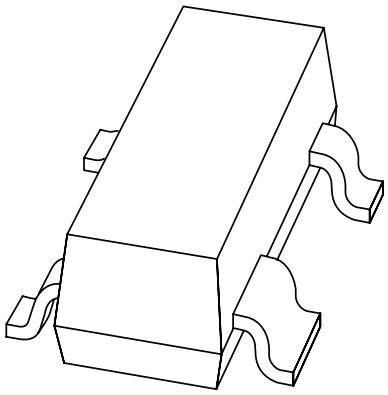
DATA SHEET



BF992
Silicon N-channel dual gate MOS-FET

Product specification
Supersedes data of 1996 Jul 30

1999 Aug 11

Philips
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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

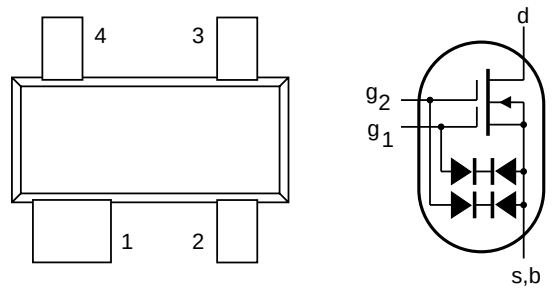
Depletion type field-effect transistor in a plastic micro-miniature SOT143B package with source and substrate interconnected.

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

CAUTION
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_2	gate 2
4	g_1	gate 1



Marking code: M92.

Fig.1 Simplified outline (SOT143B) and symbol.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{DS}	drain-source voltage (DC)		–	20	V
I_D	drain current (DC)		–	40	mA
P_{tot}	total power dissipation	T_{amb} = 60 °C	–	200	mW
$\lvert Y_{fs} \rvert$	forward transfer admittance	f = 1 kHz; I_D = 15 mA; V_{DS} = 10 V; $V_{G2\text{-}S}$ = 4 V	25	–	mS
$C_{ig1\text{-}s}$	input capacitance at gate 1	f = 1 MHz; I_D = 15 mA; V_{DS} = 10 V; $V_{G2\text{-}S}$ = 4 V	4	–	pF
C_{rs}	reverse transfer capacitance	f = 1 MHz; I_D = 15 mA; V_{DS} = 10 V; $V_{G2\text{-}S}$ = 4 V	30	–	fF
F	noise figure	G_S = 2 mS; I_D = 15 mA; V_{DS} = 10 V; $V_{G2\text{-}S}$ = 4 V; f = 200 MHz	1.2	–	dB
T_j	operating junction temperature		–	150	°C

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		–	±10	mA
I_{G2}	gate 2 current		–	±10	mA
P_{tot}	total power dissipation	$T_{amb} \leq 60$ °C; see Fig.2; note 1	–	200	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	operating junction temperature		–	150	°C

Note

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

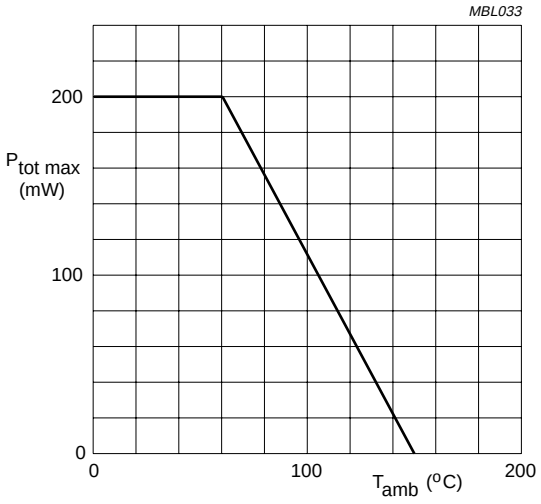


Fig.2 Power derating curves.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	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

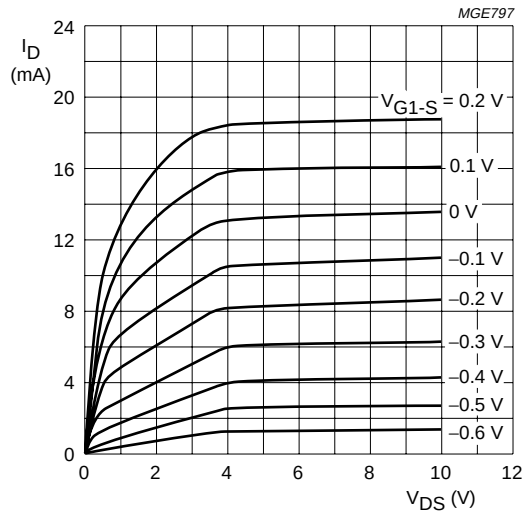
T_j = 25 °C unless otherwise specified.

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

DYNAMIC CHARACTERISTICS

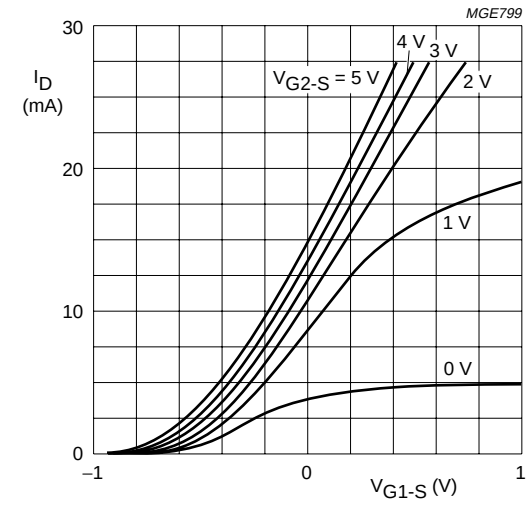
Common source; T_{amb} = 25 °C; V_{DS} = 10 V; $V_{G2\text{-}S}$ = 4 V; I_D = 15 mA; unless otherwise specified.

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



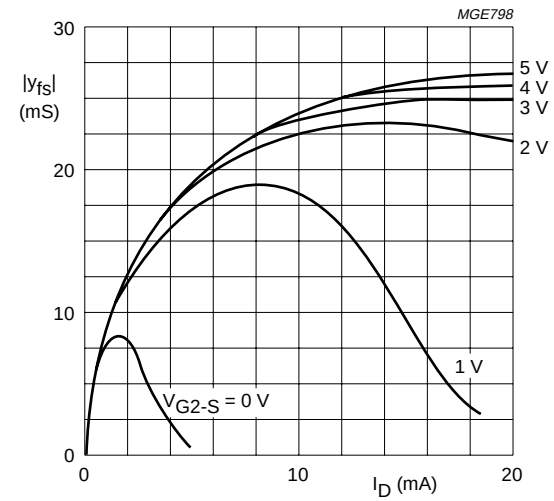
V_{G2-S} = 4 V; T_j = 25 °C.

Fig.3 Output characteristics; typical values.



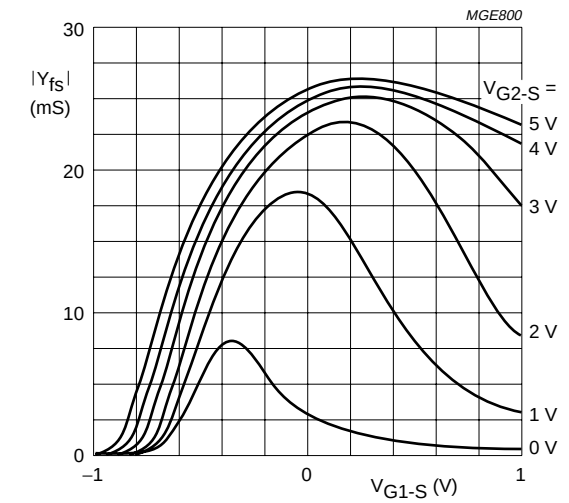
V_{DS} = 10 V; T_j = 25 °C.

Fig.4 Transfer characteristics; typical values.



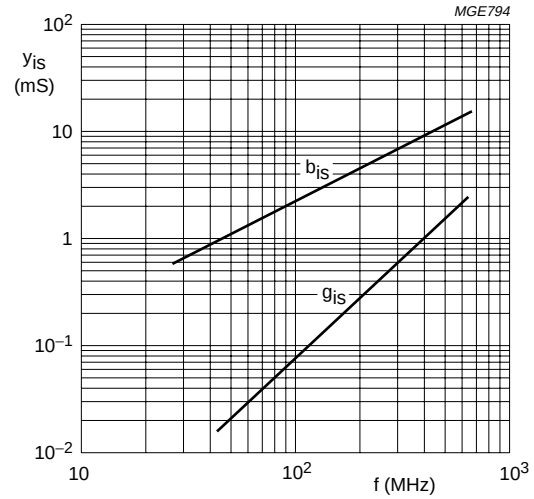
V_{DS} = 10 V; T_j = 25 °C.

Fig.5 Forward transfer admittance as a function of drain current; typical values.



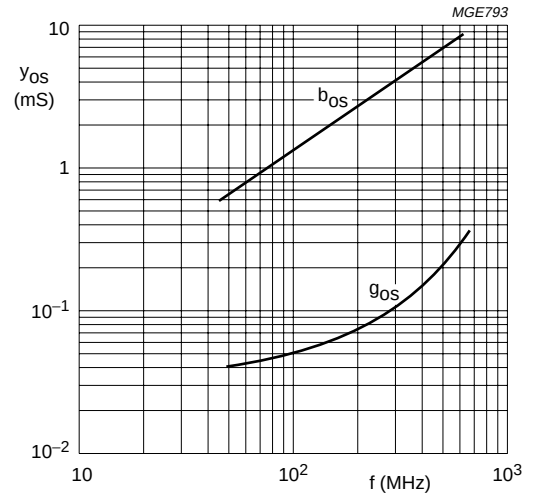
V_{DS} = 10 V; T_j = 25 °C.

Fig.6 Forward transfer admittance as a function of gate 1-source voltage; typical values.



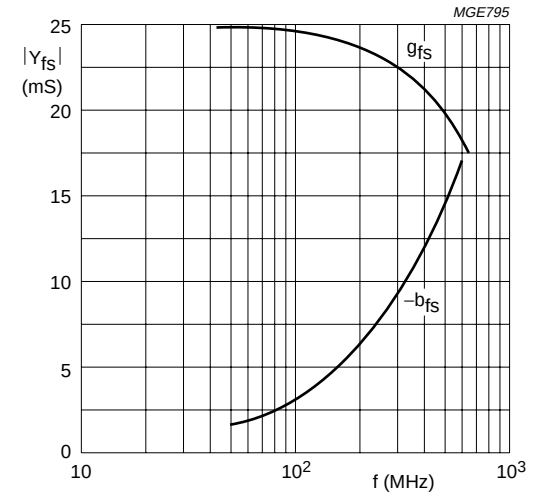
V_{DS} = 10 V; $V_{G2\text{-}S}$ = 4 V; I_D = 15 mA; T_{amb} = 25 °C.

Fig.7 Input admittance as a function of frequency; typical values.



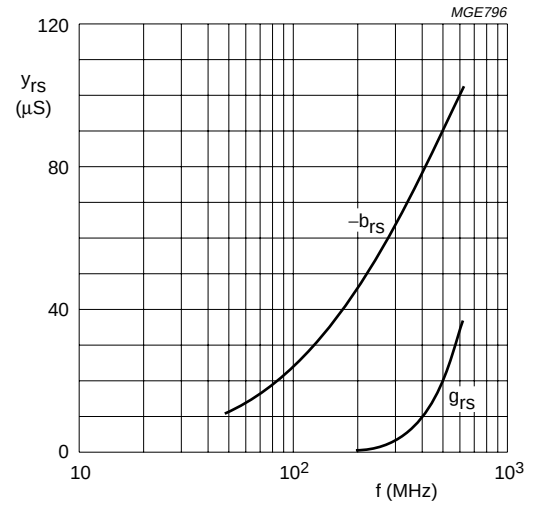
V_{DS} = 10 V; $V_{G2\text{-}S}$ = 4 V; I_D = 15 mA; T_{amb} = 25 °C.

Fig.8 Output admittance as a function of frequency; typical values.



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

Fig.9 Forward transfer admittance as a function of frequency; typical values.

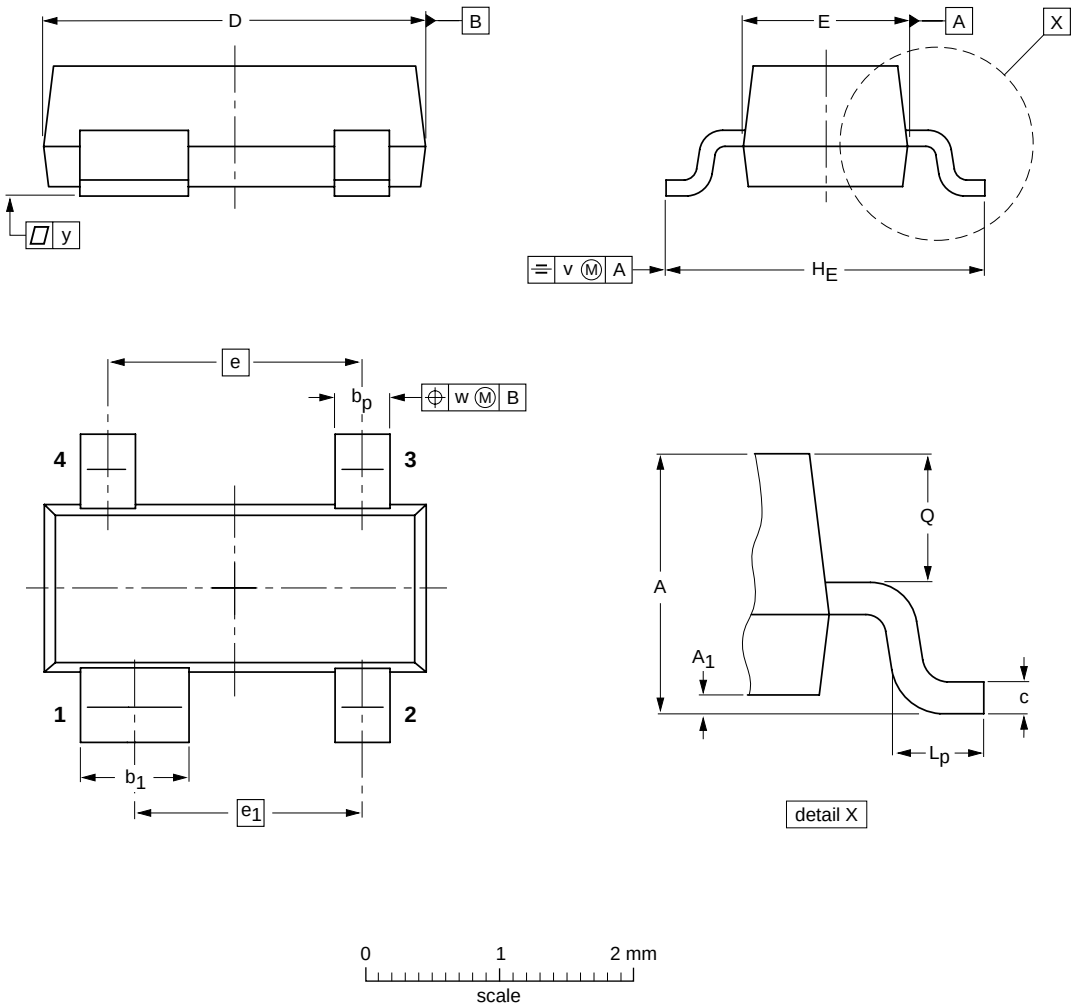


V_{DS} = 10 V; $V_{G2\text{-}S}$ = 4 V; I_D = 15 mA; T_{amb} = 25 °C.

Fig.10 Reverse transfer admittance as a function of frequency; typical values.

PACKAGE OUTLINE

Plastic surface mounted package; 4 leads **SOT143B**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	b_1	c	D	E	e	e_1	H_E	L_p	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

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.	

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Printed in The Netherlands 125004/03/pp12 Date of release: 1999 Aug 11 Document order number: 9397 750 06013

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