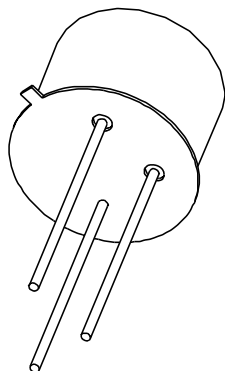


# DATA SHEET



## **BSX62; BSX63** NPN switching transistors

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

1997 Jun 19

## NPN switching transistors

## BSX62; BSX63

## FEATURES

- High current (max. 3 A)
- Low voltage (max. 60 V).

## APPLICATIONS

- Medium power switching.

## DESCRIPTION

NPN switching transistor in a TO-39 metal package.

## PINNING

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

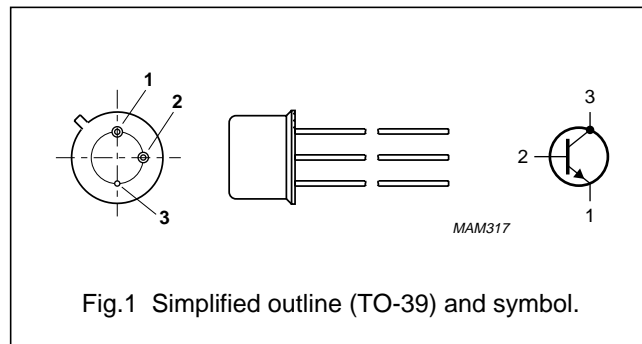


Fig.1 Simplified outline (TO-39) and symbol.

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	–	60	V
	BSX62		–	–	80	V
$V_{CEO}$	collector-emitter voltage	open base	–	–	40	V
	BSX63		–	–	60	V
$I_C$	collector current (DC)		–	–	3	A
$P_{tot}$	total power dissipation	$T_{case} \leq 25\text{ °C}$	–	–	5	W
$h_{FE}$	DC current gain	$I_C = 1\text{ A}; V_{CE} = 1\text{ V}$	63	100	160	
	BSX62-10; BSX63-10		100	160	250	
$f_T$	transition frequency	$I_C = 200\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$	30	70	–	MHz
$t_{off}$	turn-off time	$I_{Con} = 1\text{ A}; I_{Bon} = 50\text{ mA}; I_{Boff} = -50\text{ mA}$	–	–	1.5	$\mu\text{s}$

## NPN switching transistors

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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			
	BSX62		–	60	V
	BSX63		–	80	V
V <sub>CEO</sub>	collector-emitter voltage	open base			
	BSX62		–	40	V
	BSX63		–	60	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	5	V
I <sub>C</sub>	collector current (DC)		–	3	A
I <sub>CM</sub>	peak collector current		–	3	A
I <sub>BM</sub>	peak base current		–	500	mA
P <sub>tot</sub>	total power dissipation	T <sub>case</sub> ≤ 25 °C	–	5	W
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	200	°C
T <sub>amb</sub>	operating ambient temperature		–65	+150	°C

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient	in free air	200	K/W
R <sub>th j-c</sub>	thermal resistance from junction to case		28	K/W

## NPN switching transistors

## BSX62; BSX63

**CHARACTERISTICS**

$T_{\text{case}} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{\text{CBO}}$	collector cut-off current BSX62	$V_{\text{CB}} = 40\text{ V}$	–	–	100	nA
		$V_{\text{CB}} = 40\text{ V}; T_{\text{case}} = 150\text{ }^{\circ}\text{C}$	–	–	100	$\mu\text{A}$
$I_{\text{CBO}}$	collector cut-off current BSX63	$V_{\text{CB}} = 60\text{ V}$	–	–	100	nA
		$V_{\text{CB}} = 60\text{ V}; T_{\text{case}} = 150\text{ }^{\circ}\text{C}$	–	–	100	$\mu\text{A}$
$I_{\text{EBO}}$	emitter cut-off current	$I_{\text{C}} = 0; V_{\text{EB}} = 5\text{ V}$	–	–	100	nA
$h_{\text{FE}}$	DC current gain BSX62-10; BSX63-10 BSX62-16; BSX63-16	$I_{\text{C}} = 100\text{ mA}; V_{\text{CE}} = 1\text{ V}$	–	110	–	
			–	180	–	
$h_{\text{FE}}$	DC current gain BSX62-10; BSX63-10 BSX62-16; BSX63-16	$I_{\text{C}} = 1\text{ A}; V_{\text{CE}} = 1\text{ V}$	63	100	160	
			100	160	250	
$h_{\text{FE}}$	DC current gain BSX62-10; BSX63-10 BSX62-16; BSX63-16	$I_{\text{C}} = 2\text{ A}; V_{\text{CE}} = 5\text{ V}$	–	70	–	
			–	120	–	
$V_{\text{CEsat}}$	collector-emitter saturation voltage	$I_{\text{C}} = 1\text{ A}; I_{\text{B}} = 100\text{ mA}$	–	–	700	mV
		$I_{\text{C}} = 2\text{ A}; I_{\text{B}} = 200\text{ mA}$	–	–	800	mV
$V_{\text{BEsat}}$	base-emitter saturation voltage	$I_{\text{C}} = 1\text{ A}; I_{\text{B}} = 100\text{ mA}$	–	–	1.2	V
		$I_{\text{C}} = 2\text{ A}; I_{\text{B}} = 200\text{ mA}$	–	–	1.3	V
$V_{\text{BE}}$	base-emitter voltage	$I_{\text{C}} = 100\text{ mA}; V_{\text{CE}} = 1\text{ V}$	–	–	1	V
		$I_{\text{C}} = 1\text{ A}; V_{\text{CE}} = 1\text{ V}$	–	–	1.2	V
		$I_{\text{C}} = 2\text{ A}; V_{\text{CE}} = 5\text{ V}$	–	–	1.3	V
$C_{\text{c}}$	collector capacitance	$I_{\text{E}} = i_{\text{e}} = 0; V_{\text{CB}} = 10\text{ V}; f = 1\text{ MHz}$	–	–	70	pF
$f_{\text{T}}$	transition frequency	$I_{\text{C}} = 200\text{ mA}; V_{\text{CE}} = 10\text{ V}; f = 100\text{ MHz}$	30	70	–	MHz
<b>Switching times (between 10% and 90% levels)</b>						
$t_{\text{on}}$	turn-on time	$I_{\text{Con}} = 1\text{ A}; I_{\text{Bon}} = 50\text{ mA}; I_{\text{Boff}} = -50\text{ mA}$	–	–	300	ns
$t_{\text{off}}$	turn-off time		–	–	1.5	$\mu\text{s}$

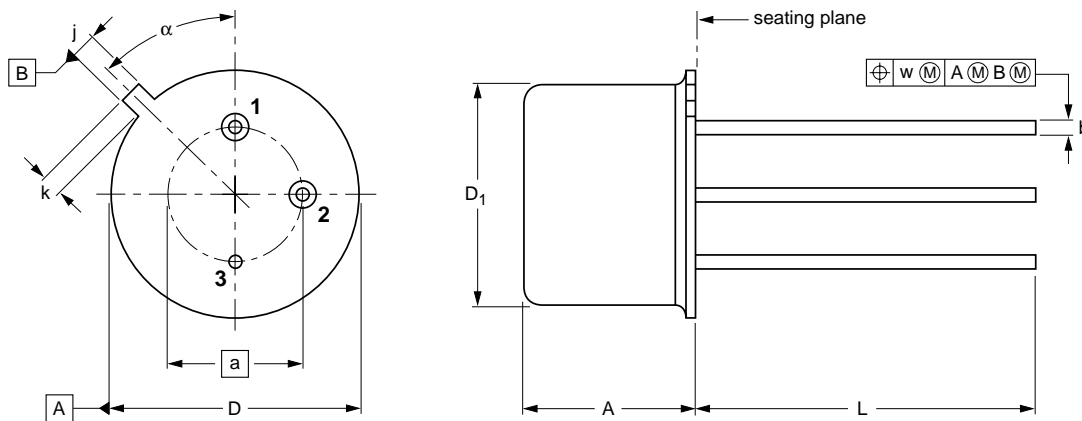
NPN switching transistors

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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	α
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 transistors

BSX62; BSX63

**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 transistors

BSX62; BSX63

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