Motor Drive System Reference series

DC motor drive reference design with 2-Channel Half-Bridge Gate Driver IC for automotive applications

REFMOT001

General Description

The ROHM BD16950EFV-C is an AEC-Q100 automotive qualified 2-channel Half-Bridge Gate Driver IC, suitable for DC motor drive in Automotive applications such as Power Window Lifter, Sunroof Module, Wiper, Seat belt tensioner, Seat positioning, 2H motors etc.

This EVK enables the performance evaluation of this IC in research and development laboratories.

Features

- Plug & Play DC Motor Evaluation Kit
- No need for device driver installation for GUI application, it recognizes the board as Human Interface Device
- Single Power Supply with Reverse Polarity Protection
- Power supply for on Board Logic from LDO or USB
- Discrete H-Bridge FETs with high current capability
- Test pins for easy signal monitoring

Applications

- DC motor drive in Automotive applications
  Power Window Lifter, Sunroof Module, Wiper, Seat belt tensioner, Seat positioning, 2H motors etc.

Web page

https://www.rohm.com/reference-designs/refmot001

Key Specifications

- Name of board: BD16950EFV-EVK-001
- Input voltage: 5.5V to 40V
  (for Motor Driving) , other voltages are converted by the embedded regulators.
- Gate drive voltage   11V typ.
- Gate drive current   1mA to 31mA typ.
- Drive channels   2ch Half Bridge (1ch Full Bridge)
- Interface   SPI (Serial Peripheral Interface)

Board Image

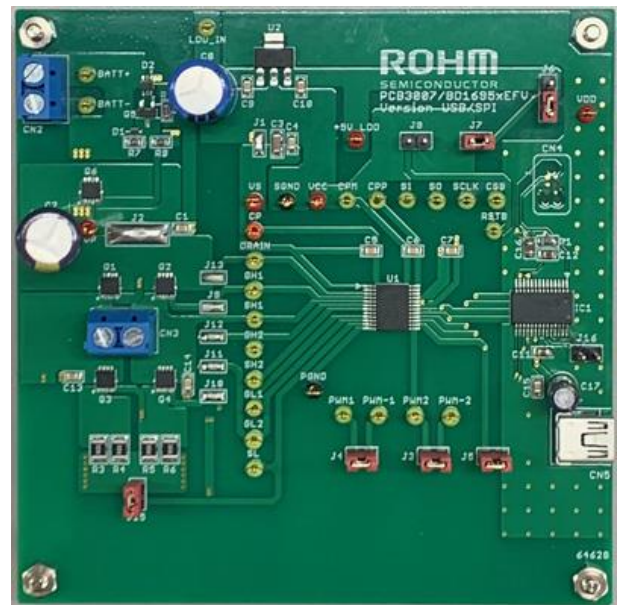| Board No.	W (Typ) x D (Typ)
BD16950EFV-EVK-001	100mm x 100mm

Figure 1. BD16950EFV-EVK-001 Board

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System block diagram

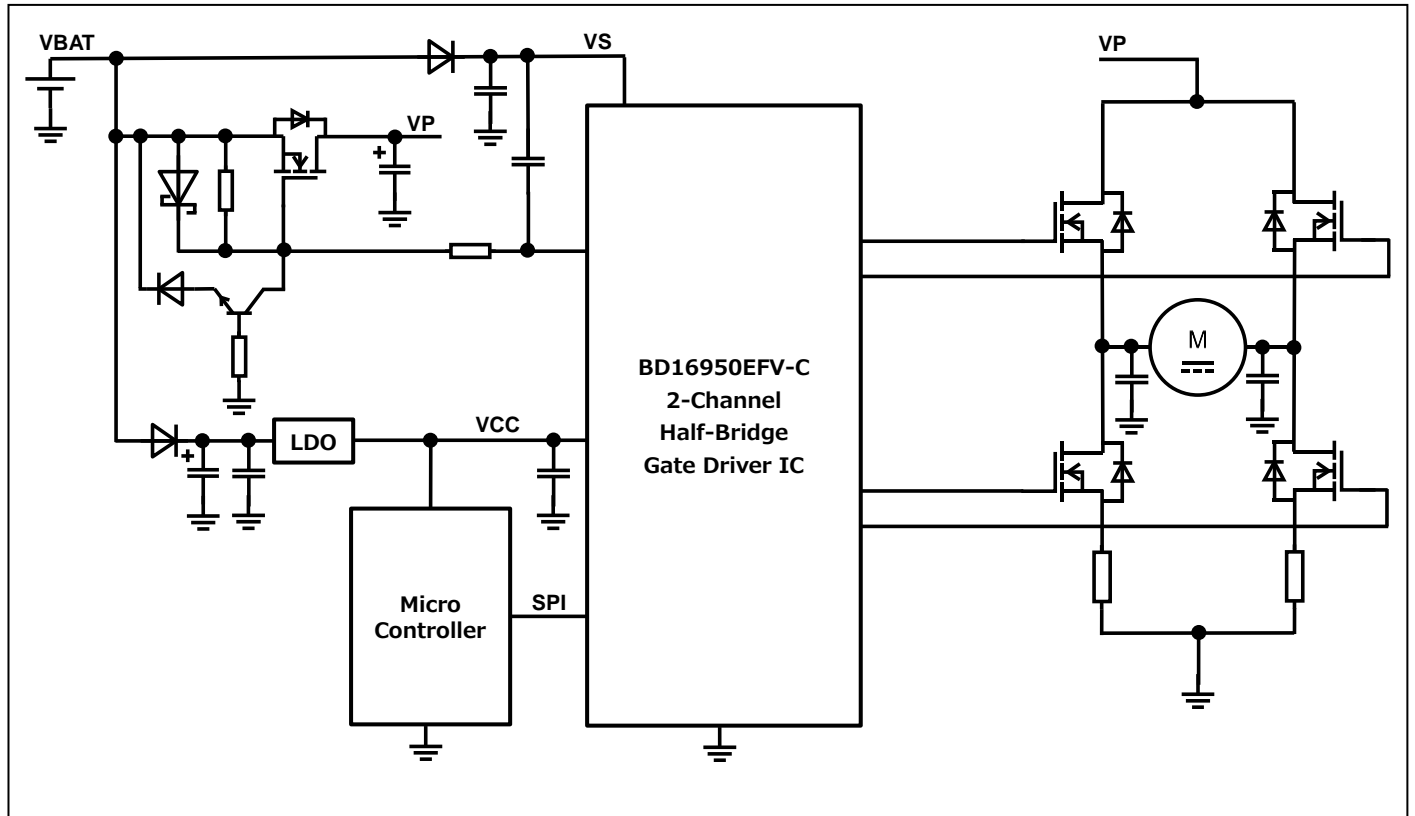Figure 2. shows typical application diagram of REFMOT001 usage.

Figure 2. REFMOT001 block diagram

Electrical Characteristic

Table 1 Electrical Characteristics of REFMOT001

Parameter	Min	Typ	Max	Unit	Conditions
Power supply voltage	5.5	-	40	V	
Logic power supply voltage	3.3	-	5.5	V	
Gate Drive Voltage	-	11	-	V	
SPI Clock Frequency	-	-	7	MHz	

Key components in the design

Table 2 Key parts list of REFMOT001

Key components	Product type
BD16950EFV-C	2ch Half-Bridge Gate Driver
BD450M2FP3-C	200mA 5V, Fixed Output, Low Iq, High-Accuracy LDO Regulator for Automotive
RQ3G270BF	Power MOSFET (Under development)

Design support contents

In the ROHM official web site, various design support contents are available to download.
https://www.rohm.com/reference-designs/refmot001
It is possible to start your pcb design based on design resources such as
- Schematic
- PCB layout (gerber data)
- Parts list

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