



STEVAL-IHM040V1

BLDC/PMSM driver demonstration board based on STM32 and the SLLIMM™ nano

Data brief

Features

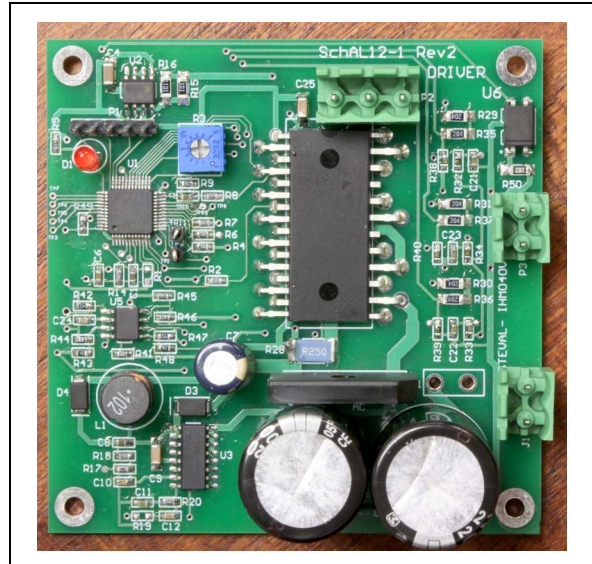
- Extended AC input mains range: 115 or 230 VAC nominal at 50/60 Hz, or DC input voltage between 150 and 350 VDC
- Output current: 0.5 A_{RMS} to the motor
- Power stage: 3-phase inverter bridge implemented using the STGIPN3H60 SLLIMM-nano intelligent power module
- RoHS compliant

Description

The STEVAL-IHM040V1 is a 3-phase permanent magnet brushless motor driver designed to drive a motor using either the six step or field oriented control (FOC) commutation technique. The board can operate from an AC mains of either 115 or 230 V_{AC} nominal at 50/60 Hz, or from a DC input voltage between 150 and 350 VDC. The board can supply a continuous output current of 0.5 A_{RMS} to the motor.

The circuit consists of three main blocks. The first is the digital control block, which uses the STM32F100C8T6 microcontroller to implement the control algorithms and to generate the control signals for the power stage. The main outputs of the control block are the signals for the power stage.

The second block is the power stage, a 3-phase inverter bridge implemented using the STGIPN3H60 SLLIMM-nano intelligent power module. The SLLIMM includes the 6 IGBTs, gate drivers and level shift required to interface the logic signals from the digital control to the motor terminals. The SLLIMM also provides a hardware overcurrent shutdown and an op-amp used to scale and bias the current sensing.



The third block is the power supply, which employs the VIPER16 to convert the high voltage DC bus to a regulated 15 V supply that supplies the SLLIMM and analog circuitry on the board. The 15 V supply also supplies an L78L33 linear regulator that provides the 3.3 V logic supply for the microcontroller.

Two firmware control programs are available, one for six steps and one for FOC, which run on the same hardware platform.

Figure 1. SLLIMM-based BLDC driver (1 of 3)

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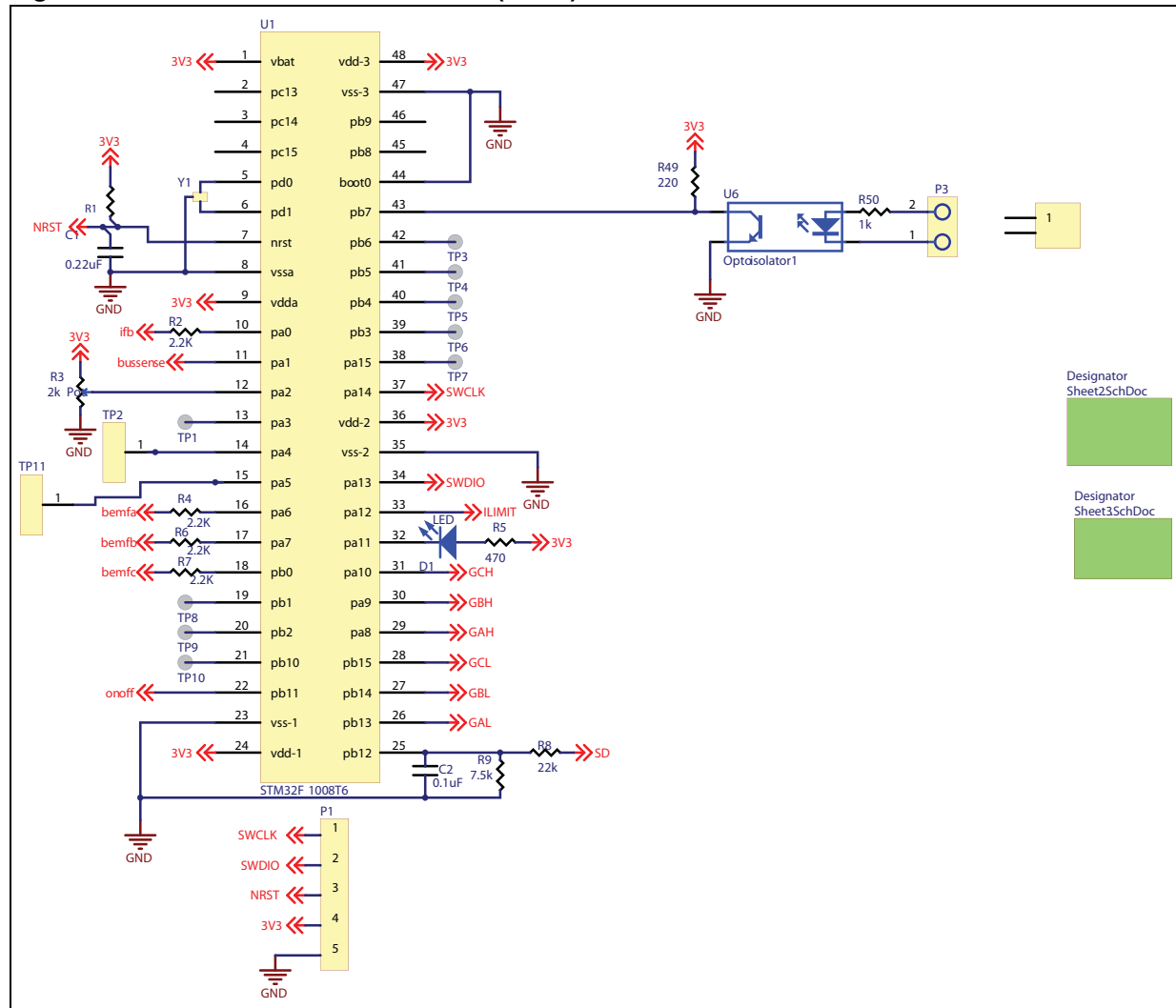


Figure 2. SLLIMM-based BLDC driver (2 of 3)

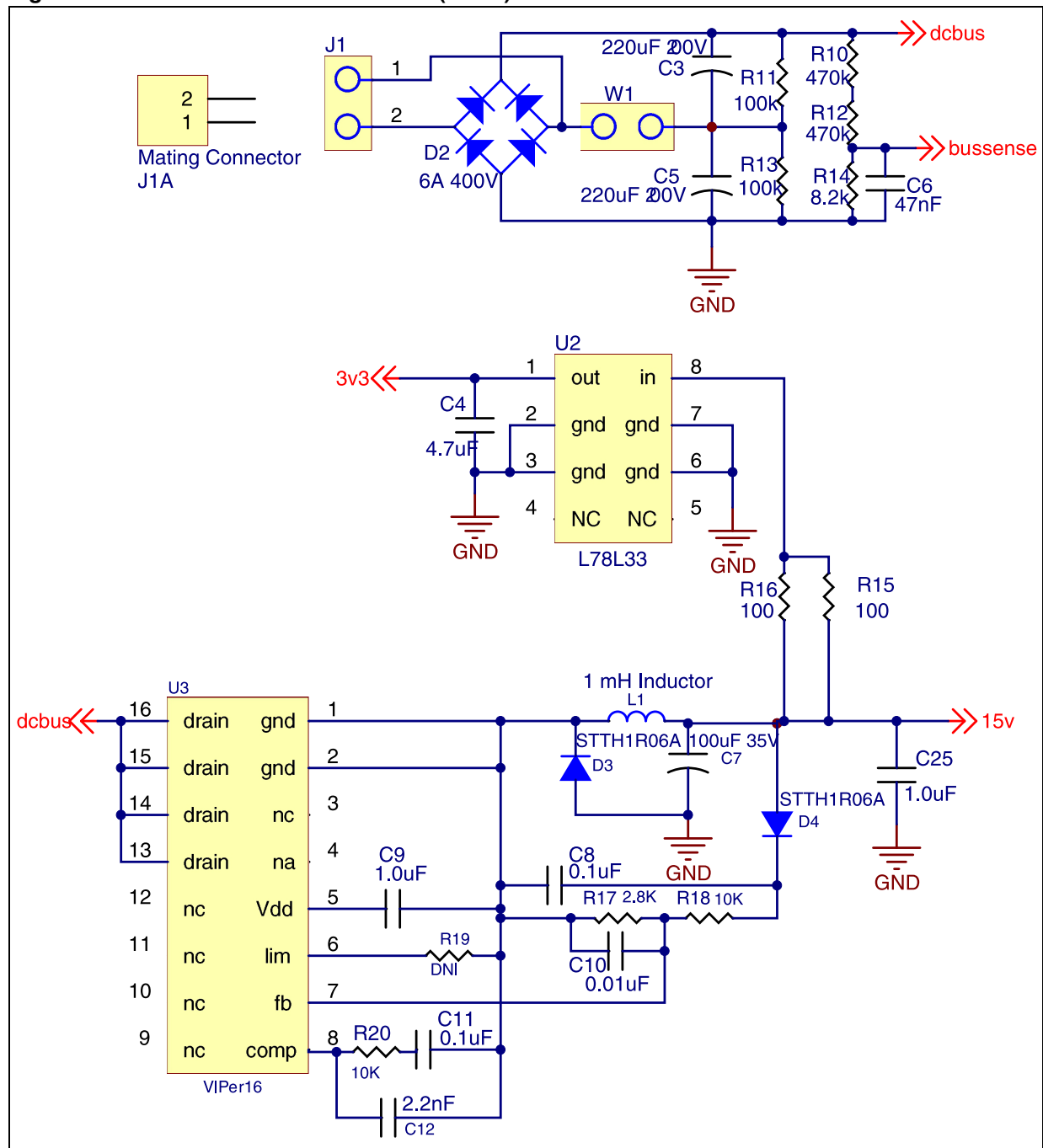
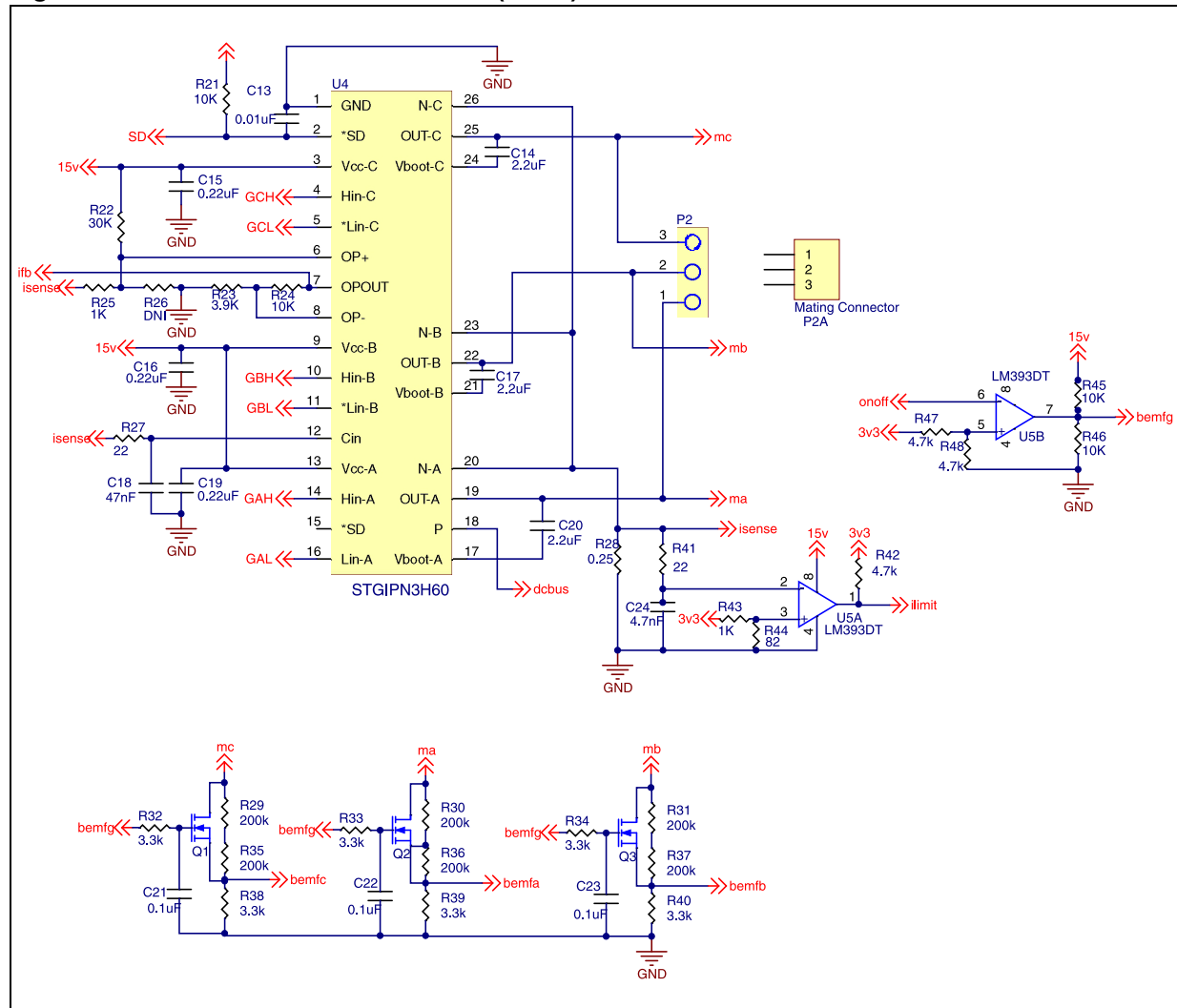


Figure 3. SLLIMM-based BLDC driver (3 of 3)



2 Revision history

Table 1. Document revision history

| Date | Revision | Changes |
|-------------|----------|------------------|
| 19-Dec-2012 | 1 | Initial release. |

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