

PRELIMINARY DATA SHEET

NEC

NPN SILICON + SiGe RF TWIN TRANSISTOR μ PA869TS

NPN SILICON + SiGe RF TRANSISTOR (WITH 2 DIFFERENT ELEMENTS) IN A 6-PIN SUPER LEAD-LESS MINIMOLD (1007 PACKAGE)

FEATURES

- 2 different built-in transistors (NESG2046M33, 2SC5800)
 - Q1: High gain SiGe transistor
 $f_T = 18 \text{ GHz TYP.}$, $|S_{21e}|^2 = 13 \text{ dB TYP. @ } V_{CE} = 1 \text{ V, } I_C = 15 \text{ mA, } f = 2 \text{ GHz}$
 - Q2: Low phase distortion transistor suited for OSC applications
 $f_T = 6.5 \text{ GHz TYP.}$, $|S_{21e}|^2 = 5.5 \text{ dB TYP. @ } V_{CE} = 1 \text{ V, } I_C = 15 \text{ mA, } f = 2 \text{ GHz}$
- 6-pin super lead-less minimold (1007 package)

BUILT-IN TRANSISTORS

	Q1	Q2
3-pin super lead-less minimold part No.	NESG2046M33	—
3-pin thin-type ultra super minimold part No.	—	2SC5800

ORDERING INFORMATION

Part Number	Quantity	Supplying Form
μ PA869TS	50 pcs (Non reel)	• 8 mm wide embossed taping
μ PA869TS-T3	10 kpcs/reel	• Pin 1 (Q1 Collector), Pin 6 (Q1 Base) face the perforation side of the tape

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

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

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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

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

Parameter	Symbol	Ratings		Unit
		Q1	Q2	
Collector to Base Voltage	V _{CBO}	13	13	V
Collector to Emitter Voltage	V _{CEO}	5	5	V
Emitter to Base Voltage	V _{EBO}	1.5	1.5	V
Collector Current	I _C	40	100	mA
Total Power Dissipation	P _{tot} ^{Note}	110	110	mW
		130 in 2 elements		
Junction Temperature	T _j	150		°C
Storage Temperature	T _{stg}	−65 to +150		°C

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

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

(1) Q1

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Collector Cut-off Current	I _{CBO}	V _{CB} = 5 V, I _E = 0 mA	–	–	100	nA
Emitter Cut-off Current	I _{EBO}	V _{EB} = 0.5 V, I _C = 0 mA	–	–	100	nA
DC Current Gain	h _{FE} ^{Note 1}	V _{CE} = 1 V, I _C = 2 mA	140	180	220	–
Gain Bandwidth Product	f _T	V _{CE} = 1 V, I _C = 15 mA, f = 2 GHz	15	18	–	GHz
Insertion Power Gain	S _{21e} ²	V _{CE} = 1 V, I _C = 15 mA, f = 2 GHz	11	13	–	dB
Noise Figure	NF	V _{CE} = 1 V, I _C = 3 mA, f = 2 GHz, Z _S = Z _{opt}	–	0.8	1.5	dB
Associated Gain	G _a	V _{CE} = 1 V, I _C = 3 mA, f = 2 GHz, Z _S = Z _{opt}	9.5	11.5	–	dB
Reverse Transfer Capacitance	C _{re} ^{Note 2}	V _{CB} = 1 V, I _E = 0 mA, f = 1 MHz	–	0.2	0.4	pF

(2) Q2

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Collector Cut-off Current	I _{CBO}	V _{CB} = 5 V, I _E = 0 mA	–	–	600	nA
Emitter Cut-off Current	I _{EBO}	V _{EB} = 0.5 V, I _C = 0 mA	–	–	600	nA
DC Current Gain	h _{FE} ^{Note 1}	V _{CE} = 1 V, I _C = 5 mA	100	120	145	–
Gain Bandwidth Product (1)	f _T	V _{CE} = 1 V, I _C = 5 mA, f = 2 GHz	3	4.5	–	GHz
Gain Bandwidth Product (2)	f _T	V _{CE} = 1 V, I _C = 15 mA, f = 2 GHz	5	6.5	–	GHz
Insertion Power Gain (1)	S _{21e} ²	V _{CE} = 1 V, I _C = 5 mA, f = 2 GHz	3	4	–	dB
Insertion Power Gain (2)	S _{21e} ²	V _{CE} = 1 V, I _C = 15 mA, f = 2 GHz	4.5	5.5	–	dB
Noise Figure	NF	V _{CE} = 1 V, I _C = 10 mA, f = 2 GHz, Z _S = Z _{opt}	–	1.9	2.5	dB
Reverse Transfer Capacitance	C _{re} ^{Note 2}	V _{CB} = 0.5 V, I _E = 0 mA, f = 1 MHz	–	0.6	0.8	pF

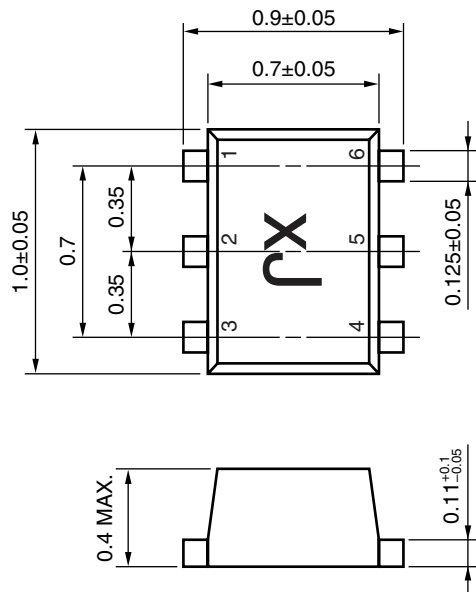
- Notes 1.** Pulse measurement: PW ≤ 350 μs, Duty Cycle ≤ 2%
- 2.** Collector to base capacitance when the emitter grounded

h_{FE} CLASSIFICATION

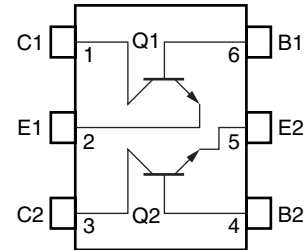
Rank	FB
Marking	xJ
h _{FE} Value of Q1	140 to 220
h _{FE} Value of Q2	100 to 145

PACKAGE DIMENSIONS

6-PIN SUPER LEAD-LESS MINIMOLD (1007 PACKAGE) (UNIT: mm)



(Top View)



PIN CONNECTIONS

1. Collector (Q1)
2. Emitter (Q1)
3. Collector (Q2)
4. Base (Q2)
5. Emitter (Q2)
6. Base (Q1)

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