

High Voltage Protection 8-Channel T/R Switch Demoboard

General Description

The Supertex MD0100DB1 demo board contains four MD0100DK6-G dual packages providing 8 T/R switches in the system. There are no other external components on the board.

This demo board replaces 8 discrete diode bridge protection circuits. The input of the MD0100DB1 is called T_x which is connected to the output of the transmitter, and the output is called R_x which is connected to the input of the receiver. The T_x and R_x are interchangeable.

The MD0100DB is especially laid out so that all the inputs are on one side and all the outputs are on other side of the board. It provides for easy replacement on the system for testing.

This demo board can be put into the system directly by removing the diode bridge connections between the transmitter and receiver (please see Figure 1), and it can then be connected up to 8 pairs of transmitters/receivers as shown in the connection diagram in Figure 2.

Specifications

Parameter	Value
V_{A-B} , differential voltage drop	0V to $\pm 100V$
I_{PEAK}	$\pm 60mA$
T_{ON}	$\leq 20ns$
T_{OFF}	$\leq 20ns$

Board Layout

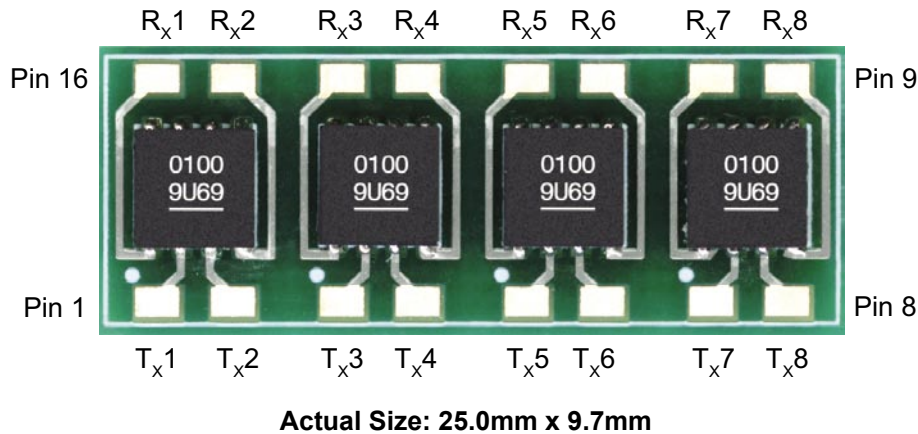


Figure 1: Conventional discrete T/R switch with Diode Bridge

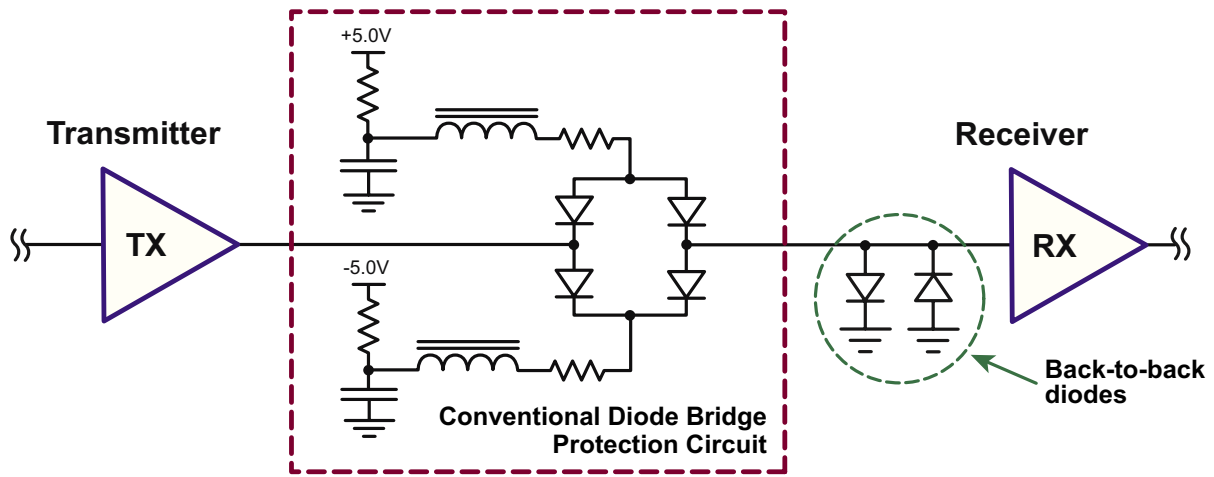
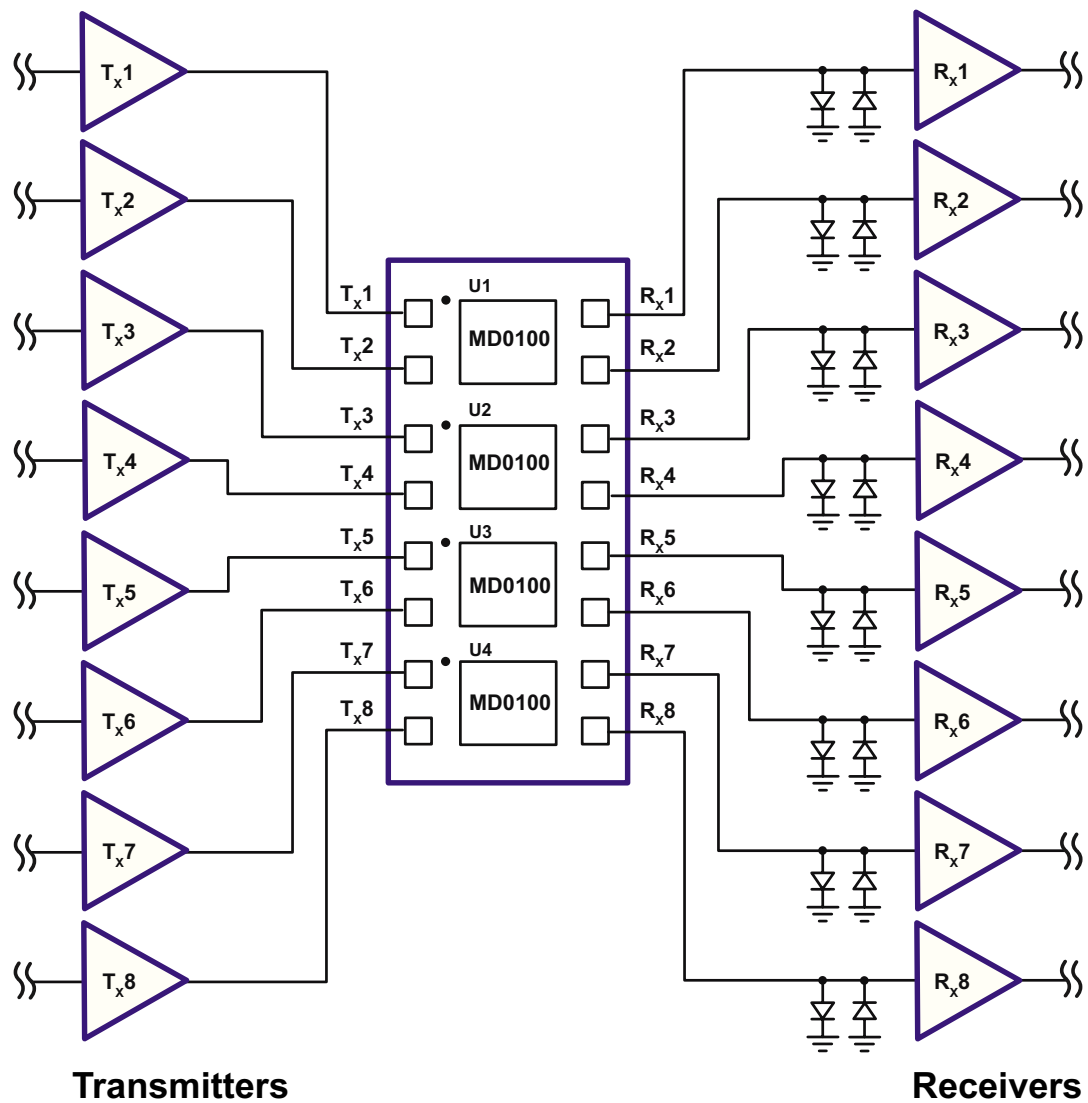


Figure 2: MD0100DB1 Connection Diagram



Operation

The MD0100 can be considered a normally closed switch controlled by a switch control. The switch control monitors the voltage drop across terminals T_x and R_x . If the voltage difference is greater than $\pm 2.0V$, the T/R switch will start to open. Once in the open state, there is a small amount of current flowing through the T/R switch, $200\mu A$, to detect if the high voltage is still present or not. The T/R switch will not close until the voltage across terminal T_x and R_x drops back within $\pm 2.0V$.

It is important to make sure that the back-to-back diodes are connected from the output of this demoboard to ground (please refer to Figure 1). This is to allow the initial peak current to flow through the switch so it can drop $\pm 2.0V$ and operate correctly. If the diodes are absent, there will be no path current and if the voltage drop across the two terminals is less than $\pm 2.0V$, then the switch will remain in the closed position.

Pin Description

Pin #	Pin Name	Function
1	T_x1	Input of the switch #1, connects to the output of the transmitter.
2	T_x2	Input of the switch #2, connects to the output of the transmitter.
3	T_x3	Input of the switch #3, connects to the output of the transmitter.
4	T_x4	Input of the switch #4, connects to the output of the transmitter.
5	T_x5	Input of the switch #5, connects to the output of the transmitter.
6	T_x6	Input of the switch #6, connects to the output of the transmitter.
7	T_x7	Input of the switch #7, connects to the output of the transmitter.
8	T_x8	Input of the switch #8, connects to the output of the transmitter.
9	R_x8	Output of the switch #8, connects to the input of the receiver.
10	R_x7	Output of the switch #7, connects to the input of the receiver.
11	R_x6	Output of the switch #6, connects to the input of the receiver.
12	R_x5	Output of the switch #5, connects to the input of the receiver.
13	R_x4	Output of the switch #4, connects to the input of the receiver.
14	R_x3	Output of the switch #3, connects to the input of the receiver.
15	R_x2	Output of the switch #2, connects to the input of the receiver.
16	R_x1	Output of the switch #1, connects to the input of the receiver.

Bill Of Materials

Part	Description	Value	Package	Manufacturer	Part Number
U1 - U4	T/R switch	$\pm 100V$	4x4 8-Lead DFN	Supertex	MD0100DK6-G

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