PRELIMINARY DATA SHEET

NEC

NPN SiGe RF TWIN TRANSISTOR

μPA880TS

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

FEATURES

- 2 different built-in transistors (NESG2046M33, NESG2107M33)
  - Q1: High gain SiGe transistor
    - f_T = 18 GHz TYP., $|S_{21e}|^2$ = 13 dB TYP. @ V_{CE} = 1 V, I_C = 15 mA, f = 2 GHz
  - Q2: Low phase distortion SiGe transistor suited for OSC applications
    - f_T = 10 GHz TYP., $|S_{21e}|^2$ = 9 dB TYP. @ V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz
- 6-pin super lead-less minimold (1007 package)

BUILT-IN TRANSISTORS

	Q1	Q2
3-pin super lead-less minimold part No.	NESG2046M33	NESG2107M33

ORDERING INFORMATION

Part Number	Quantity	Supplying Form
μPA880TS	50 pcs (Non reel)	• 8 mm wide embossed taping
μPA880TS-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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ABSOLUTE MAXIMUM RATINGS (T_A = +25°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 $cm^2 \times$ 1.0 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	$\lvert S_{21e} \rvert^2$	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	–	–	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 = 5 mA	140	180	220	–
Gain Bandwidth Product (1)	f_T	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	7	10	–	GHz
Gain Bandwidth Product (2)	f_T	V_{CE} = 1 V, I_C = 20 mA, f = 2 GHz	–	17	–	GHz
Insertion Power Gain (1)	$\lvert S_{21e} \rvert^2$	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	7.5	9	–	dB
Insertion Power Gain (2)	$\lvert S_{21e} \rvert^2$	V_{CE} = 1 V, I_C = 20 mA, f = 2 GHz	–	10	–	dB
Noise Figure	NF	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz, $Z_S = Z_{opt}$	–	0.9	1.5	dB
Associated Gain	G_a	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz, $Z_S = Z_{opt}$	7	10	–	dB
Reverse Transfer Capacitance	C_{re} Note 2	V_{CB} = 1 V, I_E = 0 mA, f = 1 MHz	–	0.5	0.7	pF

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

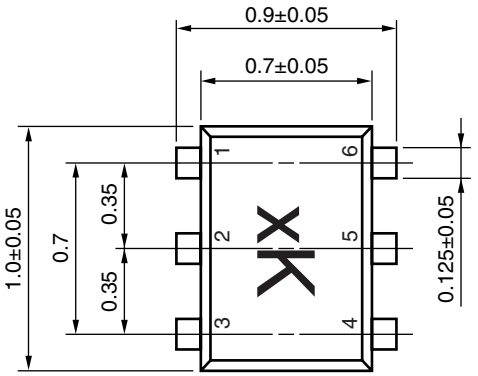
2. Collector to base capacitance when the emitter grounded

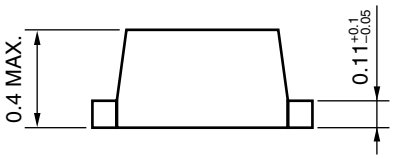
h_{FE} CLASSIFICATION

Rank	FB
Marking	xK
h_{FE} Value of Q1	140 to 220
h_{FE} Value of Q2	140 to 220

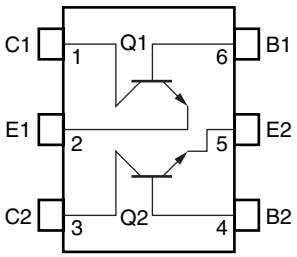
PACKAGE DIMENSIONS

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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▶For further information, please contact

NEC Compound Semiconductor Devices, Ltd. **http://www.ncsd.necel.com/**
E-mail: salesinfo@ml.ncsd.necel.com (sales and general)
techinfo@ml.ncsd.necel.com (technical)
5th Sales Group, Sales Division TEL: +81-44-435-1588 FAX: +81-44-435-1579

NEC Compound Semiconductor Devices Hong Kong Limited
E-mail: ncsd-hk@elhk.nec.com.hk (sales, technical and general)

Hong Kong Head Office	TEL: +852-3107-7303	FAX: +852-3107-7309
Taipei Branch Office	TEL: +886-2-8712-0478	FAX: +886-2-2545-3859
Korea Branch Office	TEL: +82-2-558-2120	FAX: +82-2-558-5209

NEC Electronics (Europe) GmbH **http://www.ee.nec.de/**
TEL: +49-211-6503-01 FAX: +49-211-6503-487

California Eastern Laboratories, Inc. **http://www.cel.com/**
TEL: +1-408-988-3500 FAX: +1-408-988-0279

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