

# ANTREX Electronics

## Electronic Components Sourcing Information

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### Product Reference Information

|                      |                           |
|----------------------|---------------------------|
| <b>Part Number:</b>  | PQMH2Z                    |
| <b>Manufacturer:</b> | Nexperia USA Inc.         |
| <b>Package:</b>      | 6-XFDN Exposed Pad        |
| <b>Availability:</b> | Please confirm with sales |

#### Product Page:

<https://antrexco.com/product/details/nexperia-usa-inc/pqmh2z.html>

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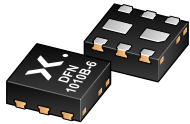
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#### Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.



# PQM2H2

NPN/NPN resistor-equipped transistors;  
R1 = 47 k $\Omega$ , R2 = 47 k $\Omega$

16 April 2025

Product data sheet

## 1. General description

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

NPN/PNP complement: PQMD12.

## 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

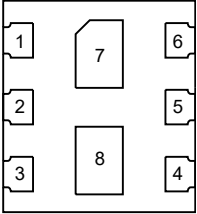
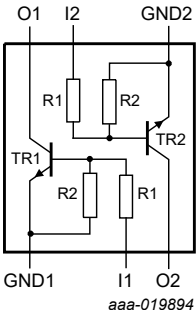
Table 1. Quick reference data

| Symbol           | Parameter                 | Conditions               |     | Min | Typ | Max | Unit       |
|------------------|---------------------------|--------------------------|-----|-----|-----|-----|------------|
| Per transistor   |                           |                          |     |     |     |     |            |
| 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] | 33  | 47  | 61  | k $\Omega$ |
| R2/R1            | bias resistor ratio       |                          | [1] | 0.8 | 1   | 1.2 |            |

[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      |  <p>Transparent top view<br/><b>DFN1010B-6 (SOT1216)</b></p> |  <p>aaa-019894</p> |
| 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

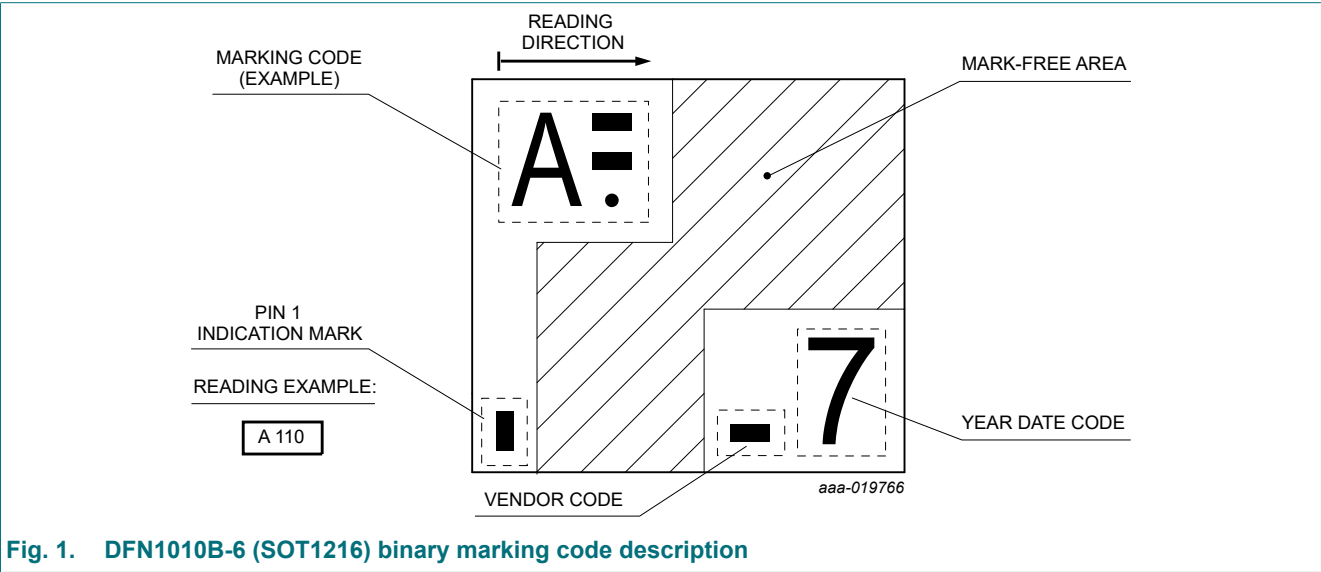
Table 3. Ordering information

| Type number | Package    |                                                                                                                               |         |
|-------------|------------|-------------------------------------------------------------------------------------------------------------------------------|---------|
|             | Name       | Description                                                                                                                   | Version |
| PQMH2       | 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 |
|-------------|--------------|
| PQMH2       | A<br>010     |

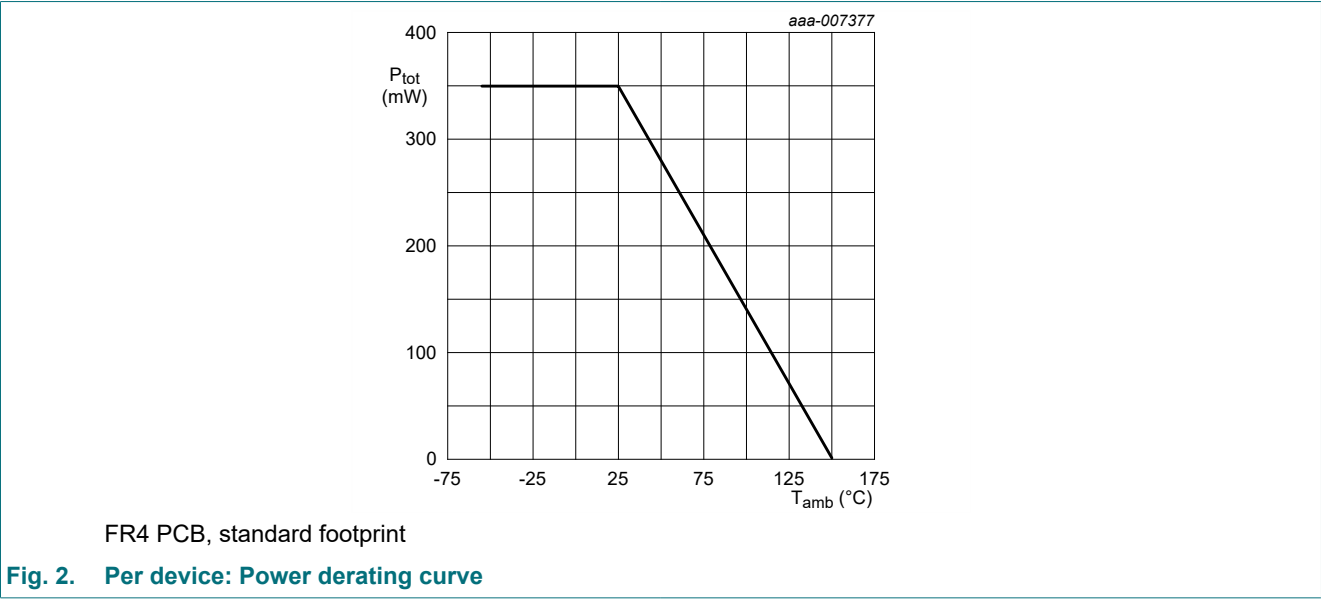


8. Limiting values

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

| Symbol           | Parameter                 | Conditions                          |     | Min | Max | Unit |
|------------------|---------------------------|-------------------------------------|-----|-----|-----|------|
| Per transistor   |                           |                                     |     |     |     |      |
| V <sub>CBO</sub> | collector-base voltage    | open emitter                        |     | -   | 50  | V    |
| V <sub>CEO</sub> | collector-emitter voltage | open base                           |     | -   | 50  | V    |
| V <sub>EBO</sub> | emitter-base voltage      | open collector                      |     | -   | 10  | V    |
| V <sub>I</sub>   | input voltage             | positive                            |     | -   | 40  | V    |
|                  |                           | negative                            |     | -   | -10 | V    |
| I <sub>O</sub>   | output current            |                                     |     | -   | 100 | mA   |
| I <sub>CM</sub>  | peak collector current    | t <sub>p</sub> ≤ 1 ms; singel pulse |     | -   | 100 | mA   |
| P <sub>tot</sub> | total power dissipation   | T <sub>amb</sub> ≤ 25 °C            | [1] | -   | 230 | mW   |
| Per device       |                           |                                     |     |     |     |      |
| P <sub>tot</sub> | total power dissipation   | T <sub>amb</sub> ≤ 25 °C            | [1] | -   | 350 | mW   |
| T <sub>j</sub>   | junction temperature      |                                     |     | -   | 150 | °C   |
| T <sub>amb</sub> | ambient temperature       |                                     |     | -55 | 150 | °C   |
| T <sub>stg</sub> | storage temperature       |                                     |     | -65 | 150 | °C   |

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

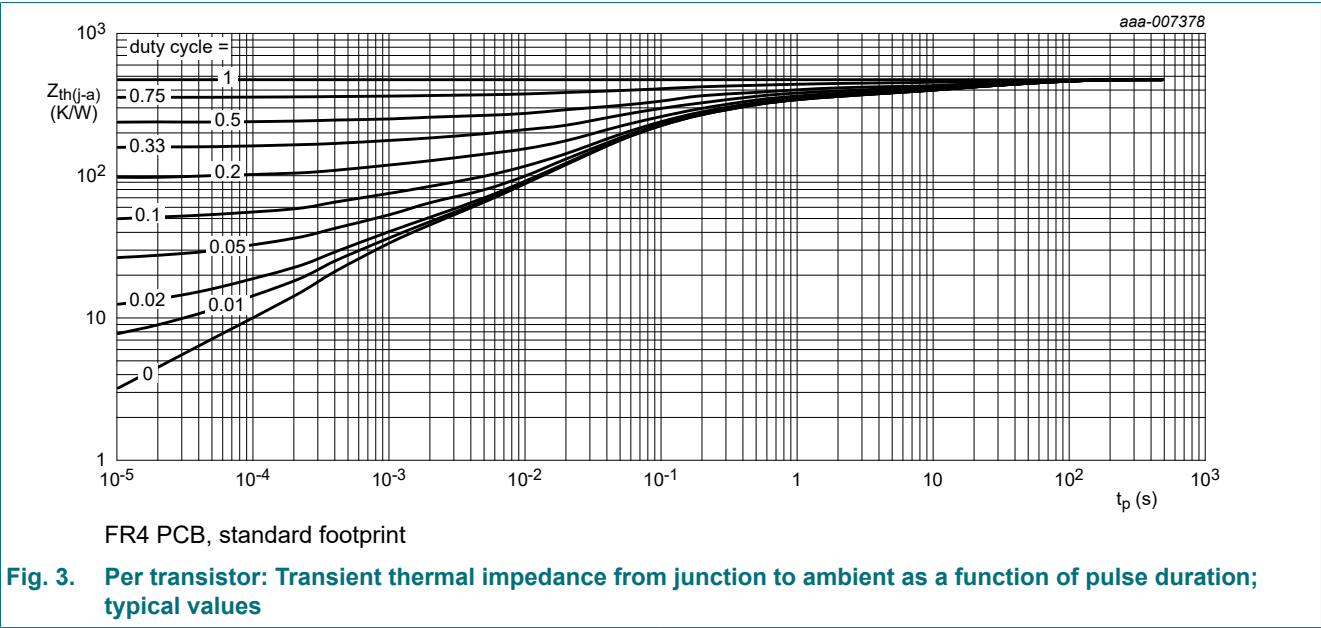


9. Thermal characteristics

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.

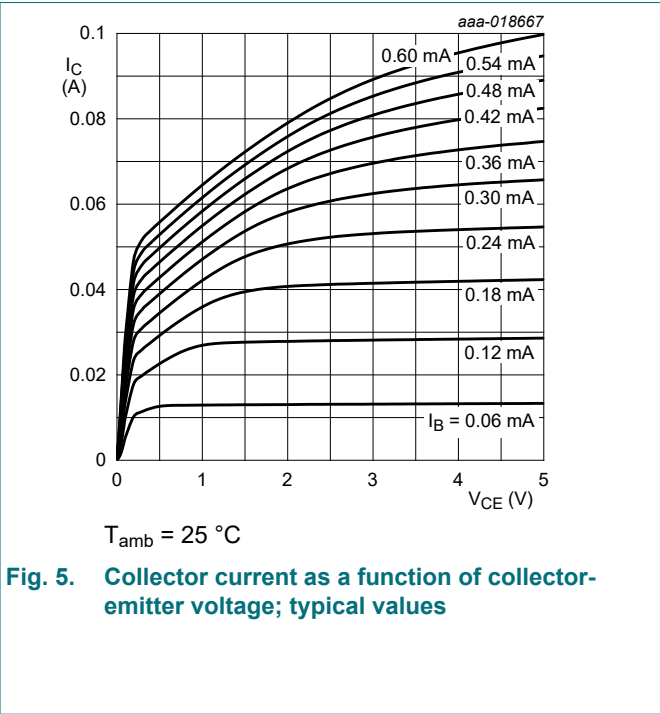
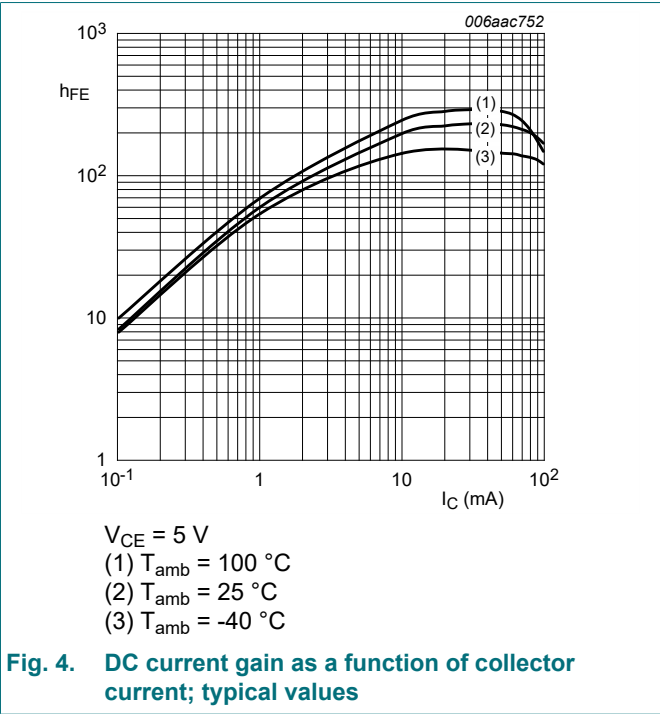


10. Characteristics

Table 7. Characteristics

| Symbol              | Parameter                            | Conditions                                                                           |     | Min | Typ | Max | Unit |
|---------------------|--------------------------------------|--------------------------------------------------------------------------------------|-----|-----|-----|-----|------|
| Per transistor      |                                      |                                                                                      |     |     |     |     |      |
| I <sub>CBO</sub>    | collector-base cut-off current       | V <sub>CB</sub> = 50 V; I <sub>E</sub> = 0 A; T <sub>amb</sub> = 25 °C               |     | -   | -   | 100 | nA   |
| I <sub>CEO</sub>    | collector-emitter cut-off current    | V <sub>CE</sub> = 30 V; I <sub>B</sub> = 0 A; T <sub>amb</sub> = 25 °C               |     | -   | -   | 1   | μA   |
|                     |                                      | V <sub>CE</sub> = 30 V; I <sub>B</sub> = 0 A; T <sub>amb</sub> = 150 °C              |     | -   | -   | 5   | μA   |
| I <sub>EBO</sub>    | emitter-base cut-off current         | V <sub>EB</sub> = 5 V; I <sub>C</sub> = 0 A; T <sub>amb</sub> = 25 °C                |     | -   | -   | 90  | μA   |
| h <sub>FE</sub>     | DC current gain                      | V <sub>CE</sub> = 5 V; I <sub>C</sub> = 5 mA; T <sub>amb</sub> = 25 °C               |     | 80  | -   | -   |      |
| V <sub>CEsat</sub>  | collector-emitter saturation voltage | I <sub>C</sub> = 10 mA; I <sub>B</sub> = 0.5 mA; T <sub>amb</sub> = 25 °C            |     | -   | -   | 150 | mV   |
| V <sub>I(off)</sub> | off-state input voltage              | V <sub>CE</sub> = 5 V; I <sub>C</sub> = 100 μA; T <sub>amb</sub> = 25 °C             |     | -   | 1.2 | 0.8 | V    |
| V <sub>I(on)</sub>  | on-state input voltage               | V <sub>CE</sub> = 0.3 V; I <sub>C</sub> = 2 mA; T <sub>amb</sub> = 25 °C             |     | 3   | 1.6 | -   | V    |
| R1                  | bias resistor 1 (input)              | T <sub>amb</sub> = 25 °C                                                             | [1] | 33  | 47  | 61  | kΩ   |
| R2/R1               | bias resistor ratio                  |                                                                                      | [1] | 0.8 | 1   | 1.2 |      |
| C <sub>c</sub>      | collector capacitance                | V <sub>CB</sub> = 10 V; I <sub>E</sub> = 0 A; f = 1 MHz; T <sub>amb</sub> = 25 °C    |     | -   | -   | 2.5 | pF   |
| f <sub>T</sub>      | transition frequency                 | V <sub>CE</sub> = 5 V; I <sub>C</sub> = 10 mA; f = 100 MHz; T <sub>amb</sub> = 25 °C | [2] | -   | 230 | -   | MHz  |

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



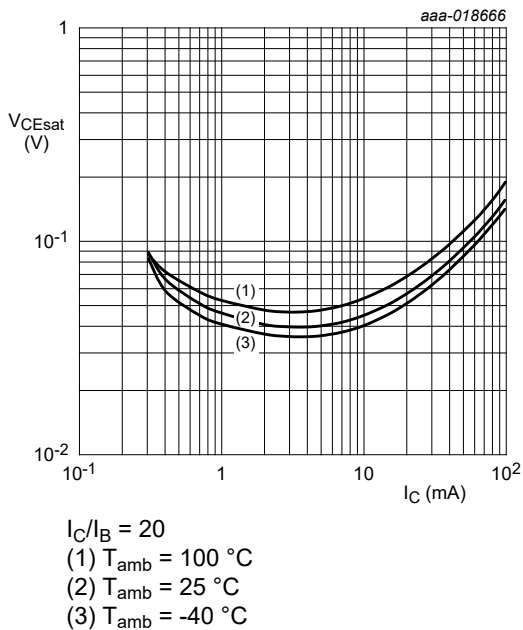


Fig. 6. Collector-emitter saturation voltage as a function of collector current; typical values

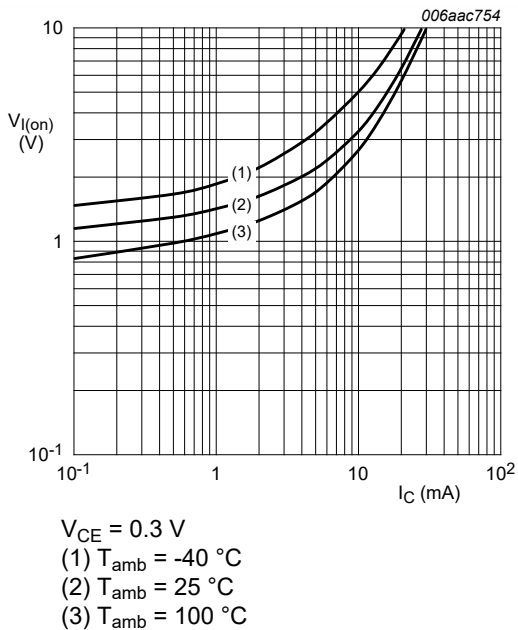


Fig. 7. On-state input voltage as a function of collector current; typical values

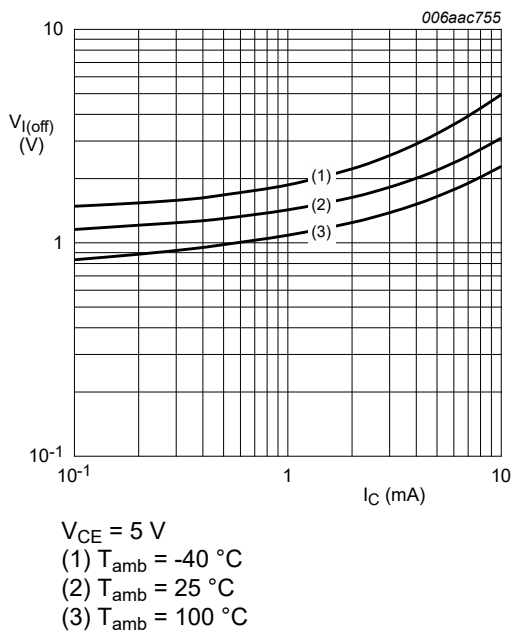


Fig. 8. Off-state input voltage as a function of collector current; typical values

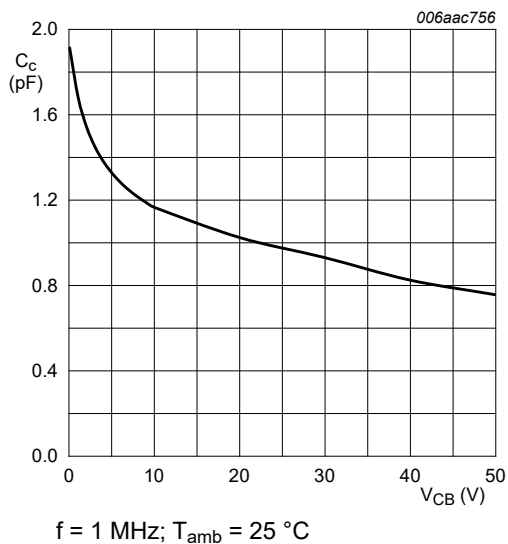
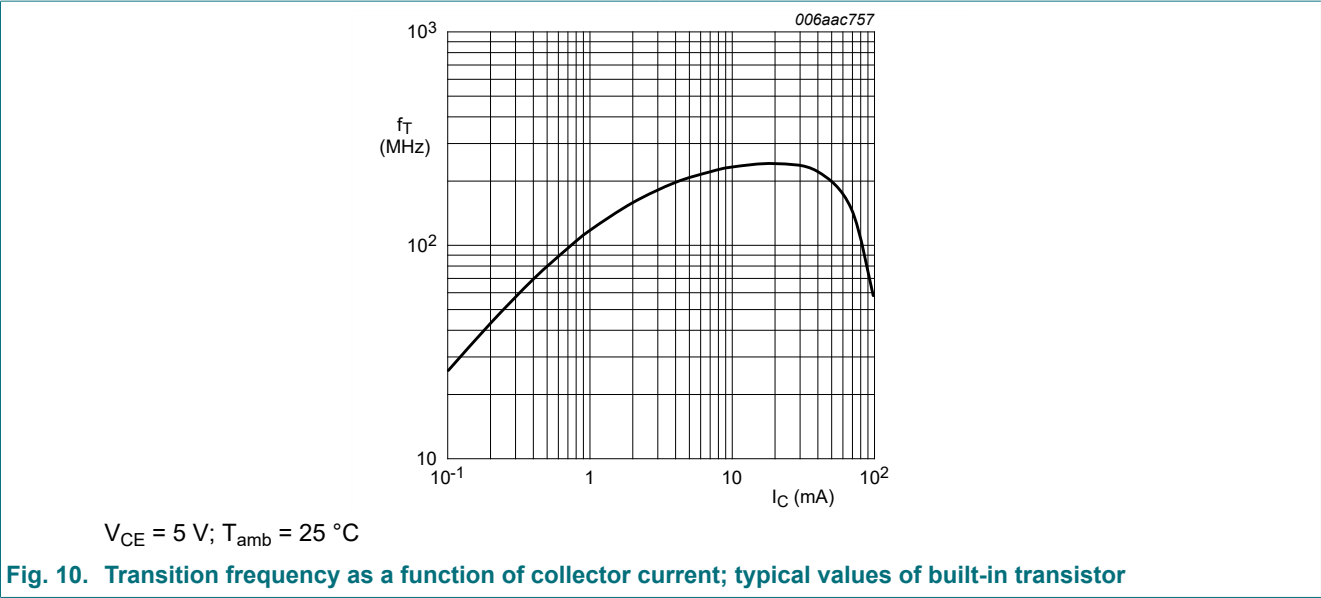


Fig. 9. Collector capacitance as a function of collector-base voltage; typical values



11. Test information

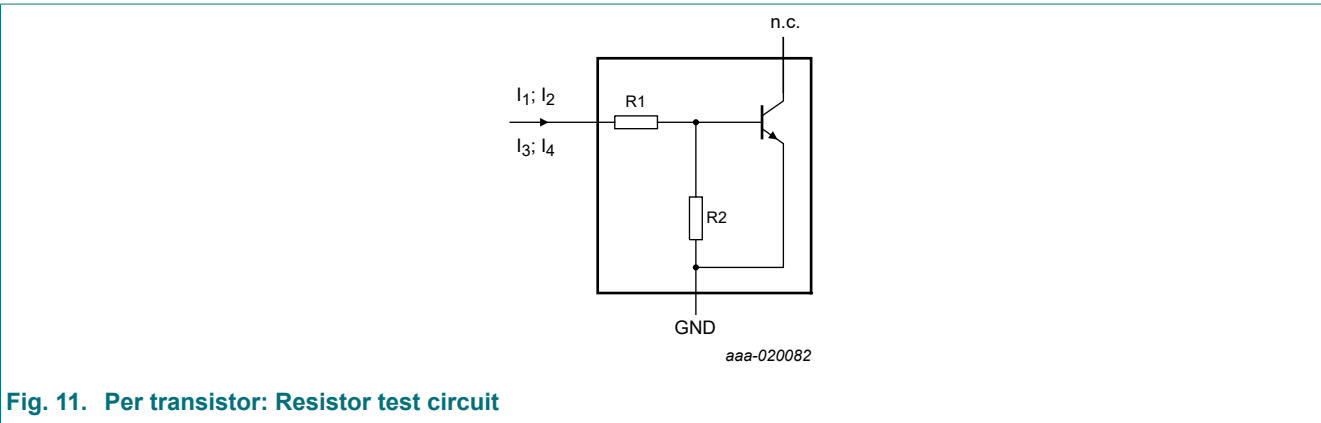
Quality information

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)
- $$R1 = \frac{V(I12) - V(I11)}{I12 - I11}$$
- Calculation of bias resistor ratio (R2/R1)

$$\frac{R2}{R1} = \frac{V(I4) - V(I3)}{R1 \cdot (I4 - I3)} - 1$$



Resistor test conditions

Table 8. Resistor test conditions

| R1 (kΩ) | R2 (kΩ) | Test conditions |                 |                 |                 |
|---------|---------|-----------------|-----------------|-----------------|-----------------|
|         |         | I <sub>11</sub> | I <sub>12</sub> | I <sub>13</sub> | I <sub>14</sub> |
| 47      | 47      | 55 μA           | 105 μA          | -55 μA          | -105 μA         |

12. Package outline

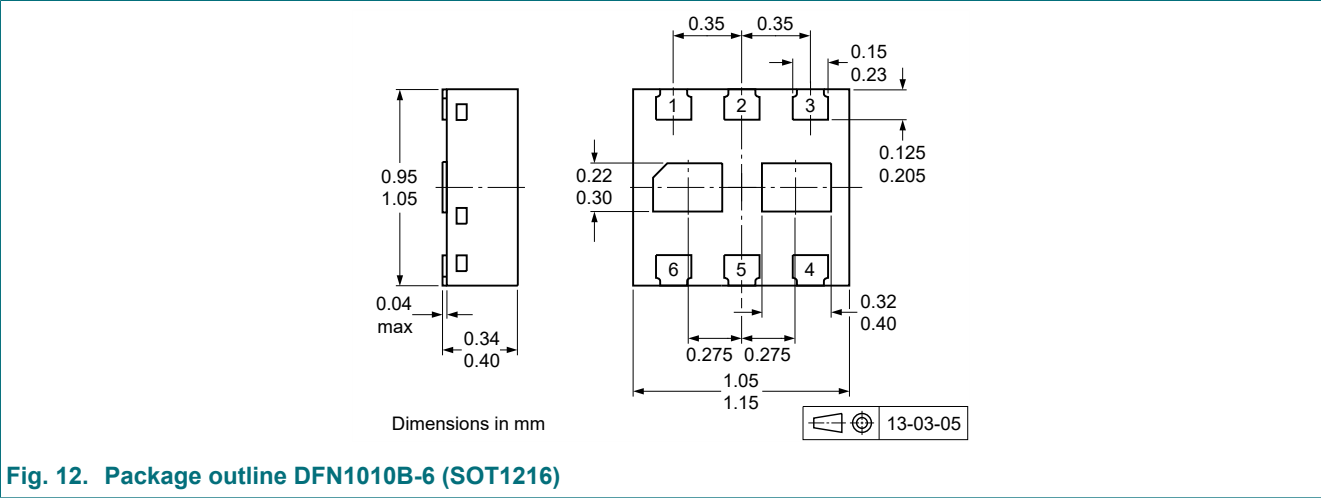
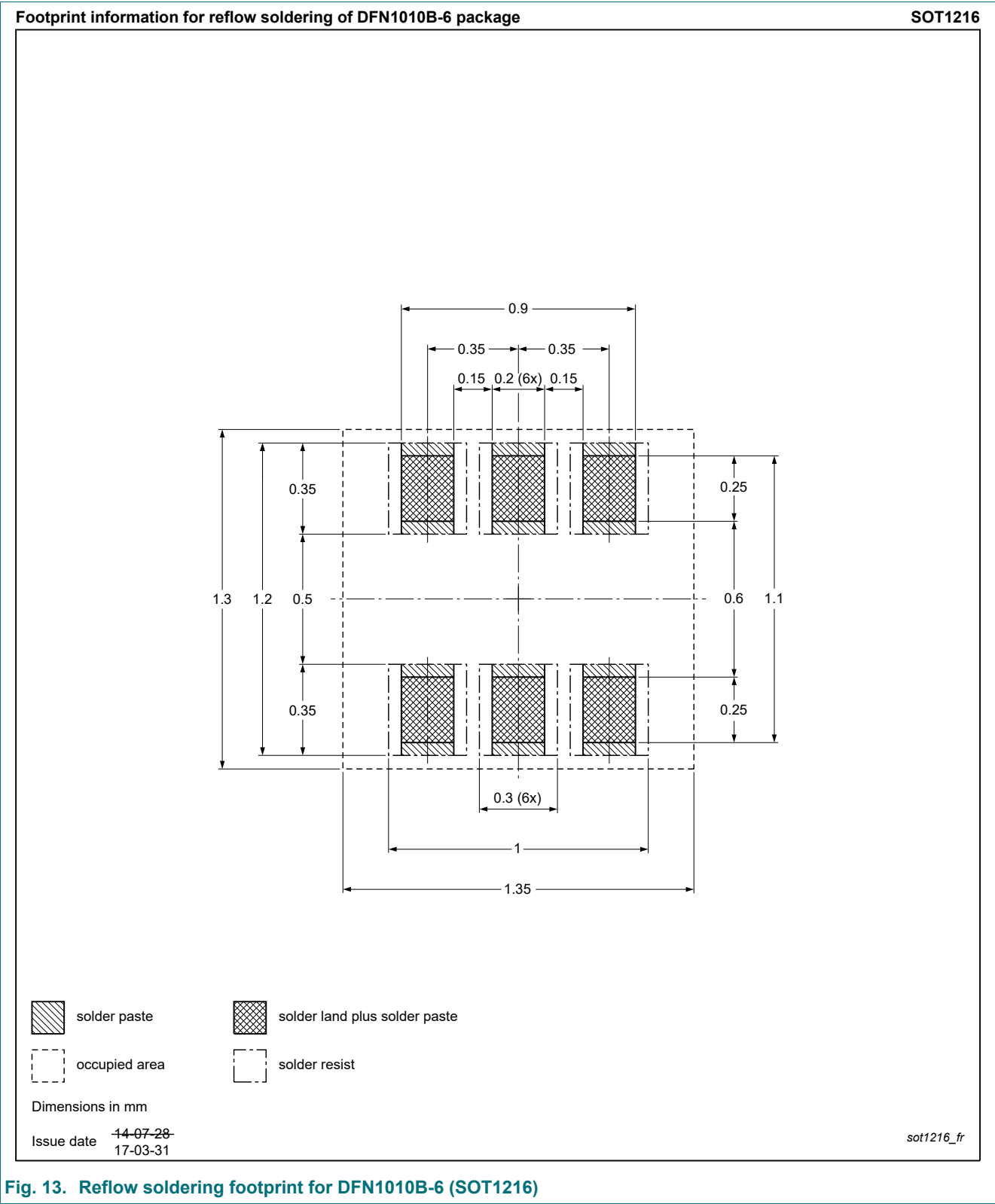


Fig. 12. Package outline DFN1010B-6 (SOT1216)

13. Soldering



14. Revision history

Table 9. Revision history

| Data sheet ID  | Release date                                                      | Data sheet status  | Change notice | Supersedes |
|----------------|-------------------------------------------------------------------|--------------------|---------------|------------|
| PQMH2 v.2      | 20250416                                                          | Product data sheet | -             | PQMH2 v.1  |
| Modifications: | <ul style="list-style-type: none"><li>Soldering changed</li></ul> |                    |               |            |
| PQMH2 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.                                     |

- [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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