BZT52H-A series

Voltage regulator diodes

Rev. 1 — 25 January 2022 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
- Wide working voltage range: nominal 2.4 V to 75 V (E24 range)
- Small plastic package suitable for surface-mounted design
- Very tight tolerance: ±1 %

3. Applications

- General regulation functions

4. Quick reference data

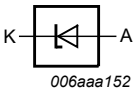
Table 1. Quick reference data

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]	-	-	375	mW
			[3]	-	-	830	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.

5. Pinning information

Table 2. Pinning

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

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZT52H-A2V4 to BZT52H-A75	-	plastic surface-mounted package; 2 leads	SOD123F

7. Marking

Table 4. Marking codes

Type number	Marking code	Type number	Marking code	Type number	Marking code	Type number	Marking code
BZT52H-A2V4	FT	BZT52H-A6V2	G4	BZT52H-A16	GE	BZT52H-A43	GY
BZT52H-A2V7	FU	BZT52H-A6V8	G5	BZT52H-A18	GF	BZT52H-A47	GR
BZT52H-A3V0	FV	BZT52H-A7V5	G6	BZT52H-A20	GG	BZT52H-A51	GS
BZT52H-A3V3	FW	BZT52H-A8V2	G7	BZT52H-A22	GH	BZT52H-A56	GT
BZT52H-A3V6	FX	BZT52H-A9V1	G8	BZT52H-A24	GJ	BZT52H-A62	GU
BZT52H-A3V9	FY	BZT52H-A10	G9	BZT52H-A27	GK	BZT52H-A68	GV
BZT52H-A4V3	FZ	BZT52H-A11	GA	BZT52H-A30	GL	BZT52H-A75	GW
BZT52H-A4V7	G1	BZT52H-A12	GB	BZT52H-A33	GM	-	-
BZT52H-A5V1	G2	BZT52H-A13	GC	BZT52H-A36	GN	-	-
BZT52H-A5V6	G3	BZT52H-A15	GD	BZT52H-A39	GP	-	-

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 Table 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]	-	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 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]	-	-	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 °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; BZT52H-A2V4 to BZT52H-A24

T_j = 25 °C unless otherwise specified.

BZT52H -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	A	2.37	2.43	400	85	50	1	-3.5	0.0	450	6.0
2V7	A	2.67	2.73	500	83	20	1	-3.5	0.0	450	6.0
3V0	A	2.97	3.03	500	95	10	1	-3.5	0.0	450	6.0
3V3	A	3.26	3.34	500	95	5	1	-3.5	0.0	450	6.0
3V6	A	3.56	3.64	500	95	5	1	-3.5	0.0	450	6.0
3V9	A	3.86	3.94	500	95	3	1	-3.5	0.0	450	6.0
4V3	A	4.25	4.35	500	95	3	1	-3.5	0.0	450	6.0
4V7	A	4.65	4.75	500	78	3	2	-3.5	0.2	300	6.0
5V1	A	5.04	5.16	480	60	2	2	-2.7	1.2	300	6.0
5V6	A	5.54	5.66	400	40	1	2	-2.0	2.5	300	6.0
6V2	A	6.13	6.27	150	10	3	4	0.4	3.7	200	6.0
6V8	A	6.73	6.87	80	8	2	4	1.2	4.5	200	6.0
7V5	A	7.42	7.58	80	10	1	5	2.5	5.3	150	4.0
8V2	A	8.11	8.29	80	10	0.7	5	3.2	6.2	150	4.0
9V1	A	9.00	9.20	100	10	0.5	6	3.8	7.0	150	3.0
10	A	9.90	10.10	70	10	0.2	7	4.5	8.0	90	3.0
11	A	10.89	11.11	70	10	0.1	8	5.4	9.0	85	2.5
12	A	11.88	12.12	90	10	0.1	8	6.0	10.0	85	2.5
13	A	12.87	13.13	110	10	0.1	8	7.0	11.0	80	2.5
15	A	14.85	15.15	110	15	0.05	10.5	9.2	13.0	75	2.0
16	A	15.84	16.16	170	20	0.05	11.2	10.4	14.0	75	1.5
18	A	17.82	18.18	170	20	0.05	12.6	12.4	16.0	70	1.5
20	A	19.80	20.20	220	20	0.05	14	14.4	18.0	60	1.5
22	A	21.78	22.22	220	25	0.05	15.4	16.4	20.0	60	1.25
24	A	23.76	24.24	220	30	0.05	16.8	18.4	22.0	55	1.25

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

Table 9. Characteristics per type; BZT52H-A27 to BZT52H-A51

T_j = 25 °C unless otherwise specified.

BZT52H -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 = 2 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	A	26.73	27.27	250	40	0.05	18.9	21.4	25.3	50	1.0
30	A	29.70	30.30	250	40	0.05	21	24.4	29.4	50	1.0
33	A	32.67	33.33	250	40	0.05	23.1	27.4	33.4	45	0.9
36	A	35.64	36.36	250	60	0.05	25.2	30.4	37.4	45	0.8
39	A	38.61	39.39	300	75	0.05	27.3	33.4	41.2	45	0.7
43	A	42.57	43.43	325	80	0.05	30.1	37.6	46.6	40	0.6
47	A	46.53	47.47	325	90	0.05	32.9	42.0	51.8	40	0.5
51	A	50.49	51.51	350	100	0.05	35.7	46.6	57.2	40	0.4

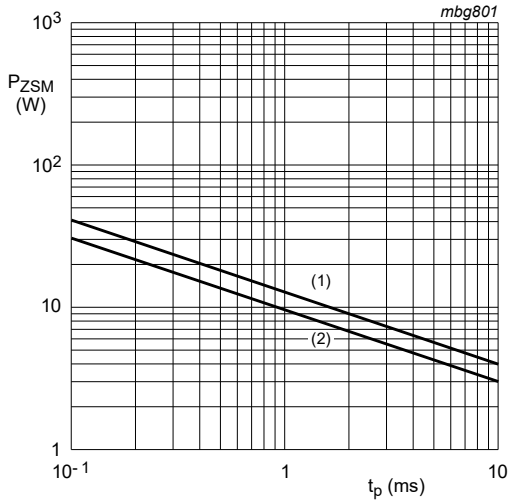
[1] f = 1 MHz; V_R = 0 V.
[2] t_p = 100 µs; T_{amb} = 25 °C.

Table 10. Characteristics per type; BZT52H-A56 to BZT52H-A75

T_j = 25 °C unless otherwise specified.

BZT52H -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 = 2 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	A	55.44	56.56	375	120	0.05	39.2	52.2	63.8	40	0.3
62	A	61.38	62.62	400	140	0.05	43.4	58.8	71.6	35	0.3
68	A	67.32	68.68	400	160	0.05	47.6	65.6	79.8	35	0.25
75	A	74.25	75.75	400	175	0.05	52.5	73.4	88.6	35	0.20

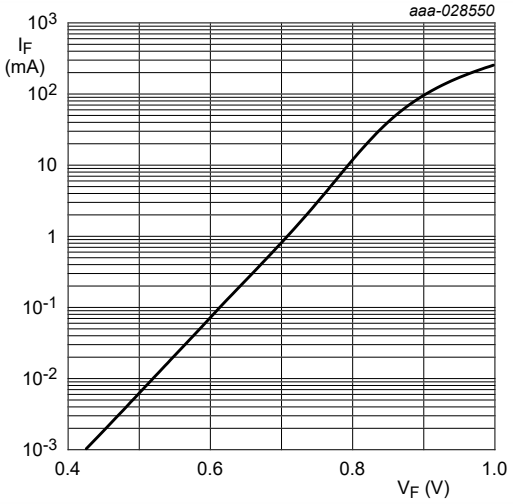
[1] f = 1 MHz; V_R = 0 V.
[2] t_p = 100 µs; T_{amb} = 25 °C.



(1) T_j = 25 °C (before surge)

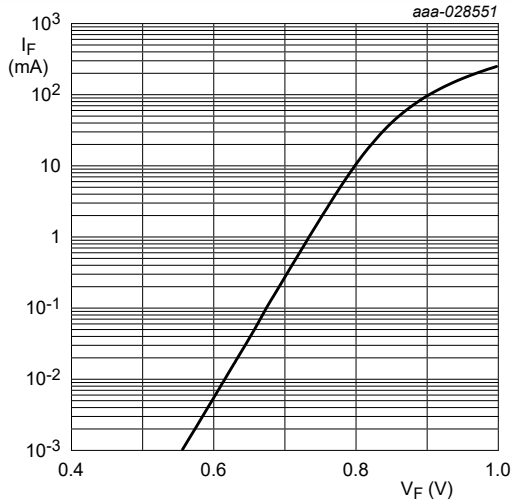
(2) T_j = 150 °C (before surge)

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



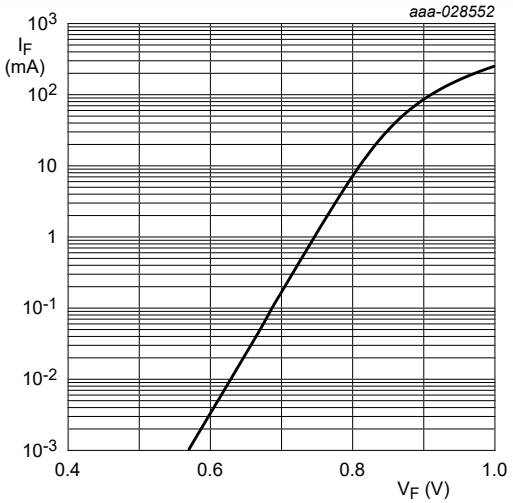
T_j = 25 °C

Fig. 2. Forward current as a function of forward voltage; typical values (BZT52H-A2V4)



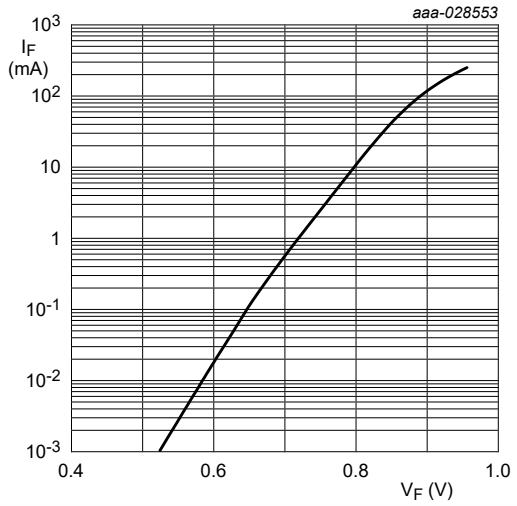
T_j = 25 °C

Fig. 3. Forward current as a function of forward voltage; typical values (BZT52H-A6V8)



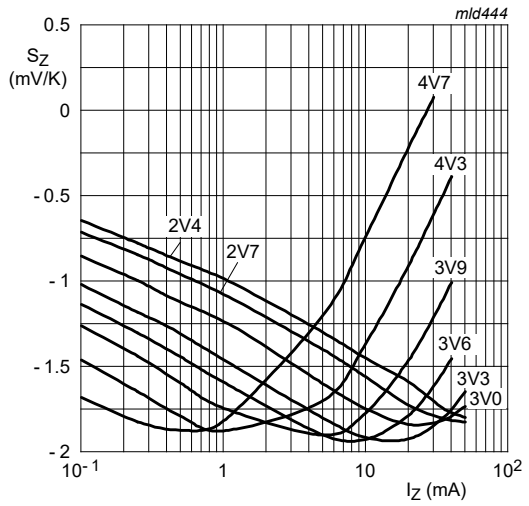
T_j = 25 °C

Fig. 4. Forward current as a function of forward voltage; typical values (BZT52H-A7V5)



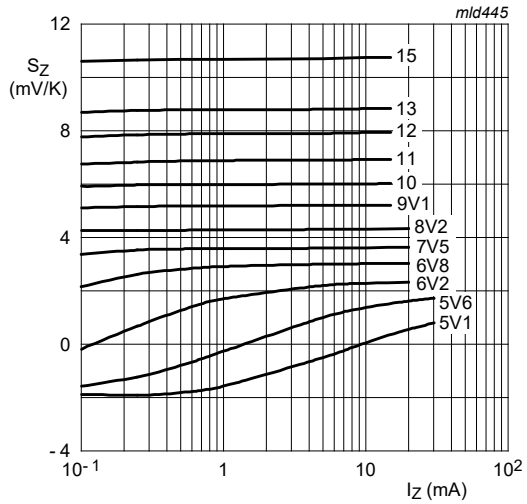
T_j = 25 °C

Fig. 5. Forward current as a function of forward voltage; typical values (BZT52H-A75)



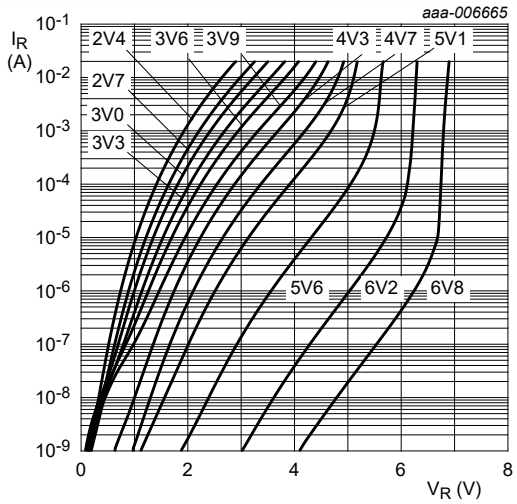
T_j = 25 °C to 150 °C

Fig. 6. Temperature coefficient as a function of working current; typical values (BZT52H-A2V4 to BZT52H-A4V7)



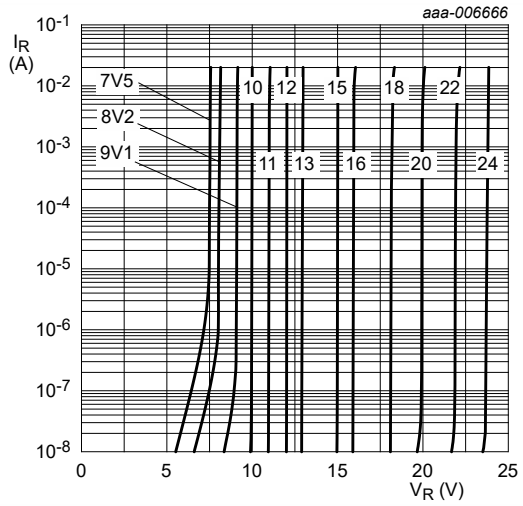
T_j = 25 °C to 150 °C

Fig. 7. Temperature coefficient as a function of working current; typical values (BZT52H-A5V1 to BZT52H-A15)



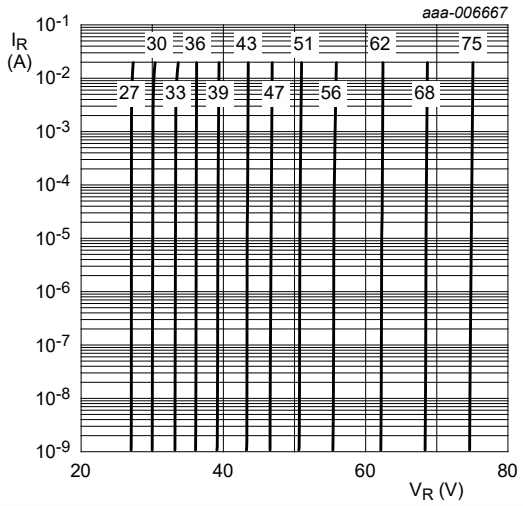
T_j = 25 °C

Fig. 8. Reverse current as a function of reverse voltage; typical values (BZT52H-A2V4 to BZT52H-A6V8)



T_j = 25 °C

Fig. 9. Reverse current as a function of reverse voltage; typical values (BZT52H-A7V5 to BZT52H-A24)



T_j = 25 °C

Fig. 10. Reverse current as a function of reverse voltage; typical values (BZT52H-A27 to BZT52H-A75)

11. Package outline

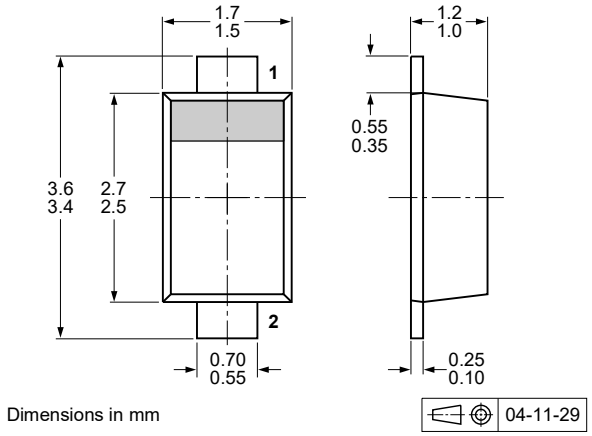
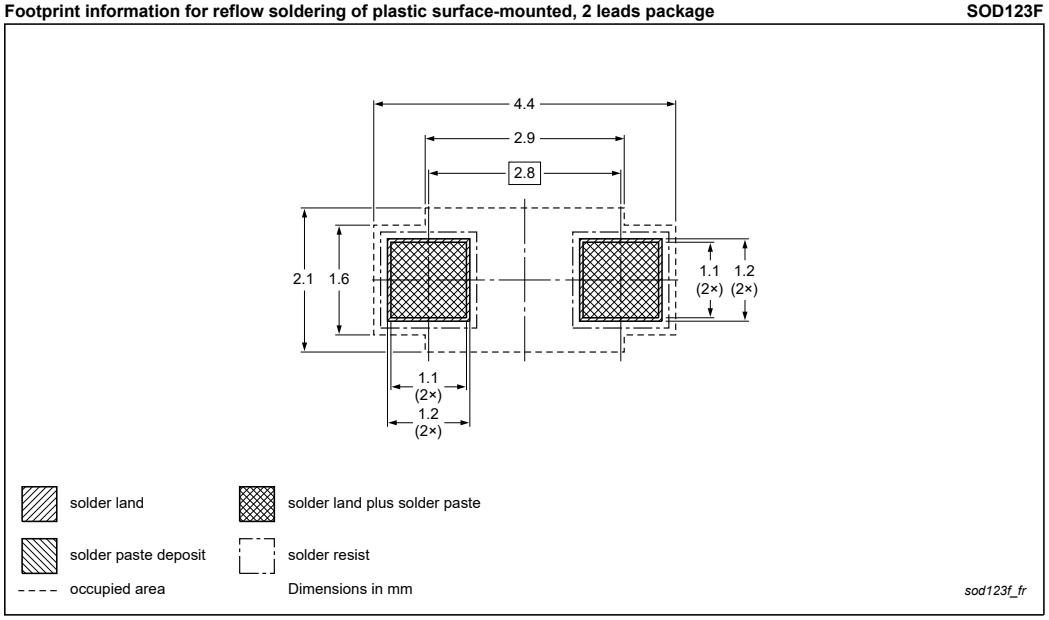


Fig. 11. Package outline SOD123F

12. Soldering



Reflow soldering is the only recommended soldering method.

Fig. 12. Reflow soldering footprint SOD123F

13. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZT52H-A_SER v.1	20220125	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.

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Date of release: 25 January 2022

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