



# PDTA143TMB

50 V, 100 mA PNP resistor-equipped transistor;  
R1 = 4.7 k $\Omega$ , R2 = open

26 May 2025

Product data sheet

## 1. General description

PNP Resistor-Equipped Transistor (RET) in a leadless ultra small DFN1006B-3 (SOT883B) Surface-Mounted Device (SMD) plastic package.

NPN complement: PDTC143TMB

## 2. Features and benefits

- 100 mA output current capability
- Reduces component count
- Built-in bias resistors
- Reduces pick and place costs
- Simplifies circuit design
- Leadless ultra small SMD plastic package
- Low package height of 0.37 mm
- AEC-Q101 qualified

## 3. Applications

- Low-current peripheral driver
- Control of IC inputs
- Replaces general-purpose transistors in digital applications
- Mobile applications

## 4. Quick reference data

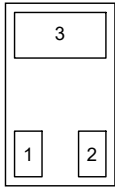
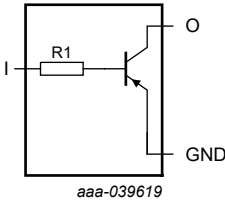
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>CEO</sub>	collector-emitter voltage	open base	-	-	-50	V
I <sub>O</sub>	output current		-	-	-100	mA
R1	bias resistor 1 (input)	T <sub>amb</sub> = 25 °C	3.3	4.7	6.1	k $\Omega$

50 V, 100 mA PNP resistor-equipped transistor; R1 = 4.7 kΩ, R2 = open

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	I	input (base)	 <p>Transparent top view</p> <p><b>DFN1006B-3 (SOT883B)</b></p>	
2	G	GND (emitter)		
3	O	output (collector)		

6. Ordering information

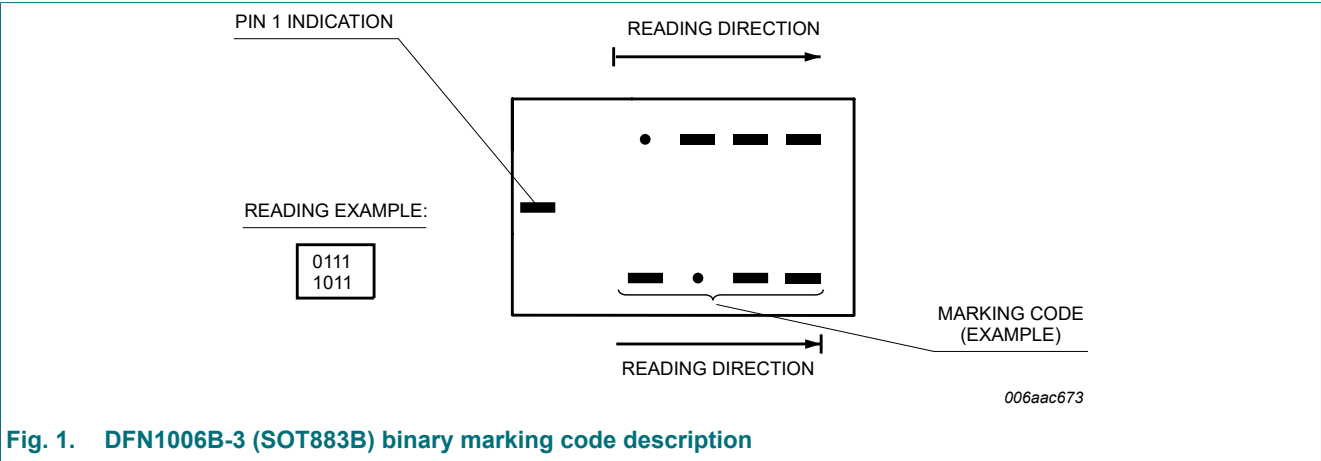
Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">PDTA143TMB</a>	DFN1006B-3	plastic, leadless ultra small plastic package; 3 solder lands; 0.35 mm pitch; 1.0 mm x 0.6 mm x 0.37 mm body	<a href="#">SOT883B</a>

7. Marking

Table 4. Marking codes

Type number	Marking code
PDTA143TMB	0010 1000

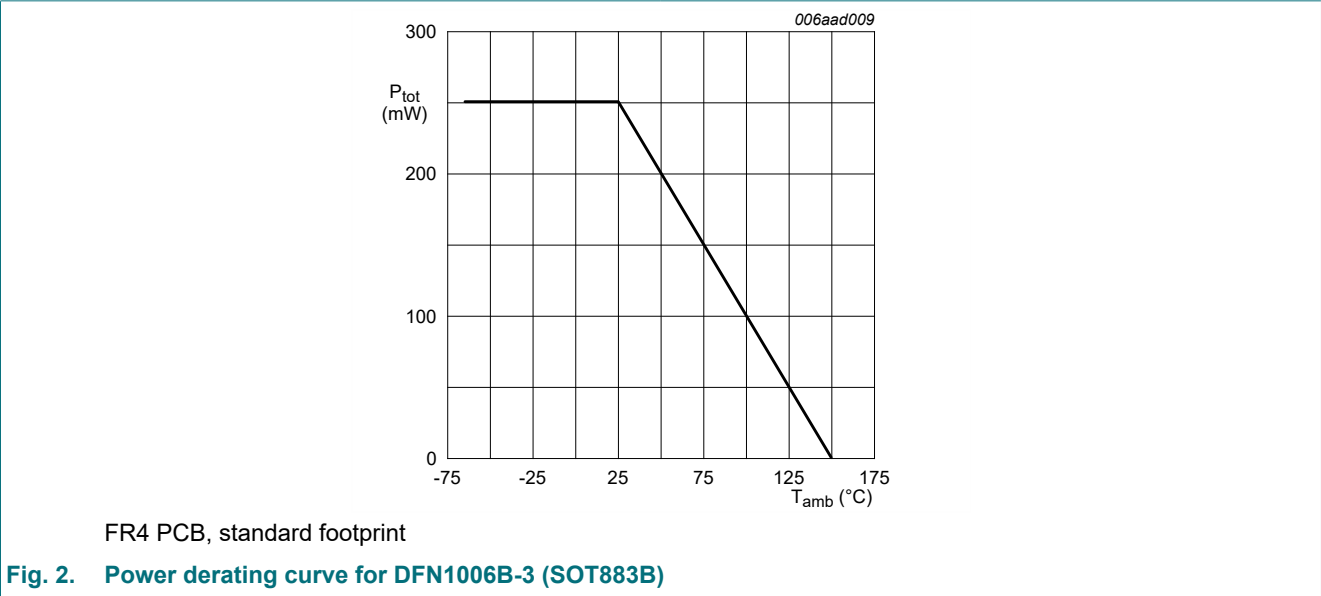


8. Limiting values

Table 5. Limiting values  
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V <sub>CBO</sub>	collector-base voltage	open emitter		-	-50	V
V <sub>CEO</sub>	collector-emitter voltage	open base		-	-50	V
V <sub>EBO</sub>	emitter-base voltage	open collector		-	-5	V
I <sub>O</sub>	output current			-	-100	mA
I <sub>CM</sub>	peak collector current	t <sub>p</sub> ≤ 1 ms; pulsed		-	-100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	[1]	-	250	mW
T <sub>j</sub>	junction temperature			-	150	°C
T <sub>amb</sub>	ambient temperature			-65	150	°C
T <sub>stg</sub>	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]	-	-	500	K/W

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

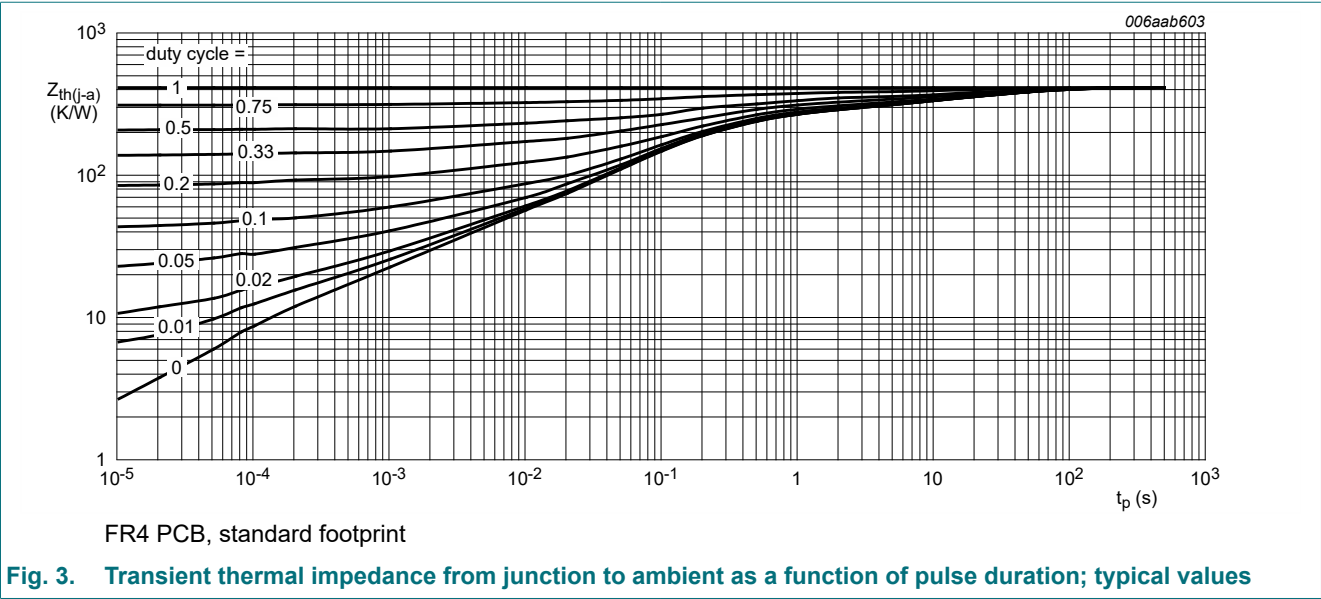


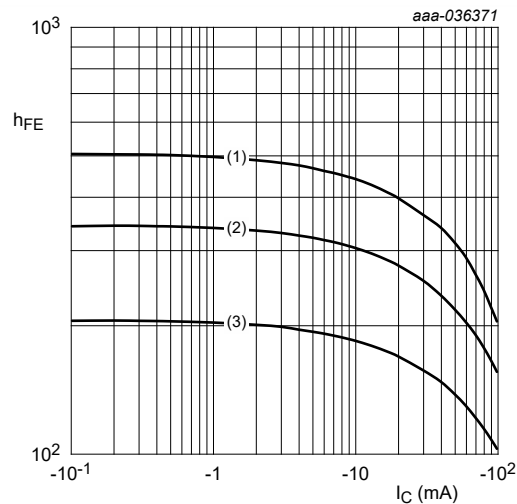
Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

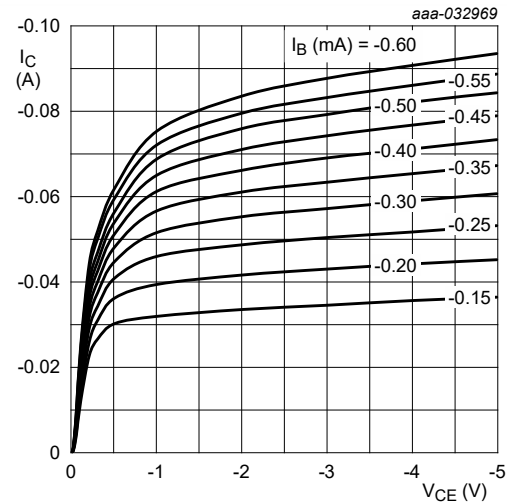
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -50\text{ V}$ ; $I_E = 0\text{ A}$ ; $T_{amb} = 25\text{ °C}$		-	-	-100	nA
$I_{CEO}$	collector-emitter cut-off current	$V_{CE} = -30\text{ V}$ ; $I_B = 0\text{ A}$ ; $T_{amb} = 25\text{ °C}$		-	-	-100	nA
		$V_{CE} = -30\text{ V}$ ; $I_B = 0\text{ A}$ ; $T_j = 150\text{ °C}$		-	-	-5	μA
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = -5\text{ V}$ ; $I_C = 0\text{ A}$ ; $T_{amb} = 25\text{ °C}$		-	-	-100	nA
$h_{FE}$	DC current gain	$V_{CE} = -5\text{ V}$ ; $I_C = -1\text{ mA}$ ; $T_{amb} = 25\text{ °C}$		200	-	-	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -5\text{ mA}$ ; $I_B = -0.25\text{ mA}$ ; $T_{amb} = 25\text{ °C}$		-	-	-150	mV
R1	bias resistor 1 (input)	$T_{amb} = 25\text{ °C}$		3.3	4.7	6.1	kΩ
$C_c$	collector capacitance	$V_{CB} = -10\text{ V}$ ; $I_E = 0\text{ A}$ ; $i_e = 0\text{ A}$ ; $f = 1\text{ MHz}$ ; $T_{amb} = 25\text{ °C}$		-	-	3	pF
$f_T$	transition frequency	$V_{CE} = -5\text{ V}$ ; $I_C = -10\text{ mA}$ ; $f = 100\text{ MHz}$ ; $T_{amb} = 25\text{ °C}$	[1]	-	180	-	MHz

[1] Characteristics of built-in transistor.



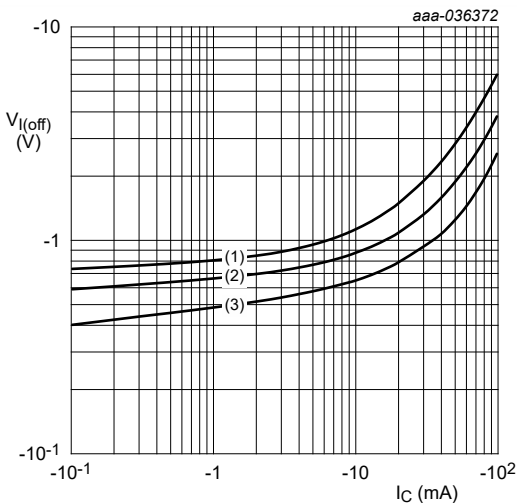
$V_{CE} = -5$  V  
(1)  $T_{amb} = 100$  °C  
(2)  $T_{amb} = 25$  °C  
(3)  $T_{amb} = -40$  °C

Fig. 4. DC current gain as a function of collector current; typical values



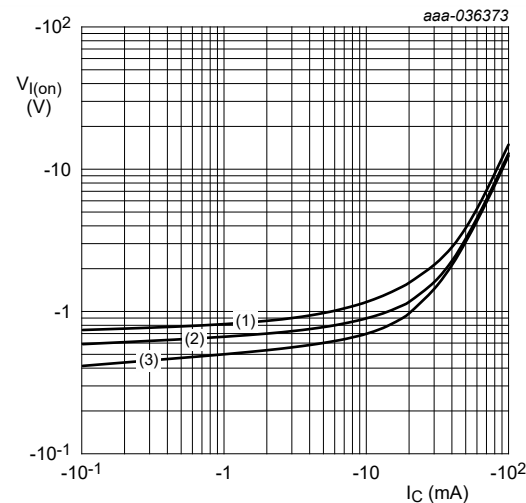
$T_{amb} = 25$  °C

Fig. 5. Collector current as a function of collector-emitter voltage; typical values



$V_{CE} = -5$  V  
(1)  $T_{amb} = -40$  °C  
(2)  $T_{amb} = 25$  °C  
(3)  $T_{amb} = 100$  °C

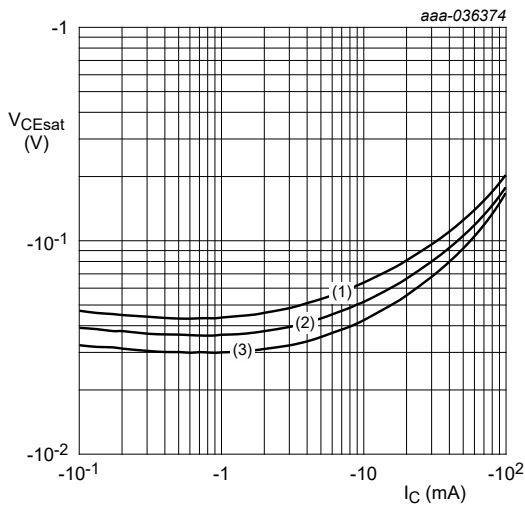
Fig. 6. Off-state input voltage as a function of collector current; typical values



$V_{CE} = -0.3$  V  
(1)  $T_{amb} = -40$  °C  
(2)  $T_{amb} = 25$  °C  
(3)  $T_{amb} = 100$  °C

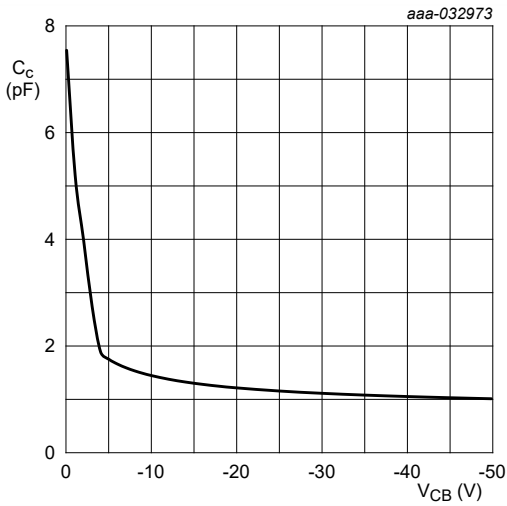
Fig. 7. On-state input voltage as a function of collector current; typical values

50 V, 100 mA PNP resistor-equipped transistor; R1 = 4.7 kΩ, R2 = open



$I_C/I_B = 20$   
(1)  $T_{amb} = 100\text{ }^{\circ}\text{C}$   
(2)  $T_{amb} = 25\text{ }^{\circ}\text{C}$   
(3)  $T_{amb} = -40\text{ }^{\circ}\text{C}$

Fig. 8. Collector-emitter saturation voltage as a function of collector current; typical values



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

Fig. 9. Collector capacitance as a function of collector-base voltage; typical values

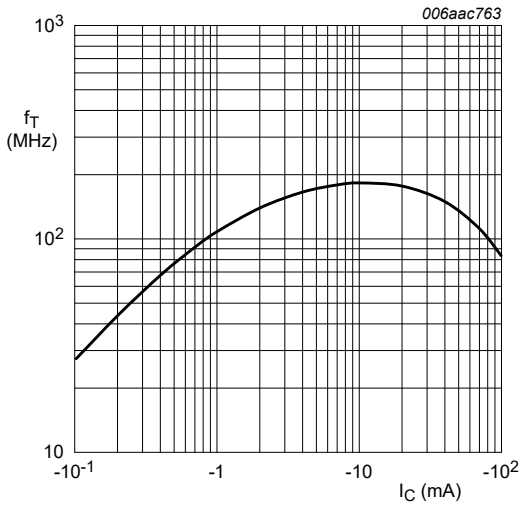


Fig. 10. Transition frequency as a function of collector current; typical values of built-in transistor

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.

Resistor calculation

- Calculation of bias resistor 1 (R1)

$$R_1 = \frac{V(I_2) - V(I_1)}{I_2 - I_1}$$

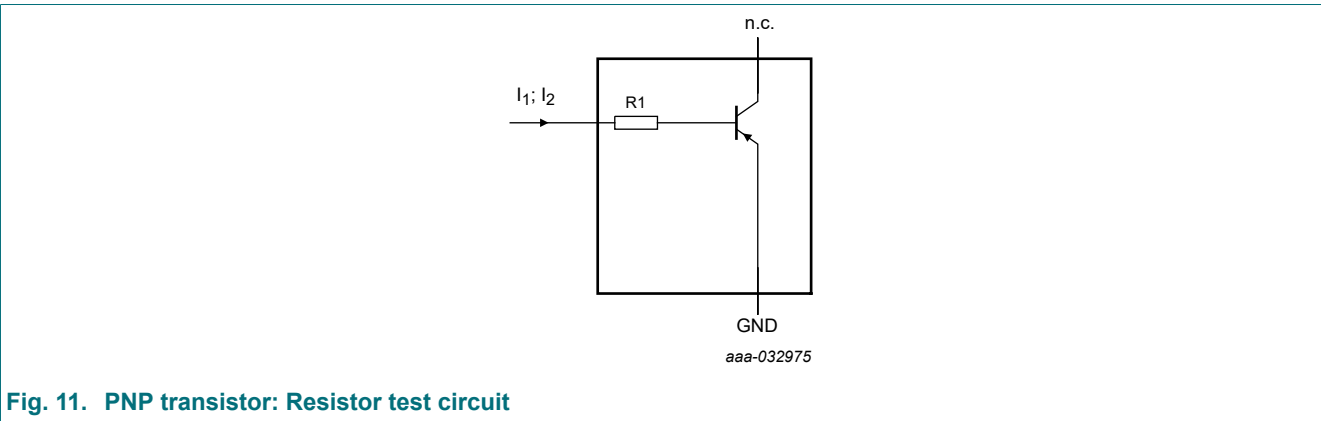


Fig. 11. PNP transistor: Resistor test circuit

Resistor test conditions

Table 8. Resistor test conditions

Type number	R1 (kΩ)	R2 (kΩ)	Test conditions			
			I1	I2	I3	I4
PDTA143TMB	4.7	open	-600 μA	-700 μA	-	-

12. Package outline

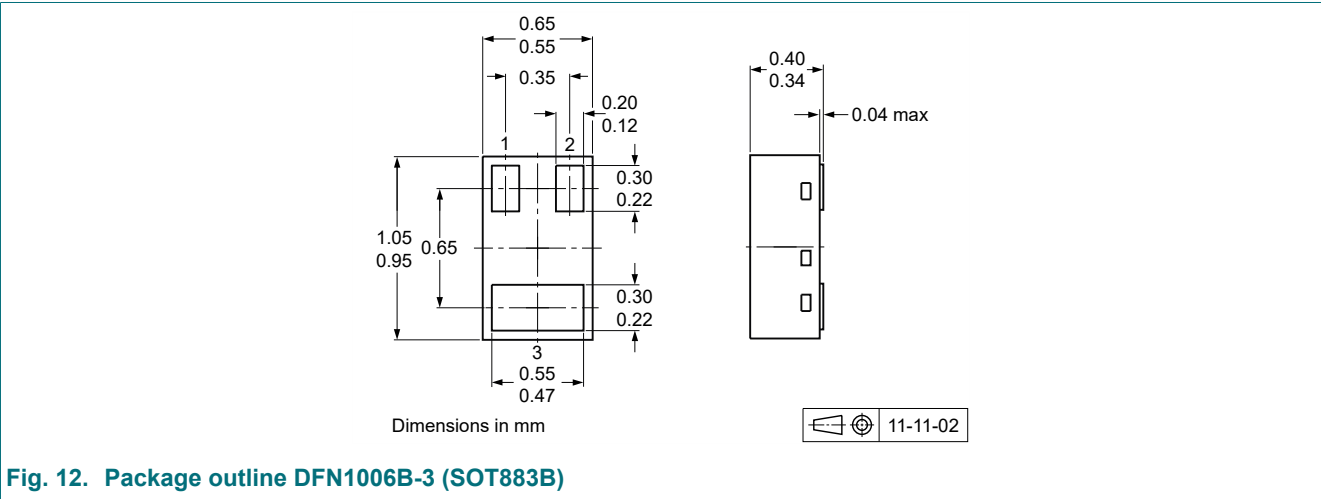


Fig. 12. Package outline DFN1006B-3 (SOT883B)

13. Soldering

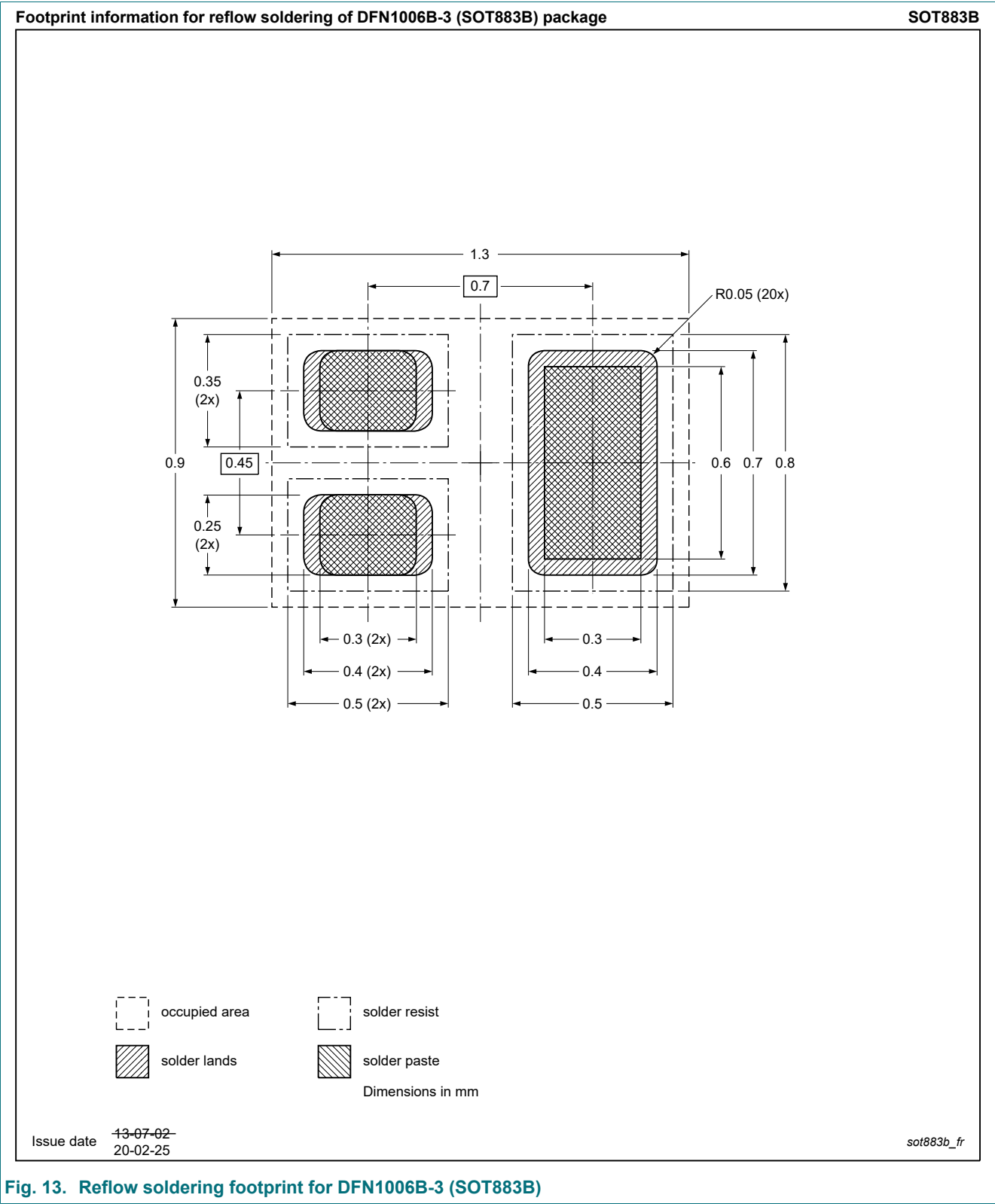


Fig. 13. Reflow soldering footprint for DFN1006B-3 (SOT883B)



14. Revision history

Table 9. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PDTA143TMB v.3	20250526	Product data sheet	-	PDTA143TMB v.2
Modification:	<ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>Legal texts have been adapted to the new company name where appropriate.</li><li>Characteristics: Graphs added/replaced</li><li>Test information expanded</li></ul>			
PDTA143TMB v.2	20120504	Product data sheet	-	PDTA143TMB v.1
PDTA143TMB v.1	20122504	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".
- [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>.

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