

LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCTS CHARACTERISTICS

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

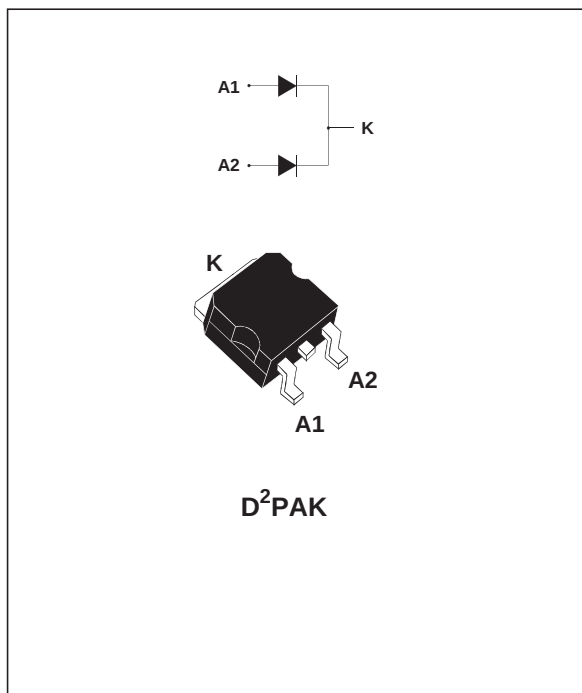
FEATURES AND BENEFITS

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low forward voltage drop
- Low thermal resistance

DESCRIPTION

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

Packaged in D²PAK, 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°C δ = 0.5	Per diode Per device	20 40	A
I _{FSM}	Surge non repetitive forward current	tp = 10 ms sinusoidal		220	A
I _{RRM}	Peak repetitive reverse current	tp=2 μs square F=1kHz		1	A
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

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

STPS41L45CG

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode Total	1.5 0.8	$^{\circ}\text{C/W}$
$R_{th(c)}$	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	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	0.47	
		$T_j = 25^{\circ}\text{C}$	$I_F = 40\text{ A}$			0.68	
		$T_j = 125^{\circ}\text{C}$	$I_F = 40\text{ A}$		0.60	0.66	

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

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.

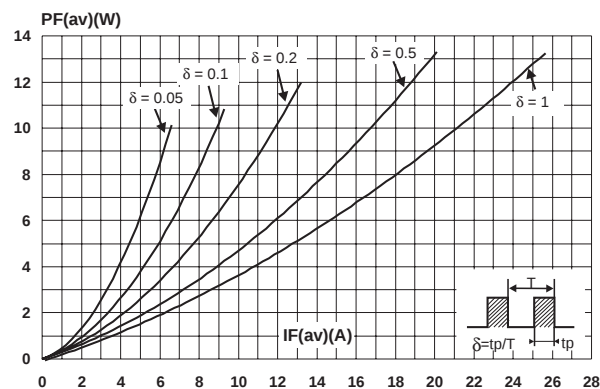


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$).

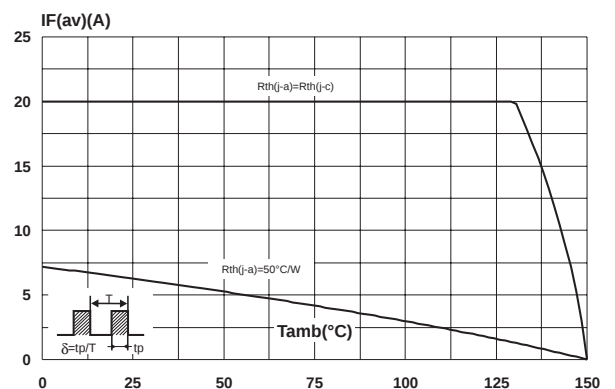


Fig. 3: Non repetitive surge peak forward current versus overload duration (maximum values).

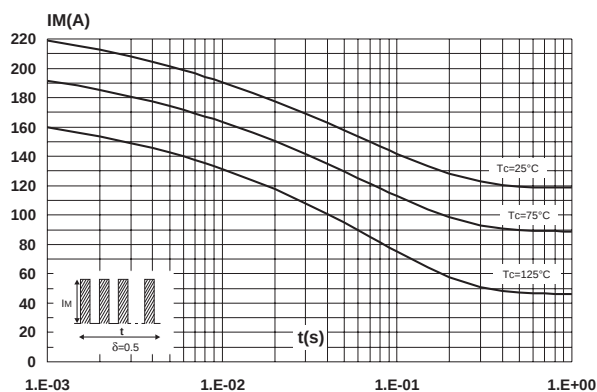


Fig. 4: Relative variation of thermal impedance junction to case versus pulse duration.

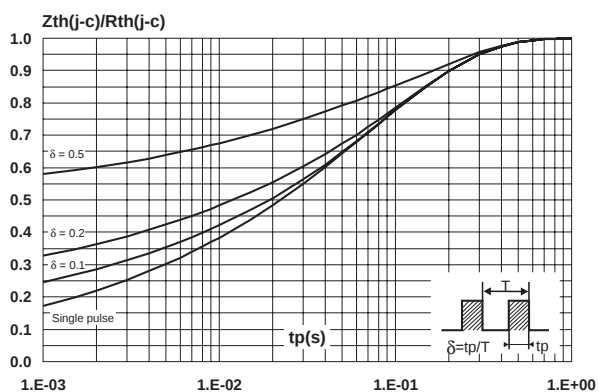


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values).

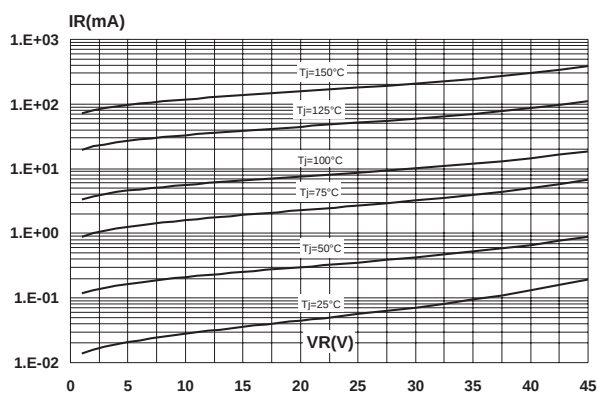


Fig. 6: Junction capacitance versus reverse voltage applied (typical values).

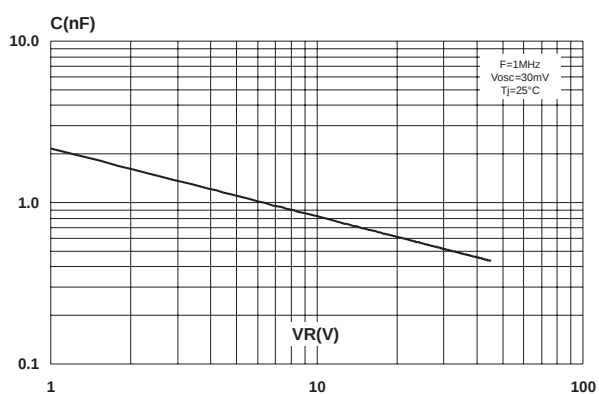


Fig. 7: Forward voltage drop versus forward current.

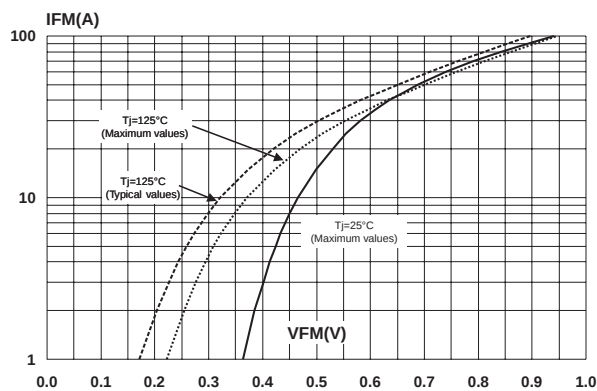
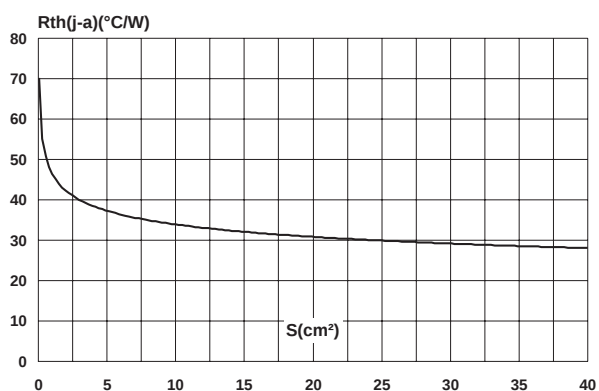


Fig. 8: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, $\text{Cu} = 35\mu\text{m}$).

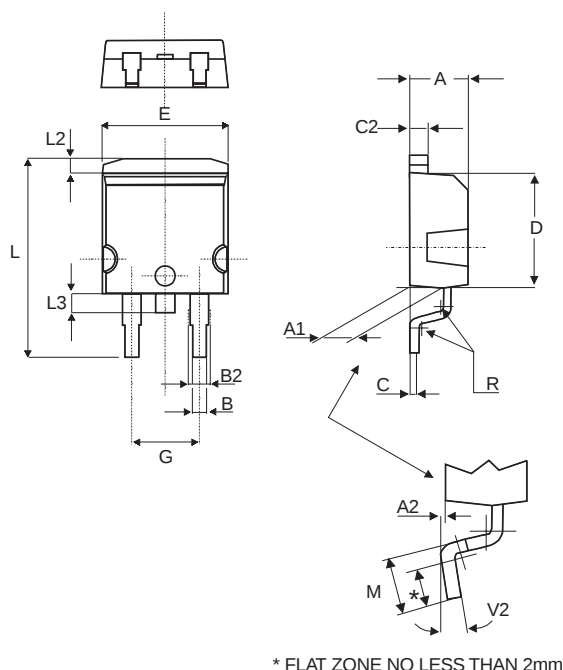


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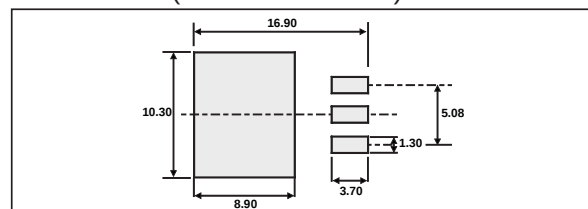
PACKAGE MECHANICAL DATA

D²PAK

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°



FOOTPRINT (dimensions in mm)



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

■ Epoxy meets UL94,V0

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