



BZX884 series

Voltage regulator diodes

Rev. 5 — 14 December 2020

Product data sheet

1. General description

General-purpose Zener diodes in an SOD882 (DFN1006-2) leadless ultra small Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Total power dissipation: $P_{tot} \leq 250$ mW
- Wide working voltage range: nominal 2.4 V to 75 V (E24 range)
- Two tolerance series: $\pm 2\%$ and $\pm 5\%$
- Leadless ultra small plastic package suitable for surface-mounted design
- AEC-Q101 qualified

3. Applications

- General regulation functions
- ElectroStatic Discharge (ESD) ultra high-speed switching
- High-frequency applications

4. Quick reference data

Table 1. Quick reference data

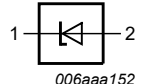
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 10$ mA	[1]	-	-	0.9	V
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[2]	-	-	250	mW

[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.

5. Pinning information

Table 2. Pinning

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

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZX884-B2V4 to BZX884-C75 ^[1]	DFN1006-2	leadless ultra small plastic package; 2 terminals; body 1.0 x 0.6 x 0.5 mm	SOD882

[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	Mark. Code	Type number	Mark. Code	Type number	Mark. Code	Type number	Mark. Code
BZX884-B2V4	A1	BZX884-B15	AL	BZX884-C2V4	B1	BZX884-C15	BL
BZX884-B2V7	A2	BZX884-B16	C1	BZX884-C2V7	B2	BZX884-C16	D1
BZX884-B3V0	A3	BZX884-B18	C2	BZX884-C3V0	B3	BZX884-C18	D2
BZX884-B3V3	A4	BZX884-B20	C3	BZX884-C3V3	B4	BZX884-C20	D3
BZX884-B3V6	A5	BZX884-B22	C4	BZX884-C3V6	B5	BZX884-C22	D4
BZX884-B3V9	A6	BZX884-B24	C5	BZX884-C3V9	B6	BZX884-C24	D5
BZX884-B4V3	A7	BZX884-B27	C6	BZX884-C4V3	B7	BZX884-C27	D6
BZX884-B4V7	A8	BZX884-B30	C7	BZX884-C4V7	B8	BZX884-C30	D7
BZX884-B5V1	A9	BZX884-B33	C8	BZX884-C5V1	B9	BZX884-C33	D8
BZX884-B5V6	AA	BZX884-B36	C9	BZX884-C5V6	BA	BZX884-C36	D9
BZX884-B6V2	AB	BZX884-B39	CA	BZX884-C6V2	BB	BZX884-C39	DA
BZX884-B6V8	AC	BZX884-B43	CB	BZX884-C6V8	BC	BZX884-C43	DB
BZX884-B7V5	AD	BZX884-B47	CC	BZX884-C7V5	BD	BZX884-C47	DC
BZX884-B8V2	AE	BZX884-B51	CD	BZX884-C8V2	BE	BZX884-C51	DD
BZX884-B9V1	AF	BZX884-B56	CE	BZX884-C9V1	BF	BZX884-C56	DE
BZX884-B10	AG	BZX884-B62	CF	BZX884-C10	BG	BZX884-C62	DF
BZX884-B11	AH	BZX884-B68	CG	BZX884-C11	BH	BZX884-C68	DG
BZX884-B12	AJ	BZX884-B75	CH	BZX884-C12	BJ	BZX884-C75	DH
BZX884-B13	AK	-	-	BZX884-C13	BK	-	-

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
I_{ZSM}	non-repetitive peak reverse current	$t_p = 100 \mu s$; square wave; $T_{amb} = 25^\circ C$; prior to surge		see Table 7		
P_{tot}	total power dissipation	$T_{amb} = 25^\circ C$	[1]	-	250	mW
T_j	junction temperature			-	150	$^\circ C$
T_{amb}	ambient temperature			-55	+150	$^\circ C$
T_{stg}	storage temperature			-65	+150	$^\circ C$

[1] Refer to SOD882 standard mounting conditions (footprint), FR4 with 60 μ copper strip line.

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]	-	-	500	K/W

[1] Refer to SOD882 standard mounting conditions (footprint), FR4 with 60 μm copper strip line.

10. Characteristics

Table 7. Electrical characteristics

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

Symbol	Parameter	Conditions	Max	Unit
V_F	forward voltage	$I_F = 10\text{ mA}$	0.9	V
I_R	reverse current			
	BZX884-B/C2V4	$V_R = 1\text{ V}$	50	μA
	BZX884-B/C2V7	$V_R = 1\text{ V}$	20	μA
	BZX884-B/C3V0	$V_R = 1\text{ V}$	10	μA
	BZX884-B/C3V3	$V_R = 1\text{ V}$	5	μA
	BZX884-B/C3V6	$V_R = 1\text{ V}$	5	μA
	BZX884-B/C3V9	$V_R = 1\text{ V}$	3	μA
	BZX884-B/C4V3	$V_R = 1\text{ V}$	3	μA
	BZX884-B/C4V7	$V_R = 2\text{ V}$	3	μA
	BZX884-B/C5V1	$V_R = 2\text{ V}$	2	μA
	BZX884-B/C5V6	$V_R = 2\text{ V}$	1	μA
	BZX884-B/C6V2	$V_R = 4\text{ V}$	3	μA
	BZX884-B/C6V8	$V_R = 4\text{ V}$	2	μA
	BZX884-B/C7V5	$V_R = 5\text{ V}$	1	μA
	BZX884-B/C8V2	$V_R = 5\text{ V}$	700	nA
	BZX884-B/C9V1	$V_R = 6\text{ V}$	500	nA
	BZX884-B/C10	$V_R = 7\text{ V}$	200	nA
	BZX884-B/C11	$V_R = 8\text{ V}$	100	nA
	BZX884-B/C12	$V_R = 8\text{ V}$	100	nA
	BZX884-B/C13	$V_R = 8\text{ V}$	100	nA
	BZX884-B/C15 to 75	$V_R = 0.7 V_{Znom}$	50	nA

Table 8. Electrical characteristics per type

BZX884-B or C	Working voltage V _Z (V); at I _Z = 5 mA				Differential resistance r _{diff} (Ω);				Temperature coefficient S _Z (mV/K); I _{Ztest} = 5 mA	Diode capacit. C _d (pF)[1]	Non- repetitive peak reverse current I _{ZSM} (A) at t _p = 100 μs; T _{amb} = 25°C
	Tol. ± 2% (B)		Tol. ± 5% (C)		at I _{Ztest} = 1 mA		at I _{Ztest} = 5 mA				
	Min	Max	Min	Max	Typ	Max	Typ	Max	Typ	Max	Max
2V4	2.35	2.45	2.28	2.52	275	400	70	100	-1.3	450	6
2V7	2.65	2.75	2.57	2.84	300	450	75	100	-1.4	440	6
3V0	2.94	3.06	2.85	3.15	325	500	80	95	-1.6	425	6
3V3	3.23	3.37	3.14	3.47	350	500	85	95	-1.8	410	6
3V6	3.53	3.67	3.42	3.78	375	500	85	90	-1.9	390	6
3V9	3.82	3.98	3.71	4.10	400	500	85	90	-1.9	370	6
4V3	4.21	4.39	4.09	4.52	410	600	80	90	-1.7	350	6
4V7	4.61	4.79	4.47	4.94	425	500	50	80	-1.2	320	6
5V1	5.00	5.20	4.85	5.36	400	480	40	60	-0.5	300	6
5V6	5.49	5.71	5.32	5.88	80	400	15	40	1.0	275	6
6V2	6.08	6.32	5.89	6.51	40	150	6	10	2.2	250	6
6V8	6.66	6.94	6.46	7.14	30	80	6	15	3.0	215	6
7V5	7.35	7.65	7.13	7.88	15	80	2	10	3.6	170	4
8V2	8.04	8.36	7.79	8.61	20	80	2	10	4.3	150	4
9V1	8.92	9.28	8.65	9.56	20	100	2	10	5.2	120	3
10	9.80	10.20	9.50	10.50	20	150	2	10	6.0	110	3
11	10.78	11.22	10.45	11.55	25	150	2	10	6.9	110	2.5
12	11.76	12.24	11.40	12.60	25	150	2	10	7.9	105	2.5
13	12.74	13.26	12.35	13.65	25	170	2	10	8.8	105	2.5
15	14.70	15.30	14.25	15.75	25	200	3	15	10.7	100	2
16	15.68	16.32	15.20	16.80	50	200	10	40	12.4	90	1.5
18	17.64	18.36	17.10	18.90	50	225	10	45	14.4	80	1.5
20	19.60	20.40	19.00	21.00	60	225	15	55	16.4	70	1.5
22	21.56	22.44	20.90	23.10	60	250	20	55	18.4	60	1.25
24	23.52	24.48	22.80	25.20	60	250	25	70	20.4	55	1.25

[1] $f = 1$ MHz; $V_R = 0$ V

BZX884-B or C	Working voltage V _Z (V); at I _Z = 2 mA				Differential resistance r _{diff} (Ω);				Temperature coefficient S _Z (mV/K); I _{Ztest} = 2 mA	Diode capacit. C _d (pF)[1]	Non- repetitive peak reverse current I _{ZSM} (A) at t _p = 100 μs; T _{amb} = 25°C
	Tol. ± 2% (B)		Tol. ± 5% (C)		at I _{Ztest} = 0.5 mA		at I _{Ztest} = 2 mA				
	Min	Max	Min	Max	Typ	Max	Typ	Max	Typ	Max	Max
27	26.46	27.57	25.65	28.35	65	300	25	80	23.4	50	1.0
30	29.40	30.60	28.50	31.50	70	300	30	80	26.6	50	1.0
33	32.34	33.66	31.35	34.65	75	325	35	80	29.7	45	0.9
36	35.28	36.72	34.20	37.80	80	350	35	90	33.0	45	0.8
39	38.22	39.78	37.05	40.95	80	350	40	130	36.4	45	0.7
43	42.14	43.86	40.85	45.15	85	375	45	150	41.2	40	0.6
47	46.06	47.94	44.65	49.35	85	375	50	170	46.1	40	0.5
51	49.98	52.02	48.45	53.55	90	400	60	180	51	40	0.4
56	54.88	57.12	53.20	58.80	100	425	70	200	57.0	40	0.3
62	60.76	63.24	58.90	65.10	120	450	80	215	64.4	35	0.3
68	66.64	69.36	64.60	71.40	150	475	90	240	71.7	35	0.25
75	73.50	76.50	71.25	78.75	170	500	95	255	80.2	35	0.2

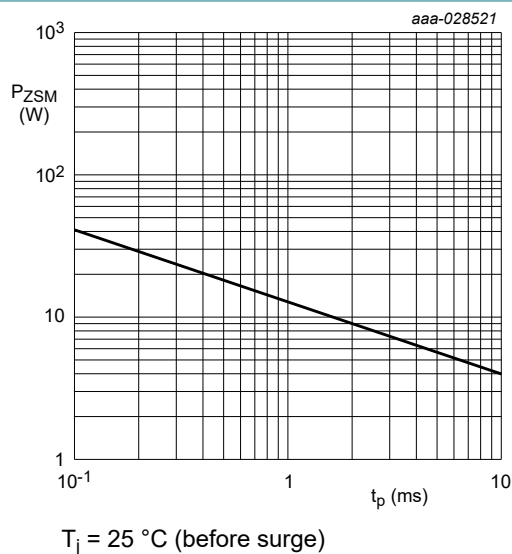
[1] $f = 1$ MHz; $V_R = 0$ V

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

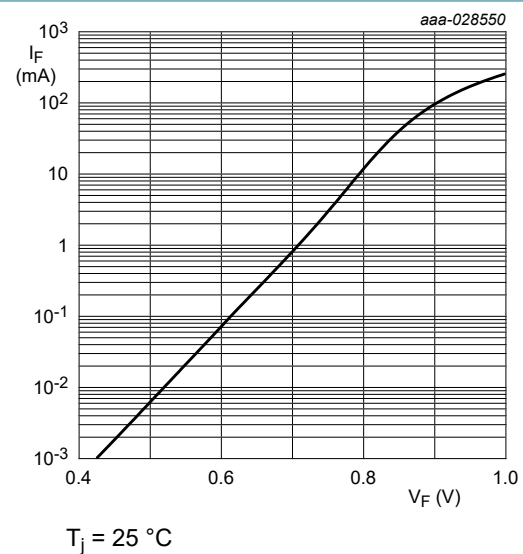


Fig. 2. BZX884-B/C2V4: Forward current as a function of forward voltage; typical values

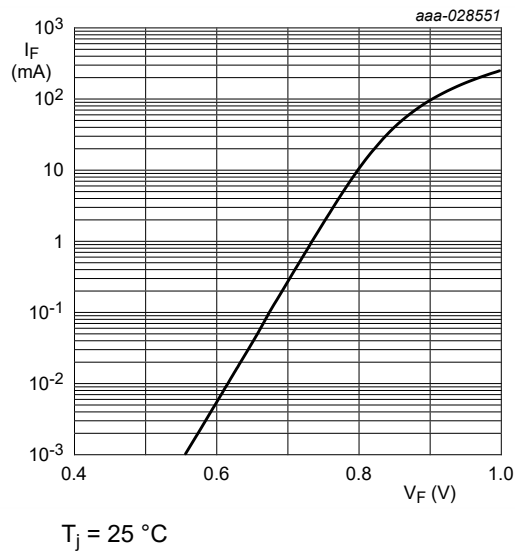


Fig. 3. BZX884-B/C6V8: Forward current as a function of forward voltage; typical values

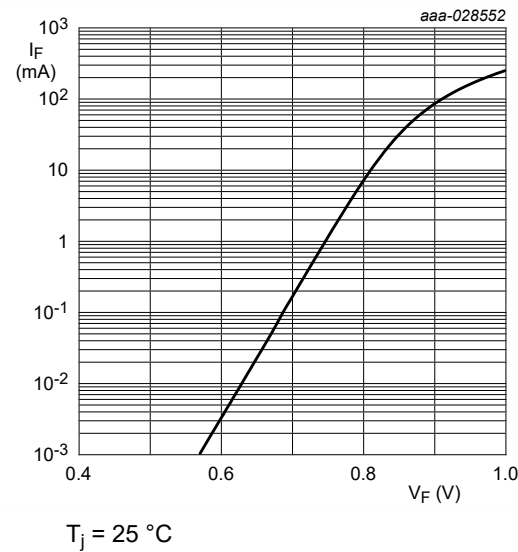


Fig. 4. BZX884-B/C7V5: Forward current as a function of forward voltage; typical values

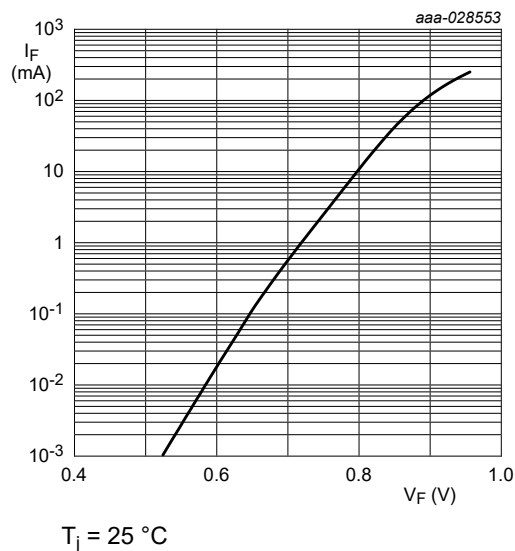


Fig. 5. BZX884-B/C75: Forward current as a function of forward voltage; typical values

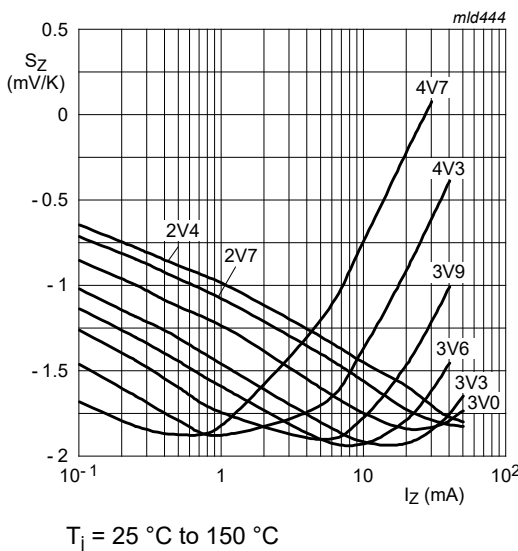


Fig. 6. BZX884-B/C2V4 to B/C4V7: Temperature coefficient as a function of working current; typical values

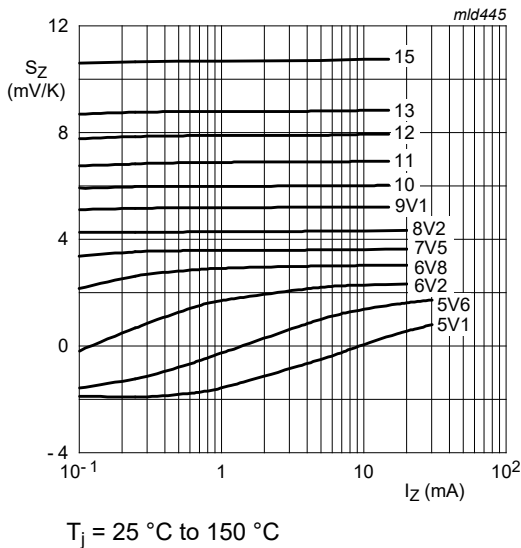


Fig. 7. BZX884-B/C5V1 to B/C15: Temperature coefficient as a function of working current; typical values

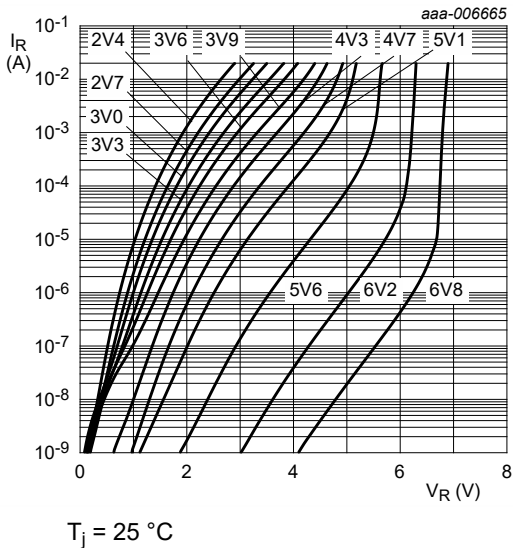


Fig. 8. BZX884-B/C2V4 to B/C6V8: Reverse current as a function of reverse voltage; typical values

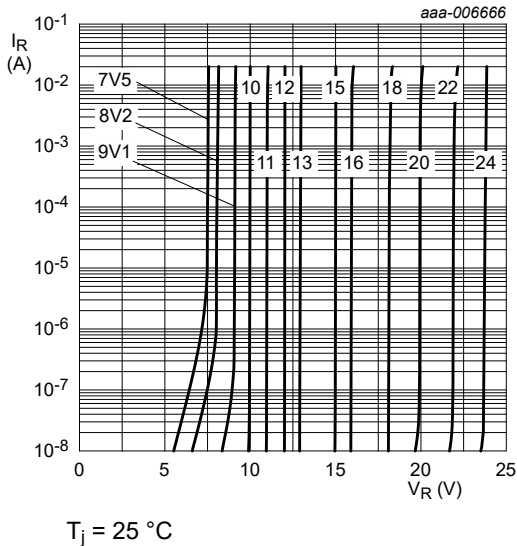


Fig. 9. BZX884-B/C7V5 to B/C24: Reverse current as a function of reverse voltage; typical values

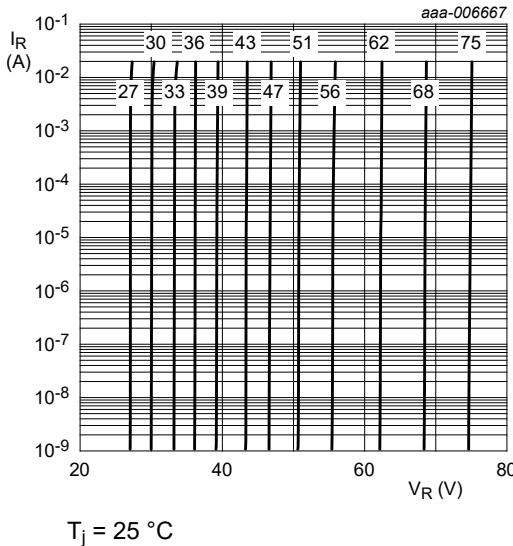


Fig. 10. BZX884-B/C27 to B/C75: Reverse current as a function of reverse voltage; typical values

11. Package outline

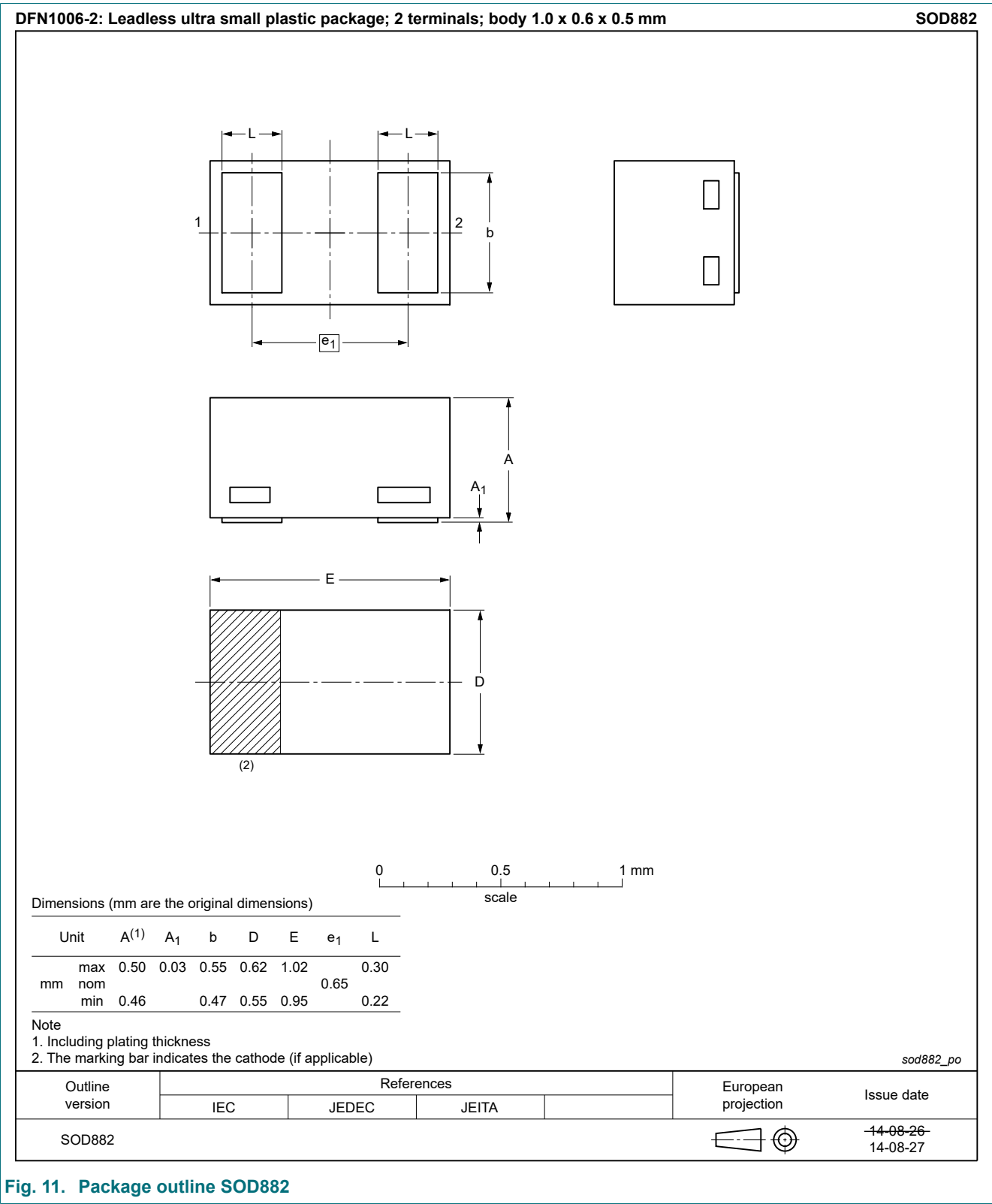
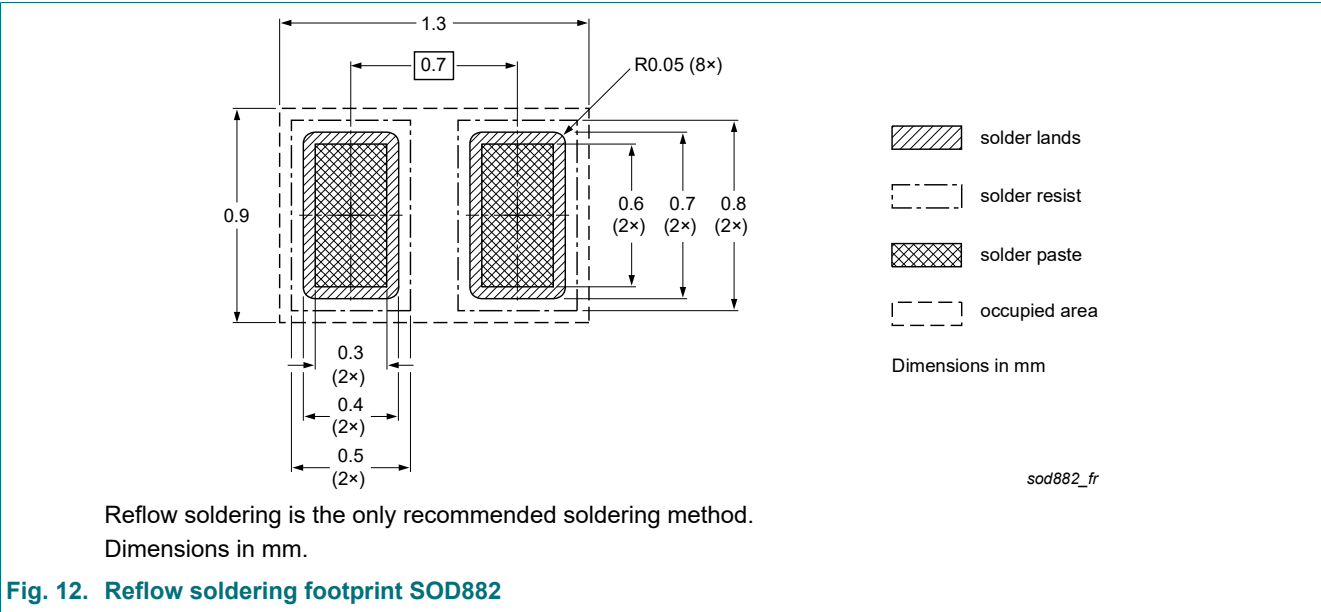


Fig. 11. Package outline SOD882

12. Soldering



13. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZX884_BC_SER v.5	20201214	Product data sheet	-	BZX884_SER v.4
Modifications:	- Characteristics: Working voltage min. value at tolerance $\pm 2\%$ for BZX884B/C4V3 corrected - Characteristics: Graphs and figures aligned			
BZX884_SER v.4	20180323	Product data sheet	-	BZX884_SER v.3
BZX884_SER v.3	20171114	Product data sheet	-	BZX884_SER v.2

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

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. Nexperia does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local Nexperia sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between Nexperia and its customer, unless Nexperia and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the Nexperia product is deemed to offer functions and qualities beyond those described in the Product data sheet.

Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, Nexperia does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. Nexperia takes no responsibility for the content in this document if provided by an information source outside of Nexperia.

In no event shall Nexperia be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, Nexperia's aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the Terms and conditions of commercial sale of Nexperia.

Right to make changes — Nexperia reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use in automotive applications — This Nexperia product has been qualified for use in automotive applications. Unless otherwise agreed in writing, the product is not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or

equipment, nor in applications where failure or malfunction of an Nexperia product can reasonably be expected to result in personal injury, death or severe property or environmental damage. Nexperia and its suppliers accept no liability for inclusion and/or use of Nexperia products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. Nexperia makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using Nexperia products, and Nexperia accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the Nexperia product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

Nexperia does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using Nexperia products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). Nexperia does not accept any liability in this respect.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — Nexperia products are sold subject to the general terms and conditions of commercial sale, as published at <http://www.nexperia.com/profile/terms>, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. Nexperia hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of Nexperia products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Translations — A non-English (translated) version of a document is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

Contents

1. General description..... 1

2. Features and benefits..... 1

3. Applications..... 1

4. Quick reference data..... 1

5. Pinning information..... 1

6. Ordering information..... 2

7. Marking..... 2

8. Limiting values..... 3

9. Thermal characteristics..... 3

10. Characteristics..... 4

11. Package outline..... 9

12. Soldering..... 10

13. Revision history..... 11

14. Legal information..... 12

© Nexperia B.V. 2020. All rights reserved

For more information, please visit: <http://www.nexperia.com>

For sales office addresses, please send an email to: salesaddresses@nexperia.com

Date of release: 14 December 2020