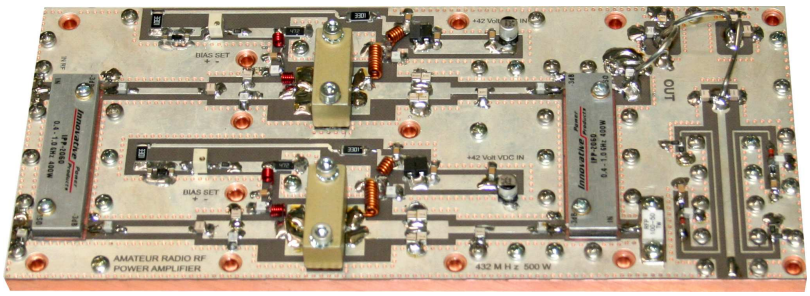
HAM RADIO

RF POWER AMPLIFIER 500 W 432 MHz

- RF Dispositive : MRF6V2300N Freescale
- Frequency Range 430 – 436 MHz
- 7 W Input ± 1dB (@ 500 W Carrier Out)
- Harmonic product ≤ - 75 dBc
- S.W.R. input (@ 432 MHz) ≤ 1.1:5
- Input - Output Impedance 50 Ω
- CW – FM – SSB " JT 65 " Mode
- Vdd 47.5 Volt (Max 48)
- Idd (@ 500 W Out RF) 18 A ± 5%
- Max Temperature Copper Base Plated 60°C
- Coupled with 90 ° hybrid
- Low Pass Filter included
- Directional Coupler included (PWR – SWR)
- Adjustable Bias
- High efficiency (≥ 64%)
- H 24 Service (with adequate ventilation)
- HIGH Quality
- High stability
- Teflon PC Board
- 5.5 mm thickness Copper Base Plated



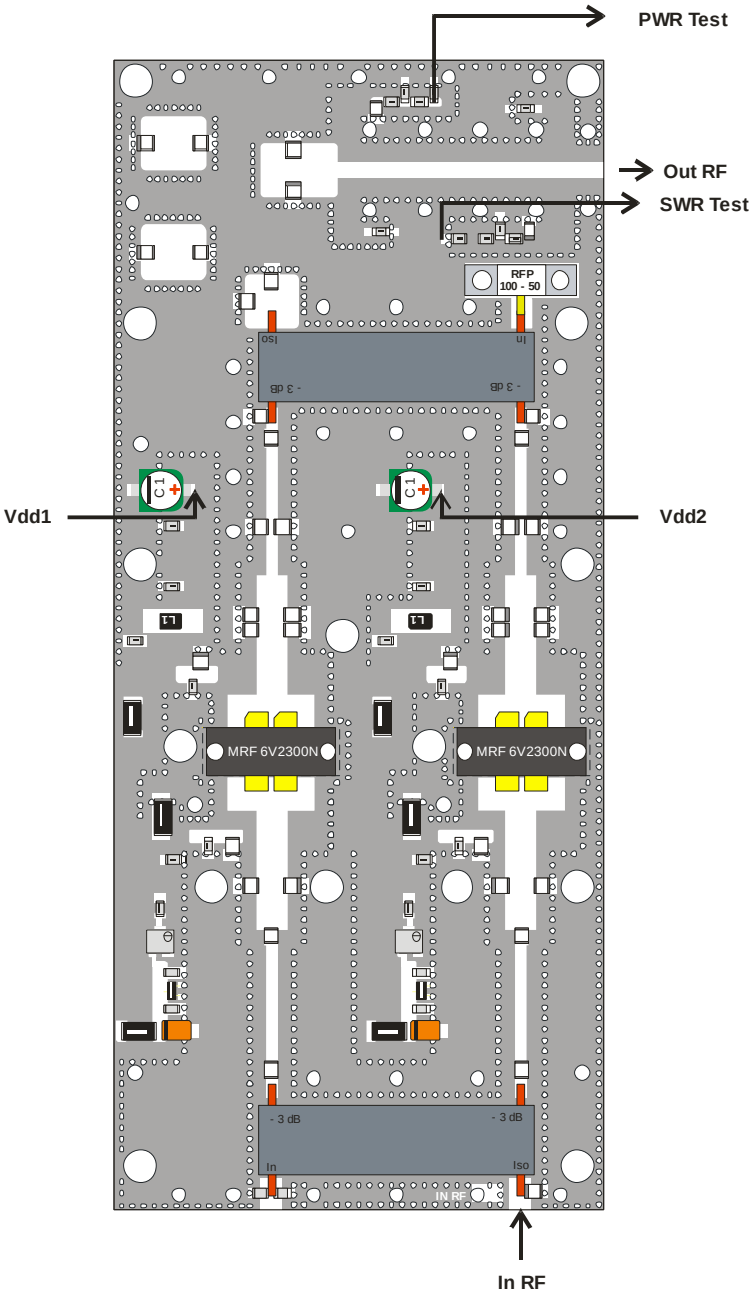
Dimension : 90 X 210 X 25 mm
Weight : ≤ 0.9 Kg

GENERAL DESCRIPTION

Our latest product in the HAM product category is the MD 500P - 432. This pallet performs our variety of the Amateur radio equipments. It has exceptional characteristics and it is technically made up of "in the state of the art".
MD 500P – 432 allows an easy assembling in order to create a complete " SSPA "(Solid State Power Amplifier).
The realization is very simple: a cooler, two fan , a power supply, a simple protection, RF coaxial relays and RF connectors.
Having an high output power, it is recommended to use an adequate low pass filter (LPF).

The module needs to be mounted onto an heat sink able to dissipate about 500W (without exceeding of 50°C temperature compared to the ambient one of 25°C).
The power supplier will produce a well stabilized voltage of 47 - 48 V.
The relative current is 20 A min (Id) with no limitation.
Its high linearity makes it suitable for SSB usage and with an adequate ventilation, it will be also suitable for EME full power.

CONNECTIONS

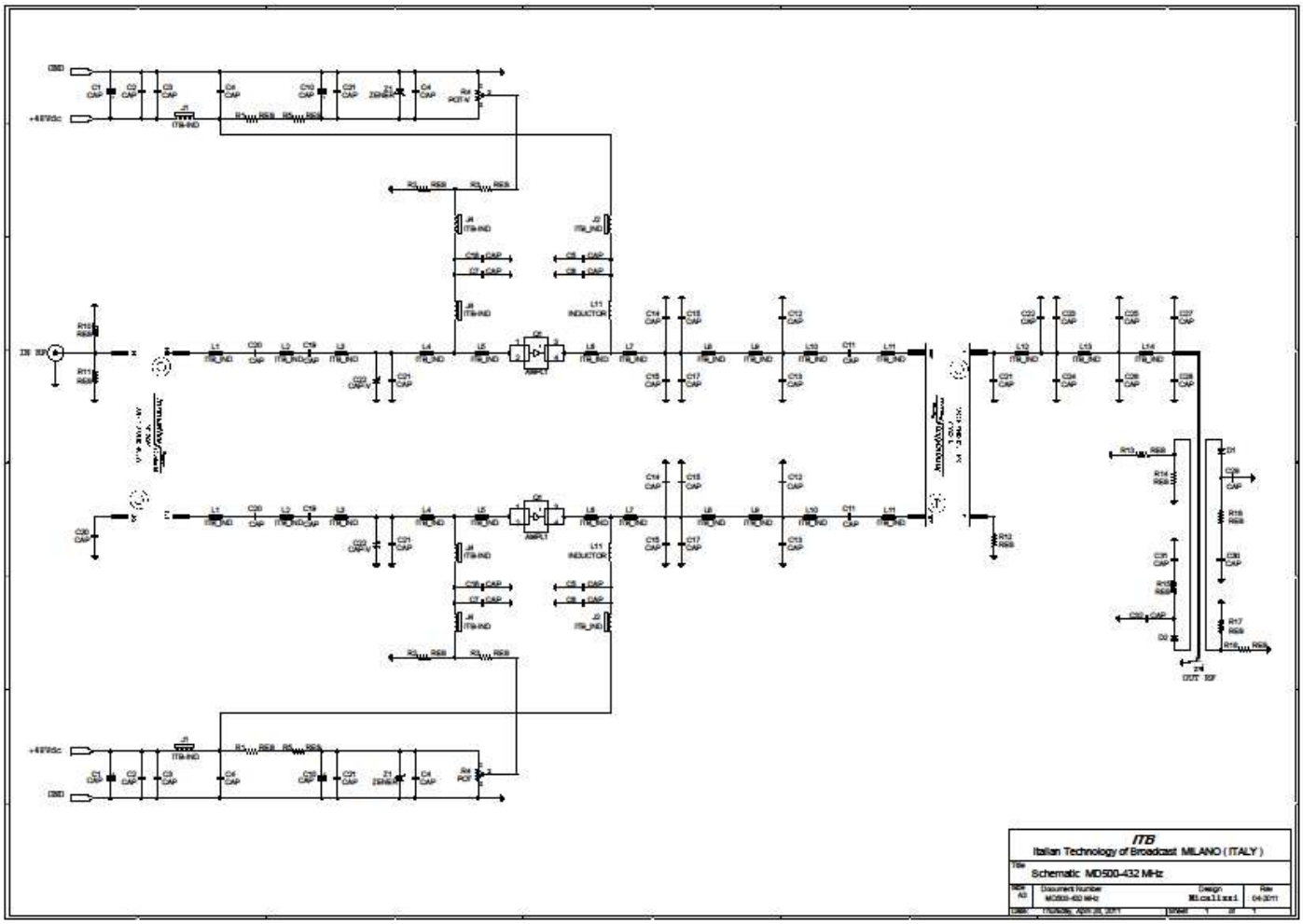


Vdd1 = 45.5 – 47.5 Volt +

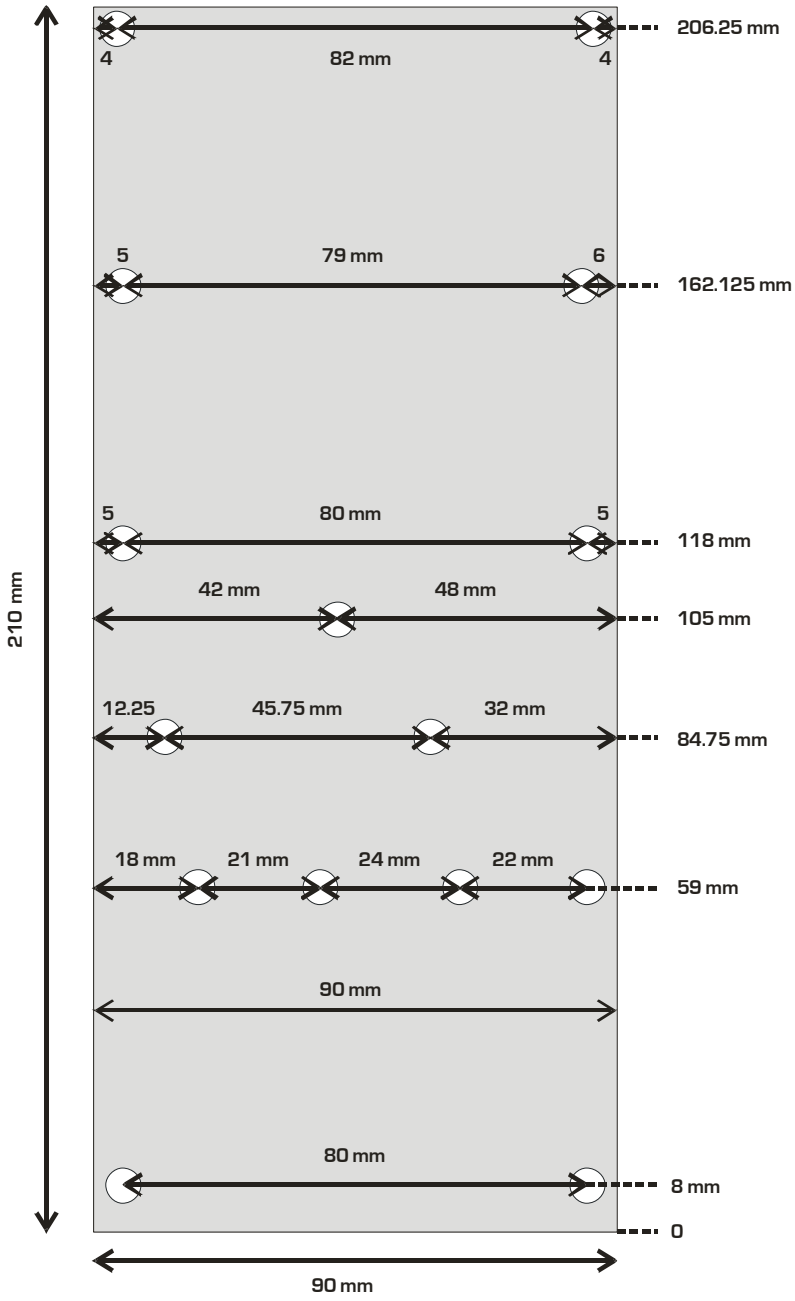
Vdd2 = 45.5 – 47.5 Volt +

RF In = input Max 7 - 8 W

Schematic Diagram



Drilling on the heat sink



VENTILATION SYSTEM

Assembling and testing

ADVANCED OPERATION

1) Before to fix the **MD 500P – 432 Pallet** with 15 screws of m3 x 12 mm on the suitable heat sink (power dissipation), laying a thin layer of heat conduction paste **(p.4-5)** under the pallet
2) Install the fans (typeFFB0848EHE DELTA or equivalent) as per description (**p.5)**
3) Connect the RF output through a coaxial connector or cable to 50 **Ω (p. 2)** through attenuator able to handle high power such as 1 KW – 30 dB (min)
4) Connect the Bolometer probe (1 W out of scale referred to 30dB attenuation) at the output of the feed through attenuator.
5) Connect the transmitter's cable along the coaxial 50 **Ω** cable to RF input **(p.2)**
6) Setup the voltage of the power supplier to 47 - 48 Volt.
7) Setup the current limit of the power supplier at 20 A (48-50 Volt as reference).
8) Connect the positive power (+ Vdd) with a proper electrical cable **(p.2)** and negative power to heat sink

TURNING ON

1) Turn on the Transmitter at ZERO Watts output power
2) Turn on at DC 47 - 48 Volt the power supplier **(you will notice see an Id current of about 150 Ma x 2)**
3) Activate the fan coil process

At this point, please increase the output power of the Transmitter until you will be able to get 100 W.
We recommend to this operation with an extremely attention since the gain of the PA is high.
We also recommend to put a 6 – 10 dB 100W attenuator (in the input stage).
Following, you can increase the driving level until you will get an output power not beyond 500 W (please see general characteristics of the datasheet).
Please verify during this operation both the Bolometer (for measuring the RF signal) and the Amperometer, will indicate an increasing of output power .
If this will not happen, it means the RF output cable **is not well connected!**

INHIBIT

This input allows the regulation of the output power.
Appling a negative voltages of - 5 (minus five) Volts on this pin the amplifier doesn't work.
Of course, the operating class of the amplifier will be close to "C class" .
This tuning can be done by an interface (made up of a recommended circuit) that limits the output power at 1000W and able to activate the VSWR protection.
We strongly suggest to tune this protection (the one of the VSWR) to MAX 50 W: following you must disable (TURN OFF) the Vdd**!**

TEMPERATURE CONTROL

We recommend to avoid exceeding the temperature of 70° C of the flange of the transistor **(if you use/adopt lowers and silenced fain coils).** The temperature can be measured on the aluminium **clamp** of the transistor.

We also recommend to use only Teflon coaxial cables for the RF output, and good quality RF connectors.

We suggest to insert the **MD 500P – 432** into an RF shielded box.