

# 2SC4226

NPN Silicon RF Transistor

R09DS0022EJ0200

Rev.2.00

NPN Epitaxial Silicon RF Transistor for High-Frequency Low-Noise Amplification 3-pin super Minimold

Jun 29, 2011

## DESCRIPTION

The 2SC4226 is a low supply voltage transistor designed for VHF, UHF low noise amplifier.

It is suitable for a high density surface mount assembly since the transistor has been applied 3-pin super minimold package.

## FEATURES

- Low noise :  $NF = 1.2 \text{ dB TYP. @ } V_{CE} = 3 \text{ V, } I_C = 7 \text{ mA, } f = 1 \text{ GHz}$
- High gain :  $|S_{21e}|^2 = 9 \text{ dB TYP. @ } V_{CE} = 3 \text{ V, } I_C = 7 \text{ mA, } f = 1 \text{ GHz}$
- 3-pin super minimold package

## <R> ORDERING INFORMATION

Part Number	Order Number	Package	Quantity	Supplying Form
2SC4226	2SC4226-A	3-pin super Minimold (Pb-Free)	50 pcs (Non reel)	<ul style="list-style-type: none"> <li>• 8 mm wide embossed taping</li> <li>• Pin 3 (Collector) face the perforation side of the tape</li> </ul>
2SC4226-T1	2SC4226-T1-A		3 kpcs/reel	

**Remark** To order evaluation samples, please contact your nearby sales office.

The unit sample quantity is 50 pcs.

## ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = +25°C)

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	V <sub>CBO</sub>	20	V
Collector to Emitter Voltage	V <sub>CEO</sub>	12	V
Emitter to Base Voltage	V <sub>EBO</sub>	3	V
Collector Current	I <sub>C</sub>	100	mA
Total Power Dissipation	P <sub>tot</sub> <sup>Note</sup>	150	mW
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-65 to +150	°C

**Note** Free air

## CAUTION

Observe precautions when handling because these devices are sensitive to electrostatic discharge.

The mark <R> shows major revised points.

The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = +25°C)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0	–	–	1.0	μA
Emitter Cut-off Current	I <sub>EB0</sub>	V <sub>EB</sub> = 1 V, I <sub>C</sub> = 0	–	–	1.0	μA
DC Current Gain	h <sub>FE</sub> <sup>Note 1</sup>	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 7 mA	40	110	250	–
RF Characteristics						
Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 7 mA	3.0	4.5	–	GHz
Insertion Power Gain	S <sub>21e</sub>   <sup>2</sup>	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 7 mA, f = 1 GHz	7	9	–	dB
Noise Figure	NF	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 7 mA, f = 1 GHz	–	1.2	2.5	dB
Reverse Transfer Capacitance	C <sub>re</sub> <sup>Note 2</sup>	V <sub>CB</sub> = 3 V, I <sub>E</sub> = 0, f = 1 MHz	–	0.7	1.5	pF

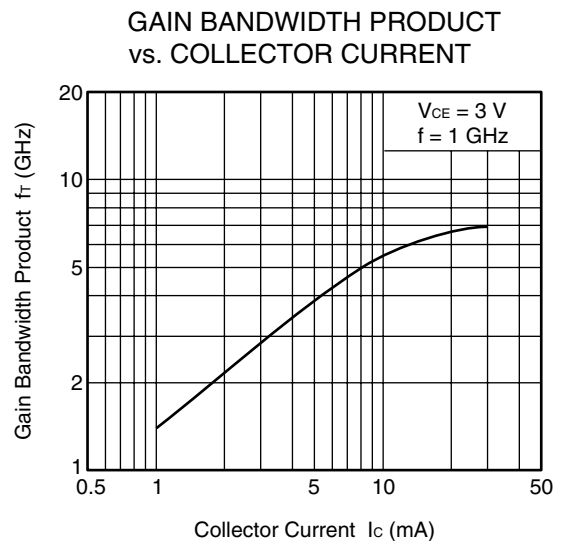
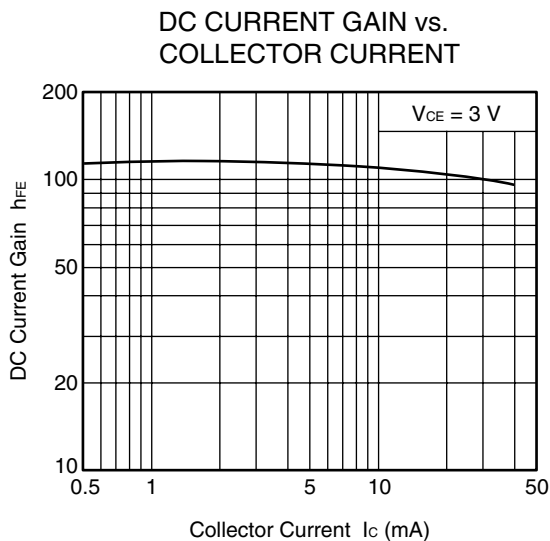
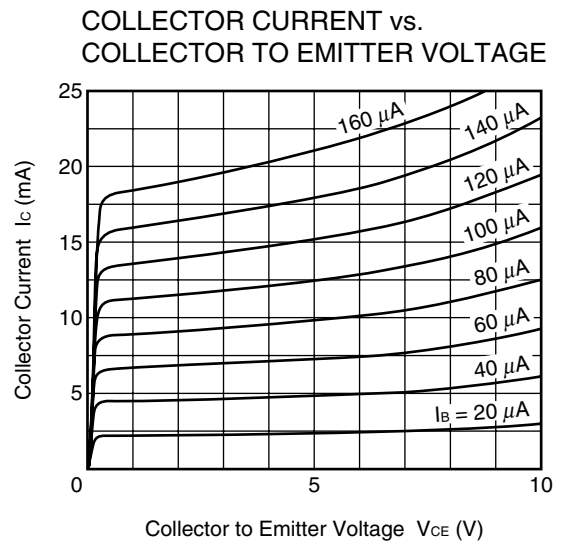
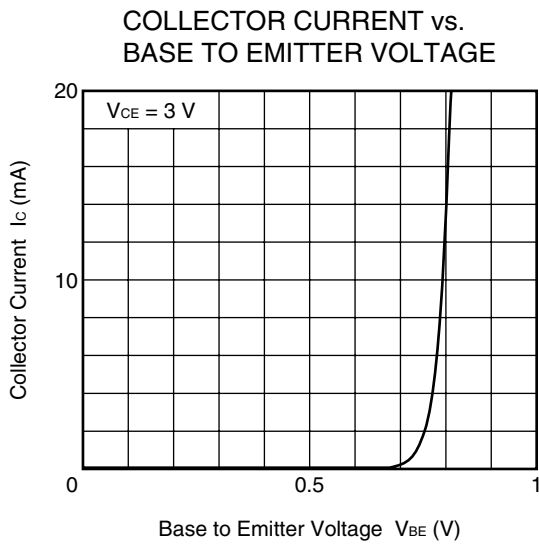
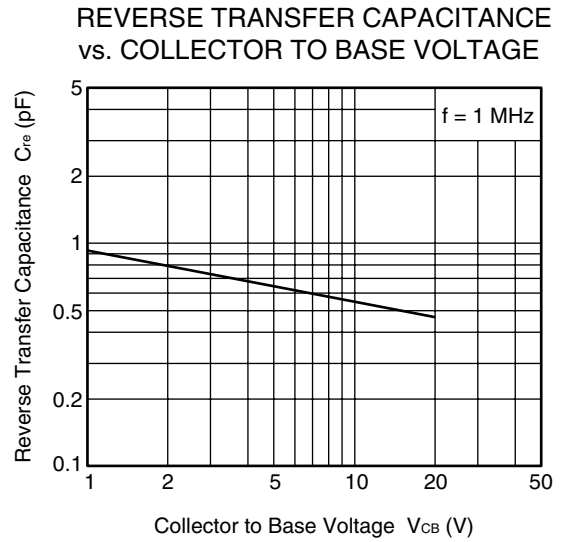
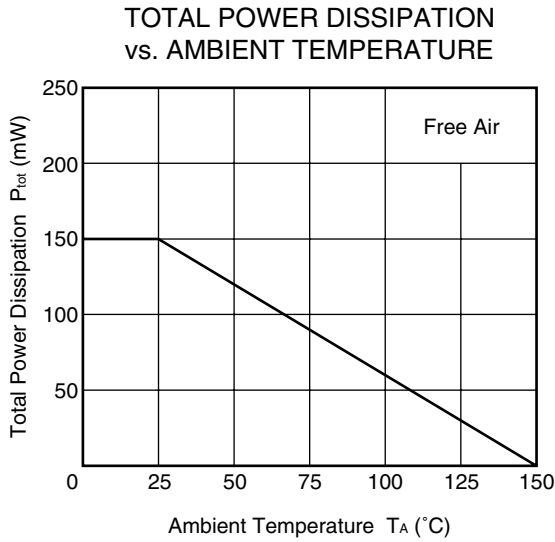
**Notes 1.** Pulse measurement: PW ≤ 350 μs, Duty Cycle ≤ 2%

**2.** Collector to base capacitance when the emitter grounded

<R> h<sub>FE</sub> CLASSIFICATION

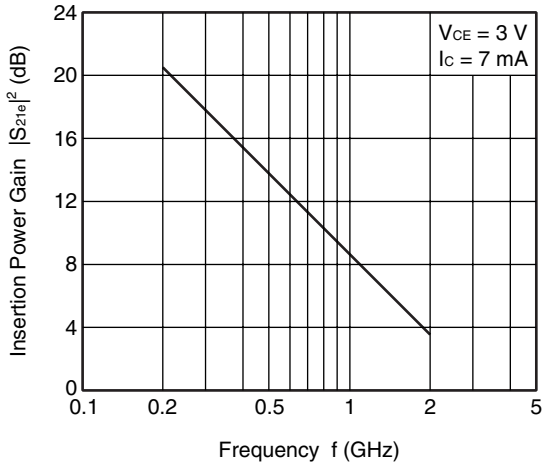
Rank	R23/Y23	R24/Y24	R25/Y25
Marking	R23	R24	R25
h <sub>FE</sub> Value	40 to 80	70 to 140	125 to 250

**TYPICAL CHARACTERISTICS (T<sub>A</sub> = +25°C, unless otherwise specified)**

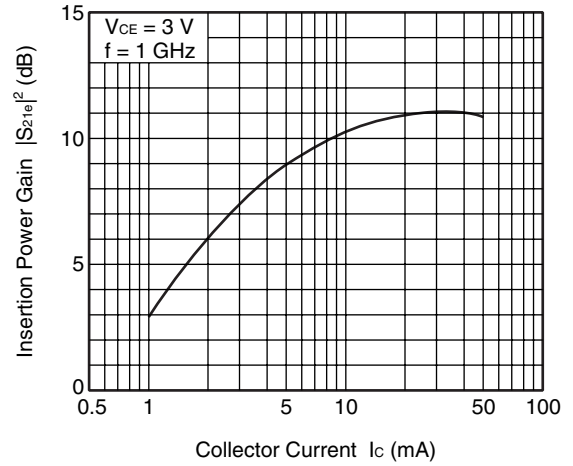


**Remark** The graphs indicate nominal characteristics.

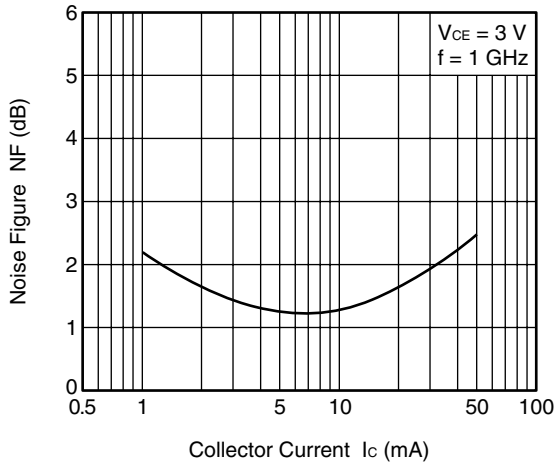
INSERTION POWER GAIN vs. FREQUENCY



INSERTION POWER GAIN vs. COLLECTOR CURRENT



NOISE FIGURE vs. COLLECTOR CURRENT



**Remark** The graphs indicate nominal characteristics.

## S-PARAMETERS

S-parameters and noise parameters are provided on our Web site in a format (S2P) that enables the direct import of the parameters to microwave circuit simulators without the need for keyboard inputs.

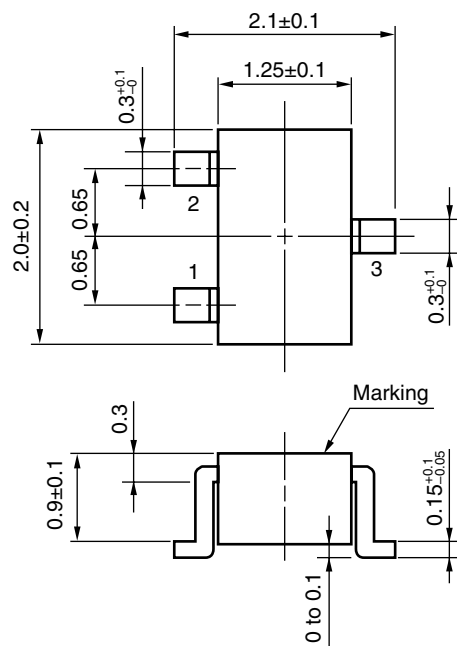
Click here to download S-parameters.

[RF and Microwave] → [Device Parameters]

URL <http://www2.renesas.com/microwave/en/download.html>

## PACKAGE DIMENSIONS

## 3-PIN SUPER MINIMOLD (UNIT: mm)



## PIN CONNECTIONS

1. Emitter
2. Base
3. Collector

(EIAJ : SC-70)

<b>Revision History</b>	<b>2SC4226 Data Sheet</b>
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Rev.	Date	Description	
		Page	Summary
-	Dec 2003	-	Previous No. :PU10450EJ01V0DS
2.00	Jun 29, 2011	p.1	Modification of <b>ORDERING INFORMATION</b>
		p.2	Modification of <b>h<sub>FE</sub> CLASSIFICATION</b>

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