



STPS10L40CT/CG/CF

LOW DROP POWER SCHOTTKY RECTIFIER

MAJOR PRODUCTS CHARACTERISTICS

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

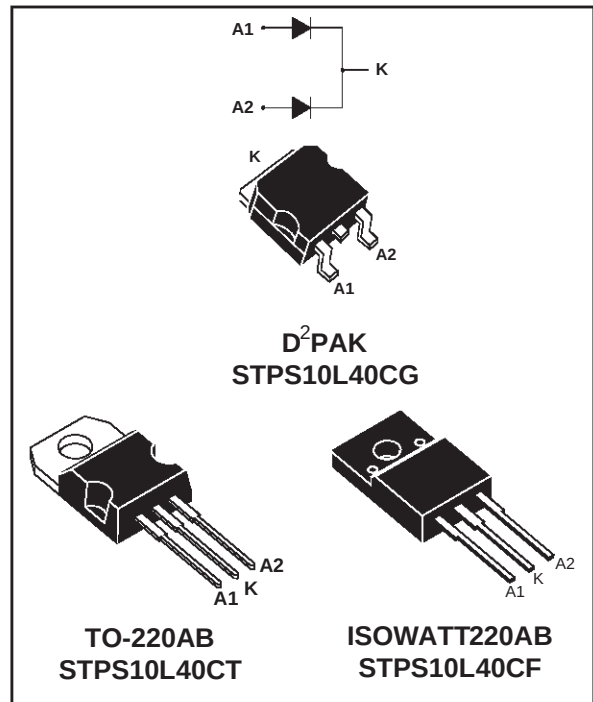
FEATURES AND BENEFITS

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

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	$t_p = 2\text{ }\mu\text{s}$	$F = 1\text{ kHz}$ square	1	A
I_{RSM}	Non repetitive peak reverse current	$t_p = 100\text{ }\mu\text{s}$	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 Total	3 1.7	°C/W
$R_{th(c)}$			Coupling	0.35	
$R_{th(j-c)}$	Junction to case	ISOWATT220AB	Per diode Total	5 3.8	°C/W
$R_{th(c)}$			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	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			0.2	mA
		$T_j = 100^\circ\text{C}$			8	25	mA
V_F^*	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 5\text{ A}$			0.53	V
		$T_j = 125^\circ\text{C}$	$I_F = 5\text{ A}$		0.36	0.46	
		$T_j = 25^\circ\text{C}$	$I_F = 10\text{ A}$			0.67	
		$T_j = 125^\circ\text{C}$	$I_F = 10\text{ A}$		0.49	0.59	

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

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).

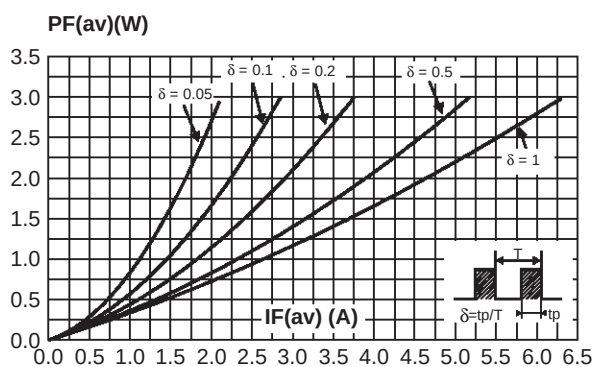


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$, per diode).

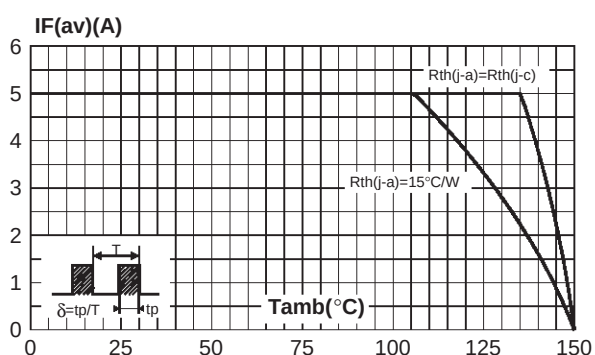


Fig. 3-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB and D²PAK).

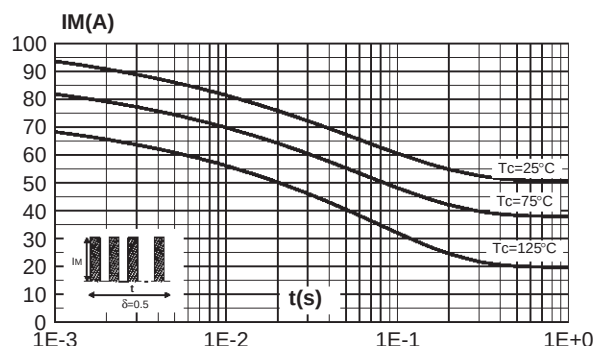


Fig. 3-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB).

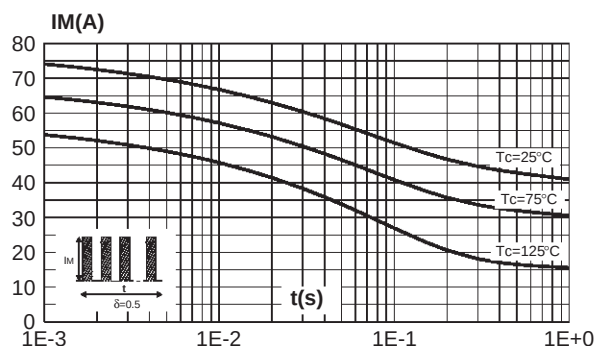


Fig. 4-1: Relative variation of thermal impedance junction to case versus pulse duration. (TO-220AB and D²PAK).

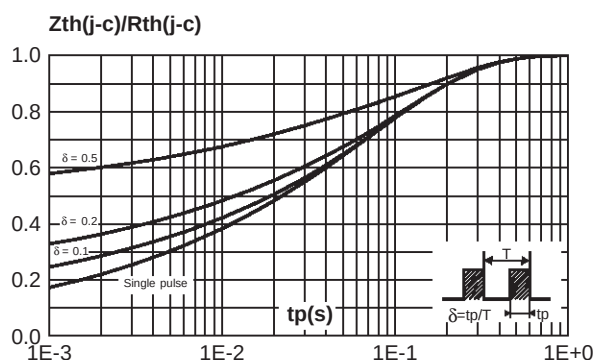


Fig. 4-2: Relative variation of thermal impedance junction to case versus pulse duration. (ISOWATT220AB).

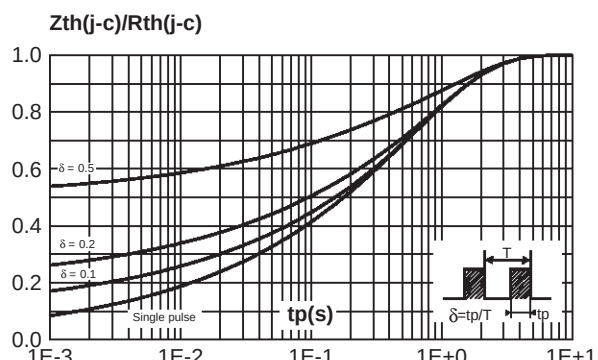


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values, per diode).

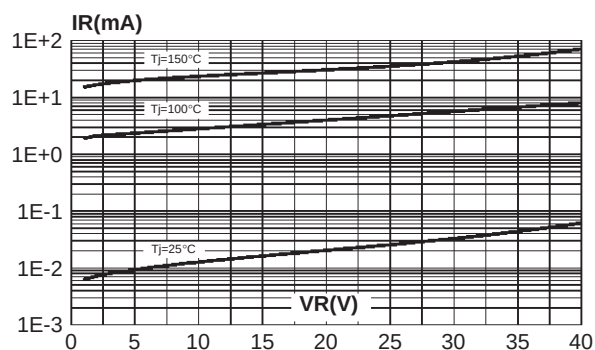
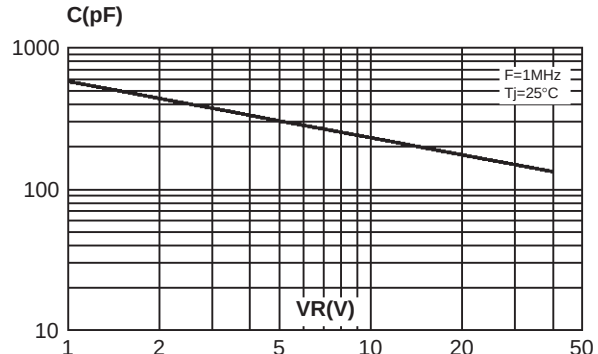


Fig. 6: Junction capacitance versus reverse voltage applied (typical values, per diode).



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

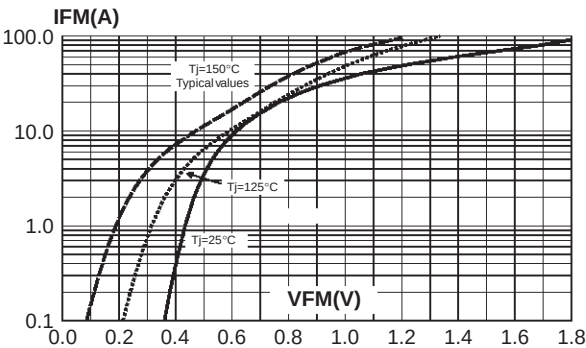
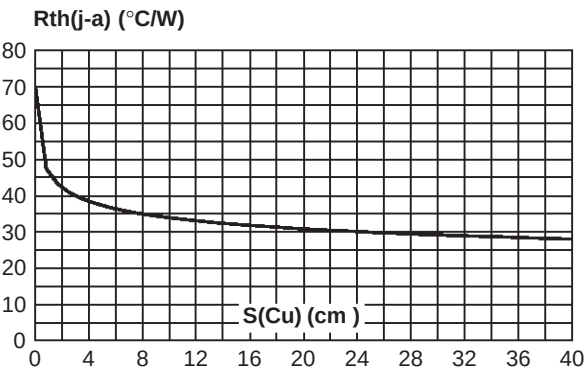
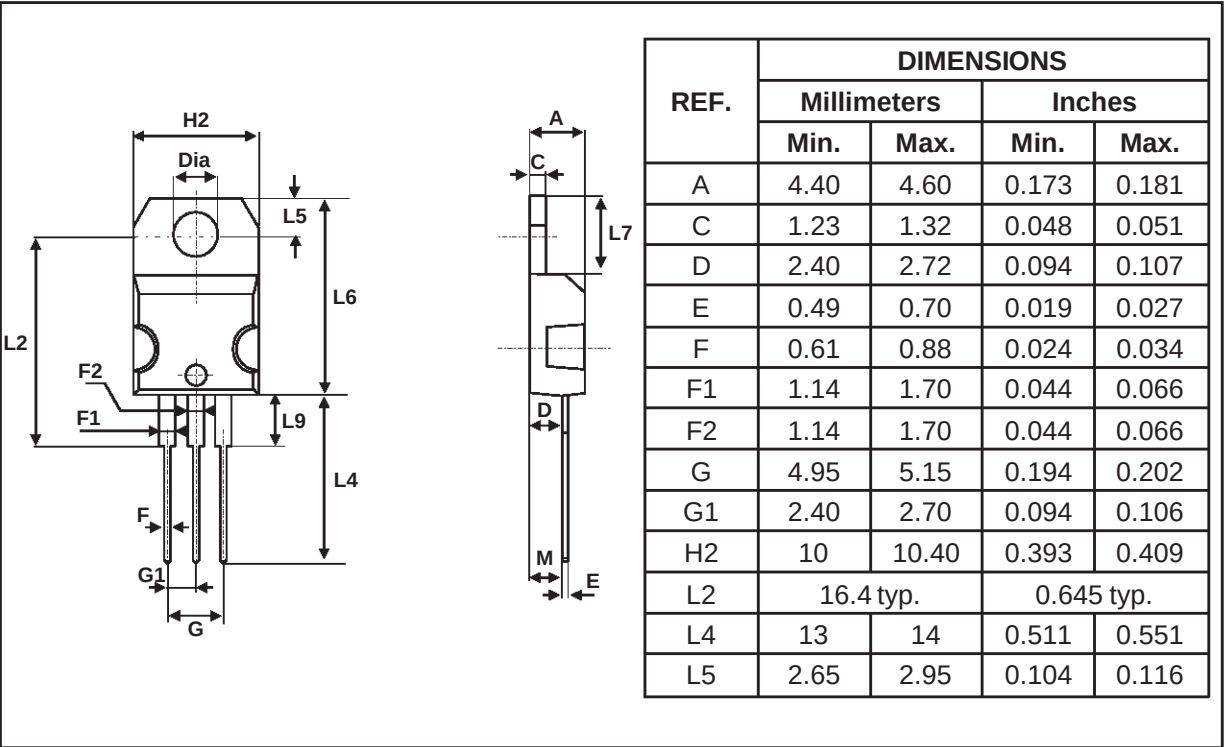


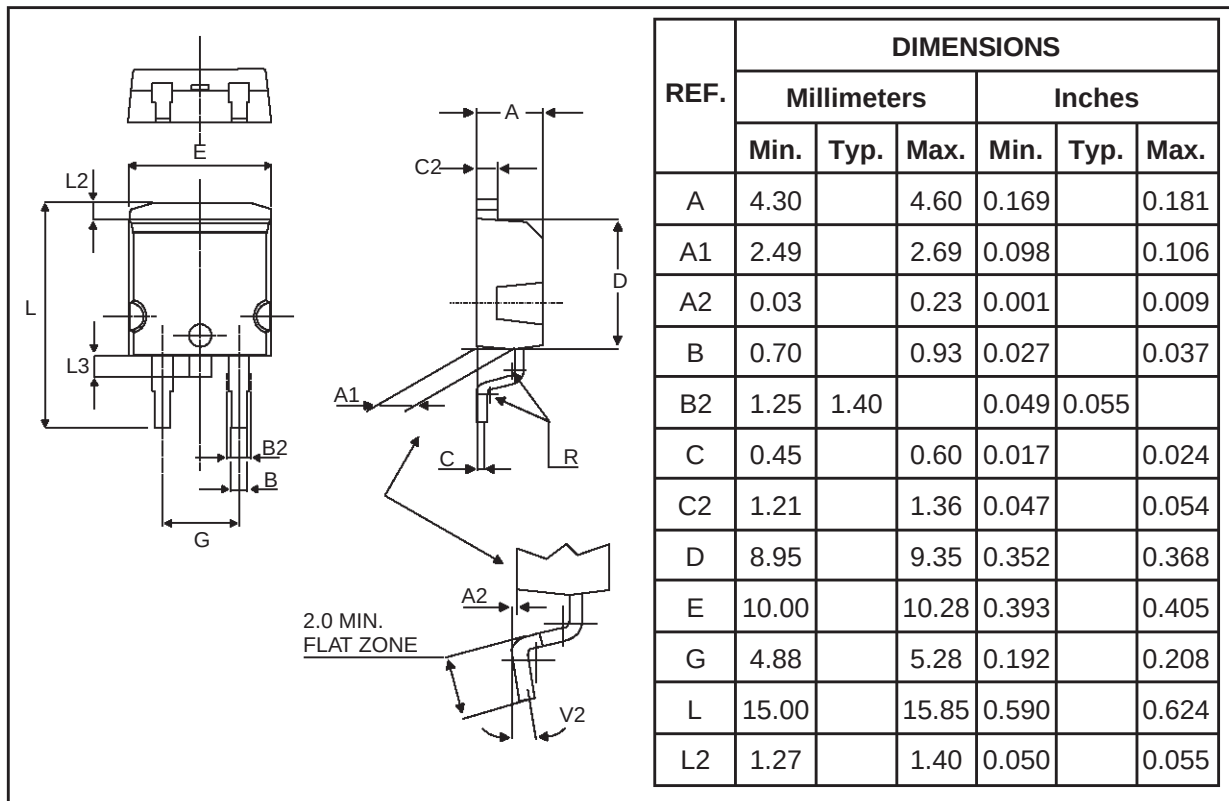
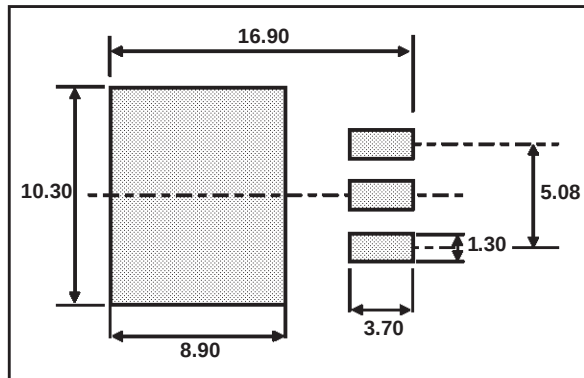
Fig. 8: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35μm)(D²PAK).



PACKAGE MECHANICAL DATA
TO-220AB



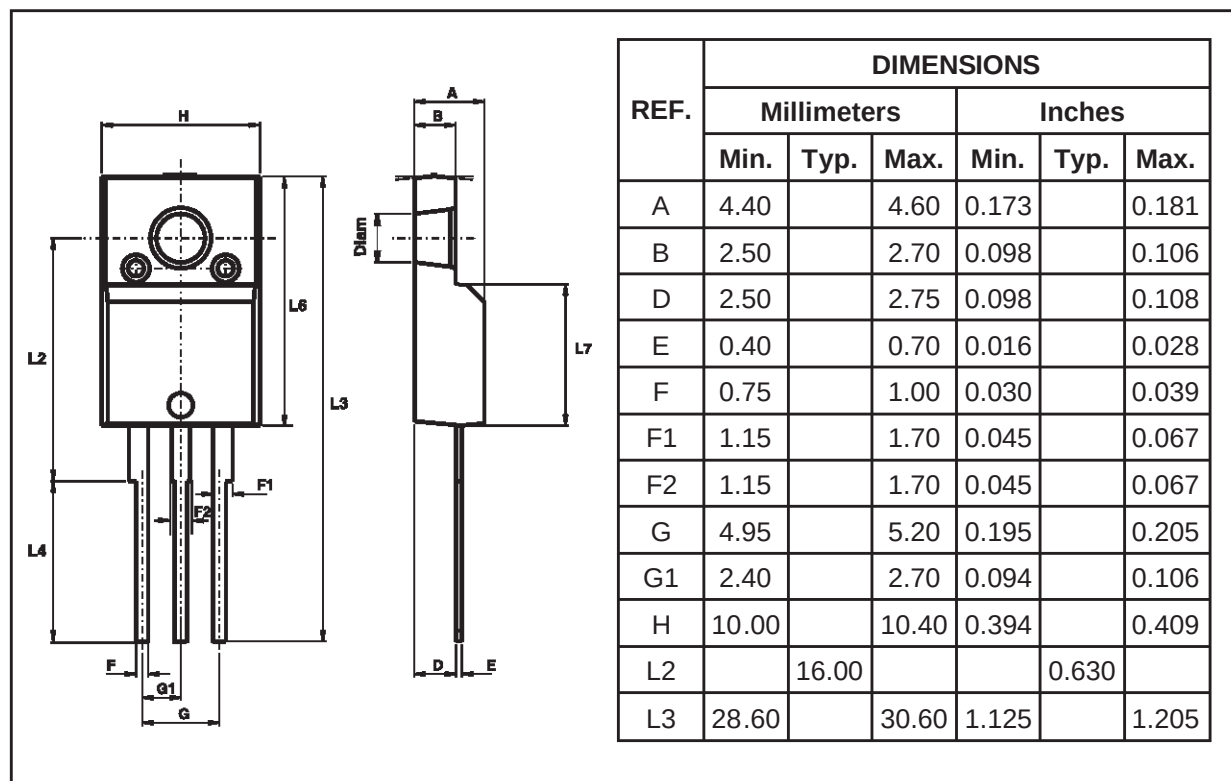
- Cooling method : C
- Recommended torque value : 0.55 m.N
- Maximum torque value : 0.70 m.N

PACKAGE MECHANICAL DATA
D²PAK

FOOT PRINT DIMENSIONS (in millimeters)


- Cooling method: by conduction (method C)

STPS10L40CT/CG/CF

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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