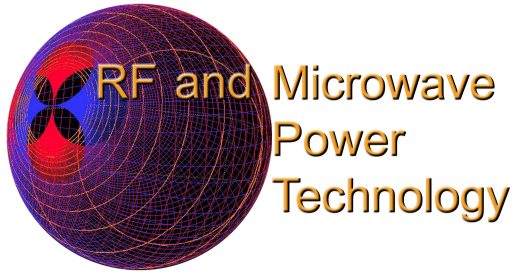


# RFM30-512-20-HSD



## 30-512MHz 20W Class A High Performance Amplifier with High Speed Disable

- ❖ Class A 20W linear amplifier
- ❖ Fast output disable,  $\leq 1\mu\text{sec}$
- ❖ VVA, over 30dB range
- ❖ Analog temperature out
- ❖ High temperature alarm
- ❖ Temperature compensated bias
- ❖ Available with input limiter and/or heatsink and fan



The RFM30-512-20-HSD is a Class A high performance amplifier module, outstanding as a driver stage in military communication or radar systems. It features a fast output disable control with  $\leq 1\mu\text{sec}$  response time. It exhibits excellent full power and back-off linearity, and utilizes all gold metallized MOSFETs for maximum ruggedness.

Specifications				
$V_{\text{sup}} = +28\text{VDC}$ , $I_{\text{DQ}} = 3.45\text{A}$ , $P_{\text{out}} = 20\text{W}$ , $T_{\text{base}} = 25^\circ\text{C}$ , $Z_{\text{load}} = 50\Omega$				
Parameter	Min	Typ	Max	Units
Freq. Range <small>*Amplifier is usable to 20MHz. Contact RFMPT for details.</small>	30*		512	MHz
$P_{1\text{dB}}$	20	>25	See Figure 4	W
Input Power		-3	0	dBm
Gain	43	46		dB
Gain Flatness		+/-1.1	+/-1.5	dB
Drain Current		3.8	4.1	A
Efficiency	17	19		%
IRL		-20	-14	dB
$f_2$		-37	-24	dBc
$f_3$		-45	-24	dBc
$\text{IMD}_3$ <small>20W PEP, <math>\Delta f = 10\text{kHz}</math> See Fig. 2 for 10W PEP</small>		-37	-30	dBc
Dimensions	3.20 X 5.40 X 1.50 (81.28 X 137.16 X 38.10)			inch (mm)

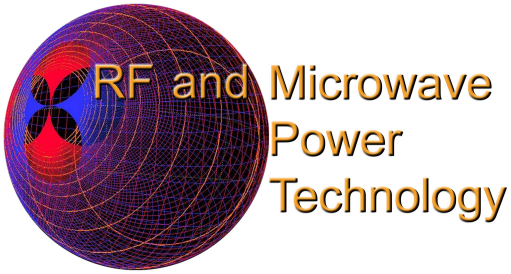
Maximum Ratings	
Operation beyond these ratings will void warranty.	
Parameter	Value
$V_{\text{supply}}$	24-28VDC
Bias Current	3.5A
Drain Current	4.3A
Load Mismatch*	5:1
Housing Base Temperature	65°C
Storage Temp.	-40°C to 85°C

\*All phase angles, 20W forward power, current limited to 4.3A for 5 seconds max.

Option Ordering Info	
Input limiter	RFM30-512-20-HSD-LIM
Heatsink and fan	RFM30-512-20-HSD-HSF

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**30-512MHz 20W Class A High Performance Amplifier with High Speed Disable**

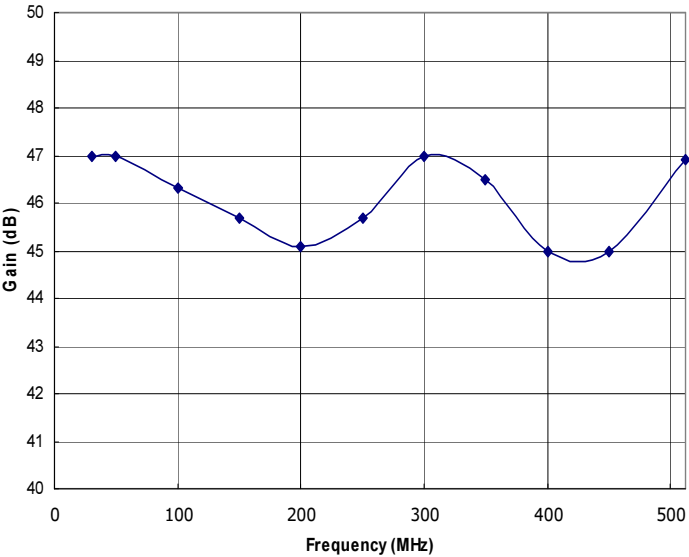


Figure 1: RFM30-512-20-HSD Typical Gain @ P<sub>out</sub>=20W.

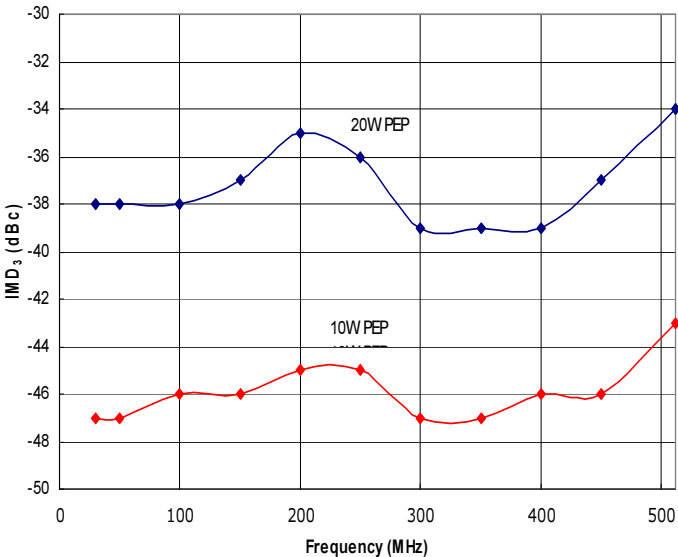


Figure 2: RFM30-512-20-HSD Typical IMD<sub>3</sub> @ 20W and 10W PEP, Δf=10kHz.

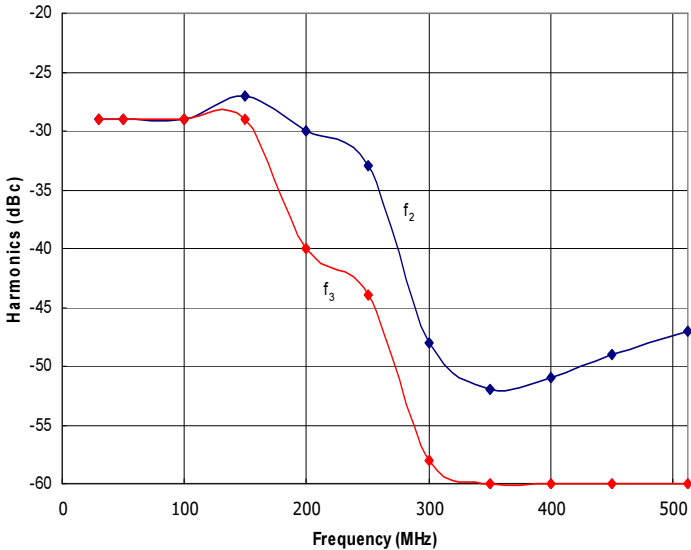


Figure 3: RFM30-512-20-HSD Typical f<sub>2</sub> and f<sub>3</sub> @ P<sub>out</sub>=20W.

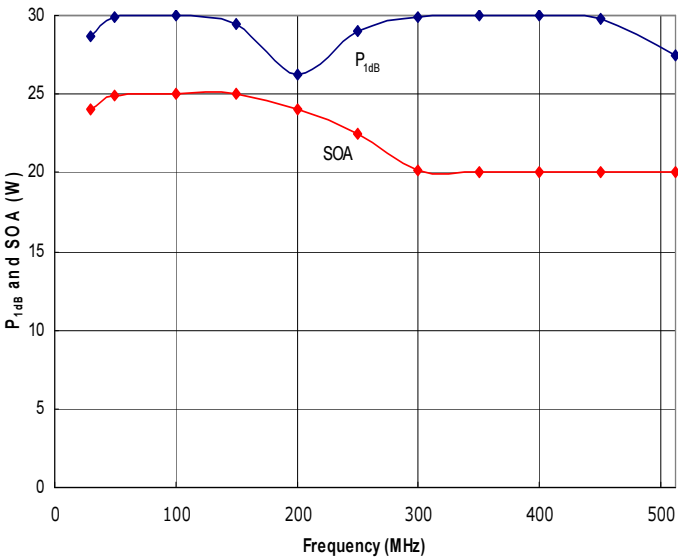
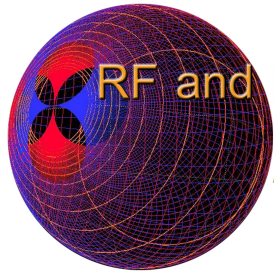


Figure 4: RFM30-512-20-HSD Typical P<sub>1dB</sub> and Safe Operating Area (SOA). Do not exceed the SOA shown above without first contacting RFMPT to discuss your application.

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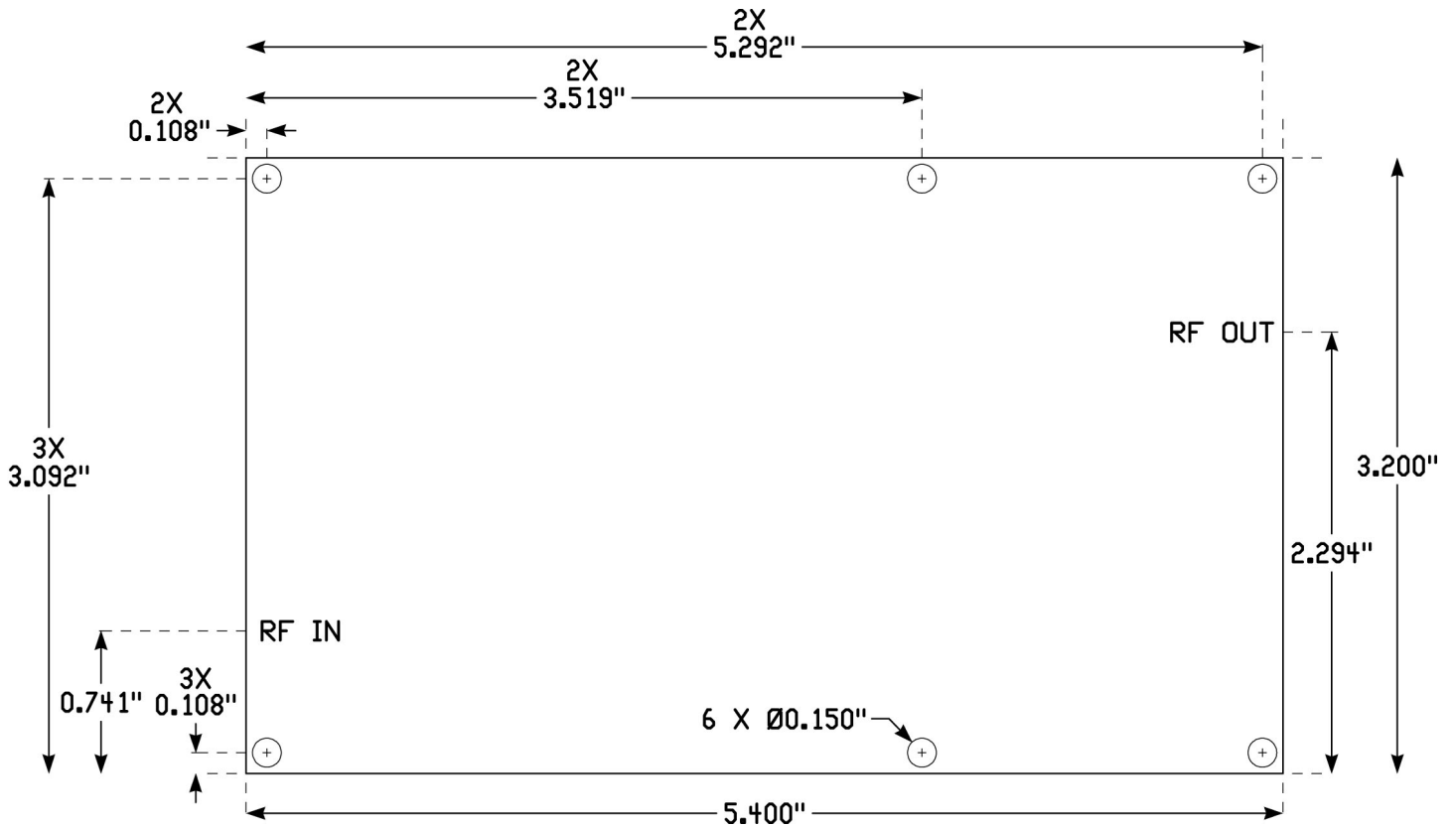


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RFM30-512-20-HSD

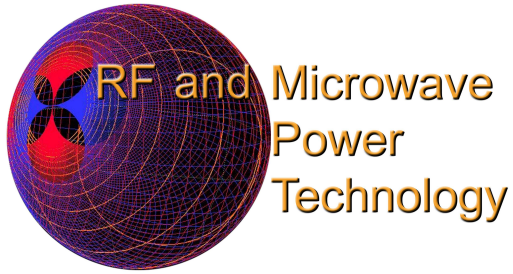
**30-512MHz 20W Class A  
High Performance Amplifier  
with High Speed Disable**

### Amplifier Mounting Hole and RF Locations



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## 30-512MHz 20W Class A High Performance Amplifier with High Speed Disable

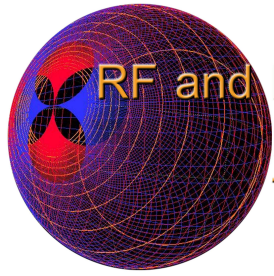
### Interface Pins and Functions

- 1: VVA** The voltage variable attenuator has a slope of approximately 30dB/volt, from 0.65 to 1.65V. Maximum attenuation is reached by 2.0V. The acceptable control range is 0 to 3.6V. **Do not exceed 3.6VDC on this pin.** Maximum RF input power is +3dBm, without the limiter option. Do not exceed the SOA in Figure 4. The VVA control voltage should be set to zero volts during amplifier power up and power down.
- 2: Temp Alarm** This indicates an over-temp condition, and is set to trip at a housing base temperature of approximately +65°C. It is an open drain output, pulled up internally to +15VDC, and will pull down to 0V at +65°C. The end user may either scale this range to suitable voltages with a simple resistive divider, or use an analog or digital input capable of handling +15VDC. This signal exhibits 5°C of hysteresis, and will reset to +15VDC at approximately +60°C.
- 3: Output Disable** This is active high at +5VDC, and is TTL compatible. It disables the second and output stages of the amplifier, and will reduce full rated output power to zero in  $\leq 1\mu\text{sec}$ . When set to 0VDC, the amplifier will return to full power in  $\leq 50\mu\text{sec}$ .
- 4: NC**
- 5: NC**
- 6: Temp Out** This is an analog signal that is a nominal +0.750V at +25°C. It has a positive slope of 10mV/°C with increasing temperature. An offset will exist between the temperature reported on this pin and the actual housing base temperature directly under the output transistor, until steady state conditions are reached. It is up to the end user to properly characterize this signal's response with their chosen cooling configuration.
- 7: NC**
- 8: GND** Amplifier ground. Connect to power supply return/ground. A minimum of 20 gauge wire is recommended.
- 9: +28VDC** Nominal supply voltage is +28VDC. As low as +24VDC may be used, with a reduction in  $P_{1dB}$  and linearity. A minimum of 20 gauge wire is recommended.

### Limiter Option

The limiter option significantly impacts amplifier linearity. Please contact RFMPT to learn more.





**Instructions for Amplifier 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 amplifier 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 amplifier damage. Use six #6-32 screws to mount the amplifier 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 a proper signal source to the RF IN connector, and desired load to the RF OUT connector. Torque connectors to industry standards for the type supplied with the amplifier.
- 4) Connect DC  $V_{supply}$  to pin 9 of the interface connector. Connect power supply return/ground to pin 8 of the interface connector. Ensure that  $V_{supply}$  is within the voltage range in the Maximum Ratings section.
- 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.
- 6) Apply DC power and sufficient RF drive to achieve desired output level. Ensure that the Safe Operating Area (SOA) power level indicated in Figure 4 is not exceeded, or amplifier damage may occur, and will void the warranty.
- 7) To disconnect the amplifier, first remove the RF drive, then DC power, then the RF connections.

Contact the factory at [support@rfmpt.com](mailto:support@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	5-23-2016	Initial release.

