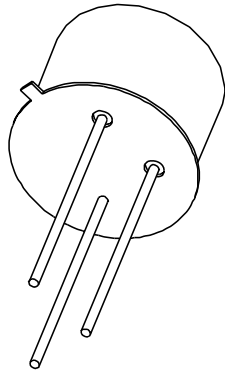


# DATA SHEET



## **BFX34** NPN switching transistor

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

1997 Apr 22

# NPN switching transistor

# BFX34

### FEATURES

- High current (max. 2 A)
- Low voltage (max. 60 V).

### APPLICATIONS

- High-current switching, e.g. inverters and switching regulators.

### DESCRIPTION

NPN switching transistor in a TO-39 metal package.

### PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	collector, connected to case

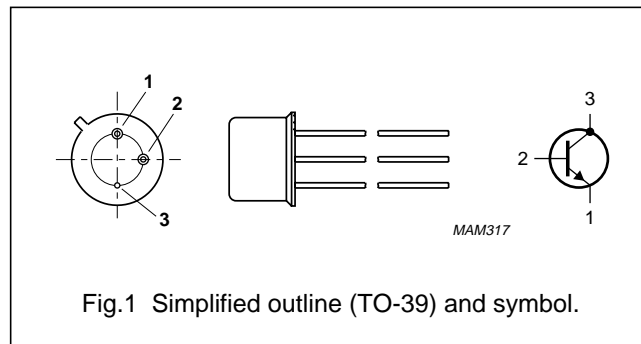


Fig.1 Simplified outline (TO-39) and symbol.

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	120	V
$V_{CEO}$	collector-emitter voltage	open base	–	60	V
$I_C$	collector current (DC)		–	2	A
$P_{tot}$	total power dissipation	$T_{case} \leq 25\text{ }^\circ\text{C}$	–	5	W
$h_{FE}$	DC current gain	$I_C = 2\text{ A}; V_{CE} = 2\text{ V}$	40	150	
$f_T$	transition frequency	$I_C = 0.5\text{ A}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$	70	–	MHz
$t_{off}$	turn-off time	$I_{Con} = 5\text{ A}; I_{Bon} = 0.5\text{ A}; I_{Boff} = -0.5\text{ A}$	–	1.2	$\mu\text{s}$

## NPN switching transistor

BFX34

## 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	–	120	V
$V_{CEO}$	collector-emitter voltage	open base	–	60	V
$V_{EBO}$	emitter-base voltage	open collector	–	6	V
$I_C$	collector current (DC)		–	2	A
$I_{CM}$	peak collector current		–	5	A
$I_{BM}$	peak base current		–	1.5	A
$P_{tot}$	total power dissipation	$T_{case} \leq 25\text{ °C}$	–	5	W
		$T_{amb} \leq 25\text{ °C}$	–	0.87	W
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	200	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air	200	K/W
$R_{th\ j-c}$	thermal resistance from junction to case		35	K/W

## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$I_E = 0$ ; $V_{CB} = 60\text{ V}$	–	–	10	$\mu\text{A}$
$I_{EBO}$	emitter cut-off current	$I_C = 0$ ; $V_{EB} = 4\text{ V}$	–	–	10	$\mu\text{A}$
$h_{FE}$	DC current gain	$I_C = 1\text{ A}$ ; $V_{CE} = 2\text{ V}$	–	130	–	
		$I_C = 1.5\text{ A}$ ; $V_{CE} = 0.6\text{ V}$	–	60	–	
		$I_C = 2\text{ A}$ ; $V_{CE} = 2\text{ V}$	40	110	150	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 5\text{ A}$ ; $I_B = 0.5\text{ A}$	–	0.77	1	V
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 5\text{ A}$ ; $I_B = 0.5\text{ A}$	–	1.43	1.8	V
$C_c$	collector capacitance	$I_E = i_e = 0$ ; $V_{CB} = 10\text{ V}$ ; $f = 1\text{ MHz}$	–	36	–	pF
$C_e$	emitter capacitance	$I_C = i_c = 0$ ; $V_{EB} = 0.5\text{ V}$ ; $f = 1\text{ MHz}$	–	440	–	pF
$f_T$	transition frequency	$I_C = 0.5\text{ A}$ ; $V_{CE} = 5\text{ V}$ ; $f = 100\text{ MHz}$	70	100	–	MHz
<b>Switching times (between 10% and 90% levels)</b>						
$t_{on}$	turn-on time	$I_{Con} = 5\text{ A}$ ; $I_{Bon} = 0.5\text{ A}$ ;	–	0.2	0.6	$\mu\text{s}$
$t_{off}$	turn-off time	$I_{Boff} = -0.5\text{ A}$	–	0.34	1.2	$\mu\text{s}$

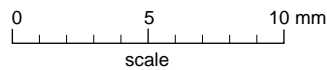
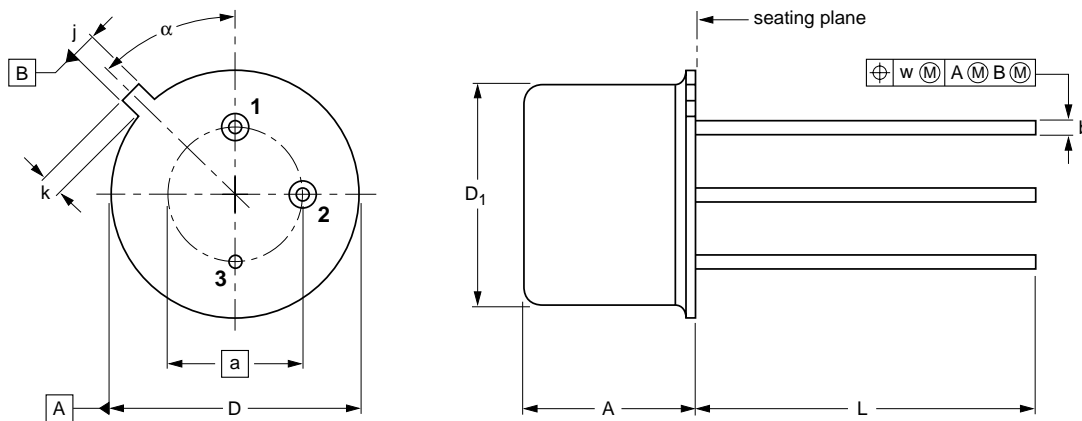
# NPN switching transistor

BFX34

## PACKAGE OUTLINE

Metal-can cylindrical single-ended package; 3 leads

SOT5/11



DIMENSIONS (mm are the original dimensions)

UNIT	A	a	b	D	D <sub>1</sub>	j	k	L	w	$\alpha$
mm	6.60 6.35	5.08	0.48 0.41	9.39 9.08	8.33 8.18	0.85 0.75	0.95 0.75	14.2 12.7	0.2	45°

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT5/11		TO-39				97-04-11

## NPN switching transistor

BFX34

**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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NPN switching transistor

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**NOTES**

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**NOTES**

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