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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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NPN SILICON + SiGe RF TWIN TRANSISTOR

μPA868TS

Phase-out/Discontinued

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

FEATURES

- 2 different built-in transistors (2SC5436, NESG2107M33)
 - Q1: High gain transistor
 $f_T = 12 \text{ GHz TYP.}, |S_{21e}|^2 = 9.0 \text{ dB TYP. @ } V_{CE} = 1 \text{ V, } I_C = 10 \text{ mA, } f = 2 \text{ GHz}$
 - Q2: Built-in low phase noise SiGe transistor suited for OSC applications
 $f_T = 10.0 \text{ GHz TYP.}, |S_{21e}|^2 = 9.0 \text{ dB TYP. @ } V_{CE} = 1 \text{ V, } I_C = 5 \text{ mA, } f = 2 \text{ GHz}$
- 6-pin super lead-less minimold package (1007 PKG)

BUILT-IN TRANSISTORS

	Q1	Q2
Flat-lead 3-pin thin-type ultra super minimold part No.	2SC5436	–
3-pin super lead-less minimold part No.	–	NESG2107M33

★ ORDERING INFORMATION

Part Number	Order Number	Package	Quantity	Supplying Form
μPA868TS	μPA868TS-A	6-pin super lead-less minimold package (1007 PKG) (Pb-Free) ^{Note}	50 pcs (Non reel)	• 8 mm wide embossed taping • Pin 1 (Q1 Collector), Pin 6 (Q1 Base) face the perforation side of the tape
μPA868TS-T3	μPA868TS-T3-A		10 kpcs/reel	

Note With regards to terminal solder (the solder contains lead) plated products (conventionally plated), contact your nearby sales office.

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}	5	13	V
Collector to Emitter Voltage	V _{CEO}	3	5	V
Emitter to Base Voltage	V _{EBO}	2	1.5	V
Collector Current	I _C	30	100	mA
Total Power Dissipation	P _{tot} ^{Note}	90	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 cm² × 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 _{CB0}	V _{CB} = 5 V, I _E = 0 mA	–	–	100	nA
Emitter Cut-off Current	I _{EB0}	V _{EB} = 1 V, I _C = 0 mA	–	–	100	nA
DC Current Gain	h _{FE} ^{Note 1}	V _{CE} = 1 V, I _C = 10 mA	70	–	140	–
Gain Bandwidth Product	f _T	V _{CE} = 1 V, I _C = 10 mA, f = 2 GHz	10.0	12.0	–	GHz
Insertion Power Gain	S _{21e} ²	V _{CE} = 1 V, I _C = 10 mA, f = 2 GHz	7.0	9.0	–	dB
Noise Figure	NF	V _{CE} = 1 V, I _C = 3 mA, f = 2 GHz, Z _S = Z _{opt}	–	1.5	2.0	dB
Reverse Transfer Capacitance	C _{re} ^{Note 2}	V _{CB} = 0.5 V, I _E = 0 mA, f = 1 MHz	–	0.4	0.7	pF

(2) Q2

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Collector Cut-off Current	I _{CB0}	V _{CB} = 5 V, I _E = 0 mA	–	–	100	nA
Emitter Cut-off Current	I _{EB0}	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	7.0	10.0	–	GHz
Gain Bandwidth Product (2)	f _T	V _{CE} = 1 V, I _C = 20 mA, f = 2 GHz	–	17.0	–	GHz
Insertion Power Gain (1)	S _{21e} ²	V _{CE} = 1 V, I _C = 5 mA, f = 2 GHz	7.5	9.0	–	dB
Insertion Power Gain (2)	S _{21e} ²	V _{CE} = 1 V, I _C = 20 mA, f = 2 GHz	–	10.0	–	dB
Associated Gain	G _a	V _{CE} = 1 V, I _C = 5 mA, f = 2 GHz, Z _S = Z _{opt}	7.0	10.0	–	dB
Noise Figure	NF	V _{CE} = 1 V, I _C = 5 mA, f = 2 GHz, Z _S = Z _{opt}	–	0.9	1.5	dB
Reverse Transfer Capacitance	C _{re} ^{Note 2}	V _{CB} = 1 V, I _E = 0 mA, f = 1 MHz	–	0.5	0.7	pF

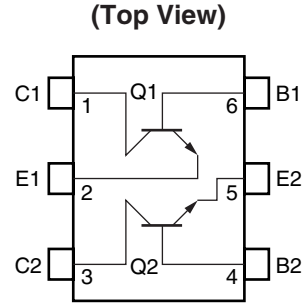
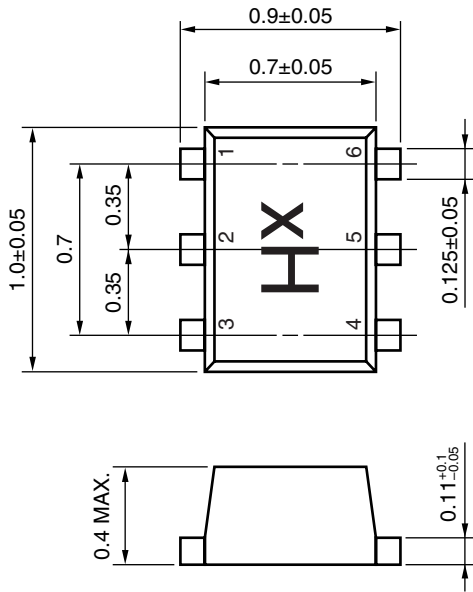
- Notes 1.** Pulse measurement: PW ≤ 350 μs, Duty Cycle ≤ 2%
2. Collector to base capacitance when the emitter grounded

h_{FE} CLASSIFICATION

Rank	FB
Marking	xH
h _{FE} Value of Q1	70 to 140
h _{FE} Value of Q2	140 to 220

PACKAGE DIMENSIONS

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



PIN CONNECTIONS

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

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