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Should be replaced with:

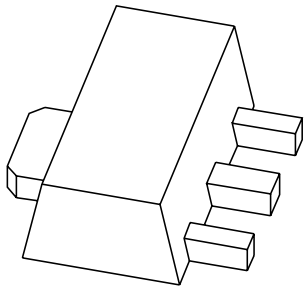
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Kind regards,

Team Nexperia

# DATA SHEET



## **BF621; BF623** PNP high-voltage transistors

Product data sheet  
Supersedes data of 1999 Apr 21

2004 Dec 14

## PNP high-voltage transistors

## BF621; BF623

## FEATURES

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

## APPLICATIONS

- Video output stages.

## DESCRIPTION

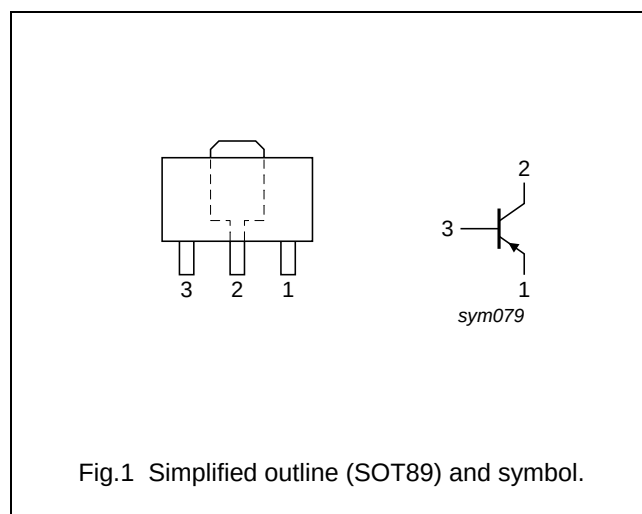
PNP high-voltage transistor in a SOT89 plastic package.  
NPN complements: BF620 and BF622.

## MARKING

| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| BF621       | DF           |
| BF623       | DB           |

## PINNING

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



## ORDERING INFORMATION

| TYPE NUMBER | PACKAGE |                                                                                |         |
|-------------|---------|--------------------------------------------------------------------------------|---------|
|             | NAME    | DESCRIPTION                                                                    | VERSION |
| BF621       | SC-62   | plastic surface mounted package; collector pad for good heat transfer; 3 leads | SOT89   |
| BF623       |         |                                                                                |         |

## PNP high-voltage transistors

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**LIMITING VALUES**

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

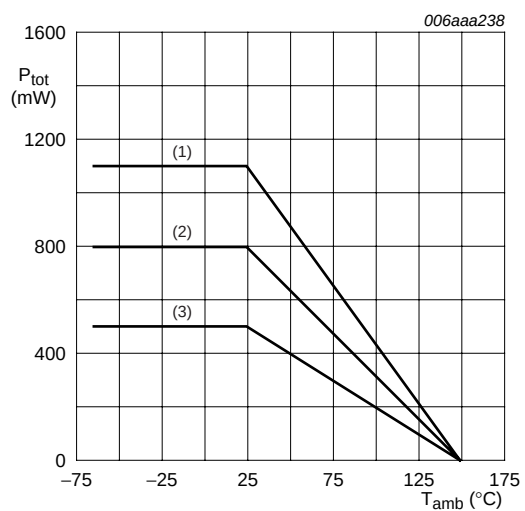
| SYMBOL           | PARAMETER                 | CONDITIONS               | MIN. | MAX. | UNIT |
|------------------|---------------------------|--------------------------|------|------|------|
| V <sub>CBO</sub> | collector-base voltage    | open emitter             | –    | –300 | V    |
|                  | BF621<br>BF623            |                          |      | –250 | V    |
| V <sub>CEO</sub> | collector-emitter voltage | open base                | –    | –300 | V    |
|                  | BF621<br>BF623            |                          |      | –250 | V    |
| V <sub>EBO</sub> | emitter-base voltage      | open collector           | –    | –5   | V    |
| I <sub>C</sub>   | collector current (DC)    |                          | –    | –50  | mA   |
| I <sub>CM</sub>  | peak collector current    |                          | –    | –100 | mA   |
| I <sub>BM</sub>  | peak base current         |                          | –    | –50  | mA   |
| P <sub>tot</sub> | total power dissipation   | T <sub>amb</sub> ≤ 25 °C |      |      |      |
|                  |                           | note 1                   | –    | 0.5  | W    |
|                  |                           | note 2                   | –    | 0.8  | W    |
|                  |                           | note 3                   | –    | 1.1  | W    |
| T <sub>stg</sub> | storage temperature       |                          | –65  | +150 | °C   |
| T <sub>j</sub>   | junction temperature      |                          | –    | 150  | °C   |
| T <sub>amb</sub> | 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 cm<sup>2</sup>.
3. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 6 cm<sup>2</sup>.

## PNP high-voltage transistors

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- (1) FR4 PCB; 6 cm<sup>2</sup> mounting pad for collector.  
(2) FR4 PCB; 1 cm<sup>2</sup> mounting pad for collector.  
(3) FR4 PCB; standard footprint.

Fig.2 Power derating curves.

PNP high-voltage transistors

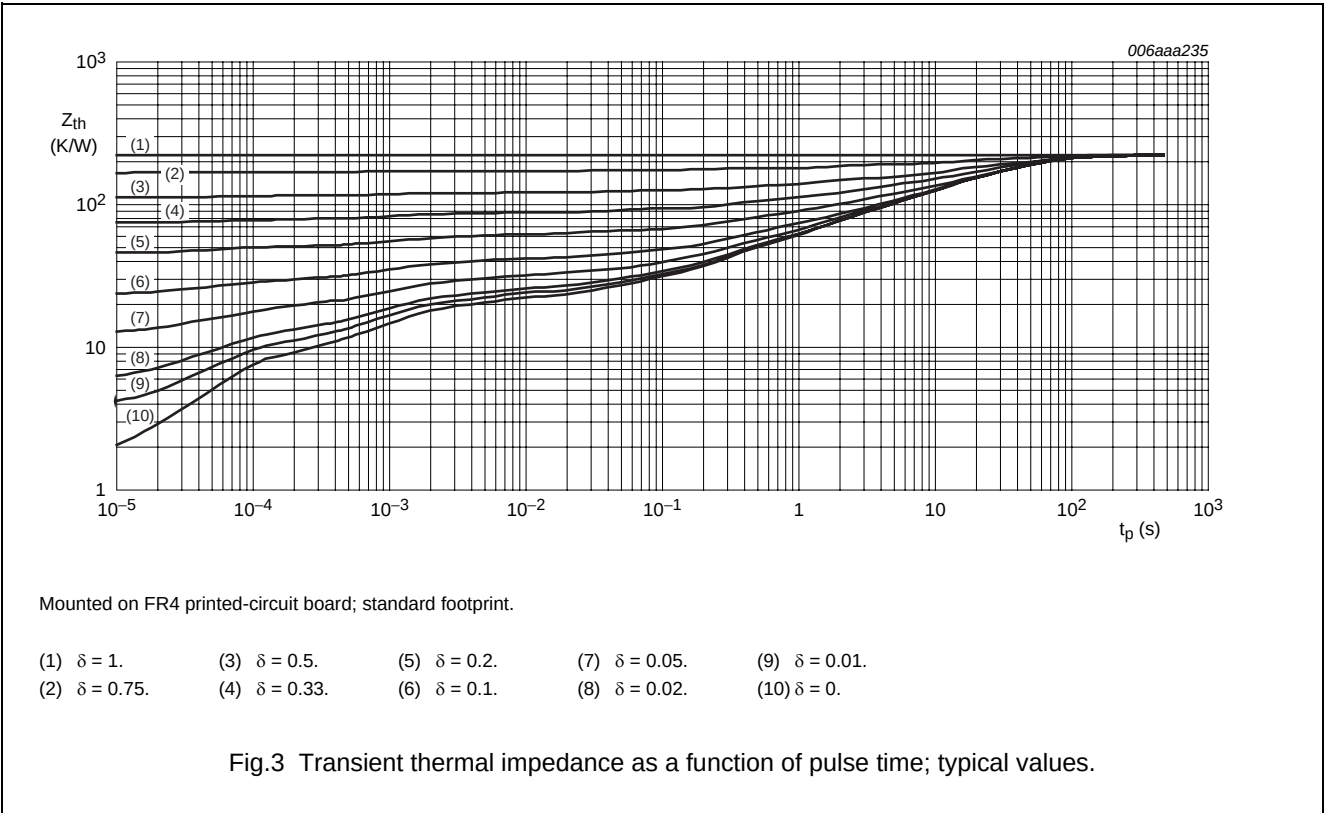
BF621; BF623

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  |

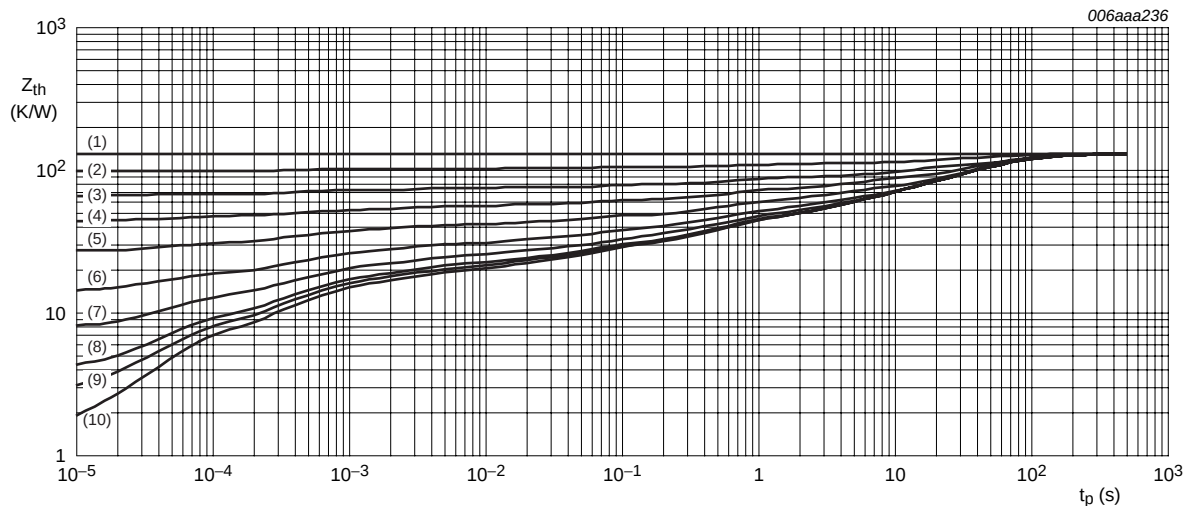
Notes

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 cm<sup>2</sup>.
3. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 6 cm<sup>2</sup>.



## PNP high-voltage transistors

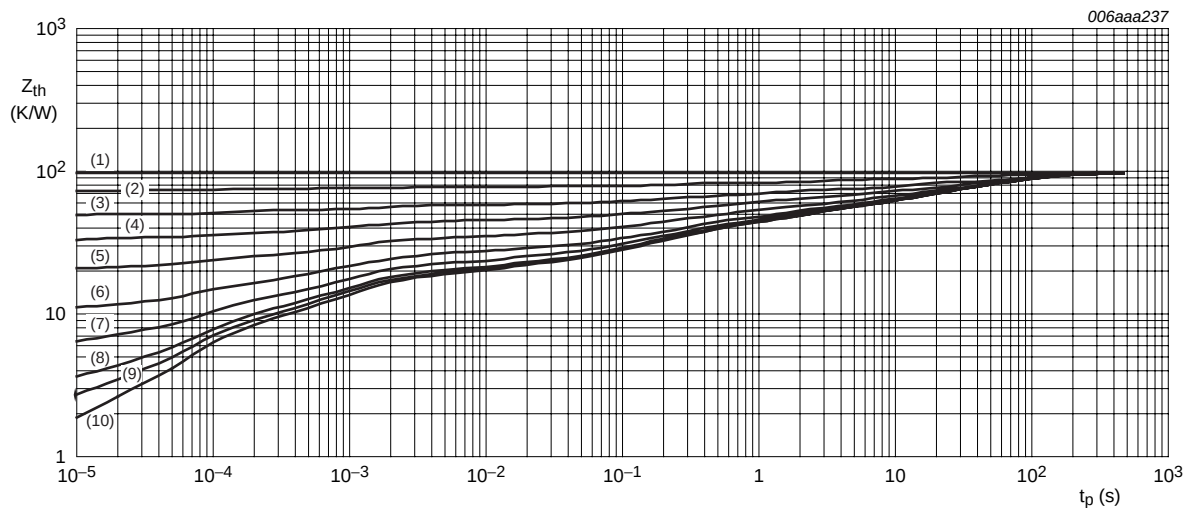
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Mounted on FR4 printed-circuit board; mounting pad for collector 1 cm<sup>2</sup>.

- |                      |                      |                     |                      |                      |
|----------------------|----------------------|---------------------|----------------------|----------------------|
| (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 cm<sup>2</sup>.

- |                      |                      |                     |                      |                      |
|----------------------|----------------------|---------------------|----------------------|----------------------|
| (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.

## PNP high-voltage transistors

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**CHARACTERISTICS** $T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

| SYMBOL             | PARAMETER                            | CONDITIONS                                                                                             | MIN. | MAX. | UNIT          |
|--------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------|------|------|---------------|
| $I_{\text{CBO}}$   | collector-base cut-off current       | $I_{\text{E}} = 0\text{ A}; V_{\text{CB}} = -200\text{ V}$                                             | –    | –10  | nA            |
|                    |                                      | $I_{\text{E}} = 0\text{ A}; V_{\text{CB}} = -200\text{ V}; T_{\text{J}} = 150\text{ }^{\circ}\text{C}$ | –    | –10  | $\mu\text{A}$ |
| $I_{\text{EBO}}$   | emitter-base cut-off current         | $I_{\text{C}} = 0\text{ A}; V_{\text{EB}} = -5\text{ V}$                                               | –    | –50  | nA            |
| $h_{\text{FE}}$    | DC current gain                      | $I_{\text{C}} = -25\text{ mA}; V_{\text{CE}} = -20\text{ V}$                                           | 50   | –    |               |
| $V_{\text{CEsat}}$ | collector-emitter saturation voltage | $I_{\text{C}} = -30\text{ mA}; I_{\text{B}} = -5\text{ mA}$                                            | –    | –800 | mV            |
| $C_{\text{re}}$    | feedback capacitance                 | $I_{\text{C}} = i_{\text{c}} = 0\text{ A}; V_{\text{CE}} = -30\text{ V}; f = 1\text{ MHz}$             | –    | 1.6  | pF            |
| $f_{\text{T}}$     | transition frequency                 | $I_{\text{C}} = -10\text{ mA}; V_{\text{CE}} = -10\text{ V}; f = 100\text{ MHz}$                       | 60   | –    | MHz           |



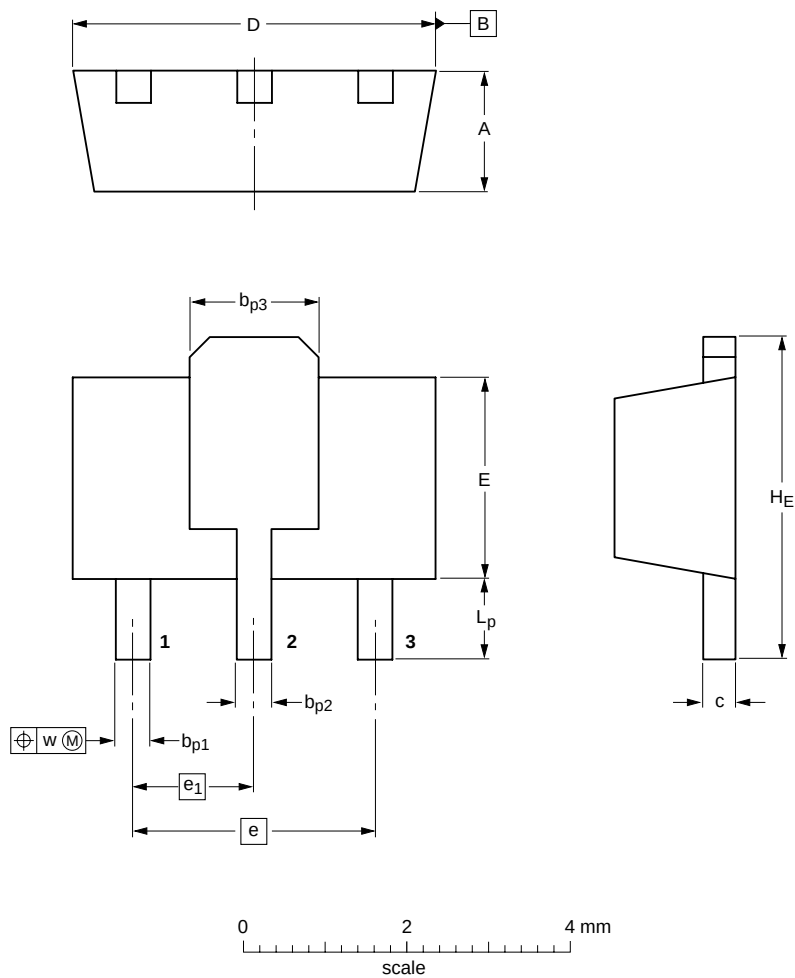
PNP high-voltage transistors

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PACKAGE OUTLINE

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

SOT89



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | b <sub>p1</sub> | b <sub>p2</sub> | b <sub>p3</sub> | c            | D          | E          | e   | e <sub>1</sub> | H <sub>E</sub> | L <sub>p</sub> | w    |
|------|------------|-----------------|-----------------|-----------------|--------------|------------|------------|-----|----------------|----------------|----------------|------|
| mm   | 1.6<br>1.4 | 0.48<br>0.35    | 0.53<br>0.40    | 1.8<br>1.4      | 0.44<br>0.23 | 4.6<br>4.4 | 2.6<br>2.4 | 3.0 | 1.5            | 4.25<br>3.75   | 1.2<br>0.8     | 0.13 |

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

## PNP high-voltage transistors

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## DATA SHEET STATUS

| DOCUMENT STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)</sup> | 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

1. Please consult the most recently issued document before initiating or completing a design.
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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## **Contact information**

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

For sales offices addresses send e-mail to: [salesaddresses@nxp.com](mailto:salesaddresses@nxp.com)

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