DATA SHEET

BF901; BF901R
Silicon n-channel dual gate MOS-FETs

Product specification
File under Discrete Semiconductors, SC07

November 1992

Philips
Semiconductors

PHILIPS

Silicon n-channel dual gate MOS-FETs BF901; BF901R

FEATURES

- Intended for low voltage operation
- Short channel transistor with high ratio $|Y_{fs}|:C_{is}$
- Low noise gain-controlled amplifier to 1 GHz
- BF901R has reverse pinning.

DESCRIPTION

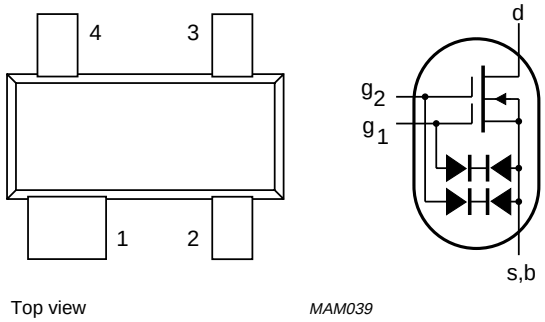
Enhancement type field-effect transistors in plastic microminiature SOT143 and SOT143R envelopes, with source and substrate interconnected. They are intended for UHF and VHF applications, such as television tuners and professional communications equipment especially suited for low voltage operation. These MOS-FET tetrodes are protected against excessive input voltage surges by integrated back-to-back diodes between gates and source.

PINNING

PIN	DESCRIPTION
1	source
2	drain
3	gate 2
4	gate 1

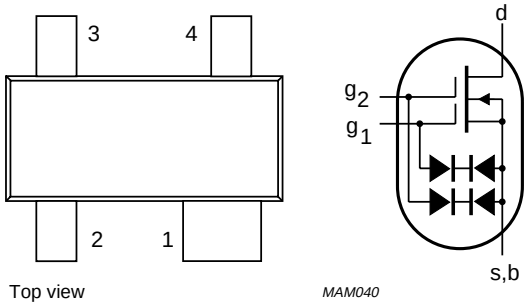
QUICK REFERENCE DATA

SYMBOL	PARAMETER	TYP.	MAX.	UNIT
V_{DS}	drain-source voltage	–	12	V
I_D	drain current	–	30	mA
P_{tot}	total power dissipation	–	200	mW
T_j	junction temperature	–	150	°C
$\|Y_{fs}\|$	transfer admittance	28	35	mS
C_{ig1-s}	input capacitance at gate 1	2.35	2.75	pF
C_{rs}	feedback capacitance	25	–	fF
F	noise figure at 800 MHz	1.7	–	dB



Marking code: MO1.

Fig.1 Simplified outline (SOT143) and symbol.



Marking code: MO2.

Fig.2 Simplified outline (SOT143R) and symbol.

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DS}	drain-source voltage		–	12	V
V_{D-G2}	drain-gate 2 voltage		–	6	V
I_D	DC drain current		–	30	mA
$\pm I_{G1-S}$	gate 1-source current		–	10	mA
$\pm I_{G2-S}$	gate 2-source current		–	10	mA
P_{tot}	total power dissipation				
	BF901	up to T_{amb} = 50 °C (note 1)	–	200	mW
	BF901R	up to T_{amb} = 40 °C (note 1)	–	200	mW
T_{stg}	storage temperature		–65	150	°C
T_j	junction temperature		–	150	°C

THERMAL RESISTANCE

SYMBOL	PARAMETER	THERMAL RESISTANCE
$R_{th\ j-a}$	thermal resistance from junction to ambient (note 1)	
	BF901	500 K/W
	BF901R	550 K/W

Note

1. Device mounted on an FR4 printboard.

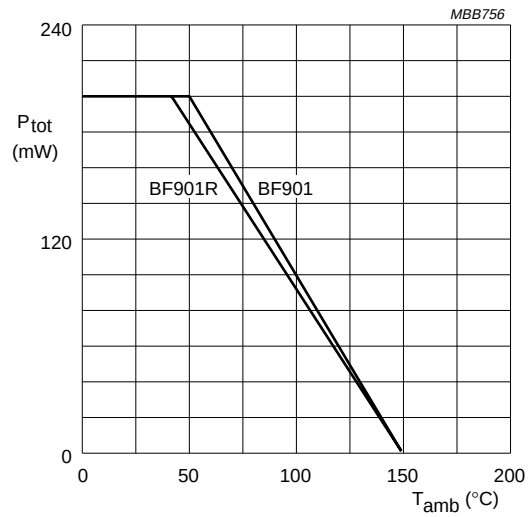


Fig.3 Power derating curve.

STATIC CHARACTERISTICS

T_j = 25 °C.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$\pm I_{G1-SS}$	gate 1 cut-off current	$\pm V_{G1-S}$ = 5 V; $V_{G2-S} = V_{DS}$ = 0	–	50	nA
$\pm I_{G2-SS}$	gate 2 cut-off current	$\pm V_{G2-S}$ = 5 V; $V_{G1-S} = V_{DS}$ = 0	–	50	nA
$\pm V_{(BR)G1-SS}$	gate 1-source breakdown voltage	$\pm I_{G1-SS}$ = 10 mA; $V_{G2-S} = V_{DS}$ = 0	6	20	V
$\pm V_{(BR)G2-SS}$	gate 2-source breakdown voltage	$\pm I_{G2-SS}$ = 10 mA; $V_{G1-S} = V_{DS}$ = 0	6	20	V
$V_{G1-S(th)}$	gate 1-source threshold voltage	I_D = 20 μA; V_{DS} = 8 V; V_{G2-S} = 4 V	0	0.7	V
$V_{G2-S(th)}$	gate 2-source threshold voltage	I_D = 20 μA; V_{DS} = 8 V; V_{G1-S} = 0	0.3	1	V
I_{DSX}	drain-source current	V_{DS} = 4 V; V_{G1-S} = 1.1 V; V_{G2-S} = 3.4 V	2	18	mA

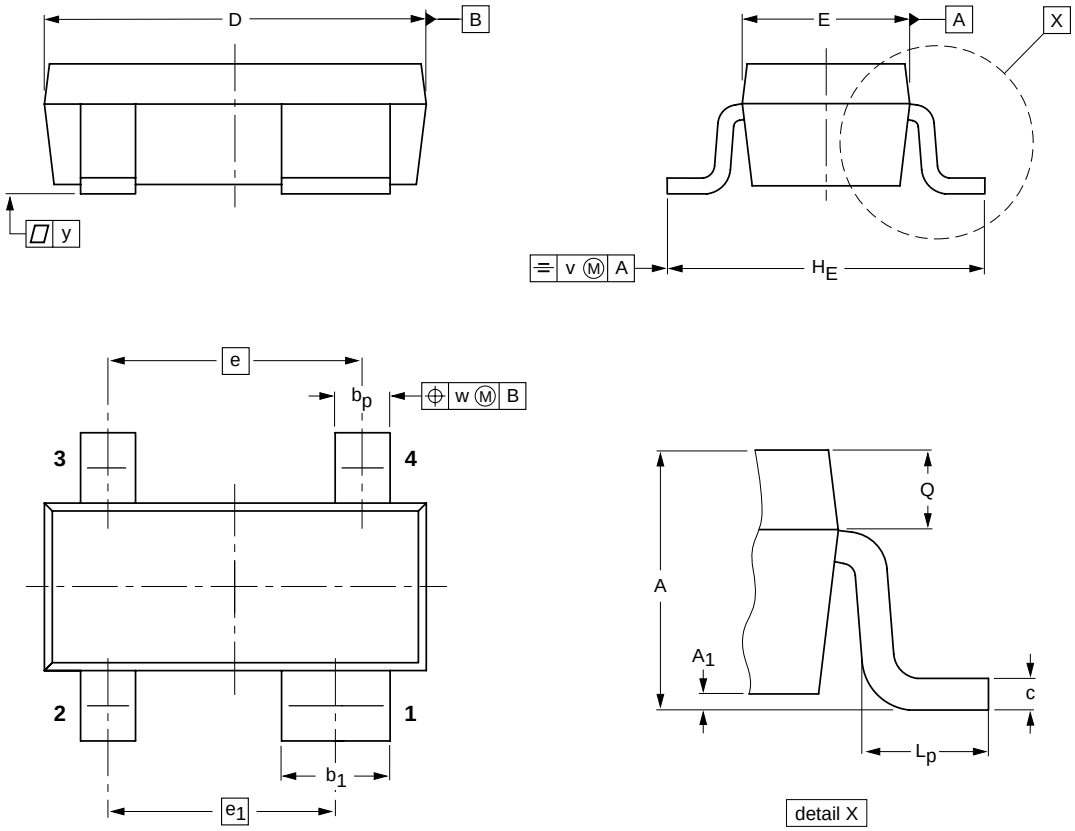
DYNAMIC CHARACTERISTICS

Measuring conditions (common source): I_D = 14 mA; V_{DS} = 5 V; V_{G2-S} = 4 V; T_{amb} = 25 °C.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$\lvert Y_{fs} \rvert$	transfer admittance	pulsed; T_j = 25 °C	25	28	35	mS
C_{ig1-s}	input capacitance at gate 1	f = 1 MHz	–	2.35	2.75	pF
C_{ig2-s}	input capacitance at gate 2	f = 1 MHz	–	1.2	–	pF
C_{os}	output capacitance	f = 1 MHz	–	1.4	–	pF
C_{rs}	feedback capacitance	f = 1 MHz	–	25	–	fF
F	noise figure	f = 200 MHz; G_s = 2 mS; $B_s = B_{sopt.}$	–	0.7	–	dB
		f = 800 MHz; G_s = 3.3 mS; $B_s = B_{sopt.}$	–	1.7	–	dB

PACKAGE OUTLINE

Plastic surface mounted package; reverse pinning; 4 leads **SOT143R**

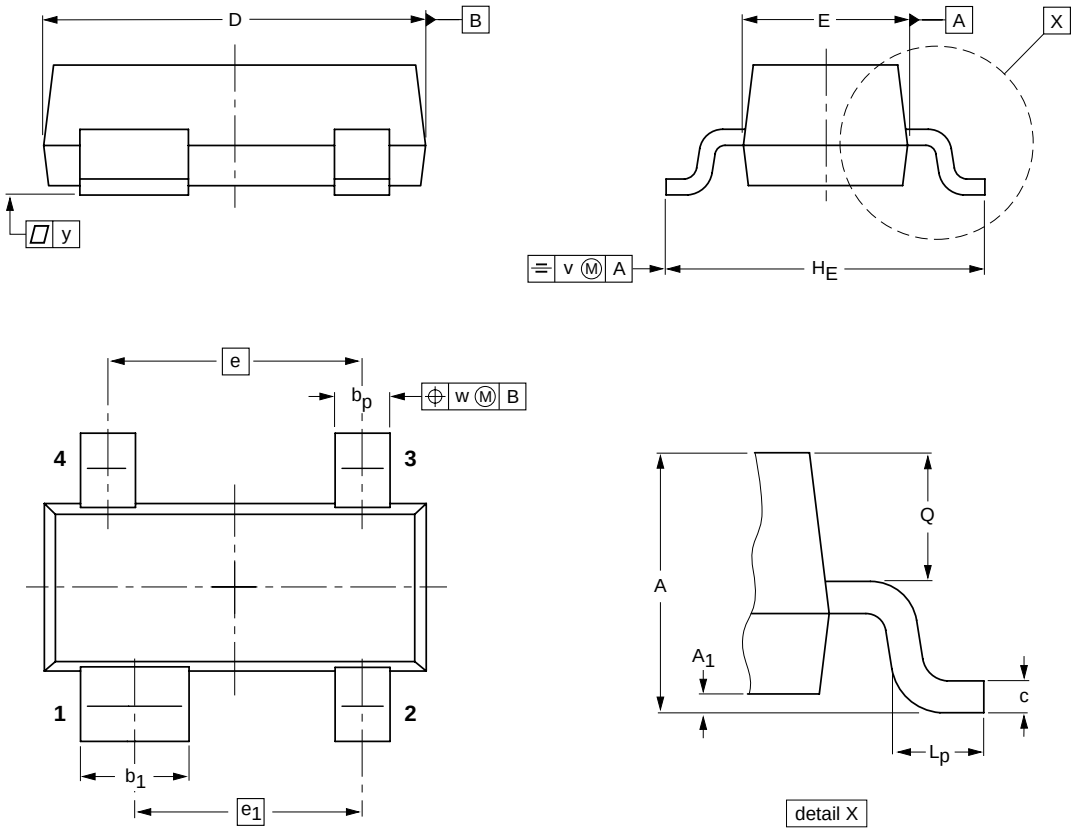


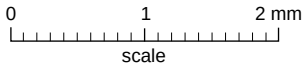
DIMENSIONS (mm are the original dimensions)

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	0.55 0.25	0.45 0.25	0.2	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT143R						97-03-10

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.
Short-form specification	The data in this specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.
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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