

300 W PV converter to be integrated into a photovoltaic panel based on SPV1020 and bypass diodes SPV1001N30 and SPV1001N40

Data brief

Features

- PWM mode DC-DC boost converter
- Duty cycle controlled by MPPT algorithm with 0.2% accuracy
- Operating input voltage range: 6.5 V to 40 V
- Operating output voltage: up to 120 V
- Overvoltage, overcurrent, overtemperature protection
- Built in soft-start
- Up to 98% efficiency
- Automatic transition to burst mode for improved efficiency at low solar radiation
- SPI interface for remote telemetry and control
- RoHS compliant

Description

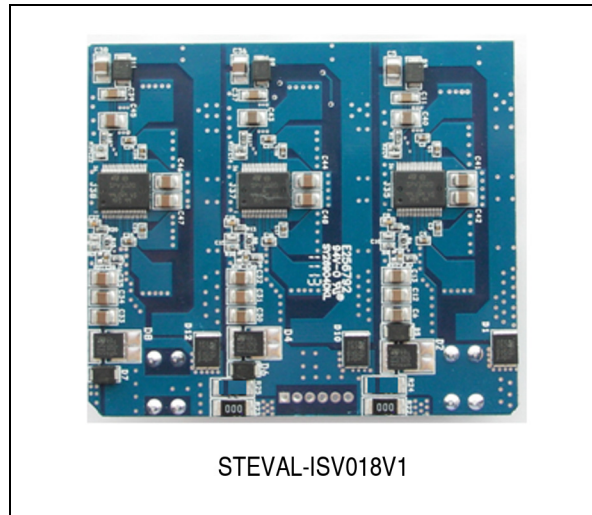
The STEVAL-ISV018V1 demonstration board contains three SPV1020s in the same PCB and is suitable for distributed PV panels with 3 isolated strings. The outputs of the SPV1020s can be connected in parallel or in series, despite the pairs of independent inputs.

The STEVAL-ISV018v1 default setting is output series connection.

The SPV1020, is a monolithic DC-DC boost converter designed to maximize the power generated by photovoltaic panels independent of temperature and amount of solar radiation.

The optimization of the power conversion is obtained with an embedded logic which performs the MPPT (max power point tracking) algorithm on the PV cells connected to the converter.

One or more converters can be housed in the connection box of PV panels, replacing the bypass diodes and, thanks to the fact that the maximum power point is locally computed, the efficiency at system level is higher than that of conventional topologies, where the MPP is computed in the main centralized inverter.



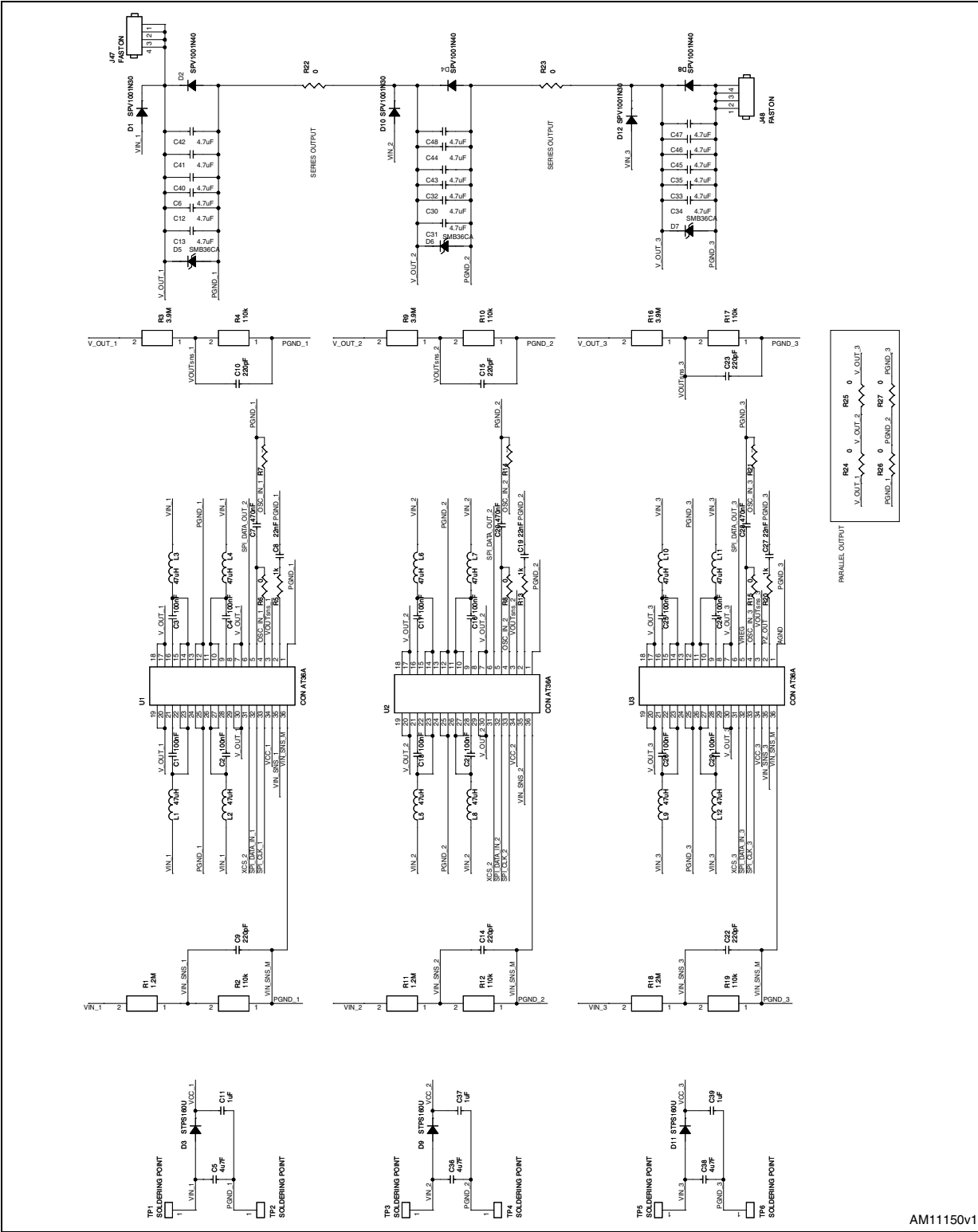
For a cost effective application solution and the meeting of miniaturization needs, the SPV1020 embeds the power MOSFETs for active switches and synchronous rectification, minimizing the number of external devices. Furthermore, the 4 phase interleaved topology of the DC-DC converter allows the use of electrolytic capacitors to be avoided, which could severely limit the lifetime.

It works at fixed frequency in PWM mode, where the duty cycle is controlled by the embedded logic running a Perturb and Observe MPPT algorithm. The switching frequency, internally generated and set by default at 100 kHz, is externally tunable, while the duty cycle can range from 5% to 90% with a step of 0.2%.

Safety of the application is guaranteed by stopping the drivers in the case of output overvoltage or overtemperature.

1 Schematic

Figure 1. Schematic diagram



AM11150v1



2 Revision history

Table 1. Document revision history

Date	Revision	Changes
26-Apr-2012	1	Initial release.

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