



STEVAL-IHM023V2

1 kW 3-phase motor control demonstration board featuring L6390 drivers and STGP10NC60KD IGBT

Data brief

Features

- Minimum input voltage: 125 VDC or 90 VAC
- Maximum input voltage: 400 VDC or 285 VAC
- Input voltage range with applied input voltage doubler from 65 VAC to 145 VAC
- Voltage range for low-voltage motor control applications from 18 VDC to 35 VDC
- Possibility to use auxiliary +15 V supply voltage
- Maximum output power for motors up to 1 kW
- Regenerative brake control
- Input inrush limitation with bypass relay
- + 15 V auxiliary power supply based on buck converter with VIPer™16
- IGBT power switch STGP10NC60KD in a TO-220 package - compatible with other ST IGBTs or power MOSFETs in the TO-220 package
- Fully populated board design with test points and safety isolated plastic cover
- Motor control connector for interface with the STM3210B-EVAL board and other ST motor control dedicated kits
- Tachometer input
- Hall/encoder inputs
- Possibility to connect the BEMF daughterboard for sensorless six-step control of BLDC motors
- PCB type and size:
 - Material of PCB - FR-4
 - Double-sided layout
 - Copper thickness: 60 µm
 - Total dimensions of demonstration board: 127 mm x 180 mm
- RoHS compliant

Description

The STEVAL-IHM023V2 demonstration board implements a 1 kW three-phase motor control featuring the L6390 high and low-side drivers and



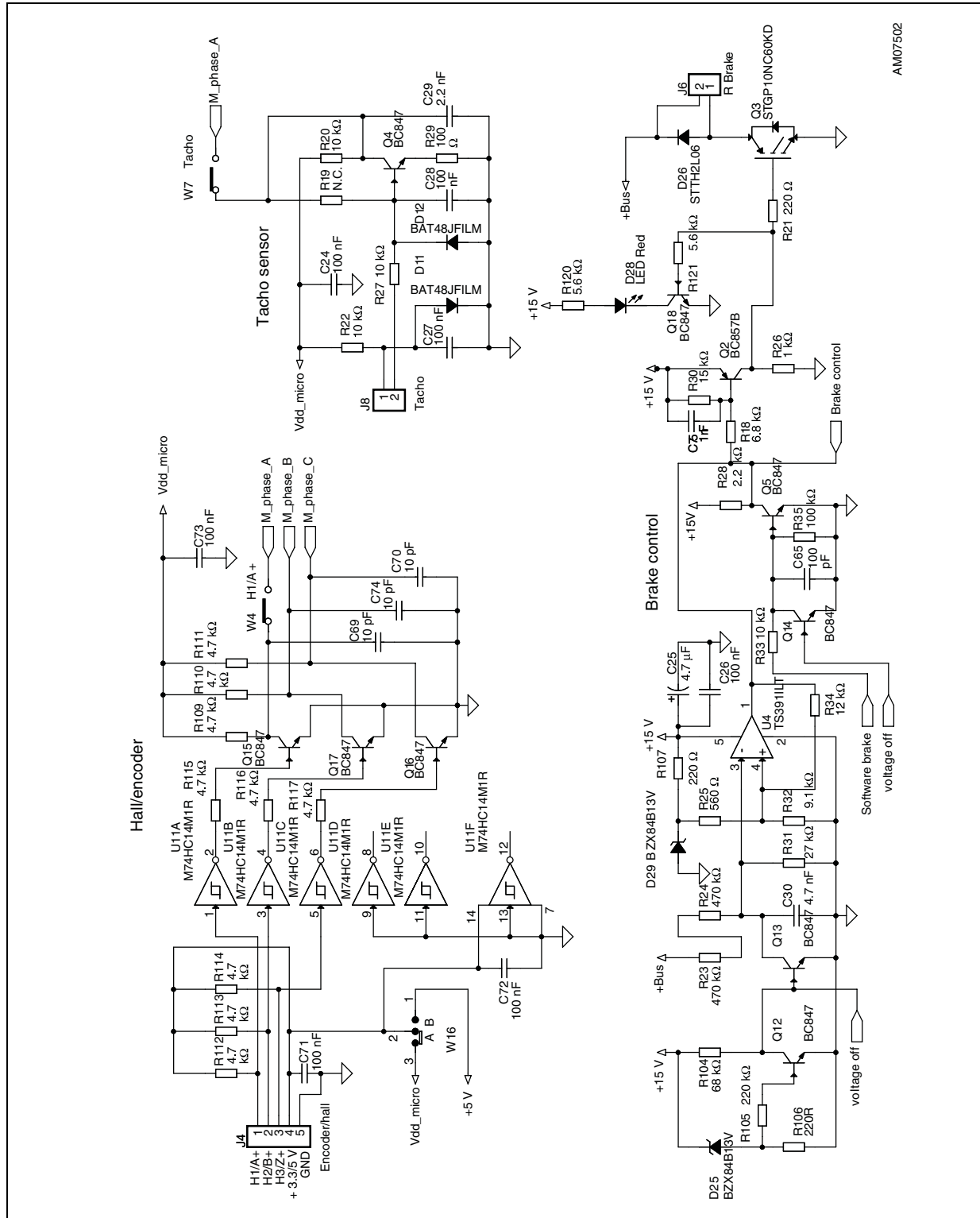
the STGP10NC60KD IGBT. The demonstration board is an AC/DC inverter that generates a three-phase waveform for driving three- or two-phase motors such as induction motors or PMSM motors up to 1000 W with or without sensors.

The STEVAL-IHM023V2 is a universal, fully evaluated and populated design consisting of a three-phase inverter bridge based on STMicroelectronics' 600 V IGBT STGP10NC60KD in a TO-220 package mounted on a heatsink and the L6390 high-voltage high-side and low-side driver featuring an integrated comparator for hardware protection features such as overcurrent and overtemperature. The driver also integrates an operational amplifier suitable for advanced current sensing. Thanks to this advanced characteristic, the system has been specifically designed to achieve an accurate and fast conditioning of the current feedback, thus matching the typical requirements in field oriented control (FOC).

The board has been designed to be compatible with single-phase mains, supplying from 90 VAC to 285 VAC or from 125 VDC to 400 VDC for DC voltage. With reconfiguration of the input sourcing, the board is suitable also for low-voltage DC applications up to 35 VDC.

1 Schematics

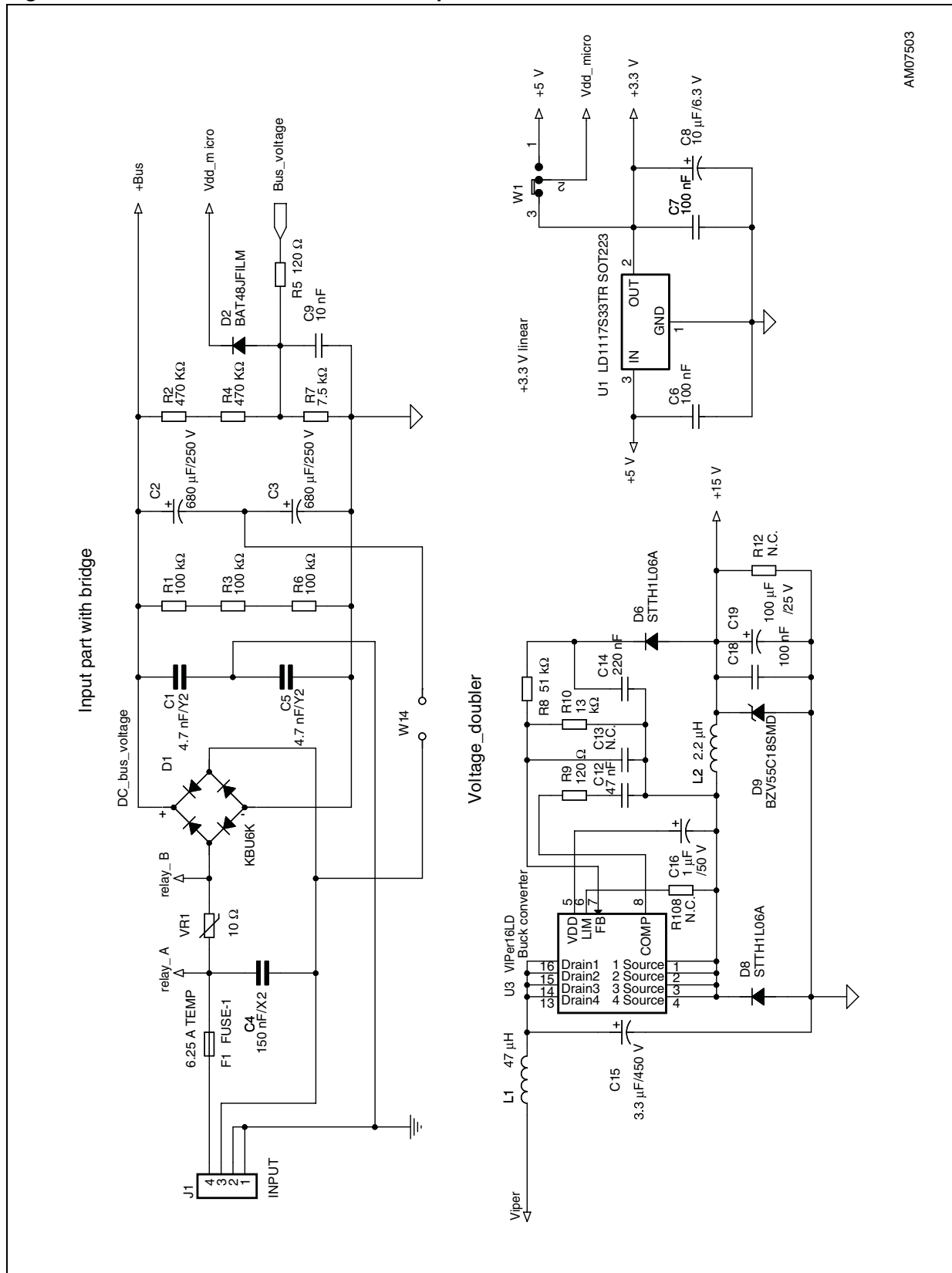
Figure 1. STEVAL- IHM023V2 schematic - part 1



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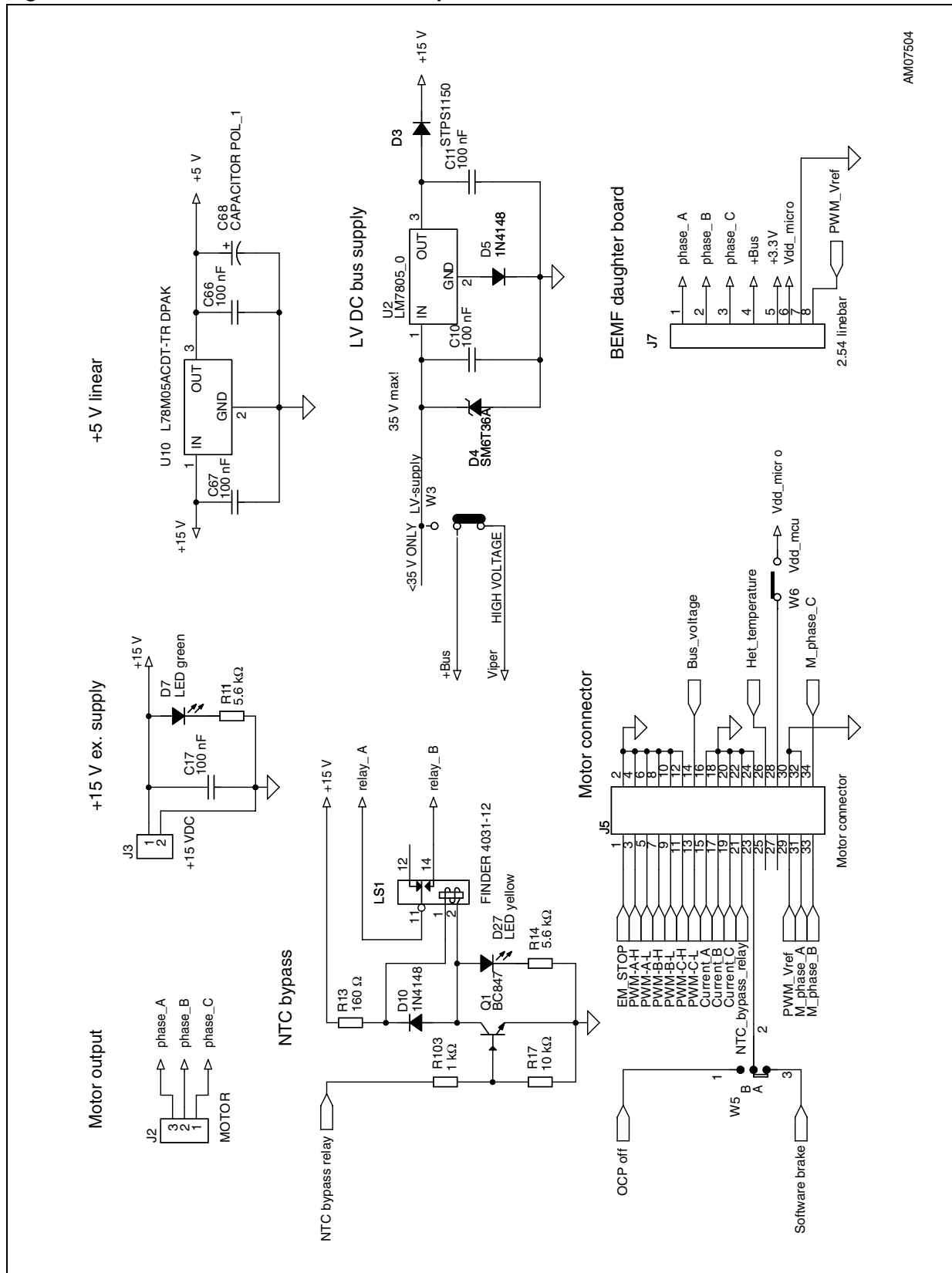


Figure 2. STEVAL- IHM023V2 schematic - part 2



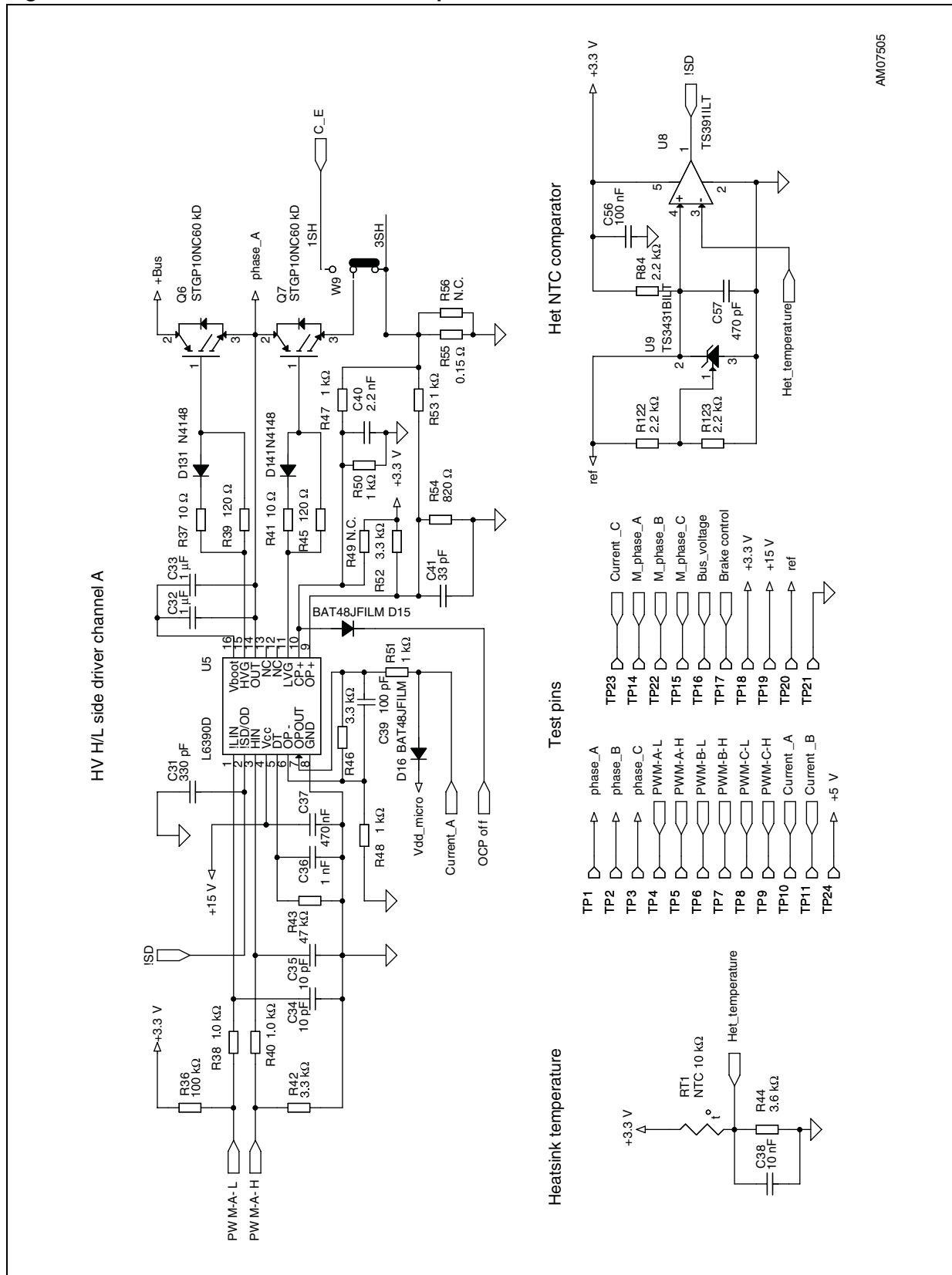
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Figure 3. STEVAL- IHM023V2 schematic - part 3



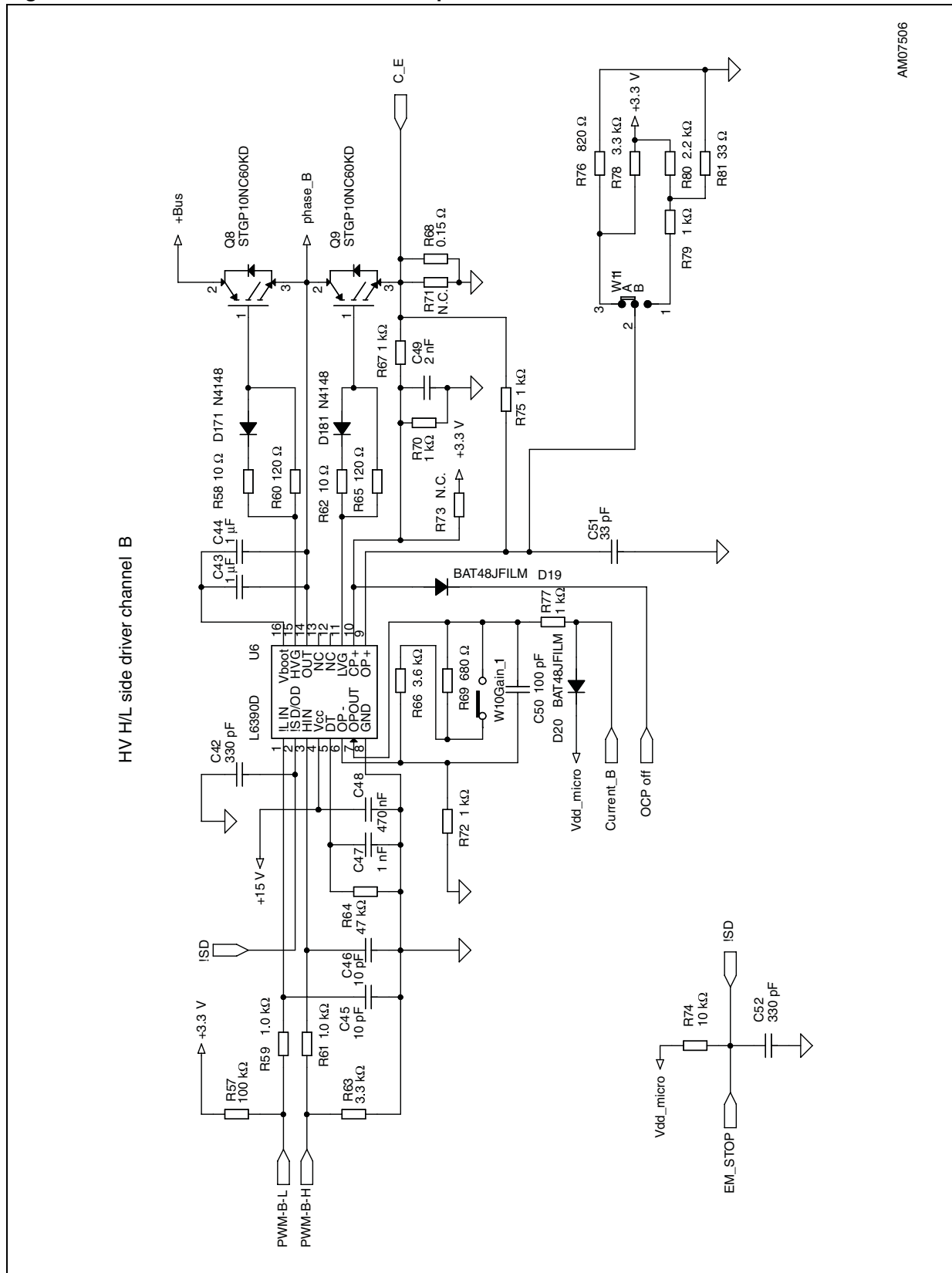
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Figure 4. STEVAL- IHM023V2 schematic - part 4



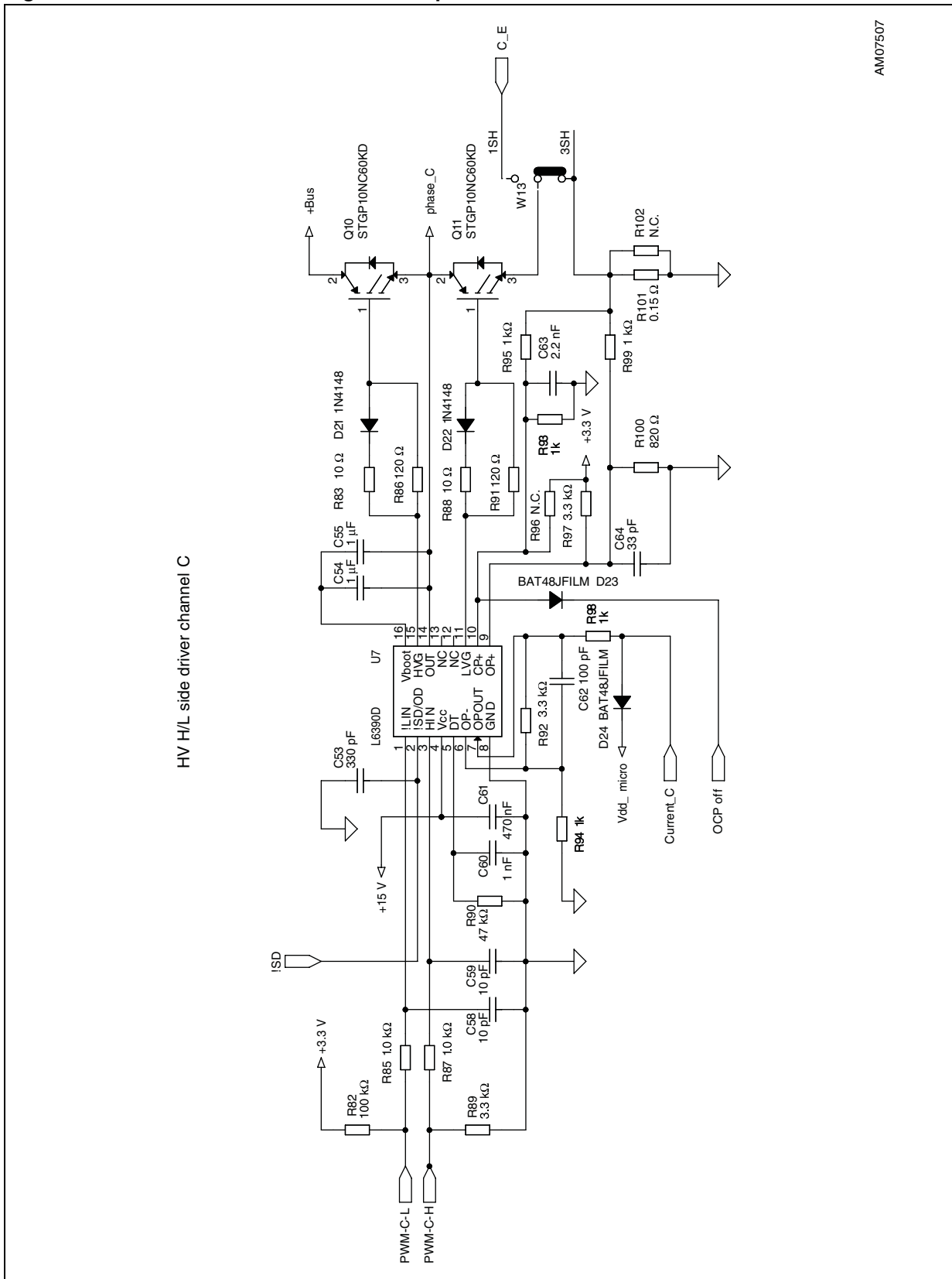
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Figure 5. STEVAL- IHM023V2 schematic - part 5



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Figure 6. STEVAL- IHM023V2 schematic - part 6



2 Revision history

Table 1. Document revision history

Date	Revision	Changes
26-Sep-2011	1	Initial release.

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