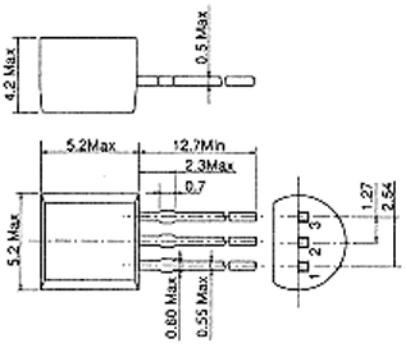
HITACHI

2SC3337

SILICON NPN EPITAXIAL

UHF/VHF WIDE BAND AMPLIFIER



1. Base
2. Emitter
3. Collector

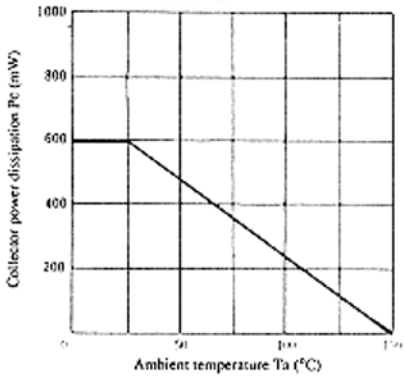
(Dimensions in mm)

(JEDEC TO-92)

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Item	Symbol	2SC3337	Unit
Collector to base voltage	V_{CBO}	20	V
Collector to emitter voltage	V_{CEO}	15	V
Emitter to base voltage	V_{EBO}	3	V
Collector current	I_C	100	mA
Collector power dissipation	P_C	600	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	20	—	—	V
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	I_C = 1mA, R_{BE} = ∞	15	—	—	V
Emitter cutoff current	I_{EBO}	V_{EB}= 3V, I_C = 0	—	—	10	μA
Collector cutoff current	I_{CBO}	V_{CB} =15V, I_E = 0	—	—	0.5	μA
DC current transfer ratio	h_{FE}	V_{CE} = 5V, I_C = 50mA	30	100	200	
Collector output capacitance	C_{ob}	V_{CB} = 5V, I_E = 0, f = 1MHz	—	1.5	2.3	pF
Gain bandwidth product	f_T	V_{CE} = 5V, I_C = 50mA	3.0	4.4	—	GHz
Power gain	PG	V_{CE} = 5V, I_C = 50mA, f = 900MHz	—	8.6	—	dB
Noise figure	NF	V_{CE} = 5V, I_C = 10mA, f = 900MHz	—	2.9	—	dB

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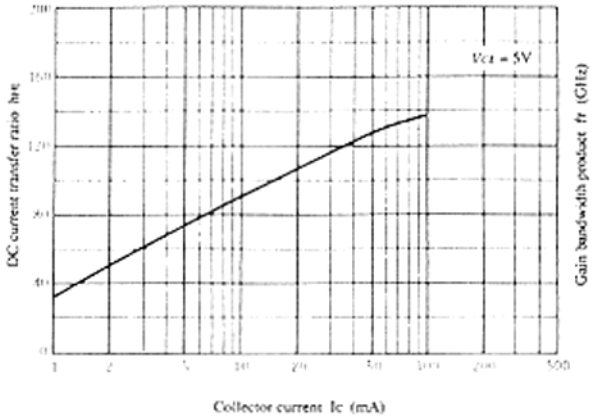
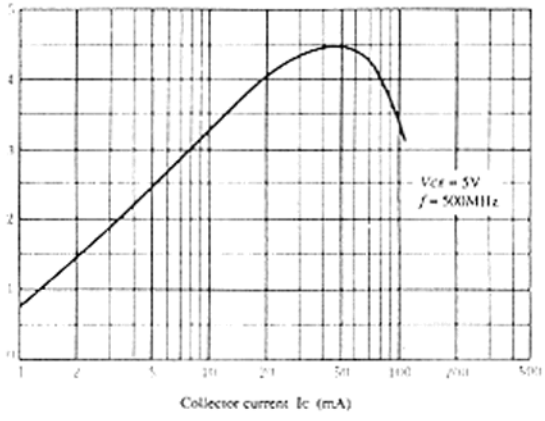
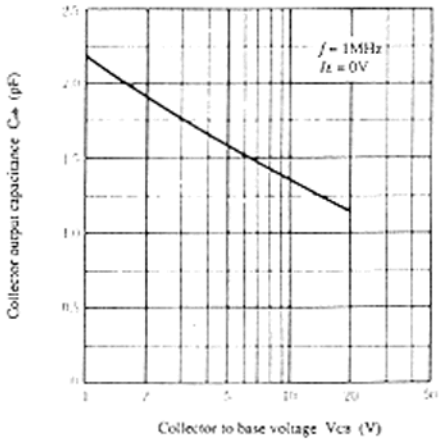
DC CURRENT TRANSFER RATIO VS. COLLECTOR CURRENT



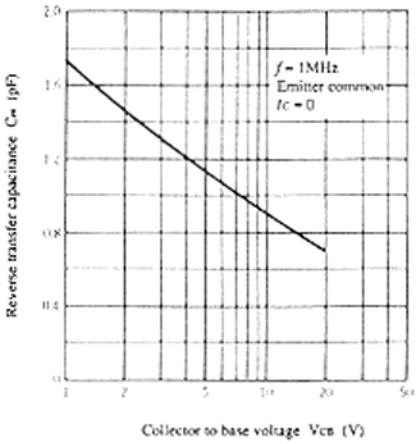
GAIN BANDWIDTH PRODUCT VS. COLLECTOR CURRENT



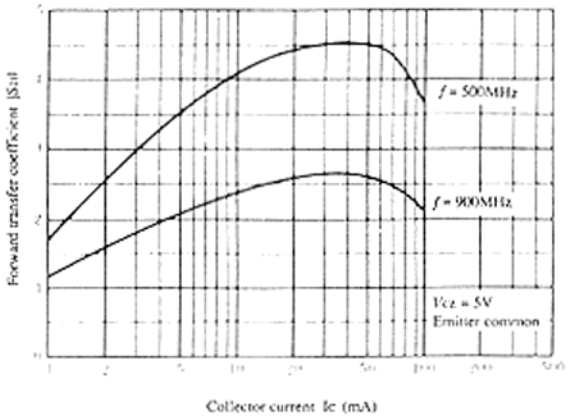
COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



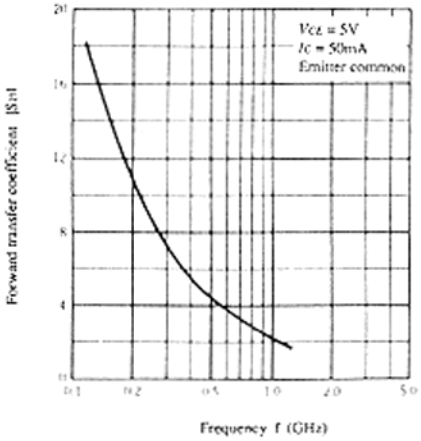
REVERSE TRANSFER CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



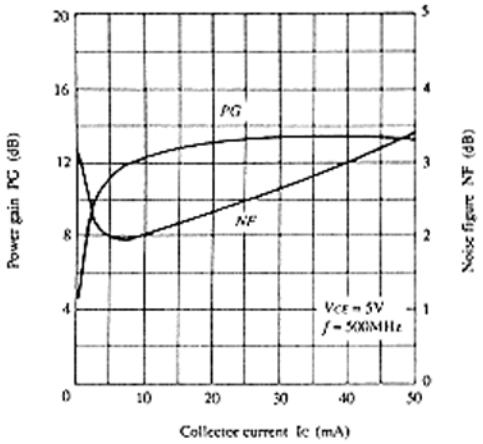
FORWARD TRANSFER COEFFICIENT VS. COLLECTOR CURRENT



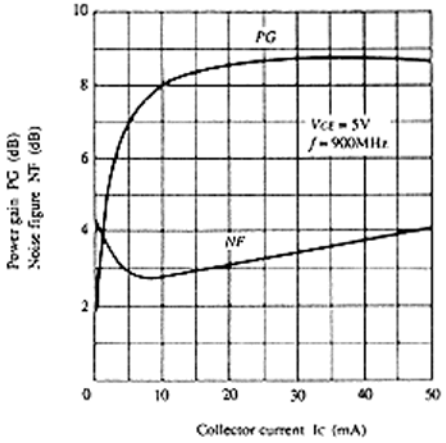
FORWARD TRANSFER COEFFICIENT VS. FREQUENCY



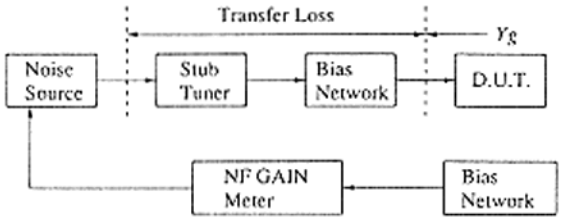
POWER GAIN AND NOISE FIGURE VS. COLLECTOR CURRENT



POWER GAIN AND NOISE FIGURE VS. COLLECTOR CURRENT



NOISE FIGURE AND POWER GAIN MEASUREMENT BLOCK DIAGRAM



Item	f = 500MHz	f = 900MHz
Transfer Loss (dB)	0.4	0.65
Y_g (mS)	9.785 + j67.25	46.32 + j129.77

S PARAMETERS (V_{CE}=5V, Ic=50mA, Zo=50Ω Emitter common)

f	Return Loss		Transfer Loss		Transfer Loss		Return Loss	
	Input	(S_{11})	Forward	(S_{21})	Reverse	(S_{12})	Output	(S_{22})
MHz	Ratio	Angle	Ratio	Angle	Ratio	Angle	Ratio	Angle
100	0.3115	−144.2	21.195	104.6	0.018	60.8	0.2946	−54.7
200	0.3024	−169.7	11.089	91.9	0.038	64.0	0.1731	−51.7
300	0.3039	173.6	7.484	85.2	0.058	66.4	0.1267	−48.4
400	0.3189	163.4	5.728	79.4	0.080	67.8	0.0994	−48.9
500	0.3255	152.5	4.639	74.3	0.100	65.6	0.0844	−36.9
600	0.3608	143.2	3.894	69.4	0.117	63.3	0.0424	−10.8
700	0.3841	138.3	3.376	64.6	0.140	60.7	0.0248	−17.9
800	0.3960	133.7	2.956	59.8	0.159	59.0	0.0165	−115.7
900	0.4079	125.7	2.680	55.1	0.177	55.6	0.0099	68.5
1000	0.4342	120.5	2.419	50.9	0.198	54.0	0.0188	86.4

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Y PARAMETERS (V_{CE}=5V, I_C=50mA) (Emitter common)

f	yie		yfe		yre		yoe	
	Real	Imaginary	Absolute	Angle	Absolute	Angle	Real	Imaginary
MHz	mS	mS	mS	deg	mS	deg	mS	mS
100	16.143	6.729	652.332	−53.3	0.560	−97.1	3.418	3.485
200	16.784	5.698	369.998	−72.3	1.262	−100.2	3.044	4.648
300	17.084	4.358	256.758	−83.1	1.991	−101.9	3.214	5.993
400	17.022	3.968	199.714	−90.5	2.773	−102.1	3.274	7.393
500	17.449	3.980	163.471	−96.9	3.519	−105.6	3.966	9.070
600	19.122	4.018	147.018	−104.3	4.435	−110.4	5.794	11.063
700	20.167	4.860	133.442	−108.1	5.518	−112.0	6.671	13.609
800	20.965	5.270	122.967	−112.0	6.596	−112.8	8.217	16.101
900	22.620	5.217	114.655	−118.5	7.584	−118.0	10.804	17.752
1000	24.300	4.492	107.585	−124.4	8.805	−121.3	13.171	19.422