ADA4945-1CP-EBZ Differential Amplifier Evaluation Board

FEATURES
Enables quick breadboarding and prototyping
User defined circuit configuration

GENERAL DESCRIPTION
The Analog Devices, Inc., ADA4945-1CP-EBZ evaluation board allows the user to evaluate the performance of the ADA4945-1 fully differential amplifier. The ADA4945-1CP-EBZ evaluation board can be configured to accept either a single-ended or differential input signal.

The ADA4945-1CP-EBZ evaluation board uses several 2-pin and 3-pin headers to control various features of the ADA4945-1. Apply the proper jumpers to set the ADA4945-1 high and low output clamp levels, set the ADA4945-1 output common-mode voltage, choose high or low power mode for the ADA4945-1, and set the ADA4945-1 digital ground level.

Optimized power and ground planes ensure low noise and high speed operation. Component placement and power supply bypassing provide maximum circuit flexibility and performance. The ADA4945-1CP-EBZ evaluation board accepts 0402 surface mount technology (SMT) components, 0805 bypass capacitors, and 2.54 mm headers.

Input and output signals are brought to and from the board via 50 Ω, side launch Subminiature Version A (SMA) connectors.

Full specifications on the ADA4945-1 are available in the ADA4945-1 data sheet. Consult the data sheet in conjunction with this user guide when working with the ADA4945-1CP-EBZ evaluation board.

EVALUATION BOARD PHOTOGRAPH

Figure 1.
TABLE OF CONTENTS

Features .............................................................................................. 1
General Description ........................................................................ 1
Evaluation Board Photograph ......................................................... 1
Revision History ............................................................................... 2
Functionality and Control ............................................................... 3
  Output Clamps.............................................................................. 3
  Setting the Digital Ground (DGND) Level ......................... 3
  Output Common-Mode Voltage ............................................. 3
Evaluation Board Schematic and Artwork .................. 4
Ordering Information ..................................................................... 5
Bill of Materials ............................................................................. 5

REVISION HISTORY

3/2019—Revision 0: Initial Version
FUNCTIONALITY AND CONTROL

OUTPUT CLAMPS
Use the 3-pin P4 and P5 headers to set the ADA4945-1 output clamp voltage levels at the $+V_{CLAMP}$ pin and the $-V_{CLAMP}$ pin (see Figure 2 and Figure 3). To set the $+V_{CLAMP}$ voltage level to the positive supply (VCC), place a jumper across Pin 1 and Pin 2 of the P5 header. To set the $+V_{CLAMP}$ voltage level to any user defined level, apply an external voltage at Pin 2 of the P5 header. Pin 3 is connected to analog ground (AGND). Use the P4 header to set the $-V_{CLAMP}$ voltage level to the negative supply (VEE) or a user defined level.

SETTING THE DIGITAL GROUND (DGND) LEVEL
Use the 3-pin P2 header to set the logic reference (DGND) level to VEE, AGND, or a user defined level. To set the DGND level to VEE, place a jumper across Pin 1 and Pin 2 of the P2 header. To set the DGND level to AGND, place a jumper across Pin 2 and Pin 3 of the P2 header. If a different logic reference level is required, apply the desired voltage directly to Pin 2.

SUPPLIES, POWER MODES, AND DISABLE
The VCC and VEE power supplies are connected at the 3-pin P1 header.
Use the 3-pin P3 header to select full power operating mode or low power operating mode. Short Pin 1 and Pin 2 to place the ADA4945-1 in full power operating mode. Short Pin 2 and Pin 3 to place the ADA4945-1 in low power operating mode.
Short across the 2-pin PD header to place the ADA4945-1 in disable mode.

OUTPUT COMMON-MODE VOLTAGE
To set the output common-mode voltage ($V_{OCM}$) to a user defined level, apply the desired voltage to the loop style VOCM test point. When no voltage is applied to the VOCM test point, the ADA4945-1 $V_{OCM}$ defaults to an internally generated level midway between $+V_{CLAMP}$ and $-V_{CLAMP}$.
ORDERING INFORMATION

BILL OF MATERIALS

Table 1. ADA4945-1CP-EBZ Bill of Materials

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
<th>Reference Designation</th>
<th>Manufacturer</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>High speed, ±0.1 µV/°C offset drift, fully differential ADC driver</td>
<td>U1</td>
<td>Analog Devices</td>
<td>ADA4945-1</td>
</tr>
<tr>
<td>5</td>
<td>0.1 µF ceramic capacitors, 0402</td>
<td>C7, C10 to C13</td>
<td>TDK</td>
<td>CGA2B1X7R1C104K050BC</td>
</tr>
<tr>
<td>2</td>
<td>10 µF tantalum capacitors, 0805</td>
<td>C8, C9</td>
<td>Taiyo Yuden</td>
<td>JMK212U106MG-T</td>
</tr>
<tr>
<td>6</td>
<td>0 Ω chip resistors, 0402</td>
<td>R1, R2, R7, R8, R11, R12</td>
<td>Panasonic</td>
<td>ERJ-2GE0R00X</td>
</tr>
<tr>
<td>4</td>
<td>499 Ω chip resistors, 0402</td>
<td>R5, R6, R9, R10</td>
<td>Panasonic</td>
<td>ERJ-2KF490X</td>
</tr>
<tr>
<td>2</td>
<td>56.2 Ω chip resistors, 0402</td>
<td>R3, R4</td>
<td>Panasonic</td>
<td>ERJ-2KF56R2X</td>
</tr>
<tr>
<td>1</td>
<td>1 kΩ chip resistor, 0402</td>
<td>R26</td>
<td>Panasonic</td>
<td>ERJ-2KF1001X</td>
</tr>
<tr>
<td>2</td>
<td>0 Ω chip resistors, 0805</td>
<td>L1, L2</td>
<td>Panasonic</td>
<td>ERJ-6GEY0R00V</td>
</tr>
<tr>
<td>1</td>
<td>Berg 2-pin header</td>
<td>PD</td>
<td>Amphenol</td>
<td>69157-102HLF</td>
</tr>
<tr>
<td>5</td>
<td>Berg 3-pin headers</td>
<td>P1 to P5</td>
<td>Samtec</td>
<td>TSW-103-08-G-S</td>
</tr>
<tr>
<td>2</td>
<td>Test point loops</td>
<td>VOCM</td>
<td>Components Corp.</td>
<td>TP-104-01-09</td>
</tr>
<tr>
<td>4</td>
<td>Connectors, side launch SMA</td>
<td>VINN, VINP, VOUTN, VOUTP</td>
<td>Samtec</td>
<td>SMA-J-P-H-EM1</td>
</tr>
<tr>
<td>13</td>
<td>Chip resistors, 0402, do not install (DNI)</td>
<td>R13 to R25</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>6</td>
<td>Ceramic capacitors, 0402, DNI</td>
<td>C1 to C6</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

©2019 Analog Devices, Inc. All rights reserved. Trademarks and registered trademarks are the property of their respective owners.

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 non-exclusive, non-transferable, non-assignable 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 discontinuance 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, 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 OR 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.

©2019 Analog Devices, Inc. All rights reserved. Trademarks and registered trademarks are the property of their respective owners.

Rev. 0 | Page 5 of 5