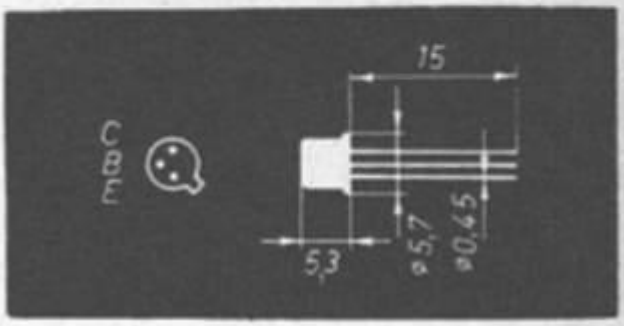
Verwendung: Silizium-npn-Planar-Epitaxie-Transistor für HF-Verstärker und allgemeine Anwendung bei Umgebungstemperaturen ϑ_a von −40 °C bis +125 °C

SF 136

Abmessungen: Bauform A 3/15 – 3a, TGL 11 811
Kollektor am Gehäuse
Masse ≈ 0,5 g



Zulässige Höchstwerte bis ϑ_{jmax}

U_{CBO}	= 20 V	P_{tot}	= 1 W
U_{CEO}	= 12 V	bei ϑ_C	= 25 °C
U_{EBO}	= 5 V	ϑ_j	= 175 °C
I_C	= 200 mA	ϑ_a	= 125 °C
I_B	= 20 mA		
P_{tot}	= 300 mW		
bei ϑ_a	= 25 °C		

Wärmewiderstand $R_{th} \leqq 500 \frac{grd}{W}$

$R_{thl} \leqq 150 \frac{grd}{W}$

Kennwerte für ϑ_a = 25 °C –5 grd

	Min.	Typ	Max.	Meßbedingungen	Stromverstärkungsgruppen
Restströme					
I_{CBO}		0,1 nA	100 nA	U_{CB} = 20 V	
I_{CEO}		0,5 nA	100 nA	U_{EB} = 5 V	
Durchbruchspannung					
$U_{(BR)CEO}$	12 V	32 V		I_C = 10 mA	
Sättigungsspannung					
U_{CEsat}			0,3 V	I_C = 10 mA, I_B = 1 mA	
$U_{BE\text{-}at}$		0,75 V		I_C = 10 mA, I_B = 1 mA	
Gleichstromverstärkung					
B	18		35	U_{CE} = 1 V, I_C = 10 mA	A
B	28		71		B
B	56		140		C
B	122		280		D
B	224		560		E
B	450		1120		F
Übergangsfrequenz					
f_T	300 MHz			U_{CE} = 10 V, I_C = 10 mA, f = 100 MHz	

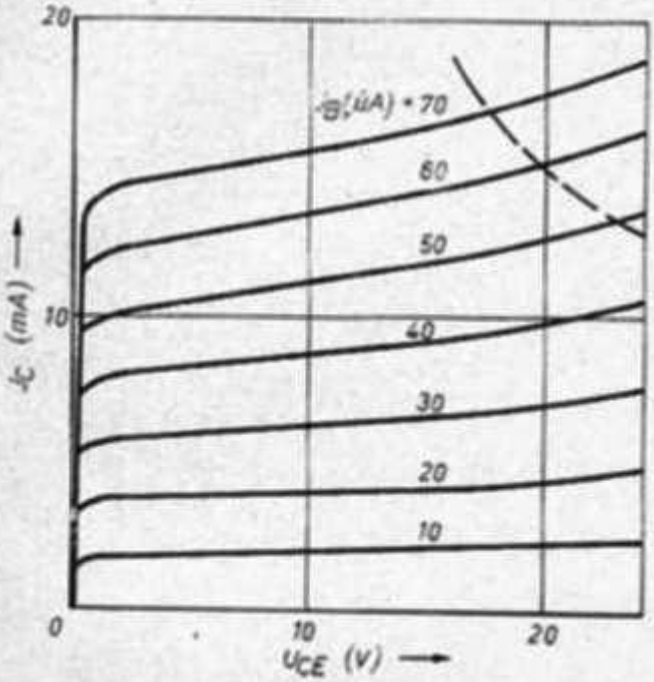
SF 136

	Min.	Typ	Max.	Meßbedingungen	Stromverstärkungsgruppen
Ausgangskapazität					
C_{22b}		2,55 pF	5 pF	$U_{CB} = 10$ V, $I_E = 0$, f = 2 MHz	
Rückwirkungszeitkonstante					
$\frac{\lvert h_{12b} \rvert}{\omega}$		120 ps	300 ps	$U_{CB} = 10$ V, $I_C = 10$ mA, f = 30 MHz	
Rauschfaktor					
F		7,8 dB		$U_{CE} = 6$ V, $I_C = 0{,}2$ mA, f = 1 kHz, $R_G = 500\,\Omega$	
F		8,2 dB		$U_{CE} = 5$ V, $I_C = 10$ mA, f = 100 MHz, $R_G = 60\,\Omega$	
Schwingfrequenz					
f_{max}			550 MHz	$U_{CE} = 10$ V, $I_C = 5$ mA	
Leistungsverstärkung					
V_{peopt}		23 dB		$U_{CE} = 10$ V, $I_C = 5$ mA, f = 30 MHz	
Vierpolparameter					
h_{11e}		6,9 kΩ		$U_{CE} = 6$ V, $I_C = 2$ mA, f = 1 kHz	
h_{12e}		$4{,}1 \cdot 10^{-4}$			
h_{21e}		510			
h_{22e}		64 µS			
Y-Parameter					
$Y_{11e} = (1{,}2 + j\,2{,}3)$ mS				bei $U_{CE} = 10$ V, $I_C = 5$ mA, f = 50 MHz	
$Y_{12e} = (0{,}013 + j\,0{,}54)$ mS					
$Y_{21e} = (29 - j\,31)$ mS					
$Y_{22e} = (1{,}56 + j\,1{,}25)$ mS					

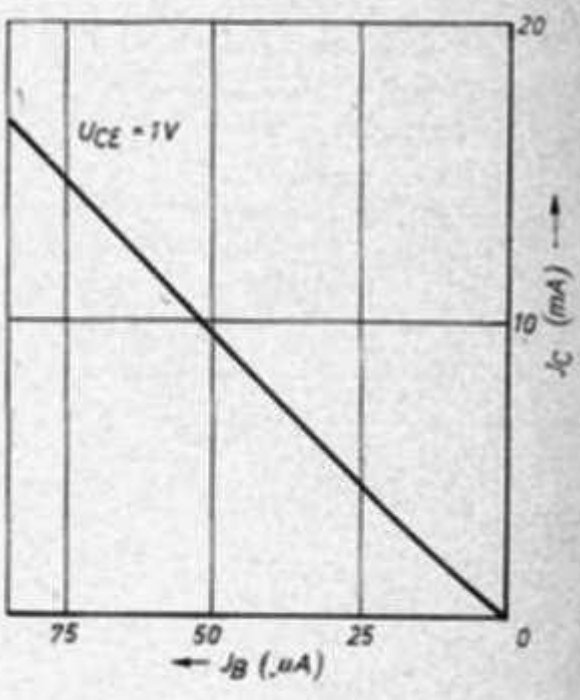
Bestellbeispiel für einen Transistor der Stromverstärkungsgruppe D

Transistor SF 136 D

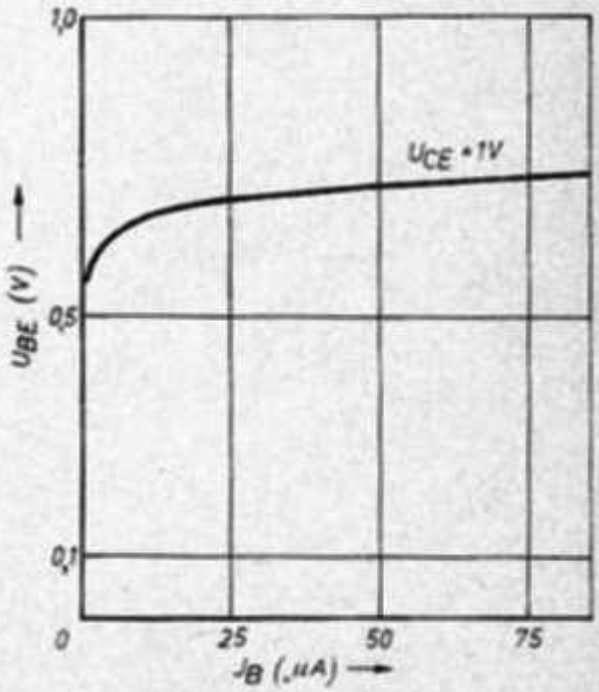
$J_C = f(U_{CE})$
J_B Parameter



$J_C = f(J_B)$
U_{CE} Parameter

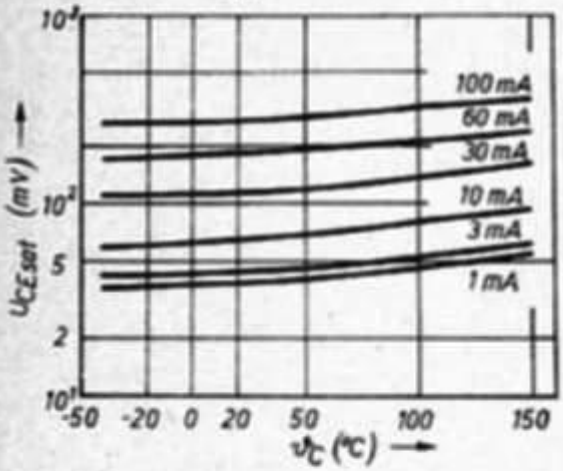


$U_{BE} = f(J_B)$
U_{CE} = Parameter

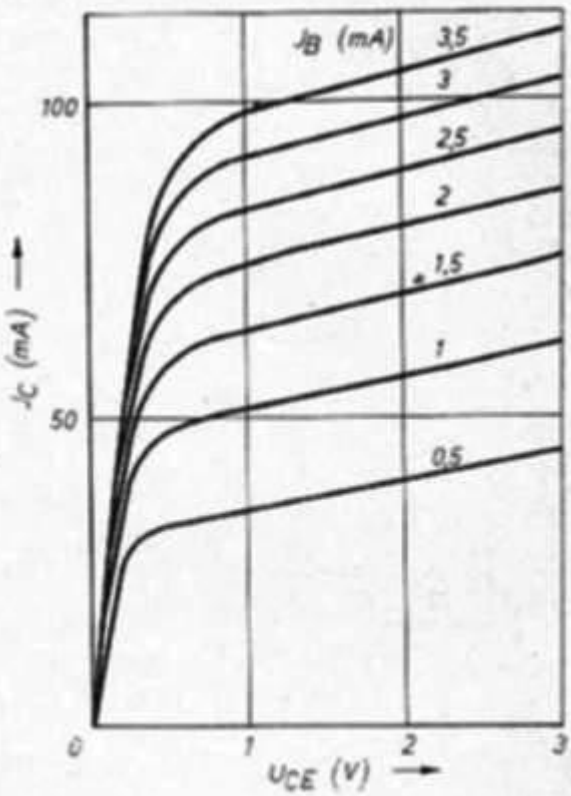


$U_{CE\,sat} = f(J_C, \vartheta_C)$

$\frac{J_C}{J_B} = 10$

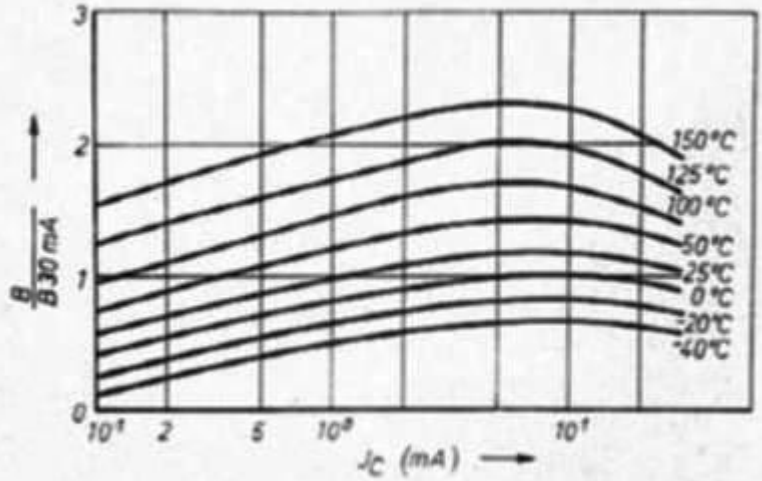


$I_C = f(U_{CE})$
I_B = Parameter

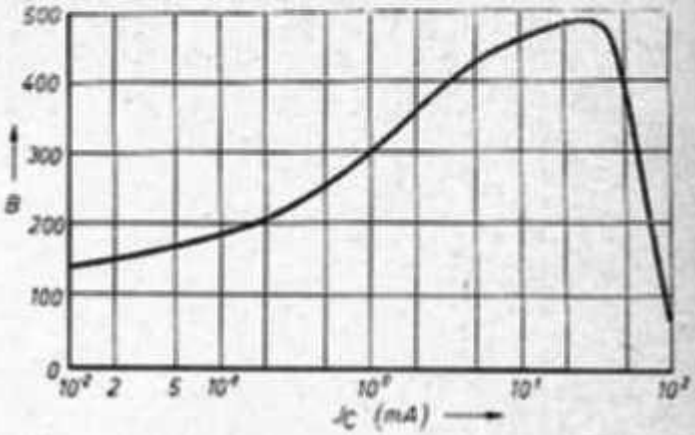


$B_N = f(J_C, \vartheta_C)$

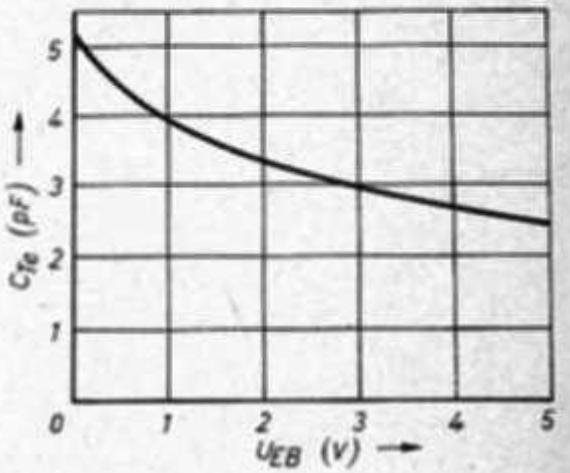
$U_{CE} = 1V$



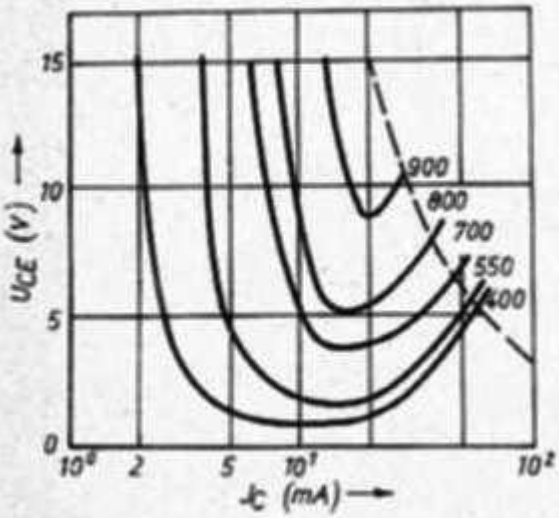
$B = f(I_C)$
$U_{CE} = 6\,V$
für $I_C = 50\,mA$
$U_{CE} = 3\,V$



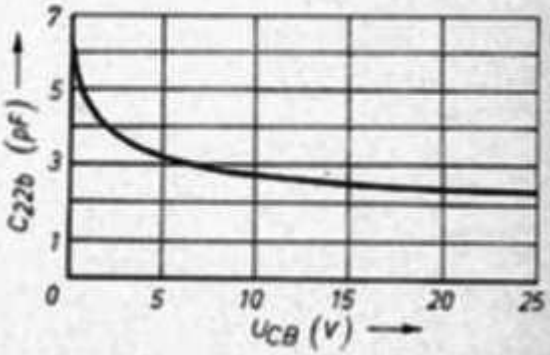
$C_{Te} = \varphi(U_{EB})$
$I_C = 0$



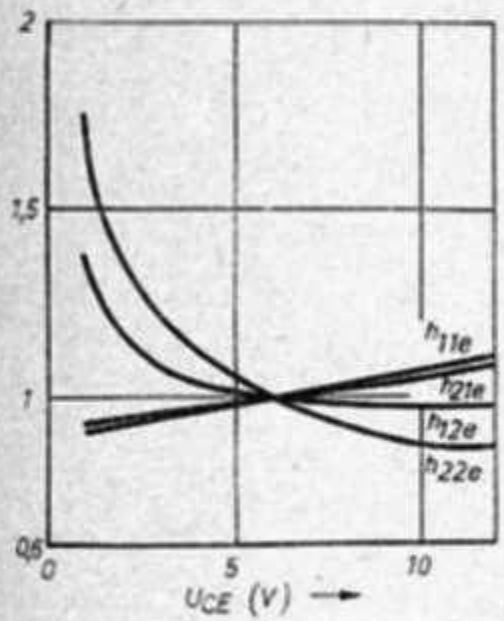
$f_T = g(U_{CE}, I_C)$
Parameter f_T (MHz)



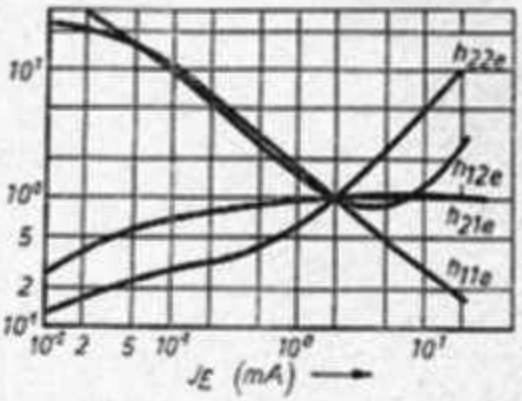
$C_{22b} = \varphi(U_{CB})$
$I_E = 0$
$f = 30\,MHz$

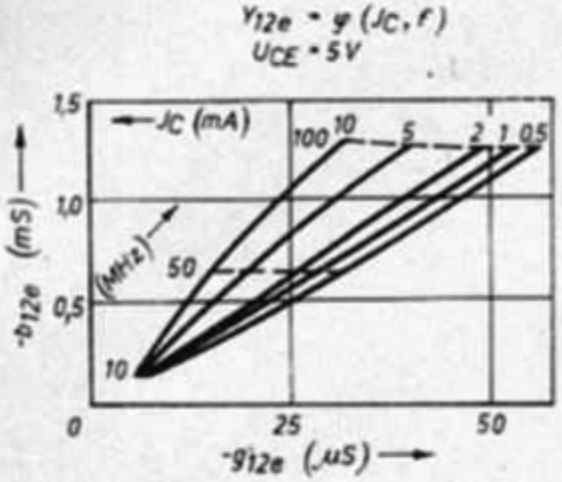


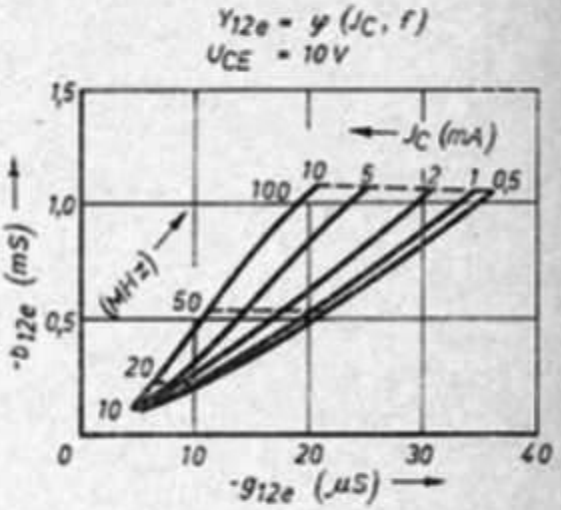
h-Parameter normiert
J_E = 2mA
f = 1kHz
Bezugswert bei U_{CE}=6V

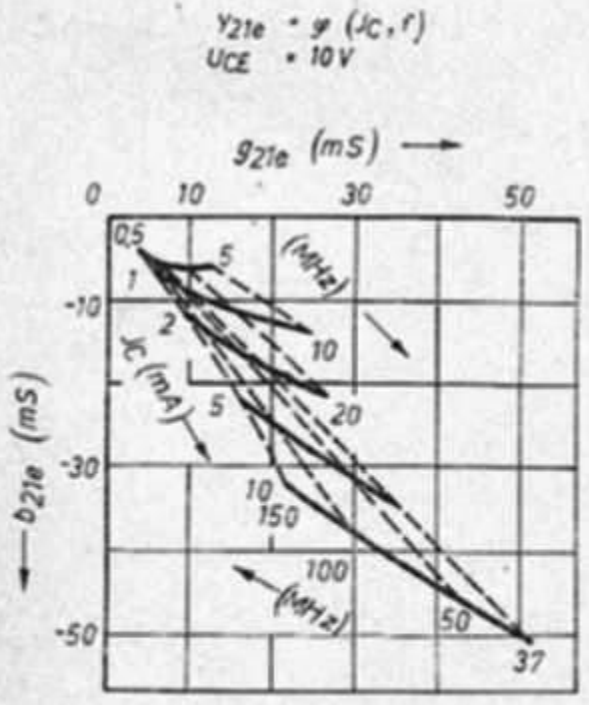


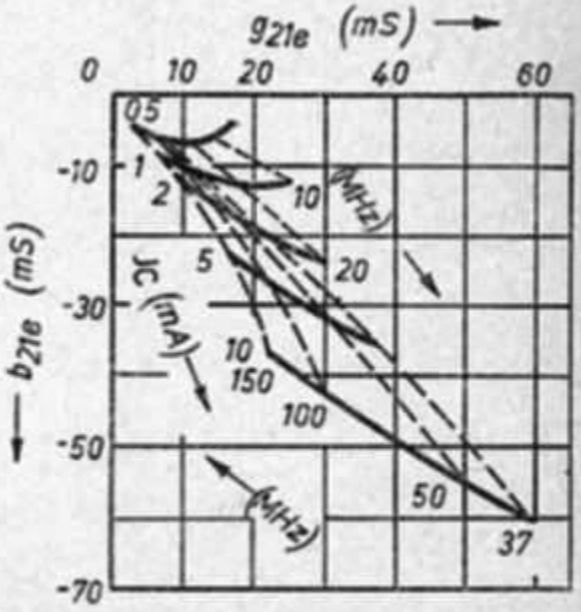
h-Parameter normiert
U_{CE} = 6V
f = 1kHz
Bezugswert bei J_E = 2mA



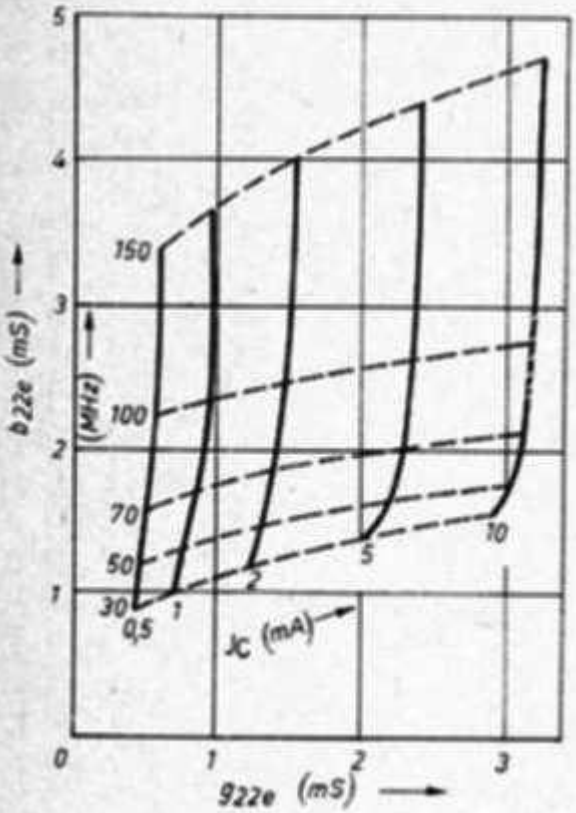

$Y_{12e} = y\,(J_C, f)$
$U_{CE} = 5V$
J_C (mA)
100 10 5 2 1 0,5
(MHz)
50
10
$-b_{12e}$ (mS)
$-g_{12e}$ (µS)
1,5
1,0
0,5
0
25
50


$Y_{12e} = y\,(J_C, f)$
$U_{CE} = 10V$
J_C (mA)
100 10 5 2 1 0,5
(MHz)
50
20
10
$-b_{12e}$ (mS)
$-g_{12e}$ (µS)
1,5
1,0
0,5
0
10
20
30
40


$Y_{21e} = y\,(J_C, f)$
$U_{CE} = 10V$
g_{21e} (mS)
0 10 30 50
0,5 1 2 5 10 20 50 100 150
(MHz)
J_C (mA)
$-b_{21e}$ (mS)
-10
-30
-50
37


g_{21e} (mS)
0 10 20 40 60
0,5 1 2 5 10 20 50 100 150
(MHz)
J_C (mA)
b_{21e} (mS)
-10
-30
-50
-70
37

$Y_{22e} = y\,(J_C, f)$
$U_{CE} = 5\,V$



$Y_{22e} = y\,(J_C, f)$
$U_{CE} = 10\,V$