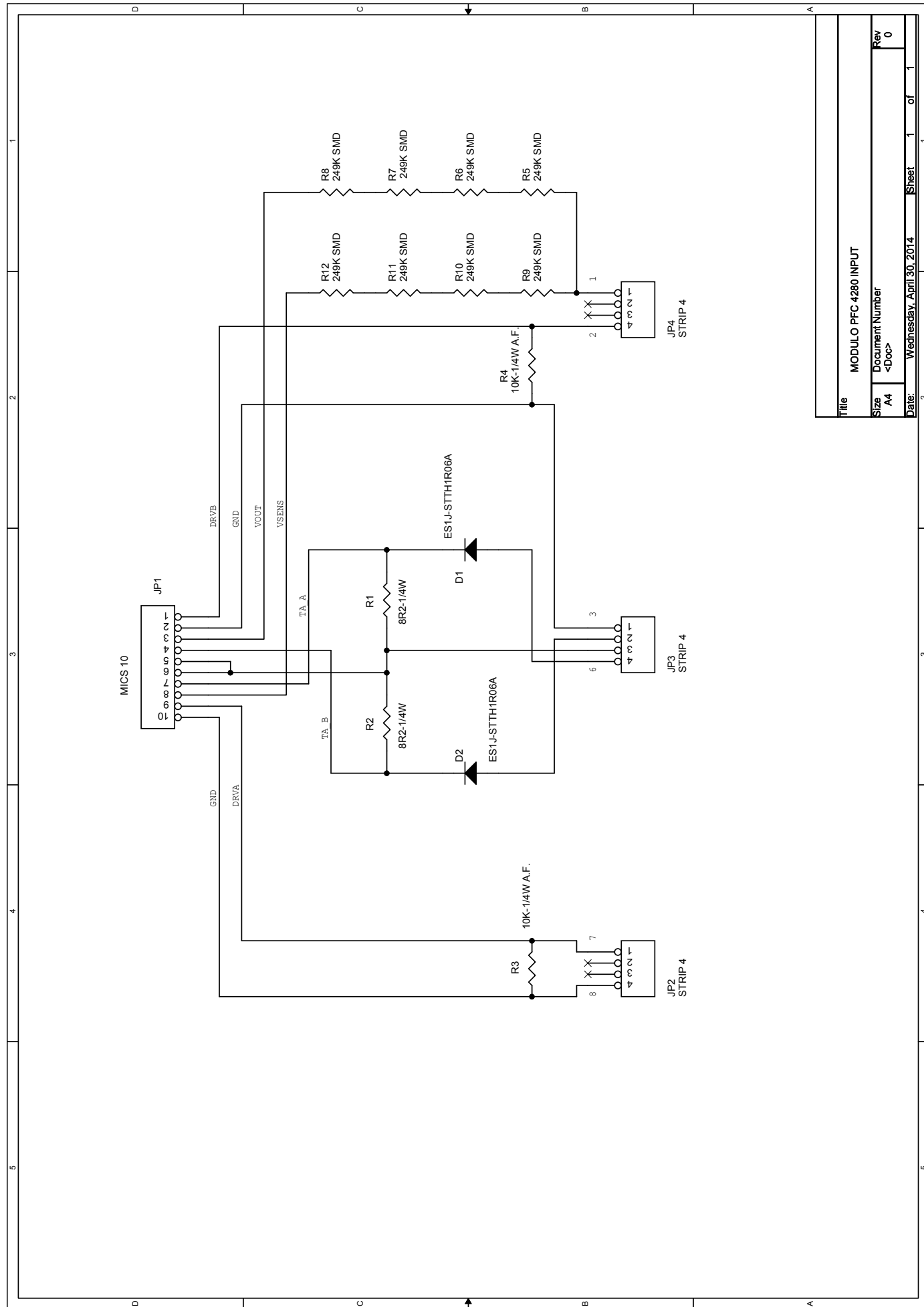
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DOCUMENT NUMBER PFC4280INPR1_MDSR1_MNT. DWG
REV
DATE: 4 MARZO 2014



Title	MODULO PFC 4280 INPUT
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MODULO PFC 4280 INPUT
Revised: Wednesday, April 30, 2014
Revision: 0

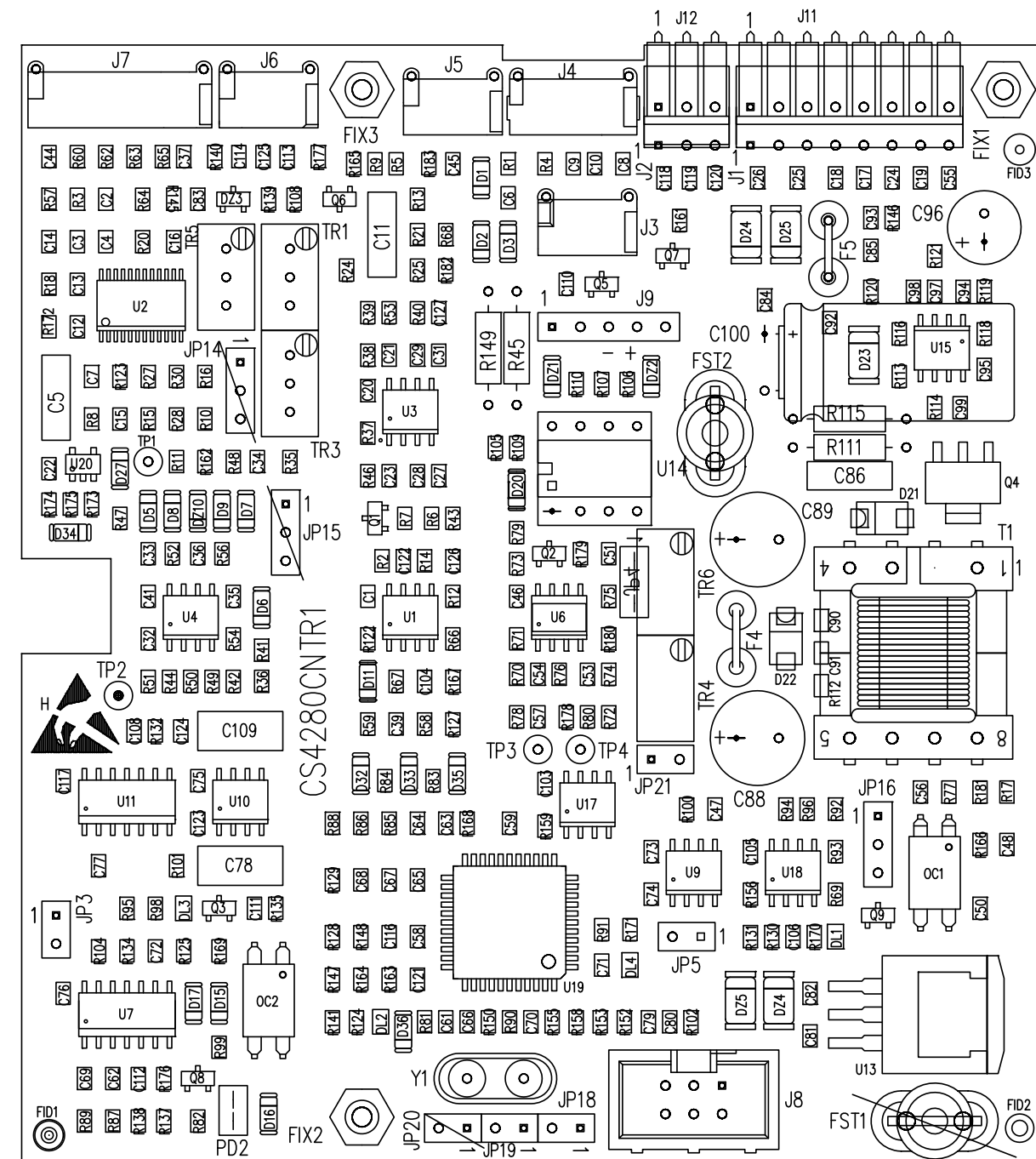
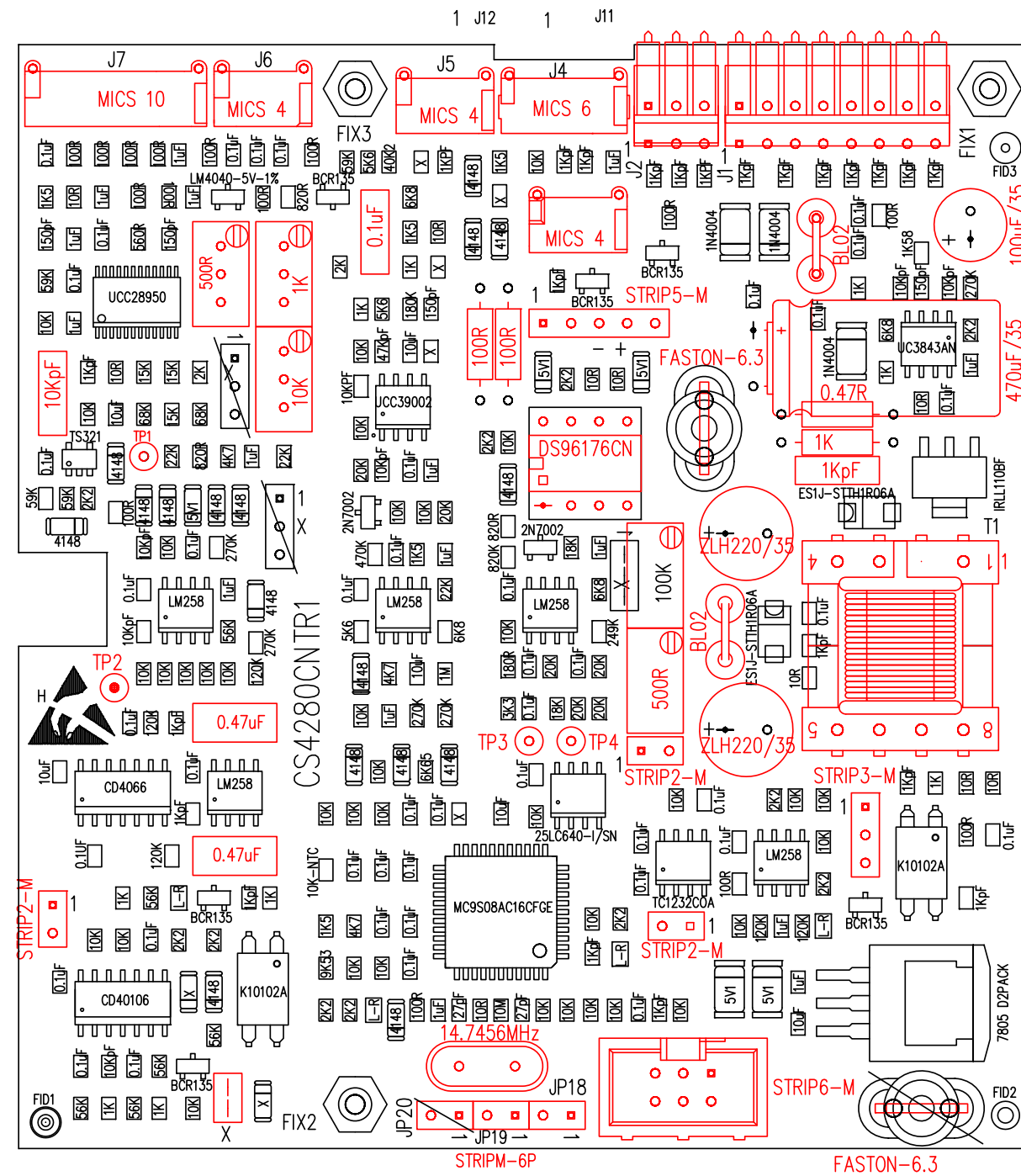
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2	1	C2	100nF
3	1	D1	1N4007
4	2	JP1,JP2	STRIP 4
5	1	JP3	MICS 10
6	1	L1	100uH
7	8	R1,R2,R3,R4, R5,R6,R7,R8	249K-0805
8	2	R9,R10	68K-1W

MODULO PFC 4280 INPUT
Revised: Wednesday, April 30, 2014
Revision: 0

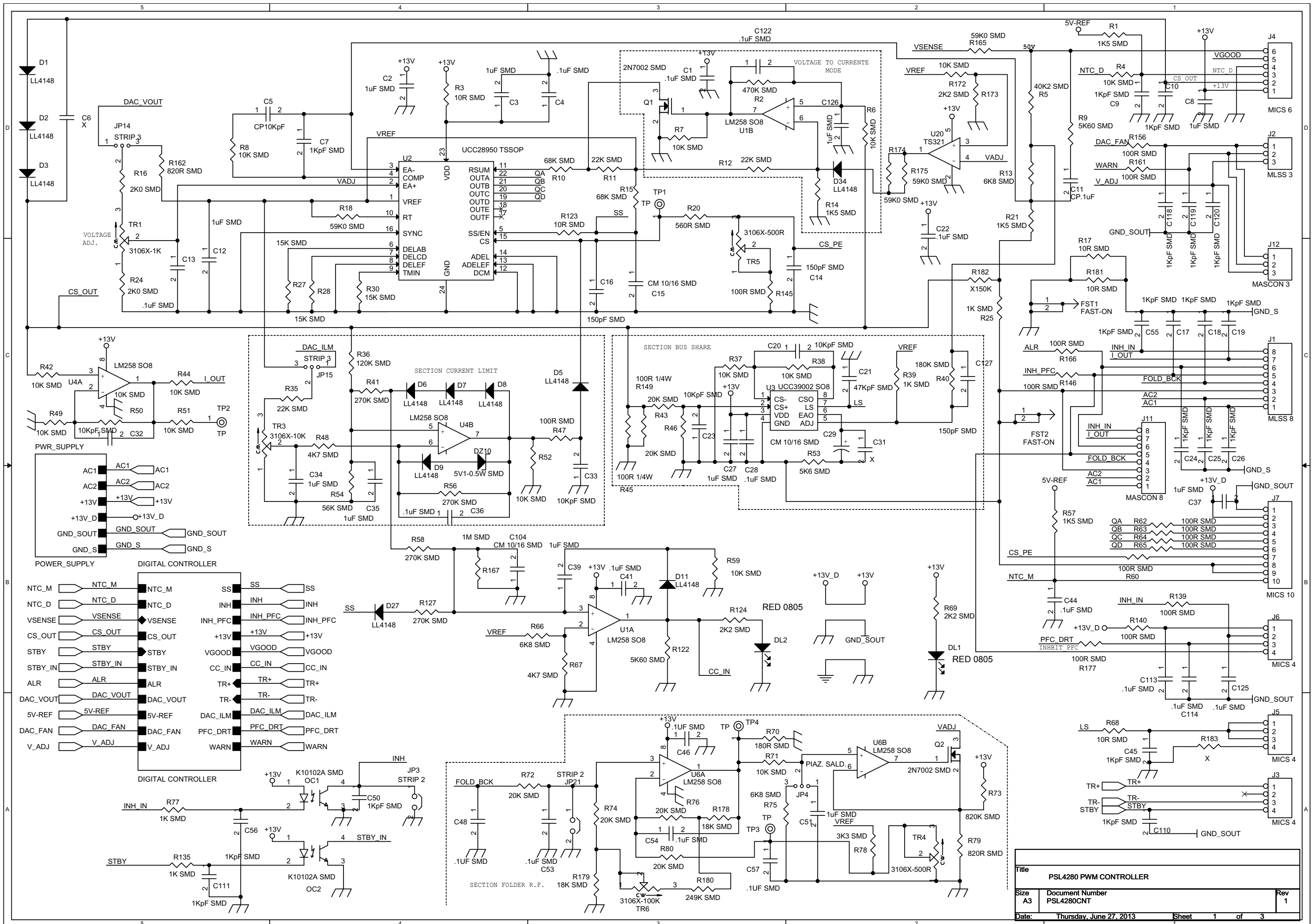
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1	2	D1,D2	ES1J-STTH1R06A
2	1	JP1	MICS 10
3	3	JP2,JP3,JP4	STRIP 4
4	2	R1,R2	8R2-1/4W
5	2	R3,R4	10K-1/4W A.F.
6	7	R5,R6,R8,R9, R10,R11,R12	249K SMD
7	1	R7	249K SMD

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DOCUMENT NUMBER PFC4280CNT_R1_MNT. DWG	REV 1
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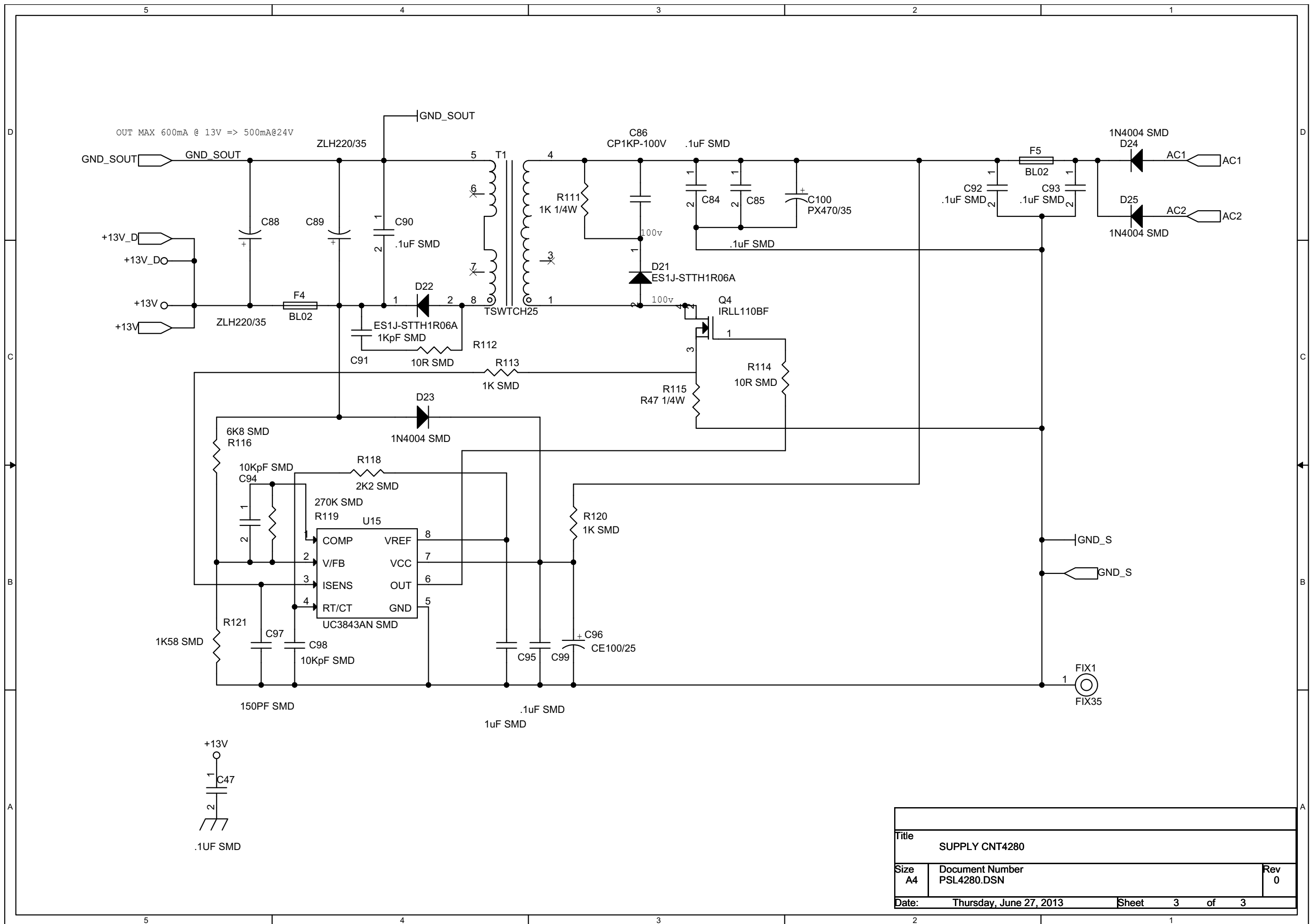
8.9 Power supply (KPSL4280.LC)









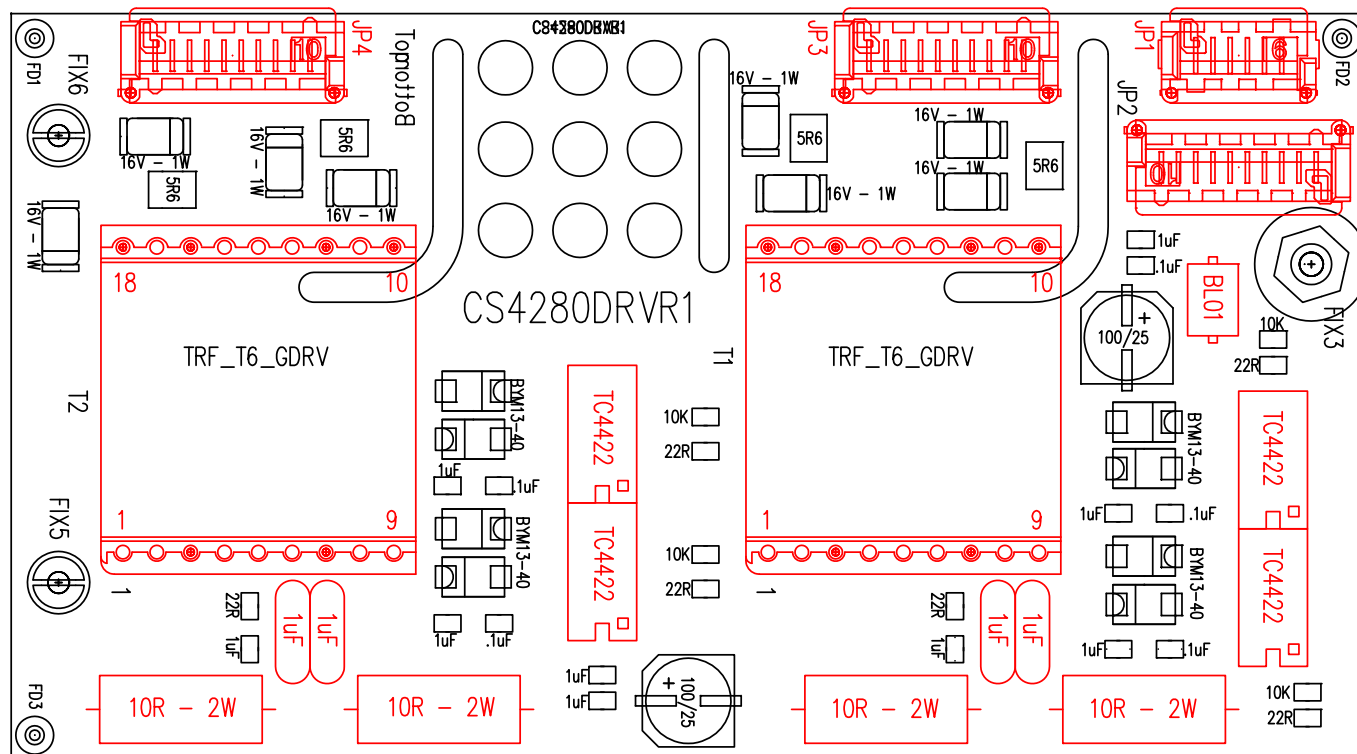


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Size	Document Number	Rev
A4	PSL4280.DSN	0
Date:	Thursday, June 27, 2013	Sheet 3 of 3

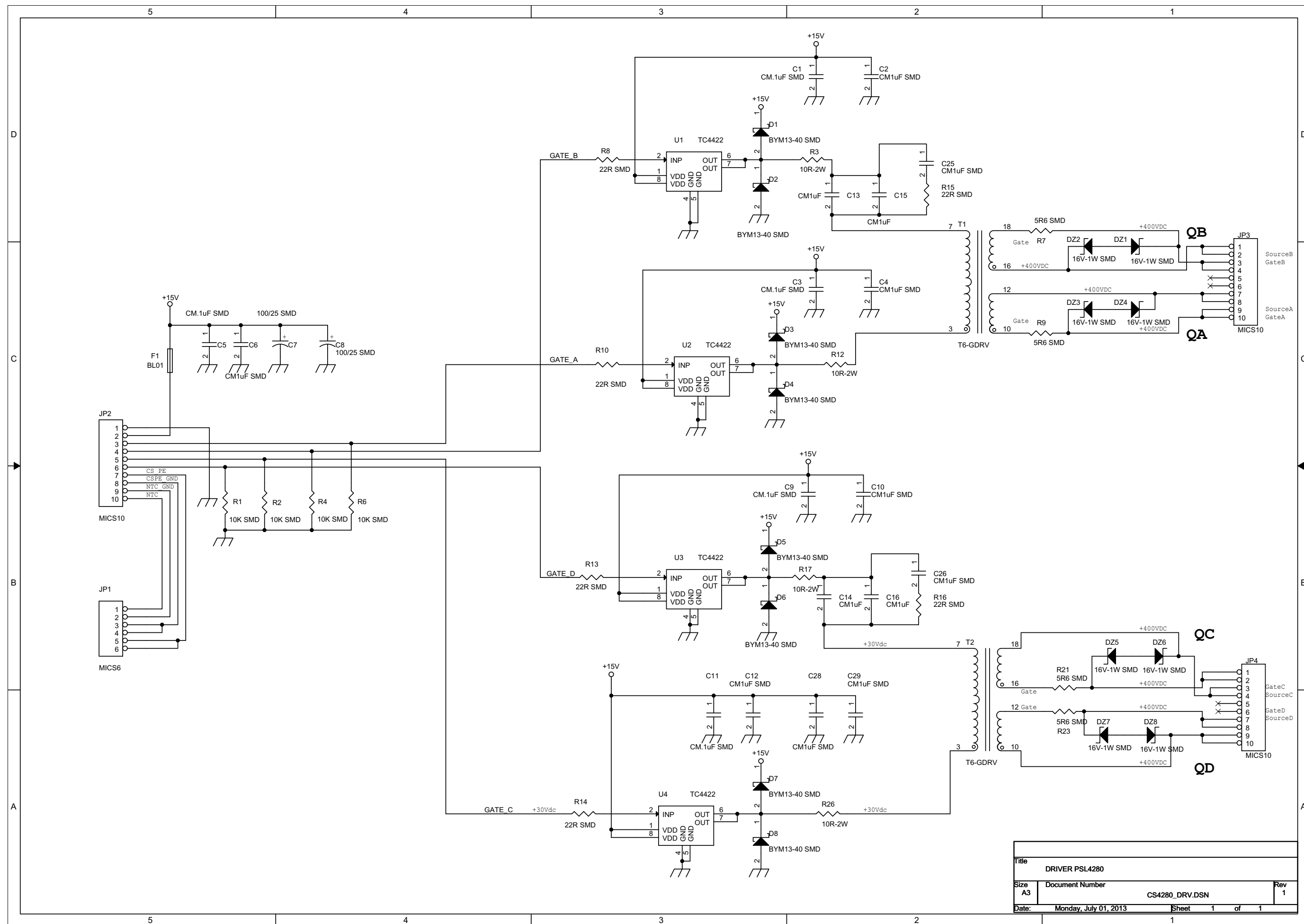
PSL4280CNT Revision: 1

Item	Quantity	Reference	Part
1	44	C1,C4,C13,C22,C28,C36, C41,C44,C46,C47,C48,C53, C54,C57,C58,C63,C64,C65, C67,C68,C69,C72,C73,C74, C75,C76,C77,C79,C84,C85, C90,C92,C93,C99,C103, C105,C108,C112,C113,C114, C116,C121,C122,C125	.1uF SMD
2	16	C2,C3,C8,C12,C27,C34,C35, C37,C39,C51,C61,C82,C83, C95,C106,C126	1uF SMD
3	1	C5	CP10KpF
4	6	C6,D16,D17,C31,R168,R183	X
5	23	C7,C9,C10,C17,C18,C19, C24,C25,C26,C45,C50,C55, C56,C71,C80,C91,C110, C111,C118,C119,C120,C123, C124	1KpF SMD
6	1	C11	CP.1uF
7	4	C14,C16,C97,C127	150pF SMD
8	3	C15,C29,C104	CM 10/16 SMD
9	7	C20,C23,C32,C33,C62,C94, C98	10KpF SMD
10	1	C21	47KpF SMD
11	3	C59,C81,C117	10uF SMD
12	2	C66,C70	27pF SMD
13	1	C78	CP .47uF
14	1	C86	CP1KP-100V
15	2	C88,C89	ZLH220/35
16	1	C96	CE100/25
17	1	C100	PX470/35
18	1	C109	CP .47uF
19	4	DL1,DL2,DL3,DL4	ROSSO 0805
20	3	DZ1,DZ2,DZ10	5V1-0.5W SMD
21	1	DZ3	LM4040-5V-1%
22	2	DZ4,DZ5	5V1-1W SMD
23	17	D1,D2,D3,D5,D6,D7,D8,D9, D11,D15,D20,D27,D32,D33, D34,D35,D36	LL4148
24	2	D21,D22	ES1J-STTH1R06A
25	3	D23,D24,D25	1N4004 SMD
26	1	FIX1	FIX35
27	2	FST1,FST2	FAST-ON
28	2	F4,F5	BL02
29	6	JP3,JP5,JP18,JP19,JP20, JP21	STRIP 2
30	1	JP4	PIAZ. SALD.
31	3	JP14,JP15,JP16	STRIP 3
32	1	J1	MLSS 8
33	1	J2	MLSS 3

34	3 J3,J5,J6	MICS 4	77	1 R115	R47 1/4W
35	1 J4	MICS 6	78	1 R121	1K58 SMD
36	1 J7	MICS 10	79	1 R129	NTC-10K SMD
37	1 J8	STRIP 6	80	1 R147	9K53 SMD
38	1 J9	STRIP 5	81	1 R167	1M SMD
39	1 J11	MASCON 8	82	2 R178,R179	18K SMD
40	1 J12	MASCON 3	83	1 R180	249K SMD
41	2 OC1,OC2	K10102A SMD	84	1 R182	X150K
42	1 PD2	LUNENO	85	4 TP1,TP2,TP3,TP4	TP
43	2 Q1,Q2	2N7002 SMD	86	1 TR1	3106X-1K
44	6 Q3,Q5,Q6,Q7,Q8,Q9	BCR135	87	1 TR3	3106X-10K
45	1 Q4	IRLL110BF	88	2 TR4,TR5	3106X-500R
46	5 R1,R14,R21,R57,R128	1K5 SMD	89	1 TR6	3106X-100K
47	1 R2	470K SMD	90	1 T1	TSWTCH25
48	10 R3,R17,R68,R106,R107, R112,R114,R123,R150,R181	10R SMD	91	5 U1,U4,U6,U10,U18	LM258 SO8
49	37 R4,R6,R7,R8,R37,R38,R42, R44,R49,R50,R51,R52,R59, R71,R82,R84,R85,R86,R88, R91,R92,R93,R96,R100, R102,R104,R109,R131,R134, R152,R153,R155,R158,R159, R163,R164,R172	10K SMD	92	1 U2	UCC28950 TSSOP
			93	1 U3	UCC39002 SO8
			94	1 U7	CD40106 SOIC
			95	1 U9	TC1232COA
			96	1 U11	CD4066 SOIC
			97	1 U13	7805 D2PACK
			98	1 U14	DS96176CN
50	1 R5	40K2 SMD	99	1 U15	UC3843AN SMD
51	2 R9,R122	5K60 SMD	100	1 U17	25LC640-I/SN
52	2 R10,R15	68K SMD	101	1 U19	MC9S08AC16CFGE 44- LQFP
53	3 R11,R12,R35	22K SMD	102	1 U20	TS321
54	4 R13,R66,R75,R116	6K8 SMD	103	1 Y1	QA461-14.7456MHz
55	2 R16,R24	2K0 SMD			
56	4 R18,R165,R174,R175	59K0 SMD			
57	1 R20	560R SMD			
58	9 R25,R39,R77,R87,R95,R113, R120,R135,R137	1K SMD			
59	3 R27,R28,R30	15K SMD			
60	5 R36,R101,R130,R132,R170	120K SMD			
61	1 R40	180K SMD			
62	5 R41,R56,R58,R119,R127	270K SMD			
63	6 R43,R46,R72,R74,R76,R80	20K SMD			
64	2 R45,R149	100R 1/4W			
65	15 R47,R60,R62,R63,R64,R65, R81,R139,R140,R145,R146, R156,R161,R166,R177	100R SMD			
66	3 R48,R67,R148	4K7 SMD			
67	1 R53	5K6 SMD			
68	6 R54,R89,R98,R99,R138, R176	56K SMD			
69	11 R69,R94,R105,R110,R118, R124,R125,R141,R169,R171, R173	2K2 SMD			
70	1 R70	180R SMD			
71	1 R73	820K SMD			
72	1 R78	3K3 SMD			
73	3 R79,R108,R162	820R SMD			
74	1 R83	6K65 SMD			
75	1 R90	10M SMD			
76	1 R111	1K 1/4W			

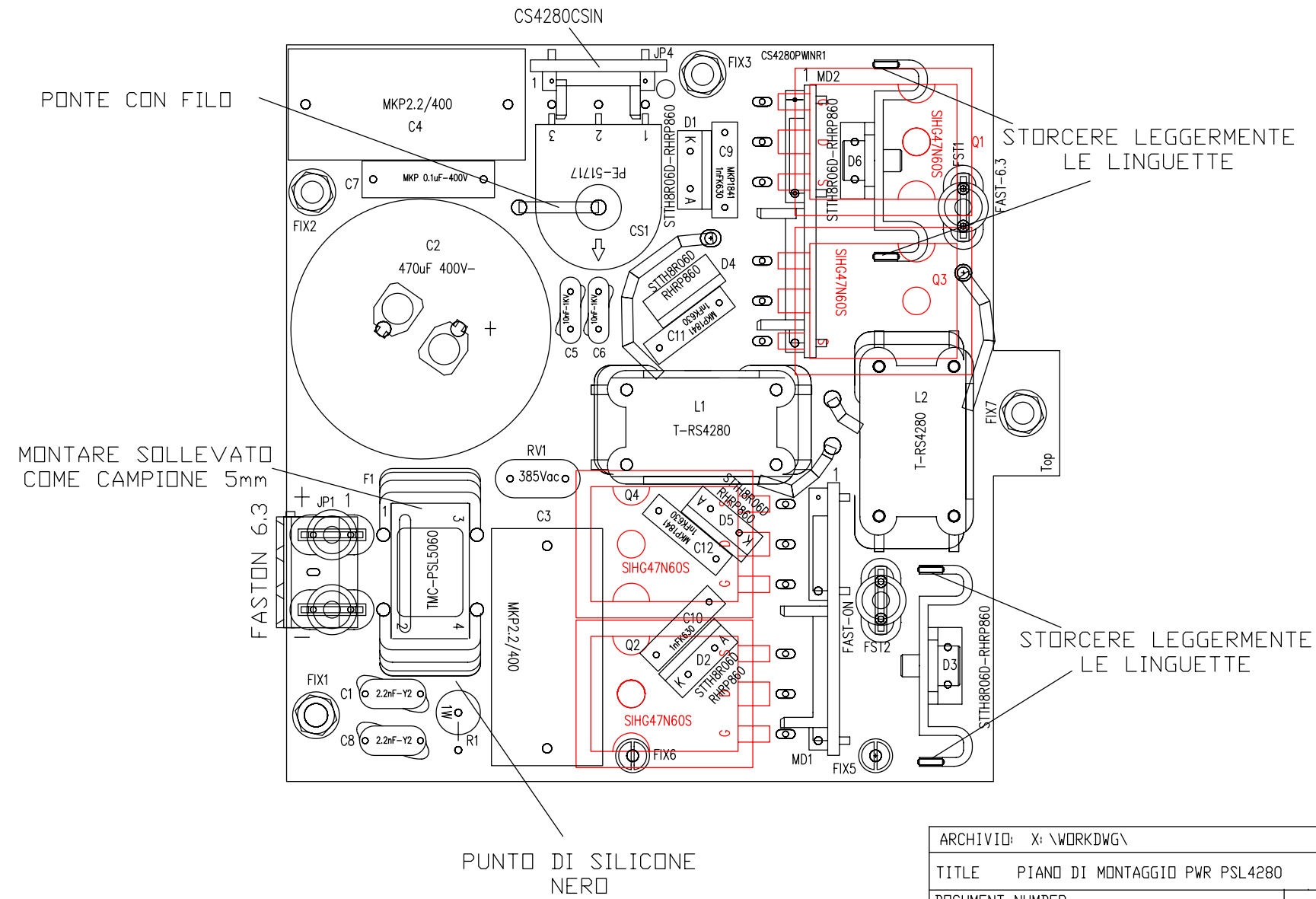


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2	9	C2,C4,C6,C10,C12,C25,C26, C28,C29	CM1uF SMD
3	2	C7,C8	100/25 SMD
4	4	C13,C14,C15,C16	CM1uF
5	8	DZ1,DZ2,DZ3,DZ4,DZ5,DZ6, DZ7,DZ8	16V-1W SMD
6	8	D1,D2,D3,D4,D5,D6,D7,D8	BYM13-40 SMD
7	1	F1	BL01
8	1	JP1	MICS6
9	3	JP2,JP3,JP4	MICS10
10	4	R1,R2,R4,R6	10K SMD
11	4	R3,R12,R17,R26	10R-2W
12	4	R7,R9,R21,R23	5R6 SMD
13	6	R8,R10,R13,R14,R15,R16	22R SMD
14	2	T1,T2	T6-GDRV
15	4	U1,U2,U3,U4	TC4422

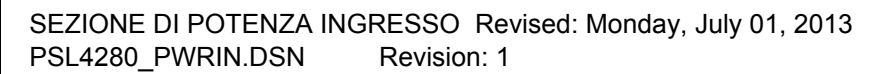


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Date:	Monday, July 01, 2013	Sheet 1 of 1

PIANO DI MONTAGGIO POWER INPUT PSL4280 R1

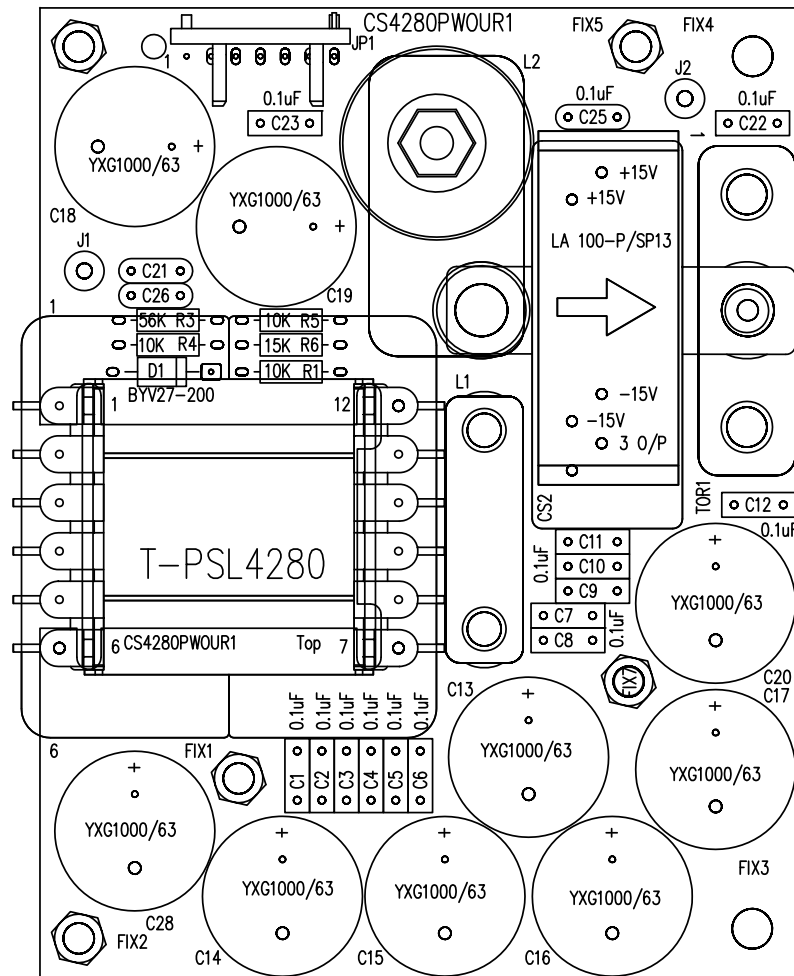


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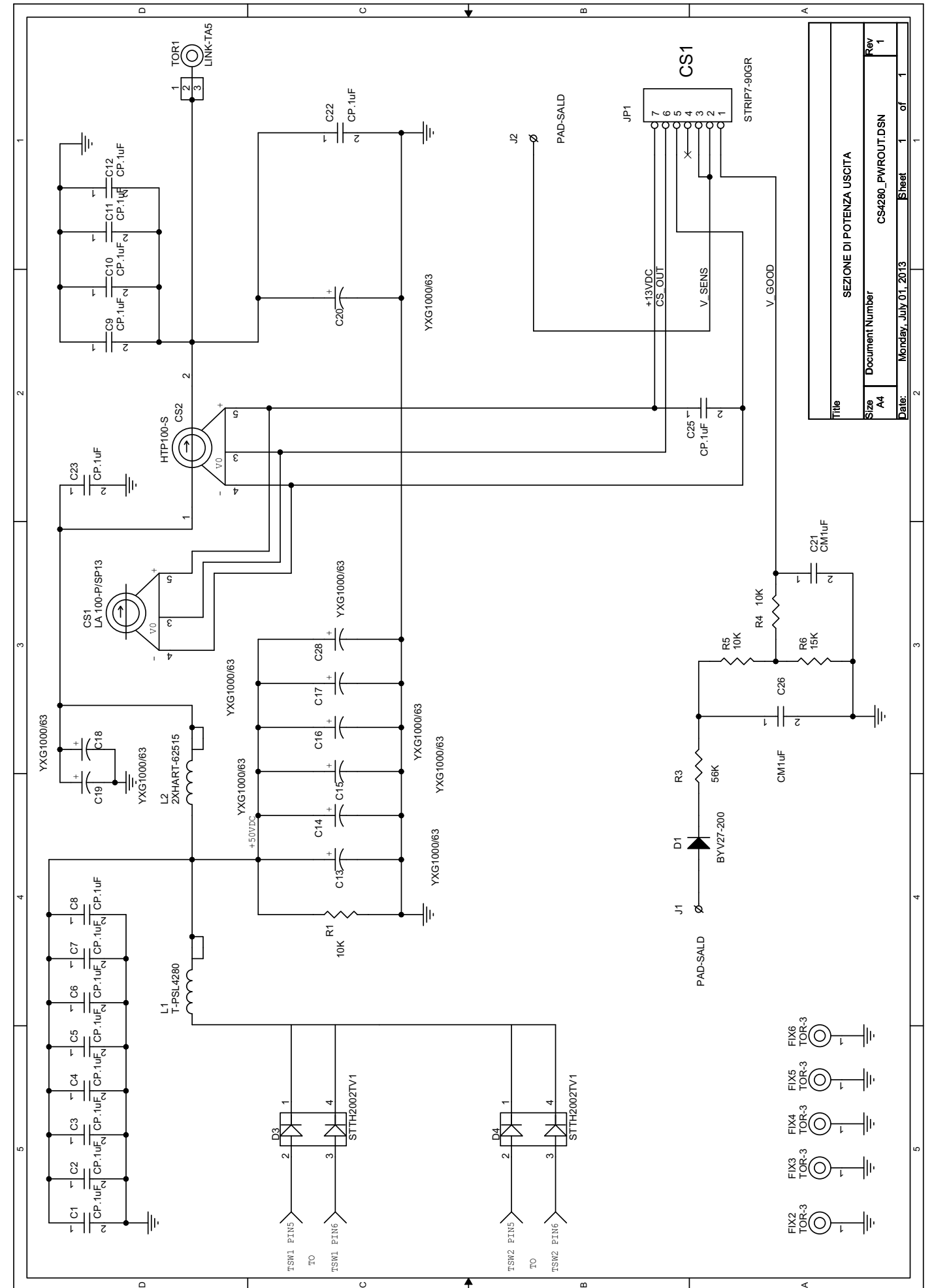
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1	1	CS1	PE-51718
2	2	C1,C8	Y2K2pF
3	1	C2	470/400
4	2	C3,C4	CP2.2/400
5	2	C5,C6	CD10KpF-1KV
6	1	C7	CP.1uF-400'V
7	4	C9,C10,C11,C12	1KpF
8	6	D1,D2,D3,D4,D5,D6	STTH8R06D-RHRP860
9	4	FIX1,FIX2,FIX4,FIX11	FIX35
10	3	FIX6,FIX8,FIX10	FIX-SNAP
11	4	FST1,FST2,H10,H11	FAST-ON
12	1	F1	TMC-PSL5060
13	2	H1,H2	KL105/29
14	1	JP1	KRA3/2
15	1	JP4	STRIP 6
16	2	L1,L2	1.5uH
17	2	MD1,MD2	MODULO MOS
18	4	Q1,Q2,Q3,Q4	STW45NM50-SiG47N60E-GE3
19	1	RV1	VARISTOR-385Vac
20	1	R1	470K
21	2	TSW1,TSW2	TSWTCH42

Title				
SEZIONE DI POTENZA INGRESSO				
Size A4	Document Number			Rev 1
	PSL4280_PWRIN.DSN			
Date:	Monday, July 01, 2013	Sheet	1 of 1	



SEZIONE DI POTENZA INGRESSO Revised: Monday, July 01, 2013
PSL4280_PWRIN.DSN Revision: 1

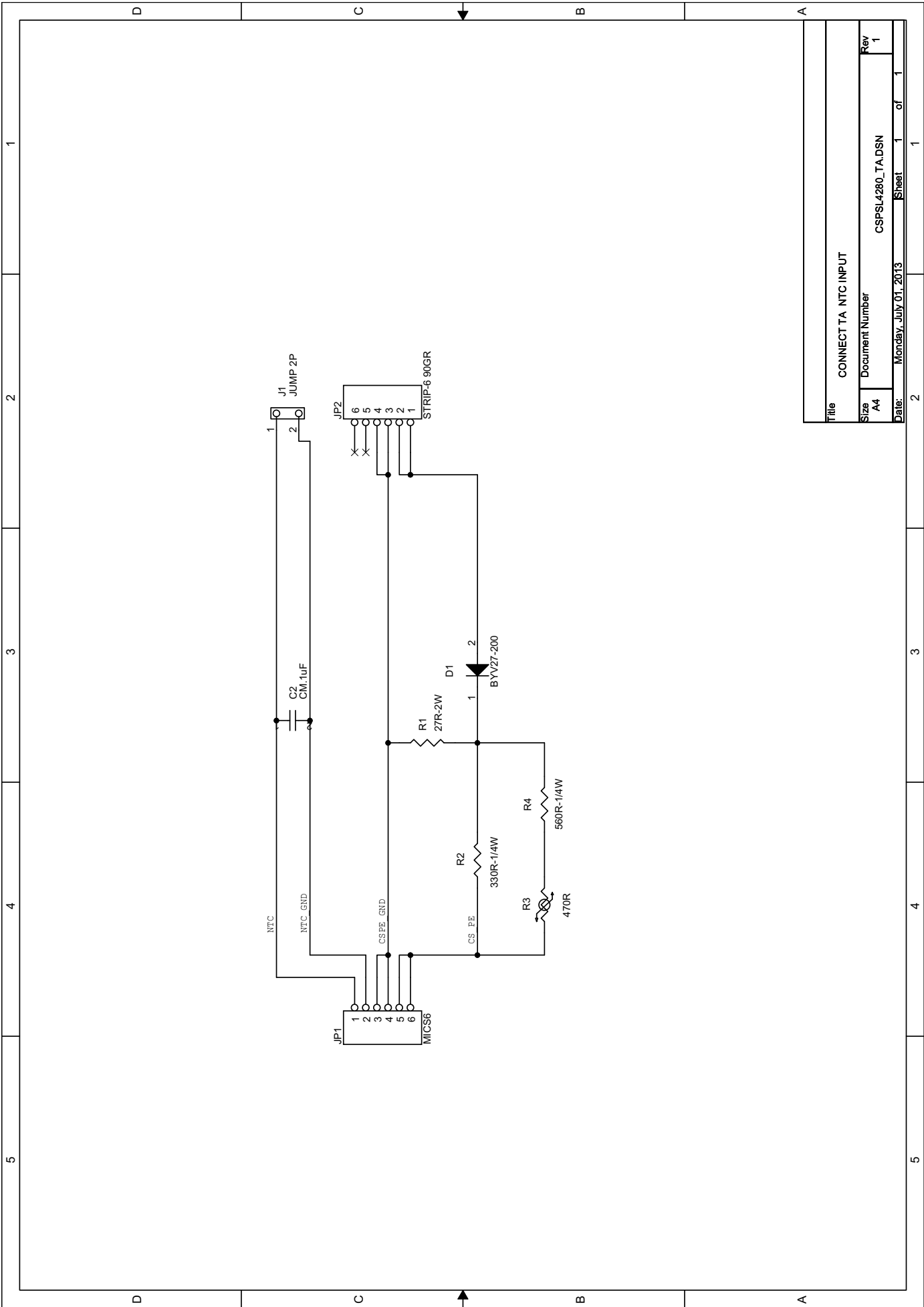
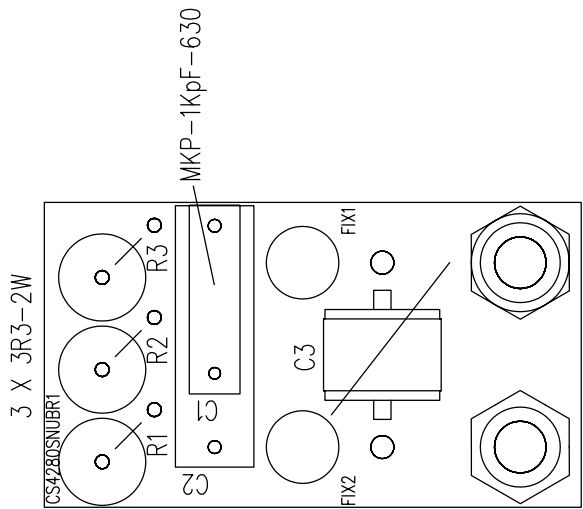
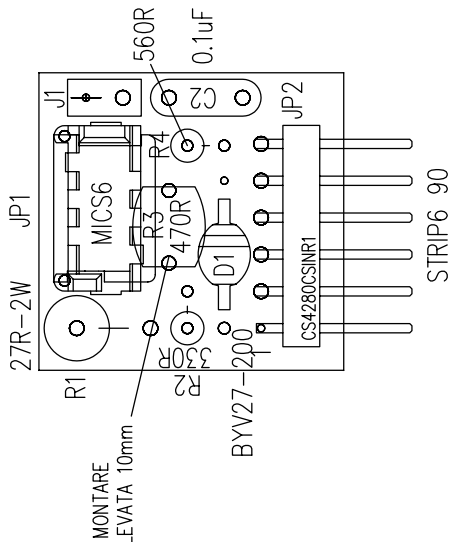
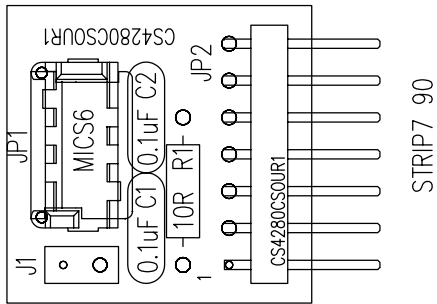
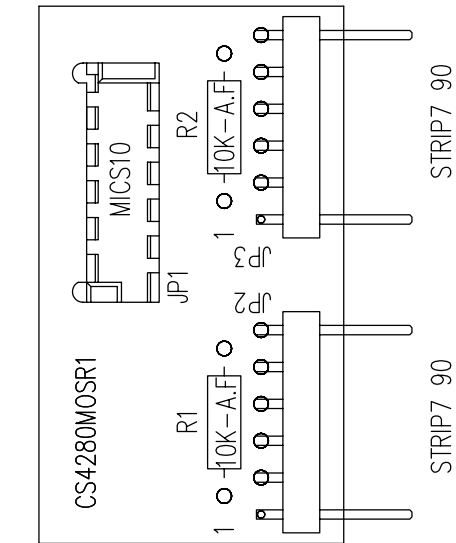
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3	1	C2	470/400
4	2	C3,C4	CP2.2/400
5	2	C5,C6	CD10KpF-1KV
6	1	C7	CP.1uF-400V
7	4	C9,C10,C11,C12	1KpF
8	6	D1,D2,D3,D4,D5,D6	STTH8R06D-RHRP860
9	4	FIX1, FIX2, FIX4, FIX11	FIX35
10	3	FIX6, FIX8, FIX10	FIX-SNAP
11	4	FST1, FST2, H10, H11	FAST-ON
12	1	F1	TMC-PSL5060
13	2	H1, H2	KL105/29
14	1	JP1	KRA3/2
15	1	JP4	STRIP 6
16	2	L1, L2	1.5uH
17	2	MD1, MD2	MODULO MOS
18	4	Q1, Q2, Q3, Q4	STW45NM50-SiG47N60E-GE3
19	1	RV1	VARISTOR-385Vac
20	1	R1	470K
21	2	TSW1, TSW2	TSWTCH42



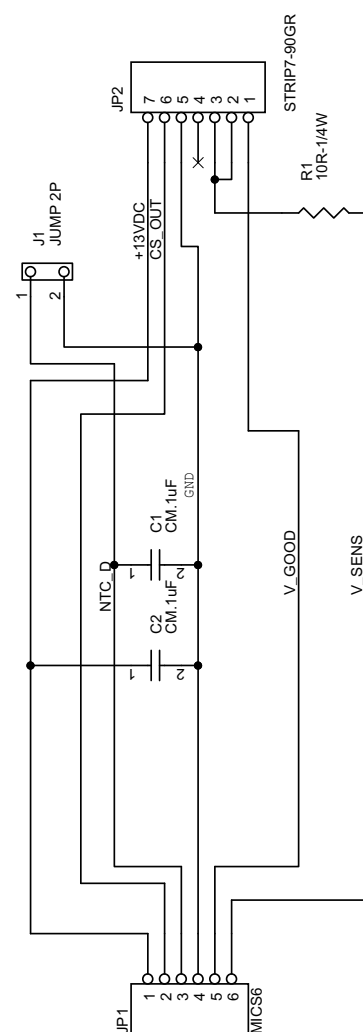
CONNECT TA NTC INPUT Revised: Monday, June 11, 2013
CSPSL4280_TA.DSN Revision: 1

Bill Of Materials June 27, 2013

Item	Quantity	Reference	Part
1	1	C2	CM.1uF
2	1	D1	BYV27-200
3	1	JP1	MICS6
4	1	JP2	STRIP-6 90GR
5	1	J1	JUMP 2P
6	1	R1	27R-2W
7	1	R2	330R-1/4W
8	1	R3	470R
9	1	R4	560R-1/4W



CONNECT TA NTC INPUT			
Size	Document Number	CSPSL4280_TA.DSN	Rev
A4			1
Date:	Monday, July 01, 2013	Sheet	1 of 1

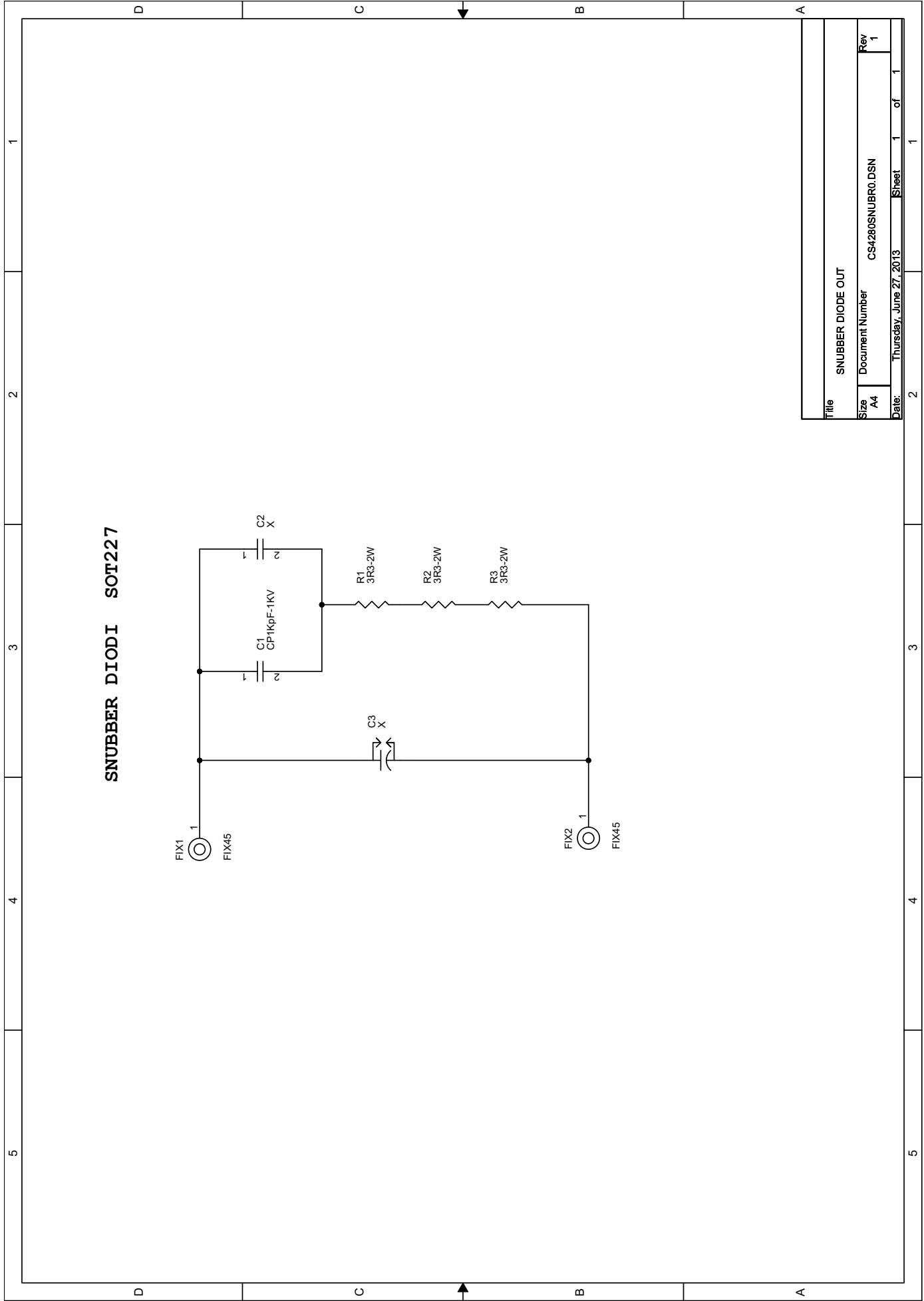


file	CONNECT TA NTC OUT		Rev
Size A4	Document Number	CS4280CSOUR0.DSN	1
Date:	Thursday, June 27, 2013		of 1
	Sheet	1	

CONNECT TA NTC OUT Revised: Monday, June 10, 2013
CS4280CSOUR0.DSN Revision: 1

Bill Of Materials June 27, 2013 7:58:00 Page1

Item	Quantity	Reference	Part
1	2	C1	CM.1uF
		C2	CM.1uF
2	1	JP1	MICS6
3	1	JP2	STRIP7-90GR
4	1	J1	JUMP 2P
5	1	R1	10R-1/4W

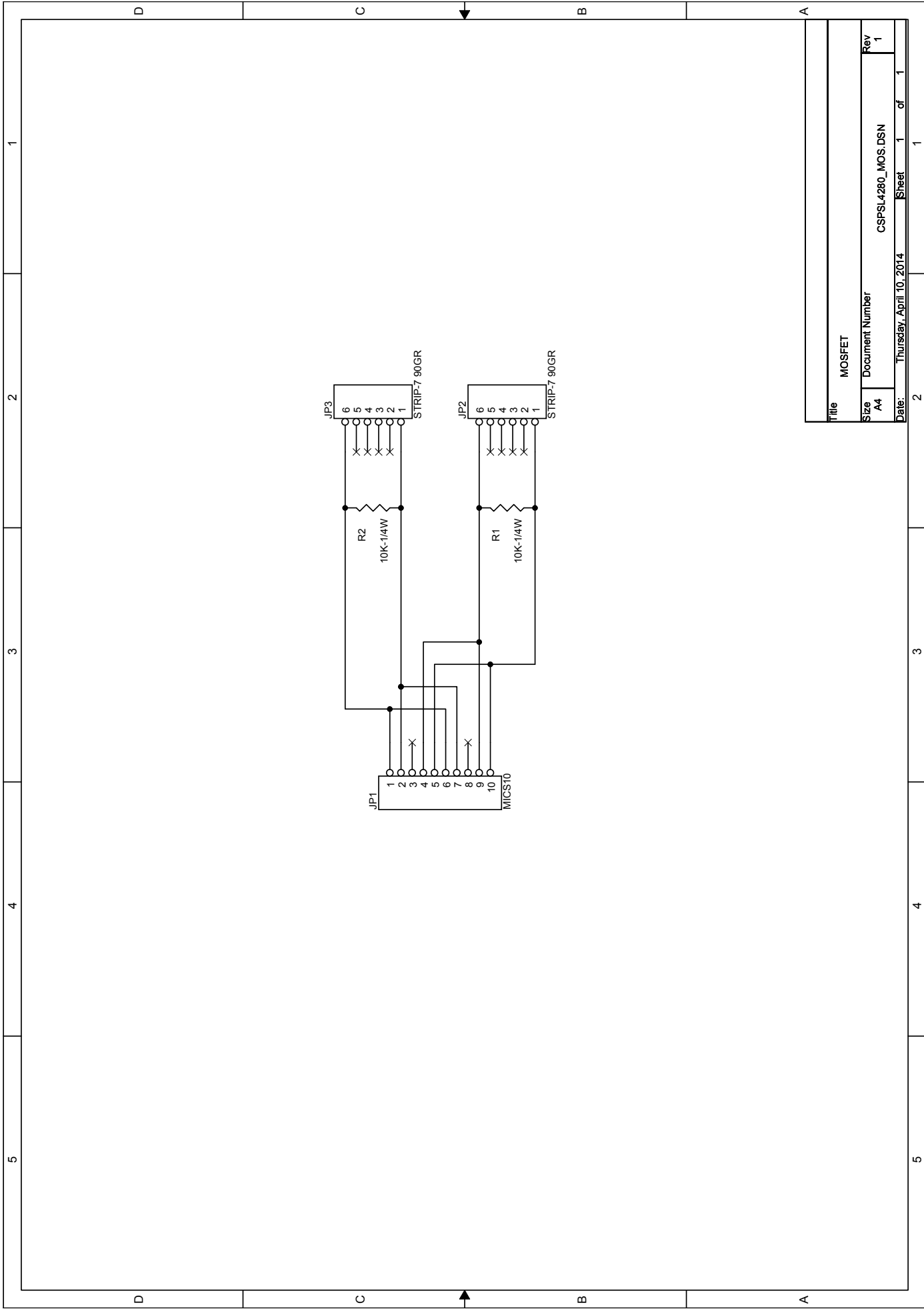


Title			
SNUBBER DIODE OUT			
Document Number		CS4280SNUBR0.DSN	
Size	A4	Rev	1
Date:		Thursday, June 27, 2013	Sheet 1 of 1

SNUBBER DIODE OUT Revised: Monday, June 10, 2013
CS4280SNUBR0.DSN Revision: 1

Bill Of Materials June 27,2013 7:59:07 Page1

Item	Quantity	Reference	Part
1	1	C1	CP1KpF-1KV
2	2	C2	X
		C3	X
3	2	FIX1	FIX45
		FIX2	FIX45
4	3	R1	3R3-2W
		R2	3R3-2W
		R3	3R3-2W



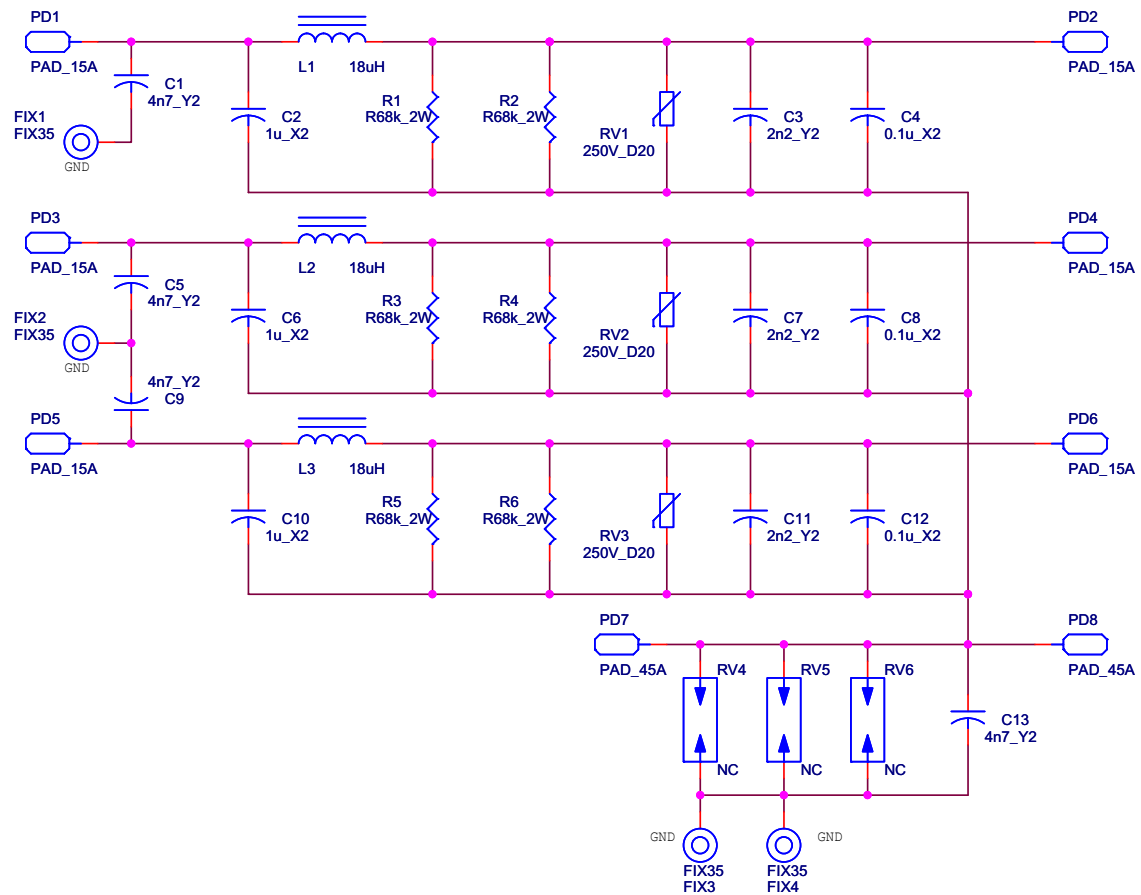
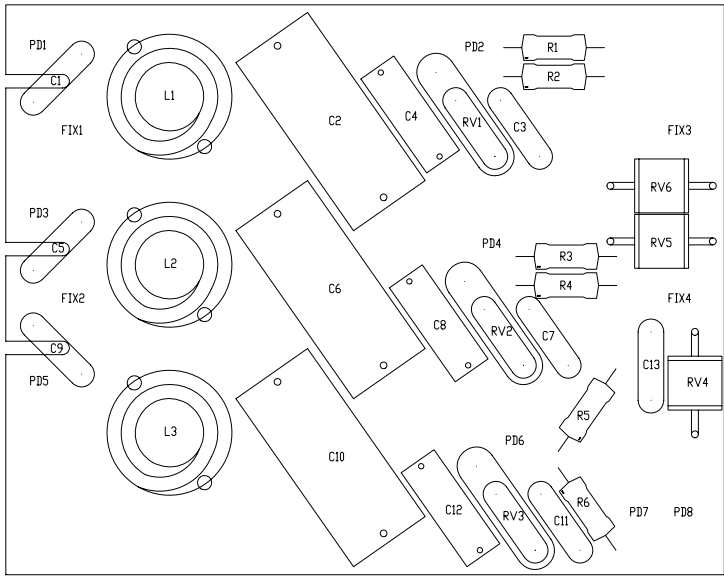
Title	MOSFET
Size	A4
Document Number	CSPSL4280_MOS.DSN
Rev	1
Date:	Thursday, April 10, 2014
Sheet	1 of 1

MOSFET Revised: Thursday, April 10, 2014
CSPSL4280_MOS.DSN Revision: 1

Bill Of Materials Page1

Item	Quantity	Reference Part
1	1 JP1	MICS10
2	2 JP2,JP3	STRIP-7 90GR
3	2 R1,R2	10K-1/4W

8.10 Surge protection board (SL046SR1002)

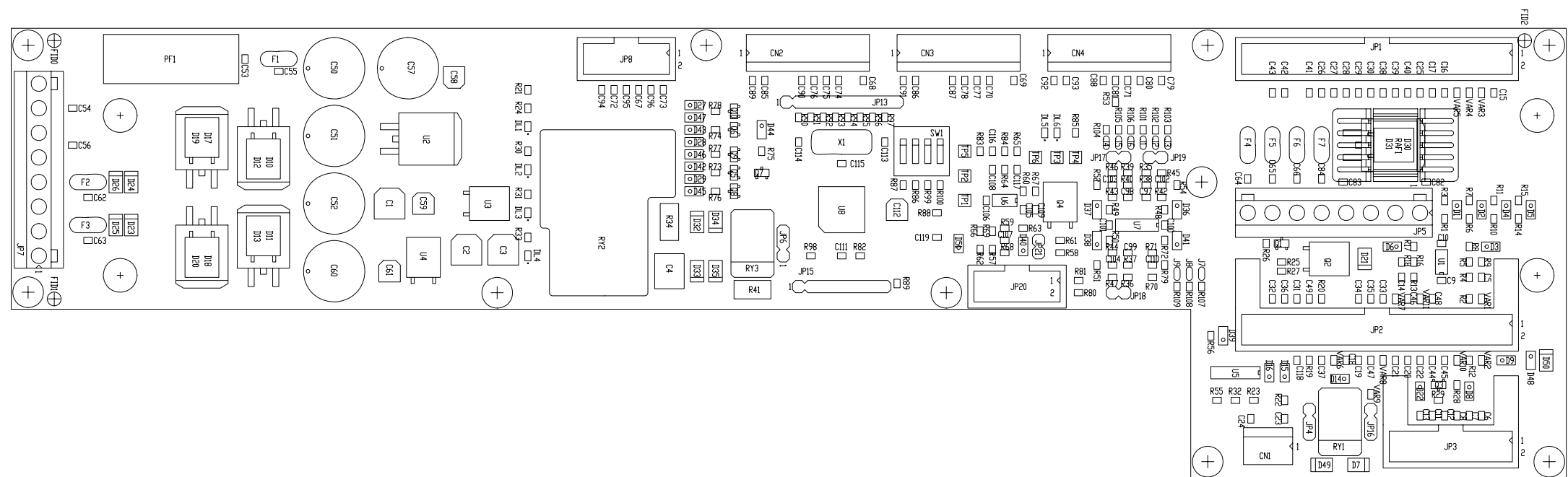


CS1
CSSR0176R2

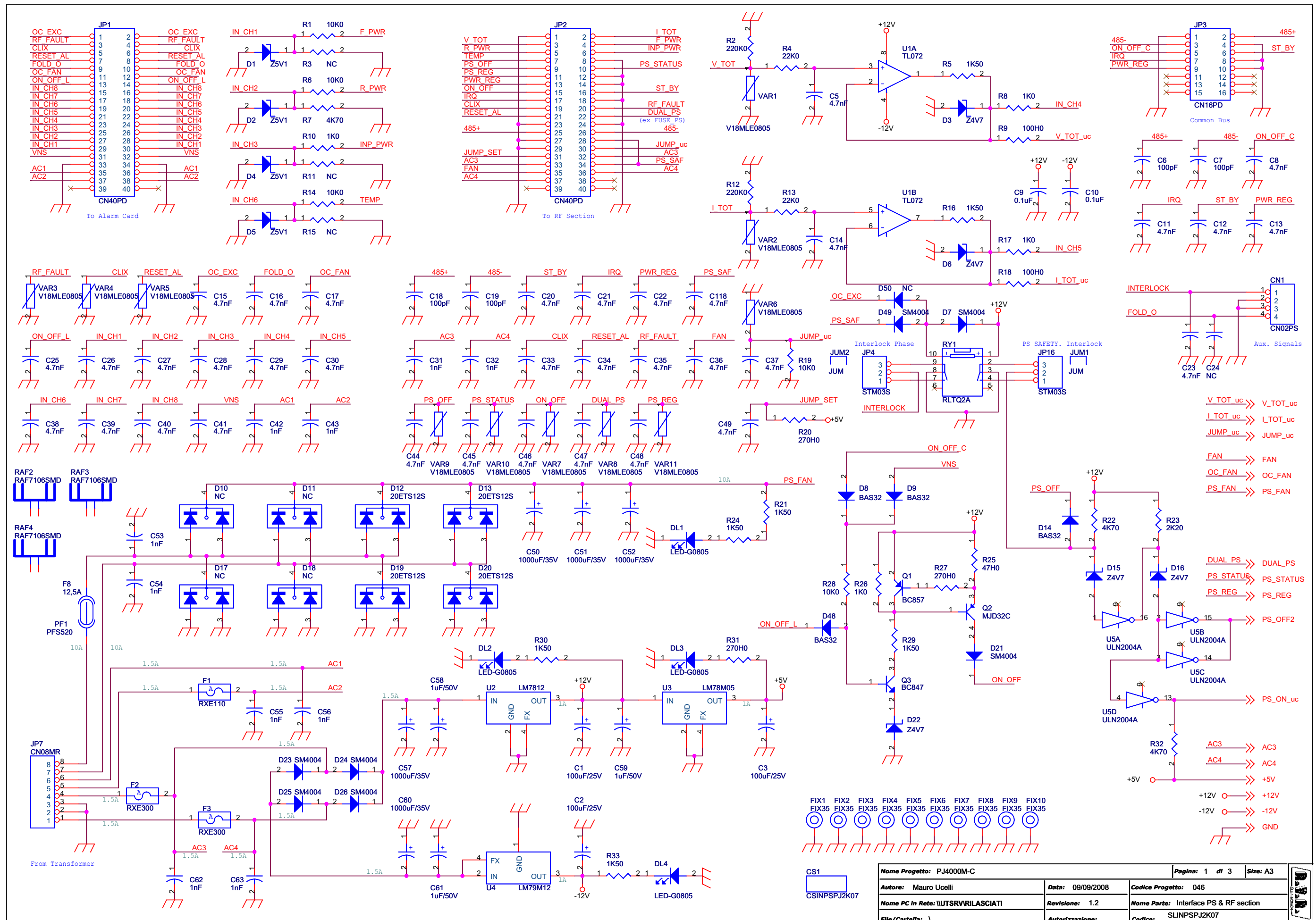
Nome Progetto: PJ4000MC		Pagina: 1 di 1	Size: A4
Autore: Mauro Ucelli	Data: 27/03/08	Codice Progetto: 046	
Nome PC in Rete: //UTSRV/Rilasciati	Revisione: 1.0	Nome Parte: Mains filter	
File/ Cartella: *	Autorizzazione:	Codice: SL046SR1002	

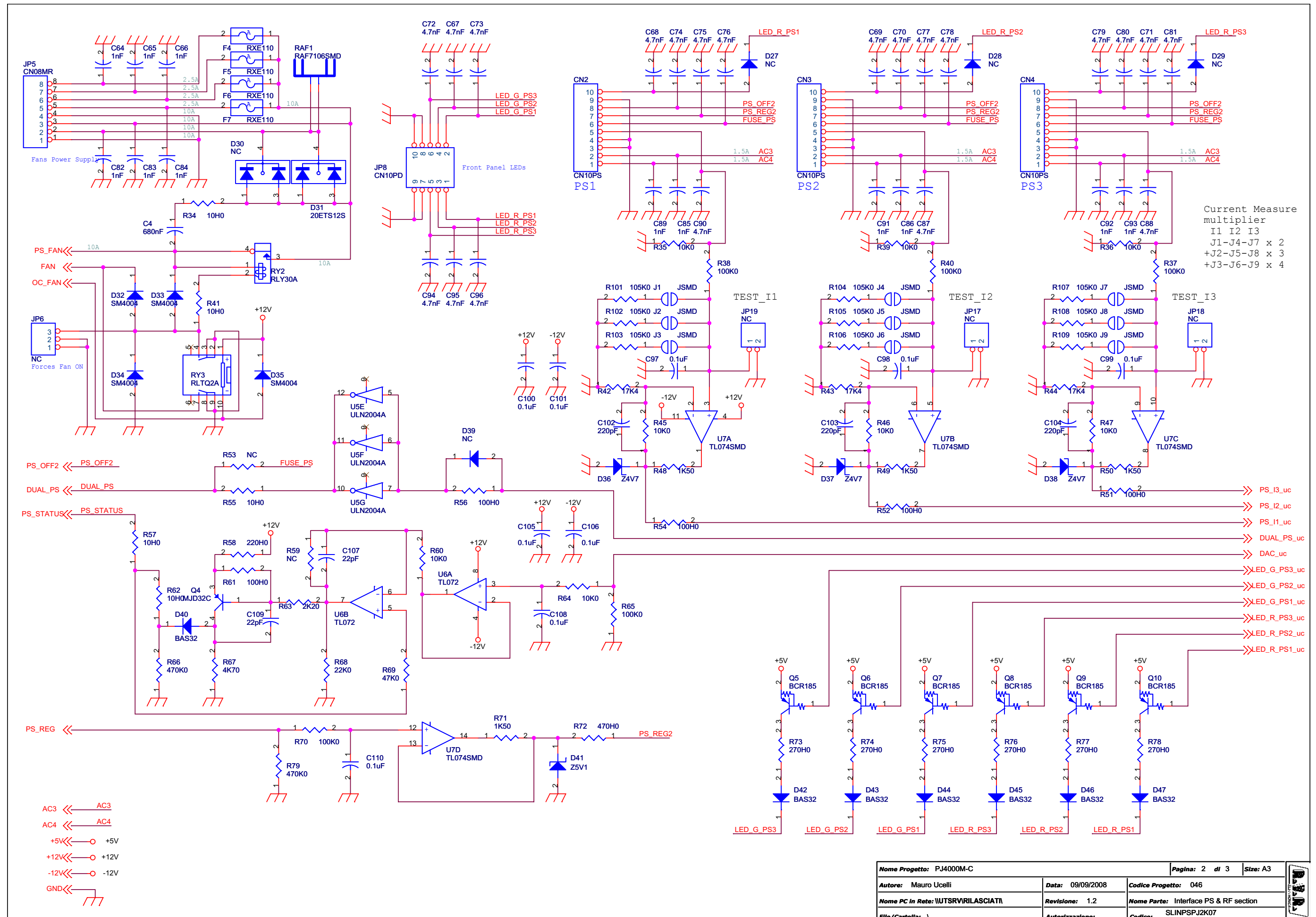
Mains filter
SL046SR1002
Revision: 1.0
Mauro Ucelli
27/03/08

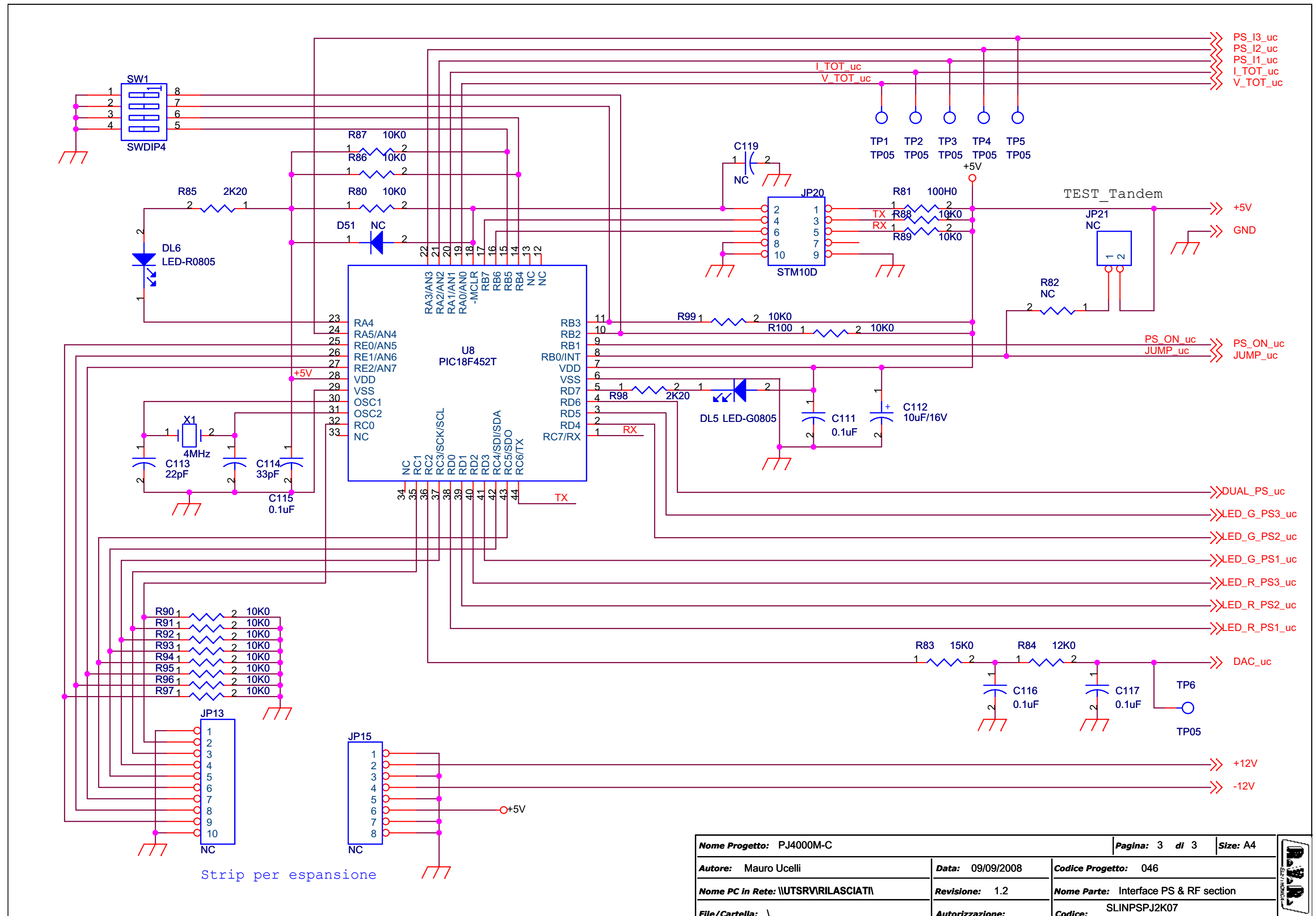
Item	Quantity	Reference	Part	Description	Code1
1	1	CS1	CSSR0176R2		CSSR0176R2
2	4	C1,C5,C9,C13	4n7_Y2	Condensatore tipo Y2	CCY472MD250
3	3	C2,C6,C10	1u_X2	Condensatore tipo X2	CPP105MN271
4	3	C3,C7,C11	2n2_Y2	Condensatore tipo Y2	CCY222MD251
5	3	C4,C8,C12	0.1u_X2	Condensatore tipo X2	CPP104MG271
6	4	FIX1, FIX2, FIX3, FIX4	FIX35		
7	3	L1, L2, L3	18uH	Induttanza su cilindro di ferrite	BOB02010004A
8	6	PD1, PD2, PD3, PD4, PD5, PD6	PAD_15A		
9	2	PD7, PD8	PAD_45A		
10	3	RV1, RV2, RV3	250V_D20	Varistore a pastiglia diametro 20mm	MOV250V40
11	3	RV4, RV5, RV6	NC	Surge Arrester	
12	6	R1, R2, R3, R4, R5, R6	R68k_2W	Resistenza 2W	RSM002J0068K



	NOME PROGETTO: PJ4000M-C		NOME PARTE: SCHEDA INTERFACCIA PS-RF				
	AUTORE: M. UCCELLI		DATA: 15/05/2007	REVISIONE: 1.0	SCALA: 1:1	SIZE: A3	PAGINA: 1 DI 1
ARCHIVIAZIONE ELETTRONICA: "CARTELLA RILASCIATI" SU "UTSRV"			CODICE PROGETTO: 046		CODICE DISEGNO: SLINPSPJ2K07		
MATERIALE: <>		TRATTAMENTO: <>		PROFILO: <>		STATO: ESECUTIVO	





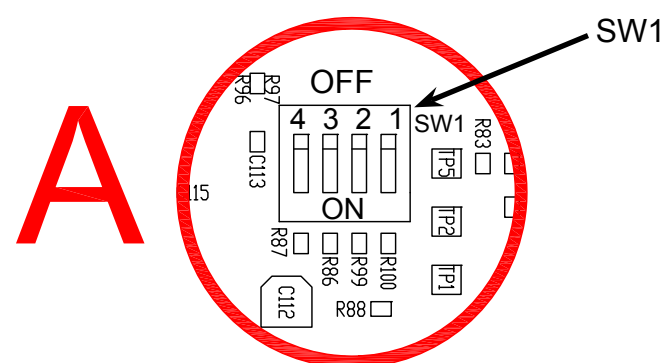
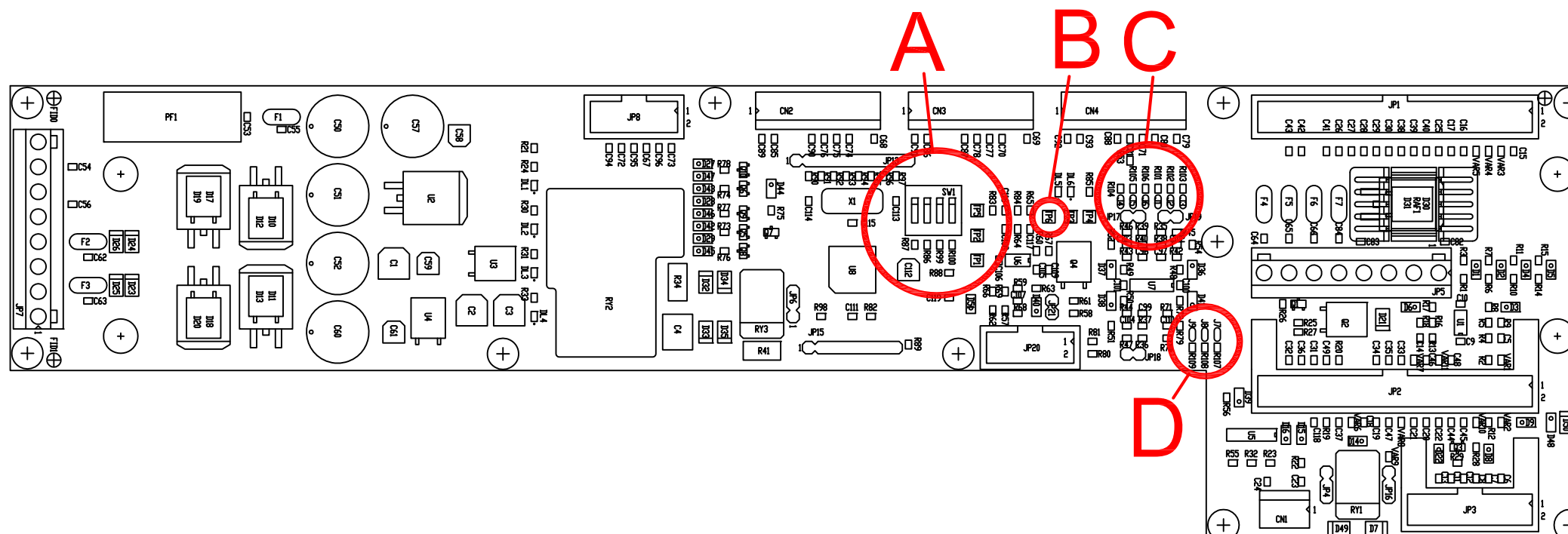


Interface PS & RF section Revised: 09/09/2008
SLINPSPJ2K07 Revision: 1.2
PJ4000M-C
046
Mauro Ucelli
09/09/08

Item	Quantity	Reference	Part	Description
1	1	CN1	CN02PS	Connettore 2 poli Mascon p 2.5mm
2	3	CN2,CN3,CN4	CN10PS	Connettore 10 poli Mascon
3	1	CS1	CSINPSPJ2K07	Circuito stampato
4	3	C1,C2,C3	100uF/25V	Cond. Elett. SMD d. 6.3mm
5	1	C4	680nF	Cond. SMD 2824
6	56	C5,C8,C11,C12,C13,C14, C15,C16,C17,C20,C21,C22, C23,C25,C26,C27,C28,C29, C30,C33,C34,C35,C36,C37, C38,C39,C40,C41,C44,C45, C46,C47,C48,C49,C67,C68, C69,C70,C71,C72,C73,C74, C75,C76,C77,C78,C79,C80, C81,C87,C88,C90,C94,C95, C96,C118	4.7nF	Cond. SMD 0805
7	4	C6,C7,C18,C19	100pF	Cond. SMD 0805 COG
8	15	C9,C10,C97,C98,C99,C100, C101,C105,C106,C108,C110, C111,C115,C116,C117	0.1uF	Cond. SMD 0805
9	2	C24,C119	NC	Cond. SMD 0805
10	22	C31,C32,C42,C43,C53,C54, C55,C56,C62,C63,C64,C65, C66,C82,C83,C84,C85,C86, C89,C91,C92,C93	1nF	Cond. SMD 0805 COG
11	5	C50,C51,C52,C57,C60	1000uF/35V	Cond. Elettr. Dia 13 P5.08
12	3	C58,C59,C61	1uF/50V	Cond. Elett. SMD d. 4mm
13	3	C102,C103,C104	220pF	Cond. SMD 0805 COG
14	3	C107,C109,C113	22pF	Cond. SMD 0805 COG
15	1	C112	10uF/16V	Cond. Elett. SMD d. 4mm
16	1	C114	33pF	Cond. SMD 0805 COG
17	5	DL1,DL2,DL3,DL4,DL5	LED-G0805	LED SMD 0805
18	1	DL6	LED-R0805	LED SMD 0805
19	5	D1,D2,D4,D5,D41	Z5V1	MINIMELF SMD Zener Diode
20	8	D3,D6,D15,D16,D22,D36, D37,D38	Z4V7	MINIMELF SMD Zener Diode
21	11	D7,D21,D23,D24,D25,D26, D32,D33,D34,D35,D49	SM4004	Diodo SMD cont. SMA
22	11	D8,D9,D14,D40,D42,D43, D44,D45,D46,D47,D48	BAS32	MINIMELF SMD Diode
23	5	D10,D11,D17,D18,D30	NC	Doppio diodo shottky SMD
24	5	D12,D13,D19,D20,D31	20ETS12S	Doppio diodo shottky DMS D2PAK
25	5	D27,D28,D29,D39,D51	NC	MINIMELF SMD Diode
26	1	D50	NC	Diodo SMD cont. SMA
27	10	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6,FIX7,FIX8,FIX9, FIX10	FIX35	Foro fissaggio 3.5mm
28	5	F1,F4,F5,F6,F7	RXE110	Fusibile autorip. RXE p5mm
28A	2	F2,F3	RXE300	Fusibile autorip. RXE p5mm
29	1	F8	12,5A	Fusibile rapido 5x20mm
30	2	JP1,JP2	CN40PD	Conn. flat 40 poli
31	1	JP3	CN16PD	Connettore 16 poli Flat cs
32	2	JP4,JP16	STM03S	Strip maschio 3 pin

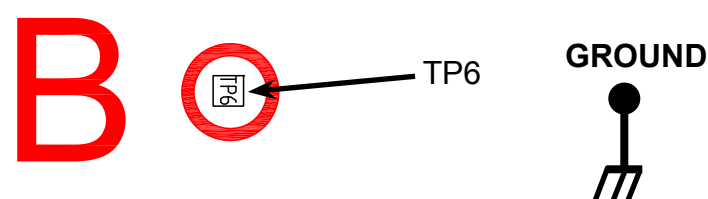
33	2	JP5,JP7	CN08MR	Conn. Phoenix p. 5mm 8 pin
34	1	JP6	NC	Strip maschio 3 pin
35	1	JP8	CN10PD	Connettore 10 poli Flat cs
36	1	JP13	NC	Strip femmina 10 pin
37	1	JP15	NC	Strip femmina 8 pin
38	4	JP17,JP18,JP19,JP21	NC	Strip maschio 2 pin
39	1	JP20	STM10D	Connettore 10 poli Flat cs
40	2	JUM1,JUM2	JUM	Ponticello jumper
41	9	J1,J2,J3,J4,J5,J6,J7,J8, J9	JSDM	Pad SMD a saldare
42	1	PF1	PFS520	Portafusibile 5x20 10A
43	1	Q1	BC857	Trans. PNP SOT23
44	2	Q2,Q4	MJD32C	Trans. PNP DPAK
45	1	Q3	BC847	Trans. NPN SOT23
46	6	Q5,Q6,Q7,Q8,Q9,Q10	BCR185	Trans./Res. PNP SOT23
47	4	RAF1,RAF2,RAF3,RAF4	RAF7106SMD	Dissipatore SMD Mod. 7106
48	2	RY1,RY3	RLTQ2A	Rele' TQ2
49	1	RY2	RLY30A	Rele' 30A NO
50	28	R1,R6,R14,R19,R28,R35, R36,R39,R45,R46,R47,R60, R64,R80,R86,R87,R88,R89, R90,R91,R92,R93,R94,R95, R96,R97,R99,R100	10K0	Res. SMD 0805
51	2	R2,R12	220K0	Res. SMD 0805
52	6	R3,R11,R15,R53,R59,R82	NC	Res. SMD 0805
53	3	R4,R13,R68	22K0	Res. SMD 0805
54	11	R5,R16,R21,R24,R29,R30, R33,R48,R49,R50,R71	1K50	Res. SMD 0805
55	4	R7,R22,R32,R67	4K70	Res. SMD 0805
56	4	R8,R10,R17,R26	1K0	Res. SMD 0805
57	8	R9,R18,R51,R52,R54,R56, R61,R81	100H0	Res. SMD 0805
58	9	R20,R27,R31,R73,R74,R75, R76,R77,R78	270H0	Res. SMD 0805
59	4	R23,R63,R85,R98	2K20	Res. SMD 0805
60	1	R25	47H0	Res. SMD 0805
61	2	R34,R41	10H0	Res. SMD 2512 5%
62	5	R37,R38,R40,R65,R70	100K0	Res. SMD 0805
63	3	R42,R43,R44	17K4	Res. SMD 0805
64	3	R55,R57,R62	10H0	Res. SMD 0805
65	1	R58	220H0	Res. SMD 0805
66	2	R66,R79	470K0	Res. SMD 0805
67	1	R69	47K0	Res. SMD 0805
68	1	R72	470H0	Res. SMD 0805
69	1	R83	15K0	Res. SMD 0805
70	1	R84	12K0	Res. SMD 0805
71	9	R101,R102,R103,R104,R105, R106,R107,R108,R109	105K0	Res. SMD 0805
72	1	SW1	SWDIP4	Dip switch 4 vie
73	6	TP1,TP2,TP3,TP4,TP5,TP6	NC	Test point
74	2	U1,U6	TL072	Dual Op. SMD SO8
75	1	U2	LM7812	Stabilizzatore SMD D2PAK
76	1	U3	LM78M05	Stabilizzatore SMD DPAK
77	1	U4	LM79M12	Stabilizzatore SMD DPAK
78	1	U5	ULN2004A	Seven Inv. Buffer OC
79	1	U7	TL074SMD	Quad Op. SMD SO14
80	1	U8	PIC18F452T	TQFP44 SMD Microprocessor
81	11	VAR1,VAR2,VAR3,VAR4,VAR5, VAR6,VAR7,VAR8,VAR9, VAR10,VAR11	V18MLE0805	ESD SMD protector
82	1	X1	4MHz	Quarzo SMD HC49SMD

8.11.1 Board settings

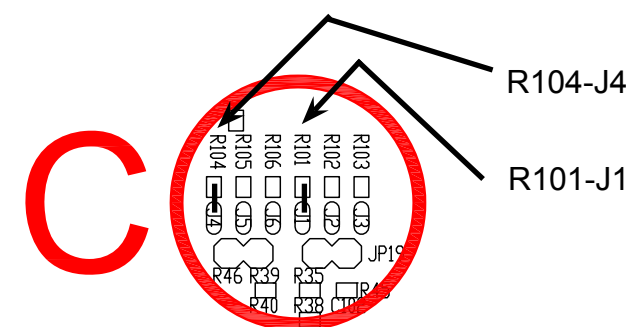


Set the switches as follows:

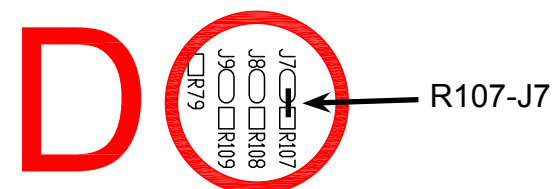
SW	ON	OFF
1		X
2	X	
3		X
4		X



By making a bridge with a cable between TP6 and GROUND is inhibited the operation of this board

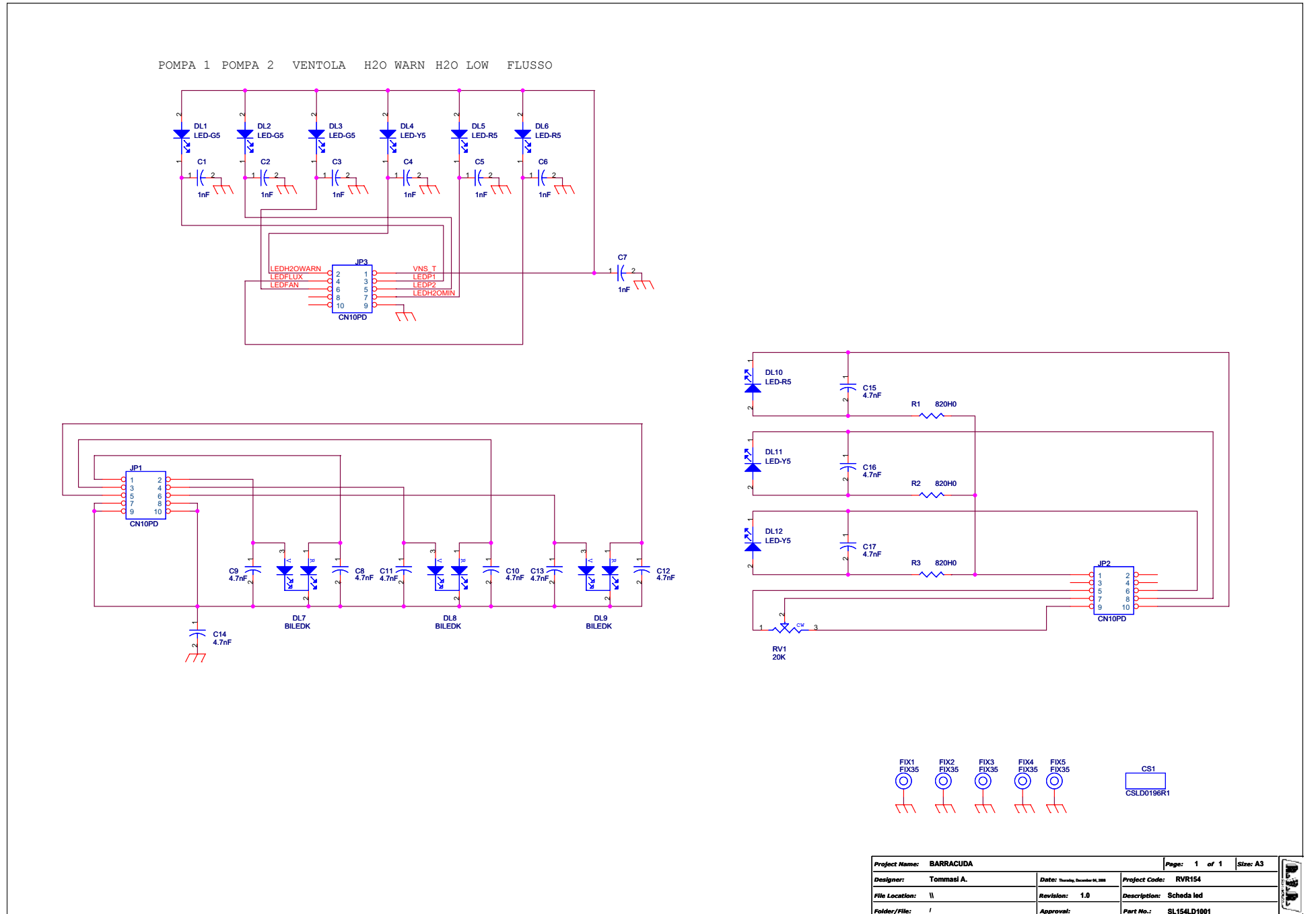
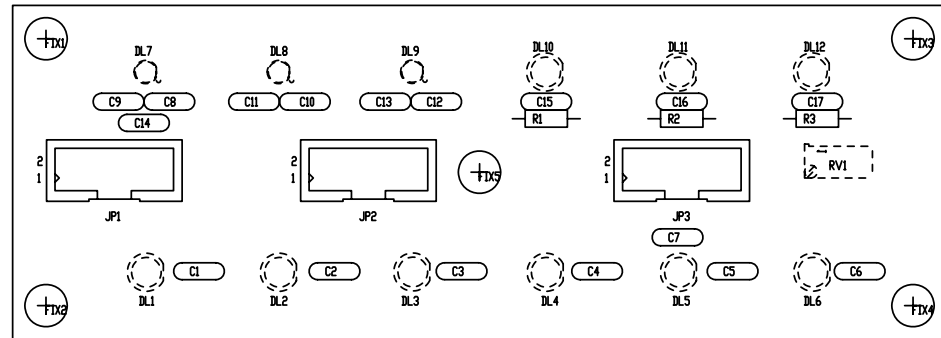


Make the following jumpers with a drop of tin:
R104-J4
R101-J1



Make the following jumper with a drop of tin:
R107-J7

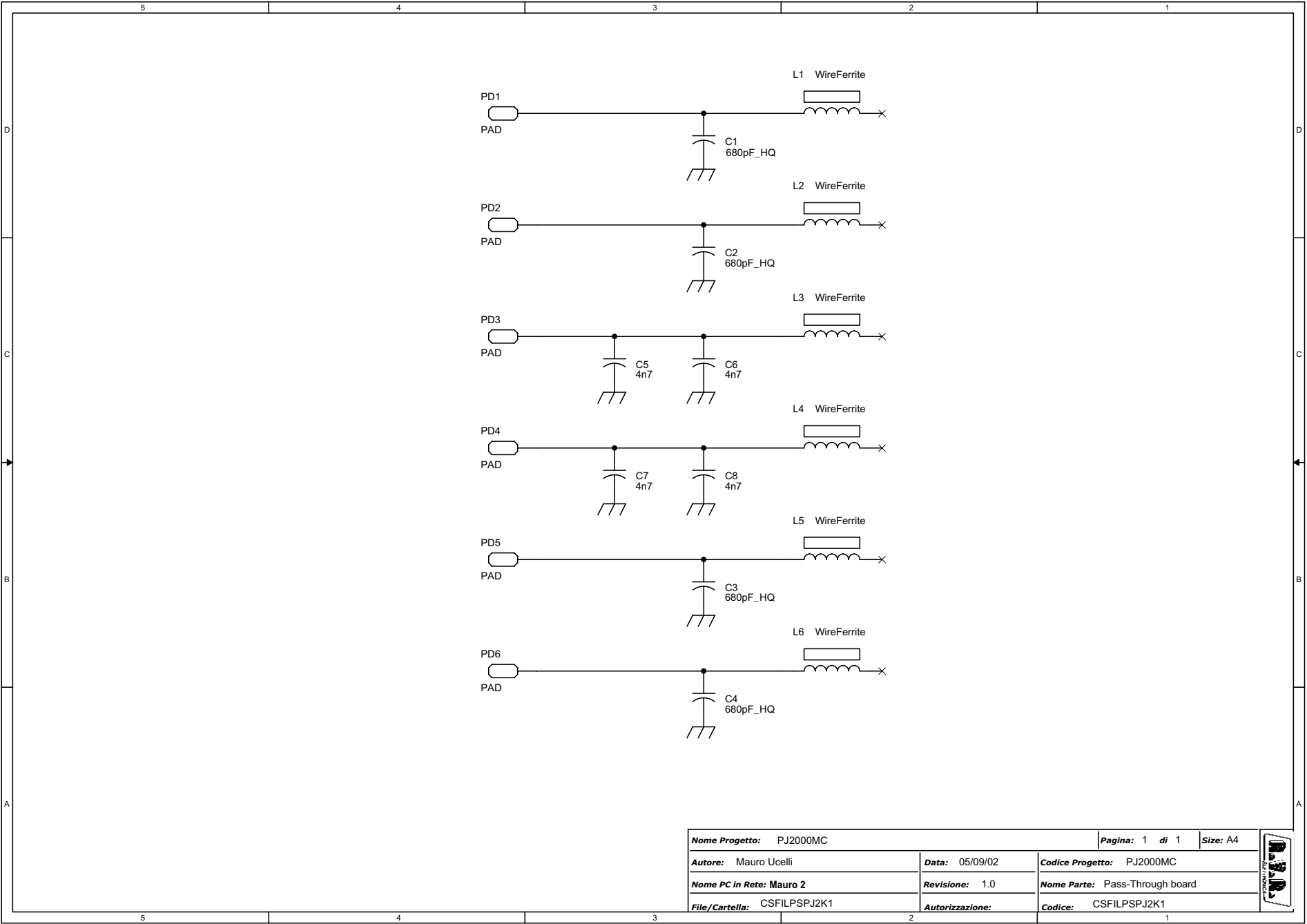
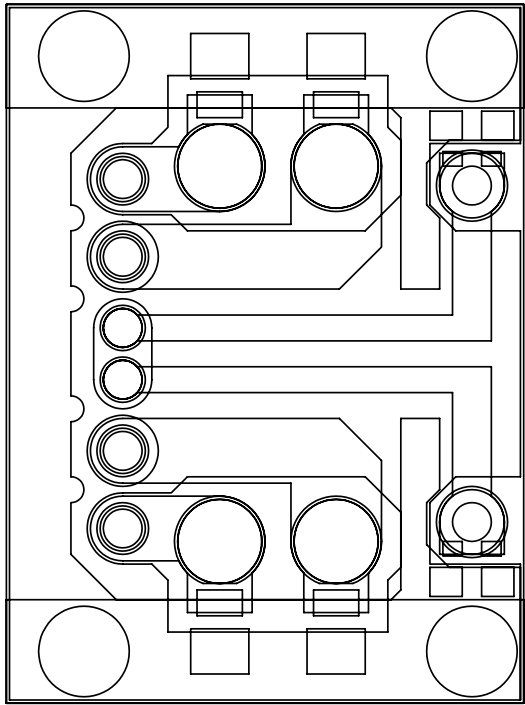
8.12 LED board (SL154LD1001)



Scheda led Revised: 04/12/2008
SL154LD1001 Revision: 1.0
Tommasi A.

Item	Quantity	Reference	Part	Description
1	1	CS1	CSLD0196R1	Circuito stampato
2	7	C1,C2,C3,C4,C5,C6,C7	1nF	Cond. ceramico p 5mm
3	10	C8,C9,C10,C11,C12,C13,C14,C15,C16,C17	4.7nF	Cond. ceramico p 5mm
4	3	DL1,DL2,DL3	LED-G5	LED Verde dia. 5mm
5	3	DL5,DL6,DL10	LED-R5	LED Rosso dia. 5mm
6	3	DL7,DL8,DL9	BILEDK	Doppio led V-R 5mm Catodo com.
7	3	DL4, DL11,DL12	LED-Y5	LED Giallo dia. 5mm
8	5	FIX1, FIX2, FIX3, FIX4, FIX5	FIX35	Foro fissaggio 3.5mm
9	3	JP1, JP2, JP3	CN10PD	Connettore 10 poli Flat cs
10	1	RV1	20K	Trimmer Rg V 3296W
11	3	R1,R2,R3	820H0	Res. 1/4W 1%

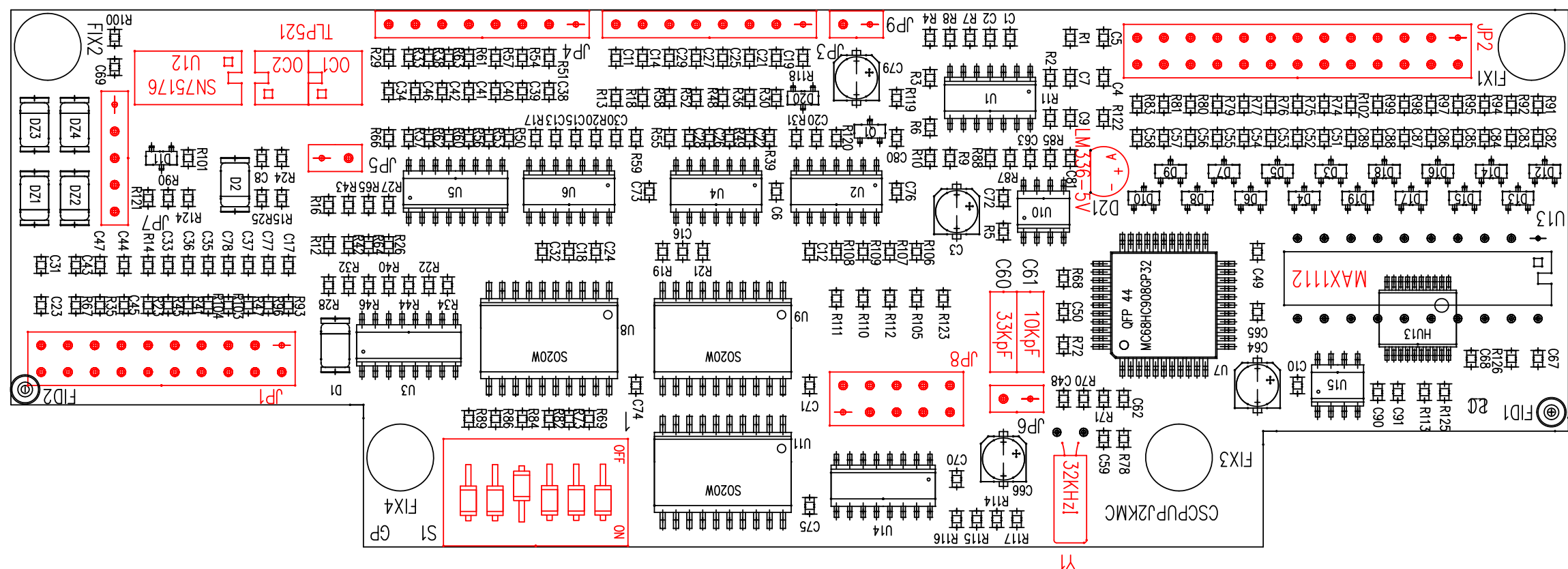
8.13 Pass-Throught board (SLFILPSPJ2K1)



Pass-Throught board
SLFILPSPJ2K1
Revision: 1.0
PJ2000MC
Mauro Ucelli
05/09/2002

Item	Quantity	Reference	Part	Description
1	4	C1,C2,C3,C4	680pF_HQ	;Condensatore Chip HQ
2	4	C5,C6,C7,C8	4n7	;Condensatore SMD size 0805
3	6	L1,L2,L3,L4, L5,L6	WireFerrite	;Filo di rame arg. diam. 1mm lung. 20mm con tubetto in Ferrite

8.14 CPU board (CPUPJ2KMC)



NOME PARTE: Scheda CPU

NOME PROGETTO: HC5/10



AUTORE:U.T. – Rev.: BERTI J.

DATA:11/02/2004 REVISIONE:1.0

SCALA:1:1

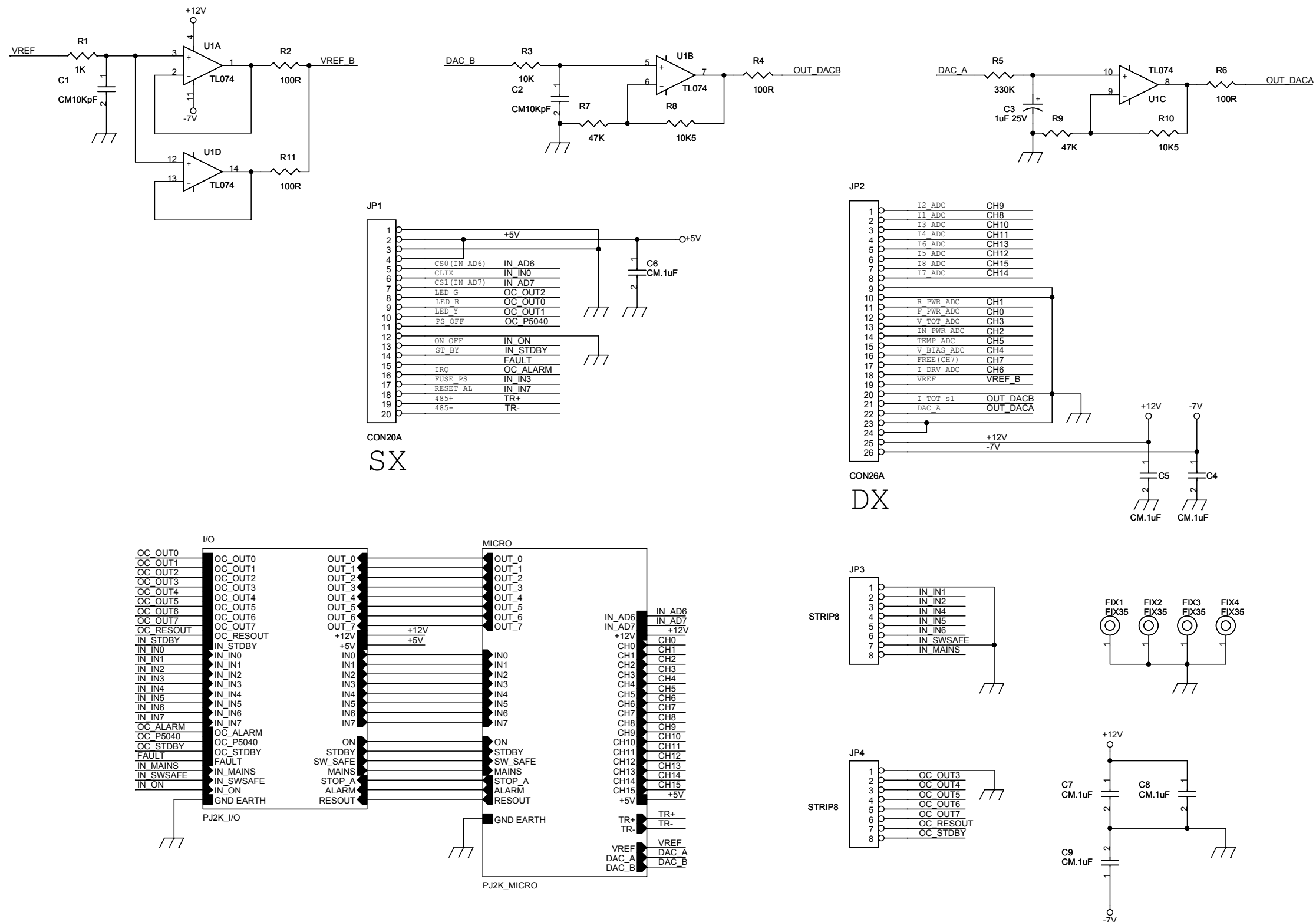
SIZE:A4

PAGINA:1 DI 1

ARCHIVIAZIONE ELETTRONICA:CARTELLA PROGETTI

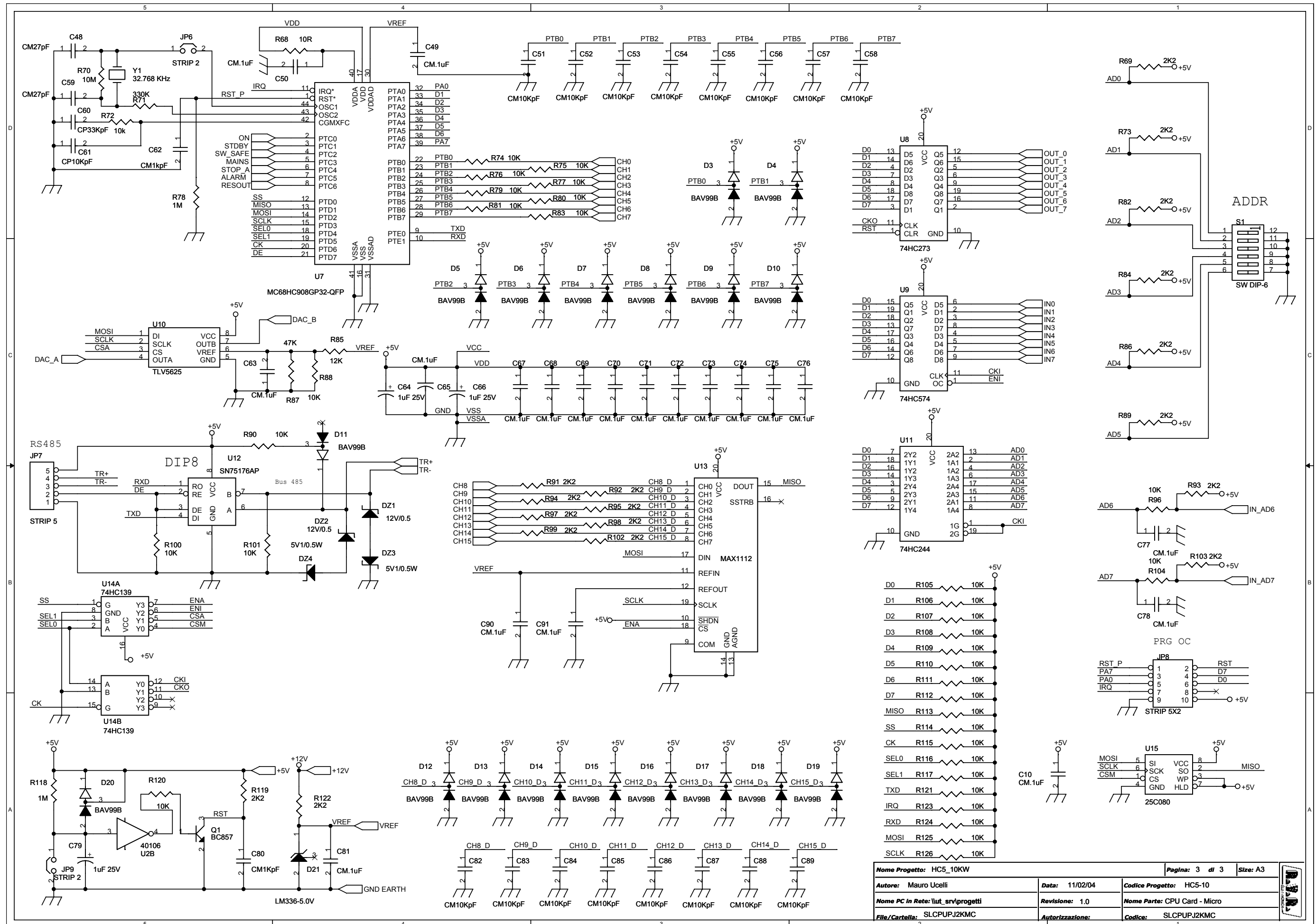
CODICE PROGETTO:014

CODICE DISEGNO:SLCPUPJ2KMC



Nome Progetto: HC5_10KW		Pagina: 1 di 3	Size: A3
Autore: Mauro Ucelli	Data: 11/02/04	Codice Progetto: HC5-10	
Nome PC in Rete: \lut_srv\progetti	Revisione: 1.0	Nome Parte: CPU Card - General Section	
File/Cartella: SLCPUPJ2KMC	Autorizzazione:	Codice: SLCPUPJ2KMC	

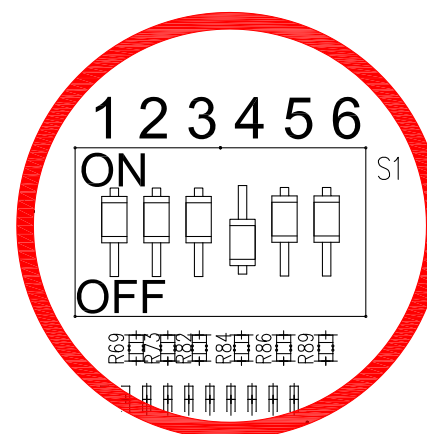
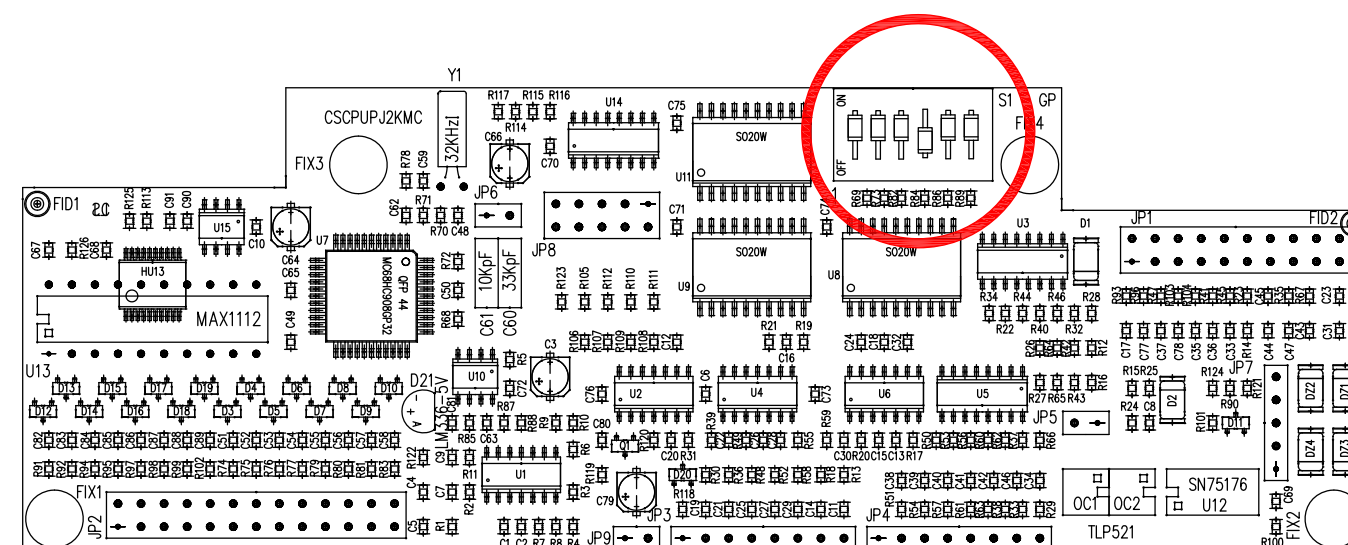




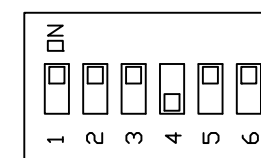
Nome Progetto: HC5_10KW	Data: 11/02/04	Codice Progetto: HC5-10
Autore: Mauro Ucelli	Revisione: 1.0	Nome Parte: CPU Card - Micro
Nome PC In Rete: \lut_srv\progetti	Autorizzazione:	Codice: SLCPUJ2KMC
File/Cartella: SLCPUJ2KMC		

Item	Quantity	Reference	Part
1	18	C1, C2, C51, C52, C53, C54, C55, C56, C57, C58, C82, C83, C84, C85, C86, C87, C88, C89	CM10KpF
2	4	C3, C64, C66, C79	1uF 25V
3	38	C4, C5, C6, C7, C8, C9, C10, C12, C13, C15, C16, C18, C20, C22, C24, C26, C28, C30, C32, C49, C50, C63, C65, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C81, C90, C91	CM.1uF
4	25	C11, C14, C17, C19, C21, C23, C25, C27, C29, C31, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47	CM4K7pF
5	2	C48, C59	CM27pF
6	1	C60	CP33KpF
7	1	C61	CP10KpF
8	2	C62, C80	CM1KpF
9	2	DZ2, DZ1	12V/0.5
10	2	DZ4, DZ3	5V1/0.5W
11	2	D1, D2	1N4004
12	18	D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20	BAV99B
13	1	D21	LM336-5.0V
14	4	FIX1, FIX2, FIX3, FIX4	FIX35
15	1	JP1	CON20A
16	1	JP2	CON26A
17	2	JP4, JP3	STRIP8
18	3	JP5, JP6, JP9	STRIP 2
19	1	JP7	STRIP 5
20	1	JP8	STRIP 5X2
21	2	OC1, OC2	TLP521-1
22	1	Q1	BC857
23	5	R1, R14, R15, R24, R25	1K
24	4	R2, R4, R6, R11	100R
25	35	R3, R72, R74, R75, R76, R77, R79, R80, R81, R83, R88, R90, R96, R100, R101, R104, R105, R106, R107, R108, R109, R110, R111, R112, R113, R114, R115, R116, R117, R120, R121, R123, R124, R125, R126	10K
26	2	R71, R5	330K
27	15	R7, R9, R16, R17, R20, R21, R27, R31, R39, R43, R49, R55, R59, R65, R87	47K
28	2	R8, R10	10K5
29	30	R12, R13, R18, R19, R26, R30, R36, R42, R48, R52, R58, R64, R69, R73, R82, R84, R86, R89, R91, R92, R93, R94, R95, R97, R98, R99, R102, R103, R119, R122	2K2
30	28	R22, R23, R28, R29, R32, R33, R34, R35, R37, R38, R40, R41, R44, R45, R46, R47, R50, R51, R53, R54, R56, R57, R60, R61, R62, R63, R66, R67	22R
31	1	R68	10R
32	1	R70	10M
33	2	R118, R78	1M
34	1	R85	12K
35	1	S1	SW DIP-6
36	1	U1	TL074
37	3	U2, U4, U6	40106
38	2	U5, U3	ULN2004A
39	1	U7	MC68HC908GP32-QFP
40	1	U8	74HC273
41	1	U9	74HC574
42	1	U10	TLV5625
43	1	U11	74HC244
44	1	U12	SN75176AP
45	1	U13	MAX1112
46	1	U14	74HC139
47	1	U15	25C080
48	1	Y1	32.768 KHz

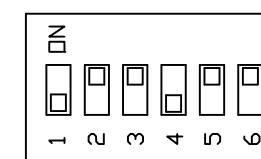
8.14.1 Set module address



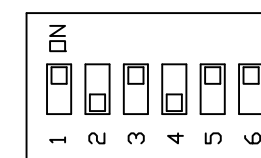
MODULE ADDRESS



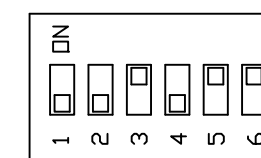
**Module 1
Address 8**



**Module 2
Address 9**

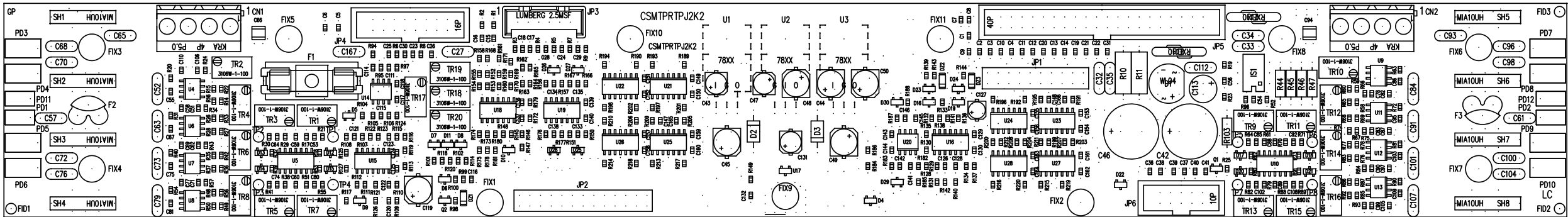


**Module 3
Address 10**

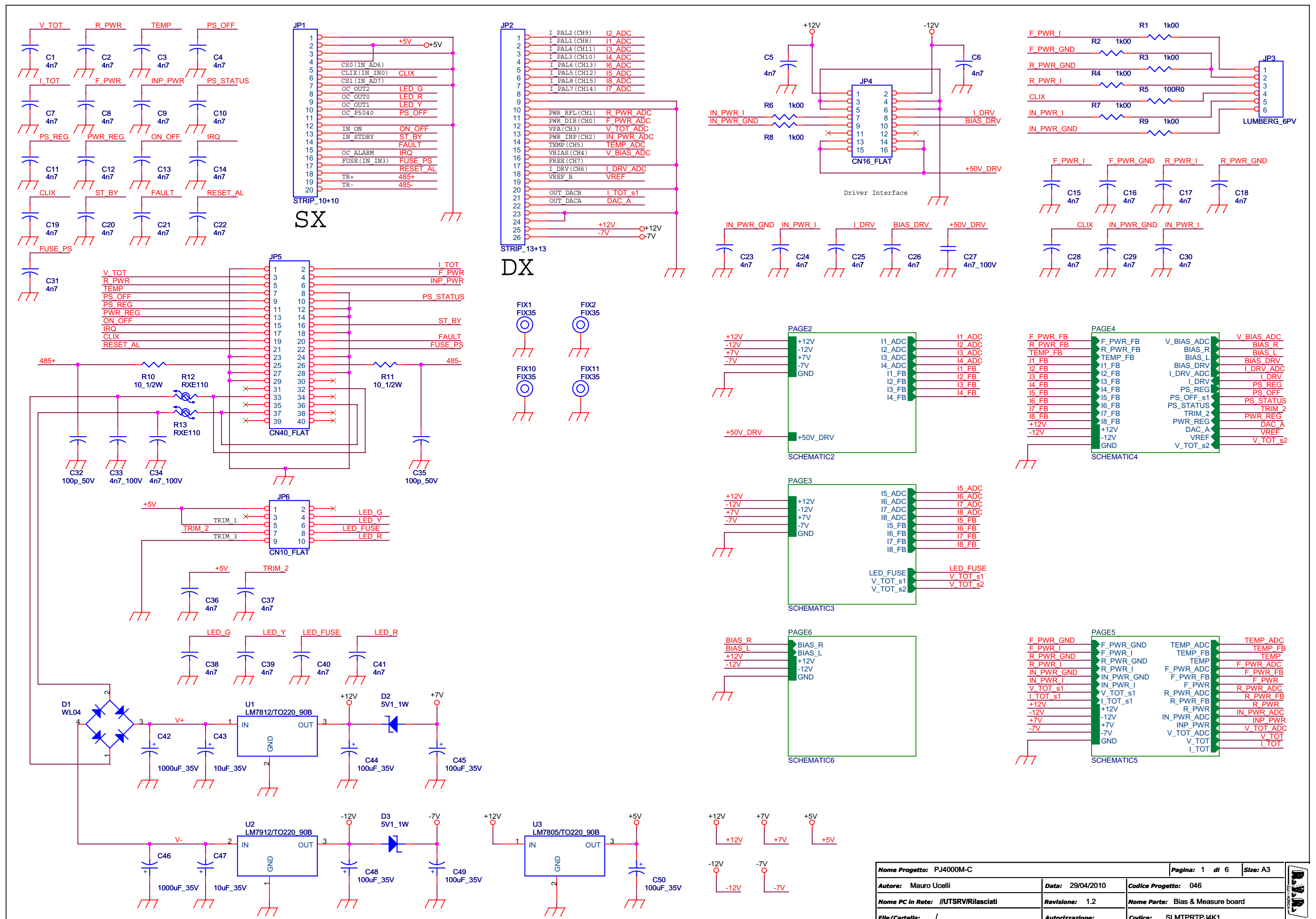


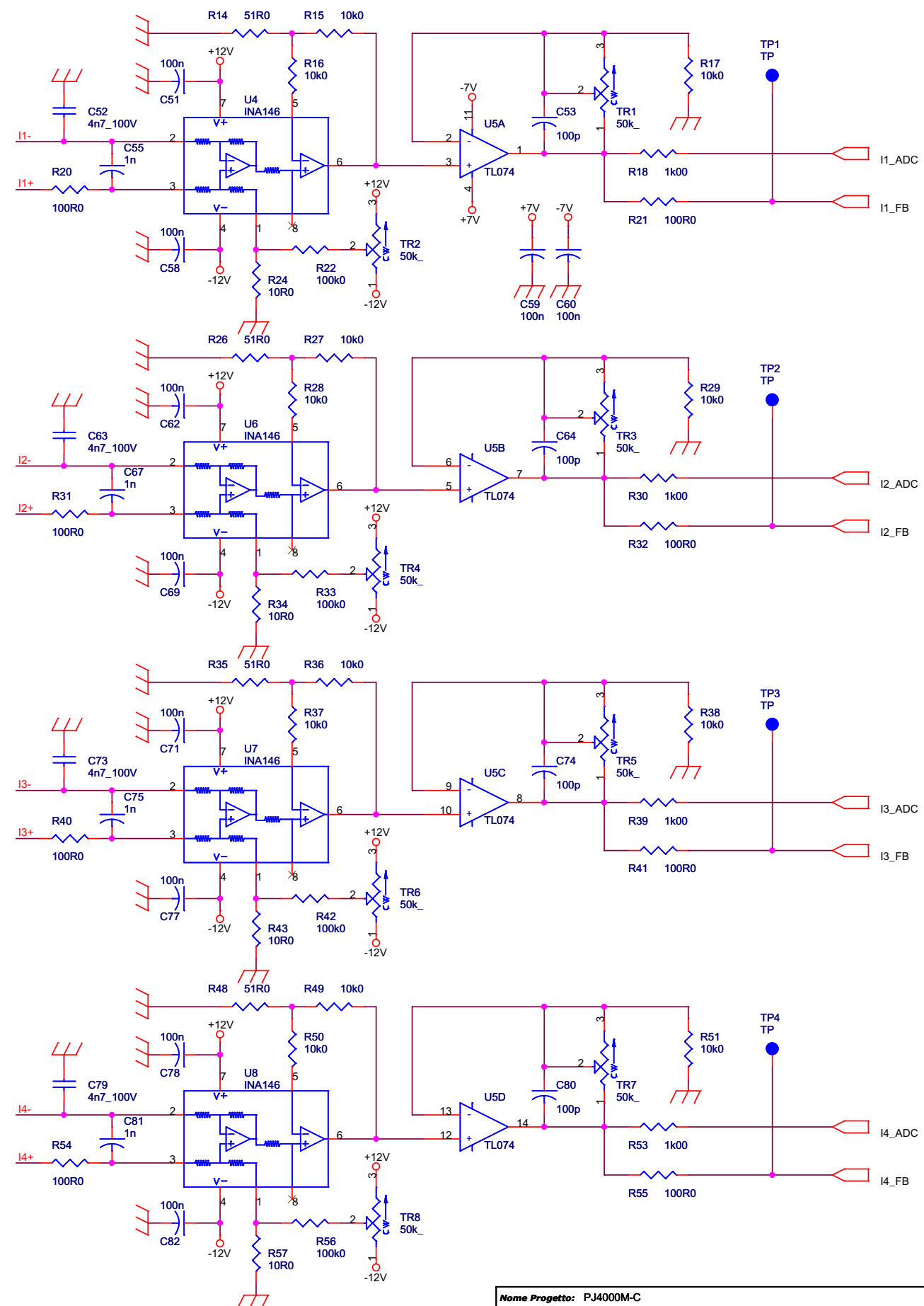
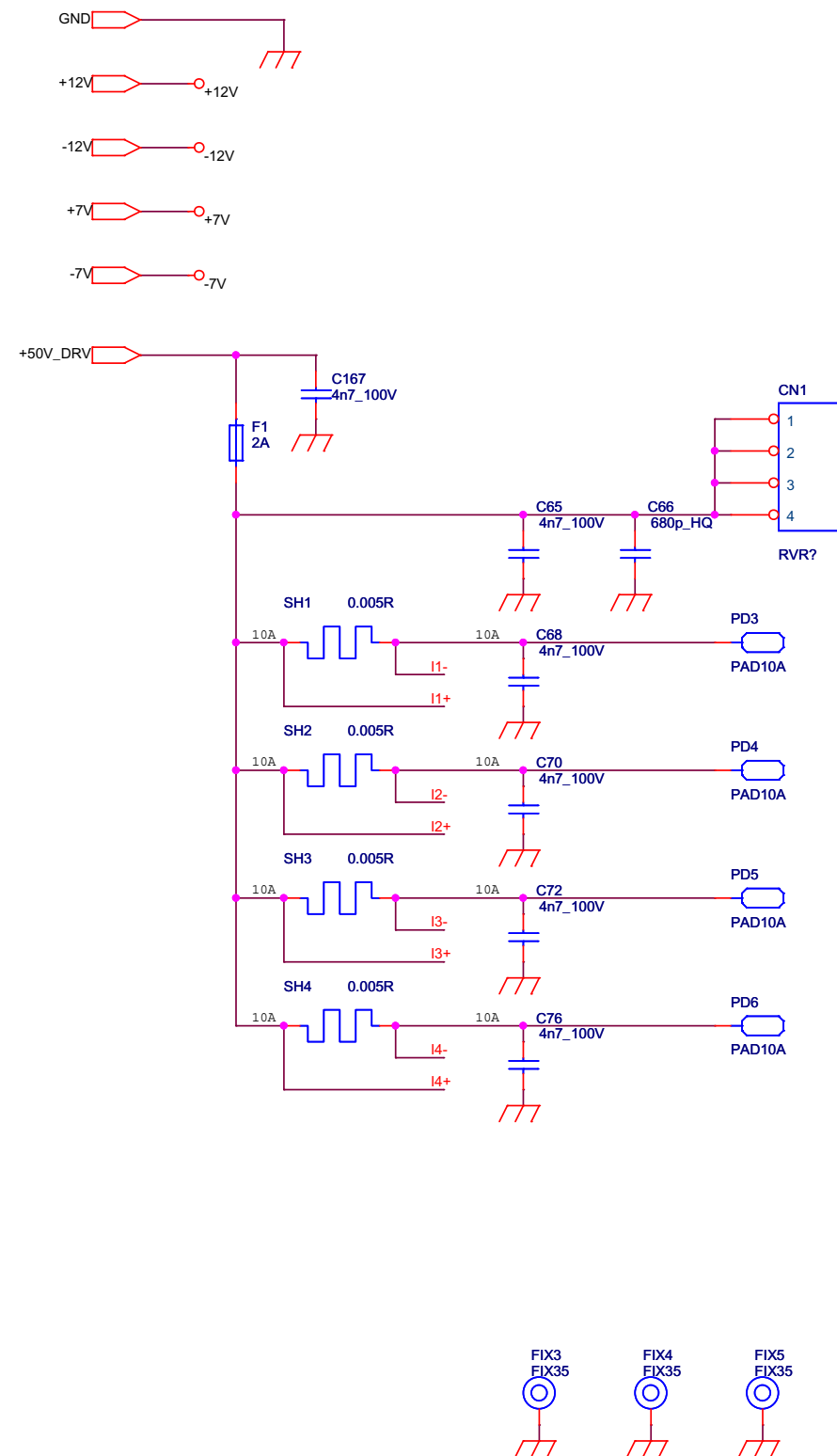
**Module 4
Address 11**

8.15 Bias board (SLMTPRTPJ4K1)

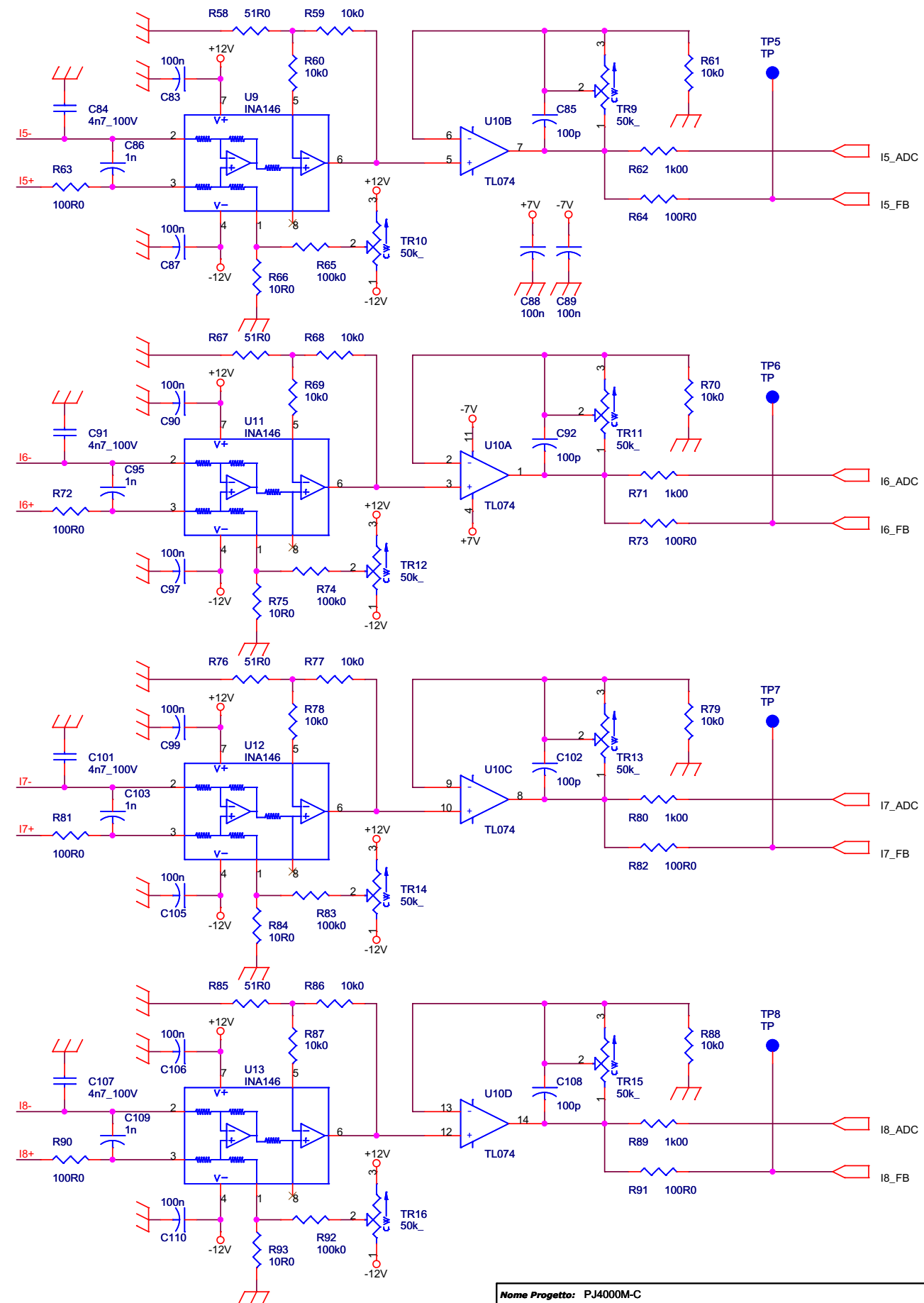
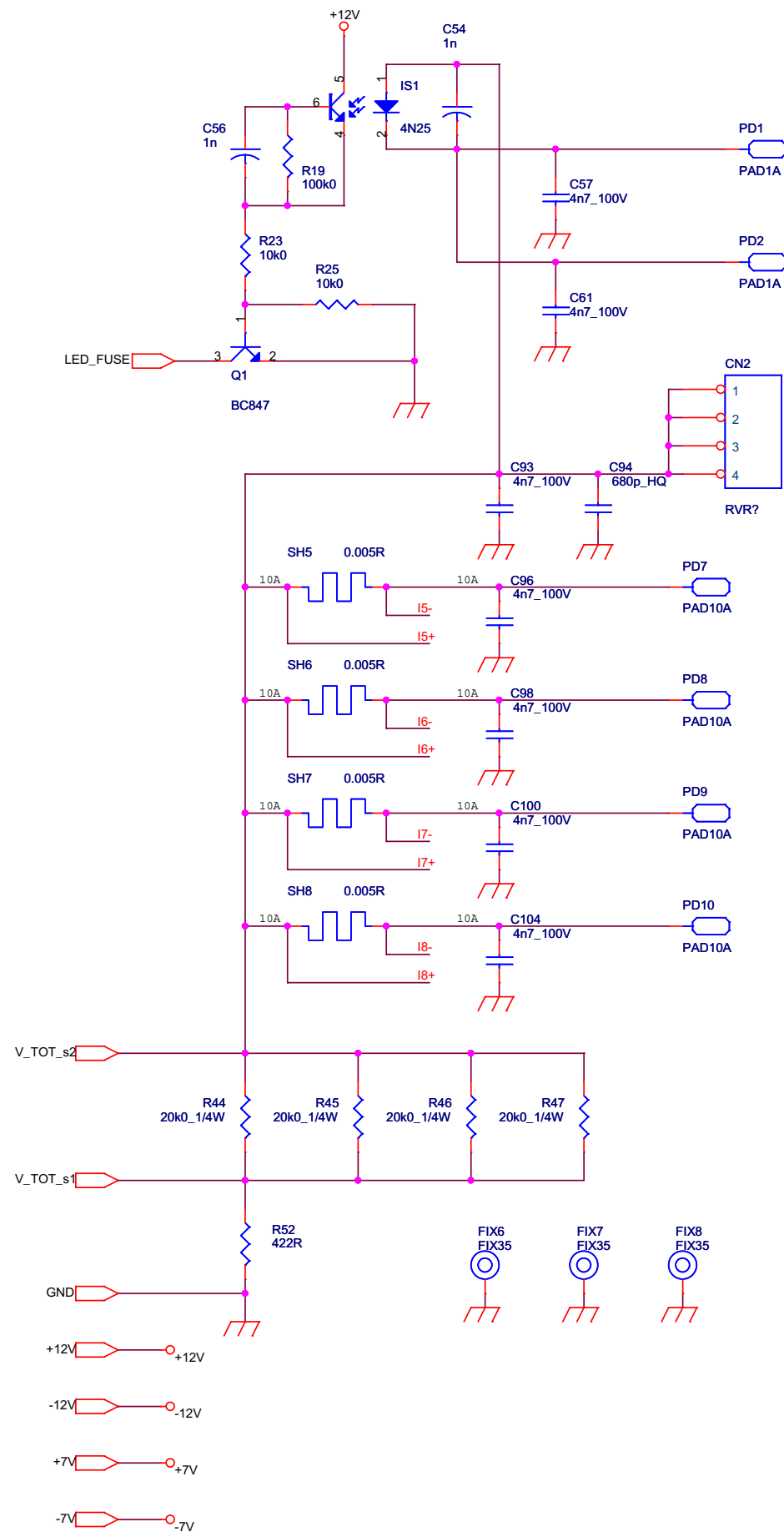


NOME PROGETTO	TX10000M-C	NOME PARTES & MEASURE BOARD
AUTORE:	M. UCELLI	DATA 07/06/2008
ARCHIVIAZIONE ELETTRONICA PROGETTI	SU "C:\PROG\PROG\TX10000M-C"	CODICE DISC. SLMTPRTPJ4K1
MATERIALE	TRATTAMENTO:	PROFILO
		STATO ESECUTIVO

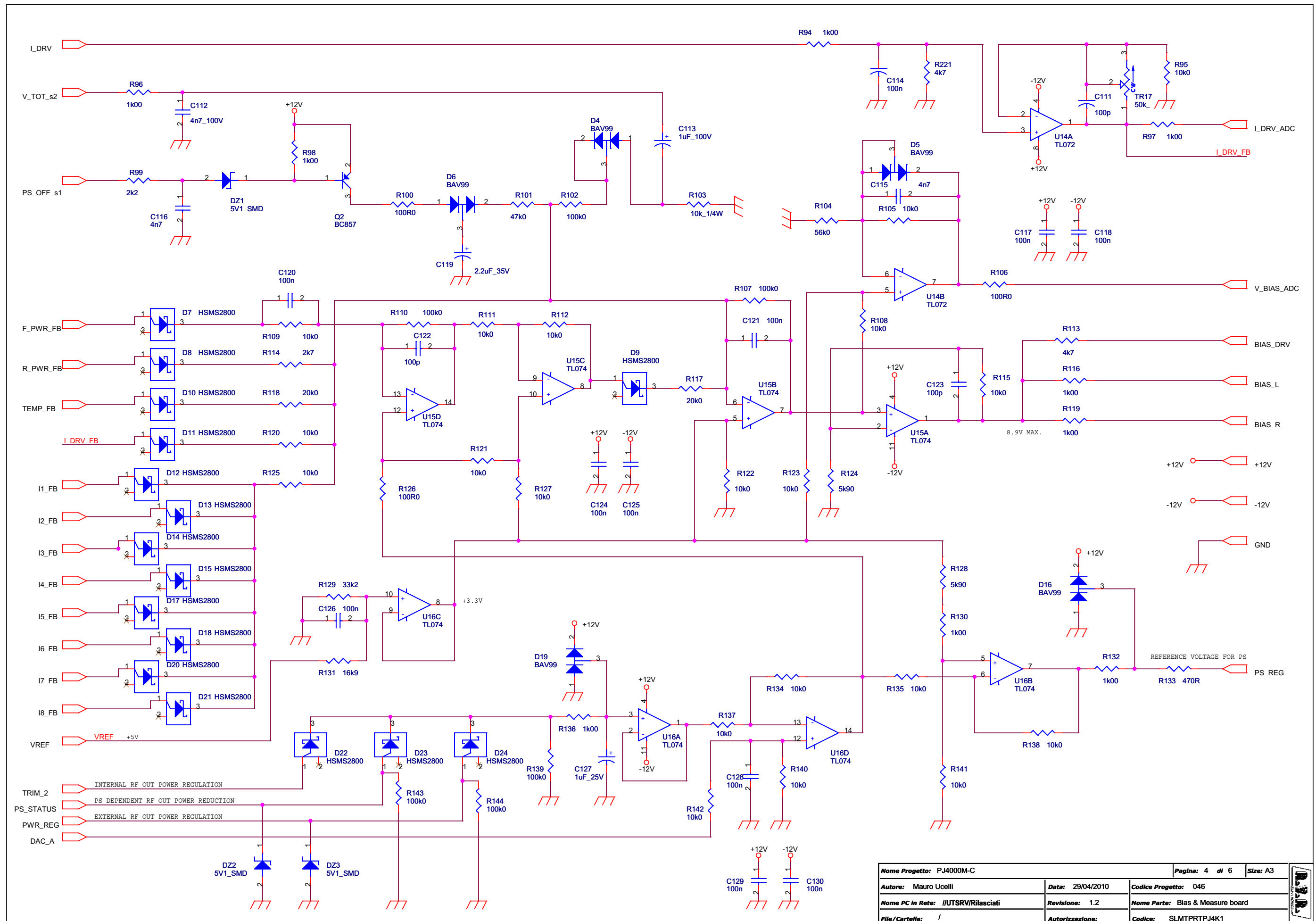




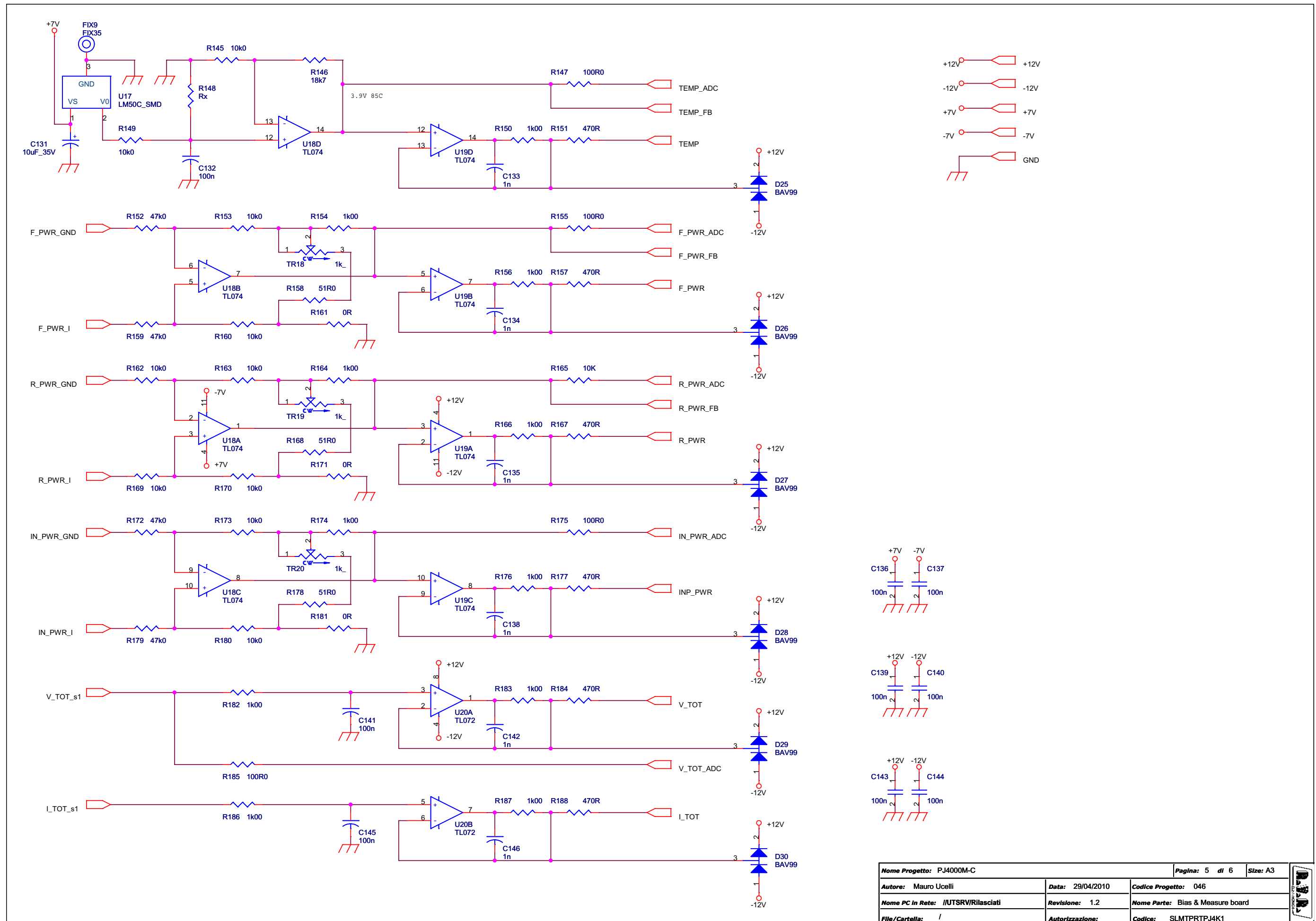
Nome Progetto: PJ4000M-C		Pagina: 2 di 6	Size: A3
Autore: Mauro Ucelli	Data: 29/04/2010	Codice Progetto: 046	
Nome PC In Rete: //UTSRV/Rilasciati	Revisione: 1.2	Nome Parte: Bias & Measure board	
File/Cartella: /	Autorizzazione:	Codice: SLMTPRTPJ4K1	



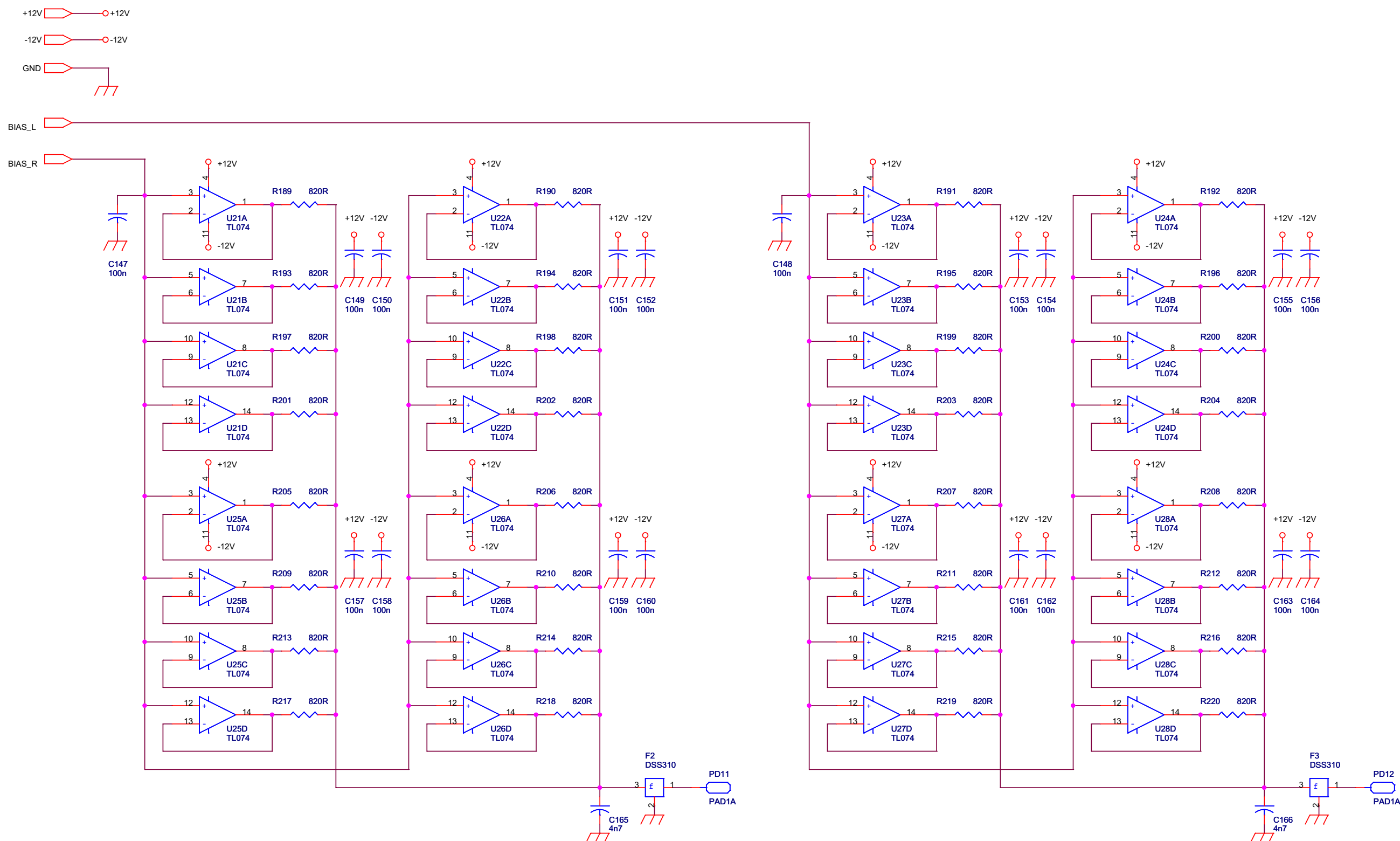
Nome Progetto: PJ4000M-C		Pagina: 3 di 6	Size: A3
Autore: Mauro Ucelli	Data: 29/04/2010	Codice Progetto: 046	
Nome PC in Rete: //UTSRV/Rilasciati	Revisione: 1.2	Nome Parte: Bias & Measure board	
File/Cartella: /	Autorizzazione:	Codice: SLMTPRTPJ4K1	



Nome Progetto: PJ4000M-C		Pagina: 4 di 6	Size: A3
Autore: Mauro Ucelli	Data: 29/04/2010	Codice Progetto: 046	
Nome PC In Rete: //UTSRV/Rilasciati	Revisione: 1.2	Nome Parte: Bias & Measure board	
File/Cartella: /	Autorizzazione:	Codice: SLMTPRTPJ4K1	



Nome Progetto: PJ4000M-C		Pagina: 5 di 6	Size: A3
Autore: Mauro Ucelli		Data: 29/04/2010	Codice Progetto: 046
Nome PC in Rete: I/UTSRV/Rilasciati		Revisione: 1.2	Nome Parte: Bias & Measure board
File/Cartella: /		Autorizzazione:	Codice: SLMTPRTPJ4K1



Nome Progetto: PJ4000M-C		Pagina: 6 di 6	Size: A3
Autore: Mauro Ucelli	Data: 29/04/2010	Codice Progetto: 046	
Nome PC in Rete: //UTSRV/Rilasciati	Revisione: 1.2	Nome Parte: Bias & Measure board	
File/Cartella: /	Autorizzazione:	Codice: SLMTPTPTJ4K1	

Bias & Measure board
SLMTPRTPJ4K1
Revision: 1.2
046
PJ4000M-C
Mauro Ucelli
29/04/2010

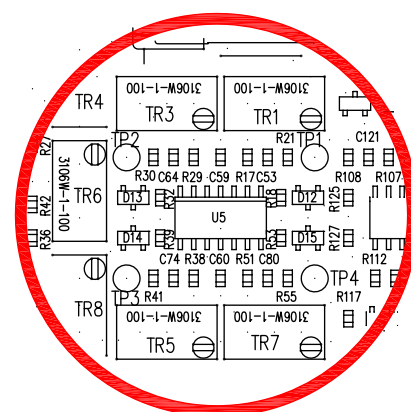
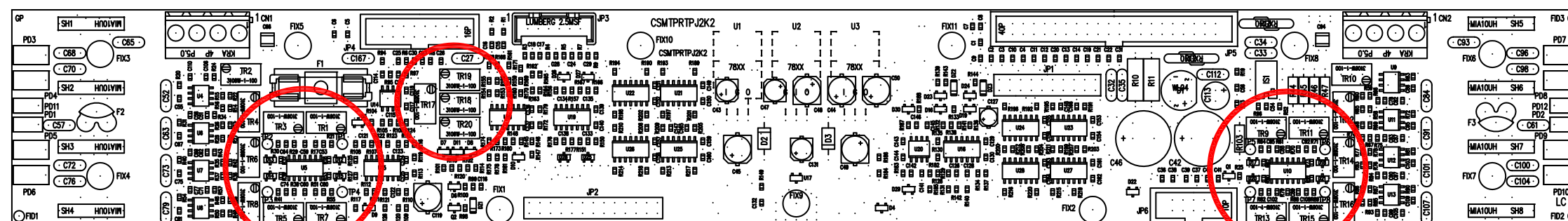
Item	Quantity	Reference	Part	Description	RVR Code
1	2	CN2,CN1	Connettore mecan.	Semilavorato RVR	FISCAVKIT113 (PZ1) + BLCFCAV113 (PZ2)
2	40	C1,C2,C3,C4,C5,C6,C7,C8, C9,C10,C11,C12,C13,C14, C15,C16,C17,C18,C19,C20, C21,C22,C23,C24,C25,C26, C28,C29,C30,C31,C36,C37, C38,C39,C40,C41,C115, C116,C165,C166	4n7	(0805/0603):Componente SMD size 0805 o 0603	CCC085472KXC
3	25	C27,C33,C34,C52,C57,C61, C63,C65,C68,C70,C72,C73, C76,C79,C84,C91,C93,C96, C98,C100,C101,C104,C107, C112,C167	4n7 100V	(CCP5):Condesatore Ceramico passo 5.08	CMS472MC101
4	2	C32,C35	100p 50V	(CCP5):Condesatore Ceramico passo 5.08	CKM101KC600C
5	2	C46,C42	1000uF 35V	(CEV_D13,2P5,08):Cond. Elet. Vert. diam. 13.2mm passo 5.08	CEA108MC350V
6	3	C43,C47,C131	10uF 35V	(CES5X5,5):Cond. Elet. All. SMD diametro 5 altezza 5.5	CES106B350
7	5	C44,C45,C48,C49,C50	100uF 35V	(CES6,3X8):Cond. Elet. All. SMD diametro 6.5 altezza 8	CES107E250
8	1	C119	2,2uF 35V	Cond. Elet. All. SMD diametro 4 altezza 5.5	CES225A500
9	58	C51,C58,C59,C60,C62,C69, C71,C77,C78,C82,C83,C87, C88,C89,C90,C97,C99,C105, C106,C110,C114,C117,C118, C120,C121,C124,C125,C126, C128,C129,C130,C132,C136, C137,C139,C140,C141,C143, C144,C145,C147,C148,C149, C150,C151,C152,C153,C154, C155,C156,C157,C158,C159, C160,C161,C162,C163,C164	100n	(0805/0603):Componente SMD size 0805 o 0603	CCC085104KXC
10	11	C53,C64,C74,C80,C85,C92, C102,C108,C111,C122,C123	100p	(0805/0603):Componente SMD size 0805 o 0603	CCC085101JCC
11	16	C54,C55,C56,C67,C75,C81, C86,C95,C103,C109,C133, C134,C135,C138,C142,C146	1n	(0805/0603):Componente SMD size 0805 o 0603	CCC085102JNC
12	2	C94,C66	680p HQ	(CSMD HQ):Chip HQ 680p	CHQ681JA101
13	1	C113	1uF 100V	(CEV_D6,6P2,54):Cond. Elet. Vert. diam. 6.5mm passo 2.54	CEA105MA500V
14	1	C127	1uF 25V	(CES4X5,5):Cond. Elet. All. SMD diametro 4 altezza 5.5	CES105A500
15	3	DZ1,D22,DZ3	5V1_SMD	(MINIMELF):Zener SMD 5V1	DIZ5V1MINI
16	1	D1	WL04	(WL04):Ponte diodi rettificatore circolare	PNRWL02
17	2	D3,D2	5V1 1W	(ZENER 1W):Diodo Zener 5V1 1W (come diodi rettificatori da 1A)	DIZ5V11W
18	11	D4,D5,D6,D16,D19,D25,D26, D27,D28,D29,D30	BAV99	(SOT-23):Diodo SMD SOT-23	DISBAV99
19	16	D7,D8,D9,D10,D11,D12,D13, D14,D15,D17,D18,D20,D21, D22,D23,D24	HSMS2800	(SOT-23):Diodo SMD SOT-23	DISHSMS2800
20	11	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6,FIX7,FIX8,FIX9, FIX10,FIX11	FIX35	(FIX35):Non è un componente	
21	1	F1	2A	(FHOLDER_C):Portafusibile a Clip per Fuse 5x20 2A da c.s.	PFSS5X20CS+FUS5X20RP2+COPPFSS5X20CS
22	2	F3,F2	DSS310	(DSS310):Filtro MURATA mod. DSS310	FILTRO ANTIDIST.EMI MURATA 22NF 50V
23	1	IS1	4N25	(DIP6_L):Opto su zoccolo 8pins	LED4N26
24	1	JP1	STRIP 10x10	(STRIP10X2):Strip 10+10 poli passo 2.54 Femmina	CNTSTF10DDB
25	1	JP2	STRIP 13x13	(STRIP13X2):Strip 13+13 poli passo 2.54 Femmina	CNTSTF13DDB
26	1	JP3	LUMBERG 6PV	(LUMBERG 6PV):Connettore tipo Lumberg 6 poli verticale	CNT25MSF6
27	1	JP4	CN16_FLAT	(FLAT16V):Conn. per Flat Cable 16pp Vert	CNTMCS16A
28	1	JP5	CN40_FLAT	(FLAT40V):Conn. per Flat Cable 40pp Vert	CNTMCS40A
29	1	JP6	CN10_FLAT	(FLAT10V):Conn. per Flat Cable 10pp Vert	CNTMCS10A
30	4	PD1,PD2,PD11,PD12	PAD1A	(PAD1A):Non è un componente	
31	8	PD3,PD4,PD5,PD6,PD7,PD8, PD9,PD10	PAD10A	(PAD10A):Non è un componente	
32	1	Q1	BC847	(SOT-23):Transistor SMD	TRNBC847
33	1	Q2	BC857	(SOT-23):Transistor SMD	TRNBC857
34	36	R1,R2,R3,R4,R6,R7,R8,R9, R18,R30,R39,R53,R62, R71,R80,R89,R94,R96,R97, R98,R116,R119,R130,R132, R136,R150,R154,R156,R164, R166,R174,R176,R182,R183, R186,R187	1k00	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F0001K
35	24	R5,R20,R21,R31,R32,R40, R41,R54,R55,R63,R64,R72, R73,R81,R82,R90,R91,R100, R106,R126,R147,R155, R175,R185	100R0	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F0100H
36	2	R11,R10	10 1/2W	(R1/2W):Resistenza 10 Ohm 1/2W	RSC1/2J0010H
37	2	R12,R13	RXE110	(RXE110):PTC (Fusibile Autoripristinante)	FUSAUTRX110A
38	11	R14,R26,R35,R48,R58,R67, R76,R85,R158,R168,R178	51R0	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F0051H
39	57	R15,R16,R17,R23,R27,R28, R29,R36,R37,R38,R49,R50, R51,R59,R60,R61,R68,R69, R70,R77,R78,R79,R86,R87, R88,R95,R105,R108,R109, R111,R112,R115,R120,R121, R122,R123,R125,R127,R134, R135,R137,R138,R140,R141, R142,R145,R149,R153,R160, R162,R163,R169,R170,R173, R180,R165,R25	10k0	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F0010K
40	15	R19,R22,R33,R42,R56,R65, R74,R83,R92,R102,R107, R110,R139,R143,R144	100k0	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F0100K
41	8	R24,R34,R43,R57,R66,R75, R84,R93	10R0	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F0010H
42	4	R44,R45,R46,R47	20k0 1/4W	(R1/4W):Resistenza 20K 1% 1/4W	RSM1/4F0020K
43	1	R52	422R	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F0422H

NOTA1

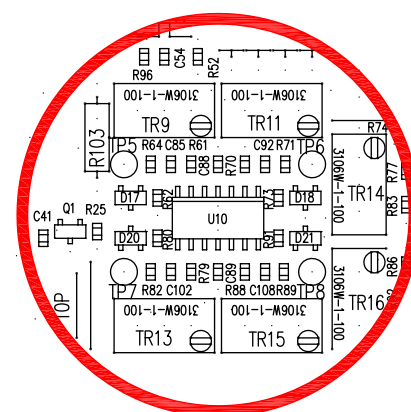
44	1	R99	2k2	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH126F002K2
45	5	R101,R152,R159,R172,R179	47k0	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F0047K
46	1	R103	10k 1/4W	(R1/4W):Resistenza 10K 5% 1/4W	RSM1/4F0010K
47	1	R104	56k0	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F0056K
48	2	R113,R221	4k7	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH126F004K7
49	1	R114	2k7	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F002K7
50	2	R117,R118	20k0	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F0020K
51	2	R128,R124	5k90	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F005K9
52	1	R129	33k2	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F0033K
53	1	R131	16k9	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F016K9
54	7	R133,R151,R157,R167,R177, R184,R188	470R	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F0470H
55	1	R146	18k7	(0805/0603):Componente SMD 1% size 0805 o 0603	RCH085F018K7
56	1	R148	Rx	Non Installata	
57	3	R161,R171,R181	0R	(0805/0603):Componente SMD size 0805 o 0603	RCH085F0000H
58	32	R189,R190,R191,R192,R193, R194,R195,R196,R197,R198, R199,R200,R201,R202,R203, R204,R205,R206,R207,R208, R209,R210,R211,R212,R213, R214,R215,R216,R217,R218, R219,R220	820R	(0805/0603):Componente SMD 5% size 0805	RCH085J0825H
59	8	SH1,SH2,SH3,SH4,SH5,SH6, SH7,SH8	0.005R	SHUNT (2.5W) p.15.2, larg. 3, fori diam. 1.9 0.005 Ohm	RSH03W0H005
60	8	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8	TP	(TP2,54):Non è un componente	
61	17	TR1,TR2,TR3,TR4,TR5,TR6, TR7,TR8,TR9,TR10,TR11, TR12,TR13,TR14,TR15,TR16, TR17	50k	(TRIM87W):Trimmer resistivo multigiri reg. in testa	RVT3296WK050
62	3	TR18,TR19,TR20	1k	(TRIM87W):Trimmer resistivo multigiri reg. in testa	RVT3296WK001
63	1	U1	LM7812/TO220_90B	(78XX/TO220_90BOT)	CIL7812P
64	1	U2	LM7912/TO220_90B	(79XX/TO220_90BOT)	CIL7912PCIS
65	1	U3	LM7805/TO220_90B	(78XX/TO220_90BOT)	CIL7805P
66	8	U4,U6,U7,U8,U9,U11,U12, U13	INA146	(SO-8):IC SMD 8pins	CILINA146SMD
67	14	U5,U10,U15,U16,U18,U19, U21,U22,U23,U24,U25,U26, U27,U28	TL074	(TL074/SO14): IC SMD 14pins	CILTL074SMD
68	2	U14,U20	TL072	(TL072/SO8):IC SMD 8pins	CILTL072SMD
69	1	U17	LM50C_SMD	(SOT-23):IC Sonda termica LM50C SMD	CILLM50C
70	1	CS1	CSMTPRTPJ2K2	Circuito stampato	CSMTPRTPJ2K2
	1			Zoccolo x integrato a 6 pin	ZIN06TORN5

NOTA1 Mettere a massa il pin 34 grattando via il solder resist che ricopre tutto il ground che sta intorno

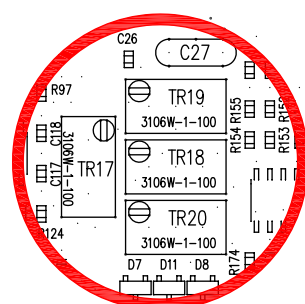
8.15.1 Adjustments



A



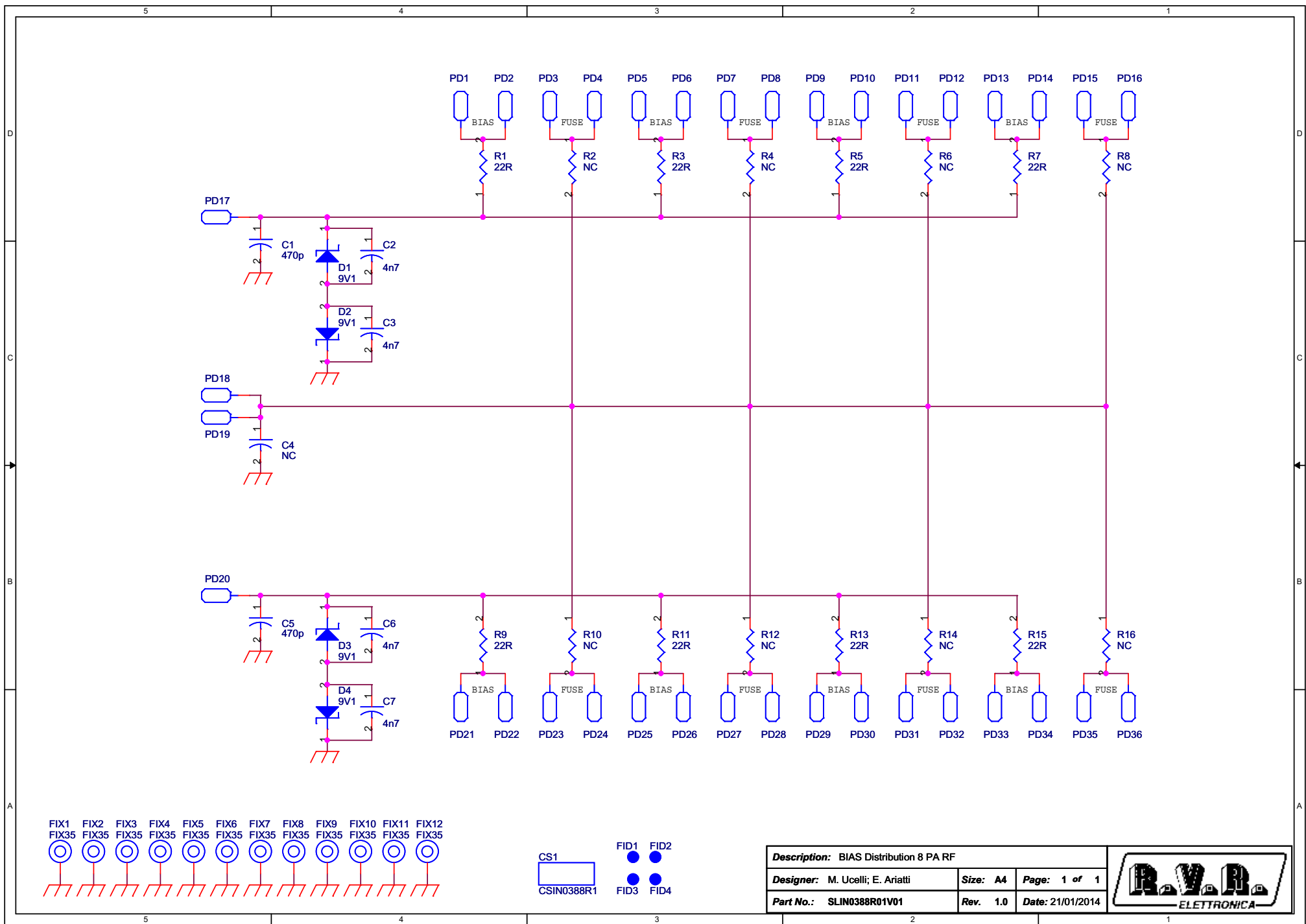
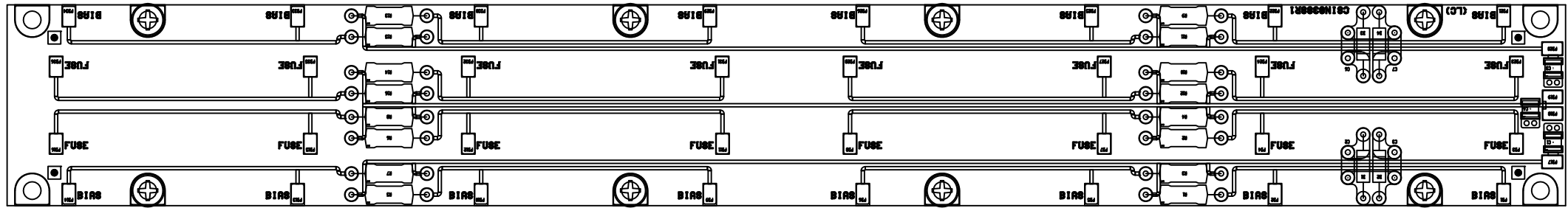
C



B

Ref.	Trimmer	Function
A	TR1	Adjusting current reading Pallet mosfet 1
A	TR3	Adjusting current reading Pallet mosfet 2
A	TR5	Adjusting current reading Pallet mosfet 3
A	TR7	Adjusting current reading Pallet mosfet 4
C	TR9	Adjusting current reading Pallet mosfet 5
C	TR11	Adjusting current reading Pallet mosfet 6
C	TR13	Adjusting current reading Pallet mosfet 7
C	TR15	Adjusting current reading Pallet mosfet 8
B	TR17	Adjusting current reading Pallet driver
B	TR18	Adjusting Reading FWD power, output from the module
B	TR19	Adjusting Reading RFL power, output from the module
B	TR20	Adjusting Reading FWD power, input to the splitter

8.16 8 way splitter (SLIN0388R01V01)



BIAS Distribution 8 PA RF
SLIN0388R01V01
21/01/2014
Rev. 1.0
46
M. Ucelli / E. Ariatti

Item	Qty	Reference	Part	Description
1	1	CS1	CSIN0388R1	Circuito stampato
2	2	C1,C5	470p	Cond. SMD 1212 HQ
3	4	C2,C3,C6,C7	4n7	Cond. ceramico p 5mm
4	1	C4	NC	Cond. SMD 1212 HQ
5	4	D1,D2,D3,D4	9V1	1W Zener Diode
6	4	FID1,FID2,FID3,FID4	FID	Fiducial CS
7	12	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8, FIX9, FIX10, FIX11, FIX12	FIX35	Foro fissaggio 3.5mm
8	36	PD1,PD2,PD3,PD4,PD5,PD6, PD7,PD8,PD9,PD10,PD11, PD12,PD13,PD14,PD15,PD16, PD17,PD18,PD19,PD20,PD21, PD22,PD23,PD24,PD25,PD26, PD27,PD28,PD29,PD30,PD31, PD32,PD33,PD34,PD35,PD36	PAD	Pad a saldare
9	8	R1,R3,R5,R7,R9,R11,R13, R15	22R	Res. Strato Metallico 2W
10	8	R2,R4,R6,R8,R10,R12,R14,R16	NC	Res. 1/2W 10k

Description: BIAS Distribution 8 PA RF

Designer: M. Ucelli; E. Ariatti

Part No.: SLIN0388R01V01

Size: A4

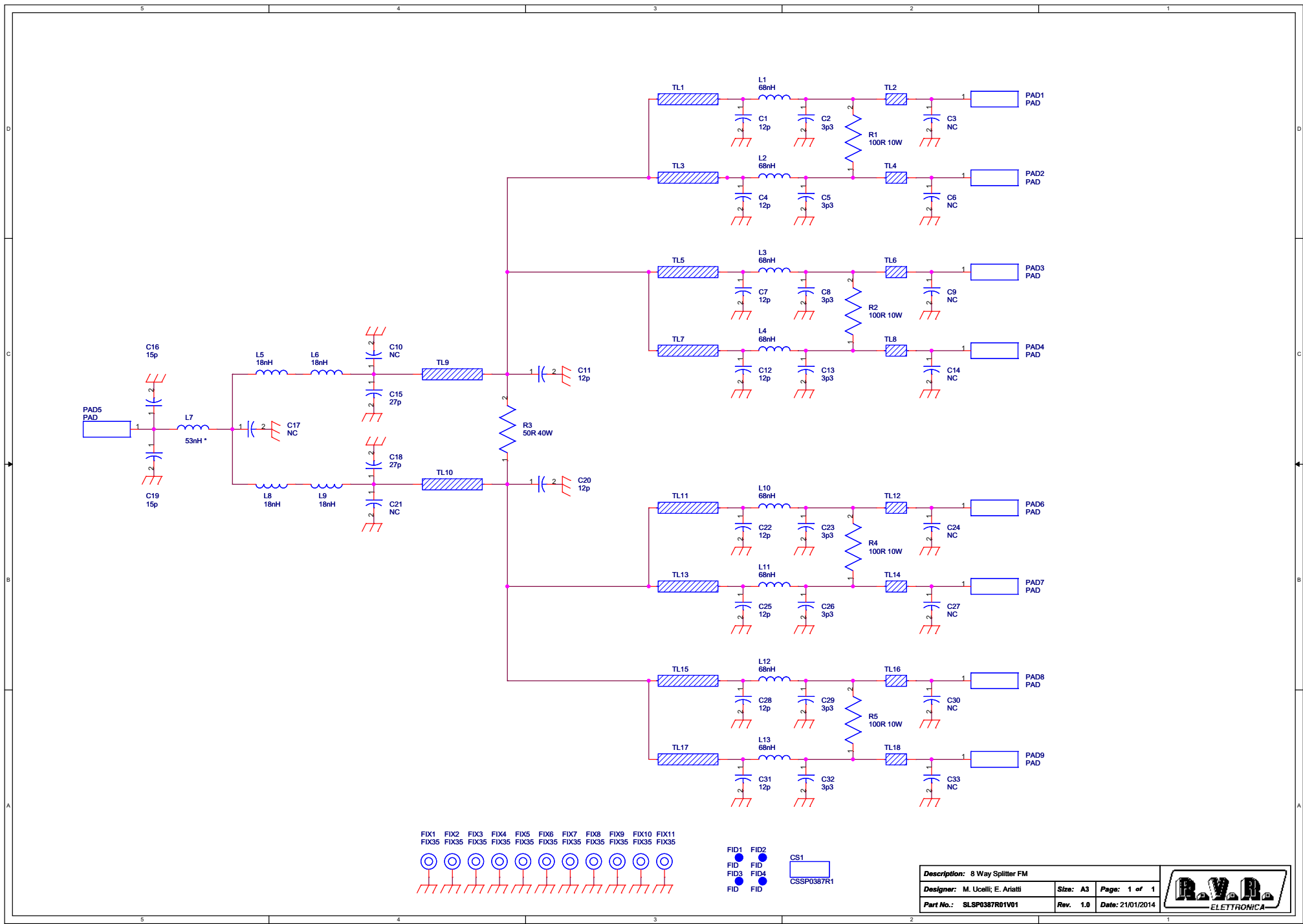
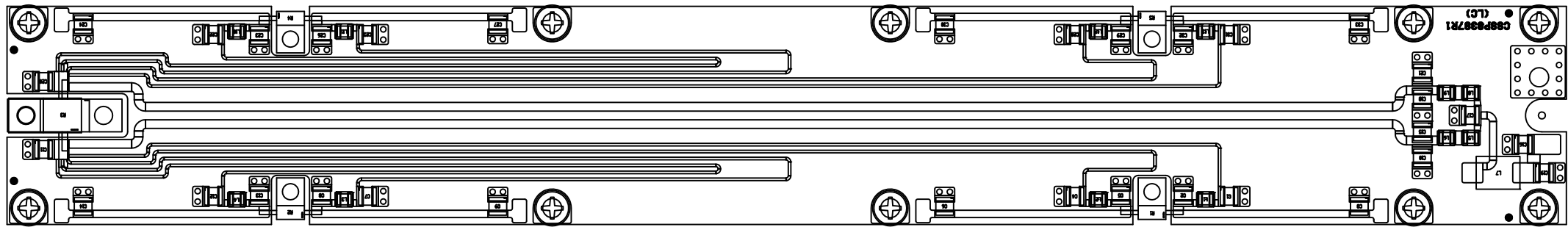
Page: 1 of 1

Rev. 1.0

Date: 21/01/2014



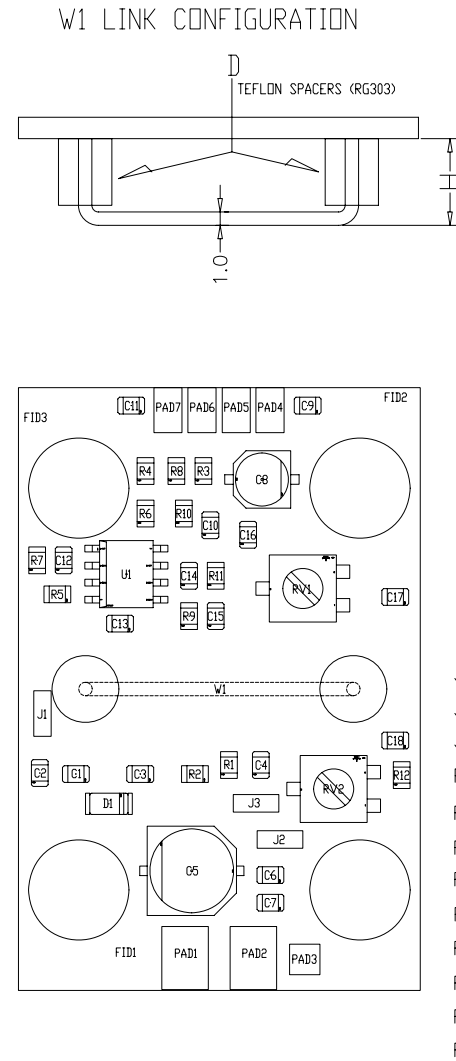
8.17 Bias distribution 8 PA RF (SLSP0387R01V01)



8 Ways Splitter FM
SLSP0387R01V01
Revision: 1.0
21/01/2014
46
Mauro Ucelli / E. Ariatti

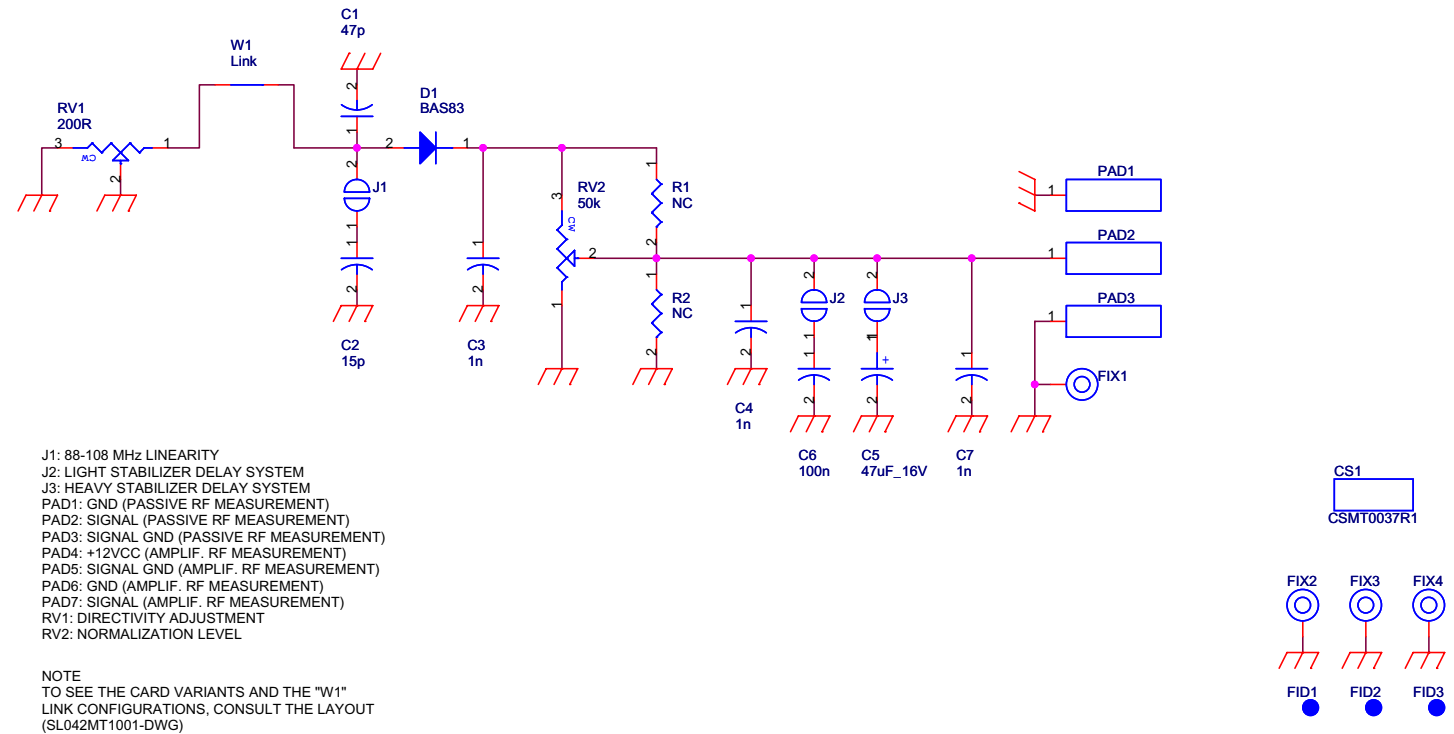
Item	Qty	Reference	Part	Description
1	1	CS1	CSSP0387R1	Circuito stampato
2	10	C1,C4,C7,C11,C12,C20,C22,C25,C28,C31	12p	Cond. SMD 1212 HQ
3	8	C2,C5,C8,C13,C23,C26,C29,C32	3p3	Cond. SMD 1212 HQ
4	11	C3,C6,C9,C10,C14,C17,C21,C24,C27,C30,C33	NC	Cond. SMD 1212 HQ
5	2	C15,C18	27p	Cond. SMD 1212 HQ
6	2	C16,C19	15p	Cond. SMD 1212 HQ
7	4	FID1,FID2,FID3,FID4	FID	Fiducial CS
8	11	FIX1,FIX2,FIX3,FIX4,FIX5,FIX6,FIX7,FIX8,FIX9,FIX10,FIX11	FIX35	Foro fissaggio 3.5mm
9	8	L1,L2,L3,L4,L10,L11,L12,L13	68nH	Induttanza SMD HQ 2520 (1008)
10	4	L5,L6,L8,L9	18nH	Induttanza SMD HQ 2520 (1008)
11	1	L7	53nH *	4 spire filo rame arg. Φ 1mm, avvolte su Φ 4mm; lunghezza solenoide 5,5mm
12	9	PAD1,PAD2,PAD3,PAD4,PAD5,PAD6,PAD7,PAD8,PAD9	PAD	Pad SMD saldare
13	4	R1,R2,R4,R5	100R 10W	Resistenza KDI 1 fix, 100ohm 10W
14	1	R3	50R 40W	Resistenza KDI 2 fix, 50 ohm 40W
15	10	TL1,TL3,TL5,TL7,TL9,TL10,TL11,TL13,TL15,TL17	TLINE_L	Linea strip CS
16	8	TL2,TL4,TL6,TL8,TL12,	TLINE_S	Linea strip CS

8.18 FWD e RFL Power Meter board (SL042MT1501)



CONFIGURATIONS DETAIL

CARD CODE	H link W1 (mm)	D spacers W1	Jumper J1	Jumper J2	Jumper J3
SL042MT1001					
SL042MT1101	5.3		X		
SL042MT1201	4		X		
SL042MT1301	7.6		X		
SL042MT1401	8.5	X	X		X
SL042MT1501	4.5		X		



Project Name: Generic RF PWR Measurement		Page: 1 of 1	Size: A4
Designer: Mauro Ucelli	Date: Thursday, April 17, 2008	Project Code: 042	
File Location: \IUTSR\VRILASCIATI	Revision: 1.1	Description: RF Power measure board	
Folder/File: I	Approval:	Part No.: SL042MT1001	

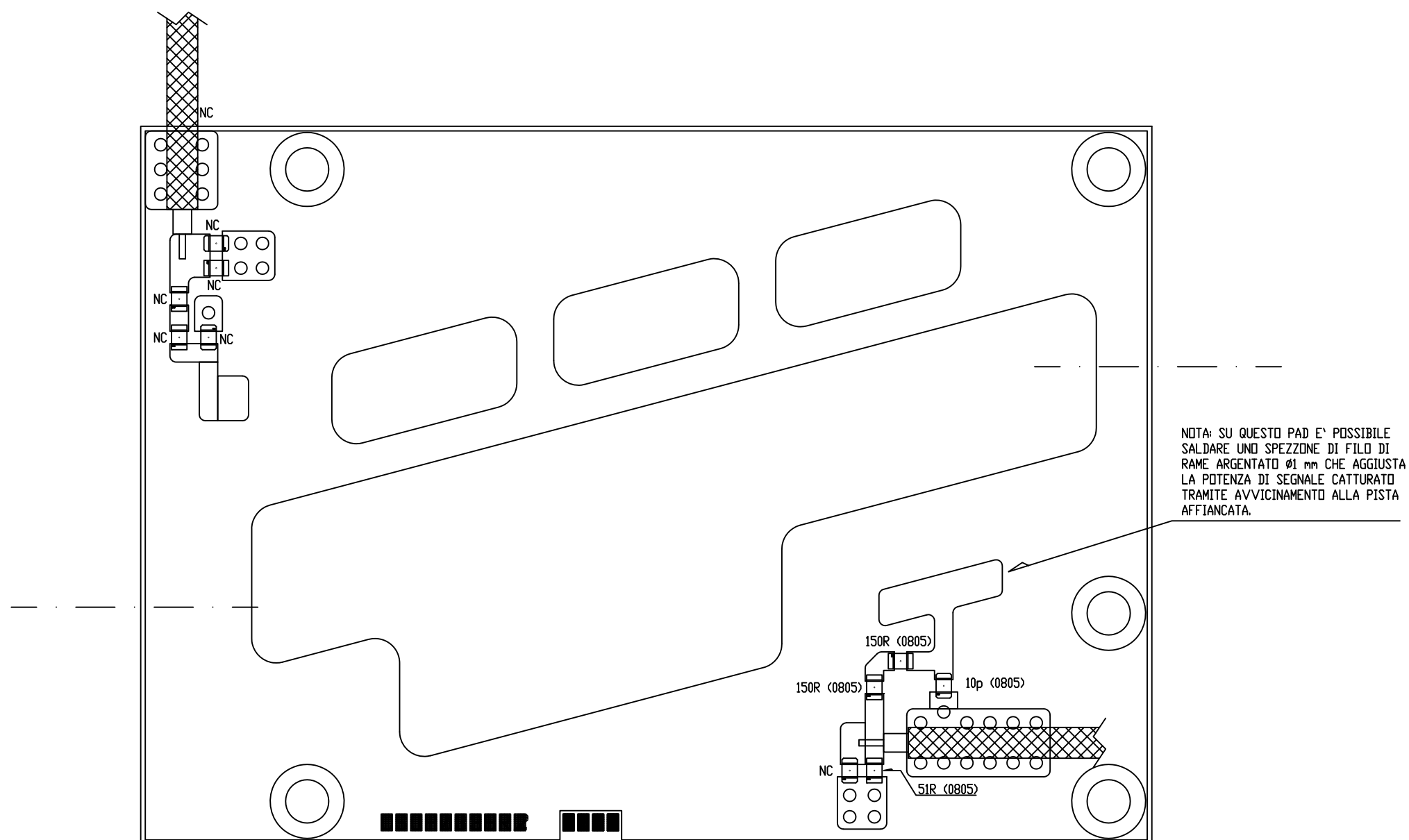
RF Power measure board
SL042MT1001

Revision: 1.1

Generic RF PWR Measurement

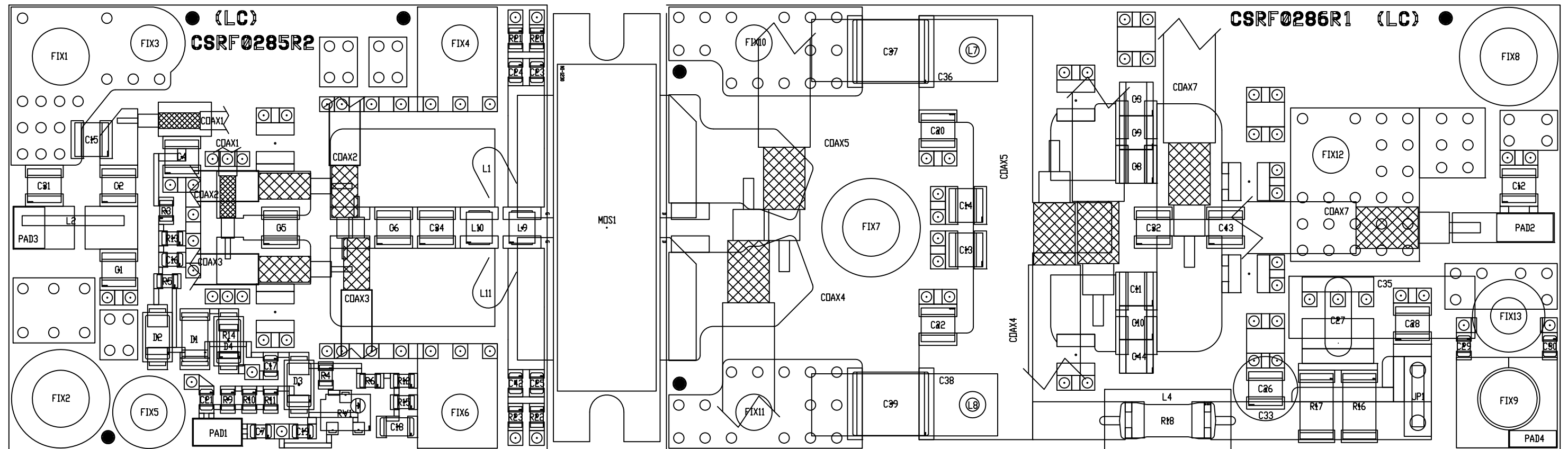
Item	Quantity	Reference	Part	Description
1	1	CS1	CSMT0037R1	Printed Circuit Board
2	1	C1	47p	SMD 0805 COG Capacitor
3	1	C2	15p	SMD 0805 COG Capacitor
4	3	C3,C4,C7	1n	SMD 0805 Capacitor
5	1	C5	47uF_16V	Elect. SMD d. 6.3mm Cap.
6	1	C6	100n	SMD 0805 Capacitor
7	1	D1	BAS83	MINIMELF SMD Diode
8	3	FID1,FID2,FID3	FID	
9	4	FIX1,FIX2,FIX3,FIX4	FIX35	Fixing Hole 3.5mm
10	3	J1,J2,J3	JSMD	SMD Pad to solder
11	3	PAD1,PAD2,PAD3	PAD	
12	1	RV1	200R	Trimmer SMD
13	1	RV2	50k	Trimmer SMD
14	2	R1,R2	NC	SMD 0805 Res.
15	1	W1	Link	Wire to solder

8.19 Out board (SLOP0338R2)



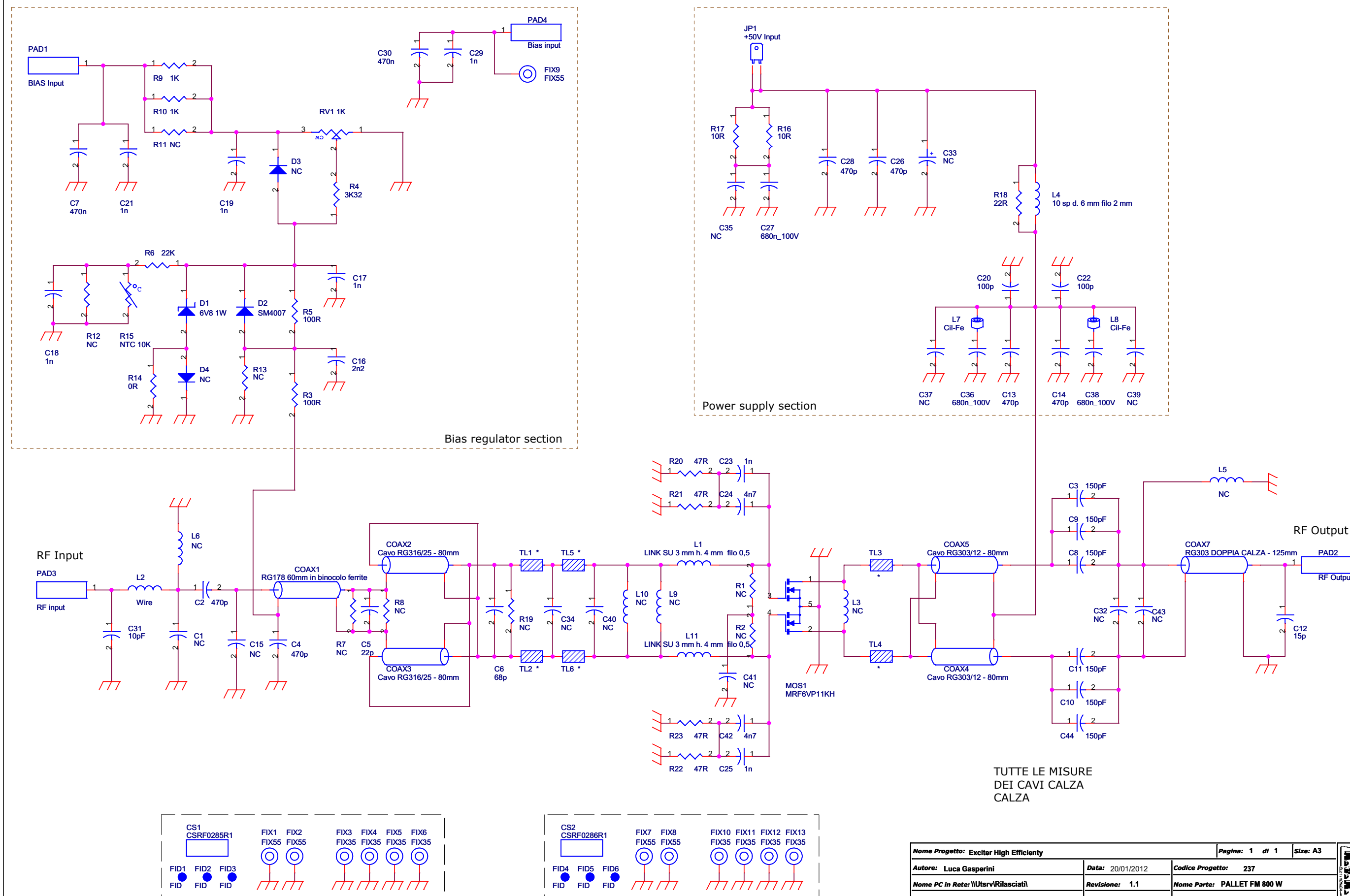
Item	Quantity	Reference	Part
1	2	R1, R2	150R
2	1	R3	51R
3	1	C1	10pF
4	1	P1	PAG2003MS

8.20 Amplifier modules - Pallet Mosfet (KKFIN237H)*



* In the event of a request for replacement, check the version of the pallet RF, on the yellow label on the back of the module

Pallet type	Mosfet type (to cosult datasheet)
KKFIN237H	MRF6VP11KH
KKFIN237L	MRFE6VP61K25H
KKFIN237N	MRFE6VP61K25H



PALLET FM 800 W Revised: 26/08/2013
SL237RF1001 Revision: 1.4
Exciter High Efficienty
237
L. Gasperini / A. Tommasi

Item	Quantity	Reference	Part
1	1	COAX1	RG178 60mm in binocular ferrite
2	2	COAX2, COAX3	Cable RG316/25 - 80mm
3	2	COAX5, COAX4	Cable RG303/12 - 80mm
4	1	COAX7	RG142 DOUBLE BRAIDING - 125r
5	1	CS1	CSRF0285R2
6	1	CS2	CSRF0286R1
7	1	C1	NC
8	2	C2, C4	470p
9	4	C13, C14, C26, C28	470p
10	1	C30	470n
11	1	C5	22p
12	1	C6	68p
13	2	C7	470n
14	6	C3, C44, C8, C9, C10, C11	150pF
15	1	C12	15p
16	5	C15, C32, C34, C40, C43	NC
17	1	C16	2n2
18	5	C17, C19, C21, C23, C25	1n
19	1	C18	1n
20	2	C22, C20	100p
21	2	C42, C24	4n7
22	1	C27	1uF_100V
23	1	C31	10pF
24	1	C29	1n
25	3	C36, C38	680n_100V
26	2	C37, C39	NC
27	1	C41	NC
28	1	D1	6V8 1W
29	1	D2	SM4007
30	1	D3	NC
31	1	D4	4V7 1/2W
32	6	FID1, FID2, FID3, FID4, FID5, FID6	FID
33	5	FIX1, FIX2, FIX7, FIX8, FIX9	FIX55
34	8	FIX3, FIX4, FIX5, FIX6, FIX10, FIX11, FIX12, FIX13	FIX35
35	1	JP1	+50V Input
36	2	L11, L1	LINK SU 3 mm h. 4 mm wire 0,5
37	1	L2	Wire
38	1	L3	NC
39	1	L4	10 sp d. 6 mm wire 2 mm
40	2	L5, L9	NC
41	1	L6	NC
42	2	L7, L8	Cil-Fe
43	1	L10	NC
44	1	MOS1	MRF6VP11KH
45	2	PAD4, PAD1	BIAS Input
46	1	PAD2	RF Output
47	1	PAD3	RF input
48	1	RV1	1K
49	5	R1, R2, R7, R8, R19	NC
50	2	R3, R5	100R
51	1	R4	3K32
52	1	R6	22K
53	2	R10, R9	1K
54	3	R11, R12, R13	NC
55	1	R14	NC
56	1	R15	NTC 10K
57	2	R17, R16	10R
58	1	R18	22R
59	4	R20, R21, R22, R23	47R
60	6	TL1, TL2, TL3, TL4, TL5, TL6	*
61	1		Ferrite balun

8.20.1 Datasheet of MRF6VP11KH

Freescale Semiconductor Technical Data

RF Power Field Effect Transistors N-Channel Enhancement-Mode Lateral MOSFETs

Designed primarily for pulse wideband applications with frequencies up to 150 MHz. Devices are unmatched and are suitable for use in industrial, medical and scientific applications.

- Typical Pulse Performance at 130 MHz: $V_{DD} = 50$ Volts, $I_{DQ} = 150$ mA, $P_{out} = 1000$ Watts Peak (200 W Avg.), Pulse Width = 100 μ sec, Duty Cycle = 20%
Power Gain — 26 dB
Drain Efficiency — 71%
- Capable of Handling 10:1 VSWR, @ 50 Vdc, 130 MHz, 1000 Watts Peak Power

Features

- Characterized with Series Equivalent Large-Signal Impedance Parameters
- CW Operation Capability with Adequate Cooling
- Qualified Up to a Maximum of 50 V_{DD} Operation
- Integrated ESD Protection
- Designed for Push-Pull Operation
- Greater Negative Gate-Source Voltage Range for Improved Class C Operation
- In Tape and Reel, R6 Suffix = 150 Units, 56 mm Tape Width, 13 inch Reel.
R5 Suffix = 50 Units, 56 mm Tape Width, 13 inch Reel.

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	-0.5, +110	Vdc
Gate-Source Voltage	V_{GS}	-6.0, +10	Vdc
Storage Temperature Range	T_{stg}	-65 to +150	°C
Case Operating Temperature	T_C	150	°C
Operating Junction Temperature (1,2)	T_J	225	°C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value (2,3)	Unit
Thermal Resistance, Junction to Case CW: Case Temperature 67°C, 1000 W CW, 100 MHz	$R_{\theta JC}$	0.13	°C/W
Thermal Impedance, Junction to Case Pulse: Case Temperature 80°C, 1000 W Peak, 100 μ sec Pulse Width, 20% Duty Cycle	$Z_{\theta JC}$	0.03	°C/W

- Continuous use at maximum temperature will affect MTTF.
- MTTF calculator available at <http://www.freescale.com/rf>. Select Software & Tools/Development Tools/Calculators to access MTTF calculators by product.
- Refer to AN1955, *Thermal Measurement Methodology of RF Power Amplifiers*. Go to <http://www.freescale.com/rf>. Select Documentation/Application Notes - AN1955.

Document Number: MRF6VP11KH
Rev. 8, 9/2012



MRF6VP11KHR6 MRF6VP11KGSR5

1.8-150 MHz, 1000 W, 50 V
LATERAL N-CHANNEL
BROADBAND
RF POWER MOSFETs

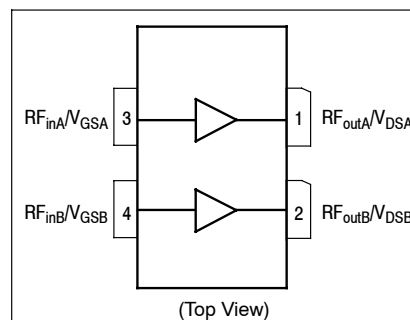
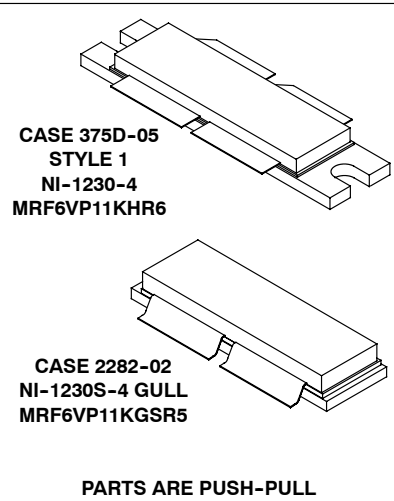


Figure 1. Pin Connections

Table 3. ESD Protection Characteristics

Test Methodology	Class
Human Body Model (per JESD22-A114)	2, passes 2000 V
Machine Model (per EIA/JESD22-A115)	A, passes 125 V
Charge Device Model (per JESD22-C101)	IV, passes 2000 V

Table 4. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Off Characteristics (1)					
Gate-Source Leakage Current ($V_{GS} = 5$ Vdc, $V_{DS} = 0$ Vdc)	I_{GSS}	—	—	10	μ Adc
Drain-Source Breakdown Voltage ($I_D = 300$ mA, $V_{GS} = 0$ Vdc)	$V_{(BR)DSS}$	110	—	—	Vdc
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 50$ Vdc, $V_{GS} = 0$ Vdc)	I_{DSS}	—	—	100	μ Adc
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 100$ Vdc, $V_{GS} = 0$ Vdc)	I_{DSS}	—	—	5	mA

On Characteristics

Gate Threshold Voltage (1) ($V_{DS} = 10$ Vdc, $I_D = 1600$ μ Adc)	$V_{GS(th)}$	1	1.63	3	Vdc
Gate Quiescent Voltage (2) ($V_{DD} = 50$ Vdc, $I_D = 150$ mAdc, Measured in Functional Test)	$V_{GS(Q)}$	1.5	2.2	3.5	Vdc
Drain-Source On-Voltage (1) ($V_{GS} = 10$ Vdc, $I_D = 4$ Adc)	$V_{DS(on)}$	—	0.28	—	Vdc

Dynamic Characteristics (1)

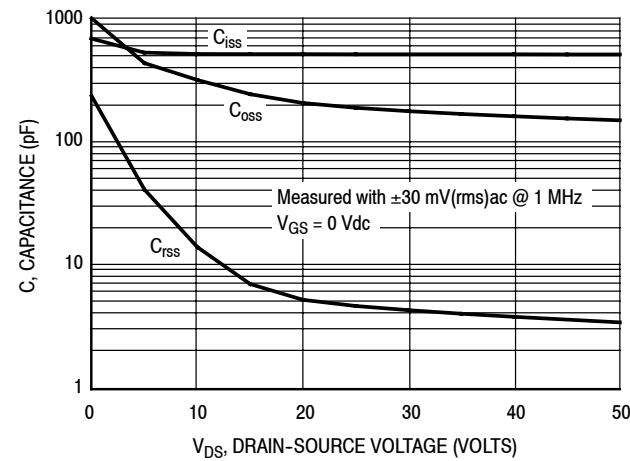
Reverse Transfer Capacitance ($V_{DS} = 50$ Vdc $\pm$ 30 mV(rms)ac @ 1 MHz, $V_{GS} = 0$ Vdc)	C_{rss}	—	3.3	—	pF
Output Capacitance ($V_{DS} = 50$ Vdc $\pm$ 30 mV(rms)ac @ 1 MHz, $V_{GS} = 0$ Vdc)	C_{oss}	—	147	—	pF
Input Capacitance ($V_{DS} = 50$ Vdc, $V_{GS} = 0$ Vdc $\pm$ 30 mV(rms)ac @ 1 MHz)	C_{iss}	—	506	—	pF

Functional Tests (2,3) (In Freescale Test Fixture, 50 ohm system) $V_{DD} = 50$ Vdc, $I_{DQ} = 150$ mA, $P_{out} = 1000$ W Peak (200 W Avg.), $f = 130$ MHz, 100 μ sec Pulse Width, 20% Duty Cycle

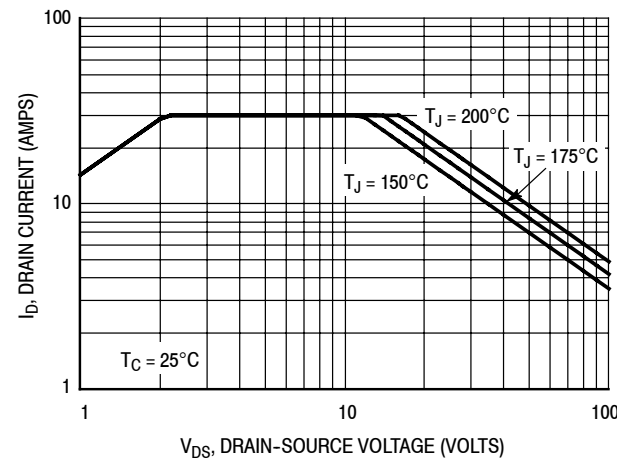
Power Gain	G_{ps}	24	26	28	dB
Drain Efficiency	η_D	69	71	—	%
Input Return Loss	IRL	—	-16	-9	dB

- Each side of device measured separately.
- Measurements made with device in push-pull configuration.
- Measurements made with device in straight lead configuration before any lead forming operation is applied. Lead forming is used for gull wing (GS) parts.

TYPICAL CHARACTERISTICS



Note: Each side of device measured separately.
Figure 4. Capacitance versus Drain-Source Voltage



Note: Each side of device measured separately.
Figure 5. DC Safe Operating Area

TYPICAL CHARACTERISTICS

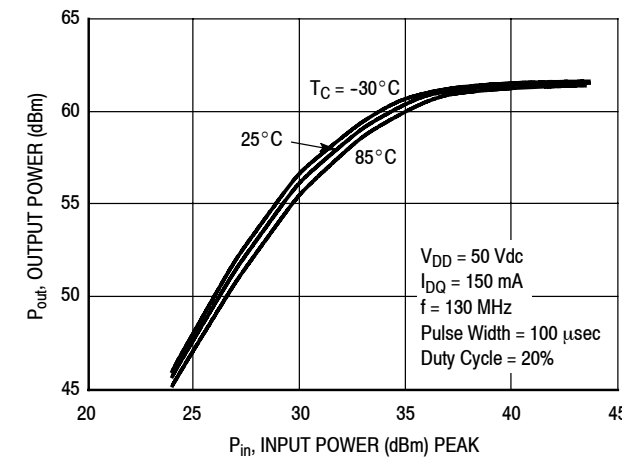


Figure 10. Output Power versus Input Power

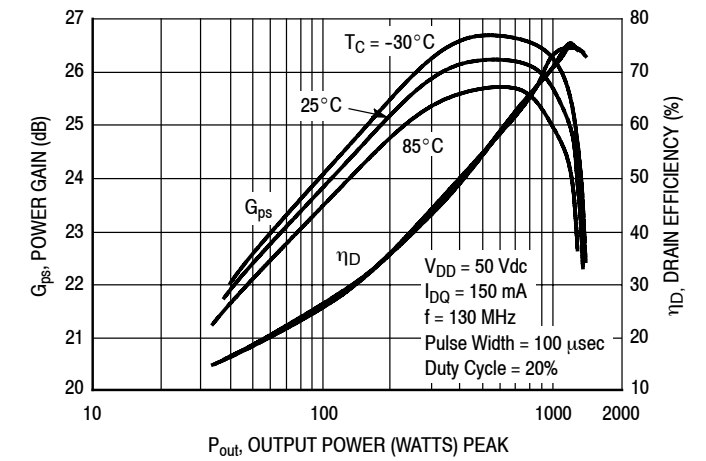


Figure 11. Power Gain and Drain Efficiency versus Output Power

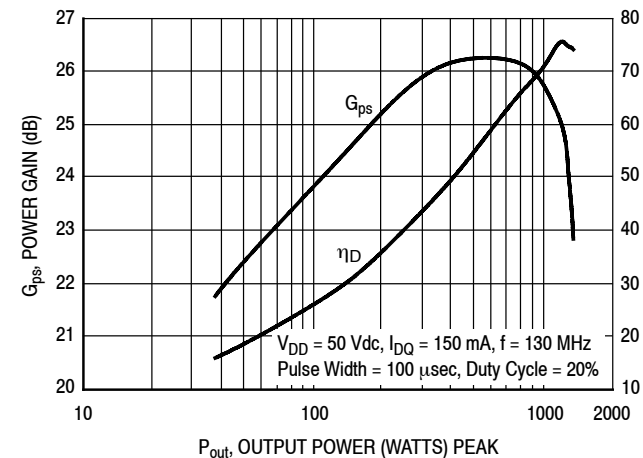


Figure 6. Power Gain and Drain Efficiency versus Output Power

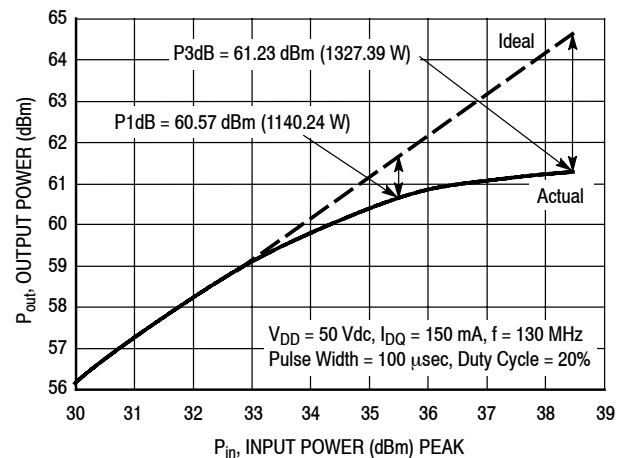


Figure 7. Output Power versus Input Power

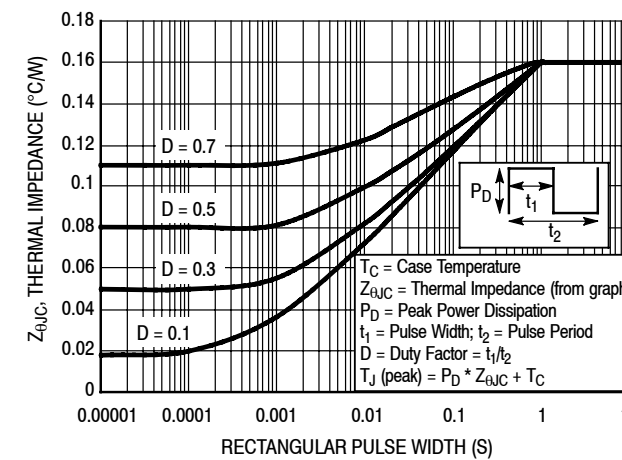
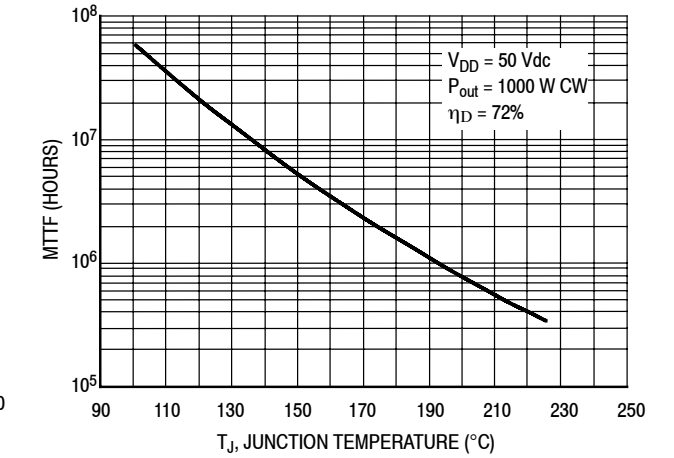


Figure 12. Transient Thermal Impedance



Note: MTTF value represents the total cumulative operating time under indicated test conditions.

MTTF calculator available at freescale.com/RFpower. Select Software & Tools/Development Tools/Calculators to access MTTF calculators by product.

For Pulse applications or CW conditions, use the MTTF calculator referenced above.

Figure 13. MTTF versus Junction Temperature - CW

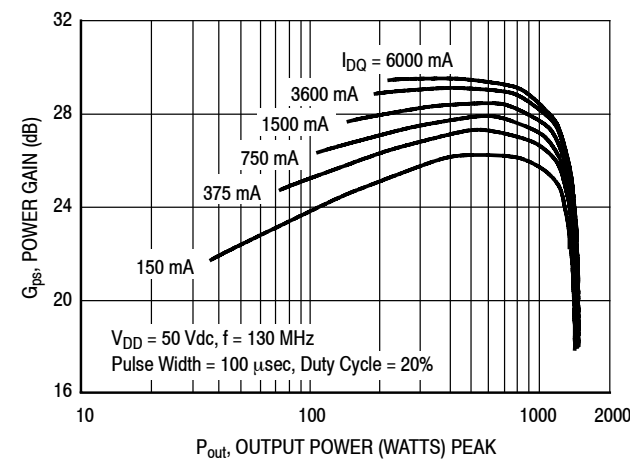


Figure 8. Power Gain versus Output Power

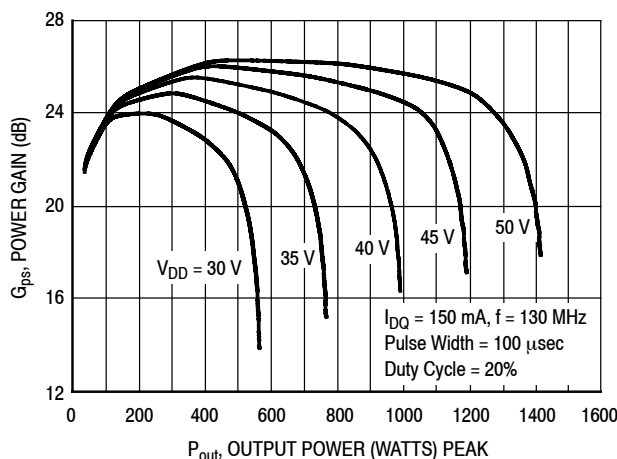
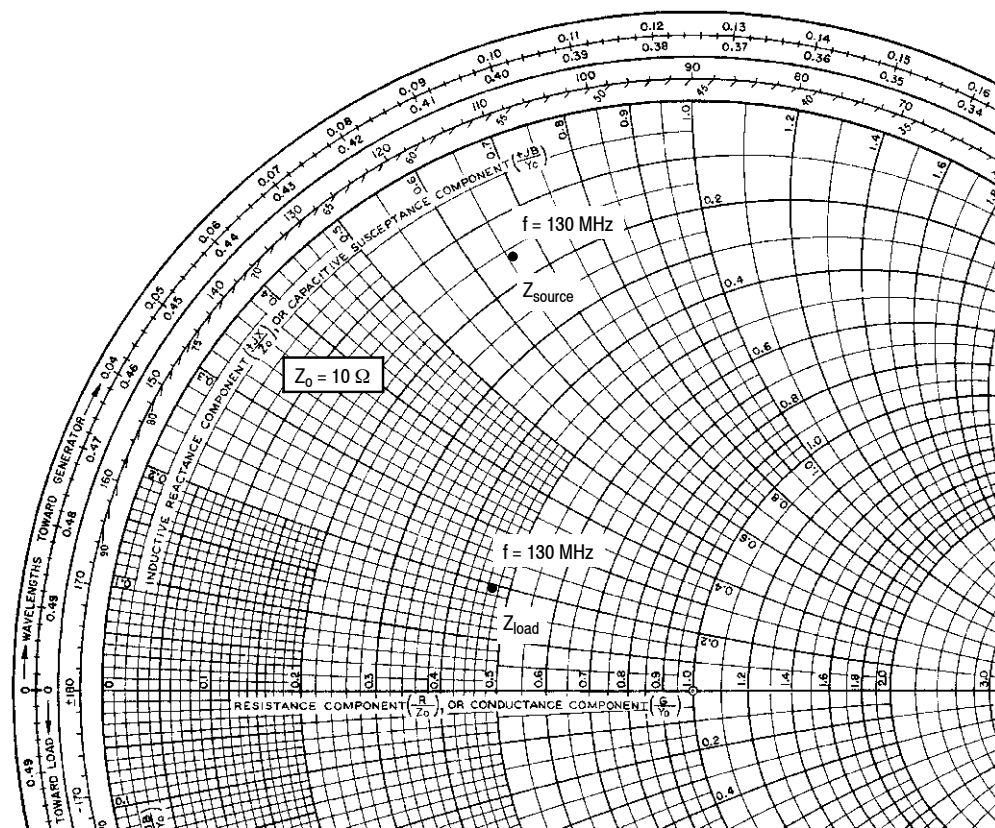


Figure 9. Power Gain versus Output Power



$V_{DD} = 50 \text{ Vdc}$, $I_{DQ} = 150 \text{ mA}$, $P_{out} = 1000 \text{ W Peak}$

f MHz	Z_{source} Ω	Z_{load} Ω
130	$1.58 + j6.47$	$4.6 + j1.85$

Z_{source} = Test circuit impedance as measured from gate to gate, balanced configuration.

Z_{load} = Test circuit impedance as measured from drain to drain, balanced configuration.

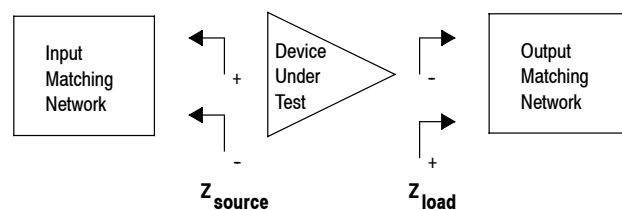
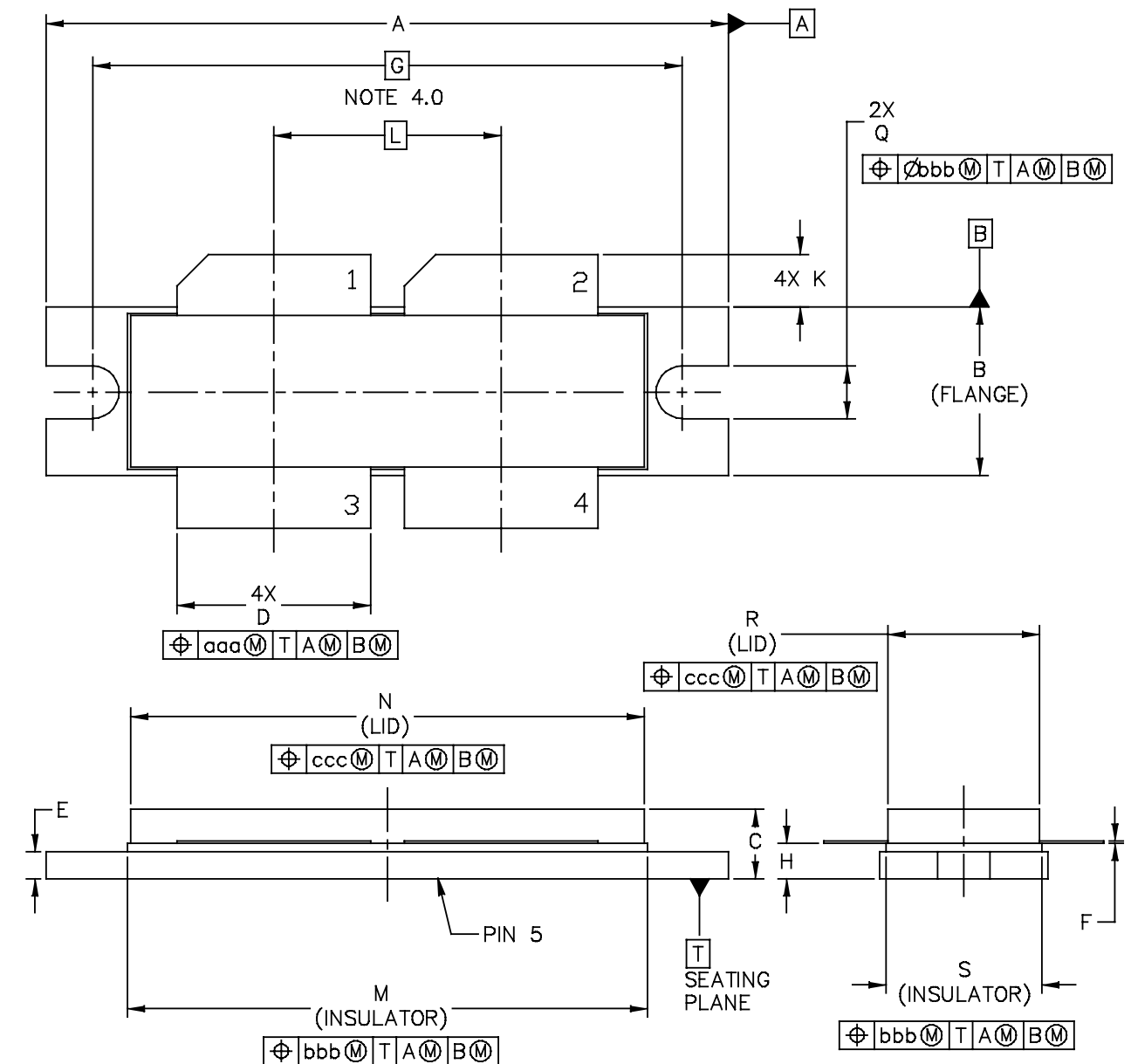


Figure 14. Series Equivalent Source and Load Impedance

PACKAGE DIMENSIONS



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	DOCUMENT NO: 98ASB16977C	REV: E
	CASE NUMBER: 375D-05	31 MAR 2005
	STANDARD: NON-JEDEC	

NOTES:

- 1.0 INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
- 2.0 CONTROLLING DIMENSION: INCH
- 3.0 DIMENSION H IS MEASURED .030 (0.762) AWAY FROM PACKAGE BODY.
- 4.0 RECOMMENDED BOLT CENTER DIMENSION OF 1.52 (38.61) BASED ON M3 SCREW.

STYLE 1:

- PIN 1 - DRAIN
 2 - DRAIN
 3 - GATE
 4 - GATE
 5 - SOURCE

DIM	INCH		MILLIMETER		DIM	INCH		MILLIMETER	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	1.615	1.625	41.02	41.28	N	1.218	1.242	30.94	31.55
B	.395	.405	10.03	10.29	Q	.120	.130	3.05	3.3
C	.150	.200	3.81	5.08	R	.355	.365	9.01	9.27
D	.455	.465	11.56	11.81	S	.365	.375	9.27	9.53
E	.062	.066	1.57	1.68					
F	.004	.007	0.1	0.18					
G	1.400 BSC		35.56 BSC		aaa	.013		0.33	
H	.082	.090	2.08	2.29	bbb	.010		0.25	
K	.117	.137	2.97	3.48	ccc	.020		0.51	
L	.540 BSC		13.72 BSC						
M	1.219	1.241	30.96	31.52					

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NI-1230

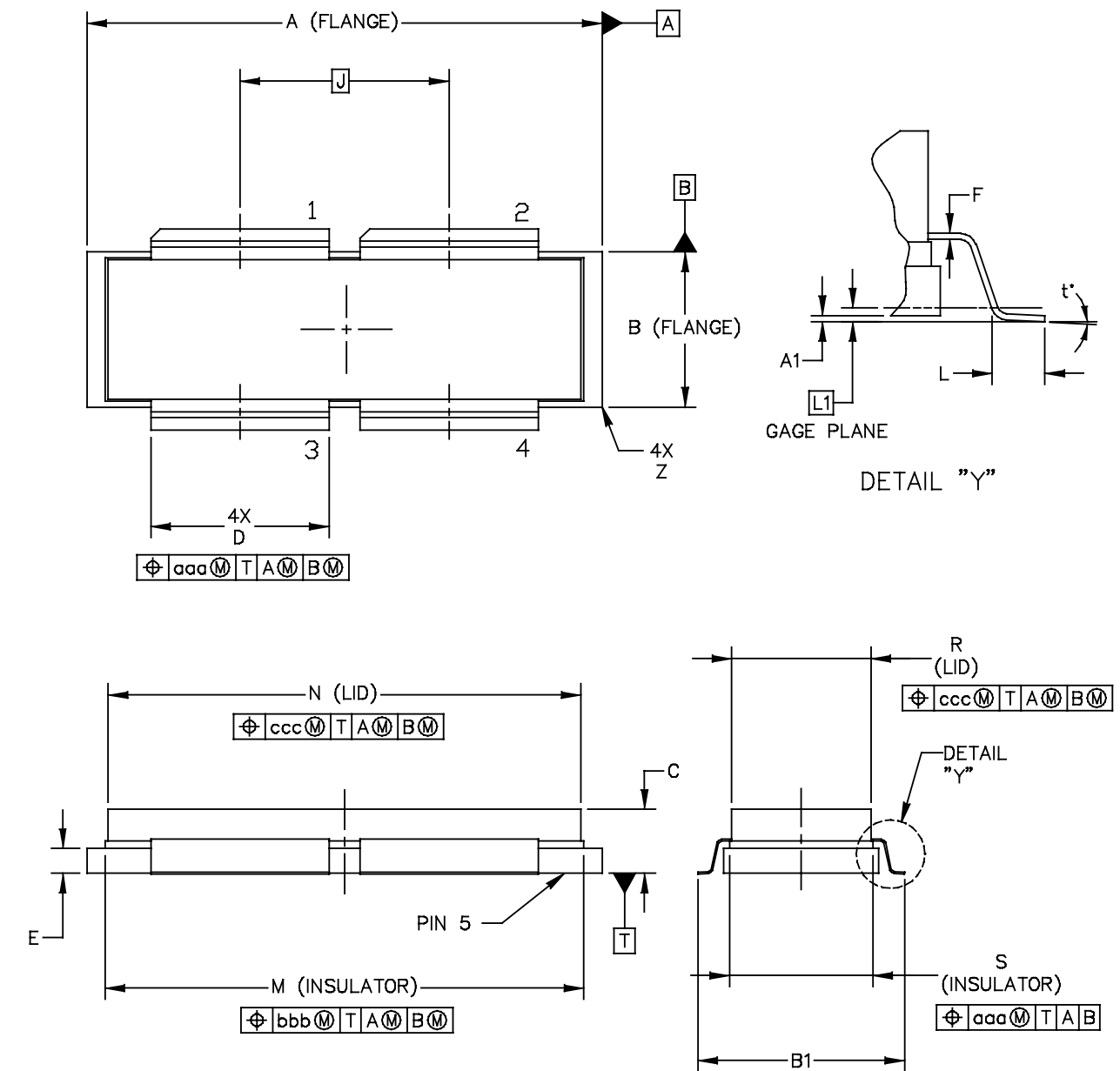
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STANDARD: NON-JEDEC

REV: E

31 MAR 2005



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MECHANICAL OUTLINE

PRINT VERSION NOT TO SCALE

TITLE:

NI-1230S-4 GULL

DOCUMENT NO: 98ASA00459D

CASE NUMBER: 2282-02

STANDARD: NON-JEDEC

REV: 0

10 AUG 2012

NOTES:

1. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M–1994.
2. CONTROLLING DIMENSION: INCH
3. DIMENSION A1 IS MEASURED WITH REFERENCE TO DATUM T. THE POSITIVE VALUE IMPLIES THAT THE PACKAGE BOTTOM IS HIGHER THAN THE LEAD BOTTOM.

PRODUCT DOCUMENTATION AND SOFTWARE

Refer to the following documents to aid your design process.

Application Notes

- AN1955: Thermal Measurement Methodology of RF Power Amplifiers

Engineering Bulletins

- EB212: Using Data Sheet Impedances for RF LDMOS Devices

Software

- Electromigration MTTF Calculator
- RF High Power Model

For Software, do a Part Number search at <http://www.freescale.com>, and select the “Part Number” link. Go to the Software & Tools tab on the part’s Product Summary page to download the respective tool.

REVISION HISTORY

The following table summarizes revisions to this document.

INCHES		MILLIMETERS		INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX	DIM	MIN	MAX
A	1.265	1.275	32.13	32.39	R	.355	.365
A1	−.001	.011	−0.03	0.28	S	.365	.375
B	.395	.405	10.03	10.29	Z	R.000	R.040
B1	.564	.574	14.32	14.58	t*	0*	8*
C	.150	.200	3.81	5.08			
D	.455	.465	11.56	11.81	aaa	.013	0.33
E	.062	.066	1.57	1.68	bbb	.010	0.25
F	.004	.007	0.10	0.18	ccc	.020	0.51
J	.540 BSC		13.72 BSC				
L	.038	.046	0.97	1.17			
L1	.01 BSC		0.25 BSC				
M	1.219	1.241	30.96	31.52			
N	1.218	1.242	30.94	31.55			
© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.			MECHANICAL OUTLINE			PRINT VERSION NOT TO SCALE	
TITLE: NI−1230S−4 GULL					DOCUMENT NO: 98ASA00459D		REV: 0
					CASE NUMBER: 2282−02		10 AUG 2012
					STANDARD: NON−JEDEC		

Revision	Date	Description
0	Jan. 2008	• Initial Release of Data Sheet
1	Apr. 2008	• Corrected description and part number for the R1 resistor and updated R2 resistor to latest RoHS compliant part number in Table 5, Test Circuit Component Designations and Values, p. 3. • Added Fig. 12, Maximum Transient Thermal Impedance, p. 6
2	July 2008	• Added MTTF CW graph, Fig. 13, MTTF versus Junction Temperature, p. 6
3	Sept. 2008	• Added Note to Fig. 4, Capacitance versus Drain–Source Voltage, to denote that each side of device is measured separately, p. 5 • Updated Fig. 5, DC Safe Operating Area, to clarify that measurement is on a per–side basis, p. 5 • Corrected Fig. 13, MTTF versus Junction Temperature – CW, to reflect the correct die size and increased the MTTF factor accordingly, p. 6 • Corrected Fig. 14, MTTF versus Junction Temperature – Pulsed, to reflect the correct die size and increased the MTTF factor accordingly, p. 6
4	Dec. 2008	• Fig. 15, Series Equivalent Source and Load Impedance, corrected Z _{source} copy to read “Test circuit impedance as measured from gate to gate, balanced configuration” and Z _{load} copy to read “Test circuit impedance as measured from drain to drain, balanced configuration”, p. 7
5	July 2009	• Added 1000 W CW thermal data at 100 MHz to Thermal Characteristics table, p. 1 • Changed “EKME630ELL471MK25S” part number to “MCGPR63V477M13X26–RH”, changed R1 Description from “1 KΩ, 1/4 W Axial Leaded Resistor” to “1 KΩ, 1/4 W Carbon Leaded Resistor” and “CMF601000R0FKEK” part number to “MCCFR0W4J0102A50”, Table 5, Test Circuit Component Designations and Values, p. 3 • Corrected Fig. 13, MTTF versus Junction Temperature – CW, to reflect change in Drain Efficiency from 70% to 72%, p. 6 • Added Electromigration MTTF Calculator and RF High Power Model availability to Product Documentation, Tools and Software, p. 20
6	Dec. 2009	• Device frequency range improved from 10–150 MHz to 1.8–150 MHz, p. 1 • Reporting of pulsed thermal data now shown using the Z _{θJC} symbol, Table 2. Thermal Characteristics, p. 1
7	Apr. 2010	• Operating Junction Temperature increased from 200°C to 225°C in Maximum Ratings table and related “Continuous use at maximum temperature will affect MTTF” footnote added, p. 1
8	Sept. 2012	• Added part number MRF6VP11KGSR5, p. 1 • Added 2282–02 (NI–1230S–4 Gull) package isometric, p. 1, and Mechanical Outline, p. 10, 11 • Table 3, ESD Protection Characteristics: added the device’s ESD passing level as applicable to each ESD class, p. 2 • Modified figure titles and/or graph axes labels to clarify application use, p. 5, 6 • Fig. 12, Transient Thermal Impedance: graph updated to show correct CW operation, p. 6 • Fig. 13, MTTF versus Junction Temperature – CW: MTTF end temperature on graph changed to match maximum operating junction temperature, p. 6 • Fig. 14, MTTF versus Junction Temperature – Pulsed removed, p. 6. Refer to the device’s MTTF Calculator available at freescale.com/RFpower . Select Software & Tools/Development Tools/Calculators to access MTTF calculators by product.

8.20.2 Datasheet of MRFE6VP61K25H

Freescall Semiconductor Technical Data

RF Power LDMOS Transistors High Ruggedness N-Channel Enhancement-Mode Lateral MOSFETs

These high ruggedness devices are designed for use in high VSWR industrial (including laser and plasma exciters), broadcast (analog and digital), aerospace and radio/land mobile applications. They are unmatched input and output designs allowing wide frequency range utilization, between 1.8 and 600 MHz.

- Typical Performance: $V_{DD} = 50$ Volts, $I_{DQ} = 100$ mA

Signal Type	P_{out} (W)	f (MHz)	G_{ps} (dB)	η_D (%)
Pulse (100 μ sec, 20% Duty Cycle)	1250 Peak	230	24.0	74.0
CW	1250 CW	230	22.8	74.8

Application Circuits (1) — Typical Performance

Frequency (MHz)	Signal Type	P_{out} (W)	G_{ps} (dB)	η_D (%)
27	CW	1300	27	81
40	CW	1300	26	85
81.36	CW	1250	27	84
87.5–108	CW	1100	24	80
144–148	CW	1250	26	78
170–230	DVB-T	225	25	30
352	Pulse (200 μ sec, 20% Duty Cycle)	1250	21.5	66
352	CW	1150	20.5	68
500	CW	1000	18	58

1. Contact your local Freescale sales office for additional information on specific circuit designs.

Load Mismatch/Ruggedness

Frequency (MHz)	Signal Type	VSWR	P_{out} (W)	Test Voltage	Result
230	Pulse (100 μ sec, 20% Duty Cycle)	> 65:1 at all Phase Angles	1500 Peak (3 dB Overdrive)	50	No Device Degradation

Features

- Unmatched Input and Output Allowing Wide Frequency Range Utilization
- Device can be used Single-Ended or in a Push-Pull Configuration
- Qualified Up to a Maximum of 50 V_{DD} Operation
- Characterized from 30 V to 50 V for Extended Power Range
- Suitable for Linear Application with Appropriate Biasing
- Integrated ESD Protection with Greater Negative Gate-Source Voltage Range for Improved Class C Operation
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- In Tape and Reel. R6 Suffix = 150 Units, 56 mm Tape Width, 13-inch Reel. R5 Suffix = 50 Units, 56 mm Tape Width, 13-inch Reel.

Document Number: MRFE6VP61K25H
Rev. 4.1, 3/2014



MRFE6VP61K25HR6
MRFE6VP61K25HR5
MRFE6VP61K25HSR5
MRFE6VP61K25GSR5

1.8–600 MHz, 1250 W CW, 50 V
WIDEBAND
RF POWER LDMOS TRANSISTORS

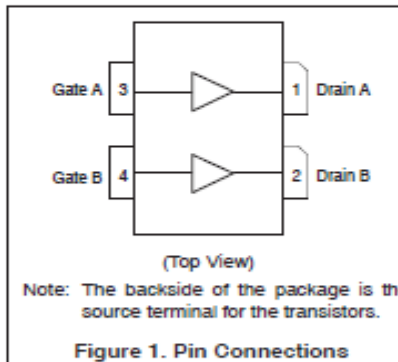
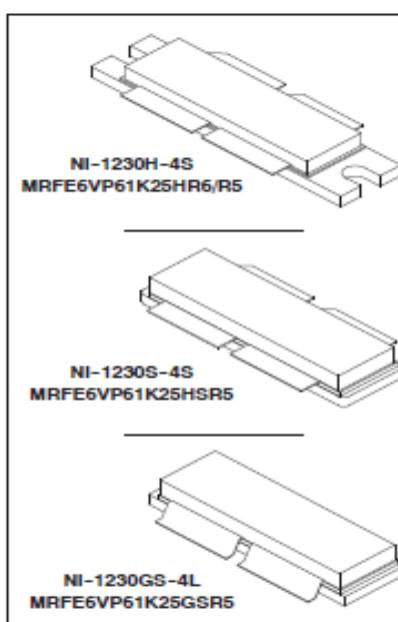


Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	–0.5, +133	Vdc
Gate-Source Voltage	V_{GS}	–6.0, +10	Vdc
Storage Temperature Range	T_{stg}	–65 to +150	°C
Case Operating Temperature	T_C	150	°C
Operating Junction Temperature (1,2)	T_J	225	°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1333 6.67	W W/°C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value (2,3)	Unit
Thermal Resistance, Junction to Case CW: Case Temperature 63°C , 1250 W CW, $I_{DQ} = 100$ mA, 230 MHz	$R_{\theta JC}$	0.15	°C/W
Thermal Impedance, Junction to Case Pulse: Case Temperature 66°C , 1250 W Pulse, 100 μ sec Pulse Width, 20% Duty Cycle, $I_{DQ} = 100$ mA, 230 MHz	$Z_{\theta JC}$	0.03	°C/W

Table 3. ESD Protection Characteristics

Test Methodology	Class
Human Body Model (per JESD22-A114)	2, passes 3500 V
Machine Model (per EIA/JESD22-A115)	B, passes 250 V
Charge Device Model (per JESD22-C101)	IV, passes 4000 V

Table 4. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Off Characteristics (4)					
Gate-Source Leakage Current ($V_{GS} = 5$ Vdc, $V_{DS} = 0$ Vdc)	I_{GSS}	—	—	1	μAdc
Drain-Source Breakdown Voltage ($V_{GS} = 0$ Vdc, $I_D = 100$ mA)	$V_{DS(BR)}$	133	—	—	Vdc
Zero Gate Voltage Drain Leakage Current ($V_{GS} = 50$ Vdc, $V_{DS} = 0$ Vdc)	I_{DSS}	—	—	10	μAdc
Zero Gate Voltage Drain Leakage Current ($V_{GS} = 100$ Vdc, $V_{DS} = 0$ Vdc)	I_{DSS}	—	—	20	μAdc
On Characteristics					
Gate Threshold Voltage (4) ($V_{DS} = 10$ Vdc, $I_D = 1776$ μAdc)	$V_{GS(th)}$	1.7	2.2	2.7	Vdc
Gate Quiescent Voltage ($V_{DD} = 50$ Vdc, $I_D = 100$ mAdc, Measured in Functional Test)	$V_{GS(Q)}$	1.9	2.2	2.9	Vdc
Drain-Source On-Voltage (4) ($V_{GS} = 10$ Vdc, $I_D = 2$ Adc)	$V_{DS(on)}$	—	0.15	—	Vdc
Forward Transconductance ($V_{GS} = 10$ Vdc, $I_D = 30$ Adc)	g_m	—	26.0	—	S
Dynamic Characteristics (4)					
Reverse Transfer Capacitance ($V_{DS} = 50$ Vdc ± 30 mV(rms)ac @ 1 MHz, $V_{GS} = 0$ Vdc)	C_{rss}	—	2.8	—	pF
Output Capacitance ($V_{DS} = 50$ Vdc ± 30 mV(rms)ac @ 1 MHz, $V_{GS} = 0$ Vdc)	C_{oss}	—	185	—	pF
Input Capacitance ($V_{DS} = 50$ Vdc, $V_{GS} = 0$ Vdc ± 30 mV(rms)ac @ 1 MHz)	C_{iss}	—	562	—	pF

- Continuous use at maximum temperature will affect MTTF.
- MTTF calculator available at <http://www.freescale.com/mttf>. Select Software & Tools/Development Tools/Calculators to access MTTF calculators by product.
- Refer to AN1955, *Thermal Measurement Methodology of RF Power Amplifiers*. Go to <http://www.freescale.com/mttf>. Select Documentation/Application Notes – AN1955.
- Each side of device measured separately.

(continued)

MRFE6VP61K25HR6 MRFE6VP61K25HR5 MRFE6VP61K25HSR5 MRFE6VP61K25GSR5

Table 4. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted) (continued)

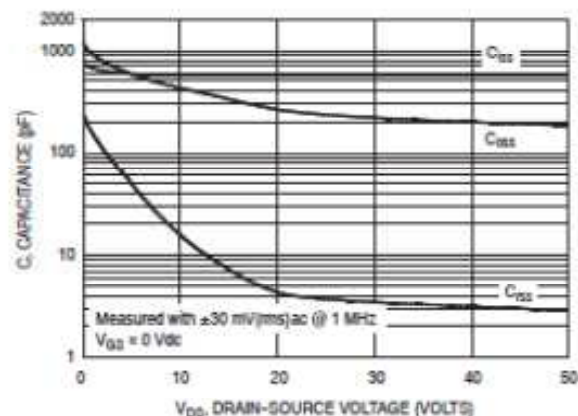
Characteristic	Symbol	Min	Typ	Max	Unit
Functional Tests (1) (In Freescale Test Fixture, 50 ohm system) $V_{DD} = 50$ Vdc, $I_{DQ} = 100$ mA, $P_{out} = 1250$ W Peak (250 W Avg.), $f = 230$ MHz, 100 μ sec Pulse Width, 20% Duty Cycle					
Power Gain	G_{ps}	23.0	24.0	26.0	dB
Drain Efficiency	η_D	72.5	74.0	—	%
Input Return Loss	IRL	—	–14	–10	dB

Table 5. Load Mismatch/Ruggedness (In Freescale Test Fixture, 50 ohm system) $I_{DQ} = 100$ mA

Frequency (MHz)	Signal Type	VSWR	P_{out} (W)	Test Voltage, V_{DD}	Result
230	Pulse (100 μ sec, 20% Duty Cycle)	> 65:1 at all Phase Angles	1500 Peak (3 dB Overdrive)	50	No Device Degradation

- Measurements made with device in straight lead configuration before any lead forming operation is applied. Lead forming is used for gull wing (GS) parts.

TYPICAL CHARACTERISTICS



Note: Each side of device measured separately.
Figure 4. Capacitance versus Drain-Source Voltage

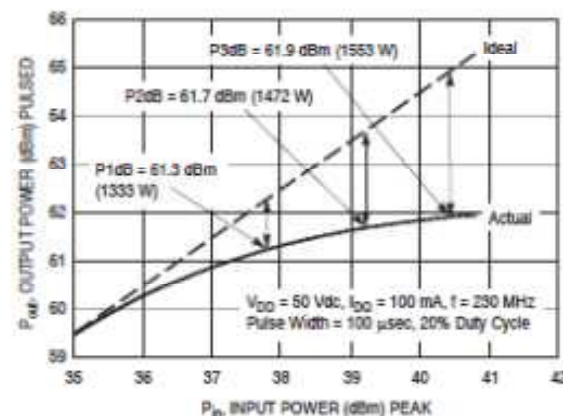


Figure 5. Output Power versus Input Power

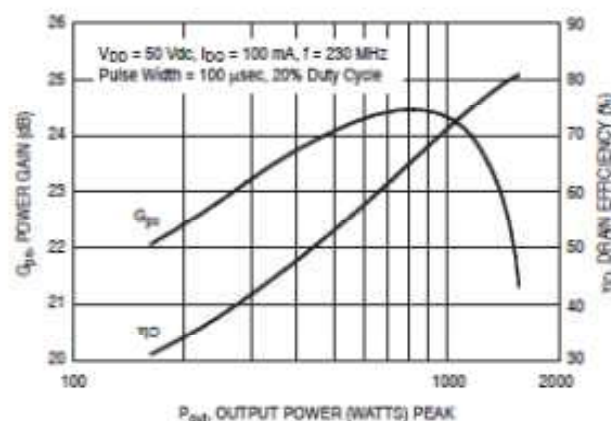


Figure 6. Power Gain and Drain Efficiency versus Output Power

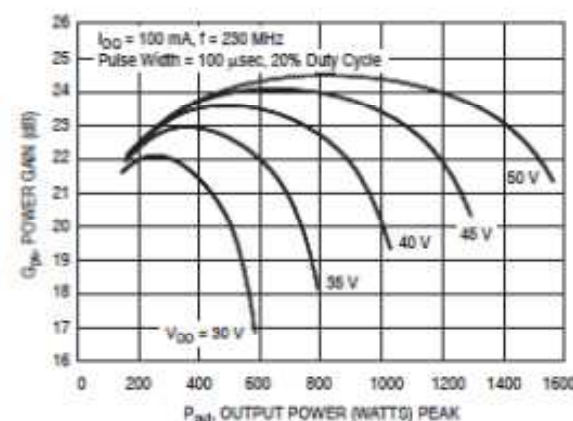


Figure 7. Power Gain versus Output Power

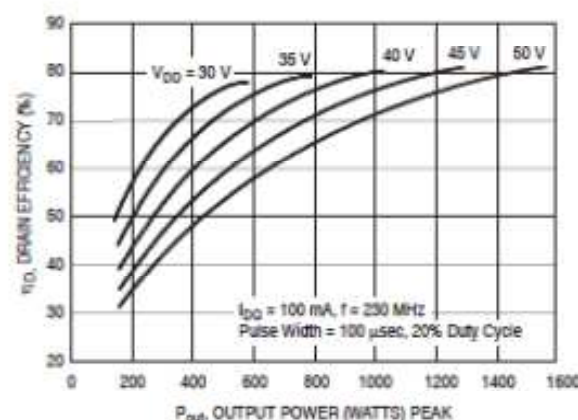


Figure 8. Drain Efficiency versus Output Power

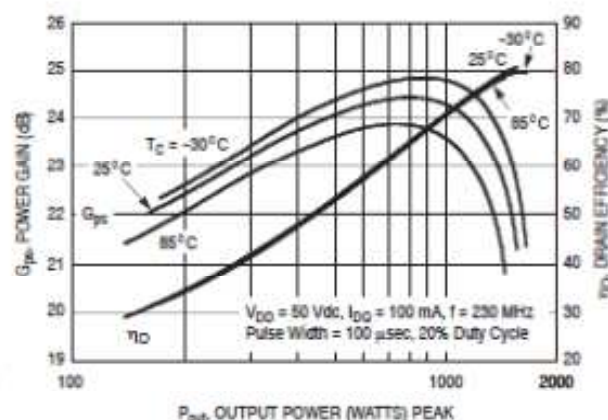


Figure 9. Power Gain and Drain Efficiency versus Output Power

TYPICAL CHARACTERISTICS — 87.5-108 MHz FM BROADCAST REFERENCE CIRCUIT

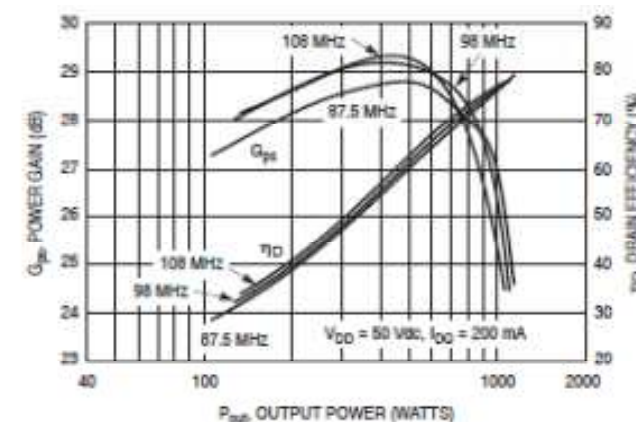


Figure 15. Power Gain and Drain Efficiency versus Output Power

$V_{DD} = 50 \text{ Vdc}$, $I_{DD} = 200 \text{ mA}$, $P_{out} = 1100 \text{ W CW}$

f MHz	Z_{source} Ω	Z_{load} Ω
87.5	$2.20 + j6.70$	$4.90 + j2.90$
98	$2.30 + j6.90$	$4.10 + j2.50$
108	$2.30 + j7.00$	$4.40 + j3.60$

Z_{source} = Test circuit impedance as measured from gate to gate, balanced configuration.

Z_{load} = Test circuit impedance as measured from drain to drain, balanced configuration.

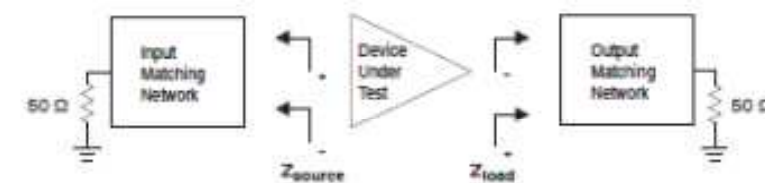


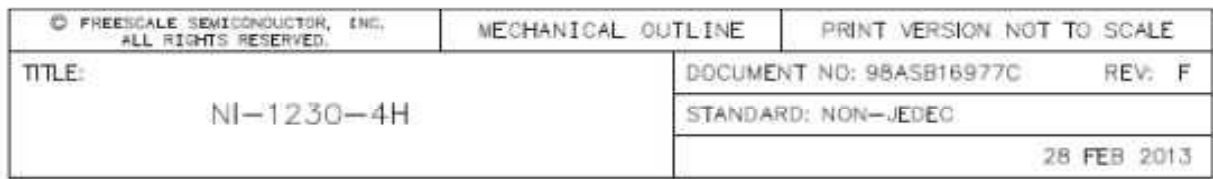
Figure 16. Series Equivalent 87.5-108 MHz FM Broadcast Reference Circuit Source and Load Impedance

MRFE6VP61K25HR6 MRFE6VP61K25HR5 MRFE6VP61K25HSR5 MRFE6VP61K25GSR5

RF Device Data

MRFE6VP61K25HR6 MRFE6VP61K25HR5 MRFE6VP61K25HSR5 MRFE6VP61K25GSR5

RF Device Data

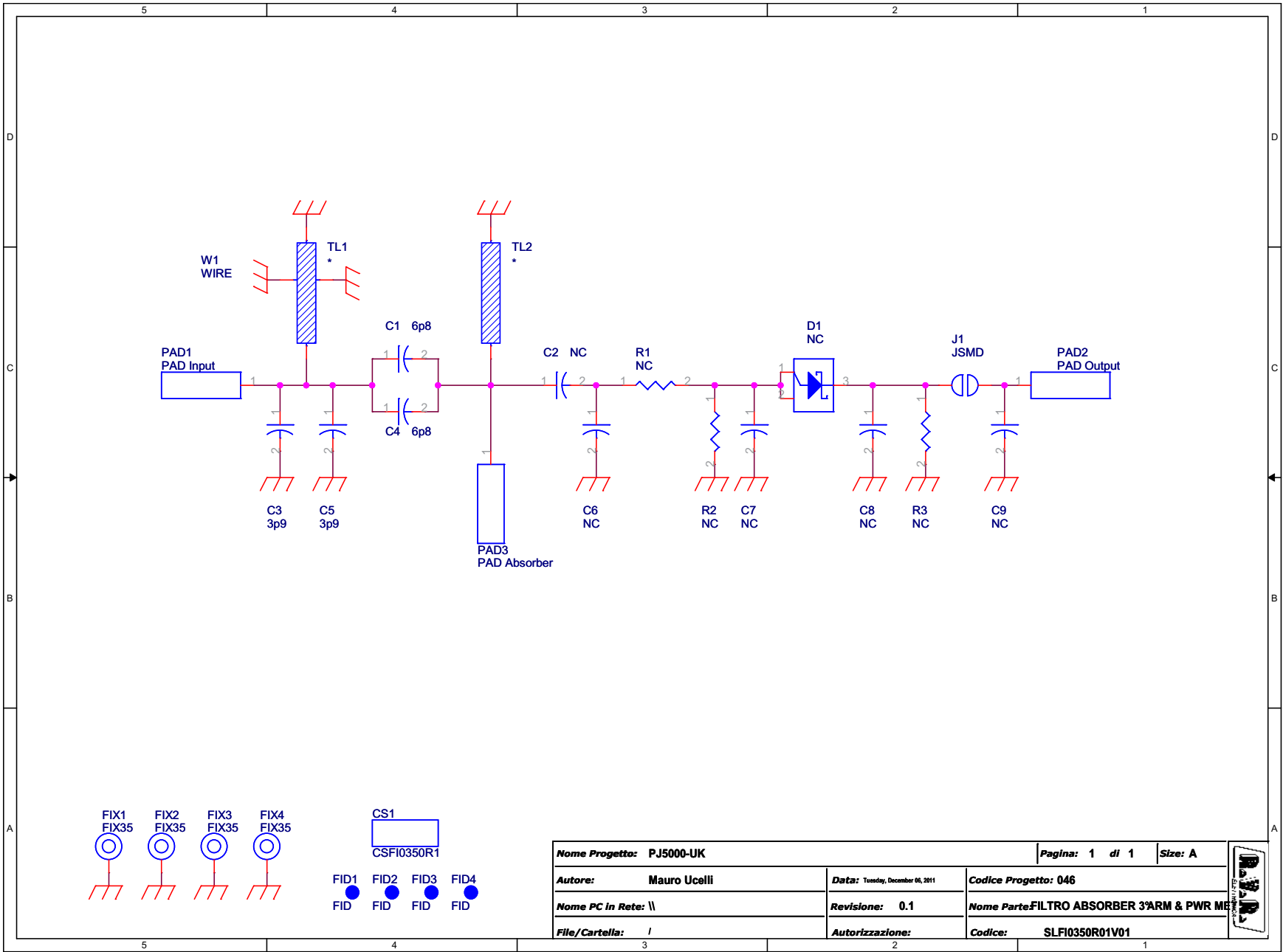
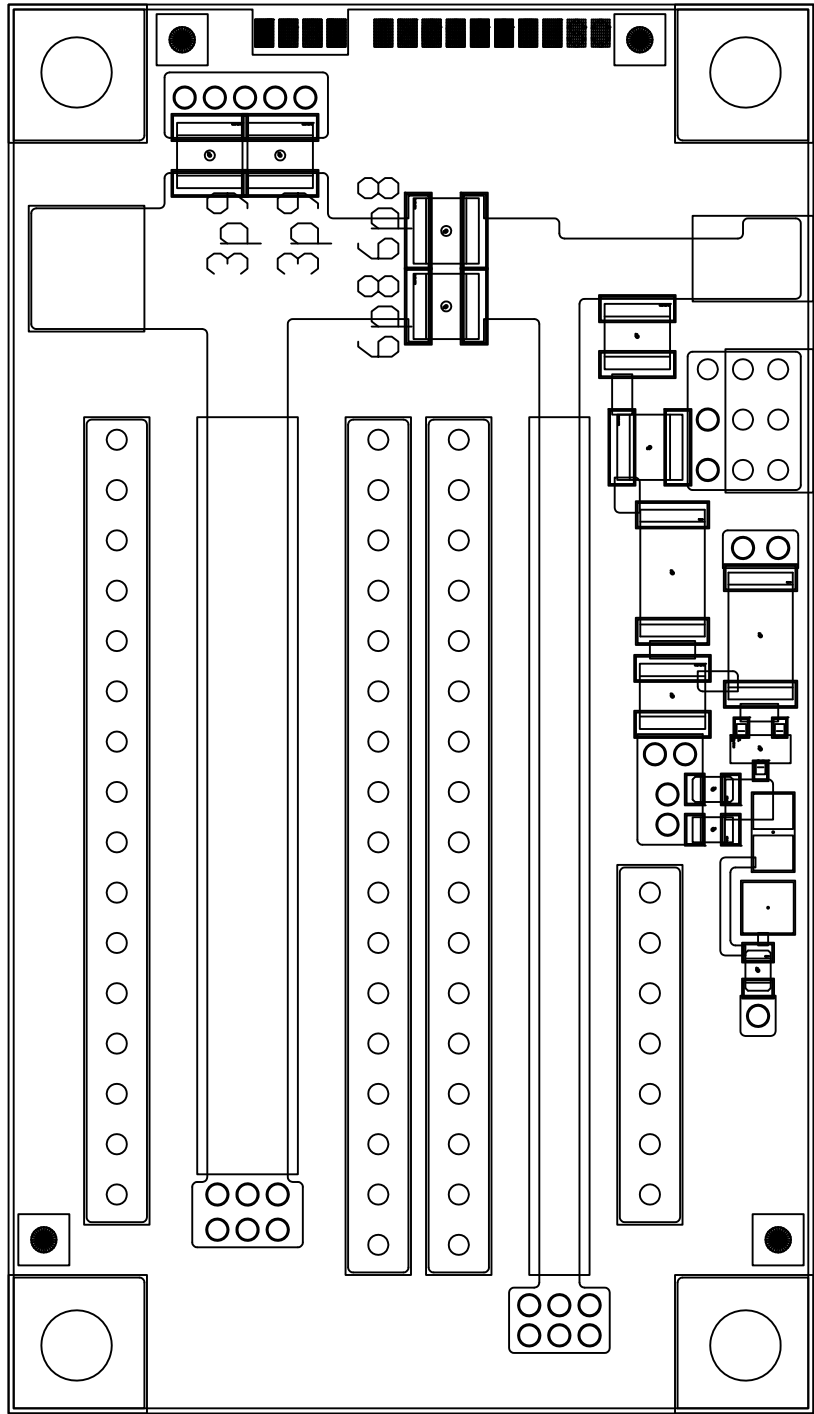


1. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: INCH
3. DIMENSION H IS MEASURED .030 INCH (0.762 MM) AWAY FROM PACKAGE BODY.
4. RECOMMENDED BOLT CENTER DIMENSION OF 1.52 INCH (38.61 MM) BASED ON M3 SCREW.

INCH			MILLIMETER		INCH			MILLIMETER	
DIM	MIN	MAX	MIN	MAX	DIM	MIN	MAX	MIN	MAX
AA	1.615	1.625	41.02	41.28	N	1.218	1.242	30.94	31.55
BB	.395	.405	10.03	10.29	Q	.120	.130	3.05	3.30
CC	.170	.190	4.32	4.83	R	.355	.365	9.02	9.27
D	.455	.465	11.56	11.81	S	.365	.375	9.27	9.53
E	.062	.066	1.57	1.68					
F	.004	.007	0.10	0.18					
G	1.400 BSC		35.56 BSC		aaa	.013		0.33	
H	.082	.090	2.08	2.29	bbb	.010		0.25	
K	.117	.137	2.97	3.48	ccc	.020		0.51	
L	.540 BSC		13.72 BSC						
M	1.219	1.241	30.96	31.52					

© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.			MECHANICAL OUTLINE			PRINT VERSION NOT TO SCALE		
TITLE: NI-1230-4H						DOCUMENT NO: 98ASB16977C REV: F		
						STANDARD: NON-JEDEC		
						28 FEB 2013		

8.21 Harmonics Pick-Up (CSFI0350R1)



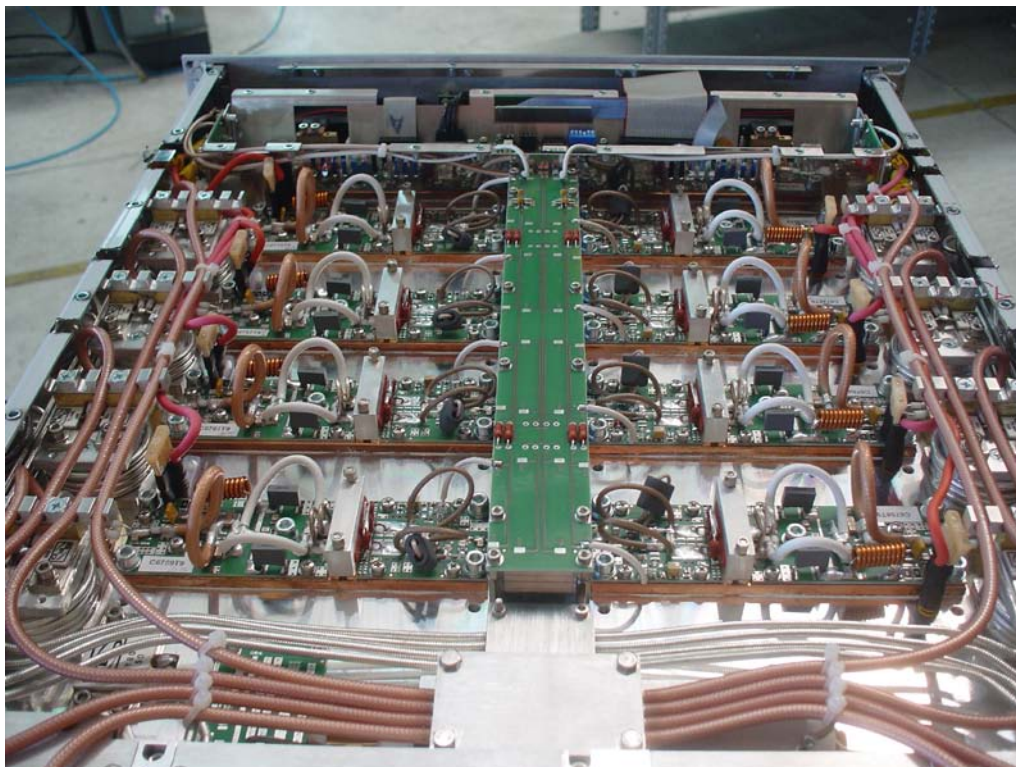
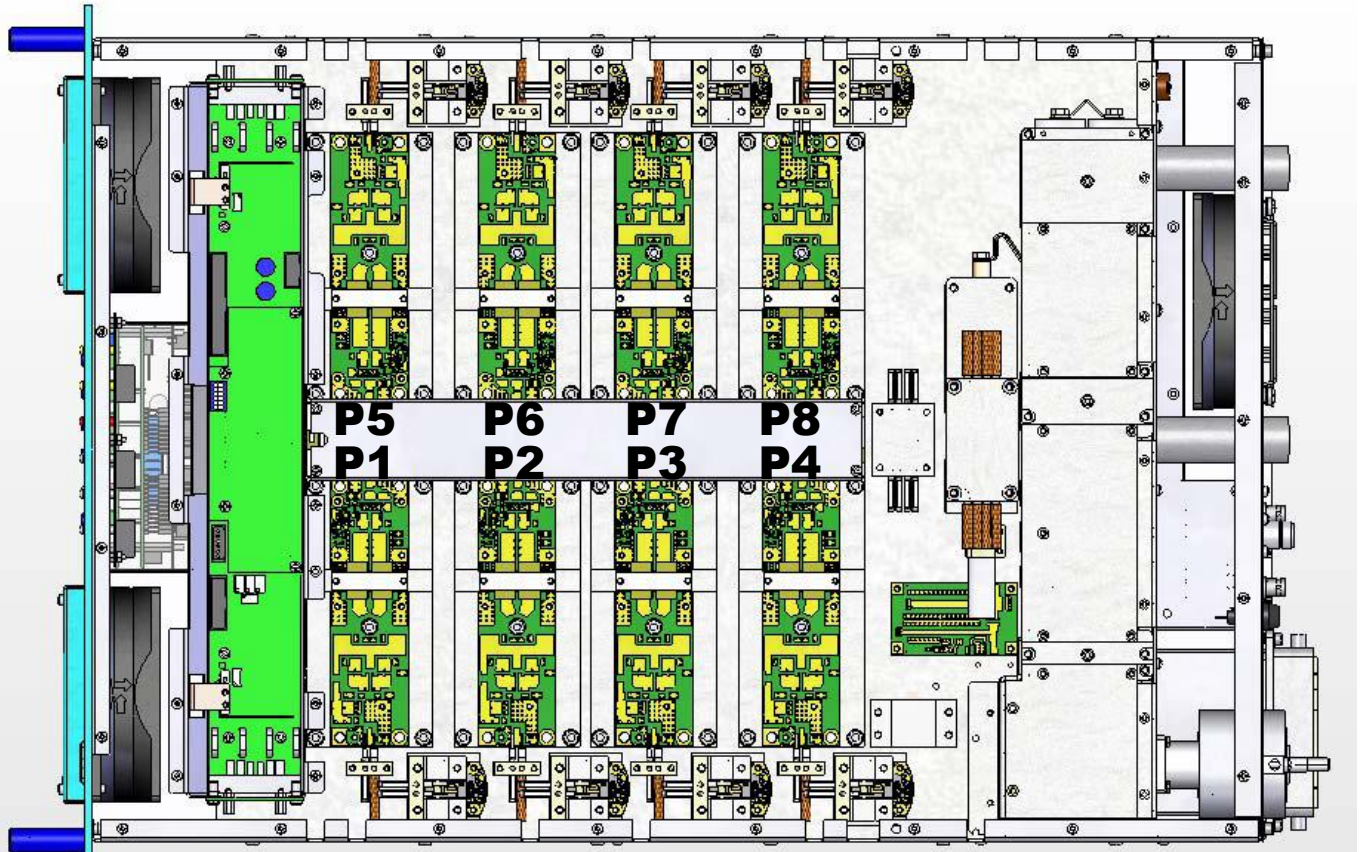
FILTRO ABSORBER 3°ARM & PWR MET
SLFI0350R01V01
Revision: 0.1

Item	Quantity	Reference	Part	Description
1	1	CS1	CSFI0350R1	Circuito stampato
2	2	C1,C4	6p8	Cond. SMD 1212 HQ
3	3	C2,C6,C7	NC	Cond. SMD 1212 HQ
4	2	C3,C5	3p9	Cond. SMD 1212 HQ
5	2	C8,C9	NC	Cond. SMD 0805 COG
6	1	D1	NC	
7	4	FID1,FID2,FID3,FID4	FID	Fiducial CS
8	4	FIX1,FIX2,FIX3,FIX4	FIX35	Foro fissaggio 3.5mm
9	1	J1	JSMDS	Pad SMD a saldare
10	1	PAD1	PAD Input	Pad SMD saldare
11	1	PAD2	PAD Output	Pad SMD saldare
12	1	PAD3	PAD Absorber	Pad SMD saldare
13	2	R1,R2	NC	Res. SMD 2512 1%
14	1	R3	NC	Res. SMD 0805
15	2	TL1,TL2	*	Linea strip CS
16	1	W1	WIRE	Filo a saldare diam 1mm

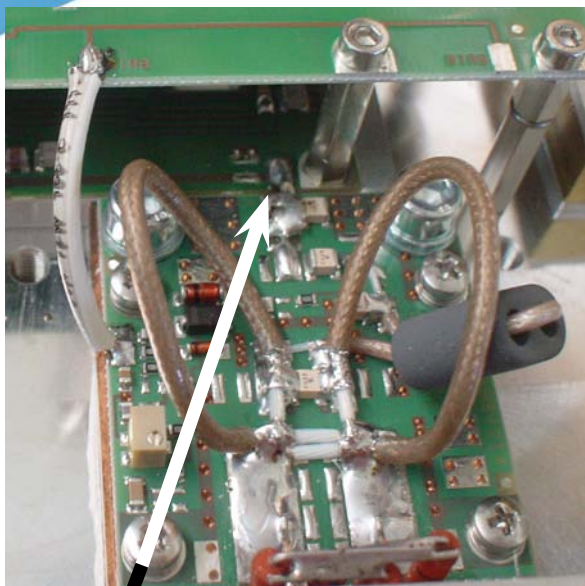
9. Replacement parts

9.1 Replacement Pallet mosfet

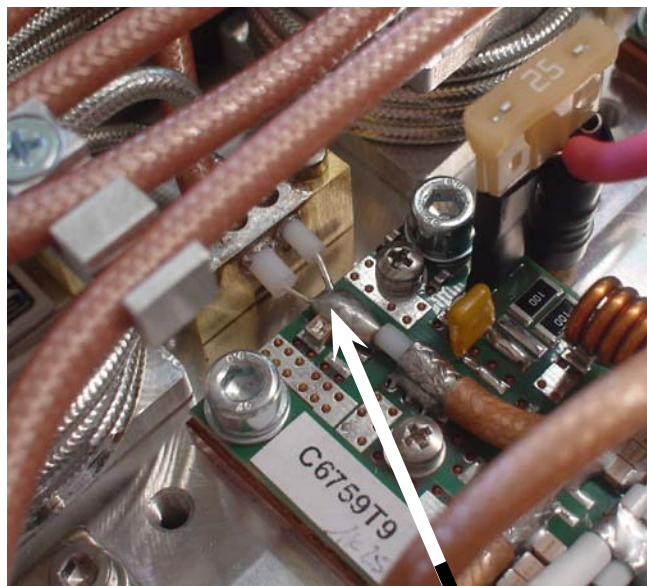
From the drawing you can see the layout of the pallet.



Remove two welded jumpers to the end, one connected to the splitter and the other connected to the RF combiner and unsolder the bias wire.

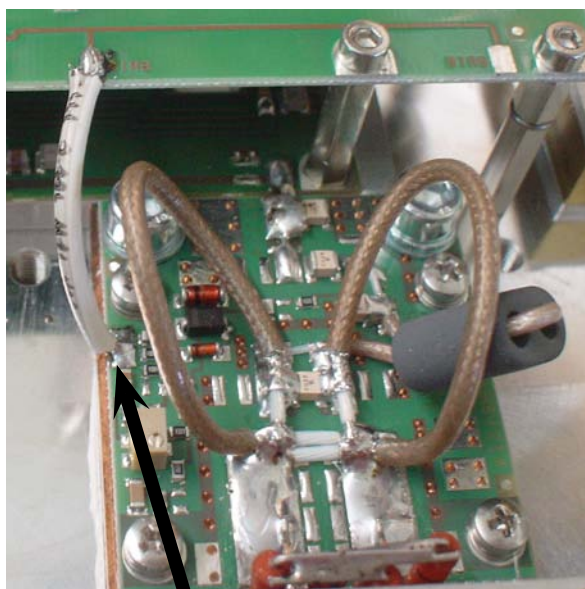


Jumper side
splitter (input)

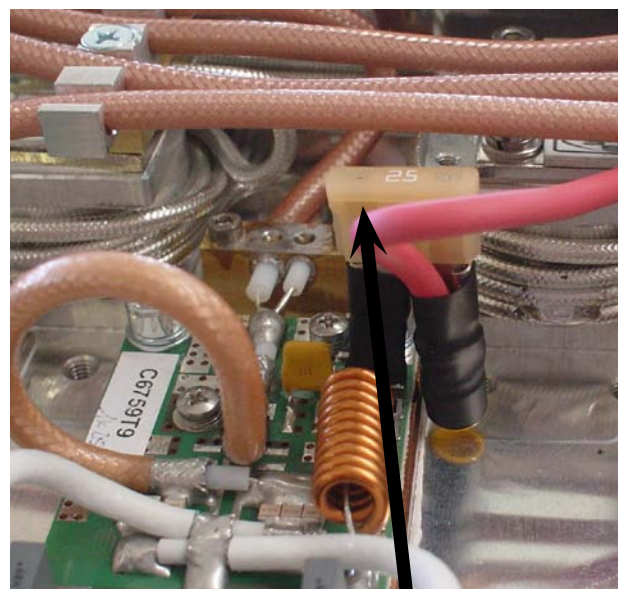


Jumper side
combiner (output)

Unsolder the bias wire and remove the fuse.

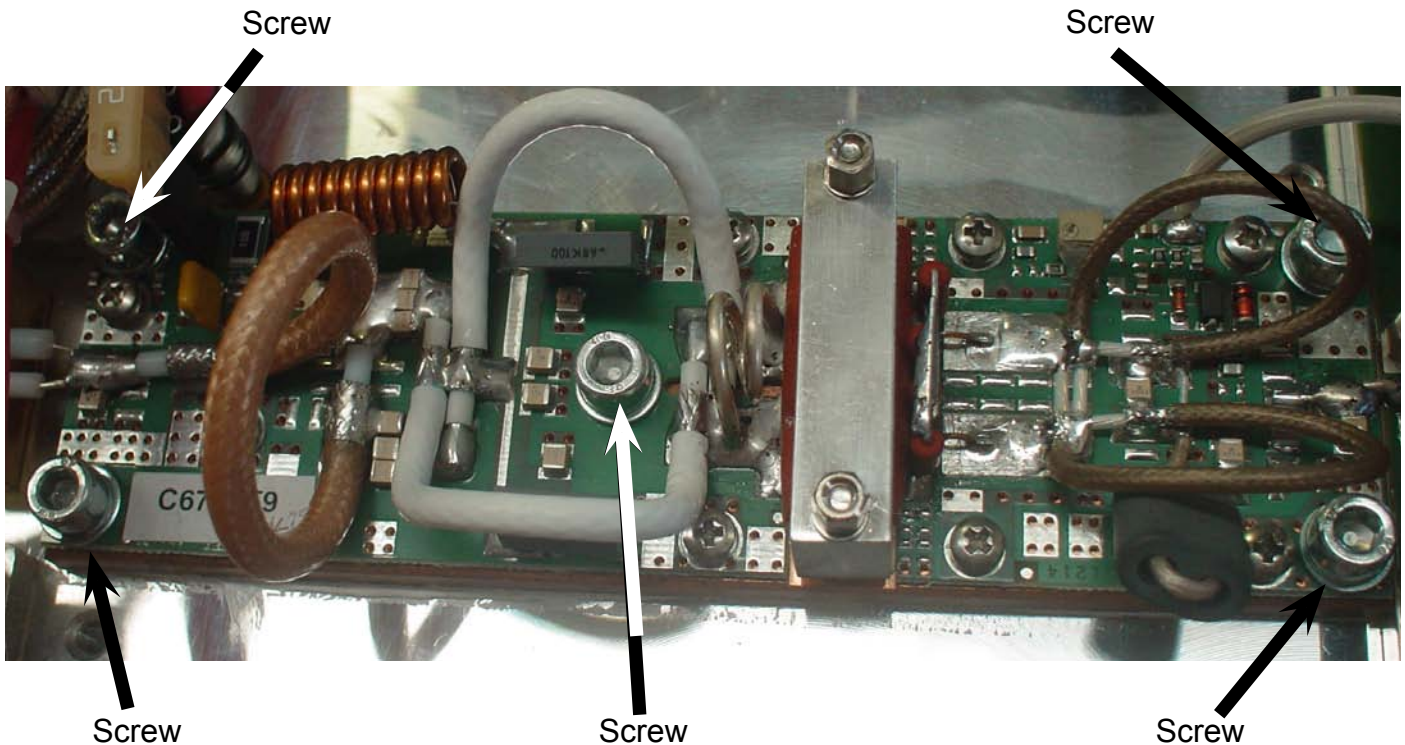


Bias wire



Fuse

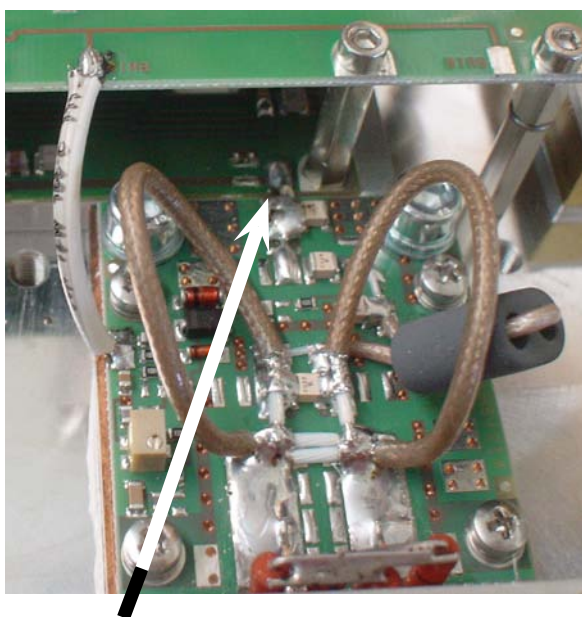
Remove the M5 socket head screws with setscrew wrench to 4. Make sure the wrench is in good conditions and damaged there may be a risk to run the seat of the wrench can be problematic to disassemble the pallet.



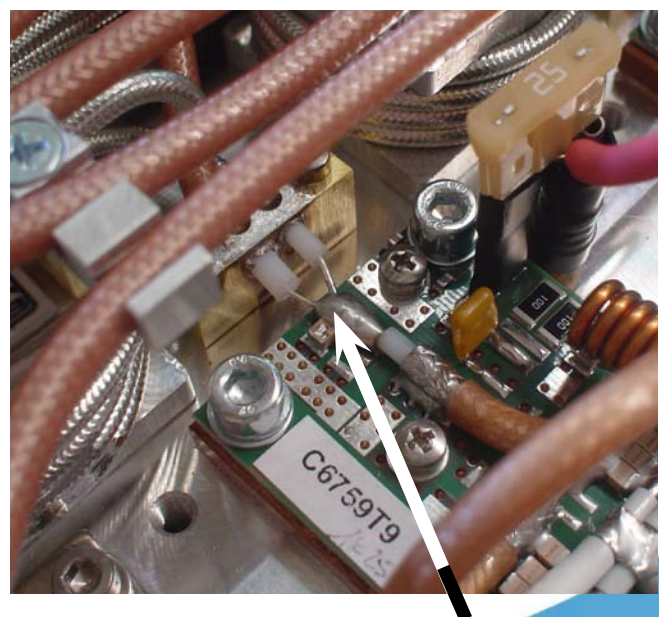
Once removed the old pallet clean fine the complete area from old conductive paste and remove superfluous tin from the board of combinator and splitter.

Take a new pallet, stretch uniformly the conductive paste, do not exaggerate with the pasta because it can escape when the screws are tightened.

Place pallet in its seat, place screws and tighten in crossed mode, so as to tighten evenly. Once done, reinsert the jumpers on splitter and RF combiner.

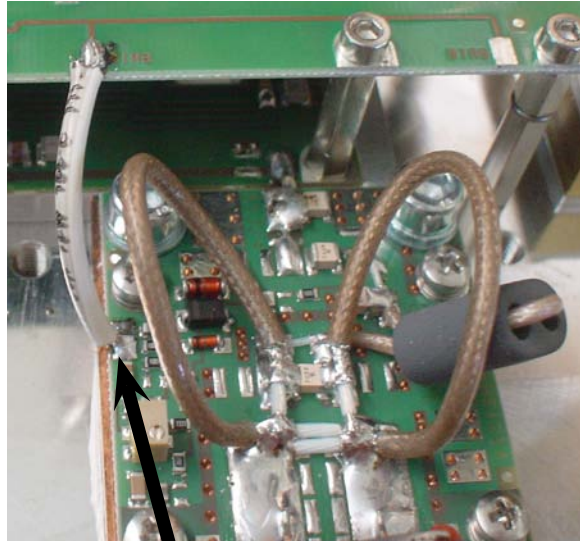


Jumper side
splitter (input)



Jumper side
combiner (output)

Reconnect the bias wire.

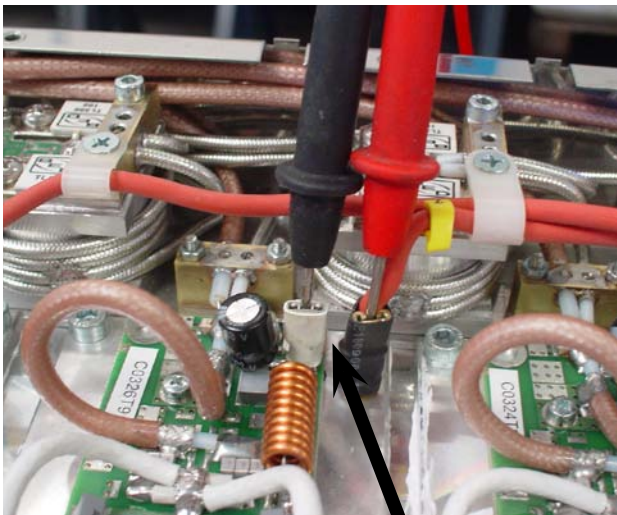


Bias wire

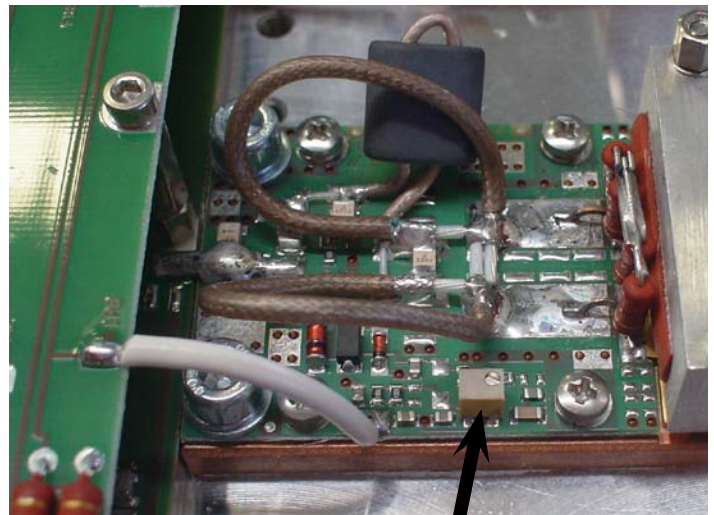
When completed assembly connect the module to a dummy load at 5 Kw if possible next to the CCU of the transmitter 10 Kw (or higher). Then we'll see why.

Feed the module (400Vac o 230Vac).

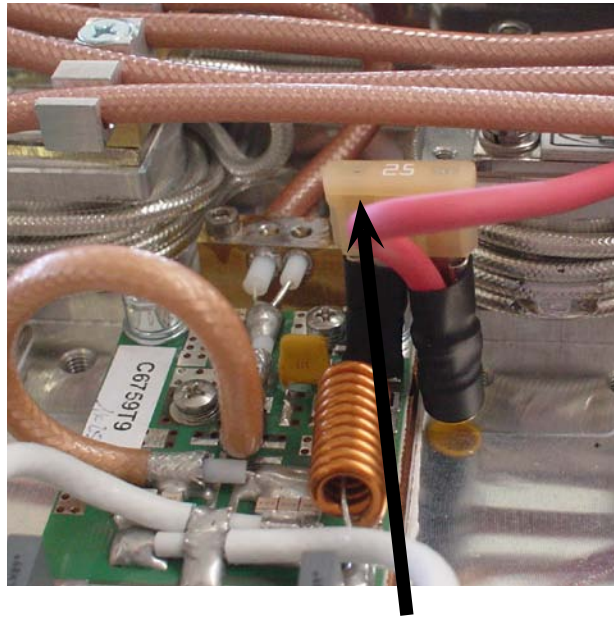
Take a multimeter by setting for measure DC current and point the ferrule to testing, in place of the fuse and setting with trimmer the Bias current. The value is 1 A at rest.



Multimeter to the place
of the fuse



Trimmer



Fuse

Once calibrated the current, turn off the module, reinsert the fuse, connected the DB-15 cable of "Common Bus" relative at the module you have removed, on the rear panel of same.

Take an "Exciter", possibly with attenuator 6dB in series and up gradually with the power, checking in the menù R.F. Unit xx (xx is the number of module we are calibrating) of CCU if all mosfet absorb same current and working properly.

The maximum difference of absorption beetwen one pallet and the other one must be 2A at the power of 3 Kw. If this difference is greater verify the reason.

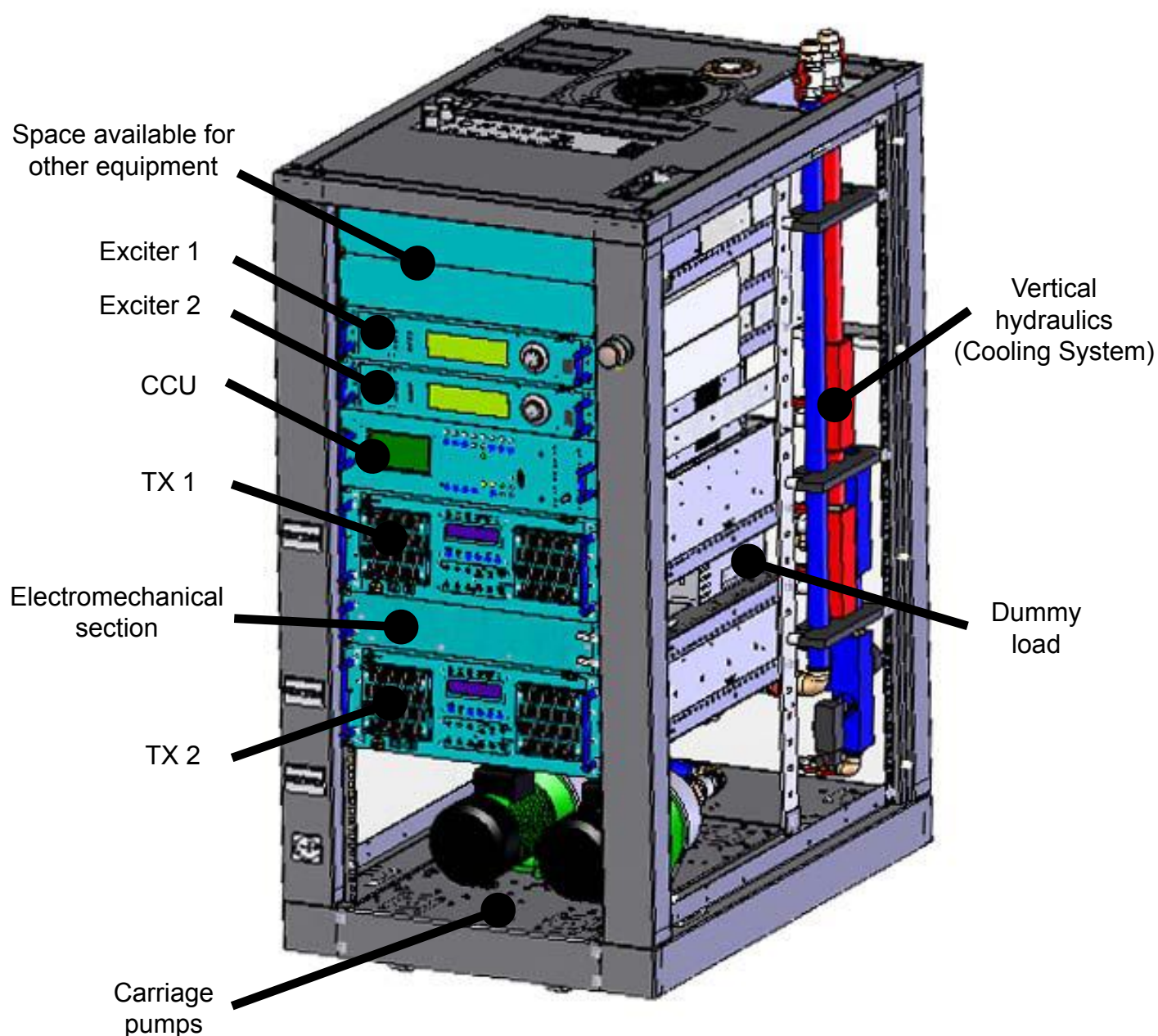
Possible causes may be:

- n°1 mosfet who does not work properly;
- pilotage from splitter not correct;
- fuse is not inserted properly.

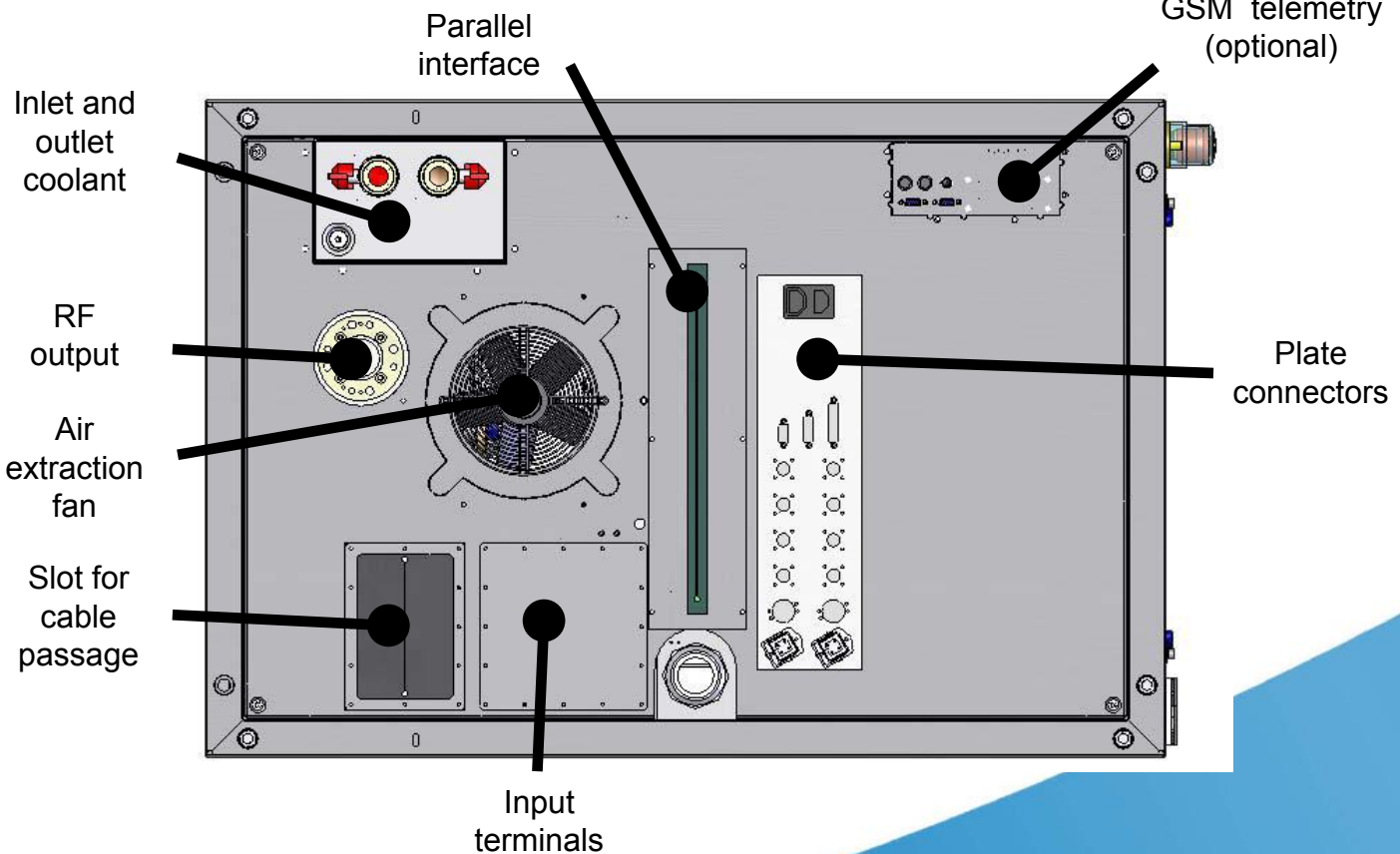
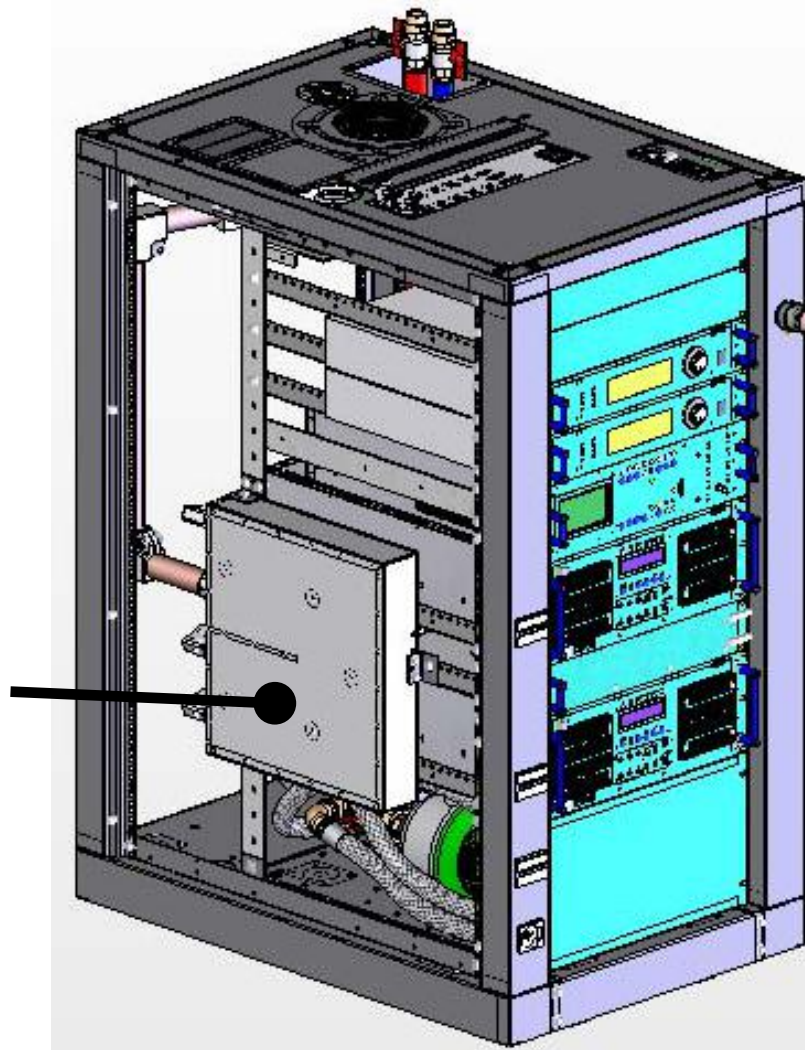
10. Electrical and mechanical parts

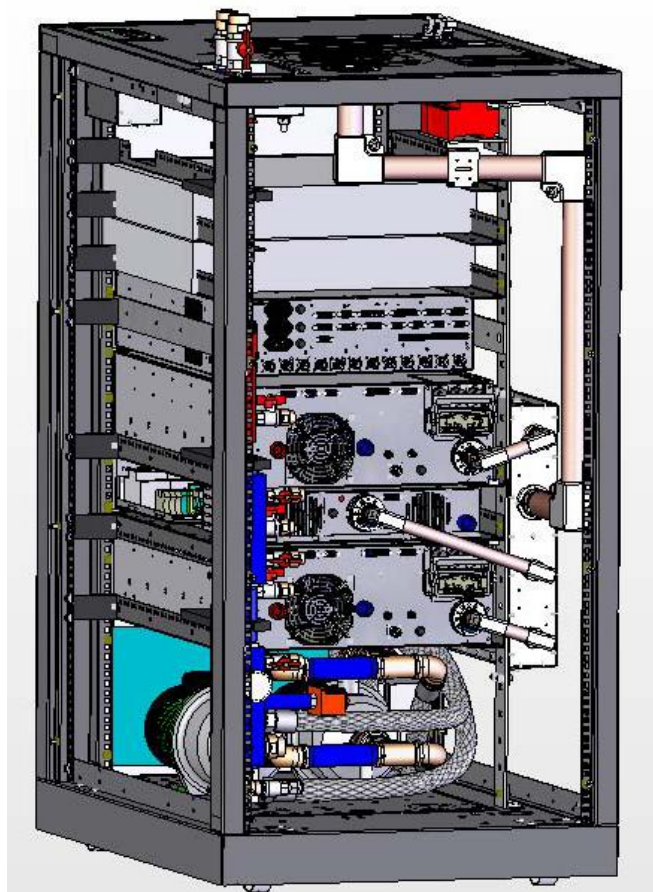
This chapter is an overview of the machine, so you can identify quickly the location of the various electrical and mechanical parts.

10.1 General view



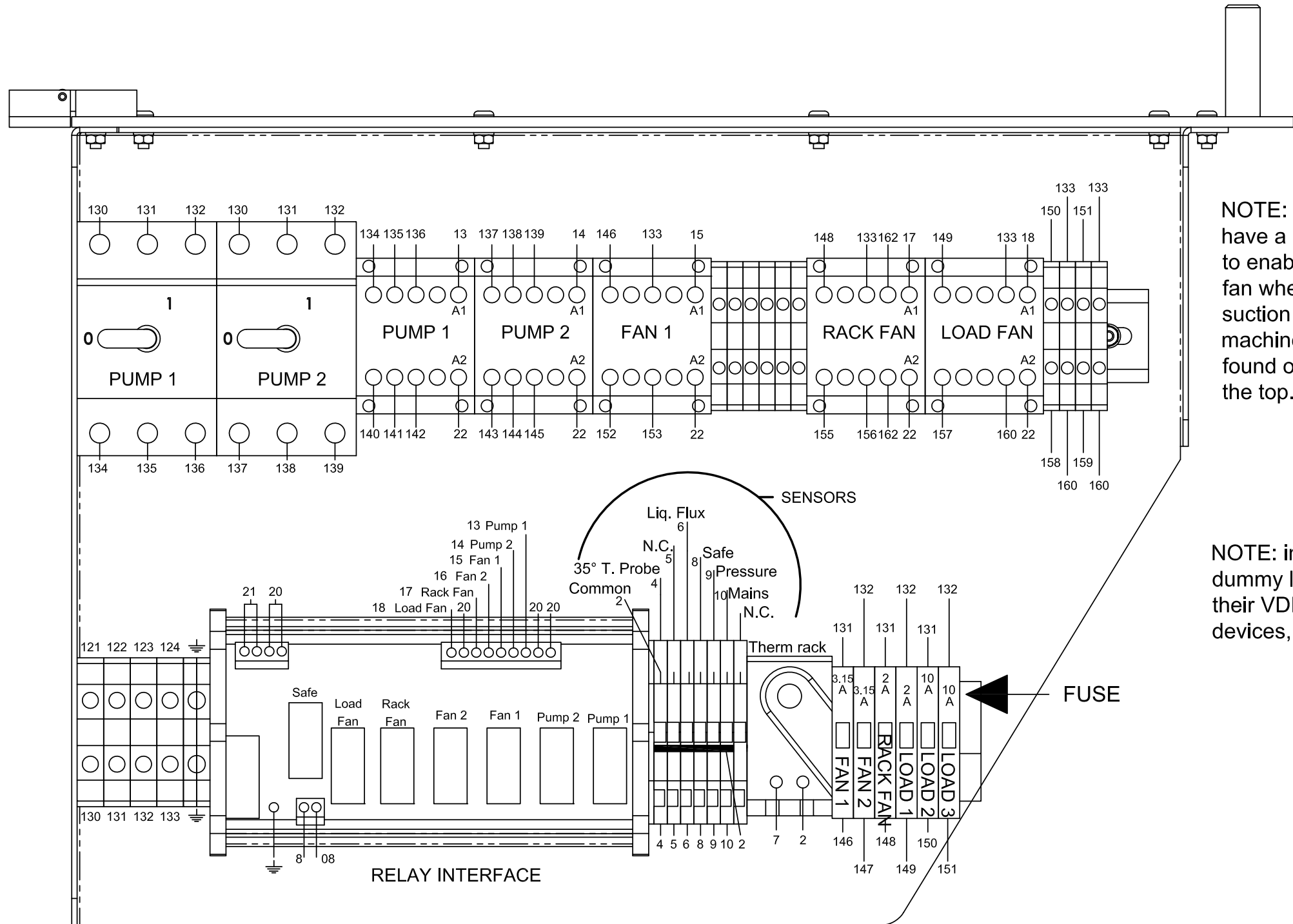
Hybrid
coupler





Rear view

10.2 Electromechanical section



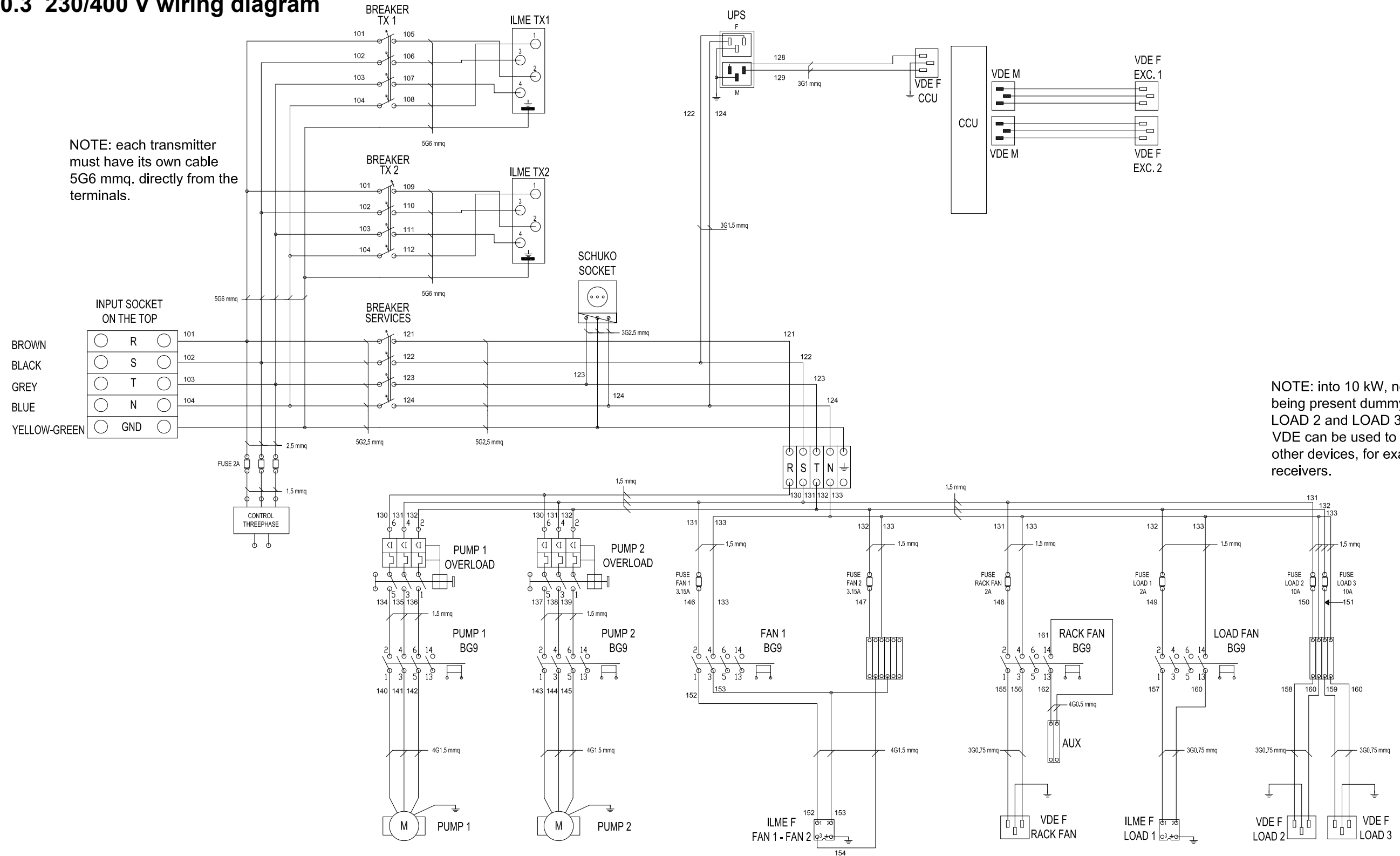
NOTE: terminals 161 and 162 have a "free contact" and serves to enable an external exhaust fan when starts working the suction blower inside the machine. This contact can be found on the input terminal on the top.

NOTE: into 10 kW, not being present dummy loads (LOAD 2) and (LOAD 3), their VDE can be used to power other devices, for example receivers.

Telecomitalia

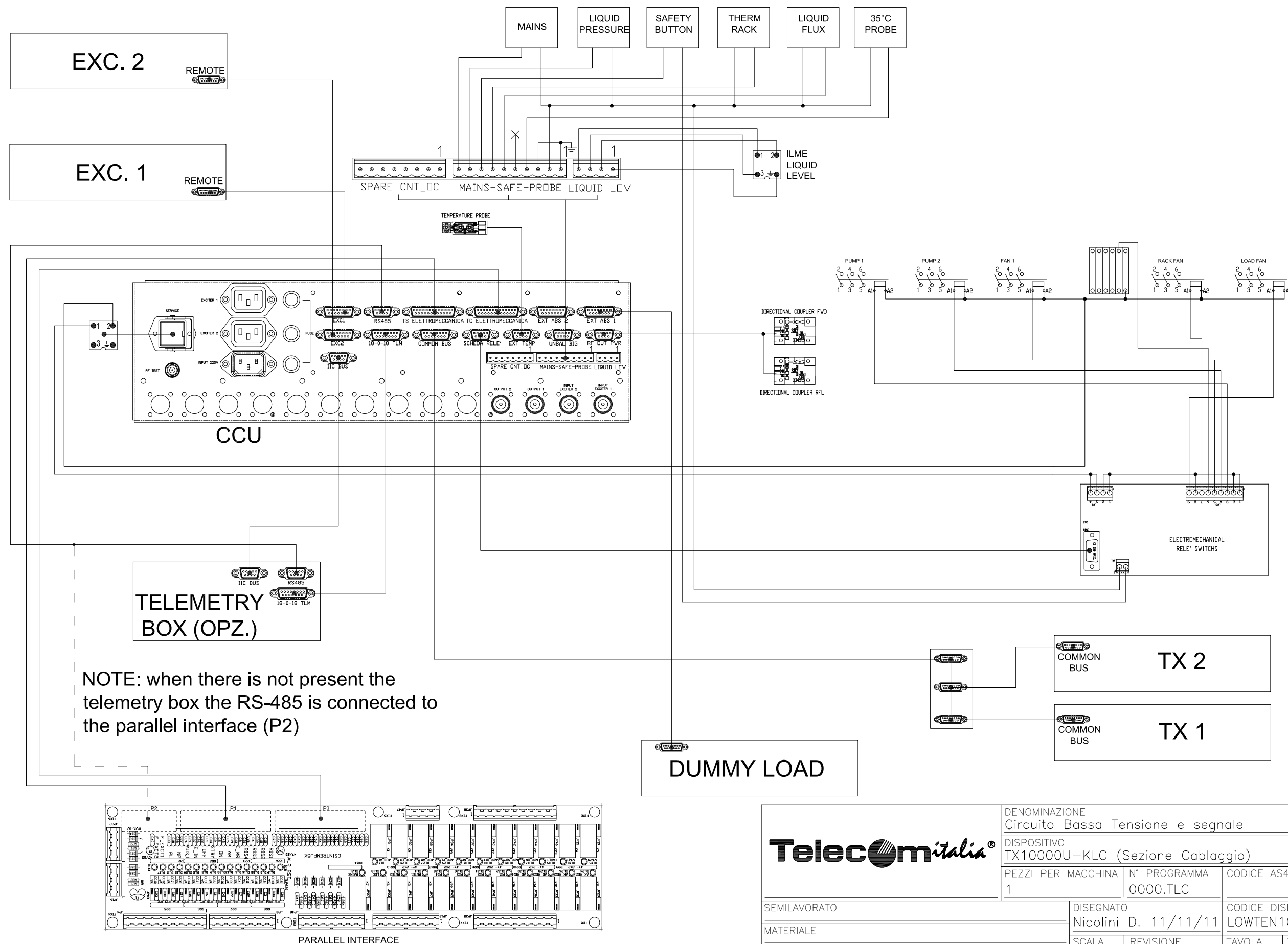
DENOMINAZIONE:			
Electromechanical section for 10Kw H2O			
N° PROGRAMMA			MACCHINA
---			---
SEMILAVORATO:	PESO GREZZO	AUTORE	CODICE DISEGNO
---	---	Nicolini Daniele	PELRCK10KWH20
MATERIALE:	PESO [KG]	SCALA	REVISIONE
---	---	1:1	01
TRATTAMENTO:	DATA	FORMATO	CODICE AS400
---	11/11/2011	A3	---
TOLLERANZA GENERALE SECONDO UNI ISO 2768-f			

10.3 230/400 V wiring diagram



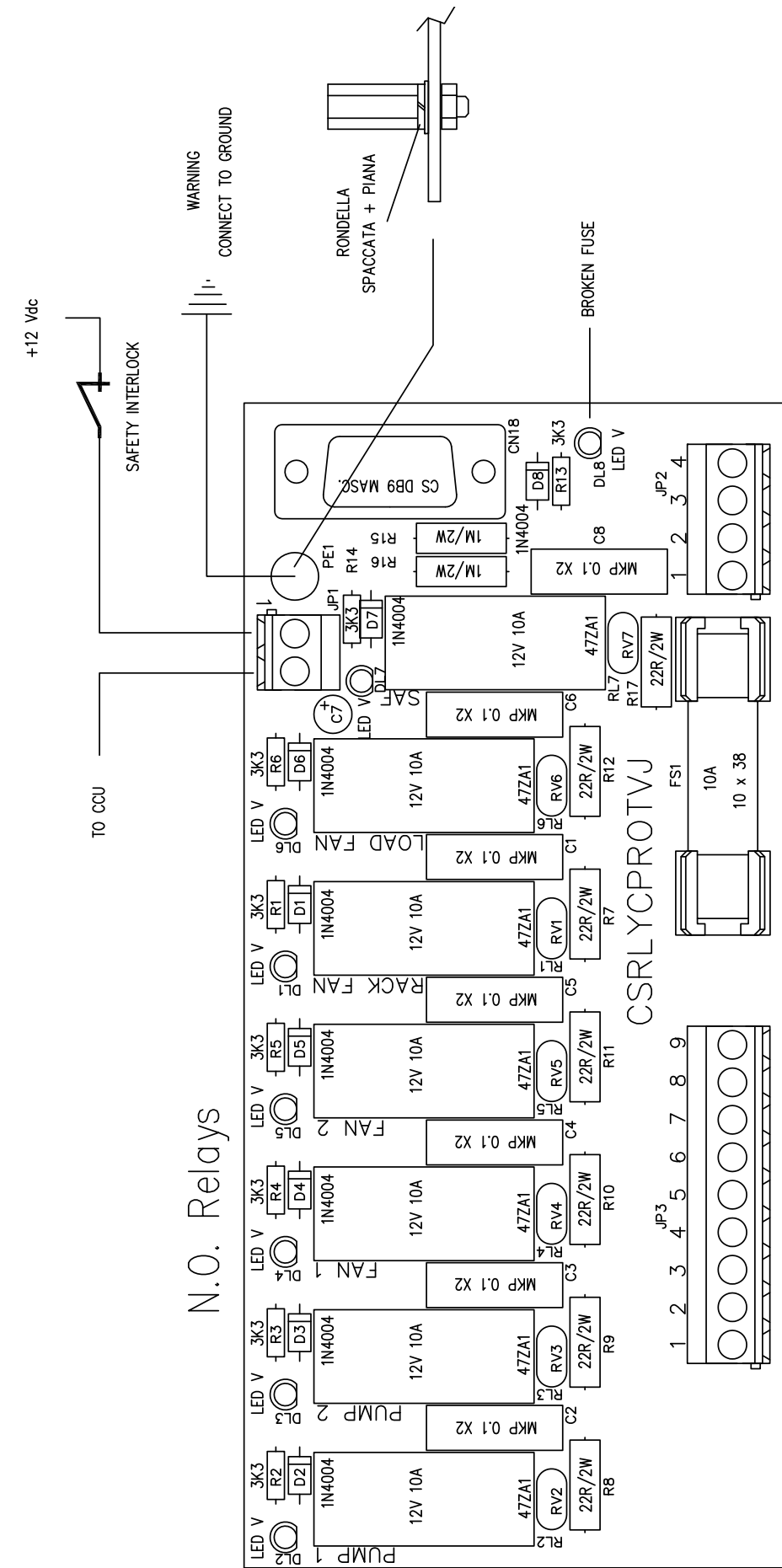
				DENOMINAZIONE	
				Circuito a 220/380 Volt	
				DISPOSITIVO	
				TX10000U-KLC (Sezione cablaggio)	
PEZZI PER MACCHINA		N° PROGRAMMA		CODICE	
1		0000.TLC		AS400	
SEMILAVORATO			DISEGNATO		CODICE DISEGNO
			Nicolini D. 11/11/11		3FRCK10UKLC
MATERIALE			SCALA	REVISIONE	TAVOLA
TRATTAMENTO			1: 1	01	1 di 1
			TOLLERANZA		
			+/- 0.1mm		

10.4 Low tension and signals wiring diagrams



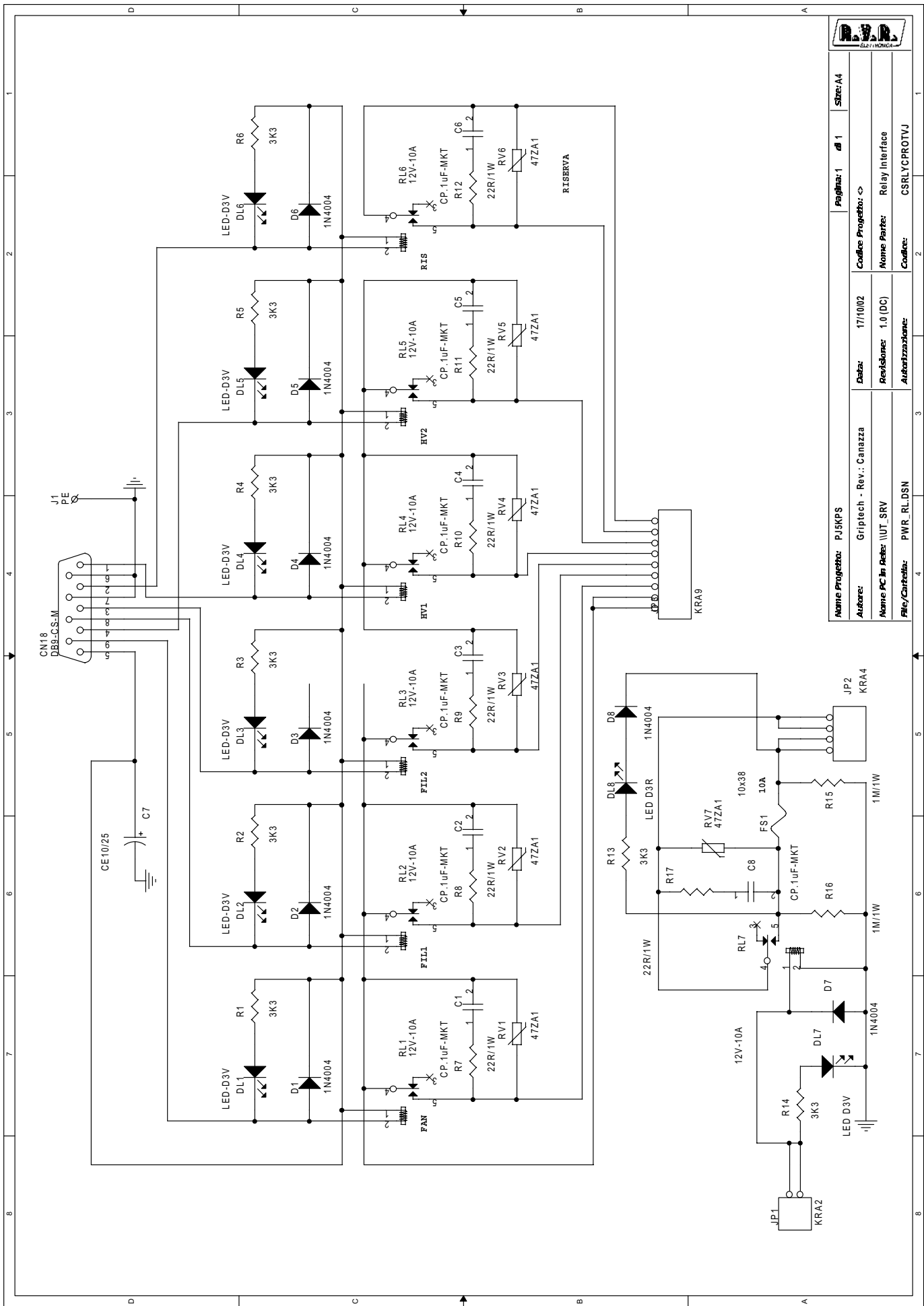
Telecomitalia®				DENOMINAZIONE Circuito Basso Tensione e segnale	
				DISPOSITIVO TX10000U-KLC (Sezione Cablaggio)	
PEZZI PER MACCHINA 1		N° PROGRAMMA 0000.TLC		CODICE AS400	
SEMILAVORATO		DISEGNATO Nicolini D. 11/11/11		CODICE DISEGNO LOWTEN10UKLC	
MATERIALE		SCALA 1:1		TAVOLA 1 di 1	
TRATTAMENTO		REVISIONE 01		TOLLERANZA +/- 0.1mm	

10.5 Relay interface board (CSRLYCPROTVJ)



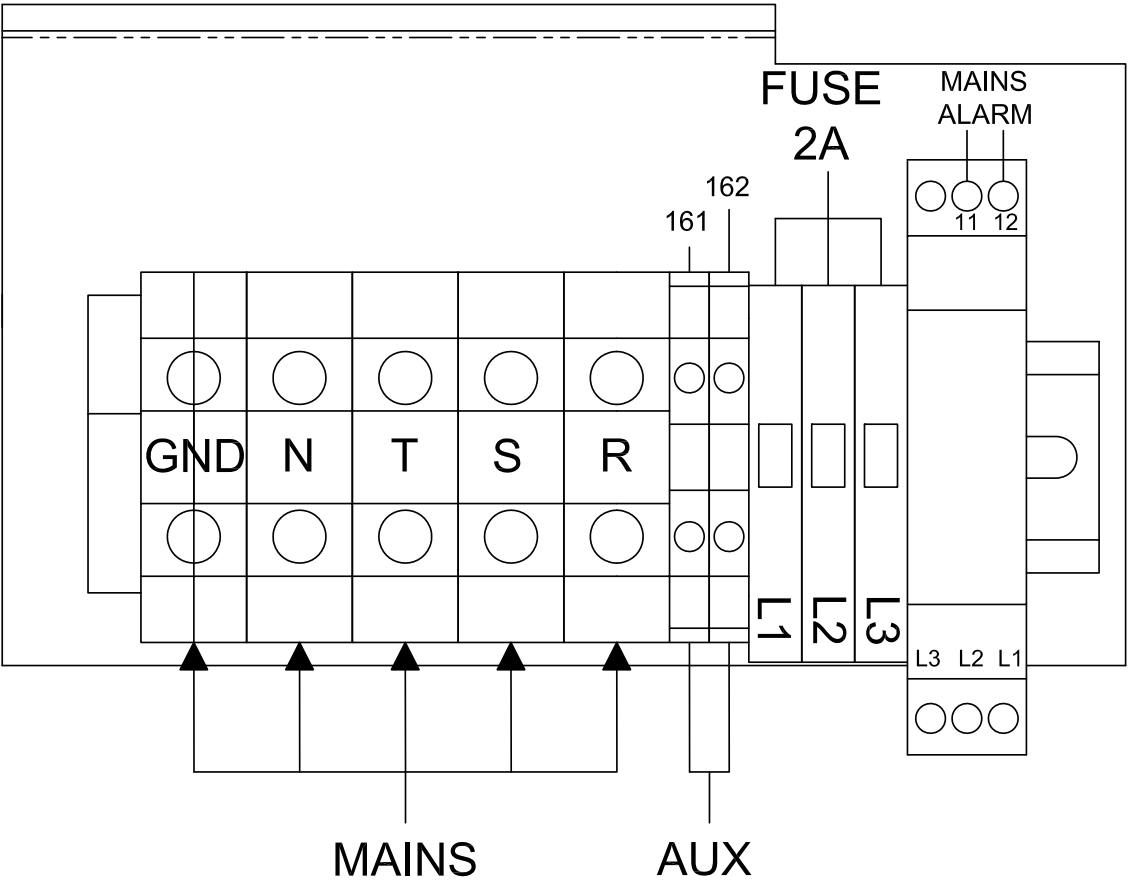
JP3	Contactor	Relay	JP3	Contactor	Relay
1	COMMON	/	6	FAN 2	RL5
2	COMMON	/	7	RACK FAN	RL1
3	PUMP 1	RL2	8	COMMON	/
4	PUMP 2	RL3	9	LOAD FAN	RL6
5	FAN 1	RL4			

Nome Progetto:	PJ5KPS	Pagina:	1	di	1	Size:	A4
Autore:	Griptech - Rev.: Canazza	Data:	17/10/02	Codice Progetto:			
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Relay interface		
File/Caricab:	VAL_PWR.DWG	Autorizzazione:		Codice:	CSRLYCPROTVJ		
Scala:		Titolamento:		Profilo:			



Nome Progetto:	PJ5KPS	Pagina:	1	di	1	Size:	A4
Autore:	Griptech - Rev.: Canazza	Data:	17/10/02	Codice Progetto:			
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Relay interface		
File/Caricab:	PWR_RL.DSN	Autorizzazione:		Codice:	CSRLYCPROTVJ		

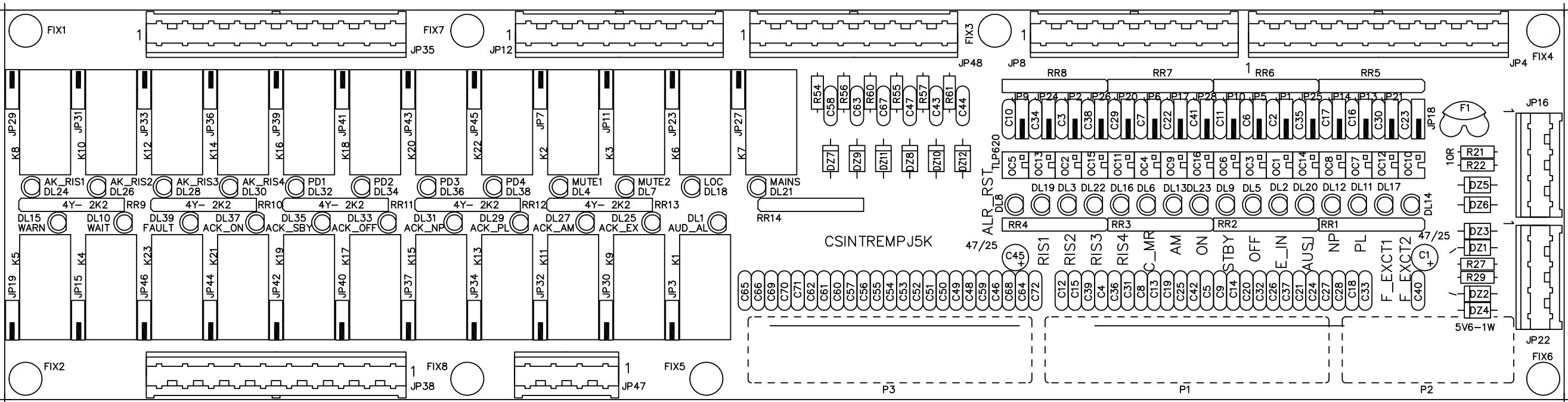
10.6 Input terminals



NOTE: NOTE: terminals 161 and 162 have a "free contact" and serves to enable an external exhaust fan when starts working the suction blower inside the machine.
This contact is activated by the contactors that activates the internal fan (RACK FAN)
FAN OFF - OPEN CONTACT
FAN ON - CLOSE CONTACT

		DENOMINAZIONE:	
		Morsettiera di alimentazione Rack H20	
N° PROGRAMMA		MACCHINA	
---		---	
SEMILAVORATO:		AUTORE	CODICE DISEGNO
---		Nicolini Daniele	MORINGRCKH20
MATERIALE:	PESO [kg]	SCALA	REVISIONE
---	0.65	1: 5	0
TRATTAMENTO:	DATA	CODICE AS400	
---	10/06/2011	---	
TOLLERANZA GENERALE SECONDO UNI ISO 2768-f		FORMATO	()
		A4	

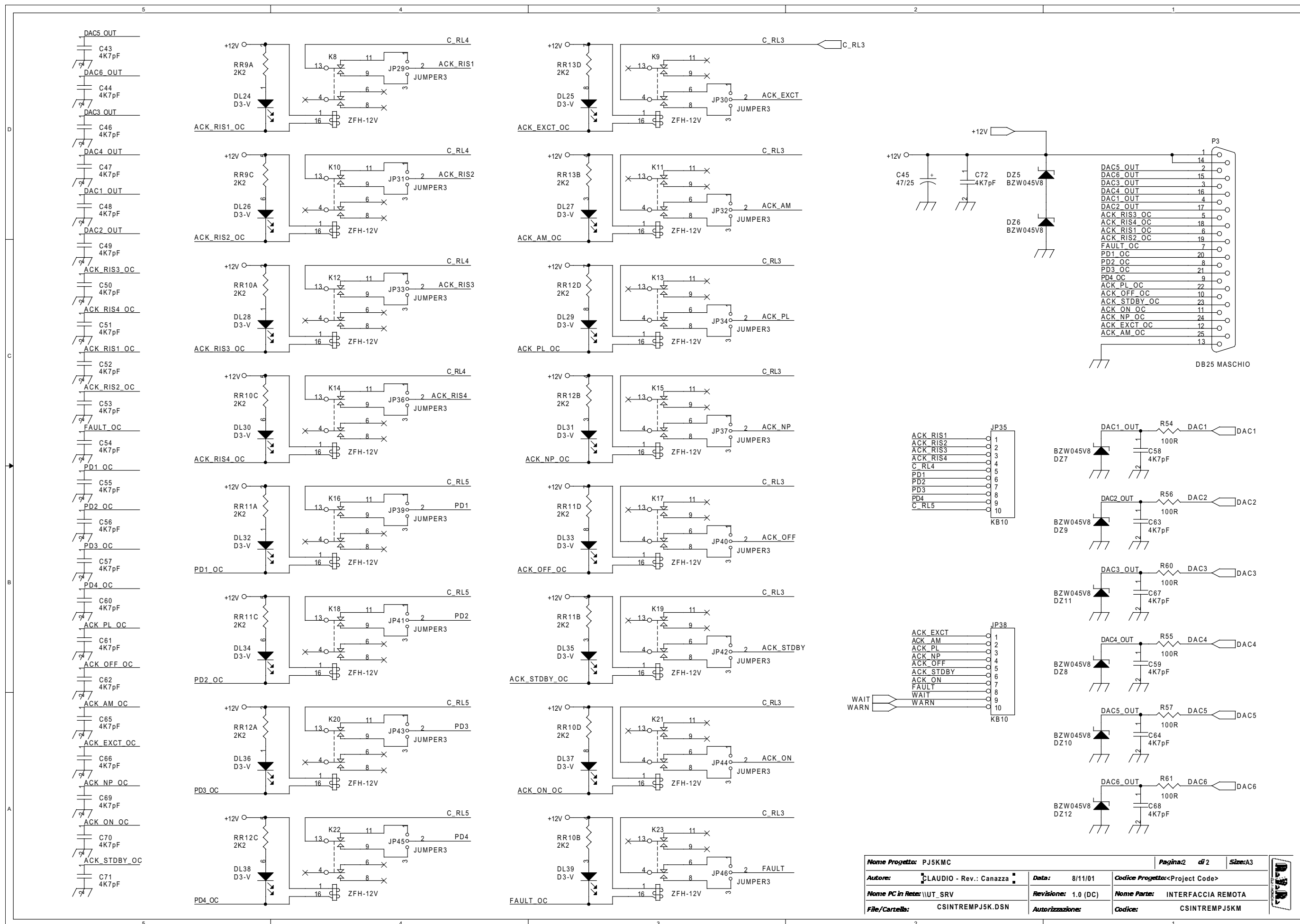
10.7 Parallel interface (CSINTREMPJ5K)



Nome Progetto: PK5KPS - Interfaccia parallela		Pagina: 1 di 1	Size: A3
Autore: Griptech - Rev.: Canazza	Data: 08/10/2002	Codice Progetto: <>	
Nome PC in Rete: \\UT_SRV	Revisione: 1.0 (DC)	Nome Parte: Interfaccia parallela	
File/Cartella: PJ5_REM_MNT.DWG	Autorizzazione:	Codice: SLINTREMPJ5K	
Scala: <>	Materiale: <>	Treatment: <>	Profilo: <>







10.7.1 Description

A parallel-type interface is mounted on the top of the TX10000U-KLC, in which the different signals are available through terminal blocks (Figure 10-7-1). This interface is connected to the CCU from which it receives the different signals and to which the eventual commands are forwarded.

The card contains digital inputs, digital outputs and analog outputs. Among the digital inputs, a “copy” of all the possible orders that can be given locally to the unit by using the buttons of the control unit are displayed.

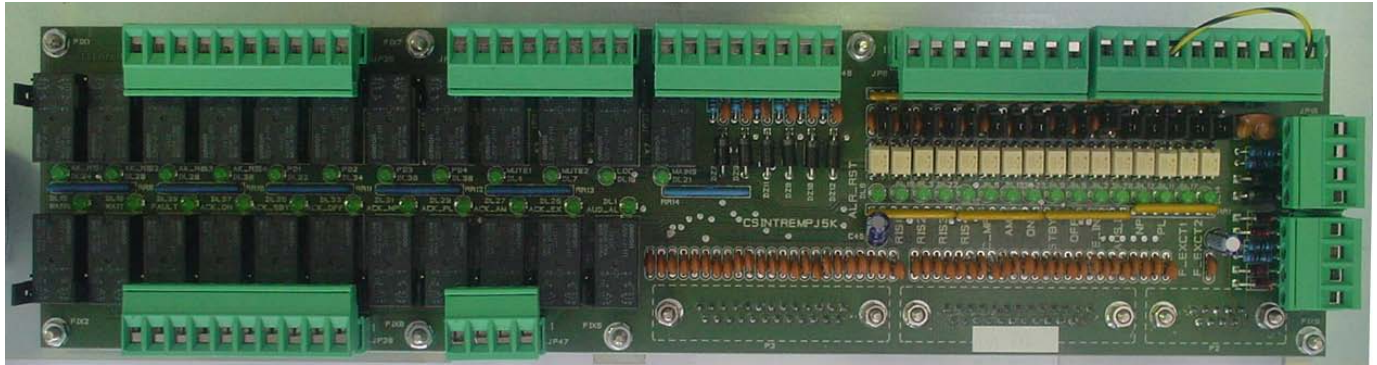


Figure 10-7-1

The digital outputs supply information concerning the status of the TX10000U-KLC.

The analogue outputs enable the remote control of the most important parameters, for example the forward and reflected power.

This interface was designed for a maximum configurability and adaptability to the tel metry systems to which it may be connected. For example, each digital input can be configured through a jumper in order to be “active” when grounded or when connected to a supply source between +12V and +24V.

The scheme of one generic digital input is shown in Figure 10-7-2 b). Please pay attention to the anti-parallel type optocouplers, so that if the jumper is closed between the pins 1 and 2, by grounding the DIGITAL INPUT, the input is active. On the contrary by closing 2 and 3, the input is active when the DIGITAL INPUT is connected to a positive voltage. Each digital output can be configured individually as “Normally open “ or “Normally closed “ (NO or NC). In Figure 10-7-2 a) the scheme of a generic digital output is shown. Please note that when the jumper is closed between 1 and 2, the output is normally short-circuited with the common pin, while in the other case the circuit is normally open.

It is important to remember that the different commands can be given to the unit through the parallel interface only if the Local/Remote selector situated on the front panel is on the “Remote” position.

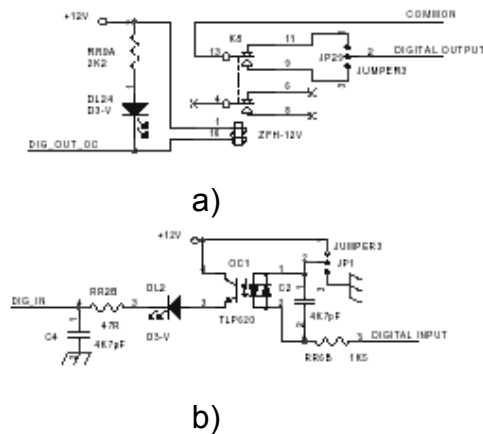


Figure 10-7-2

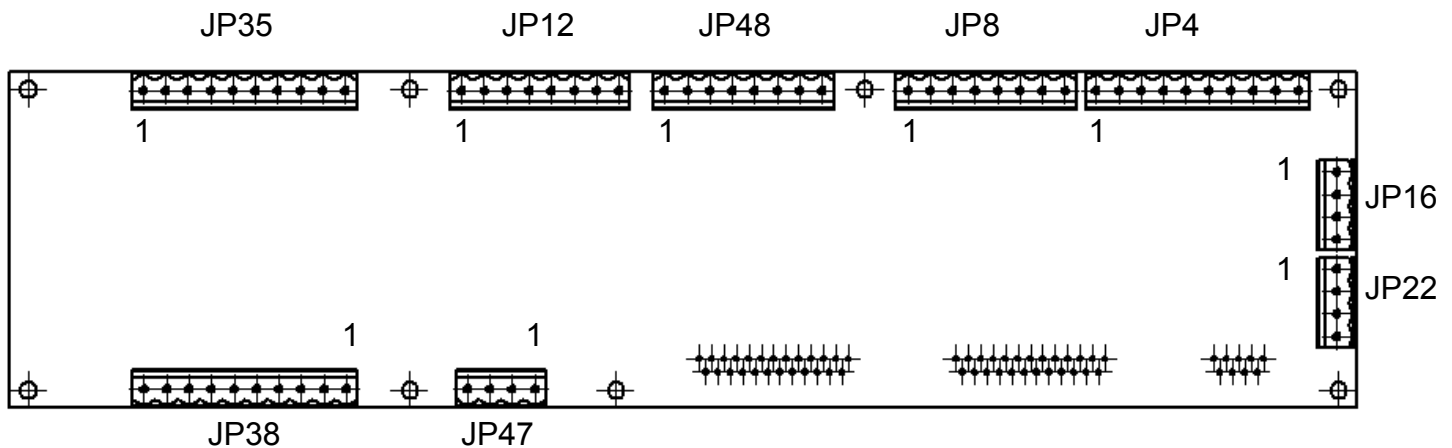


Figure 10-7-3

The following table describes the function of each jumper of the parallel interface. The first column indicates the identifying number of the jumper as shown on Figure 10-7-3, the second indicates the name of the signal and the third column describes its function.

Clamp	Type	Name	Description
JP4/1	In	ON	Corresponds to the ON button of the control unit
JP4/2	In	STDBY	Corresponds to the STDBY button of the control unit
JP4/3	In	OFF	Corresponds to the OFF button of the control unit
JP4/4	In	EXT INH	External inhibition jumper. It is a "N.C." type jumper, which means that it must be active for the TX10000U-KLC to work. Upon delivery, this terminal is closed to ground by a jumper.
JP4/5	In	AUX INH	Auxiliary external inhibition jumper. It is a "N.O." type jumper, which means that it must be not active for the PJ10KPS-C to work. It is "auxiliary" because even if nothing is connected to it the PJ10KPS-C works normally.
JP4/6	In	NOM PWR	Corresponds to the NOMINAL POWER button of the control unit

JP4/7	In	LOW PWR	Corresponds to the REDUCED POWER button of the control unit
JP4/8	In	AUDIO ALARM EXC. 1	Audio alarm of exciter 1. This input, when active, indicates an alarm on exciter 1. If the TX10000U-KLC is in automatic changeover modality, if the exciter 1 is on air and if this signal remains active for a time lag equivalent to the time set in the Settings menu at line Exc. Wait time, the changeover procedure between the exciters will be started.
JP4/9	In	AUDIO ALARM EXC. 2	Same as AUDIO ALARM EXC. 1 for exciter 2.
JP4/10	/	GND	Grounding contact.
JP8/1	In	ALARM RESET	Corresponds to the ALARM RESET button on the control unit
JP8/2	In	RESRV. 1	Reserve 1 input. When this input is active, the failure is registered by the software in the Alarms menu. For example it can be connected to a switch that indicates that the door of the station is open or to a sensor of a power reserve of an electric generator. In this way, by consulting the menus of the unit, it is possible to trace the moment at which (time and date) the failure occurred.
JP8/3	In	RESRV. 2	Same as JP8/2
JP8/4	In	RESRV. 3	Same as JP8/2
JP8/5	In	RESRV. 4	Same as JP8/2
JP8/6	In	EXCITER CHANGE-OVER CMD	This command launches the changeover procedure between the exciters. It has the same function as when you press the OK button when selecting line On air exciter in the menu Exciters. In order to launch the changeover between the exciters through this command, the manual changeover modality should be formerly selected through the correspondent button on the control unit or through the JP8/7 jumper, having however the unit in "Remote" modality.
JP8/7	In	EXCITER CHANGE-OVER	Corresponds to ther EXCITER CHANGE-OVER button of the control unit
JP8/8	/	GND	Ground
JP16/1	Out	+12V dc	Power source. A maximum of 100 mA can be absorbed between this jumper and JP16/2. This power source can be used if the user wants to enter the comands following a positive logic (high voltage - active comand)
JP16/2	Out	+12V dc	Same as JP16/1
JP16/3	/	GND	Ground
JP16/4	/	GND	Ground
JP22/1	I/O	TX/RX +	Bus RS 485. Please note that this serial port is operational only when the unit is in "Remote" modality.

JP22/2	I/O	TX/RX -	Bus RS 485
JP22/3	/	LINE TRM	Line termination for bus RS 485
JP22/4	/	LINE TRM	Line termination for bus RS 485
JP48/1	/	GND	Ground
JP48/2	/	GND	Ground
JP48/3	Out	FWD PWR	Forward power. Analogical output, 3.9V for 5000W
JP48/4	Out	RFL PWR	Reflect power. Analogical output, 3.9V for 1200W
JP48/5	Out	OUT AIR TEMP	Temperature of the air at the output of the chimney. Analogical output, 0V for -50°C, 3.9V for 100°C
JP48/6	Out	/	Not used
JP48/7	Out	EFF.	General efficiency. Analogical output, 3.9V for 100%, 0V for 0%.
JP48/8	Out	OUT DAC 6	Reserved for future applications.
JP12/1	Out	CMN MUTE 1	Common contact MUTE 1 (see JP12/2).
JP12/2	Out	MUTE 1	MUTE exciter 1. Digital output, active when exciter 1 is inhibited by the control unit. Like all the digital outputs on the parallele interface, it can be configured through jumper as normally open or normally closed. This output has a common contact dedicated to this function (JP12/1).
JP12/3	Out	CMN MUTE 2	Common contact MUTE 2 (see JP12/4).
JP12/4	Out	MUTE 2	MUTE exciter 2. Digital output, active when exciter 2 is inhibited by the control unit. This output has a common contact dedicated to this function (JP12/3).
JP12/5	Out	CMN LOCAL	Common contact LOCAL (see JP12/6).
JP12/6	Out	LOCAL	LOCAL/REMOTE status. Digital output, active when the TX10000U-KLC is setted in local modality. This output has a common contact dedicated to this function (JP12/5).
JP12/7	Out	CMN MAINS	Common contact MAINS (see JP12/8).
JP12/8	Out	MAINS	MAINS alarm, active when are present problems on the alimentation
JP47/1	Out	AUDIO ALARM	“AUDIO” alarm (see JP4/8 and JP4/9). This output is active when the on air exciter is in audio alarm status. This output has a common contact dedicated to this function (JP47/2).
JP47/2	Out	CMN AUDIO ALARM	Common contact AUDIO ALARM (see JP47/1).
JP47/3	Out	CMN RL3	Common contact shared from the outputs JP38/1-10.
JP47/4	Out	CMN RL3	Parallel contact with JP47/3.
JP35/1	Out	RESRV. 1	Reserve 1. Digitale output, active when the INPUT RESERVE 1 input (JP8/2) is active. The common contact of this output is RL4 (JP35/5)
JP35/2	Out	ON PROTF	Pulse output, every minute is activated when the ProtF is ON. The common contact of this output is RL4 (JP35 / 5)
JP35/3	Out	OFF PROTF	Pulse output, every minute is activated when the ProtF is OFF. The common contact of this output is RL4 (JP35 / 5)

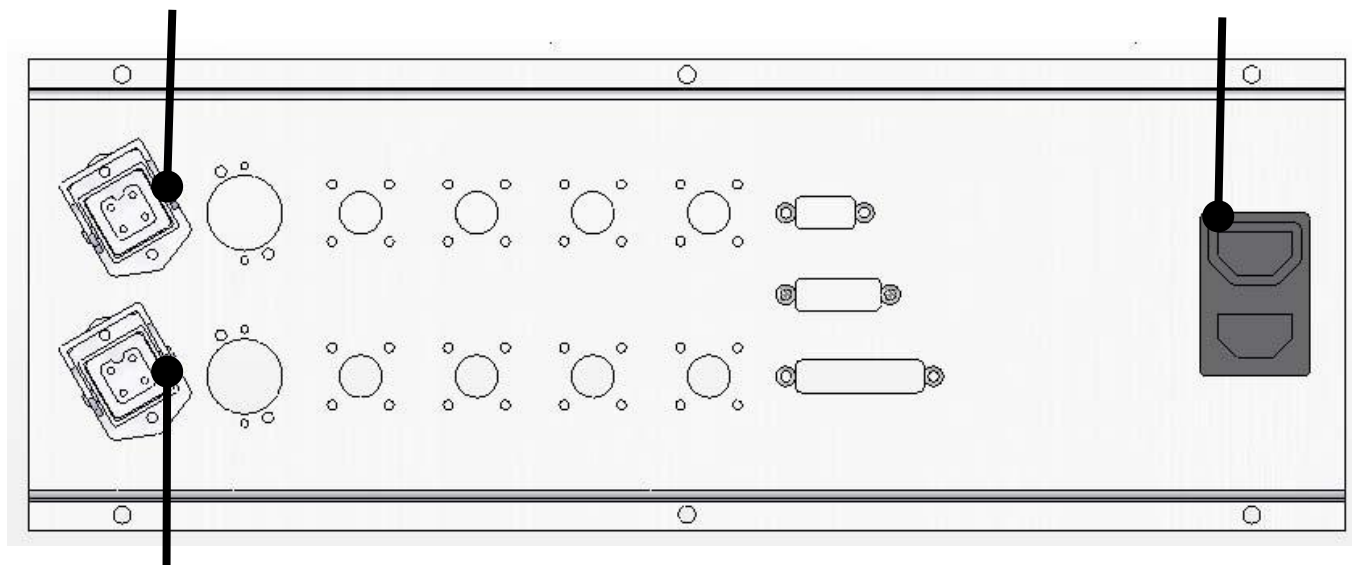
JP35/4	Out	RESRV. 4	Same as JP35/1, corresponds to INPUT RESERVE 4. The common contact of this output RL4 (JP35/5)
JP35/5	Out	CMN RL4	Common contact shared between different digital outputs (JP35/1-4)
JP35/6	Out	SET1.	Digital output, active when the parameter SET1 is active (see menu Settings). The common contact of this output RL5 (JP35/10).
JP35/7	Out	SET2.	Same as JP36/6, corresponds to SET2. The common contact of this output is RL5 (JP35/10).
JP35/8	Out	SET3.	Same as JP36/6, corresponds to SET3. The common contact of this output is RL5 (JP35/10).
JP35/9	Out	SET4.	Similar to JP36/6, related to SET4. The common contact of this output is the RL5 (JP35/10).
JP35/10	Out	CMN RL5	Common contact shared between the different digital output (JP35/6-9)
JP38/1	Out	EXC. ON AIR	Digital output, active when the exciter 1 is on air, and not active when the exciter 2 is on air. common contact of this output is the RL3 (JP47/3).
JP38/2	Out	AUTO/MAN	Digital output, active when the TX10000U-KLC is in changeover mode as regards the exciters. The common contact of this output is RL3 (JP47/3).
JP38/3	Out	LOWER POWER	Digital output, active when the TX10000U-KLC is set for the lower power level. Common contact of this output is the RL3 (JP47/3).
JP38/4	Out	NOMINAL POWER	Digital output, active when the TX10000U-KLC is set for the nominal power level. common contact of this output is the RL3 (JP47/3).
JP38/5	Out	OFF	Digital output, active when the TX10000U-KLC is set for the lower power level. The common contact of this output is the RL3 (JP47/3).
JP38/6	Out	STDBY	Digital output, active when the TX10000U-KLC is set for the lower power level. The common contact of this output is the RL3 (JP47/3).
JP38/7	Out	ON	Digital output, active when the TX10000U-KLC is set on ON mode. The common contact of this output is the RL3 (JP47/3).
JP38/8	Out	FAULT	Digital output, active when the TX10000U-KLC is set on FAULT mode. The common contact of this output is the RL3 (JP47/3).
JP38/9	Out	WAIT	Digital output, active when the TX10000U-KLC is set on WAIT mode. The common contact of this output is the RL3 (JP47/3).
JP38/10	Out	WARNING	Digital output, active when the TX10000U-KLC is set on WARNING mode. The common contact of this output is the RL3 (JP47/3).

10.8 Plate connectors

Ilme male connector, input liquid level alarm of the external unit

VDE pan for UPS connection.

If you do not have a UPS, make a bridge.



Ilme female connector for power supply fan/s of the external unit

Pinout ilme male alarm input

Pin	Cable color	Description
1	Brown	Minimum level of liquid in the tank
2	Yellow	Common +12V
3	White	Empty tank
GND	Green	Common ground

Pinout ilme female power supply fan/s

Pin	Cable color	Description
1	Black	Fan 1 phase
2	Blue	Common neutral
3	Gray	Fan 2 phase
GND	Yellow-green	Common ground

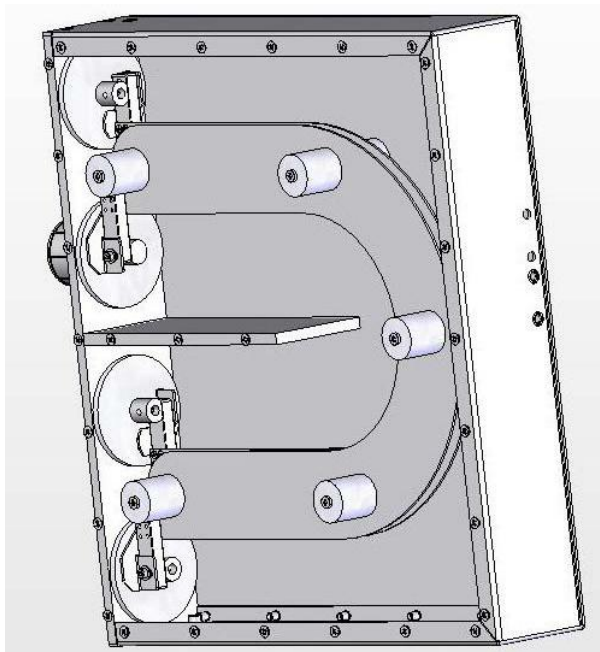
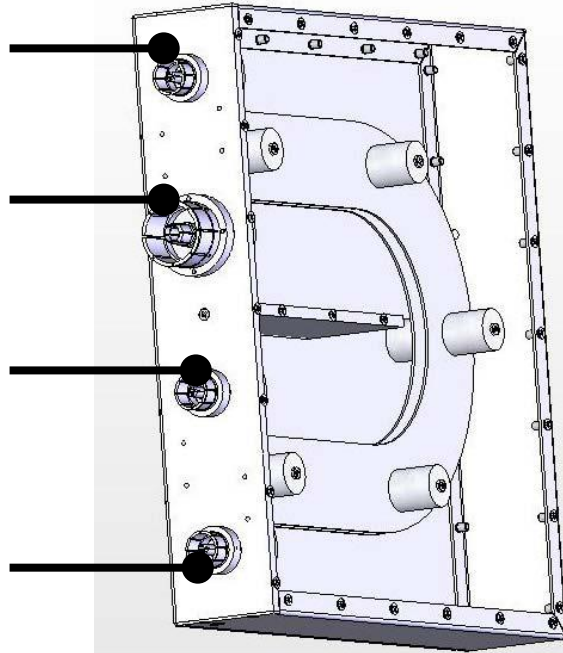
10.9 Hybrid coupler (COUP3DB5KT)

Input Module 1
Flange 7/8 panel

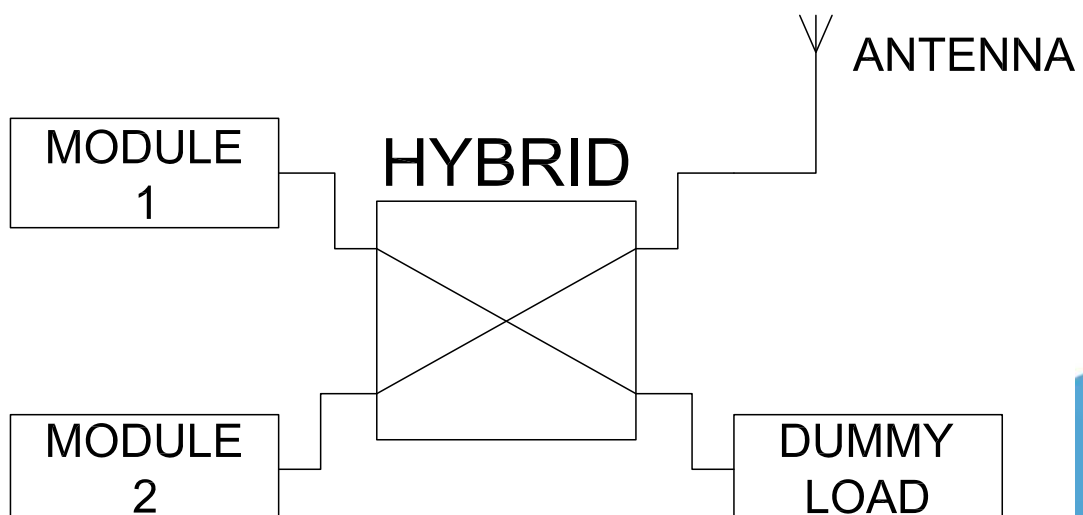
Output combiner
Flange 1-5/8 panel

Output to dummy load
Flange 7/8 panel

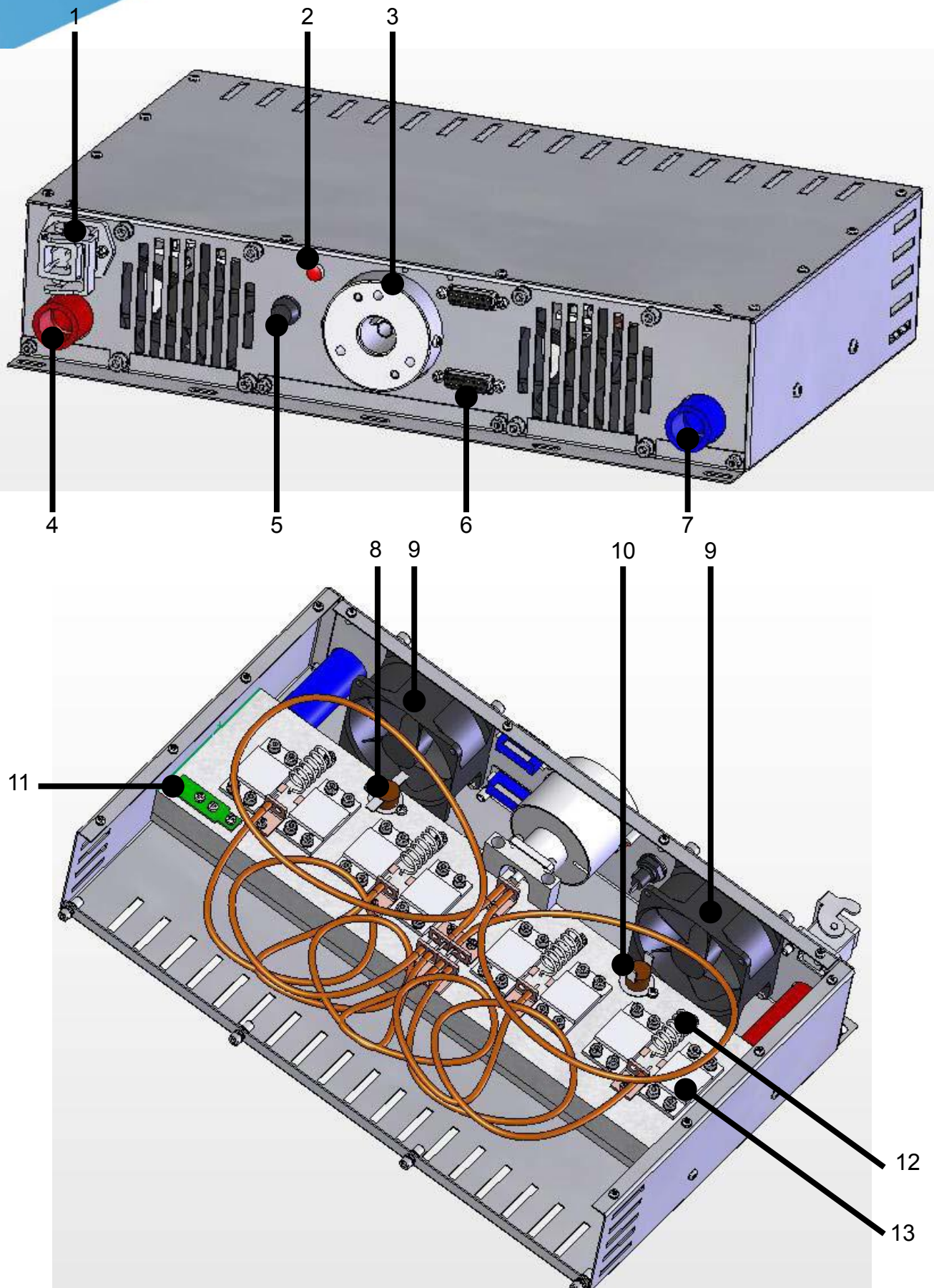
Input Module 2
Flange 7/8 panel



Inside view

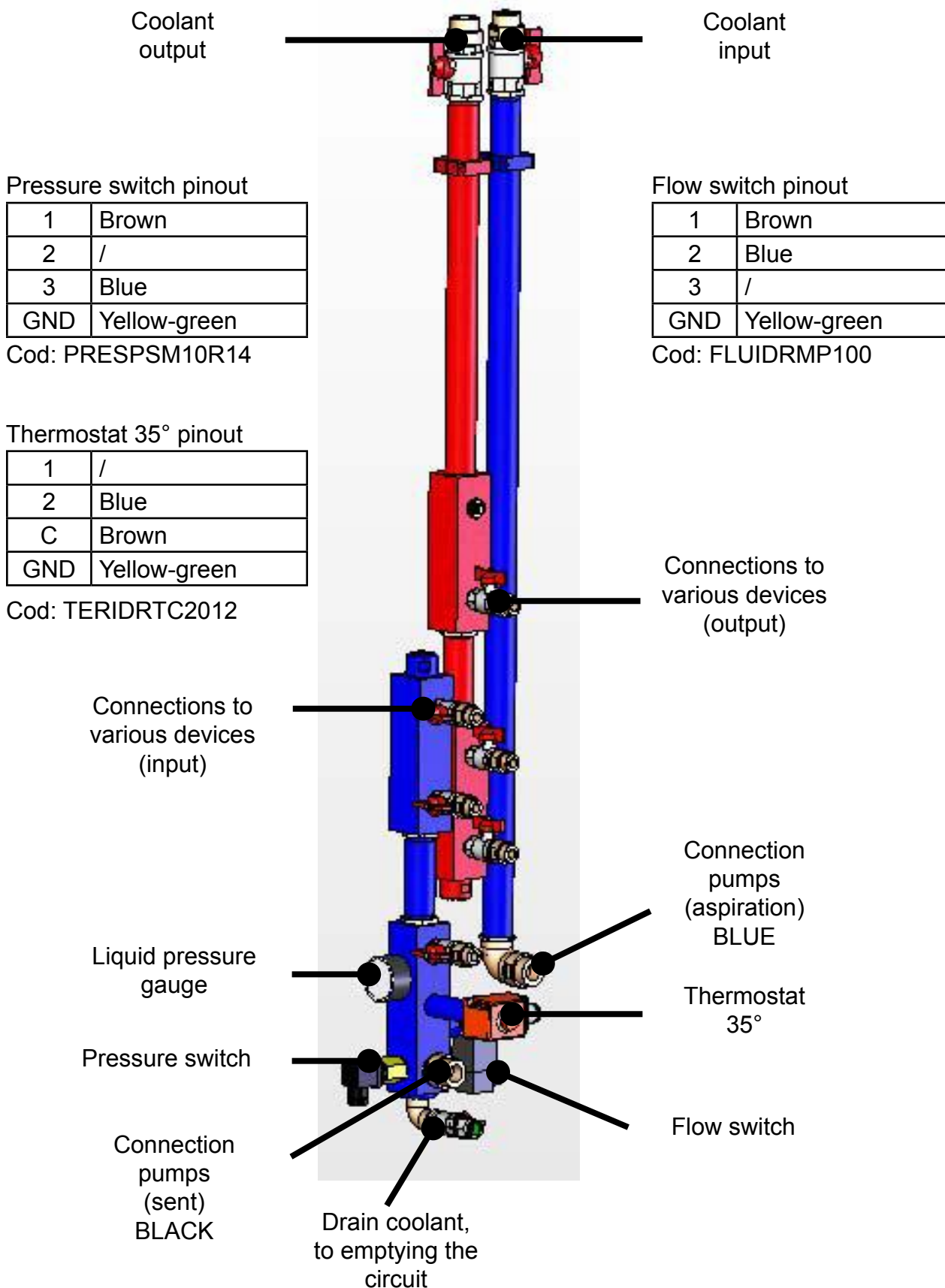


10.10 Dummy load (PF1KDI5KWH2O)

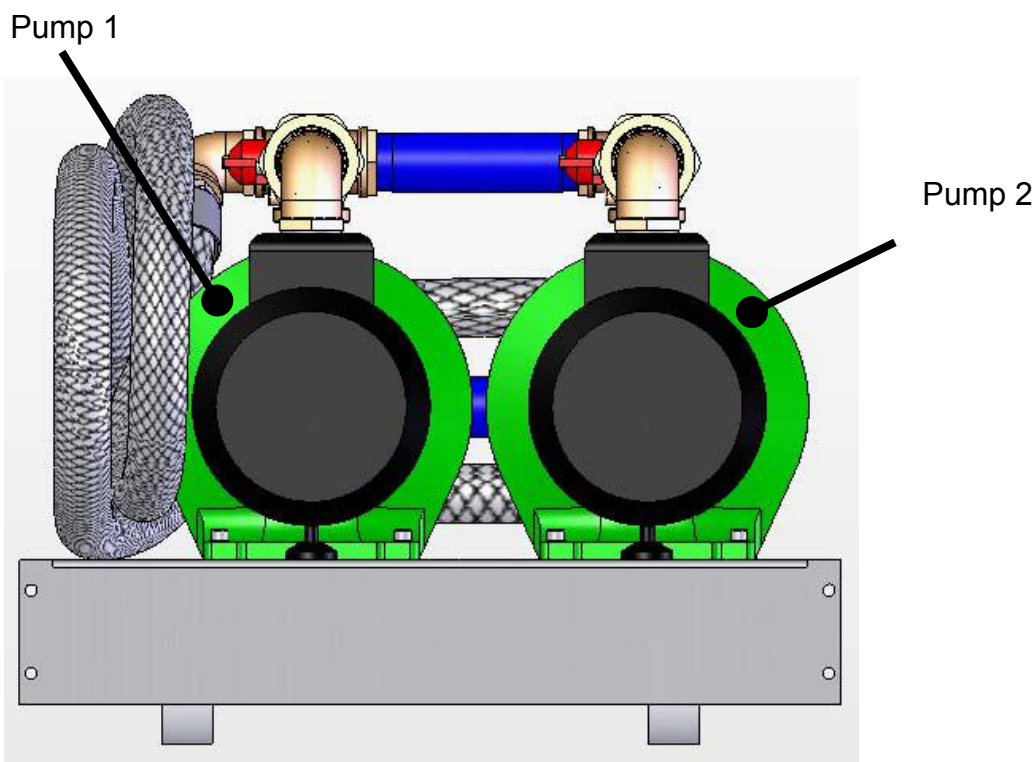


1	Plug for mains power supply	/
2	Voltage presence indicator lamp	/
3	RF input connector (7/8" EIA flange)	/
4	Hydraulic connector for the input of liquid cooling (1/2 ")	/
5	Protection fuse fans	2A
6	DB-15 connector for reading power / temperature	/
7	Hydraulic connector for the output of liquid cooling (1/2 ")	/
8	Temperature sensor 120° NC	SETBIMET120NC
9	Fans for ventilation load	VTL8550N
10	Temperature sensor 50° NA	SETBIMET50NA
11	Temperature probe	SLSNDTMPJ5K
12	Compensation coil	BOB01020033A-1
13	KDI resistor 100 Ω 800 W (termination)	RDT800J0100

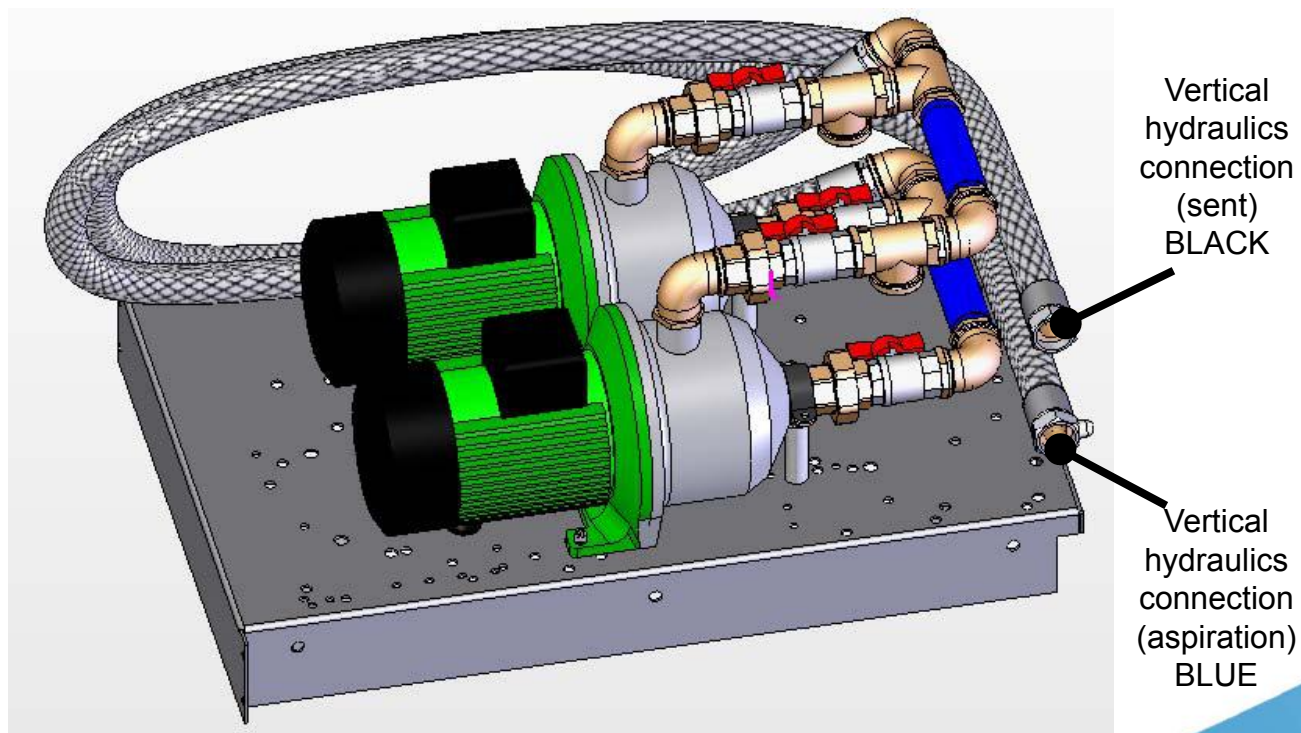
10.11 Vertical hydraulics



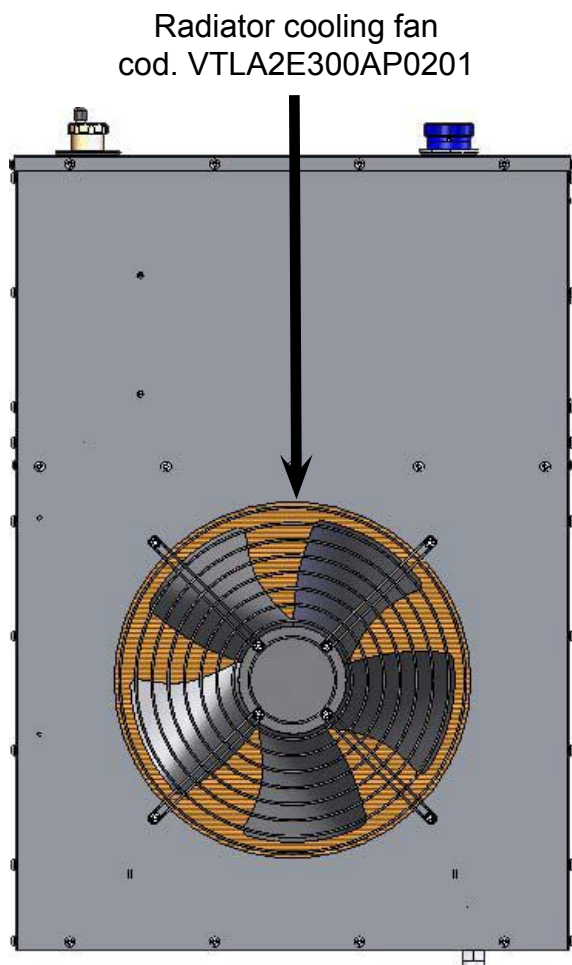
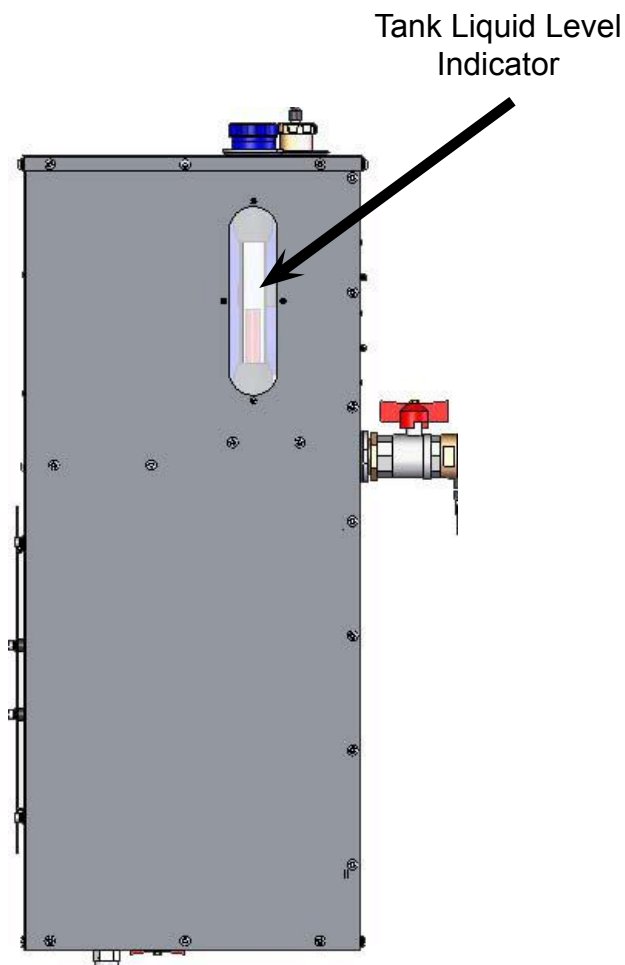
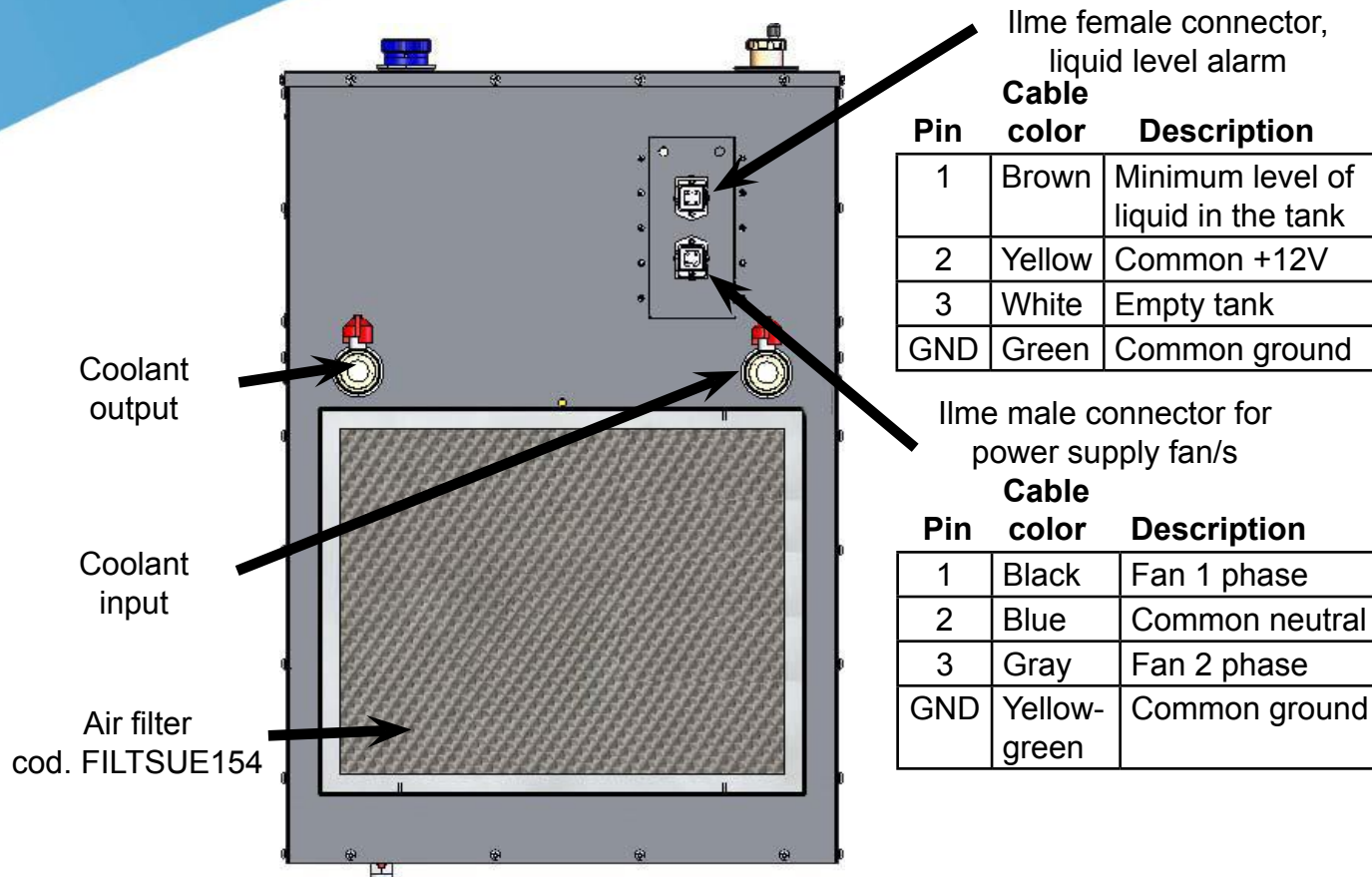
10.12 Carriage pumps (CARPOMP03)

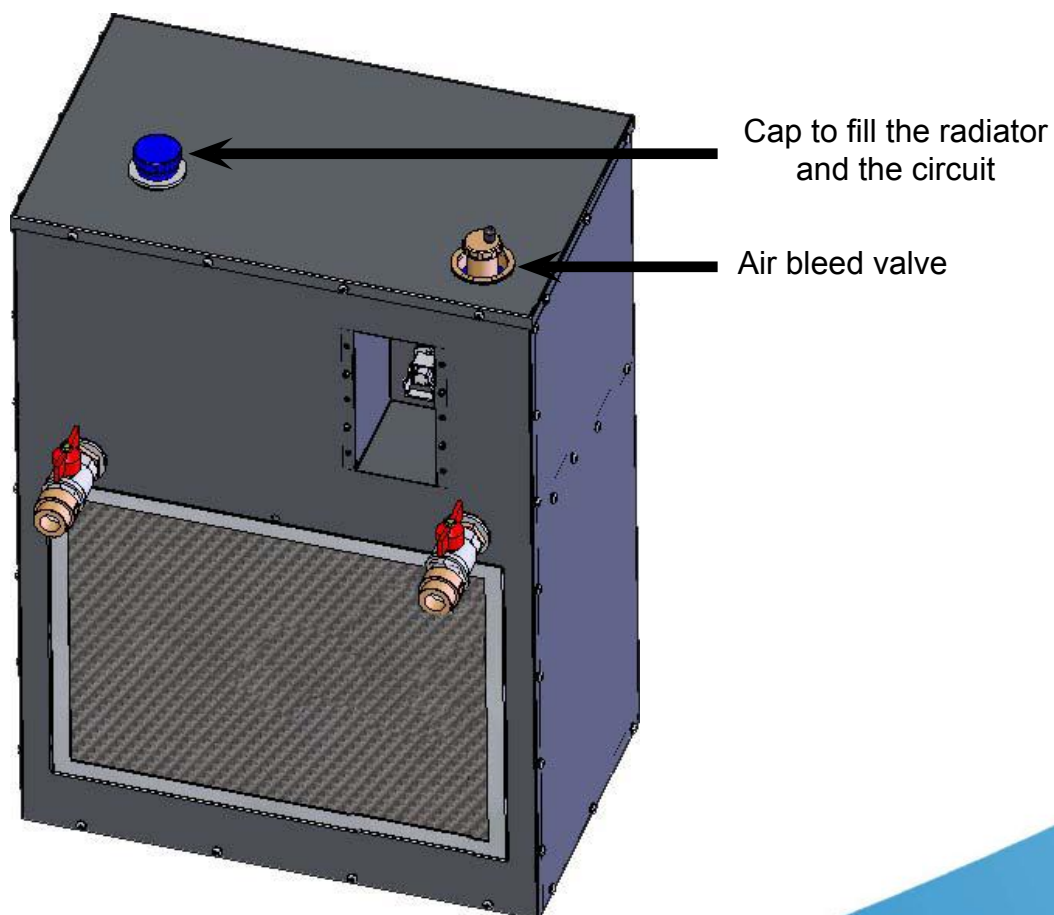
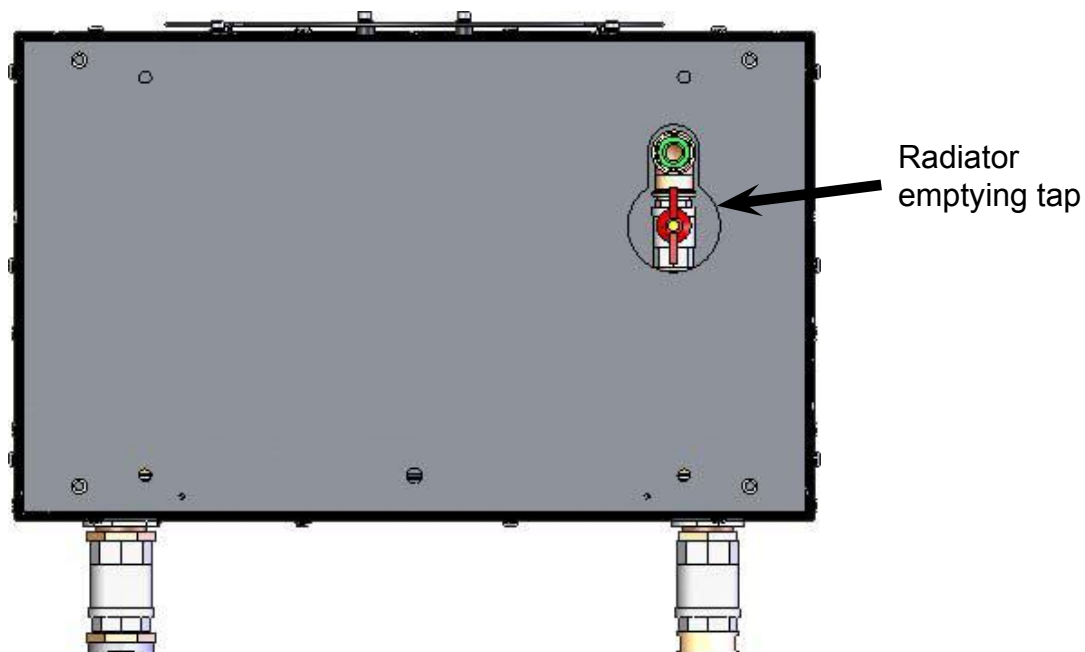


Single pump	POMMHI202DM
Complete carriage	CARPOMP03



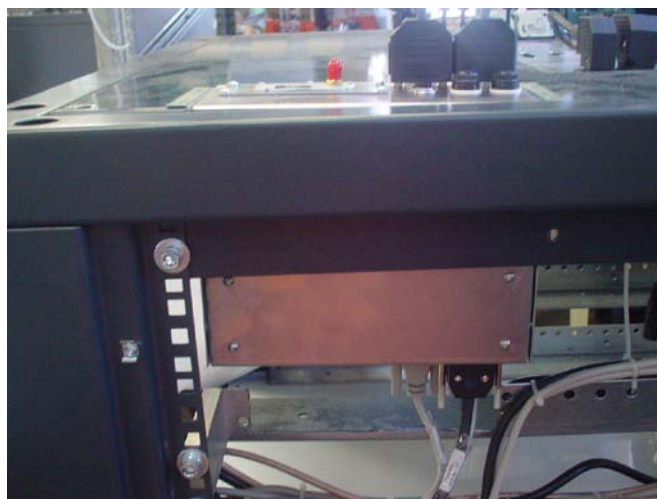
10.13 External unit



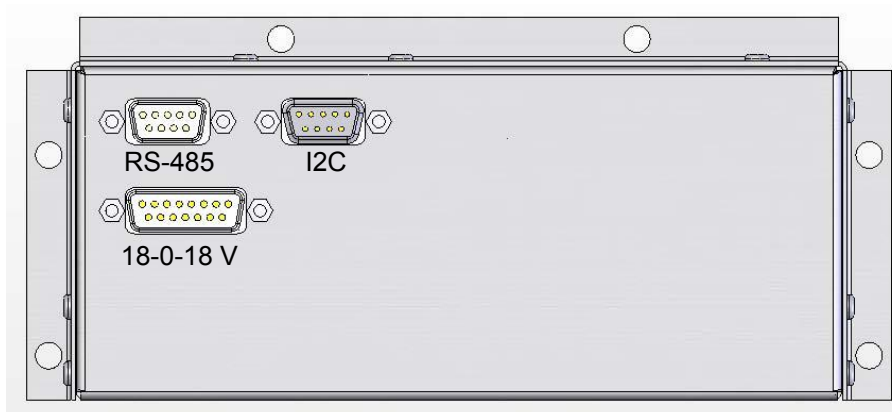


10.14 GSM Telemetry

R.V.R. Elettronica's plug-in series transmitters, may be optionally fitted with the telemetry device that enables the user to remotely check all the machine's working parameters and control some of them, and provides the transmitter with the ability to trigger "alarms" when problems arise while the transmitter is on air, possibly sending GSM Short Messages (SMS) to the maintainer's cellular phone or to any other number stored in the machine's memory. Telemetry is installed on the top rack of the transmitter, in the front right.

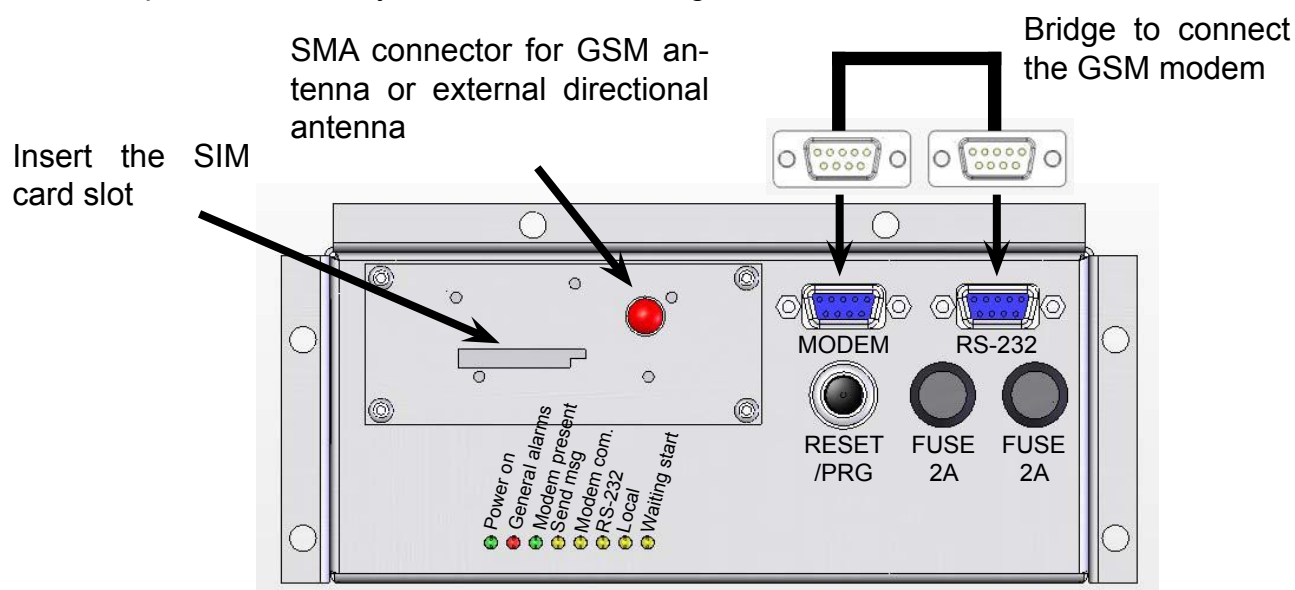


The bottom part of the telemetry contains the following connectors:



RS-485	DB9 male connector for connecting the RS-485 bus from the CCU
I2C	DB9 male connector for connecting the I2C bus from the CCU
18-0-18 V	DB15 male to connect power from the CCU

The top of the telemetry contains the following connectors:



Modem	DB 9 female connector connected to the modem internal GSM
RS-232	DB 9 female connector to connect the GSM modem, with telemetry, or to connect with the PC via RS-232 to the transmitter
Reset/prg	Button to reset the telemetry or programming
Fuse 2A	Fuse protection
Fuse 2A	Fuse protection
Power on	The LED on indicates that the telemetry is powered
General alarms	The LED on indicates that the memory of the telemetry alarms are present
Modem present	The LED on indicates that the GSM modem is present and correctly detected by the telemetry
Send sms	The LED on indicates that the GSM modem is sending SMS messages
Modem com.	The LED on indicates that the modem is connected
RS-232	The LED blinks when you connect your PC to the RS-232 telemetry to communicate with the transmitter using the "Telecon 32bit"
Local	The LED on indicates that the transmitter is in LOCAL (via the selector switch on the CCU) and telemetry will not send alert messages or you can remotely connect to the transmitter
Waiting start	The LED blinks for about 45 on first boot. During this period, the telemetry, it analyzes the whole machine to check status and does not send alerts

Note: you need to enter the bridge supplied with the telemetry between the connector MODEM and RS-232 to connect the GSM modem, otherwise will not work

Nota: Please note that to fully deploy the features of this telemetry system, the you will need to sign a contract with a GSM service provider including DATA COMMUNICATIONS.

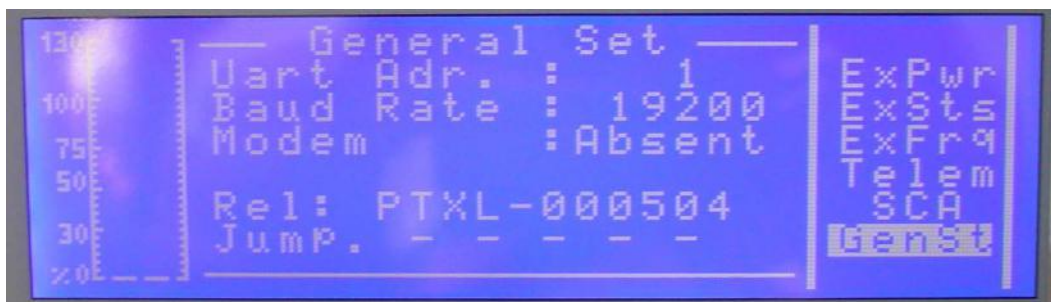
The use of the telemetry system requires the correct setting of the addresses in the connected pieces of equipment, since they communicate on a shared bus.

Set the Uart address of exciter 1 to "1", exciter 2 to "2".

To make this adjustment, from the main menu of the exciter place the cursor light on the "Admin" and click on it.



Scroll down the menu next to the item "GenSt", click on it and select "Uart Adr." and set it to 1 on the first exciter (the lower) and 2 on the second (if present).



We must now set the address on the CCU, which must be absolutely 3 (this address is already set to factory).

From the main menu (the one that shows the direct and reflected power), press the ESC key and then OK and move the cursor bright, on the "Settings" menu and press OK. Select the line "Talk Address" and press OK, with the UP 'and DOWN keys' set the parameter 3.



10.14.1 Installing and configuring the PC software

You will need:

- A PC running on Windows 98 or newer (the software has been tested with 98, NT, 2000 and XP)
- The “Telecon 32bit” CD ROM, provided with the machine
- DB9 pin-to-pin cable long enough to link the PC to the TLC5KPS

Insert the CDROM in the PC, browse and executethe program setup_telecon.exe.

Follow the instructions on screen to install the software on your PC.

Then run the program Station_upgrade.exe, which will update the list of stations.

Follow the instructions on screen to install the update.

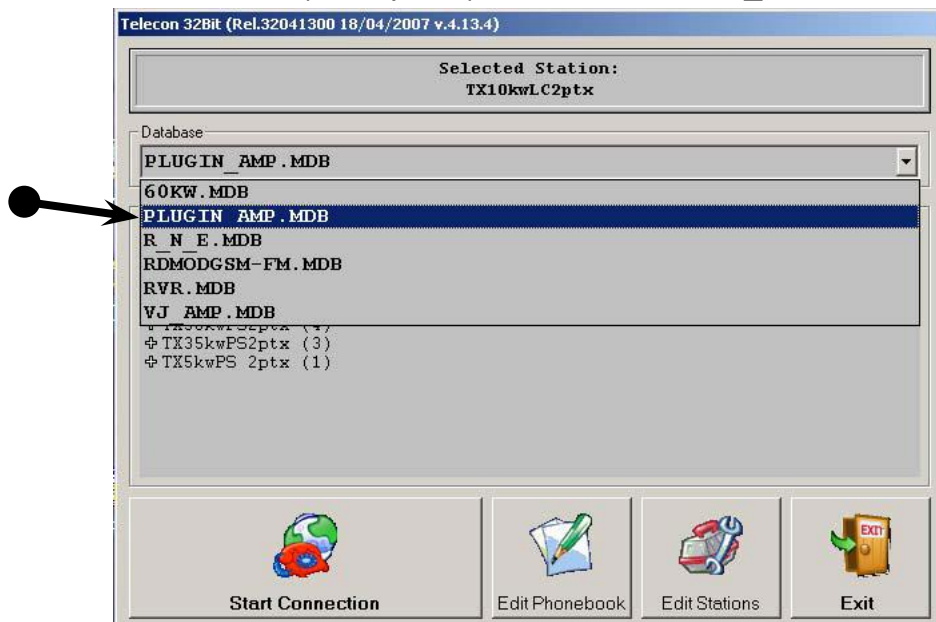
Please note that if you already have an installed version of the Telecon32bit software, the new software will just upgrade it and will not affect you installed station database.

WARNING: The transmitter must be in REMOTE otherwise there can't be connected to the telemetry.

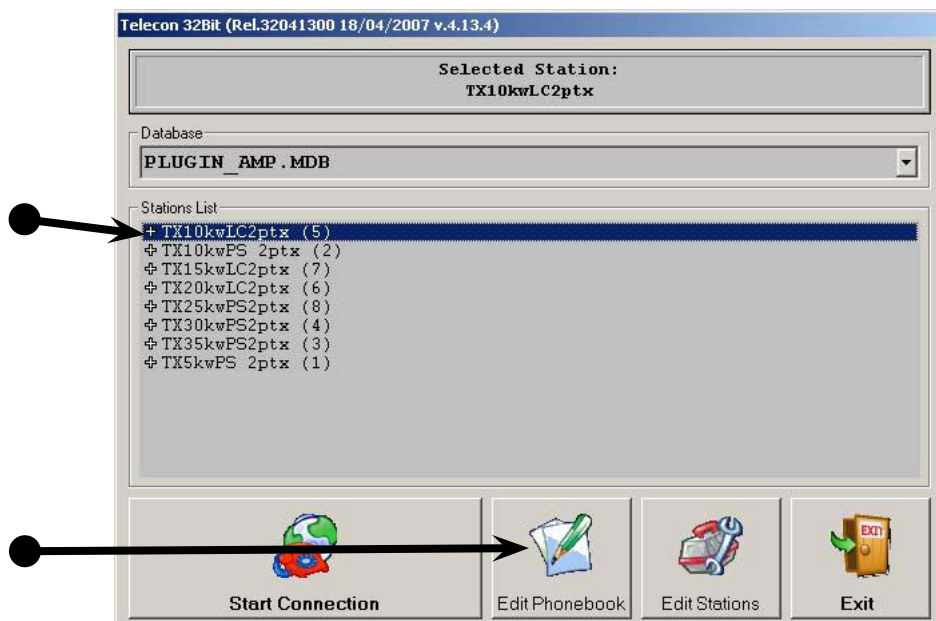
Launch the Telecon program: Start -> Programs -> Telecon 32bit

You will be presented with the database selection screen.

On the Database combobox (the top line), select the PLUGIN_AMP.MDB database.



Then select the station TX10kwLC2ptx station and click on “Edit Phonebook”.



This will open the following screen

The first time will need access to the telemetry via the DB9 cable, so you can set the details of the station and telephone numbers to which messages will be sent.

Plug the cable into a PC serial port (for those who no longer have the serial port you can use a USB - RS-232 converter, not supplied), and the other end is connected to the RS232 port of the telemetry (if it has already been added to the bridge between the modem and RS-232 remove)

Set the following parameters:

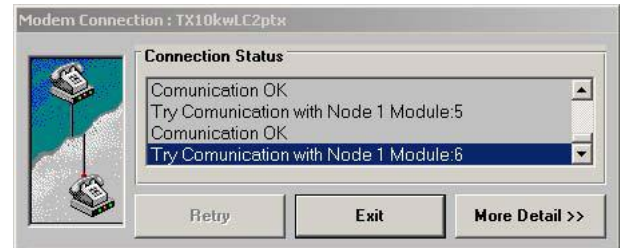
Com: select the serial port in use on the PC (COM1,COM2,ecc...)

Baud: is the speed of the serial port, should always be 9600 otherwise it will you communicate

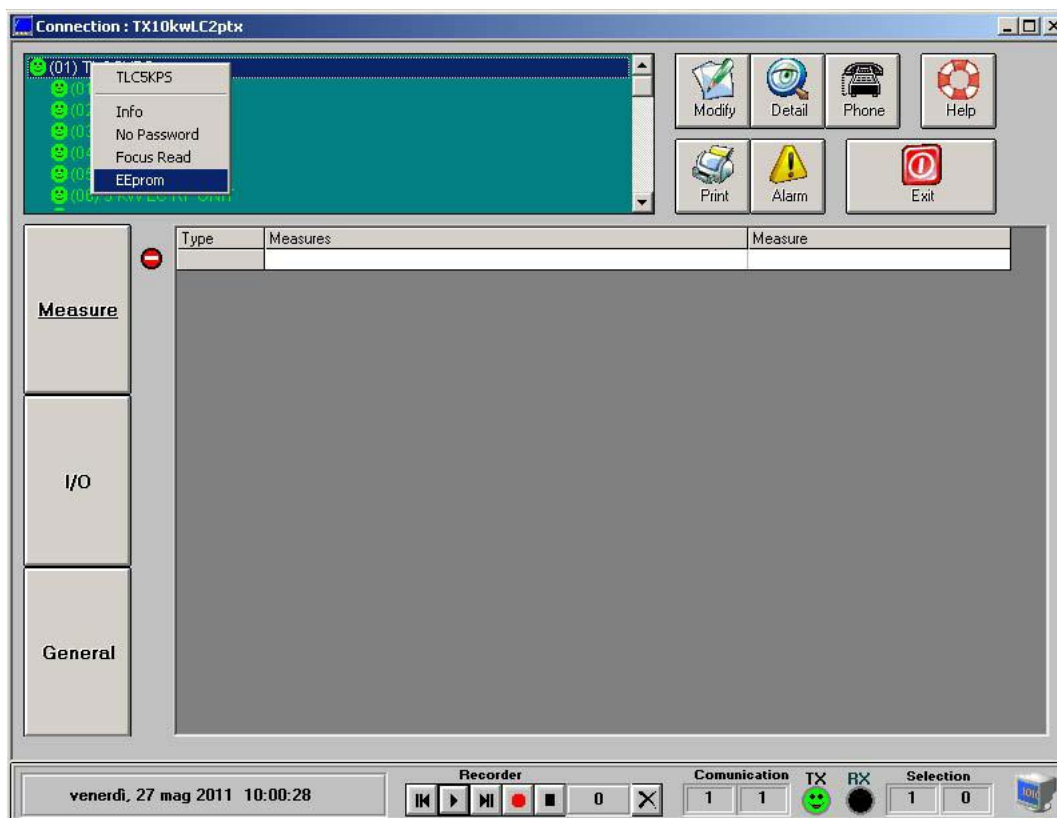
Type: is the type of connection between PC and telemetry, in this case, select "Cable"

Press the button "Return" at the top right and return to the main screen.

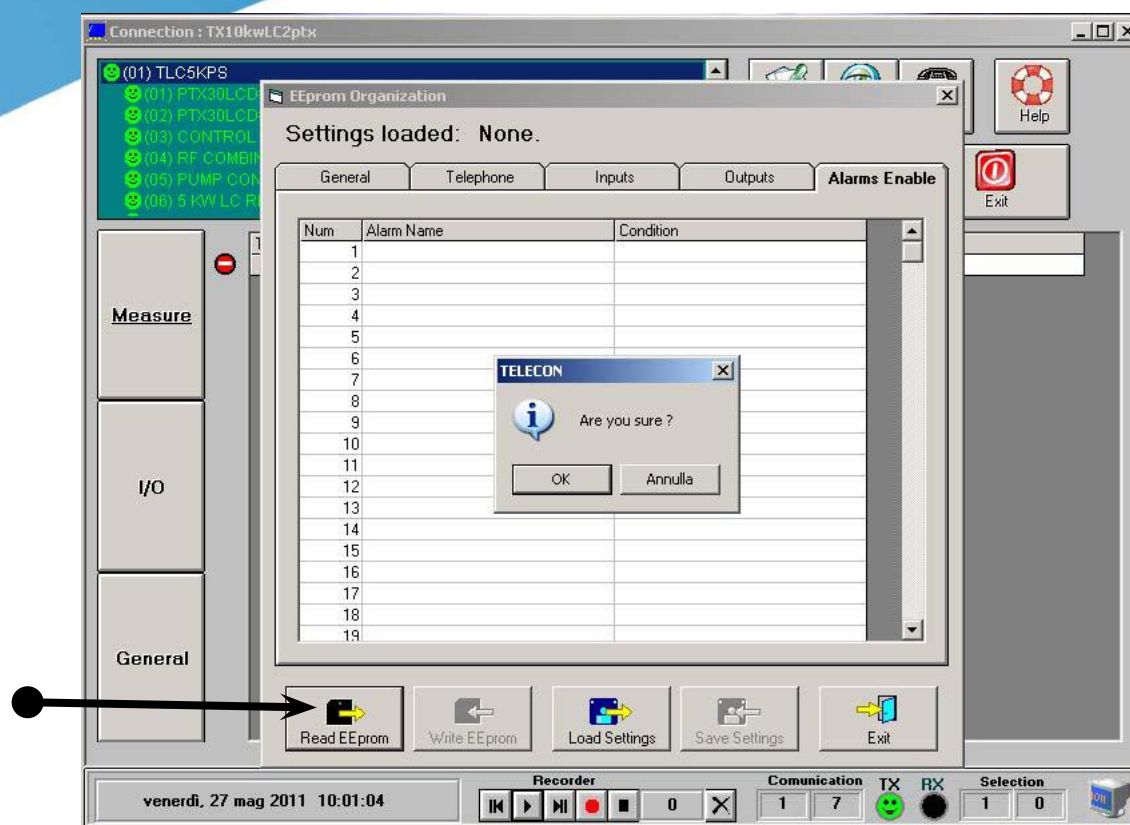
Press the “Start Connection” and at this point will be the link.
This will display the following screen.



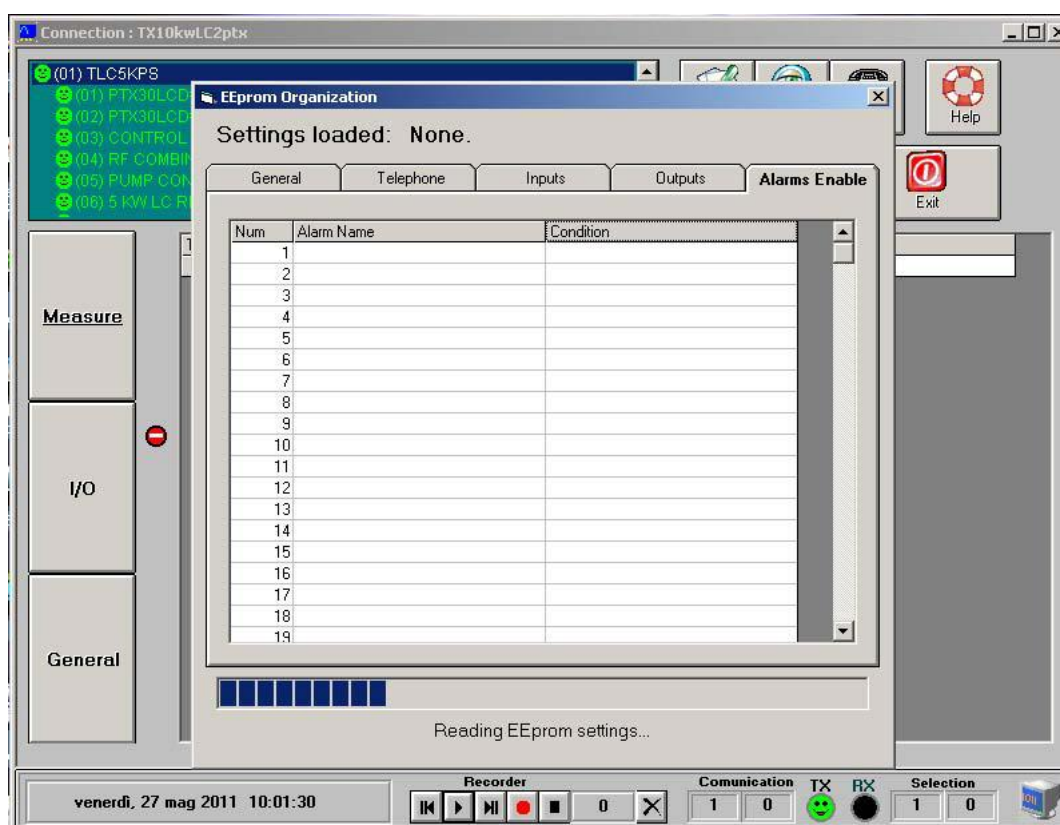
If everything is done correctly it will open the following screen.



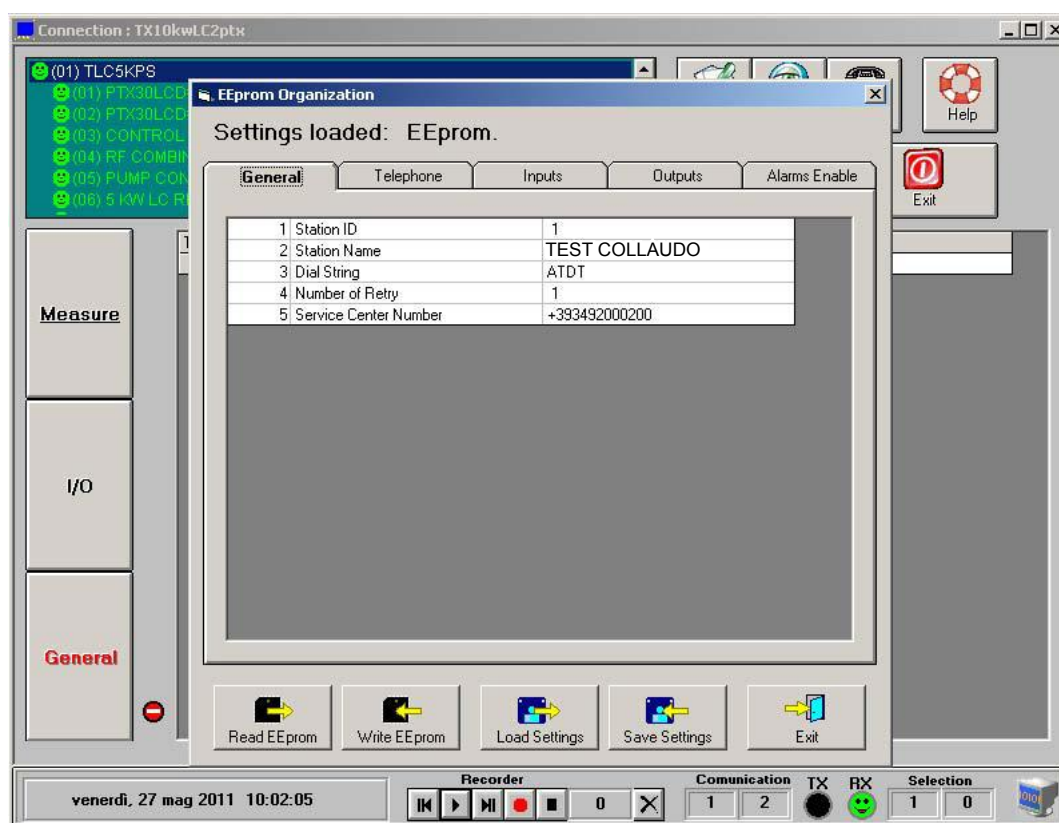
Click 2 times on the top item on the left “(01) TLC5KPS” (in this box are listed all the devices connected to the machine via I2C BUS, in this case we are querying the telemetry) with the left mouse button, opens a drop down menu and click the last entry “Eeprom”.
A screen will open, click on button “Read EEPROM” and the question “Are you sure?” press OK.



Begin reading the data in the EEPROM. The blue squares at the bottom, showing what progress has been reached, the reading of the EEPROM.



When the blue bar is full, you will see the following screen.

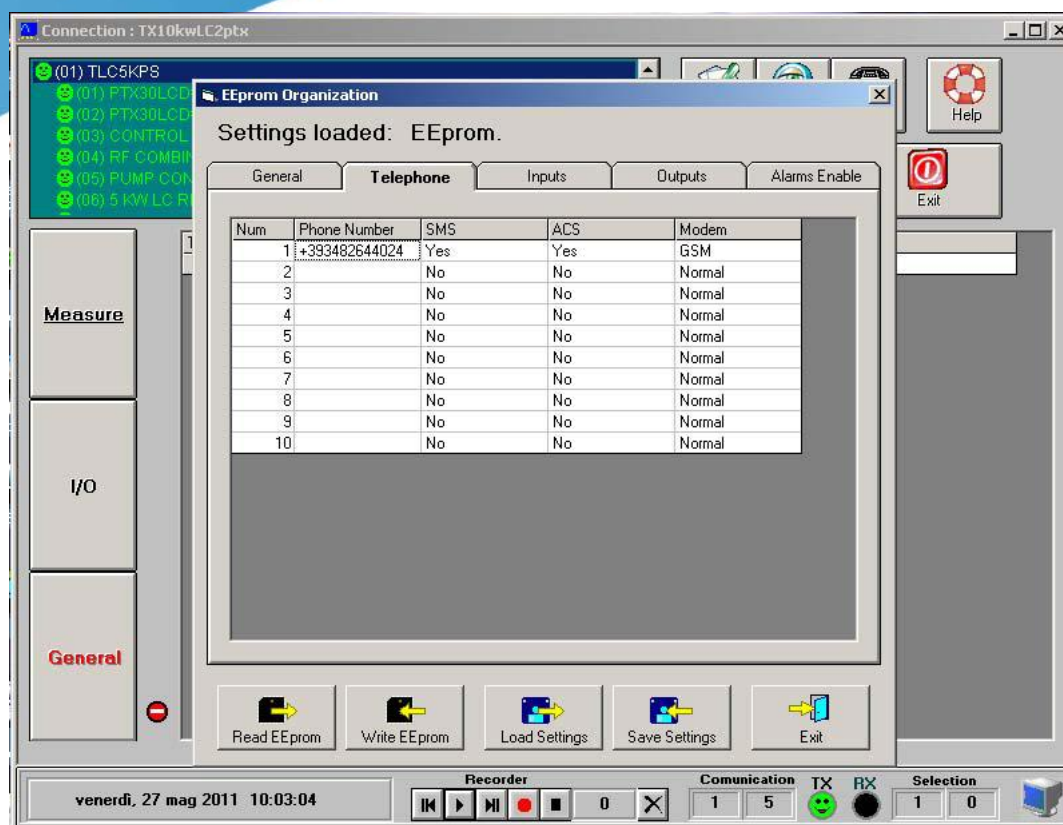


The screen that opens shows the inside pages of different settings, but those that we have to compile us, are the first two, “General” and “Telephone”.

GENERAL

Station ID	Identification of the address of the transmitter, usually 1
Station Name	Mnemonic name of the station, like place or frequency, this name will be displayed in the SMS message you will arrive
Dial String	Normally ATDT
Number of Retry	Number of messages to send. We suggest to set this value to at least 2, in case of problems with the SMS Service Centre.
Service Center Number	Service center number of your mobile operator Note: before the number, there must always be the international prefix of the state where you are eg. +39 For Italy

Clicking on the various fields you can change their values.



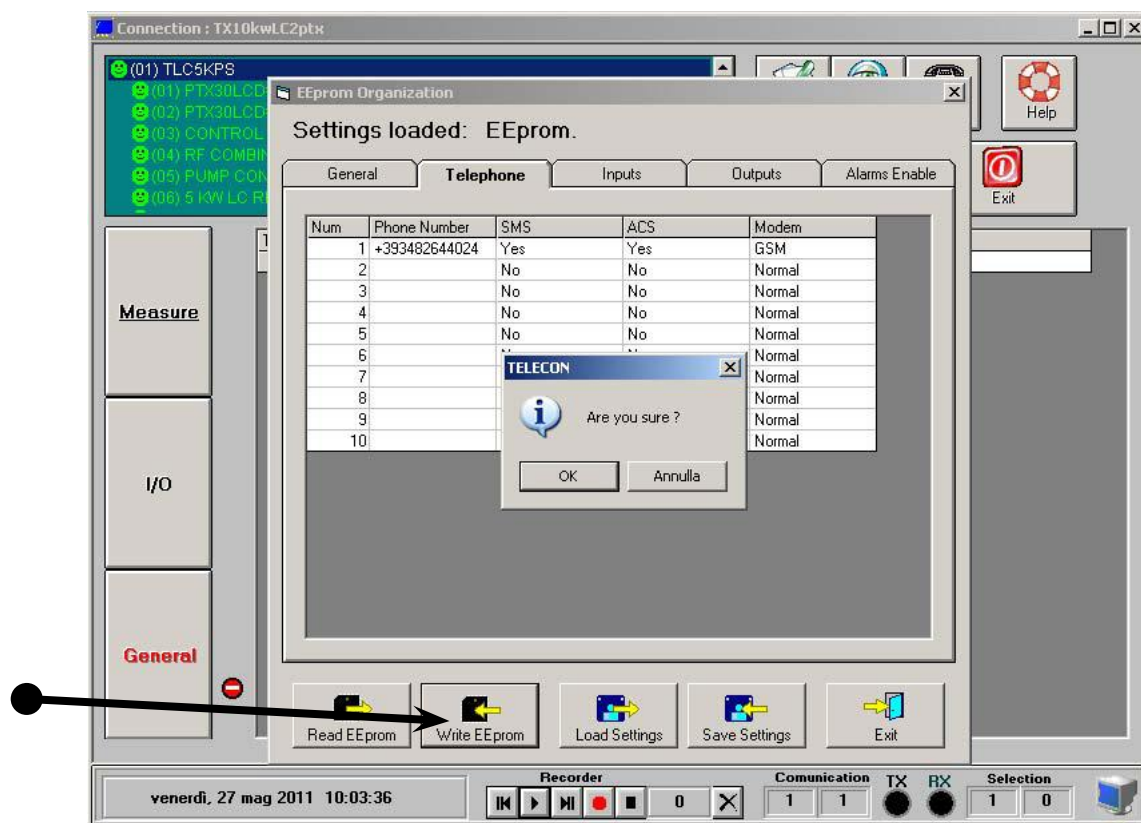
TELEPHONE

1.....10	Memory location where you save the phone number
Phone Number	Telephone number to which messages are sent Note: before the number, there must always be the international prefix of the state where you are eg. +39 For Italy
SMS	Yes: the SMS message in case of alarm, is sent to the number set No: the SMS message in case of alarm, will not be sent to the number set
ACS	Yes: the number set, can be sent to telemetry, via SMS requests for information or modify parameters No: the number set, can not send telemetry, via SMS requests for information or modify parameters
Modem	Select the type of modem used, in this case GSM

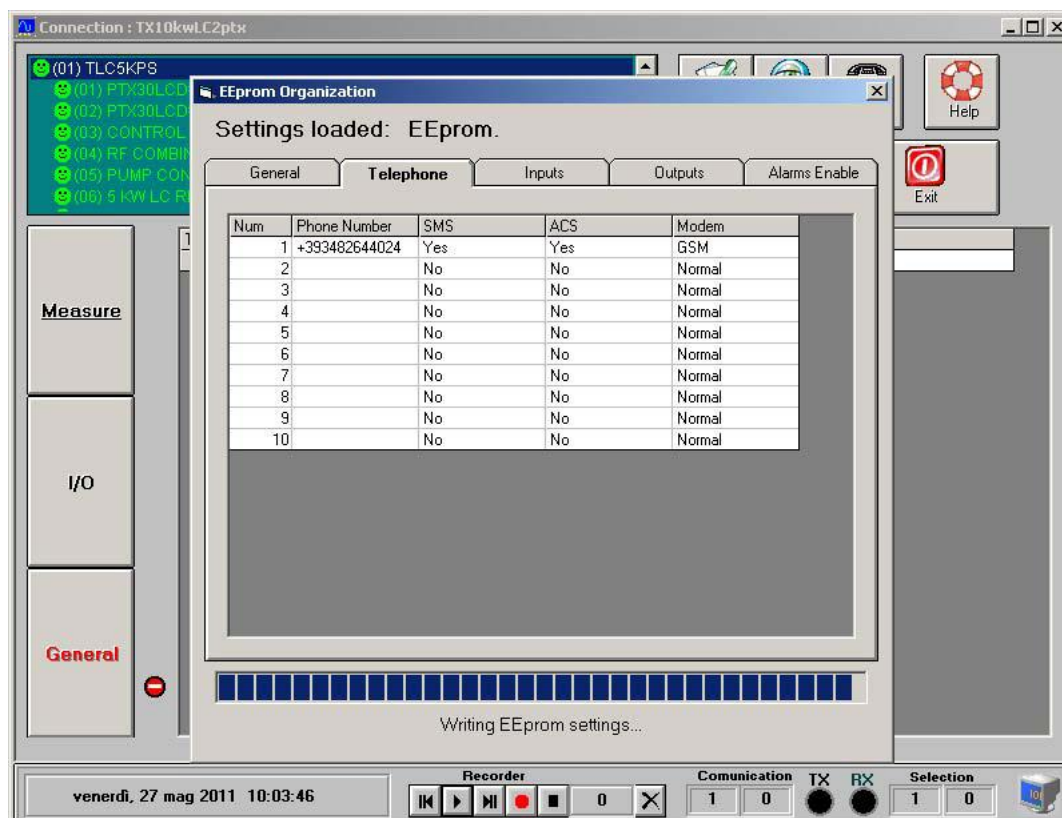
Clicking on the various fields you can change their values.
The possible combinations of parameters SMS and ACS are:

SMS	ACS	
Yes	Yes	OK
Yes	No	OK
No	Yes	Condition not possible
No	No	OK, but the number set will be ignored

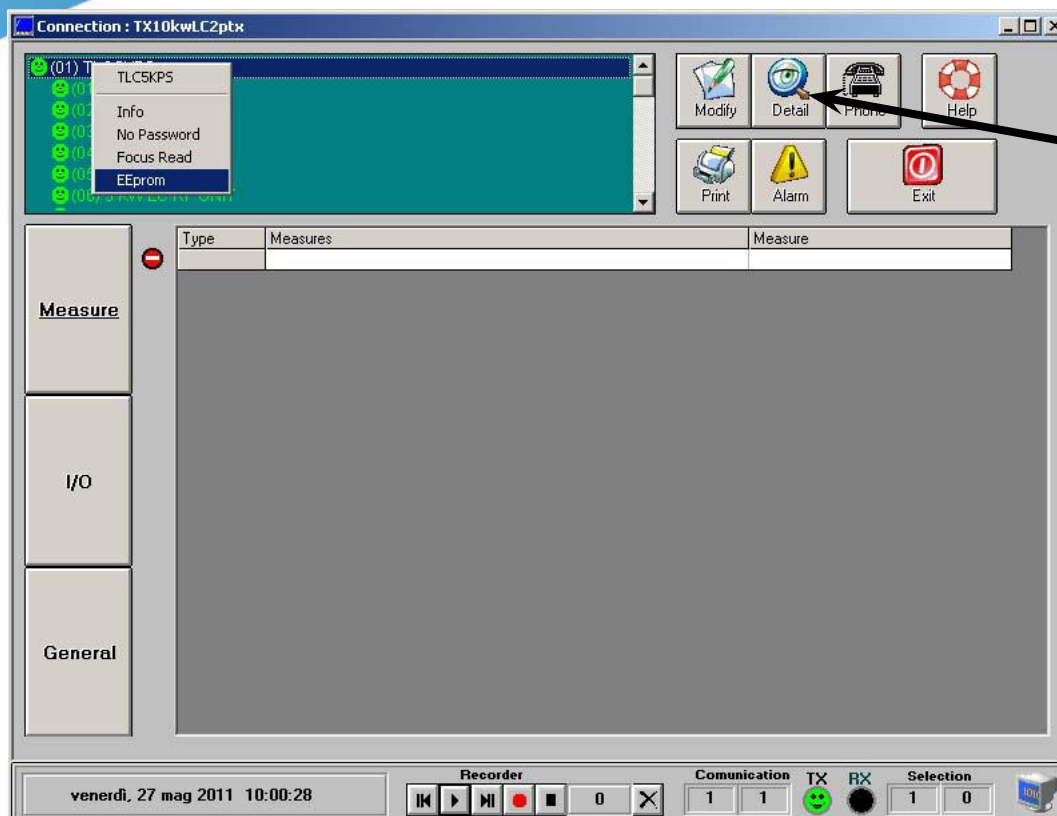
Once completed these settings, click on “Write EEPROM” to write in the memory, when asked answer OK



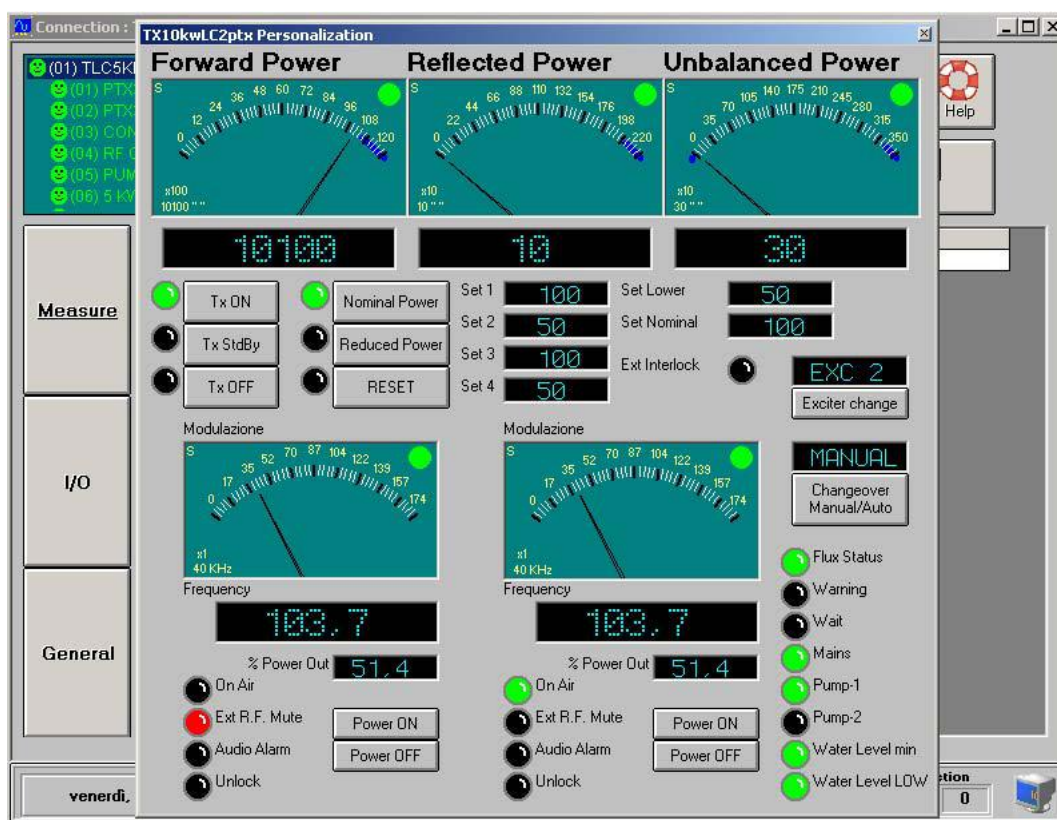
Start writing data into the EEPROM. The blue squares at the bottom, showing what progress has been reached, the writing of the EEPROM.



Once you have finished writing, press the button “Exit” to return to the main screen as well.



Now press “Details” in the upper right and will open the following screen.



Through this screen and possible see all the parameters of trsmettitore as if you were in front of the machine: forward power, reflected, unbalanced, frequency, see the status of the LEDs, you can turn it off, turn it on, reset alarms and exchange the exciters. To exit this screen press the X in the upper right.

Back to the main screen, select the entries in the top left, you can view the parameters of the devices inserted in the machine: eccitatore 1 e 2, control unit, RF combiner, pump control, RF unit 5KW.

On the left side there are 3 buttons: Measure, I / O and General. Each displays different information (not always all 3 are available for all devices).

“Measure” contains all the measures questioned apparatus (eg, measurements of currents, voltages, temperatures, etc. ...).

“I / O” indicates the status of its internal relay system questioned.

“General” contains general information about interrogated apparatus (frequency, forward and reflected power and so on ...).

In the “Measure” and “General”, by moving the mouse cursor over the various lines of information, appears Simble prohibition red, this indicates that you can not change that value.

The only screen where you can change the values, is that “I / O,” in which, positioned over several lines, a blue arrow appears, this indicates that you can change that value. Is possible, always on the “Measure” and “General”, which appears a yellow exclamation mark, this indicates that the relevant measure is outside the range of accepted values.

Example: tab “Measure” PTX

Connection : TX10kwLC2ptx

(01) TLC5KPS
 (01) PTX30LCD#1
 (02) PTX30LCD#2
 (03) CONTROL UNIT
 (04) RF COMBINER
 (05) PUMP CONTROL
 (06) 5 KW LC RF UNIT

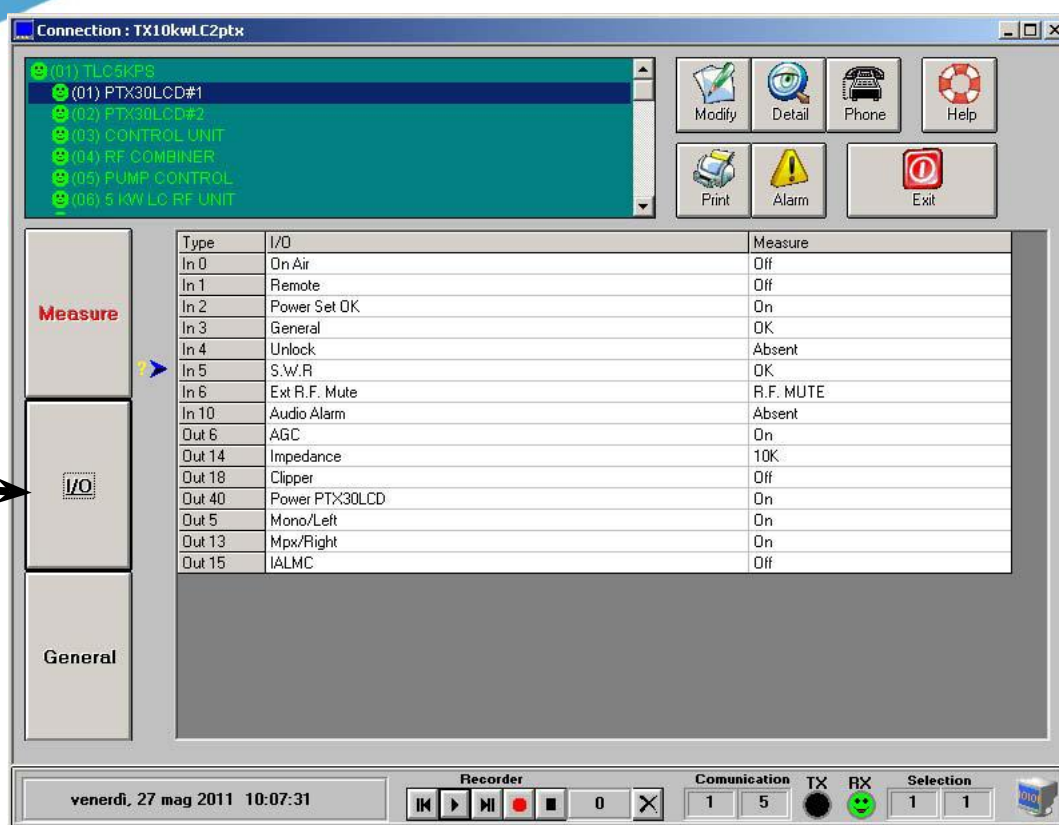
Modify Detail Phone Help
 Print Alarm Exit

Type	Measures	Measure
In 5	RDS	0 %
In 2	Modulazione	40 KHz
In 6	Varicap Voltage	7.33 V
In 7	Negative Voltage	-11.35 V
In 8	LCD Inverter	8.62 V
In 9	Internal 15V	15.25 V
In 10	CPU Voltage 5V	5.08 V
In 13	Pa Voltage	3.91 V
In 14	PA Current	0.04 A
In 17	Dirver Voltage	1.37 V
In 18	Driver Current	0.0 A
In 19	Temperature	26.73 °C
InD 24	External Interlock	RF Muted
Out 0	% Power Out	51.4 %

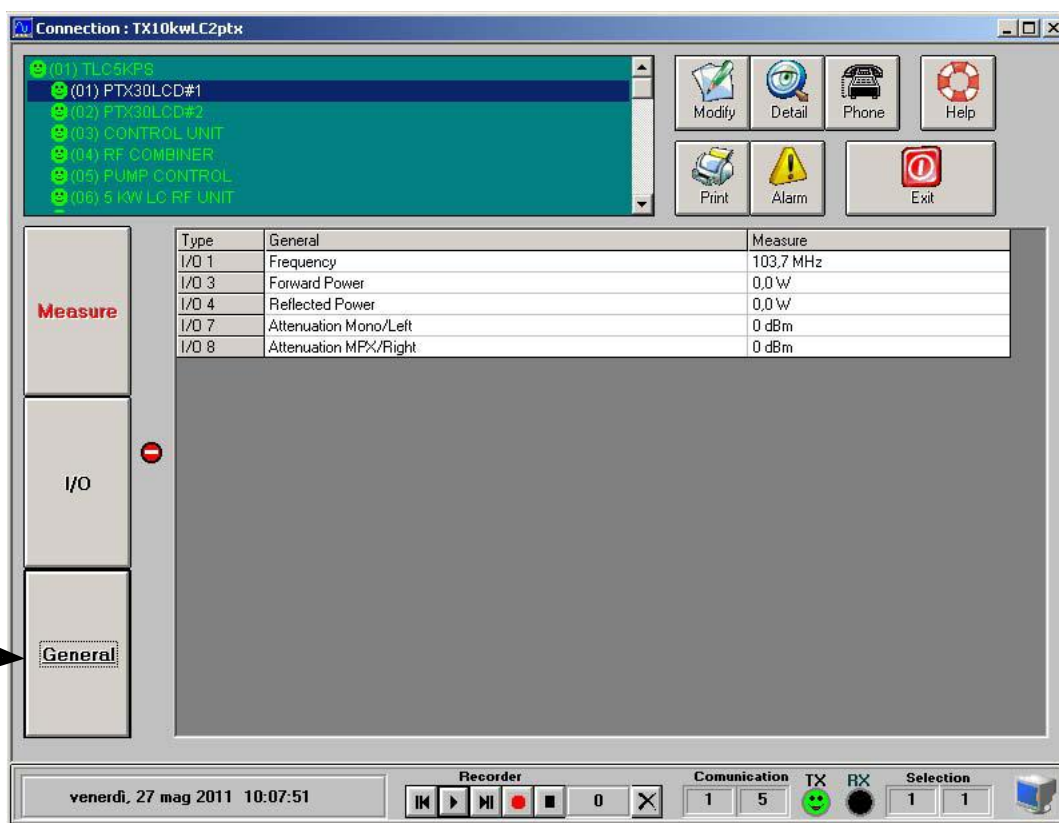
Measure
 I/O
 General

venerdì, 27 mag 2011 10:06:54
 Recorder
 Communication TX RX Selection
 1 2 1 1

Example: tab "I/O" PTX

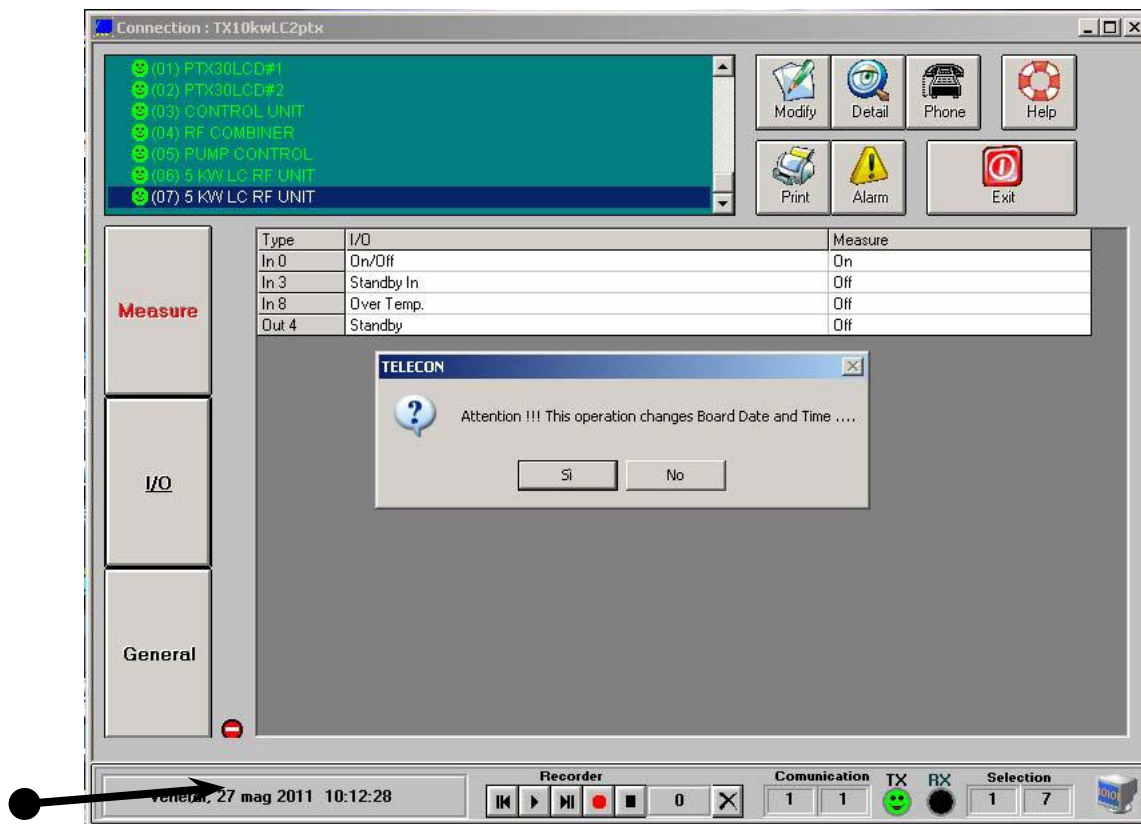


Example: tab "General" PTX

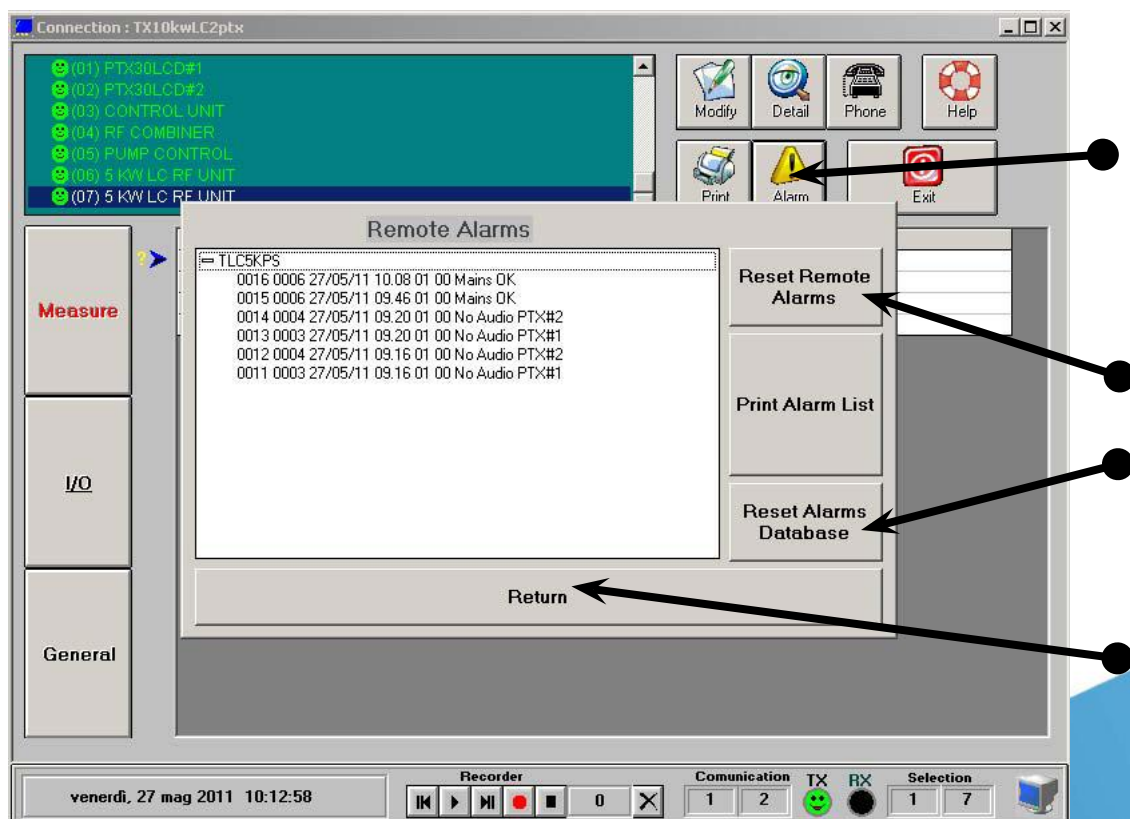


Clicking on the date on the bottom left is possible, write in the telemetry time and date (the same set on computer), so that if there are alarms can be known with precision time and date on which the event occurred.

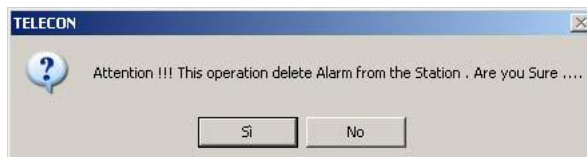
Once you click on the confirmation date is asked to do this, answer “Yes”.



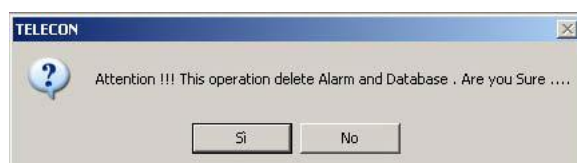
Also from the main screen, clicking on the “Alarms”, a screen opens where you can view the alarms (to display the list, click on the “+” next to TLC5KPS)



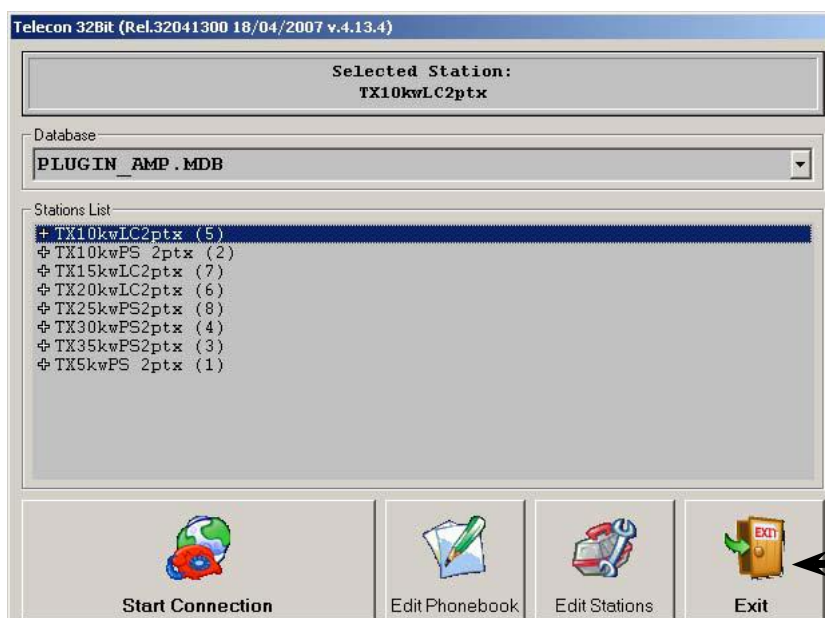
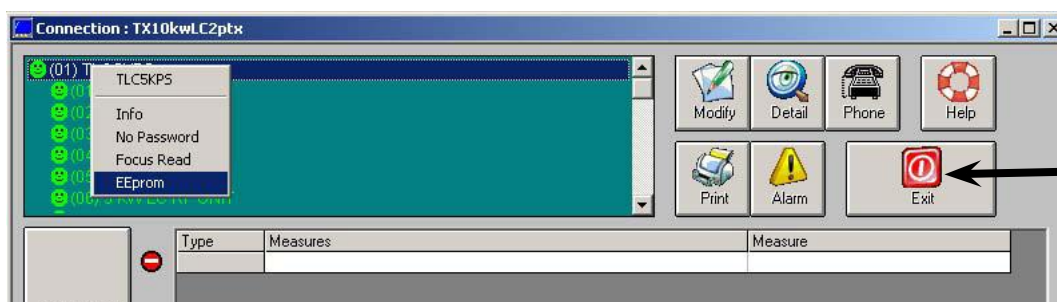
From this screen you can also reset the alarms.
Clicking on the “Remote Reset Alarms” resets the alarms stored in the telemetry.
You will be asked the following question, answer “Yes”.



Clicking on the “Reset Alarms Database” deletes the alarm list on this screen the program.
You will be asked the following question, answer “Yes”.



Click on the “Return” at the bottom to return to the main screen.
Press the “Exit” to return to the selection of the type of transmitter.

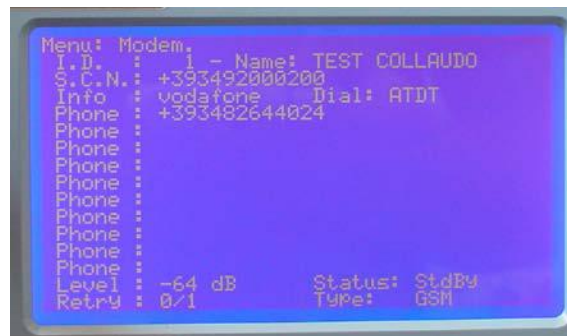


Then disconnect the RS-232 cable by the telemetry, and reconnect the bridge MODEM - RS-232. Now you can connect remotely to the transmitter, using a GSM modem connected to your PC, or via phone to verify that everything works correctly.

Press the “Exit” to exit permanently from the program.

Leave the transmitter in “REMOTE” if you do get warning messages or be able to connect remotely via PC or mobile phone

Checked in the “Modem” menu of the CCU, if where they have been properly stored the data entered (see chap. 5.1.13)



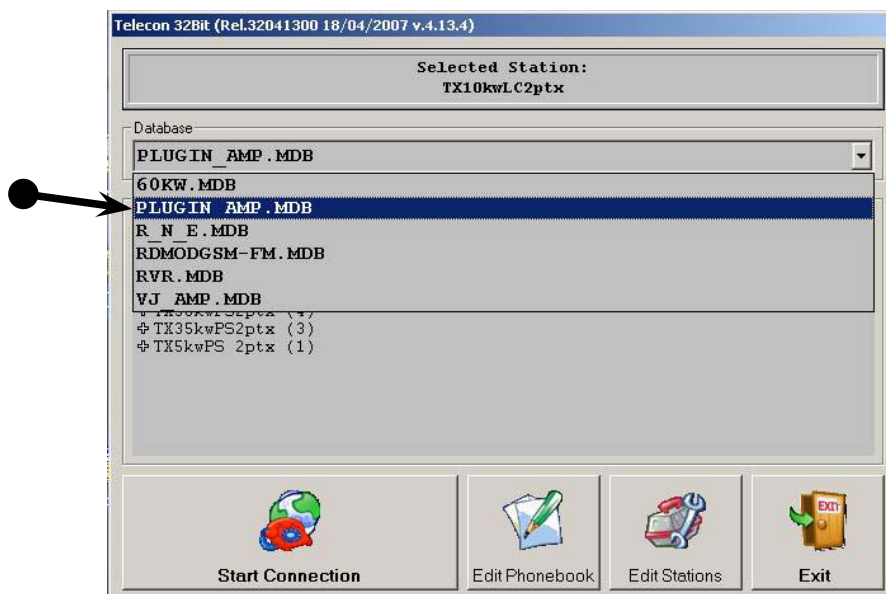
10.14.2 Dial-up via PC

WARNING: The transmitter must be in **REMOTE** otherwise there can be connected to the telemetry.

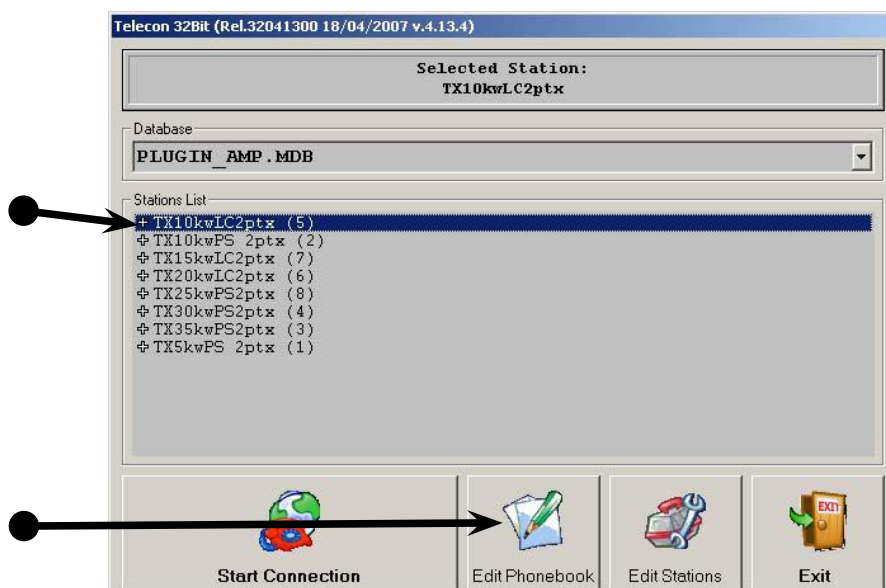
Launch the Telecon program: Start -> Programs -> Telecon 32bit

You will be presented with the database selection screen.

On the Database combobox (the top line), select the PLUGIN_AMP.MDB database.



Then select the station TX10kwLC2ptx station and click on “Edit Phonebook”.



This will open the following screen

Connect the GSM modem to a PC serial port (for those who no longer have the serial port you can use a USB converter - RS-232, not supplied).

Set the following parameters:

Telephone Number: set the phone number of the SIM present in the GSM telemetry, of transmitter, we want to control (**Note: there is always the number in front of the international prefix of the state where you are eg. +39 for Italy**).

Com: select the serial port in use on the PC (COM1,COM2,ecc...)

Baud: is the speed of the serial port, should always be 9600 otherwise it will you communicate

Type: is the type of connection between PC and telemetry, in this case, select "GSM"

Press the button "Return" at the top right and return to the main screen.

Press the "Start Connection" and at this point will be the link.
Now follow the steps previously listed.

10.14.3 Dial-up via mobile

The commands that can be sent to the transmitter using SMS messages are as follows:

Command	Reply	Description
INFO	Station: "station name"- ID: "ID number"- FWD: "value"- RFL: "value" UNBAL: "value" TX On (or TX Off or TX StdBy)- Low Power / <i>Nom Power</i> Audio Present / Audio Absent Alarm Present / Alarm Absent	Information about the transmitter's status
TXON	Station: "station name"- ID: "ID number"- TX is On -	Switching on the transmitters
TXOFF	Station: "station name"- ID: "ID number"- TX is Off -	Switching off the transmitters
LOWPWR	Station: "station name"- ID: "ID number"- LowPwr OK-	Low power setting
NOMPWR	Station: "station name"- ID: "ID number"- NomPwr OK-	Nominal power setting
ALARM	Station: "station name"- ID: "ID number"- Alarm: "List of the alarms in memory"-	List of the alarms in memory
RESET	Station: "station name"- ID: "ID number"- ALARM RESET OK-	Resetting the alarms in memory

Every time you send a command must always return back a reply message, to confirm that the command was received and executed.

The reply message may arrive within a maximum time of 5 min. After this time the command is void.

These commands can be sent only if the telephone number used is in memory of the telemetry and the parameter "ACS" is set to "Yes".

WARNING: The transmitter must be in REMOTE otherwise not receive any command.

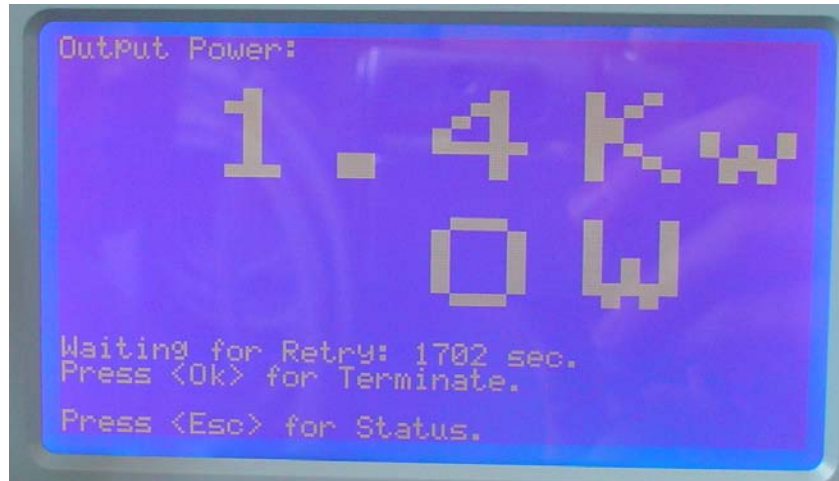
10.14.4 Alarms

These are the alarms that the transmitter can send:

1	Foward Power	The power has dropped below the value set in PWG2 (menu settings of the CCU)
2	Reflected Power	The power has risen above the value set in PWG4 (menu settings of the CCU)
3	Unbalanced Power	The power on the dummy load has exceeded the 3500 W
4	No Audio PTX1	No audio input to PTX1
5	No Audio PTX2	No audio input to PTX2
6	Mains Fault (solo se è presente l' UPS)	Is no longer the power supply, the transmitter is turned off, the UPS takes on the logic control, modulators and telemetry
7	Water Level Min	The liquid in the tank has reached the minimum level - Refill as soon as possible
8	Water Level Low	The tank is empty, the transmitter is turned off - It 'requires operator intervention
9	Flux	There is no flow of fluid in the circuit, the transmitter is turned off and start the automatic exchange pumps - It 'requires operator intervention
10	Mains OK	It is not an alarm, is sent the first time you turned on the telemetry or when the mains voltage returns

10.15 Derating of the system

In case of failure of one of the two modules of 5 kW, which implies unbalanced power over 1500 W for a time longer than 1 min., si attiva la procedura di “Derating”, it turns on the “de-rating”, which leads to a lower power output from the transmitter, to a value of about 1400 W.



This state persists for 1800 sec. After this time the CCU restores the nominal power. If the unbalanced power, still exceeds 1500W, the derating procedure is repeated. If you do not want to wait until the time of the procedure, press “OK”.

11. Installation

11.1 Transmitter connection

First check that the apparatus has not been damaged in transport.

Verify the integrity of the mechanical parts and control that these not been left at the mercy of climatic agents.

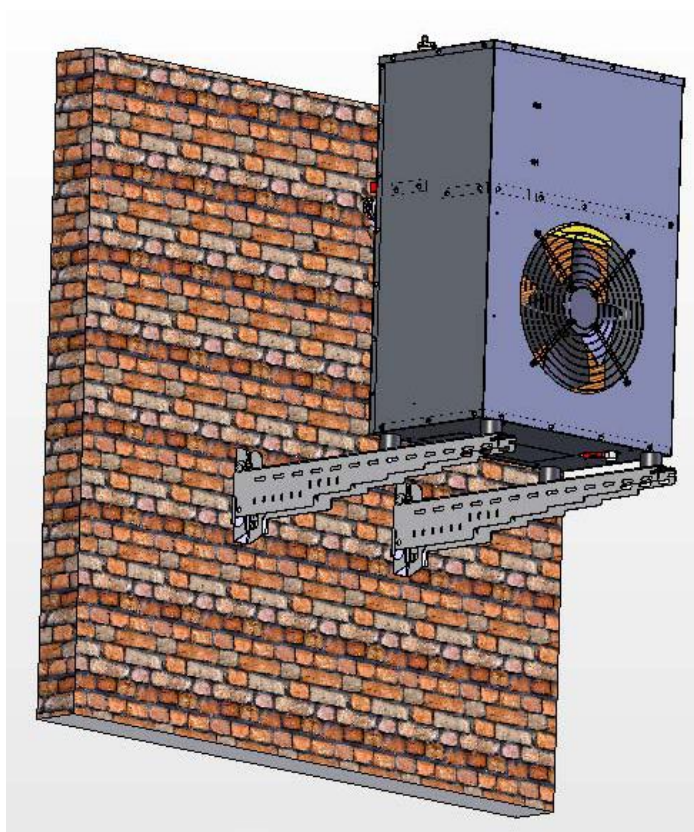
Once removed the packaging protections, place it in the position you want it to run.

Fix on the floor with the screws (x4) positioned in the corners at the base of the rack.

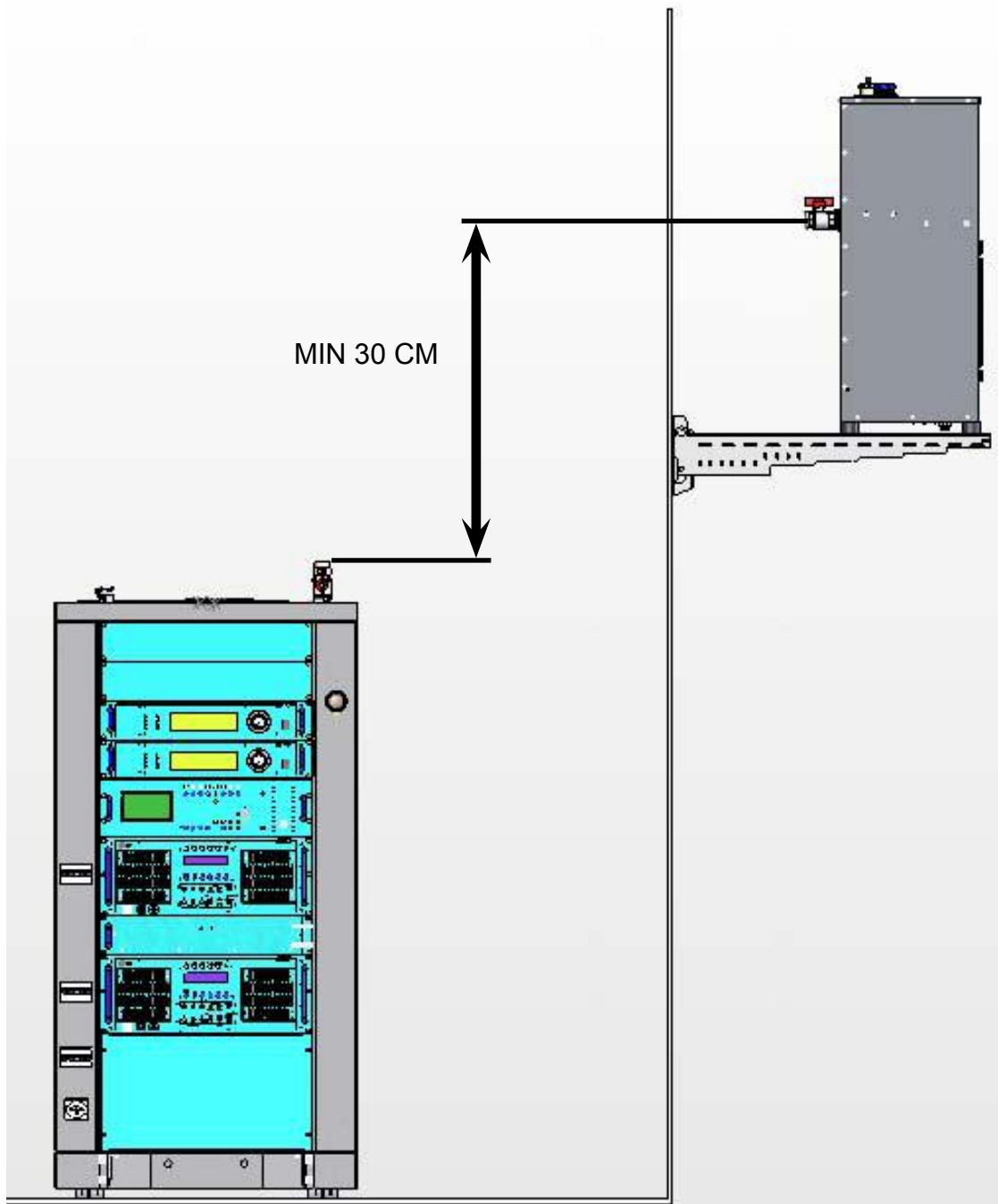


Climb the external cooling unit ensuring the brackets to the wall in a convenient location to connect the hydraulic hoses and electrical connections from the apparatus.

Supplied to the radiator are provided two brackets that can be used for the purpose.



IMPORTANT: when climbed the radiator make sure that the height of the inlet and outlet of the liquid, are always at least 30 cm higher than the pipes placed on the top of rack. In addition, the tubes must always follow a path down, and never, up. This is let to facilitate the loading of the liquid and to create a smooth flow.



After mounting the radiator to connect pipes from the outdoor unit for cooling liquid and remember to put the gasket provided on the transmitter.



Photos with gasket mounted



For the connection of the tubes respect the blue and red, on the outdoor unit are marked with colored sheath for the identification.



Make sure that the tubes that leave from the outdoor unit, proceed up the transmitter always down to facilitate the loading of the liquid. It may be recommended to mount the cable tray.

On the transmitter always observe the color red and blue.



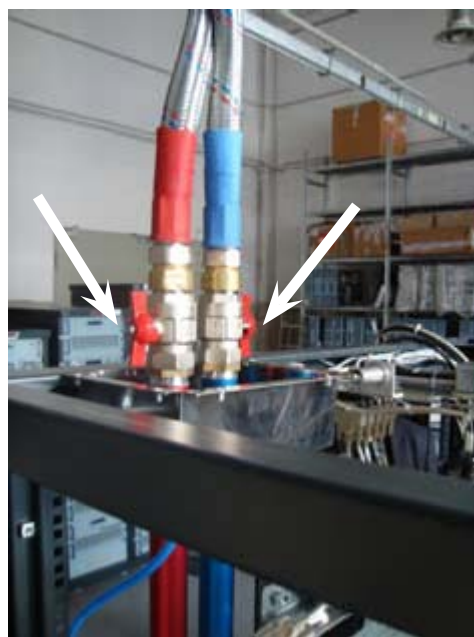
Once connected to the tubes, connect the two power cables from the outdoor unit to the top of the transmitter, you can not reverse because they are both male-female. The two wires are interchangeable as they are pin-to-pin. These cables are used to bring power to the radiator fan and the signals of the level of liquid in the tank.
Photos of the connection of external unit.



Photo of the cable connection on the transmitter.



Be sure to open the taps and removing the cap of the vent valve of the outdoor unit.
Fill the liquid tank of external unit.



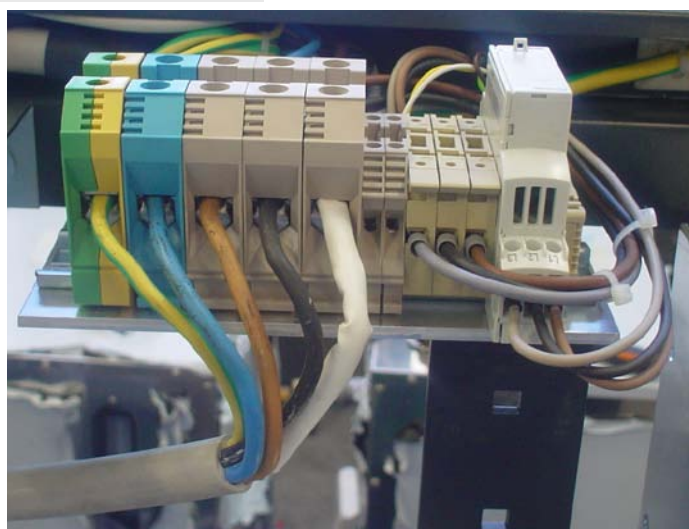
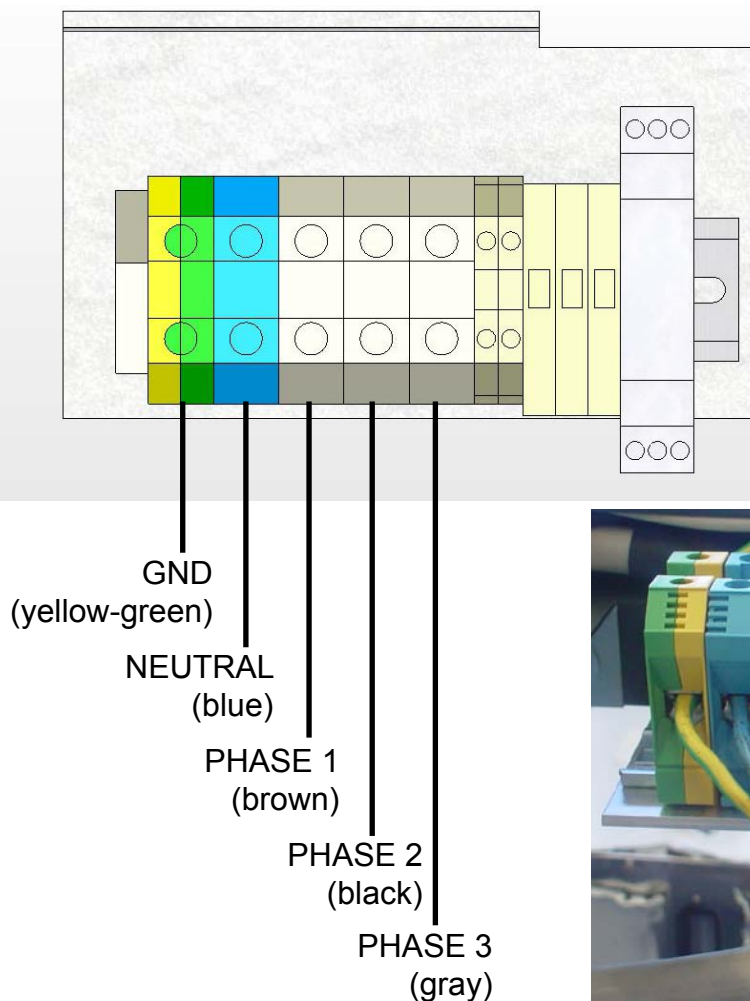
On the cooling unit is a placed level indicator, when there is no liquid, the red float, it will be on a low level.



When the red float will be red on an high level, it means the tank is full.



Open, on the top of the machine, the cover in order to access to the input terminal block and connect the power supply (make sure it's the same with which the machine has been created, threephase 380 or threephase 220, 50 or 60 Hz, otherwise it could seriously damage).



CAUTION: The connection of the machine to the electric alimentation is performed fixing to a 5 poles cable with bare terminals to a terminal block. Making sure without any possibility of error that the cable is not under tension while working on it. Always on the top, on the plate connectors, put the VDE bridge or the UPS (opz.) and turn it on, otherwise the control logic will not work.



Once connected the electric alimentation, turn on the automatic services (BRAKER SERVICES) to power the machine.

Check the menu “cooling” of the CCU, the “Mains”, which should be “OK”, otherwise if there is “Alr” means that the RST phases are not in the correct order, to solve the problem simply invert two phases.

At this point we need to bleed the pumps, is necessary to remove the air from the circuit of the liquid, to do this pull the carriage pumps, from the base of rak.



Loosen the bolt located above the two pumps, placing the paper under in order to absorb any liquid outputs (VERY IMPORTANT, DO NOT REMOVE THE BOLT COMPLETELY, BUT ONLY LOOSENED, BECAUSE THE LIQUID, COULD DAMAGE THE MACHINE LOCATED ABOVE THE PUMP),done this it will go out the whole residual air of the circuit.

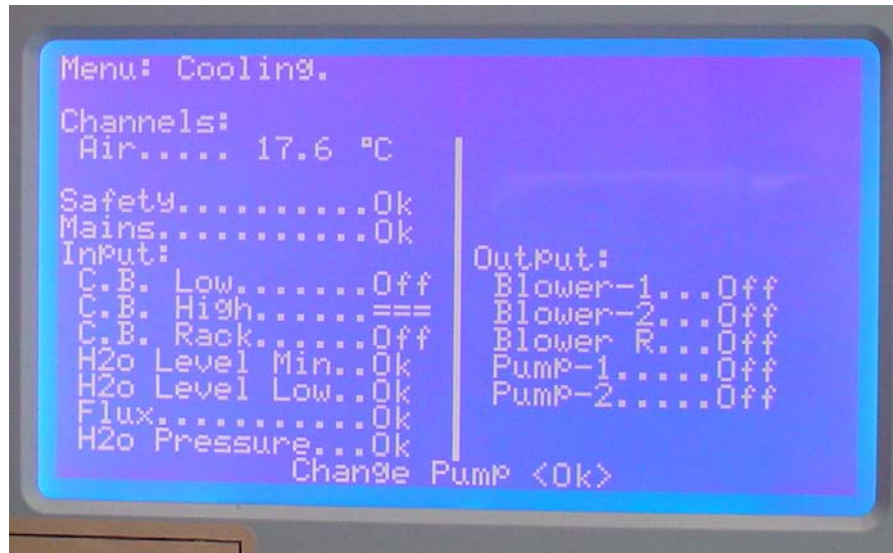


At this point, turn on the pumps: go on and contactors PUMP 1 and PUMP 2 positioned on the electromechanical section, and move the small lever on them to close the contact by pushing alternately, to run well pumps. Try for about a minute and if the flow is not "ok" pause and repeat the procedure loosening the bolt located on the pump and let out air again.



THIS OPERATION HAS TO BE REPEAT MINIMUM 4 -5 TIMES, TO DO THIS HAVE A GOOD FLOW OF LIQUID, IN THE MEANTIME YOU SHOULD ALWAYS MAKE SURE THAT THE TANK IS ALWAYS FULL, OTHERWISE YOU MUST ADD THE LIQUID SUPPLIED.

ONCE THE CIRCUIT IS LOADED CORRECTLY, YOU WILL SEE COOLING IN THE MENU, THE FLOW WILL BE GIVE YOU "OK" AND THE TWO LEVELS OF THE TANK WILL BE "OK".



Once loaded well liquid circuit turn left for 30/40 minutes without power, to remove any air bubbles and constantly check the fluid level in the tank of the radiator and add if necessary. Remember to close the cap of the vent valve external unit. Connect the antenna cable.

The coolant can be supplied with the machine:

- AGIP ECO PERMANENT

The following are the technical characteristics of liquid.

11.1.1 Datasheet coolant



AGIP ECO PERMANENT

AGIP ECO PERMANENT is a biodegradable, Nitrite-Amine-Phosphate free product, easy-use for direct application, i.e. without dilution with water, as a coolant in the radiator systems of all types of vehicles, including heavy trucks. To obtain the full advantages of the high performance of this product, it is advisable not to mix it with other types of antifreeze.

CHARACTERISTICS (TYPICAL FIGURES)

AGIP ECO PERMANENT

Boiling point	°C	108
Freezing point	°C	-40
Colour	-	turquoise
Mass density at 15°C	kg/l	1,078

PROPERTIES AND PERFORMANCE

- AGIP ECO PERMANENT has a very low freezing point, which means that it can be used in all types of climate, all the year round.
- It is a long-life fluid which remains stable during storage as well as in use. It can therefore remain in service for long periods without having to be changed.
- It is not acidic, and so does not damage metals, even those most readily affected, such as aluminium, copper and soldering alloys.
- Its considerable alkalinity reduces any tendency towards corrosion, even after long periods of service.
- Its special anti-rust properties prevent damage to any ferrous metals with which it comes in contact.
- The special formulation prevents scale formation in cooling system components, even at high circulation velocities.
- Antifoaming properties also contribute to good heat exchange between the fluid and cooling system components, even at high circulation velocities.
- It does not cause swelling in rubber components of cooling systems.
- It has a high boiling point which ensures continued performance even under severe service conditions.
- Its inherent anti-cavitation properties, either in the pump or in the cylinder block, make it particularly suitable for applications where cavitation is likely to be a problem, e.g. in high-power engines, in cooling systems with high circulation velocities, or in diesels where vibration can cause problems.

SPECIFICATIONS

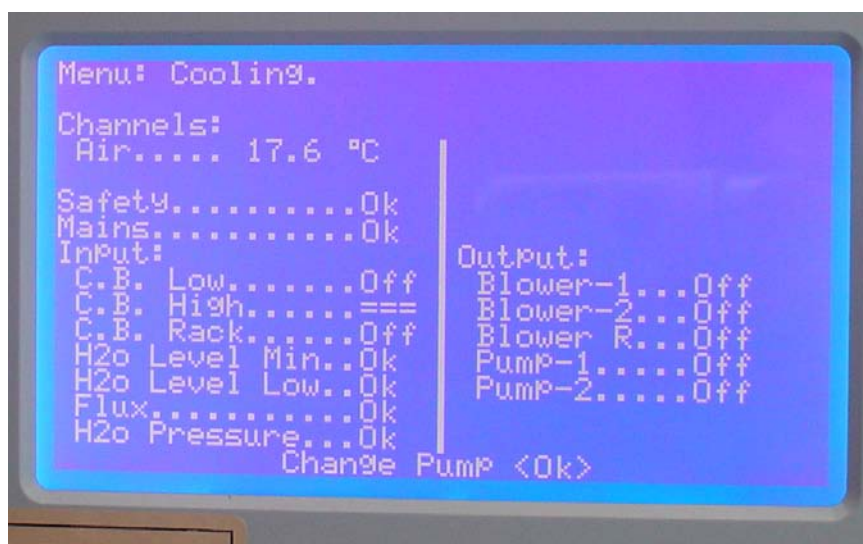
AGIP ECO PERMANENT meets the requirements of the following specification and tests:

- ASTM D 3306, general performances
- ASTM D 2570, simulated service corrosion test
- ASTM D 4340, aluminium corrosion under heat-rejecting conditions
- BMW 291-A, sludges and corrosion test
- CUNA 956-10, rubber compatibilità
- Maserati

11.2 First start in power

After loading the circuit of the liquid and the air removed, checked that everything is OK in the menu Cooling and connected the antenna you can go on power.

Putting exchange exciter in manual (press the corresponding button on the front panel of the CCU, thus turning on the LED MANUAL) and make sure the two ptx are zero power, and set the correct frequency. Set Tx ON, check in the menu Cooling if the pump is turned on and the indication Flux it's OK.



Go in the settings menù and set the power to the desired value, ex. 10Kw.



Verify that the 5 Kw modules are ON and that the internal power supplies generate a VPA voltage of 20 volts (RF menu Units 01-02)



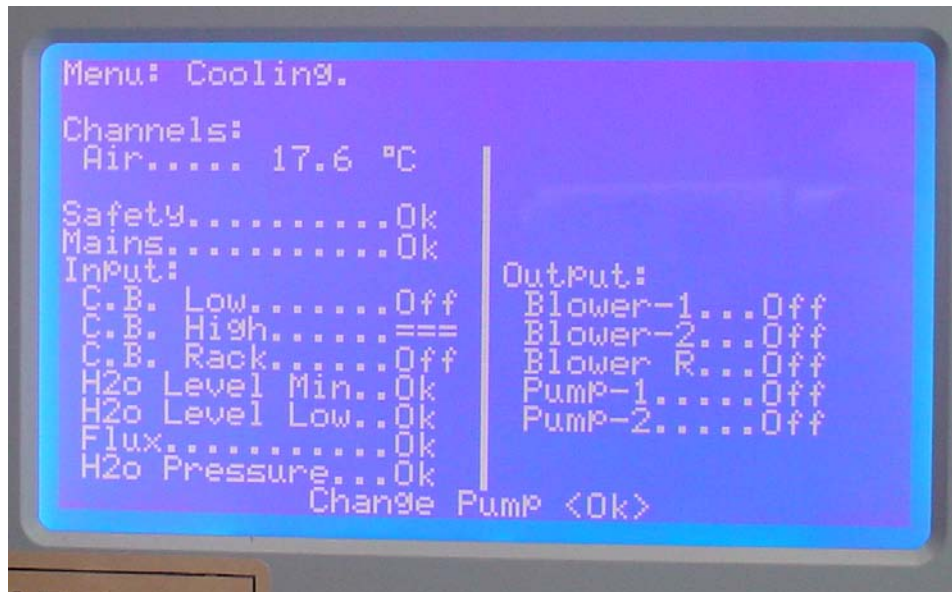
Then go to the Service menu, get power for exciter 1 to about 10-12 watts of excitement and you will see that the modules will lead to a power of 750-800 W for about 15-20 seconds, then will rise, the VPA voltage, from 20 volts to 50 volts, At this point you have unlocked the power supplies and if there are no problems of ROS or FOLDBACK, the modules of power will rise the power until they reach the power set in the Settings menu over 2 / 3 watts to keep the saturation of amplifiers foldback.



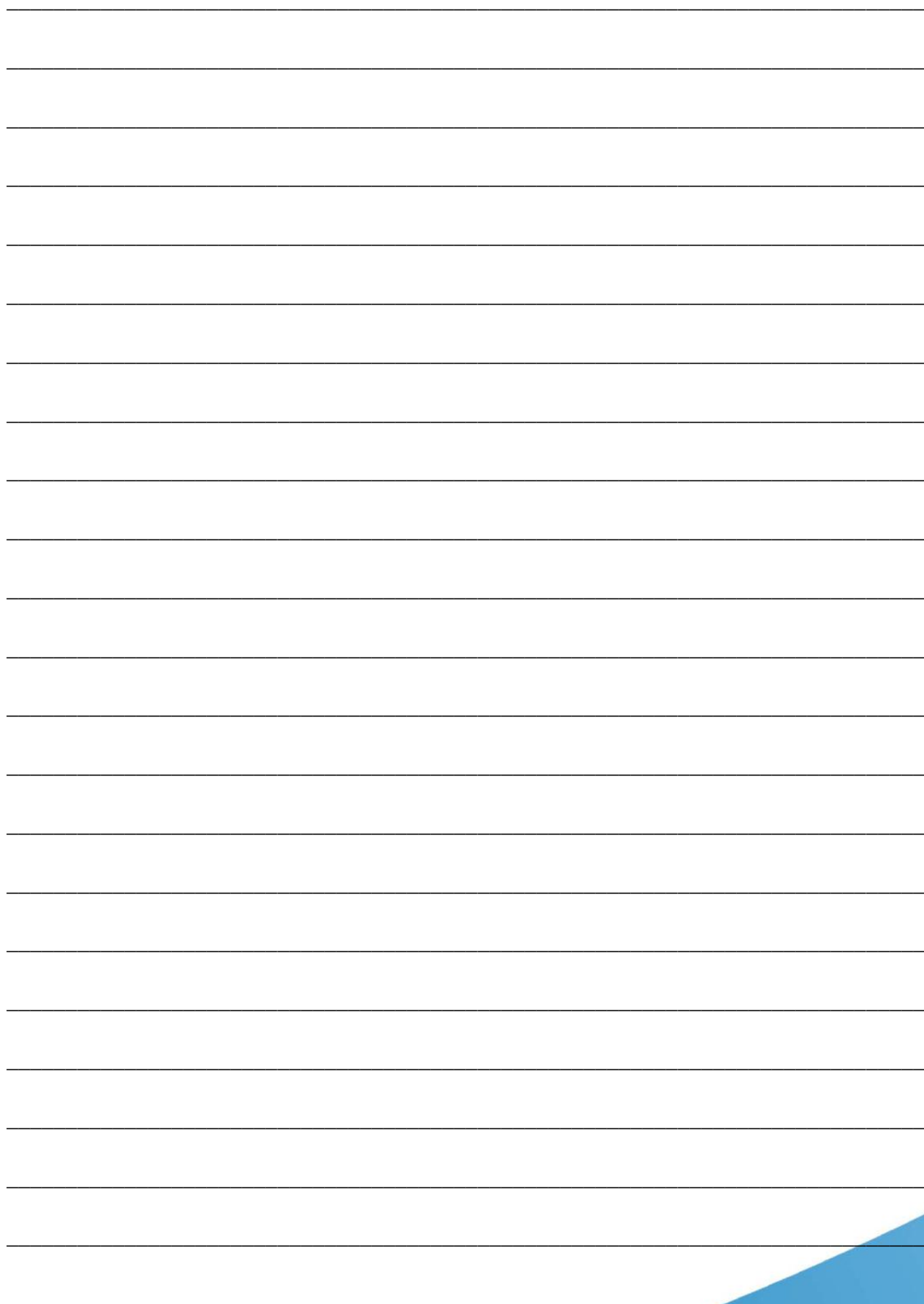
Remember to check that the parameters match the test card, attached to the machine. If there were significant differences it may be that the antenna or the filter cavity are incorrect. Once the machine arrived at the power set and everything is ok, go on the trimmer on the front panel of the individual amplifiers (PWR ADJ located between the LEDs) and set it up as the single amplifier down of 50 watts, In this way, even in situations of power surges the machine will not go up ever. Set the exciter 2 at the same power of exciter 1, if present. Set exciter exchange automatically, even if only one exciter. Put the final in REMOTE if you want to operate the GSM Telemetry (if installed). If there is too unbalanced power on the dummy load inside the machine, operate on Phase ADJ control on the front panel of the CCU (see Chap. 5.3 for explanation). Check that the parameters of the machine remain stable.

11.3 Ordinary maintenance

Check once every two months that the liquid in the tank at the proper level. Indications are displayed in the menu cooling.



If you should have lowered the level, top up with the same type of liquid with which the machine has been supplied.





Revision History

Date	Version	Reason	Editor
23/05/2011	1.0	First version	Nicolini D.
11/11/2011	1.1	Adding information	Nicolini D.
16/04/2012	2.0	New version	Nicolini D.
26/07/2012	2.1	Updated PSL5060 board	Nicolini D.
18/09/2012	2.2	Adding information	Nicolini D.
13/05/2015	3.0	New version of PJ5000U-KLC	Nicolini D.

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