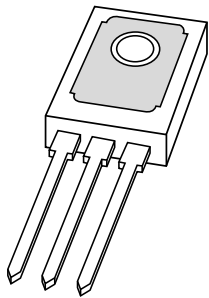


# DATA SHEET



**BF419**

**NPN high-voltage transistor**

Product specification  
Supersedes data of September 1994  
File under Discrete Semiconductors, SC04

1997 Apr 09

# NPN high-voltage transistor

**BF419**

## FEATURES

- Low current (max. 100 mA)
- High voltage (max. 250 V).

## APPLICATIONS

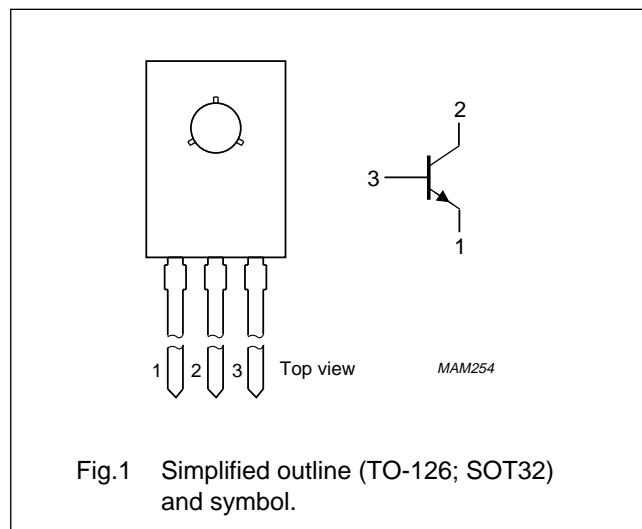
- Driver for line output transistors in colour television receivers.

## DESCRIPTION

NPN high-voltage transistor in a TO-126; SOT32 plastic package.

## PINNING

PIN	DESCRIPTION
1	emitter
2	collector connected to mounting base
3	base



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	300	V
$V_{CEO}$	collector-emitter voltage	open base	–	250	V
$I_{CM}$	peak collector current		–	300	mA
$P_{tot}$	total power dissipation	$T_{mb} \leq 90\text{ }^\circ\text{C}$	–	6	W
$h_{FE}$	DC current gain	$I_C = 20\text{ mA}; V_{CE} = 10\text{ V}$	45	–	
$C_{re}$	feedback capacitance	$I_C = i_c = 0; V_{CE} = 30\text{ V}; f = 1\text{ MHz}$	–	3.5	pF
$f_T$	transition frequency	$I_C = 15\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$	90	–	MHz

## NPN high-voltage transistor

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## 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	–	300	V
$V_{CEO}$	collector-emitter voltage	open base	–	250	V
$V_{EBO}$	emitter-base voltage	open collector	–	5	V
$I_C$	collector current (DC)		–	100	mA
$I_{CM}$	peak collector current	note 1	–	300	mA
$I_{BM}$	peak base current		–	100	mA
$P_{tot}$	total power dissipation	$T_{mb} \leq 90\text{ °C}$	–	6	W
		$T_{amb} \leq 70\text{ °C}$	–	800	mW
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C

## Note

- Precautions should be taken during switch-on of the BF419 where an overshoot of current is likely to occur. The amplitude of the overshoot depends on the relative magnitude of stray external capacities to the transistor collector capacity. It is desirable to keep the stray capacities to a minimum by short lead lengths etc. so as to minimize the area of the switching path.

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	100	K/W
$R_{th\ j-mb}$	thermal resistance from junction to mounting base	10	K/W

## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$I_E = 0; V_{CB} = 250\text{ V}$	–	50	nA
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = 3\text{ V}$	–	50	nA
$h_{FE}$	DC current gain	$I_C = 20\text{ mA}; V_{CE} = 10\text{ V}$	45	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 200\text{ mA}; I_B = 20\text{ mA};$ note 1	–	6	V
$C_c$	collector capacitance	$I_E = i_e = 0; V_{CB} = 30\text{ V}; f = 1\text{ MHz}$	–	4.5	pF
$C_{re}$	feedback capacitance	$I_C = i_c = 0; V_{CE} = 30\text{ V}; f = 1\text{ MHz}$	–	3.5	pF
$f_T$	transition frequency	$I_C = 15\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$	90	–	MHz

## Note

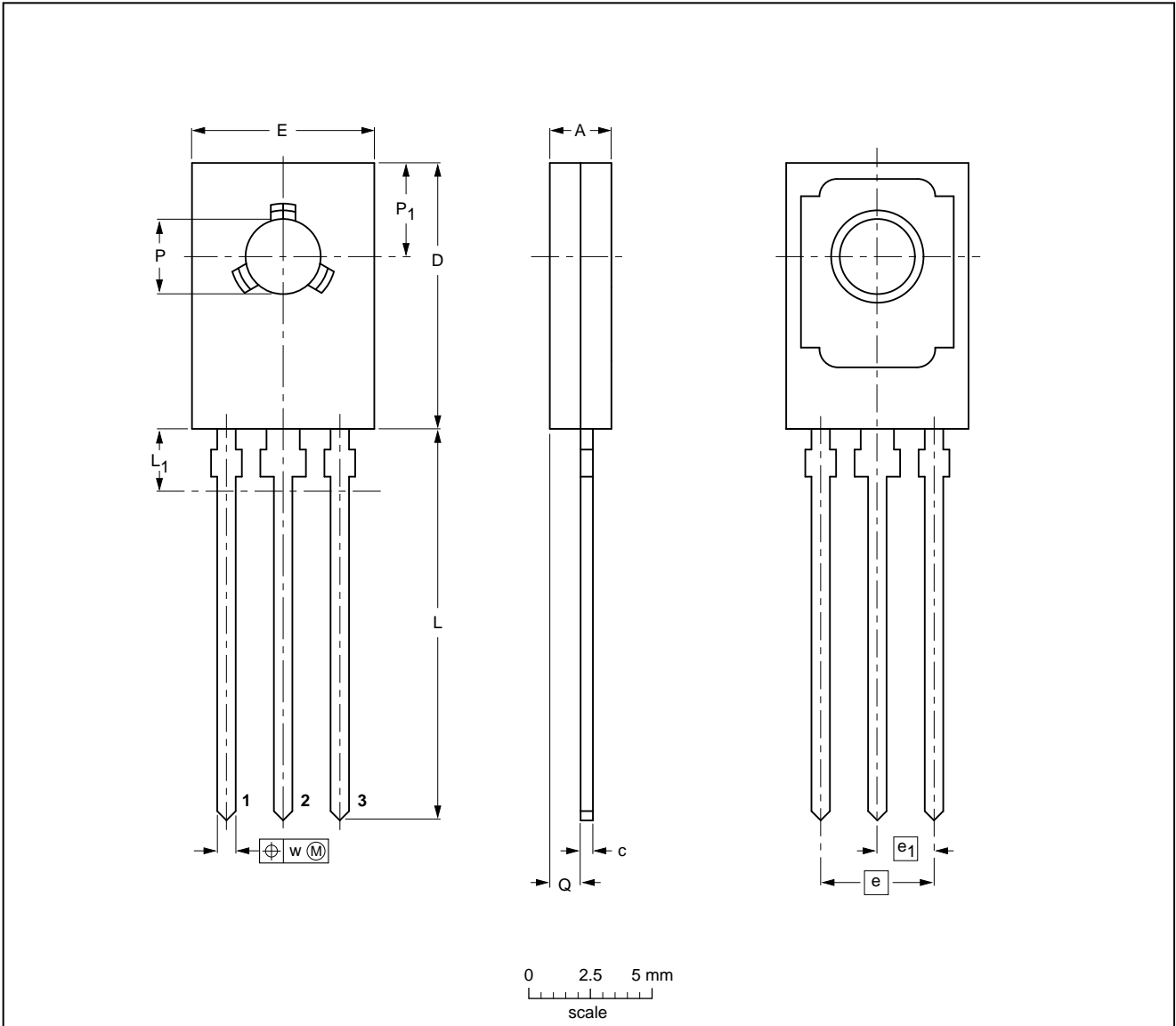
- Pulse test:  $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$ .

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PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; mountable to heatsink, 1 mounting hole; 3 leads SOT32



DIMENSIONS (mm are the original dimensions)

UNIT	A	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	L	L <sub>1</sub> <sup>(1)</sup> max	Q	P	P <sub>1</sub>	w
mm	2.7 2.3	0.88 0.65	0.60 0.45	11.1 10.5	7.8 7.2	4.58	2.29	16.5 15.3	2.54	1.5 0.9	3.2 3.0	3.9 3.6	0.254

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT32		TO-126				97-03-04

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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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**NOTES**

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**NOTES**

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