

LOW DROP POWER SCHOTTKY RECTIFIER

Table 1: Main Product Characteristics

$I_{F(AV)}$	2 x 12.5 A
V_{RRM}	30 V
T_j	150°C
$V_F(max)$	0.45 V

FEATURES AND BENEFITS

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low forward voltage drop for higher efficiency
- Low thermal resistance

DESCRIPTION

Dual Schottky rectifier suited for switch Mode Power Supply and high frequency DC to DC converters.

Packaged in D²PAK, this device is intended for use in low voltage high frequency inverters, free wheeling and polarity protection applications.

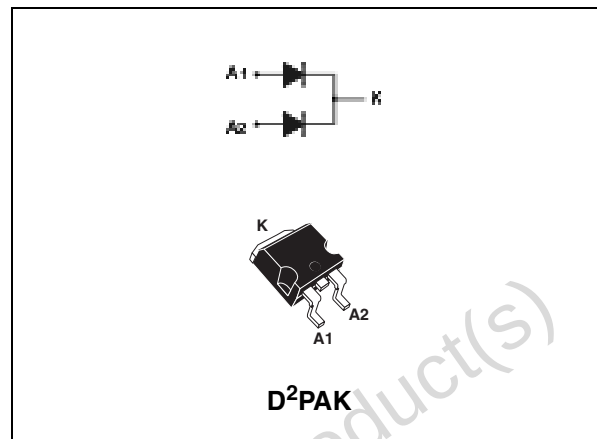


Table 2: Order Codes

Part Numbers	Marking
STPS2530CG	STPS2530CG
STPS2530CG-TR	STPS2530CG

Table 3: Absolute Ratings (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			30	V
$I_{F(RMS)}$	RMS forward voltage			30	A
$I_{F(AV)}$	Average forward current	$T_c = 140^\circ\text{C}$ $\delta = 0.5$	Per diode Per device	12.5 25	A
I_{FSM}	Surge non repetitive forward current		$t_p = 10\text{ms}$ sinusoidal	180	A
I_{RRM}	Peak repetitive reverse current		$t_p = 2\text{ }\mu\text{s}$ square $F=1\text{kHz}$	1	A
I_{RSM}	Non repetitive peak reverse current		$t_p = 100\text{ }\mu\text{s}$ square	2	A
P_{ARM}	Repetitive peak avalanche power		$t_p = 1\text{ }\mu\text{s}$ $T_j = 25^\circ\text{C}$	3000	W
T_{stg}	Storage temperature range			-65 to + 150	°C
T_j	Maximum operating junction temperature *			150	°C
dV/dt	Critical rate of rise of reverse voltage (rated V_R , $T_j = 25^\circ\text{C}$)			10000	V/ μs

* : $\frac{dP_{tot}}{dT_j} > \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

Table 4: Thermal Parameters

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	2.2	$^{\circ}\text{C/W}$
		Total	1.3	
$R_{th(c)}$	Coupling		0.3	

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j(\text{diode } 1) = P(\text{diode } 1) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode } 2) \times R_{th(c)}$$

Table 5: Static Electrical Characteristics (per diode)

Symbol	Parameter	Tests conditions	Min.	Typ	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$	0.15	1.0	mA
		$T_j = 125^{\circ}\text{C}$		80	160	
V_F^{**}	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 12.5\text{A}$	0.47	0.53	V
		$T_j = 125^{\circ}\text{C}$		0.39	0.45	
		$T_j = 25^{\circ}\text{C}$	$I_F = 25\text{A}$	0.54	0.64	
		$T_j = 125^{\circ}\text{C}$		0.49	0.59	

Pulse test: $^* tp = 5\text{ ms}$, $\delta < 2\%$

$^{**} tp = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation: $P = 0.31 \times I_{F(AV)} + 0.0112 I_{F(RMS)}^2$

Figure 1: Conduction losses versus average current

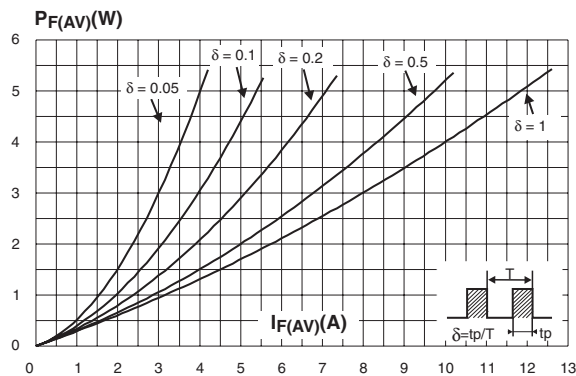
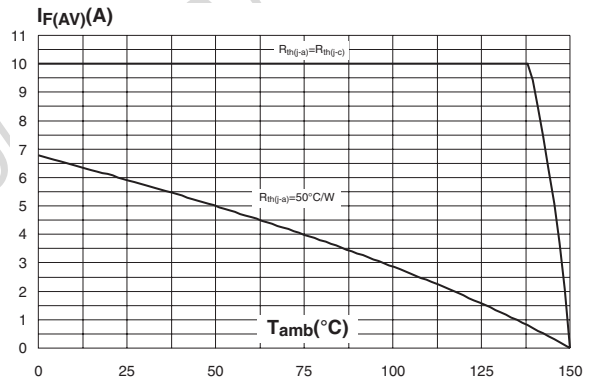
Figure 2: Average forward current versus ambient temperature ($\delta = 0.5$, per diode)

Figure 3: Normalized avalanche power derating versus pulse duration

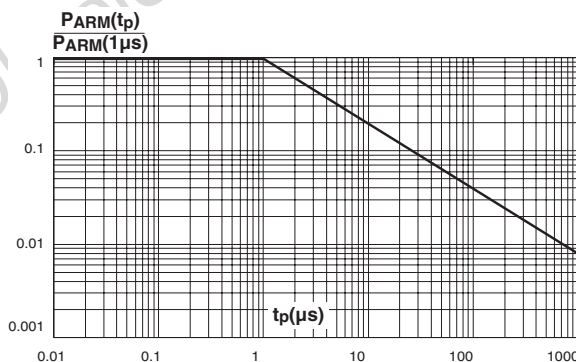


Figure 4: Normalized avalanche power derating versus junction temperature

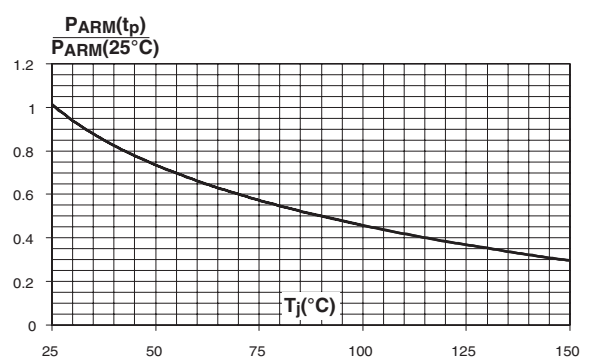


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values)

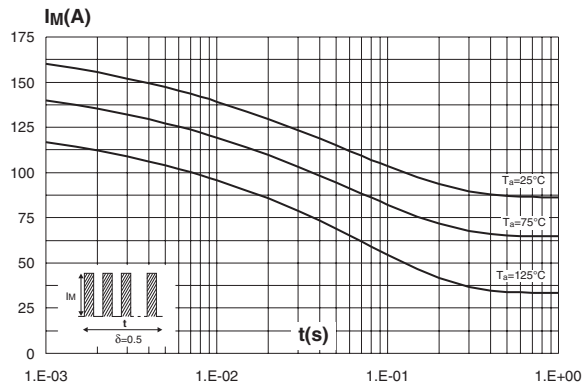


Figure 6: Relative variation of thermal impedance junction to case versus pulse duration

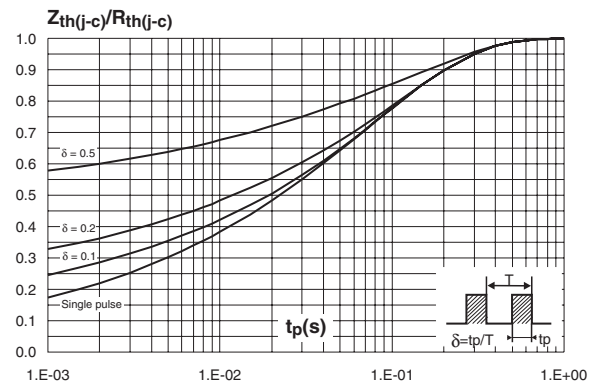


Figure 7: Reverse leakage current versus reverse voltage applied (typical values)

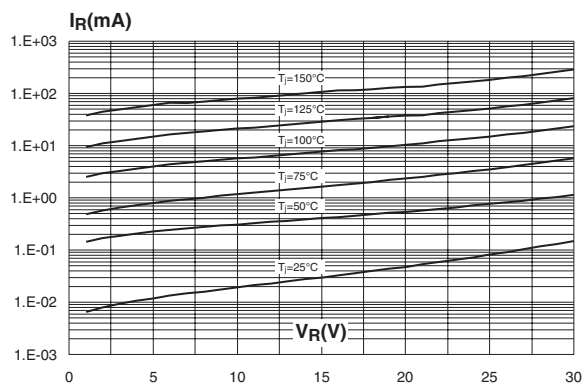


Figure 8: Junction capacitance versus reverse voltage applied (typical values)

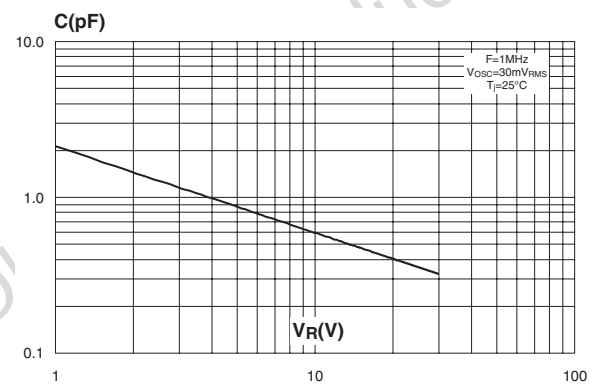


Figure 9: Forward voltage drop versus forward current

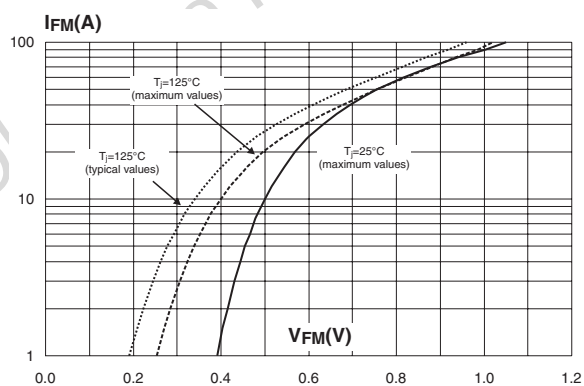


Figure 10: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35μm)

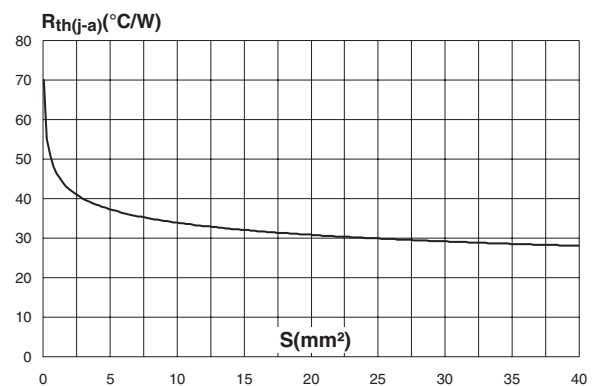


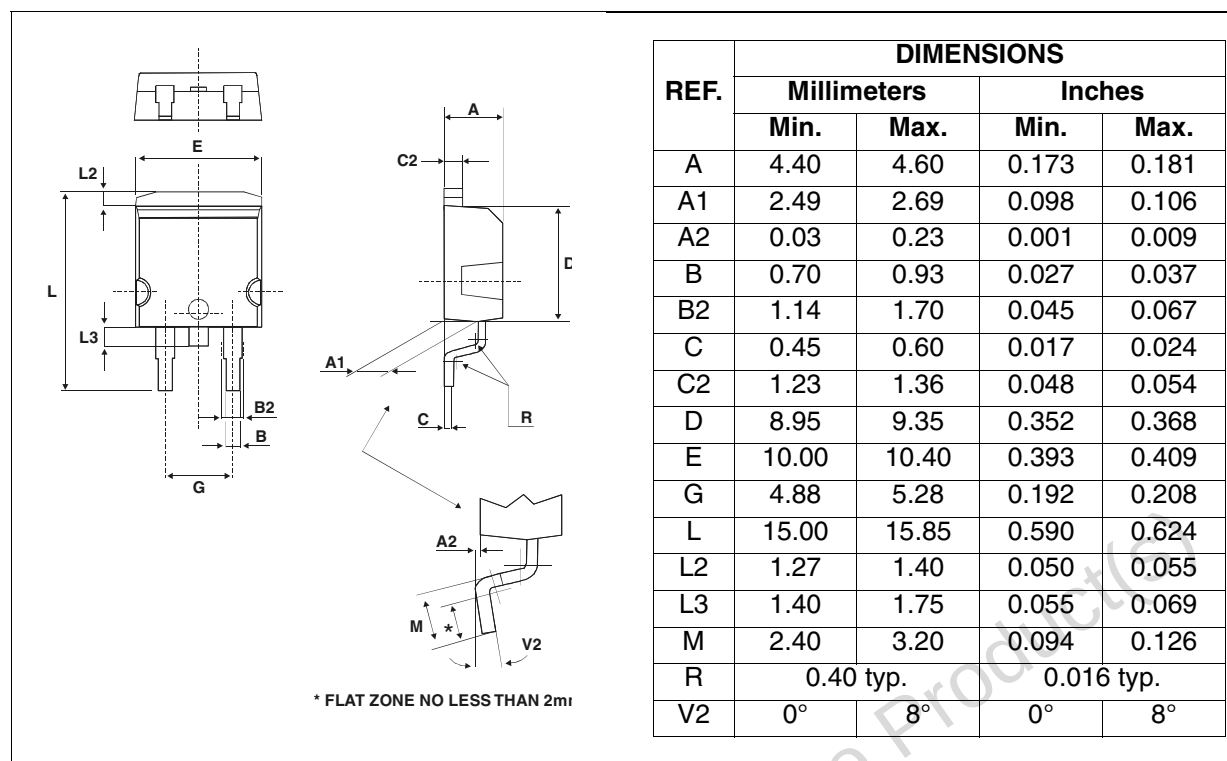
Figure 11: D²PAK Package Mechanical Data

Figure 12: Foot Print Dimensions (in millimeters)

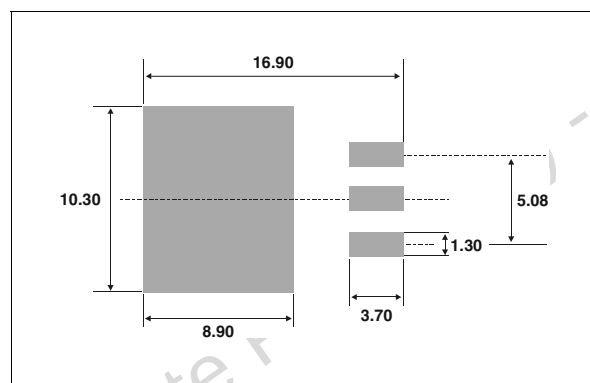


Table 6: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS2530CG	STPS2530CG	D ² PAK	1.48 g	50	Tube
STPS2530CG-TR	STPS2530CG			1000	Tape & reel

■ Epoxy meets UL94, V0

Table 7: Revision History

Date	Revision	Description of Changes
16-Apr-2005	1	First issue.

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