



BC807RA

45 V, 500 mA PNP/PNP general-purpose double transistors

14 September 2018

Product data sheet

1. General description

PNP/PNP general-purpose double transistors in a leadless ultra small DFN1412-6 (SOT1268) Surface-Mounted Device (SMD) plastic package.

NPN/NPN complement: BC817RA

NPN/PNP complement: BC817RAPN

2. Features and benefits

- Reduces component count
- Reduces pick and place costs
- Low package height of 0.5 mm
- AEC-Q101 qualified

3. Applications

- General-purpose switching and amplification
- Mobile applications

4. Quick reference data

Table 1. Quick reference data

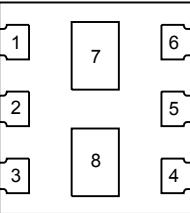
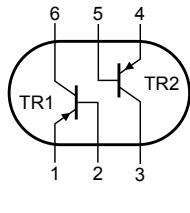
| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|-----------------------|---------------------------|---|-----|-----|-----|------|------|
| Per transistor | | | | | | | |
| V_{CEO} | collector-emitter voltage | open base | | - | - | -45 | V |
| I_C | collector current | | | - | - | -500 | mA |
| I_{CM} | peak collector current | single pulse; $t_p \leq 1$ ms | | - | - | -1 | A |
| h_{FE} | DC current gain | $V_{CE} = -1$ V; $I_C = -100$ mA; $T_{amb} = 25$ °C | | 160 | - | 400 | |
| | | $V_{CE} = -1$ V; $I_C = -500$ mA; $T_{amb} = 25$ °C | [1] | 40 | - | - | |

[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$

nexperia

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|---------------|---|---|
| 1 | E1 | emitter TR1 |  Transparent top view DFN1412-6 (SOT1268) |  sym018 |
| 2 | B1 | base TR1 | | |
| 3 | C2 | collector TR2 | | |
| 4 | E2 | emitter TR2 | | |
| 5 | B2 | base TR2 | | |
| 6 | C1 | collector TR1 | | |
| 7 | C1 | collector TR1 | | |
| 8 | C2 | collector TR2 | | |

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|-----------|---|---------|
| | Name | Description | Version |
| BC807RA | DFN1412-6 | plastic thermal enhanced ultra thin small outline package; no leads; 6 terminals; body: 1.4 mm x 1.2 mm x 0.47 mm | SOT1268 |

7. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| BC807RA | A9 |

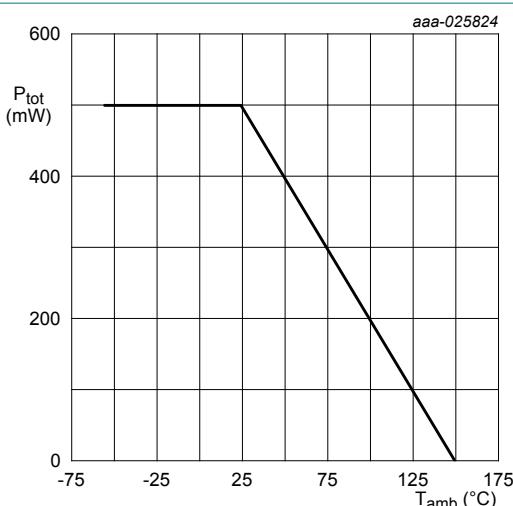
8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol | Parameter | Conditions | | Min | Max | Unit |
|-----------------------|---------------------------|-------------------------------|-----|-----|------|------|
| Per transistor | | | | | | |
| V_{CBO} | collector-base voltage | open emitter | | - | -50 | V |
| V_{CEO} | collector-emitter voltage | open base | | - | -45 | V |
| V_{EBO} | emitter-base voltage | open collector | | - | -5 | V |
| I_C | collector current | | | - | -500 | mA |
| I_{CM} | peak collector current | single pulse; $t_p \leq 1$ ms | | - | -1 | A |
| I_{BM} | peak base current | | | - | -200 | mA |
| P_{tot} | total power dissipation | $T_{amb} \leq 25$ °C | [1] | - | 350 | mW |
| Per device | | | | | | |
| P_{tot} | total power dissipation | $T_{amb} \leq 25$ °C | [1] | - | 500 | 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.



FR4 PCB, standard footprint

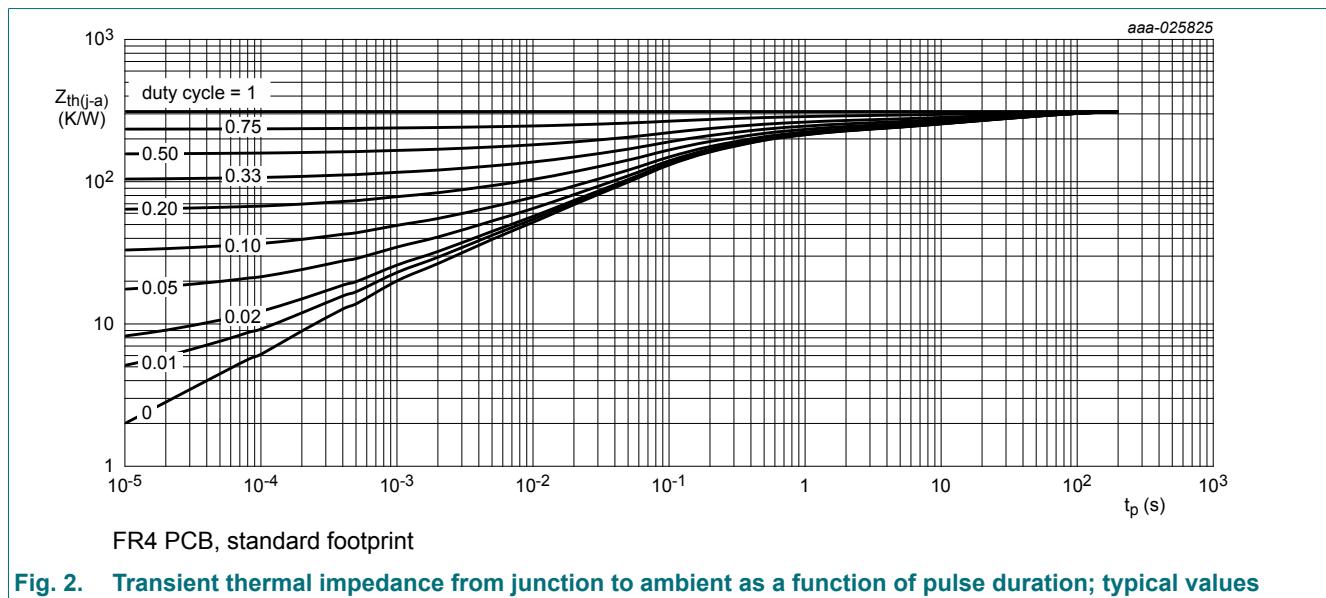
Fig. 1. Power derating curve

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] | - | - | 358 | K/W |
| Per device | | | | | | | |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | - | - | 250 | K/W |

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

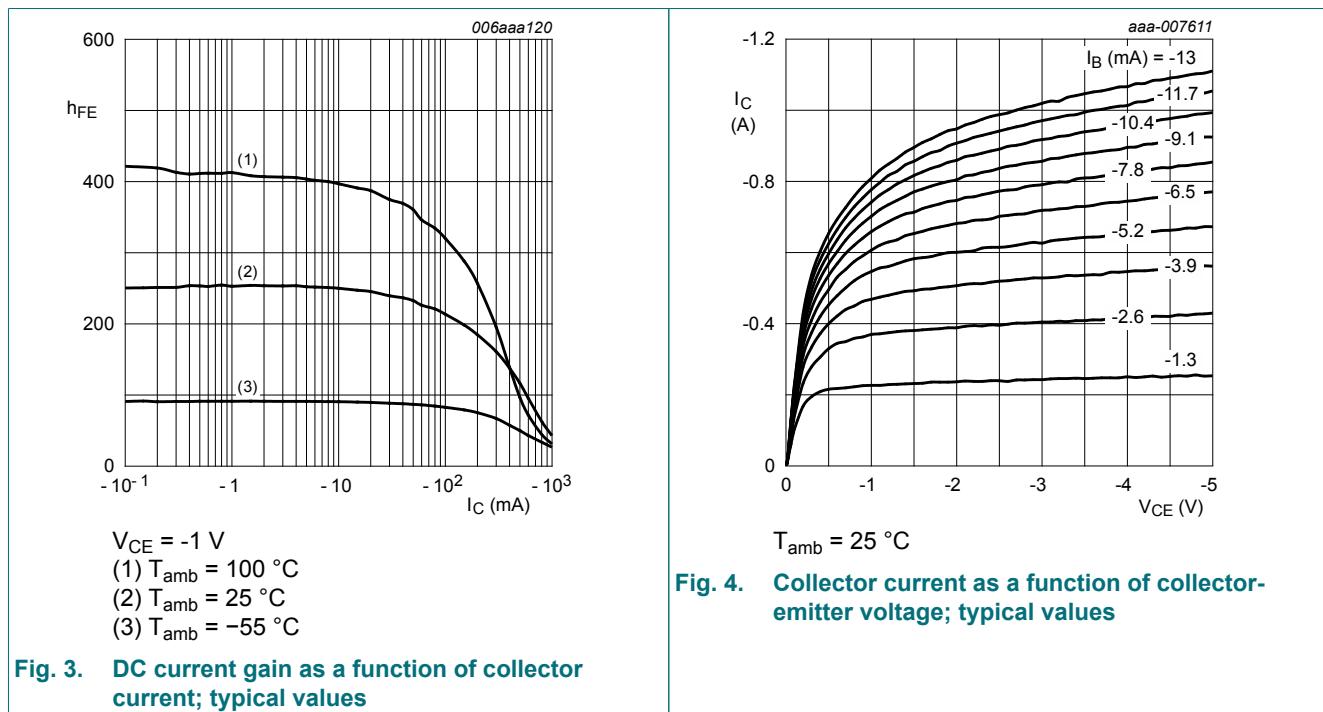


10. Characteristics

Table 7. Characteristics

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|-----------------------|--------------------------------------|--|-----|-----|-----|------|---------------|
| Per transistor | | | | | | | |
| I_{CBO} | collector-base cut-off current | $V_{CB} = -20 \text{ V}$; $I_E = 0 \text{ A}$; $T_{amb} = 25 \text{ }^\circ\text{C}$ | | - | - | -100 | nA |
| | | $V_{CB} = -20 \text{ V}$; $I_E = 0 \text{ A}$; $T_j = 150 \text{ }^\circ\text{C}$ | | - | - | -5 | μA |
| I_{EBO} | emitter-base cut-off current | $V_{EB} = -5 \text{ V}$; $I_C = 0 \text{ A}$; $T_{amb} = 25 \text{ }^\circ\text{C}$ | | - | - | -100 | nA |
| h_{FE} | DC current gain | $V_{CE} = -1 \text{ V}$; $I_C = -100 \text{ mA}$; $T_{amb} = 25 \text{ }^\circ\text{C}$ | | 160 | - | 400 | |
| | | $V_{CE} = -1 \text{ V}$; $I_C = -500 \text{ mA}$; $T_{amb} = 25 \text{ }^\circ\text{C}$ | [1] | 40 | - | - | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = -500 \text{ mA}$; $I_B = -50 \text{ mA}$; $T_{amb} = 25 \text{ }^\circ\text{C}$ | [1] | - | - | -700 | mV |
| V_{BE} | base-emitter voltage | $V_{CE} = -1 \text{ V}$; $I_C = -500 \text{ mA}$; $T_{amb} = 25 \text{ }^\circ\text{C}$ | [1] | - | - | -1.2 | V |
| C_c | collector capacitance | $V_{CB} = -10 \text{ V}$; $I_E = 0 \text{ A}$; $i_e = 0 \text{ A}$; $f = 1 \text{ MHz}$; $T_{amb} = 25 \text{ }^\circ\text{C}$ | | - | 6 | - | pF |
| f_T | transition frequency | $V_{CE} = -5 \text{ V}$; $I_C = -10 \text{ mA}$; $f = 100 \text{ MHz}$; $T_{amb} = 25 \text{ }^\circ\text{C}$ | | 80 | - | - | MHz |

[1] Pulse test: $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$



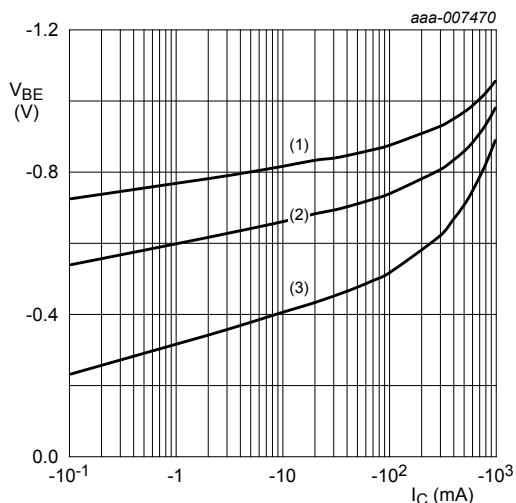


Fig. 5. Base-emitter voltage as a function of collector current; typical values

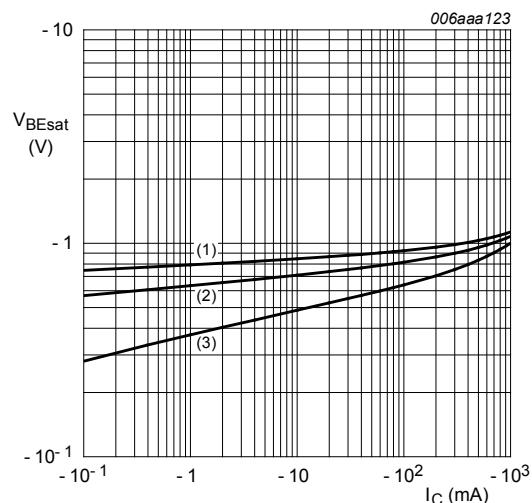


Fig. 6. Base-emitter saturation voltage as a function of collector current; typical values

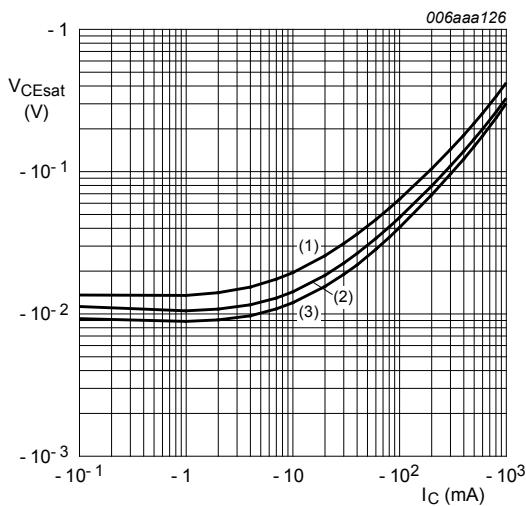


Fig. 7. Collector-emitter saturation voltage as a function of collector current; typical values

11. Test information

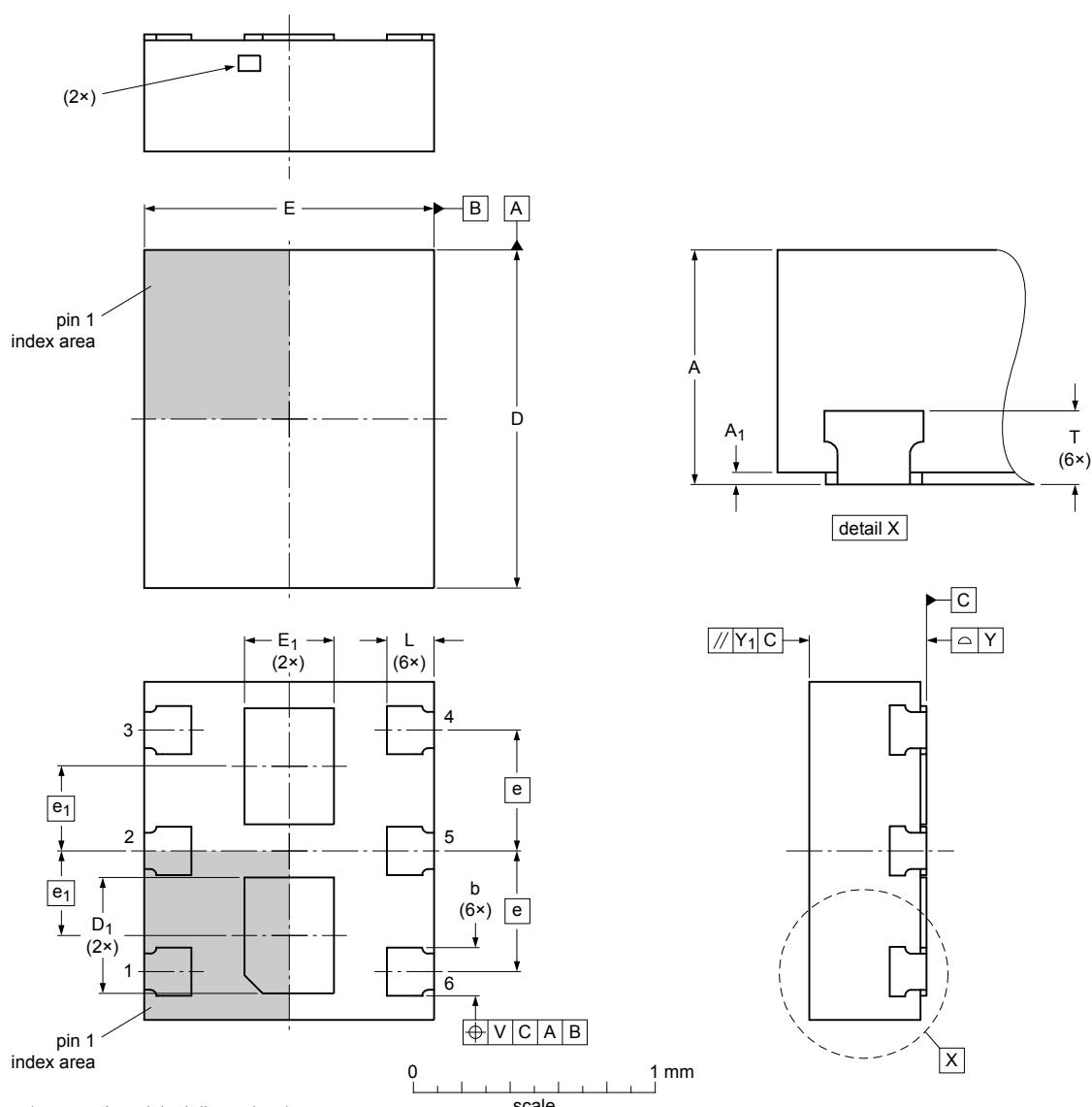
Quality information

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.

12. Package outline

DFN1412-6: plastic thermal enhanced ultra thin small outline package; no leads; 6 terminals; body: 1.4 x 1.2 x 0.47 mm

SOT1268



Dimensions (mm are the original dimensions)

| Unit ⁽¹⁾ | A | A ₁ | b | D | D ₁ | E | E ₁ | e | e ₁ | L | T | V | Y | Y ₁ |
|---------------------|-----|----------------|------|------|----------------|------|----------------|------|----------------|-------|-------|------|-----|----------------|
| mm | min | 0.44 | 0.00 | 0.15 | 1.35 | 0.43 | 1.15 | 0.32 | | 0.145 | 0.10 | | | |
| mm | nom | 0.47 | | 0.20 | 1.40 | 0.48 | 1.20 | 0.37 | 0.5 | 0.35 | 0.195 | 0.16 | 0.1 | 0.05 |
| mm | max | 0.50 | 0.04 | 0.25 | 1.45 | 0.53 | 1.25 | 0.42 | | 0.245 | 0.22 | | | |

Note

1. Dimension A is including plating thickness.

sot1268_po

| Outline version | References | | | European projection | Issue date |
|-----------------|------------|-------|-------|---------------------|----------------------|
| | IEC | JEDEC | JEITA | | |
| SOT1268 | --- | | | | 18-08-23 18-09-11 |

Fig. 8. Package outline DFN1412-6 (SOT1268)

13. Soldering

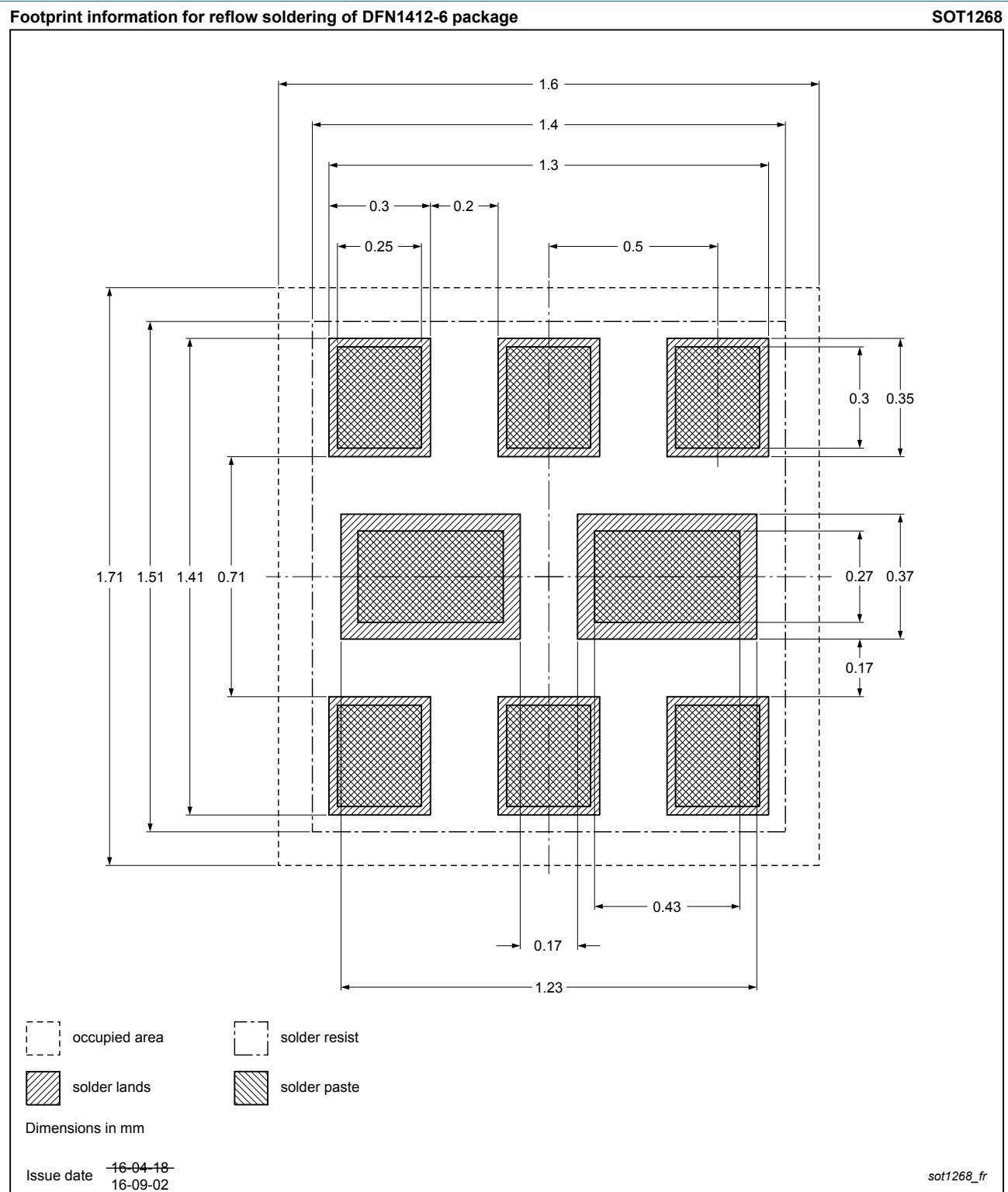


Fig. 9. Reflow soldering footprint for DFN1412-6 (SOT1268)

14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|---|--------------------|---------------|-------------|
| BC807RA v.2 | 20180914 | Product data sheet | - | BC807RA v.1 |
| Modifications: | <ul style="list-style-type: none">Package outline drawing updated: Unit T added | | | |
| BC807RA v.1 | 20170616 | 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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Date of release: 14 September 2018

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