

## Isolated Switch Driver BM79330FV-LB, BM79331FV-LB Evaluation Board

# BM79330FV-EVK-001, BM79331FV-EVK-001

## User's Guide

BM7933x FV-EVK-001 (BM79330FV-EVK-001, BM79331FV-EVK-001) is an evaluation board for the Rohm Isolated switch driver BM7933x FV-LB. BM7933x FV-LB integrates an isolation element and can control 4-channels of MOS switches. This user's guide explains how to drive the MOS switch of the BM7933x FV-EVK-001.

### Equipment

- BM7933x FV-EVK-001                      1 Unit
- Regulated Power Supply                2 Units
- Signal sources                              4 Signals
- Register                                      4 pcs

### Connection Method and Measurement Procedure

1. Isolated Switch Driver supports both sink-type and source-type output configurations.

For sink-type configurations, connect the external wiring as shown in Figure 1.

For source-type configurations, connect the external wiring as shown in Figure 2.

Observe the following three points when making connections.

- ① The sink or source type must be used in the same configuration for all channels.
- ② Ensure the VIO voltage does not exceed 30 V.
- ③ Select the load resistor (RL) with an adequate power rating according to the current.

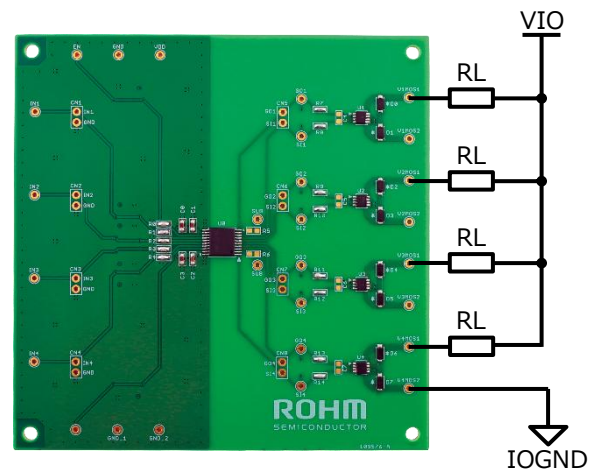


Figure 1. sink-type configuration

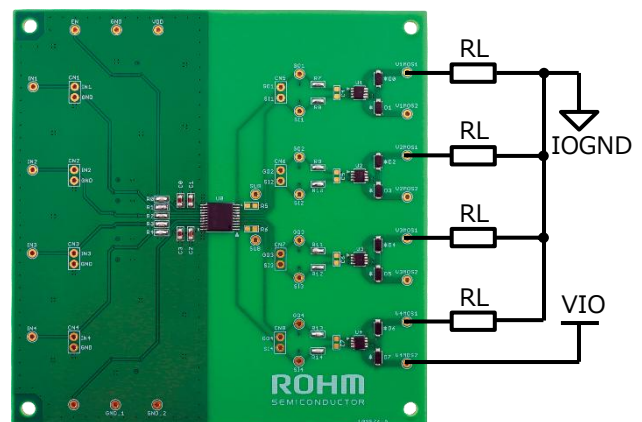


Figure 2. source-type configuration

- Connect the output terminals of the regulated power supply between the VDD and GND terminals and between the VIO and IOGND terminals on the evaluation board, and then apply power (Figure 3).  
(VDD-GND is 5.0V)

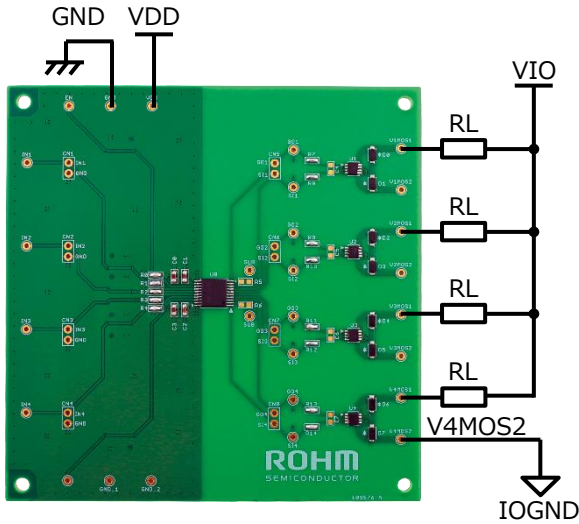


Figure 3. Power Connection

- Set the EN terminal to High or Open, and input digital signals to the IN1, IN2, IN3, and IN4 terminals (Figure 4). When the EN terminal is set to Low, Isolated Switch Driver enters power-down mode.

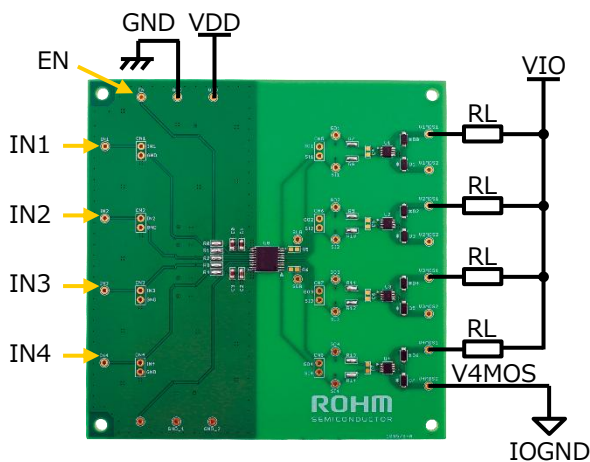


Figure 4. Input Signals

- Figure below shows the input/output waveform image when using BM79330FV-LB with VIO=5.0V, RL=510Ω, and a digital signal input to the IN terminal (Figure 5, Figure 6).

The output voltage of V1MOS1, V2MOS1, V3MOS1, V4MOS1 are determined based on the IOGND reference.

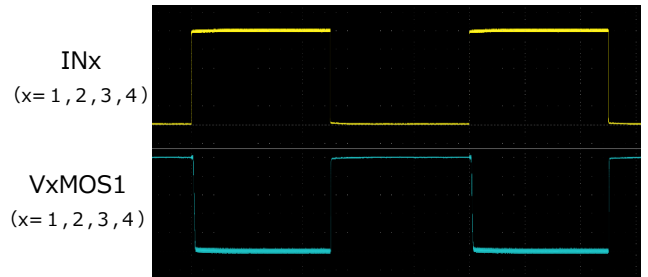


Figure 5. In/Out waveform image(sink-type)

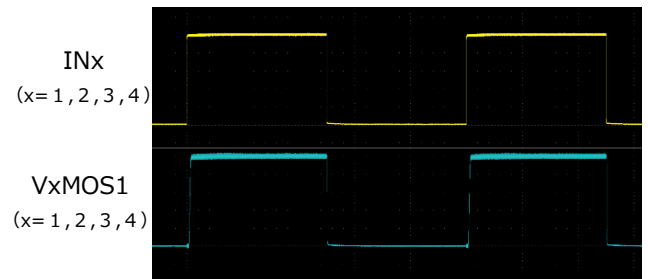


Figure 6. In/Out waveform image(source-type)

**Evaluation Board Information**

Power Supply Voltage Range (VDD-GND) : 4.5V ~ 5.5 V

Operating Temperature Range : -40 °C ~ +125 °C

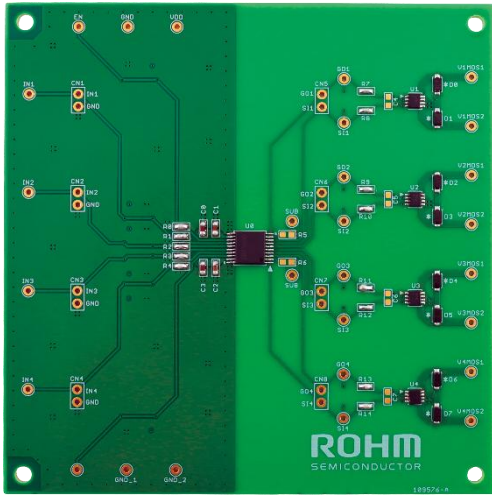


Figure 7. Board Photo (Top View)

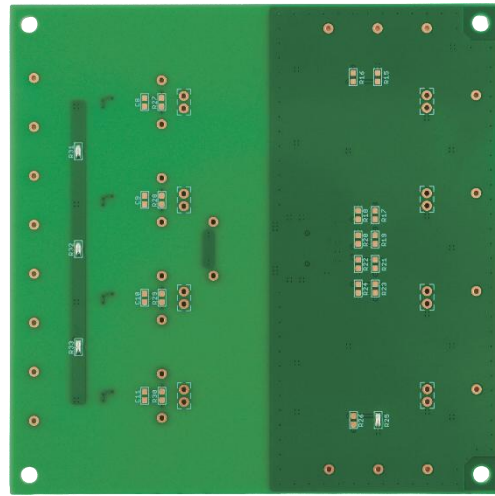


Figure 8. Board Photo (Bottom View)

Table 1. BOM list

Parts No.	Description	Value
U0	BM7933xFV-LB	-
U1, U2, U3, U4	QH8KC5TCR NchMOSFET	-
D0, D1, D2, D3, D4, D5, D6, D7	KDZLVTR51 Zener Diode	-
C1, C2	VDD Bypass Capacitor	0.1μF
C0, C3	VDD Bypass Capacitor	10μF
R0, R1, R2, R3, R4	EN, IN1-4 Input Lines	0Ω
R7, R8, R9, R10, R11, R12, R13, R14	NMOS Connect Lines	0Ω
R25	SGND Connect Lines	0Ω
R31, R32, R33	NchMOSFET Common Line	0Ω
Other		open

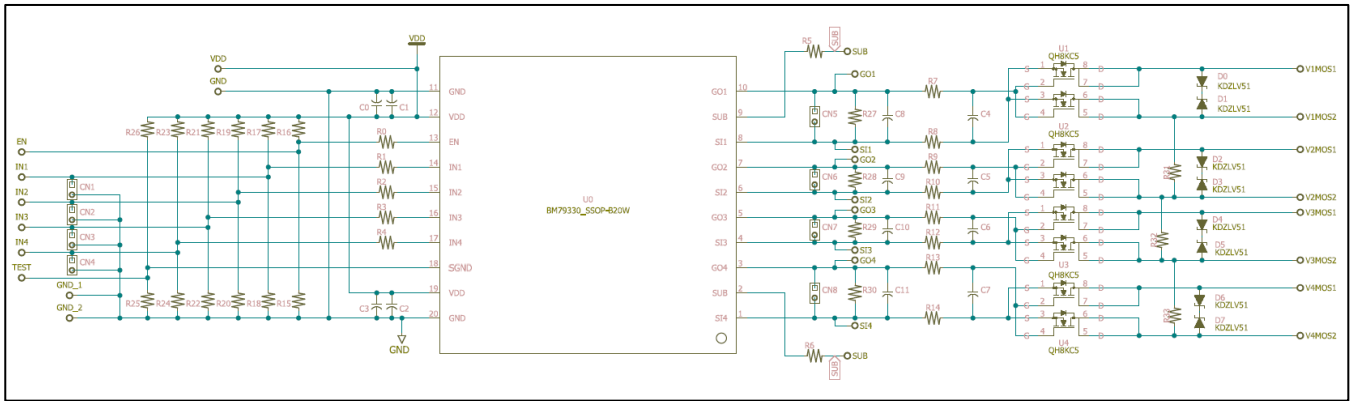


Figure 9. Circuit Diagram

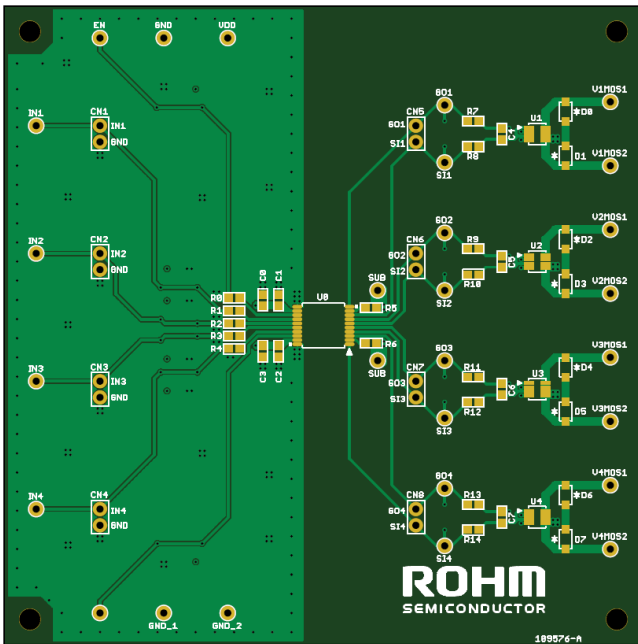


Figure 10. Board Layout (Top view)

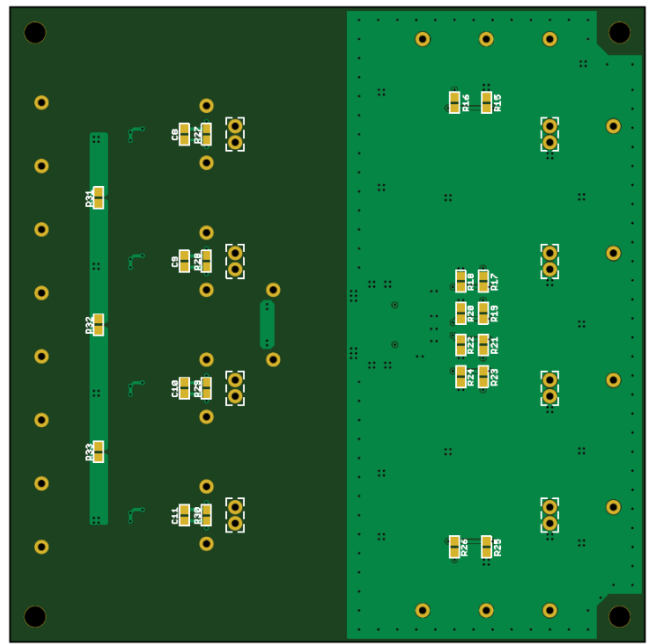


Figure 11. Board Layout (Bottom view)

Appendix

Application Example : Driving High-Voltage MOS switches.

Connecting the outputs allows the generation of a driving voltage matched to the high-voltage component.

It is capable of bidirectional switch control for high-voltage lines.

Ex 1 ) SJ-MOSFET Driving Circuit

Stacking the outputs in three stages, achieve a driving voltage of 13.5 V.

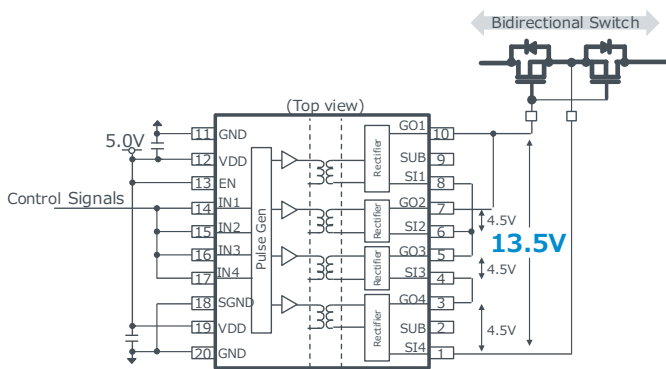


Figure 12. SJ-MOSFET Driving Circuit Configuration

Ex 2 ) SiC-MOSFET Driving Circuit

Stacking the outputs in four stages, achieve a driving voltage of 18 V.

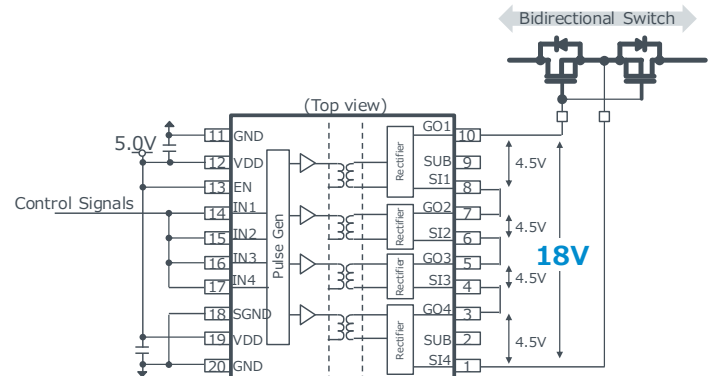


Figure 13. SiC-MOSFET Driving Circuit Configuration

Connect and use the evaluation board wiring according to Figure 14 and Figure 15. (R7, R8, R9, R10, R11, R12, R13, R14 are Open)

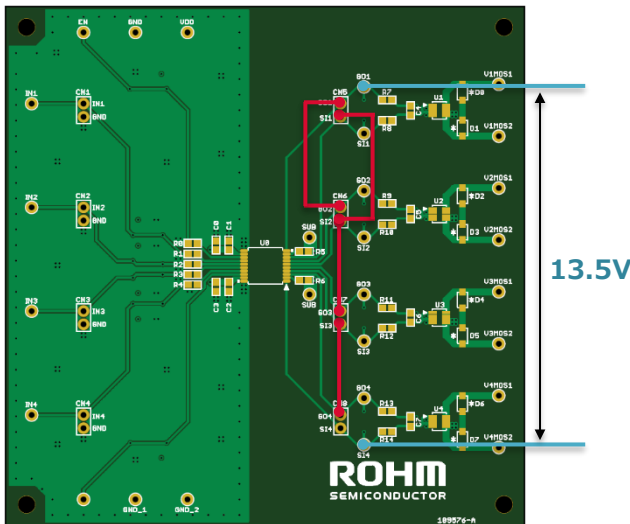


Figure 14. Three stage Stacking Connection Diagram

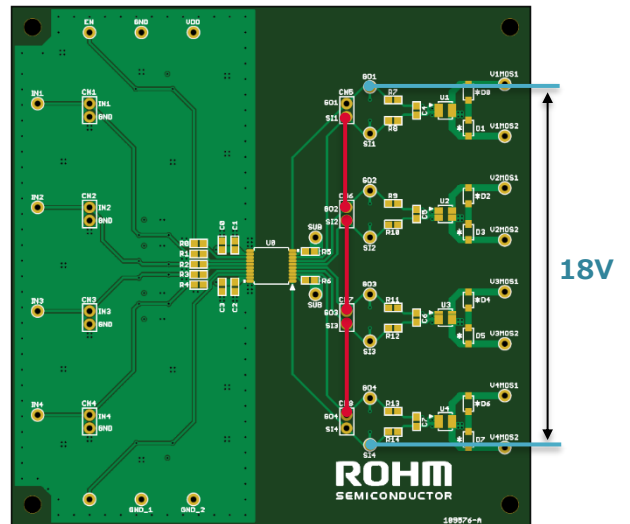


Figure 15. Four stage Stacking Connection Diagram

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