



BF621

PNP high-voltage transistor

30 June 2023

Product data sheet

1. General description

PNP high-voltage transistor in a SOT89 (SC-62) flat lead Surface-Mounted Device (SMD) plastic package.

NPN complement: BF620

2. Features and benefits

- Low current (max. -50 mA)
- High voltage (max. -300 V)
- AEC-Q101 qualified

3. Applications

- Video output stages

4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------|---------------------------|--|-----|-----|------|------|
| V_{CE0} | collector-emitter voltage | open base | - | - | -300 | V |
| I_C | collector current | | - | - | -50 | mA |
| h_{FE} | DC current gain | $V_{CE} = -20\text{ V}$; $I_C = -25\text{ mA}$; $T_{amb} = 25\text{ °C}$ | 50 | - | - | |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------|--------------------|----------------|
| 1 | E | emitter | <p>SOT89</p> | <p>sym079</p> |
| 2 | C | collector | | |
| 3 | B | base | | |

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-----------------------|---------|--|-----------------------|
| | Name | Description | Version |
| BF621 | SOT89 | plastic, surface-mounted package; 3 leads; 1.5 mm pitch; 4.5 mm x 2.5 mm x 1.5 mm body | SOT89 |

7. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| BF621 | DF |

8. Limiting values

Table 5. Limiting values

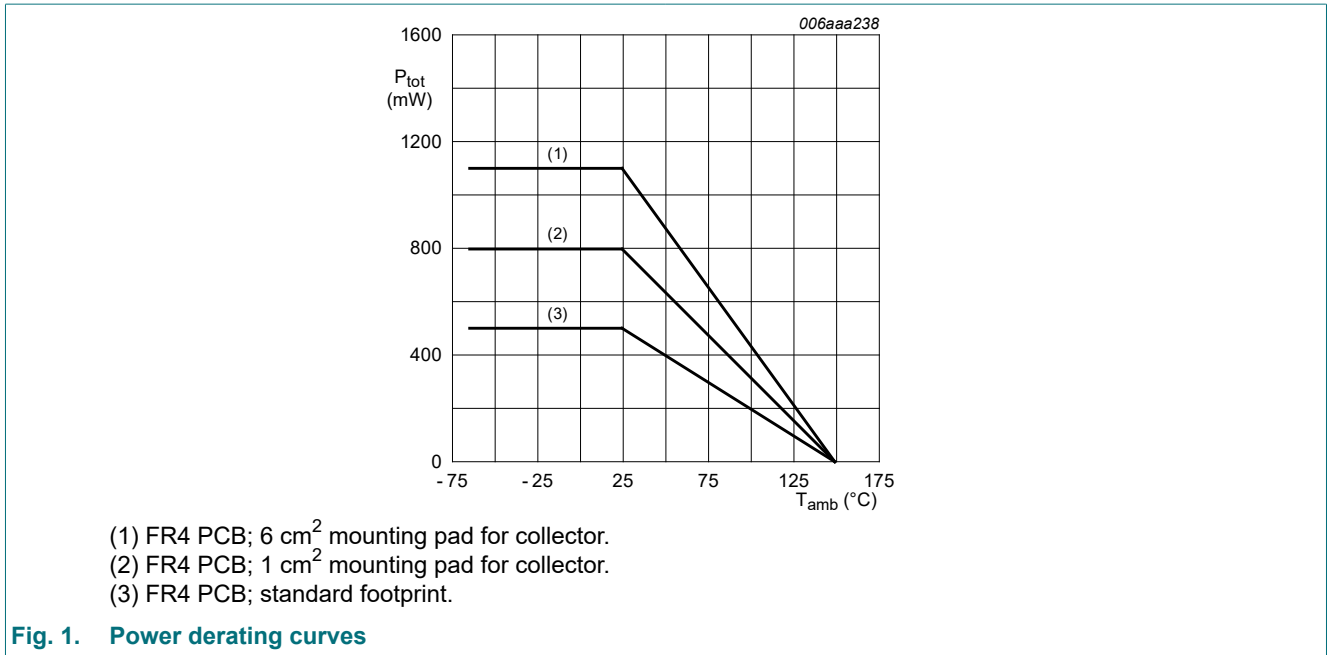
In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol | Parameter | Conditions | | Min | Max | Unit |
|-----------|---------------------------|-------------------------------|-----|-----|------|------|
| V_{CBO} | collector-base voltage | open emitter | | - | -300 | V |
| V_{CEO} | collector-emitter voltage | open base | | - | -300 | V |
| V_{EBO} | emitter-base voltage | open collector | | - | -5 | V |
| I_C | collector current | | | - | -50 | mA |
| I_{CM} | peak collector current | single pulse; $t_p \leq 1$ ms | | - | -100 | mA |
| I_{BM} | peak base current | | | - | -50 | mA |
| P_{tot} | total power dissipation | $T_{amb} \leq 25$ °C | [1] | - | 0.5 | W |
| | | | [2] | - | 0.8 | W |
| | | | [3] | - | 1.1 | W |
| 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 copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 1 cm^2 .

[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 6 cm^2 .

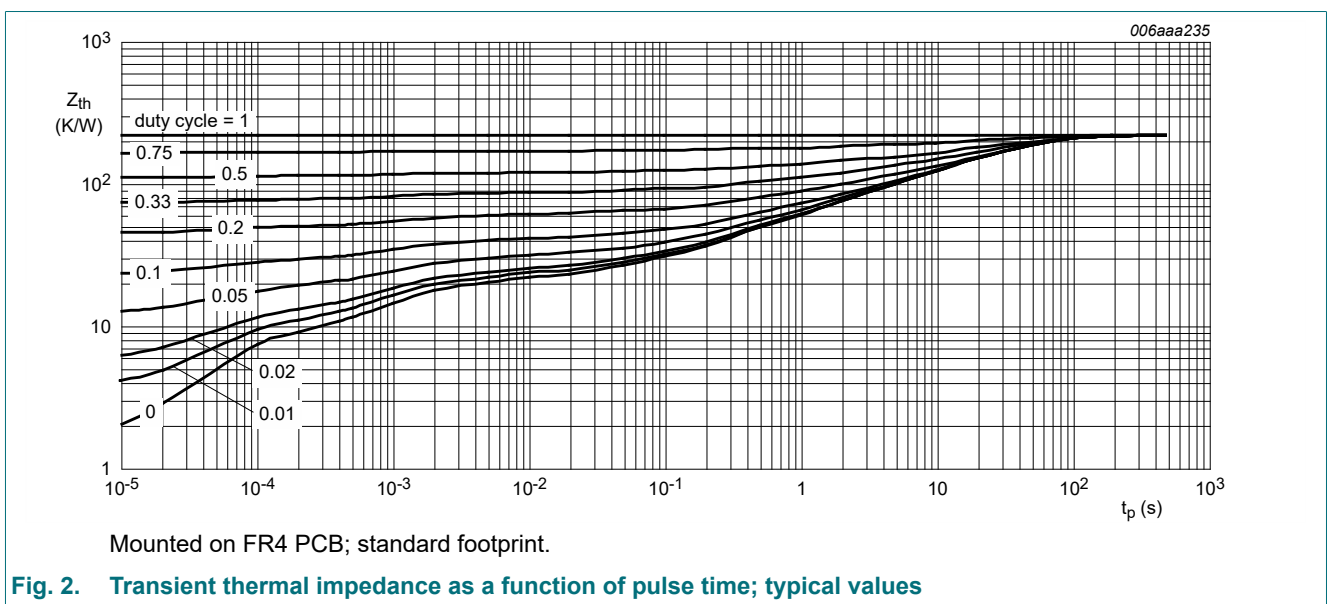


9. Thermal characteristics

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] | - | - | 250 | K/W |
| | | | [2] | - | - | 156 | K/W |
| | | | [3] | - | - | 113 | K/W |
| R _{th(j-sp)} | thermal resistance from junction to solder point | | | - | - | 30 | K/W |

- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 1 cm².
- [3] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 6 cm².



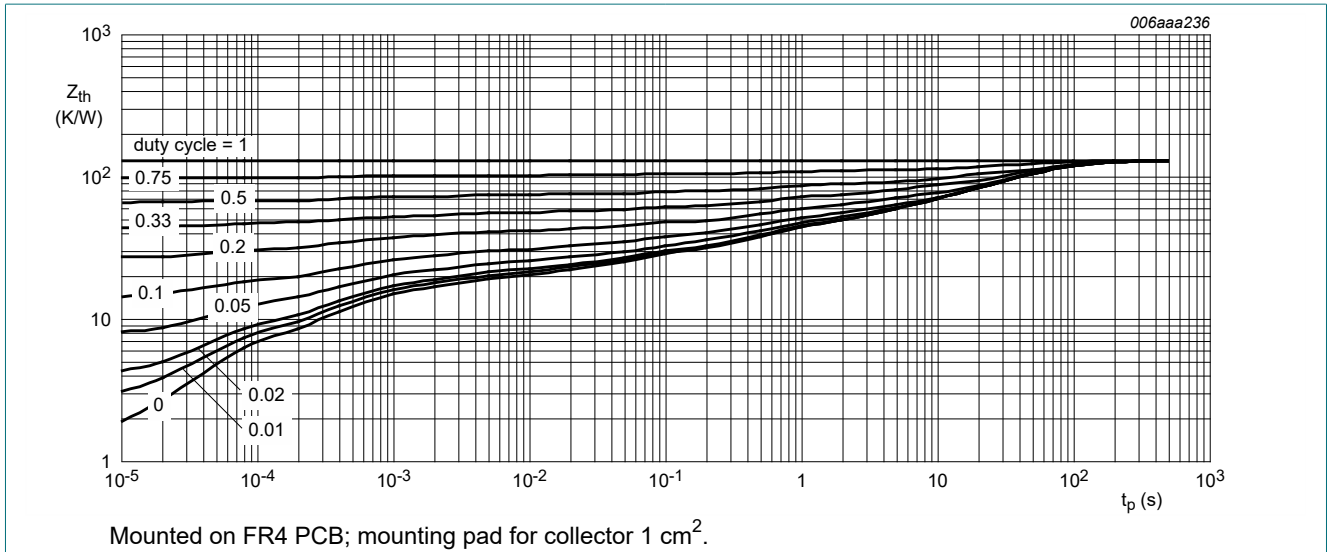


Fig. 3. Transient thermal impedance as a function of pulse time; typical values

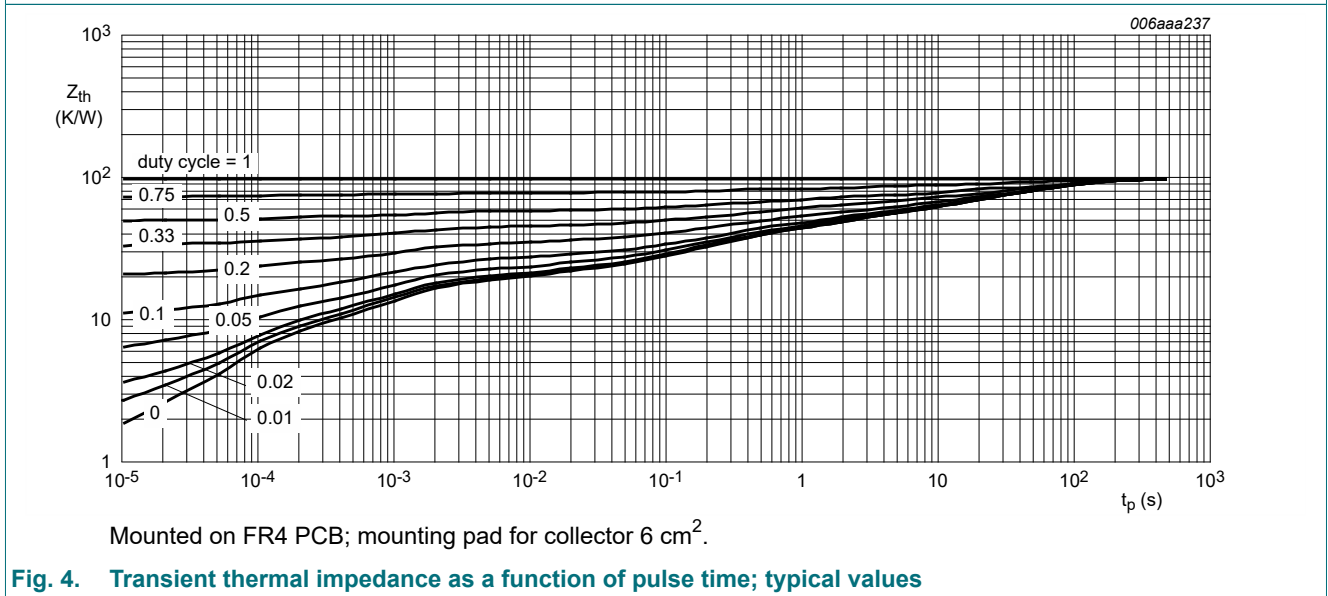


Fig. 4. Transient thermal impedance as a function of pulse time; typical values

10. Characteristics

Table 7. Characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------------------|--------------------------------------|--|-----|-----|------|------|
| I _{CBO} | collector-base cut-off current | V _{CB} = -200 V; I _E = 0 A; T _{amb} = 25 °C | - | - | -10 | nA |
| | | V _{CB} = -200 V; I _E = 0 A; T _j = 150 °C | - | - | -10 | μA |
| I _{EBO} | emitter-base cut-off current | V _{EB} = -5 V; I _C = 0 A; T _{amb} = 25 °C | - | - | -50 | nA |
| h _{FE} | DC current gain | V _{CE} = -20 V; I _C = -25 mA; T _{amb} = 25 °C | 50 | - | - | |
| V _{CEsat} | collector-emitter saturation voltage | I _C = -30 mA; I _B = -5 mA; T _{amb} = 25 °C | - | - | -800 | mV |
| C _{re} | feedback capacitance | V _{CB} = -30 V; I _C = 0 A; i _c = 0 A; f = 1 MHz; T _{amb} = 25 °C | - | - | 1.6 | pF |
| f _T | transition frequency | V _{CE} = -10 V; I _C = -10 mA; f = 100 MHz; T _{amb} = 25 °C | 60 | - | - | MHz |

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

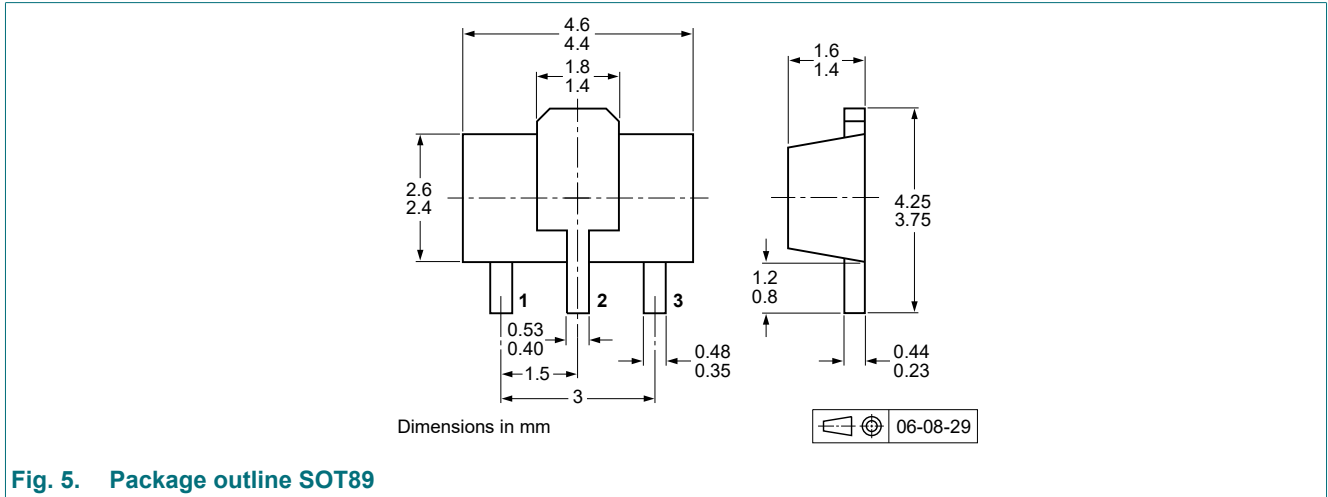


Fig. 5. Package outline SOT89

13. Soldering

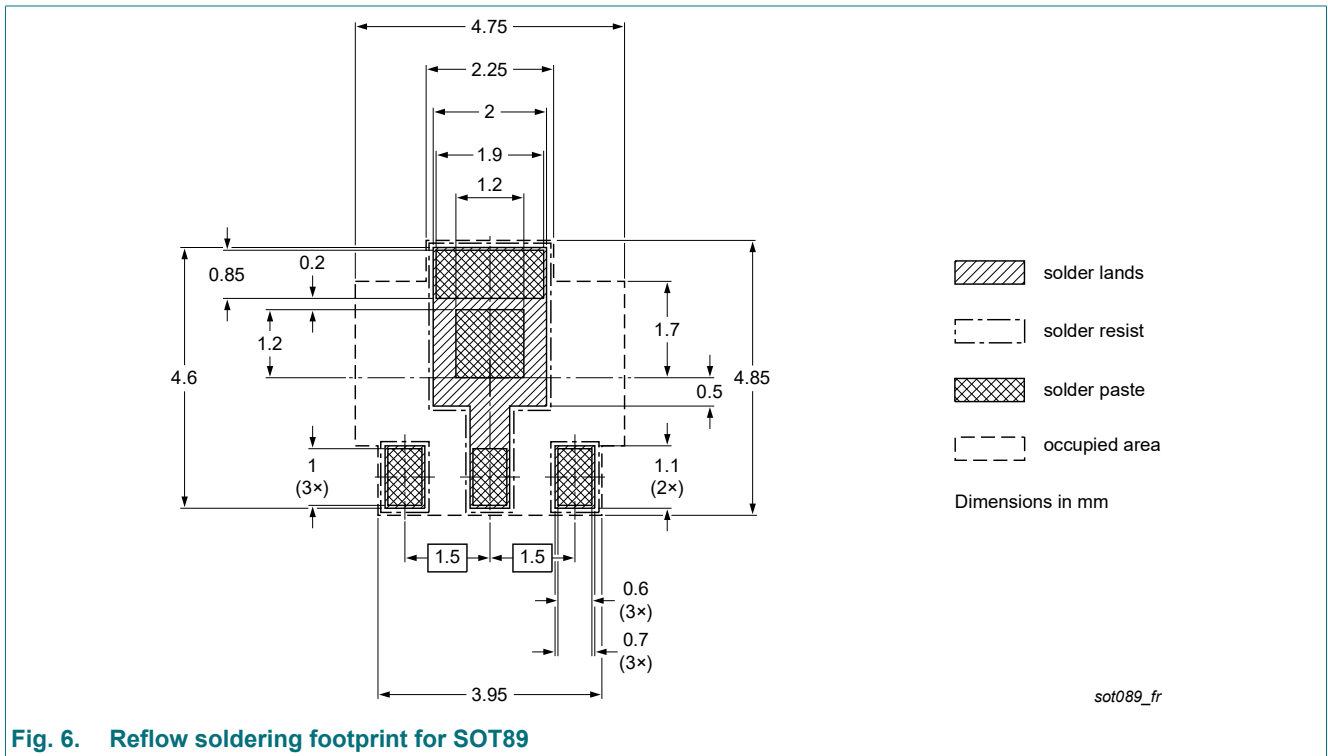


Fig. 6. Reflow soldering footprint for SOT89

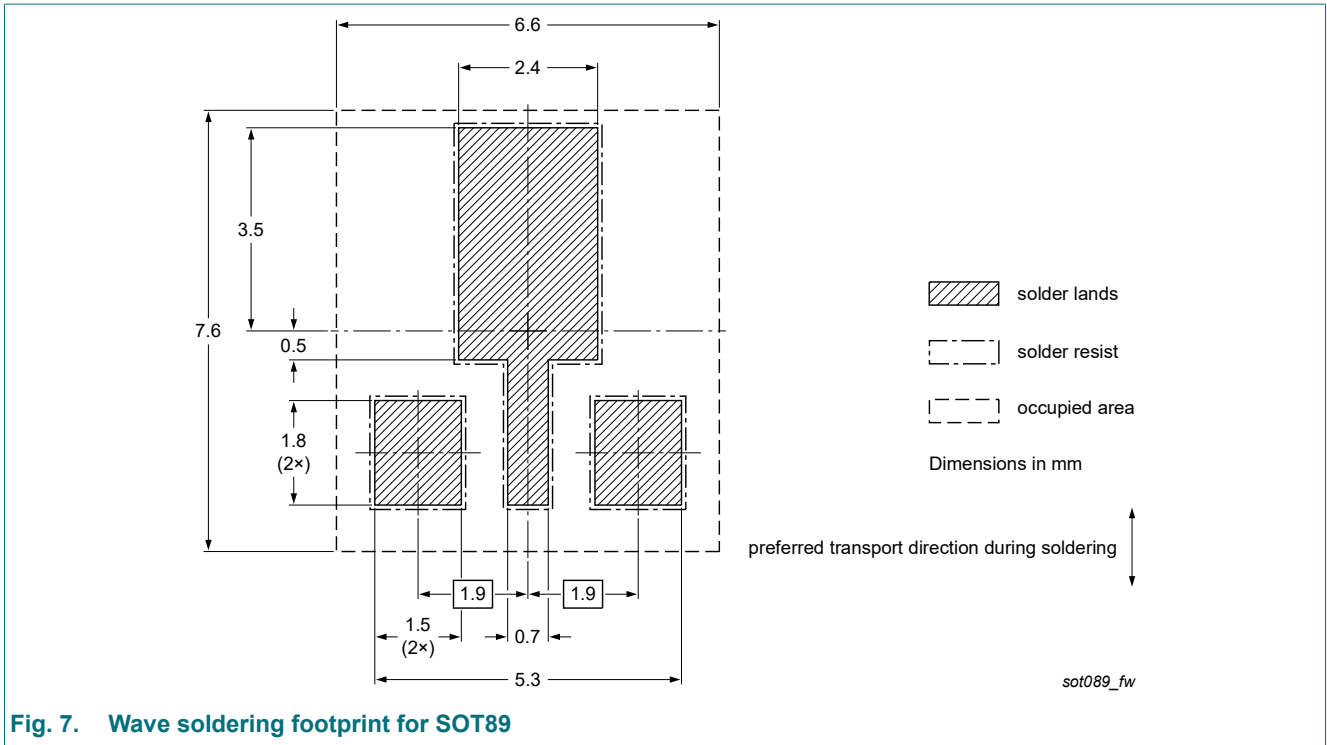


Fig. 7. Wave soldering footprint for SOT89

14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|---|--------------------|---------------|---------------|
| BF621 v.3 | 20230630 | Product data sheet | - | BF621_623 v.2 |
| Modifications: | <ul style="list-style-type: none">• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.• Legal texts have been adapted to the new company name where appropriate.• Family data sheet splitted to single type data sheets. | | | |
| BF621_623 v.2 | 20041214 | Product data sheet | - | BF621_623 v.1 |
| BF621_623 v.1 | 19990421 | 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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