

## Power Schottky rectifier

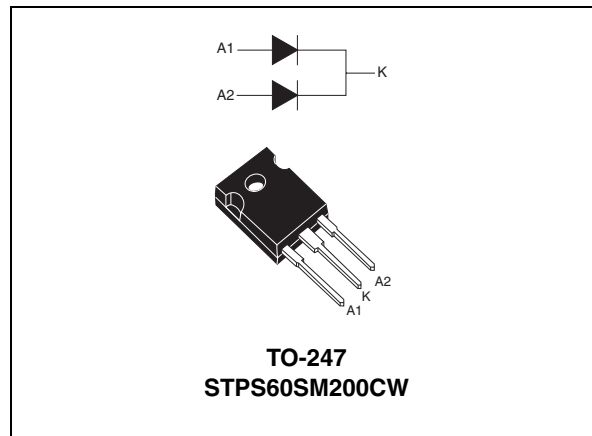
### Features

- High reverse voltage (200 V)
- Low forward voltage drop
- High frequency operation

### Description

The STPS60SM200C is a dual Schottky rectifier suited for high frequency switched-mode power supply.

Housed in TO-247, this device is especially suited for use in telecom base station SMPS, providing these applications with a good efficiency at both low and high load.



**Table 1. Device summary**

Symbol	Value
$I_{F(AV)}$	2 x 30 A
$V_{RRM}$	200 V
$T_j$ (max)	175 °C
$V_F$ (typ)	640 mV

# 1 Characteristics

**Table 2. Absolute ratings (limiting values per diode at 25 °C, unless otherwise specified)**

Symbol	Parameter		Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage		200	V
I <sub>F(RMS)</sub>	Forward current rms		50	A
I <sub>F(AV)</sub>	Average forward current δ = 0.5	Per diode, δ = 0.5	T <sub>C</sub> = 155 °C	A
		per device, δ = 0.5	T <sub>C</sub> = 150 °C	
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal, T <sub>C</sub> = 25 °C	500	A
T <sub>stg</sub>	Storage temperature range		-65 to + 175	°C
T <sub>j</sub>	Maximum operating junction temperature <sup>(1)</sup>		-40 to + 175	°C

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

**Table 3. Thermal resistance**

Symbol	Parameter		Value	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	0.7	°C/W
		Total	0.5	
R <sub>th(c)</sub>	Coupling		0.3	

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

**Table 4. Static electrical characteristics (per diode)**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> <sup>(1)</sup>	Reverse leakage current	T <sub>j</sub> = 25 °C	V <sub>R</sub> = V <sub>RRM</sub>			0.05	mA
		T <sub>j</sub> = 125 °C			6	13	
V <sub>F</sub> <sup>(2)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 7.5 A		0.67	0.70	V
		T <sub>j</sub> = 125 °C			0.51	0.55	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 15 A		0.73	0.77	
		T <sub>j</sub> = 125 °C			0.57	0.61	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 30 A		0.79	0.83	
		T <sub>j</sub> = 125 °C			0.64	0.69	

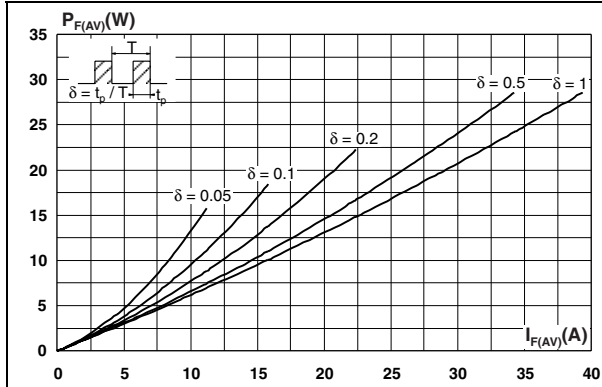
1. Pulse test: t<sub>p</sub> = 5 ms, δ < 2%

2. Pulse test: t<sub>p</sub> = 380 μs, δ < 2%

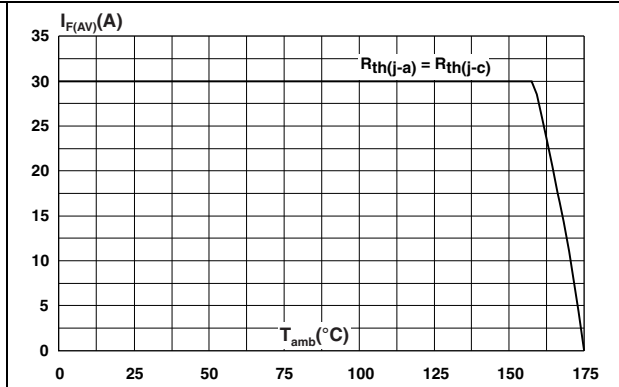
To evaluate the conduction losses use the following equation:

$$P = 0.58 \times I_{F(AV)} + 0.0037 \times I_{F(RMS)}^2$$

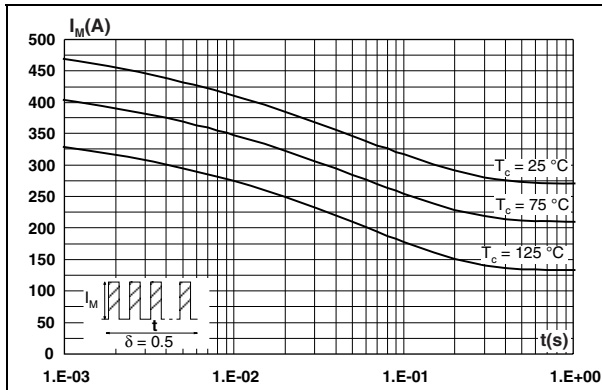
**Figure 1. Average forward power dissipation versus average forward current (per diode)**



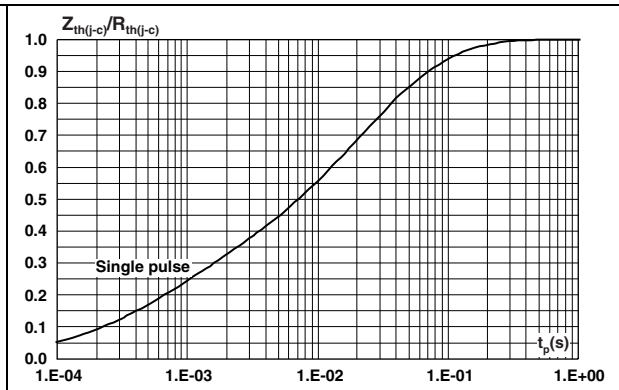
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )**



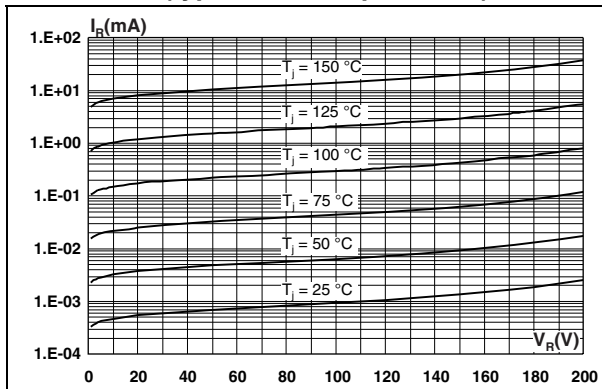
**Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)**



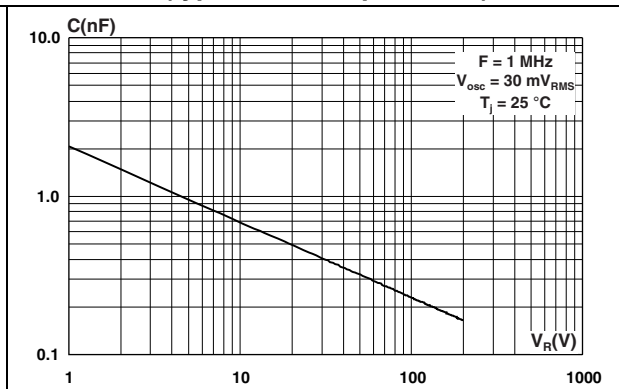
**Figure 4. Relative variation of thermal impedance junction to case versus pulse duration**



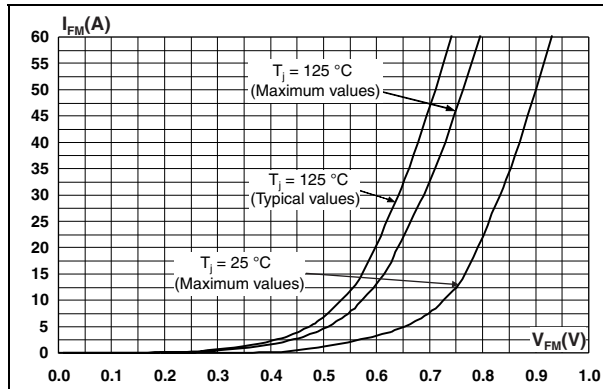
**Figure 5. Reverse leakage current versus reverse voltage applied (typical values, per diode)**



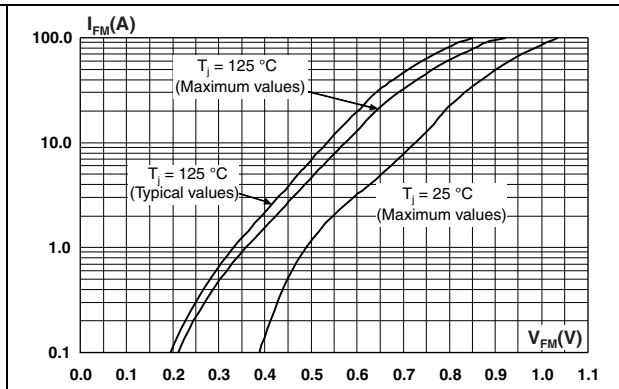
**Figure 6. Junction capacitance versus reverse voltage applied (typical values, per diode)**



**Figure 7. Forward voltage drop versus forward current (per diode, low level)**



**Figure 8. Forward voltage drop versus forward current (per diode, high level)**



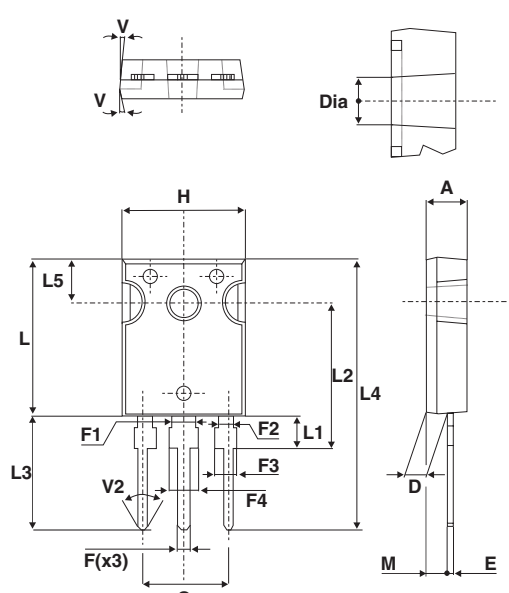
## 2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.55 to 1.0 N·m

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**Table 5. TO-247 dimensions**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.85	5.16	0.191	0.203
D	2.20	2.60	0.086	0.102
E	0.40	0.80	0.015	0.031
F	1.00	1.40	0.039	0.055
F1	3.00 typ.		0.118 typ.	
F2	2.00 typ.		0.079 typ.	
F3	1.90	2.40	0.075	0.094
F4	3.00	3.40	0.118	0.134
G	10.90 typ.		0.429 typ.	
H	15.45	16.03	0.608	0.631
L	19.85	21.09	0.781	0.830
L1	3.70	4.30	0.146	0.169
L2	18.30	19.13	0.720	0.753
L3	14.20	20.30	0.559	0.799
L4	34.05	41.38	1.341	1.629
L5	5.35	6.30	0.211	0.248
M	2.00	3.00	0.079	0.118
V	5° typ.		5° typ.	
V2	60° typ.		60° typ.	
Dia.	3.55	3.65	0.140	0.144



### 3 Ordering information

**Table 6. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS60SM200CW	STPS60SM200CW	TO-247	4.45 g	30	Tube

### 4 Revision history

**Table 7. Document revision history**

Date	Revision	Changes
17-May-2011	1	First issue.

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