

## Industrial digital output expansion board based on IPS160HF for STM32 Nucleo



### Features

- Based on **IPS160HF** single high-side switch, which features:
  - Operation up to 60 V/2.4 A
  - Low power dissipation ( $R_{ON(MAX)} = 120\text{ m}\Omega$ )
  - Fast decay for inductive loads
  - Open load detection and diagnostics
  - Overload and overheating protections with thermal shut-down and cut-off
  - PowerSSO-12L package
- Application board operating range: 12 to 33 V/0 to 2.4 A
- Extended voltage operating range (J1 open) up to 60 V
- Status and diagnostic LEDs
- 3 kV galvanic isolation
- Supply rail reverse polarity protection
- Ready for Safety Digital Output Architecture
- Wide application development potential in **STM32 Nucleo** development environment
- Equipped with Arduino™ UNO R3 connectors
- CE certified
- RoHS and China RoHS compliant

### Description

The **X-NUCLEO-OUT08A1** industrial digital output expansion board for **STM32 Nucleo** provides a powerful and flexible evaluation and development environment for 2 A (typ.) digital output modules, featuring the safe driving and smart diagnostic capabilities of the **IPS160HF** single high-side switch.

The **X-NUCLEO-OUT08A1** interfaces with the microcontroller on the **STM32 Nucleo** via 3 kV optocouplers driven by GPIO pins and Arduino™ UNO R3 (default configuration) and ST morpho (optional, not mounted) connectors.

The expansion board should be connected to either a **NUCLEO-F401RE** or **NUCLEO-G431RB** development board, and can also be stacked with another **X-NUCLEO-OUT08A1** or **X-NUCLEO-OUT10A1**.

Up to four **X-NUCLEO-OUT08A1** expansion boards can be stacked to evaluate up to a quad channel digital output module with 2 A (typ.) capability each.

It is also possible to evaluate the typical cascade architecture of a single channel digital output module for safety applications: in this scenario, the first shield output is connected to the supply of the second one. Dedicated on-board hardware can be enabled or disabled to activate fast discharge of high capacitive loads, output voltage sensing, and an additional surge pulse output line protection.

Product summary	
Industrial digital output expansion board based on IPS160HF for STM32 Nucleo	<a href="#">X-NUCLEO-OUT08A1</a>
Software expansion for STM32Cube driving industrial digital output based on intelligent power switch (IPS)	<a href="#">X-CUBE-IPS</a>
Single high-side switch	<a href="#">IPS160HF</a>
Applications	<a href="#">Industrial Safety</a> <a href="#">Industrial Tools</a>

# 1 Schematic diagrams

Figure 1. X-NUCLEO-OUT08A1 circuit schematic (1 of 2)

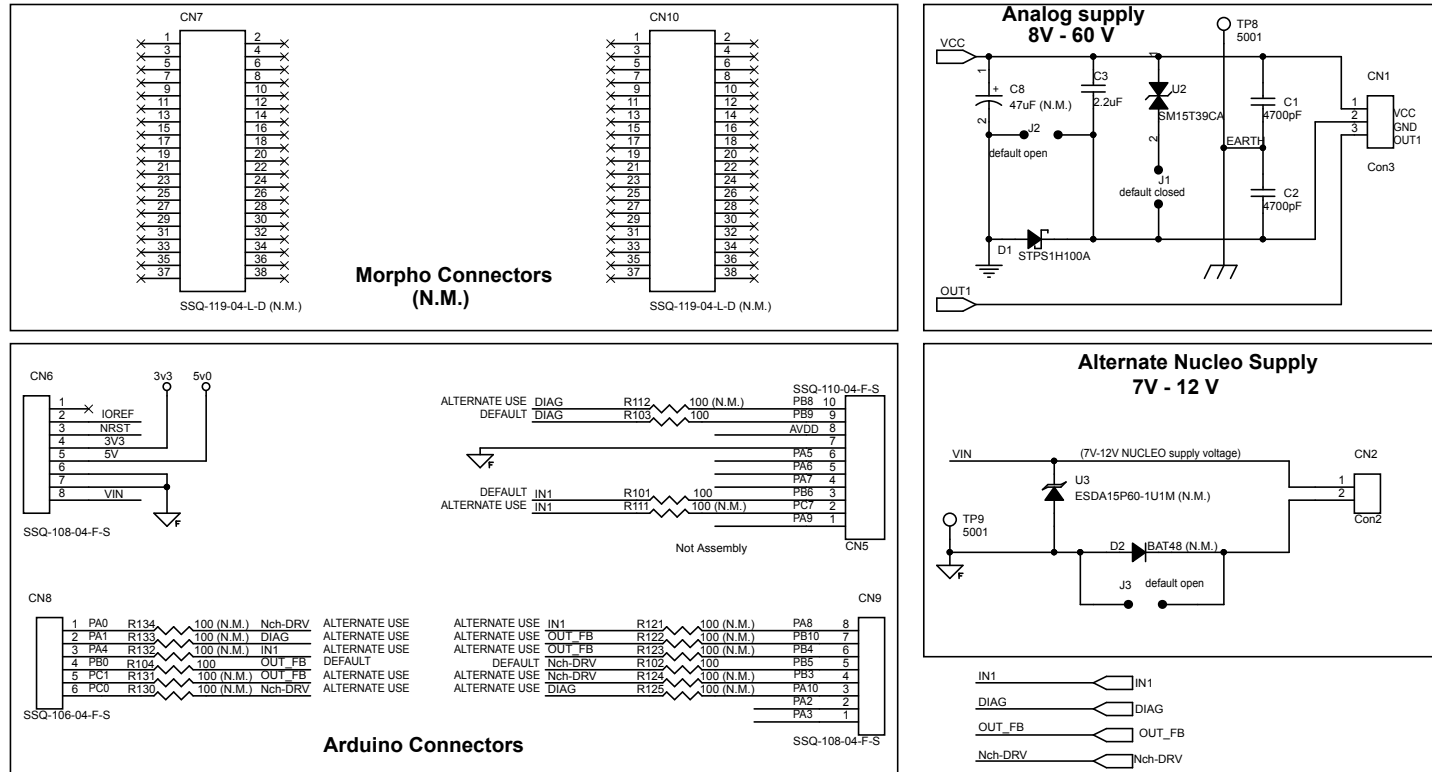
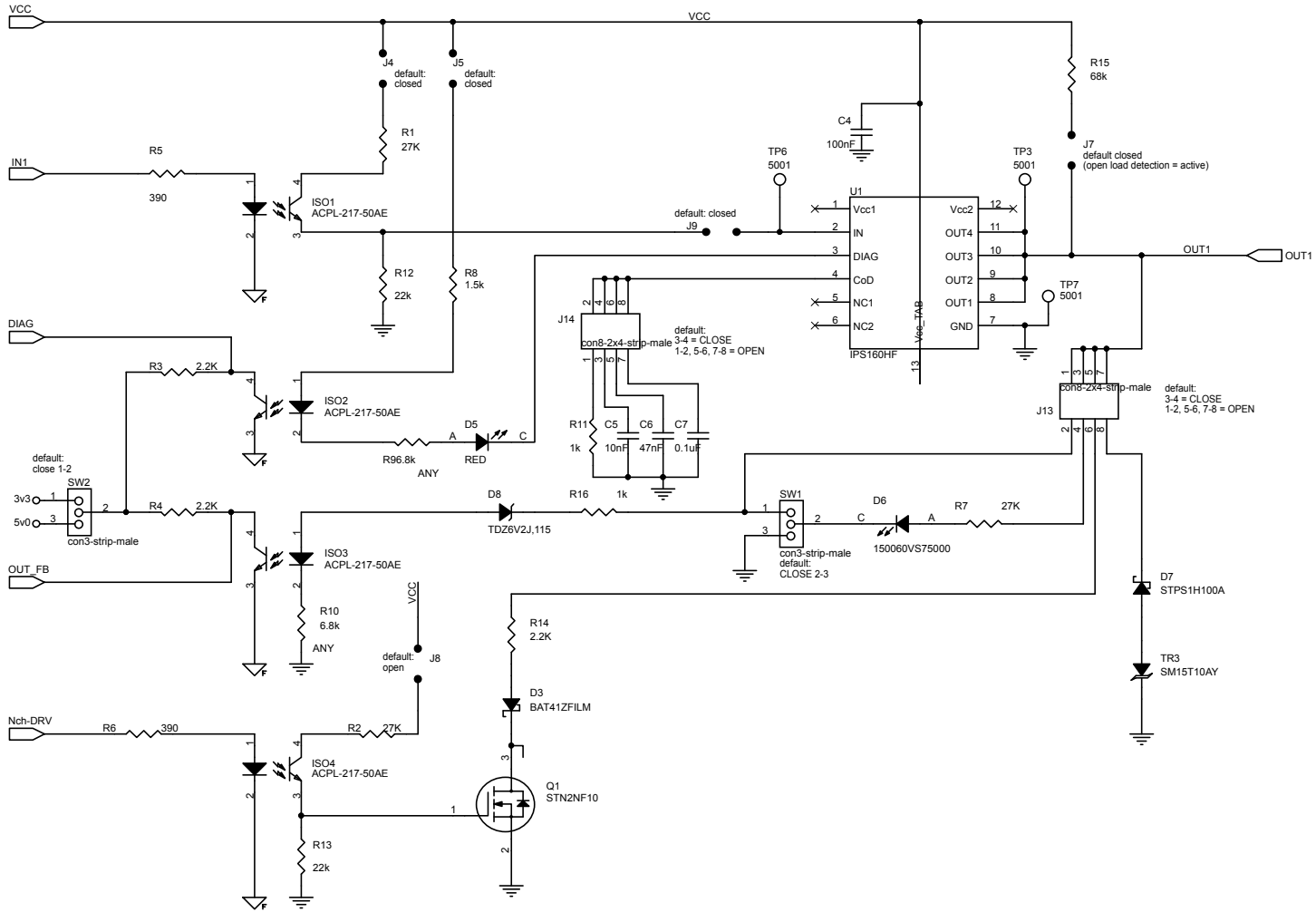


Figure 2. X-NUCLEO-OUT08A1 circuit schematic (2 of 2)



## Revision history

**Table 1. Document revision history**

Date	Version	Changes
12-Jun-2020	1	Initial release.
03-11-2022	2	Updated Product summary and Description.

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