THE DATASHEET OF

NZX12D,133

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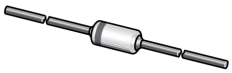


NZX series

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

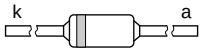
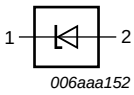
$T_j = 25$ °C unless otherwise specified.

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.

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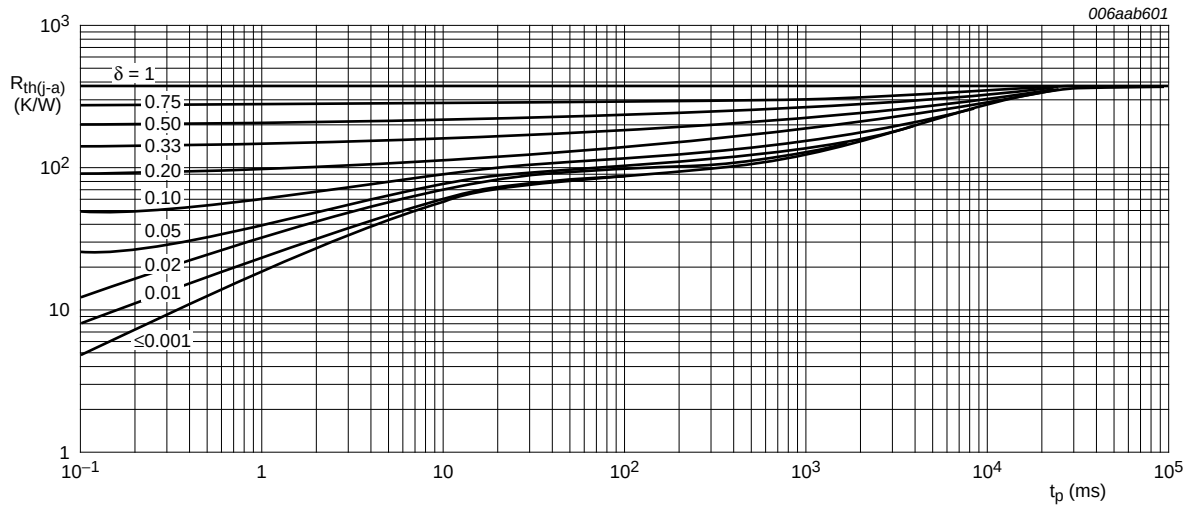

Fig 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

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			

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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			

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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			

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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			

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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			

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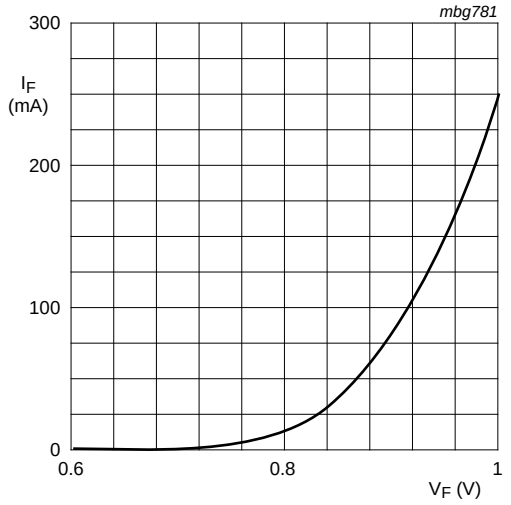
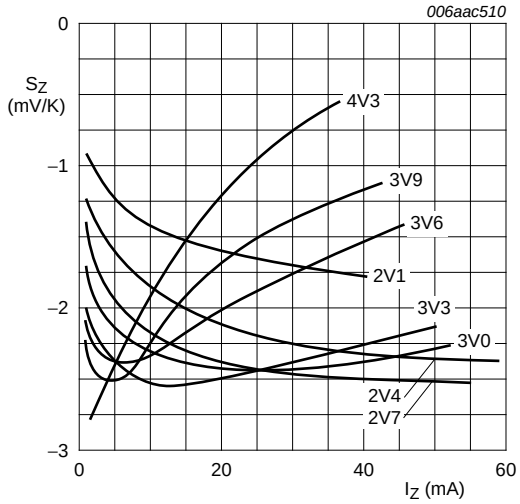


T_j = 25 °C

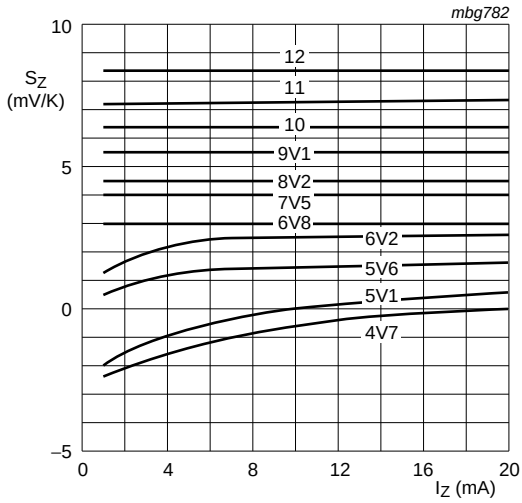
Fig 2. Forward current as a function of forward voltage; typical values



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

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8. Package outline

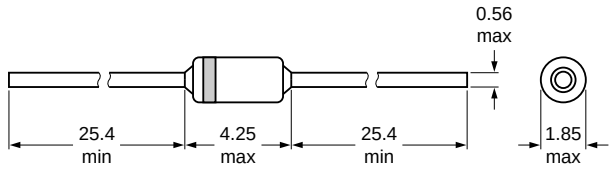

Fig 5. Package outline SOD27 (SC-40)

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.

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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	-	-

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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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