



PDTA113ZM-Q

50 V, 100 mA PNP resistor-equipped transistor;
R1 = 1 k Ω , R2 = 10 k Ω

13 March 2025

Product data sheet

1. General description

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

2. Features and benefits

- Built-in bias resistors
- Reduces component count
- Simplifies circuit design
- Reduces pick and place costs
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

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

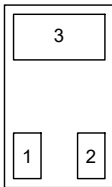
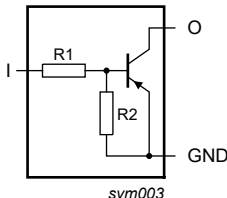
4. Quick reference data

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	0.7	1	1.3	k Ω
R2/R1	bias resistor ratio		8	10	12	

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
PDTA113ZM-Q	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
PDTA113ZM-Q	G3

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
V _I	input voltage			-10	5	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, 60 μm copper, tin-plated and standard footprint.
- [2] Reflow soldering is the only recommended soldering method.

9. Thermal characteristics

Table 6. Thermal characteristics

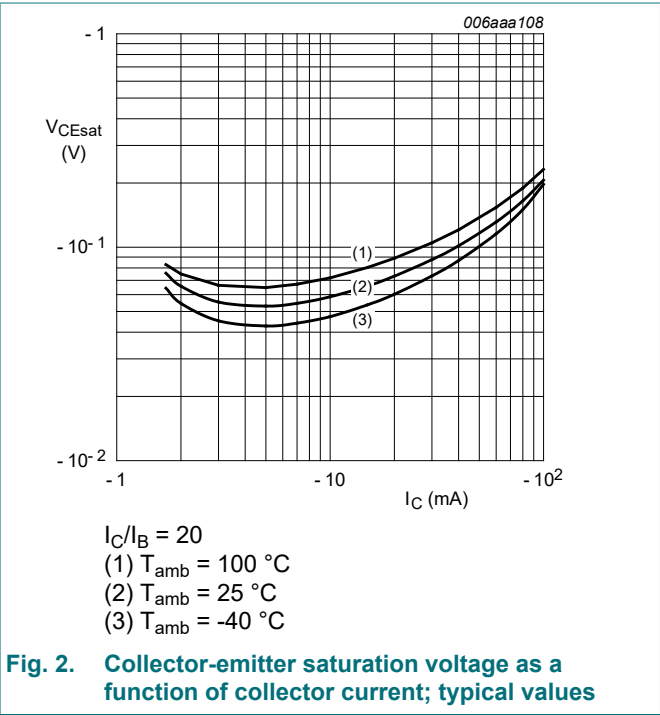
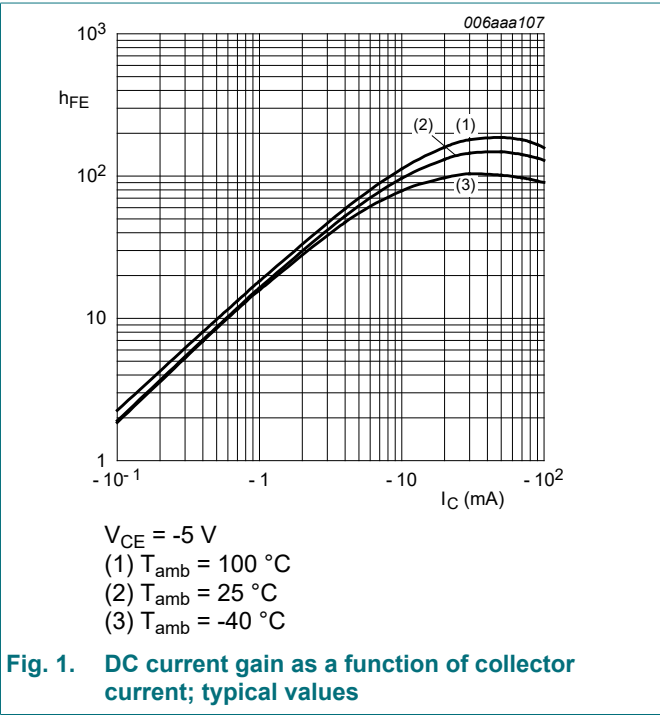
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
R _{th(j-a)}	thermal resistance from junction to ambient	in free air	[1] [2]	-	-	500	K/W

- [1] Device mounted on an FR4 PCB, single-sided, 60 μm copper, tin-plated and 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	$I_C = -100\text{ }\mu\text{A}$; $T_{\text{lead}} = 0\text{ }^\circ\text{C}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$	-100	-	-	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	$I_C = -2\text{ mA}$; $I_B = 0$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$	-100	-	-	V
I_{CBO}	collector-base cut-off current	$V_{CB} = -50\text{ V}$; $I_E = 0\text{ A}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$	-	-	-100	nA
I_{CEO}	collector-emitter cut-off current	$V_{CE} = -30\text{ V}$; $I_B = 0\text{ A}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$	-	-	-1	μA
		$V_{CE} = -30\text{ V}$; $I_B = 0\text{ A}$; $T_j = 150\text{ }^\circ\text{C}$	-	-	-50	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -5\text{ V}$; $I_C = 0\text{ A}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$	-	-	-800	μA
h_{FE}	DC current gain	$V_{CE} = -5\text{ V}$; $I_C = -5\text{ mA}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$	35	-	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -10\text{ mA}$; $I_B = -0.5\text{ mA}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$	-	-	-150	mV
$V_{I(off)}$	off-state input voltage	$V_{CE} = -5\text{ V}$; $I_C = -100\text{ }\mu\text{A}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$	-	-0.65	-0.3	V
$V_{I(on)}$	on-state input voltage	$V_{CE} = -300\text{ mV}$; $I_C = -20\text{ mA}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$	-2.5	-0.95	-	V
R1	bias resistor 1 (input)	$T_{\text{amb}} = 25\text{ }^\circ\text{C}$	0.7	1	1.3	kΩ
R2/R1	bias resistor ratio		8	10	12	
C_c	collector capacitance	$V_{CB} = -10\text{ V}$; $I_E = 0\text{ A}$; $i_e = 0\text{ A}$; $f = 1\text{ MHz}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$	-	-	2	pF



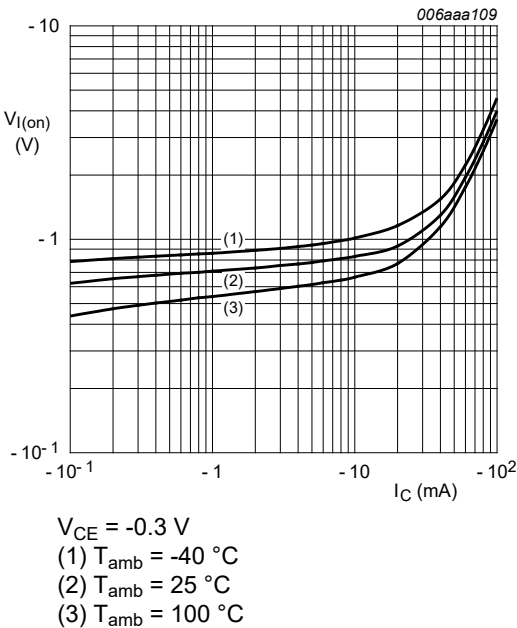


Fig. 3. On-state input voltage as a function of collector current; typical values

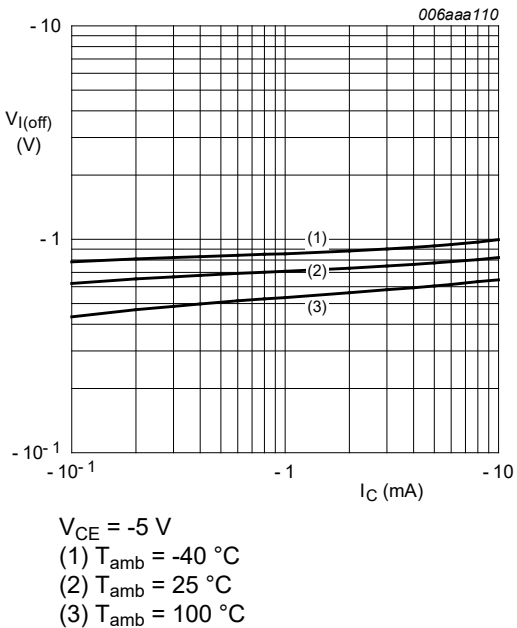


Fig. 4. Off-state input voltage as a function of collector current; typical values

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)

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

- Calculation of bias resistor ratio (R2/R1)

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

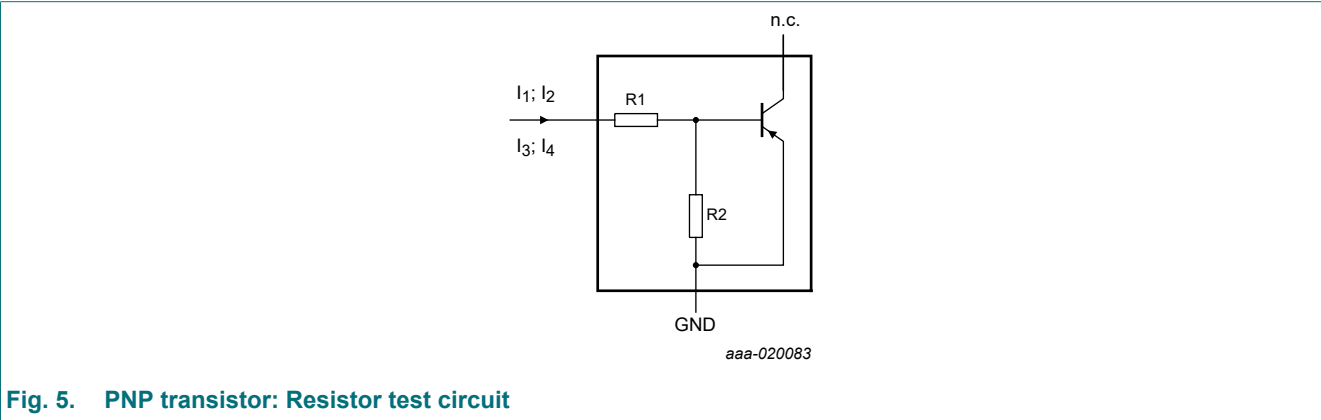


Fig. 5. PNP transistor: Resistor test circuit

Resistor test conditions

Table 8. Resistor test conditions

Type number	R1 (kΩ)	R2 (kΩ)	Test conditions			
			I ₁	I ₂	I ₃	I ₄
PDTA113ZM-Q	1	10	-700 μA	-800 μA	450 μA	550 μA

12. Package outline

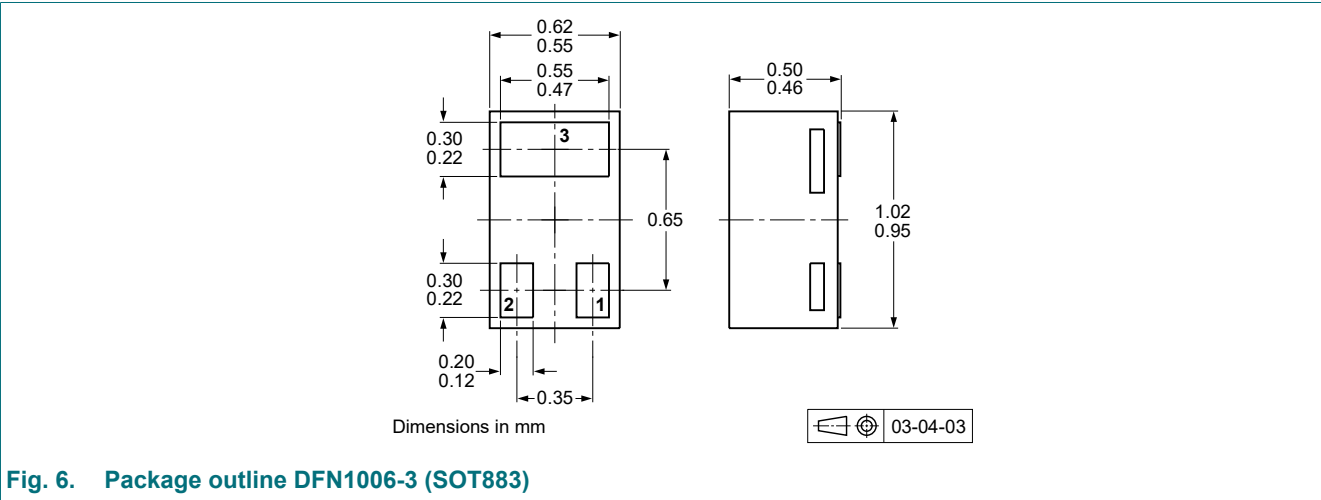


Fig. 6. Package outline DFN1006-3 (SOT883)

13. Soldering

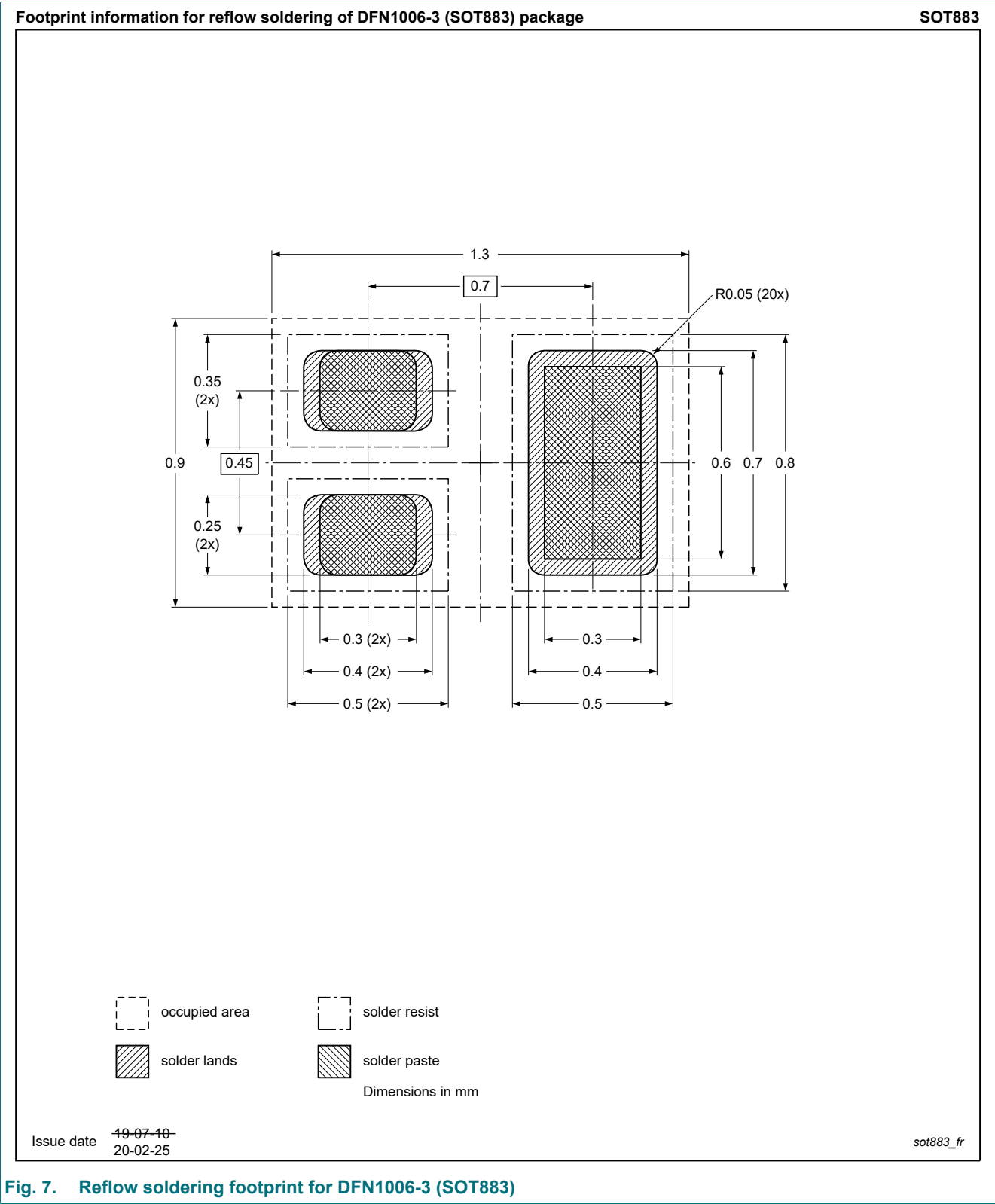


Fig. 7. Reflow soldering footprint for DFN1006-3 (SOT883)

50 V, 100 mA PNP resistor-equipped transistor; R1 = 1 kΩ, R2 = 10 kΩ

14. Revision history

Table 9. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PDTA113ZM-Q v.1	20250313	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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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Contents

1. General description..... 1

2. Features and benefits..... 1

3. Applications..... 1

4. Quick reference data..... 1

5. Pinning information..... 1

6. Ordering information..... 2

7. Marking..... 2

8. Limiting values..... 2

9. Thermal characteristics..... 2

10. Characteristics..... 3

11. Test information..... 5

12. Package outline..... 6

13. Soldering..... 7

14. Revision history..... 8

15. Legal information..... 9

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