

Evaluating the **ADM2490E**—5 kV, Signal Isolated, High Speed, 16 Mbps, ESD Protected, Full Duplex, *iCoupler*, Isolated RS-485 Transceiver

FEATURES

- Full duplex, isolated RS-485/RS-422 transceivers
- Suitable for 5 V or 3 V operation on V_{DD1}
- Suitable for 5 V operation on V_{DD2}
- 16 Mbps data rate
- 32 nodes on bus

APPLICATIONS

- Isolated RS-485/RS-422 interfaces
- INTERBUS
- Industrial field networks
- Multipoint data transmission systems

EVALUATION KIT CONTENTS

- EVAL-ADM2490EEBZ

GENERAL DESCRIPTION

The EVAL-ADM2490EEBZ allows the isolated **ADM2490E** RS-485 transceiver to be easily and quickly evaluated. The evaluation board allows all of the input and output functions to be exercised without the need for external components.

The **ADM2490E** differential bus transceiver is an integrated, galvanically isolated component designed for bidirectional data communication on multipoint bus transmission lines.

The device uses Analog Devices, Inc., *iCoupler*® technology to combine a 2-channel isolator, a three-state differential line driver, and a differential input receiver into a single package. The logic side of the device is powered with either a 5 V or a 3 V supply, and the bus side uses an isolated 5 V supply.

EVALUATION BOARD PHOTOGRAPH

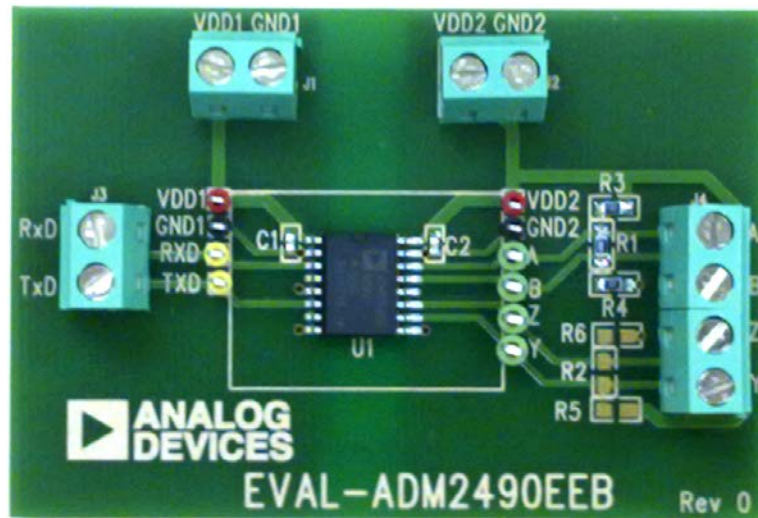


Figure 1.

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REVISION HISTORY

2/13—Revision 0: Initial Version

EVALUATION BOARD CONFIGURATIONS

SETTING UP THE EVALUATION BOARD

The EVAL-ADM2490EEBZ allows the isolated [ADM2490E](#) RS-485 transceiver to be easily and quickly evaluated. The evaluation board allows all of the input and output functions to be exercised without the need for external components.

A termination resistor (R_T) of $120\ \Omega$ is fitted on the receiving side of the transceiver, along with a pull-up resistor of $1.3\ \text{k}\Omega$ on the noninverting side and a pull-down resistor of $1.3\ \text{k}\Omega$ on the inverting side for fail-safe operation.

The logic side is suitable for 5 V or 3 V operation on V_{DD1} . There are two 100 nF decoupling capacitors (C1 and C2) fitted between

V_{DD1} and GND_1 and between V_{DD2} and GND_2 , respectively. The bus side is suitable for 5 V operation on V_{DD2} . See Figure 2.

Refer to the [AN-960 Application Note, RS-485/RS-422 Circuit Implementation Guide](#), for an explanation of bus termination and fail-safe biasing.

To set up the evaluation board for testing, the connections described in Table 1 must be made between two evaluation boards. TxD and RxD serve as the transmitting and receiving lines, respectively.

Table 1. Evaluation Board Connections

Screw Terminal Board	Description
Screw Terminal Board 1	
Y	Noninverting output
Z	Inverting output
A	Noninverting input
B	Inverting input
Screw Terminal Board 2	
A	Noninverting input
B	Inverting input
Y	Noninverting output
Z	Inverting output

EVALUATION BOARD SCHEMATIC AND ARTWORK

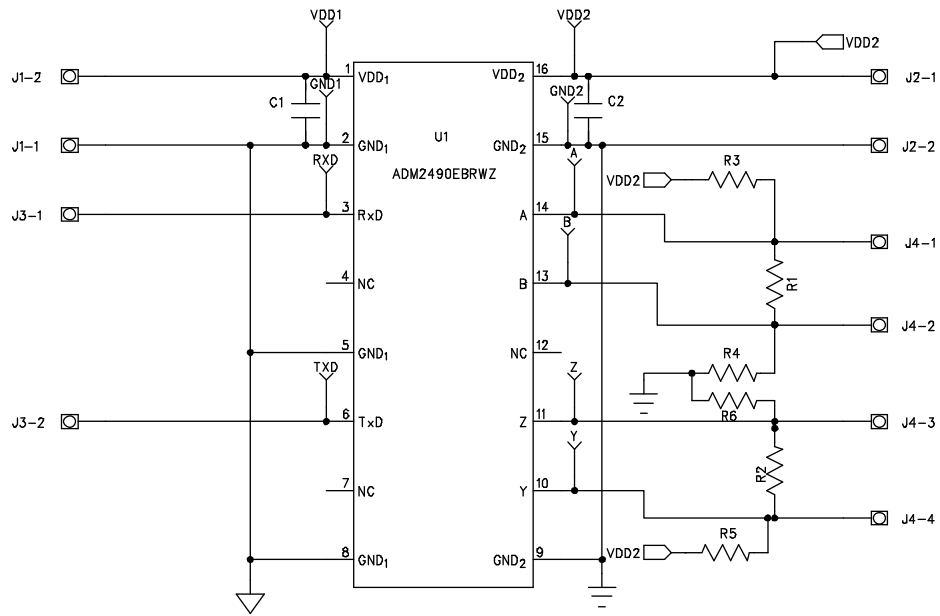


Figure 2. EVAL-ADM2490EEBZ Schematic

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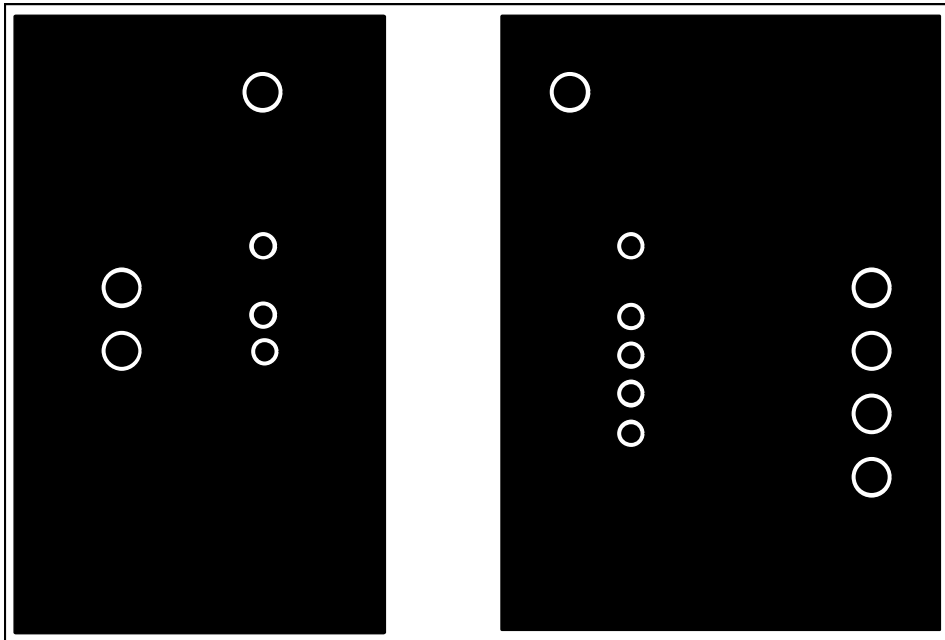


Figure 3. EVAL-ADM2490EEBZ Solder Side

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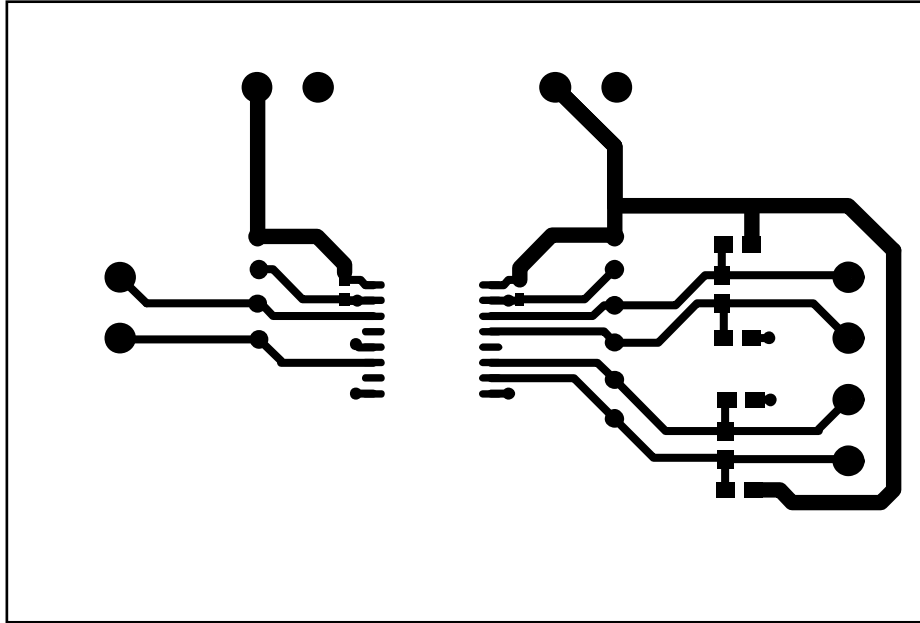


Figure 4. EVAL-ADM2490EEBZ Components

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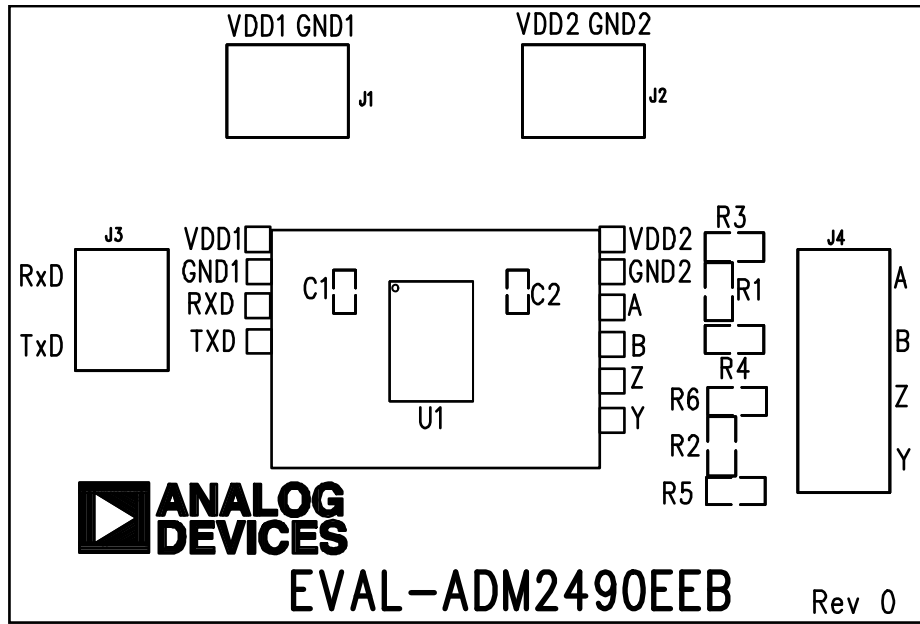


Figure 5. EVAL-ADM2490EEBZ Silkscreen

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BILL OF MATERIALS

Table 2.

Quantity	Reference Designator	Description	Supplier/Part Number
1	R1	Resistor, 120 Ω , 0805	Tyco Electronics Connectivity/Neohm/CPF0603B120RE1
2	R3, R4	Resistor, 1.3 k Ω , 0805	Tyco Electronics Connectivity/Neohm/CPF0603B1K3E1
3	R2, R5, R6	Resistor, 0805	Do not insert
2	C1, C2	Capacitor, Size 0603, 100 nF	AVX Corporation/06033G104ZAT2A
3	J1, J2, J3	Connector/power, 2-pin terminal block (5 mm pitch)	Lumberg/KRM 02
1	J4	Connector/Power 4, 4-pin terminal block	Lumberg/KRM 04
1	U1	16-lead wide body SOIC	Analog Devices/ ADM2490EBRWZ
2	GND ₁ , GND ₂	Test point, black	Vero Technologies/20-2137
2	V _{DD1} , V _{DD2}	Test point, red	Vero Technologies/20-313137
2	RxD, TxD	Test point, yellow	Vero Technologies/20-313140
4	A, B, Z, Y	Test point, green	Vero Technologies/20-313138

RELATED LINKS

Resource	Description
ADM2490E	Product Page: 5 kV Signal Isolated, High Speed (16 Mbps), ESD Protected, Full Duplex RS-485 Transceiver
AN-960	Application Note: RS-485/RS-422 Circuit Implementation Guide

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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