

Cool bypass switches



STMicroelectronics

System-in-package solution for photovoltaic applications

The SPV100x series implements a cool bypass rectifier working as a Schottky diode, but with a much lower forward voltage drop and reverse leakage current.

It consists of a power MOS transistor accurately controlled in order to charge a capacitor during the off time and drive its gate during the on time with the charge previously stored in the capacitor.

On and off times are accurately set to reduce the average voltage drop across the drain and source terminals and consequently to reduce the power dissipation.

Key features

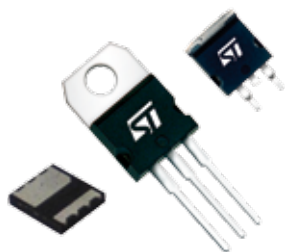
- Maximum DC reverse voltage: 30 to 40 V
- Maximum forward current: 16 A
- Leakage current: $<10 \mu\text{A}$
- Packages: TO-220, D²PAK, PQFN

Key benefits

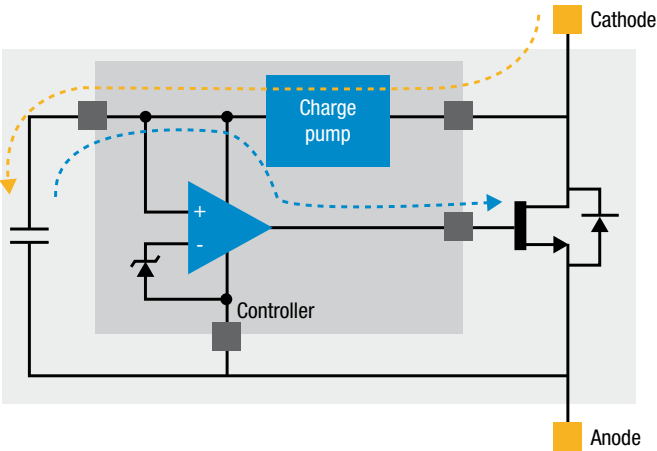
- Lower power dissipation, cooler temperature
- Longer lifetime, higher reliability
- ESD: HBM $>8 \text{ kV}$
- Non-repetitive peak surge: $>250 \text{ A}$

Targeted applications

- Photovoltaic panels



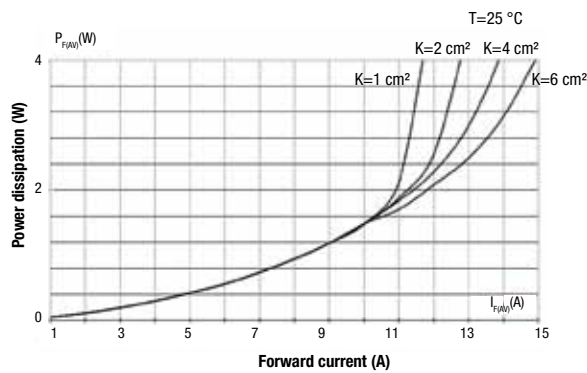
Cool bypass switch block diagram



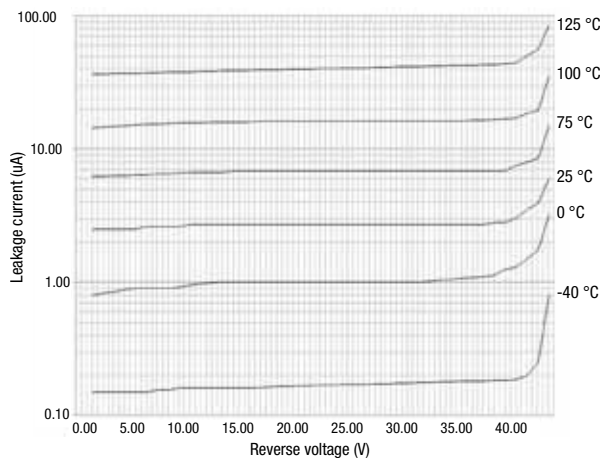
System-in-package design



Power dissipation versus forward current for different sizes of heatsink



Leakage current versus reverse voltage for different values of ambient temperature



Device summary

Part number	Package	Packing type	Repetitive peak reverse voltage max (V)	Average rectified current max (A)	R _{DS(on)} (mΩ)
SPV1001	TO-220, D ² PAK	Tube, tape and reel	40	16	8
SPV1002	TO-220, D ² PAK	Tube, tape and reel	40	16	6
SPV1001N	PQFN	Tape and reel	40	12.5	8

