

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>2 x 10 A</b>
<b>V<sub>RMM</sub></b>	<b>45 V</b>
<b>T<sub>j(max)</sub></b>	<b>175 °C</b>
<b>V<sub>F(max)</sub></b>	<b>0.57 V</b>

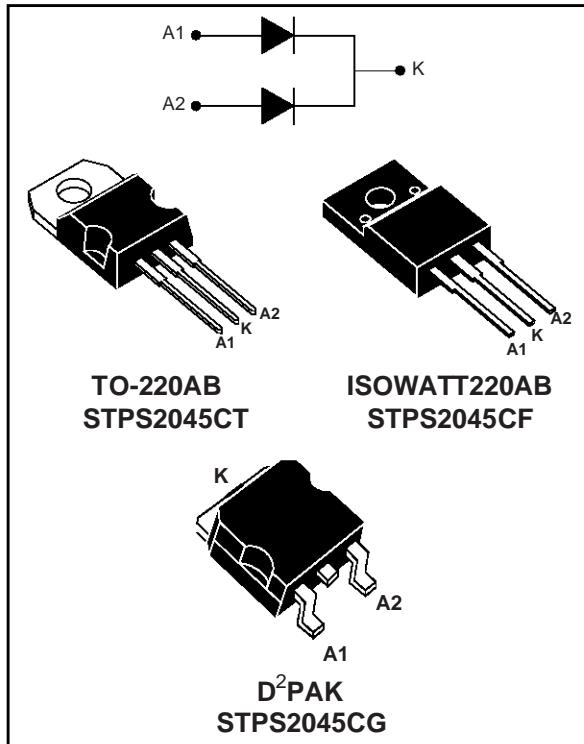
### FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- INSULATED PACKAGE: ISOWATT220AB  
Insulating voltage = 2000V DC  
Capacitance = 12pF

### DESCRIPTION

Dual center tap Schottky rectifier suited for Switch-Mode Power Supply and high frequency DC to DC converters.

Packaged either in TO-220AB, ISOWATT220AB or D<sup>2</sup>PAK, this device is especially 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 <sub>RMM</sub>	Repetitive peak reverse voltage				45	V
I <sub>F(RMS)</sub>	RMS forward current				30	A
I <sub>F(AV)</sub>	Average forward current $\delta = 0.5$	TO-220AB	T <sub>c</sub> = 155°C	Per diode	10	A
		D <sup>2</sup> PAK		Per device	20	
I <sub>FSM</sub>	Surge non repetitive forward current		tp = 10 ms sinusoidal		180	A
I <sub>RRM</sub>	Repetitive peak reverse current		tp = 2 µs square F = 1kHz		1	A
I <sub>RSR</sub>	Non repetitive peak reverse current		tp = 100 ms square		2	A
T <sub>stg</sub>	Storage temperature range				-65 to +175	°C
T <sub>j</sub>	Maximum operating junction temperature*				175	°C
dV/dt	Critical rate of rise of reverse voltage				10000	V/µs

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

## STPS2045CT/CF/CG

### THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AB/ D <sup>2</sup> PAK		Per diode Total	2.2 1.3
		ISOWATT220AB		Per diode Total	4.5 3.5
$R_{th(c)}$		TO-220AB/ D <sup>2</sup> PAK		Coupling	0.3
		ISOWATT220AB			2.5

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j \text{ (diode 1)} = P \text{ (diode1)} \times R_{th(j-c)} \text{ (per diode)} + P \text{ (diode 2)} \times R_{th(c)}$$

### STATIC ELECTRICAL CHARACTERISTICS (Per diode)

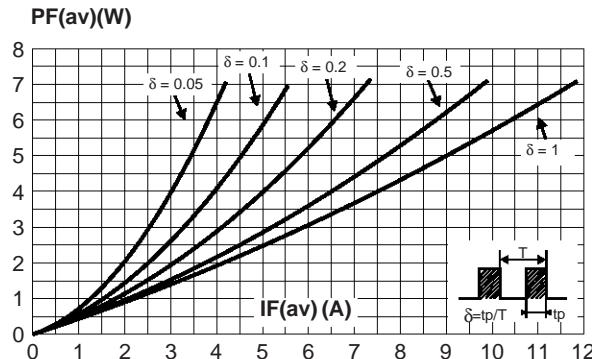
Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
$I_R$ *	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			100	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$			7	15	$\text{mA}$
$V_F$ *	Forward voltage drop	$T_j = 125^\circ\text{C}$	$I_F = 10 \text{ A}$		0.5	0.57	V
		$T_j = 25^\circ\text{C}$	$I_F = 20 \text{ A}$			0.84	
		$T_j = 125^\circ\text{C}$	$I_F = 20 \text{ A}$		0.65	0.72	

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

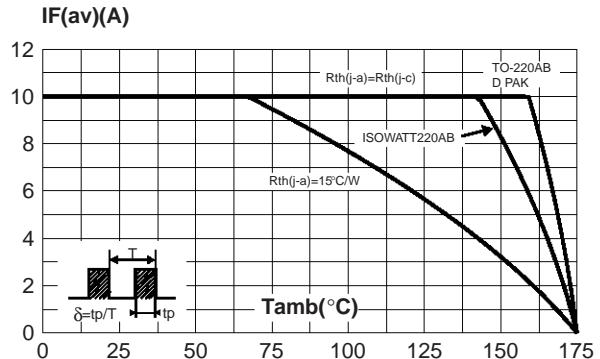
To evaluate the conduction losses use the following equation:

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

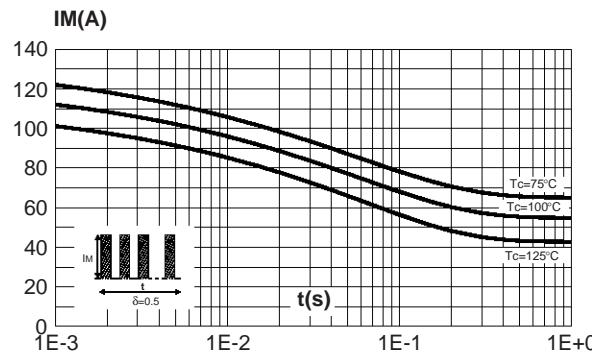
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



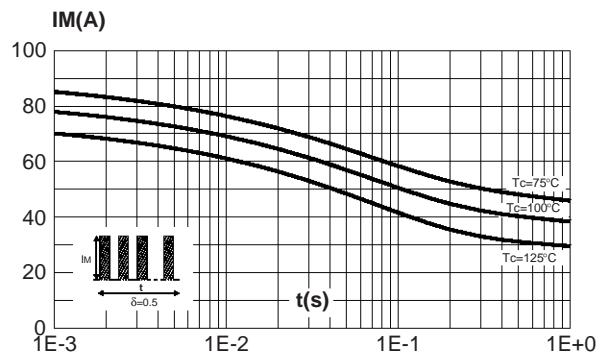
**Fig. 2:** Average current versus ambient temperature ( $\delta=0.5$ , per diode).



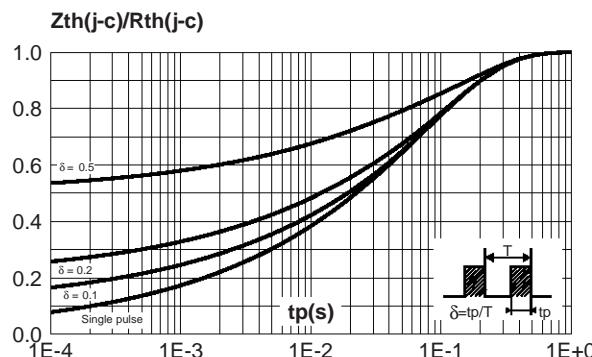
**Fig. 3-1:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB and D<sup>2</sup>PAK).



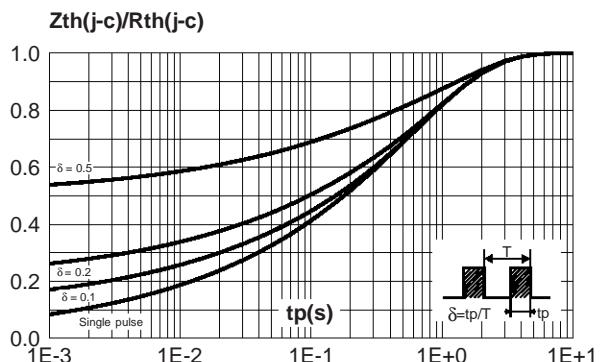
**Fig. 3-2:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB).



**Fig. 4-1:** Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220AB and D<sup>2</sup>PAK).



**Fig. 4-2:** Relative variation of thermal transient impedance junction to case versus pulse duration (ISOWATT220AB).



**PACKAGE MECHANICAL DATA**  
 ISOWATT220AB

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
B	2.50	2.70	0.098	0.106
D	2.50	2.75	0.098	0.108
E	0.40	0.70	0.016	0.028
F	0.75	1.00	0.030	0.039
F1	1.15	1.70	0.045	0.067
F2	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.40	2.70	0.094	0.106
H	10.00	10.40	0.394	0.409
L2	16.00 typ.		0.630 typ.	
L3	28.60	30.60	1.125	1.205
L4	9.80	10.60	0.386	0.417
L6	15.90	16.40	0.626	0.646
L7	9.00	9.30	0.354	0.366
Diam	3.00	3.20	0.118	0.126

Type	Marking	Package	Weight	Base qty	Delivery mode
STPS2045CT	STPS2045CT	TO-220AB	2.25 g.	50	Tube
STPS2045CF	STPS2045CF	ISOWATT220AB	2.08 g.	50	Tube
STPS2045CG	STPS2045CG	D <sup>2</sup> PAK	1.48 g.	50	Tube
STPS2045CG-TR	STPS2045CG	D <sup>2</sup> PAK	1.48 g.	1000	Tape & reel

- Cooling method: by conduction (C)
- Recommended torque value: 0.55 N.m.
- Maximum torque value: 0.7 N.m.
- Epoxy meets UL94, V0