

# DATA SHEET

## **BFQ236; BFQ236A** NPN video transistors

Product specification  
Supersedes data of November 1992  
File under Discrete Semiconductors, SC05

1997 Oct 02

## NPN video transistors

## BFQ236; BFQ236A

### FEATURES

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

### APPLICATIONS

- CRT amplifier buffer/driver in high-resolution colour graphics monitors.

### DESCRIPTION

NPN video transistor in a SOT223 plastic package. PNP complements: BFQ256 and BFQ256A.

### PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	emitter
4	collector

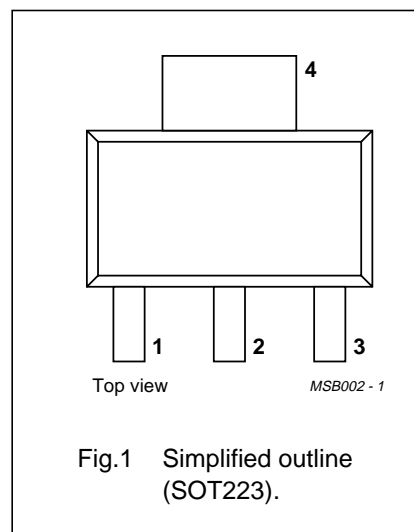


Fig.1 Simplified outline (SOT223).

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter				
	BFQ236		–	–	100	V
	BFQ236A		–	–	115	V
$V_{CER}$	collector-emitter voltage	$R_{BE} = 100 \Omega$				
	BFQ236		–	–	95	V
	BFQ236A		–	–	110	V
$I_C$	collector current (DC)		–	–	300	mA
$P_{tot}$	total power dissipation	$T_s \leq 115 \text{ }^\circ\text{C}$ ; note 1	–	–	2	W
$h_{FE}$	DC current gain	$I_C = 50 \text{ mA}$ ; $V_{CE} = 10 \text{ V}$ ; see Fig.4	20	35	–	
$f_T$	transition frequency	$I_C = 50 \text{ mA}$ ; $V_{CE} = 10 \text{ V}$ ; $f = 100 \text{ MHz}$				
	BFQ236		1	1.4	–	GHz
	BFQ236A		0.8	1.2	–	GHz

### Note

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

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**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter	–	100	V
	BFQ236 BFQ236A			115	V
V <sub>CEO</sub>	collector-emitter voltage	open base	–	65	V
	BFQ236 BFQ236A			95	V
V <sub>CER</sub>	collector-emitter voltage	R <sub>BE</sub> = 100 Ω	–	95	V
	BFQ236 BFQ236A			110	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	3	V
I <sub>C</sub>	collector current (DC)		–	300	mA
P <sub>tot</sub>	total power dissipation	T <sub>s</sub> ≤ 115 °C; note 1; see Fig.3	–	2	W
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	175	°C

**Note**

1. T<sub>s</sub> is the temperature at the soldering point of the collector lead.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-s</sub>	thermal resistance from junction to soldering point	T <sub>s</sub> = 115 °C; P <sub>tot</sub> = 2 W; notes 1 and 2	30	K/W

**Notes**

1. T<sub>s</sub> is the temperature at the soldering point of the collector lead.
2. Device mounted on a printed-circuit board measuring 40 × 40 × 1 mm (collector pad 35 × 17 mm).

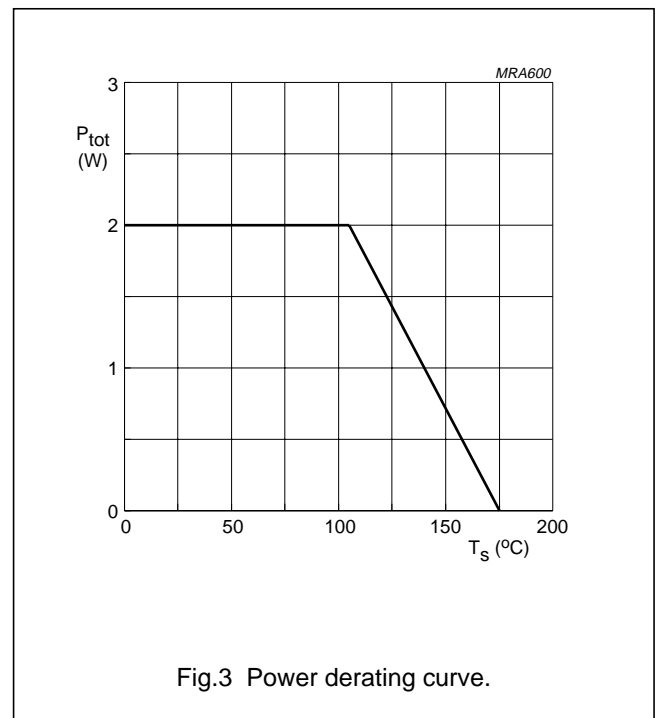
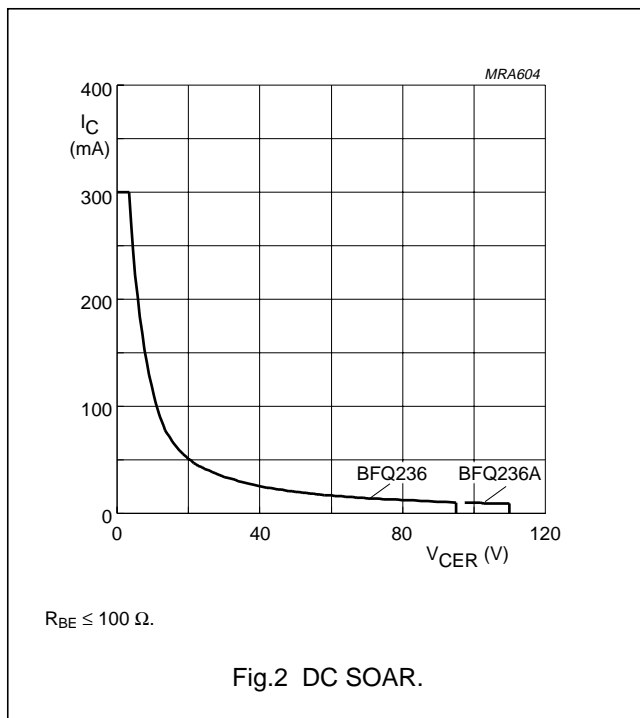
NPN video transistors

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**CHARACTERISTICS**

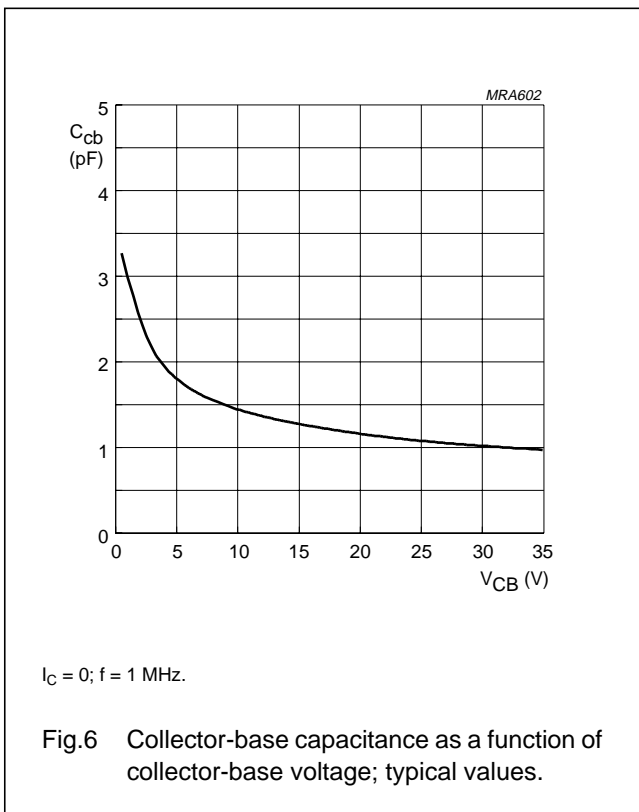
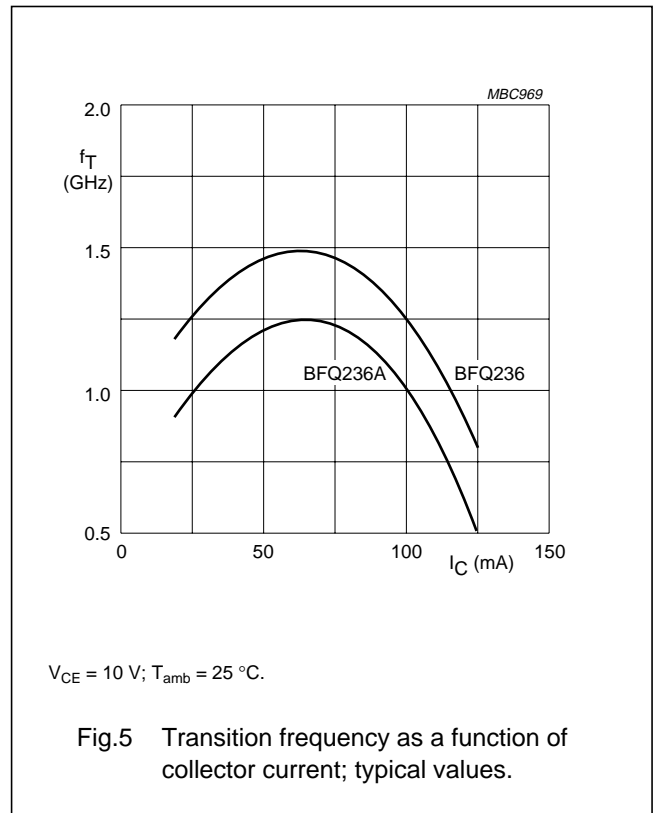
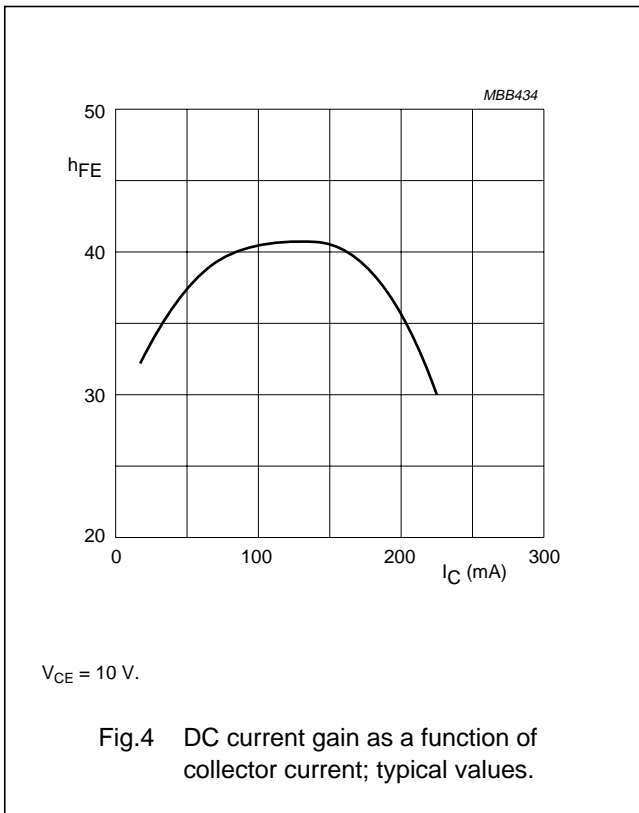
T<sub>j</sub> = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V <sub>(BR)CBO</sub>	collector-base breakdown voltage BFQ236 BFQ236A	I <sub>C</sub> = 100 µA; I <sub>E</sub> = 0	100	–	–	V
			115	–	–	V
V <sub>(BR)CEO</sub>	collector-emitter breakdown voltage BFQ236 BFQ236A	I <sub>C</sub> = 10 mA; I <sub>B</sub> = 0	65	–	–	V
			95	–	–	V
V <sub>(BR)CER</sub>	collector-emitter breakdown voltage BFQ236 BFQ236A	I <sub>C</sub> = 1 mA; R <sub>BE</sub> = 100 Ω	95	–	–	V
			110	–	–	V
I <sub>CES</sub>	collector-emitter cut-off current	I <sub>B</sub> = 0; V <sub>CE</sub> = 50 V	–	–	100	µA
I <sub>CBO</sub>	collector-base cut-off current	I <sub>E</sub> = 0; V <sub>CB</sub> = 50 V	–	–	20	µA
h <sub>FE</sub>	DC current gain	I <sub>C</sub> = 50 mA; V <sub>CE</sub> = 10 V; see Fig.4	20	35	–	
C <sub>c</sub>	collector capacitance	I <sub>E</sub> = i <sub>e</sub> = 0; V <sub>CB</sub> = 10 V; f = 1 MHz	–	1.8	–	pF
C <sub>cb</sub>	collector-base capacitance	I <sub>C</sub> = i <sub>c</sub> = 0; V <sub>CB</sub> = 10 V; f = 1 MHz; see Fig.6	–	1.5	–	pF
f <sub>T</sub>	transition frequency BFQ236 BFQ236A	I <sub>C</sub> = 50 mA; V <sub>CE</sub> = 10 V; f = 100 MHz; see Fig.5	1	1.4	–	GHz
			0.8	1.2	–	GHz



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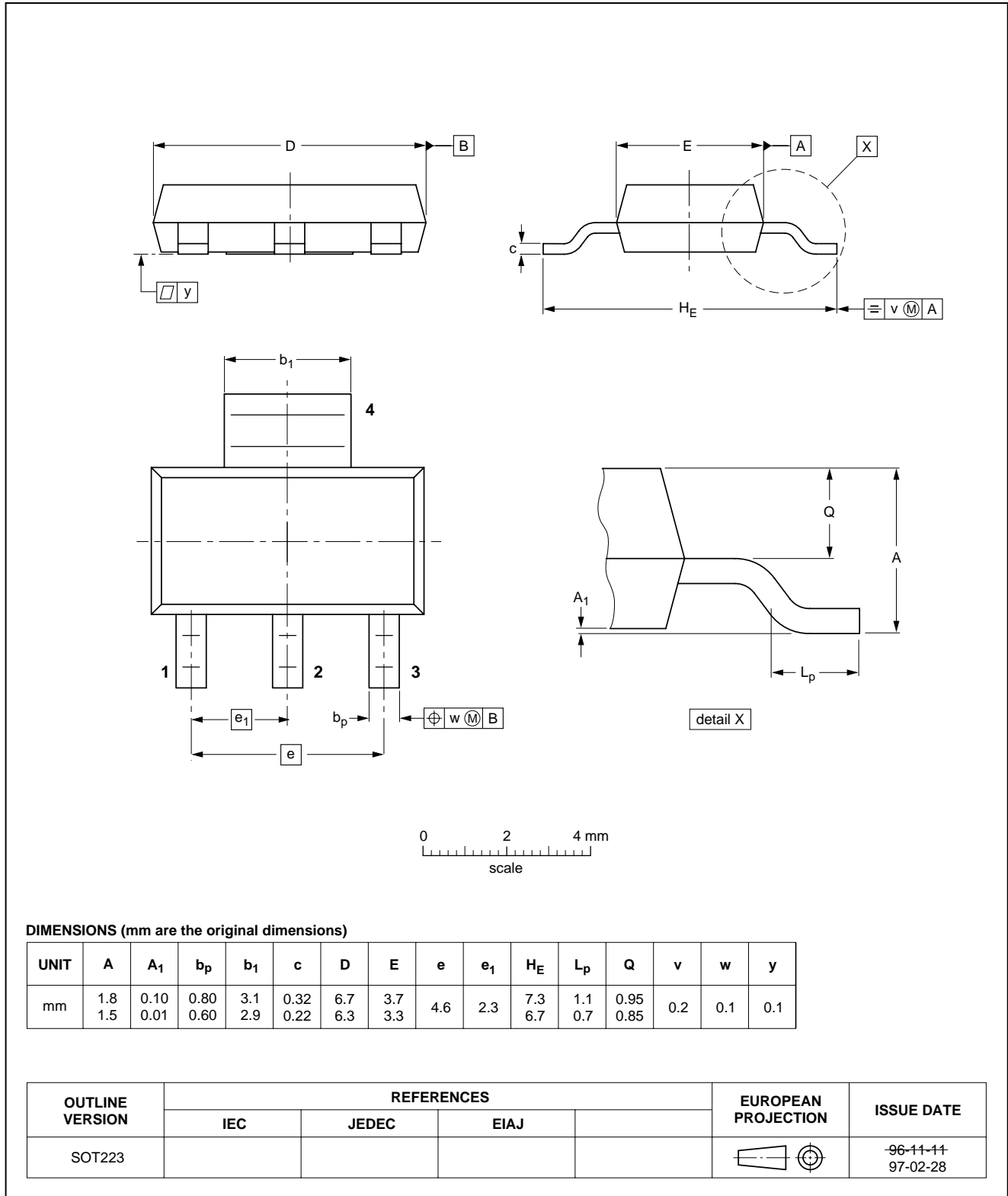
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PACKAGE OUTLINE

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

SOT223



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**DEFINITIONS**

<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.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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