

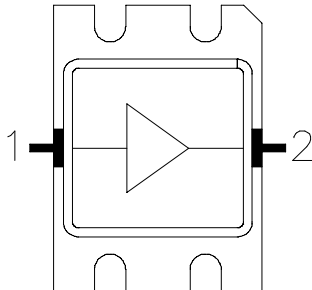
MECPKC45W

4.7 to 5.1 GHz GaN HEMT Power Amplifier



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Functional Block Diagram



Pin #	Symbol	Description
1	Vg/ RF IN	Gate voltage/RF Input matched to 50Ω
2	Vd/ RF OUT	Drain voltage/RF Output matched to 50Ω
Package Bottom	Ground	Source connected to ground

Product Description

MECPKC45W is a single stage High Power Amplifier designed by MEC for C-Band applications and based on a 0.5μm GaN on SiC process.

The MECPKC45W provides more than 40W of output power in the frequency range from 4.7 GHz to 5.1 GHz with a PAE higher than 40% and 14 dB of Linear Gain.

The MECPKC45W is provided within a CuMo power package for optimal thermal dissipation. It is fully matched to 50 Ω at the pin of the package.

Advanced Thin Film technology and manufacturing has been exploited to get a reliable and reproducible product performance.

Main Features

- 0.5μm GaN HEMT Technology
- 4.7 – 5.1 GHz full performances
Frequency Range
- more than 40W Output Power @ Pin 36 dBm
- more than 40% PAE @ Pin 36 dBm
- 14 dB Linear Gain
- Bias: VDD = 40V, Idq = 400 mA,
Vg = -1.9V (Typ.)
- CuMo Power package with RFin and RFout pin interfaces
- Fully matched to 50 Ω within the package

Applications

- Radar
- Telecom

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Main Characteristics*

Test Conditions: $T_{\text{base_plate}} = 25^{\circ}\text{C}$, $V_{\text{dd}} = 40\text{ V}$, $I_{\text{dq}} = 400\text{ mA}$, Pulse Width = $50\text{ }\mu\text{s}$, Duty Cycle = 15%

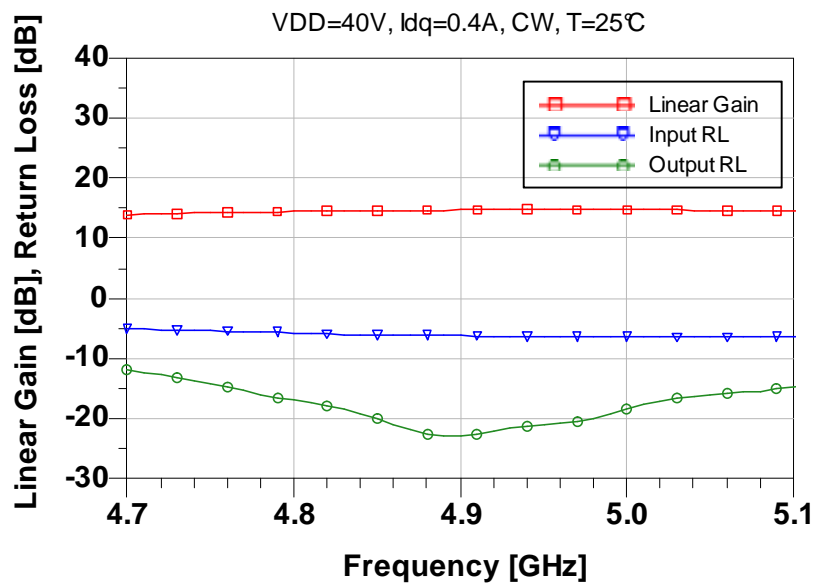
Parameter	Min	Typ	Max	Unit
Operating frequency	4.7		5.1	GHz
Small Signal Gain	13.9	14.3	14.7	dB
Input Return Loss			-5	dB
Output Return Loss			-11.9	dB
Output Power @ Pin = 36 dBm	41		49	W
Power Added Efficiency @ Pin = 36 dBm	41		46	%
Drain Supply Voltage		40		V
Supply Quiescent Drain Current		400		mA
Supply Drain Current @ Pin = 36 dBm	2.1		2.5	A
Gate Voltage		1.9		V

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

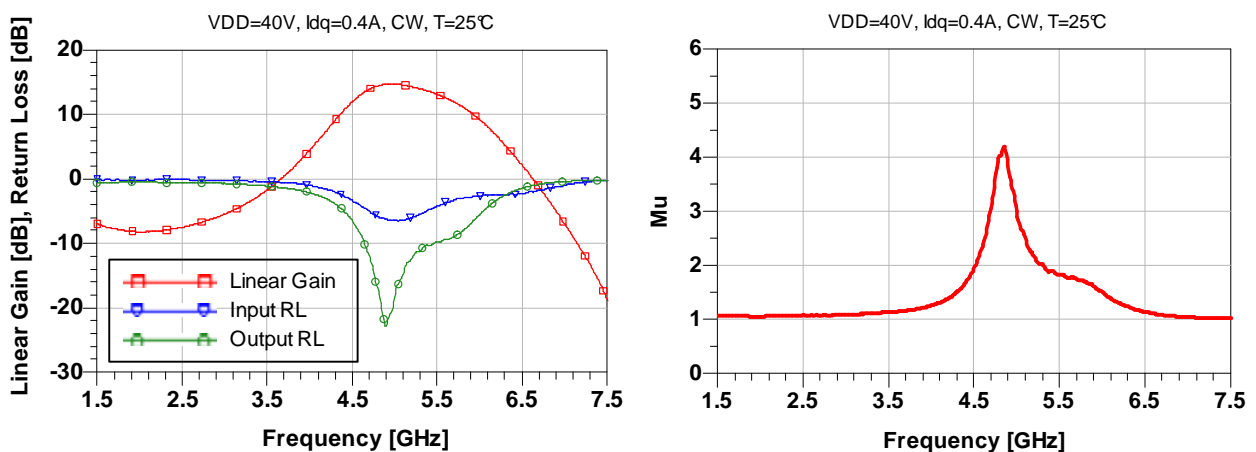
More details are available upon request at contact.mec@mec-mmic.com

Typical Measured Performances

Linear Gain, Input and Output Return Loss Vs. Frequency (Operating Band)

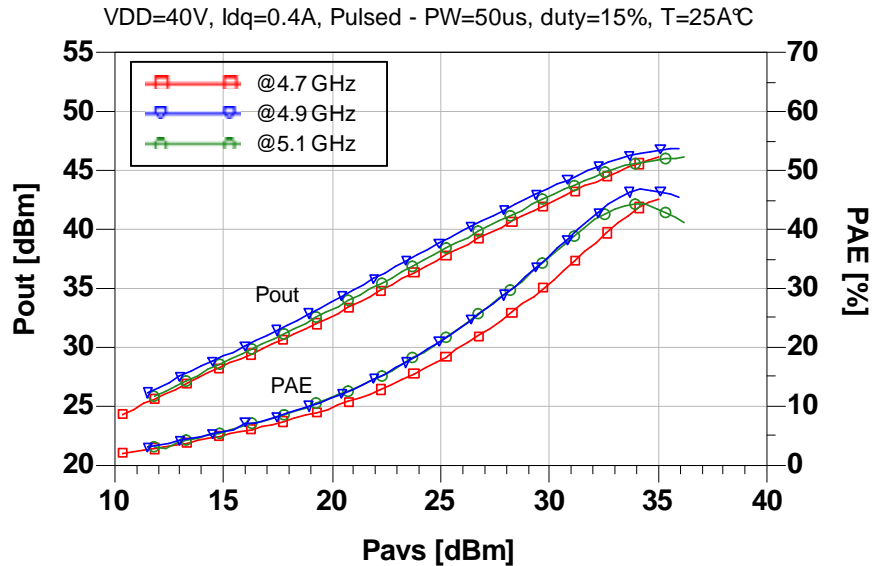


Linear Gain, Input and Output Return Loss Vs. Frequency (Broadband)**

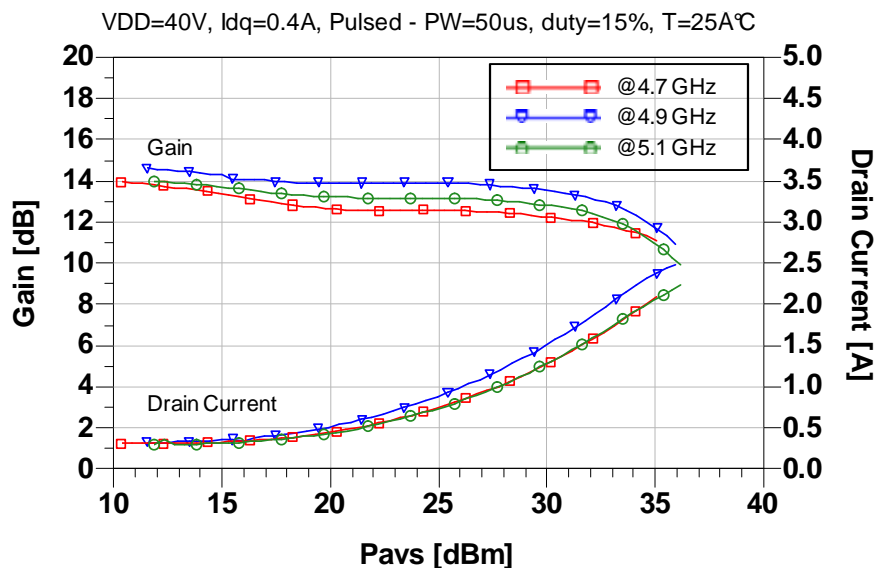


** S-parameter file is available upon request at contact.mec@mec-mmhc.com

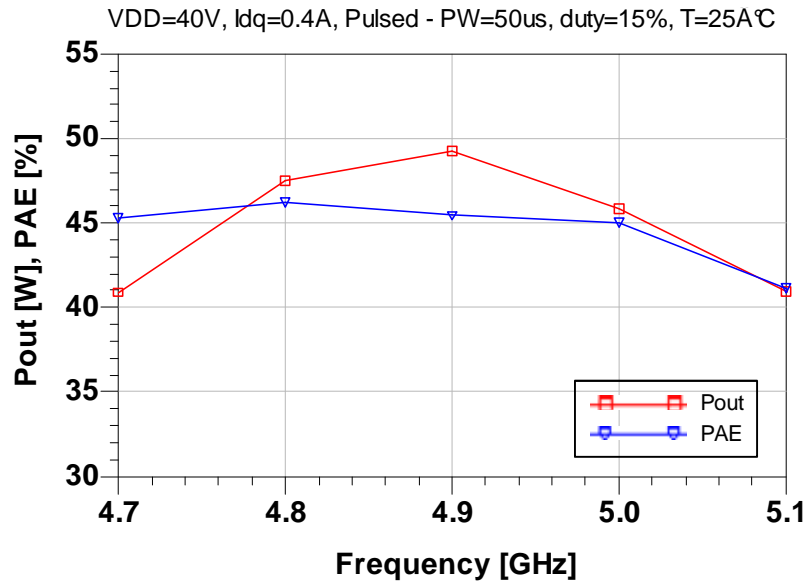
Output Power and PAE Vs. Input Power



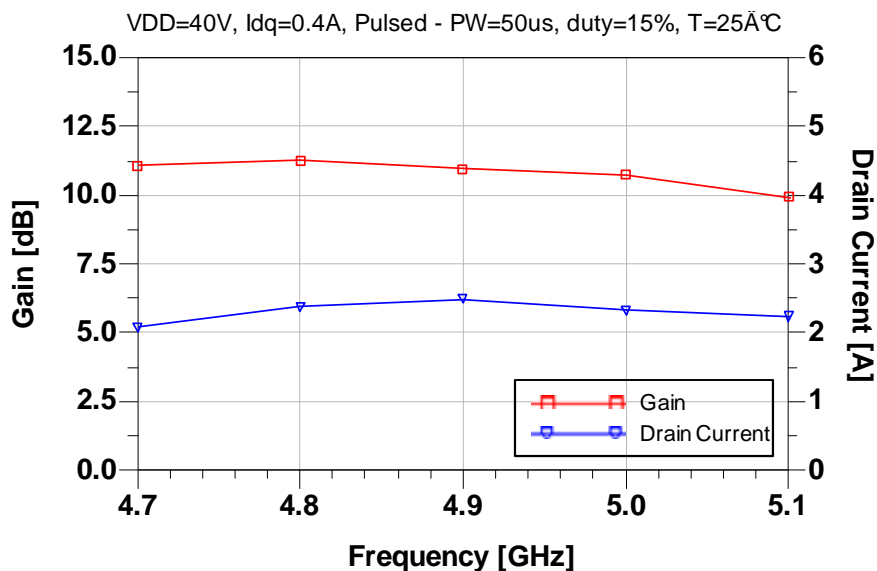
Gain and Drain Current Vs. Input Power



Output Power and PAE @ Pin = 36 dBm Vs. Frequency



Gain and Drain Current @ Pin = 36 dBm Vs. Frequency



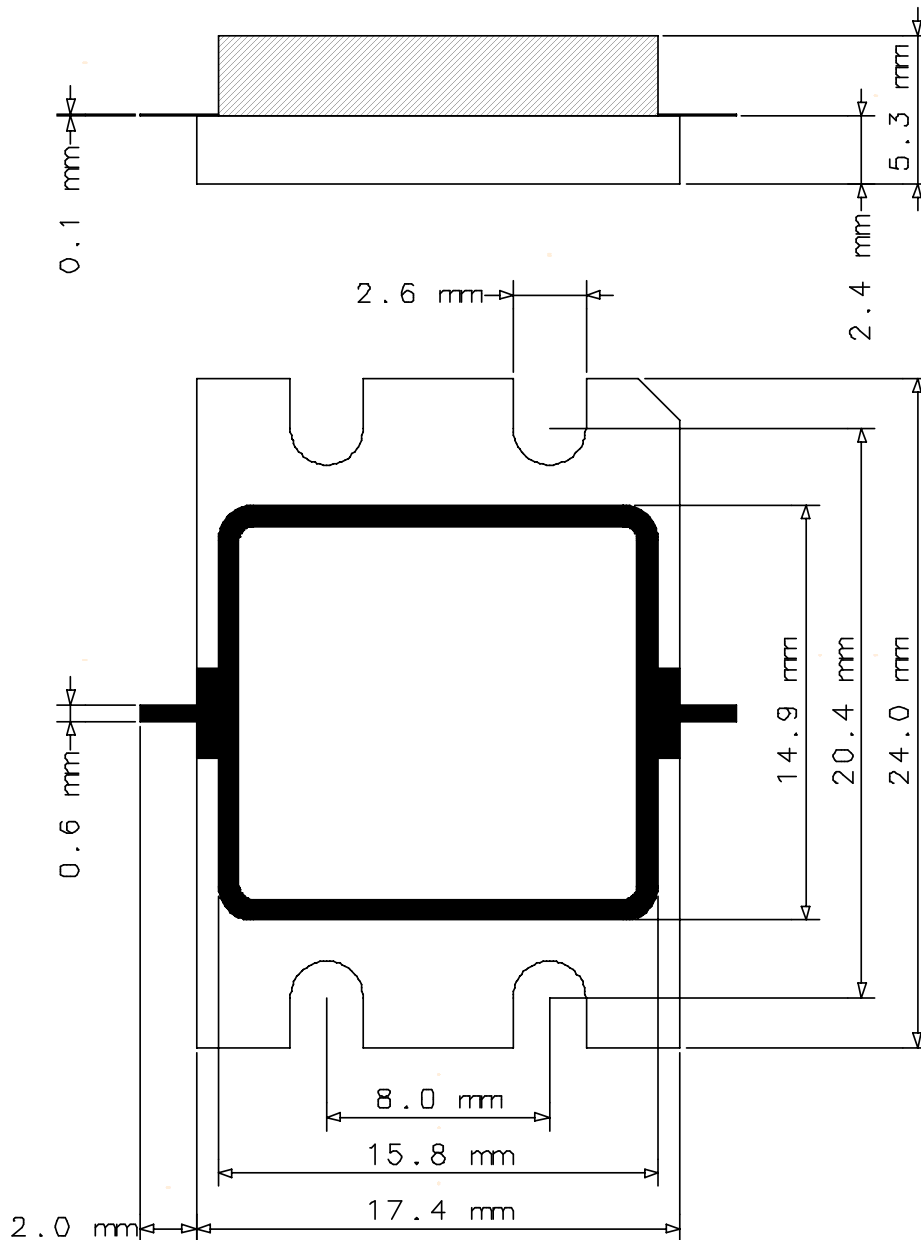
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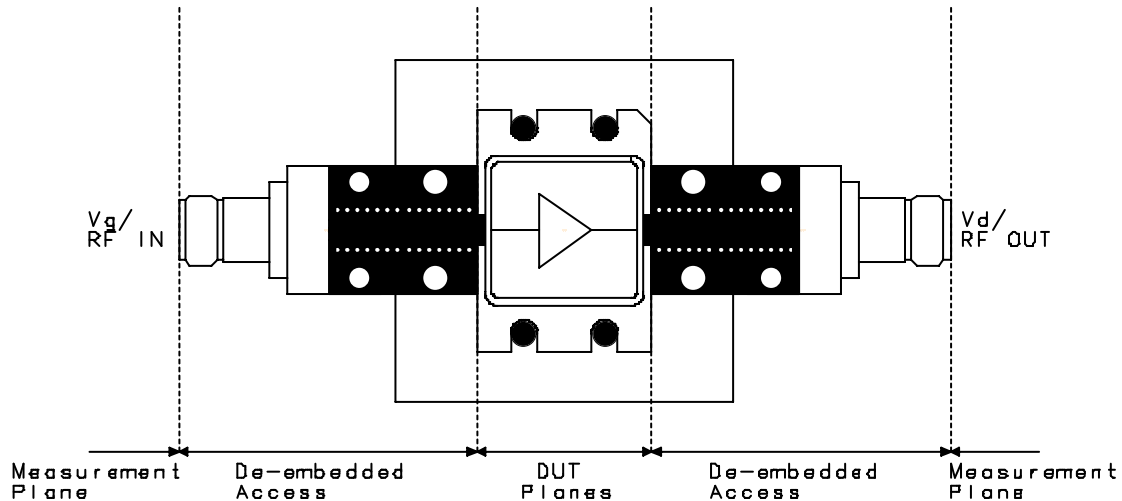
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Package Outline



Detailed package dimensions and characteristics are available upon request at contact.mec@mec-mmic.com

Test Board



The device characteristics were measured at the package pins, by de-embedding at both ports the Shielded Conductor-backed Coplanar Waveguide access plus the input and output connectors by a TRL calibration.

Further details of the Test Board are available upon request at contact.mec@mec-mmic.com.

To implement RF to DC decoupling and improve input return loss, custom test-fixtures can be designed and provided upon request (contact.mec@mec-mmic.com).

Bias Procedure

Bias-Up

1. V_g set to -5 V.
2. V_d set to +40 V.
3. Adjust V_g until quiescent I_d is 400 mA ($V_g = -1.9$ V Typical).
4. Apply RF signal.

Bias-Down

1. Turn off RF signal.
2. Reduce V_g to -5 V ($I_{d0} \approx 0$ mA).
3. Set V_d to 0 V.
4. Set V_g to 0 V.

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Contact Information

For additional technical Information and Requirements:

Email: contact.mec@mec-mmic.com

Tel: +39 0516333403

For sales Information and Requirements:

Email: sales@mec-mmic.com

Tel: +39 0637511124

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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