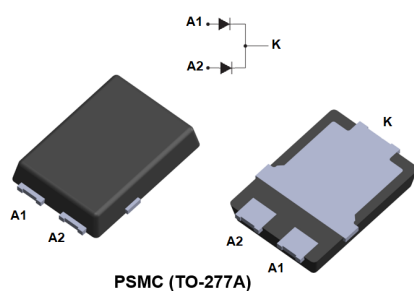


## 40 V, 2 x 5 A low forward voltage power Schottky rectifier



### Features

- Low profile design – 1.1mm package typical height
- Wettable flanks for automatic visual inspection
- Very low conduction losses
- High forward surge current capability
- ECOPACK2 compliant

### Applications

- DC/DC converter
- Stand by power
- Oring
- Polarity protection

### Description

This 2 x 5 A, 40 V Schottky diode is suitable for power supply, especially for lighting power, as well as auxiliary power in server or telecom SMPS.

Packaged in PSMC (TO-277A), this STPS10L40CSF, dual diode device provides a high level of efficiency in a compact and flat package is ideal for oring function in server for instance.



#### Product status link

[STPS10L40CSF](#)

#### Product summary

$I_{F(AV)}$	2 x 5 A
$V_{RRM}$	40 V
$T_j \text{ (max.)}$	150 °C
$V_F \text{ (typ.)}$	0.370 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				40	V
I <sub>F(AV)</sub>	Average forward current, δ = 0.5 square wave	T <sub>C</sub> = 135 °C <sup>(1)</sup>	Per diode	5	A	
			Per device	10		
P <sub>ARM</sub>	Repetitive avalanche power	t <sub>p</sub> = 10 μs	T <sub>J</sub> = 125 °C	165	W	
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal		120	A	
T <sub>stg</sub>	Storage temperature range			-65 to +175	°C	
T <sub>J</sub>	Maximum operating junction temperature <sup>(2)</sup>			+150	°C	

1. Value based on  $R_{th(j-c)}(max.)$ .

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

**Table 2. Thermal resistance parameter**

Symbol	Parameter		Typ. value	Unit
$R_{th(j-c)}$	Junction to case, per device	PSMC (TO-277)	1.0	°C/W

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
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-		125	$\mu\text{A}$
		$T_j = 125\text{ °C}$		-	30	50	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 5\text{ A}$	-		0.495	V
		$T_j = 125\text{ °C}$		-	0.370	0.430	
		$T_j = 25\text{ °C}$	$I_F = 10\text{ A}$	-		0.600	
		$T_j = 125\text{ °C}$		-	0.505	0.590	

1. Pulse test:  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

2. Pulse test:  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses, use the following equation:

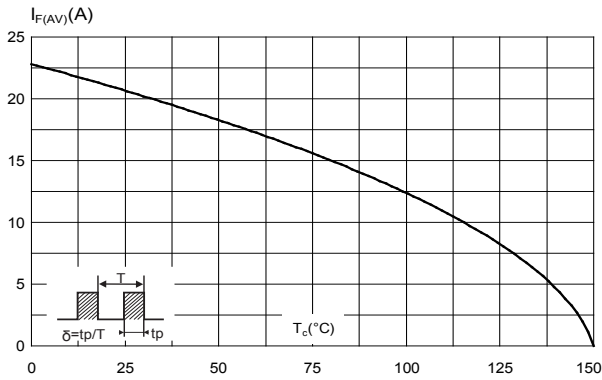
$$P = 0.25 \times I_{F(AV)} + 0.036 \times I_{F(RMS)}^2$$

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

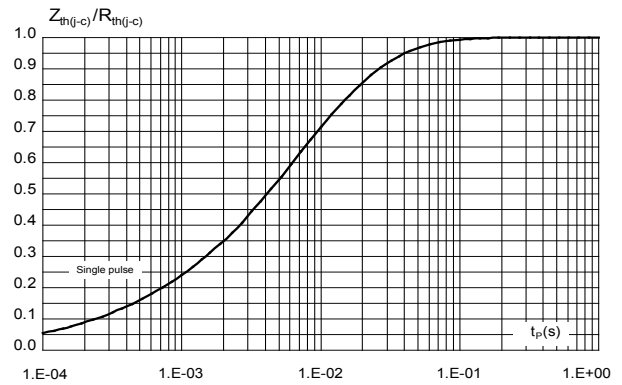
- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

## 1.1 Characteristics (curves)

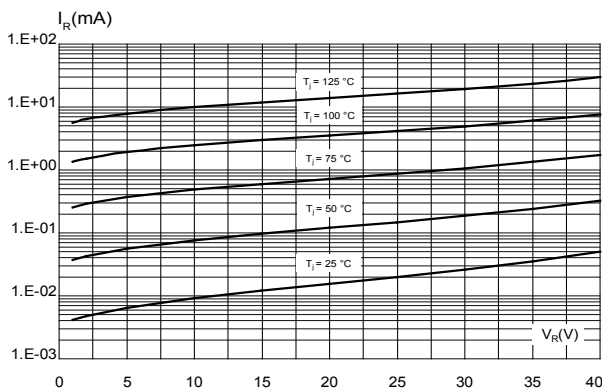
**Figure 1. Average forward current versus case temperature ( $\delta = 0.5$ , per diode)**



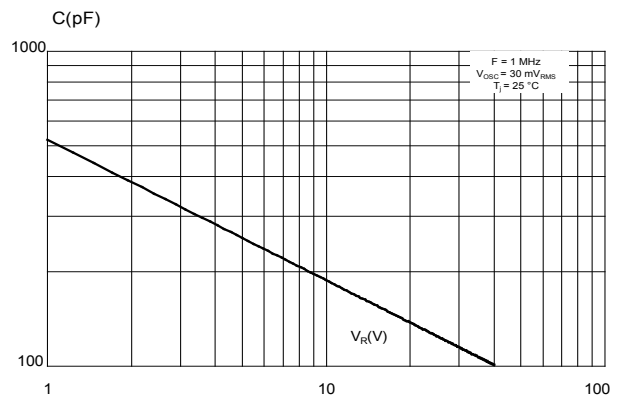
**Figure 2. Relative variation of thermal impedance junction to case versus pulse duration**



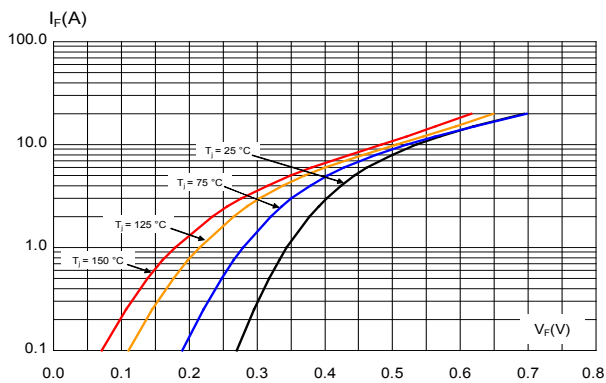
**Figure 3. Reverse leakage current versus reverse voltage applied (typical values, per diode)**



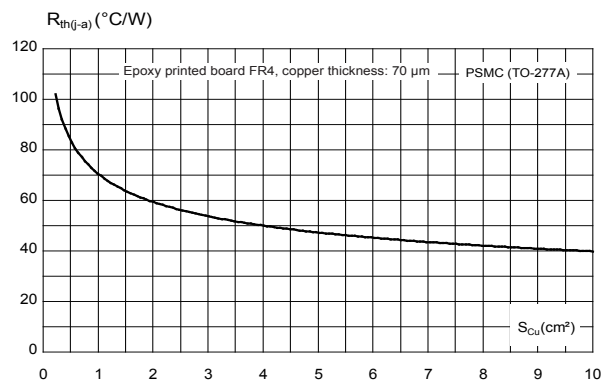
**Figure 4. Junction capacitance versus reverse voltage applied (typical values, per diode)**



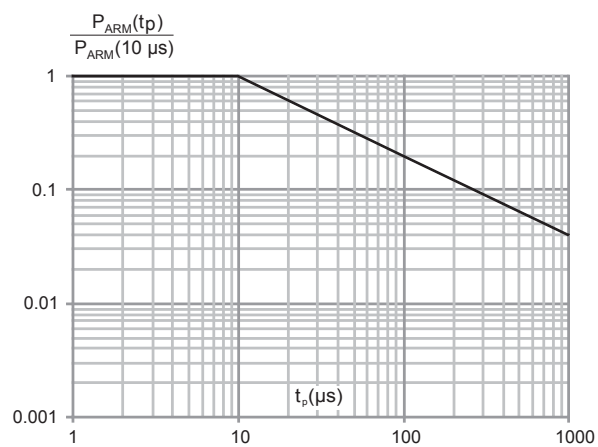
**Figure 5. Forward voltage drop versus forward current (typical values, per diode)**



**Figure 6. Thermal resistance junction to ambient versus copper surface under tab (typical values, epoxy printed board FR4,  $e_{Cu} = 70 \mu m$ )**



**Figure 7. Normalized avalanche power derating versus pulse duration ( $T_j = 125\text{ }^{\circ}\text{C}$ )**



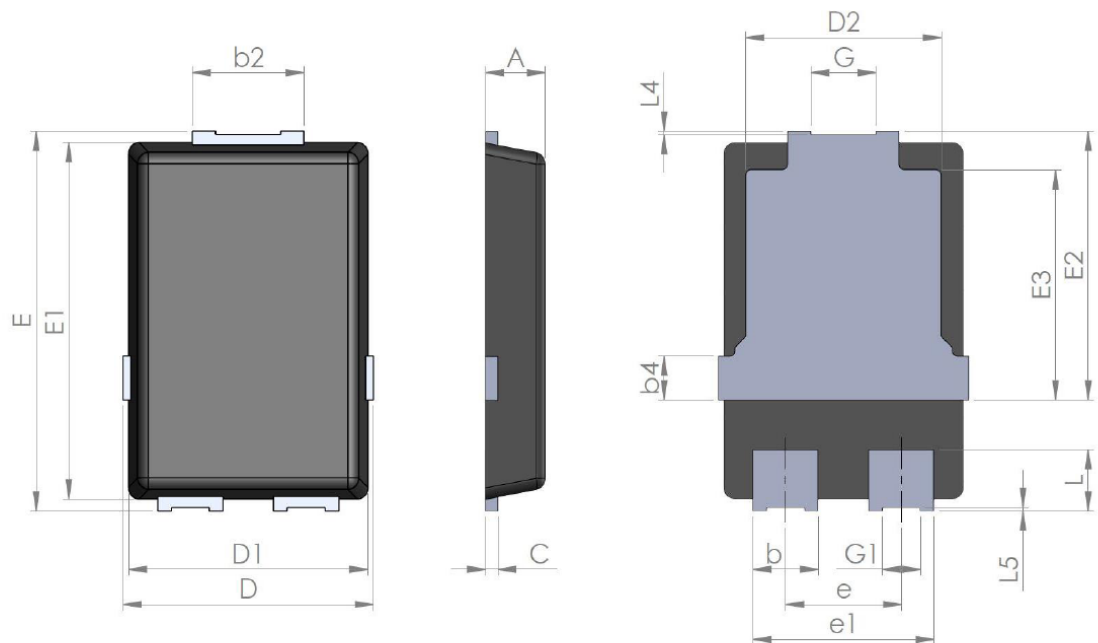
## 2 Package information

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 PSMC (TO-277A) package information

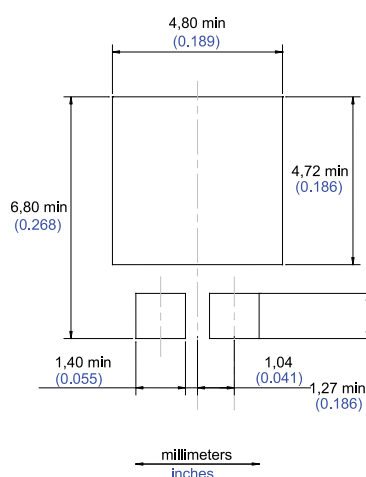
- Epoxy meets UL94,V0
- Cooling method : by conduction (C)

**Figure 8. PSMC (TO-277A) package outline**



**Table 4. PSMC (TO-277A) package mechanical data**

Ref.	Dimensions					
	Millimeters			Inches (for reference only)		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.00	1.10	1.20	0.039	0.043	0.047
b	1.05	1.20	1.35	0.041	0.047	0.053
b2	1.90	2.05	2.20	0.075	0.081	0.087
b4		0.75			0.029	
C	0.15	0.23	0.40	0.006	0.009	0.016
D	4.45	4.60	4.75	0.175	0.181	0.187
D1	4.25	4.40	4.45	0.167	0.173	0.175
D2	3.40	3.60	3.70	0.134	0.142	0.146
E	6.35	6.50	6.65	0.250	0.256	0.262
E1	6.05	6.10	6.15	0.238	0.240	0.242
E2	4.50	4.60	4.70	0.177	0.181	0.185
E3		3.94			1.55	
e		2.13			0.084	
e1		3.33			0.131	
G		1.20			0.047	
G1		0.70			0.027	
L	0.90	1.05	1.24	0.035	0.041	0.049
L4	0.02			0.0008		
L5	0.02			0.0008		

**Figure 9. PSMC (TO-277A) package footprint in mm (in inches)**


**Note:** For package and tape orientation, reel and inner box dimensions and tape outline please check [TN1173](#)

### 3 Ordering information

**Table 5. Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS10L40CSF	10L40C	PSMC (TO-277A)	90 mg	6000	Tape and reel

## Revision history

**Table 6. Document revision history**

Date	Version	Changes
20-May-2021	1	Initial release.



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