ROHM
SEMICONDUCTOR

Motor Drive System Reference series

12V power supply, 3 hall sensor support, Three-phase brushless motor drive with Microcontroller system reference

REFMOT101

General Description

This design consists of a three-hall sensor three-phase brushless DC motor pre-driver and a MOSFET.

It is an evaluation board that can drive a brushless DC motor with a supply voltage of 12V (typ) and a motor current of 6A (max) by adding a speed control circuit using a microcontroller to the 3 Hall sensor 3-phase brushless DC motor drive circuit.

It requires only one external power supply. When a Hall IC is used, the logic IC can detect the direction of rotation and output a triple multiplier FG.

Key Specifications

- Name of board: RMS332SD-011
- Input voltage: 6.0V to 18.0V
- Nb of outputs:
  6A(Max)(depending on driving capability of MOSFET)
- Output voltage: 3 hall sensor 120 degree commutation
- EMC performance:
  Input: Control input (DC or PWM), Rotation direction switching, Short brake.
  Outputs: Rotation direction detection, triple multiplier FG output, FG output.

Features

- 3 Hall Sensor Three Phase Brushless DC Motor Pre-Driver and Output MOS P+N Configuration
- Supply voltage 12V(typ)
- Output current 6A(max)
- PWM drive with 120 degree commutation.
- Rotation direction switching, short braking function
- Rotation direction detection output, triple FG output possible (when Hall IC is used)
- Speed control by MCU is possible.

Board Image

Board No.	W (Typ) x D (Typ)
RMS332SD-011	60mm×75mm

Figure 1. RMS332SD-011 Board

Applications

- Small Mobility Unit
- Fans
- Pumps

Web page

https://www.rohm.com/reference-designs/refmot101

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System block diagram

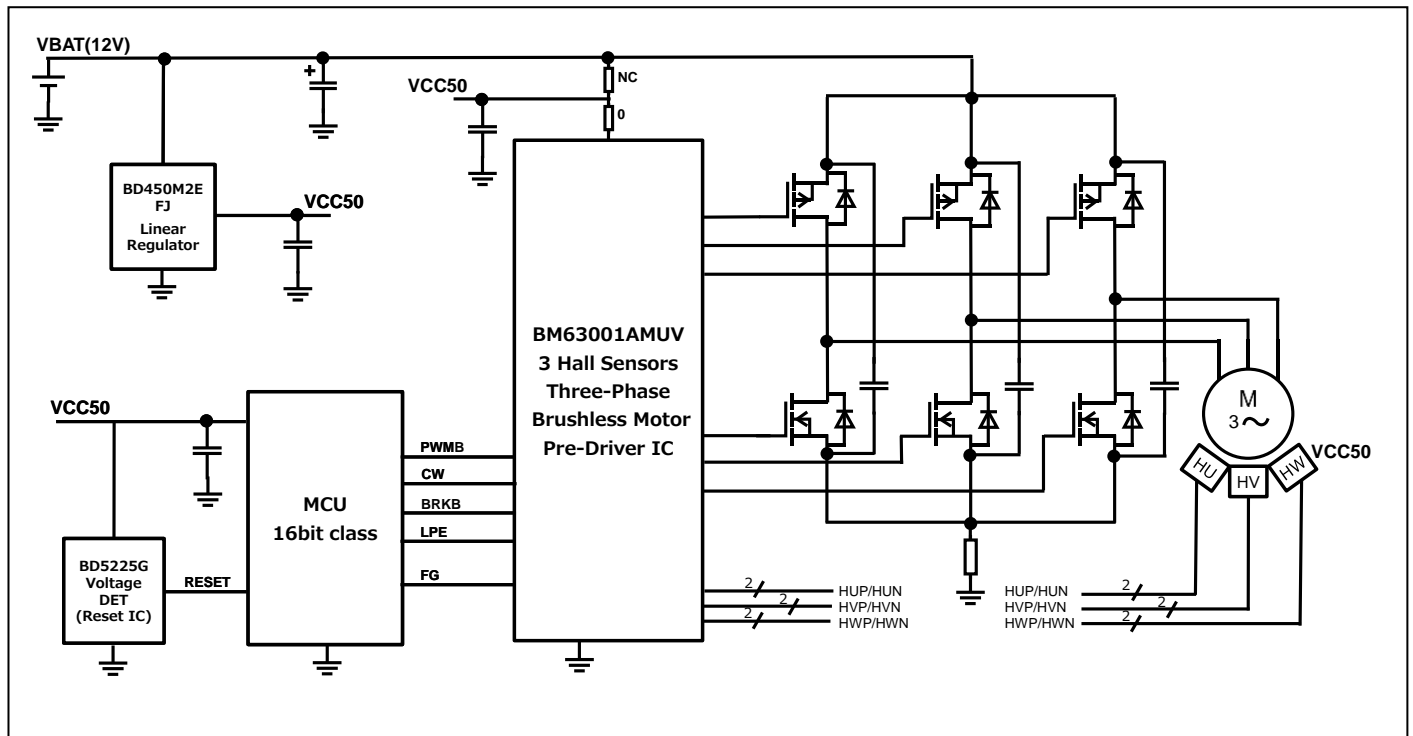Figure 2. shows typical application diagram of REFMOT101 usage.

Figure 2. REFMOT101 block diagram

Electrical Characteristic

Table 1 Electrical Characteristics of REFMOT101

Parameter	Min	Typ	Max	Unit	Conditions
Power supply voltage (VCC)	6.0	12.0	8.0	V	
Linear regulator output (V_{CC50})	4.8	5.0	5.1	V	
Hall sensor minimum input voltage	50	-	-	mVpp	
Output current	-	-	6	A	

Key components in the design

Table 2 Key parts list of REFMOT101

Key components	Product type
BD63001AMUV	Three-Phase Brushless Motor Predriver
RRH140P03	4V Drive Pch MOSFET
RS3E135BN	Nch 30V 13.5A Middle Power MOSFET
BD450M2EFJ-C	200-mA 3.3-V or 5.0-V Output LDO Regulators
BD5225G	2.5V, Adjustable Delay, High Accuracy Voltage Detector

Design support contents

In the ROHM official web site, various design support contents are available to download.
https://www.rohm.com/reference-designs/refmot101
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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