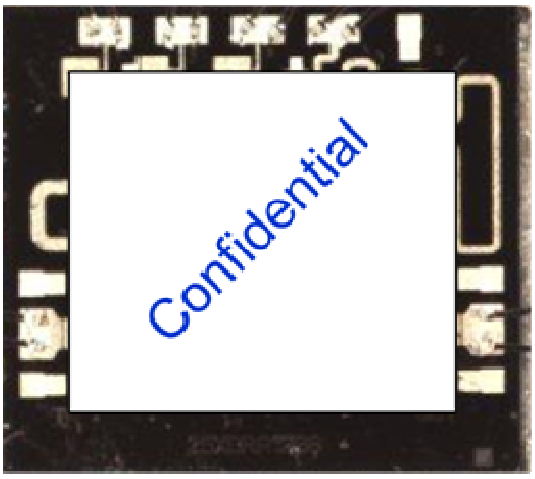
MEC25XDRA

X-Band 0.5 Watt Power Amplifier



MEC25XDRA is a 0.25µm GaAs pHEMT based Power Amplifier designed by MEC for X-Band applications.

In the frequency range from 8.9 GHz to 11 GHz it provides more than 21 dB of linear gain and input and output return loss of 15 dB and 12 dB respectively.

When driven at 1 dB of Gain compression it gives in the same frequency band an output power greater than 27 dBm with an overall PAE above 40%.

Main Features

- 0.25µm GaAs pHEMT Technology
- 8.9– 11.0 GHz full performance Frequency Range
- Small Signal Gain > 21 dB
- Input Output RL > 12 dB
- P1dB > 27 dBm

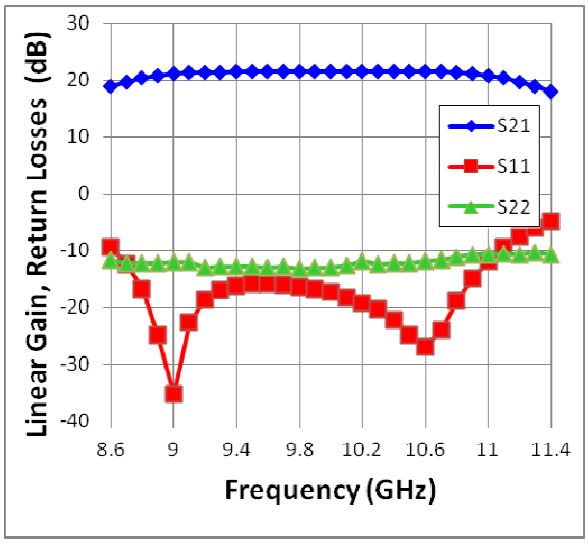
- Bias: Vd = 6V, Id = 190mA, Vg = -0.5 V (Typ.)

- Chip Size: 1.98 x 1.80 x 0.07 mm^3

Typical Applications

- Radar
- Point-to-Point Radio
- X Band Driver

Measured Data



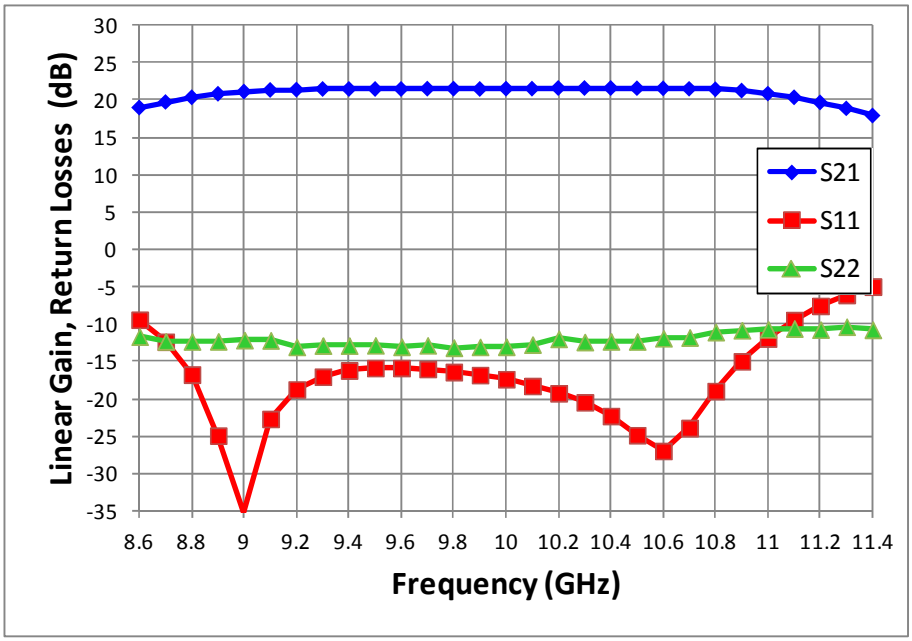
Main Characteristics

Test Conditions: T_{base_plate} = 25°C , Vd = 6 V, Idq = 190 mA

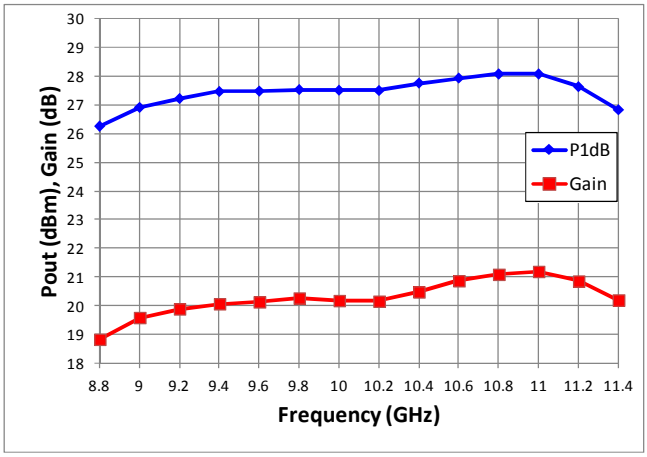
Parameter	Min	Typ	Max	Unit
Operating frequency	8.9		11.0	GHz
Small Signal Gain		21		dB
Input Return Loss			-15	dB
Output Return Loss			-12	dB
Output Power at 1 dB of Gain Compression	27			dBm
Drain Supply Voltage		6		V
Supply Quiescent Drain Current		190		mA
PAE	40			%

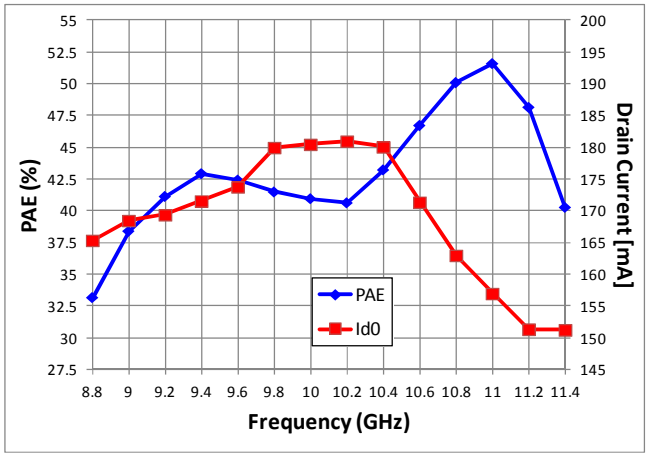
MEC25XDRA - Selected Measurements

Test Conditions: T_{base_plate} = 25°C , Vd = 6 V, Idq = 190 mA

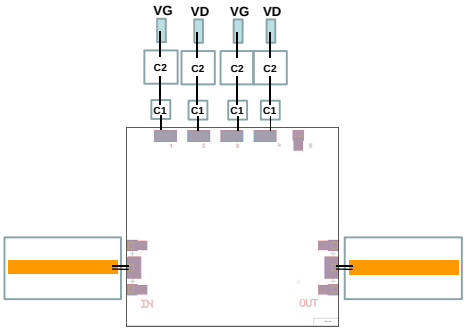


Test Conditions: T_{base_plate} = 25°C , Vd = 6 V, Idq = 190 mA - Input Power = 7 dBm

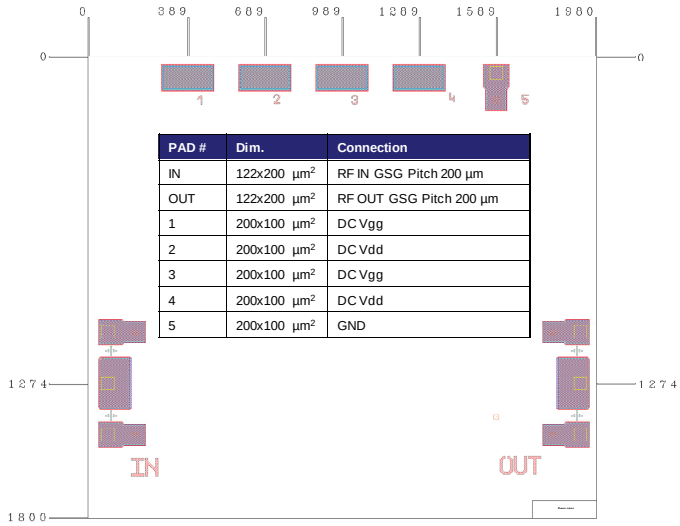




Bond Pad Configuration & Assembly Recommendations



Bond Pad #	Connection	External Components
IN and OUT	**2** Bonding Wires L_bond = 0.3nH	
1, 3 **Vg**	L_bond ≤ 1 nH	C1 = 100pF/10V C2 = 10nF/10V
2, 4, **Vd**	L_bond ≤ 1nH	C1 = 100pF/50V C2 = 10nF/50V



PAD #	Dim.	Connection
IN	122x200 μm^2	RF IN GSG Pitch 200 µm
OUT	122x200 μm^2	RF OUT GSG Pitch 200 µm
1	200x100 μm^2	DC Vgg
2	200x100 μm^2	DC Vdd
3	200x100 μm^2	DC Vgg
4	200x100 μm^2	DC Vdd
5	200x100 μm^2	GND

Eutectic Die bond using AuSn (80/20) solder is recommended.

The backside of the die is the Source (ground) contact.

Thermosonic ball or wedge bonding are the preferred connection methods.

Gold wire must be used for connections.

Bias Procedure

Bias-Up

1. Vg set to - 1.5 V.
2. Vd set to +6 V.
3. Adjust Vg until quiescent Id is 190 mA (Vg = -0.5 V Typical).
4. Apply RF signal.

Bias-Down

1. Turn off RF signal.
2. Reduce Vg to -1.5 V (Id0 ≈ 0 mA).
3. Set Vd to 0 V.
4. Turn off Vd.
5. Turn off Vg.

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.