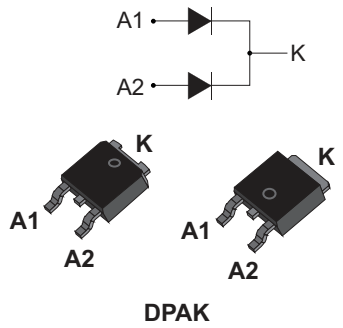
STPS15H100C

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
- ECOPACK®2 compliant component for DPAK on demand

Description

Dual center tab Schottky rectifier suited for switched mode power supply and high frequency DC to DC converters.

Packaged in DPAK, this device is intended for use in high frequency inverters.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 x 7.5 A
V_{RRM}	100 V
T_j	175 °C
V_F (typ)	0.62 V

1 Characteristics

Table 2. Absolute ratings (limiting values per diode at 25 °C unless otherwise specified)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			100	V
$I_{F(RMS)}$	Forward rms current			10	A
$I_{F(AV)}$	Average forward current, δ = 0.5, square wave	T_c = 135 °C(1)	Per diode	7.5	A
			Per device	15	
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal		75	A
P_{ARM}	Repetitive peak avalanche power	t_p = 10 µs, T_j = 125 °C		475	W
T_{stg}	Storage temperature range			-65 to +175	°C
T_j	Maximum operating junction temperature(2)			175	°C

1. Value based on $R_{th(j-c)}$ max (per diode)
2. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ 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	Per diode	4	°C/W
		Total	2.4	
$R_{th(c)}$	Coupling		0.7	

When the diodes 1 and 2 are used simultaneously:

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

Table 4. Static electrical characteristics (per diode)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			3	µA
		T_j = 125 °C			1.3	4	mA
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 7.5 A			0.8	V
		T_j = 125 °C	I_F = 7.5 A		0.62	0.67	
		T_j = 25 °C	I_F = 12 A			0.85	
		T_j = 125 °C	I_F = 12 A		0.68	0.73	
		T_j = 25 °C	I_F = 15 A			0.89	
		T_j = 125 °C	I_F = 15 A		0.71	0.76	

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

To evaluate the conduction losses use the following equation:

$P = 0.58 \times I_{F(AV)} + 0.012\ I_F{}^2{}_{(RMS)}$

Figure 1. Conduction losses versus average current (per diode)

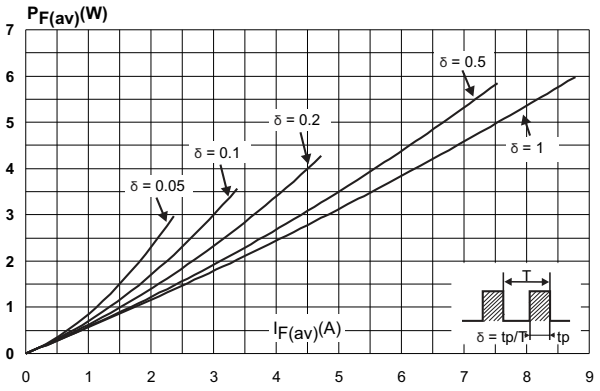


Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)

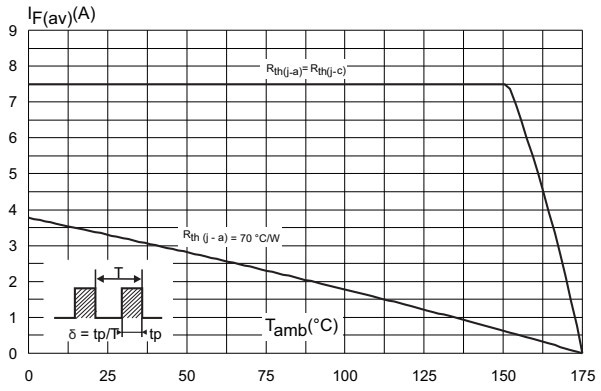


Figure 3. Normalized avalanche power derating versus pulse duration at T_j = 125 °C

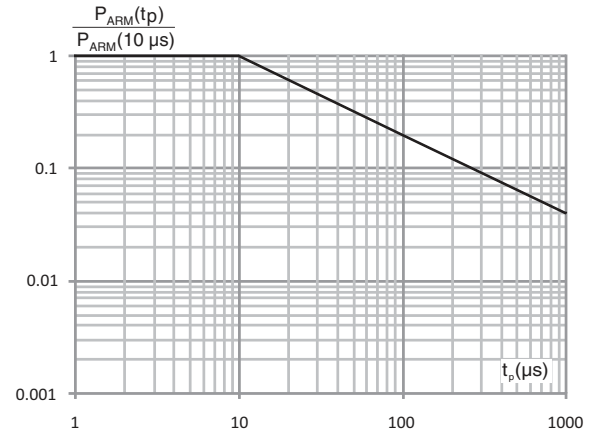


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

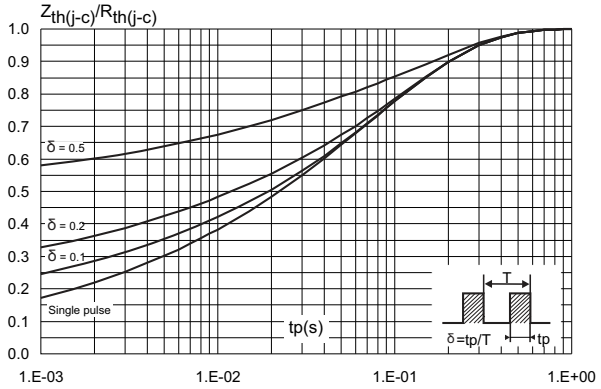


Figure 5. Reverse leakage current versus reverse voltage applied (typical values, per diode)

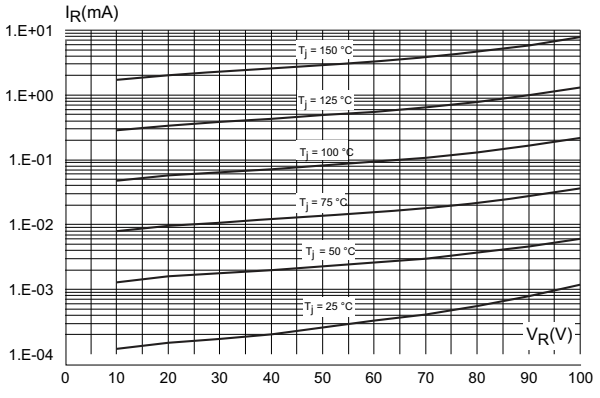


Figure 6. Junction capacitance versus reverse voltage applied (typical values, per diode)

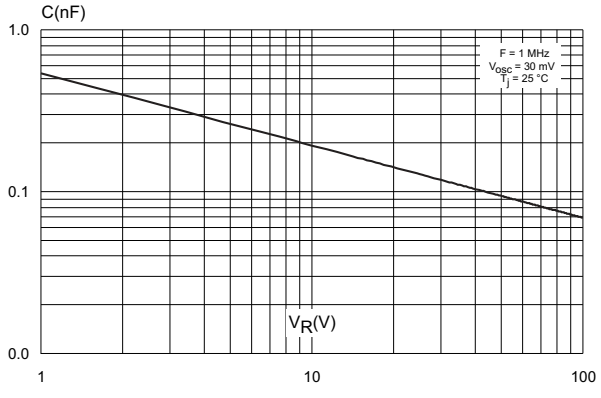


Figure 7. Forward voltage drop versus forward current (per diode)

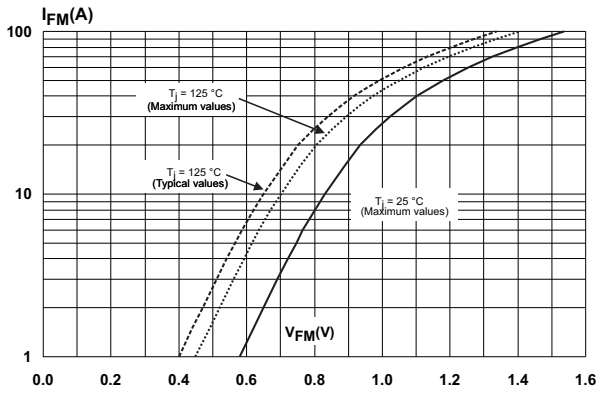
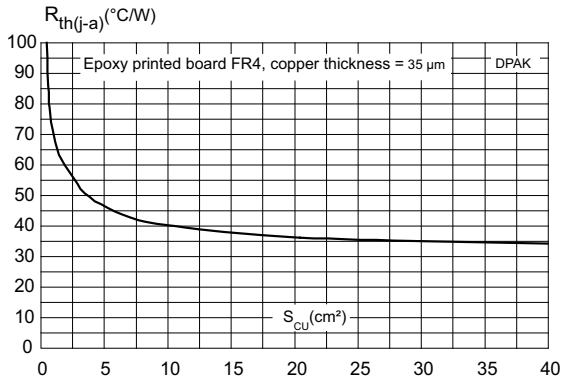


Figure 8. Thermal resistance junction to ambient versus copper surface under tab



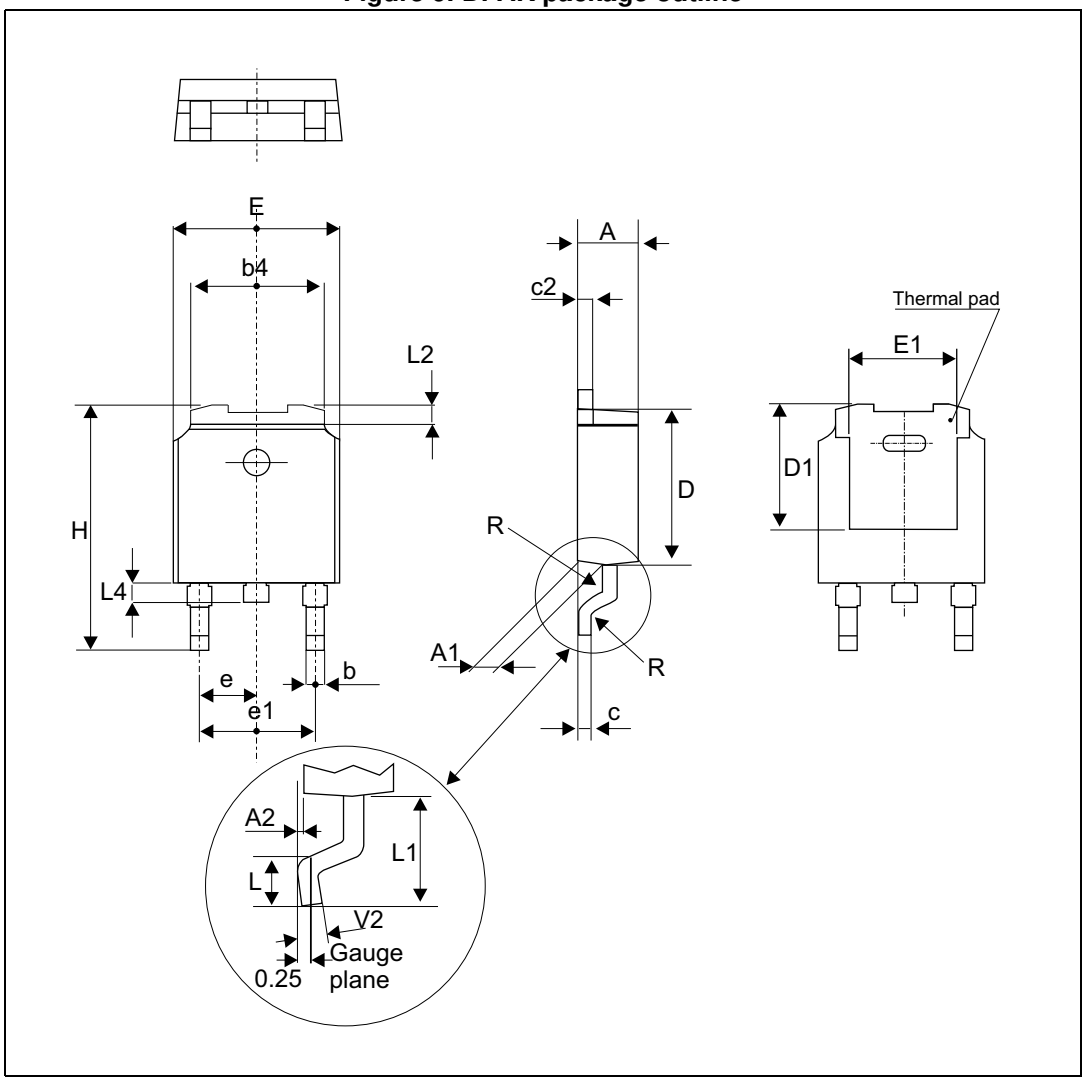
2 Package Information

- Epoxy meets UL94,V0
- Cooling method: by conduction (C)

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.

2.1 DPAK package information

Figure 9. DPAK package outline

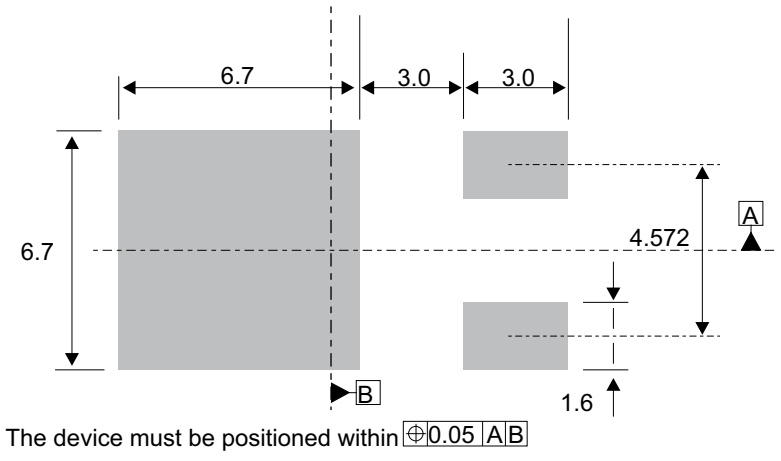


Note: This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

Table 5. DPAK package mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.18		2.40	0.085		0.094
A1	0.90		1.10	0.035		0.043
A2	0.03		0.23	0.001		0.009
b	0.64		0.90	0.025		0.035
b4	4.95		5.46	0.194		0.214
c	0.46		0.61	0.018		0.024
c2	0.46		0.60	0.018		0.023
D	5.97		6.22	0.235		0.244
D1	4.95		5.60	0.194		0.220
E	6.35		6.73	0.250		0.264
E1	4.32		5.50	0.170		0.216
e		2.28			0.090	
e1	4.40		4.70	0.173		0.185
H	9.35		10.40	0.368		0.409
L	1.00		1.78	0.039		0.070
L2			1.27			0.050
L4	0.60		1.02	0.023		0.040
V2	-8°		+8°	-8°		8°

Figure 10. DPAK footprint dimensions (in mm)



3 Ordering Information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS15H100CB	S15H100	DPAK	0.30 g	75	Tube
STPS15H100CB-TR	S15H100	DPAK	0.30 g	2500	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Description of Changes
Mar-2004	3	Last issue
08-Jun-2006	4	Reformatted to current standard. Added IPAK.
01-Aug-2014	5	Updated DPAK package information and reformatted to current standard. Removed IPAK.
17-Sep-2014	6	Updated Figure 3 and Figure 11.
18-Dec-2015	7	Updated DPAK package information and reformatted to current standard.