RFG37-43-200XR-HSD

37-43MHz 200W Class A/AB High Performance RF Generator with high speed disable

- **Class A/AB 200W RF generator module**
- **37-43MHz bandwidth**
- **VCO frequency control**
- **VVA power control with >30dB range**
- **Fast output disable, ≤5µsec**
- **Analog temp out / High temp alarm**
- **Temperature compensated bias**
- **Available with heatsink and fan**

The RFG37-43-200XR-HSD is a 200W 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} = +46VDC, I_{DQ} = 0.50A, P_{out} = 200W, T_{base} = 30°C, Z_{load} = 50Ω

Parameter	Min	Typ	Max	Units
Freq. Range	37		43	MHz
Output Power	200			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		6.1	6.4	A
Efficiency	68	71		%
f_2		-34	-27	dBc
f_3		-14	-10	dBc
Dimensions	3.80 X 7.95 X 1.45 (96.52 X 201.93 X 36.83)			inch (mm)

Maximum Ratings

Operation beyond these ratings may damage amplifier.

Parameter	Value
V_{supply}	44-48VDC
Bias Current	0.8A
Drain Current	7.5A
Load Mismatch*	5:1
Housing Base Temperature	75°C
Storage Temperature	-40°C to 85°C

*All phase angles, 200W forward power, current limited to 7.5A for 5 seconds max.

Option Ordering Info

Heatsink and fan	RFG37-43-200XR-HSD-HSF

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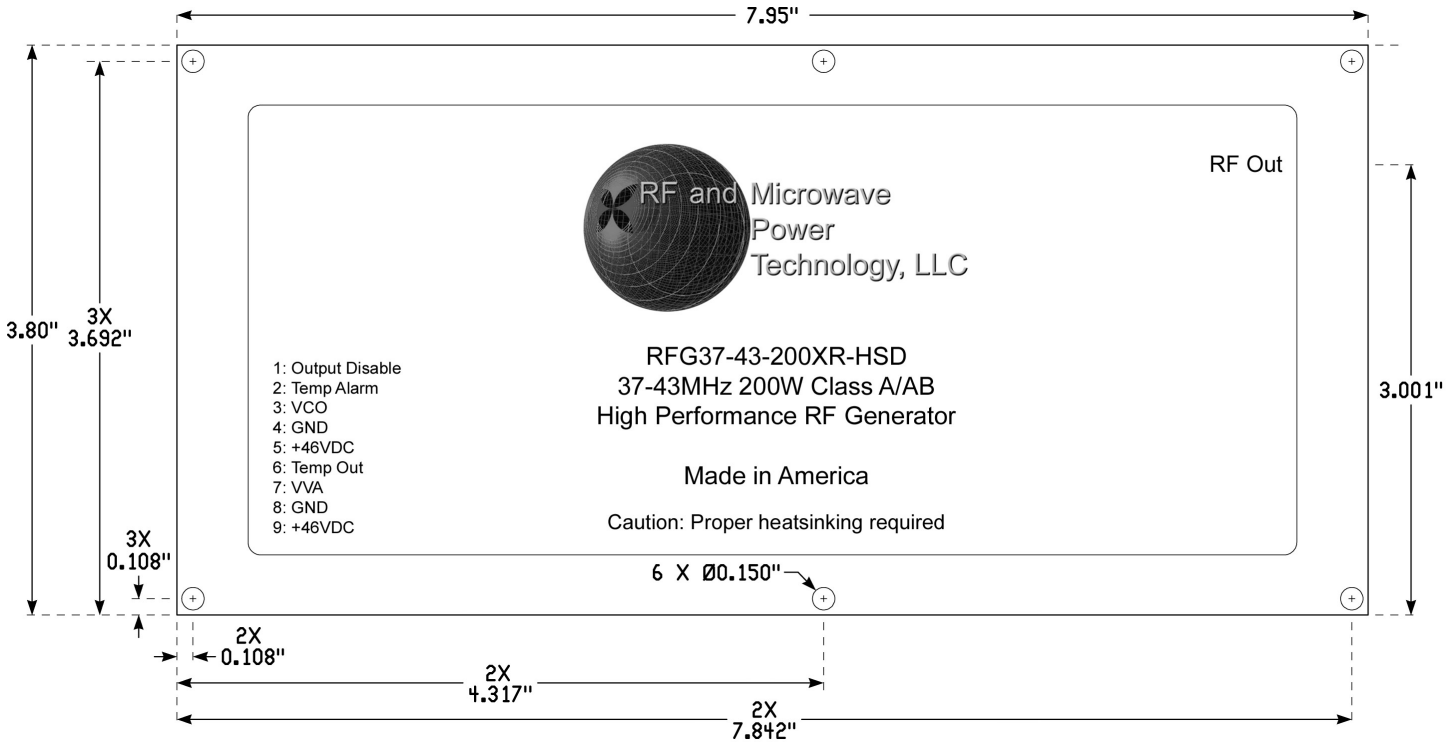
Amplifier Mounting Hole and RF Locations



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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 ≤5µsec. When set to 0VDC, the generator will return to full power in approximately 1.1msec. The first stage MMIC remains powered any time Vcc is applied to the DB-9 connector.

2: Temp Alarm This indicates an over-temperature condition, and is set to trip at a housing base temperature of approximately +65°C. 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 2.0-4.9VDC. 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: GND Generator ground. Connect to power supply return/ground. Must use in parallel with pin #8. A minimum of 20 gauge wire is recommended.

5: +46VDC The nominal supply voltage is +46VDC. As low as +44VDC may be used, with a reduction in output power. Must use in parallel with pin #9. A minimum of 20 gauge wire is recommended.

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 gain/output is not linear. Furthermore, minimum attenuation is not required for 200W 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 maximum 200W into 50 ohms) will be realized from approximately 1.6-3.6VDC. 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 200W 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 Generator ground. Connect to power supply return/ground. Must use in parallel with pin #4. A minimum of 20 gauge wire is recommended.

9: +46VDC The nominal supply voltage is +46VDC. As low as +44VDC may be used, with a reduction in output power. Must use in parallel with pin #9. A minimum of 20 gauge wire is recommended.

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Instructions for RF Generator Use

1) If not supplied with a heatsink, apply a layer of high quality thermal grease (Wakefield Type 120 or equivalent) to the underside of the generator housing. Thinner is better, but ensure that when mounted to your heatsink, contact across the *entire* module base is made. Gaps and air bubbles will significantly reduce cooling, leading to possible generator damage. Use six #6-32 screws to mount the generator to your heatsink.

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 DC V_{supply} to pins 5 and 9 of the interface connector. Connect power supply return/ground to pins 4 and 8 of the interface connector. Ensure that V_{supply} is within the voltage range in the Maximum Ratings section. A safety ground wire should be soldered to the GND stud below the DB-9 connector.

5) Apply desired signals/monitoring lines to remainder of 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 2.0-4.9VDC. Refer to the test datasheet supplied with each generator for VCO voltages required for each of the test frequencies.

7) Apply 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 200W forward power from the generator.

8) To disconnect the generator, set the VVA control to +5VDC, remove 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
Pre	5-28-2017	Preliminary release.
A	8-21-2017	Initial release.