

NPN SILICON EPITAXIAL TRANSISTOR (WITH BUILT-IN 2 $\times$ 2SC4570) SMALL MINI MOLD

μ PA813T has built-in 2 transistors which were developed for UHF.

FEATURES

- High f_T
 $f_T = 5.5$ GHz TYP. (@ $V_{CE} = 5$ V, $I_C = 5$ mA, $f = 1$ GHz)
- Small Collector Capacitance
 $C_{ob} = 0.7$ pF TYP. (@ $V_{CB} = 5$ V, $I_E = 0$, $f = 1$ MHz)
- A Surface Mounting Package Adopted
- Built-in 2 Transistors (2 $\times$ 2SC4570)

ORDERING INFORMATION

PART NUMBER	QUANTITY	PACKING STYLE
μ PA813T	Loose products (50 PCS)	Embossed tape 8 mm wide. Pin 6 (Q1 Base), Pin 5 (Q1 Emitter), Pin 4 (Q2 Emitter) face to perforation side of the tape.
μ PA813T-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.)

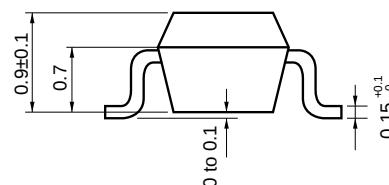
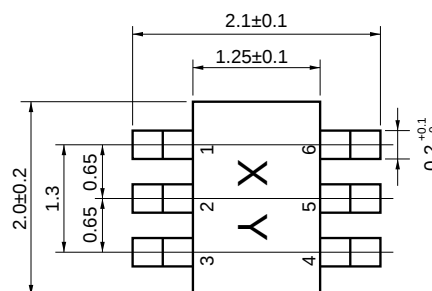
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

PARAMETER	SYMBOL	RATING	UNIT
Collector to Base Voltage	V_{CBO}	20	V
Collector to Emitter Voltage	V_{CEO}	12	V
Emitter to Base Voltage	V_{EBO}	3	V
Collector Current	I_C	30	mA
Total Power Dissipation	P_T	120 in 1 element 160 in 2 elements ^{Note}	mW
Junction Temperature	T_J	125	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to $+125$	$^\circ\text{C}$

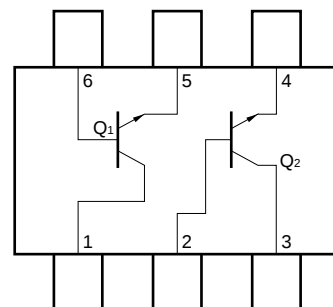
Note 90 mW must not be exceeded in 1 element.

PACKAGE DRAWINGS

(Unit: mm)



PIN CONFIGURATION (Top View)



PIN CONNECTIONS

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

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

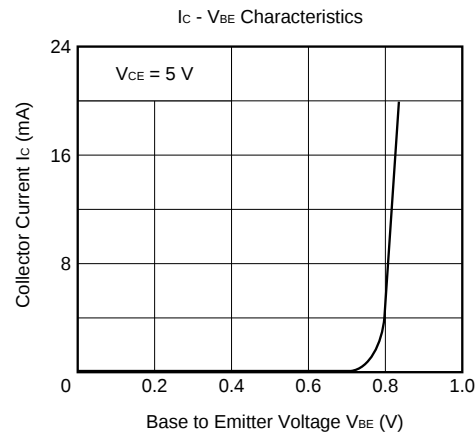
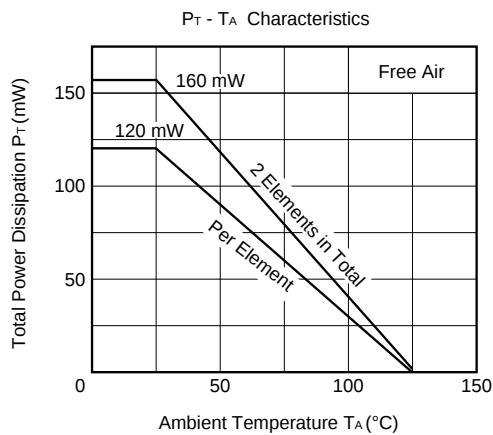
PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cutoff Current	I_{CBO}	$V_{CB} = 15\text{ V}, I_E = 0$			0.1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 1\text{ V}, I_C = 0$			0.1	μA
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$h_{FE} = 10, I_C = 5\text{ mA}$			0.5	V
DC Current Gain	h_{FE}	$V_{CE} = 5\text{ V}, I_C = 5\text{ mA}$ Note 1	60		200	
Gain Bandwidth Product	f_T	$V_{CE} = 5\text{ V}, I_C = 5\text{ mA}, f = 1\text{ GHz}$		5.5		GHz
Feed-back Capacitance	C_{re}	$V_{CB} = 5\text{ V}, I_E = 0, f = 1\text{ MHz}$ Note 2		0.7	0.9	pF
Insertion Power Gain	$ S_{21e} ^2$	$V_{CE} = 5\text{ V}, I_C = 5\text{ mA}, f = 1\text{ GHz}$	5			dB
h_{FE} Ratio	h_{FE1}/h_{FE2}	$V_{CE} = 5\text{ V}, I_C = 5\text{ mA}$ 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 $\leq 2\%$

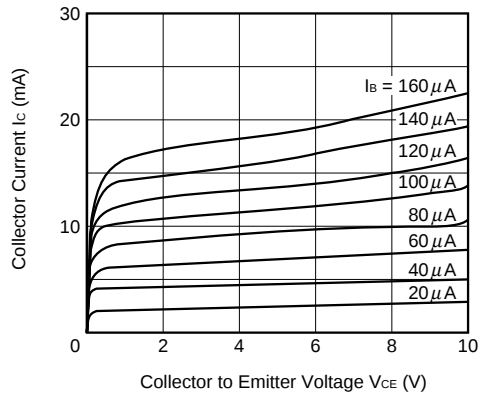
2. Measured with 3-pin bridge, emitter and case should be connected to guard pin of bridge.

 h_{FE} CLASSIFICATION

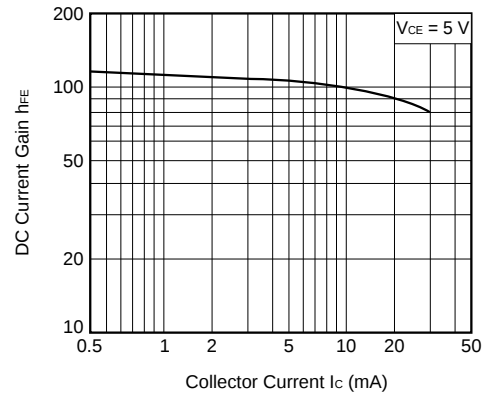
Rank	FB	GB
Marking	73T	74T
h_{FE} Value	60 to 120	100 to 200

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

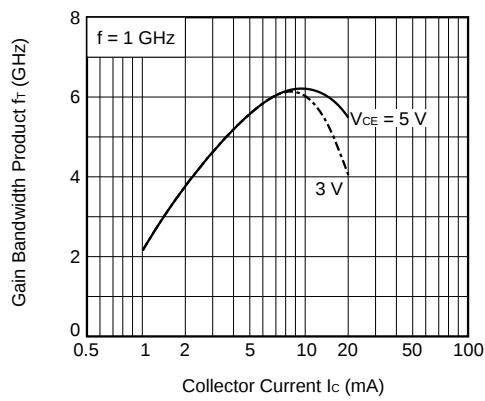
$I_C - V_{CE}$ Characteristics



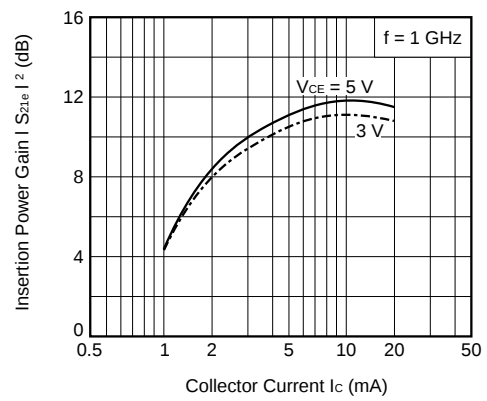
$h_{FE} - I_C$ Characteristics



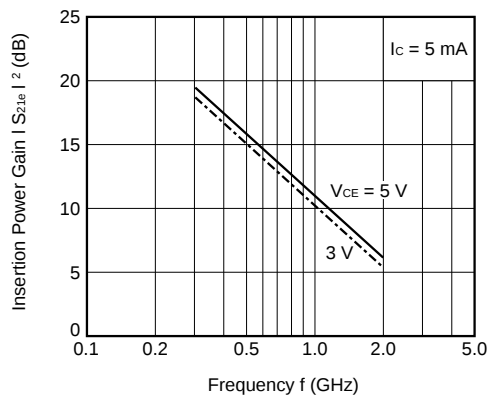
$f_T - I_C$ Characteristics



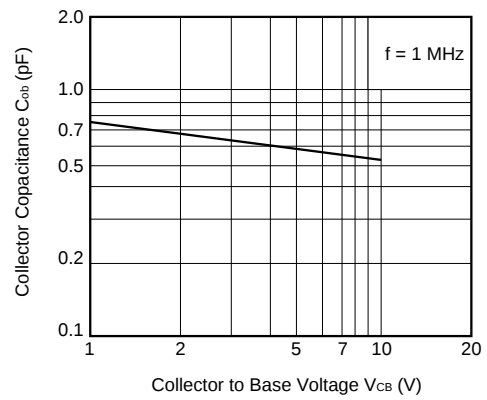
$|S_{21e}|^2 - I_C$ Characteristics



$|S_{21e}|^2 - f$ Characteristics



$C_{ob} - V_{CB}$ Characteristics



S-PARAMETERS(V_{CE} = 3 V, I_c = 1 mA)

FREQUENCY MHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100.00	0.946	-12.8	3.592	168.0	0.028	81.3	0.995	-5.8
200.00	0.922	-23.6	3.355	158.1	0.050	76.1	0.973	-10.5
300.00	0.852	-34.3	3.222	146.1	0.074	66.2	0.928	-16.1
400.00	0.829	-43.7	2.991	139.7	0.093	62.9	0.904	-19.0
500.00	0.709	-52.1	2.037	129.9	0.107	56.9	0.847	-21.9
600.00	0.752	-64.0	2.750	124.4	0.122	54.8	0.827	-24.7
700.00	0.697	-73.5	2.601	114.1	0.131	49.6	0.798	-26.3
800.00	0.624	-82.5	2.493	107.7	0.144	46.3	0.781	-29.7
900.00	0.574	-89.9	2.286	100.0	0.149	45.1	0.759	-32.1
1000.00	0.534	-97.0	2.146	93.7	0.156	41.1	0.725	-36.2
1100.00	0.509	-104.9	2.011	89.3	0.162	41.2	0.693	-38.2
1200.00	0.477	-113.0	1.937	83.7	0.166	38.8	0.651	-40.5
1300.00	0.449	-120.5	1.853	80.1	0.175	37.0	0.627	-41.4
1400.00	0.429	-127.4	1.751	74.4	0.173	35.8	0.601	-42.4
1500.00	0.418	-135.0	1.691	70.1	0.179	33.9	0.597	-43.5
1600.00	0.405	-142.8	1.619	66.6	0.178	36.1	0.583	-44.9
1700.00	0.390	-151.7	1.568	62.4	0.183	35.0	0.579	-48.0
1800.00	0.375	-157.6	1.542	59.2	0.193	36.6	0.567	-50.3
1900.00	0.364	-163.3	1.494	54.1	0.197	34.8	0.546	-53.5
2000.00	0.373	-168.7	1.461	48.9	0.206	32.7	0.532	-56.1
2100.00	0.379	-174.9	1.363	46.4	0.201	34.0	0.516	-58.7
2200.00	0.384	177.1	1.284	41.8	0.204	32.3	0.504	-61.1
2300.00	0.386	171.4	1.284	41.7	0.208	35.2	0.492	-64.3
2400.00	0.383	166.4	1.255	38.6	0.213	35.0	0.479	-67.9
2500.00	0.389	162.8	1.284	34.9	0.229	36.4	0.466	-72.3
2600.00	0.396	158.5	1.228	31.3	0.236	35.3	0.448	-75.8
2700.00	0.409	153.9	1.193	25.6	0.248	32.2	0.427	-80.0
2800.00	0.417	149.4	1.152	25.2	0.245	33.4	0.415	-83.4
2900.00	0.425	145.5	1.100	20.1	0.247	32.1	0.401	-87.1
3000.00	0.442	142.2	1.100	20.0	0.257	35.2	0.398	-92.0

(V_{CE} = 3 V, I_c = 3 mA)

FREQUENCY MHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100.00	0.861	-21.0	8.797	160.7	0.026	80.3	0.975	-10.6
200.00	0.785	-37.8	7.879	145.4	0.046	69.8	0.904	-18.1
300.00	0.670	-52.8	6.888	130.9	0.063	61.3	0.808	-25.1
400.00	0.600	-64.2	6.034	122.6	0.076	58.7	0.744	-27.9
500.00	0.533	-73.9	5.269	113.3	0.083	54.7	0.664	-29.7
600.00	0.485	-86.1	4.818	108.4	0.093	55.1	0.631	-31.0
700.00	0.435	-96.1	4.305	99.2	0.100	52.4	0.596	-31.3
800.00	0.382	-105.6	3.973	94.3	0.111	51.5	0.575	-33.2
900.00	0.348	-113.7	3.515	87.7	0.116	52.0	0.555	-34.6
1000.00	0.323	-121.7	3.214	82.8	0.125	50.2	0.526	-37.4
1100.00	0.305	-129.5	3.104	79.6	0.132	51.5	0.499	-38.7
1200.00	0.288	-137.9	2.907	75.2	0.138	50.4	0.468	-40.1
1300.00	0.276	-144.9	2.748	72.1	0.149	50.2	0.449	-40.3
1400.00	0.270	-151.2	2.554	67.9	0.153	49.3	0.428	-40.7
1500.00	0.272	-158.1	2.422	64.1	0.162	48.2	0.422	-41.3
1600.00	0.276	-165.3	2.299	61.8	0.168	50.2	0.412	-42.1
1700.00	0.276	-174.1	2.204	58.5	0.177	49.0	0.405	-44.6
1800.00	0.272	-179.5	2.149	55.7	0.189	49.9	0.393	-46.7
1900.00	0.272	175.4	2.068	51.4	0.198	47.8	0.374	-49.4
2000.00	0.284	171.7	2.011	46.6	0.212	45.3	0.359	-51.6
2100.00	0.296	167.0	1.860	44.9	0.211	45.8	0.345	-53.9
2200.00	0.310	160.8	1.748	40.8	0.218	43.4	0.331	-55.6
2300.00	0.320	156.5	1.730	41.0	0.227	45.6	0.317	-58.7
2400.00	0.327	152.4	1.682	38.3	0.236	44.3	0.303	-61.8
2500.00	0.335	149.8	1.712	34.9	0.254	44.7	0.287	-65.6
2600.00	0.347	146.3	1.633	31.8	0.263	42.3	0.270	-69.0
2700.00	0.360	143.0	1.591	26.4	0.278	38.1	0.253	-72.7
2800.00	0.370	139.6	1.520	26.0	0.275	38.9	0.238	-76.2
2900.00	0.384	136.7	1.453	21.4	0.278	36.8	0.223	-79.8
3000.00	0.404	134.4	1.448	21.6	0.289	39.0	0.213	-85.5