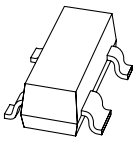

BF992

Silicon N-channel dual gate MOS-FET

Rev. 04 — 21 November 2007 Product data sheet

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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

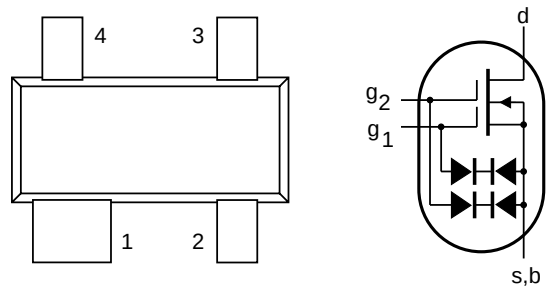

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Fig.1 Simplified outline (SOT143B) and symbol.

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.

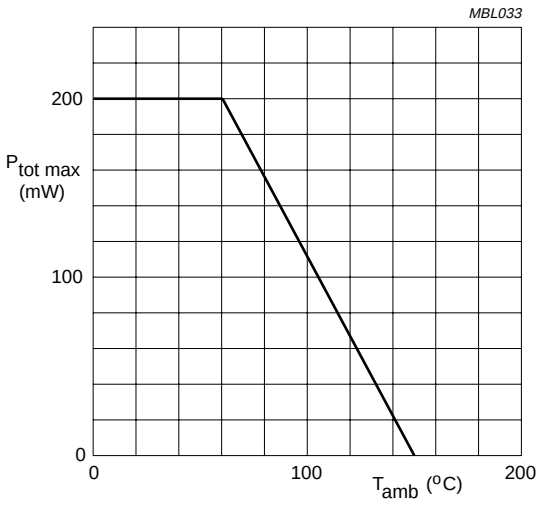


Fig.2 Power derating curves.

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

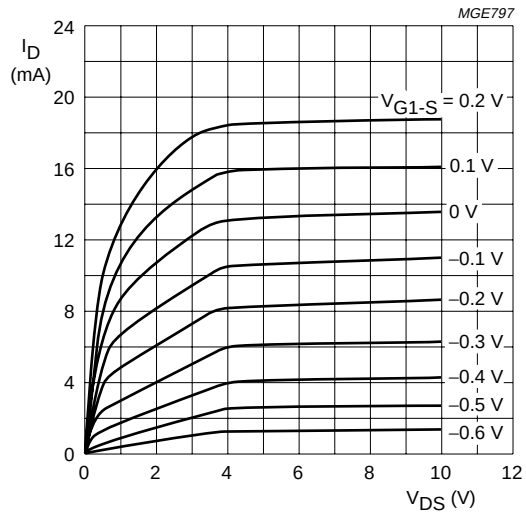
T_j = 25 °C unless otherwise specified.

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

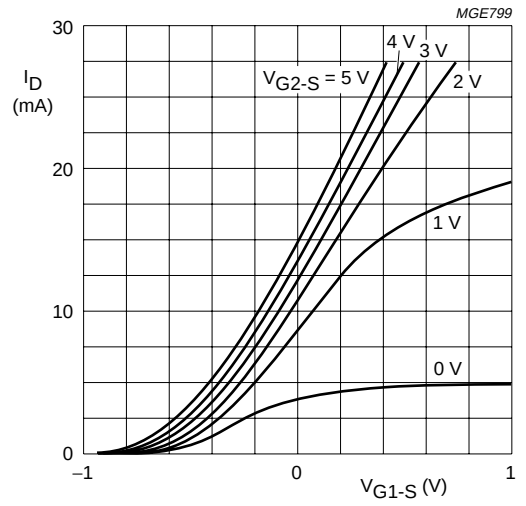
Common source; T_{amb} = 25 °C; V_{DS} = 10 V; $V_{G2\text{-}S}$ = 4 V; I_D = 15 mA; unless otherwise specified.

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



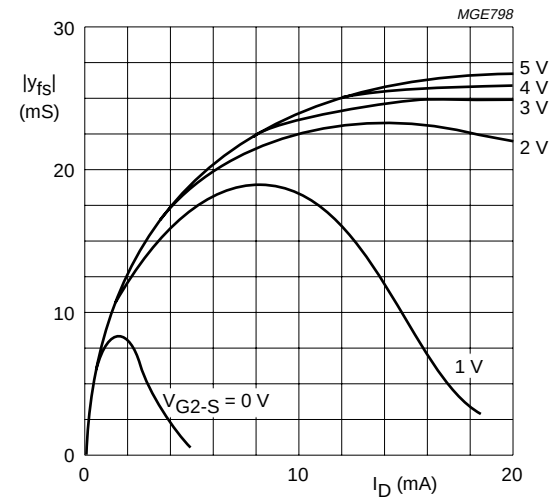
V_{G2-S} = 4 V; T_j = 25 °C.

Fig.3 Output characteristics; typical values.



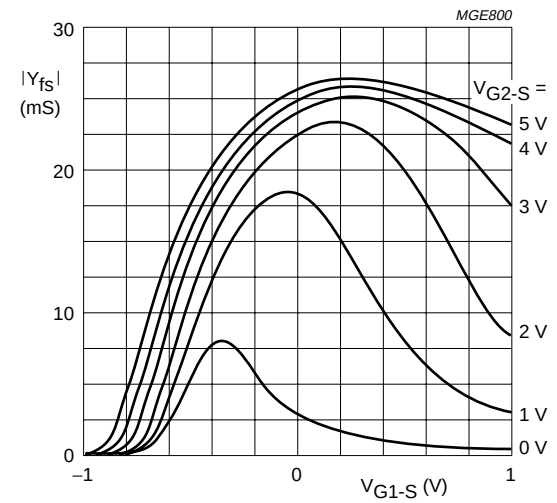
V_{DS} = 10 V; T_j = 25 °C.

Fig.4 Transfer characteristics; typical values.



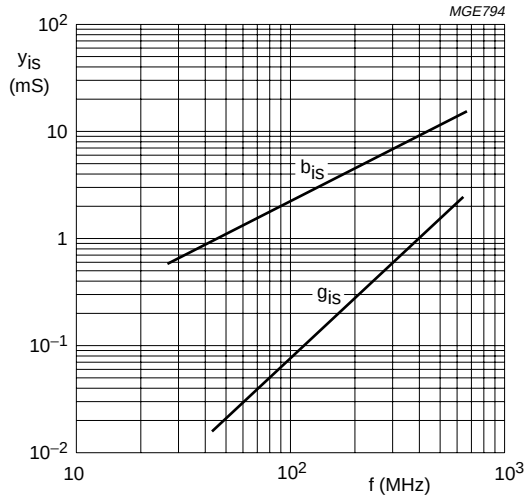
V_{DS} = 10 V; T_j = 25 °C.

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



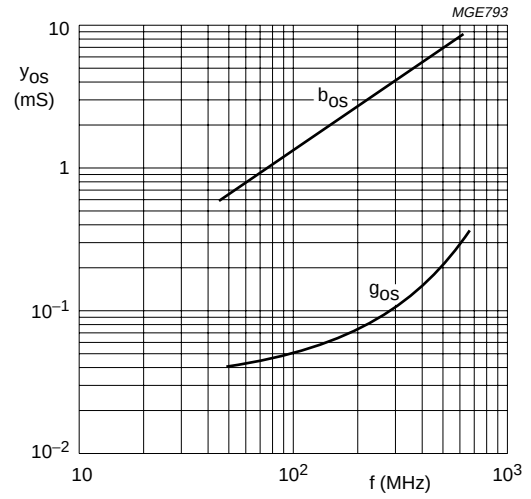
V_{DS} = 10 V; T_j = 25 °C.

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



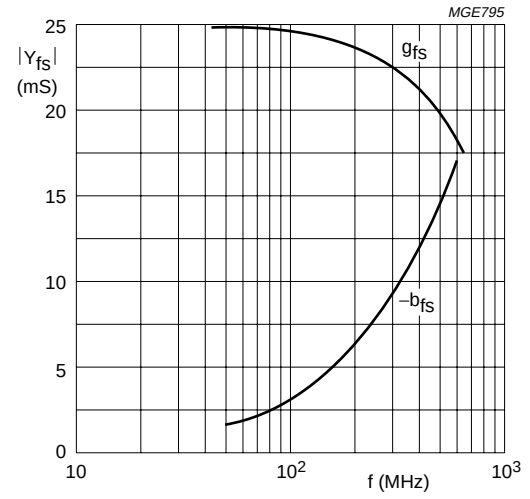
V_{DS} = 10 V; $V_{G2\text{-}S}$ = 4 V; I_D = 15 mA; T_{amb} = 25 °C.

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



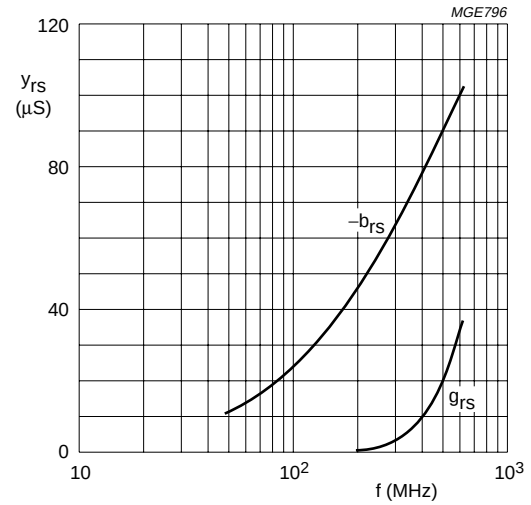
V_{DS} = 10 V; $V_{G2\text{-}S}$ = 4 V; I_D = 15 mA; T_{amb} = 25 °C.

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.

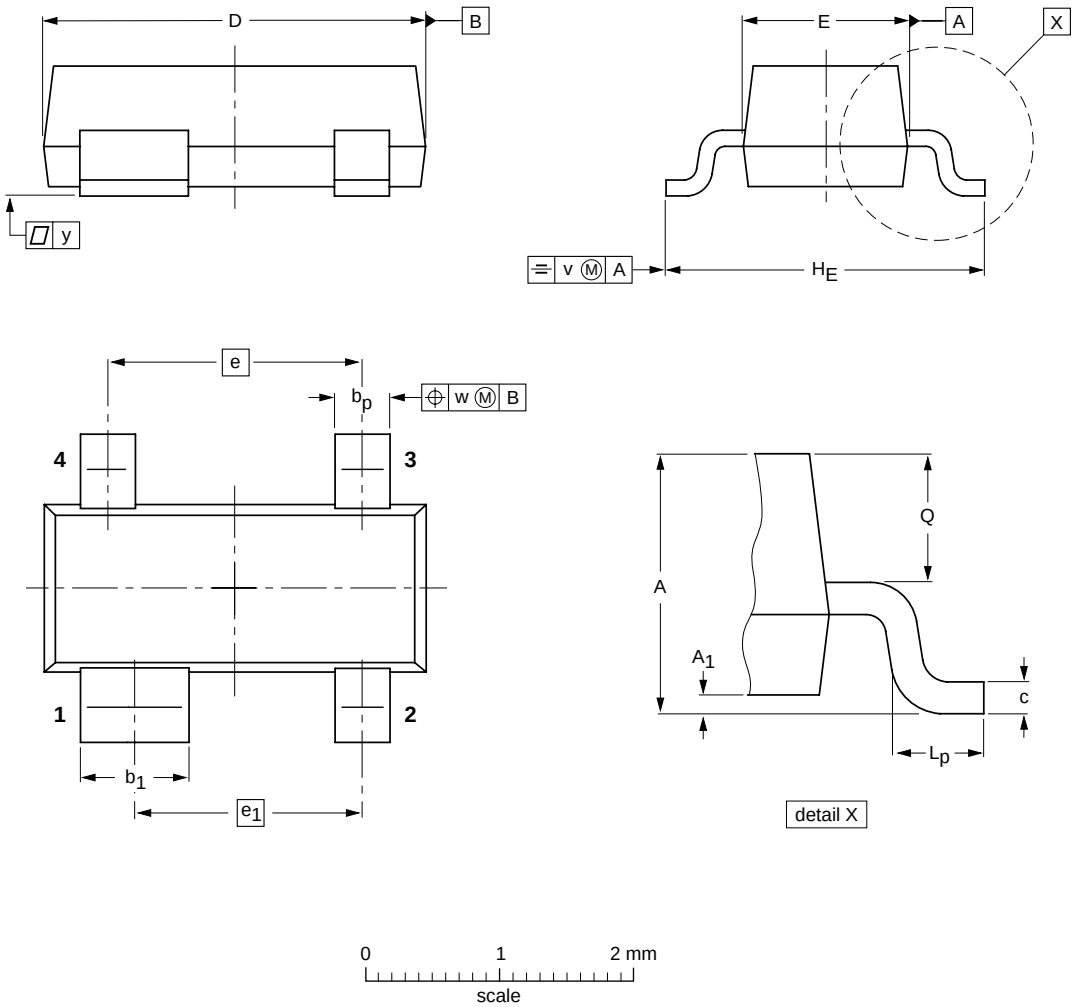


V_{DS} = 10 V; $V_{G2\text{-}S}$ = 4 V; I_D = 15 mA; T_{amb} = 25 °C.

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

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Document status[1][2]	Product status[3]	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.

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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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