DATA SHEET

AL106-84LF: GaAs IC 900 MHz High Dynamic Range Amplifier

Features

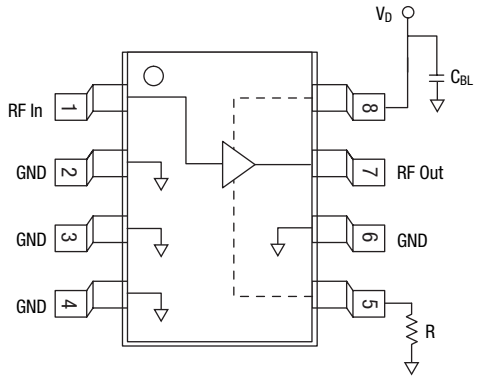
- 18 dBm output power
- 32 dBm output IP3
- 1.8 dB noise figure
- Single 5 V supply
- Input and output matched to 50 Ω
- Ideal for cellular applications
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

Description

The AL106-84LF is a high dynamic range amplifier for 900 MHz applications. The amplifier has 19 dBm output power, high input intercept point (IIP3) of 18 dBm, low noise figure of 1.8 dB and operates from a single positive bias of 5 V. External resistor sets the amplifier drain current. No external matching elements are required. As a low noise driver amplifier, it is ideally suited for 900 MHz wireless base station applications. The AL106-84LF is encapsulated in an SOIC-8 package with slug for improved heat dissipation and reliability.

NEW Skyworks offers lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant packaging.

Pin Out



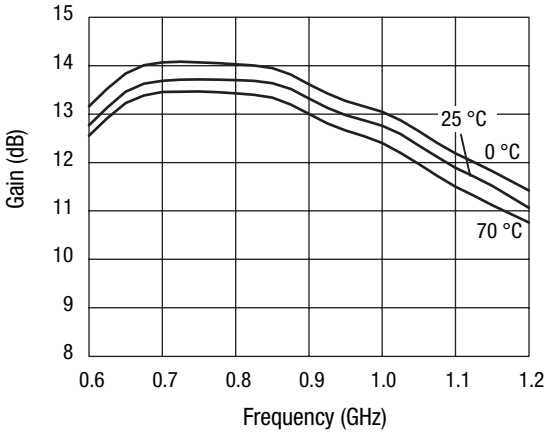
Electrical Specifications at 25 °C

V_D = 5 V, I_D = 80 mA, Z_O = 50 Ω, unless otherwise noted

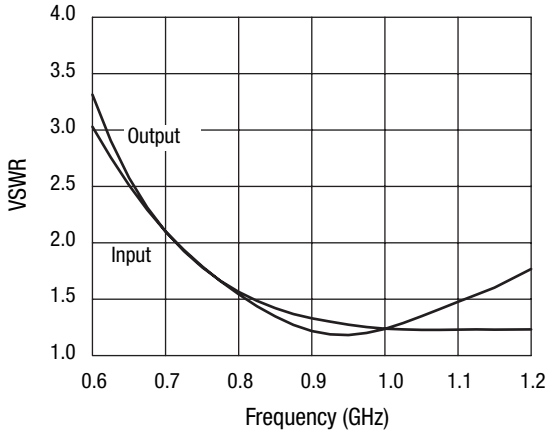
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Small signal gain		800–960 MHz	13	14		dB
Input P_{-1dB}		900 MHz	5.5	7		dB
Input IIP3	P_{IN} = -5 dBm	900 MHz	17.5	18.5		dBm
Noise figure		800–960 MHz		1.8	2.4	dB
Reverse isolation		800–960 MHz		22		dB
Input VSWR		800–960 MHz		1.5:1		
Output VSWR		800–900 MHz		1.5:1		

Typical Performance Data at 25 °C

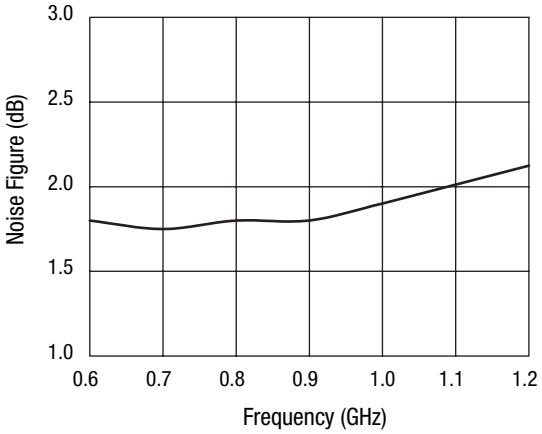
V_D = 5 V, I_D = 80 mA, Z_O = 50 Ω, unless otherwise noted



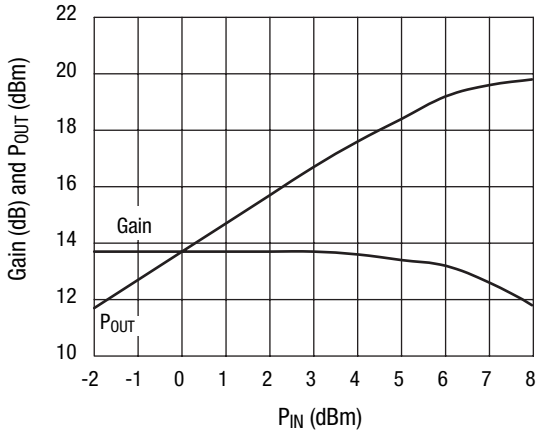
Gain vs. Frequency Over Temperature



Input and Output VSWR vs. Frequency



Noise Figure vs. Frequency



P_{OUT} and Gain vs. P_{IN} 900 MHz

Power Supply and Current Settings

V_D of 5 V is fed to pin 8. A 200 pF bypass capacitor should be placed as close as possible to the lead. The current can be set 60–110 mA by changing the resistor connected to pin 5 at a distance of up to 5 mm away from the lead on FR4 substrate. Typical values for the resistor (R) are 8–18 Ω.

Absolute Maximum Ratings

Characteristic	Value
Drain voltage (V_D)	7 V
Current (I_D)	150 mA
Input power (P_{IN})	20 dBm
Operating temperature (T_{OP})	-30 °C to +100 °C
Storage temperature (T_{ST})	-65 °C to +120 °C

Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

CAUTION: *Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions must be employed at all times.*

Recommended Solder Reflow Profiles

Refer to the *"Recommended Solder Reflow Profile"* Application Note.

Tape and Reel Information

Refer to the *"Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation"* Application Note.

Pin Configuration

Terminal	Symbol	Function
1	RF In	RF input
2	GND	Ground
3	GND	Ground
4	GND	Ground
5	R	Current set external resistor
6	GND	Ground
7	RF Out	RF output
8	V_D	5 V supply through bypass cap

SOIC-8 with Slug