

17 W Solid State Power Amplifier

0.3 - 3 GHz



ENGAD00073

Rev. V1

Features

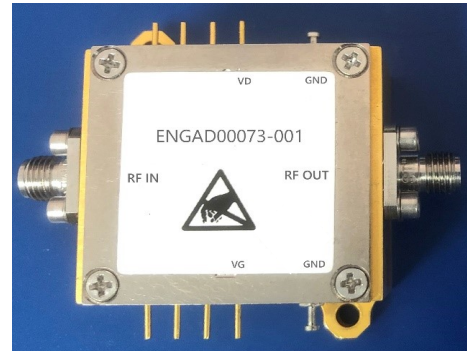
- 0.3 to 3 GHz Band Coverage
- Saturated Output Power: 17 W
- Average PAE @ P_{SAT}: 50%
- Solid State GaAs MMIC
- SMA Input/Output Interface
- Dual Bias Supply Required
- Size: 1.44" x 1.28" x 0.82"
- RoHS* Compliant

Applications

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

Description

The ENGAD00073 is a packaged Solid State Power Amplifier (SSPA) operating across 0.3 to 3 GHz with a nominal saturated output power (P_{sat}) of 17 W and average 50% power added efficiency (PAE). The ENGAD00073 uses SMA connectors for the RF input and output ports. RF port impedance is 50 ohms. The ENGAD00073 operates at 28 V drain voltage with a quiescent bias current of 0.2 A. The SSPA uses the ENPGA00239A MMIC which offers 17 W output power and 50% average PAE.



Ordering Information

Part Number	Package
ENGAD00073	bulk

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Electrical Specifications: Freq. = 0.3 - 3 GHz, $T_A = +25^\circ\text{C}$, $V = 28\text{ V}$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Saturated Power	—	W	12	17	—
PAE @ P_{SAT}	average	%	—	50	—
Small Signal Gain	—	dB	26	30	—
Input Return Loss	—	dB	—	12	—
Output Return Loss	—	dB	—	12	—
DC Current	Small Signal P_{SAT}	A	—	0.2 1.2	—

Recommended Operating Conditions

Parameter	Units	Min.	Typ.	Max.
Drain Voltage	V	18	28	30
Gate Voltage	V	-1.5	-2.2	-2.5
RF Input Power (for 17 W Output Power)	dBm	—	20	—

Absolute Maximum Ratings^{1,2}

Parameter	Absolute Maximum
Drain Voltage	+32 V
Gate Voltage	-6 V
RF Input Power	27 dBm
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +125°C

- Exceeding any one or combination of these limits may cause permanent damage to this device.
- 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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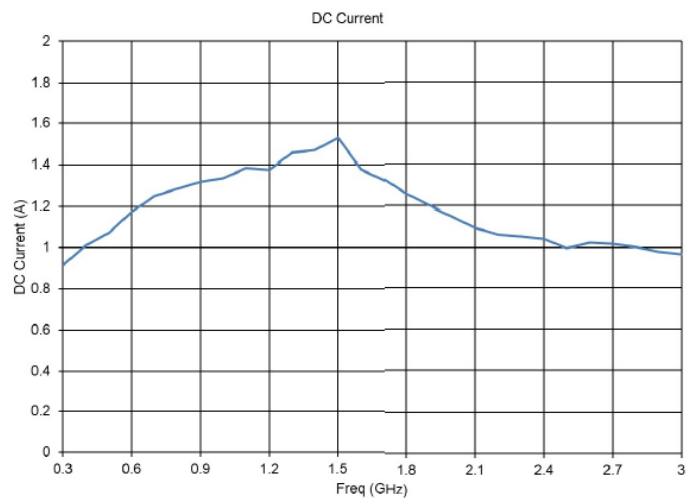
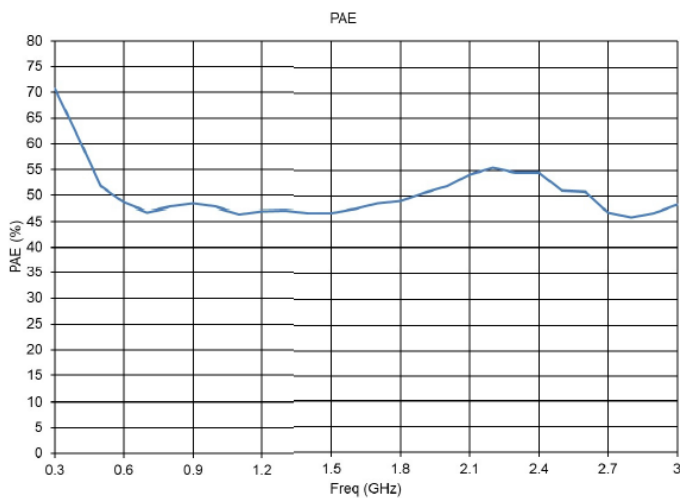
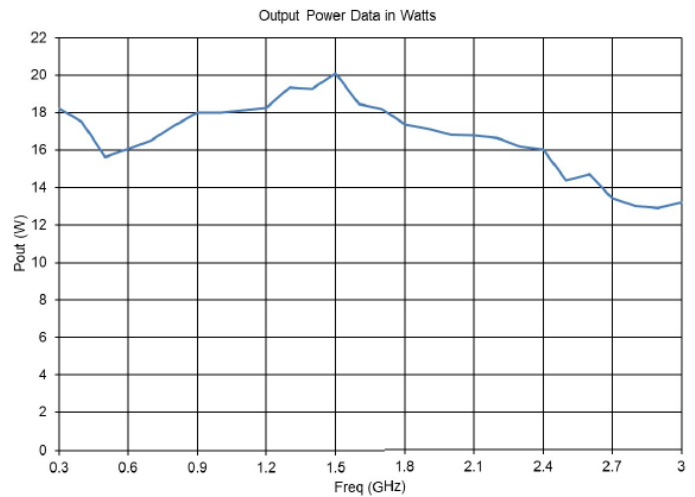
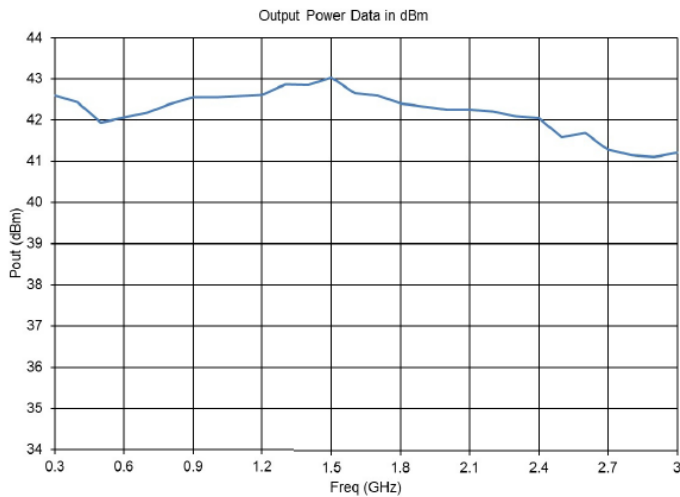


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Typical Performance

Saturated Output Power, Efficiency, and DC Current: $T_A = 25^\circ\text{C}$, $V_D = +28\text{ V}$, $V_G = -2.2\text{ V}$, $I_d = 1.2\text{ A}$, $P_{IN} = +20\text{ dBm}$



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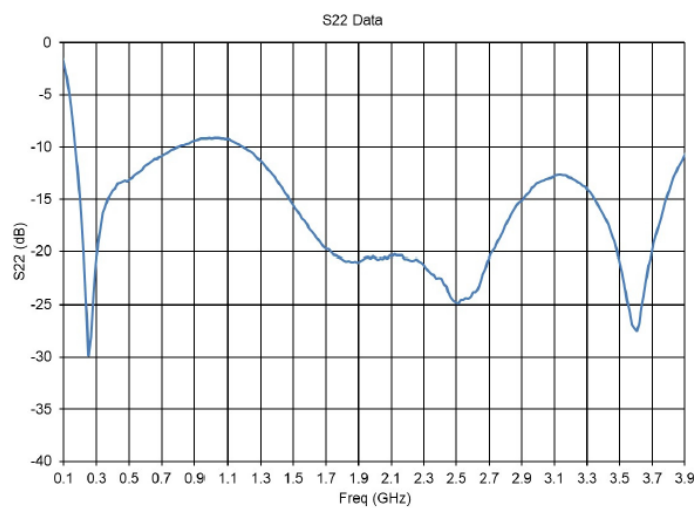
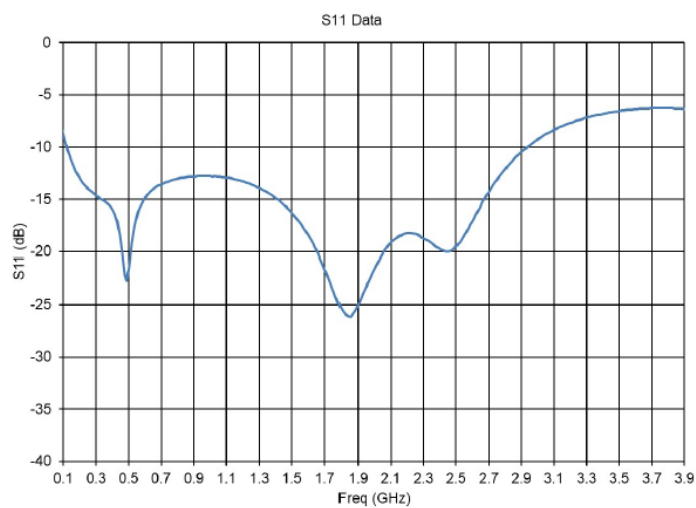
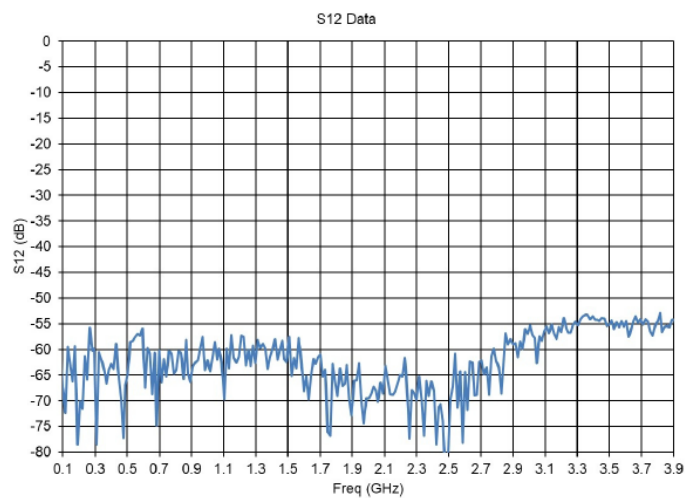
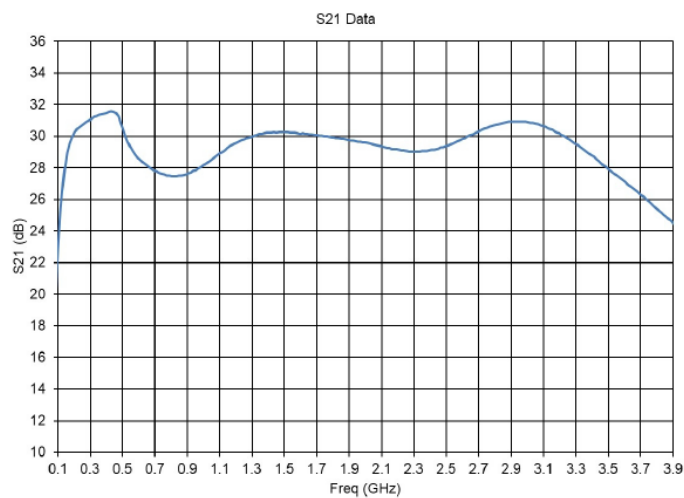


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Typical Performance

Small Signal Gain, and Return Loss: $T_A = 25^\circ\text{C}$, $V_D = +28\text{ V}$, $V_G = -2.2\text{ V}$, $I_d = 0.2\text{ A}$, $P_{IN} = -20\text{ dBm}$



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Amplifier Biasing Procedure

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

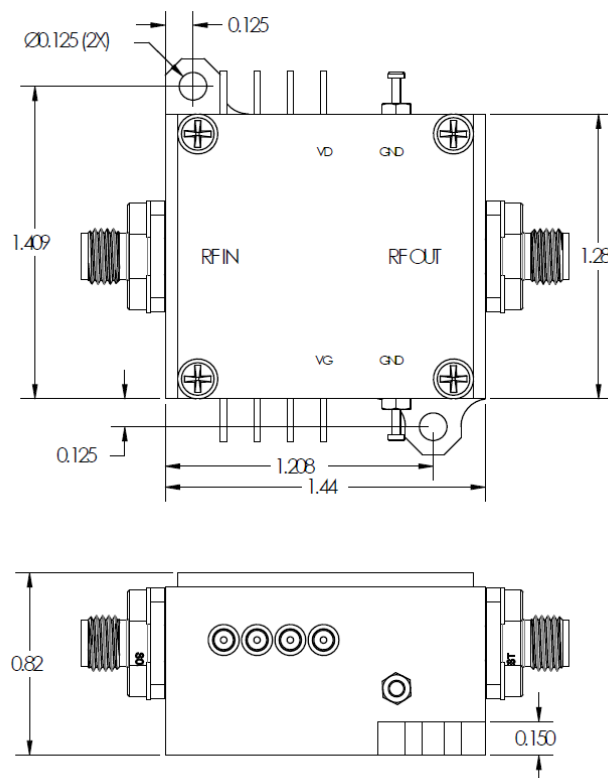
Amplifier Bias Up Procedure

1. Apply -5 V to VG
2. Apply +28 V to VD
3. Adjust VG to set amplifier $I_{dq} = 200$ mA
4. Turn on RF signal

Amplifier Bias Down Procedure

1. Turn off RF signal
2. Set VD to 0 V
3. Set VG 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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