

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 Ω 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.

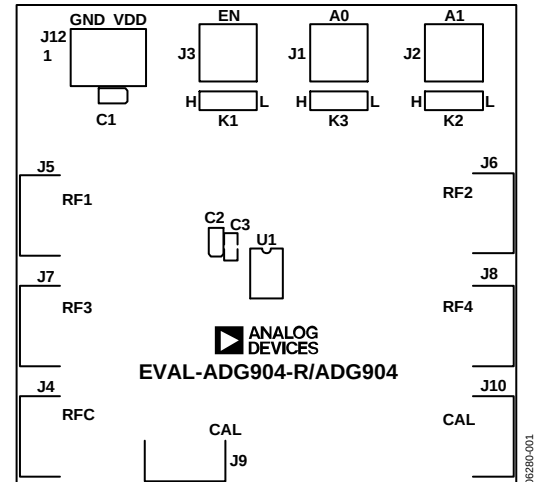


Figure 1. Evaluation Board (Top View)

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

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

Rev. A

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REVISION HISTORY

11/13—Rev. 0 to Rev. A

Changes to Table 1	1
Changes to Ordering Guide	5

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 Ω transmission line to the bottom left SMA Connector J4. RF1, RF2, RF3, and RF4 are connected through 50 Ω 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 μ 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.

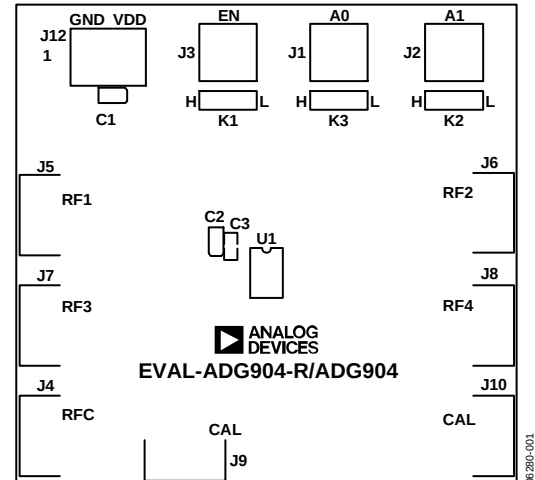


Figure 2. [ADG904/ADG904-R](#) Evaluation Board (Top View)

EVAL-ADG904/ADG904-R

SCHEMATIC

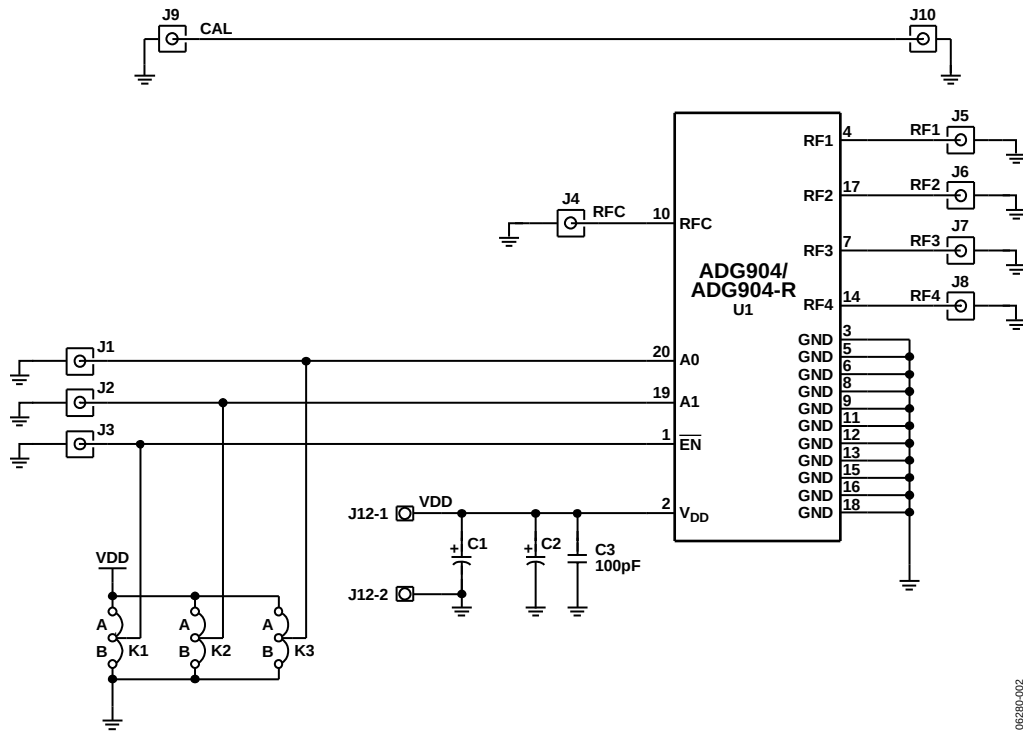


Figure 3. Schematic of the [ADG904/ADG904-R](#) Evaluation Board

062390-002

ORDERING INFORMATION

BILL OF MATERIALS

Table 2. Bill of Materials

Item	Quantity	Reference	Part Description	Supplier/No.
1	2	C1, C2	10 μ 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 ¹	Description
EVAL-ADG904EBZ	Evaluation Board
EVAL-ADG904REBZ	Evaluation Board

¹ 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.

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