

## Motor control power board based on the SLLIMM-nano 2<sup>nd</sup> series

Data brief



- Universal design for further evaluation with bread board and testing pins
- Very compact size
- RoHS compliant

### Description

The STEVAL-IPMNG3Q is a compact motor drive power board based on SLLIMM™-nano (small low-loss intelligent molded module) 2<sup>nd</sup> series product (STGIPQ3H60T-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 IGBTs 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<sub>CC</sub> 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-IPMNG3Q is compatible with ST's control board based on STM32, providing a complete platform for motor control.

### Features

- Input voltage: from 125 to 400 V<sub>DC</sub>
- Nominal power: up to 300 W
- Nominal current: up to 1.8 A
- Input auxiliary voltage: up to 20 V<sub>DC</sub>
- 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
- IGBT intelligent power module:
  - 2<sup>nd</sup> series SLLIMM-nano IPM (STGIPQ3H60T-H – full molded package)
- Motor control connector (32 pins) interfacing with ST MCU boards

## Schematic diagrams

Figure 1: STEVAL-IPMNG3Q circuit schematic (1 of 5)

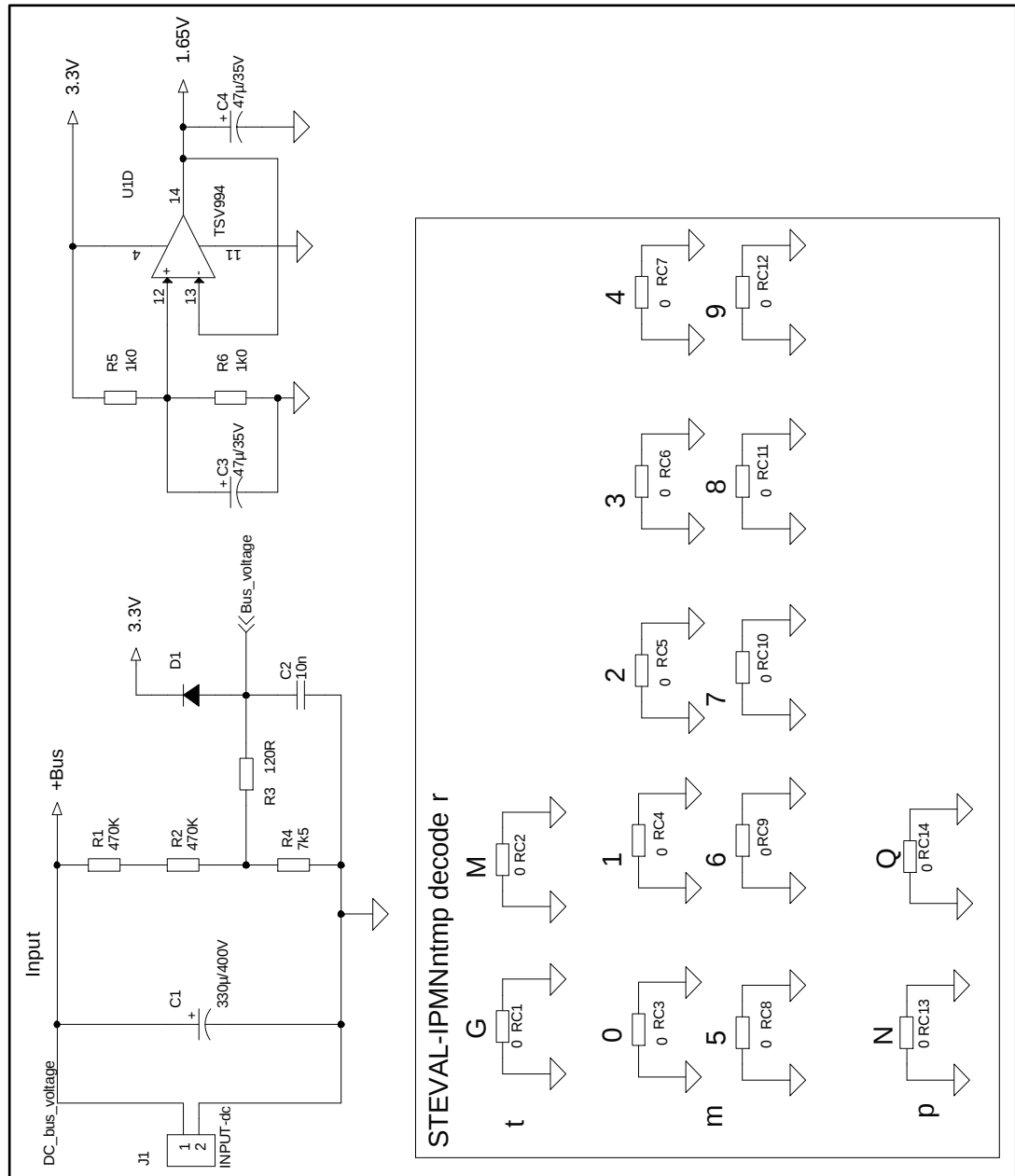
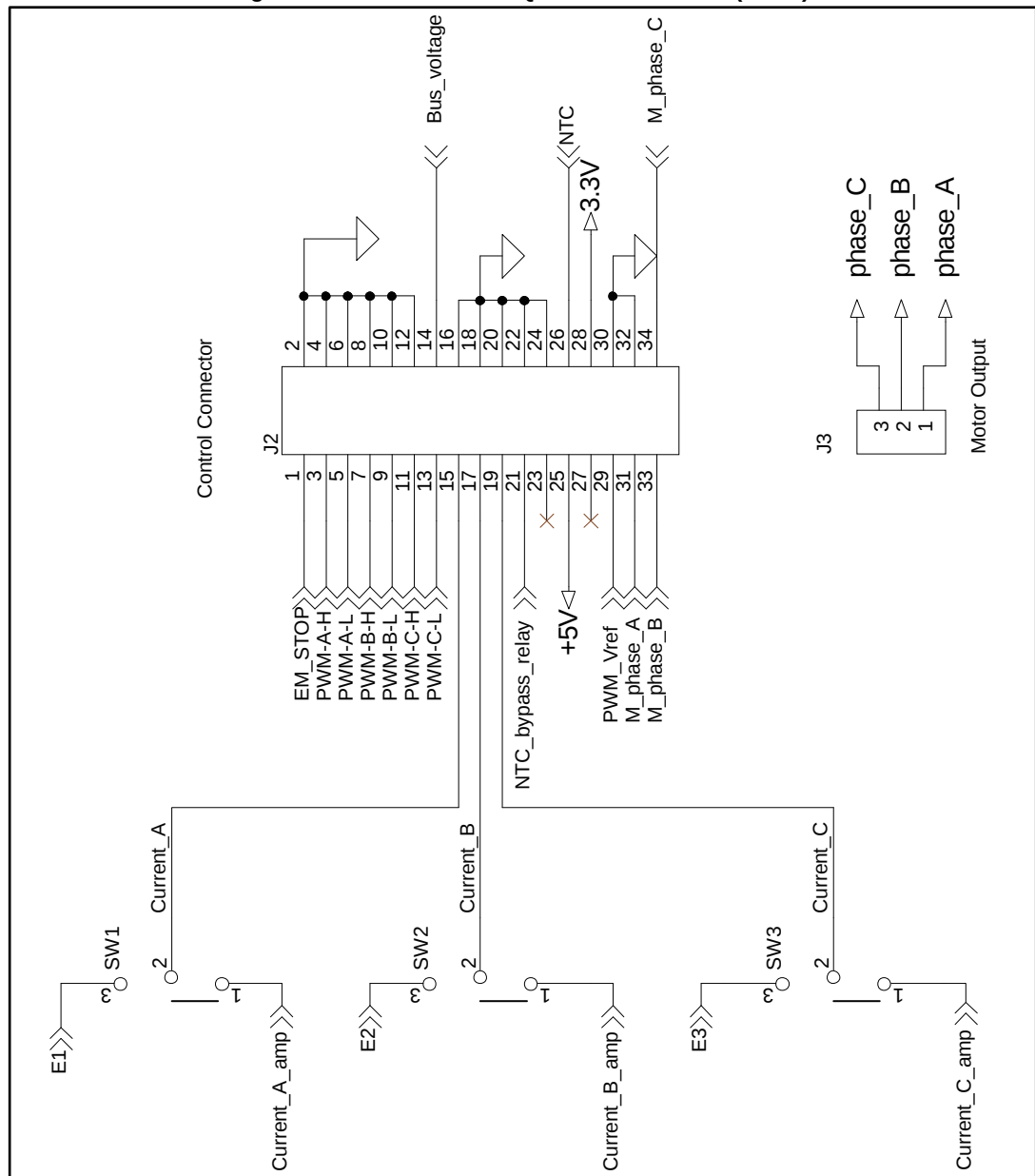


Figure 2: STEVAL-IPMNG3Q circuit schematic (2 of 5)



**Figure 3: STEVAL-IPMNG3Q circuit schematic (3 of 5)**

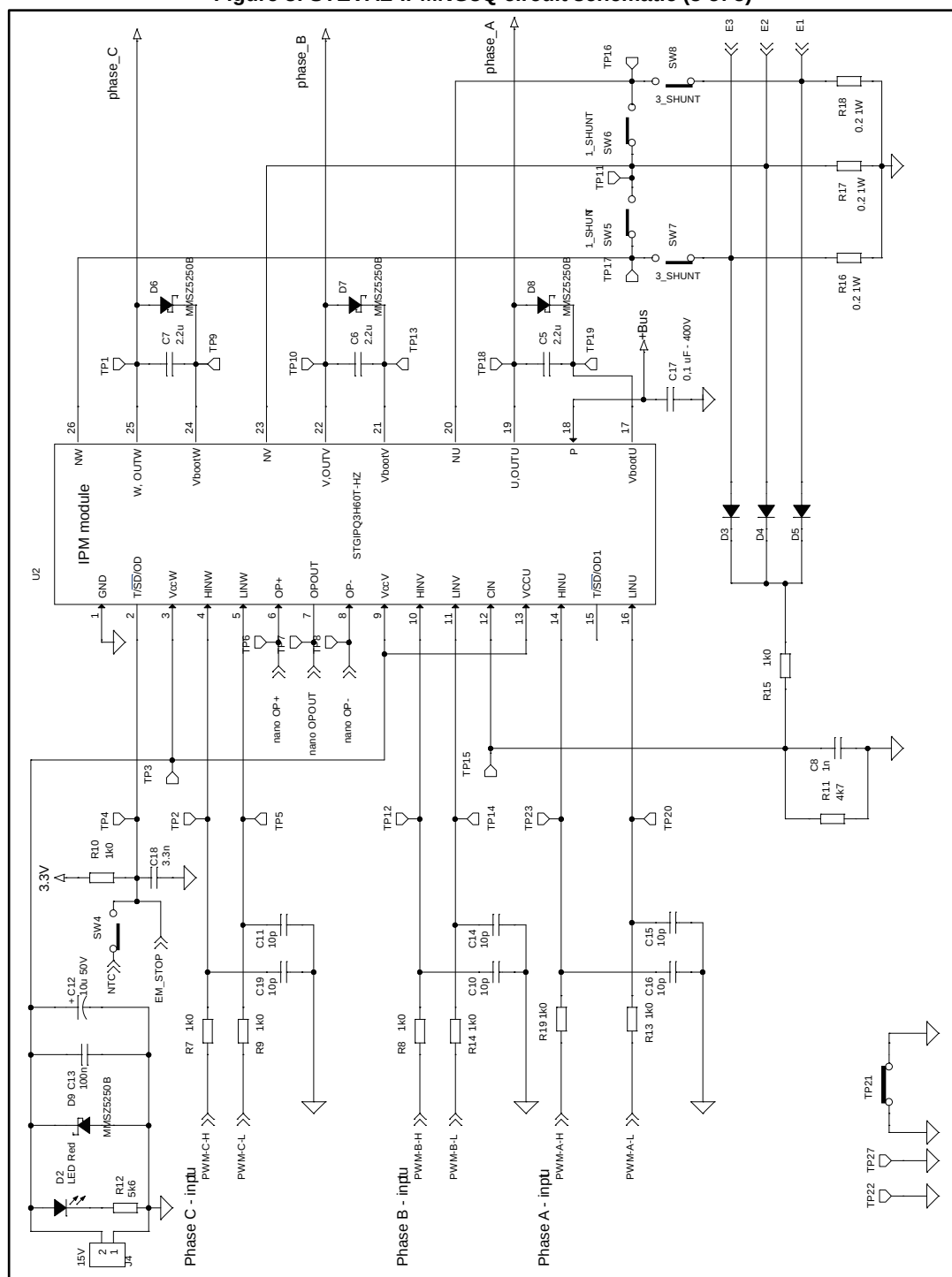


Figure 4: STEVAL-IPMNG3Q circuit schematic (4 of 5)

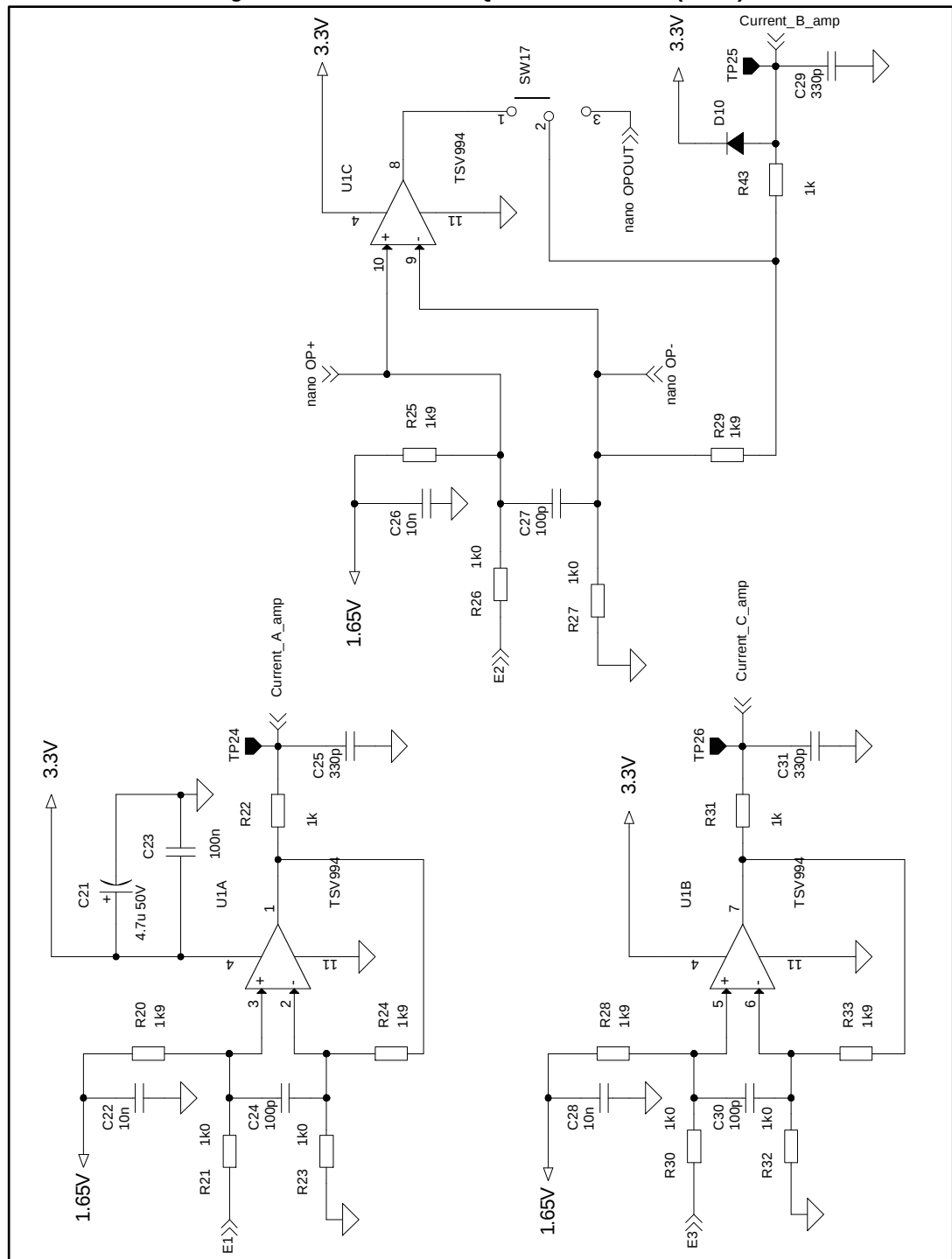
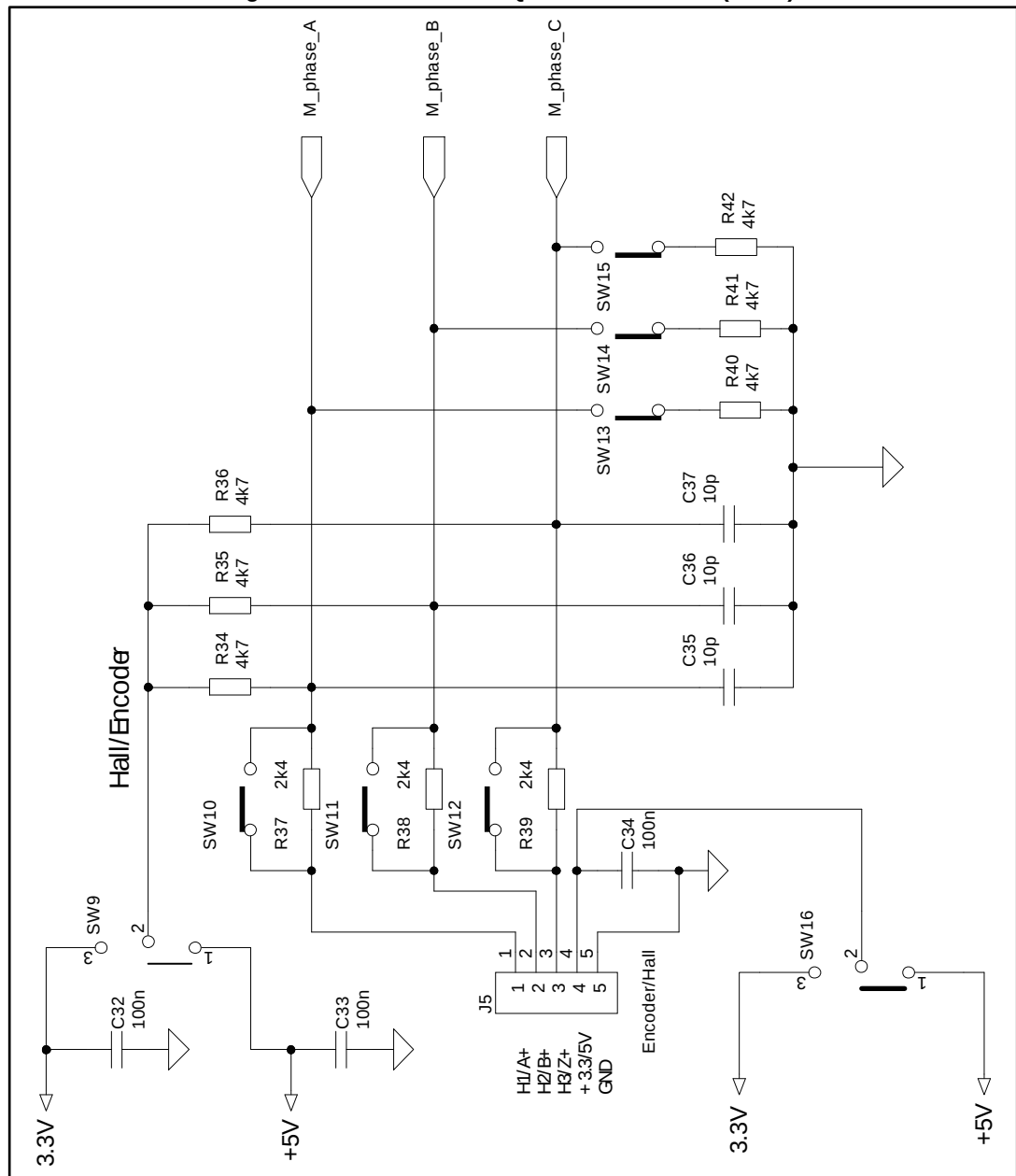


Figure 5: STEVAL-IPMNG3Q circuit schematic (5 of 5)



## Revision history

Table 1: Document revision history

| Date        | Version | Changes                      |
|-------------|---------|------------------------------|
| 22-Feb-2017 | 1       | Initial release.             |
| 19-Sep-2017 | 2       | Updated cover page features. |

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