



PDTA143TMB

50 V, 100 mA NPN resistor-equipped transistor;
R1 = 4.7 k Ω , R2 = open

26 May 2025

Product data sheet

1. General description

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

PNP complement: PDTA143TMB

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

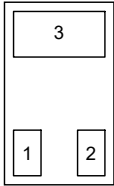
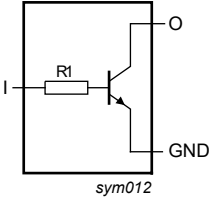
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{CEO}	collector-emitter voltage	open base	-	-	50	V
I _O	output current		-	-	100	mA
R1	bias resistor 1 (input)	T _{amb} = 25 °C	3.3	4.7	6.1	k Ω

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	I	input (base)	 Transparent top view DFN1006B-3 (SOT883B)	 sym012
2	G	GND (emitter)		
3	O	output (collector)		

6. Ordering information

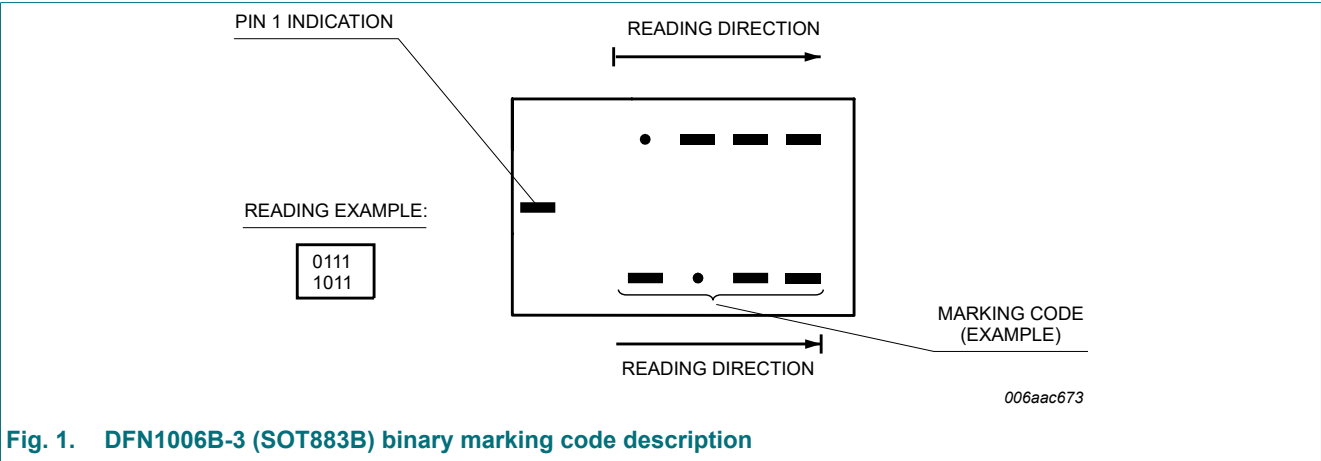
Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PDTC143TMB	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	SOT883B

7. Marking

Table 4. Marking codes

Type number	Marking code
PDTC143TMB	0011 1011

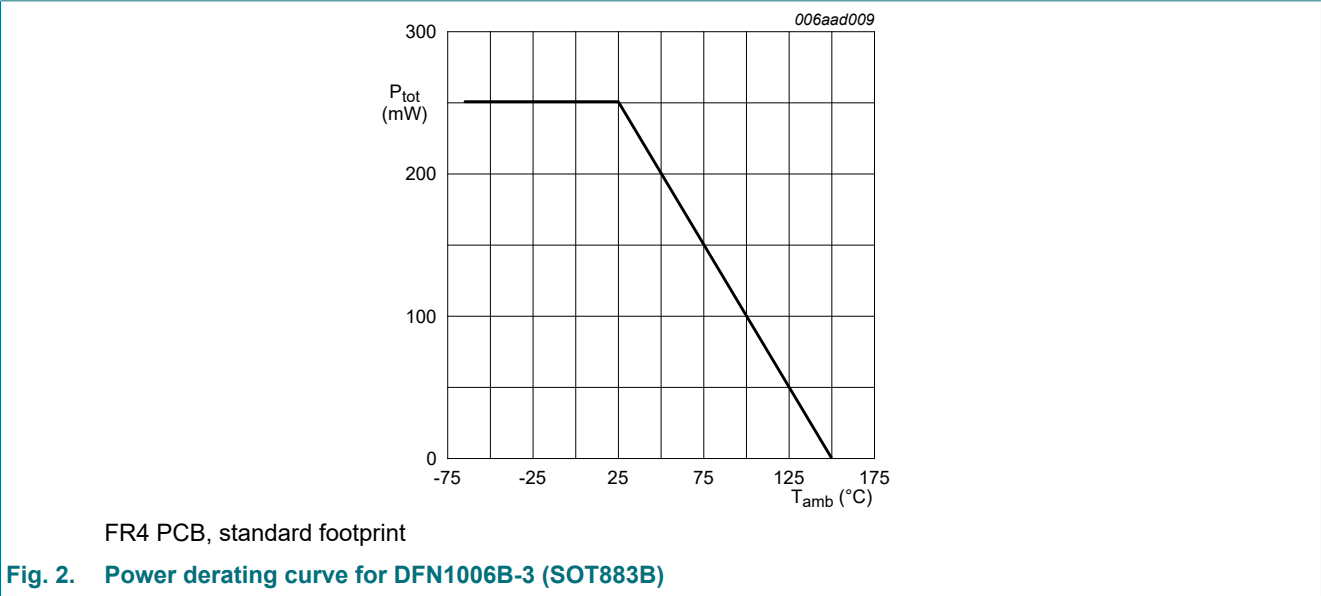


8. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V _{CBO}	collector-base voltage	open emitter		-	50	V
V _{CEO}	collector-emitter voltage	open base		-	50	V
V _{EBO}	emitter-base voltage	open collector		-	5	V
I _O	output current			-	100	mA
I _{CM}	peak collector current	t _p ≤ 1 ms; pulsed		-	100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	250	mW
T _j	junction temperature			-	150	°C
T _{amb}	ambient temperature			-65	150	°C
T _{stg}	storage temperature			-65	150	°C

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

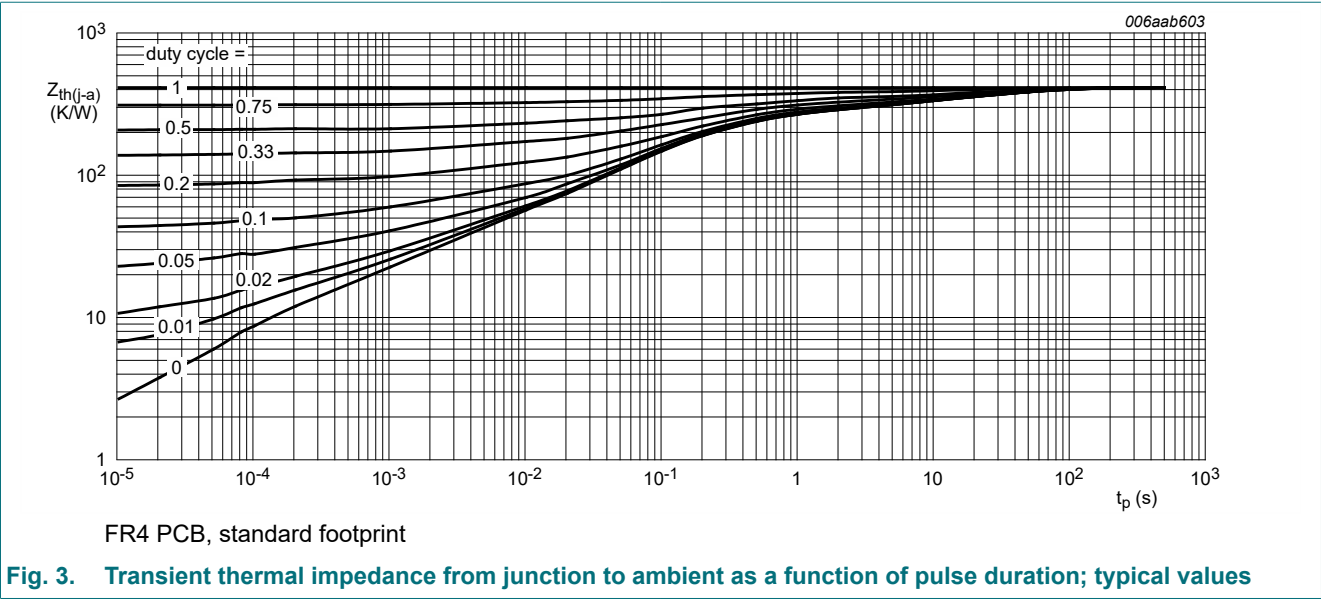


9. Thermal characteristics

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.

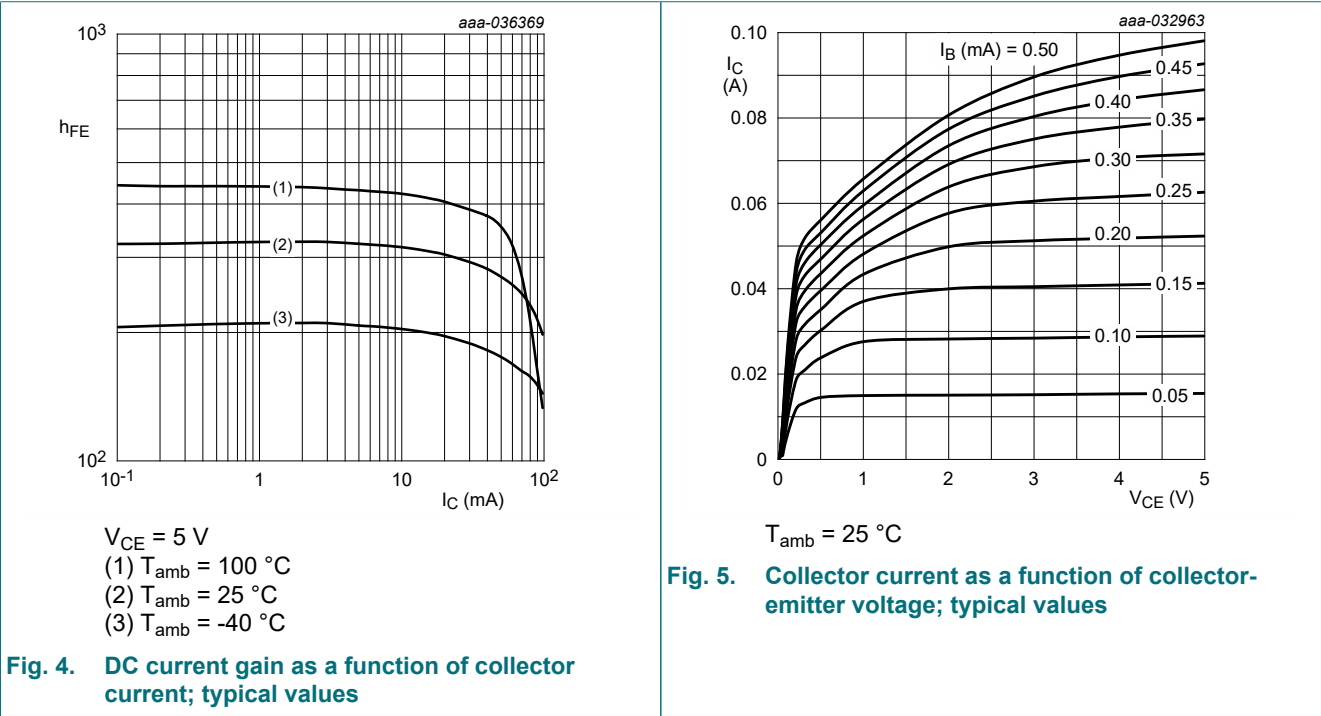


10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I _{CBO}	collector-base cut-off current	V _{CB} = 50 V; I _E = 0 A; T _{amb} = 25 °C		-	-	100	nA
I _{CEO}	collector-emitter cut-off current	V _{CE} = 30 V; I _B = 0 A; T _{amb} = 25 °C		-	-	1	μA
		V _{CE} = 30 V; I _B = 0 A; T _j = 150 °C		-	-	5	μA
I _{EBO}	emitter-base cut-off current	V _{EB} = 5 V; I _C = 0 A; T _{amb} = 25 °C		-	-	100	nA
h _{FE}	DC current gain	V _{CE} = 5 V; I _C = 1 mA; T _{amb} = 25 °C		200	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C = 5 mA; I _B = 0.25 mA; T _{amb} = 25 °C		-	-	100	mV
R1	bias resistor 1 (input)	T _{amb} = 25 °C		3.3	4.7	6.1	kΩ
C _c	collector capacitance	V _{CB} = 10 V; I _E = 0 A; i _e = 0 A; f = 1 MHz; T _{amb} = 25 °C		-	-	2.5	pF
f _T	transition frequency	V _{CE} = 5 V; I _C = 10 mA; f = 100 MHz; T _{amb} = 25 °C	[1]	-	230	-	MHz

[1] Characteristics of built-in transistor.



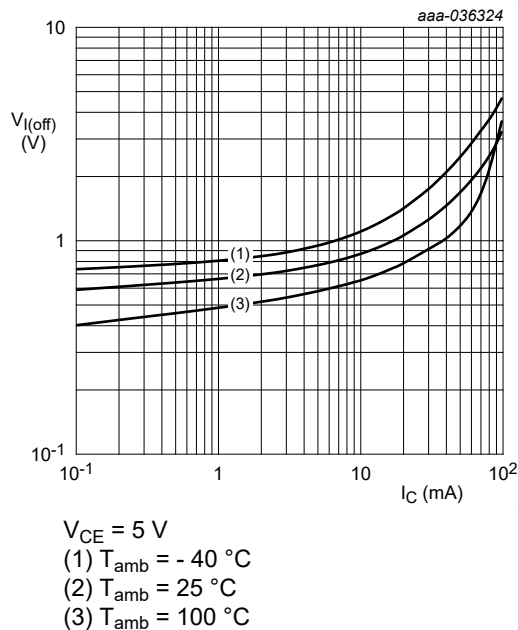


Fig. 6. Off-state input voltage as a function of collector current; typical values

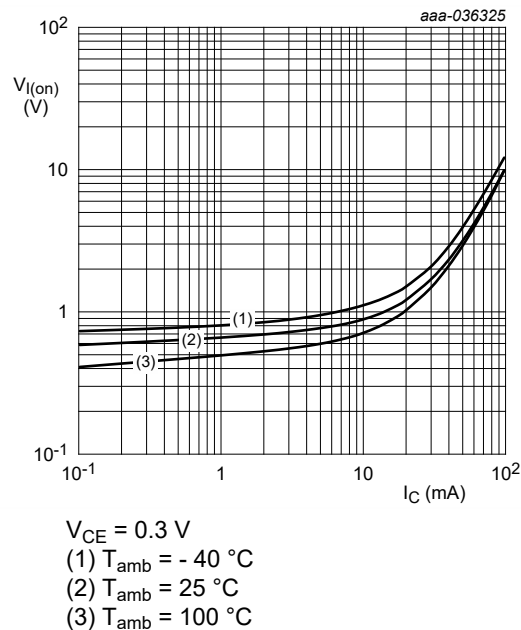


Fig. 7. On-state input voltage as a function of collector current; typical values

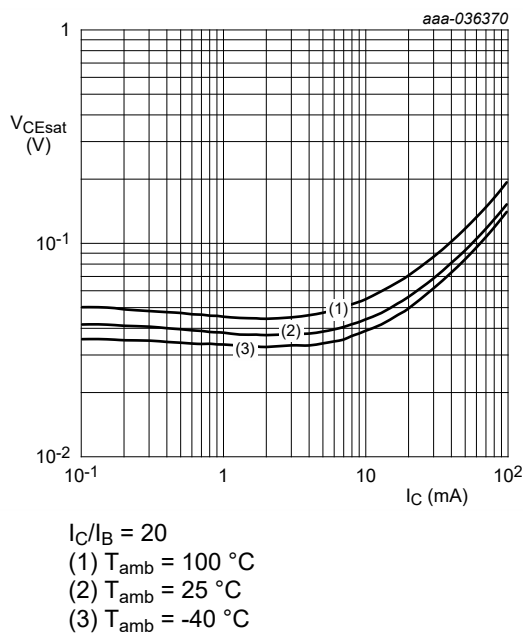


Fig. 8. Collector-emitter saturation voltage as a function of collector current; typical values

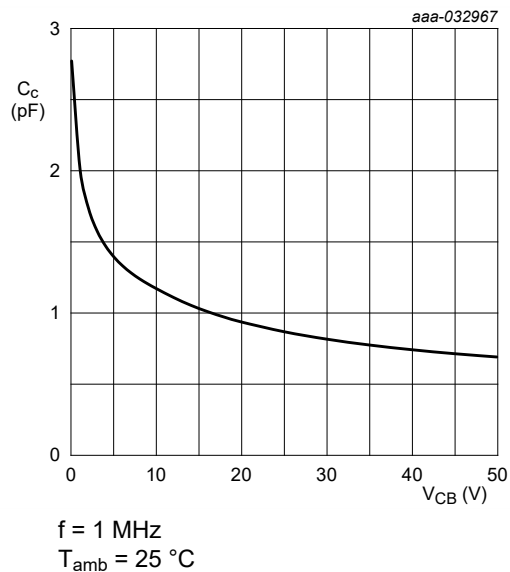
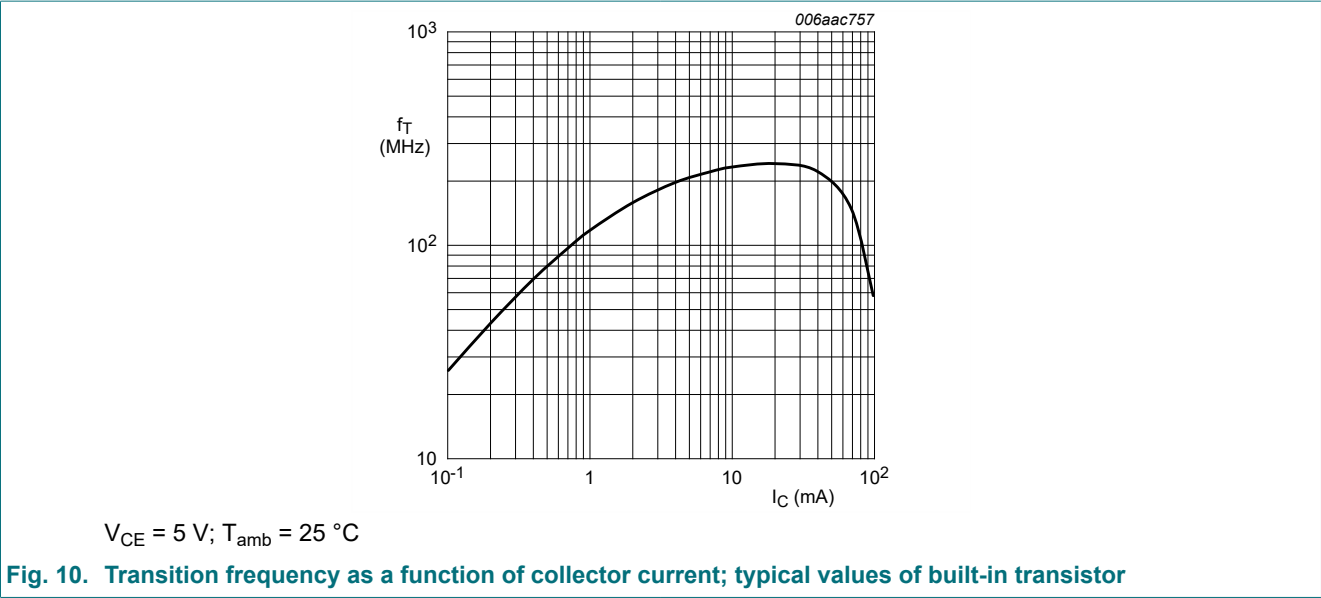


Fig. 9. Collector capacitance as a function of collector-base voltage; typical values

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



11. Test information

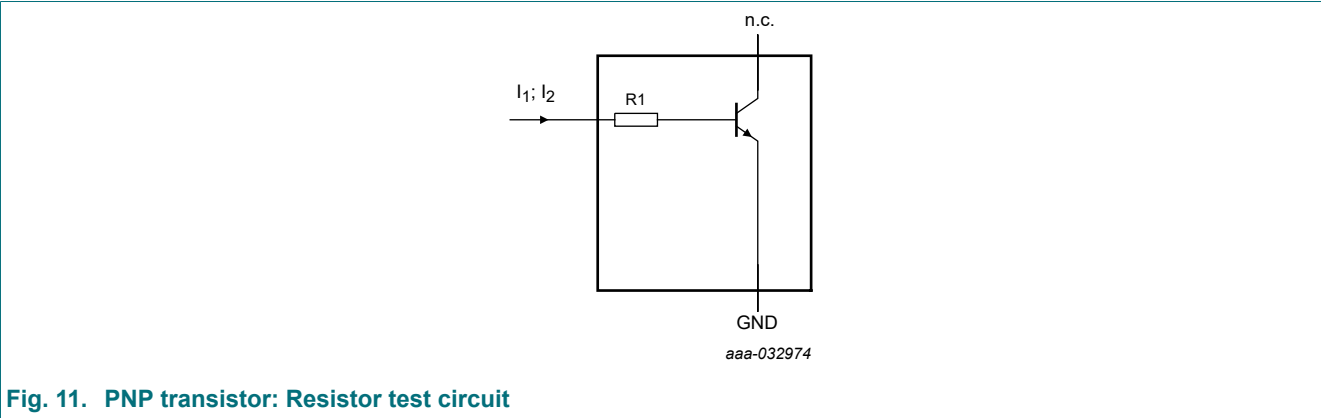
Quality information

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)

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

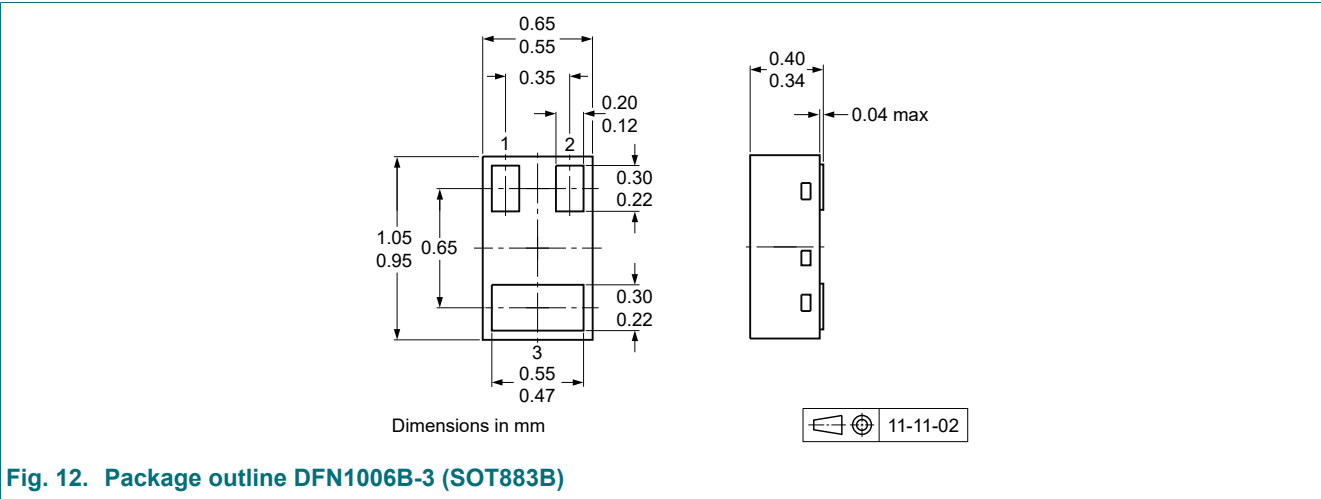


Resistor test conditions

Table 8. Resistor test conditions

Type number	R1 (kΩ)	R2 (kΩ)	Test conditions			
			I ₁	I ₂	I ₃	I ₄
PDTC143TMB	4.7	open	600 μA	700 μA	-	-

12. Package outline



13. Soldering

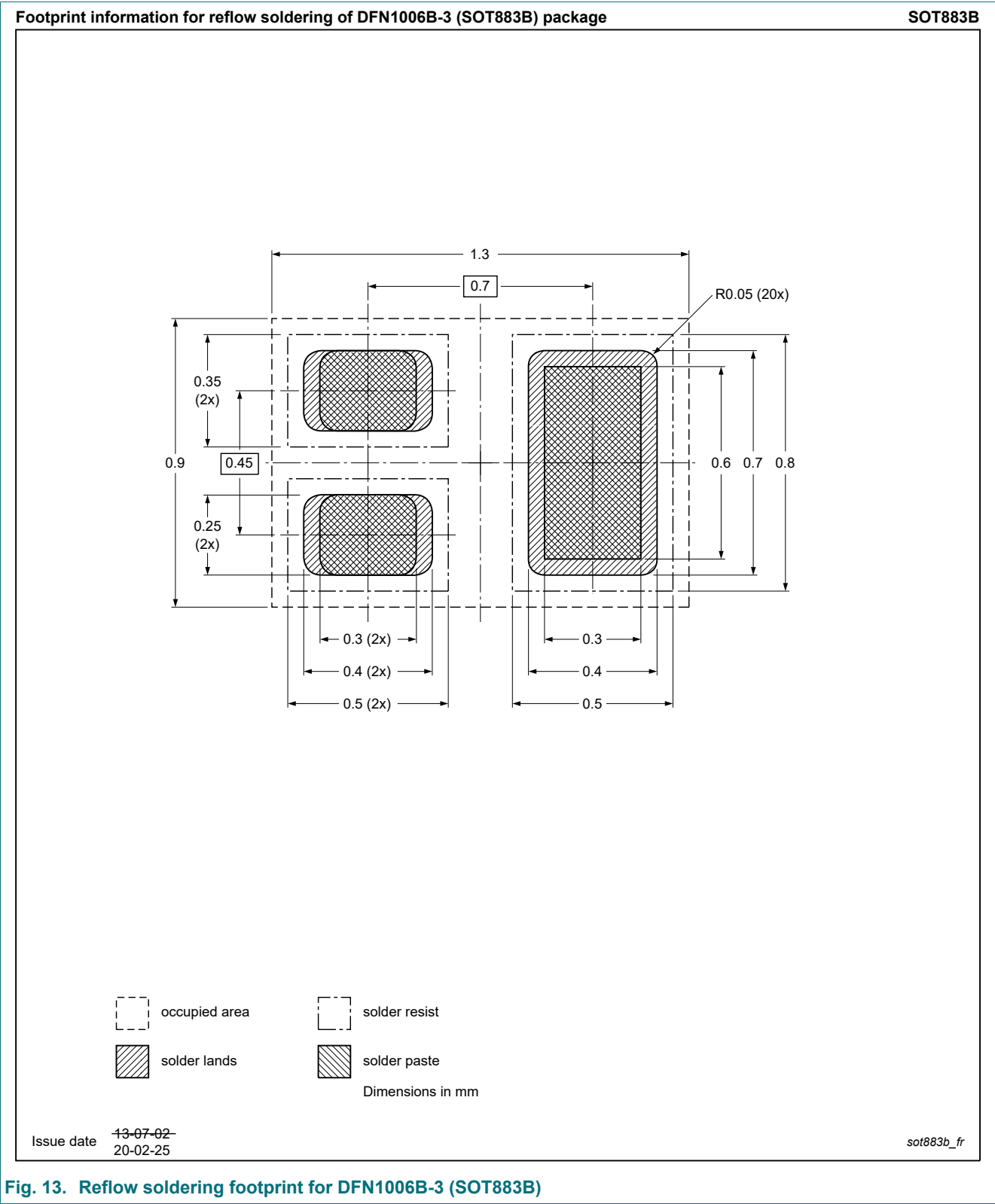


Fig. 13. Reflow soldering footprint for DFN1006B-3 (SOT883B)

14. Revision history

Table 9. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PDTC143TMB v.3	20250526	Product data sheet	-	PDTC143TMB v.2
Modification:	- The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. - Legal texts have been adapted to the new company name where appropriate. - Characteristics: Graphs added/replaced - Test information expanded			
PDTC143TMB v.2	20120504	Product data sheet	-	PDTC143TMB v.1
PDTC143TMB v.1	20120425	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".
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