



STEVAL-ISV013V1

250 W DC-DC solar module demonstration board for distributed photovoltaic architecture

Data brief

Features

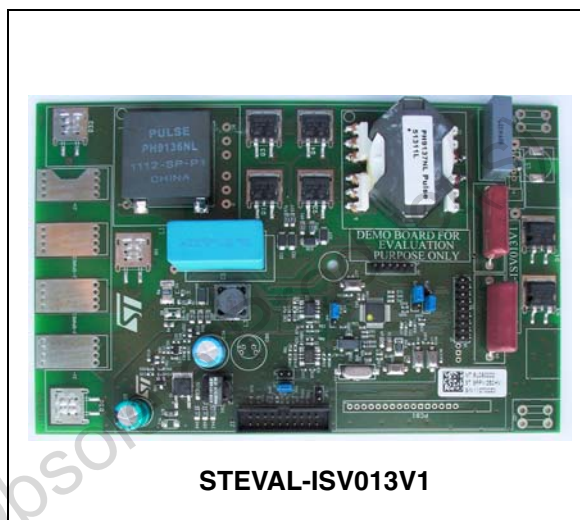
- Input voltage range from 10 V to 45 V
- Output voltage range from 350 V to 430 V
- Digital control section managed by the STM32
- Several I/O connectors to be connected to the photovoltaic panel (input side) and the inverter (output side)
- Ready to be connected to a PLM or ZigBee® external module for communication
- Possibility to meter and monitor the status of the panel
- Fire and anti-theft protections
- RoHS compliant

Description

The STEVAL-ISV013V1 demonstration board is a fully integrated module designed for a smart junction box in distributed photovoltaic architecture. The module represents an easy-to-use, fully-protected solution to implement precise photovoltaic panel control, diagnostics and protection.

The STEVAL-ISV013V1 demonstration board is the base element for a new photovoltaic panel configuration able to increase the panel energy produced and to simplify the photovoltaic field design and implementation. Furthermore, the maintenance cost will be reduced as the device is able to monitor the status of the individual panels and to communicate these data to a remote control unit. The STEVAL-ISV013V1 demonstration board uses an isolated converter, which is the input of the panel output. This voltage is stepped up to the voltage defined by the inverter, needed to create a sinusoidal output with a magnitude big enough to transfer energy to the grid.

The module features an embedded MPPT (maximum power point tracking) algorithm based on the “perturb and observe” (P&O) technique to



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search for the best operating point of the panel in order to maximize the energy produced in every environmental condition.

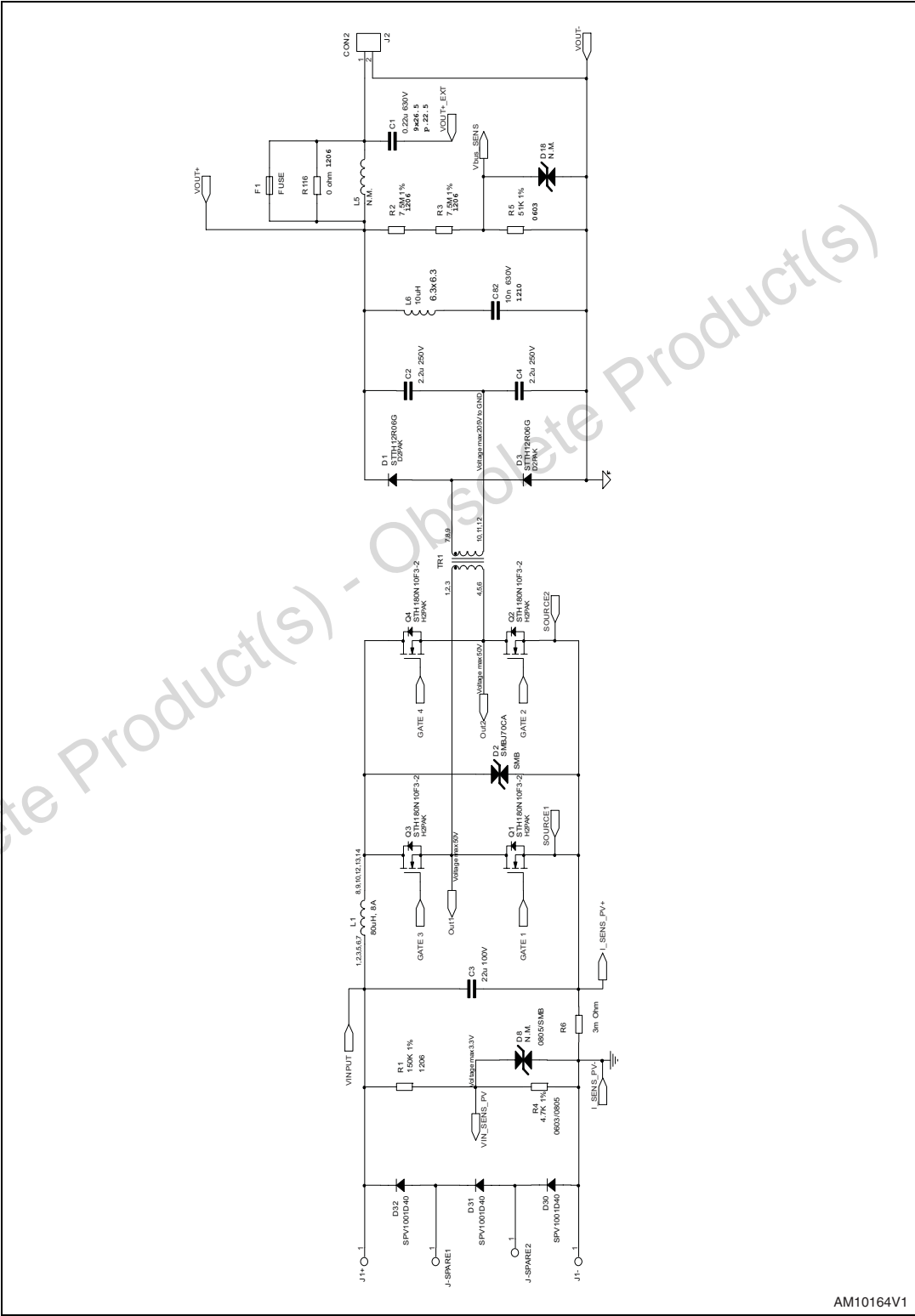
The module is internally protected from a surge or lightning reaching the connection wires.

The STEVAL-ISV013V1 demonstration board includes a PLM or ZigBee® module for communication. The PLM is supported by a proprietary protocol stack for networking. A gateway to RS485 in modbus is available. The unit is designed to operate in a harsh environment, offering a high level of protection and very high reliability.

The ZigBee® module is based on system-on-chip (SoC) technology, integrating both IEEE 802.15.4 radio transceiver and computing capabilities and is designed to run a fully compliant ZigBee® PRO network protocol stack.

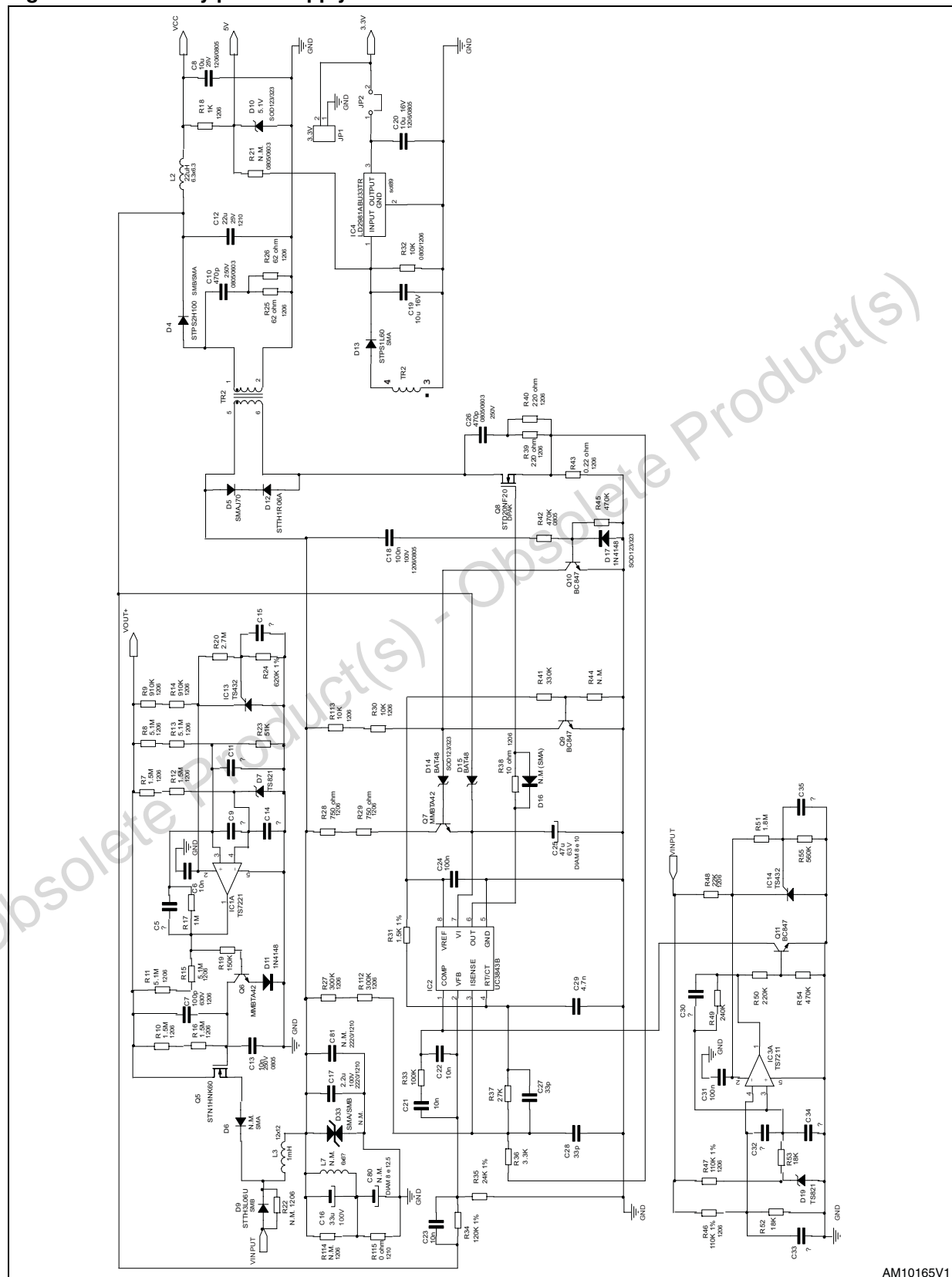
1 Schematic circuit

Figure 1. Isolated full-bridge boost converter



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Figure 2. Auxiliary power supply



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2 Revision history

Table 1. Document revision history

| Date | Revision | Changes |
|-------------|----------|------------------|
| 07-Sep-2011 | 1 | Initial release. |

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