

DATA SHEET

NEC

NPN SILICON RF TWIN TRANSISTOR μ PA826TC

NPN SILICON EPITAXIAL TRANSISTOR (WITH 2 ELEMENTS) IN A FLAT-LEAD 6-PIN THIN-TYPE ULTRA SUPER MINIMOLD

DESCRIPTION

The μ PA826TC 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 = 1.5 dB TYP. @ $V_{CE} = 3$ V, $I_c = 3$ mA, $f = 2$ GHz
- High gain: $|S_{21e}|^2 = 8.5$ dB TYP. @ $V_{CE} = 3$ V, $I_c = 10$ mA, $f = 2$ GHz
- Low voltage operation
- Small reverse transfer capacitance: $C_{re} = 0.4$ pF TYP.
- Built-in 2 transistors ($2 \times 2SC5435$)
- Flat-lead 6-pin thin-type ultra super minimold package

BUILT-IN TRANSISTORS

	Q1, Q2
3-pin thin-type ultra super minimold part No.	2SC5435

ORDERING INFORMATION

Part Number	Quantity	Supplying Form
μ PA826TC	50 pcs (Non reel)	• 8 mm wide embossed taping
μ PA826TC-T1	3 kpcs/reel	• Pin 6 (Q1 Base), Pin 5 (Q2 Emitter), Pin 4 (Q2 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.

Because this product uses high-frequency technology, avoid excessive static electricity, etc.

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 Compound Semiconductor Devices representative for availability and additional information.

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	V _{CB0}	9	V
Collector to Emitter Voltage	V _{CEO}	6	V
Emitter to Base Voltage	V _{EBO}	2	V
Collector Current	I _C	30	mA
Total Power Dissipation	P _{tot} ^{Note}	180 in 1 element	mW
		230 in 2 elements	
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-65 to +150	°C

Note Mounted on 1.08 cm² × 1.0 mm (t) glass epoxy PCB

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Collector Cut-off Current	I _{CB0}	V _{CB} = 5 V, I _E = 0 mA	–	–	0.1	μA
Emitter Cut-off Current	I _{EBO}	V _{EB} = 1 V, I _C = 0 mA	–	–	0.1	μA
DC Current Gain	h _{FE} ^{Note 1}	V _{CE} = 3 V, I _C = 10 mA	75	–	150	–
Gain Bandwidth Product	f _T	V _{CE} = 3 V, I _C = 10 mA, f = 2 GHz	10.0	12.0	–	GHz
Insertion Power Gain	S _{21e} ²	V _{CE} = 3 V, I _C = 10 mA, f = 2 GHz	7.0	8.5	–	dB
Noise Figure	NF	V _{CE} = 3 V, I _C = 3 mA, f = 2 GHz, Z _S = Z _{opt}	–	1.5	2.5	dB
Reverse Transfer Capacitance	C _{re} ^{Note 2}	V _{CB} = 3 V, I _E = 0 mA, f = 1 MHz	–	0.4	0.7	pF

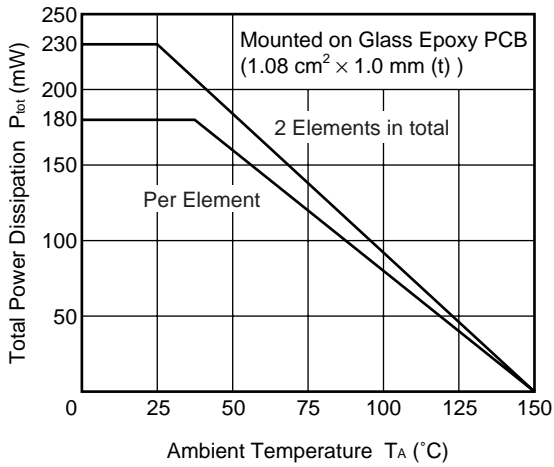
- Notes** 1. Pulse measurement: PW ≤ 350 μs, Duty Cycle ≤ 2%
 2. Collector to base capacitance when the emitter grounded

h_{FE} CLASSIFICATION

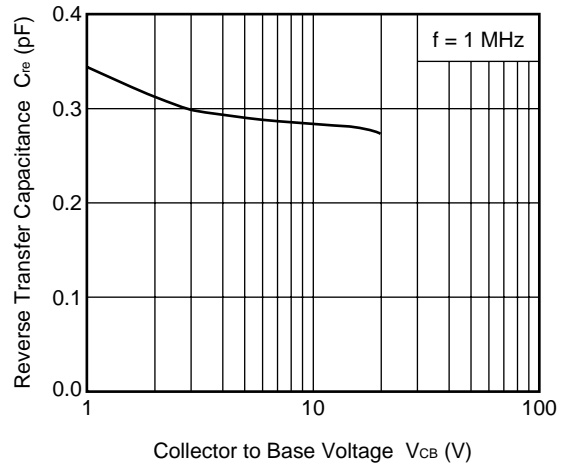
Rank	KB
Marking	83
h _{FE} Value	75 to 150

★ TYPICAL CHARACTERISTICS (Unless otherwise specified, $T_A = +25^\circ\text{C}$)

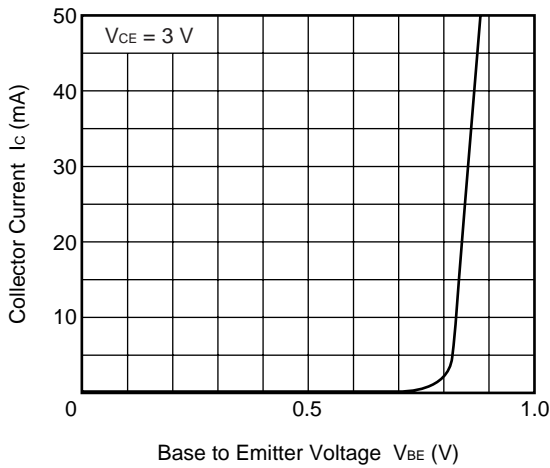
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



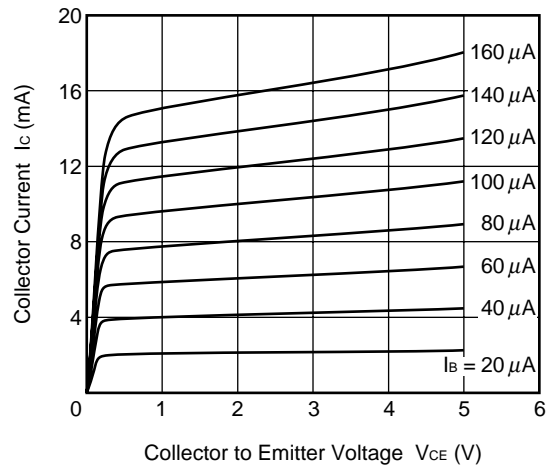
REVERSE TRANSFER CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



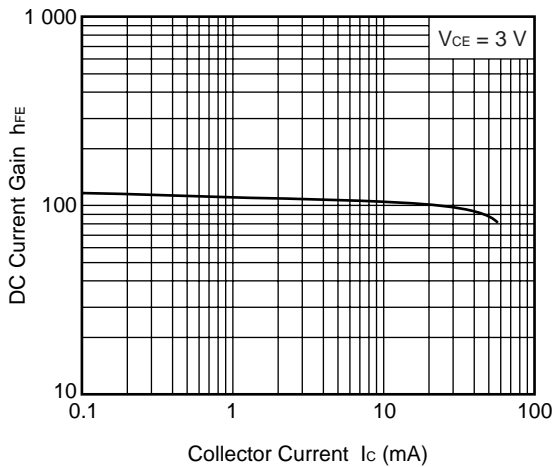
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



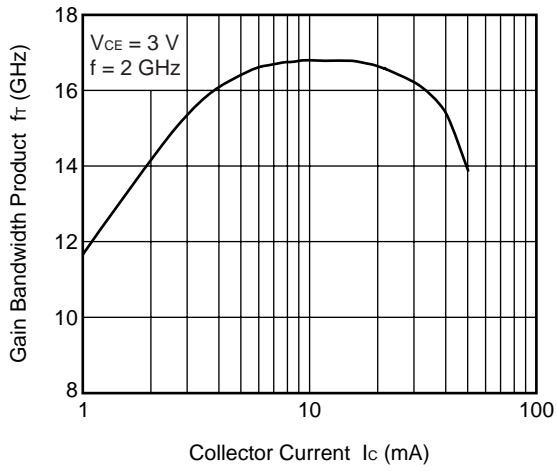
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



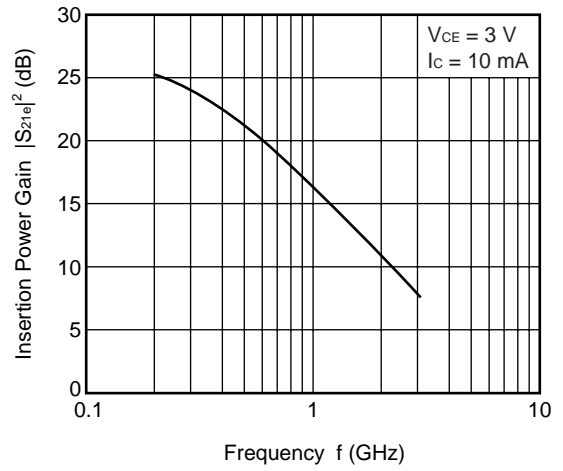
DC CURRENT GAIN vs. COLLECTOR CURRENT



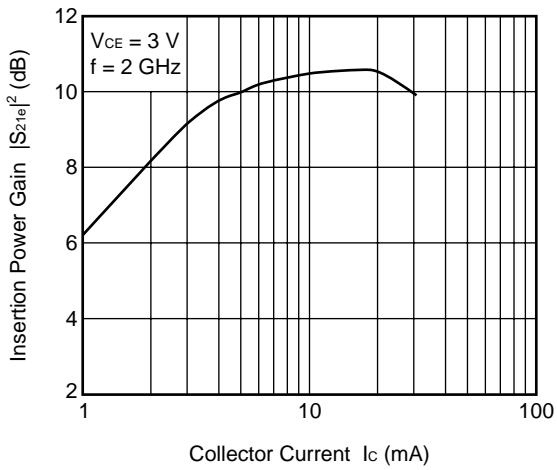
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



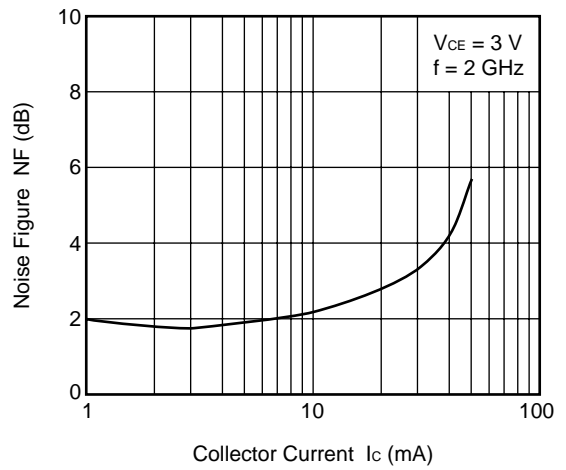
INSERTION POWER GAIN vs. FREQUENCY



INSERTION POWER GAIN vs. COLLECTOR CURRENT



NOISE FIGURE vs. COLLECTOR CURRENT



Remark The graphs indicate nominal characteristics.

S-PARAMETERS Q1

V_{CE} = 3 V, I_c = 1 mA, Z_o = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)
0.1	0.962	-14.0	3.900	166.5	0.031	34.7	1.012	-9.6
0.2	0.939	-25.6	3.769	154.0	0.044	70.0	0.986	-19.1
0.3	0.925	-38.2	3.657	142.4	0.058	61.6	0.980	-28.7
0.4	0.900	-51.3	3.558	130.1	0.075	48.7	0.965	-38.0
0.5	0.887	-63.0	3.505	118.5	0.089	39.6	0.941	-47.0
0.6	0.841	-75.3	3.365	106.7	0.105	30.7	0.918	-56.1
0.7	0.809	-88.2	3.262	94.8	0.115	20.4	0.889	-64.7
0.8	0.774	-100.0	3.176	83.8	0.127	10.5	0.865	-73.4
0.9	0.737	-111.6	3.064	72.8	0.140	3.2	0.838	-82.0
1.0	0.695	-123.9	2.954	61.9	0.144	-6.4	0.806	-90.6
1.1	0.656	-135.9	2.843	51.6	0.155	-15.5	0.775	-98.6
1.2	0.622	-147.4	2.760	41.1	0.162	-23.4	0.753	-106.5
1.3	0.591	-159.8	2.660	30.8	0.170	-30.9	0.726	-114.6
1.4	0.557	-171.5	2.579	21.0	0.175	-38.4	0.705	-122.4
1.5	0.528	-176.8	2.491	11.1	0.178	-46.0	0.679	-130.1
1.6	0.501	164.3	2.414	1.0	0.185	-53.6	0.655	-137.7
1.7	0.477	151.6	2.333	-8.7	0.186	-61.2	0.635	-145.6
1.8	0.453	139.1	2.267	-18.1	0.191	-68.4	0.613	-153.2
1.9	0.434	126.6	2.196	-27.3	0.196	-75.6	0.594	-160.6
2.0	0.416	114.2	2.120	-37.0	0.196	-82.6	0.573	-168.1
2.1	0.400	100.9	2.060	-46.1	0.197	-89.9	0.557	-175.3
2.2	0.389	88.4	1.988	-55.7	0.199	-95.5	0.535	-176.8
2.3	0.381	75.3	1.930	-64.5	0.197	-102.9	0.515	-169.2
2.4	0.372	62.9	1.866	-73.7	0.200	-108.7	0.494	-161.7
2.5	0.364	50.9	1.801	-82.2	0.200	-115.5	0.478	-154.7
2.6	0.369	39.1	1.753	-90.6	0.203	-119.5	0.468	-147.9
2.7	0.371	27.4	1.706	-99.1	0.202	-126.2	0.465	-140.3
2.8	0.374	16.2	1.662	-107.7	0.204	-132.3	0.456	-131.9
2.9	0.380	5.3	1.622	-115.8	0.203	-138.6	0.445	-124.1
3.0	0.387	-5.7	1.575	-124.6	0.207	-144.4	0.438	-115.8

V_{CE} = 3 V, I_c = 3 mA, Z_o = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)
0.1	0.897	-19.4	9.548	161.9	0.017	64.0	0.985	-13.5
0.2	0.852	-34.6	8.940	146.2	0.038	62.6	0.955	-25.7
0.3	0.811	-50.0	8.404	131.7	0.059	54.4	0.918	-37.0
0.4	0.753	-66.7	7.863	117.0	0.066	44.1	0.864	-48.0
0.5	0.693	-81.0	7.381	103.8	0.072	36.3	0.804	-58.1
0.6	0.630	-94.7	6.795	91.1	0.082	25.6	0.754	-67.8
0.7	0.572	-109.1	6.304	78.9	0.088	14.9	0.707	-76.1
0.8	0.520	-121.6	5.842	67.8	0.095	7.6	0.662	-84.3
0.9	0.477	-135.0	5.452	56.8	0.107	2.4	0.623	-92.6
1.0	0.430	-147.6	5.076	46.4	0.110	-5.0	0.587	-100.0
1.1	0.396	-160.5	4.745	36.3	0.117	-12.0	0.559	-107.5
1.2	0.364	-173.4	4.475	26.7	0.122	-18.8	0.529	-114.8
1.3	0.338	173.4	4.206	17.2	0.129	-26.4	0.504	-122.1
1.4	0.313	160.3	3.973	8.1	0.133	-32.3	0.481	-129.2
1.5	0.298	147.3	3.765	-0.9	0.137	-38.6	0.463	-136.2
1.6	0.281	133.4	3.574	-9.9	0.144	-44.6	0.443	-143.5
1.7	0.271	120.0	3.416	-18.8	0.147	-50.0	0.425	-150.7
1.8	0.262	106.3	3.252	-27.4	0.154	-56.2	0.406	-157.9
1.9	0.258	93.2	3.122	-36.0	0.159	-63.2	0.393	-165.3
2.0	0.255	80.2	2.976	-44.6	0.165	-68.0	0.376	-172.0
2.1	0.258	66.4	2.868	-52.9	0.168	-75.3	0.361	-179.6
2.2	0.260	54.1	2.743	-61.4	0.172	-81.5	0.348	-173.0
2.3	0.265	42.4	2.644	-69.6	0.176	-87.4	0.334	-165.3
2.4	0.275	31.1	2.548	-77.8	0.183	-93.4	0.321	-157.6
2.5	0.280	19.4	2.455	-85.9	0.188	-99.6	0.308	-149.7
2.6	0.293	9.2	2.380	-94.1	0.194	-104.8	0.298	-141.6
2.7	0.301	-1.5	2.301	-101.8	0.198	-110.8	0.285	-133.8
2.8	0.312	-11.1	2.223	-109.9	0.203	-118.0	0.274	-125.6
2.9	0.324	-20.5	2.163	-117.8	0.208	-123.6	0.266	-116.6
3.0	0.335	-29.5	2.090	-125.7	0.214	-129.9	0.257	-108.0

V_{CE} = 3 V, I_c = 5 mA, Z_o = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)
0.1	0.826	-21.1	14.048	158.2	0.034	61.3	0.983	-15.5
0.2	0.768	-41.4	12.791	140.1	0.038	63.4	0.917	-29.2
0.3	0.698	-59.8	11.643	123.8	0.048	50.7	0.848	-42.4
0.4	0.621	-76.6	10.439	108.1	0.054	41.1	0.770	-53.7
0.5	0.550	-92.4	9.468	94.4	0.062	35.2	0.699	-63.0
0.6	0.481	-105.8	8.453	81.9	0.075	23.9	0.643	-72.1
0.7	0.424	-120.4	7.645	70.2	0.077	16.2	0.590	-79.7
0.8	0.378	-134.0	6.978	59.2	0.085	13.4	0.549	-87.0
0.9	0.337	-146.8	6.337	49.0	0.092	5.2	0.514	-94.7
1.0	0.301	-159.9	5.839	39.1	0.099	-1.0	0.484	-101.5
1.1	0.271	-173.9	5.407	29.6	0.103	-6.9	0.455	-108.4
1.2	0.248	172.7	5.042	20.6	0.112	-12.8	0.435	-114.4
1.3	0.232	159.0	4.697	11.6	0.116	-19.1	0.415	-121.9
1.4	0.217	145.0	4.423	2.9	0.124	-24.5	0.396	-128.5
1.5	0.210	131.7	4.184	-5.7	0.130	-30.4	0.383	-135.8
1.6	0.200	115.3	3.921	-14.2	0.135	-36.9	0.365	-142.3
1.7	0.200	102.9	3.724	-22.7	0.143	-43.1	0.349	-149.7
1.8	0.199	88.9	3.544	-31.1	0.152	-49.2	0.335	-156.6
1.9	0.202	75.8	3.400	-38.9	0.156	-55.4	0.322	-163.7
2.0	0.207	62.7	3.229	-47.3	0.162	-61.6	0.312	-171.0
2.1	0.216	49.7	3.095	-55.3	0.168	-68.4	0.296	-178.7
2.2	0.223	38.6	2.968	-63.7	0.174	-73.7	0.283	-173.5
2.3	0.233	28.1	2.860	-71.4	0.180	-80.5	0.272	-166.3
2.4	0.244	17.2	2.751	-79.4	0.187	-87.0	0.261	-158.1
2.5	0.254	6.4	2.652	-87.3	0.193	-92.9	0.247	-149.5
2.6	0.266	-2.5	2.567	-95.1	0.199	-99.3	0.238	-141.5
2.7	0.281	-11.9	2.471	-102.7	0.206	-105.5	0.228	-132.0
2.8	0.290	-20.6	2.392	-110.5	0.212	-112.9	0.221	-123.1
2.9	0.301	-29.6	2.321	-118.3	0.218	-118.4	0.209	-114.6
3.0	0.317	-37.3	2.251	-125.9	0.225	-125.7	0.203	-104.7

V_{CE} = 3 V, I_c = 10 mA, Z_o = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)
0.1	0.733	-29.0	21.168	152.6	0.019	22.5	0.956	-19.9
0.2	0.629	-52.2	18.320	130.8	0.033	55.6	0.842	-36.2
0.3	0.531	-73.1	15.647	112.6	0.046	47.9	0.739	-49.3
0.4	0.433	-91.9	13.294	96.9	0.046	38.3	0.638	-59.6
0.5	0.368	-107.2	11.506	83.8	0.049	39.7	0.564	-67.2
0.6	0.314	-122.4	9.992	71.9	0.065	28.2	0.514	-74.7
0.7	0.270	-137.0	8.802	61.3	0.068	23.4	0.469	-80.8
0.8	0.237	-152.3	7.864	51.2	0.073	15.0	0.432	-87.6
0.9	0.210	-165.9	7.091	41.6	0.085	11.8	0.408	-94.1
1.0	0.188	-178.6	6.459	32.4	0.090	6.1	0.386	-99.7
1.1	0.171	163.3	5.944	23.5	0.095	0.4	0.368	-106.8
1.2	0.160	148.5	5.495	15.0	0.108	-6.2	0.352	-113.0
1.3	0.160	133.4	5.104	6.4	0.110	-12.2	0.337	-119.9
1.4	0.153	117.1	4.780	-1.8	0.116	-18.5	0.323	-126.2
1.5	0.158	102.8	4.493	-9.9	0.123	-25.1	0.309	-133.5
1.6	0.163	89.3	4.226	-18.5	0.133	-30.2	0.298	-140.5
1.7	0.168	76.9	4.010	-26.2	0.142	-37.7	0.286	-148.0
1.8	0.175	64.2	3.788	-34.4	0.147	-42.9	0.277	-155.0
1.9	0.186	52.7	3.622	-41.8	0.150	-50.5	0.264	-162.5
2.0	0.196	41.6	3.433	-50.0	0.162	-56.5	0.253	-169.5
2.1	0.209	30.7	3.296	-57.9	0.168	-63.1	0.241	-177.5
2.2	0.220	20.8	3.152	-65.9	0.176	-69.6	0.230	-174.4
2.3	0.231	11.5	3.031	-73.5	0.180	-75.9	0.217	-166.3
2.4	0.245	2.5	2.913	-81.1	0.189	-82.3	0.209	-158.1
2.5	0.258	-6.2	2.803	-88.9	0.197	-89.4	0.197	-148.9
2.6	0.270	-14.0	2.711	-96.4	0.203	-96.1	0.188	-139.2
2.7	0.284	-22.6	2.615	-104.1	0.212	-101.9	0.177	-130.3
2.8	0.293	-30.2	2.529	-111.6	0.216	-108.9	0.172	-121.0
2.9	0.305	-38.8	2.453	-119.2	0.222	-115.3	0.161	-110.5
3.0	0.321	-45.8	2.367	-126.8	0.232	-122.2	0.154	-100.0

S-PARAMETERS Q2

V_{CE} = 3 V, I_c = 1 mA, Z_o = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)
0.1	0.970	-13.8	4.079	166.5	0.029	51.6	1.002	-9.5
0.2	0.946	-25.9	3.922	153.7	0.040	68.9	0.984	-19.3
0.3	0.926	-38.7	3.809	142.2	0.053	60.3	0.974	-29.0
0.4	0.902	-51.6	3.696	129.7	0.069	49.1	0.960	-38.3
0.5	0.878	-64.1	3.620	117.8	0.088	40.2	0.931	-47.3
0.6	0.847	-76.1	3.484	106.0	0.101	30.8	0.906	-56.1
0.7	0.802	-88.4	3.363	94.4	0.112	22.0	0.880	-64.7
0.8	0.769	-100.4	3.229	83.4	0.122	12.2	0.850	-73.5
0.9	0.737	-112.0	3.120	72.5	0.137	3.4	0.824	-82.0
1.0	0.700	-123.5	3.018	62.0	0.141	-4.9	0.794	-90.0
1.1	0.664	-135.2	2.897	51.5	0.151	-12.8	0.767	-98.2
1.2	0.633	-146.6	2.810	41.3	0.156	-21.6	0.738	-105.9
1.3	0.606	-158.3	2.706	31.3	0.164	-30.1	0.716	-113.9
1.4	0.574	-169.4	2.617	21.6	0.168	-37.7	0.690	-121.2
1.5	0.545	-179.3	2.519	11.9	0.173	-45.0	0.665	-129.1
1.6	0.526	167.4	2.445	1.9	0.179	-51.8	0.642	-136.5
1.7	0.500	156.0	2.361	-7.5	0.182	-58.7	0.623	-144.4
1.8	0.479	144.8	2.291	-16.5	0.184	-65.7	0.601	-151.9
1.9	0.464	133.0	2.224	-25.9	0.188	-73.4	0.580	-159.2
2.0	0.445	121.5	2.152	-35.1	0.192	-79.5	0.568	-166.5
2.1	0.428	109.3	2.091	-44.2	0.191	-87.0	0.543	-173.5
2.2	0.418	98.5	2.028	-53.4	0.194	-92.4	0.532	-178.7
2.3	0.408	87.2	1.970	-62.0	0.196	-99.0	0.511	-171.2
2.4	0.401	75.6	1.916	-70.8	0.197	-105.2	0.498	-163.5
2.5	0.392	64.4	1.862	-79.5	0.200	-111.9	0.482	-155.8
2.6	0.393	52.9	1.814	-88.1	0.202	-117.3	0.469	-147.8
2.7	0.388	42.2	1.763	-96.8	0.204	-122.7	0.456	-139.9
2.8	0.387	32.0	1.715	-105.1	0.207	-129.6	0.444	-132.4
2.9	0.385	21.2	1.671	-113.3	0.207	-135.3	0.430	-124.4
3.0	0.387	10.9	1.628	-121.8	0.210	-140.8	0.421	-116.1

V_{CE} = 3 V, I_c = 3 mA, Z_o = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)
0.1	0.884	-18.2	9.862	161.4	0.025	51.3	0.990	-13.2
0.2	0.854	-34.8	9.160	145.9	0.033	71.8	0.950	-25.5
0.3	0.811	-50.9	8.603	131.2	0.056	47.3	0.914	-37.0
0.4	0.747	-66.6	8.001	116.6	0.057	44.8	0.853	-48.2
0.5	0.695	-81.2	7.497	103.4	0.075	36.0	0.798	-58.0
0.6	0.631	-94.9	6.889	90.5	0.083	28.0	0.739	-66.8
0.7	0.575	-108.5	6.360	78.5	0.087	18.2	0.692	-75.3
0.8	0.531	-121.2	5.887	67.6	0.099	9.6	0.648	-83.3
0.9	0.484	-133.6	5.475	57.0	0.102	1.8	0.609	-91.3
1.0	0.449	-145.6	5.118	46.6	0.106	-3.9	0.574	-98.2
1.1	0.414	-158.0	4.781	36.7	0.113	-9.9	0.543	-105.7
1.2	0.386	-169.8	4.498	27.2	0.121	-18.4	0.516	-112.7
1.3	0.362	178.3	4.232	17.9	0.127	-22.6	0.493	-119.6
1.4	0.339	166.5	4.008	8.9	0.131	-29.9	0.468	-126.5
1.5	0.324	154.5	3.795	-0.1	0.135	-35.5	0.448	-133.2
1.6	0.309	142.0	3.602	-9.0	0.141	-41.7	0.429	-140.5
1.7	0.301	130.0	3.440	-17.7	0.149	-48.2	0.413	-147.4
1.8	0.286	118.9	3.274	-25.9	0.150	-54.2	0.392	-153.8
1.9	0.280	106.7	3.143	-34.6	0.157	-59.9	0.379	-160.8
2.0	0.277	94.6	3.014	-43.0	0.162	-65.5	0.364	-167.8
2.1	0.274	82.5	2.893	-51.3	0.166	-73.1	0.346	-174.6
2.2	0.273	71.2	2.788	-59.7	0.174	-78.3	0.334	-177.5
2.3	0.276	60.5	2.685	-67.7	0.178	-84.6	0.319	-170.4
2.4	0.276	49.5	2.587	-75.9	0.182	-90.5	0.305	-163.3
2.5	0.279	38.2	2.502	-83.9	0.189	-96.3	0.292	-155.4
2.6	0.287	28.6	2.423	-91.9	0.193	-102.4	0.279	-147.8
2.7	0.289	17.9	2.350	-99.9	0.201	-108.7	0.267	-139.4
2.8	0.297	8.4	2.273	-107.8	0.207	-115.0	0.257	-131.4
2.9	0.303	-0.8	2.208	-115.5	0.210	-120.8	0.243	-123.9
3.0	0.313	-10.1	2.145	-123.3	0.220	-127.3	0.235	-114.8

V_{CE} = 3 V, I_C = 5 mA, Z_O = 50 Ω

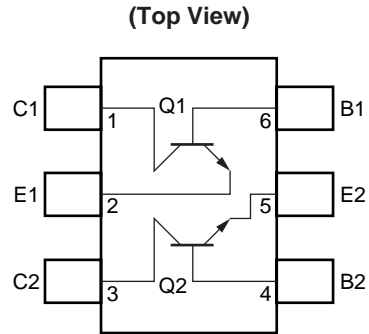
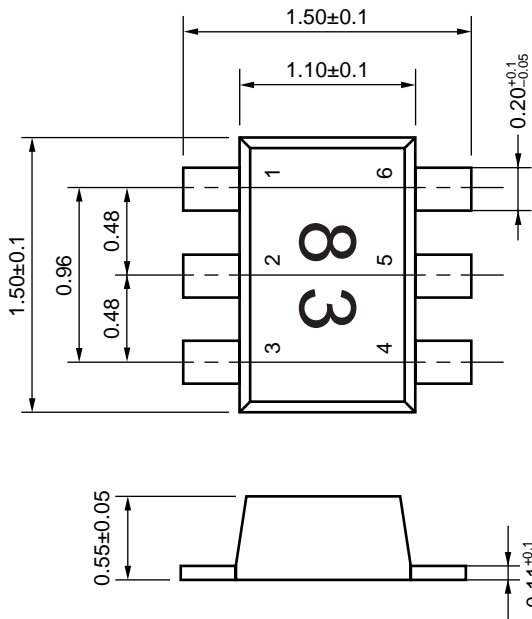
Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)
0.1	0.844	-22.4	13.863	158.4	0.032	25.1	0.989	-16.2
0.2	0.781	-41.1	12.602	140.6	0.032	63.4	0.916	-29.6
0.3	0.714	-58.5	11.489	124.4	0.046	50.1	0.846	-42.4
0.4	0.635	-76.3	10.332	108.8	0.057	42.6	0.775	-53.2
0.5	0.573	-91.3	9.395	95.1	0.062	33.1	0.696	-62.8
0.6	0.506	-105.5	8.394	82.7	0.072	28.2	0.642	-71.0
0.7	0.454	-119.5	7.618	71.0	0.077	18.4	0.591	-78.8
0.8	0.406	-132.3	6.913	60.0	0.084	10.4	0.548	-85.6
0.9	0.371	-144.2	6.330	50.2	0.093	8.1	0.512	-92.9
1.0	0.340	-156.8	5.828	40.4	0.099	-0.7	0.480	-99.8
1.1	0.310	-169.6	5.402	30.8	0.102	-5.6	0.453	-106.5
1.2	0.286	179.3	5.038	21.9	0.108	-12.4	0.429	-112.6
1.3	0.273	166.3	4.710	12.9	0.116	-17.8	0.411	-119.6
1.4	0.257	154.4	4.429	4.3	0.120	-24.7	0.391	-125.9
1.5	0.248	141.9	4.176	-4.2	0.130	-29.9	0.373	-132.9
1.6	0.238	129.3	3.957	-12.9	0.133	-36.7	0.355	-138.9
1.7	0.236	117.4	3.764	-21.2	0.141	-42.0	0.340	-146.5
1.8	0.232	105.0	3.582	-29.4	0.146	-48.4	0.329	-152.7
1.9	0.233	93.6	3.431	-37.6	0.154	-54.6	0.314	-159.6
2.0	0.229	81.8	3.262	-45.5	0.162	-60.1	0.301	-166.4
2.1	0.233	69.7	3.133	-53.7	0.165	-67.4	0.284	-173.4
2.2	0.236	59.9	3.007	-61.9	0.174	-72.8	0.272	-179.8
2.3	0.242	48.8	2.896	-69.6	0.180	-79.0	0.255	-171.7
2.4	0.246	38.0	2.793	-77.6	0.185	-85.5	0.246	-165.3
2.5	0.250	28.1	2.688	-85.3	0.191	-92.6	0.234	-157.2
2.6	0.262	18.8	2.606	-93.3	0.199	-98.4	0.222	-149.1
2.7	0.271	8.8	2.530	-101.1	0.205	-104.1	0.211	-140.4
2.8	0.279	0.1	2.447	-108.7	0.212	-111.3	0.201	-132.6
2.9	0.289	-9.4	2.366	-116.8	0.217	-117.1	0.187	-124.7
3.0	0.299	-17.6	2.298	-124.2	0.224	-123.5	0.181	-115.3

V_{CE} = 3 V, I_C = 10 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)
0.1	0.722	-28.8	21.436	152.5	0.023	23.1	0.955	-21.3
0.2	0.625	-52.9	18.522	130.8	0.036	60.5	0.836	-36.4
0.3	0.535	-73.7	15.755	112.8	0.038	46.3	0.726	-49.2
0.4	0.443	-91.6	13.325	97.0	0.047	41.9	0.630	-58.7
0.5	0.388	-108.2	11.605	83.9	0.052	33.9	0.555	-66.8
0.6	0.330	-121.2	10.044	72.5	0.062	32.8	0.506	-73.1
0.7	0.291	-136.6	8.855	61.4	0.066	21.3	0.461	-79.8
0.8	0.263	-149.1	7.909	51.6	0.075	15.9	0.424	-85.8
0.9	0.236	-162.4	7.131	42.3	0.083	12.1	0.402	-91.8
1.0	0.215	-175.4	6.521	33.2	0.088	7.1	0.375	-97.2
1.1	0.205	171.2	5.982	24.4	0.095	0.2	0.356	-103.4
1.2	0.194	157.8	5.546	15.9	0.102	-5.7	0.337	-109.3
1.3	0.187	145.7	5.160	7.6	0.110	-10.8	0.323	-116.2
1.4	0.182	133.0	4.823	-0.6	0.116	-18.0	0.308	-121.3
1.5	0.183	120.7	4.518	-8.8	0.123	-23.1	0.299	-128.5
1.6	0.182	108.1	4.283	-16.8	0.128	-30.1	0.281	-134.7
1.7	0.185	97.0	4.049	-24.7	0.140	-35.9	0.271	-142.0
1.8	0.188	85.5	3.842	-32.6	0.145	-41.3	0.259	-148.0
1.9	0.196	74.2	3.670	-40.4	0.151	-48.9	0.246	-154.8
2.0	0.202	64.0	3.508	-48.5	0.160	-55.0	0.234	-161.9
2.1	0.207	53.0	3.356	-56.2	0.167	-62.4	0.222	-168.6
2.2	0.215	43.4	3.207	-64.3	0.173	-68.3	0.210	-175.6
2.3	0.225	34.3	3.092	-71.8	0.182	-74.4	0.195	-176.5
2.4	0.233	24.5	2.977	-79.4	0.189	-81.1	0.187	-169.8
2.5	0.240	15.2	2.869	-87.0	0.195	-87.5	0.173	-161.8
2.6	0.254	6.7	2.764	-94.8	0.202	-94.5	0.161	-152.6
2.7	0.263	-1.8	2.669	-102.3	0.209	-100.5	0.150	-144.6
2.8	0.274	-10.0	2.587	-109.9	0.218	-107.5	0.140	-136.2
2.9	0.282	-18.0	2.507	-117.3	0.223	-113.3	0.124	-128.6
3.0	0.292	-26.1	2.432	-125.0	0.231	-120.3	0.119	-118.4

PACKAGE DIMENSIONS

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



PIN CONNECTIONS

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

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