

LOW DROP POWER SCHOTTKY RECTIFIER

MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 15 A
V_{RRM}	30 V
$T_j(\text{max})$	150°C
$V_F(\text{max})$	0.42 V

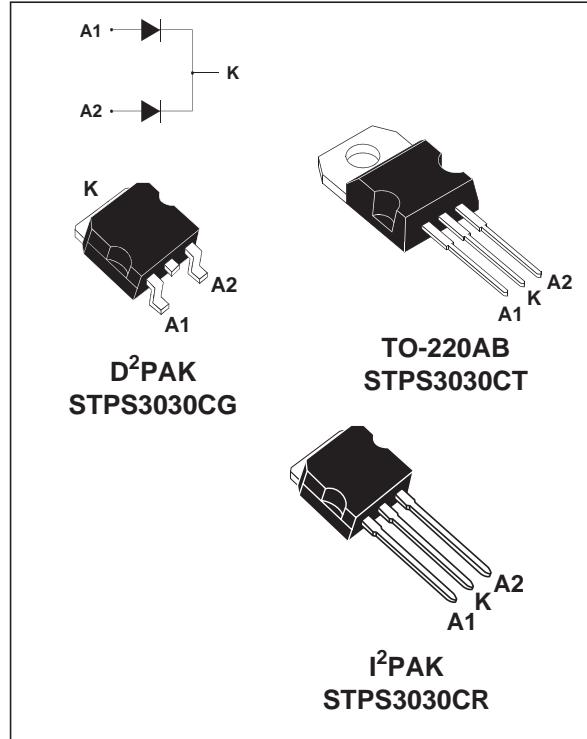
FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW FORWARD VOLTAGE DROP FOR HIGHER EFFICIENCY
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

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

Packaged in TO-220AB, D²PAK and I²PAK, this device is intended for use in low voltage high frequency inverters, free wheeling and polarity protection applications.



ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			30	V
$I_{F(RMS)}$	RMS forward current			30	A
$I_{F(AV)}$	Average forward current	$T_c = 135^\circ\text{C}$ $\delta = 0.5$	Per diode Per device	15 30	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10 \text{ ms}$	Sinusoidal	250	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	3	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\mu\text{s}$	$T_j = 25^\circ\text{C}$	4100	W
T_{stg}	Storage temperature range	$-65 \text{ to } +150^\circ\text{C}$			$^\circ\text{C}$
T_j	Maximum operating junction temperature *	150			$^\circ\text{C}$
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

STPS3030CT/CG/CR

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case TO-220AB - D ² PAK - I ² PAK	1.2	°C/W
	Per diode Total	0.8	
$R_{th(c)}$	Coupling	0.4	°C/W

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$		0.23	1.0	mA
		$T_j = 125^\circ\text{C}$			125	180	
V_F^*	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 15 \text{ A}$		0.44	0.49	V
		$T_j = 125^\circ\text{C}$	$I_F = 15 \text{ A}$		0.36	0.40	
		$T_j = 25^\circ\text{C}$	$I_F = 30 \text{ A}$		0.53	0.58	
		$T_j = 125^\circ\text{C}$	$I_F = 30 \text{ A}$		0.49	0.53	

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

To evaluate the conduction losses use the following equation :
 $P = 0.26 \times I_{F(AV)} + 0.0107 I_F^2(\text{RMS})$

Fig. 1: Conduction losses versus average current.

Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$).

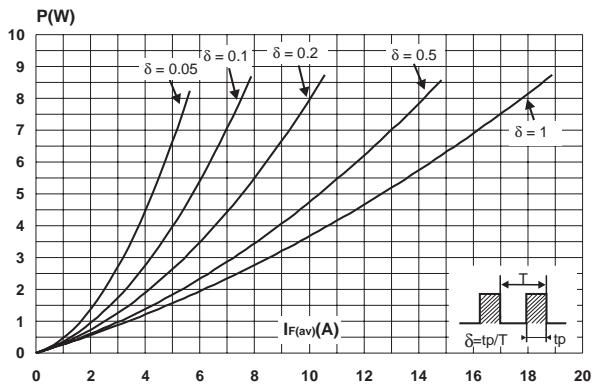


Fig. 3: Normalized avalanche power derating versus pulse duration.

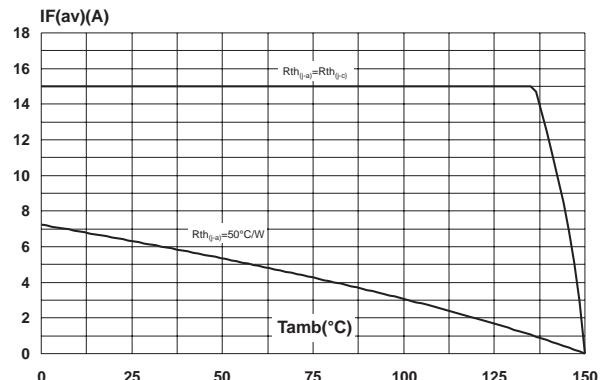


Fig. 4: Normalized avalanche power derating versus junction temperature.

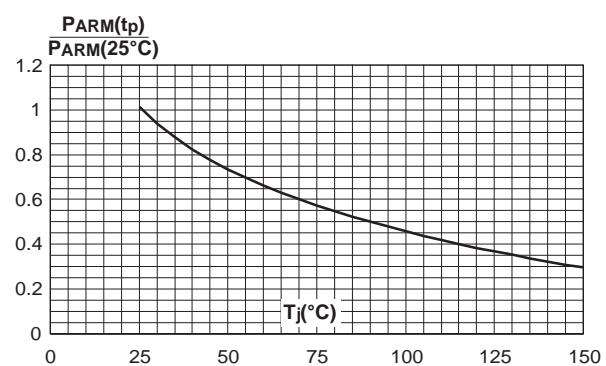
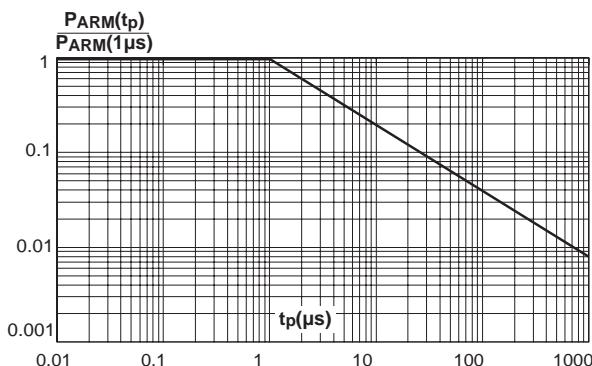


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values).

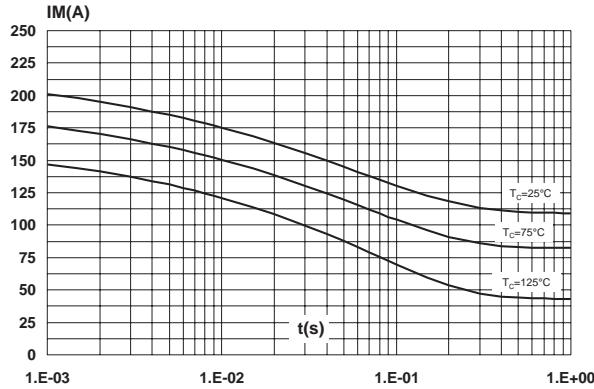


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

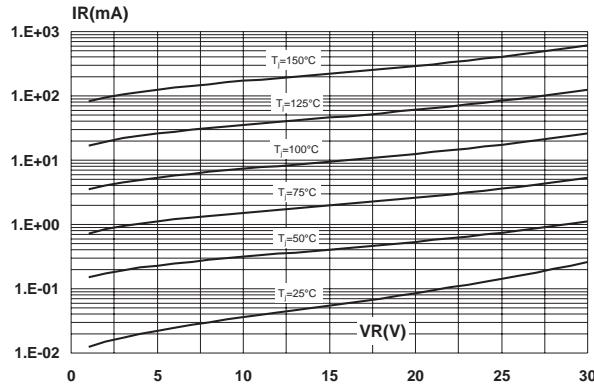


Fig. 9: Forward voltage drop versus forward current.

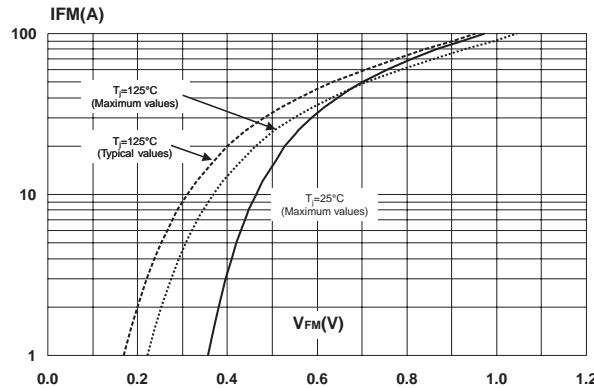


Fig. 6: Relative variation of thermal impedance junction to case versus pulse duration.

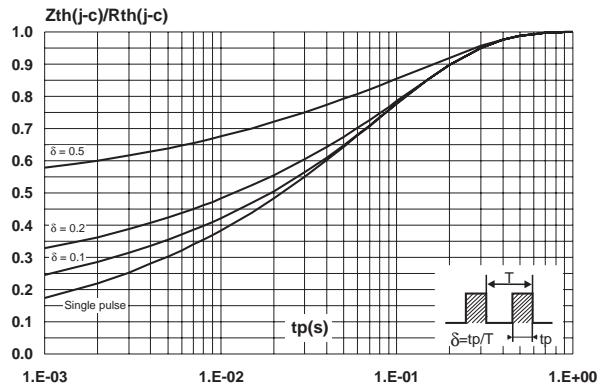


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

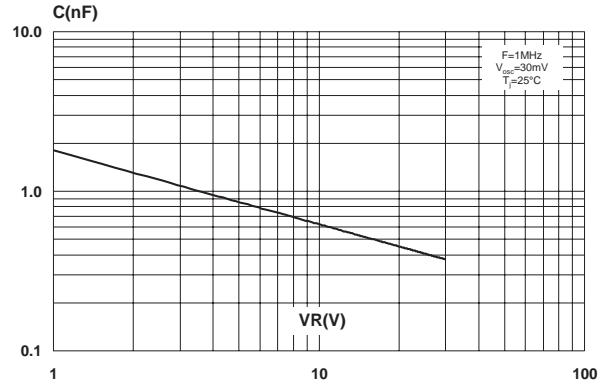
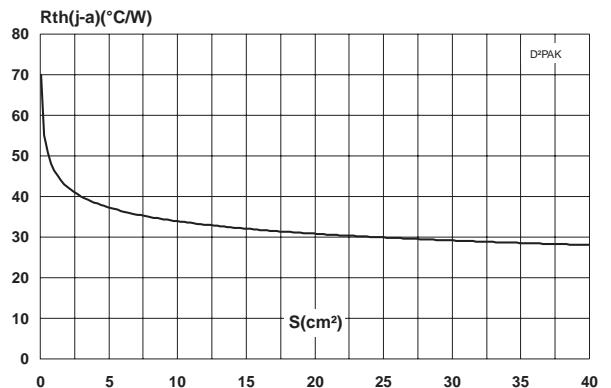


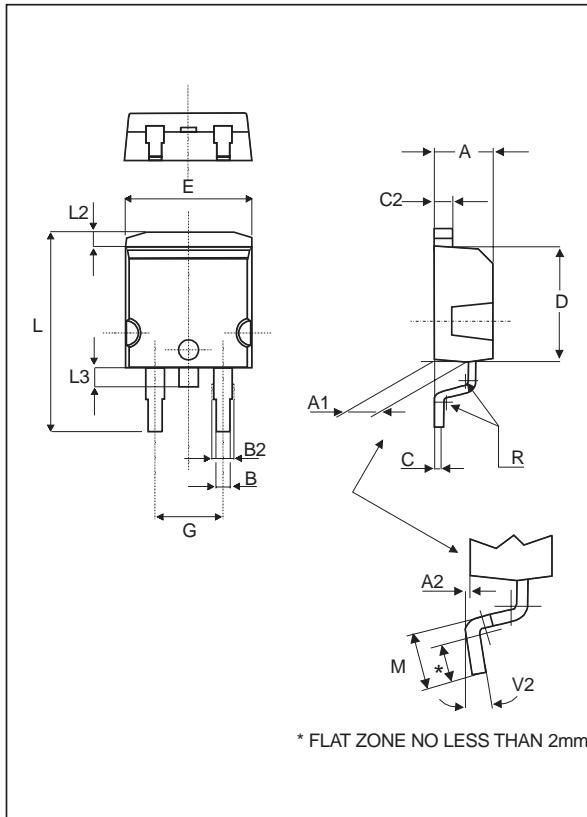
Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = $35\mu\text{m}$).



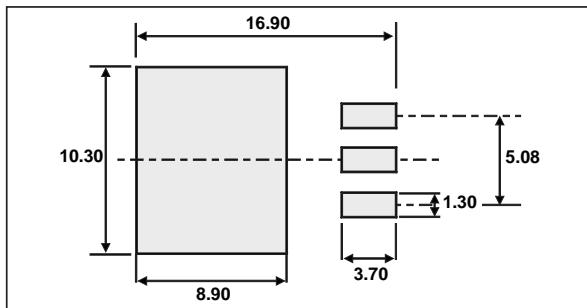
PACKAGE MECHANICAL DATA
I²PAK

The diagram illustrates the physical dimensions of the STPS3030CT/CG/CR package. The top view shows the chip outline with width E and height L2. The side view shows the total height L, lead spacing L1, lead thickness b, lead pitch e, and various lead and body clearances (c, c1, c2, D, A, A1). The bottom view shows the chip outline with width E and height L2.

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
b	0.70	0.93	0.028	0.037
b1	1.14	1.17	0.044	0.046
b2	1.14	1.17	0.044	0.046
c	0.45	0.60	0.018	0.024
c2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
e	2.40	2.70	0.094	0.106
E	10.0	10.4	0.394	0.409
L	13.1	13.6	0.516	0.535
L1	3.48	3.78	0.137	0.149
L2	1.27	1.40	0.050	0.055

PACKAGE MECHANICAL DATA
D²PAK


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°

FOOTPRINT

STPS3030CT/CG/CR

PACKAGE MECHANICAL DATA TO-220AB

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
F2	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
G1	2.40	2.70	0.094	0.106
H2	10	10.40	0.393	0.409
L2	16.4 typ.		0.645 typ.	
L4	13	14	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam.	3.75	3.85	0.147	0.151

- COOLING METHOD : C
- RECOMMENDED TORQUE VALUE : 0.55 M.N
- MAXIMUM TORQUE VALUE : 0.70 M.N

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS3030CT	STPS3030CT	TO-220AB	2.2 g	50	Tube
STPS3030CG	STPS3030CG	D ² PAK	1.48 g	50	Tube
STPS3030CG-TR	STPS3030CG	D ² PAK	1.48 g	1000	Tape & reel
STPS3030CR	STPS3030CR	I ² PAK	1.49 g	50	Tube

- EPOXY MEETS UL94,V0

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