

2SC4926

Silicon NPN Epitaxial

HITACHI

ADE-208-1128A (Z)
2nd. Edition
Mar. 2001

Application

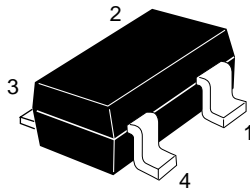
VHF / UHF wide band amplifier

Features

- High gain bandwidth product
 $f_T = 11 \text{ GHz Typ}$
- High gain, low noise figure
 $PG = 16.5 \text{ dB Typ}$, $NF = 1.1 \text{ dB Typ}$ at $f = 900 \text{ MHz}$

Outline

MPAK-4



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

Note: Marking is "YD-".

Attention: This is electrostatic sensitive device.

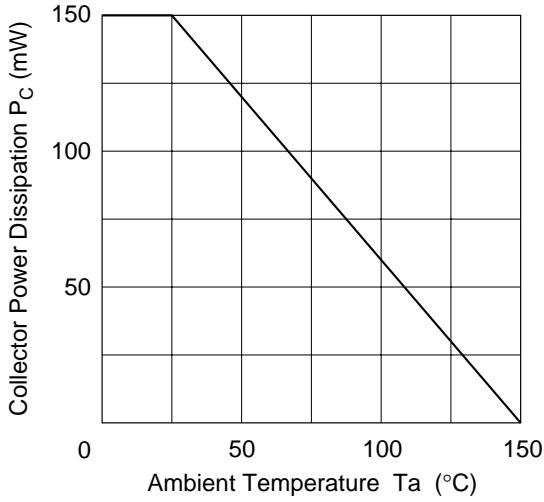
Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

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	$^\circ\text{C}$

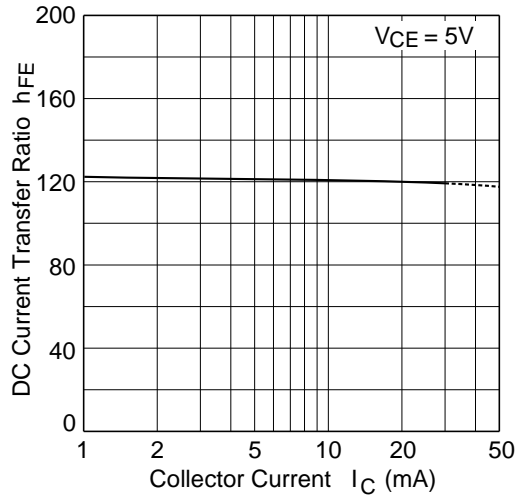
Electrical Characteristics ($T_a = 25^\circ\text{C}$)

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}	—	—	10	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	120	250		$V_{\text{CE}} = 5 \text{ V}$, $I_{\text{C}} = 20 \text{ mA}$
Collector output capacitance	C_{ob}	—	0.6	1.1	pF	$V_{\text{CB}} = 5 \text{ V}$, $I_{\text{E}} = 0$, $f = 1 \text{ MHz}$
Gain bandwidth product	f_{T}	8.0	11.0	—	GHz	$V_{\text{CE}} = 5 \text{ V}$, $I_{\text{C}} = 20 \text{ mA}$
S_{21} Parameter	$ S_{21} $	—	16	—	dB	$V_{\text{CE}} = 5 \text{ V}$, $I_{\text{C}} = 20 \text{ mA}$, $f = 1000 \text{ MHz}$
Power gain	PG	13.5	16.5	—	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	$V_{\text{CE}} = 5 \text{ V}$, $I_{\text{C}} = 5 \text{ mA}$, $f = 900 \text{ MHz}$

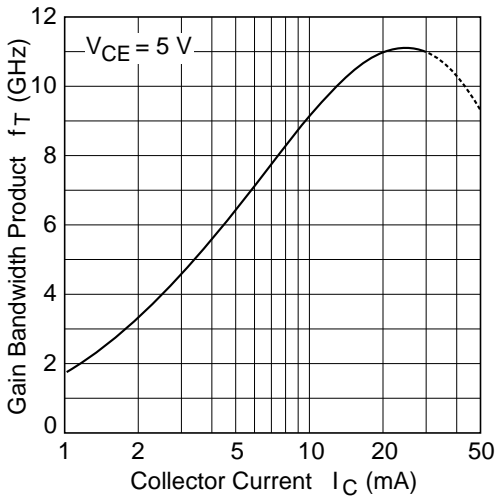
Maximum Collector Dissipation Curve



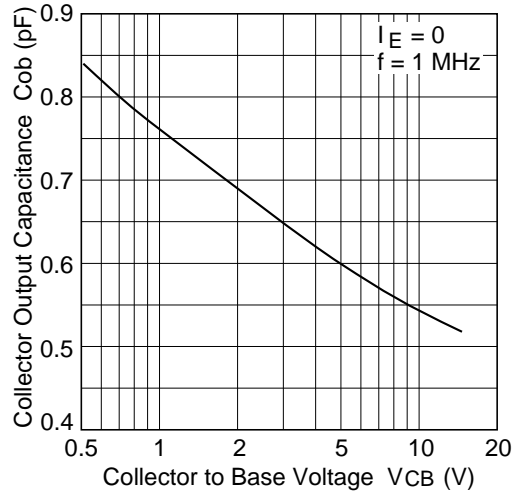
DC Current Transfer Ratio vs. Collector Current



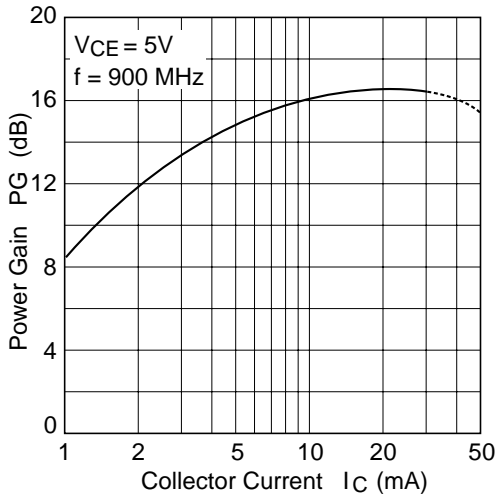
Gain Bandwidth Product vs. Collector Current



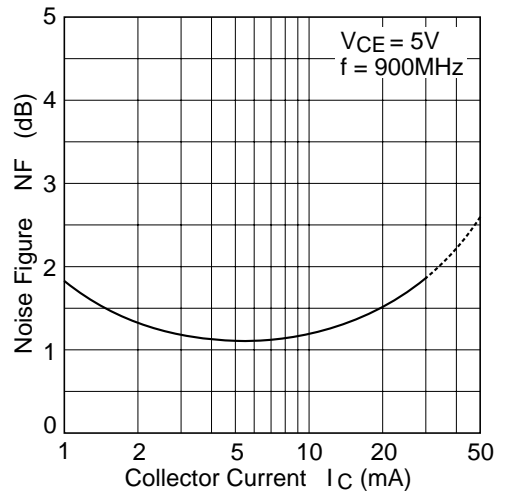
Collector Output Capacitance vs. Collector to Base Voltage



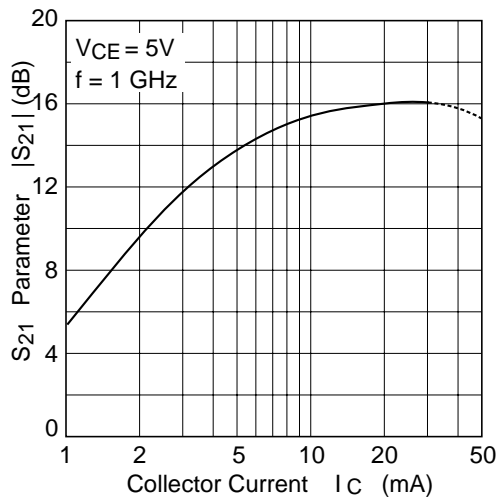
Power Gain vs. Collector Current



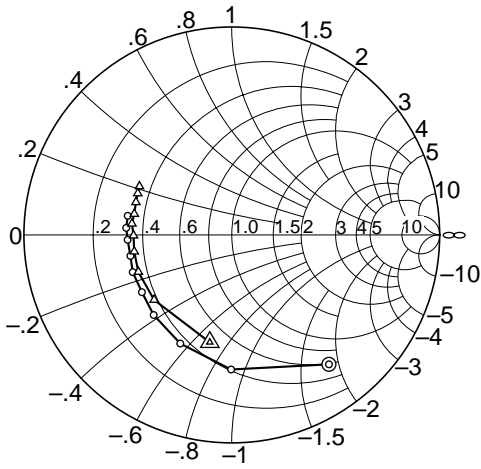
Noise Figure vs. Collector Current



S21 Parameter vs. Collector Current

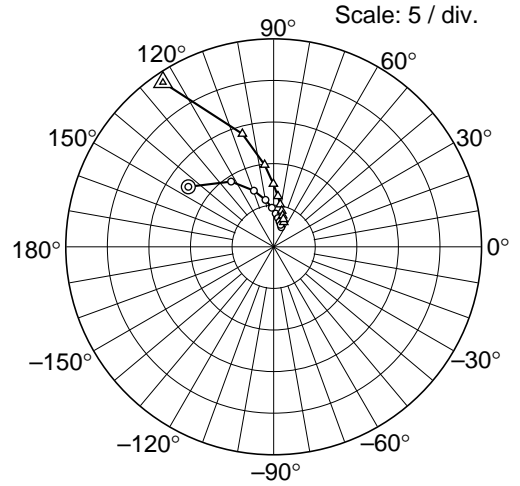


S11 Parameter vs. Frequency



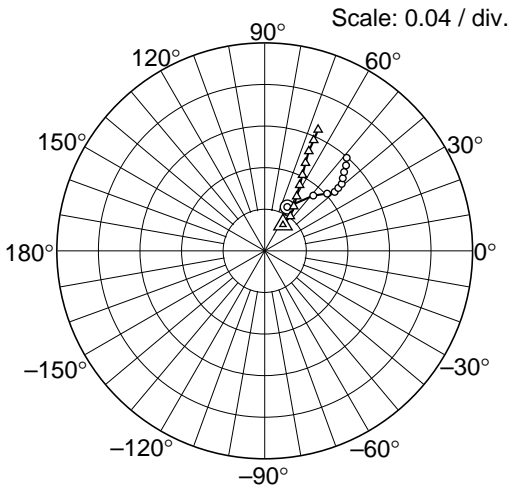
Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)
 ○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 20\text{ mA}$)

S21 Parameter vs. Frequency



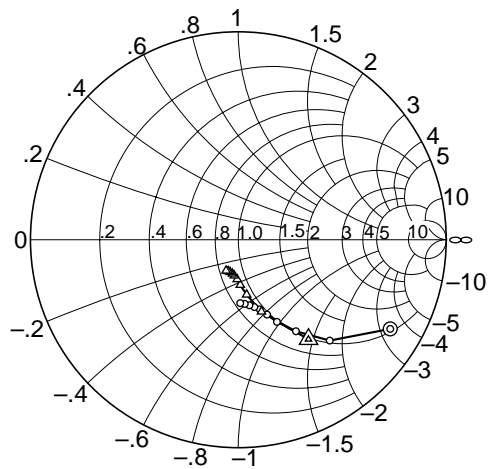
Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)
 ○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 20\text{ mA}$)

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)
 ○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 20\text{ mA}$)

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

Freq. (MHz)	S11		S21		S12		S22	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.777	-53.1	12.52	144.9	0.0475	62.8	0.849	-30.4
400	0.647	-90.3	9.36	123.1	0.0708	48.7	0.655	-47.8
600	0.579	-115.4	7.16	109.4	0.0817	42.5	0.522	-57.8
800	0.538	-134.3	5.73	99.9	0.0880	40.1	0.438	-64.8
1000	0.513	-147.5	4.70	92.6	0.0933	40.5	0.386	-69.0
1200	0.508	-159.4	4.00	86.5	0.0980	41.0	0.350	-72.9
1400	0.500	-168.3	3.49	81.6	0.102	42.9	0.333	-76.6
1600	0.501	-177.3	3.09	76.8	0.108	44.8	0.319	-80.4
1800	0.508	176.2	2.78	72.5	0.113	46.4	0.310	-84.3
2000	0.510	169.6	2.53	68.7	0.119	48.6	0.305	-88.3

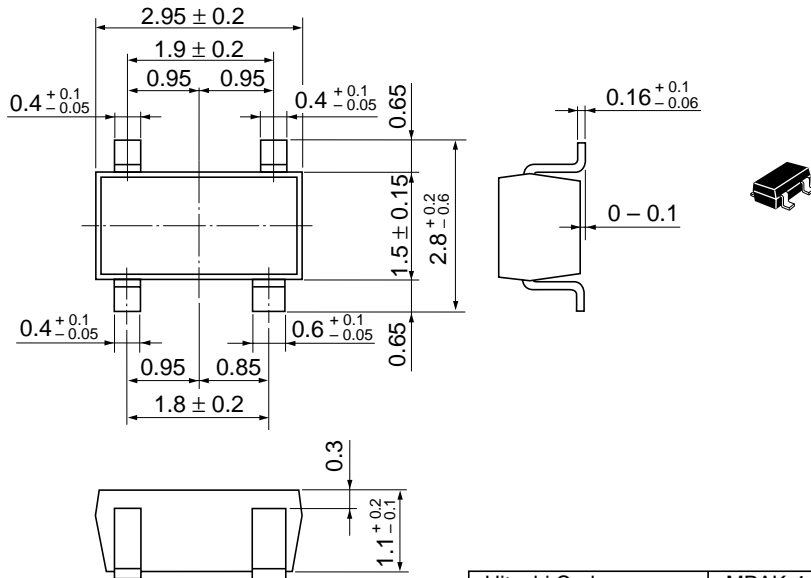
S Parameter ($V_{CE} = 5 \text{ V}$, $I_C = 20 \text{ mA}$, $Z_O = 50 \Omega$, Emitter common)

Freq. (MHz)	S11		S21		S12		S22	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.527	-101.6	23.79	124.0	0.0307	55.1	0.587	-54.9
400	0.488	-140.1	14.12	105.5	0.0413	53.4	0.363	-72.2
600	0.482	-158.4	9.89	96.3	0.0510	56.8	0.267	-81.4
800	0.478	-170.3	7.56	90.3	0.0606	59.5	0.218	-87.6
1000	0.474	-179.6	6.10	85.2	0.0716	62.0	0.191	-91.7
1200	0.484	173.6	5.14	81.2	0.0817	63.5	0.174	-96.5
1400	0.481	167.9	4.44	77.4	0.0931	65.1	0.166	-100.0
1600	0.486	161.2	3.92	74.0	0.105	66.1	0.161	-104.4
1800	0.496	156.2	3.52	70.7	0.117	66.1	0.159	-107.9
2000	0.502	152.3	3.20	67.7	0.127	66.2	0.161	-111.9

Package Dimensions

As of January, 2001

Unit: mm



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

Cautions

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