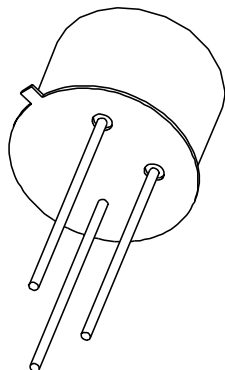


DATA SHEET



BSX45; BSX46; BSX47 NPN medium power transistors

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

1997 Apr 23

NPN medium power transistors

BSX45; BSX46; BSX47

FEATURES

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

APPLICATIONS

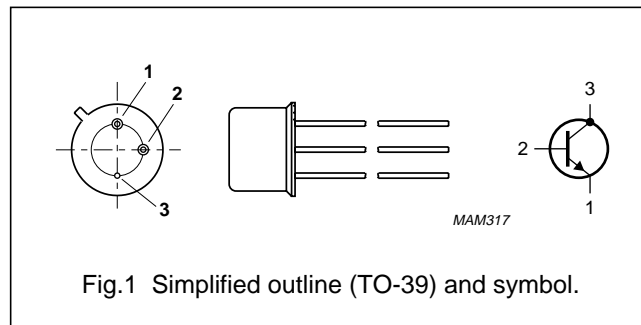
- General industrial applications.

DESCRIPTION

NPN medium power transistor in a TO-39 metal package.

PINNING

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



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter				
	BSX45		–	–	80	V
	BSX46		–	–	100	V
	BSX47		–	–	120	V
V_{CEO}	collector-emitter voltage	open base				
	BSX45		–	–	40	V
	BSX46		–	–	60	V
	BSX47		–	–	80	V
I_{CM}	peak collector current		–	–	1.5	A
P_{tot}	total power dissipation	$T_{case} \leq 25\text{ }^{\circ}\text{C}$	–	–	6.25	W
h_{FE}	DC current gain	$I_C = 100\text{ mA}; V_{CE} = 1\text{ V}$				
	BSX45-10; BSX46-10; BSX47-10		63	100	160	
	BSX45-16; BSX46-16; BSX47-16		100	160	250	
f_T	transition frequency	$I_C = 50\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$	50	–	–	MHz

NPN medium power transistors

BSX45; BSX46; BSX47

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			
	BSX45		–	80	V
	BSX46		–	100	V
	BSX47		–	120	V
V_{CEO}	collector-emitter voltage	open base			
	BSX45		–	40	V
	BSX46		–	60	V
	BSX47		–	80	V
V_{EBO}	emitter-base voltage	open collector	–	7	V
I_C	collector current (DC)		–	1	A
I_{CM}	peak collector current		–	1.5	A
I_{BM}	peak base current		–	200	mA
P_{tot}	total power dissipation	$T_{case} \leq 25\text{ °C}$	–	6.25	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		28	K/W

NPN medium power transistors

BSX45; BSX46; BSX47

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{CBO}	collector cut-off current BSX45; BSX46	I _E = 0; V _{CB} = 60 V	–	–	30	nA
		I _E = 0; V _{CB} = 60 V; T _{amb} = 150 °C	–	–	10	μA
I _{CBO}	collector cut-off current BSX47	I _E = 0; V _{CB} = 80 V	–	–	30	nA
		I _E = 0; V _{CB} = 80 V; T _{amb} = 150 °	–	–	10	μA
I _{EBO}	emitter cut-off current	I _C = 0; V _{EB} = 5 V	–	–	10	nA
h _{FE}	DC current gain BSX45-10; BSX46-10; BSX47-10 BSX45-16; BSX46-16	I _C = 100 μA; V _{CE} = 1 V	15	40	–	
			25	90	–	
h _{FE}	DC current gain BSX45-10; BSX46-10; BSX47-10 BSX45-16; BSX46-16; BSX47-16	I _C = 100 mA; V _{CE} = 1 V	63	100	160	
			100	160	250	
h _{FE}	DC current gain BSX45-10; BSX46-10; BSX47-10 BSX45-16; BSX46-16	I _C = 500 mA; V _{CE} = 1 V	25	40	–	
			35	60	–	
h _{FE}	DC current gain BSX45-10; BSX46-10; BSX47-10 BSX45-16; BSX46-16	I _C = 1 A; V _{CE} = 1 V	–	20	–	
			–	30	–	
V _{CEsat}	collector-emitter saturation voltage BSX45; BSX46	I _C = 1 A; I _B = 100 mA	–	–	1	V
V _{CEsat}	collector-emitter saturation voltage BSX47	I _C = 500 mA; I _B = 25 mA	–	–	900	mV
V _{BE}	base-emitter voltage	I _C = 100 mA; V _{CE} = 1 V	–	–	1	V
		I _C = 500 mA; V _{CE} = 1 V	0.75	–	1.5	V
		I _C = 1 A; V _{CE} = 1 V	–	–	2	V
C _c	collector capacitance BSX45 BSX46 BSX47	I _E = i _e = 0; V _{CB} = 10 V; f = 1 MHz	–	–	25	pF
			–	–	20	pF
			–	–	15	pF
C _e	emitter capacitance	I _C = i _c = 0; V _{EB} = 0.5 V; f = 1 MHz	–	–	80	pF
f _T	transition frequency	I _C = 50 mA; V _{CE} = 10 V; f = 100 MHz	50	–	–	MHz
F	noise figure	I _C = 100 μA; V _{CE} = 5 V; R _S = 1 kΩ; f = 1 kHz; B = 200 Hz	–	3.5	–	dB
Switching times (between 10% and 90% levels)						
t _{on}	turn-on time	I _{Con} = 100 mA; I _{Bon} = 5 mA; I _{Boff} = –5 mA	–	–	200	ns
t _{off}	turn-off time		–	–	850	ns

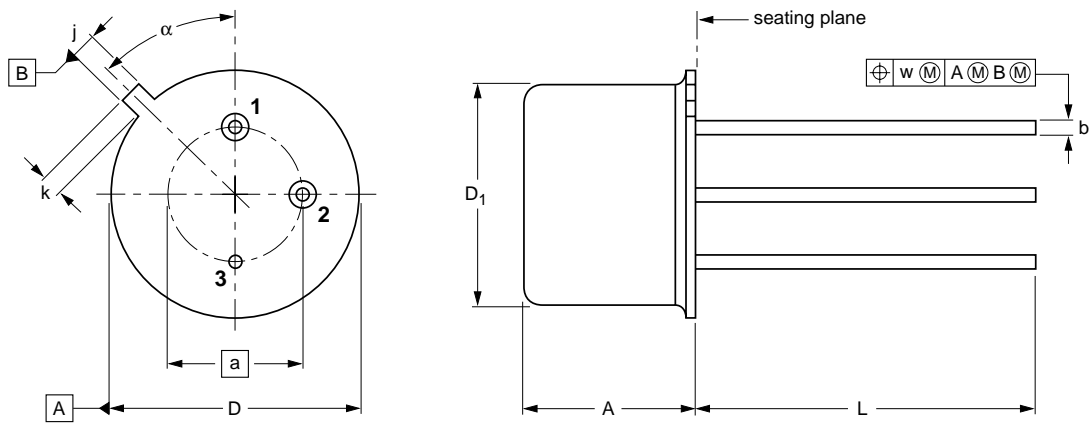
NPN medium power transistors

BSX45; BSX46; BSX47

PACKAGE OUTLINE

Metal-can cylindrical single-ended package; 3 leads

SOT5/11



DIMENSIONS (mm are the original dimensions)

UNIT	A	a	b	D	D ₁	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 medium power transistors

BSX45; BSX46; BSX47

DEFINITIONS

Data Sheet Status	
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.
Limiting values	
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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

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NPN medium power transistors

BSX45; BSX46; BSX47

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