

POWER SCHOTTKY RECTIFIERS

MAIN PRODUCTS CHARACTERISTICS

I_{F(av)}	2 x 20 A
V_{RRM}	45 V
T_j (max)	175 °C
V_F (max)	0.63 V

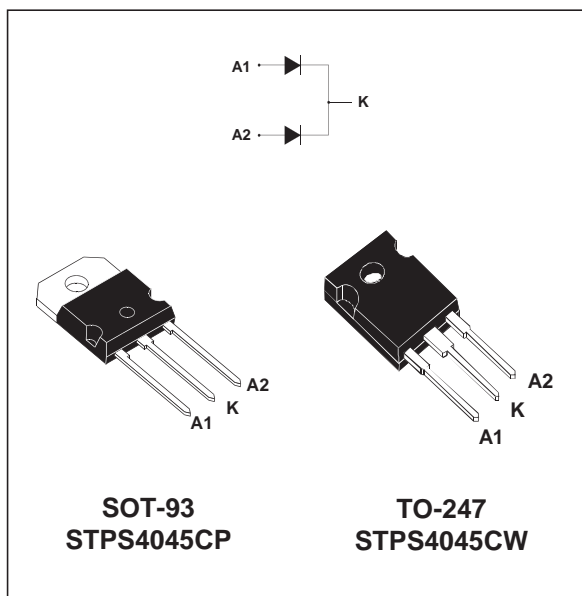
FEATURES AND BENEFITS

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

DESCRIPTION

Dual center tap Schottky rectifier suited for switchmode power supply and high frequency DC to DC converters.

Packaged either in SOT-93 or 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			45	V
I _{F(RMS)}	RMS forward current			30	A
I _{F(AV)}	Average forward current	T _c = 150°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}	Repetitive Peak reverse current	tp = 2 μs square F = 1kHz		1	A
I _{RSM}	Non repetitive peak reverse current	tp = 100 μs square		3	A
P _{ARM}	Repetitive peak avalanche power	tp = 1μs Tj = 25°C		6000	W
T _{stg}	Storage temperature range			- 65 to + 175	°C
Tj	Maximum operating junction temperature *			175	°C
dV/dt	Critical rate of rise of 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

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	$T_J = 25^{\circ}\text{C}$	$V_R = V_{RRM}$			200	μA
		$T_J = 125^{\circ}\text{C}$			11	40	mA
V_F^*	Forward voltage drop	$T_J = 125^{\circ}\text{C}$	$I_F = 20\text{ A}$		0.56	0.63	V
		$T_J = 25^{\circ}\text{C}$	$I_F = 40\text{ A}$			0.94	
		$T_J = 125^{\circ}\text{C}$	$I_F = 40\text{ A}$		0.7	0.83	

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

To evaluate the conduction losses use the following equation :
 $P = 0.46 \times I_{F(AV)} + 0.0085 I_{F(RMS)}^2$

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

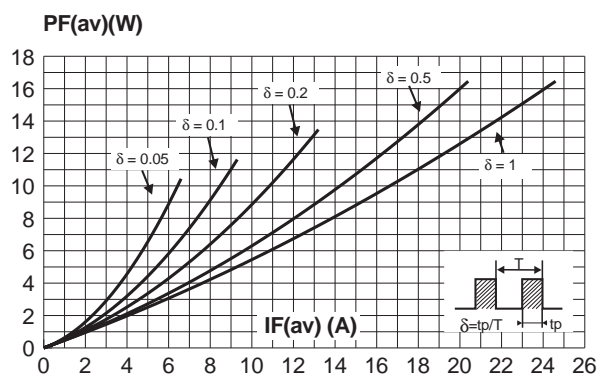


Fig. 2: Average current versus ambient temperature (per diode).

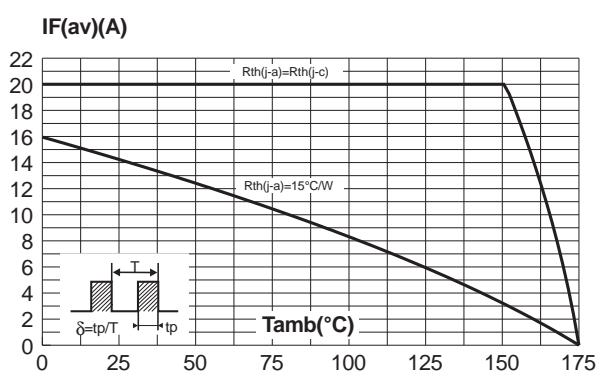


Fig. 3: Normalized avalanche power derating versus pulse duration.

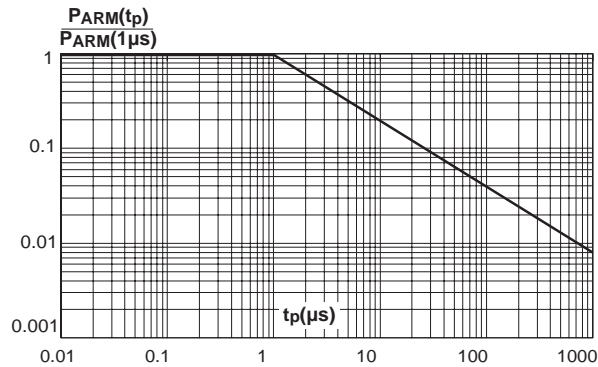


Fig. 4: Normalized avalanche power derating versus junction temperature.

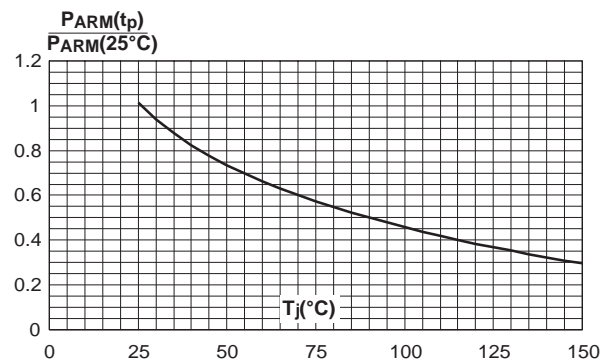


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values) (per diode).

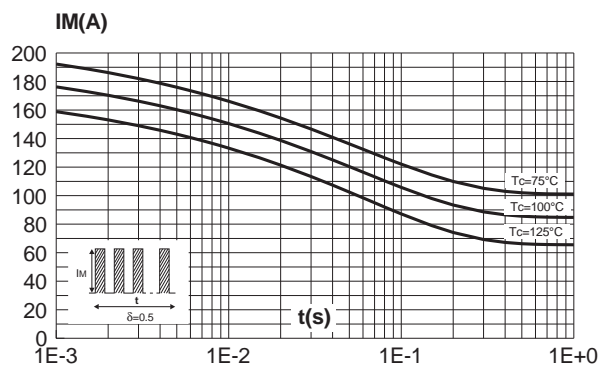


Fig. 6: Relative variation of thermal transient impedance junction to case versus pulse duration.

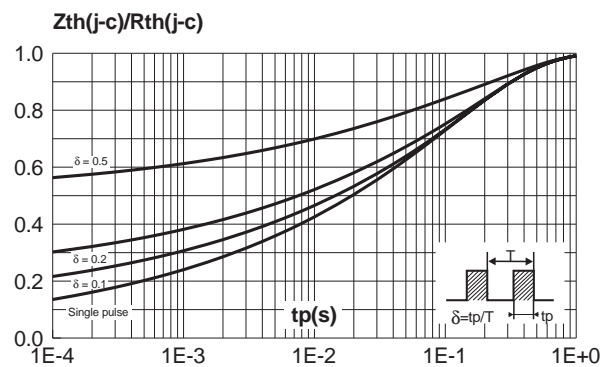


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values) (per diode).

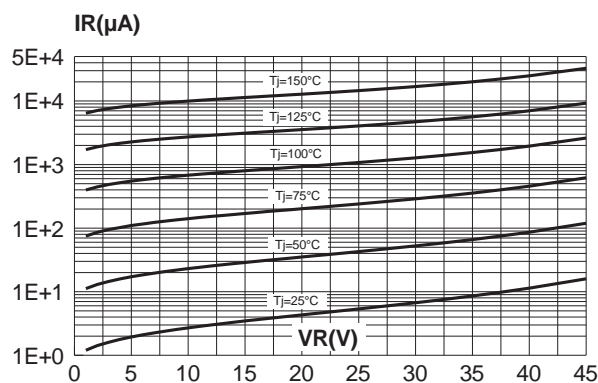


Fig. 8: Junction capacitance versus reverse voltage applied (typical values) (per diode).

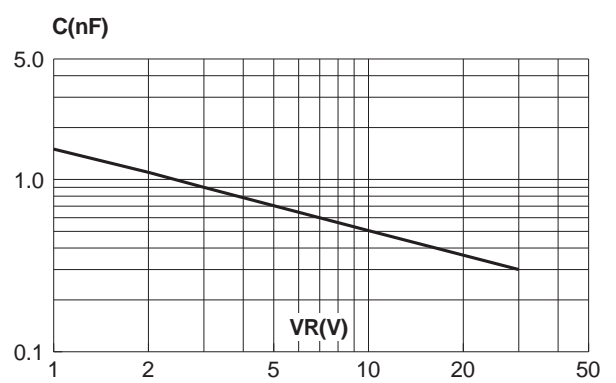
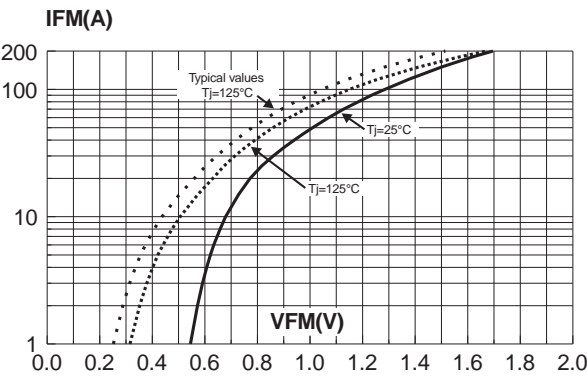
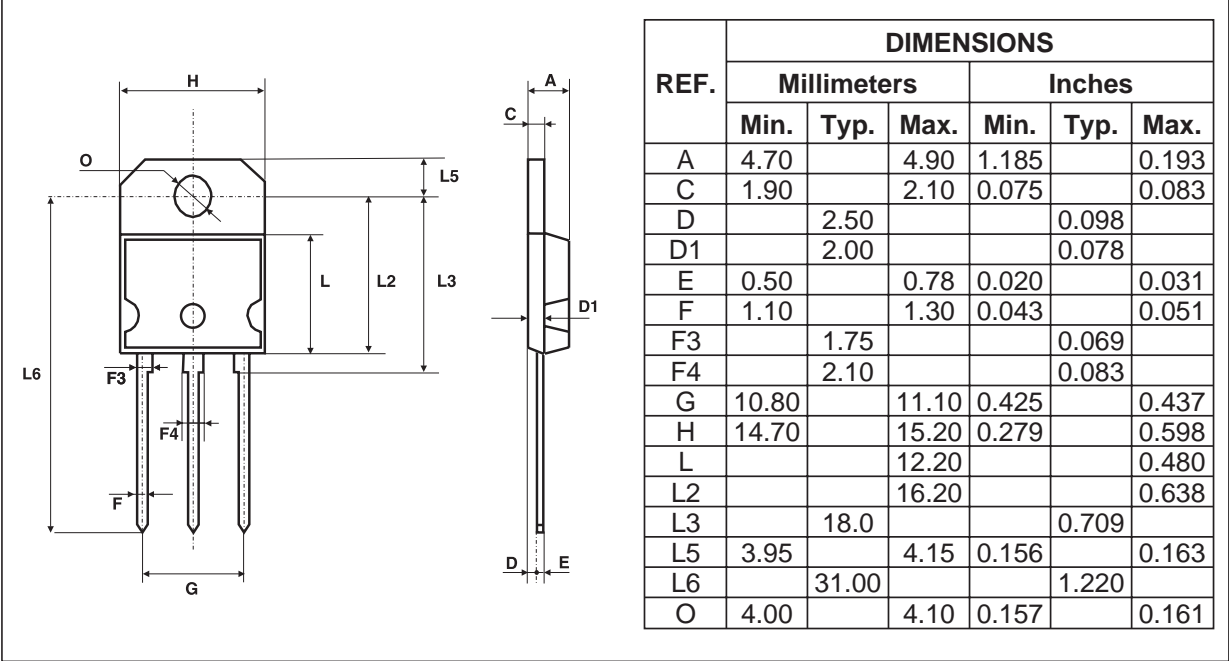


Fig. 9: Forward voltage drop versus forward current (maximum values) (per diode).



PACKAGE MECHANICAL DATA
SOT-93



PACKAGE MECHANICAL DATA
TO-247

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.16	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.079	
F3	1.90		2.40	0.075		0.094
F4	3.00		3.40	0.118		0.134
G		10.90			0.429	
H	15.45		16.03	0.608		0.631
L	19.85		21.09	0.781		0.830
L1	3.70		4.30	0.146		0.169
L2	18.30		19.13	0.720		0.753
L3	14.20		20.30	0.559		0.799
L4	34.05		41.38	1.341		1.629
L5	5.35		6.30	0.211		0.248
M	2.00		3.00	0.079		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.140		0.144

Type	Marking	Package	Weight	Base qty	Delivery mode
STPS4045CP	STPS4045CP	SOT-93	3.97 g.	30	Tube
STPS4045CW	STPS4045CW	TO-247	4.46 g.	30	Tube

- COOLING METHOD: BY CONDUCTION (C)
- RECOMMENDED TORQUE VALUE: 0.8 N.M
- MAXIMUM TORQUE VALUE: 1.0 N.M.
- EPOXY MEETS UL94,V0

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