

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 20 A
$V_{RRM}$	30 V
$T_j(max)$	150°C
$V_F(max)$	0.40 V

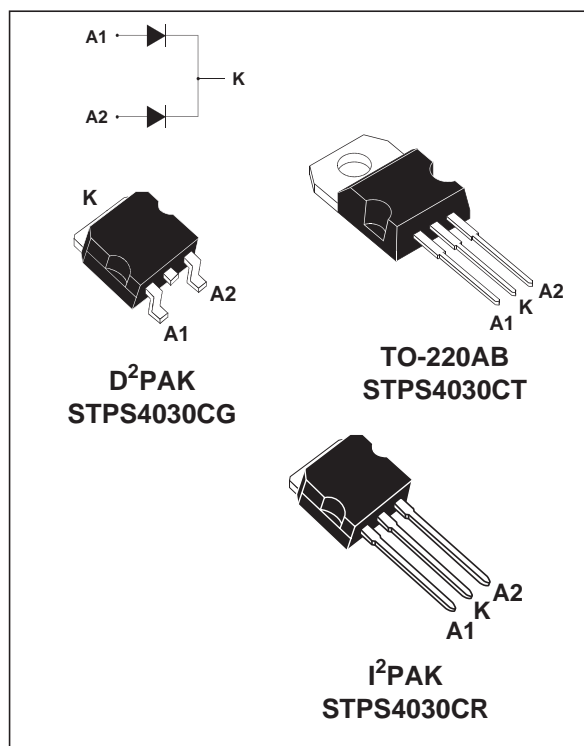
### FEATURES AND BENEFITS

- 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, D<sup>2</sup>PAK and I<sup>2</sup>PAK, 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			32	A
$I_{F(AV)}$	Average forward current	$T_c = 130^\circ\text{C}$ $\delta = 0.5$	Per diode Per device	20 40	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms}$ Sinusoidal		220	A
$I_{RRM}$	Peak repetitive reverse current	$t_p = 2\text{ }\mu\text{s}$ square $F = 1\text{ kHz}$		2	A
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 1\text{ }\mu\text{s}$ $T_j = 25^\circ\text{C}$		5300	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/ $\mu\text{s}$

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

## THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case TO-220AB - D <sup>2</sup> PAK - I <sup>2</sup> PAK	Per diode	1.6	°C/W
		Total	0.85	
$R_{th(c)}$		Coupling	0.1	°C/W

## STATIC ELECTRICAL CHARACTERISTICS (per diode)

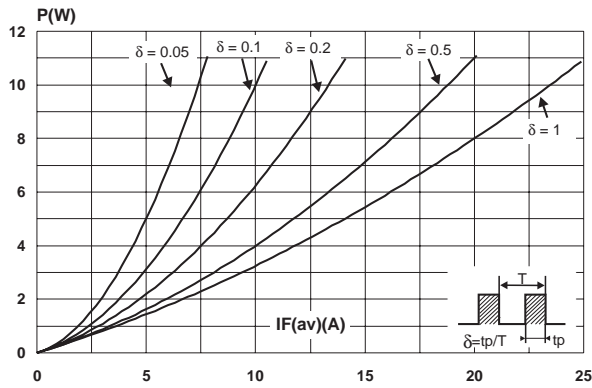
Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
$I_R$ *	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$		0.50	1.0	mA
		$T_j = 125^\circ\text{C}$			170	350	
$V_F$ *	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 20\text{ A}$		0.44	0.49	V
		$T_j = 125^\circ\text{C}$	$I_F = 20\text{ A}$		0.35	0.40	
		$T_j = 25^\circ\text{C}$	$I_F = 40\text{ A}$		0.52	0.61	
		$T_j = 125^\circ\text{C}$	$I_F = 40\text{ A}$		0.46	0.55	

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

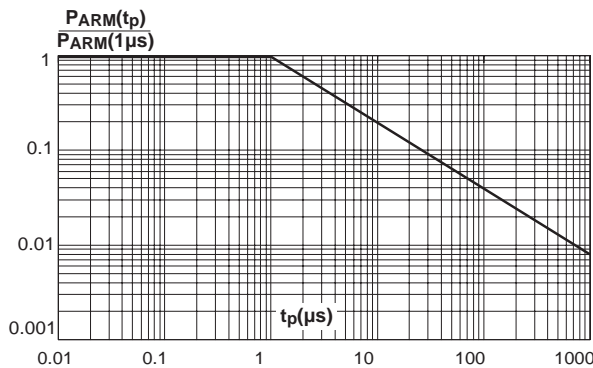
To evaluate the conduction losses use the following equation :

$$P = 0.25 \times I_{F(AV)} + 0.0075 I_{F(RMS)}^2$$

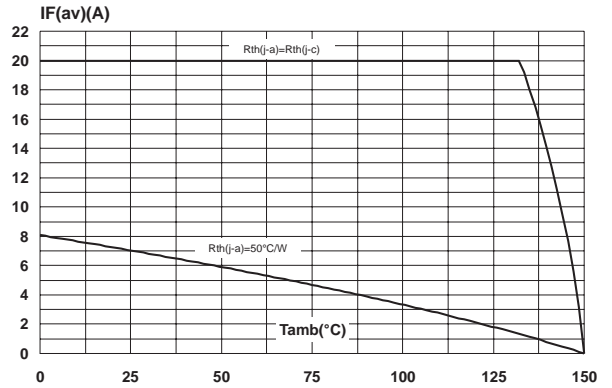
**Fig. 1:** Conduction losses versus average current.



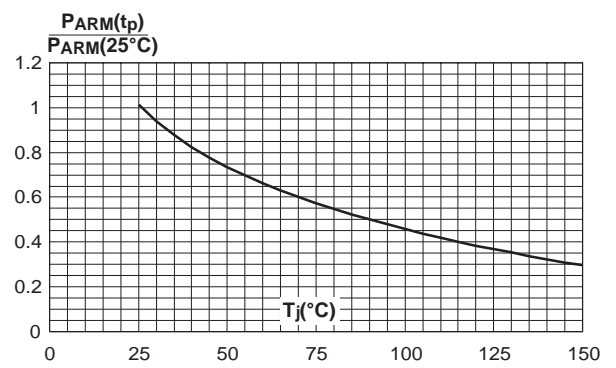
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



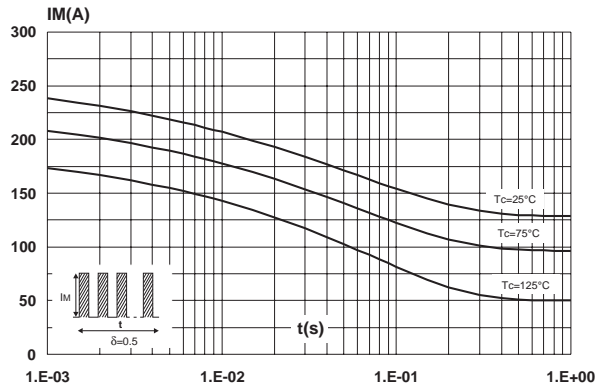
**Fig. 2:** Average forward current versus ambient temperature ( $\delta = 0.5$ ).



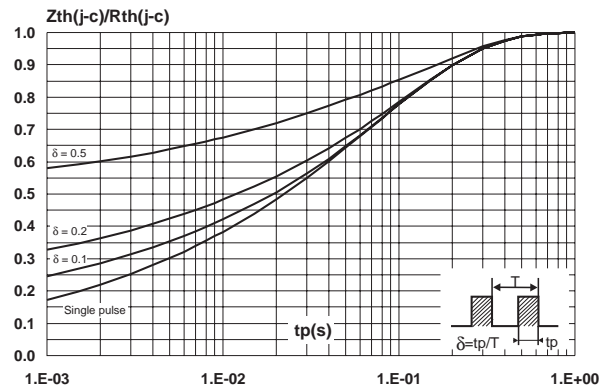
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



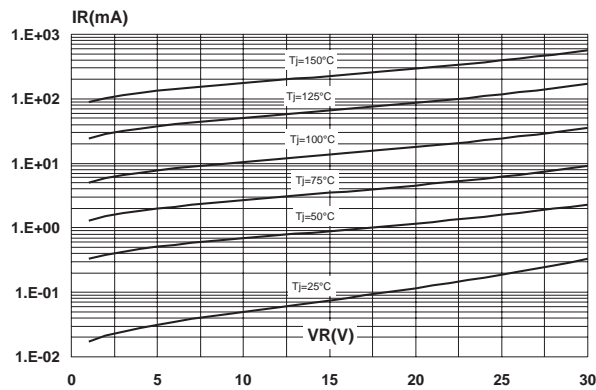
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values).



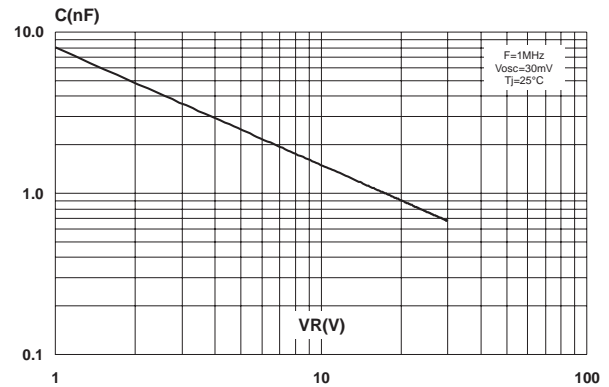
**Fig. 6:** Relative variation of thermal impedance junction to case versus pulse duration.



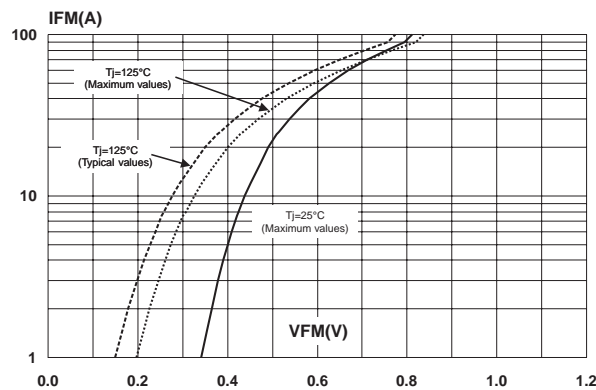
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values).



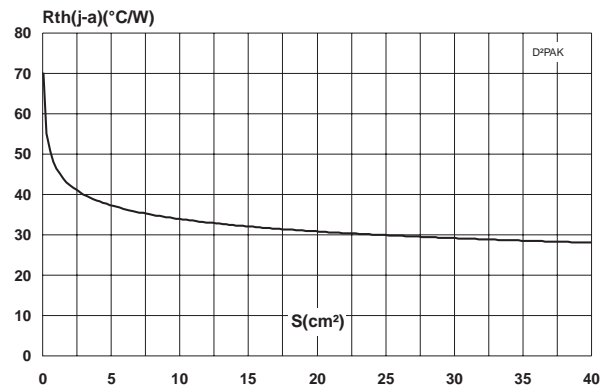
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values).



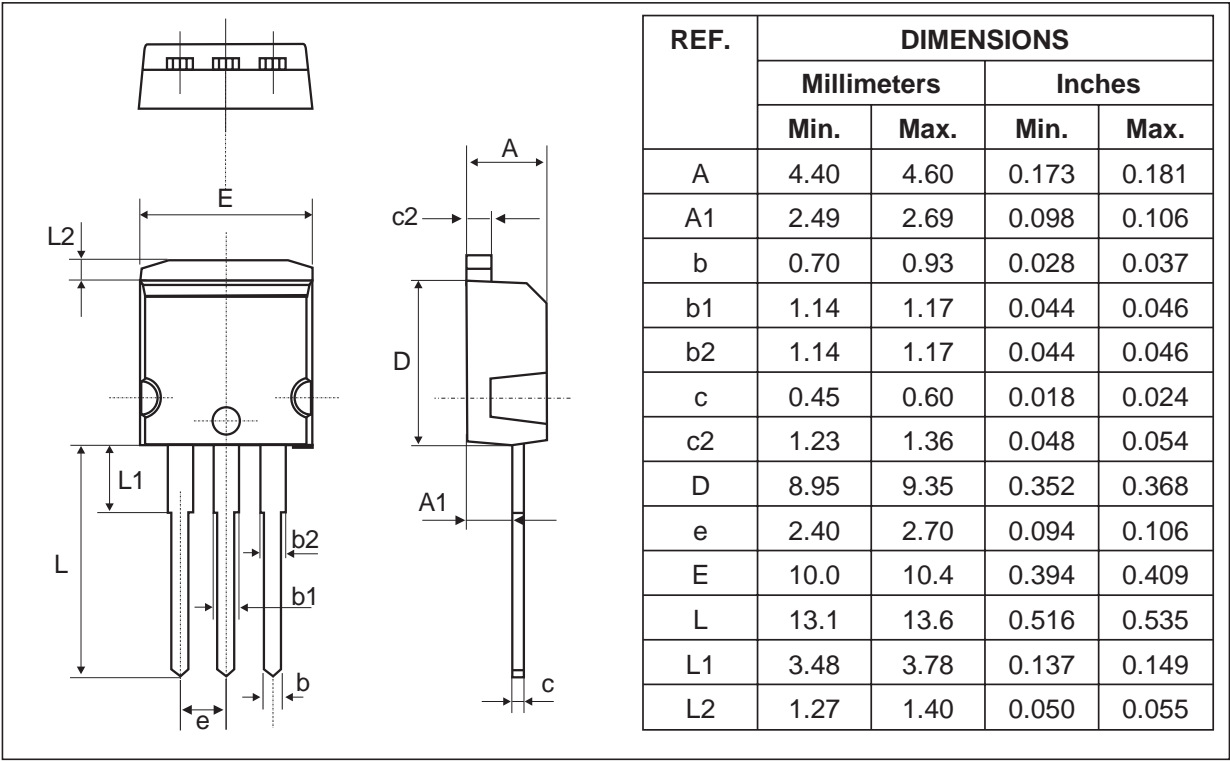
**Fig. 9:** Forward voltage drop versus forward current.



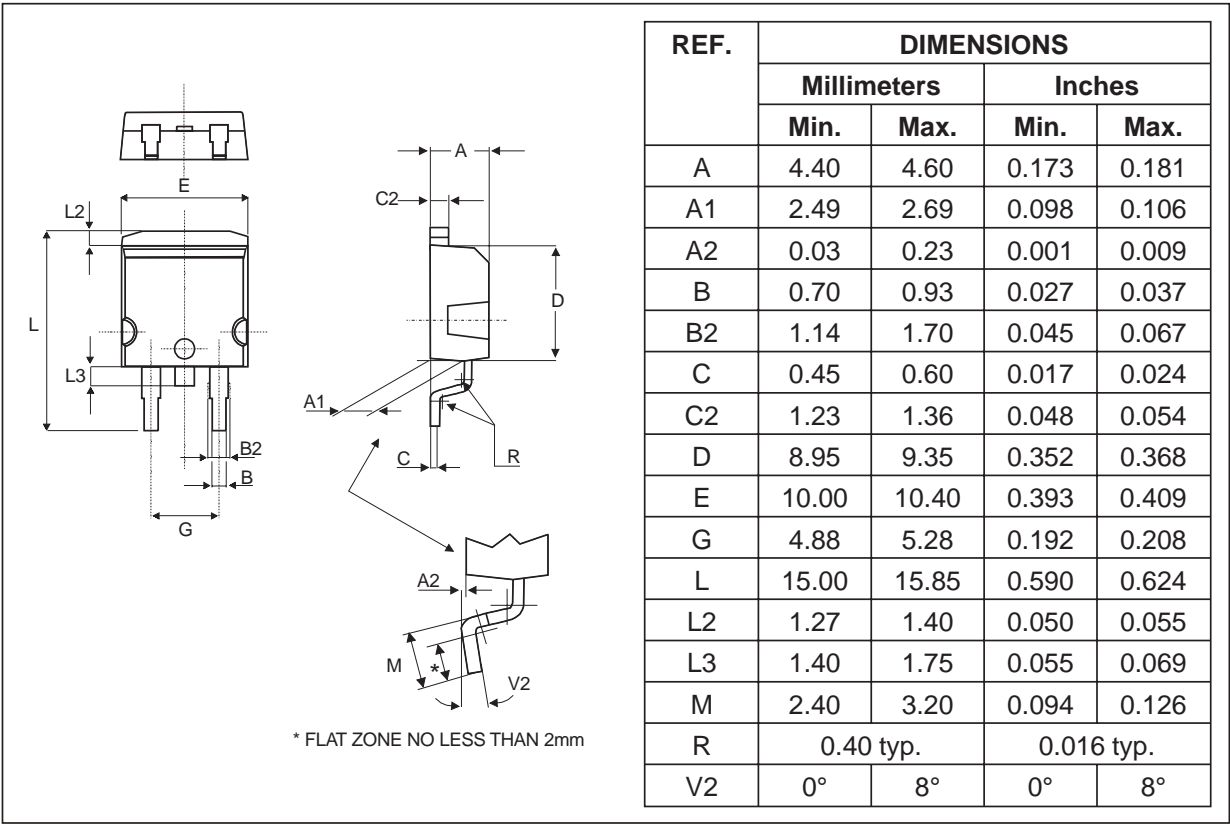
**Fig. 10:** Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35μm).



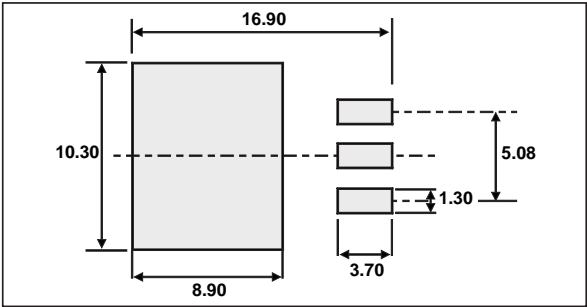
PACKAGE MECHANICAL DATA  
I<sup>2</sup>PAK

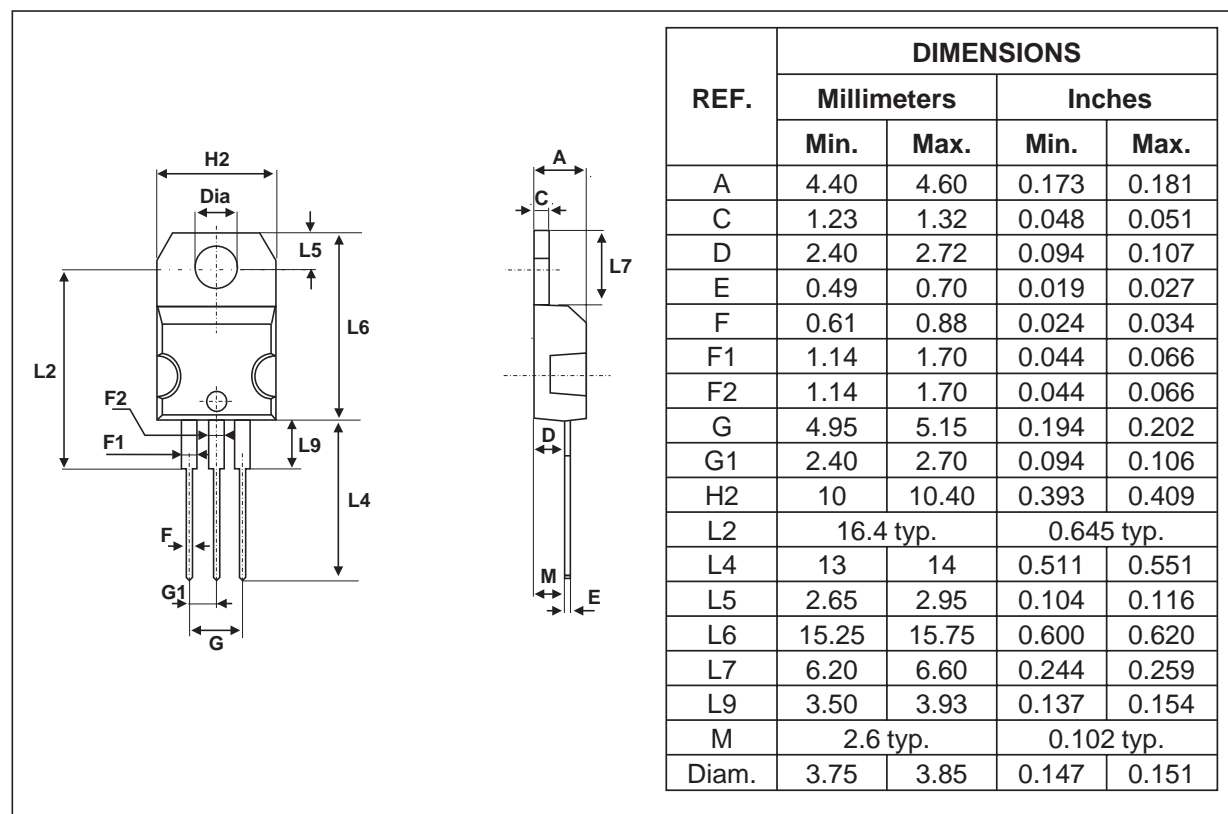


PACKAGE MECHANICAL DATA  
D<sup>2</sup>PAK



FOOTPRINT



**PACKAGE MECHANICAL DATA**  
 TO-220AB


- 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
STPS4030CT	STPS4030CT	TO-220AB	2.2 g	50	Tube
STPS4030CG	STPS4030CG	D <sup>2</sup> PAK	1.48 g	50	Tube
STPS4030CG-TR	STPS4030CG	D <sup>2</sup> PAK	1.48 g	1000	Tape & reel
STPS4030CR	STPS4030CR	I <sup>2</sup> PAK	1.49 g	50	Tube

- EPOXY MEETS UL94,V0

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