

## Evaluation Board for the **ADA4433-1**, Fully Differential Video Filter Amplifier Offered in 8-Lead LFCSP

### FEATURES

- Fully assembled and tested**
- Enables quick customer evaluation**
- Edge-mounted SMA connector provisions**
- Easy connection to test equipment and other circuits**

### GENERAL DESCRIPTION

The **ADA4433-1BCP-EBZ** evaluation board makes it easy for designers to quickly observe the performance of the **ADA4433-1** video filter in real-world applications. Input signals are applied through the SMA jacks (+IN, -IN), and outputs are taken from SMA jacks (+OUT, -OUT). Power is applied through the red +VS test point. Ground the black GND test point. The **ADA4433-1** operates on a single-supply voltage ranging from 2.6 V to 3.6 V, and draws approximately 14 mA.

The evaluation board is configured with an input termination resistor (R1) of 75 Ω. Chose this resistor to provide the correct termination or load for the input signal source. For example, current-mode video digital-to-analog converter (DAC) outputs that require a 300 Ω load resistance. In this case, replace R1 with a 300 Ω resistor.

The **ADA4433-1** inputs can be driven by either a balanced or an unbalanced source. For unbalanced signals, bias the unused input (-IN) to approximately 0.5 V. For a 3.3 V supply, this can be achieved by using the on-board voltage divider by setting R2 = 1.33 kΩ and

R3 = 7.5 kΩ. Populate the decoupling capacitor (C3) with 0.1 μF to help eliminate noise.

By default, the **ADA4433-1BCP-EBZ** is configured for single-ended input operation where the input signal is applied to SMA (+IN). For a balanced input configuration, R4 provides placement for the differential termination resistor.

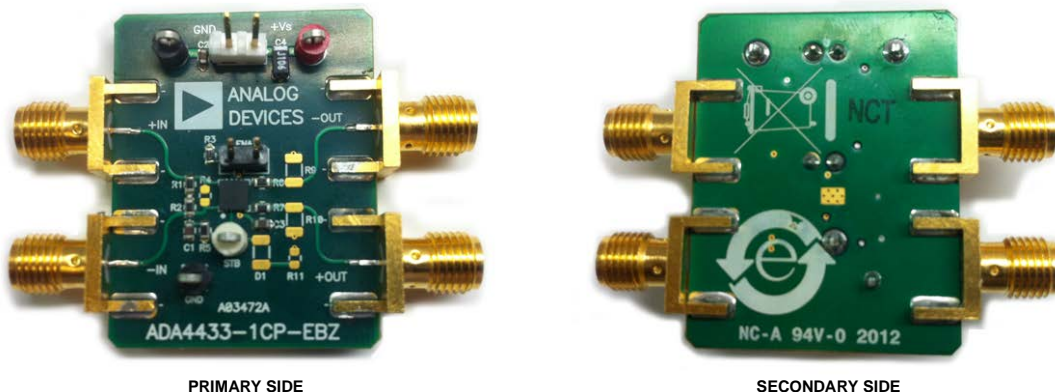
The **ADA4433-1BCP-EBZ** evaluation board is configured to drive a back terminated 150 Ω differential load. Series back-termination resistors (37.5 Ω each) are installed on both outputs. These can be changed to match the actual differential load impedance.

The **ADA4433-1** can be powered down (disabled) by grounding the green ENA test point at the top left of the evaluation board. On the evaluation board, this pin is pulled up to +VS through the 4.7 kΩ resistor (R7).

In normal operation, the short-to-battery output flag (STB) is held at a logic low. During a short-to-battery fault condition (where a voltage ranging from 5 V to 18 V is applied to either or both outputs), the STB output voltage is driven to a logic high state. The STB yellow test point (lower left side of the evaluation board) can be used to monitor the short-to-battery output flag function.

Figure 1 shows the evaluation board, primary side and secondary side. Figure 2 shows the evaluation board schematic. The printed circuit board (PCB) layout pattern for the primary side and secondary side are shown in Figure 3 and Figure 4.

### DIGITAL PICTURE OF EVALUATION BOARD



NOTES  
1. THE EVALUATION BOARD SILKSCREEN PART NUMBER LABELING ON YOUR BOARD MAY BE DIFFERENT FROM WHAT IS SHOWN HERE.

Figure 1. **ADA4433-1BCP-EBZ** Primary Side and Secondary Side of PCB

10786-001

**TABLE OF CONTENTS**

Features .....	1	Evaluation Board Schematic and Artwork.....	3
General Description .....	1	Ordering Information.....	4
Digital Picture of Evaluation Board .....	1	Bill of Materials.....	4
Revision History .....	2		

**REVISION HISTORY**

5/12—Revision 0: Initial Version

EVALUATION BOARD SCHEMATIC AND ARTWORK

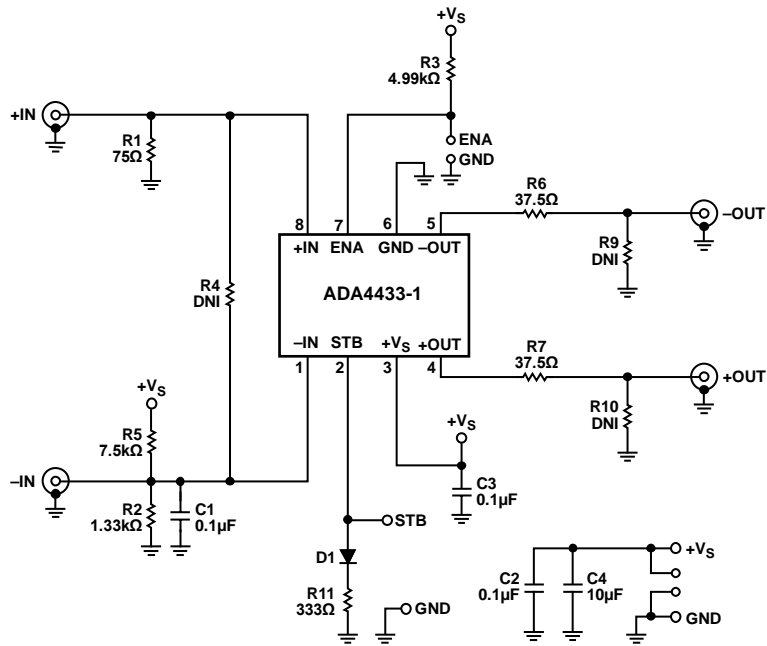


Figure 2. ADA4433-1BCP-EBZ Evaluation Board Circuit Schematic

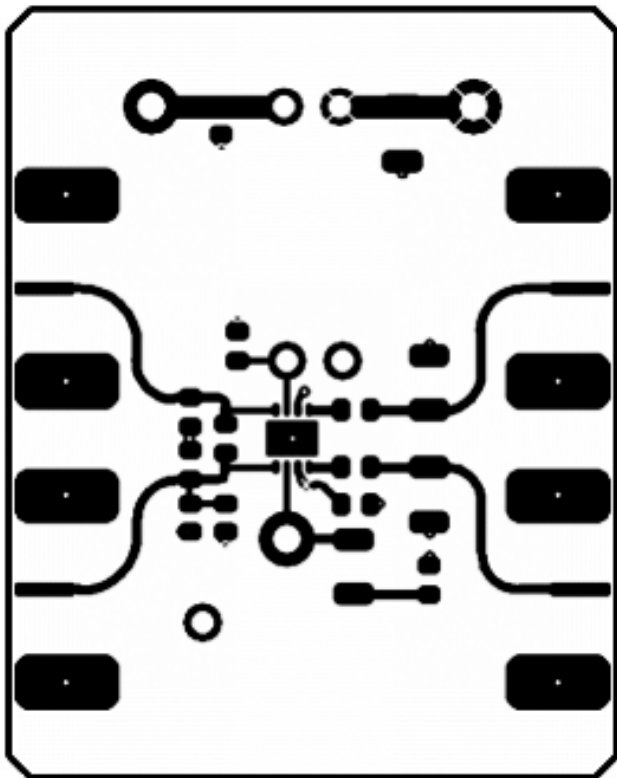


Figure 3. ADA4433-1BCP-EBZ Board Layout Pattern, Primary Side

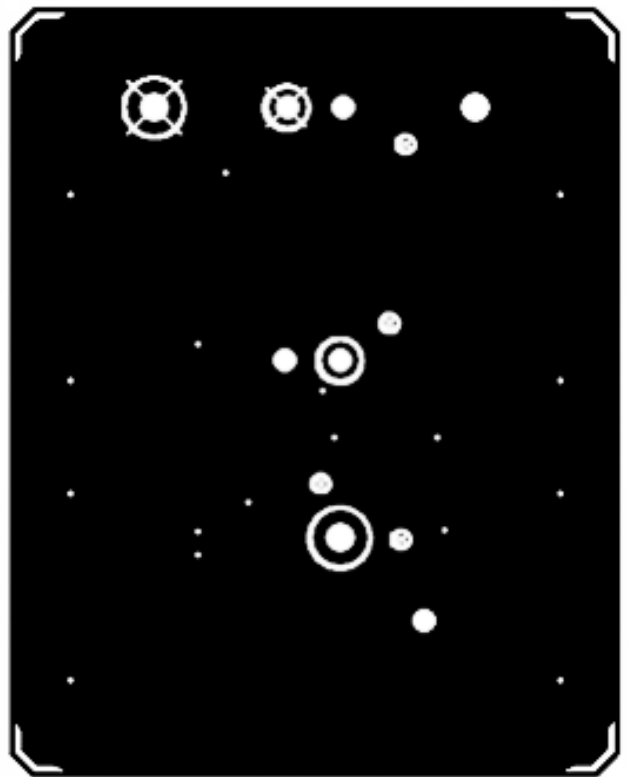


Figure 4. ADA4433-1BCP-EBZ Board Layout Pattern, Secondary Side

## ORDERING INFORMATION

### BILL OF MATERIALS

Table 1.

Quantity	Reference Designator	Description	Package
1	U1	ADA4433-1	8-Lead LFCSP
1	+VS	Red test point loop connector	TP1
3	C1, C2, C3	0.1 $\mu$ F chip capacitors	0603
1	C4	10 $\mu$ F chip capacitor	1206
1	ENA	2-Pin BERG connector	
2	GND	Black test point loop connector	TP1
4	+IN, -IN, -OUT, +OUT	SMA coaxial end launch connectors	
1	R1	75 $\Omega$ resistor	0603
1	R2	1.33 k $\Omega$ resistor	0603
1	R3	4.99 k $\Omega$ resistor	0603
1	R5	7.5 k $\Omega$ resistor	0603
2	R6, R7	37.5 $\Omega$ resistors	0603
1	R11	333 $\Omega$ resistor	0603
1	STB	Yellow test point loop connector	TP1
1	R4	Do not install resistors	0603
1	D1	Surface mount LED diode red	1206
2	R9, R10	Do not install resistors	1206



#### 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.

#### Legal Terms and Conditions

By using the evaluation board discussed herein (together with any tools, components documentation or support materials, the "Evaluation Board"), you are agreeing to be bound by the terms and conditions set forth below ("Agreement") unless you have purchased the Evaluation Board, in which case the Analog Devices Standard Terms and Conditions of Sale shall govern. Do not use the Evaluation Board until you have read and agreed to the Agreement. Your use of the Evaluation Board shall signify your acceptance of the Agreement. This Agreement is made by and between you ("Customer") and Analog Devices, Inc. ("ADI"), with its principal place of business at One Technology Way, Norwood, MA 02062, USA. Subject to the terms and conditions of the Agreement, ADI hereby grants to Customer a free, limited, personal, temporary, non-exclusive, non-sublicensable, non-transferable license to use the Evaluation Board FOR EVALUATION PURPOSES ONLY. Customer understands and agrees that the Evaluation Board is provided for the sole and exclusive purpose referenced above, and agrees not to use the Evaluation Board for any other purpose. Furthermore, the license granted is expressly made subject to the following additional limitations: Customer shall not (i) rent, lease, display, sell, transfer, assign, sublicense, or distribute the Evaluation Board; and (ii) permit any Third Party to access the Evaluation Board. As used herein, the term "Third Party" includes any entity other than ADI, Customer, their employees, affiliates and in-house consultants. The Evaluation Board is NOT sold to Customer; all rights not expressly granted herein, including ownership of the Evaluation Board, are reserved by ADI. CONFIDENTIALITY. This Agreement and the Evaluation Board shall all be considered the confidential and proprietary information of ADI. Customer may not disclose or transfer any portion of the Evaluation Board to any other party for any reason. Upon discontinuation of use of the Evaluation Board or termination of this Agreement, Customer agrees to promptly return the Evaluation Board to ADI. ADDITIONAL RESTRICTIONS. Customer may not disassemble, decompile or reverse engineer chips on the Evaluation Board. Customer shall inform ADI of any occurred damages or any modifications or alterations it makes to the Evaluation Board, including but not limited to soldering or any other activity that affects the material content of the Evaluation Board. Modifications to the Evaluation Board must comply with applicable law, including but not limited to the RoHS Directive. TERMINATION. ADI may terminate this Agreement at any time upon giving written notice to Customer. Customer agrees to return to ADI the Evaluation Board at that time. LIMITATION OF LIABILITY. THE EVALUATION BOARD PROVIDED HEREUNDER IS PROVIDED "AS IS" AND ADI MAKES NO WARRANTIES OR REPRESENTATIONS OF ANY KIND WITH RESPECT TO IT. ADI SPECIFICALLY DISCLAIMS ANY REPRESENTATIONS, ENDORSEMENTS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, RELATED TO THE EVALUATION BOARD INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, TITLE, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. IN NO EVENT WILL ADI AND ITS LICENSORS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES RESULTING FROM CUSTOMER'S POSSESSION OR USE OF THE EVALUATION BOARD, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DELAY COSTS, LABOR COSTS OR LOSS OF GOODWILL. ADI'S TOTAL LIABILITY FROM ANY AND ALL CAUSES SHALL BE LIMITED TO THE AMOUNT OF ONE HUNDRED US DOLLARS (\$100.00). EXPORT. Customer agrees that it will not directly or indirectly export the Evaluation Board to another country, and that it will comply with all applicable United States federal laws and regulations relating to exports. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the substantive laws of the Commonwealth of Massachusetts (excluding conflict of law rules). Any legal action regarding this Agreement will be heard in the state or federal courts having jurisdiction in Suffolk County, Massachusetts, and Customer hereby submits to the personal jurisdiction and venue of such courts. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement and is expressly disclaimed.