

BZT52 series

Voltage regulator diodes

Rev. 2 — 13 October 2025 Product data sheet

1. General description

General-purpose Zener diodes in an SOD123 small and flat lead Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Total power dissipation: ≤ 590 mW
- Two tolerance series: ±2 % and approximately ±5 %
- Wide working voltage range: nominal 2.4 V to 75 V (E24 range)
- Small plastic package suitable for surface-mounted design
- Low differential resistance

3. Applications

- General regulation functions

4. Quick reference data

Table 1. Quick reference data

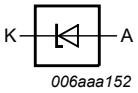
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 10 mA	[1]	-	-	0.9	V
P_{tot}	total power dissipation	T_{amb} ≤ 25 °C	[2]	-	-	350	mW
			[3]	-	-	590	mW

[1] Pulse test: t_p ≤ 300 µs; δ ≤ 0.02.
[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2.

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5. Pinning information

Table 2. Pinning

Pin	Symbol	Description		Simplified outline	Graphic symbol
1	K	cathode	[1]		
2	A	anode			

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZT52-B2V4 to BZT52-C75 [1]	-	plastic surface-mounted package; 2 leads	SOD123

[1] The series consists of 74 types with nominal working voltages from 2.4 V to 75 V.

7. Marking

Table 4. Marking codes

Type number	Marking code	Type number	Marking code	Type number	Marking code	Type number	Marking code
BZT52-B2V4	D7	BZT52-B15	DS	BZT52-C2V4	C1	BZT52-C15	CL
BZT52-B2V7	D8	BZT52-B16	DT	BZT52-C2V7	C2	BZT52-C16	CM
BZT52-B3V0	D9	BZT52-B18	DU	BZT52-C3V0	C3	BZT52-C18	CN
BZT52-B3V3	DA	BZT52-B20	DV	BZT52-C3V3	C4	BZT52-C20	CP
BZT52-B3V6	DB	BZT52-B22	DW	BZT52-C3V6	C5	BZT52-C22	CQ
BZT52-B3V9	DC	BZT52-B24	DY	BZT52-C3V9	C6	BZT52-C24	CR
BZT52-B4V3	DD	BZT52-B27	E1	BZT52-C4V3	C7	BZT52-C27	CS
BZT52-B4V7	DE	BZT52-B30	E2	BZT52-C4V7	C8	BZT52-C30	CT
BZT52-B5V1	DF	BZT52-B33	E3	BZT52-C5V1	C9	BZT52-C33	CU
BZT52-B5V6	DG	BZT52-B36	E4	BZT52-C5V6	CA	BZT52-C36	CV
BZT52-B6V2	DH	BZT52-B39	E5	BZT52-C6V2	CB	BZT52-C39	CW
BZT52-B6V8	DJ	BZT52-B43	E6	BZT52-C6V8	CC	BZT52-C43	CY
BZT52-B7V5	DK	BZT52-B47	E7	BZT52-C7V5	CD	BZT52-C47	D1
BZT52-B8V2	DL	BZT52-B51	E8	BZT52-C8V2	CE	BZT52-C51	D2
BZT52-B9V1	DM	BZT52-B56	E9	BZT52-C9V1	CF	BZT52-C56	D3
BZT52-B10	DN	BZT52-B62	EA	BZT52-C10	CG	BZT52-C62	D4
BZT52-B11	DP	BZT52-B68	EB	BZT52-C11	CH	BZT52-C68	D5
BZT52-B12	DQ	BZT52-B75	EC	BZT52-C12	CJ	BZT52-C75	D6
BZT52-B13	DR	-	-	BZT52-C13	CK	-	-

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8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
I_F	forward current			-	250	mA
I_{ZSM}	non-repetitive peak reverse current			-	see Tables 8, 9 and 10	
P_{ZSM}	non-repetitive peak reverse power dissipation		[1]	-	40	W
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[2]	-	350	mW
			[3]	-	590	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-55	+150	°C
T_{stg}	storage temperature			-65	+150	°C

[1] t_p = 100 µs; square wave; T_j = 25 °C prior to surge.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2.

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	350	K/W
			[2]	-	-	210	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	55	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2.
[3] Soldering point of cathode tab.

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10. Characteristics

Table 7. Characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 10 mA	[1]	-	-	0.9	V

[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

Table 8. Characteristics per type; BZT52-B2V4 to BZT52-C24

T_j = 25 °C unless otherwise specified.

BZT52 -xxx	Sel	Working voltage V_Z (V); I_Z = 5 mA		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (µA)		Temperature coefficient S_Z (mV/K); I_Z = 5 mA		Diode capacitance C_d (pF) [1]	Non-repetitive peak reverse current I_{ZSM} (A) [2]
		Min	Max	I_Z = 1 mA	I_Z = 5 mA	Max	V_R (V)	Min	Max	Max	Max
2V4	B	2.35	2.45	400	85	50	1	-3.5	0.0	450	6.0
	C	2.2	2.6								
2V7	B	2.65	2.75	500	83	20	1	-3.5	0.0	450	6.0
	C	2.5	2.9								
3V0	B	2.94	3.06	500	95	10	1	-3.5	0.0	450	6.0
	C	2.8	3.2								
3V3	B	3.23	3.37	500	95	5	1	-3.5	0.0	450	6.0
	C	3.1	3.5								
3V6	B	3.53	3.67	500	95	5	1	-3.5	0.0	450	6.0
	C	3.4	3.8								
3V9	B	3.82	3.98	500	95	3	1	-3.5	0.0	450	6.0
	C	3.7	4.1								
4V3	B	4.21	4.39	500	95	3	1	-3.5	0.0	450	6.0
	C	4.0	4.6								
4V7	B	4.61	4.79	500	78	3	2	-3.5	0.2	300	6.0
	C	4.4	5.0								
5V1	B	5.0	5.2	480	60	2	2	-2.7	1.2	300	6.0
	C	4.8	5.4								
5V6	B	5.49	5.71	400	40	1	2	-2.0	2.5	300	6.0
	C	5.2	6.0								
6V2	B	6.08	6.32	150	10	3	4	0.4	3.7	200	6.0
	C	5.8	6.6								
6V8	B	6.66	6.94	80	8	2	4	1.2	4.5	200	6.0
	C	6.4	7.2								
7V5	B	7.35	7.65	80	10	1	5	2.5	5.3	150	4.0
	C	7.0	7.9								
8V2	B	8.04	8.36	80	10	0.7	5	3.2	6.2	150	4.0
	C	7.7	8.7								
9V1	B	8.92	9.28	100	10	0.5	6	3.8	7.0	150	3.0
	C	8.5	9.6								

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BZT52 -xxx	Sel	Working voltage V_Z (V); I_Z = 5 mA		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (µA)		Temperature coefficient S_Z (mV/K); I_Z = 5 mA		Diode capacitance C_d (pF) [1]	Non-repetitive peak reverse current I_{ZSM} (A) [2]
		Min	Max	I_Z = 1 mA	I_Z = 5 mA	Max	V_R (V)	Min	Max	Max	Max
10	B	9.8	10.2	70	10	0.2	7	4.5	8.0	90	3.0
	C	9.4	10.6								
11	B	10.8	11.2	70	10	0.1	8	5.4	9.0	85	2.5
	C	10.4	11.6								
12	B	11.8	12.2	90	10	0.1	8	6.0	10.0	85	2.5
	C	11.4	12.7								
13	B	12.7	13.3	110	10	0.1	8	7.0	11.0	80	2.5
	C	12.4	14.1								
15	B	14.7	15.3	110	15	0.05	10.5	9.2	13.0	75	2.0
	C	13.8	15.6								
16	B	15.7	16.3	170	20	0.05	11.2	10.4	14.0	75	1.5
	C	15.3	17.1								
18	B	17.6	18.4	170	20	0.05	12.6	12.4	16.0	70	1.5
	C	16.8	19.1								
20	B	19.6	20.4	220	20	0.05	14	14.4	18.0	60	1.5
	C	18.8	21.2								
22	B	21.6	22.4	220	25	0.05	15.4	16.4	20.0	60	1.25
	C	20.8	23.3								
24	B	23.5	24.5	220	30	0.05	16.8	18.4	22.0	55	1.25
	C	22.8	25.6								

[1] f = 1 MHz; V_R = 0 V.
[2] t_p = 100 µs; T_{amb} = 25 °C.

Table 9. Characteristics per type; BZT52-B27 to BZT52-C51

T_j = 25 °C unless otherwise specified.

BZT52 -xxx	Sel	Working voltage V_Z (V); I_Z = 2 mA		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (µA)		Temperature coefficient S_Z (mV/K); I_Z = 5 mA		Diode capacitance C_d (pF) [1]	Non-repetitive peak reverse current I_{ZSM} (A) [2]
		Min	Max	I_Z = 1 mA	I_Z = 5 mA	Max	V_R (V)	Min	Max	Max	Max
27	B	26.5	27.5	250	40	0.05	18.9	21.4	25.3	50	1.0
	C	25.1	28.9								
30	B	29.4	30.6	250	40	0.05	21	24.4	29.4	50	1.0
	C	28.0	32.0								
33	B	32.3	33.7	250	40	0.05	23.1	27.4	33.4	45	0.9
	C	31.0	35.0								
36	B	35.3	36.7	250	60	0.05	25.2	30.4	37.4	45	0.8
	C	34.0	38.0								
39	B	38.2	39.8	300	75	0.05	27.3	33.4	41.2	45	0.7
	C	37.0	41.0								
43	B	42.1	43.9	325	80	0.05	30.1	37.6	46.6	40	0.6
	C	40.0	46.0								

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BZT52 -xxx	Sel	Working voltage V_Z (V); I_Z = 2 mA		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (µA)		Temperature coefficient S_Z (mV/K); I_Z = 5 mA		Diode capacitance C_d (pF) [1]	Non-repetitive peak reverse current I_{ZSM} (A) [2]
		Min	Max	I_Z = 1 mA	I_Z = 5 mA	Max	V_R (V)	Min	Max	Max	Max
47	B	46.1	47.9	325	90	0.05	32.9	42.0	51.8	40	0.5
	C	44.0	50.0								
51	B	50.0	52.0	350	100	0.05	35.7	46.6	57.2	40	0.4
	C	48.0	54.0								

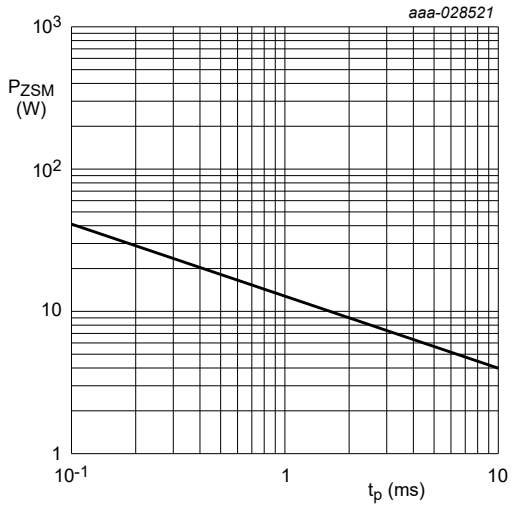
[1] f = 1 MHz; V_R = 0 V.
[2] t_p = 100 µs; T_{amb} = 25 °C.

Table 10. Characteristics per type; BZT52-B56 to BZT52-C75

T_j = 25 °C unless otherwise specified.

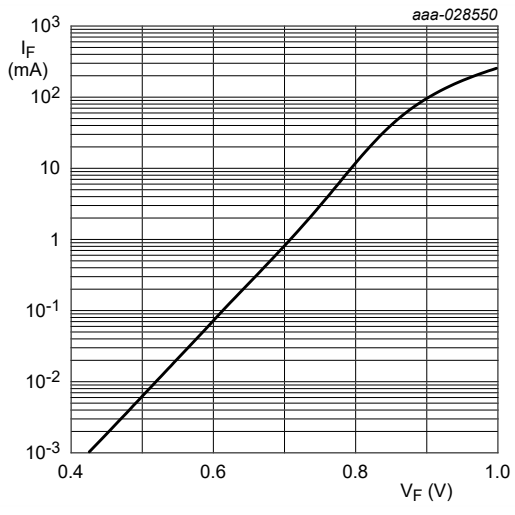
BZT52 -xxx	Sel	Working voltage V_Z (V); I_Z = 2 mA		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (µA)		Temperature coefficient S_Z (mV/K); I_Z = 5 mA		Diode capacitance C_d (pF) [1]	Non-repetitive peak reverse current I_{ZSM} (A) [2]
		Min	Max	I_Z = 0.5 mA	I_Z = 2 mA	Max	V_R (V)	Min	Max	Max	Max
56	B	54.9	57.1	375	120	0.05	39.2	52.2	63.8	40	0.3
	C	52.0	60.0								
62	B	60.8	63.2	400	140	0.05	43.4	58.8	71.6	35	0.3
	C	58.0	66.0								
68	B	66.6	69.4	400	160	0.05	47.6	65.6	79.8	35	0.25
	C	64.0	72.0								
75	B	73.5	76.5	400	175	0.05	52.5	73.4	88.6	35	0.20
	C	70.0	79.0								

[1] f = 1 MHz; V_R = 0 V.
[2] t_p = 100 µs; T_{amb} = 25 °C.



(1) T_j = 25 °C (before surge)

Fig. 1. Non-repetitive peak reverse power dissipation as a function of pulse duration; maximum values

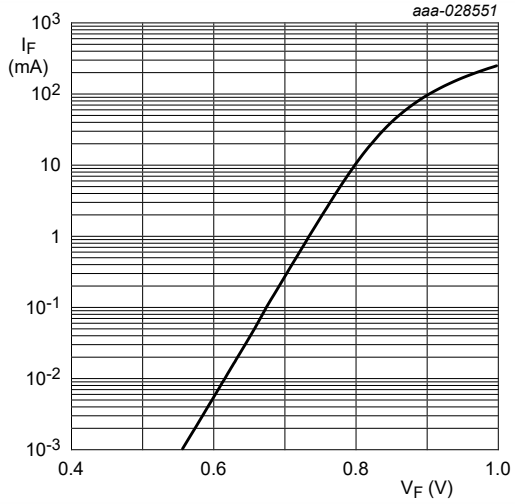


T_j = 25 °C

Fig. 2. Forward current as a function of forward voltage; typical values (BZT52-B/C2V4)

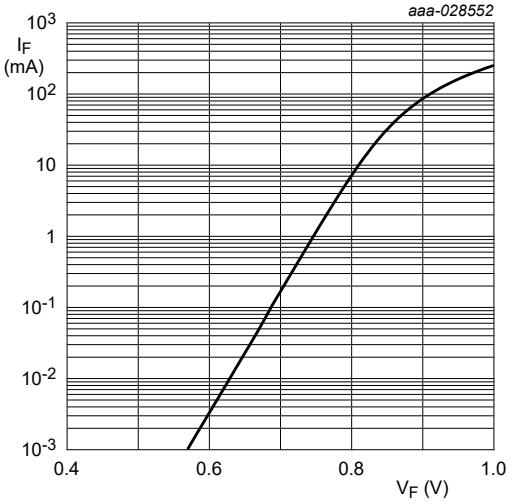
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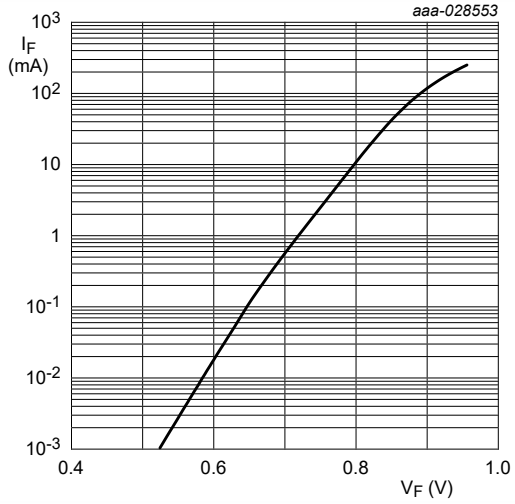
T_j = 25 °C

Fig. 3. Forward current as a function of forward voltage; typical values (BZT52-B/C6V8)



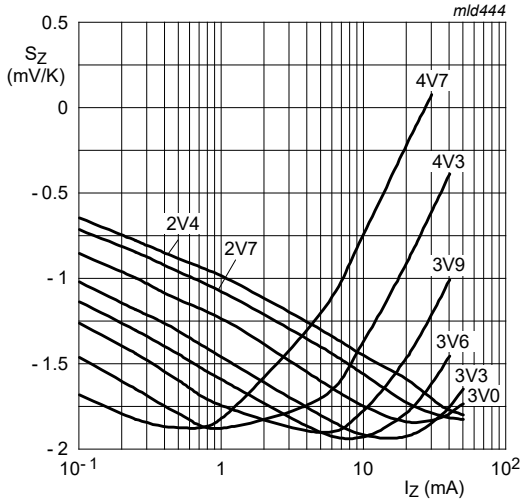
T_j = 25 °C

Fig. 4. Forward current as a function of forward voltage; typical values (BZT52-B/C7V5)



T_j = 25 °C

Fig. 5. Forward current as a function of forward voltage; typical values (BZT52-B/C75)

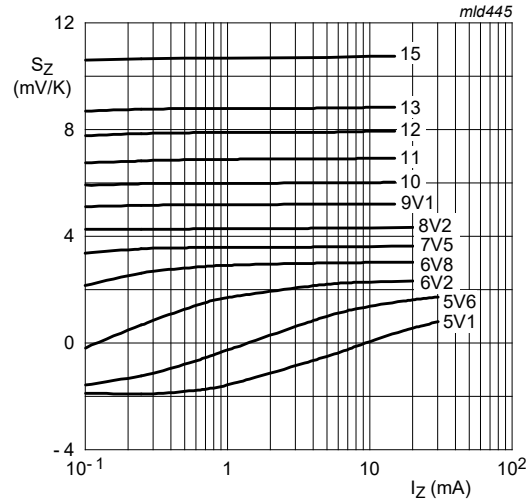


T_j = 25 °C to 150 °C

Fig. 6. Temperature coefficient as a function of working current; typical values (BZT52-B/C2V4 to B/C4V7)

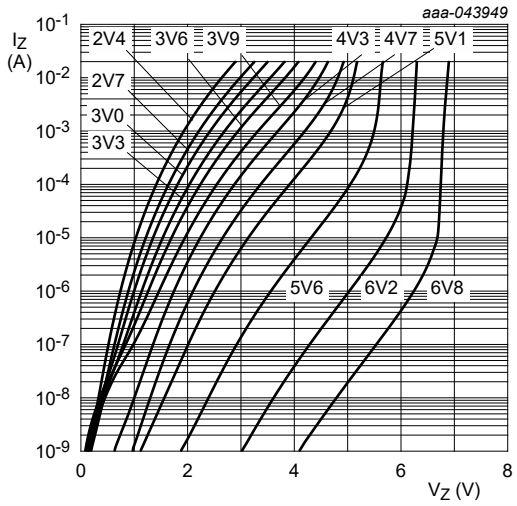
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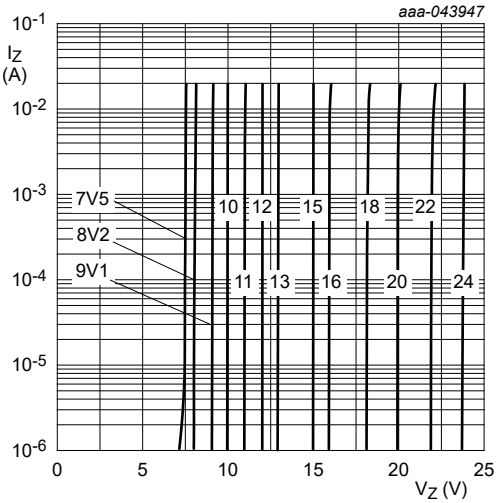
T_j = 25 °C to 150 °C

Fig. 7. Temperature coefficient as a function of working current; typical values (BZT52-B/C5V1 to B/C15)



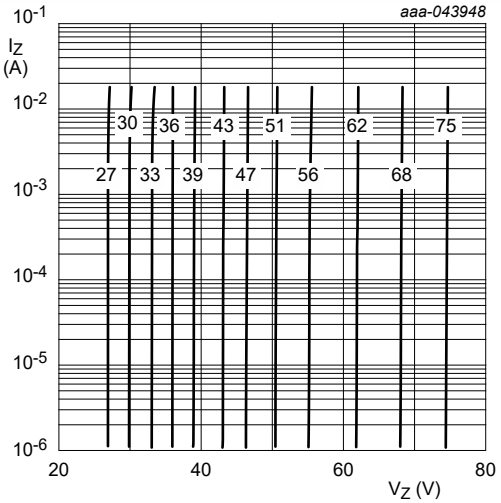
T_j = 25 °C

Fig. 8. Reverse current as a function of reverse voltage; typical values (BZT52-B/C2V4 to -B/C6V8)



T_j = 25 °C

Fig. 9. Reverse current as a function of reverse voltage; typical values (BZT52-B/C7V5 to B/C24)



T_j = 25 °C

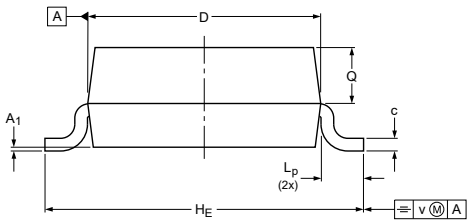
Fig. 10. Reverse current as a function of reverse voltage; typical values (BZT52-B/C27 to -B/C75)

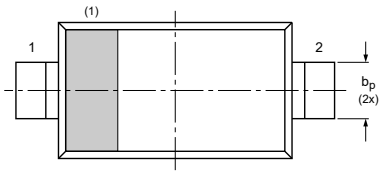
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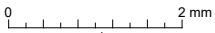
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11. Package outline

Plastic surface-mounted package; 2 leads **SOD123**







Dimensions (mm are the original dimensions)

Unit		A	A_1	b_p	c	D	E	H_E	L_p	Q	v
mm	max	1.3	0.10	0.70	0.25	2.80	1.7	3.75	0.45	0.7	0.2
	nom										
	min	1.0	0.00	0.55	0.10	2.55	1.5	3.45	0.15	0.6	

Note
1. The marking band indicates the cathode.

sod123_po

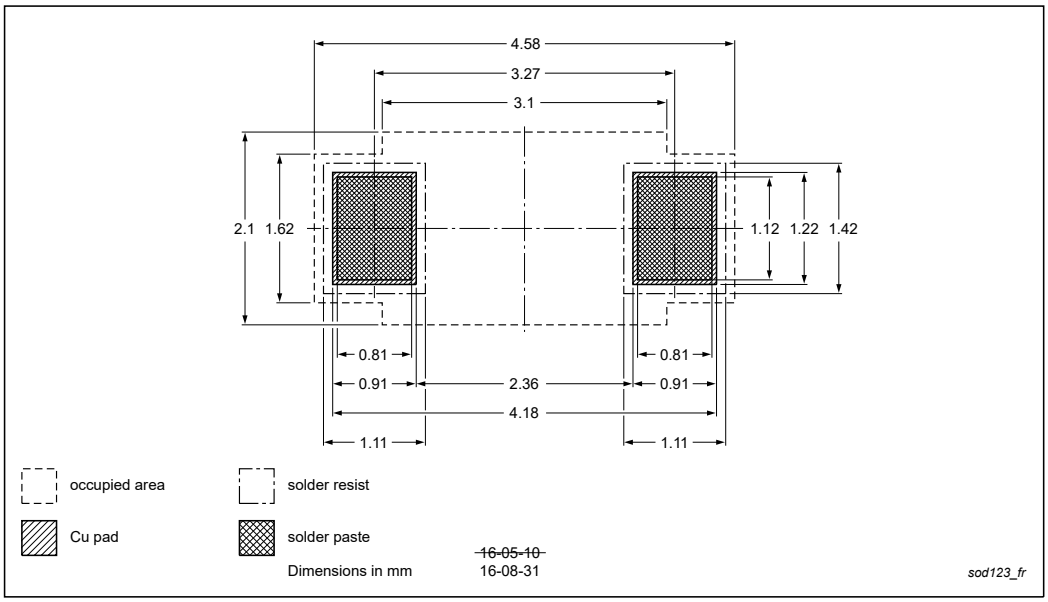
Outline version	References			European projection	Issue date
	IEC	JEDEC	JEITA		
SOD123					~~16-05-26~~ 16-08-31

Fig. 11. Package outline SOD123

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12. Soldering



Reflow soldering is the only recommended soldering method.

Fig. 12. Reflow soldering footprint SOD123

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13. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZT52_SER v.2	20251013	Product data sheet	-	BZT52_SER v.1
Modifications:	• Products with C-selction changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s). • The products of B-selction (former data sheet name: BZT52-B_SER) are added to this data sheet • Characteristics: Graphs of Fig 8, 9 and 10 exchanged with newer ones			
BZT52_SER v.1	20170316	Product data sheet	-	-

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14. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at https://www.nexperia.com.

Definitions

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