

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC5085

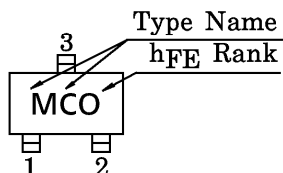
VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

- Low Noise Figure, High Gain.
- $NF=1.1\text{dB}$, $|S_{21e}|^2=11\text{dB}$ ($f=1\text{GHz}$)

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CB0}	20	V
Collector-Emitter Voltage	V_{CEO}	12	V
Emitter-Base Voltage	V_{EB0}	3	V
Base Current	I_B	40	mA
Collector Current	I_C	80	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



Unit in mm

JEDEC	—
EIAJ	SC-70
TOSHIBA	2-2E1A

Weight : 0.006g

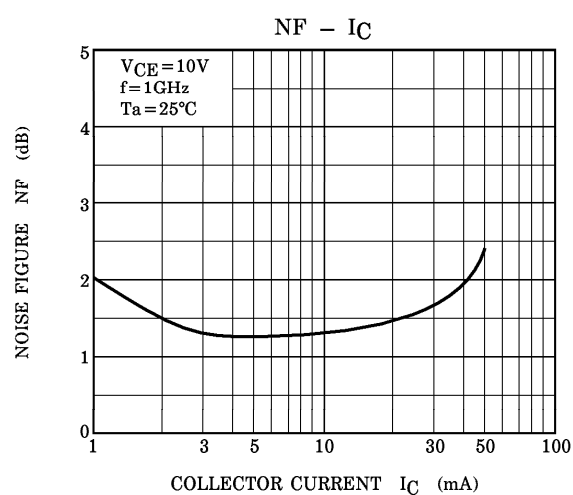
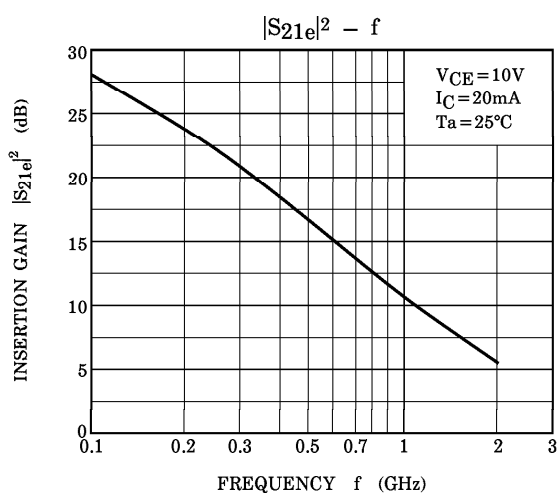
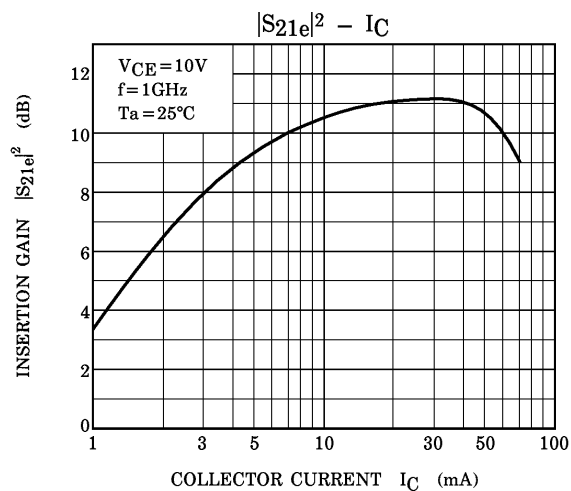
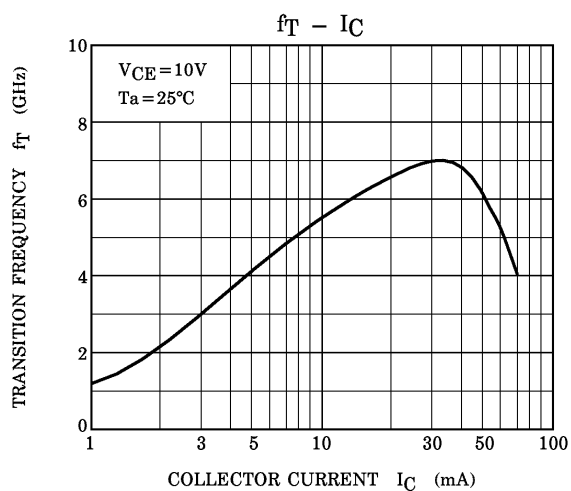
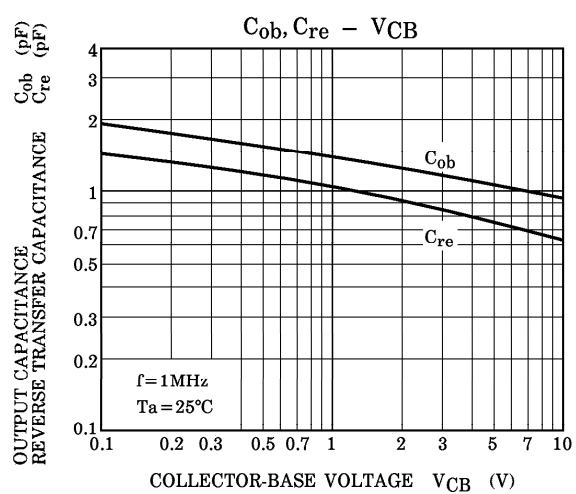
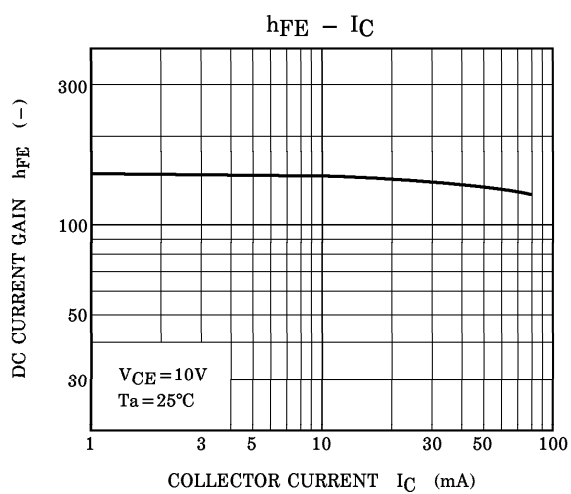
MICROWAVE CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

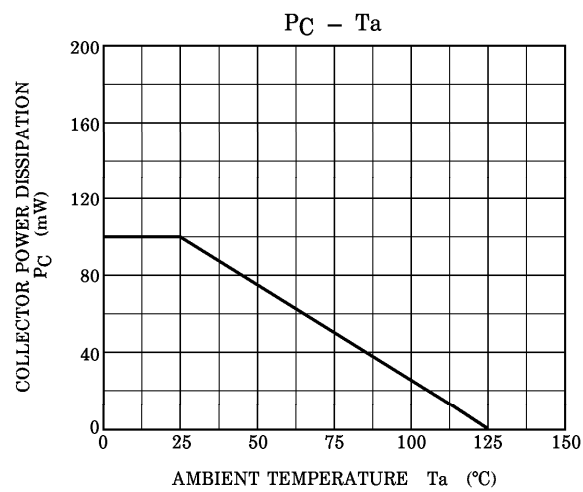
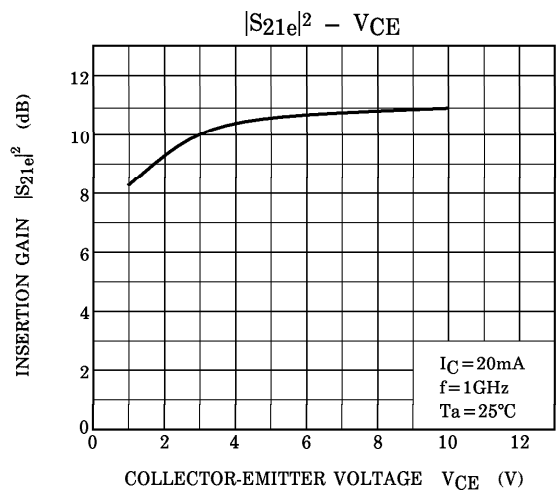
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f_T	$V_{CE}=10\text{V}$, $I_C=20\text{mA}$	5	7	—	GHz
Insertion Gain	$ S_{21e} ^2 (1)$	$V_{CE}=10\text{V}$, $I_C=20\text{mA}$, $f=500\text{MHz}$	—	16.5	—	dB
	$ S_{21e} ^2 (2)$	$V_{CE}=10\text{V}$, $I_C=20\text{mA}$, $f=1\text{GHz}$	7.5	11	—	
Noise Figure	NF (1)	$V_{CE}=10\text{V}$, $I_C=5\text{mA}$, $f=500\text{MHz}$	—	1	—	dB
	NF (2)	$V_{CE}=10\text{V}$, $I_C=5\text{mA}$, $f=1\text{GHz}$	—	1.1	2	

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	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB}=1\text{V}$, $I_C=0$	—	—	1	μA
DC Current Gain	h_{FE} (Note 1)	$V_{CE}=10\text{V}$, $I_C=20\text{mA}$	80	—	240	—
Output Capacitance	C_{ob}	$V_{CB}=10\text{V}$, $I_E=0$, $f=1\text{MHz}$ (Note 2)	—	1.0	—	pF
Reverse Transfer Capacitance	C_{re}		—	0.65	1.15	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.





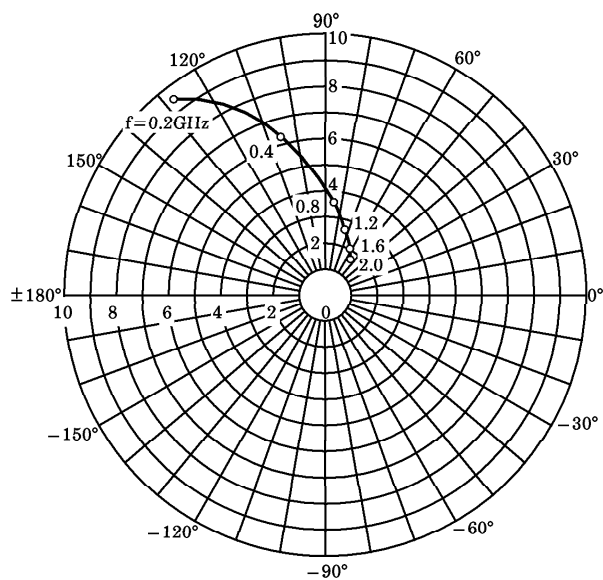
S-Parameter $Z_0 = 50\Omega$, $T_a = 25^\circ\text{C}$
 $V_{CE} = 10\text{V}$, $I_C = 5\text{mA}$

frequency (MHz)	S11		S21		S12		S22	
	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
200	0.672	-73.0	9.460	128.6	0.052	53.6	0.707	-31.3
400	0.498	-115.9	6.268	105.9	0.068	46.8	0.513	-36.2
600	0.443	-141.7	4.554	93.3	0.078	49.0	0.437	-36.6
800	0.426	-158.7	3.556	84.5	0.088	53.2	0.401	-36.8
1000	0.422	-171.9	2.948	77.5	0.099	57.9	0.383	-38.3
1200	0.428	177.5	2.526	71.1	0.113	62.7	0.373	-40.6
1400	0.437	168.3	2.240	65.5	0.133	65.8	0.367	-43.9
1600	0.449	159.9	1.997	60.1	0.152	67.6	0.362	-48.2
1800	0.464	153.1	1.821	55.0	0.171	68.7	0.358	-52.8
2000	0.485	146.7	1.686	50.9	0.195	70.6	0.350	-57.6

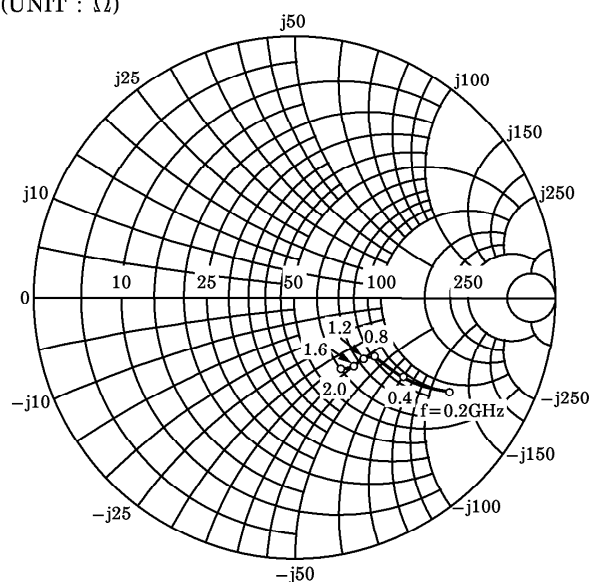
$V_{CE} = 10\text{V}$, $I_C = 20\text{mA}$

frequency (MHz)	S11		S21		S12		S22	
	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
200	0.392	-116.4	16.247	109.3	0.034	59.7	0.420	-43.7
400	0.329	-152.1	8.775	94.5	0.054	66.0	0.280	-38.4
600	0.321	-170.6	6.018	86.3	0.075	69.5	0.244	-33.7
800	0.321	177.5	4.598	80.2	0.097	70.7	0.231	-31.7
1000	0.324	167.9	3.767	74.8	0.119	71.2	0.225	-31.3
1200	0.332	160.3	3.191	70.0	0.142	71.3	0.225	-32.7
1400	0.341	153.5	2.812	65.2	0.168	70.0	0.225	-36.2
1600	0.352	146.6	2.502	60.7	0.190	68.4	0.222	-40.3
1800	0.362	142.2	2.264	56.5	0.212	66.8	0.217	-44.9
2000	0.379	137.7	2.092	52.8	0.236	66.3	0.212	-49.4

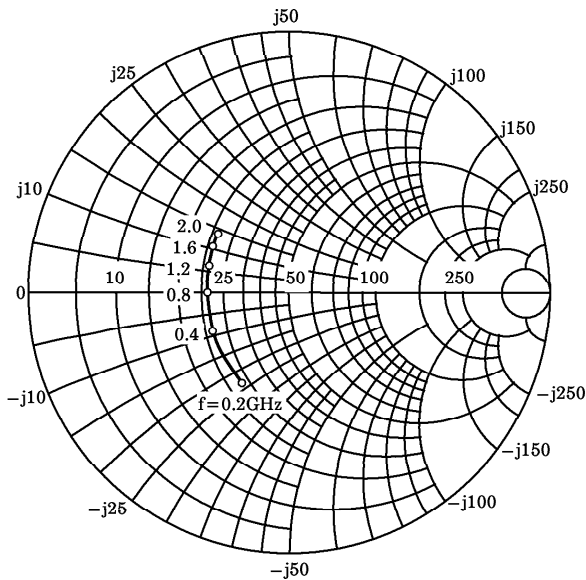
S21e
V_{CE} = 10V
I_C = 5mA
T_a = 25°C



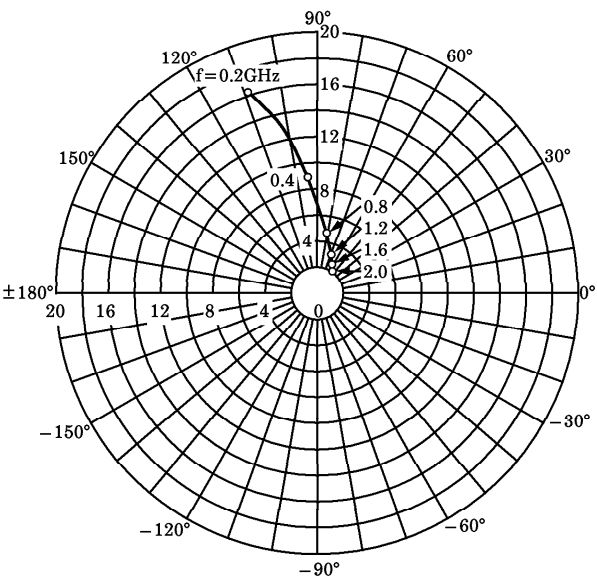
S22e
V_{CE} = 10V
I_C = 5mA
T_a = 25°C
(UNIT : Ω)



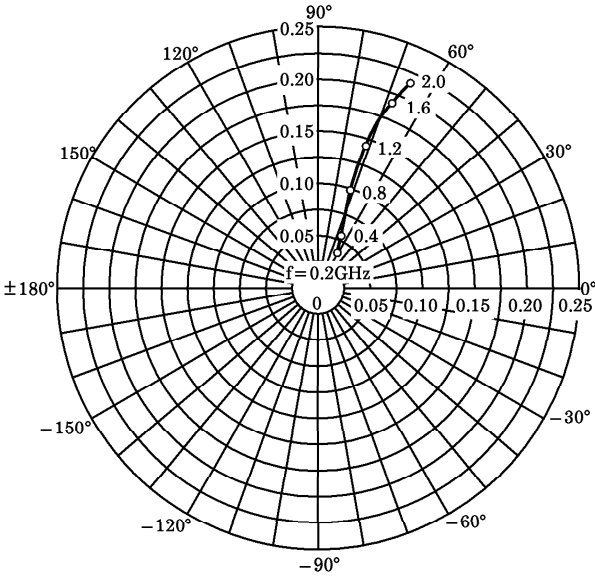
S_{11e}
V_{CE} = 10V
I_C = 20mA
T_a = 25°C
(UNIT : Ω)



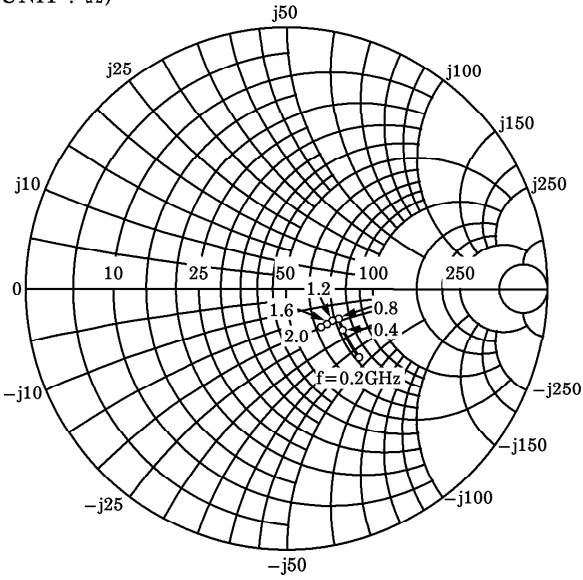
S_{21e}
V_{CE} = 10V
I_C = 20mA
T_a = 25°C



S_{12e}
V_{CE} = 10V
I_C = 20mA
T_a = 25°C



S_{22e}
V_{CE} = 10V
I_C = 20mA
T_a = 25°C
(UNIT : Ω)



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