STPS2045CH

Power Schottky rectifier

Datasheet — production data

Features

- Very small conduction losses
- Avalanche rated
- Low forward voltage drop
- High frequency operation

Description

This device is a dual diode Schottky rectifier, suited to high frequency switch mode power supply.

Packaged in IPAK, this device is intended to be used in notebook, game station and desktop adapters, providing in these applications a good efficiency at both low and high load.

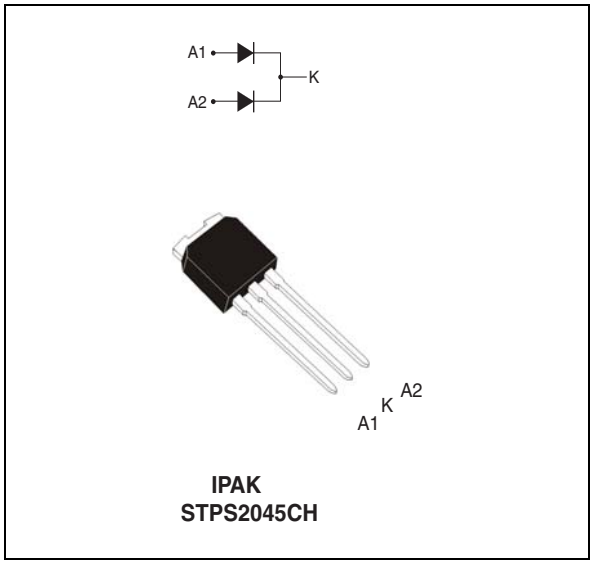

Figure 1. Electrical characteristics[(a)]

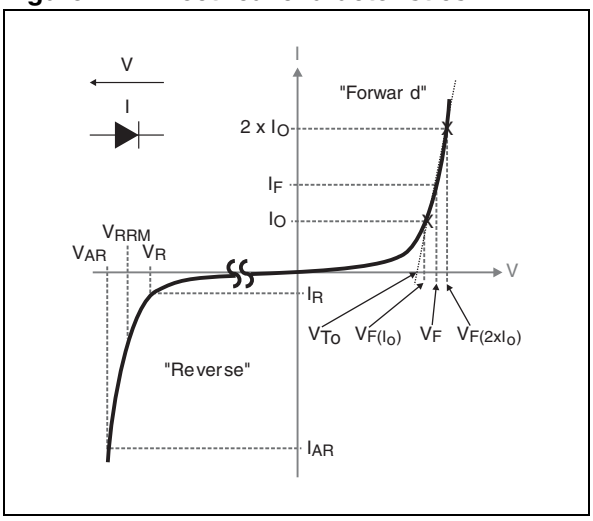

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 x 10 A
V_{RRM}	45 V
$T_{j\ (max)}$	175 °C
$V_{F\ (max)}$	0.57 V

1 Characteristics

Table 2. Absolute ratings (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			45	V
$I_{F(RMS)}$	Forward rms voltage			20	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	$T_c = 155$ °C	Per diode	10	A
		$T_c = 150$ °C	Per package	20	
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms sine-wave		150	A
P_{ARM}(1)	Repetitive peak avalanche power	$t_p = 10$ µs, $T_j = 125$ °C		280	W
V_{ARM}(2)	Maximum repetitive peak avalanche voltage	$t_p < 10$ µs, $T_j < 125$ °C, $I_{AR} < 4.7$ A		60	V
V_{ASM}(2)	Maximum single-pulse peak avalanche voltage	$t_p < 10$ µs, $T_j < 125$ °C, $I_{AR} < 4.7$ A		60	V
T_{stg}	Storage temperature range			-65 to + 175	°C
T_j	Maximum operating junction temperature(3)			+ 175	°C

Table 3. Thermal resistance parameters

Symbol	Parameter		Value	Unit
$R_{th\ (j-c)}$	Junction to case	Per diode Total	2.50 1.6	°C/W
$R_{th\ (c)}$	Coupling		0.7	°C/W

When the diodes 1 and 2 are used simultaneously:
ΔT_j(diode 1) = P(diode1) x $R_{th(j-c)}$(Per diode) + P(diode 2) x $R_{th(c)}$

Table 4. Static electrical characteristics (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R (1)	Reverse leakage current	$T_j = 25$ °C	$V_R = V_{RRM}$			100	µA
		$T_j = 125$ °C			7	15	mA
V_F (2)	Forward voltage drop	$T_j = 125$ °C	$I_F = 10$ A		0.5	0.57	V
		$T_j = 25$ °C	$I_F = 20$ A			0.84	
		$T_j = 125$ °C			0.65	0.72	

1. Pulse test: $t_p = 5$ ms, $\delta < 2\%$
2. Pulse test: $t_p = 380$ µs, $\delta < 2\%$

To evaluate the conduction losses use the following equation:

$$P = 0.42 \times I_{F(AV)} + 0.015\ I_F^2{}_{(RMS)}$$

Figure 2. Average forward power dissipation versus average forward current (per diode)

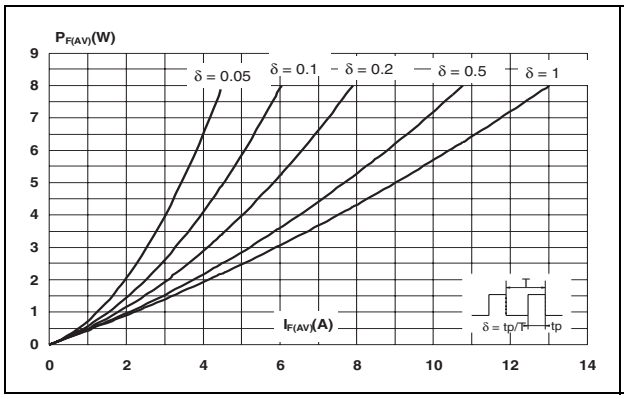

Figure 3. Junction capacitance versus reverse voltage applied (typical values, per diode)

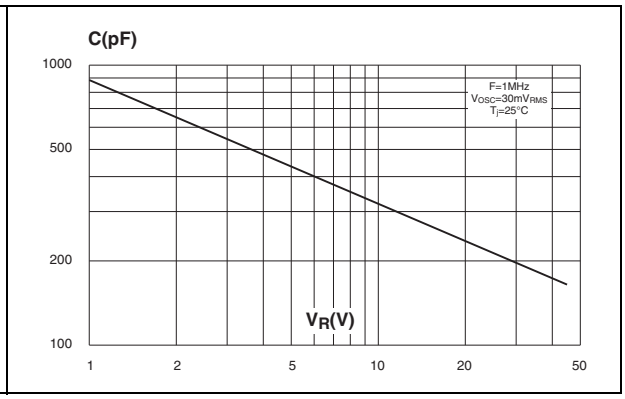

Figure 4. Normalized avalanche power derating versus pulse duration

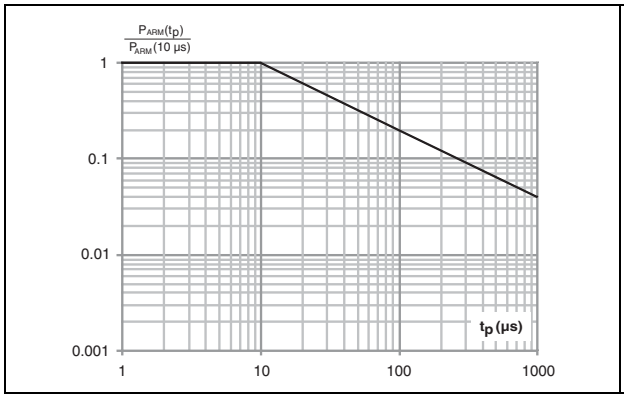

Figure 5. Relative variation of thermal impedance junction to case versus pulse duration

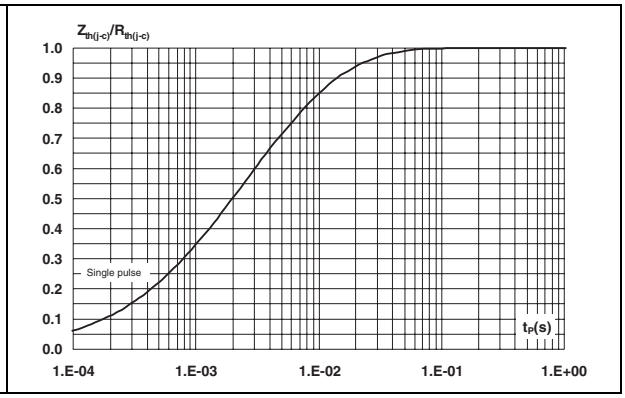

Figure 6. Reverse leakage current versus reverse voltage applied (typical values, per diode)

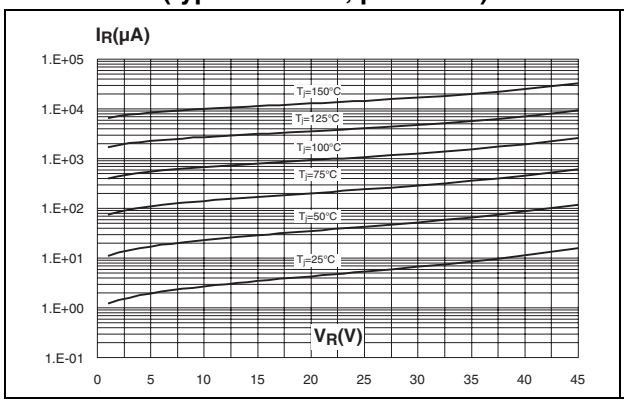

Figure 7. Forward voltage drop versus forward current (per diode)