PRELIMINARY DATA SHEET

NEC

NPN SILICON RF TWIN TRANSISTOR

μPA831TD

NPN SILICON RF TRANSISTOR (WITH 2 DIFFERENT ELEMENTS) IN A 6-PIN LEAD-LESS MINIMOLD (M16, 1208 PACKAGE)

FEATURES

- 2 different built-in transistors (2SC5006, 2SC5007)
- Low noise
  Q1: NF = 1.2 dB TYP. @ V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz
  Q2: NF = 1.4 dB TYP. @ V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz
- High gain
  Q1: $|S_{21e}|^2$ = 9.0 dB TYP. @ V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz
  Q2: $|S_{21e}|^2$ = 12.0 dB TYP. @ V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz
- 6-pin lead-less minimold (M16, 1208 package)

BUILT-IN TRANSISTORS

	Q1	Q2
3-pin ultra super minimold part No.	2SC5006	2SC5007

ORDERING INFORMATION

Part Number	Quantity	Supplying Form
μPA831TD	50 pcs (Non reel)	• 8 mm wide embossed taping
μPA831TD-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}	20	20	V
Collector to Emitter Voltage	V_{CEO}	12	10	V
Emitter to Base Voltage	V_{EBO}	3	1.5	V
Collector Current	I_C	100	65	mA
Total Power Dissipation	P_{tot} Note	190	190	mW
		210 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} = 10 V, I_E = 0 mA	–	–	1.0	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 1 V, I_C = 0 mA	–	–	1.0	μA
DC Current Gain	h_{FE} Note 1	V_{CE} = 3 V, I_C = 7 mA	70	–	140	–
Gain Bandwidth Product	f_T	V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz	3	4.5	–	GHz
Insertion Power Gain	$\lvert S_{21e} \rvert^2$	V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz	7.0	9.0	–	dB
Noise Figure	NF	V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz, $Z_S = Z_{opt}$	–	1.2	2.5	dB
Reverse Transfer Capacitance	C_{re} Note 2	V_{CB} = 3 V, I_E = 0 mA, f = 1 MHz	–	0.7	1.5	pF

(2) Q2

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Collector Cut-off Current	I_{CBO}	V_{CB} = 10 V, I_E = 0 mA	–	–	0.8	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 1 V, I_C = 0 mA	–	–	0.8	μA
DC Current Gain	h_{FE} Note 1	V_{CE} = 3 V, I_C = 7 mA	70	–	150	–
Gain Bandwidth Product	f_T	V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz	4.5	7	–	GHz
Insertion Power Gain	$\lvert S_{21e} \rvert^2$	V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz	10.0	12.0	–	dB
Noise Figure	NF	V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz, $Z_S = Z_{opt}$	–	1.4	2.7	dB
Reverse Transfer Capacitance	C_{re} Note 2	V_{CB} = 3 V, I_E = 0 mA, f = 1 MHz	–	–	0.9	pF

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

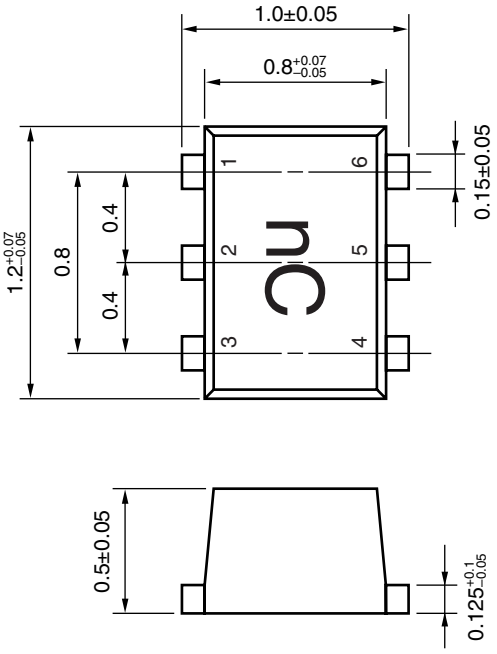
2. Collector to base capacitance when the emitter grounded

h_{FE} CLASSIFICATION

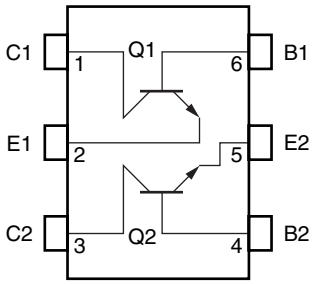
Rank	FB
Marking	nC
h_{FE} Value of Q1	70 to 140
h_{FE} Value of Q2	70 to 150

PACKAGE DIMENSIONS

6-PIN LEAD-LESS MINIMOLD (M16, 1208 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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