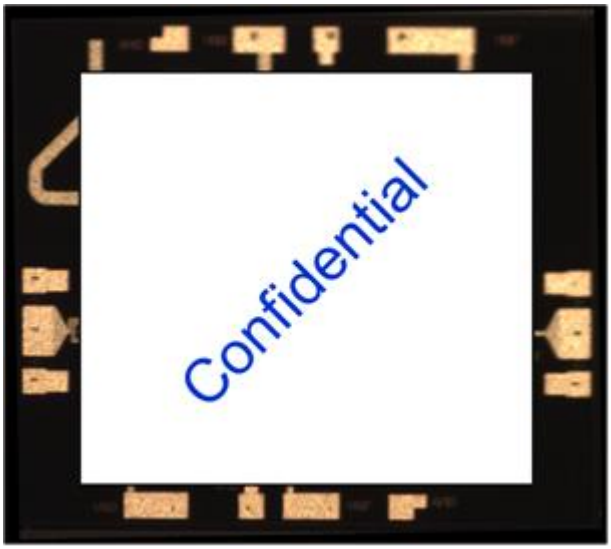
MECWideX

X-Ku-Band 0.5Watt Wideband Power Amplifier



MECWideX is a 0.25µm GaAs pHEMT based wideband Power Amplifier designed by MEC for X- to Ku-Band applications.

In the frequency range from 8.0 GHz to 14 GHz it provides more than 18 dB of linear gain and input return loss better than 10 dB.

When driven at 1 dB of Gain compression it gives an output power greater than 27 dBm which increase to 29 dBm at saturation. It is also designed to be very efficient in the whole wide frequency band: PAE is above 35% at 1 dB of gain compression and reaches nearly 40% at saturation.

Main Features

- 0.25µm GaAs pHEMT Technology
- 8.0 – 14.0 GHz full performance Frequency Range
- Small Signal Gain > 18 dB
- Input Return Loss > 10 dB
- P1dB > 27 dBm
- Psat > 29 dBm
- PAE > 35 %

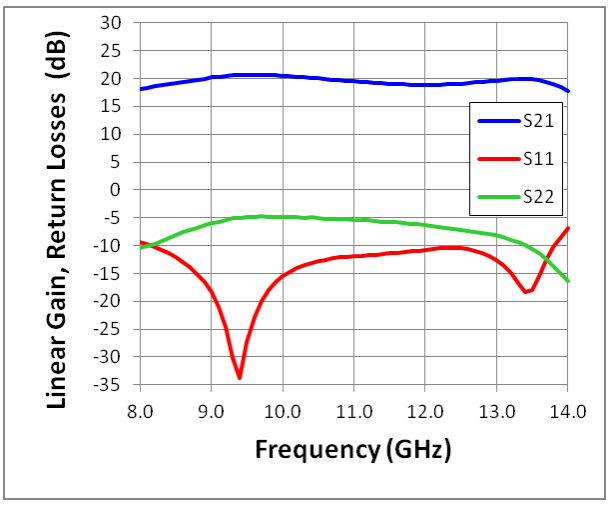
- Bias: Vd = 6V, Id = 190mA, Vg = -0.5 V (Typ.)

- Chip Size: 2.31 x 2.00 x 0.07 mm^3

Typical Applications

- Point-to-Point Radio
- X- to Ku-Band Driver

Measured Data



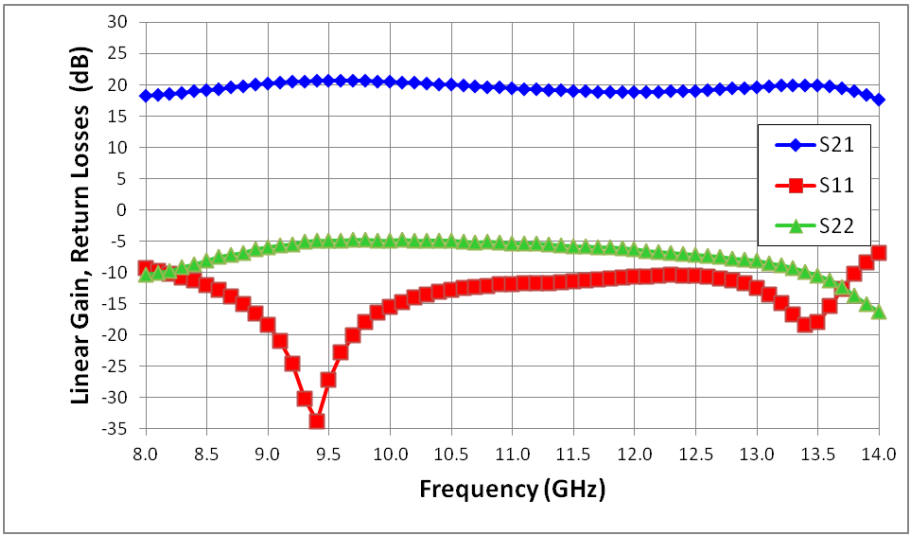
Main Characteristics

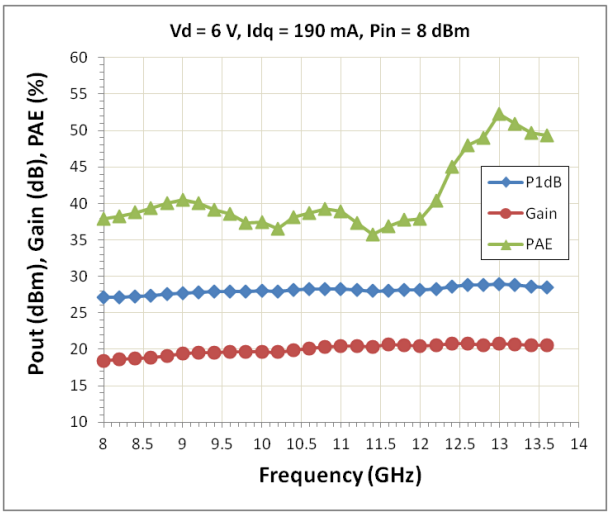
Test Conditions: T_{base_plate} = 25°C , Vd = 6 V, Idq = 190 mA

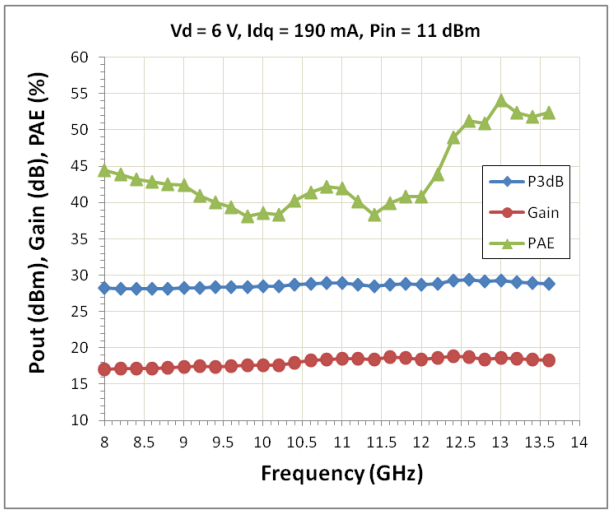
Parameter	Min	Typ	Max	Unit
Operating frequency	8.0		14.0	GHz
Small Signal Gain	18			dB
Input Return Loss			-10	dB
Output Return Loss			-5	dB
Output Power at 1 dB of Gain Compression	27			dBm
Saturated Output Power (3 dB of Gain Compr.)	29			dBm
PAE at 1 dB of Gain Compression	35			
PAE at 3 dB of Gain Compression	38			
Drain Supply Voltage		6		V
Supply Quiescent Drain Current		190		mA

MECWideX - Selected Measurements

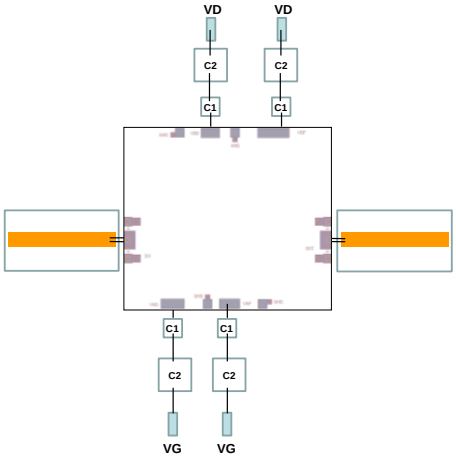
Test Conditions: T_{base_plate} = 25°C , Vd = 6 V, Idq = 190 mA



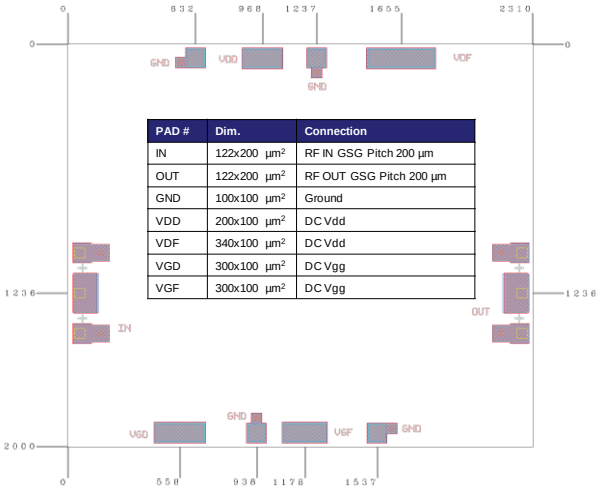




Bond Pad Configuration & Assembly Recommendations



Bond Pad #	Connection	External Components
IN and OUT	**2** Bonding Wires L_bond = 0.2nH	
VDD VDF	L_bond ≤ 1 nH	C1 = 100pF/10V C2 = 10nF/10V
VGD VGF	L_bond ≤ 1nH	C1 = 100pF/50V C2 = 10nF/50V



PAD #	Dim.	Connection
IN	122x200 µm²	RF IN GSG Pitch 200 µm
OUT	122x200 µm²	RF OUT GSG Pitch 200 µm
GND	100x100 µm²	Ground
VDD	200x100 µm²	DC Vdd
VDF	340x100 µm²	DC Vdd
VGD	300x100 µm²	DC Vgg
VGF	300x100 µm²	DC Vgg

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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