

ANTREX Electronics

Electronic Components Sourcing Information

Product Reference Information

Part Number: PQMD10Z
Manufacturer: Nexperia USA Inc.
Package: 6-XFDFN Exposed Pad
Availability: Please confirm with sales

Product Page:

<https://antrexco.com/product/details/nexperia-usa-inc/pqmd10z.html>

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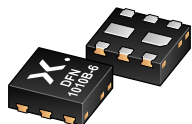
CoC / RoHS / REACH documents available on request

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Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.



PQMD10

NPN/PNP resistor-equipped transistors;
R1 = 2.2 k Ω , R2 = 47 k Ω

15 April 2025

Product data sheet

1. General description

NPN/PNP double Resistor-Equipped Transistors (RET) in a leadless ultra small DFN1010B-6 (SOT1216) Surface-Mounted Device (SMD) plastic package.

NPN/PNP complement: PQMH10

2. Features and benefits

- 100 mA output current capability
- Built-in bias resistors
- Simplifies circuit design
- Low package height of 0.37 mm
- Reduces component count
- Reduces pick and place costs
- 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

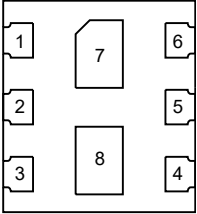
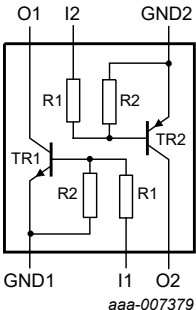
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor; for the PNP transistor with negative polarity							
V _{CEO}	collector-emitter voltage	open base		-	-	50	V
I _O	output current			-	-	100	mA
R1	bias resistor 1 (input)	T _{amb} = 25 °C	[1]	1.54	2.2	2.86	k Ω
R2/R1	bias resistor ratio		[1]	17	21	26	

[1] See section "Test information" for resistor calculation and test conditions.

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	GND1	GND (emitter) TR1	 Transparent top view DFN1010B-6 (SOT1216)	 aaa-007379
2	I1	input (base) TR1		
3	O2	output (collector) TR2		
4	GND2	GND (emitter) TR2		
5	I2	input (base) TR2		
6	O1	output (collector) TR1		
7	O1	output (collector) TR1		
8	O2	output (collector) TR2		

6. Ordering information

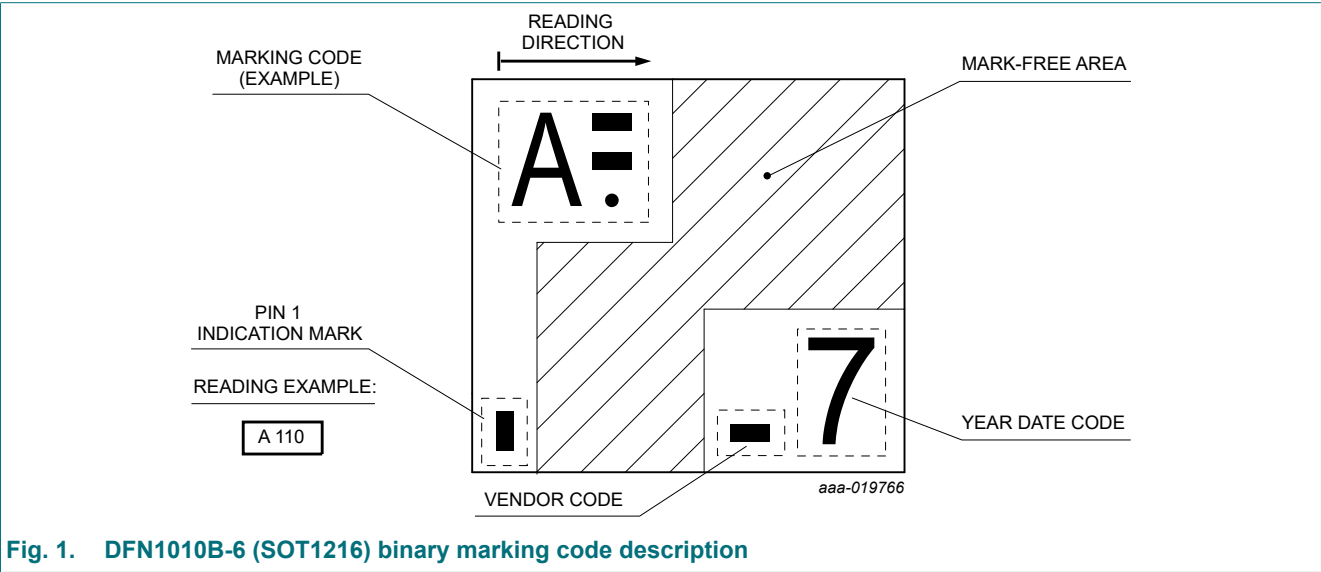
Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PQMD10	DFN1010B-6	plastic, leadless thermal enhanced ultra thin small outline package; 6 terminals; 0.35 mm pitch; 1.1 mm x 1 mm x 0.37 mm body	SOT1216

7. Marking

Table 4. Marking codes

Type number	Marking code
PQMD10	B 010

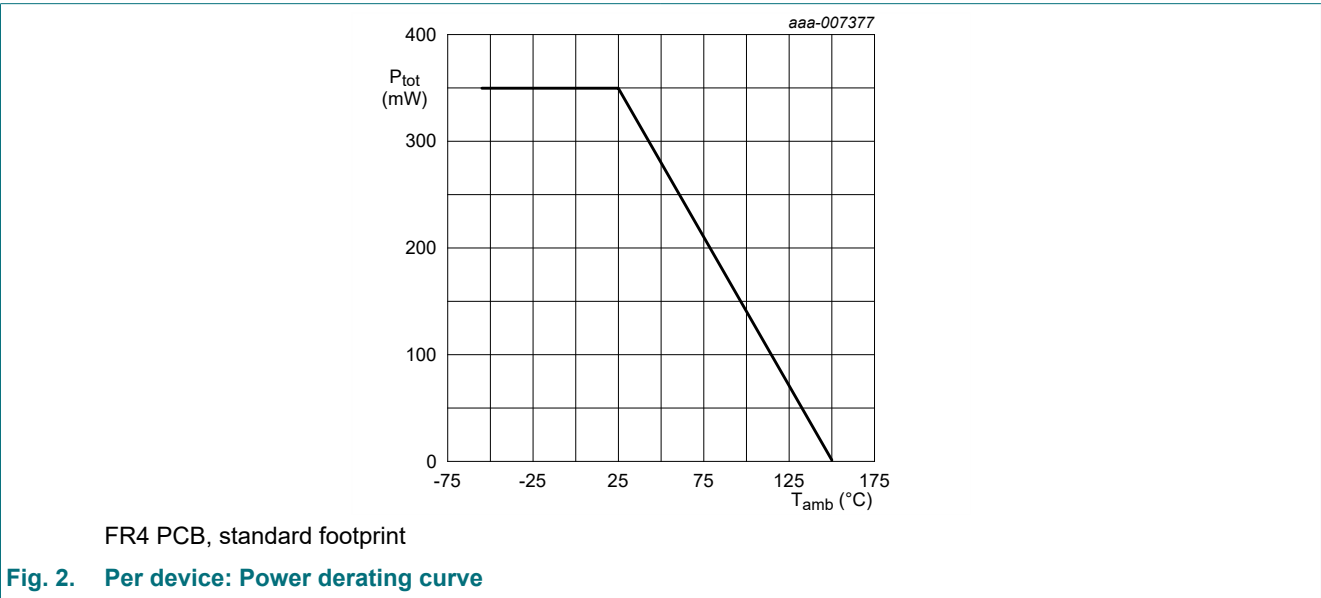


8. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
Per transistor; for the PNP transistor with negative polarity						
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	TR1; positive		-	12	V
		TR1; negative		-	-5	V
		TR2; positive		-	5	V
		TR2; negative		-	-12	V
I _O	output current			-	100	mA
I _{CM}	peak collector current	t _p ≤ 1 ms; single pulse		-	100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	230	mW
Per device						
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	350	mW
T _j	junction temperature			-	150	°C
T _{amb}	ambient temperature			-55	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.

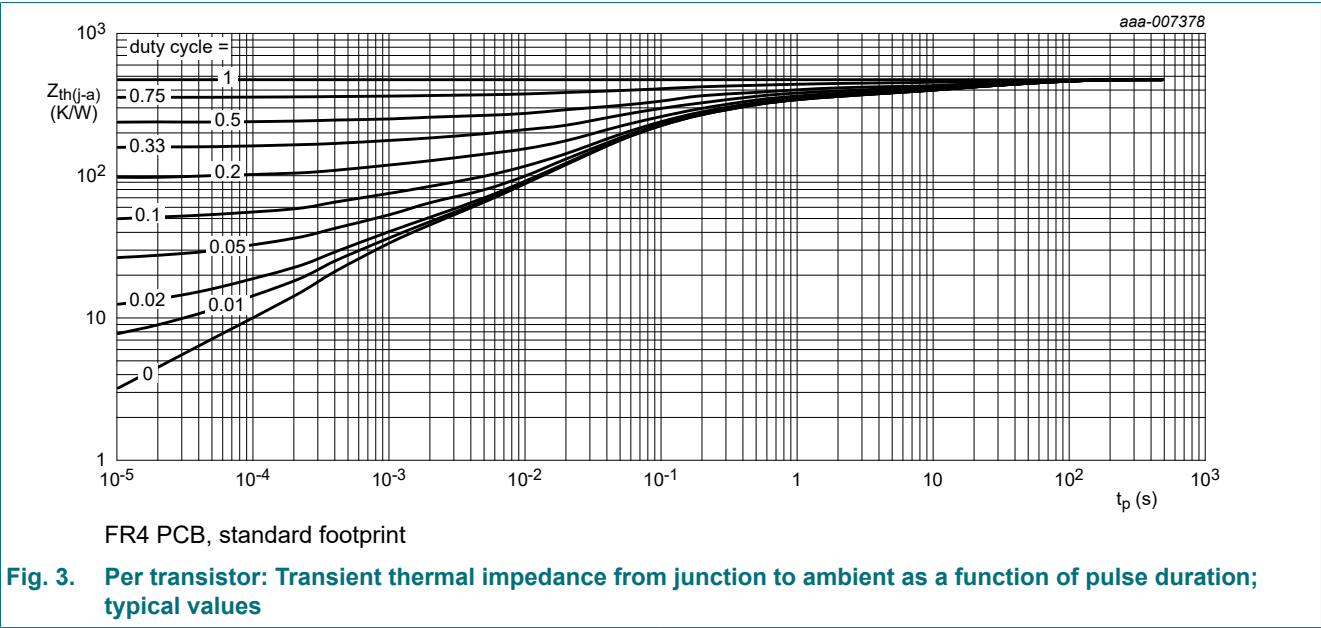


9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	543	K/W
Per device							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	357	K/W

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

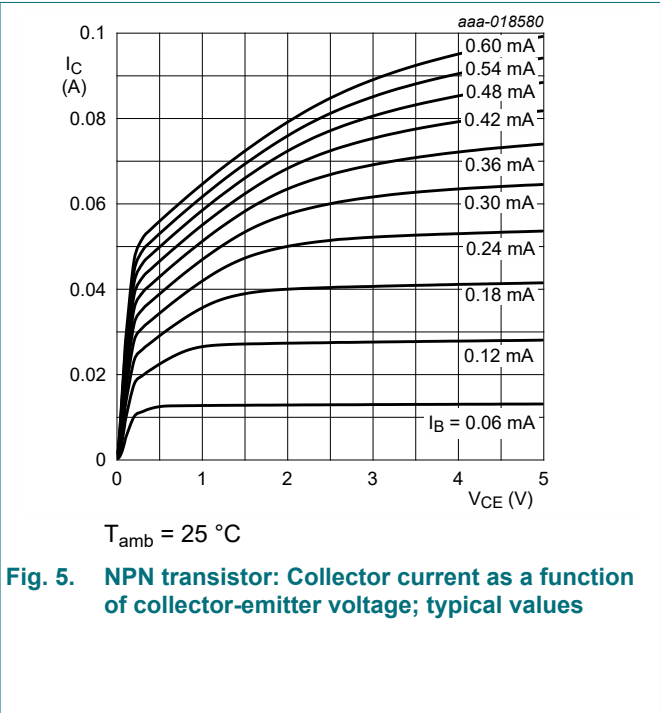
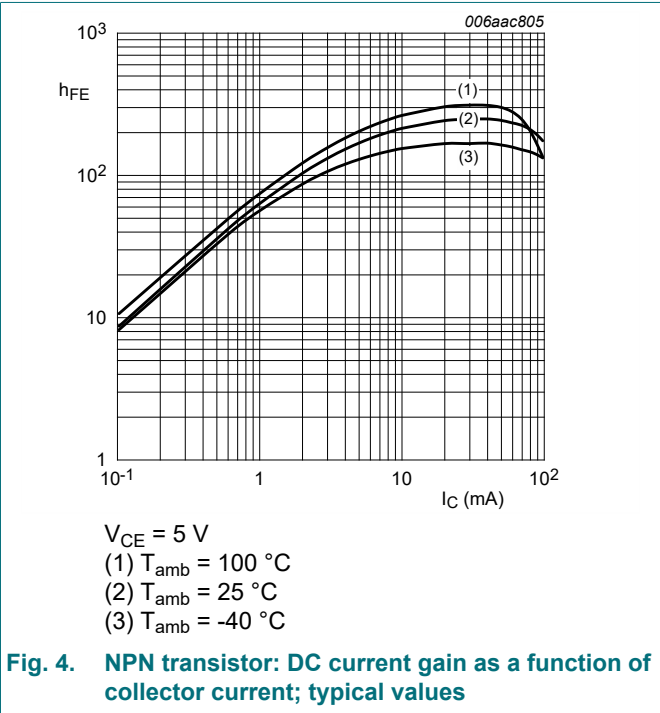


10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor; for the PNP transistor with negative polarity							
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 _{amb} = 150 °C		-	-	5	μA
I _{EBO}	emitter-base cut-off current	V _{EB} = 5 V; I _C = 0 A; T _{amb} = 25 °C		-	-	180	μA
h _{FE}	DC current gain	V _{CE} = 5 V; I _C = 10 mA; T _{amb} = 25 °C		100	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C = 5 mA; I _B = 0.25 mA; T _{amb} = 25 °C		-	-	100	mV
V _{I(off)}	off-state input voltage	V _{CE} = 5 V; I _C = 100 μA; T _{amb} = 25 °C		-	0.6	0.5	V
V _{I(on)}	on-state input voltage	V _{CE} = 0.3 V; I _C = 5 mA; T _{amb} = 25 °C		1.1	0.75	-	V
R1	bias resistor 1 (input)	T _{amb} = 25 °C	[1]	1.54	2.2	2.86	kΩ
R2/R1	bias resistor ratio		[1]	17	21	26	
C _c	collector capacitance	V _{CB} = 10 V; I _E = 0 A; f = 1 MHz; T _{amb} = 25 °C; TR1 (NPN)		-	-	2.5	pF
		V _{CB} = -10 V; I _E = 0 A; f = 1 MHz; T _{amb} = 25 °C; TR2 (PNP)		-	-	3	pF
f _T	transition frequency	V _{CE} = 5 V; I _C = 10 mA; f = 100 MHz; T _{amb} = 25 °C; TR1 (NPN)	[2]	-	230	-	MHz
		V _{CE} = -5 V; I _C = -10 mA; f = 100 MHz; T _{amb} = 25 °C; TR2 (PNP)	[2]	-	180	-	MHz

[1] See section "Test information" for resistor calculation and test conditions.
[2] Characteristics of built-in transistor



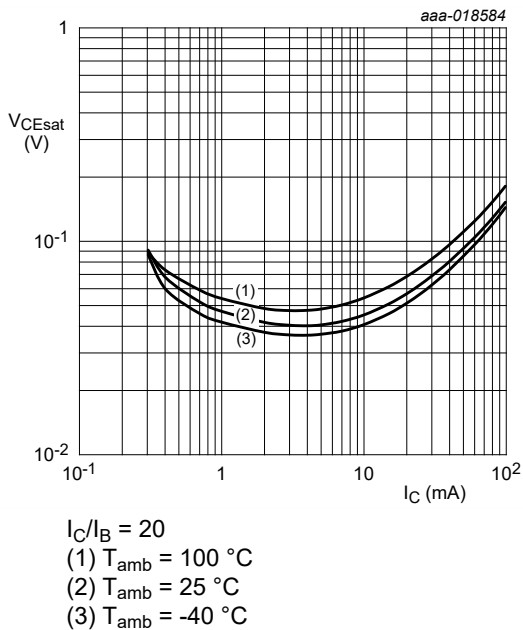


Fig. 6. NPN transistor: Collector-emitter saturation voltage as a function of collector current; typical values

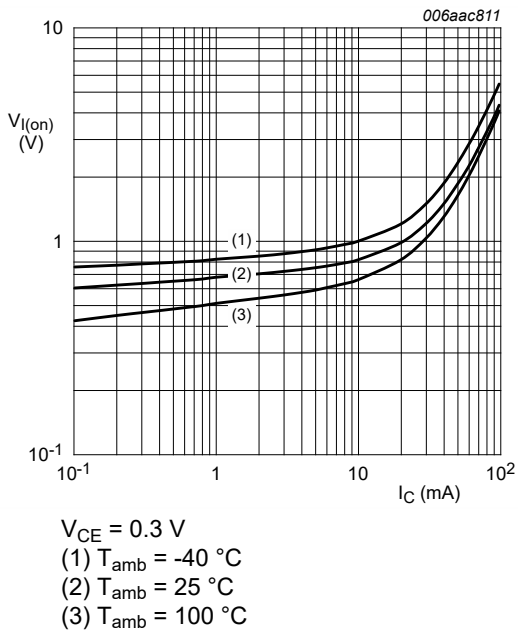


Fig. 7. NPN transistor: On-state input voltage as a function of collector current; typical values

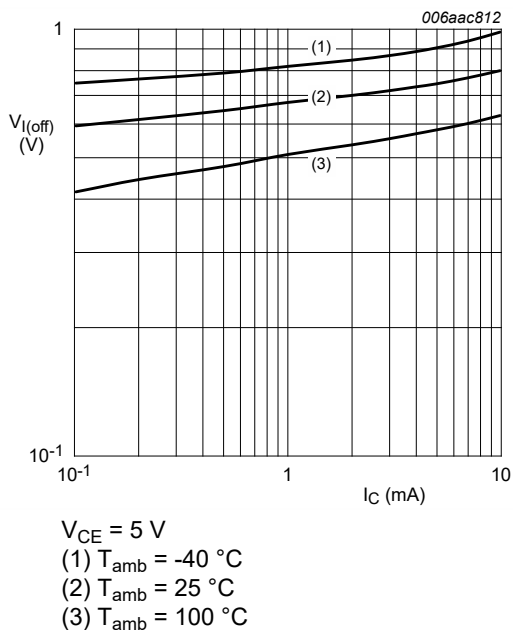


Fig. 8. NPN transistor: Off-state input voltage as a function of collector current; typical values

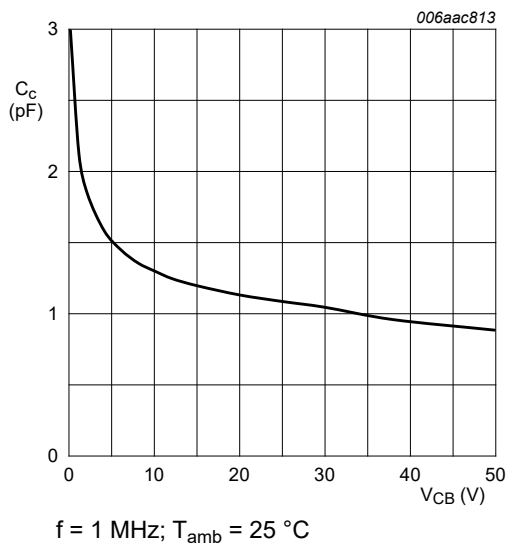


Fig. 9. NPN transistor: Collector capacitance as a function of collector-base voltage; typical values

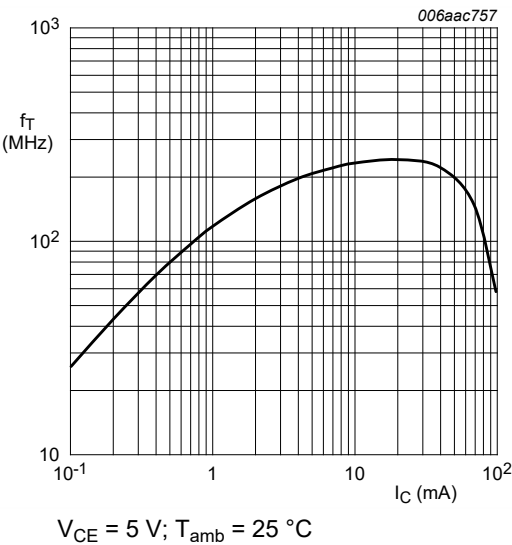


Fig. 10. NPN transistor: Transition frequency as a function of collector current; typical values of built-in transistor

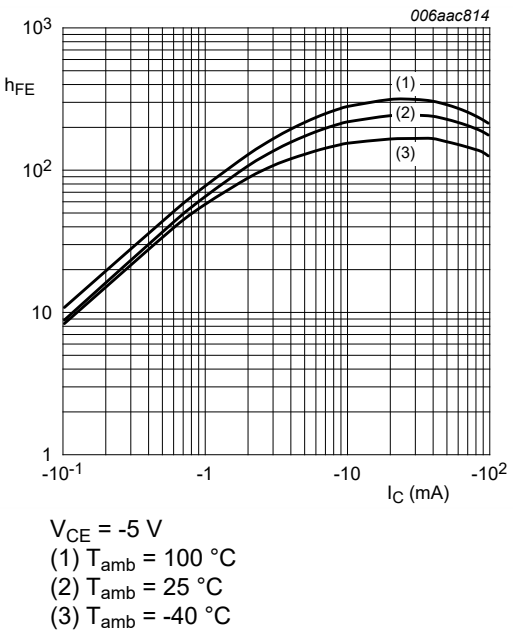


Fig. 11. PNP transistor: DC current gain as a function of collector current; typical values

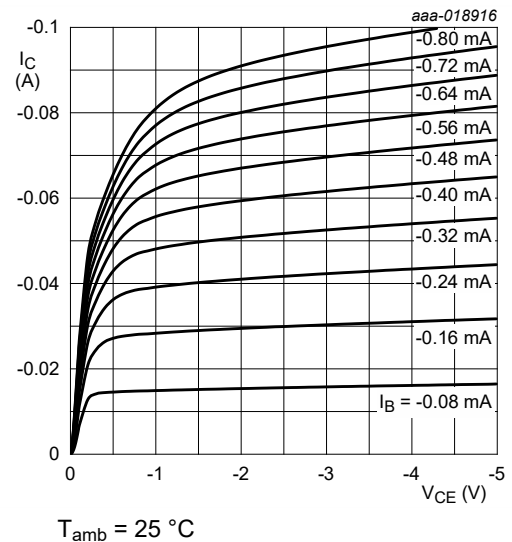


Fig. 12. PNP transistor: Collector current as a function of collector-emitter voltage; typical values

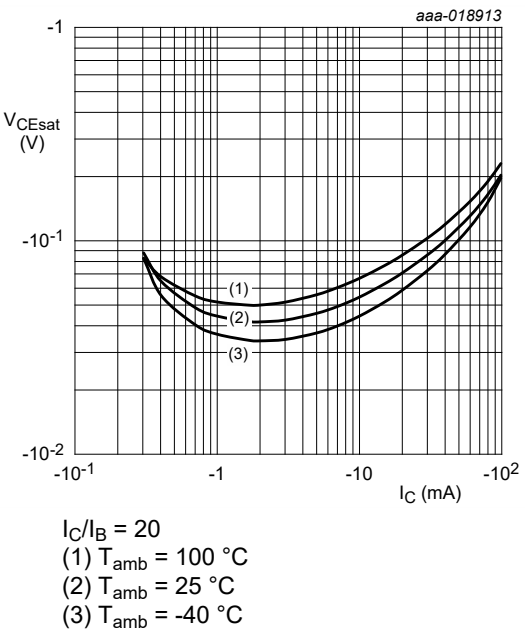
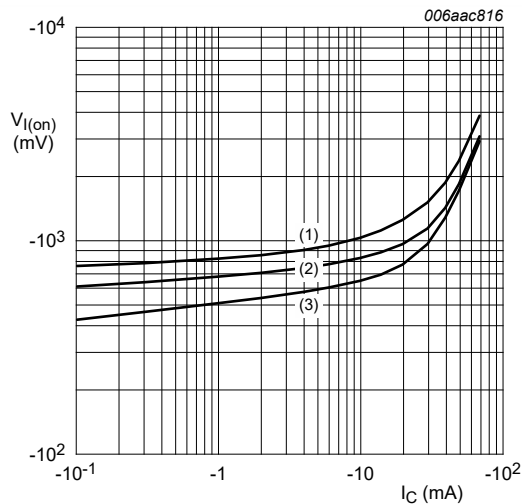
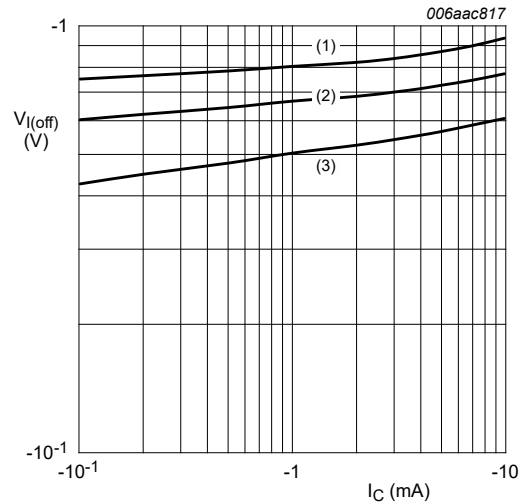


Fig. 13. PNP transistor: Collector-emitter saturation voltage as a function of collector current; typical values



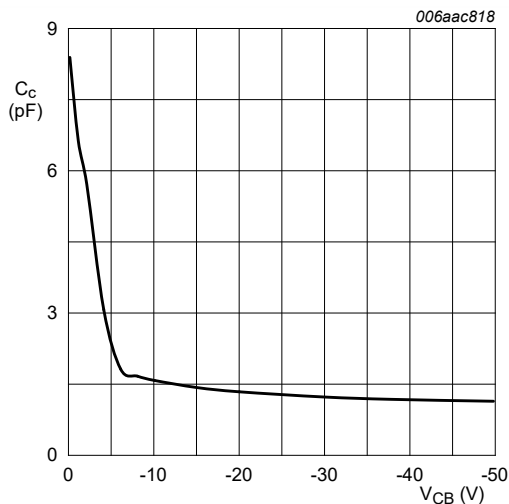
$V_{CE} = -0.3\text{ V}$
(1) $T_{amb} = -40^\circ\text{C}$
(2) $T_{amb} = 25^\circ\text{C}$
(3) $T_{amb} = 100^\circ\text{C}$

Fig. 14. PNP transistor: On-state input voltage as a function of collector current; typical values



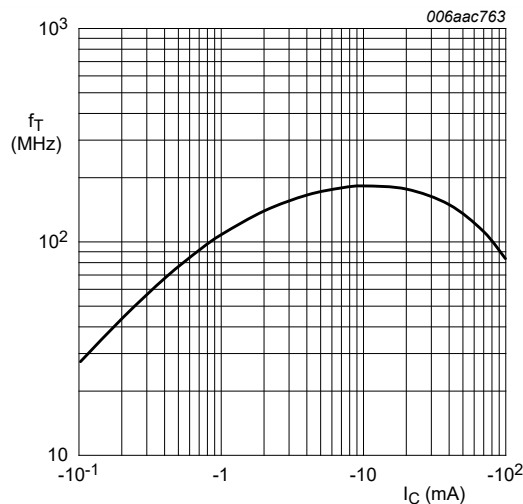
$V_{CE} = -5\text{ V}$
(1) $T_{amb} = -40^\circ\text{C}$
(2) $T_{amb} = 25^\circ\text{C}$
(3) $T_{amb} = 100^\circ\text{C}$

Fig. 15. PNP transistor: Off-state input voltage as a function of collector current; typical values



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

Fig. 16. PNP transistor: Collector capacitance as a function of collector-base voltage; typical values



$V_{CE} = -5\text{ V}$; $T_{amb} = 25^\circ\text{C}$

Fig. 17. PNP transistor: 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)

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

- Calculation of bias resistor ratio (R2/R1)

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

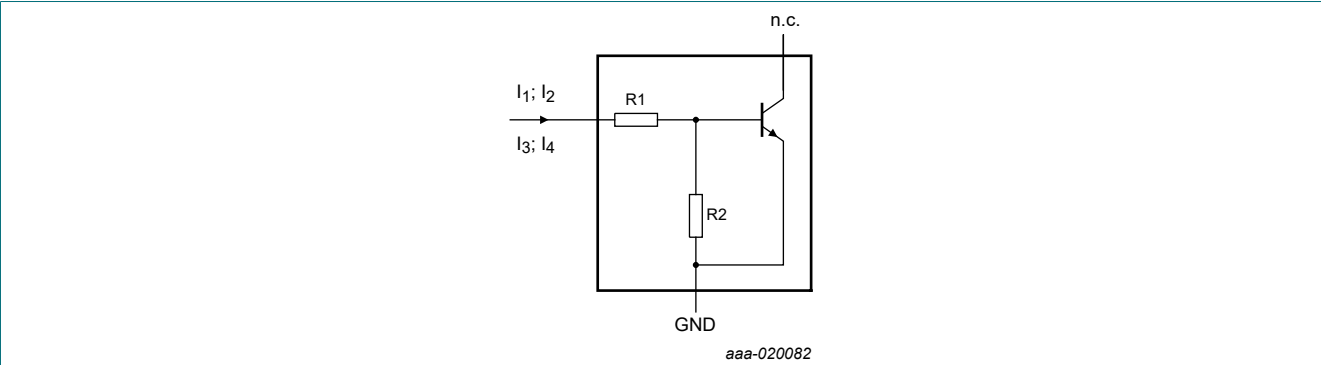


Fig. 18. NPN transistor: Resistor test circuit

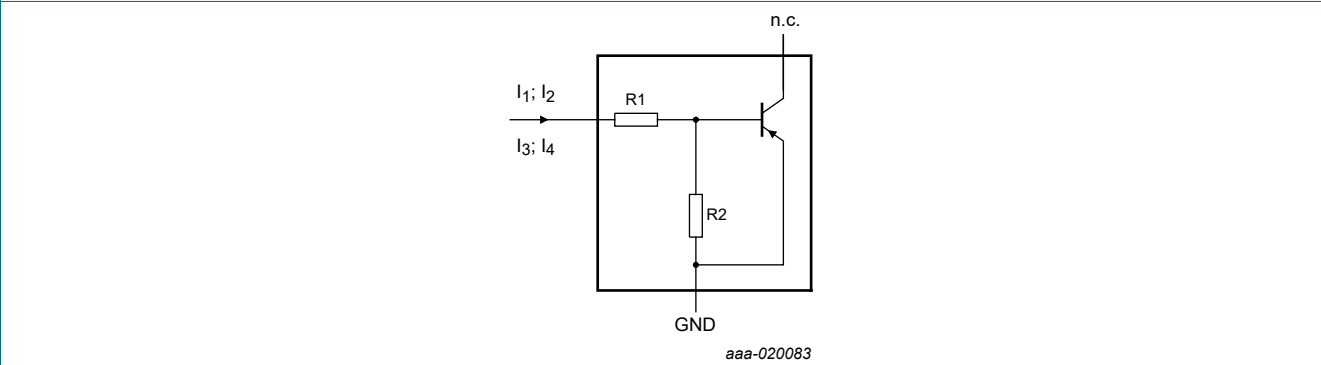


Fig. 19. PNP transistor: Resistor test circuit

Resistor test conditions

Table 8. Resistor test conditions

Product	R1 (kΩ)	R2 (kΩ)	Test conditions			
			I1	I2	I3	I4
TR1 (NPN)	2.2	47	90 μA	140 μA	-55 μA	-105 μA
TR2 (PNP)	2.2	47	-90 μA	-140 μA	55 μA	105 μA

12. Package outline

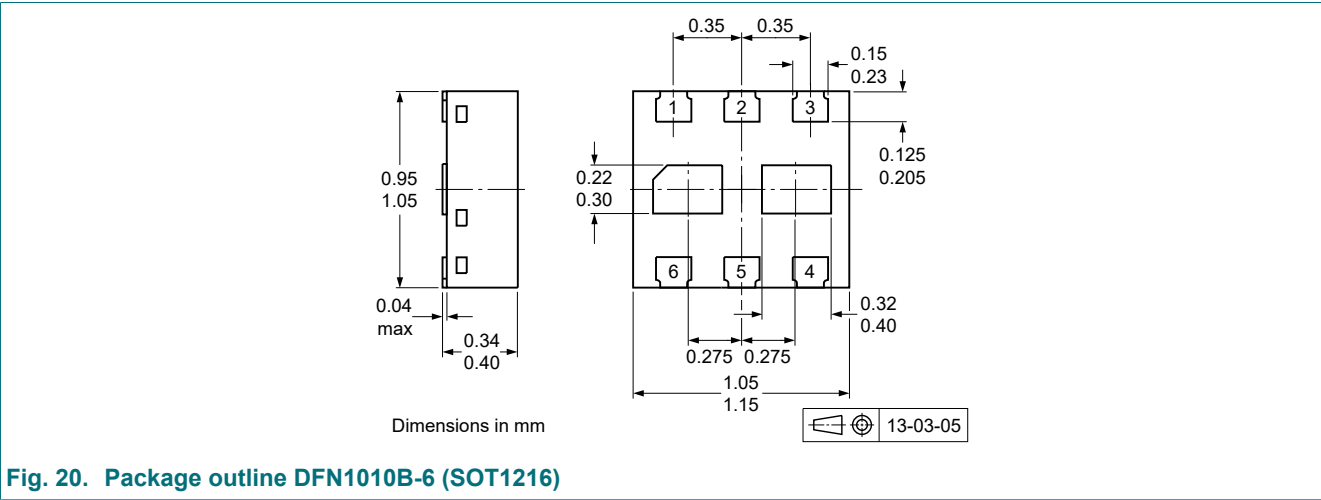


Fig. 20. Package outline DFN1010B-6 (SOT1216)

13. Soldering

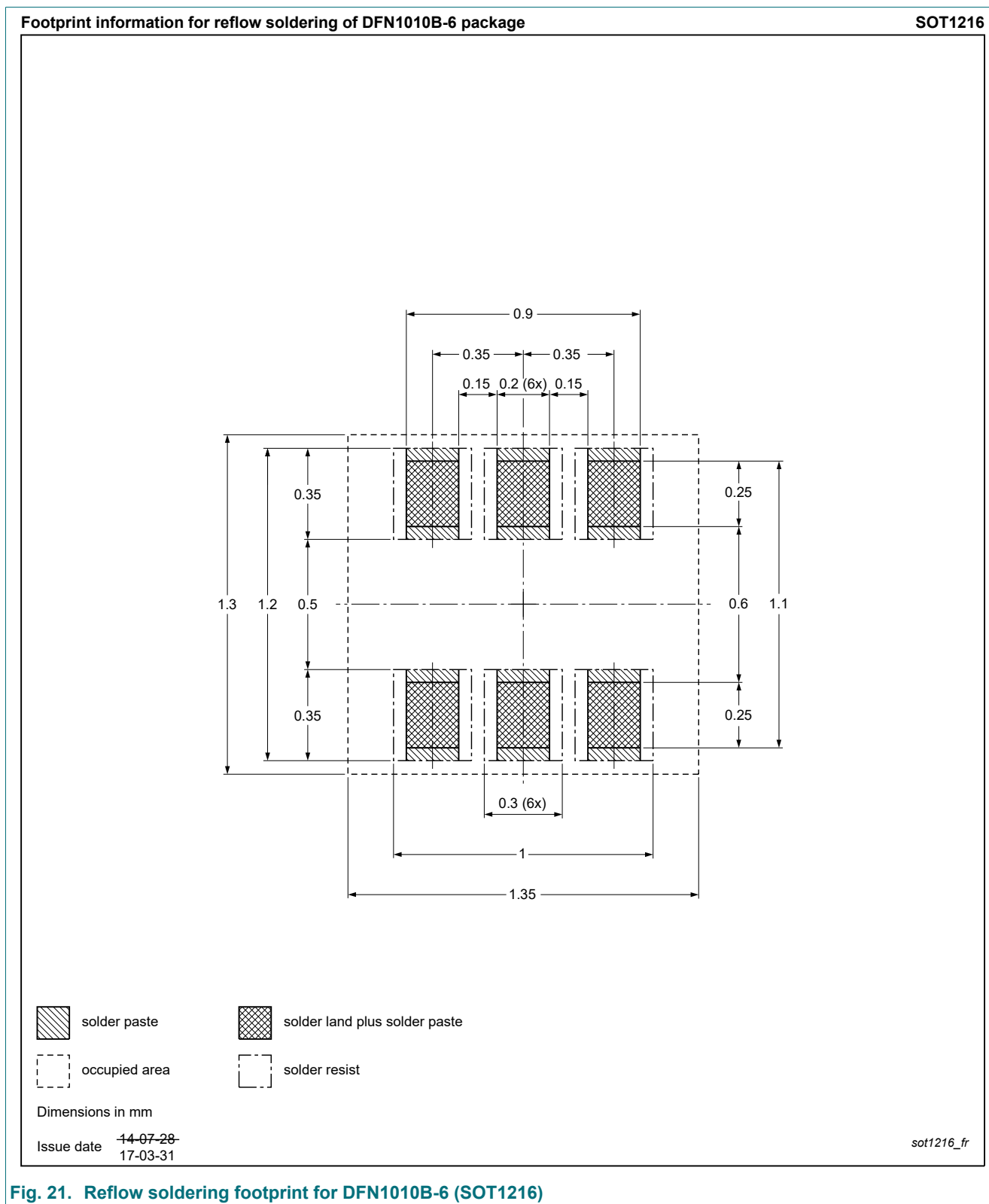


Fig. 21. Reflow soldering footprint for DFN1010B-6 (SOT1216)

14. Revision history

Table 9. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PQMD10 v.2	20250415	Product data sheet	-	PQMD10 v.1
Modifications:	Soldering changed			
PQMD10 v.1	20151104	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".
- [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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Contents

1. General description..... 1

2. Features and benefits..... 1

3. Applications..... 1

4. Quick reference data..... 1

5. Pinning information.....2

6. Ordering information.....2

7. Marking.....2

8. Limiting values..... 3

9. Thermal characteristics..... 4

10. Characteristics..... 5

11. Test information..... 9

12. Package outline..... 10

13. Soldering..... 11

14. Revision history.....12

15. Legal information.....13

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