

## Low capacitance, low series inductance and resistance Schottky diodes

### Features

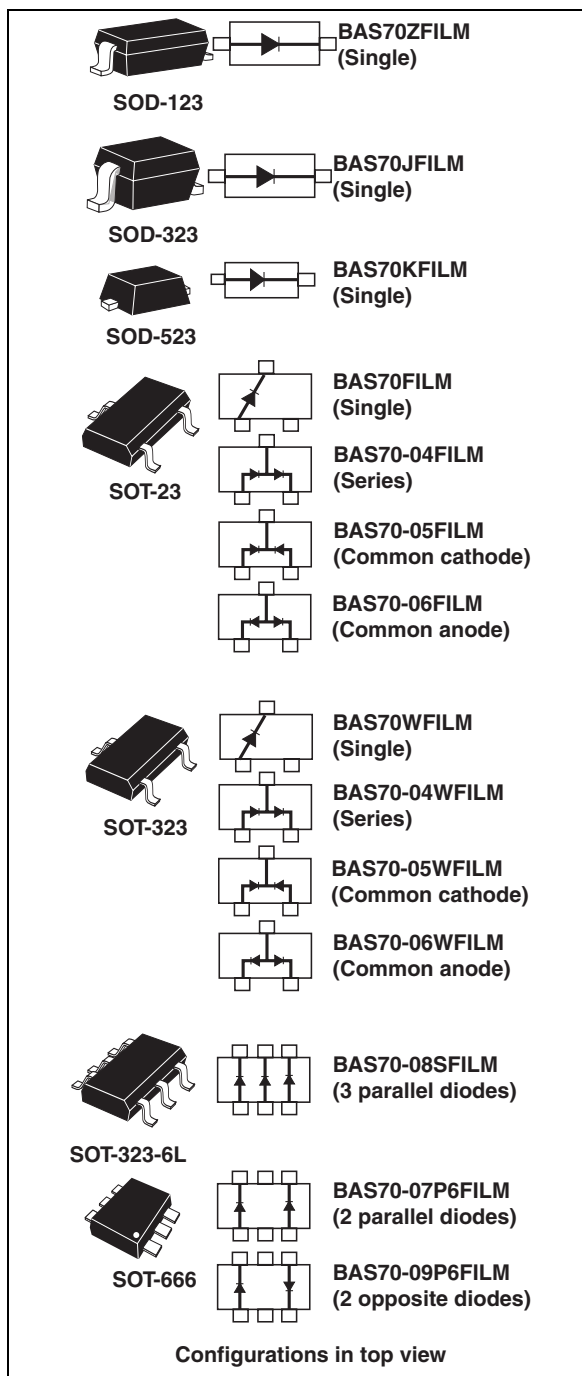
- Very low conduction losses
- Negligible switching losses
- Low forward and reverse recovery times
- Surface mount device
- Low capacitance diode
- Low resistance and inductance

### Description

The BAS70 series uses 70 V Schottky barrier diodes packaged in SOD-123, SOD-323, SOD-523, SOT-23, SOT-323, SOT-323-6L or SOT-666. These diodes are specially suited for signal detection and temperature compensation in RF applications.

**Table 1. Device summary**

Symbol	Value
$I_F$	70 mA
$V_{RRM}$	70 V
C (max)	2 pF
$T_j$ (max)	150 °C



# 1 Characteristics

**Table 2. Absolute ratings (limiting values at  $T_j = 25\text{ °C}$ , unless otherwise specified)**

Symbol	Parameter	Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage	70	V
$I_F$	Continuous forward current	70	mA
$I_{FSM}$	Surge non repetitive forward current $t_p = 10\text{ ms}$ Sinusoidal	1	A
$T_{stg}$	Storage temperature range	- 65 to +150	°C
$T_j$	Maximum operating junction temperature	150	°C
$T_L$	Maximum soldering temperature	260	°C

**Table 3. Thermal parameters**

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient <sup>(1)</sup>	SOD-123, SOT-23	500
		SOT-323, SOD-323	550
		SOD-523, SOT-666	600
			°C/W

1. 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	$T_j = 25\text{ °C}$	$V_R = 50\text{ V}$		100	nA
			$V_R = 70\text{ V}$		10	µA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 1\text{ mA}$		410	mV
			$I_F = 10\text{ mA}$		750	
			$I_F = 15\text{ mA}$		1000	

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

2. Pulse test:  $t_p = 380\text{ µs}$ ,  $\delta < 2\%$

**Table 5. Dynamic characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C	Diode capacitance	$V_R = 0\text{ V}$ , $F = 1\text{ MHz}$			2	pF
$R_F$	Differential forward resistance	$I_F = 10\text{ mA}$ , $F = 100\text{ MHz}$		30		Ω
$L_S$	Series inductance			1.5		nH

Figure 1. Average forward power dissipation versus average forward current

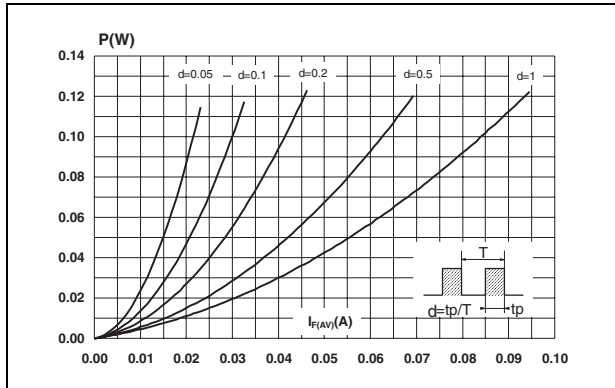


Figure 2. Average forward current  $I_{F(AV)}$  versus ambient temperature  $T_{amb}$  ( $\delta = 1$ )

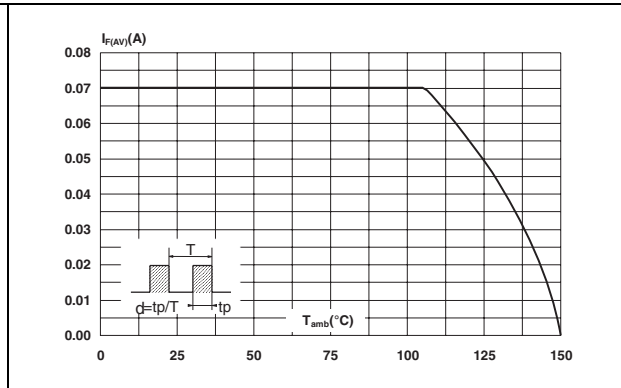


Figure 3. Reverse leakage current  $I_R$  versus reverse applied voltage  $V_R$  (typical values)

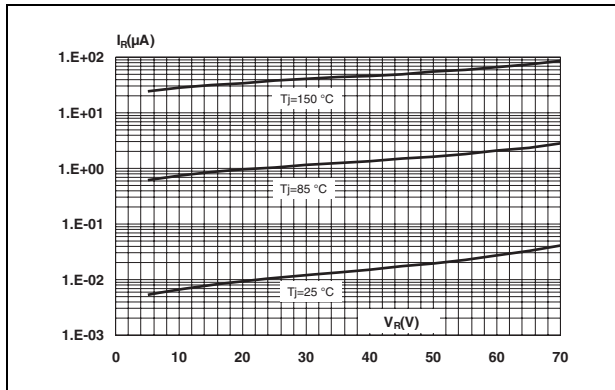


Figure 4. Reverse leakage current  $I_R$  versus junction temperature  $T_J$  (typical values)

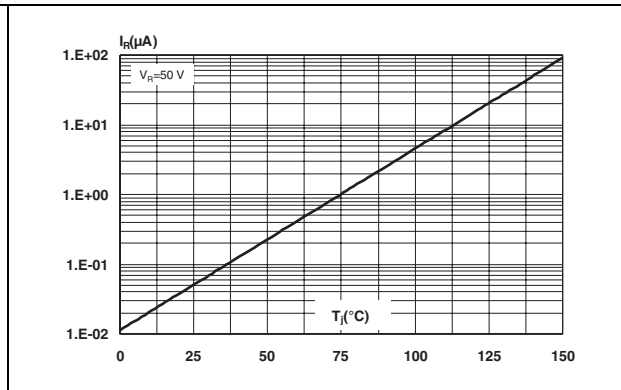


Figure 5. Junction capacitance  $C$  versus reverse applied voltage  $V_R$  (typical values)

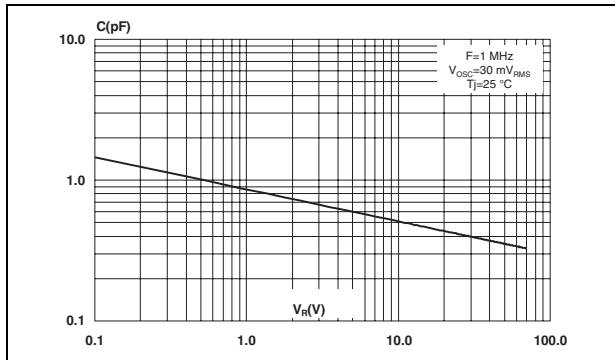


Figure 6. Forward voltage drop  $V_{FM}$  versus forward current  $I_{FM}$  (typical values)

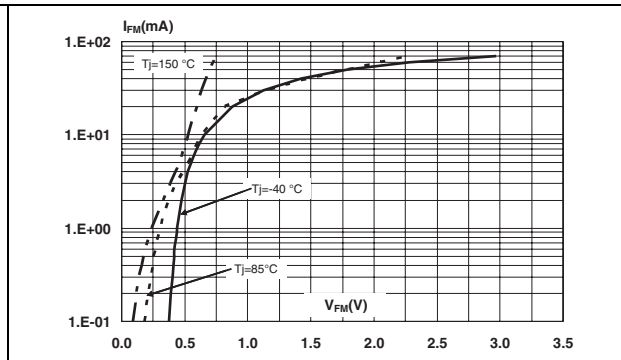


Figure 7. Forward voltage drop versus forward current (typical values)

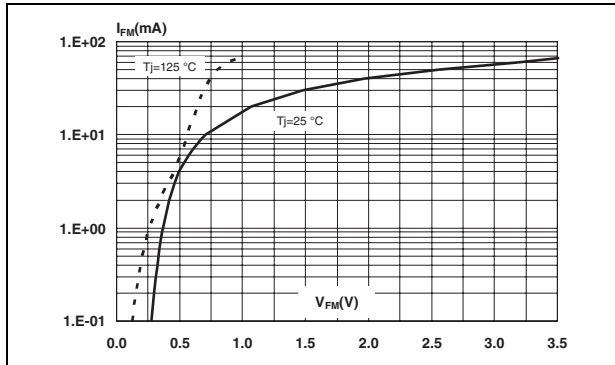


Figure 8. Differential forward resistance versus forward current (typical values)

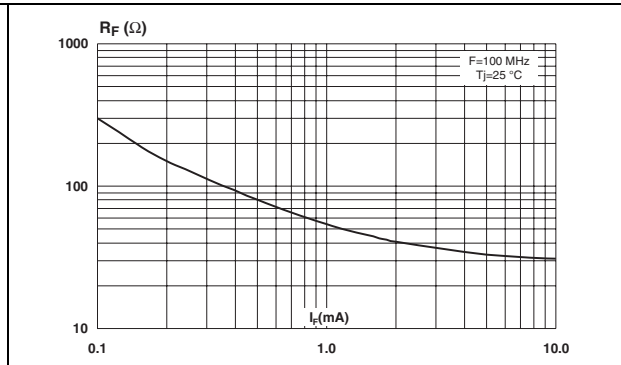


Figure 9. Relative variation of thermal impedance junction to ambient versus pulse duration

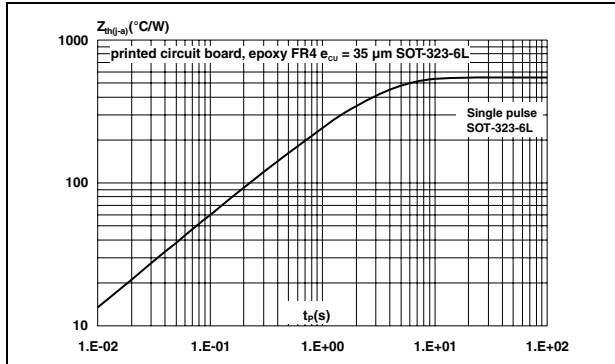


Figure 10. Relative variation of thermal impedance junction to ambient versus pulse duration

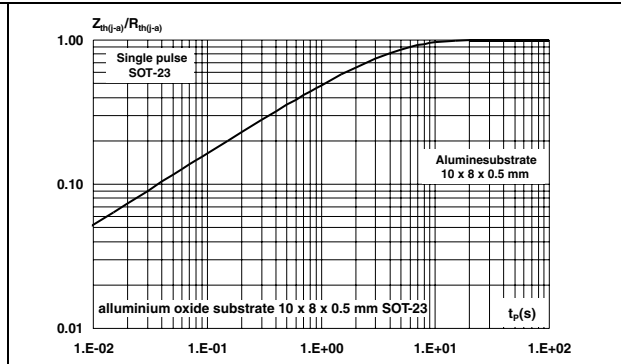


Figure 11. Relative variation of thermal impedance junction to ambient versus pulse duration

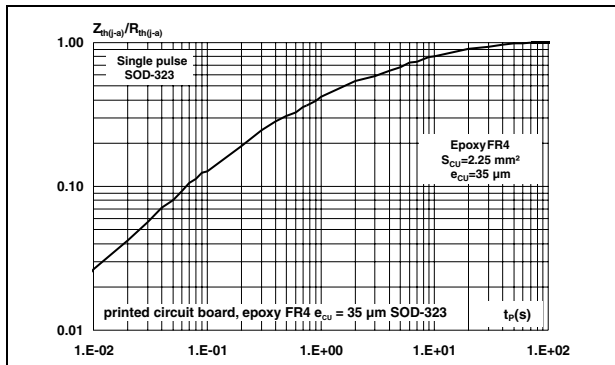


Figure 12. Relative variation of thermal impedance junction to ambient versus pulse duration

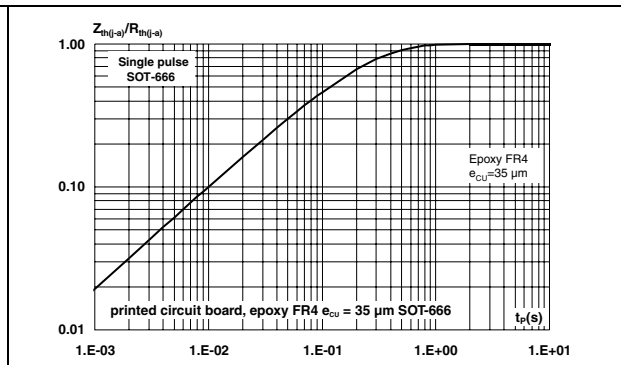


Figure 13. Relative variation of thermal impedance junction to ambient versus pulse duration

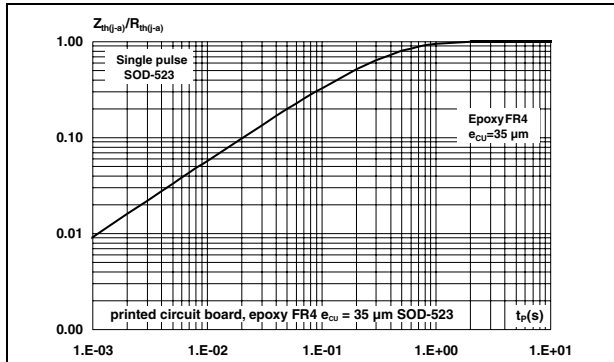
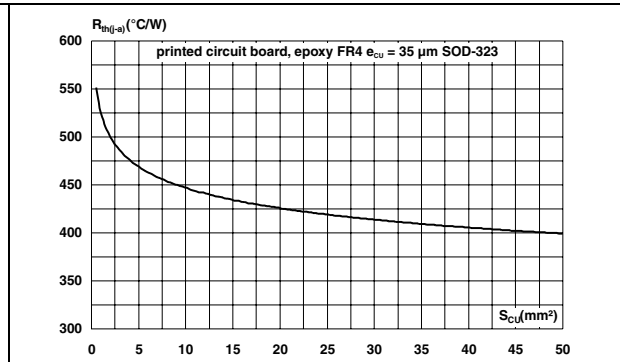
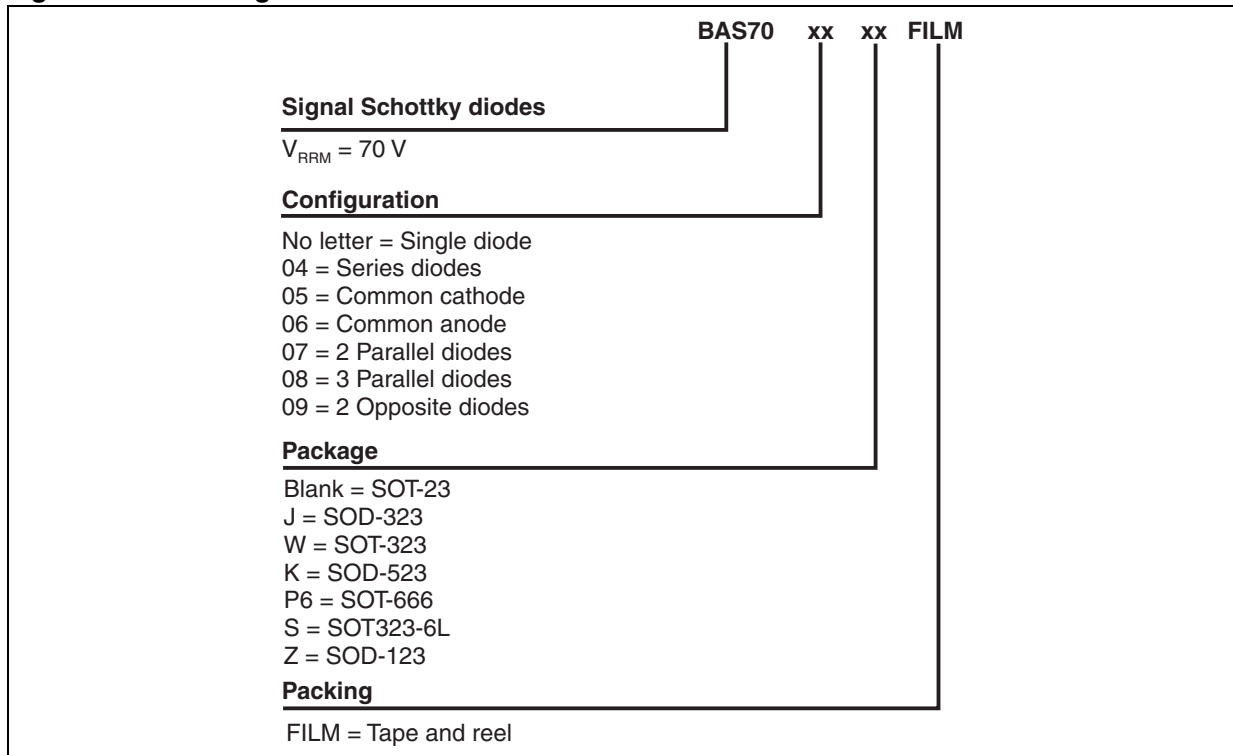


Figure 14. Thermal impedance junction to ambient versus copper surface under each lead



## 2 Ordering information scheme

Figure 15. Ordering information scheme



### 3 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](http://www.st.com). ECOPACK® is an ST trademark.

**Table 6. SOD-123 dimensions**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		1.45		0.057
A1	0	0.1	0	0.004
A2	0.85	1.35	0.033	0.053
b	0.55 Typ.		0.022 Typ.	
c	0.15 Typ.		0.039 Typ.	
D	2.55	2.85	0.1	0.112
E	1.4	1.7	0.055	0.067
G	0.25		0.01	
H	3.55	3.95	0.14	0.156

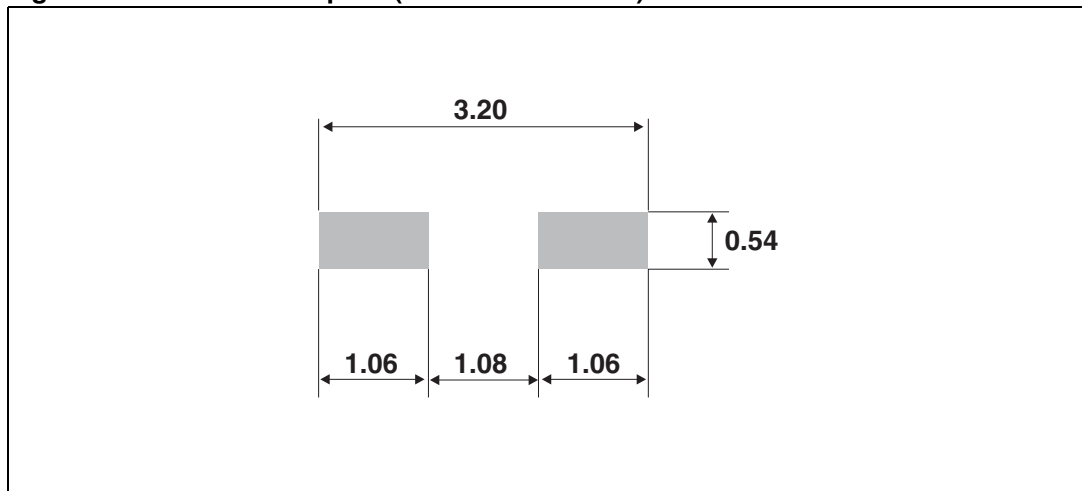
**Figure 16. SOD-123 footprint (dimensions in mm)**



**Table 7. SOD-323 dimensions**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		1.17		0.046
A1	0	0.1	0	0.004
b	0.25	0.44	0.01	0.017
c	0.1	0.25	0.004	0.01
D	1.52	1.8	0.06	0.071
E	1.11	1.45	0.044	0.057
H	2.3	2.7	0.09	0.106
L	0.1	0.46	0.004	0.02
Q1	0.1	0.41	0.004	0.016

**Figure 17. SOD-323 footprint (dimensions in mm)**



**Table 8. SOD-523 dimensions**

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

**Figure 18. SOD-523 footprint (dimensions in mm)**

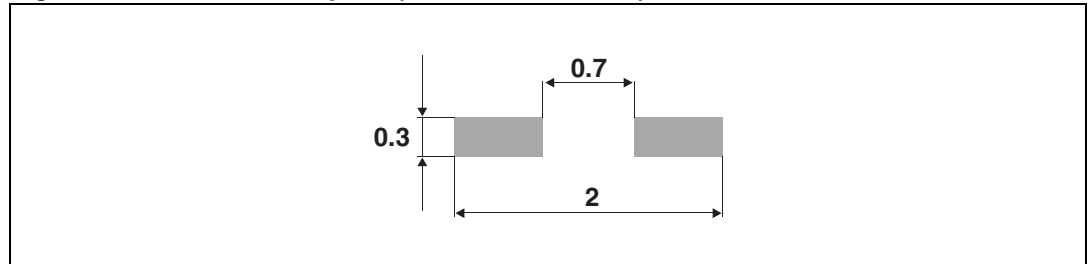




Table 9. SOT-23 dimensions

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.89	1.4	0.035	0.055
A1	0	0.1	0	0.004
B	0.3	0.51	0.012	0.02
c	0.085	0.18	0.003	0.007
D	2.75	3.04	0.108	0.12
e	0.85	1.05	0.033	0.041
e1	1.7	2.1	0.067	0.083
E	1.2	1.6	0.047	0.063
H	2.1	2.75	0.083	0.108
L	0.6 typ.		0.024 typ.	
S	0.35	0.65	0.014	0.026

Figure 19. SOT-23 footprint (dimensions in mm)

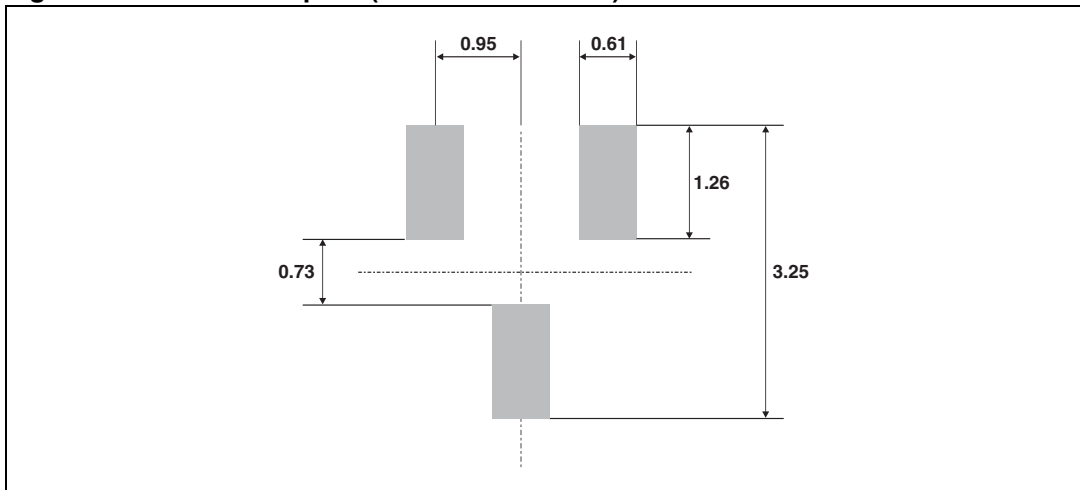


Table 10. SOT-323 dimensions

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	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	1.8	2.0	2.2	0.071	0.079	0.086
E	1.15	1.25	1.35	0.045	0.049	0.053
e		0.65			0.026	
H	1.8	2.1	2.4	0.071	0.083	0.094
L	0.1	0.2	0.3	0.004	0.008	0.012
q	0		30°	0		30°

Figure 20. SOT-323 footprint (dimensions in mm)

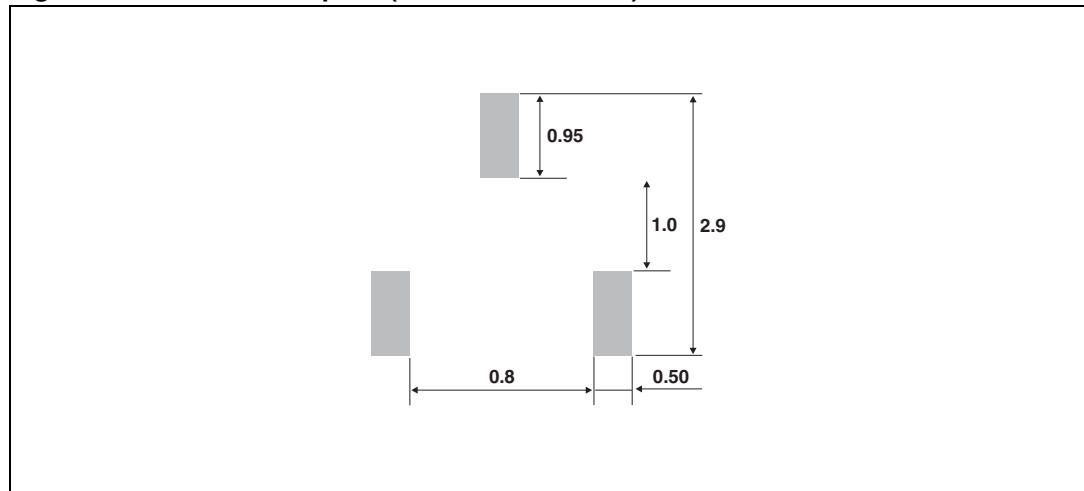


Table 11. SOT323-6L dimensions

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.8	1.1	0.031	0.043
A1	0	0.1	0	0.004
A2	0.8	1	0.031	0.039
b	0.15	0.3	0.006	0.012
c	0.1	0.18	0.004	0.007
D	1.8	2.2	0.071	0.086
E	1.15	1.35	0.045	0.053
e	0.65 Typ.		0.025 Typ.	
H	1.8	2.4	0.071	0.094
Q	0.1	0.4	0.004	0.016

Figure 21. SOT323-6L footprint (dimensions in mm)

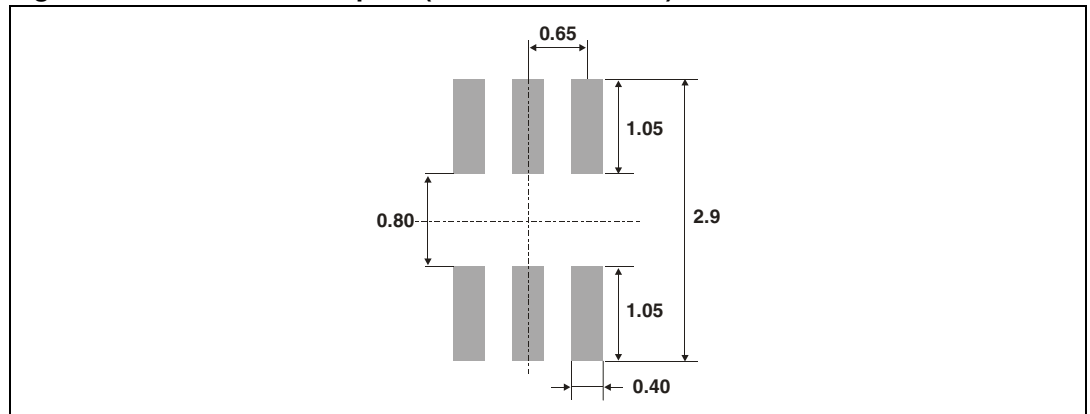
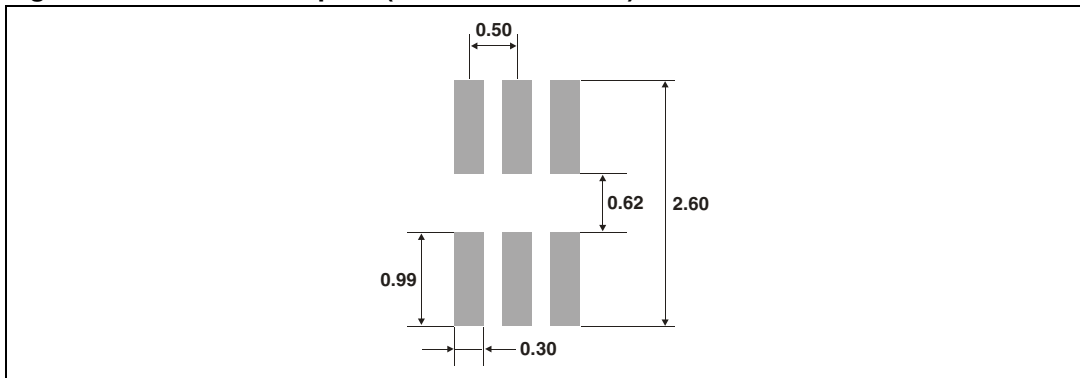


Table 12. SOT-666 dimensions

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.45		0.60	0.018		0.024
A3	0.08		0.18	0.003		0.007
b	0.17		0.34	0.007		0.013
b1	0.19	0.27	0.34	0.007	0.011	0.013
D	1.50		1.70	0.059		0.067
E	1.50		1.70	0.059		0.067
E1	1.10		1.30	0.043		0.051
e		0.50			0.020	
L1		0.19			0.007	
L2	0.10		0.30	0.004		0.012
L3		0.10			0.004	

Figure 22. SOT-666 footprint (dimensions in mm)



## 4 Ordering information

**Table 13. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
BAS70ZFILM	Z70	SOD-123	10 mg	3000	Tape and reel
BAS70FILM	D76	SOT-23 Single	10 mg	3000	Tape and reel
BAS70-04FILM	D96	SOT-23 Series	10 mg	3000	Tape and reel
BAS70-05FILM	D97	SOT-23 Common cathode	10 mg	3000	Tape and reel
BAS70-06FILM	D98	SOT-23 Common anode	10 mg	3000	Tape and reel
BAS70WFILM	D28	SOT-323 Single	6 mg	3000	Tape and reel
BAS70-04WFILM	D31	SOT-323 Series	6 mg	3000	Tape and reel
BAS70-05WFILM	D30	SOT-323 Common cathode	6 mg	3000	Tape and reel
BAS70-06WFILM	D29	SOT-323 Common anode	6 mg	3000	Tape and reel
BAS70-08SFILM	D33	SOT323-6L 3 Parallel	6 mg	3000	Tape and reel
BAS70JFILM	76	SOD-323	5 mg	3000	Tape and reel
BAS70KFILM	76	SOD-523	1.4 mg	3000	Tape and reel
BAS70-07P6FILM	P7	SOT-666 2 Parallel	2.9 mg	3000	Tape and reel
BAS70-09P6FILM	Q7	SOT-666 2 Opposite	2.9 mg	3000	Tape and reel

## 5 Revision history

**Table 14. Document revision history**

Date	Revision	Changes
24-Jul-2006	1	BAS70J / W datasheets merged. ECOPACK statement added. SOD-523 and SOT-666 packages added.
12-Oct-2009	2	Updated Table 8 quote "L1" from 0.10 to 0.05.

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