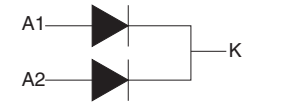
STPS40H100CW

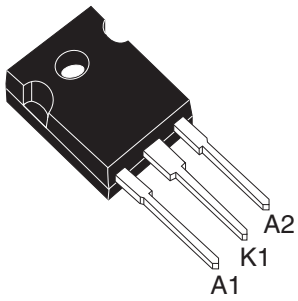
High voltage power Schottky rectifier

Datasheet – production data

Features

- Negligible switching losses
- Low leakage current
- Good trade off between leakage current and forward voltage drop
- Low thermal resistance
- Avalanche capability specified





TO-247

Description

Dual center tap Schottky rectifier suited for switch mode power supplies and high frequency DC to DC converters.

Packaged in TO-247, this device is intended for use in high frequency inverters.

Table 1. Device summary

$I_{F(AV)}$	2 x 20 A
V_{RRM}	100 V
T_j (max)	175 °C
V_F(max)	0.61 V

1 Characteristics

Table 2. Absolute ratings (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			100	V
$I_{F(RMS)}$	Forward rms current			30	A
$I_{F(AV)}$	Average forward current	T_c = 160 °C δ = 0.5	Per diode Per device	20 40	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal		300	A
I_{RRM}	Repetitive peak reverse current	t_p = 2 µs F= 1 kHz square		1	A
I_{RSM}	Non repetitive peak reverse current	t_p = 100 µs square		4	A
E_{AS}	Non repetitive avalanche energy	T_j = 25 °C, L = 60 mH I_{as} = 3 A		36	mJ
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs, T_j = 25 °C		26400	W
T_{stg}	Storage temperature range			-65 to + 175	°C
T_j	Maximum operating junction temperature			175	°C
dV/dt	Critical rate of rise of reverse voltage			10000	V/µs

Table 3. Thermal resistance

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode Total	0.9 0.55	°C/W
$R_{th(c)}$		Coupling	0.1	

When the diodes 1 and 2 are used simultaneously :

ΔTj(diode 1) = P(diode1) x $R_{th(j-c)}$(Per diode) + P(diode 2) x $R_{th(c)}$

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R (1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			10	µA
		T_j = 125 °C			5	15	mA
V_F (2)	Forward voltage drop	T_j = 25 °C	I_F = 20 A			0.73	V
		T_j = 125 °C	I_F = 20 A		0.58	0.61	
		T_j = 25 °C	I_F = 40 A			0.85	
		T_j = 125 °C	I_F = 40 A		0.67	0.72	

1. Pulse test: t_p = 5 ms, δ < 2%
2. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:
$P = 0.5 \times I_{F(AV)} + 0.0055\ I_F{}^2{}_{(RMS)}$

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

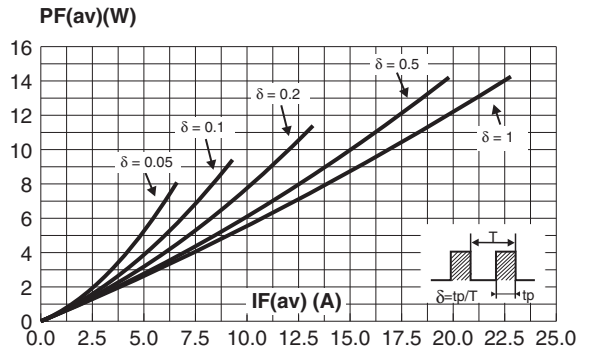


Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)

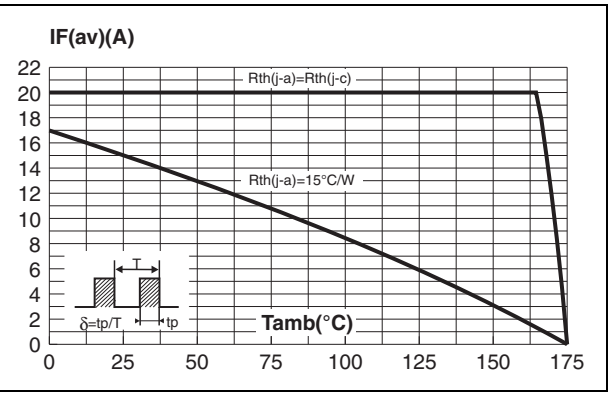


Figure 3. Normalized avalanche power derating versus pulse duration

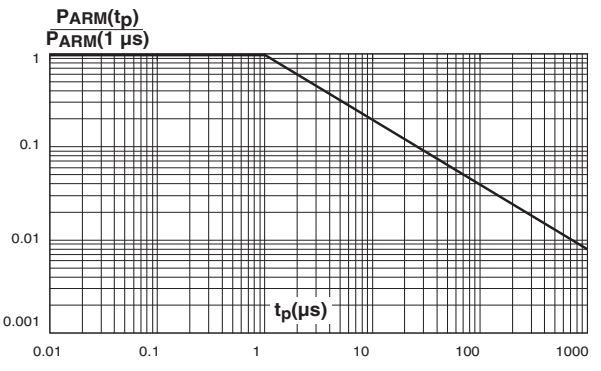


Figure 4. Normalized avalanche power derating versus junction temperature

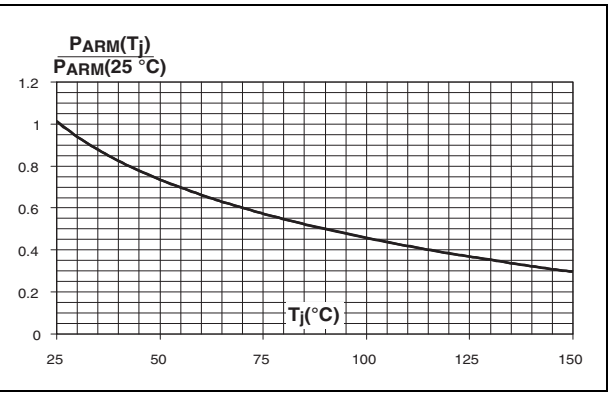


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

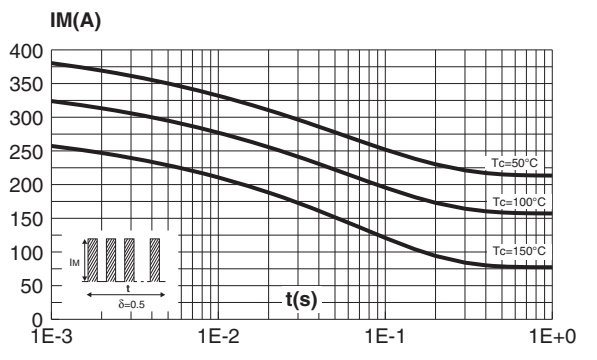


Figure 6. Relative variation of thermal impedance junction to case versus pulse duration

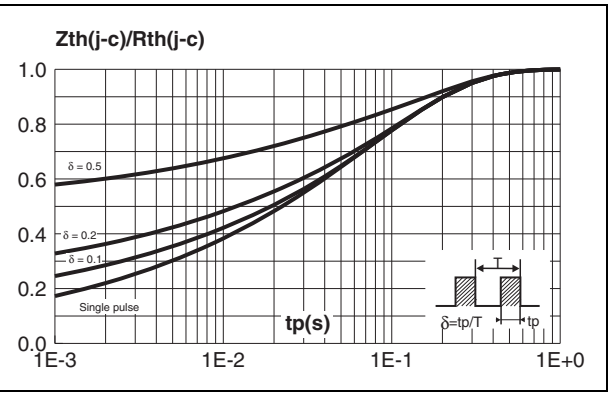


Figure 7. Reverse leakage current versus reverse voltage applied (maximum values, per diode)

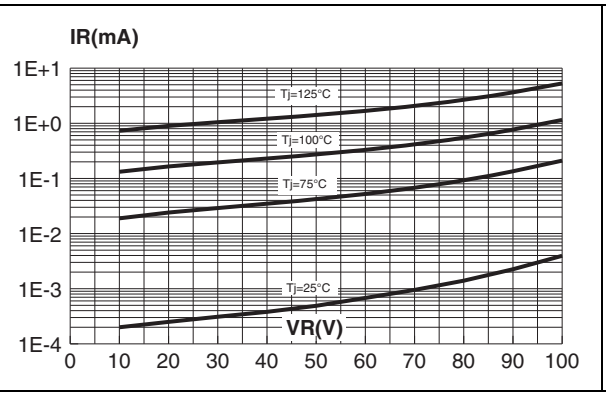


Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode)

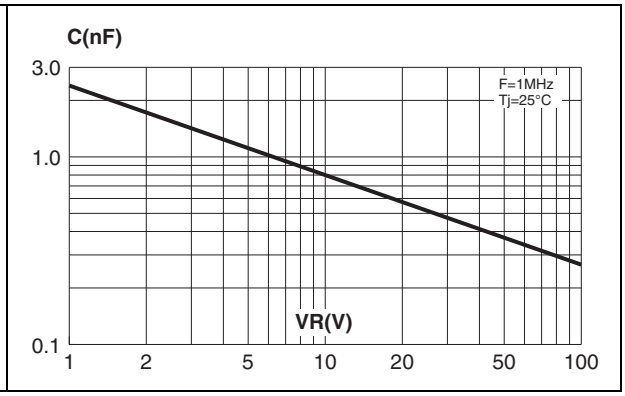
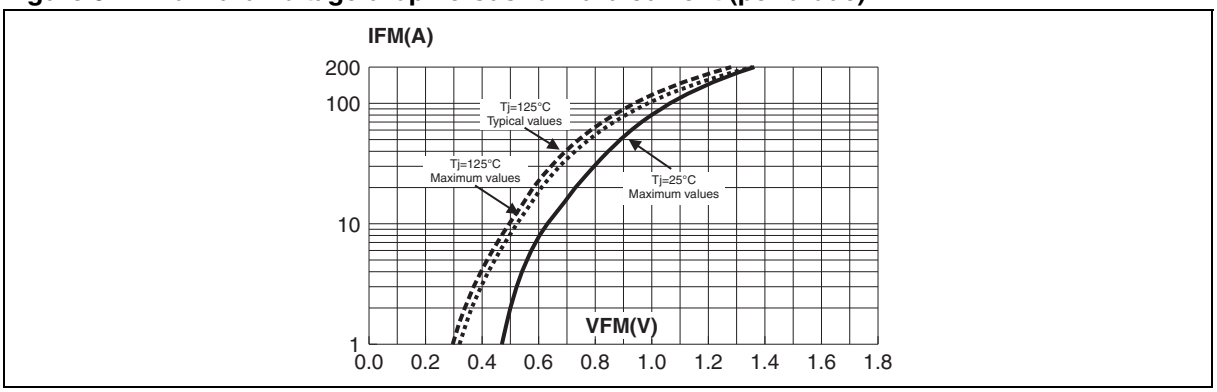


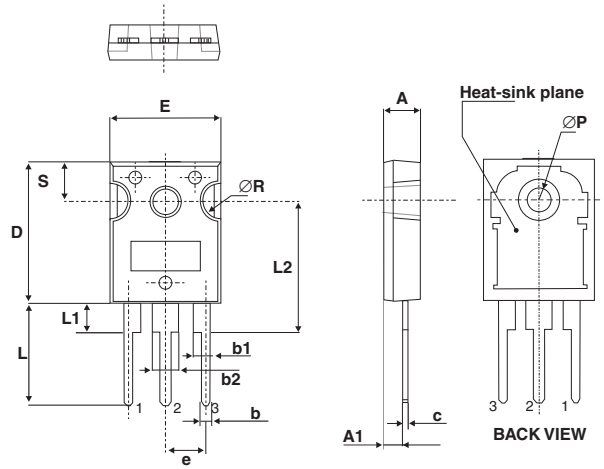
Figure 9. Forward voltage drop versus forward current (per diode)



2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque values: 0.55 N·m (1.0 N·m maximum)

Table 5. TO-247 dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ	Max.
A	4.85		5.15	0.191		0.203
A1	2.20		2.60	0.086		0.102
b	1.00		1.40	0.039		0.055
b1	2.00		2.40	0.078		0.094
b2	3.00		3.40	0.118		0.133
c	0.40		0.80	0.015		0.031
D(1)	19.85		20.15	0.781		0.793
E	15.45		15.75	0.608		0.620
e	5.30	5.45	5.60	0.209	0.215	0.220
L	14.20		14.80	0.559		0.582
L1	3.70		4.30	0.145		0.169
L2	18.50 typ.			0.728 typ.		
ØP(2)	3.55		3.65	0.139		0.143
ØR	4.50		5.50	0.177		0.217
S	5.30	5.50	5.70	0.209	0.216	0.224

1. Dimension D plus gate protrusion does not exceed 20.5 mm
2. Resin thickness around the mounting hole is not less than 0.9 mm

3 Ordering information

Table 6. Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS40H100CW	STPS40H100CW	TO-247	4.36 g	30	Tube

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
Jul-2003	4D	Previous release.
16-Jan-2013	5	Updated package graphic to clarify lead length.

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