STPS50U100C

Ultralow forward voltage power Schottky rectifier

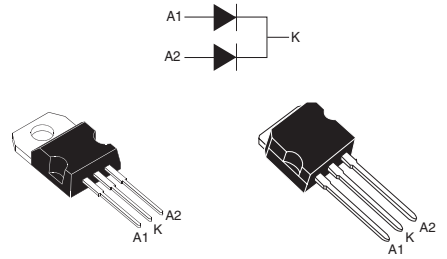
Features

- Ultralow forward voltage drop
- High current capability
- High frequency operation
- ECOPACK®2 compliant components

Description

The STPS50U100C is a dual power Schottky diode rectifier, suited for high frequency switch mode power supply.

Featuring an ultralow forward voltage drop, this device, packaged in TO-220AB and I²PAK, is intended to be used in notebook, game station and desktop adaptors as well as server SMPS. It has been especially designed to help power supply manufacturers meet the recently introduced worldwide efficiency standards.



TO-220AB
STPS50U100CT

I²PAK
STPS50U100CR

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 x 25 A
V_{RRM}	100 V
$V_{F(TYP)}$ @ 25 A @ 125 °C	0.64 V
$T_{j\ (max)}$	150 °C

1 Characteristics

Table 2. 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			50	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	T_C = 120 °C T_C = 105 °C	Per diode Per device	25 50	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms, half sine-wave		250	A
T_{stg}	Storage temperature range			-65 to + 150	°C
T_j	Maximum operating junction temperature(1)			150	°C

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

Symbol	Parameter		Value	Unit
$R_{th\ (j-c)}$	Junction to case	Per diode Per device	1.3 0.9	°C/W
$R_{th\ (c)}$	Coupling		0.45	°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

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R	Reverse leakage current	T_j = 25 °C	V_R = 70 V	-	15	-	µA
		T_j = 125 °C		-	10	-	mA
		T_j = 25 °C	$V_R = V_{RRM}$	-	30	200	µA
		T_j = 125 °C		-	15	40	mA
V_F	Forward voltage drop	T_j = 25 °C	I_F = 5 A	-	0.48	-	V
		T_j = 125 °C		-	0.38	-	
		T_j = 25 °C	I_F = 15 A	-	0.58	-	
		T_j = 125 °C		-	0.54	-	
		T_j = 25 °C	I_F = 25 A	-	0.67	0.73	
		T_j = 125 °C		-	0.64	0.7	

To evaluate the conduction losses use the following equation:

$P = 0.475 \times I_{F(AV)} + 0.009\ I_F^2{}_{(RMS)}$

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

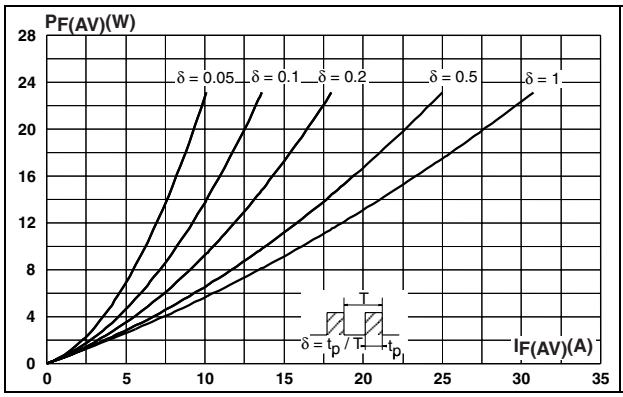


Figure 2. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

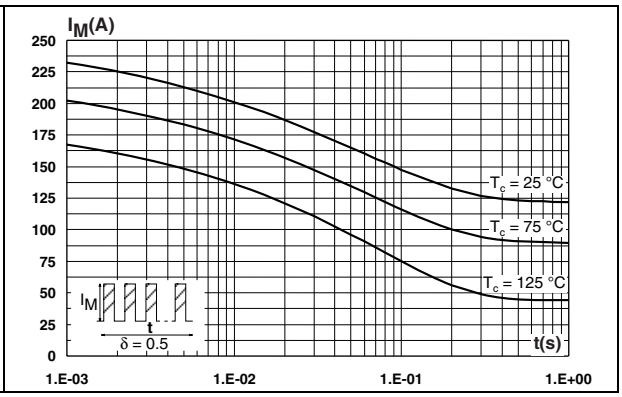


Figure 3. Reverse leakage current versus reverse voltage applied (typical values, per diode)

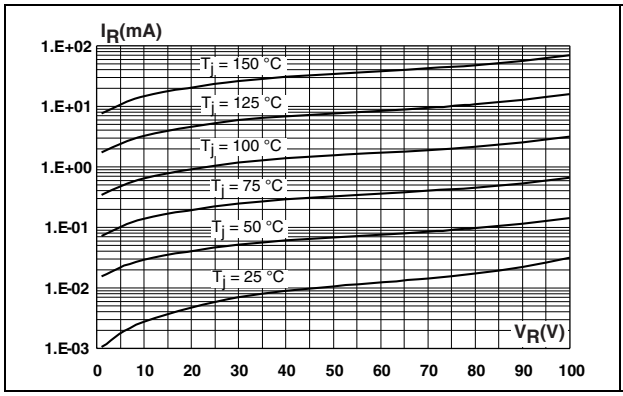


Figure 4. Average forward current versus ambient temperature (δ = 0.5, per diode)

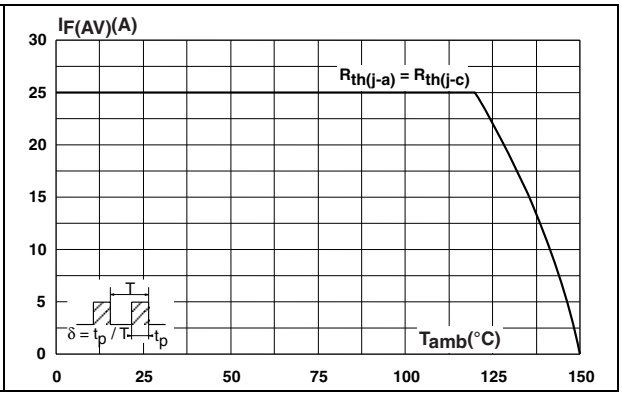


Figure 5. Relative variation of thermal impedance junction to case versus pulse duration

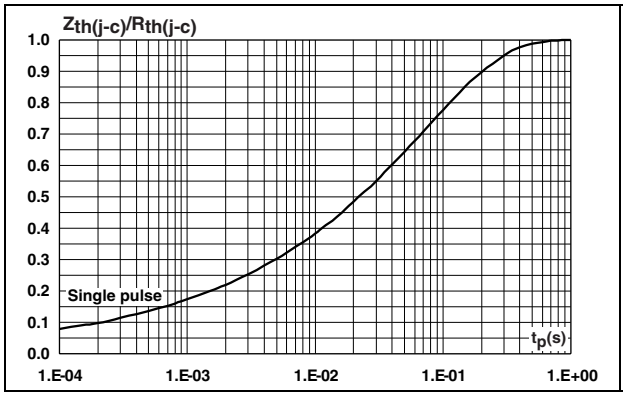
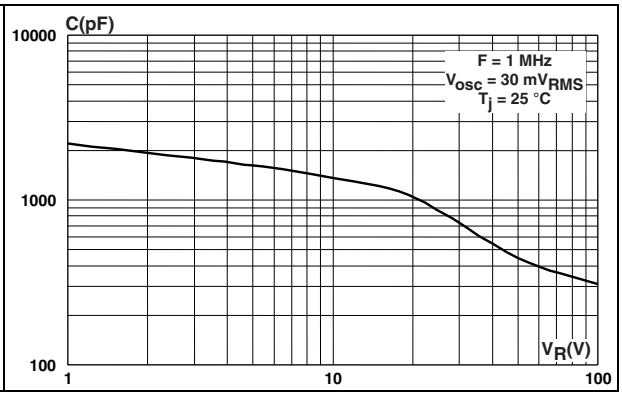


Figure 6. Junction capacitance versus reverse voltage applied (typical values, per diode)



4 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS50U100CT	STPS50U100C	TO-220AB	2.23 g	50	Tube
STPS50U100CR	STPS50U100C	I^2PAK	1.49 g	50	Tube