DISCRETE SEMICONDUCTORS

DATA SHEET

BF996SN-channel dual-gate MOS-FET

Product specification

April 1991



N-channel dual-gate MOS-FET

BF996S

FEATURES

 Protected against excessive input voltage surges by integrated back-to-back diodes between gates and source.

APPLICATIONS

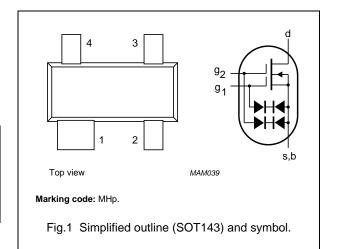
- RF applications such as:
 - UHF television tuners
 - Professional communication equipment.

PINNING

PIN	SYMBOL	DESCRIPTION	
1	s, b	source	
2	d	drain	
3	g ₂	gate 2	
4	9 1	gate 1	

DESCRIPTION

Depletion type field-effect transistor in a plastic SOT143 microminiature package with interconnected source and substrate.



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V _{DS}	drain-source voltage		_	20	V
I_D	drain current		-	30	mA
P _{tot}	total power dissipation	up to T _{amb} = 60 °C	_	200	mW
Tj	junction temperature		_	150	°C
Y _{fs}	transfer admittance	$f = 1 \text{ kHz}; I_D = 10 \text{ mA}; V_{DS} = 15 \text{ V}; V_{G2-S} = 4 \text{ V}$	18	_	mS
C _{ig-1s}	input capacitance at gate 1	$f = 1 \text{ MHz}$; $I_D = 10 \text{ mA}$; $V_{DS} = 15 \text{ V}$; $V_{G2-S} = 4 \text{ V}$	2.3	2.6	pF
C _{rs}	feedback capacitance	$f = 1 \text{ MHz}$; $I_D = 10 \text{ mA}$; $V_{DS} = 15 \text{ V}$; $V_{G2-S} = 4 \text{ V}$	25	_	fF
F	noise figure	$f = 200 \text{ MHz } G_S = 2 \text{ mS}; B_S = B_{Sopt};$ $I_D = 10 \text{ mA}; V_{DS} = 15 \text{ V}; V_{GS-2} = 4 \text{ V}$	1	_	dB

April 1991 2

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N-channel dual-gate MOS-FET

BF996S

LIMITING VALUES

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

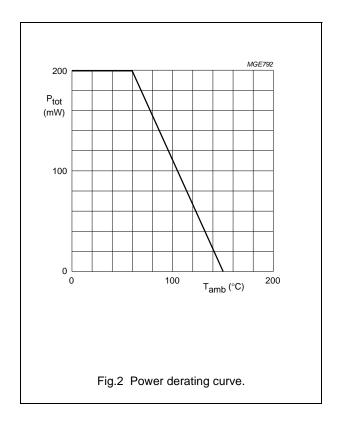
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V _{DS}	drain-source voltage		_	20	V
I _D	drain current (DC)		_	30	mA
I _{D(AV)}	average drain current		-	30	mA
I _{G1-S}	gate 1 source		-	±10	mA
I _{G1-S}	gate 2 source		-	±10	mA
P _{tot}	total power dissipation	up to T _{amb} = 60 °C; note 1	_	200	mW
T _{stg}	storage temperature range		-65	+150	°C
Tj	junction temperature		_	150	°C

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 to the Limiting values and the Thermal characteristics

1. Device mounted on a ceramic substrate of $8 \times 10 \times 0.7$ mm.



N-channel dual-gate MOS-FET

BF996S

STATIC CHARACTERISTICS

 $T_i = 25$ °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I _{G1-SS}	gate cut-off current	$V_{G1-S} = \pm 5 \text{ V}; V_{G2-S} = V_{DS} = 0$	_	±50	nA
I _{G2-SS}	gate cut-off current	$V_{G2-S} = \pm 5 \text{ V}; V_{G1-S} = V_{DS} = 0$	_	±50	nA
V _{(BR)G1-SS}	gate-source breakdown voltage	$I_{G1-S} = \pm 10 \text{ mA}; V_{G2-S} = V_{DS} = 0$	±6	±20	V
V _{(BR)G2-SS}	gate-source breakdown voltage	$I_{G2-S} = \pm 10 \text{ mA}; V_{G1-S} = V_{DS} = 0$	±6	±20	V
I _{DSS}	drain current	V _{DS} = 15 V; V _{G1-S} = 0; V _{G2-S} = 4 V	4	20	mA
V _{(P)G1-S}	gate-source cut-off current	$I_D = 20 \mu A; V_{DS} = 15 V; V_{G2-S} = 4 V$	_	-2.5	V
V _{(P)G2-S}	gate-source cut-off current	$I_D = 20 \mu A; V_{DS} = 15 V; V_{G1-S} = 0$	_	-2	V

DYNAMIC CHARACTERISTICS

Measuring conditions (common source): I_D = 10 mA; V_{DS} = 15 V; V_{G2-S} = 4 V; T_{amb} = 25 °C.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Y _{fs}	transfer admittance	f = 1 kHz	15	18	_	mS
C _{ig1-s}	input capacitance at gate 1	f = 1 MHz	_	2.3	2.6	pF
C _{ig2-s}	input capacitance at gate 2	f = 1 MHz	_	1.2	_	pF
C _{rs}	feedback capacitance	f = 1 MHz	_	25	_	fF
Cos	output capacitance	f = 1 MHz	_	0.8	_	pF
F	noise figure	$f = 200 \text{ MHz}; G_S = 2 \text{ mS}; B_S = B_{Sopt}$	_	1	_	dB
		$f = 800 \text{ MHz}; G_S = 3.3 \text{ mS}; B_S = B_{Sopt}$	_	1.8	_	dB
G _P	power gain	$f = 200 \text{ MHz}; G_S = 2 \text{ mS}; B_S = B_{Sopt}; G_L = 0.5 \text{ mS}; B_L = B_{Lopt}$	-	25	-	dB
		$f = 800 \text{ MHz}; G_S = 3.3 \text{ mS};$	_	18	_	dB
		$B_S = B_{Sopt}$; $G_L = 1 \text{ mS}$; $B_L = B_{Lopt}$				

April 1991

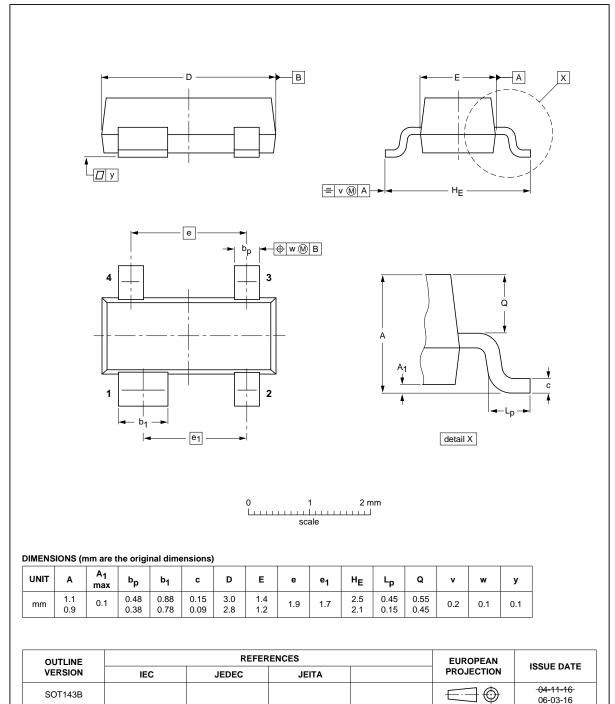
N-channel dual-gate MOS-FET

BF996S

PACKAGE OUTLINE

Plastic surface-mounted package; 4 leads

SOT143B



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BF996S

DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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N-channel dual-gate MOS-FET

BF996S

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Contact information

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