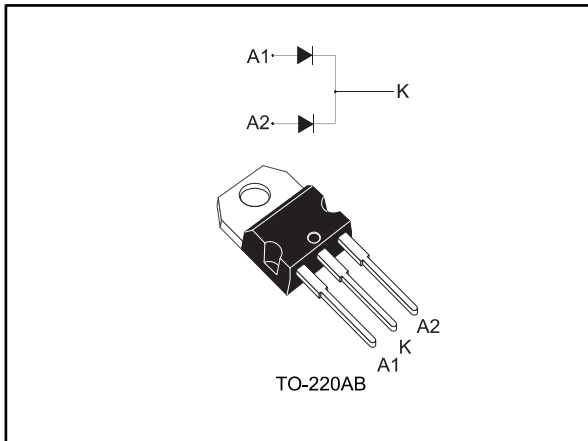


## High voltage power Schottky rectifier

Datasheet - production data



### Description

This dual diode Schottky rectifier is suited for high frequency switched mode power supplies.

Packaged in TO-220AB this device is intended for use to enhance the reliability of the application.

**Table 1: Device summary**

Symbol	Value
$I_{F(AV)}$	2 x 30 A
$V_{RRM}$	170 V
$T_j$ (max.)	175 °C
$V_F$ (typ.)	0.76 V

### Features

- High junction temperature capability
- Good trade-off between leakage current and forward voltage drop
- Low leakage current
- Low thermal resistance
- Avalanche capability specified
- High frequency operation
- ECOPACK<sup>®</sup>2 compliant component

# 1 Characteristics

**Table 2: Absolute ratings (limiting values, per diode, 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		45	A	
I <sub>F(AV)</sub>	Average forward current $\delta = 0.5$ , square wave	T <sub>C</sub> = 150 °C	Per diode	30	A
			Per device	60	
I <sub>FSM</sub>	Surge non repetitive forward current		t <sub>p</sub> = 10 ms sinusoidal	270	A
P <sub>ARM</sub>	Repetitive peak avalanche power		t <sub>p</sub> = 10 $\mu$ s, T <sub>j</sub> = 125 °C	985	W
T <sub>stg</sub>	Storage temperature range		-65 to +175	°C	
T <sub>j</sub>	Maximum operating junction temperature <sup>(1)</sup>		175		

**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		Max. value	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	1.0	°C/W
		Total	0.7	
R <sub>th(c)</sub>	Coupling		0.4	

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 (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>	-		35	$\mu$ A
		T <sub>j</sub> = 125 °C		-	8	35	mA
V <sub>F</sub> <sup>(2)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 30 A	-		0.94	V
		T <sub>j</sub> = 125 °C		-	0.72	0.76	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 60 A	-	0.97	1.05	
		T <sub>j</sub> = 125 °C		-	0.86	0.92	

**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 conduction losses, use the following equation:

$$P = 0.60 \times I_{F(AV)} + 0.0053 \times I_{F(RMS)}^2$$

### 1.1 Characteristics (curves)

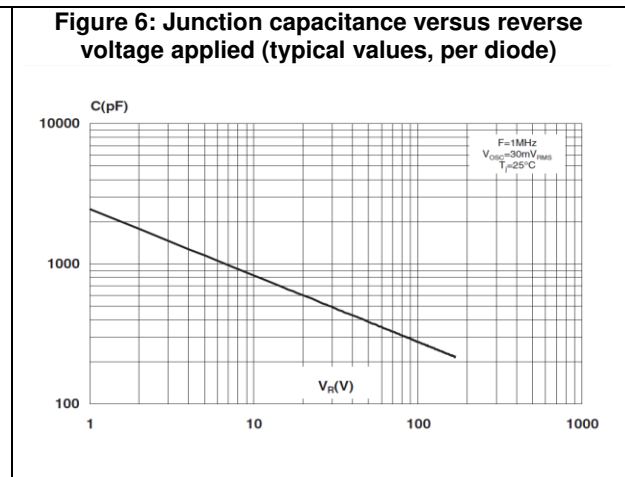
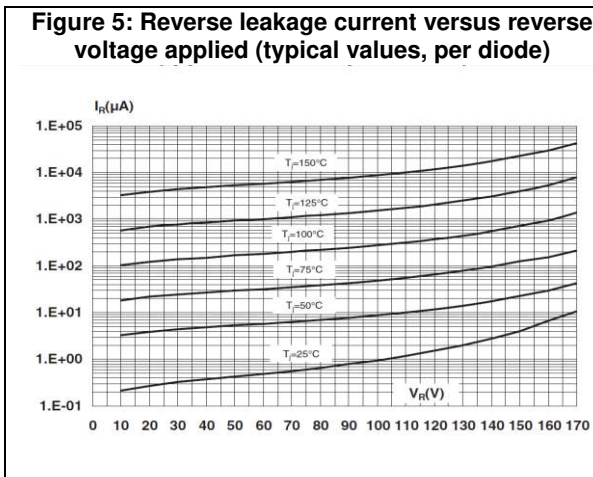
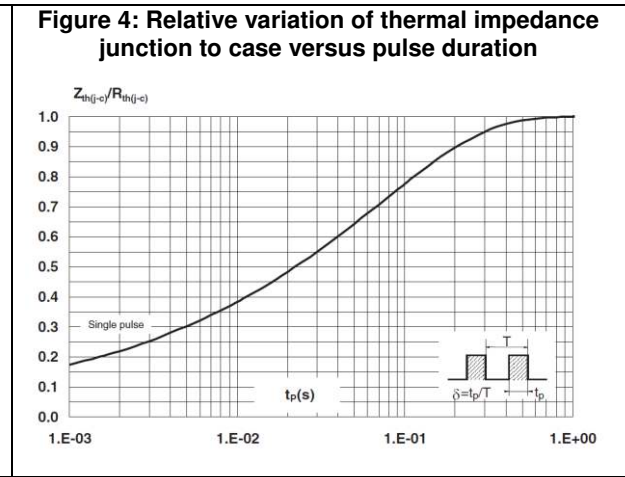
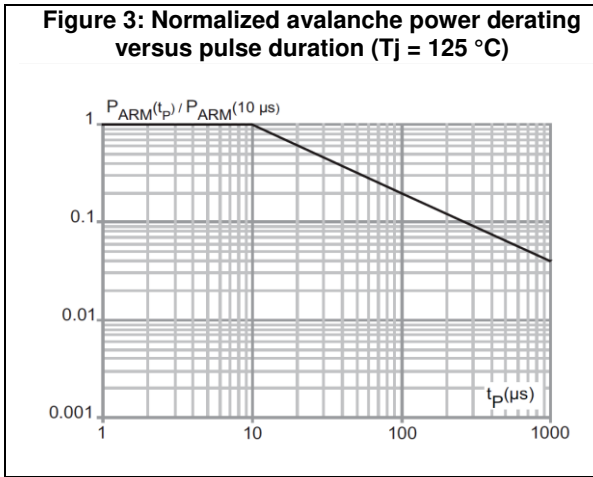
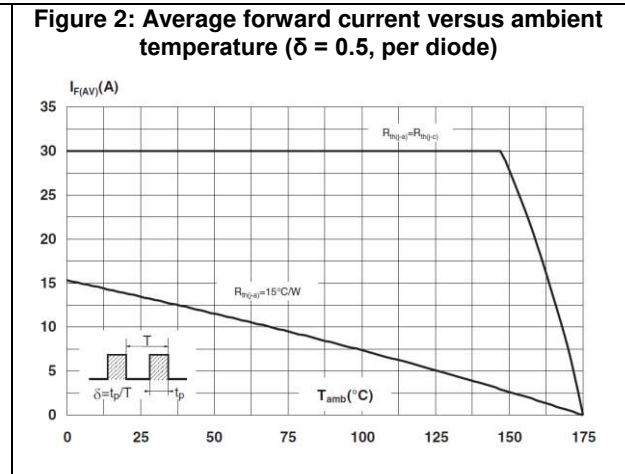
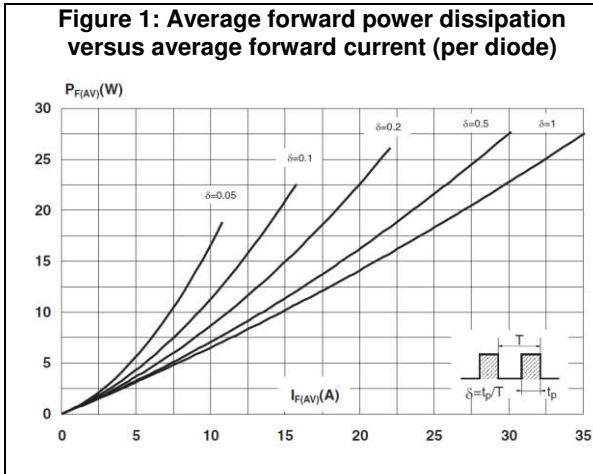


Figure 7: Forward voltage drop versus forward current (per diode, low level)

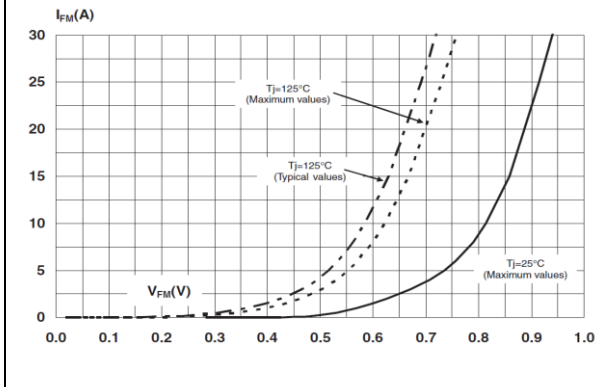
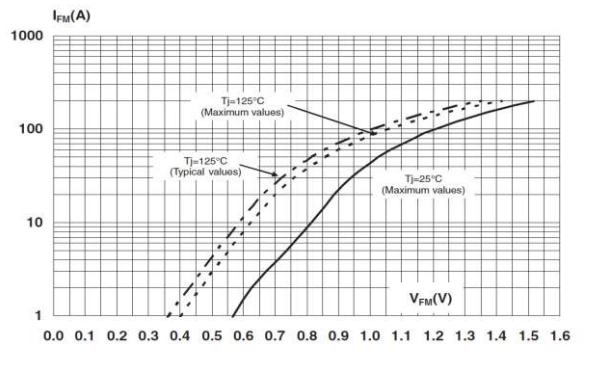


Figure 8: Forward voltage drop versus forward current (per diode, high level)



## 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.

- Cooling method: by conduction (C)
- Epoxy meets UL 94,V0
- Recommended torque value: 0.55 N·m
- Maximum torque value: 0.7 N·m

### 2.1 TO-220AB package information

Figure 9: TO-220AB package outline

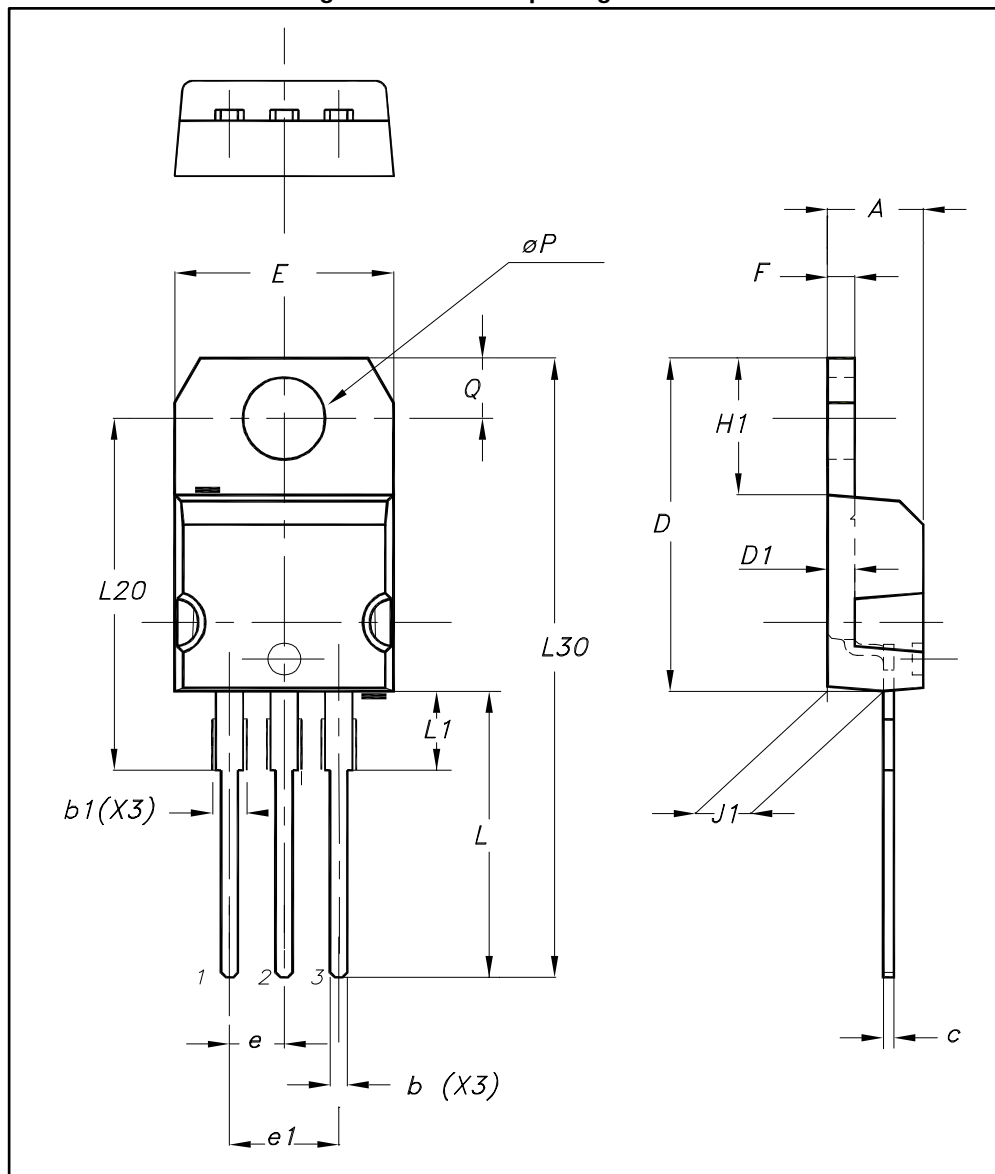


Table 5: TO-220AB package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
b	0.61	0.88	0.240	0.035
b1	1.14	1.70	0.045	0.067
c	0.48	0.70	0.019	0.028
D	15.25	15.75	0.600	0.620
D1	1.27 typ.		0.050 typ.	
E	10.00	10.40	0.394	0.409
e	2.40	2.70	0.094	0.106
e1	4.95	5.15	0.195	0.203
F	1.23	1.32	0.048	0.052
H1	6.20	6.60	0.244	0.260
J1	2.40	2.72	0.094	0.107
L	13.00	14.00	0.512	0.551
L1	3.50	3.93	0.138	0.155
L20	16.40 typ.		0.646 typ.	
L30	28.90 typ.		1.138 typ.	
θP	3.75	3.85	0.148	0.152
Q	2.65	2.95	0.104	0.116

### 3 Ordering information

Table 6: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS60170CT	STPS60170CT	TO-220AB	1.95 g	50	Tube

### 4 Revision history

Table 7: Document revision history

Date	Revision	Changes
18-Feb-2005	1	First issue.
11-Dec-2015	2	Updated conduction losses equation values and reformatted to current standard.
15-Jan-2018	3	Updated <a href="#">Table 2: "Absolute ratings (limiting values, per diode, at 25 °C, unless otherwise specified)"</a> .

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