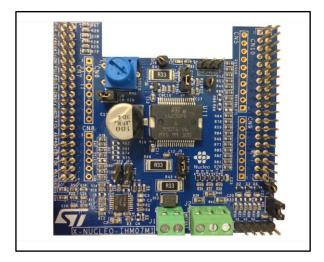


X-NUCLEO-IHM07M1

Three-phase brushless DC motor driver expansion board based on L6230 for STM32 Nucleo

Data brief



Features

- 3-phase driver for BLDC/PMSM motors
- Nominal operating voltage range from 8 V to 48 VDC
- 2.8 A output peak current (1.4 A_{RMS})
- Operating frequency up to 100 kHz
- Non dissipative overcurrent detection and protection
- Cross-conduction protection
- Thermal measuring and overheating protection
- Compatible with STM32 Nucleo boards
- Equipped with ST Morpho connectors
- 3-shunt and 1-shunt configurable jumpers for motor current sensing
- Hall/Encoder motor sensor connector and circuit
- Debug connector for DAC, GPIOs, etc.
- Potentiometer available for speed regulation
- User LED
- RoHS compliant

Description

The X-NUCLEO-IHM07M1 is a three-phase brushless DC motor driver expansion board based on the L6230 for STM32 Nucleo. It provides an affordable and easy-to-use solution for driving three-phase brushless DC motor in your STM32 Nucleo project. The X-NUCLEO-IHM07M1 is compatible with the ST Morpho connector and supports the addition of other boards which can be stacked with onto a single STM32 Nucleo board. The user can also mount the Arduino UNO R3 connector. The driver used on this STM32 Nucleo board is the L6230, a DMOS fully integrated driver for three-phase brushless DC motors assembled in a PowerSO-36 package (L6230PD), with overcurrent and thermal protection. The L6230 driver is optimized for six-step and FOC algorithms thanks to independent current sensing.



1 Schematic diagrams

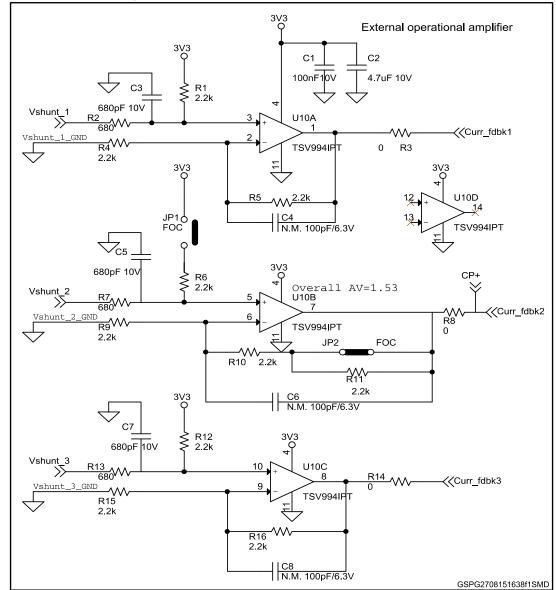
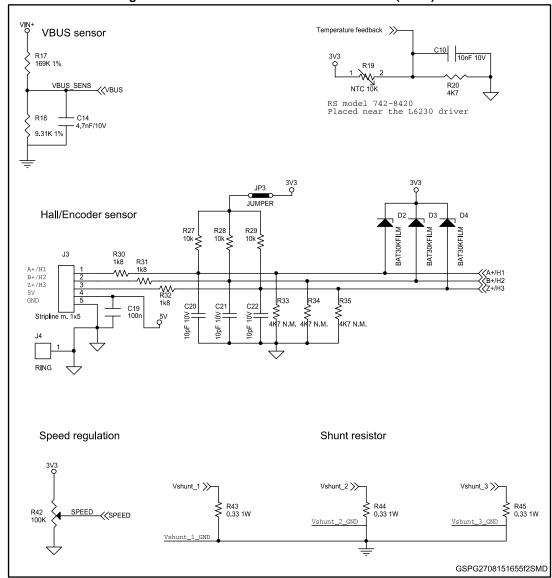


Figure 1: X-NUCLEO-IHM07M1 circuit schematic (1 of 4)

X-NUCLEO-IHM07M1 Schematic diagrams

Figure 2: X-NUCLEO-IHM07M1 circuit schematic (2 of 4)



Schematic diagrams X-NUCLEO-IHM07M1

L6230 DMOS driver for three-phase brushless DC motor Power connector 00000000000000 CURRENT REF 9 10 IN1 EN1 IN1 NI EN1 00TZ 00TZ 00TZ \perp BEMF detection - six step GPIO_BEMF GPIO_BEMF GPIO_BEMF OUT1 BEMF1 (BEMF1 Single/three shunt configuration GSPG2708151724f3SMD

Figure 3: X-NUCLEO-IHM07M1 circuit schematic (3 of 4)

X-NUCLEO-IHM07M1 Schematic diagrams

-{{CPOUT GPIO_BEMF JZ/ ON: 1) 12VMAX ON J26 2) JP5 (Nudeo pin 2,3) 2) JP1 (Nudeo) Removed STM32 Nucleo part used OPEN BY DEFAULT PC13 - START/STOP (B1 BUTTON) RESET - MCU RST (B2 BUTTON) C10_12 >> PA12-TIM1 ETR Q R52 A 1855 **BEMF** six-step C10_24 >> PB1 0 R78 ∑‱ 2885 <u>z</u> > PC9 - GPIO C10_22 〉 9 $\frac{2}{\text{JUMPER VIN 3A}}$ C7_37 C7_34 C10_15 C10_26 C10_1 \$0 **(**(CURRENT REF J7 Stripline m. 1x3 Temperature feedback R62 NM 13K 1% ((C7_34 <</p> 7 2 8 CN10 0 R82 PA5-DAC 0 R82 PA5/PB13 0 R85 PB5-DAC PWM Currents 0-N.M. R76 PA4- DAC 0 R77 PB4-PWM N.N. 4.99K NShunt 1 1 → PA1 - EmbPGA R61 AING RING Vshunt_3>> PB0 - EmbPGA Arduino/STMorpho connector EmbPGA C10_11 C10_30 C10_29 $\frac{\text{C7}}{\text{C10}}$ 27 C7_28 C7_36 C7_38 C7_30 C7_35 DAC/REF A+/H1 B+/H2 Z+/H3 CN8 CN6 55 C7_18 C6 2 + C Hall/Encoder sensor 888888 PA10-WH PWM 248 0 5 \$\$\$\$ %R58 0 $\begin{array}{c} \text{C10} \ 21 \\ \text{C7} \ 2 \end{array} \right\} \times \begin{array}{c} \text{R64} \ 0 \\ \text{R67} \ 0 \end{array}$ $\frac{\text{C10}}{\text{C7}} \frac{33}{3} \frac{\text{R70}}{\text{R72}} \frac{0}{0}$ C10_14 >>PA11_ GSPG2708151747f4SMD C10_28 >>F302_ CN7 C10_23 C7_1

Figure 4: X-NUCLEO-IHM07M1 circuit schematic (4 of 4)

Revision history X-NUCLEO-IHM07M1

2 Revision history

Table 1: Document revision history

Date	Version	Changes
27-Aug-2015	1	Initial release.

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