

# BF992

Silicon N-channel dual gate MOS-FET

Rev. 04 — 21 November 2007

Product data sheet

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NXP Semiconductors

# Silicon N-channel dual gate MOS-FET

**BF992**

## APPLICATIONS

- VHF applications such as VHF television tuners and FM tuners with 12 V supply voltage. The device is also suitable for use in professional communications equipment.

## DESCRIPTION

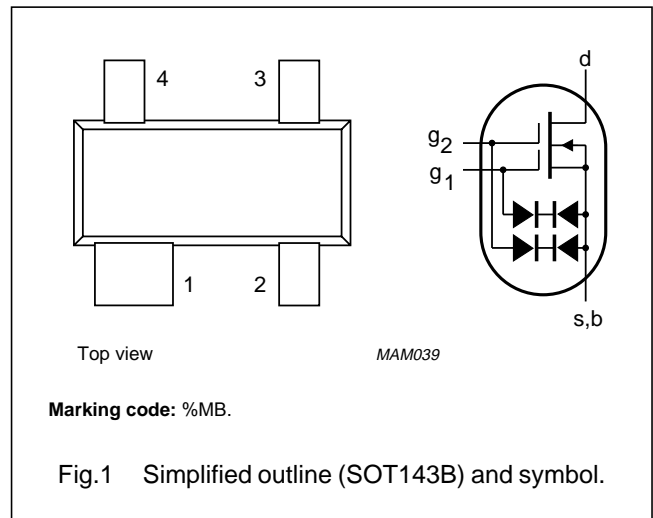
Depletion type field-effect transistor in a plastic micro-miniature SOT143B package with source and substrate interconnected.

The transistor is protected against excessive input voltage surges by integrated back-to-back diodes between gates and source.

<b>CAUTION</b>
The device is supplied in an antistatic package. The gate-source input must be protected against static discharge during transport or handling.

## PINNING

PIN	SYMBOL	DESCRIPTION
1	s, b	source
2	d	drain
3	g <sub>2</sub>	gate 2
4	g <sub>1</sub>	gate 1



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V <sub>DS</sub>	drain-source voltage (DC)		–	20	V
I <sub>D</sub>	drain current (DC)		–	40	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> = 60 °C	–	200	mW
Y <sub>fs</sub>	forward transfer admittance	f = 1 kHz; I <sub>D</sub> = 15 mA; V <sub>DS</sub> = 10 V; V <sub>G2-S</sub> = 4 V	25	–	mS
C <sub>ig1-s</sub>	input capacitance at gate 1	f = 1 MHz; I <sub>D</sub> = 15 mA; V <sub>DS</sub> = 10 V; V <sub>G2-S</sub> = 4 V	4	–	pF
C <sub>rs</sub>	reverse transfer capacitance	f = 1 MHz; I <sub>D</sub> = 15 mA; V <sub>DS</sub> = 10 V; V <sub>G2-S</sub> = 4 V	30	–	fF
F	noise figure	G <sub>S</sub> = 2 mS; I <sub>D</sub> = 15 mA; V <sub>DS</sub> = 10 V; V <sub>G2-S</sub> = 4 V; f = 200 MHz	1.2	–	dB
T <sub>j</sub>	operating junction temperature		–	150	°C

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## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{DS}$	drain-source voltage		–	20	V
$I_D$	drain current		–	40	mA
$I_{G1}$	gate 1 current		–	$\pm 10$	mA
$I_{G2}$	gate 2 current		–	$\pm 10$	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 60\text{ }^\circ\text{C}$ ; see Fig.2; note 1	–	200	mW
$T_{stg}$	storage temperature		–65	+150	$^\circ\text{C}$
$T_j$	operating junction temperature		–	150	$^\circ\text{C}$

### Note

1. Device mounted on a ceramic substrate, 8 mm × 10 mm × 0.7 mm.

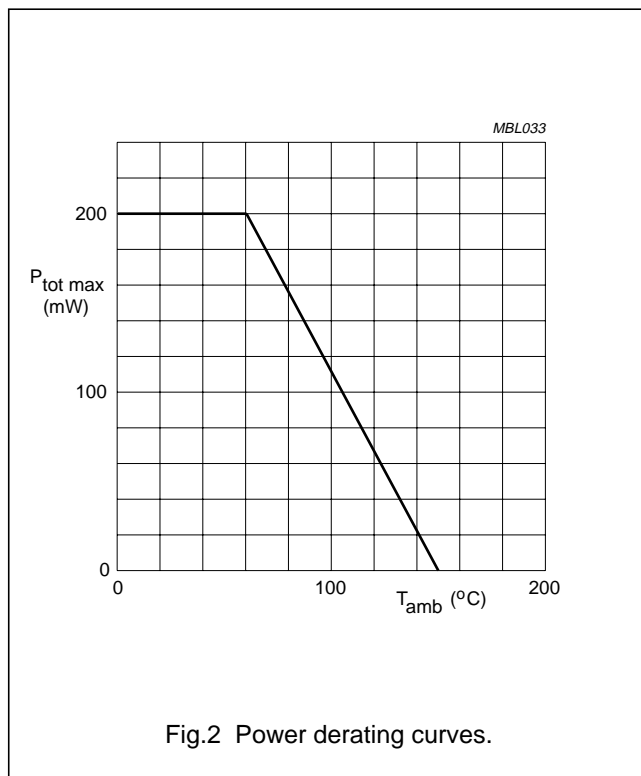


Fig.2 Power derating curves.

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## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient in free air	note 1	460	K/W

## Note

1. Device mounted on a ceramic substrate, 8 mm × 10 mm × 0.7 mm.

## STATIC CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$\pm V_{(BR)G1-SS}$	gate 1-source breakdown voltage	$V_{G2-S} = V_{DS} = 0$ ; $I_{G1-SS} = \pm 10\text{ mA}$	8	20	V
$\pm V_{(BR)G2-SS}$	gate 2-source breakdown voltage	$V_{G1-S} = V_{DS} = 0$ ; $I_{G2-SS} = \pm 10\text{ mA}$	8	20	V
$-V_{(P)G1-S}$	gate 1-source cut-off voltage	$V_{G2-S} = 4\text{ V}$ ; $V_{DS} = 10\text{ V}$ ; $I_D = 20\text{ }\mu\text{A}$	0.2	1.3	V
$-V_{(P)G2-S}$	gate 2-source cut-off voltage	$V_{G1-S} = 0$ ; $V_{DS} = 10\text{ V}$ ; $I_D = 20\text{ }\mu\text{A}$	0.2	1.1	V
$\pm I_{G1-SS}$	gate 1 cut-off current	$V_{G2-S} = V_{DS} = 0$ ; $V_{G1-S} = \pm 7\text{ V}$	–	25	nA
$\pm I_{G2-SS}$	gate 2 cut-off current	$V_{G1-S} = V_{DS} = 0$ ; $V_{G2-S} = \pm 7\text{ V}$	–	25	nA

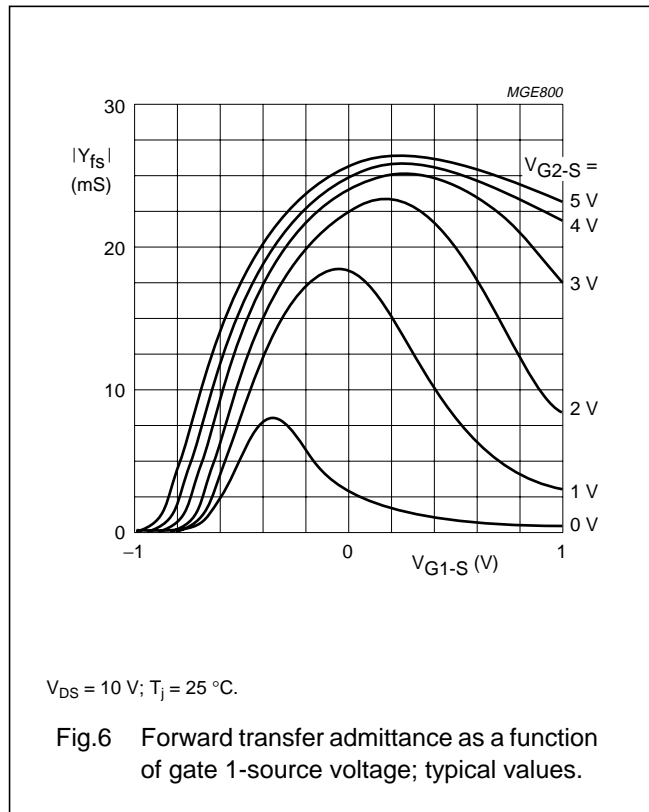
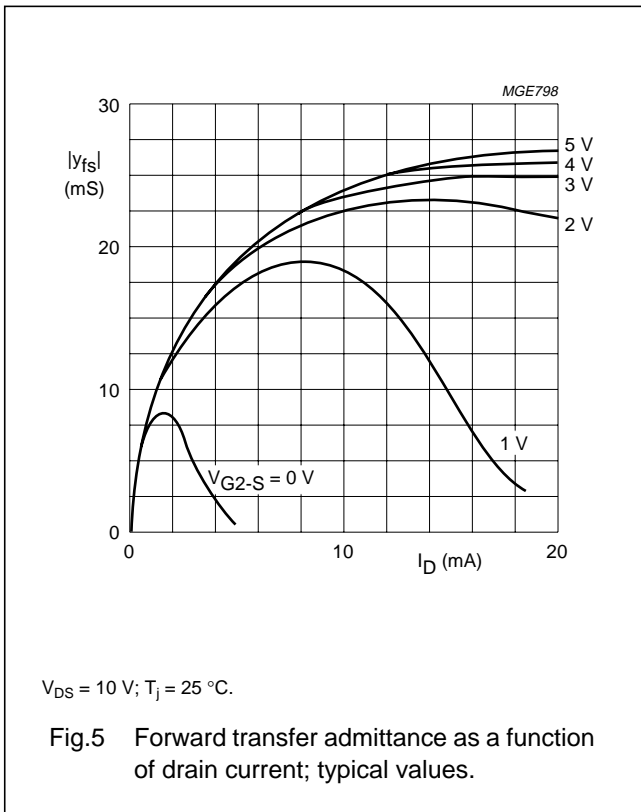
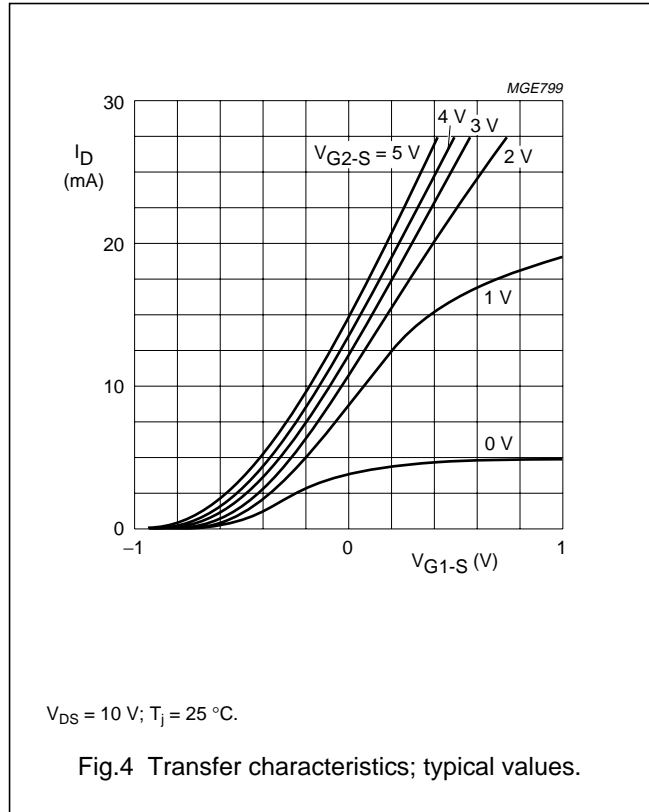
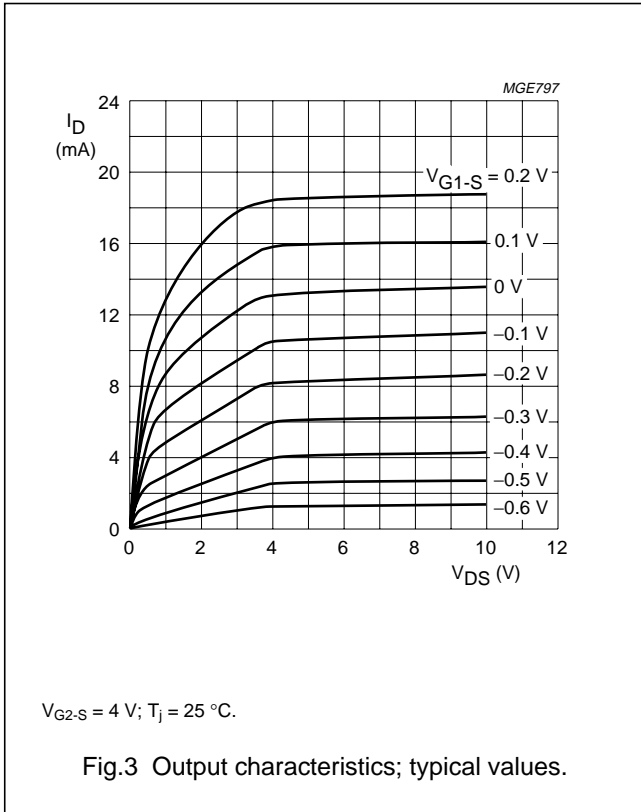
## DYNAMIC CHARACTERISTICS

Common source;  $T_{amb} = 25\text{ °C}$ ;  $V_{DS} = 10\text{ V}$ ;  $V_{G2-S} = 4\text{ V}$ ;  $I_D = 15\text{ mA}$ ; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$ y_{fs} $	forward transfer admittance		20	25	–	mS
$C_{ig1-s}$	input capacitance at gate 1	$f = 1\text{ MHz}$	–	4	–	pF
$C_{ig2-s}$	input capacitance at gate 2	$f = 1\text{ MHz}$	–	1.7	–	pF
$C_{os}$	output capacitance	$f = 1\text{ MHz}$	–	2	–	pF
$C_{rs}$	reverse transfer capacitance	$f = 1\text{ MHz}$	–	30	40	fF
F	noise figure	$f = 200\text{ MHz}$ ; $G_S = 2\text{ mS}$	–	1.2	–	dB

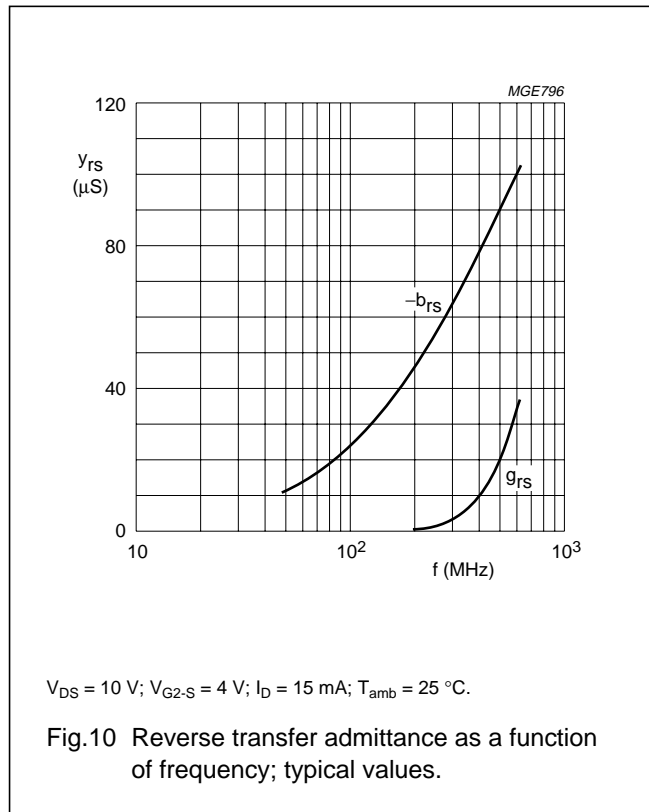
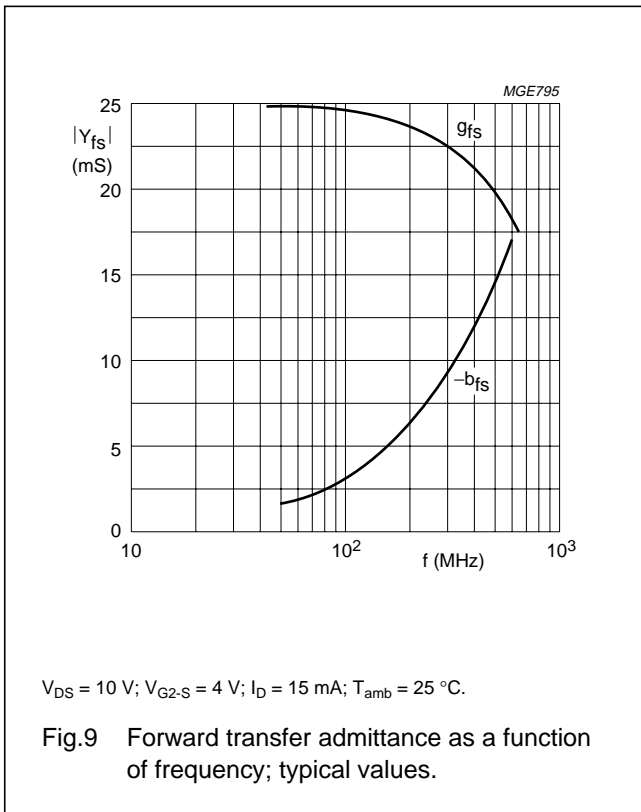
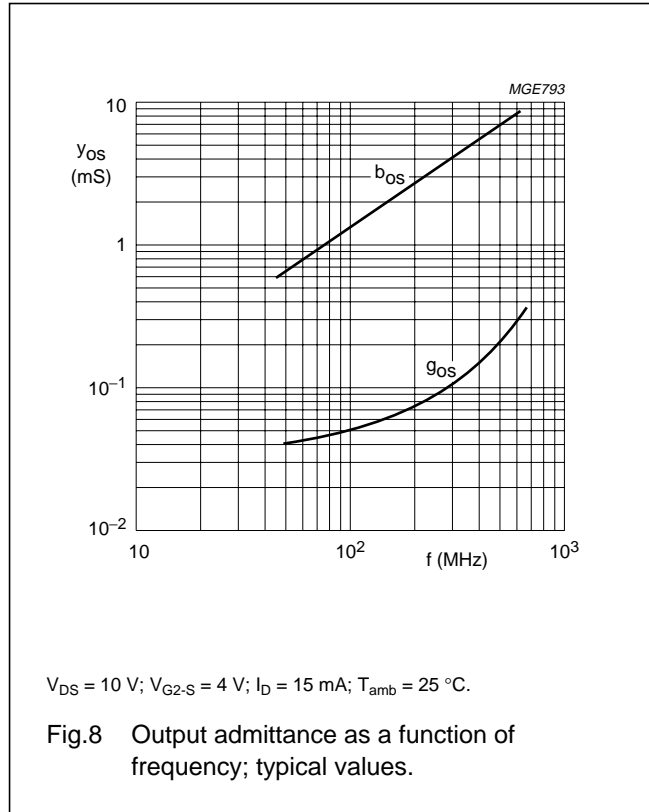
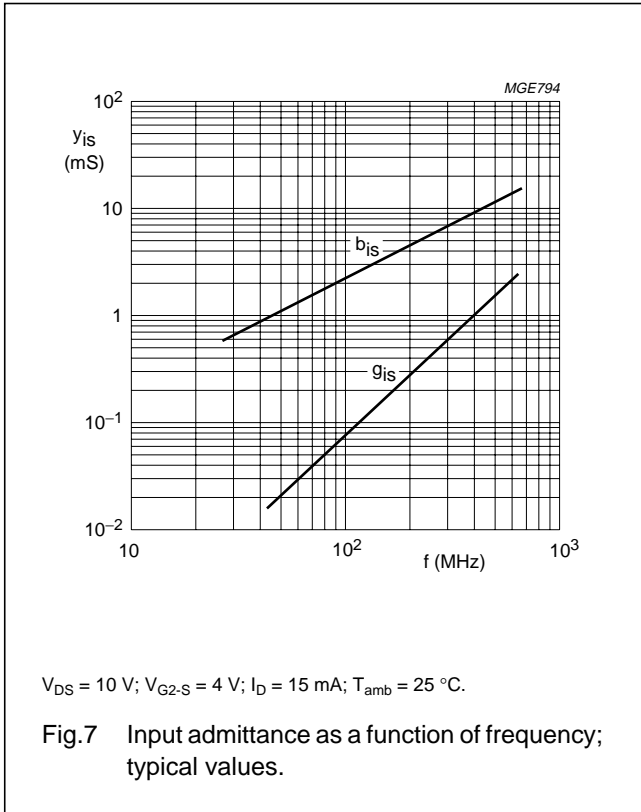
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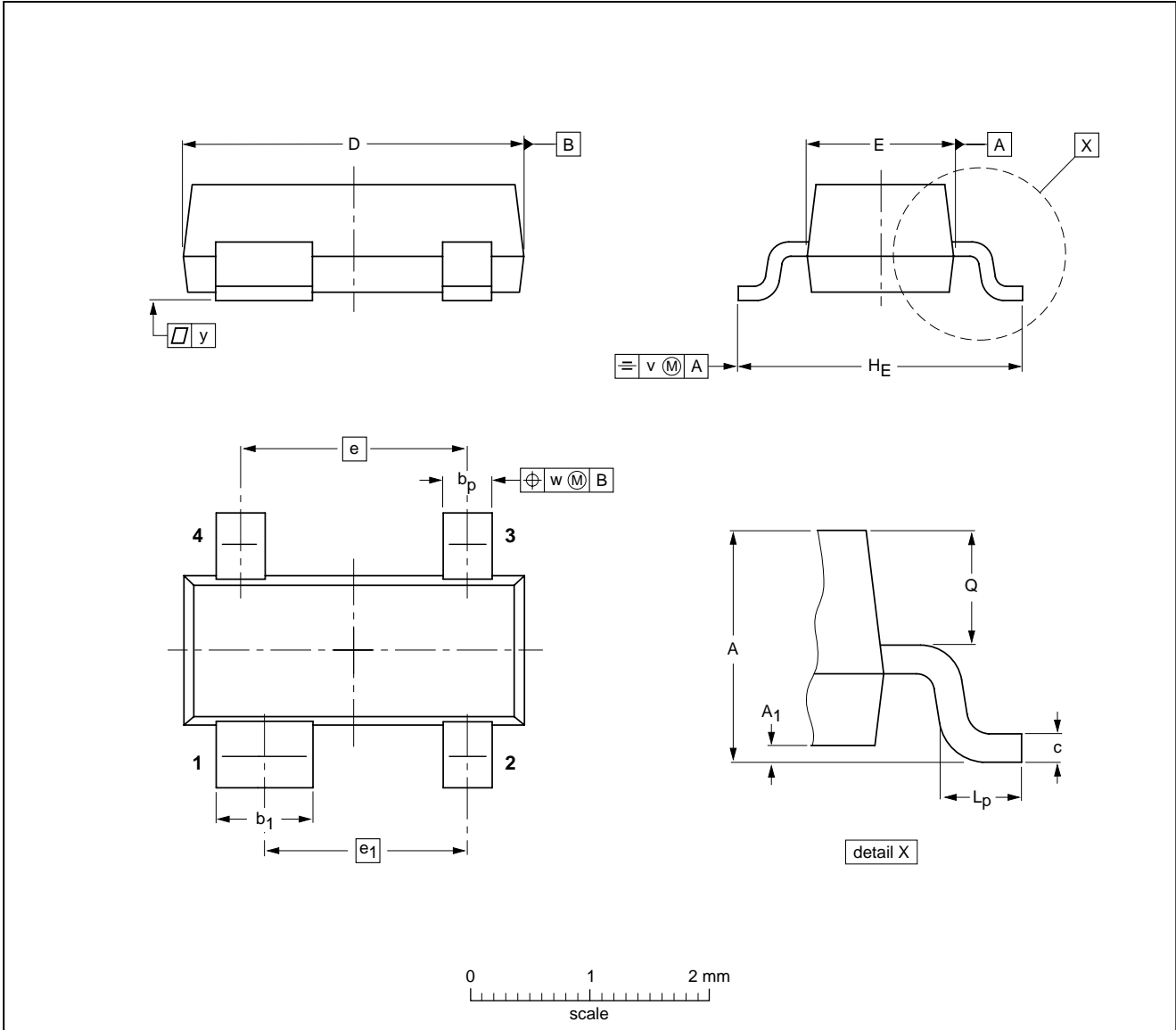
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## PACKAGE OUTLINE

Plastic surface mounted package; 4 leads

SOT143B



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max	b <sub>p</sub>	b <sub>1</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	Q	v	w	y
mm	1.1 0.9	0.1	0.48 0.38	0.88 0.78	0.15 0.09	3.0 2.8	1.4 1.2	1.9	1.7	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT143B						97-02-28

## Legal information

### Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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## Revision history

### Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BF992_N_4	20071121	Product data sheet	-	BF992_3
Modifications:	• Fig. 1 on page 2; Figure note changed			
BF992_3 (9397 750 06013)	19990811	Product specification	-	BF992_2
BF992_2	19960730	Product specification	-	BF992_SF_1
BF992_SF_1	-	-	-	-

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