



# STPS40L40CT/CW

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	<b>2 x 20 A</b>
$V_{RRM}$	<b>40 V</b>
$T_j$ (max)	<b>150 °C</b>
$V_F$ (max)	<b>0.49 V</b>

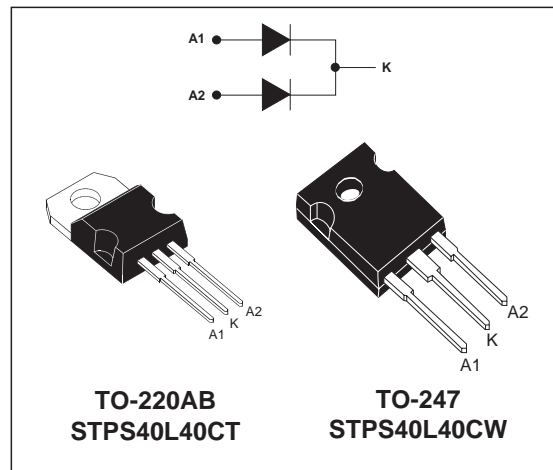
### FEATURES AND BENEFITS

- LOW FORWARD VOLTAGE DROP MEANING VERY SMALL CONDUCTION LOSSES
- LOW DYNAMIC LOSSES AS A RESULT OF THE SCHOTTKY BARRIER
- 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 and TO-247 this device is 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		30	A	
$I_{F(AV)}$	Average forward current	$T_c = 130^\circ\text{C}$	Per diode	20	A
		$\delta = 0.5$	Per device	40	
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ Sinusoidal	230	A	
$I_{RRM}$	Repetitive peak reverse current	$t_p = 2 \mu\text{s}$ square F = 1kHz	2	A	
$I_{RSM}$	Non repetitive peak reverse current	$t_p = 100 \mu\text{s}$ square	3	A	
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 1 \mu\text{s}$ $T_j = 25^\circ\text{C}$	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/ $\mu\text{s}$	

\* :  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th}(j-a)}$  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	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 :  
 $\Delta T_j(\text{diode } 1) = P(\text{diode } 1) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode } 2) \times R_{th(c)}$

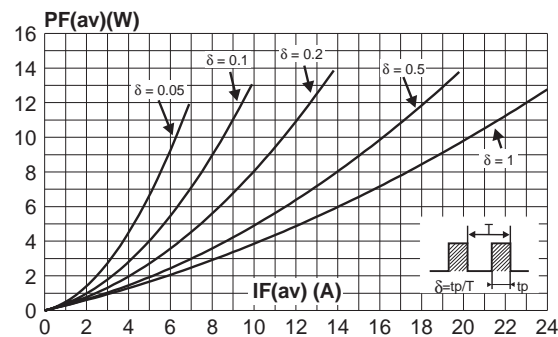
### STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$			0.8	mA
		$T_j = 100^{\circ}\text{C}$			30	70	
$V_F^*$	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	

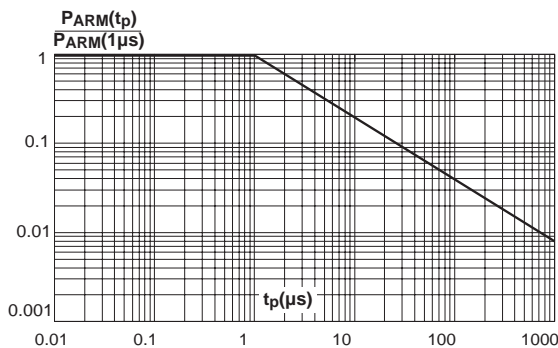
Pulse test : \*  $t_p = 380\ \mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation :  
 $P = 0.28 \times I_{F(AV)} + 0.0105 I_{F(RMS)}^2$

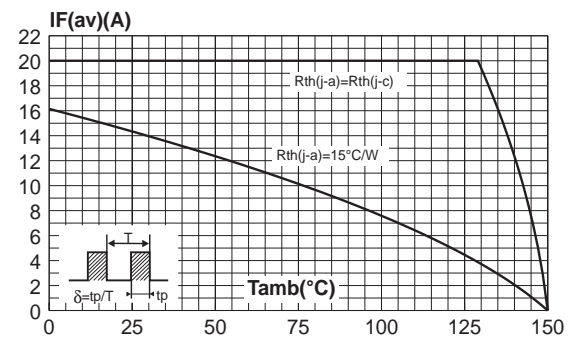
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



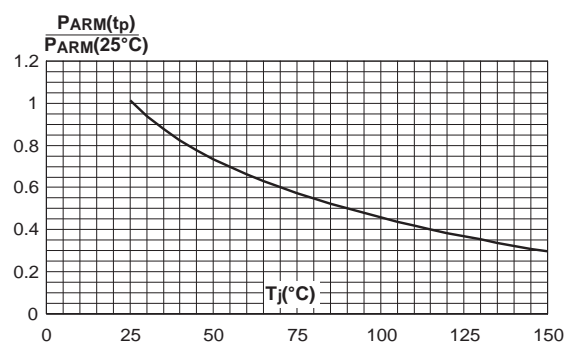
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



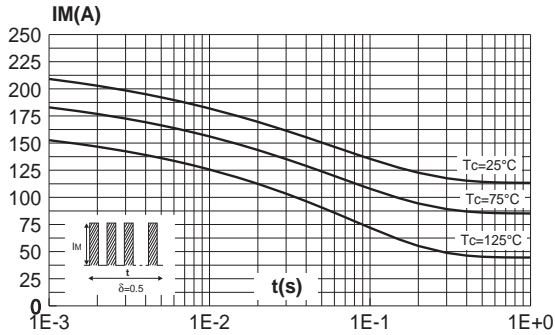
**Fig. 2:** Average current versus ambient temperature ( $\delta = 0.5$ , per diode).



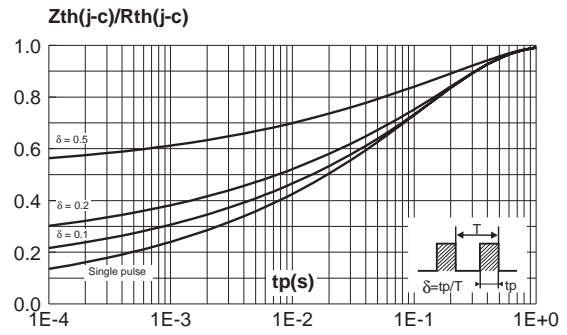
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



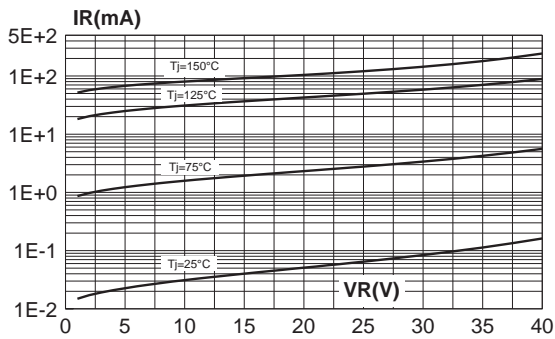
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode).



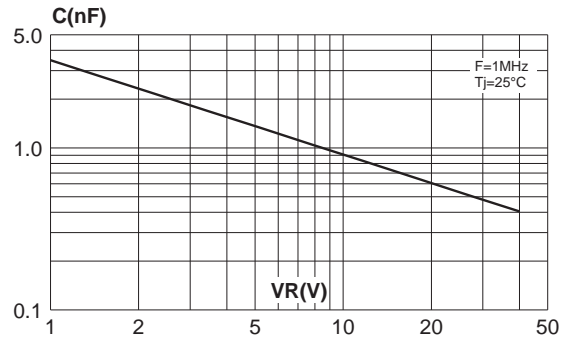
**Fig. 6:** Relative variation of thermal impedance junction to case versus pulse duration.



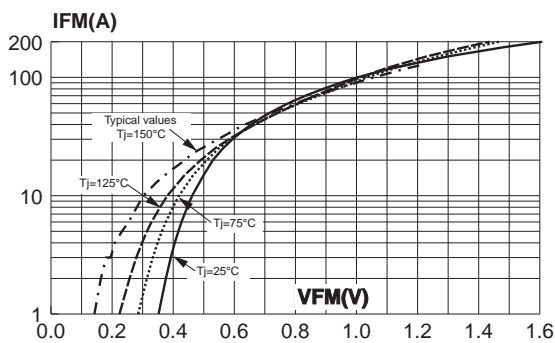
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



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

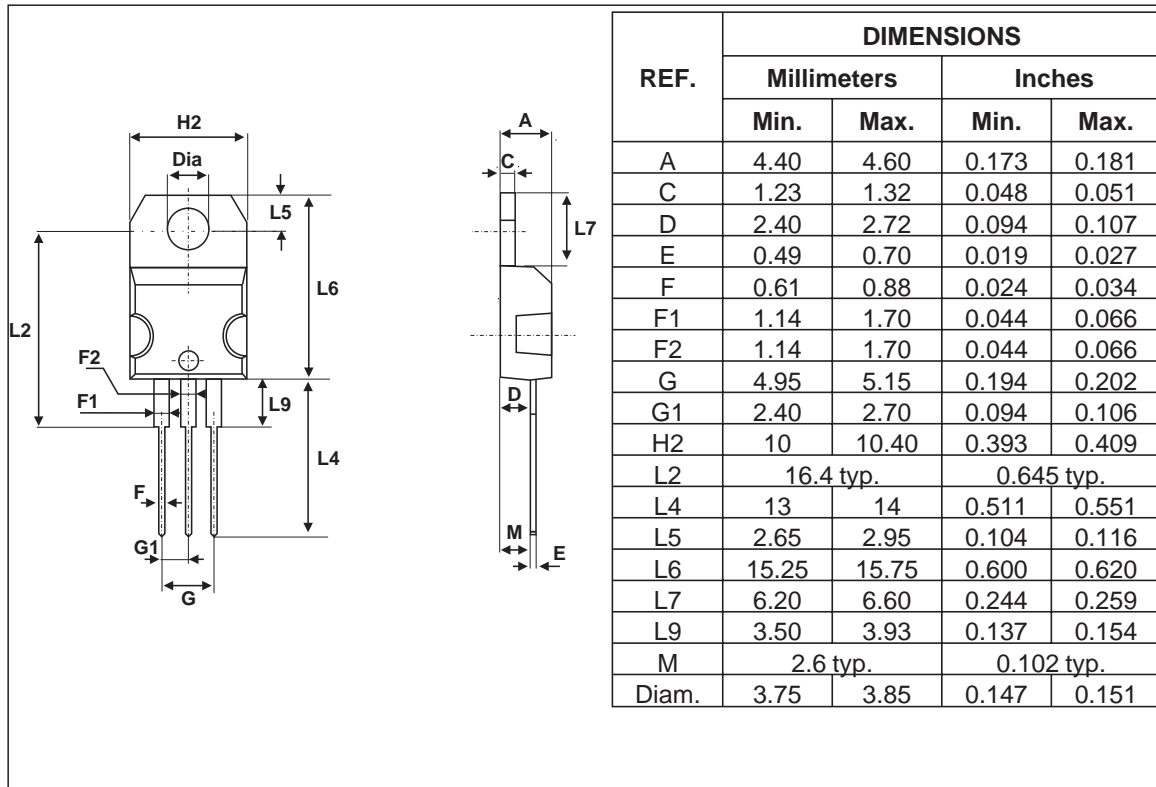


**Fig. 9:** Forward voltage drop versus forward current (maximum values, per diode).

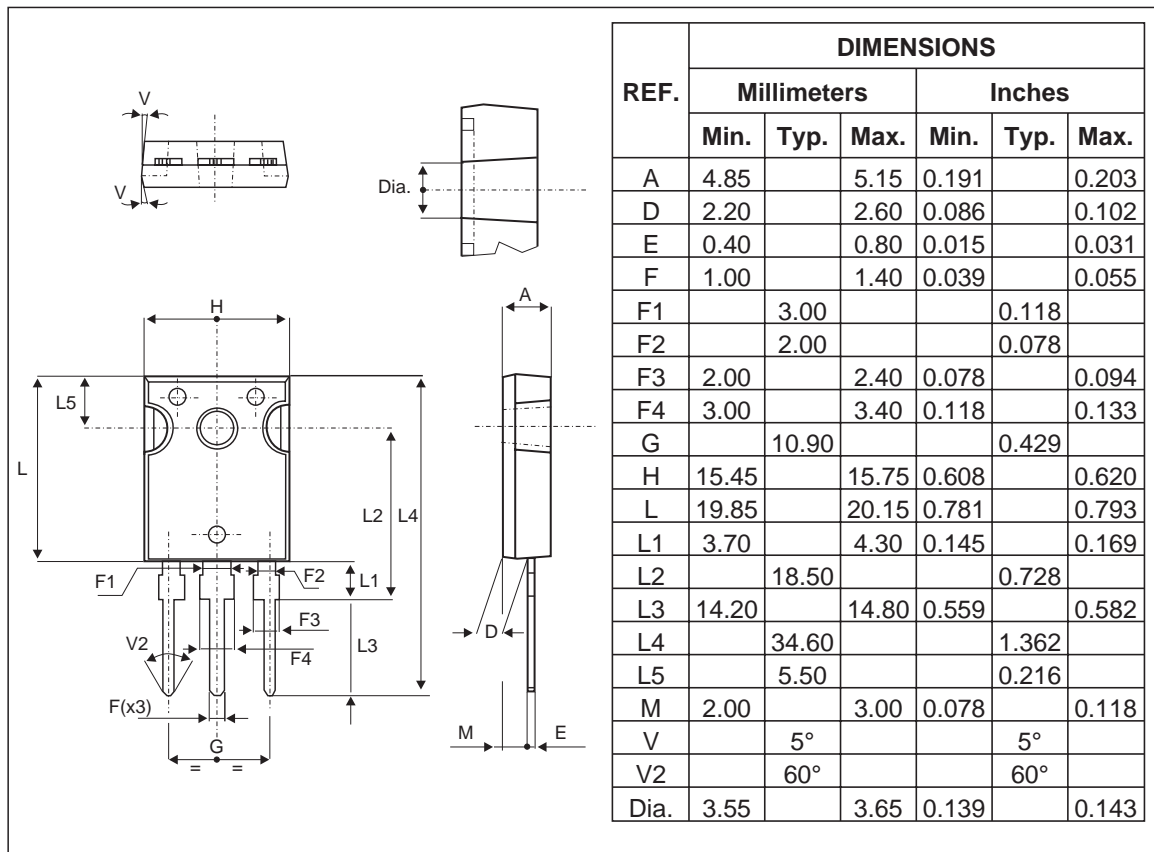


# STPS40L40CT/CW

## PACKAGE MECHANICAL DATA TO-220AB



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

**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
STPS40L40CT	STPS40L40CT	TO-220AB	2g	50	Tube
STPS40L40CW	STPS40L40CW	TO-247	4.4g	30	Tube

- EPOXY MEETS UL94,V0

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