

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
$V_F(\text{max})$	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 3: Absolute Ratings (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			30	V
$I_{F(\text{RMS})}$	RMS forward voltage			30	A
$I_{F(AV)}$	Average forward current	$T_c = 140^\circ\text{C}$	Per diode	12.5	A
		$\delta = 0.5$	Per device	25	
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ms}$ sinusoidal		180	A
I_{RRM}	Peak repetitive reverse current	$t_p = 2 \mu\text{s}$ square	$F=1\text{kHz}$	1	A
I_{RSM}	Non repetitive peak reverse current	$t_p = 100 \mu\text{s}$ square		2	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\mu\text{s}$	$T_j = 25^\circ\text{C}$	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

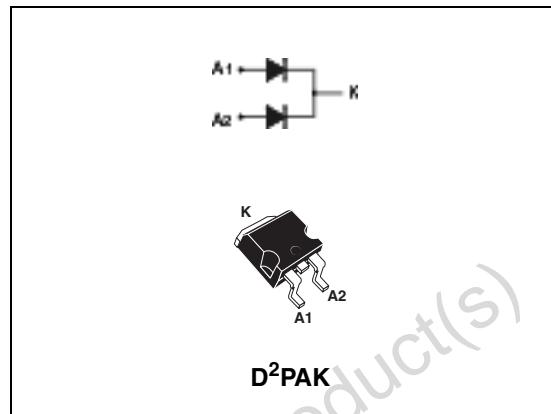


Table 2: Order Codes

Part Numbers	Marking
STPS2530CG	STPS2530CG
STPS2530CG-TR	STPS2530CG

STPS2530C

Table 4: Thermal Parameters

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	2.2 Total	$^{\circ}\text{C/W}$
$R_{th(c)}$	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: * $t_p = 5\text{ ms}, \delta < 2\%$

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

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

Figure 1: Conduction losses versus average current

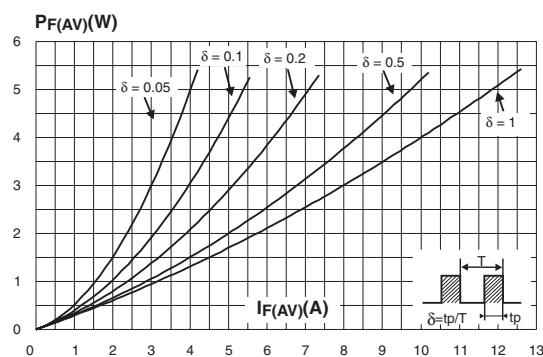


Figure 3: Normalized avalanche power derating versus pulse duration

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

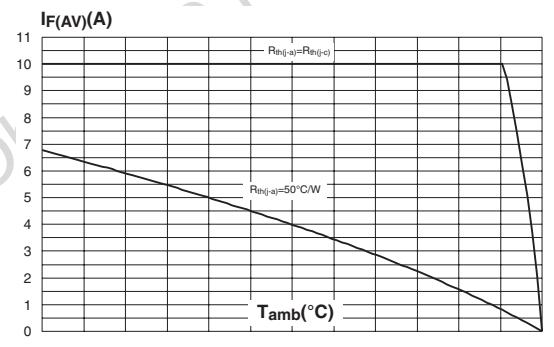


Figure 4: Normalized avalanche power derating versus junction temperature

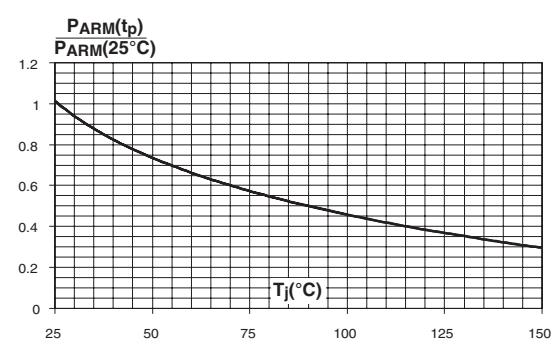
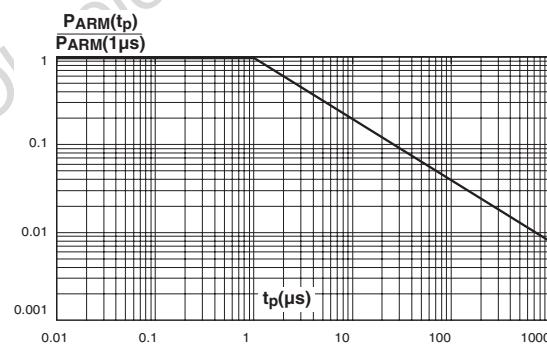


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values)

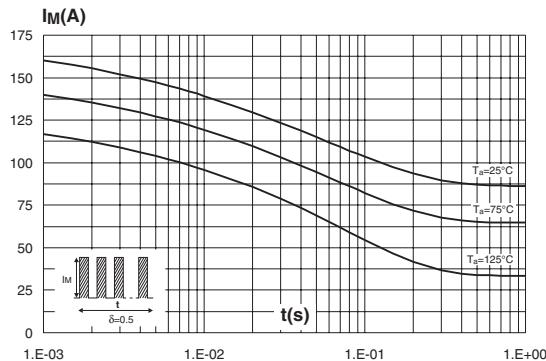


Figure 7: Reverse leakage current versus reverse voltage applied (typical values)

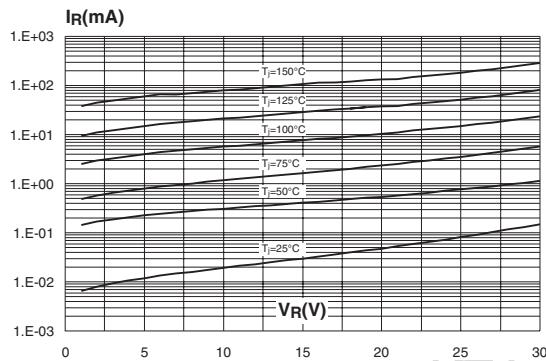


Figure 9: Forward voltage drop versus forward current

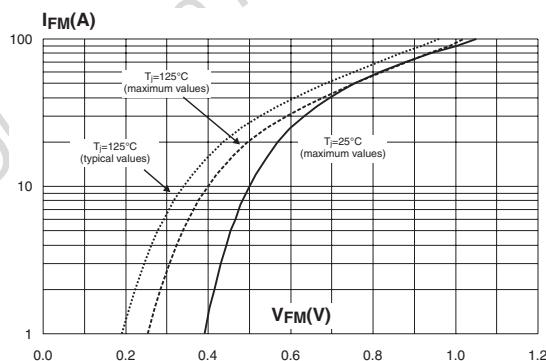


Figure 6: Relative variation of thermal impedance junction to case versus pulse duration

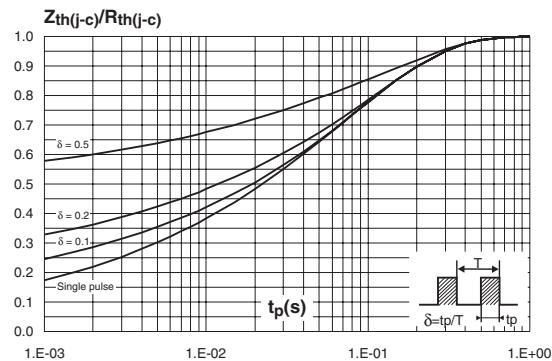


Figure 8: Junction capacitance versus reverse voltage applied (typical values)

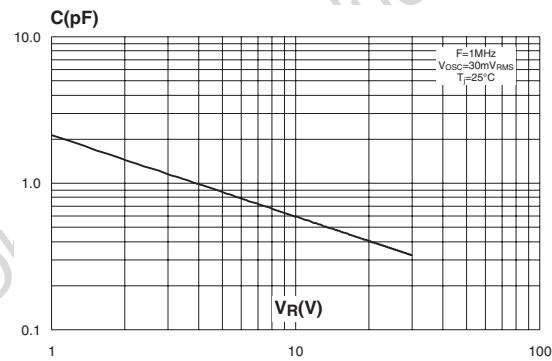
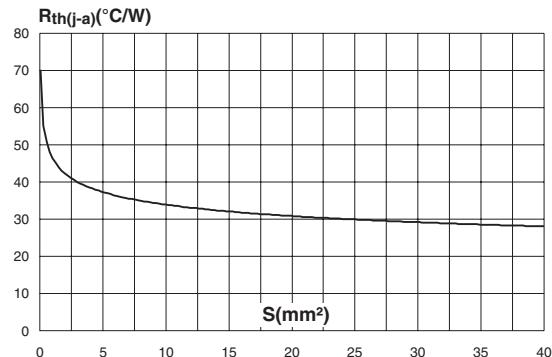


Figure 10: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35μm)



STPS2530C

Figure 11: D²PAK Package Mechanical Data

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

Figure 12: Foot Print Dimensions (in millimeters)

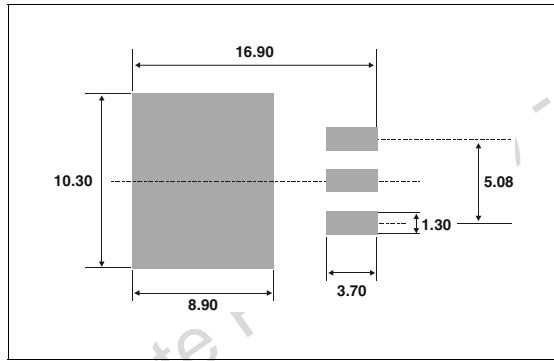


Table 6: Ordering Information

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.

Obsolete Product(s) - Obsolete Product(s)

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