



PDTA143XM

50 V, 100 mA PNP resistor-equipped transistor;
R1 = 4.7 k Ω , R2 = 10 k Ω

7 May 2025

Product data sheet

1. General description

PNP Resistor-Equipped Transistor (RET) in an ultra small SOT883 (SC-101) in Surface-Mounted Device (SMD) plastic package.

NPN-complement: PDTC143XM

2. Features and benefits

- 100 mA output current capability
- Built-in bias resistors
- Simplifies circuit design
- Reduces component count
- Reduces pick and place costs
- AEC-Q101 qualified

3. Applications

- Digital applications in automotive and industrial segments
- Control of IC inputs
- Cost-saving alternative for BC847/857 series in digital applications
- Switching loads

4. Quick reference data

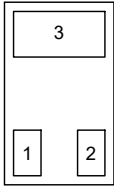
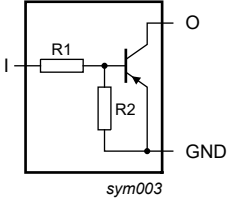
Table 1. Quick reference data

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
R2/R1	bias resistor ratio		1.7	2.1	2.6	

50 V, 100 mA PNP resistor-equipped transistor; R1 = 4.7 kΩ, R2 = 10 kΩ

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	I	input (base)	 Transparent top view DFN1006-3 (SOT883)	 sym003
2	G	GND (emitter)		
3	O	output (collector)		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PDTA143XM	DFN1006-3	plastic, leadless ultra small package; 3 terminals; 0.35 mm pitch; 1 mm x 0.6 mm x 0.48 mm body	SOT883

7. Marking

Table 4. Marking codes

Type number	Marking code
PDTA143XM	DN

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		-	-7	V
V _I	input voltage			-20	7	V
I _O	output current			-	-100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1] [2]	-	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, 70 μm copper strip line, standard footprint.
[2] Reflow soldering is the only recommended soldering method.

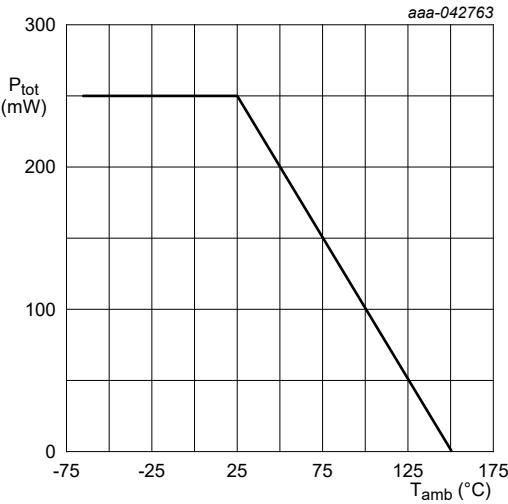


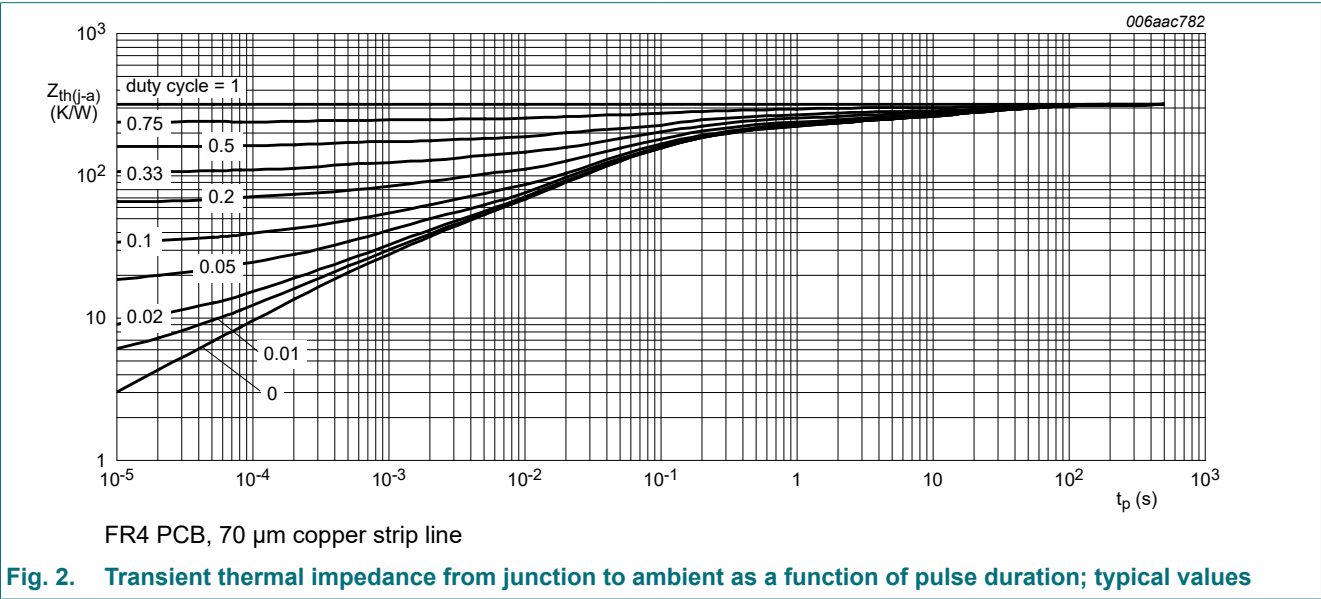
Fig. 1. Power derating curve

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] [2]	-	-	500	K/W

- [1] Device mounted on an FR4 PCB with 70 μm copper strip line, standard footprint.
- [2] Reflow soldering is the only recommended soldering method.

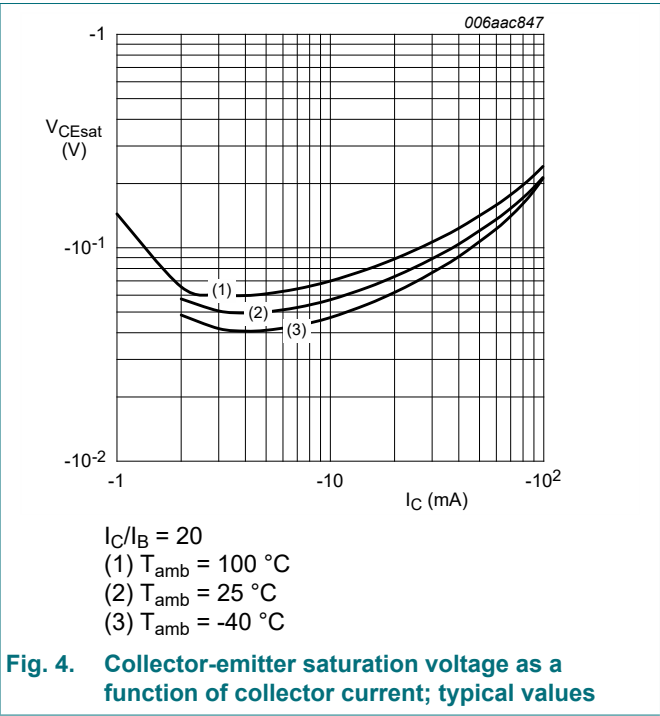
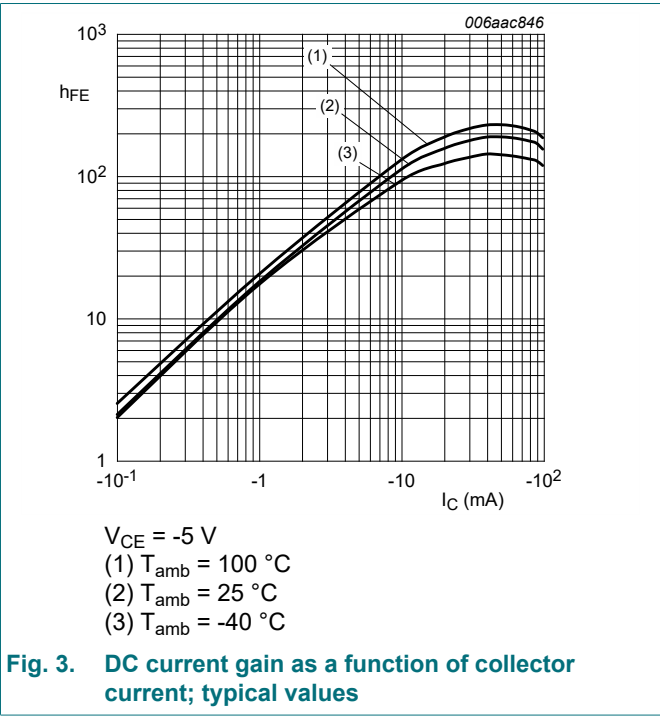


10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = -100\text{ A}$; $I_E = 0\text{ A}$; $T_{amb} = 25\text{ °C}$	-50	-	-	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	$I_C = 2\text{ mA}$; $T_{amb} = 25\text{ °C}$	-50	-	-	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	$I_C = 0\text{ A}$; $I_E = 100\text{ }\mu\text{A}$	-7	-	-	V
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	$V_{CE} = -30\text{ V}$; $I_B = 0\text{ A}$; $T_{amb} = 25\text{ °C}$	-	-	-1	μA
		$V_{CE} = -30\text{ V}$; $I_B = 0\text{ A}$; $T_j = 150\text{ °C}$	-	-	-5	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -5\text{ V}$; $I_C = 0\text{ A}$; $T_{amb} = 25\text{ °C}$	-	-	-600	μA
h_{FE}	DC current gain	$V_{CE} = -5\text{ V}$; $I_C = -10\text{ mA}$; $T_{amb} = 25\text{ °C}$	50	-	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -10\text{ mA}$; $I_B = -0.5\text{ mA}$; $T_{amb} = 25\text{ °C}$	-	-	-100	mV
$V_{I(off)}$	off-state input voltage	$V_{CE} = -5\text{ V}$; $I_C = -100\text{ }\mu\text{A}$; $T_{amb} = 25\text{ °C}$	-	-0.9	-0.3	V
$V_{I(on)}$	on-state input voltage	$V_{CE} = -0.3\text{ V}$; $I_C = -20\text{ mA}$; $T_{amb} = 25\text{ °C}$	-2.5	-1.5	-	V
R1	bias resistor 1 (input)	$T_{amb} = 25\text{ °C}$	3.3	4.7	6.1	kΩ
R2/R1	bias resistor ratio		1.7	2.1	2.6	
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.



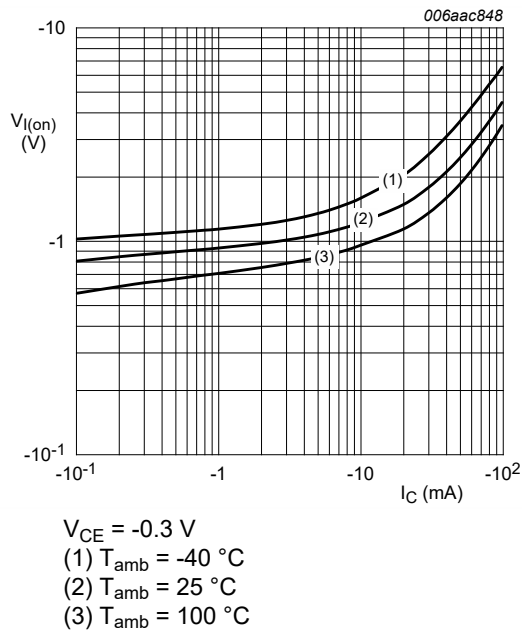


Fig. 5. On-state input voltage as a function of collector current; typical values

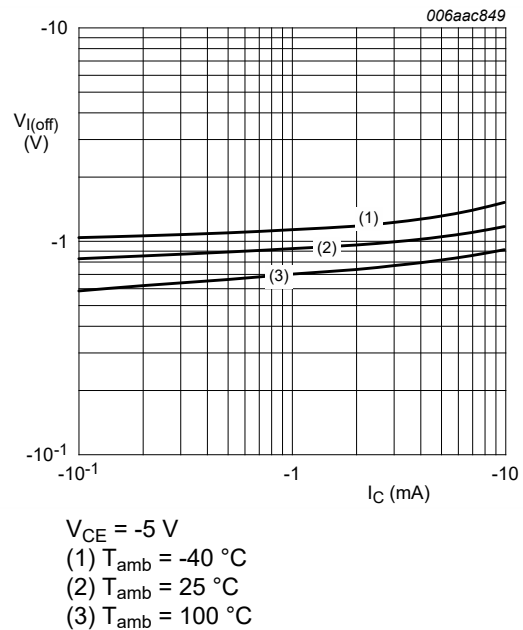


Fig. 6. Off-state input voltage as a function of collector current; typical values

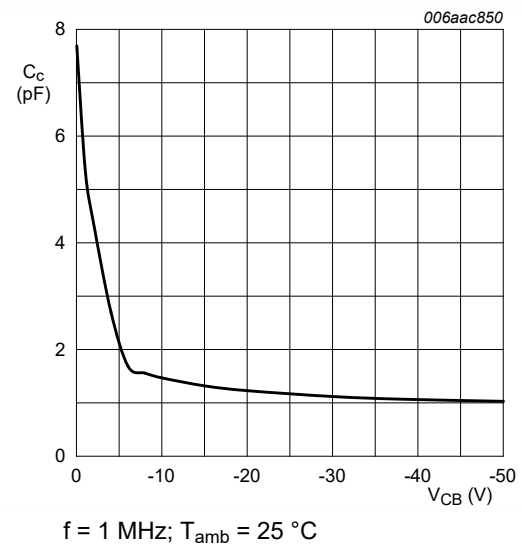


Fig. 7. Collector capacitance as a function of collector-base voltage; typical values

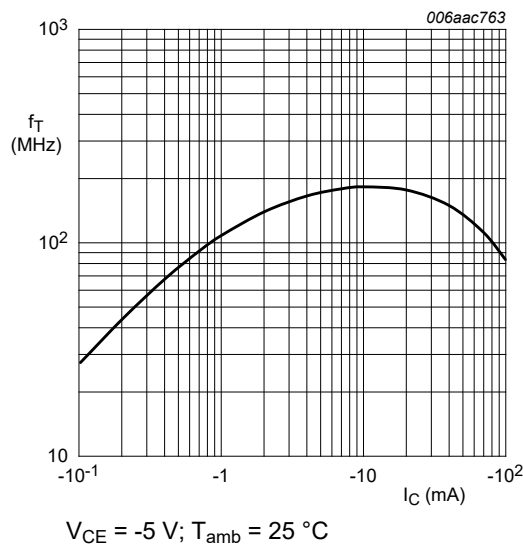


Fig. 8. Transition frequency as a function of collector current; typical values of built-in transistor

11. Test information

Resistor calculation

- Calculation of bias resistor 1 (R1)

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

- Calculation of bias resistor ratio (R2/R1)

$$\frac{R_2}{R_1} = \frac{V(I_4) - V(I_3)}{R_1 \cdot (I_4 - I_3)} - 1$$

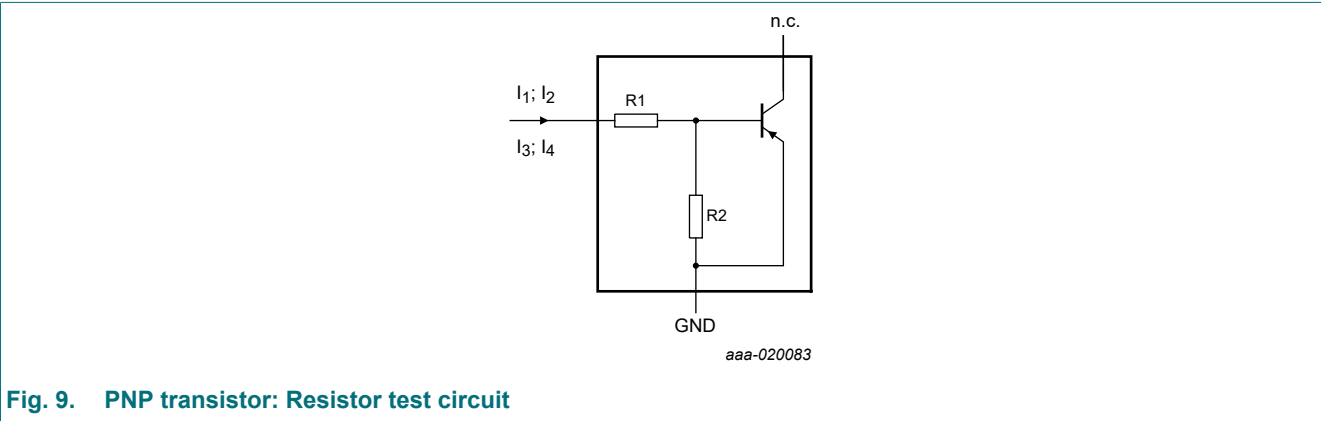


Fig. 9. PNP transistor: Resistor test circuit

Resistor test conditions

Table 8. Resistor test conditions

Type number	R1 (kΩ)	R2 (kΩ)	Test conditions			
			I1	I2	I3	I4
PDTA143XM	4.7	10	-350 μA	-450 μA	350 μA	450 μA

12. Package outline

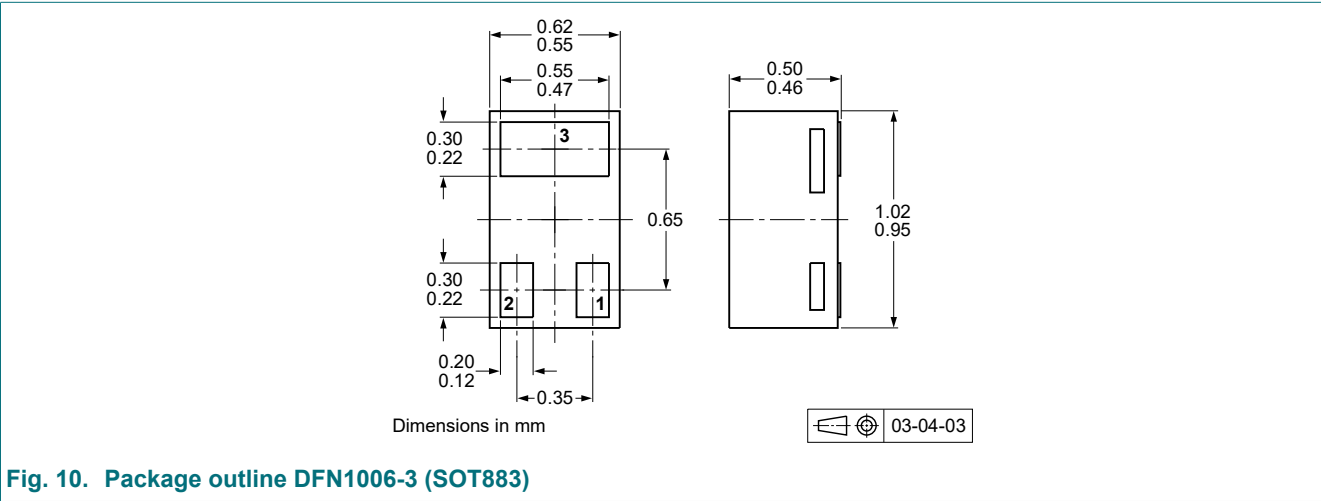
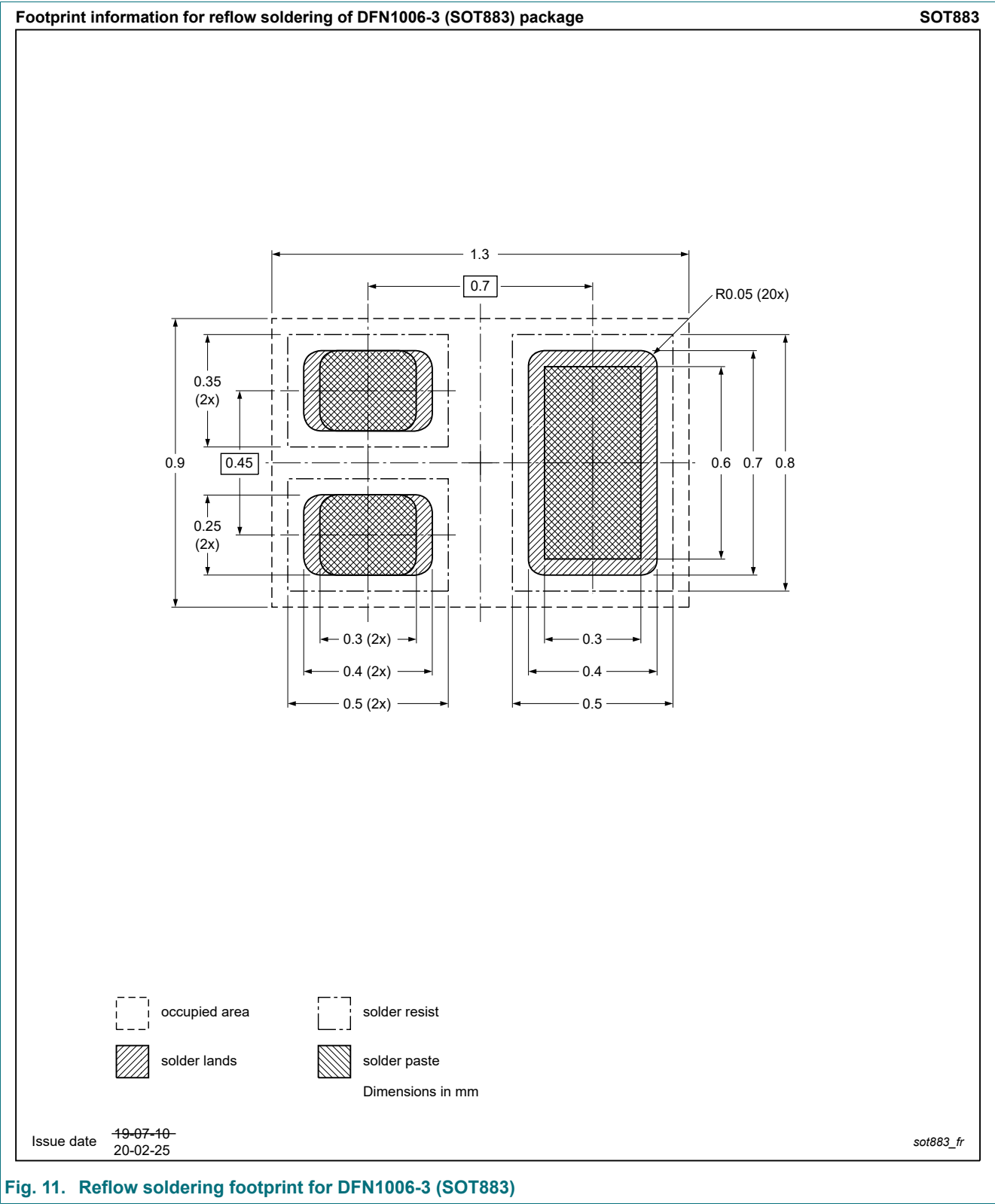


Fig. 10. Package outline DFN1006-3 (SOT883)

13. Soldering



14. Revision history

Table 9. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PDTA143XM v.6	20250507	Product data sheet	-	PDTA143X_SER v.5
Modification:	- Family data sheet split to single type data sheets. - Test information extended.			
PDTA143X_SER v.5	20111209	Product data sheet	-	PDTA143X_SERIES v.4
PDTA143X_SERIES v.4	20070416	Product data sheet	-	PDTA143X_SERIES v.3
PDTA143Z_SERIES v.3	20040804	Product specification	-	PDTA143X_SERIES v.2
PDTA143X_SERIES v.2	20030410	Product specification	-	-

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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