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## STPS40L40CT/CW

### LOW DROP POWER SCHOTTKY RECTIFIER

#### MAIN PRODUCTS CHARACTERISTICS

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

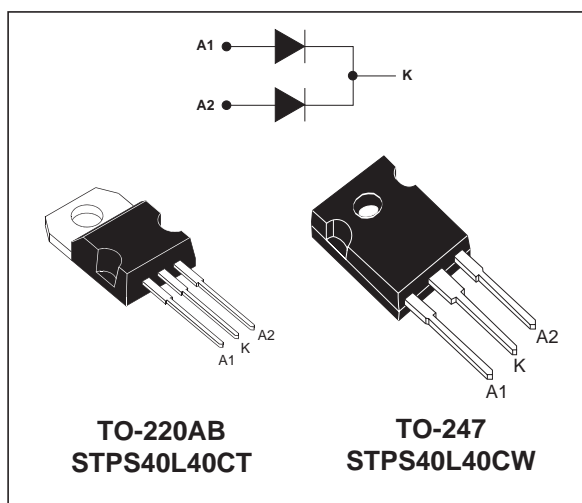
#### FEATURES AND BENEFITS

- LOW FORWARD VOLTAGE DROP MEANING VERY SMALL CONDUCTION LOSSES
- LOW 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	$T_c = 130^\circ\text{C}$ $\delta = 0.5$	Per diode: 20 Per device: 40	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10$ ms Sinusoidal	230	A
$I_{RRM}$	Repetitive peak reverse current	$t_p = 2$ $\mu\text{s}$ 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

## STPS40L40CT/CW

### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	1.5	°C/W
		Total	0.8	
R <sub>th(c)</sub>		Coupling	0.1	°C/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)

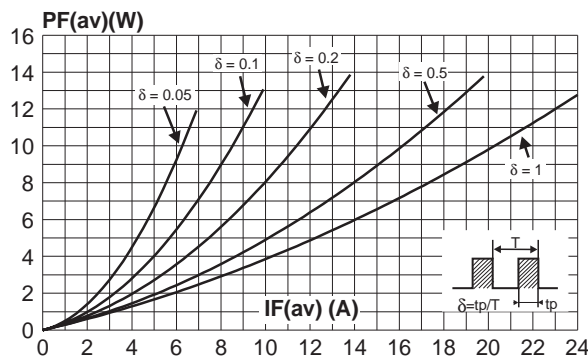
Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			0.8	mA
		T <sub>j</sub> = 100°C			30	70	
V <sub>F</sub> *	Forward voltage drop	T <sub>j</sub> = 25°C	I <sub>F</sub> = 20 A			0.53	V
		T <sub>j</sub> = 125°C	I <sub>F</sub> = 20 A		0.42	0.49	
		T <sub>j</sub> = 25°C	I <sub>F</sub> = 40 A			0.69	
		T <sub>j</sub> = 125°C	I <sub>F</sub> = 40 A		0.6	0.7	

Pulse test : \* tp = 380 μs, δ < 2%

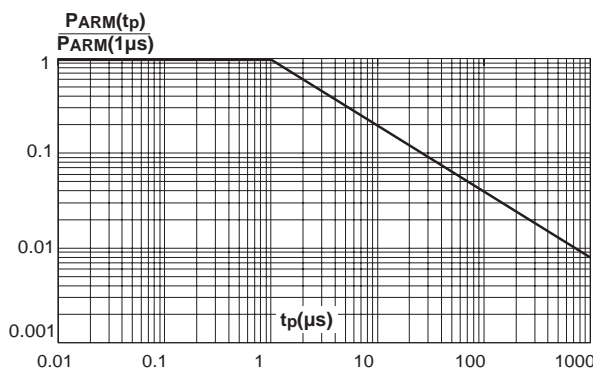
To evaluate the conduction losses use the following equation :

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

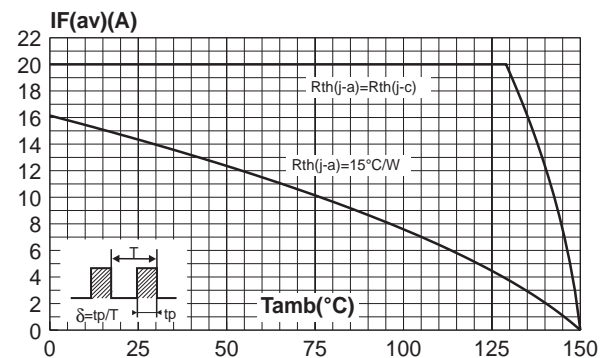
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



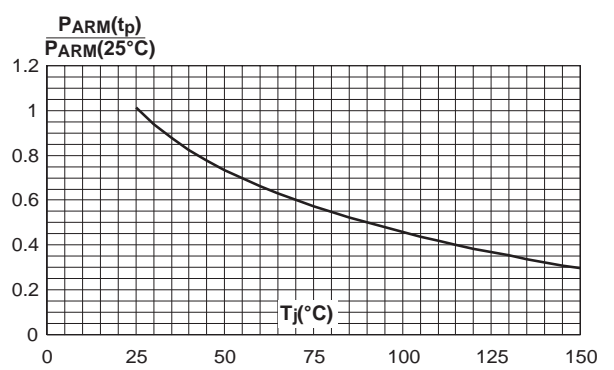
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



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

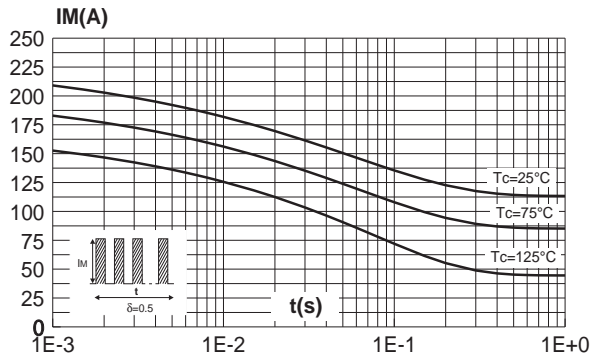


**Fig. 4:** Normalized avalanche power derating versus junction temperature.

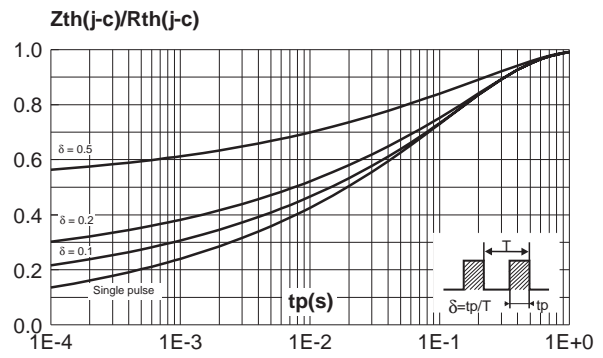


**STPS40L40CT/CW**

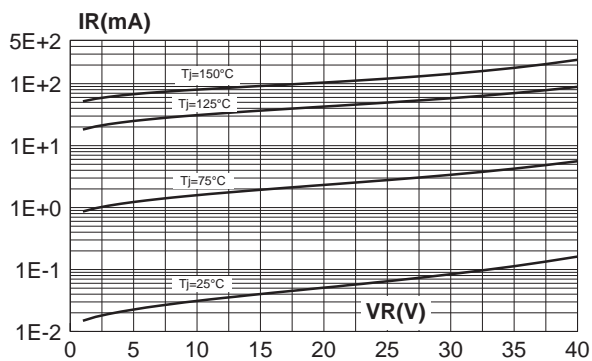
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode).



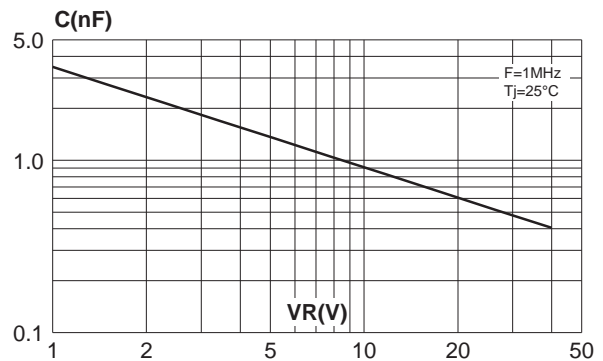
**Fig. 6:** Relative variation of thermal impedance junction to case versus pulse duration.



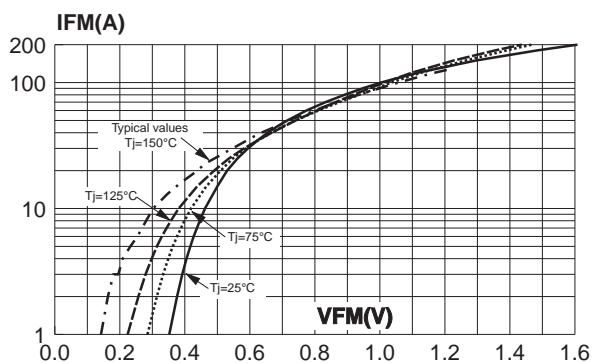
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



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



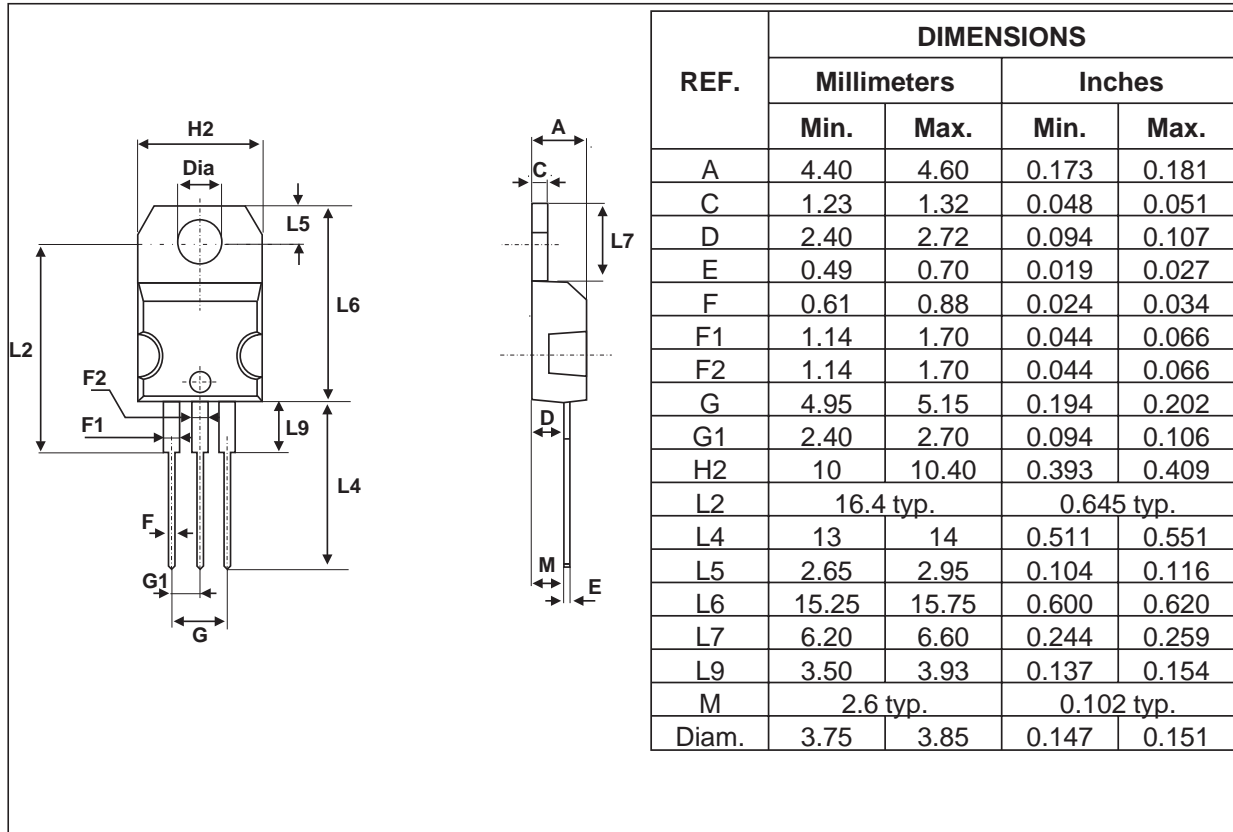
**Fig. 9:** Forward voltage drop versus forward current (maximum values, per diode).



**STPS40L40CT/CW**

**PACKAGE MECHANICAL DATA**

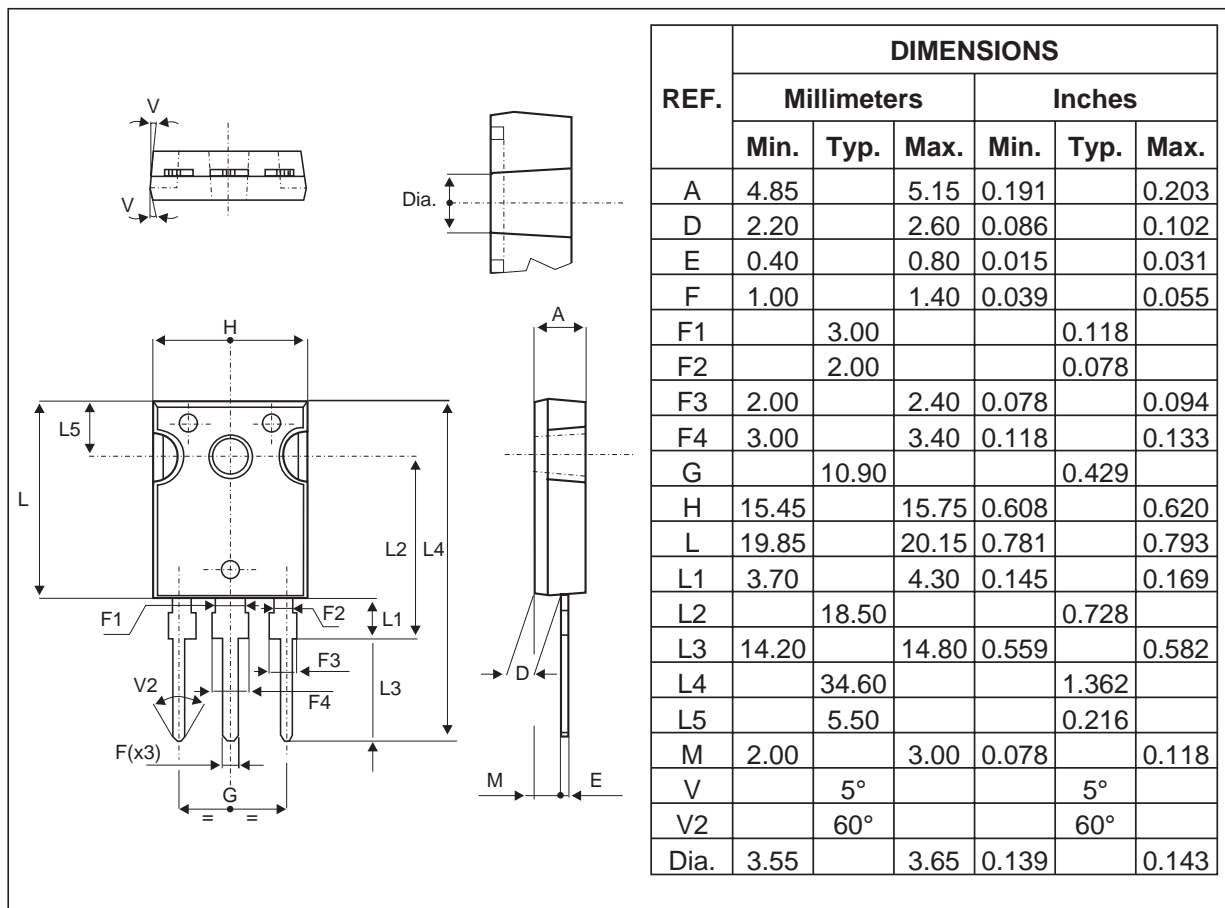
TO-220AB



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

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

- EPOXY MEETS UL94,V0

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