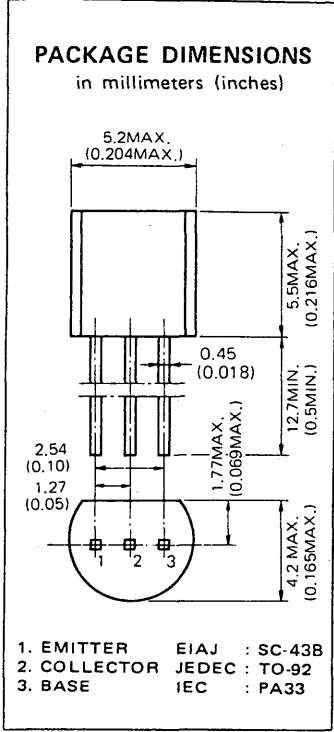


DESCRIPTION The 2SA990 is designed for use in driver stage of AF amplifier.

FEATURE • High h_{FE} . h_{FE} : 400 TYP. ($V_{CE} = -6.0$ V, $I_C = -1.0$ mA)

ABSOLUTE MAXIMUM RATINGS

- Maximum Temperatures
 - Storage Temperature -55 to +125 °C
 - Junction Temperature +125 °C Maximum
- Maximum Power Dissipation ($T_a = 25$ °C)
 - Total Power Dissipation 250 mW
- Maximum Voltages and Currents ($T_a = 25$ °C)
 - V_{CBO} Collector to Base Voltage -60 V
 - V_{CEO} Collector to Emitter Voltage -50 V
 - V_{EBO} Emitter to Base Voltage -5.0 V
 - I_C Collector Current -100 mA
 - I_B Base Current -20 mA



ELECTRICAL CHARACTERISTICS ($T_a = 25$ °C)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
h_{FE1}	DC Current Gain	150	380		—	$V_{CE} = -6.0$ V, $I_C = -0.1$ mA
h_{FE2}	DC Current Gain	200	400	800	—	$V_{CE} = -6.0$ V, $I_C = -1.0$ mA
f_T	Gain Bandwidth Product	50	180		MHz	$V_{CE} = -6.0$ V, $I_E = 1.0$ mA
C_{ob}	Output Capacitance		4.5	6.0	pF	$V_{CB} = -10$ V, $I_E = 0$, $f = 1.0$ MHz
NV	Noise Voltage		25	40	mV	$V_{CE} = -5.0$ V, $I_C = -1.0$ mA, $R_G = 100$ k Ω , $G_V = 80$ dB, $f = 10$ Hz to 1.0 kHz
I_{CBO}	Collector Cutoff Current			-100	nA	$V_{CB} = -60$ V, $I_E = 0$
I_{EBO}	Emitter Cutoff Current			-100	nA	$V_{EB} = -5.0$ V, $I_C = 0$
V_{BE}	Base to Emitter Voltage	-0.58	-0.62	-0.68	V	$V_{CE} = -6.0$ V, $I_C = -1.0$ mA
$V_{CE(sat)}$	Collector Saturation Voltage		-0.18	-0.30	V	$I_C = -100$ mA, $I_B = -10$ mA

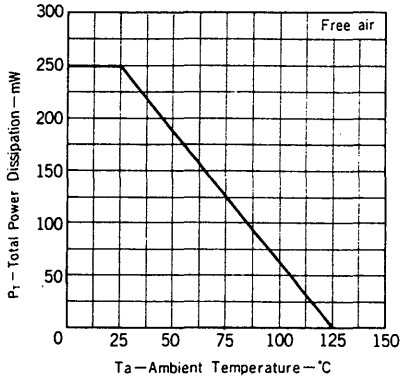
Classification of h_{FE2}

Rank	P	F	E
Range	200 - 400	300 - 600	400 - 800

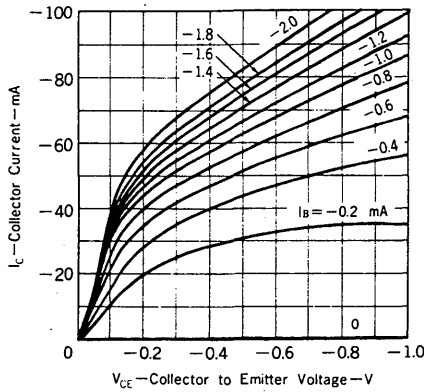
h_{FE2} Test Conditions : $V_{CE} = -6.0$ V, $I_C = -1.0$ mA

TYPICAL CHARACTERISTICS (Ta = 25 °C unless otherwise noted)

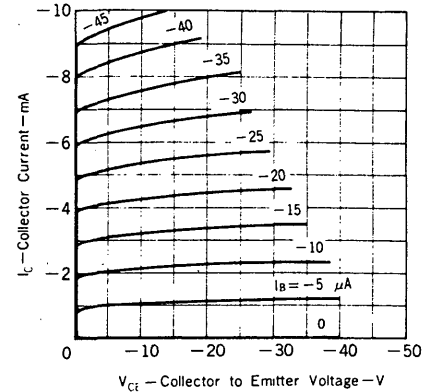
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



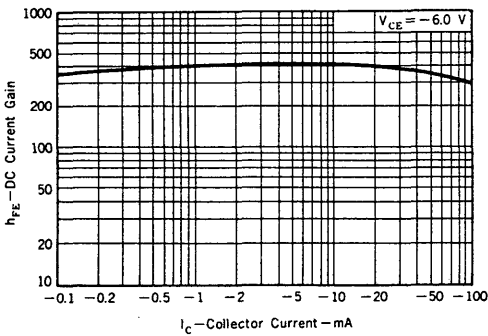
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



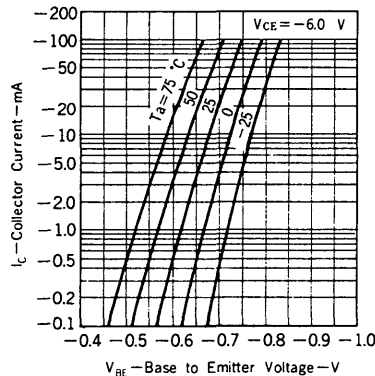
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



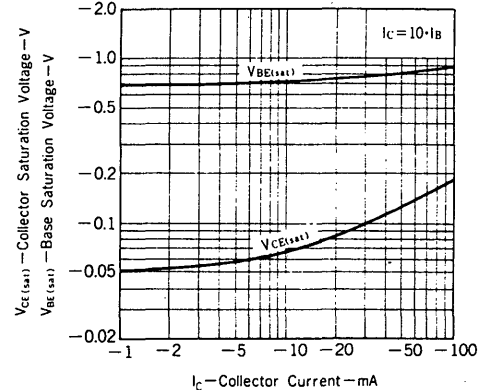
DC CURRENT GAIN vs. COLLECTOR CURRENT



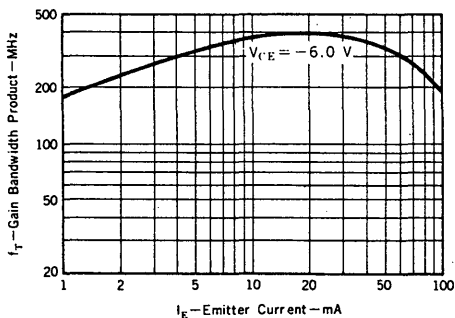
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



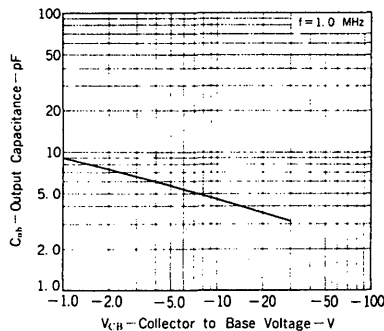
COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



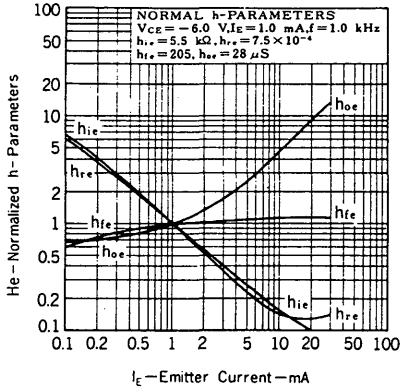
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



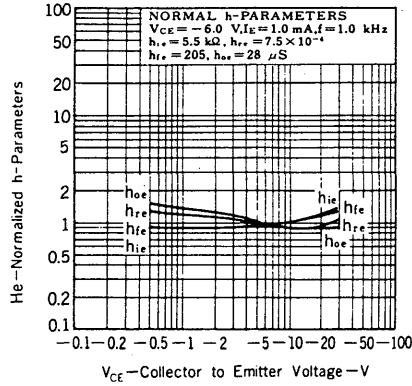
OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



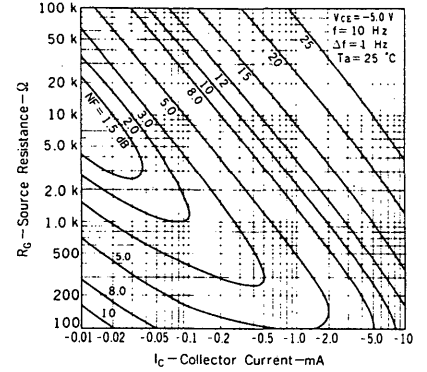
NORMALIZED h-PARAMETERS vs. EMITTER CURRENT



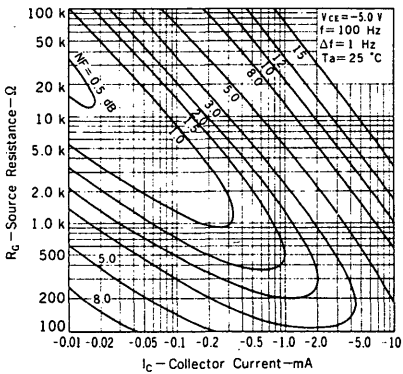
NORMALIZED h-PARAMETERS vs. COLLECTOR TO EMITTER VOLTAGE



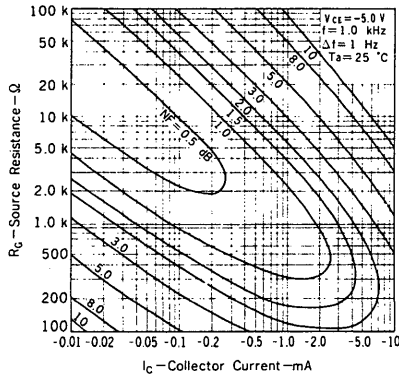
NOISE FIGURE MAP 1



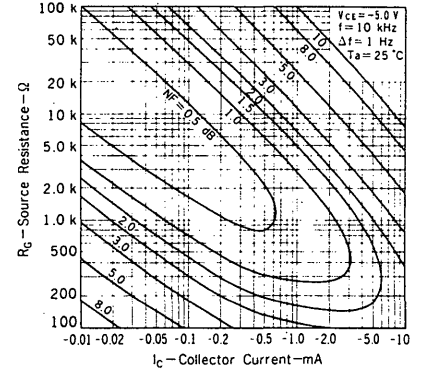
NOISE FIGURE MAP 2



NOISE FIGURE MAP 3



NOISE FIGURE MAP 4



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