2SC2115

シリコンNPNエピタキシアルプレーナ形トランジス
SILICON NPN EPITAXIAL PLANAR TRANSIST

TENTATIVE

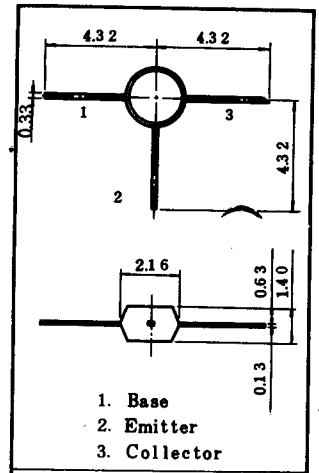
○ UHF～C バンド低雑音増幅用

○ 超高速スイッチング用

○ UHF～C Band Low Noise Amplifier Applications

○ High Speed Switching Applications

- $f_T = 6.5$ GHz
- $G_{pe} = 11.5$ dB (f = 2GHz)



JEDEC	
EIAJ	
TOSHIBA	2-2B1A

最大定格 MAXIMUM RATINGS (T_a = 25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT
コレクタ・ベース間電圧	V_{CBO}	20	V
コレクタ・エミッタ間電圧	V_{CEO}	10	V
エミッタ・ベース間電圧	V_{EBO}	2.0	V
コレクタ電流	I_C	30	mA
エミッタ電流	I_E	30	mA
コレクタ損失	P_C	150	mW
接合部温度	T_j	125	℃
保存温度	T_{stg}	−65～125	℃

マイクロ波特性 MICROWAVE CHARACTERISTICS (T_a = 25℃)

CHARACTERISTICS	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
トランジション周波数	f_T	V_{CE} = 5V I_C = 10mA	—	6.5	—	GHz
電力利得	G_{pe}	V_{CE} = 5V I_C = 10mA, f = 2GHz	—	9	—	dB
雑音指数	NF	V_{CE} = 5V I_C = 5mA, f = 2GHz	—	4.0	—	dB
最大発振周波数	f_{max}	V_{CE} = 5V I_C = 10mA	—	10.0	—	GHz

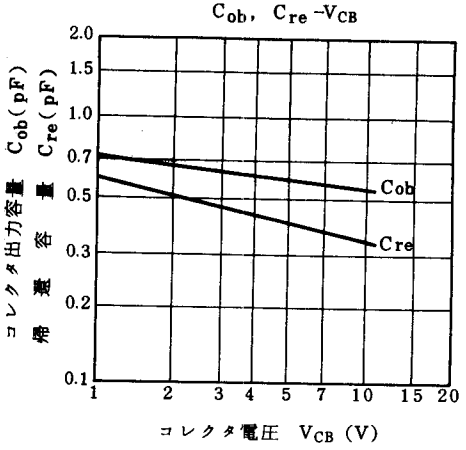
電気的特性 ELECTRICAL CHARACTERISTICS ($T_a = 25℃$)

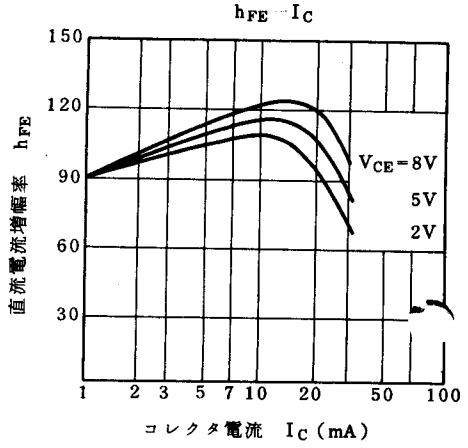
CHARACTERISTIC	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
コレクタしゃ断電流	I_{CBO}	$V_{CB} = 10V$, $I_E = 0$	—	—	1.0	μA
エミッタしゃ断電流	I_{EBO}	$V_{EB} = 1V$, $I_C = 0$	—	—	1.0	μA
直流電流増幅率	h_{FE}	$V_{CE} = 5V$, $I_C = 10mA$	30	120	—	—
コレクタ・エミッタ間飽和電圧	$V_{CE}(sat)$	$I_C = 10mA$, $I_B = 1mA$	—	0.20	—	V
ベース・エミッタ間飽和電圧	$V_{BE}(sat)$	$I_C = 10mA$, $I_B = 1mA$	—	0.87	—	V
コレクタ出力容量	C_{ob}	$V_{CB} = 5V$, $I_E = 0$ f = 1MHz	—	0.60	0.8	pF
帰還容量	C_{re}		—	0.45	—	pF
エミッタ入力容量	C_{ib}	$V_{EB} = 0$, $I_C = 0$, f = 1MHz	—	1.2	—	pF

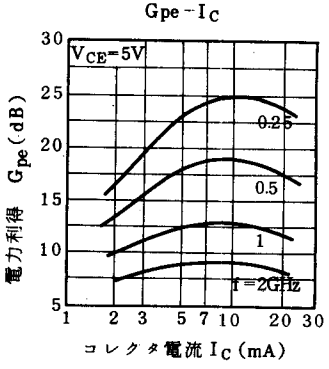
Note : —

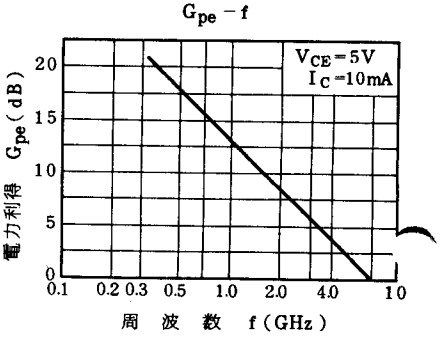
Cre は Boonton Electronics Corp. 製 75D Direct Capacitance Bridge によって三端子法で測定。

Cre is measured by 3 Terminal Method with Boonton Electronics Corp. 75D Direct Capacitance Bridge.

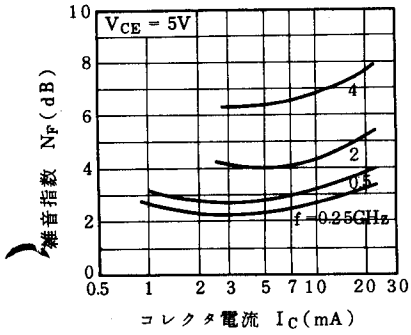

Cob, Cre -VCB
コレクタ出力容量 Cob(pF)
帰還容量 Cre(pF)
2.0
1.5
1.0
0.7
0.5
0.3
0.2
0.1
Cob
Cre
1 2 3 4 5 7 10 15 20
コレクタ電圧 VCB (V)


hFE -IC
直流電流増幅率 hFE
150
120
90
60
30
VCE=8V
5V
2V
1 2 3 5 7 10 20 50 100
コレクタ電流 IC (mA)

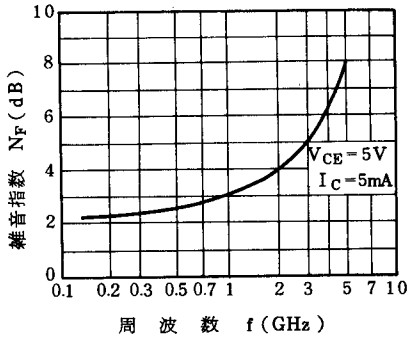

Gpe-IC
VCE=5V
電力利得 Gpe(dB)
30
25
20
15
10
5
0.25
0.5
1
f=2GHz
1 2 3 5 7 10 20 30
コレクタ電流 IC (mA)


Gpe -f
VCE=5V
IC=10mA
電力利得 Gpe(dB)
20
15
10
5
0
0.1 0.2 0.3 0.5 1.0 2.0 4.0 10
周波数 f(GHz)

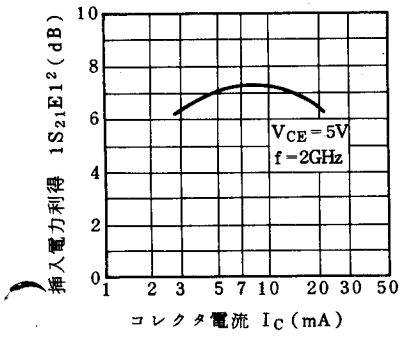
$N_F - I_C$



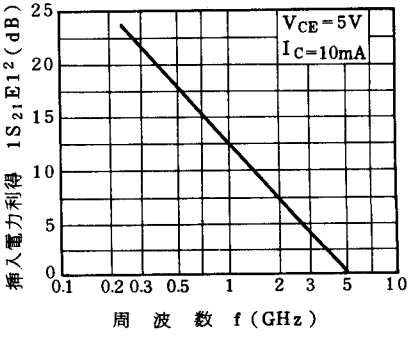
$N_F - f$



$|S_{21}E|^2 - I_C$



$|S_{21}E|^2 - f$

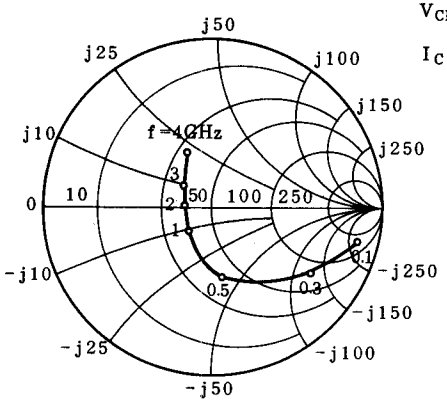


2SC2115のエミッタ接地，小信号Sパラメータ

COMMON EMITTER SMALL SIGNAL S-PARAMETERS OF 2SC2115

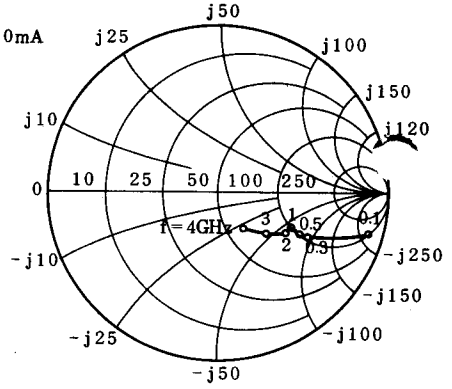
V_{CE}= 5V

I_C = 10mA



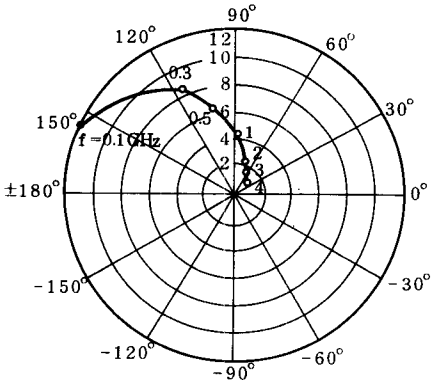
S_{11E}

(Unit in Ω)

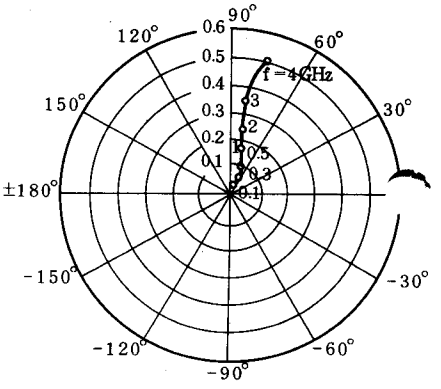


S_{22E}

(Unit in Ω)



S_{21E}



S_{12E}