



STPS20150CT/CG/CR/CFP

HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

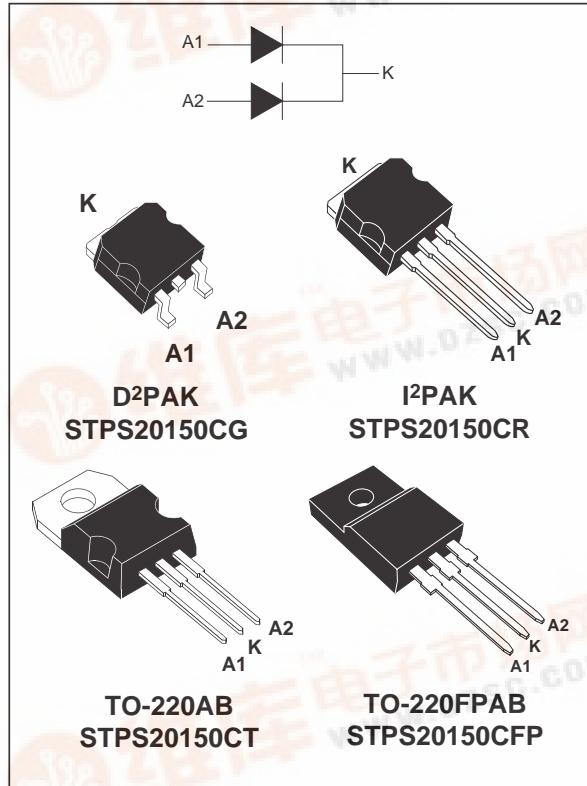
$I_{F(AV)}$	$2 \times 10 \text{ A}$
V_{RRM}	150 V
T_j	175°C
$V_F(\text{max})$	0.75 V

FEATURES AND BENEFITS

- HIGH JUNCTION TEMPERATURE CAPABILITY
- GOOD TRADE OFF BETWEEN LEAKAGE CURRENT AND FORWARD VOLTAGE DROP
- LOW LEAKAGE CURRENT
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Dual center tap schottky rectifier designed for high frequency Switched Mode Power Supplies.



ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter				Value	Unit		
V_{RRM}	Repetitive peak reverse voltage				150	V		
$I_{F(RMS)}$	RMS forward current				30	A		
$I_{F(AV)}$ $\delta = 0.5$	Average forward current $\delta = 0.5$		TO-220AB D ² PAK / I ² PAK	$T_c = 155^\circ\text{C}$	Per diode	10	A	
			TO-220FPAB	$T_c = 135^\circ\text{C}$	Per device	20		
I_{FSM}	Surge non repetitive forward current		$t_p = 10 \text{ ms}$ sinusoidal		180	A		
PARM	Repetitive peak avalanche power		$t_p = 1\mu\text{s}$ $T_j = 25^\circ\text{C}$		6700	W		
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/ μ s		

STPS20150CT/CG/CR/CFP

THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AB / D ² PAK / I ² PAK	Per diode	2.2	°C/W
		TO-220FPAB		4.5	
		TO-220AB / D ² PAK / I ² PAK	Total	1.3	
		TO-220FPAB		3.5	
$R_{th(c)}$		TO-220AB / D ² PAK / I ² PAK	Coupling	0.3	
		TO-220FPAB		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	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			5.0	µA
		$T_j = 125^\circ\text{C}$				5.0	mA
V_F **	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 10 \text{ A}$			0.92	V
		$T_j = 125^\circ\text{C}$	$I_F = 10 \text{ A}$		0.69	0.75	
		$T_j = 25^\circ\text{C}$	$I_F = 20 \text{ A}$			1	
		$T_j = 125^\circ\text{C}$	$I_F = 20 \text{ A}$		0.79	0.86	

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

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

To evaluate the conduction losses use the following equation:

$$P = 0.64 \times I_{F(AV)} + 0.011 I_F^2(\text{RMS})$$

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

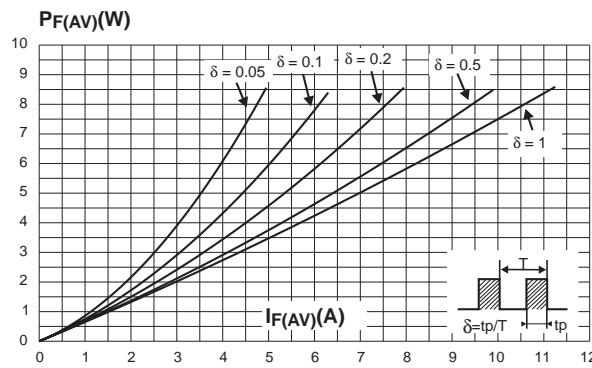


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$, per diode).

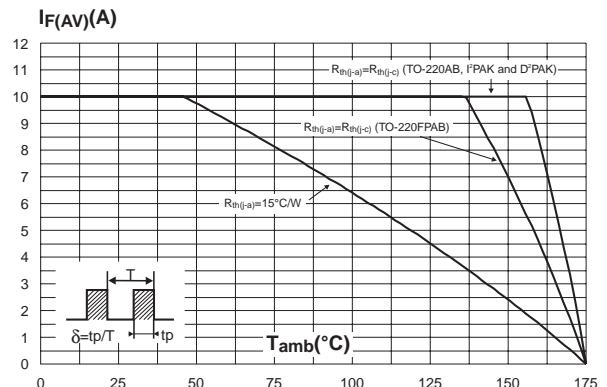


Fig. 3: Normalized avalanche power derating versus pulse duration.

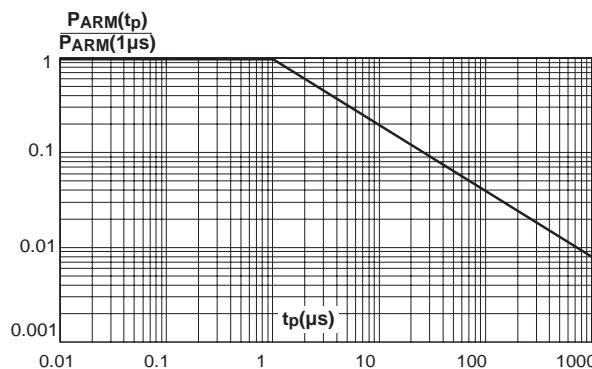


Fig. 4: Normalized avalanche power derating versus junction temperature.

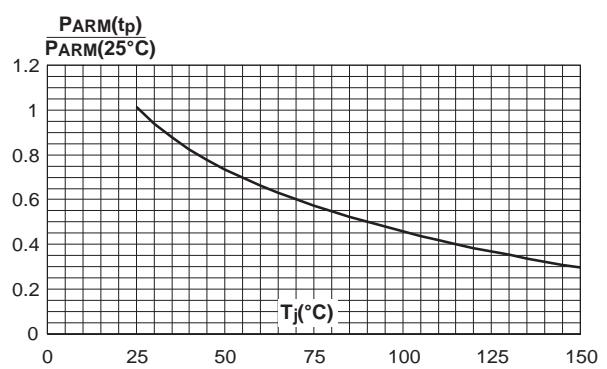


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode). TO-220AB, i²PAK and D²PAK

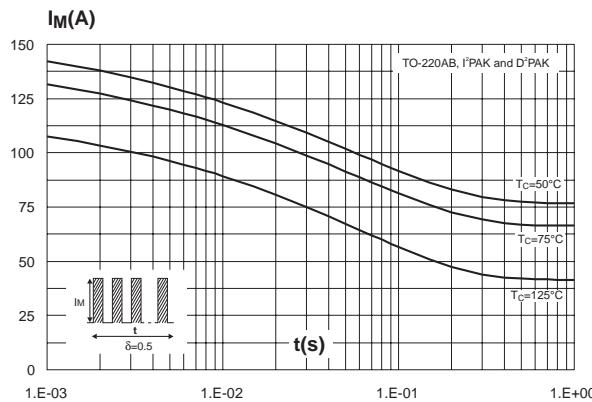
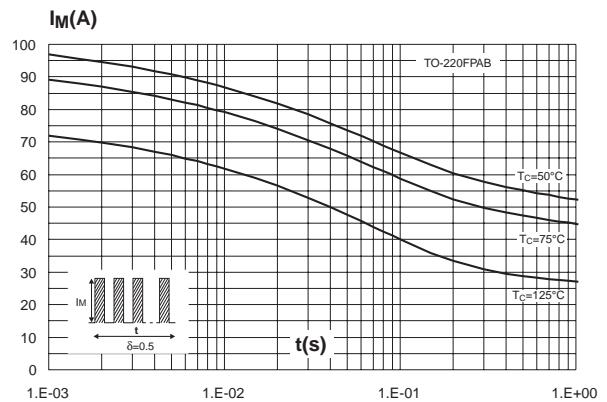


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode). TO-220FPAB



STPS20150CT/CG/CR/CFP

Fig. 6-1: Relative variation of thermal impedance junction to case versus pulse duration. TO-220AB, I²PAK and D²PAK

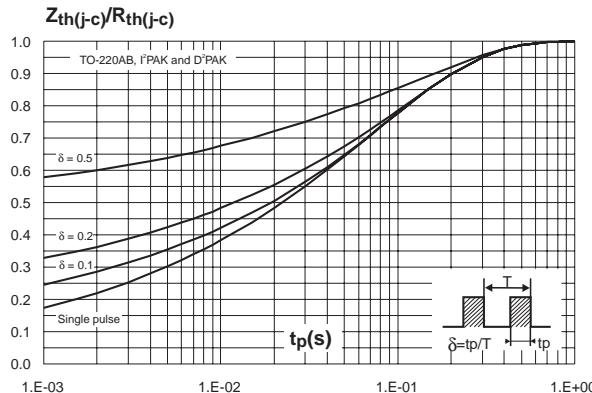


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

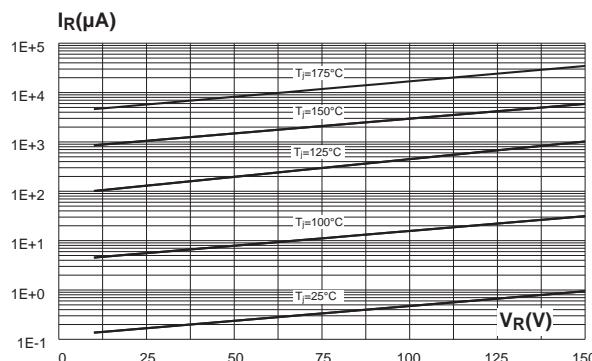


Fig. 8: Forward voltage drop versus forward current (per diode).

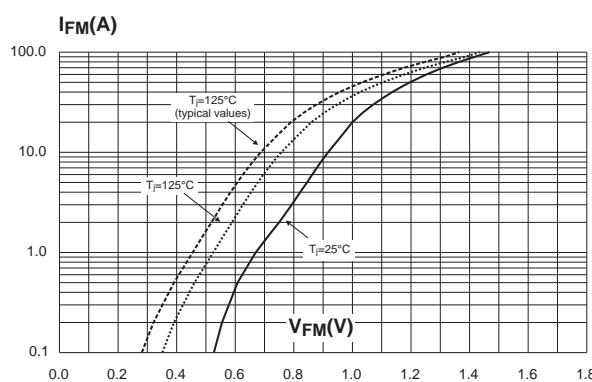


Fig. 6-2: Relative variation of thermal impedance junction to case versus pulse duration. TO-220FPAB

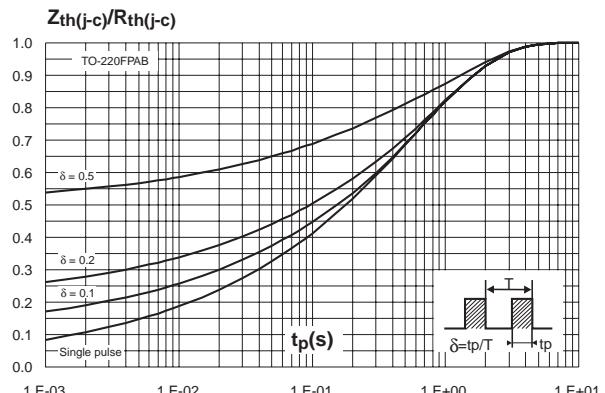


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

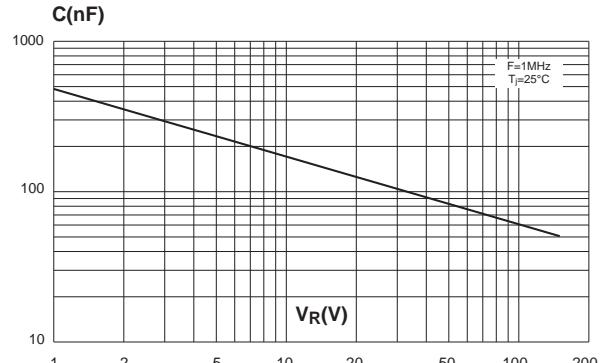
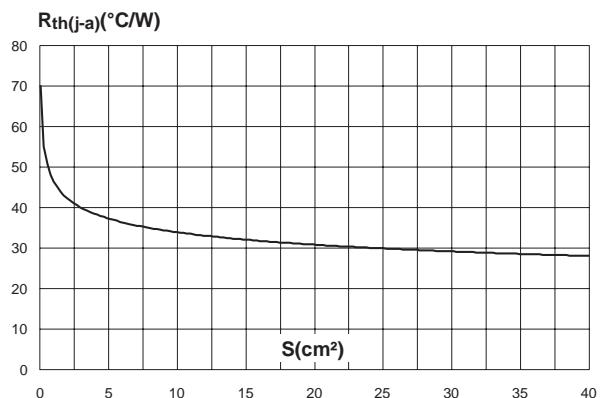


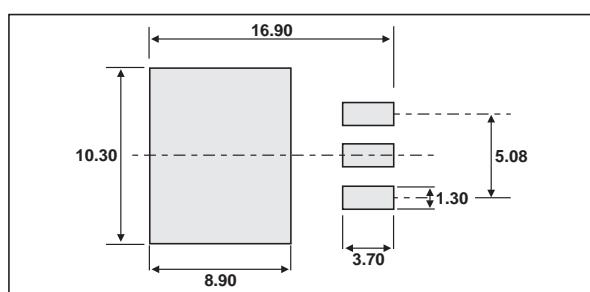
Fig. 9: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board, Cu = 35μm) (STPS20150CG only).



PACKAGE MECHANICAL DATA
D²PAK

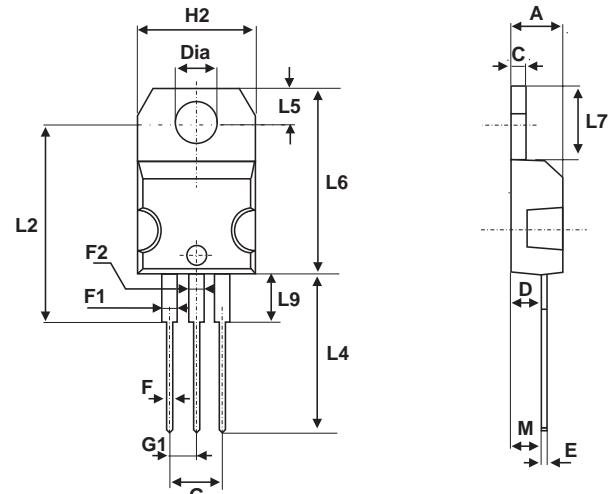
REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.60	0.169		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.70		0.93	0.027		0.037
B2	1.25	1.40		0.049	0.055	
C	0.45		0.60	0.017		0.024
C2	1.21		1.36	0.047		0.054
D	8.95		9.35	0.352		0.368
E	10.00		10.28	0.393		0.405
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
R		0.40			0.016	
V2	0°		8°	0°		8°

FOOT PRINT DIMENSIONS (in millimeters)



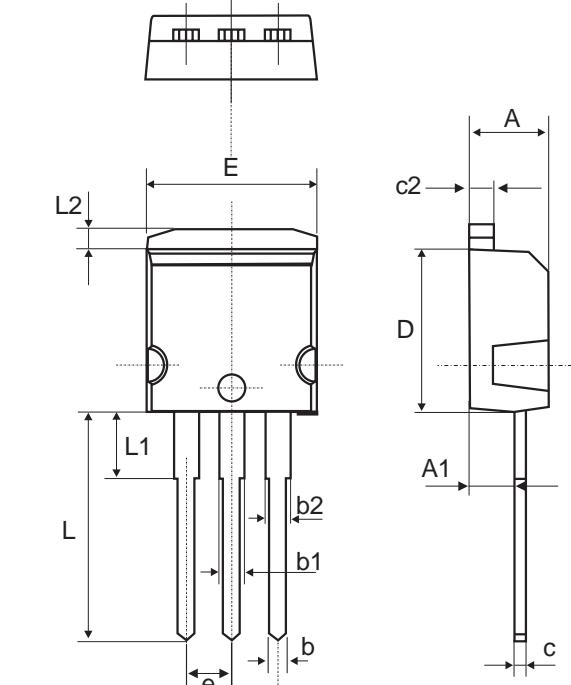
STPS20150CT/CG/CR/CFP

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

PACKAGE MECHANICAL DATA I²PAK



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

OTHER INFORMATION

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS20150CT	STPS20150CT	TO-220AB	2.20 g	50	Tube
STPS20150CG	STPS20150CG	D ² PAK	1.48 g	50	Tube
STPS20150CG-TR	STPS20150CG	D ² PAK	1.48 g	1000	Tape & Reel
STPS20150CR	STPS20150CR	I ² PAK	1.49 g	50	Tube
STPS20150CFP	STPS20150CFP	TO-220FPAB	2.0 g	50	Tube

- EPOXY MEETS UL94,V0

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 2003 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany

Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore
Spain - Sweden - Switzerland - United Kingdom - United States.