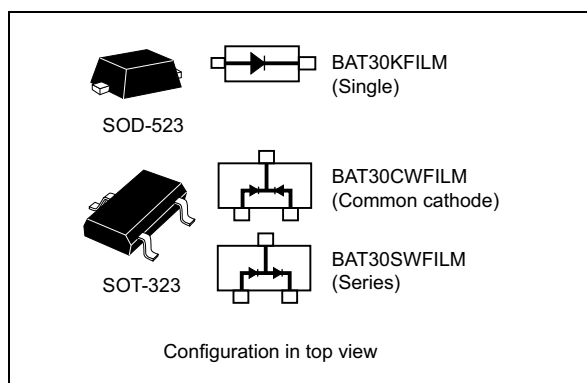


Small signal Schottky diodes

Datasheet - production data



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 $T_{amb} = 25\text{ °C}$, 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	$t_p = 10\text{ ms}$ Sinusoidal	1	A
I_{FRM}	Repetitive peak forward current, square wave	$T_A = 85\text{ °C}$, $\delta = 0.1$	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	$T_j = 25\text{ }^{\circ}\text{C}$	$V_R = 5\text{ V}$	-		0.5	μA
			$V_R = 10\text{ V}$	-		1	
			$V_R = 25\text{ V}$	-	0.65	3	
			$V_R = 30\text{ V}$	-		5	
		$T_j = 70\text{ }^{\circ}\text{C}$	$V_R = 10\text{ V}$	-	7	20	
		$T_j = 85\text{ }^{\circ}\text{C}$		-	18	50	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ }^{\circ}\text{C}$	$I_F = 0.1\text{ mA}$	-		240	mV
			$I_F = 1\text{ mA}$	-		300	
			$I_F = 10\text{ mA}$	-		375	
			$I_F = 30\text{ mA}$	-		430	
			$I_F = 100\text{ mA}$	-		500	
			$I_F = 200\text{ mA}$	-		580	
			$I_F = 300\text{ mA}$	-	530		

1. Pulse test: $t_p = 5\text{ ms}$, $\delta < 2\%$ 2. Pulse test: $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

Table 5. Dynamic characteristics

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

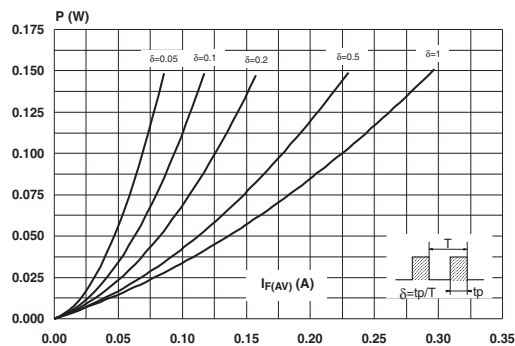
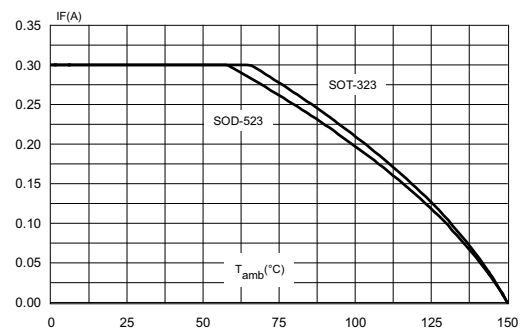
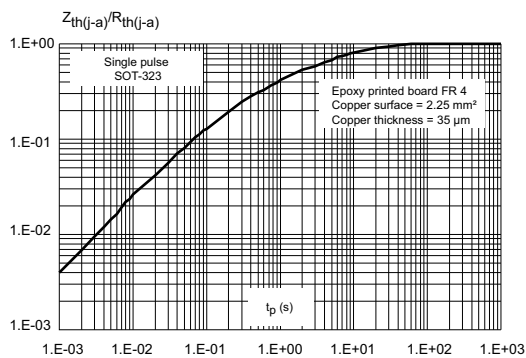
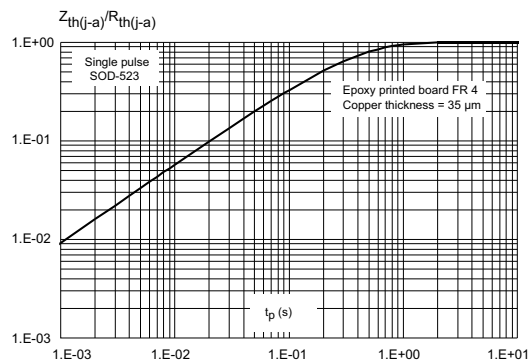
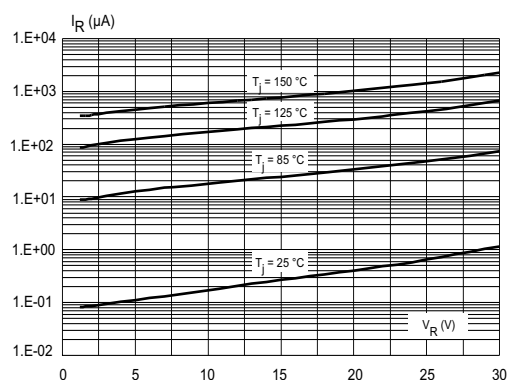
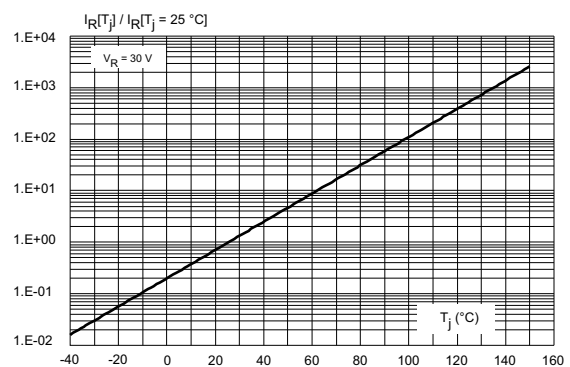
Figure 1. Power dissipation versus average forward current**Figure 2. Continuous forward current versus ambient temperature****Figure 3. Relative variation of thermal impedance junction to ambient versus pulse duration****Figure 4. Relative variation of thermal impedance junction to ambient versus pulse 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)

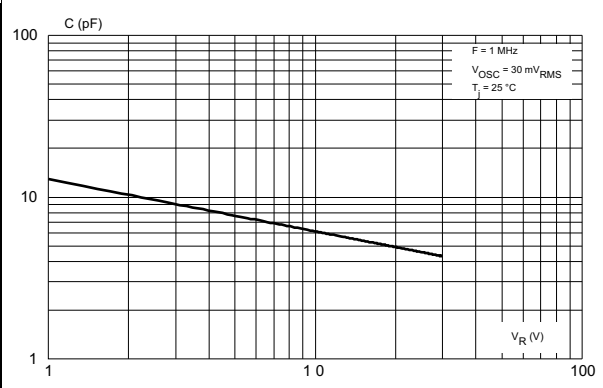


Figure 8. Forward voltage drop versus forward current (typical values)

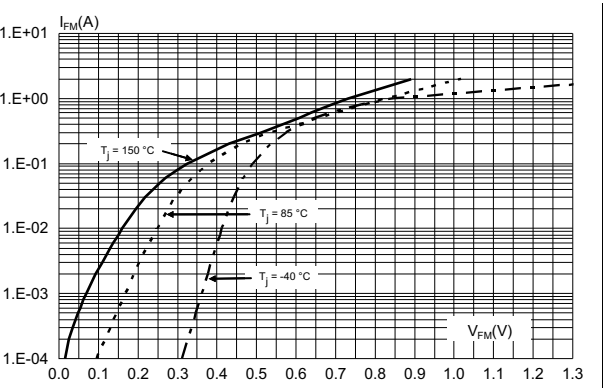
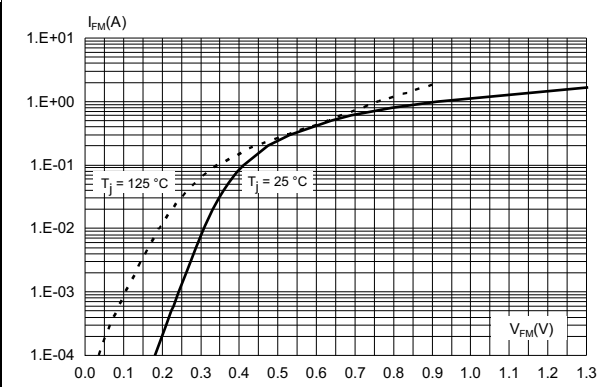


Figure 9. Forward voltage drop versus forward current (typical values)



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

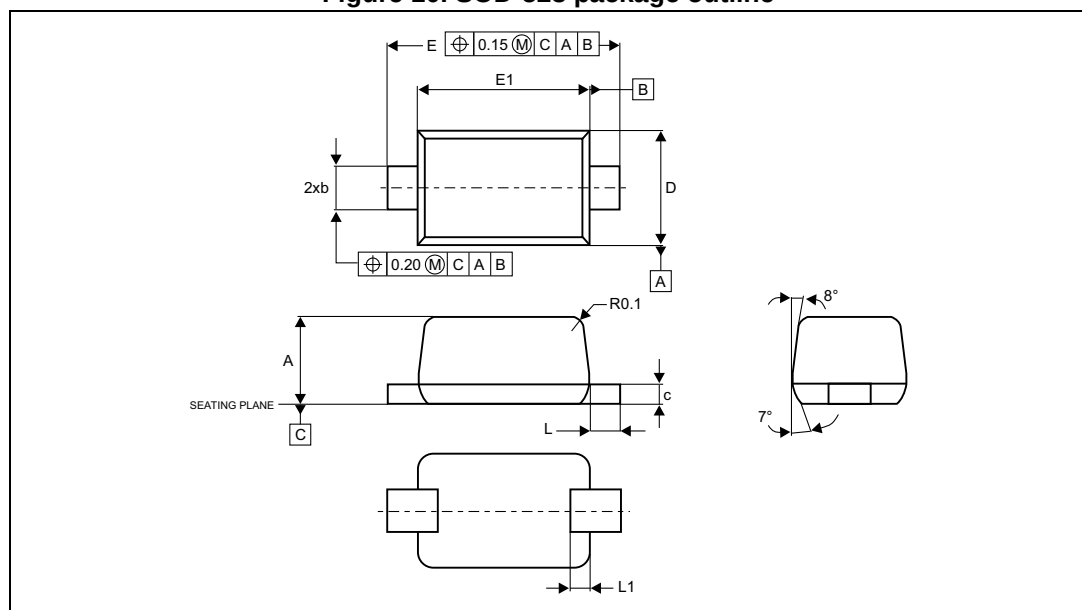
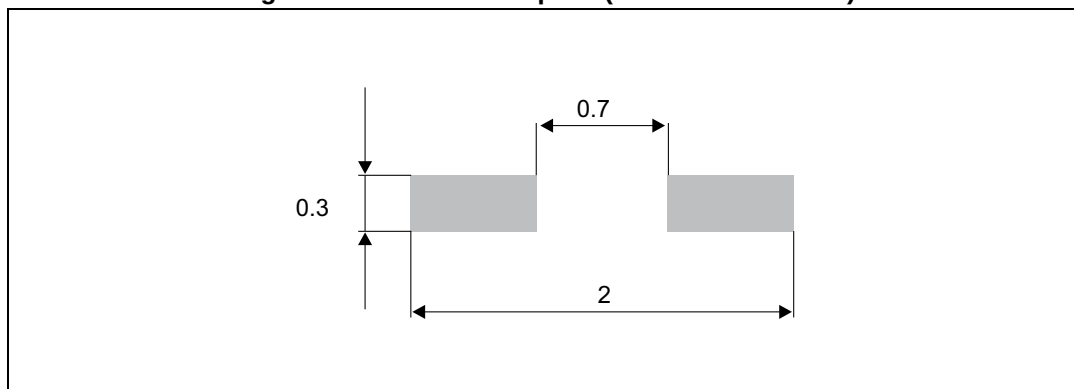


Table 6. SOD-523 package mechanical data

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

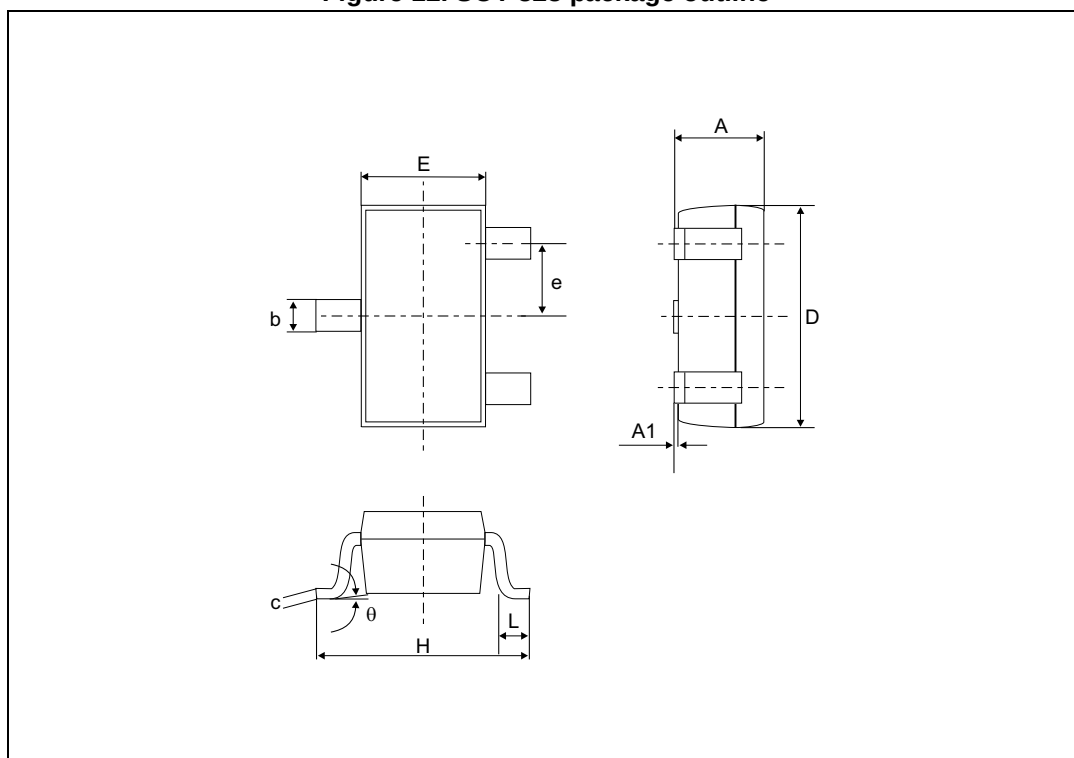
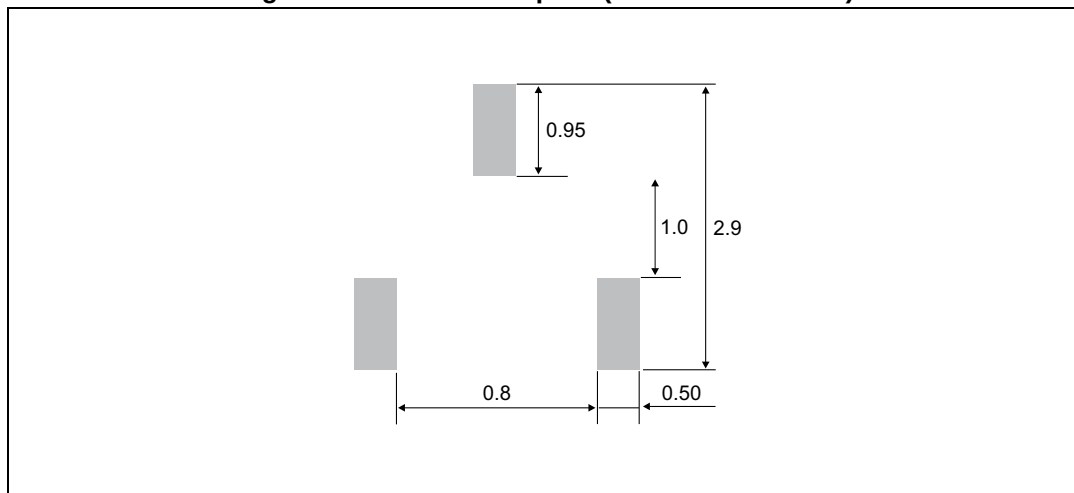


Table 7. SOT-323 package mechanical data

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)

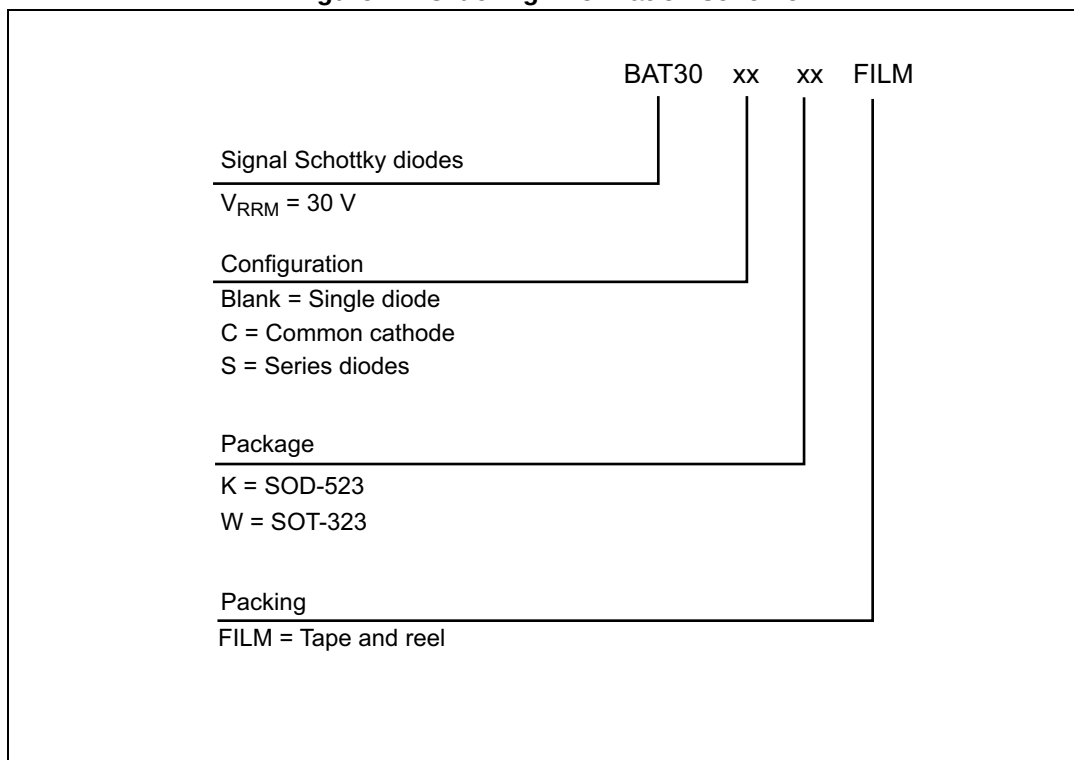


3 Ordering information

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 $T_{amb} = 25\text{ }^{\circ}\text{C}$, 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.

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