

### FEATURES

Evaluation board for the ADG904/ADG904-R  
RF through for evaluation board calibration

### INTRODUCTION

This evaluation board document describes the evaluation board for the ADG904/ADG904-R wideband multiplexers.

The ADG904/ADG904-R are wideband, analog 4:1 multiplexers, using a CMOS process to provide high isolation and low insertion loss to 1 GHz. The ADG904 is an absorptive/matched mux having 50  $\Omega$  terminated shunt legs, whereas the ADG904-R is a reflective mux. These devices are designed such that the isolation is high over the dc to 1 GHz frequency range.

The ADG904/ADG904-R switch one of four inputs to a common output, RFC, as determined by the 3-bit binary address lines (A0, A1, and  $\overline{\text{EN}}$ ). A Logic 1 on the  $\overline{\text{EN}}$  pin disables the device.

The ADG904/ADG904-R have on-board CMOS control logic, thus eliminating the need for external controlling circuitry. The control inputs are CMOS compatible.

Complete information and specifications for the ADG904 and ADG904-R are available in the ADG904/ADG904-R data sheet available from Analog Devices, Inc., and should be consulted in conjunction with this evaluation board document when using the evaluation board.

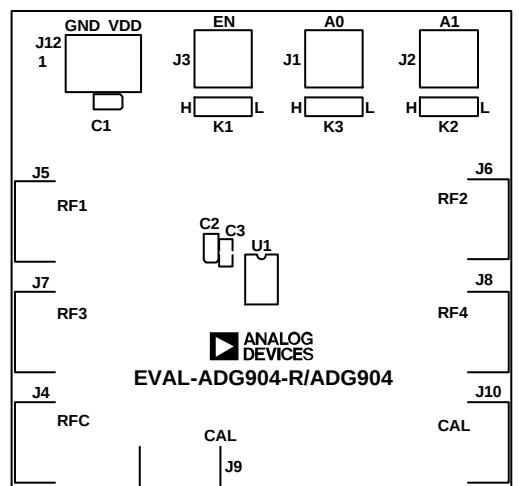


Figure 1. Evaluation Board (Top View)

### POWER SUPPLIES

This evaluation board has one analog power supply input,  $V_{DD}$ , and a ground (GND).  $V_{DD}$  can equal 1.65 V to 2.75 V.

The A0, A1, and  $\overline{\text{EN}}$  control inputs are applied by the SMB connectors; or, they can be tied high to  $V_{DD}$  or low to GND by using the links (K1 to K3) on the evaluation board. See Table 1 for details.

Table 1. Link Operation

| A0 (K3) | A1 (K2) | $\overline{\text{EN}}$ (K1) | On Switch |
|---------|---------|-----------------------------|-----------|
| X       | X       | H                           | None      |
| L       | L       | L                           | RF1       |
| L       | H       | L                           | RF2       |
| H       | L       | L                           | RF3       |
| H       | H       | L                           | RF4       |

#### Rev. 0

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REVISION HISTORY

9/07—Revision 0: Initial Version

## ADG904/ADG904-R

The ADG904/ADG904-R evaluation board allows designers to evaluate the high performance, wideband switches with minimum effort. To test these devices to ensure that they meet the user's requirements, the user needs only a power supply and a network analyzer to use this evaluation board.

The RFC port is connected through a 50  $\Omega$  transmission line to the bottom left SMA Connector J4. RF1, RF2, RF3, and RF4 are connected through 50  $\Omega$  transmission lines to the SMA connectors (J5, J6, J7, and J8, respectively). A through transmission line connects J9 and J10, and this transmission line is used to estimate the loss of the PCB over the environmental conditions being evaluated (see Figure 2).

The board is constructed of a 4-layer, FR4 material with a dielectric constant of 4.3 and an overall thickness of 0.062 inches. Two ground layers with grounded planes provide ground for the RF transmission lines. The design of the transmission lines incorporates a coplanar wave guide with a ground plane model using a trace width of 0.024 inches, clearance to a ground plane of 0.008 inches, dielectric thickness of 0.02 inches, and a metal thickness of 0.0021 inches.

Two 10  $\mu$ F surface-mount, tantalum decoupling capacitors are provided on the VDD line, one placed close to the DUT along with a 100 pF ceramic capacitor on the VDD line.

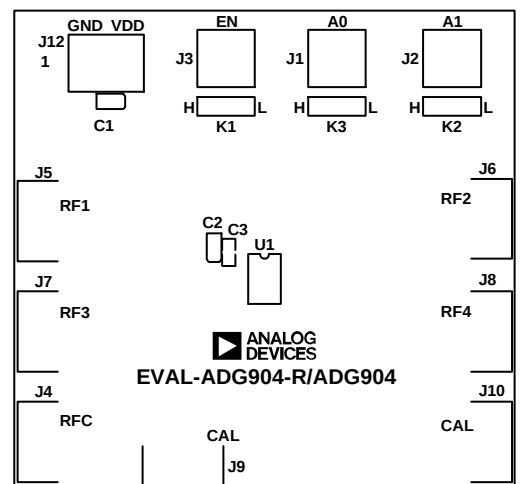


Figure 2. ADG904/ADG904-R Evaluation Board (Top View)

# EVAL-ADG904/ADG904-R

## SCHEMATIC

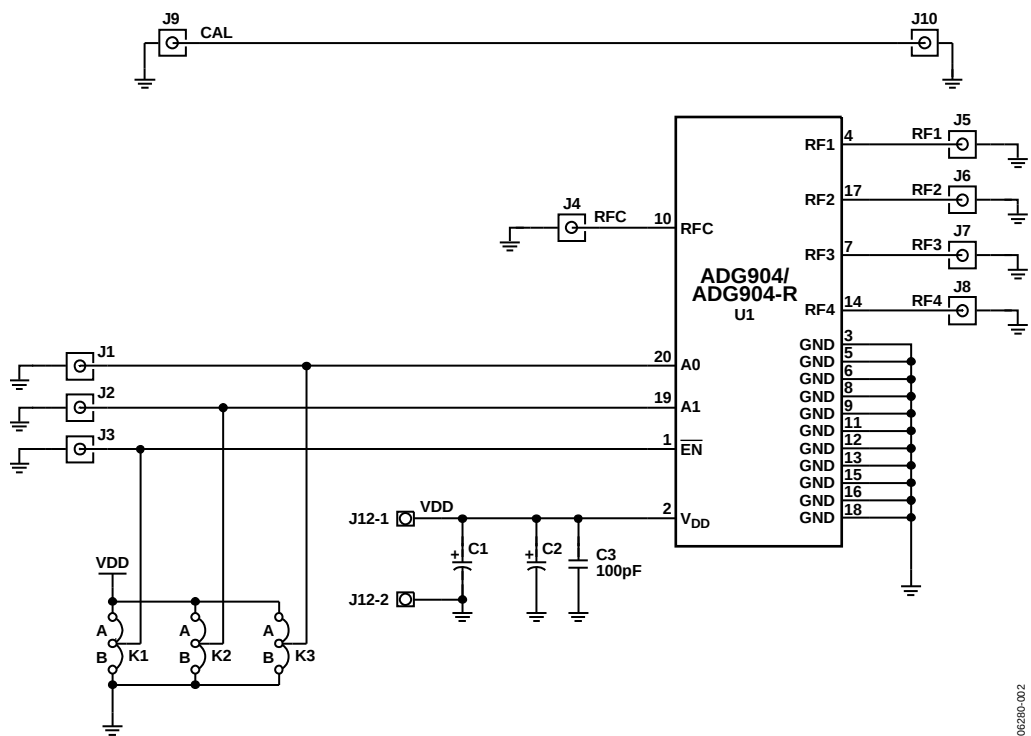


Figure 3. Schematic of the ADG904/ADG904-R Evaluation Board

## ORDERING INFORMATION

### BILL OF MATERIALS

Table 2. Bill of Materials

| Item | Quantity | Reference  | Part Description                    | Supplier/No.                    |
|------|----------|------------|-------------------------------------|---------------------------------|
| 1    | 2        | C1, C2     | 10 $\mu$ F, 10 V tantalum capacitor | FEC 197-130                     |
| 2    | 1        | C3         | 100 pF NPO ceramic capacitor        | FEC 722-080                     |
| 3    | 3        | J1, J2, J3 | Straight SMB jack                   | FEC 310-682                     |
| 4    | 7        | J4 to J10  | SMA end-launch RF connector         | Johnson Components 142-0701-851 |
| 5    | 1        | J12        | 2-pin terminal block                | FEC 151-785                     |
| 6    | 3        | K1, K2, K3 | JUMPER2/SIP3                        | FEC 512-047 and FEC 150-410     |
| 7    | 1        | U1         | ADG904-R/ADG904                     | Analog Devices, Inc.            |

### ORDERING GUIDE

| Model                       | Description      |
|-----------------------------|------------------|
| EVAL-ADG904EBZ <sup>1</sup> | Evaluation Board |
| EVAL-ADG904REB              | Evaluation Board |

<sup>1</sup> Z = RoHS Compliant Part.

### ESD CAUTION



**ESD (electrostatic discharge) sensitive device.** Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

**NOTES**

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## NOTES