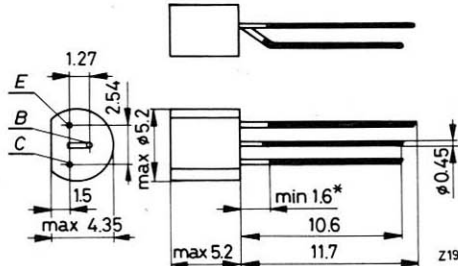


NPN Silicon Planar Epitaxial Transistors

intended for use in AF pre-amplifier, and driver stages as well as in DC voltage amplifiers. The BC 184 is primarily used for low-noise pre-amplifiers. BC 182, BC 183 and BC 184 are complementary pairs with BC 212, BC 213 and BC 214 together, respectively.

Dimensions in mm



* not tinned

Case: TO-92Z

Mass: approx. 0.25 g

Absolute maximum ratings

		BC 182	BC 183	BC 184	
Collector-emitter voltage	V_{CEO}	50	30	30	V
Collector-base voltage	V_{CBO}	60	45	45	V
Emitter-base voltage	V_{EBO}		6		V
Collector current	I_C		200		mA
Junction temperature	T_j		150		°C
Storage temperature	T_s		-65 ... +150		°C
Total power dissipation $T_{amb} = 25^\circ\text{C}$	P_{tot}		300		mW

Thermal resistance

junction to ambient	R_{thja}		= 420		K/W
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Static characteristics¹

$T_{amb} = 25^\circ\text{C}$

Collector-base
cut-off current

$V_{CB} = 50\text{ V}$	I_{CBO}	≤15	-	-	nA
$V_{CB} = 30\text{ V}$	I_{CBO}	-	≤15	≤15	nA

Emitter-base
cut-off current

$V_{EB} = 4\text{ V}$	I_{EBO}	≤15	≤15	≤15	nA
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Collector-base
breakdown voltage

$I_C = 10\ \mu\text{A}$	$V_{(BR)CBO}$	≥60	≥45	≥45	V
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Collector-emitter
breakdown voltage

$I_C = 2\text{ mA}$	$V_{(BR)CEO}$	≥50	≥30	≥30	V
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Emitter-base
breakdown voltage

$I_E = 10\ \mu\text{A}$	$V_{(BR)EBO}$	≥6	≥6	≥6	V
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¹ measured under pulsed conditions

BC 182, BC 183, BC 184

	BC 182	BC 183	BC 184	
DC forward current transfer ratio ¹				
$V_{CE} = 5\text{ V}, I_C = 0.01\text{ mA}$	h_{21E} 90	90	—	in group A
	h_{21E} 150	150	150	in group B
	h_{21E} —	270	270	in group C
$V_{CE} = 5\text{ V}, I_C = 2\text{ mA}$	h_{21E} 170	170	—	in group A
	(120 ... 220)	(120 ... 220)		
	h_{21E} 290	290	290	in group B
	(180 ... 460)	(180 ... 460)	(180 ... 460)	
	h_{21E} —	500	500	in group C
		(380 ... 800)	(380 ... 800)	
$V_{CE} = 5\text{ V}, I_C = 100\text{ mA}$	h_{21E} 120	120	—	in group A
	h_{21E} 200	200	—	in group B
	h_{21E} —	400	—	in group C
Collector-emitter saturation voltage				
$I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$	V_{CEsat}	≤ 0.25		V
$I_C = 100\text{ mA}, I_B = 5\text{ mA}$	V_{CEsat}	≤ 0.6		V
Base-emitter saturation voltage				
$I_C = 100\text{ mA}, I_B = 5\text{ mA}$	V_{BEsat}	≤ 1.2		V
Base-emitter voltage				
$V_{CE} = 5\text{ V}, I_C = 10\text{ }\mu\text{A}$	V_{BE}	0.52		V
$V_{CE} = 5\text{ V}, I_C = 2\text{ mA}$	V_{BE}	0.55 ... 0.7		V
Dynamic characteristics				
$T_{amb} = 25^\circ\text{C}$				
Transition frequency				
$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}, f = 100\text{ MHz}$	f_T	≥ 150		MHz
Collector-base capacitance				
$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$	C_{CBO}	3 (≤ 5)		pF
Emitter-base capacitance				
$V_{EB} = 0.5\text{ V}, f = 1\text{ MHz}$	C_{EBO}	8		pF
Noise figure				
$V_{CE} = 5\text{ V}, I_C = 200\text{ }\mu\text{A}, R_G = 2\text{ k}\Omega, f = 1\text{ kHz}, B = 1\text{ Hz}$	F	2 (≤ 10)	2 (≤ 10)	—
$V_{CE} = 5\text{ V}, I_C = 200\text{ }\mu\text{A}, R_G = 2\text{ k}\Omega, f = 10\text{ Hz} \dots 10\text{ kHz}$	F	—	—	≤ 4

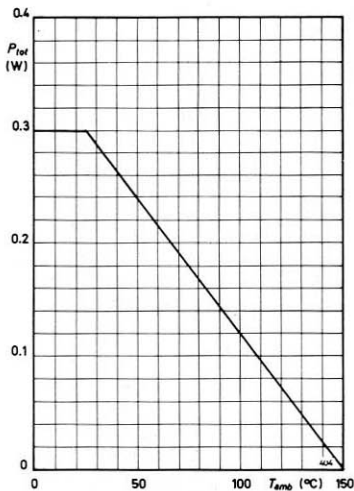
¹ as requested, the devices are available, at extra charge, selected in group A, B or C according to their DC forward current transfer ratios h_{21E}

Low frequency small signal hybrid parameters
 $V_{CE} = 5\text{ V}$, $I_C = 2\text{ mA}$, $f = 1\text{ kHz}$

Type	BC 182	BC 183	BC 184	
h_{11e}	3.6 (1.6 ... 8.5)	4.5 (1.6 ... 15)	6.6 (3.2 ... 15)	$k\Omega$
h_{12e}	1.7	2.0	2.5	10^{-4}
h_{21e}	222 (125 ... 260) 330 (240 ... 500) —	222 (125 ... 260) 330 (240 ... 500) 600 (450 ... 900)	— 330 (240 ... 500) 600 (450 ... 900)	in group A in group B in group C
h_{22e}	25 (≤ 60)	30 (≤ 110)	45 (≤ 110)	μS

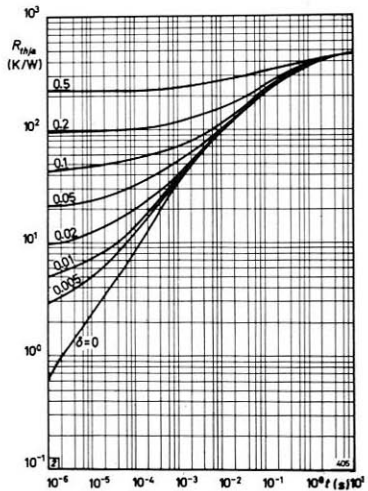
Permissible total power dissipation versus ambient temperature

$P_{tot} = f(T_{amb})$



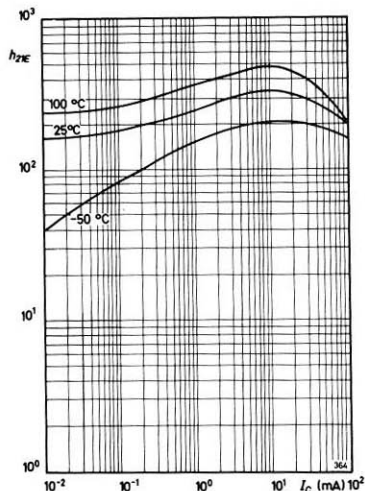
Pulse thermal resistance versus pulse duration

$R_{thja} = f(t)$, $\delta =$ parameter



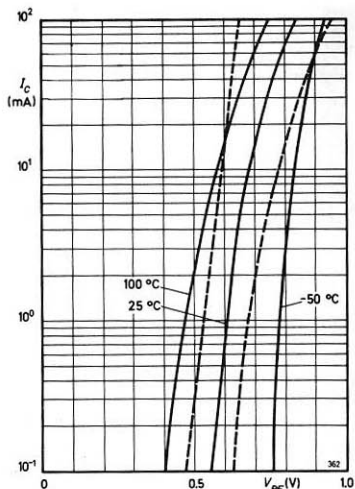
DC forward current transfer ratio versus collector current

$h_{21E} = f(I_C)$
 $V_{CE} = 5\text{ V}$, $T_{amb} = \text{parameter}$
 (common emitter configuration)



Collector current versus base-emitter voltage

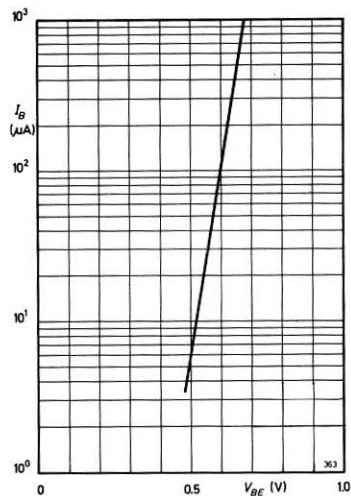
$I_C = f(V_{BE})$
 $V_{CE} = 5\text{ V}$, $T_{amb} = \text{parameter}$
 (common emitter configuration)



— Typical
 - - - - - Scattering limit at $T_{amb} = 25\text{ °C}$

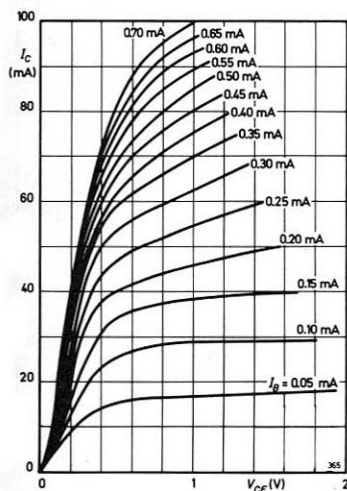
Base current versus base-emitter voltage

$I_B = f(V_{BE})$, $V_{CE} = 5\text{ V}$
 (common emitter configuration)



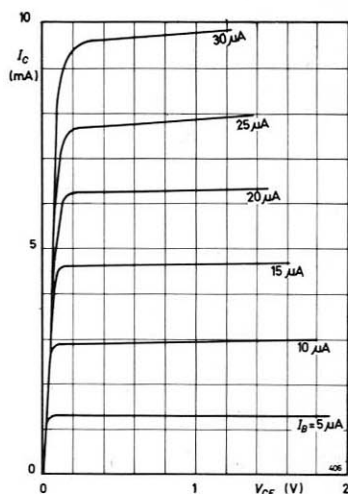
Collector current versus collector-emitter voltage

$I_C = f(V_{CE})$, $I_B = \text{parameter}$
(common emitter configuration)



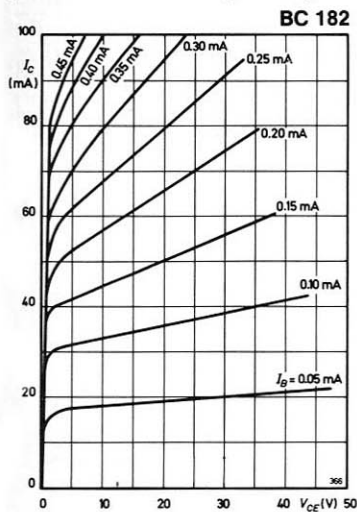
Collector current versus collector-emitter voltage

$I_C = f(V_{CE})$, $I_B = \text{parameter}$
(common emitter configuration)



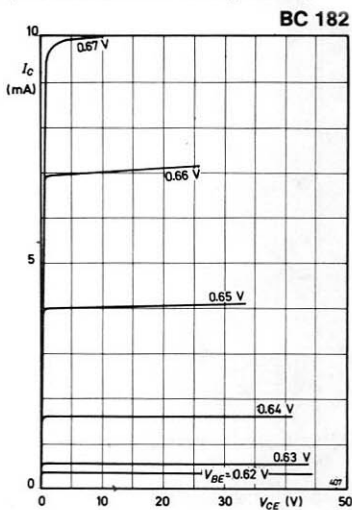
Collector current versus collector-emitter voltage

$I_C = f(V_{CE})$, $I_B = \text{parameter}$
(common emitter configuration)



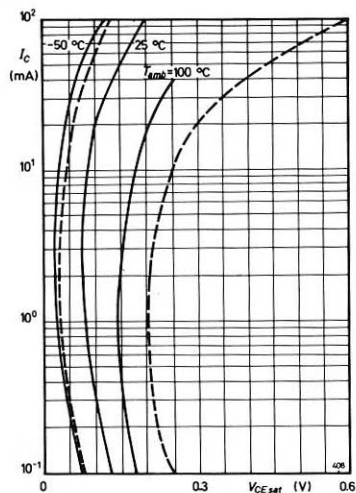
Collector current versus collector-emitter voltage

$I_C = f(V_{CE})$, $V_{BE} = \text{parameter}$
(common emitter configuration)



Collector current versus collector-emitter saturation voltage

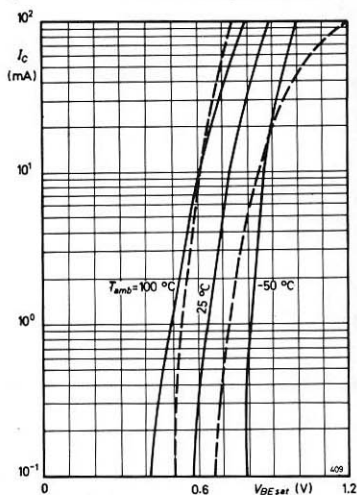
$I_C = f(V_{CEsat})$
 $h_{21E} = 20, T_{amb} = \text{parameter}$
 (common emitter configuration)



— Typical
 - - - - - Scattering limit at $T_{amb} = 25\text{ °C}$

Collector current versus base-emitter saturation voltage

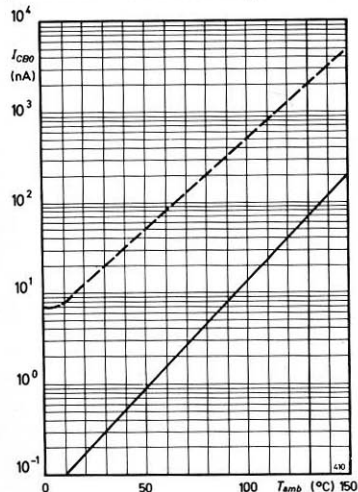
$I_C = f(V_{BEsat})$
 $h_{21E} = 20, T_{amb} = \text{parameter}$
 (common emitter configuration)



— Typical
 - - - - - Scattering limit at $T_{amb} = 25\text{ °C}$

Collector-base cut-off current versus ambient temperature

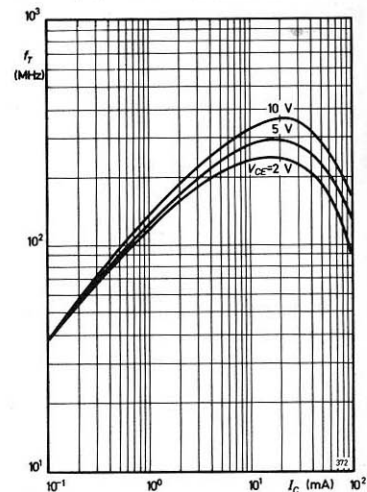
$I_{CBO} = f(T_{amb})$ at the maximum permissible reverse voltage



— Typical
 - - - - - Scattering limit

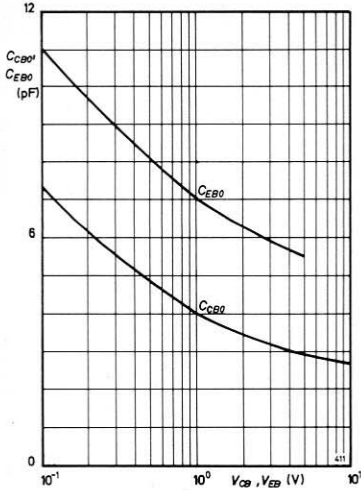
Transition frequency versus collector current

$f_T = f(I_C), V_{CE} = \text{parameter}$



Collector-base and emitter-base capacitance versus collector-base and emitter-base voltage, respectively

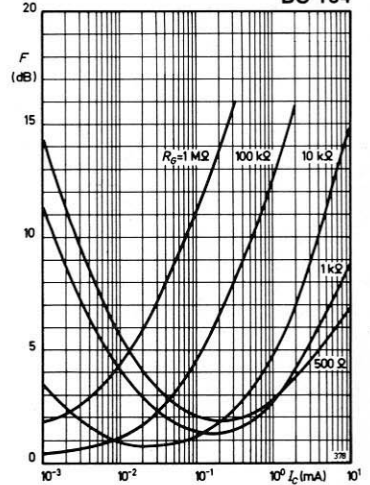
$C_{CB0} = f(V_{CB}); C_{EB0} = f(V_{EB})$



Noise figure versus collector current

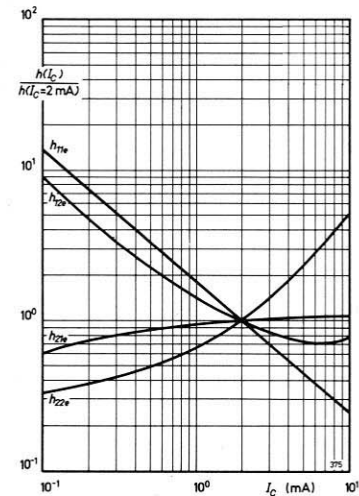
$F = f(I_C), V_{CE} = 5 \text{ V}, f = 1 \text{ kHz}$
 $R_G = \text{parameter}$

BC 184



h-parameters versus collector current

$\frac{h_e(I_C)}{h_e(I_C = 2 \text{ mA})} = f(I_C)$
 $h_e(I_C = 2 \text{ mA})$
 $V_{CE} = 5 \text{ V}$



h-parameters versus collector-emitter voltage

$\frac{h_e(V_{CE})}{h_e(V_{CE} = 5 \text{ V})} = f(V_{CE})$
 $h_e(V_{CE} = 5 \text{ V})$
 $I_C = 2 \text{ mA}$

