

# 40 W Solid State Power Amplifier

## 15.2 - 18.2 GHz



ENGAD00081

Rev. V1

### Features

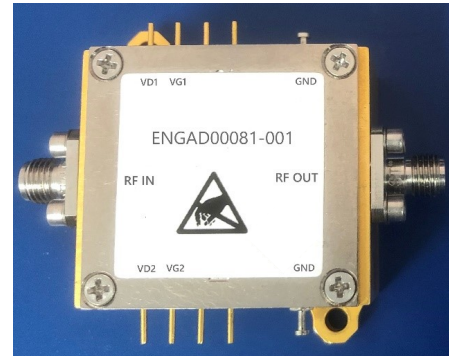
- 15.2 to 18.2 GHz Band Coverage
- Saturated Output Power: 40 W
- Average PAE @ P<sub>SAT</sub>: 30%
- Solid State GaN MMIC
- SMA Input/Output Interface
- Dual Bias Supply Required
- Size: 1.44" x 1.28" x 0.82"
- RoHS\* Compliant

### Applications

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

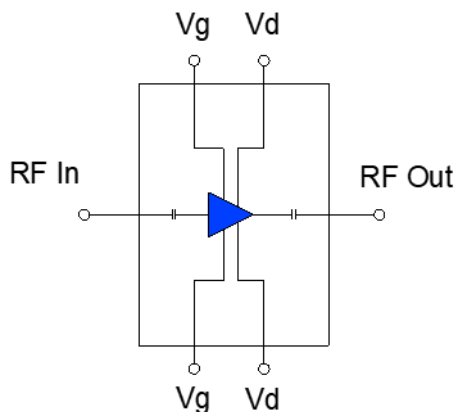
### Description

The ENGAD00081 is a packaged Solid State Power Amplifier (SSPA) operating across 15.2 to 18.2 GHz with a nominal saturated output power (P<sub>sat</sub>) of 40 W and average 30% power added efficiency (PAE). The ENGAD00081 uses SMA connectors for the RF input and output ports. RF port impedance is 50 ohms. The ENGAD00081 operates at 28 V drain voltage with a quiescent bias current of 0.6 A.



### Ordering Information

Part Number	Package
ENGAD00081	bulk



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

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**Electrical Specifications: Freq. = 15.2 - 18.2 GHz, T<sub>A</sub> = +25°C, V = 28 V**

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Saturated Power	—	W	25	40	—
PAE @ P <sub>SAT</sub>	average	%	—	30	—
Small Signal Gain	—	dB	20	24	—
Input Return Loss	—	dB	—	10	—
Output Return Loss	—	dB	—	12	—
DC Current	Small Signal P <sub>SAT</sub>	A	—	0.6 5.0	—

### Recommended Operating Conditions

Parameter	Units	Min.	Typ.	Max.
Drain Voltage	V	26	28	30
Gate Voltage	V	-1.5	-1.85	-2.1
RF Input Power (for 40 W Output Power)	dBm	—	30	—

### Absolute Maximum Ratings<sup>1,2</sup>

Parameter	Absolute Maximum
Drain Voltage	+32 V
Gate Voltage	-6 V
RF Input Power	33 dBm
Operating Temperature	-40°C to +60°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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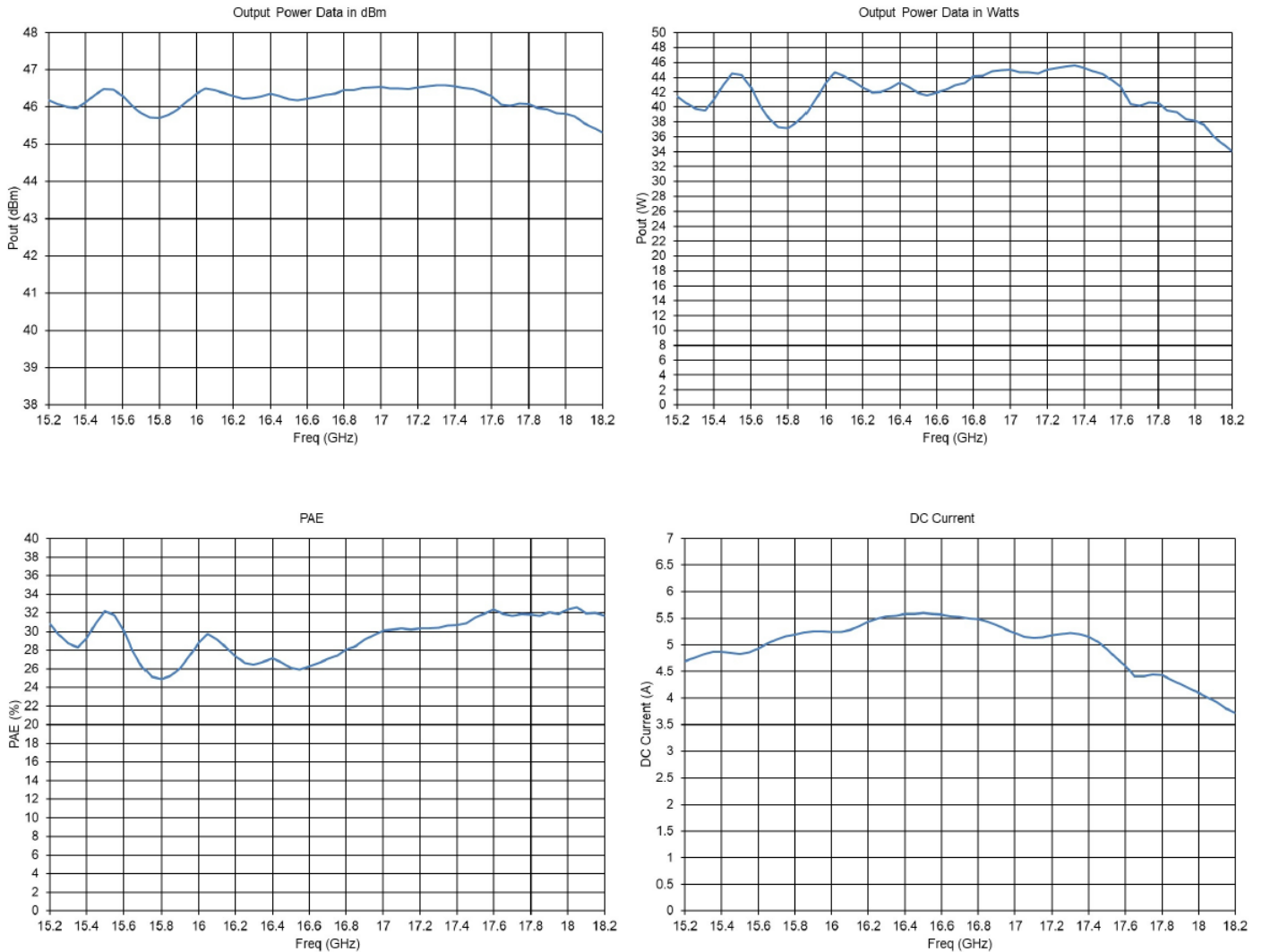


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### Typical Performance

**Saturated Output Power, Efficiency, and DC Current:  $T_A = 25^\circ\text{C}$ ,  $V_D = +28\text{ V}$ ,  $V_G = -1.85\text{ V}$ ,  $I_d = 5\text{ A}$ ,  $P_{IN} = +30\text{ dBm}$**



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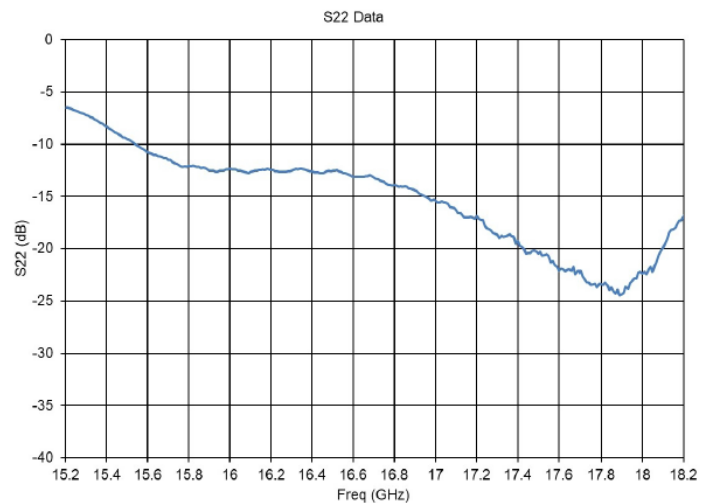
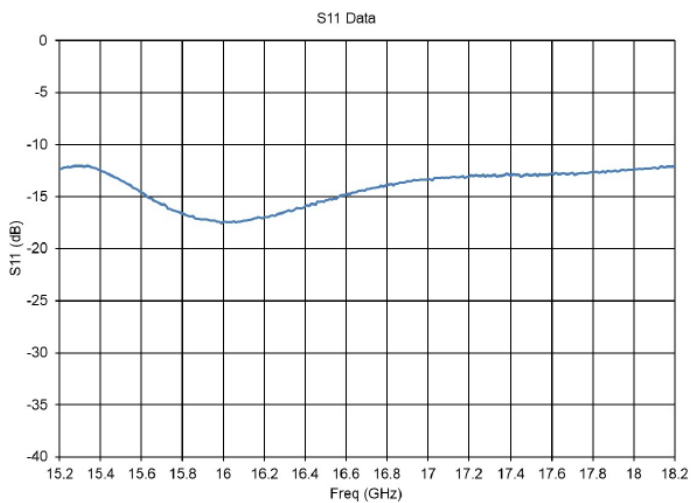
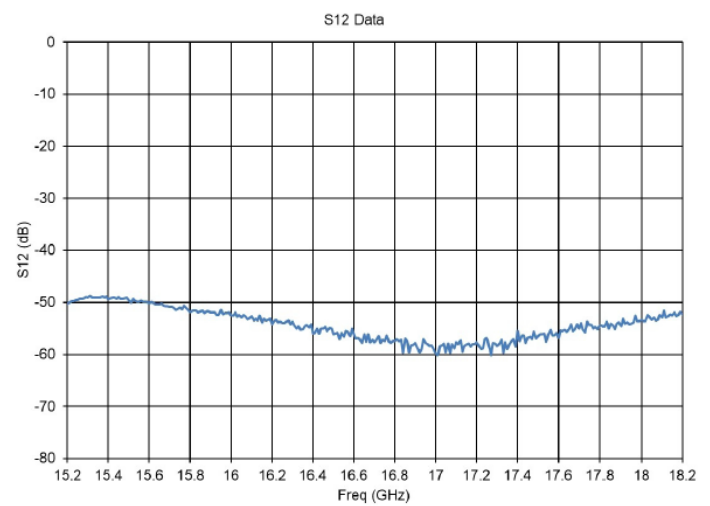
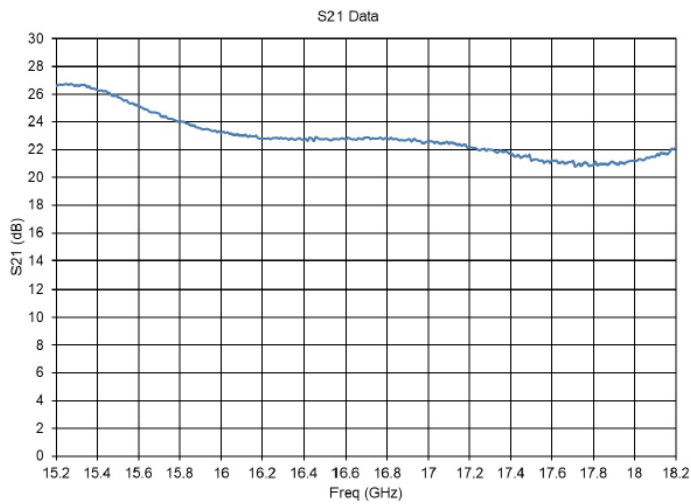


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### Typical Performance

**Small Signal Gain, Reverse Isolation, and Return Loss:  $T_A = 25^\circ\text{C}$ ,  $V_D = +28\text{ V}$ ,  $V_G = -1.85\text{ V}$ ,  $I_d = 0.6\text{ A}$ ,  $P_{IN} = -20\text{ dBm}$**



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### Amplifier Biasing Procedure

To prevent inadvertent damage to the unit, the following bias procedure is recommended.

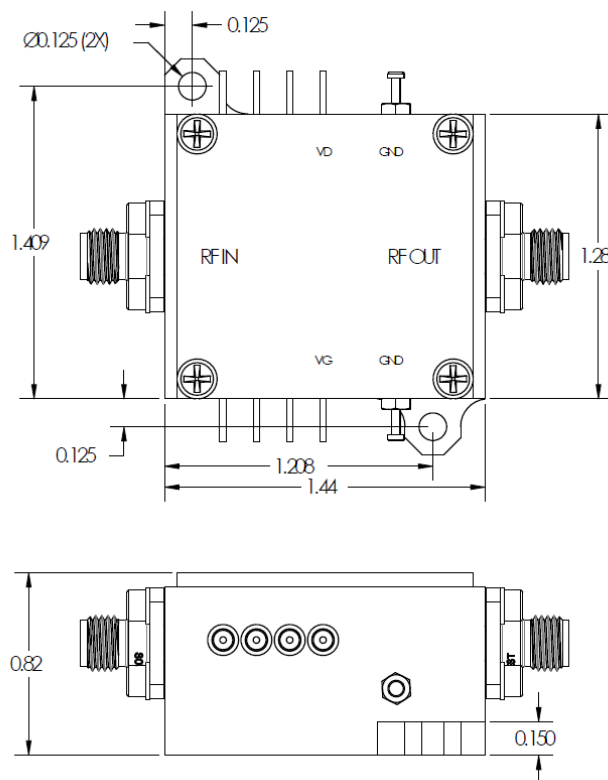
#### Amplifier Bias Up Procedure

1. Apply -5 V to VG1 and VG2
2. Apply +28 V to VD1 and VD2
3. Adjust VG1 to set amplifier  $I_{dq} = 300$  mA
4. Adjust VG2 to set amplifier  $I_{dq} = 600$  mA (amplifier total current)
5. Turn on RF signal

#### Amplifier Bias Down Procedure

1. Turn off RF signal
2. Set VD1 and VD2 to 0 V
3. Set VG1 and VG2 to -5 V
4. Turn off power supplies

### Outline Drawing



#### Notes:

1. All dimensions are given in inches unless otherwise specified. Typical tolerance: +0.005/-0.005.
2. To prevent inadvertent damage, mount unit to a low thermal resistance on heatsink or cold plate.

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