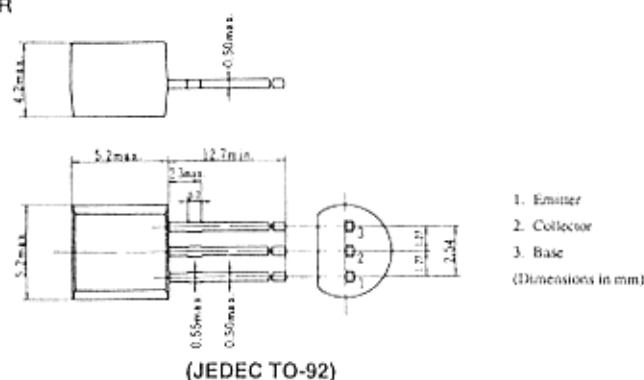


2SC460, 2SC461

SILICON NPN EPITAXIAL PLANAR

2SC460 HIGH FREQUENCY AMPLIFIER, MIXER

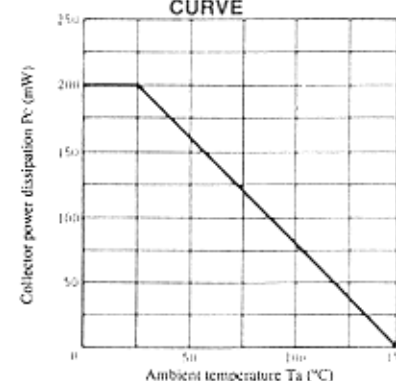
2SC461 VHF AMPLIFIER, MIXER



■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Item	Symbol	2SC460	2SC461	Unit
Collector to base voltage	V _{CB0}	30	30	V
Collector to emitter voltage	V _{CE0}	30	30	V
Emitter to base voltage	V _{EB0}	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	2SC460			2SC461			Unit
			min.	typ.	max.	min.	typ.	max.	
Collector to base breakdown voltage	V _{(BR)CBO}	I _C = 10μA, I _E = 0	30	—	—	30	—	—	V
Collector to emitter breakdown voltage	V _{(BR)CEO}	I _C = 1mA, R _{BE} = ∞	30	—	—	30	—	—	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 _{EB} = 2V, I _C = 0	—	—	0.5	—	—	0.5	μA
Base to emitter voltage	V _{BE}	V _{CE} = 12V, I _C = 2mA	—	0.63	0.75	—	0.63	0.75	V
DC current transfer ratio	h _{FE} *	V _{CE} = 12V, I _C = 2mA	35	—	200	35	—	200	
Collector to emitter saturation voltage	V _{CE(sat)}	I _C = 10mA, I _B = 1mA	—	0.6	1.1	—	0.6	1.1	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	—	1.8	3.5	—	1.8	3.5	pF
10.7MHz Power gain	PG	V _{CE} = 6V, I _E = -1mA f = 10.7MHz	26	29	—	—	—	—	dB
100MHz Power gain	PG	V _{CE} = 6V, I _E = -1mA f = 100MHz	—	—	—	13	17	—	dB
Noise figure	NF	V _{CE} = 6V, I _C = 2mA, f = 1MHz R _g = 500Ω	—	2.0	—	—	—	—	dB

* The 2SC460 and 2SC461 are grouped by h_{FE} as follows.

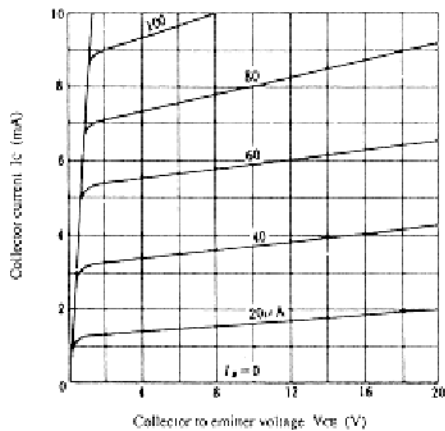
A	B	C
35 to 70	60 to 120	100 to 200

2SC460, 2SC461

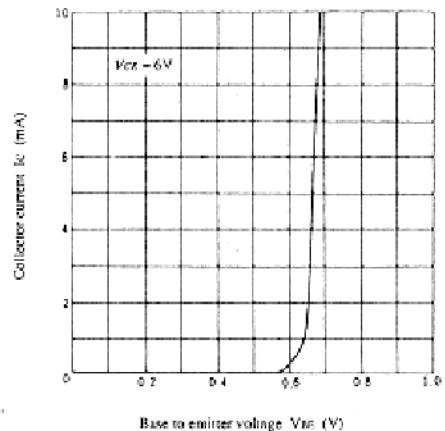
■ SMALL SIGNAL y PARAMETERS (V_{CE}=6V, I_C=1mA, Emitter Common)

Item	Symbol	f	2SC460A, 2S461A	2SC460B, 2SC461B	2SC460C, 2SC461C	Unit
Input admittance	y _{ie}	455kHz	0.58 + j0.074	0.42 + j0.068	0.30 + j0.051	mS
		4.5MHz	0.65 + j0.79	0.50 + j0.7	0.35 + j0.57	
		10.7MHz	0.91 + j2.0	0.61 + j1.9	0.39 + j1.3	
		100MHz	7.4 + j14	5.6 + j12	3.8 + j6.0	
Reverse transfer admittance	y _{re}	455kHz	- j0.003	- j0.003	- j0.003	mS
		4.5MHz	- j0.04	- j0.04	- j0.04	
		10.7MHz	- j0.13	- j0.13	- j0.13	
		100MHz	- j1.0	- j1.0	- j1.0	
Forward transfer admittance	y _{fe}	455kHz	38 - j0.1	37 - j0.1	37 - j0.2	mS
		4.5MHz	35 - j1.0	35 - j1.2	34 - j1.8	
		10.7MHz	34 - j2.5	34 - j2.5	33 - j4.5	
		100MHz	28 - j20	26 - j19	20 - j19	
Output admittance	y _{oe}	455kHz	0.0098 + j0.009	0.013 + j0.009	0.016 + j0.012	mS
		4.5MHz	0.02 + j0.09	0.023 + j0.092	0.03 + j0.10	
		10.7MHz	0.11 + j0.4	0.11 + j0.4	0.12 + j0.4	
		100MHz	0.40 + j1.7	0.50 + j2.0	0.83 + j2.0	

TYPICAL OUTPUT CHARACTERISTICS

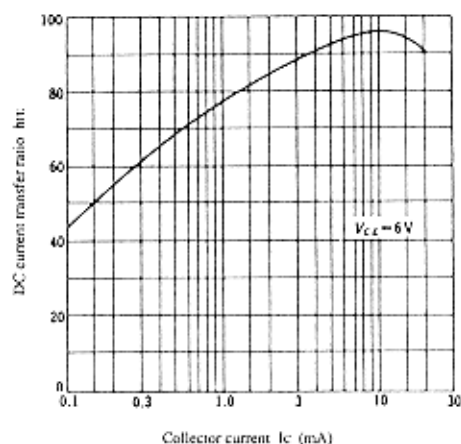


TYPICAL TRANSFER CHARACTERISTICS

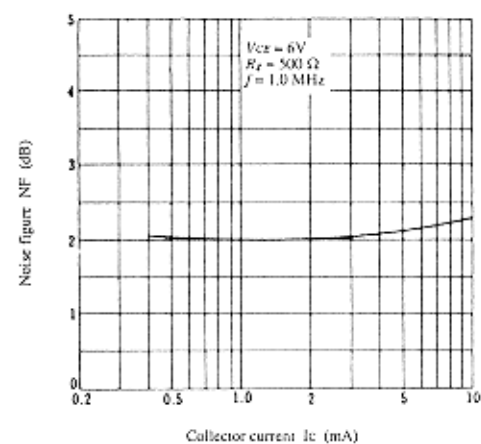


2SC460, 2SC461

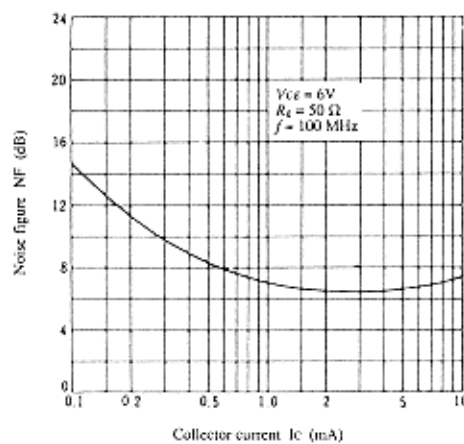
DC CURRENT TRANSFER RATIO VS.
COLLECTOR CURRENT



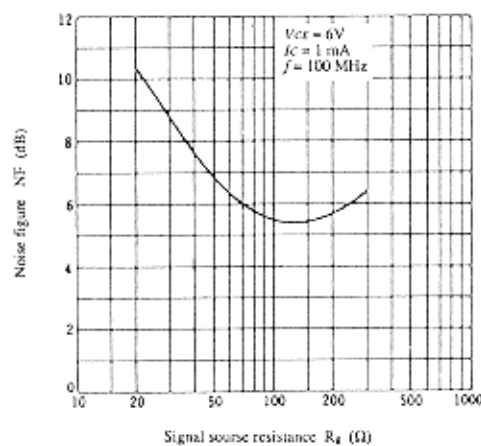
NOISE FIGURE VS. COLLECTOR CURRENT



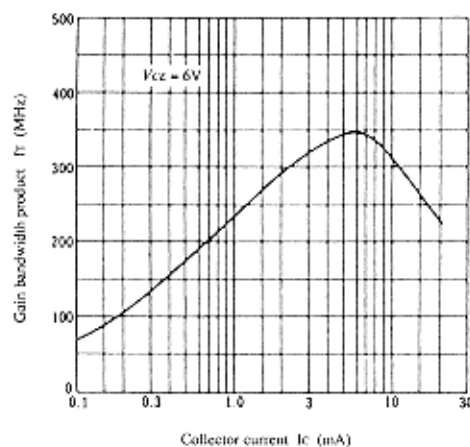
NOISE FIGURE VS. COLLECTOR CURRENT



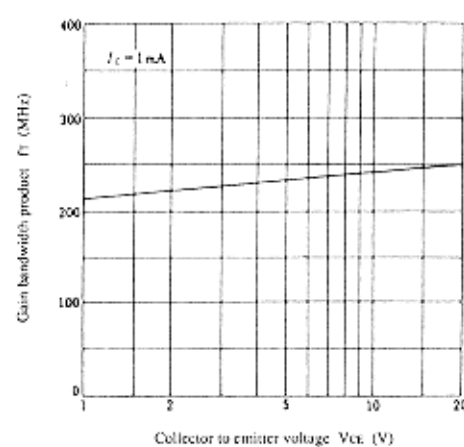
NOISE FIGURE VS. SIGNAL SOURCE RESISTANCE



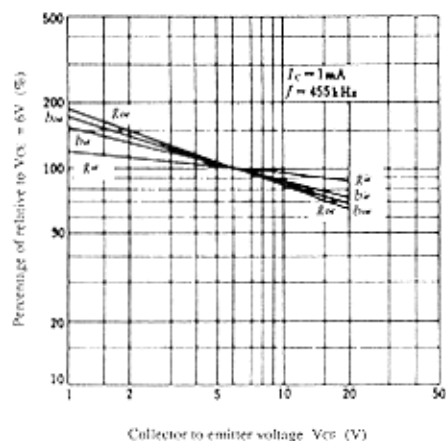
GAIN BANDWIDTH PRODUCT VS.
COLLECTOR CURRENT



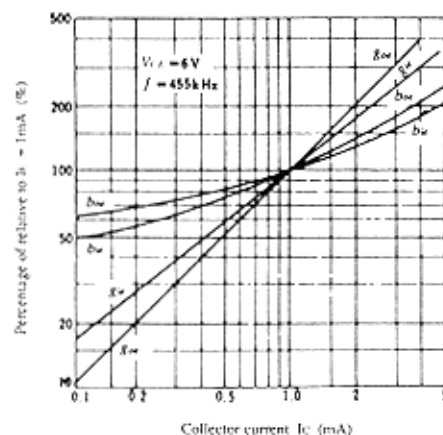
GAIN BANDWIDTH PRODUCT VS. COLLECTOR
TO EMITTER VOLTAGE



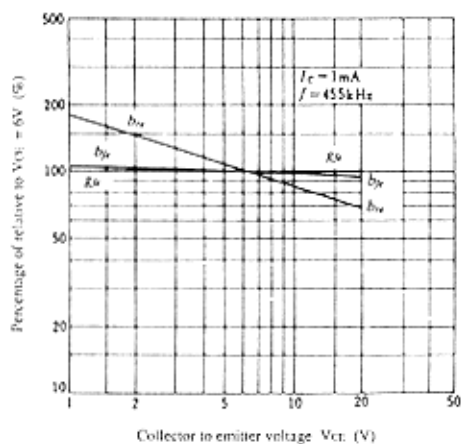
ADMITTANCE VS. COLLECTOR TO
EMITTER VOLTAGE



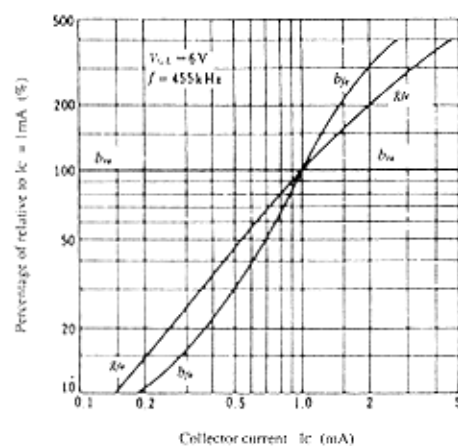
ADMITTANCE VS. COLLECTOR CURRENT



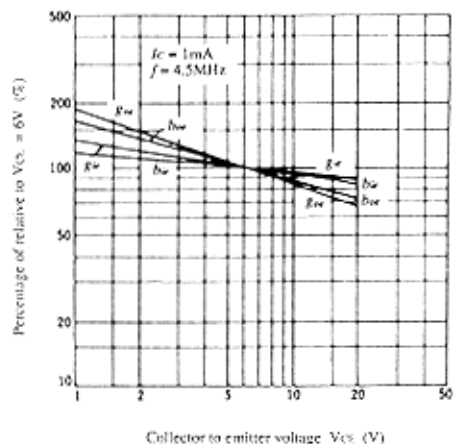
TRANSFER ADMITTANCE VS. COLLECTOR
TO Emitter VOLTAGE



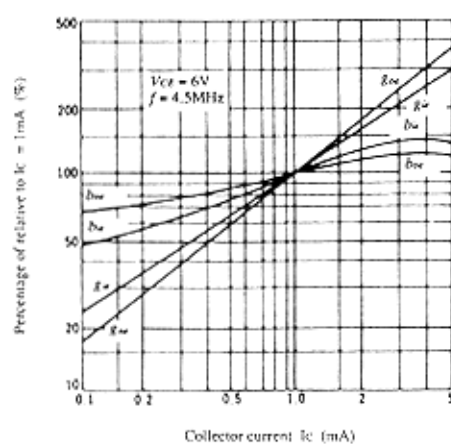
TRANSFER ADMITTANCE VS.
COLLECTOR CURRENT



ADMITTANCE VS. COLLECTOR
TO Emitter VOLTAGE

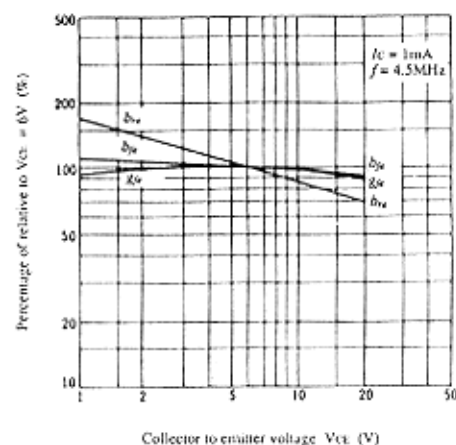


ADMITTANCE VS. COLLECTOR CURRENT

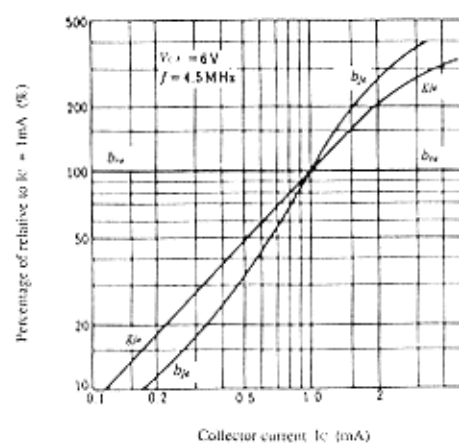


2SC460, 2SC461

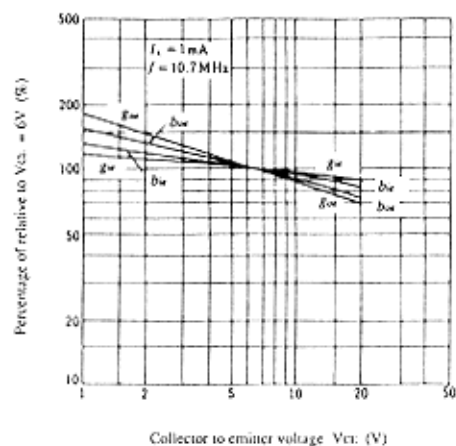
TRANSFER ADMITTANCE VS. COLLECTOR TO EMITTER VOLTAGE



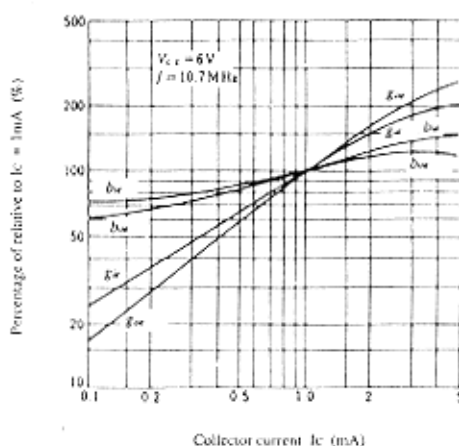
TRANSFER ADMITTANCE VS. COLLECTOR CURRENT



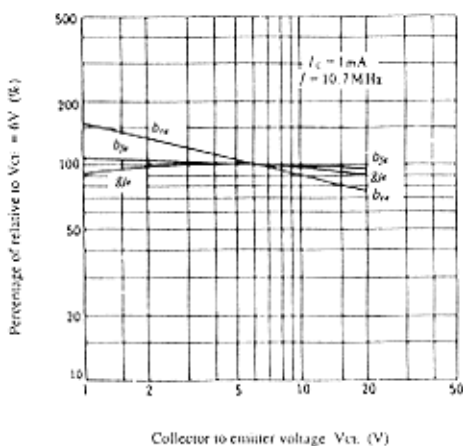
ADMITTANCE VS. COLLECTOR TO EMITTER VOLTAGE



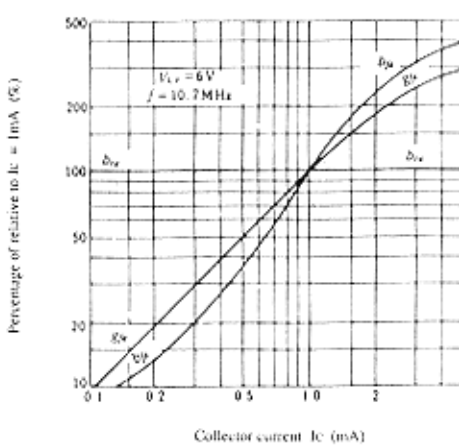
ADMITTANCE VS. COLLECTOR CURRENT



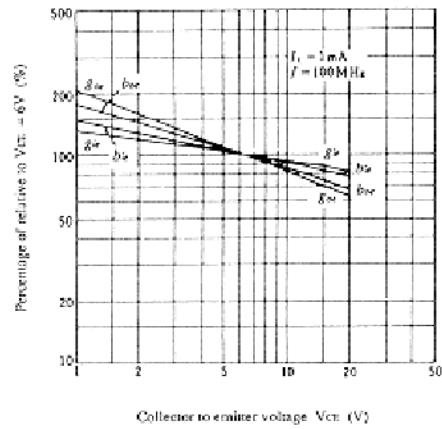
TRANSFER ADMITTANCE VS. COLLECTOR TO EMITTER VOLTAGE



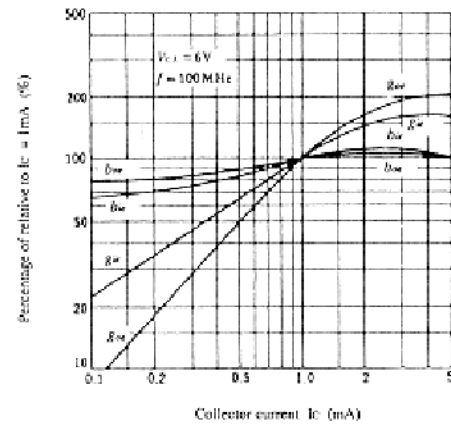
TRANSFER ADMITTANCE VS. COLLECTOR CURRENT



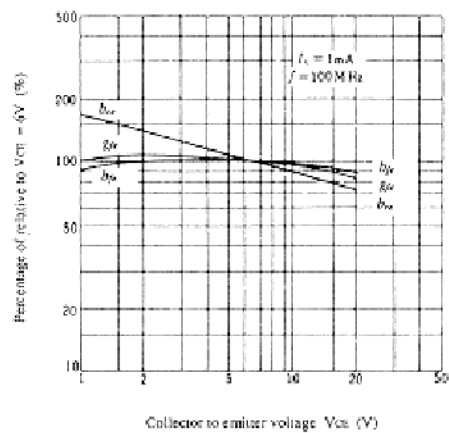
ADMITTANCE VS. COLLECTOR TO
EMITTER VOLTAGE



ADMITTANCE VS. COLLECTOR CURRENT



TRANSFER ADMITTANCE VS. COLLECTOR
TO Emitter VOLTAGE



TRANSFER ADMITTANCE VS.
COLLECTOR CURRENT

