



# BAS21J

## Single high-speed switching diode

Rev. 01 — 8 March 2007

Product data sheet

## 1. Product profile

### 1.1 General description

Single high-speed switching diode, encapsulated in a SOD323F (SC-90) very small and flat lead Surface-Mounted Device (SMD) plastic package.

### 1.2 Features

- High switching speed:  $t_{rr} \leq 50$  ns
- Low leakage current
- Repetitive peak reverse voltage:  $V_{RRM} \leq 300$  V
- Excellent coplanarity and improved thermal behavior
- Low capacitance:  $C_d \leq 2$  pF
- Reverse voltage:  $V_R \leq 300$  V
- Very small and flat lead SMD plastic package

### 1.3 Applications

- High-speed switching
- General-purpose switching
- Voltage clamping
- Reverse polarity protection

### 1.4 Quick reference data

Table 1. Quick reference data



Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current		[1] -	-	250	mA
$I_R$	reverse current	$V_R = 250$ V	-	-	150	nA
$V_R$	reverse voltage		-	-	300	V
$t_{rr}$	reverse recovery time		[2] -	-	50	ns

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

[2] When switched from  $I_F = 30$  mA to  $I_R = 30$  mA;  $R_L = 100$   $\Omega$ ; measured at  $I_R = 3$  mA.

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Symbol
1	cathode		 <i>sym006</i>
2	anode		

[1] The marking bar indicates the cathode.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS21J	SC-90	plastic surface-mounted package; 2 leads	SOD323F

4. Marking

Table 4. Marking codes

Type number	Marking code
BAS21J	AN

## 5. Limiting values

**Table 5. Limiting values**

*In accordance with the Absolute Maximum Rating System (IEC 60134).*

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage		-	300	V
$V_R$	reverse voltage		-	300	V
$I_F$	forward current		[1] -	250	mA
$I_{FRM}$	repetitive peak forward current	$t_p \leq 0.5$ ms; $\delta \leq 0.25$	-	1	A
$I_{FSM}$	non-repetitive peak forward current	square wave	[2]		
		$t_p = 100$ $\mu$ s	-	3	A
		$t_p = 1$ ms	-	2.3	A
		$t_p = 10$ ms	-	1.7	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25$ °C	[3][4] -	550	mW
$T_j$	junction temperature		-	150	°C
$T_{amb}$	ambient temperature		-65	+150	°C
$T_{stg}$	storage temperature		-65	+150	°C

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

[2]  $T_j = 25$  °C prior to surge.

[3] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

[4] Reflow soldering is the only recommended soldering method.

## 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][2] -	-	230	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3] -	-	55	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

[2] Reflow soldering is the only recommended soldering method.

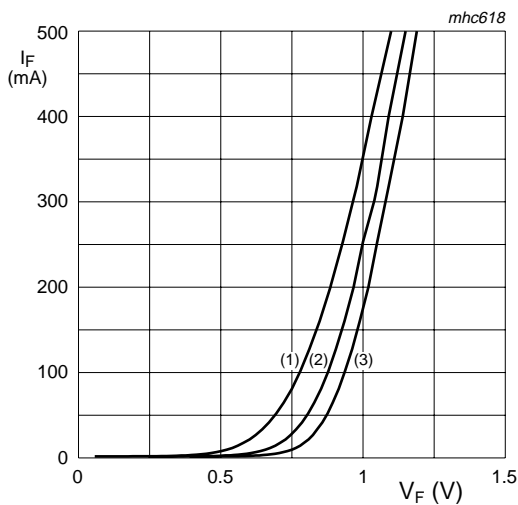
[3] Soldering point of cathode tab.

7. Characteristics

Table 7. Characteristics  
*T<sub>amb</sub> = 25 °C unless otherwise specified.*

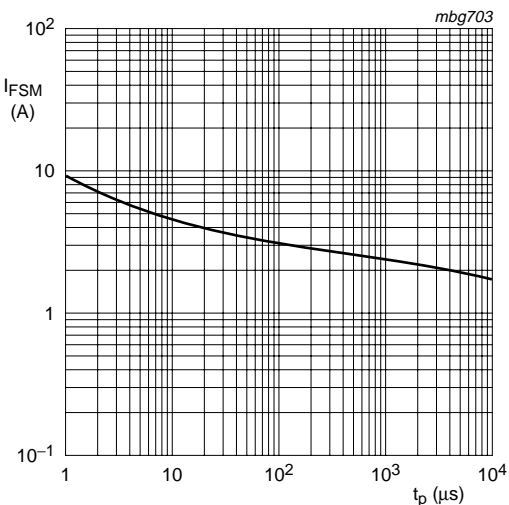
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 100 mA	[1]	-	1.1	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 250 V	-	-	150	nA
		V <sub>R</sub> = 250 V; T <sub>j</sub> = 150 °C	-	-	50	μA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 0 V; f = 1 MHz	-	-	2	pF
t <sub>rr</sub>	reverse recovery time		[2]	-	50	ns

[1] Pulse test: t<sub>p</sub> ≤ 300 μs; δ ≤ 0.02.  
[2] When switched from I<sub>F</sub> = 30 mA to I<sub>R</sub> = 30 mA; R<sub>L</sub> = 100 Ω; measured at I<sub>R</sub> = 3 mA.



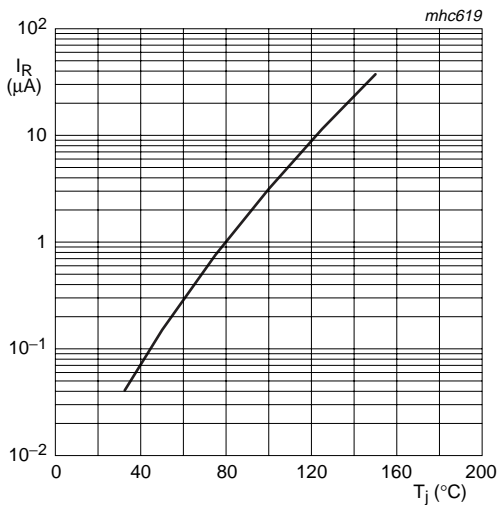
- (1)  $T_{amb} = 150\text{ }^{\circ}\text{C}$
- (2)  $T_{amb} = 75\text{ }^{\circ}\text{C}$
- (3)  $T_{amb} = 25\text{ }^{\circ}\text{C}$

Fig 1. Forward current as a function of forward voltage; typical values



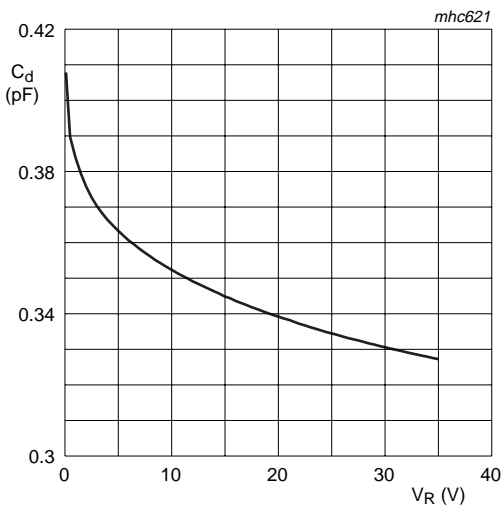
Based on square wave currents.  
 $T_j = 25\text{ }^{\circ}\text{C}$ ; prior to surge

Fig 2. Non-repetitive peak forward current as a function of pulse duration; maximum values



$V_R = 250\text{ V}$

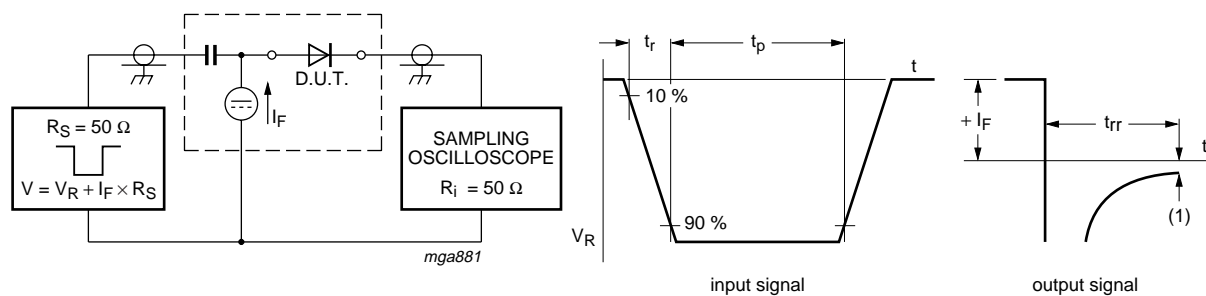
Fig 3. Reverse current as a function of junction temperature; typical values



$f = 1\text{ MHz}$ ;  $T_{amb} = 25\text{ }^{\circ}\text{C}$

Fig 4. Diode capacitance as a function of reverse voltage; typical values

## 8. Test information



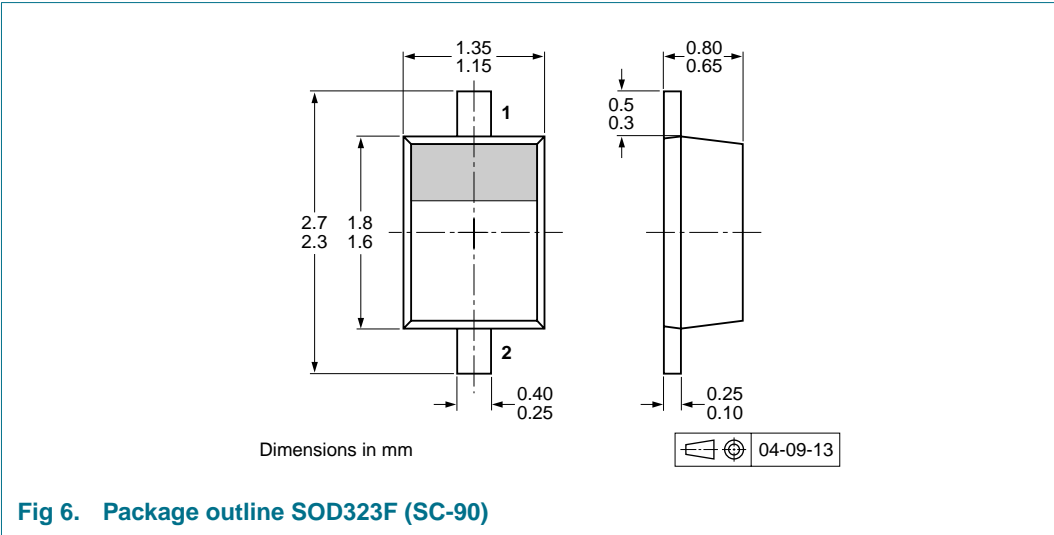
(1)  $I_R = 1\text{ mA}$

Input signal: reverse pulse rise time  $t_r = 0.6\text{ ns}$ ; reverse voltage pulse duration  $t_p = 100\text{ ns}$ ; duty cycle  $\delta = 0.05$

Oscilloscope: rise time  $t_r = 0.35\text{ ns}$

**Fig 5. Reverse recovery time test circuit and waveforms**

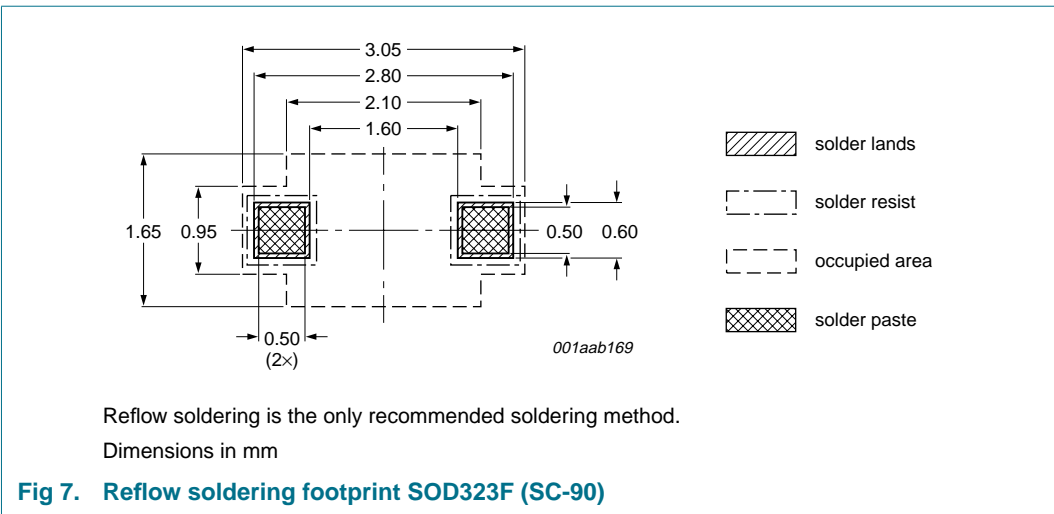
9. Package outline



10. Packing information

Please refer to packing information on [www.nexperia.com](http://www.nexperia.com).

11. Soldering



12. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAS21J_1	20070308	Product data sheet	-	-



## 13. Legal information

### 13.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.



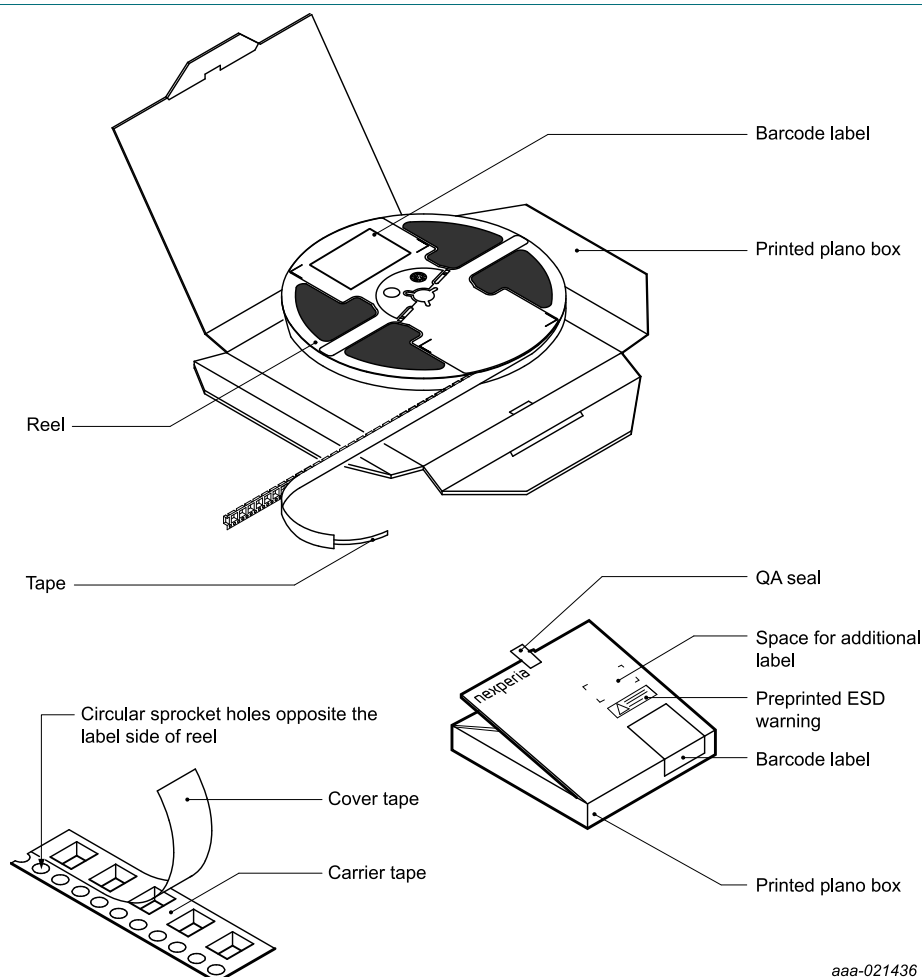
# SOD323F

Reel pack for SMD, 7"; Q1/T1-Q2/T3 product orientation

Rev. 2 — 28 April 2020

Packing information

## 1. Packing method



aaa-021436

Fig. 1. Reel pack for SMD

Table 1. Dimensions and quantities

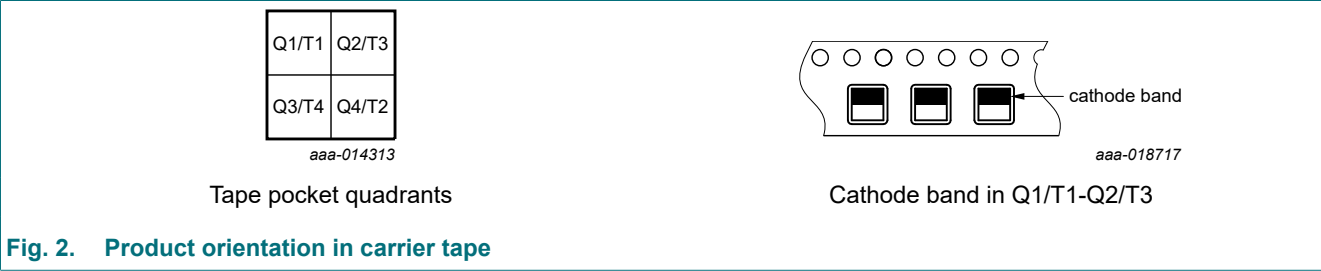
Package version	12 NC ending	Orderable part number ending	Reel dimensions d × w (mm)[1]	SPQ/PQ (pcs)[2]	Reels per box	Outer box dimensions l × w × h (mm)[3]
SOD323F	115	115 or X	180 x 8	3000	1	185 x 185 x 17

[1] d = reel diameter; w = tape width.

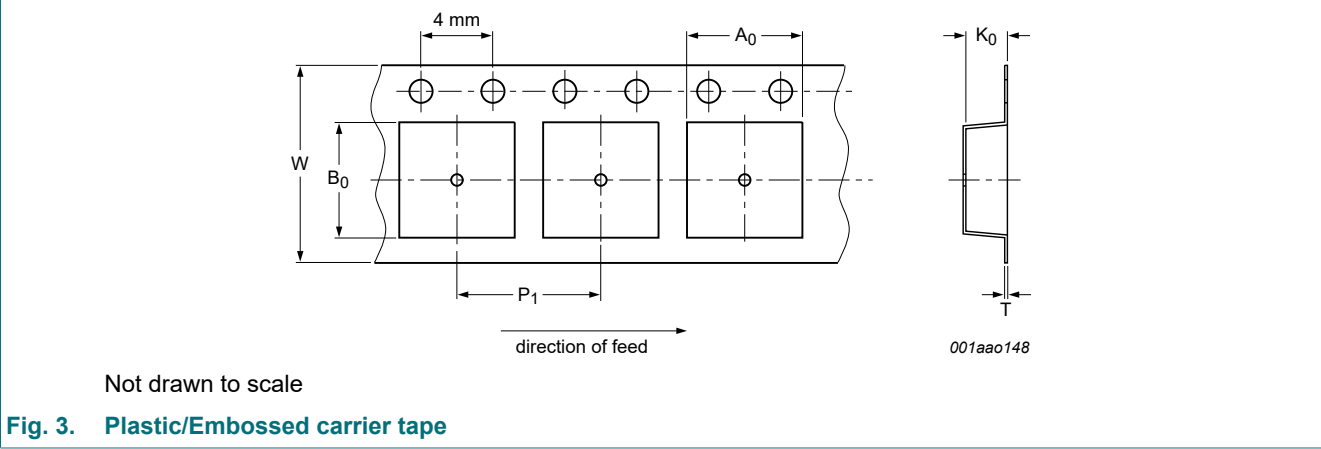
[2] Packing quantity dependent on specific product type. Please contact your local Nexperia representative for ordering.

[3] Dimensions for reference only.

2. Product orientation



3. Carrier tape dimensions



4. Reel dimensions

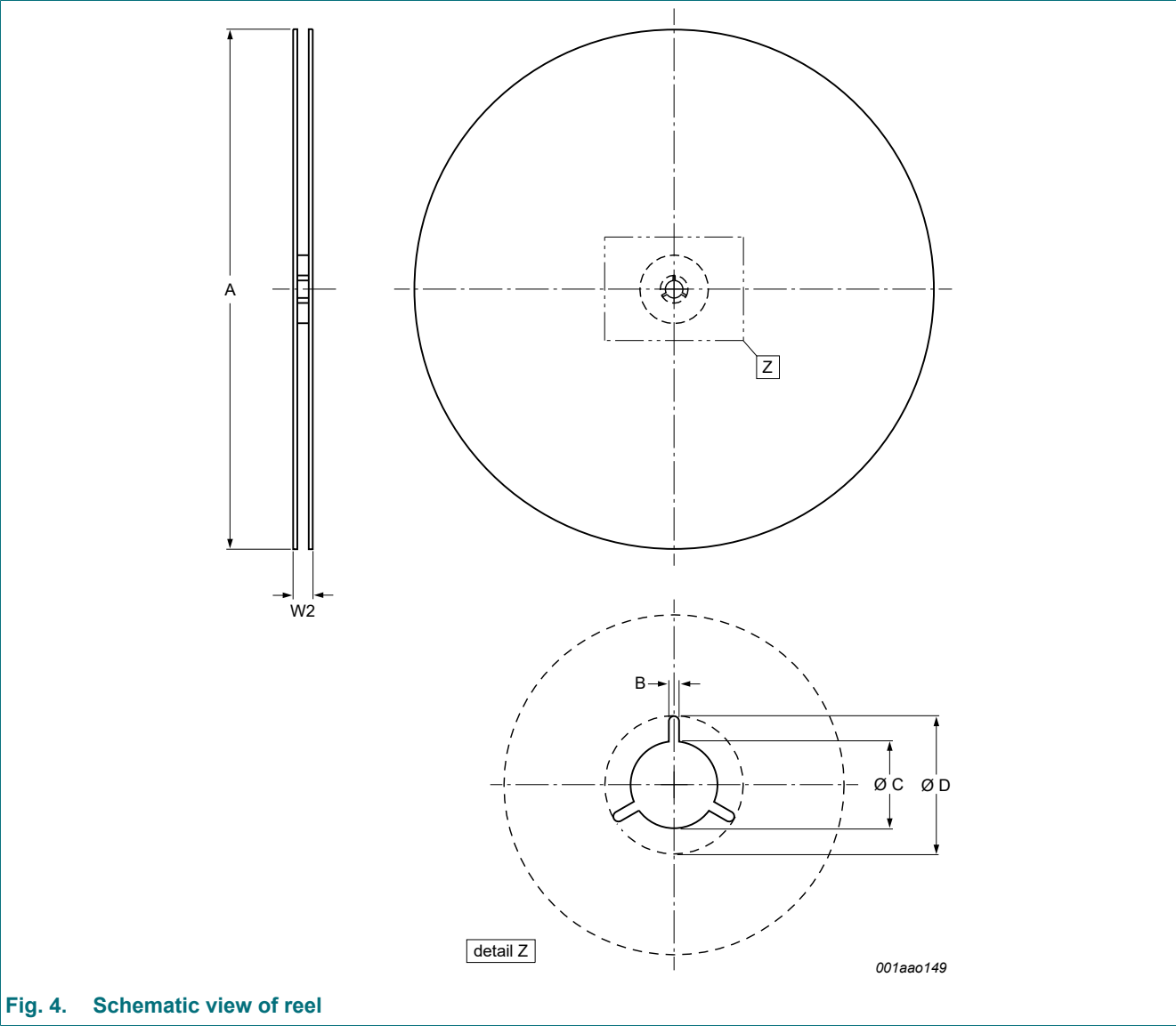


Fig. 4. Schematic view of reel

Table 3. Reel dimensions

In accordance with IEC 60286-3

A [nom] (mm)	W2 [max] (mm)	B [min] (mm)	C [min] (mm)	D [min] (mm)
180	14.4	1.5	12.8	20.2

5. Barcode label

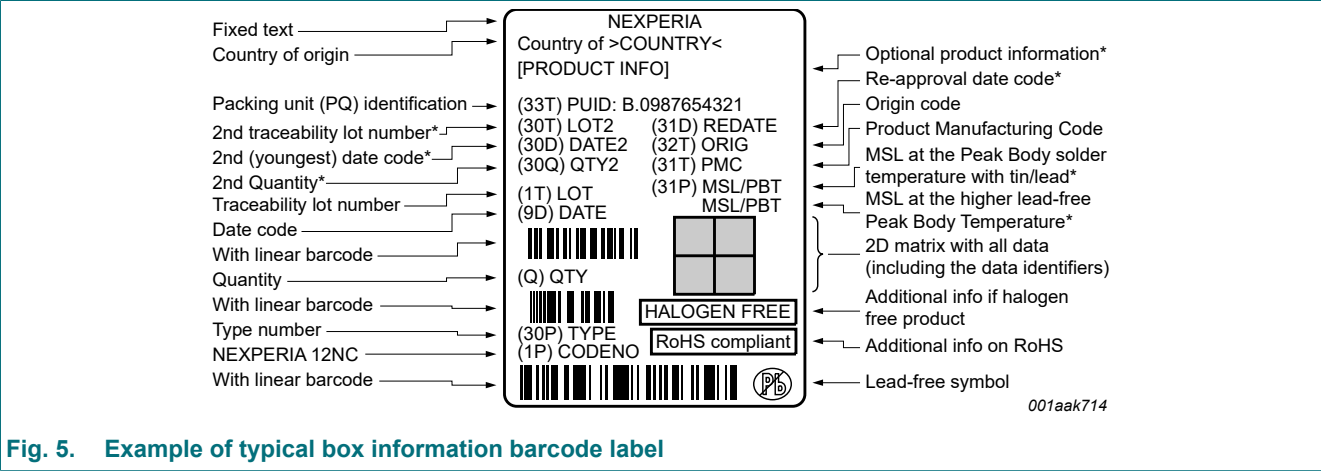


Fig. 5. Example of typical box information barcode label

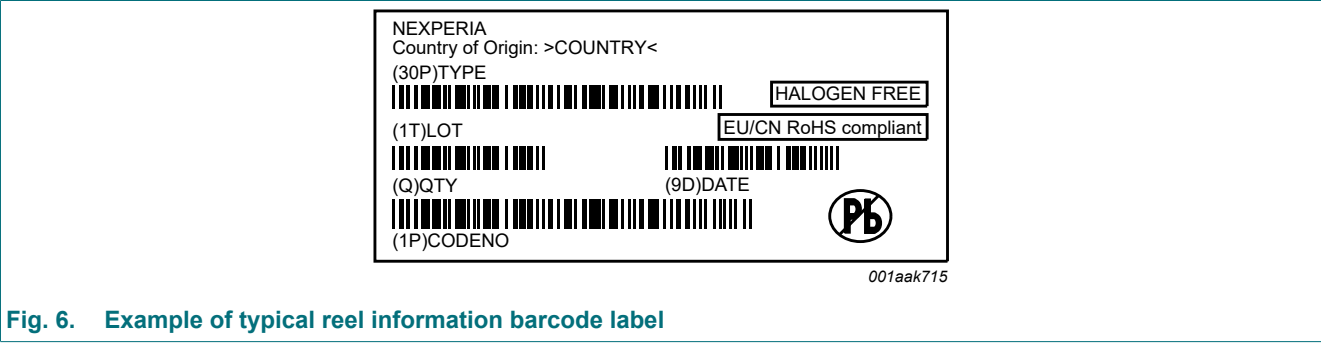


Fig. 6. Example of typical reel information barcode label

Table 4. Barcode label dimensions

Box barcode label l × w (mm)	Reel barcode label l × w (mm)
100 × 75	36 × 75

6. Revision history

Table 5. Revision history

Document ID	Release date	Modifications	Supersedes
SOD323F_115 v. 2	20200428	<ul style="list-style-type: none"><li>The format of this packing information document has been redesigned to comply with the identity guidelines of Nexperia.</li><li>Table 1: Outer box dimensions updated</li><li>Table 2: Tolerances added to carrier tape dimensions.</li><li>Section 4 "Reel dimensions" added.</li><li>Section 5 "Barcode label" added.</li><li>Legal texts have been adapted to the new company name where appropriate.</li></ul>	SOD323F_115 v. 1
SOD323F_115 v. 1	20121001	-	-

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## BAS21J

Single high-speed switching diode

 AUTOMOTIVE QUALIFIED

Single high-speed switching diode, encapsulated in a SOD323F (SC-90) very small and flat lead Surface-Mounted Device (SMD) plastic package.

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### Features and benefits

- High switching speed:  $t_{rr} \leq 50$  ns
- Low capacitance:  $C_d \leq 2$  pF
- Low leakage current
- Reverse voltage:  $V_R \leq 300$  V
- Repetitive peak reverse voltage:  $V_{RRM} \leq 300$  V
- Very small and flat lead SMD plastic package
- Excellent coplanarity and improved thermal behavior
- AEC-Q101 qualified

### Applications

- High-speed switching
- Voltage clamping
- General-purpose switching
- Reverse polarity protection




### Parametrics

Type number	Package version	Package name	Size (mm)	$V_R$ [max] (V)	$I_{FSM}$ [max] (A)	$V_F$ [max] (mV)	$I_R$ [max] (nA)	$I_{FRM}$ (mA)	Configuration	$t_{rr}$ [max] (ns)	$I_F$ [max] (mA)	$C_d$ [max] (pF)
BAS21J	SOD323F	SC-90	1.7 x 1.25 x 0.7	300	3	1100@ $I_F=100$ mA	150@ $V_R=250$ V	1000	single	50	250	2

### Package

Type number	Orderable part number, (Ordering code (12NC))	Status	Marking	Package	Package information	Reflow-/Wave soldering	Packing
BAS21J	BAS21JZ ( 9340 609 33301 )	Samples available / Development	AN	 SC-90 (SOD323F).	<a href="#">SOD323F</a>	<a href="#">REFLOW_BG-BD-1</a> <a href="#">WAVE_BG-BD-1</a>	Multi-reel 11" T1/Q1 SMD Pitch 4mm
	BAS21J,115 ( 9340 609 33115 )	Active	AN				<a href="#">Reel 7" Q1/T1 or Q2/T3</a>
	BAS21JF ( 9340 609 33135 )	Active	AN				Reel 13" or 11 ¼" Q1/T1

### Quality, reliability & chemical content

Type number	Orderable part number	Chemical content	RoHS / RHF	MSL	MSL leadfree
BAS21J	BAS21JZ	<a href="#">BAS21J</a>	<div><div>EU/CN RoHS COMPLIANT</div><div> <b>Pb</b> <b>D</b></div></div>	1	1
BAS21J	BAS21J,115	<a href="#">BAS21J</a>	<div><div>EU/CN RoHS COMPLIANT</div><div> <b>Pb</b> <b>D</b></div></div>	1	1
BAS21J	BAS21JF	<a href="#">BAS21J</a>	<div><div>EU/CN RoHS COMPLIANT</div><div> <b>Pb</b> <b>D</b></div></div>	1	1

[Quality and reliability disclaimer](#)

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