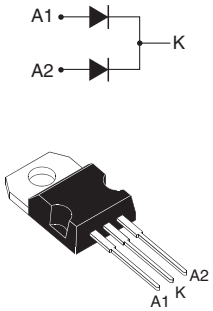
STPS2545CT-Y

Automotive power Schottky rectifier

Datasheet – production data

Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low thermal resistance
- Avalanche capability specified
- AEC-Q101 qualified



TO-220AB

Description

Dual center tab Schottky rectifier suited for switch mode power supplies and high frequency DC to DC converters.

This device is especially intended for use in low voltage, high frequency inverters, free-wheeling and polarity protection in automotive applications.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 x 12.5 A
V_{RRM}	45 V
$T_{j\ (max)}$	175 °C
$V_{F(max)}$	0.57 V

1 Characteristics

Table 2. Absolute ratings (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			45	V
$I_{F(RMS)}$	Forward rms current			30	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	$T_c = 160$ °C	Per diode	12.5	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms sinusoidal		200	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1$ µs, $T_j = 25$ °C		4800	W
T_{stg}	Storage temperature range			-65 to + 175	°C
T_j	Operating junction temperature range(1)			-40 to + 175	°C
dV/dt	Critical rate of rise reverse voltage			10000	V/µs

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

Table 3. Thermal resistances parameters

Symbol	Parameter		Value	Unit
$R_{th\ (j-c)}$	Junction to case	Per diode	1.6	°C/W
$R_{th\ (c)}$	Coupling		0.6	°C/W

When the diodes 1 and 2 are used simultaneously:
ΔT_j(diode 1) = P(diode 1) x $R_{th(j-c)}$(per diode) + P(diode 2) x $R_{th(c)}$

Table 4. Static electrical characteristics (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R (1)	Reverse leakage current	$T_j = 25$ °C	$V_R = V_{RRM}$			125	µA
		$T_j = 125$ °C			9	25	mA
V_F (1)	Forward voltage drop	$T_j = 125$ °C	$I_F = 12.5$ A		0.50	0.57	V
		$T_j = 25$ °C	$I_F = 25$ A			0.84	
		$T_j = 125$ °C	$I_F = 25$ A		0.65	0.72	

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

To evaluate the conduction losses use the following equation:

$P = 0.42 \times I_{F(AV)} + 0.012 \times I_F{}^2{}_{(RMS)}$

Figure 1. Conduction losses versus average current

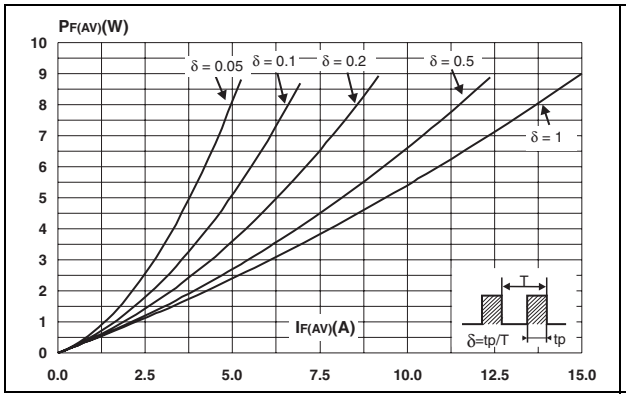


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

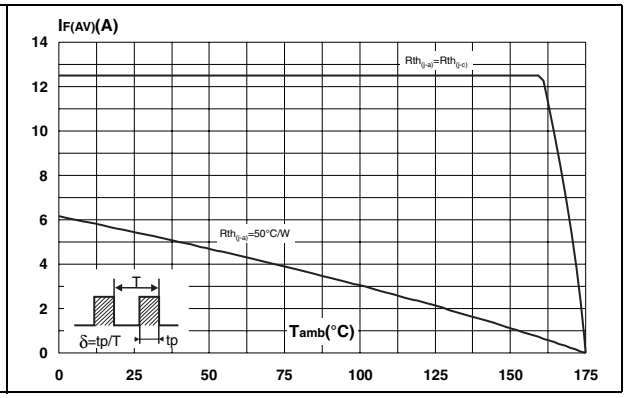


Figure 3. Normalized avalanche power derating versus pulse duration

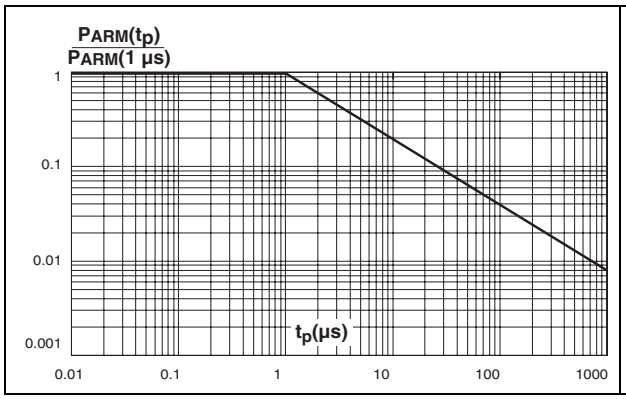


Figure 4. Normalized avalanche power derating versus junction temperature

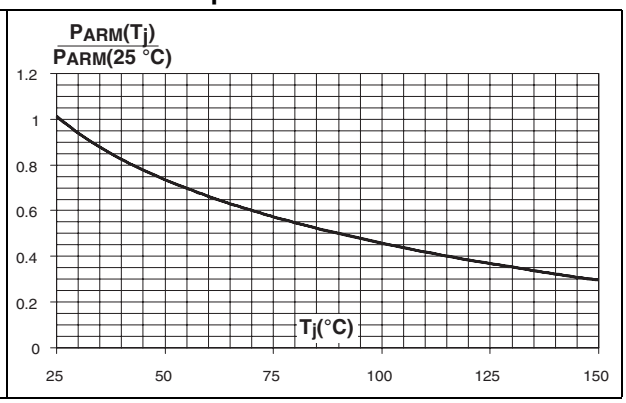


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)

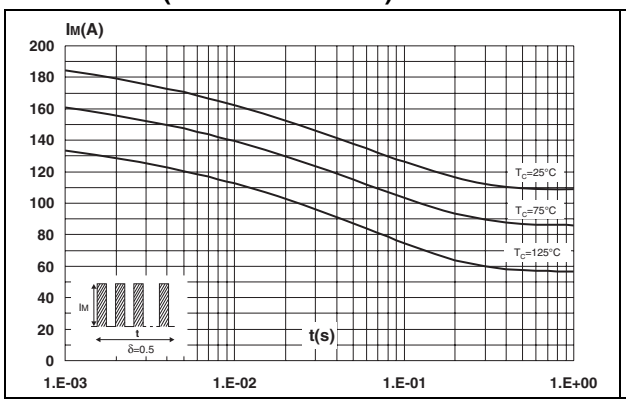


Figure 6. Relative variation of thermal impedance junction to case versus pulse duration

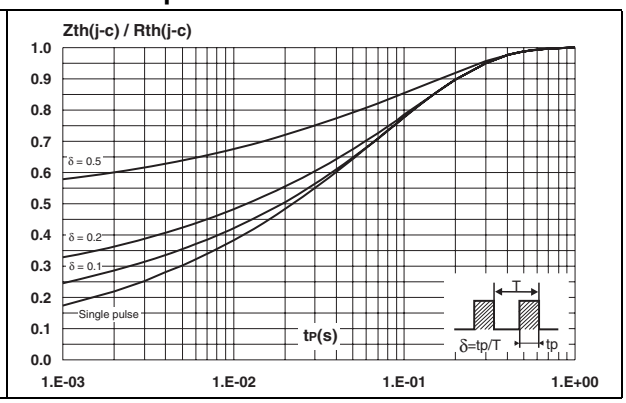


Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

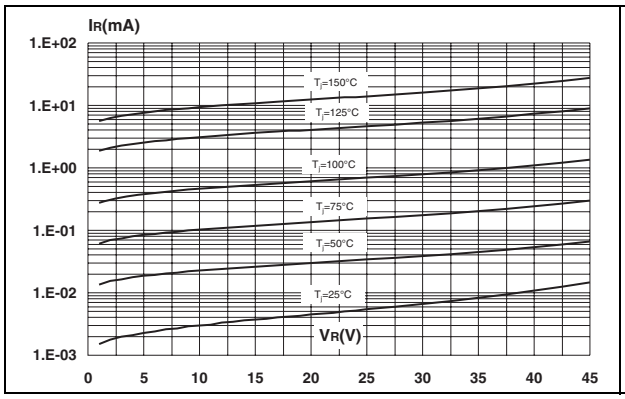


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

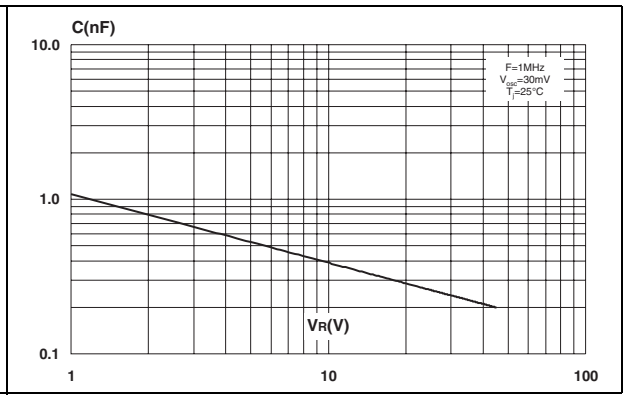


Figure 9. Forward voltage drop versus forward current

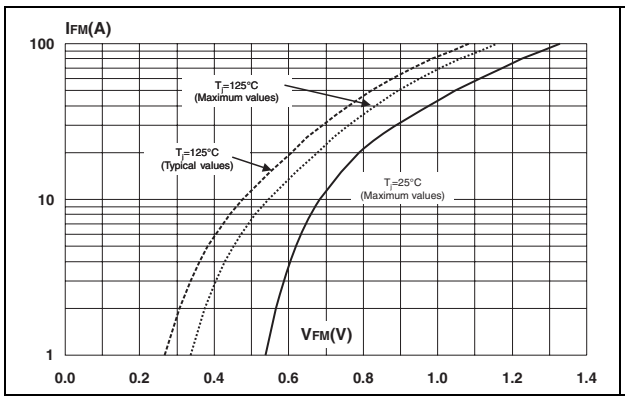
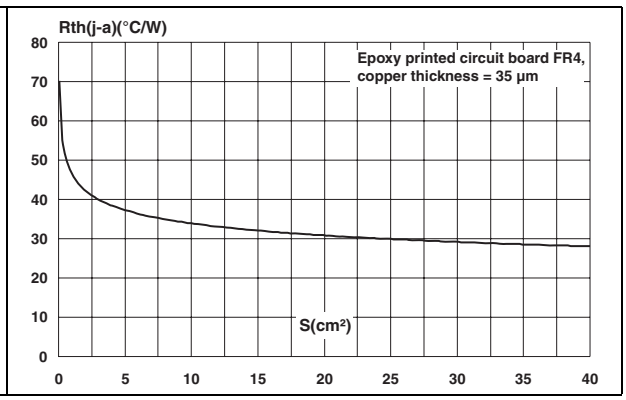


Figure 10. Thermal resistance junction to ambient versus copper surface under tab



2 Package information

- Epoxy meets UL94, V0
- Lead-free package

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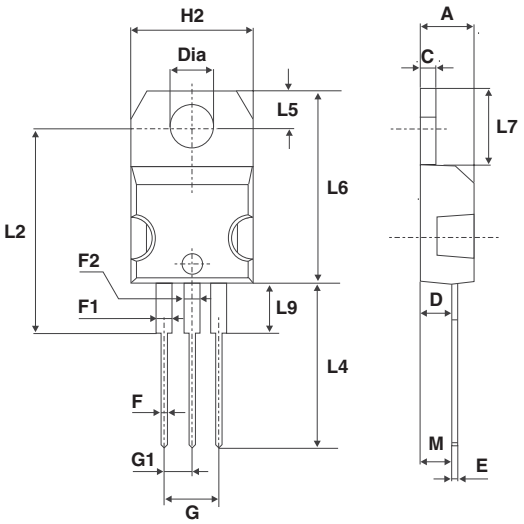
Table 5. TO-220AB dimensions



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

Note: Leads are raw copper on all exposed areas before plating finishing.

3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS2545CTY	STPS2545CTY	TO-220AB	1.9 g	50	Tube

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
19-Sep-2011	1	First issue.
28-Jun-2012	2	Corrected typographical error in *Table 3*.

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