



# STEVAL-IFP010V1

Demonstration board for the VNI2140J  
dual high-side, solid-state smart power relay

Data Brief

## Features

- Output current: 1 A per channel
- Shorted load protection
- Junction over-temperature protection
- Case over-temperature protection for thermal independence of the channels
- Non-simultaneous TCSD (thermal case shutdown) restart for the various channels
- Protection against loss of ground
- Current limitation
- Under-voltage shutdown
- Open load in OFF state and short to  $V_{CC}$  detection
- Open drain diagnostic outputs
- 3.3 V CMOS/TTL compatible inputs
- Fast demagnetization of inductive loads
- Conforms to IEC 61131-2 supply voltage: +4 V to +36 V

## Description

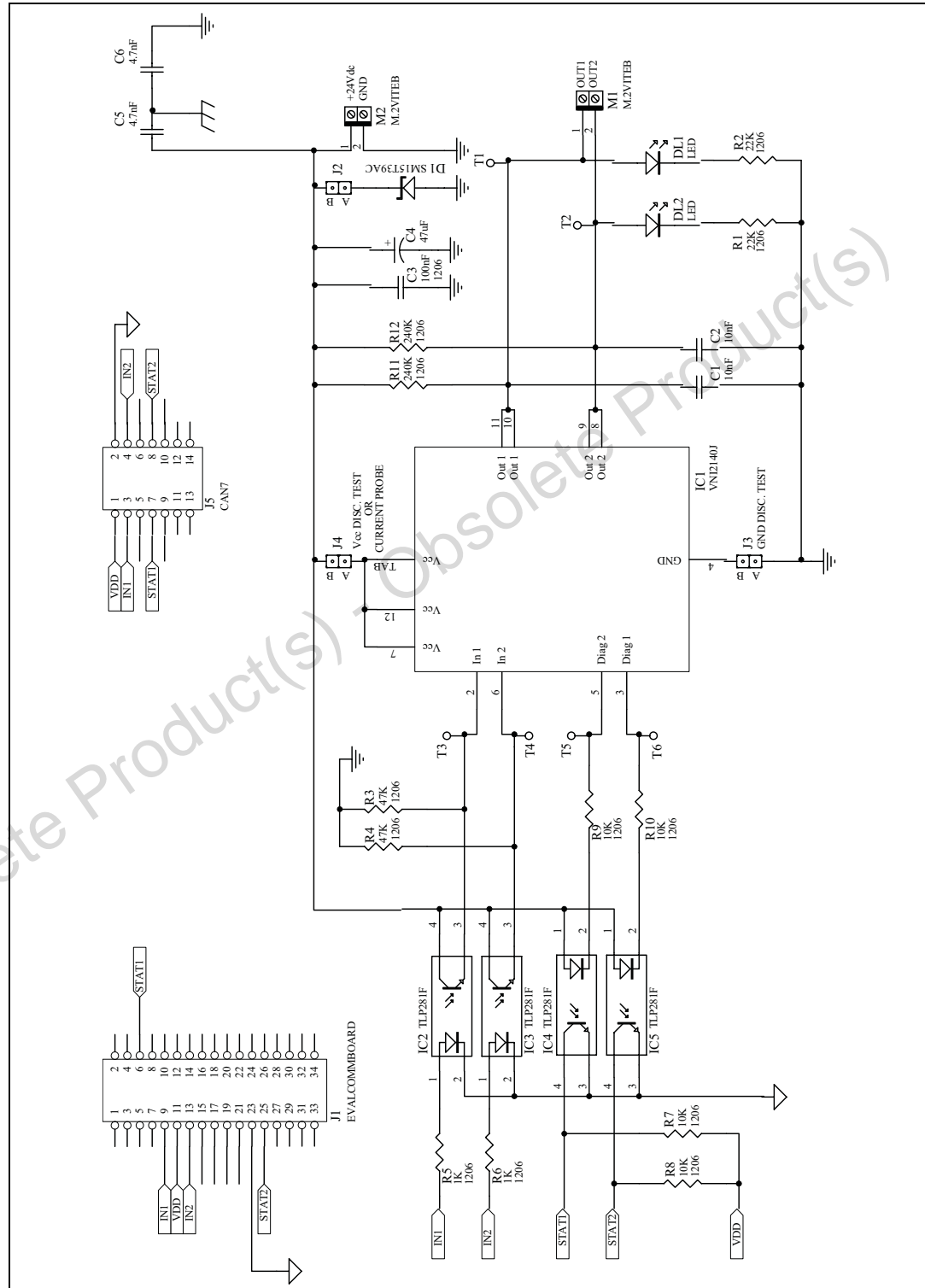
This demonstration board is based on the VNI2140J, a monolithic device designed using ST's VIPower technology for driving two independent resistive or inductive loads with one side connected to ground. Active current limitation prevents the dropping of system power supply in case of a shorted load. Built-in thermal shutdown protects the chip from over-temperature and short-circuit. In overload condition, channel turns OFF and back ON automatically in order to maintain the junction temperature between TTSD and TR. If this condition causes case temperature to reach TCSD, the overloaded channel is turned OFF and will restart only when case temperature has decreased down to TCR.



In cases where more than one channel is in overload, the TCSD restart will not be simultaneous, in order to prevent high peak current from the supply. Non overloaded channels continue to operate normally. The open drain diagnostics output indicates over-temperature.

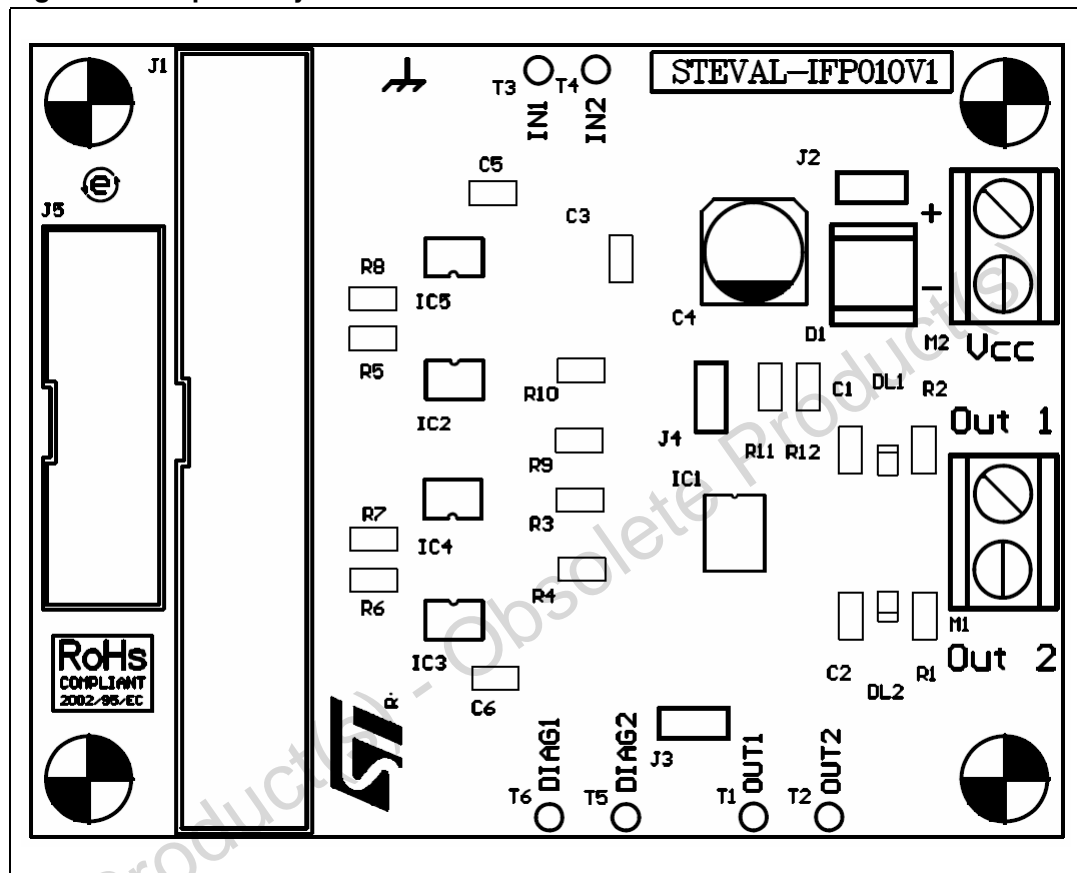
# 1 Board schematic

Figure 1. Schematic diagram



## 2 Board layout

Figure 2. Top overlay<sup>(1)</sup>



1. Drawing not to scale

### 3 Bill of materials

Table 1. BOM list

Designator	Part type	Description
C1	10 nF	SMD capacitor
C2	10 nF	SMD capacitor
C3	100 nF	SMD capacitor
C4	47 $\mu$ F	SMD capacitor
C5	4.7 nF	SMD capacitor
C6	4.7 nF	SMD capacitor
D1	SM15T39AC	ST Transil diode
DL1	LED	SMD LED diode
DL2	LED	SMD LED diode
IC1	VNI2140J	ST HSD IC
IC2	TLP281F	Optocoupler
IC3	TLP281F	Optocoupler
IC4	TLP281F	Optocoupler
IC5	TLP281F	Optocoupler
J1	EVALCOMMBOARD	34.P plug
J3	GND disc. test	Jumper
J4	V <sub>CC</sub> disc. test	Jumper
J5	CAN7	14.P plug
M1		2-screw connector
M2		2-screw connector
R1	22 k $\Omega$	R-1206 SMD resistor
R10	10 k $\Omega$	R-1206 SMD resistor
R11	240 k $\Omega$	R-1206 SMD resistor
R12	240 k $\Omega$	R-1206 SMD resistor
R2	22 k $\Omega$	R-1206 SMD resistor
R3	47 k $\Omega$	R-1206 SMD resistor
R4	47 k $\Omega$	R-1206 SMD resistor
R5	1 k $\Omega$	R-1206 SMD resistor
R6	1 k $\Omega$	R-1206 SMD resistor
R7	10 k $\Omega$	R-1206 SMD resistor
R8	10 k $\Omega$	R-1206 SMD resistor
R9	10 k $\Omega$	R-1206 SMD resistor

## 4 Revision history

**Table 2. Document revision history**

Date	Revision	Changes
13-Jun-2008	1	Initial release

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