

Power Schottky rectifier

Features

- High current capability
- Avalanche rated
- Low forward voltage drop current
- High frequency operation

Description

This Schottky rectifier is suited for high frequency switch mode power supply.

Packaged in TO-220AB, D²PAK and I²PAK, this device is intended to be used in notebook, game station and desktop adaptors, providing in these applications a good efficiency at both low and high load.

Table 1. Device summary

I _{F(AV)}	2 x 20 A
V _{RRM}	100 V
T _j (max)	150 °C
V _F (typ)	0.435 V

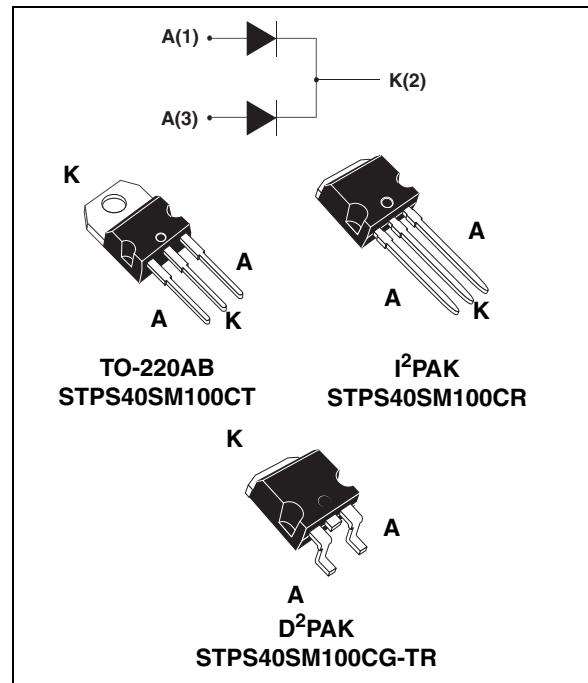
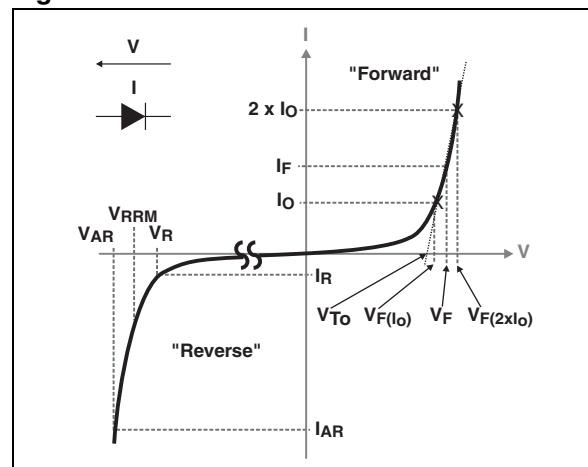


Figure 1. Electrical characteristics (a)



1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter	Value	Unit
V _{RRM}	Repetitive peak reverse voltage	100	V
I _{F(RMS)}	Forward current rms	60	A
I _{F(AV)}	Average forward current $\delta = 0.5$	T _c = 130 °C T _c = 125 °C	Per diode Per device
			20 40
I _{FSM}	Surge non repetitive forward current	t _p = 10 ms sinusoidal	530
P _{ARM⁽¹⁾}	Repetitive peak avalanche power	t _p = 1 µs T _j = 25 °C	18000
V _{ARM⁽²⁾}	Maximum repetitive peak avalanche voltage	t _p < 1 µs T _j < 150 °C I _{AR} < 45 A	120
V _{ASM⁽²⁾}	Maximum single pulse peak avalanche voltage	t _p < 1 µs T _j < 150 °C I _{AR} < 45 A	120
T _{stg}	Storage temperature range	-65 to + 175	°C
T _j	Maximum operating junction temperature ⁽³⁾	150	°C

Table 3. Thermal resistance

Symbol	Parameter	Value	Unit
R _{th(j-c)}	Junction to case	1.3	°C/W
		0.7	
R _{th(c)}	Coupling	0.1	

Table 4. Static electrical characteristics (per diode, at 25 °C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I _{R⁽¹⁾}	Reverse leakage current	T _j = 25 °C		7		µA
		T _j = 125 °C		7		mA
		T _j = 25 °C		13	45	µA
		T _j = 125 °C		13	45	mA
V _{F⁽²⁾}	Forward voltage drop	T _j = 25 °C		520		mV
		T _j = 125 °C		435		
		T _j = 25 °C		620	700	
		T _j = 125 °C		520	580	
		T _j = 25 °C		740	810	
		T _j = 125 °C		605	665	

1. Pulse test: t_p = 5 ms, δ < 2%2. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 0.580 \times I_{F(AV)} + 0.0043 \times I_{F(RMS)}^2$$

Figure 2. Average forward power dissipation versus average forward current (per diode)

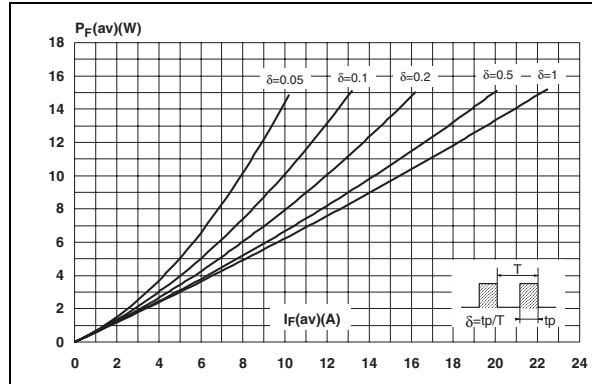


Figure 3. Average forward current versus ambient temperature ($\delta = 0.5$, per diode)

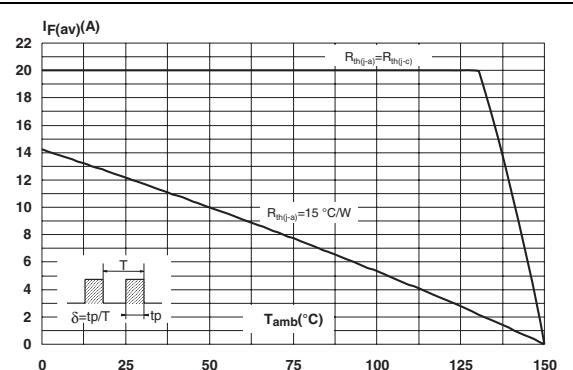


Figure 4. Normalized avalanche power derating versus pulse duration

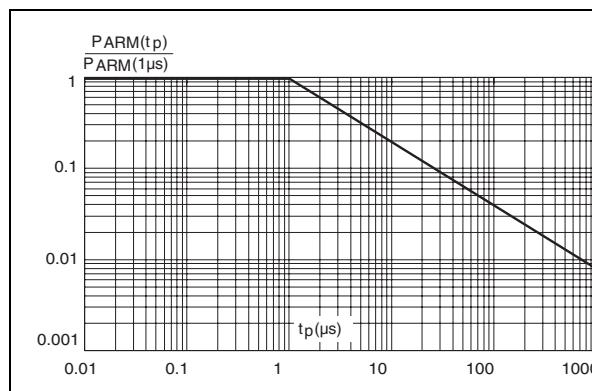


Figure 5. Normalized avalanche power derating versus junction temperature

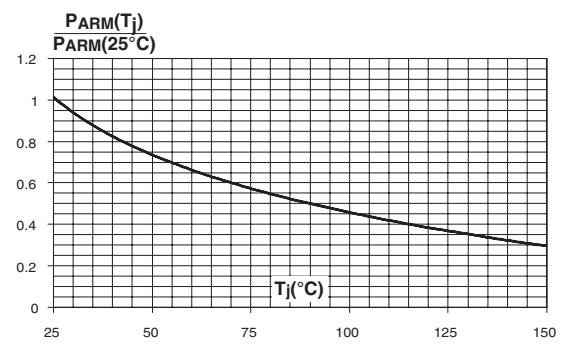


Figure 6. Non repetitive surge peak forward current versus overload duration, maximum values, per diode

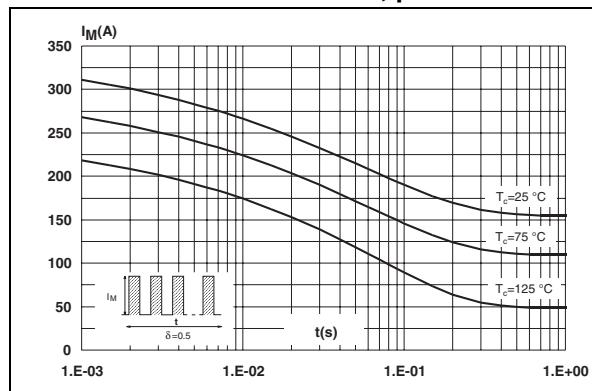
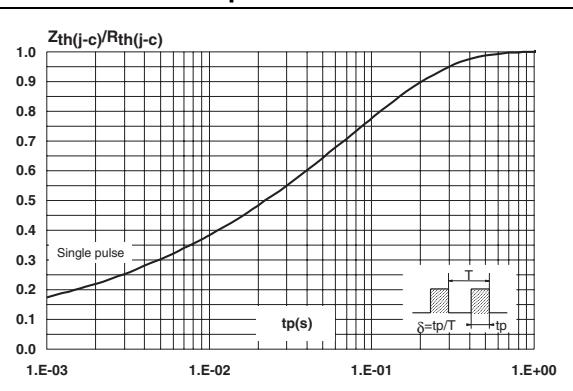


Figure 7. Relative variation of thermal impedance junction to case versus pulse duration



3 Ordering information

Table 8. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS40SM100CT	PS40SM100CT	TO-220AB	2.2 g	50	Tube
STPS40SM100CR	PS40SM100CR	I ² PAK	1.49 g	50	Tube
STPS40SM100CG	PS40SM100CG	D ² PAK	1.48 g	50	Tube
STPS40SM100CG-TR	PS40SM100CG	D ² PAK	1.48 g	1000	Tape and reel