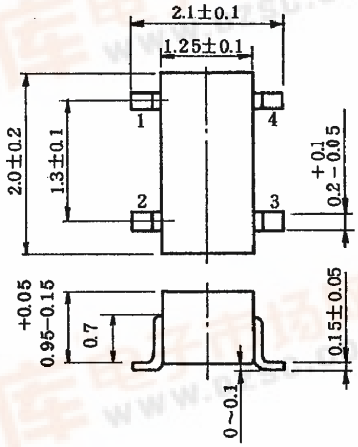
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC4842

VHF~UHF BAND LOW NOISE AMPLIFIER APPLICATIONS.

Unit in mm

- Low Noise Figure, High Gain.
- NF = 1.1dB, $|S_{21e}|^2$ = 14dB (f = 1GHz)



1, 3. EMITTER
2. BASE
4. COLLECTOR

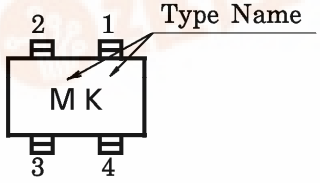
JEDEC	—
EIAJ	—
TOSHIBA	2-2K1A

Weight : 0.006g

MAXIMUM RATINGS (Ta = 25°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
Collector Current	I_C	80	mA
Base Current	I_B	40	mA
Collector Power Dissipation	P_C	100	mW
Junction Temperature	T_j	125	°C
Storage Temperature Range	T_{stg}	−55~125	°C

Marking



MICROWAVE CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Transition Frequency	f_T	V_{CE} = 10V, I_C = 20mA	5	7	—	GHz
Insertion Gain	$\|S_{21e}\|^2$ (1)	V_{CE} = 10V, I_C = 20mA, f = 500MHz	—	19.5	—	dB
	$\|S_{21e}\|^2$ (2)	V_{CE} = 10V, I_C = 20mA, f = 1GHz	10.5	14	—	
Noise Figure	NF (1)	V_{CE} = 10V, I_C = 5mA, f = 500MHz	—	1	—	dB
	NF (2)	V_{CE} = 10V, I_C = 5mA, f = 1GHz	—	1.1	2	

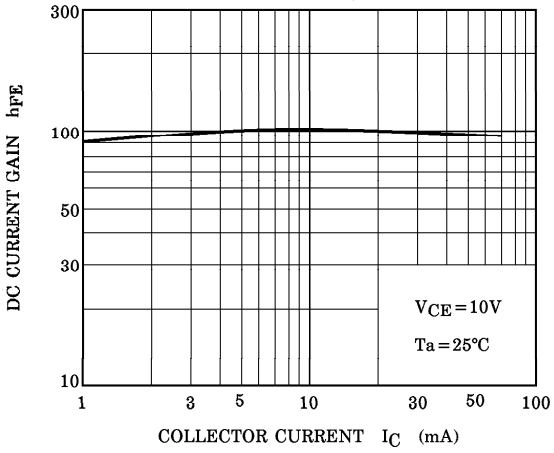
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	V_{CB} = 10V, I_E = 0	—	—	1	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 1V, I_C = 0	—	—	1	μA
DC Current Gain	h_{FE}	V_{CE} = 10V, I_C = 20mA	30	—	250	—
Output Capacitance	C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz (Note)	—	0.8	—	pF
Reverse Transfer Capacitance	C_{re}		—	0.55	1	pF

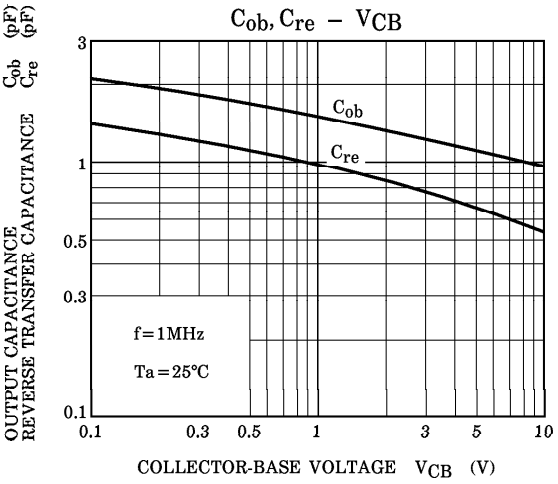
Note : C_{re} is measured by 3 terminal method with capacitance bridge.

961001EAA2

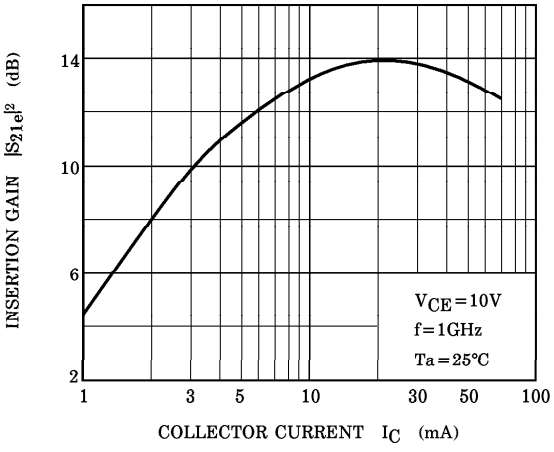
h_{FE} – I_C



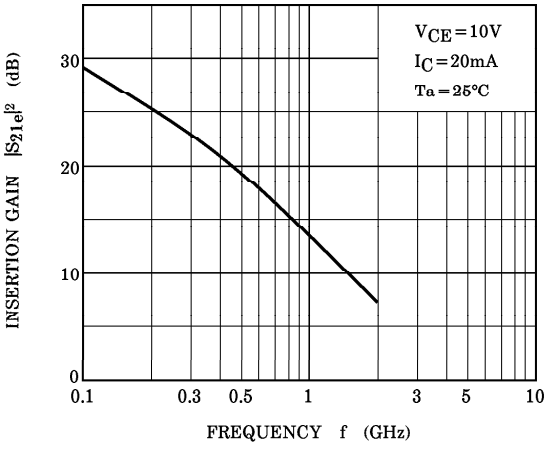
C_{ob}, C_{re} – V_{CB}



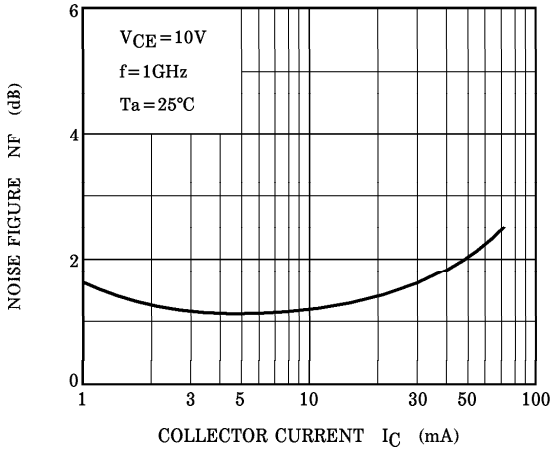
$|S_{21e}|^2$ – I_C



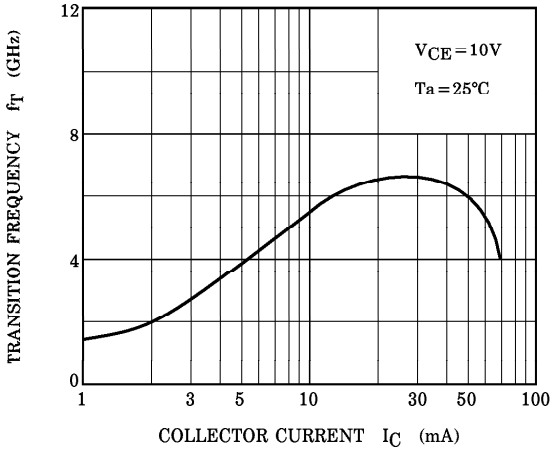
$|S_{21e}|^2$ – f



NF – I_C



f_T – I_C



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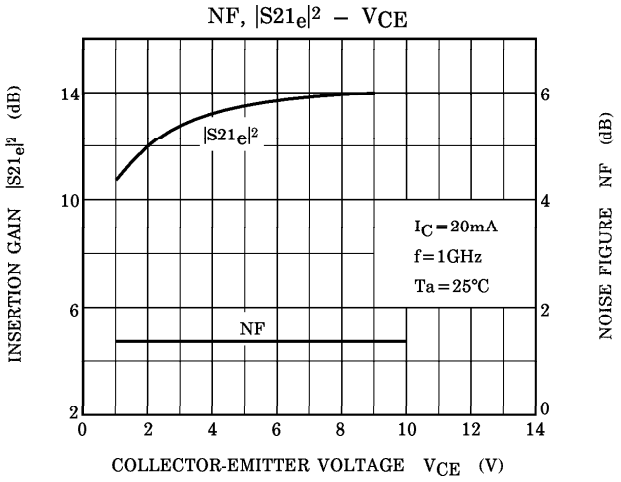
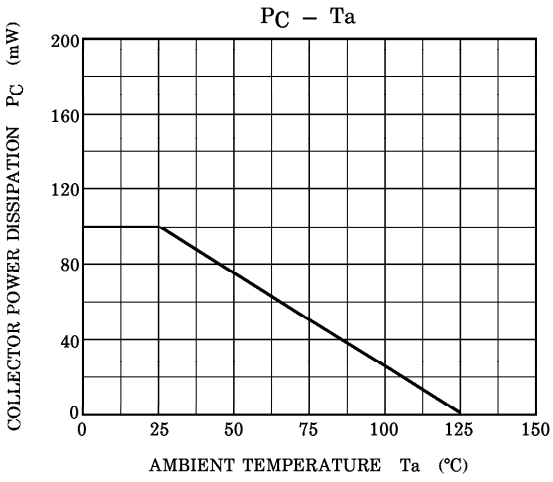




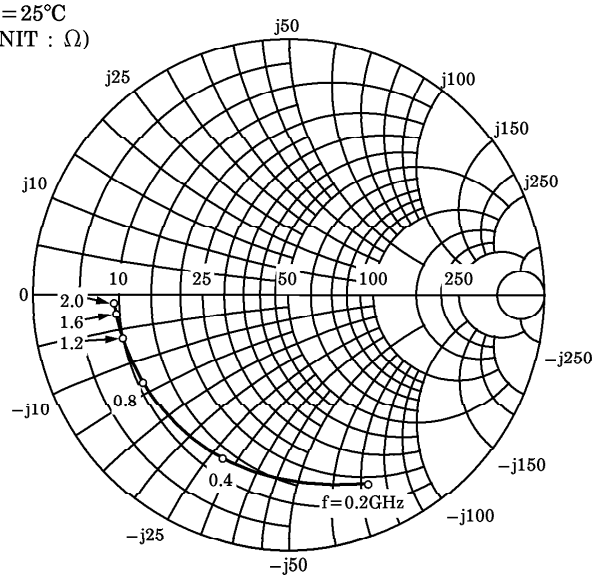
S-PARAMETER Z_O = 50Ω, Ta = 25°C
V_{CE} = 10V, I_C = 5mA

FREQUENCY	S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
200	0.794	−68.9	10.322	137.8	0.048	54.1	0.798	−29.8
400	0.722	−112.7	7.453	114.8	0.065	38.7	0.599	−41.1
600	0.699	−136.4	5.534	101.5	0.070	33.4	0.500	−45.9
800	0.683	−150.6	4.321	92.9	0.072	32.5	0.450	−49.3
1000	0.678	−160.9	3.499	86.1	0.073	33.7	0.425	−53.1
1200	0.680	−168.2	2.967	81.2	0.073	36.5	0.412	−57.1
1400	0.688	−173.8	2.584	76.5	0.074	40.7	0.408	−61.5
1600	0.692	−178.4	2.291	72.6	0.075	45.7	0.406	−66.2
1800	0.702	−177.5	2.071	68.8	0.078	50.8	0.409	−70.6
2000	0.709	−173.7	1.902	64.9	0.082	56.0	0.416	−75.4

V_{CE} = 10V, I_C = 20mA

FREQUENCY	S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
200	0.645	−117.4	19.826	117.5	0.029	45.7	0.517	−47.9
400	0.637	−150.2	11.127	100.3	0.037	46.1	0.334	−53.2
600	0.643	−163.3	7.616	91.9	0.043	51.2	0.273	−54.3
800	0.646	−171.5	5.780	86.7	0.050	56.4	0.247	−56.6
1000	0.653	−177.7	4.629	82.0	0.057	60.7	0.237	−60.2
1200	0.662	178.1	3.903	78.7	0.065	64.0	0.235	−64.2
1400	0.668	174.2	3.399	75.0	0.073	66.8	0.237	−69.2
1600	0.678	170.7	3.006	71.7	0.082	69.1	0.241	−74.1
1800	0.679	167.5	2.711	68.7	0.091	71.1	0.248	−78.5
2000	0.631	164.6	2.475	65.2	0.100	72.7	0.259	−83.1

S_{11e}
V_{CE} = 10V
I_C = 5mA
Ta = 25°C
(UNIT : Ω)



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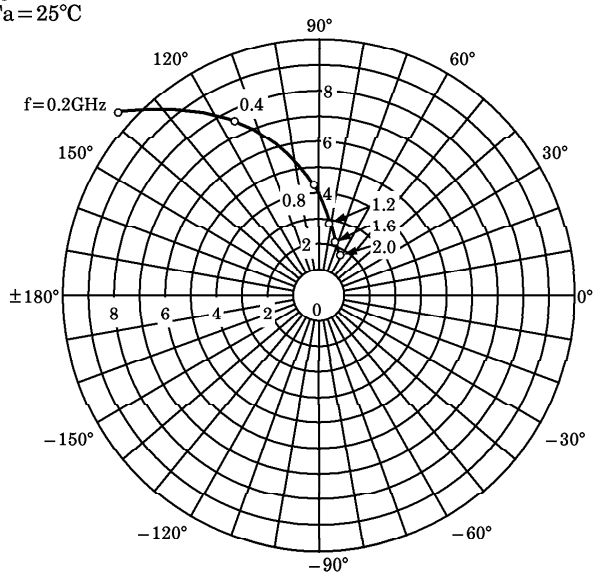

S_{12e}
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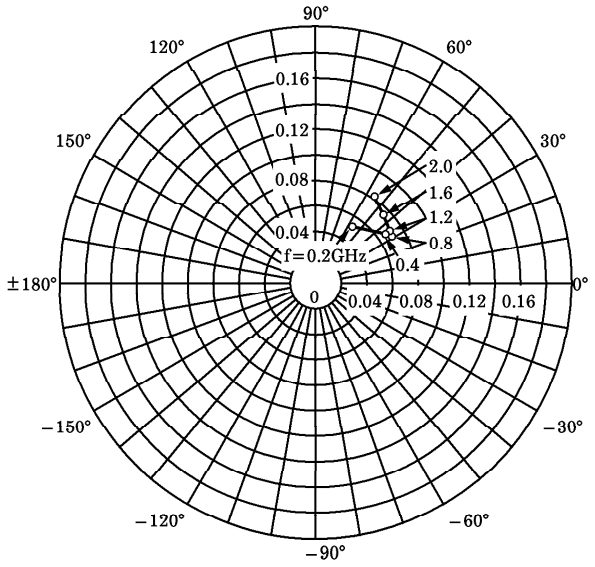

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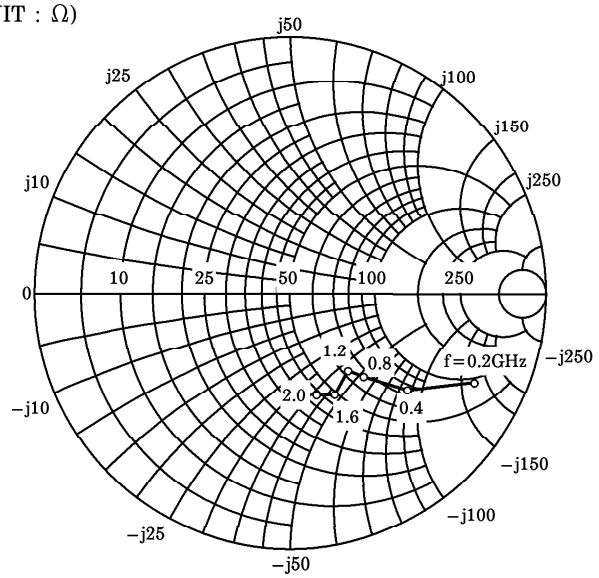

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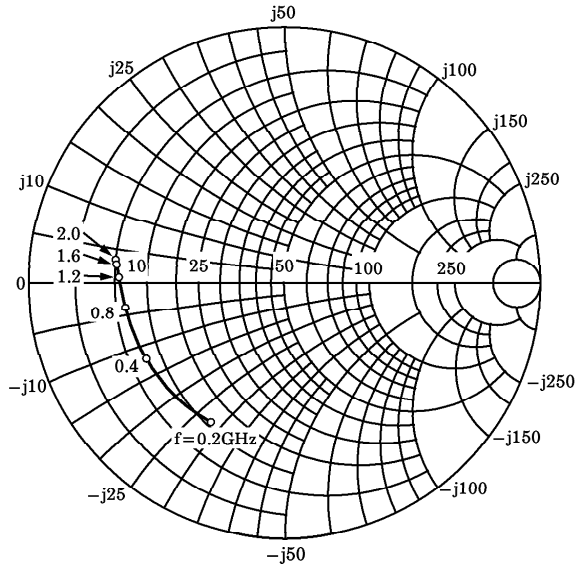

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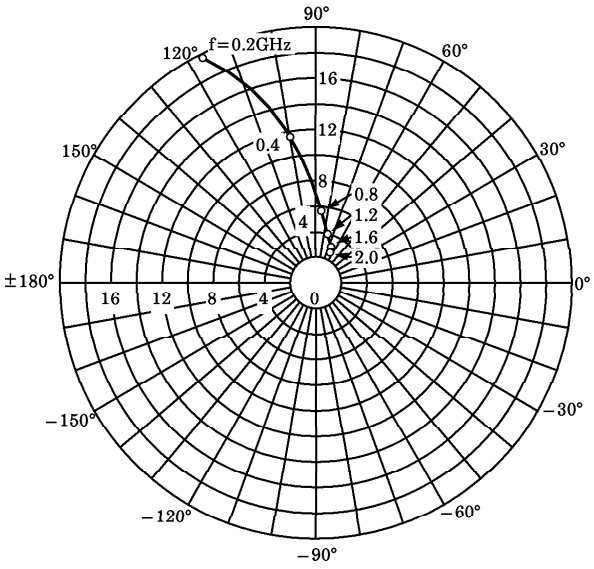

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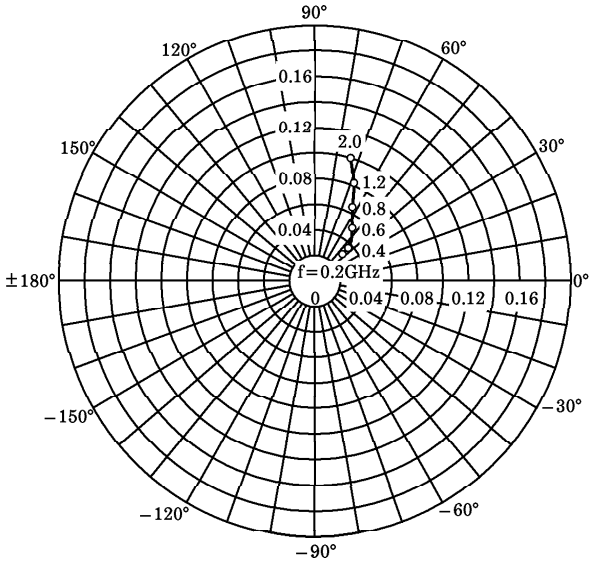

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