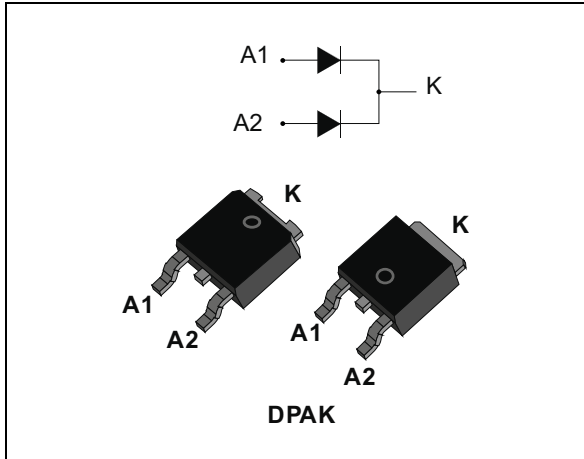


Low drop power Schottky rectifier

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 low voltage, high frequency inverters, free-wheeling and polarity protection applications.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 x 7.5 A
V_{RRM}	45 V
T_j	150 °C
V_F (typ)	0.40 V

Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low forward voltage drop
- Low capacitance
- Avalanche specification
- ECOPACK^{®2} compliant component for DPAK on demand

1 Characteristics

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

Symbol	Parameter		Value	Unit
V _{RRM}	Repetitive peak reverse voltage		45	V
I _{F(RMS)}	Forward rms current		10	A
I _{F(AV)}	Average forward current, $\delta = 0.5$, square wave	T _c = 140 °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	265	W
T _{stg}	Storage temperature range		-65 to +175	°C
T _j	Maximum operating junction temperature ⁽²⁾		150	°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 resistances

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 °C	V _R = V _{RRM}			1	mA
		T _j = 125 °C			23	45	
V _F ⁽²⁾	Forward voltage drop	T _j = 25 °C	I _F = 7.5 A			0.52	V
		T _j = 125 °C	I _F = 7.5 A		0.40	0.46	
		T _j = 25 °C	I _F = 12 A			0.60	
		T _j = 125 °C	I _F = 12 A		0.49	0.57	
		T _j = 25 °C	I _F = 15 A			0.64	
		T _j = 125 °C	I _F = 15 A		0.53	0.63	

- Pulse test: t_p = 380 μs, δ < 2%
- Pulse test: t_p = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 0.29 \times I_{F(AV)} + 0.023 I_{F(RMS)}^2$$

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

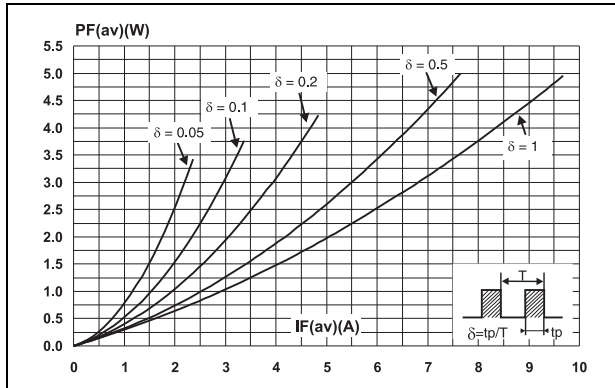


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)(per diode)

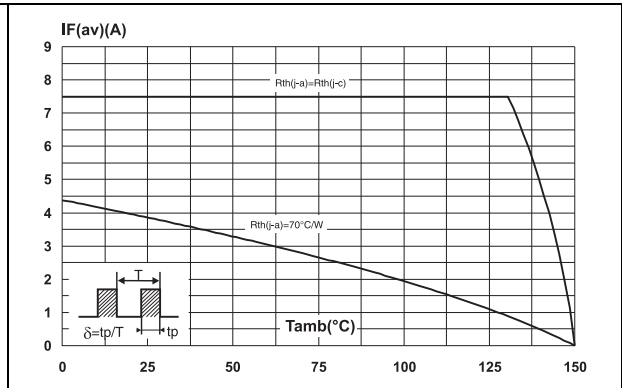


Figure 3. Normalized avalanche power derating versus pulse duration at $T_j = 125^{\circ}C$

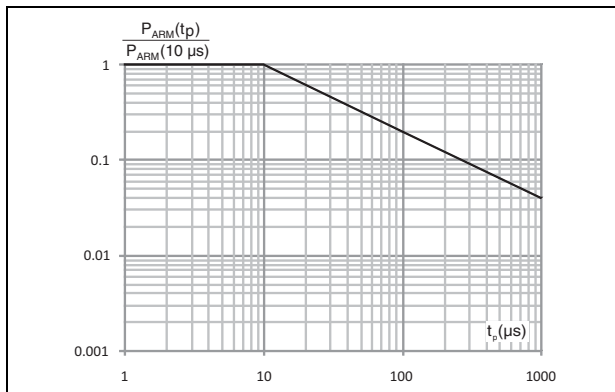


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

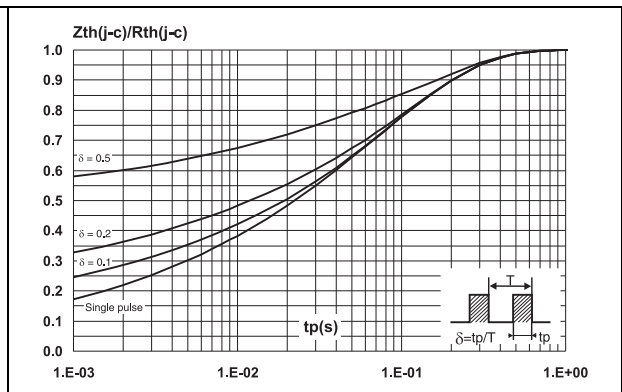


Figure 5. Reverse leakage current versus reverse voltage applied (typical values, per diode)

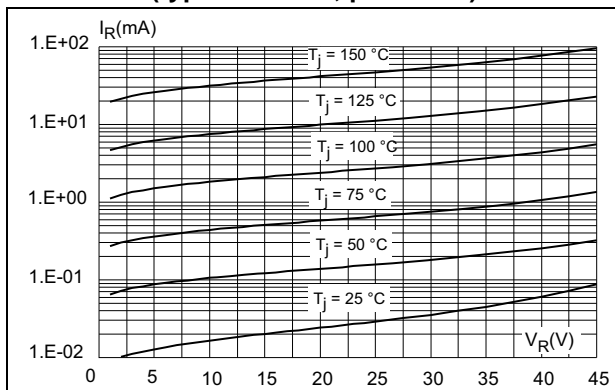


Figure 6. Junction capacitance versus reverse voltage applied (typical values, per diode)

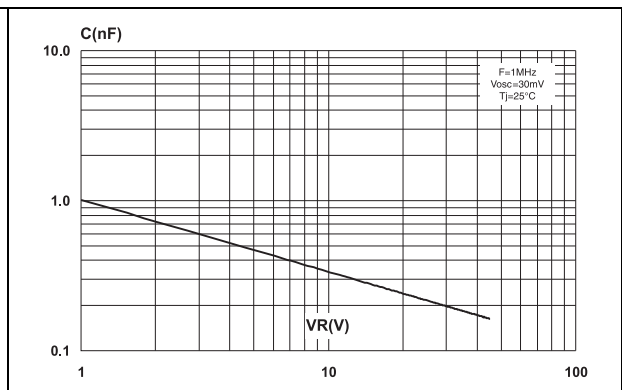


Figure 7. Forward voltage drop versus forward current (per diode)

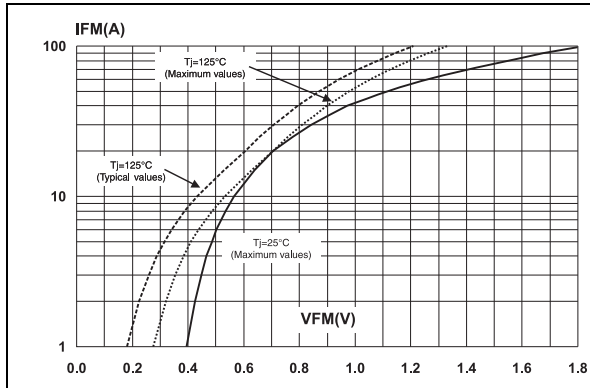
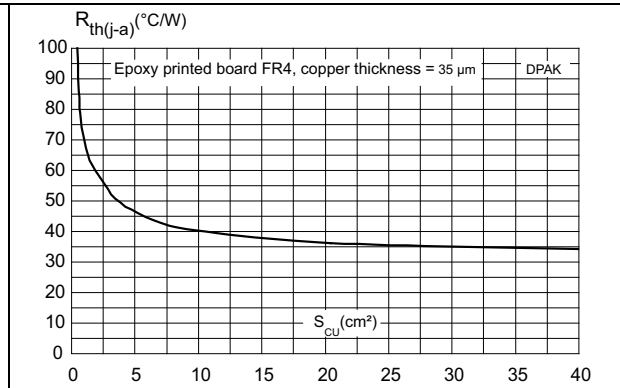


Figure 8. Thermal resistance junction to ambient versus copper surface under tab

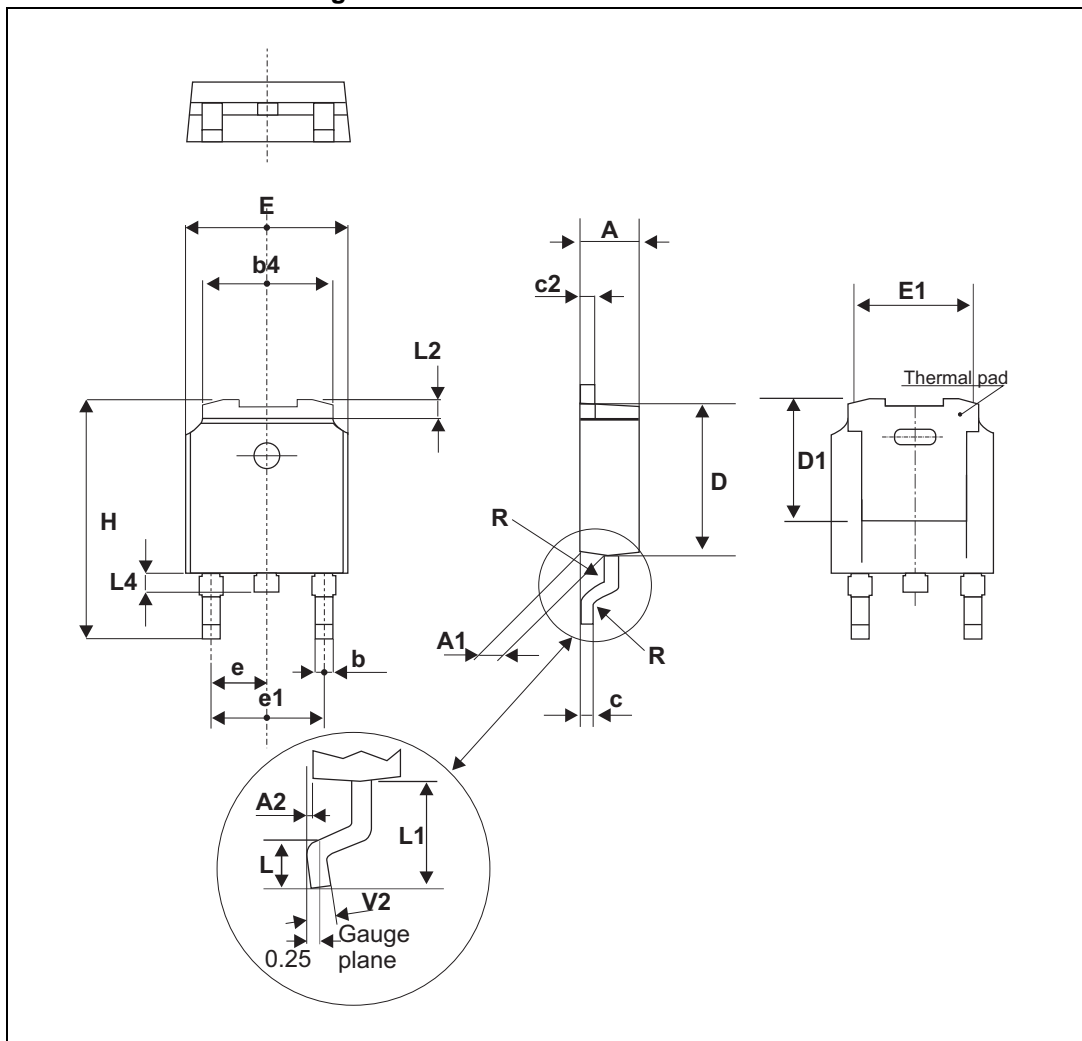


2 Package Information

- 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.

Figure 9. DPAK dimension definitions

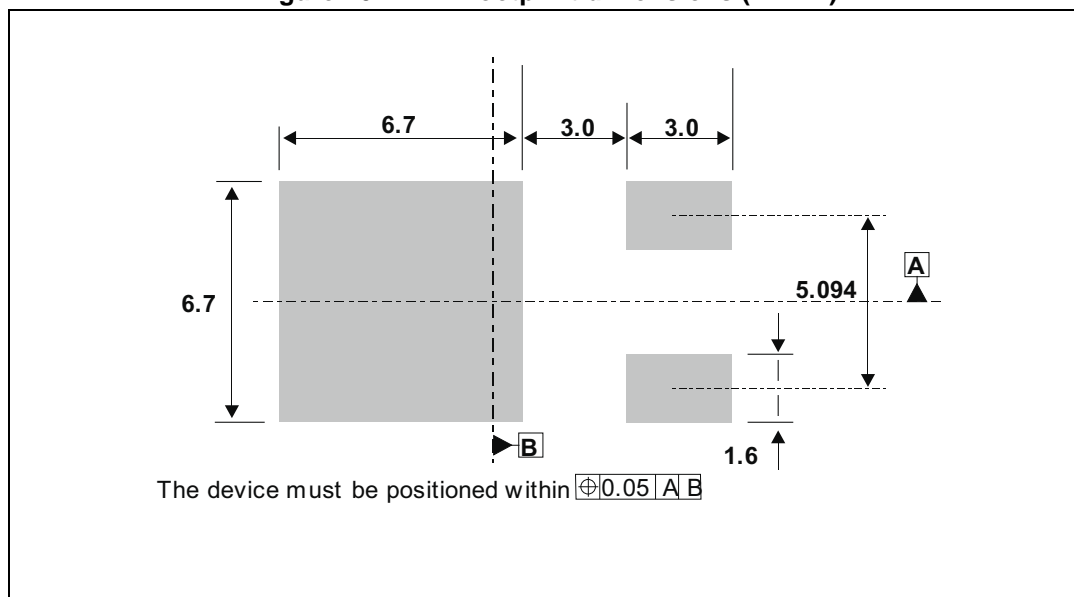


Note: This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

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 10. DPAK footprint dimensions (in mm)



3 Ordering Information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS15L45CB	S15L45C	DPAK	0.32 g	75	Tube
STPS15L45CB-TR	S15L45C	DPAK	0.32 g	2500	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Description of Changes
27-Jun-2012	2	Automatic revalidation date workflow started.
20-Nov-2014	3	Updated DPAK package information and reformatted to current standard. Removed IPAK.

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