

# TDE500VCA

## Power Amplifier Section 500W

### Charateristics

- 100 – 500 MHz
- Pout: 200-500 W CW Signal
- Gain: 20dB
- 50 Ohm in/out Impedance
- Classe AB Operation
- Device: 2 x NXP BLF888A
- Supply: 28- 42 Vdc
- High temperature protection
- Dimension: (LxWxH)  
196x146x41.5mm  
7.71"x5.74"x1.63"
- Weight: 1.9Kg / 4.19lb

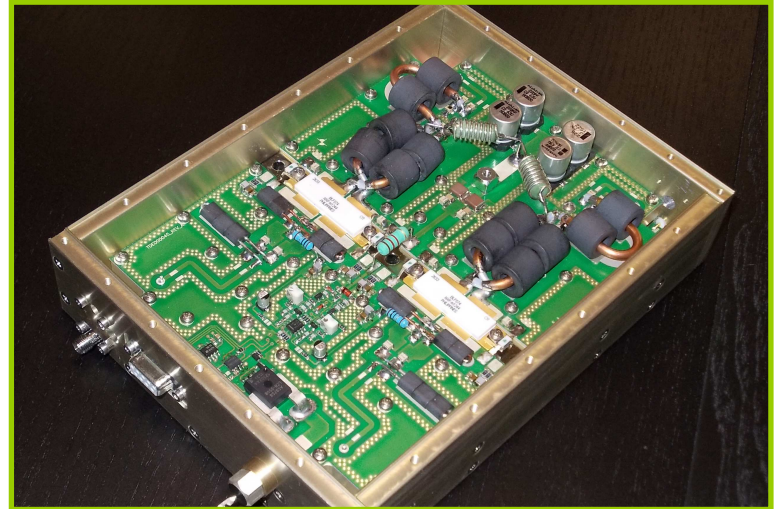
### Applications

- Industrial application
- Research & Development
- Test and validation
- Scientific equipments

### Benefits

- Excellent ruggedness
- High power density
- High power gain
- High efficiency
- Low performance spreading unit to unit

**RoHS  
Compliant**



TDE500VCA is an high linear amplifier, designed to work in the entire band 100 - 500Mhz, with relevant power level in most common transmission standard.

TDE500VCA is equipped with the latest generation of LDMOS power devices, making this amplifier the technology state of art.

### Eletrical Specification

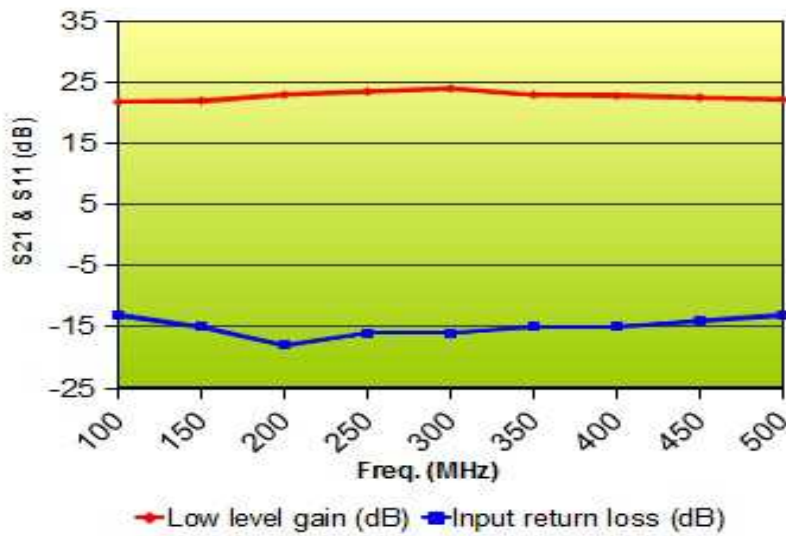
| Parameter                                   | Min. | Typ. | Max. | Units. | Note     |
|---|------|------|------|--------|----------|
| Frequency Range                             | 100  |      | 500  | MHz    |          |
| Power gain low level                        | 15   | 20   |      | dB     |          |
| Power Out CW Signal<br>Vcc 28V Idq=0.9+0.9A |      | 200  |      | W      | Note 5-6 |
| Power Out CW Signal<br>Vcc 48V Idq=1+1A     |      | 500  |      | W      | Note 5-6 |
| Supply Voltage                              | 28   | 48   |      | V      |          |
| Efficiency 200W CW                          | 39   | 42   |      | %      | Note 6   |
| Efficiency 500W CW                          | 42   | 45   |      | %      | Note 6   |
| F2 second harmonic                          | -30  | -40  |      | dBc    |          |
| F3 second harmonic                          | -20  | -26  |      | dBc    |          |
| IMD @ 50 W                                  | -30  | -40  |      | dBc    |          |
| IMD @ 125 W                                 | -30  | -40  |      | dBc    |          |
|   |      |      |      |        |          |

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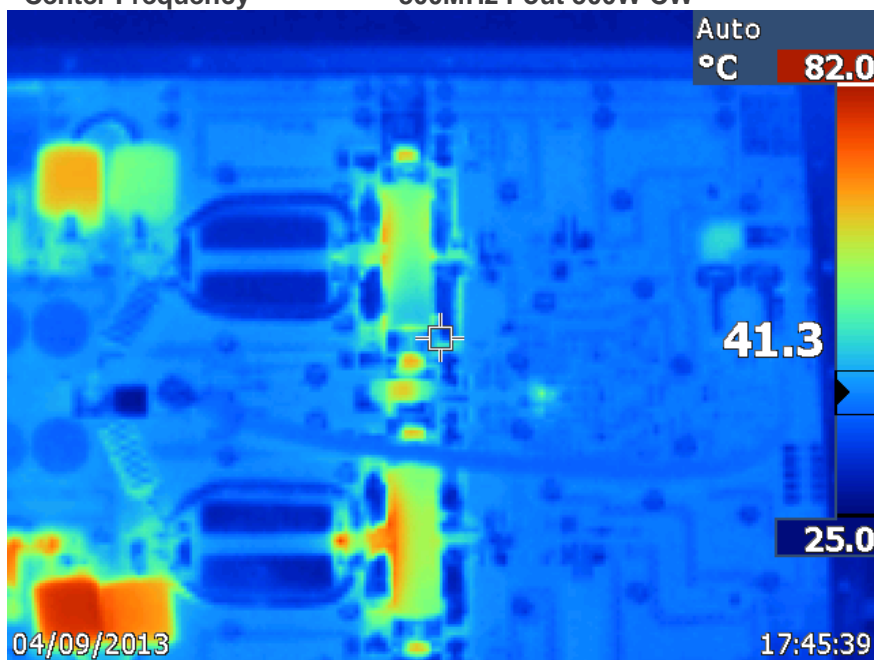
## Gain Low Level

- Test Condition Vcc 50V Idq= 1.5 + 1.5A
- Amplitude vs Frequency
- Return Loss



## Thermal Image

- Test Condition Vcc 50V Idq= 0.5 + 0.5A
- Center Frequency 300MHz Pout 500W CW



# TDE500VCA

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### CW Power

• Test Condition  $V_{cc}$  28V  $I_{dq}$ = 0.9 + 0.9A

**TDE500VCA**  $V_{cc}$ :28V  $I_{dq}$ :0,9+0,9Amps *Prototype Nr.2\_ Tested by: M.Morresi\_Data test: 28/04/2013*

| Freq. | Pin (dBm) | Pout (dBm) | Pout (W) | Gain (dB) | I. (Amps) | P. C. (W) | Eff. (%) | F2 second harmonic (dBc) | F3 second harmonic (dBc) | 2 Tone IMD@50W | Ids 2 Tone IMD@50W |
|-------|-----------|------------|----------|-----------|-----------|-----------|----------|--------------------------|--------------------------|----------------|--------------------|
| 100   | 30,5      | 53         | 200      | 22,5      | 16        | 448       | 44,6     | -36                      | -18                      | -36            | 9,4                |
| 150   | 33        | 53         | 200      | 20        | 11,7      | 327,6     | 61,1     | -35                      | -26                      | -33            | 9,5                |
| 200   | 32        | 53         | 200      | 21        | 15        | 420       | 47,6     | -33                      | -19                      | -31            | 9,1                |
| 250   | 32        | 53         | 200      | 21        | 14,7      | 411,6     | 48,6     | -32                      | -27                      | -33            | 9,5                |
| 300   | 31        | 53         | 200      | 22        | 16        | 448       | 44,6     | -44                      | -42                      | -33            | 9,6                |
| 350   | 32        | 53         | 200      | 21        | 18,3      | 512,4     | 39,0     | -36                      | -41                      | -32            | 10,3               |
| 400   | 33        | 53         | 200      | 20        | 17,8      | 498,4     | 40,1     | -31                      | -50                      | -31            | 11,5               |
| 450   | 33        | 53         | 200      | 20        | 15,6      | 436,8     | 45,8     | -33                      | -50                      | -33            | 11                 |
| 500   | 34        | 53         | 200      | 19        | 20,6      | 576,8     | 34,7     | -36                      | -50                      | -35            | 11,5               |

• Test Condition  $V_{cc}$  48V  $I_{dq}$ = 1 + 1A

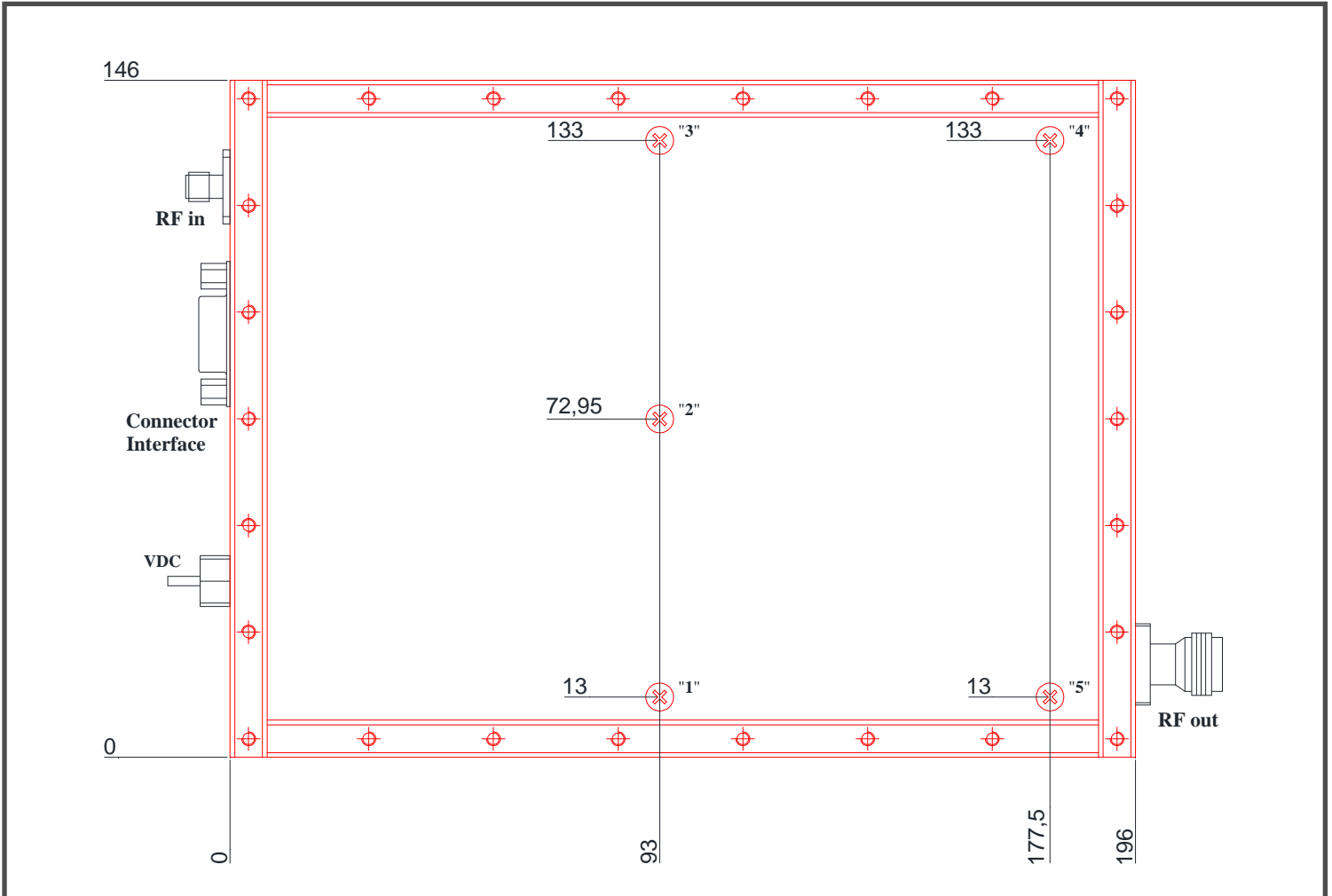
**TDE500VCA**  $V_{cc}$ :48V  $I_{dq}$ :1+1Amps *Prototype Nr.2\_ Tested by: M.Morresi\_Data test: 28/04/2013*

| Freq. | Pin (dBm) | Pout (dBm) | Pout (W) | Gain (dB) | I. (Amps) | P. C. (W) | Eff. (%) | F2 second harmonic (dBc) | F3 third harmonic (dBc) | 2 Tone IMD@125W | Ids 2 Tone IMD@125W |
|-------|-----------|------------|----------|-----------|-----------|-----------|----------|--------------------------|-------------------------|-----------------|---------------------|
| 100   | 36,5      | 57         | 500      | 20,5      | 27        | 1296      | 38,6     | -36                      | -42                     | -28             | 16                  |
| 150   | 36        | 57         | 500      | 21        | 20        | 960       | 52,1     | -36                      | -42                     | -30             | 15                  |
| 200   | 35,5      | 57         | 500      | 21,5      | 23        | 1104      | 45,3     | -31                      | -19                     | -31             | 15                  |
| 250   | 35        | 57         | 500      | 22        | 23        | 1104      | 45,3     | -35                      | -28                     | -33             | 14                  |
| 300   | 34,2      | 57         | 500      | 22,8      | 23,7      | 1137,6    | 44,0     | -40                      | -40                     | -36             | 14,5                |
| 350   | 34,5      | 57         | 500      | 22,5      | 27,5      | 1320      | 37,9     | -36                      | -42                     | -36             | 15,3                |
| 400   | 35        | 57         | 500      | 22        | 27        | 1296      | 38,6     | -31                      | -48                     | -36             | 17                  |
| 450   | 36        | 57         | 500      | 21        | 20        | 960       | 52,1     | -28                      | -40                     | -33             | 16,5                |
| 500   | 33        | 54         | 500      | 21        | 26,5      | 1272      | 39,3     | -36                      | -46                     | -35             | 15,5                |

# TDE500VCA

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### Mechanical Specifications



### Screws Type

Screws point 1-2-3 M4 Socket head cap screws + 3 split lock washers WZ  $\varnothing$  4.5 + 3 flat washers WZ  $\varnothing$  4.5.

Screws point 4-5 M3 Socket head cap screws + 2 split lock washers WZ  $\varnothing$  3.5 + 2 flat washers WZ  $\varnothing$  3.5.

### Recommendend Torque

The recommended Torque is: 0.9 N/m for Devices Fixing (4 places) and 1 N/m for other screws.

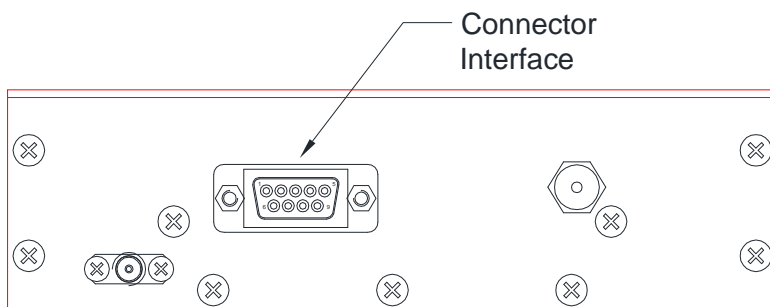
### Thermal Compound

Recommended Dow Corning 340 ( thermal compound ) or equivalent

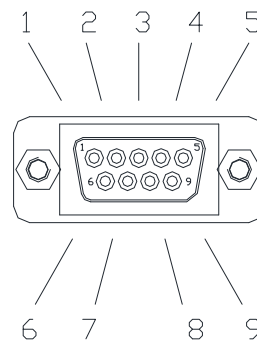
# TDE500VCA

## Power Amplifier Section 500W

### Connector Interface



D-SUB 9 PIN FEMALE



- Pin 1 +12Volts
- Pin 2 Temperature Monitor (10mV/°C)
- Pin 3 Current Monitor (60mV/A)
- Pin 4 Bias shut down
- Pin 5 GND
- Pin 6 Not Used
- Pin 7 Not Used
- Pin 8 Not Used
- Pin 9 Not Used

### Application Note

Read carefully Application note before use. For any additional information or suggestion please contact TDE technical staff.

#### Note 1 cooling system requirements

Cooling system must assure that amplifier will work in safety conditions. This amplifier is self protected against high temperature, however we recommend to use the amplifier at lower temperature as possible, this because lower temperature means a better MTBF.

Please be sure that heatsink surface is cleaned and very smoothed, be also sure to use a good quality thermal compound between flange and heatsink.

High power concentrations means that is not easy to dissipate the power in case of work at full power CW for long time.

In case that your application foresee to work more than 2/3 Min continuously in this condition we strongly recommend a water cooling system.

# *TDE500VCA*

## *Power Amplifier Section 500W*

### **Note 2 (Load matching)**

This amplifier use the rugged RF device on the market, it can work without power reduction on a load with 3:1 of VSWR.

Anyway we recommend to foresee an appropriate protection system able to switch off the power in case of excessive power reflection.

### **Note 3 (quiescent current)**

Quiescent current is set in factory at about 2 amps (1A for device).

### **Note 4 (shielding)**

Due to the High gain of this pallet, is required a good isolation between output power section and any driver stage mounted inside the same rack.

### **Note 5 (CW applications)**

Due to the high linearity of devices, this amplifier is capable to deliver more than nominal power in case of overdriver. Please avoid to overcom the nominal power because this can destroy the matching element on the output section. It is a good practice to use a current limited power supply, to assure the safety operation.

In case of work in CW for long time please read the note 1

### **Note 6 (Efficiency)**

To improve the efficiency is a good practice take the input power at the maximum level and adjust the output power by means reducing supply voltage, in case that your application allow this solution the efficiency can improve of about 10% in many parts of band.

## **Important Note**

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