RFG37-43-500XR-HSD

37-43MHz 500W Class A/AB High Performance RF Generator with high speed disable

- **Class A/AB 500W RF generator module**
- **37-43MHz bandwidth**
- **VCO frequency control**
- **VVA power control with >30dB range**
- **Fast output disable, ≤7µsec**
- **Analog temp out / High temp alarm**
- **Temperature compensated bias**

The RFG37-43-500XR-HSD is a 500W Class A/AB high performance RF generator module, outstanding for use as a frequency agile plasma driver. Utilizing an XR-rated output transistor and conservatively designed driver stages, it possesses excellent ruggedness for use in demanding plasma or other high VSWR applications. It is supplied with an N output connector.

Specifications

V_{sup} = +48VDC, I_{DQ} = 1.10A, P_{out} = 500W, T_{base} = 35°C, Z_{load} = 50Ω

Parameter	Min	Typ	Max	Units
Freq. Range	37		43	MHz
Output Power	500			W
VCO Control Range (See important notes, Page 3)	0		+5	VDC
VVA Control Range (See important notes, Page 3)	0		+5	VDC
DC Supply Current		14.0	14.5	A
Efficiency	72	74		%
f_2		-36	-30	dBc
f_3		-16	-10	dBc
Dimensions	4.10 X 8.80 X 1.50 (104.14 X 223.52 X 38.10)			inch (mm)

Maximum Ratings

Operation beyond these ratings may damage amplifier.

Parameter	Value
V_{supply}	44-48VDC
Bias Current	1.25A
Drain Current	17A
Load Mismatch*	5:1
Housing Base Temperature	75°C
Storage Temperature	-40°C to 85°C

*All phase angles, 500W forward power, current limited to 17A for 5 seconds max.

Option Ordering Info

Contact RFMPT for available options.

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MADE IN AMERICA

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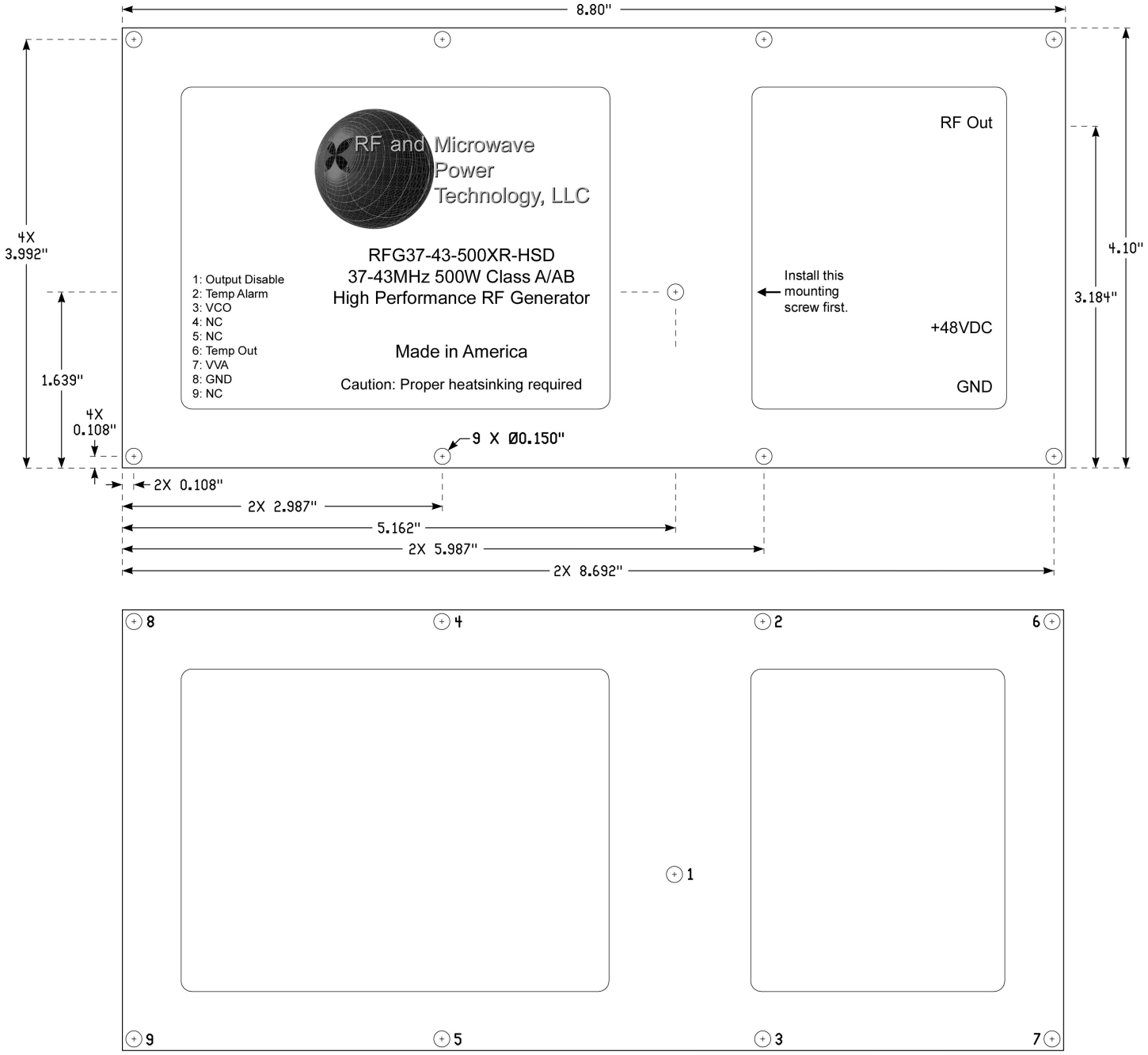
Generator Mounting Hole and RF Out Locations, and Mounting Screw Tightening Sequence



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Interface Pins and Functions

1: Output Disable This is active high at +5VDC, and is TTL compatible. It disables the second and output stages of the generator, and will reduce full rated output power to zero in ≤7µsec. When set to 0VDC, the generator will return to full power in approximately 750µsec. The VCO, VVA and first stage MMIC remain powered any time Vcc is applied to the +48VDC feedthru connector.

2: Temp Alarm This indicates an over-temperature condition, and is set to trip at a housing base temperature of approximately +65°C. This is 10°C below the generator's maximum rated housing temperature in order to give the operator advance notice of a potential cooling issue. Its output is an active low buffered 5VDC signal and will pull down to 0V at +65°C. This signal exhibits 5°C of hysteresis, and will reset to +5VDC at approximately +60°C.

3: VCO Control The internal VCO operates on a 0-5VDC control signal. Important: The actual VCO control range for the 37-43MHz operational range of the generator is approximately 2.0-5.0VDC. Ensure that the VCO control voltage does not cause the generator to go below 37MHz or above 43MHz. Performance will degrade beyond this range, and in extreme cases, amplifier damage may occur. Do not exceed +5VDC on this pin.

4: NC This pin is not connected internally, and can be left floating.

5: NC This pin is not connected internally, and can be left floating.

6: Temp Out This is an analog signal that is a nominal +0.75V at +25°C. The temp monitor IC has a positive slope of 10mV/°C with increasing temperature. However, a temperature gradient and an offset will exist between the temperature reported on this pin and the actual housing base temperature directly under the output transistor. It is up to the end user to properly characterize this signal's response with their chosen cooling configuration.

7: VVA The voltage variable attenuator IC has a slope of approximately 15dB/volt in its linear range. However, the RF generator's gain/output is not linear. Furthermore, minimum attenuation is not required for 500W output into 50 ohms. The VVA control circuit has additional drive headroom so that the output power can be increased to compensate for mismatched loads. The amount of available overdrive is limited by design to prevent excessive generator output saturation. While the control pin range is 0-5VDC, the "linear" range of attenuation (for the maximum 500W into 50 ohms) will be realized from approximately 1.4-3.6VDC. Minimum attenuation (maximum output power) is achieved at or below approximately 1.0VDC. Maximum attenuation (minimum output power) is achieved at or above 4.0VDC. Do not exceed the rated output power of the generator of 500W CW. Do not exceed +5VDC on this pin. Important: The VVA control voltage should be set to +5VDC (maximum attenuation) during generator power up and power down. This will minimize RF output as the transistor drains' voltage ramps up/down.

8: GND Control signal ground. Connected internally to +48VDC ground and may be left floating if a single point ground is desired, using the GND stud located on the RF OUT end of the housing. If this pin is used, a minimum of 20 gauge wire is recommended. Important: DO NOT use this pin as the main power supply ground. The generator must be grounded through the GND stud and/or heatsink.

9: NC This pin is not connected internally, and can be left floating.

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Instructions for RF Generator Use

1) Apply a layer of high quality thermal grease (Wakefield Type 120 or better) to the underside of the generator housing. Thinner is better, but ensure that when mounted to your heatsink, contact across the *entire* housing base is made. Gaps and air bubbles will significantly reduce cooling, leading to possible generator damage. Use nine #6-32 screws to mount the generator to your heatsink. Refer to the figure on the bottom of Page 2 for the proper order in which to torque the mounting screws.

2) Guarantee sufficient airflow through the heatsink fins to keep the maximum housing base temperature at or less than that specified in the Maximum Ratings section. Contact RFMPT for details on how to qualify your heatsink's performance, if needed.

3) Connect the desired load to the RF Out connector. Torque connector to industry standards for the type supplied with the generator.

4) Connect the DC V_{supply} to the +48VDC feedthru connector. While the generator can be grounded through a heatsink, a safety ground wire should be soldered to the GND stud. Ensure that V_{supply} is within the voltage range in the Maximum Ratings section.

5) Apply desired signals/monitoring lines to the interface pins. Refer to the Interface Pins and Functions section for signal descriptions, limits, and timing requirements. Important: At a very minimum, the VCO and VVA lines need to be connected to proper control sources.

6) Important: Set the VVA control line voltage to +5VDC (maximum attenuation). Set the VCO control line voltage to a point in its active control region of 2.0-5.0VDC. Refer to the test datasheet supplied with each generator for VCO voltages required for each of the test frequencies.

7) Apply V_{supply} DC power. Slowly decrease the VVA control voltage to achieve the desired RF output level. For digital control, a 12 bit DAC is recommended. Remember that the output power will be a nonlinear function of control voltage. Adjust the VCO control line as needed to achieve the desired RF frequency. Gain of the internal amplifier chain varies over frequency, so monitor RF output power as the VCO is adjusted and maintain a maximum of 500W forward power from the generator.

8) To disconnect the generator, set the VVA control to +5VDC, remove V_{supply} DC power and the VCO control signal, then remove the RF output connection.

Contact the factory at sales@rfmpt.com with any questions, or for special options, testing requirements, and/or operating conditions not specified in this document.

Document Control

Revision	Date	Notes
A	10-18-2017	Initial release.