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# Evaluation Board for the ADM2491E ±8 kV Signal Isolated, High Speed (16 Mbps), ESD Protected, Full/Half Duplex RS-485 Transceiver

## FEATURES

- Configurable as half/full duplex, isolated RS-485/RS-422 transceivers
- Suitable for 5 V or 3.3 V operation on $V_{DD1}$
- Suitable for 5 V operation on $V_{DD2}$
- 16 Mbps data rate
- 32 nodes on bus

## ADM2491E APPLICATIONS

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

## EVALUATION KIT CONTENTS

EVAL–ADM2491EEBZ

## GENERAL DESCRIPTION

The EVAL-ADM2491EEBZ allows the isolated ADM2491E 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 ADM2491E differential bus transceiver is an integrated, galvanically isolated component designed for bidirectional data communication on multipoint bus transmission lines.

The device employs Analog Devices, Inc., *i*Coupler® technology to combine a 3-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 3.3 V supply, and the bus side uses an isolated 5 V supply.

## EVALUATION BOARD DIGITAL PHOTOGRAPH

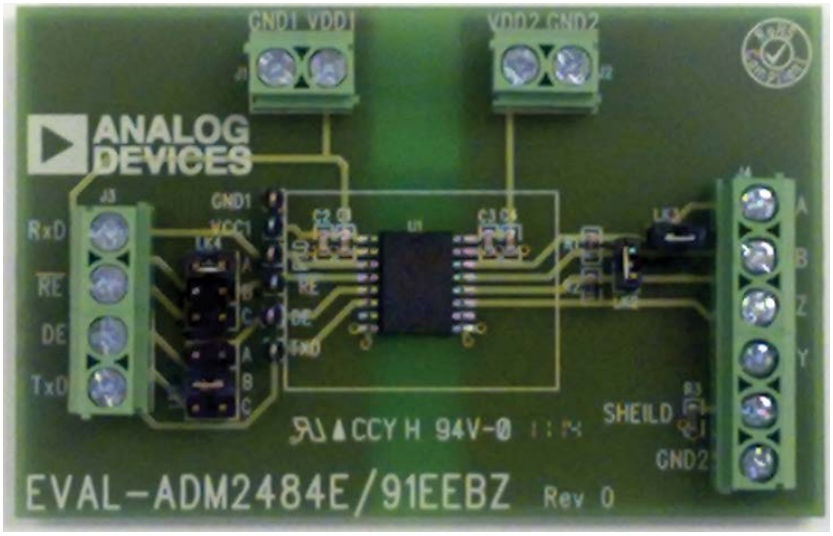


*Figure 1.*

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## REVISION HISTORY

**2/13—Rev. 0 to Rev. A**

Changes to Features and General Description ..... 1
Changes to Setting Up the Evaluation Board Section ..... 3

**8/11—Revision 0: Initial Version**

# EVALUATION BOARD CONFIGURATIONS

## SETTING UP THE EVALUATION BOARD

The EVAL-ADM2491E EBZ allows the isolated ADM2491E 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, is fitted on the receiver inputs; this can be changed or removed, if necessary. The value of the termination resistor should be equal to the characteristic impedance of the cable used; 120 Ω is the standard termination resistor value. Remove RT if the board is connected to a bus that is already terminated at both ends.

The logic side is suitable for 5 V or 3.3 V operation on VDD1. There is a 100 nF decoupling capacitor, C2, and a 10 nF decoupling capacitor, C1 fitted between VDD1 and GND1. The bus side is suitable for 5 V operation on VDD2. There is a 100 nF decoupling capacitor, C3, and a 10 nF decoupling capacitor, C4, fitted between VDD2 and GND2. See Figure 2.

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

## HALF-/FULL DUPLEX CONFIGURATION

To set up the EVAL-ADM2491EEBZ for full duplex configuration, the jumpers, LK1 and LK2, must be removed. For a half-duplex configuration, these jumpers must be included. LK1 ties B to Y, and LK2 ties A to Z.

**Table 1. Board Configurations and Jumper Settings**

| Configuration | Jumpers Fitted | Jumpers Open |
|---|---|---|
| Half-Duplex Configuration | LK1, LK2 | Not applicable |
| Full Duplex Configuration | Not applicable | LK1, LK2 |
| $\overline{RE}$ High | LK4 (Position A) | LK4 (Position B and Position C) |
| $\overline{RE}$ Low | LK4 (Position B) | LK4 (Position A and Position C) |
| Using the Screw Terminal for $\overline{RE}$ | LK4 (Position C) | LK4 (Position A and Position B) |
| RTS High | LK3 (Position A) | LK3 (Position B and Position C) |
| RTS Low | LK3 (Position B) | LK3 (Position A and Position C) |
| Using the Screw Terminal for RTS | LK3 (Position C) | LK3 (Position A and Position B) |

# EVALUATION BOARD SCHEMATIC AND ARTWORK

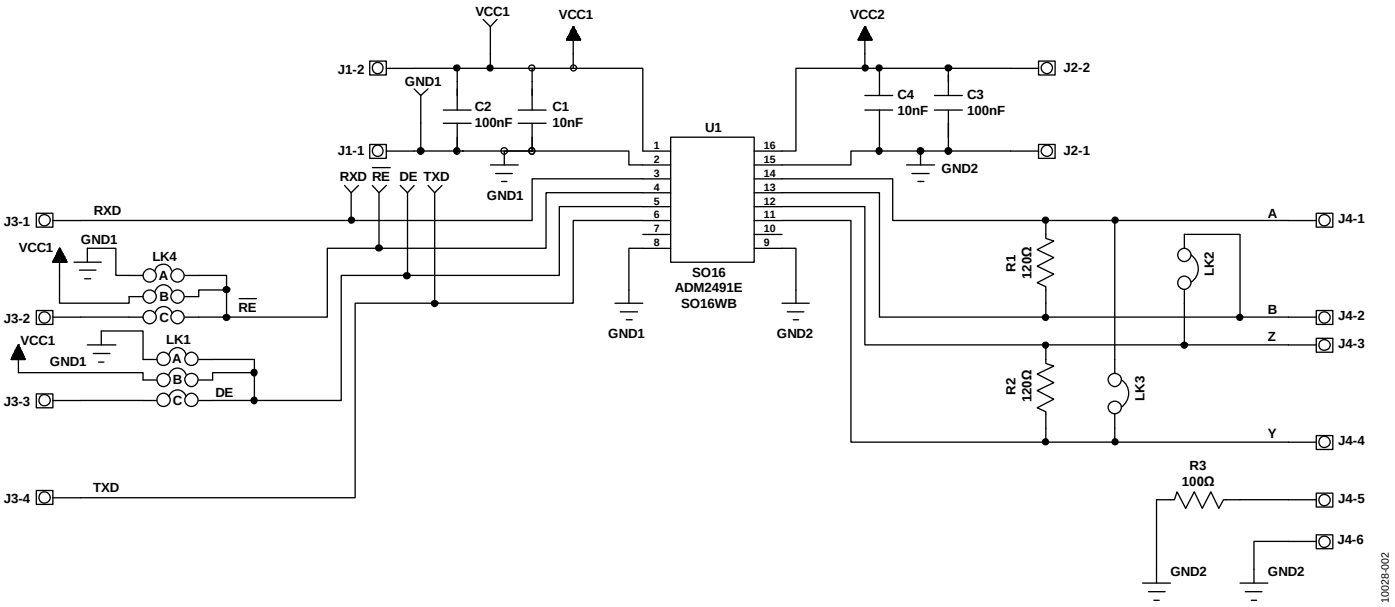


*Figure 2. EVAL-ADM2491EEBZ Schematic*

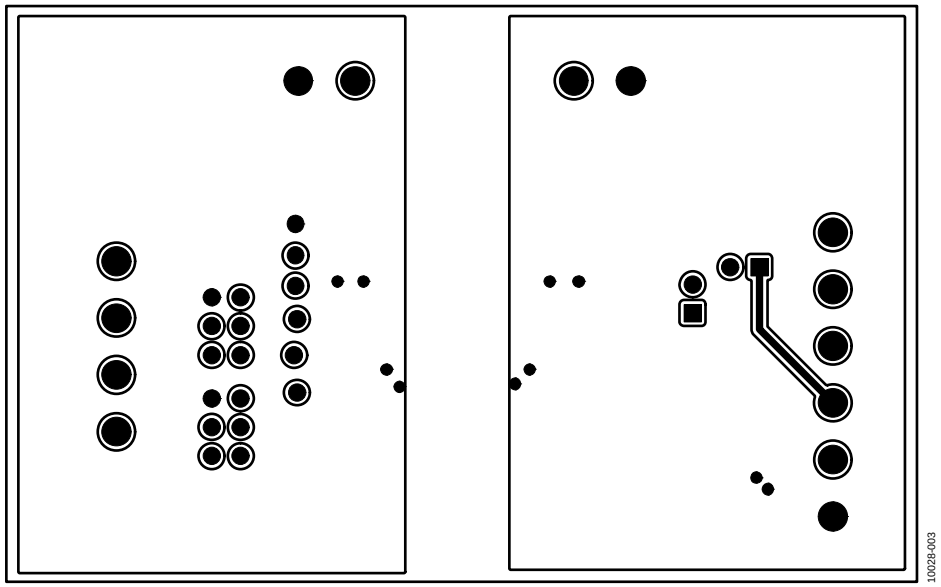


*Figure 3. EVAL-ADM2491EEBZ Solder Side*

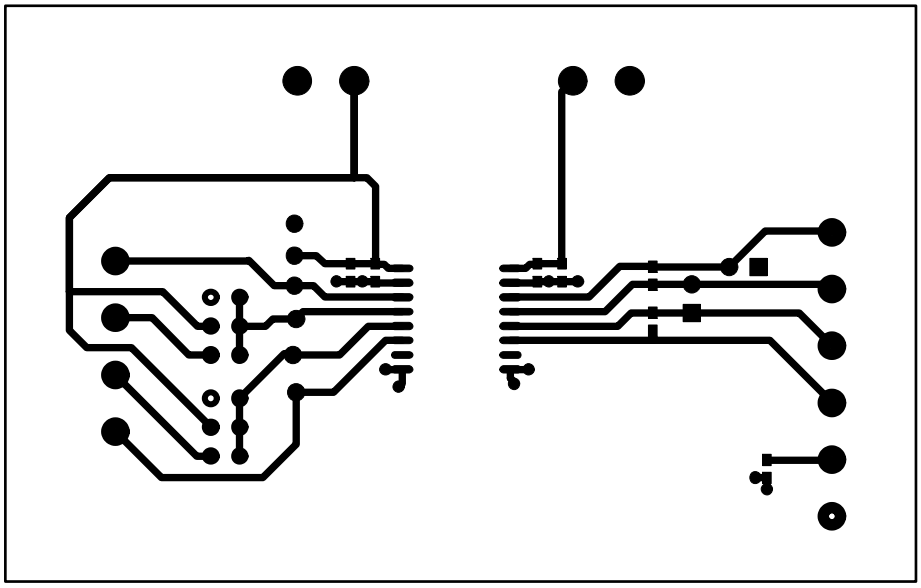


*Figure 4. EVAL-ADM2491EEBZ Components*

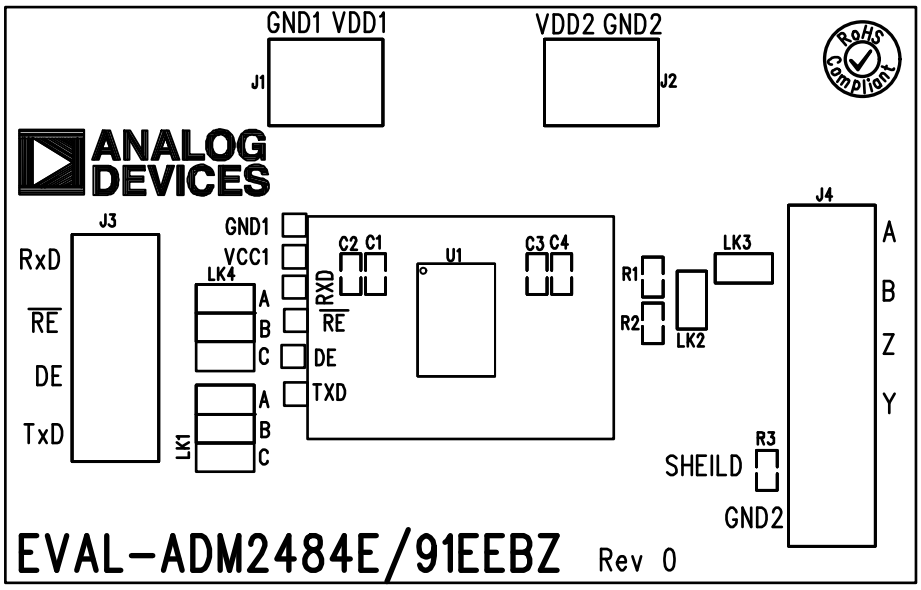


*Figure 5. EVAL-ADM2491EEBZ Silkscreen*

# ORDERING INFORMATION

## BILL OF MATERIALS

**Table 2.**

| Quantity | Reference Designator | Description | Supplier/Part Number |
|---|---|---|---|
| 2 | R1, R2 | Resistor, 120 Ω, 0603 | Tyco Electronics Connectivity/Neohm/CPF0603B120RE1 |
| 1 | R3 | Resistor, 100 Ω, 0603 | Tyco Electronics Connectivity/Neohm/CPF0603B120RE1 |
| 2 | C1, C4 | Capacitor, Size 0603, 10 nF | AVX Corporation/06031C103K4Z2A |
| 2 | C2, C3 | Capacitor, Size 0603, 100 nF | AVX Corporation/06033G104ZAT2A |
| 2 | J1, J2 | CON\POWER, 2-pin terminal block (5 mm pitch) | Lumberg/KRM 02 |
| 1 | J4 | CON\POWER, terminal block, PCB, 3-way | Lumberg/KRM 03 |
| 1 | J3 | CON\POWER4, 4-pin terminal block | Lumberg/KRM 04 |
| 2 | LK1, LK2 | Board-to-board connector header, 4-way, 2-row and Jumper ×2 | SPC Technology/SPC20499, Harwin/M7566-05 |
| 2 | LK3, LK4 | Board-to-board connector header, 2-way, 1-row and Jumper × 2 | Molex/22-28-4020, Harwin/M7566-05 |
| 1 | U1 | 16-lead wide body SOIC | Analog Devices/ADM2491EBRWZ |
| 1 | GND1 | Test point, black | Vero Technologies/20-2137 |
| 1 | VCC1 | Test point, red | Vero Technologies/20-313137 |
| 4 | RXD, DE, $\overline{RE}$, TXD | Test point, yellow | Vero Technologies/20-313140 |

## RELATED LINKS

| Resource | Description |
|---|---|
| ADM2491E | 5 kV Signal Isolated, High Speed (16 Mbps), ESD Protected, Full/Half Duplex RS-485 Transceiver |
| AN-960 | 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.



**UG10028-0-2/13(A)**

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