DATA SHEET

NEC

NPN SILICON GERMANIUM RF TRANSISTOR
2SC5843

NPN SiGe RF TRANSISTOR FOR LOW NOISE, HIGH-GAIN AMPLIFICATION 6-PIN LEAD-LESS MINIMOLD (M16, 1208 PACKAGE)

FEATURES

- Ideal for low noise, high-gain amplification
  NF = 0.9 dB TYP. @ V_{CE} = 2 V, I_C = 5 mA, f = 2 GHz
- Maximum stable power gain: MSG = 20.0 dB TYP. @ V_{CE} = 2 V, I_C = 20 mA, f = 2 GHz
- SiGe technology (f_T = 60 GHz, f_{max} = 60 GHz)
- 6-pin lead-less minimold (M16, 1208 package)

ORDERING INFORMATION

Part Number	Quantity	Supplying Form
2SC5843	50 pcs (Non reel)	• 8 mm wide embossed taping
2SC5843-T3	10 kpcs/reel	• Pin 1 (Collector), Pin 6 (Emitter) face the perforation side of the tape

Remark To order evaluation samples, contact your nearby sales office.
The unit sample quantity is 50 pcs.

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	V_{CBO}	8.0	V
Collector to Emitter Voltage	V_{CEO}	2.3	V
Emitter to Base Voltage	V_{EBO}	1.2	V
Collector Current	I_C	35	mA
Total Power Dissipation	P_{tot} Note	80	mW
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	–65 to +150	°C

Note Mounted on 1.08 $cm^2 \times$ 1.0 mm (t) glass epoxy PCB

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

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The mark ★ shows major revised points.

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I_{CBO}	V_{CB} = 5 V, I_E = 0 mA	–	–	200	nA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 0.5 V, I_C = 0 mA	–	–	200	nA
DC Current Gain	h_{FE} Note 1	V_{CE} = 2 V, I_C = 5 mA	200	–	400	–
RF Characteristics						
Insertion Power Gain	$\|S_{21e}\|^2$	V_{CE} = 2 V, I_C = 20 mA, f = 2 GHz	16.0	18.0	–	dB
Noise Figure	NF	V_{CE} = 2 V, I_C = 5 mA, f = 2 GHz, $Z_S = Z_{opt}$	–	0.9	1.1	dB
Reverse Transfer Capacitance	C_{re} Note 2	V_{CB} = 2 V, I_E = 0 mA, f = 1 MHz	–	0.17	0.22	pF
Maximum Stable Power Gain	MSG Note 3	V_{CE} = 2 V, I_C = 20 mA, f = 2 GHz	18.0	20.0	–	dB

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

2. Collector to base capacitance when the emitter grounded

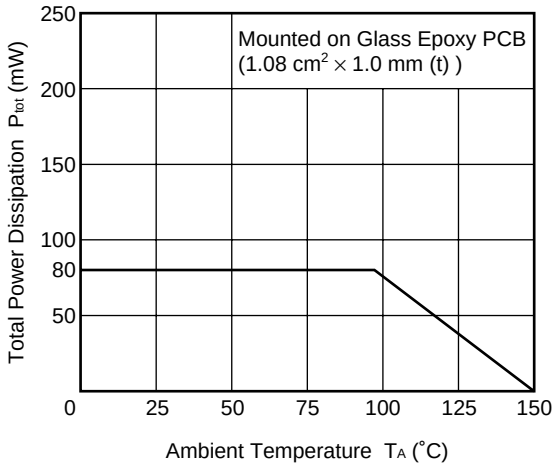
3. $MSG = \left| \frac{S_{21}}{S_{12}} \right|$

h_{FE} CLASSIFICATION

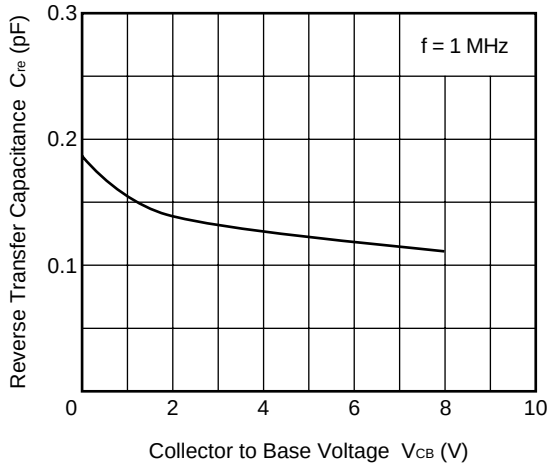
Rank	FB
Marking	zD
h_{FE} Value	200 to 400

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

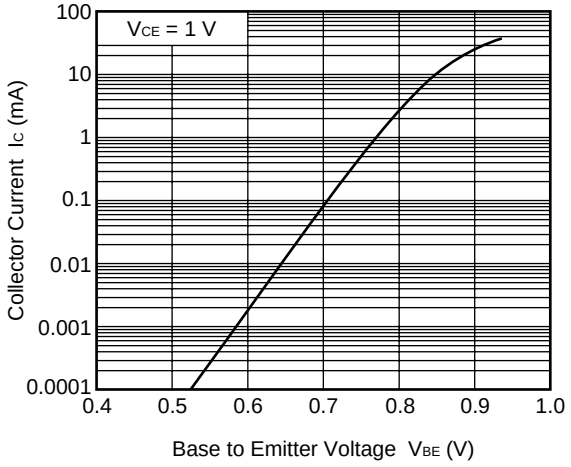
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



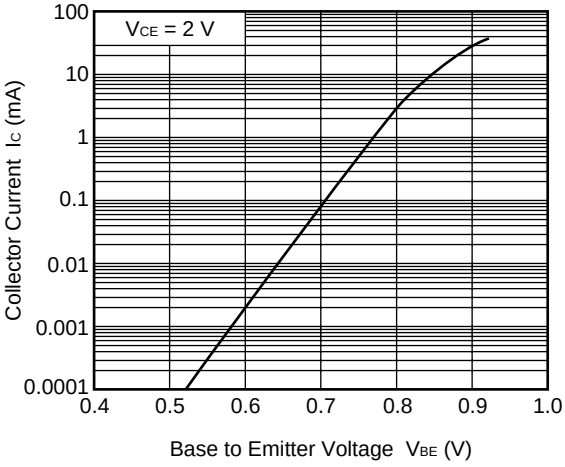
REVERSE TRANSFER CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



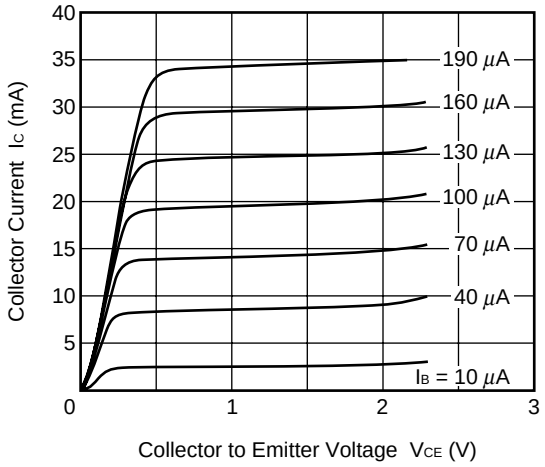
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE

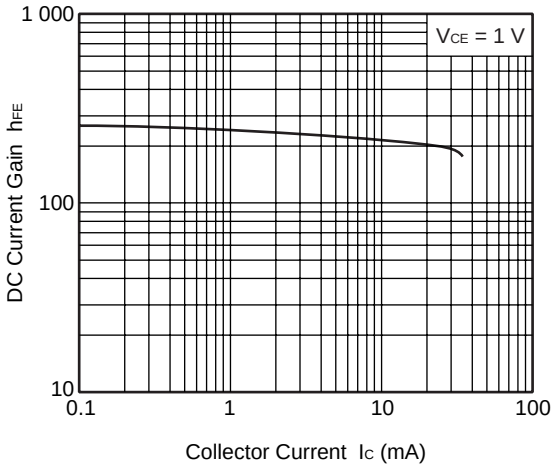


COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE

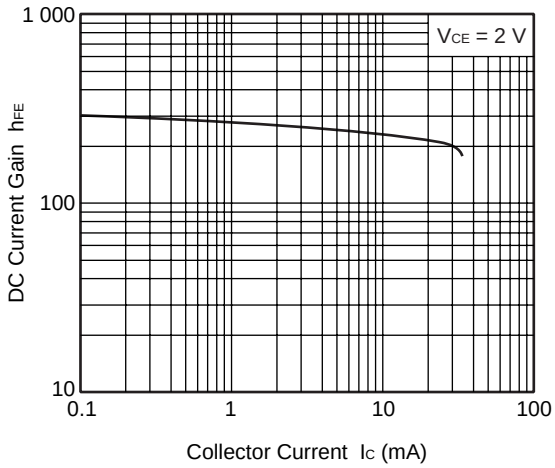


Remark The graphs indicate nominal characteristics.

DC CURRENT GAIN vs.
COLLECTOR CURRENT



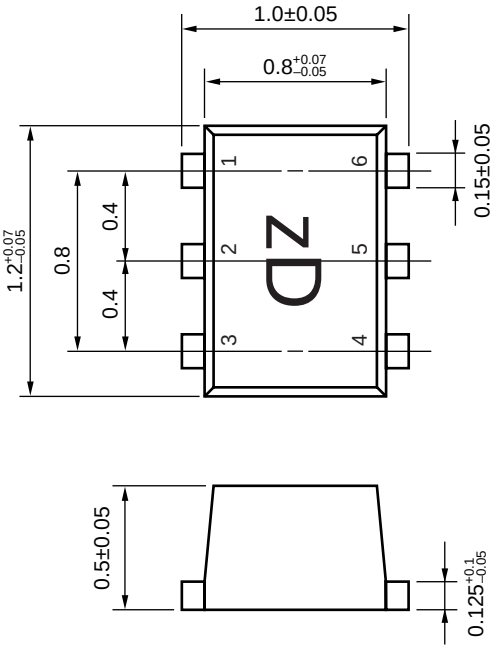
DC CURRENT GAIN vs.
COLLECTOR CURRENT



Remark The graphs indicate nominal characteristics.

PACKAGE DIMENSIONS

6-PIN LEAD-LESS MINIMOLD (M16, 1208 PACKAGE) (UNIT: mm)



PIN CONNECTIONS

1. Collector
2. Emitter
3. Emitter
4. Base
5. Emitter
6. Emitter

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