

Important notice

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Should be replaced with:

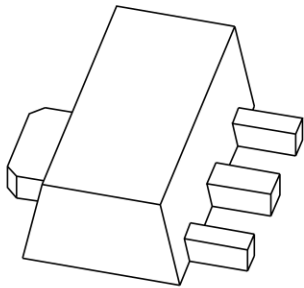
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Kind regards,

Team Nexperia

DATA SHEET



BF620; BF622 NPN high-voltage transistors

Product data sheet
Supersedes data of 1999 Apr 21

2004 Dec 14

NPN high-voltage transistors

BF620; BF622

FEATURES

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

APPLICATIONS

- Video output stages.

DESCRIPTION

NPN high-voltage transistor in a SOT89 plastic package.
PNP complements: BF621 and BF623.

MARKING

| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| BF620 | DC |
| BF622 | DA |

PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | emitter |
| 2 | collector |
| 3 | base |

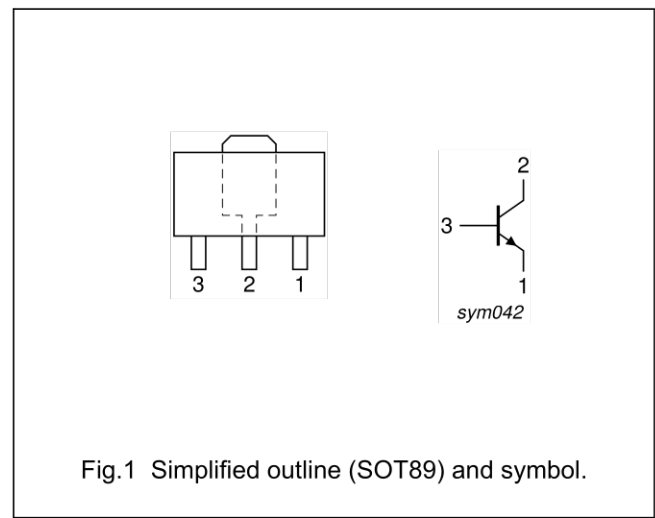


Fig.1 Simplified outline (SOT89) and symbol.

ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|-------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| BF620 | SC-62 | plastic surface mounted package; collector pad for good heat transfer; 3 leads | SOT89 |
| BF622 | | | |

NPN high-voltage transistors

BF620; BF622

LIMITING VALUES

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

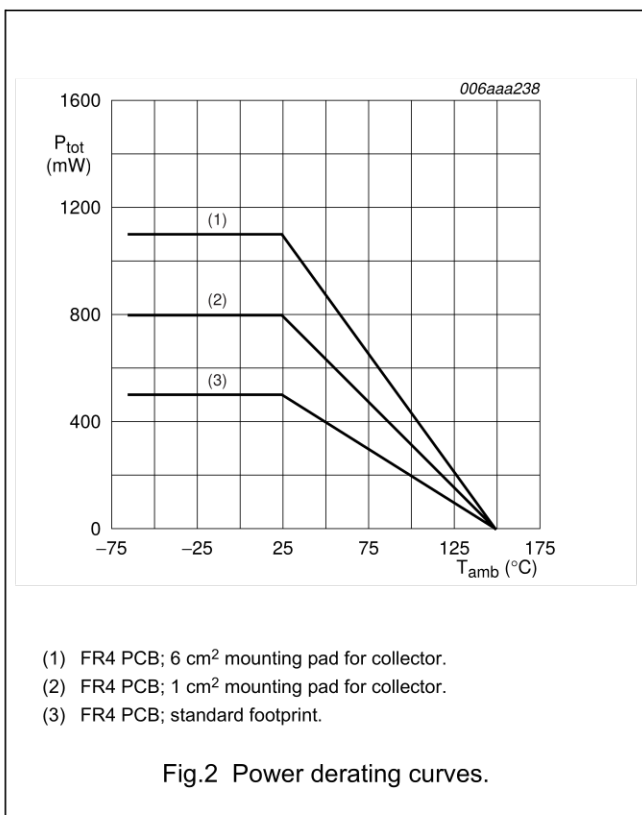
| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|---------------------------|--------------------------|------|------|------|
| V _{CBO} | collector-base voltage | open emitter | – | 300 | V |
| | BF620 | | | 250 | V |
| V _{CEO} | collector-emitter voltage | open base | – | 300 | V |
| | BF622 | | | 250 | V |
| V _{EBO} | emitter-base voltage | open collector | – | 5 | V |
| I _C | collector current (DC) | | – | 50 | mA |
| I _{CM} | peak collector current | | – | 100 | mA |
| I _{BM} | peak base current | | – | 50 | mA |
| P _{tot} | total power dissipation | T _{amb} ≤ 25 °C | – | 0.5 | W |
| | | note 1 | – | 0.8 | W |
| | | note 2 | – | 1.1 | W |
| | note 3 | – | | | |
| T _{stg} | storage temperature | | –65 | +150 | °C |
| T _j | junction temperature | | – | 150 | °C |
| T _{amb} | ambient temperature | | –65 | +150 | °C |

Notes

1. Device mounted on a printed-circuit board, single-sided copper, tin-plated and standard footprint.
2. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 1 cm².
3. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 6 cm².

NPN high-voltage transistors

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NPN high-voltage transistors

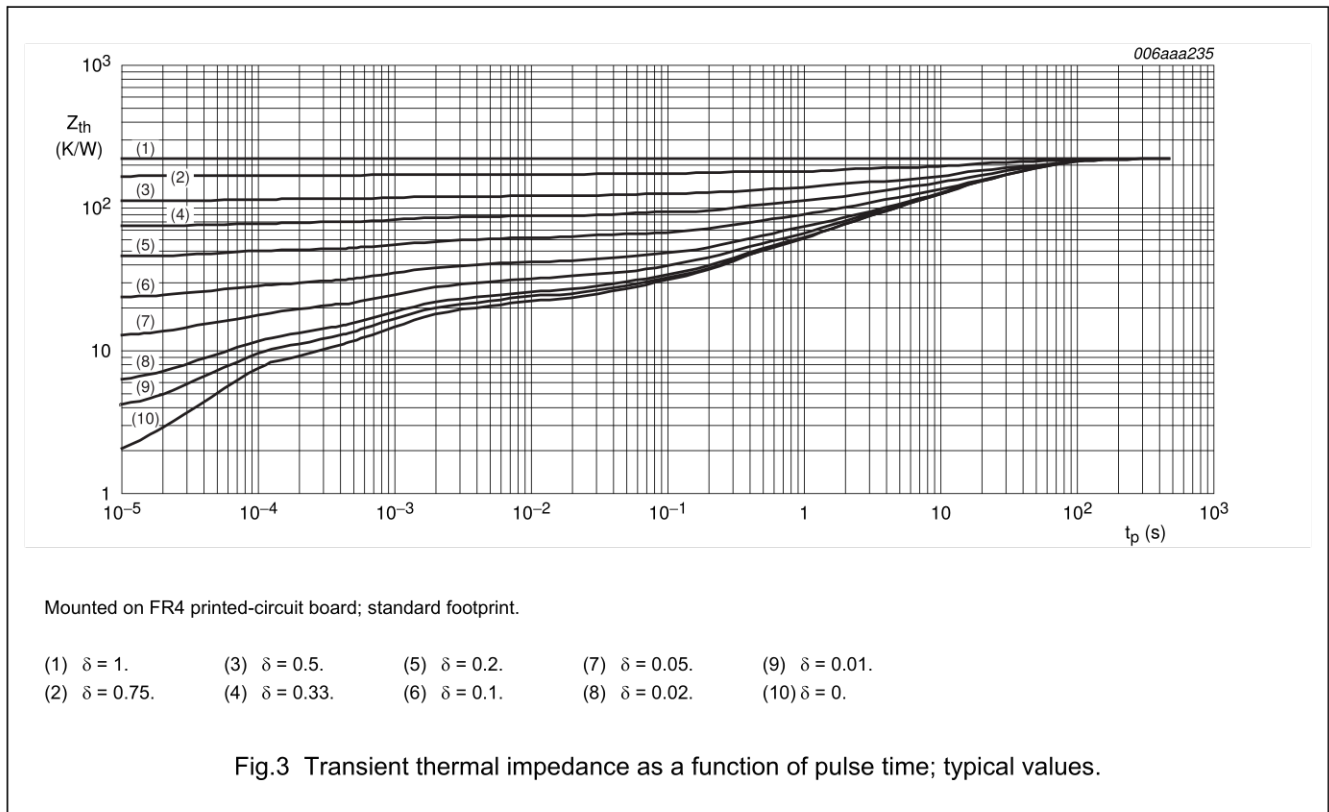
BF620; BF622

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------|---|-------------|-------|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | | |
| | | note 1 | 250 | K/W |
| | | note 2 | 156 | K/W |
| | | note 3 | 113 | K/W |
| $R_{th(j-s)}$ | thermal resistance from junction to soldering point | | 30 | K/W |

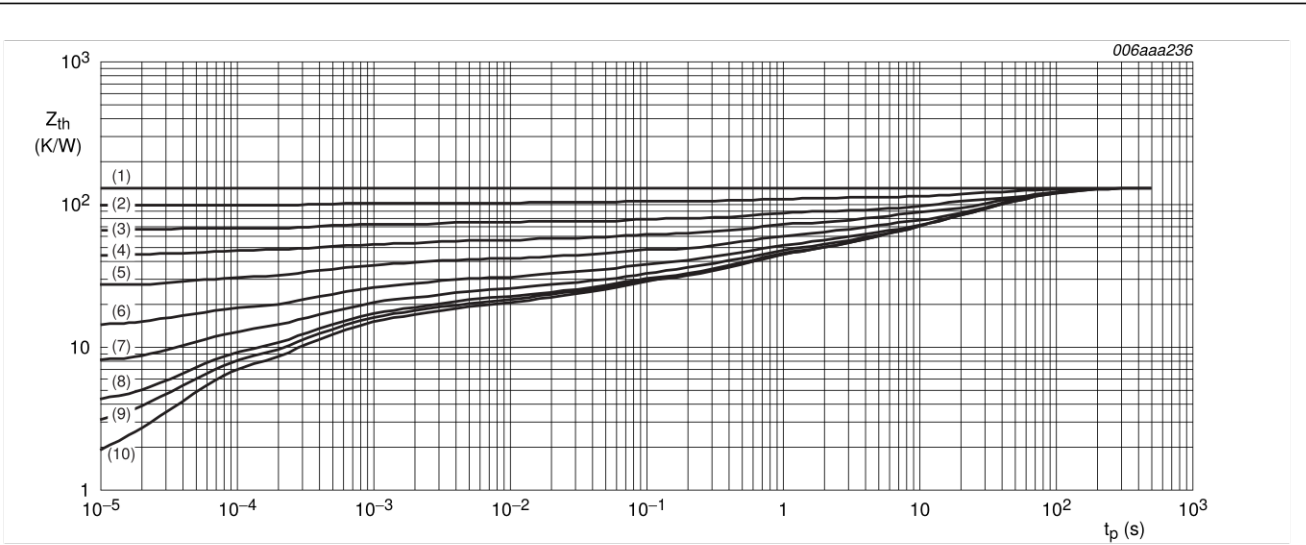
Notes

1. Device mounted on a printed-circuit board, single-sided copper, tin-plated and standard footprint.
2. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 1 cm².
3. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 6 cm².



NPN high-voltage transistors

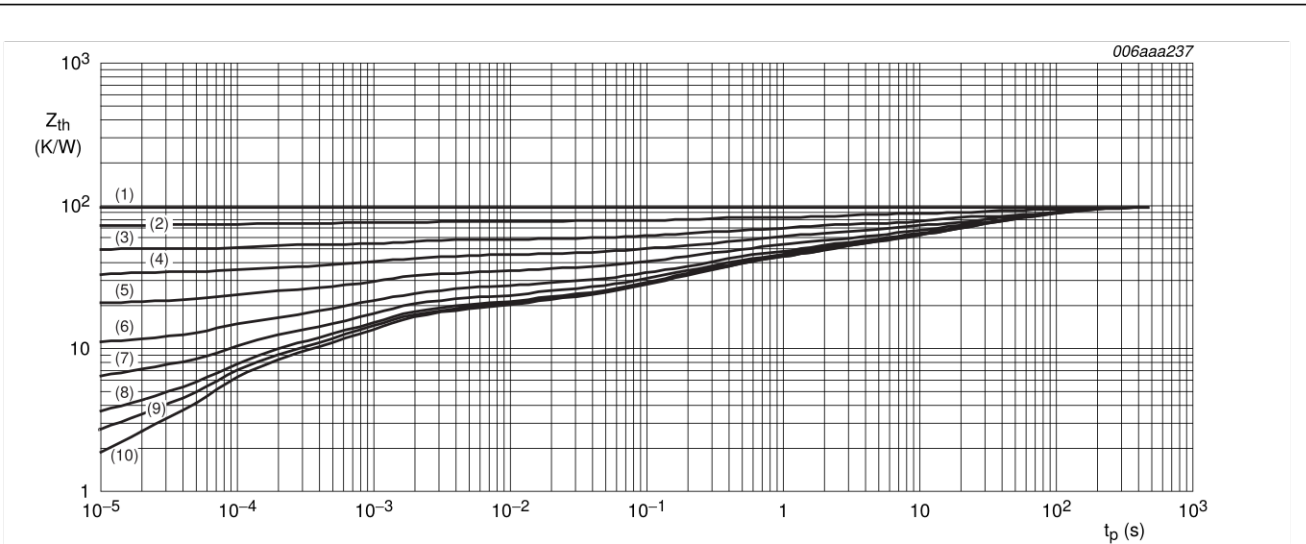
BF620; BF622



Mounted on FR4 printed-circuit board; mounting pad for collector 1 cm².

- (1) $\delta = 1.$ (3) $\delta = 0.5.$ (5) $\delta = 0.2.$ (7) $\delta = 0.05.$ (9) $\delta = 0.01.$
- (2) $\delta = 0.75.$ (4) $\delta = 0.33.$ (6) $\delta = 0.1.$ (8) $\delta = 0.02.$ (10) $\delta = 0.$

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



Mounted on FR4 printed-circuit board; mounting pad for collector 6 cm².

- (1) $\delta = 1.$ (3) $\delta = 0.5.$ (5) $\delta = 0.2.$ (7) $\delta = 0.05.$ (9) $\delta = 0.01.$
- (2) $\delta = 0.75.$ (4) $\delta = 0.33.$ (6) $\delta = 0.1.$ (8) $\delta = 0.02.$ (10) $\delta = 0.$

Fig.5 Transient thermal impedance as a function of pulse time; typical values.

NPN high-voltage transistors

BF620; BF622

CHARACTERISTICS $T_{amb} = 25\text{ °C}$ unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-------------|--------------------------------------|--|------|------|---------------|
| I_{CBO} | collector-base cut-off current | $I_E = 0\text{ A}; V_{CB} = 200\text{ V}$ | – | 10 | nA |
| | | $I_E = 0\text{ A}; V_{CB} = 200\text{ V}; T_j = 150\text{ °C}$ | – | 10 | μA |
| I_{EBO} | emitter-base cut-off current | $I_C = 0\text{ A}; V_{EB} = 5\text{ V}$ | – | 50 | nA |
| h_{FE} | DC current gain | $I_C = 25\text{ mA}; V_{CE} = 20\text{ V}$ | 50 | – | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 30\text{ mA}; I_B = 5\text{ mA}$ | – | 600 | mV |
| C_{re} | feedback capacitance | $I_C = i_c = 0\text{ A}; V_{CE} = 30\text{ V}; f = 1\text{ MHz}$ | – | 1.6 | pF |
| f_T | transition frequency | $I_C = -10\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$ | 60 | – | MHz |

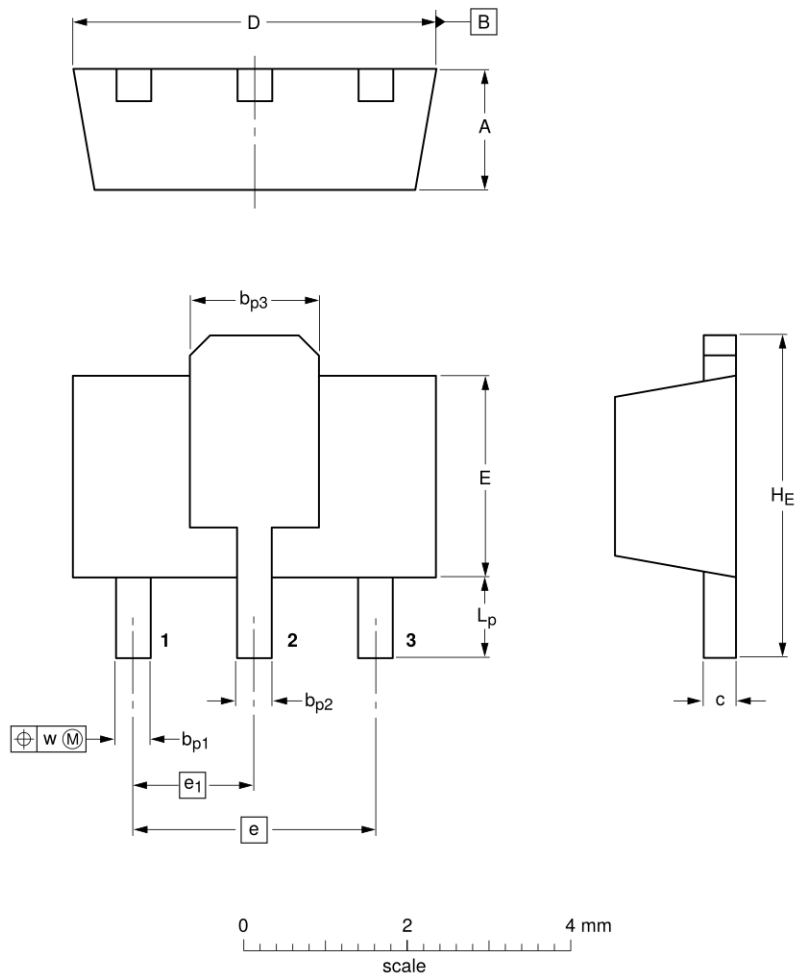
NPN high-voltage transistors

BF620; BF622

PACKAGE OUTLINE

Plastic surface-mounted package; collector pad for good heat transfer; 3 leads

SOT89



DIMENSIONS (mm are the original dimensions)

| UNIT | A | b _{p1} | b _{p2} | b _{p3} | c | D | E | e | e ₁ | H _E | L _p | w |
|------|------------|-----------------|-----------------|-----------------|--------------|------------|------------|-----|----------------|----------------|----------------|------|
| mm | 1.6 1.4 | 0.48 0.35 | 0.53 0.40 | 1.8 1.4 | 0.44 0.23 | 4.6 4.4 | 2.6 2.4 | 3.0 | 1.5 | 4.25 3.75 | 1.2 0.8 | 0.13 |

| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|--------|-------|---------------------|----------------------|
| | IEC | JEDEC | JEITA | | |
| SOT89 | | TO-243 | SC-62 | | 04-08-03 06-03-16 |

NPN high-voltage transistors

BF620; BF622

DATA SHEET STATUS

| DOCUMENT STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | DEFINITION |
|--------------------------------|-------------------------------|---|
| Objective data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary data sheet | Qualification | This document contains data from the preliminary specification. |
| Product data sheet | Production | This document contains the product specification. |

Notes

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2. 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 URL <http://www.nxp.com>.

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NXP Semiconductors

Customer notification

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

Contact information

For additional information please visit: <http://www.nxp.com>

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