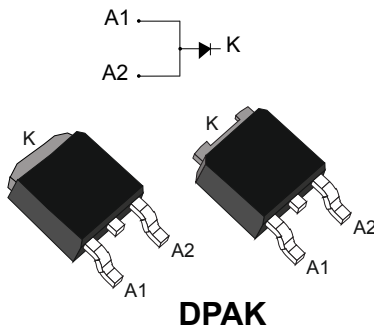


## 2 x 7.5 A - 45 V low drop power Schottky rectifier



### Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low forward voltage drop
- Low capacitance
- Avalanche capability specified
- **ECOPACK2** compliant component

### Applications

- SMPS
- Freewheeling diodes
- Switching diodes

### Description

Dual center tab Schottky rectifier suited for SMPS and high frequency DC to DC converters.

Packaged in DPAK, the **STPS15L45C** is intended for use in low voltage, high frequency inverters, freewheeling and polarity protection applications.

#### Product status link

[STPS15L45C](#)

#### Product summary

Symbol	Value
$I_{F(AV)}$	2 x 7.5 A
$V_{RRM}$	45 V
$T_{j(max.)}$	150 °C
$V_{F(typ.)}$	0.40 V

# 1 Characteristics

**Table 1. Absolute ratings (limiting values, per diode, at 25 °C unless otherwise specified)**

Symbol	Parameter		Value	Unit	
V <sub>RRM</sub>	Repetitive peak reverse voltage		45	V	
I <sub>F(RMS)</sub>	Forward rms current		10	A	
I <sub>F(AV)</sub>	Average forward current	T <sub>c</sub> = 140 °C, δ = 0.5 square wave	Per diode	7.5	A
			Per device	15	
I <sub>FSM</sub>	Surge non repetitive forward current		t <sub>p</sub> = 10 ms sinusoidal	75	A
P <sub>ARM</sub>	Repetitive peak avalanche power		t <sub>p</sub> = 10 μs, T <sub>j</sub> = 125 °C	265	W
T <sub>stg</sub>	Storage temperature range		-65 to +175	°C	
T <sub>j</sub>	Maximum operating junction temperature <sup>(1)</sup>		150	°C	

1.  $(dP_{tot}/dT_j) < (1/R_{th(j-a)})$  condition to avoid thermal runaway for a diode on its own heatsink.

**Table 2. Thermal resistance parameters**

Symbol	Parameter		Max. value	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	4	°C/W
		Total	2.4	
R <sub>th(c)</sub>	Coupling		0.7	

When the diodes 1 and 2 are used simultaneously :

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

For more information, please refer to the following application note :

- AN5088 : Rectifiers thermal management, handling and mounting recommendations

**Table 3. Static electrical characteristics (per diode)**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> <sup>(1)</sup>	Reverse leakage current	T <sub>j</sub> = 25 °C	V <sub>R</sub> = V <sub>RRM</sub>	-		500	μA
		T <sub>j</sub> = 125 °C		-	60	120	mA
V <sub>F</sub> <sup>(2)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 7.5 A	-		0.52	V
		T <sub>j</sub> = 125 °C		-	0.40	0.46	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 12 A	-		0.60	
		T <sub>j</sub> = 125 °C		-	0.49	0.57	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 15 A	-		0.64	
		T <sub>j</sub> = 125 °C		-	0.53	0.63	

1. Pulse test: t<sub>p</sub> = 5 ms, δ < 2%

2. Pulse test: t<sub>p</sub> = 380 μs, δ < 2%

To evaluate the conduction losses, use the following equation:

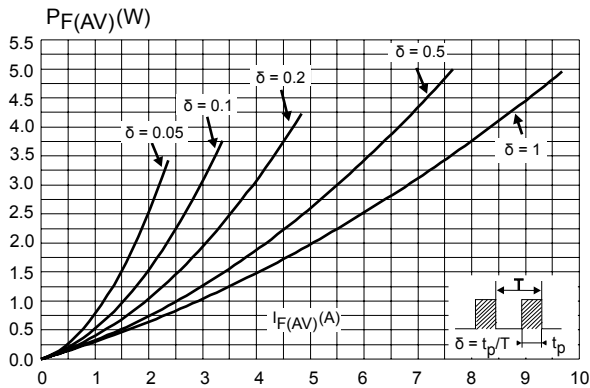
$$P = 0.29 \times I_{F(AV)} + 0.023 \times I_{F(RMS)}^2$$

For more information, please refer to the following application notes related to the power losses :

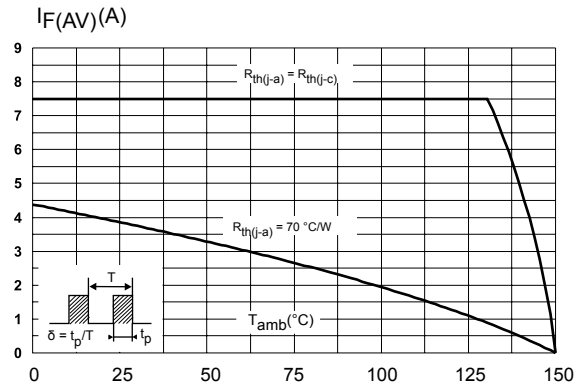
- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

### 1.1 Characteristics (curves)

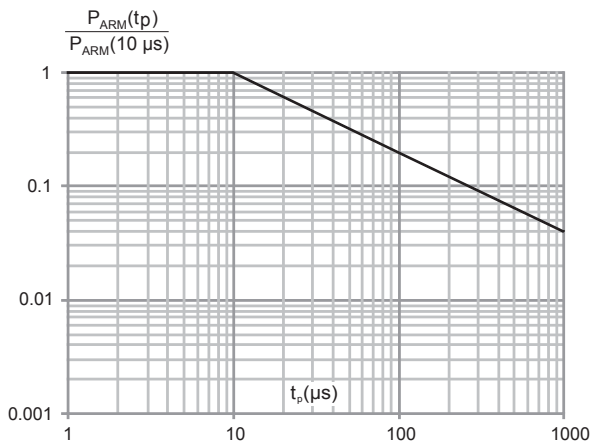
**Figure 1. Average forward power dissipation versus average forward current (per diode)**



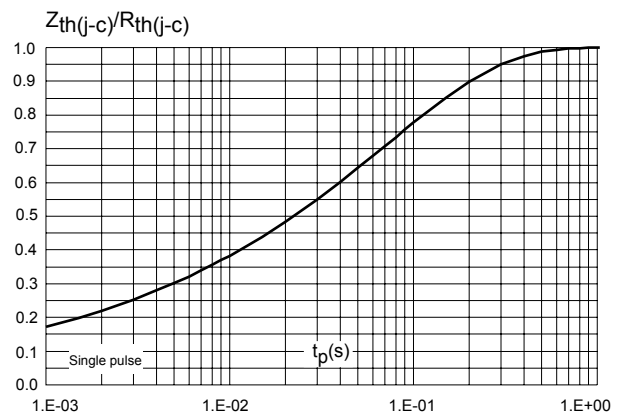
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ , per diode)**



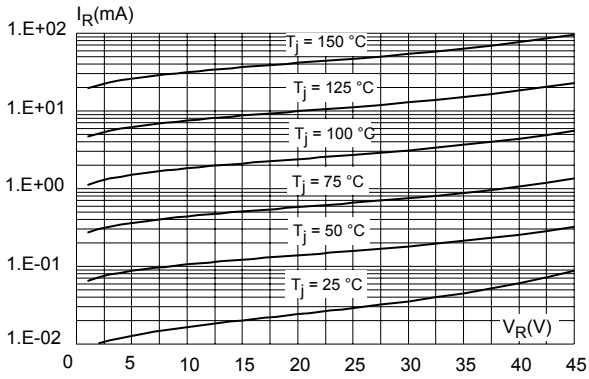
**Figure 3. Normalized avalanche power derating versus pulse duration ( $T_j = 125\text{ }^{\circ}\text{C}$ )**



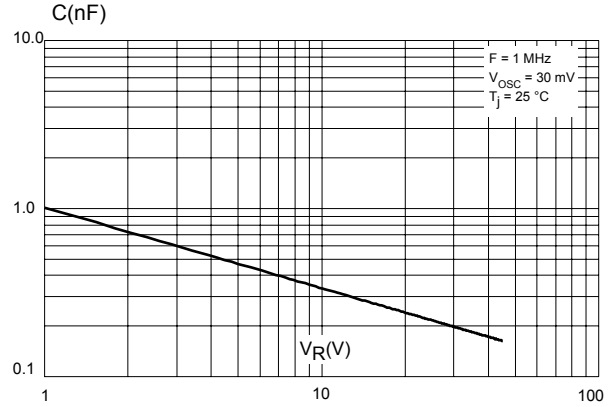
**Figure 4. Relative variation of thermal impedance junction to case versus pulse duration**



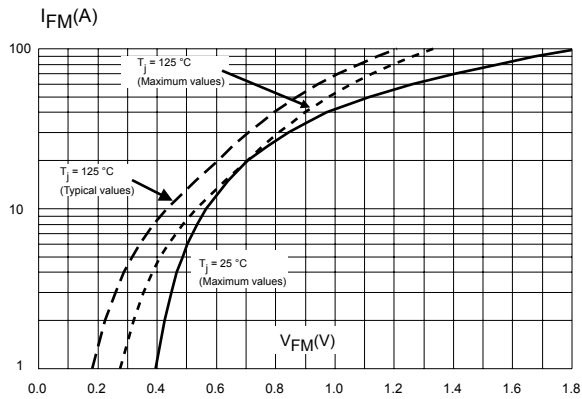
**Figure 5. Reverse leakage current versus reverse voltage applied (typical values, per diode)**



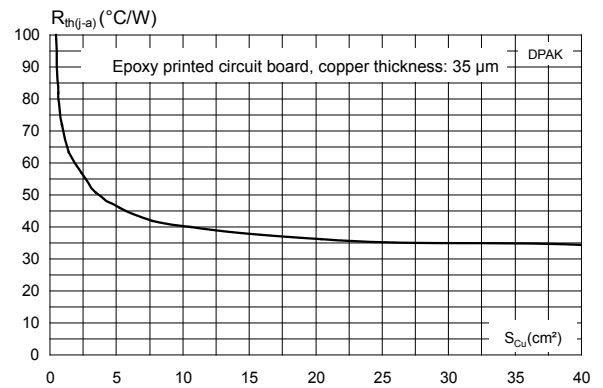
**Figure 6. Junction capacitance versus reverse voltage applied (typical values, per diode)**



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



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



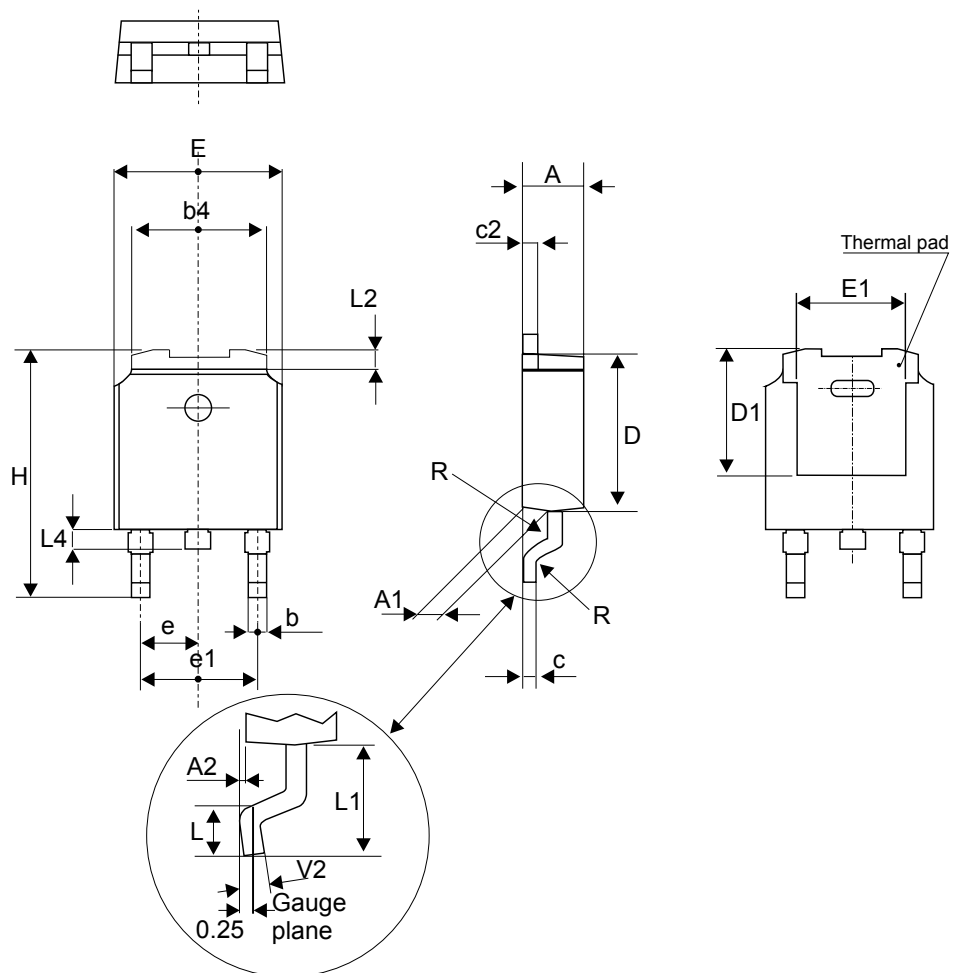
## 2 Package information

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](http://www.st.com). ECOPACK is an ST trademark.

### 2.1 DPAK package information

- Epoxy meets UL 94, V0
- Cooling method: by conduction (C)

**Figure 9. DPAK package outline**

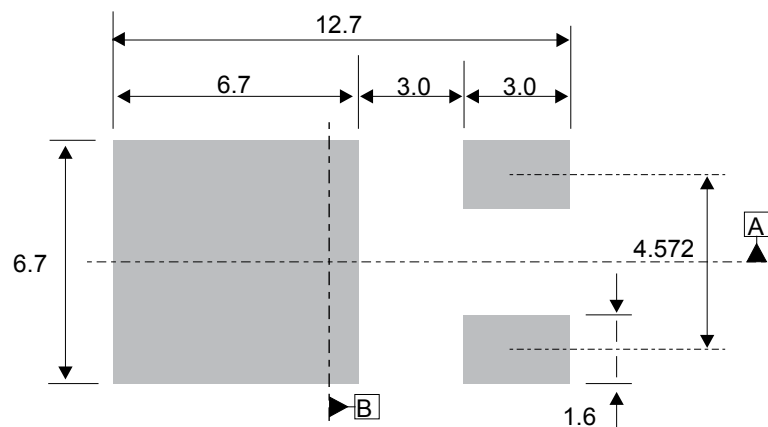


*Note:* This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

**Table 4. DPAK package mechanical data**

Ref.	Dimensions			
	Millimeters		Inches (for reference only)	
	Min.	Max.	Min.	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	0.215
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	0.265
E1	4.32	5.50	0.170	0.216
e	2.286 typ.		0.090 typ.	
e1	4.40	4.70	0.173	0.185
H	9.35	10.40	0.368	0.409
L	1.0	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 recommended footprint (dimensions in mm)**



The device must be positioned within  $\oplus 0.05$  AB

### 3 Ordering Information

**Table 5. Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS15L45CB	S15L45C	DPAK	0.35 g	75	Tube
STPS15L45CB-TR				2500	Tape and reel



## Revision history

**Table 6. Document revision history**

Date	Version	Changes
10-Mar-2011	2	Automatic revalidation date workflow started.
07-Jul-2015	3	Updated DPAK package information and reformatted to current standard. Removed IPAK.
29-Nov-2018	4	Updated DPAK package information and reformatted to current standard.
09-Aug-2019	5	Added <a href="#">Section Applications</a> . Updated <a href="#">Table 3</a> , <a href="#">Figure 4</a> and <a href="#">Table 5</a> .

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