

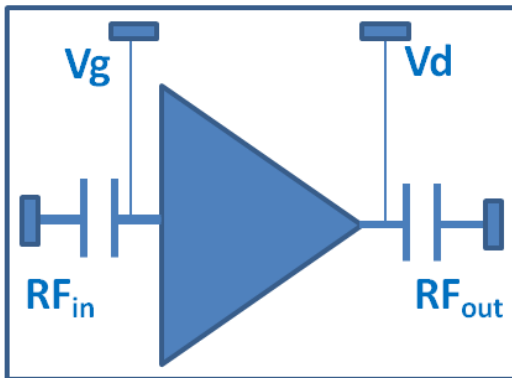
MECXQMM-70W

8.4 to 9.8 GHz GaN HEMT Power Amplifier



MICROWAVE ELECTRONICS FOR COMMUNICATIONS

Functional Block Diagram



Main Features

- 0.25 μ m GaN HEMT Technology
- 8.4 – 9.8 GHz full performances Frequency Range
- 70W Output Power @ Pin 40 dBm
- 35% PAE @ Pin 40 dBm
- 12.5 dB Linear Gain
- Bias: VDD = 30V, Idq = 1.5 A - Pulsed Regime
- Fully matched to 50 Ω
- Integrated RF to DC decoupling
- Very compact hybrid assembly:
- Easy integration either within a module or a power package

Product Description

MECXQMM-70W is a single stage High Power Amplifier designed by MEC for X-Band applications. It is based on a 0.25 μ m GaN on SiC process.

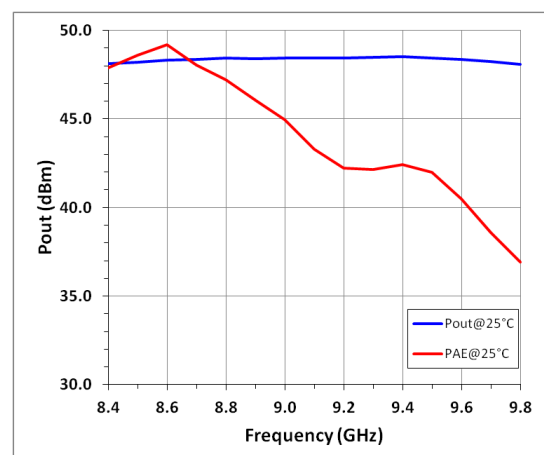
The MECXQMM-70W provides more than 60W of output power in the frequency range from 8.4 GHz to 9.8 GHz with a PAE higher than 35% and 12.5 dB of Linear Gain.

The MECXQMM-70W is provided as hybrid assembly. On the customers' needs can be arranged to ease its integration within a particular module or assembled within a power packaged.

It is fully matched to 50 Ω and provides DC to RF de-couplings.

Applications

- Radar
- Telecom



Vdd=30V, Idq= 1.5 A, PW=250 μ s - duty=20%

Pin = 40dBm

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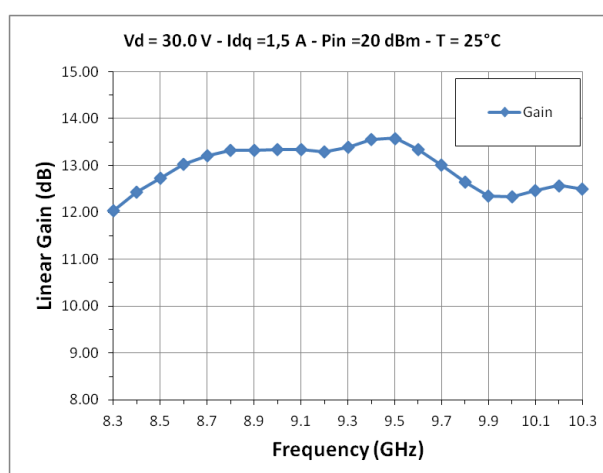
Main Characteristics*

Test Conditions: $T_{\text{base_plate}} = 25^{\circ}\text{C}$, $V_{\text{dd}} = 30\text{ V}$, $I_{\text{dq}} = 1.5\text{ A}$, Pulse width = 125 μs , Duty Cycle = 10%

Parameter	Min	Typ	Max	Unit
Operating frequency	8.4		9.8	GHz
Small Signal Gain	12.5		13.5	dB
Input Return Loss		9		dB
Output Return Loss		10		dB
Output Power @ $P_{\text{in}} = 40\text{ dBm}$	48.2		48.6	dBm
Power Added Efficiency @ $P_{\text{in}} = 40\text{ dBm}$	38.0		49.0	%
Drain Supply Voltage		30		V
Supply Quiescent Drain Current		1.5		A
Supply Drain Current @ $P_{\text{in}} = 40\text{ dBm}$	4.0		5.0	A
Gate Voltage		-2.6		V

*Performances described in this document are based on preliminary on-jig characterization.

More details are available upon request at contact.mec@mec-mmic.com



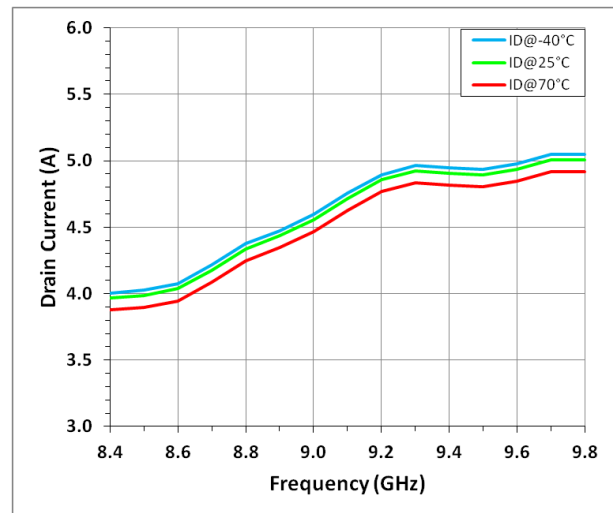
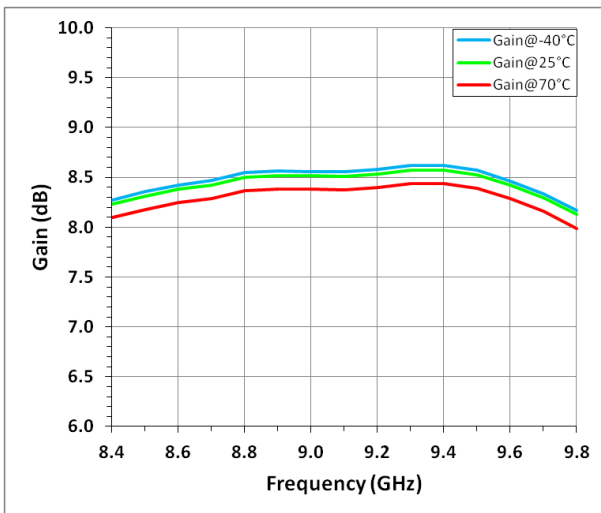
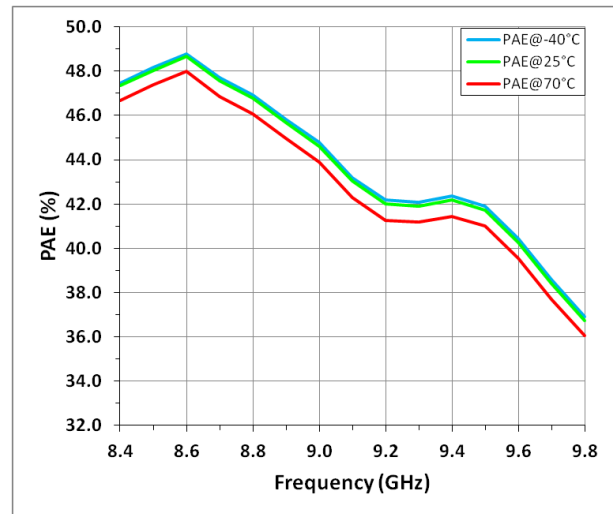
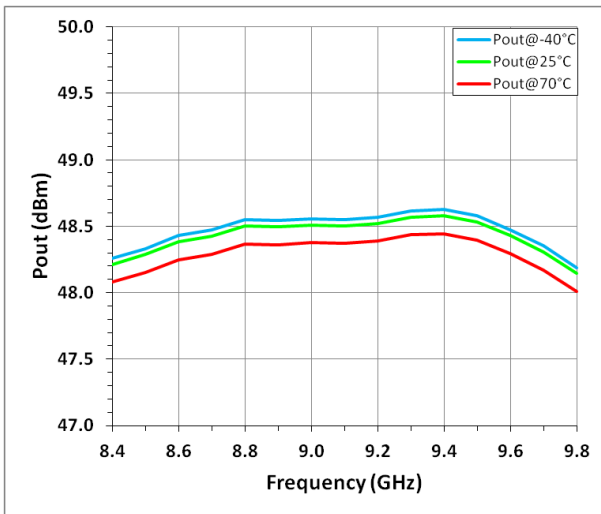
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**Power Performance Vs. Frequency Vs. Temperature - Pin = 40 dBm
Vd = 30V, Idq = 1.5A - Pulsed: PW = 125μs - duty cycle = 10%**



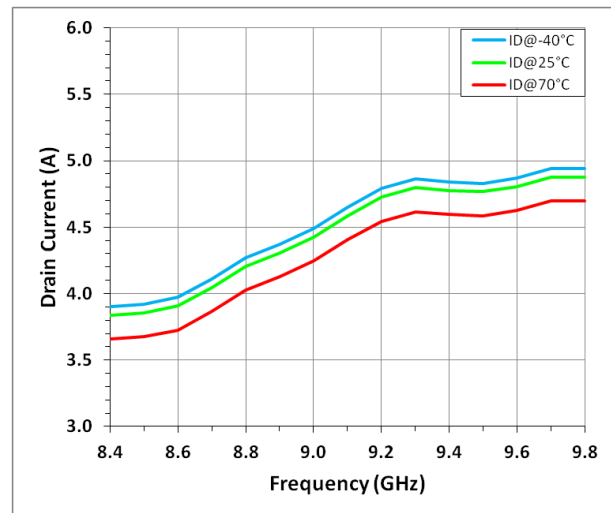
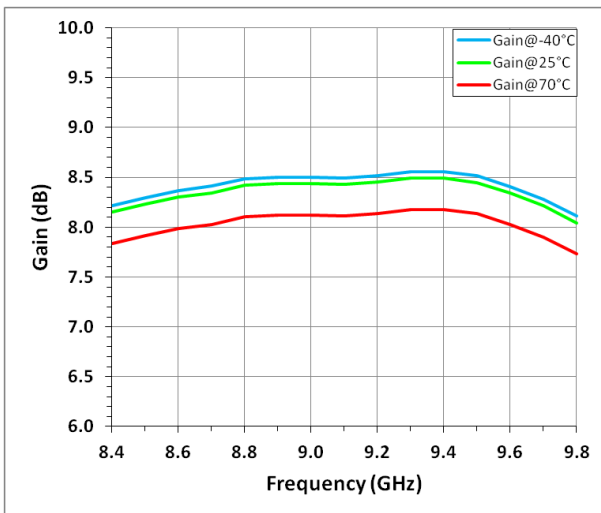
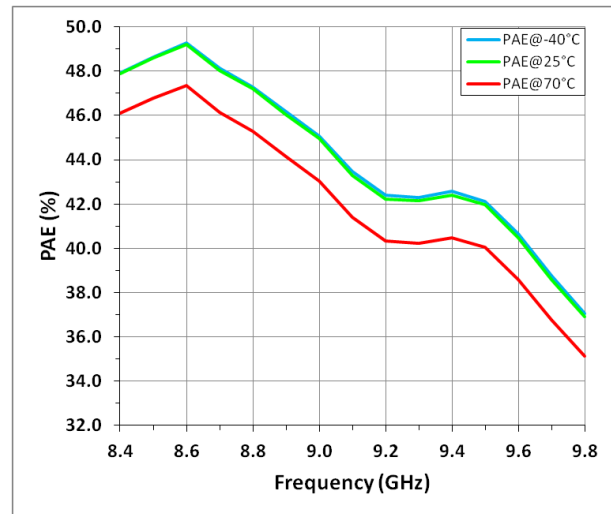
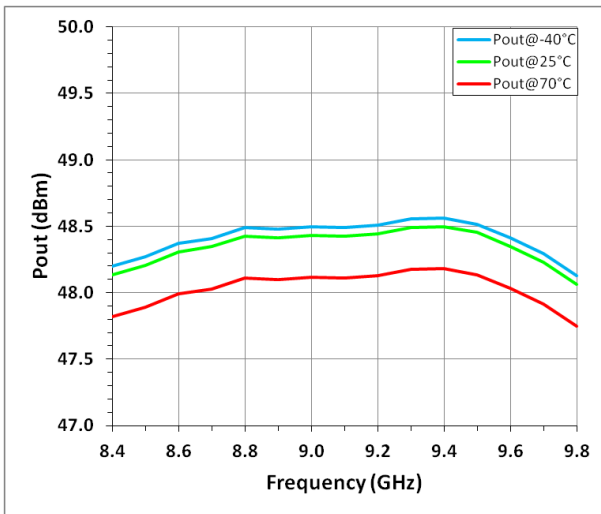
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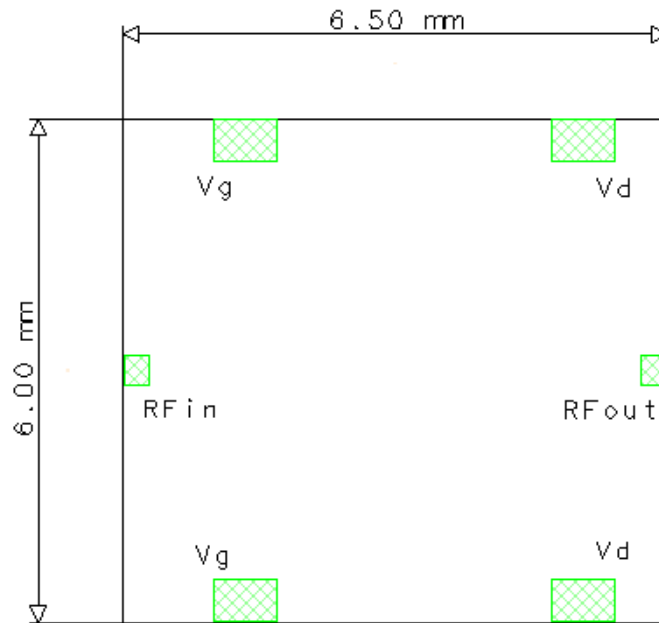


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**Power Performance Vs. Frequency Vs. Temperature - Pin = 40 dBm
Vd = 30V, Idq = 1.5A - Pulsed: PW = 250μs - duty cycle = 20%**



Hybrid Assembly Outline



The drawing shows the dimensions of the hybrid assembly. It can be easily mounted on a more complex power amplifier module or packaged depending upon the particular needs. Contact MEC to discuss the different options available (contact.mec@mec-mmhc.com)

Bias Procedure

Bias-Up

1. Vg set to -5 V.
2. Vd set to +30 V.
3. Adjust Vg until quiescent Id is 1.5A (Vg = -2.6 V Typical).
4. Apply RF signal.

Bias-Down

1. Turn off RF signal.
2. Reduce Vg to -5 V (Id0 ≈ 0 mA).
3. Set Vd to 0 V.
4. Set Vg to 0 V.

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Contact Information

For additional technical Information and Requirements:

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Notice

The furnished information is believed to be reliable. However, performances and specifications contained herein are based on preliminary characterizations and then susceptible to possible variations. On the basis of customer requirements the product can be tested and characterized in specific operating conditions and, if needed, tuned to meet custom specifications.

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