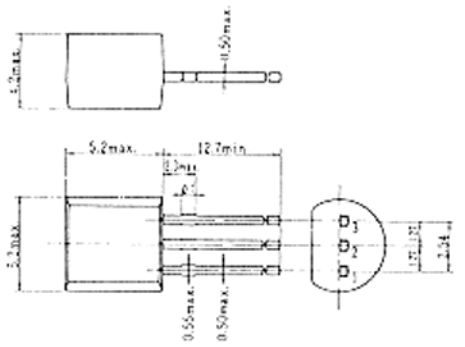
HITACHI

2SC1856

SILICON NPN

VHF AMPLIFIER
VHF TV TUNER RF AMPLIFIER

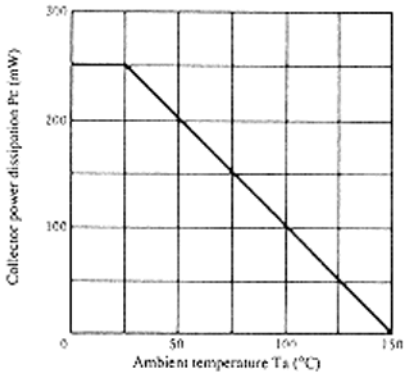


(JEDEC TO-92)

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Item	Symbol	2SC1856	Unit
Collector to base voltage	V_{CBO}	20	V
Collector to emitter voltage	V_{CEO}	20	V
Emitter to base voltage	V_{EBO}	3	V
Collector current	I_C	20	mA
Emitter current	I_E	−20	mA
Collector power dissipation	P_C	250	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 = 100μA, I_E = 0	20	—	—	V
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	I_C = 3mA, R_{BE} = ∞	20	—	—	V
Emitter to base breakdown voltage	$V_{(BR)EBO}$	I_E = 100μA, I_C = 0	3	—	—	V
Collector cutoff current	I_{CBO}	V_{CB} =20V, I_E = 0	—	—	100	nA
DC current transfer ratio	h_{FE}	V_{CE} = 10V, I_C = 2mA	20	—	200	
Gain bandwidth product	f_T	V_{CE} = 10V, I_C = 2mA	400	550	—	MHz
Reverse transfer capacitance	C_{re}*	V_{CB} =12V, I_E = 0 f = 1MHz, Emitter Common	—	0.35	0.45	pF
Power gain	PG	V_{CC} =12V, V_{AGC} = 1.7V, f = 200MHz, (I_C ≒ 2mA)	18	22	27	dB
Noise figure	NF	V_{CE} =10V, I_C = 2mA, f= 200MHz	—	2.5	3.2	dB
AGC voltage	V_{AGC}	V_{CC} =12V, GR = 30dB, f = 200MHz	4.3	4.7	5.1	V

* Measured by the balanced type capacitance bridge. (Emitter lead is connected to earth terminal of the tester.)

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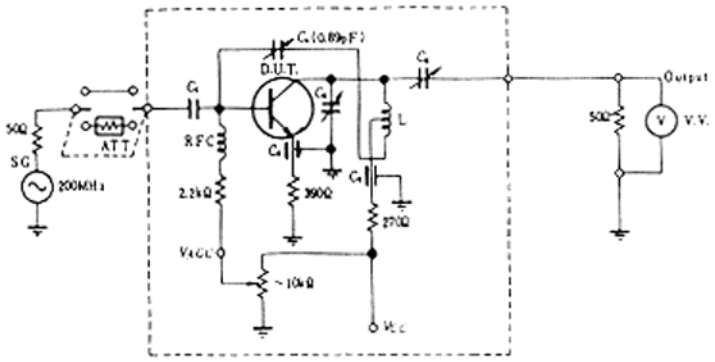
PG, NF and V_{AGC} Test Circuit

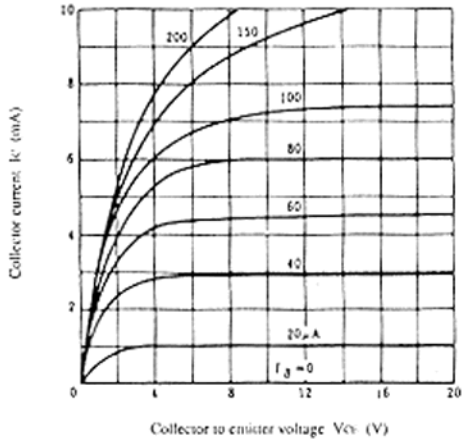


C_1 : 0.005μF
C_2 : } 0.005μF
C_3 :
C_4 : 10pF max
C_5 : 10pF max
C_6 : 10pF max
L : 1.0mm Cu wire plated with Sn 4 T, 9.5mm inside dia, ground with 2 T from collector, pitch 2.0mm.
ATT: 30dB

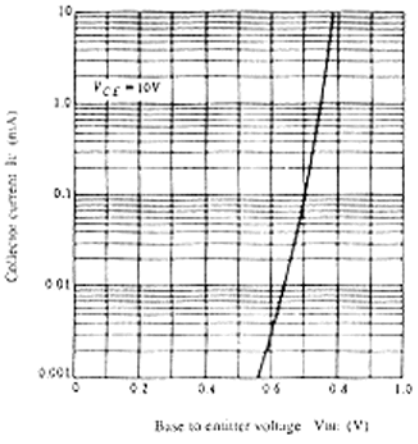
V_{AGC} Test Procedure

1. Set up at Vcc = 12V and V_{AGC} = 1.7V.
2. Adjust C_5 for max. output with ATT (30 dB) connected.
3. Adjust output of SG for V_{out} = 1mV.
4. Then, remove ATT and adjust V_{AGC} for V_{out} = 1mV. (at this time, output of SG and C_5 should not be changed.)
5. The V_{AGC} value adjusted is defined as the AGC voltage at 30 dB attenuation.

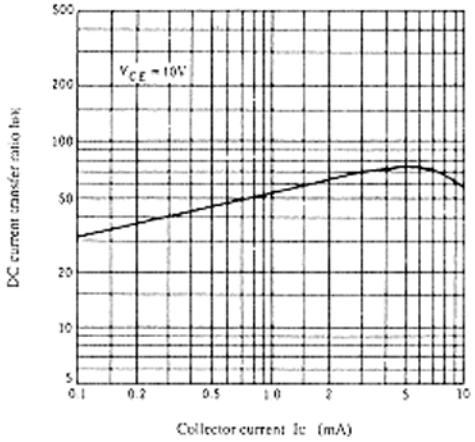
TYPICAL OUTPUT CHARACTERISTICS



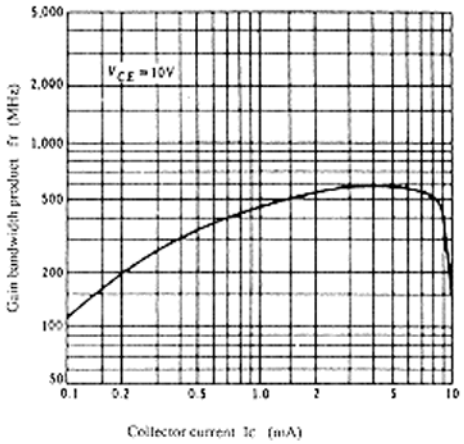
TYPICAL TRANSFER CHARACTERISTICS



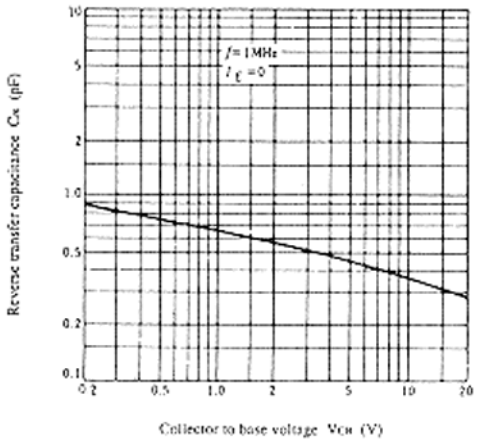
DC CURRENT TRANSFER RATIO VS. COLLECTOR CURRENT



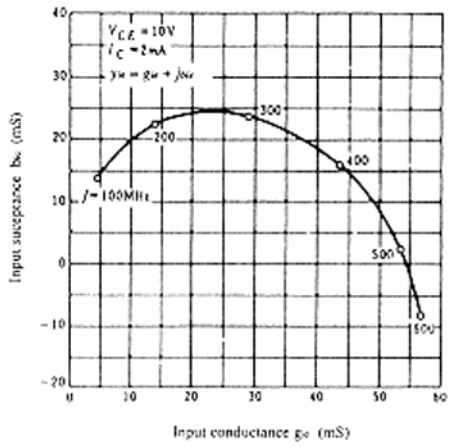
GAIN BANDWIDTH PRODUCT VS. COLLECTOR CURRENT



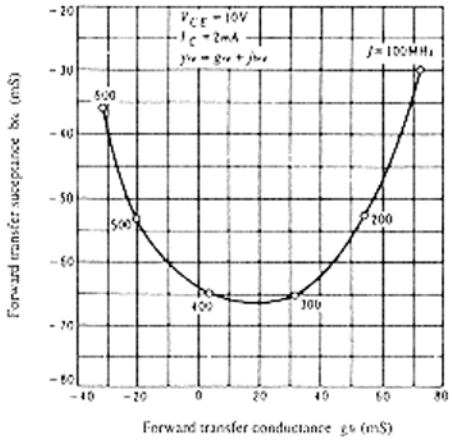
REVERSE TRANSFER CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



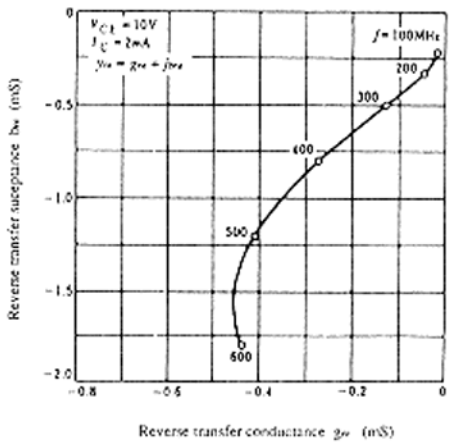
INPUT ADMITTANCE VS. FREQUENCY



FORWARD TRANSFER ADMITTANCE VS. FREQUENCY



REVERSE TRANSFER ADMITTANCE VS. FREQUENCY



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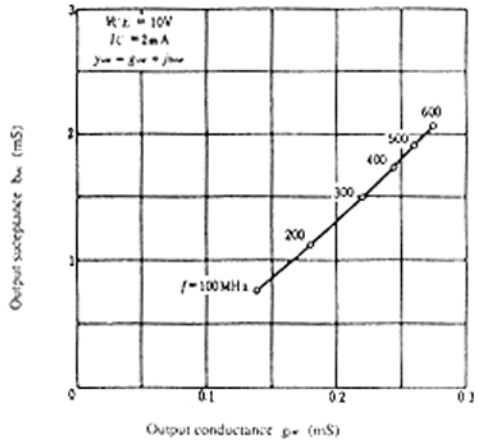
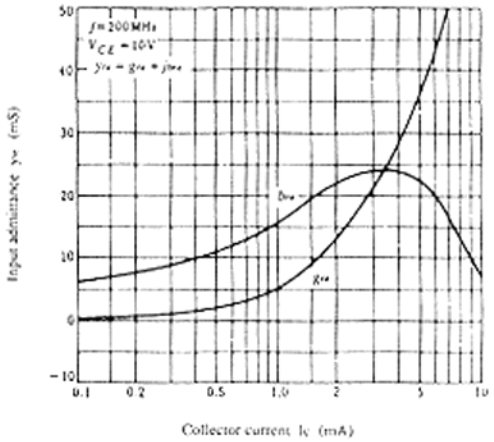
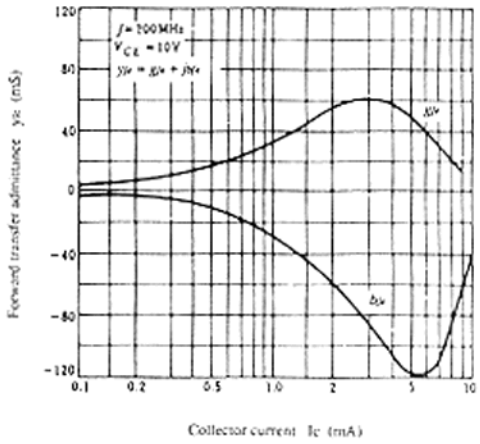
OUTPUT ADMITTANCE VS. FREQUENCY



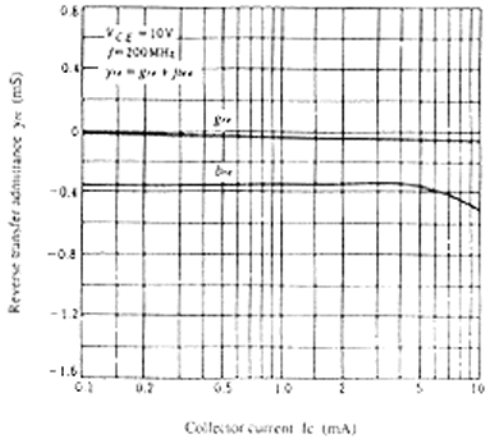
INPUT ADMITTANCE VS. COLLECTOR CURRENT



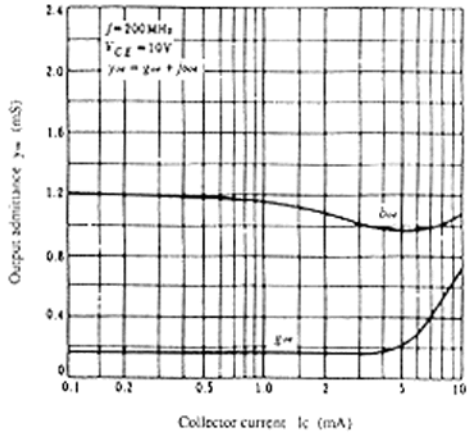
FORWARD TRANSFER ADMITTANCE VS. COLLECTOR CURRENT



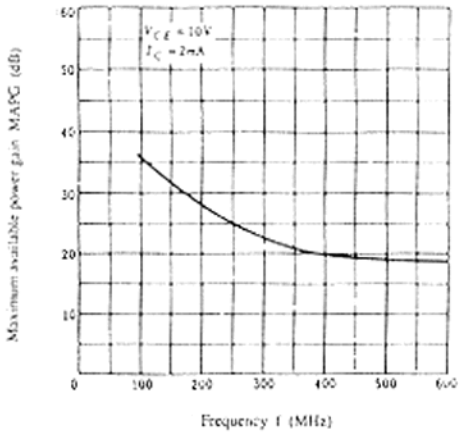
REVERSE TRANSFER ADMITTANCE VS. COLLECTOR CURRENT



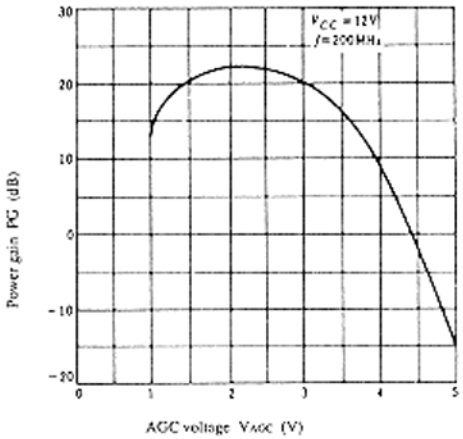
OUTPUT ADMITTANCE VS. COLLECTOR CURRENT



MAXIMUM AVAILABLE POWER GAIN VS. FREQUENCY



POWER GAIN VS. AGC VOLTAGE



POWER GAIN & NOISE FIGURE VS. COLLECTOR CURRENT