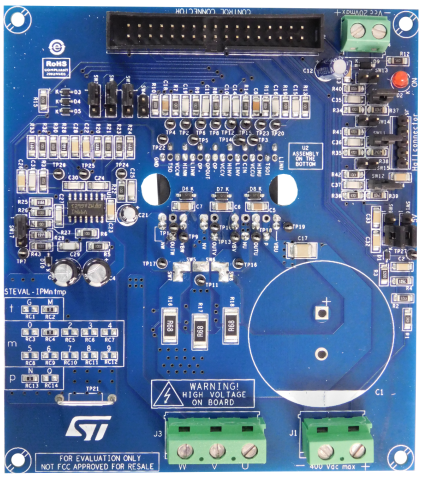
STEVAL-IPMnM1N

Data brief

60 W motor control power board based on STIPN1M50T-H SLLIMM™nano IPM MOSFET



Features

- Input voltage: from 125 to 400 V_{DC}
- Nominal power: up to 60 W
- Nominal current: up to 0.35 Arms
- Input auxiliary voltage: up to 20 V_{DC}
- Single- or three-shunt resistors for current sensing (with sensing network)
- Three options for current sensing: dedicated external op-amps, internal SLLIMM-nano op-amp (single) or via MCU
- Overcurrent hardware protection
- IPM temperature monitoring and protection
- Hall sensor or encoder input
- Intelligent power module:
  - SLLIMM-nano IPM MOSFET-based (STIPN1M50T-H – full molded package)
- Motor control connector (32 pins) interfacing with ST MCU boards
- Universal design for further evaluation with bread board and testing pins
- Very compact size
- RoHS compliant

Product summary	
Compact motor drive power board	STEVAL-IPMnM1N
SLLIMM-nano small low-loss intelligent molded module IPM, 3-phase inverter, 1 A, 3.6 Ohm max., 500 V MOSFET	STIPN1M50T-H

Description

The STEVAL-IPMnM1N is a compact motor drive power board based on SLLIMM™-nano (small low-loss intelligent molded module) 2nd series MOSFET-based product (STIPN1M50T-H) . It provides an affordable and easy-to-use solution for driving high power motors in a wide range of applications such as power white goods, air conditioning, compressors, power fans and 3-phase inverters for motor drives in general.

The IPM itself consists of short-circuit rugged MOSFETs and a wide range of features like undervoltage lockout, smart shutdown, internal temperature sensor and NTC, overcurrent protection and internal op-amp.

The main characteristics of this evaluation board are small size, minimal BOM and high efficiency. It features an interface circuit (BUS and V_{CC} connectors), bootstrap capacitors, snubber capacitor, hardware short-circuit protection, fault event signal and temperature monitoring. It is designed to work in single- or three-shunt configuration and with triple current sensing options: three dedicated on-board op-amps, op-amps embedded on MCU or single internal IPM op-amp. The Hall/Encoder part completes the circuit.

The system is designed to achieve accurate and fast conditioning of current feedback to satisfy the typical requirements for field oriented control (FOC).

The STEVAL-IPMnM1N is compatible with ST's control board based on STM32, providing a complete platform for motor control.

1 Schematic diagrams

Figure 2. **STEVAL-IPMnM1N circuit schematic (1 of 5)**

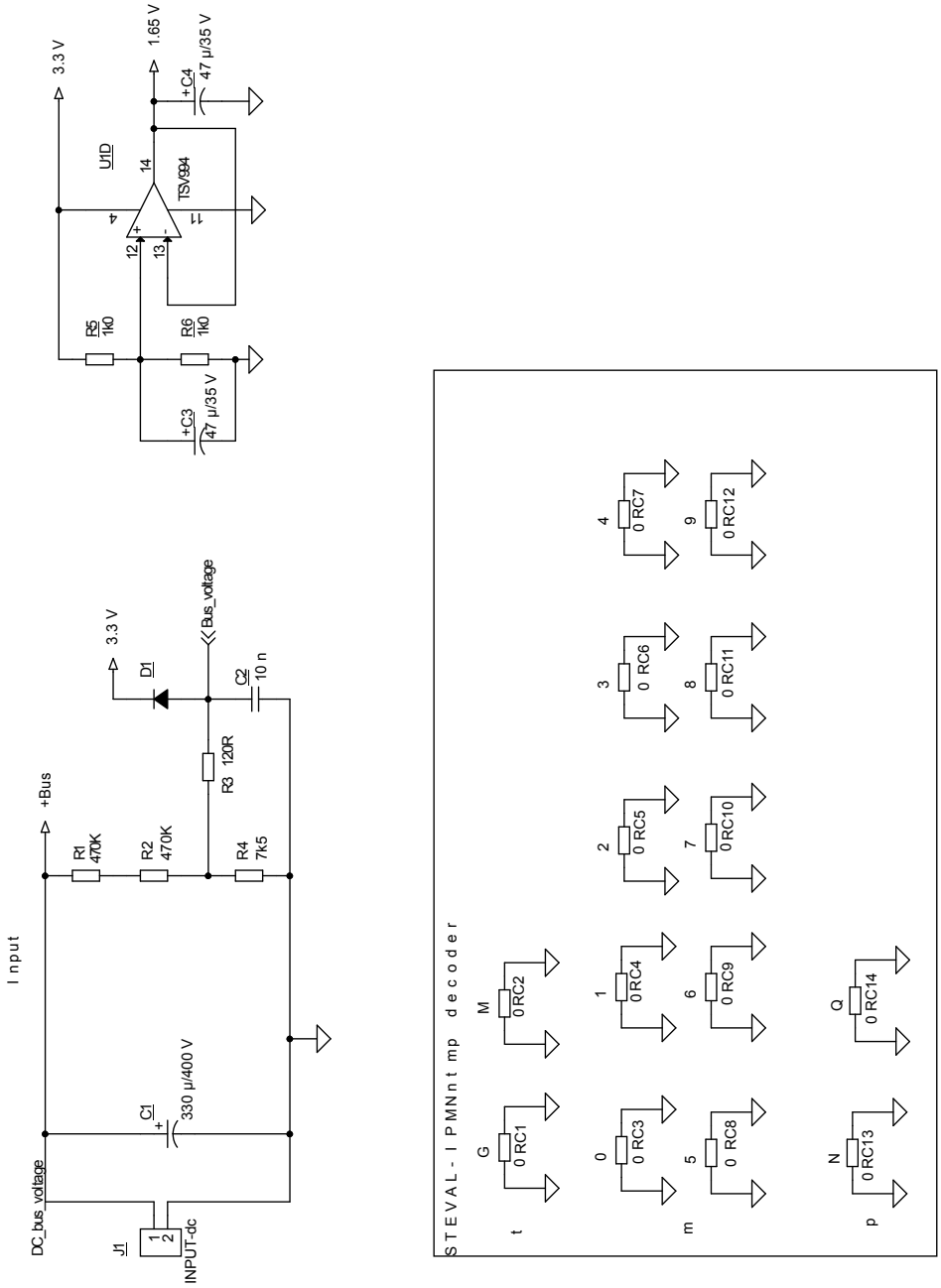


Figure 3. **STEVAL-IPMnM1N circuit schematic (2 of 5)**

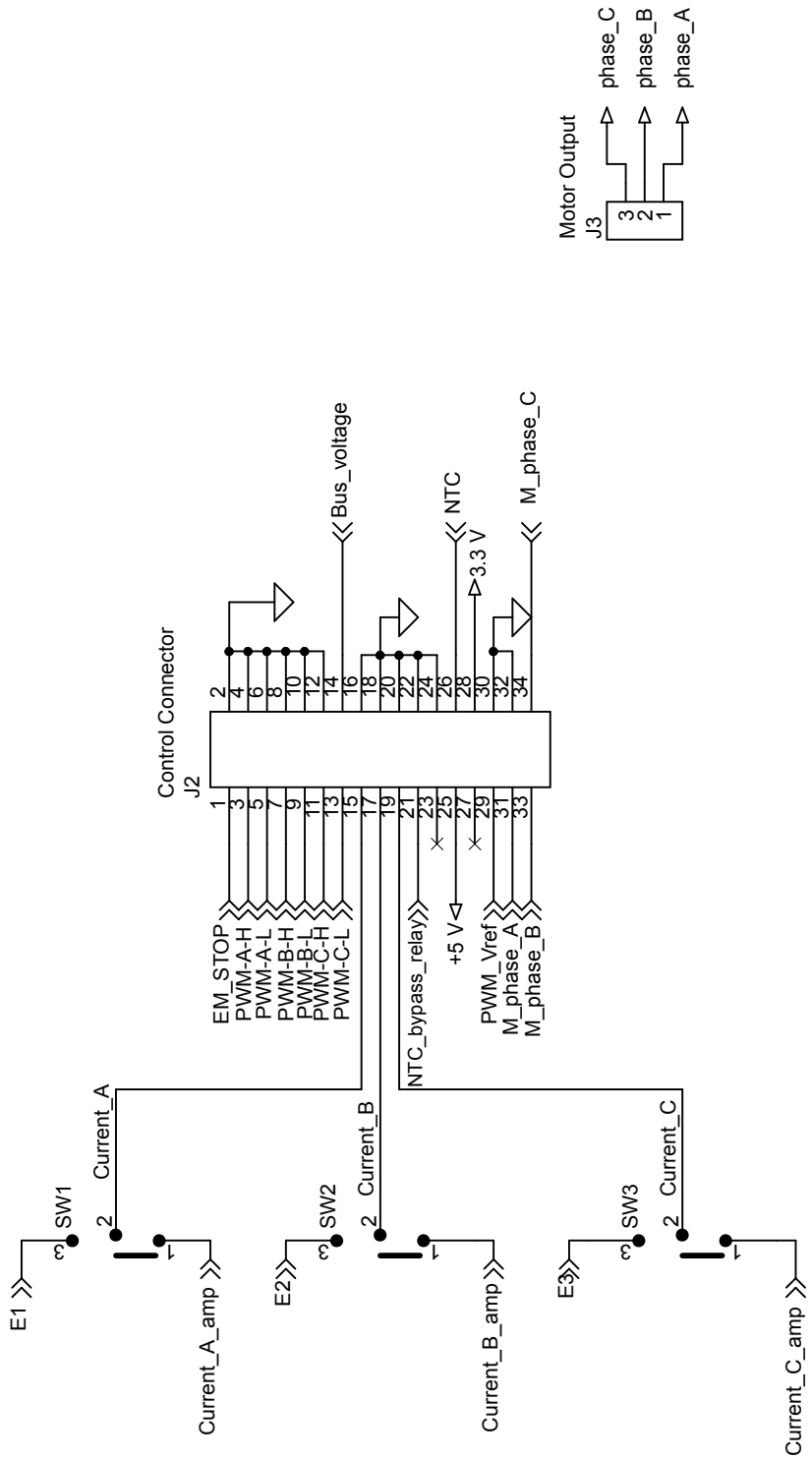


Figure 4. **STEVAL-IPMnM1N circuit schematic (3 of 5)**

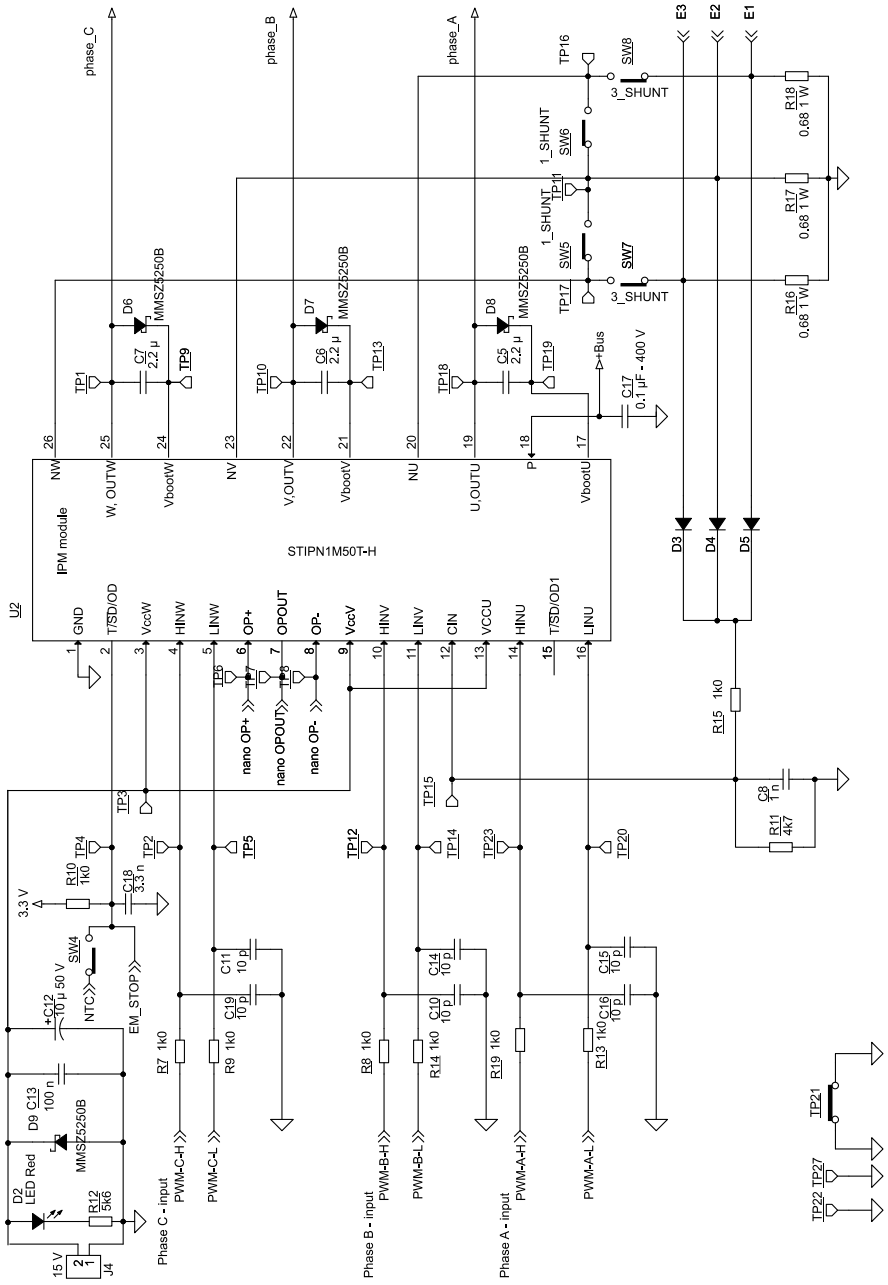


Figure 5. **STEVAL-IPMnM1N circuit schematic (4 of 5)**

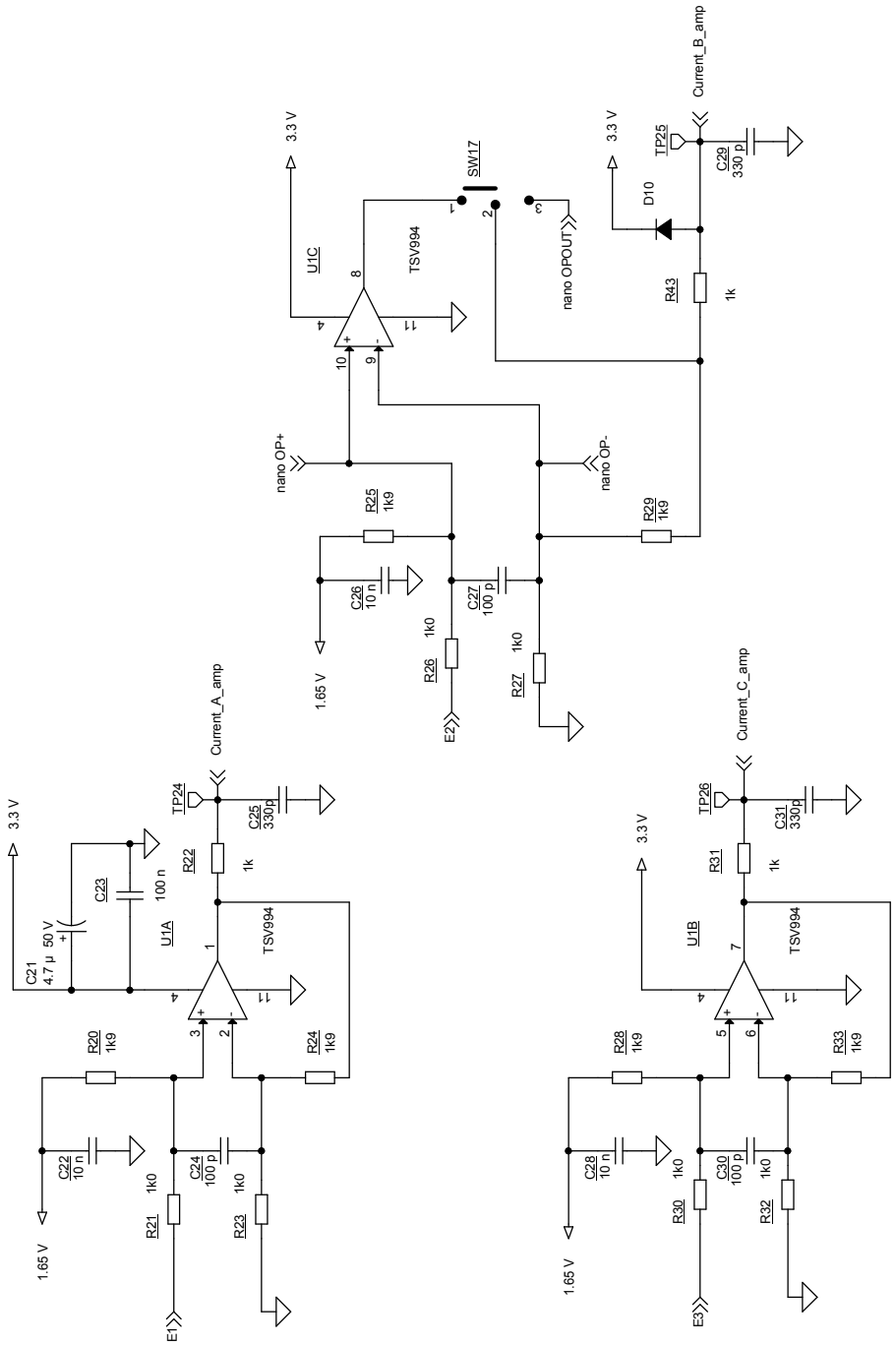
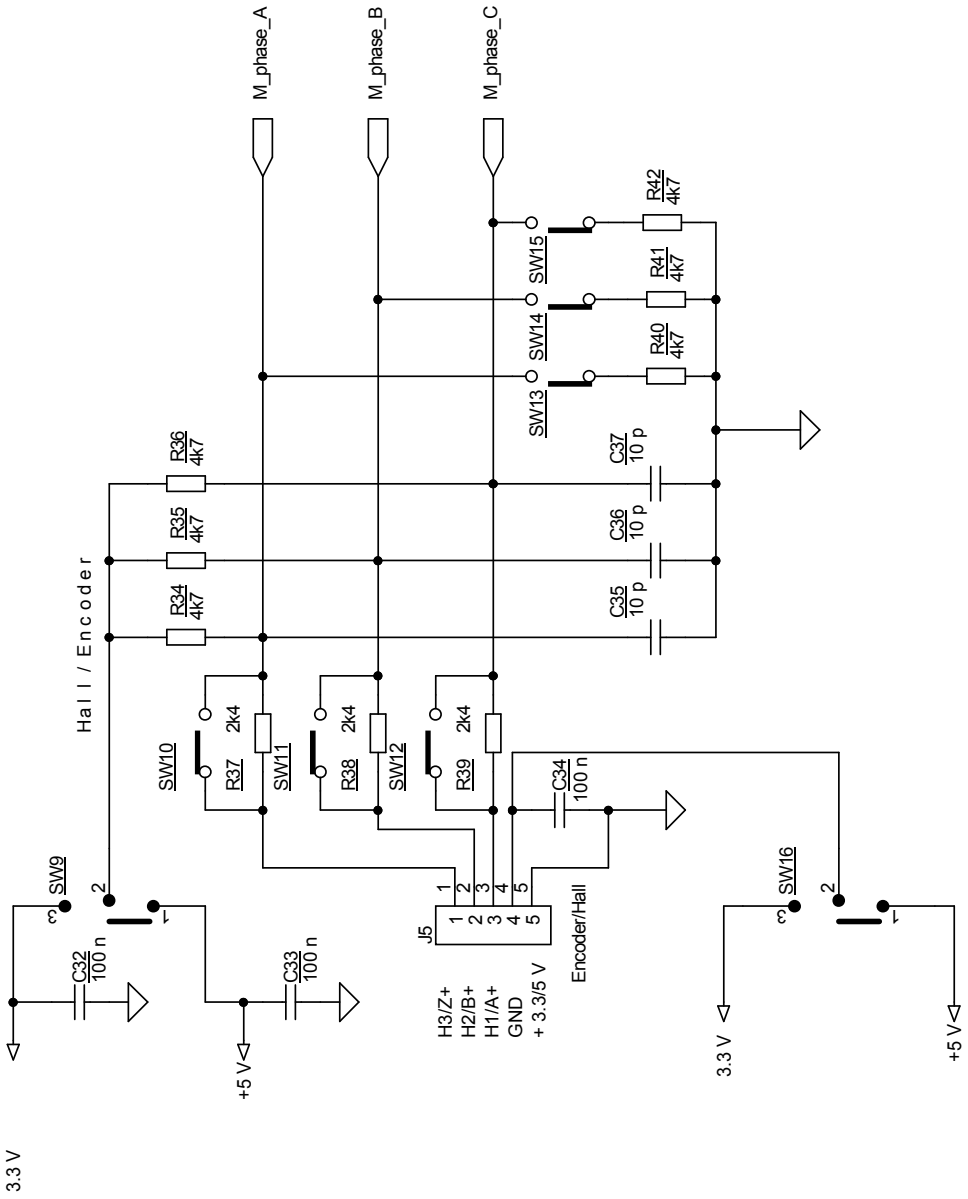


Figure 6. **STEVAL-IPMnM1N circuit schematic (5 of 5)**



Revision history

Table 1. **Document revision history**

Date	Version	Changes
05-Sep-2017	1	Initial release.
03-Apr-2018	2	Updated title.

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