

# DATA SHEET

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

Product specification  
Supersedes data of April 1991  
File under Discrete Semiconductors, SC07

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

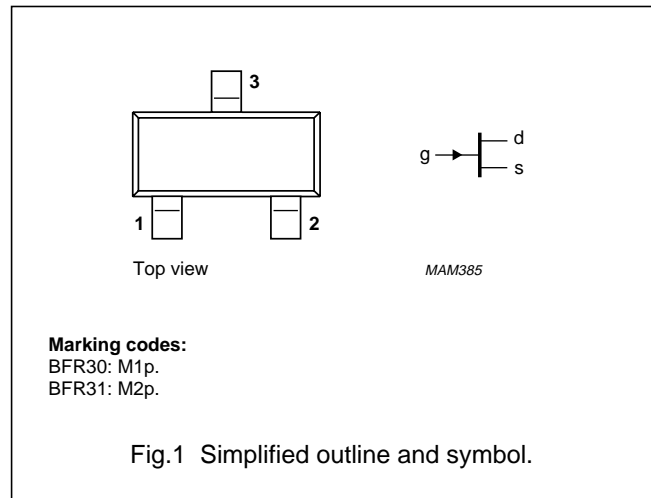
- Low level general purpose amplifiers in thick and thin-film circuits.

### 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. For further information, refer to Philips specs.: SNW-EQ-608, SNW-FQ-302A and SNW-FQ-302B.

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{DS}$	drain-source voltage		–	±25	V
$V_{GSO}$	gate-source voltage	open drain	–	–25	V
$P_{tot}$	total power dissipation	$T_{amb} \leq 40\text{ °C}$	–	250	mW
$I_{DSS}$	drain current	$V_{GS} = 0; V_{DS} = 10\text{ V}$			
	BFR30				
	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				
	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.

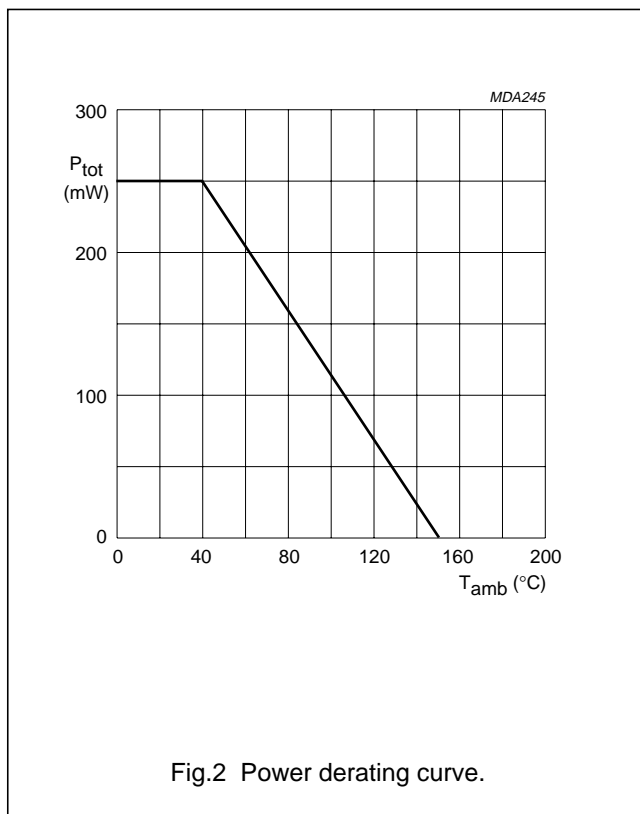


Fig.2 Power derating curve.

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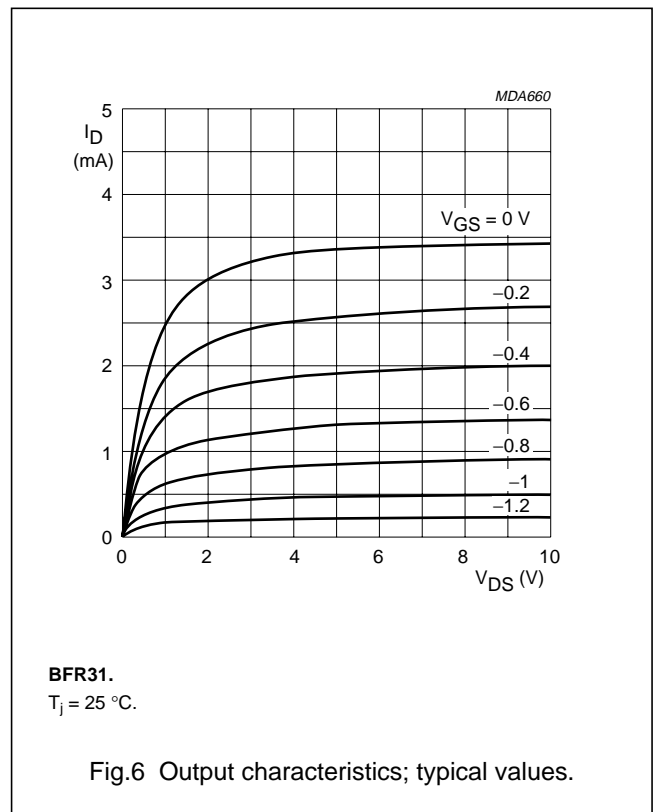
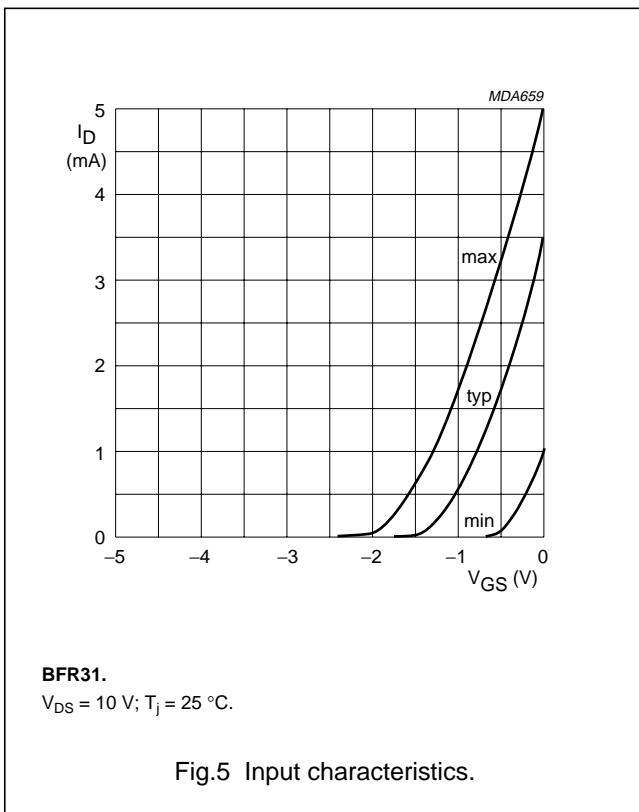
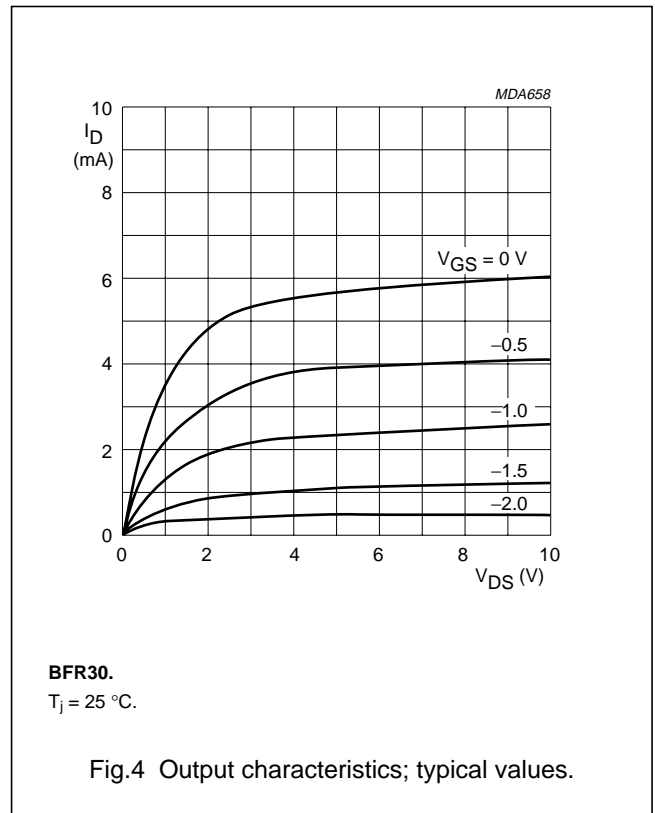
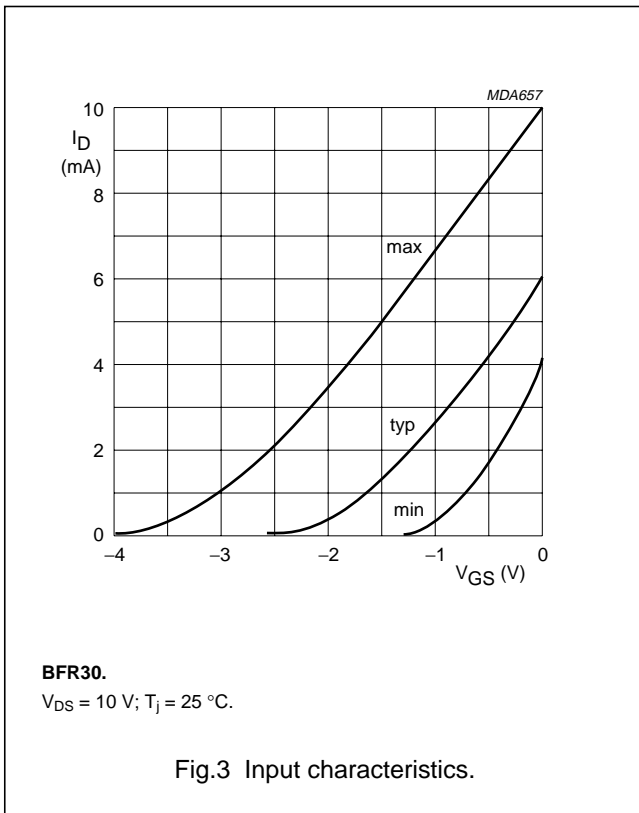
**CHARACTERISTICS**

$T_j = 25\text{ °C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{GSS}$	gate cut-off current	$V_{DS} = 0; V_{GS} = -10\text{ V}$	–	–0.2	nA
$I_{DSS}$	drain current BFR30 BFR31	$V_{GS} = 0; V_{DS} = 10\text{ V}$	4 1	10 5	mA mA
$V_{GS}$	gate-source voltage BFR30 BFR31	$I_D = 1\text{ mA}; V_{DS} = 10\text{ V}$	–0.7 0	–3 –1.3	V V
$V_{GS}$	gate-source voltage BFR30 BFR31	$I_D = 50\text{ }\mu\text{A}; V_{DS} = 10\text{ V}$	– –	–4 –2	V V
$V_{GSoff}$	gate-source cut-off voltage BFR30 BFR31	$I_D = 0.5\text{ nA}; V_{DS} = 10\text{ V}$	– –	–5 –2.5	V V
$ y_{fs} $	common-source transfer admittance BFR30 BFR31	$I_D = 1\text{ mA}; V_{DS} = 10\text{ V}; f = 1\text{ kHz};$ $T_{amb} = 25\text{ °C}$	1 1.5	4 4.5	mS mS
$ y_{fs} $	common-source transfer admittance BFR30 BFR31	$I_D = 200\text{ }\mu\text{A}; V_{DS} = 10\text{ V}; f = 1\text{ kHz};$ $T_{amb} = 25\text{ °C}$	0.5 0.75	– –	mS mS
$ y_{os} $	common source output admittance BFR30 BFR31	$I_D = 1\text{ mA}; V_{DS} = 10\text{ V}; f = 1\text{ kHz}$	– –	40 25	$\mu\text{S}$ $\mu\text{S}$
$ y_{os} $	common source output admittance BFR30 BFR31	$I_D = 200\text{ }\mu\text{A}; V_{DS} = 10\text{ V}; f = 1\text{ kHz}$	– –	20 15	$\mu\text{S}$ $\mu\text{S}$
$C_{is}$	input capacitance	$V_{DS} = 10\text{ V}; f = 1\text{ MHz}$ $I_D = 1\text{ mA}$ $I_D = 0.2\text{ nA}$	– –	4 4	pF pF
$C_{rs}$	feedback capacitance	$V_{DS} = 10\text{ V}; f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$ $I_D = 1\text{ mA}$ $I_D = 200\text{ }\mu\text{A}$	– –	1.5 1.5	pF pF
$V_n$	equivalent input noise voltage	$I_D = 200\text{ }\mu\text{A}; V_{DS} = 10\text{ V};$ $B = 0.6\text{ to }100\text{ Hz}$	–	0.5	$\mu\text{V}$

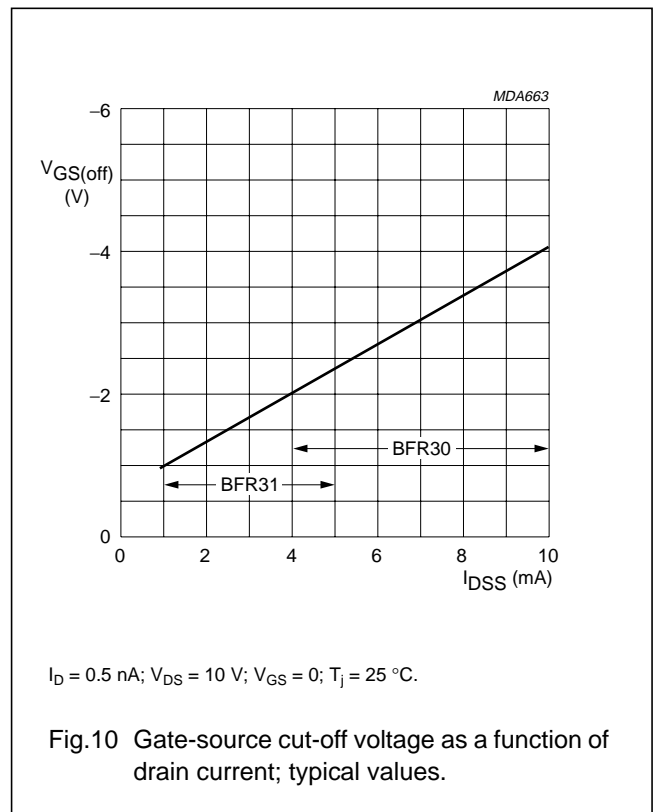
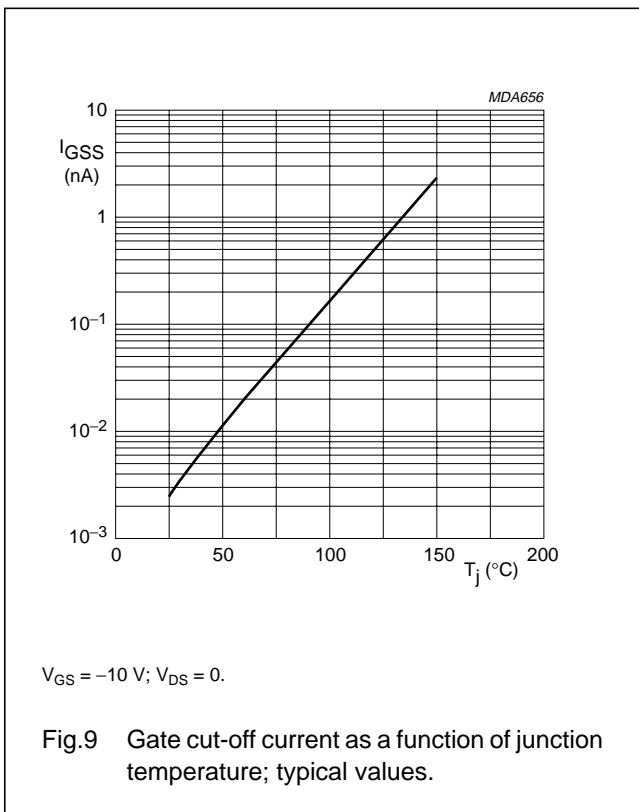
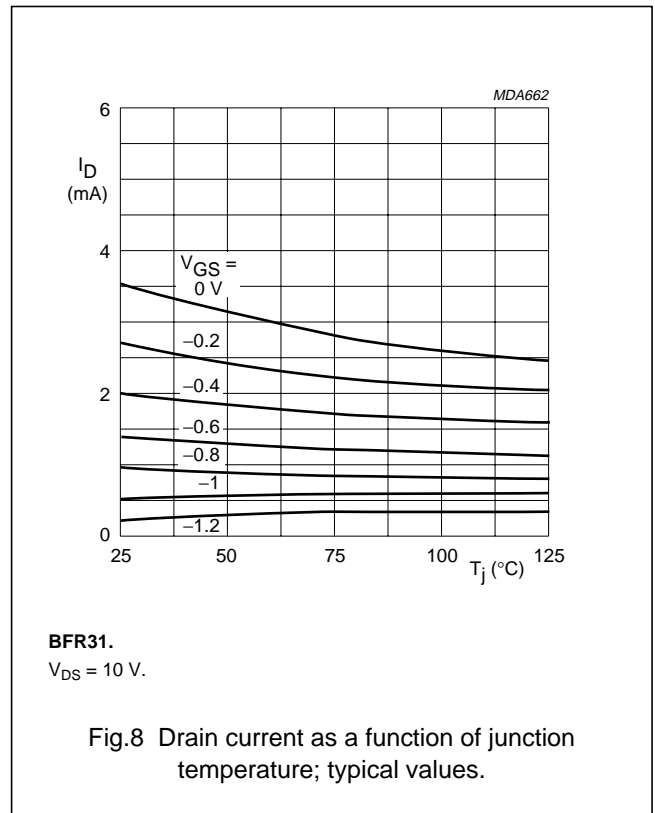
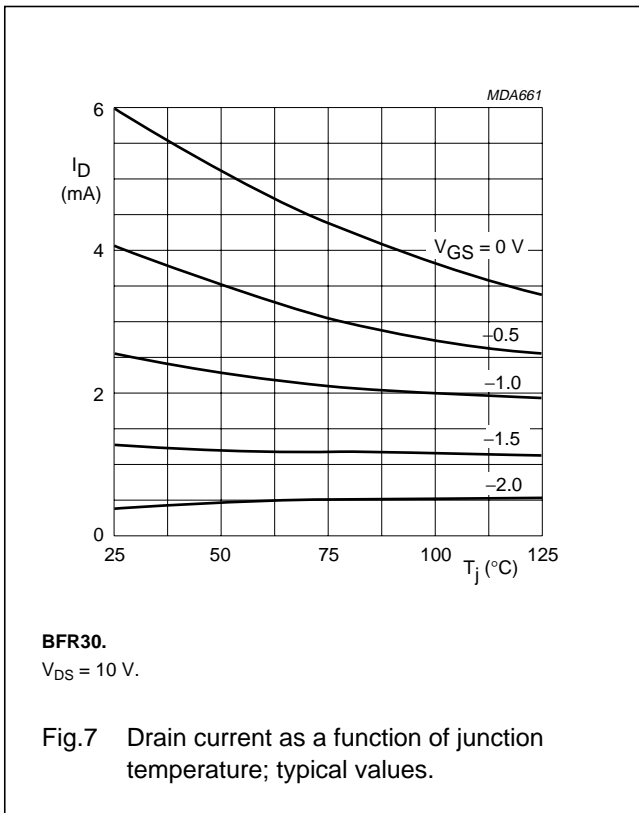
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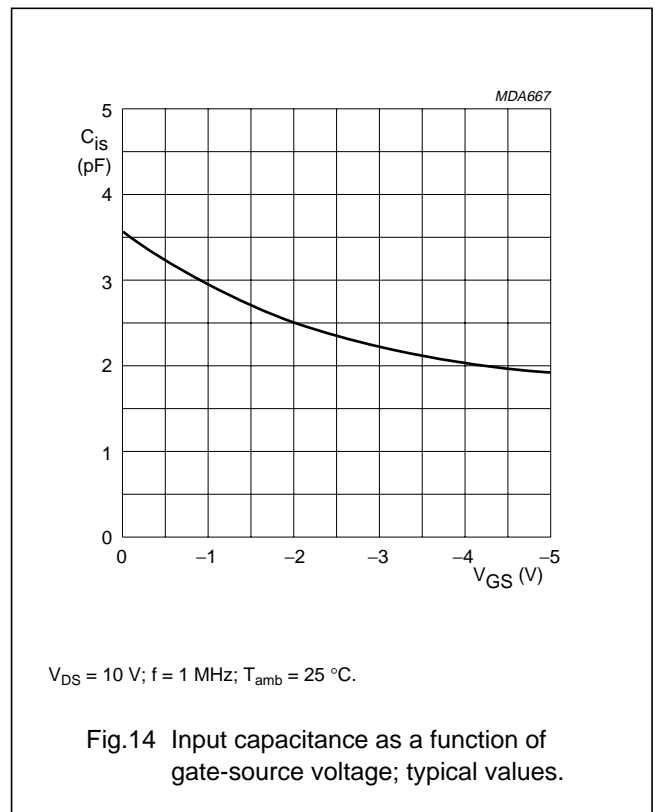
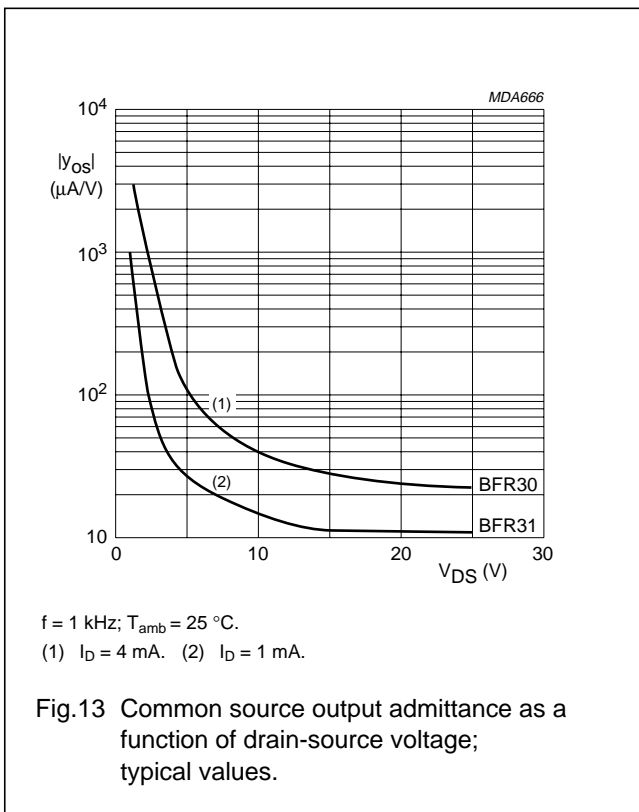
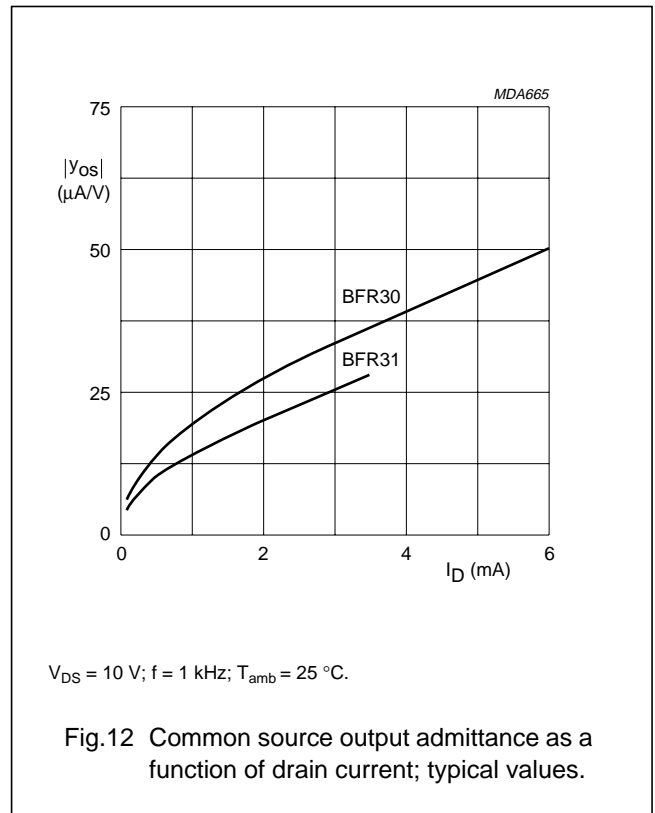
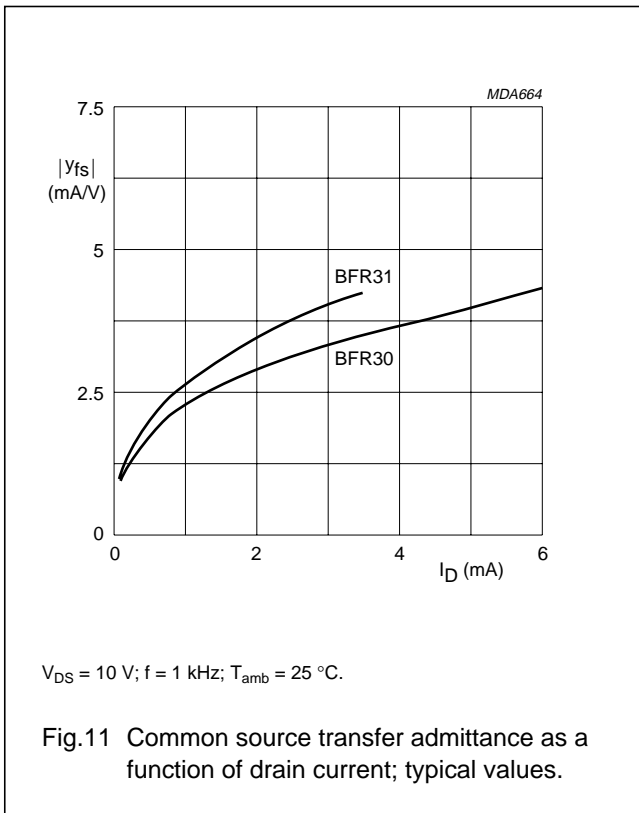
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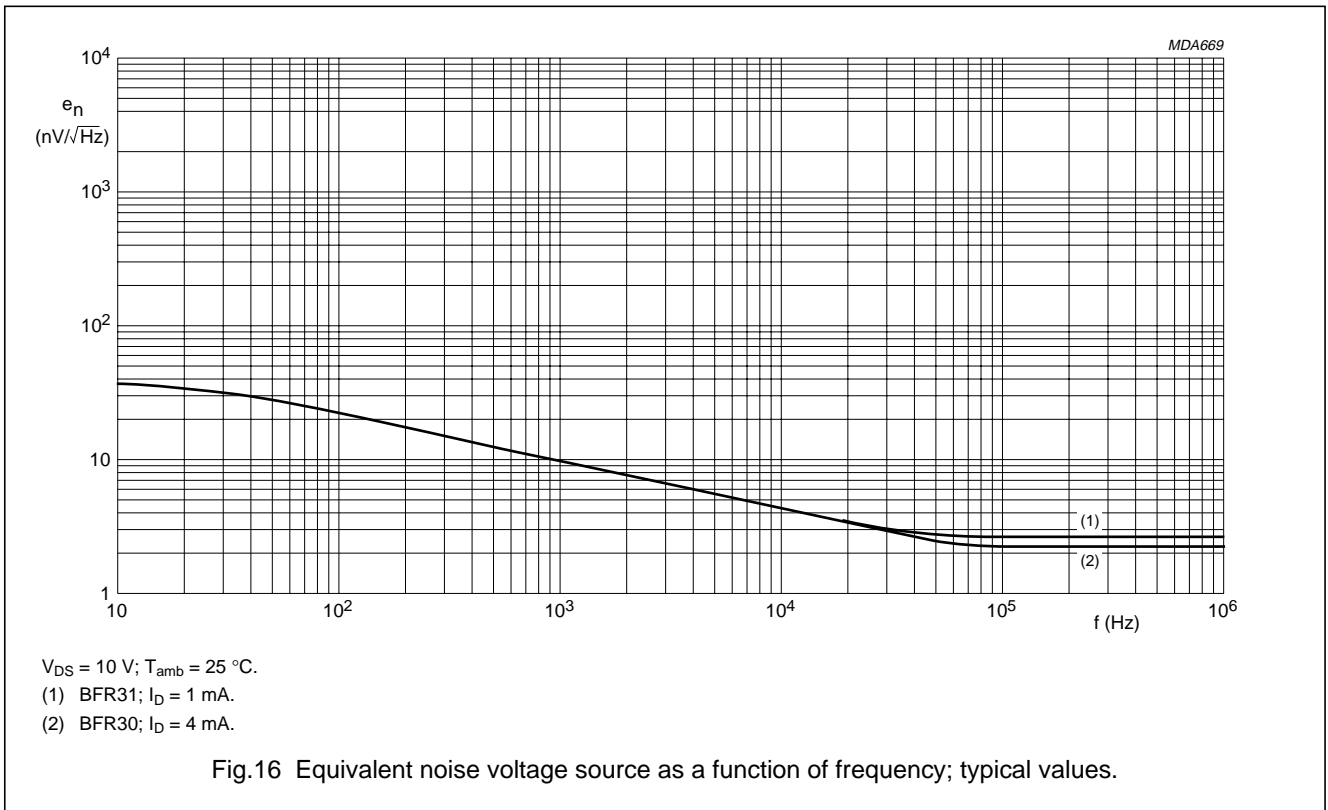
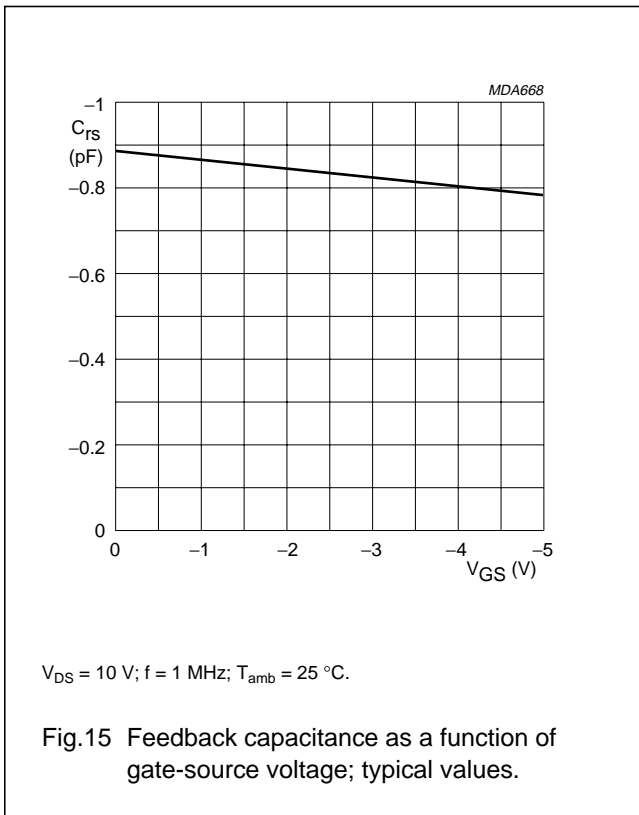
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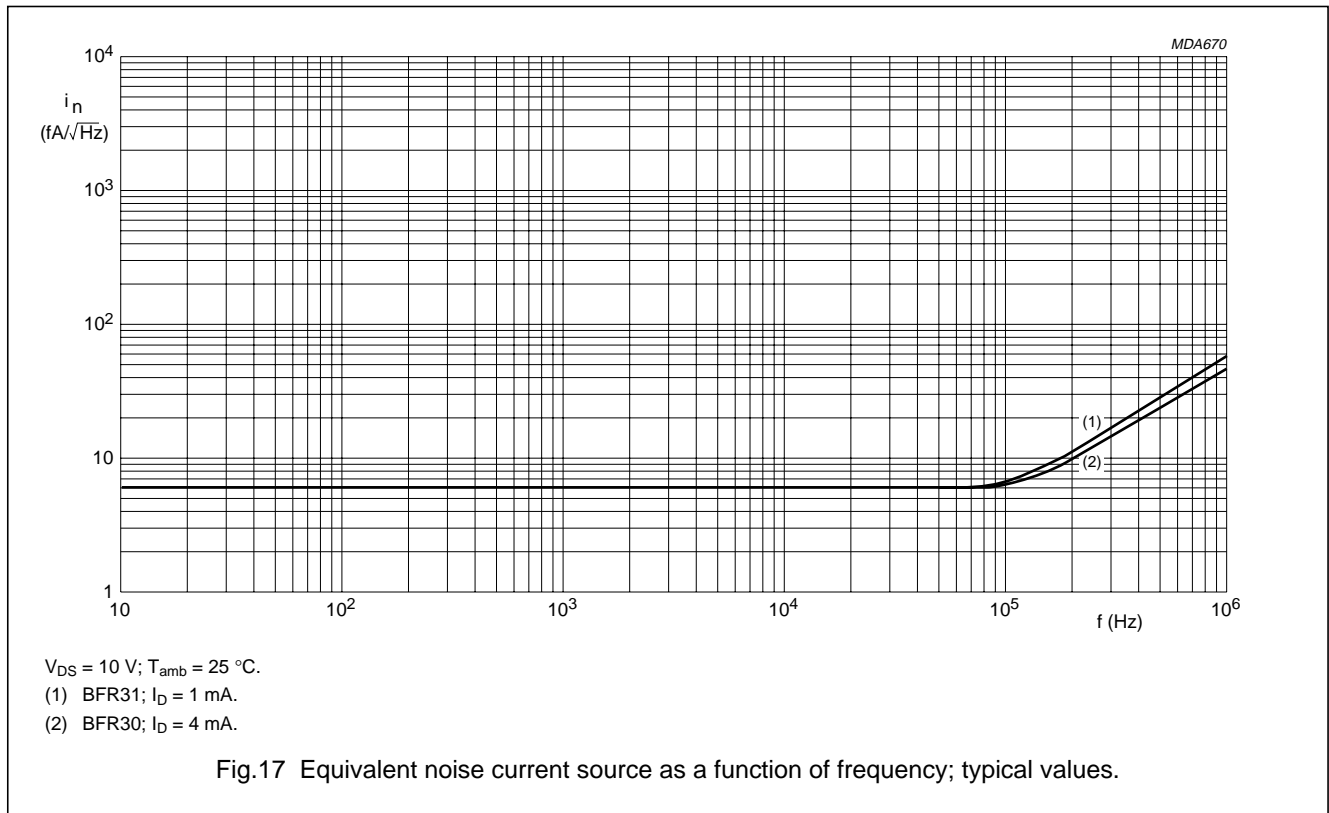
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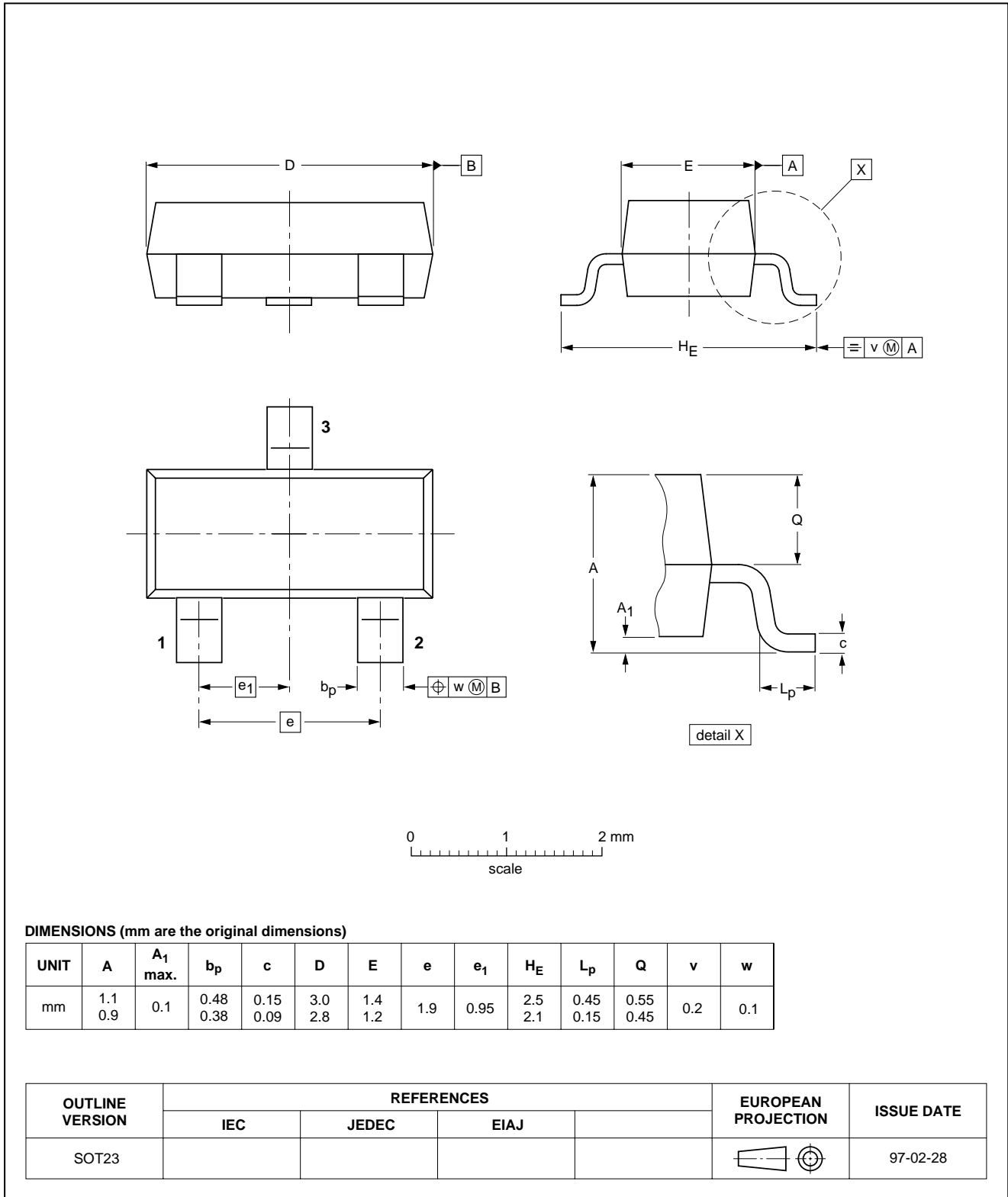
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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



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**DEFINITIONS**

<b>Data Sheet Status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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