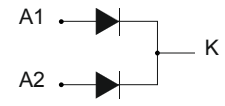
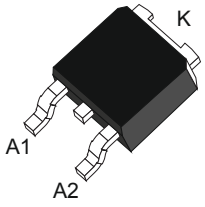
STPS15H100C-Y

Datasheet

Automotive high voltage power Schottky rectifier





DPAK



Features

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

Description

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

Packaged in DPAK, the STPS15H100C-Y is intended for use in high frequency LED head lamp circuits for automotive applications.

Product status	
STPS15H100C-Y	
Product summary	
Symbol	**Value**
$I_{F(AV)}$	2 x 7.5 A
V_{RRM}	100 V
$T_{j(max.)}$	175 °C
$V_{F(max.)}$	0.67 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			100	V
$I_{F(RMS)}$	Forward rms current			10	A
$I_{F(AV)}$	Average forward current	T_c = 150 °C, δ = 0.5 square wave	Per diode	7.5	A
		T_c = 145 °C, δ = 0.5 square wave	Per device	15	
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal		75	A
P_{ARM}	Repetitive peak avalanche power	t_p = 10 µs, T_j = 125 °C		475	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		Max. value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	4	°C/W
		Total	2.4	
$R_{th(c)}$	Coupling		0.7	

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 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	µA
		T_j = 125 °C		-	1.3	4	mA
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 7.5 A	-		0.8	V
		T_j = 125 °C		-	0.62	0.67	
		T_j = 25 °C	I_F = 12 A	-		0.85	
		T_j = 125 °C		-	0.68	0.73	
		T_j = 25 °C	I_F = 15 A	-		0.89	
		T_j = 125 °C		-	0.71	0.76	

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

To evaluate the conduction losses, use the following equation:
$P = 0.58 \times I_{F(AV)} + 0.012 \times I_F{}^2{}_{(RMS)}$

1.1 Characteristics (curves)

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

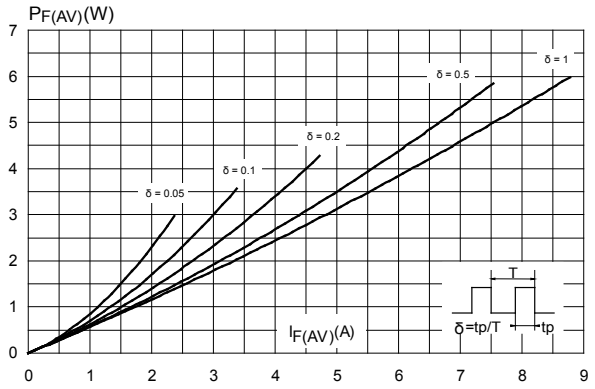


Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)

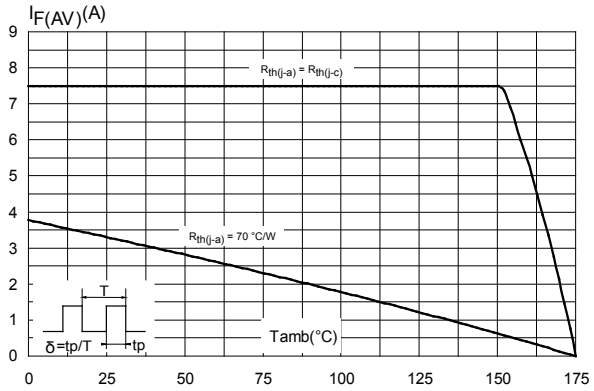


Figure 3. Normalized avalanche power derating versus pulse duration (T_j = 125 °C)

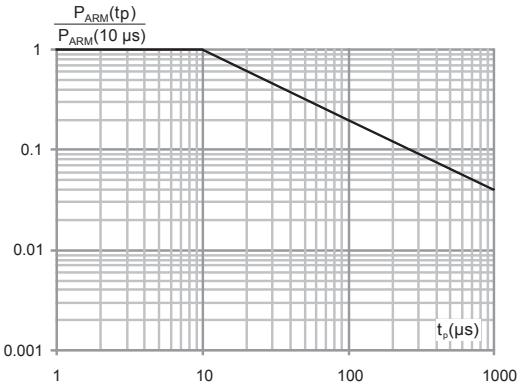


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

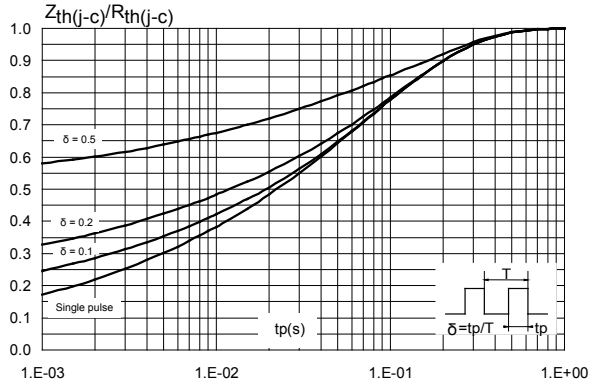


Figure 5. Reverse leakage current versus reverse voltage applied (typical values, per diode)

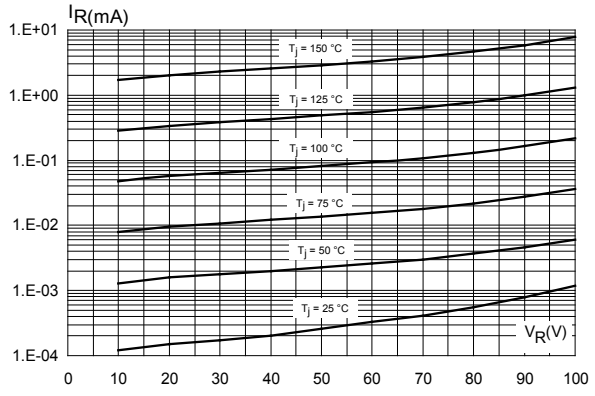


Figure 6. Junction capacitance versus reverse voltage applied (typical values, per diode)

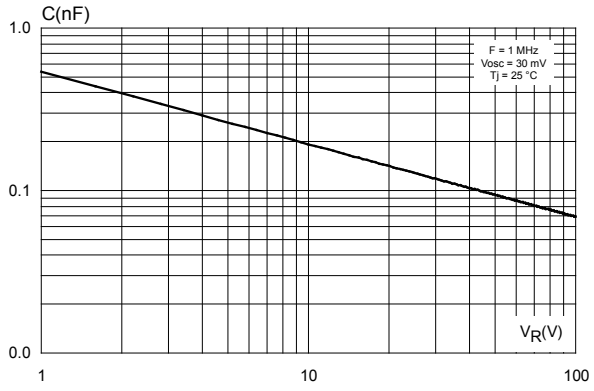


Figure 7. Forward voltage drop versus forward current (per diode)

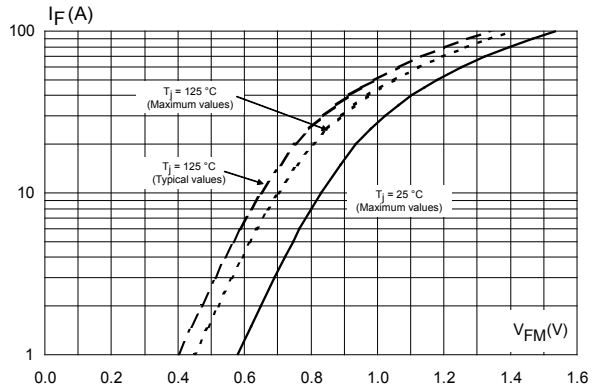
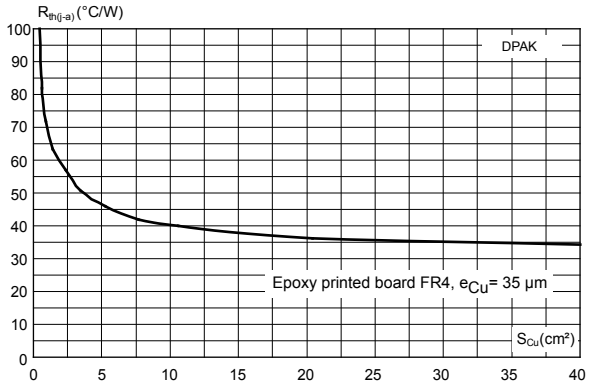


Figure 8. Thermal resistance junction to ambient versus copper surface under tab



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 DPAK package information

- Epoxy meets UL94, V0
- Lead-free packages

Figure 9. DPAK package outline

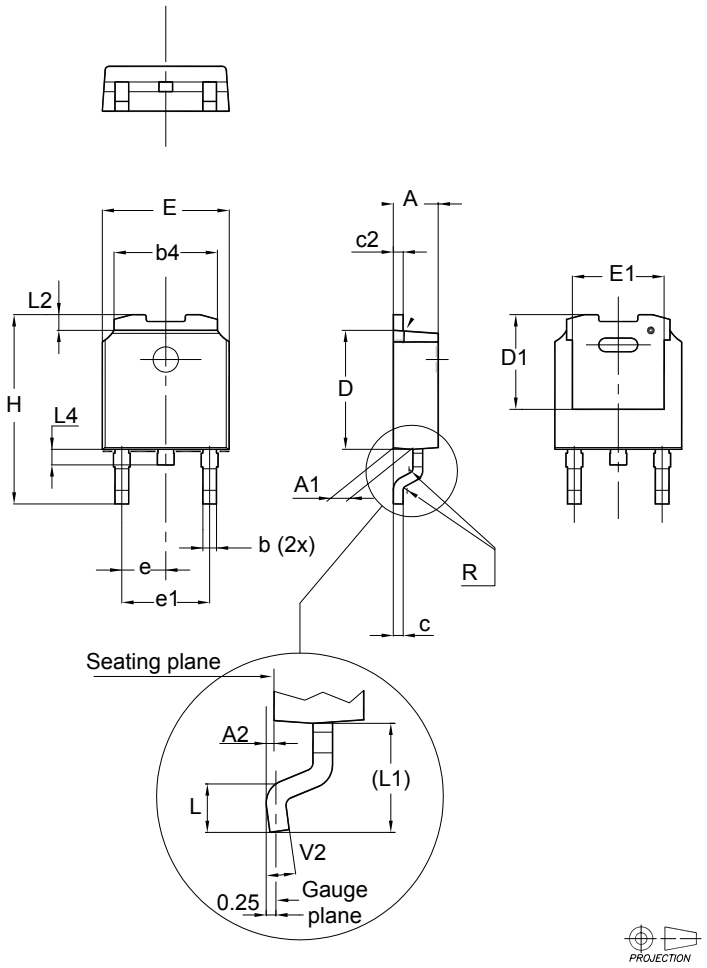
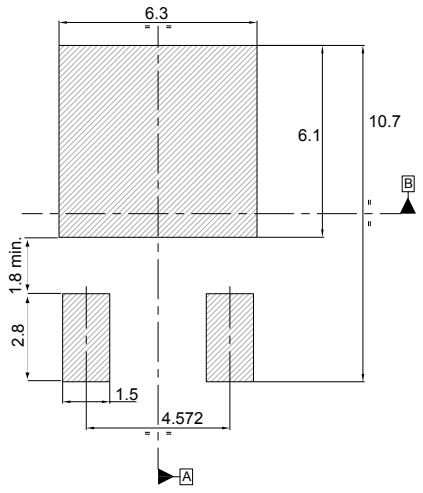


Table 4. DPAK mechanical data

Dim.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035		0.043
A2	0.03		0.23	0.001		0.009
b	0.64		0.90	0.025		0.035
b4	5.20		5.40	0.205		0.213
c	0.45		0.60	0.018		0.024
c2	0.48		0.60	0.019		0.024
D	6.00		6.20	0.236		0.244
D1	4.95	5.10	5.25	0.195	0.201	0.207
E	6.40		6.60	0.252		0.260
E1	4.60	4.70	4.80	0.181	0.185	0.189
e	2.16	2.28	2.40	0.085	0.090	0.094
e1	4.40		4.60	0.173		0.181
H	9.35		10.10	0.368		0.398
L	1.00		1.50	0.039		0.059
(L1)	2.60	2.80	3.00	0.102	0.110	0.118
L2	0.65	0.80	0.95	0.026	0.031	0.037
L4	0.60		1.00	0.024		0.039
R		0.20			0.008	
V2	0°		8°	0°		8°

Figure 10. DPAK recommended footprint (dimensions are in mm)



The device must be positioned within ⌖ 0.05 A B

3 Ordering Information

Table 5. Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS15H100CBY-TR	S15 H100Y	DPAK	0.30 g	2500	Tape and reel

Revision history

Table 6. Document revision history

Date	Version	Changes
04-Nov-2011	1	Initial release.
16-Apr-2018	2	Updated Figure 3. Normalized avalanche power derating versus pulse duration (T_j = 125 °C), Table 1. Absolute ratings (limiting values, per diode, at 25 °C unless otherwise specified) and Section ● Description. Removed figure 4.

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