

# DATA SHEET

**BFT46**

N-channel silicon FET

Product specification

December 1997



N-channel silicon FET

BFT46

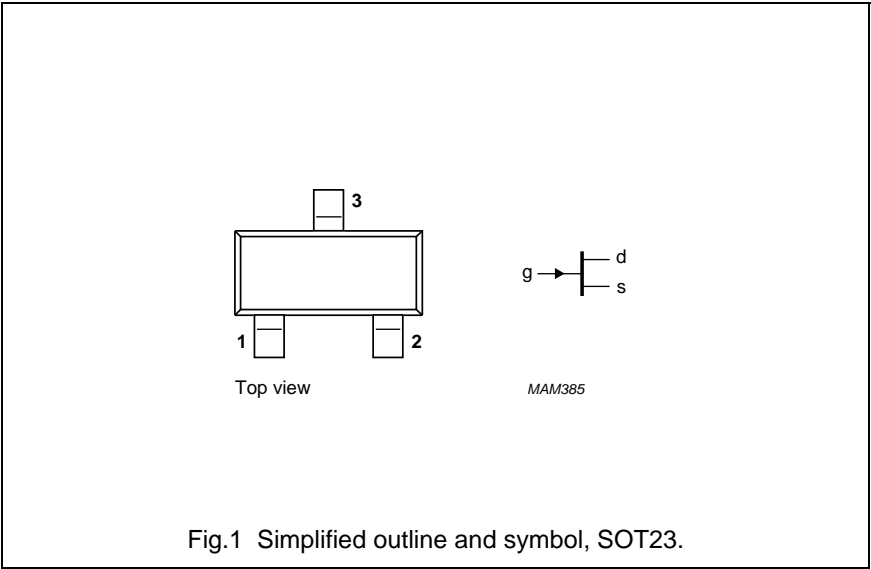
DESCRIPTION

Symmetrical n-channel silicon epitaxial planar junction field-effect transistor in a microminiature plastic envelope. The transistor is intended for low level general purpose amplifiers in thick and thin-film circuits.

PINNING

- 1 = drain
- 2 = source
- 3 = gate

**Note :** Drain and source are interchangeable.



Marking code

BFT46 = M3p

QUICK REFERENCE DATA

Drain-source voltage	$\pm V_{DS}$	max.	25 V
Gate-source voltage (open drain)	$-V_{GSO}$	max.	25 V
Total power dissipation up to $T_{amb} = 40\text{ }^{\circ}\text{C}$	$P_{tot}$	max.	250 mW
Drain current			
$V_{DS} = 10\text{ V}; V_{GS} = 0$	$I_{DSS}$	>	0,2 mA
		<	1,5 mA
Transfer admittance (common source)			
$I_D = 0,2\text{ mA}; V_{DS} = 10\text{ V}; f = 1\text{ kHz}$	$ y_{fs} $	>	0,5 mS
Equivalent noise voltage			
$V_{DS} = 10\text{ V}; I_D = 200\text{ }\mu\text{A}; B = 0,6\text{ to }100\text{ Hz}$	$V_n$	<	0,5 $\mu\text{V}$

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**RATINGS**

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Drain-source voltage	$\pm V_{DS}$	max.	25 V
Drain-gate voltage (open source)	$V_{DGO}$	max.	25 V
Gate-source voltage (open drain)	$-V_{GSO}$	max.	25 V
Drain current	$I_D$	max.	10 mA
Gate current	$I_G$	max.	5 mA
Total power dissipation up to $T_{amb} = 40\text{ }^{\circ}\text{C}^{(1)}$	$P_{tot}$	max.	250 mW
Storage temperature range	$T_{stg}$		-65 to +150 $^{\circ}\text{C}$
Junction temperature	$T_j$	max.	150 $^{\circ}\text{C}$

**THERMAL RESISTANCE**

From junction to ambient <sup>(1)</sup>	$R_{th\ j-a}$	=	430 K/W
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**Note**

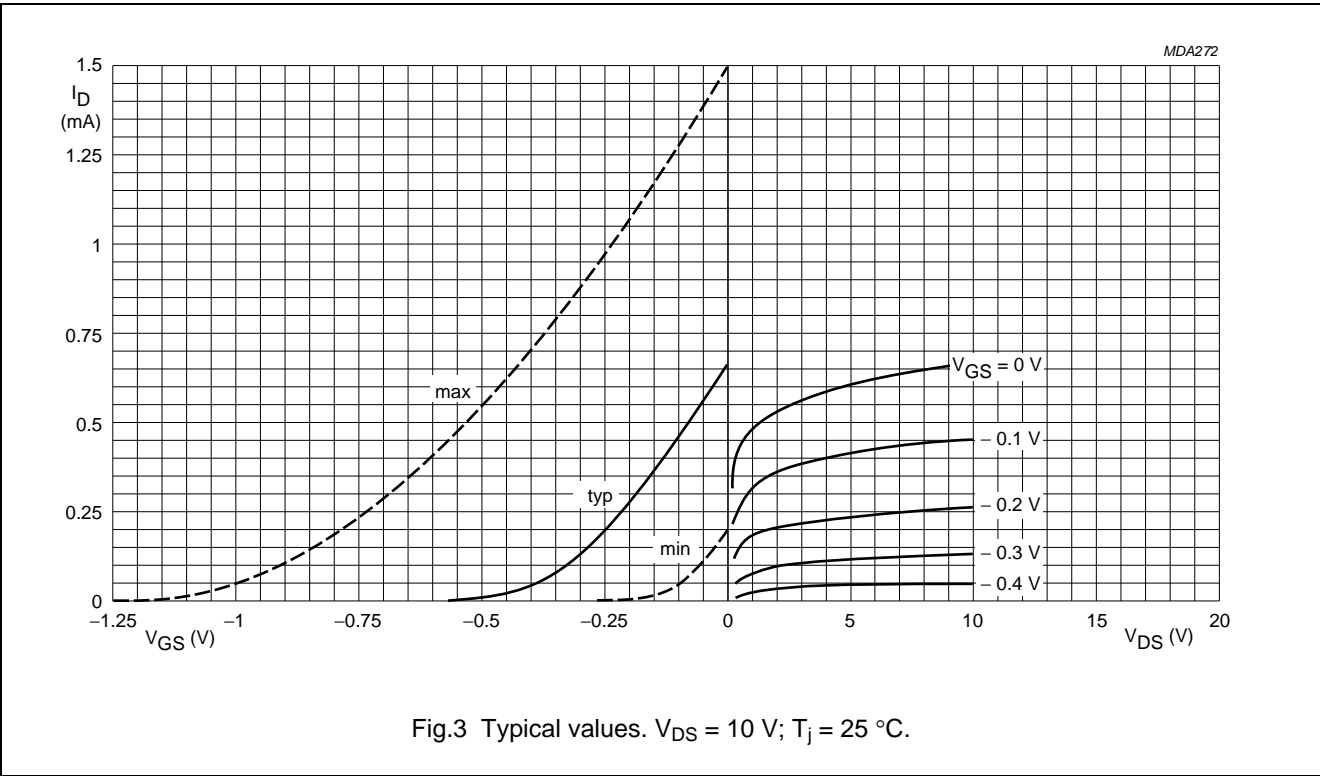
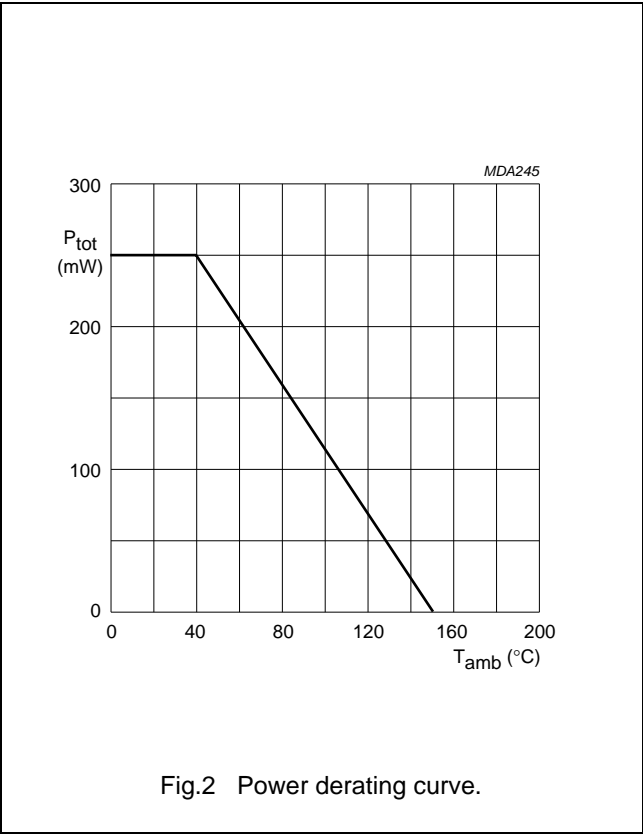
1. Mounted on a ceramic substrate of 8 mm × 10 mm × 0,7 mm.

**CHARACTERISTICS** $T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise specified

Gate cut-off current			
$-V_{GS} = 10\text{ V}; V_{DS} = 0$	$-I_{GSS}$	<	0,2 nA
Drain current			
$V_{DS} = 10\text{ V}; V_{GS} = 0$	$I_{DSS}$	>	0,2 mA
		<	1,5 mA
Gate-source voltage			
$I_D = 50\text{ }\mu\text{A}; V_{DS} = 10\text{ V}$	$-V_{GS}$	>	0,1 V
		<	1,0 V
Gate-source cut-off voltage			
$I_D = 0,5\text{ nA}; V_{DS} = 10\text{ V}$	$-V_{(P)GS}$	<	1,2 V
y-parameters at $f = 1\text{ kHz}$ ;			
$V_{DS} = 10\text{ V}; V_{GS} = 0; T_{amb} = 25\text{ }^{\circ}\text{C}$			
Transfer admittance	$ y_{fs} $	>	1,0 mS
Output admittance	$ y_{os} $	<	10 $\mu\text{S}$
$V_{DS} = 10\text{ V}; I_D = 200\text{ }\mu\text{A}; T_{amb} = 25\text{ }^{\circ}\text{C}$			
Transfer admittance	$ y_{fs} $	>	0,5 mS
Output admittance	$ y_{os} $	<	5 $\mu\text{S}$
Input capacitance at $f = 1\text{ MHz}$ ;			
$V_{DS} = 10\text{ V}; V_{GS} = 0; T_{amb} = 25\text{ }^{\circ}\text{C}$	$C_{is}$	<	5 pF
Feedback capacitance at $f = 1\text{ MHz}$ ;			
$V_{DS} = 10\text{ V}; V_{GS} = 0; T_{amb} = 25\text{ }^{\circ}\text{C}$	$C_{rs}$	<	1,5 pF
Equivalent noise voltage			
$V_{DS} = 10\text{ V}; I_D = 200\text{ }\mu\text{A}; T_{amb} = 25\text{ }^{\circ}\text{C}$			
$B = 0,6\text{ to }100\text{ Hz}$	$V_n$	<	0,5 $\mu\text{V}$

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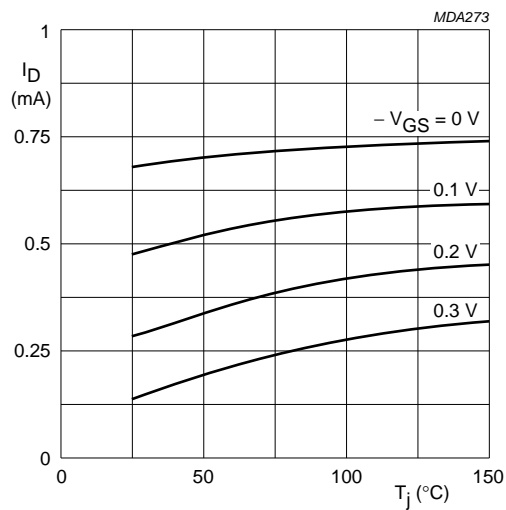


Fig.4 Typical values.  $V_{DS} = 10\text{ V}$ .

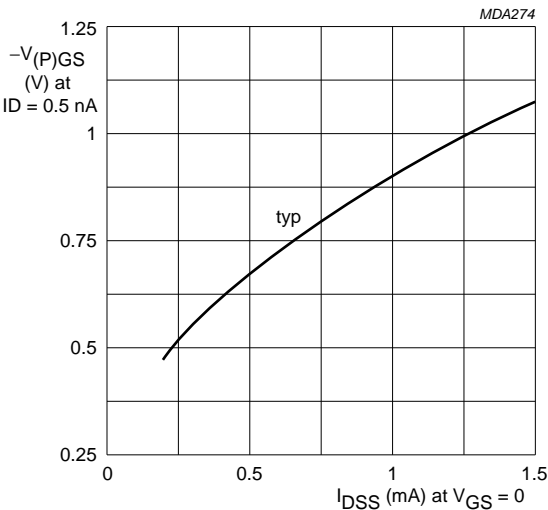


Fig.5 Correlation between  $-V_{(P)GS}$  and  $I_{DSS}$ .  $V_{DS} = 10\text{ V}$ ;  $T_j = 25\text{ °C}$ .

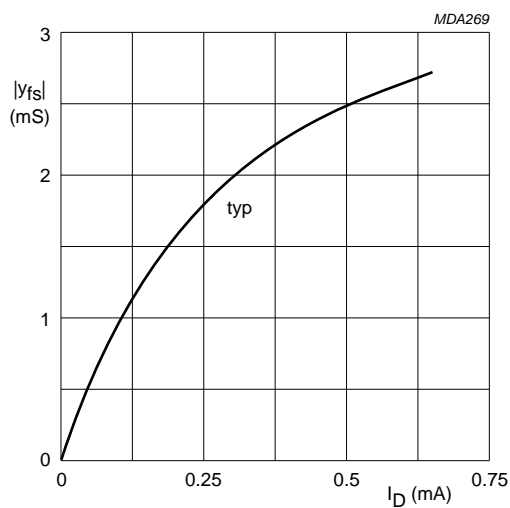


Fig.6  $|y_{fs}|$  versus  $I_D$ .  $V_{DS} = 10\text{ V}$ ;  $f = 1\text{ kHz}$ ;  $T_{amb} = 25\text{ °C}$ .

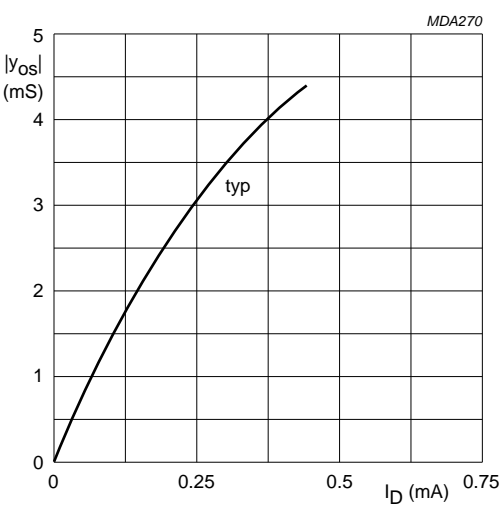


Fig.7  $|y_{os}|$  versus  $I_D$ .  $V_{DS} = 10\text{ V}$ ;  $f = 1\text{ kHz}$ ;  $T_{amb} = 25\text{ °C}$ .

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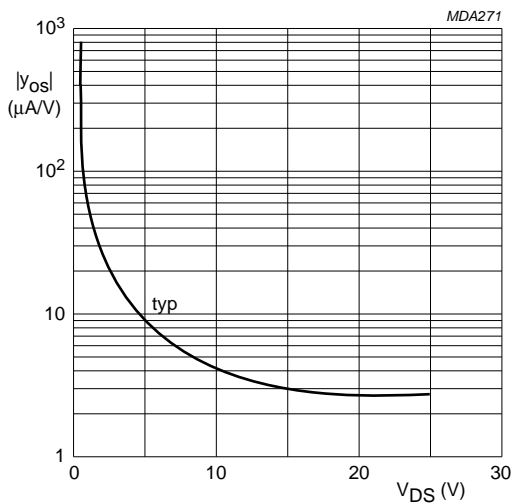


Fig.8  $|y_{os}|$  versus  $V_{DS}$ .  $I_D = 0,4$  mA;  $f = 1$  kHz;  $T_{amb} = 25$  °C.

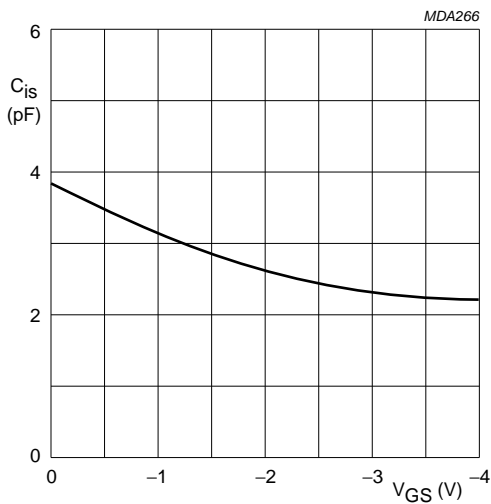


Fig.9 Typical values.  $V_{DS} = 10$  V;  $T_{amb} = 25$  °C.

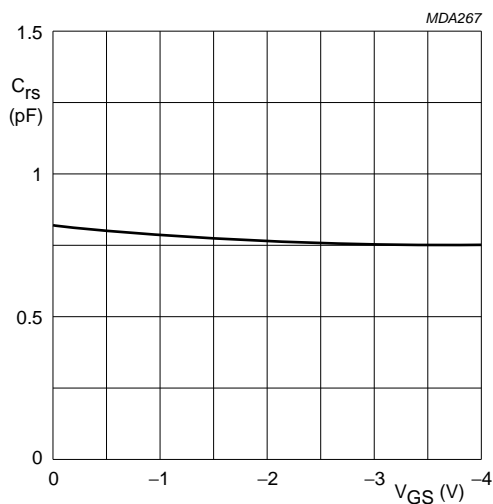


Fig.10 Typical values.  $V_{DS} = 10$  V,  $T_{amb} = 25$  °C.

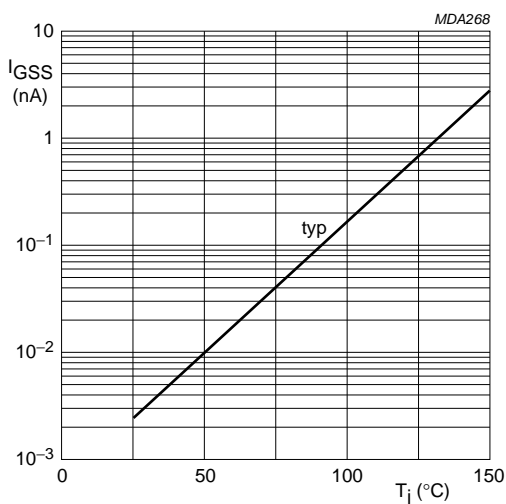
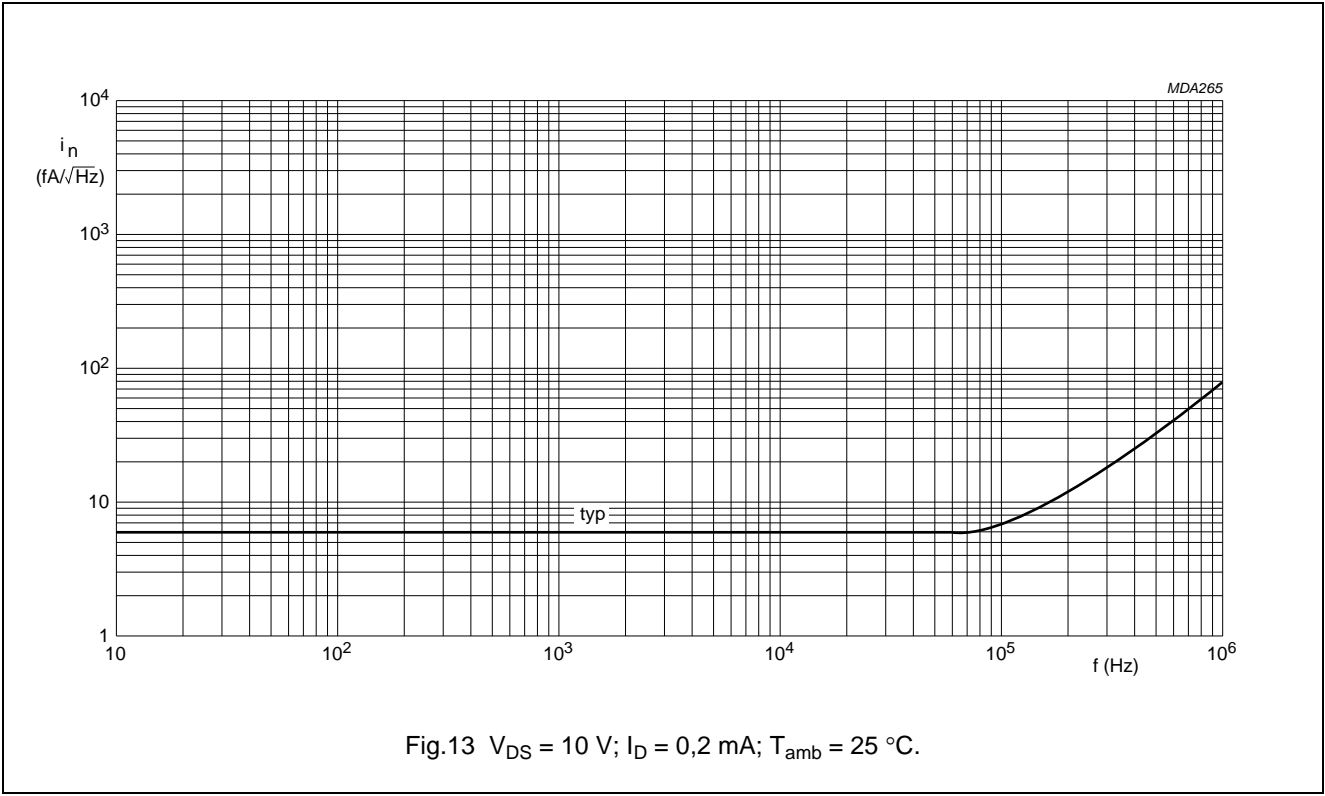
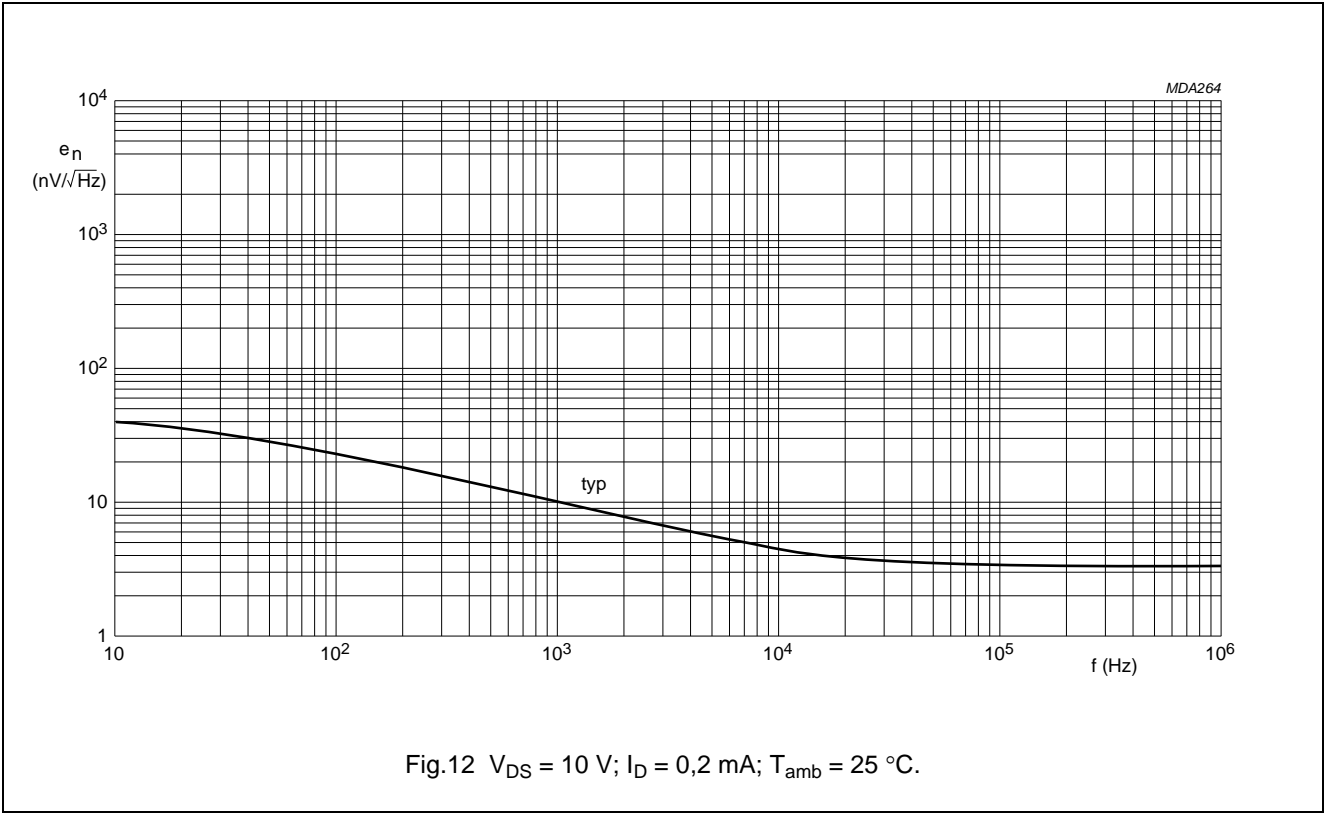


Fig.11  $I_{GSS}$  versus  $T_j$ .  $-V_{GSS} = 10$  V;  $V_{DS} = 0$ .

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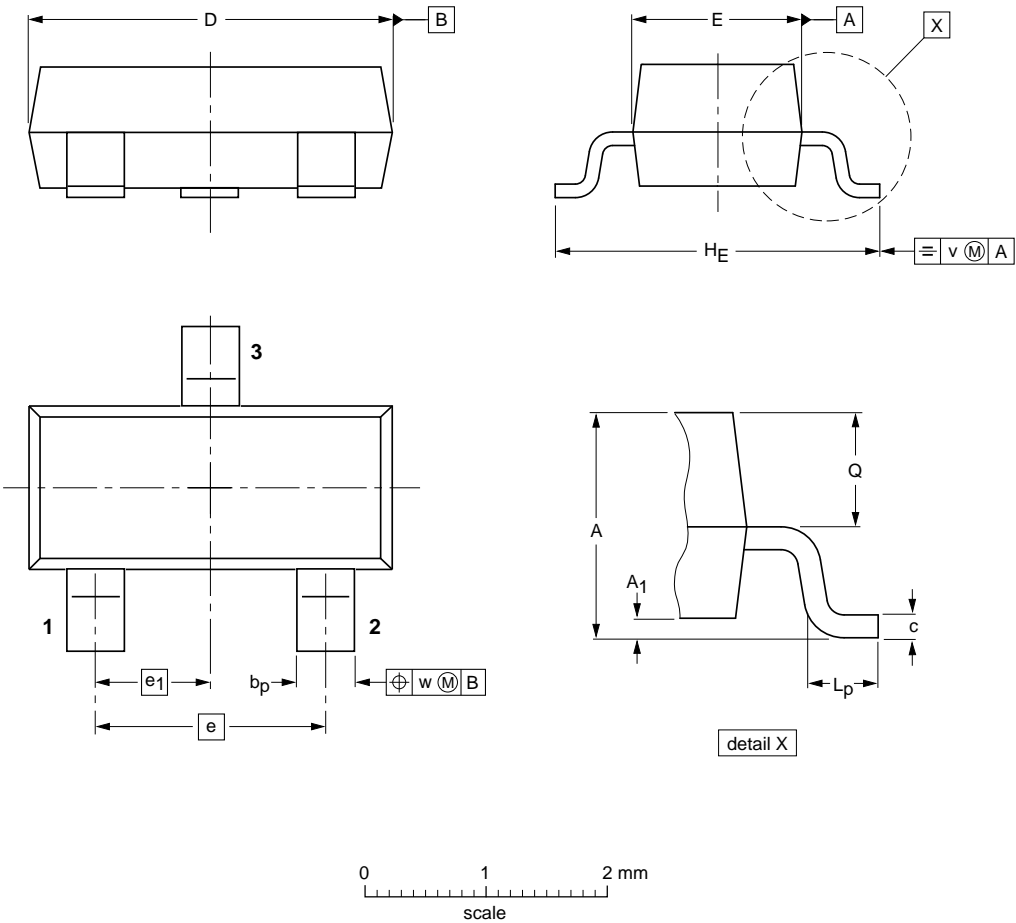
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PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max.	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	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				<del>04-11-04</del> 06-03-16

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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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