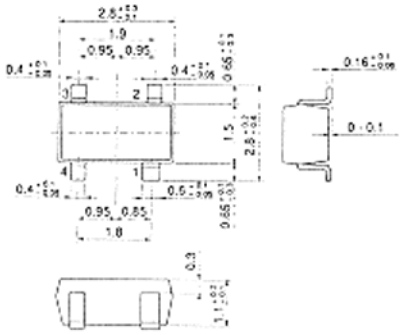
HITACHI

2SC4126

SILICON NPN EPITAXIAL

VHF AND UHF WIDE BAND AMPLIFIER



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

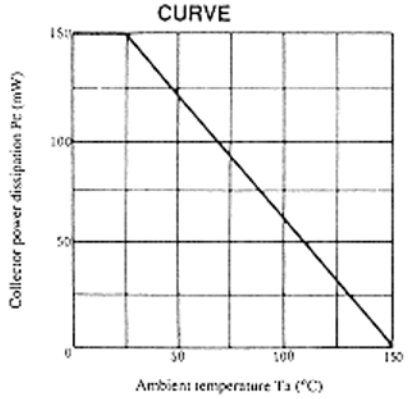
(Dimensions in mm)

(MPAK-4)

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Item	Symbol	2SC4126	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	11	V
Emitter to base voltage	V_{EBO}	2	V
Collector current	I_C	50	mA
Collector power dissipation	P_C	150	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	−55 to +150	°C

MAXIMUM COLLECTOR DISSIPATION CURVE



■ ELECTRICAL CHARACTERISTICS (Ta=25°C)

Item	Symbol	Test Condition	min.	typ.	max.	Unit
Collector to base breakdown voltage	$V_{(BR)CBO}$	I_C = 10μA, I_E = 0	15	—	—	V
Collector cutoff current	I_{CBO}	V_{CB} =12V, I_E = 0	—	—	1	μA
	I_{CEO}	V_{CE} =10V, R_{BE} = ∞	—	—	1	μA
Emitter cutoff current	I_{EBO}	V_{EB} =1V, I_C = 0	—	—	1	μA
DC current transfer ratio	h_{FE}	V_{CE} = 5V, I_C = 20mA	50	—	250	
Collector output capacitance	C_{ob}	V_{CB} = 5V, I_E = 0, f = 1MHz	—	1.0	1.5	pF
Gain bandwidth product	f_T	V_{CE} = 5V, I_C = 20mA	4.5	6.0	—	GHz
Power gain	PG	V_{CE} = 5V, I_C = 20mA, f = 900MHz	9.0	11.0	—	dB
Noise figure	NF	V_{CE} = 5V, I_C = 5mA, f = 900MHz	—	1.5	3.0	dB

* Marking is "MI-".

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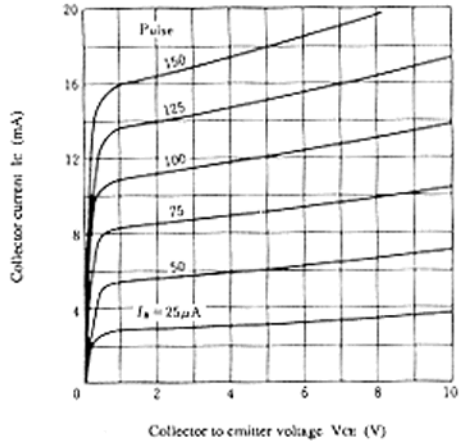
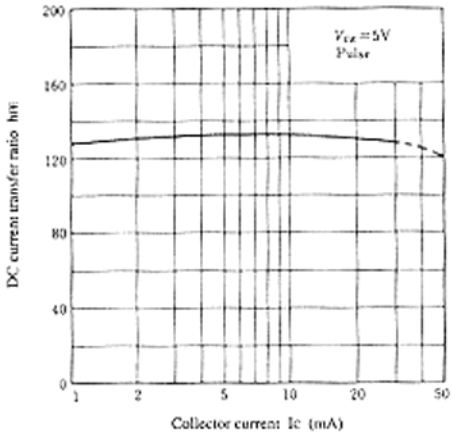
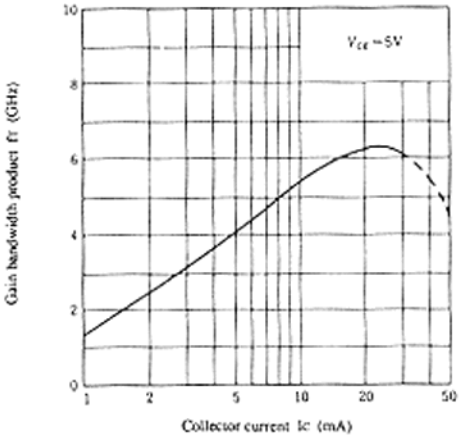
TYPICAL OUTPUT CHARACTERISTICS



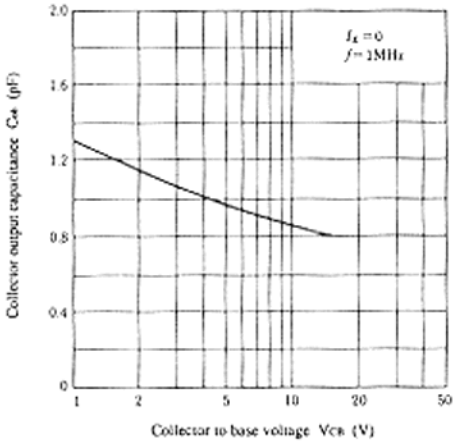
DC CURRENT TRANSFER RATIO VS. COLLECTOR CURRENT



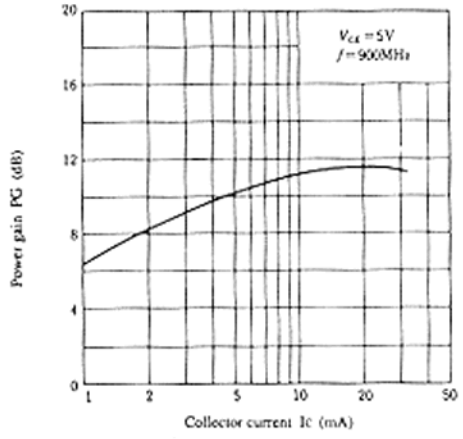
GAIN BANDWIDTH PRODUCT VS. COLLECTOR CURRENT



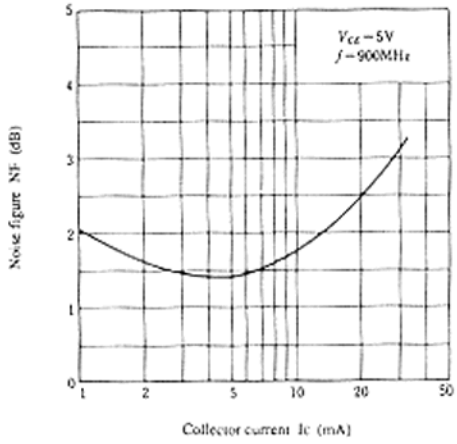
COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



POWER GAIN VS. COLLECTOR CURRENT

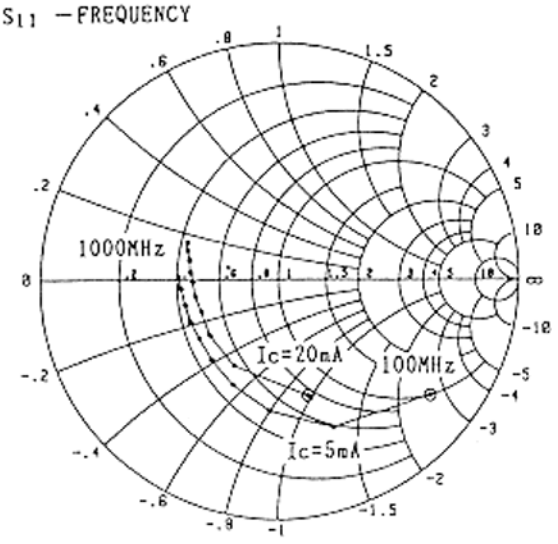


NOISE FIGURE VS. COLLECTOR CURRENT

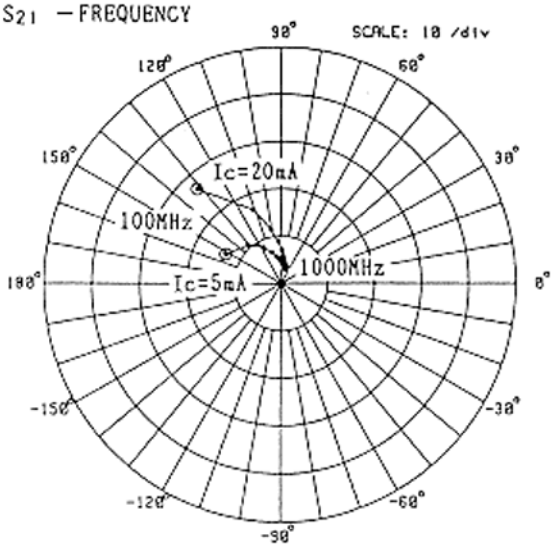


■ **S PARAMETERS** (Emitter Common)

S_{11} — FREQUENCY

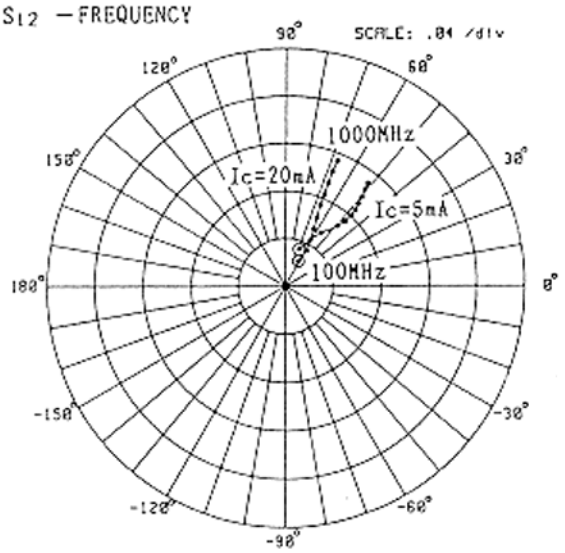


S_{21} — FREQUENCY

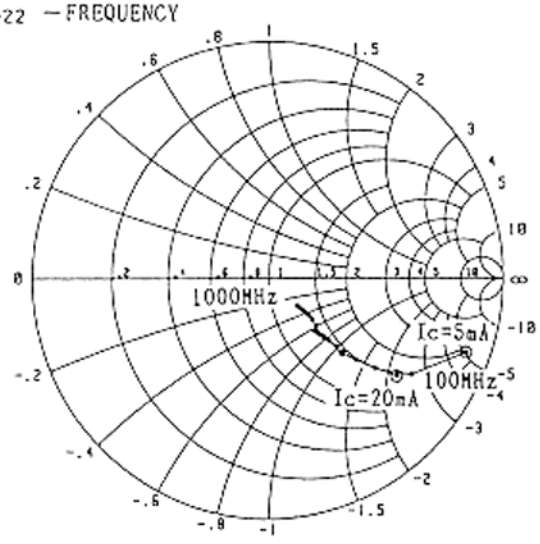


Test Condition : V_{CE}=5V, Z_o=50Ω
FREQ.=100-1000MHz
(100MHz Step)

S_{12} — FREQUENCY



S_{22} — FREQUENCY



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■ S PARAMETERS (Emitter Common)

(V_{CE}=5V, I_C=5mA Zo=50Ω)

Freq. (MHz)	$\|S_{11}\|$	$\angle S_{11}$ (DEG.)	$\|S_{21}\|$	$\angle S_{21}$ (DEG.)	$\|S_{12}\|$	$\angle S_{12}$ (DEG.)	$\|S_{22}\|$	$\angle S_{22}$ (DEG.)	Gmax† (dB)
100	0.798	−37.3	13.345	152.3	0.033	69.6	0.898	−20.1	34.03
200	0.659	−69.4	10.696	131.4	0.054	56.0	0.730	−33.1	26.37
300	0.550	−93.7	8.434	117.0	0.067	49.2	0.592	−39.3	21.96
400	0.480	−113.6	6.815	107.3	0.074	47.3	0.502	−42.3	19.07
500	0.438	−129.8	5.684	100.0	0.081	47.0	0.442	−43.7	16.96
600	0.414	−143.6	4.847	94.2	0.087	47.3	0.399	−44.4	15.28
700	0.410	−154.4	4.229	89.4	0.092	48.6	0.366	−45.3	13.95
800	0.406	−164.7	3.750	85.0	0.098	49.5	0.340	−46.3	12.80
900	0.412	−174.9	3.352	81.0	0.104	50.6	0.317	−47.4	11.78
1000	0.424	−178.1	3.071	77.4	0.110	51.6	0.299	−48.3	11.01

(V_{CE}=5V, I_C=20mA Zo=50Ω)

Freq. (MHz)	$\|S_{11}\|$	$\angle S_{11}$ (DEG.)	$\|S_{21}\|$	$\angle S_{21}$ (DEG.)	$\|S_{12}\|$	$\angle S_{12}$ (DEG.)	$\|S_{22}\|$	$\angle S_{22}$ (DEG.)	Gmax† (dB)
100	0.501	−75.1	26.789	131.8	0.024	62.2	0.683	−36.5	32.54
200	0.402	−117.1	16.600	111.1	0.035	58.5	0.446	−45.4	26.13
300	0.368	−141.0	11.543	100.7	0.044	61.3	0.337	−45.6	22.40
400	0.347	−157.6	8.823	94.7	0.054	63.3	0.282	−44.2	19.83
500	0.354	−169.0	7.131	89.5	0.063	65.0	0.250	−42.8	17.92
600	0.358	−178.7	5.979	85.8	0.074	66.6	0.228	−42.1	16.36
700	0.370	174.9	5.158	82.3	0.084	66.9	0.208	−42.1	15.08
800	0.380	167.1	4.536	79.2	0.094	67.3	0.192	−42.7	13.98
900	0.400	161.5	4.042	76.5	0.104	67.6	0.178	−43.2	13.03
1000	0.411	157.0	3.677	73.5	0.114	67.4	0.165	−43.3	12.24

$$\dagger G_{max} = \frac{1}{|1 - |S_{11}|^2|} \cdot |S_{21}|^2 \cdot \frac{1}{|1 - |S_{22}|^2|}$$