



STPS41L45CG/CT/CR

LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 20 A
V_{RRM}	45 V
$T_j(\text{max})$	150 °C
$V_F(\text{max})$	0.47 V

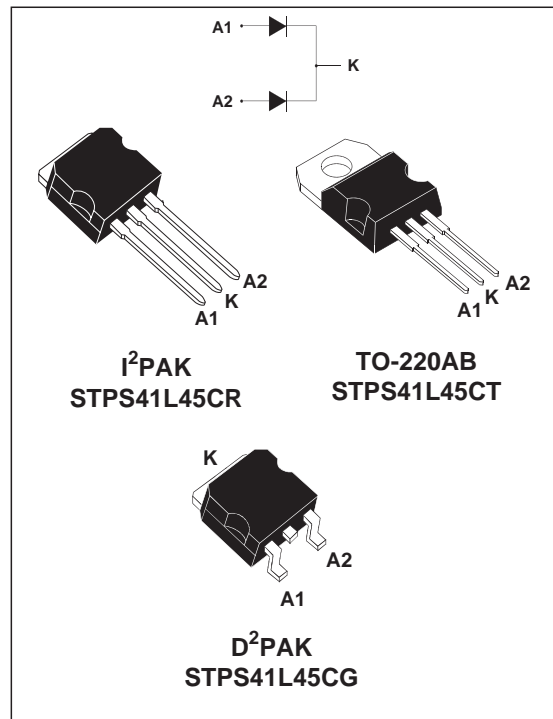
FEATURES AND BENEFITS

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

DESCRIPTION

Dual center tab Schottky rectifier suited for 5V output in off line AC/DC power supplies.

Packaged in D²PAK, I²PAK 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		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 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	$t_p = 1 \mu\text{s}$ $T_j = 25^\circ\text{C}$	10000	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/ μs

$$* : \frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}} \text{ thermal runaway condition for a diode on its own heatsink}$$

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THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	1.5	°C/W
		Total	0.8	
$R_{th(c)}$	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_R^*	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			1.2	mA	
		$T_j = 125^\circ\text{C}$			110	220		
V_F^*	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 20\text{ A}$			0.53	V	
		$T_j = 125^\circ\text{C}$			0.42	0.47		
		$T_j = 25^\circ\text{C}$		$I_F = 40\text{ A}$				0.68
		$T_j = 125^\circ\text{C}$				0.60		0.66

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

To evaluate the conduction losses use the following equation :
 $P = 0.28 \times I_{F(AV)} + 0.0095 I_{F(RMS)}^2$

Fig. 1: Conduction losses versus average current.

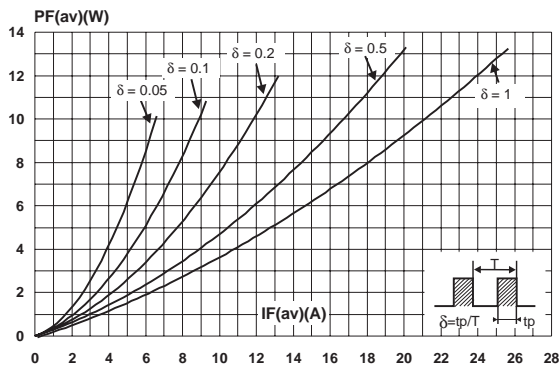


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$).

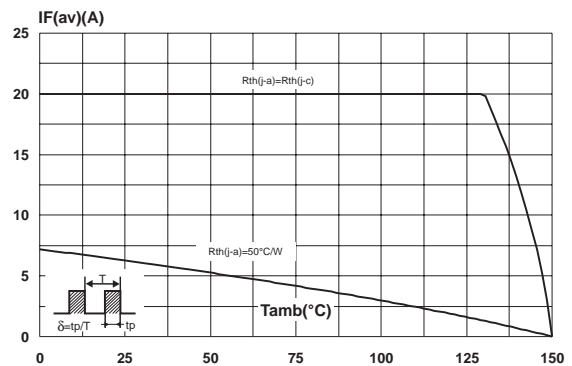


Fig. 3: Normalized avalanche power derating versus pulse duration.

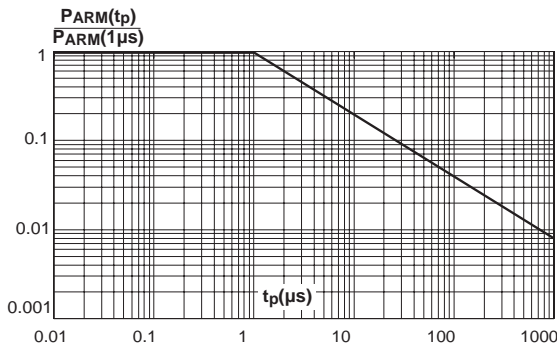


Fig. 4: Normalized avalanche power derating versus junction temperature.

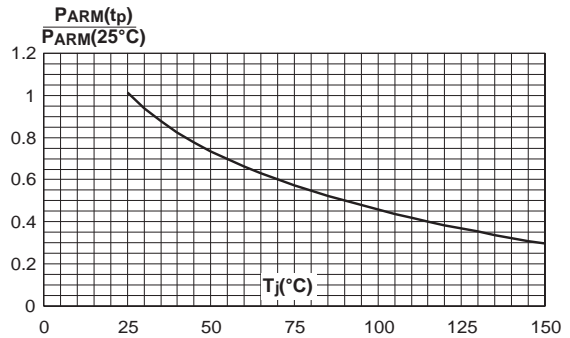


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values).

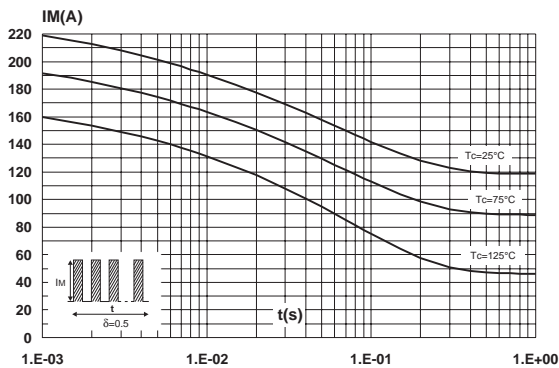


Fig. 6: Relative variation of thermal impedance junction to case versus pulse duration.

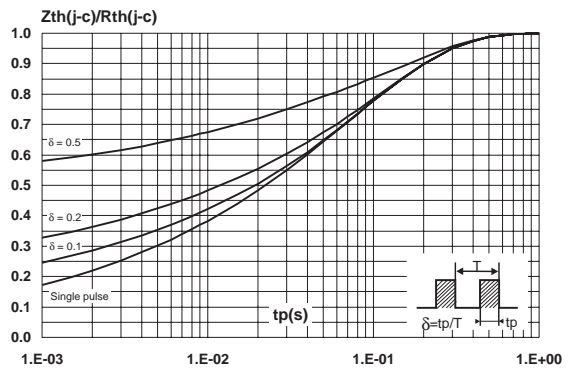


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

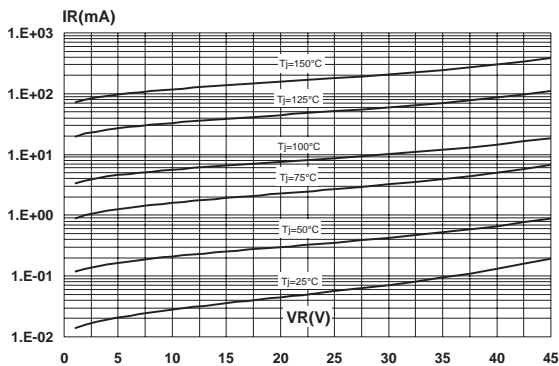
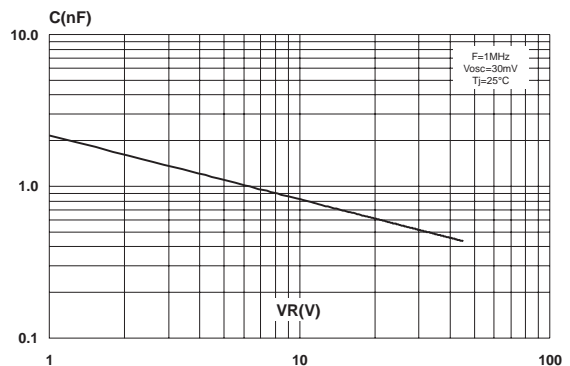


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).



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Fig. 9: Forward voltage drop versus forward current.

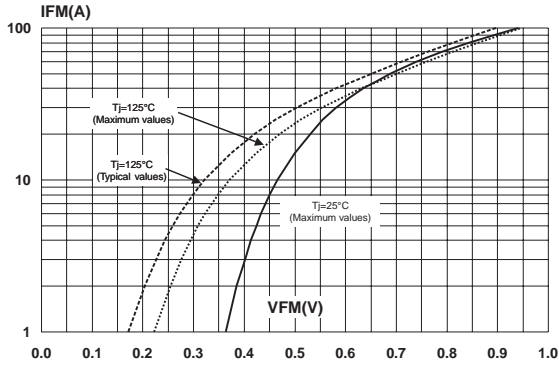
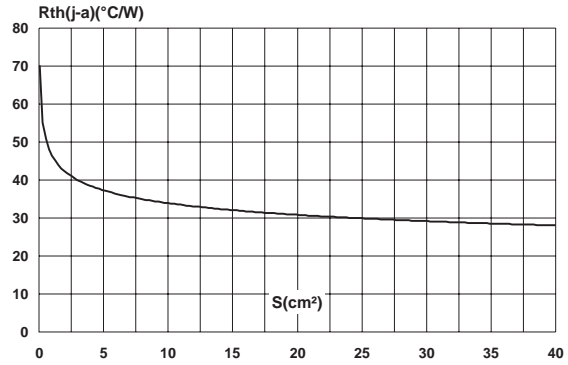
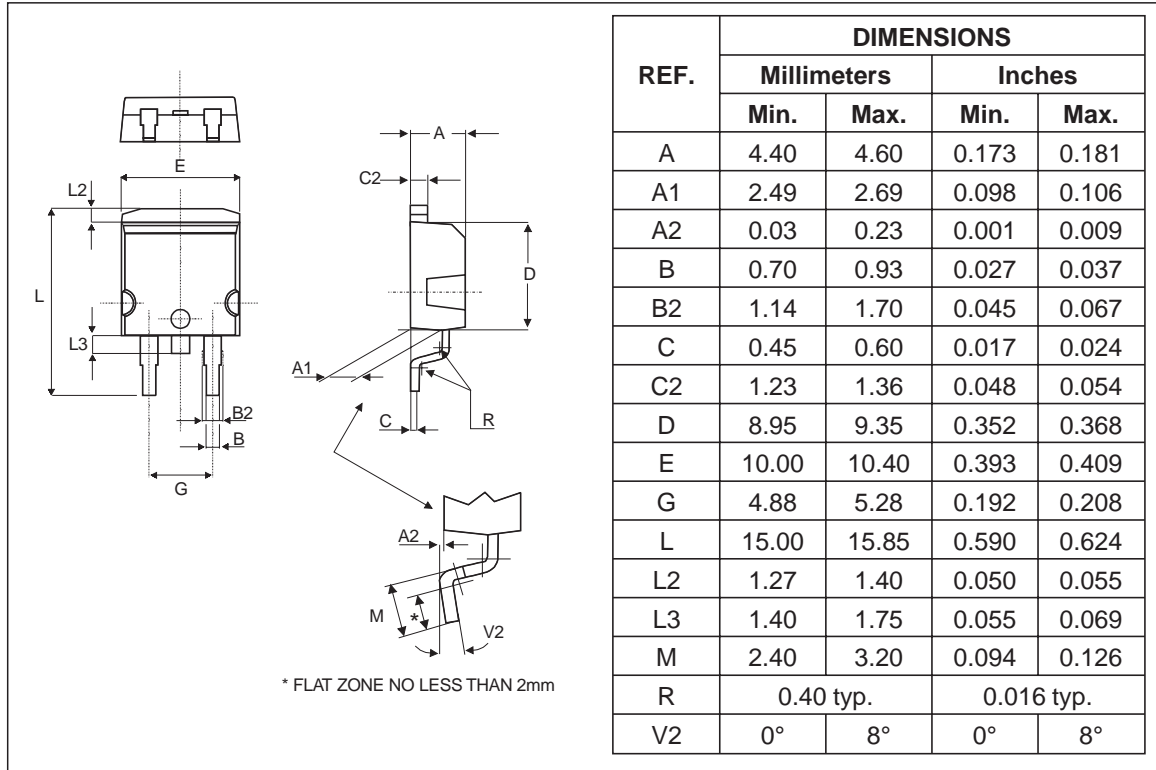


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35µm) (STPS41L45CG only).

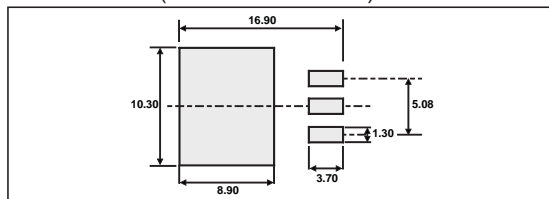


PACKAGE MECHANICAL DATA

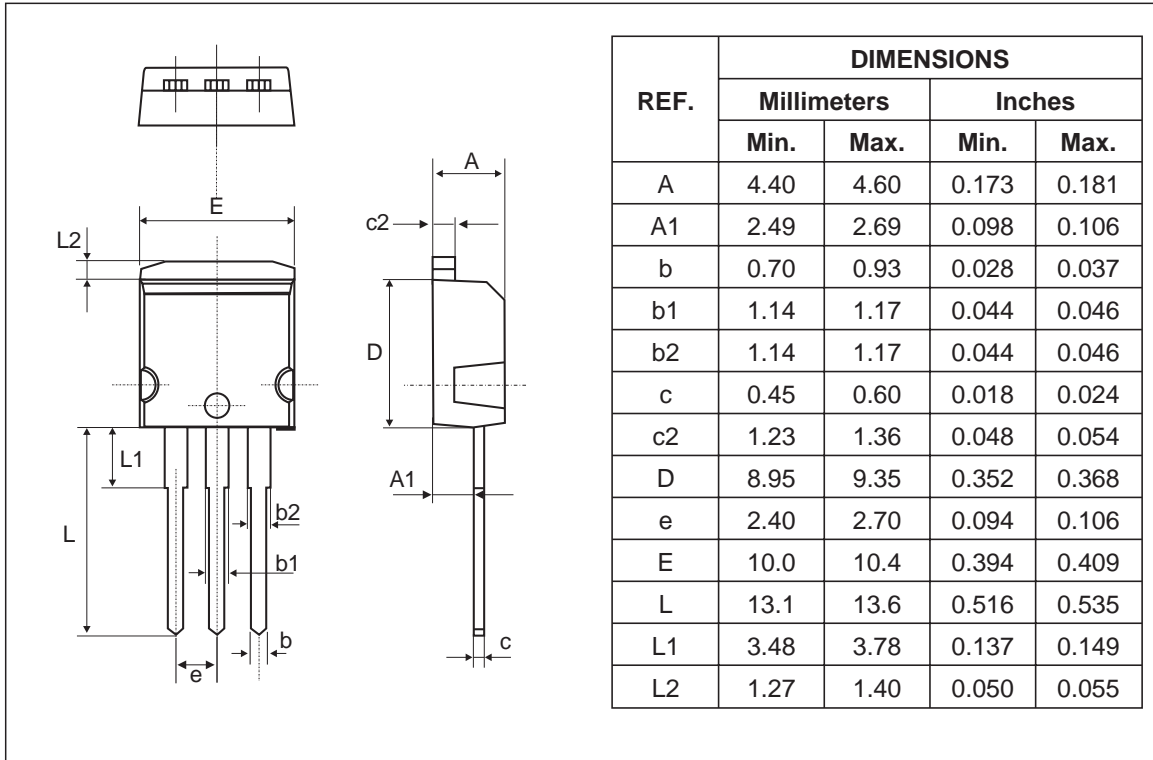
D²PAK



FOOTPRINT (dimensions in mm)

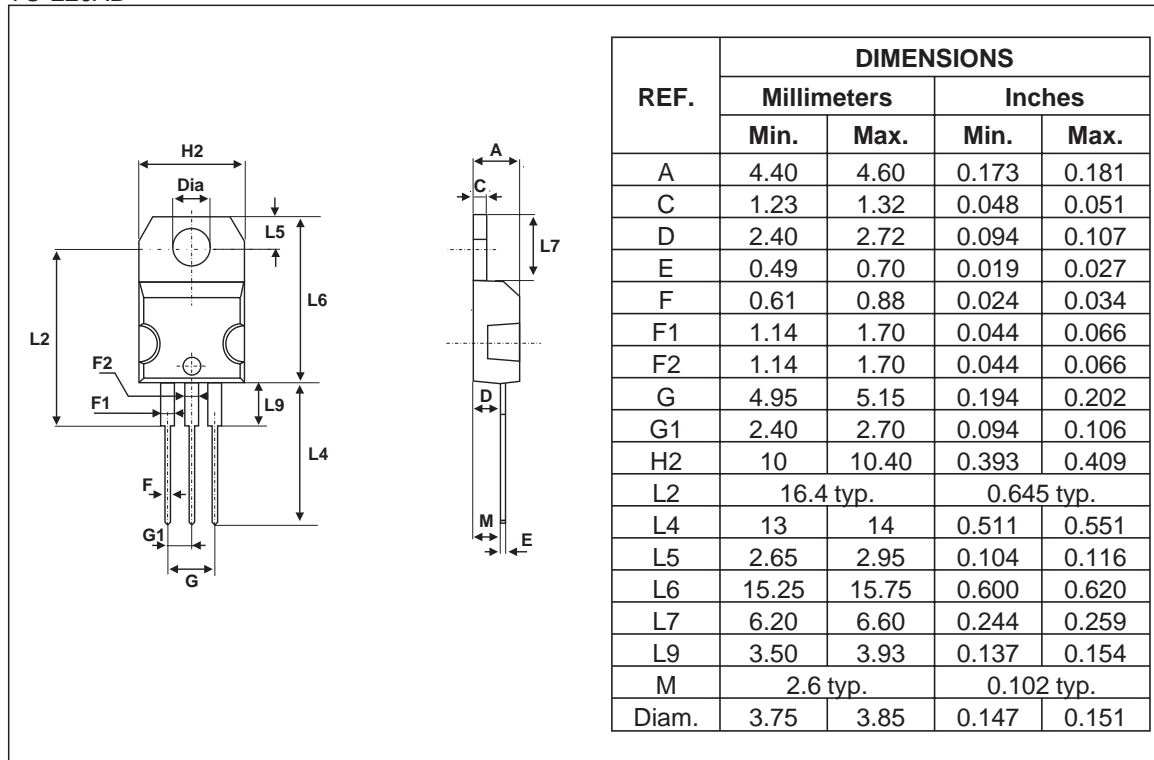


PACKAGE MECHANICAL DATA
I²PAK



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PACKAGE MECHANICAL DATA TO-220AB



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS41L45CG	STPS41L45CG	D ² PAK	1.48 g	50	Tube
STPS41L45CG-TR	STPS41L45CG	D ² PAK	1.48 g	1000	Tape & reel
STPS41L45CT	STPS41L45CT	TO-220AB	2.20 g	50	Tube
STPS41L45CR	STPS41L45CR	I ² PAK	1.49 g	50	Tube

■ EPOXY MEETS UL94,V0

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