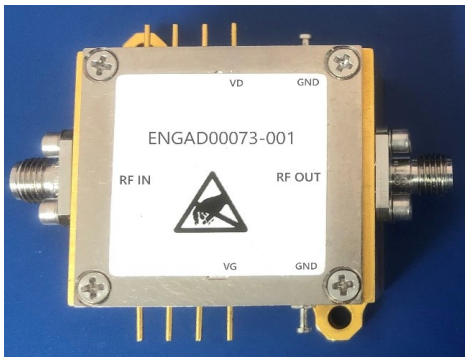
17 W Solid State Power Amplifier
0.3 - 3 GHz

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 (Psat) 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 ENGPA00239A MMIC which offers 17 W output power and 50% average PAE.

Ordering Information

Part Number	Package
ENGAD00073	bulk

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

Electrical Specifications: Freq. = 0.3 - 3 GHz, T_A = +25°C, V = 28 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

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

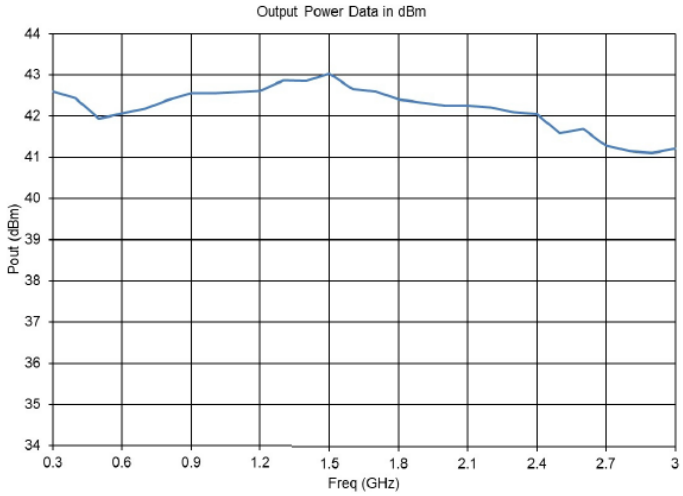
Please observe the following precautions to avoid damage:

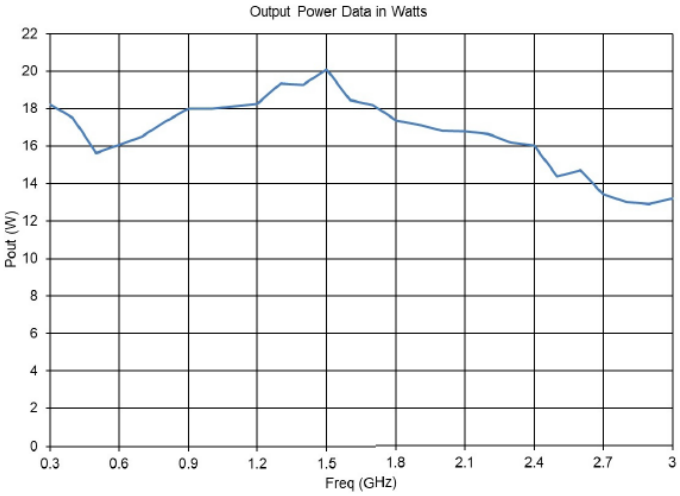
Static Sensitivity

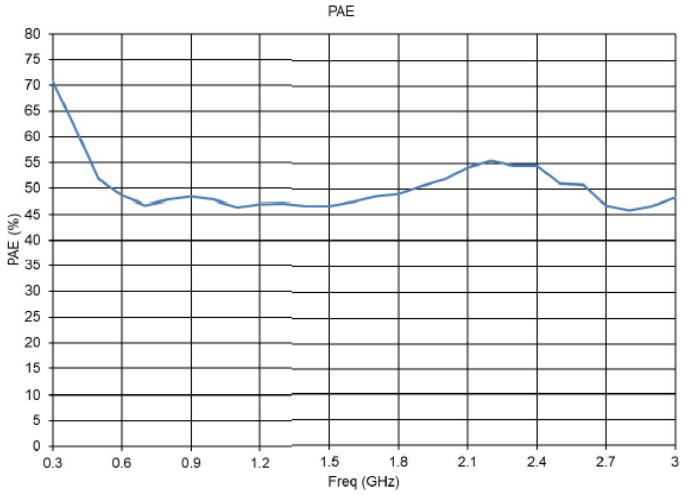
These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

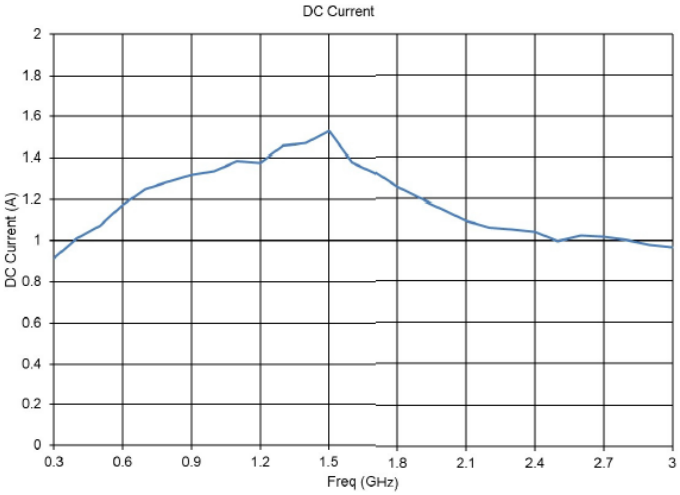
Typical Performance

Saturated Output Power, Efficiency, and DC Current: T_A = 25°C, V_D = +28 V, V_G = -2.2 V, Id = 1.2 A, P_{IN} = +20 dBm



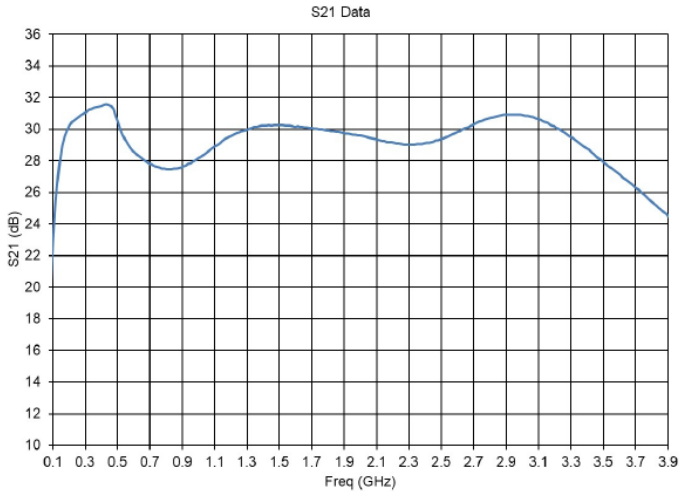


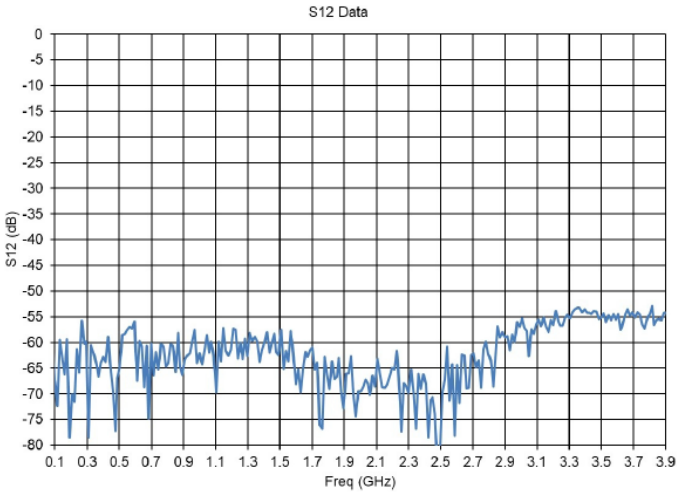


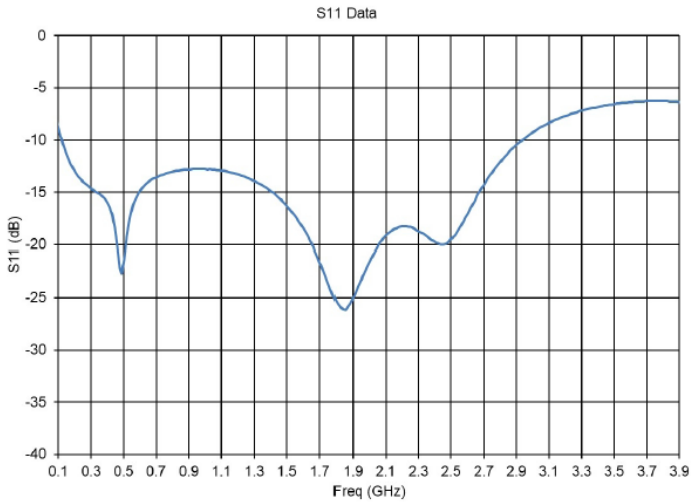


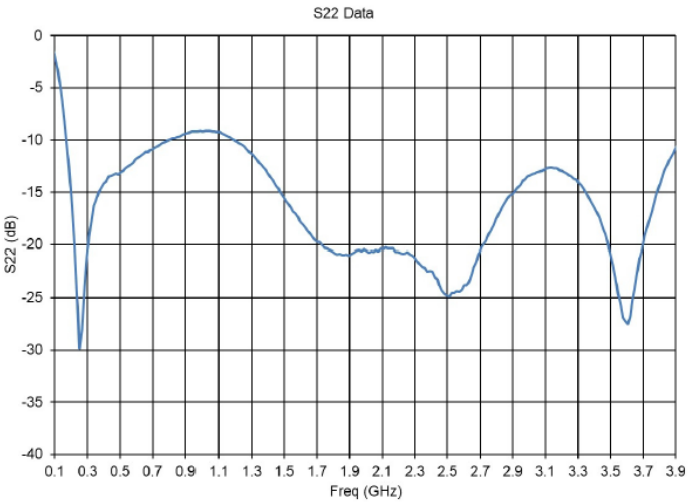
Typical Performance

Small Signal Gain, and Return Loss: T_A = 25°C, V_D = +28 V, V_G = -2.2 V, Id = 0.2 A, P_{IN} = -20 dBm









Amplifier Biasing Procedure

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

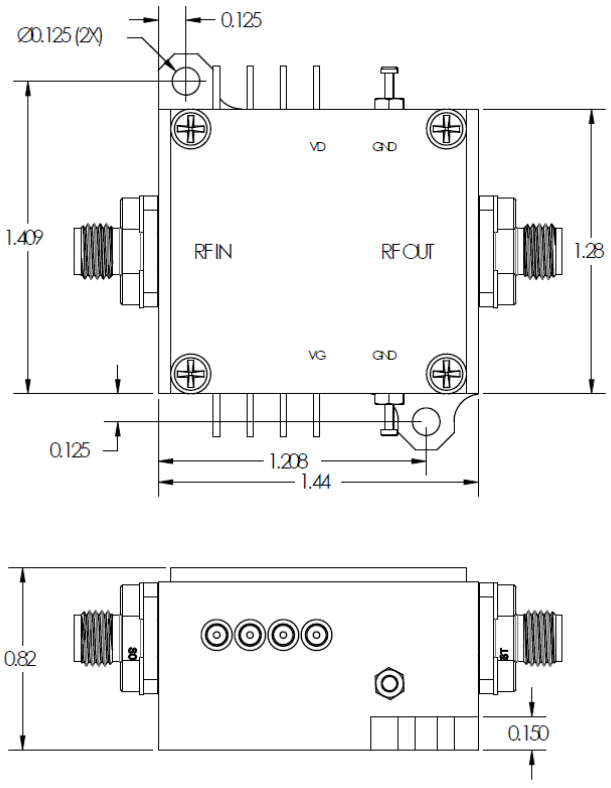
Amplifier Bias Up Procedure

1. Apply -5 V to VG
2. Apply +28 V to VD
3. Adjust VG to set amplifier Idq = 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.