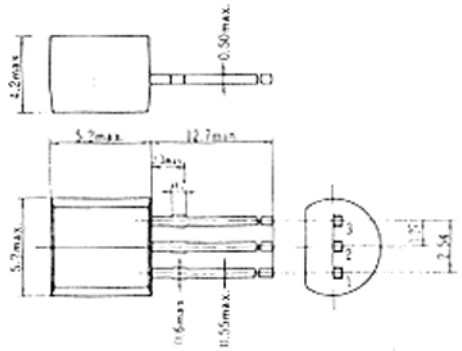
HITACHI

2SC1344, 2SC1345

SILICON NPN EPITAXIAL

LOW FREQUENCY LOW NOISE AMPLIFIER

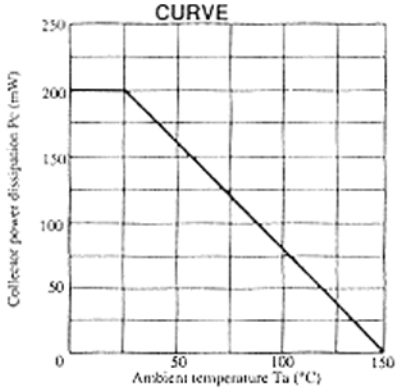


(JEDEC TO-92)

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Item	Symbol	2SC1344	2SC1345	Unit
Collector to base voltage	V_{CBO}	30	55	V
Collector to emitter voltage	V_{CEO}	30	50	V
Emitter to base voltage	V_{EBO}	5	5	V
Collector current	I_C	100	100	mA
Collector power dissipation	P_C	200	200	mW
Junction temperature	T_j	150	150	°C
Storage temperature	T_{stg}	−55 to +150	−55 to +150	°C

MAXIMUM COLLECTOR DISSIPATION CURVE



■ ELECTRICAL CHARACTERISTICS (Ta=25°C)

Item	Symbol	Test Condition	2SC1344			2SC1345			Unit
			min.	typ.	max.	min.	typ.	max.	
Collector to base breakdown voltage	$V_{(BR)CBO}$	I_C = 10μA, I_E = 0	30	—	—	55	—	—	V
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	I_C = 1mA, R_{BE} = ∞	30	—	—	50	—	—	V
Emitter to base breakdown voltage	$V_{(BR)EBO}$	I_E = 10μA, I_C = 0	5	—	—	5	—	—	V
Collector cutoff current	I_{CBO}	V_{CB} = 18V, I_E = 0	—	—	0.5	—	—	0.5	μA
Emitter cutoff current	I_{EBO}	V_{CB} = 2V, I_C = 0	—	—	0.5	—	—	0.5	μA
DC current transfer ratio	h_{FE}*	V_{CE} = 12V, I_C = 2mA	250	—	1200	250	—	1200	
Base to emitter voltage	V_{BE}	V_{CE} = 12V, I_C = 2mA	—	—	0.75	—	—	0.75	V
Collector to emitter saturation voltage	$V_{CE(sat)}$	I_C = 10mA, I_B = 1mA	—	—	0.5	—	—	0.5	V
Gain bandwidth product	f_T	V_{CE} = 12V, I_C = 2mA,	—	230	—	—	230	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz	—	—	3.5	—	—	3.5	pF
Noise figure	NF	V_{CE} = 6V, I_C = 0.1mA, f = 10Hz, R_g = 10kΩ	—	—	8	—	—	8	dB
		V_{CE} = 6V, I_C = 0.1mA, f = 1kHz, R_g = 10kΩ	—	—	1	—	—	1	dB

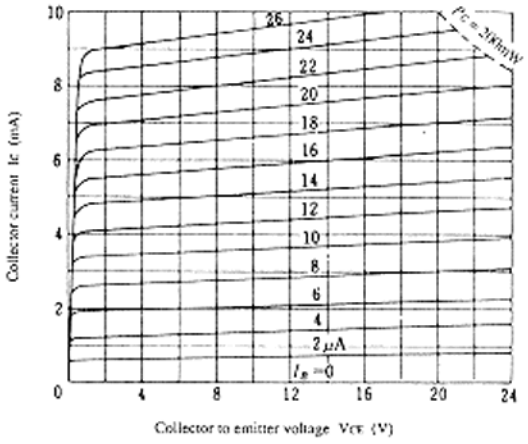
* The 2SC1344 and 2SC1345 are grouped by h_{FE} as follows.

D	E	F
250 to 500	400 to 800	600 to 1200

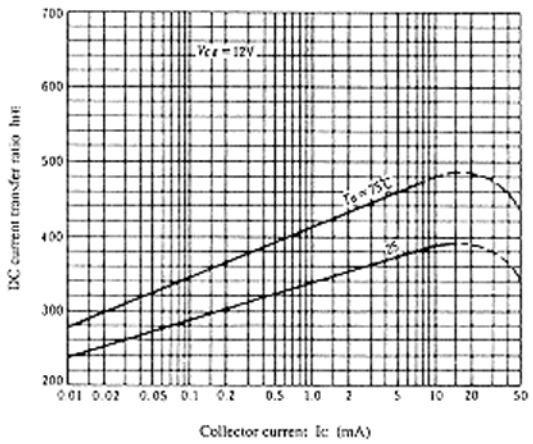
■ **SMALL SIGNAL h PARAMETERS** (V_{CE}=5V, I_C=0.1mA, f=270Hz, Ta=25°C, Emitter common)

Item	Symbol	D	E	F	Unit
Input impedance	h_{ie}	110	170	240	kΩ
Voltage feedback ratio	h_{re}	9.5	14.5	16	$\times 10^{-4}$
Current transfer ratio	h_{fe}	340	540	825	
Output admittance	h_{oe}	12.0	12.5	13.5	μS

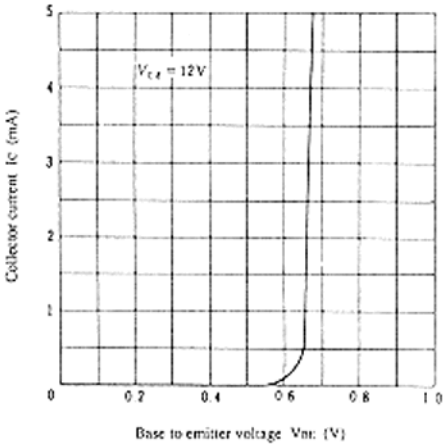
TYPICAL OUTPUT CHARACTERISTICS



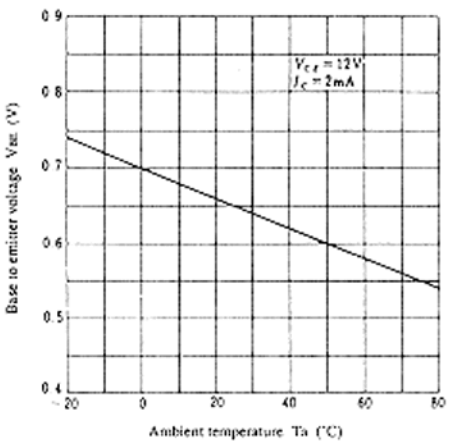
DC CURRENT TRANSFER RATIO VS. COLLECTOR CURRENT



TYPICAL TRANSFER CHARACTERISTICS

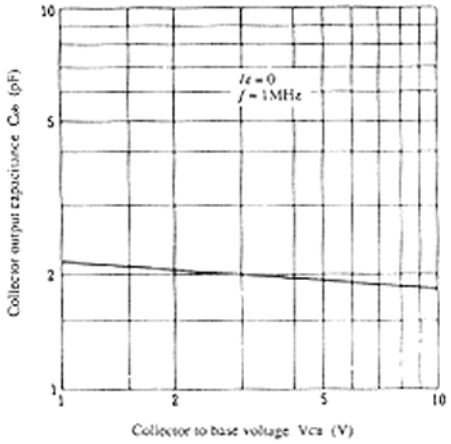


BASE TO EMITTER VOLTAGE VS. AMBIENT TEMPERATURE

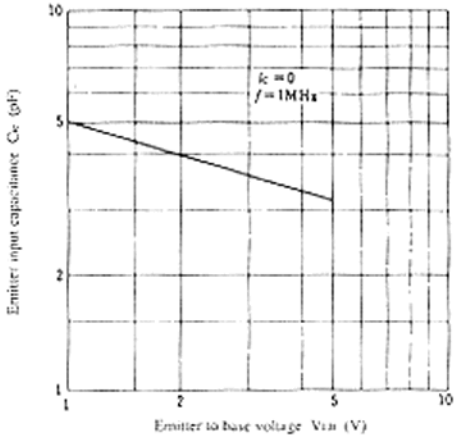


2SC1344, 2SC1345

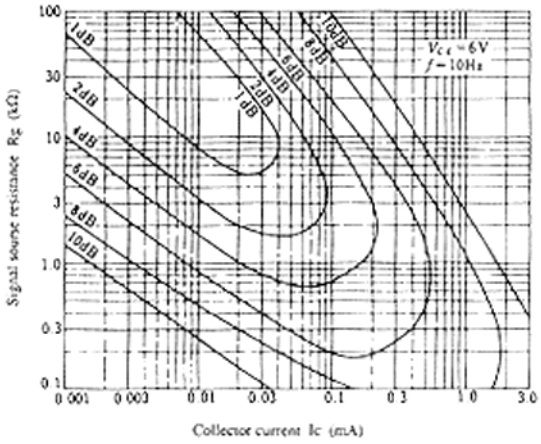
COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



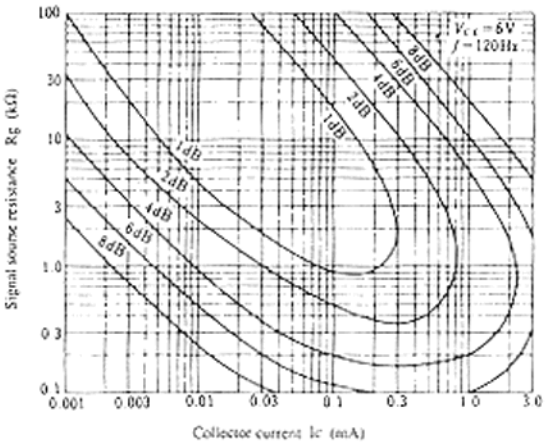
EMITTER INPUT CAPACITANCE VS. EMITTER TO BASE VOLTAGE



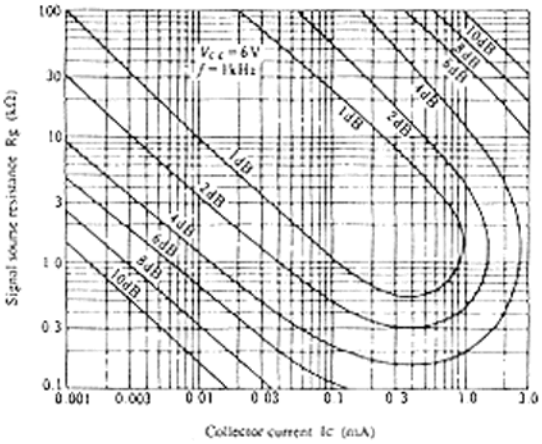
CONTOURS OF CONSTANT NOISE FIGURE



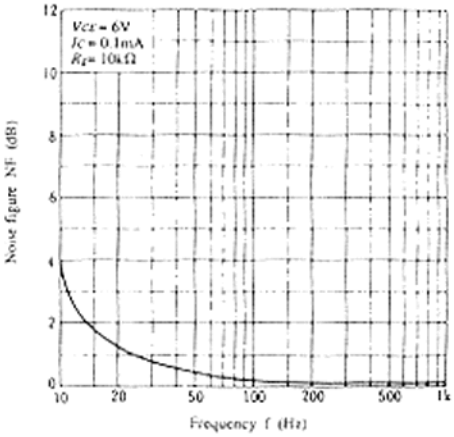
CONTOURS OF CONSTANT NOISE FIGURE



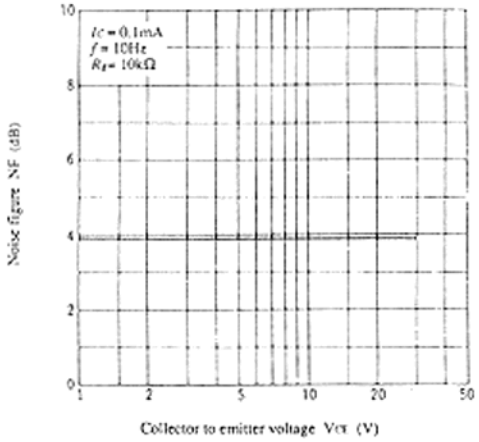
CONTOURS OF CONSTANT NOISE FIGURE



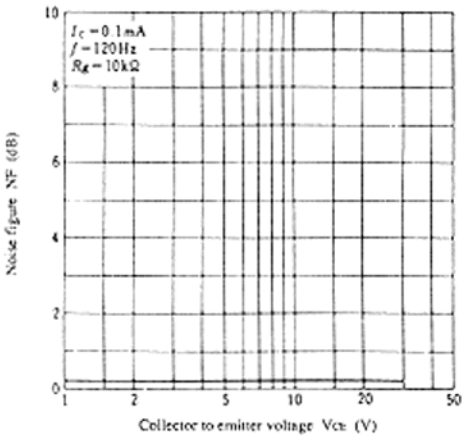
NOISE FIGURE VS. FREQUENCY



NOISE FIGURE VS. COLLECTOR TO EMITTER VOLTAGE



NOISE FIGURE VS. COLLECTOR TO EMITTER VOLTAGE



NOISE FIGURE VS. COLLECTOR TO EMITTER VOLTAGE