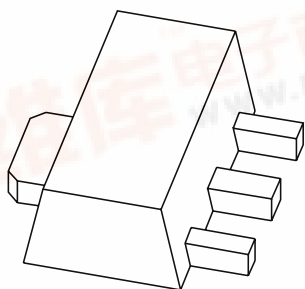


# DATA SHEET



## **BST39; BST40** NPN high-voltage transistors

Product data sheet  
Supersedes data of 2000 Jul 03

2004 Dec 14

**NXP**  
founded by Philips

NPN high-voltage transistors

BST39; BST40

FEATURES

- Low current (max. 100 mA)
- High voltage (max. 350 V).

APPLICATIONS

- General purpose switching and amplification.

DESCRIPTION

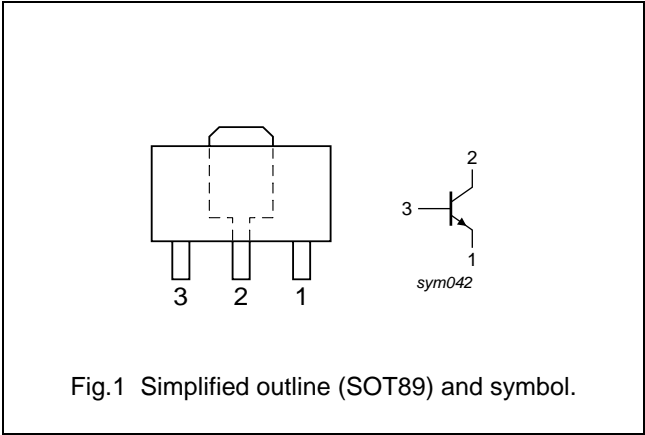
NPN high-voltage transistor in a SOT89 plastic package.  
PNP complements: BST15 and BST16.

MARKING

TYPE NUMBER	MARKING CODE
BST39	AT1
BST40	AT2

PINNING

PIN	DESCRIPTION
1	emitter
2	collector
3	base



ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BST39	SC-62	plastic surface mounted package; collector pad for good heat transfer; 3 leads	SOT89
BST40			

# NPN high-voltage transistors

## BST39; BST40

### 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	–	400	V
	BST39		–	300	V
V <sub>CEO</sub>	collector-emitter voltage	open base	–	350	V
	BST39		–	250	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	5	V
I <sub>C</sub>	collector current (DC)		–	100	mA
I <sub>CM</sub>	peak collector current		–	200	mA
I <sub>BM</sub>	peak base current		–	100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C; note 1	–	1.3	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

### Note

- Device mounted on a printed-circuit board, single-sided copper, tin-plated, mounting pad for collector 6 cm<sup>2</sup>.  
For other mounting conditions, see “Thermal considerations for SOT89 in the General Part of associated Handbook”.

### THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	note 1	96	K/W
R <sub>th(j-s)</sub>	thermal resistance from junction to soldering point		16	K/W

### Note

- Device mounted on a printed-circuit board, single-sided copper, tin-plated, mounting pad for collector 6 cm<sup>2</sup>.  
For other mounting conditions, see “Thermal considerations for SOT89 in the General Part of associated Handbook”.

### CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I <sub>CBO</sub>	collector-base cut-off current	I <sub>E</sub> = 0 A; V <sub>CB</sub> = 300 V	–	20	nA
I <sub>EBO</sub>	emitter-base cut-off current	I <sub>C</sub> = 0 A; V <sub>EB</sub> = 5 V	–	100	nA
h <sub>FE</sub>	DC current gain	I <sub>C</sub> = 20 mA; V <sub>CE</sub> = 10 V	40	–	
V <sub>CEsat</sub>	collector-emitter saturation voltage	I <sub>C</sub> = 50 mA; I <sub>B</sub> = 4 mA	–	500	mV
C <sub>c</sub>	collector capacitance	I <sub>E</sub> = i <sub>e</sub> = 0 A; V <sub>CB</sub> = 10 V; f = 1 MHz	–	2	pF
f <sub>T</sub>	transition frequency	I <sub>C</sub> = 10 mA; V <sub>CE</sub> = 10 V; f = 100 MHz	70	–	MHz

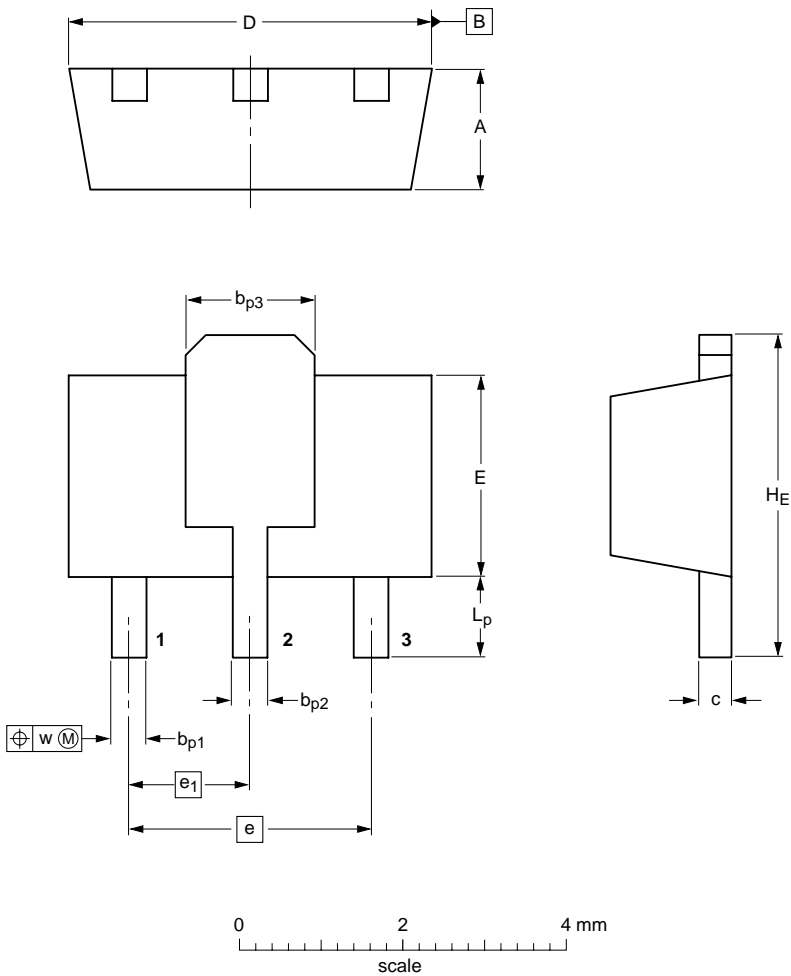
NPN high-voltage transistors

BST39; BST40

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

# BST39; BST40

## 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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### **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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Printed in The Netherlands

R75/05/pp6

Date of release: 2004 Dec 14

Document order number: 9397 750 13876

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