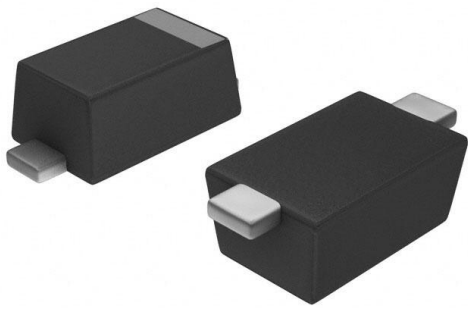


BZT52H-C5V1,115 Datasheet

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DiGi Electronics Part Number	BZT52H-C5V1,115-DG
Manufacturer	Nexperia USA Inc.
Manufacturer Product Number	BZT52H-C5V1,115
Description	DIODE ZENER 5.1V 375MW SOD123F
Detailed Description	Zener Diode 5.1 V 375 mW ±5% Surface Mount SOD-123F

This model BZT52H-C5V1,115 is available at DiGi Electronics.

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Purchase and inquiry

Manufacturer Product Number:

BZT52H-C5V1,115

Series:

-

Voltage - Zener (Nom) (Vz):

5.1 V

Power - Max:

375 mW

Current - Reverse Leakage @ Vr:2 μ A @ 2 V**Operating Temperature:**

-65°C ~ 150°C (TA)

Qualification:

AEC-Q101

Package / Case:

SOD-123F

Base Product Number:

BZT52

Manufacturer:

Nexperia USA Inc.

Product Status:

Active

Tolerance:

±5%

Impedance (Max) (Zzt):

60 Ohms

Voltage - Forward (Vf) (Max) @ If:

900 mV @ 10 mA

Grade:

Automotive

Mounting Type:

Surface Mount

Supplier Device Package:

SOD-123F

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.10.0050

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



BZT52H series

Voltage regulator diodes

Rev. 7 — 1 January 2023

Product data sheet

1. General description

General-purpose Zener diodes in an SOD123F small and flat lead Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Total power dissipation: ≤ 830 mW
- Three tolerance series: $\pm 1\%$, $\pm 2\%$ and approximately $\pm 5\%$
- Wide working voltage range: nominal 2.4 V to 75 V (E24 range)
- Small plastic package suitable for surface-mounted design

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	$T_{amb} \leq 25$ °C	[2]	-	-	375	mW
			[3]	-	-	830	mW


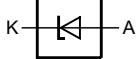
[1] Pulse test: $t_p \leq 300$ μ s; $\delta \leq 0.02$.

[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 cm².

5. Pinning information

Table 2. Pinning

Pin	Symbol	Description		Simplified outline	Graphic symbol
1	K	cathode	[1]		 006aaa152
2	A	anode			

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZT52H series[1]	-	plastic surface-mounted package; 2 leads	SOD123F

[1] The series consists of 111 types with 37 breakdown voltages with nominal working voltages from 2.4 V to 75 V and $\pm 1\%$, $\pm 2\%$ and $\pm 5\%$ tolerances.

7. Marking

Table 4. Marking codes

Type number	Marking code	Type number	Marking code	Type number	Marking code
BZT52H-A2V4	FT	BZT52H-B2V4	DC	BZT52H-C2V4	B3
BZT52H-A2V7	FU	BZT52H-B2V7	DD	BZT52H-C2V7	B4
BZT52H-A3V0	FV	BZT52H-B3V0	DE	BZT52H-C3V0	B5
BZT52H-A3V3	FW	BZT52H-B3V3	DF	BZT52H-C3V3	B6
BZT52H-A3V6	FX	BZT52H-B3V6	DG	BZT52H-C3V6	B7
BZT52H-A3V9	FY	BZT52H-B3V9	DH	BZT52H-C3V9	B8
BZT52H-A4V3	FZ	BZT52H-B4V3	DJ	BZT52H-C4V3	B9
BZT52H-A4V7	G1	BZT52H-B4V7	DK	BZT52H-C4V7	BA
BZT52H-A5V1	G2	BZT52H-B5V1	DL	BZT52H-C5V1	BB
BZT52H-A5V6	G3	BZT52H-B5V6	DM	BZT52H-C5V6	BC
BZT52H-A6V2	G4	BZT52H-B6V2	DN	BZT52H-C6V2	BD
BZT52H-A6V8	G5	BZT52H-B6V8	DP	BZT52H-C6V8	BE
BZT52H-A7V5	G6	BZT52H-B7V5	DQ	BZT52H-C7V5	BF
BZT52H-A8V2	G7	BZT52H-B8V2	DR	BZT52H-C8V2	BG
BZT52H-A9V1	G8	BZT52H-B9V1	DS	BZT52H-C9V1	BH
BZT52H-A10	G9	BZT52H-B10	DT	BZT52H-C10	BJ
BZT52H-A11	GA	BZT52H-B11	DU	BZT52H-C11	BK
BZT52H-A12	GB	BZT52H-B12	DV	BZT52H-C12	BL
BZT52H-A13	GC	BZT52H-B13	DW	BZT52H-C13	BM
BZT52H-A15	GD	BZT52H-B15	DX	BZT52H-C15	BN
BZT52H-A16	GE	BZT52H-B16	DY	BZT52H-C16	BP
BZT52H-A18	GF	BZT52H-B18	DZ	BZT52H-C18	BQ
BZT52H-A20	GG	BZT52H-B20	E1	BZT52H-C20	BR
BZT52H-A22	GH	BZT52H-B22	E2	BZT52H-C22	BS
BZT52H-A24	GJ	BZT52H-B24	E3	BZT52H-C24	BT
BZT52H-A27	GK	BZT52H-B27	E4	BZT52H-C27	BU
BZT52H-A30	GL	BZT52H-B30	E5	BZT52H-C30	BV
BZT52H-A33	GM	BZT52H-B33	E6	BZT52H-C33	BW
BZT52H-A36	GN	BZT52H-B36	E7	BZT52H-C36	BX
BZT52H-A39	GP	BZT52H-B39	E8	BZT52H-C39	BY
BZT52H-A43	GY	BZT52H-B43	E9	BZT52H-C43	BZ
BZT52H-A47	GR	BZT52H-B47	EA	BZT52H-C47	C1
BZT52H-A51	GS	BZT52H-B51	EB	BZT52H-C51	C2
BZT52H-A56	GT	BZT52H-B56	EC	BZT52H-C56	C3
BZT52H-A62	GU	BZT52H-B62	ED	BZT52H-C62	C4
BZT52H-A68	GV	BZT52H-B68	EE	BZT52H-C68	C5
BZT52H-A75	GW	BZT52H-B75	EF	BZT52H-C75	C6

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		[1] -	see Tables 8, 9 and 10	
P_{ZSM}	non-repetitive peak reverse power dissipation		[1] -	40	W
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[2] -	375	mW
			[3] -	830	mW
T_j	junction temperature		-	150	°C
T_{amb}	ambient temperature		-65	+150	°C
T_{stg}	storage temperature		-65	+150	°C

[1] $t_p = 100\ \mu\text{s}$; square wave; $T_j = 25\text{ °C}$ 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] -	-	330	K/W
			[2] -	-	150	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3] -	-	70	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.

10. Characteristics

Table 7. Characteristics

$T_j = 25\text{ °C}$ unless otherwise specified.

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

[1] Pulse test: $t_p \leq 300\ \mu\text{s}$; $\delta \leq 0.02$.

Table 8. Characteristics per type; BZT52H-A2V4 to BZT52H-C24

 $T_j = 25\text{ °C}$ unless otherwise specified.

BZT52H -xxx	Sel	Working voltage V_Z (V) $I_Z = 5\text{ mA}$		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (μA)		Temperature coefficient S_Z (mV/K) $I_Z = 5\text{ mA}$		Diode capacitance C_d (pF) [1]	Non-repetitive peak reverse current I_{ZSM} (A) [2]
		Min	Max	$I_Z = 1\text{ mA}$	$I_Z = 5\text{ mA}$	Max	V_R (V)	Min	Max	Max	Max
2V4	A	2.37	2.43	400	85	50	1	-3.5	0.0	450	6.0
	B	2.35	2.45								
	C	2.20	2.60								
2V7	A	2.67	2.73	500	83	20	1	-3.5	0.0	450	6.0
	B	2.65	2.75								
	C	2.50	2.90								
3V0	A	2.97	3.03	500	95	10	1	-3.5	0.0	450	6.0
	B	2.94	3.06								
	C	2.80	3.20								
3V3	A	3.26	3.34	500	95	5	1	-3.5	0.0	450	6.0
	B	3.23	3.37								
	C	3.10	3.50								
3V6	A	3.56	3.64	500	95	5	1	-3.5	0.0	450	6.0
	B	3.53	3.67								
	C	3.40	3.80								
3V9	A	3.86	3.94	500	95	3	1	-3.5	0.0	450	6.0
	B	3.82	3.98								
	C	3.70	4.10								
4V3	A	4.25	4.35	500	95	3	1	-3.5	0.0	450	6.0
	B	4.21	4.39								
	C	4.00	4.60								
4V7	A	4.65	4.75	500	78	3	2	-3.5	0.2	300	6.0
	B	4.61	4.79								
	C	4.40	5.00								
5V1	A	5.04	5.16	480	60	2	2	-2.7	1.2	300	6.0
	B	5.00	5.20								
	C	4.80	5.40								
5V6	A	5.54	5.66	400	40	1	2	-2.0	2.5	300	6.0
	B	5.49	5.71								
	C	5.20	6.00								
6V2	A	6.13	6.27	150	10	3	4	0.4	3.7	200	6.0
	B	6.08	6.32								
	C	5.80	6.60								
6V8	A	6.73	6.87	80	8	2	4	1.2	4.5	200	6.0
	B	6.66	6.94								
	C	6.40	7.20								
7V5	A	7.42	7.58	80	10	1	5	2.5	5.3	150	4.0
	B	7.35	7.65								
	C	7.00	7.90								

BZT52H -xxx	Sel	Working voltage V_Z (V) $I_Z = 5$ mA		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (μ A)		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
8V2	A	8.11	8.29	80	10	0.7	5	3.2	6.2	150	4.0
	B	8.04	8.36								
	C	7.70	8.70								
9V1	A	9.00	9.20	100	10	0.5	6	3.8	7.0	150	3.0
	B	8.92	9.28								
	C	8.50	9.60								
10	A	9.90	10.10	70	10	0.2	7	4.5	8.0	90	3.0
	B	9.80	10.20								
	C	9.40	10.60								
11	A	10.89	11.11	70	10	0.1	8	5.4	9.0	85	2.5
	B	10.80	11.20								
	C	10.40	11.60								
12	A	11.88	12.12	90	10	0.1	8	6.0	10.0	85	2.5
	B	11.80	12.20								
	C	11.40	12.70								
13	A	12.87	13.13	110	10	0.1	8	7.0	11.0	80	2.5
	B	12.70	13.30								
	C	12.40	14.10								
15	A	14.85	15.15	110	15	0.05	10.5	9.2	13.0	75	2.0
	B	14.70	15.30								
	C	13.80	15.60								
16	A	15.84	16.16	170	20	0.05	11.2	10.4	14.0	75	1.5
	B	15.70	16.30								
	C	15.30	17.10								
18	A	17.82	18.18	170	20	0.05	12.6	12.4	16.0	70	1.5
	B	17.60	18.40								
	C	16.80	19.10								
20	A	19.80	20.20	220	20	0.05	14	14.4	18.0	60	1.5
	B	19.60	20.40								
	C	18.80	21.20								
22	A	21.78	22.22	220	25	0.05	15.4	16.4	20.0	60	1.25
	B	21.60	22.40								
	C	20.80	23.30								
24	A	23.76	24.24	220	30	0.05	16.8	18.4	22.0	55	1.25
	B	23.50	24.50								
	C	22.80	25.60								

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

Table 9. Characteristics per type; BZT52H-A27 to BZT52H-C51

 $T_j = 25\text{ °C}$ unless otherwise specified.

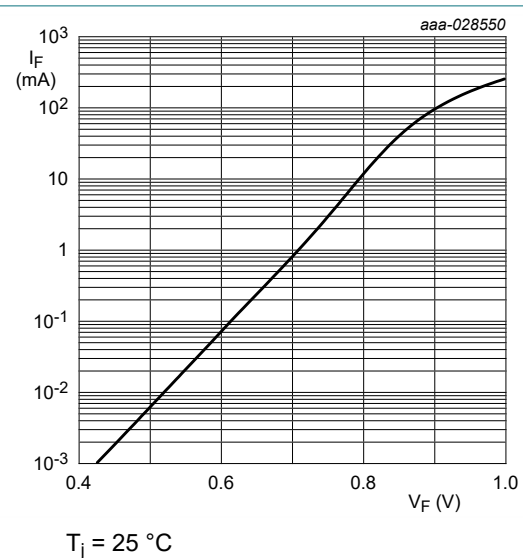
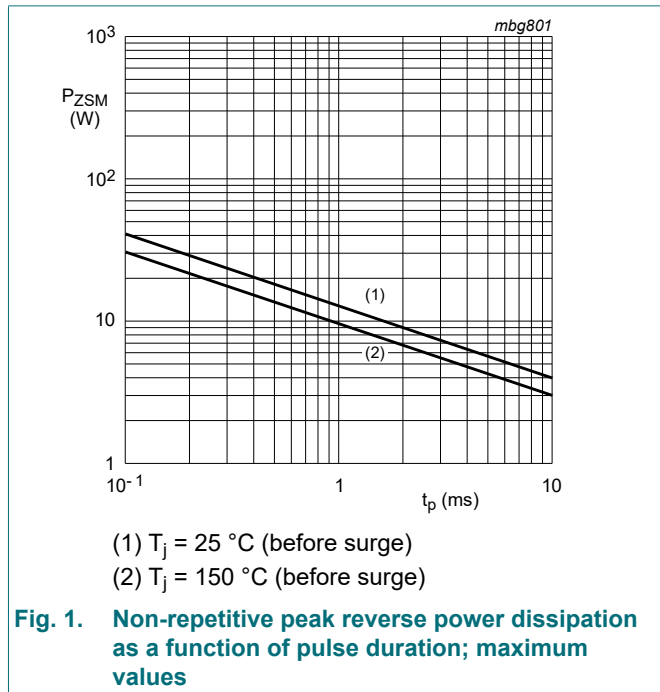
BZT52H -xxx	Sel	Working voltage V_Z (V) $I_Z = 2\text{ mA}$		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (μA)		Temperature coefficient S_Z (mV/K) $I_Z = 2\text{ mA}$		Diode capacitance C_d (pF) [1]	Non-repetitive peak reverse current I_{ZSM} (A) [2]
		Min	Max	$I_Z = 1\text{ mA}$	$I_Z = 5\text{ mA}$	Max	V_R (V)	Min	Max	Max	Max
27	A	26.73	27.27	250	40	0.05	18.9	21.4	25.3	50	1.0
	B	26.50	27.50								
	C	25.10	28.90								
30	A	29.70	30.30	250	40	0.05	21	24.4	29.4	50	1.0
	B	29.40	30.60								
	C	28.00	32.00								
33	A	32.67	33.33	250	40	0.05	23.1	27.4	33.4	45	0.9
	B	32.30	33.70								
	C	31.00	35.00								
36	A	35.64	36.36	250	60	0.05	25.2	30.4	37.4	45	0.8
	B	35.30	36.70								
	C	34.00	38.00								
39	A	38.61	39.39	300	75	0.05	27.3	33.4	41.2	45	0.7
	B	38.20	39.80								
	C	37.00	41.00								
43	A	42.57	43.43	325	80	0.05	30.1	37.6	46.6	40	0.6
	B	42.10	43.90								
	C	40.00	46.00								
47	A	46.53	47.47	325	90	0.05	32.9	42.0	51.8	40	0.5
	B	46.10	47.90								
	C	44.00	50.00								
51	A	50.49	51.51	350	100	0.05	35.7	46.6	57.2	40	0.4
	B	50.00	52.00								
	C	48.00	54.00								

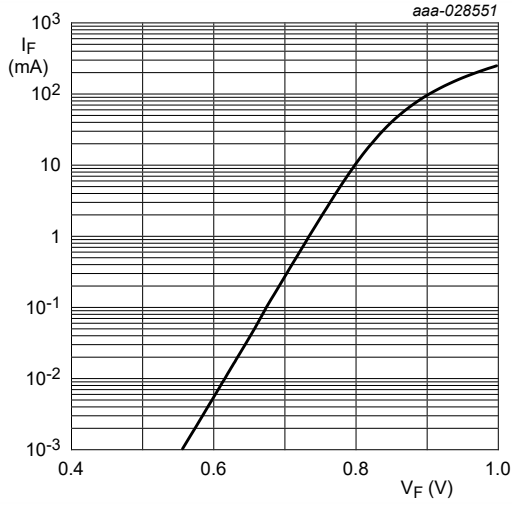
[1] $f = 1\text{ MHz}$; $V_R = 0\text{ V}$ [2] $t_p = 100\text{ }\mu\text{s}$; $T_{amb} = 25\text{ °C}$.

Table 10. Characteristics per type; BZT52H-A56 to BZT52H-C75

 $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

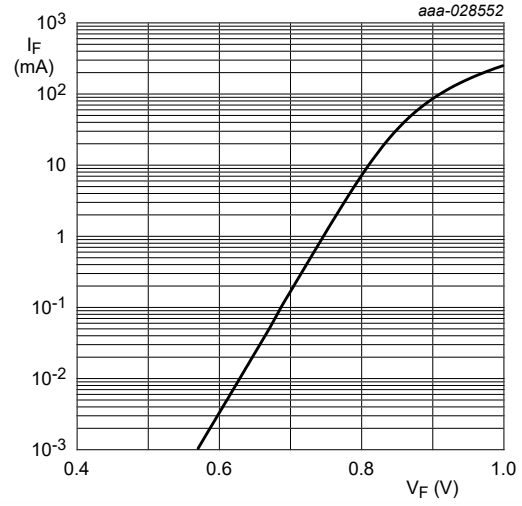
BZT52H -xxx	Sel	Working voltage V_Z (V) $I_Z = 2\text{ mA}$		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (μA)		Temperature coefficient S_Z (mV/K) $I_Z = 2\text{ mA}$		Diode capacitance C_d (pF) [1]	Non-repetitive peak reverse current I_{ZSM} (A) [2]
		Min	Max	$I_Z = 0.5\text{ mA}$	$I_Z = 2\text{ mA}$	Max	V_R (V)	Min	Max	Max	Max
56	A	55.44	56.56	375	120	0.05	39.2	52.2	63.8	40	0.3
	B	54.90	57.10								
	C	52.00	60.00								
62	A	61.38	62.62	400	140	0.05	43.4	58.8	71.6	35	0.3
	B	60.80	63.20								
	C	58.00	66.00								
68	A	67.32	68.68	400	160	0.05	47.6	65.6	79.8	35	0.25
	B	66.60	69.40								
	C	64.00	72.00								
75	A	74.25	75.75	400	175	0.05	52.5	73.4	88.6	35	0.20
	B	73.50	76.50								
	C	70.00	79.00								

[1] $f = 1\text{ MHz}$; $V_R = 0\text{ V}$ [2] $t_p = 100\text{ }\mu\text{s}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$.



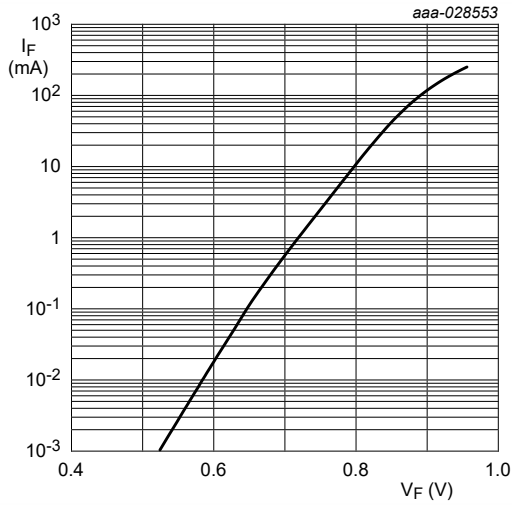
$T_j = 25\text{ °C}$

Fig. 3. Forward current as a function of forward voltage; typical values (BZT52H-A/B/C6V8)



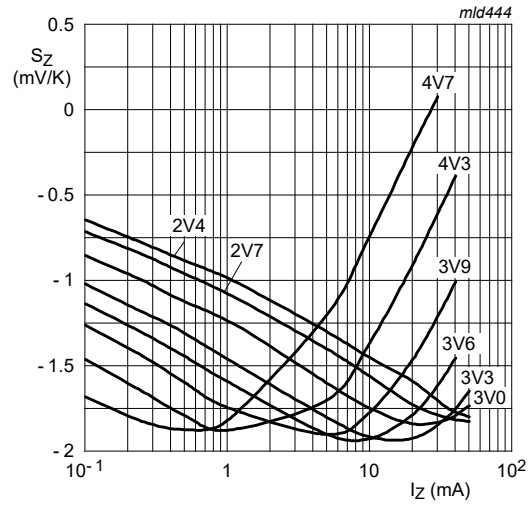
$T_j = 25\text{ °C}$

Fig. 4. Forward current as a function of forward voltage; typical values (BZT52H-A/B/C7V5)



$T_j = 25\text{ °C}$

Fig. 5. Forward current as a function of forward voltage; typical values (BZT52H-A/B/C7V5)



$T_j = 25\text{ °C to }150\text{ °C}$

Fig. 6. Temperature coefficient as a function of working current; typical values (BZT52H-A/B/C2V4 to BZT52H-A/B/C4V7)

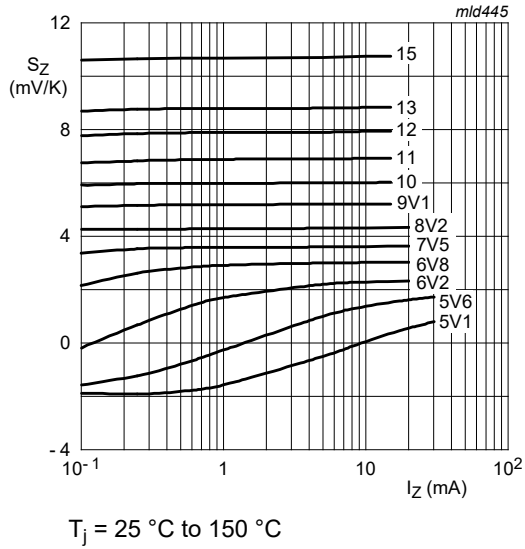


Fig. 7. Temperature coefficient as a function of working current; typical values (BZT52H-A/B/C5V1 to BZT52H-A/B/C15)

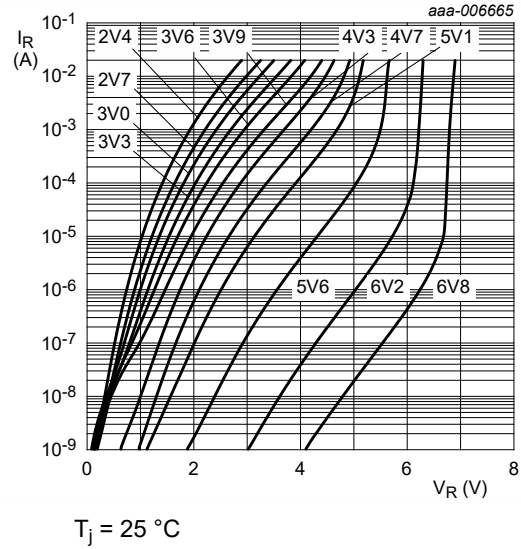


Fig. 8. Reverse current as a function of reverse voltage; typical values (BZT52H-A/B/C2V4 to BZT52H-A/B/C6V8)

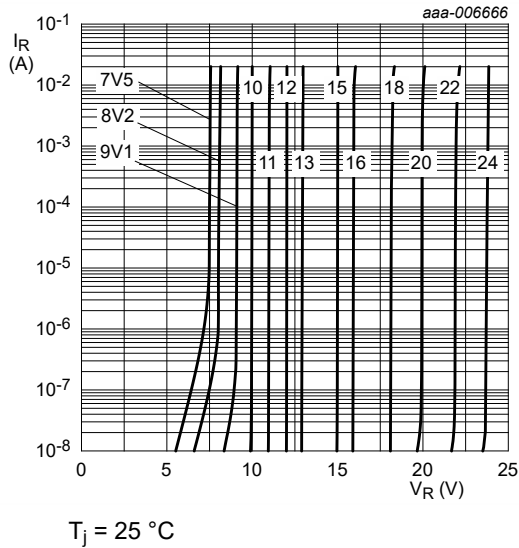


Fig. 9. Reverse current as a function of reverse voltage; typical values (BZT52H-A/B/C7V5 to BZT52H-A/B/C24)

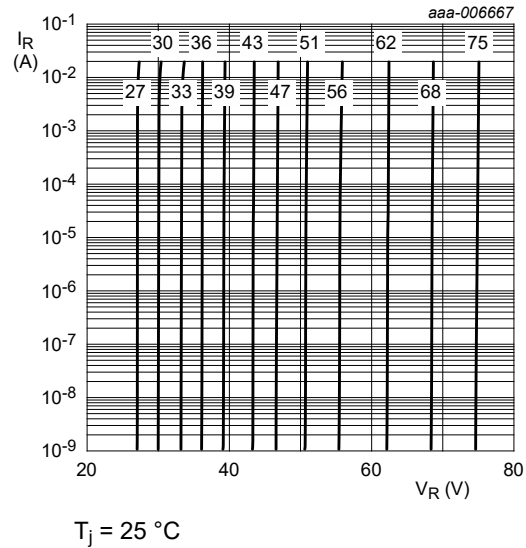
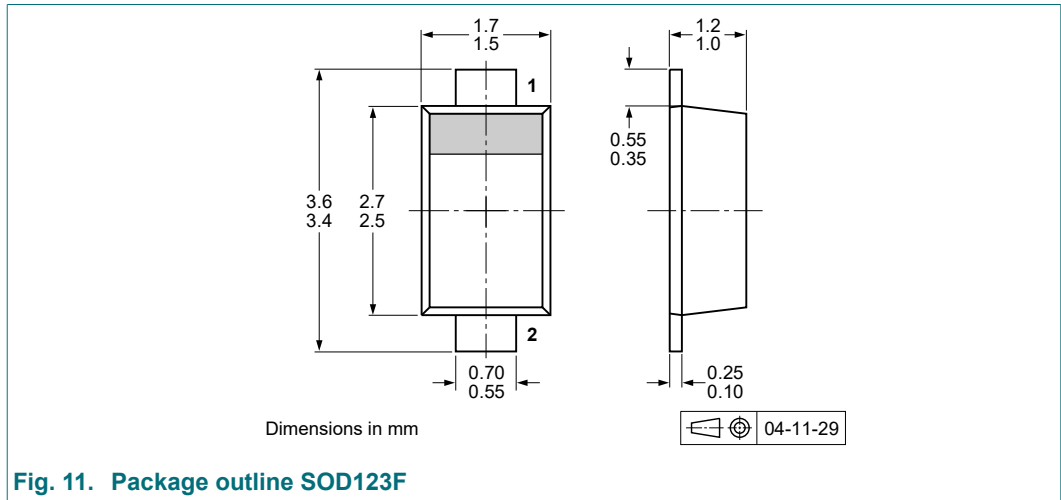
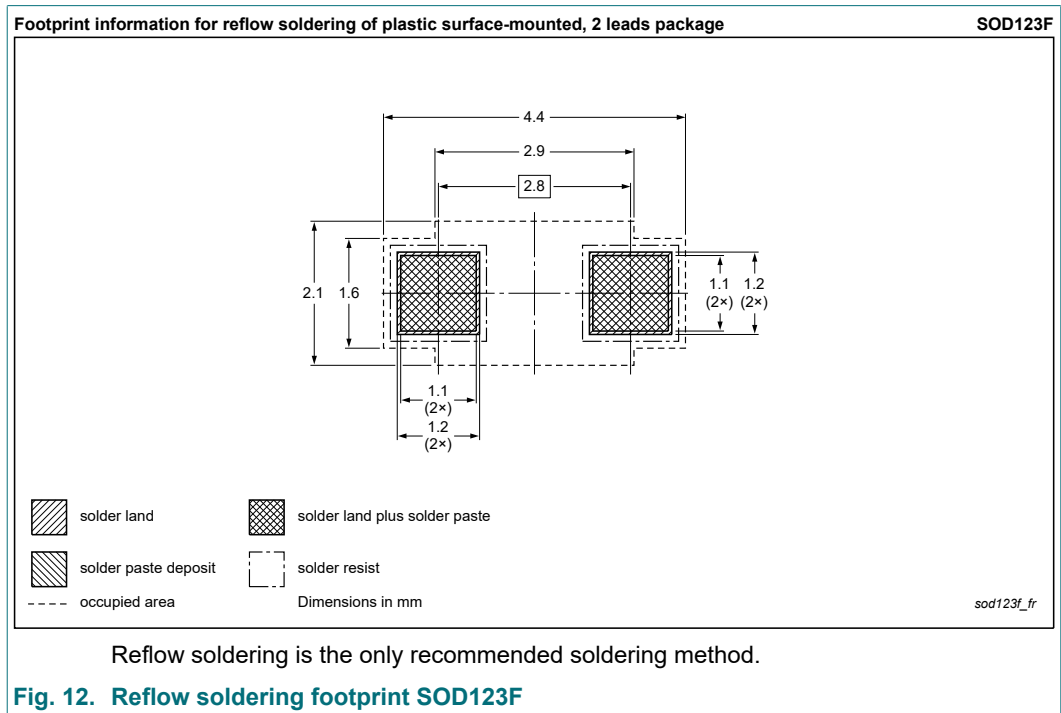


Fig. 10. Reverse current as a function of reverse voltage; typical values (BZT52H-A/B/C27 to BZT52H-A/B/C75)

11. Package outline



12. Soldering



13. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZT52H_SER v.7	20230101	Product data sheet	-	BZT52H_SER v.6
Modifications:	<ul style="list-style-type: none"> BZT52H-A selections added Products changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternatives. 			
BZT52H_SER v.6	20220207	Product data sheet	-	BZT52H_SER v.5
BZT52H_SER v.5	20201130	Product data sheet	-	BZT52H_SER v.4
BZT52H_SER v.4	20190121	Product data sheet	-	BZT52H_SER v.3
BZT52H_SER v.3	20091115	Product data sheet	-	BZT52H_SER v.2
BZT52H_SER v.2	20091115	Product data sheet	-	BZT52H_SER v.1
BZT52H_SER v.1	20051222	Product data sheet	-	-

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".
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