



ANALOG DEVICES UG-496 Evaluation Board User Guide

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Evaluation Board User Guide UG-496

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

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FEATURES

Full duplex, isolated RS-485/RS-422 transceivers
Suitable for 5 V or 3 V operation on VDD1
Suitable for 5 V operation on VDD2
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.

PLEASE SEE THE LAST PAGE FOR AN IMPORTANT WARNING AND LEGAL TERMS AND CONDITIONS.

REVISION HISTORY

2/13—Revision 0: Initial Version

EVALUATION BOARD CONFIGURATIONS

SETTING UP THE EVALUATION BOARD

The E VA L -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 (RT) of 120 Ω is fitted on the receiving side of the transceiver, along with a pull-up resistor of 1.3 kΩ onthe noninverting side and a pull-down resistor of 1.3 kΩ on the inverting side for fail-safe operation.

The logic side is suitable for 5 V or 3 V operation on VDD1. There are two 100 nF decoupling capacitors (C1 and C2) fitted between VDD1 and GND1 and between VDD2 and GND2, respectively. The bus side is suitable for 5 V operation on VDD2. See Figure 2.

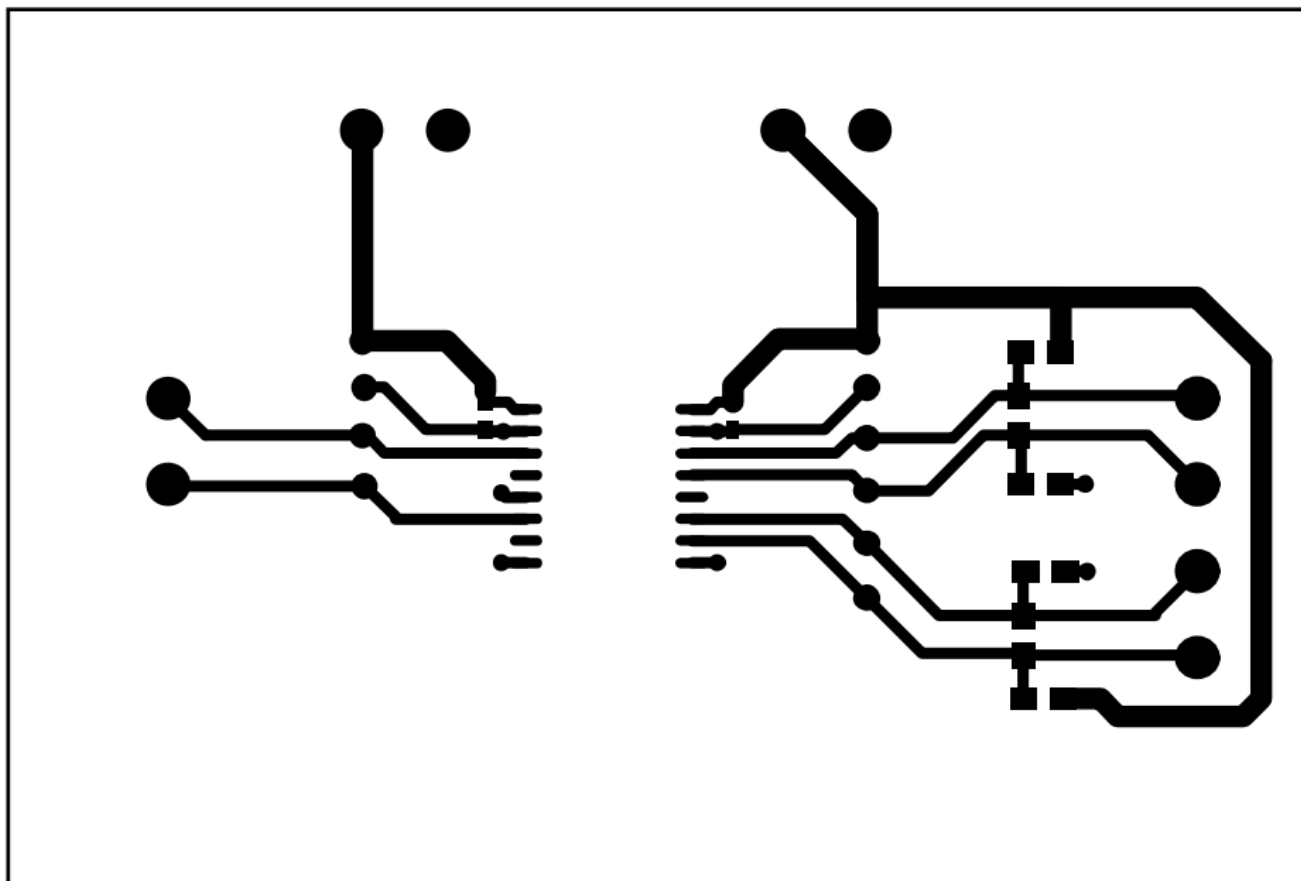
Refer to the AN-960 Application Note, RS-485/RS-422 Circuit Implementation Guide, for an explanation of bus termination and fail-safe biasing.

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

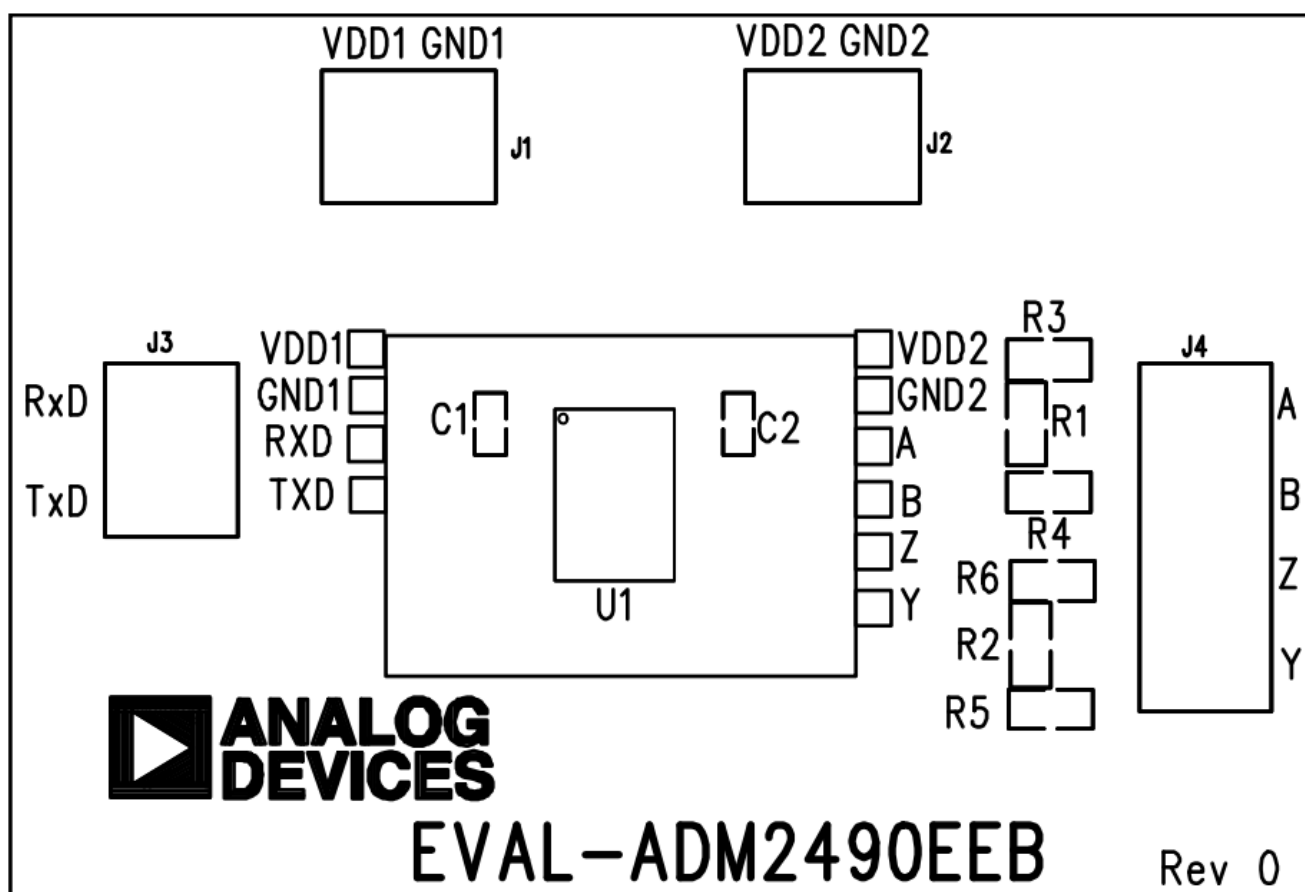
| Screw Terminal Board | Description |
|--|--|
| Screw Terminal Board 1 Y Z A B | Noninverting output Inverting output Noninverting input Inverting input |
| Screw Terminal Board 2 A B Y Z | Noninverting input Inverting input Noninverting output Inverting output |

EVALUATION BOARD SCHEMATIC AND ARTWORK



11163-004

Figure 4. EVAL-ADM2490EEBZ Components



11163-005

Figure 5. EVAL-ADM2490EEBZ Silkscreen

BILL OF MATERIALS

Table 2.

| Quantity | Reference Designator | Description | Supplier/Part Number |
|----------|----------------------|---|---|
| 1 | R1 | Resistor, 120 Ω , 0805 | Tyco Electronics |
| 2 | R3, R4 | Resistor, 1.3 k Ω , 0805 | Connectivity/Neohm/CPF0603B120RE1 |
| 3 | R2, R5, R6 | Resistor, 0805 | Tyco Electronics Connectivity/Neohm/CPF0603B1K3 |
| 2 | C1, C2 | Capacitor, Size 0603, 100 nF | E1 |
| 3 | J1, J2, J3 | Connector/power, 2-pin terminal block | Do not insert |
| 1 | J4 | (5 mm pitch) | AVX Corporation/06033G104ZAT2A |
| 1 | U1 | Connector/Power 4, 4-pin terminal block | Lumberg/KRM 02 |
| 2 | GND1, GND2 | | Lumberg/KRM 04 |
| 2 | VDD1, VDD2 | 16-lead wide body SOIC | Analog Devices/ADM2490EBRWZ |
| 2 | RxD, TxD | Test point, black | Vero Technologies/20-2137 |
| 4 | A, B, Z, Y | Test point, red | Vero Technologies/20-313137 |
| | | Test point, yellow | Vero Technologies/20-313140 |
| | | Test point, green | Vero Technologies/20-313138 |

RELATED LINKS

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

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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Documents / Resources

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|  | <p>ANALOG DEVICES UG-496 Evaluation Board [pdf] User Guide UG-496 Evaluation Board, UG-496, Evaluation Board, Board</p> |
|---|--|

References

-  [Mixed-signal and digital signal processing ICs | Analog Devices](#)

Manuals+.