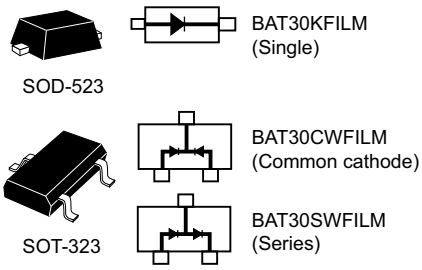
BAT30

Small signal Schottky diodes

Datasheet - production data



Configuration in top view

Description

The BAT30 series uses 30 V Schottky barrier diodes encapsulated in SOD-523 or SOT-323 packages.

This device is specially suited for switching mode applications needing low forward voltage drop diodes.

Features

- Very low conduction losses
- Negligible switching losses
- Low forward and reverse recovery times
- Extremely fast switching
- Surface mount device
- Low capacitance diode
- ECOPACK®2 and RoHS compliant component

Table 1. Device summary

Symbol	Value
I_F	300 mA
V_{RRM}	30 V
C (typ.)	14 pF
T_j (max.)	150 °C

1 Characteristics

Table 2. Absolute ratings (limiting values at T_{amb} = 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		30	V
I_F	Continuous forward current		300	mA
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms Sinusoidal	1	A
I_{FRM}	Repetitive peak forward current, square wave	T_A = 85 °C, δ = 0.1	0.9	A
P_D(1)	Power dissipation	SOT-323	225	mW
		SOD-523	200	
T_{stg}	Storage temperature range		-65 to +150	°C
T_j	Maximum operating junction temperature		150	°C
T_L	Maximum soldering temperature		260	°C

1. On epoxy printed circuit board with recommended pad layout

Table 3. Thermal parameters

Symbol	Parameter		Value	Unit
$R_{th(j-a)}$	Junction to ambient(1)	SOT-323	550	°C/W
		SOD-523	600	

1. On epoxy printed circuit board with recommended pad layout

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	V_R = 5 V	-		0.5	µA
			V_R = 10 V	-		1	
			V_R = 25 V	-	0.65	3	
			V_R = 30 V	-		5	
		T_j = 70 °C	V_R = 10 V	-	7	20	
		T_j = 85 °C		-	18	50	
V_F(2)	Forward voltage drop	T_j = 25° C	I_F = 0.1 mA	-		240	mV
			I_F = 1 mA	-		300	
			I_F = 10 mA	-		375	
			I_F = 30 mA	-		430	
			I_F = 100 mA	-		500	
			I_F = 200 mA	-		580	
			I_F = 300 mA	-	530		

1. Pulse test: t_p = 5 ms, δ < 2 %
2. Pulse test: t_p = 380 µs, δ < 2 %

Table 5. Dynamic characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C	Diode capacitance	V_R = 0 V, F = 1 MHz	-	22	-	pF
		V_R = 1 V, F = 1 MHz	-	14	-	
		V_R = 10 V, F = 1 MHz	-	6	-	

Figure 1. Power dissipation versus average forward current

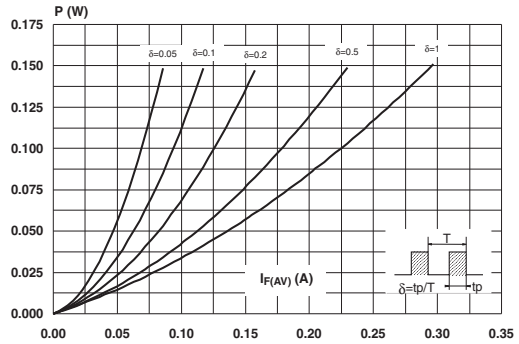


Figure 2. Continuous forward current versus ambiant temperature

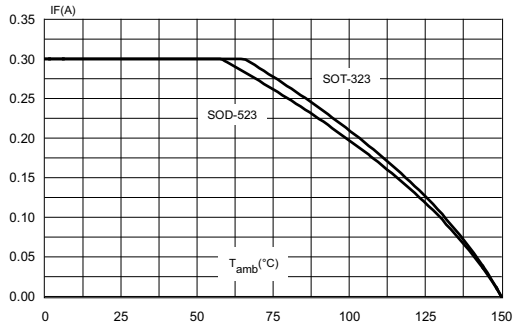


Figure 3. Relative variation of thermal impedance junction to ambient versus pulse duration

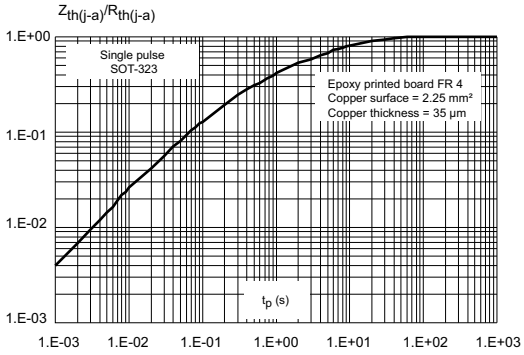


Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration

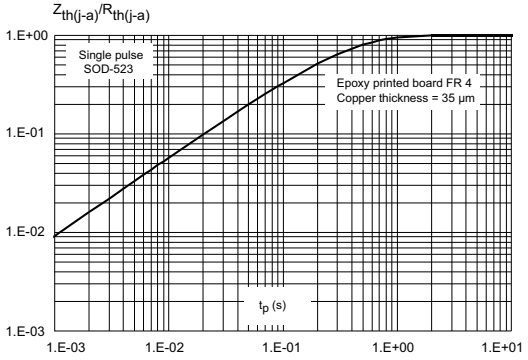


Figure 5. Leakage current versus reverse applied voltage (typical values)

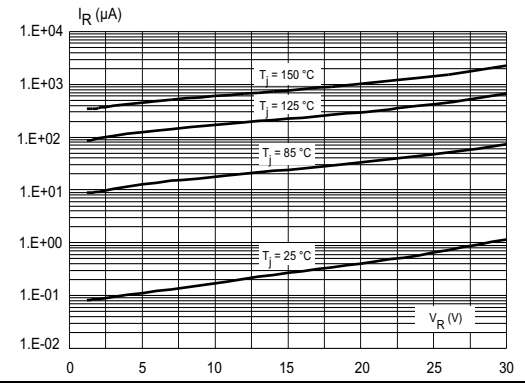


Figure 6. Relative variation of reverse leakage current versus junction temperature (typical values)

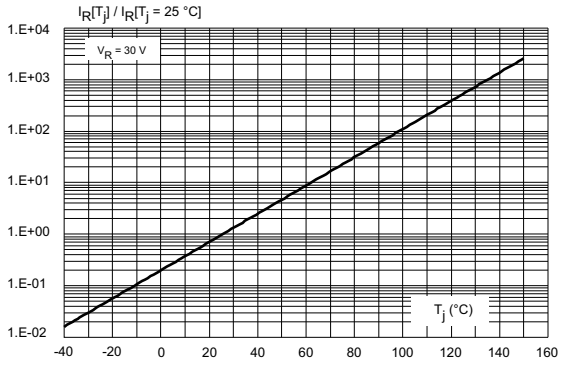


Figure 7. Junction capacitance versus reverse applied voltage (typical values)

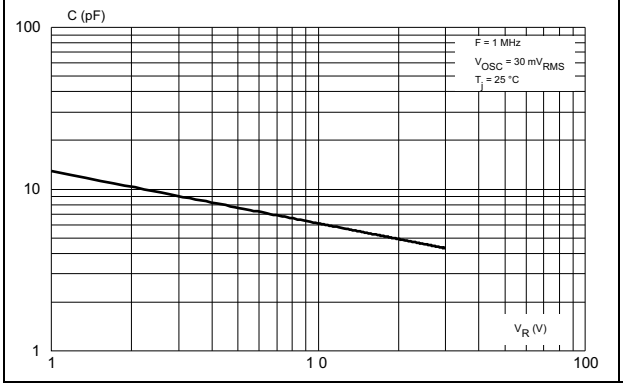


Figure 8. Forward voltage drop versus forward current (typical values)

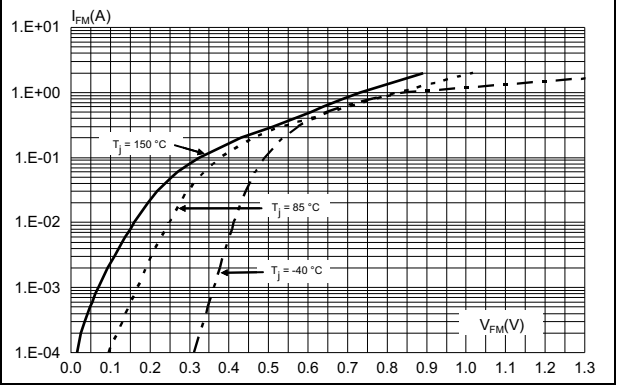
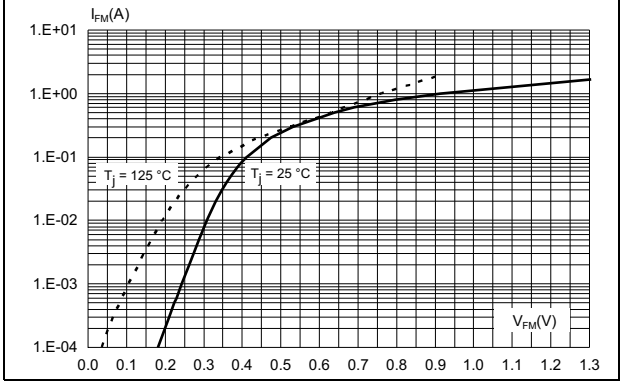


Figure 9. Forward voltage drop versus forward current (typical values)



2 Package information

- Epoxy meets UL94, V0
- Lead-free packages

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 SOD-523 package information

Figure 10. SOD-523 package outline

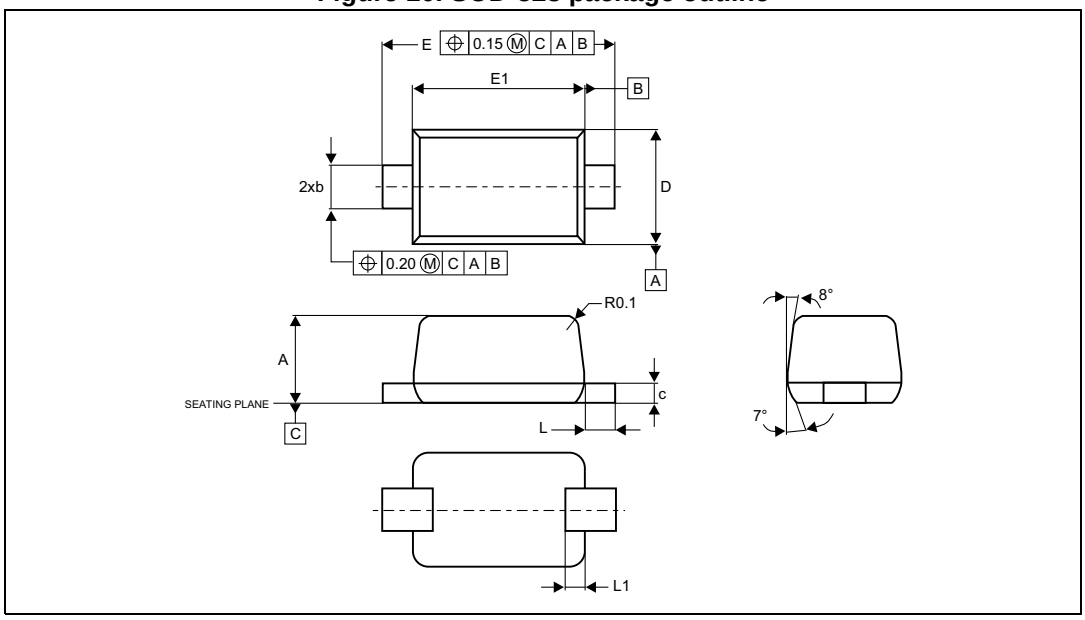
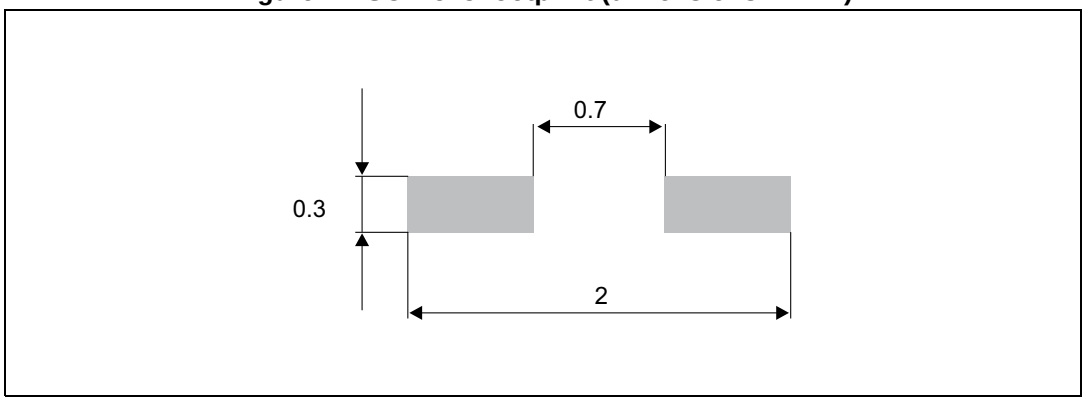


Table 6. SOD-523 package mechanical data

Ref.	Dimensions					
	Millimeters			Inches[1]		
	Typ.	Min.	Max.	Typ.	Min.	Max.
A	0.60	0.50	0.70	0.024	0.020	0.028
E	1.60	1.50	1.70	0.063	0.059	0.067
E1	1.20	1.10	1.30	0.047	0.043	0.051
D	0.80	0.70	0.90	0.031	0.028	0.035
b	-	0.25	0.35	-	0.010	0.014
c	-	0.07	0.20	-	0.003	0.008
L	0.20	0.15	0.25	0.008	0.006	0.010
L1	-	0.05	0.20	-	0.002	0.008

1. Values in inches are converted from mm and rounded to 4 decimal digits.

Figure 11. SOD-523 footprint (dimensions in mm)



2.2 SOT-323 package information

Figure 12. SOT-323 package outline

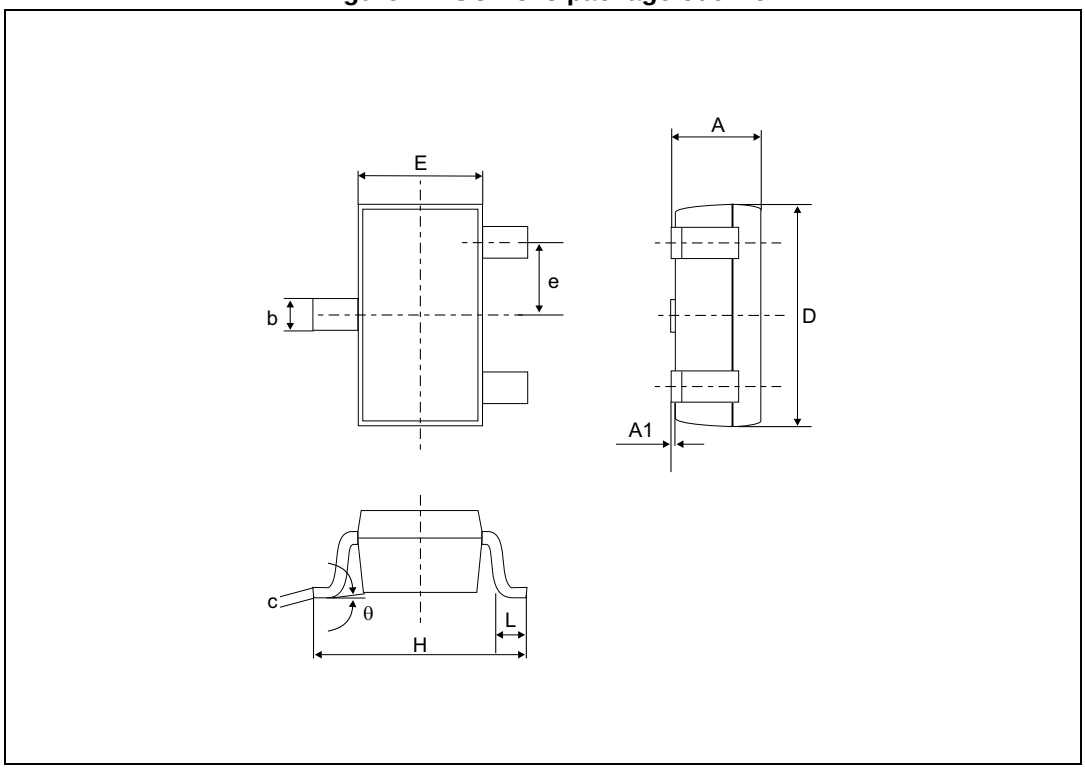
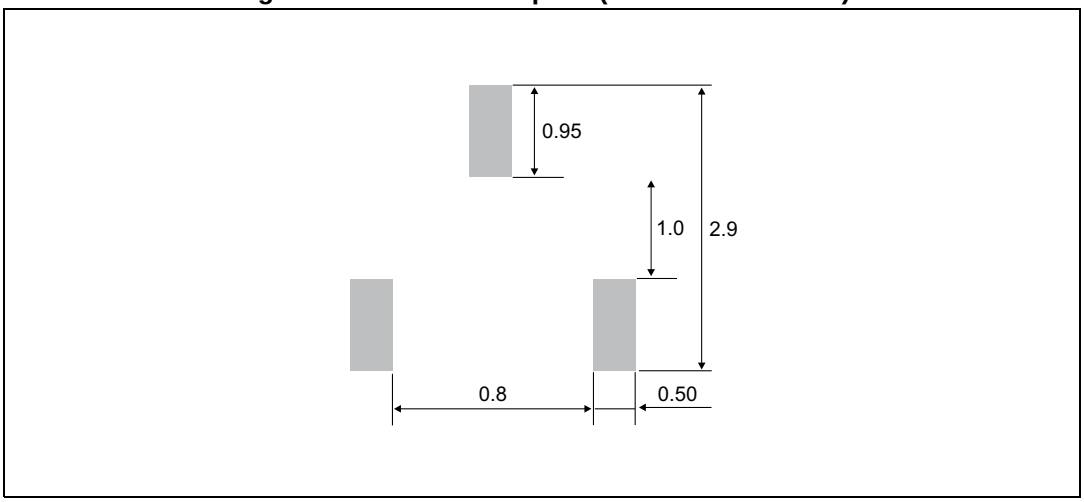


Table 7. SOT-323 package mechanical data

Ref.	Dimensions					
	Millimeters			Inches[1]		
	Typ.	Min.	Max.	Typ.	Min.	Max.
A	-	0.8	1.1	-	0.031	0.043
A1	-	0.0	0.1	-	0.0	0.004
b	-	0.25	0.4	-	0.010	0.016
c	-	0.1	0.26	-	0.004	0.010
D	2.0	1.8	2.2	0.079	0.071	0.086
E	1.25	1.15	1.35	0.049	0.045	0.053
e	0.65	-	-	0.026	-	-
H	2.1	1.8	2.4	0.083	0.071	0.094
L	0.2	0.1	0.3	0.008	0.004	0.012
q	-	0	30°	-	0	30°

1. Values in inches are converted from mm and rounded to 4 decimal digits.

Figure 13. SOT-323 footprint (dimensions in mm)

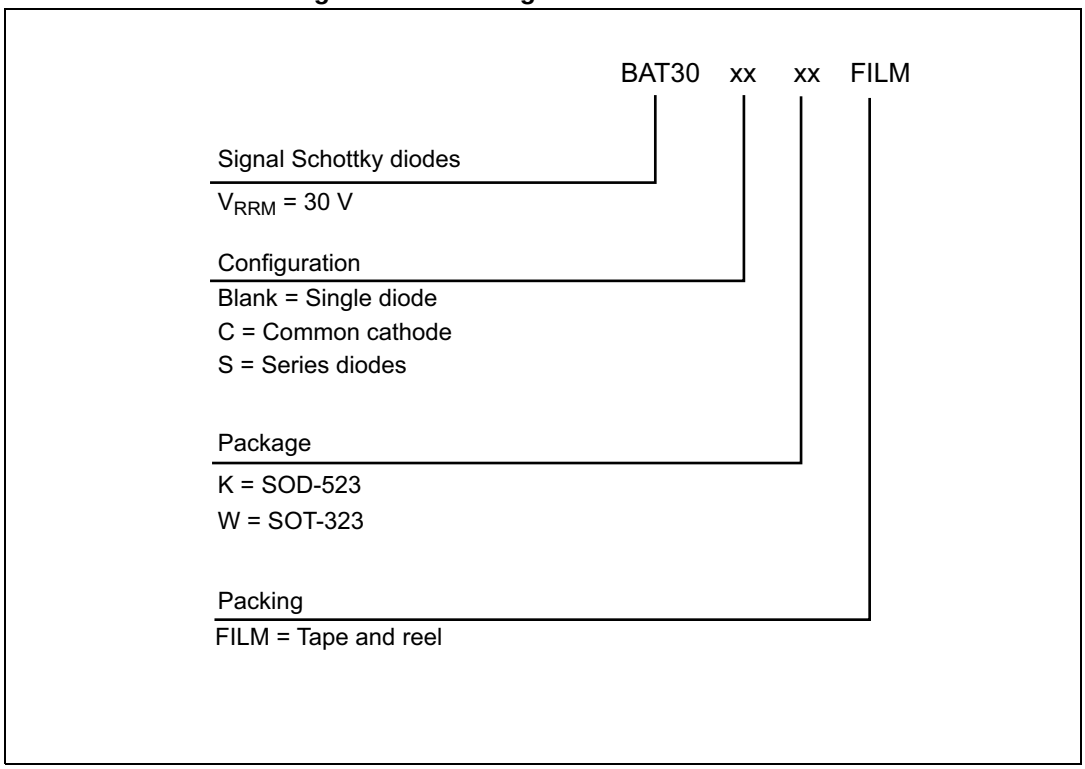


3 Ordering information

Table 8. Ordering information

Order code	Marking	Package	Weight	Base qty.	Packing mode
BAT30CWFILM	C30	SOT-323 Common cathode	6 mg	3000	Tape and reel
BAT30KFILM	30	SOD-523 Single	1.45 mg	3000	Tape and reel
BAT30SWFILM	S30	SOT-323 Serial	6 mg	3000	Tape and reel

Figure 14. Ordering information scheme



4 Revision history

Table 9. Document revision history

Date	Revision	Changes
24-Jul-2006	1	First issue
08-Jul-2009	2	Added SOD-923 package. Table 12 sorted on alphabetic sequence of order code. Updated ECOPACK statement.
13-Oct-2009	3	Updated *Table 6* quote “L1” from 0.10 to 0.05.
01-Apr-2014	4	Added Pin 1 anode marker to SOT-666 package graphics. Updated *Table 2: Absolute ratings (limiting values at T_{amb} = 25 °C, unless otherwise specified)*.
01-Apr-2015	5	Package information updated and removed: SOD-323, SOD-923, SOT-23 and SOT666. Updated cover page. Updated *Table 2* and *Table 3*. Updated *Figure 14* and *Figure 3*. Format updated to current standard.