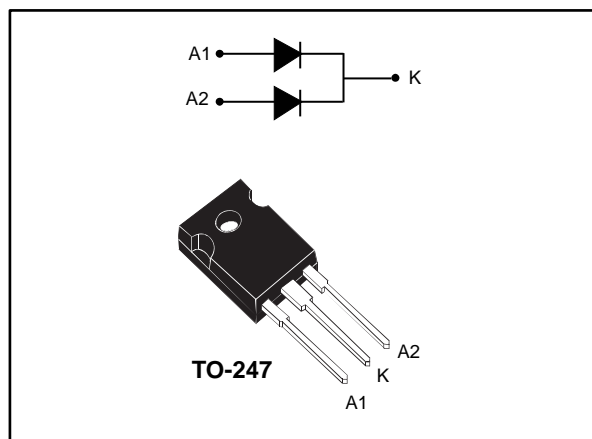


## High voltage power Schottky rectifier

Datasheet - production data



### Description

Dual rectifier suited for switch mode power supply and high frequency switched mode power supplies.

Packaged in TO-247, this device is intended for the application reliability enhancement.

**Table 1: Device summary**

Symbol	Value
$I_{F(AV)}$	2 x 40 A
$V_{RRM}$	170 V
$V_F$ (max.)	0.74 V
$T_j$	175 °C

### Features

- High junction temperature capability
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Low thermal resistance
- High frequency operation
- Avalanche specification

# 1 Characteristics

**Table 2: Absolute ratings (limiting values at 25 °C, unless otherwise specified)**

Symbol	Parameter		Value	Unit	
V <sub>RRM</sub>	Repetitive peak reverse voltage		170	V	
I <sub>F(RMS)</sub>	Forward rms current		80	A	
I <sub>F(AV)</sub>	Average forward current $\delta = 0.5$ , square wave	T <sub>c</sub> = 150 °C	Per diode	40	A
			Per device	80	
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal	500	A	
P <sub>ARM</sub>	Repetitive peak avalanche power	t <sub>p</sub> = 1 $\mu$ s, T <sub>j</sub> = 25 °C	38200	W	
T <sub>stg</sub>	Storage temperature range		-65 to +175	°C	
T <sub>j</sub>	Maximum operating junction temperature <sup>(1)</sup>		175	°C	
dV/dt	Critical rate of rise of reverse voltage		10000	V/ $\mu$ s	

**Notes:**

<sup>(1)</sup>(dP<sub>tot</sub>/dT<sub>j</sub>) < (1/R<sub>th(j-a)</sub>) condition to avoid thermal runaway for a diode on its own heatsink.

**Table 3: Thermal parameters**

Symbol	Parameter		Maximum	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	0.7	°C/W
		Total	0.5	
R <sub>th(c)</sub>	Coupling		0.3	

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j (\text{diode1}) = P_{(\text{diode1})} \times R_{th(j-c)(\text{per diode})} + P_{(\text{diode2})} \times R_{th(c)}$$

**Table 4: Static electrical characteristics**

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>	-		80	$\mu$ A
		T <sub>j</sub> = 125 °C		-	20	80	mA
V <sub>F</sub> <sup>(2)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 40 A	-	0.80	0.84	V
		T <sub>j</sub> = 125 °C		-	0.68	0.74	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 80 A	-	0.90	0.96	
		T <sub>j</sub> = 125 °C		-	0.80	0.86	

**Notes:**

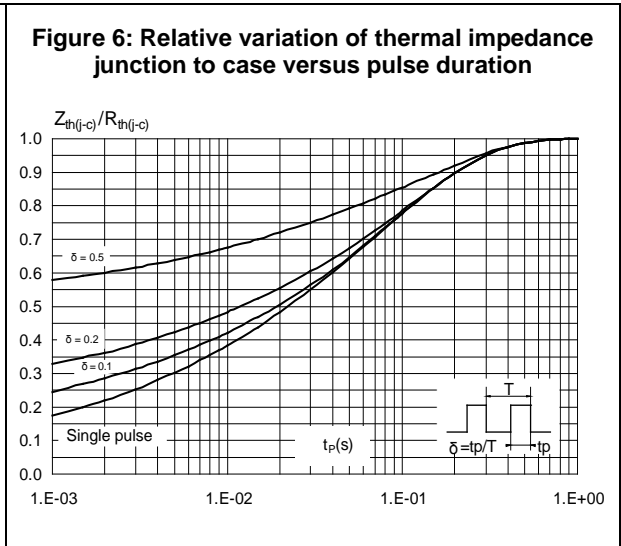
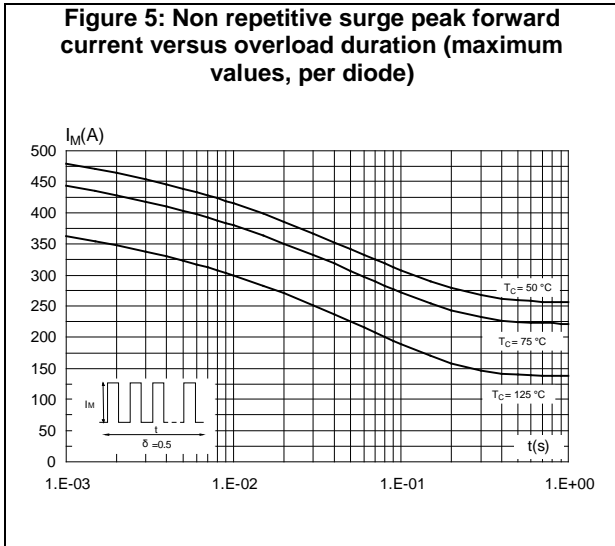
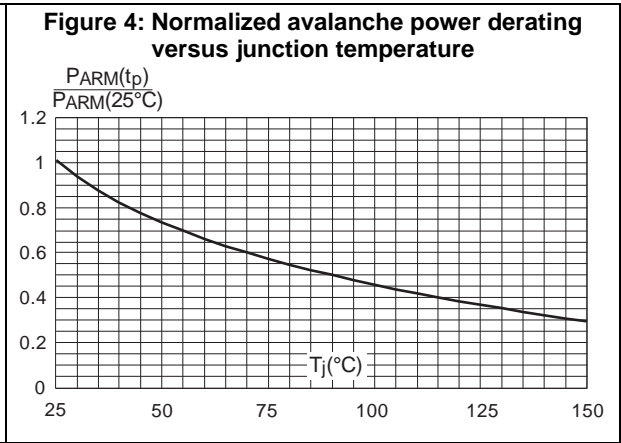
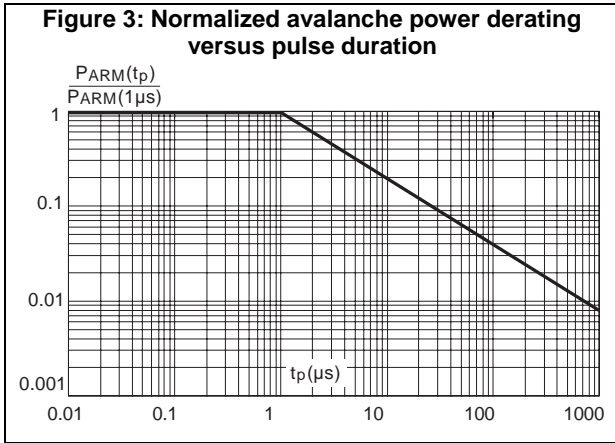
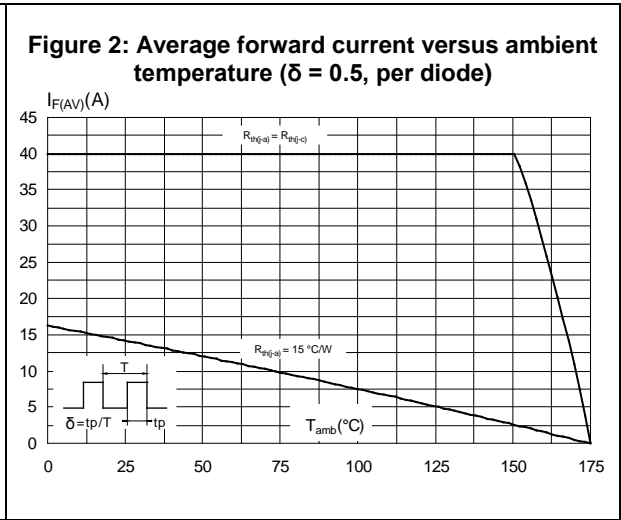
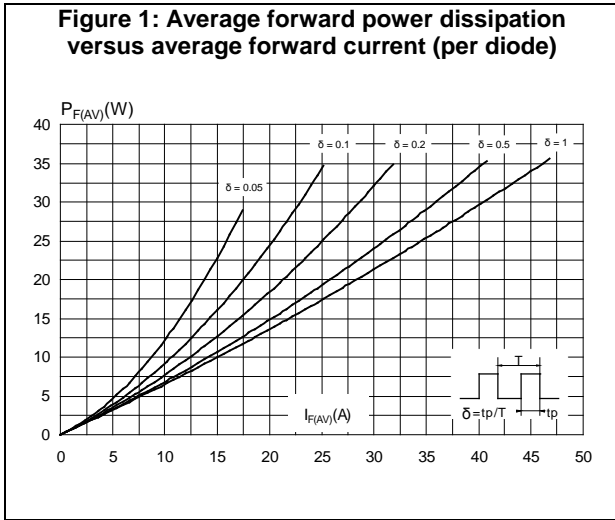
<sup>(1)</sup>Pulse test: t<sub>p</sub> = 5 ms,  $\delta < 2\%$

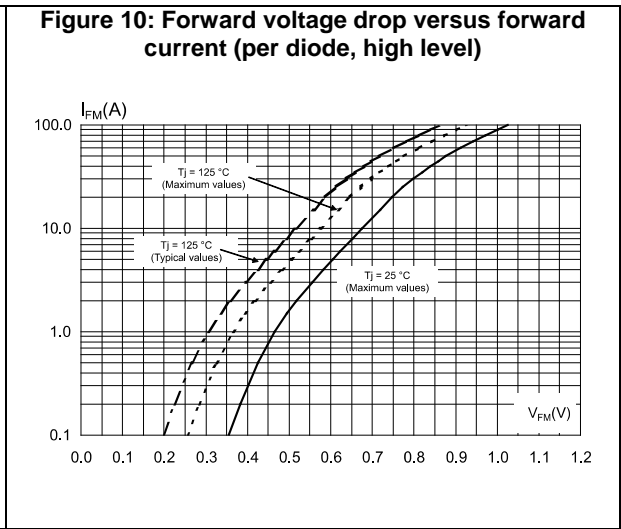
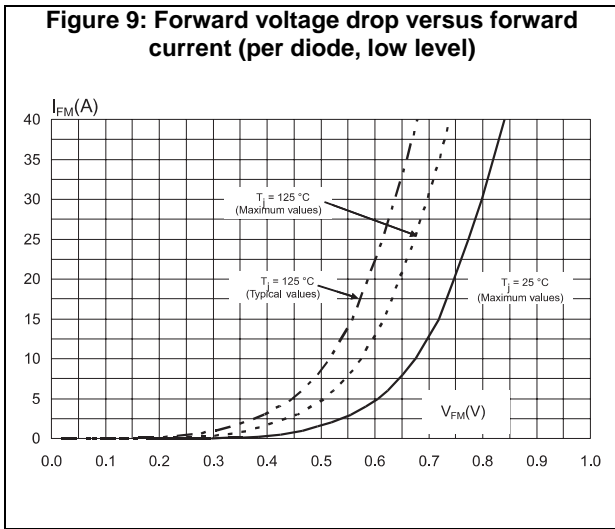
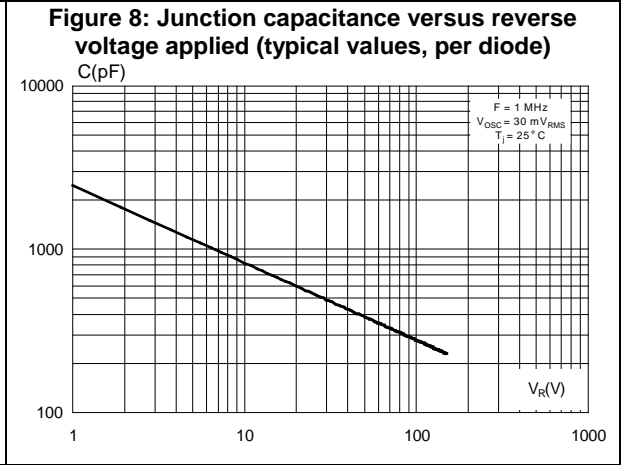
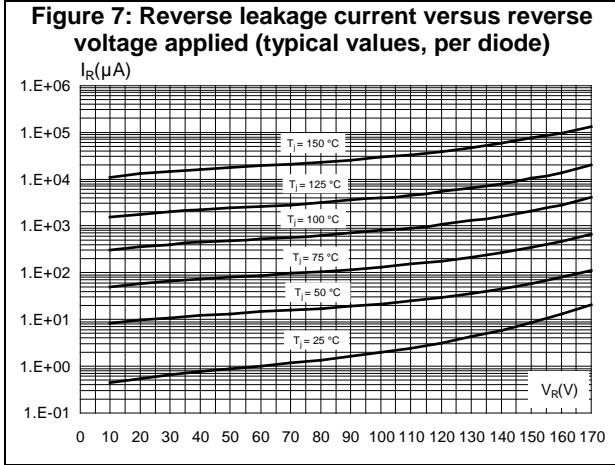
<sup>(2)</sup>Pulse test: t<sub>p</sub> = 380  $\mu$ s,  $\delta < 2\%$

To evaluate the maximum conduction losses, use the following equation:

$$P = 0.62 \times I_{F(AV)} + 0.003 \times I_{F^2(RMS)}$$

# 1.1 Characteristics (curves)





## 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.

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque values: 0.8 N-m
- Maximum torque value: 1.0 N-m

### 2.1 TO-247 package information

Figure 11: TO-247 package outline

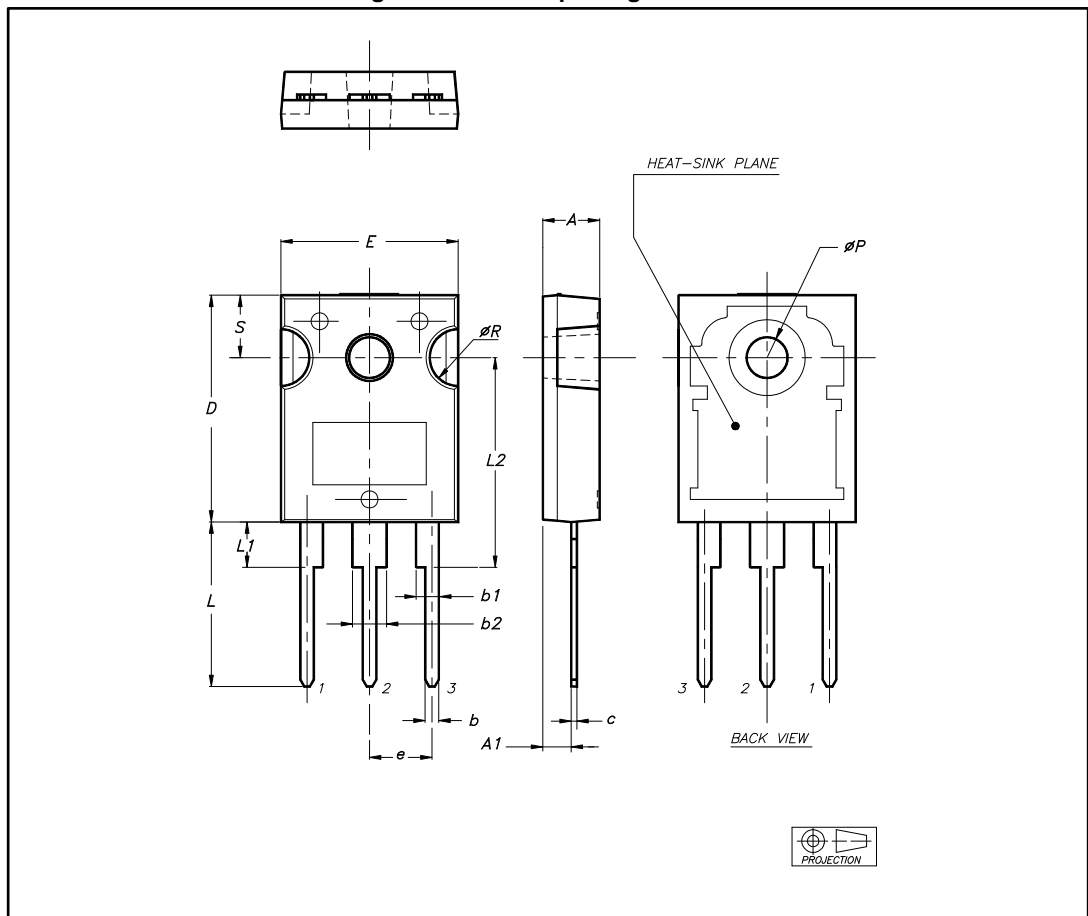


Table 5: TO-247 package mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
A1	2.20		2.60	0.086		0.102
b	1.00		1.40	0.039		0.055
b1	2.00		2.40	0.078		0.094
b2	3.00		3.40	0.118		0.133
c	0.40		0.80	0.015		0.031
D <sup>(1)</sup>	19.85		20.15	0.781		0.793
E	15.45		15.75	0.608		0.620
e	5.30	5.45	5.60	0.209	0.215	0.220
L	14.20		14.80	0.559		0.582
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
ØP <sup>(2)</sup>	3.55		3.65	0.139		0.143
ØR	4.50		5.50	0.177		0.217
S	5.30	5.50	5.70	0.209	0.216	0.224

**Notes:**

<sup>(1)</sup>Dimension D plus gate protusion does not exceed 20.5 mm

<sup>(2)</sup>Resin thickness around the mounting hole is not less than 0.9 mm.

### 3 Ordering information

Table 6: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS80170CW	STPS80170CW	TO-247	4.43 g	30	Tube

### 4 Revision history

Table 7: Document revision history

Date	Revision	Changes
16-Sep-2005	1	First issue.
18-Jan-2018	2	Minor text change to improve readability. Updated <a href="#">Section 2.1: "TO-247 package information"</a> .

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