

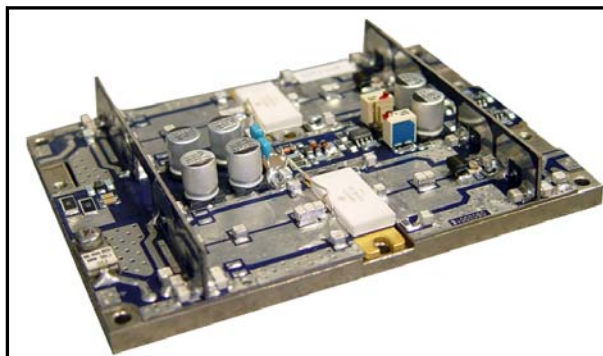


# AMP 450-UHF HIGH POWER AMPLIFIER MODULE FOR UHF TV BROADCAST

## 400W pep –27dBc min LDMOS Technology

Designed for analog and digital TV transposers and transmitters, this amplifier incorporates microstrip technology and push-pull LDMOS to enhance ruggedness and reliability.

- 470 - 862 MHz
- (28 ÷ 32 Volt) 30 Nominal
- Input/Output 50Ω - 50Ω
- Class AB
- Gain : 14 dB min; 15 dB typ
- Devices: MRF377 or equivalent
- Pout : 450W pep Max. –27 dBc Min. (two-tone test 6MHz spacing )
- Connectorized version available
- Mechanical compatible with Motorola MRFA 2604

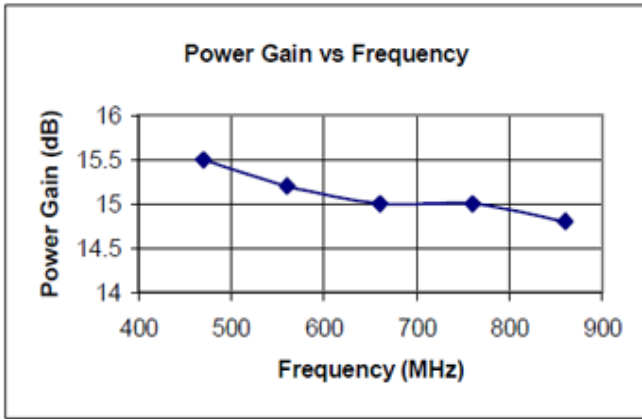


**ABSOLUTE MAXIMUM RATINGS (Device Flange T = 70 °C)**

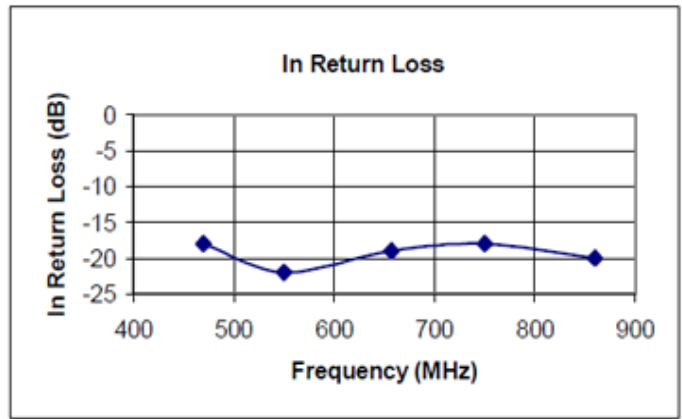
Symbol	Parameter	Value	Unit
Vs	Voltage Supply	35	V dc
Is	Current Supply	25	A dc
Tstg	Storage Temperature Range	-20 + 80	°C
Tc	Operating Base Plate Temperature <sup>1</sup>	0 + 75 <sup>2</sup>	°C
ψ	VSWR max	3:1 all phase angle	-
	Max input power	See note <sup>3</sup>	-
	Max cw output power	200	Watt

### ELECTRICAL SPECIFICATIONS (Base Plate T.= 45 °C, 50Ω loaded, Vd = 30 V)

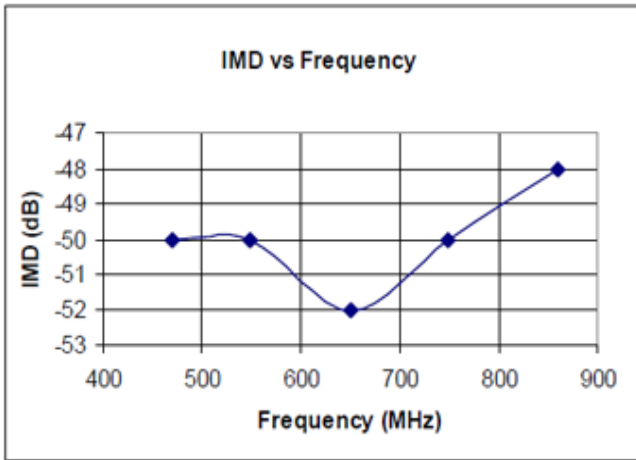
Symbol	Parameter	Test Conditions	Value			Unit
			Min	Typ.	Max	
BW	Bandwidth	Pout = 200 W (CW)	470		862	MHz
Gp	Power gain	Pref = 200 W (CW)	14	15	-	dB
Pout -1dB	Power Output @ 1dB Compression	Referred to Pout = 60W (CW) <sup>4</sup>	270	350	-	W
Iq *	Quiescent Current	Pout = 0 W – Total * <sup>5</sup>	-	-	4.0	A
Itot	@ PMax	300W Ps Black Level Video + Audio	-	-	21	A
Irl	Input return loss	Pout = 250 W CW	16	20	-	dB
Ψ	Load mismatch	Pref = 250 W CW, f= 862MHz, load VSWR = 2:1, all phase angles	No degradation in Pout			
Gr	Gain Flatness	Pref = 250 W CW, BW: 470-862MHz		±0.5	±1.5	dB
η	Drain Efficiency	Pout = 300 W <sup>6</sup> (CW)	40	45	-	%
	Pout separate ampl.	Sync. Compression < 1dB without correction	350			Wps
	Pout common ampl.	Pout 300W ps common ampl. dual sound, with Red Field sound 1 @ -13dB and sound 2 @ -20dB without precorrection	-45	-50		dBc
	Pout DVB-T	Pout 90Wrms without precorrection	-28	-30		dBc



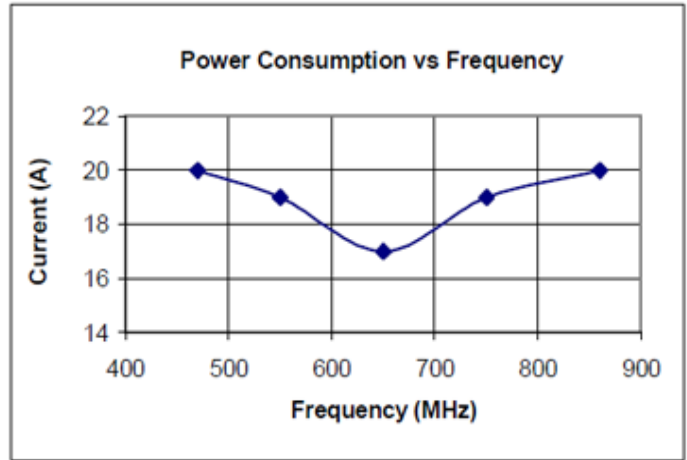
Test Condition: Vd 30V, Idq 2 x 1.3A, Pout 300W ps Level



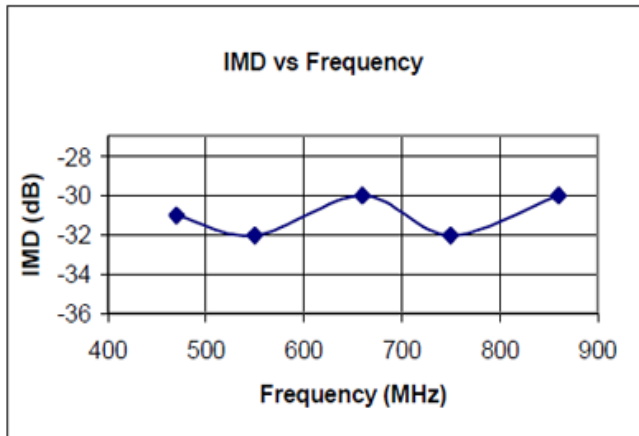
Test Condition: Vd 30V, Idq 2 x 1.3A, Pout Low



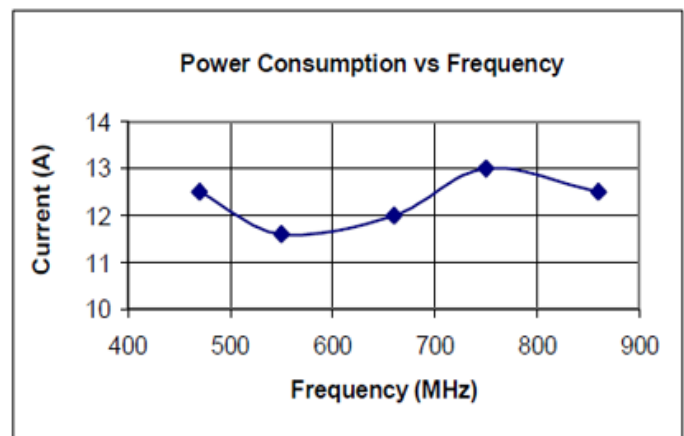
Test Condition: Vd 30V, Idq 2 x 1.3A, Pout 300W ps (red field with sound 1 @-13dB and sound 2 @-20dB)



Test Condition: Vd 30V, Idq 2 x 1.3A, Pout 300W ps with black field



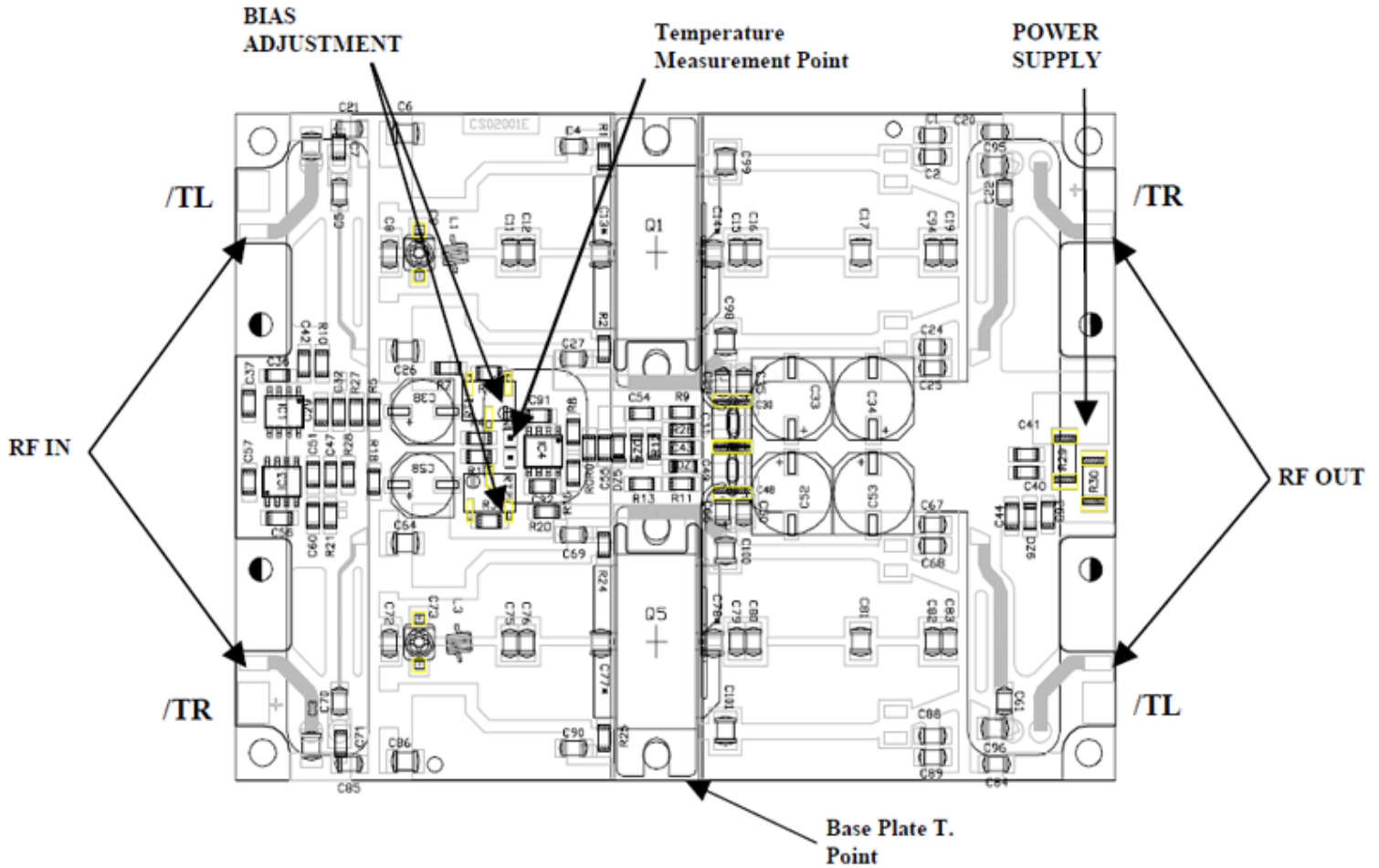
Test Condition: Vd 30V, Idq 2 x 1.3A, Pout 90Wrms DVB-T signal



Test Condition: Vd 30V, Idq 2 x 1.3A, Pout 90Wrms DVB-T signal

The operating voltage range of this module is from 28V to 32V, 30V nominal. If used at 32V, the max power available will be higher but with a consequently decrease of efficiency and MTBF. Under conditions of overdrive or reflected power, when a multicarrier signal is applied, the 32V supply can be the reason of a minor ruggedness. Please, use suitable protection circuits.

# AMP 450-UHF Layout and Connections<sup>7</sup>



**NOTE.** In response to customer request, this pallet has been designed to allow two different positions of IN/OUT connections:  
 /TL = connection on the left side, /TR = connection on the right side.

## HEATSINK MOUNTING/HARDWARE

### 1. HEATSINK TOOLING

- Planarity: better than 0.03 mm
- Roughness: typical value 0.8

### 2. THERMAL COMPOUND

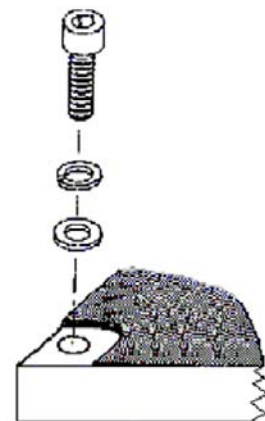
- Paste with silicones
- Thickness: optimum between 0.06 mm and 0.15 mm, on the whole back surface of the amplifier.

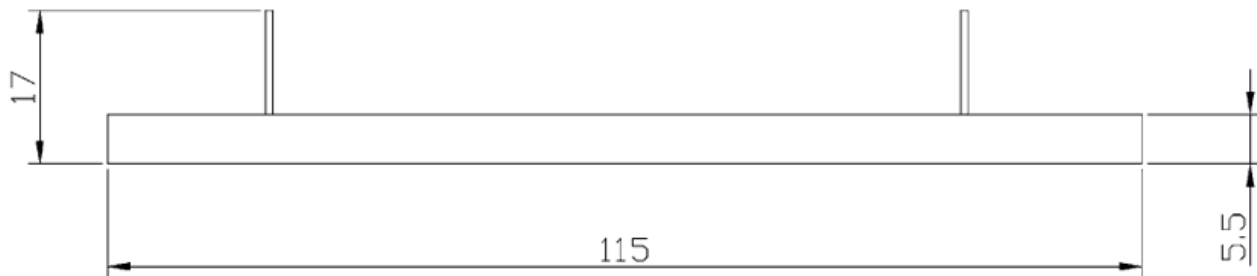
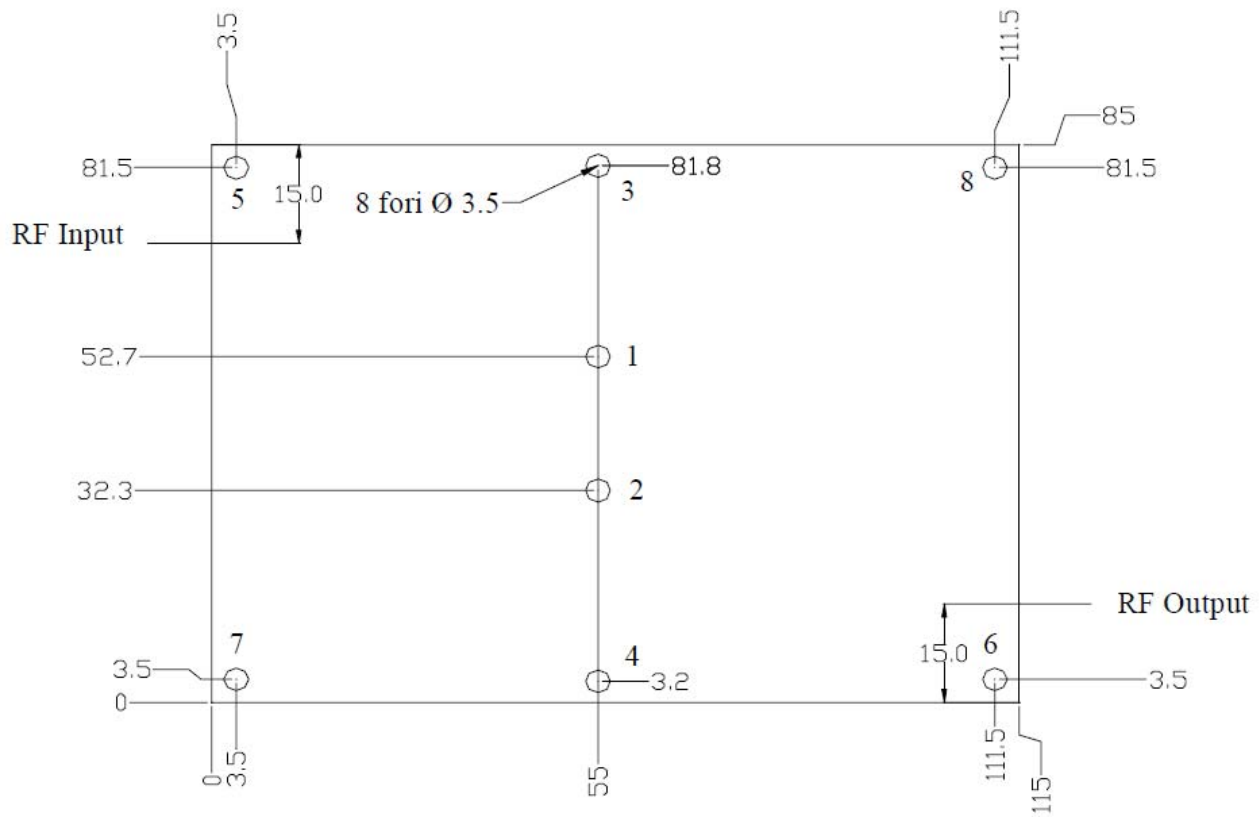
### 3. SCREWS

- 8 x M3 - Socket head cap screws.
- 8 Split lock washers WZ Ø3 + 8 Flat washers ZU Ø 3.
- The recommended Torque is 12 Kg . cm (10.5 in . lbs).

### 4. TIGHTENING ORDER

- See next figure:





\*Dimensions in mm.

In the interests of continual product improvement all specifications are subject to change without notice

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<sup>1</sup> A temperature sensor is mounted on the circuit to have an immediate working temperature measurement. The temperature can be measured by a Voltmeter on the “Temperature Measurement Point” (see picture on pag. 3), 10mV = 1 °C. **Warning:** the measured temperature refers to the Printed Circuit Board and not to the device flanges.

<sup>2</sup> **Warning:** The base plate temperature must be 75 °C max, using an appropriate Heatsink.

<sup>3</sup> The input power must not exceed +6dB, for 1 microsec. , the nominal input power referred to the 1dBcp power output.

<sup>4</sup> Max 200W cw continuous work

<sup>5</sup> The Quiescent Current is set at typical value, in factory. This parameter can be adjusted by the final user depending on the applied signal and/or frequency and output power (See Application note

ING01). **Warning:** Do not exceed the specified max Iq value).

\* Depending of handling signal (analog /digital)

<sup>6</sup> Do not keep the amplifier working at this Pout for more than one minute

<sup>7</sup> Do not keep the amplifier working at this Pout for more than one minute

<sup>7</sup> Ingenium provides the pallet without unbalance load resistors (input 50 Ohm 20W/output 50 Ohm 100W. Dimensions: 13 x 6.3mm, about, 1 hole).