



# STEVAL-ISV004V2

## 240 W PV converter for photovoltaic panels based on the SPV1020

Data brief

### Features

- Operating input voltage: 6.5 V to 45 V
- Max output voltage: 40 V
- Max input current: 8 A
- PWM mode DC-DC boost converter
- Duty cycle controlled by MPPT algorithm with 0.2% accuracy
- Protection against overvoltage, overcurrent and overtemperature
- Built-in soft-start
- Up to 98% efficiency
- Automatic transition to burst mode for improved efficiency during low solar radiation
- SPI interface
- RoHS compliant

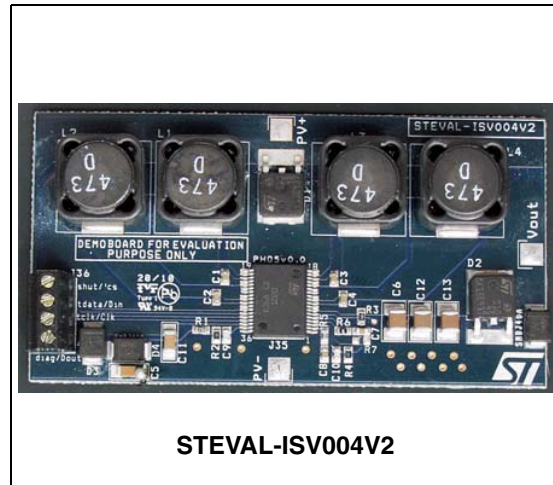
### Description

The STEVAL-ISV004V2 demonstration board is based on the SPV1020 monolithic DC-DC boost converter in a PSSO36 package designed to maximize the power generated by photovoltaic panels, independent of temperature and amount of solar radiation.

Optimization of power conversion is obtained through embedded logic, which performs the MPPT (max power point tracking) algorithm based on monitoring of the voltage and current supplied by the PV cells.

The precision of the algorithm is guaranteed by a 10-bit ADC for current and voltage sensing.

For cost-effectiveness and miniaturization of the application, the SPV1020 embeds 8 power MOSFETs for active switching and synchronous rectification, minimizing the number of external components required. The 4-phase interleaved topology of the DC-DC converter means that electrolytic capacitors can be avoided, which would otherwise severely limit system lifetime.

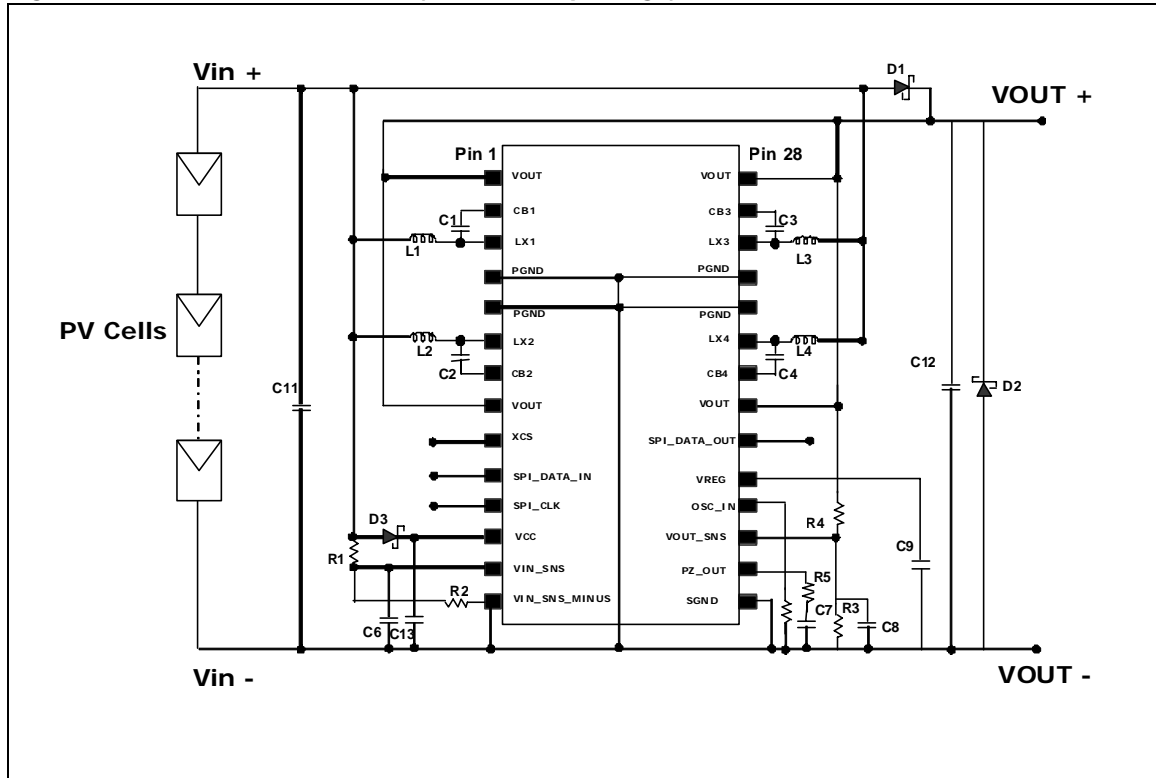


PWM switching (duty cycle varies between 5% and 90%, with 0.2% accuracy) is regulated by default at 100 kHz by an internal oscillator, but is programmable between 50 kHz and 200 kHz via an external resistor.

Application safety is ensured by stopping the PWM switching in case of output overvoltage (set by external trimming), overcurrent (internally regulated at 4 A for each channel) and overtemperature (160 °C).

# 1 Connection diagram

Figure 1. SPV1020 connections (for PSSO36 package)



## 2 Revision history

**Table 1. Document revision history**

Date	Revision	Changes
12-Aug-2010	1	Initial release.
17-Nov-2010	2	Updated title on cover page.

**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.

© 2010 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 - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

[www.st.com](http://www.st.com)