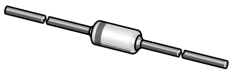
THE DATASHEET OF

NZX24B,133

www.win-source.net 0086-755-83957316



NZX series

Single Zener diodes

Rev. 4 — 28 November 2011 Product data sheet

1. Product profile

1.1 General description

General-purpose Zener diodes in a SOD27 (SC-40) small hermetically sealed glass package.

1.2 Features and benefits

- Total power dissipation: $P_{tot} \leq 500$ mW
- Low differential resistance
- Low leakage current

1.3 Applications

- General regulation functions

1.4 Quick reference data

Table 1. Quick reference data

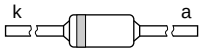
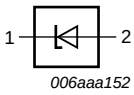
$T_j = 25$ °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 200$ mA	[1]	-	-	1.5	V

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

2. Pinning information

Table 2. Pinning

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

[1] The marking band indicates the cathode.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
NZX2V1B to NZX36X[1]	SC-40	hermetically sealed glass package; axial leaded; 2 leads	SOD27

[1] The series consists of 112 types with nominal working voltages from 2.1 V to 36 V.

4. Marking

Table 4. Marking codes

Type number	Marking code
NZX2V1B to NZX36X	the diodes are type branded

5. 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
P_{tot}	total power dissipation	$T_{tp} \leq 25$ °C	-	500	mW
T_j	junction temperature		-	175	°C
T_{amb}	ambient temperature		−55	+175	°C
T_{stg}	storage temperature		−65	+175	°C

6. 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]	-	-	380	K/W
$R_{th(j-t)}$	thermal resistance from junction to tie-point		[1]	-	-	300	K/W

[1] Device mounted on an FR4 Printed-Circuit Board (PCB) without metallization pad; maximum lead length 8 mm.

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

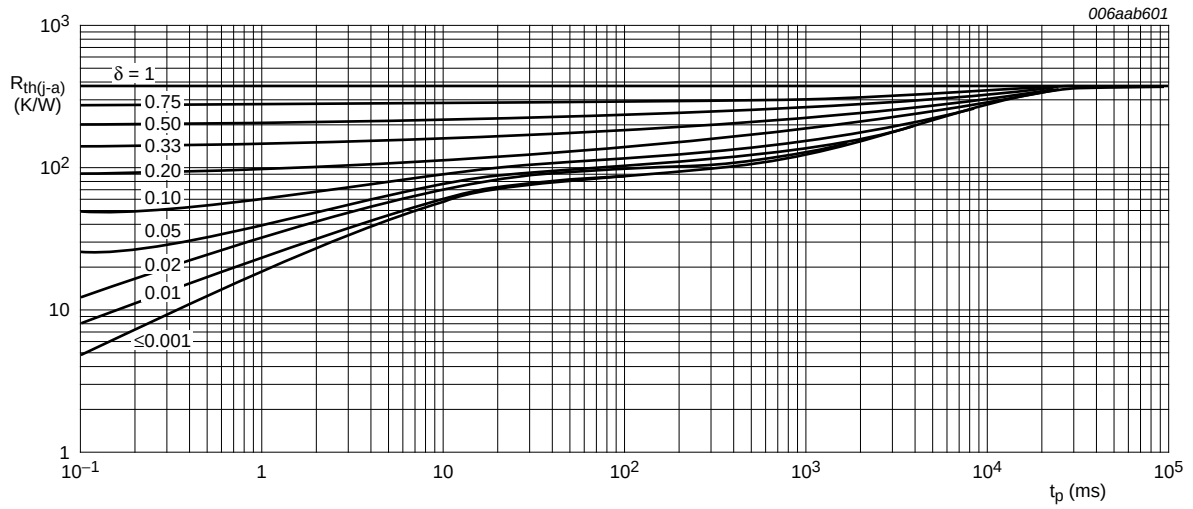


Fig 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

7. Characteristics

Table 7. Characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 200 mA	[1]	-	-	1.5	V

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

Table 8. Characteristics per type; NZX2V1B to NZX18C

T_j = 25 °C unless otherwise specified.

NZXxxx	Sel	Working voltage V_Z (V)		Differential resistance r_{dif} (Ω)	Reverse current I_R (μA)	
		I_Z = 5 mA		I_Z = 5 mA		
		Min	Max	Max	Max	V_R (V)
2V1	B	2.0	2.2	100	5	0.5
2V4	A	2.3	2.5	100	50	1
	B	2.4	2.6			
2V7	A	2.5	2.7	100	20	1
	B	2.6	2.8			
	C	2.7	2.9			
3V0	A	2.8	3.0	100	10	1
	B	2.9	3.1			
	C	3.0	3.2			
3V3	A	3.1	3.3	100	5	1
	B	3.2	3.4			
	C	3.3	3.5			

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

Table 8. Characteristics per type; NZX2V1B to NZX18C *…continued*

T_j = 25 °C unless otherwise specified.

NZXxxx	Sel	Working voltage V_Z (V)		Differential resistance r_{dif} (Ω)	Reverse current I_R (μA)	
		I_Z = 5 mA		I_Z = 5 mA		
		Min	Max	Max	Max	V_R (V)
3V6	A	3.4	3.6	100	5	1
	B	3.5	3.7			
	C	3.6	3.8			
3V9	A	3.7	3.9	100	3	1
	B	3.8	4.0			
	C	3.9	4.1			
4V3	A	4.0	4.2	100	3	1
	B	4.1	4.3			
	C	4.2	4.4			
	D	4.3	4.5			
4V7	A	4.4	4.6	100	3	2
	B	4.5	4.7			
	C	4.6	4.8			
	D	4.7	4.9			
5V1	A	4.8	5.0	100	2	2
	B	4.9	5.1			
	C	5.0	5.2			
	D	5.1	5.3			
5V6	A	5.2	5.5	40	1	2
	B	5.3	5.6			
	C	5.4	5.7			
	D	5.5	5.8			
	E	5.6	5.9			
6V2	A	5.7	6.0	15	3	4
	B	5.8	6.1			
	C	6.0	6.3			
	D	6.1	6.4			
	E	6.3	6.6			
6V8	A	6.4	6.7	15	2	4
	B	6.6	6.9			
	C	6.7	7.0			
	D	6.9	7.2			

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

Table 8. Characteristics per type; NZX2V1B to NZX18C *…continued*

T_j = 25 °C unless otherwise specified.

NZXxxx	Sel	Working voltage V_Z (V)		Differential resistance r_{dif} (Ω)	Reverse current I_R (μA)	
		I_Z = 5 mA		I_Z = 5 mA		
		Min	Max	Max	Max	V_R (V)
7V5	A	7.0	7.3	15	1	5
	B	7.2	7.6			
	C	7.3	7.7			
	D	7.5	7.9			
	X	7.07	7.45			
8V2	A	7.7	8.1	20	0.7	5
	B	7.9	8.3			
	C	8.1	8.5			
	D	8.3	8.7			
9V1	A	8.5	8.9	20	0.5	6
	B	8.7	9.1			
	C	8.9	9.3			
	D	9.1	9.5			
	E	9.3	9.7			
10	A	9.5	9.9	25	0.2	7
	B	9.7	10.1			
	C	9.9	10.3			
	D	10.2	10.6			
11	A	10.4	10.8	25	0.1	8
	B	10.7	11.1			
	C	10.9	11.3			
	D	11.1	11.6			
12	A	11.4	11.9	35	0.1	8
	B	11.6	12.1			
	C	11.9	12.4			
	D	12.2	12.7			
	X	11.44	12.03			
13	A	12.4	12.9	35	0.1	8
	B	12.6	13.1			
	C	12.9	13.4			
14	A	13.2	13.7	35	0.05	9.8
	B	13.5	14.0			
	C	13.8	14.3			

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

Table 8. Characteristics per type; NZX2V1B to NZX18C *…continued*

T_j = 25 °C unless otherwise specified.

NZXxxx	Sel	Working voltage V_Z (V)		Differential resistance r_{dif} (Ω)	Reverse current I_R (μA)	
		I_Z = 5 mA		I_Z = 5 mA		
		Min	Max	Max	Max	V_R (V)
15	A	14.1	14.7	40	0.05	10.5
	B	14.5	15.1			
	C	14.9	15.5			
	X	14.35	15.09			
16	A	15.3	15.9	45	0.05	11.2
	B	15.7	16.5			
	C	16.3	17.1			
18	A	16.9	17.7	55	0.05	12.6
	B	17.5	18.3			
	C	18.1	19.0			

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

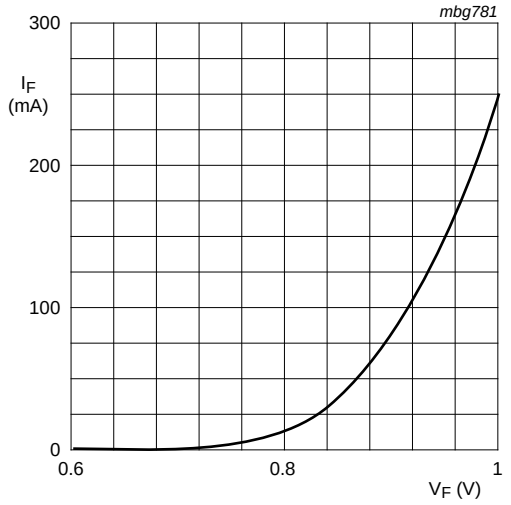
Table 9. Characteristics per type; NZX20A to NZX36X

T_j = 25 °C unless otherwise specified.

NZXxxx	Sel	Working voltage V_Z (V)		Differential resistance r_{dif} (Ω)	Reverse current I_R (μA)	
		I_Z = 2 mA		I_Z = 2 mA		
		Min	Max	Max	Max	V_R (V)
20	A	18.8	19.7	60	0.05	14
	B	19.5	20.4			
	C	20.2	21.2			
22	A	20.9	21.9	65	0.05	15.4
	B	21.6	22.6			
	C	22.3	23.3			
24	A	22.9	24.0	70	0.05	16.8
	B	23.6	24.7			
	C	24.3	25.5			
	X	22.61	23.77			
27	A	25.2	26.6	80	0.05	18.9
	B	26.2	27.6			
	C	27.2	28.6			
	X	26.99	28.39			
30	A	28.2	29.6	100	0.05	21
	B	29.2	30.6			
	C	30.2	31.6			
	X	29.02	30.51			
33	A	31.2	32.6	120	0.05	23.1
	B	32.2	33.6			
	C	33.2	34.5			
36	A	34.2	35.7	140	0.05	25.2
	B	35.3	36.8			
	C	36.4	38.0			
	X	35.36	37.19			

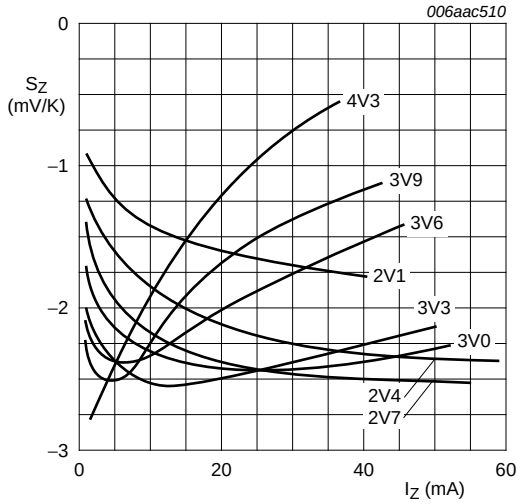
All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved



T_j = 25 °C

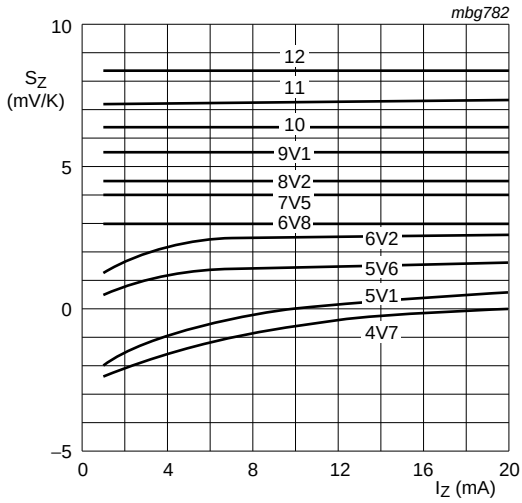
Fig 2. Forward current as a function of forward voltage; typical values



NZX2V1 to NZX4V3

T_j = 25 °C to 150 °C

Fig 3. Temperature coefficient as a function of working current; typical values



NZX4V7 to NZX12

T_j = 25 °C to 150 °C

Fig 4. Temperature coefficient as a function of working current; typical values

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

8. Package outline

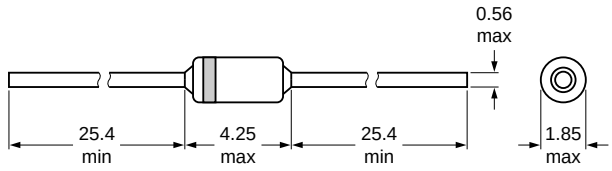


Fig 5. Package outline SOD27 (SC-40)

9. Packing information

Table 10. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number[2]	Package	Description	Packing quantity	
			5000	10000
NZX2V1B to NZX36X	SOD27	26 mm tape ammopack, axial	-143	-
		52 mm tape ammopack, axial	-	-133
		52 mm reel pack, axial	-	-113

[1] For further information and the availability of packing methods, see Section 12.

[2] The series consists of 112 types with nominal working voltages from 2.1 V to 36 V.

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

10. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
NZX_SER v.4	20111128	Product data sheet	-	NZX_SER v.3
Modifications:	• Section 1.2: corrected. • Section 11 “Legal information”: updated.			
NZX_SER v.3	20110121	Product data sheet	-	NZX_SER v.2
NZX_SER v.2	20090603	Product data sheet	-	NZX_SER v.1
NZX_SER v.1	20080724	Product data sheet	-	-

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

11. Legal information

11.1 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 URL http://www.nexperia.com.

11.2 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.

11.3 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.

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 — Nexperia products are 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 a Nexperia product can reasonably be expected to result in personal injury, death or severe property or environmental damage. Nexperia accepts 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.

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.

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

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.

Non-automotive qualified products — Unless this data sheet expressly states that this specific Nexperia product is automotive qualified, the product is not suitable for automotive use. It is neither qualified nor tested in accordance with automotive testing or application requirements. Nexperia accepts no liability for inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

In the event that customer uses the product for design-in and use in automotive applications to automotive specifications and standards, customer (a) shall use the product without Nexperia's warranty of the product for such automotive applications, use and specifications, and (b) whenever customer uses the product for automotive applications beyond Nexperia's specifications such use shall be solely at customer's own risk, and (c) customer fully indemnifies Nexperia for any liability, damages or failed product claims resulting from customer design and use of the product for automotive applications beyond Nexperia's standard warranty and Nexperia's product specifications.

11.4 Trademarks

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

12. Contact information

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

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

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

13. Contents

1 Product profile 1
1.1 General description 1
1.2 Features and benefits 1
1.3 Applications 1
1.4 Quick reference data 1
2 Pinning information 1
3 Ordering information 2
4 Marking 2
5 Limiting values 2
6 Thermal characteristics 2
7 Characteristics 3
8 Package outline 9
9 Packing information 9
10 Revision history 10
11 Legal information 11
11.1 Data sheet status 11
11.2 Definitions 11
11.3 Disclaimers 11
11.4 Trademarks 12
12 Contact information 12
13 Contents 13

© **Nexperia B.V. 2017. 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: 28 November 2011

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- View NZX24B,133 on WIN SOURCE
- Nexperia USA Inc. Information

Optimize Your Supply Chain with WIN SOURCE Solutions

- Global Sourcing Solution
- Obsolete Management
- Cost Control Management
- Shortage Management
- Alternative Solution
- Excess Inventory Management