

# DATA SHEET

## **BFQ166** NPN video transistor

Product specification  
Supersedes data of November 1995  
File under Discrete Semiconductors, SC05

1997 Oct 02

## NPN video transistor

## BFQ166

## FEATURES

- Low output capacitance
- High gain bandwidth
- Good thermal stability
- Gold metallization ensures excellent reliability
- High current applicability
- Surface mounting.

## APPLICATIONS

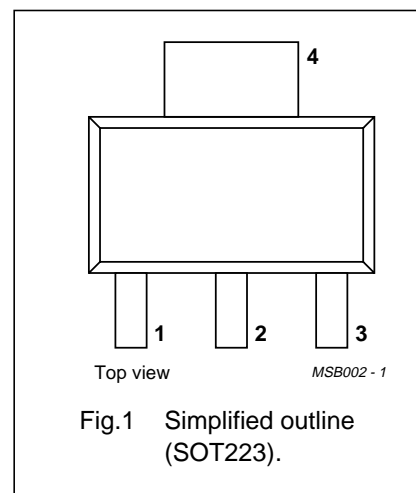
- Video amplifier cascode driver in high-resolution colour graphics monitors.

## DESCRIPTION

NPN video transistor in a SOT223 plastic package.

## PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	emitter
4	collector



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	–	20	V
$V_{CER}$	collector-emitter voltage	$R_{BE} = 100 \Omega$	–	–	19	V
$I_C$	collector current (DC)		–	–	500	mA
$P_{tot}$	total power dissipation	$T_s \leq 105 \text{ }^\circ\text{C}$ ; note 1	–	–	2	W
$h_{FE}$	DC current gain	$I_C = 300 \text{ mA}$ ; $V_{CE} = 5 \text{ V}$ ; see Fig.4	50	60	–	
$f_T$	transition frequency	$I_C = 300 \text{ mA}$ ; $V_{CE} = 5 \text{ V}$ ; $f = 100 \text{ MHz}$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$	1	–	–	GHz

## Note

1.  $T_s$  is the temperature at the soldering point of the collector lead.

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	20	V
$V_{CEO}$	collector-emitter voltage	open base	–	10	V
$V_{CER}$	collector-emitter voltage	$R_{BE} = 100 \Omega$	–	19	V
$V_{EBO}$	emitter-base voltage	open collector	–	3	V
$I_C$	collector current (DC)		–	500	mA
$P_{tot}$	total power dissipation	$T_s \leq 105 \text{ }^\circ\text{C}$ ; note 1; see Fig.3	–	2	W
$T_{stg}$	storage temperature		–65	+150	$^\circ\text{C}$
$T_j$	junction temperature		–	175	$^\circ\text{C}$

## Note

1.  $T_s$  is the temperature at the soldering point of the collector lead.

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## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-s}$	thermal resistance from junction to soldering point	$T_s = 105\text{ °C}$ ; $P_{tot} = 2\text{ W}$ ; notes 1 and 2	35	K/W

## Notes

- $T_s$  is the temperature at the soldering point of the collector lead.
- Device mounted on a printed-circuit board measuring  $40 \times 40 \times 1\text{ mm}$  (collector pad  $35 \times 17\text{ mm}$ ).

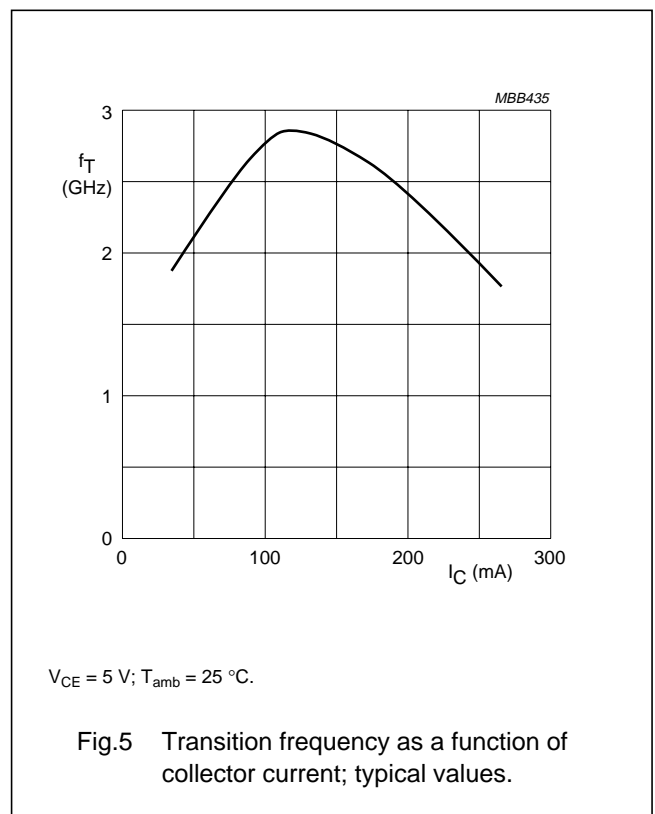
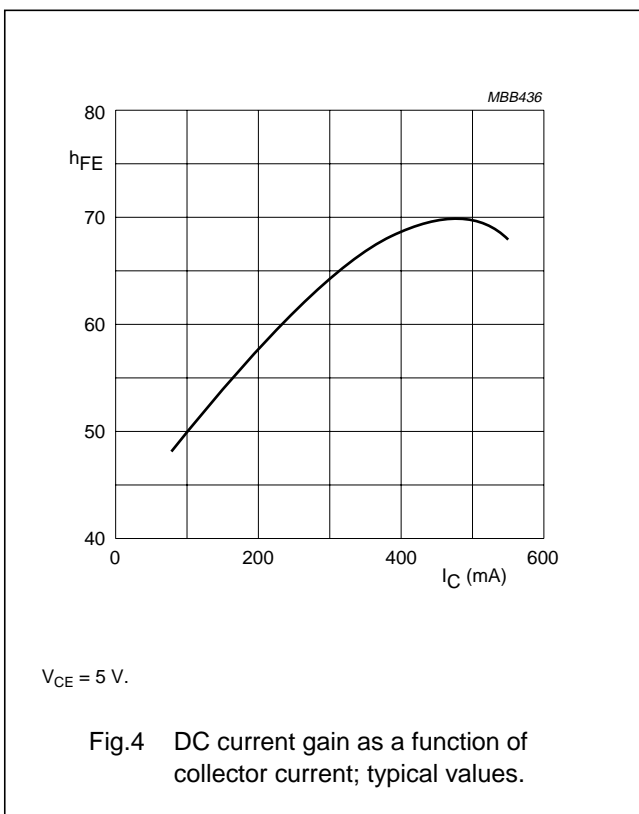
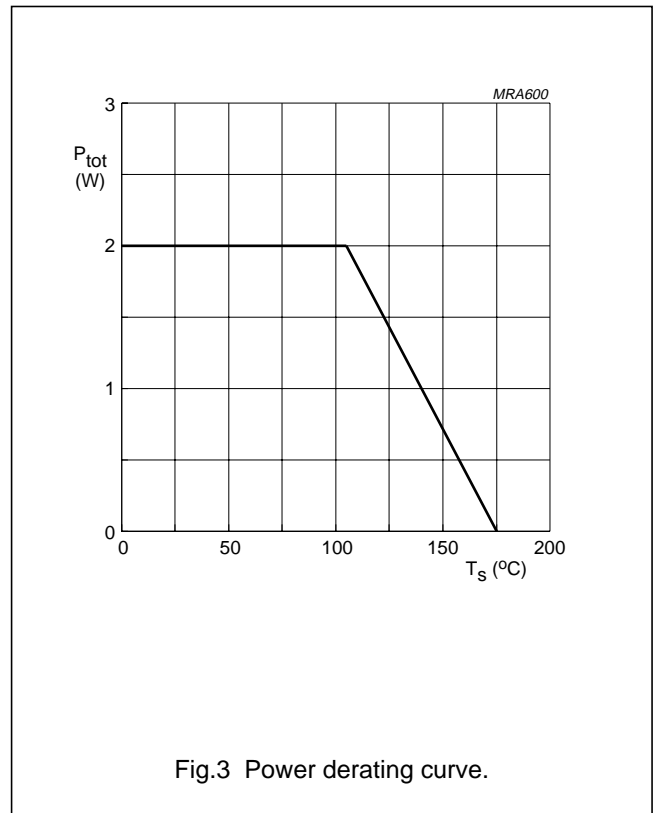
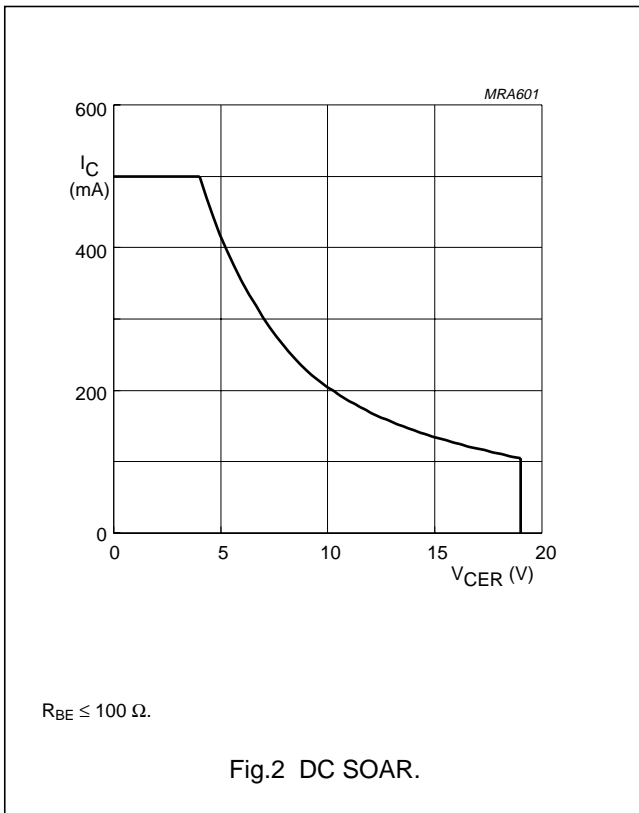
## CHARACTERISTICS

$T_j = 25\text{ °C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = 5\text{ mA}$ ; $I_E = 0$	20	–	–	V
$V_{(BR)CER}$	collector-emitter breakdown voltage	$I_C = 10\text{ mA}$ ; $R_{BE} = 100\ \Omega$	19	–	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	$I_C = 10\text{ mA}$ ; $I_B = 0$	10	–	–	V
$I_{CES}$	collector-emitter cut-off current	$V_{CE} = 10\text{ V}$ ; $V_{BE} = 0$	–	–	100	$\mu\text{A}$
$h_{FE}$	DC current gain	$I_C = 300\text{ mA}$ ; $V_{CE} = 5\text{ V}$ ; see Fig.4	50	60	–	
$C_c$	collector capacitance	$I_E = i_e = 0$ ; $V_{CB} = 5\text{ V}$ ; $f = 1\text{ MHz}$	–	4.5	–	pF
$C_{cb}$	collector-base capacitance	$I_C = i_c = 0$ ; $V_{CB} = 5\text{ V}$ ; $f = 1\text{ MHz}$ ; see Fig.6	–	3.2	–	pF
$f_T$	transition frequency	$I_C = 300\text{ mA}$ ; $V_{CE} = 5\text{ V}$ ; $f = 100\text{ MHz}$ ; $T_{amb} = 25\text{ °C}$ ; see Fig.5	1	–	–	GHz

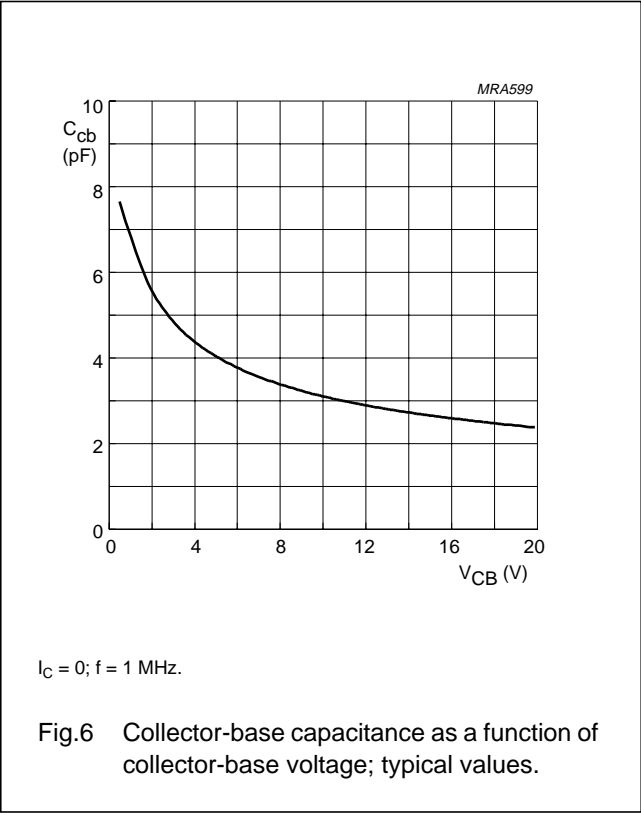
NPN video transistor

BFQ166



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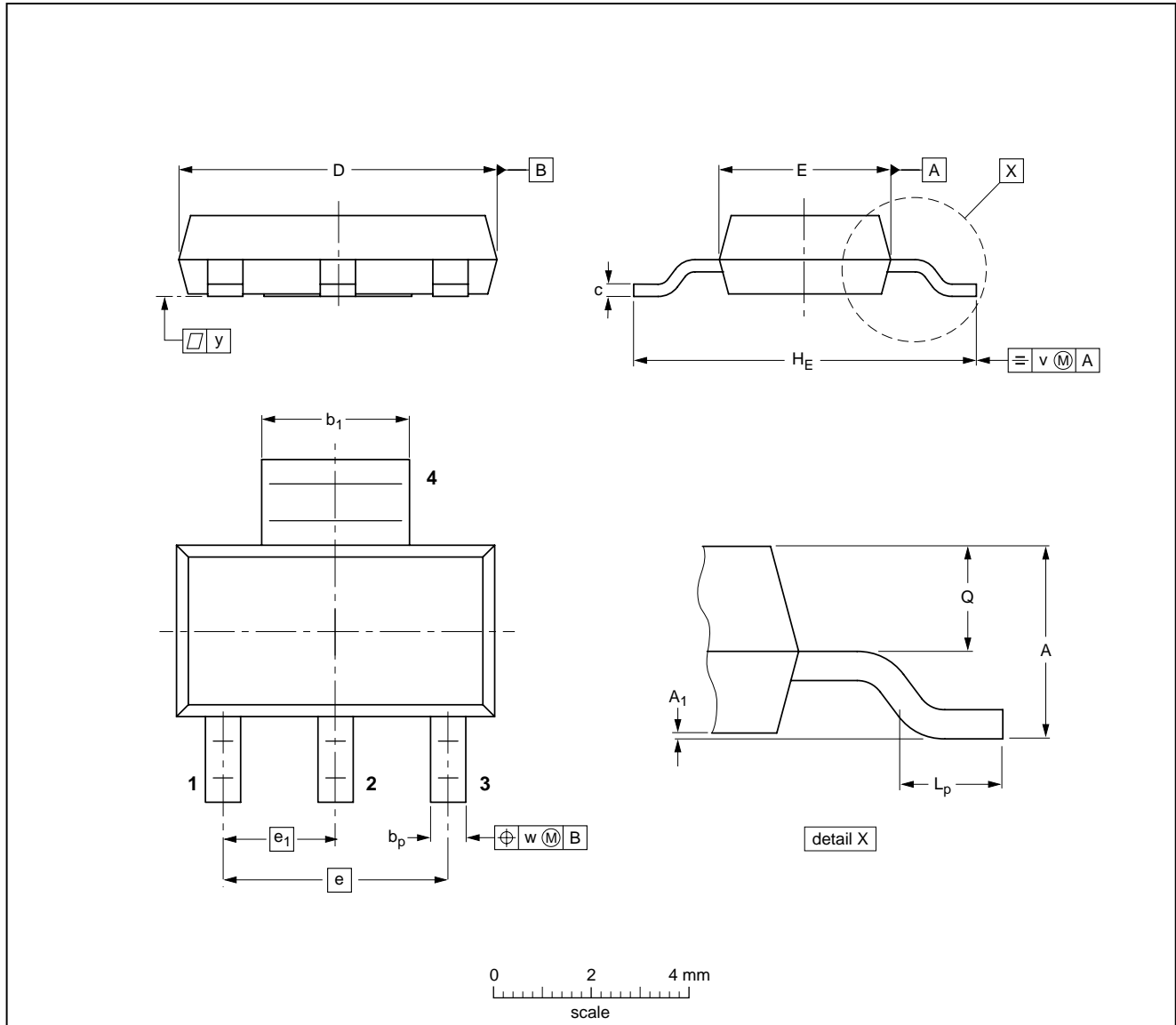
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PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads

SOT223



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub>	b <sub>p</sub>	b <sub>1</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	Q	v	w	y
mm	1.8 1.5	0.10 0.01	0.80 0.60	3.1 2.9	0.32 0.22	6.7 6.3	3.7 3.3	4.6	2.3	7.3 6.7	1.1 0.7	0.95 0.85	0.2	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT223						96-11-11 97-02-28

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<b>Data sheet status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
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