BZX8850S-Q series

Low-current voltage regulator diodes

Rev. 2 — 17 July 2024 Product data sheet

1. General description

Low-current voltage regulator diodes in an ultra small SOD882BD (DFN1006BD-2) leadless Surface-Mounted Device (SMD) plastic package with side-wettable flanks.

2. Features and benefits

- Total power dissipation: ≤ 365 mW
- Two tolerance series: ± 2 % and approximately ± 5 %
- Working voltage range: nominal 1.8 V to 51 V
- Specified at a low test current (50 µA), ideal for low bias and portable battery-powered applications
- BZX8850S-B11-Q to -C51-Q: Intentional minor rise of leakage current for optimized fast switching and noise reduction [AN90031]
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- Low-current general regulation functions

4. Quick reference data

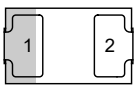
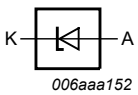
Table 1. Quick reference data

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]	-	-	365	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.

5. Pinning information

Table 2. Pinning

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

[1] The marking bar indicates the cathode.

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6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZX8850S-Q series	DFN1006BD-2	Leadless ultra small plastic package with side-wettable flanks (SWF): 2 terminals; 0.65 mm pitch; 1 mm x 0.6 mm x 0.47 mm body	SOD882BD

7. Marking

Table 4. Marking Codes

Type number	Mark. code	Type number	Mark. code	Type number	Mark. code	Type number	Mark. code
BZX8850S-B1V8-Q	NJ	BZX8850S-B10-Q	P4	BZX8850S-C1V8-Q	5N	BZX8850S-C10-Q	7G
BZX8850S-B2V0-Q	NK	BZX8850S-B11-Q	P5	BZX8850S-C2V0-Q	5P	BZX8850S-C11-Q	7H
BZX8850S-B2V2-Q	NL	BZX8850S-B12-Q	P6	BZX8850S-C2V2-Q	5Q	BZX8850S-C12-Q	7J
BZX8850S-B2V4-Q	NM	BZX8850S-B13-Q	P7	BZX8850S-C2V4-Q	5R	BZX8850S-C13-Q	7K
BZX8850S-B2V7-Q	NP	BZX8850S-B15-Q	P8	BZX8850S-C2V7-Q	5S	BZX8850S-C15-Q	7M
BZX8850S-B3V0-Q	NQ	BZX8850S-B16-Q	P9	BZX8850S-C3V0-Q	5T	BZX8850S-C16-Q	7N
BZX8850S-B3V3-Q	NR	BZX8850S-B18-Q	SW	BZX8850S-C3V3	5U	BZX8850S-C18-Q	7P
BZX8850S-B3V6-Q	NS	BZX8850S-B20-Q	SX	BZX8850S-C3V6-Q	5V	BZX8850S-C20-Q	7Q
BZX8850S-B3V9-Q	NT	BZX8850S-B22-Q	SY	BZX8850S-C3V9-Q	5W	BZX8850S-C22-Q	7R
BZX8850S-B4V3-Q	NU	BZX8850S-B24-Q	SZ	BZX8850S-C4V3-Q	5X	BZX8850S-C24-Q	7S
BZX8850S-B4V7-Q	NV	BZX8850S-B27-Q	T1	BZX8850S-C4V7-Q	5Y	BZX8850S-C27-Q	7T
BZX8850S-B5V1-Q	NW	BZX8850S-B30-Q	T2	BZX8850S-C5V1-Q	5Z	BZX8850S-C30-Q	7U
BZX8850S-B5V6-Q	NX	BZX8850S-B33-Q	T3	BZX8850S-C5V6-Q	7A	BZX8850S-C33-Q	7V
BZX8850S-B6V2-Q	NY	BZX8850S-B36-Q	T4	BZX8850S-C6V2-Q	7B	BZX8850S-C36-Q	7W
BZX8850S-B6V8-Q	NZ	BZX8850S-B39-Q	T5	BZX8850S-C6V8-Q	7C	BZX8850S-C39-Q	7X
BZX8850S-B7V5-Q	P1	BZX8850S-B43-Q	T6	BZX8850S-C7V5-Q	7D	BZX8850S-C43-Q	7Y
BZX8850S-B8V2-Q	P2	BZX8850S-B47-Q	T7	BZX8850S-C8V2-Q	7E	BZX8850S-C47-Q	7Z
BZX8850S-B9V1-Q	P3	BZX8850S-B51-Q	T8	BZX8850S-C9V1-Q	7F	BZX8850S-C51-Q	8A

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			-	200	mA
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 µs; square wave; T_j = 25 °C; prior to surge		-	40	W
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	365	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			−55	+150	°C
T_{stg}	storage temperature			−65	+150	°C

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single sided copper, tin-plated and standard footprint.

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]	-	-	340	K/W

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single sided copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Electrical characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		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. Electrical characteristics per type: BZX8850S-B1V8-Q to BZX8850S-C36-Q

T_j = 25 °C unless otherwise specified.

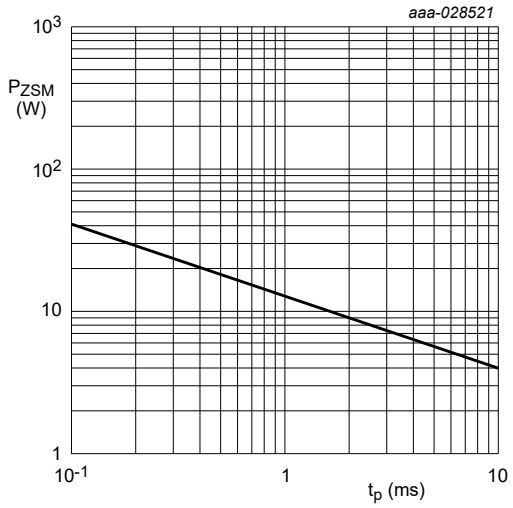
BZX8850S-xxx-Q	Sel.	Working voltage V_Z (V)		Differential resistance r_{diff} (Ω)		Reverse current I_R (µA)		Temperature coefficient S_Z (mV/K)		Diode capacitance C_d (pF)
		I_Z = 50 µA		I_Z = 1 mA	I_Z = 5 mA			I_Z = 5 mA		f = 1 MHz V_R = 0 V
		Min	Max	Max	Max	Max	V_R (V)	Min	Max	Max
1V8	B	1.76	1.84	600	100	7.5	1.0	-3.5	0	220
	C	1.71	1.89							
2V0	B	1.96	2.04	600	100	7	1.0	-3.5	0	220
	C	1.88	2.12							
2V2	B	2.15	2.25	600	100	4	1.0	-3.5	0	210
	C	2.09	2.31							
2V4	B	2.35	2.45	600	100	2	1.0	-3.5	0	200
	C	2.28	2.52							
2V7	B	2.65	2.75	600	100	1	1.0	-3.5	0	190
	C	2.565	2.835							
3V0	B	2.94	3.06	600	100	0.8	1.0	-3.5	0.2	170
	C	2.85	3.15							
3V3	B	3.23	3.37	600	100	7.5	1.5	-3.5	1.2	160
	C	3.13	3.47							
3V6	B	3.53	3.67	600	95	7.5	2.0	-3.5	1.2	160
	C	3.42	3.78							
3V9	B	3.82	3.98	600	95	5.0	2.0	-2.7	2.5	150
	C	3.70	4.10							
4V3	B	4.21	4.39	600	95	4.0	2.0	-2.7	2.5	150
	C	4.09	4.52							
4V7	B	4.61	4.79	600	80	5.0	3.0	-2.7	2.5	140
	C	4.47	4.94							
5V1	B	5.00	5.20	500	60	5.0	3.0	-2.0	3.7	130
	C	4.85	5.36							
5V6	B	5.49	5.71	400	40	2.0	4.0	-2.0	3.7	120
	C	5.32	5.88							
6V2	B	6.08	6.32	160	10	1.0	5.0	0.4	4.5	110
	C	5.89	6.51							
6V8	B	6.66	6.94	80	15	0.1	5.1	1.2	4.5	100
	C	6.46	7.14							
7V5	B	7.35	7.65	80	15	0.1	5.7	2.5	5.3	150
	C	7.13	7.88							
8V2	B	8.04	8.36	80	15	0.1	6.2	3.2	6.2	150
	C	7.79	8.61							
9V1	B	8.92	9.28	100	15	0.1	6.9	3.8	7.0	150
	C	8.65	9.56							
10	B	9.80	10.20	150	20	0.1	7.6	4.5	8.0	90
	C	9.50	10.50							

BZX8850S-xxx-Q	Sel.	Working voltage V_Z (V)		Differential resistance r_{diff} (Ω)		Reverse current I_R (µA)		Temperature coefficient S_Z (mV/K)		Diode capacitance C_d (pF)
		I_Z = 50 µA		I_Z = 1 mA	I_Z = 5 mA			I_Z = 5 mA		f = 1 MHz V_R = 0 V
		Min	Max	Max	Max	Max	V_R (V)	Min	Max	Max
11	B	10.80	11.20	150	20	0.05	8.4	5.4	9.0	85
	C	10.45	11.55							
12	B	11.80	12.20	150	25	0.05	9.1	6.0	10	85
	C	11.40	12.60							
13	B	12.70	13.30	170	30	0.05	9.8	7.0	11	80
	C	12.35	13.65							
15	B	14.70	15.30	200	30	0.05	11.4	9.2	13	75
	C	14.25	15.75							
16	B	15.70	16.30	200	40	0.05	12.1	10.4	14	75
	C	15.20	16.80							
18	B	17.60	18.40	225	45	0.05	13.6	12.4	16	70
	C	17.10	18.90							
20	B	19.60	20.40	225	55	0.05	15.2	14.4	18	60
	C	19.00	21.00							
22	B	21.60	22.40	250	55	0.05	16.7	16.4	20	60
	C	20.90	23.10							
24	B	23.50	24.50	250	70	0.05	18.2	18.4	22	55
	C	22.80	25.20							
27	B	26.50	27.50	300	80	0.05	20.4	21.4	25.3	50
	C	25.65	28.35							
30	B	29.40	30.60	300	80	0.05	22.8	24.4	29.4	50
	C	28.50	31.50							
33	B	32.30	33.70	325	80	0.05	25.0	27.4	33.4	45
	C	31.35	34.65							
36	B	35.30	36.70	350	90	0.05	27.3	30.4	37.4	45
	C	34.20	37.80							

Table 9. Electrical characteristics per type: BZX8850S-B39-Q to BZX8850S-C51-Q

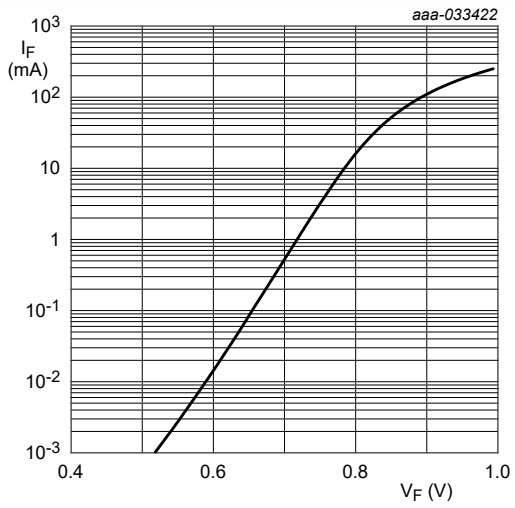
T_j = 25 °C unless otherwise specified.

BZX8850S-xxx-Q	Sel.	Working voltage V_Z (V)		Differential resistance r_{diff} (Ω)		Reverse current I_R (μA)		Temperature coefficient S_Z (mV/K)		Diode capacitance C_d (pF)
		I_Z = 50 μA		I_Z = 0.5 mA	I_Z = 2 mA			I_Z = 2 mA		f = 1 MHz V_R = 0 V
		Min	Max	Max	Max	Max	V_R (V)	Min	Max	Max
39	B	38.20	39.80	350	130	0.05	29.6	33.4	41.2	45
	C	37.05	40.95							
43	B	42.10	43.90	375	150	0.05	32.6	37.6	46.6	40
	C	40.85	45.15							
47	B	46.10	47.90	375	170	0.05	32.9	42.0	51.8	40
	C	44.00	50.00							
51	B	50.00	52.00	400	180	0.05	35.7	46.6	57.2	40
	C	48.00	54.00							



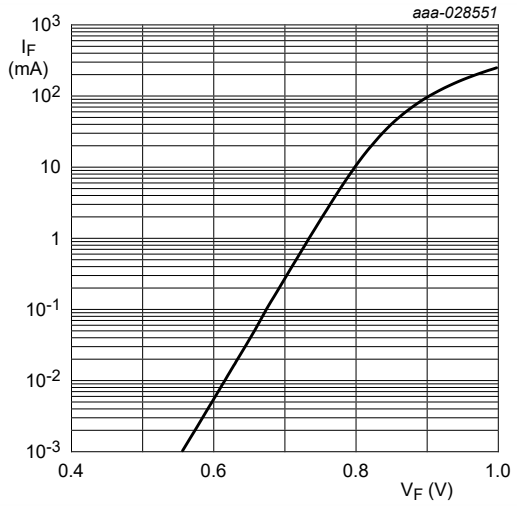
T_j = 25 °C (before surge)

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



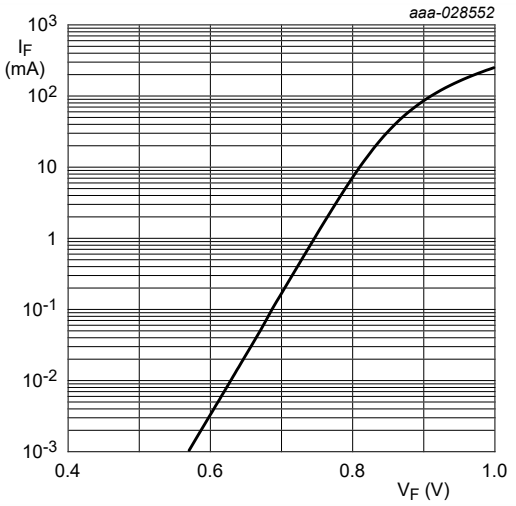
T_j = 25 °C

Fig. 2. Forward current as a function of forward voltage; typical values (BZX8850S-B/C1V8-Q)



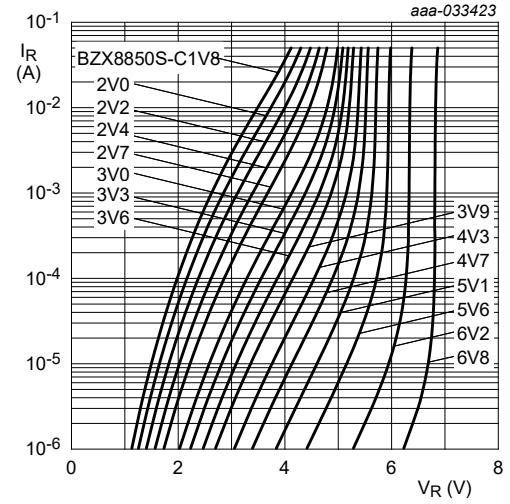
T_j = 25 °C

Fig. 3. Forward current as a function of forward voltage; typical values (BZX8850S-B/C6V8-Q)



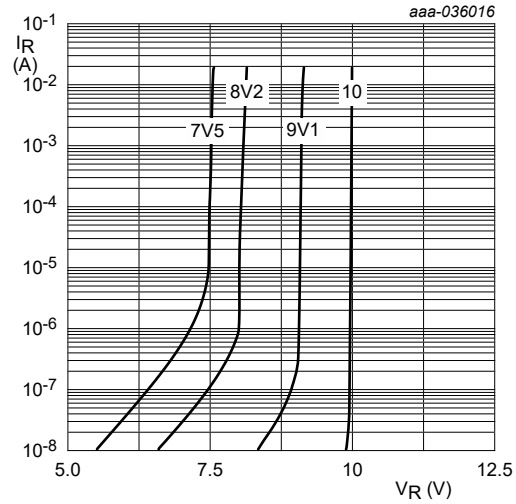
T_j = 25 °C

Fig. 4. Forward current as a function of forward voltage; typical values (BZX8850S-B/C7V5-Q)



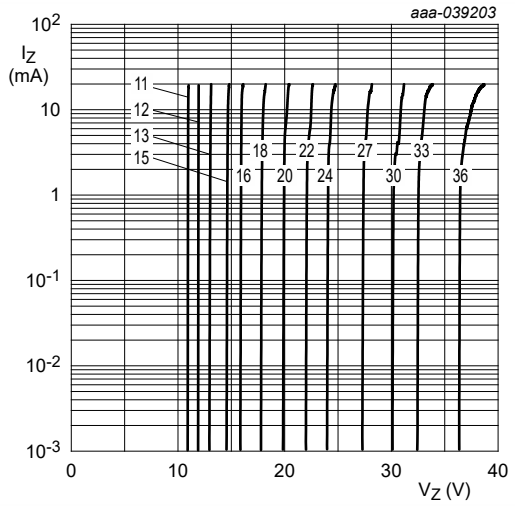
T_{amb} = 25 °C

Fig. 5. Reverse current as a function of reverse voltage; typical values (BZX8850S-B/C1V8-Q to BZX8850S-B/C6V8-Q)



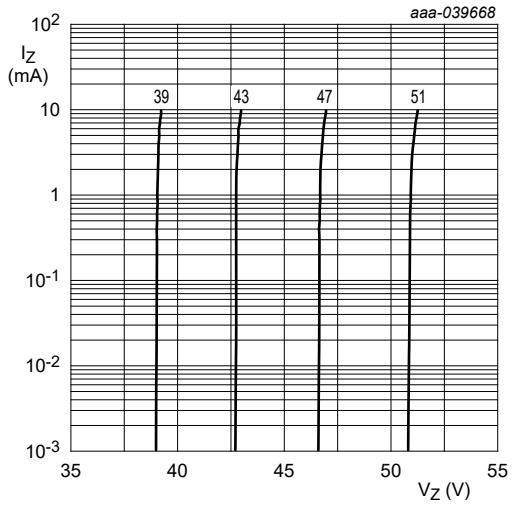
T_{amb} = 25 °C

Fig. 6. Reverse current as a function of reverse voltage; typical values (BZX8850S-B/C7V5-Q to BZX8850S-B/C10-Q)



T_{amb} = 25 °C

Fig. 7. Reverse current as a function of reverse voltage; typical values (BZX8850S-B/C11-Q to BZX8850S-B/C36-Q)



T_{amb} = 25 °C

Fig. 8. Reverse current as a function of reverse voltage; typical values (BZX8850S-B/C39-Q to BZX8850S-B/C51-Q)

11. Test information

Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101 - Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

12. Package outline

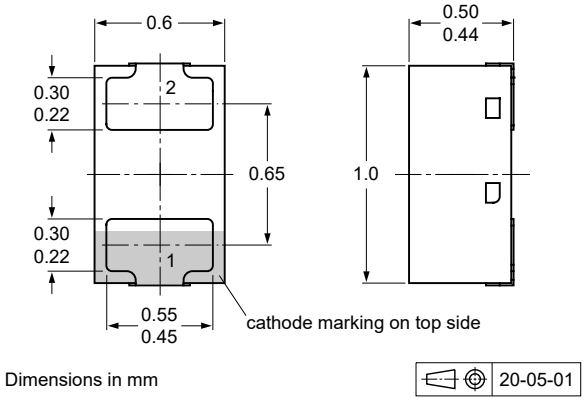


Fig. 9. Package outline DFN1006BD-2 (SOD882BD)

13. Soldering

Footprint information for reflow soldering of DFN1006BD-2 package **SOD882BD**

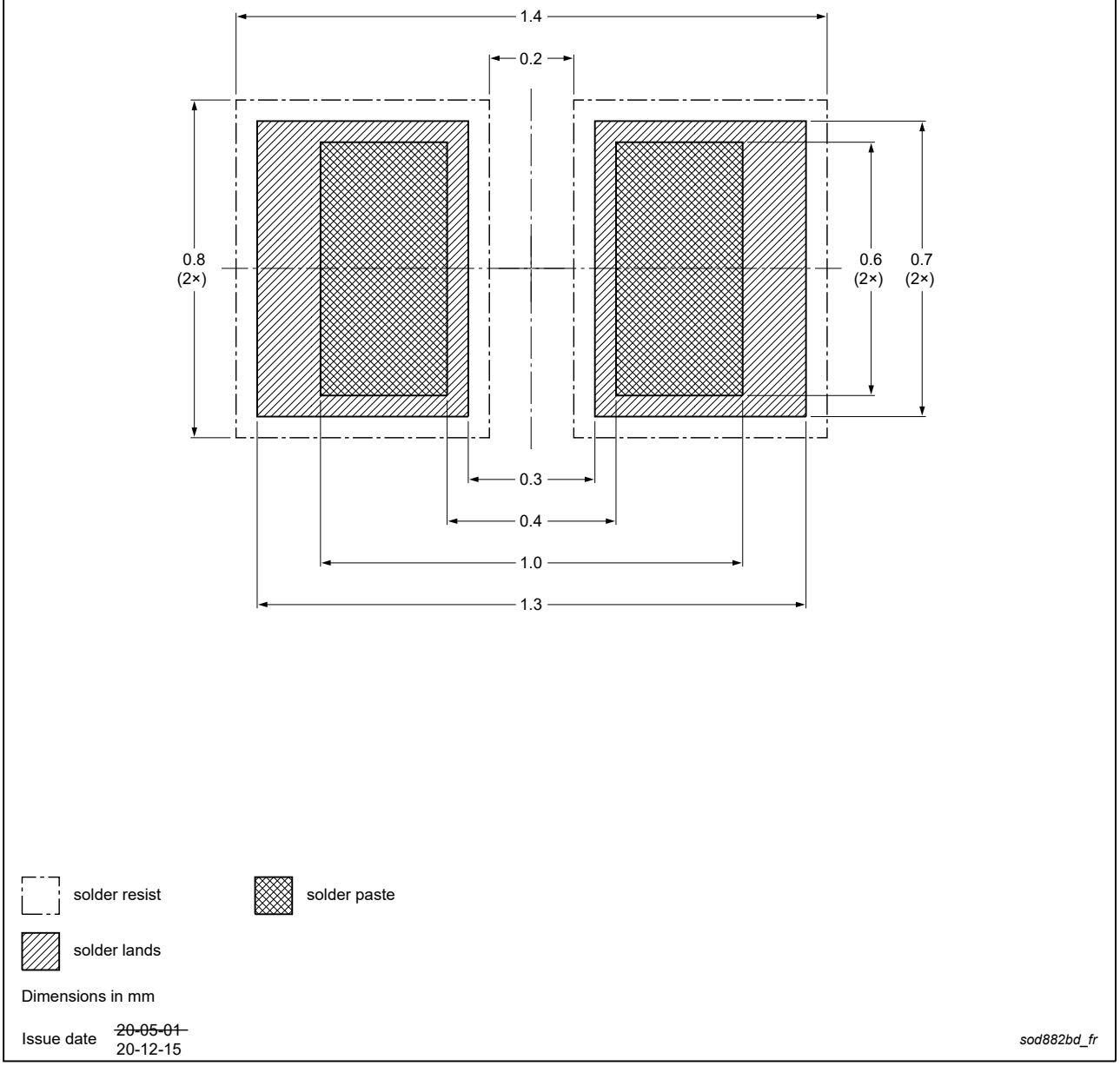


Fig. 10. Reflow soldering footprint for DFN1006BD-2 (SOD882BD)

14. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZX8850S-Q_SER v.2	20240717	Product data sheet	-	BZX8850S-Q_SER v.1
Modifications:	• Products removed BZX8850S-C56-Q and higher voltages • Products added: BZX8850S-B1V8-Q to BZX8850S-B51-Q			
BZX8850S-Q_SER v.1	20210825	Product data sheet	-	-

15. 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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