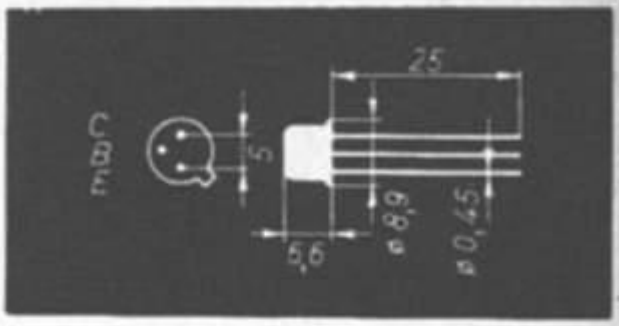
Verwendung: Silizium-npn-Planar-Epitaxie-Transistor für Breitbandverstärkung und als mittelschneller Schalter bei Umgebungstemperaturen ϑ_a von −55 °C bis +125 °C

SF 128

Abmessungen: Bauform B 3/25 – 3a, TGL 11 811

Kollektor am Gehäuse

Masse ≈ 1 g



Zulässige Höchstwerte bis ϑ_{jmax}

U_{CBO} =	100 V	I_B =	250 mA
U_{CEO} =	60 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

Kennwerte für ϑ_a = 25 °C –5 grd

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

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

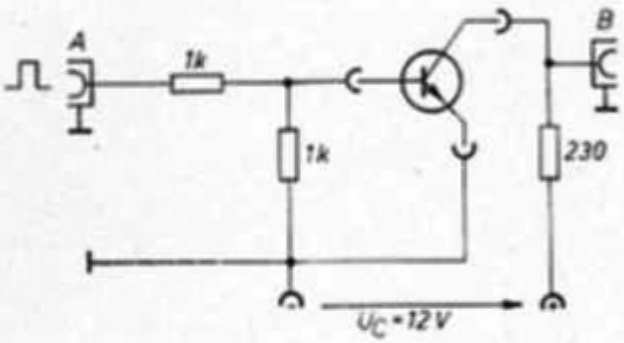
	Min.	Typ	Max.	Meßbedingungen	Stromverstärkungsgruppen
Restströme					
I_{CBO}		1 nA	100 nA	U_{CBOmax}	
Durchbruchspannungen					
$U_{(BR)CBO}$	100 V			I_{CBO} = 5 µA	
$U_{(BR)CEO}$	60 V			I_{CEO} = 50 mA	
$U_{(BR)EBO}$	7 V			I_{EBO} = 5 µA	
Sättigungsspannung					
U_{CEsat}			0,5 V	I_C = 150 mA, I_B = 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
Ubergangsfrequenz					
f_T	60 MHz	100 MHz		U_{CE} = 10 V, I_C = 10 mA, f = 15 MHz	

SF 128

	Min.	Typ	Max.	Meßbedingungen	Stromverstärkungsgruppen
Ausgangskapazität					
$C22_b$	10 pF	12 pF	20 pF	$U_{CB} = 10$ V, $I_E = 0$, f = 2 MHz	
Eingangskapazität					
$C11_b$	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} b_{11} g_{22} b_{22}		3,8 mS 177 pF 0,4 mS 29 pF		$U_{CE} = 6$ V, Ic = 2 mA, f = 5 MHz	
h-Parameter					
h_{11e} h_{12e} h_{21e} h_{22e}		1,25 kΩ $4{,}1 \cdot 10^{-4}$ 100 27 µS		$U_{CE} = 6$ V, Ic = 2 mA, f = 1 kHz	
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					
$\left\lvert h_{12b} \right\rvert_{\omega}$	150 ps	300 ps	550 ps	$U_{CE} = 10$ V, Ic = 10 mA, f = 30 MHz	
Schaltzeiten					
t_r t_s		0,55 µs 1,3 µs		m = 1 m = 3 siehe Meßschaltung	

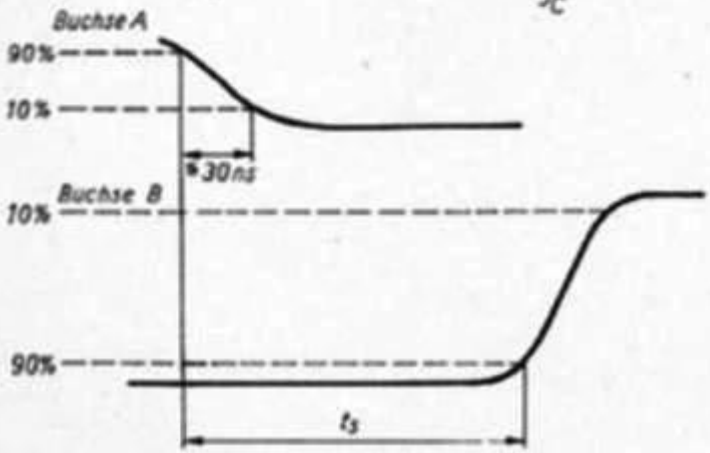
Bestellbeispiel für einen Transistor der Stromverstärkungsgruppe E — **Transistor SF 128 E**

Schaltung für die Schaltzeitmessung:

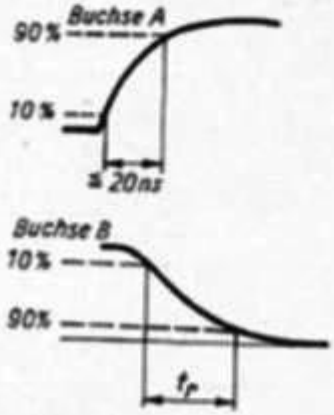


Oszilloskop DG 2-10
Eingangsimpulse: t_i = 1 µs
$\frac{t_i}{T}$ = 0,5 %

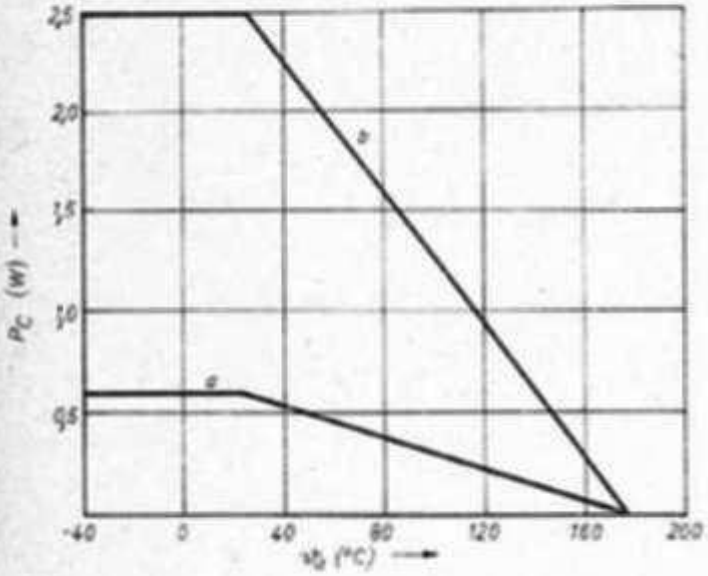
Speicherzeit t_s bei m = 3 mit $m = \frac{J_B \cdot B}{J_C}$



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



SF 128

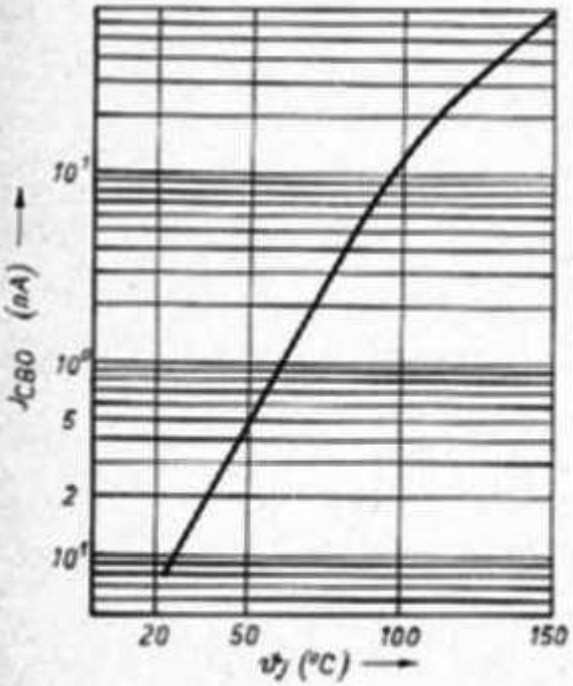


$P_C = f(\vartheta_a)$

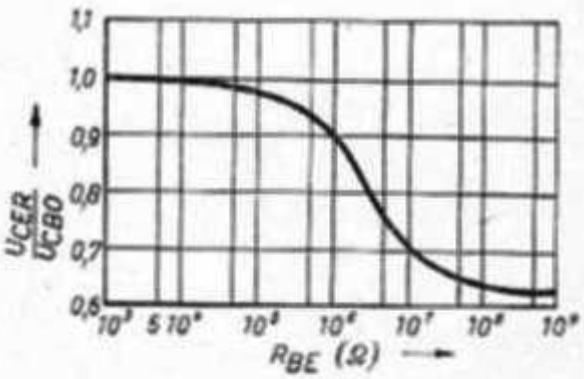
a = freitragende Montage

b = ideale Kühlung

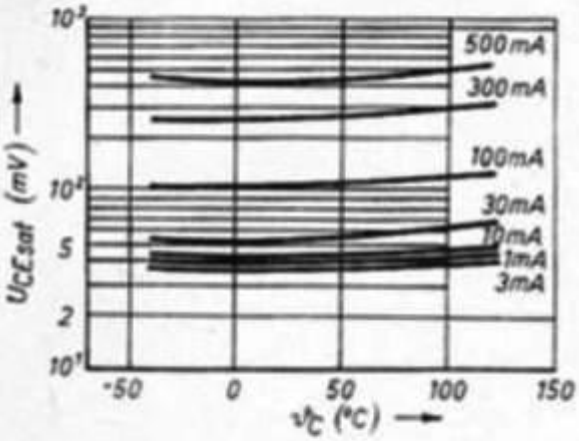
$J_{CBO} = f(\vartheta_j)$
$U_{CB} = 20\,V$



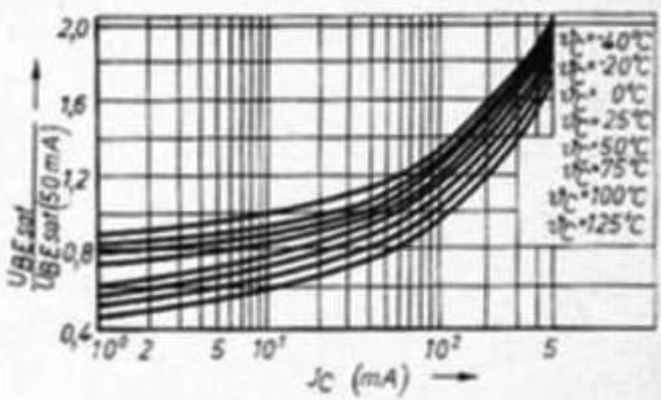
$U_{CER} = f(R_{BE})$
$J_C = 1\,mA$
normiert auf U_{CBO}



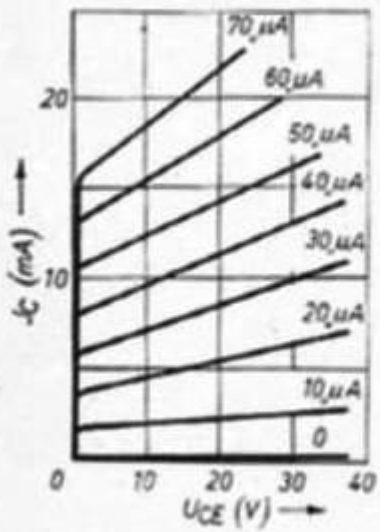
$U_{CEsat} = f(\vartheta_C)$
$\frac{J_C}{J_B} = 10$



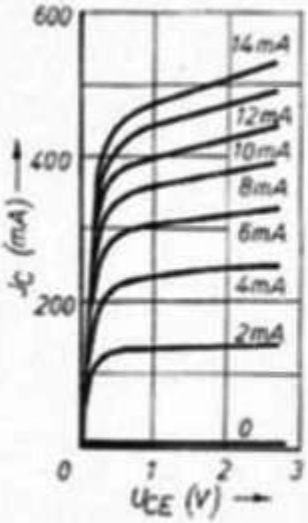
U_{BEsat} (normiert)
B = 10
ϑ_C = Parameter



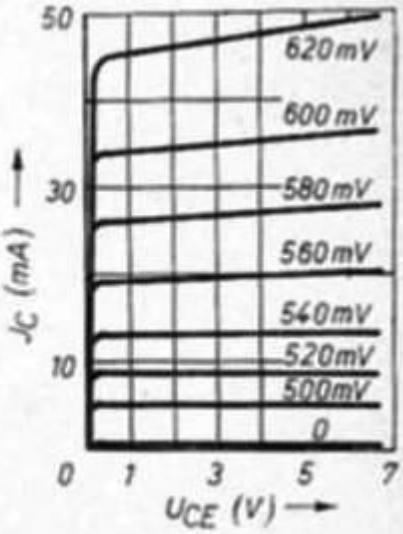
$J_C = f(U_{CE})$
J_B Parameter



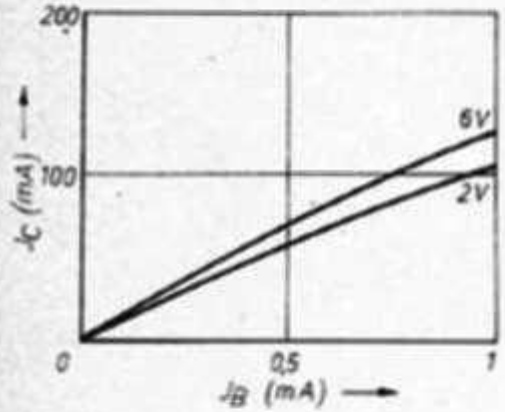
$J_C = f(U_{CE})$
J_B Parameter



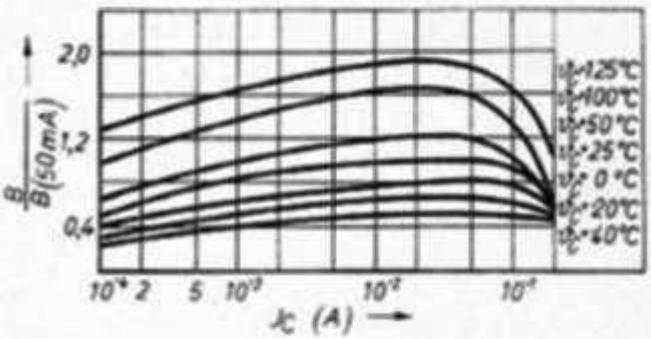
$J_C = f(U_{CE})$
U_{BE} Parameter



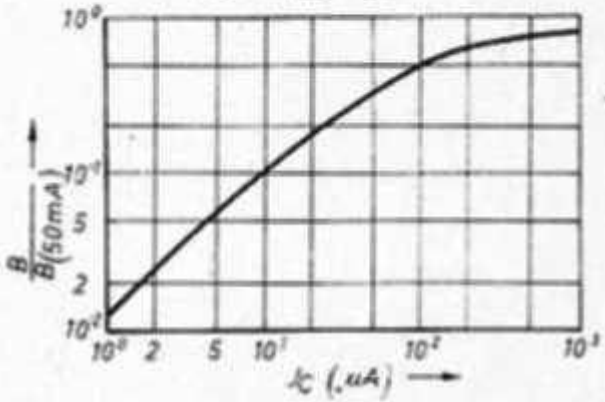
$I_C = f(I_B)$
U_{CE} Parameter



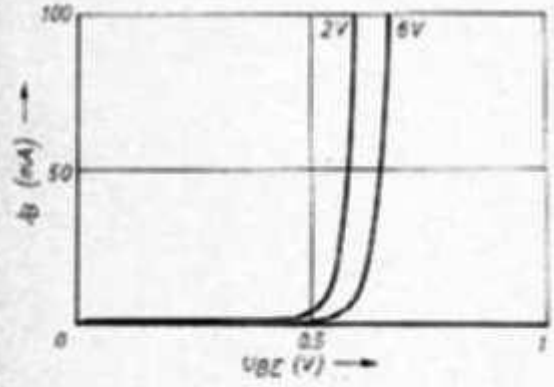
B (normiert) = f (Ic)
U_{CE} = 2 V
ϑ_c = Parameter



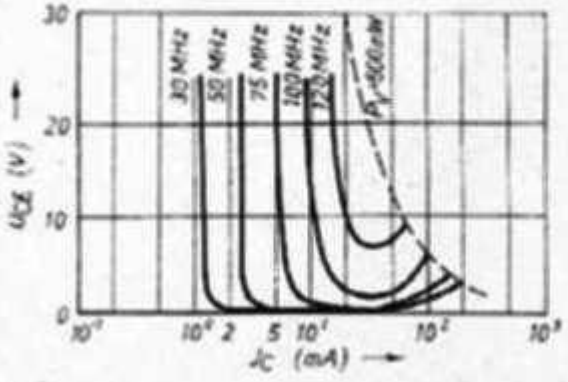
B (normiert) = f (I_C)
U_{CE} = 2 V
ϑ_a = 25 °C



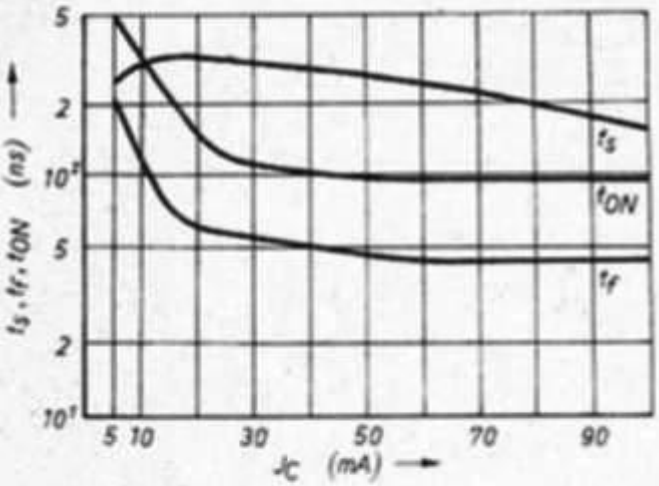
$I_B = f(U_{BE})$
U_{CE}-Parameter



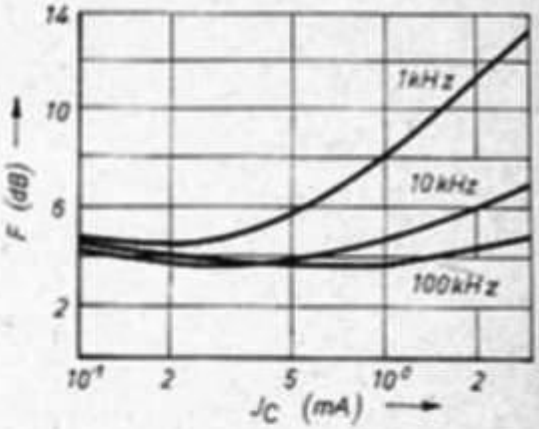
$U_{CE} = f(I_C)$ f_1 = Parameter
Kurven konst. f_1 = Frequenz



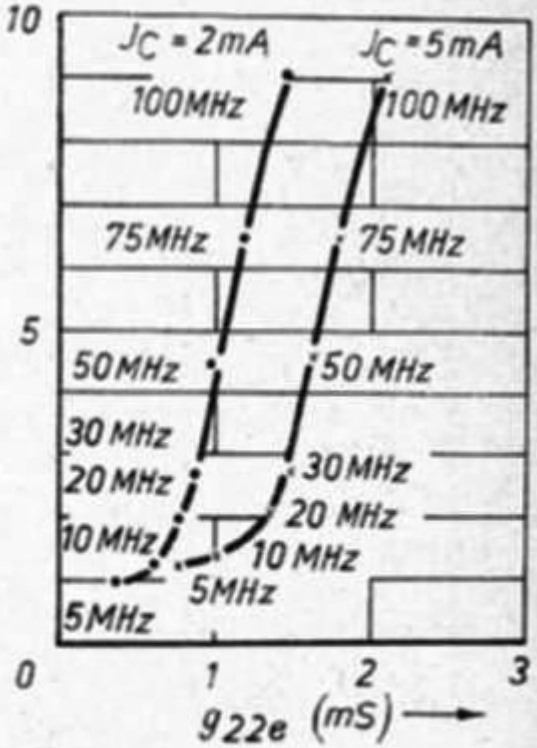
$t_s, t_r, t_{ON} = f(J_C)$
$I_C = 10^1 B_1 = -10^1 B_2$



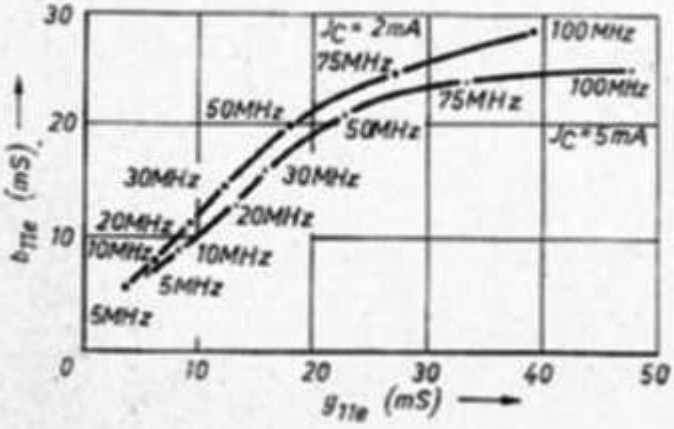
$F = f(J_C)$
f - Parameter
$U_{CE} = 6V$



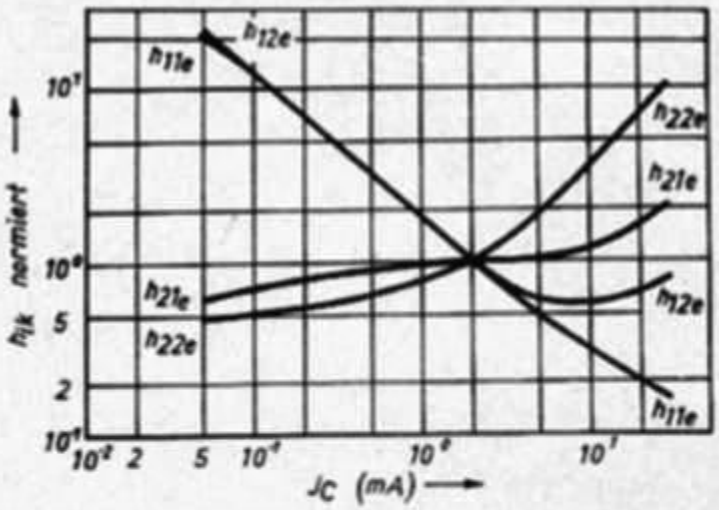
Y_{22e}
$U_{CE} = 6V$ J_C = Parameter



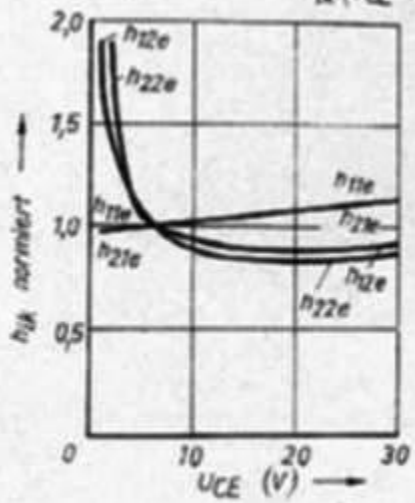
Y_{11e}
$U_{CE} = 6V$ J_C = Parameter



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})
I_E = 0