BF861A; BF861B; BF861C

N-channel junction FETs

Rev. 5 — 15 September 2011 Product data sheet

1. Product profile

1.1 General description

N-channel symmetrical junction field effect transistors in a SOT23 package.

CAUTION

The device is supplied in an antistatic package. The gate-source input must be protected against static discharge during transport or handling.

1.2 Features and benefits

- High transfer admittance
- Low feedback capacitance
- Low input capacitance
- Low noise.

1.3 Applications

- Preamplifiers for AM tuners in car radios.

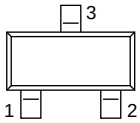
1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{DS}	drain-source voltage (DC)		-	-	25	V
I_{DSS}	drain current					
	BF861A	V_{GS} = 0 V; V_{DS} = 8 V	2	-	6.5	mA
	BF861B	V_{GS} = 0 V; V_{DS} = 8 V	6	-	15	mA
	BF861C	V_{GS} = 0 V; V_{DS} = 8 V	12	-	25	mA
P_{tot}	total power dissipation	up to T_{amb} = 25 °C	-	-	250	mW
$\lvert y_{fs} \rvert$	forward transfer admittance;					
	BF861A	V_{GS} = 0 V; V_{DS} = 8 V	12	-	20	mS
	BF861B	V_{GS} = 0 V; V_{DS} = 8 V	16	-	25	mS
	BF861C	V_{GS} = 0 V; V_{DS} = 8 V	20	-	30	mS
C_{iss}	input capacitance	f = 1 MHz	-	-	10	pF
C_{rss}	reverse transfer capacitance	f = 1 MHz	-	-	2.7	pF

2. Pinning information

Table 2. Discrete pinning

Pin	Description	Simplified outline	Symbol
1	source		
2	drain		
3	gate		

sym053

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BF861A	-	plastic surface mounted package; 3 leads	SOT23
BF861B	-	plastic surface mounted package; 3 leads	SOT23
BF861C	-	plastic surface mounted package; 3 leads	SOT23

4. Marking

Table 4. Marking codes

Type number	Marking code[1]
BF861A	28*
BF861B	29*
BF861C	30*

[1] * = p: Made in Hong Kong.
* = t: Made in Malaysia.
* = W: Made in China.

5. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V_{DS}	drain-source voltage (DC)			-	25	V
V_{GSO}	gate-source voltage	open drain		-	25	V
V_{DGO}	drain-gate voltage (DC)	open source		-	25	V
I_G	forward gate current (DC)			-	10	mA
P_{tot}	total power dissipation	up to T_{amb} = 25 °C	[1]	-	250	mW
T_{stg}	storage temperature			−65	+150	°C
T_j	operating junction temperature			-	150	°C

[1] Device mounted on an FR4 printed-circuit board.

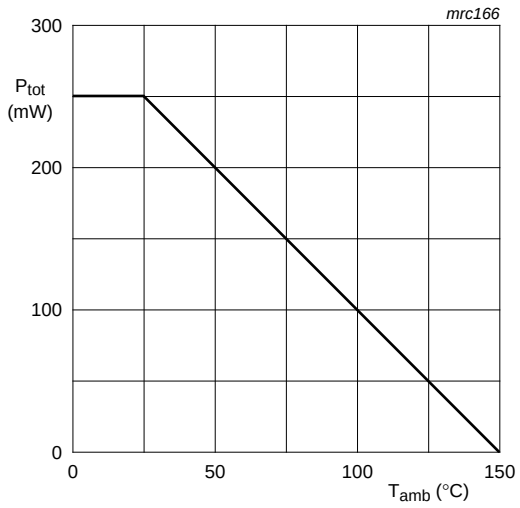


Fig 1. Power derating curve.

6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Typ	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient		[1]	500	K/W

[1] Device mounted on an FR4 printed-circuit board.

7. Characteristics

Table 7. Characteristics

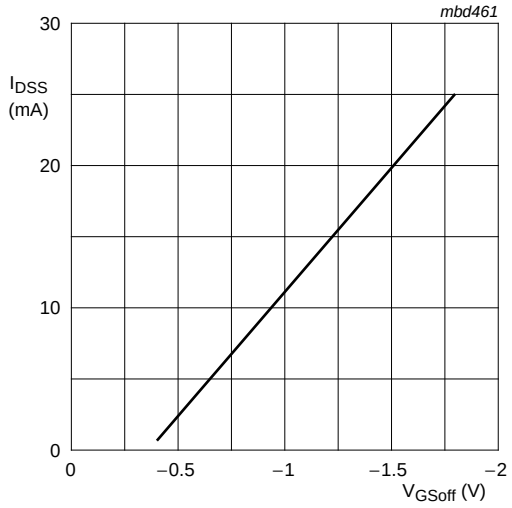
T_j = 25 °C; V_{DS} = 8 V; V_{GS} = 0 V unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)GSS}$	gate-source breakdown voltage	I_G = −1 μA	−25	-	-	V
V_{GSoff}	gate-source cut-off voltage					
	BF861A	I_D = 1 μA	−0.2	-	−1	V
	BF861B	I_D = 1 μA	−0.5	-	−1.5	V
	BF861C	I_D = 1 μA	−0.8	-	−2	V
V_{GSS}	gate-source forward voltage	V_{DS} = 0 V; I_G = 1 mA	-	-	1	V
I_{DSS}	drain current					
	BF861A		2	-	6.5	mA
	BF861B		6	-	15	mA
	BF861C		12	-	25	mA
I_{GSS}	gate cut-off current	V_{GS} = −20 V; V_{DS} = 0 V	-	-	−1	nA

Table 7. Characteristics *...continued*

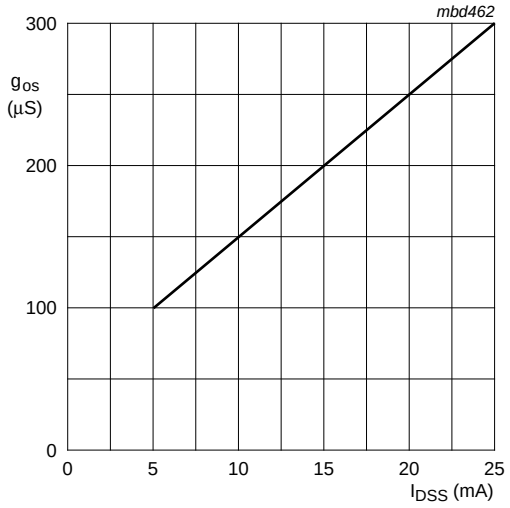
T_j = 25 °C; V_{DS} = 8 V; V_{GS} = 0 V unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$\lvert y_{fs} \rvert$	forward transfer admittance					
	BF861A		12	-	20	mS
	BF861B		16	-	25	mS
	BF861C		20	-	30	mS
g_{os}	common source output conductance					
	BF861A		-	-	200	µS
	BF861B		-	-	250	µS
	BF861C		-	-	300	µS
C_{iss}	input capacitance	f = 1 MHz	-	-	10	pF
C_{rss}	reverse transfer capacitance	f = 1 MHz	-	2.1	2.7	pF
$V_n/\sqrt{B}$	equivalent input noise voltage	V_{GS} = 0 V; f = 1 MHz	-	1.5	-	nV/√Hz



V_{DS} = 8 V.

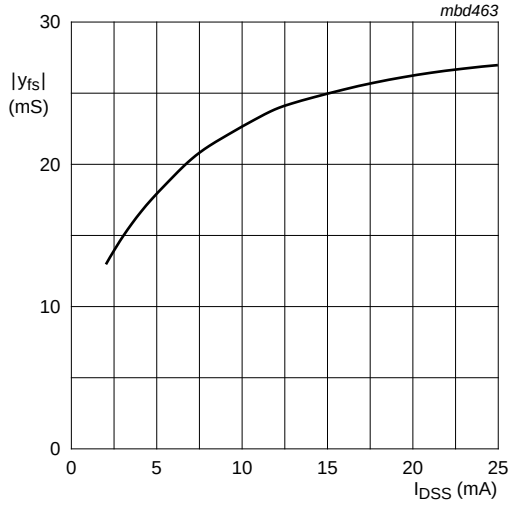
Fig 2. Drain current as a function of gate-source cut-off voltage; typical values.



V_{DS} = 8 V.

V_{GS} = 0 V.

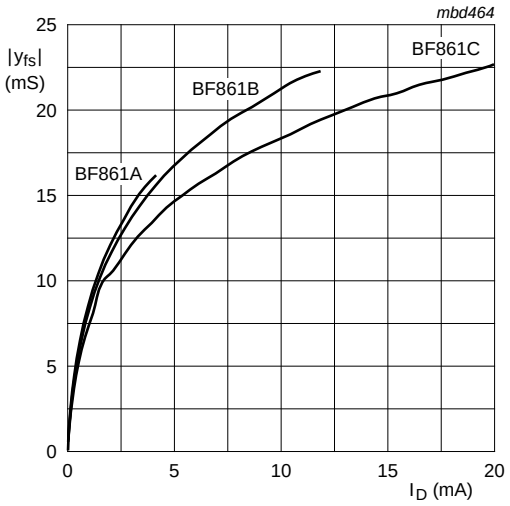
Fig 3. Common-source output conductance as a function of drain current; typical values.



V_{DS} = 8 V.

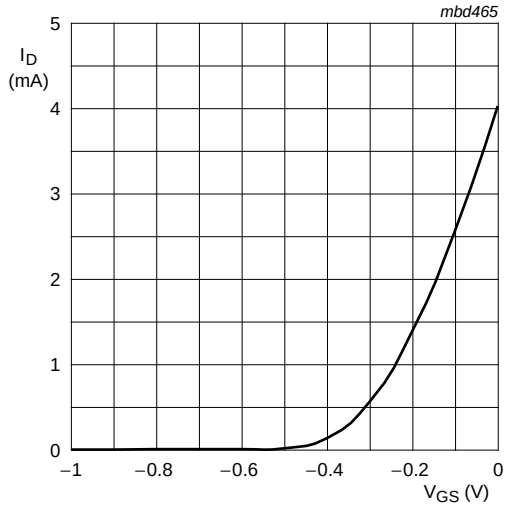
V_{GS} = 0 V.

Fig 4. Forward transfer admittance as a function of drain current; typical values.



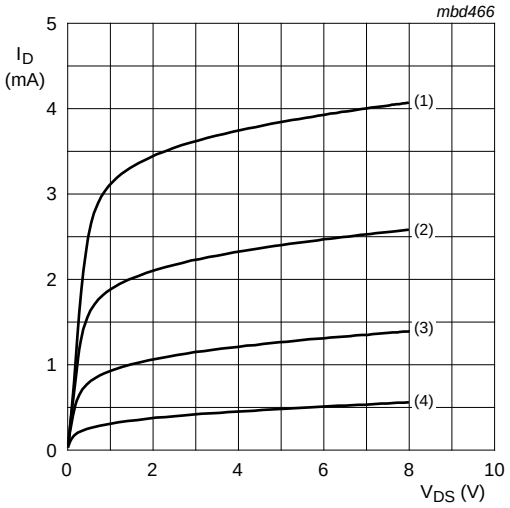
V_{DS} = 8 V.

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



V_{DS} = 8 V.

Fig 6. Typical input characteristics; BF861A.



V_{DS} = 8 V.

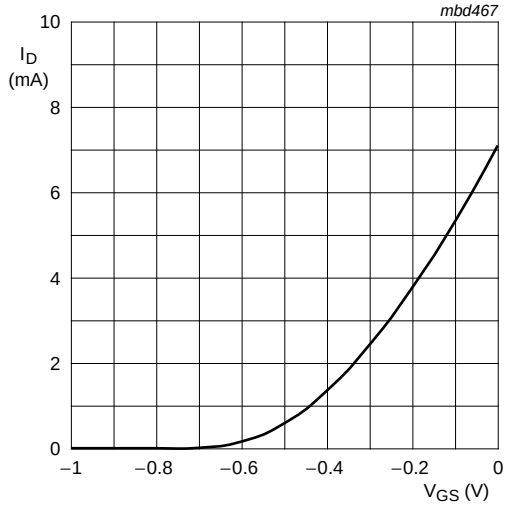
(1) V_{GS} = 0 V.

(2) V_{GS} = −100 mV.

(3) V_{GS} = −200 mV.

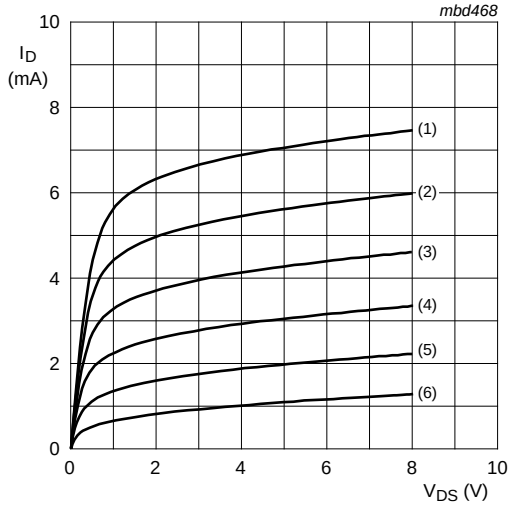
(4) V_{GS} = −300 mV.

Fig 7. Typical output characteristics: BF861A.



V_{DS} = 8 V.

Fig 8. Typical input characteristics; BF861B.



V_{DS} = 8 V.

(1) V_{GS} = 0 V.

(2) V_{GS} = −100 mV.

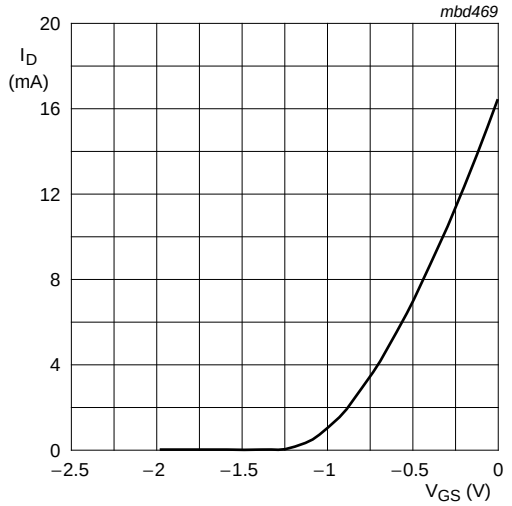
(3) V_{GS} = −200 mV.

(4) V_{GS} = −300 mV.

(5) V_{GS} = −400 mV.

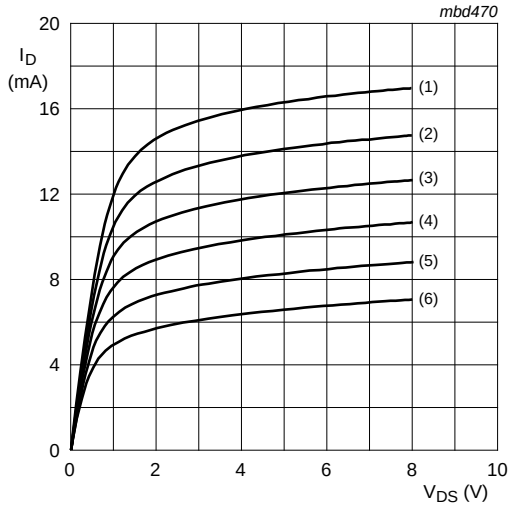
(6) V_{GS} = −500 mV.

Fig 9. Typical output characteristics; BF861B.



V_{DS} = 8 V.

Fig 10. Typical input characteristics; BF861C.



V_{DS} = 8 V.

(1) V_{GS} = 0 V.

(2) V_{GS} = −200 mV.

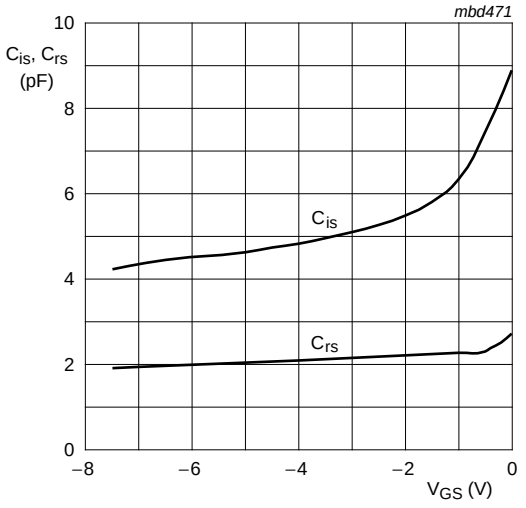
(3) V_{GS} = −400 mV.

(4) V_{GS} = −600 mV.

(5) V_{GS} = −800 mV.

(6) V_{GS} = −1 V.

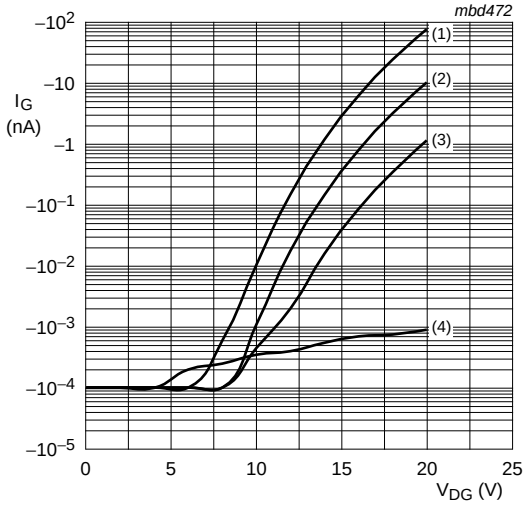
Fig 11. Typical output characteristics; BF861C.



V_{DS} = 8 V.

f = 1 MHz.

Fig 12. Input and reverse transfer capacitance as functions of gate-source voltage; typical values.



V_{DS} = 8 V.

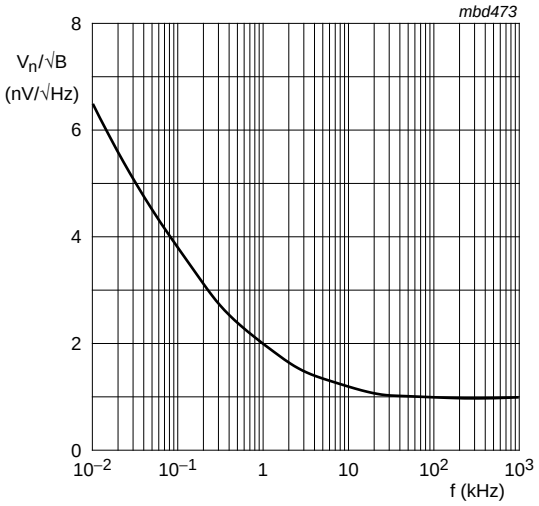
(1) I_D = 10 mA.

(2) I_D = 1 mA.

(3) I_D = 0.1 mA.

(4) $I_D = I_{GSS}$.

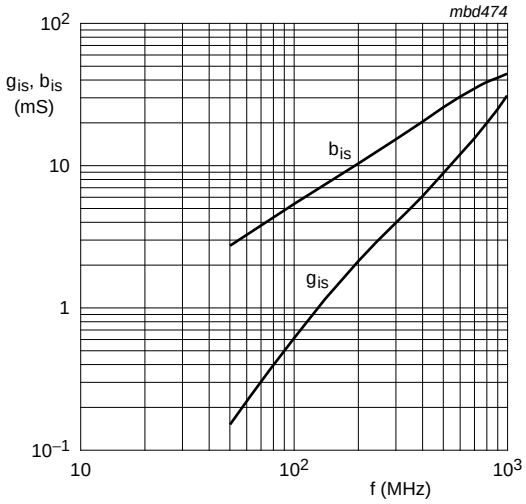
Fig 13. Gate current as a function of drain-gate voltage; typical values.



V_{DS} = 8 V.

V_{GS} = 0 V.

Fig 14. Equivalent input noise as a function of frequency; typical values.

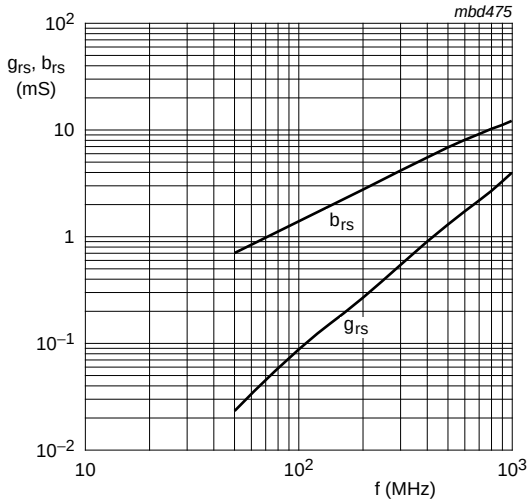


V_{DS} = 8 V.

V_{GS} = 0 V.

T_{amb} = 25 °C.

Fig 15. Common-source input admittance; typical values.

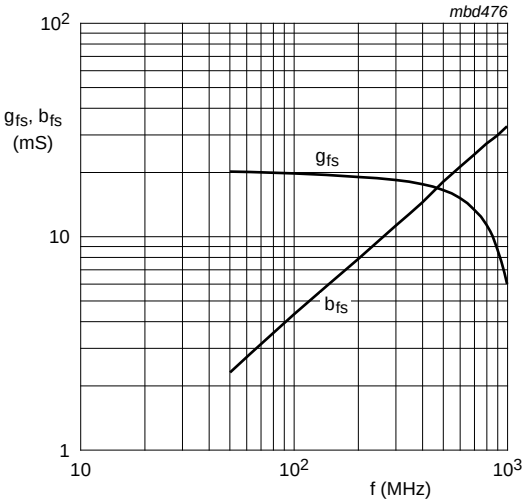


V_{DS} = 8 V.

V_{GS} = 0 V.

T_{amb} = 25 °C.

Fig 16. Common-source reverse admittance; typical values.

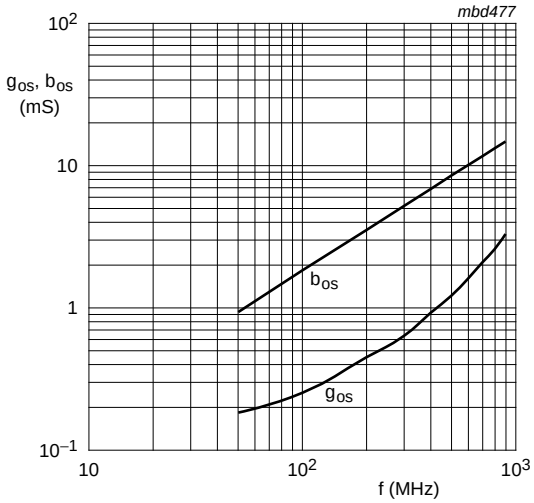


V_{DS} = 8 V.

V_{GS} = 0 V.

T_{amb} = 25 °C.

Fig 17. Common-source forward transfer admittance; typical values.



V_{DS} = 8 V.

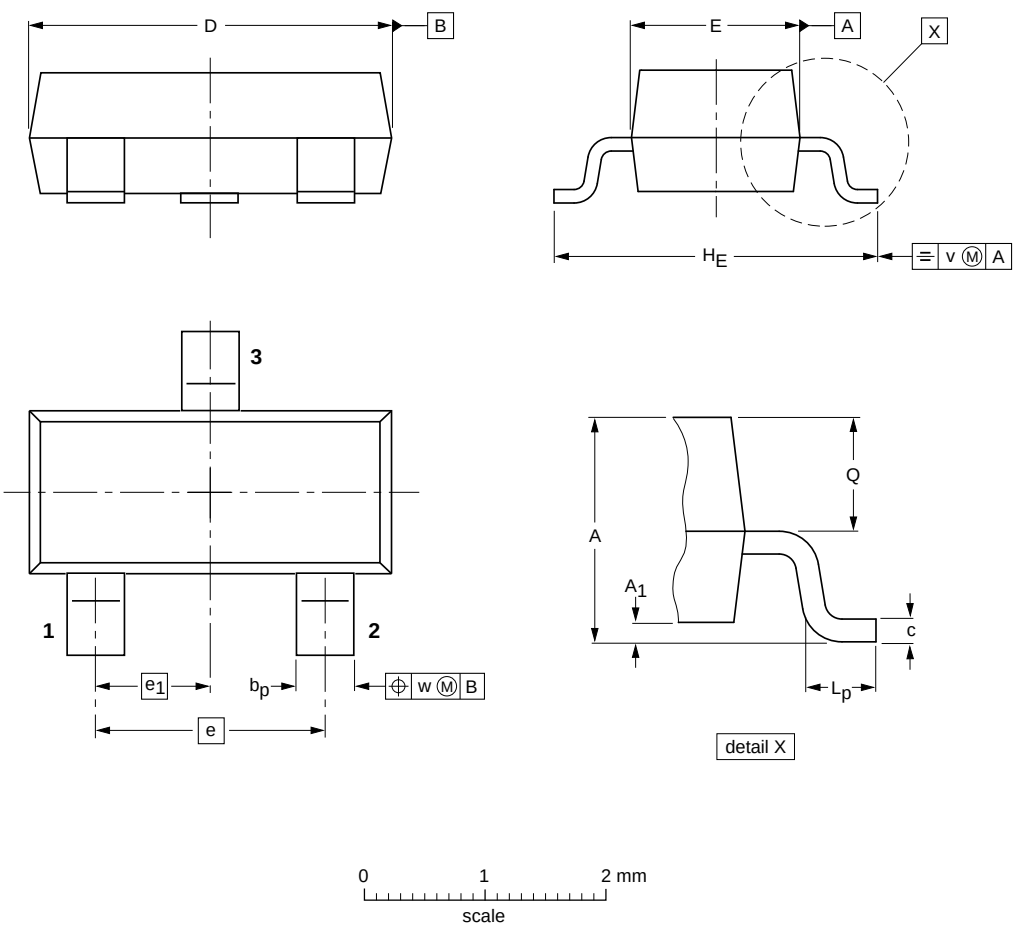
V_{GS} = 0 V.

T_{amb} = 25 °C.

Fig 18. Common-source output admittance; typical values.

8. Package outline

Plastic surface-mounted package; 3 leads **SOT23**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT23		TO-236AB				~~04-11-04~~ 06-03-16

Fig 19. Package outline

9. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BF861A_BF861B_BF861C v.5	20110915	Product data sheet	-	BF861A_BF861B_BF861C v.4
Modifications:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Package outline drawings have been updated to the latest version.			
BF861A_BF861B_BF861C v.4 (9397 750 13395)	20040924	Product data sheet	-	BF861 v.3
BF861 v.3 (9397 750 02667)	19970904	Product specification	-	BF861 v.2
BF861 v.2	19950414	-	-	BF861 v.1
BF861 v.1	19940829	-	-	-

10. Legal information

10.1 Data sheet status

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.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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11. Contact information

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- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- *Регистрацию проекта у производителя компонентов.*
- *Техническую поддержку проекта.*
- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

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