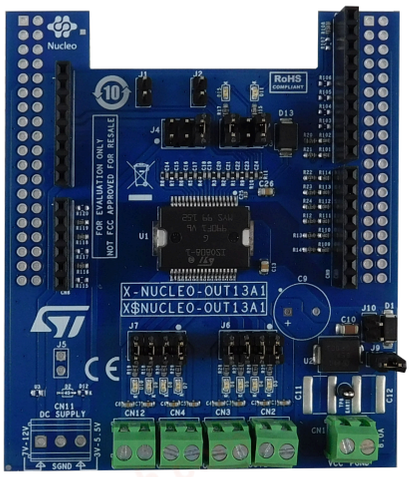
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# X-NUCLEO-OUT13A1

Data brief

## Industrial digital output expansion board based on ISO808-1 for STM32 Nucleo




STM32 Nucleo

| Product summary | |
|---|---|
| Industrial digital output expansion board based on ISO808-1 for STM32 Nucleo | X-NUCLEO-OUT13A1 |
| Software expansion for STM32Cube driving industrial digital output based on intelligent power switch (IPS) | X-CUBE-IPS |
| Galvanic isolated octal high-side power solid state relay for high inductive loads | ISO808TR-1 |
| Applications | Programmable Logic Controllers |

## Features

- Based on the ISO808-1 octal high-side switch, which features:
  - Operating range 9.2 to 36 V
  - Low power dissipation ($R_{ON(MAX)}$ = 260 mΩ)
  - Process side operating current: up to 1 A per channel
  - Embedded 2k $V_{RMS}$ galvanic isolation
  - Direct (jitter < 20 us) and synchronous (jitter < 6 us) control modes
  - Fast decay for inductive loads
  - Undervoltage lock-out
  - Overload and overtemperature protections
  - Loss of ground protection
  - PowerSO36 package
- Application board process side operating range: 10 (J10 open) to 33 V (J9 closed)
- Extended operating range of process side from 9.2 (J10 closed) up to 36 V (J9 open)
- Application board logic side operating voltage 3.3 to 5 V
- Green LEDs for outputs on/off status (J6 and J7 close 1-2, 3-4, 5-6, 7-8)
- Red LED for common overheating and communication error diagnostic (J3 close 1-2)
- Yellow LED for common output enable status signalization (J3 close 5-6)
- Direct control mode (J1, J2 closed)
- Synchronous control mode (J1, J2 open)
- Process and logic supply rails reverse polarity protections
- Compatible with STM32 Nucleo development boards
- Equipped with Arduino® UNO R3 connectors
- RoHS and China RoHS compliant
- CE certified

## Description

The X-NUCLEO-OUT13A1 is an industrial digital output expansion board for STM32 Nucleo. It provides a powerful and flexible environment for the evaluation of the driving and diagnostic capabilities of the ISO808-1 octal high-side smart power solid state relay, with embedded galvanic isolation, in a digital output module connected to 1.0 A industrial loads.

The X-NUCLEO-OUT13A1 directly interfaces with the microcontroller on the STM32 Nucleo driven by GPIO pins and Arduino® R3 connectors.

The galvanic isolation between the microcontroller and the process stage is guaranteed by the ISO808-1.

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

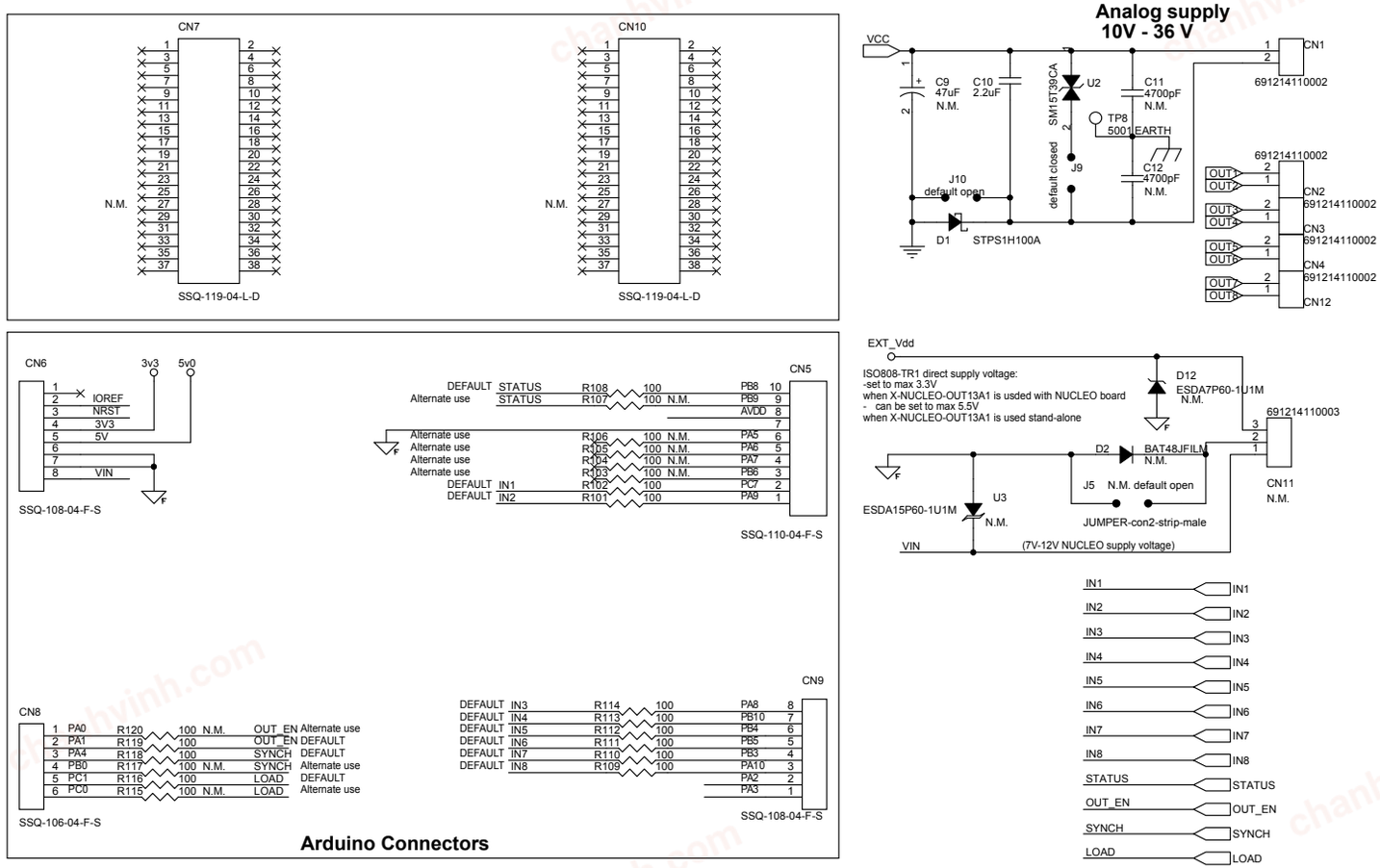
It is also possible to evaluate a system composed of a X-NUCLEO-OUT13A1 stacked on other expansion boards.

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# 1 Schematic diagrams

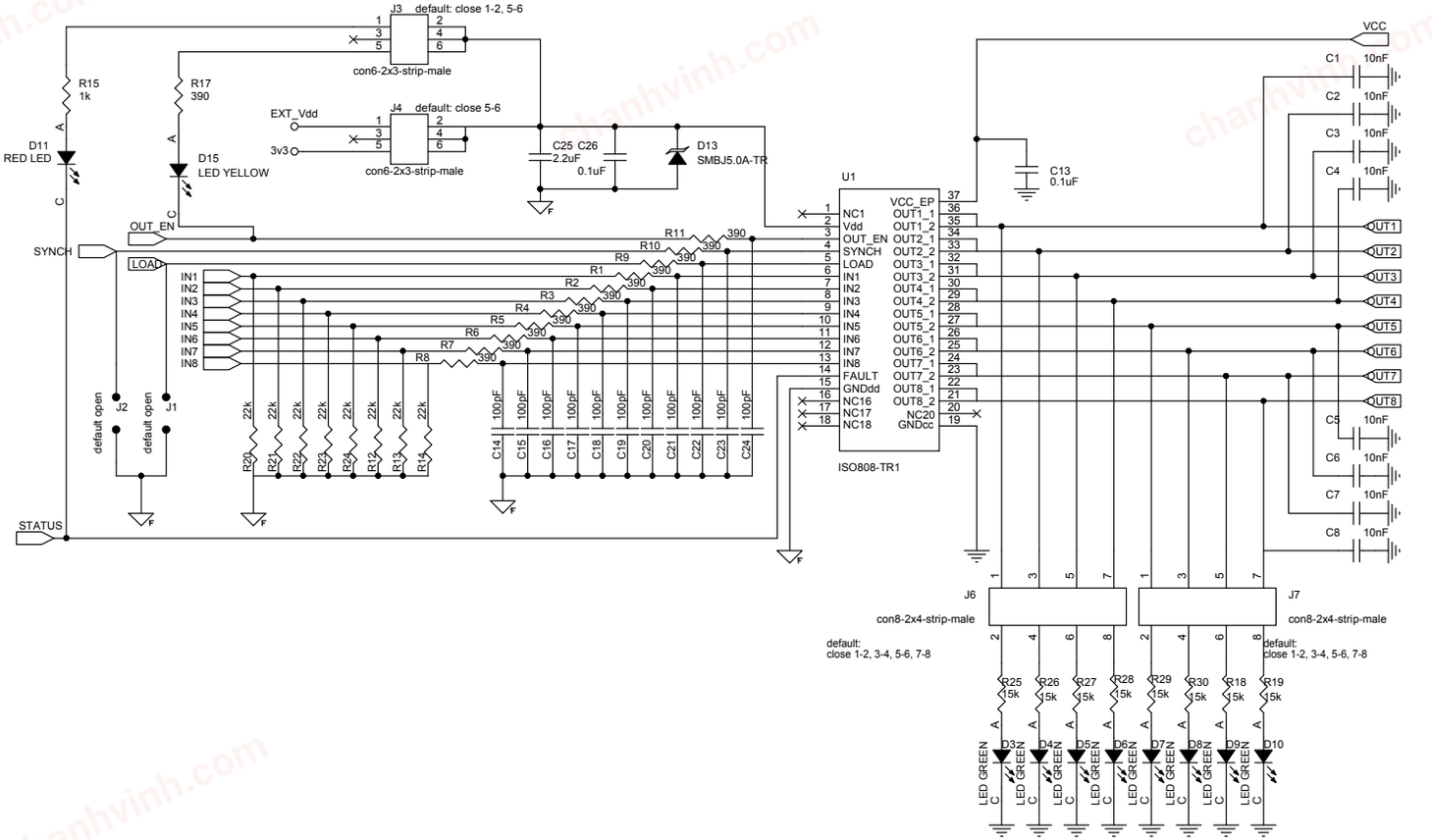
Figure 1. **X-NUCLEO-OUT13A1 circuit schematic (1 of 2)**



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**Figure 2. X-NUCLEO-OUT13A1 circuit schematic (2 of 2)**



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# 2 Board versions

Table 1. **X-NUCLEO-OUT13A1 versions**

| Finished good | Schematic diagrams | Bill of materials |
|---|---|---|
| X$NUCLEO-OUT13A1 (1) | X$NUCLEO-OUT13A1 schematic diagrams | X$NUCLEO-OUT13A1 bill of materials |

1. *This code identifies the X-NUCLEO-OUT13A1 evaluation board first version.*

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## Revision history

Table 2. **Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 21-Dec-2022 | 1 | Initial release. |
| 23-May-2023 | 2 | Minor text changes. |

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