

High voltage power Schottky rectifier

Main product characteristics

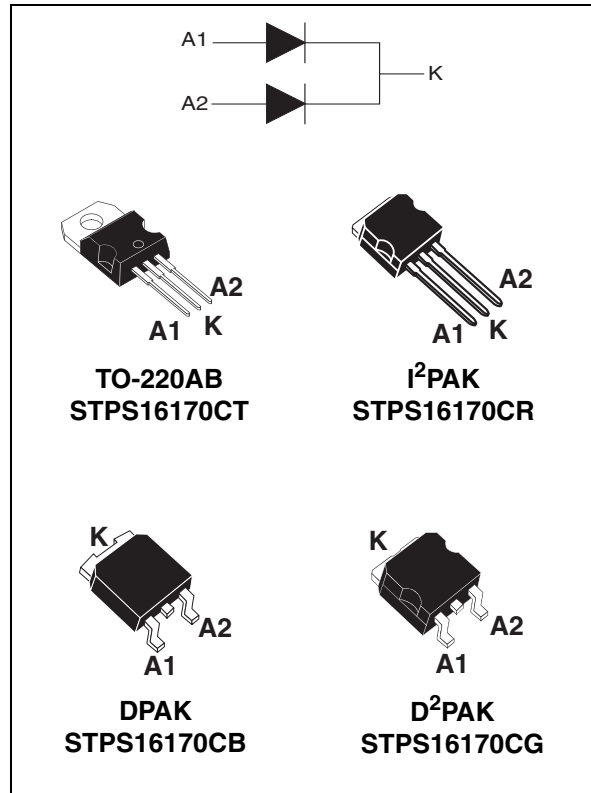
$I_{F(AV)}$	2 x 8 A
V_{RRM}	170 V
T_j	175° C
V_F (typ)	0.70 V

Features and benefits

- High junction temperature capability
- Good trade-off between leakage current and forward voltage drop
- Low leakage current
- Avalanche capability specified

Description

Dual centre tab Schottky rectifier designed for high frequency switch mode power supplies.



Order codes

Part Number	Marking
STPS16170CT	STPS16170CT
STPS16170CG	STPS16170CG
STPS16170CG-TR	STPS16170CG
STPS16170CR	STPS16170CR
STPS16170CB-TR	PS16170CB
STPS16170CB	PS16170CB

1 Characteristics

Table 1. Absolute ratings (limiting values per diode, $T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			170	V
$I_{F(RMS)}$	RMS forward current			20	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	$T_c = 150^{\circ}\text{C}$	Per diode	8	A
			Total package	16	
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ Sinusoidal		75	A
P_{ARM}	Releative peak avalanche power	$T_j = 25^{\circ}\text{C}$	$t_p = 1\mu\text{s}$	4700	W
T_{stg}	Storage temperature range			-65 to + 175	$^{\circ}\text{C}$
T_j	Maximum operating junction temperature ⁽¹⁾			175	$^{\circ}\text{C}$
dV/dt	Critical rate of rise of reverse voltage			10 000	V/ μs

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

Table 2. Thermal parameters

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	3	$^{\circ}\text{C/W}$
		Total	1.8	
$R_{th(c)}$	Coupling		0.6	

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$			15	μA
		$T_j = 125^{\circ}\text{C}$				15	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 8\text{ A}$			0.92	V
		$T_j = 125^{\circ}\text{C}$			0.70	0.75	
		$T_j = 25^{\circ}\text{C}$	$I_F = 16\text{ A}$			1	
		$T_j = 125^{\circ}\text{C}$			0.8	0.86	

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:

$$P = 0.64 \times I_{F(AV)} + 0.014 \times I_{F(RMS)}^2$$

Figure 1. Conduction losses versus average forward current (per diode)

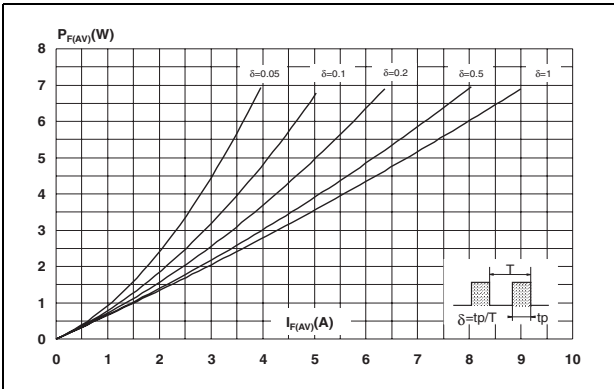


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$, per diode)

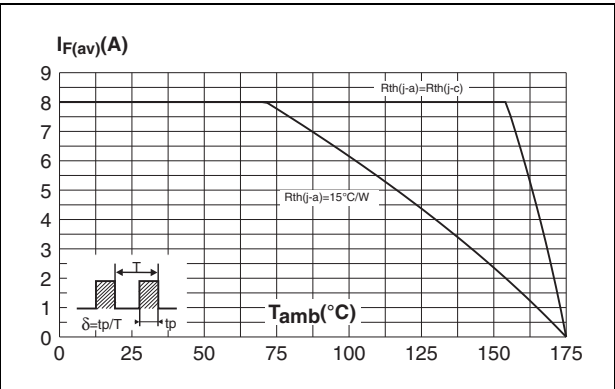


Figure 3. Normalized avalanche power derating versus pulse duration

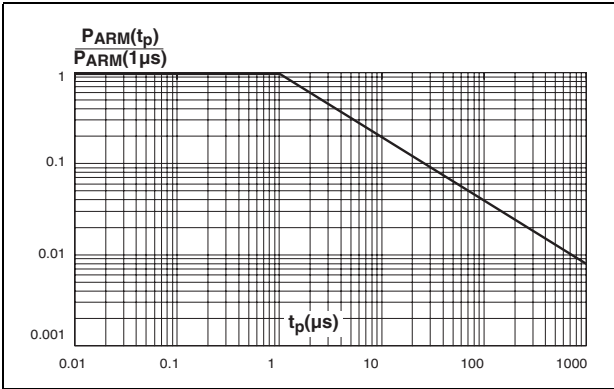


Figure 4. Normalized avalanche power derating versus junction temperature

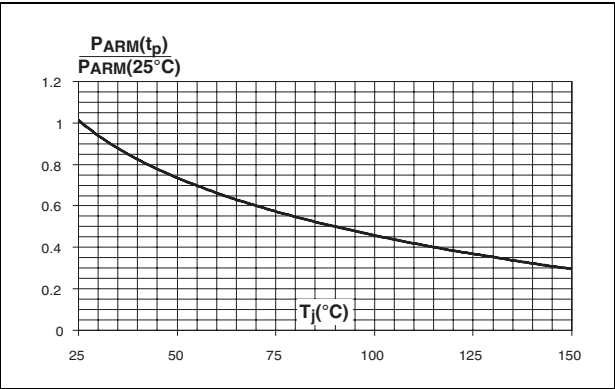


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

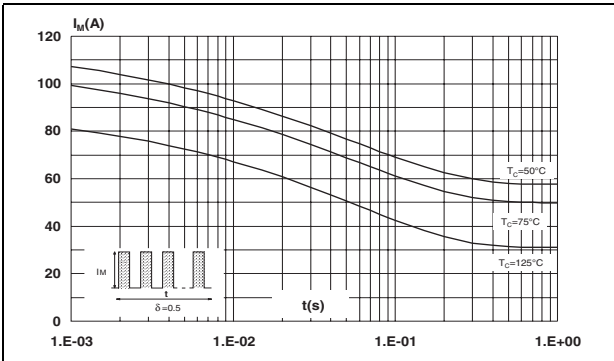
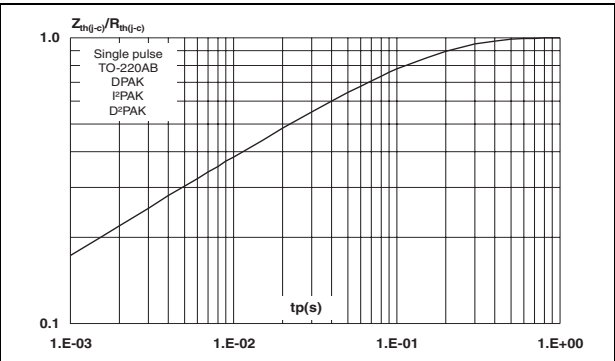


Figure 6. Relative variation of thermal impedance junction to case versus pulse duration



3 Ordering information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
STPS16170CT	STPS16170CT	TO-220ABB	2.23 g	50	Tube
STPS16170CG	STPS16170CG	D ² PAK	1.48 g	50	Tube
STPS16170CG-TR	STPS16170CG	D ² PAK	1.48 g	1000	Tape and reel
STPS16170CR	STPS16170CR	I ² PAK	1.49 g	50	Tube
STPS16170CB-TR	PS16170CB	DPAK	0.3 g	2500	Tape and reel
STPS16170CB	PS16170CB	DPAK	0.3 g	75	Tube