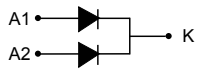
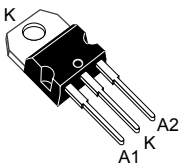
STPS20150C

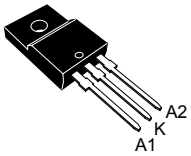
Datasheet

High voltage power Schottky rectifier

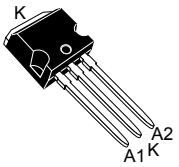




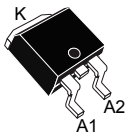
TO-220AB

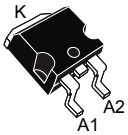


TO-220FPAB



I²PAK





D²PAK

Product status link	
STPS20150C	
Product summary	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	150 V
T_j (max)	175 °C
V_F (typ)	0.69 V

Features

- High junction temperature capability
- Good trade off between leakage current and forward voltage drop
- Low leakage current
- Avalanche capability specified
- Insulated package: TO-220FPAB
  - Insulating voltage = 2000 V_{RMS} sine
- ECOPACK®2 compliant component for D²PAK on demand

Description

Dual center tap Schottky rectifier designed for high frequency switch mode power supplies.

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				150	V
$I_{F(RMS)}$	Forward rms current				30	A
$I_{F(AV)}$	Average forward current δ = 0.5, square wave	TO-220AB, D^2PAK, I^2PAK	T_C = 155 °C	Per diode	10	A
		TO-220FPAB	T_C = 135 °C	Per diode		
		All types		Per device	20	
I_{FSM}	Surge non repetitive forward current	tp = 10 ms sinusoidal			180	A
P_{ARM}	Repetitive peak avalanche power	tp = 10 µs, T_j= 125 °C			480	W
T_{stg}	Storage temperature range				-65 to + 175	°C
T_j	Maximum operating junction temperature [1]				+ 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 parameter

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AB, D^2PAK, I^2PAK	Per diode	2.2	°C/W
		TO-220FPAB		4.5	
		TO-220AB, D^2PAK, I^2PAK	Total	1.3	
		TO-220FPAB		3.5	
$R_{th(c)}$	Coupling	TO-220AB, D^2PAK, I^2PAK	-	0.3	°C/W
		TO-220FPAB		2.5	

When the diodes 1 and 2 are used simultaneously :
$\Delta Tj(diode\ 1) = P(diode1) \times R_{th(j-c)}(Per\ diode) + P(diode\ 2) \times R_{th(c)}$

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	$V_R = V_{RRM}$	-		5.0	µA
		T_j = 125 °C		-		5.0	mA
V_F [2]	Forward voltage drop	T_j = 25 °C	I_F = 10 A	-		0.92	V
				-	0.69	0.75	
			I_F = 20A	-		1.0	
				-	0.79	0.86	

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: $P = 0.64 \times I_{F(AV)} + 0.011\ I_F^2{}_{(RMS)}$

1.1 Characteristics (curves)

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

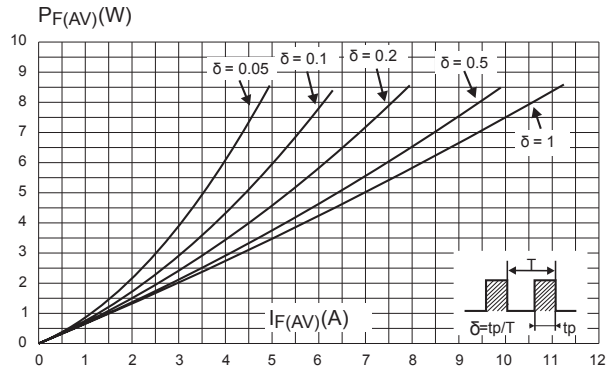


Figure 2. Average forward current versus ambient temperature (δ= 0.5, per diode)

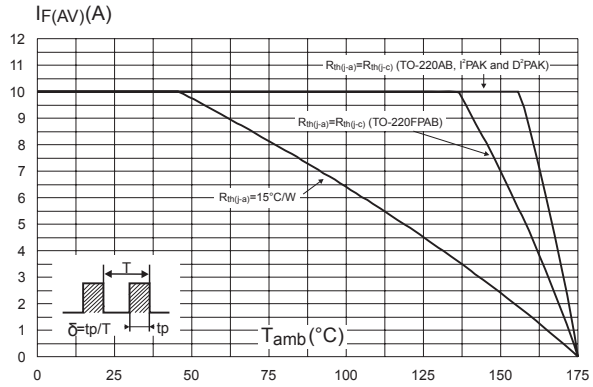


Figure 3. Normalized avalanche power derating versus pulse (T_j= 125 °C)

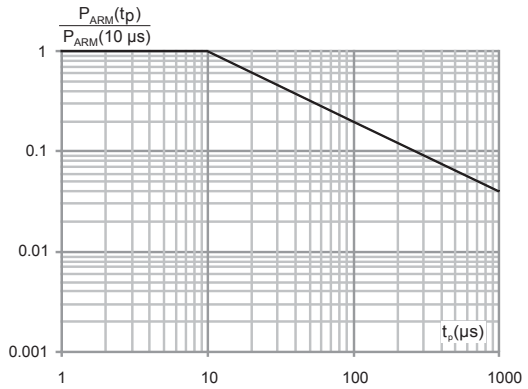


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration (per diode)

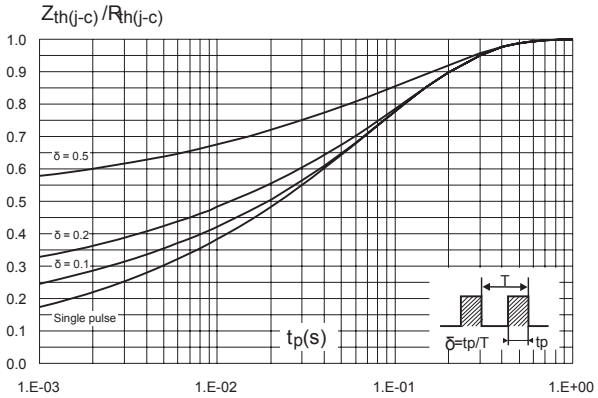


Figure 5. Relative variation of thermal impedance junction to case versus pulse duration (per diode)

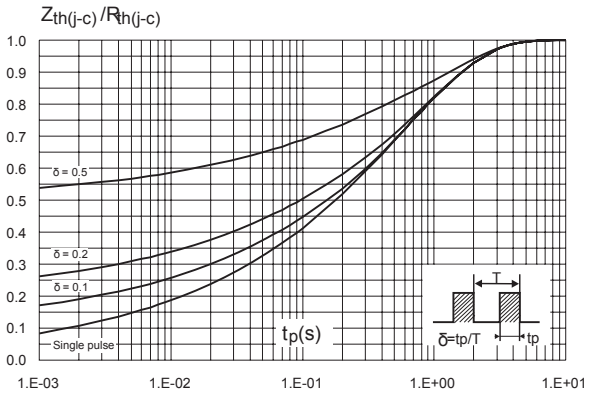
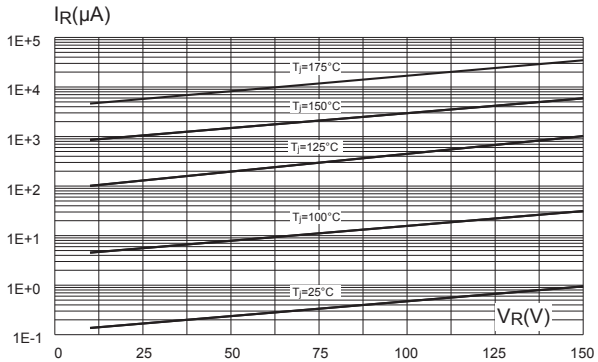


Figure 6. Reverse leakage current versus reverse voltage applied (typical values, per diode)



3 Ordering information

Table 8. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS20150CT	STPS20150CT	TO-220AB	1.95 g	50	Tube
STPS20150CFP	STPS20150CFP	TO-220FPAB	1.9 g	50	Tube
STPS20150CR	STPS20150CR	I^2PAK	1.5 g	50	Tube
STPS20150CG-TR	STPS20150CG	D^2PAK	1.38 g	1000	Tape and reel
STPS20150CG	STPS20150CG	D^2PAK	1.38 g	50	Tube