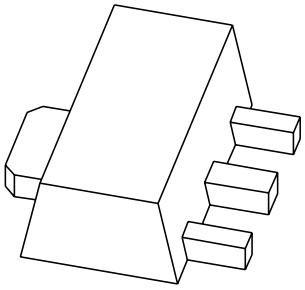
DATA SHEET



BSR40; BSR41; BSR42; BSR43
NPN medium power transistors

Product data sheet
Supersedes data of 1999 Apr 28

2004 Dec 13

NXP founded by Philips

NPN medium power transistors

BSR40; BSR41; BSR42; BSR43

FEATURES

- High current (max. 1 A)
- Low voltage (max. 80 V).

APPLICATIONS

- Thick and thin-film circuits
- Telephony and general industrial applications.

DESCRIPTION

NPN medium power transistor in a SOT89 plastic package. PNP complements: BSR30; BSR31 and BSR33.

MARKING

TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE
BSR40	AR1	BSR42	AR3
BSR41	AR2	BSR43	AR4

PINNING

PIN	DESCRIPTION
1	emitter
2	collector
3	base

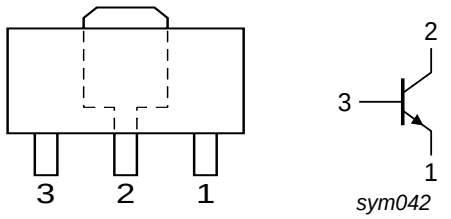


Fig.1 Simplified outline (SOT89) and symbol.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BSR40	SC-62	plastic surface mounted package; collector pad for good heat transfer; 3 leads	SOT89
BSR41			
BSR42			
BSR43			

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter			
	BSR40; BSR41		−	70	V
	BSR42; BSR43		−	90	V
V_{CEO}	collector-emitter voltage	open base			
	BSR40; BSR41		−	60	V
	BSR42; BSR43		−	80	V
V_{EBO}	emitter-base voltage	open collector	−	5	V
I_C	collector current (DC)		−	1	A
I_{CM}	peak collector current		−	2	A
I_{BM}	peak base current		−	0.2	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	−	1.35	W
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		−	150	°C
T_{amb}	ambient temperature		−65	+150	°C

Note

1. Device mounted on a printed-circuit board, single-sided copper, tin-plated, mounting pad for collector 6 cm^2. For other mounting conditions, see *"Thermal considerations for SOT89 in the General Part of associated Handbook".*

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	note 1	93	K/W
$R_{th(j-s)}$	thermal resistance from junction to soldering point		13	K/W

Note

1. Device mounted on a printed-circuit board, single-sided copper, tin-plated, mounting pad for collector 6 cm^2. For other mounting conditions, see *"Thermal considerations for SOT89 in the General Part of associated Handbook".*

CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

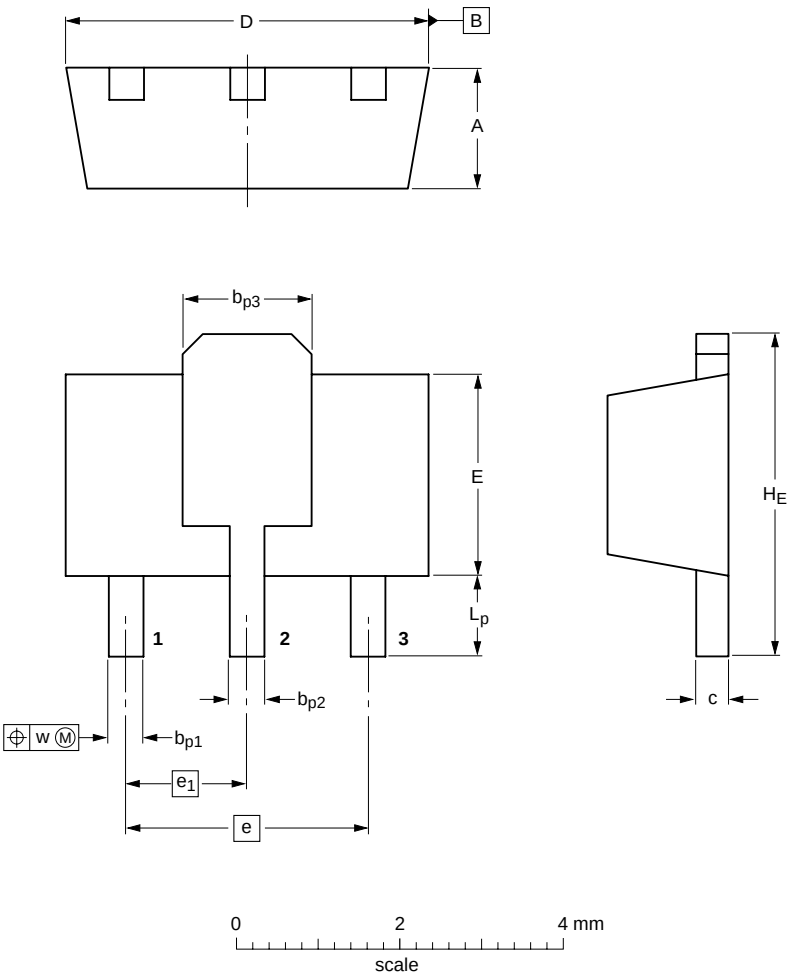
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	I_E = 0 A; V_{CB} = 60 V	–	100	nA
		I_E = 0 A; V_{CB} = 60 V; T_j = 150 °C	–	50	μA
I_{EBO}	emitter-base cut-off current	I_C = 0 A; V_{EB} = 5 V	–	100	nA
h_{FE}	DC current gain	I_C = 100 μA; V_{CE} = 5 V; note 1			
	BSR40; BSR42		10	–	
	BSR41; BSR43		30	–	
	DC current gain	I_C = 100 mA; V_{CE} = 5 V; note 1			
	BSR40; BSR42		40	120	
	BSR41; BSR43		100	300	
	DC current gain	I_C = 500 mA; V_{CE} = 5 V; note 1			
	BSR40; BSR42		30	–	
	BSR41; BSR43		50	–	
V_{CEsat}	collector-emitter saturation voltage	I_C = 150 mA; I_B = 15 mA; note 1	–	250	mV
		I_C = 500 mA; I_B = 50 mA; note 1	–	500	mV
V_{BEsat}	base-emitter saturation voltage	I_C = 150 mA; I_B = 15 mA; note 1	–	1	V
		I_C = 500 mA; I_B = 50 mA; note 1	–	1.2	V
C_c	collector capacitance	$I_E = i_e$ = 0 A; V_{CB} = 10 V; f = 1 MHz	–	12	pF
C_e	emitter capacitance	$I_C = i_c$ = 0 A; V_{EB} = 0.5 V; f = 1 MHz	–	90	pF
f_T	transition frequency	I_C = 50 mA; V_{CE} = 10 V; f = 100 MHz	100	–	MHz
Switching times (between 10% and 90% levels)					
t_{on}	turn-on time	I_{Con} = 100 mA; I_{Bon} = 5 mA; I_{Boff} = −5 mA	–	250	ns
t_{off}	turn-off time		–	1	μs

Note

1. Pulse test: $t_p \leq 300$ μs; $\delta \leq 0.01$.

PACKAGE OUTLINE

Plastic surface-mounted package; collector pad for good heat transfer; 3 leads **SOT89**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b_{p1}	b_{p2}	b_{p3}	c	D	E	e	e_1	H_E	L_p	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

DATA SHEET STATUS

DOCUMENT STATUS[1]	PRODUCT STATUS[2]	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.

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NXP Semiconductors

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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