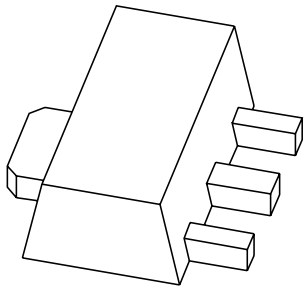


# DATA SHEET



## **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

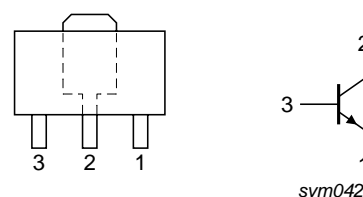


Fig.1 Simplified outline (SOT89) and symbol.

## 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).

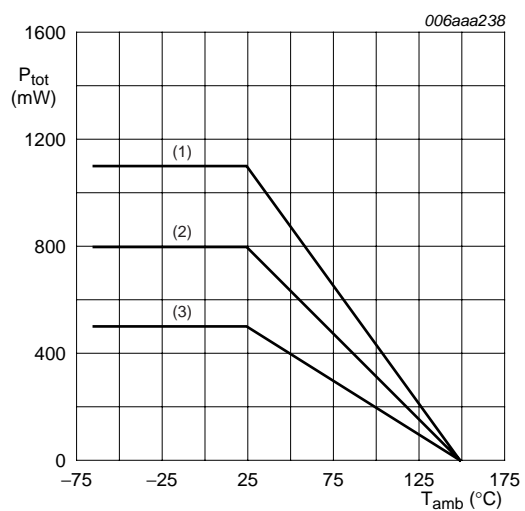
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter			
	BF620		–	300	V
	BF622		–	250	V
V <sub>CEO</sub>	collector-emitter voltage	open base			
	BF620		–	300	V
	BF622		–	250	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	5	V
I <sub>C</sub>	collector 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>.

## NPN high-voltage transistors

BF620; BF622



- (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.

NPN high-voltage transistors

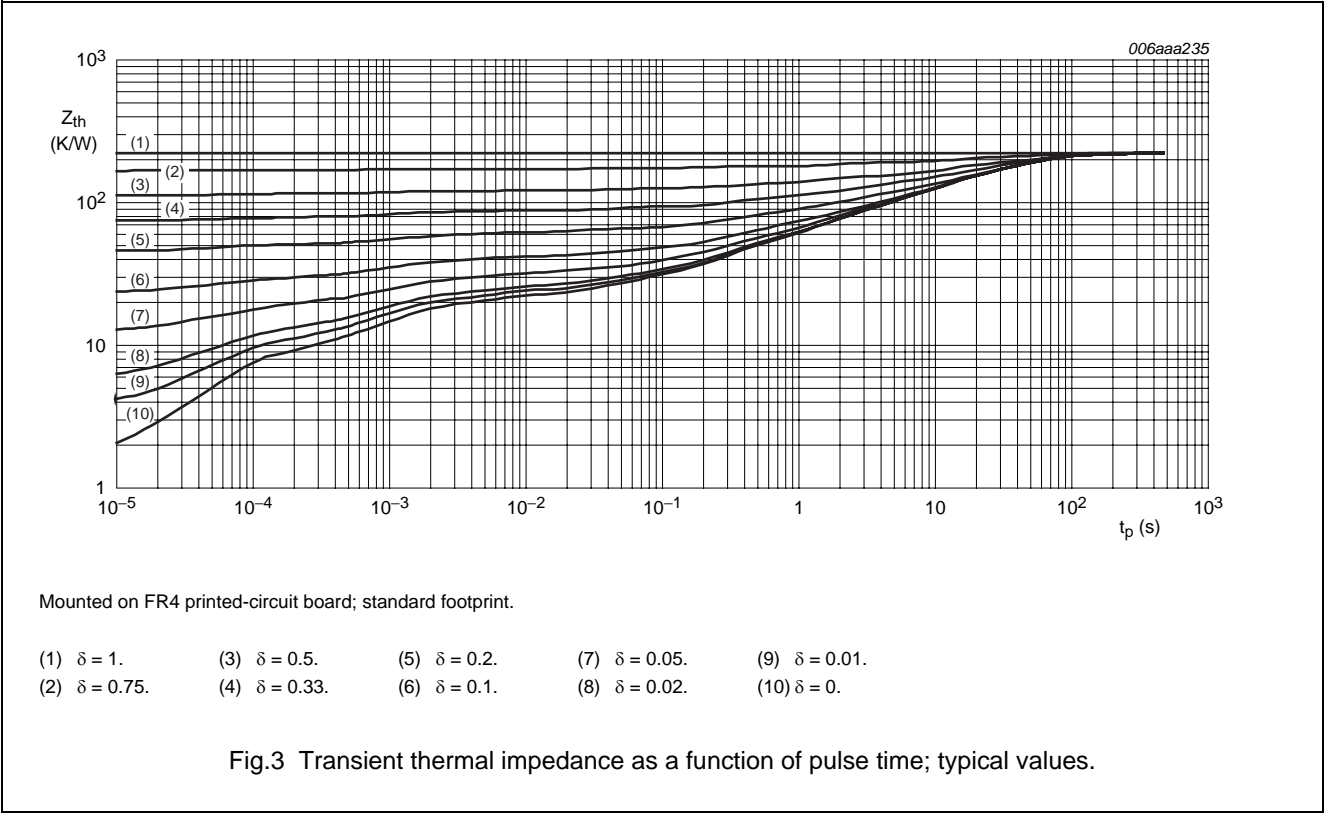
BF620; BF622

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

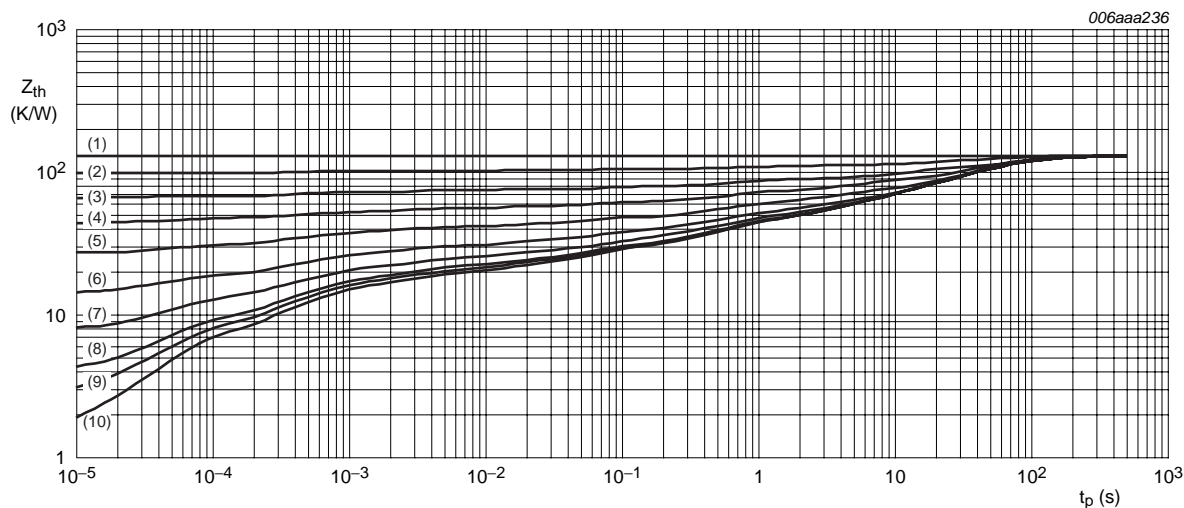
Notes

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 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>.



## NPN high-voltage transistors

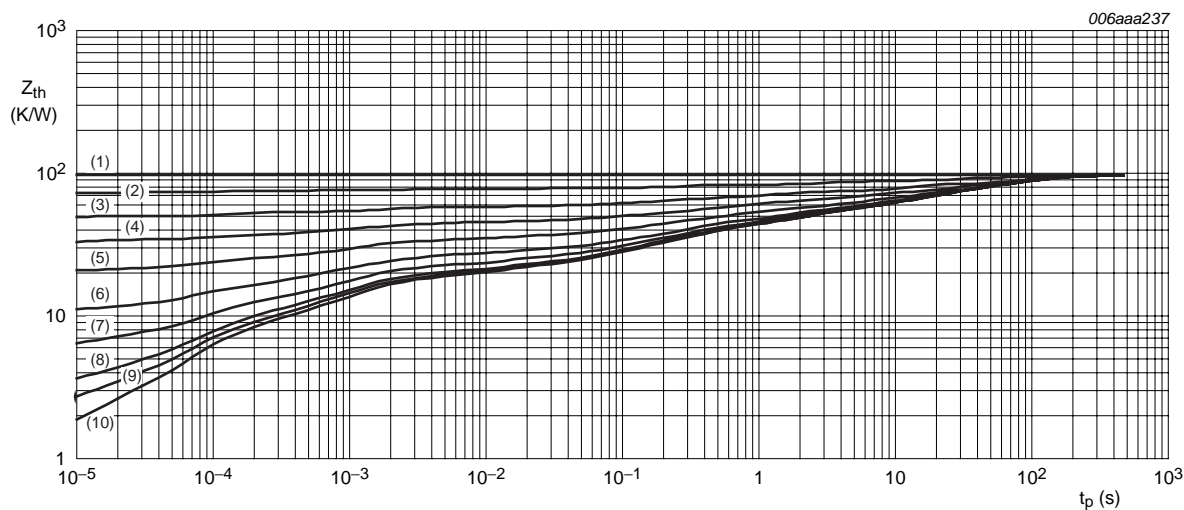
BF620; BF622



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**

$T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$  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	$I_{\text{C}} = 30\text{ mA}; I_{\text{B}} = 5\text{ mA}$	–	600	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

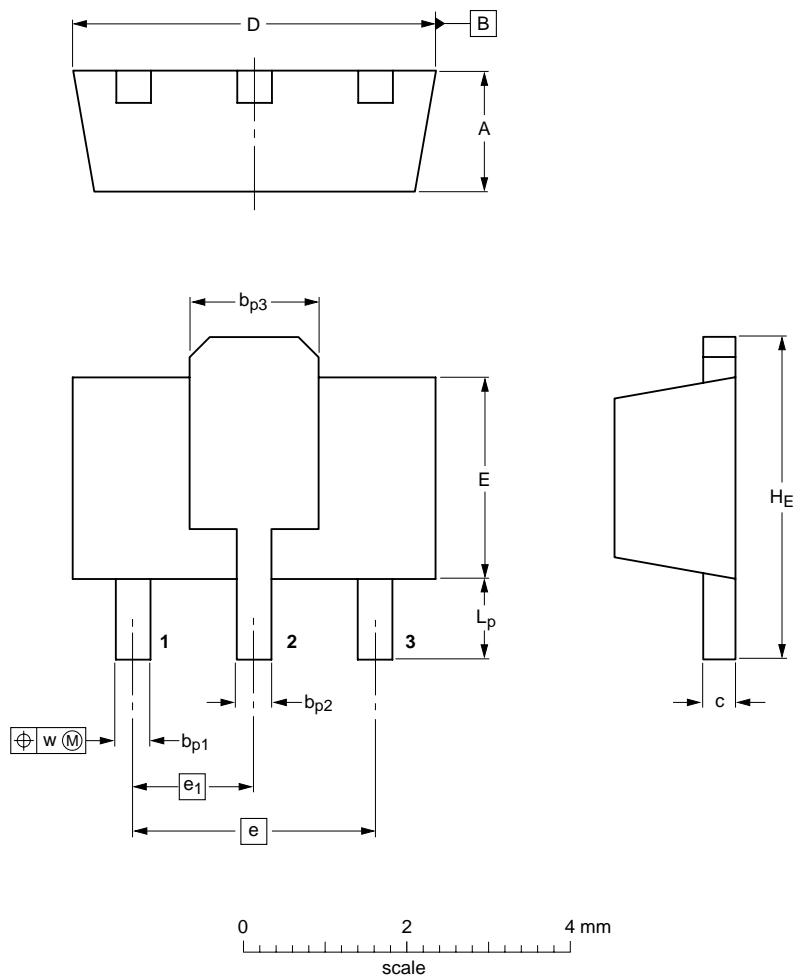
NPN high-voltage transistors

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	bp1	bp2	bp3	c	D	E	e	e1	HE	Lp	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 <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

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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**

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