STPS3045C-Y

Automotive power Schottky rectifier

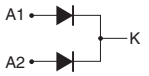
Features

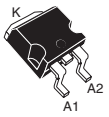
- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low thermal resistance
- Avalanche rated
- AEC-Q101 qualified

Description

This device is a dual center tap Schottky rectifier suited for switch mode power supply and high frequency DC to DC converters.

Packaged in D^2PAK, this device is especially intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.





D^2PAK
STPS3045CGY

Table 1. Device summary

$I_{F(AV)}$	2 x 15 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 voltage			30	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	T_C = 155 °C	Per diode Per device	10 30	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal		220	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs T_j = 25 °C		6000	W
T_{stg}	Storage temperature range			-65 to +175	°C
T_j	Maximum operating junction temperature(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 resistance parameters

Symbol	Parameter		Value	Unit
$R_{th\ (j-c)}$	Junction to case	Per diode Total	1.60 0.85	° C/W
$R_{th\ (c)}$	Coupling		0.10	° C/W

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 4. Static electrical characteristics (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R (1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$	-	-	200	µA
		T_j = 125 °C		-	11	40	mA
V_F (1)	Forward voltage drop	T_j = 125 °C	I_F = 15 A	-	0.5	0.57	V
		T_j = 25 °C	I_F = 30 A	-	-	0.84	
		T_j = 125 °C		-	0.65	0.72	

1. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:

$P = 0.42 \times I_{F(AV)} + 0.01\ I_F{}^2{}_{(RMS)}$

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

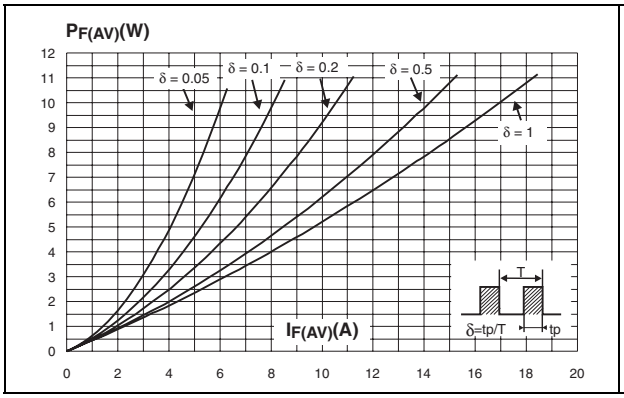


Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)

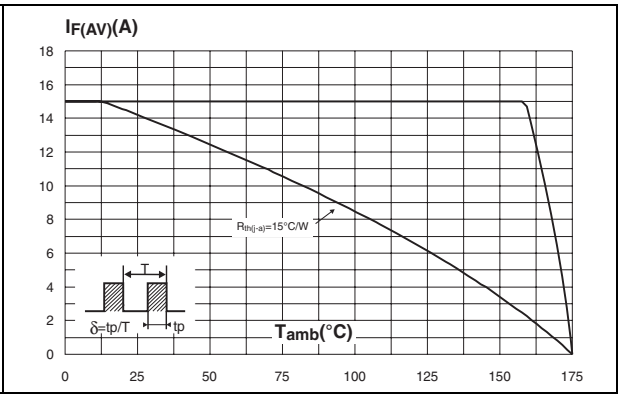


Figure 3. Normalized avalanche power derating versus pulse duration

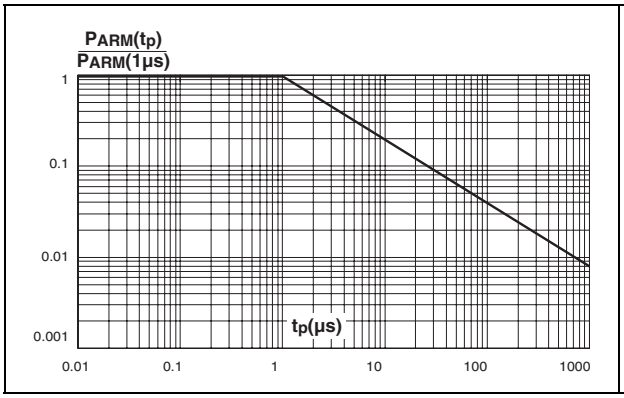


Figure 4. Normalized avalanche power derating versus junction temperature

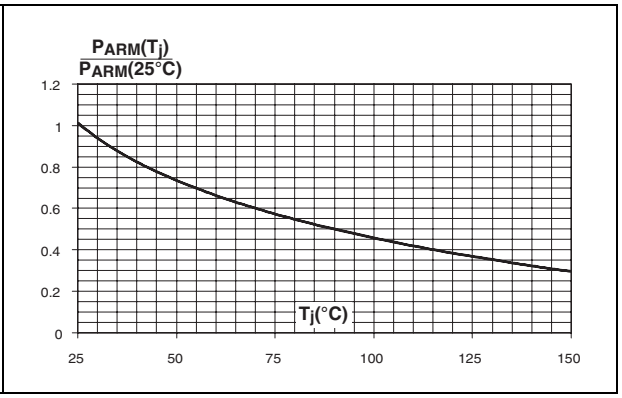


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

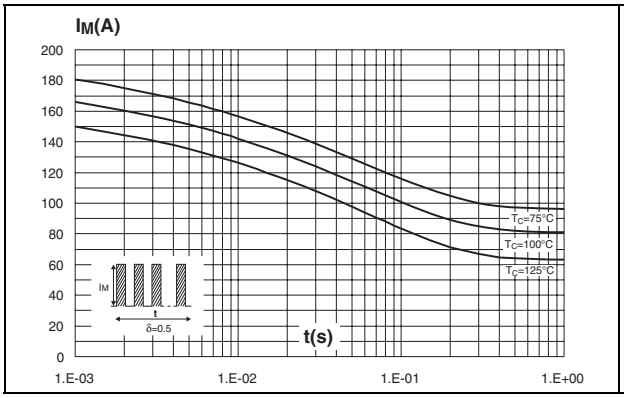


Figure 6. Relative variation of thermal impedance junction to ambient versus pulse duration

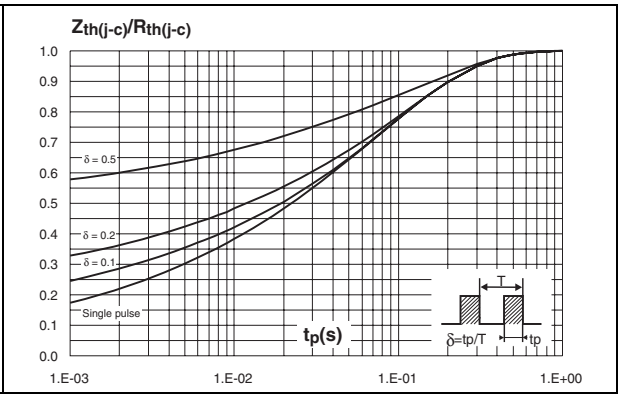


Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)

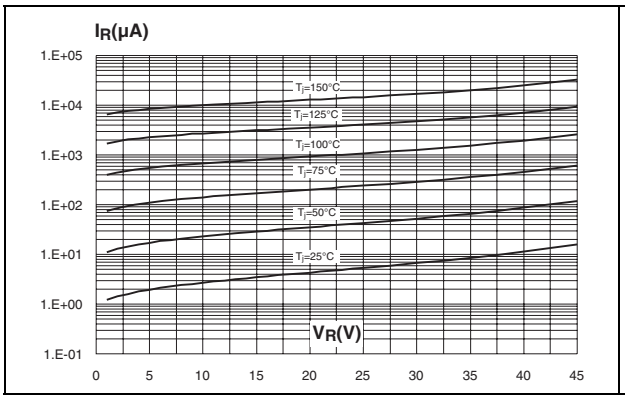


Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode)

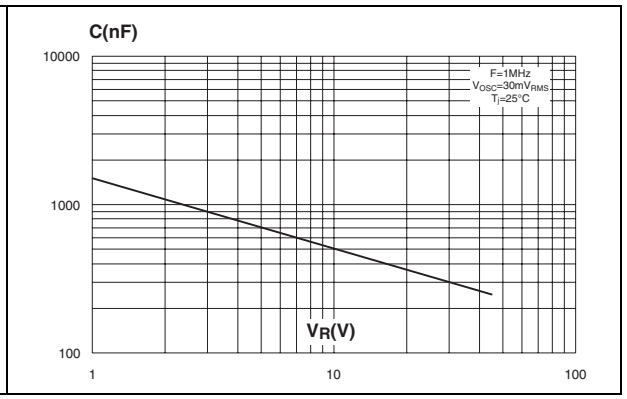


Figure 9. Forward voltage drop versus forward current (maximum values, per diode)

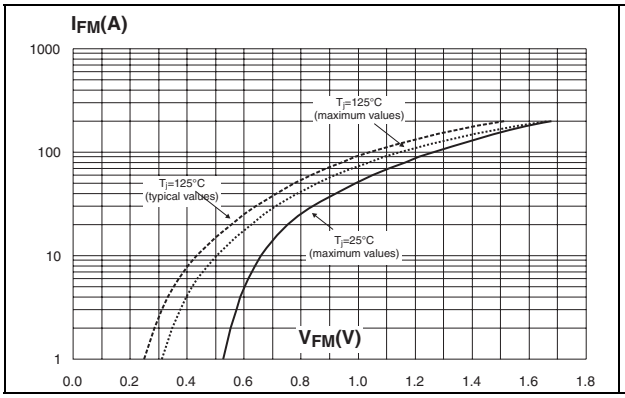
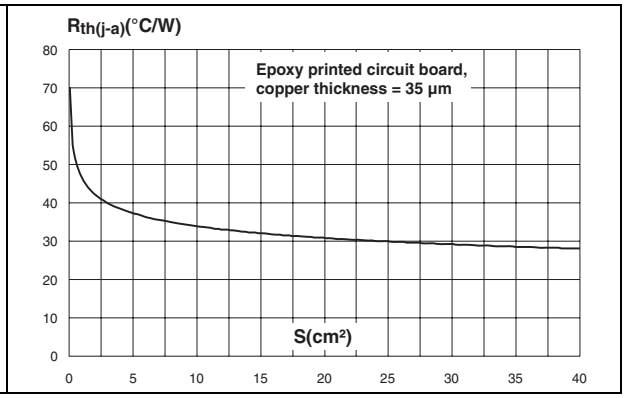


Figure 10. Thermal resistance junction to ambient versus copper surface under tab



2 Package information

- Epoxy meets UL94,V0
- Lead-free package

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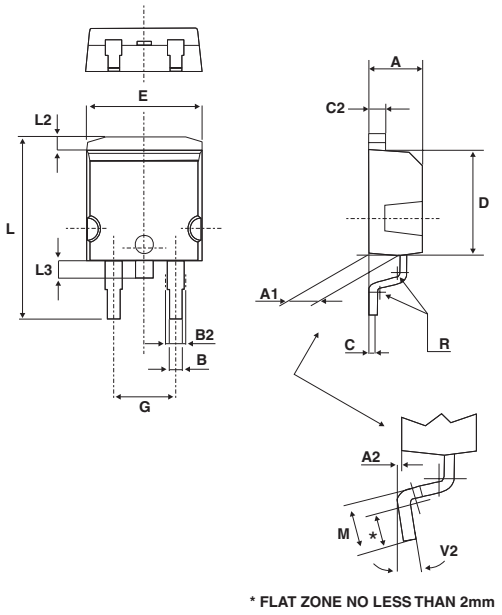
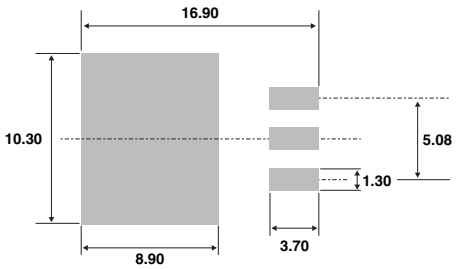
Table 5. Package dimensions D²PAK



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

Figure 11. Footprint dimensions (in millimeters)



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS3045CGY-TR	STPS3045CGY	D^2PAK	1.48 g	1000	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
24-May-2011	1	Initial release.

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