STPS30120DJF

Power Schottky rectifier

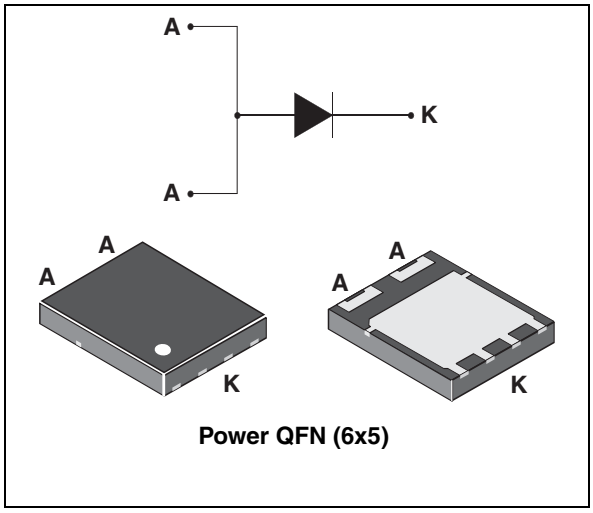
Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low forward voltage drop
- Low thermal resistance
- High avalanche capability specified
- ECOPACK®2 compliant component

Description

Schottky rectifier suited for switch mode power supply and high frequency DC to DC converters.

Packaged in Power QFN, this device is intended for use in low voltage, high frequency inverters, free-wheeling and polarity protection applications.



Power QFN (6x5)

Table 1. Device summary

$I_{F(AV)}$	30 A
V_{RRM}	120 V
T_j (max)	150 °C
V_F(max)	0.68 V

1 Characteristics

Table 2. Absolute Ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		120	V
$I_{F(RMS)}$	Forward rms current		45	A
$I_{F(AV)}$	Average forward current	T_c = 80 °C, δ = 0.5	30	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	200	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs T_j = 25 °C	12500	W
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Maximum operating junction temperature (1)		150	°C

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

Table 3. Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	2.5	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			35	µA
		T_j = 125 °C			5.5	16	mA
V_F(1)	Forward voltage drop	T_j = 25 °C	I_F = 15 A			0.84	V
		T_j = 125 °C			0.61	0.67	
		T_j = 25 °C	I_F = 30 A			0.92	
		T_j = 125 °C			0.68	0.75	

1. Pulse test: tp = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:
$P = 0.61 \times I_{F(AV)} + 0.005\ I_F{}^2{}_{(RMS)}$

Figure 1. Average forward power dissipation versus average forward current

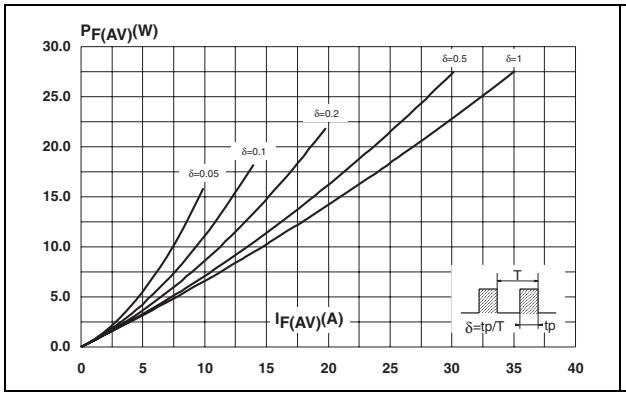


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

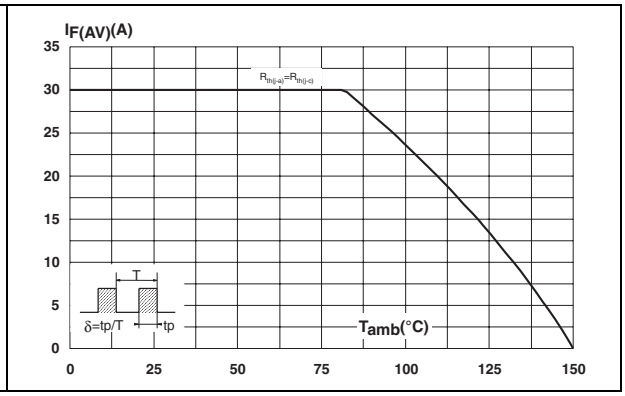


Figure 3. Normalized avalanche power derating versus pulse duration

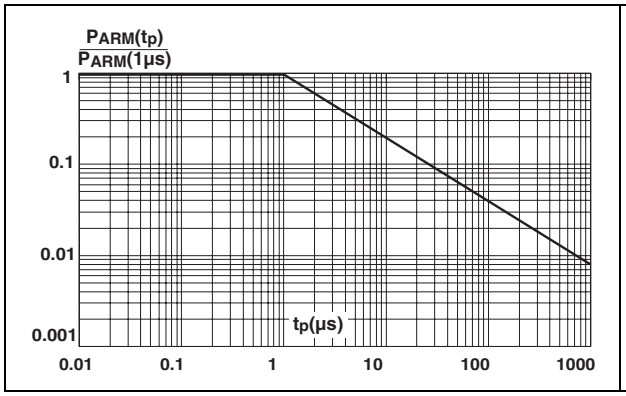


Figure 4. Normalized avalanche power derating versus junction temperature

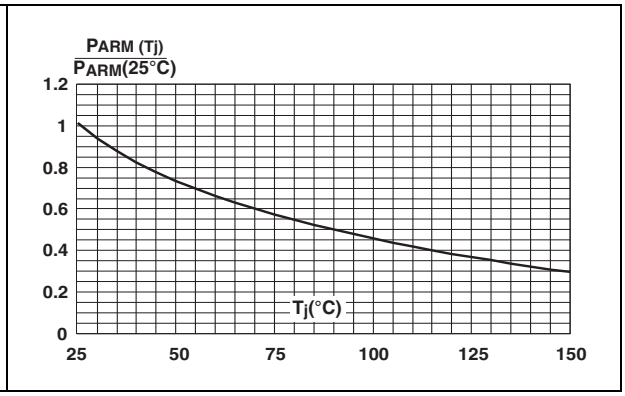


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)

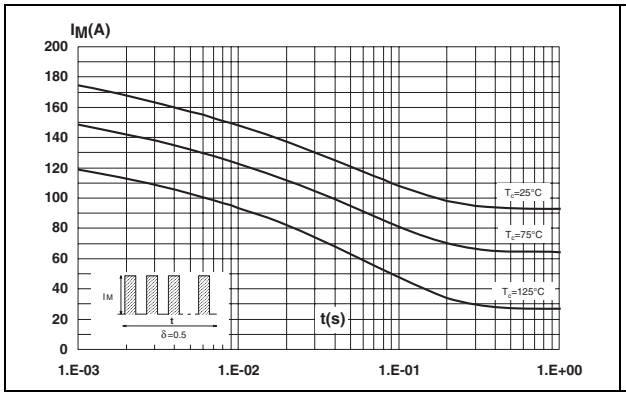


Figure 6. Relative variation of thermal impedance, junction to case, versus pulse duration

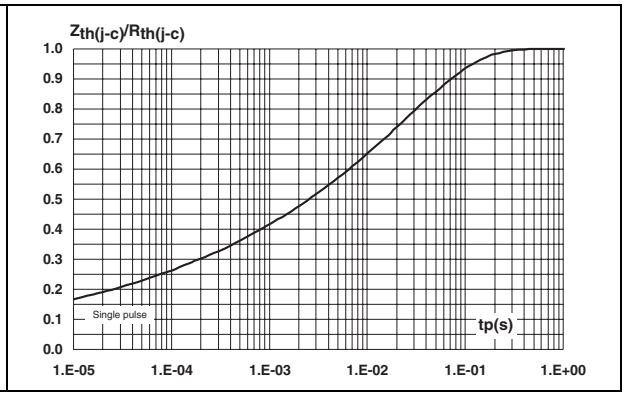


Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

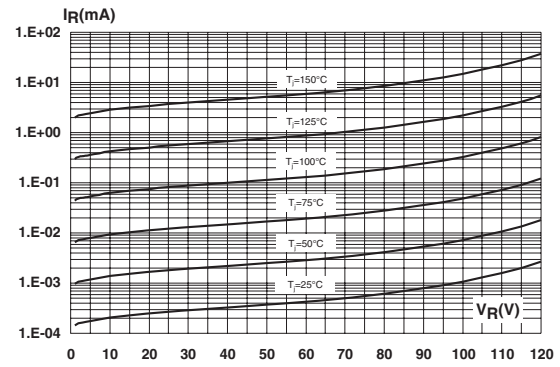


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

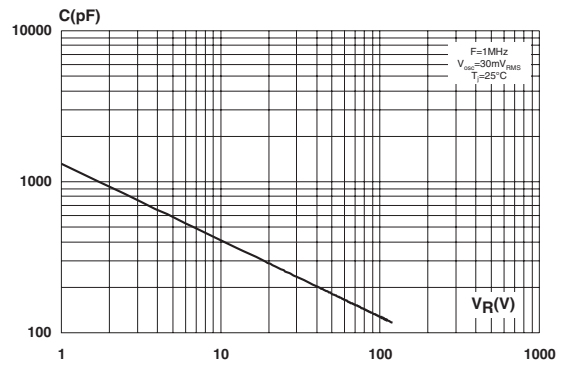


Figure 9. Forward voltage drop versus forward current

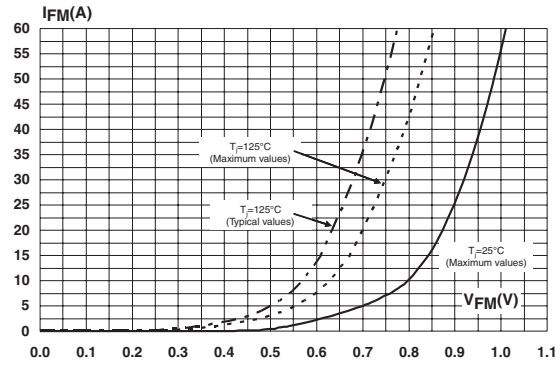
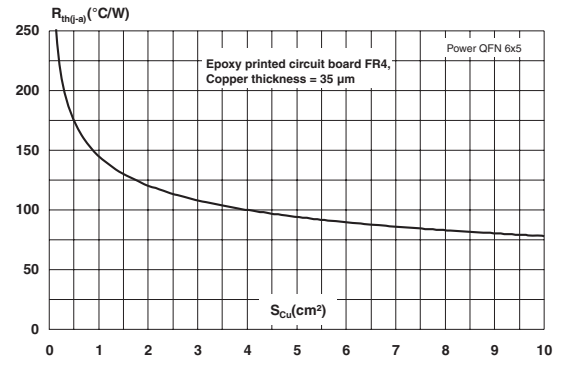


Figure 10. Thermal resistance junction to ambient versus copper surface under tab

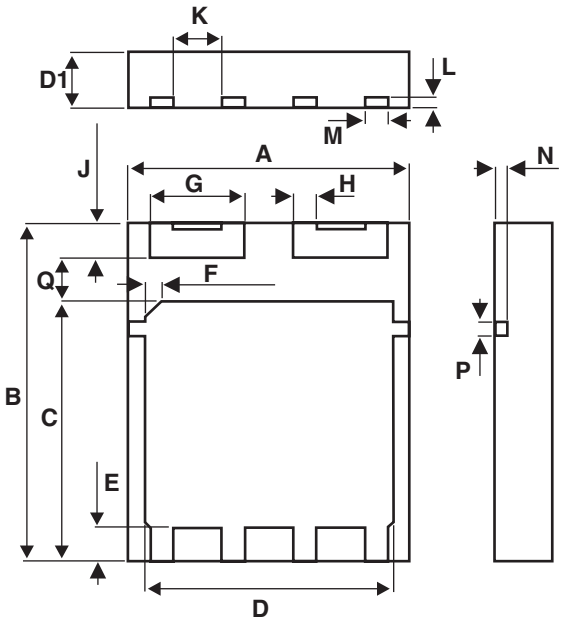


2 Package information

- Epoxy meets UL94,V0

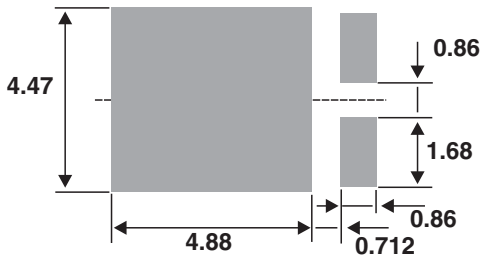
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 5. Package dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.95	5.05	0.195	0.199
B	5.95	6.05	0.234	0.238
C	4.58	4.68	0.180	0.184
D	4.37	4.47	0.172	0.176
D1	0.95	1.05	0.037	0.041
F	Chamfer 0.30 x 45° typ.		Chamfer 0.012 x 45° typ.	
G	1.68 typ.		0.066 typ.	
H	0.41 typ.		0.016 typ.	
J	0.59	0.63	0.022	0.026
K	0.86 typ.		0.034 typ.	
L	0.20 typ.		0.008 typ.	
M	0.41 typ.		0.016 typ.	
N	0.20 typ.		0.008 typ.	
P	0.25 typ.		0.01 typ.	
Q	0.71	0.81	0.028	0.032

Figure 11. Footprint (in millimeters)



Both anode pads must be connected together.

3 Ordering Information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS30120CDJF-TR	STPS30120CDJF	Power QFN (6x5) ECOPACK®2	0.095 g	5000	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
18-May-2009	1	First issue.

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