2SC5337

Data Sheet

NPN Silicon RF Transistor for High-Frequency Low Distortion Amplifier 4-Pin Power Minimold

R09DS0047EJ0300
Rev.3.00
Sep 14, 2012

FEATURES

- Low distortion: IM_2 = 59.0 dB TYP., IM_3 = 82.0 dB TYP. @ V_{CE} = 10 V, I_C = 50 mA
- Low noise
  NF = 1.5 dB TYP. @ V_{CE} = 10 V, I_C = 50 mA, f = 500 MHz
  NF = 2.0 dB TYP. @ V_{CE} = 10 V, I_C = 50 mA, f = 1 GHz
- 4-pin power minimold package with improved gain from the 2SC4536

<R> ORDERING INFORMATION

Part Number	Order Number	Package	Quantity	Supplying Form
2SC5337	2SC5337-AZ	4-pin power minimold (Pb-Free) Note	25 pcs (Non reel)	• Magazine case
2SC5337-T1	2SC5337-T1-AZ		1 kpcs/reel	• 12 mm wide embossed taping • Collector face the perforation side of the tape

Note Contains Lead in the part except the electrode terminals.

Remark To order evaluation samples, please contact your nearby sales office.
Unit sample quantity is 25 pcs.

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	V_{CBO}	30	V
Collector to Emitter Voltage	V_{CEO}	15	V
Emitter to Base Voltage	V_{EBO}	3.0	V
Collector Current	I_C	250	mA
Total Power Dissipation	P_{tot} Note	2.0	W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	–65 to +150	°C

Note Mounted on 16 $cm^2 \times 0.7$ mm (t) ceramic substrate (Copper plating)

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.

<R> ELECTRICAL CHARACTERISTICS (T_A = +25°C)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I_{CBO}	V_{CB} = 20 V, I_E = 0	–	0.01	5.0	μA
Emitter Cut-off Current	I_{EBO}	V_{BE} = 2 V, I_C = 0	–	0.03	5.0	μA
DC Current Gain	h_{FE} Note 1	V_{CE} = 10 V, I_C = 50 mA	60	120	200	–
RF Characteristics						
Insertion Power Gain	S_{21e} 2	V_{CE} = 10 V, I_C = 50 mA, f = 1 GHz	7.0	8.3	–	dB
Noise Figure (1)	NF Note 2	V_{CE} = 10 V, I_C = 50 mA, f = 500 MHz	–	1.5	3.5	dB
Noise Figure (2)	NF Note 2	V_{CE} = 10 V, I_C = 50 mA, f = 1 GHz	–	2.0	3.5	dB
2nd Order Intermoduration Distortion	IM_2	V_{CE} = 10 V, I_C = 50 mA, R_S = R_L = 75 Ω, V_{in} = 105 dBμV/75 Ω, f_1 = 190 MHz, f_2 = 90 MHz, f = $f_1 - f_2$	–	59.0	–	dB
3rd Order Intermoduration Distortion	IM_3	V_{CE} = 10 V, I_C = 50 mA, R_S = R_L = 75 Ω, V_{in} = 105 dBμV/75 Ω, f_1 = 190 MHz, f_2 = 200 MHz, f = $2 \times f_1 - f_2$	–	82.0	–	dB

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

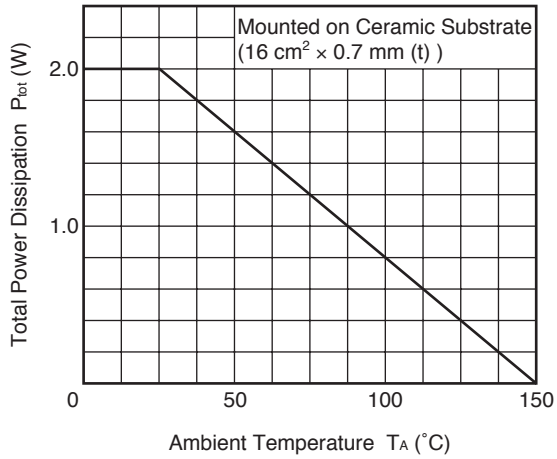
2. R_S = R_L = 50 Ω, tuned

<R> h_{FE} CLASSIFICATION

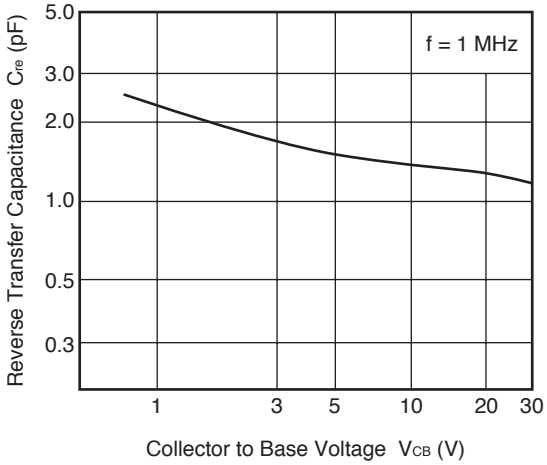
Rank	QR/YQR	QS/YQS
Marking	QR	QS
h_{FE} Value	60 to 120	100 to 200

TYPICAL CHARACTERISTICS (Unless otherwise specified, T_A = +25°C)

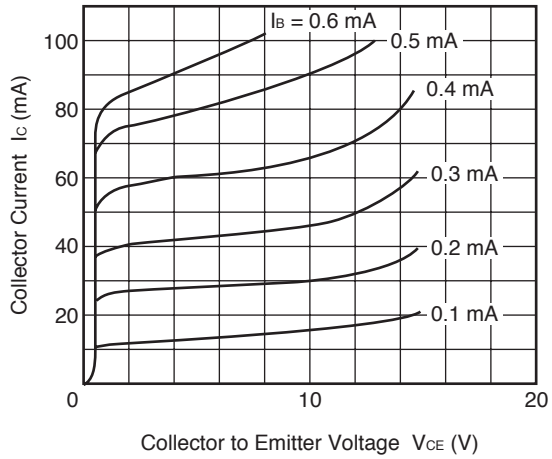
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



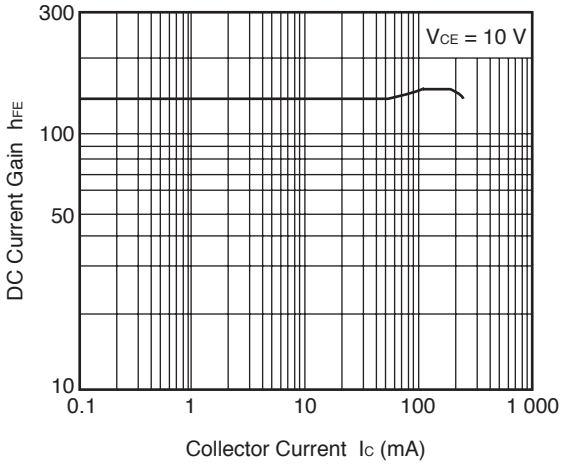
REVERSE TRANSFER CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



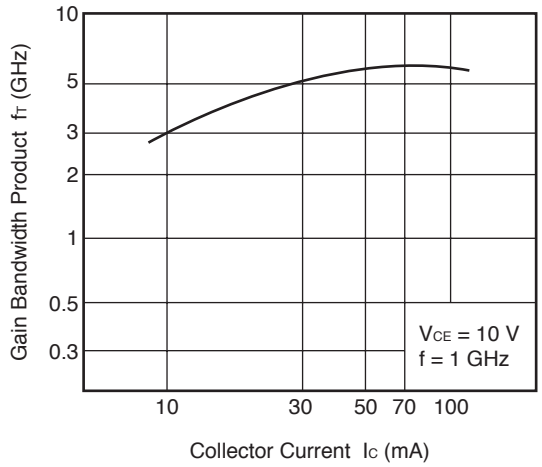
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



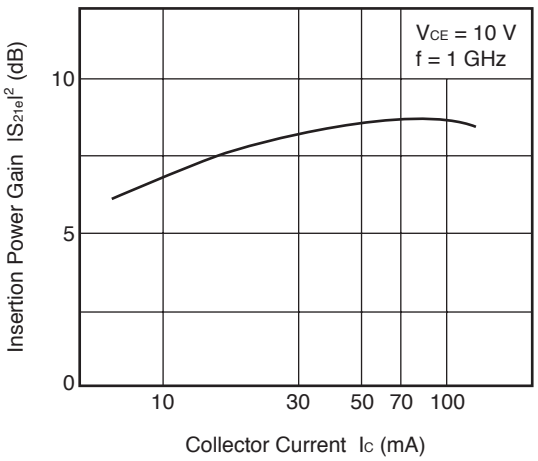
DC CURRENT GAIN vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT

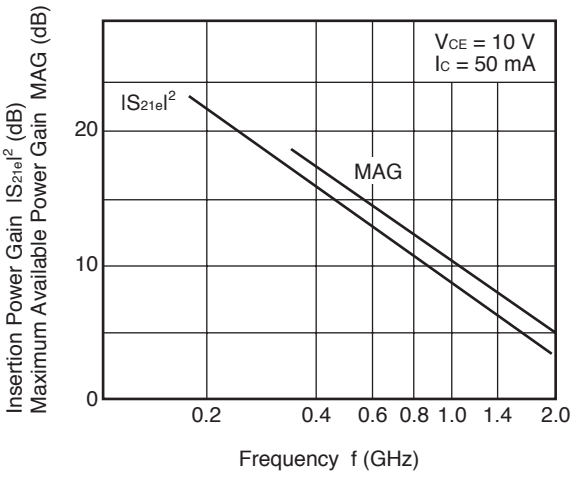


INSERTION POWER GAIN vs. COLLECTOR CURRENT

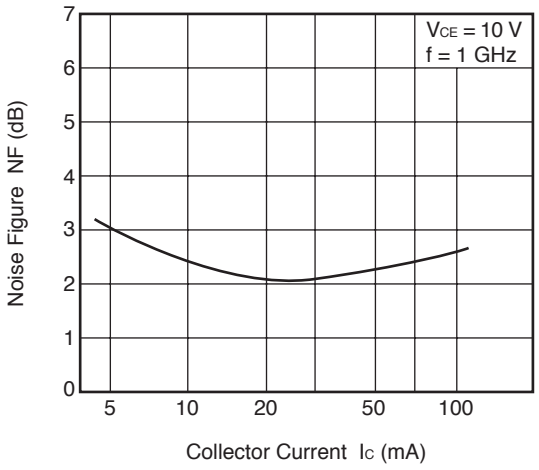


Remark The graphs indicate nominal characteristics.

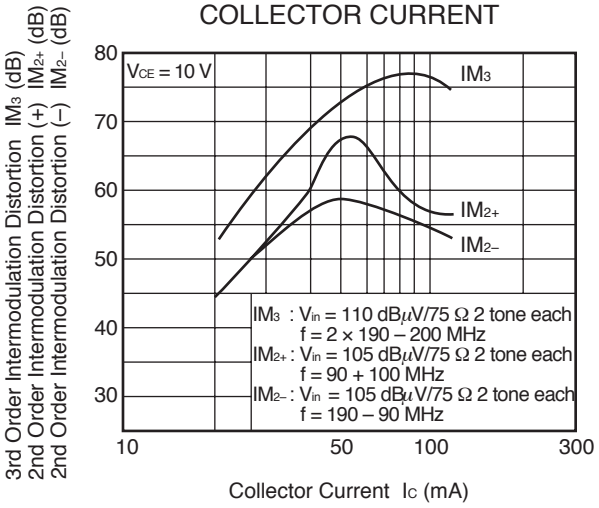
INSERTION POWER GAIN, MAG vs. FREQUENCY



NOISE FIGURE vs. COLLECTOR CURRENT



IM3, IM2+, IM2– vs. COLLECTOR CURRENT



Remark The graphs indicate nominal characteristics.

<R> S-PARAMETERS

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

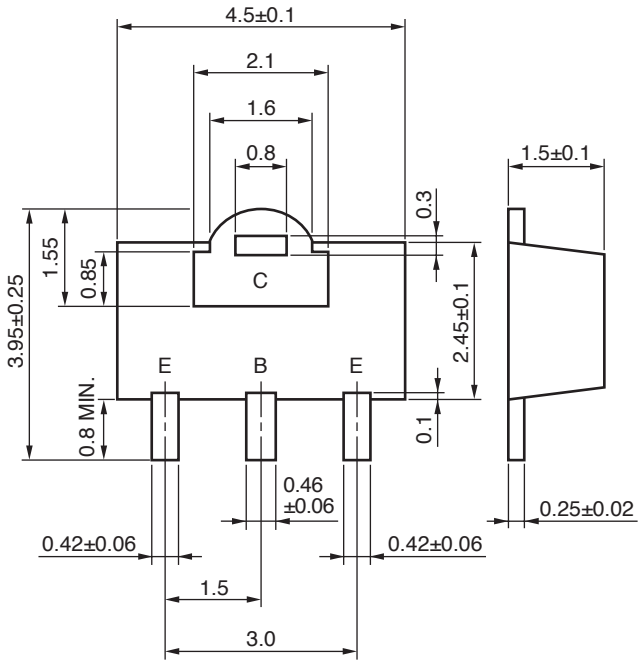
Click here to download S-parameters.

[Products] → [RF Devices] → [Device Parameters]

URL http://www.renesas.com/products/microwave/

PACKAGE DIMENSIONS

4-PIN POWER MINIMOLD (UNIT: mm)



PIN CONNECTIONS

E : Emitter
C : Collector
B : Base

Revision History	2SC5337 Data Sheet

Rev.	Date	Description	
		Page	Summary
1.00	Mar 01, 1996	–	First edition issued
2.00	Aug 28, 2001	–	Second edition issued
2.10	Sep 06, 2001	–	Second V1 edition issued
3.00	Sep 14, 2012	Throughout	The company name is changed to Renesas Electronics Corporation.
		p.1	Modification of ORDERING INFORMATION
		p.2	Modification of ELECTRICAL CHARACTERISTICS
		p.2	Modification of h_{FE} CLASSIFICATION
		p.4	Modification of method for obtaining S-parameters