

**MICROWAVE LOW NOISE AMPLIFIER
NPN SILICON EPITAXIAL TRANSISTOR
(WITH BUILT-IN 2 ELEMENTS) SUPER MINI MOLD**

FEATURES

- Low Current, High Gain
 $|S_{21e}|^2 = 9 \text{ dB TYP. @ } V_{CE} = 2 \text{ V, } I_C = 7 \text{ mA, } f = 2 \text{ GHz}$
 $|S_{21e}|^2 = 8.5 \text{ dB TYP. @ } V_{CE} = 1 \text{ V, } I_C = 5 \text{ mA, } f = 2 \text{ GHz}$
- A Super Mini Mold Package Adopted
- Built-in 2 Transistors ($2 \times 2SC5179$)

ORDERING INFORMATION

PART NUMBER	QUANTITY	PACKING STYLE
μ PA807T	Loose products (50 PCS)	Embossed tape 8 mm wide. Pin 6 (Q1 Base), Pin 5 (Q2 Base), Pin 4 (Q2 Emitter) face to perforation side of the tape.
μ PA807T-T1	Taping products (3 KPCS/Reel)	

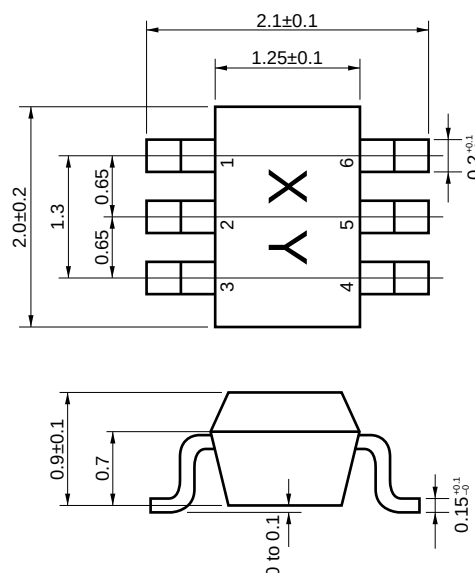
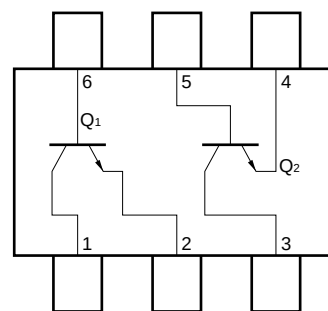
Remark If you require an evaluation sample, please contact an NEC Sales Representative. (Unit sample quantity is 50 pcs.)

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

PARAMETER	SYMBOL	RATING	UNIT
Collector to Base Voltage	V_{CBO}	5	V
Collector to Emitter Voltage	V_{CEO}	3	V
Emitter to Base Voltage	V_{EBO}	2	V
Collector Current	I_C	10	mA
Total Power Dissipation	P_T	30 in 1 element 60 in 2 elements	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65 to +150	$^\circ\text{C}$

PACKAGE DRAWINGS

(Unit: mm)

**PIN CONFIGURATION (Top View)****PIN CONNECTIONS**

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

This device uses radio frequency technology. Take due precautions to protect it from excessive input levels such as static electricity.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

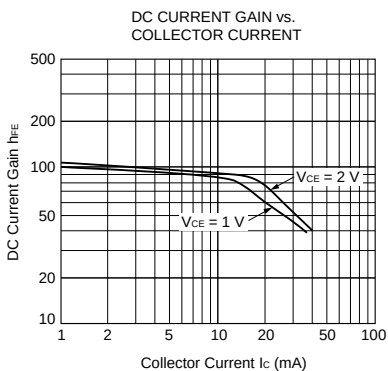
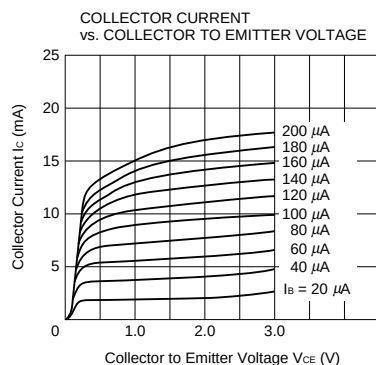
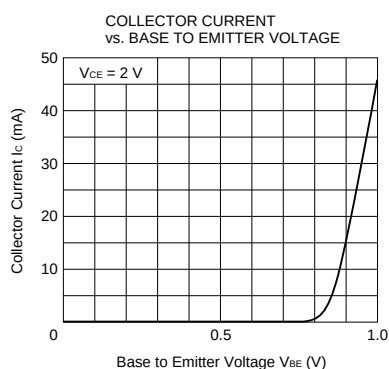
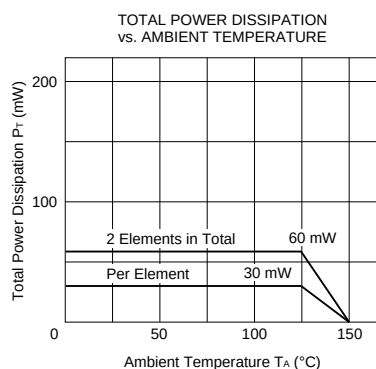
PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cutoff Current	I_{CBO}	$V_{CB} = 5\text{ V}, I_E = 0$			0.1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 1\text{ V}, I_C = 0$			0.1	μA
DC Current Gain	h_{FE}	$V_{CE} = 2\text{ V}, I_C = 7\text{ mA}$ Note 1	70		140	
Gain Bandwidth Product (1)	f_T	$V_{CE} = 2\text{ V}, I_C = 7\text{ mA}, f = 2\text{ GHz}$	10	13		GHz
Gain Bandwidth Product (2)	f_T	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	8.5	12		GHz
Feed-back Capacitance	C_{re}	$V_{CB} = 2\text{ V}, I_E = 0, f = 1\text{ MHz}$ Note 2		0.4	0.6	pF
Insertion Power Gain (1)	$ S_{21e} ^2$	$V_{CE} = 2\text{ V}, I_C = 7\text{ mA}, f = 2\text{ GHz}$	7.5	9		dB
Insertion Power Gain (2)	$ S_{21e} ^2$	$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	7	8.5		dB
Noise Figure (1)	NF	$V_{CE} = 2\text{ V}, I_C = 3\text{ mA}, f = 2\text{ GHz}$		1.5	2	dB
Noise Figure (2)	NF	$V_{CE} = 1\text{ V}, I_C = 3\text{ mA}, f = 2\text{ GHz}$		1.5	2	dB
h_{FE} Ratio	h_{FE1}/h_{FE2}	$V_{CE} = 2\text{ V}, I_C = 7\text{ mA}$ A smaller value among h_{FE} of $h_{FE1} = Q1, Q2$ A larger value among h_{FE} of $h_{FE2} = Q1, Q2$	0.85			

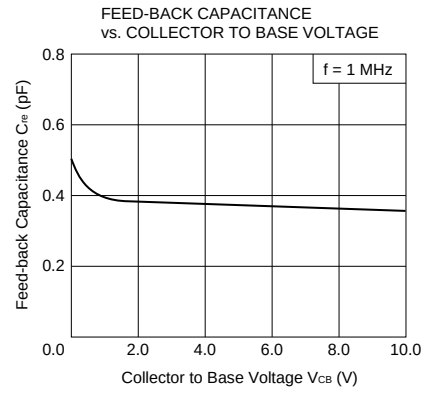
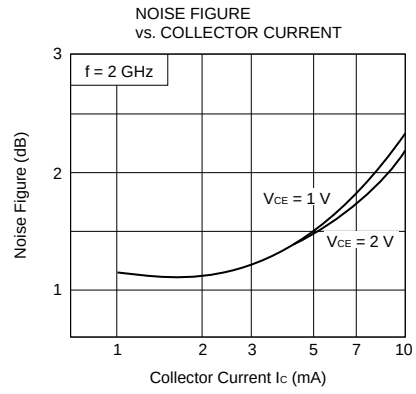
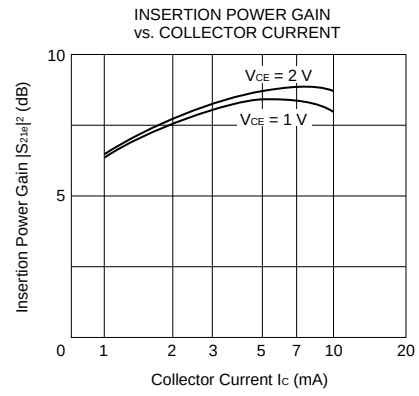
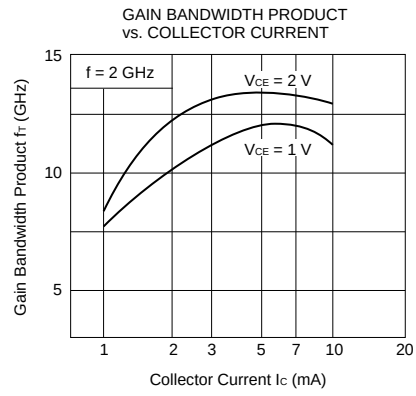
Notes 1. Pulse Measurement: $P_w \leq 350\text{ }\mu\text{s}$, Duty cycle $\leq 2\%$

2. Measured with 3-pin bridge, emitter and case should be connected to guard pin of bridge.

 h_{FE} CLASSIFICATION

Rank	KB
Marking	T84
h_{FE} Value	70 to 140

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



S-PARAMETERS

 $V_{CE} = 1 \text{ V}$, $I_C = 1 \text{ mA}$, $Z_O = 50 \Omega$

FREQUENCY		S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
100.0000	0.982	−3.7	1.968	174.3	0.020	83.4	0.994	−4.0	
200.0000	0.983	−7.5	1.939	167.5	0.038	82.6	0.992	−8.1	
300.0000	0.973	−10.6	1.930	161.8	0.058	79.2	0.980	−11.5	
400.0000	0.955	−14.9	2.014	156.4	0.075	75.4	0.959	−15.5	
500.0000	0.946	−17.9	1.934	150.9	0.091	72.8	0.949	−18.8	
600.0000	0.918	−22.1	1.988	146.3	0.107	69.9	0.923	−22.1	
700.0000	0.900	−25.8	1.951	141.7	0.122	66.8	0.901	−25.6	
800.0000	0.873	−29.1	1.931	137.1	0.136	64.2	0.875	−28.4	
900.0000	0.845	−33.3	1.996	133.2	0.148	61.7	0.851	−31.2	
1000.0000	0.827	−35.8	1.900	129.5	0.158	59.8	0.832	−34.1	
1100.0000	0.799	−40.3	1.963	125.6	0.170	57.6	0.806	−36.4	
1200.0000	0.776	−43.4	1.944	121.7	0.179	55.7	0.781	−38.8	
1300.0000	0.753	−46.8	1.909	118.0	0.189	54.3	0.761	−41.1	
1400.0000	0.718	−50.7	1.936	114.1	0.196	52.7	0.736	−43.1	
1500.0000	0.695	−53.4	1.870	110.7	0.205	50.9	0.719	−45.4	
1600.0000	0.663	−57.1	1.878	107.2	0.211	49.7	0.698	−47.0	
1700.0000	0.634	−60.0	1.849	104.0	0.215	48.5	0.677	−48.9	
1800.0000	0.609	−62.8	1.810	100.6	0.222	47.3	0.658	−50.3	
1900.0000	0.581	−65.7	1.786	97.9	0.227	46.4	0.642	−51.9	
2000.0000	0.554	−69.0	1.773	94.7	0.231	45.8	0.622	−53.4	

 $V_{CE} = 1 \text{ V}$, $I_C = 3 \text{ mA}$, $Z_O = 50 \Omega$

FREQUENCY		S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
100.0000	0.932	−6.3	5.517	168.9	0.019	83.2	0.975	−7.0	
200.0000	0.914	−12.8	5.308	160.7	0.037	79.3	0.951	−13.6	
300.0000	0.881	−18.1	5.147	152.7	0.054	74.7	0.913	−19.1	
400.0000	0.833	−25.4	5.209	145.3	0.067	70.9	0.857	−24.5	
500.0000	0.797	−29.6	4.893	139.4	0.080	67.7	0.819	−28.7	
600.0000	0.737	−35.8	4.844	133.4	0.092	65.8	0.765	−32.1	
700.0000	0.687	−41.6	4.709	127.6	0.101	63.4	0.720	−35.6	
800.0000	0.636	−46.0	4.495	122.5	0.111	62.2	0.680	−37.8	
900.0000	0.583	−51.0	4.406	117.5	0.118	61.4	0.645	−40.0	
1000.0000	0.541	−54.6	4.184	113.4	0.127	60.5	0.616	−41.8	
1100.0000	0.495	−59.2	4.048	108.6	0.135	59.5	0.587	−43.4	
1200.0000	0.452	−61.8	3.894	104.4	0.143	59.0	0.561	−44.6	
1300.0000	0.420	−65.0	3.693	101.0	0.150	58.2	0.538	−46.0	
1400.0000	0.381	−67.5	3.545	97.1	0.158	58.2	0.517	−47.1	
1500.0000	0.354	−70.0	3.369	94.2	0.165	57.4	0.502	−48.3	
1600.0000	0.325	−71.8	3.227	91.2	0.173	57.5	0.483	−48.9	
1700.0000	0.299	−73.7	3.089	88.6	0.180	57.2	0.469	−49.9	
1800.0000	0.276	−75.3	2.965	85.9	0.187	56.9	0.457	−50.5	
1900.0000	0.254	−77.3	2.842	83.7	0.194	56.8	0.446	−51.3	
2000.0000	0.234	−79.0	2.744	81.2	0.201	56.7	0.434	−52.2	