

Verwendung: Silizium-npn-Planar-Epitaxie-Transistor für HF-Verstärker und allgemeine Anwendung bei Umgebungstemperaturen ϑ_a von -40°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 $\vartheta_{j\text{max}}$

$U_{\text{CBO}} = 40$ V $P_{\text{tot}} = 1$ W

$U_{\text{CEO}} = 20$ V bei $\vartheta_{\text{C}} = 25^\circ\text{C}$

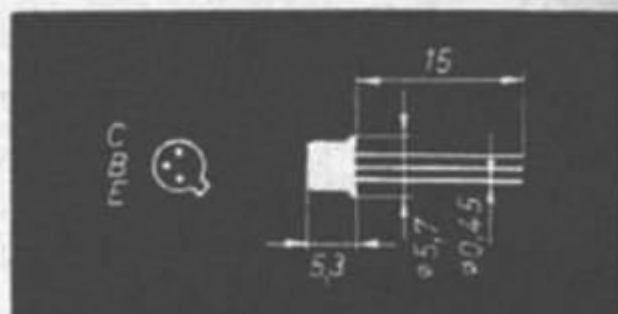
$U_{\text{EB0}} = 5$ V $\vartheta_{\text{j}} = 175^\circ\text{C}$

$I_{\text{C}} = 200$ mA $\vartheta_{\text{a}} = 125^\circ\text{C}$

$I_{\text{B}} = 20$ mA

$P_{\text{tot}} = 300$ mW

bei $\vartheta_{\text{a}} = 25^\circ\text{C}$



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

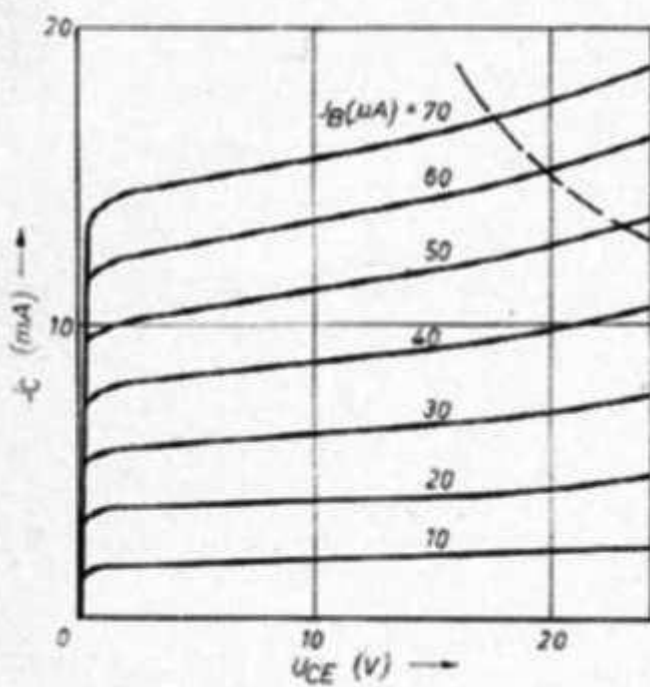
$R_{\text{thl}} \leq 150 \frac{\text{grad}}{\text{W}}$

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

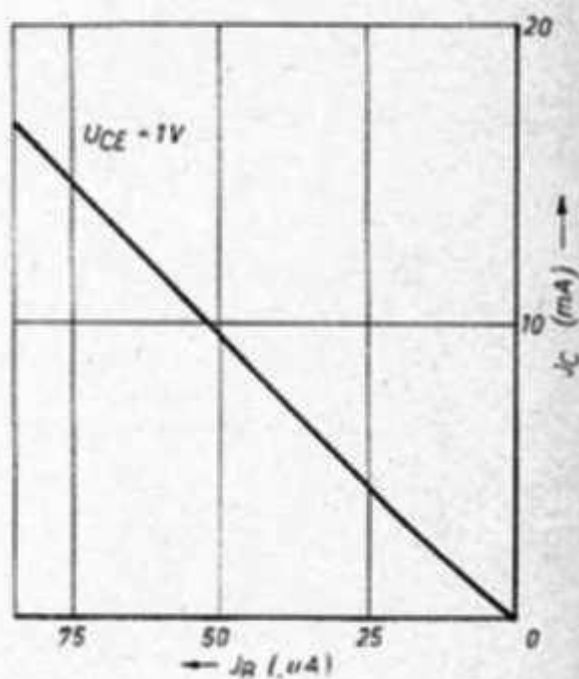
	Min.	Typ	Max.	Meßbedingungen	Stromverstärkungsgruppen
Restströme					
I_{CBO}		0,15 nA	100 nA	$U_{\text{CB}} = 40$ V	
I_{CEO}		3,5 nA	100 nA	$U_{\text{EB}} = 5$ V	
Durchbruchspannung					
$U_{(\text{BR})\text{CEO}}$	20 V	38 V		$I_{\text{C}} = 10$ mA	
Sättigungsspannung					
U_{CEsat}			0,3 V	$I_{\text{C}} = 10$ mA, $I_{\text{B}} = 1$ mA	
U_{BEsat}		0,75		$I_{\text{C}} = 10$ mA, $I_{\text{B}} = 1$ mA	
Gleichstromverstärkung					
B	18		35	$U_{\text{CE}} = 1$ V, $I_{\text{C}} = 10$ 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}	300 MHz			$U_{\text{CE}} = 10$ V, $I_{\text{C}} = 10$ mA, $f = 100$ MHz	

	Min.	Typ	Max.	Meßbedingungen	Strom- verstärkungs- gruppen
Ausgangskapazität					
C_{22b}		2,5 pF	5 pF	$U_{CB} = 10 \text{ V}$, $I_E = 0$, $f = 2 \text{ MHz}$	
Rückwirkungszeitkonstante					
$\frac{h_{12b}}{\omega}$		75 ps	130 ps	$U_{CB} = 10 \text{ V}$, $I_C = 10 \text{ mA}$, $f = 30 \text{ MHz}$	
Rauschfaktor					
F		6,85 dB		$U_{CE} = 6 \text{ V}$, $I_C = 0,2 \text{ mA}$, $f = 1 \text{ kHz}$, $R_G = 500 \Omega$	
F		7,5 dB		$U_{CE} = 10 \text{ V}$, $I_C = 10 \text{ mA}$, $f = 185 \text{ MHz}$, $R_G = 60 \Omega$	
Schwingfrequenz					
f_{max}			650 MHz	$U_{CE} = 10 \text{ V}$, $I_C = 10 \text{ mA}$	
Leistungsverstärkung					
V_{p0opt}		25 dB		$U_{CE} = 10 \text{ V}$, $I_C = 5 \text{ mA}$, $f = 50 \text{ MHz}$	
Vierpolparameter					
h_{11e}		3,2 k Ω		$U_{CE} = 6 \text{ V}$, $I_C = 2 \text{ mA}$, $f = 1 \text{ kHz}$	
h_{12e}		$2,5 \cdot 10^{-4}$			
h_{21e}		310			
h_{22e}		31 μS			
Y-Parameter					
$Y_{11e} = (2,2 + j 3,5) \text{ mS}$ $Y_{12e} = (0,017 + j 0,58) \text{ mS}$ $Y_{21e} = (35 - j 39) \text{ mS}$ $Y_{22e} = (1,15 + j 1,3) \text{ mS}$				bei $U_{CE} = 10 \text{ V}$, $I_C = 5 \text{ mA}$, $f = 50 \text{ MHz}$	

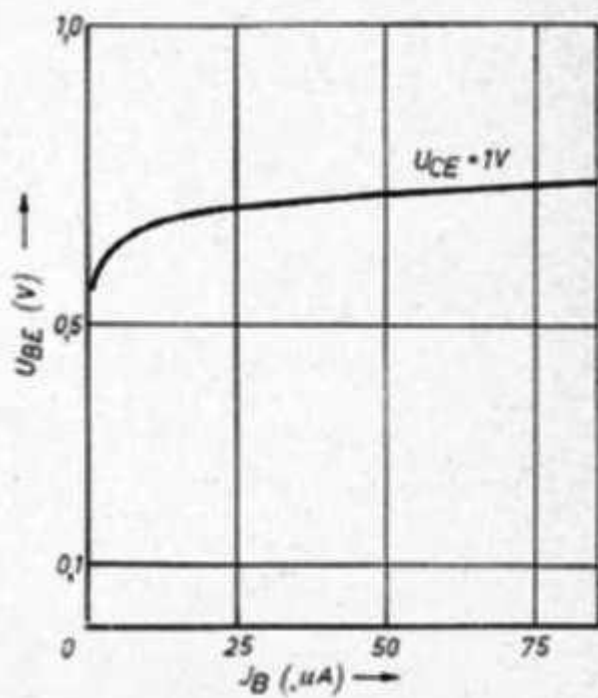
$J_C = f(U_{CE})$
 J_B Parameter



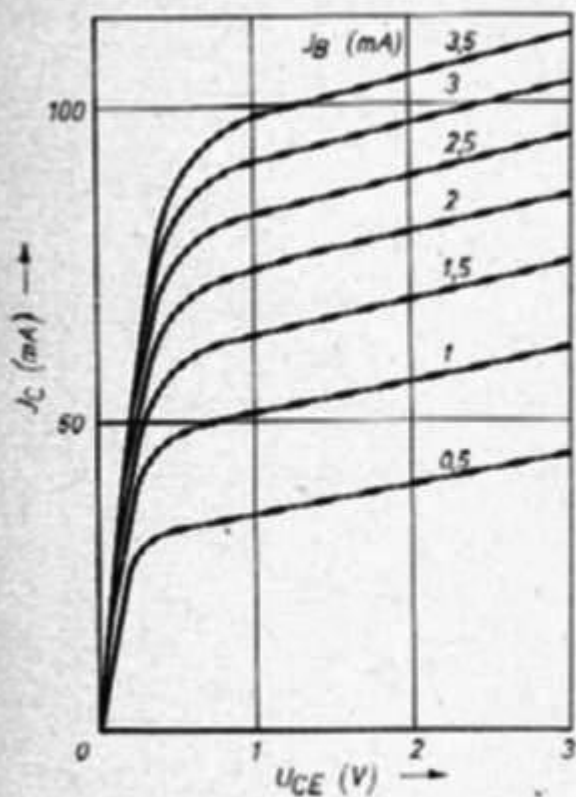
$J_C = f(J_B)$
 U_{CE} Parameter



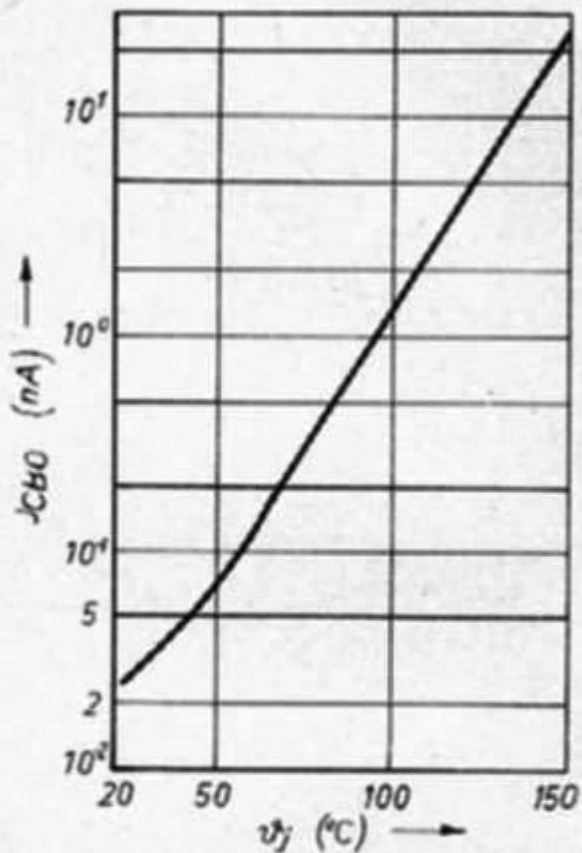
$U_{BE} = f(J_B)$
 $U_{CE} = \text{Parameter}$



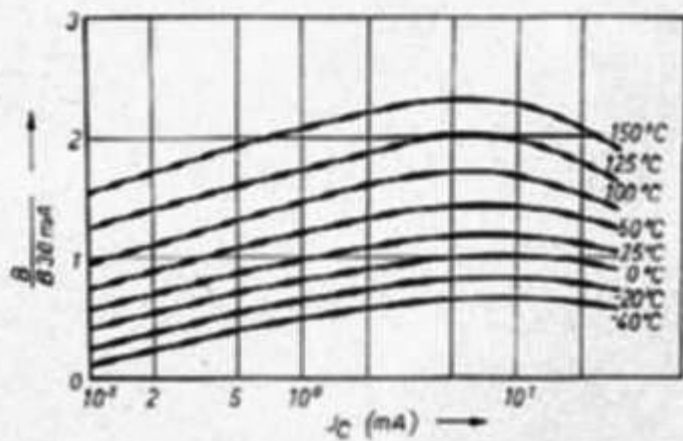
$J_C = f(U_{CE})$
 J_B Parameter



$J_{CBO} = f(\vartheta_j)$
 $U_{CB} = 40V$



$\beta_N = f(J_C, \vartheta_C)$
 $U_{CE} = 1V$

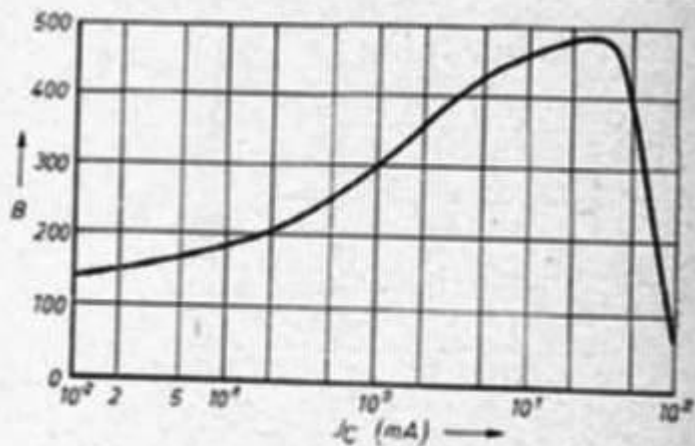


$$B = f(I_C)$$

$$U_{CE} = 6V$$

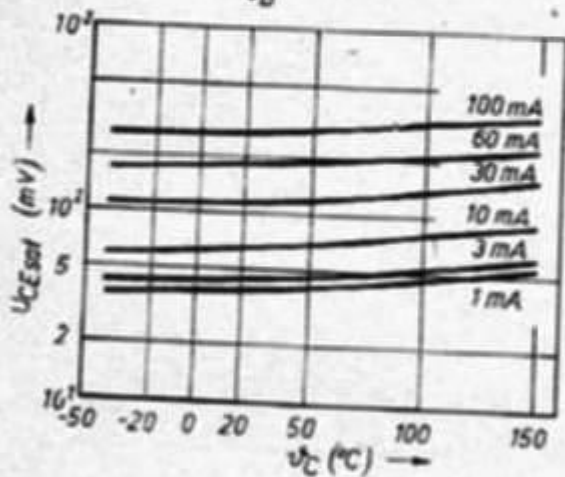
$$\text{für } I_C = 50 \text{ mA}$$

$$U_{CE} = 3V$$



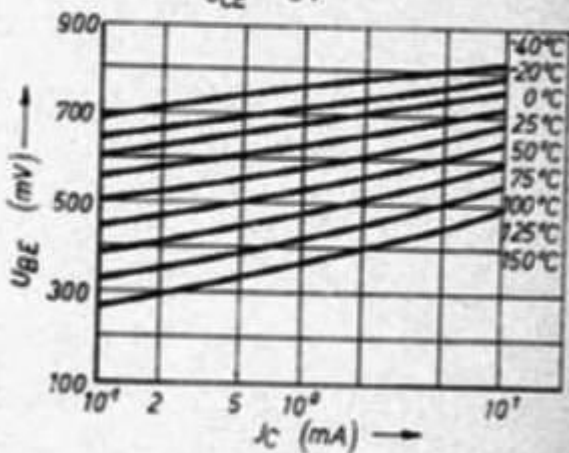
$$U_{CEsat} = f(I_C, \psi_C)$$

$$\frac{I_C}{\beta B} = 10$$



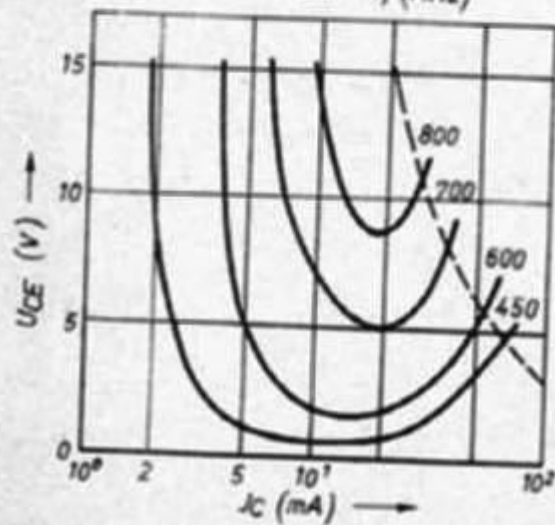
$$U_{BE} = f(\psi_C, I_C)$$

$$U_{CE} = 5V$$



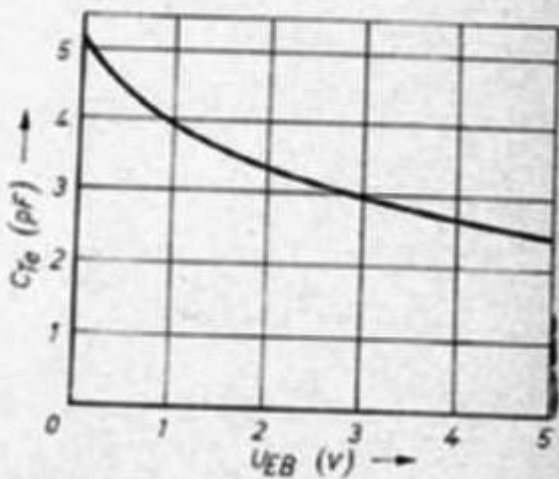
$$f_T = g(U_{CE}, I_C)$$

$$\text{Parameter } f_T \text{ (MHz)}$$

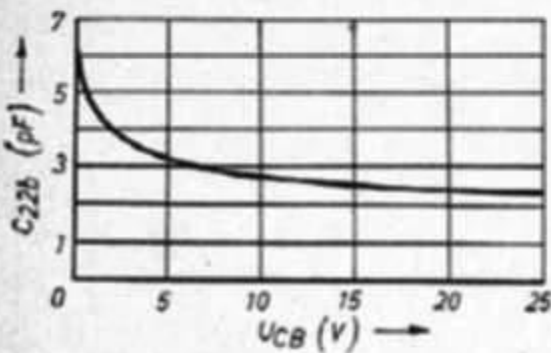


$$C_{Te} = \varphi(U_{EB})$$

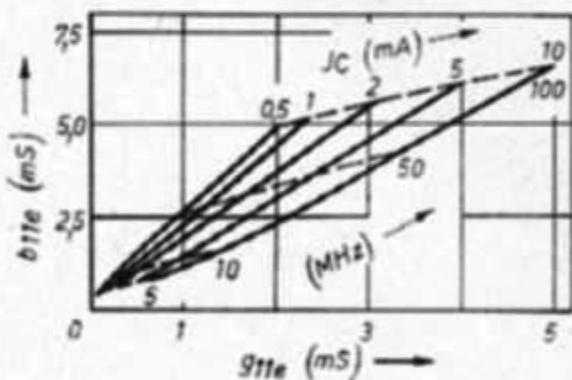
$$I_C = 0$$



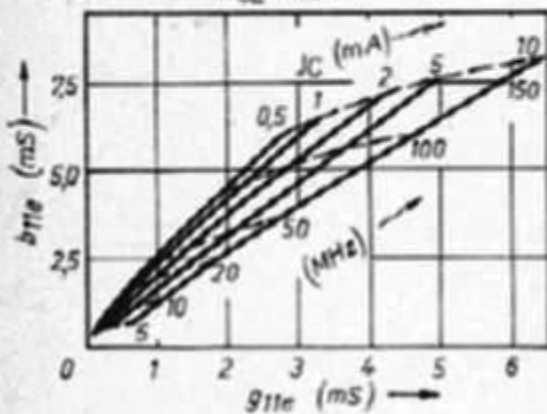
$C_{22b} = \varphi(U_{CB})$
 $I_E = 0$
 $f = 30 \text{ MHz}$



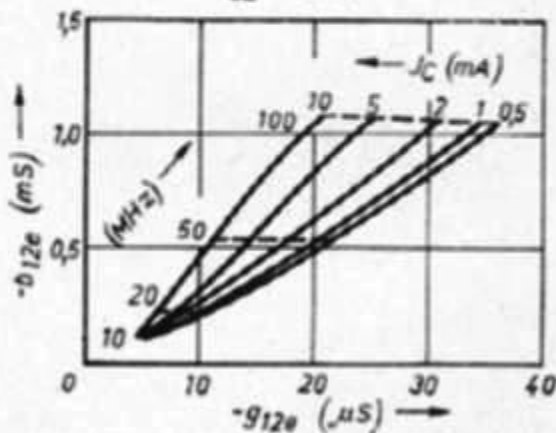
$Y_{11e} = \varphi(I_C, f)$
 $U_{CE} = 5 \text{ V}$



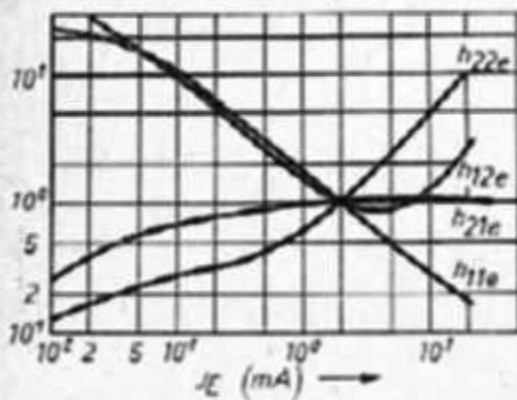
$Y_{11e} = \varphi(I_C, f)$
 $U_{CE} = 10 \text{ V}$



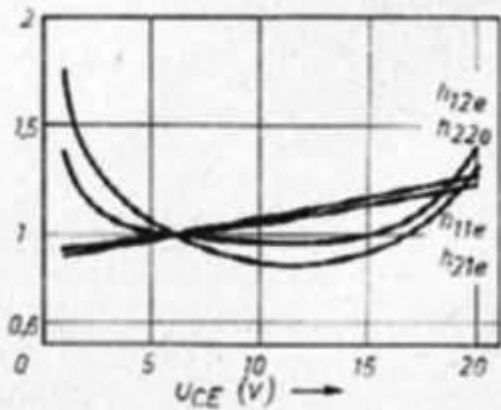
$Y_{12e} = \varphi(I_C, f)$
 $U_{CE} = 10 \text{ V}$



h-Parameter normiert
 $U_{CE} = 6 \text{ V}$
 $f = 1 \text{ kHz}$
 Bezugswert bei $I_E = 2 \text{ mA}$

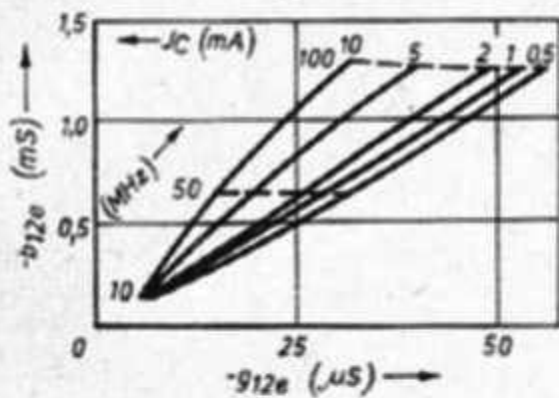


h-Parameter normiert
 $I_E = 2 \text{ mA}$
 $f = 1 \text{ kHz}$
 Bezugswert bei $U_{CE} = 6 \text{ V}$



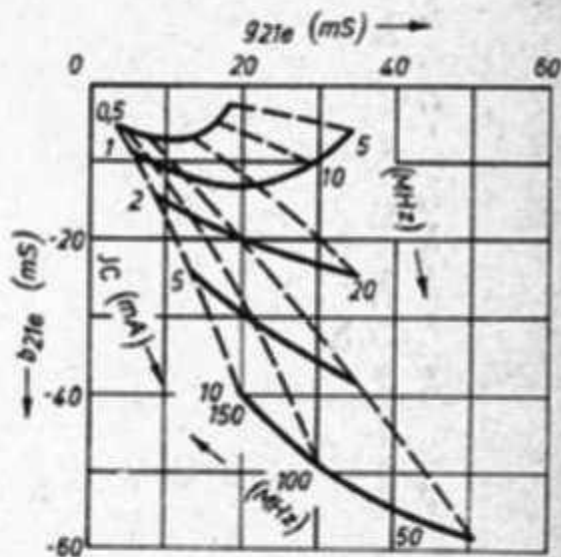
$$Y_{12e} = y(J_C, f)$$

$$U_{CE} = 5V$$



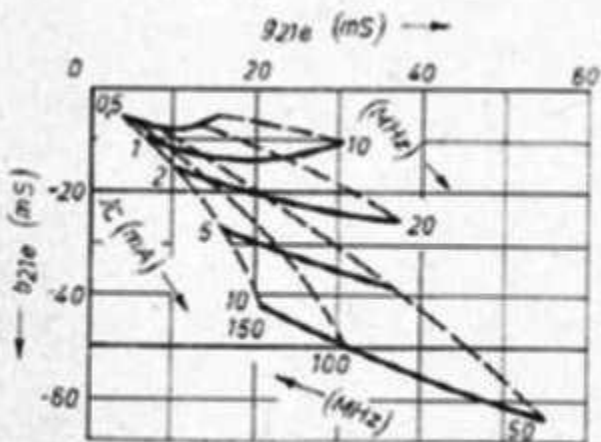
$$Y_{21e} = y(J_C, f)$$

$$U_{CE} = 10V$$



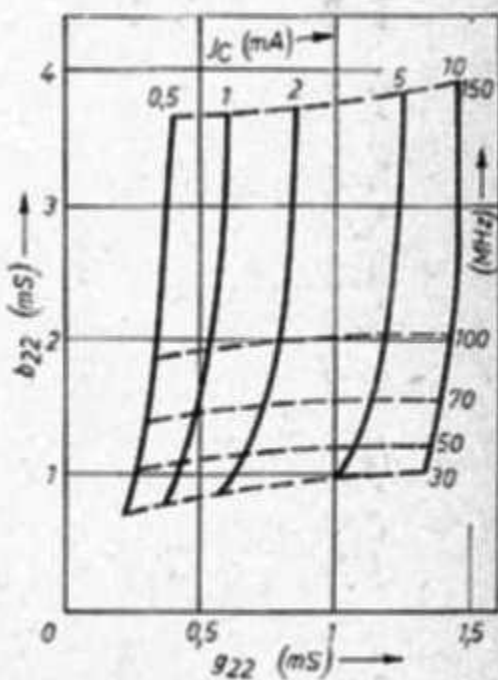
$$Y_{21e} = y(J_C, f)$$

$$U_{CE} = 5V$$



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

$$U_{CE} = 10V$$



$$Y_{22} = y(j\omega, f)$$

$$U_{CE} = 5V$$

