



STPS40L45CG/CT/CW

LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 20 A
V_{RRM}	45 V
T_j (max)	150 °C
V_F (max)	0.49 V

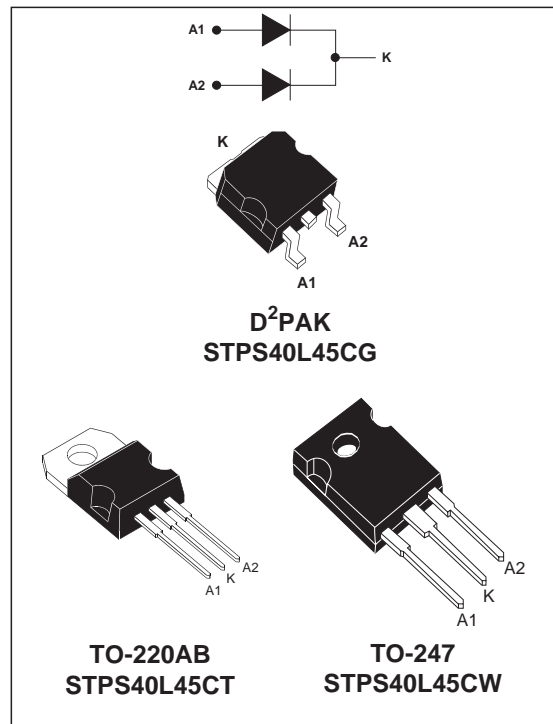
FEATURES AND BENEFITS

- LOW FORWARD VOLTAGE DROP MEANING VERY SMALL CONDUCTION LOSSES
- LOW SWITCHING LOSSES ALLOWING HIGH FREQUENCY OPERATION
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Dual center tap Schottky barrier rectifier designed for high frequency Switched Mode Power Supplies and DC to DC converters.

Packaged in TO-220AB, TO-247 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		45	V	
$I_{F(RMS)}$	RMS forward current		30	A	
$I_{F(AV)}$	Average forward current	$T_c = 130^\circ\text{C}$ $\delta = 0.5$	Per diode Per device	20 40	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms Sinusoidal	230	A	
I_{RRM}	Repetitive peak reverse current	$t_p = 2$ μs square F = 1kHz	2	A	
I_{RSM}	Non repetitive peak reverse current	$t_p = 100$ μs square	3	A	
P_{ARM}	Repetitive peak avalanche power	$t_p = 1$ μs $T_j = 25^\circ\text{C}$	8100	W	
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	Per diode	1.5	$^{\circ}\text{C}/\text{W}$
		Total	0.8	
$R_{th(c)}$		Coupling	0.1	$^{\circ}\text{C}/\text{W}$

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	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$			0.6	mA
		$T_j = 125^{\circ}\text{C}$			140	280	mA
V_F^*	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 20 \text{ A}$			0.53	V
		$T_j = 125^{\circ}\text{C}$	$I_F = 20 \text{ A}$		0.42	0.49	
		$T_j = 25^{\circ}\text{C}$	$I_F = 40 \text{ A}$			0.69	
		$T_j = 125^{\circ}\text{C}$	$I_F = 40 \text{ A}$		0.6	0.7	

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

To evaluate the conduction losses use the following equation :

$$P = 0.28 \times I_{F(AV)} + 0.0105 I_{F(RMS)}^2$$

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

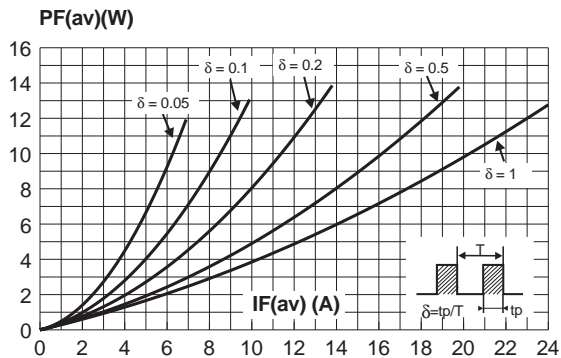


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$, per diode)

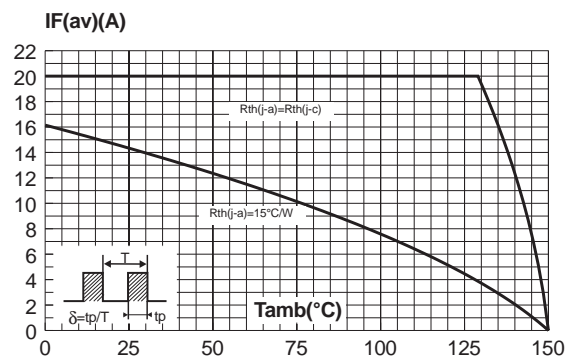


Fig. 3: Normalized avalanche power derating versus pulse duration.

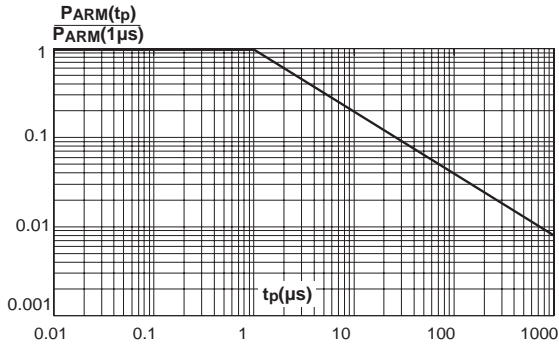


Fig. 4: Normalized avalanche power derating versus junction temperature.

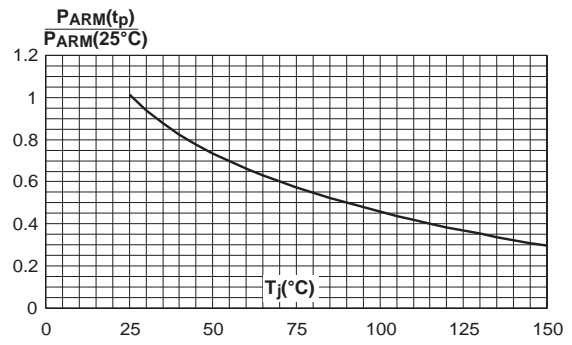


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values, per diode).

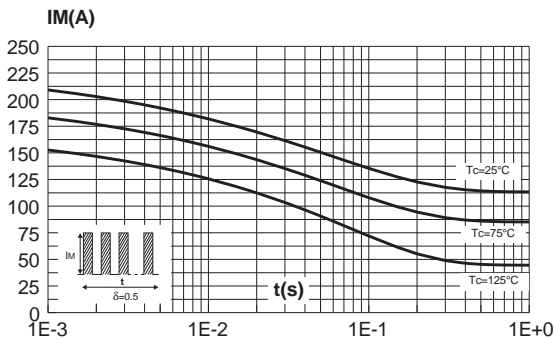


Fig. 6: Relative variation of thermal impedance junction to case versus pulse duration.

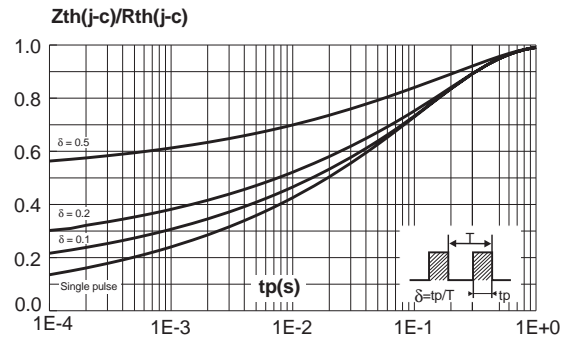


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

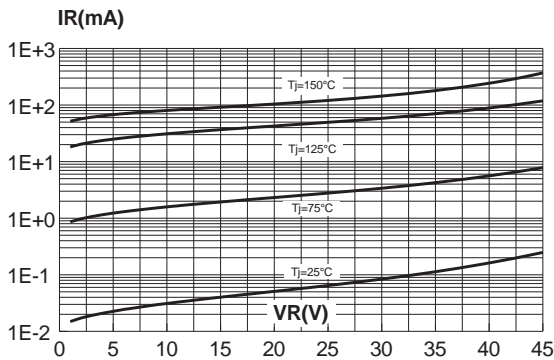
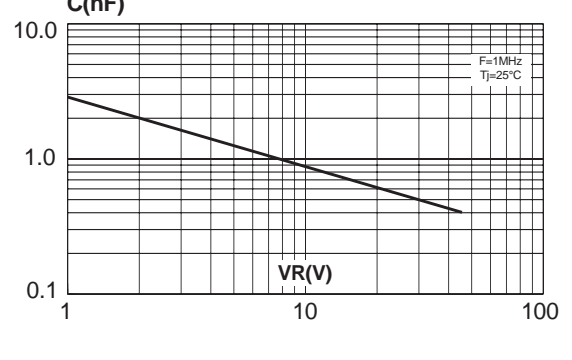


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).



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Fig. 9: Forward voltage drop versus forward current (maximum values, per diode).

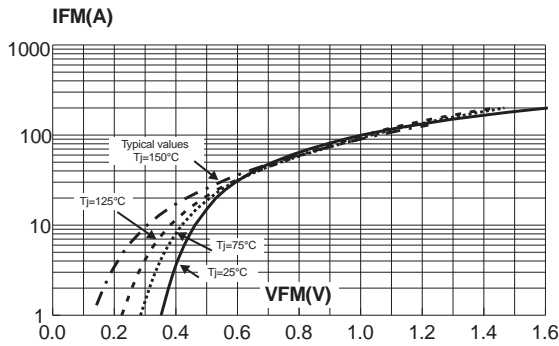
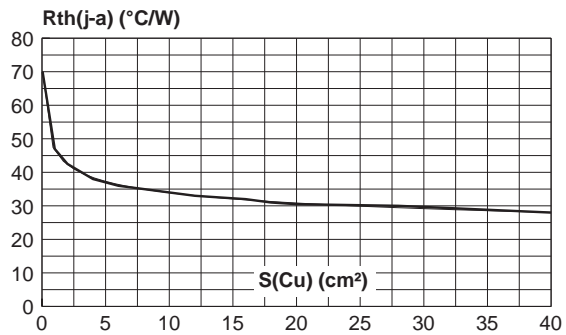
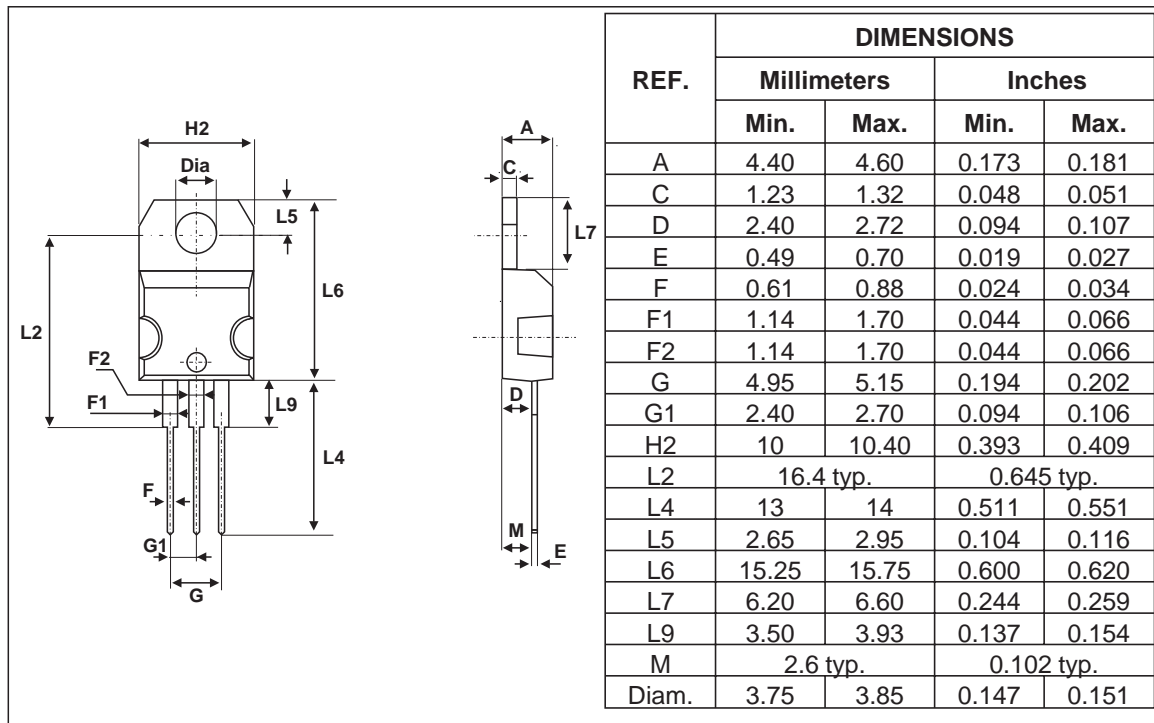


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm) (STPS40L45CG only).

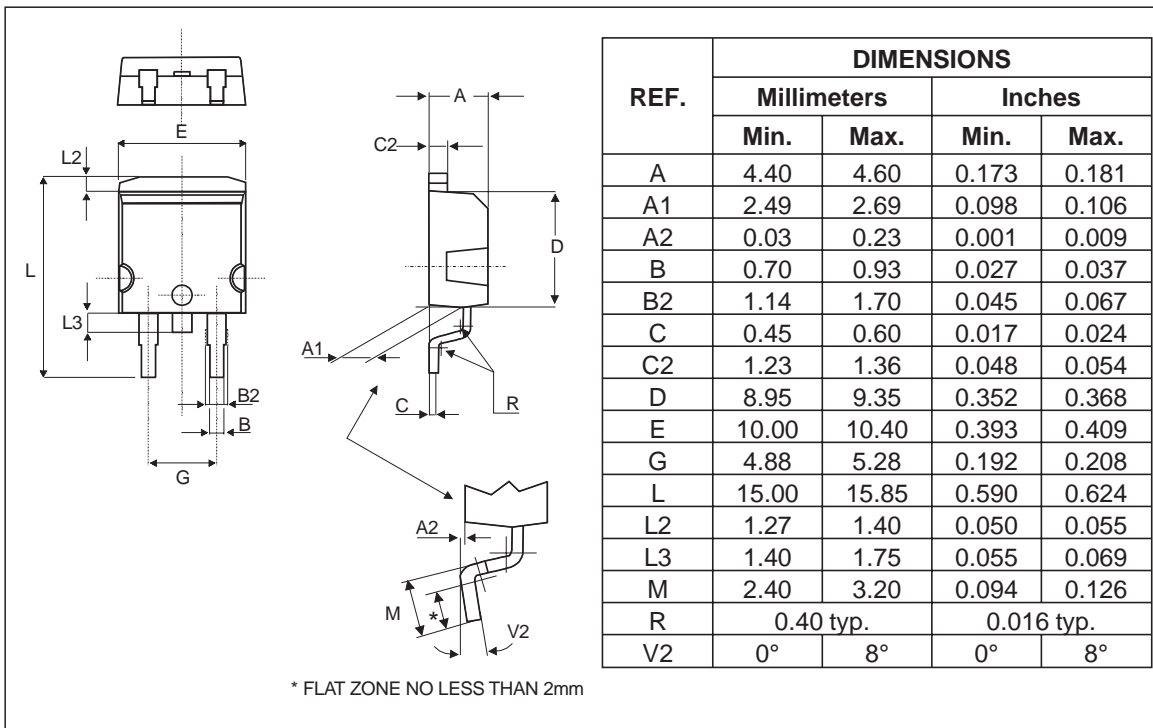


PACKAGE MECHANICAL DATA TO-220AB



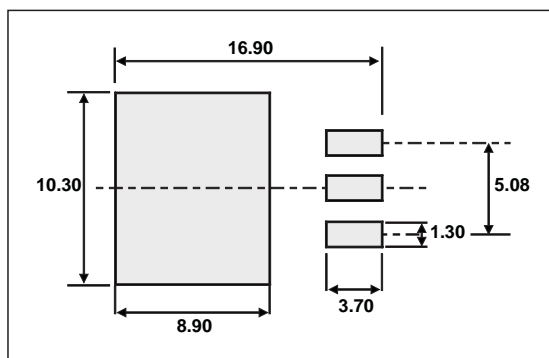
- COOLING METHOD : C
- RECOMMENDED TORQUE VALUE : 0.55M.N
- MAXIMUM TORQUE VALUE : 0.70 M.N

PACKAGE MECHANICAL DATA
D²PAK



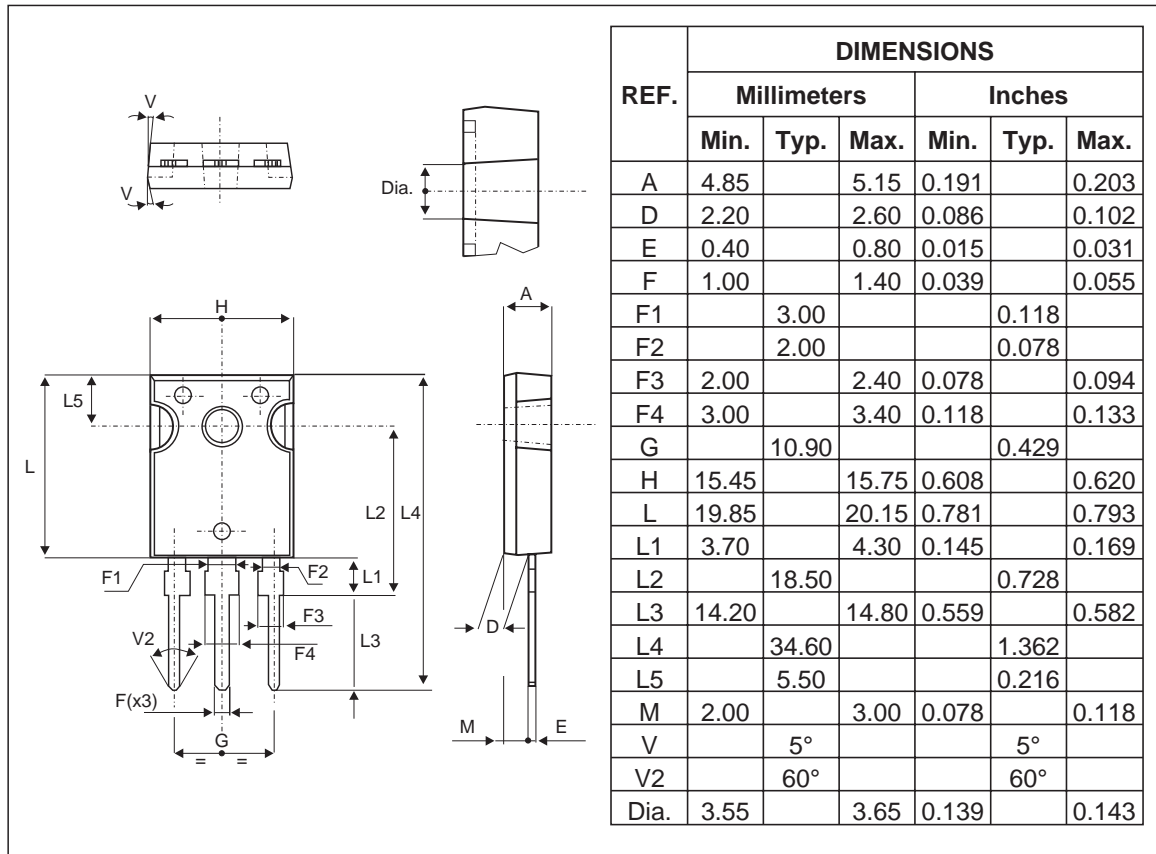
- COOLING METHOD : BY CONDUCTION (METHOD C)

FOOT PRINT (in millimeters)
D²PAK



STPS40L45CT/CW

PACKAGE MECHANICAL DATA TO-247



- COOLING METHOD : C
- RECOMMENDED TORQUE VALUE : 0.8M.N
- MAXIMUM TORQUE VALUE : 1.0M.N

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS40L45CG	STPS40L45CG	D2PAK	1.8g	500	Tape & Reel
STPS40L45CT	STPS40L45CT	TO-220AB	2g	50	Tube
STPS40L45CW	STPS40L45CW	TO-247	4.4g	30	Tube

- EPOXY MEETS UL94,V0

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