STPS2060C

High voltage power Schottky rectifier

Main product characteristics

$I_{F(AV)}$	2 x 10 A
V_{RRM}	60 V
T_j (max)	150° C
V_F (max)	0.7 V

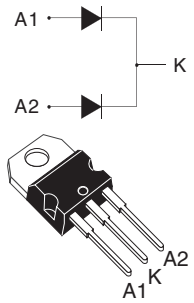
Description

High voltage dual Schottky rectifier suited for switch mode power supplies and other power converters.

Packaged in TO-220, this device is intended for use in medium voltage operation, and particularly, in high frequency circuitries where low switching losses and low noise are required.

Order code

Part Number	Marking
STPS2060CT	STPS2060CT



TO-220AB
STPS2060CT

Features and benefits

- Negligible switching losses
- Low forward voltage drop
- Low capacitance
- High reverse avalanche surge capability
- Avalanche rated

Table 1. Absolute ratings (limiting values, per diode at 25° C, unless otherwise specified)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			60	V
$I_{F(RMS)}$	RMS forward current		Per diode	20	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	T_c = 135° C	Per diode	10	A
			Per device	20	
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	Per diode	200	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs T_j = 25° C	Per device	10800	W
T_{stg}	Storage temperature range			-65 to + 150	°C
T_j	Maximum operating junction temperature (1)			150	°C

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

1 Characteristics

Table 2. Thermal resistance

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	1.6	°C/W
		Total	0.9	
$R_{th(c)}$		Coupling	0.15	

When the diodes 1 and 2 are used simultaneously:

ΔT_j(diode 1) = P(diode1) x $R_{th(j-c)}$(Per diode) + P(diode 2) x $R_{th(c)}$

Table 3. Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25° C	$V_R = V_{RRM}$			150	µA
		T_j = 125° C				100	mA
V_F(2)	Forward voltage drop	T_j = 25° C	I_F = 10 A			0.80	V
		T_j = 125° C	I_F = 10 A		0.60	0.70	
		T_j = 25° C	I_F = 20 A			0.94	
		T_j = 125° C	I_F = 20 A		0.75	0.85	

1. Pulse test: tp = 5 ms, δ < 2%
2. Pulse test: tp = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:

$P = 0.55 \times I_{F(AV)} + 0.015\ I_F{}^2{}_{(RMS)}$

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

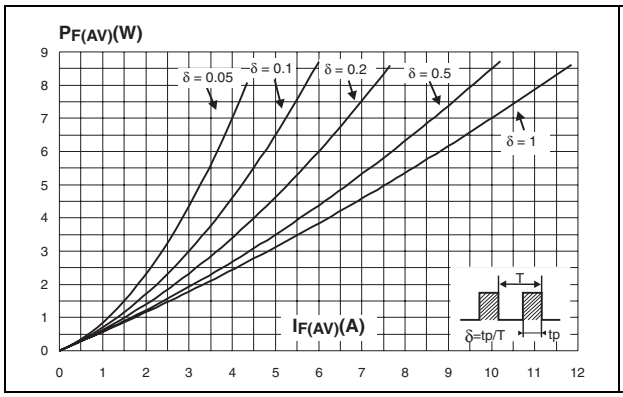


Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)

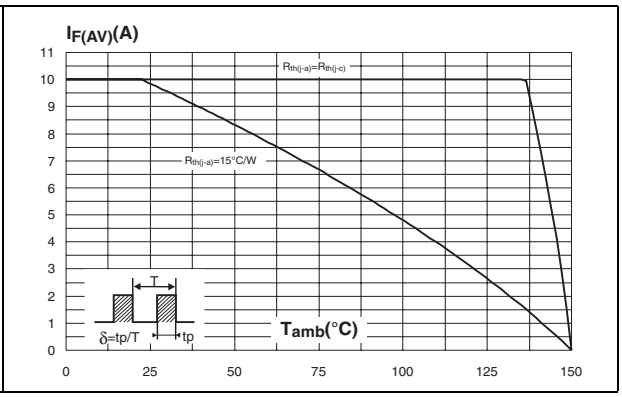


Figure 3. Normalized avalanche power derating versus pulse duration

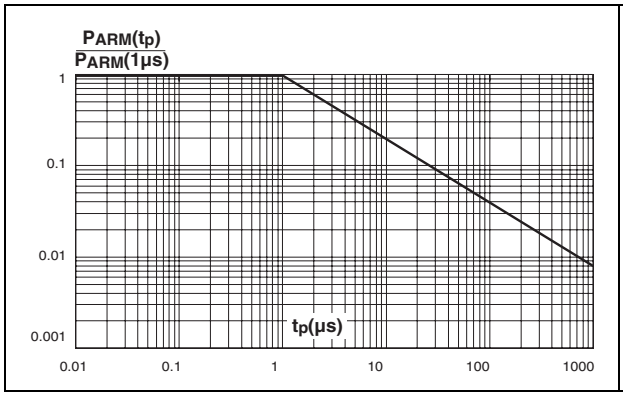


Figure 4. Normalized avalanche power derating versus junction temperature

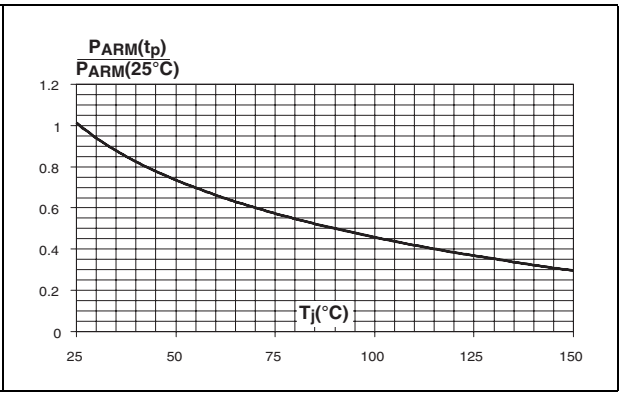


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

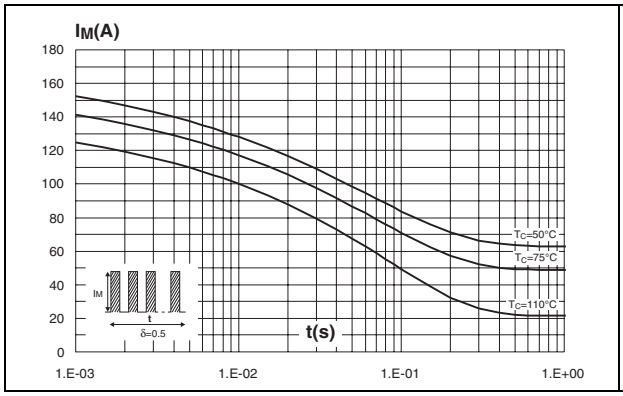


Figure 6. Relative variation of thermal impedance junction to case versus pulse duration

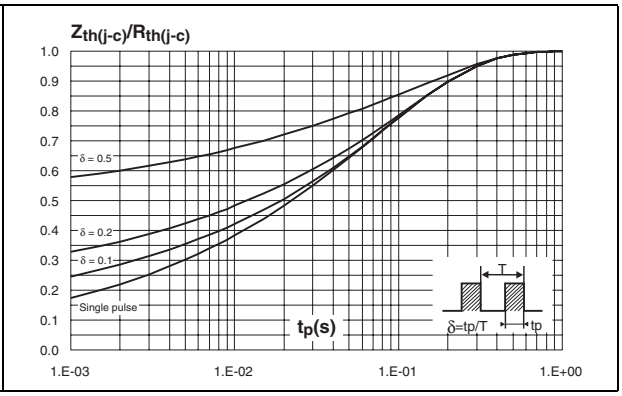


Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)

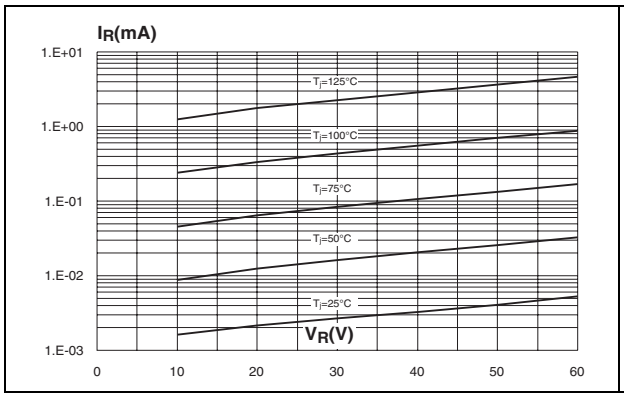


Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode)

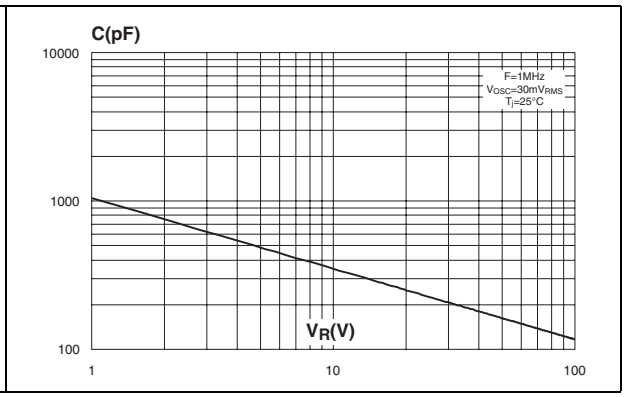
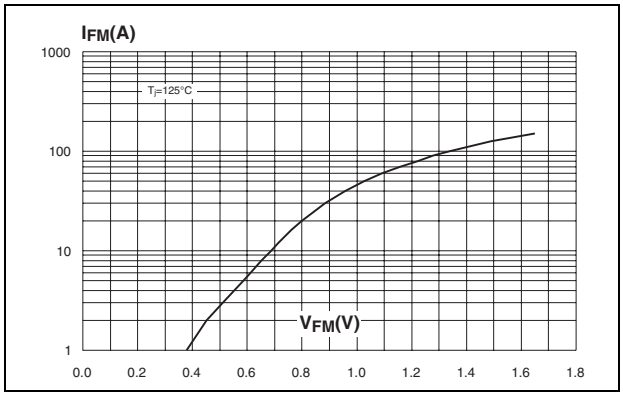


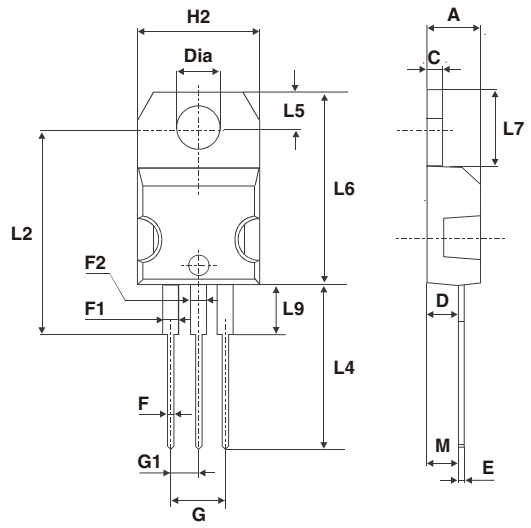
Figure 9. Forward voltage drop versus forward current (maximum values, per diode)



2 Package information

Epoxy meets UL94,V0

Table 4. TO-220AB dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
F2	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
G1	2.40	2.70	0.094	0.106
H2	10	10.40	0.393	0.409
L2	16.4 typ.		0.645 typ.	
L4	13	14	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam.	3.75	3.85	0.147	0.151

Cooling Method: C

Recommended torque value: 0.55 Nm

Maximum torque value: 0.70 Nm

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

3 Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS2060CT	STPS2060CT	TO-220AB	2.2 g	50	Tube

4 Revision History

Date	Revision	Changes
25-Jul-2006	1	First issue.

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