

## 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<sub>DD1</sub>**  
**Suitable for 5V operation on V<sub>DD2</sub>**  
**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., iCoupler® 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 V<sub>DD1</sub> or V<sub>DD2</sub> = 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  $\Omega$  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                |
|---------------------------------------------------------------------|------------------|-----------------------------|
| $\overline{\text{RE}}$ High                                         | LK2 (Position A) | LK3, LK2 (Position B and C) |
| $\overline{\text{RE}}$ Low                                          | LK2 (Position B) | LK3, LK2 (Position A and C) |
| Using the Screw Terminal for $\overline{\text{RE}}$                 | 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 $\overline{\text{RE}}$ to DE, Only One Other Jumper Can Be Used | LK3 and LK1/LK2  |                             |

## EVALUATION BOARD SCHEMATIC AND ARTWORK

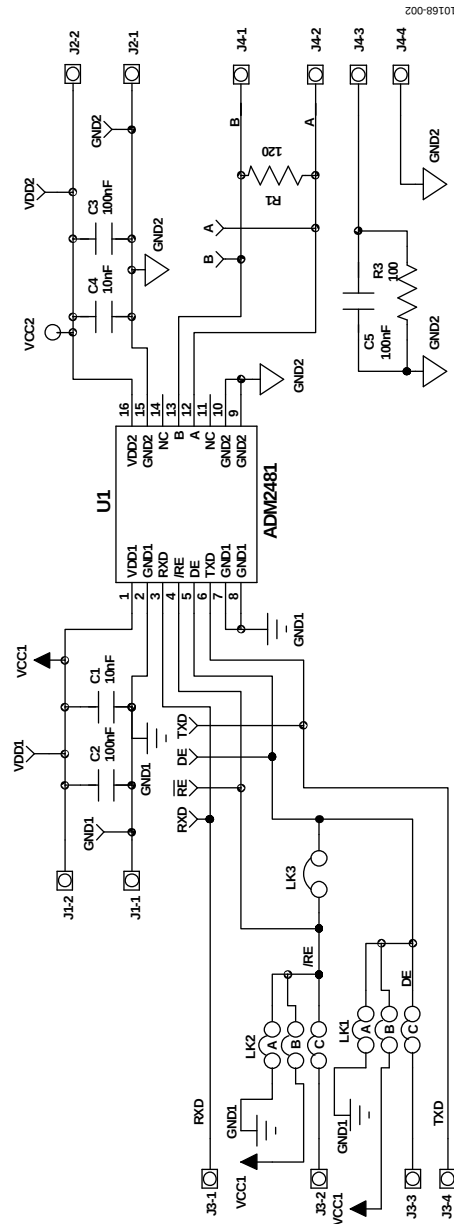
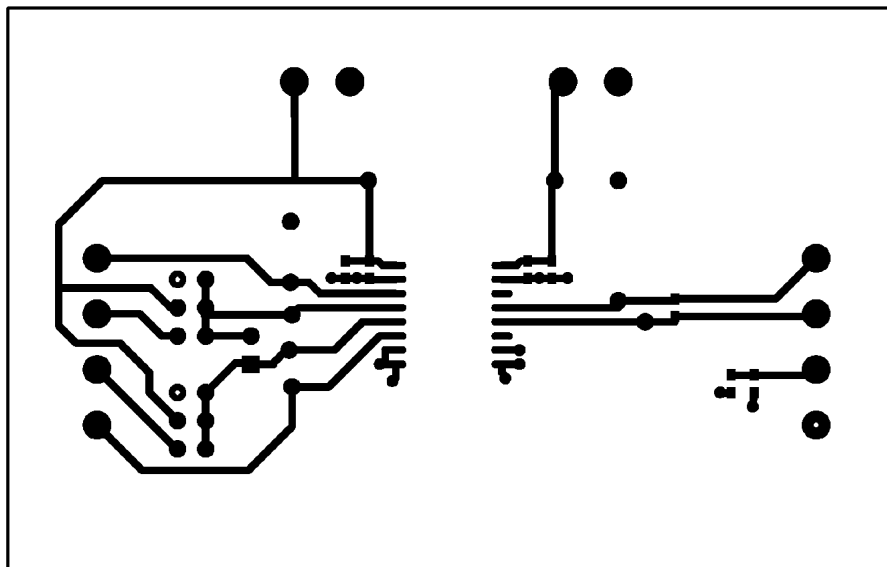
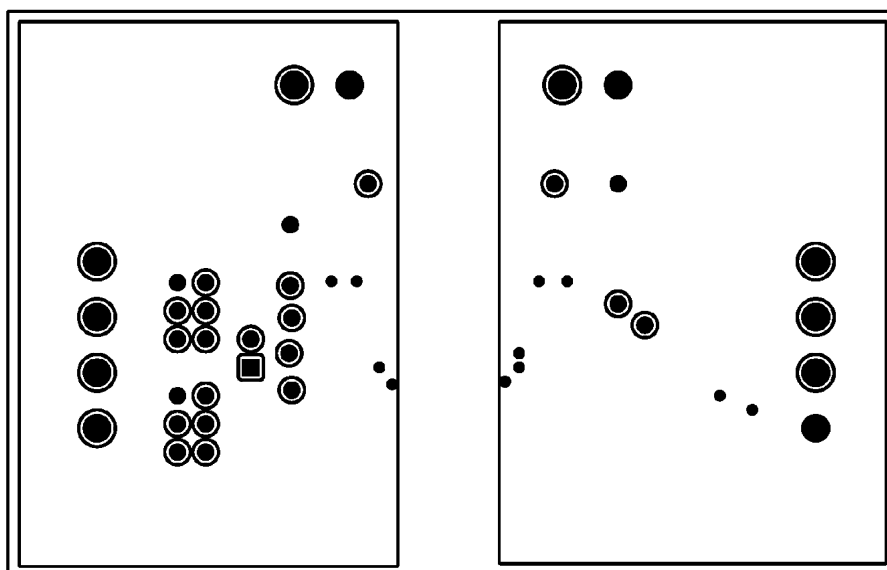


Figure 2. EVAL-ADM2481EBZ Schematic



1016B-003

Figure 3. EVAL-ADM2481EBZ Silkscreen



1016B-004

Figure 4. EVAL-ADM2481EBZ Solder Side

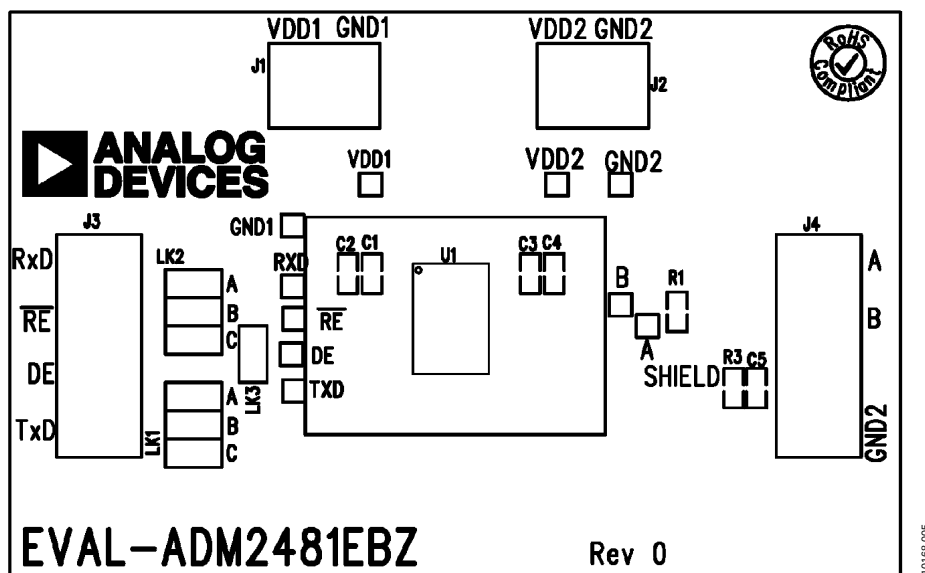


Figure 5. EVAL-ADM2481EBZ

## ORDERING INFORMATION

### BILL OF MATERIALS

Table 2.

| Quantity | Reference Designator                  | Description                                                 | Supplier/Part Number                        |
|----------|---------------------------------------|-------------------------------------------------------------|---------------------------------------------|
| 1        | R1                                    | Resistor, 120 $\Omega$ , 0603                               | VISHAY DALE/CRCW0603100RJNEA                |
| 1        | R3                                    | Resistor, 100 $\Omega$ , 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 x2 | SPC Technology/SPC20499<br>HARWIN/M7566-05  |
| 1        | U3                                    | 16-lead SOIC, wide body                                     | Analog Devices/ <a href="#">ADM2481BRWZ</a> |
| 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, $\overline{\text{RE}}$ , TXD | Test point, yellow                                          | Vero Technologies/20-313140                 |

### RELATED LINKS

| Resource                | Description                                                      |
|-------------------------|------------------------------------------------------------------|
| <a href="#">ADM2481</a> | 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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