

NPN SILICON EPITAXIAL TRANSISTOR  
(WITH BUILT-IN 2  $\times$  2SC5006)  
FLAT-LEAD 6-PIN THIN-TYPE ULTRA SUPER MINIMOLD

## DESCRIPTION

The  $\mu$ PA801TC has built-in low-voltage two transistors which are designed to amplify low noise in the VHF band to the UHF band.

## FEATURES

- Low noise: NF = 1.2 dB TYP. @ f = 1 GHz,  $V_{CE} = 3$  V,  $I_c = 7$  mA
- High gain:  $|S_{21e}|^2 = 9.0$  dB TYP. @ f = 1 GHz,  $V_{CE} = 3$  V,  $I_c = 7$  mA
- Flat-lead 6-pin thin-type ultra super minimold package
- Built-in 2 transistors (2  $\times$  2SC5006)

## ORDERING INFORMATION

Part Number	Package	Quantity	Supplying Form
$\mu$ PA801TC	Flat-lead 6-pin thin-type ultra super minimold	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.
$\mu$ PA801TC-T1		Taping products (3 kp/reel)	

**Remark** To order evaluation samples, please contact your local NEC sales office. (Part number for sample order:  $\mu$ PA801TC. Unit sample quantity is 50 pcs.)

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

Parameter	Symbol	Ratings	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	$I_c$	100	mA
Total Power Dissipation	$P_T$ <sup>Note</sup>	200 in 1 element 230 in 2 elements	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 to +150	$^\circ\text{C}$

**Note** Mounted on 1.08 cm<sup>2</sup>  $\times$  1.0 mm glass epoxy substrate.

## Caution Electro-static sensitive devices

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.  
Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = +25 °C)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector Cutoff Current	I <sub>CB0</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0	–	–	1.0	μA
Emitter Cutoff Current	I <sub>EB0</sub>	V <sub>EB</sub> = 1 V, I <sub>C</sub> = 0	–	–	1.0	μA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 7 mA <sup>Note 1</sup>	70	–	250	
Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 7 mA, f = 1 GHz	3.0	4.5	–	GHz
Feedback Capacitance	C <sub>re</sub>	V <sub>CB</sub> = 3 V, I <sub>E</sub> = 0, f = 1 MHz <sup>Note 2</sup>	–	0.7	1.5	pF
Insertion Power Gain	S <sub>21e</sub>   <sup>2</sup>	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 7 mA, f = 1 GHz	7.0	9.0	–	dB
Noise Figure	NF	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 7 mA, f = 1 GHz	–	1.2	2.5	dB

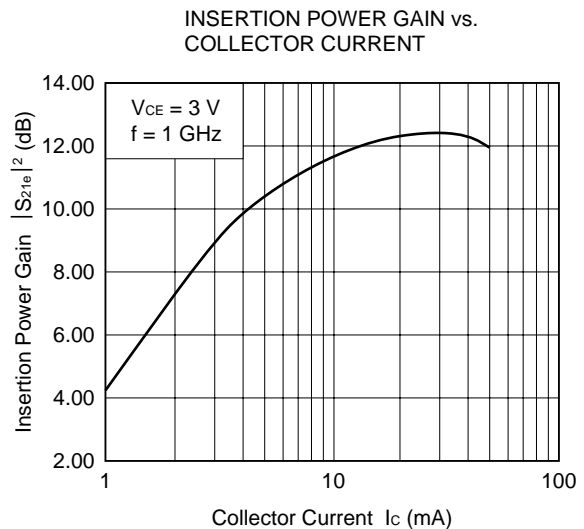
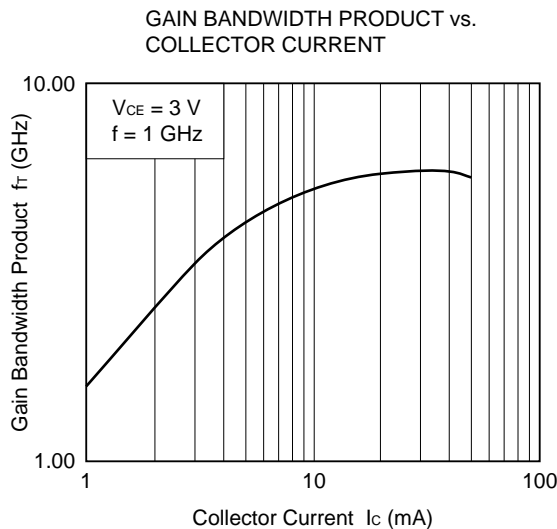
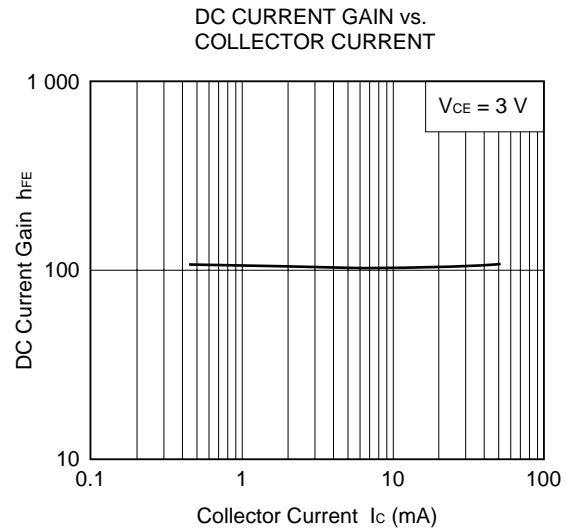
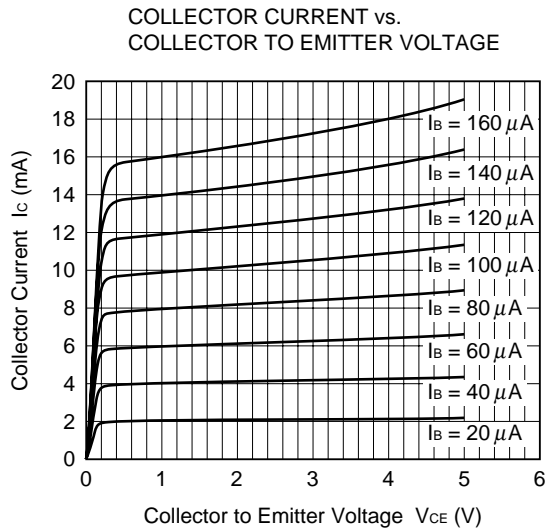
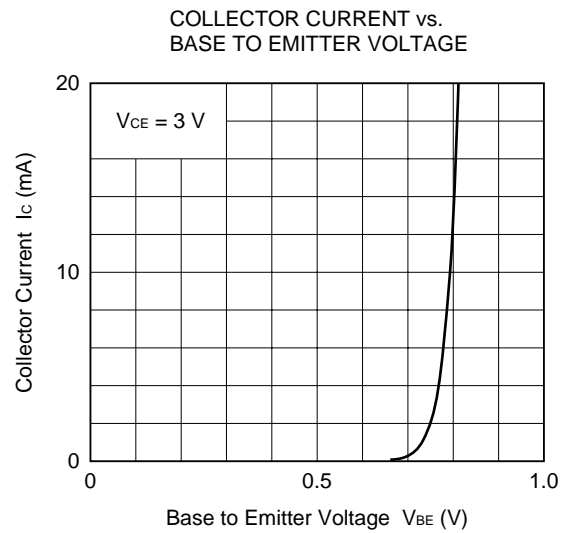
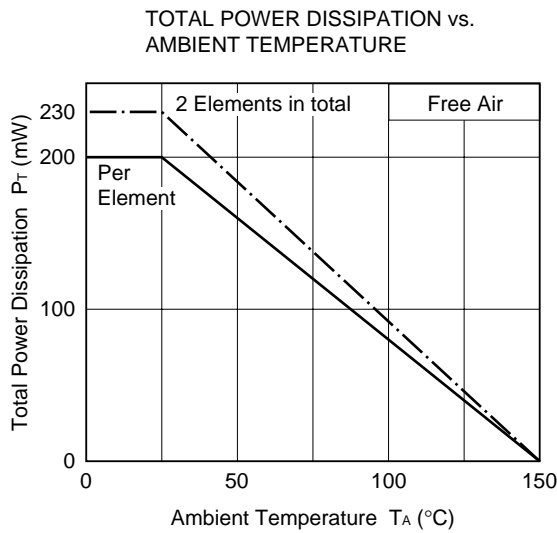
**Notes 1.** Pulse Measurement: PW ≤ 350 μs, Duty Cycle ≤ 2 %

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

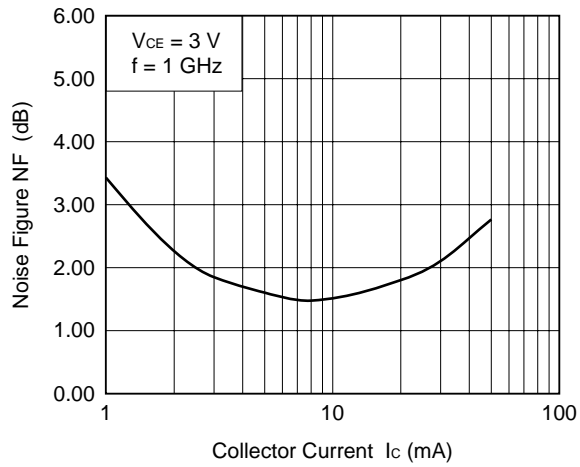
**h<sub>FE</sub> CLASSIFICATION**

Rank	FB	GB
Marking	70	71
h <sub>FE</sub> Value	70 to 140	125 to 250

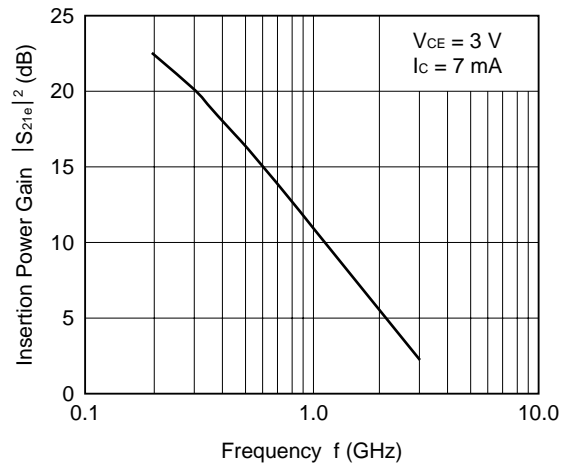
TYPICAL CHARACTERISTICS ( $T_A = +25\text{ }^\circ\text{C}$ )



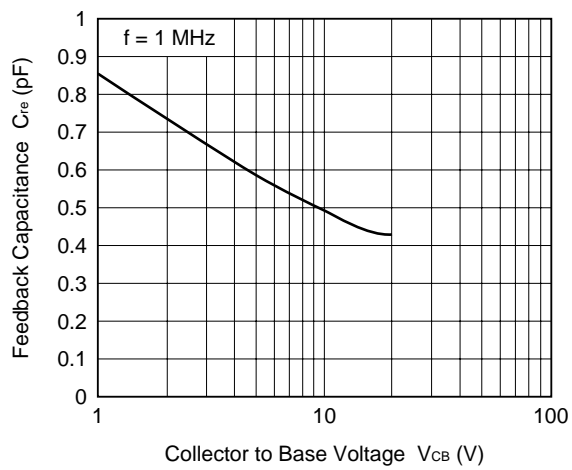
NOISE FIGURE vs. COLLECTOR CURRENT



INSERTION POWER GAIN vs. FREQUENCY



FEEDBACK CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



S-PARAMETERS Q1

V<sub>CE</sub> = 3 V, I<sub>c</sub> = 1 mA

FREQUENCY GHz	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.935	-30.6	4.001	157.5	0.033	52.0	0.979	-12.9
0.2	0.917	-58.7	3.602	137.5	0.082	54.2	0.938	-25.9
0.3	0.885	-83.8	3.244	119.5	0.109	38.9	0.894	-37.9
0.4	0.852	-107.8	2.910	101.9	0.129	21.3	0.834	-48.3
0.5	0.824	-128.9	2.622	86.4	0.140	6.9	0.785	-57.6
0.6	0.799	-148.1	2.351	71.6	0.149	-3.0	0.746	-66.3
0.7	0.781	-165.3	2.118	58.4	0.154	-15.2	0.708	-74.4
0.8	0.766	178.7	1.928	45.7	0.153	-24.2	0.680	-82.4
0.9	0.760	163.9	1.761	33.9	0.152	-34.4	0.662	-90.4
1.0	0.759	150.0	1.625	22.6	0.150	-42.1	0.647	-98.4
1.1	0.756	136.9	1.506	11.6	0.149	-51.0	0.633	-106.7
1.2	0.752	124.4	1.405	1.1	0.148	-58.9	0.620	-114.7
1.3	0.756	112.6	1.311	-9.2	0.141	-65.3	0.614	-123.0
1.4	0.755	100.9	1.233	-19.3	0.133	-72.1	0.605	-131.2
1.5	0.762	90.0	1.157	-29.1	0.129	-76.6	0.599	-139.6
1.6	0.764	79.3	1.094	-38.9	0.122	-84.1	0.593	-148.1
1.7	0.770	69.1	1.038	-48.3	0.119	-88.3	0.592	-157.1
1.8	0.771	58.7	0.981	-57.7	0.113	-91.8	0.589	-165.9
1.9	0.775	49.3	0.934	-66.4	0.105	-95.5	0.585	-174.6
2.0	0.780	39.4	0.885	-75.1	0.103	-96.9	0.585	176.4
2.1	0.783	29.9	0.846	-84.0	0.098	-99.6	0.585	167.0
2.2	0.787	20.9	0.803	-93.0	0.099	-101.5	0.580	157.7
2.3	0.791	11.9	0.770	-101.0	0.097	-100.6	0.580	147.9
2.4	0.790	2.8	0.732	-109.1	0.101	-101.3	0.581	138.2
2.5	0.790	-6.0	0.698	-116.8	0.106	-102.6	0.579	128.5
2.6	0.790	-14.2	0.669	-124.3	0.110	-104.2	0.580	118.5
2.7	0.791	-22.1	0.641	-131.7	0.116	-105.4	0.583	108.7
2.8	0.797	-30.1	0.619	-138.9	0.125	-109.3	0.584	98.7
2.9	0.804	-38.1	0.601	-146.4	0.133	-110.7	0.585	88.8
3.0	0.812	-46.0	0.574	-153.7	0.148	-117.1	0.590	78.7

V<sub>CE</sub> = 3 V, I<sub>c</sub> = 3 mA

FREQUENCY GHz	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.857	-42.7	9.861	150.3	0.038	65.3	0.945	-21.7
0.2	0.803	-78.7	8.253	127.1	0.072	39.2	0.826	-39.0
0.3	0.754	-108.0	6.931	107.8	0.087	27.5	0.719	-52.7
0.4	0.711	-133.4	5.798	90.7	0.093	18.6	0.622	-62.5
0.5	0.687	-154.4	4.995	76.6	0.103	7.4	0.555	-71.8
0.6	0.680	-172.0	4.317	63.2	0.110	-2.7	0.501	-79.9
0.7	0.663	172.2	3.797	51.6	0.104	-11.0	0.467	-87.0
0.8	0.658	157.8	3.376	40.7	0.110	-17.9	0.435	-93.9
0.9	0.658	144.8	3.038	30.1	0.109	-22.5	0.417	-101.6
1.0	0.656	132.2	2.769	20.0	0.108	-28.4	0.400	-108.5
1.1	0.663	120.8	2.543	10.1	0.111	-34.1	0.382	-116.4
1.2	0.658	109.9	2.347	0.6	0.112	-40.1	0.374	-123.9
1.3	0.670	99.2	2.178	-8.8	0.111	-44.2	0.364	-131.8
1.4	0.672	88.7	2.037	-18.0	0.110	-48.1	0.359	-139.7
1.5	0.679	79.0	1.906	-27.2	0.114	-52.5	0.350	-148.5
1.6	0.684	69.2	1.801	-36.4	0.118	-57.6	0.342	-156.6
1.7	0.690	60.0	1.702	-45.2	0.119	-61.6	0.339	-165.2
1.8	0.695	50.4	1.609	-53.9	0.121	-66.0	0.335	-173.8
1.9	0.700	41.6	1.524	-62.6	0.124	-70.1	0.331	177.1
2.0	0.701	32.5	1.448	-71.2	0.128	-74.6	0.329	168.2
2.1	0.711	23.4	1.384	-79.6	0.130	-79.2	0.328	159.0
2.2	0.713	14.9	1.314	-88.2	0.134	-82.6	0.324	149.8
2.3	0.723	6.6	1.261	-96.2	0.139	-86.5	0.323	139.7
2.4	0.725	-1.7	1.204	-104.4	0.146	-92.3	0.323	130.4
2.5	0.729	-10.3	1.151	-112.3	0.150	-96.8	0.324	119.9
2.6	0.732	-18.0	1.105	-120.1	0.158	-102.0	0.326	110.3
2.7	0.728	-25.4	1.067	-127.1	0.164	-106.7	0.329	100.2
2.8	0.739	-33.1	1.029	-135.4	0.171	-112.3	0.335	90.5
2.9	0.746	-40.7	1.004	-143.2	0.177	-116.4	0.337	80.2
3.0	0.756	-48.1	0.958	-150.7	0.186	-122.7	0.344	70.1

V<sub>CE</sub> = 3 V, I<sub>c</sub> = 5 mA

FREQUENCY GHz	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.783	-51.7	14.007	145.2	0.034	42.3	0.908	-27.8
0.2	0.723	-93.1	11.108	120.2	0.063	42.5	0.733	-46.9
0.3	0.685	-122.8	8.897	100.9	0.076	28.2	0.603	-61.7
0.4	0.650	-148.0	7.192	84.7	0.078	19.6	0.506	-71.0
0.5	0.641	-167.0	6.076	71.3	0.083	5.9	0.444	-80.2
0.6	0.621	175.9	5.181	59.2	0.086	4.9	0.390	-87.2
0.7	0.622	161.7	4.506	48.3	0.091	-3.0	0.359	-94.7
0.8	0.620	148.3	3.989	38.0	0.092	-7.8	0.333	-101.4
0.9	0.617	136.2	3.576	27.9	0.098	-15.3	0.310	-109.2
1.0	0.623	124.7	3.247	18.5	0.099	-19.1	0.299	-116.2
1.1	0.629	113.7	2.972	8.9	0.100	-24.7	0.282	-124.2
1.2	0.628	103.2	2.735	-0.2	0.107	-28.2	0.271	-131.4
1.3	0.639	93.3	2.537	-9.3	0.109	-35.2	0.264	-139.9
1.4	0.639	83.5	2.367	-18.0	0.113	-38.4	0.255	-146.9
1.5	0.648	74.2	2.209	-26.9	0.118	-43.5	0.248	-156.2
1.6	0.653	64.5	2.081	-35.8	0.122	-48.1	0.244	-164.9
1.7	0.661	55.7	1.970	-44.2	0.127	-51.6	0.242	-174.5
1.8	0.667	46.8	1.858	-53.2	0.130	-57.0	0.235	177.5
1.9	0.672	38.2	1.768	-61.3	0.135	-62.9	0.235	167.7
2.0	0.674	29.4	1.677	-69.7	0.143	-66.9	0.230	159.0
2.1	0.683	21.1	1.596	-78.1	0.145	-73.8	0.227	148.8
2.2	0.688	12.6	1.520	-86.7	0.153	-79.1	0.226	139.4
2.3	0.693	4.3	1.460	-94.5	0.158	-83.6	0.227	128.7
2.4	0.701	-3.8	1.393	-102.6	0.163	-89.5	0.229	118.7
2.5	0.704	-11.9	1.333	-110.3	0.170	-95.0	0.230	108.1
2.6	0.709	-20.2	1.273	-118.3	0.176	-100.3	0.232	98.2
2.7	0.707	-27.4	1.233	-125.5	0.184	-105.5	0.237	87.9
2.8	0.716	-34.6	1.194	-133.2	0.191	-111.8	0.244	78.2
2.9	0.724	-42.3	1.158	-141.0	0.197	-117.8	0.250	68.2
3.0	0.731	-49.5	1.113	-148.6	0.204	-123.7	0.257	57.8

V<sub>CE</sub> = 3 V, I<sub>c</sub> = 7 mA

FREQUENCY GHz	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.757	-59.4	17.566	141.1	0.052	28.0	0.894	-32.9
0.2	0.674	-105.0	13.237	114.8	0.055	39.5	0.660	-54.2
0.3	0.636	-134.6	10.240	96.1	0.065	26.5	0.528	-68.3
0.4	0.605	-159.0	8.099	80.8	0.067	19.9	0.429	-78.4
0.5	0.604	-176.4	6.754	67.9	0.073	13.9	0.363	-86.8
0.6	0.599	167.7	5.730	56.5	0.079	6.6	0.320	-93.8
0.7	0.593	154.1	4.957	46.0	0.078	4.0	0.287	-100.9
0.8	0.599	141.8	4.368	36.2	0.085	-4.0	0.265	-108.5
0.9	0.600	130.4	3.911	26.6	0.092	-7.4	0.247	-115.7
1.0	0.600	119.6	3.542	17.4	0.093	-11.2	0.232	-122.7
1.1	0.610	109.2	3.242	8.1	0.099	-16.7	0.220	-131.6
1.2	0.611	99.1	2.985	-0.8	0.103	-21.9	0.211	-138.9
1.3	0.619	89.4	2.757	-9.5	0.111	-27.5	0.205	-147.6
1.4	0.624	80.2	2.580	-18.2	0.116	-31.0	0.198	-156.5
1.5	0.632	71.0	2.411	-27.0	0.121	-36.4	0.193	-165.6
1.6	0.637	61.9	2.264	-35.5	0.128	-43.4	0.185	-174.8
1.7	0.644	53.4	2.144	-44.0	0.133	-47.9	0.186	175.7
1.8	0.650	44.4	2.018	-52.7	0.137	-53.5	0.179	167.3
1.9	0.659	36.1	1.913	-60.5	0.143	-58.8	0.180	156.3
2.0	0.659	27.4	1.816	-69.1	0.151	-64.1	0.176	147.7
2.1	0.669	18.9	1.732	-77.2	0.156	-70.6	0.176	136.8
2.2	0.674	10.8	1.646	-85.6	0.162	-76.7	0.178	126.0
2.3	0.679	2.8	1.579	-93.6	0.167	-81.9	0.178	115.3
2.4	0.685	-5.2	1.510	-101.3	0.174	-88.1	0.180	104.9
2.5	0.693	-13.3	1.448	-109.2	0.181	-94.5	0.183	94.2
2.6	0.696	-21.3	1.387	-117.1	0.186	-100.3	0.187	83.6
2.7	0.695	-28.2	1.342	-124.0	0.195	-105.7	0.192	74.2
2.8	0.701	-35.7	1.296	-132.0	0.202	-112.5	0.201	65.5
2.9	0.709	-43.1	1.256	-139.8	0.208	-118.0	0.207	54.1
3.0	0.719	-50.4	1.208	-147.4	0.214	-124.3	0.218	44.5

S-PARAMETERS Q2

V<sub>CE</sub> = 3 V, I<sub>c</sub> = 1 mA

FREQUENCY GHz	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.940	-31.2	3.801	156.2	0.043	43.7	1.001	-13.7
0.2	0.918	-58.6	3.406	136.0	0.083	51.6	0.942	-27.2
0.3	0.871	-83.6	3.051	117.4	0.107	36.1	0.888	-38.6
0.4	0.831	-107.6	2.711	99.6	0.124	19.3	0.838	-48.9
0.5	0.807	-128.4	2.453	83.9	0.135	7.3	0.791	-58.6
0.6	0.779	-146.8	2.184	69.7	0.142	-2.1	0.753	-67.3
0.7	0.759	-164.1	1.971	55.9	0.147	-16.0	0.727	-76.1
0.8	0.746	-179.3	1.802	43.7	0.146	-23.4	0.697	-84.5
0.9	0.736	166.5	1.651	32.0	0.147	-32.1	0.681	-92.9
1.0	0.731	153.2	1.526	20.5	0.140	-39.8	0.667	-101.0
1.1	0.723	140.5	1.414	9.4	0.137	-48.4	0.658	-109.8
1.2	0.722	128.7	1.327	-1.1	0.133	-54.4	0.643	-118.1
1.3	0.722	116.7	1.242	-11.2	0.127	-60.2	0.641	-126.8
1.4	0.721	105.8	1.177	-21.2	0.123	-65.3	0.634	-135.6
1.5	0.727	95.2	1.116	-30.9	0.118	-69.9	0.626	-144.6
1.6	0.725	84.2	1.056	-40.9	0.114	-73.0	0.622	-153.5
1.7	0.725	74.3	1.005	-49.9	0.110	-75.5	0.619	-162.7
1.8	0.726	64.0	0.956	-59.5	0.105	-77.3	0.615	-172.1
1.9	0.730	54.7	0.918	-68.0	0.109	-77.4	0.611	178.5
2.0	0.728	44.5	0.878	-76.9	0.110	-76.3	0.608	169.1
2.1	0.733	35.2	0.841	-85.5	0.111	-77.9	0.606	159.3
2.2	0.730	25.8	0.807	-94.4	0.120	-79.5	0.602	149.3
2.3	0.731	16.5	0.781	-102.3	0.128	-80.0	0.598	139.2
2.4	0.734	7.4	0.750	-110.4	0.141	-82.6	0.590	129.1
2.5	0.733	-1.2	0.724	-118.2	0.156	-87.3	0.586	119.0
2.6	0.738	-10.2	0.698	-125.9	0.170	-92.0	0.574	109.6
2.7	0.740	-19.0	0.671	-133.2	0.184	-96.9	0.572	100.7
2.8	0.741	-27.9	0.652	-140.1	0.193	-101.9	0.584	91.3
2.9	0.736	-36.5	0.639	-147.2	0.214	-106.9	0.589	81.0
3.0	0.736	-44.7	0.619	-154.0	0.236	-112.4	0.594	70.3

V<sub>CE</sub> = 3 V, I<sub>c</sub> = 3 mA

FREQUENCY GHz	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.859	-41.8	9.399	149.0	0.040	52.8	0.952	-21.0
0.2	0.786	-78.1	7.841	125.3	0.072	43.0	0.828	-38.2
0.3	0.730	-106.6	6.534	105.8	0.085	28.3	0.721	-51.8
0.4	0.681	-131.0	5.449	88.9	0.093	16.7	0.631	-61.4
0.5	0.645	-151.5	4.687	74.3	0.096	9.5	0.568	-69.9
0.6	0.630	-168.6	4.043	61.3	0.100	1.8	0.519	-77.6
0.7	0.615	176.0	3.570	49.7	0.109	-6.0	0.488	-85.1
0.8	0.607	161.8	3.179	38.5	0.108	-12.5	0.466	-92.2
0.9	0.604	149.3	2.862	27.9	0.110	-17.2	0.445	-99.8
1.0	0.598	137.2	2.618	17.6	0.112	-23.3	0.431	-107.7
1.1	0.598	126.1	2.413	7.8	0.114	-27.9	0.413	-115.7
1.2	0.598	114.8	2.233	-2.0	0.117	-32.0	0.405	-123.2
1.3	0.599	104.9	2.088	-11.2	0.122	-36.9	0.398	-131.5
1.4	0.598	94.7	1.956	-20.5	0.125	-41.1	0.394	-139.5
1.5	0.604	84.9	1.838	-29.8	0.129	-44.7	0.386	-148.1
1.6	0.604	75.1	1.744	-39.0	0.133	-48.5	0.378	-157.0
1.7	0.610	66.0	1.658	-48.0	0.139	-53.2	0.376	-165.8
1.8	0.609	56.6	1.573	-56.8	0.144	-57.0	0.370	-174.4
1.9	0.613	47.8	1.512	-65.5	0.154	-63.1	0.366	176.1
2.0	0.613	38.9	1.438	-74.1	0.160	-65.5	0.364	167.7
2.1	0.618	29.9	1.386	-82.8	0.169	-72.3	0.359	158.0
2.2	0.617	21.1	1.328	-91.6	0.178	-77.2	0.356	148.6
2.3	0.624	12.6	1.280	-100.0	0.188	-82.0	0.352	138.5
2.4	0.622	4.1	1.231	-108.2	0.199	-87.0	0.349	128.5
2.5	0.626	-4.5	1.186	-116.2	0.211	-93.2	0.345	118.4
2.6	0.635	-13.0	1.144	-124.7	0.221	-99.9	0.337	109.3
2.7	0.638	-21.2	1.105	-132.1	0.232	-106.5	0.337	101.0
2.8	0.635	-29.4	1.072	-139.7	0.241	-112.0	0.347	91.9
2.9	0.635	-37.6	1.045	-147.6	0.251	-118.3	0.352	81.5
3.0	0.639	-45.6	1.023	-155.3	0.265	-124.6	0.355	71.2

V<sub>CE</sub> = 3 V, I<sub>c</sub> = 5 mA

FREQUENCY		S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
GHz	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	
0.1	0.781	-51.3	14.135	143.2	0.051	51.1	0.894	-27.2	
0.2	0.688	-93.4	10.958	117.3	0.064	43.0	0.722	-46.9	
0.3	0.637	-122.8	8.655	98.1	0.068	28.4	0.594	-60.1	
0.4	0.592	-146.1	6.978	82.3	0.076	20.3	0.500	-69.4	
0.5	0.572	-165.5	5.847	68.7	0.080	14.1	0.435	-77.1	
0.6	0.556	178.5	4.984	56.8	0.084	11.2	0.395	-83.4	
0.7	0.545	164.5	4.330	45.6	0.091	4.9	0.364	-89.8	
0.8	0.542	151.4	3.848	35.6	0.097	-3.9	0.345	-97.3	
0.9	0.541	139.6	3.453	25.6	0.099	-6.8	0.329	-104.1	
1.0	0.541	128.6	3.142	15.8	0.108	-11.6	0.315	-111.6	
1.1	0.542	118.3	2.886	6.4	0.114	-15.6	0.301	-119.0	
1.2	0.541	107.9	2.666	-2.8	0.119	-22.1	0.294	-127.0	
1.3	0.547	98.4	2.476	-12.0	0.128	-25.6	0.289	-134.9	
1.4	0.548	88.5	2.321	-20.8	0.133	-31.5	0.279	-142.5	
1.5	0.551	79.8	2.184	-29.7	0.140	-36.8	0.272	-151.2	
1.6	0.554	70.5	2.067	-38.6	0.149	-41.8	0.268	-159.4	
1.7	0.557	61.4	1.959	-47.3	0.157	-47.1	0.264	-169.4	
1.8	0.561	52.5	1.856	-56.2	0.167	-52.5	0.258	-177.0	
1.9	0.563	44.2	1.783	-64.5	0.173	-58.1	0.256	172.7	
2.0	0.564	35.5	1.698	-73.1	0.183	-63.6	0.253	164.0	
2.1	0.571	26.9	1.630	-81.6	0.192	-70.6	0.247	154.6	
2.2	0.572	18.4	1.566	-90.3	0.204	-76.0	0.245	144.2	
2.3	0.573	10.1	1.510	-98.3	0.213	-82.0	0.240	134.3	
2.4	0.575	2.0	1.454	-106.6	0.226	-89.0	0.240	124.5	
2.5	0.578	-6.3	1.407	-114.8	0.236	-95.5	0.234	113.3	
2.6	0.585	-14.4	1.351	-123.1	0.248	-102.1	0.226	104.2	
2.7	0.589	-22.7	1.303	-130.6	0.254	-108.9	0.222	96.8	
2.8	0.591	-30.9	1.273	-138.3	0.263	-115.2	0.236	88.4	
2.9	0.589	-39.0	1.240	-146.2	0.274	-121.3	0.242	77.7	
3.0	0.594	-46.6	1.204	-153.9	0.287	-127.5	0.247	66.9	

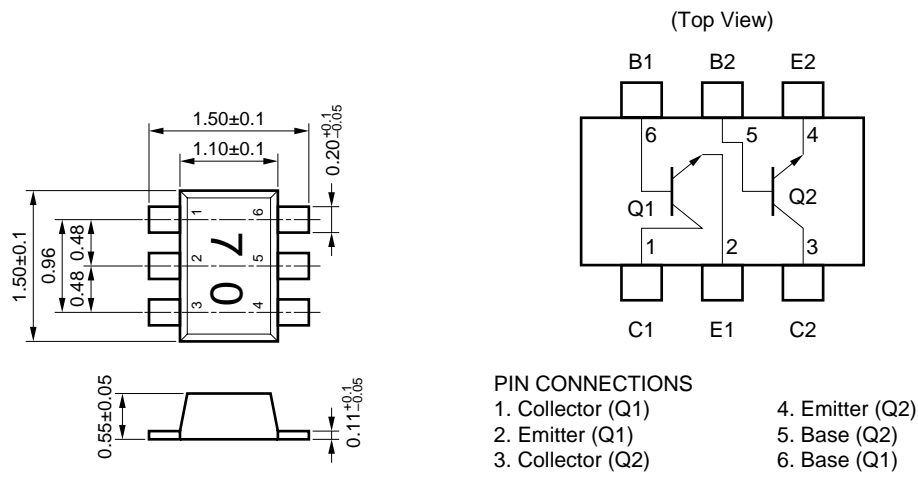
V<sub>CE</sub> = 3 V, I<sub>c</sub> = 7 mA

FREQUENCY		S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
GHz	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	
0.1	0.716	-59.5	17.531	138.7	0.041	39.9	0.858	-33.8	
0.2	0.624	-104.0	12.884	112.1	0.056	44.5	0.646	-53.1	
0.3	0.565	-133.6	9.834	93.5	0.059	35.1	0.513	-65.0	
0.4	0.540	-156.9	7.746	78.3	0.066	22.5	0.421	-73.6	
0.5	0.522	-173.9	6.422	65.9	0.071	19.6	0.367	-80.3	
0.6	0.516	170.6	5.451	54.8	0.080	15.8	0.331	-87.4	
0.7	0.516	157.5	4.723	44.0	0.084	7.2	0.301	-93.6	
0.8	0.515	145.5	4.200	33.9	0.091	3.9	0.280	-99.5	
0.9	0.512	134.4	3.754	24.3	0.100	-0.4	0.267	-107.3	
1.0	0.515	124.0	3.404	15.0	0.108	-4.6	0.255	-114.1	
1.1	0.518	113.5	3.124	5.7	0.116	-10.2	0.243	-121.6	
1.2	0.516	104.0	2.875	-3.4	0.124	-16.1	0.233	-129.8	
1.3	0.522	95.0	2.683	-12.1	0.132	-20.6	0.228	-138.1	
1.4	0.520	85.4	2.510	-20.9	0.140	-26.7	0.219	-146.0	
1.5	0.527	76.6	2.361	-29.9	0.150	-32.7	0.216	-155.1	
1.6	0.531	67.8	2.221	-38.6	0.159	-39.1	0.209	-163.4	
1.7	0.532	59.2	2.111	-47.1	0.169	-44.3	0.209	-172.8	
1.8	0.536	50.4	2.004	-55.6	0.178	-49.6	0.201	179.6	
1.9	0.537	42.2	1.916	-64.1	0.187	-56.4	0.199	169.0	
2.0	0.542	33.1	1.829	-72.5	0.196	-62.8	0.194	160.6	
2.1	0.546	25.1	1.757	-80.8	0.206	-69.4	0.191	151.0	
2.2	0.551	16.6	1.684	-89.5	0.217	-75.6	0.188	140.7	
2.3	0.553	8.9	1.623	-97.4	0.227	-82.7	0.185	130.1	
2.4	0.553	0.7	1.563	-105.7	0.237	-88.8	0.185	119.5	
2.5	0.559	-7.5	1.515	-113.9	0.251	-95.8	0.181	108.6	
2.6	0.566	-15.6	1.455	-122.3	0.259	-102.7	0.173	97.9	
2.7	0.569	-23.8	1.399	-129.7	0.265	-110.4	0.171	91.3	
2.8	0.567	-31.7	1.368	-137.4	0.276	-116.8	0.183	83.4	
2.9	0.568	-39.8	1.337	-145.1	0.286	-122.5	0.188	71.9	
3.0	0.571	-47.4	1.301	-153.0	0.298	-129.1	0.194	61.8	



PACKAGE DIMENSIONS

FLAT-LEAD 6 PIN THIN-TYPE ULTRA SUPER MINIMOLD (UNIT: mm)



[MEMO]

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