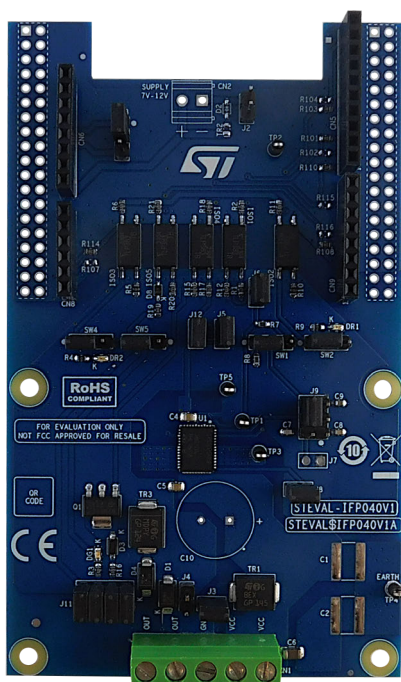


## Industrial digital output expansion board based on IPS1025HF in a QFN48L package



### Features

- Based on the **IPS1025HF** single high-side switch, which features:
  - Operating range up to 60 V
  - Low-power dissipation ( $R_{ON(MAX)} = 25\text{ m}\Omega$ )
  - Propagation delay at startup  $< 60\text{ }\mu\text{s}$
  - Fast decay for inductive loads
  - Smart driving of capacitive load
  - Under-voltage lock-out
  - Overload and overtemperature protections
  - QFN48L 8x6 mm package
- Application board operating range: 8-33 V/0-2.5 A
- Extended voltage operating range (J3 open) up to 60 V
- Green LED for output on/off status (J11 close 3-4 and SW5 close 1-2)
- Red LEDs for overload and overheating diagnostics (SW2 and SW4 close 2-3)
- Output voltage on/off status feedback (J11 close 1-2)
- Control signal for fast discharge of output voltage (J11 close 5-6, J12 close)
- External fast discharge circuitry for huge inductive loads (J11 close 7-8)
- 5 kV galvanic isolation
- Supply rail reverse polarity protection
- Compatible with **STM32 Nucleo** development boards
- Equipped with Arduino® UNO R3 connectors
- CE certified
- RoHS and China RoHS compliant
- Not FCC approved for resale

### Product summary

|                                                                                                                                          |                                       |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Industrial digital output expansion board based on IPS1025HF                                                                             | <b>STEVAL-IFP040V1</b>                |
| High efficiency, high-side switch with extended diagnostics, smart driving for capacitive loads, and short propagation delay at power-on | <b>IPS1025HFQ</b>                     |
| Software expansion for STM32Cube driving industrial digital output based on IPS                                                          | <b>X-CUBE-IPS</b>                     |
| Applications                                                                                                                             | <b>Programmable Logic Controllers</b> |

### Description

The **STEVAL-IFP040V1** is an industrial digital output expansion board. It provides a powerful and flexible environment for the evaluation of the driving and diagnostic capabilities of the **IPS1025HF** single high-side, smart power, solid-state relay in a digital output module connected to 2.5 A industrial loads.

The **STEVAL-IFP040V1** can interface with the microcontroller on the **STM32 Nucleo** via 5 kV optocouplers driven by the GPIO pins and Arduino® UNO R3 connectors.

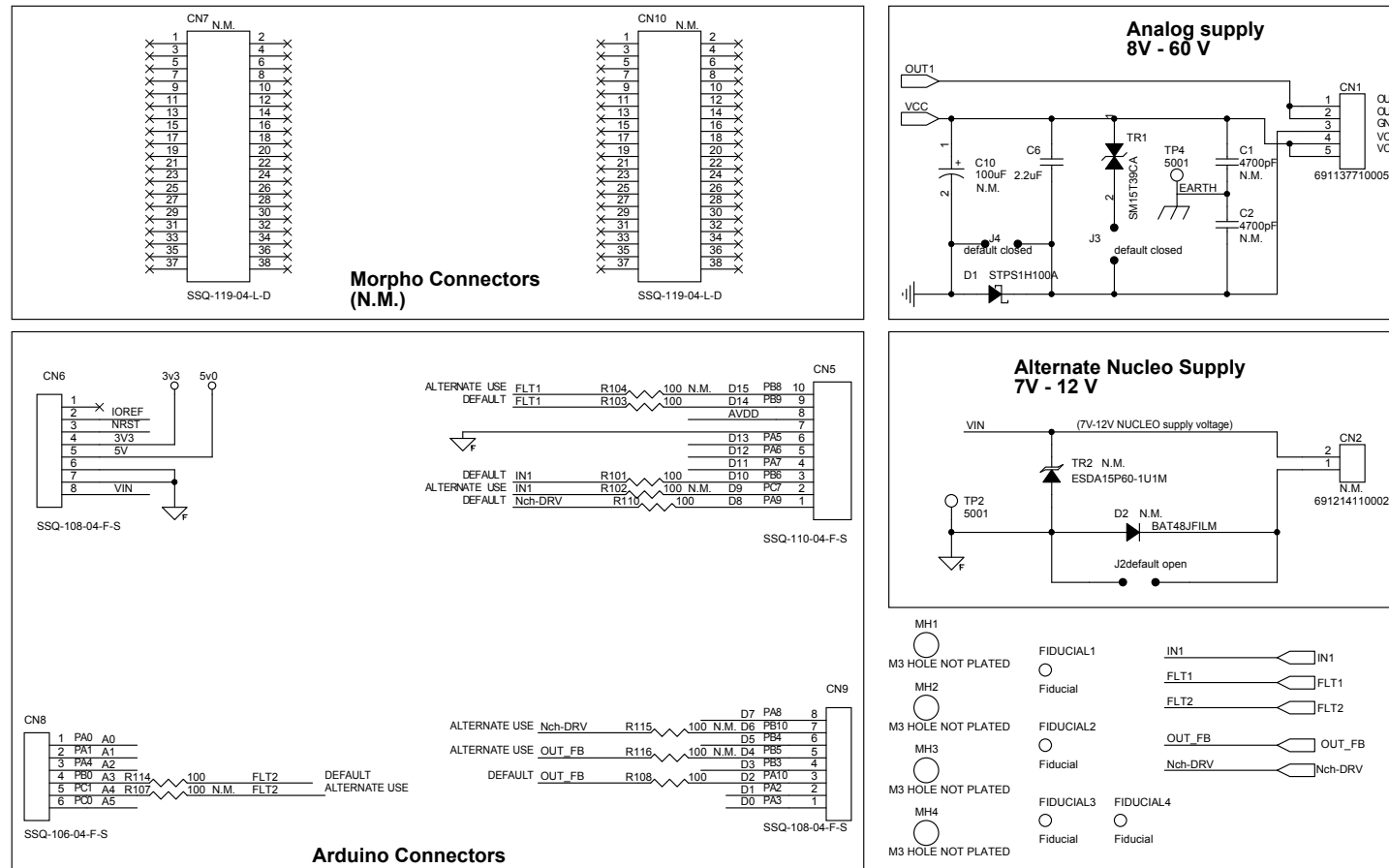
The expansion board can be connected to either a **NUCLEO-F401RE** or a **NUCLEO-G431RB** development board.

You can also evaluate a system consisting of an **STEVAL-IFP045V1** stacked on an **STEVAL-IFP040V1** expansion board.

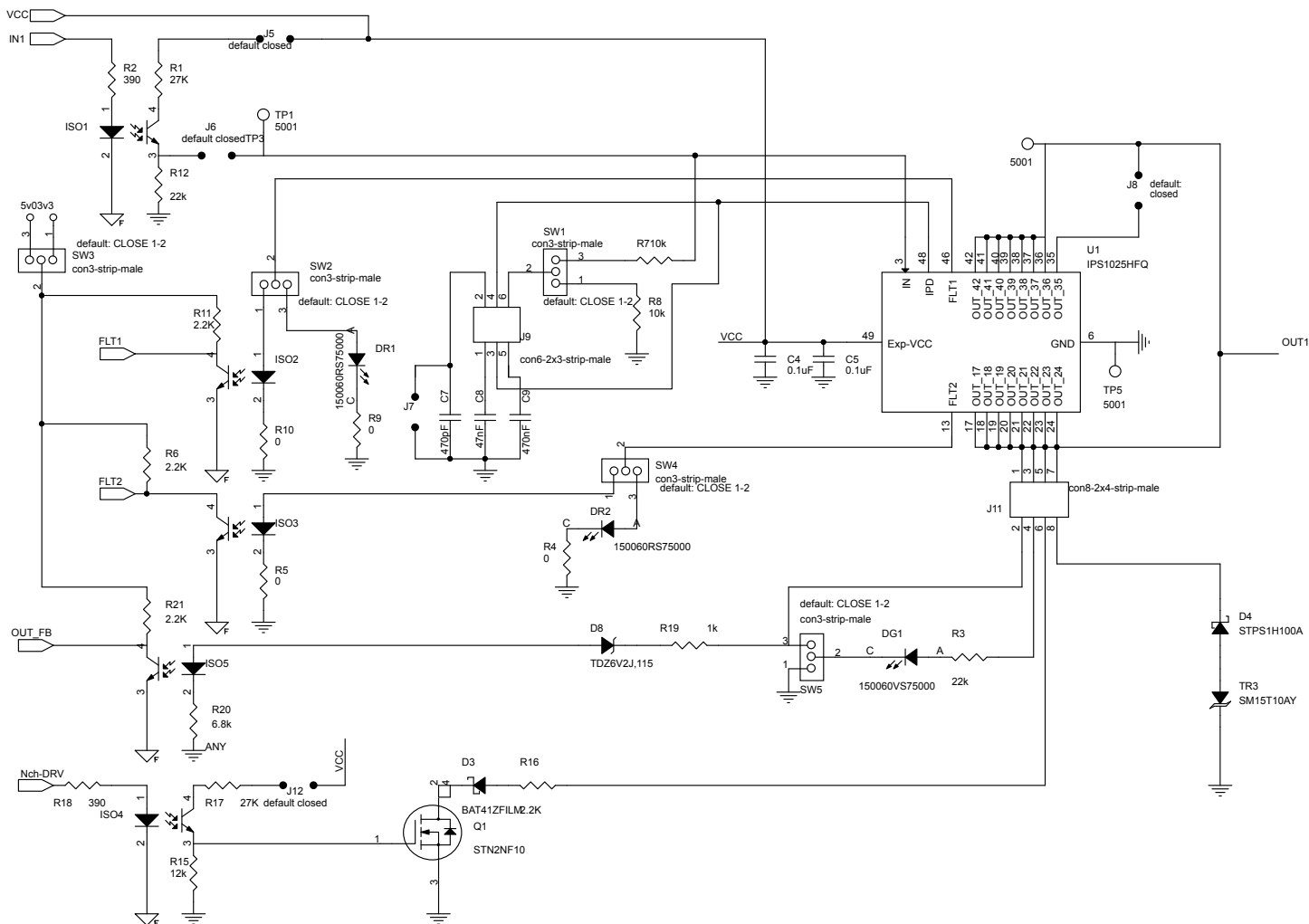
Supplying the **STEVAL-IFP045V1** through the main supply rail and the **STEVAL-IFP040V1** through the output of the **STEVAL-IFP045V1**, you can achieve the typical architecture of a single channel digital output for safety systems. The process stages of the two expansion boards result cascaded. The load connected to the **STEVAL-IFP040V1** output can be supplied only when both cascaded systems are properly working.

## Schematic diagrams

Figure 1. STEVAL-IFP040V1 circuit schematic (1 of 2)



**Figure 2. STEVAL-IFP040V1 circuit schematic (2 of 2)**



## 2 Board versions

**Table 1. STEVAL-IFP040V1 versions**

| PCB version                      | Schematic diagrams                   | Bill of materials                   |
|----------------------------------|--------------------------------------|-------------------------------------|
| STEVAL\$IFP040V1A <sup>(1)</sup> | STEVAL\$IFP040V1A schematic diagrams | STEVAL\$IFP040V1A bill of materials |

1. This code identifies the STEVAL-IFP040V1 evaluation board first version. It is printed on the board PCB.

## Revision history

Table 2. Document revision history

| Date        | Revision | Changes          |
|-------------|----------|------------------|
| 29-Aug-2022 | 1        | Initial release. |

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