
2SC5080

Silicon NPN Epitaxial

HITACHI

Application

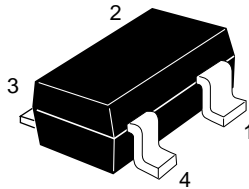
VHF / UHF wide band amplifier

Features

- High gain bandwidth product
 $f_T = 13.5 \text{ GHz Typ}$
- High gain, low noise figure
 $PG = 18 \text{ dB Typ}$, $NF = 1.1 \text{ dB Typ}$ at $f = 900 \text{ MHz}$

Outline

MPAK-4



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

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Item	Symbol	Rated	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	8	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	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

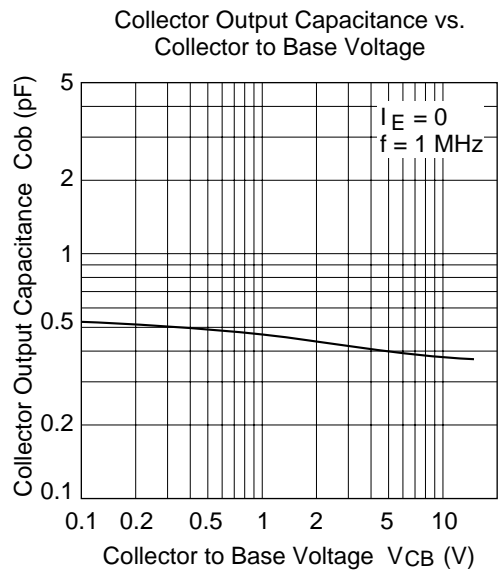
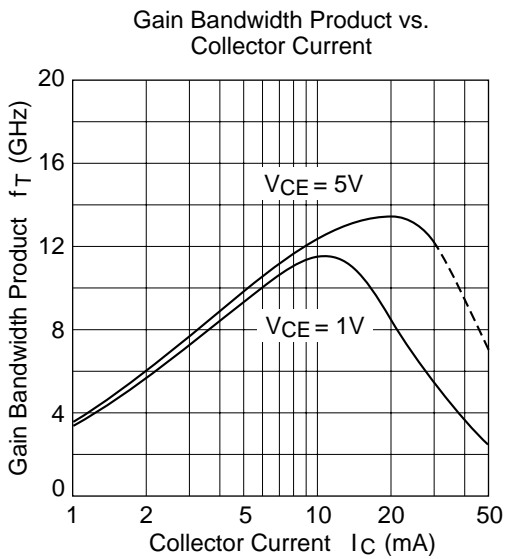
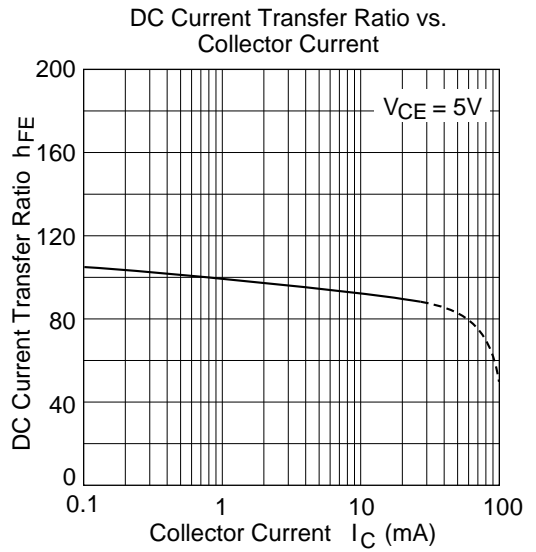
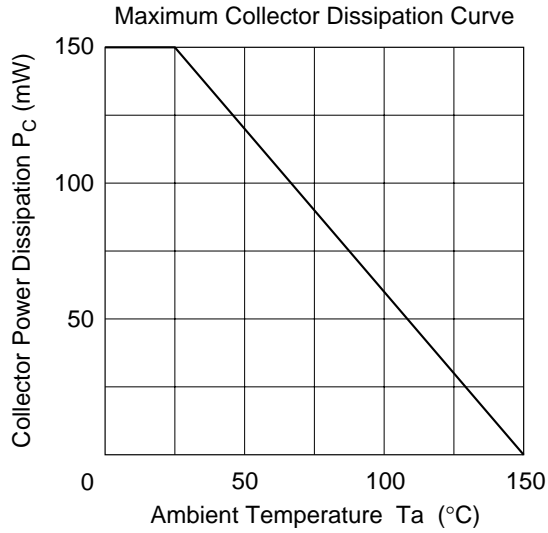
Electrical Characteristics ($T_a = 25^\circ\text{C}$)

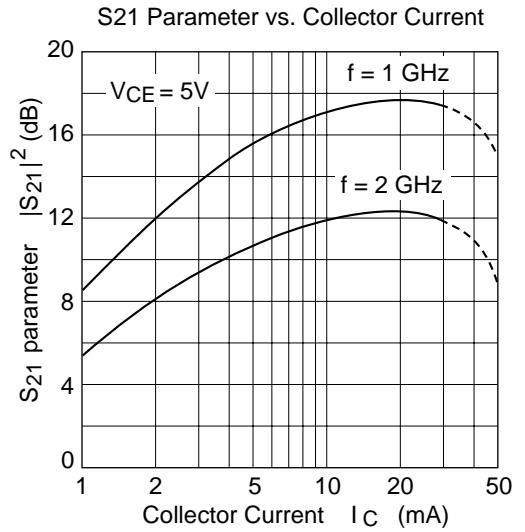
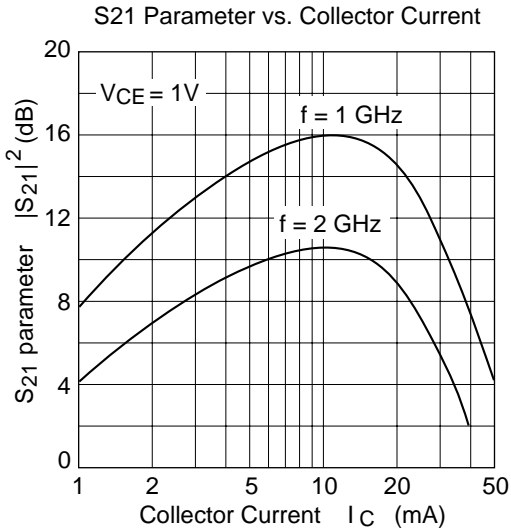
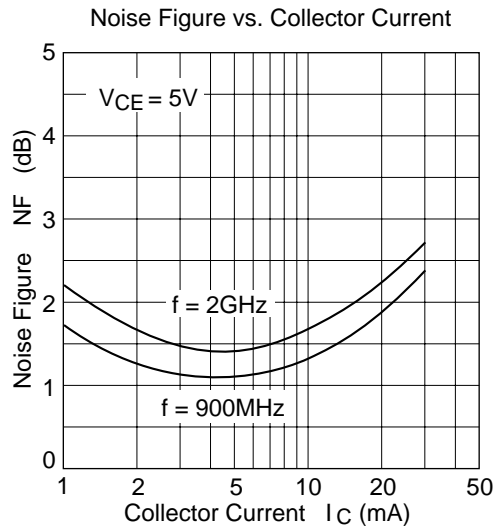
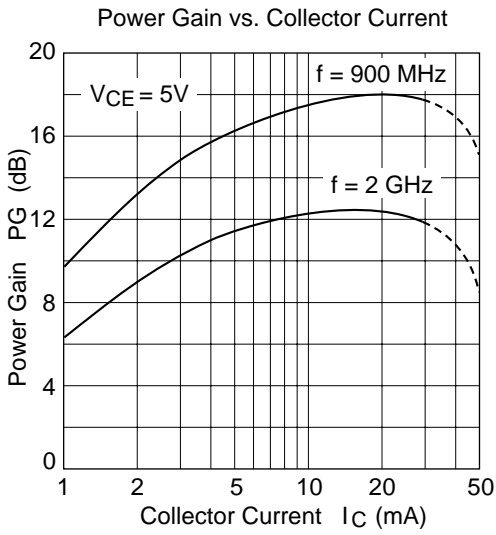
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(\text{BR})\text{CBO}}$	15	—	—	V	$I_{\text{C}} = 10 \mu\text{A}$, $I_{\text{E}} = 0$
Collector cutoff current	I_{CBO}	—	—	1	μA	$V_{\text{CB}} = 12 \text{ V}$, $I_{\text{E}} = 0$
	I_{CEO}	—	—	1	mA	$V_{\text{CE}} = 8 \text{ V}$, $R_{\text{BE}} = \infty$
Emitter cutoff current	I_{EBO}	—	—	10	μA	$V_{\text{EB}} = 1.5 \text{ V}$, $I_{\text{C}} = 0$
DC current transfer ratio	h_{FE}	50	90	160		$V_{\text{CE}} = 5 \text{ V}$, $I_{\text{C}} = 20 \text{ mA}$
Collector output capacitance	C_{ob}	—	0.4	0.75	pF	$V_{\text{CB}} = 5 \text{ V}$, $I_{\text{E}} = 0$, $f = 1 \text{ MHz}$
Gain bandwidth product	f_{T}	10.5	13.5	—	GHz	$V_{\text{CE}} = 5 \text{ V}$, $I_{\text{C}} = 20 \text{ mA}$
Power gain	PG	15	18	—	dB	$V_{\text{CE}} = 5 \text{ V}$, $I_{\text{C}} = 20 \text{ mA}$, $f = 900 \text{ MHz}$
Noise figure	NF	—	1.1	2.0	dB	$V_{\text{CE}} = 5 \text{ V}$, $I_{\text{C}} = 5 \text{ mA}$, $f = 900 \text{ MHz}$

Note: Marking is "ZD-".

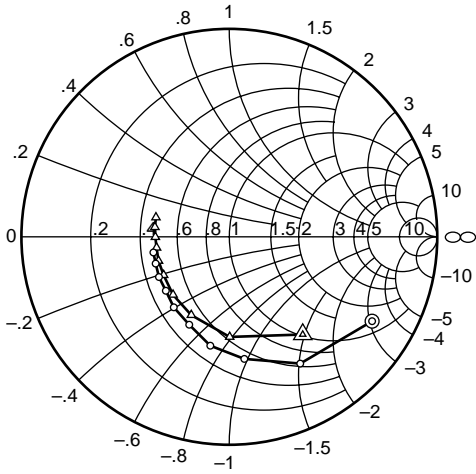
Attention: This device is very sensitive to electro static discharge.

It is recommended to adopt appropriate cautions when handling this transistor.



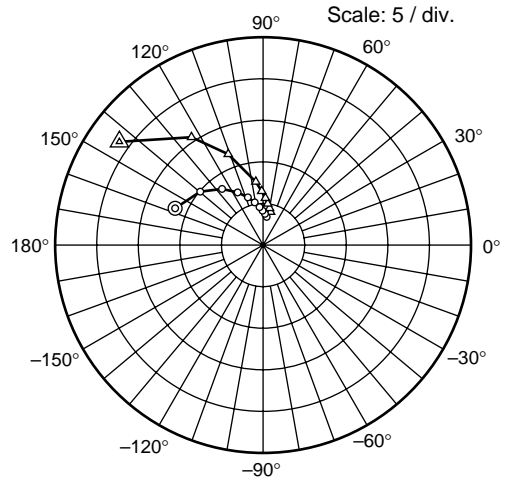


S11 Parameter vs. Frequency



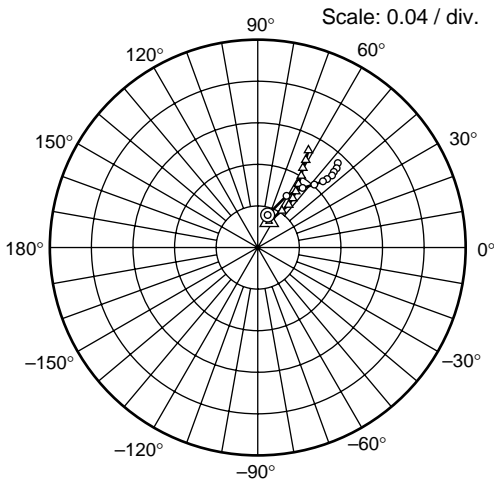
Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)
 ○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 20\text{ mA}$)

S21 Parameter vs. Frequency



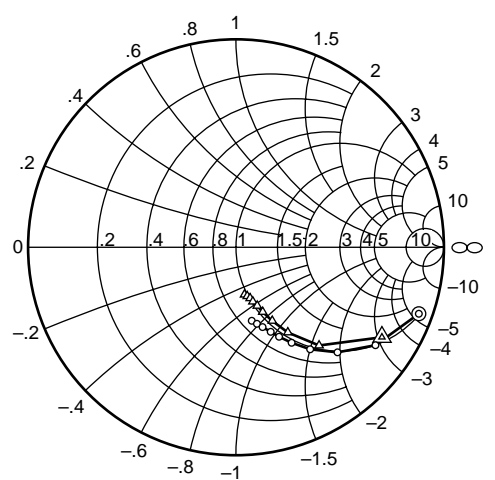
Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)
 ○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 20\text{ mA}$)

S12 Parameter vs. Frequency



Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)
 ○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 20\text{ mA}$)

S22 Parameter vs. Frequency



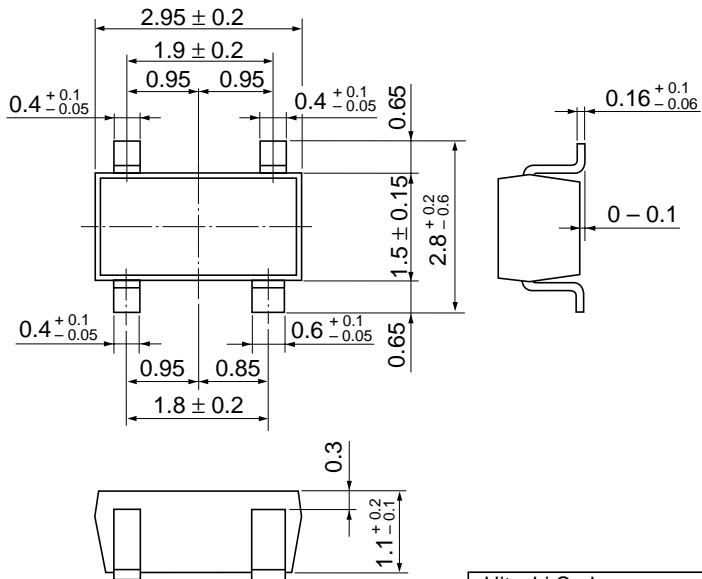
Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)
 ○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 20\text{ mA}$)

S Parameters ($V_{CE} = 5 \text{ V}$, $I_C = 5 \text{ mA}$, $Z_O = 50 \Omega$)

Freq. (MHz)	S11		S21		S12		S22	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.798	-30.8	11.47	157.3	0.0329	73.0	0.936	-20.0
400	0.699	-60.8	9.88	139.6	0.0570	60.8	0.820	-35.1
600	0.592	-83.0	8.35	126.1	0.0718	53.0	0.703	-46.0
800	0.532	-99.9	7.03	115.7	0.0817	48.0	0.607	-54.0
1000	0.465	-114.5	6.02	107.6	0.0891	45.4	0.532	-59.8
1200	0.432	-128.2	5.23	101.0	0.0939	44.6	0.478	-64.3
1400	0.401	-139.6	4.58	95.2	0.0993	44.1	0.440	-67.7
1600	0.390	-150.2	4.14	90.7	0.103	44.8	0.405	-71.6
1800	0.373	-160.5	3.76	86.4	0.108	45.1	0.382	-74.7
2000	0.373	-168.3	3.42	82.6	0.112	46.5	0.362	-77.9

S Parameters ($V_{CE} = 5 \text{ V}$, $I_C = 20 \text{ mA}$, $Z_O = 50 \Omega$)

Freq. (MHz)	S11		S21		S12		S22	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.588	-53.1	21.24	144.3	0.0275	66.3	0.826	-31.8
400	0.482	-89.8	15.59	123.6	0.0423	56.6	0.619	-49.8
600	0.419	-115.9	11.75	111.0	0.0507	53.9	0.480	-58.7
800	0.389	-134.1	9.29	102.4	0.0581	54.5	0.395	-63.8
1000	0.366	-149.7	7.64	96.5	0.0652	55.8	0.337	-67.6
1200	0.365	-161.9	6.47	91.4	0.0726	57.3	0.300	-70.1
1400	0.354	-171.4	5.63	97.1	0.0806	58.7	0.274	-72.8
1600	0.356	-179.7	4.98	83.5	0.0877	60.4	0.255	-74.6
1800	0.361	172.7	4.48	79.9	0.0959	61.2	0.242	-77.1
2000	0.365	165.3	4.06	77.0	0.105	62.4	0.232	-79.9



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

Cautions

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