

2% savings with avalanche specified Power Schottky

Complete range of Power Schottky with explicit avalanche specification for precise matching design



Rectifier devices usually represent 10 to 15% of the cost of a switch mode power supply bill of material.

Therefore, a 20% saving on the cost of rectifiers, with the use of **STMicroelectronics** avalanche specification diodes, can lead to a 2% saving in cost of the total BOM of the SMPS. Alternatively, 2% can be gained on the system efficiency.

Thanks to exhaustive characterization, reliability and R&D validation, ST offers the best solution by rating the avalanche for each of its power Schottky diodes.

Avalanche rating: a key specification

The avalanche rating temperature and pulse width derating curves ensure a precise match between the power converter voltage spikes and the capability of the diodes.

This key information provides designers with the opportunity to choose between upgrading the efficiency by 2% or reducing the BOM cost by 2%.

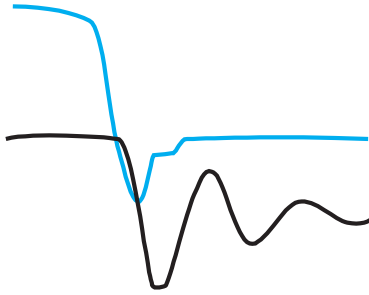
Key benefits

Choose between efficiency and cost savings

280W SMPS	Applications improvements examples with avalanche		
	Reference design	Efficiency improvement	Cost saving
3.3V/10A	STPS3045CT	STPS3030CT	STPS2030CT
5.0V/25A	STPS6045CW	STPS6030CW	STPS3030CT
12V/10A	STPS20H100CT	STPS20L60CT	STPS10L60CT
Efficiency	Nominal	+2%	Unchanged
Diode cost	Nominal	Unchanged	From -15 to -25%
SMPS cost	Nominal	Unchanged	-2%

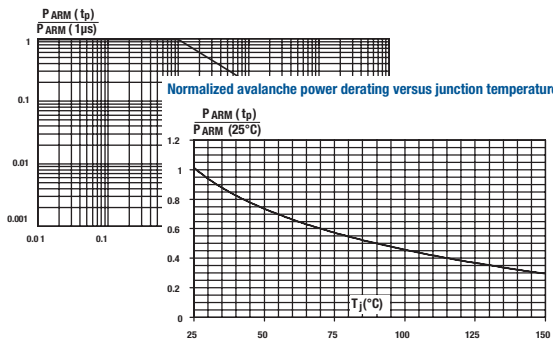
Key steps

- Spike measurement and avalanche power calculation in applications (PP)

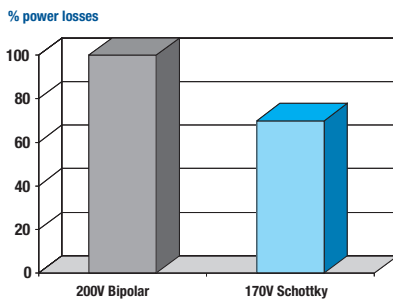


- Comparison with the diode capability specified in datasheet ($PP < P_{ARM}$)

Normalized avalanche power derating versus pulse duration



- Power losses budget verification

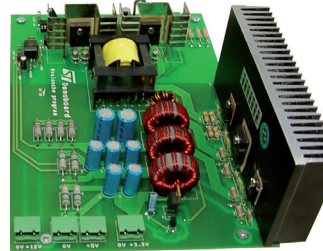


Application notes

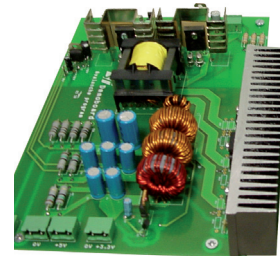
Available on www.st.com

- AN1768: Admissible avalanche power of Schottky diodes
- AN2025: Converter improvement using Schottky rectifier avalanche specification

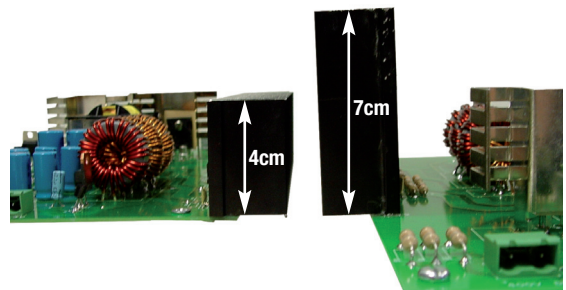
Avalanche demoboard



Configuration with standard design rule



Configuration with design rule avalanche



Cost and space saving with a heatsink gain of 43%
(@ constant $T_{case} = 68^{\circ}C$)



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