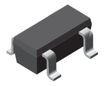
WEITRON

2SC5097

NPN 10 GHz RF Wideband Transistor

Pb Lead(Pb)-Free



SOT-143

FEATURES:

* SOT-143 package
* Low noise figure
* High power gain

APPLIEATION:

VHF~UHF Band Low Noise Amplifier Applications.

MAXIMUM RATINGS (Ta=25 ºC)

Rating	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	10	V
Emitter-Base Voltage	V_{EBO}	1.5	V
Base Current	I_B	7	mA
Collector Current - Continuous	I_C	15	mA
Collector Power Dissipation	P_D	150	mW
Junction temperature	T_j	125	℃
Storage temperature	T_{stg}	-55~125	℃

Device Marking

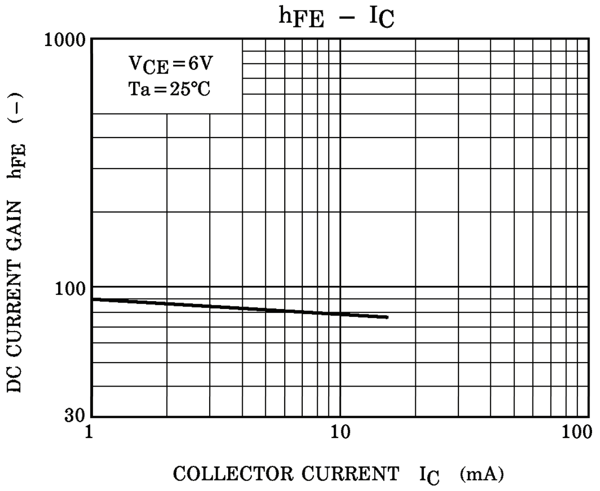
2SC5097=N42

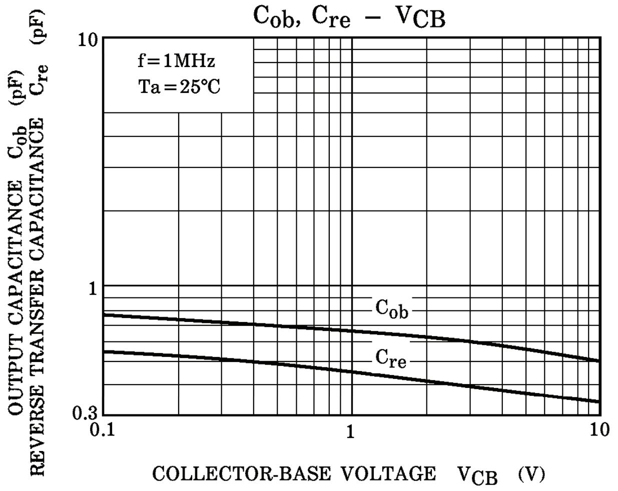
ELECTRICAL CHARACTERISTICS (Ta = 25ºC)

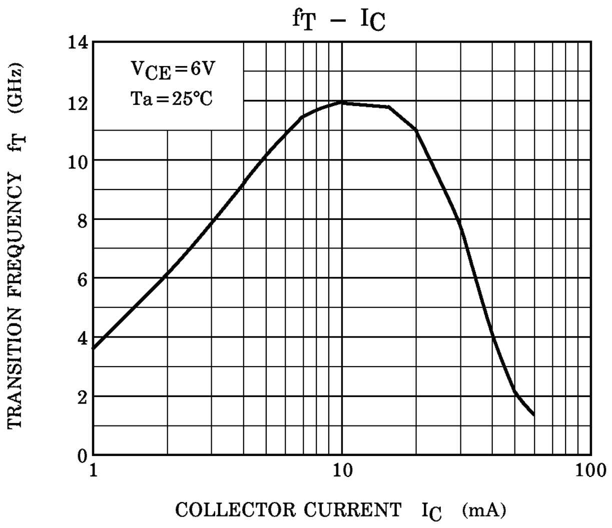
Characteristics	Symbol	Min	Typ	Max	Unit
Collector-Emitter Voltage (I_C =10mA , I_B=0)	V_{CEO}	10	-	-	V
Collector-Base Voltage (I_C =10µA , I_E=0)	V_{CBO}	20	-	-	V
Collector Cut-off current (V_{CB}=10V , I_E=0)	I_{CBO}	-	-	1	µA
Emitter Cut-off Current (V_{CB}=1V, I_C=0)	I_{EBO}	-	-	1	µA
DC current gain (V_{CE} = 6V , I_C=7mA)	h_{FE} (1)	50	-	160	-
Transition frequency (V_{CE} = 6V , I_C =7mA)	f_T	7	10	-	GHz
Ootput capacitance (V_{CB} = 10V , I_E =0 , f = 1MHz) (2)	Cob	-	0.5	0.9	pF
Reverse Transfer capacitance (V_{CB} = 10V , I_E =0 , f = 1MHz) (2)	Cre	-	0.4	0.85	pF
Insertion gain (V_{CE} = 6V , I_C=7mA , f = 1GHz) (V_{CE} = 6V , I_C=7mA , f = 2GHz)	$\|S21e\|^2$	12.5 7	15.5 10	- -	dB
Noise Figure (V_{CE} = 6V , I_C=3mA , f = 1GHz) (V_{CE} = 6V , I_C=3mA , f = 2GHz)	NF	- -	1.3 1.8	2.5 3.0	dB

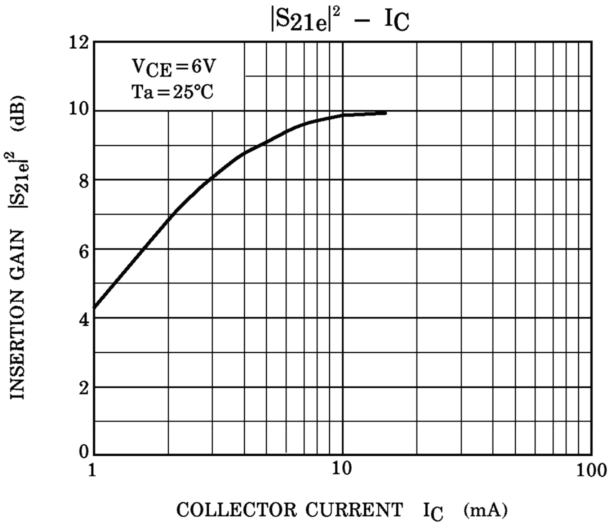
1. h_{FE} Classification R : 50 ~100 O : 80 ~160

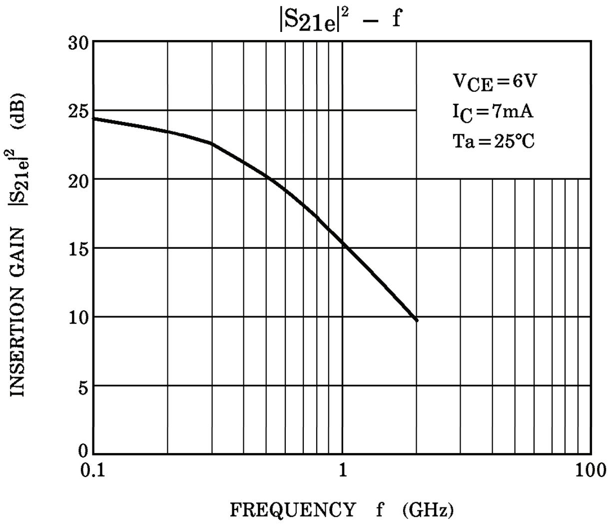
2. Cre is measured by 3 terminal method with capacitance bridge.

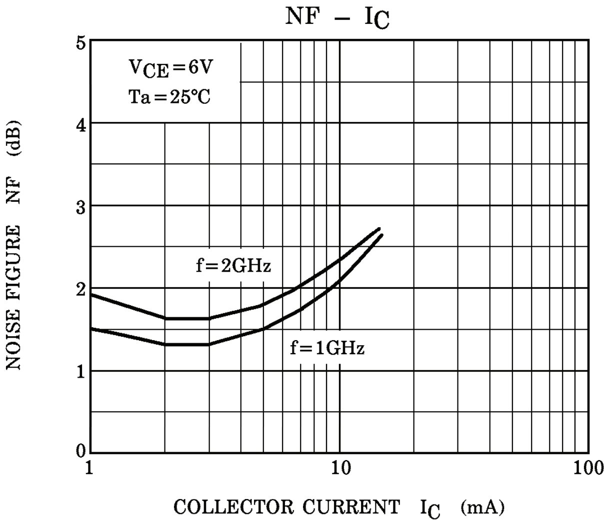

h_{FE} – I_C
V_{CE}=6V
Ta=25°C
DC CURRENT GAIN h_{FE} (–)
1000
100
30
1
10
100
COLLECTOR CURRENT I_C (mA)

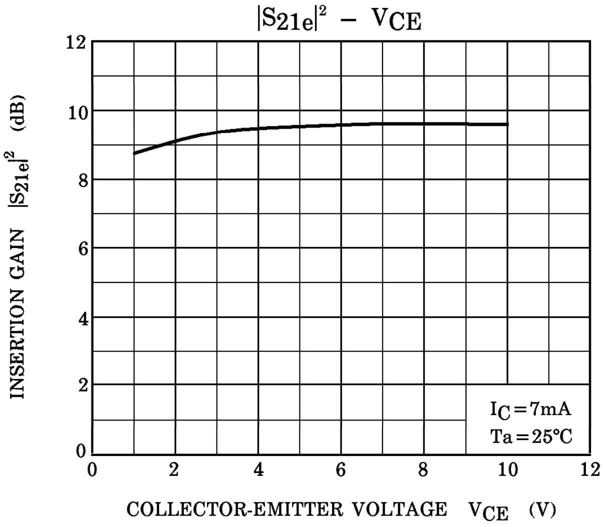

C_{ob}, C_{re} – V_{CB}
f=1MHz
Ta=25°C
OUTPUT CAPACITANCE C_{ob} (pF)
REVERSE TRANSFER CAPACITANCE C_{re} (pF)
C_{ob}
C_{re}
10
1
0.3
0.1
1
10
COLLECTOR-BASE VOLTAGE V_{CB} (V)

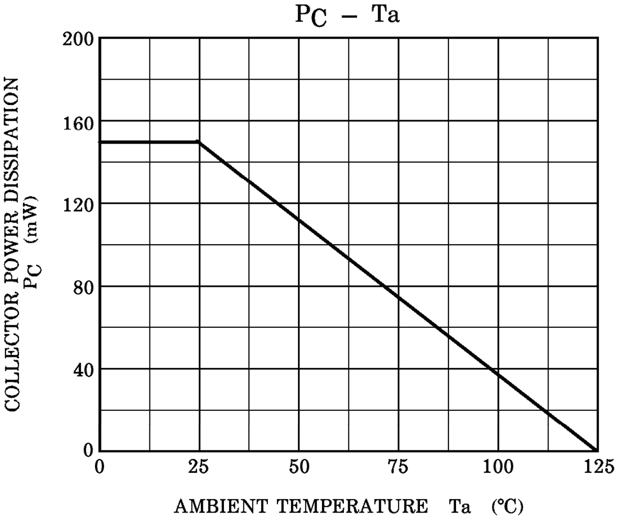

f_T – I_C
V_{CE}=6V
Ta=25°C
TRANSITION FREQUENCY f_T (GHz)
14
12
10
8
6
4
2
0
1
10
100
COLLECTOR CURRENT I_C (mA)


$|S_{21e}|^2$ – I_C
V_{CE}=6V
Ta=25°C
INSERTION GAIN $|S_{21e}|^2$ (dB)
12
10
8
6
4
2
0
1
10
100
COLLECTOR CURRENT I_C (mA)


$|S_{21e}|^2$ – f
V_{CE}=6V
I_C=7mA
Ta=25°C
INSERTION GAIN $|S_{21e}|^2$ (dB)
30
25
20
15
10
5
0
0.1
1
100
FREQUENCY f (GHz)

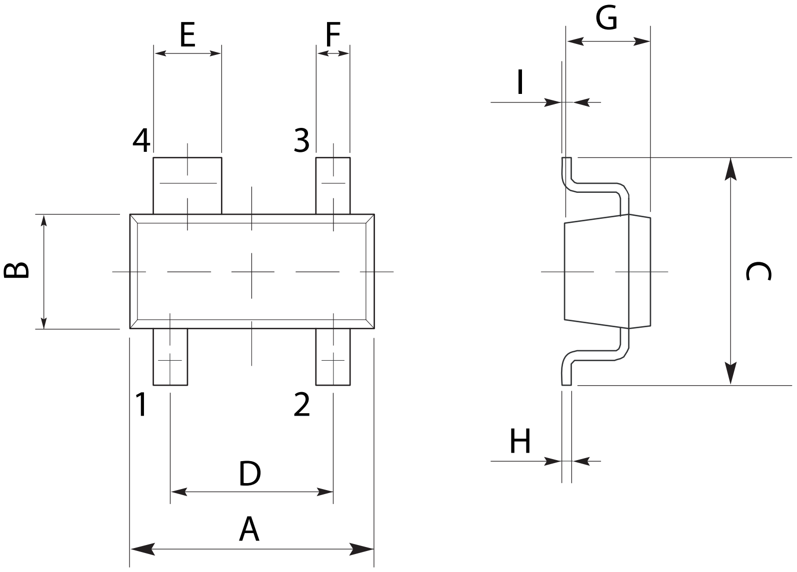

NF – I_C
V_{CE}=6V
Ta=25°C
NOISE FIGURE NF (dB)
f=2GHz
f=1GHz
5
4
3
2
1
0
1
10
100
COLLECTOR CURRENT I_C (mA)


$|S_{21e}|^2$ – V_{CE}
INSERTION GAIN $|S_{21e}|^2$ (dB)
12
10
8
6
4
2
0
0
2
4
6
8
10
12
I_C=7mA
Ta=25°C
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)


P_C – Ta
COLLECTOR POWER DISSIPATION P_C (mW)
200
160
120
80
40
0
0
25
50
75
100
125
AMBIENT TEMPERATURE Ta (°C)

SOT-143 Outline Dimensions

unit:mm



DIM	MILLIMETERS MIN	MILLIMETERS MAX
A	2.80	3.00
B	1.35	1.75
C	2.40	2.60
D	1.90	
E	0.60	
F	0.40	
G	1.05	1.25
H	0.10	0.26
I	0.00	0.10