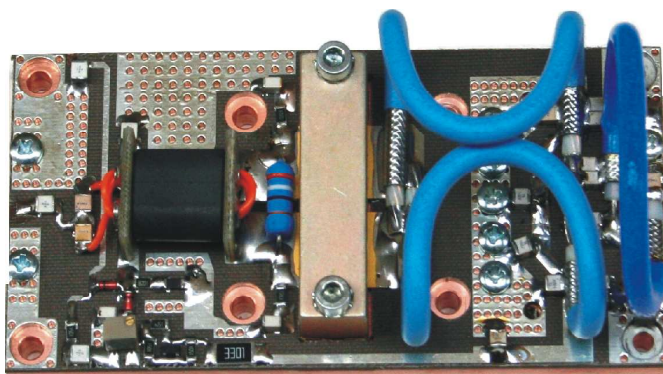


## HAM RADIO

### 1KW 144 MHz RF POWER MODULE

- Operating Frequency: 142 - 146 MHz
- 3.5 W Input  $\pm$  1dB
- V.S.W.R. input (@ 144 MHz)  $\leq$  1.1:5
- 50  $\Omega$  Impedance (in - out)
- CW – FM – SSB “JT 65” Mode
- Transistor : MRF6VP61K25H ( 1250 W )
- Vdd 48 - 50 Volt
- Id (@ 1 KW RF out) 30 A  $\pm$  5%
- Maximum copper base plate temperature: 80°C
- adjustable bias (Class A,AB,C)
- High efficiency (  $\geq$  80% )
- 24hr continuous service (with adequate ventilation)
- HIGH quality
- HIGH stability
- Teflon PCB
- copper base plate, 7.5 mm thickness



Dimensions : 100 X 50 X 35 mm

#### GENERAL DESCRIPTION

Our latest product in the HAM product category is the MD 1KP AR -144. This module 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 1KP AR 144 allows an easy assembling in order to create a complete “ SSPA “(Solid State Power Amplifier).

The realization is very simple: a heatsink, two fans, a power supply, a simple protection, RF coaxial relays and RF connectors.

Having an high output power, it is highly recommended to use an adequate low pass filter (LPF).

Its high linearity makes it suitable for SSB usage and with an adequate ventilation, it will be also suitable for EME full power.

The module needs to be mounted on a heat sink able to dissipate about 500W (without exceeding of 50°C temperature compared to the ambient one of 25°C).

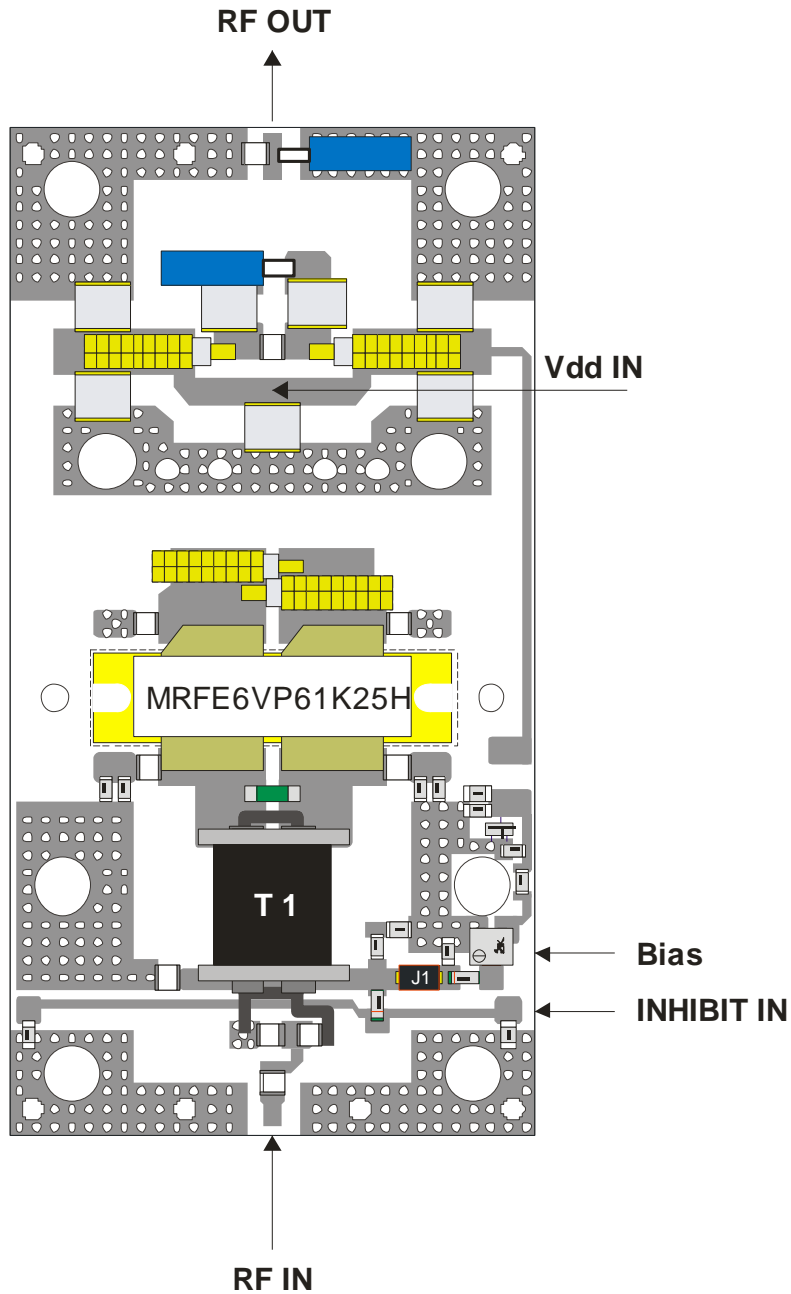
The power supply must provide a well stabilized voltage of 48-50 V.

The relative current is 30 A min (Id) with no limitation.

This power module has very high gain. It is highly recommended to use a RF power attenuator in front of the input of the PA module, onto the heatsink.

This power divider serves two purposes. First it protects the amplifier against too high input power. Secondly it is not advised to reduce the power of a driver transceiver to some watts, because linearity usually decreases at low power levels. So better run at a medium power level (and good linearity) and then reduce the power level with a divider. Further, some transceivers produce short a full power spike even at low power settings, which will overdrive the module. Suitable RF attenuators are available as an option.

## CONNECTIONS

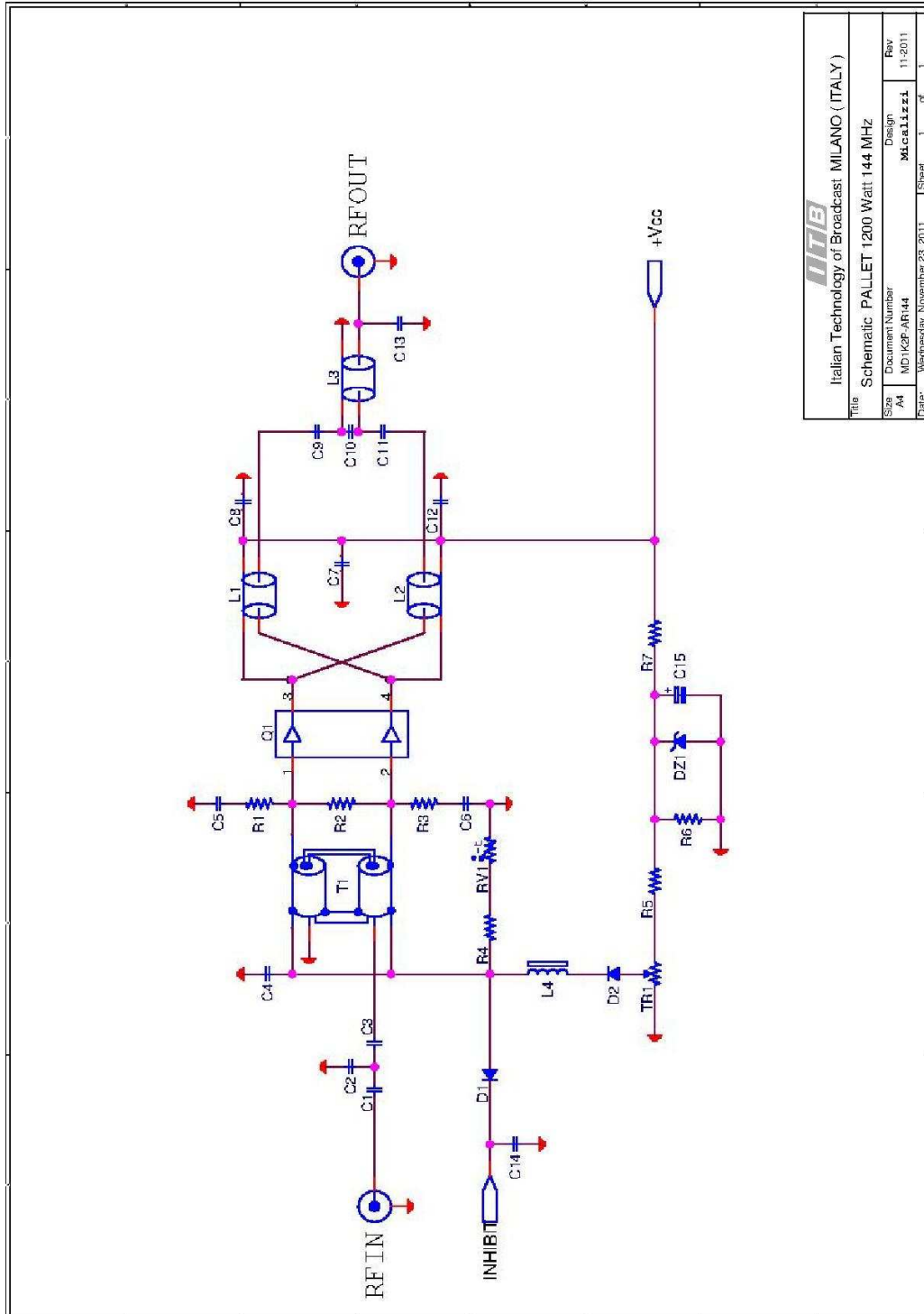


**Vdd = + 50 Volt**

**Inhibit = 0 ... -5 Volt MAX (minus 5V!)**

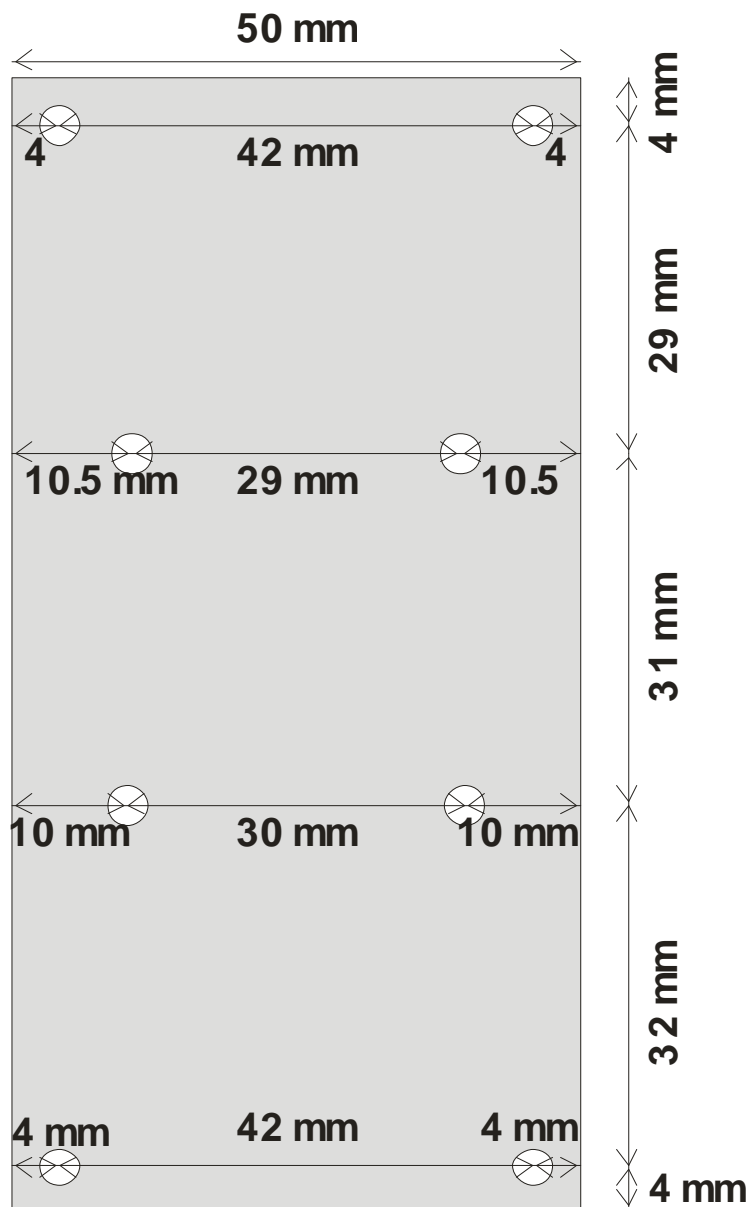
**RF In = input 4.5 W max**

## SCHEMATIC DIAGRAM

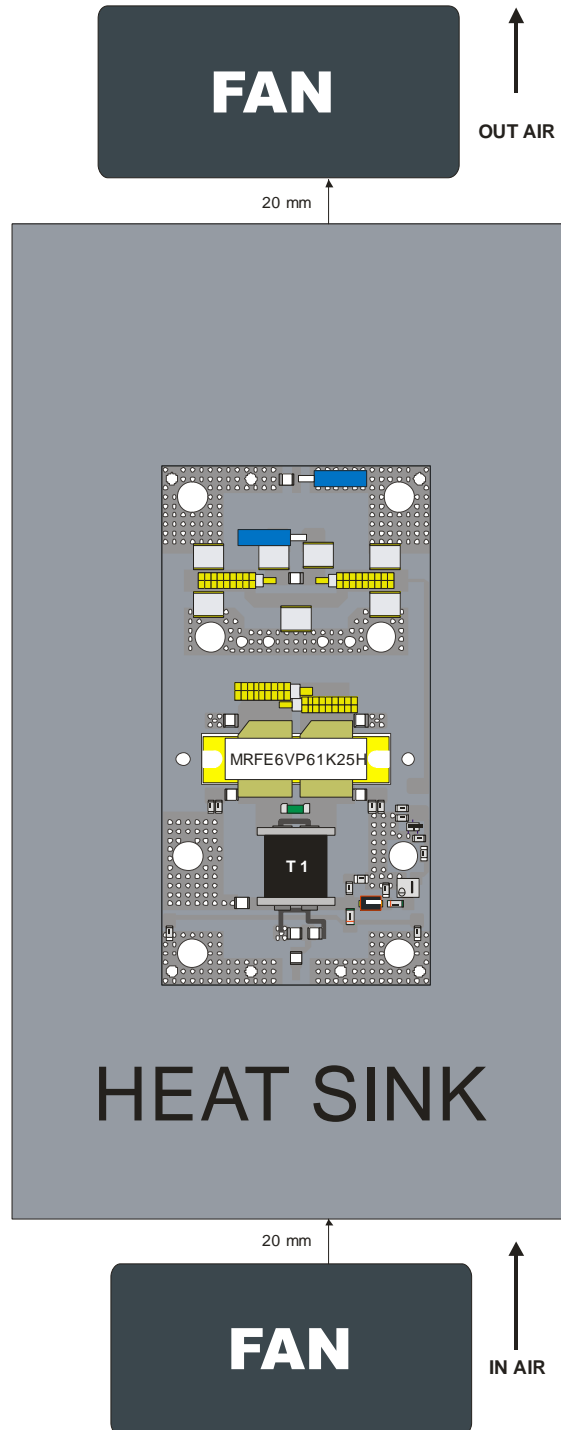


Italian Technology of Broadcast MILANO (ITALY)	
Title	Schematic: PALLET 1200 Watt 144 MHz
Size	A4
Document Number	MD1KP-AR144
Design	M.LucaLizzi
Rev	11-2011
Date:	Wednesday, November 23, 2011
Sheet	1 of 1

## Heat Sink holes



## VENTILATION SYSTEM



## Assembling and testing

### TEST SETUP

**This amplifier has very high gain. We highly recommend to put a 6 – 10 dB, 100W attenuator in front of the module (see hint on p.1).**

- Before fixing the **MD 1KP AR 144** module with 8 screws of M3x12 mm on a suitable heat sink (with power dissipation), add a **thin** layer of heat conduction paste (**p.4-5**) under the module
- Install the fans (type FFB0848EHE DELTA or equivalent) as per description (**p.5**)
- Connect the RF output to a 30dB (or more) power attenuator suitable for 1500W.
- Connect a Bolometer probe (3W full scale using an 30dB attenuator) to the power attenuator's output.
- Connect the transmitter's output to RF input (**p.2**)
- Set the voltage of the power supply to 48-50 Volt.
- Set the current limit of the power supplier at 30A.
- Connect the positive power ( + Vdd) with a suitable electrical cable (**p.2**), connect ground to heatsink.

### TURNING ON

- Set Transmitter to ZERO Watts output power. He said ZERO! If your transmitter has a minimum output power of 5W or so, do not use it. At least not for the first test, even with a recommended input attenuator.
- Turn on Power supply and check idle current. **Should be around 1A for linear (SSB) operation.**
- Turn on fans (cooling system)
- Switch to transmit and carefully (he said carefully!) increase the output power of the transmitter until 100 - 200 W RF output of the module is reached.
- **We recommend to this operation to be done extremely careful because the gain of the PA is high.**
- If everything looks right, driving level may be increased until an output power not beyond 1000 W is reached (please see general characteristics of the datasheet).
- Please verify during this operation that both the Bolometer (for measuring the RF signal) and the Amperemeter will indicate increase of output power. IF DC input increases but output not, RF output cables might **not well connected!**
- **Don't forget to monitor the heatsink temperature as well!**

### INHIBIT

This input allows the regulation of the output power. This input is not suitable for reducing the output power in linear mode, as the operating class of the amplifier will be close to "C class" in this case.

The amplifier is shut off if a negative voltage of - 5 (minus five) Volts is applied to this input. External protection circuitry may use this input to shut off the module due to excess temperature, excess output power, excess reflected power or poor SWR. We strongly suggest to allow a max. reflected power of 200W. Following you must disable (TURN OFF) the Vdd!

### TEMPERATURE CONTROL AND OTHER HINTS

We recommend to avoid temperatures of more than 80–90°C measured on the flange of the transistor . The temperature can be measured on the aluminium **bracket** which holds the transistor in place.

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

We suggest to insert the **MD 1KP AR 144** into an RF shielded box. Make sure your DC power supply is connected via cables suitable for a current of 30A.

Please do not forget to include a suitable Lowpass Filter (LPF) in the system. It is available as an option.



## TEST REPORT

<b>Model</b>	<b>Date</b>			<b>Test Driver</b>
<b>MD 1KP AR 144</b>				<b>Mkz</b>

Serial n° \_\_\_\_\_

Freq. Test    144 MHz

Vdd.            50 Volt

Bias            2 A

Output Power	250	500	750	1000	1200	1500	1750	2000
Input Power W								
Total Current A								

Please keep this sheet, it is required for any support and/or repair issues.