



# STPS10H100CT/CG/CR/CFP

## HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

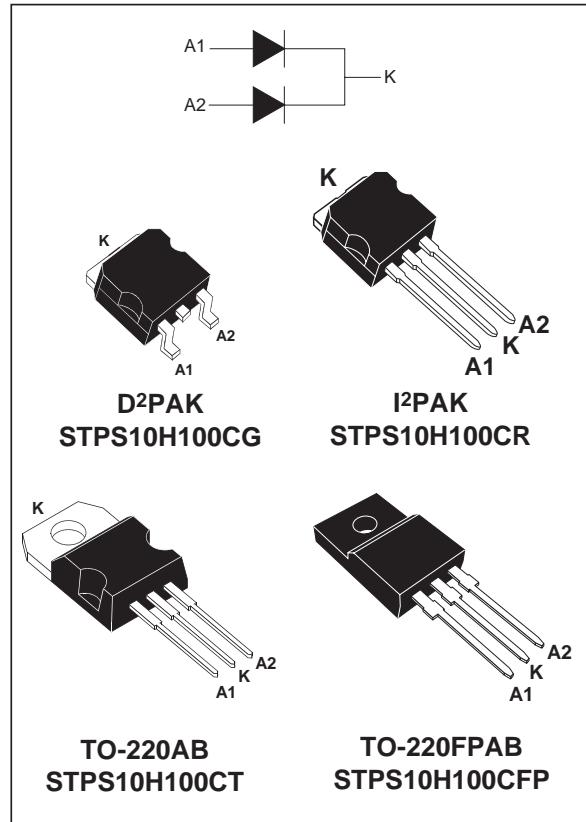
$I_{F(AV)}$	2 x 5 A
$V_{RRM}$	100 V
$T_j$	175°C
$V_F$ (max)	0.61 V

### FEATURES AND BENEFITS

- HIGH JUNCTION TEMPERATURE CAPABILITY FOR CONVERTERS LOCATED IN CONFINED ENVIRONMENT.
- LOW LEAKAGE CURRENT AT HIGH TEMPERATURE.
- LOW STATIC AND DYNAMIC LOSSES AS A RESULT OF THE SCHOTTKY BARRIER.

### DESCRIPTION

Schottky barrier rectifier designed for high frequency miniature Switched Mode Power Supplies such as adaptors and on board DC/DC converters. Packaged in TO-220AB, TO-220FPAB, D<sup>2</sup>PAK and I<sup>2</sup>PAK.



### ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter				Value	Unit			
$V_{RRM}$	Repetitive peak reverse voltage				100	V			
$I_{F(RMS)}$	RMS forward current				10	A			
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AB D <sup>2</sup> PAK / I <sup>2</sup> PAK	$T_c = 165^\circ\text{C}$	per diode per device	5	A			
		TO-220FPAB	$T_c = 160^\circ\text{C}$		10				
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10 \text{ ms sinusoidal}$		180	A			
$I_{IRRM}$	Repetitive peak reverse current		$t_p = 2 \mu\text{s square } F = 1\text{kHz}$		1	A			
$T_{stg}$	Storage temperature range				- 65 to + 175	°C			
$T_j$	Maximum operating junction temperature *				175	°C			
$dV/dt$	Critical rate of rise of reverse voltage				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

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## THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case	D2PAK / I2PAK TO-220AB	Per diode	2.2	°C/W
			Total	1.3	
			Coupling	0.3	
$R_{th(c)}$	Junction to case	TO-220FPAB	Per diode	4.5	°C/W
			Total	3.5	
			Coupling	2.5	

When the diodes 1 and 2 are used simultaneously :

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

## STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$I_R$ *	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			3.5	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$			1.3	4.5	$\text{mA}$
$V_F$ **	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 5 \text{ A}$			0.73	V
		$T_j = 125^\circ\text{C}$			0.57	0.61	
		$T_j = 25^\circ\text{C}$	$I_F = 10 \text{ A}$			0.85	
		$T_j = 125^\circ\text{C}$			0.66	0.71	

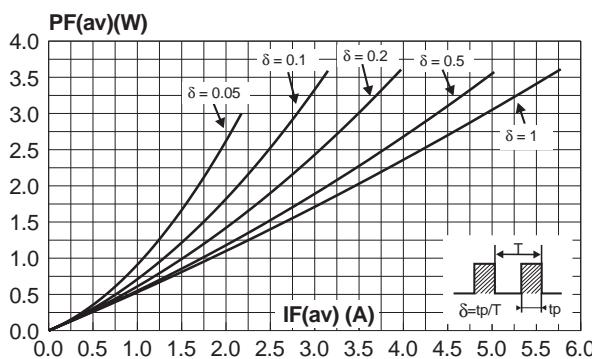
Pulse test : \*  $t_p = 5 \text{ ms}, \delta < 2\%$

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

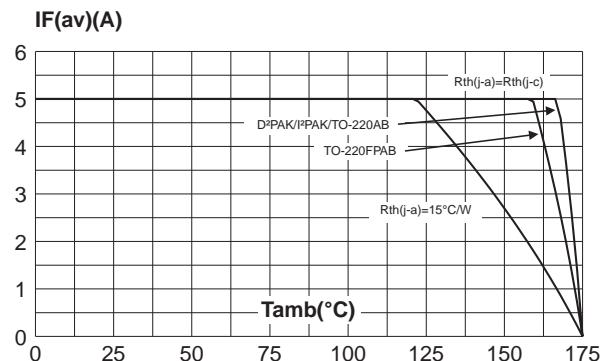
To evaluate the maximum conduction losses use the following equation :

$$P = 0.51 \times I_{F(AV)} + 0.02 \times I_F^2(\text{RMS})$$

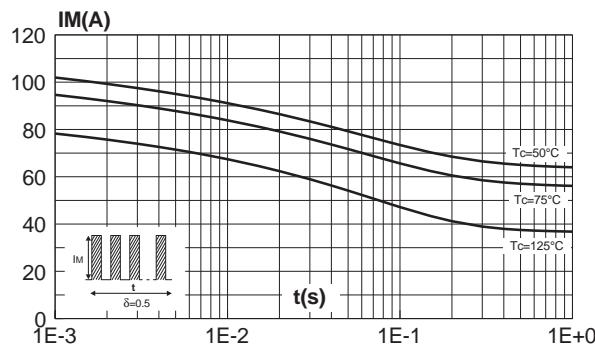
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



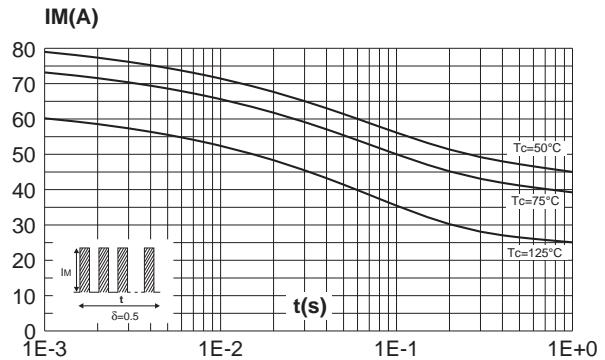
**Fig. 2:** Average forward current versus ambient temperature ( $\delta=0.5$ , per diode).



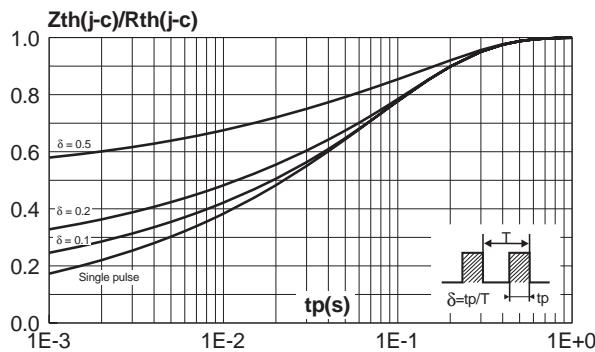
**Fig. 3-1:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode)



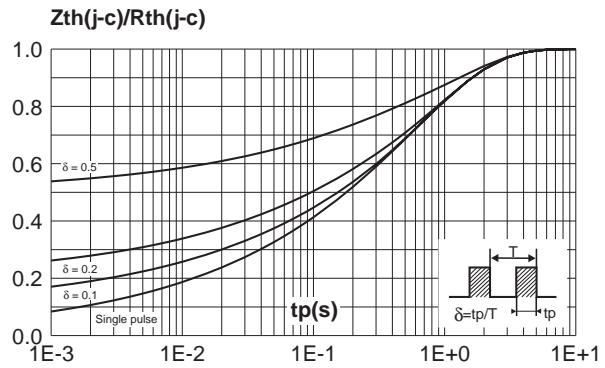
**Fig. 3-2:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode)(TO-220FPAB)



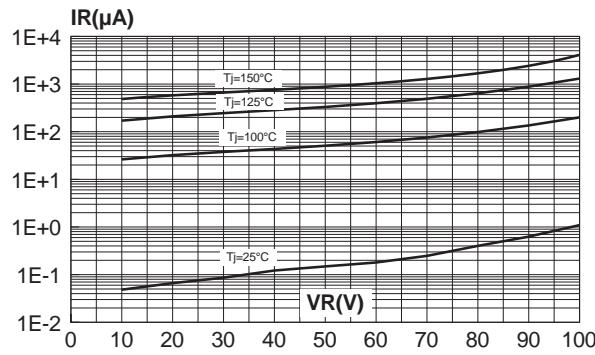
**Fig. 4-1:** Relative variation of thermal impedance junction to case versus pulse duration (per diode).



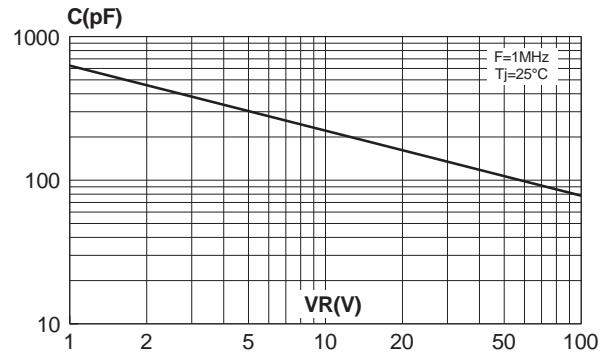
**Fig. 4-2:** Relative variation of thermal impedance junction to case versus pulse duration (per diode).(TO-220FPAB)



**Fig. 5:** Reverse leakage current versus reverse voltage applied (typical values, per diode).

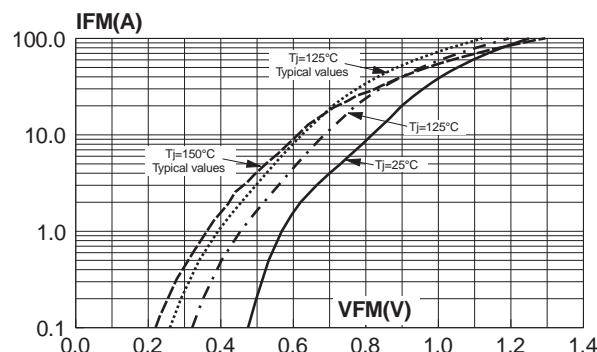


**Fig. 6:** Junction capacitance versus reverse voltage applied (typical values, per diode).

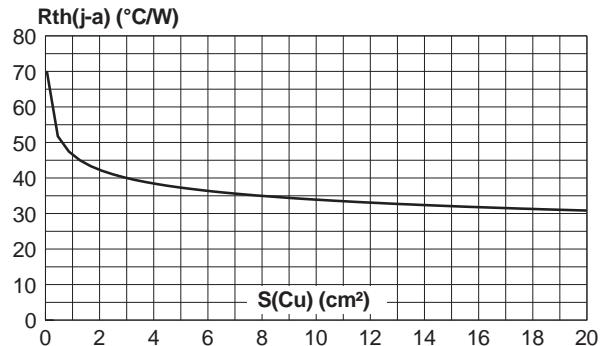


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**Fig. 7:** Forward voltage drop versus forward current (maximum values, per diode).



**Fig. 8:** Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm) (D<sup>2</sup>PAK).

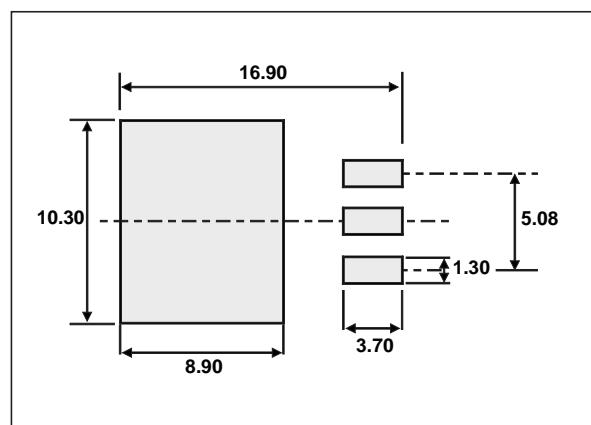


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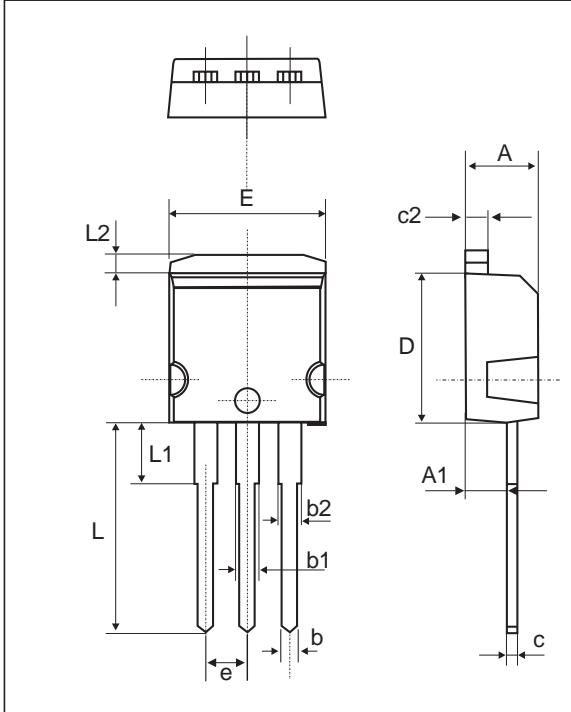
## PACKAGE MECHANICAL DATA D<sup>2</sup>PAK

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°

## FOOT PRINT in millimeters

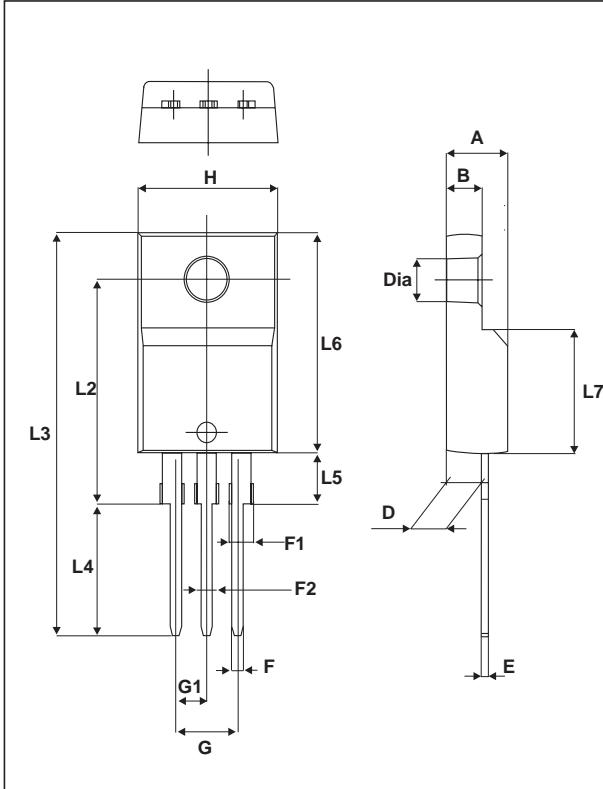


**PACKAGE MECHANICAL DATA**  
I<sup>2</sup>PAK



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**  
TO-220FPAB



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
B	2.5	2.7	0.098	0.106
D	2.5	2.75	0.098	0.108
E	0.45	0.70	0.018	0.027
F	0.75	1	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	2.4	2.7	0.094	0.106
H	10	10.4	0.393	0.409
L2	16 Typ.		0.63 Typ.	
L3	28.6	30.6	1.126	1.205
L4	9.8	10.6	0.386	0.417
L5	2.9	3.6	0.114	0.142
L6	15.9	16.4	0.626	0.646
L7	9.00	9.30	0.354	0.366
Dia.	3.00	3.20	0.118	0.126

## STPS10H100CT/CG/CR/CFP

### 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
STPS10H100CT	STPS10H100CT	TO-220AB	2.20g	50	Tube
STPS10H100CFP	STPS10H100CFP	TO-220FPAB	2.0 g	50	Tube
STPS10H100CG	STPS10H100CG	D <sup>2</sup> PAK	1.48g	50	Tube
STPS10H100CG-TR	STPS10H100CG	D <sup>2</sup> PAK	1.48g	1000	Tape and reel
STPS10H100CR	STPS10H100CR	I <sup>2</sup> PAK	1.49g	50	Tube

- Epoxy meets UL94,V0

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