MECGaNXMOD-70W

8.0 to 10.0 GHz GaN HEMT Power Module

Product Description

MECGaNXMOD-70W is a multi-stage High Power Amplifier designed by MEC for X-Band applications. It is based on a 0.25µm GaN on SiC process.

The MECGaNXMOD-70W provides more than 70W of output power in the frequency range from 8.0 GHz to 10.0 GHz with a PAE higher than 25%, 34dB of Linear Gain and 26dB of Saturated Gain.

The Power Module integrates both Bias conditioning networks and DC blocking capacitors on both RF I/O ports, simplifying system integration. It is fully matched to 50 Ω.

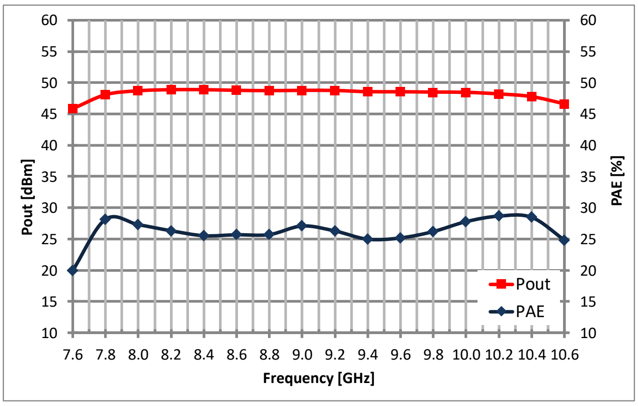
The MECGaNXMOD-70W can be provided in connectorized version (standard or customized version) or in chip&wire configuration, to be integrated in specific module or package.

Main Features

- 0.25µm GaN HEMT Technology
- 8.0 – 10.0 GHz full performances Frequency Range
- 70W min. Saturated Output Power
- 25% min. PAE @ Saturated Pout
- 26 dB Saturated Gain
- Bias: VDD = 30V, Idq = 3.6 A
  Pulsed Regime
- Fully matched to 50 Ω
- Integrated RF to DC decoupling
- Very compact hybrid assembly
- Available for connectorized or chip&wire solution

Applications

- Radar
- Defence
- Space
- Itar-free



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Main Characteristics*

Test Conditions: T_{base_plate} = 25°C, Vdd = 30 V, Idq = 3.6 A, Pulse width = 128 µs, Duty Cycle = 10%

Parameter	Min	Typ	Max	Unit
Operating frequency	8.0		10.0	GHz
Small Signal Gain	34		35	dB
Input Return Loss		10		dB
Output Return Loss		10		dB
Output Power @ Pin = 22 dBm	70		77	W
Power Added Efficiency @ Pin = 22 dBm		25		%
Drain Supply Voltage		30		V
Supply Quiescent Drain Current		3.6		A
Supply Drain Current @ Pin = 22 dBm	8		10	A
Gate Voltage		-3.4		V

*Performances described in this document are based on characterization of not-connectorized version.

Absolute Maximum Rating*			
Symbol	**Parameter**	**Values**	**Unit**
Vd	Drain Bias Voltage	35	V
Vg_min	Negative Gate Bias Voltage	-10	V
Vg_max	Positive Gate Bias Voltage	0	V
Pin	Maximum peak input Power	24	dBm
Tj	Maximum junction temperature	230	°C

* Tamb = 25°C

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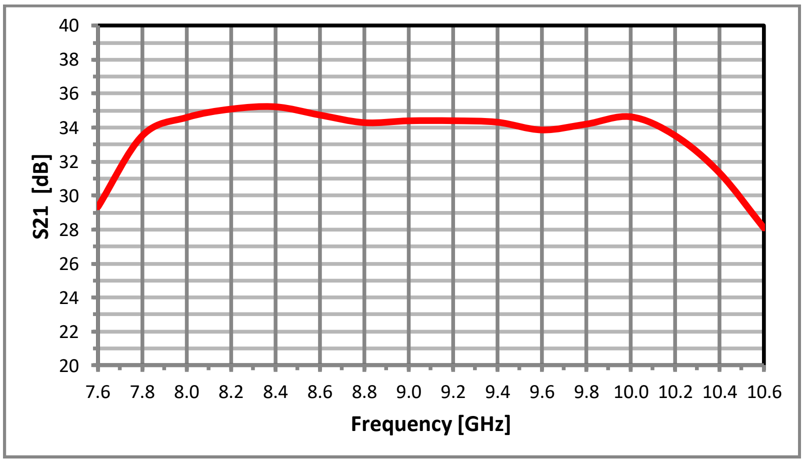
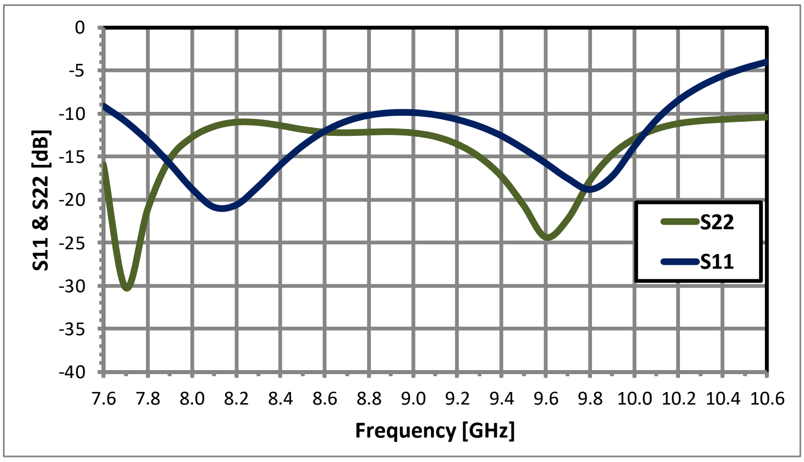
Thermal and Reliability Information			
Conditions	**Parameter**	**Values**	**Unit**
VD = 30 V, ID = 10.2 A Pin = 24 dBm **Pout = 70W** **Pdiss = 225W CW** Tbaseplate = 60°C Duty= 10%	**Equivalent Thermal Resistance**	**5.3**	**°C/W**
	Channel Temperature	**180**	**°C**
	Mean Time Failure	**0.6E+7**	**Hrs**

Measured Performance – Small Signal (Pulsed)

Test Conditions: T_{base_plate} = 25°C, Vdd = 30 V, Idq = 3.6 A, Pulse width = 128 µs, Duty Cycle = 10%





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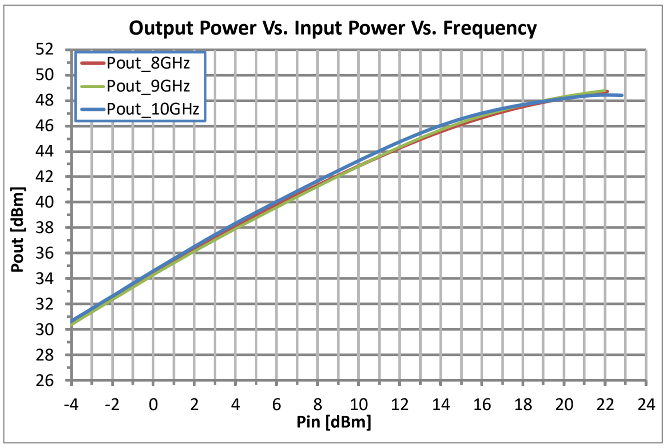
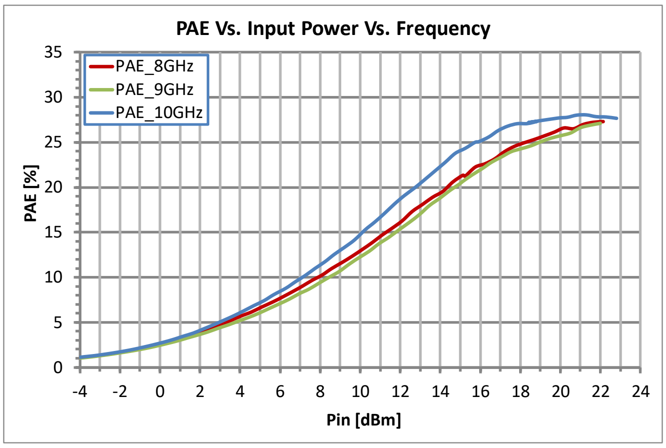
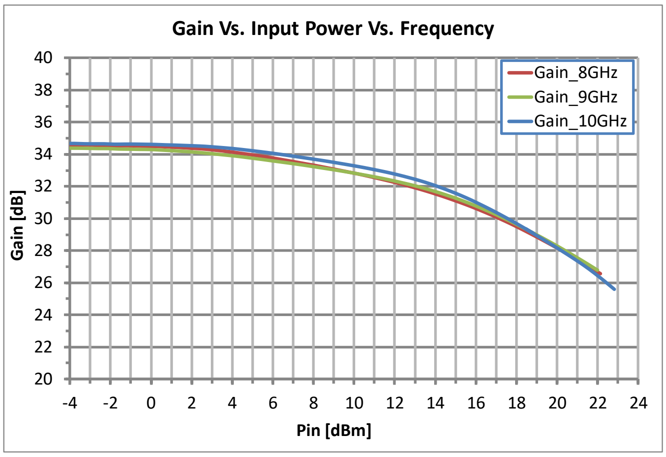
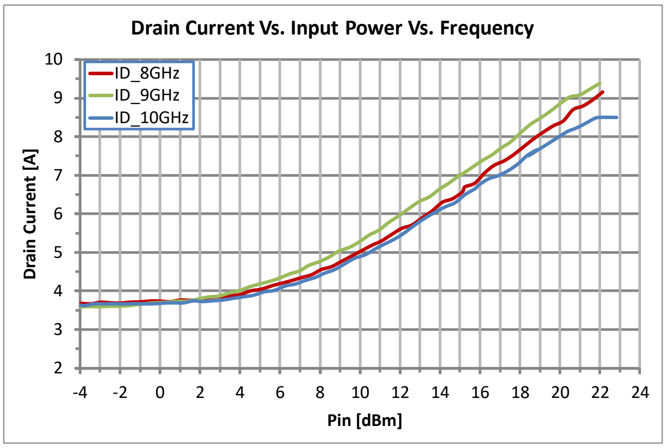
Measured Performance – Large Signal (Pulsed)

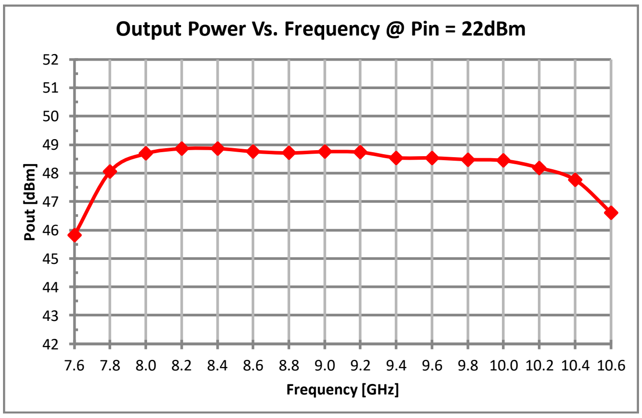
Test Conditions: T_{base_plate} = 25°C, Vdd = 30 V, Idq = 3.6 A, Pulse width = 128 µs, Duty Cycle = 10%

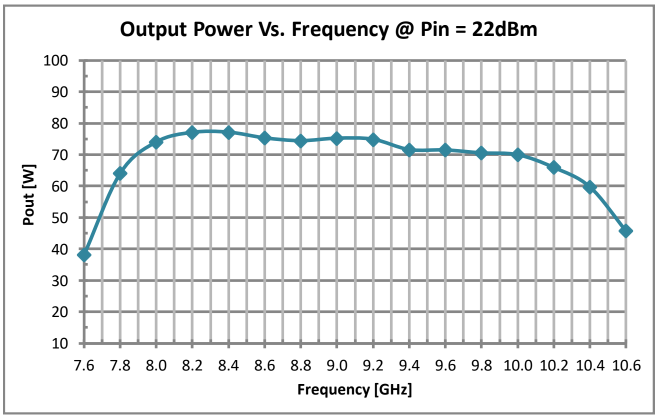


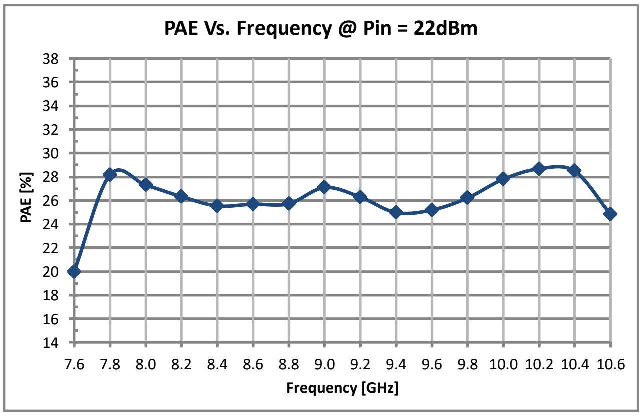


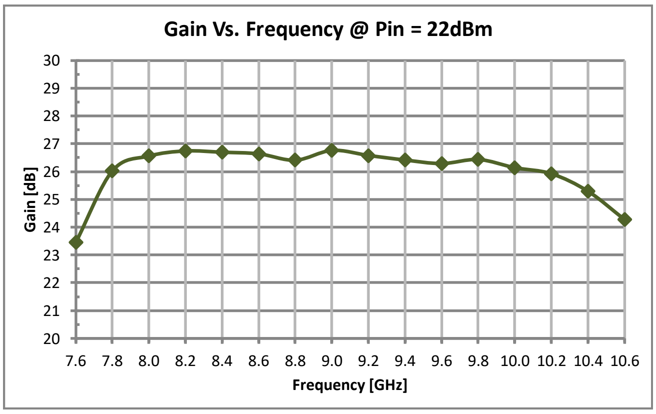


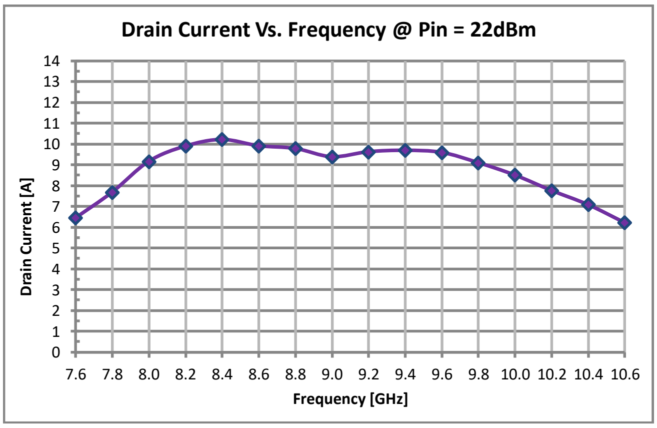


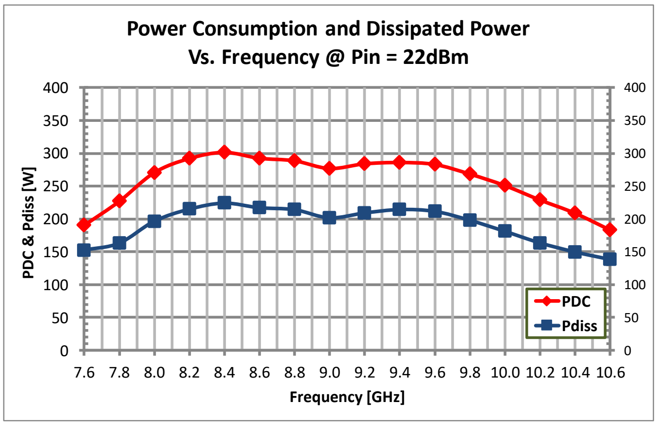












Bias Procedure

Bias-Up

1. Vg set to -5 V.
2. Vd set to +30 V.
3. Adjust Vg until quiescent Id is 3.6 A (Vg = -3.4 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.

The embedded DC network can be configured for either Gate or Drain pulsing.

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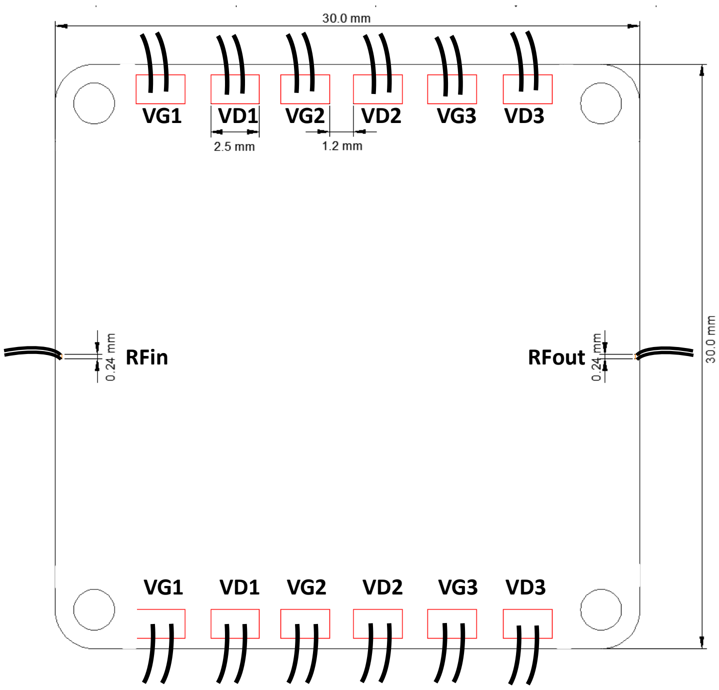
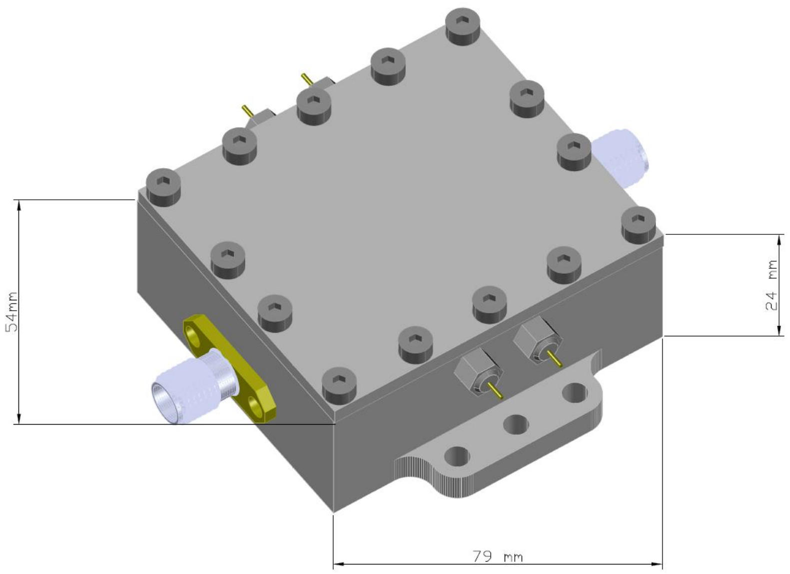
Assembly Outline for Chip&Wire option



Bond Pad	Description
RFin	Input RF Port
RFout	Output RF Port
VG1, VG2, VG3	Gate Negative Supply Voltage
VD1, VD2, VD3	Drain Positive Supply Voltage

The drawing shows a standard assembly configuration. If required, the Drain Pads and the Gate Pads of the different stages can be easily joint in one common Pad

Mechanical Drawing of possible connectorized version



Contact Information

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Notice

The furbished 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.