

## Evaluation Board for the **ADM3052** Isolated CAN Transceiver with Integrated High Voltage, Bus Side Linear Regulator

### FEATURES

- Easy evaluation of the **ADM3052**
- Isolated, controller area network (CAN) transceiver
- Integrated bus side linear regulator (V<sub>+</sub>)
- Bus side powered by V<sub>+</sub> and V<sub>-</sub>
- 11 V to 25 V operation on V<sub>+</sub>
- 5 V or 3.3 V operation on V<sub>DD1</sub>
- High speed data rates up to 1 Mbps
- Connect 110 or more nodes on the bus

### APPLICATIONS

- CAN data buses
- Industrial field networks
- DeviceNet applications

### EVALUATION KIT CONTENTS

EVAL-ADM3052EBZ

### GENERAL DESCRIPTION

The **EVAL-ADM3052EBZ** allows quick and easy evaluation of the **ADM3052** isolated CAN transceiver. The evaluation board allows all the input and output functions of the **ADM3052** to be exercised without the need for external components.

The **ADM3052** is an isolated CAN, physical layer transceiver with a V<sub>+</sub> integrated linear regulator. The **ADM3052** complies with the ISO 11898 standard.

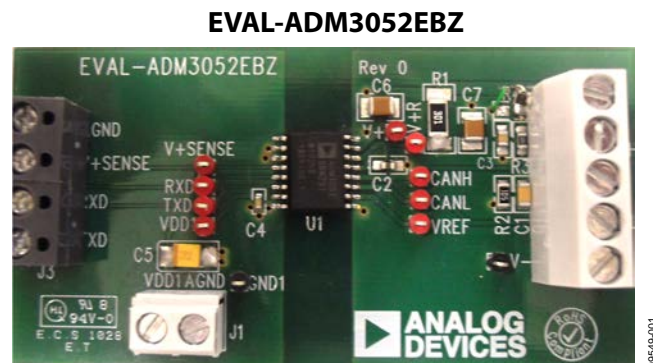


Figure 1.

The device uses Analog Devices, Inc., *iCoupler*® technology to combine a 3-channel isolator, a CAN transceiver, and a linear regulator into a single, 16-lead, wide body SOIC package. The power is isolated between a single 3.3 V or 5 V supply on V<sub>DD1</sub>, the logic side, and a single 24 V supply provided on V<sub>+</sub>, the bus side.

The linear regulator takes the V<sub>+</sub> bus power and regulates it down to 5 V. The linear regulator uses two regulation loops to share the power dissipation between the internal die and an external resistor (R1), which reduces the internal heat dissipation in the package. This 300 Ω external resistor should be capable of dissipating 750 mW of power and have a tolerance of 1%.

Full details on the **ADM3052** are provided in the **ADM3052** data sheet available from Analog Devices, Inc., which should be consulted in conjunction with this evaluation board user guide.

**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
EVAL-ADM3052EBZ.....	1	Ordering Information.....	6
General Description .....	1	Bill of Materials.....	6
Revision History .....	2	Related Links.....	6

**REVISION HISTORY**

**10/13—Rev. 0 to Rev. A**

Changes to R1; Table 1 .....	6
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**12/11—Revision 0: Initial Version**

## EVALUATION BOARD CONFIGURATION

### SETTING UP THE EVALUATION BOARD

The EVAL-ADM3052EBZ allows the ADM3052 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-ADM3052EBZ, the power is isolated between a single 3.3 V or 5 V supply on VDD1, the logic side, and a single 24 V supply provided on V+, the bus side.

R1, the 300 Ω external resistor, is used by the built-in linear regulator to share the power dissipation between R1 and the internal die to reduce the internal heat dissipation in the package.

The bus voltage sense pin (V+SENSE), detects when V+ is connected on the bus side. A low on V+SENSE indicates that power is available on the bus side, and a high on V+SENSE indicates that power is absent from the bus side.

VDD1 is the power supply of the logic side. A 22 μF decoupling capacitor, C5, is fitted between VDD1 and GND1. A capacitor of 1 μF is fitted on the C<sub>INT</sub> pin. A 100 nF capacitor, C6, is fitted between V+ and V−, and a 10 μF capacitor, C7, is fitted between V+R and V−.

An example operation of the EVAL-ADM3052EBZ 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 scope probes to the CANH and CANL test points. A plot of the oscilloscope for TXD, CANH, and CANL is shown in Figure 2. Channel 1 shows the TXD signal, and Channel 2 and Channel 3 show the CANH and CANL signals, respectively.

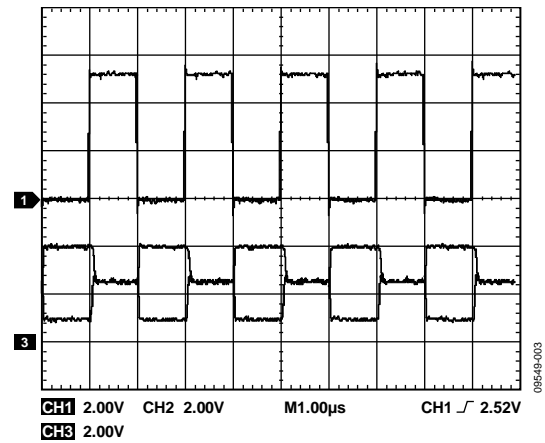


Figure 2. TXD, CANH, and CANL Signals

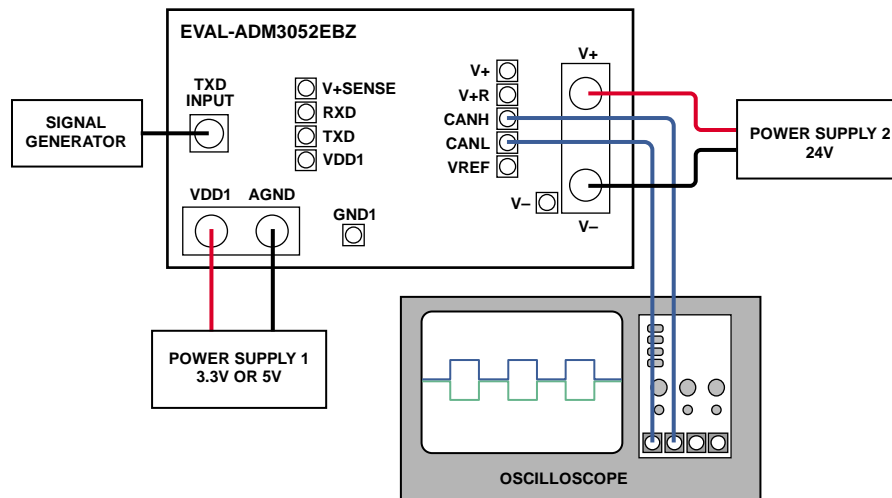


Figure 3. Basic Isolated CAN Transceiver Evaluation Board Operation

EVALUATION BOARD SCHEMATIC AND LAYOUT

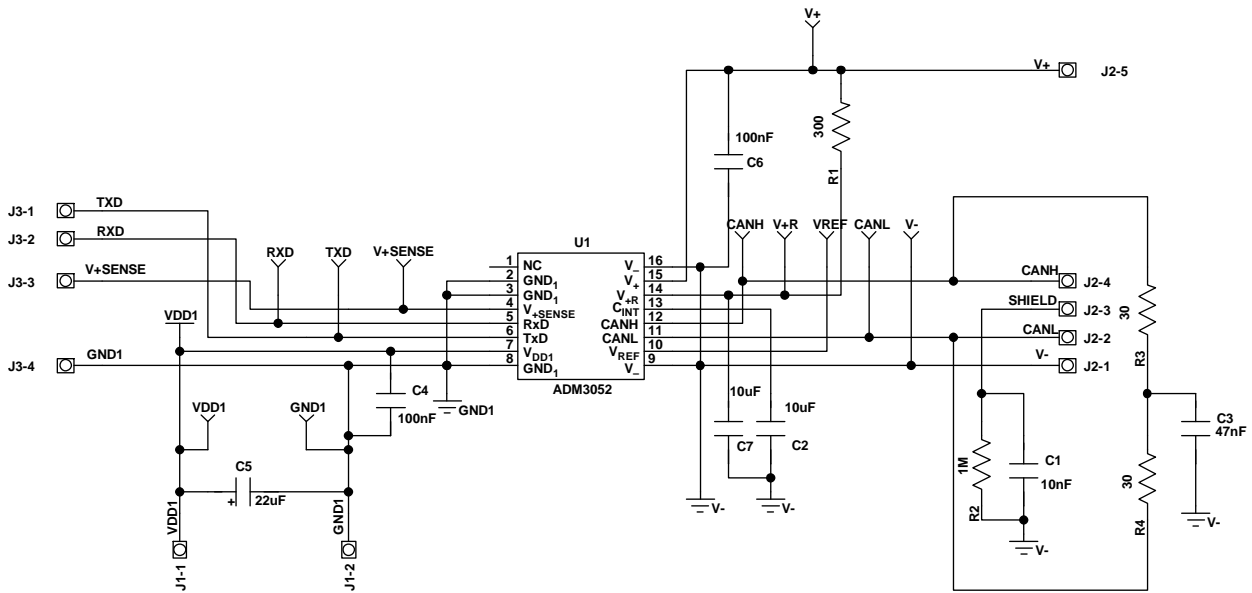


Figure 4. EVAL-ADM3052EBZ Schematic

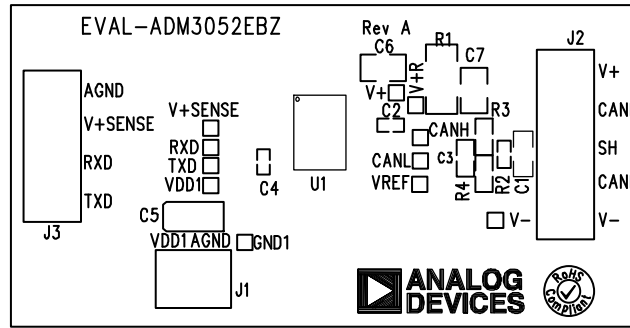


Figure 5. EVAL-ADM3052EBZ Silkscreen

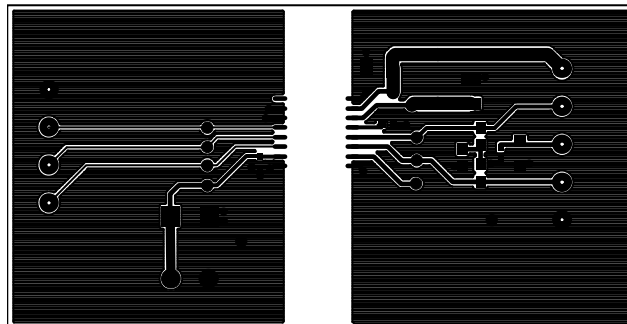


Figure 6. EVAL-ADM3052EBZ Component Side

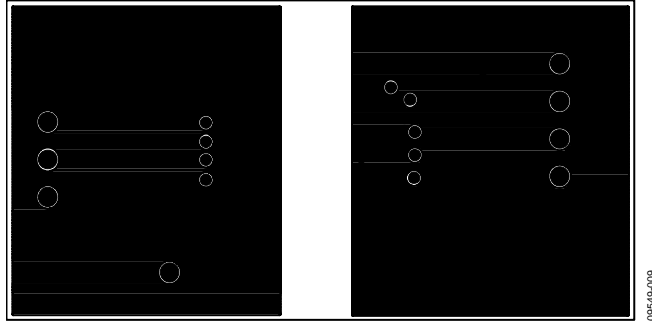


Figure 7. EVAL-ADM3052EBZ Solder Side

**ORDERING INFORMATION****BILL OF MATERIALS**

Table 1.

Quantity	Reference Designator	Description	Supplier/Part Number
1	C1	Capacitor, 10 nF, 1206	AVX Corporation/12067C103KAT1A
1	C2	Capacitor, 10 $\mu$ F, 0603	KEMET/C0603C106M9PACTU
1	C3	Capacitor, 47 nF, 0805	AVX Corporation/08055C473KAT2A
1	C4	Capacitor, 100 nF, 0603	AVX Corporation/06033C104JAT2A
1	C5	Capacitor, 22 $\mu$ F, RTAJ_C	AVX Corporation/TAJB226K016R
1	C6	Capacitor, 100 nF, 1210	KEMET/C1210C104J5GACTU
1	C7	Capacitor, 10 $\mu$ F, 1210	Multicomp/MCCA000492
1	CANH	Test point	Vero Technologies/20-313137
1	CANL	Test point	Vero Technologies/20-313137
1	J1	Connector\POWER	Lumberg/KRM 02
1	J2	Connector\POWER5	Lumberg/KRE 05
1	J3	Connector\POWER4	Lumberg/KRM 04
1	R1	Resistor, 300 $\Omega$ , 2010	Multicomp/MCPWR10FTEQ3000
1	R2	Resistor, 1 M $\Omega$ , 1206	Yageo (Phycomp)/RV1206JR-071ML
2	R3, R4	Resistor, 30 $\Omega$ , 0805	Multicomp/MC 0.1W 0805 1% 30R
7	RXD, TXD, V+, V+R, V+SENSE, VDD1, VREF	Test point	Vero Technologies/20-313137
1	U1	16-lead SOIC_W	Analog Devices/ADM3052BRWZ
2	GND1, V-	Test point	Vero Technologies/20-2137

**RELATED LINKS**

Resource	Description
<a href="#">ADM3052</a>	Product Page, Isolated CAN Transceiver with Integrated High Voltage, Bus-Side, Linear Regulator

**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.

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