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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

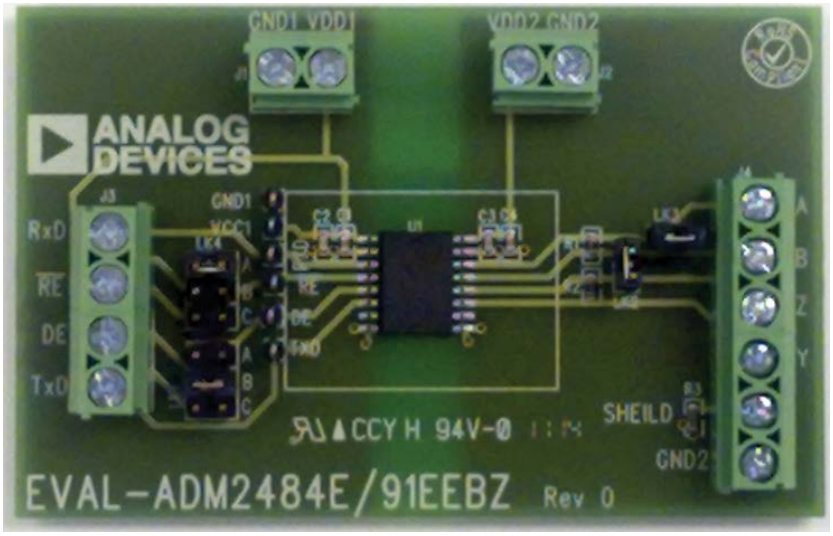


Figure 1.

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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

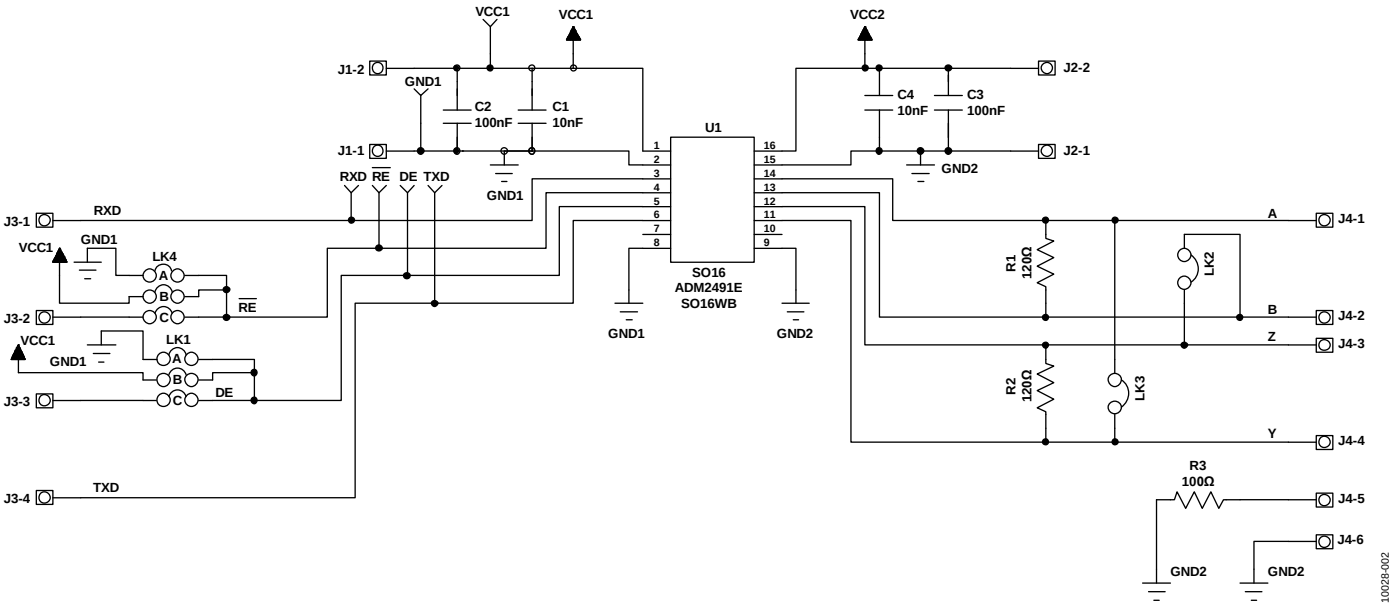


Figure 2. EVAL-ADM2491EEBZ Schematic

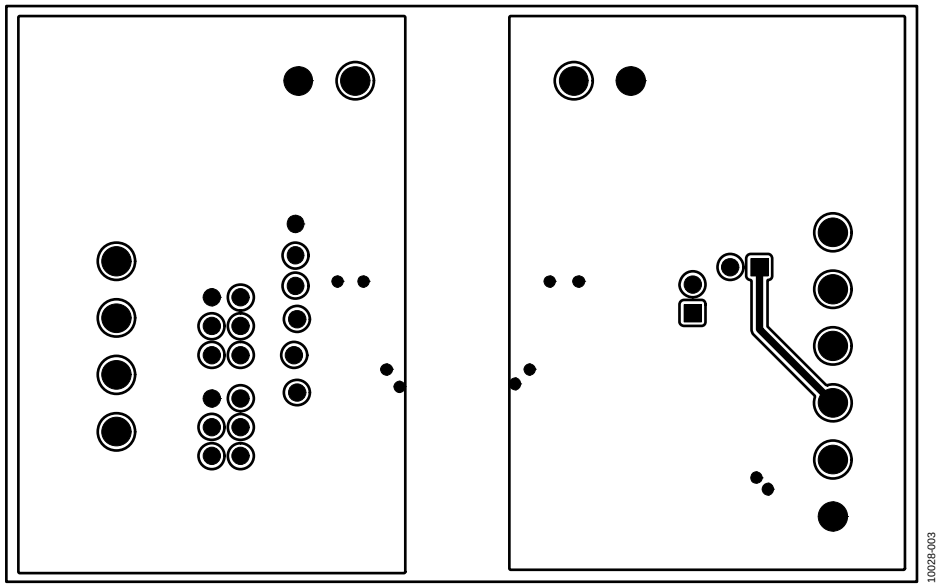


Figure 3. EVAL-ADM2491EEBZ Solder Side

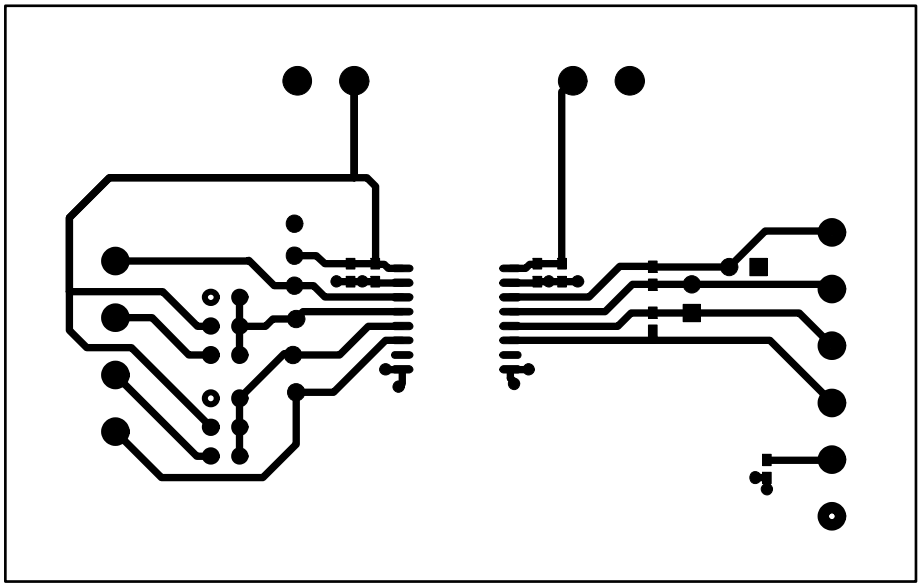


Figure 4. EVAL-ADM2491EEBZ Components

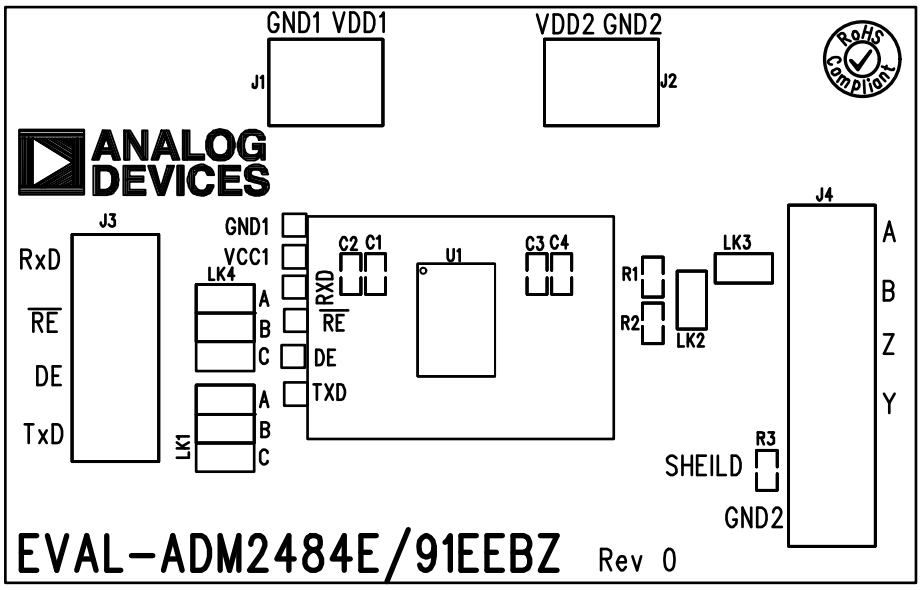


Figure 5. EVAL-ADM2491EEBZ Silkscreen

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.

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