

HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

Table 1: Main Product Characteristics

$I_{F(AV)}$	2 x 30 A
V_{RRM}	170 V
T_j	175 °C
$V_F(\text{max})$	0.76 V

FEATURES AND BENEFITS

- 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

DESCRIPTION

Dual center tab Schottky rectifier 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.

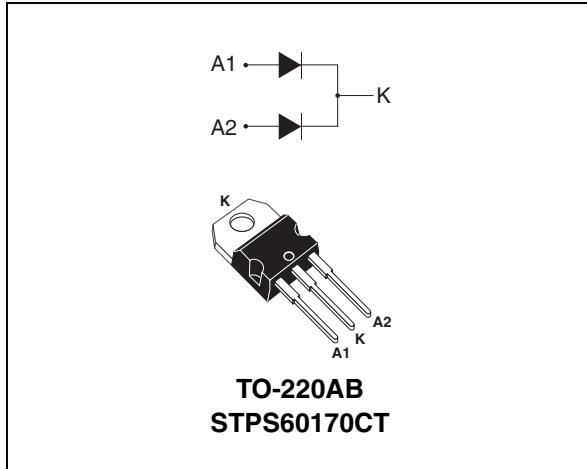


Table 2: Order Code

Part Number	Marking
STPS60170CT	STPS60170CT

Table 3: Absolute Ratings (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			170	V
$I_{F(\text{RMS})}$	RMS forward current			60	A
$I_{F(AV)}$	Average forward current	$T_c = 150 \text{ }^\circ\text{C}$	$\delta = 0.5$	Per diode 30 Per device 60	A
I_{FSM}	Surge non repetitive forward current		$t_p = 10 \text{ ms sinusoidal}$	270	A
P_{ARM}	Repetitive peak avalanche power		$t_p = 1 \mu\text{s}$	$T_j = 25 \text{ }^\circ\text{C}$	17300 W
T_{stg}	Storage temperature range			-65 to + 175	$^\circ\text{C}$
T_j	Maximum operating junction temperature *			175	$^\circ\text{C}$
dV/dt	Critical rate of rise of reverse voltage			10000	V/ μs

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

STPS60170C

Table 4: Thermal Parameters

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode Total	1.0 0.7
$R_{th(c)}$		Coupling	0.4
			°C/W

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$$

Table 5: Static Electrical Characteristics (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ	Max.	Unit
I_R *	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			35	μA
		$T_j = 125^\circ\text{C}$			8	35	mA
V_F **	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 30 \text{ A}$			0.94	V
		$T_j = 125^\circ\text{C}$			0.72	0.76	
		$T_j = 25^\circ\text{C}$	$I_F = 60 \text{ A}$		0.97	1.05	
		$T_j = 125^\circ\text{C}$			0.86	0.92	

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

** $t_p = 380 \mu\text{s}, \delta < 2\%$

To evaluate the conduction losses use the following equation: $P = 0.60 \times I_F(\text{AV}) + 0.053 I_F^2 (\text{RMS})$

Figure 1: Average forward power dissipation versus average forward current (per diode)

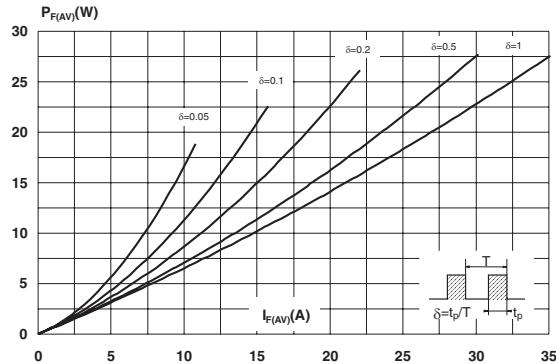


Figure 3: Normalized avalanche power derating versus pulse duration

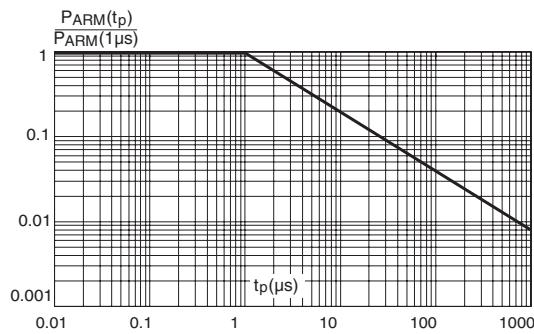


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

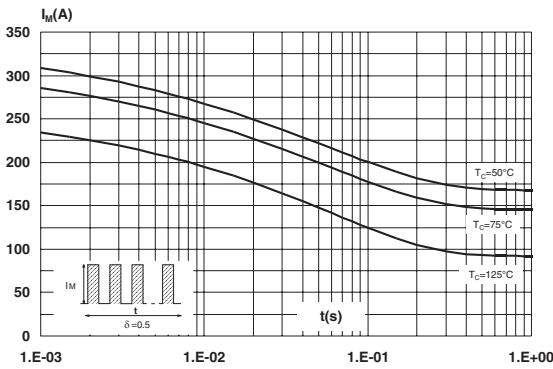


Figure 2: Average forward current versus ambient temperature ($\delta = 0.5$, per diode)

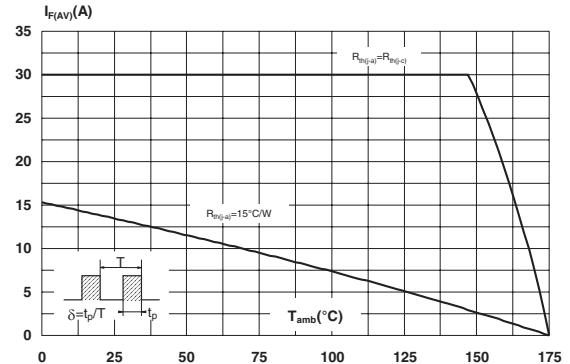


Figure 4: Normalized avalanche power derating versus junction temperature

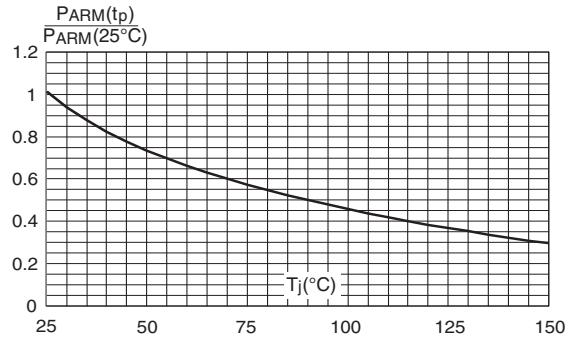


Figure 6: Relative variation of thermal impedance junction to case versus pulse duration

