

Evaluation Board for the **ADM3054** 5 kV rms Signal Isolated High Speed CAN Transceiver with Bus Protection

FEATURES

- Easy evaluation of the **ADM3054** controller area network (CAN) transceiver
- Isolated ground planes (logic side and bus side)
- Convenient connections through screw terminal blocks
 - 3.3 V or 5 V power on the logic side (VDD1)
 - 5 V power on the bus side (VDD2)
 - Ground on logic side (GND1) and bus side (GND2)
 - Logic signals: RXD, TXD, VDD2SENSE
 - Cable shield and bus signals: CANH and CANL
- Jumper-selectable SMB jack inputs for RXD and TXD
- Test points for measuring all signals
- Termination resistors ($2 \times 30 \Omega$) with common-mode filter

APPLICATIONS

- ADM3054 part evaluation
- Evaluation connected to existing CAN controllers/data buses

EVALUATION KIT CONTENTS

EVAL-ADM3054EBZ

GENERAL DESCRIPTION

The **EVAL-ADM3054EBZ** allows quick and easy evaluation of the **ADM3054** isolated CAN transceiver. The evaluation board allows all of the input and output functions to be exercised without the need for external components. Screw terminal blocks provide convenient connections for logic signals and power.

The main device on the evaluation board, the **ADM3054**, is a controller area network (CAN) physical layer transceiver with integrated digital isolation, allowing a protocol layer CAN controller to access the physical layer bus. The **ADM3054** complies with the ISO 11898 standard. It is capable of running at data rates of up to 1 Mbps.

The evaluation board has separate ground and power planes for the logic side and the bus side. This allows evaluation of the isolation capability of the **ADM3054**, which employs Analog Devices, Inc., *iCoupler*® technology to combine a 3-channel isolator and a CAN transceiver into a single, 16-lead wide body SOIC package.

The power is isolated between a single 3.3 V or 5 V supply on VDD1, the logic side, and a single 5 V supply provided on VDD2, the bus side. Loss of power on the bus side (VDD2) can be detected by an integrated VDD2SENSE signal.

EVAL-ADM3054EBZ



Figure 1.

TABLE OF CONTENTS

Features	1	Evaluation Board Configuration	3
Applications.....	1	Setting Up the Evaluation Board.....	3
Evaluation Kit Contents.....	1	Evaluation Board Schematic and Layout.....	4
General Description	1	Ordering Information.....	6
EVAL-ADM3054EBZ.....	1	Bill of Materials.....	6
Revision History	2	Related Links.....	6

REVISION HISTORY

1/12—Revision 0: Initial Version

EVALUATION BOARD CONFIGURATION

SETTING UP THE EVALUATION BOARD

The [EVAL-ADM3054EBZ](#) allows the [ADM3054](#) isolated CAN transceiver to be quickly and easily evaluated. The evaluation board allows all of the input and output functions to be exercised without the need for external components.

On the [EVAL-ADM3054EBZ](#), the power is isolated between a single 3.3 V or 5 V supply on VDD1, the logic side, and a single 5 V supply provided on VDD2, the bus side. When the part is in recessive mode and actively switching states at 1 Mbps, the typical supply current from VDD1 (I_{DD1}) is less than 3 mA. When the part is in the recessive state, the supply current from VDD2 (I_{DD2}) is typically less than 10 mA; in the dominant state, it is typically less than 75 mA; and when actively switching states at 1 Mbps, it is typically less than 55 mA with a default 60 Ω load installed.

The bus voltage sense pin ($V_{DD2SENSE}$), detects when VDD2 is connected on the bus side. A low on VDD2SENSE indicates that power is available on the bus side, and a high on VDD2SENSE indicates that power is absent from the bus side.

VDD1 and VDD2 are the power supplies of the logic and bus sides, respectively. A 22 μ F decoupling capacitor, C1, is fitted at the connector between VDD1 and GND1. Capacitors of 100 nF and 1 μ F are fitted on the V_{DD1} and V_{DD2} pins, respectively, decoupling from GND1 and GND2.

An example operation of the [EVAL-ADM3054EBZ](#) is shown in Figure 3. Connect a signal generator on TXD and set up a

500 kHz square wave clock with output swing between 0 V and 5 V. Connect the oscilloscope probes to the CANH and CANL test points. A plot of the oscilloscope for TXD, RXD, CANH, and CANL is shown in Figure 2. Channel 1 shows the TXD signal, Channel 2 and Channel 3 show the CANH and CANL signals, respectively, and Channel 4 shows the RXD signal.

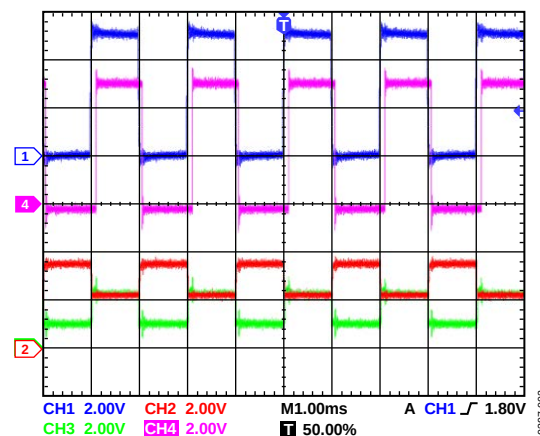


Figure 2. TXD, RXD, CANH, and CANL Signals

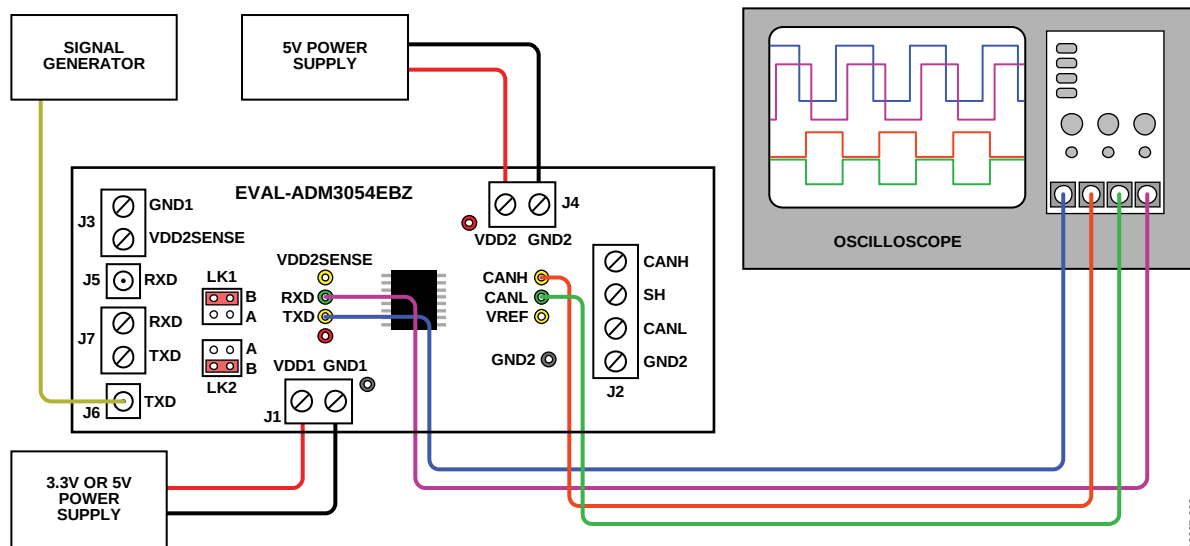


Figure 3. Basic Isolated CAN Transceiver Evaluation Board Operation

EVALUATION BOARD SCHEMATIC AND LAYOUT

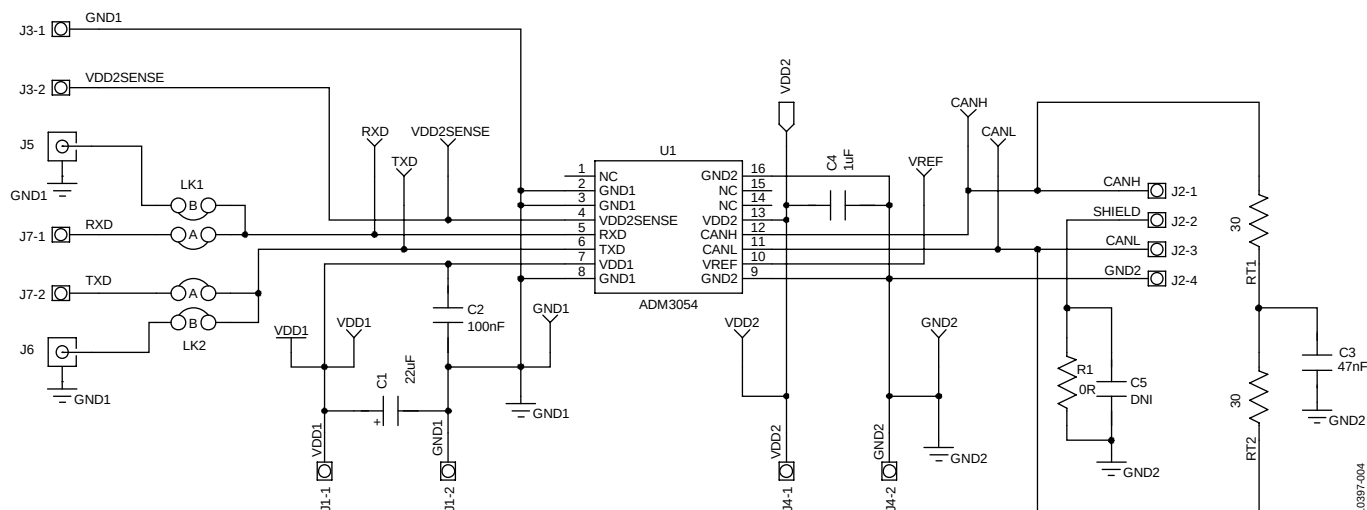


Figure 4. EVAL-ADM3054EBZ Schematic

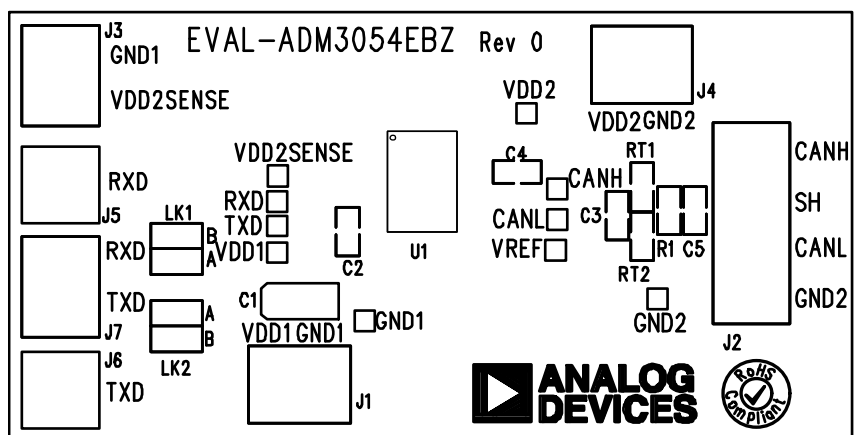


Figure 5. EVAL-ADM3054EBZ Silkscreen

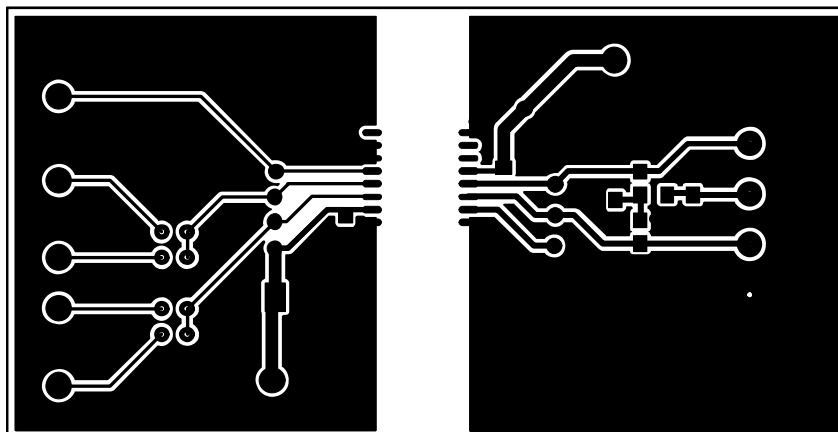


Figure 6. EVAL-ADM3054EBZ Component Side

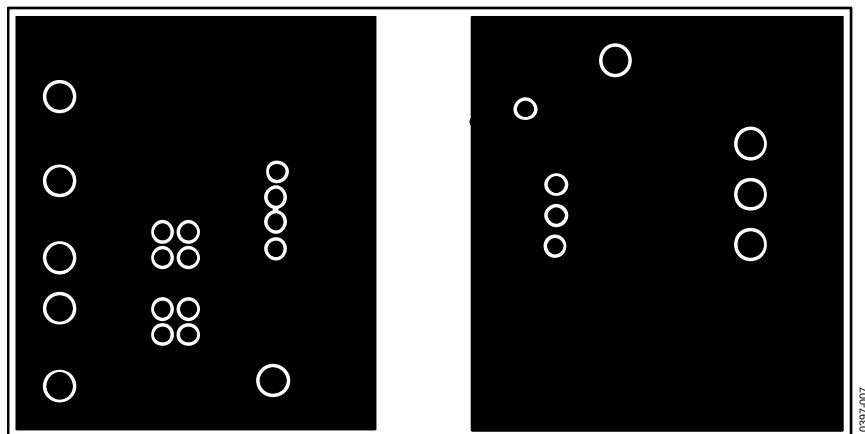


Figure 7. [EVAL-ADM3054EBZ](#) Solder Side

ORDERING INFORMATION

BILL OF MATERIALS

Table 1.

Quantity	Reference Designator	Description	Supplier/Part Number
1	C1	Capacitor, tantalum, 22 μ F, TAJ_C	AVX Corporation/TAJC226K016RNJ
2	C2, C4	Capacitor, 100 nF, 0805	Yageo (Phycomp)/CC0805KRX7R7BB104
1	C3	Capacitor, 47 nF, 0805	Multicomp/MCCA000270
1	C5	Not placed/optional	N/A
4	CANH, TXD, VDD2SENSE, VREF	Test point, yellow	Vero Technologies/20-313140
2	CANL, RXD	Test point, green	Vero Technologies/20-313138
2	GND1, GND2	Test point, black	Vero Technologies/20-2137
4	J1, J3, J4, J7	Terminal block, 2-way	Lumberg/KRM 02
1	J2	Terminal block, 4-way	Lumberg/KRM 04
2	J5, J6	Connector, SMB jack	Multicomp/24-14-2-TGG
2	LK1, LK2	4-pin (2 $\times$ 2) 0.1" header and shorting block	Harwin/M20-9953646 & M7566-05
1	R1	Resistor, 0 Ω , 0805	Vishay Draloric/MC 0.063W 0603 0R
2	RT1, RT2	Resistor, 30 Ω , 0805	Multicomp/MCPWR05FTFW0300
1	U1	16-lead SOIC, wide body	Analog Devices/ADM3054BRWZ
2	VDD1, VDD2	Test point, red	Vero Technologies/20-313137

RELATED LINKS

Resource	Description
ADM3054	Product Page, 5 kV rms Signal Isolated High Speed CAN Transceiver with Bus Protection

NOTES

NOTES

**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 NONINFRINGEMENT 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.