To our customers,

Old Company Name in Catalogs and Other Documents

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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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RENESAS

NPN SILICON RF TWIN TRANSISTOR
μPA810TC

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

DESCRIPTION

The μPA810TC 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
- Built-in 2 transistors (2 × 2SC5006)

ORDERING INFORMATION

Part Number	Package	Quantity	Supplying Form
μPA810TC	Flat-lead 6-pin thin-type ultra super minimold	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.
μPA810TC-T1		Taping products (3 kp/reel)	

Remark To order evaluation samples, please contact your local NEC sales office. (Part number for sample order: μPA810TC. Unit sample quantity is 50 pcs.)

ABSOLUTE MAXIMUM RATINGS (T_A = +25°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 Note	200 in 1 element 230 in 2 elements	mW
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	–65 to +150	°C

Note Mounted on 1.08 cm^2 × 1.0 mm glass epoxy substrate.

Caution Electro-static sensitive devices

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ELECTRICAL CHARACTERISTICS (T_A = +25 °C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector Cutoff Current	I_{CBO}	V_{CB} = 10 V, I_E = 0	–	–	1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 1 V, I_C = 0	–	–	1.0	μA
DC Current Gain	h_{FE}	V_{CE} = 3 V, I_C = 7 mA[Note 1]	70	–	140	
Gain Bandwidth Product	f_T	V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz	3.0	4.5	–	GHz
Feedback Capacitance	C_{re}	V_{CB} = 3 V, I_E = 0, f = 1 MHz[Note 2]	–	0.7	1.5	pF
Insertion Power Gain	$\|S_{21e}\|^2$	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	–	1.2	2.5	dB

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

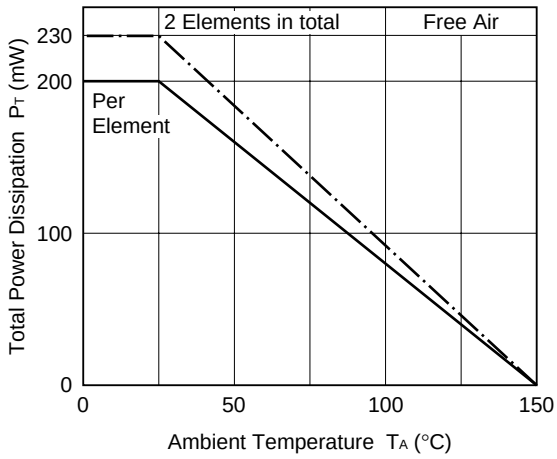
2. Measured with 3-pin bridge, emitter and case should be connected to guard pin of bridge.

h_{FE} CLASSIFICATION

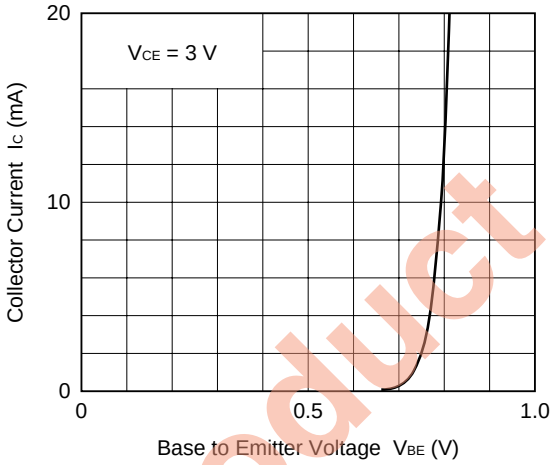
Rank	FB
Marking	75
h_{FE} Value	70 to 140

TYPICAL CHARACTERISTICS (T_A = +25 °C)

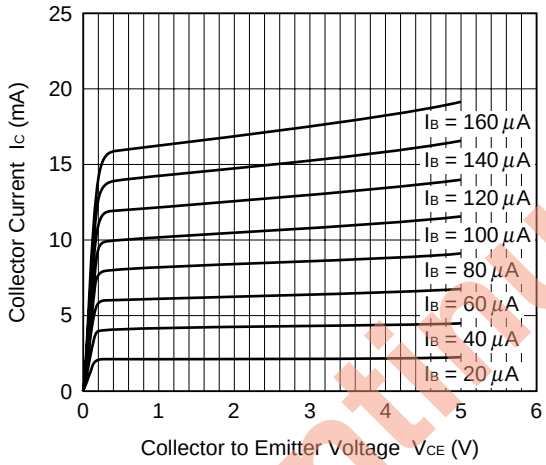
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



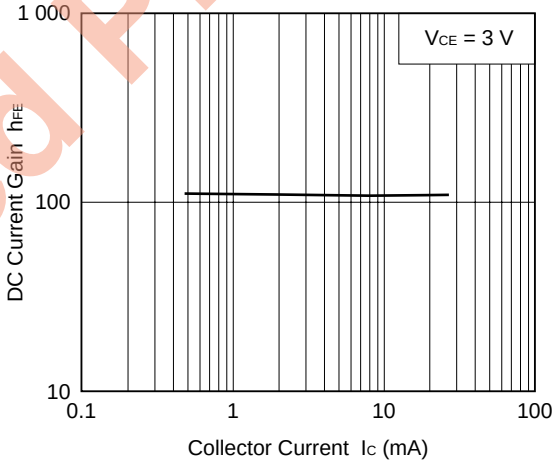
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



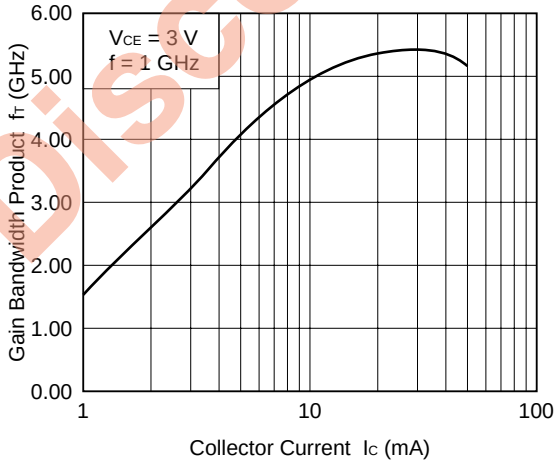
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



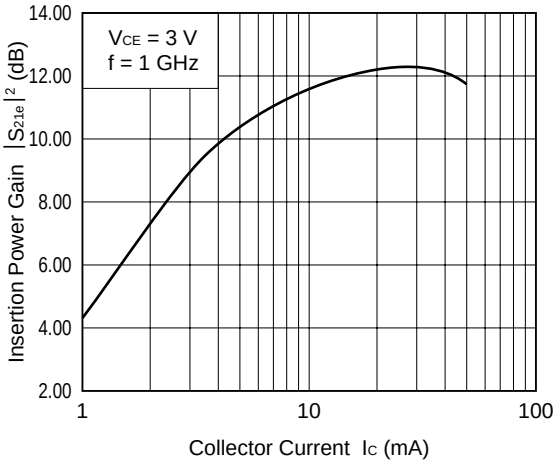
DC CURRENT GAIN vs. COLLECTOR CURRENT



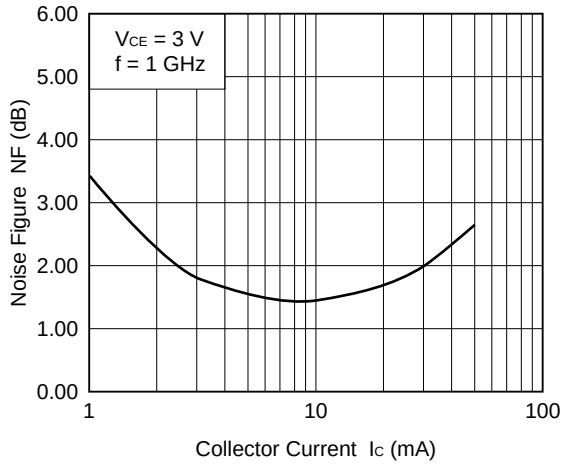
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



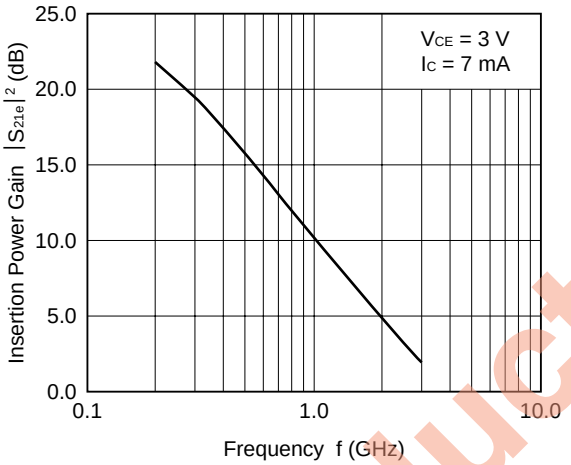
INSERTION POWER GAIN vs. COLLECTOR CURRENT



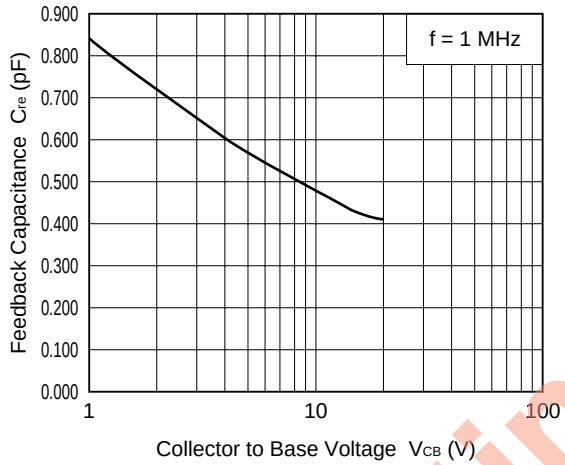
NOISE FIGURE vs. COLLECTOR CURRENT



INSERTION POWER GAIN vs. FREQUENCY



FEEDBACK CAPACITANCE vs.
COLLECTOR TO BASE VOLTAGE



S-PARAMETERS Q1

V_{CE} = 3 V, I_C = 1 mA

FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
GHz	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.949	–30.7	3.885	156.9	0.056	46.5	0.990	–13.3
0.2	0.916	–58.0	3.492	136.7	0.077	53.1	0.942	–26.2
0.3	0.883	–82.5	3.150	118.8	0.107	35.9	0.897	–38.0
0.4	0.835	–106.7	2.819	101.2	0.126	22.2	0.838	–48.3
0.5	0.808	–127.0	2.566	85.6	0.135	7.8	0.786	–57.4
0.6	0.774	–146.3	2.282	71.3	0.145	–2.5	0.747	–65.9
0.7	0.764	–163.4	2.074	57.7	0.155	–13.9	0.713	–73.9
0.8	0.748	–179.2	1.892	45.6	0.153	–24.1	0.684	–82.4
0.9	0.738	165.9	1.730	33.6	0.151	–31.6	0.662	–89.9
1.0	0.729	152.0	1.607	22.3	0.150	–39.8	0.643	–97.9
1.1	0.733	138.9	1.490	11.4	0.146	–48.3	0.625	–106.2
1.2	0.727	126.4	1.394	0.7	0.140	–54.3	0.615	–114.4
1.3	0.733	115.0	1.307	–9.2	0.134	–59.8	0.603	–122.7
1.4	0.732	103.2	1.230	–19.5	0.129	–65.4	0.595	–131.0
1.5	0.737	92.6	1.162	–29.1	0.126	–71.9	0.583	–139.8
1.6	0.739	81.7	1.105	–38.6	0.116	–75.3	0.576	–148.3
1.7	0.744	71.5	1.048	–48.0	0.116	–77.5	0.570	–157.5
1.8	0.746	61.4	1.003	–57.5	0.110	–79.5	0.565	–167.0
1.9	0.752	51.8	0.955	–66.2	0.108	–81.9	0.561	–176.6
2.0	0.752	42.2	0.910	–75.1	0.108	–81.8	0.555	174.3
2.1	0.758	32.8	0.871	–83.6	0.111	–83.7	0.549	164.4
2.2	0.759	23.8	0.832	–92.5	0.112	–82.2	0.545	153.7
2.3	0.767	15.0	0.802	–100.4	0.120	–83.3	0.539	143.2
2.4	0.768	6.0	0.768	–108.8	0.132	–84.4	0.537	132.7
2.5	0.770	–2.3	0.740	–116.5	0.144	–88.2	0.528	121.7
2.6	0.775	–11.0	0.711	–124.6	0.161	–92.7	0.522	110.5
2.7	0.779	–19.0	0.691	–132.1	0.178	–97.7	0.515	99.2
2.8	0.779	–26.7	0.667	–139.8	0.196	–105.0	0.505	88.0
2.9	0.782	–34.4	0.649	–147.6	0.207	–113.2	0.488	77.9
3.0	0.791	–42.1	0.616	–155.5	0.216	–122.8	0.482	69.4

V_{CE} = 3 V, I_C = 3 mA

FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
GHz	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.872	–40.4	9.566	149.6	0.049	43.5	0.952	–20.7
0.2	0.789	–76.2	8.034	126.3	0.068	46.8	0.832	–38.1
0.3	0.735	–105.5	6.761	107.1	0.082	32.8	0.722	–50.9
0.4	0.686	–131.0	5.671	90.2	0.091	19.2	0.630	–61.6
0.5	0.660	–150.8	4.890	75.8	0.098	9.2	0.562	–69.7
0.6	0.636	–169.3	4.198	62.8	0.106	1.4	0.512	–77.2
0.7	0.625	175.0	3.707	51.3	0.107	–7.9	0.476	–83.7
0.8	0.623	160.9	3.325	40.2	0.110	–13.8	0.443	–90.7
0.9	0.617	147.7	2.991	29.8	0.112	–19.4	0.421	–97.9
1.0	0.616	135.7	2.731	19.5	0.111	–24.1	0.400	–104.5
1.1	0.618	123.9	2.513	9.7	0.114	–28.5	0.382	–112.5
1.2	0.614	112.8	2.324	0.2	0.119	–33.8	0.372	–120.0
1.3	0.625	102.4	2.169	–9.2	0.119	–37.1	0.359	–127.7
1.4	0.629	92.2	2.035	–18.3	0.120	–42.1	0.347	–135.5
1.5	0.634	82.5	1.912	–27.3	0.124	–45.3	0.340	–144.2
1.6	0.639	72.6	1.805	–36.6	0.128	–50.3	0.329	–151.8
1.7	0.645	63.5	1.711	–45.3	0.132	–54.1	0.320	–161.2
1.8	0.651	54.2	1.621	–54.3	0.139	–58.5	0.314	–169.5
1.9	0.656	45.4	1.545	–62.8	0.145	–62.5	0.309	–179.4
2.0	0.661	36.5	1.471	–71.5	0.153	–66.8	0.297	172.1
2.1	0.668	27.8	1.409	–79.8	0.156	–72.1	0.293	162.5
2.2	0.672	19.8	1.348	–88.5	0.163	–75.8	0.286	152.4
2.3	0.678	11.3	1.297	–96.7	0.172	–81.3	0.276	141.0
2.4	0.683	2.9	1.243	–105.0	0.183	–86.4	0.274	130.8
2.5	0.691	–4.7	1.202	–113.1	0.194	–92.4	0.268	119.4
2.6	0.698	–12.4	1.158	–121.3	0.208	–98.4	0.263	107.8
2.7	0.701	–19.9	1.111	–129.3	0.218	–104.9	0.258	96.8
2.8	0.714	–27.6	1.067	–137.7	0.231	–113.3	0.255	86.6
2.9	0.722	–34.9	1.026	–145.4	0.233	–121.0	0.248	77.8
3.0	0.736	–42.3	0.983	–152.9	0.234	–129.9	0.261	69.1

V_{CE} = 3 V, I_C = 5 mA

FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
GHz	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.788	–51.6	13.755	144.7	0.031	52.4	0.911	–26.2
0.2	0.712	–90.1	10.866	119.6	0.064	46.6	0.739	–46.1
0.3	0.649	–120.7	8.673	100.1	0.068	30.2	0.607	–59.3
0.4	0.610	–144.4	7.054	84.3	0.078	18.2	0.514	–68.4
0.5	0.596	–164.3	5.936	70.7	0.082	12.2	0.442	–76.0
0.6	0.582	179.5	5.078	58.8	0.090	7.5	0.397	–83.4
0.7	0.571	164.9	4.415	48.0	0.094	–1.4	0.361	–89.4
0.8	0.570	151.3	3.924	37.5	0.098	–6.1	0.335	–95.7
0.9	0.568	139.2	3.531	27.5	0.099	–8.2	0.314	–103.5
1.0	0.574	127.9	3.199	17.9	0.105	–13.6	0.295	–110.0
1.1	0.577	117.2	2.937	8.5	0.113	–18.5	0.280	–117.1
1.2	0.579	106.4	2.708	–0.8	0.118	–24.0	0.265	–124.0
1.3	0.588	96.9	2.523	–9.8	0.120	–28.6	0.258	–132.1
1.4	0.586	86.9	2.353	–18.5	0.127	–32.8	0.246	–140.0
1.5	0.596	77.7	2.210	–27.5	0.131	–37.1	0.237	–148.1
1.6	0.603	68.5	2.079	–36.1	0.139	–43.3	0.225	–156.5
1.7	0.609	59.8	1.974	–44.6	0.148	–47.0	0.219	–166.4
1.8	0.615	50.9	1.872	–53.3	0.154	–51.8	0.210	–174.6
1.9	0.623	42.4	1.779	–61.8	0.160	–58.6	0.202	175.3
2.0	0.626	33.8	1.692	–70.3	0.169	–63.8	0.196	165.5
2.1	0.633	25.4	1.621	–78.7	0.176	–69.2	0.188	155.2
2.2	0.638	17.4	1.548	–87.2	0.184	–75.2	0.181	144.2
2.3	0.648	9.5	1.490	–95.1	0.192	–80.7	0.176	132.7
2.4	0.654	1.5	1.431	–103.4	0.203	–86.9	0.171	120.5
2.5	0.655	–6.1	1.375	–111.0	0.212	–93.4	0.168	108.1
2.6	0.666	–13.8	1.324	–119.4	0.223	–99.8	0.164	96.2
2.7	0.669	–20.8	1.280	–127.2	0.237	–106.9	0.165	84.0
2.8	0.682	–28.3	1.225	–135.5	0.244	–115.0	0.164	73.7
2.9	0.696	–35.4	1.176	–143.2	0.250	–123.5	0.161	65.2
3.0	0.715	–42.9	1.128	–150.7	0.246	–131.7	0.178	56.6

V_{CE} = 3 V, I_C = 7 mA

FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
GHz	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.719	–60.9	18.194	138.9	0.045	46.4	0.866	–32.7
0.2	0.635	–105.8	13.362	112.4	0.051	45.0	0.637	–52.7
0.3	0.579	–134.7	10.199	94.0	0.062	30.2	0.504	–65.7
0.4	0.563	–158.0	8.075	79.1	0.068	23.4	0.414	–74.9
0.5	0.545	–176.3	6.672	66.7	0.074	18.5	0.342	–81.1
0.6	0.538	169.1	5.657	55.5	0.077	13.1	0.312	–87.7
0.7	0.540	155.1	4.904	44.9	0.081	9.9	0.279	–93.2
0.8	0.539	143.2	4.348	35.3	0.087	3.7	0.254	–99.6
0.9	0.543	132.1	3.880	25.6	0.097	–2.0	0.235	–106.7
1.0	0.546	121.6	3.520	16.5	0.105	–5.3	0.220	–113.3
1.1	0.551	111.1	3.225	7.3	0.110	–10.2	0.207	–121.0
1.2	0.554	101.4	2.972	–1.7	0.119	–15.8	0.195	–127.3
1.3	0.561	92.5	2.759	–10.2	0.123	–20.9	0.184	–136.1
1.4	0.564	82.9	2.577	–18.8	0.132	–26.3	0.171	–144.6
1.5	0.575	74.1	2.415	–27.7	0.139	–31.9	0.163	–153.3
1.6	0.582	65.2	2.267	–36.4	0.148	–37.4	0.154	–163.5
1.7	0.588	56.9	2.155	–44.4	0.159	–43.3	0.145	–171.9
1.8	0.594	48.4	2.024	–53.2	0.164	–48.3	0.139	178.9
1.9	0.602	40.2	1.940	–61.3	0.174	–55.2	0.134	166.8
2.0	0.607	31.9	1.838	–69.7	0.182	–60.5	0.125	155.6
2.1	0.616	23.6	1.762	–77.8	0.188	–67.2	0.117	145.2
2.2	0.619	16.0	1.681	–86.2	0.200	–73.3	0.111	129.8
2.3	0.629	8.2	1.616	–94.2	0.207	–79.5	0.110	115.2
2.4	0.633	0.4	1.551	–102.3	0.221	–86.2	0.107	100.7
2.5	0.639	–7.0	1.488	–110.1	0.230	–93.3	0.105	86.1
2.6	0.649	–13.9	1.434	–118.6	0.242	–99.8	0.109	73.3
2.7	0.659	–21.1	1.380	–126.1	0.255	–108.1	0.105	59.7
2.8	0.671	–27.8	1.315	–134.1	0.255	–116.9	0.105	52.2
2.9	0.698	–35.2	1.262	–141.5	0.255	–126.0	0.111	46.6
3.0	0.717	–43.2	1.217	–148.4	0.243	–132.8	0.137	40.2

S-PARAMETERS Q2

V_{CE} = 3 V, I_C = 1 mA

FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
GHz	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.725	–58.0	15.087	138.9	0.039	60.2	0.850	–34.1
0.2	0.618	–99.7	11.136	112.1	0.066	41.7	0.645	–54.8
0.3	0.554	–128.8	8.515	93.3	0.077	31.6	0.508	–68.5
0.4	0.510	–153.2	6.744	78.1	0.088	26.7	0.421	–78.2
0.5	0.488	–170.9	5.601	65.6	0.091	20.7	0.353	–85.5
0.6	0.475	173.4	4.751	53.8	0.106	17.7	0.315	–92.7
0.7	0.471	160.2	4.115	43.5	0.111	10.9	0.288	–99.7
0.8	0.470	147.1	3.661	33.4	0.121	5.4	0.264	–106.4
0.9	0.467	135.4	3.277	23.6	0.130	2.8	0.246	–113.4
1.0	0.467	123.9	2.985	14.3	0.139	–2.9	0.233	–119.4
1.1	0.470	113.7	2.742	5.1	0.151	–8.4	0.219	–127.6
1.2	0.471	103.3	2.536	–4.0	0.161	–13.3	0.214	–134.2
1.3	0.473	94.2	2.365	–12.6	0.170	–18.5	0.207	–141.5
1.4	0.473	84.3	2.223	–21.2	0.181	–23.8	0.199	–148.8
1.5	0.480	75.2	2.088	–30.0	0.193	–30.2	0.195	–157.4
1.6	0.481	66.0	1.984	–38.4	0.204	–36.0	0.189	–165.8
1.7	0.482	57.5	1.885	–46.8	0.217	–40.7	0.188	–174.4
1.8	0.488	48.5	1.796	–55.1	0.228	–47.3	0.180	178.2
1.9	0.489	40.0	1.731	–63.2	0.241	–54.0	0.179	168.5
2.0	0.493	31.3	1.655	–71.6	0.252	–59.7	0.174	160.1
2.1	0.497	22.7	1.598	–79.6	0.263	–66.2	0.168	150.8
2.2	0.500	15.0	1.537	–87.8	0.276	–72.5	0.166	141.5
2.3	0.505	6.7	1.492	–95.5	0.288	–78.6	0.162	130.8
2.4	0.505	–1.6	1.443	–103.5	0.302	–85.2	0.158	121.2
2.5	0.507	–9.7	1.400	–111.1	0.315	–91.6	0.156	110.8
2.6	0.517	–17.6	1.360	–119.4	0.327	–98.1	0.156	99.5
2.7	0.518	–25.6	1.328	–126.7	0.343	–104.6	0.155	88.5
2.8	0.519	–33.5	1.291	–134.2	0.356	–111.8	0.154	78.5
2.9	0.521	–41.5	1.267	–142.0	0.370	–118.3	0.156	67.3
3.0	0.524	–48.6	1.232	–149.3	0.382	–125.4	0.159	57.6

V_{CE} = 3 V, I_C = 3 mA

FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
GHz	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.853	–42.4	8.913	147.9	0.049	45.5	0.949	–24.5
0.2	0.773	–78.7	7.359	123.2	0.083	44.9	0.796	–41.9
0.3	0.695	–108.6	6.081	103.3	0.092	28.0	0.684	–55.5
0.4	0.628	–131.6	5.025	86.5	0.108	18.0	0.593	–66.5
0.5	0.602	–152.3	4.325	72.0	0.112	11.4	0.523	–74.4
0.6	0.576	–170.1	3.701	59.2	0.119	4.5	0.478	–82.8
0.7	0.557	174.3	3.257	47.4	0.122	–1.9	0.442	–90.0
0.8	0.552	160.2	2.905	36.5	0.127	–7.8	0.416	–96.9
0.9	0.545	146.8	2.630	25.8	0.132	–10.4	0.399	–104.3
1.0	0.543	134.7	2.402	15.8	0.132	–15.8	0.380	–111.5
1.1	0.542	123.0	2.215	5.9	0.138	–21.5	0.368	–119.3
1.2	0.540	112.4	2.060	–3.5	0.145	–25.2	0.354	–126.1
1.3	0.543	101.4	1.913	–12.8	0.152	–28.7	0.352	–134.4
1.4	0.546	90.9	1.806	–21.9	0.157	–32.4	0.347	–141.5
1.5	0.550	81.2	1.704	–31.1	0.164	–35.8	0.339	–149.8
1.6	0.549	71.4	1.612	–39.5	0.171	–40.8	0.335	–158.0
1.7	0.553	62.2	1.538	–48.1	0.182	–44.9	0.332	–166.2
1.8	0.557	52.5	1.470	–57.0	0.190	–49.6	0.326	–174.5
1.9	0.559	43.3	1.412	–65.0	0.203	–54.3	0.325	176.3
2.0	0.561	33.9	1.360	–73.7	0.213	–59.6	0.320	168.1
2.1	0.568	25.6	1.303	–81.5	0.224	–65.0	0.315	158.9
2.2	0.567	16.6	1.258	–90.1	0.240	–70.3	0.313	149.6
2.3	0.571	7.9	1.217	–97.8	0.253	–75.8	0.308	140.2
2.4	0.572	–0.6	1.178	–105.9	0.266	–81.6	0.308	130.6
2.5	0.576	–9.2	1.145	–113.6	0.282	–87.6	0.304	120.5
2.6	0.584	–17.7	1.117	–121.5	0.298	–93.7	0.303	110.5
2.7	0.586	–26.1	1.082	–129.0	0.315	–99.8	0.301	100.7
2.8	0.587	–34.2	1.056	–136.8	0.331	–106.5	0.303	90.7
2.9	0.587	–42.4	1.033	–143.9	0.344	–113.0	0.299	80.1
3.0	0.590	–50.4	1.010	–151.3	0.361	–119.5	0.303	70.4

V_{CE} = 3 V, I_C = 5 mA

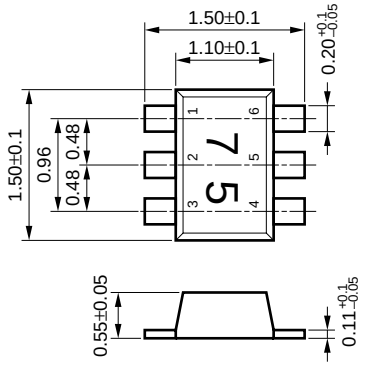
FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
GHz	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.798	–51.1	12.419	143.0	0.039	25.4	0.905	–31.1
0.2	0.688	–90.5	9.685	116.7	0.071	43.1	0.711	–49.4
0.3	0.613	–120.7	7.637	97.3	0.085	31.9	0.582	–64.1
0.4	0.555	–143.7	6.155	81.4	0.090	22.0	0.482	–74.2
0.5	0.532	–163.5	5.148	68.0	0.101	13.3	0.418	–82.1
0.6	0.516	–179.9	4.399	55.8	0.107	12.7	0.377	–88.9
0.7	0.500	165.1	3.832	45.1	0.110	4.9	0.340	–96.0
0.8	0.499	152.4	3.399	34.6	0.120	1.9	0.317	–103.5
0.9	0.493	139.9	3.066	24.7	0.129	–0.9	0.296	–109.2
1.0	0.493	128.6	2.784	15.0	0.137	–6.9	0.283	–116.5
1.1	0.493	117.5	2.564	5.5	0.144	–12.8	0.272	–124.5
1.2	0.493	107.3	2.377	–3.6	0.153	–16.6	0.263	–130.3
1.3	0.497	97.2	2.217	–12.5	0.160	–22.6	0.256	–138.4
1.4	0.496	87.3	2.078	–21.3	0.172	–26.7	0.248	–146.0
1.5	0.503	77.9	1.966	–30.1	0.184	–32.2	0.244	–153.7
1.6	0.506	68.4	1.856	–38.9	0.194	–37.7	0.238	–162.0
1.7	0.508	59.5	1.767	–47.3	0.205	–42.8	0.237	–171.0
1.8	0.511	50.4	1.687	–55.7	0.215	–48.0	0.232	–178.4
1.9	0.513	41.8	1.623	–63.9	0.227	–54.0	0.223	172.4
2.0	0.515	32.7	1.555	–72.2	0.240	–59.5	0.221	163.5
2.1	0.521	24.3	1.494	–80.2	0.252	–66.1	0.217	155.7
2.2	0.524	16.2	1.445	–88.4	0.264	–71.7	0.213	145.7
2.3	0.526	7.8	1.403	–96.4	0.276	–77.8	0.211	135.9
2.4	0.531	–0.6	1.360	–104.5	0.291	–83.9	0.207	126.3
2.5	0.533	–9.1	1.316	–112.2	0.302	–90.4	0.205	115.9
2.6	0.540	–17.5	1.277	–120.0	0.316	–96.3	0.203	105.5
2.7	0.538	–25.1	1.242	–127.7	0.332	–103.0	0.202	95.6
2.8	0.544	–32.9	1.213	–135.4	0.347	–110.0	0.204	84.8
2.9	0.542	–40.8	1.191	–142.8	0.359	–116.6	0.201	74.2
3.0	0.544	–48.3	1.160	–150.1	0.374	–123.5	0.204	64.2

V_{CE} = 3 V, I_C = 7 mA

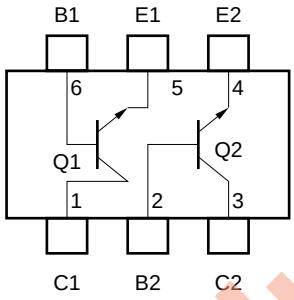
FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
GHz	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
0.1	0.725	–58.0	15.087	138.9	0.039	60.2	0.850	–34.1
0.2	0.618	–99.7	11.136	112.1	0.066	41.7	0.645	–54.8
0.3	0.554	–128.8	8.515	93.3	0.077	31.6	0.508	–68.5
0.4	0.510	–153.2	6.744	78.1	0.088	26.7	0.421	–78.2
0.5	0.488	–170.9	5.601	65.6	0.091	20.7	0.353	–85.5
0.6	0.475	173.4	4.751	53.8	0.106	17.7	0.315	–92.7
0.7	0.471	160.2	4.115	43.5	0.111	10.9	0.288	–99.7
0.8	0.470	147.1	3.661	33.4	0.121	5.4	0.264	–106.4
0.9	0.467	135.4	3.277	23.6	0.130	2.8	0.246	–113.4
1.0	0.467	123.9	2.985	14.3	0.139	–2.9	0.233	–119.4
1.1	0.470	113.7	2.742	5.1	0.151	–8.4	0.219	–127.6
1.2	0.471	103.3	2.536	–4.0	0.161	–13.3	0.214	–134.2
1.3	0.473	94.2	2.365	–12.6	0.170	–18.5	0.207	–141.5
1.4	0.473	84.3	2.223	–21.2	0.181	–23.8	0.199	–148.8
1.5	0.480	75.2	2.088	–30.0	0.193	–30.2	0.195	–157.4
1.6	0.481	66.0	1.984	–38.4	0.204	–36.0	0.189	–165.8
1.7	0.482	57.5	1.885	–46.8	0.217	–40.7	0.188	–174.4
1.8	0.488	48.5	1.796	–55.1	0.228	–47.3	0.180	178.2
1.9	0.489	40.0	1.731	–63.2	0.241	–54.0	0.179	168.5
2.0	0.493	31.3	1.655	–71.6	0.252	–59.7	0.174	160.1
2.1	0.497	22.7	1.598	–79.6	0.263	–66.2	0.168	150.8
2.2	0.500	15.0	1.537	–87.8	0.276	–72.5	0.166	141.5
2.3	0.505	6.7	1.492	–95.5	0.288	–78.6	0.162	130.8
2.4	0.505	–1.6	1.443	–103.5	0.302	–85.2	0.158	121.2
2.5	0.507	–9.7	1.400	–111.1	0.315	–91.6	0.156	110.8
2.6	0.517	–17.6	1.360	–119.4	0.327	–98.1	0.156	99.5
2.7	0.518	–25.6	1.328	–126.7	0.343	–104.6	0.155	88.5
2.8	0.519	–33.5	1.291	–134.2	0.356	–111.8	0.154	78.5
2.9	0.521	–41.5	1.267	–142.0	0.370	–118.3	0.156	67.3
3.0	0.524	–48.6	1.232	–149.3	0.382	–125.4	0.159	57.6

PACKAGE DIMENSIONS

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



(Top View)



PIN CONNECTIONS

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

[MEMO]

[MEMO]

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