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SEMICONDUCTOR



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PLED

STPS4S200xx-MS

Product specification

Description

Single chip Schottky rectifier suited for switch mode power supplies and high frequency DC to DC converters. Packaged in SMB Flat Notch, SMB Flat, SMC and DPAK, the STPS4S200S-MS is ideal for surface mounting and used in low voltage, high frequency inverters, free wheeling and polarity protection applications.

Features

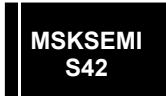
- Negligible switching losses
- High junction temperature capability
- Very small conduction losses
- Low leakage current
- $T_j = -40\text{ }^{\circ}\text{C}$ minimum operating

Applications

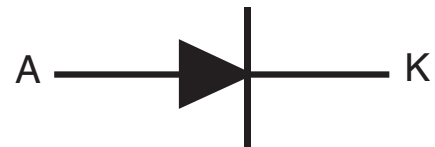
- Inverter
- Lighting
- Battery charger
- Telecom power
- Home appliance

Reference News

STPS4S200B-MS	MARKING
 TO-252	

STPS4S200S-MS	MARKING
 DO-214AB(SMC)	

STPS4S200UF-MS	MARKING
 SMBF	



Device summary

Symbol	Value
$I_F(AV)$	4 A
V_{RRM}	200 V
$T_{j(max.)}$	175 $^{\circ}\text{C}$
$V_F(typ.)$	0.64 V

Characteristics

Absolute ratings (limiting values at 25 °C, unless otherwise specified)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			200	V
I _{F(RMS)}	Forward rms current			10	A
I _{F(AV)}	Average forward current, $\delta = 0.5$, square wave	SMC, SMBF	T _L = 125 °C	4	A
		TO-252	T _c = 160°C		
I _{FSM}	Surge non repetitive forward current			130	A
	t _p = 10 ms sinusoidal				
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.

Thermal resistance parameter

Symbol	Parameter		Max. value	Unit
R _{th(j-l)}	Junction to lead (SMB Flat Notch, SMC, SMB Flat)		15	°C/W
R _{th(j-c)}	Junction to case	TO-252	3.2	

For more information, please refer to the following application note :

- AN5088 : Rectifiers thermal management, handling and mounting recommendations

Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I _R (1)	Reverse leakage current	T _j = 25 °C	V _R = V _{RRM}	-		5	μA
		T _j = 125 °C		-	0.70	2.50	mA
V _F (2)	Forward voltage drop	T _j = 25 °C	I _F = 4 A	-		0.87	V
		T _j = 125 °C		-	0.64	0.71	

1. Pulse test: t_p = 5 ms, $\delta < 2\%$

2. Pulse test: t_p = 380 μs, $\delta < 2\%$

To evaluate the conduction losses, use the following equation: P = 0.63 x

$$I_{F(AV)} + 0.020 \times I_{F(RMS)}^2$$

For more information, please refer to the following application notes related to the power losses :

- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

Characteristics (curves)

Figure 1. Average forward power dissipation versus average forward current

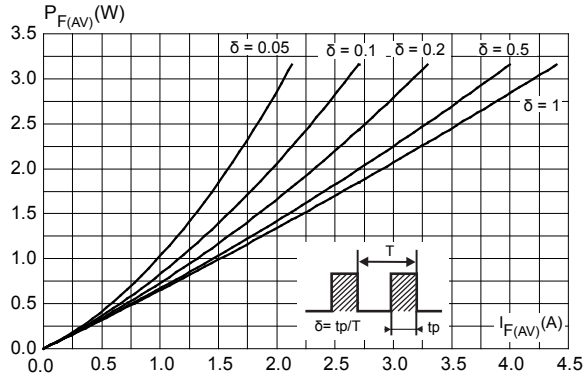


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)

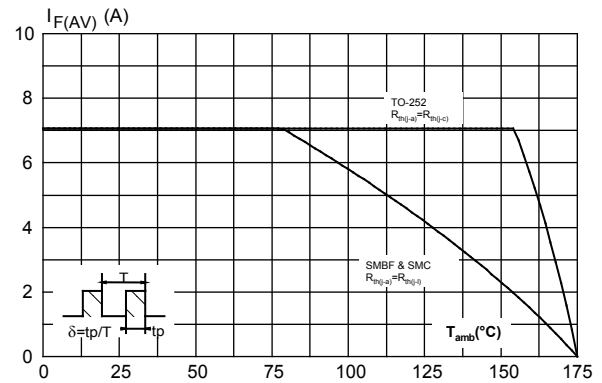


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration (TO-252)

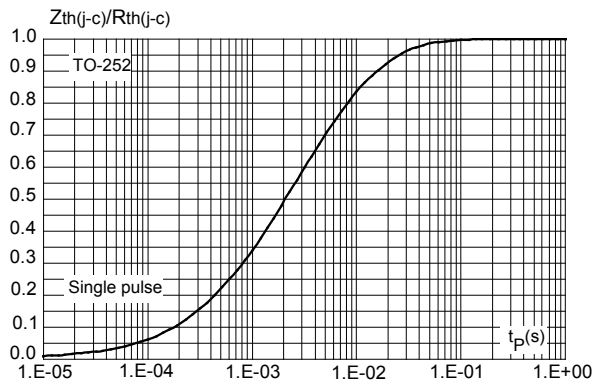


Figure 4. Relative variation of thermal impedance junction to lead versus pulse duration (SMBF)

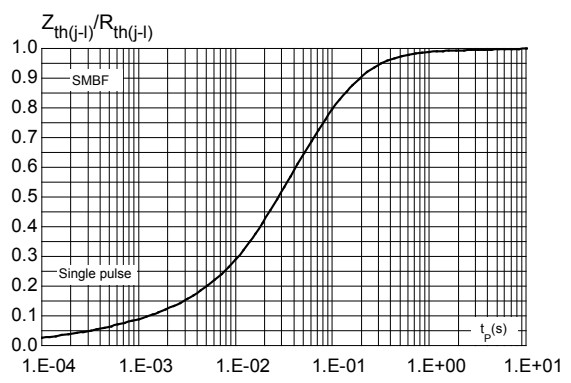


Figure 5. Relative variation of thermal impedance junction to lead versus pulse duration (SMC)

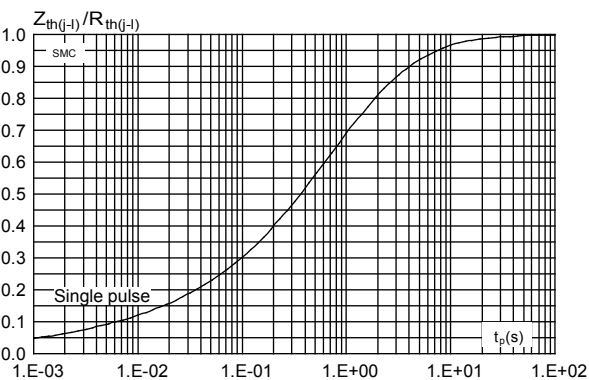


Figure 6. Reverse leakage current versus reverse voltage applied (typical values)

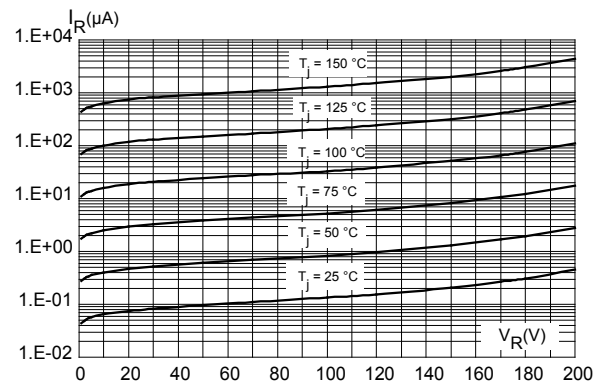


Figure 7. Junction capacitance versus reverse voltage applied (typical values)

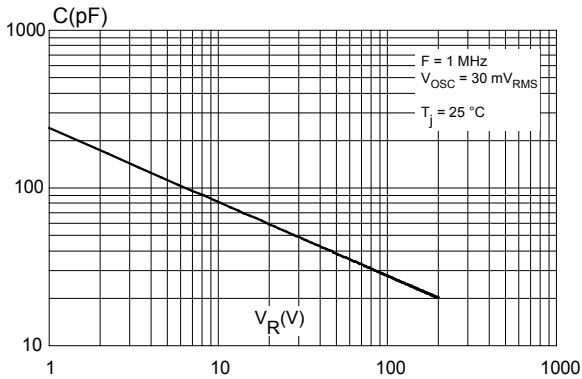


Figure 8. Forward voltage drop versus forward current (typical values)

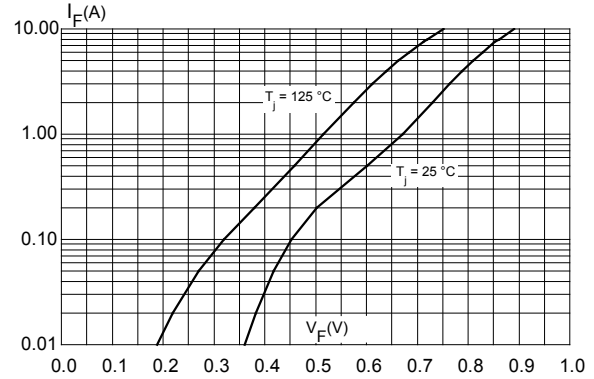


Figure 9. Forward voltage drop versus forward current (maximum values)

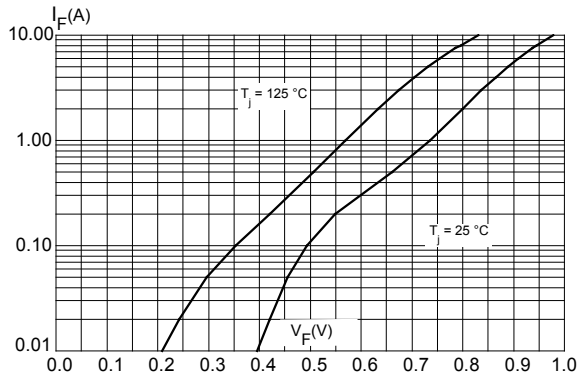


Figure 10. Thermal resistance junction to ambient versus copper surface under tab (TO-252)

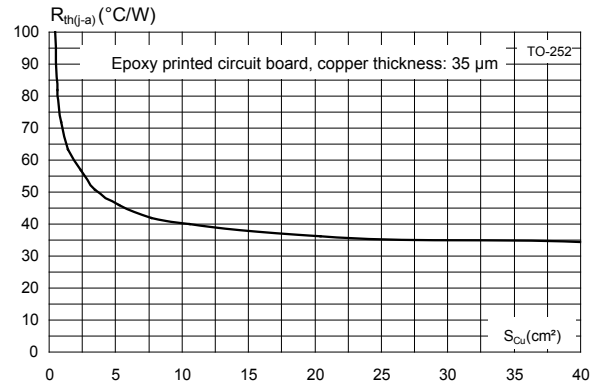


Figure 11. Thermal resistance junction to ambient versus copper surface under each lead (SMBF)

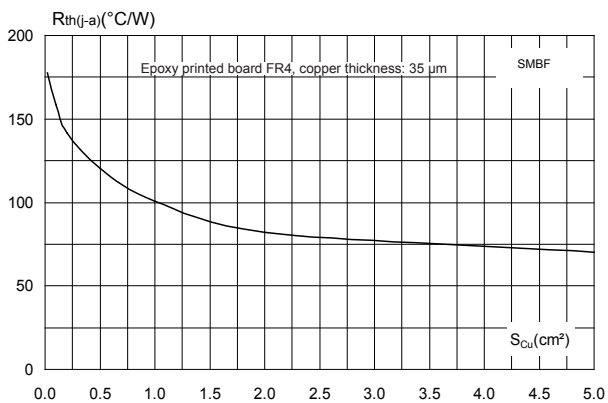
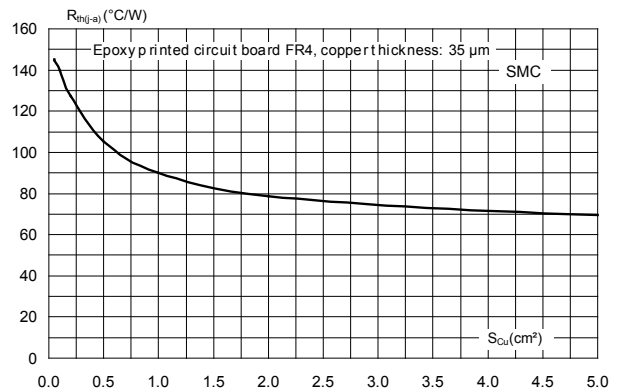
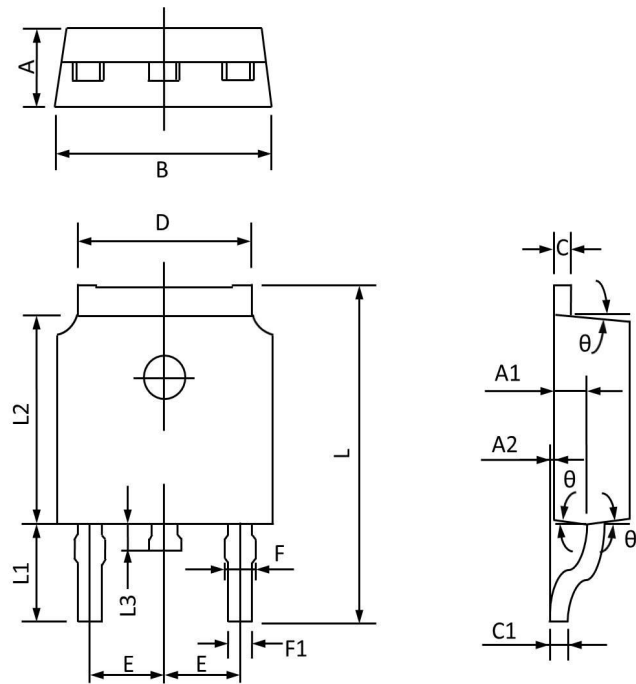


Figure 12. Thermal resistance junction to ambient versus copper surface under each lead (SMC)



TO252 PACKAGE INFORMATION

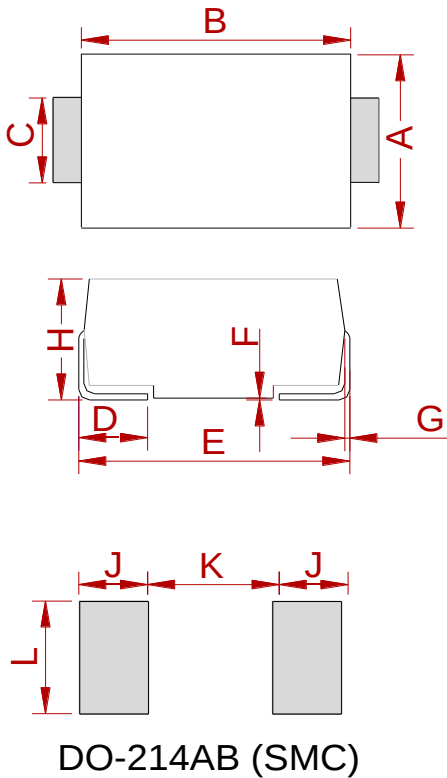


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.450	2.150	0.096	0.085
A1	1.200	0.910	0.047	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.300	0.268	0.248
C	0.580	0.350	0.023	0.014
C1	0.550	0.380	0.022	0.015
D	5.500	5.100	0.217	0.201
E	2.390	2.000	0.094	0.079
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.300	0.244	0.209
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°

REELSPECIFICATION

P/N	PKG	QTY
STPS4S200B-MS	TO-252	2500

PACKAGE MECHANICAL DATA

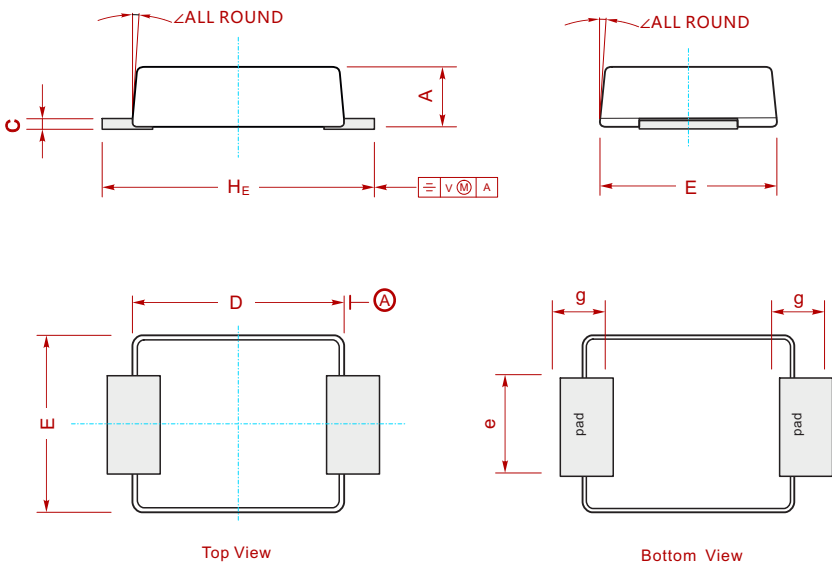


Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	5.75	6.25	0.226	0.246
B	6.90	7.40	0.272	0.291
C	2.75	3.25	0.108	0.128
D	0.95	1.52	0.037	0.060
E	7.70	8.20	0.303	0.323
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.15	2.62	0.085	0.103
J	2.40		0.094	
K		4.20		0.165
L	3.30		0.130	

REEL SPECIFICATION

P/N	PKG	QTY
STPS4S200S-MS	DO-214AB (SMC)	2500

PACKAGEECHANICALDATA



UNIT		A	C	D	E	H _E	e	g	∠
mm	max	1.3	0.26	4.4	3.7	5.5	2.2	1.0	9°
	min	1.1	0.18	4.2	3.5	5.1	1.9		
mil	max	51	10	173	146	216	86	40	
	min	43	7	165	138	200	75		

Order information

P/N	PKG	QTY
STPS4S200UF-MS	SMBF	5000

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