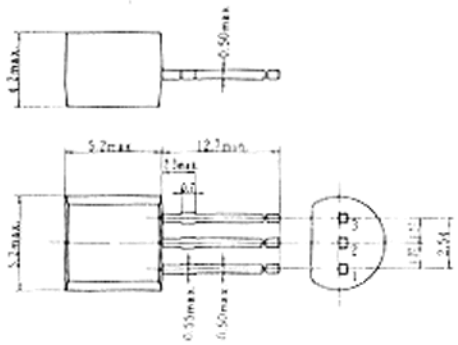
HITACHI

2SC1342

SILICON NPN EPITAXIAL PLANAR

VHF AMPLIFIER,
MIXER, LOCAL OSCILLATOR

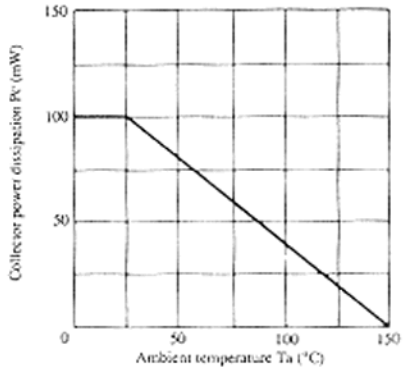


(JEDEC TO-92)

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Item	Symbol	2SC1342	Unit
Collector to base voltage	V_{CBO}	30	V
Collector to emitter voltage	V_{CEO}	20	V
Emitter to base voltage	V_{EBO}	4	V
Collector current	I_C	30	mA
Collector power dissipation	P_C	100	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	−55 to +150	°C

MAXIMUM COLLECTOR DISSIPATION CURVE



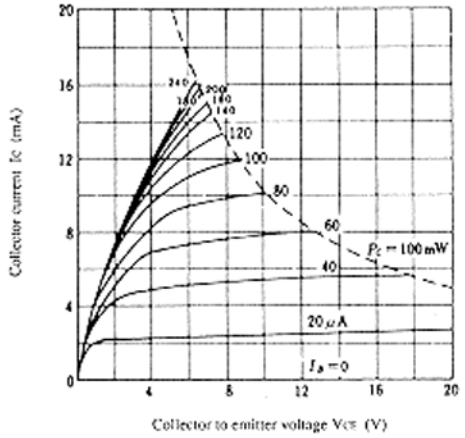
■ ELECTRICAL CHARACTERISTICS (Ta=25°C)

Item	Symbol	Test Condition	min.	typ.	max.	Unit
Collector to base breakdown voltage	$V_{(BR)CBO}$	I_C = 10μA, I_E = 0	30	—	—	V
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	I_C = 1mA, R_{BE} = ∞	20	—	—	V
Emitter to base breakdown voltage	$V_{(BR)EBO}$	I_E = 10μA, I_C = 0	4	—	—	V
Collector cutoff current	I_{CBO}	V_{CB} =10V, I_E = 0	—	—	0.5	μA
DC current transfer ratio	h_{FE}*	V_{CE} =6V, I_C = 1mA	35	—	200	
Collector to emitter saturation voltage	$V_{CE(sat)}$	I_C = 10mA, I_B = 1mA	—	0.8	1.2	V
Collector output capacitance	C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz	—	1.1	1.5	pF
Base time constant	$r_{bb'}$·C_c	V_{CB} = 6V, I_C = 1mA, f = 31.8MHz	—	20	35	ps
Gain bandwidth product	f_T	V_{CE} = 6V, I_C = 1mA	150	320	—	MHz
Noise figure	NF	V_{CE} = 6V, I_C = 1mA, f = 100MHz, R_g = 50Ω	—	5.5	8.5	dB
Reverse transfer capacitance	C_{re}	V_{CE} = 10V, I_E = −1mA, f = 1MHz	—	0.9	1.2	pF
Power gain	PG	V_{CE} = 6V, I_C = 1mA, f = 100MHz R_g = 100Ω, R_L = 550Ω, Unneutralized	13	17	—	dB

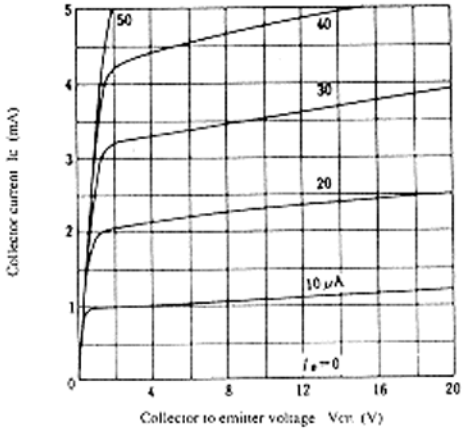
* The 2SC1342 is grouped by h_{FE} as follows.

A	B	C
35 to 70	60 to 120	100 to 200

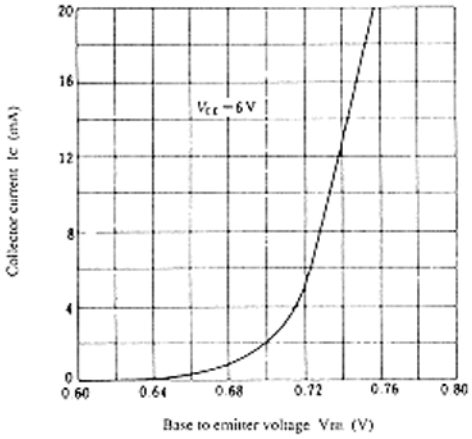
TYPICAL OUTPUT CHARACTERISTICS (1)



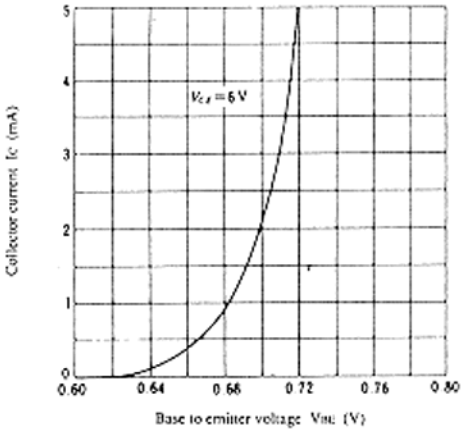
TYPICAL OUTPUT CHARACTERISTICS (2)



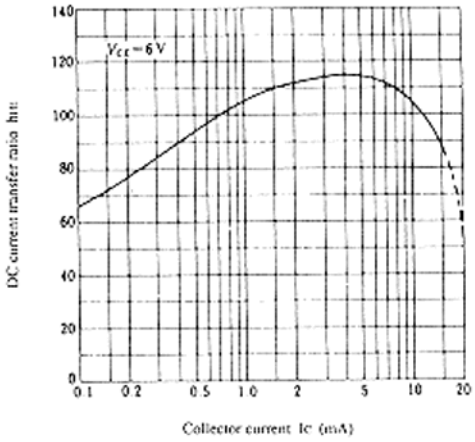
TYPICAL TRANSFER CHARACTERISTICS (1)



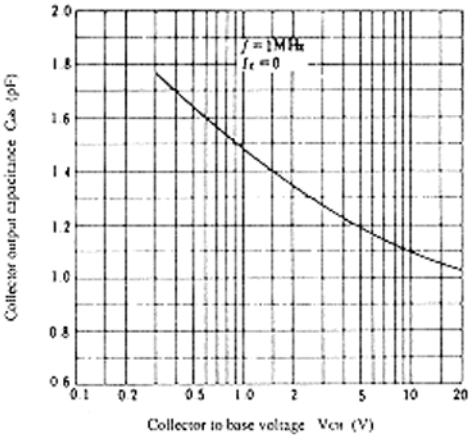
TYPICAL TRANSFER CHARACTERISTICS (2)



DC CURRENT TRANSFER RATIO VS. COLLECTOR CURRENT

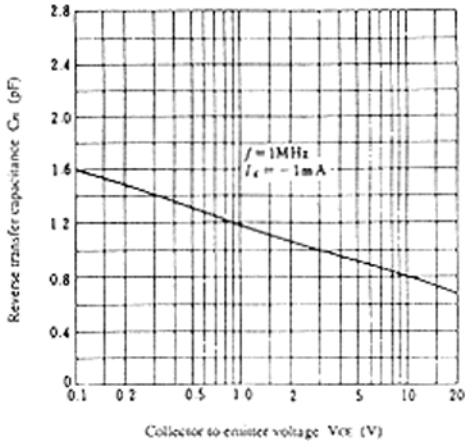


COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE

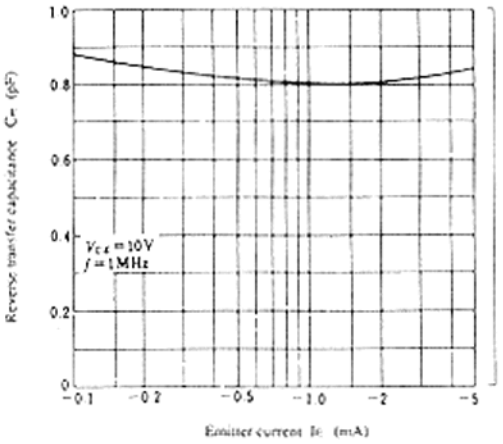


2SC1342

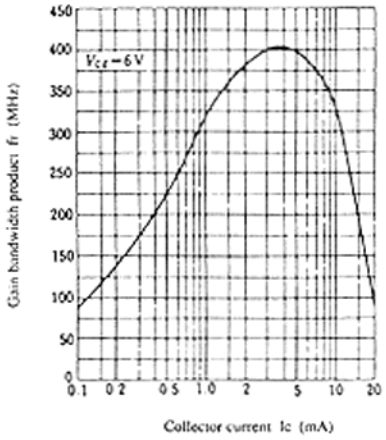
REVERSE TRANSFER CAPACITANCE VS. COLLECTOR TO EMITTER VOLTAGE



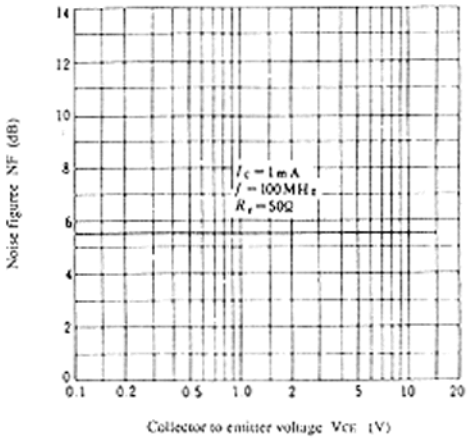
REVERSE TRANSFER CAPACITANCE VS. EMITTER CURRENT



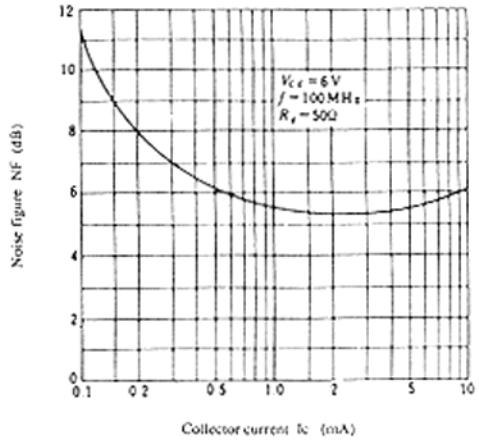
GAIN BANDWIDTH PRODUCT VS. COLLECTOR CURRENT



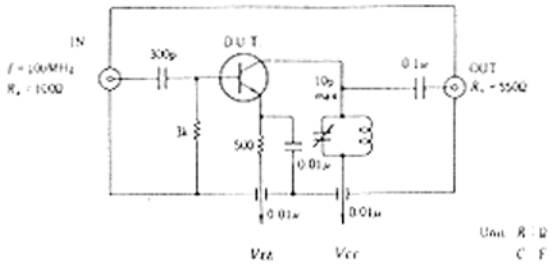
NOISE FIGURE VS. COLLECTOR TO EMITTER VOLTAGE



NOISE FIGURE VS. COLLECTOR CURRENT



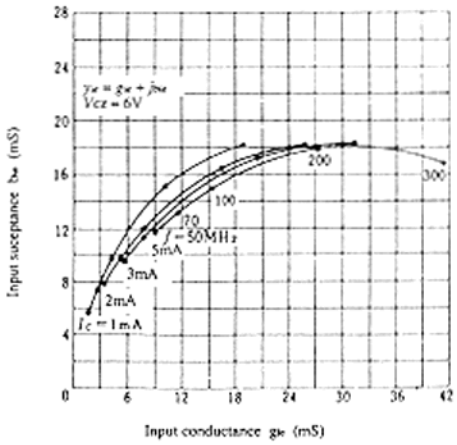
POWER GAIN TEST CIRCUIT



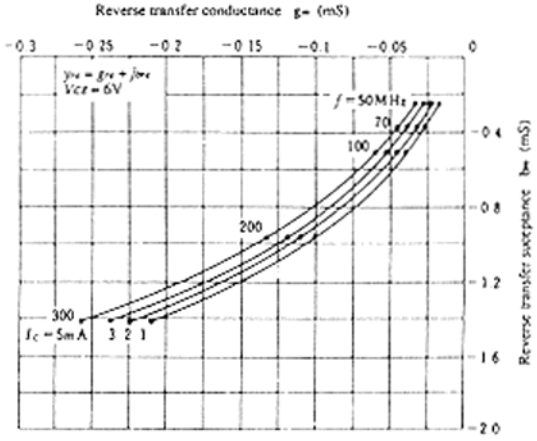
■ **SMALL SIGNAL y PARAMETERS** (V_{CE} = 6V, I_C = 1mA, Emitter Common Ta = 25°C)

Item	Symbol	f = 50MHz	f = 100MHz	f = 200MHz	Unit
Input admittance	y_{ie}	1.8 + j5.5	4.3 + j9.9	11.5 + j15.25	mS
Reverse transfer admittance	y_{re}	–0.022 – j0.26	–0.04 – j0.52	–0.105 – j0.96	
Forward transfer admittance	y_{fe}	34 – j12	28 – j19	15.5 – j25	
Output admittance	y_{oe}	0.1 + j0.5	0.15 + j0.9	0.21 + j1.45	

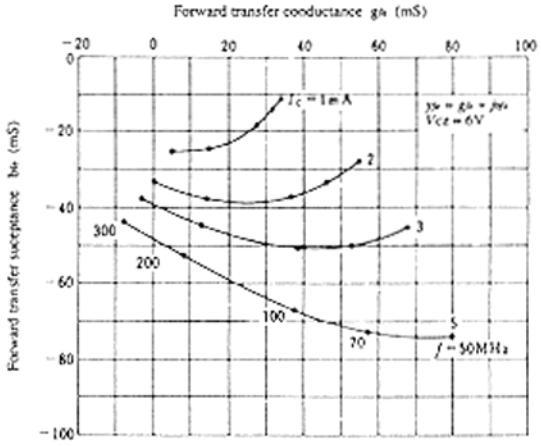
INPUT ADMITTANCE VS. FREQUENCY



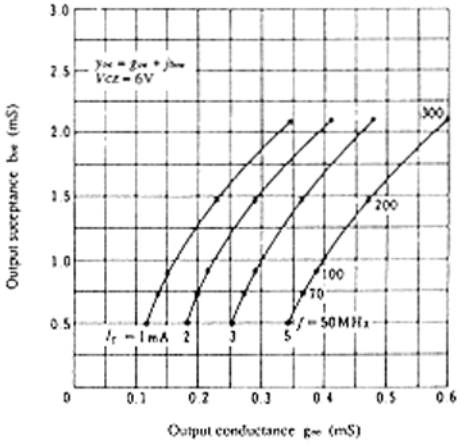
REVERSE TRANSFER ADMITTANCE VS.FREQUENCY



FORWARD TRANSFER ADMITTANCE VS. FREQUENCY

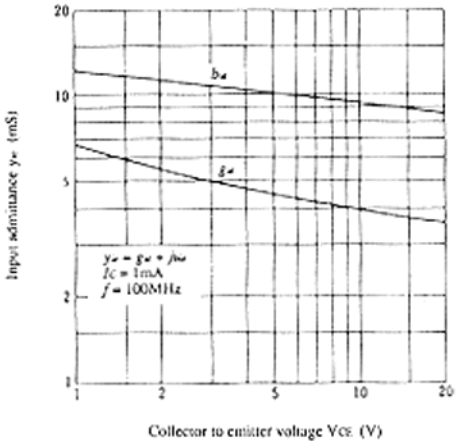


OUTPUT ADMITTANCE VS. FREQUENCY

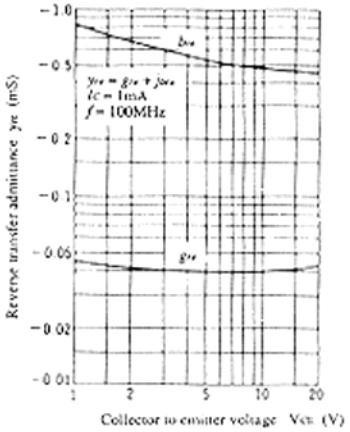


2SC1342

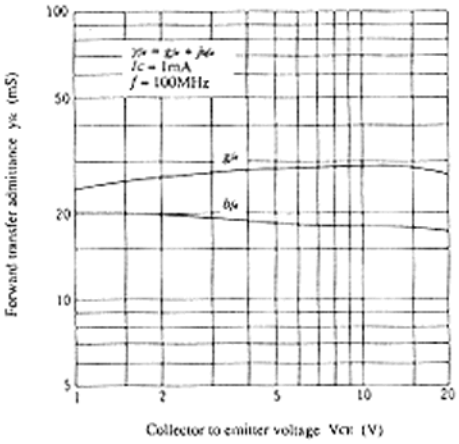
INPUT ADMITTANCE VS. COLLECTOR TO EMITTER VOLTAGE



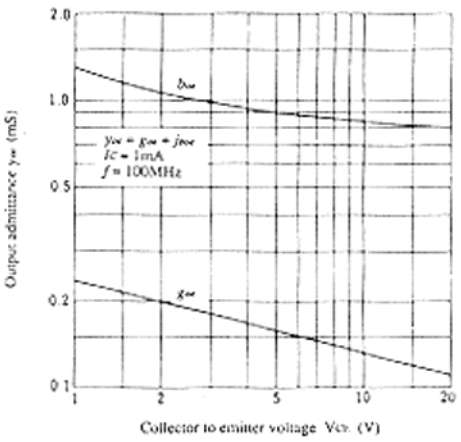
REVERSE TRANSFER ADMITTANCE VS. COLLECTOR TO EMITTER VOLTAGE



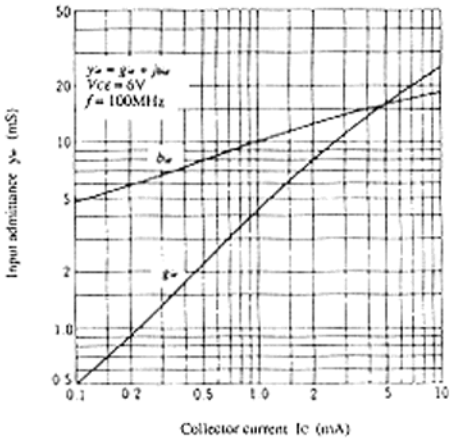
FORWARD TRANSFER ADMITTANCE VS. COLLECTOR TO EMITTER VOLTAGE



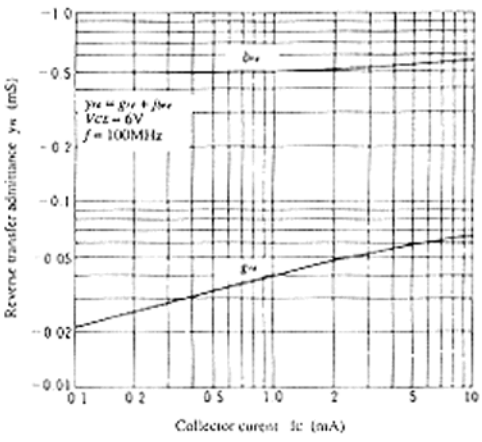
OUTPUT ADMITTANCE VS. COLLECTOR TO EMITTER VOLTAGE



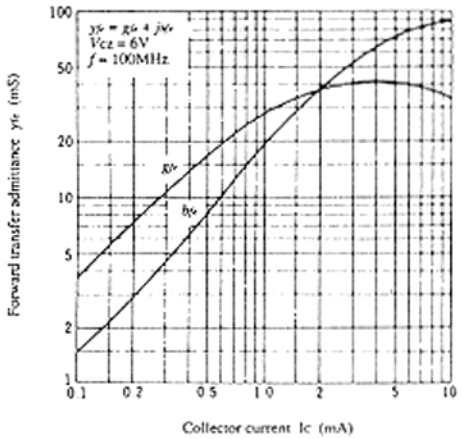
INPUT ADMITTANCE VS. COLLECTOR CURRENT



REVERSE TRANSFER ADMITTANCE VS. COLLECTOR CURRENT



FORWARD TRANSFER ADMITTANCE VS. COLLECTOR CURRENT



OUTPUT ADMITTANCE VS. COLLECTOR CURRENT