



STPS10H100CT/CG/CG-1

HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

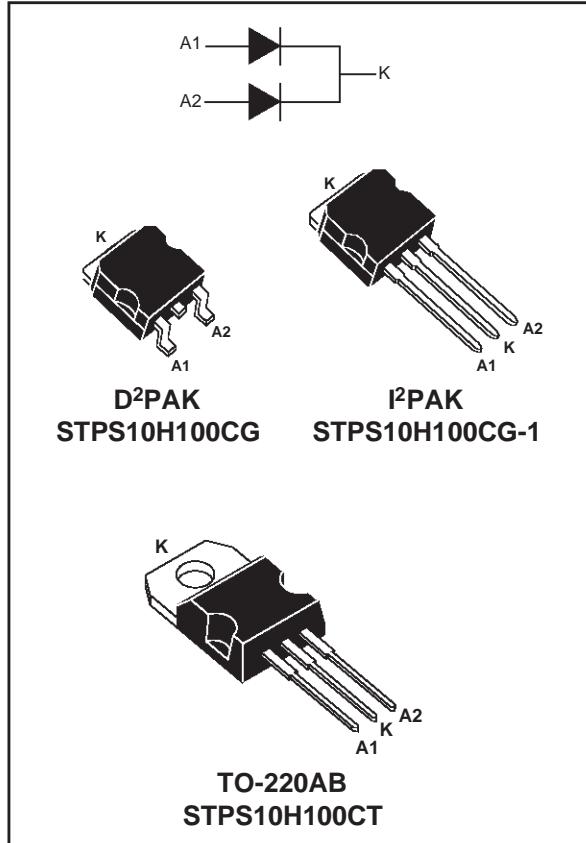
$I_{F(AV)}$	2 x 5 A
V_{RRM}	100 V
T_j	175°C
V_F (max)	0.61 V

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 TO220AB, D²PAK and I²PAK.



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	$T_c = 165^\circ\text{C}$ $\delta = 0.5$	per diode per device	5 10	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms sinusoidal		180	A
I_{RRM}	Repetitive peak reverse current	tp = 2 μs square F = 1kHz		1	A
T_{stg}	Storage temperature range			- 65 to + 175	$^\circ\text{C}$
T_j	Maximum operating junction temperature *			175	$^\circ\text{C}$
dV/dt	Critical rate of rise of reverse voltage			10000	$\text{V}/\mu\text{s}$

* : $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th}(j-a)}$ 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	Per diode	2.2
		Total	1.3
R _{th} (c)	Coupling	0.3	°C/W

When the diodes 1 and 2 are used simultaneously:

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

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I _R *	Reverse leakage current	T _j = 25°C	V _R = V _{RRM}			3.5	μA
		T _j = 125°C			1.3	4.5	mA
V _F **	Forward voltage drop	T _j = 25°C	I _F = 5 A			0.73	V
		T _j = 125°C			0.57	0.61	
		T _j = 25°C	I _F = 10 A			0.85	
		T _j = 125°C			0.66	0.71	

Pulse test : * tp = 5 ms, δ < 2%

** tp = 380 μs, δ < 2%

To evaluate the maximum conduction losses use the following equation :

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

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

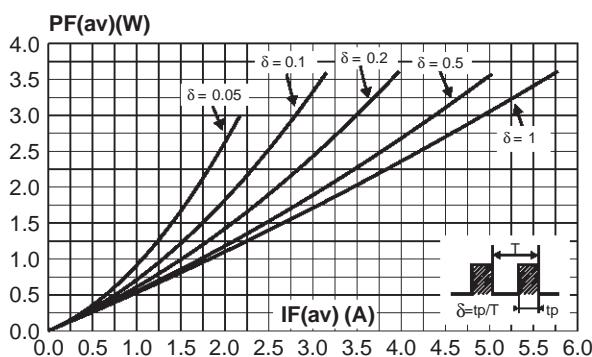


Fig. 2: Average forward current versus ambient temperature (δ=0.5, per diode).

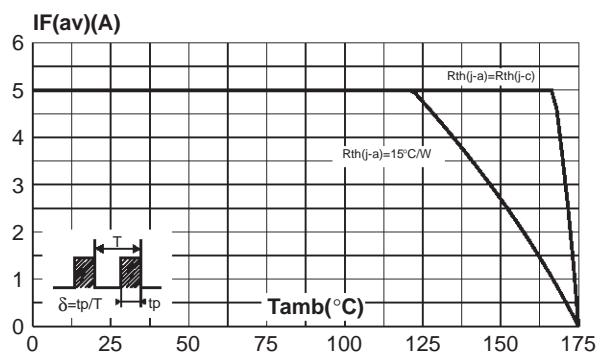


Fig. 3: Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

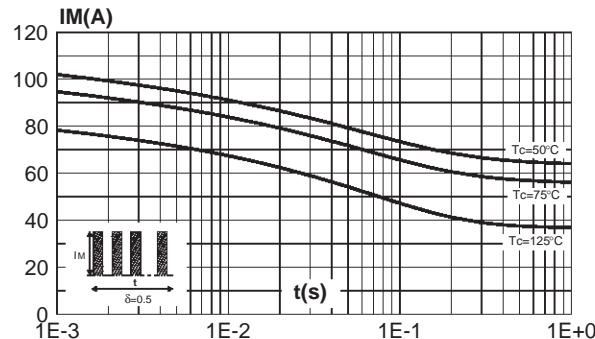


Fig. 4: Relative variation of thermal impedance junction to case versus pulse duration (per diode).

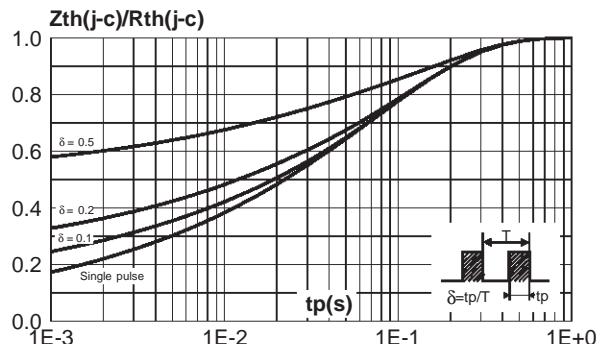


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values, per diode).

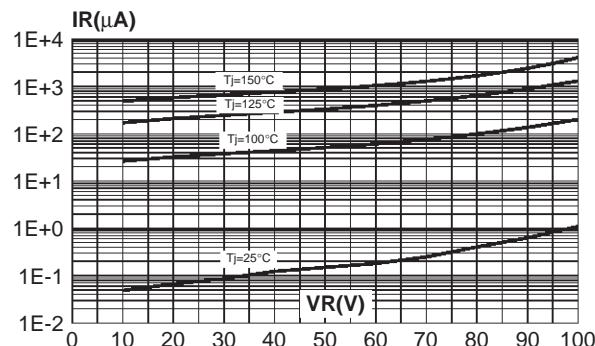


Fig. 6: Junction capacitance versus reverse voltage applied (typical values, per diode).

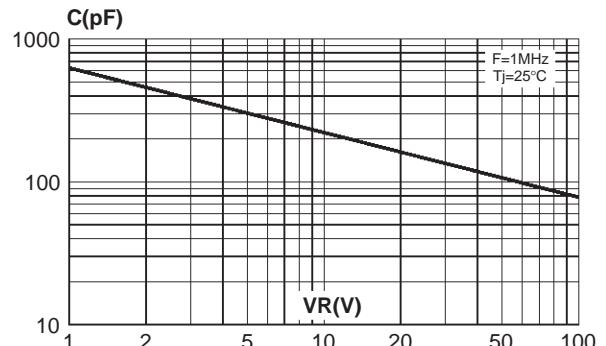


Fig. 7: Forward voltage drop versus forward current (maximum values, per diode).

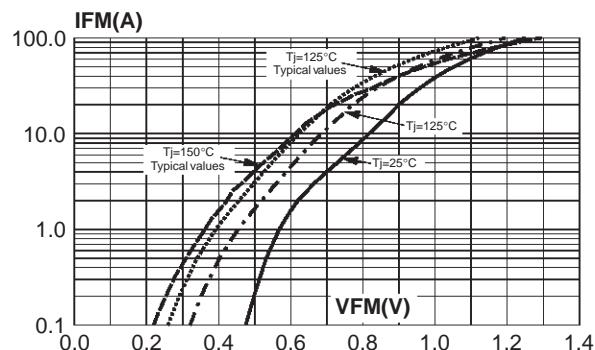
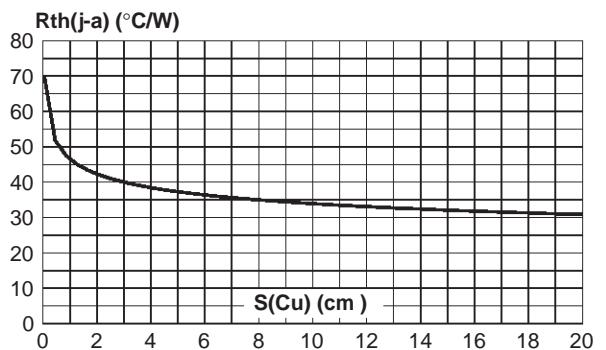
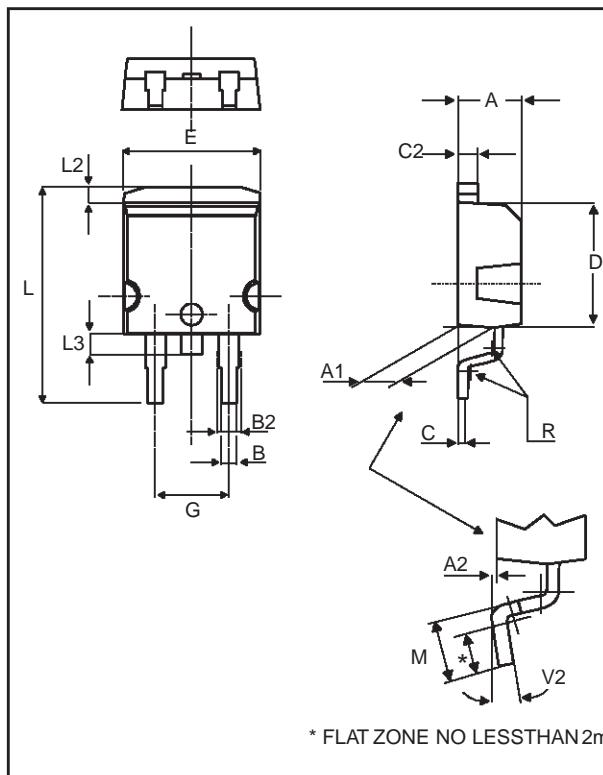


Fig. 8: Thermal resistance junction to ambient versus copper surface undertab (Epoxy printed circuit board FR4, copper thickness: 35 μm) (D²PAK).



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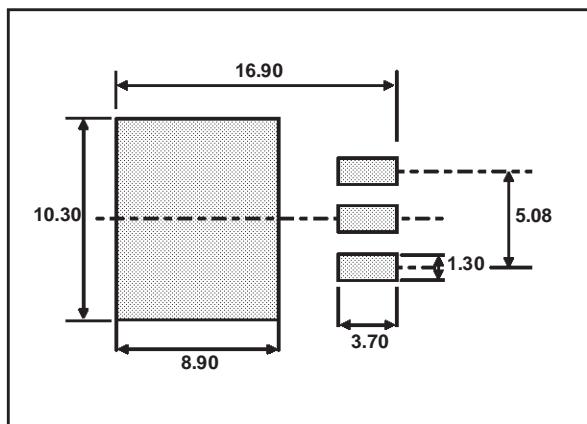
PACKAGE MECHANICAL DATA D²PAK



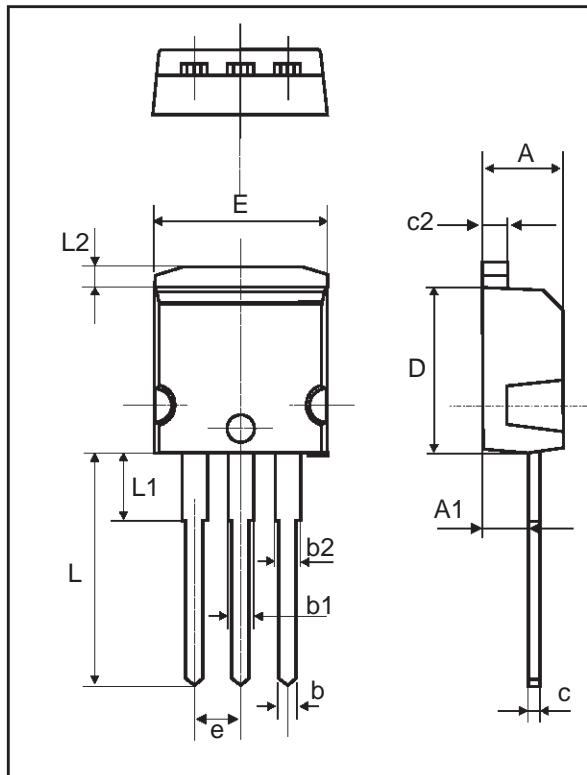
The technical drawings illustrate the physical dimensions of the STPS10H100CT/CG/CG-1 package. The top view shows the overall footprint with dimensions L, L2, L3, G, E, B2, and A. The side view provides a detailed look at the lead profile with dimensions A, C2, D, A1, C, R, and V2. The bottom view shows the lead attachment area with dimensions A2, M, and V2. A note at the bottom specifies: * FLAT ZONE NO LESS THAN 2mm.

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
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

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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
STPS10H100CG	STPS10H100CG	D ² PAK	1.48g	50	Tube
STPS10H100CG-TR	STPS10H100CG	D ² PAK	1.48g	1000	Tape and reel
STPS10H100CG-1	STPS10H100CG	I ² PAK	1.49g	50	Tube

- Epoxy meets UL94,V0

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