

Evaluating the 3.0 kV rms ADuM362N 6-Channel Digital Isolator

FEATURES

- ▶ Simplified evaluation of the ADuM36xN digital isolator family
- ▶ Supports evaluation of other 6-channel *iCoupler*® digital isolators in 16-lead QSOP package
- ▶ Compact, easy configuration, optimized for rapid evaluation on breadboards/prototype boards
- ▶ Test points can be fitted to measure all signals

EVALUATION KIT CONTENTS

- ▶ EVAL-ADuM36xNEBZ evaluation board

SUPPORTED /COUPLER DEVICES

- ▶ Supports all ADuM36xN models

DOCUMENTS NEEDED

- ▶ [ADuM362N Data Sheet](#)

EQUIPMENT NEEDED

- ▶ Oscilloscope
- ▶ Signal generator
- ▶ 2.25 V to 5.5 V supply
- ▶ Breadboard/prototype board

GENERAL DESCRIPTION

The EVAL-ADuM36xNEBZ evaluation board supports simplified, efficient evaluation of the 3.0 kV rms ADuM36xN family of *iCoupler* digital isolators. The EVAL-ADuM36xNEBZ evaluation board also grants the ability to examine multiple other 16-lead QSOP *iCoupler* digital isolators by the unpopulated U1, U3, and U4, which provide the user with multiple JEDEC standard 16-Lead QSOP footprints and routing appropriate for the evaluation of supported devices.

The EVAL-ADuM36xNEBZ evaluation board features V shaped grooves between each component (U1 to U4) that allow the user to split the PCB into sections and examine a specific device of their choice on a breadboard or similar prototyping board for ease of use.

Power supply and input/output pins can be connected either directly to the pin header connectors or onto a prototyping board.

The EVAL-ADuM36xNEBZ evaluation board follows printed circuit board (PCB) design practices, including a ground plane on each side of the isolation barrier. No other electromagnetic interference (EMI) or noise mitigation design features are included on this board.

Full specifications for the device under test (DUT) are available in the ADuM362N data sheet available from Analog Devices, inc., and must be consulted with this user guide when using the EVAL-ADuM36xNEBZ evaluation board.

EVALUATION BOARD PHOTOGRAPH

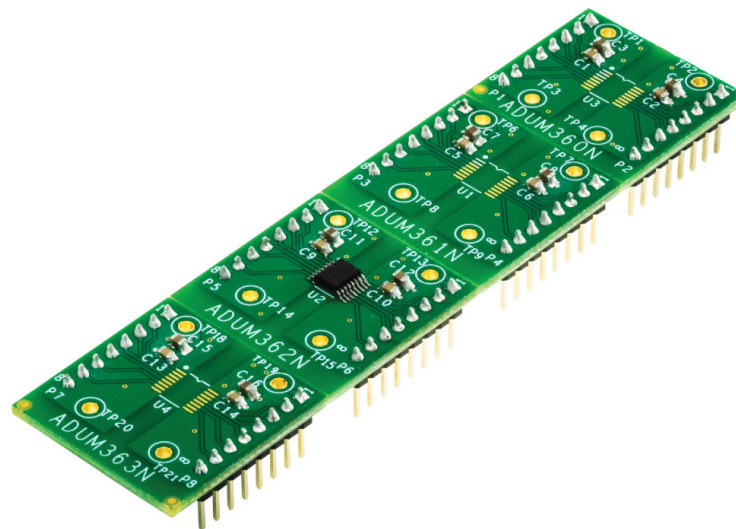


Figure 1. EVAL-ADuM36xNEBZ Evaluation Board Photograph

100

TABLE OF CONTENTS

Features.....	1	Connectors.....	3
Evaluation Kit Contents.....	1	Data Input/Output (I/O) Structures.....	3
Supported iCoupler Devices.....	1	Bypass on the PCB.....	3
Documents Needed.....	1	High Voltage Capability.....	3
Equipment Needed.....	1	Power Input.....	3
General Description.....	1	Evaluation Board Schematics and Artwork.....	4
Evaluation Board Photograph.....	1	Ordering Information.....	9
Evaluation Board Hardware.....	3	Bill of Materials.....	9
PCB Evaluation Functions.....	3		

EVALUATION BOARD HARDWARE

PCB EVALUATION FUNCTIONS

The EVAL-ADuM36xNEBZ evaluation board comes with bypass capacitors, header pins, multiple test points, and the ADuM362N (U2) installed. The evaluation board is designed to support all ADuM36xN models along with compatible iCoupler digital isolators that must be ordered and installed separately (U1, U3, and U4).

The evaluation board features V shaped grooves between each component (U1 to U4) that allow the user to split the PCB into smaller sections and evaluate a device of their choice on a bread-board/prototype board.

CONNECTORS

The EVAL-ADuM36xNEBZ PCB supports both connections made directly to the 8-pin headers or connections made to a prototyping/bread board in which the EVAL-ADuM36xNEBZ is mounted. The 8-pin header connectors for the evaluation board are located on the bottom of the PCB and are spaced appropriately to ensure compatibility with a range of standard 0.1 in. (2.54 mm) pitch spaced bread boards. The PCB can also be separated into smaller sections to evaluate a specific device and channel configuration as needed.

DATA INPUT/OUTPUT (I/O) STRUCTURES

Digital I/O signals are connected by the P1 to P8 8-pin headers to allow connections from the EVAL-ADuM36xNEBZ evaluation board to a signal generator. Each side of each iCoupler digital isolator has an 8-pin header that is used for power, ground, and data I/O connections.

To distinguish between the power and the data I/O for the corresponding device, see the schematic, [Figure 2](#).

BYPASS ON THE PCB

Optional 10 μ F power-supply decoupling capacitors are installed by default on the power lines of the PCB. These capacitors can be removed if not required by the user application. The PCB also features optimal 0.1 μ F bypass capacitors for both DUT power-supply pins, located close to the iCoupler digital isolator.

HIGH VOLTAGE CAPABILITY

The purpose of this PCB is to allow the user rapid evaluation of the ADuM36xN family of digital isolators. Note that this evaluation board cannot be used for the validation of safety functions.

POWER INPUT

Each side of the iCoupler standard data isolator requires an off-board power source. The power source must be independent if common-mode voltages are applied across the isolation barrier, or damage may occur to the power supply. Divided power and ground planes are present on the layers of the PCB on each side of the isolation barrier, as shown in [Figure 3](#) and [Figure 4](#). Power connects to V_{DD1} for Side 1 and to V_{DD2} for Side 2. To see the appropriate power pins on the connectors, see the schematic, [Figure 2](#).

EVALUATION BOARD SCHEMATICS AND ARTWORK

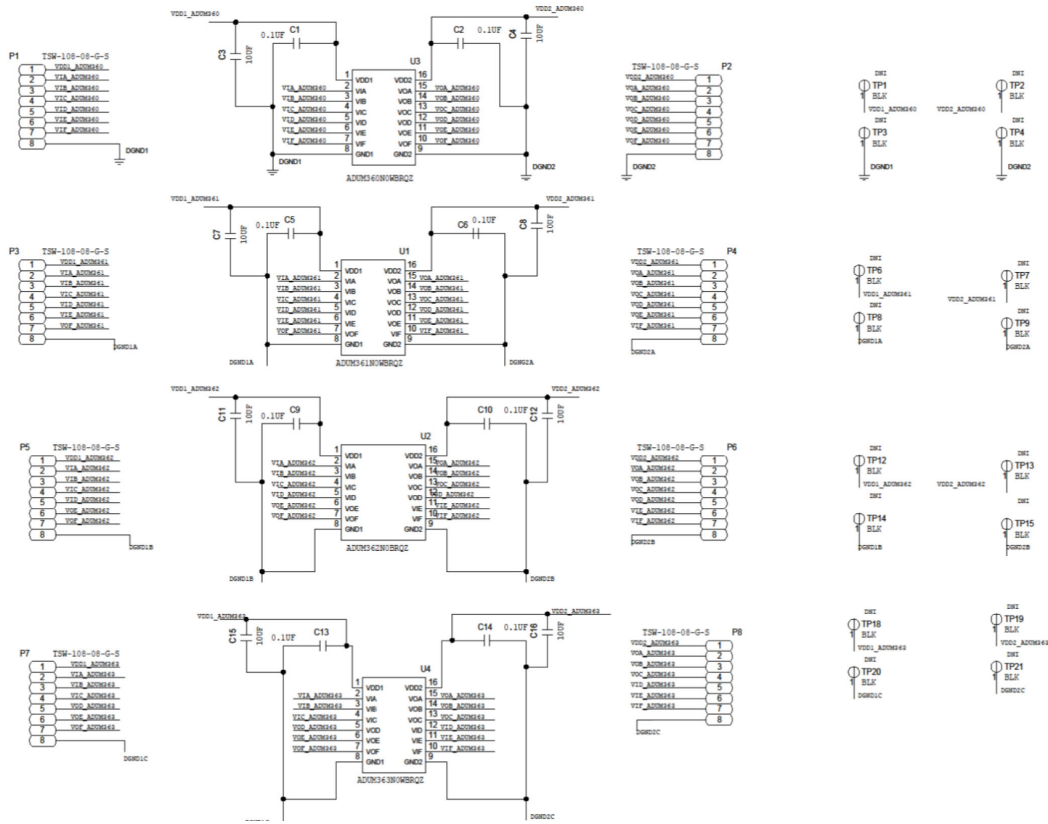
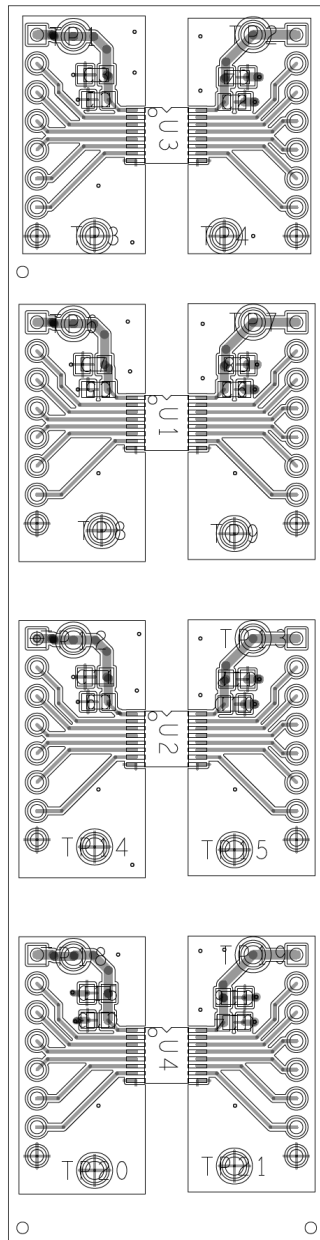


Figure 2. EVAL-ADuM36xNEBZ, Schematic

EVALUATION BOARD SCHEMATICS AND ARTWORK



003

Figure 3. EVAL-ADuM36xNEBZ Component Side, Layer 1

EVALUATION BOARD SCHEMATICS AND ARTWORK

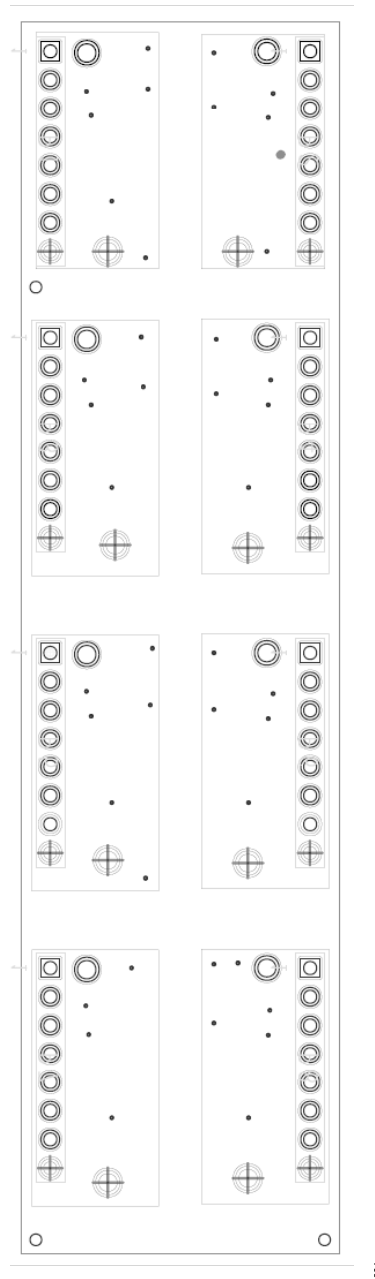


Figure 4. EVAL-ADuM36xNEBZ, Layer 2

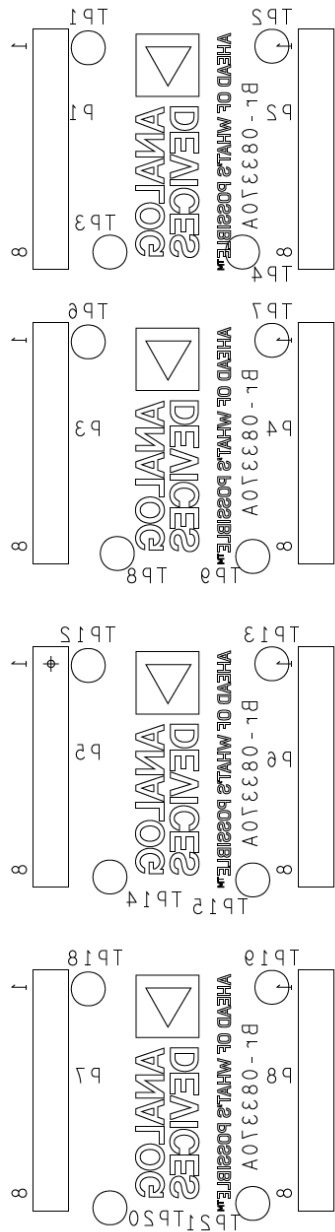
EVALUATION BOARD SCHEMATICS AND ARTWORK



808

Figure 5. EVAL-ADuM36xNEBZ, Top Silkscreen

EVALUATION BOARD SCHEMATICS AND ARTWORK



900

Figure 6. EVAL-ADuM36xNEBZ, Bottom Silkscreen

ORDERING INFORMATION

BILL OF MATERIALS

Table 1. Bill of Materials for EVAL-ADuM36xNEBZ

Quantity	Reference Designator	Description	Manufacturer	Part Number
0	TP1 to TP4, TP6 to TP9, TP12 to TP15, TP18 to TP21	Test points, black (not installed)	Keystone Electronics	5006
0	U4	3.0 kV rms 6-channel digital isolator (not installed)	Analog Devices, Inc.	ADuM36xN
0	U1	3.0 kV rms 6-channel digital isolator (not installed)	Analog Devices, Inc.	ADuM36xN
1	U2	3.0 kV rms 6-channel digital isolator	Analog Devices, Inc.	ADuM362N
0	U3	3.0 kV rms 6-channel digital isolator (not installed)	Analog Devices, Inc.	ADuM36xN
8	C1, C2, C5, C6, C9, C10, C13, C14	Ceramic capacitors, 0.1 µF, 50 V, 5%, X7R, 0805	Kemet	C0805C104J5RACTU
8	C3, C4, C7, C8, C11, C12, C15, C16	Ceramic capacitors, 10 µF, 25 V, 10%, X5R, 0805	Murata	GRM21BR61E106KA73L
8	P1 to P8	8-pin headers, 0.1 inch spacing	Samtec	TSW-108-08-G-S



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 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. All Analog Devices products contained herein are subject to release and availability.

