STPS10170C

High voltage power Schottky rectifier

Main product characteristics

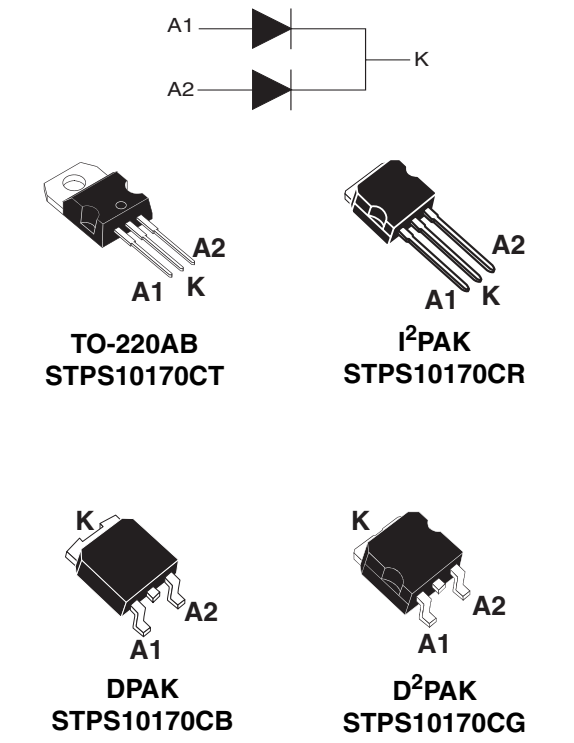
$I_{F(AV)}$	2 x 5 A
V_{RRM}	170 V
T_j	175° C
V_F (typ)	0.69 V

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
STPS10170CT	STPS10170CT
STPS10170CG	STPS10170CG
STPS10170CG-TR	STPS10170CG
STPS10170CR	STPS10170CR
STPS10170CB	PS10170CB
STPS10170CB-TR	PS10170CB

1 Characteristics

Table 1. Absolute ratings (limiting values per diode, T_{amb} = 25° C unless otherwise specified)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			170	V
$I_{F(RMS)}$	RMS forward current			10	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	T_c = 155° C	Per diode	5	A
			Total package	10	
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms Sinusoidal		75	A
P_{ARM}	Relative peak avalanche power	T_j = 25° C	t_p = 1µs	3100	W
T_{stg}	Storage temperature range			-65 to + 175	°C
T_j	Maximum operating junction temperature(1)			175	°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	4	°C/W
		Total	2.4	
$R_{th(c)}$	Coupling		0.7	

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25° C	$V_R = V_{RRM}$			10	µA
		T_j = 125° C				10	mA
V_F(2)	Forward voltage drop	T_j = 25° C	I_F = 5 A			0.92	V
		T_j = 125° C			0.69	0.75	
		T_j = 25° C	I_F = 10 A			1	
		T_j = 125° C			0.79	0.85	

1. Pulse test: t_p = 5 ms, $\delta < 2$ %
2. Pulse test: t_p = 380 µs, $\delta < 2$ %

To evaluate the conduction losses use the following equation:
$P = 0.65 \times I_{F(AV)} + 0.02 \times I_F^2{}_{(RMS)}$

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

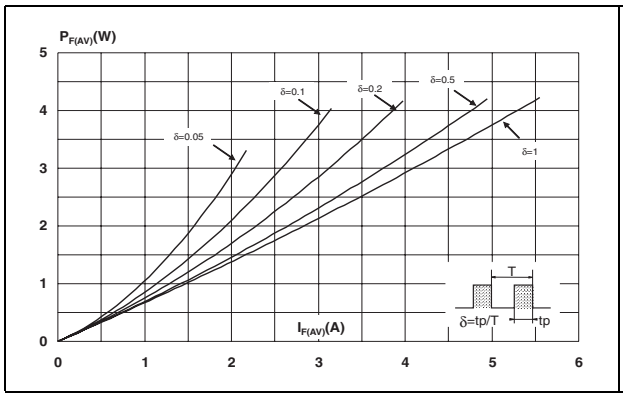


Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)

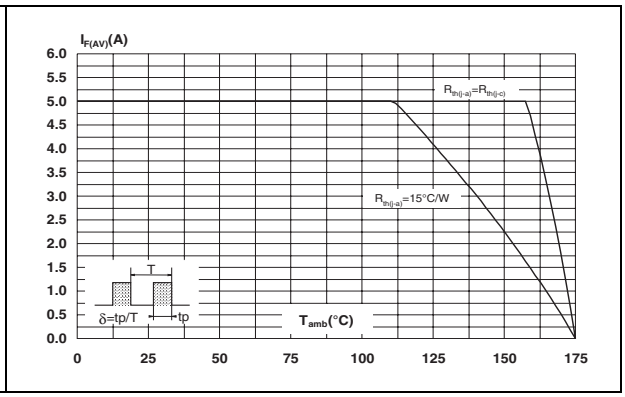


Figure 3. Normalized avalanche power derating versus pulse duration

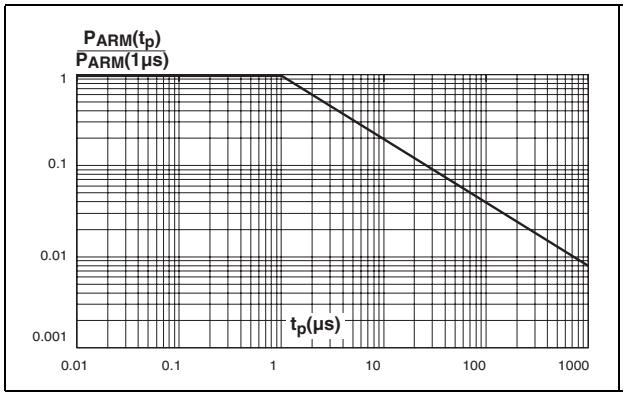


Figure 4. Normalized avalanche power derating versus junction temperature

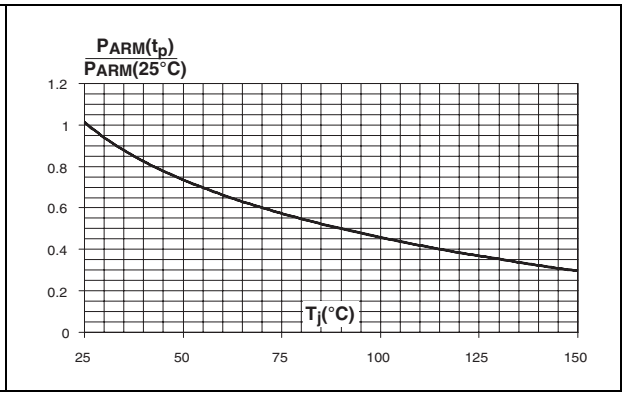


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

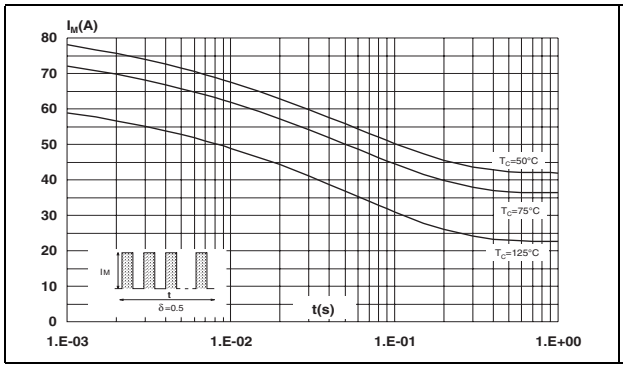
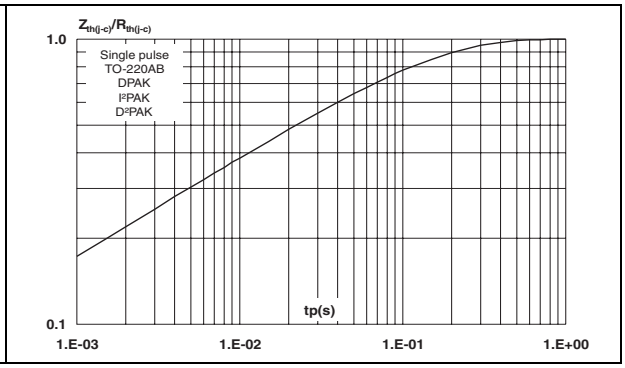


Figure 6. Relative variation of thermal impedance, junction to case versus pulse duration



3 Ordering information

Part number	Marking	Package	Weight	Base qty	Delivery mode
STPS10170CT	STPS10170CT	TO-220AB	2.23 g	50	Tube
STPS10170CG	STPS10170CG	D^2PAK	1.48 g	50	Tube
STPS10170CG-TR	STPS10170CG	D^2PAK	1.48 g	1000	Tape and reel
STPS10170CB	PS10170CB	DPAK	0.3 g	75	Tube
STPS10170CB-TR	PS10170CB	DPAK	0.3 g	2500	Tape and reel
STPS10170CR	STPS10170CR	I^2PAK	1.49 g	50	Tube