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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China









Data brief

Three-phase brushless DC motor driver expansion board based on STSPIN830 for STM32 Nucleo







Product summary		
Three-phase brushless DC motor driver expansion board based on STSPIN830 for STM32 Nucleo	X-NUCLEO-IHM16M1	
Three-phase brushless monolithic motor driver	STSPIN830	
STM32 Nucleo development board	STM32 Nucleo	

Features

- Operative voltage from 7 to 45 V
- Output current up to 1.5 A_{rms}
- · Supporting single shunt and three-shunt sensing
- Standby mode
- Flexible direct driving settable between 3 or 6 PWM inputs
- · Current limiter with adjustable reference
- Overcurrent, short-circuit and interlocking protections
- · Thermal shutdown and undervoltage lockout
- · BEMF sensing circuitry
- Bus voltage and PCB temperature sensing
- · Input connector for Hall-effect based sensors and encoder

Description

The X-NUCLEO-IHM16M1 motor driver expansion board is based on the STSPIN830 monolithic driver for three-phase brushless motors.

It represents an affordable, easy-to-use solution for driving brushless motors in your STM32 Nucleo project, implementing single and three-shunt current sensing.

The STSPIN830 embeds a PWM current limiter with adjustable threshold together with a full set of protections.

The X-NUCLEO-IHM16M1 expansion board is compatible with the Arduino and ST morpho connectors, so it can be plugged to an STM32 Nucleo development board and stacked with additional STM32 Nucleo expansion boards.

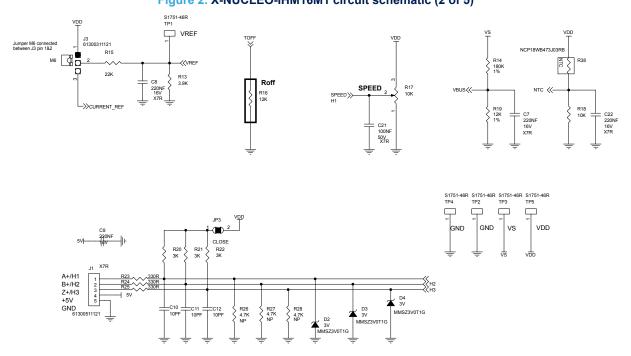


1 X-NUCLEO-IHM16M1 schematic diagrams

VREF >> EN_FAULT TOFF >> TOFF 16 STBY OUTW ENU >> 19 INU >> ->>>OUTV INU/INUH OUTV 20 ENU/INUL OUTU —>>>ou⊤u 21 INV/INVH 22 FNV/INVI SENSEW ->>SENSEV INW >> SENSEV INW/INWH R32 NP 24 ->>SENSEU ENW/INWL SENSEU J2 61300311121 M5 C5 NC 8 2.2NF R12

Figure 1. X-NUCLEO-IHM16M1 circuit schematic (1 of 5)





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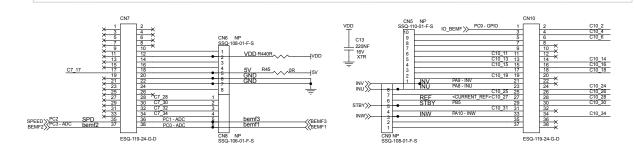


PC5 R31 OR C7_32 PA4 - DAC R39 NP DAC C10_6 C10_27 PB4 - PWM R40 OR PWM C7_28 PA0 R33 0R ->>CURRENT REF C7_17 PA15 - H1 R43 OR R81 OR F030 (H1 R29 OR C10_14 PA11 - BKIN2 R35 OR BKIN2 (F302, F303) -√⟨Curr fdbk1 C10_31 PB3 - H2 R86 OR R41 OR F303 C10_16 PB12 - BKIN R37 OR (EN_FAULT C10_18 PB11 - PhV Sense C10_19 PC7 - H2 R85 OR F030 H2 R42 0R C10_24 PB1 - PhV Sense C10_25 PB10 - H3 R84 OR C10_15 PA7 - PhW Sense R34 OR F303

C7_34 PB0 - PhW Sense R36 OR R61 OR C10_2 PC8 - H3 R87 OR F030 C10_26 PB15 C10_15 PB15 R69 NP F302 -0R R82 OR C10_34 PC4 C10_28 PB14 R73 ____OR C10_18 PA6 R83 NP F302 NTC STM32F303 Embedded OPAMP C10_13 PB14 R78 NP F302 (ENV R74 NP F303 (Embedded OPAMP ONLY) C10_30 PB13 R76 NP ((OP303_V C10_30 PB13

R79 NP F302 (ENU

Figure 3. X-NUCLEO-IHM16M1 circuit schematic (3 of 5)

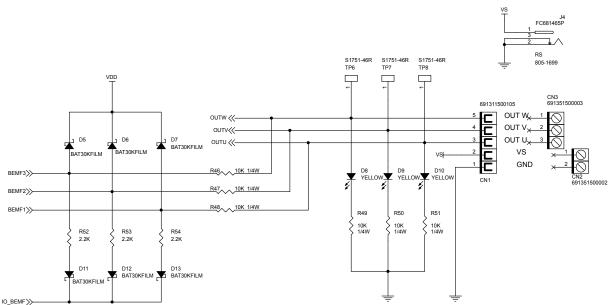


C10_11 PB13



C10_18 PB11 R77 NP (OP303_W

Figure 4. X-NUCLEO-IHM16M1 circuit schematic (4 of 5)



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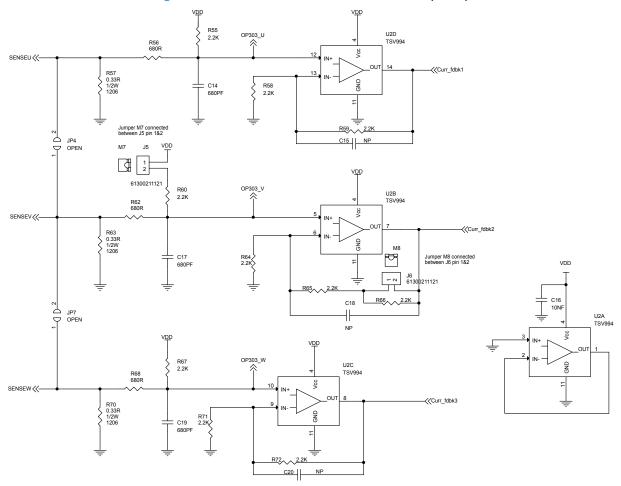


Figure 5. X-NUCLEO-IHM16M1 circuit schematic (5 of 5)

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Revision history

Table 1. Document revision history

Date	Version	Changes
15-May-2018	1	Initial release.

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