

MGA-81/82 RFIC Amplifier Demonstration Board

Assembly and Operation

Description

The MGA-8-A demonstration circuit allows you to test and evaluate the performance of either the MGA-81563 or the MGA-82563 RFIC amplifier under your specific application condition. This circuit is designed with 50 Ω input and output microstrip lines and is made on 0.031-inch thick FR-4 dielectric material. The layout accommodates a SOT-363 (SC-70) surface mount package.

A schematic diagram of the circuit is shown in Figure 1. DC blocking capacitors (C1 and C2) are used at the input and output of the RFIC to isolate device voltages from adjacent circuits or test equipment.

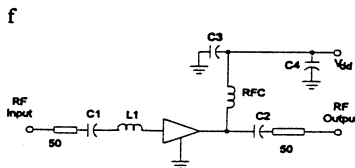


Figure 1. Schematic Diagram

Inductor L1 is used with the MGA-81563 to improve the input match. A typical value for L1 is 3.9 nH. L1 is not used with the MGA-82563.

DC power is supplied to the amplifier through the RF Output pin by means of a bias decoupling network. The bias decoupling network consists of an RF

choke (RFC) and a bypass capacitor (C3).

The value of the DC blocking and RF bypass capacitors (C1 - C3) should be chosen to provide a small reactance (typically < 5 ohms) at the lowest operating frequency. The reactance of the RF choke (RFC) should be high (e.g., several hundred ohms) at the lowest frequency of operation.

Assembly

The amplifier and related components are assembled onto the printed circuit board as shown in Figure 2.

The layout is designed to use edge-mounting SMA connectors such as the EF Johnson 142-0701-881. The connectors slip over the edge of the board without the need for drilling holes. The center conductors are soldered to the input and output microstrip lines and the ground pins of the connectors are soldered to the ground plane on the backside of the board and to the ground pads on the topside.

Space is provided on the circuit to optionally add an additional bypass capacitor, C4, to the bias line near the V_{dd} connection. C4 will not be needed unless several stages are cascaded using a common power supply.

The +V and adjacent ground pads are designed to fit a 2-pin, 0.100"

MGA-81563
MGA-82563

centerline flat header of the type popularly used on computer PC boards (e.g., Waldom-Molex 4030 series) as a convenient means of making connection to the power supply.

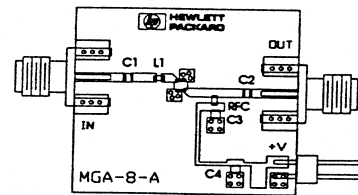


Figure 2. Assembled Circuit

Operation

The MGA-81563 and MGA-82563 amplifiers are voltage biased devices. To operate, it is only necessary to apply +3 volts to the +V connection. Typical current drain is 40 mA for the MGA-81563 and 80 mA for the MGA-82563.

Note: Actual performance of amplifiers mounted on the demonstration board may not precisely match the data shown in the data sheet. The board material, passive components, and connectors all introduce losses and parasitics that may alter the actual operating characteristics of the IC, especially at higher frequencies.

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