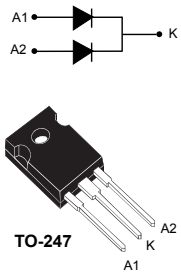
STPS61H100-Y

Datasheet

Automotive 100 V low drop power Schottky rectifier



Features

- AEC-Q101 qualified
- PPAP capable
- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Avalanche capability specified
- Low thermal resistance

Application

- DC/DC converters
- Freewheeling diodes
- Electrical vehicles (EV) and hybrid electrical vehicles

Description

The STPS61H100-Y is a dual center tap Schottky rectifier designed for high frequency switched mode power supplies such as on board DC/DC converters for automotive applications.

Product status link
STPS61H100-Y

Product summary	
$I_{F(AV)}$	2 x 30 A
V_{RRM}	100 V
$T_{j(max.)}$	175 °C
$V_{F(typ.)}$	0.63 V

1 Characteristics

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

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage	T_j = -40 to +175 °C	100	V
$I_{F(RMS)}$	Forward rms current		80	A
$I_{F(AV)}$	Average forward current, δ = 0.5 square wave	Per diode, T_c = 160 °C	30	A
		Per device, T_c = 160 °C	60	
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	450	A
P_{ARM}	Repetitive peak avalanche power	t_p = 10 µs, T_j = 125 °C	1900	W
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Operating junction temperature range(1)		-40 to +175	°C

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

Table 2. Thermal resistance parameters

Symbol	Parameter		Typ. value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	0.38	°C/W
		Per device	0.19	

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	$V_R = V_{RRM}$	-	3	16	µA
		T_j = 125 °C		-	4	16	mA
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 30 A	-	0.76	0.81	V
		T_j = 125 °C		-	0.63	0.7	
		T_j = 25 °C	I_F = 60 A	-	0.87	0.93	
		T_j = 125 °C		-	0.75	0.83	

1. *t_p = 5 ms, δ < 2%*
2. *t_p = 380 µs, δ < 2%*

To evaluate the conduction losses, use the following equation:

$P = 0.57 \times I_{F(AV)} + 0.0043 \times I_F{}^2{}_{(RMS)}$

1.1 Characteristics (curves)

Figure 1. Average forward current versus case temperature (δ = 0.5, per diode)

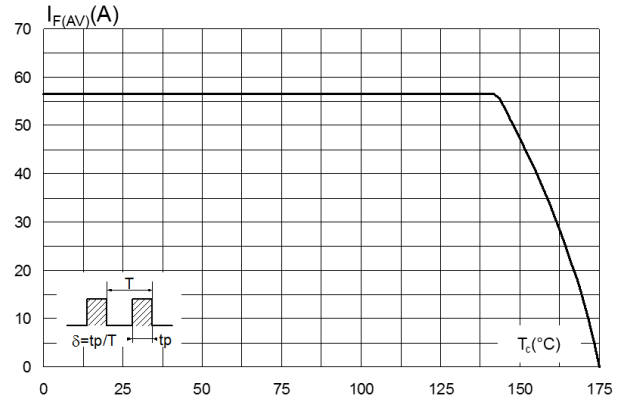


Figure 2. Relative variation of thermal impedance junction to case versus pulse duration

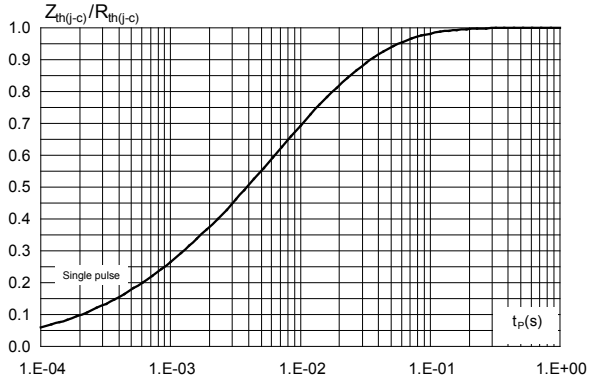


Figure 3. Reverse leakage current versus reverse voltage applied (typical values, per diode)

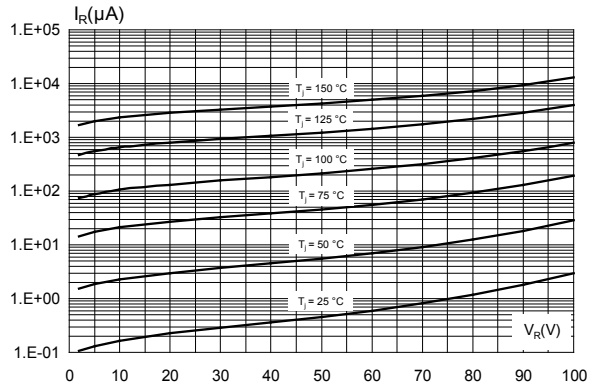


Figure 4. Junction capacitance versus reverse voltage applied (typical values, per diode)

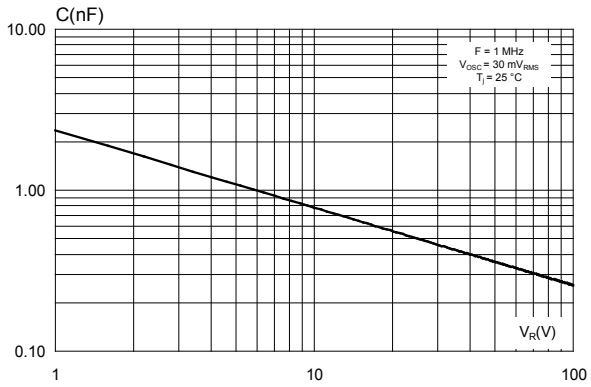


Figure 5. **Normalized avalanche power derating versus pulse duration (T_j = 125 °C)**

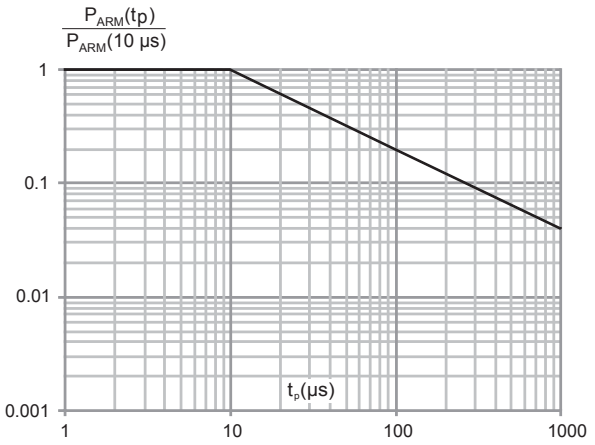
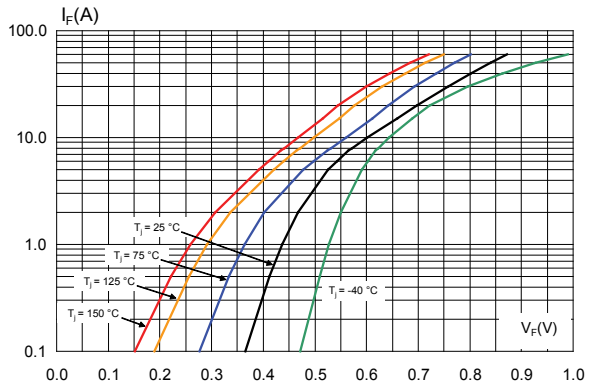


Figure 6. **Forward voltage drop versus forward current (typical values, per diode)**



2 Package information

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.

2.1 TO-247 package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.8 N·m
- Maximum torque value: 1.0 N·m

Figure 7. TO-247 package outline

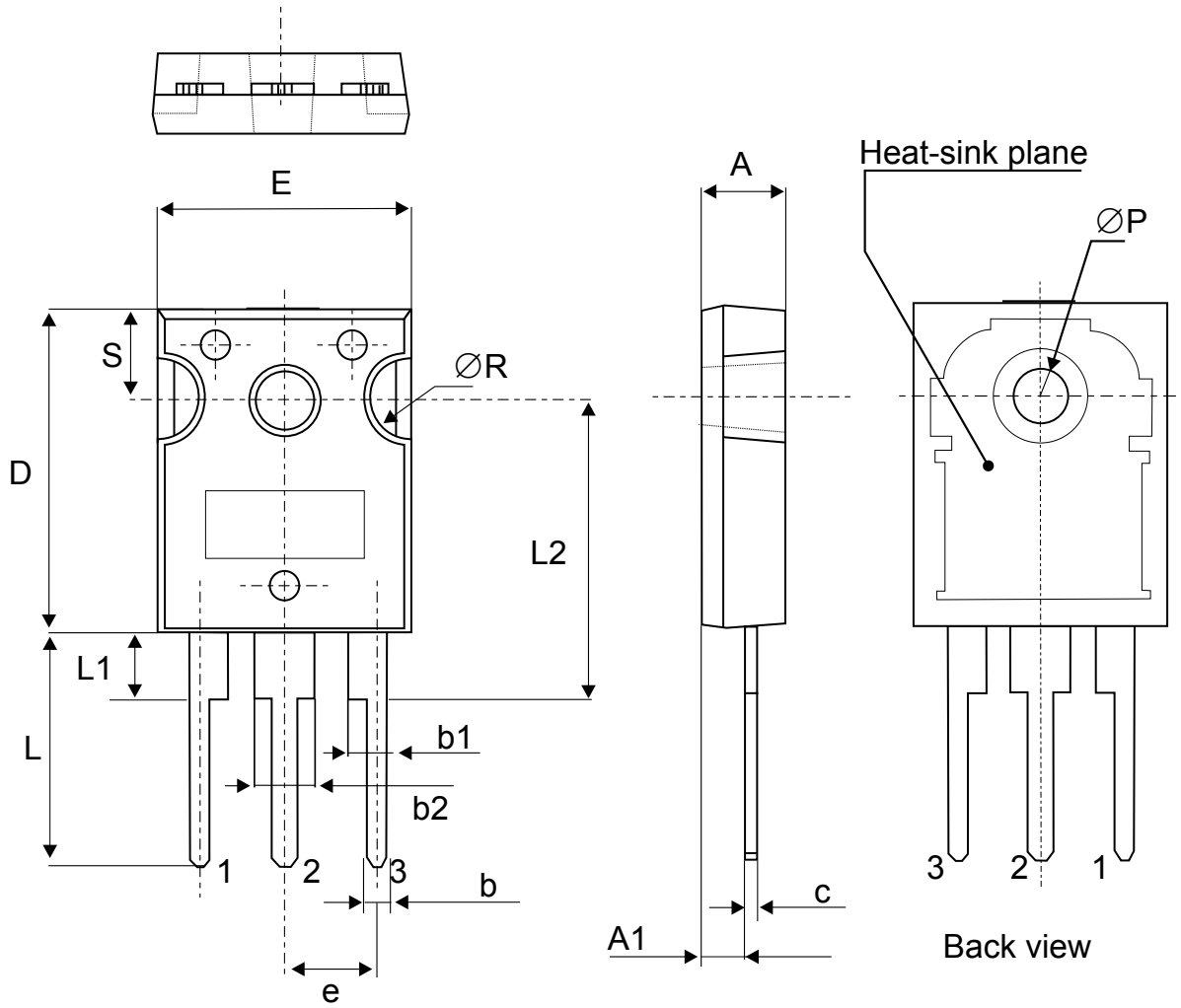


Table 4. **TO-247 package mechanical data**

Ref.	Dimensions					
	Millimeters			Inches (for reference only)		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
A1	2.20		2.60	0.086		0.102
b	1.00		1.40	0.039		0.055
b1	2.00		2.40	0.078		0.094
b2	3.00		3.40	0.118		0.133
c	0.40		0.80	0.015		0.031
D	19.85		20.15	0.781		0.793
E	15.45		15.75	0.608		0.620
e	5.30	5.45	5.60	0.209	0.215	0.220
L	14.20		14.80	0.559		0.582
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
ØP	3.55		3.65	0.139		0.143
ØR	4.50		5.50	0.177		0.217
S	5.30	5.50	5.70	0.209	0.216	0.224

3 Ordering information

Table 5. **Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS61H100CWY	STPS61H100CWY	TO-247	4.4 g	30	Tube

Revision history

Table 6. **Document revision history**

Date	Version	Changes
11-Jul-2019	1	Initial release.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

STMicroelectronics:

STPS61H100CWY