



# PDTA123EM

PNP resistor-equipped transistor; R1 = 2.2 k $\Omega$ , R2 = 2.2 k $\Omega$

8 April 2024

Product data sheet

## 1. General description

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

NPN complement: PDTC123EM

## 2. Features and benefits

- Built-in bias resistors
- Simplifies circuit design
- Reduces component count
- Reduces pick and place costs
- AEC-Q101 qualified

## 3. Applications

- General purpose switching and amplification
- Inverter and interface circuits
- Circuit driver

## 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	1.54	2.2	2.86	k $\Omega$
R2/R1	bias resistor ratio		0.8	1	1.2	

## 5. Pinning information

Table 2. Pinning information

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

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">PDTA123EM</a>	DFN1006-3	plastic, leadless ultra small package; 3 terminals; 0.35 mm pitch; 1 mm x 0.6 mm x 0.48 mm body	<a href="#">SOT883</a>

## 7. Marking

Table 4. Marking codes

Type number	Marking code
PDTA123EM	F7

## 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	-	-10	V
$V_i$	input voltage		-12	10	V
$I_O$	output current		-	-100	mA
$I_{CM}$	peak collector current		-	-100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$	[1] [2]	250	mW
$T_j$	junction temperature		-	150	$^\circ\text{C}$
$T_{amb}$	ambient temperature		-65	150	$^\circ\text{C}$
$T_{stg}$	storage temperature		-65	150	$^\circ\text{C}$

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

[2] Refer to SOT883 standard mounting conditions; FR4 with 60  $\mu\text{m}$  copper strip line.

## 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	$T_{amb} \leq 25\text{ }^\circ\text{C}$	[1] [2]	-	500	K/W

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

[2] Refer to SOT883 standard mounting conditions; FR4 with 60  $\mu\text{m}$  copper strip line.

## 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	$V_{EB} = -5\text{ V}$ ; $I_C = 0\text{ A}$ ; $T_{amb} = 25\text{ °C}$	-	-	-2	mA
$h_{FE}$	DC current gain	$V_{CE} = -5\text{ V}$ ; $I_C = -20\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	30	-	-	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -10\text{ mA}$ ; $I_B = -0.5\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	-	-	-150	mV
$V_{I(off)}$	off-state input voltage	$V_{CE} = -5\text{ V}$ ; $I_C = -1\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	-	-1.2	-0.5	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	-1.6	-	V
R1	bias resistor 1 (input)	$T_{amb} = 25\text{ °C}$	1.54	2.2	2.86	kΩ
R2/R1	bias resistor ratio		0.8	1	1.2	
$C_c$	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

## 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.

## 12. Package outline

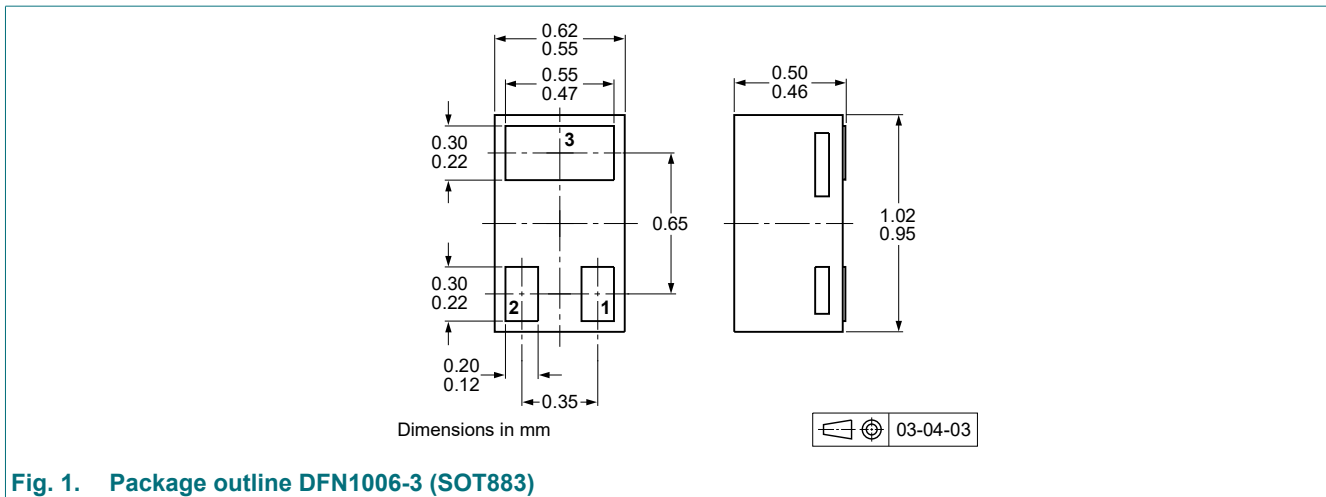


Fig. 1. Package outline DFN1006-3 (SOT883)

### 13. Soldering

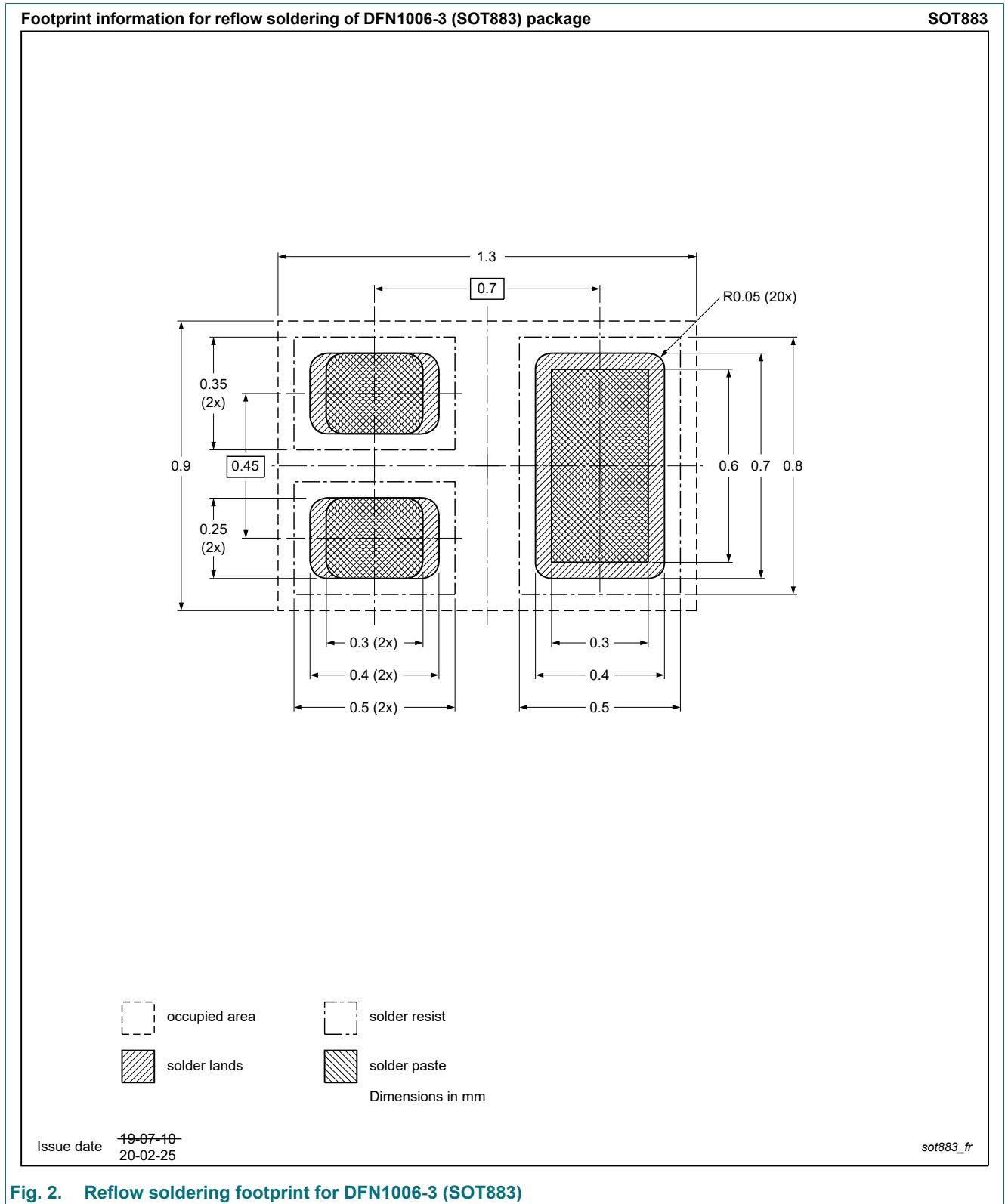


Fig. 2. Reflow soldering footprint for DFN1006-3 (SOT883)

## 14. Revision history

**Table 8. Revision history**

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PDTA123EM v.3	20240408	Product data sheet	-	PDTA123E series 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>Family data sheet reduced to single type data sheet.</li><li>Packing information removed.</li></ul>			
PDTA123E series v.2	20040802	Product data sheet	-	PDTA123E series v.1
PDTA123E series v.1	20040407	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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