

Silizium-PNP-Epitaxial-Planar-NF-Transistoren
Silicon PNP Epitaxial Planar AF Transistors

Anwendungen: NF-Vor- und Treiberstufen
in Dick- und Dünnschichtschaltungen

Application: AF pre and driver stages
in thick and thin film circuits

Vergleichbarer Typ:

Comparable type:

BCW 69/(70), BCW 29/30, BCW 61, BCF 29/30, BCX 71

BCW 69/(70), BCW 29/30, BCW 61, BCF 29/30, BCX 71

Besondere Merkmale:

Features:

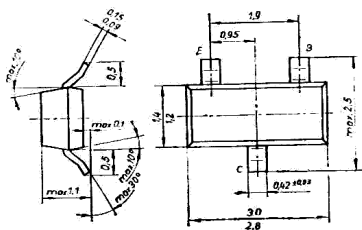
- SCE 309 für rauscharme Vorstufen
- In Gruppen sortiert

- SCE 309 for low noise pre stages
- In groups selected

Abmessungen in mm

Dimensions in mm

Gehäuse Bauform Y,
ähnlich SOT 23
TGL 11 811
Plastgehäuse
Masse ca. 0,02 g



Case construction Y,
similar SOT 23
TGL 11 811
Plastic case
Weight about 0.02 g

Absolute Grenzdaten

Absolute maximum ratings

Kollektor-Basis-Spannung
Collector-base voltage
Kollektor-Emitter-Spannung
Collector-emitter voltage
Emitter-Basis-Spannung
Emitter-base voltage
Kollektorstrom
Collector current
Kollektorspitzenstrom
Collector peak current
Basisstrom
Base current
Gesamtverlustleistung
Total power dissipation
 $t_{amb} \leq 45^\circ\text{C}$, $R_{thJA} \leq 0,7 \text{ K/mW}$

	SCE 307	SCE 308	SCE 309	
$-U_{CBO}$	50	30	30	V
$-U_{CEO}$	45	25	25	V
$-U_{EBO}$	6	5	5	V
$-I_C$		100		mA
$-I_{CM}$		200		mA
$-I_B$		50		mA
P_{tot}		150		mW

Sperrschichttemperatur

Junction temperature t_j 150 °C

Umgebungstemperaturbereich

Ambient temperature range t_{amb} -55 ... +125 °C

Lagerungstemperaturbereich

Storage temperature range t_{stg} -55 ... +150 °C

Wärmewiderstände

Thermal resistances

Sperrschicht-Umgebung

Junction-ambient

auf Glassubstrat 7×7×1 mm

on glass substrat

auf Keramik 30×12×1 mm

on ceramic

	Min.	Typ.	Max.	
R_{thJA}		0,7		K/mW
R_{thJA}		0,45		K/mW

Statische Kenngrößen

DC characteristics $t_{amb} = 25^\circ\text{C} \pm 5 \text{ K}$

Kollektor-Basis-Reststrom

Collector cut-off current

$-U_{CB} = 50 \text{ V}$ SCE 307 $-I_{CBO}$ 2 100 nA

$-U_{CB} = 30 \text{ V}$ SCE 308, SCE 309 $-I_{CBO}$ 2 100 nA

Emitter-Basis-Reststrom

Emitter cut-off current

$-U_{EB} = 5 \text{ V}$ $-I_{EBO}$ 1 nA

Kollektor-Emitter-Durchbruchspannung

Collector-emitter breakdown voltage

$-I_C = \text{mA}$ SCE 307 $-U_{(BR)CEO}^{(1)}$ 45 V

SCE 308, SCE 309 $-U_{(BR)CEO}$ 25 V

Emitter-Basis-Durchbruchspannung

Emitter-base breakdown voltage

$-I_E = 10 \mu\text{A}$ SCE 307 $-U_{(BR)EBO}$ 6 V

SCE 308, SCE 309 $-U_{(BR)EBO}$ 5 V

Kollektor-Emitter-Sättigungsspannung

Collector saturation voltage

$-I_C = 10 \text{ mA}$
 $-I_B = 0,5 \text{ mA}$ $-U_{CEsat}$ 85 mV

$-I_C = 100 \text{ mA}$
 $-I_B = 5 \text{ mA}$ $-U_{CEsat}^{(1)}$ 340 mV

	Min.	Typ.	Max.
Basis-Emitter-Sättigungsspannung			
Base saturation voltage			
— $I_C = 10 \text{ mA}$			
— $I_B = 0,5 \text{ mA}$	$-U_{BEsat}$	740	mV
— $I_C = 100 \text{ mA}$			
— $I_B = 5 \text{ mA}$	$-U_{BEsat}$	925	mV
Basis-Emitter-Spannung			
Base-emitter voltage			
— $U_{CE} = 6 \text{ V}$, — $I_C = 0,1 \text{ mA}$	$-U_{BE}$	580	mV
— $U_{CE} = 6 \text{ V}$, — $I_C = 2 \text{ mA}$	$-U_{BE}$	660	mV
— $U_{CE} = 6 \text{ V}$, — $I_C = 20 \text{ mA}$	$-U_{BE}$	690	mV
Gleichstromverstärkung			
DC forward current transfer ratio			
— $U_{CE} = 6 \text{ V}$, — $I_C = 10 \mu\text{A}$			
Gruppe/Group: C	h_{FE}	90	
D	h_{FE}	140	
E	h_{FE}	230	
— $U_{CE} = 6 \text{ V}$, — $I_C = 2 \text{ mA}$			
Gruppe/Group: C	h_{FE}	56	110
D	h_{FE}	112	190
E	h_{FE}	224	275
— $U_{CE} = 6 \text{ V}$, — $I_C = 20 \text{ mA}$			
Gruppe/Group: C	h_{FE}	120	
D	h_{FE}	210	
E	h_{FE}	290	
Dynamische Kenngrößen			
AC characteristics $t_{amb} = 25 \text{ }^\circ\text{C} - 5 \text{ K}$			
Transitfrequenz			
Gain bandwidth product			
— $U_{CE} 6 \text{ V}$, — $I_C = 0,5 \text{ mA}$, $f = 20 \text{ MHz}$			
Gruppe/Group: C	f_T	55	MHz
D	f_T	70	MHz
E	f_T	75	MHz
— $U_{CE} 6 \text{ V}$, — $I_C = 10 \text{ mA}$, $f = 20 \text{ MHz}$			
Gruppe/Group: C	f_T	145	MHz
D	f_T	254	MHz
E	f_T	295	MHz

	Min.	Typ.	Max.
Rauschfaktor			
Noise figure			
— $U_{CE} = 6 \text{ V}$, — $I_C = 0,2 \text{ mA}$, $f = 1 \text{ kHz}$, $\Delta f = 100 \text{ Hz}$, $R_G = 2 \text{ k}\Omega$			
SCE 307, SCE 308	F		8
— $U_{CE} = 6 \text{ V}$, — $I_C = 0,2 \text{ mA}$, $f = 0,03 \dots 15 \text{ kHz}$, $R_G = 2 \text{ k}\Omega$			
SCE 309	F	1,3	4
Kollektor-Rückwirkungszeitkonstante			
Feedback time constant			
— $U_{CB} = 10 \text{ V}$, — $I_C = 5 \text{ mA}$, $f = 30 \text{ MHz}$			
Gruppe/Group: C	$r_{bb} \cdot C_{b'c}$		ps
D	$r_{bb} \cdot C_{b'c}$	130	ps
E	$r_{bb} \cdot C_{b'c}$		ps
Kurzschluß-Eingangskapazität			
Short circuit input capacitance			
— $U_{EB} = 0,5 \text{ V}$, $f = 1 \text{ MHz}$	C_{ib}	9,8	pF
Kurzschluß-Ausgangskapazität			
Short circuit output capacitance			
— $U_{CB} = 6 \text{ V}$, $f = 1 \text{ MHz}$	C_{ob}	6,0	pF
— $U_{CB} = 10 \text{ V}$, $f = 1 \text{ MHz}$	C_{ob}		pF
h-Parameter in Emitterschaltung			
h-parameters inc ommon emitter configuration			
— $U_{CE} = 6 \text{ V}$, — $I_C = 2 \text{ mA}$, $f = 1 \text{ kHz}$			
Kurzschluß-Eingangswiderstand			
Short circuit input resistance			
Gruppe/Group: C	h_{ie}	1,2	k Ω
D	h_{ie}	2,2	k Ω
E	h_{ie}	3,6	k Ω
Leerlauf-Spannungsrückwirkung			
Open circuit reverse voltage transfer ratio			
Gruppe/Group: C	h_{re}	0,80	$\times 10^{-4}$
D	h_{re}	0,99	$\times 10^{-4}$
E	h_{re}	1,15	$\times 10^{-4}$

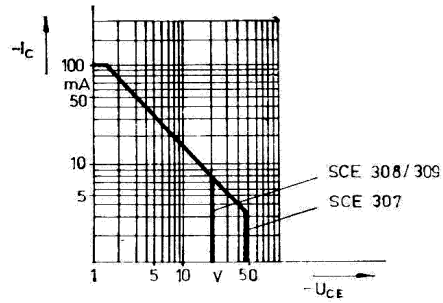
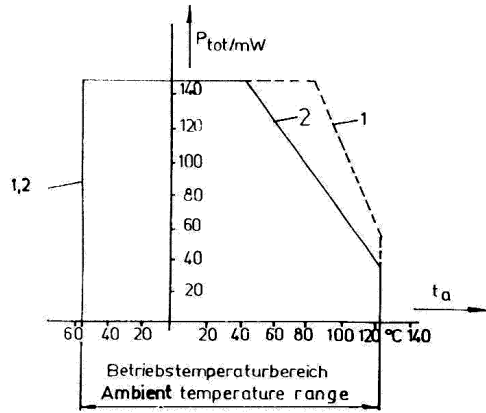
		Min.	Typ.	Max.
Kurzschluß-Stromverstärkung				
Short circuit forward current transfer ratio				
Gruppe/Group: C	h_{fe}		112	
D	h_{fe}		193	
E	h_{fe}		284	
Leerlauf-Ausgangsleitwert				
Open circuit output conductance				
Gruppe/Group: C	h_{oe}		19	μS
D	h_{oe}		31	μS
E	h_{oe}		47	μS
y-Parameter in Emitterschaltung (typ.)				
y-parameters in common emitter configuration (typ.)				
— $U_{CE} = 10 V$, — $I_C = 5 mA$, $f = 50 MHz$				
Kurzschluß-Eingangsadmittanz				
Short-circuit input admittance				
Gruppe/Group: C	Y_{ie}			mS
D	Y_{ie}		$4,19 + j 5,32$	mS
E	Y_{ie}			mS
Kurzschluß-Rückwärts-Steilheit				
Short-circuit reverse transfer admittance				
Gruppe/Group: C	Y_{re}			mS
D	Y_{re}		$-0,01 - j 1,32$	mS
E	Y_{re}			mS
Kurzschluß-Vorwärts-Steilheit				
Short-circuit forward transfer admittance				
Gruppe/Group: C	Y_{fe}			mS
D	Y_{fe}		$2,47 - j 1,32$	mS
E	Y_{fe}			mS
Kurzschluß-Ausgangsadmittanz				
Short-circuit output admittance				
Gruppe/Group: C	Y_{oe}			mS
D	Y_{oe}		$0,56 + j 1,95$	mS
E	Y_{oe}			mS

$U_{CE} = 10 V$, $I_C = 5 mA$, $f = 100 MHz$

Kurzschluß-Eingangsadmittanz				
Short-circuit input admittance				
Gruppe/Group: C	Y_{ie}			mS
D	Y_{ie}		$5,5 + j 7,7$	mS
E	Y_{ie}			mS
Kurzschluß-Rückwärts-Steilheit				
Short-circuit reverse transfer admittance				
Gruppe/Group: C	Y_{re}			mS
D	Y_{re}		$0,29 + j 2,29$	mS
E	Y_{re}			mS
Kurzschluß-Vorwärts-Steilheit				
Short-circuit forward transfer admittance				
Gruppe/Group: C	Y_{fe}			mS
D	Y_{fe}		$3,36 - j 10,3$	mS
E	Y_{fe}			mS
Kurzschluß-Ausgangsadmittanz				
Short-circuit output admittance				
Gruppe/Group: C	Y_{oe}			mS
D	Y_{oe}		$0,74 + j 3,01$	mS
E	Y_{oe}			mS

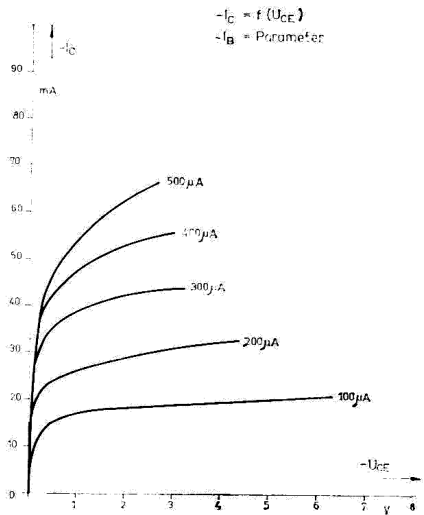
1) Messung erfolgt impulsmäßig, $t_p/T = 0,01$, $t_p = 0,3 ms$
Pulse measurement

Die typischen Werte ohne Kennzeichnung der Stromverstärkungsgruppe gelten für Bauelemente der Stromverstärkungsgruppe D.
The typical values without marking of current gain are true for devices of current gain group D.

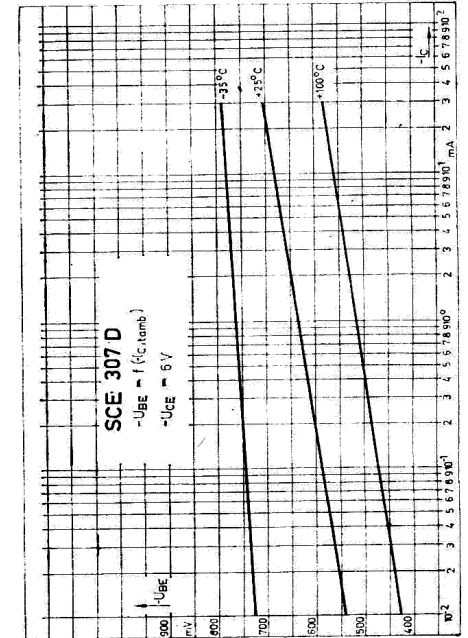
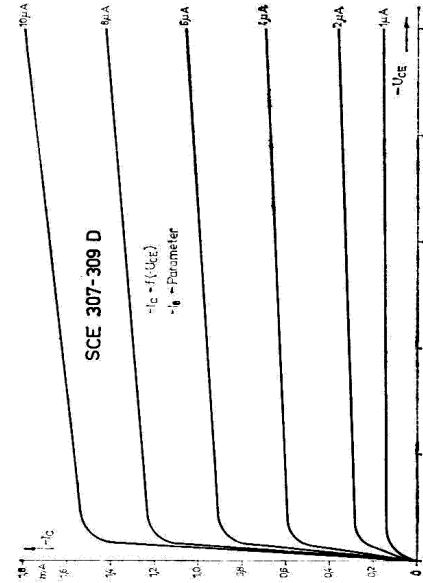
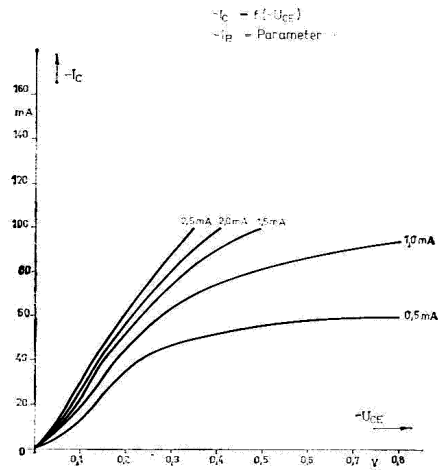


- 1 $R_{thJA} = 0,45 \text{ K/mW}$
auf Keramik/on ceramic $30 \times 12 \times 1 \text{ mm}$
- 2 $R_{thJA} = 0,7 \text{ K/mW}$
auf Glassubstrat/on glass substrat $7 \times 7 \times 1 \text{ mm}$

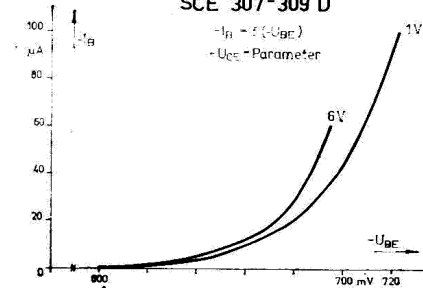
SCE 307-309 D



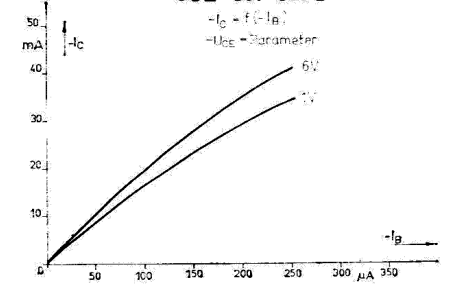
SCE 307-309 D

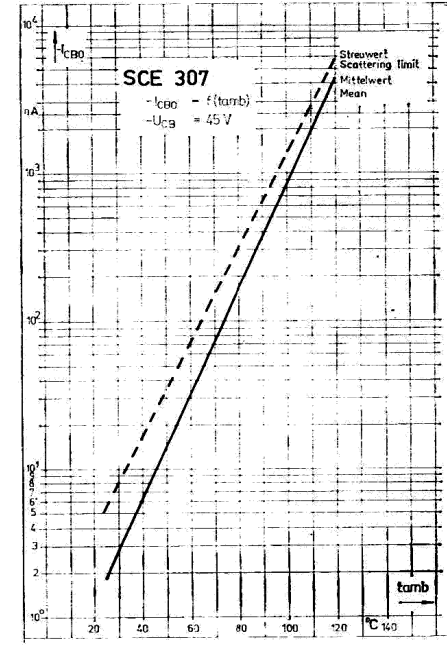
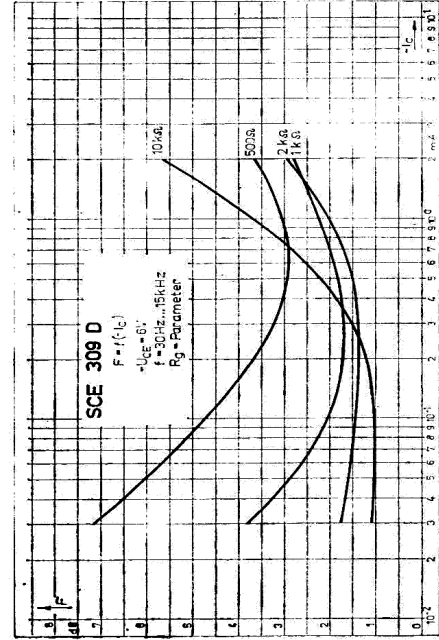
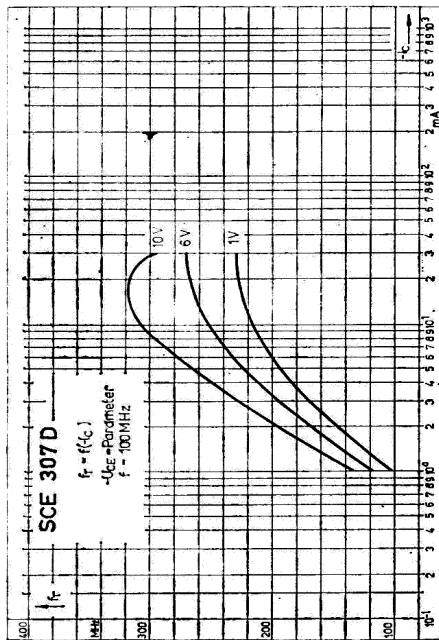
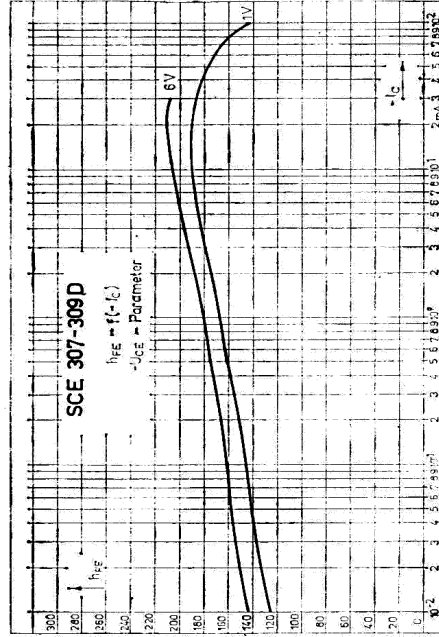
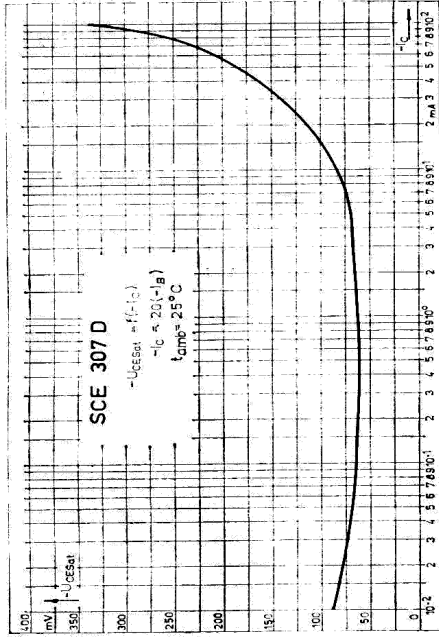


SCE 307-309 D



SCE 307-309 D





Stempelcode: / Code on case:

SCE 307 C	NC	SCE 308 E	OE
SCE 307 D	ND	SCE 309 C	PC
SCE 307 E	NE	SCE 309 D	PD
SCE 308 C	OC	SCE 309 E	PE
SCE 308 D	OD		