

Verwendung: Silizium-npn-Planar-Transistor für Breitband-, NF- und HF-Verstärker, sowie für schnellen Schaltbetrieb bei Umgebungstemperaturen von $\vartheta_a -40^\circ\text{C}$ bis $+125^\circ\text{C}$

Abmessungen: Bauform A 3/15 – 3a, TGL 11 811

Kollektor am Gehäuse

Masse $\approx 0,5$ g

Zulässige Höchstwerte bis $\vartheta_{j\text{max}}$

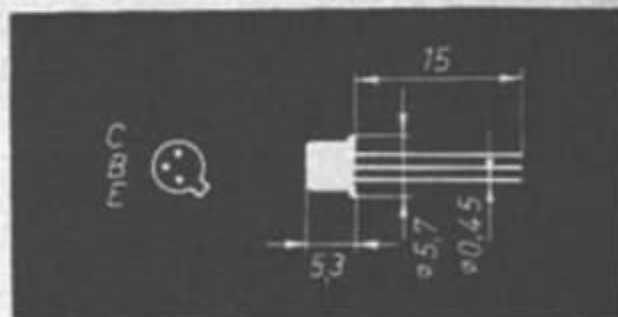
$U_{\text{CBO}} = 20$ V $P_c = 300$ mW

$U_{\text{CEO}} = 12$ V bei $\vartheta_a = 25^\circ\text{C}$

$U_{\text{EBO}} = 4$ V $\vartheta_j = 175^\circ\text{C}$

$I_c = 50$ mA $\vartheta_a = 125^\circ\text{C}$

$I_B = 10$ mA



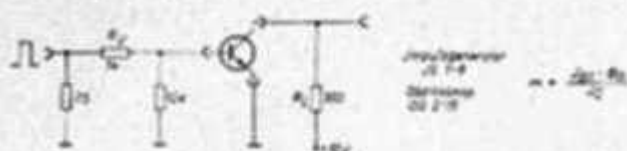
Wärmewiderstand $R_{th} \leq 500 \frac{\text{grad}}{\text{W}}$

Kennwerte für $\vartheta_a = 25^\circ\text{C} - 5$ grad

	Min.	Typ	Max.	Meßbedingungen	Strom- verstärkungs- gruppen
Restströme					
I_{CBO}		1 nA	100 nA	$U_{CB} = 20 \text{ V}$	
I_{EBO}		1 nA	100 nA	$U_{EB} = 4 \text{ V}$	
Durchbruchspannungen					
$U_{(BR)CEO}$	12 V	22 V		$I_c = 10 \text{ mA}$	
Sättigungsspannung					
U_{CEsat}		1,15 V	1,6 V	$I_c = 50 \text{ mA}, I_B = 5 \text{ mA}$	
U_{CEsat}		0,25 V	0,5 V	$I_c = 10 \text{ mA}, I_B = 1 \text{ mA}$	
U_{BEsat}	0,73 V	0,78 V	0,85 V	$I_c = 10 \text{ mA}, I_B = 1 \text{ mA}$	
Gleichstromverstärkung					
B	18		35	$U_{CE} = 1 \text{ V}, I_c = 10 \text{ mA}$	A
B	28		71		B
B	56		140		C
B	112		280		D
B	224		560		E
B	450		1120		F
Übergangsfrequenz					
f_T	200 MHz	330 MHz		$U_{CE} = 10 \text{ V}, I_c = 10 \text{ mA},$ $f = 100 \text{ MHz}$	

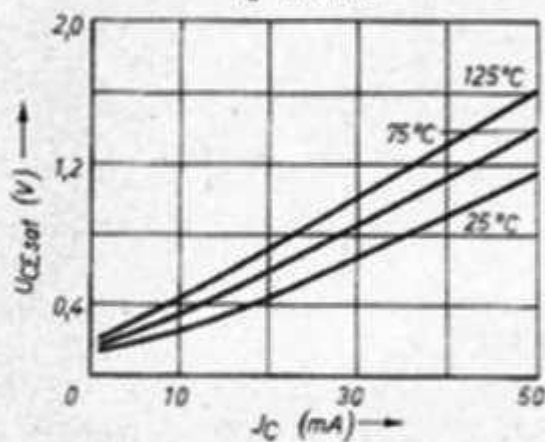
	Min.	Typ	Max.	Meßbedingungen	Strom- verstärkungs- gruppen
Ausgangskapazität					
C22b	3,5 pF	3,7 pF	5 pF	U _{CB} = 10 V, I _E = 0, f = 2 MHz	
C22b		6 pF		U _{CB} = 2 V, I _E = 0	
Eingangswiderstand					
h11e		40 Ω		U _{CE} = 6 V, I _C = 2 mA, f = 240 MHz	
Rückwirkungszeitkonstante					
$\frac{h_{12b}}{\omega}$			300 ps	U _{CB} = 10 V, I _C = 10 mA, f = 30 MHz	
Schaltzeiten					
t _d		35 ns		m = 1	} siehe Meßschaltung
t _r		160 ns		m = 1	
t _r		30 ns		m = 3	
t _s = t _f		500 ns		m = 3	
Rauschfaktor					
F		7 dB		U _{CE} = 6V, I _C = I _{Copt} R _g = R _{gopt}	f = 1 kHz
F		3,5 dB			f = 10 kHz
F		2,5 dB			f = 100 kHz
F		6 dB			f = 50MHz
Schwingfrequenz					
f _{max}			410 MHz	U _{CE} = 10 V, I _C = 10 mA	
Y-Parameter					
Y _{11e} = (0,62 + j 1,5)mS				U _{CE} = 9 V, I _C = 1 mA, f = 10,7 MHz	
Y _{12e} = -(12 + j 205)μS					
Y _{21e} = (27,5 - j 7)mS					
Y _{22e} = (0,07 + j 0,53)mS					

Schaltung für die Schaltzeitmessung:



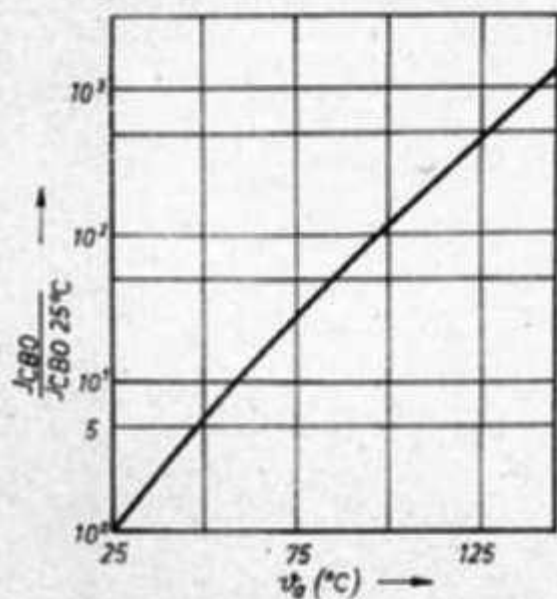
$$U_{CEsat} = f(I_C)$$

$$\frac{I_C}{I_B} = 10$$

 v_b Parameter


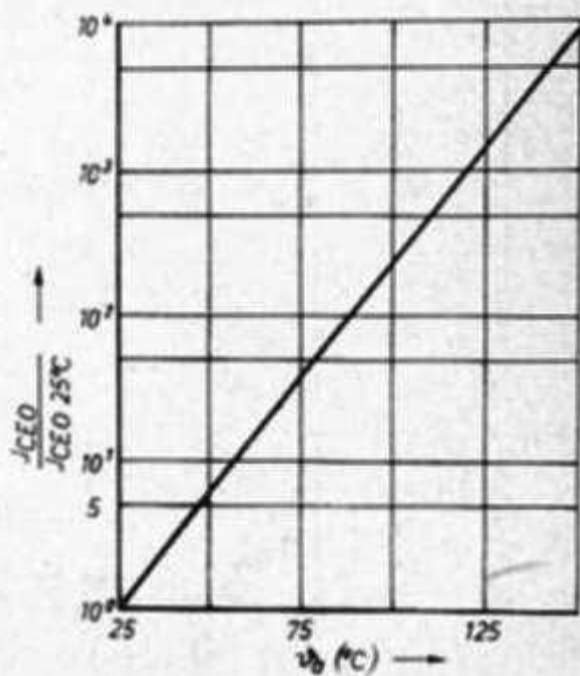
$$I_{CB0} = f(v_b)$$

$$U_{CB} = 12V$$



$$I_{CE0} = f(v_b)$$

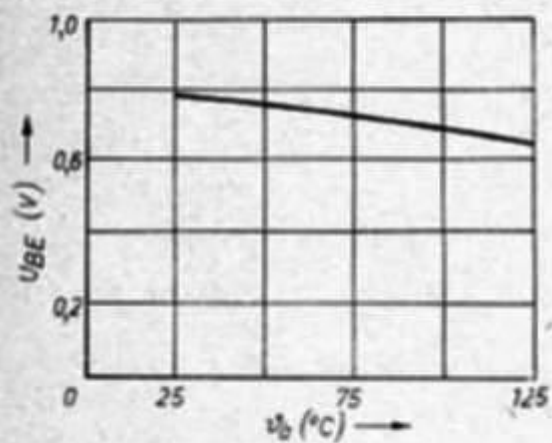
$$U_{CE} = 12V$$



$$U_{BE} = f(v_B)$$

$$J_C = 10 \text{ mA}$$

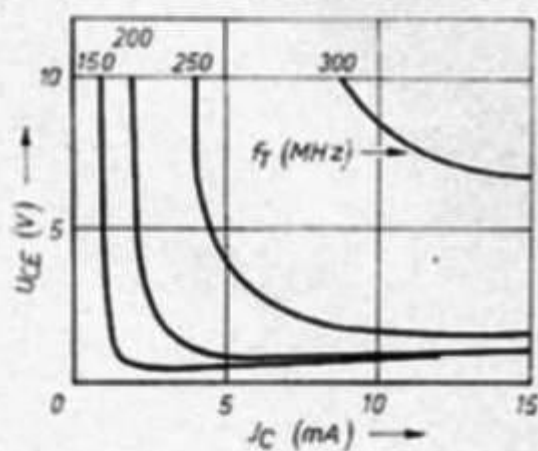
$$J_B = 1 \text{ mA}$$



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

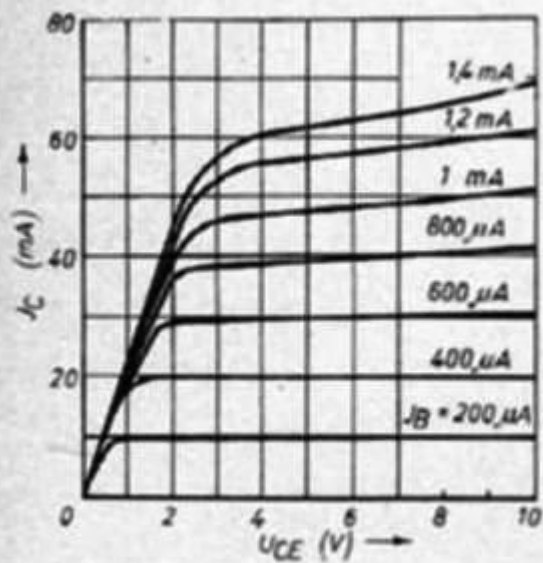
$$f_T = \text{Parameter}$$

$$f = 100 \text{ MHz}$$



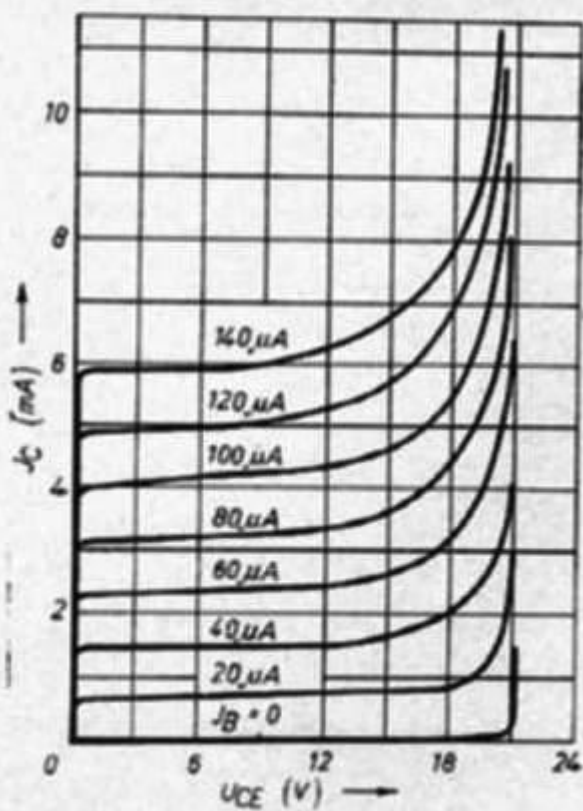
$$J_C = f(U_{CE})$$

$$J_B = \text{Parameter}$$



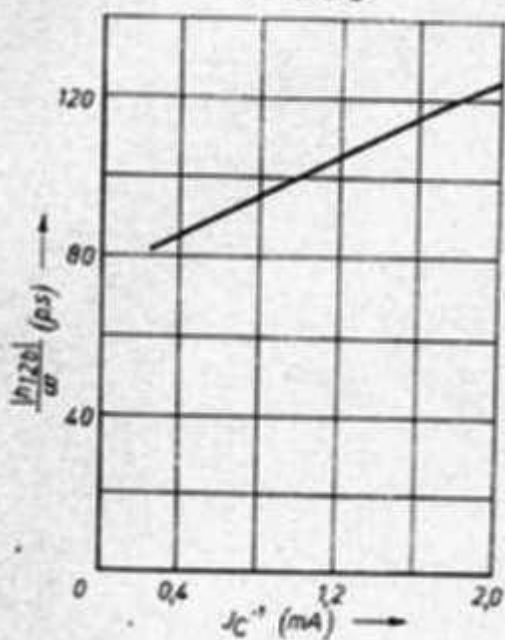
$$J_C = f(U_{CE})$$

$$J_B = \text{Parameter}$$



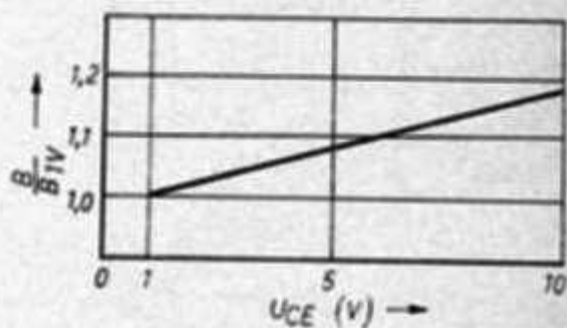
$$\frac{|h_{21e}|}{\omega} = f(I_C^{-1})$$

$U_{CB} = 6V$
 $f = 30MHz$



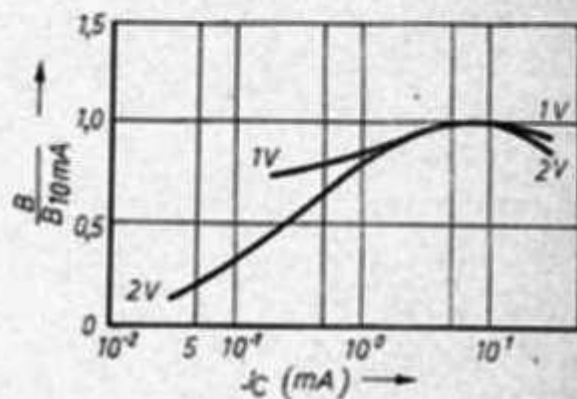
$$B = f(U_{CE})$$

$I_C = 10mA$
 $T_D = 25^\circ C$



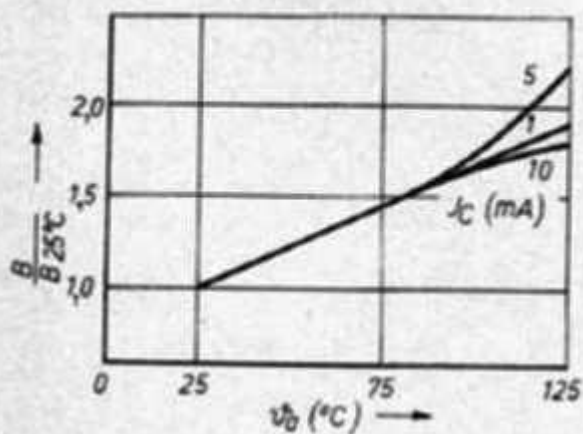
$$B = f(I_C)$$

$T_D = 25^\circ C$
 $U_{CE} = \text{Parameter}$



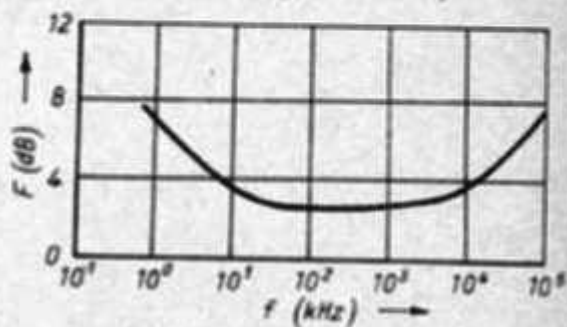
$$B = f(T_D)$$

$U_{CE} = 1V$
 $I_C = \text{Parameter}$



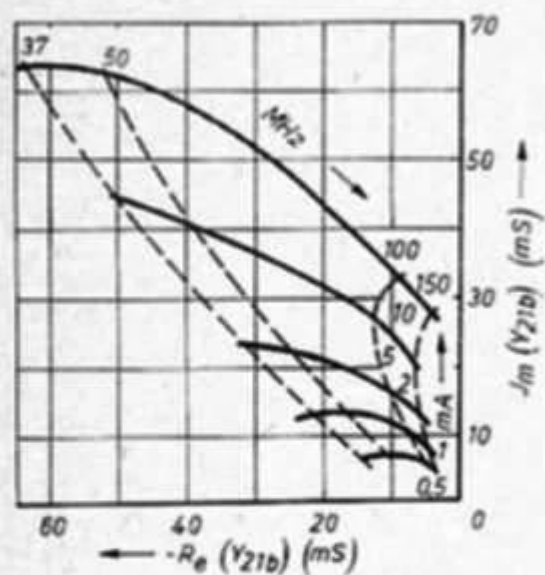
$$F = g(f)$$

$U_{CE} = 6V$
 $R_g = R_{gopt} (70-600\Omega)$
 $I_C = I_{Copt} (0.2-2mA)$



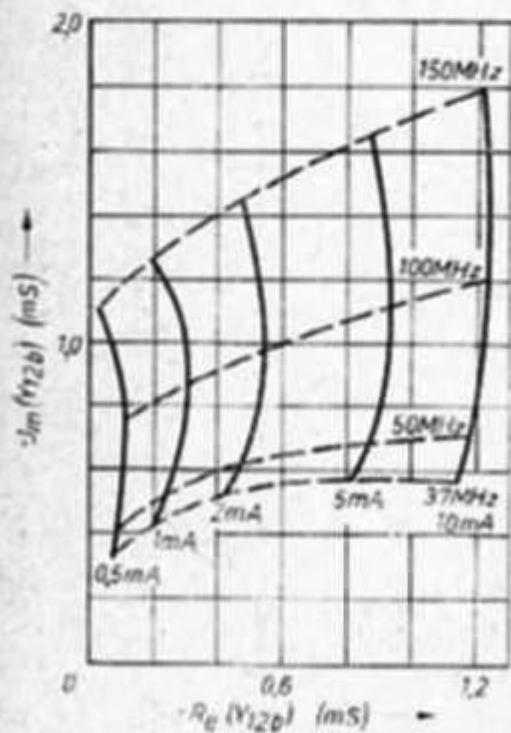
$$Y_{21b} = g(j\omega, f)$$

$$U_{CB} = 6V$$



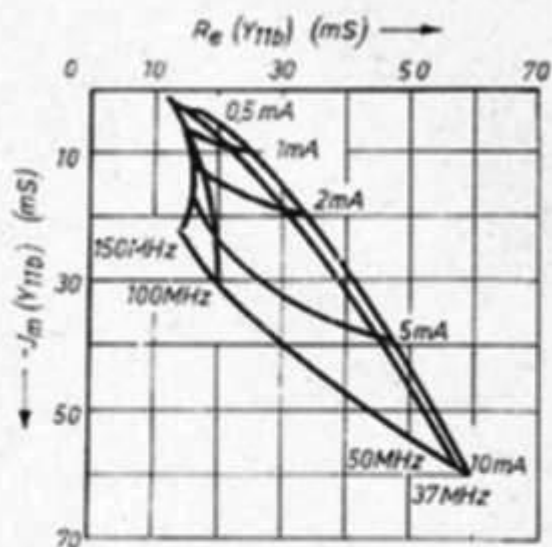
$$Y_{12b} = g(j\omega, f)$$

$$U_{CB} = 6V$$



$$Y_{11b} = g(j\omega, f)$$

$$U_{CB} = 6V$$

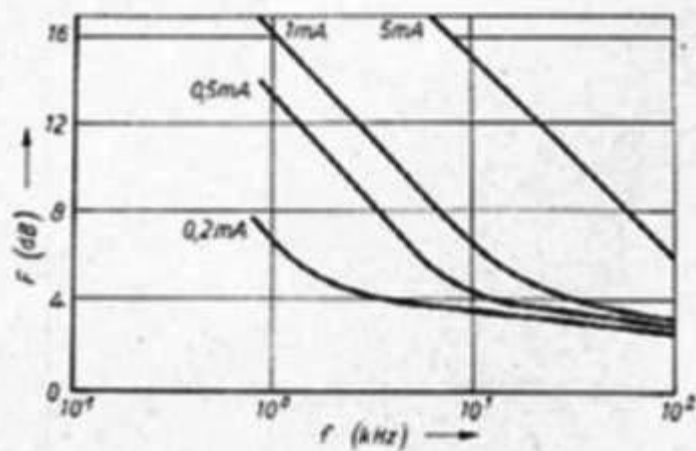


$$F = g(f)$$

$$U_{CE} = 6V$$

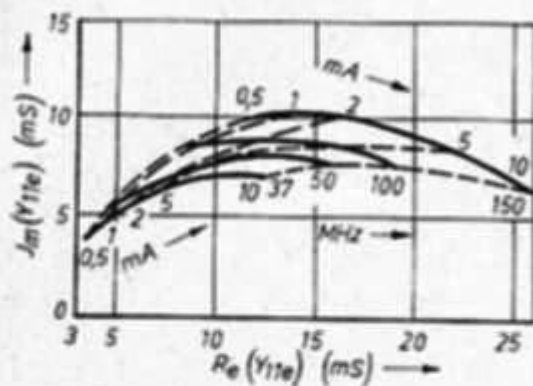
$$R_g = 500\Omega$$

$$j_c \text{ Parameter}$$



$$Y_{11e} = g(JC, f)$$

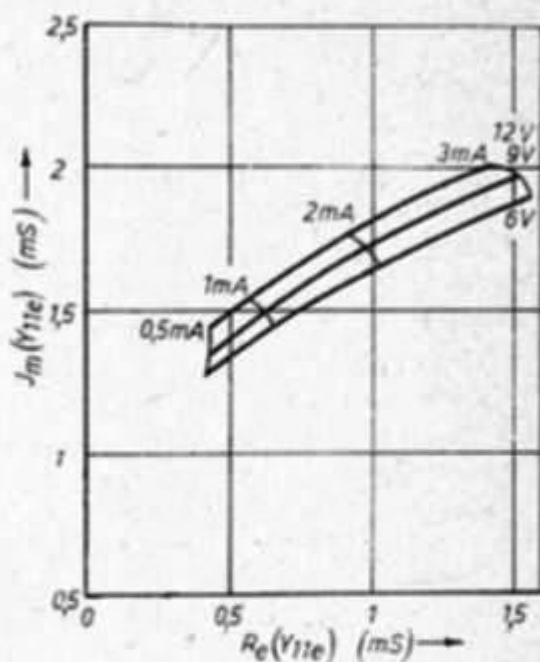
$$U_{CE} = 6V$$



$$Y_{11e} = f(JC)$$

$$U_{CE} = \text{Parameter}$$

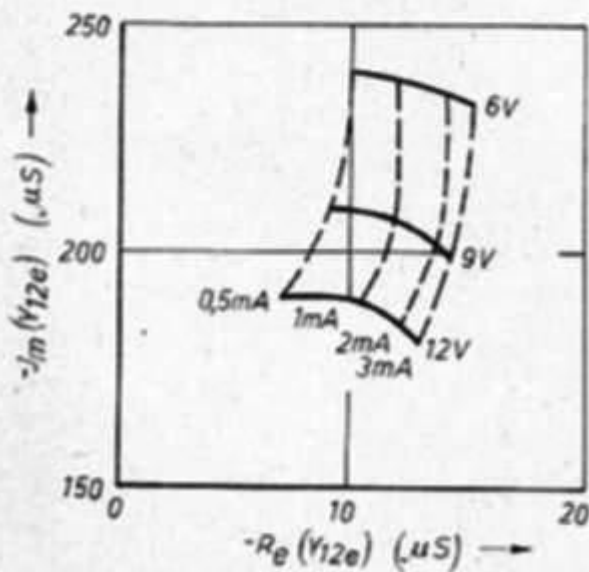
$$f = 10,7 \text{ MHz}$$



$$Y_{12e} = f(JC)$$

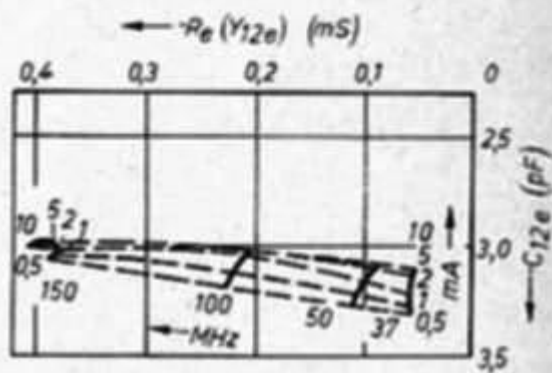
$$U_{CE} = \text{Parameter}$$

$$f = 10,7 \text{ MHz}$$



$$Y_{12e} = g(JC, f)$$

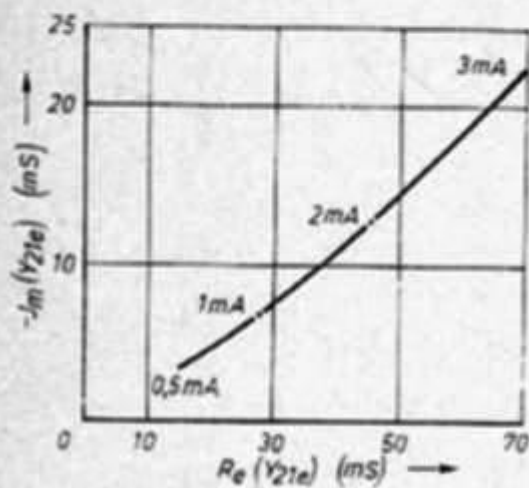
$$U_{CE} = 6V$$



$$Y_{21e} = f(J_C)$$

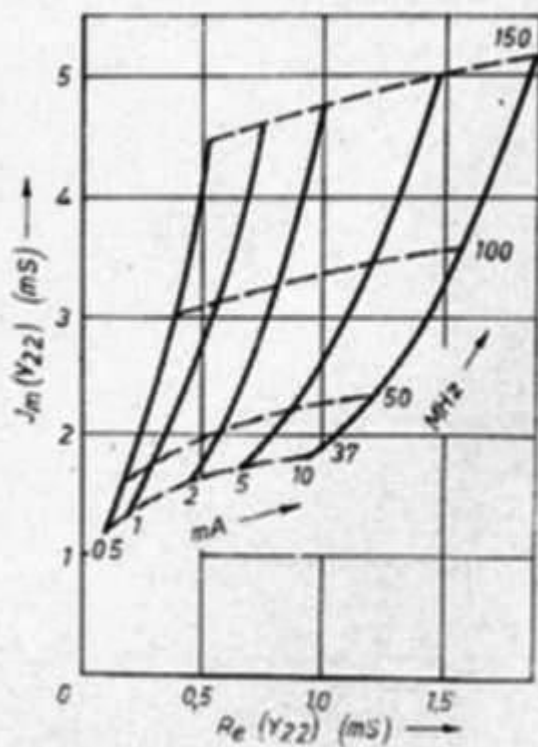
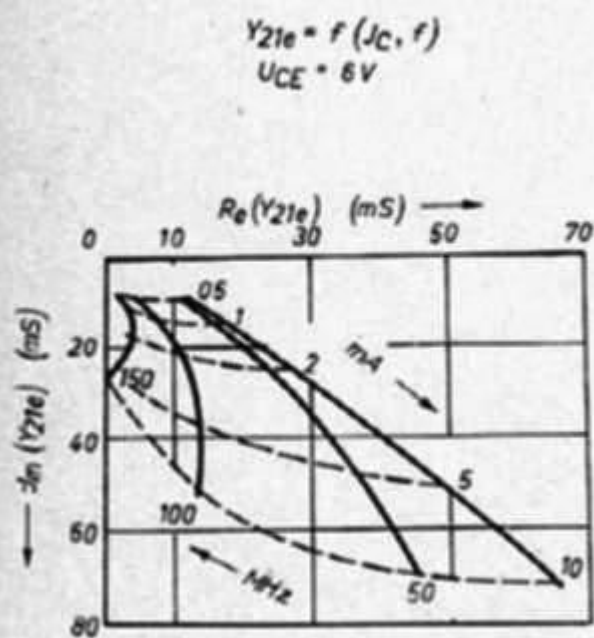
$$U_{CE} = 6-12V$$

$$f = 10,7 MHz$$



$$Y_{22e} = f(J_C, f)$$

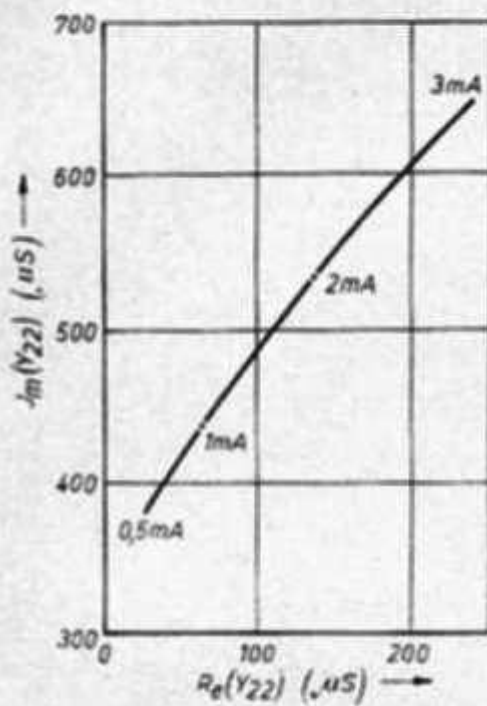
$$U_{CE} = 6V$$



$$Y_{22e} = f(I_C)$$

$$U_{CE} = 6 \dots 12V$$

$$f = 10,7MHz$$



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

$$I_E = 0$$

$$f = 2MHz$$

