

DATA SHEET

BFT25

NPN 2 GHz wideband transistor

Product specification

November 1992



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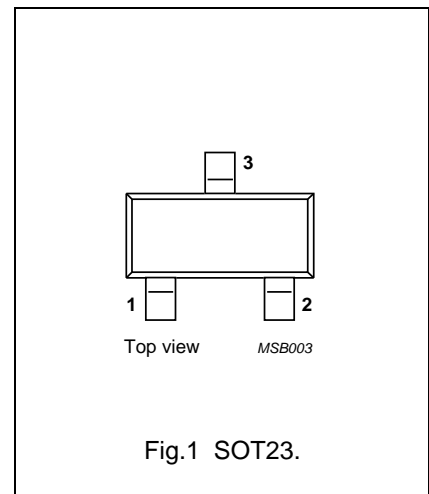
DESCRIPTION

NPN transistor in a plastic SOT23 envelope.

It is primarily intended for use in RF low power amplifiers, such as in pocket phones, paging systems, etc. The transistor features low current consumption (100 μ A to 1 mA); due to its high transition frequency, it also has excellent wideband properties and low noise up to high frequencies.

PINNING

PIN	DESCRIPTION
Code: V1p	
1	base
2	emitter
3	collector



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	8	V
V_{CEO}	collector-emitter voltage	open base	–	5	V
I_C	DC collector current		–	6.5	mA
P_{tot}	total power dissipation	up to $T_s = 167\text{ }^\circ\text{C}$; note 1	–	30	mW
f_T	transition frequency	$I_C = 1\text{ mA}$; $V_{CE} = 1\text{ V}$; $f = 500\text{ MHz}$; $T_{amb} = 25\text{ }^\circ\text{C}$	2.3	–	GHz
C_{re}	feedback capacitance	$I_C = 1\text{ mA}$; $V_{CE} = 1\text{ V}$; $f = 1\text{ MHz}$; $T_{amb} = 25\text{ }^\circ\text{C}$	–	0.45	pF
G_{UM}	maximum unilateral power gain	$I_C = 1\text{ mA}$; $V_{CE} = 1\text{ V}$; $f = 500\text{ MHz}$; $T_{amb} = 25\text{ }^\circ\text{C}$	18	–	dB
F	noise figure	$I_C = 1\text{ mA}$; $V_{CE} = 1\text{ V}$; $f = 500\text{ MHz}$; $T_{amb} = 25\text{ }^\circ\text{C}$	3.8	–	dB

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	8	V
V_{CEO}	collector-emitter voltage	open base	–	5	V
V_{EBO}	emitter-base voltage	open collector	–	2	V
I_C	DC collector current		–	6.5	mA
I_{CM}	peak collector current	$f > 1\text{ MHz}$	–	10	mA
P_{tot}	total power dissipation	up to $T_s = 167\text{ }^\circ\text{C}$; note 1	–	30	mW
T_{stg}	storage temperature		–65	150	$^\circ\text{C}$
T_j	junction temperature		–	175	$^\circ\text{C}$

Note

- T_s is the temperature at the soldering point of the collector tab.

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THERMAL RESISTANCE

SYMBOL	PARAMETER	CONDITIONS	THERMAL RESISTANCE
$R_{th\ j-s}$	thermal resistance from junction to soldering point	up to $T_s = 167^\circ\text{C}$; note 1	260 K/W

Note

- T_s is the temperature at the soldering point of the collector tab.

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0$; $V_{CB} = 5\text{ V}$	–	–	50	nA
h_{FE}	DC current gain	$I_C = 10\ \mu\text{A}$; $V_{CE} = 1\text{ V}$	20	30	–	
		$I_C = 1\text{ mA}$; $V_{CE} = 1\text{ V}$	20	40	–	
f_T	transition frequency	$I_C = 1\text{ mA}$; $V_{CE} = 1\text{ V}$; $f = 500\text{ MHz}$	1.2	2.3	–	GHz
C_c	collector capacitance	$I_E = I_e = 0$; $V_{CB} = 0.5\text{ V}$; $f = 1\text{ MHz}$	–	–	0.6	pF
C_e	emitter capacitance	$I_C = I_c = 0$; $V_{EB} = 0$; $f = 1\text{ MHz}$	–	–	0.5	pF
C_{re}	feedback capacitance	$I_C = 1\text{ mA}$; $V_{CE} = 1\text{ V}$; $f = 1\text{ MHz}$; $T_{amb} = 25^\circ\text{C}$	–	–	0.45	pF
G_{UM}	maximum unilateral power gain (note 1)	$I_C = 1\text{ mA}$; $V_{CE} = 1\text{ V}$; $f = 500\text{ MHz}$; $T_{amb} = 25^\circ\text{C}$	–	18	–	dB
		$I_C = 1\text{ mA}$; $V_{CE} = 1\text{ V}$; $f = 800\text{ MHz}$; $T_{amb} = 25^\circ\text{C}$	–	12	–	dB
F	noise figure	$I_C = 0.1\text{ mA}$; $V_{CE} = 1\text{ V}$; $f = 500\text{ MHz}$; $T_{amb} = 25^\circ\text{C}$	–	5.5	–	dB
		$I_C = 1\text{ mA}$; $V_{CE} = 1\text{ V}$; $f = 500\text{ MHz}$; $T_{amb} = 25^\circ\text{C}$	–	3.8	–	dB

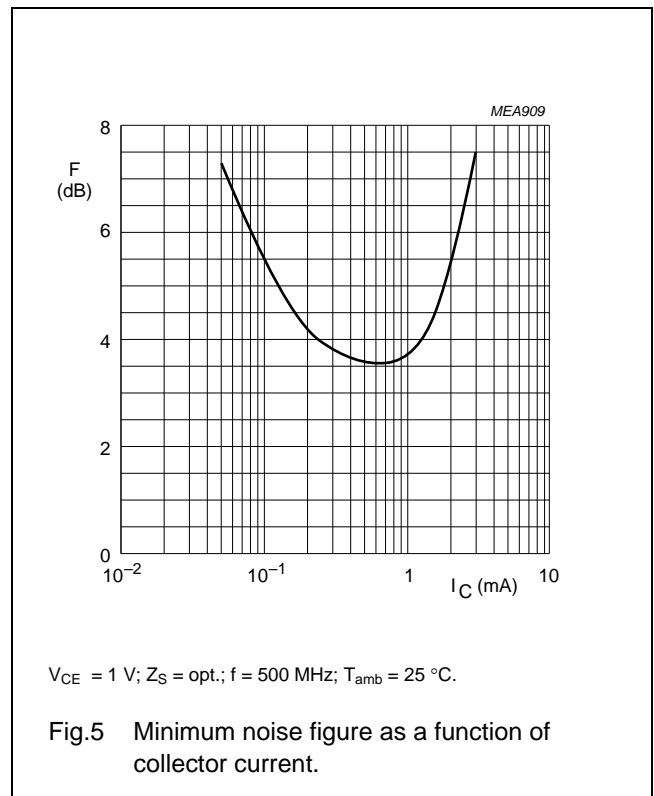
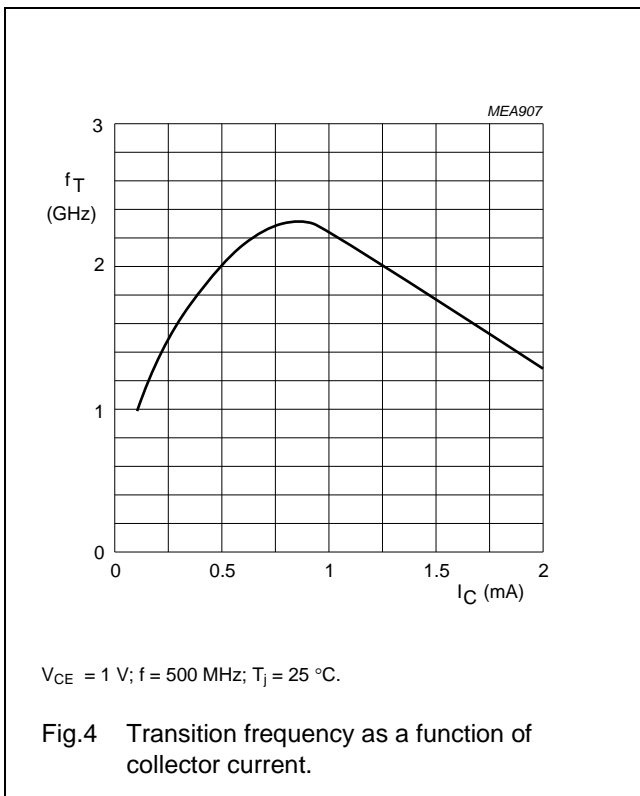
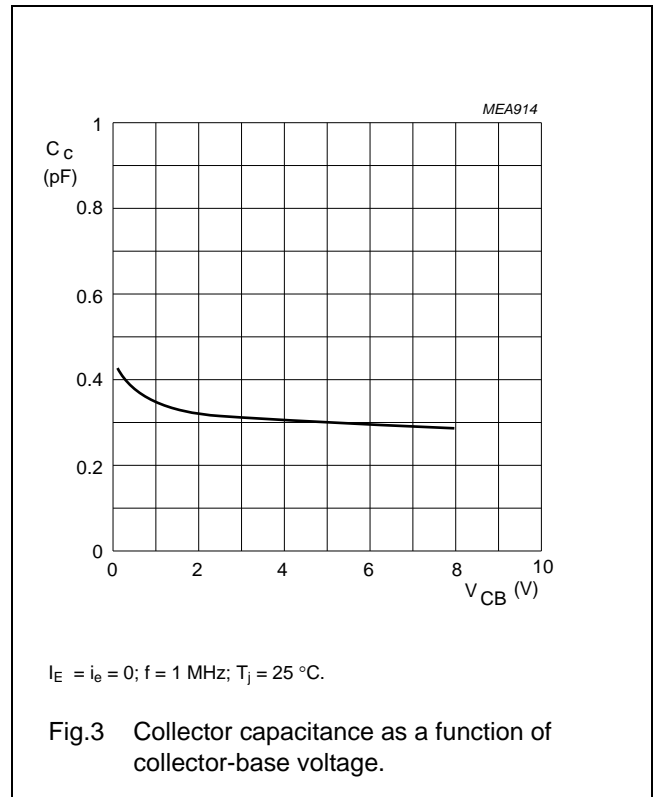
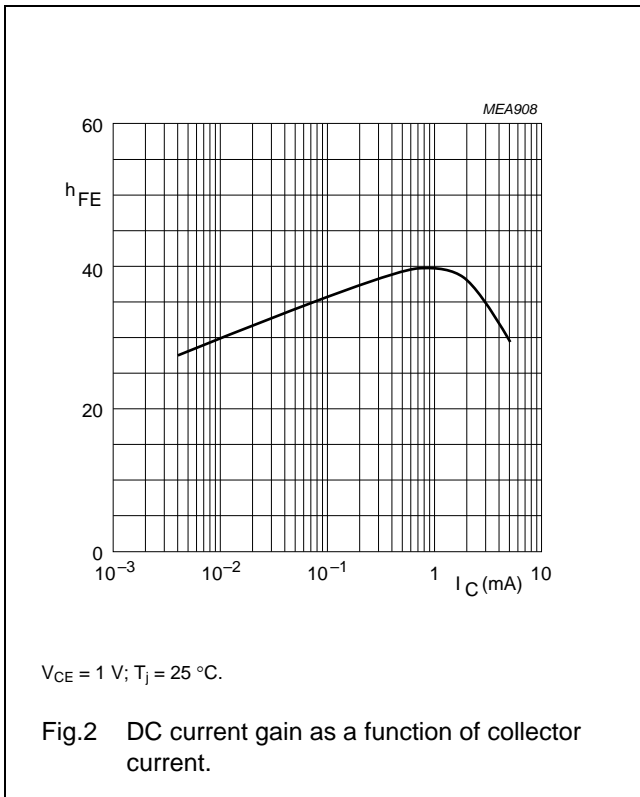
Note

- G_{UM} is the maximum unilateral power gain, assuming S_{12} is zero and

$$G_{UM} = 10 \log \frac{|S_{21}|^2}{(1 - |S_{11}|^2)(1 - |S_{22}|^2)} \text{ dB.}$$

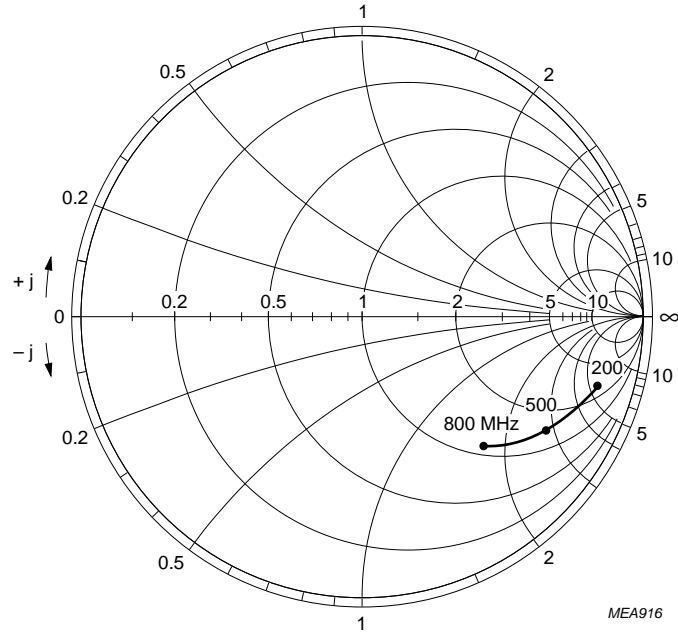
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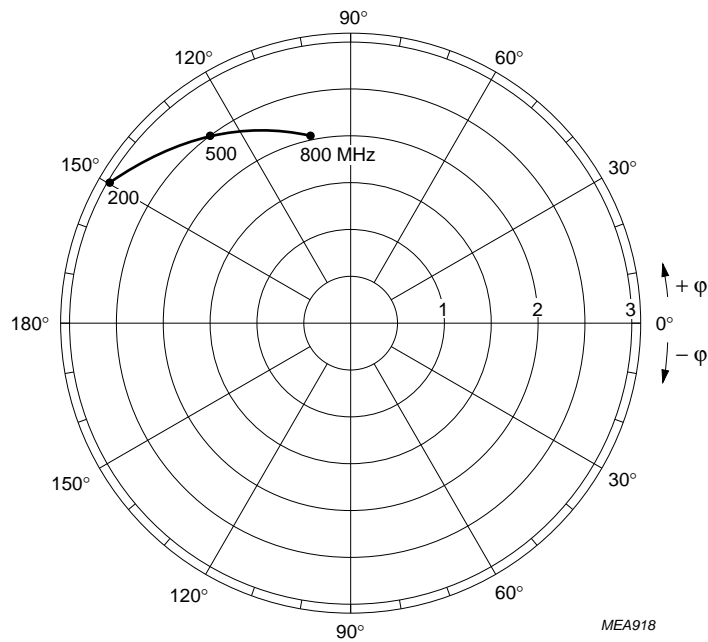
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$I_C = 1 \text{ mA}$; $V_{CE} = 1 \text{ V}$; $T_{amb} = 25 \text{ }^\circ\text{C}$.
 $Z_o = 50 \text{ } \Omega$.

Fig.6 Common emitter input reflection coefficient (S_{11}).

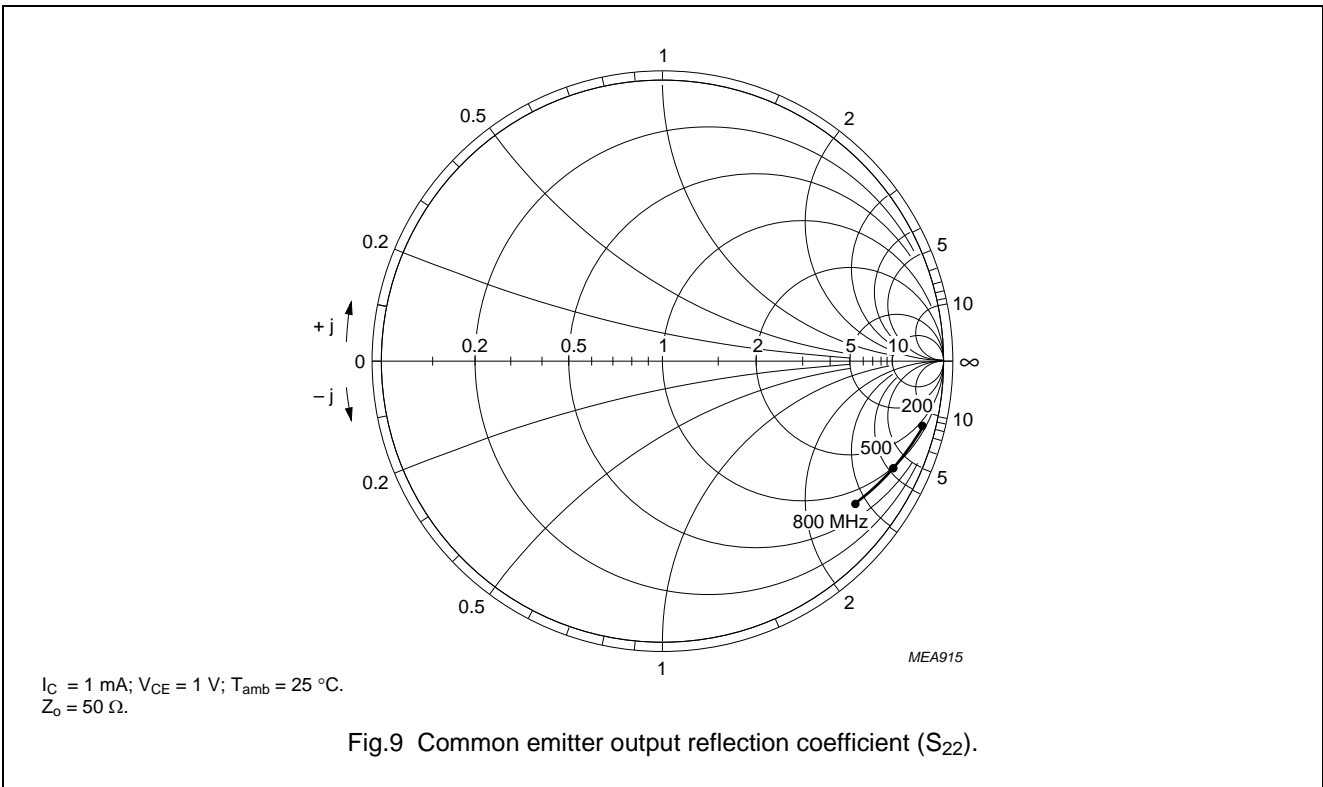
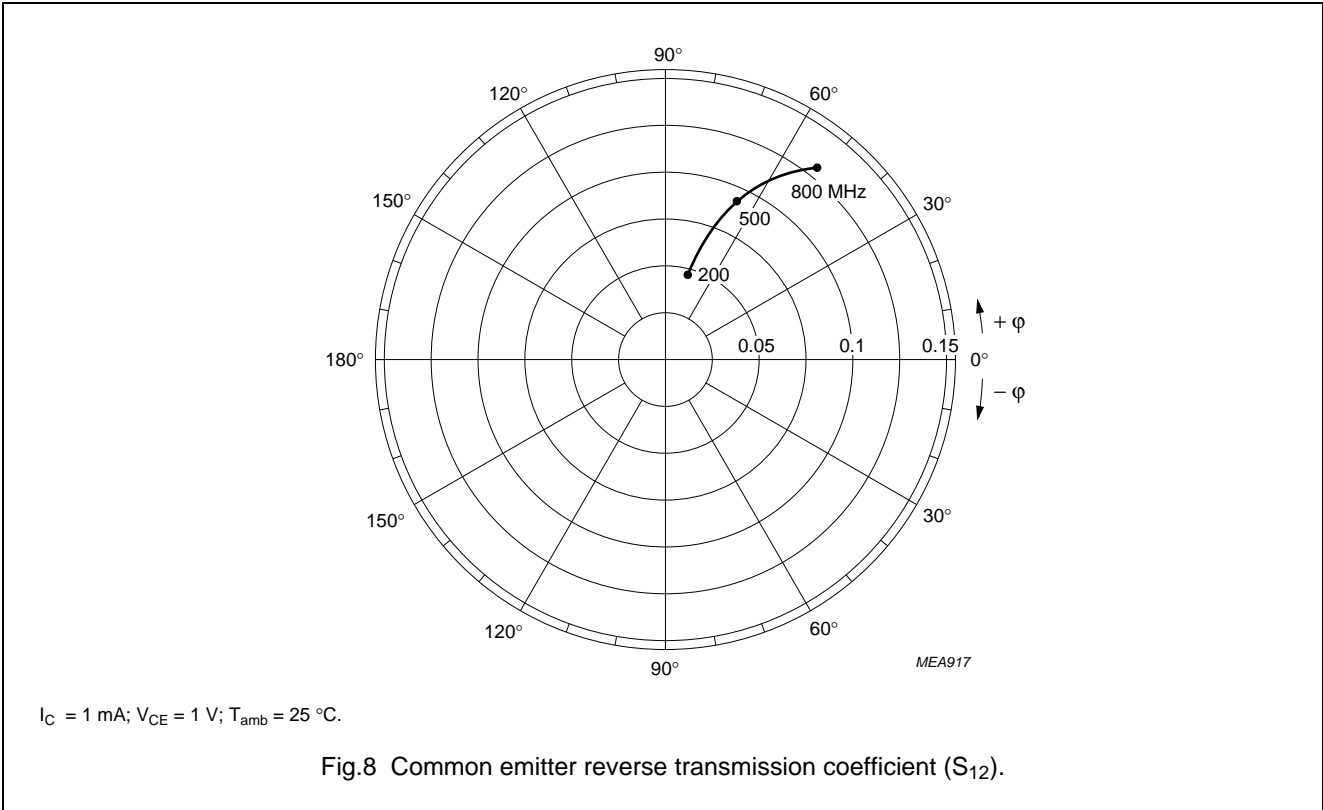


$I_C = 1 \text{ mA}$; $V_{CE} = 1 \text{ V}$; $T_{amb} = 25 \text{ }^\circ\text{C}$.

Fig.7 Common emitter forward transmission coefficient (S_{21}).

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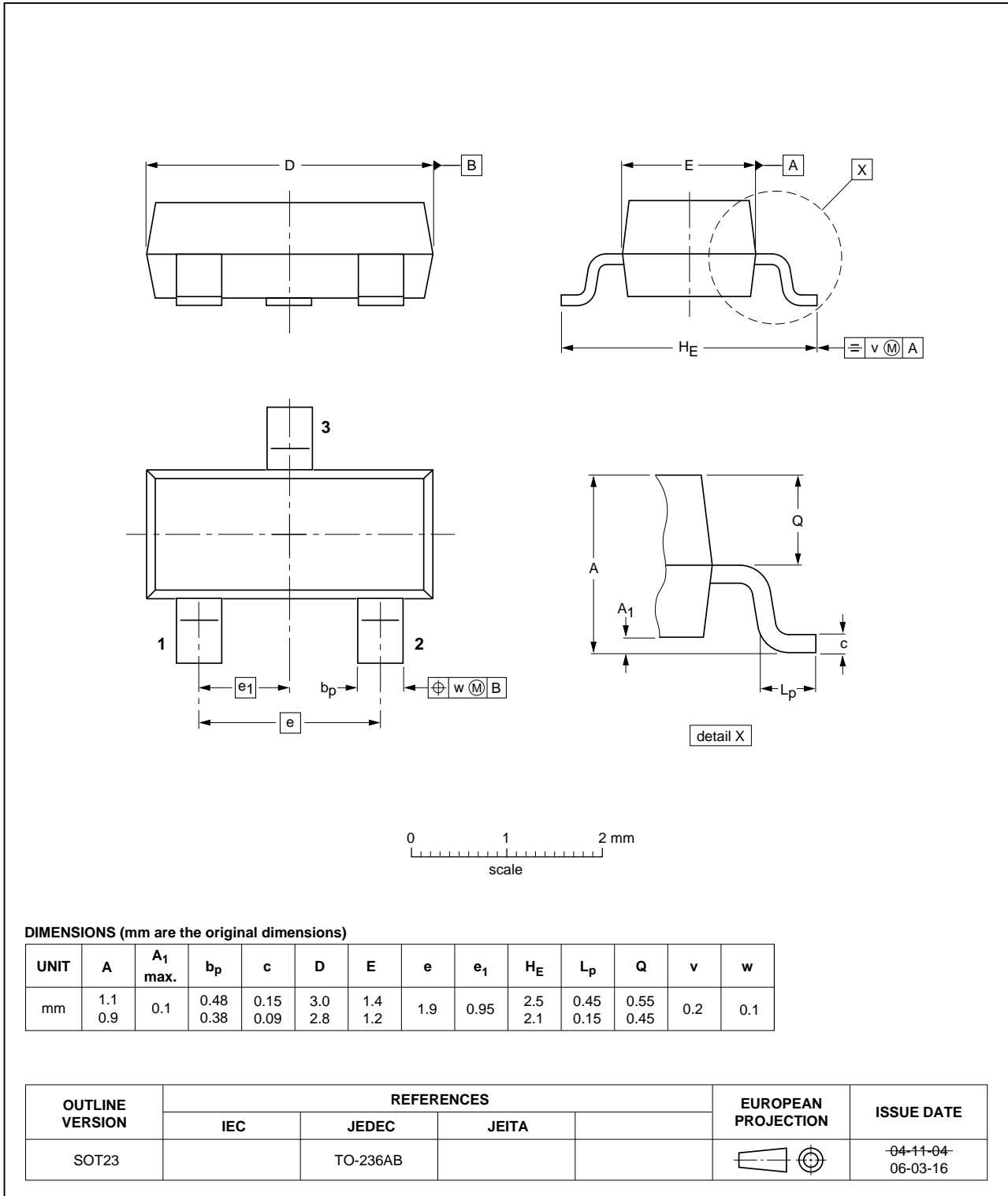
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PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



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DATA SHEET STATUS

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Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
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