



STPS10L40CT/CG/CF

LOW DROP POWER SCHOTTKY RECTIFIER

MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2x5 A
V_{RRM}	40 V
$T_j(\text{max})$	150°C
$V_F(\text{max})$	0.46 V

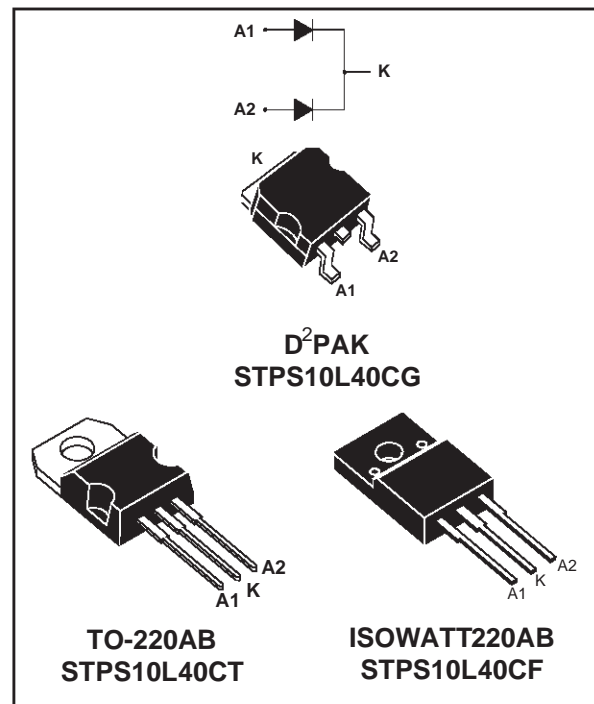
FEATURES AND BENEFITS

- 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 switchmode power supply and high frequency DC to DC converters.

Packaged in TO-220AB, ISOWATT220AB and D²PAK, 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_{RRM}	Repetitive peak reverse voltage		40	V
$I_{F(RMS)}$	RMS forward current		20	A
$I_{F(AV)}$	Average forward current	$T_c = 135^\circ\text{C}$ $\delta = 0.5$ Per diode Per device	5 10	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ Sinusoidal	150	A
I_{RRM}	Peak repetitive reverse current	$t_p = 2 \mu\text{s}$ $F = 1 \text{ kHz}$ square	1	A
I_{RSM}	Non repetitive peak reverse current	$t_p = 100 \mu\text{s}$ square	2	A
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		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 _{th(j-c)}	Junction to case	TO-220AB D ² PAK	Per diode	3	°C/W
			Total	1.7	
R _{th(c)}			Coupling	0.35	
R _{th(j-c)}	Junction to case	ISOWATT220AB	Per diode	5	°C/W
			Total	3.8	
R _{th(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 _R *	Reverse leakage current	T _j = 25°C	V _R = V _{RRM}			0.2	mA
		T _j = 100°C			8	25	mA
V _F *	Forward voltage drop	T _j = 25°C	I _F = 5 A			0.53	V
		T _j = 125°C	I _F = 5 A		0.36	0.46	
		T _j = 25°C	I _F = 10 A			0.67	
		T _j = 125°C	I _F = 10 A		0.49	0.59	

Pulse test : * t_p = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation :

$$P = 0.33 \times I_{F(AV)} + 0.026 I_{F(RMS)}^2$$

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

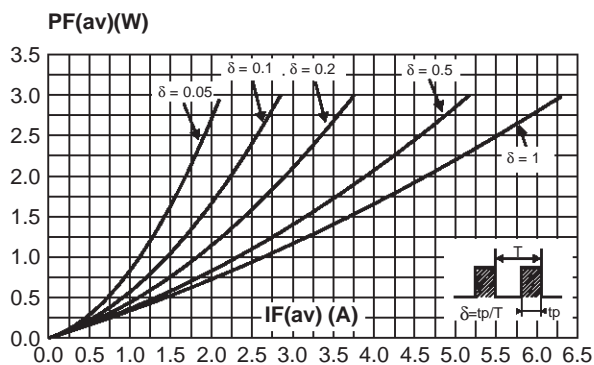


Fig. 2: Average forward current versus ambient temperature (δ=0.5, per diode).

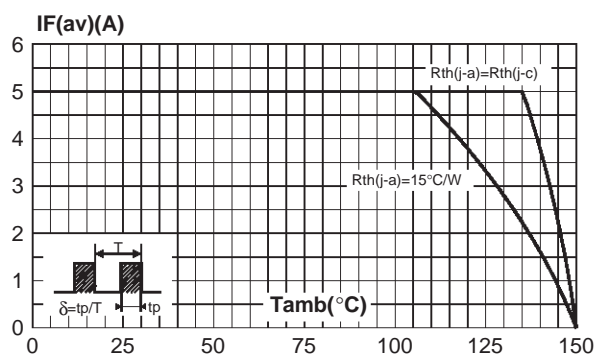


Fig. 3-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB and D²PAK).

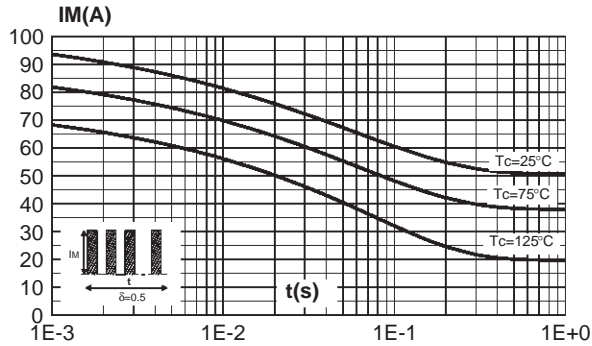


Fig. 3-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB).

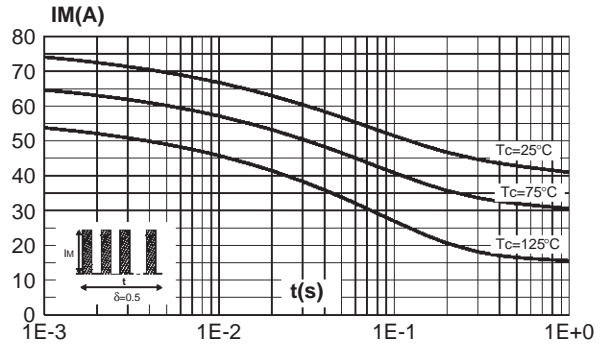


Fig. 4-1: Relative variation of thermal impedance junction to case versus pulse duration. (TO-220AB and D²PAK).

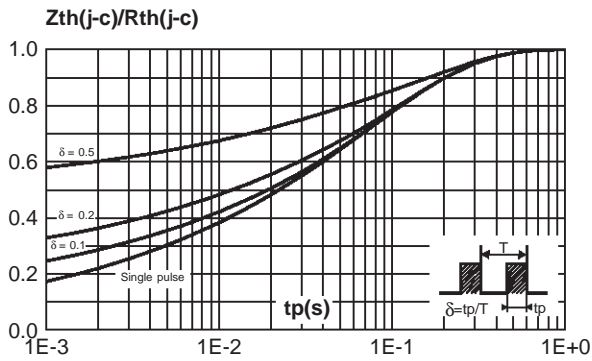


Fig. 4-2: Relative variation of thermal impedance junction to case versus pulse duration. (ISOWATT220AB).

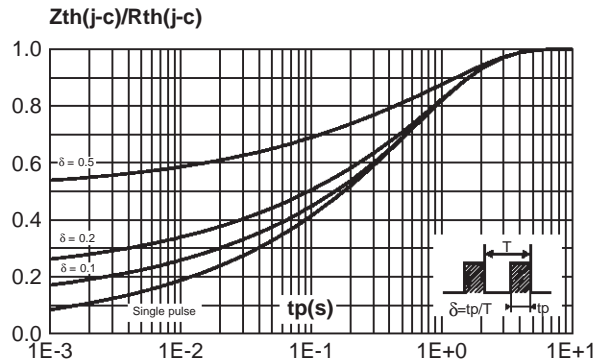


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values, per diode).

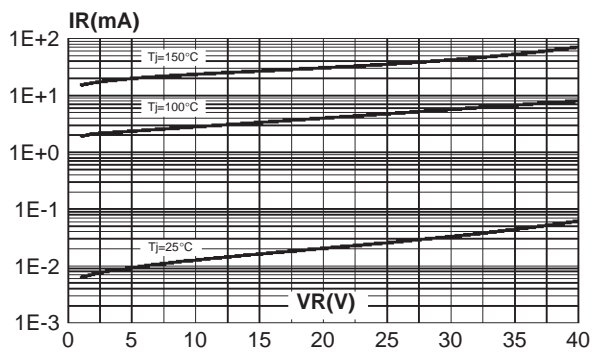
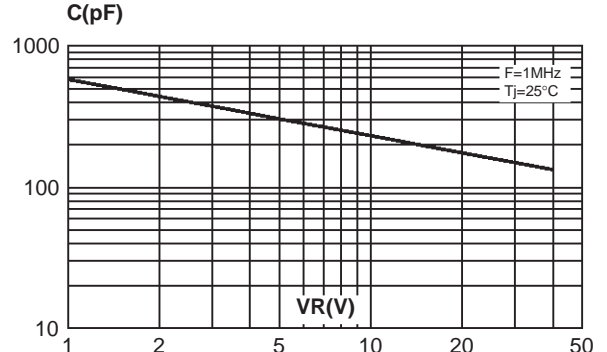


Fig. 6: Junction capacitance versus reverse voltage applied (typical values, per diode).



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

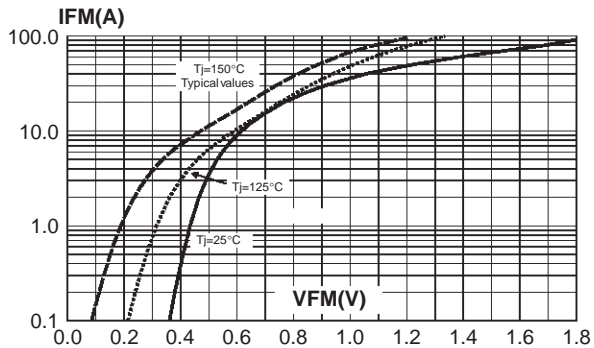
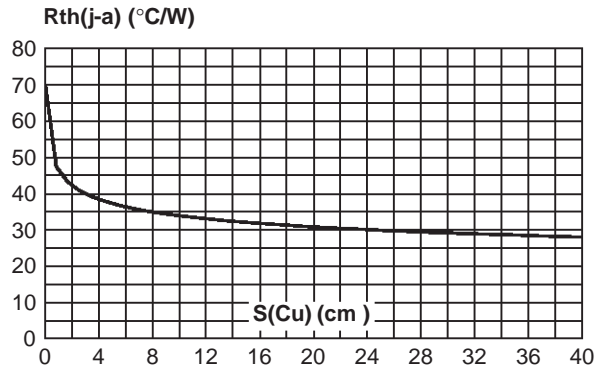
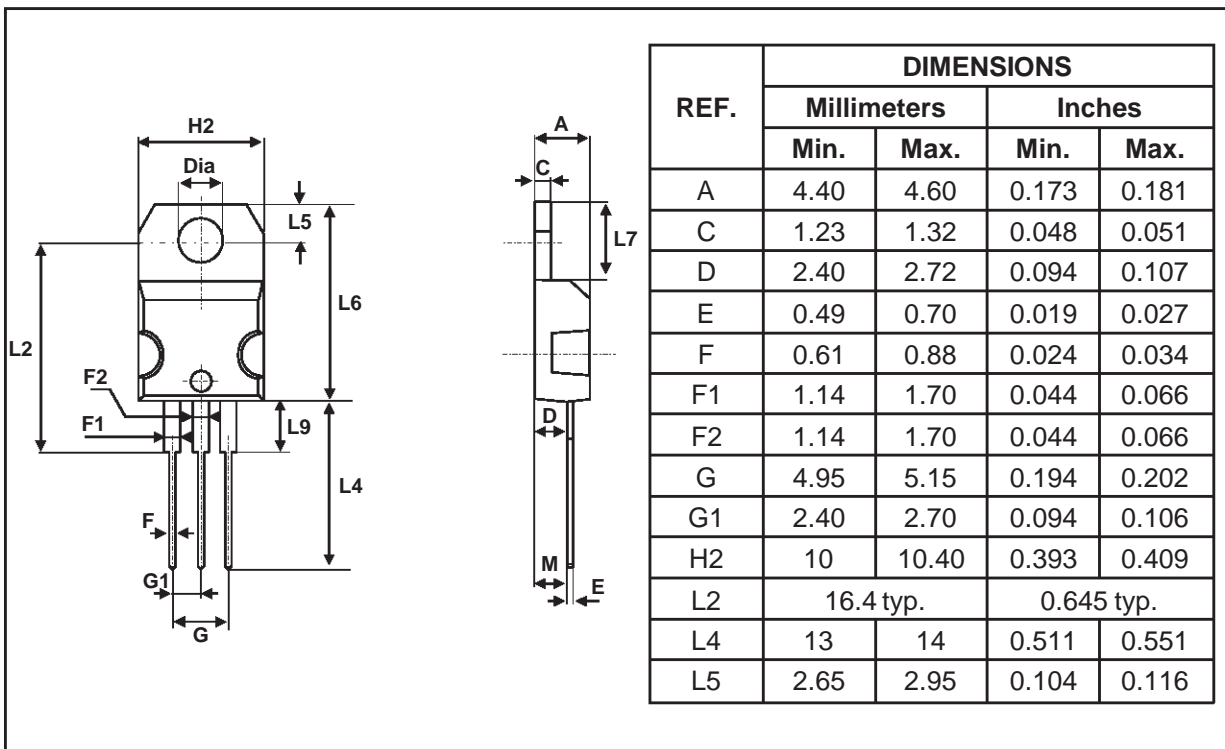


Fig. 8: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm)(D²-PAK).

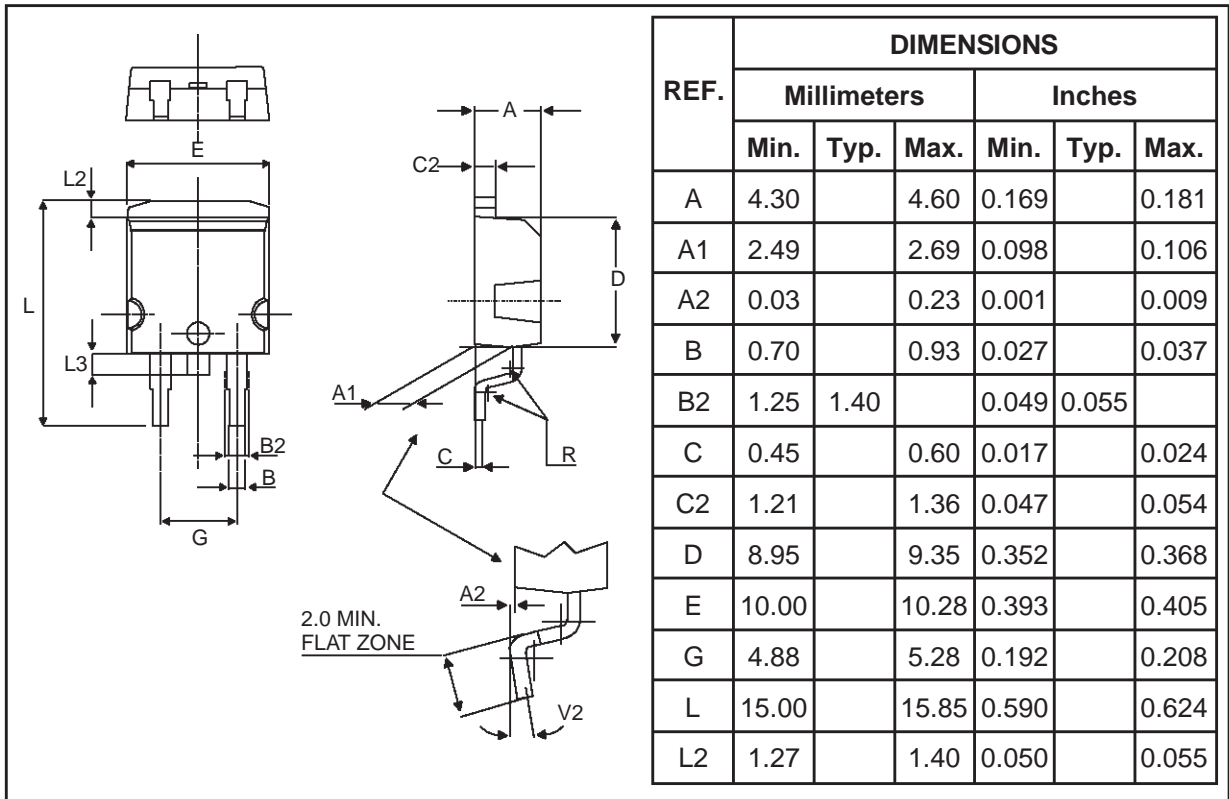


PACKAGE MECHANICAL DATA TO-220AB

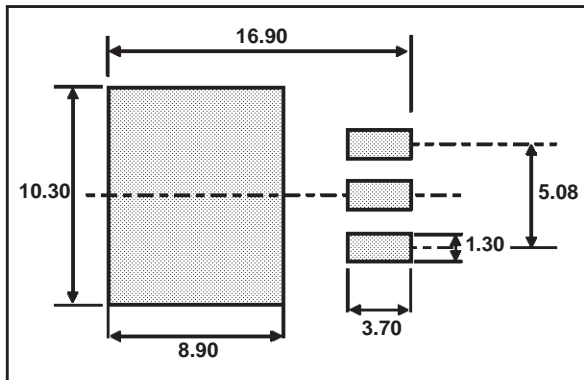


- Cooling method : C
- Recommended torque value : 0.55 m.N
- Maximum torque value : 0.70 m.N

PACKAGE MECHANICAL DATA
D²PAK



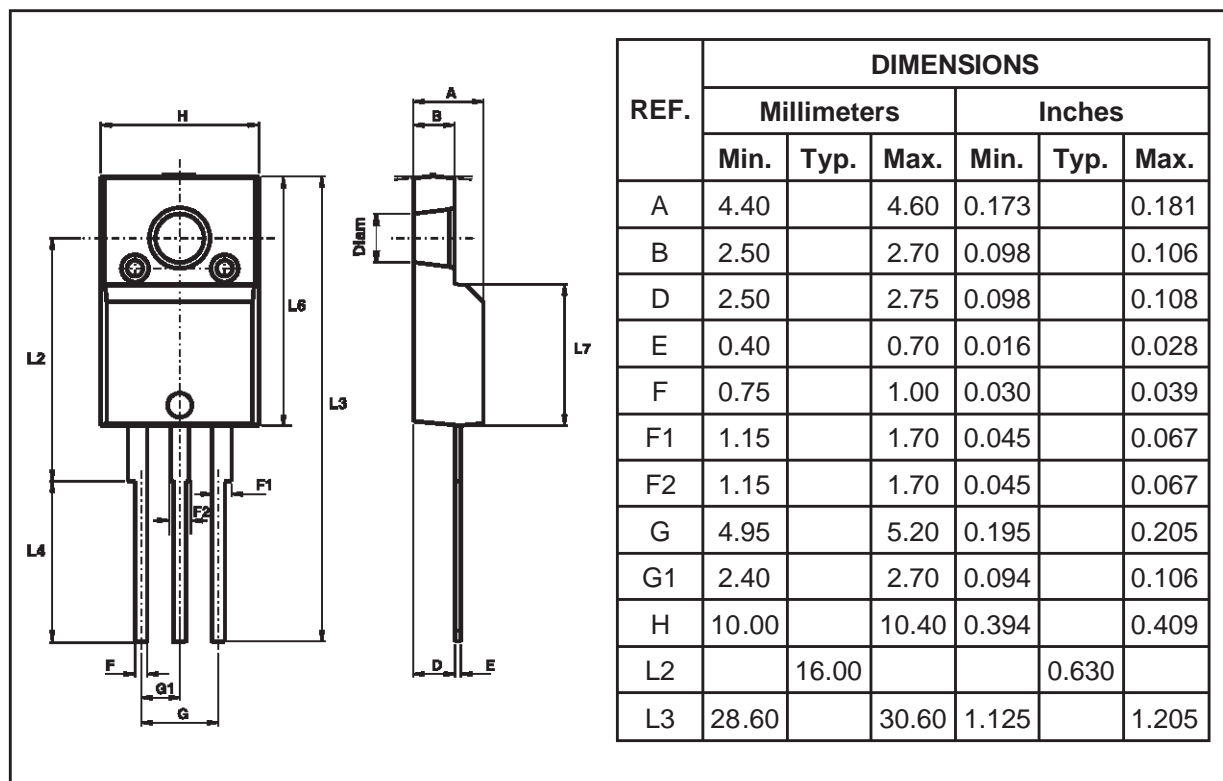
FOOT PRINT DIMENSIONS (in millimeters)



- Cooling method: by conduction (method C)

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PACKAGE MECHANICAL DATA ISOWATT220AB



- Cooling method : C
- Recommended torque value : 0.55m.N
- Maximum torque value : 0.70m.N

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS10L40CT	STPS10L40CT	TO-220AB	2.23g	50	Tube
STPS10L40CG	STPS10L40CG	D ² PAK	1.48g	50	Tube
STPS10L40CG-TR	STPS10L40CG	D ² PAK	1.48g	500	Tape & reel
STPS10L40CF	STPS10L40CF	ISOWATT220AB	2.08g	50	Tube

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