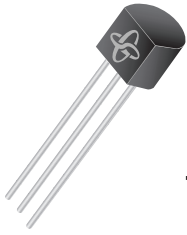
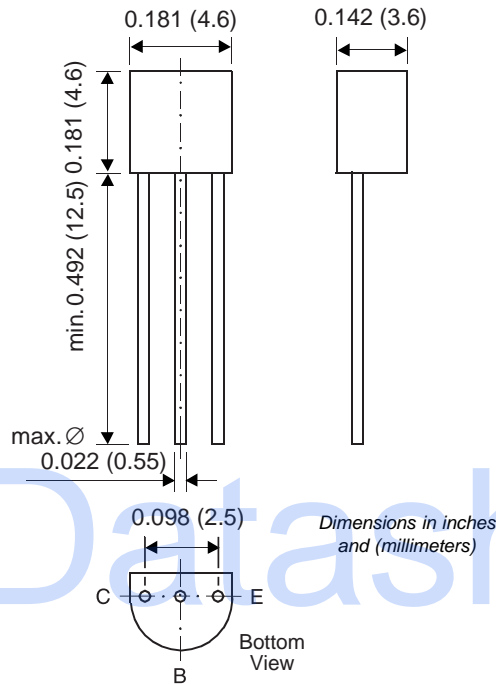


Small Signal Transistors (NPN)



TO-226AA (TO-92)



Features

- NPN Silicon Epitaxial Planar Transistors
- These transistors are subdivided into three groups A, B, and C according to their current gain. The type BC546 is available in groups A and B, however, the types BC547 and BC548 can be supplied in all three groups. As complementary types the PNP transistors BC556...BC558 are recommended.
- On special request, these transistors are also manufactured in the pin configuration TO-18.

Mechanical Data

Case: TO-92 Plastic Package

Weight: approx. 0.18g

Packaging Codes/Options:

E6/Bulk – 5K per container, 20K/box

E7/4K per Ammo mag., 20K/box

Maximum Ratings & Thermal Characteristics Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit	
Collector-Base Voltage	V _{CBO}	BC546	80	
		BC547	50	
		BC548	30	
Collector-Emitter Voltage	V _{CES}	BC546	80	
		BC547	50	
		BC548	30	
Collector-Emitter Voltage	V _{CEO}	BC546	65	
		BC547	45	
		BC548	30	
Emitter-Base Voltage	BC546, BC547 BC548	V _{EB0}	6 5	V
Collector Current	I _C	100	mA	
Peak Collector Current	I _{CM}	200	mA	
Peak Base Current	I _{BM}	200	mA	
Peak Emitter Current	-I _{EM}	200	mA	
Power Dissipation at T _{amb} = 25°C	P _{tot}	500 ⁽¹⁾	mW	
Thermal Resistance Junction to Ambient Air	R _{θJA}	250 ⁽¹⁾	°C/W	
Junction Temperature	T _J	150	°C	
Storage Temperature Range	T _S	-65 to +150	°C	

Note: (1) Valid provided that leads are kept at ambient temperature at a distance of 2 mm from case.

Small Signal Transistors (NPN)

Electrical Characteristics (T_J = 25°C unless otherwise noted)

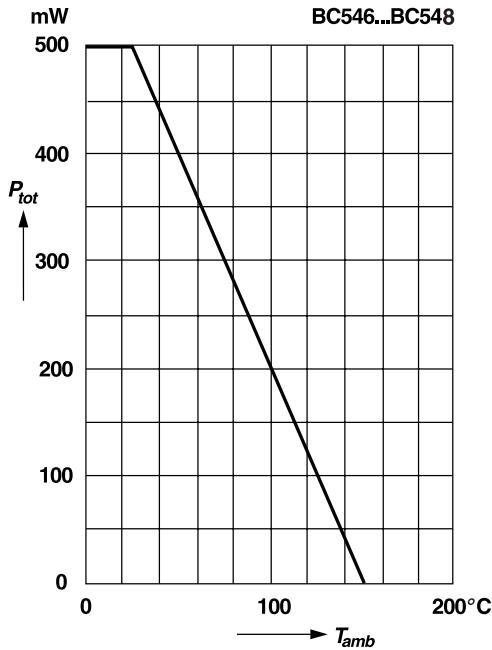
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit	
Small Signal Current Gain	Current gain group A	$V_{CE} = 5\text{ V}, I_C = 2\text{ mA},$ $f = 1\text{ kHz}$	—	220	—	—	
	B		—	330	—		
	C		—	600	—		
Input Impedance	Current gain group A	$V_{CE} = 5\text{ V}, I_C = 2\text{ mA},$ $f = 1\text{ kHz}$	1.6	2.7	4.5	k Ω	
	B		3.2	4.5	8.5		
	C		6	8.7	15		
Output Admittance	Current gain group A	$V_{CE} = 5\text{ V}, I_C = 2\text{ mA},$ $f = 1\text{ kHz}$	—	18	30	μS	
	B		—	30	60		
	C		—	60	110		
Reverse Voltage Transfer Ratio	Current gain group A	$V_{CE} = 5\text{ V}, I_C = 2\text{ mA},$ $f = 1\text{ kHz}$	—	$1.5 \cdot 10^{-4}$	—	—	
	B		—	$2 \cdot 10^{-4}$	—		
	C		—	$3 \cdot 10^{-4}$	—		
DC Current Gain	Current gain group A	$V_{CE} = 5\text{ V}, I_C = 10\text{ }\mu\text{A}$	—	90	—	—	
	B		—	150	—		
	C		—	270	—		
	Current gain group A	$V_{CE} = 5\text{ V}, I_C = 2\text{ mA}$	110	180	220		
	B		200	290	450		
	C		420	500	800		
Current gain group A	$V_{CE} = 5\text{ V}, I_C = 100\text{ mA}$	—	120	—			
B		—	200	—			
C		—	400	—			
Collector Saturation Voltage	V_{CEsat}	$I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}, I_B = 5\text{ mA}$	— —	80 200	200 600	mV	
Base Saturation Voltage	V_{BEsat}	$I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}, I_B = 5\text{ mA}$	— —	700 900	— —	mV	
Base-Emitter Voltage	V_{BE}	$V_{CE} = 5\text{ V}, I_C = 2\text{ mA}$ $V_{CE} = 5\text{ V}, I_C = 10\text{ mA}$	580 —	660 —	700 720	mV	
Collector-Emitter Cutoff Current	BC546	I_{CES}	$V_{CE} = 80\text{ V}$ $V_{CE} = 50\text{ V}$ $V_{CE} = 30\text{ V}$ $V_{CE} = 80\text{ V}, T_J = 125^\circ\text{C}$ $V_{CE} = 50\text{ V}, T_J = 125^\circ\text{C}$ $V_{CE} = 30\text{ V}, T_J = 125^\circ\text{C}$	—	0.2	15	nA
	BC547			—	0.2	15	nA
	BC548			—	0.2	15	nA
	BC546			—	—	4	μA
	BC547			—	—	4	μA
	BC548			—	—	4	μA
Gain-Bandwidth Product	f_T	$V_{CE} = 5\text{ V}, I_C = 10\text{ mA},$ $f = 100\text{ MHz}$	—	300	—	MHz	
Collector-Base Capacitance	C_{CBO}	$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$	—	3.5	6	pF	
Emitter-Base Capacitance	C_{EBO}	$V_{EB} = 0.5\text{ V}, f = 1\text{ MHz}$	—	9	—	pF	
Noise Figure	BC546, BC547 BC548	F	$V_{CE} = 5\text{ V}, I_C = 200\text{ }\mu\text{A},$ $R_G = 2\text{ k}\Omega, f = 1\text{ kHz},$ $\Delta f = 200\text{ Hz}$	—	2	10	dB

Small Signal Transistors (NPN)

Ratings and Characteristic Curves ($T_A = 25^\circ\text{C}$ unless otherwise noted)

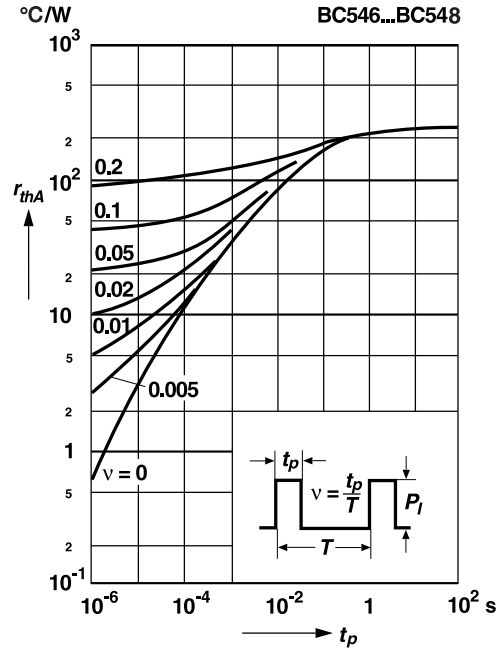
Admissible power dissipation versus temperature

Valid provided that leads are kept at ambient temperature at a distance of 2 mm from case

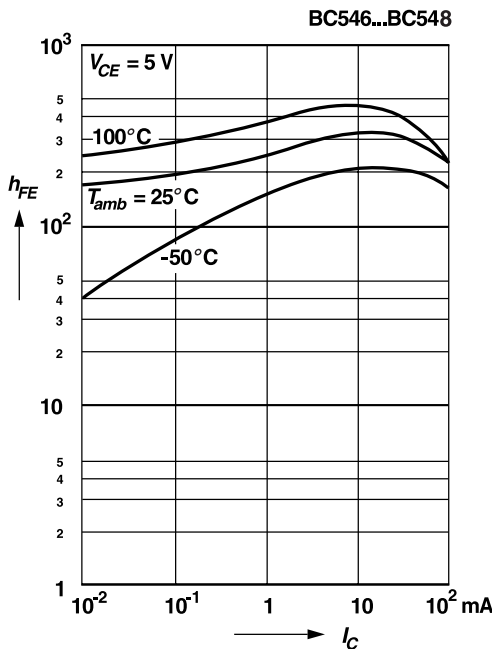


Pulse thermal resistance versus pulse duration

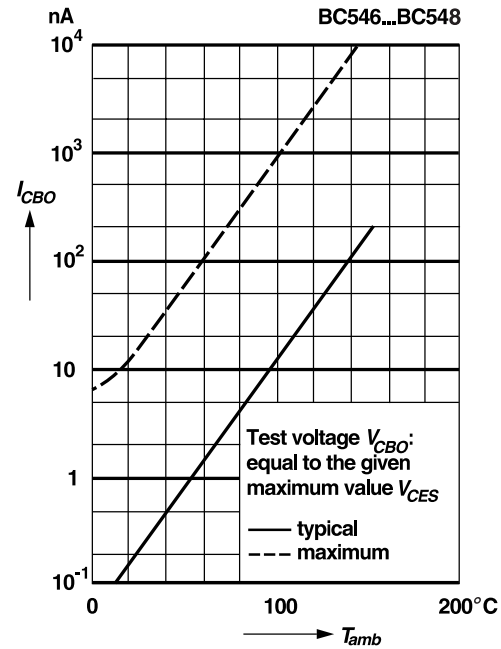
Valid provided that leads are kept at ambient temperature at a distance of 2 mm from case



DC current gain versus collector current



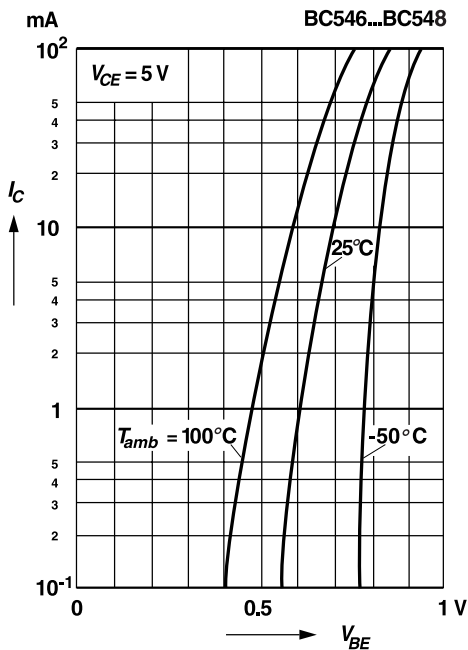
Collector-base cutoff current versus ambient temperature



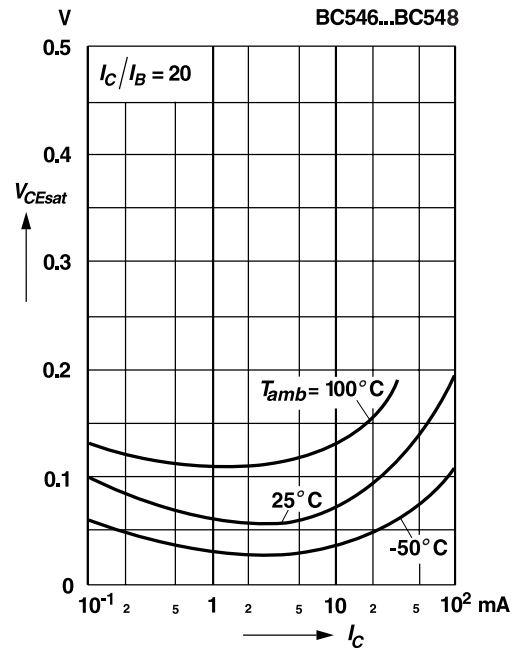
Small Signal Transistors (NPN)

Ratings and Characteristic Curves ($T_A = 25^\circ\text{C}$ unless otherwise noted)

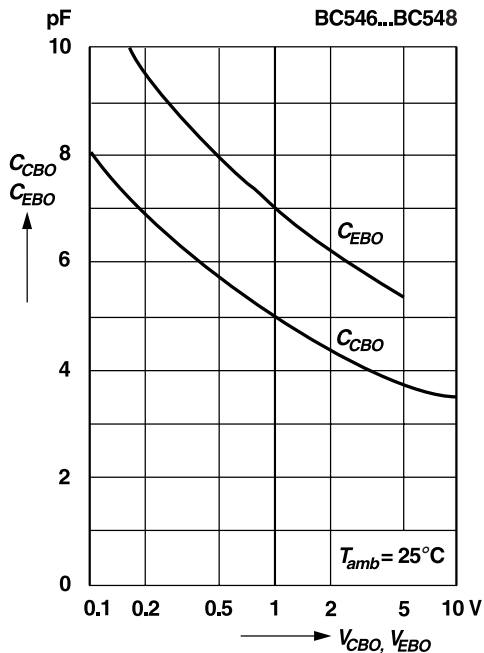
Collector current versus base-emitter voltage



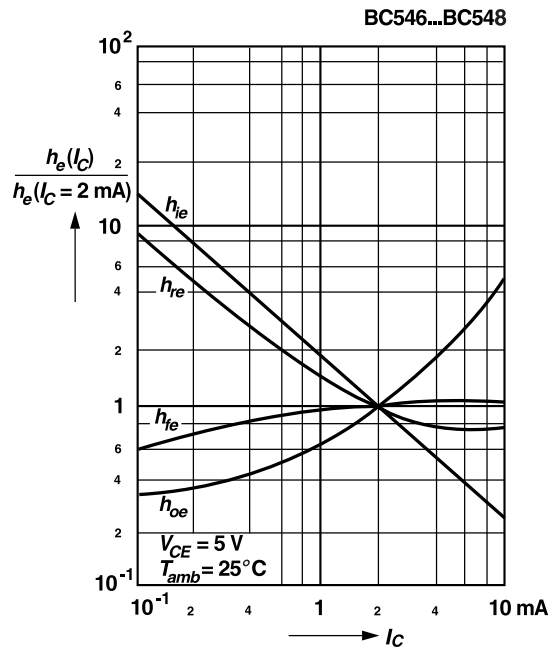
Collector saturation voltage versus collector current



Collector-base capacitance, Emitter-base capacitance versus reverse bias voltage



Relative h-parameters versus collector current



Small Signal Transistors (NPN)

Ratings and Characteristic Curves ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Gain-bandwidth product
versus collector current

