Ordering number:EN1942A

PNP/NPN Epitaxial Planar Silicon Transistors

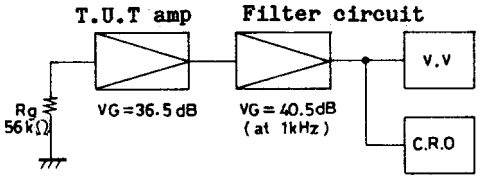
2SA1391/2SC3382

Low Noise AF Amp Applications

Features

- Adoption of FBET process.
- AF amp.
- Low-noise use.

Noise Test Circuit



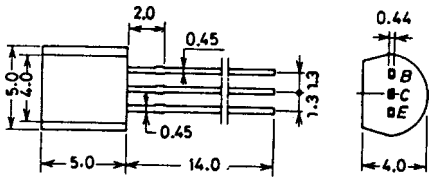
( ) : 2SA1391

Package Dimensions

unit:mm

2003A

[2SA1391/2SC3382]



JEDEC : TO-92
EIAJ : SC-43
SANYO : NP

B : Base
C : Collector
E : Emitter

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)60	V
Collector-to-Emitter Voltage	V_{CEO}		(–)50	V
Emitter-to-Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)200	mA
Collector Current (Pulse)	I_{CP}		(–)400	mA
Collector Dissipation	P_C		400	mW
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

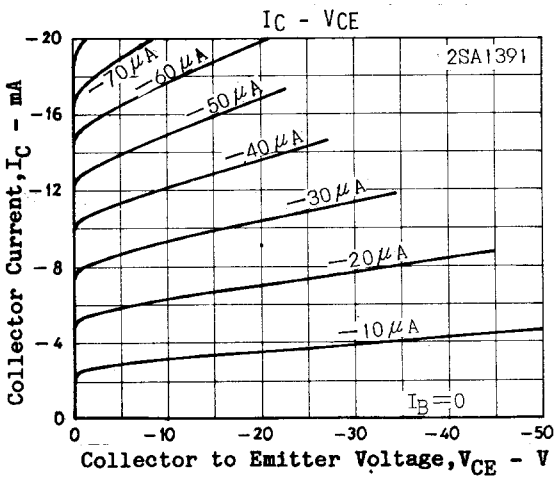
Electrical Characteristics at Ta = 25˚C

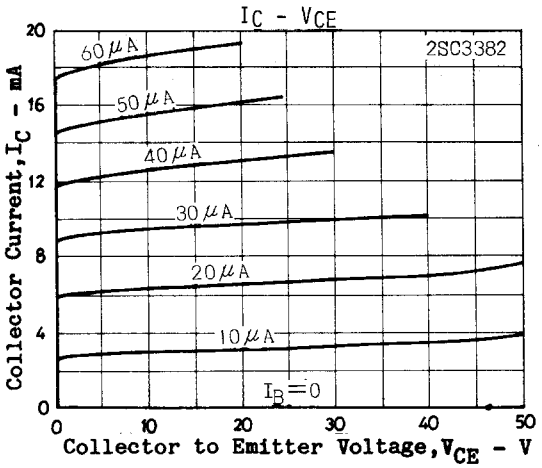
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(–)40V, I_E=0			(–)0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)5V, I_C=0			(–)0.1	μA
DC Current Gain	$h_{FE}1$	V_{CE}=(–)6V, I_C=(–)1mA	100*		560*	
	$h_{FE}2$	V_{CE}=(–)6V, I_C=(–)0.1mA	70			
Gain-Bandwidth Product	f_T	V_{CE}=(–)6V, I_C=(–)10mA		250		MHz
				(200)		MHz
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)100mA, I_B=(–)10mA			(–)0.3	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)100mA, I_B=(–)10mA			(–)1.0	V
Output Capacitance	C_{ob}	V_{CB}=(–)6V, f=1MHz		2.7		pF
				(3.7)		pF
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–)60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)50			V
Emitter-to-Base Breakdown Votage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0	(–)6			V
Noise Level	$V_{NO(ave)}$	V_{CC}=(–)30V, I_C=(–)1mA, R_g=56kΩ, V_G=77dB/1kHz			40	mV
					35	mV
Noise Peak Level	$V_{NO(peak)}$	V_{CC}=(–)30V, I_C=(–)1mA, R_g=56kΩ, V_G=77dB/1kHz			280	mV
					(200)	mV

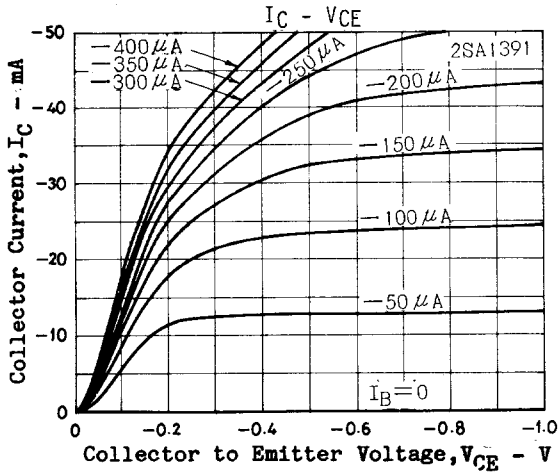
* : 2SA1391/2SC3382 are classified by 1mA h_{FE} as follows :

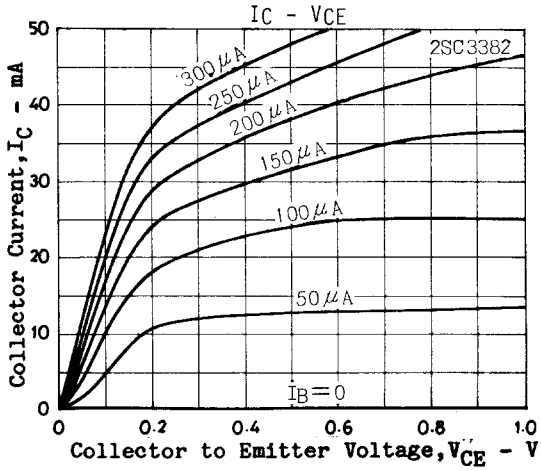
100	R	200	140	S	280	200	T	400	280	U	560

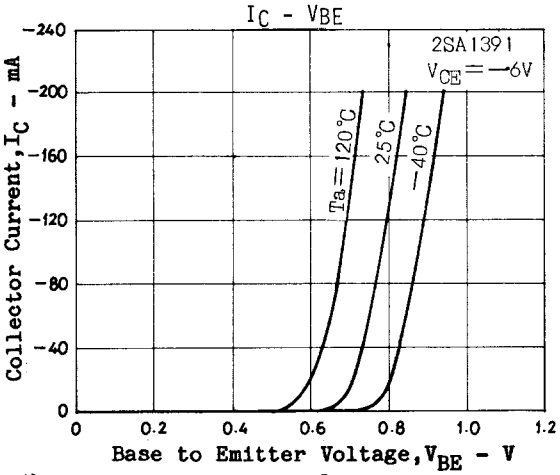
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

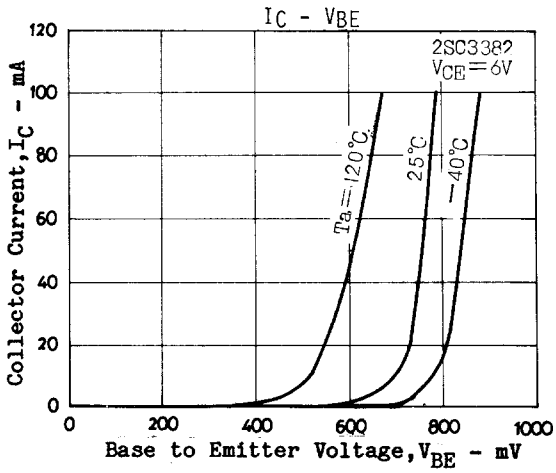

IC - VCE
2SA1391
−70μA
−60μA
−50μA
−40μA
−30μA
−20μA
−10μA
IB=0
Collector Current, IC - mA
Collector to Emitter Voltage, VCE - V

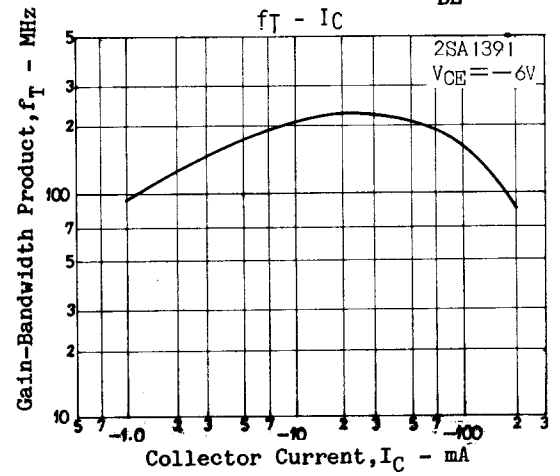

IC - VCE
2SC3382
60μA
50μA
40μA
30μA
20μA
10μA
IB=0
Collector Current, IC - mA
Collector to Emitter Voltage, VCE - V

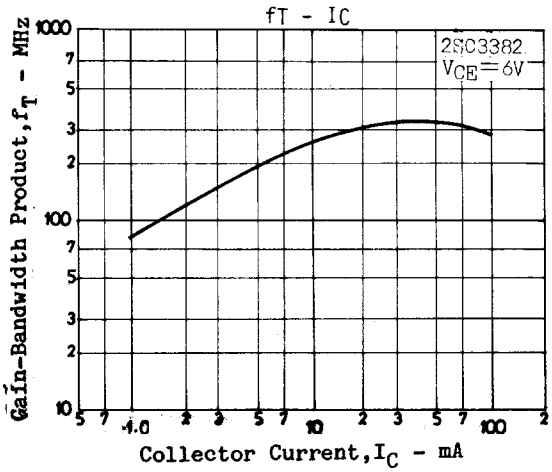

IC - VCE
2SA1391
−400μA
−350μA
−300μA
−250μA
−200μA
−150μA
−100μA
−50μA
IB=0
Collector Current, IC - mA
Collector to Emitter Voltage, VCE - V

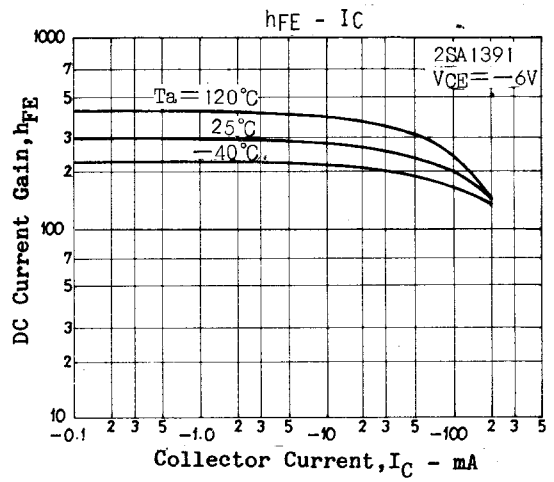

IC - VCE
2SC3382
300μA
250μA
200μA
150μA
100μA
50μA
IB=0
Collector Current, IC - mA
Collector to Emitter Voltage, VCE - V

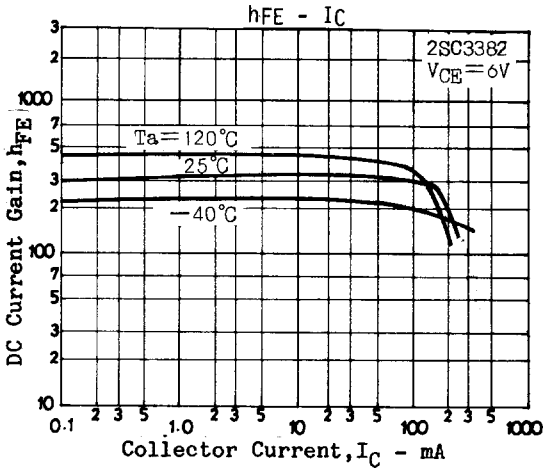

IC - VBE
2SA1391
VCE=−6V
Ta=120°C
25°C
−40°C
Collector Current, IC - mA
Base to Emitter Voltage, VBE - V

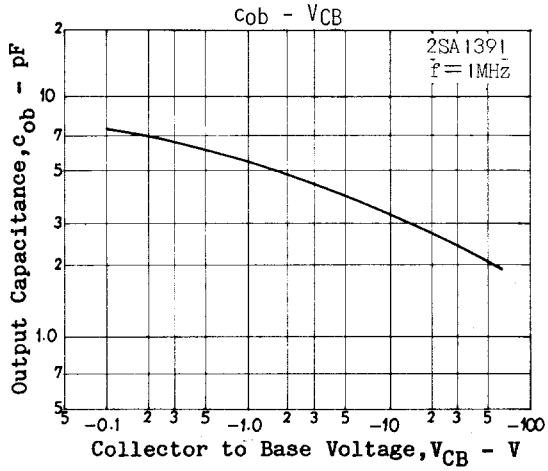

IC - VBE
2SC3382
VCE=6V
Ta=120°C
25°C
−40°C
Collector Current, IC - mA
Base to Emitter Voltage, VBE - mV

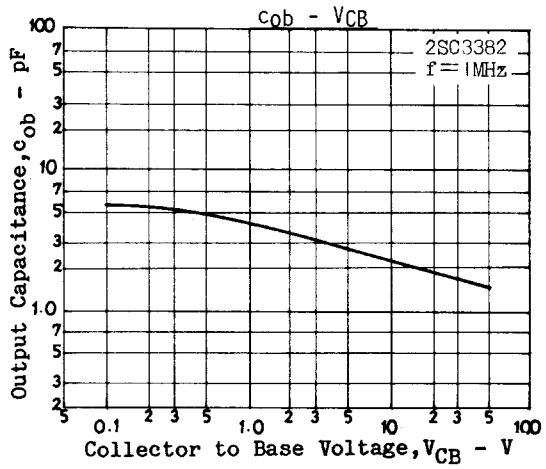

fT - IC
2SA1391
VCE=−6V
Gain-Bandwidth Product, fT - MHz
Collector Current, IC - mA

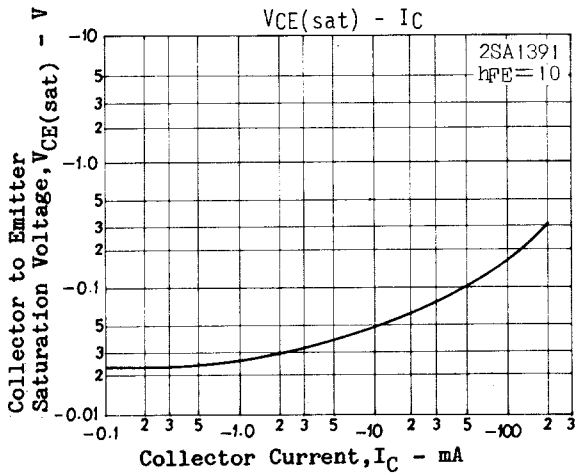

fT - IC
2SC3382
VCE=6V
Gain-Bandwidth Product, fT - MHz
Collector Current, IC - mA

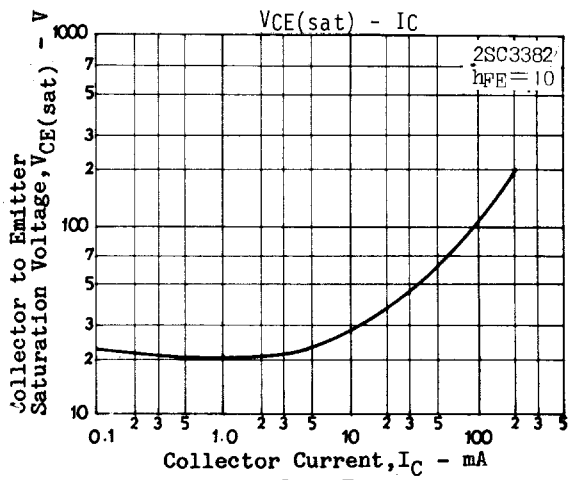

hFE - IC
2SA1391
VCE=−6V
Ta=120°C
25°C
−40°C
DC Current Gain, hFE
Collector Current, IC - mA

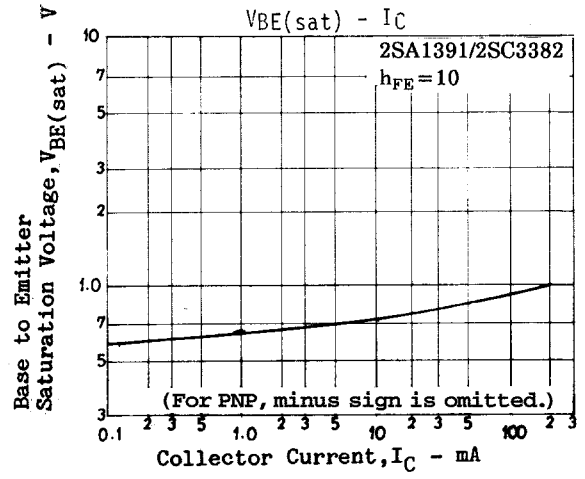

hFE - IC
2SC3382
VCE=6V
Ta=120°C
25°C
−40°C
DC Current Gain, hFE
Collector Current, IC - mA

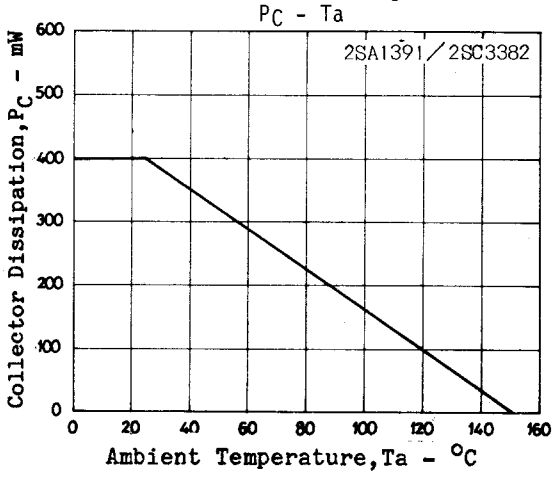

Cob - VCB
2SA1391
f=1MHz
Output Capacitance, Cob - pF
Collector to Base Voltage, VCB - V

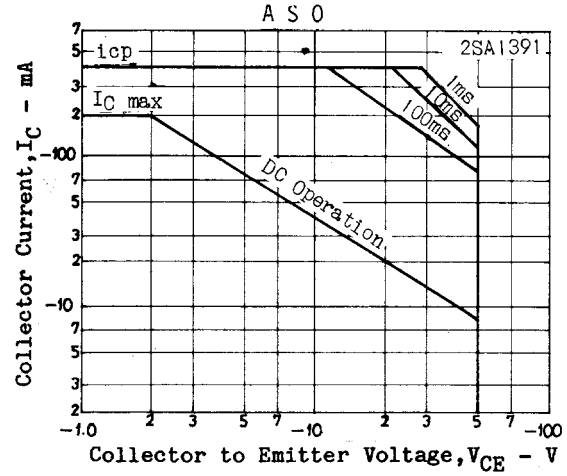

Cob - VCB
2SC3382
f=1MHz
Output Capacitance, Cob - pF
Collector to Base Voltage, VCB - V

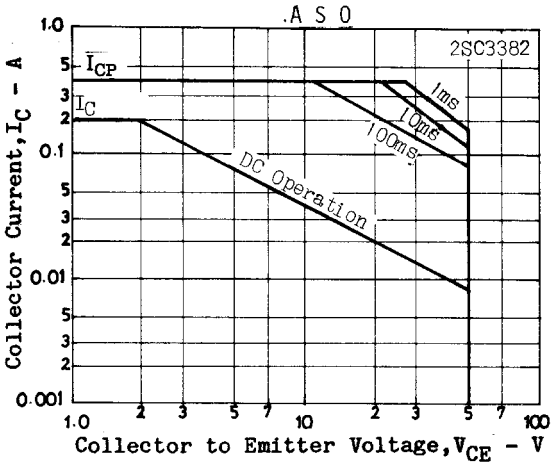

VCE(sat) - IC
2SA1391
hFE=10
Collector to Emitter Saturation Voltage, VCE(sat) - V
Collector Current, IC - mA

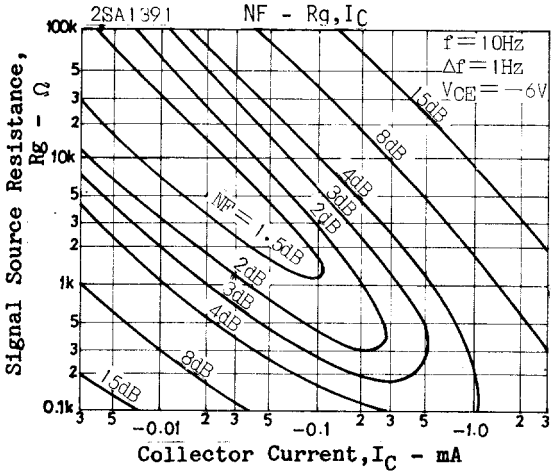

VCE(sat) - IC
2SC3382
hFE=10
Collector to Emitter Saturation Voltage, VCE(sat) - V
Collector Current, IC - mA

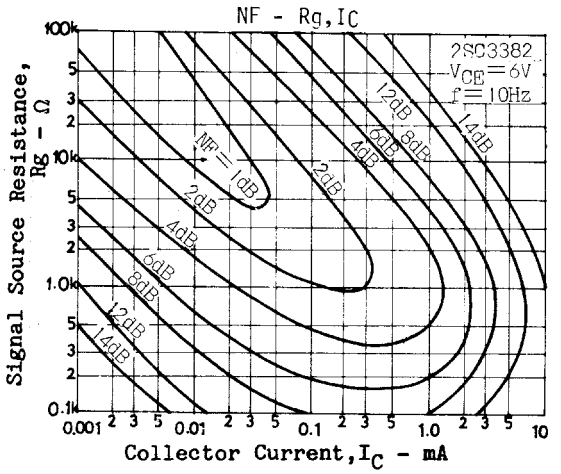

VBE(sat) - IC
2SA1391/2SC3382
hFE=10
(For PNP, minus sign is omitted.)
Base to Emitter Saturation Voltage, VBE(sat) - V
Collector Current, IC - mA

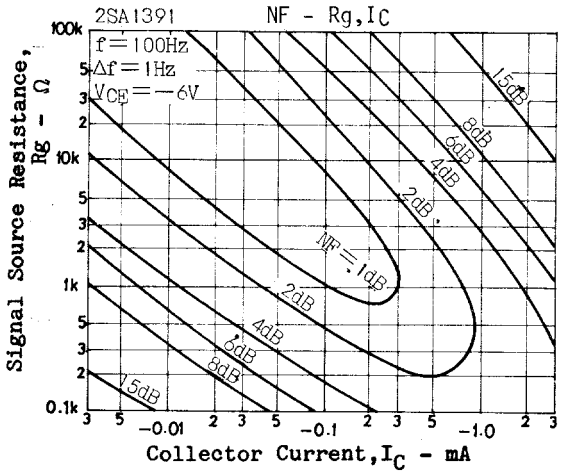

PC - Ta
2SA1391 / 2SC3382
Collector Dissipation, PC - mW
Ambient Temperature, Ta - °C

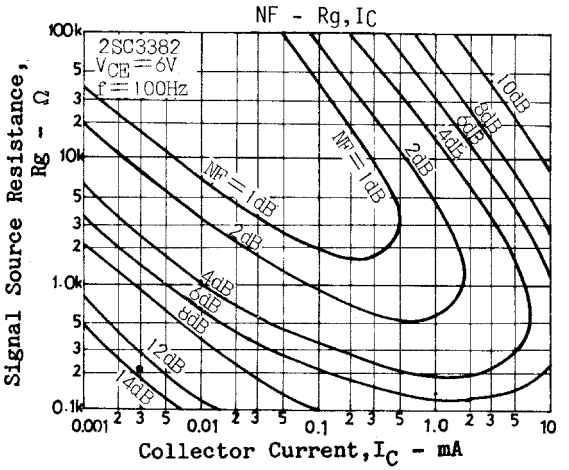

A S O
2SA1391
icp
IC max
1ms
10ms
100ms
DC Operation
Collector Current, IC - mA
Collector to Emitter Voltage, VCE - V

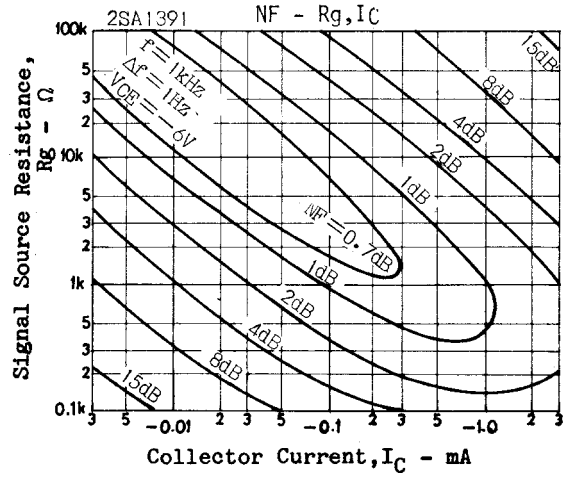

A S O
2SC3382
ICP
IC
1ms
10ms
100ms
DC Operation
Collector Current, IC - A
Collector to Emitter Voltage, VCE - V

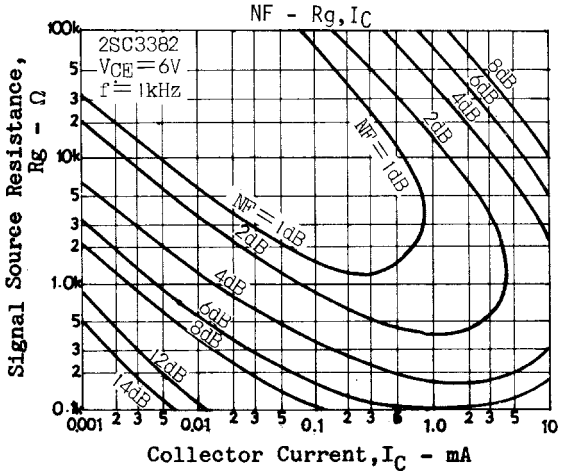

2SA1391
NF - Rg, IC
f = 10Hz
Δf = 1Hz
VCE = −6V
NF = 1.5dB
Signal Source Resistance, Rg - Ω
Collector Current, IC - mA


NF - Rg, IC
2SC3382
VCE = 6V
f = 10Hz
NF = 1dB
Signal Source Resistance, Rg - Ω
Collector Current, IC - mA


2SA1391
NF - Rg, IC
f = 100Hz
Δf = 1Hz
VCE = −6V
NF = 1dB
Signal Source Resistance, Rg - Ω
Collector Current, IC - mA


NF - Rg, IC
2SC3382
VCE = 6V
f = 100Hz
NF = 1dB
Signal Source Resistance, Rg - Ω
Collector Current, IC - mA


2SA1391
NF - Rg, IC
f = 1kHz
Δf = 1Hz
VCE = −6V
NF = 0.7dB
Signal Source Resistance, Rg - Ω
Collector Current, IC - mA


NF - Rg, IC
2SC3382
VCE = 6V
f = 1kHz
NF = 1dB
Signal Source Resistance, Rg - Ω
Collector Current, IC - mA