

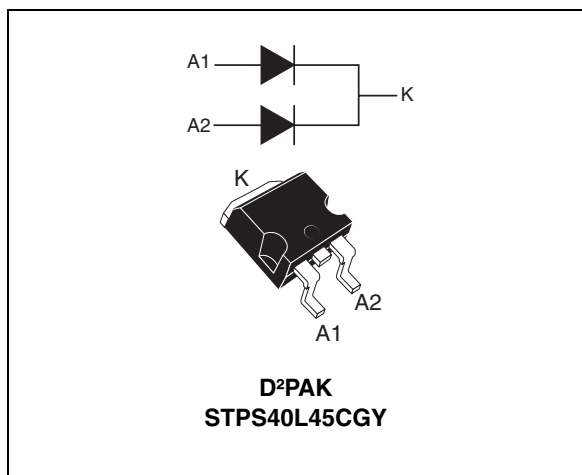
### Features

- Low forward voltage drop meaning very small conduction losses
- Low switching losses allowing high frequency operation
- Avalanche capability specified
- AEC-Q101 qualified

### Description

Dual center tap Schottky barrier rectifier designed for high frequency switched mode power supplies and DC to DC converters.

Packaged in D<sup>2</sup>PAK, this device is intended for use in low voltage, high frequency inverters, free-wheeling and polarity protection for automotive applications.



**Table 1. Device summary**

Symbol	Value
$I_{F(AV)}$	2 x 20 A
$V_{RRM}$	45 V
$T_j (max)$	150 °C
$V_F(max)$	0.49 V

# 1 Characteristics

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

Symbol	Parameter			Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage			45	V
I <sub>F(RMS)</sub>	Forward rms current			30	A
I <sub>F(AV)</sub>	Average forward current	T <sub>C</sub> =130 °C δ = 0.5	per diode per device	20 40	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal		230	A
I <sub>RRM</sub>	Repetitive peak reverse current	t <sub>p</sub> = 2 μs square F = 1 kHz		2	A
I <sub>RSM</sub>	Non repetitive peak reverse current	t <sub>p</sub> = 100 μs square		3	A
P <sub>ARM</sub>	Repetitive peak avalanche power	t <sub>p</sub> = 1 μs T <sub>j</sub> = 25 °C		8100	W
T <sub>stg</sub>	Storage temperature range			-65 to + 150	°C
T <sub>j</sub>	Operating junction temperature <sup>(1)</sup>			-40 to + 150	°C
dV/dt	Critical rate of rise of reverse voltage			10000	V/μs

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

**Table 3. Thermal resistances**

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode Total	1.5 0.8	$^{\circ}\text{C/W}$
$R_{th(c)}$	Coupling		0.1	$^{\circ}\text{C/W}$

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 4. Static electrical characteristics (per diode)**

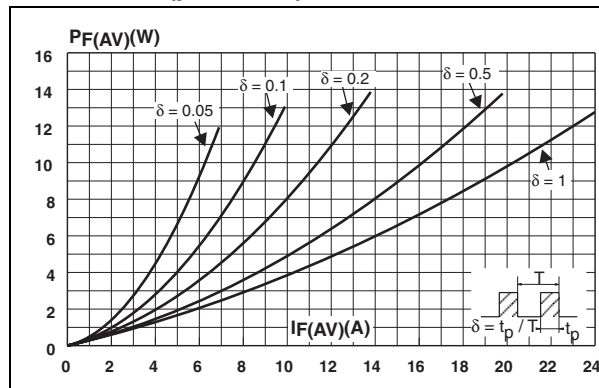
Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ }^{\circ}\text{C}$	$V_R = V_{RRM}$			0.6	mA
		$T_j = 125\text{ }^{\circ}\text{C}$			140	280	mA
$V_F^{(1)}$	Forward voltage drop	$T_j = 25\text{ }^{\circ}\text{C}$	$I_F = 20\text{ A}$			0.53	V
		$T_j = 125\text{ }^{\circ}\text{C}$	$I_F = 20\text{ A}$		0.42	0.49	
		$T_j = 25\text{ }^{\circ}\text{C}$	$I_F = 40\text{ A}$			0.69	
		$T_j = 125\text{ }^{\circ}\text{C}$	$I_F = 40\text{ A}$		0.6	0.7	

1. Pulse test:  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

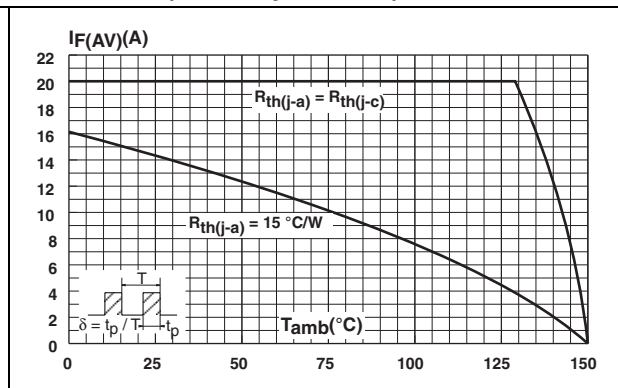
To evaluate the conduction losses use the following equation:

$$P = 0.28 \times I_{F(AV)} + 0.0105 I_{F(RMS)}^2$$

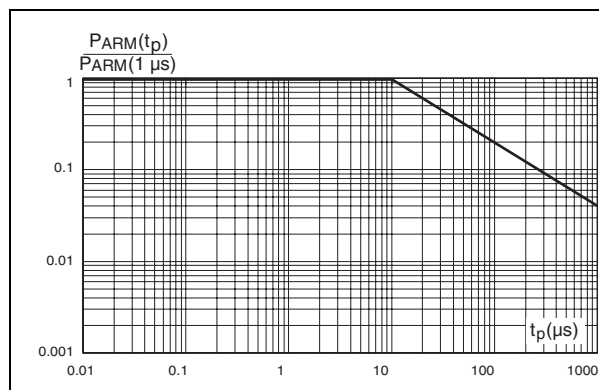
**Figure 1. Average forward power dissipation versus average forward current (per diode)**



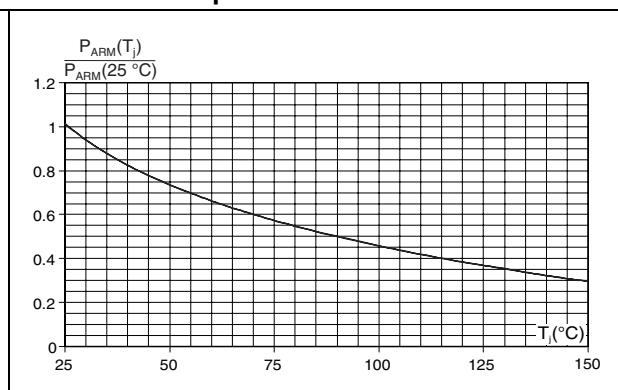
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ , per diode)**



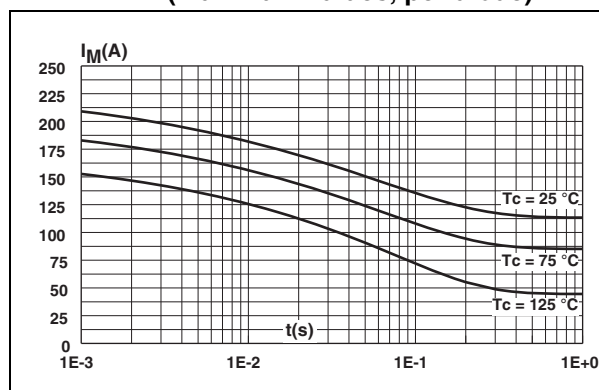
**Figure 3. Normalized avalanche power derating versus pulse duration**



**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**

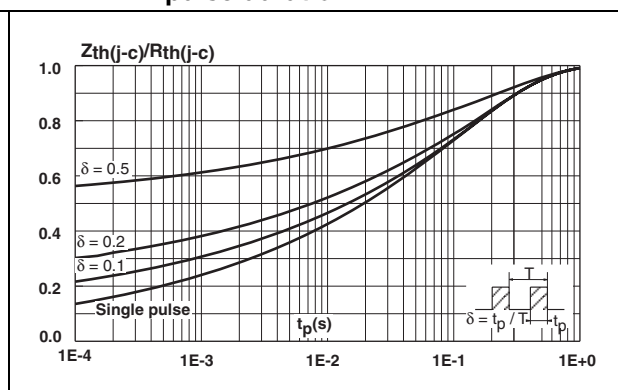


Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)

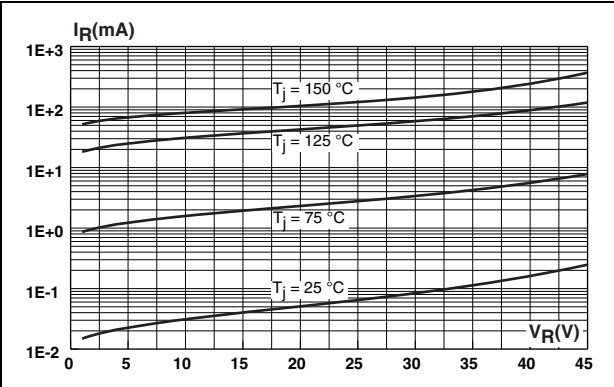


Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode)

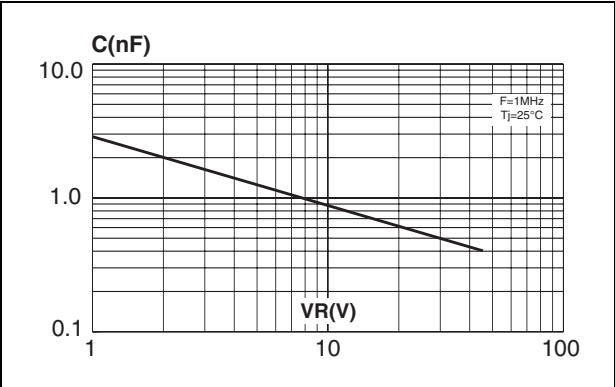


Figure 9. Forward voltage drop versus forward current (maximum values, per diode)

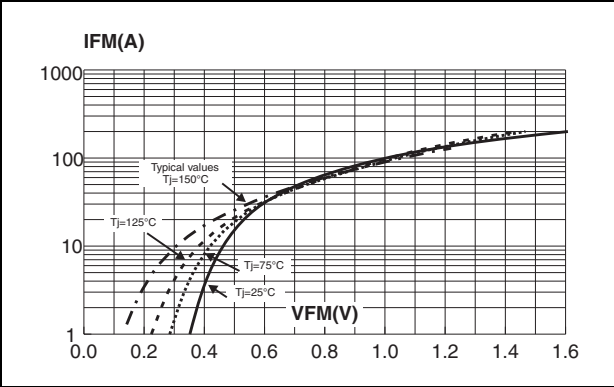
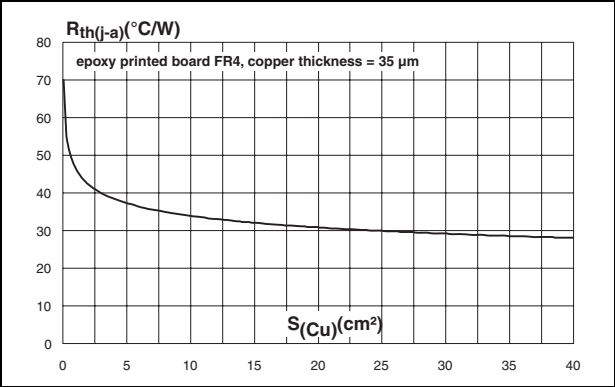


Figure 10. Thermal resistance junction to ambient versus copper surface under tab.



## 2 Package information

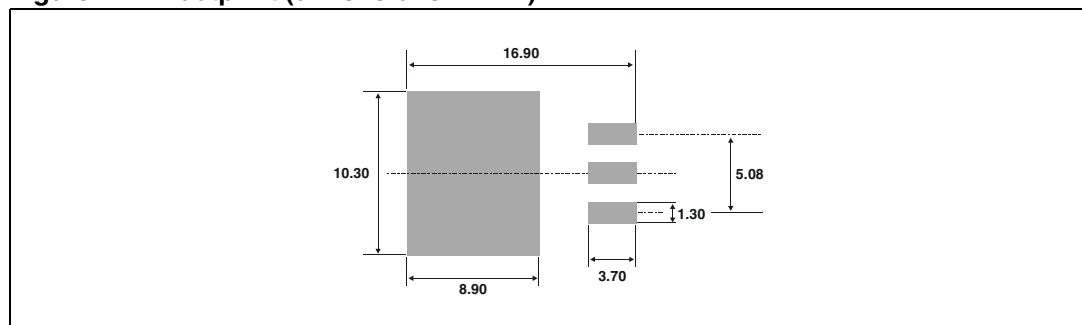
- Epoxy meets UL94, V0
- Cooling method: by conduction (C)

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**Table 5. D<sup>2</sup>PAK dimensions**

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 mm)**



### 3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS40L45CGY-TR	STPS40L45CGY	D <sup>2</sup> PAK	1.8 g	500	Tape and Reel

### 4 Revision history

Table 7. Document revision history

Date	Revision	Changes
25-Jun-2012	1	First issue.

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