

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

## 2SC5066

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

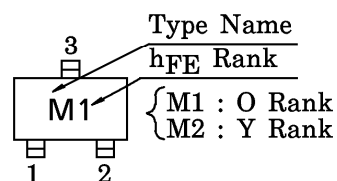
Unit in mm

- Low Noise Figure, High Gain.
- $NF=1.1\text{dB}$ ,  $|S_{21e}|^2=12\text{dB}$  ( $f=1\text{GHz}$ )

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CBO}$	20	V
Collector-Emitter Voltage	$V_{CEO}$	12	V
Emitter-Base Voltage	$V_{EBO}$	3	V
Base Current	$I_B$	15	mA
Collector Current	$I_C$	30	mA
Collector Power Dissipation	$P_C$	100	mW
Junction Temperature	$T_j$	125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	$-55\sim 125$	$^\circ\text{C}$

## MARKING



		1. BASE 2. EMITTER 3. COLLECTOR
SSM	—	
JEDEC	—	
EIAJ	SC-70	
TOSHIBA	2-2H1A	

Weight : 2.4mg

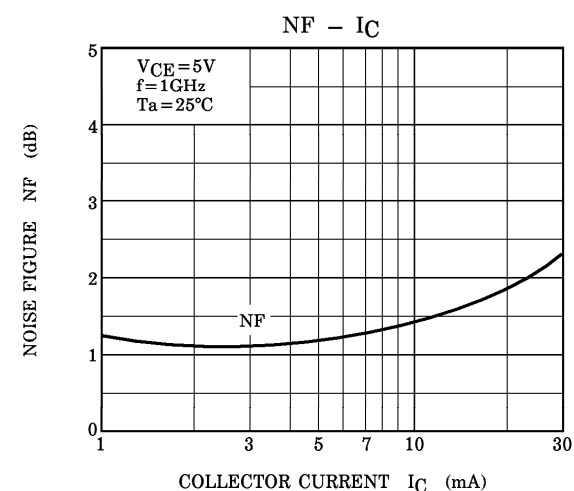
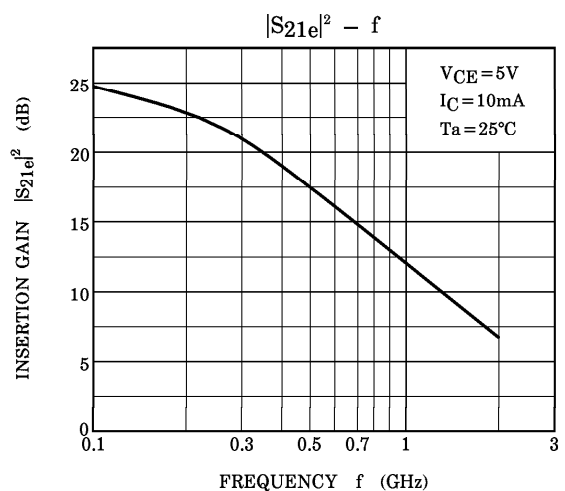
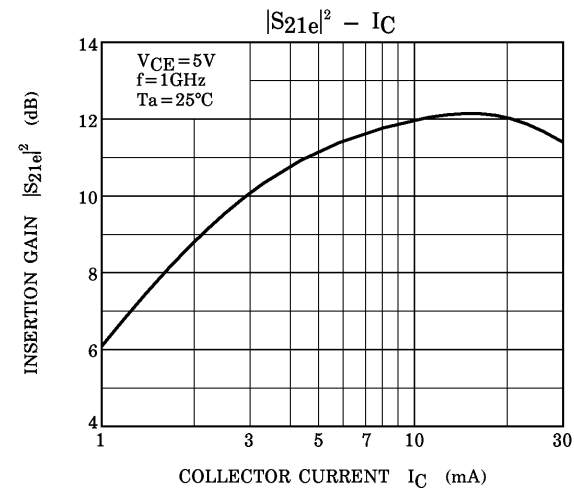
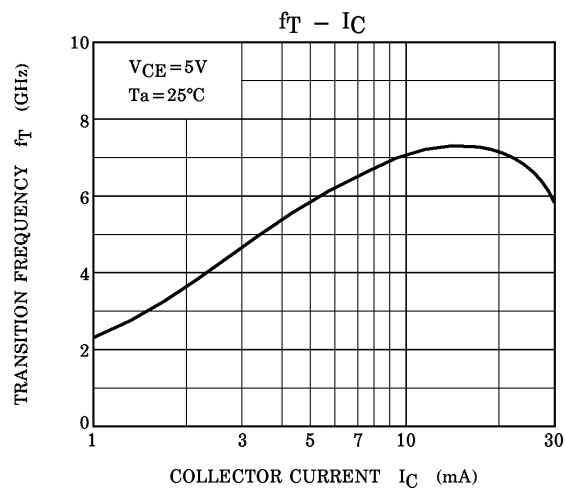
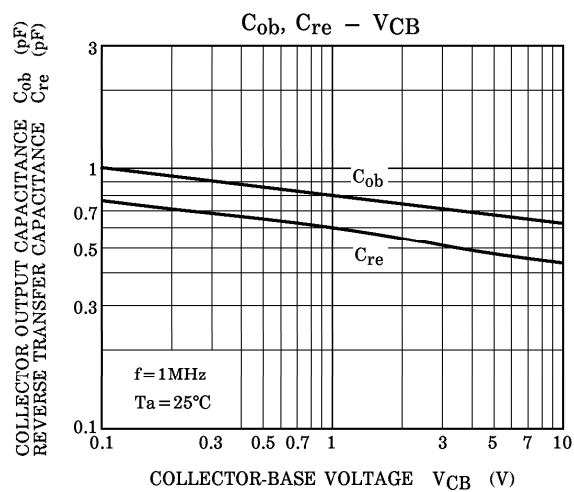
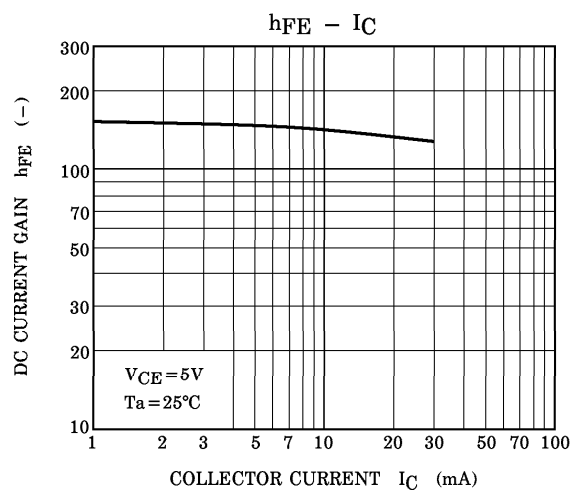
MICROWAVE CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

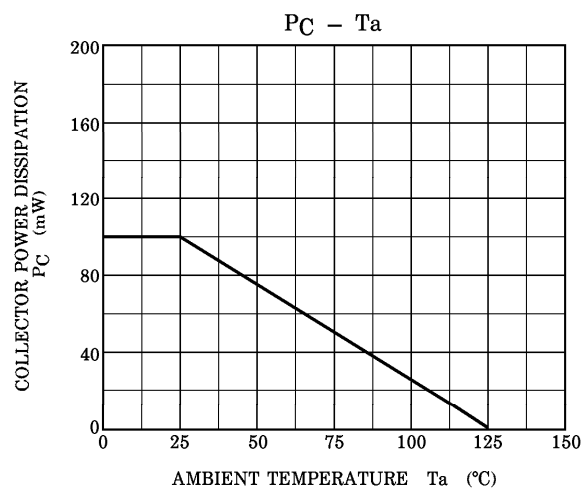
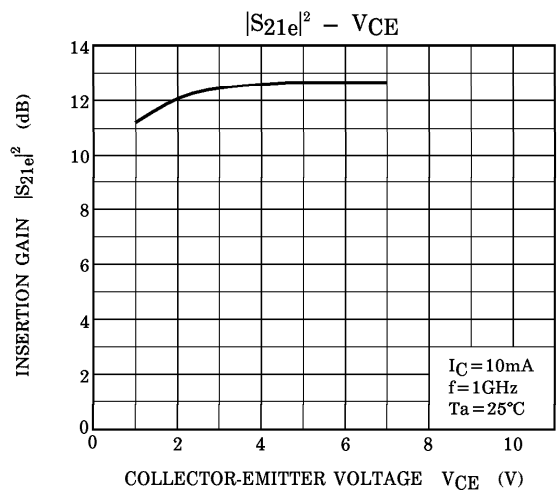
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	$f_T$	$V_{CE}=5\text{V}$ , $I_C=10\text{mA}$	5	7	—	GHz
Insertion Gain	$ S_{21e} ^2 (1)$	$V_{CE}=5\text{V}$ , $I_C=10\text{mA}$ , $f=500\text{MHz}$	—	17	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE}=5\text{V}$ , $I_C=10\text{mA}$ , $f=1\text{GHz}$	8.5	12	—	
Noise Figure	NF (1)	$V_{CE}=5\text{V}$ , $I_C=3\text{mA}$ , $f=500\text{MHz}$	—	1	—	dB
	NF (2)	$V_{CE}=5\text{V}$ , $I_C=3\text{mA}$ , $f=1\text{GHz}$	—	1.1	2.0	

ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB}=10\text{V}$ , $I_E=0$	—	—	1	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB}=1\text{V}$ , $I_C=0$	—	—	1	$\mu\text{A}$
DC Current Gain	$h_{FE}$ (Note 1)	$V_{CE}=5\text{V}$ , $I_C=10\text{mA}$	80	—	240	—
Output Capacitance	$C_{ob}$	$V_{CB}=5\text{V}$ , $I_E=0$ , $f=1\text{MHz}$ (Note 2)	—	0.7	—	pF
Reverse Transfer Capacitance	$C_{re}$		—	0.45	0.9	pF

(Note 1)  $h_{FE}$  Classification O : 80~160, Y : 120~240(Note 2)  $C_{re}$  is measured by 3 terminal method with capacitance bridge.





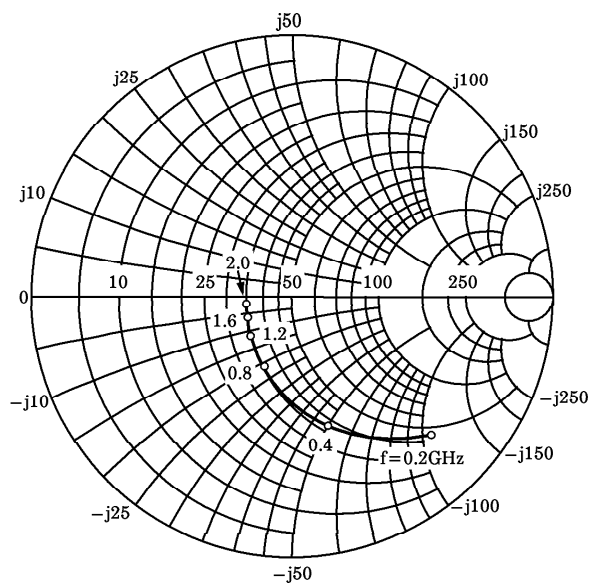
S-Parameter  $Z_O = 50\Omega$ ,  $T_a = 25^\circ\text{C}$   
 $V_{CE} = 5\text{V}$ ,  $I_C = 5\text{mA}$

frequency (MHz)	S11		S21		S12		S22	
	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
200	0.753	-43.7	10.247	140.6	0.040	65.6	0.827	-22.6
400	0.531	-75.1	7.684	117.1	0.060	57.1	0.648	-30.3
600	0.384	-96.4	5.815	103.0	0.074	56.1	0.551	-32.0
800	0.305	-112.6	4.523	93.6	0.086	57.0	0.500	-32.3
1000	0.255	-126.5	3.788	86.3	0.099	58.9	0.472	-32.4
1200	0.224	-138.4	3.244	80.7	0.112	60.2	0.455	-32.2
1400	0.203	-150.1	2.833	75.4	0.127	60.3	0.442	-32.6
1600	0.187	-159.4	2.529	70.6	0.139	60.0	0.434	-33.0
1800	0.174	-166.5	2.283	66.7	0.150	60.3	0.429	-32.6
2000	0.176	-171.2	2.107	63.0	0.164	59.2	0.428	-32.2

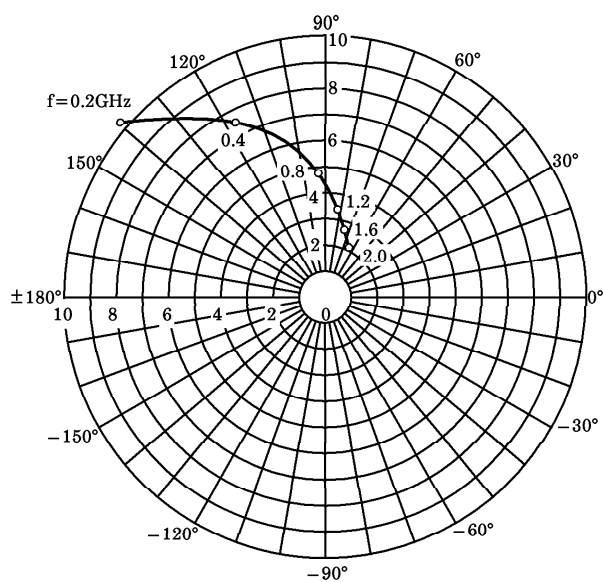
$V_{CE} = 5\text{V}$ ,  $I_C = 10\text{mA}$

frequency (MHz)	S11		S21		S12		S22	
	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
200	0.591	-58.0	14.955	129.6	0.034	64.3	0.714	-27.5
400	0.367	-90.3	9.581	107.5	0.052	61.9	0.534	-30.8
600	0.260	-110.7	6.781	96.1	0.067	63.9	0.462	-30.1
800	0.209	-126.9	5.207	88.6	0.083	65.2	0.428	-29.2
1000	0.178	-141.8	4.269	82.5	0.100	66.4	0.412	-28.6
1200	0.160	-153.7	3.618	77.7	0.117	66.7	0.403	-28.3
1400	0.150	-166.3	3.152	72.7	0.135	65.4	0.398	-28.8
1600	0.141	-175.2	2.801	68.7	0.149	64.0	0.393	-29.4
1800	0.130	178.2	2.521	65.0	0.163	63.4	0.392	-29.0
2000	0.133	174.0	2.314	61.7	0.179	61.3	0.395	-28.6

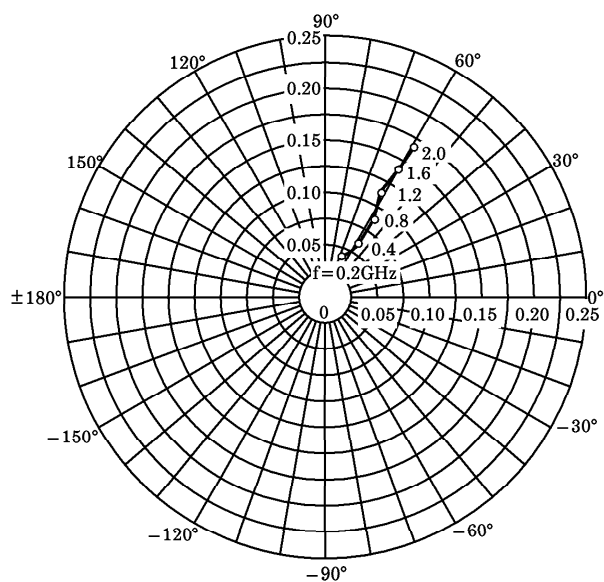
$S_{11e}$   
 $V_{CE}=5V$   
 $I_C=5mA$   
 $T_a=25^\circ C$   
 (UNIT :  $\Omega$ )



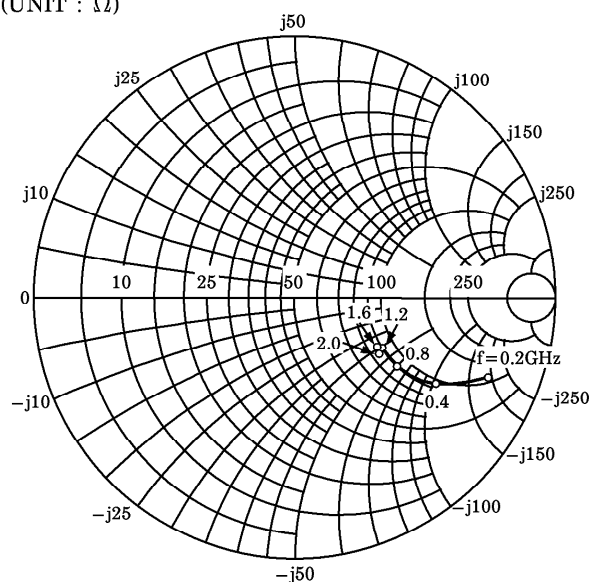
$S_{21e}$   
 $V_{CE}=5V$   
 $I_C=5mA$   
 $T_a=25^\circ C$



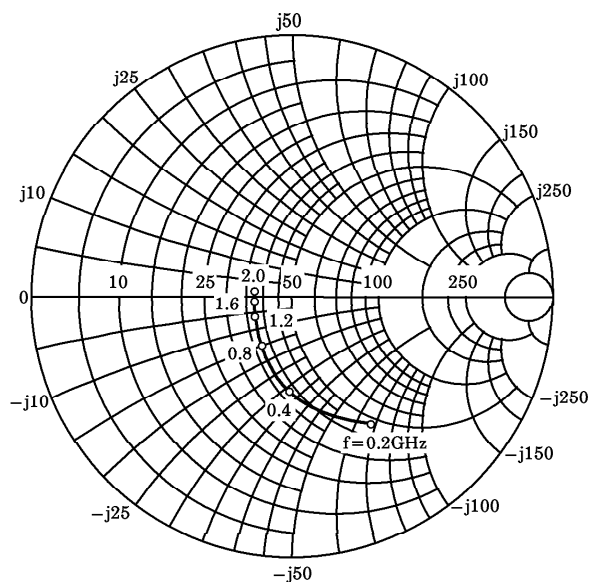
$S_{12e}$   
 $V_{CE}=5V$   
 $I_C=5mA$   
 $T_a=25^\circ C$



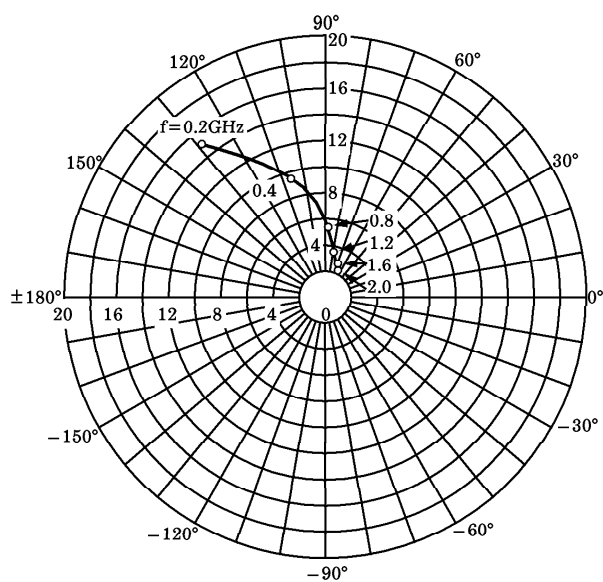
$S_{22e}$   
 $V_{CE}=5V$   
 $I_C=5mA$   
 $T_a=25^\circ C$   
 (UNIT :  $\Omega$ )



$S_{11e}$   
 $V_{CE}=5V$   
 $I_C=10mA$   
 $T_a=25^\circ C$   
 (UNIT :  $\Omega$ )



$S_{21e}$   
 $V_{CE}=5V$   
 $I_C=10mA$   
 $T_a=25^\circ C$



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