



# STPS10L40CT/CG/CF

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCTS CHARACTERISTICS

I <sub>F(AV)</sub>	2x5 A
V <sub>RRM</sub>	40 V
T <sub>j(max)</sub>	150°C
V <sub>F(max)</sub>	0.46 V

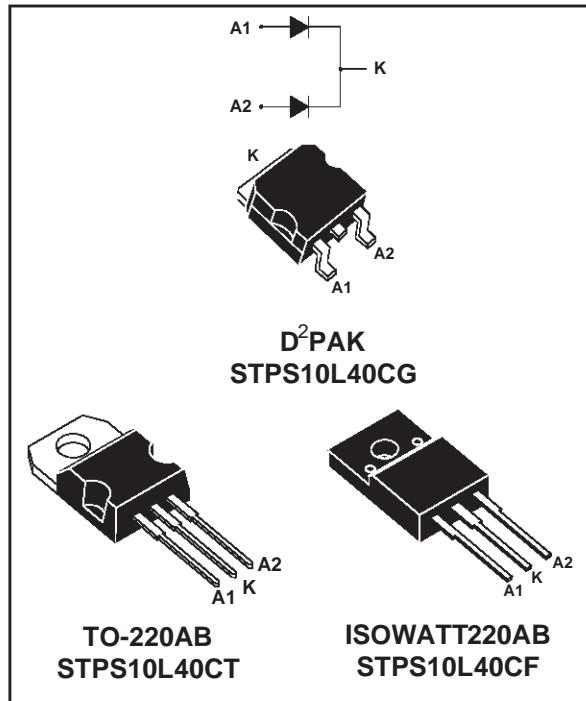
### FEATURES AND BENEFITS

- LOW FORWARD VOLTAGE DROP MEANING VERY SMALL CONDUCTION LOSSES
- LOW DYNAMIC LOSSES AS A RESULT OF THE SCHOTTKY BARRIER
- AVALANCHE RATED

### DESCRIPTION

Dual center tap Schottky rectifiers suited for Switched Mode Power Supplies and high frequency DC to DC converters.

Packaged in TO-220AB, ISOWATT220AB and D<sup>2</sup>PAK, these devices are 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>RRM</sub>	Repetitive peak reverse voltage			40	V		
I <sub>F(RMS)</sub>	RMS forward current			20	A		
I <sub>F(AV)</sub>	Average forward current	T <sub>c</sub> = 135°C δ = 0.5	Per diode Per device	5 10	A		
I <sub>FSM</sub>	Surge non repetitive forward current	tp = 10 ms Sinusoidal		150	A		
I <sub>RRM</sub>	Repetitive peak reverse current	tp = 2 μs square F = 1kHz		1	A		
I <sub>RSM</sub>	Non repetitive peak reverse current	tp = 100 μs square		2	A		
T <sub>stg</sub>	Storage temperature range			- 65 to + 150	°C		
T <sub>j</sub>	Maximum operating junction temperature *			150	°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

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### THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
R <sub>th</sub> (j-c)	Junction to case	TO-220AB D <sup>2</sup> PAK	Per diode Total	3 1.7	°C/W
R <sub>th</sub> (c)			Coupling	0.35	
R <sub>th</sub> (j-c)	Junction to case	ISOWATT220AB	Per diode Total	5 3.8	°C/W
R <sub>th</sub> (c)			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)

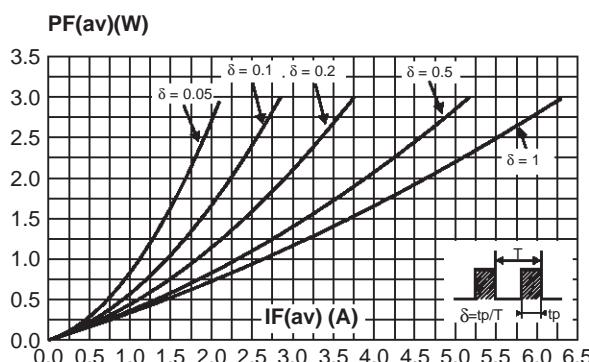
Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			0.2	mA
		T <sub>j</sub> = 100°C			8	25	mA
V <sub>F</sub> *	Forward voltage drop	T <sub>j</sub> = 25°C	I <sub>F</sub> = 5 A			0.53	V
		T <sub>j</sub> = 125°C	I <sub>F</sub> = 5 A		0.36	0.46	
		T <sub>j</sub> = 25°C	I <sub>F</sub> = 10 A			0.67	
		T <sub>j</sub> = 125°C	I <sub>F</sub> = 10 A		0.49	0.59	

Pulse test : \* tp = 380 μs, δ < 2%

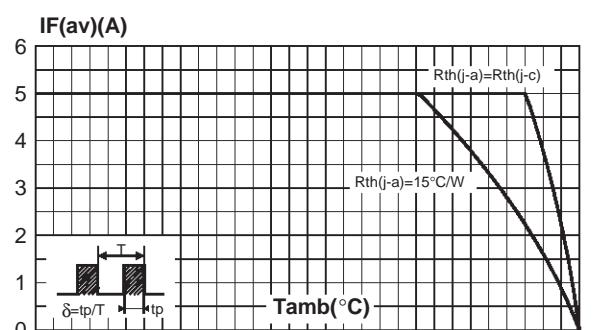
To evaluate the conduction losses use the following equation :

$$P = 0.33 \times I_F(AV) + 0.026 I_F^2(RMS)$$

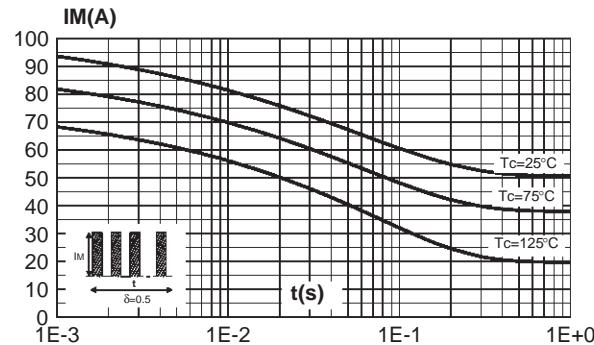
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



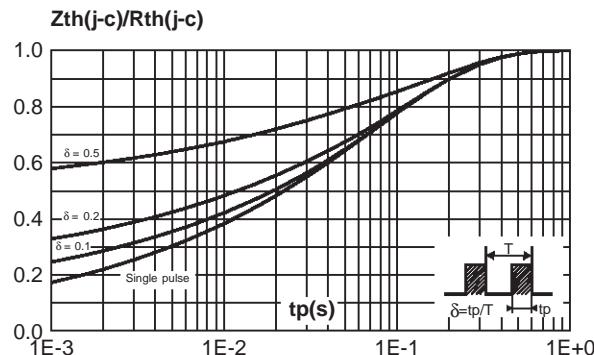
**Fig. 2:** Average forward current versus ambient temperature (δ=0.5, per diode).



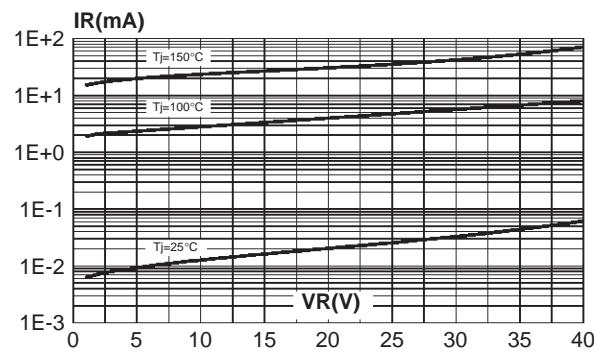
**Fig. 3-1:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB and D<sup>2</sup>PAK).



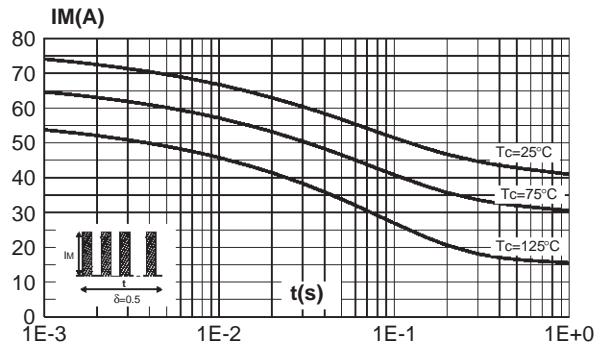
**Fig. 4-1:** Relative variation of thermal impedance junction to case versus pulse duration. (TO-220AB and D<sup>2</sup>PAK).



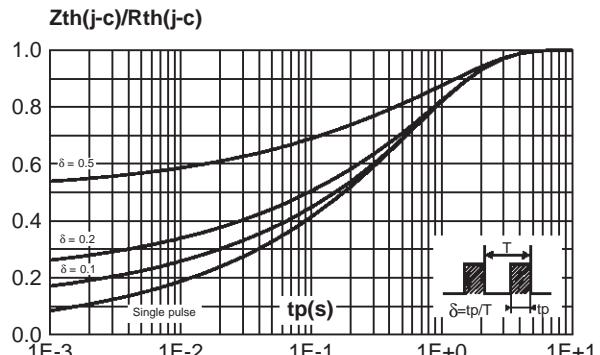
**Fig. 5:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



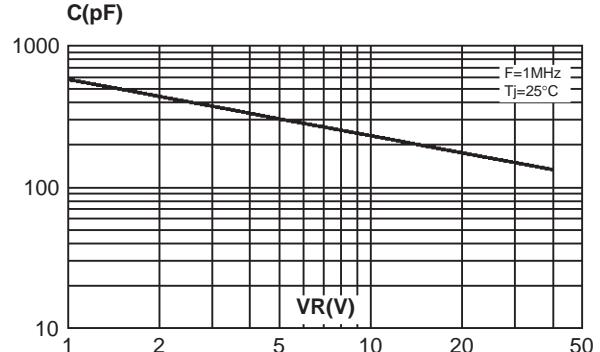
**Fig. 3-2:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB).



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

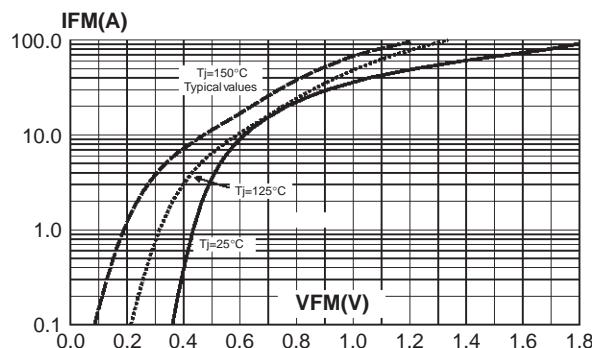


**Fig. 6:** Junction capacitance versus reverse voltage applied (typical values, per diode).

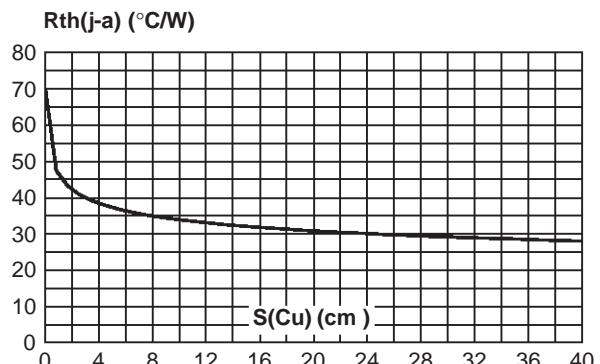


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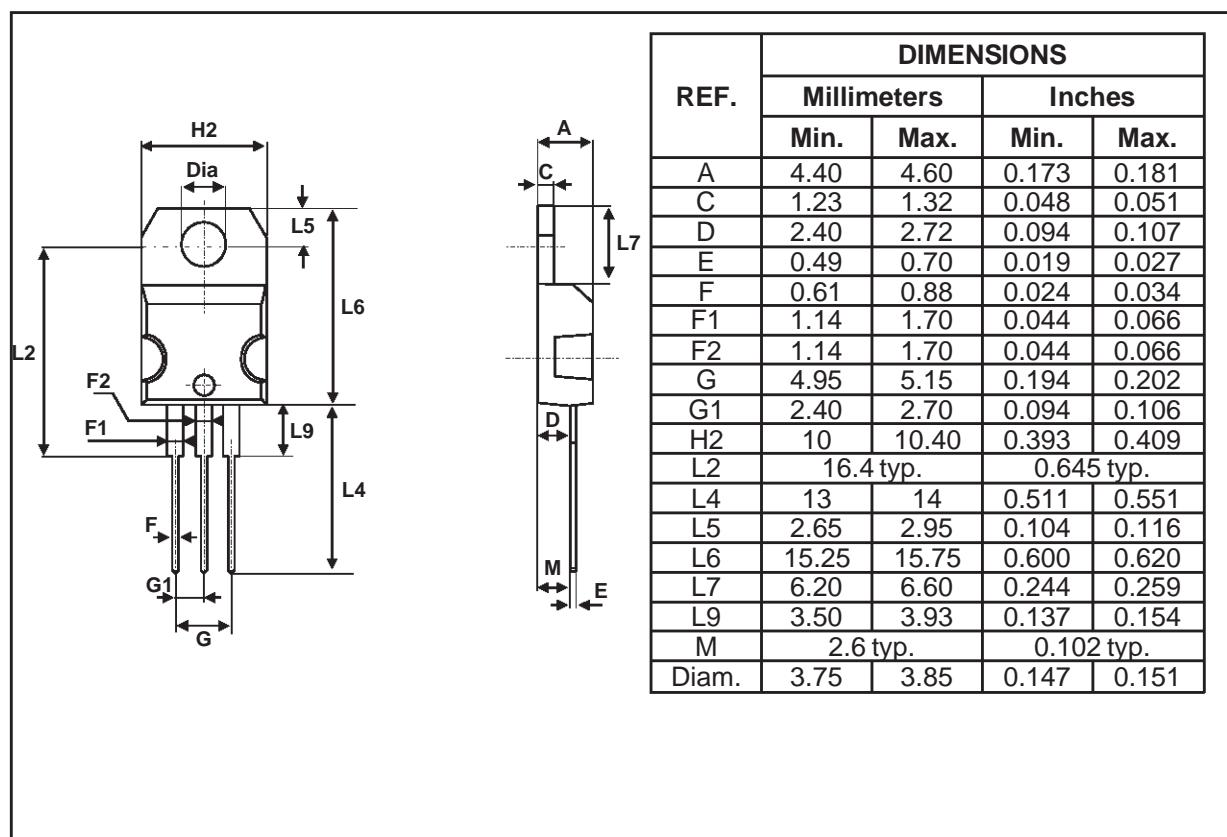
**Fig. 7:** Forward voltage drop versus forward current (maximum values, per diode).

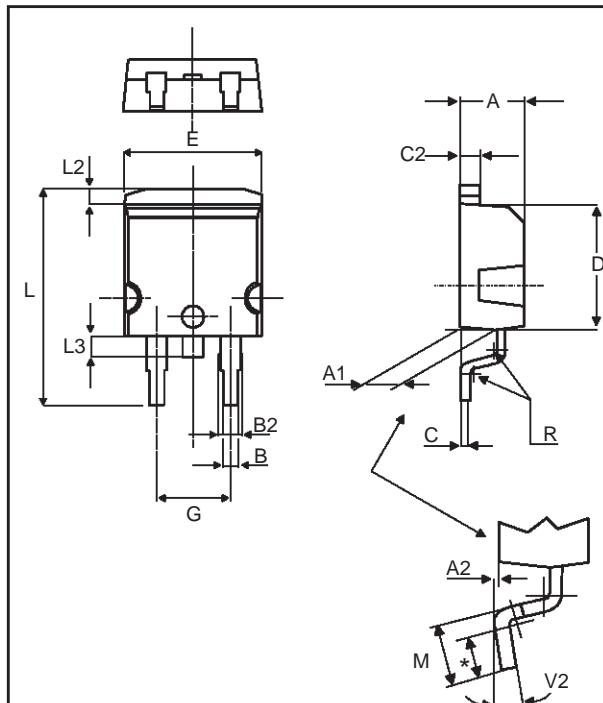


**Fig. 8:** Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm)(D<sup>2</sup>PAK).



## PACKAGE MECHANICAL DATA TO-220AB

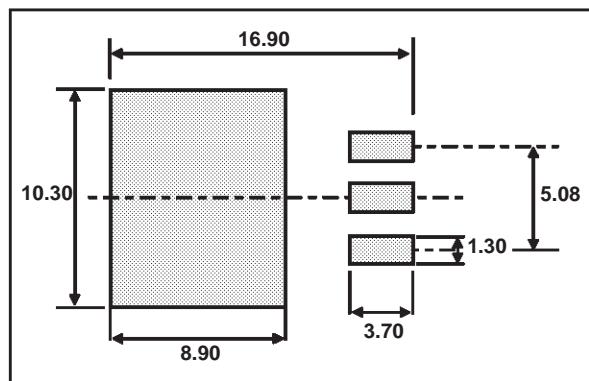


**PACKAGE MECHANICAL DATA**  
**D<sup>2</sup>PAK**


The technical drawings illustrate the physical dimensions of the D<sup>2</sup>PAK package. The top view shows the overall footprint with dimensions L, E, G, B, C, L<sub>2</sub>, L<sub>3</sub>, and B<sub>2</sub>. The side view provides height dimensions A, C<sub>2</sub>, D, and R, along with lead angle information for A1, A2, and V2. The bottom view shows the lead profile with lead width M and lead angle V2.

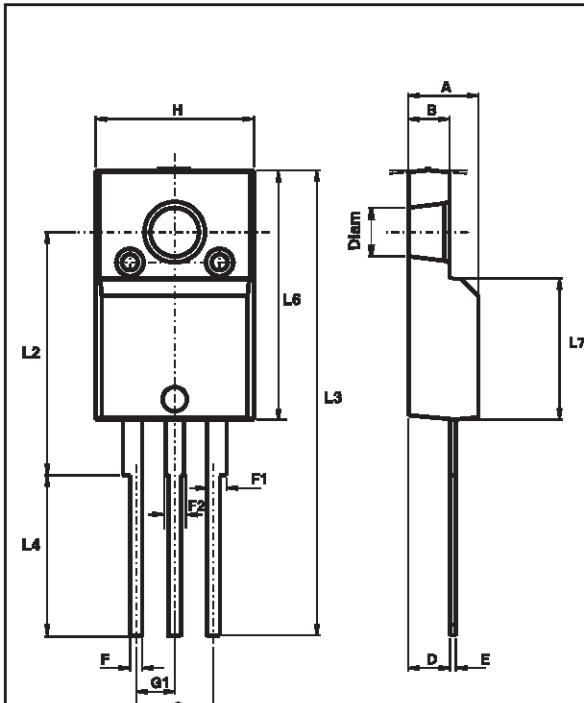
**\* FLAT ZONE NO LESS THAN 2mm**

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
C <sub>2</sub>	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
L <sub>2</sub>	1.27	1.40	0.050	0.055
L <sub>3</sub>	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V <sub>2</sub>	0°	8°	0°	8°

**FOOT PRINT DIMENSIONS (in millimeters)**


## STPS10L40CT/CG/CF

### 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

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS10L40CT	STPS10L40CT	TO-220AB	2.23g	50	Tube
STPS10L40CG	STPS10L40CG	D <sup>2</sup> PAK	1.48g	50	Tube
STPS10L40CG-TR	STPS10L40CG	D <sup>2</sup> PAK	1.48g	1000	Tape & reel
STPS10L40CF	STPS10L40CF	ISOWATT220AB	2.08g	50	Tube

- Cooling method : by conduction (C)
- Recommended torque value : 0.55 N.m.
- Maximum torque value : 0.70 N.m.
- Epoxy meets UL94,V0

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