

2SC3356

NPN Silicon RF Transistor

R09DS0021EJ0300

Rev.3.00

Jun 28, 2011

NPN Epitaxial Silicon RF Transistor for Microwave Low-Noise Amplification 3-pin Minimold

FEATURES

- Low noise and high gain : NF = 1.1 dB TYP., $G_a = 11$ dB TYP. @ $V_{CE} = 10$ V, $I_c = 7$ mA, $f = 1$ GHz
- High power gain : MAG = 13 dB TYP. @ $V_{CE} = 10$ V, $I_c = 20$ mA, $f = 1$ GHz

<R> ORDERING INFORMATION

Part Number	Order Number	Package	Quantity	Supplying Form
2SC3356	2SC3356-A	3-pin Minimold (Pb-Free)	50 pcs (Non reel)	• 8 mm wide embossed taping
2SC3356-T1B	2SC3356-T1B-A		3 kpcs/reel	• Pin 3 (Collector) face the perforation side of the tape

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

The unit sample quantity is 50 pcs.

ABSOLUTE MAXIMUM RATINGS ($T_A = +25^{\circ}\text{C}$)

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	V_{CBO}	20	V
Collector to Emitter Voltage	V_{CEO}	12	V
Emitter to Base Voltage	V_{EBO}	3.0	V
Collector Current	I_c	100	mA
Total Power Dissipation	P_{tot} ^{Note}	200	mW
Junction Temperature	T_j	150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-65 to +150	$^{\circ}\text{C}$

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_A = +25°C)

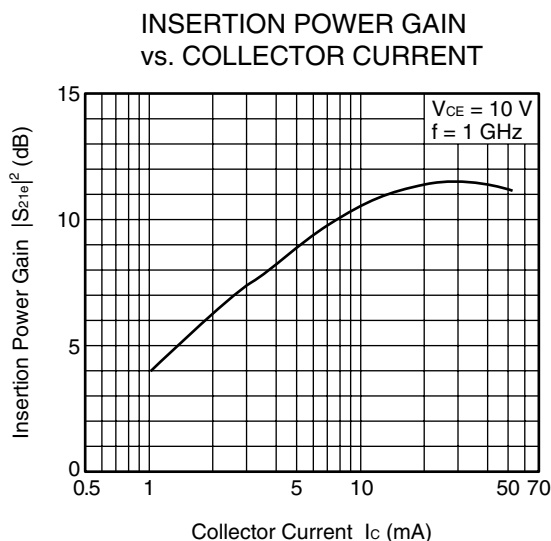
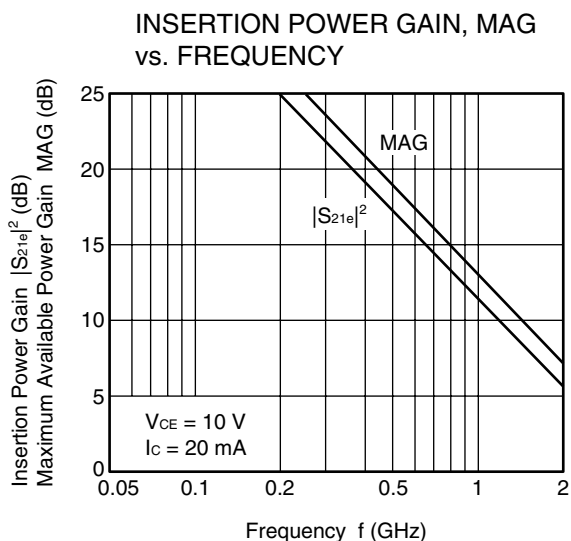
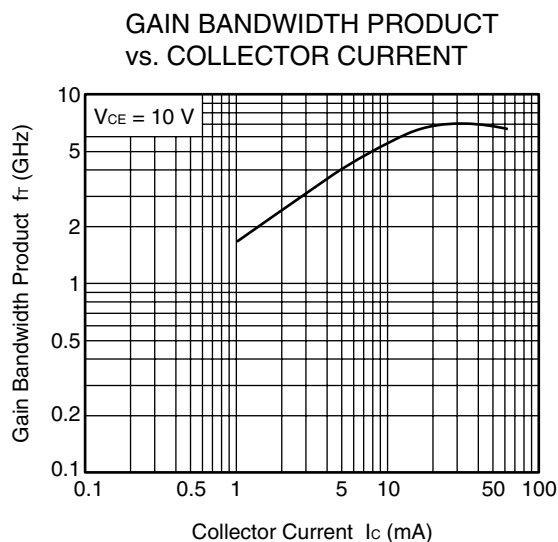
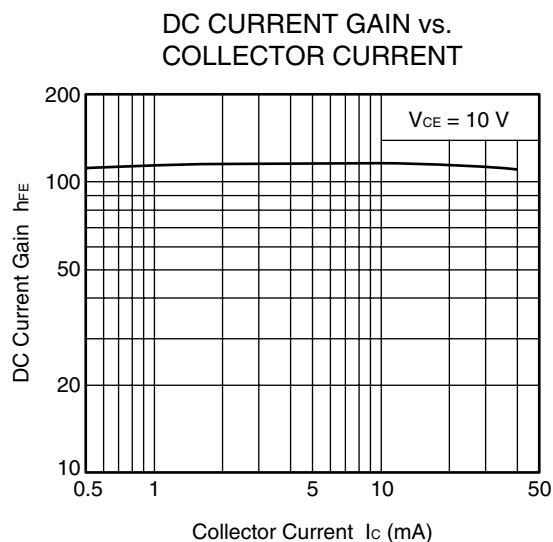
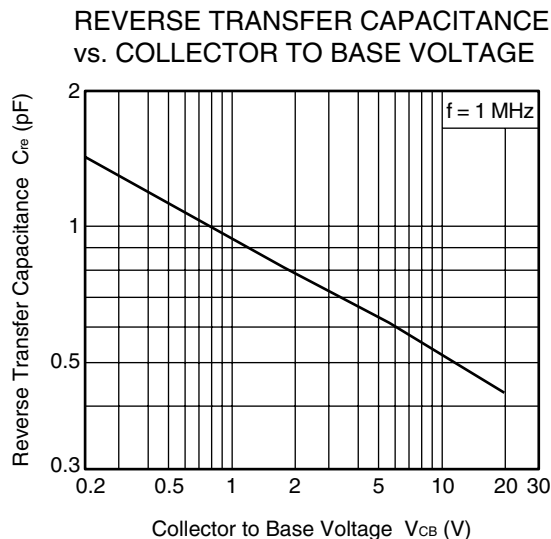
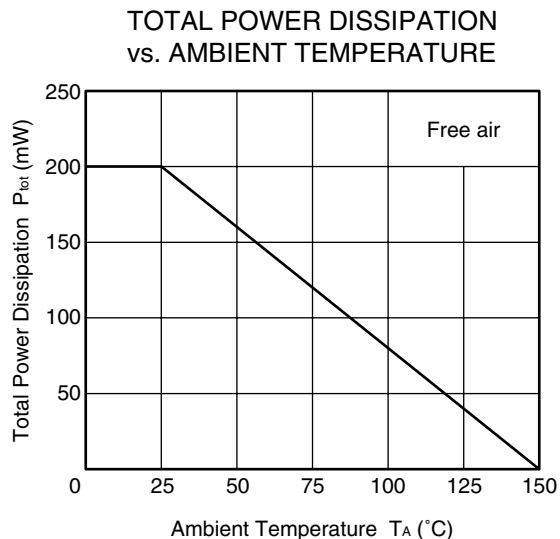
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I _{CBO}	V _{CB} = 10 V, I _E = 0	–	–	1.0	μA
Emitter Cut-off Current	I _{EBO}	V _{EB} = 1.0 V, I _C = 0	–	–	1.0	μA
DC Current Gain	h _{FE} ^{Note 1}	V _{CE} = 10 V, I _C = 20 mA	50	120	250	–
RF Characteristics						
Gain Bandwidth Product	f _T	V _{CE} = 10 V, I _C = 20 mA	–	7	–	GHz
Insertion Power Gain	S _{21e} ²	V _{CE} = 10 V, I _C = 20 mA, f = 1 GHz	–	11.5	–	dB
Noise Figure	NF	V _{CE} = 10 V, I _C = 7 mA, f = 1 GHz	–	1.1	2.0	dB
Reverse Transfer Capacitance	C _{re} ^{Note 2}	V _{CB} = 10 V, I _E = 0, f = 1 MHz	–	0.55	1.0	pF

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

2. Collector to base capacitance when the emitter grounded

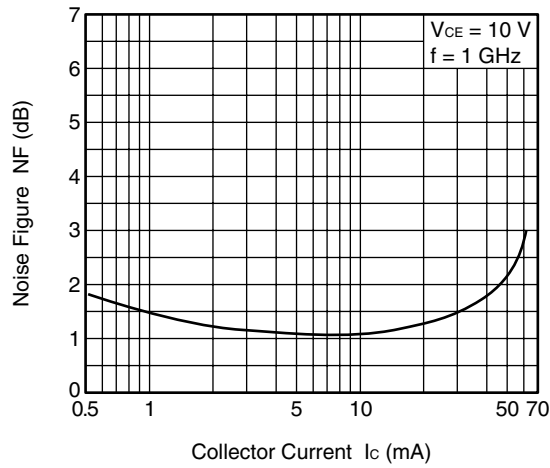
<R> **h_{FE} CLASSIFICATION**

Rank	Q/YQ	R/YR	S/YS
Marking	R23	R24	R25
h _{FE} Value	50 to 100	80 to 160	125 to 250

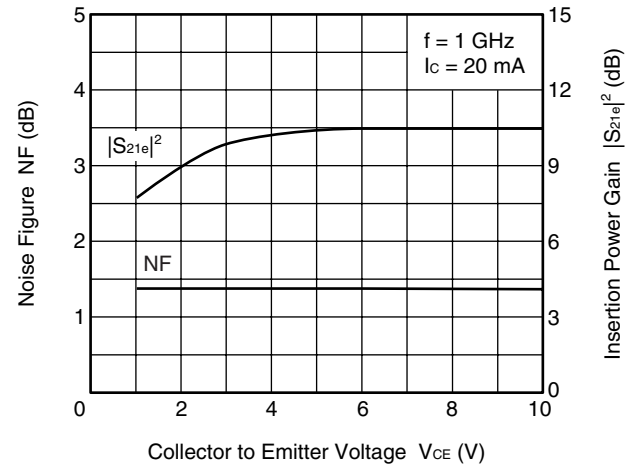
TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, unless otherwise specified)

Remark The graphs indicate nominal characteristics.

NOISE FIGURE vs.
COLLECTOR CURRENT



NOISE FIGURE, INSERTION POWER GAIN
vs. COLLECTOR TO EMITTER VOLTAGE



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.

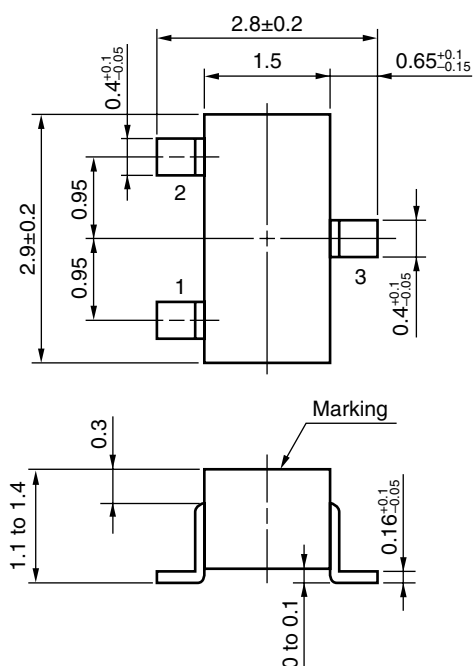
Click here to download S-parameters.

[RF and Microwave] → [Device Parameters]

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

PACKAGE DIMENSIONS

3-PIN MINIMOLD (UNIT: mm)



PIN CONNECTIONS

1. Emitter
2. Base
3. Collector

Revision History	2SC3356 Data Sheet
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Rev.	Date	Description	
		Page	Summary
–	Jun 2004	–	Previous No. :PU10209EJ02V0DS
3.00	Jun 28, 2011	p.1	Modification of ORDERING INFORMATION
		p.2	Modification of h_{FE} CLASSIFICATION

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