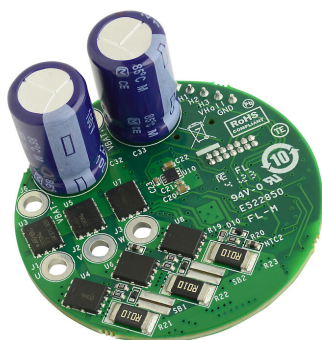


Compact reference design based on STDRIVE101 for brushless motor-driven vacuum cleaners



Features

- Operating voltage from 18 V to 52 V
- STDRIVE101, advanced three phase gate driver
- STM32G071KB microcontroller based on Arm® Cortex®-M0+ with 36 Kbytes of SRAM and 128 Kbytes of Flash
- Power stage based on STL220N6F7 60 V, 1.2 mΩ N-channel power MOSFETs with output current up to 15 Arms
- External turn-on/off trigger providing very low consumption standby
- Input connector for Hall-effect based sensors and encoder
- BEMF sensing circuitry and current limiter with adjustable reference
- Bus and temperature sensing
- Thermal shutdown, UVLO, protection against overcurrent and reverse biasing from power stage outputs
- Reliable and redundant overcurrent protection thanks to VDS monitoring"
- Extremely compact footprint (50 mm diameter)
- SWD debug interface and direct firmware update through UART (DFU)

Application

- Battery powered home appliance
- Power tools
- Fans
- Industrial automation
- Drones
- Robotics

Description

The EVLDRIIVE101-HPD is a three-phase extremely compact inverter for brushless motors based on the STDRIVE101 device in conjunction with the STM32G071KB microcontroller. It can be used with an extremely wide variety of driving techniques, with FOC and trapezoidal control, sensed and sensor-less. The board is a ready-to-use and flexible solution ideal for battery-powered three-phase applications requiring high output currents. The EVLDRIIVE101-HPD embeds a fast power-on circuit that connects/disconnects the battery, significantly extending its duration. The low $R_{ds(on)}$ STL220N6F7 MOSFETs allow operation at very high load current up to 750 W. The whole design is done in a compact circular layout of 50 mm diameter.

Debug support and programming capability are possible thanks to the provided SWD interface and the direct firmware update is also available.

Product status link

[EVLDRIIVE101-HPD](#)

[STDRIVE101](#)

[STM32G071KB](#)

[STL220N6F7](#)

[L7983](#)

[LDL112](#)

[TSV991](#)

1 EVLDRIIVE101 schematic diagram

Figure 1. EVLDRIIVE101-HPD schematic: STM32G071 and STDRIVE101

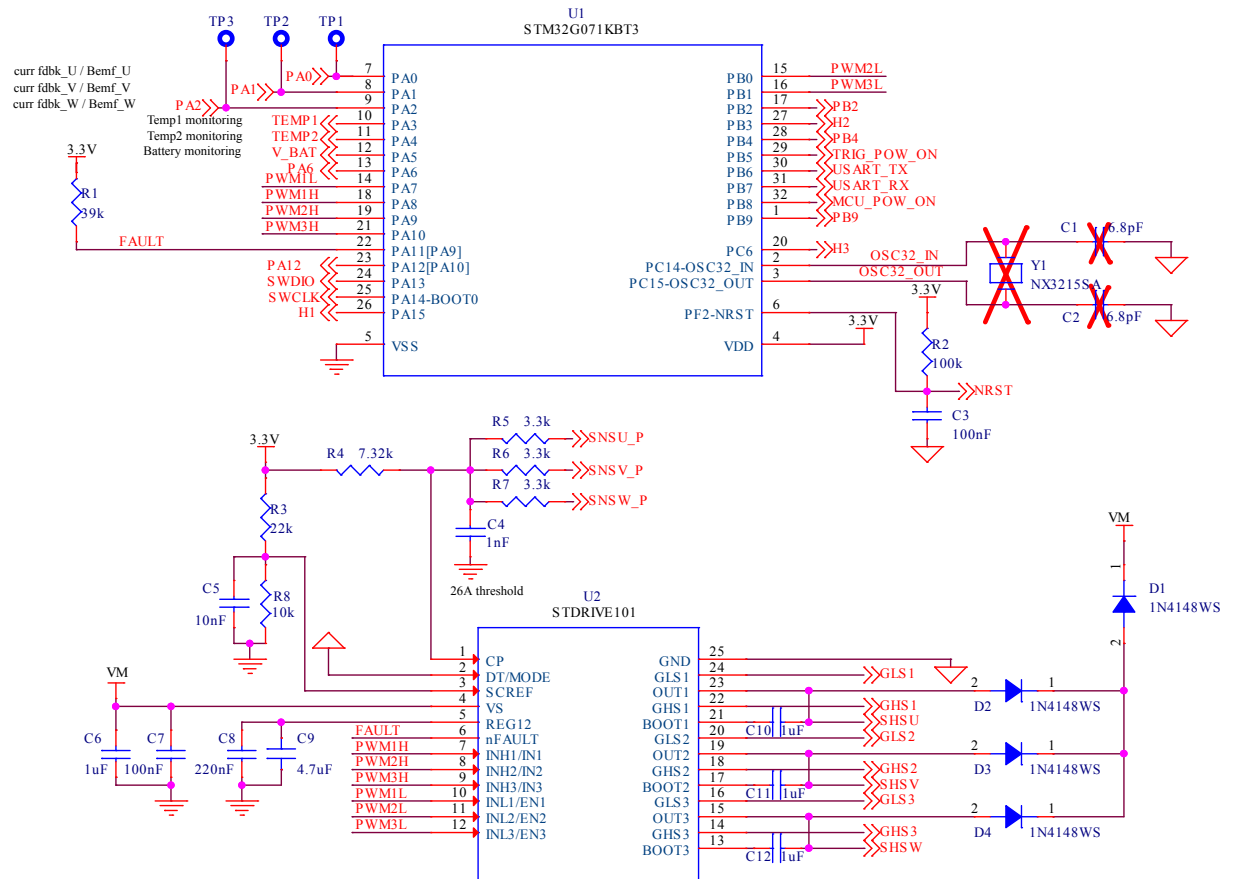


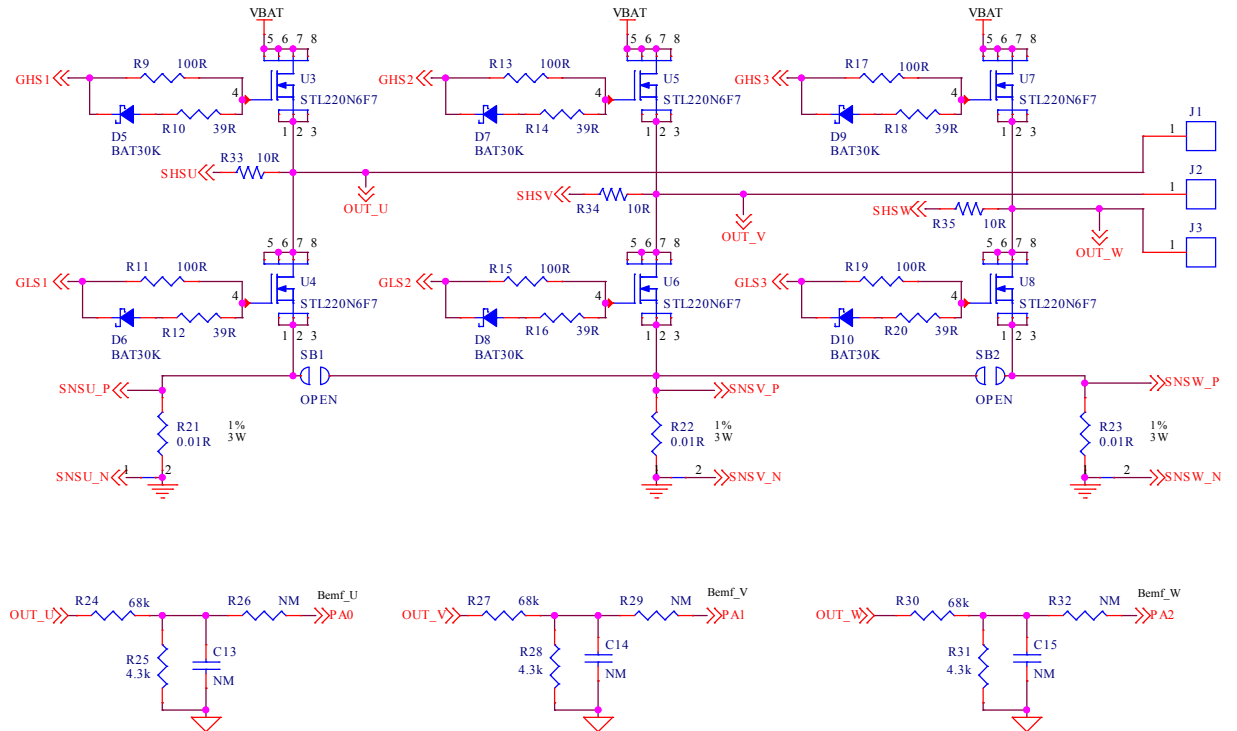
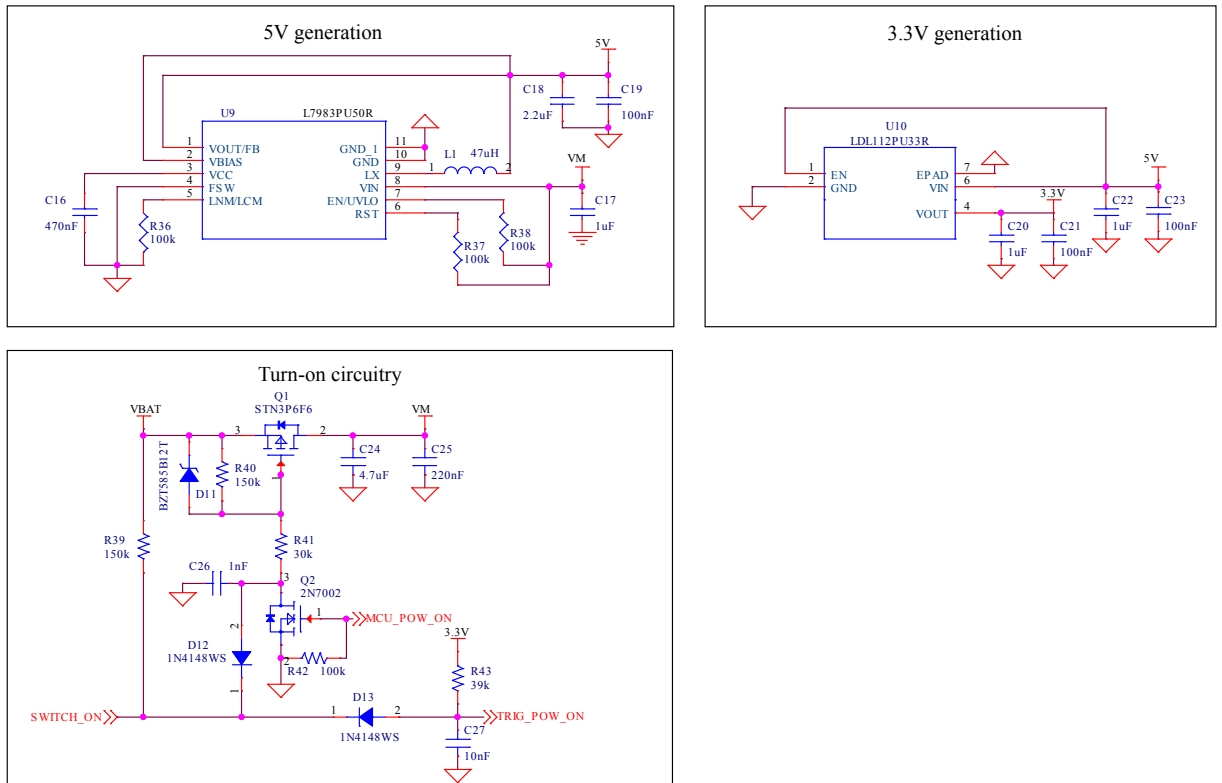
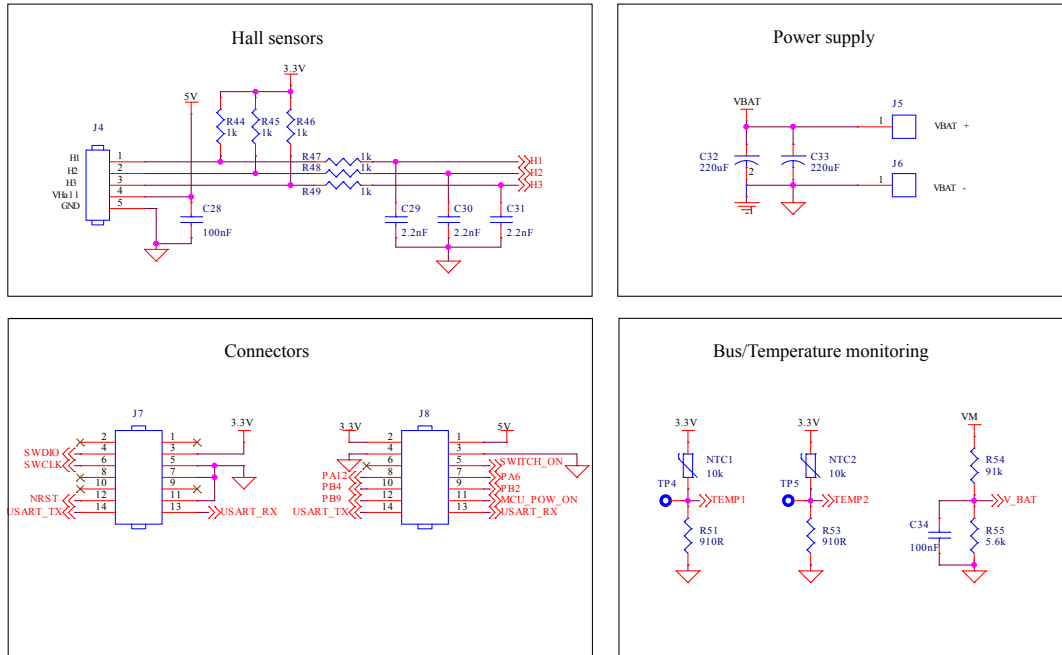
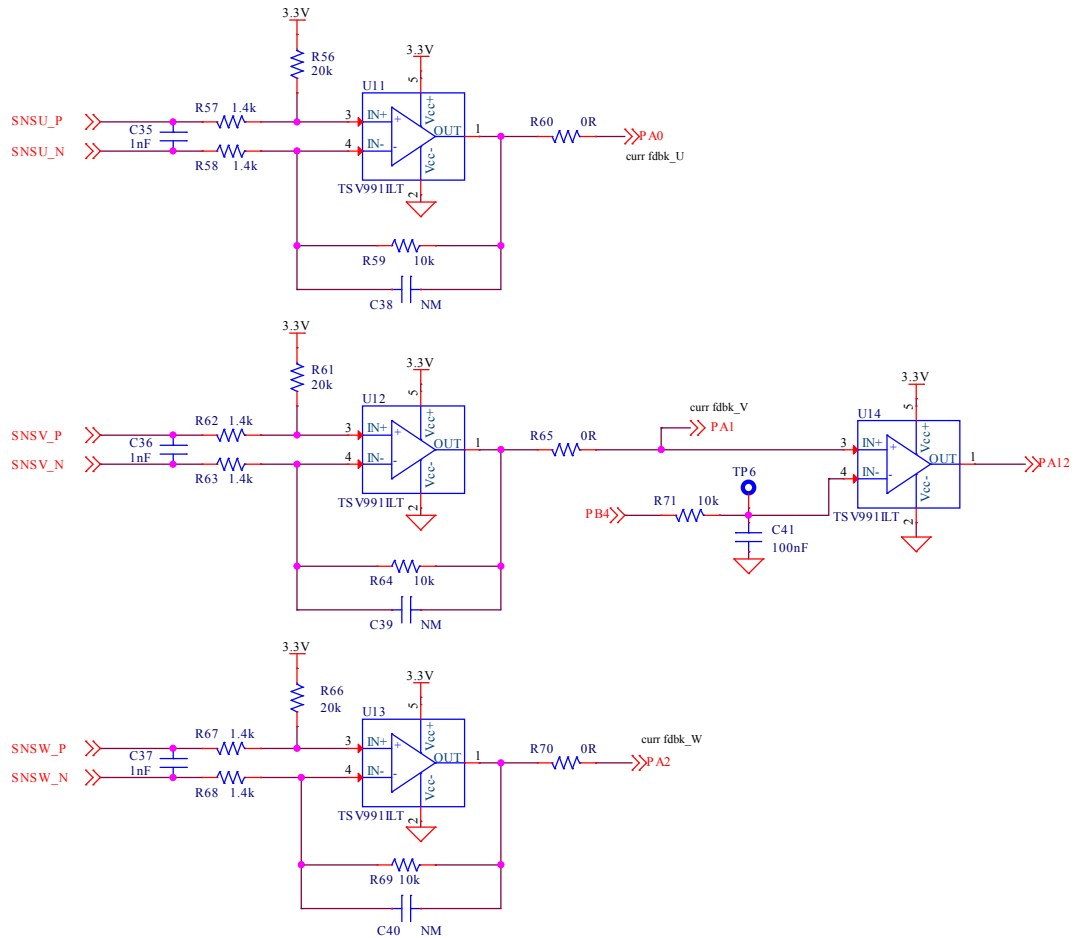
Figure 2. EVLDRIIVE101-HPD schematic: power stage

Figure 3. EVLDRIIVE101-HPD schematic: power supply conversion


Figure 4. EVLDRIVE101-HPD schematic: inputs and outputs

Figure 5. EVLDRIVE101-HPD schematic: current sensing


Revision history

Table 1. Document revision history

Date	Version	Changes
11-Dec-2023	1	Initial release.



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Table 1.

Document revision history

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