20V 1A (Peak 4A) 2ch DC Brush Motor Driver BD60210FV Evaluation board

BD60210FV-EVK-001 User's Guide

This user's guide describes the evaluation instructions using the evaluation board for BD60210FV DC brush motor driver, which features 20 V rating, 1 A (Peak 4A). This user's guide includes information on peripheral components and operating instructions.

General Description

BD60210FV is a motor driver IC with 2 H-bridge circuits that can drive DC Brush motors, and can drive "2 DC brush motors," "1 bipolar stepping motor," "4 solenoid loads," etc. Various protection circuits are also built in, contributing to high reliability of the set. This IC is a motor driver IC for refrigerators, air conditioners, photo printers, mini printers, etc. The evaluation board already includes BD60210FV, as well as capacitors, resistors, switches, pins, and sockets.

Key Specification of BD60210FV

- Input Voltage Range·····8 to 18V
- Rated Output Current (Continuous)·····1.0A
- Rated Output Current (Peak)·····4.0A
- Operating Temperature Range····· -25 to +85°C
- Output ON Resistance (High + Low)·····0.95Ω (Typ.)

Electrical Characteristics of BD60210FV

Parameter	Symbol	Range			Unit	Condition
		Min	Typ	Max		
Power Supply Voltage	V_{CC}	8	12	18	V	
Output Current (Continuous)	I_{OUT}			1.0	A	
Operating Temperature	Topr	-25	+25	+85	°C	
Circuit Current at Standby	I_{CCST}	-	0	1	μA	PS=L
Circuit Current	I_{CC}	-	2.5	5.0	mA	PS=H
High level input voltage	V_{INH}	2.0	-	-	V	
Low level input voltage	V_{INL}	-	-	0.8	V	
PWM Frequency	F_{PWM}	0	-	250	kHz	

No. 68UG040E Rev.001
2025.9

Table of Contents

1 Introduction

This user's guide describes how to set up and use the BD60210FV-EVK-001. This evaluation board is designed to drive 2 DC brush motors, 1 bipolar stepping motor, 4 solenoid loads, etc., using BD60210FV. For detailed specifications of this IC, please refer to the data sheet.

2 Hardware Description

2.1 BD60210FV-EVK-001 Circuit Diagram

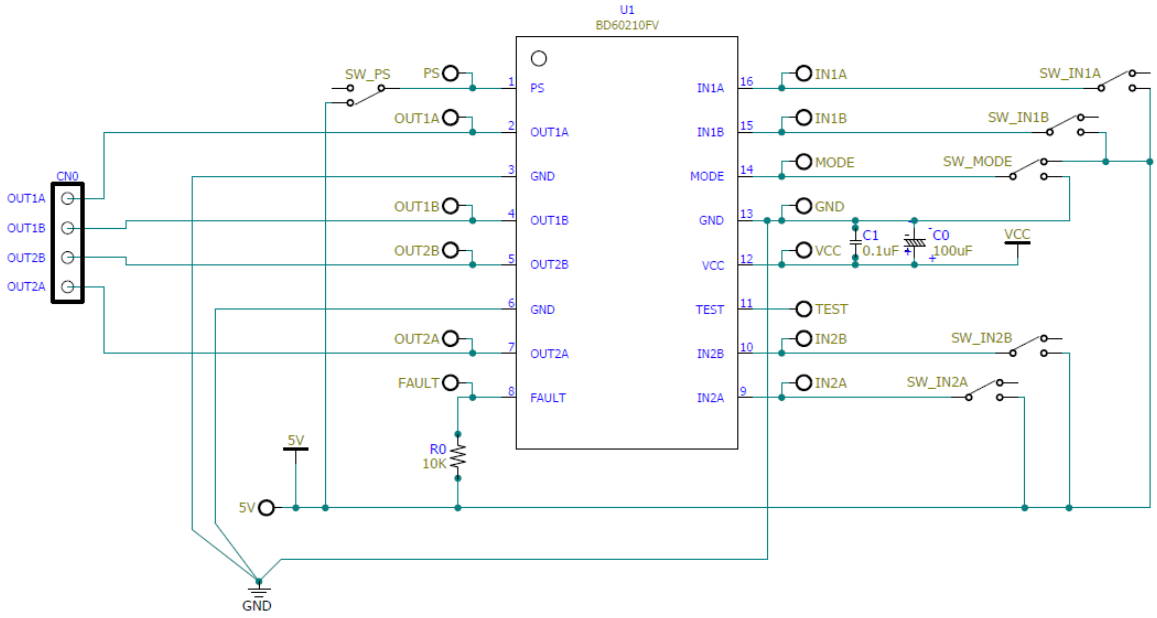

Figure 1. BD60210FV-EKV-001Circuit Diagram

2.2 Bill of Materials

Table 1. Bill of Materials for Evaluation board

Part Number	Component Values	Size (mm / inch)	Description	Quantity
U1	-	-	BD60210FV	1
C0	50V / 100μF	-	VCC Stabilization Electrolytic Capacitor	1
C1	50V / 0.1μF	3216 / 1206	VCC Stabilization Capacitor	1
CN0	-	-	Connector header for Motor Connection	1
R0	10kΩ	-	FAULT Pull-up Resistor	1
SW_PS	-	-	Logic Setting Switch (PS)	1
SW_IN1A	-	-	Logic Setting Switch (IN1A)	1
SW_IN1B	-	-	Logic Setting Switch (IN1B)	1
SW_IN2A	-	-	Logic Setting Switch (IN2A)	1
SW_IN2B	-	-	Logic Setting Switch (IN2B)	1
SW_MODE	-	-	Logic Setting Switch (MODE)	1
PS	-	-	Test Pin (PS)	1
OUT1A	-	-	Test Pin (OUT1A)	1
OUT1B	-	-	Test Pin (OUT1B)	1
OUT2B	-	-	Test Pin (OUT2B)	1
OUT2A	-	-	Test Pin (OUT2A)	1
FAULT	-	-	Test Pin (FAULT)	1
IN2A	-	-	Test Pin (IN2A)	1
IN2B	-	-	Test Pin (IN2B)	1
TEST	-	-	Test Pin (TEST)	1
VCC	-	-	Test Pin (VCC)	1
MODE	-	-	Test Pin (MODE)	1
IN1B	-	-	Test Pin (IN1B)	1
IN1A	-	-	Test Pin (IN1A)	1
5V	-	-	Test Pin (5V)	1

2.3 PCB Layout

Table 2. PCB Specifications

Board size：	50mm×50mm×1.6mm (4 layers)
Material：	FR-4
Copper foil thickness：	35μm

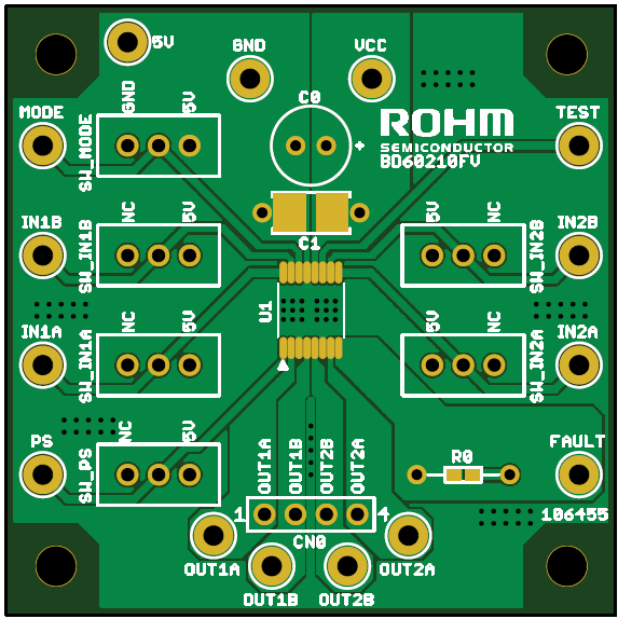

Figure 2. PCB layout (Top view)

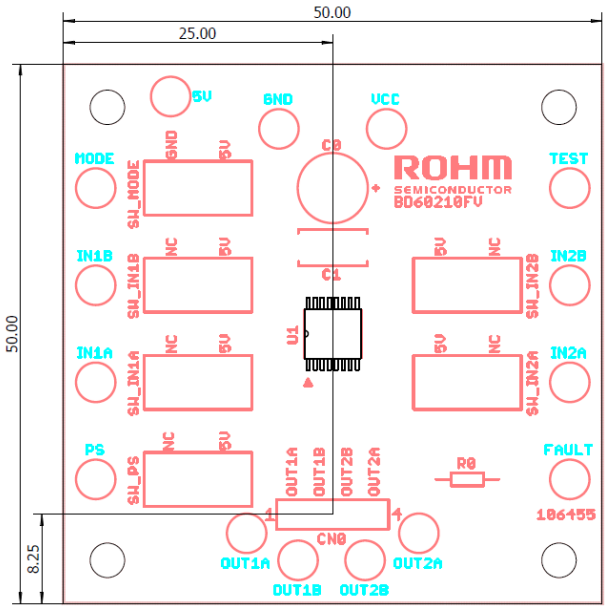

Figure 3. Silkscreen (Top view)

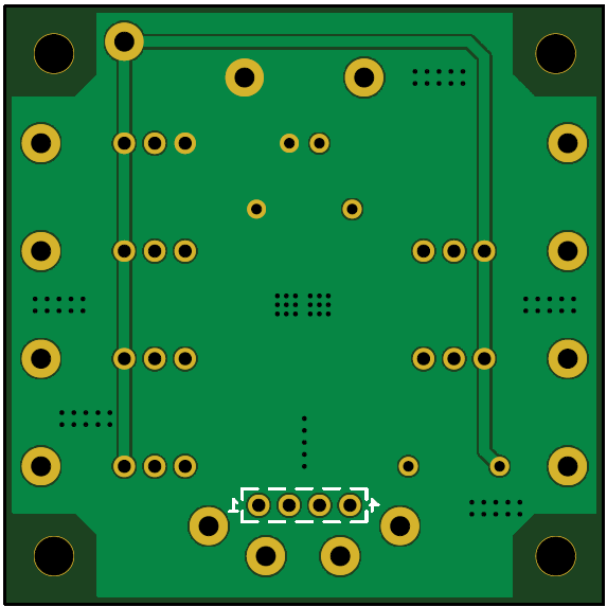

Figure 4. PCB layout (Bottom view)

3 Setup Instructions

3.1 Required Equipment

Table 3. Required equipment list

Equipment	Details	Note
Power Supply for VCC Pin	DC stabilized power supply capable of 8 to 18 V output	A power supply with a maximum output current capacity of at least 2.0A, which is the motor 2ch drive current.
Power Supply for 5 V Pin	DC stabilized power supply capable of 5V output	For supplying high-level voltage to logic setting switches.
Function Generator for PWM Input Signal	Square wave, Output frequency up to 250kHz, Output amplitude (High level: 5 V, Low level: 0 V)	Not required when PWM signal is supplied from an MCU.
Motor for driving	-	-

3.2 Wiring Example (Driving two DC brush motors)

Figure 5. Wiring example

4 Description of operation instructions

4.1 Startup Instructions (4pin-Interface)

1. Set SW_MODE=GND, other SW_xx=NC.
2. Turn on the power supply connected to the VCC Pin.
3. Turn on the power supply connected to the 5V Pin.
4. Set SW_PS=H and switch SW_xx to enable motor drive.

Table 4. Input/Output Logical Table

- **4pin - Interface Mode (MODE = L)**

Input					Output				Status
PS	IN1A	IN1B	IN2A	IN2B	OUT1A	OUT1B	OUT2A	OUT2B	(DC MOTOR)
0	X	X	X	X	Z	Z	Z	Z	STANDBY
1	0	0	-	-	Z	Z	-	-	STANDBY
1	0	1	-	-	L	H	-	-	REVERSE
1	1	0	-	-	H	L	-	-	FORWARD
1	1	1	-	-	L	L	-	-	BRAKE
1	-	-	0	0	-	-	Z	Z	STANDBY
1	-	-	0	1	-	-	L	H	REVERSE
1	-	-	1	0	-	-	H	L	FORWARD
1	-	-	1	1	-	-	L	L	BRAKE

4.2 Shutdown Instructions

1. Set SW_PS=L.
2. Turn off the power supply connected to the 5V Pin.
3. After confirming that the motor has stopped, turn off the power supply connected to the VCC Pin.

5 Revision History

Date	Revision	Changes
2025.09.19	001	New Release

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