



STEVAL-IFP010V2

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

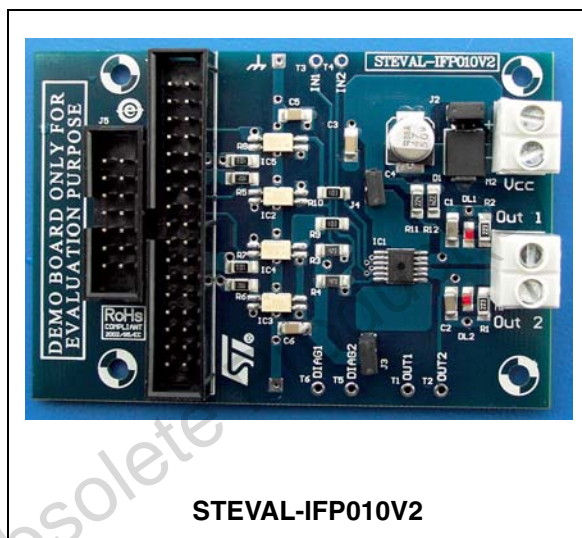
Data Brief

Features

- Output current: 1 A per channel
- Shorted load protection
- Junction overtemperature protection
- Case overtemperature 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

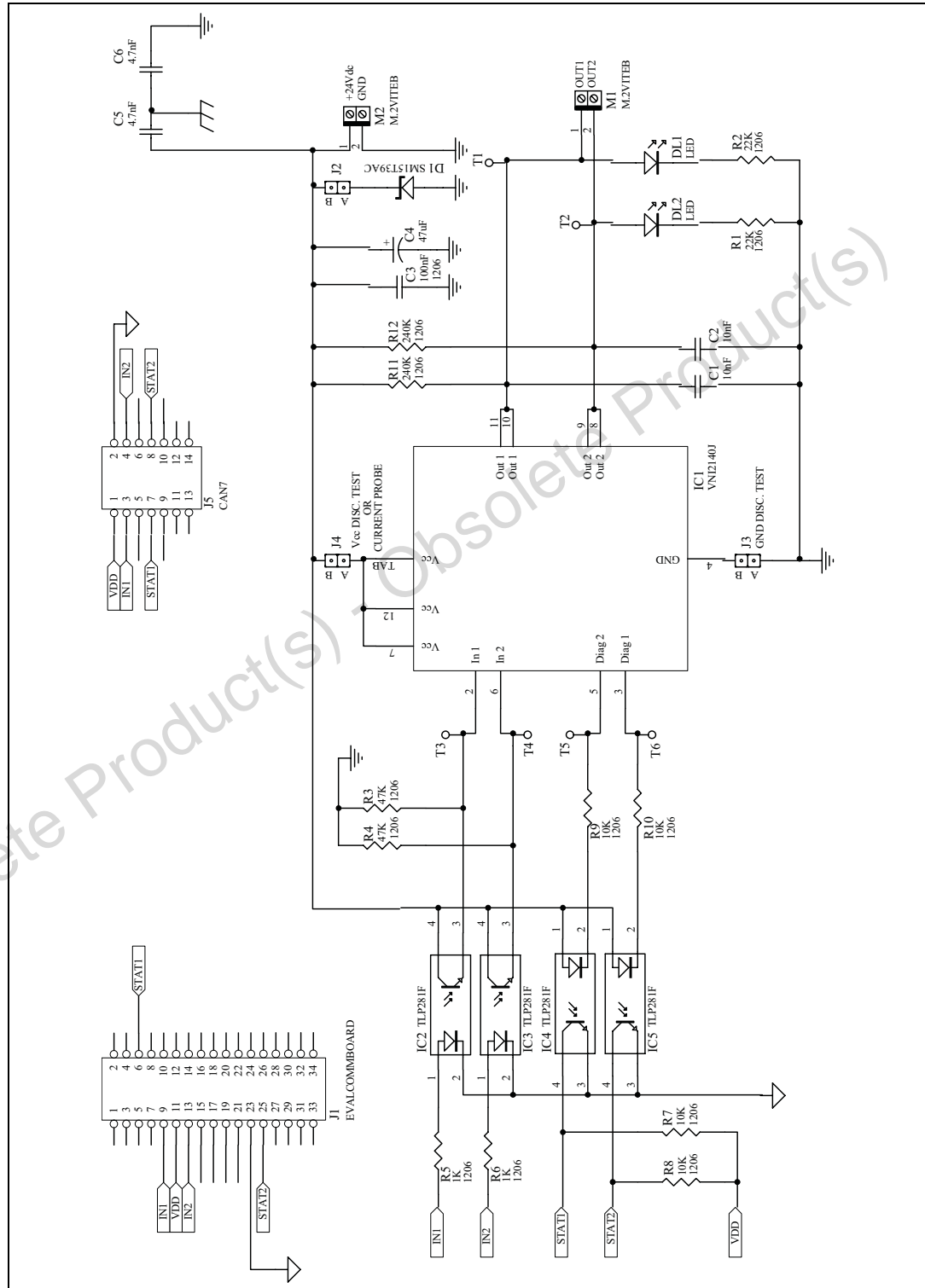
The STEVAL-IFP010V2 demonstration board is based on the VNI2140J dual high-side smart power solid-state relay. The VNI2140J is a monolithic device designed using ST's VIPower technology to drive two independent resistive or inductive loads with one side connected to ground. Active current limitation prevents a drop in system power supply in the event of a shorted load. Built-in thermal shutdown protects the chip from overtemperature and short-circuits. In overload condition, the overloaded channel automatically turns OFF and ON to maintain the junction temperature between TTSD and TR. If this condition causes the case temperature to reach TCSD, the overloaded channel is turned OFF and will restart only when the case temperature has decreased down to TCR.



in order to prevent high peak current from the supply, if more than one channel is in an overload condition the TCSD restart will not be simultaneous. Non overloaded channels continue to operate normally. The open drain diagnostics output indicates an overtemperature condition.

1 Board schematic

Figure 1. Schematic diagram



2 Bill of materials

Table 1. BOM list

Designator	Value	Description
C1	10 nF	SMD capacitor
C2	10 nF	SMD capacitor
C3	100 nF	SMD capacitor
C4	47 μ 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	EVALCOMMBBOARD	34.P plug
J3	GND disc. test	Jumper
J4	V _{CC} disc. test	Jumper
J5	CAN7	14.P plug
M1		2-screw connector
M2		2-screw connector
R1	22 k Ω	R-1206 SMD resistor
R10	10 k Ω	R-1206 SMD resistor
R11	240 k Ω	R-1206 SMD resistor
R12	240 k Ω	R-1206 SMD resistor
R2	22 k Ω	R-1206 SMD resistor
R3	47 k Ω	R-1206 SMD resistor
R4	47 k Ω	R-1206 SMD resistor
R5	1 k Ω	R-1206 SMD resistor
R6	1 k Ω	R-1206 SMD resistor
R7	10 k Ω	R-1206 SMD resistor
R8	10 k Ω	R-1206 SMD resistor
R9	10 k Ω	R-1206 SMD resistor

3 Revision history

Table 2. Document revision history

Date	Revision	Changes
06-Apr-2009	1	Initial release

Obsolete Product(s) - Obsolete Product(s)

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2009 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com