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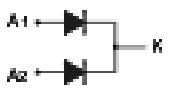
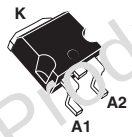
STPS2530C

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





D²PAK

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°C δ = 0.5	Per diode Per device	12.5 25	A
I_{FSM}	Surge non repetitive forward current		t_p = 10ms sinusoidal	180	A
I_{RRM}	Peak repetitive reverse current		t_p = 2 µs square F=1kHz	1	A
I_{RSM}	Non repetitive peak reverse current		t_p = 100 µs square	2	A
P_{ARM}	Repetitive peak avalanche power		t_p = 1µs T_j = 25°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°C)			10000	V/µs

* : $\frac{dPtot}{dTj} > \frac{1}{Rth(j-a)}$ 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	°C/W
		Total	1.3	
$R_{th(c)}$	Coupling		0.3	

When the diodes 1 and 2 are used simultaneously:

Δ Tj(diode 1) = P(diode 1) x $R_{th(j-c)}$(Per diode) + P(diode 2) x $R_{th(c)}$

Table 5: Static Electrical Characteristics (per diode)

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

Pulse test: * tp = 5 ms, δ < 2%

** tp = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation: P = 0.31 x $I_{F(AV)}$ + 0.012 I_F^2 (RMS)

Figure 1: Conduction losses versus average current

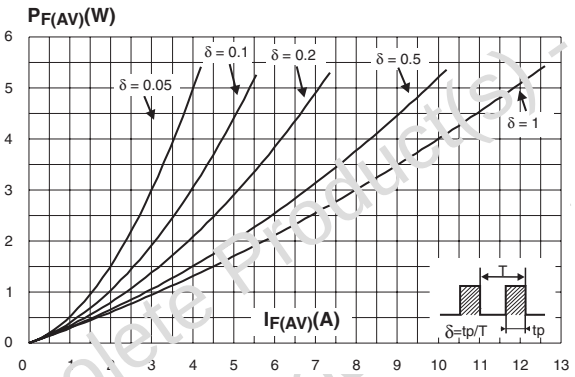


Figure 2: Average forward current versus ambient temperature (δ = 0.5, per diode)

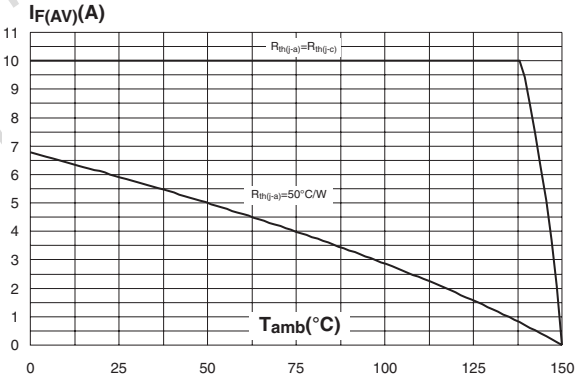


Figure 3: Normalized avalanche power derating versus pulse duration

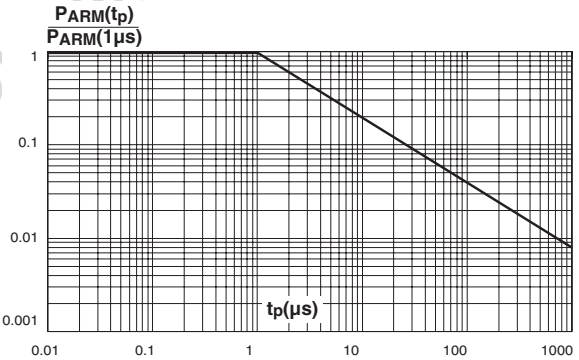


Figure 4: Normalized avalanche power derating versus junction temperature

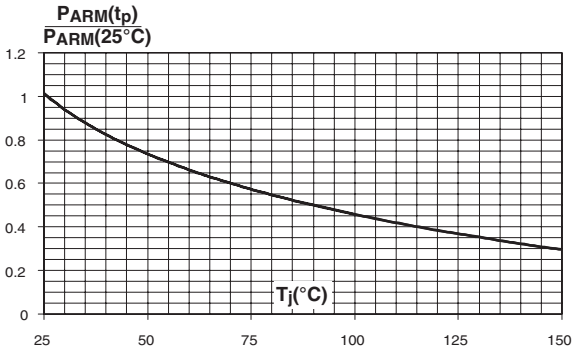


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values)

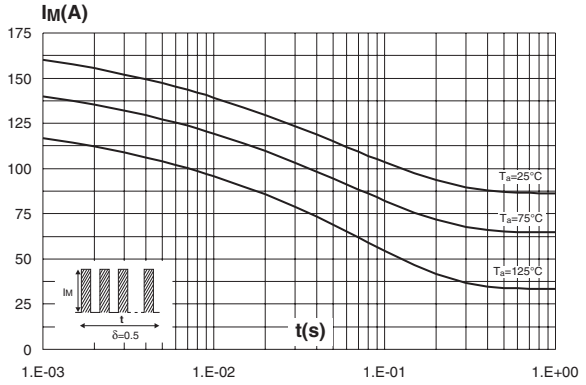


Figure 6: Relative variation of thermal impedance junction to case versus pulse duration

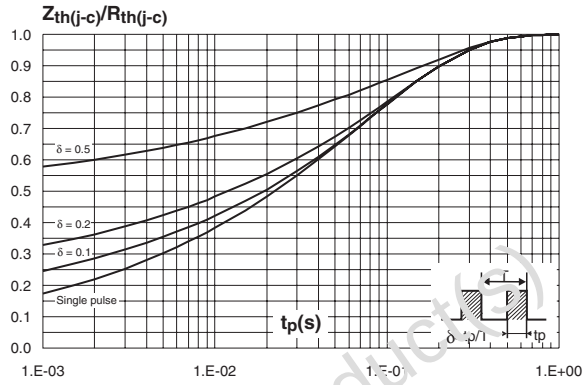


Figure 7: Reverse leakage current versus reverse voltage applied (typical values)

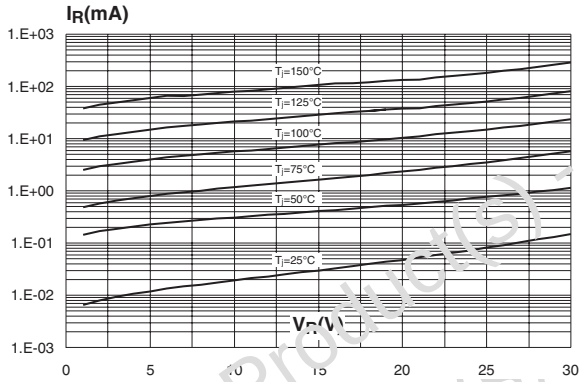


Figure 8: Junction capacitance versus reverse voltage applied (typical values)

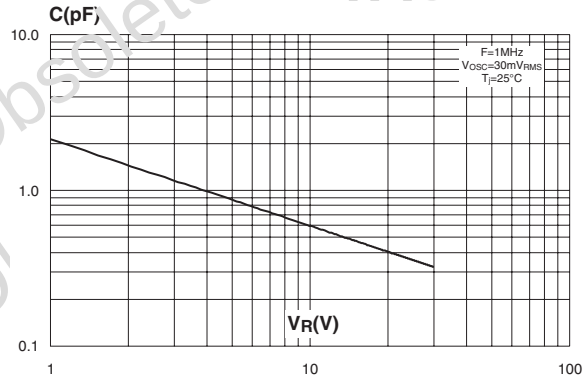


Figure 9: Forward voltage drop versus forward current

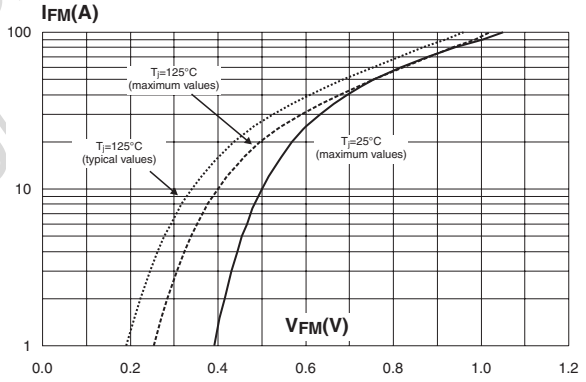


Figure 10: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35µm)

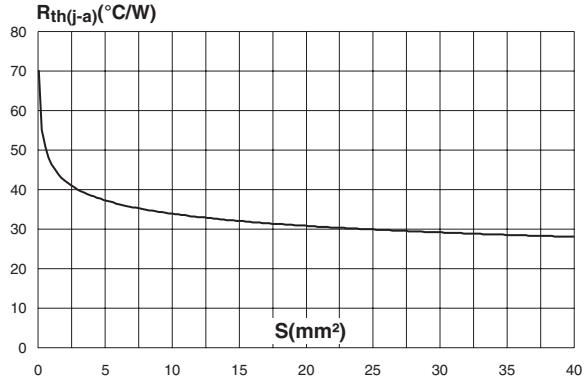
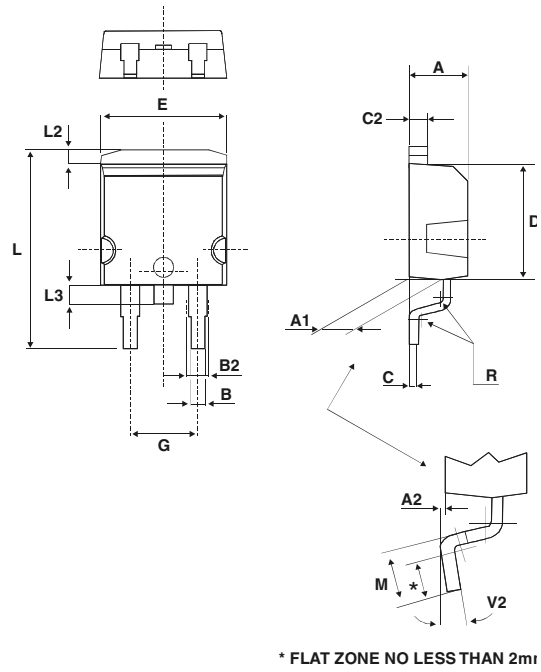


Figure 11: D²PAK Package Mechanical Data



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)

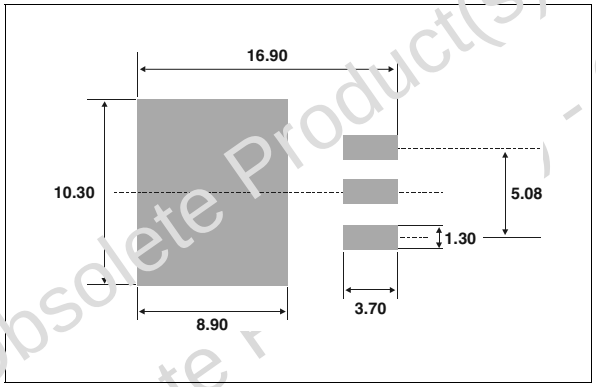


Table 6: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS2530CG	STPS2530CG	D²PAK	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.