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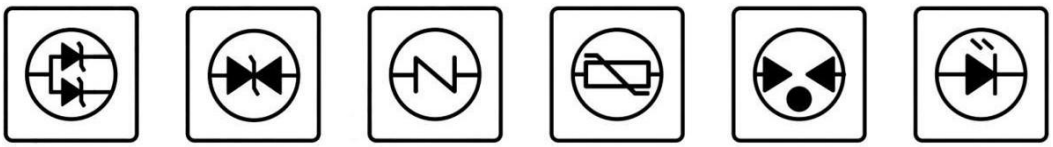
SEMICONDUCTOR



STPS2H100xx-MS

Product specification

STPS2H100xx-MS

100 V, 2 A power Schottky rectifier

Description

This Schottky rectifier is designed for high frequency miniature switched mode power supplies such as adaptors and on board DC/DC converters.

Packaged in SMA, SMAF, SMB, SMBF, the STPS2H100xx-MS is ideal for use in lighting and telecom power applications.

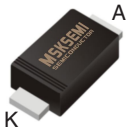
Features

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Avalanche capability specified

Reference News

STPS2H100A-MS	MARKING
 DO-214AC(SMA)	MSKSEMI S21

STPS2H100U-MS	MARKING
 DO-214AA(SMB)	MSKSEMI G21

STPS2H100AF-MS	MARKING
 SMAF	MSKSEMI F21

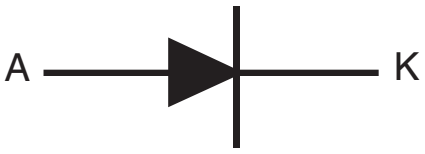
STPS2H100UF-MS	MARKING
 SMBF	MSKSEMI FG21

Applications

- Switching diode
- Battery charger
- SMPS
- DC / DC converter
- Telecom power
- LED lighting

Device summary

Symbol	Value
$I_{F(AV)}$	2 A
V_{RRM}	100 V
T_j(max)	175 °C
V_F (max)	0.65 V



Characteristics

Absolute ratings (limiting values -T_{amb} = 25° C unless otherwise stated)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			100	V
$I_{F(AV)}$	Average forward current	SMA	T_l = 130 °C, δ = 0.5	2	A
		SMB	T_l = 135 °C, δ = 0.5		
		SMAF	T_l = 145 °C, δ = 0.5		
		SMBF	T_l = 150 °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 = 10 µs, T_j = 125 °C	173	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.*

Thermal resistance

Symbol	Parameter		Max. value	Unit
$R_{th(j-l)}$	Junction to lead	SMA	30	°C/W
		SMAF	20	
		SMB	25	
		SMBF	15	

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}			1	µA
		T_j = 125 °C			0.4	1	mA
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 2 A			0.79	V
		T_j = 125 °C			0.6	0.65	
		T_j = 25 °C	I_F = 4 A			0.88	
		T_j = 125 °C			0.69	0.74	

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:

$P = 0.56 \times I_{F(AV)} + 0.045 \times I_F{}^2{}_{(RMS)}$

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

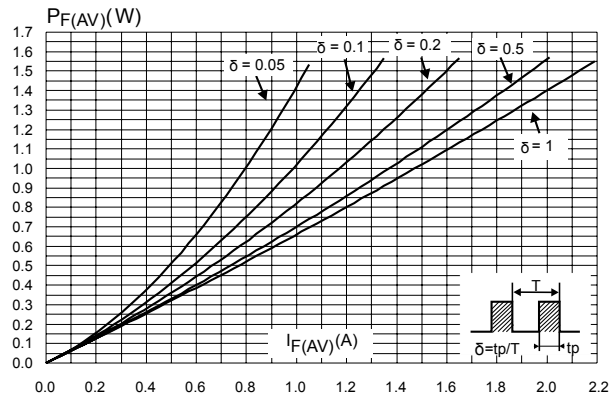


Figure 2. Average forward current versus ambient temperature (δ = 0.5, SMA / SMB)

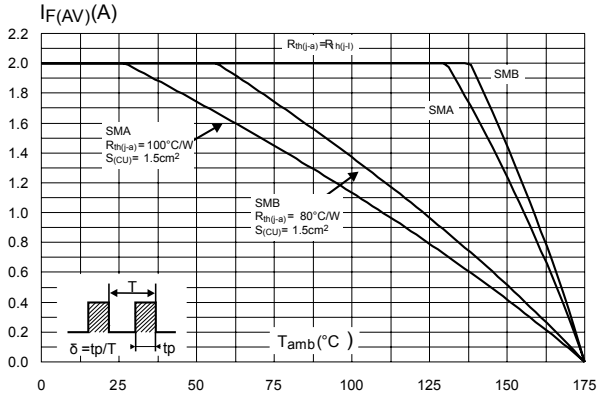


Figure 3. Average forward current versus ambient temperature (δ = 0.5, SMBF)

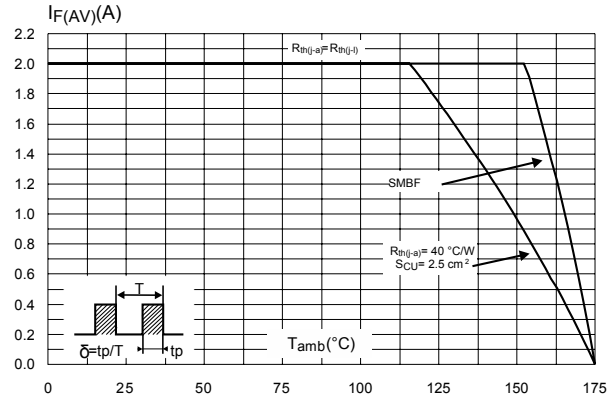


Figure 4. Average forward current versus ambient temperature (δ = 0.5, SMAF)

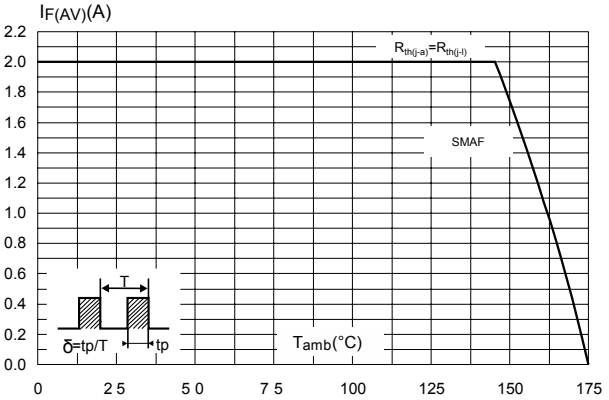


Figure 5. Normalized avalanche power derating versus junction temperature (T_j = 125 °C)

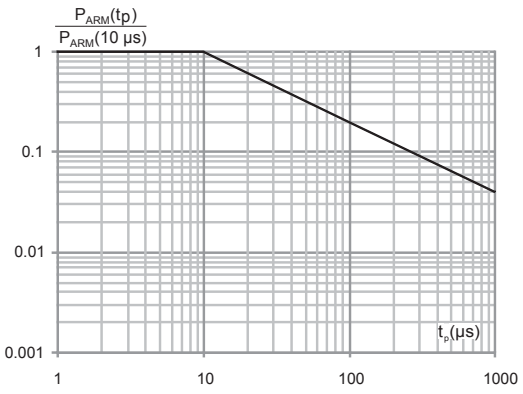


Figure 6. Relative variation of thermal impedance junction to ambient versus pulse duration (SMA)

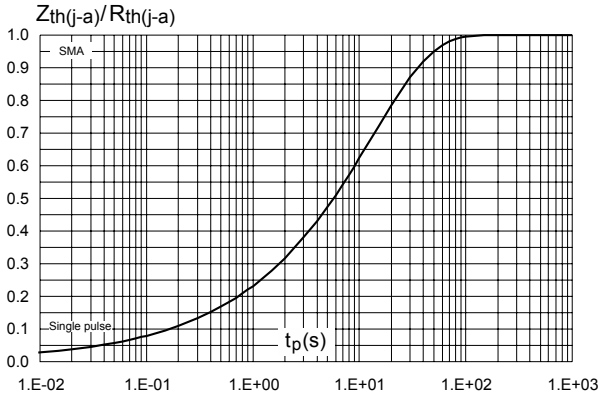


Figure 7. Relative variation of thermal impedance junction to lead versus pulse duration (SMAF)

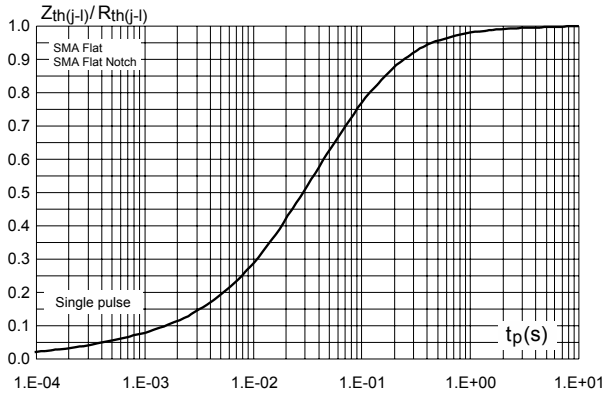


Figure 8. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)

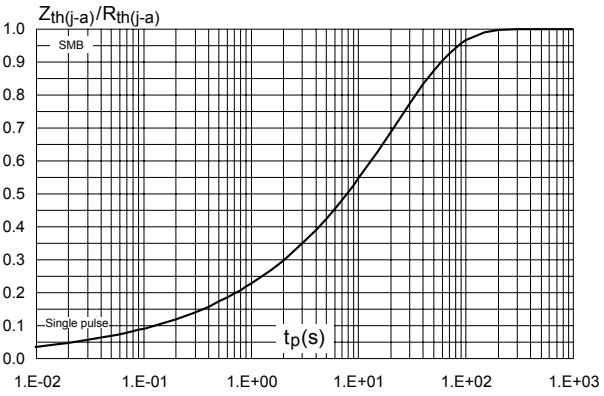


Figure 9. Relative variation of thermal impedance junction to lead versus pulse duration (SMBF)

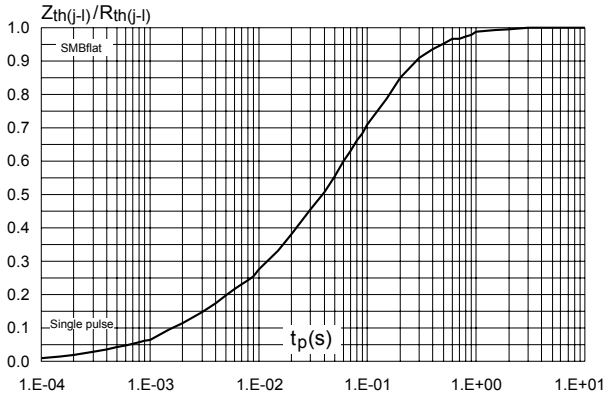


Figure 10. Reverse leakage current versus reverse voltage applied (typical values)

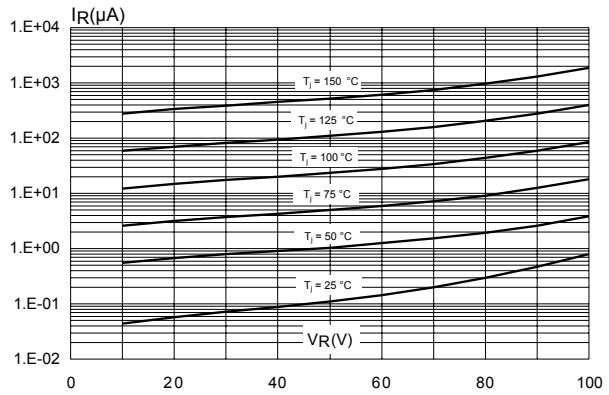


Figure 11. Junction capacitance versus reverse voltage applied (typical values)

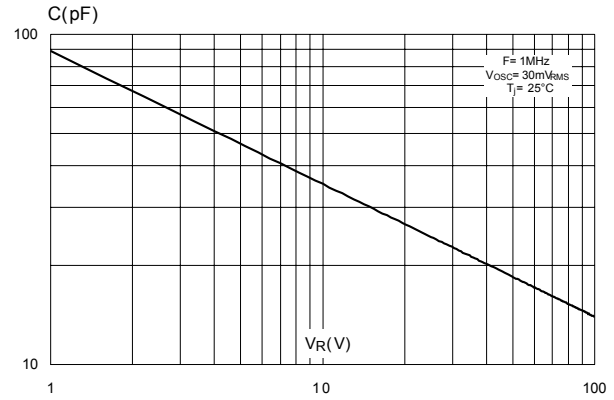


Figure 12. Forward voltage drop versus forward current (low level)

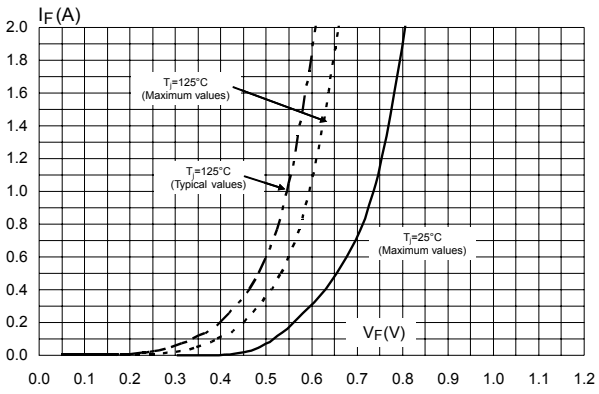


Figure 13. Forward voltage drop versus forward current (high level)

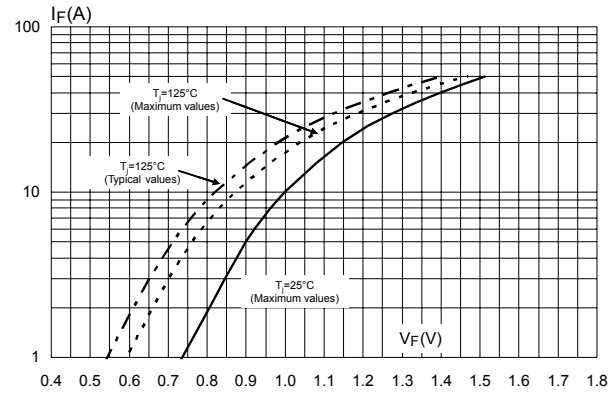


Figure 14. Thermal resistance junction to ambient versus copper surface under each lead (SMA)

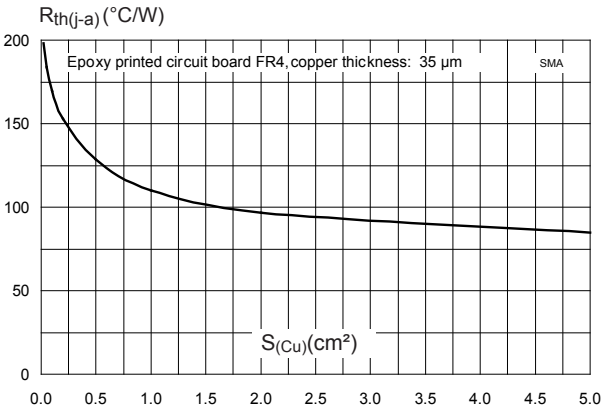


Figure 15. Thermal resistance junction to ambient versus copper surface under each lead (SMAF)

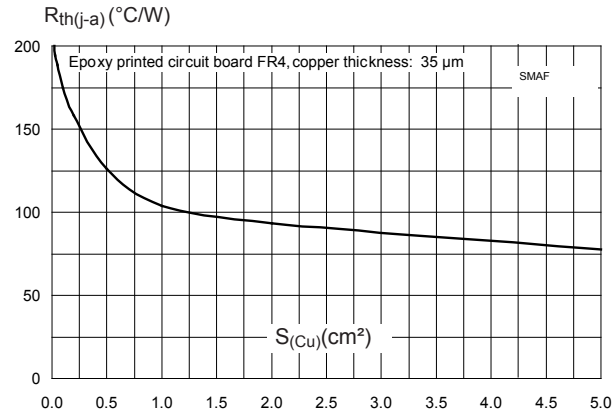
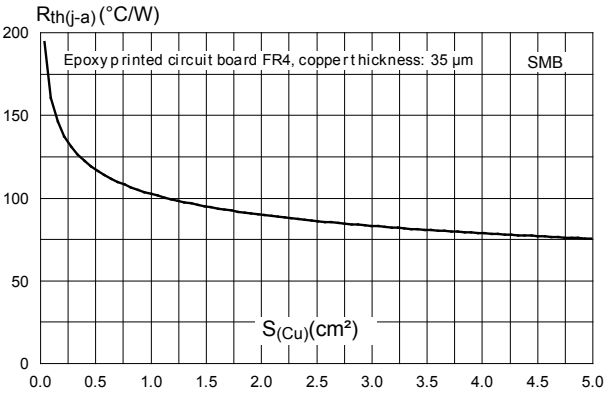
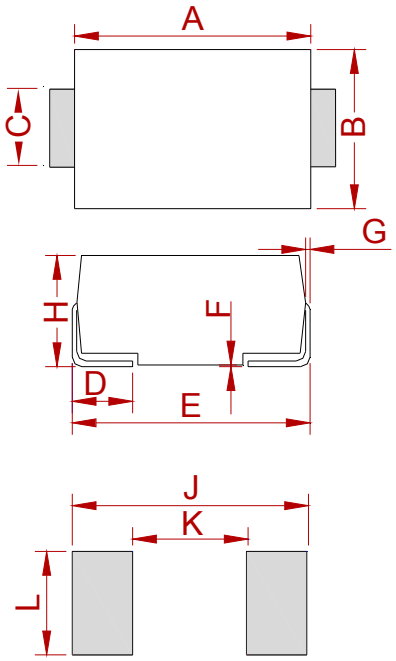


Figure 16. Thermal resistance junction to ambient versus copper surface under each lead (SMB)



PACKAGE MECHANICAL DATA



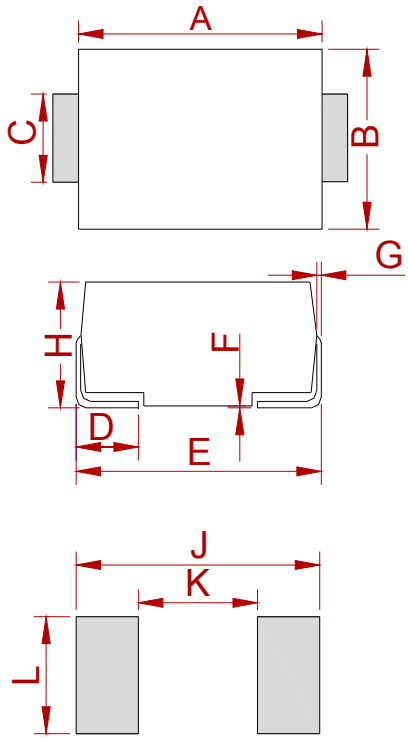
DO-214AC (SMA)

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.25	4.65	0.167	0.183
B	2.50	2.90	0.098	0.114
C	1.35	1.65	0.053	0.065
D	0.76	1.52	0.030	0.060
E	4.93	5.28	0.194	0.208
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	1.98	2.41	0.078	0.095
J	6.50		0.256	
K		2.30		0.090
L	1.70		0.067	

REEL SPECIFICATION

P/N	PKG	QTY
STPS2H100A-MS	DO-214AC (SMA)	5000

PACKAGE MECHANICAL DATA



DO-214AA (SMB)

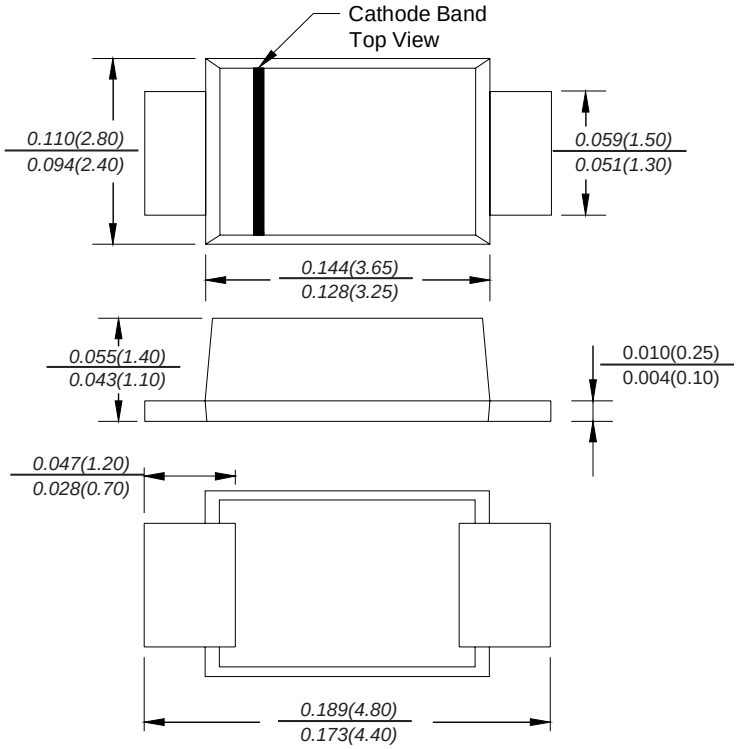
Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.25	4.75	0.167	0.187
B	3.30	3.94	0.130	0.155
C	1.85	2.21	0.073	0.087
D	0.76	1.52	0.030	0.060
E	5.08	5.59	0.200	0.220
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.11	2.44	0.083	0.096
J	6.80		0.270	
K		2.60		0.100
L	2.40		0.090	

REELSPECIFICATION

P/N	PKG	QTY
STPS2H100U-MS	DO-214AA (SMB)	2500

PACKAGE MECHANICAL DATA

SMAF

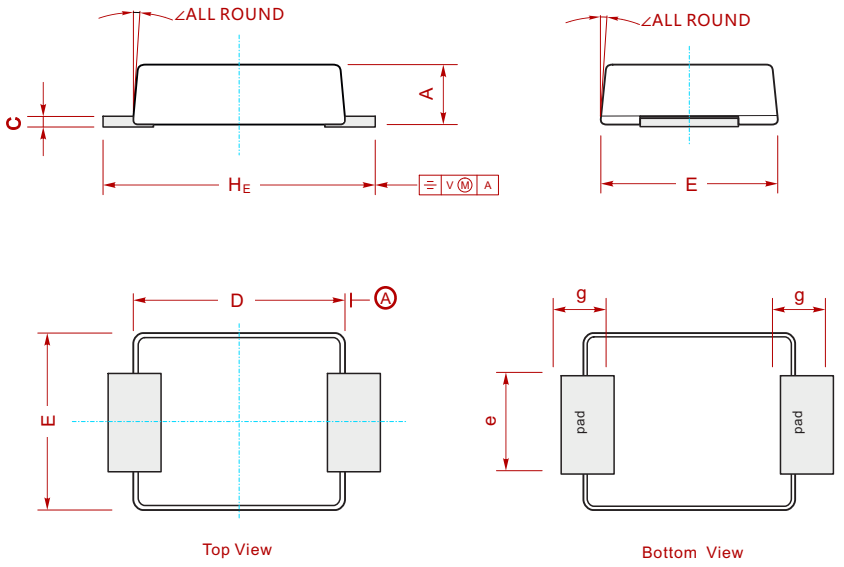


Dimensions in inches and (millimeters)

REEL SPECIFICATION

P/N	PKG	QTY
STPS2H100AF-MS	SMAF	3000

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
STPS2H100UF-MS	SMBF	5000

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