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Evaluation Board for the ADM2481 2.5 kV Signal Isolated, 500 kbps, Half-Duplex RS-485 Transceiver

FEATURES

Half-duplex, isolated RS-485 transceiver
Suitable for 5 V or 3.3 V operation on V_{DD1}
Suitable for 5V operation on V_{DD2}
500 kbps data rate
256 nodes on bus

ADM2484E APPLICATIONS

Low power RS-485/RS-422 networks
Isolated interfaces
Building control networks
Multipoint data transmission systems

EVALUATION KIT CONTENTS

EVAL–ADM2481EBZ

GENERAL DESCRIPTION

The EVAL-ADM2481EBZ allows the isolated ADM2481 RS-485 transceivers 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 ADM2481 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.

The ADM2481 is slew-limited to reduce reflections with improperly terminated transmission lines. The controlled slew rate limits the data rate to 500 kbps. The input impedance of the device is 96 kΩ, allowing up to 256 transceivers on the bus. Its driver has an active high enable feature. The driver differential outputs and receiver differential inputs are connected internally to form a differential I/O port. When the driver is disabled or when VDD1 or VDD2 = 0 V, this imposes minimal loading on the bus. An active-high receiver disable feature, which causes the receiver output to enter a high impedance state, is provided as well.

EVALUATION BOARD DIGITAL PHOTOGRAPH

Figure 1. ADM2481 Evaluation Board

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REVISION HISTORY

10/11—Revision 0: Initial Version

EVALUATION BOARD CONFIGURATIONS

SETTING UP THE EVALUATION BOARD

The EVAL-ADM2481EBZ allows the isolated ADM2481 RS-485 transceivers 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, R1, 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 R1 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 10 nF decoupling capacitor, C1, and a 100 nF decoupling capacitor, C2, 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.

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

Table 1. Board Configurations and Jumper Settings

Configuration	Jumpers Fitted	Jumpers Open
$\overline{RE}$ High	LK2 (Position A)	LK3, LK2 (Position B and C)
$\overline{RE}$ Low	LK2 (Position B)	LK3, LK2 (Position A and C)
Using the Screw Terminal for $\overline{RE}$	LK2 (Position C)	LK3, LK2 (Position A and B)
DE High	LK1 (Position A)	LK3, LK1 (Position B and C)
DE Low	LK1 (Position B)	LK3, LK1 (Position A and C)
Using the Screw Terminal for DE	LK1 (Position C)	LK3, LK1 (Position A and B)
Tie $\overline{RE}$ to DE, Only One Other Jumper Can Be Used	LK3 and LK1/LK2	

EVALUATION BOARD SCHEMATIC AND ARTWORK

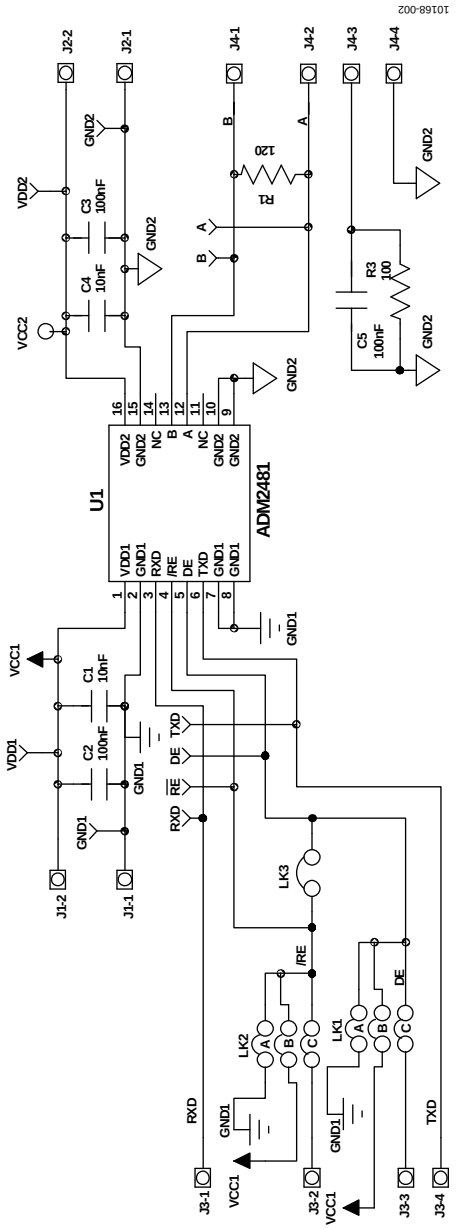

Figure 2. EVAL-ADM2481EBZ Schematic

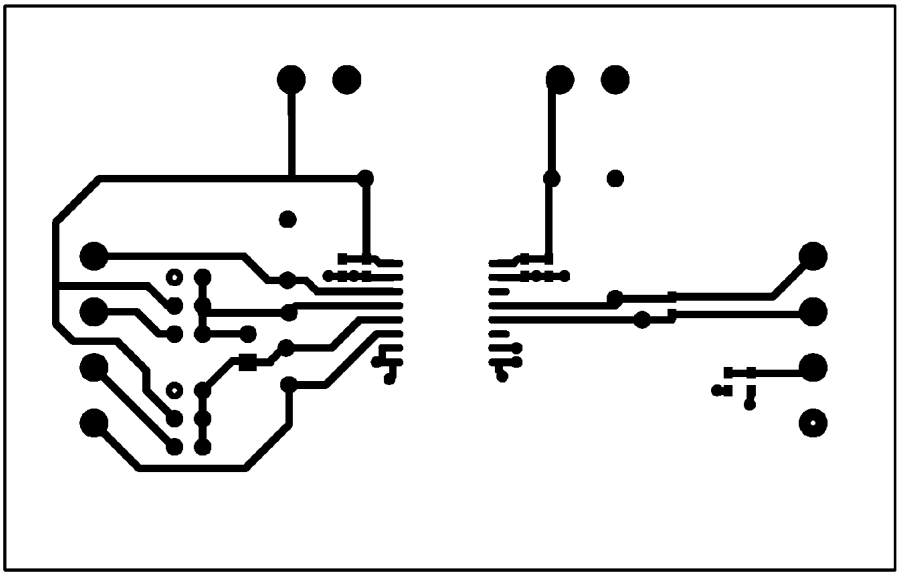

Figure 3. EVAL-ADM2481EBZ Silkscreen

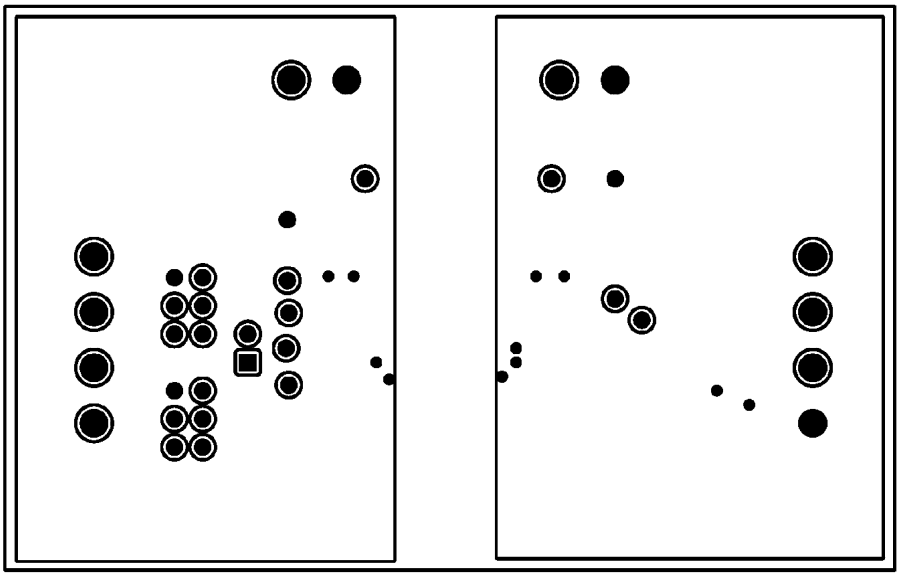

Figure 4. EVAL-ADM2481EBZ Solder Side

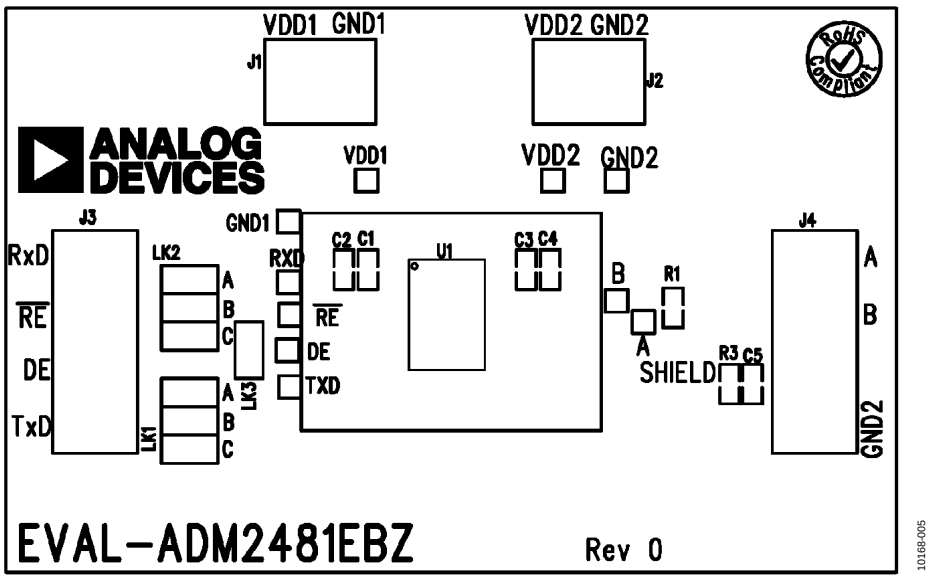

Figure 5. EVAL-ADM2481EBZ

ORDERING INFORMATION

BILL OF MATERIALS

Table 2.

Quantity	Reference Designator	Description	Supplier/Part Number
1	R1	Resistor, 120 Ω, 0603	VISHAY DALE/CRCW0603100RJNEA
1	R3	Resistor, 100 Ω, 0603	VISHAY DALE/CRCW0603100RJNEA
2	C1, C4	Capacitor, Size 0603, 10 nF	AVX Corp./06031C103K4Z2A
2	C2, C3, C5	Capacitor, Size 0603, 100 nF	AVX Corp./06033G104ZAT2A
2	J1, J2	CON\POWER, 2-pin terminal block (5 mm pitch)	Lumberg/KRM 02
2	J3, J4	CON\POWER4, 4-pin terminal block	Lumberg/KRM 04
2	LK1, LK2	Board-to-board connector header, 3-way, 2-row and Jumper ×2	SPC Technology/SPC20499 HARWIN/M7566-05
1	U3	16-lead SOIC, wide body	Analog Devices/ADM2481BRWZ
2	GND1, GND2	Test point, black	Vero Technologies/20-2137
2	VDD1, VDD2	Test point, red	Vero Technologies/20-313137
2	A, B	Test point, green	Vero Technologies/20-313138
4	RXD, DE, $\overline{RE}$, TXD	Test point, yellow	Vero Technologies/20-313140

RELATED LINKS

Resource	Description
ADM2481	2.5 kV Signal Isolated, 500 kbps, Half Duplex RS-485 Transceiver

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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