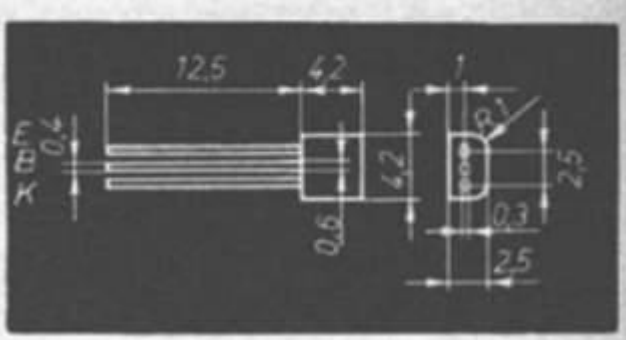
Verwendung: Silizium-npn-Planar-Transistor im Plastgehäuse für analoge Anwendungen in HF-Verstärkern und HF-Oszillatoren bis 100 MHz bei Umgebungstemperaturen ϑ_a von −40 °C bis +100 °C

SF 215

Abmessungen: Plastgehäuse
Masse ca. 0,1 g



Zulässige Höchstwerte bis ϑ_{jmax}

U_{CBO}	= 20 V	I_B	= 10 mA
U_{CEO}	= 15 V	P_{tot}	= 200 mW
U_{EBO}	= 5 V	bei ϑ_a	= 25 °C
I_C	= 100 mA	ϑ_j	= 125 °C
		ϑ_a	= 100 °C

Wärmewiderstand $R_{th} \leqq 0{,}5 \frac{grd}{mW}$

Kennwerte für ϑ_a = 25 °C −5 grd

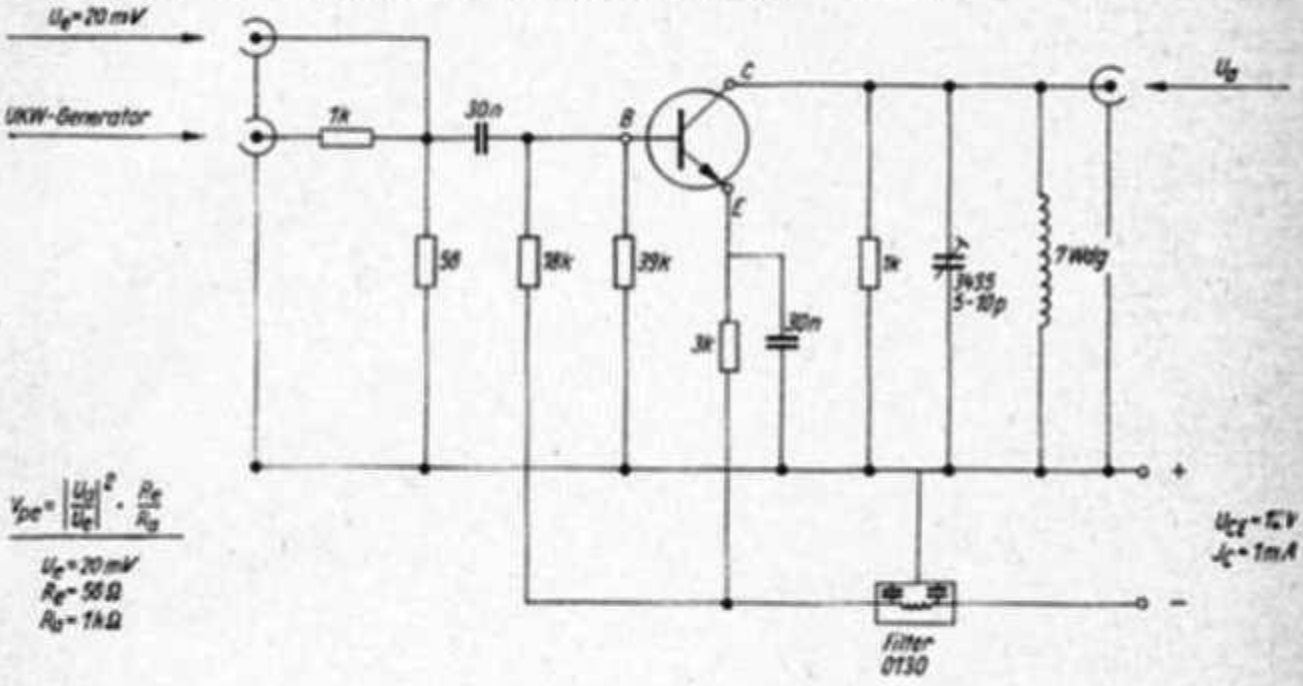
	Min.	Typ	Max.	Meßbedingungen	Stromverstärkungsgruppen
Restströme					
I_{CBO}		5 nA	100 nA	U_{CB} = 20 V	
Durchbruchspannungen					
$U_{(BR)CER}$	15 V	50 V		I_C = 100 µA,	
$U_{(BR)CBO}$		42 V		I_C = 10 µA	
$U_{(BR)EBO}$		6,8 V		I_E = 10 µA	
Stromverstärkung					
h_{21e}	28		71	U_{CE} = 6 V, I_C = 2 mA, f = 1 kHz	b
h_{21e}	56		140		c
h_{21e}	112		280		d
h_{21e}	224		560		e
Leistungsverstärkung					
V_{pe}	4 dB	6 dB		U_{CE} = 8 V, I_C = 1 mA, f = 100 MHz (siehe Meßschaltung)	
Übergangsfrequenz					
f_T		350 MHz		U_{CE} = 10 V, I_C = 5 mA, f = 100 MHz	
Ausgangskapazität					
c_{22b}		3,5 pF		U_{CE} = 10 V, f = 20 MHz	

SF 215

	Min.	Typ	Max.	Meßbedingungen	Stromverstärkungsgruppen
Rückwirkungskapazität					
c_{12e}		2,3 pF		$U_{CE} = 10$ V, $I_C = 5$ mA, f = 500 kHz	
Rückwirkungszeitkonstante					
$\frac{h_{12b}}{\omega}$		110 ps		$U_{CB} = 10$ V, $I_C = 5$ mA, f = 30 MHz	
Rauschfaktor					
F		8,0 dB		$U_{CE} = 10$ V, $I_C = 5$ mA, f = 100 MHz $R_G = 60\,\Omega$	
Vierpolparameter					
h_{11e}		3,2 kΩ		$U_{CE} = 6$ V, $I_C = 2$ mA, f = 1 kHz	
h_{12e}		$0{,}28 \cdot 10^{-3}$			
h_{21e}		86			
h_{22e}		28 µS			
Schwingfrequenz					
f_{max}			356 MHz	$U_{CE} = 10$ V, $I_C = 5$ mA	
Y-Parameter in Emitterschaltung					
$Y_{11e} = (6{,}6 + j\,7{,}3)$ mS				bei $U_{CE} = 10$ V, $I_C = 5$ mA, f = 100 MHz	
$Y_{12e} = (-0{,}3 - j\,1{,}75)$ mS					
$Y_{21e} = (23{,}5 - j\,40)$ mS					
$Y_{22e} = (1{,}72 + j\,2{,}74)$ mS					
$Y_{11e} = (4{,}2 + j\,4{,}0)$ mS				bei $U_{CE} = 10$ V, $I_C = 5$ mA, f = 50 MHz	
$Y_{12e} = (0 - j\,1{,}0)$ mS					
$Y_{21e} = (35{,}5 - j\,45{,}5)$ mS					
$Y_{22e} = (1{,}58 + j\,1{,}8)$ mS					
Y-Parameter in Basisschaltung					
$Y_{11b} = (25 - j\,26)$ mS				bei $U_{CB} = 10$ V, $I_C = 5$ mA, f = 100 MHz	
$Y_{12b} = (-1{,}7 - j\,1{,}78)$ mS					
$Y_{21b} = (-24{,}5 + j\,38{,}5)$ mS					
$Y_{22b} = (1{,}72 + j\,2{,}74)$ mS					
$Y_{11b} = (54{,}5 - j\,33)$ mS				bei $U_{CB} = 10$ V, $I_C = 5$ mA, f = 50 MHz	
$Y_{12b} = (-1{,}45 - j\,1{,}32)$ mS					
$Y_{21b} = (-48 + j\,36{,}5)$ mS					
$Y_{22b} = (1{,}58 + j\,1{,}8)$ mS					

Bestellbeispiel für einen Transistor der Stromverstärkungsgruppe f — **Transistor SF 215 f**

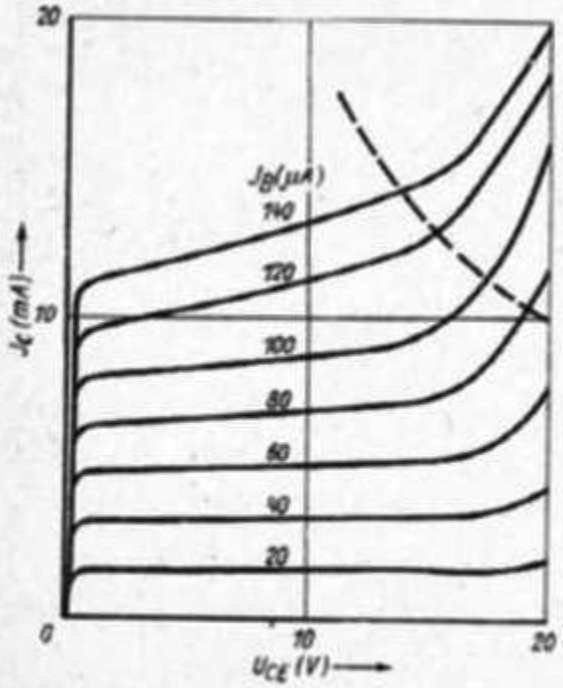
Meßschaltung zur Ermittlung der Leistungsverstärkung f = 100 MHz



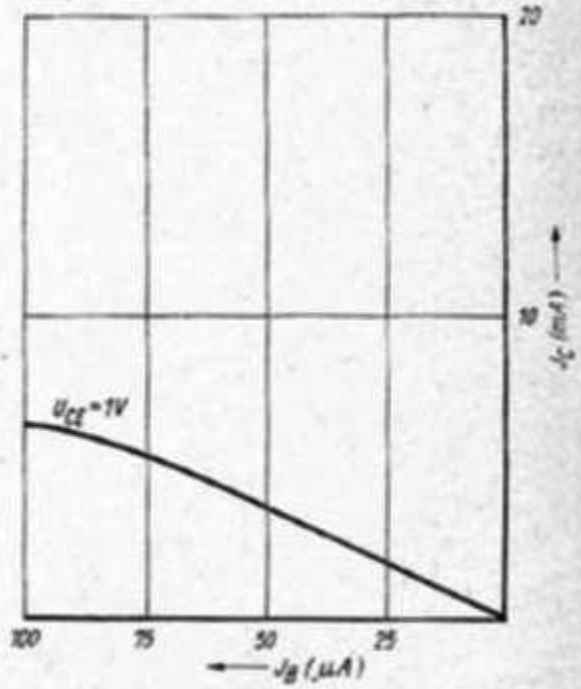
$$V_{pe} = \left|\frac{U_2}{U_1}\right|^2 \cdot \frac{R_e}{R_g}$$

U_e = 20 mV
R_e = 56 Ω
R_g = 1 kΩ

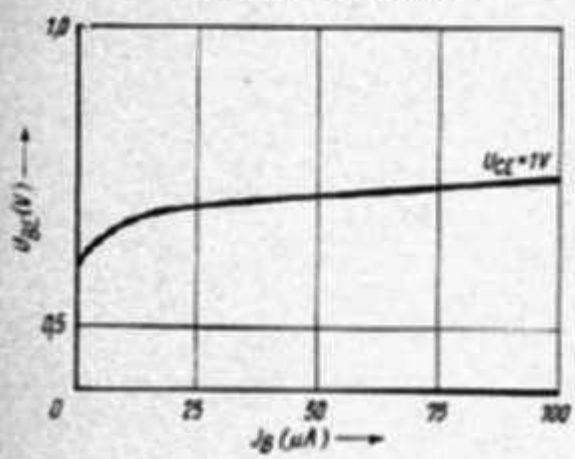
$J_C = f(U_{CE})$
J_B = Parameter



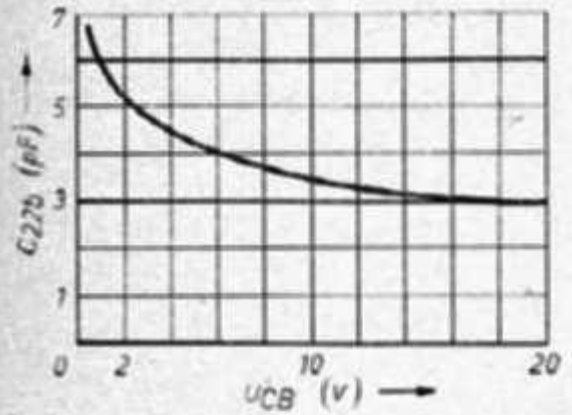
$J_C = f(J_B)$
U_{CE} = Parameter



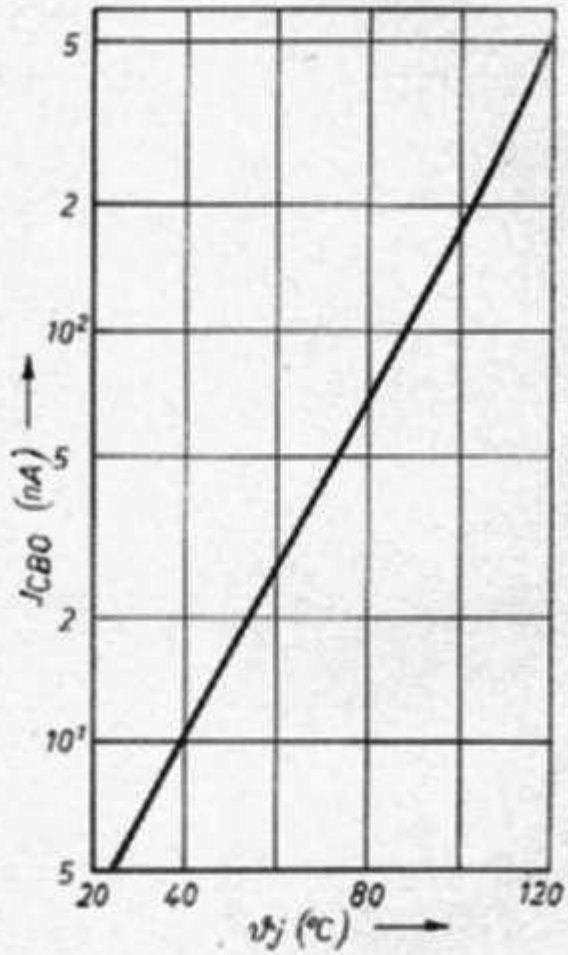
U_{BE} = f (I_B)
U_{CE} = Parameter



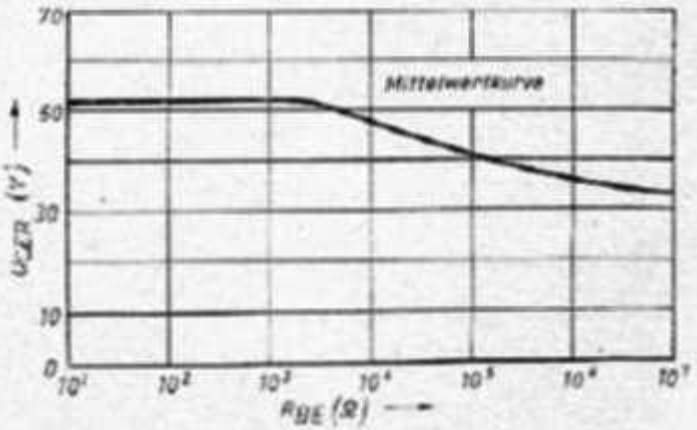
C_{22b} = f(U_{CB})
I_E = 0
f = 20MHz



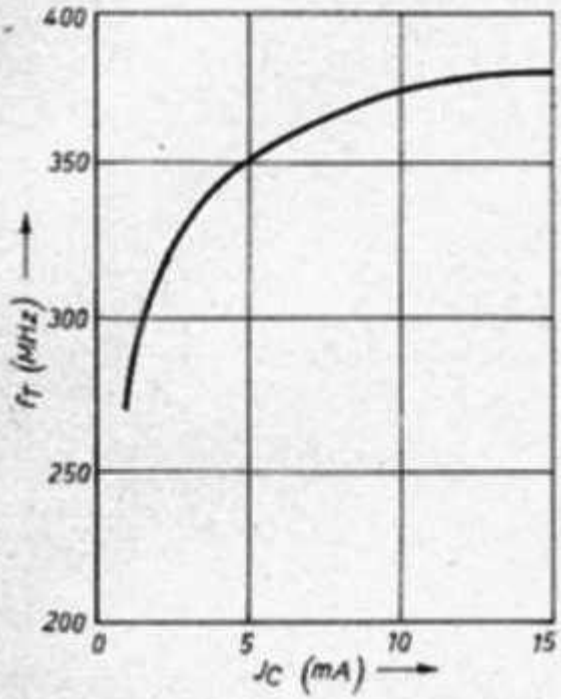
I_{CBO} = f (ϑ_j)
U_{CB} = 20V



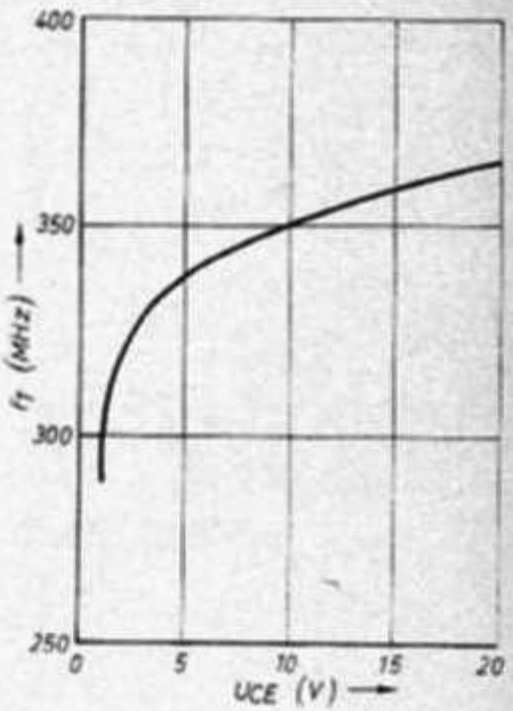
U_{CER} = f(R_{BE})
I_C = 100µA



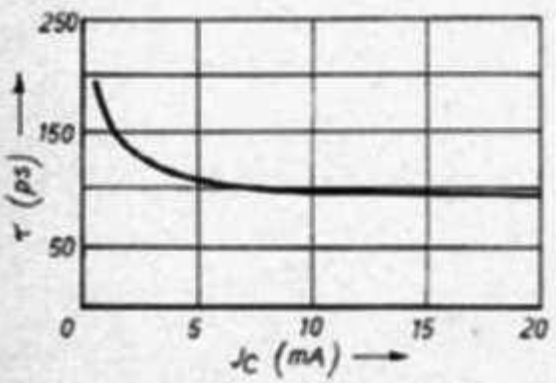
$f_T = f(J_C)$
$U_{CE} = 10\,V$



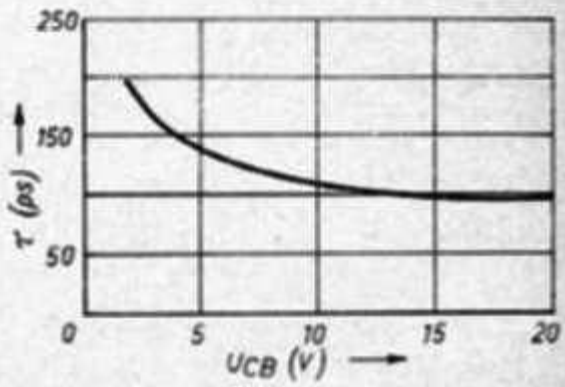
$f_T = f(U_{CE})$
$J_C = 5\,mA$



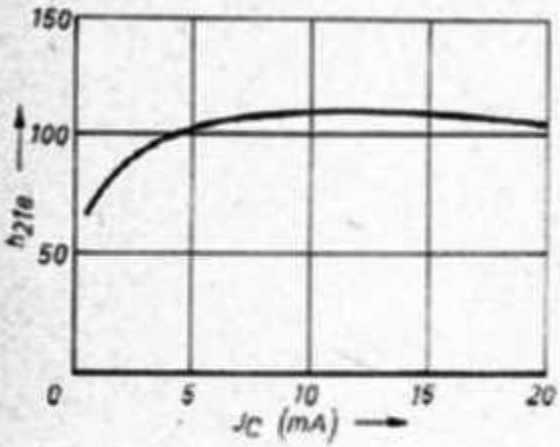
$\tau = f(J_C)$
$U_{CB} = 10\,V$
$f = 30\,MHz$



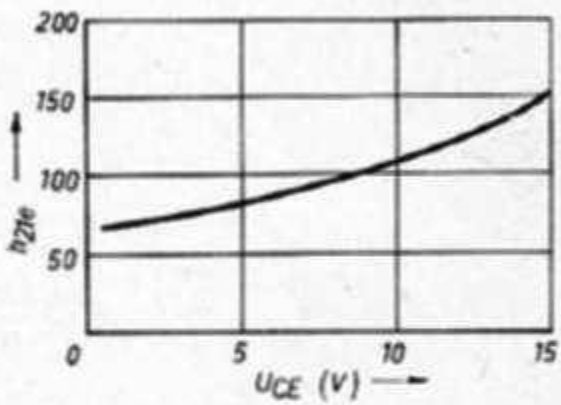
$\tau = f(U_{CB})$
$J_C = 5\,mA$
$f = 30\,MHz$



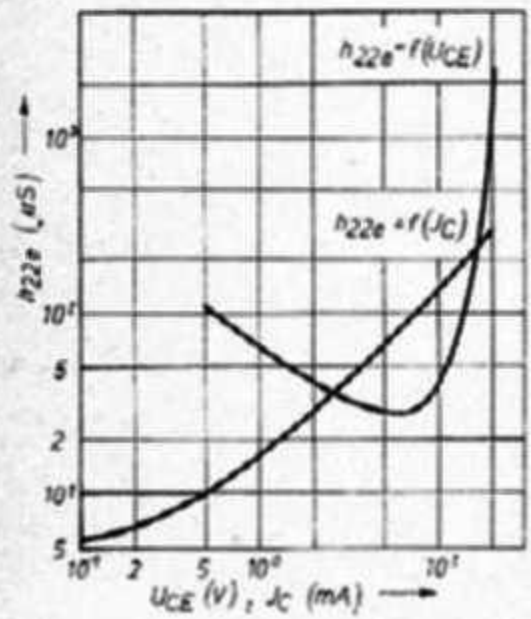
$h_{21e} = f(J_C)$
$U_{CE} = 6\,V$
$f = 1\,kHz$



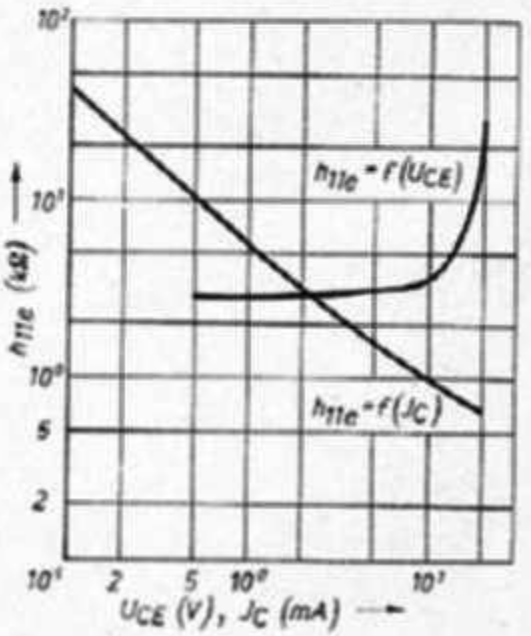
$h_{21e} = f(U_{CE})$
$J_C = 2\,mA$
$f = 1\,kHz$

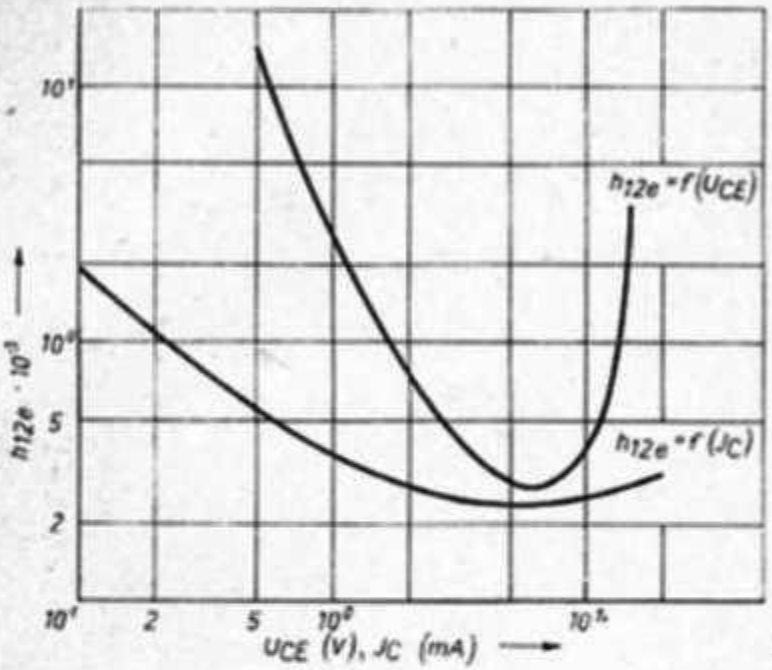


$h_{22e} = f(U_{CE})$, $J_C = 2\,mA$
$h_{22e} = f(J_C)$, $U_{CE} = 6\,V$
$f = 1\,kHz$



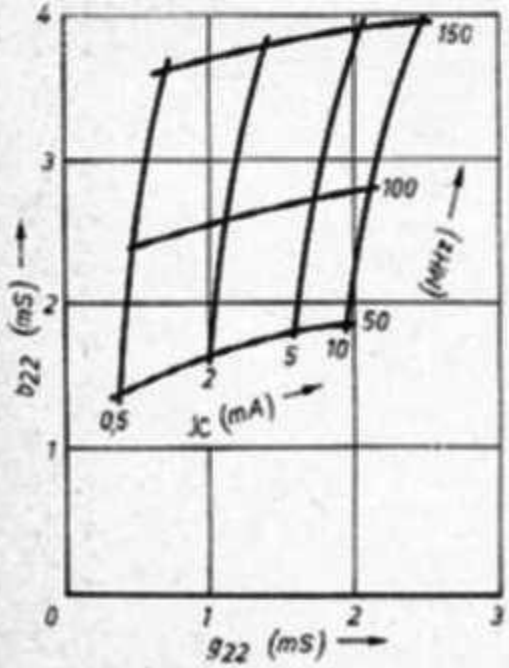
$h_{11e} = f(U_{CE})$, $J_C = 2\,mA$
$h_{11e} = f(J_C)$, $U_{CE} = 6\,V$
$f = 1\,kHz$



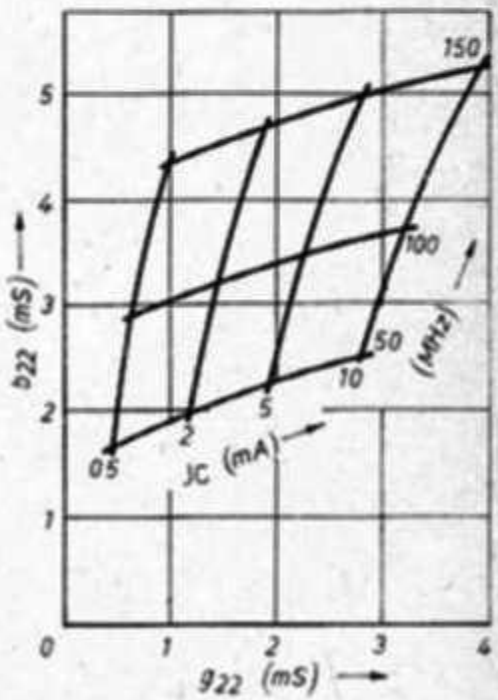


$h_{12e} = f(U_{CE})$, $J_C = 2mA$
$h_{12e} = f(J_C)$, $U_{CE} = 6V$
$f = 1kHz$

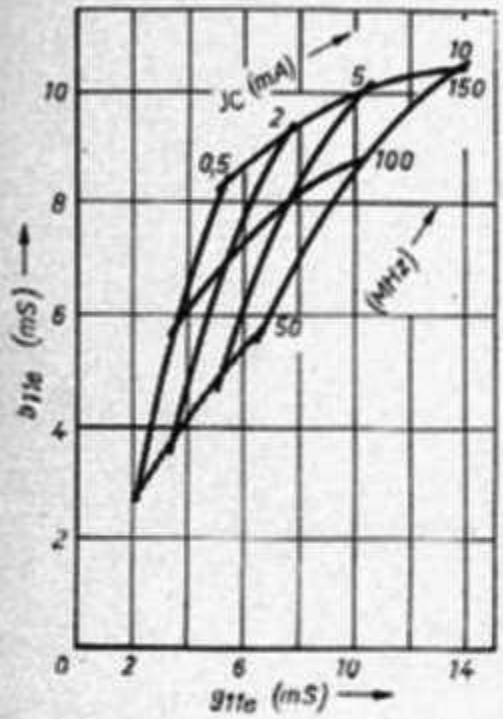
$Y_{22} = f(J_C, f)$
$U_{CE} = 10V$



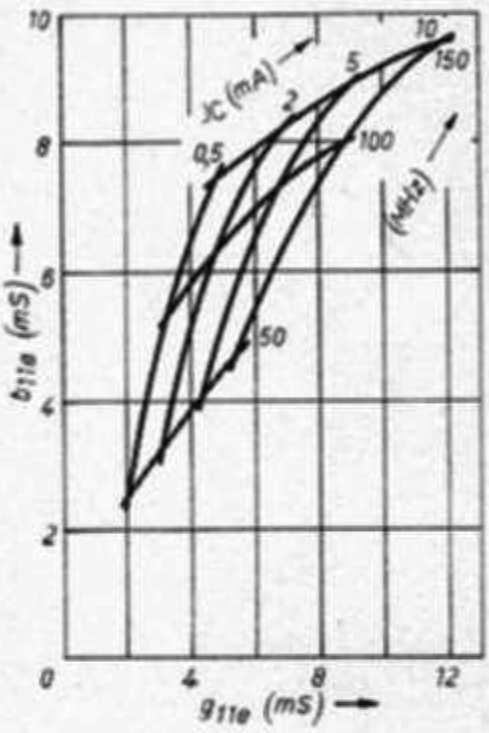
$Y_{22} = f(J_C, f)$
$U_{CE} = 5V$



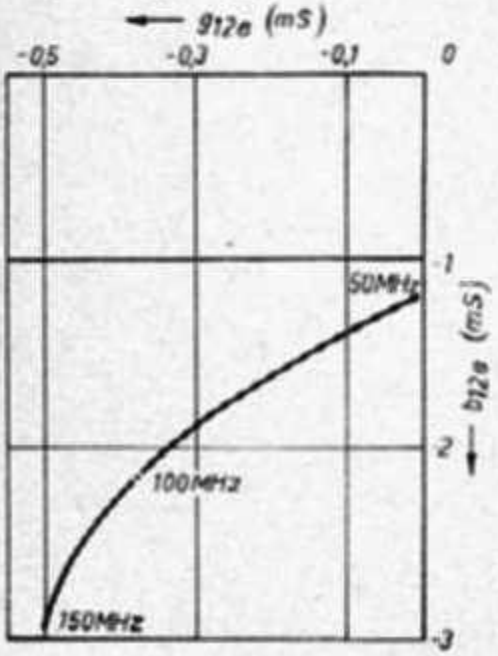
$Y_{11e} = f(I_C, f)$
$U_{CE} = 5\ V$



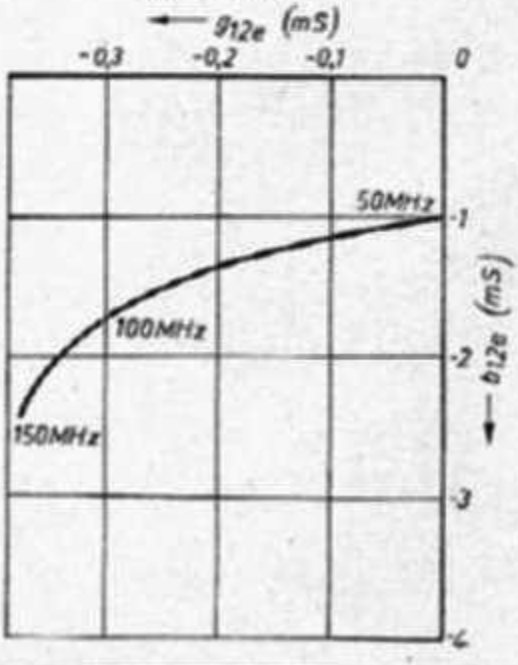
$Y_{11e} = f(I_C, f)$
$U_{CE} = 10\ V$



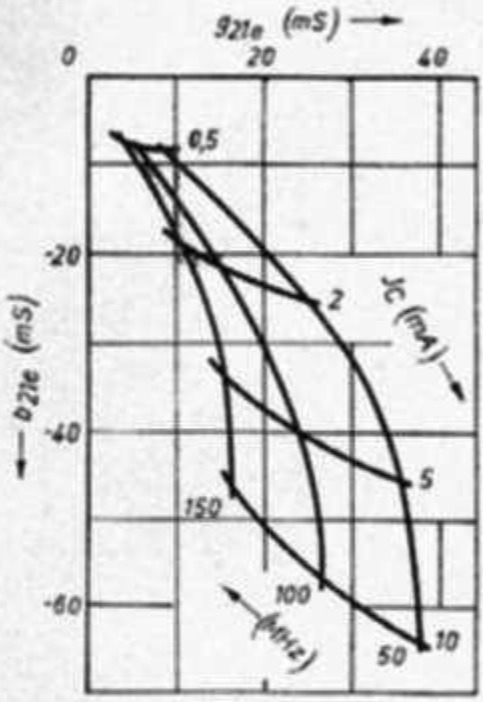
$Y_{12e} = f(f)$
$U_{CE} = 5V$
$J_C = 5\ mA$



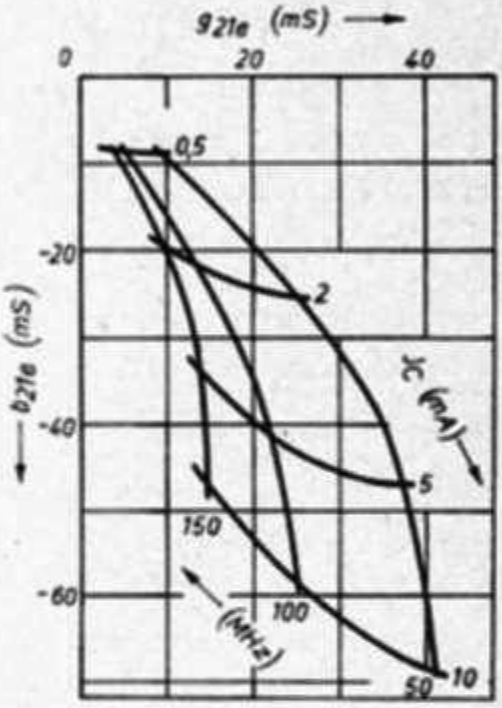
$Y_{12e} = f(f)$
$U_{CE} = 10\ V$
$J_C = 5\ mA$



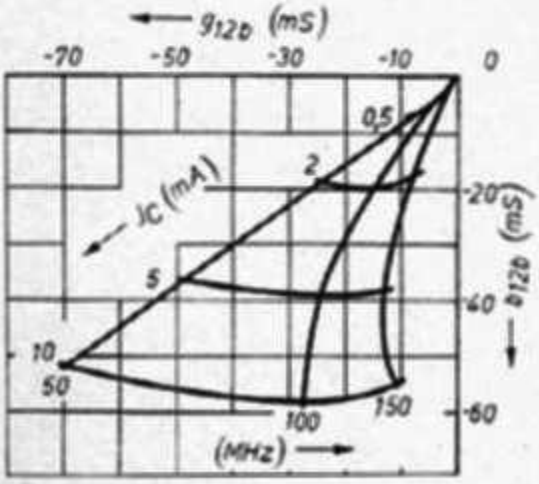
$Y_{21e} = f(I_C, f)$
$U_{CE} = 10V$



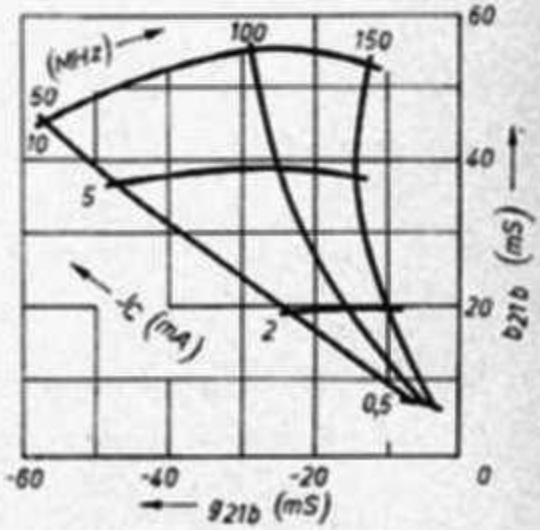
$Y_{21e} = f(I_C, f)$
$U_{CE} = 5\ V$



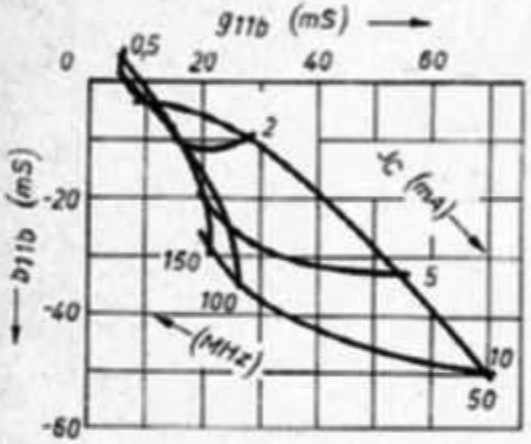
$Y_{21b} = f(J_C, f)$
$U_{CB} = 5\ V$



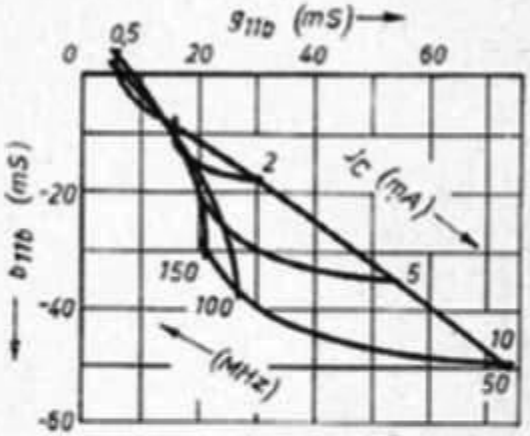
$Y_{21b} = f(J_C, f)$
$U_{CB} = 10\ V$



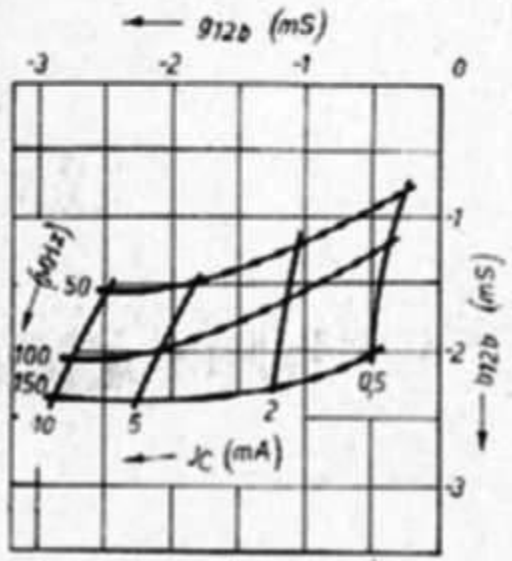
$Y_{11b} = f(J_C, f)$
$U_{CB} = 10\,V$



$Y_{11b} = f(J_C, f)$
$U_{CB} = 5\,V$



$Y_{12b} = f(J_C, f)$
$U_{CB} = 5\,V$



$Y_{12b} = f(J_C, f)$
$U_{CB} = 10\,V$