

## Evaluation Board for the ADM3051 CAN Transceiver

### FEATURES

- Easy evaluation of the [ADM3051](#) controller area network (CAN) transceiver
- Convenient connections for power and logic signals through screw terminal blocks
- Screw terminal block for bus cable signals and shield
- Test points for measuring all signals
- Configure operating mode using jumper connection
  - High speed
  - Slope control
  - Standby
- Slope control resistor of 47 k $\Omega$  fitted by default
- Termination resistors (2  $\times$  30  $\Omega$ ) with common-mode filter

### EVALUATION KIT CONTENTS

EVAL-ADM3051EBZ

### GENERAL DESCRIPTION

The EVAL-ADM3051EBZ allows quick and easy evaluation of the [ADM3051](#) CAN transceiver. The evaluation board allows all of the input and output functions to be exercised without the need for external components. Screw terminal blocks provide convenient connections for logic signals and power.

The main device on the evaluation board, the [ADM3051](#), is a controller area network (CAN) physical layer transceiver, allowing a protocol layer CAN controller to access the physical layer bus. The [ADM3051](#) complies with the ISO 11898 standard. It is capable of running at data rates of up to 1 Mbps.

For evaluation with a bus cable, a screw terminal block is provided to allow connection of CANH and CANL signals and connection of the cable shield.

### EVAL-ADM3051EBZ



Figure 1.

The operating mode of the [ADM3051](#) can be selected by jumper configuration. Three operating modes are available: high speed, slope control, and standby. Selecting standby mode connects Pin 8 (RS) of the [ADM3051](#) to V<sub>CC</sub>, placing the device in a low current standby mode. Selecting slope control mode limits EMI by connecting RS with a 47 k $\Omega$  resistor to ground to modify the rise and fall of slopes. This mode facilitates the use of unshielded cables. Alternatively, selecting high speed mode disables slope control by connecting RS to ground, allowing high speed operation. Shielded cables or other measures to control EMI are necessary in this mode.

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**REVISION HISTORY**

11/11—Revision 0: Initial Version

# EVALUATION BOARD CONFIGURATION

## SETTING UP THE EVALUATION BOARD

The EVAL-ADM3051EBZ allows the [ADM3051](#) CAN transceiver to be evaluated quickly and easily. The evaluation board allows all of the input and output functions to be exercised without the need for external components.

On the EVAL-ADM3051EBZ, the power is connected to VCC. A 22  $\mu$ F decoupling capacitor, C1, is fitted between VCC and GND at the J1 board connector, and a 100 nF capacitor (C2 in Figure 4) is fitted at the [ADM3051](#) device. With the default 60  $\Omega$  load installed, the typical supply current ( $I_{CC}$ ) is as follows:

- Recessive state: 5 mA
- Clock at 1 Mbps: 40 mA
- Clock at 250 kbps (slope control mode): 34 mA

In standby, with the bus in a recessive state, typical  $I_{CC}$  is <1 mA.

## OPERATING MODES

The LK3 jumper can be used to select the operating mode of the [ADM3051](#) device. One of three modes can be selected:

- Position A: standby mode
- Position B: high speed mode
- Position C: slope control mode

### Standby Mode

Selecting Position A on LK3 connects Pin 8 (RS) of the [ADM3051](#) to VCC, placing the device in standby mode. This is a low current mode where the driver is disabled. The receiver is slower in standby mode.

### High Speed Mode

Selecting Position B on LK3 connects Pin 8 (RS) of the [ADM3051](#) to GND, placing the device in high speed mode. This allows operation at the maximum data rate (1 Mbps). Due to fast transitions on the rising and falling edge of the output signal, a shielded cable is generally required to control EMI.

### Slope Control Mode

Selecting Position C on LK3 connects Pin 8 (RS) of the [ADM3051](#) to Resistor RS1 (default 47 k $\Omega$  installed). This places the device in slope control mode, where the edges of the output signal are controlled to reduce EMI. The maximum data rate possible is reduced in this mode.

## EVALUATION

An example operation of the EVAL-ADM3051EBZ is shown in Figure 2. Ensure that LK3 is in Position B (high speed mode). Connect a clock generator on TxD and set up a 500 kHz square wave clock with output swing between 0 V and 5 V. Connect the scope probes to the CANH and CANL test points. A plot of the oscilloscope for TxD, RxD, CANH, and CANL is shown in Figure 3. Channel 1 shows the TxD signal, Channel 4 shows the RxD signal, and Channel 2 and Channel 3 show the CANH and CANL signals, respectively.

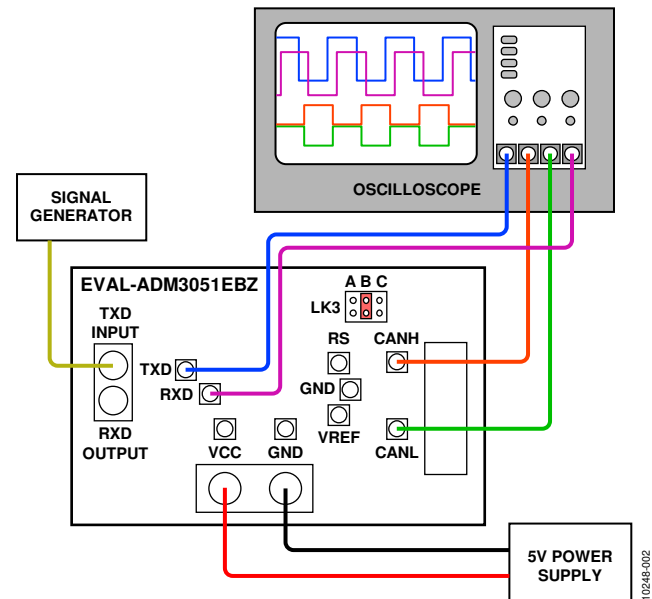


Figure 2. Basic ADM3051 CAN Transceiver Evaluation Board Operation

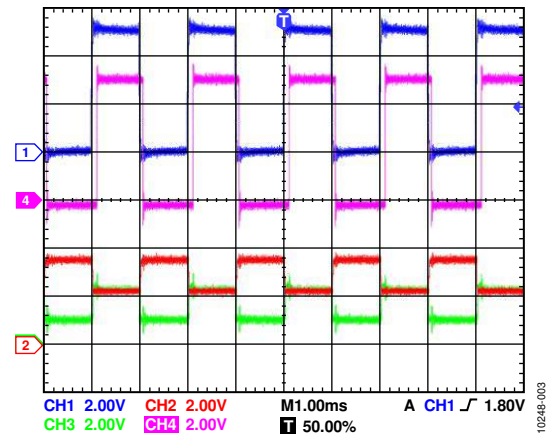


Figure 3. TxD, RxD, CANH, and CANL Signals (High Speed Mode)

EVALUATION BOARD SCHEMATIC AND LAYOUT

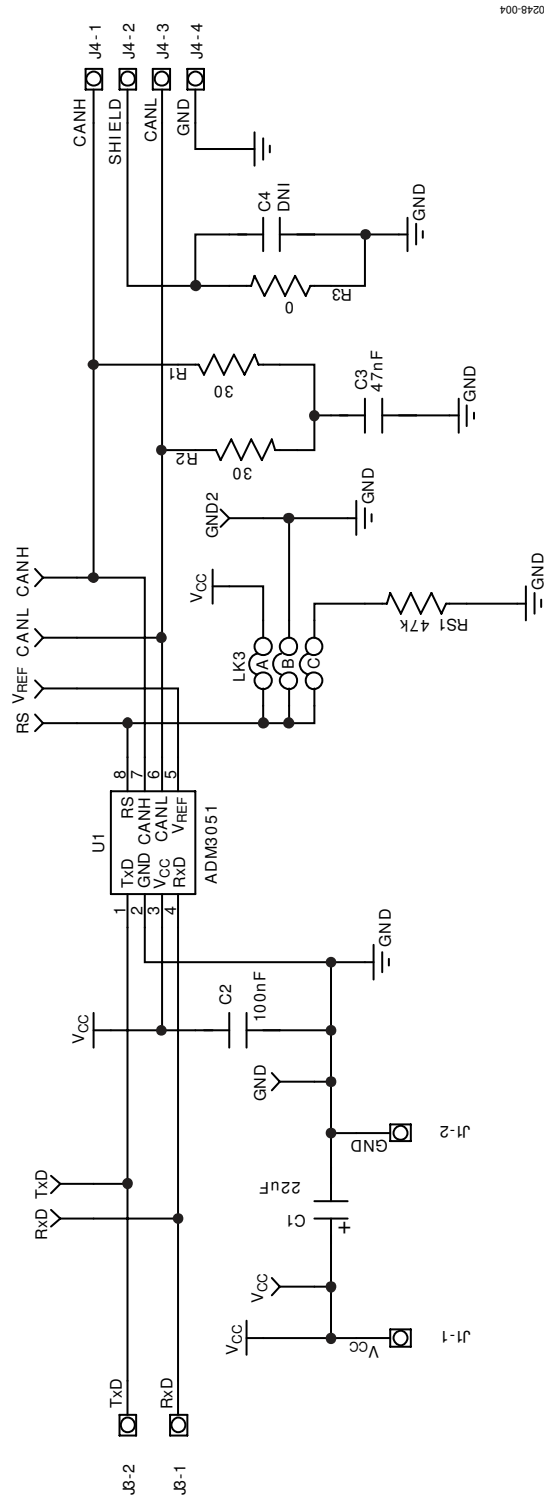


Figure 4. EVAL-ADM3051EBZ Schematic

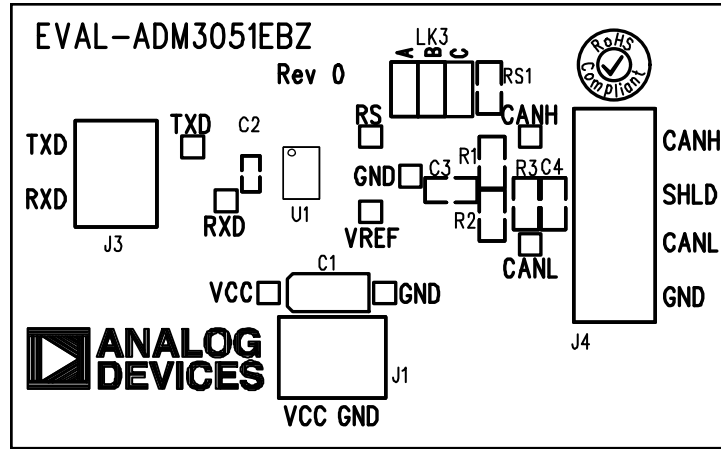


Figure 5. EVAL-ADM3051EBZ Silkscreen

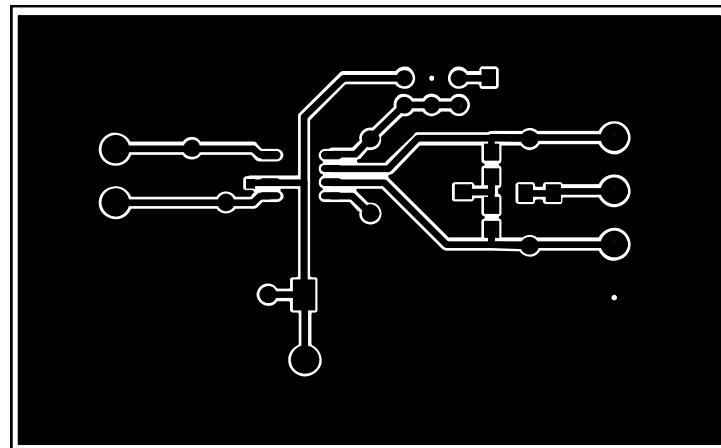


Figure 6. EVAL-ADM3051EBZ Component Side

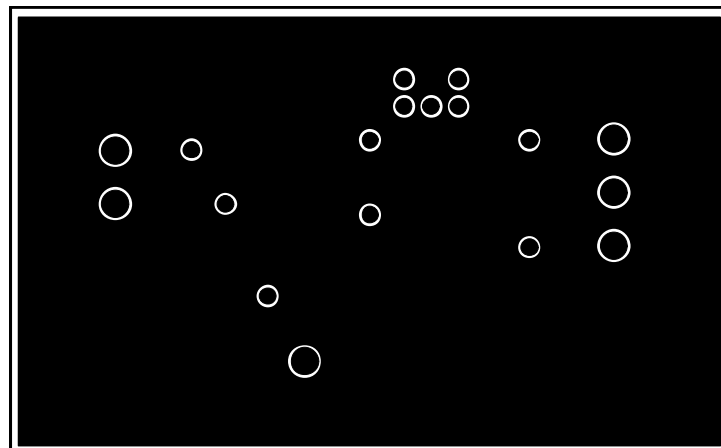


Figure 7. EVAL-ADM3051EBZ Solder Side

**ORDERING INFORMATION****BILL OF MATERIALS**

Table 1.

Quantity	Reference Designator	Description	Supplier/Part Number
1	C1	Tantalum capacitor, 22 $\mu$ F, TAJ_C	AVX Corporation/TAJC226K016RNJ
1	C2	Capacitor, 100 nF, 0603	AVX Corporation/06033C104JAT2A
1	C3	Capacitor, 47 nF, 0805	Multicomp/MCCA000270
1	C4	DNI	N/A
1	CANH, TXD, VREF	Test point	Vero Technologies/20-313140
3	CANL, RS, RXD	Test point	Vero Technologies/20-313138
2	GND	Test point	Vero Technologies/20-2137
1	J1, J3	Connector\POWER	Camden Electronics/CTB5000/2
1	J4	Connector\POWER4	Camden Electronics/CTB5000/4
1	R1, R2	Resistor, 30 $\Omega$ , 0805	Multicomp/MCPWR05FTFW0300
1	R3	Resistor, 0 $\Omega$ , 0805	Vishay Draloric/CRCW08050000Z0EA
2	RS1	Resistor, 47 k $\Omega$ , 0805	Multicomp/MC 0.1W 0805 5% 47K
1	U1	8-lead SOIC	Analog Devices/ADM3051CRZ

**RELATED LINKS**

Resource	Description
<a href="#">ADM3051</a>	Product Page, High Speed Industrial CAN Transceiver with Bus Protection for 24 V Systems

**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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