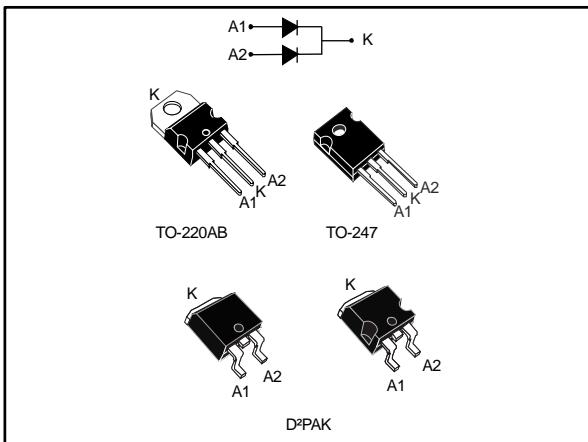


## Power Schottky rectifier

Datasheet - production data



### Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Avalanche rated
- ECOPACK®2 compliant component for D²PAK on demand

### Description

Dual center tap Schottky rectifier suited for switch mode power supply and high frequency DC to DC converters. Packaged either in TO-220AB, TO-247, or D<sup>2</sup>PAK, this device is especially intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

**Table 1: Device summary**

Symbol	Value
I <sub>F(AV)</sub>	2 x 15 A
V <sub>RRM</sub>	45 V
V <sub>F</sub> (typ.)	0.5 V
T <sub>j</sub> (max.)	175 °C ( up to 200 °C in forward mode for D <sup>2</sup> PAK)

# 1 Characteristics

**Table 2: Absolute ratings (limiting values, per diode, at 25 °C, unless otherwise specified)**

Symbol	Parameter			Value	Unit	
V <sub>RRM</sub>	Repetitive peak reverse voltage			45	V	
I <sub>F(RMS)</sub>	Forward rms current			30	A	
I <sub>F(AV)</sub>	Average forward current δ = 0.5, square wave	T <sub>C</sub> = 155 °C	Per diode	15	A	
			Per device	30		
I <sub>FSM</sub>	Surge non repetitive forward current		t <sub>p</sub> = 10 ms sinusoidal	220	A	
P <sub>ARM</sub>	Repetitive peak avalanche power		t <sub>p</sub> = 10 µs, T <sub>j</sub> = 125 °C	430	W	
T <sub>stg</sub>	Storage temperature range			-65 to +175	°C	
T <sub>j</sub>	Maximum operating junction temperature			175		
	Maximum operating junction temperature (DC forward current without reverse bias, t = 1 hour for D <sup>2</sup> PAK)			200		

**Notes:**

(<sup>1</sup>)For pulse time duration deratings, please refer to Figure 3. More details regarding the avalanche energy measurements and diode validation in the avalanche are provided in the STMicroelectronics Application notes AN1768, "Admissible avalanche power of Schottky diodes" and AN2025, "Converter improvement using Schottky rectifier avalanche specification".

(<sup>2</sup>)(dP<sub>tot</sub>/dT<sub>j</sub>) < (1/R<sub>th(j-a)</sub>) condition to avoid thermal runaway for a diode on its own heatsink.

**Table 3: Thermal parameters**

Symbol	Parameter			Value	Unit
R <sub>th(j-c)</sub>	Junction to case	TO-220AB / D <sup>2</sup> PAK		Per diode	1.60
				Total	0.95
	TO-247			Per diode	1.5
				Total	0.9
R <sub>th(c)</sub>	Coupling	TO-220AB / D <sup>2</sup> PAK/ TO-247			0.3

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j \text{ (diode1)} = P_{\text{(diode1)}} \times R_{\text{th(j-c)}} \text{ (per diode)} + P_{\text{(diode2)}} \times R_{\text{th(c)}}$$

**Table 4: Static electrical characteristics (per diode)**

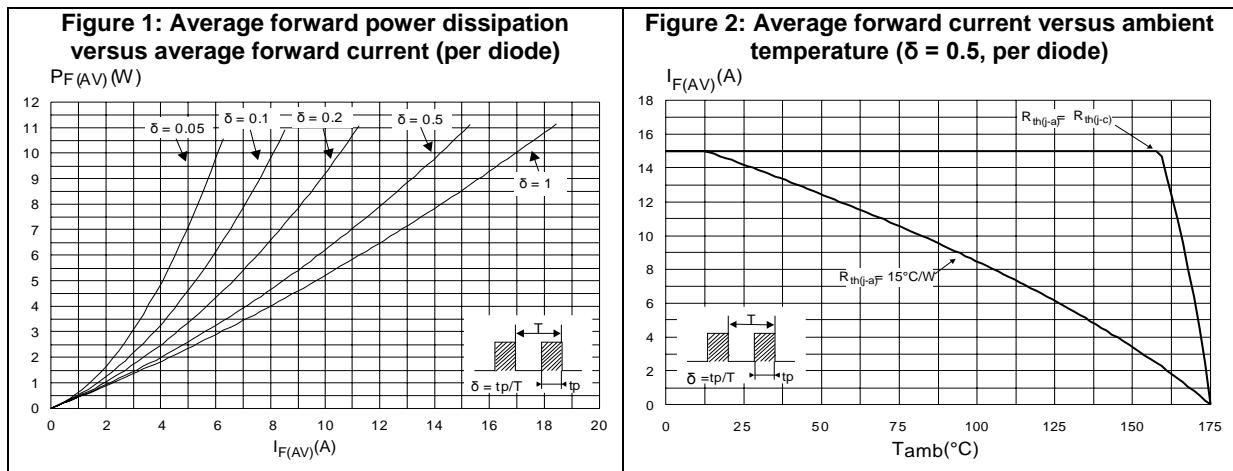
<b>Symbol</b>	<b>Parameter</b>	<b>Test conditions</b>		<b>Min.</b>	<b>Typ.</b>	<b>Max.</b>	<b>Unit</b>
$I_R$	Reverse leakage current	$T_j = 25 \text{ }^\circ\text{C}$	$V_R = V_{RRM}$	-		200	$\mu\text{A}$
		$T_j = 125 \text{ }^\circ\text{C}$		-	11	40	$\text{mA}$
$V_F$	Forward voltage drop	$T_j = 125 \text{ }^\circ\text{C}$	$I_F = 15 \text{ A}$	-	0.5	0.57	$\text{V}$
		$T_j = 25 \text{ }^\circ\text{C}$	$I_F = 30 \text{ A}$	-		0.84	
		$T_j = 125 \text{ }^\circ\text{C}$		-	0.65	0.72	

**Notes:**(1)Pulse test:  $t_p = 380 \mu\text{s}$ ,  $\delta < 2\%$ 

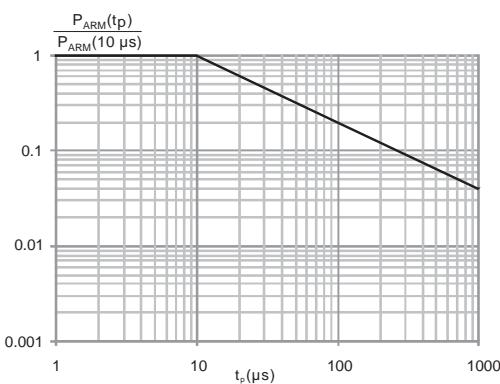
To evaluate the conduction losses use the following equation:

$$P = 0.42 \times I_{F(AV)} + 0.01 \times I_{F^2(\text{RMS})}$$

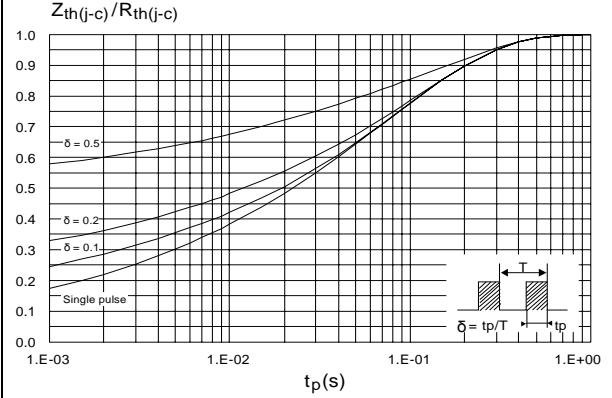
## 1.2 Characteristics (curves)



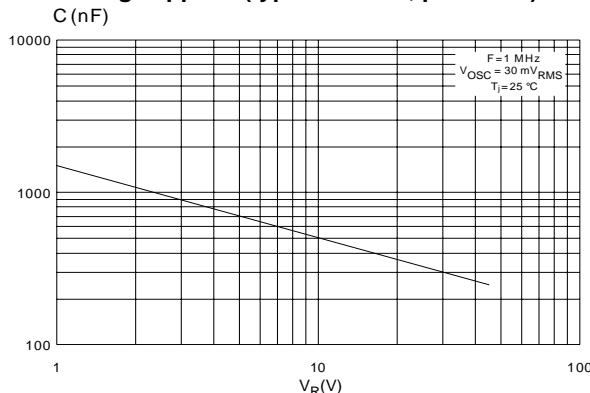
**Figure 3: Normalized avalanche power derating versus pulse duration ( $T_j = 125^\circ\text{C}$ )**



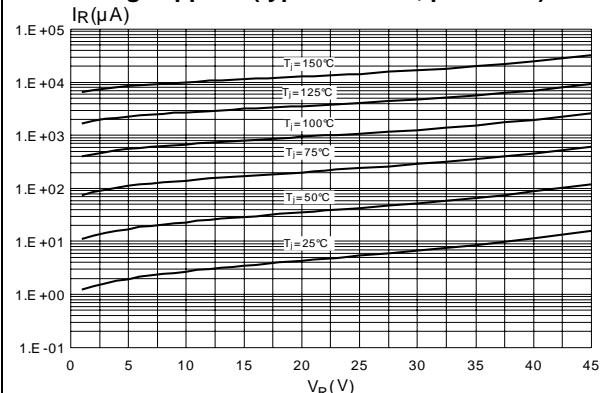
**Figure 4: Relative variation of thermal impedance junction to case versus pulse duration**



**Figure 5: Junction capacitance versus reverse voltage applied (typical values, per diode)**



**Figure 6: Reverse leakage current versus reverse voltage applied (typical values, per diode)**



### 3 Ordering information

Table 8: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS3045CT	STPS3045CT	TO-220AB	1.9 g	50	Tube
STPS3045CG	STPS3045CG	D <sup>2</sup> PAK	1.38 g	50	Tube
STPS3045CG-TR	STPS3045CG			1000	Tape and reel
STPS3045CW	STPS3045CW	TO-247	4.46 g	30	Tube