
2SC4592

Silicon NPN Epitaxial

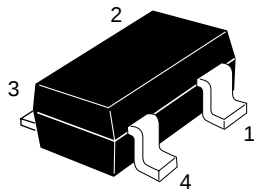
HITACHI

Application

UHF / VHF wide band amplifier

Outline

MPAK-4



- 1. Collector
- 2. Emitter
- 3. Base
- 4. Emitter

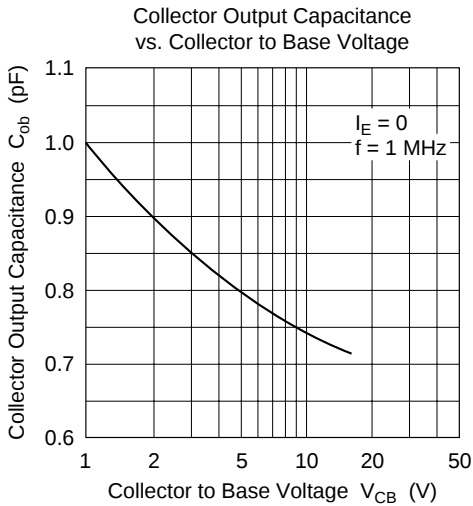
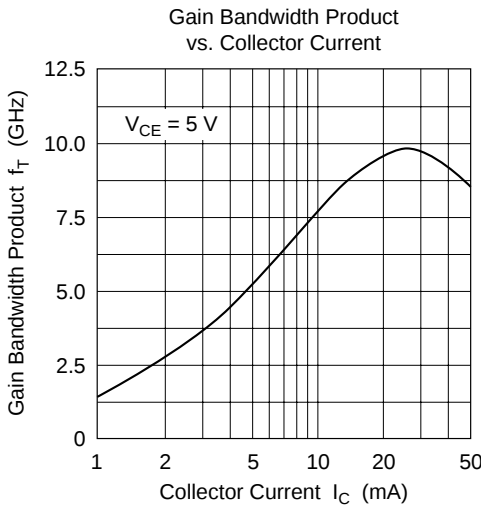
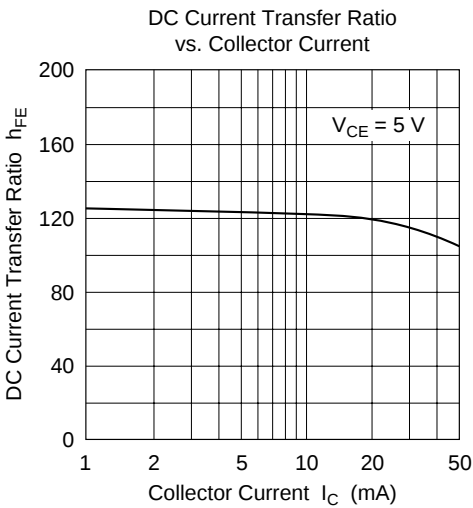
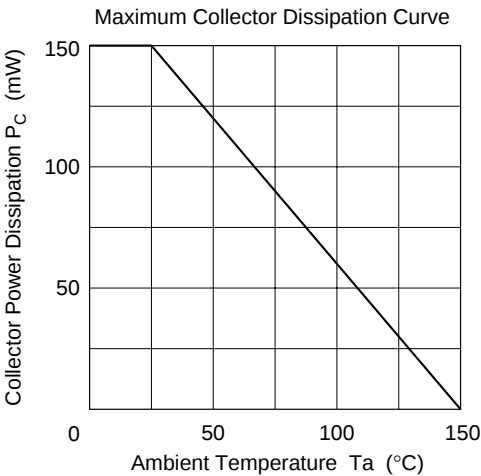
Absolute Maximum Ratings (Ta = 25°C)

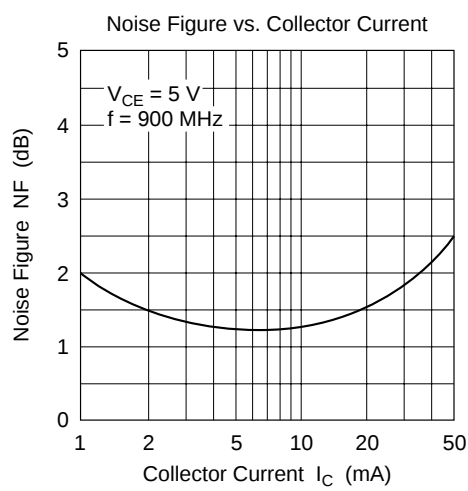
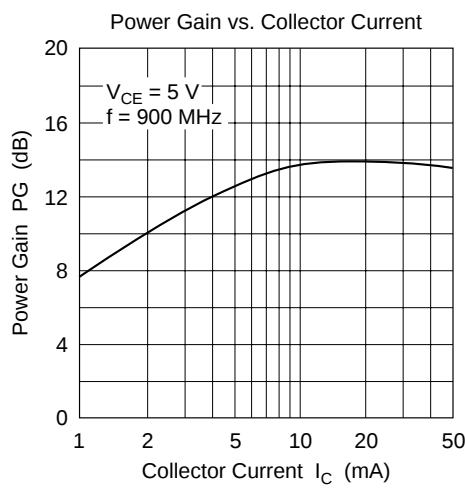
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	9	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	50	mA
Collector power dissipation	P_C	150	mW
Junction temperature	T_j	150	°C
Storage temperature	Tstg	−55 to +150	°C

Electrical Characteristics (Ta = 25°C)

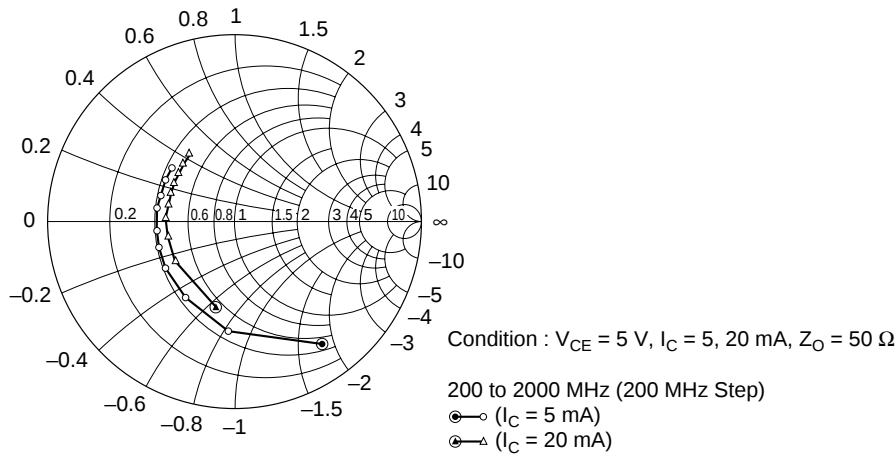
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	15	—	—	V	$I_C = 10\text{ }\mu\text{A}$, $I_E = 0$
Collector cutoff current	I_{CBO}	—	—	1	μA	$V_{CB} = 12\text{ V}$, $I_E = 0$
	I_{CEO}	—	—	1	mA	$V_{CE} = 9\text{ V}$, $R_{BE} = \infty$
Emitter cutoff current	I_{EBO}	—	—	10	μA	$V_{EB} = 1.5\text{ V}$, $I_C = 0$
DC current transfer ratio	h_{FE}	40	120	250		$V_{CE} = 5\text{ V}$, $I_C = 20\text{ mA}$
Collector output capacitance	Cob	—	0.8	1.5	pF	$V_{CB} = 5\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$
Gain bandwidth product	f_T	7.0	9.5	—	GHz	$V_{CE} = 5\text{ V}$, $I_C = 20\text{ mA}$
Power gain	PG	11.0	14.0	—	dB	$V_{CE} = 5\text{ V}$, $I_C = 20\text{ mA}$, $f = 900\text{ MHz}$
Noise figure	NF	—	1.2	2.5	dB	$V_{CE} = 5\text{ V}$, $I_C = 5\text{ mA}$, $f = 900\text{ MHz}$

Note: Marking is “XN—”.

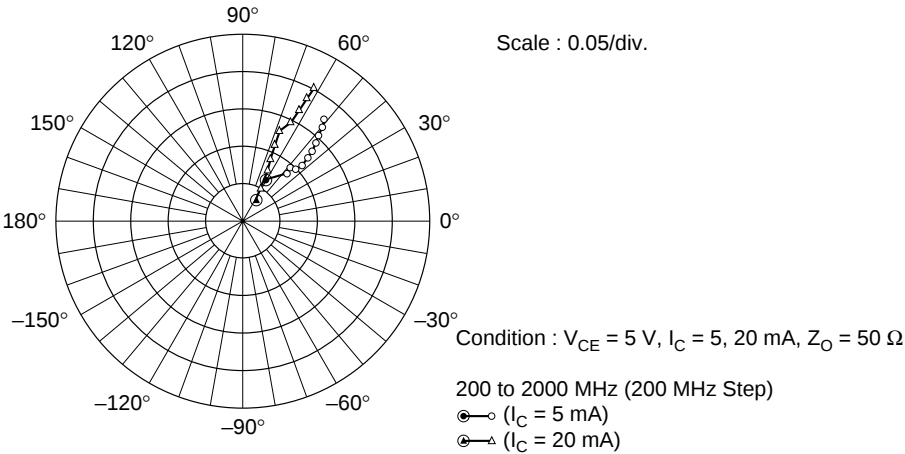




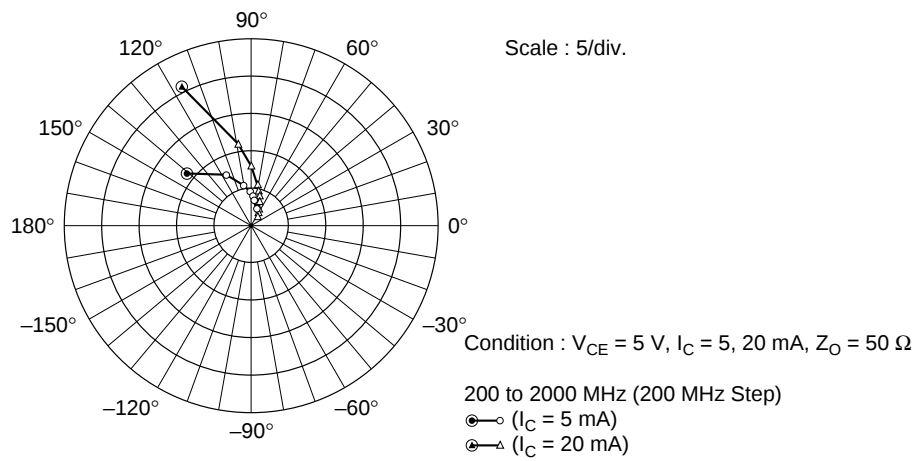
S11-Parameter vs. Frequency



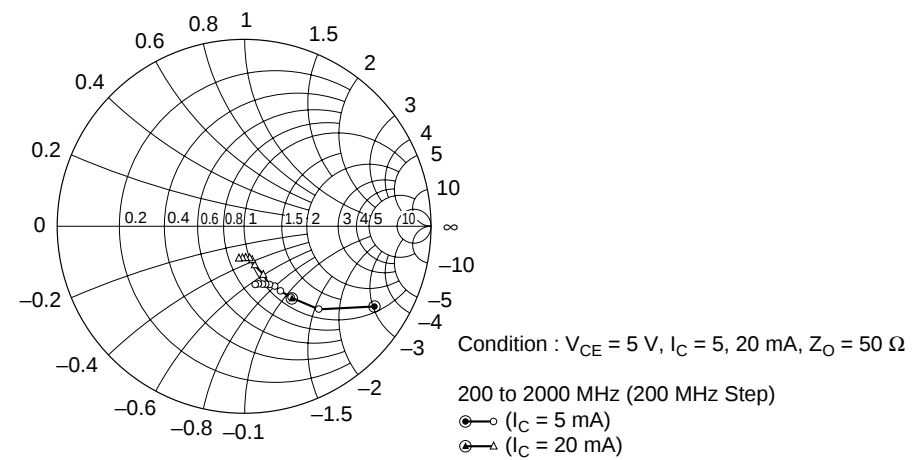
S12-Parameter vs. Frequency



S21-Parameter vs. Frequency



S22-Parameter vs. Frequency



S Parameter (V_{CE} = 5 V, I_C = 5 mA, Z_O = 50 Ω)

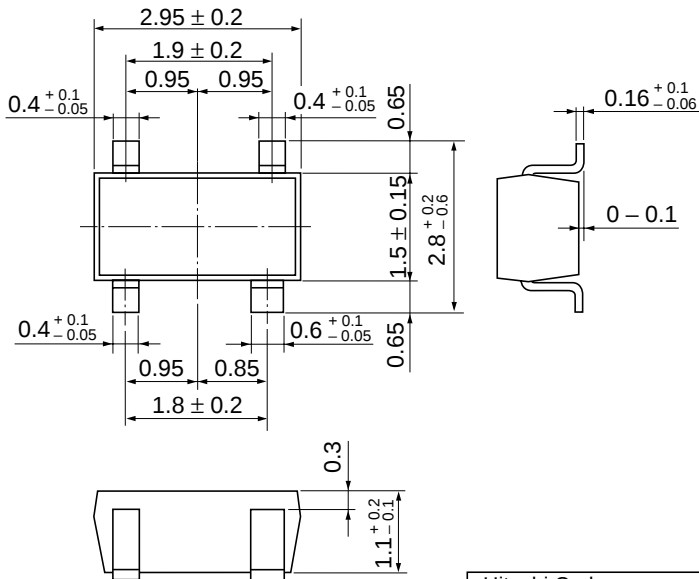
Freq. (MHz)	S11		S21		S12		S22	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
100	0.893	−28.8	12.428	159.3	0.034	74.2	0.939	−17.2
200	0.788	−54.8	10.823	141.1	0.058	61.4	0.819	−31.5
300	0.693	−76.3	9.118	127.1	0.076	52.8	0.699	−41.8
400	0.603	−94.1	7.714	116.9	0.087	47.9	0.602	−48.5
500	0.542	−110.1	6.565	108.8	0.094	45.3	0.531	−52.8
600	0.507	−122.6	5.693	102.5	0.100	44.0	0.478	−55.9
700	0.472	−133.8	5.002	96.9	0.105	43.2	0.437	−58.5
800	0.454	−144.1	4.477	92.3	0.110	42.8	0.405	−60.8
900	0.443	−152.1	4.001	88.2	0.115	43.3	0.382	−62.5
1000	0.436	−160.1	3.660	84.2	0.119	44.1	0.363	−64.3
1100	0.423	−167.8	3.372	80.9	0.124	44.6	0.350	−65.9
1200	0.420	−174.8	3.100	77.7	0.129	45.5	0.340	−66.8
1300	0.419	178.6	2.882	74.7	0.134	46.4	0.336	−68.2
1400	0.420	172.4	2.703	71.8	0.139	46.9	0.328	−69.9
1500	0.419	166.2	2.542	69.3	0.144	47.9	0.323	−71.3
1600	0.423	161.8	2.392	66.3	0.150	48.5	0.320	−72.0
1700	0.422	156.4	2.270	63.9	0.155	49.0	0.317	−74.2
1800	0.433	151.3	2.149	61.6	0.161	49.5	0.316	−76.0
1900	0.432	147.3	2.050	59.5	0.167	50.1	0.315	−77.4
2000	0.442	142.5	1.958	56.9	0.174	50.6	0.315	−79.0

2SC4592

S Parameter (V_{CE} = 5 V, I_C = 20 mA, Z_O = 50 Ω)

Freq. (MHz)	S11		S21		S12		S22	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
100	0.619	−64.2	31.361	137.5	0.025	63.5	0.729	−39.2
200	0.475	−104.2	20.515	116.0	0.036	56.8	0.483	−57.2
300	0.417	−128.3	14.505	105.1	0.045	57.8	0.356	−65.2
400	0.385	−145.2	11.189	98.3	0.054	60.1	0.287	−69.2
500	0.374	−157.4	9.053	93.4	0.063	61.6	0.245	−71.9
600	0.367	−166.9	7.608	89.6	0.072	62.8	0.220	−73.8
700	0.367	−175.4	6.547	86.1	0.081	64.1	0.201	−75.5
800	0.366	177.2	5.773	83.0	0.090	64.7	0.189	−77.2
900	0.369	172.0	5.121	80.6	0.100	64.9	0.181	−78.4
1000	0.368	166.2	4.632	77.9	0.109	65.1	0.175	−80.1
1100	0.369	160.6	4.238	75.3	0.119	65.3	0.171	−81.2
1200	0.373	155.7	3.897	73.2	0.128	65.1	0.168	−82.7
1300	0.377	151.2	3.616	71.0	0.137	65.1	0.167	−84.2
1400	0.382	146.9	3.369	68.8	0.147	64.5	0.167	−85.7
1500	0.384	142.1	3.154	66.8	0.156	64.1	0.168	−87.1
1600	0.386	138.7	2.960	64.5	0.166	63.5	0.168	−88.3
1700	0.391	133.7	2.803	62.9	0.175	63.0	0.169	−89.9
1800	0.401	130.6	2.662	60.6	0.185	62.4	0.171	−91.5
1900	0.405	127.4	2.533	59.1	0.193	61.7	0.172	−92.6
2000	0.408	12.8	2.416	57.0	0.202	61.1	0.175	−94.1

Unit: mm



Hitachi Code	MPAK-4
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.013 g

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