

2.5 W Solid State Power Amplifier 2 - 18 GHz



ENGAD00071

Rev. V1

Features

- 2 to 18 GHz Band Coverage
- Saturated Output Power: >2.5 W
- Average PAE @ P_{SAT} : 31%
- Solid State GaN MMIC
- Microstrip Input/Output Interface
- Dual Bias Supply Required
- Size: 0.25" x 0.45" x 0.055"
- RoHS* Compliant

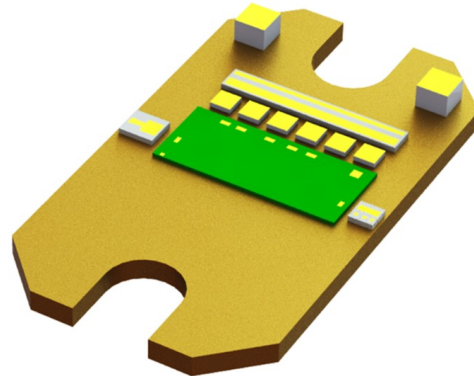
Applications

- Military & Commercial SATCOM
- Electronic Warfare Circuits
- Radar Circuits
- Transmit Circuits
- Telecom Infrastructure
- Test & Measurement Systems

Description

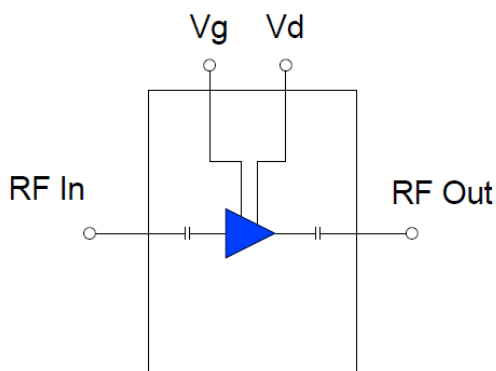
The ENGAD00071 is a carrier based Solid State Power Amplifier (SSPA) operating across 2 to 18 GHz with a saturated output power (P_{sat}) of greater than 2.5 W and average 31% power added efficiency (PAE). The ENGAD00071 uses microstrip interfaces for the RF input and output ports. The ENGAD00071 operates at 18 V drain voltage with a quiescent bias of 0.31 A. Available in bare die MMIC upon request. MMIC provides >3 Watts output power and average 33% PAE.

Carrier Based 2.5 W SSPA



Ordering Information

Part Number	Package
ENGAD00071	bulk



* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

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Electrical Specifications: Freq. = 2 - 18 GHz, T_A = +25°C, V = 18 V

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Saturated Power	—	W	2.0	2.5	—
PAE @ P _{SAT}	average	%	—	31	—
Small Signal Gain	—	dB	26	30	—
Input Return Loss	—	dB	14	16	—
Output Return Loss	—	dB	14	16	—
DC Current	Small Signal P _{SAT}	A	—	0.31 0.50	—

Recommended Operating Conditions

Parameter	Units	Min.	Typ.	Max.
Drain Voltage	V	16	18	20
Gate Voltage	V	-1.1	-1.5	-1.8
RF Input Power (for 2.5 W Output Power)	dBm	—	13	—

Absolute Maximum Ratings^{1,2}

Parameter	Absolute Maximum
Drain Voltage	+22 V
Gate Voltage	-6 V
RF Input Power	18 dBm
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +125°C

1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. MACOM does not recommend sustained operation near these survivability limits.

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

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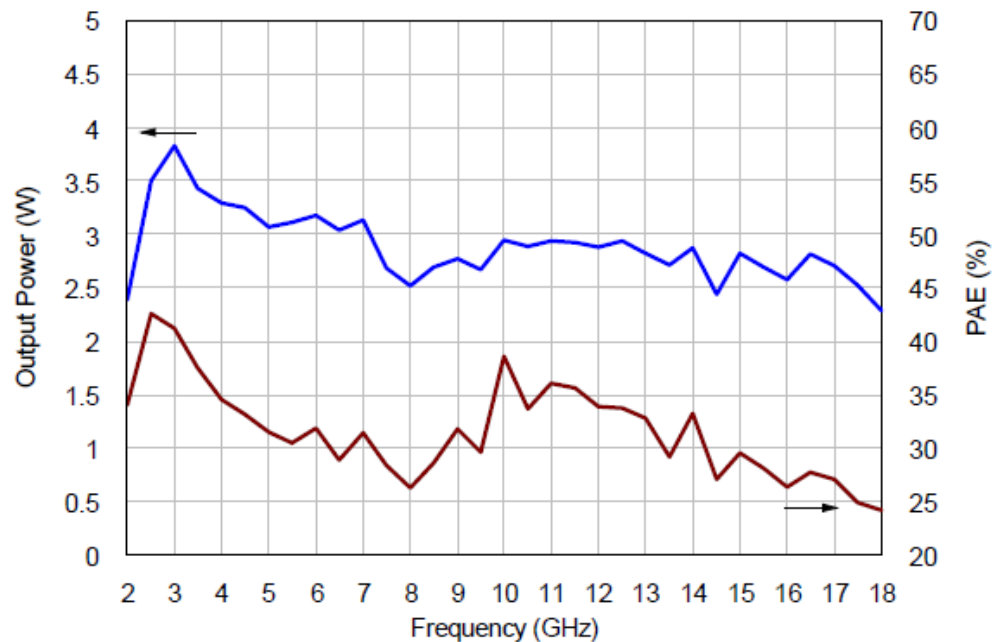
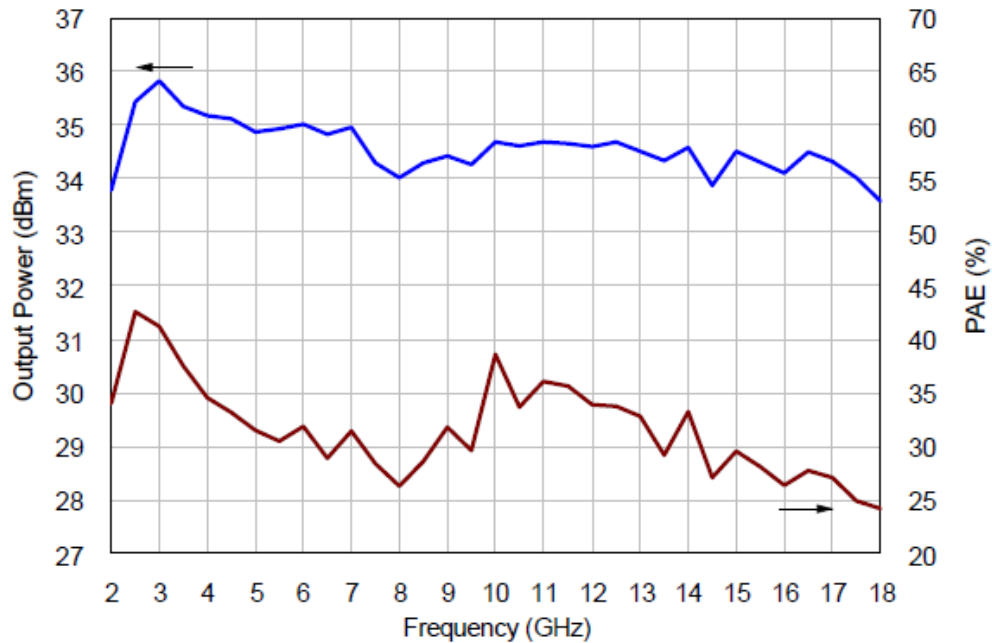


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Typical Performance

Saturated Output Power and Efficiency: $T_A = 25^\circ\text{C}$, $V_D = +18\text{ V}$, $V_G = -1.5\text{ V}$, $I_d = 0.5\text{ A}$, $P_{IN} = 13\text{ dBm}$



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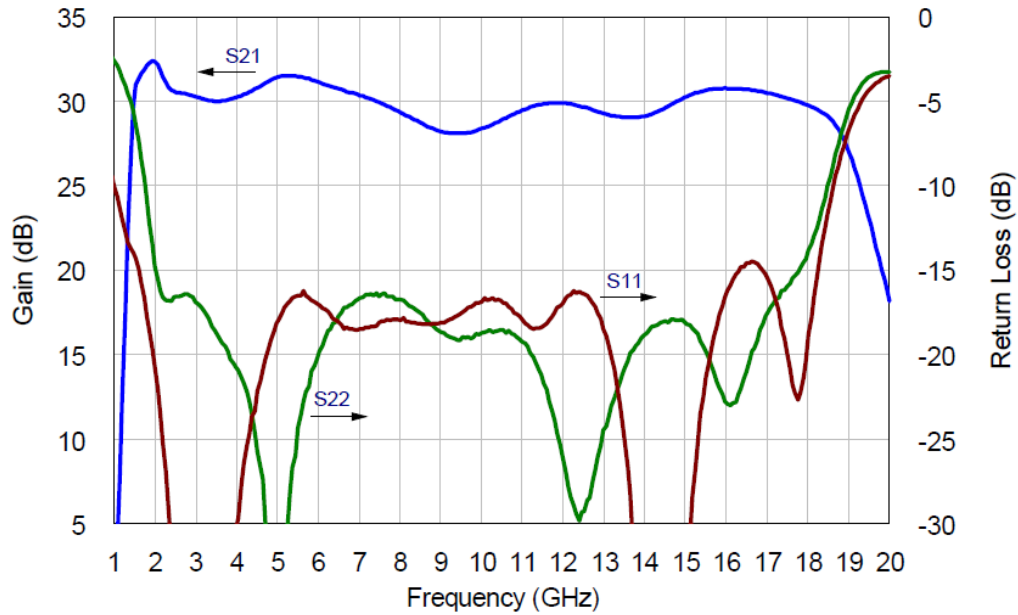


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Typical Performance

Small Signal Gain, and Return Loss: $T_A = 25^\circ\text{C}$, $V_D = +18\text{ V}$, $V_G = -1.5\text{ V}$, $I_d = 0.31\text{ A}$, $P_{IN} = -30\text{ dBm}$



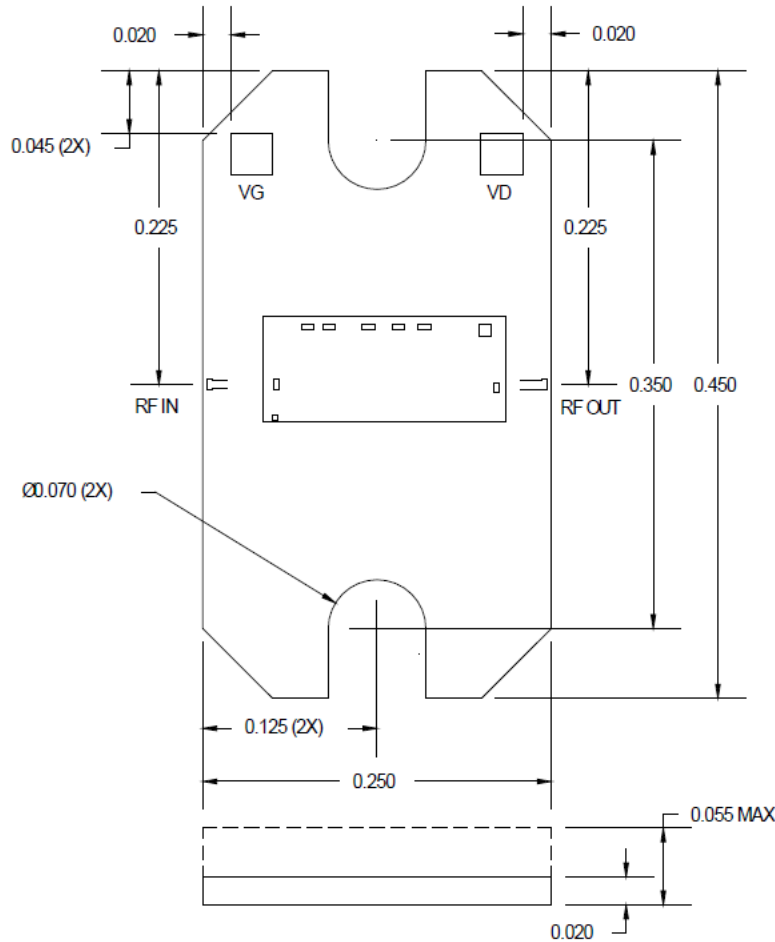
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Outline Drawing



Pad	Dimension
RF Input	4 x 8 mil
RF Output	4 x 8 mil
Drain Bias	30 x 30 mil
Gate Bias	30 x 30 mil

Notes:

1. All dimensions are given in inches unless otherwise specified. Typical tolerance: +/-0.005.
2. RF In, RF Out, Vd and Vg pad metallization is gold suitable for wire bonding or ribbon welding.
3. Add 4.7 μ F to 10 μ F capacitor to gate and drain lines if power supply capacitors are greater than 4 inches away at the next assembly.
4. Apply Vg prior to Vd.
5. Open carrier configuration. Use proper handling and packaging due to exposed die and wire bonds.

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