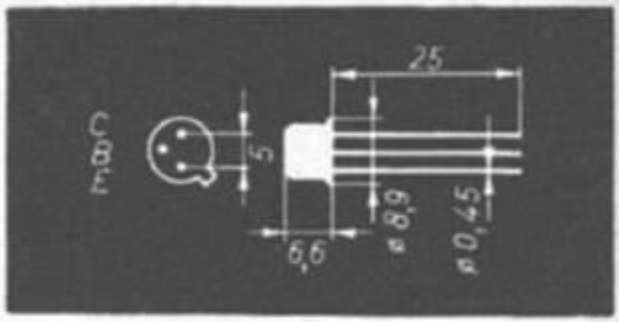
Verwendung: Silizium-npn-Planar-Epitaxie-Transistor für Breitbandverstärkung und als mittelschneller Schalter bei Umgebungstemperaturen ϑ_a von −55 °C bis +125 °C

SF 127

Abmessungen: Bauform B 3/25 – 3a, TGL 11 811
Kollektor am Gehäuse
Masse ≈ 1 g



Zulässige Höchstwerte bis ϑ_j

U_{CBO}	= 66 V	I_B	= 250 mA
U_{CEO}	= 30 V	P_C	= 600 mW
U_{EBO}	= 7 V	bei ϑ_a	= 25 °C
I_C	= 500 mA	ϑ_j	= 175 °C
		ϑ_a	= 125 °C

Wärmewiderstand $R_{th} \leqq 250 \frac{grd}{W}$

$R_{thi} \leqq 60 \frac{grd}{W}$

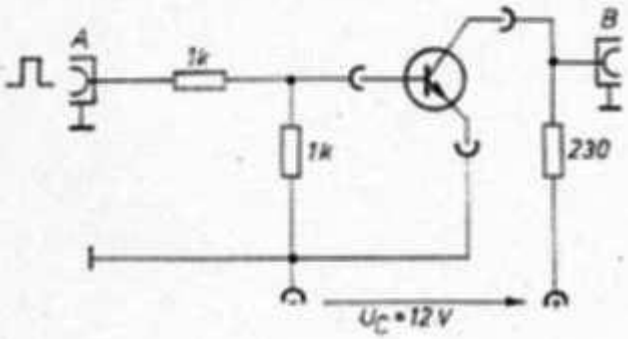
Kennwerte für ϑ_a = 25 °C –5 grd

	Min.	Typ	Max.	Meßbedingungen	Stromverstärkungsgruppen
Restströme					
I_{CBO}		1 nA	100 nA	U_{CBOmax}	
Durchbruchspannung					
$U_{(BR)CBO}$	80 V			I_{CBO} = 5 µA	
$U_{(BR)CEO}$	30 V			I_{CEO} = 50 mA	
$U_{(BR)EBO}$	7 V			I_{EBO} = 5 µA	
Sättigungsspannung					
U_{CEsat}			0,5 V	I_C = 150 mA, I_B = 15 mA	
U_{BEsat}		0,95 V			
Gleichstromverstärkung					
B	18		35	U_{CE} = 2 V, I_C = 50 mA	A
B	28		71		B
B	56		140		C
B	112		280		D
B	224		560		E
B	450		1120		F
Übergangsfrequenz					
f_T	60 MHz	100 MHz		U_{CE} = 10 V, I_C = 10 mA, f = 15 MHz	

	Min.	Typ	Max.	Meßbedingungen	Stromverstärkungsgruppen
Ausgangskapazität					
C_{22b}	10 pF	12 pF	20 pF	$U_{CB} = 10$ V, $I_E = 0$, f = 2 MHz	
Eingangskapazität					
C_{11b}	28 pF	38 pF	50 pF	$U_{EB} = 5$ V, Ic = 0, f = 2 MHz	
Basisbahnwiderstand					
R_e (h_{11e})		16,5 Ω		$U_{CE} = 10$ V, Ic = 2 mA, f = 200 MHz	
Y-Parameter					
g_{11}		3,8 mS		$U_{CE} = 6$ V, Ic = 2 mA, f = 5 MHz	
b_{11}		177 pF			
g_{22}		0,4 mS			
b_{22}		29 pF			
h-Parameter					
h_{11e}		1,25 kΩ		$U_{CE} = 6$ V, Ic = 2 mA, f = 1 kHz	
h_{12e}		$4{,}1 \cdot 10^{-4}$			
h_{21e}		100			
h_{22e}		27 µS			
Rauschfaktor					
F		4,5 dB		$U_{CE} = 6$ V, Ic = 0,2 mA, f = 1 kHz, $R_g = 500\ \Omega$, $\Delta f = 1$ kHz	
Rückwirkungszeitkonstante					
$\lvert h_{12b} \rvert \cdot \omega$	150 ps	300 ps	550 ps	$U_{CE} = 10$ V, Ic = 10 mA, f = 30 MHz	
Schaltzeiten					
t_r		0,55 µs		m = 1	siehe Meßschaltung
t_s		1,3 µs		m = 3	siehe Meßschaltung

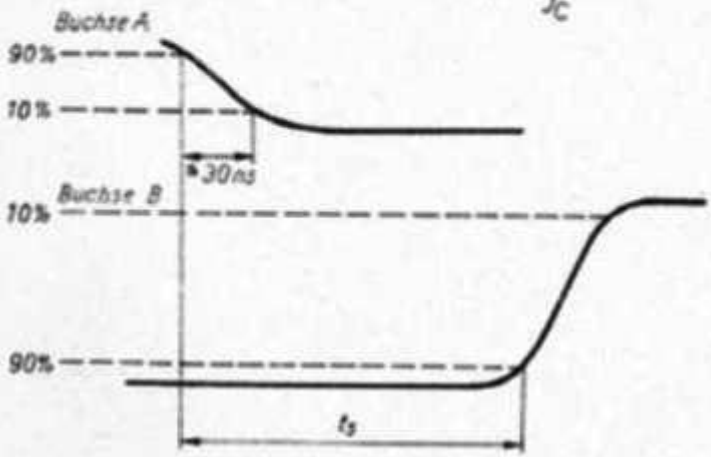
Bestellbeispiel für einen Transistor der Stromverstärkungsgruppe D — **Transistor SF 127 D**

Schaltung für die Schaltzeitmessung:

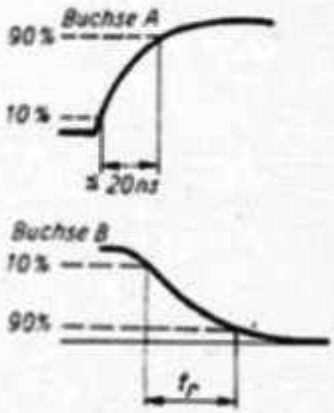


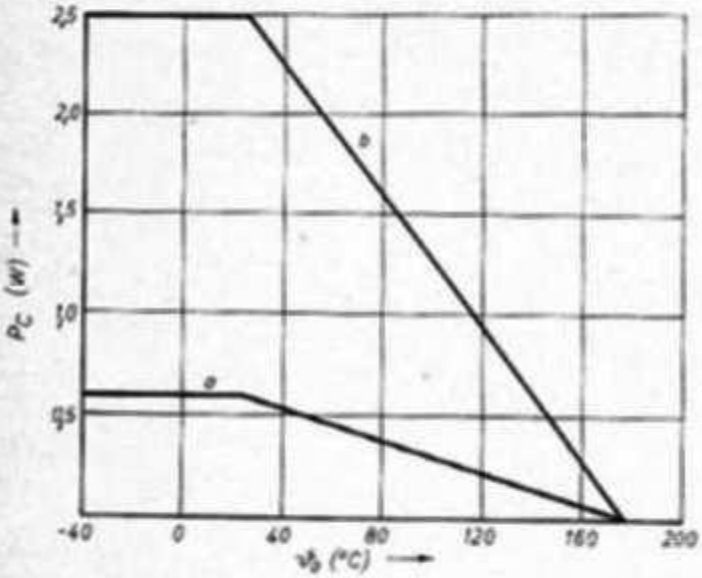
Oszilloskop DG 2-10
Eingangsimpulse: t_i = 1 µs
$\frac{t_i}{T}$ = 0,5 %

Speicherzeit t_s bei m = 3 mit $m = \frac{J_B \cdot B}{J_C}$



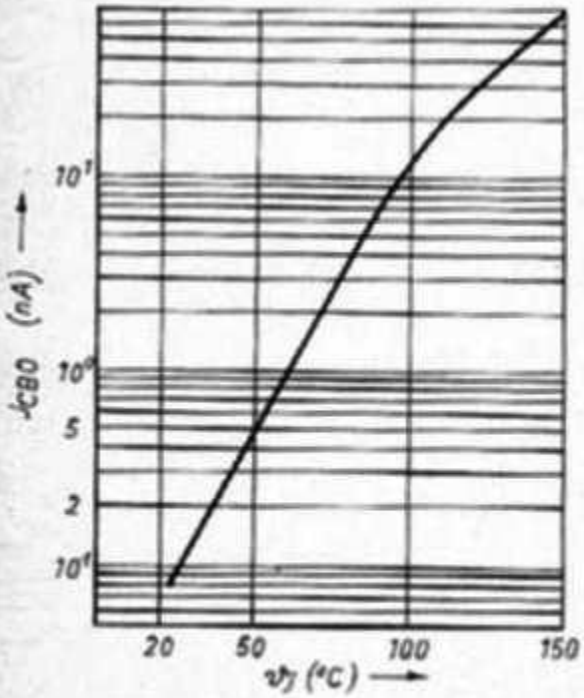
Anstiegszeit t_r bei m = 1 mit $m = \frac{J_B \cdot B}{J_C}$



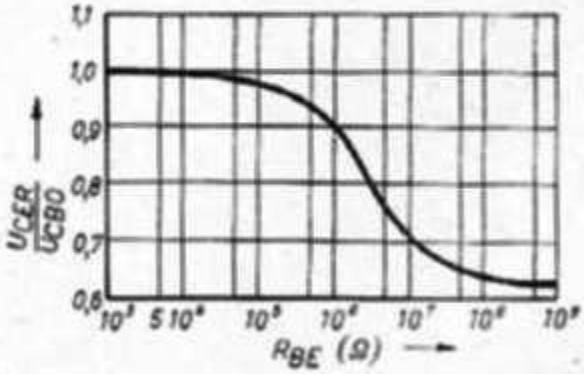


$P_C = f(\vartheta_a)$
a = freitragende Montage
b = ideale Kühlung

$J_{CBO} = f(\vartheta_j)$
$U_{CB} = 20\,V$

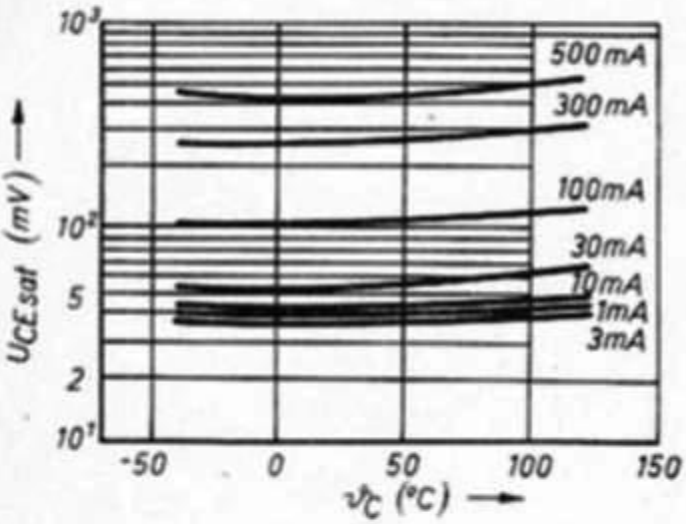


$U_{CER} = f(R_{BE})$
$J_C = 1\,mA$
normiert auf U_{CBO}



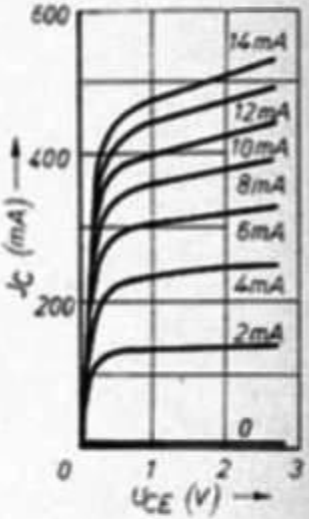
$U_{CEsat} = f(\vartheta_G)$

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



$J_C = f(U_{CE})$

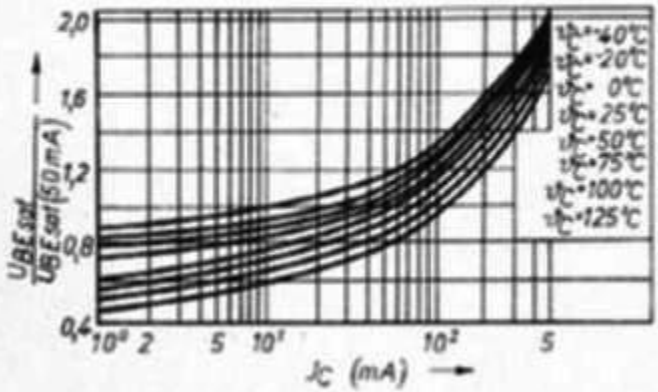
J_B = Parameter



U_{BEsat} (normiert) = f (Ic)

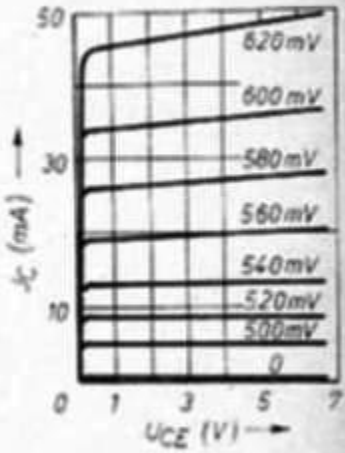
B = 10

ϑ_C = Parameter

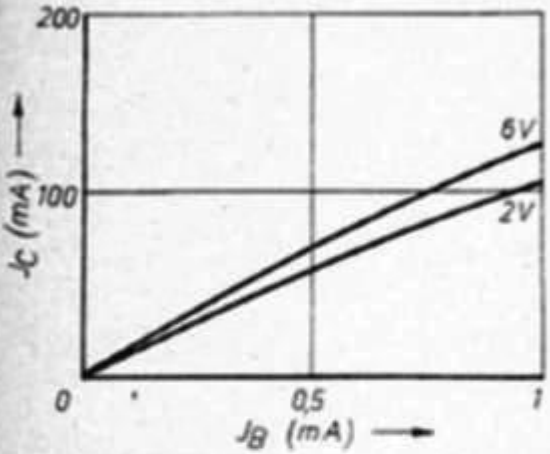


$J_C = f(U_{CE})$

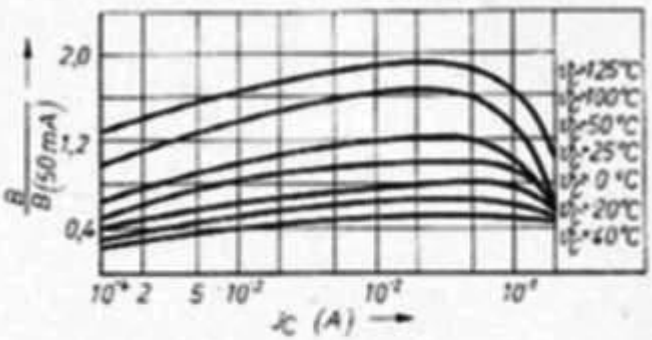
U_{BE} = Parameter



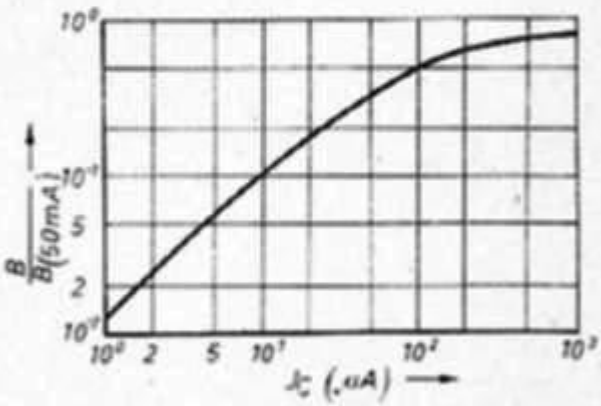
$I_C = f(I_B)$
U_{CE} = Parameter



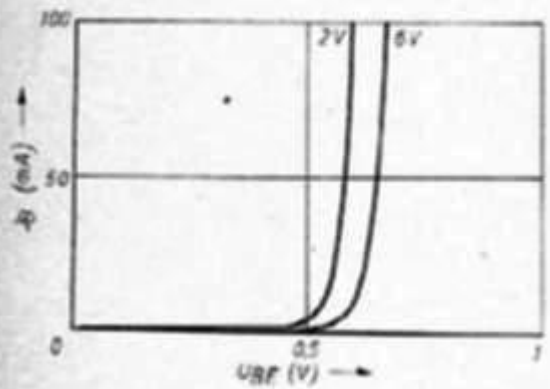
B (normiert) = f (Ic)
U_{CE} = 2 V
ϑ_C = Parameter



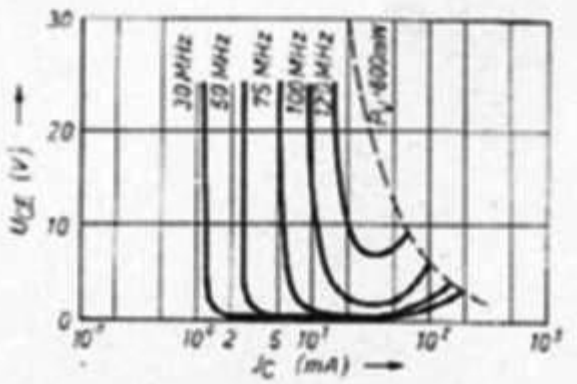
B (normiert) = f (Ic)
U_{CE} = 2 V
ϑ_a = 25 °C



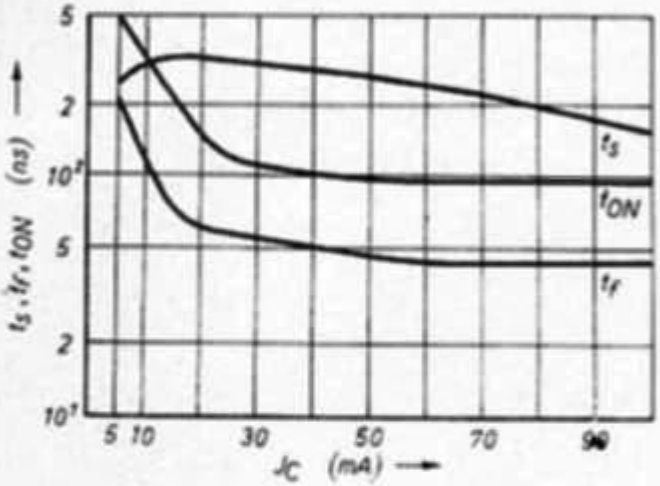
$I_B = f(U_{BE})$
U_{CE} = Parameter



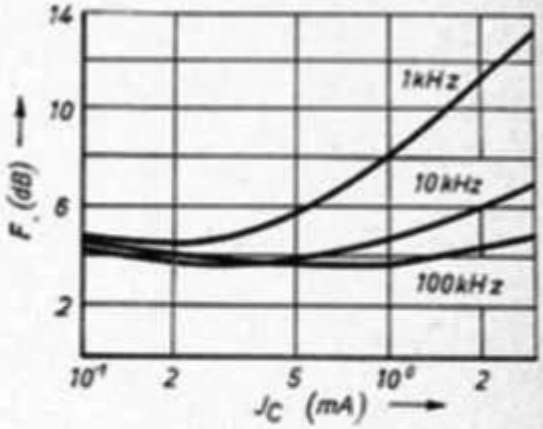
$U_{CE} = f(I_C)$ f_T = Parameter
Kurven konst. f_T = Frequenz



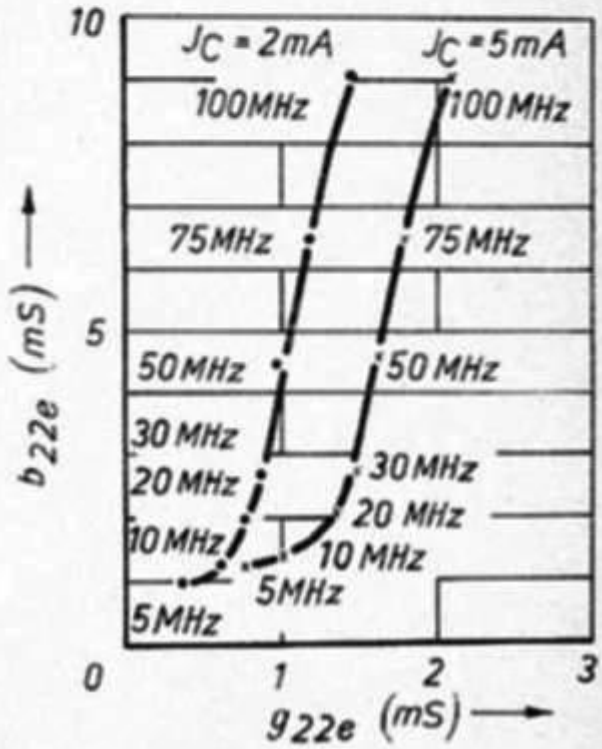
$t_s, t_r, t_{ON} = f(J_C)$
$I_C = 10^1 B_1 = -10^1 B_2$



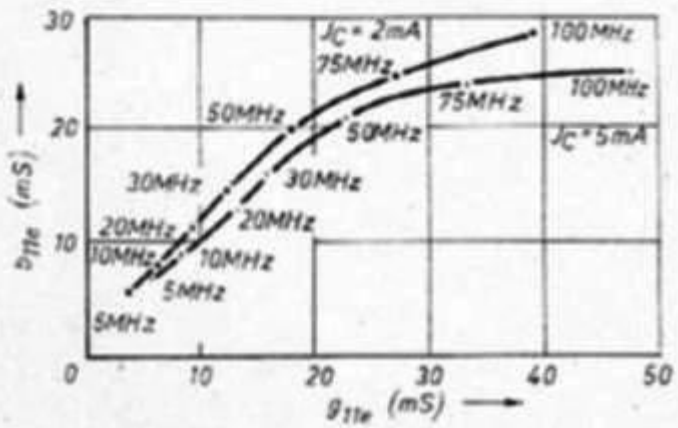
$F = f(J_C)$
f - Parameter
$U_{CE} = 6V$



Y_{22e}
$U_{CE} = 6V$ J_C = Parameter

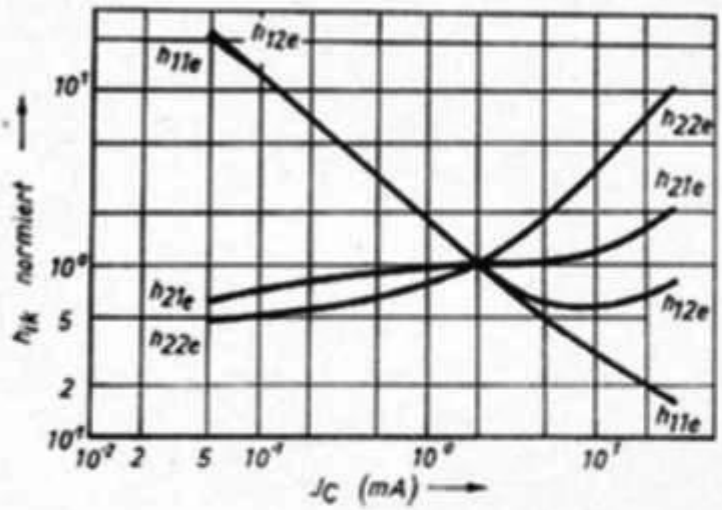


Y_{11e}
$U_{CE} = 6V$ J_C = Parameter



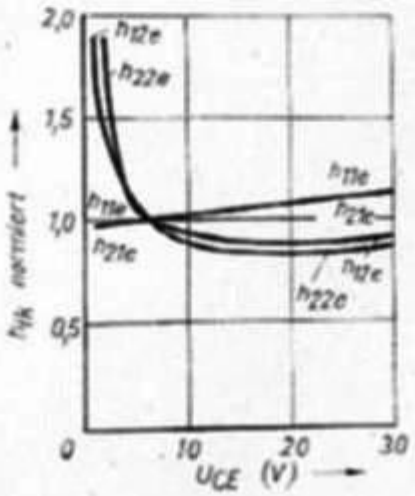
h Parameter (normiert) = f (J_C)
bei U_{CE} = 6V
f = 1kHz

h_{ik} normiert = $\frac{h_{ik}(J_C)}{h_{ik}(J_C = 2mA)}$



h Parameter (normiert) = f (U_{CE})
bei J_C = 2mA
f = 1kHz

h_{ik} normiert = $\frac{h_{ik}(U_{CE})}{h_{ik}(U_{CE} = 6V)}$



$C_{22b} = f(U_{CB})$
$J_E = 0$