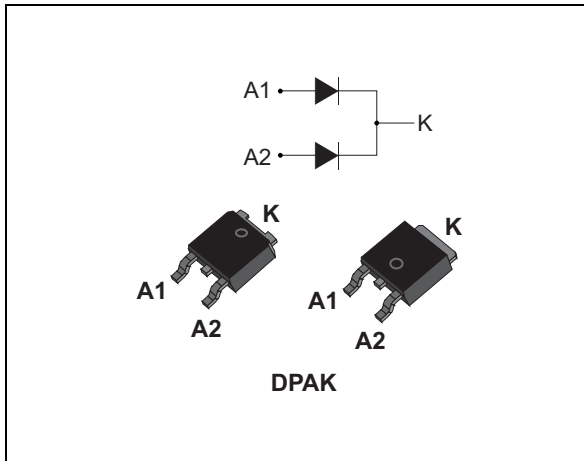


High voltage power Schottky rectifier

Datasheet - production data



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 (max)	0.67 V

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

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, $\delta = 0.5$	$T_c = 135\text{ °C}^{(1)}$	Per diode	7.5	A
			Per device	15	
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	75	A	
P_{ARM}	Repetitive peak avalanche power	$t_p = 10\text{ }\mu\text{s}$, $T_j = 125\text{ °C}$	475	W	
T_{stg}	Storage temperature range		-65 to +175	°C	
T_j	Maximum operating junction temperature ⁽²⁾		175	°C	

- Value based on $R_{th(j-c)}$ max (per diode)
- $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ 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:

$$\Delta T_j(\text{diode } 1) = P(\text{diode } 1) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode } 2) \times R_{th(c)}$$

Table 4. Static electrical characteristics (per diode)

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

- $t_p = 5\text{ ms}$, $\delta < 2\%$
- $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation:

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

Figure 1. Conduction losses versus average current

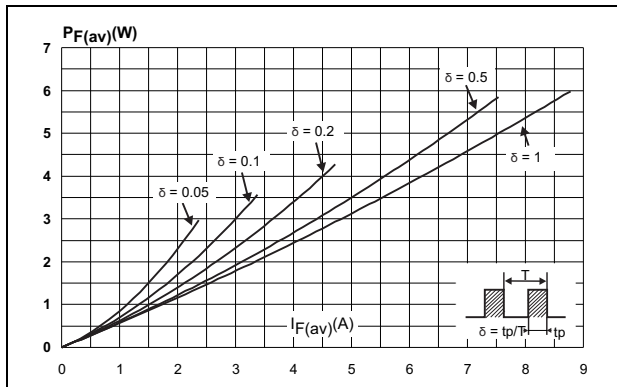


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)

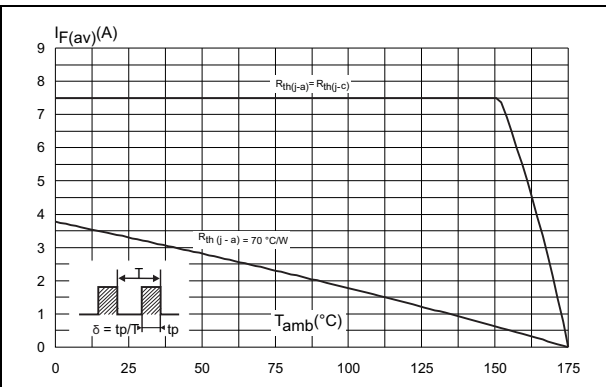


Figure 3. Normalized avalanche power derating versus pulse duration at $T_j = 125^\circ\text{C}$

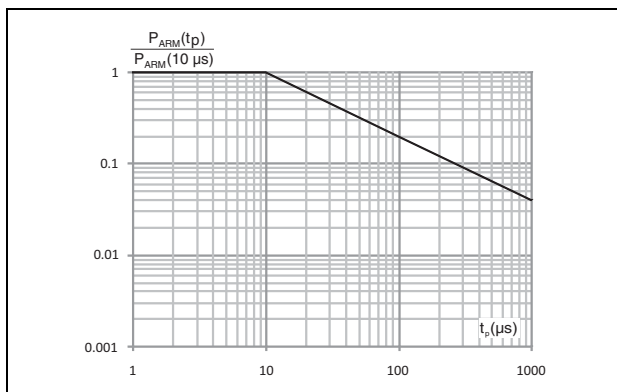


Figure 4. Non repetitive surge peak forward current versus overload duration (maximum values)

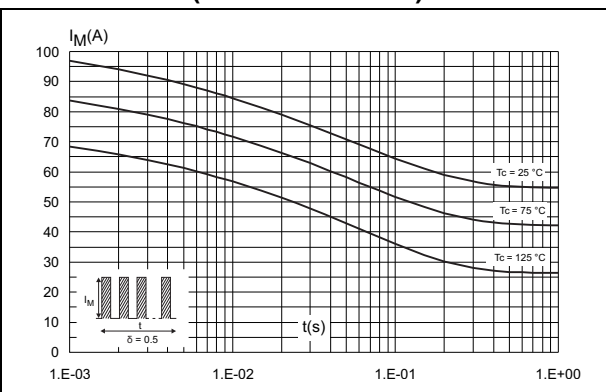


Figure 5. Relative variation of thermal impedance junction to case versus pulse duration

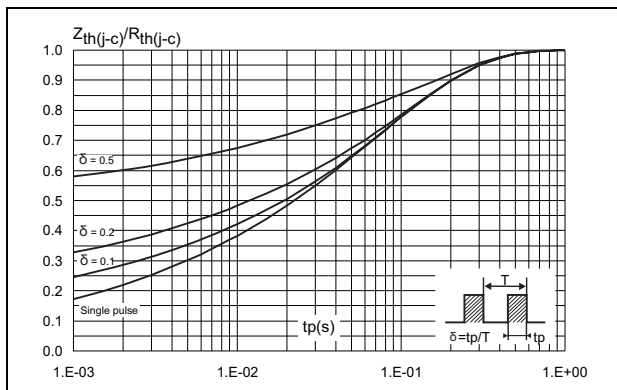


Figure 6. Reverse leakage current versus reverse voltage applied (typical values)

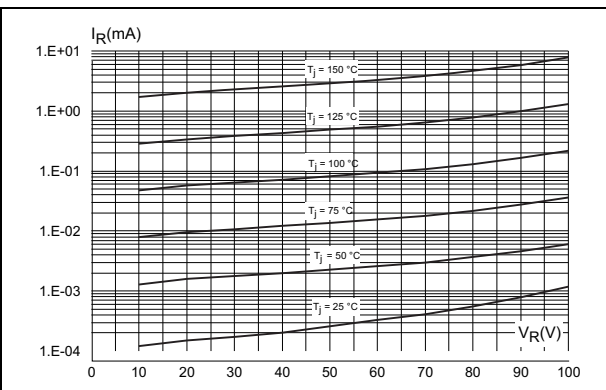


Figure 7. Junction capacitance versus reverse voltage applied (typical values)

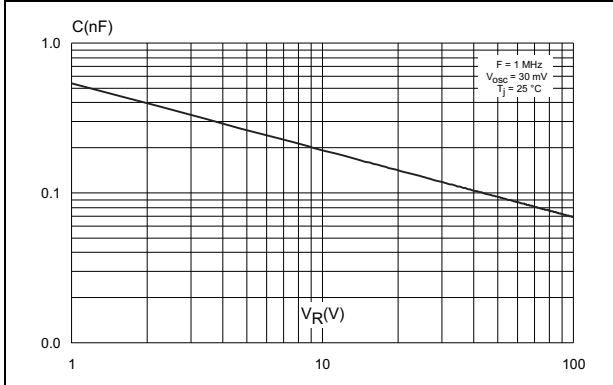


Figure 8. Forward voltage drop versus forward current

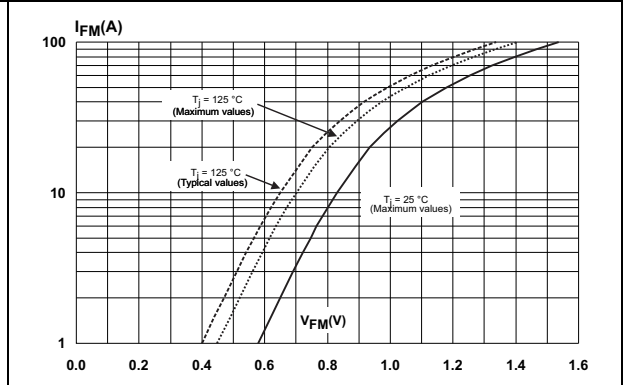
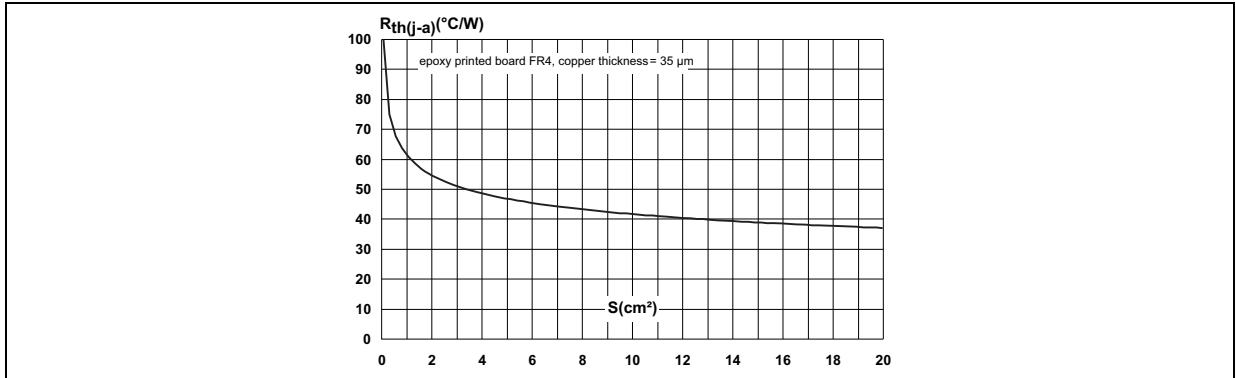


Figure 9. Thermal resistance junction to ambient versus copper surface under tab

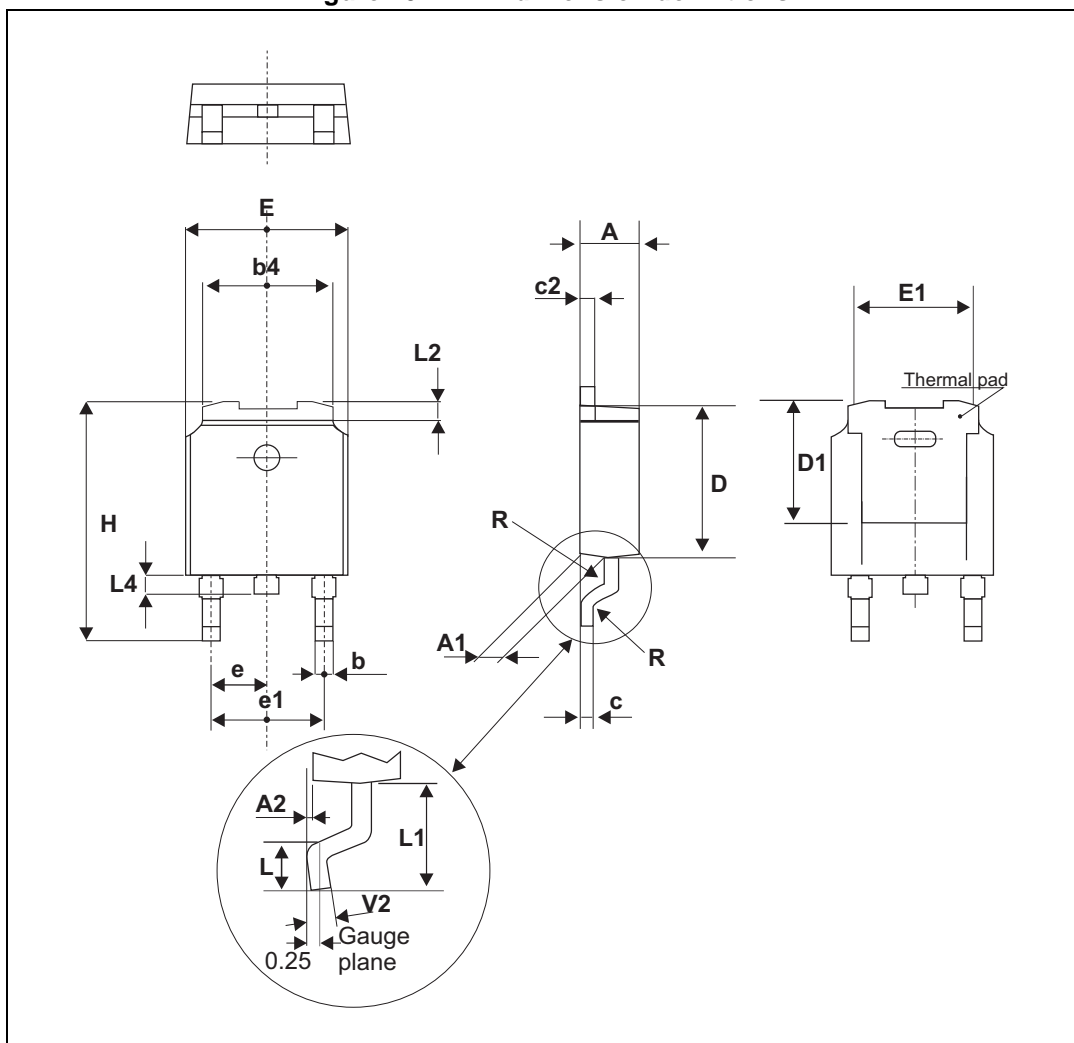


2 Package Information

- 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.

Figure 10. DPAK dimension definitions

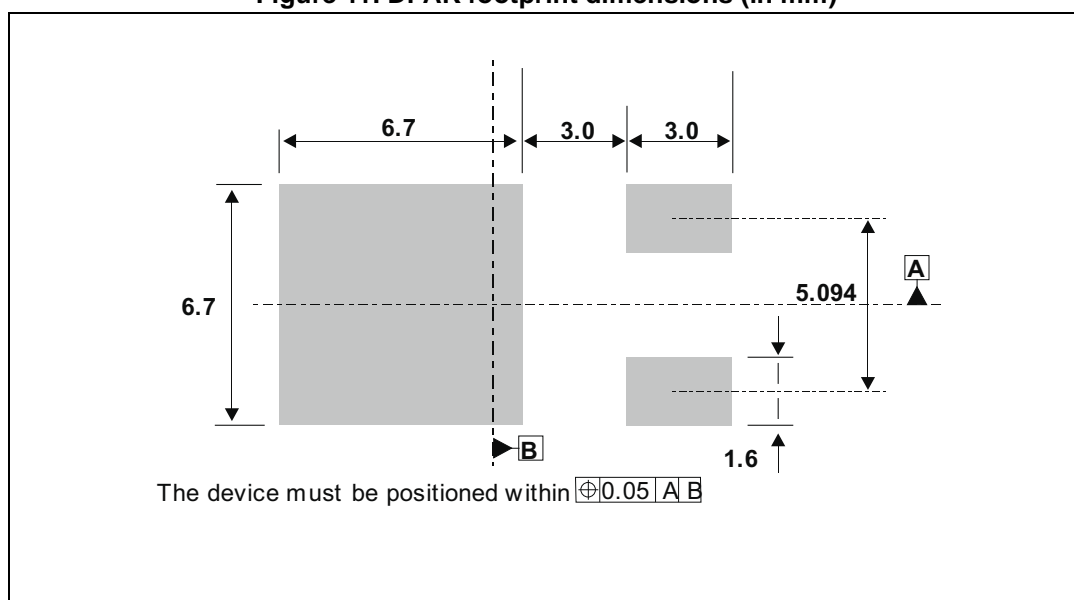


Note: This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

Table 5. DPAK dimension values

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.18		2.40	0.085		0.094
A1	0.90		1.1	0.035		0.043
A2	0.03		0.23	0.001		0.01
b	0.64		0.90	0.025		0.035
b4	4.95		5.46	0.195		0.215
c	0.46		0.61	0.018		0.024
c2	0.46		0.60	0.018		0.024
D	5.97		6.22	0.235		0.245
D1	5.10			0.201		
E	6.35		6.73	0.250		0.265
E1	4.32			0.170		
e1	4.4		4.7	0.173		0.185
H	9.35		10.40	0.368		0.407
L	1.0		1.78	0.039		0.070
L2			1.27			0.05
L4	0.6		1.02	0.024		0.040
V2	0°		8°	0°		8°

Figure 11. 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 .

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