

1 Characteristics

Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)

Symbol	Parameter	Parameter			Unit
V _{RRM}	Repetitive peak reverse voltage	Repetitive peak reverse voltage			
I _{F(RMS)}	Forward rms current DPAK			6	Α
		SMA Flat Notch	T _L = 105 °C	3	
	Average forward current, δ = 0.5, square wave	SMB	T _L = 95 °C		А
I _{F(AV)}		SMB Flat	T _L = 115 °C		
		SMC	T _L = 105 °C		
		DPAK	T _C = 135°C		
I	Surgo non rapatitiva fanyard aurrant	SMA Flat Notch	t _p = 10 ms sinusoidal	105	Α
I _{FSM}	Surge non repetitive forward current	All others	t _p = 10 ms sinusoidai	75	Α
P _{ARM}	Repetitive peak avalanche power		t _p = 10 μs, T _j = 125 °C	90	W
T _{stg}	Storage temperature range			-65 to +150	°C
Tj	Maximum operating junction temperature ⁽¹⁾			+150	°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 resistance parameter

Symbol	Parameter		Max. value	Unit
	R _{th/i-l}) Junction to lead	SMA Flat Notch	20	
R _{th(j-l)}		SMB	25	
' `tn(J-I)	Junction to lead	SMB Flat	15	°C/W
		SMC	20	
R _{th(j-c)}	Junction to case	DPAK	5.5	

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

AN5088: Rectifiers thermal management, handling and mounting recommendations

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
L (d)	T _j = 25 °C	\ \ -\\	-		20	μA	
IR ^(*)	I _R ⁽¹⁾ Reverse leakage current	T _j = 125 °C	$V_R = V_{RRM}$	-	2	10	mA
	V _F ⁽¹⁾ Forward voltage drop	T _j = 25 °C	I _F = 3 A	-		0.63	
V_(1)		T _j = 125 °C		-	0.52	0.57	V
VF		T _j = 25 °C		-		0.84	V
		T _j = 125 °C		-	0.63	0.72	

1. Pulse test: $t_p = 380 \,\mu s, \, \delta < 2\%$

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To evaluate the conduction losses, use the following equation:

$$P = 0.42 \times I_{F(AV)} + 0.050 \times I_{F^{2}(RMS)}$$

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

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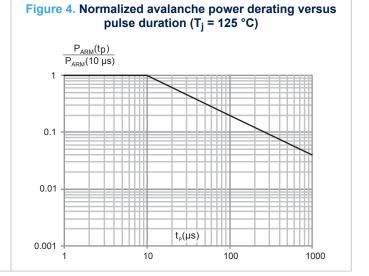
1.1 Characteristics (curves)

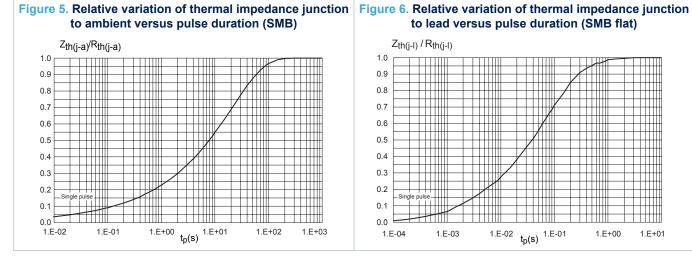
Figure 1. Average forward power dissipation versus average forward current $P_{F(AV)}(W)$ 2.5 $\delta = 0.2$ $\delta = 0.1$ $\delta = 0.5$ 5 = 0.052.0 1.0 0.5 $\delta = tp/T$ 0.0 0.5 1.0 3.0 2.0 4.0 $I_{F(AV)}(A)$

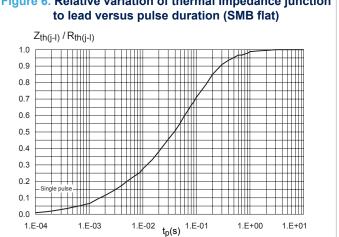
Figure 2. Average forward current versus ambient temperature (δ = 0.5) (SMB, SMC, DPAK) 3.5 $R_{th(j-a)} = R_{th(j-c)}$ 3.0 SMB $R_{th(j-a)} = R_{th(j-l)}$ SMC 2.0 $R_{th(j-a)} = R_{th(j-l)}$ 1.5 1.0 R_{th(j-a)} = 65 °C/W 0.5 Γ_{amh}(°C) 100 50 75 125 150

temperature (δ = 0.5, SMB Flat) $I_{F(AV)}(A)$ 3.5 $R_{th(j-a)} = R_{th(j-l)}$ 3.0 2.5 2.0 1.5 1.0 0.5 0.0 100 150 25 75 T_{amb}(°C) 125 0 50

Figure 3. Average forward current versus ambient



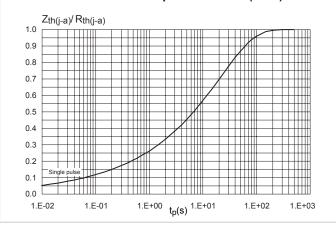




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Figure 7. Relative variation of thermal impedance junction | Figure 8. Relative variation of thermal impedance junction to ambient versus pulse duration (SMC)



to case versus pulse duration (DPAK)

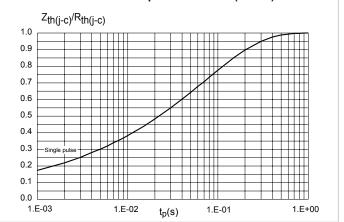


Figure 9. Reverse leakage current versus reverse voltage applied (typical values)

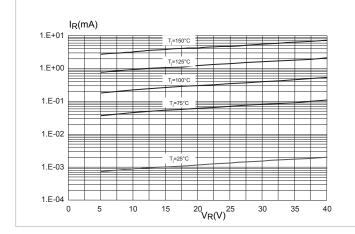


Figure 10. Junction capacitance versus reverse voltage applied (typical values)

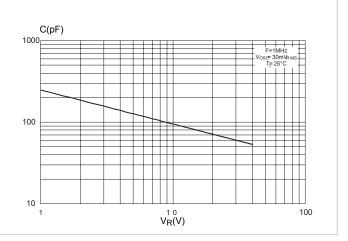


Figure 11. Forward voltage drop versus forward current

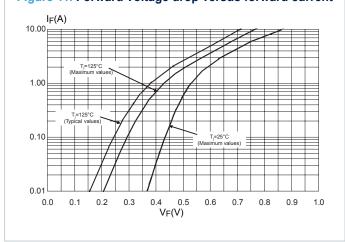
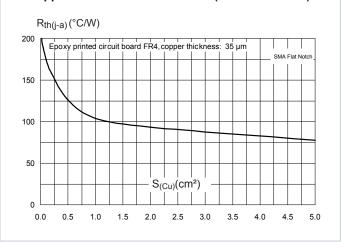


Figure 12. Thermal resistance junction to ambient versus copper surface under each lead (SMA Flat Notch)



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Figure 13. Thermal resistance junction to ambient versus copper surface under each lead (SMB)

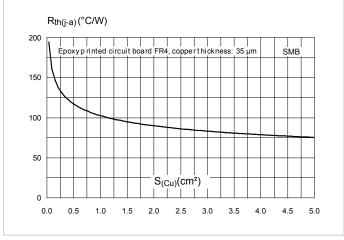


Figure 14. Thermal resistance junction to ambient versus copper surface under each lead (SMB flat)

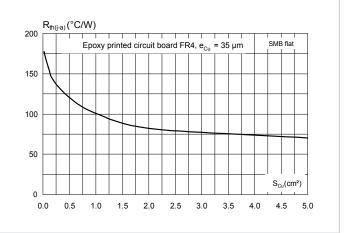


Figure 15. Thermal resistance junction to ambient versus copper surface under each lead (SMC)

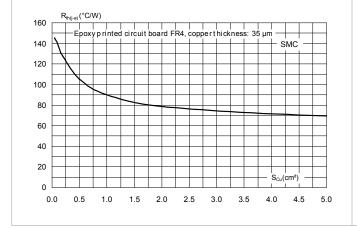
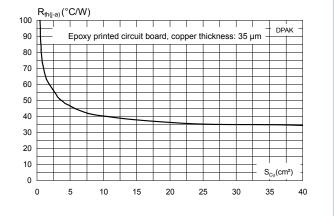


Figure 16. Thermal resistance junction to ambient versus copper surface under tab (DPAK)



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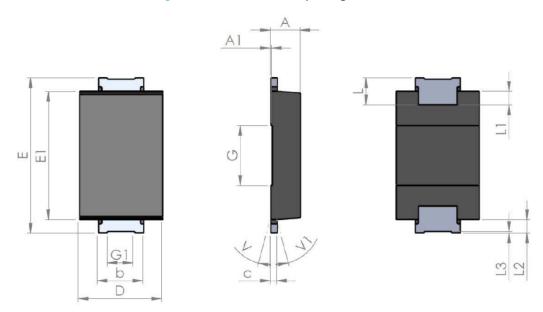
Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

2.1 SMA Flat Notch package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Band indicates cathode

Figure 17. SMA Flat Notch package outline



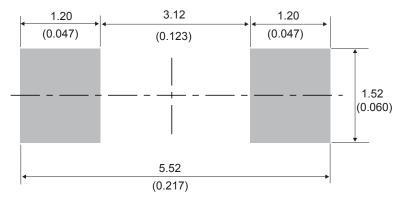
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Table 4. SMA Flat Notch package mechanical data

			Dime	nsions		
Ref.		Millimeters		Inches (for reference only)		
	Min.	Тур.	Max.	Min.	Тур.	Max.
A1	0.90		1.10	0.035		0.044
A1		0.05			0.002	
b	1.25		1.65	0.049		0.065
С	0.15		0.40	0.005		0.016
D	2.25		2.90	0.088		0.115
E	5.00		5.35	0.196		0.211
E1	3.95		4.60	0.155		0.182
G		2.00			0.079	
G1		0.85			0.033	
L	0.75		1.20	0.029		
L1		0.45			0.018	
L2		0.45			0.018	
L3		0.05			0.002	
V			8°			8°
V1			8°			8°

Figure 18. SMA Flat Notch recommended footprint in mm (inches)



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2.2 SMB package information

- Epoxy meets UL94, V0
- Lead-free package

Figure 19. SMB package outline

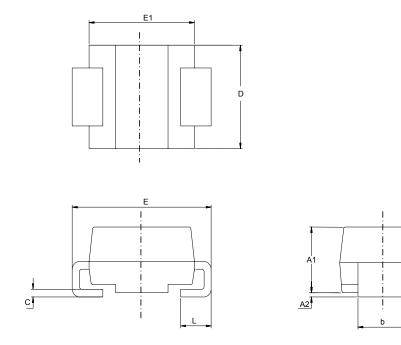


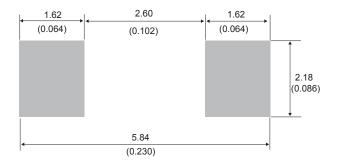
Table 5. SMB package mechanical data

	Dimensions					
Ref.	Millin	neters	Inches (for reference only)			
	Min.	Max.	Min.	Max.		
A1	1.90	2.45	0.074	0.097		
A2	0.05	0.20	0.001	0.008		
b	1.95	2.20	0.076	0.087		
С	0.15	0.40	0.005	0.016		
D	3.30	3.95	0.129	0.156		
E	5.10	5.60	0.200	0.221		
E1	4.05	4.60	0.159	0.182		
L	0.75	1.50	0.029	0.060		

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Figure 20. SMB recommended footprint



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2.3 SMB Flat package information

- Epoxy meets UL94, V0
- Lead-free package

Figure 21. SMB Flat package outline

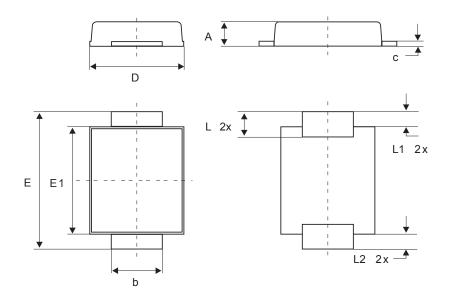


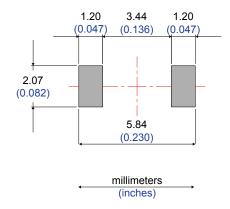
Table 6. SMB Flat mechanical data

			Di	mensions		
Ref.	Millimeters			Inches		
	Min.	Тур.	Max.	Min.	Тур.	Max.
А	0.90		1.10	0.035		0.044
b	1.95		2.20	0.076		0.087
С	0.15		0.40	0.005		0.016
D	3.30		3.95	0.129		0.156
E	5.10		5.60	0.200		0.221
E1	4.05		4.60	0.159		0.182
L	0.75		1.50	0.029		0.060
L1		0.40			0.016	
L2		0.60			0.024	

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Figure 22. Footprint recommendations, dimensions in mm (inches)



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2.4 SMC package information

• Epoxy meets UL94, V0

Figure 23. SMC package outline

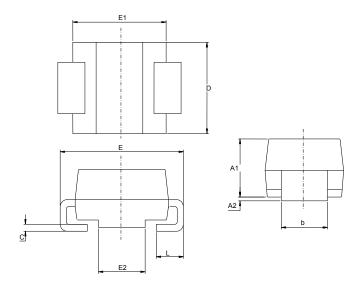


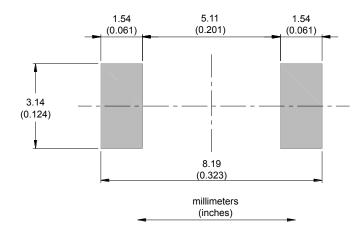
Table 7. SMC package mechanical data

	Dimensions					
Ref.	Millin	neters	Inches (for reference only)			
	Min.	Max.	Min.	Max.		
A1	1.90	2.45	0.0748	0.0965		
A2	0.05	0.20	0.0020	0.0079		
b	2.90	3.20	0.1142	0.1260		
С	0.15	0.40	0.0059	0.0157		
D	5.55	6.25	0.2185	0.2461		
Е	7.75	8.15	0.3051	0.3209		
E1	6.60	7.15	0.2598	0.2815		
E2	4.40	4.70	0.1732	0.1850		
L	0.75	1.50	0.0295	0.0591		

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Figure 24. SMC recommended footprint



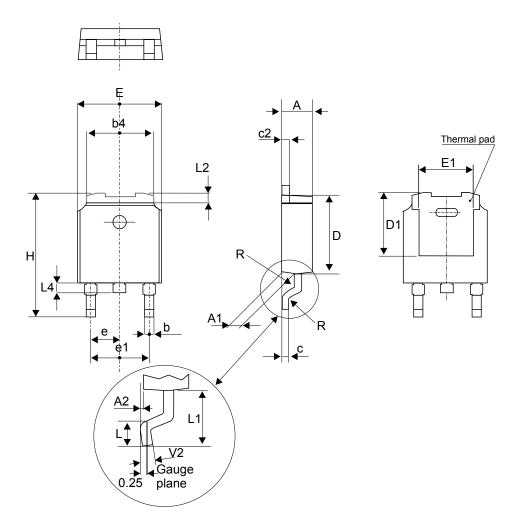
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2.5 DPAK package information

- Epoxy meets UL 94,V0
- Cooling method: by conduction (C)

Figure 25. DPAK package outline



Note: This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

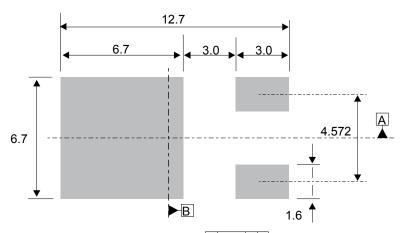
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Table 8. DPAK package mechanical data

		Dim	ensions		
Ref.	Millim	eters	Inches (for re	ference only)	
	Min.	Max.	Min.	Max.	
А	2.18	2.40	0.085	0.094	
A1	0.90	1.10	0.035	0.043	
A2	0.03	0.23	0.001	0.009	
b	0.64	0.90	0.025	0.035	
b4	4.95	5.46	0.194	0.215	
С	0.46	0.61	0.018	0.024	
c2	0.46	0.60	0.018	0.023	
D	5.97	6.22	0.235	0.244	
D1	4.95	5.60	0.194	0.220	
E	6.35	6.73	0.250	0.265	
E1	4.32	5.50	0.170	0.216	
е	2.286	S typ.	0.090 typ.		
e1	4.40	4.70	0.173	0.185	
Н	9.35	10.40	0.368	0.409	
L	1.0	1.78	0.039	0.070	
L2		1.27		0.050	
L4	0.60	1.02	0.023	0.040	
V2	-8°	+8°	-8°	+8°	

Figure 26. DPAK recommended footprint (dimensions in mm)



The device must be positioned within ⊕0.05 AB

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3 Ordering information

Table 9. Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS340AFN	A340	SMA Flat Notch	0.039 g	10 000	Tape and reel
STPS340U	U34	SMB	0.107 g	2500	Tape and reel
STPS340UF	FU34	SMB Flat	0.050 g	5000	Tape and reel
STPS340S	S34	SMC	0.243 g	10 000	Tape and reel
STPS340B-TR	S3 40	DPAK	0.320 g	2500	Tape and reel

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Revision history

Table 10. Document revision history

Date	Version	Changes
Jul-2003	7	Last update.
Feb-2005	8	Layout update. No content change.
08-Feb-2007	9	Reformatted to current standard. Added ECOPACK statement. Added SMBflat package.
10-Feb-2009	10	Updated ECOPACK statement. Corrected Y axis in Figure 10.
23-Apr-2015	11	Updated DPAK and reformatted to current standard.
22-Sep-2016	12	Updated DPAK package information and reformatted to current standard.
08-Oct-2019	13	Added Section 2.1 SMA Flat Notch package information.



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