

isc Silicon NPN RF Transistor

2SC4988

DESCRIPTION

- High Gain Bandwidth Product
 $f_T = 8.5 \text{ GHz TYP.}$
- High Gain, Low Noise Figure
 $PG = 10.5 \text{ dB TYP. , } NF = 1.3 \text{ dB TYP. @ } f = 900 \text{ MHz}$


APPLICATIONS

- Designed for use in VHF ~ UHF wide band amplifier.

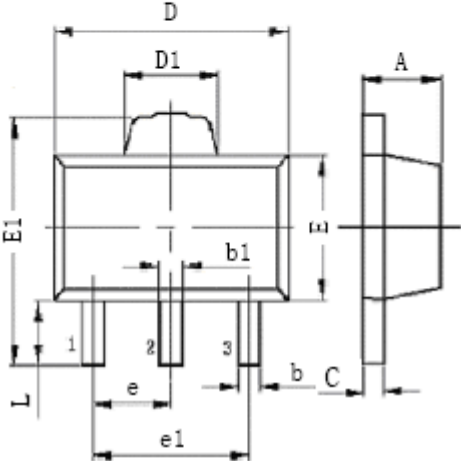
ABSOLUTE MAXIMUM RATINGS($T_a=25^\circ\text{C}$)

SYMBOL	PARAMETER	VALUE	UNIT
V_{CBO}	Collector-Base Voltage	15	V
V_{CEO}	Collector-Emitter Voltage	9	V
V_{EBO}	Emitter-Base Voltage	1.5	V
I_c	Collector Current-Continuous	0.1	A
P_c	Collector Power Dissipation @ $T_c=25^\circ\text{C}$	0.8	W
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature Range	-55~150	$^\circ\text{C}$

SOT-89 package



1: Base
2: Emitter
3: Collector



DIM	mm	
	MIN	MAX
A	1.40	1.60
b	0.32	0.52
b1	0.36	0.56
C	0.35	0.44
D	4.40	4.46
D1	1.40	1.80
E	2.30	2.60
E1	3.94	4.25
e	1.50typ	
e1	2.90	3.10
L	0.90	1.10

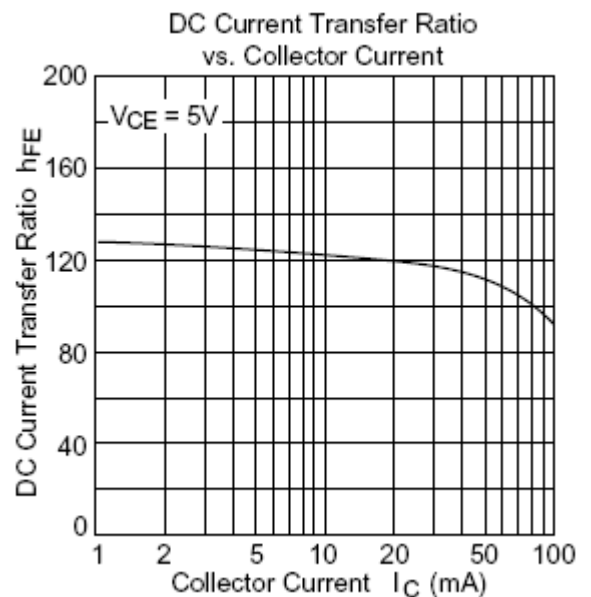
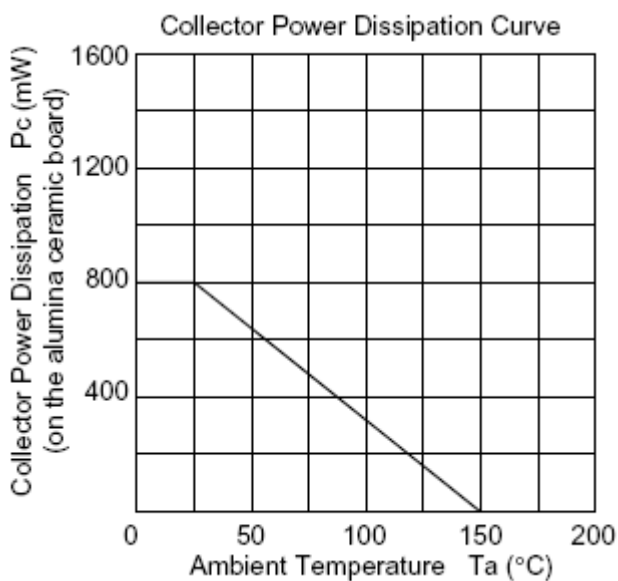
isc Silicon NPN RF Transistor

2SC4988

ELECTRICAL CHARACTERISTICS

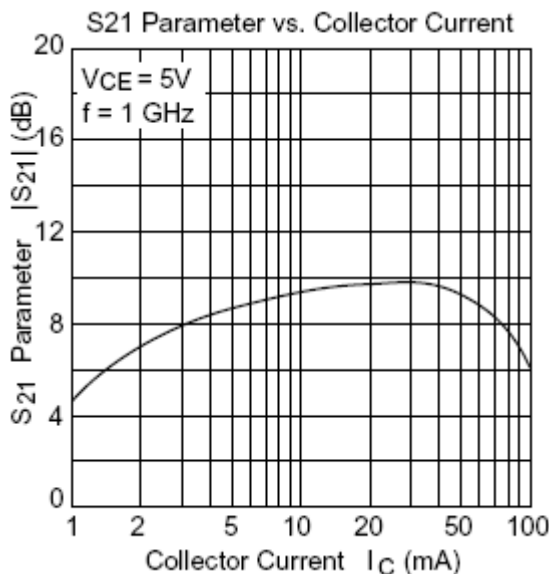
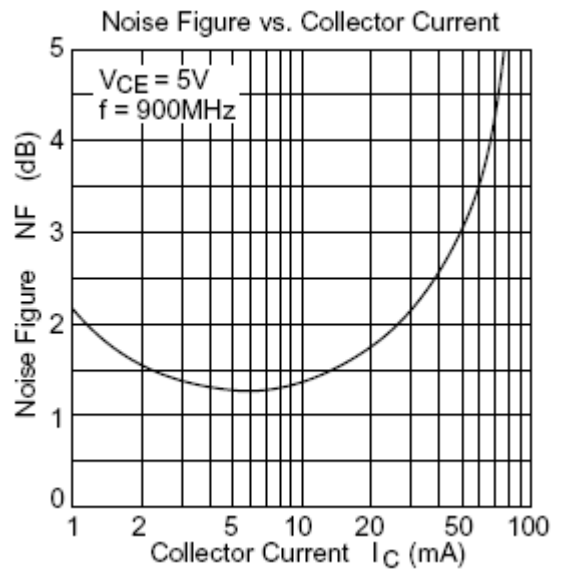
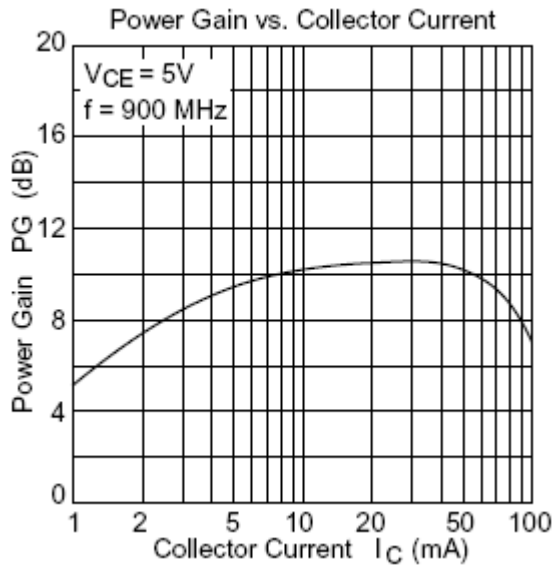
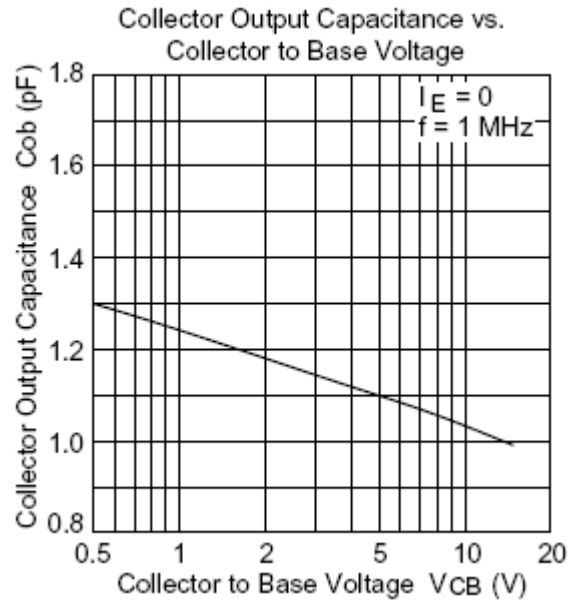
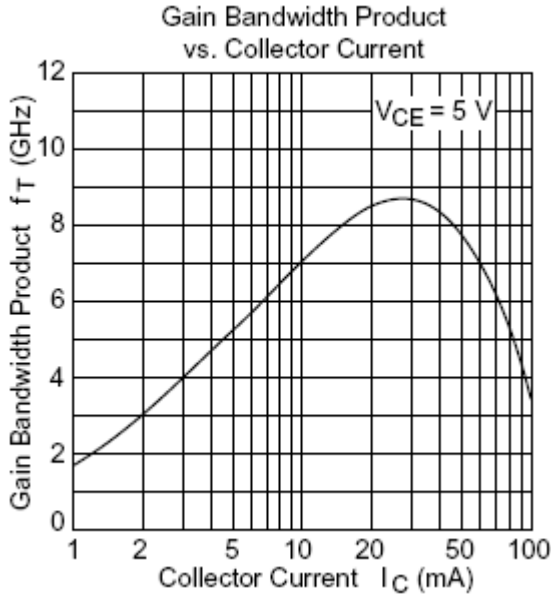
T_c=25°C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V _{(BR)CBO}	Collector-Base Breakdown Voltage	I _C = 10 μ A ; I _E = 0	15			V
I _{CBO}	Collector Cutoff Current	V _{CB} = 12V ; I _E = 0			1.0	μ A
I _{CEO}	Collector Cutoff Current	V _{CE} = 9V ; R _{BE} = ∞			1.0	μ A
I _{EBO}	Emitter Cutoff Current	V _{EB} = 1.5V ; I _C = 0			10	μ A
h _{FE}	DC Current Gain	I _C = 20mA ; V _{CE} = 5V	50		250	
f _T	Current-Gain—Bandwidth Product	I _C = 20mA ; V _{CE} = 5V	5.5	8.5		GHz
C _{OB}	Output Capacitance	I _E = 0 ; V _{CB} = 5V ; f = 1.0MHz		1.1	1.6	pF
PG	Power Gain	I _C = 20mA ; V _{CE} = 5V ; f = 900MHz	7.5	10.5		dB
NF	Noise Figure	I _C = 5mA ; V _{CE} = 5V ; f = 900MHz		1.3	2.5	dB



isc Silicon NPN RF Transistor

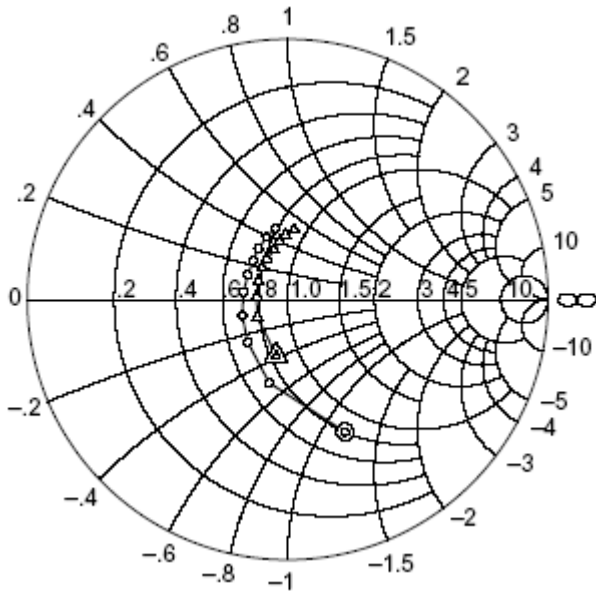
2SC4988



isc Silicon NPN RF Transistor

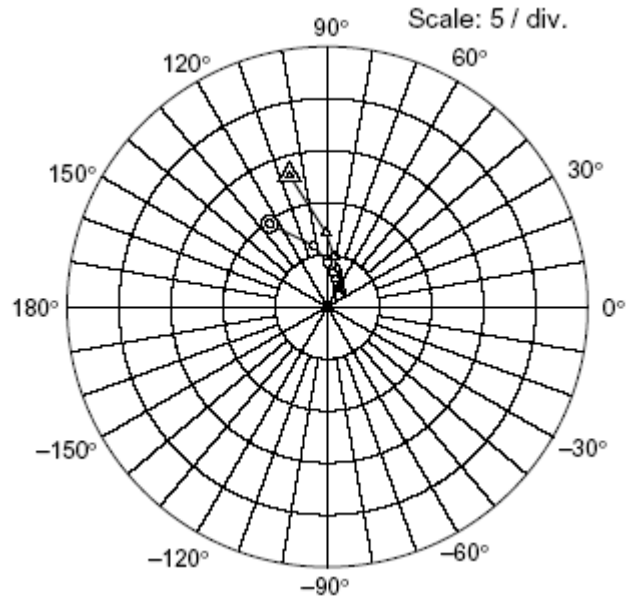
2SC4988

S₁₁ Parameter vs. Frequency



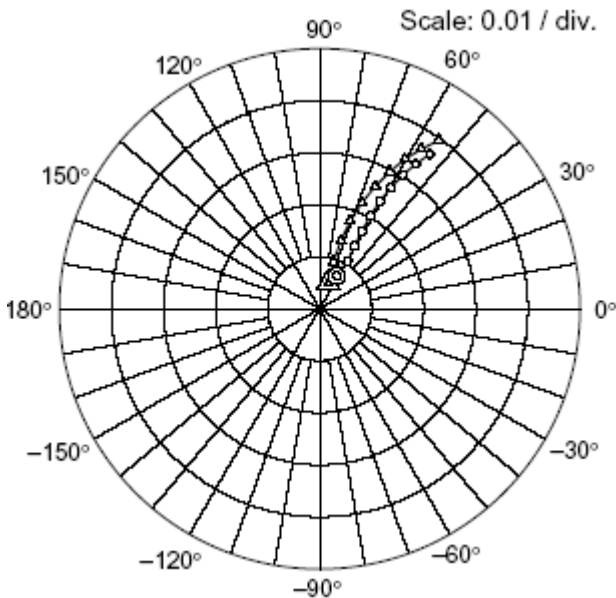
Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)
 ○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 20\text{ mA}$)

S₂₁ Parameter vs. Frequency



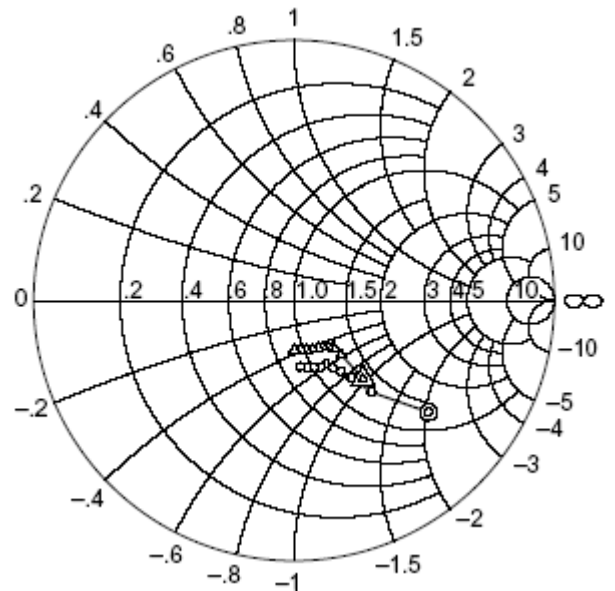
Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 200 to 2000 MHz (200 MHz step)
 ○ — ○ ($I_C = 5\text{ mA}$)
 △ — △ ($I_C = 20\text{ mA}$)

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

isc Silicon NPN RF Transistor

2SC4988

S-PARAMETER $V_{CE} = 5\text{ V}$, $I_C = 5\text{ mA}$, $Z_o = 50\ \Omega$

Freque.	S_{11}		S_{21}		S_{12}		S_{22}	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
200	0.555	-66.6	9.68	124.7	0.0717	62.3	0.672	-39.7
400	0.328	-102.5	5.98	102.2	0.106	59.4	0.462	-49.8
600	0.225	-133.1	4.24	89.3	0.138	60.8	0.371	-53.4
800	0.185	-160.5	3.31	80.3	0.170	61.4	0.326	-56.4
1000	0.172	170.5	2.71	72.4	0.204	61.3	0.301	-59.9
1200	0.179	148.5	2.34	65.8	0.237	60.7	0.285	-63.6
1400	0.200	131.7	2.06	59.9	0.270	59.5	0.276	-68.2
1600	0.224	120.0	1.86	54.4	0.303	58.1	0.268	-73.2
1800	0.253	108.7	1.71	49.6	0.334	56.4	0.262	-78.7
2000	0.277	99.8	1.58	44.9	0.365	54.5	0.256	-84.7

 $V_{CE} = 5\text{ V}$, $I_C = 20\text{ mA}$, $Z_o = 50\ \Omega$

Freque.	S_{11}		S_{21}		S_{12}		S_{22}	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
200	0.220	-101.8	13.13	106.0	0.0532	71.5	0.401	-48.6
400	0.135	-149.0	7.08	90.8	0.0946	73.6	0.277	-49.0
600	0.120	175.1	4.83	82.2	0.137	72.6	0.239	-50.1
800	0.132	148.0	3.70	75.5	0.178	70.8	0.221	-53.4
1000	0.155	129.6	3.02	69.5	0.220	68.2	0.212	-57.9
1200	0.174	117.3	2.58	63.9	0.258	65.6	0.205	-63.1
1400	0.196	105.5	2.26	58.8	0.296	62.9	0.201	-69.1
1600	0.225	97.8	2.04	54.1	0.331	60.3	0.197	-75.7
1800	0.246	92.0	1.86	50.0	0.364	57.5	0.193	-82.1
2000	0.267	84.5	1.72	45.7	0.397	54.7	0.190	-89.4