

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 20 A
$V_{RRM}$	30 V
$T_j(\text{max})$	150 °C
$V_F(\text{max})$	0.38 V

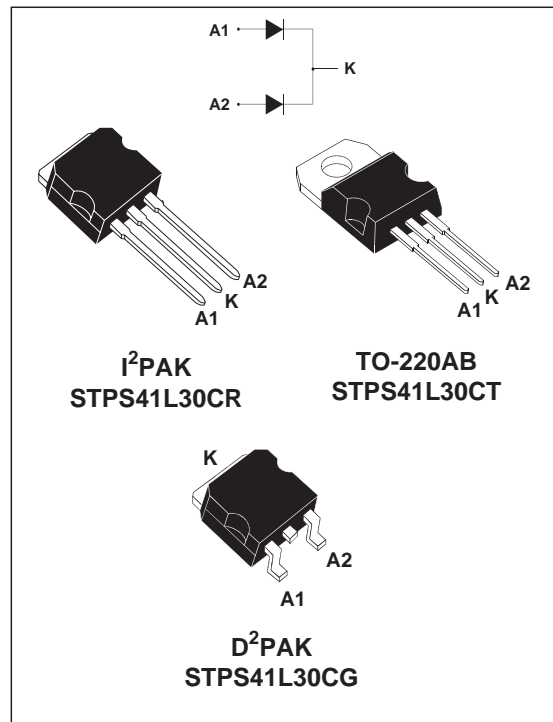
### FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW FORWARD VOLTAGE DROP
- HIGH AVALANCHE CAPABILITY
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED

### DESCRIPTION

Dual center tab Schottky rectifier suited for Switch Mode Power Supply and high frequency DC to DC converters.

Packaged in D<sup>2</sup>PAK, I<sup>2</sup>PAK and TO-220AB 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		30	V
$I_{F(RMS)}$	RMS forward current		30	A
$I_{F(AV)}$	Average forward current	$T_c = 135^\circ\text{C}$ $\delta = 0.5$	Per diode 20	A
			Per device 40	
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ sinusoidal	220	A
$I_{RRM}$	Peak repetitive reverse current	$t_p = 2 \mu\text{s}$ square $F = 1 \text{ kHz}$	1	A
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 1 \mu\text{s}$ $T_j = 25^\circ\text{C}$	6500	W
$T_{stg}$	Storage temperature range		- 65 to + 175	°C
$T_j$	Maximum operating junction temperature *		150	°C
$dV/dt$	Critical rate of rise 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

**STPS41L30CG / STPS41L30CT / STPS41L30CR**

**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	

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)**

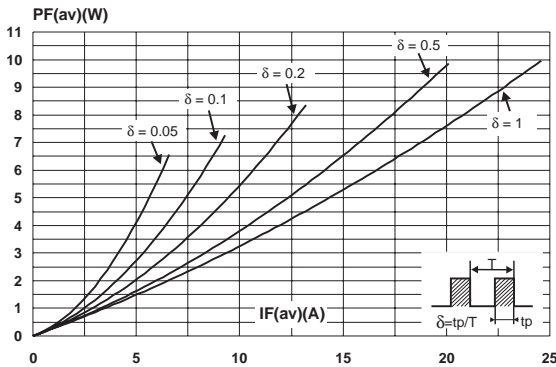
Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit	
I <sub>R</sub> *	Reverse leakage current	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			1.5	mA	
		T <sub>j</sub> = 125°C			170	350		
V <sub>F</sub> *	Forward voltage drop	T <sub>j</sub> = 25°C	I <sub>F</sub> = 20 A			0.48	V	
		T <sub>j</sub> = 125°C			0.35	0.38		
		T <sub>j</sub> = 25°C		I <sub>F</sub> = 40 A				0.57
		T <sub>j</sub> = 125°C				0.47		0.49

Pulse test : \* t<sub>p</sub> = 380 μs, δ < 2%

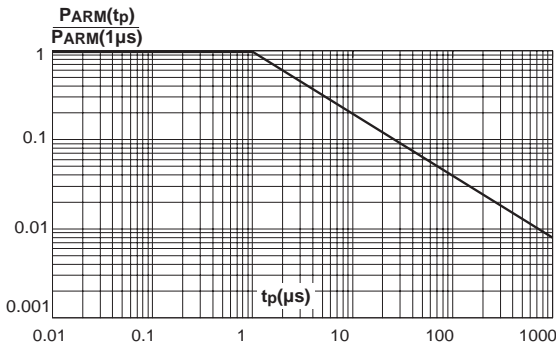
To evaluate the conduction losses use the following equation :

$$P = 0.27 \times I_{F(AV)} + 0.0055 I_{F(RMS)}^2$$

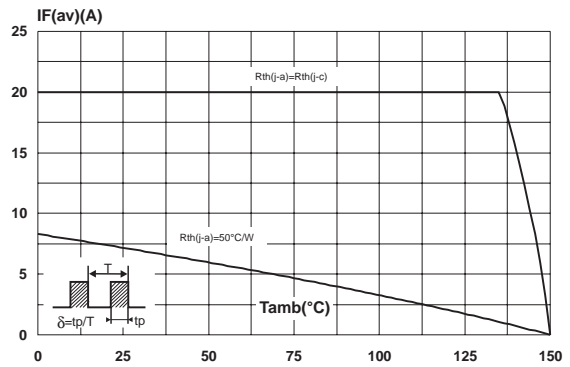
**Fig. 1:** Conduction losses versus average current.



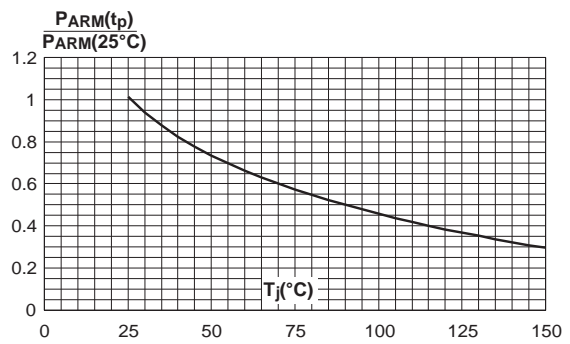
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



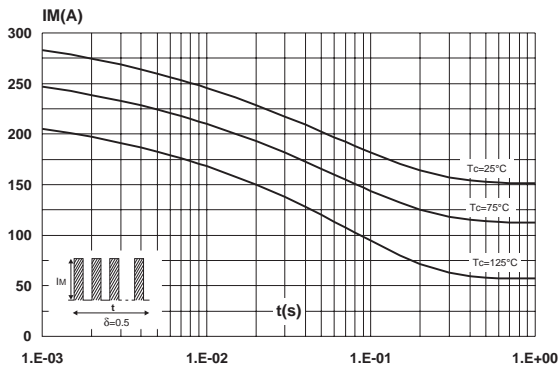
**Fig. 2:** Average forward current versus ambient temperature (δ = 0.5).



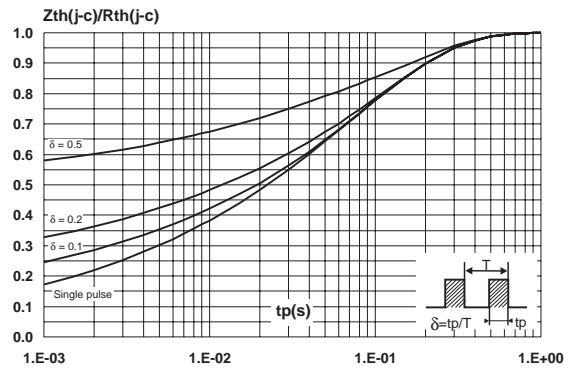
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



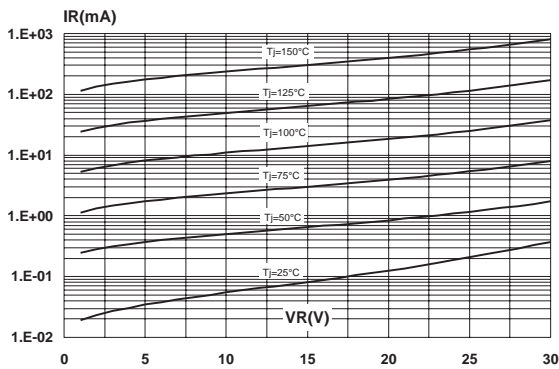
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values).



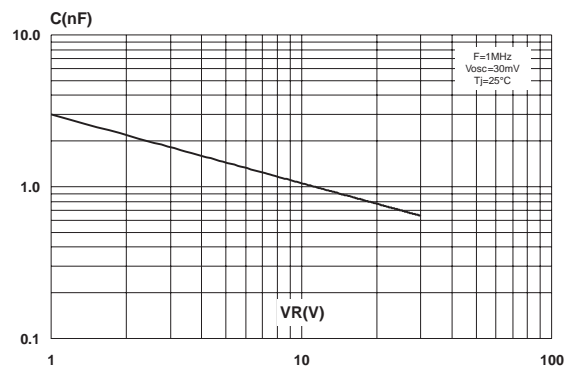
**Fig. 6:** Relative variation of thermal impedance junction to case versus pulse duration.



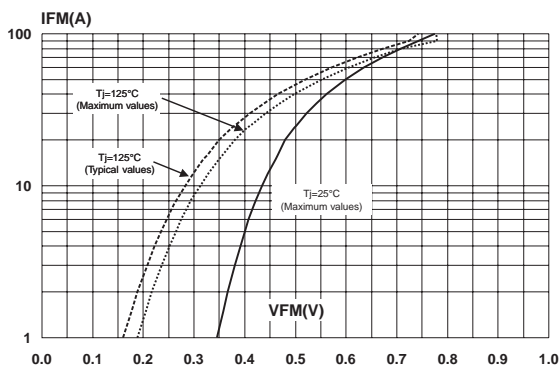
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values).



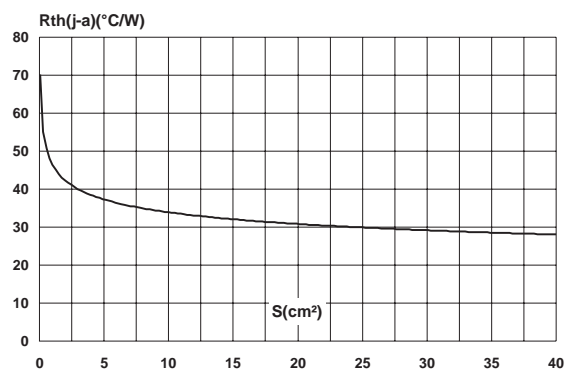
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values).



**Fig. 9:** Forward voltage drop versus forward current.

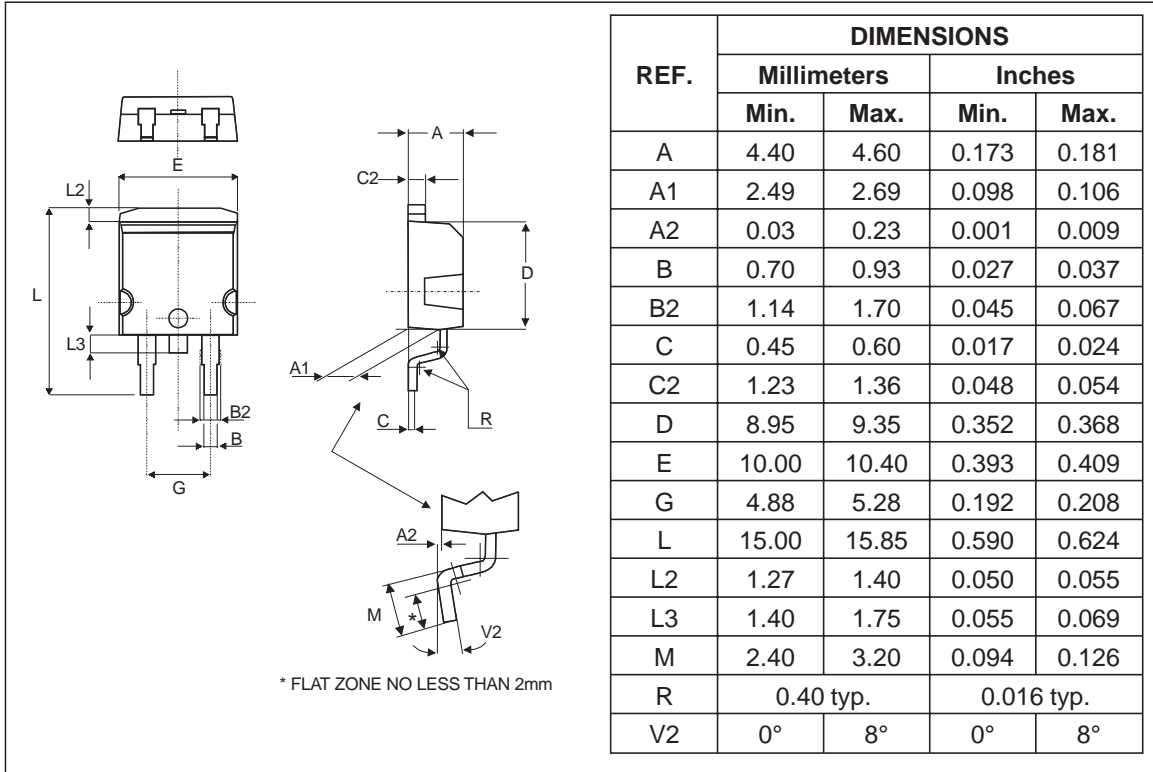


**Fig. 10:** Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35µm) (STPS41L30CG only).

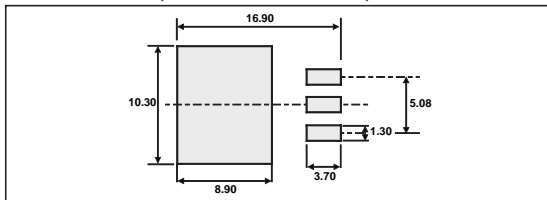


STPS41L30CG / STPS41L30CT / STPS41L30CR

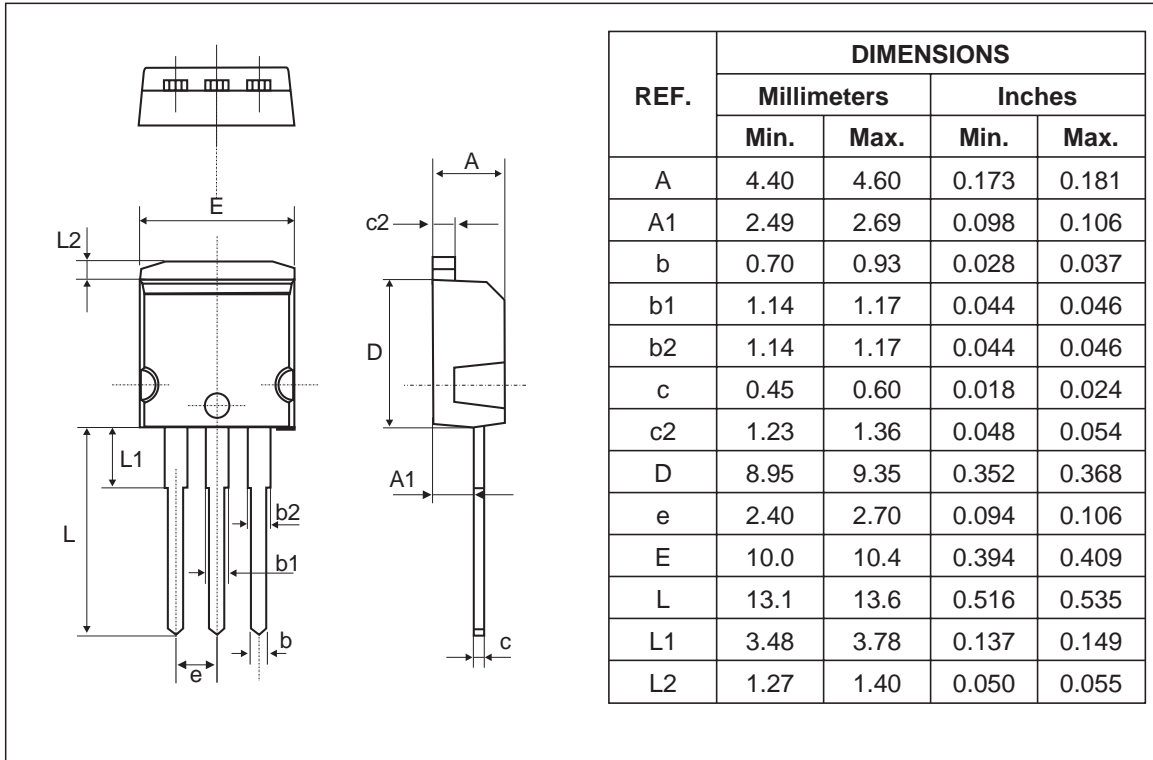
PACKAGE MECHANICAL DATA  
D<sup>2</sup>PAK



FOOTPRINT (dimensions in mm)

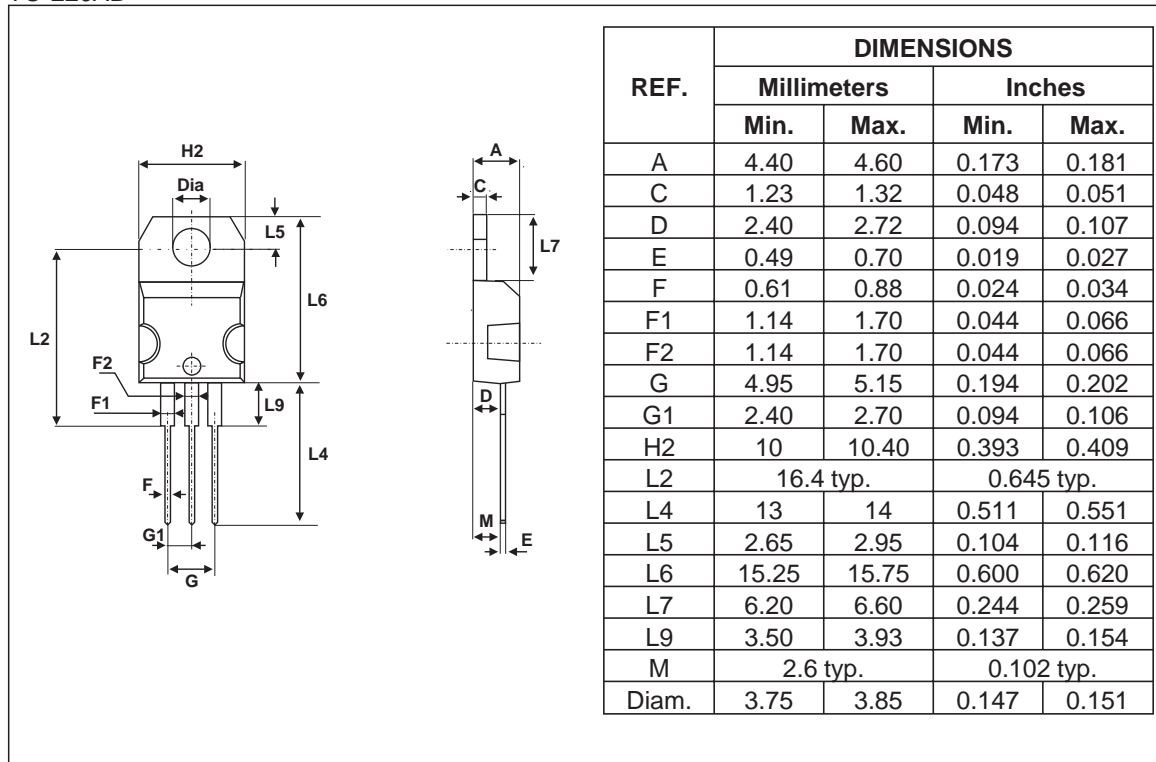


**PACKAGE MECHANICAL DATA**  
I<sup>2</sup>PAK



# STPS41L30CG / STPS41L30CT / STPS41L30CR

## PACKAGE MECHANICAL DATA TO-220AB



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS41L30CG	STPS41L30CG	D <sup>2</sup> PAK	1.48 g	50	Tube
STPS41L30CG-TR	STPS41L30CG	D <sup>2</sup> PAK	1.48 g	1000	Tape & reel
STPS41L30CT	STPS41L30CT	TO-220AB	2.20 g	50	Tube
STPS41L30CR	STPS41L30CR	I <sup>2</sup> PAK	1.49 g	50	Tube

■ EPOXY MEETS UL94,V0

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