

# DATA SHEET

## **BFR30; BFR31** N-channel field-effect transistors

Product specification  
Supersedes data of April 1991

1997 Dec 05



# N-channel field-effect transistors

# BFR30; BFR31

## DESCRIPTION

Planar epitaxial symmetrical junction N-channel field-effect transistor in a plastic SOT23 package.

## APPLICATIONS

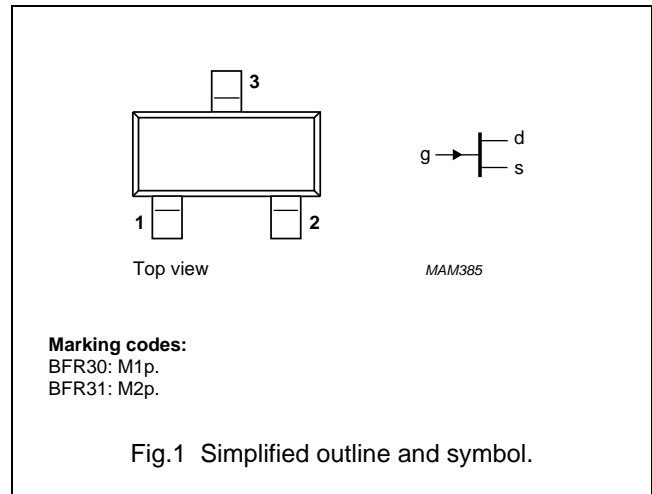
- Low level general purpose amplifiers in thick and thin-film circuits.

## PINNING - SOT23

PIN	SYMBOL	DESCRIPTION
1	d	drain <sup>(1)</sup>
2	s	source <sup>(1)</sup>
3	g	gate

## Note

1. Drain and source are interchangeable.



## CAUTION

This product is supplied in anti-static packing to prevent damage caused by electrostatic discharge during transport and handling.

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{DS}$	drain-source voltage		–	$\pm 25$	V
$V_{GSO}$	gate-source voltage	open drain	–	–25	V
$P_{tot}$	total power dissipation	$T_{amb} \leq 40\text{ }^\circ\text{C}$	–	250	mW
$I_{DSS}$	drain current	$V_{GS} = 0; V_{DS} = 10\text{ V}$			
	BFR30		4	10	mA
	BFR31	1	5	mA	
$ y_{fs} $	common-source transfer admittance	$I_D = 1\text{ mA}; V_{DS} = 10\text{ V}; f = 1\text{ kHz}$			
	BFR30		1	4	mS
	BFR31	1.5	4.5	mS	

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**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>DS</sub>	drain-source voltage		–	±25	V
V <sub>DGO</sub>	drain-gate voltage	open source	–	–25	V
V <sub>GSO</sub>	gate-source voltage	open drain	–	–25	V
I <sub>D</sub>	drain current		–	10	mA
I <sub>G</sub>	forward gate current (DC)		–	5	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 40 °C; note 1; see Fig.2	–	250	mW
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	operating junction temperature		–	150	°C

**Note**

1. Mounted on a ceramic substrate of 8 × 10 × 0.7 mm.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient	note 1	430	K/W

**Note**

1. Mounted on a ceramic substrate of 8 × 10 × 0.7 mm.

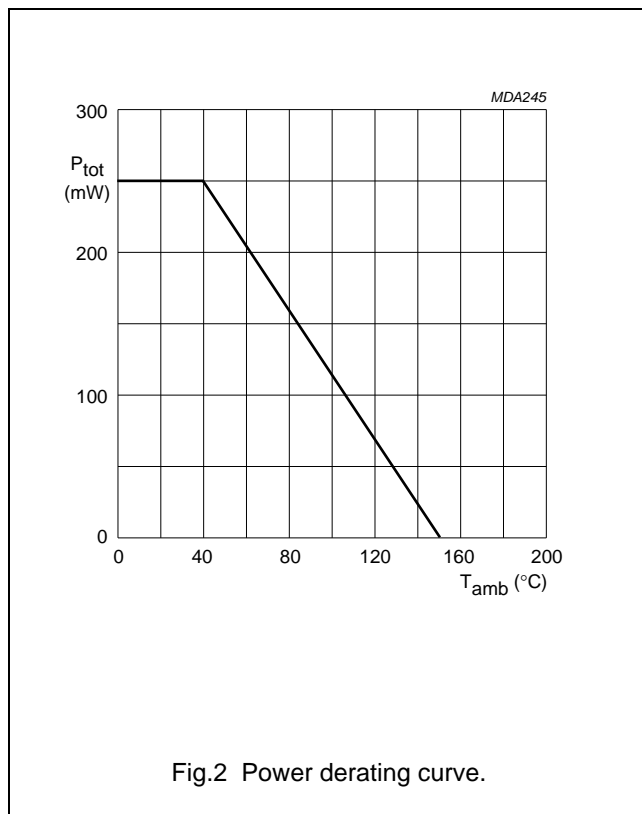


Fig.2 Power derating curve.

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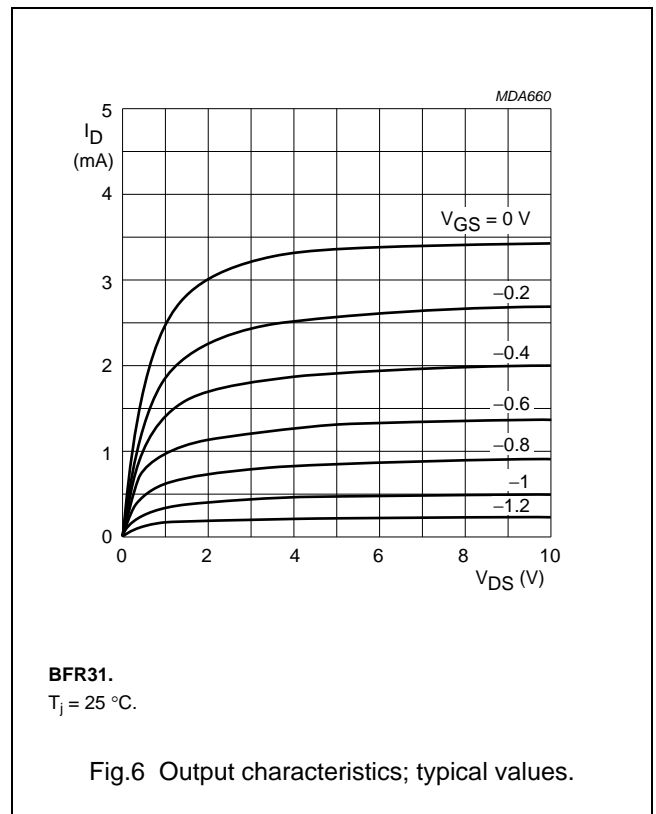
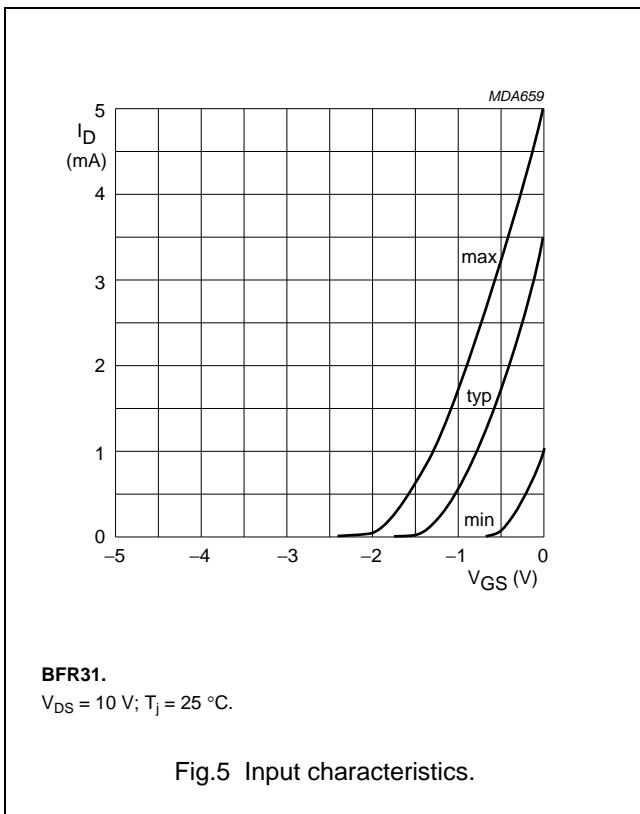
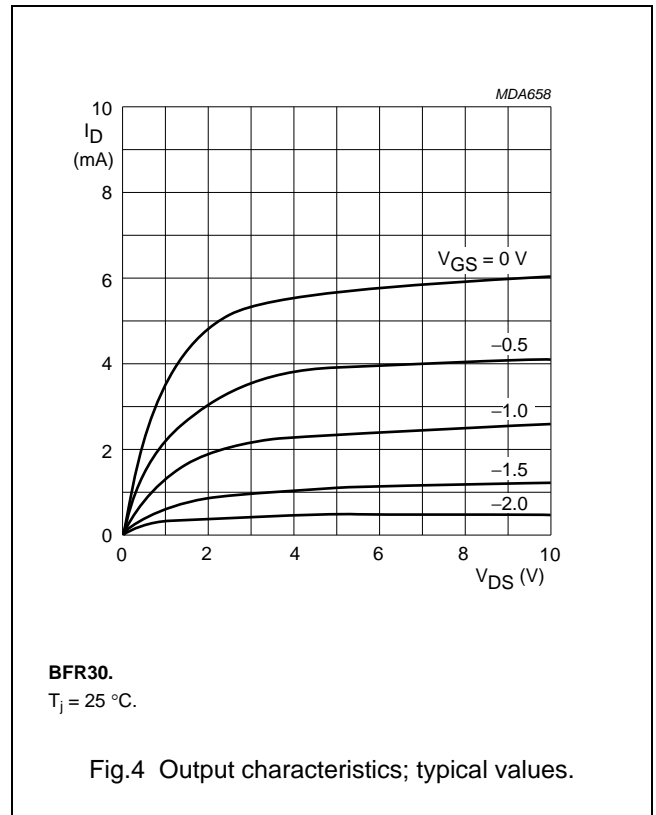
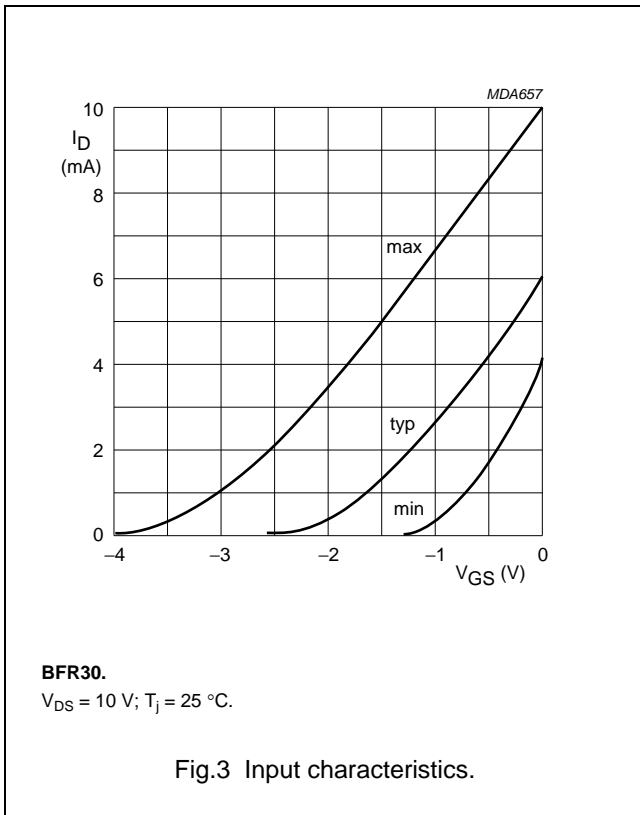
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**CHARACTERISTICS**T<sub>j</sub> = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I <sub>GSS</sub>	gate cut-off current	V <sub>DS</sub> = 0; V <sub>GS</sub> = -10 V	-	-0.2	nA
I <sub>DSS</sub>	drain current BFR30 BFR31	V <sub>GS</sub> = 0; V <sub>DS</sub> = 10 V	4 1	10 5	mA mA
V <sub>GS</sub>	gate-source voltage BFR30 BFR31	I <sub>D</sub> = 1 mA; V <sub>DS</sub> = 10 V	-0.7 0	-3 -1.3	V V
V <sub>GS</sub>	gate-source voltage BFR30 BFR31	I <sub>D</sub> = 50 μA; V <sub>DS</sub> = 10 V	- -	-4 -2	V V
V <sub>GSoff</sub>	gate-source cut-off voltage BFR30 BFR31	I <sub>D</sub> = 0.5 nA; V <sub>DS</sub> = 10 V	- -	-5 -2.5	V V
y <sub>fs</sub>	common-source transfer admittance BFR30 BFR31	I <sub>D</sub> = 1 mA; V <sub>DS</sub> = 10 V; f = 1 kHz; T <sub>amb</sub> = 25 °C	1 1.5	4 4.5	mS mS
y <sub>fs</sub>	common-source transfer admittance BFR30 BFR31	I <sub>D</sub> = 200 μA; V <sub>DS</sub> = 10 V; f = 1 kHz; T <sub>amb</sub> = 25 °C	0.5 0.75	- -	mS mS
y <sub>os</sub>	common source output admittance BFR30 BFR31	I <sub>D</sub> = 1 mA; V <sub>DS</sub> = 10 V; f = 1 kHz	- -	40 25	μS μS
y <sub>os</sub>	common source output admittance BFR30 BFR31	I <sub>D</sub> = 200 μA; V <sub>DS</sub> = 10 V; f = 1 kHz	- -	20 15	μS μS
C <sub>is</sub>	input capacitance	V <sub>DS</sub> = 10 V; f = 1 MHz I <sub>D</sub> = 1 mA I <sub>D</sub> = 0.2 nA	- -	4 4	pF pF
C <sub>rs</sub>	feedback capacitance	V <sub>DS</sub> = 10 V; f = 1 MHz; T <sub>amb</sub> = 25 °C I <sub>D</sub> = 1 mA I <sub>D</sub> = 200 μA	- -	1.5 1.5	pF pF
V <sub>n</sub>	equivalent input noise voltage	I <sub>D</sub> = 200 μA; V <sub>DS</sub> = 10 V; B = 0.6 to 100 Hz	-	0.5	μV

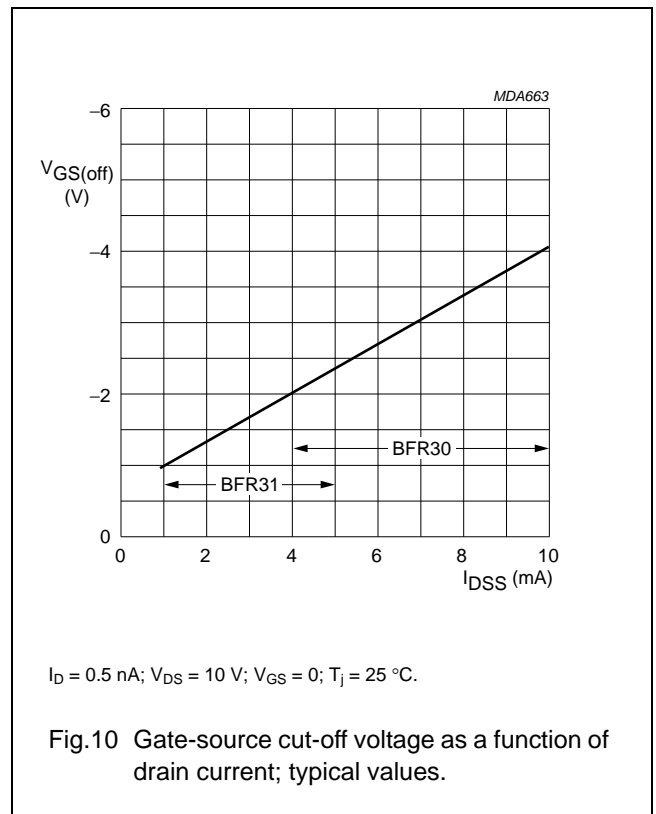
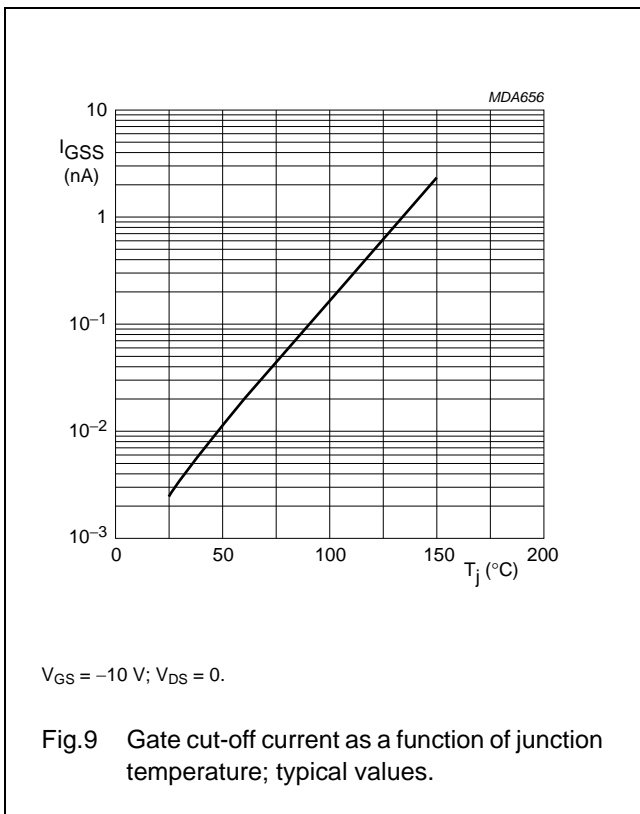
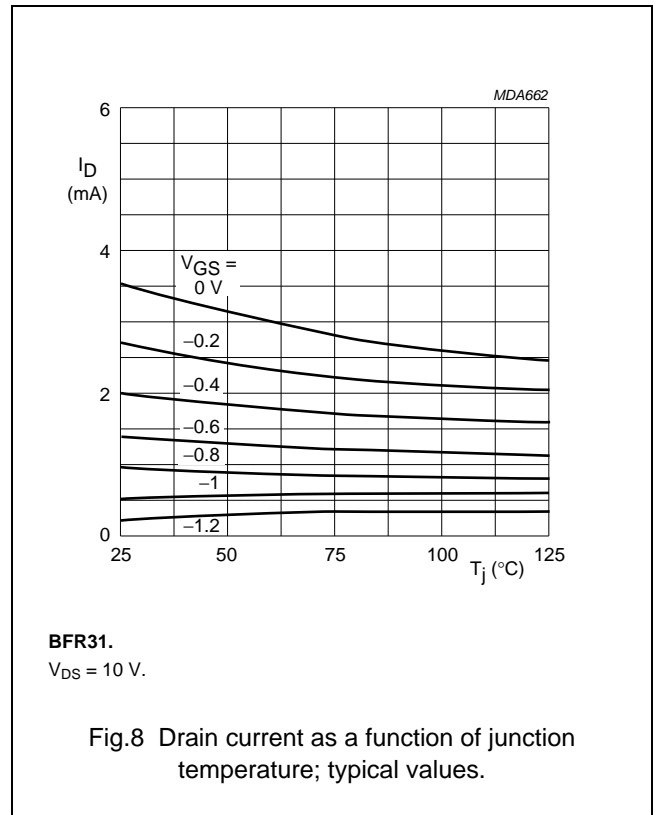
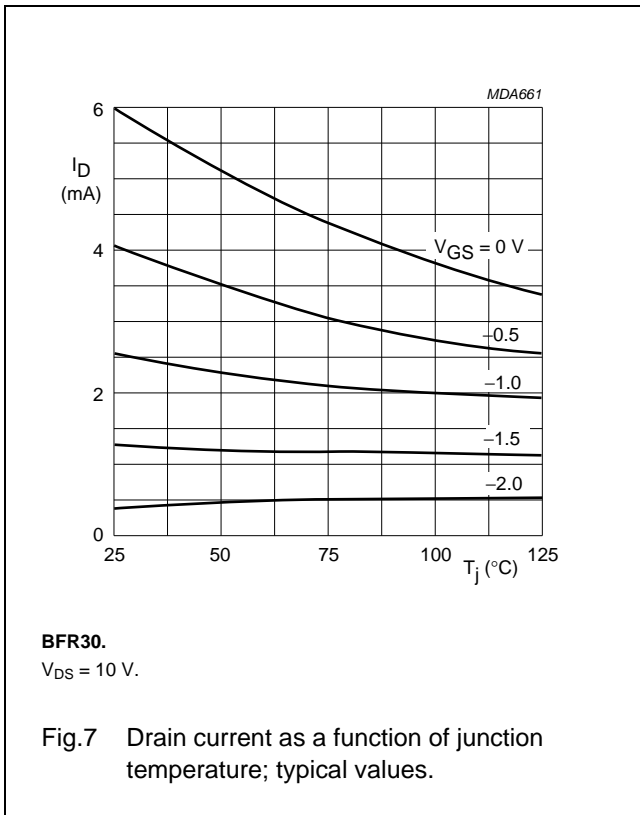
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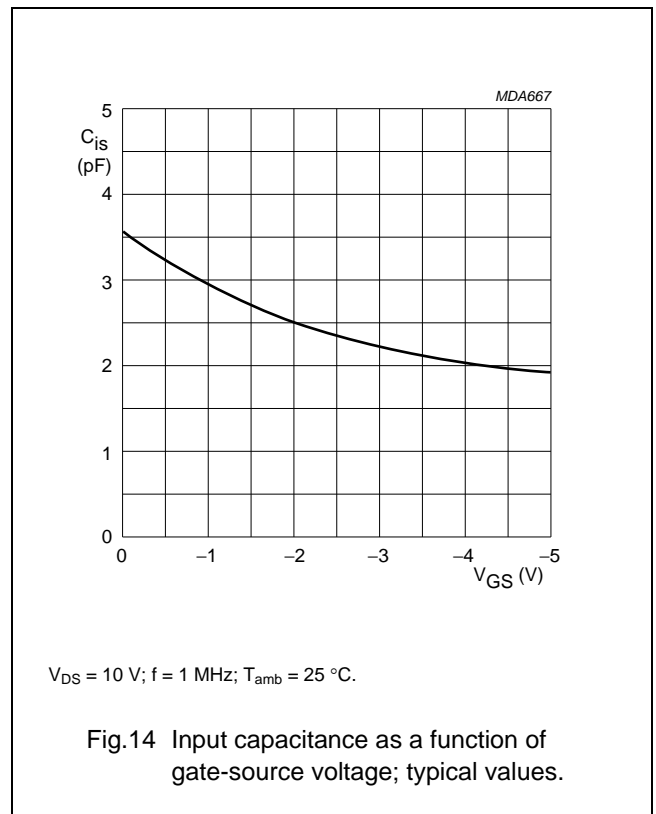
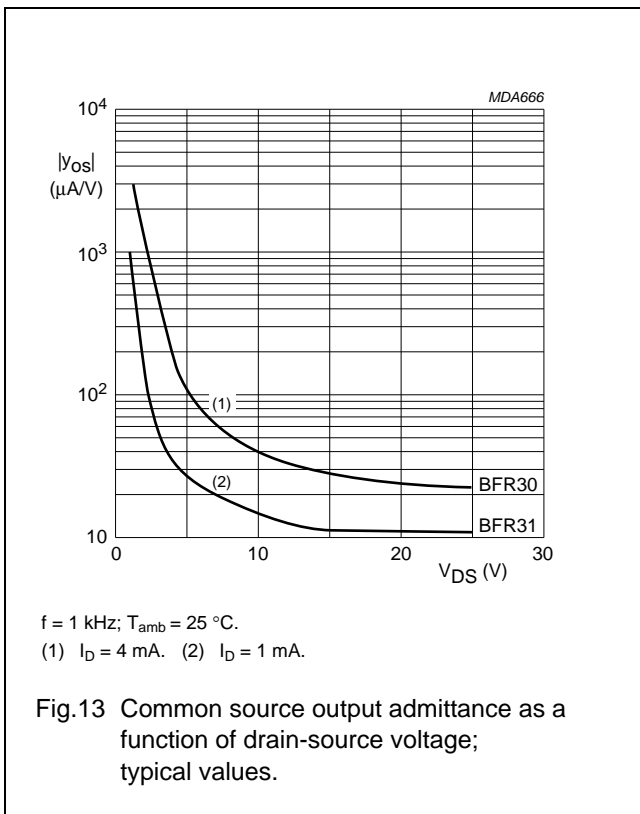
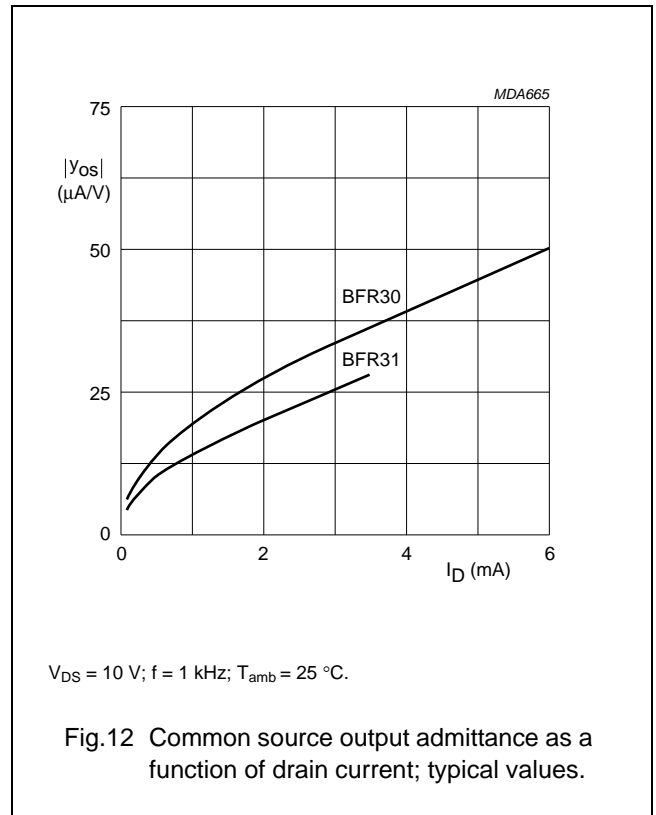
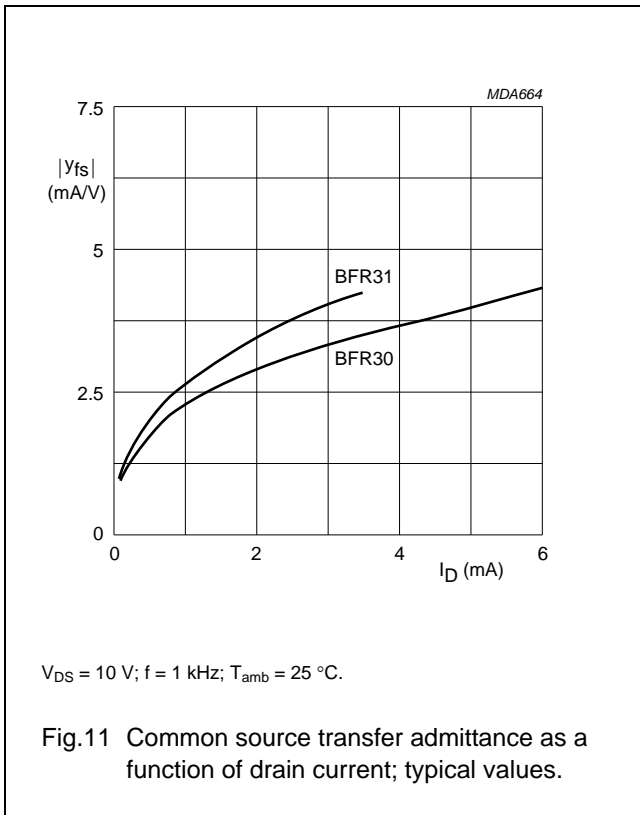
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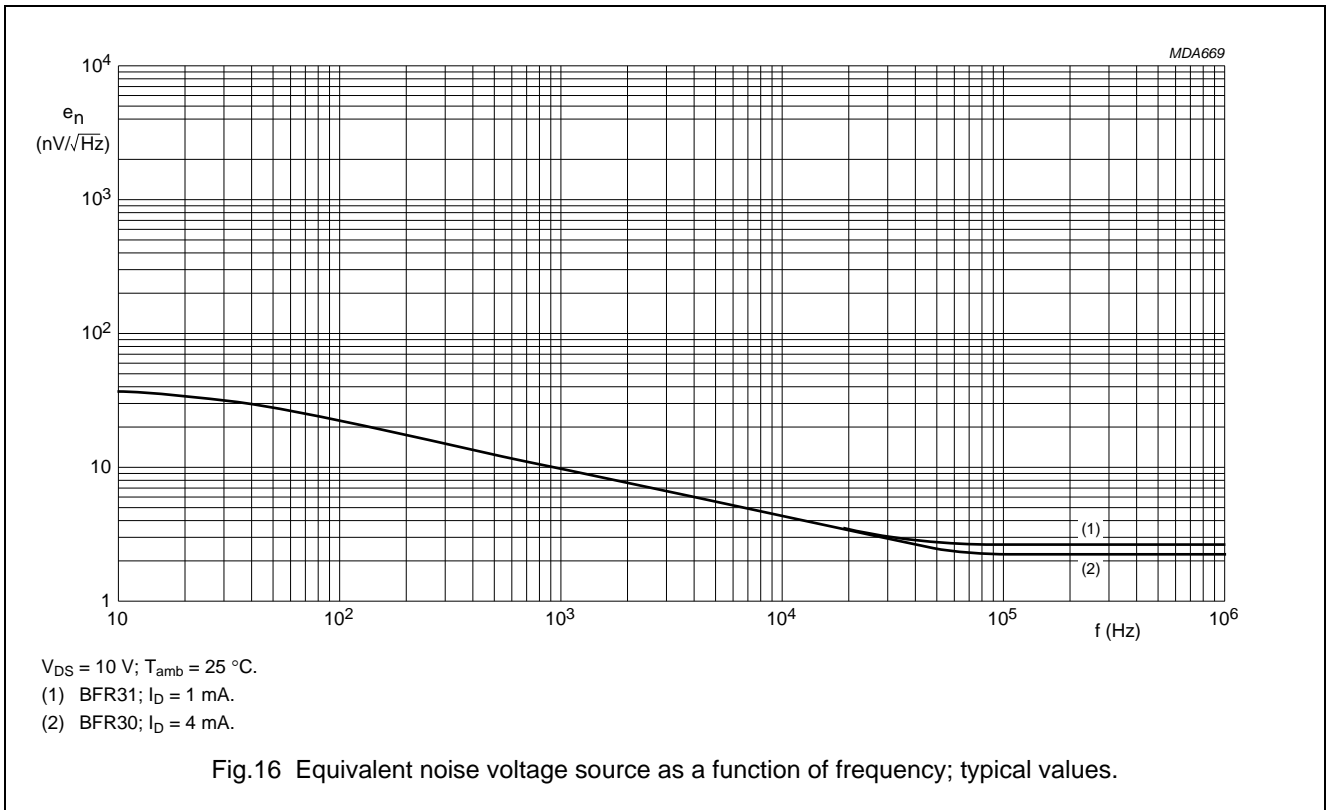
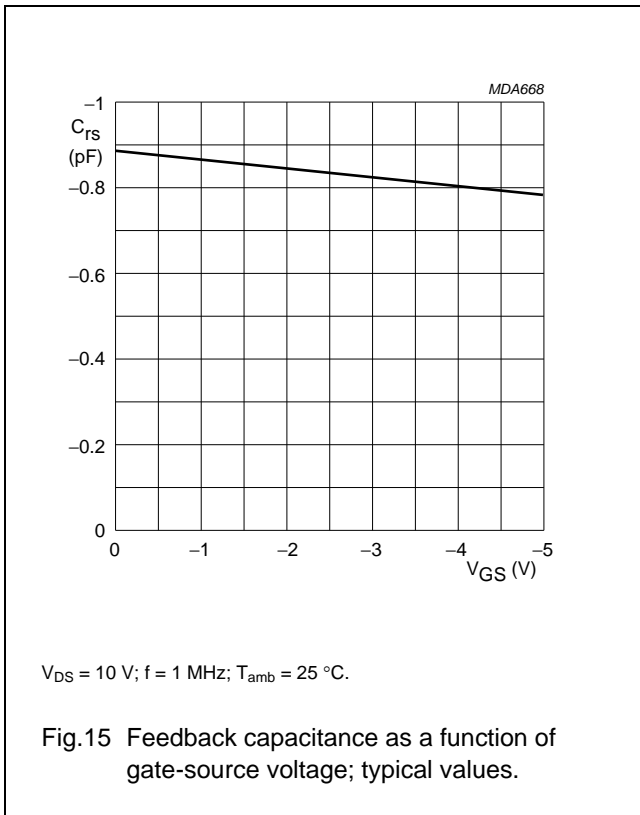
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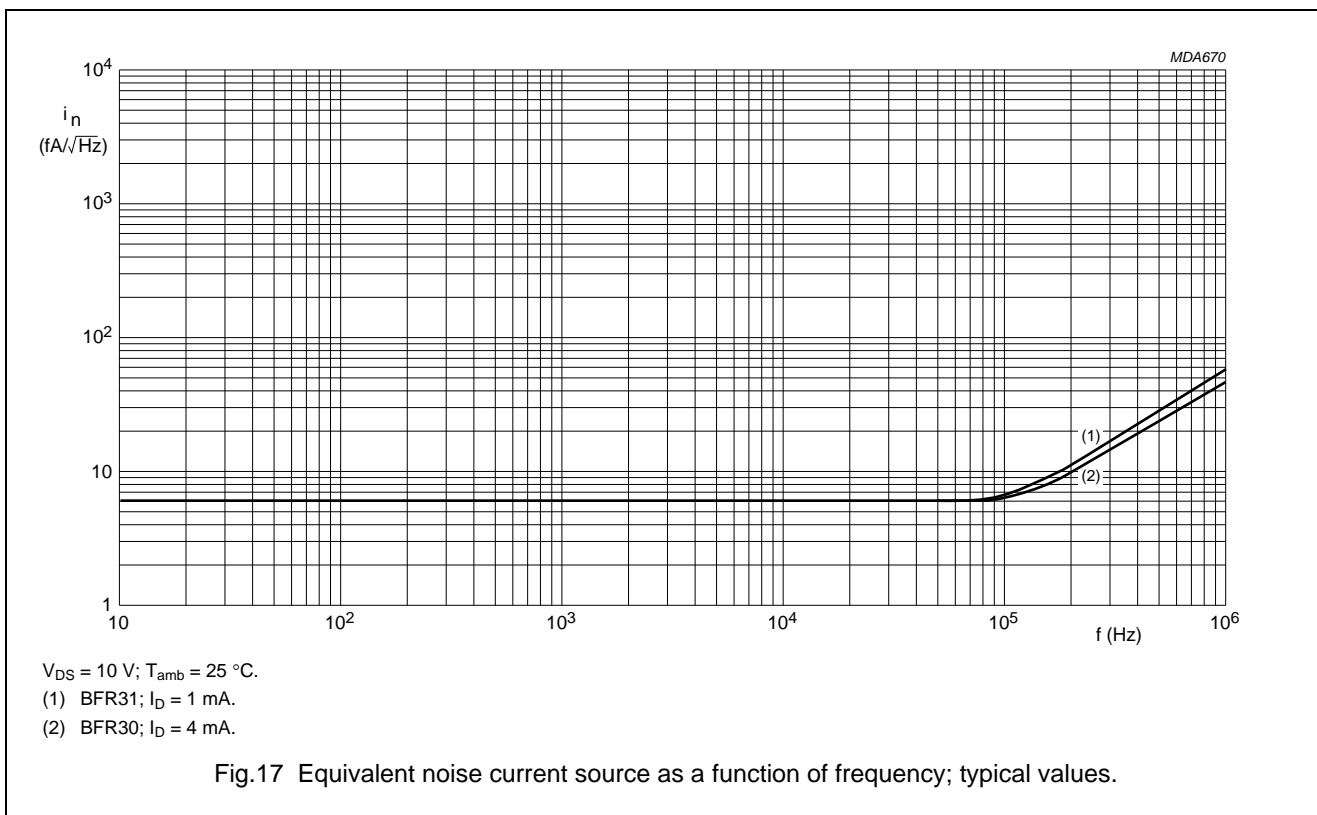
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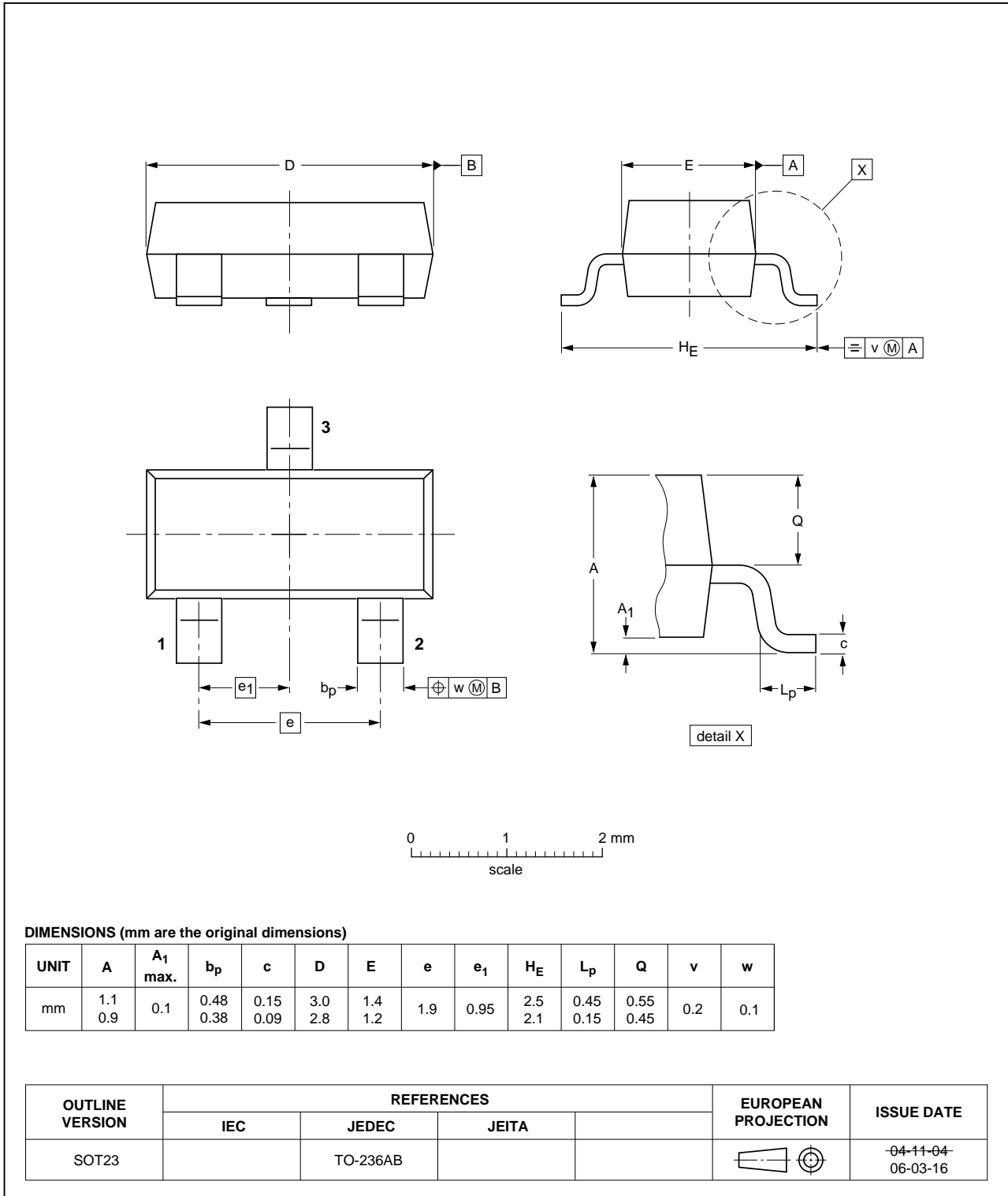
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PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



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## DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	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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