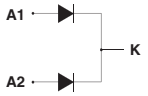
STPS20L60C-Y

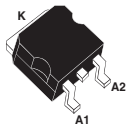
Automotive power Schottky rectifier

Datasheet – production data

Features

- Low forward voltage drop
- Negligible switching losses
- Low thermal resistance
- Avalanche capability specified
- AEC-Q101 qualified





D²PAK
STPS20L60CGY-TR

Description

This dual center tap Schottky rectifier is suited for switched mode power supplies and high frequency DC to DC converters.

Packaged in D²PAK, this device is intended for use in high frequency inverters for automotive applications.

Table 1. Device summary

$I_{F(AV)}$	2 x 10 A
V_{RRM}	60 V
$T_{j\ (max)}$	150 °C
$V_{F\ (max)}$	0.56 V

This is information on a product in full production. www.st.com

1 Characteristics

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

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			60	V
$I_{F(RMS)}$	Forward rms current			30	A
$I_{F(AV)}$	Average forward current	T_C = 140 °C δ = 0.5	Per diode Per device	10 20	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms, sinusoidal		220	A
I_{RRM}	Repetitive peak reverse current	t_p = 2 µs square, F = 1 kHz		1	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs, T_j = 25 °C		5800	W
T_{stg}	Storage temperature range			-65 to + 175	°C
T_j	Operating junction temperature range(1)			-40 to + 150	°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

Symbol	Parameter		Value	Unit
$R_{th\ (j-c)}$	Junction to case	Per diode Total	1.6 0.85	°C/W
$R_{th\ (c)}$	Coupling		0.1	°C/W

When the diodes 1 and 2 are used simultaneously:

$\Delta T_{j(diode\ 1)} = P_{(diode1)} \times R_{th(j-c)}(per\ diode) + P_{(diode2)} \times R_{th(c)}$

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	$V_R = V_{RRM}$			350	µA
		T_j = 125 °C			65	95	mA
V_F (1)	Forward voltage drop	T_j = 25 °C	I_F = 10 A			0.6	V
		T_j = 125 °C	I_F = 10 A		0.48	0.56	
		T_j = 25 °C	I_F = 20 A			0.74	
		T_j = 125 °C	I_F = 20 A		0.62	0.7	

1. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:

$P = 0.42 \times I_{F(AV)} + 0.014 \times I_F{}^2{}_{(RMS)}$

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

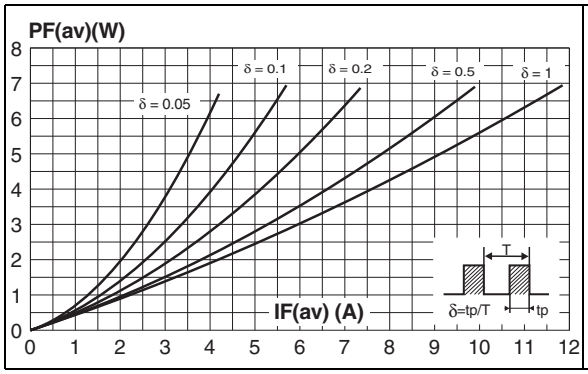


Figure 2. Average current versus ambient temperature (δ = 0.5) (per diode)

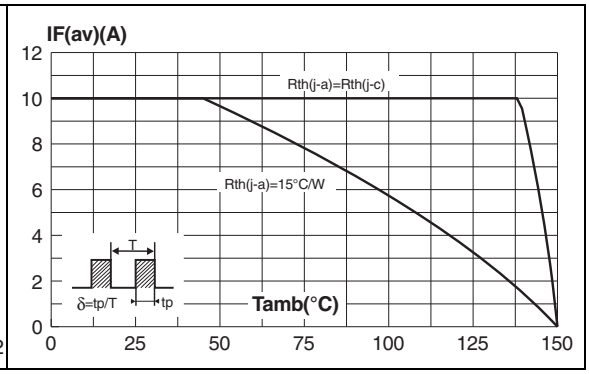


Figure 3. Normalized avalanche power derating versus pulse duration

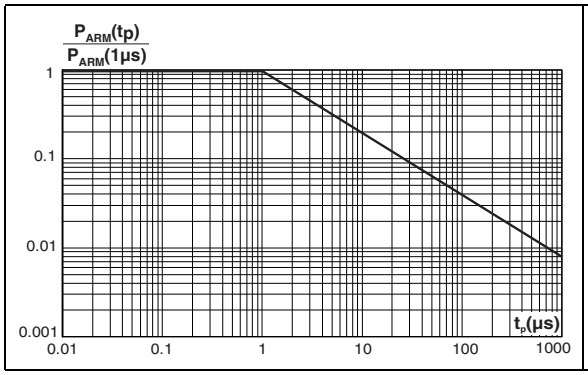


Figure 4. Normalized avalanche power derating versus junction temperature

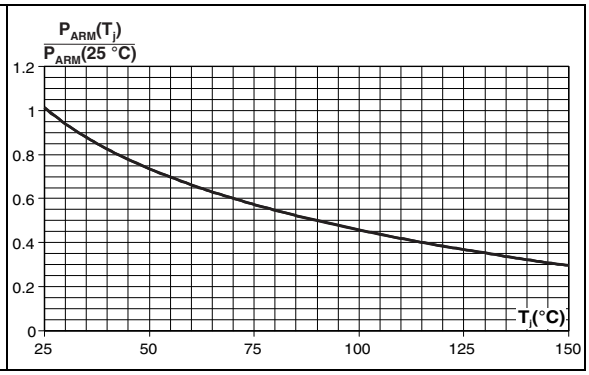


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

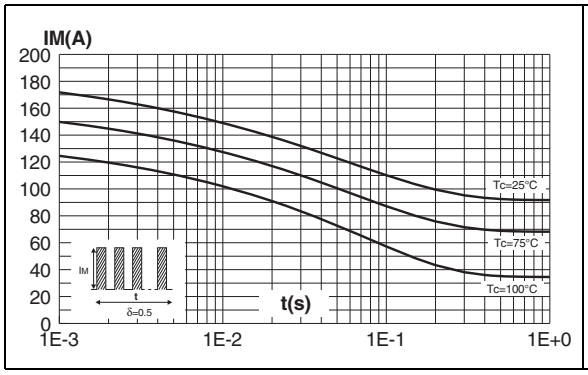


Figure 6. Relative variation of thermal transient impedance junction to case versus pulse duration

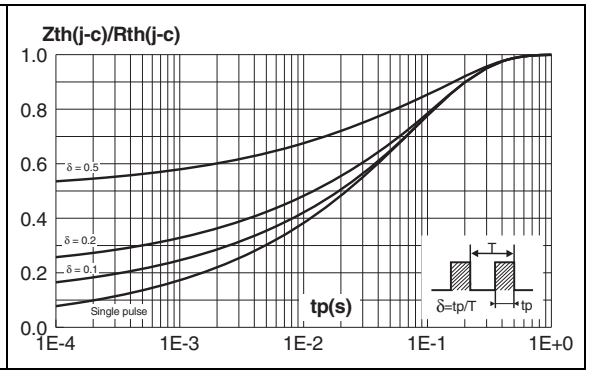


Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)

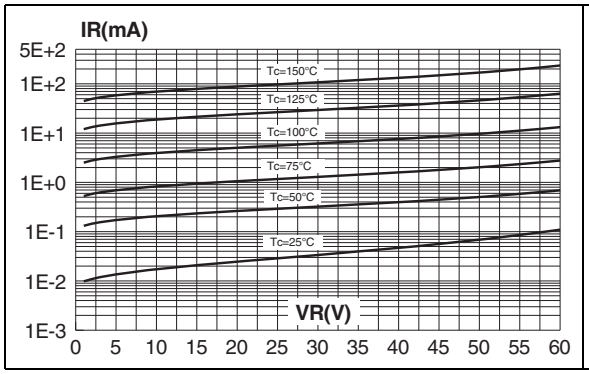


Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode)

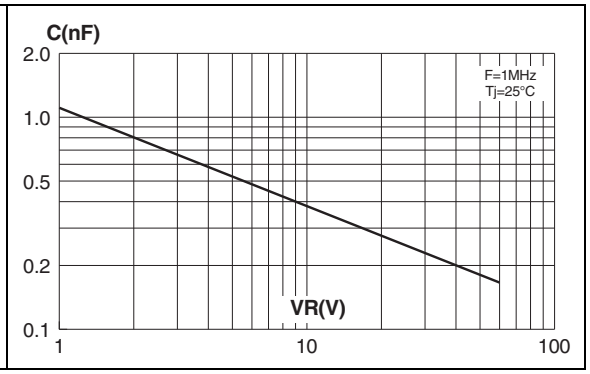
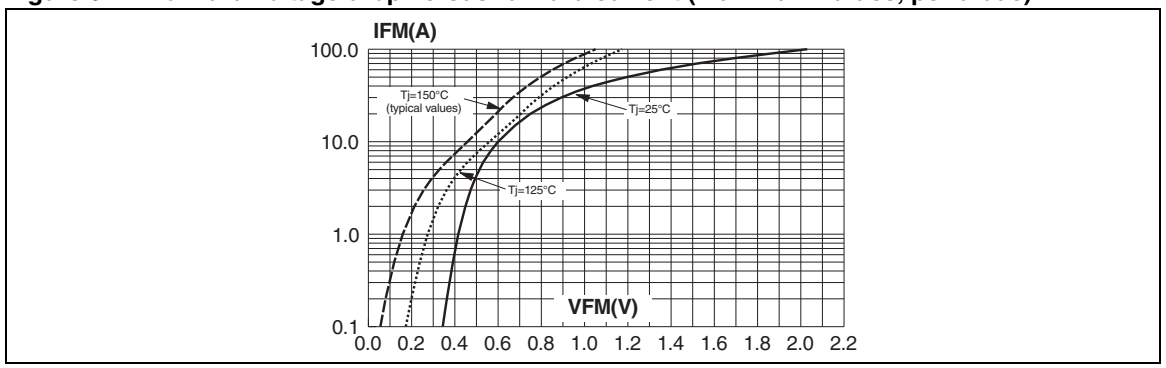


Figure 9. Forward voltage drop versus forward current (maximum values, per diode)

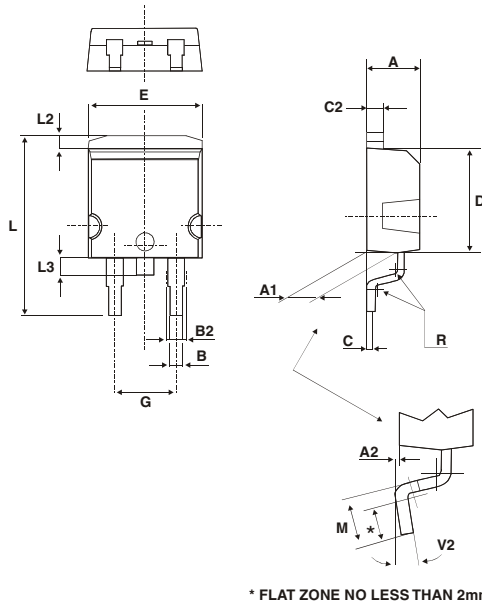


2 Package information

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

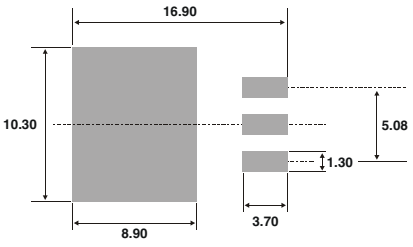
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK® is an ST trademark.

Table 5. D²PAK 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 10. Footprint (dimensions in mm)



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS20L60CGY-TR	STPS20L60CGY	D^2PAK	1.48 g	1000	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
24-Oct-2012	1	Initial release.

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