

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

STPS2L40xx-MS

Product specification

Description

Single chip Schottky rectifiers suited to Switched Mode Power Supplies and high frequency DC to DC converters. Packaged in SMB, low profile SMB and low profile SMA, this device is especially intended for surface mounting and used in low voltage, high frequency inverters, free wheeling and polarity protection applications.

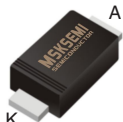
Features

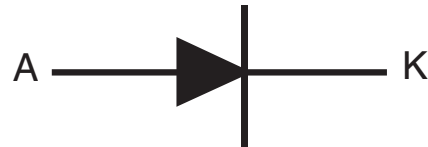
- Very small conduction losses
- Negligible switching losses
- Low forward voltage drop
- Surface mount miniature package
- Avalanche capability specified

Reference News

STPS2L40U-MS	MARKING
 DO-214AA(SMB)	

STPS2L40UF-MS	MARKING
 SMBF	

STPS2L40AF-MS	MARKING
 SMAF	



Device summary

$I_{F(AV)}$	2 A
V_{RRM}	40 V
$T_j(max)$	150 °C
$V_F(max)$	0.34 V

Characteristics

Absolute Ratings (limiting values)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			40	V
I _{F(AV)}	Average forward current	SMB	T _L = 130 °C δ = 0.5	2	A
		SMBF	T _L = 140 °C δ = 0.5		
		SMAF	T _L = 130 °C δ = 0.5		
I _{FSM}	Surge non repetitive forward current		t _p = 10 ms sinusoidal	75	A
P _{ARM}	Repetitive peak avalanche power		t _p = 1 μs T _j = 25 °C	2200	W
T _{stg}	Storage temperature range			-65 to + 150	°C
T _j	Operating junction temperature ⁽¹⁾			150	°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

Thermal resistance

Symbol	Parameter		Value	Unit
R _{th (j-l)}	Junction to lead	SMB	20	°C/W
		SMBF	10	
		SMAF	20	

Static electrical characteristics

Symbol	Tests conditions			Min.	Typ.	Max.	Unit
I _R ⁽¹⁾	Reverse leakage current	T _j = 25 °C	V _R = 40 V			220	μA
		T _j = 100 °C				20	mA
		T _j = 125 °C			38	80	mA
V _F ⁽¹⁾	Forward voltage drop	T _j = 25 °C	I _F = 1 A			0.39	V
		T _j = 125 °C			0.25	0.28	
		T _j = 25 °C	I _F = 2 A			0.43	
		T _j = 125 °C			0.31	0.34	
		T _j = 25 °C	I _F = 4 A			0.5	V
		T _j = 125 °C			0.39	0.45	

1. Pulse test: t_p = 380 μs, δ < 2

To evaluate the conduction losses use the following equation:

$$P = 0.22 \times I_{F(AV)} + 0.06 I_F^2 (RMS)$$

Figure 1. Average forward power dissipation versus average forward current

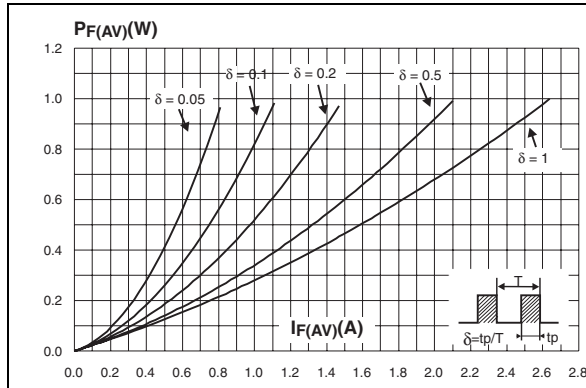


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$) SMB

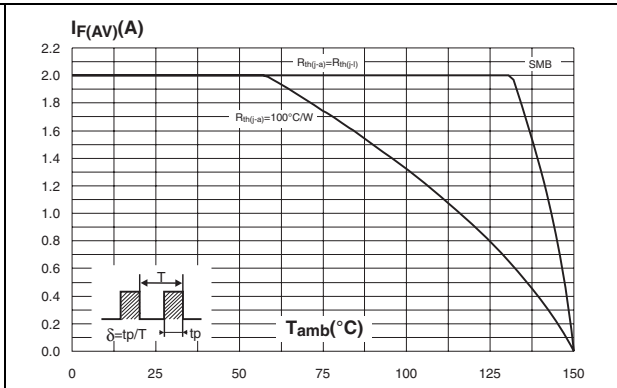


Figure 3. Average forward current versus ambient temperature ($\delta = 0.5$) SMBF

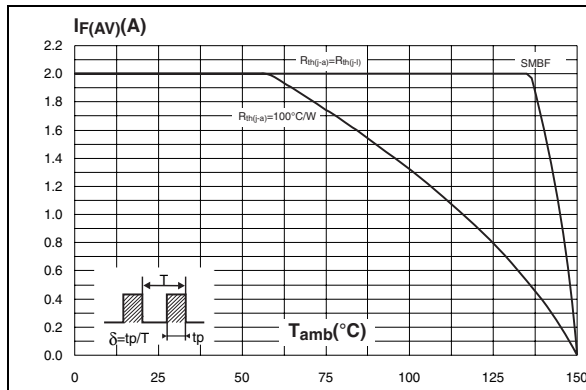


Figure 4. Average forward current versus ambient temperature ($\delta = 0.5$) SMAF

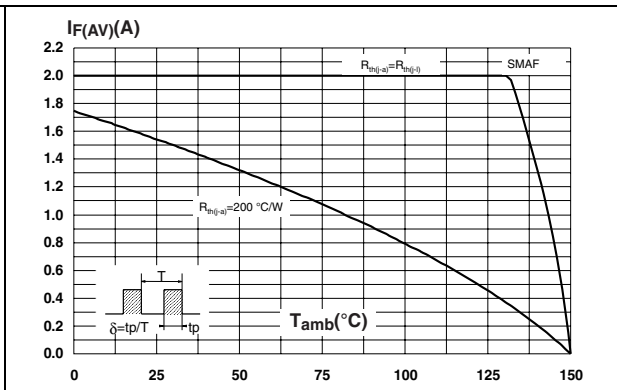


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values) SMB

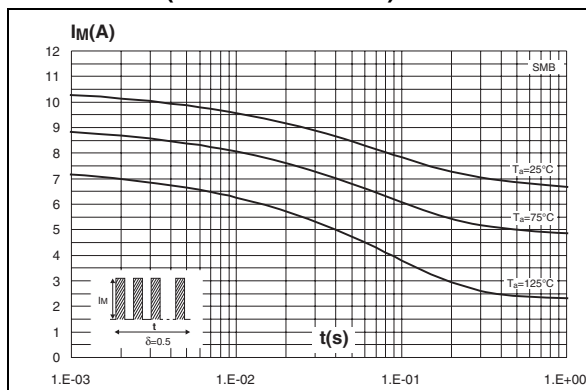


Figure 6. Non repetitive surge peak forward current versus overload duration (maximum values) SMBF

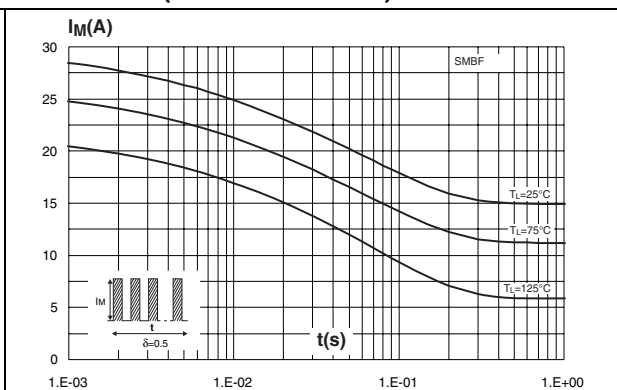


Figure 7. Non repetitive surge peak forward current versus overload duration (maximum values) SMAF

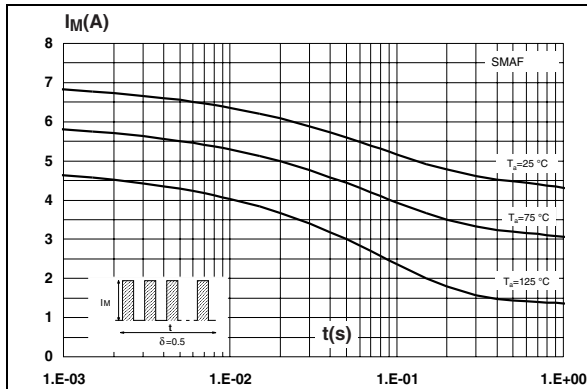


Figure 8. Normalized avalanche power derating versus pulse duration

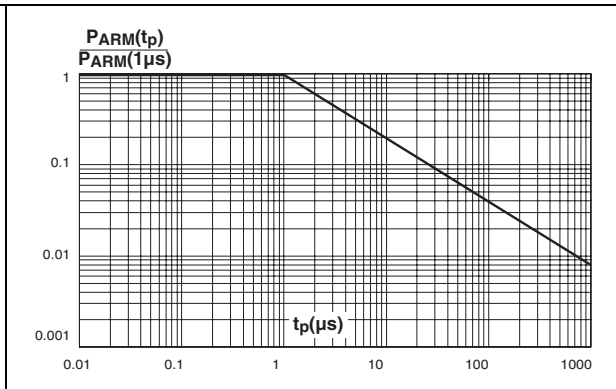


Figure 9. Normalized avalanche power derating versus junction temperature

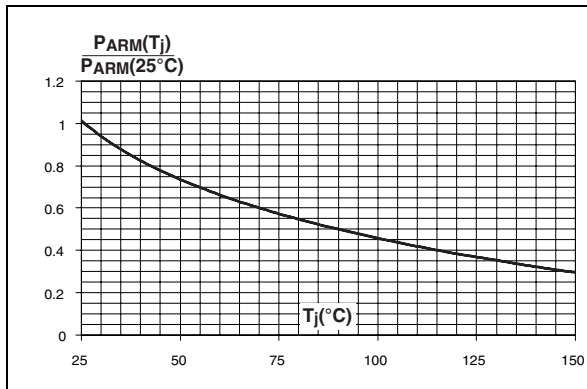


Figure 10. Relative variation of thermal impedance junction to ambient versus pulse duration - SMB

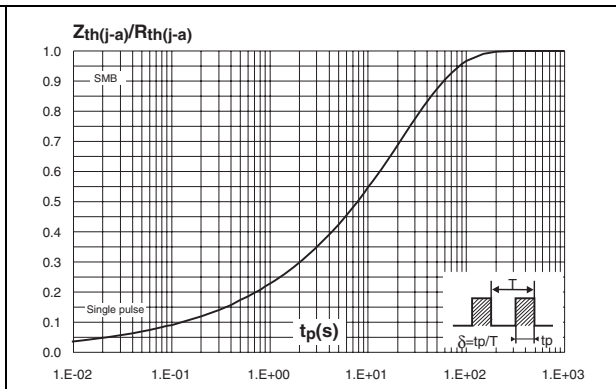


Figure 11. Relative variation of thermal impedance junction to lead versus pulse duration - SMBF

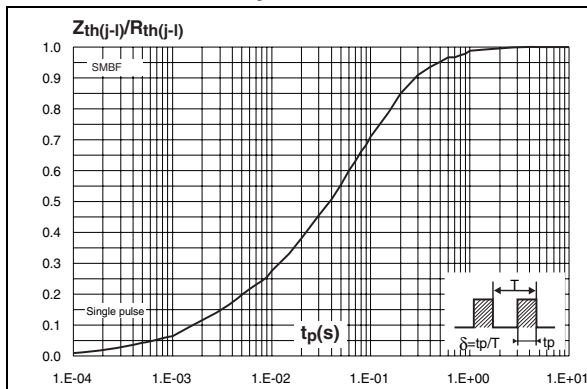
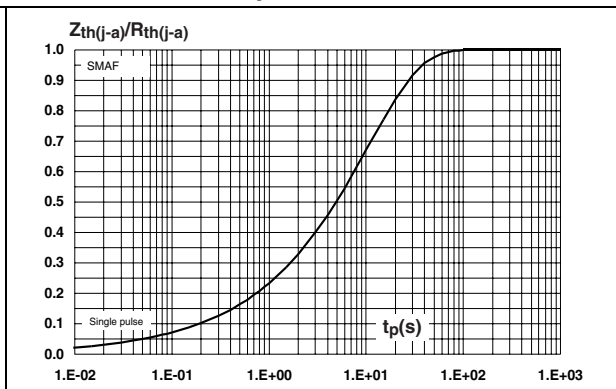
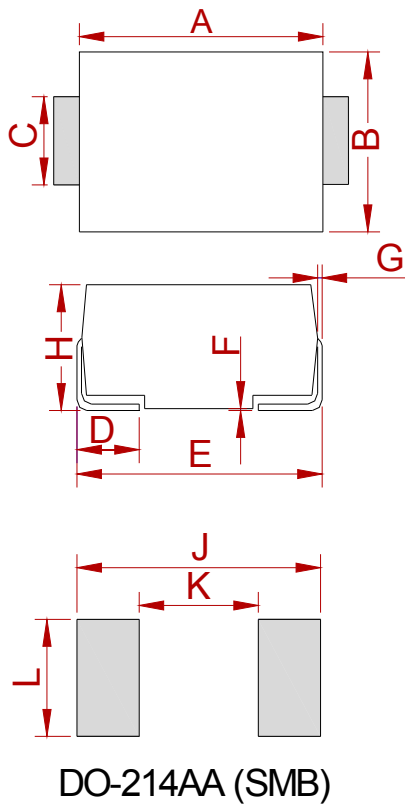


Figure 12. Relative variation of thermal impedance junction to ambient versus pulse duration - SMAF



PACKAGE MECHANICAL DATA

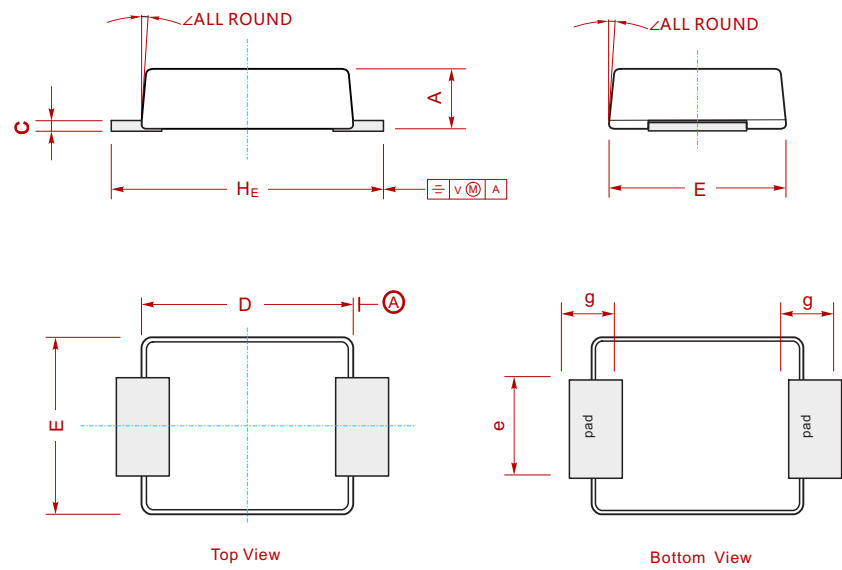


Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.25	4.75	0.167	0.187
B	3.30	3.94	0.130	0.155
C	1.85	2.21	0.073	0.087
D	0.76	1.52	0.030	0.060
E	5.08	5.59	0.200	0.220
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.11	2.44	0.083	0.096
J	6.80		0.270	
K		2.60		0.100
L	2.40		0.090	

REEL SPECIFICATION

P/N	PKG	QTY
STPS2L40U-MS	DO-214AA (SMB)	2500

PACKAGEECHANICALDATA



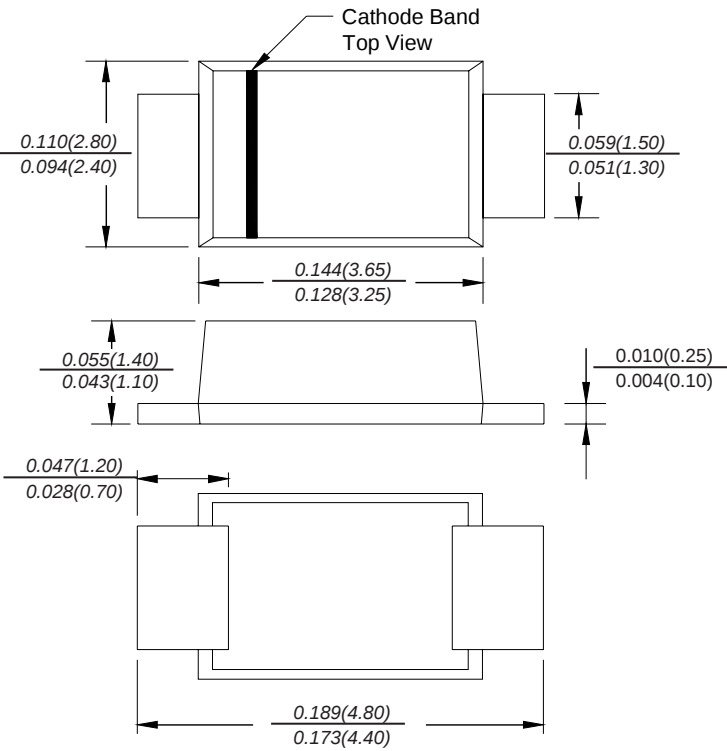
UNIT		A	C	D	E	H _E	e	g	∠
mm	max	1.3	0.26	4.4	3.7	5.5	2.2	1.0	9°
	min	1.1	0.18	4.2	3.5	5.1	1.9		
mil	max	51	10	173	146	216	86	40	
	min	43	7	165	138	200	75		

Order information

P/N	PKG	QTY
STPS2L40UF-MS	SMBF	5000

PACKAGE MECHANICAL DATA

SMAF



Dimensions in inches and (millimeters)

REEL SPECIFICATION

P/N	PKG	QTY
STPS2L40AF-MS	SMAF	3000

Attention

■ Any and all MSKSEMI Semiconductor products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your MSKSEMI Semiconductor representative nearest you before using any MSKSEMI Semiconductor products described or contained herein in such applications.

■ MSKSEMI Semiconductor assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specification of any and all MSKSEMI Semiconductor products described or contained herein.

■ Specifications of any and all MSKSEMI Semiconductor products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

■ MSKSEMI Semiconductor strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.

■ In the event that any or all MSKSEMI Semiconductor products (including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.

■ No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of MSKSEMI Semiconductor.

■ Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. MSKSEMI Semiconductor believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringement of intellectual property rights or other rights of third parties.

■ Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the MSKSEMI Semiconductor product that you intend to use.