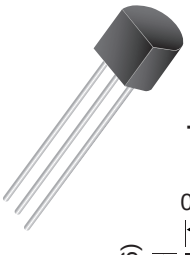
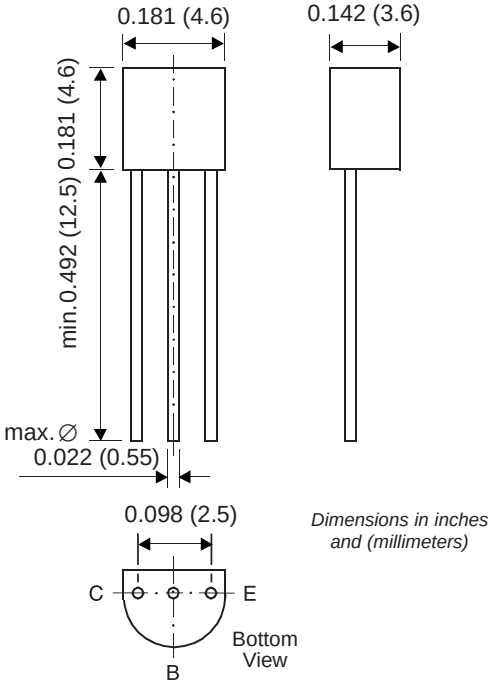
Small Signal Transistors (NPN)



TO-226AA (TO-92)



Dimensions in inches and (millimeters)

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	BC546 BC547 BC548	V_{CBO}	80 50 30	V
Collector-Emitter Voltage	BC546 BC547 BC548	V_{CES}	80 50 30	V
Collector-Emitter Voltage	BC546 BC547 BC548	V_{CEO}	65 45 30	V
Emitter-Base Voltage	BC546, BC547 BC548	V_{EBO}	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		$R_{\Theta JA}$	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.

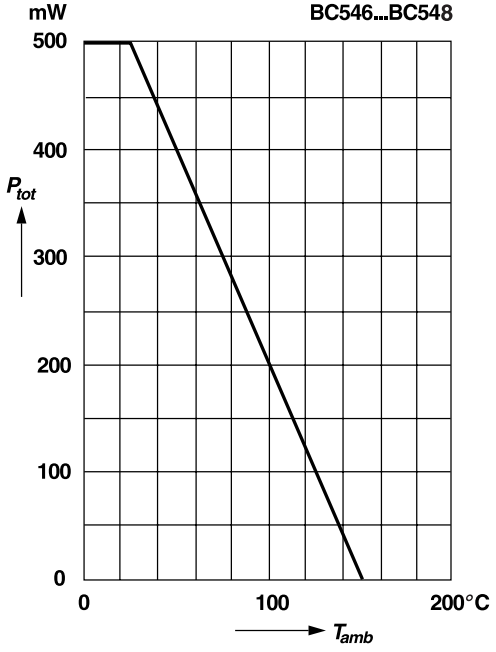
Electrical Characteristics (T_J = 25°C unless otherwise noted)

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

Ratings and Characteristic Curves (TA = 25°C unless otherwise noted)

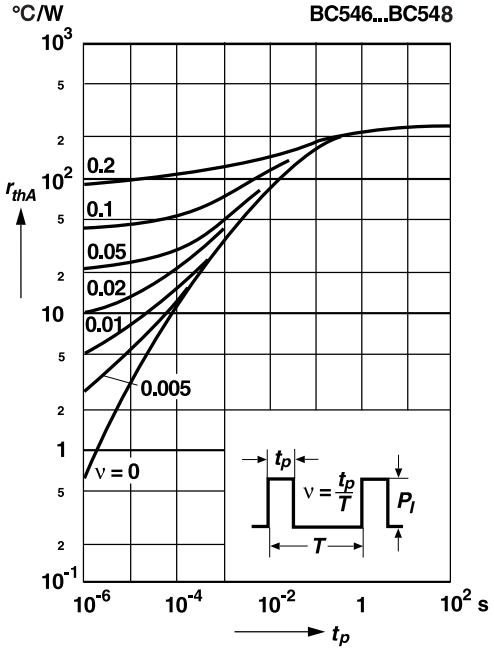
Admissible power dissipation versus temperature

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

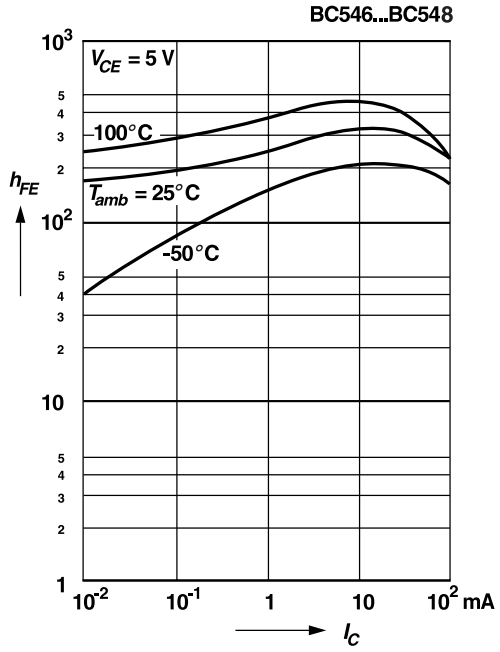


Pulse thermal resistance versus pulse duration

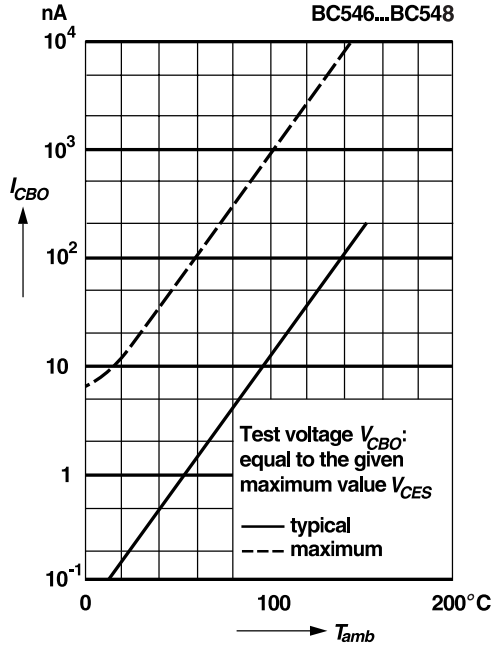
Valid provided that leads are kept at ambient temperature at a distance of 2 mm from case



DC current gain versus collector current

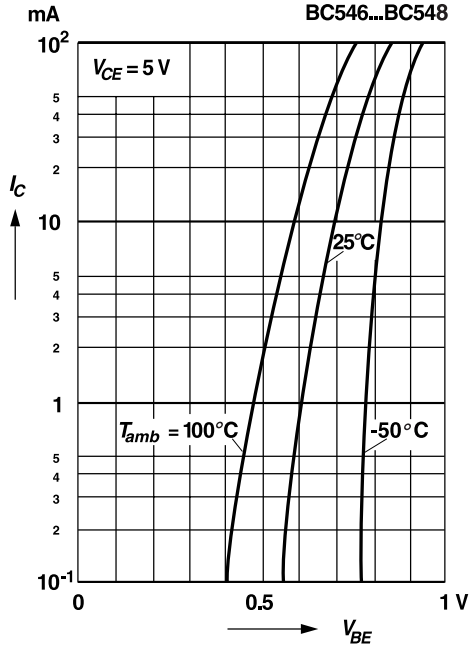


Collector-base cutoff current versus ambient temperature

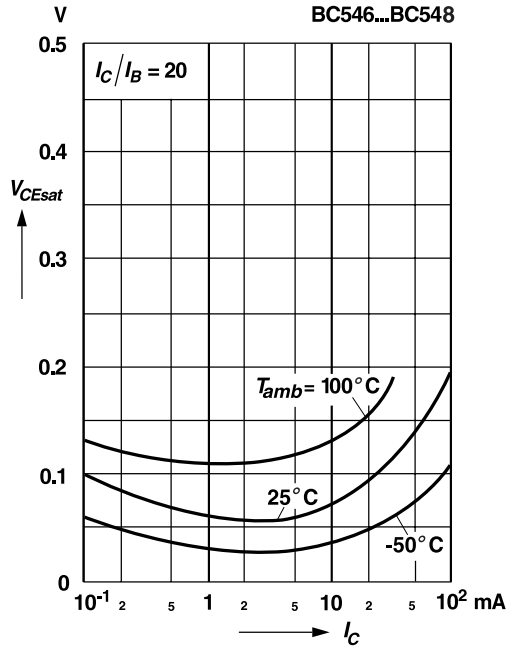


Ratings and Characteristic Curves (TA = 25°C unless otherwise noted)

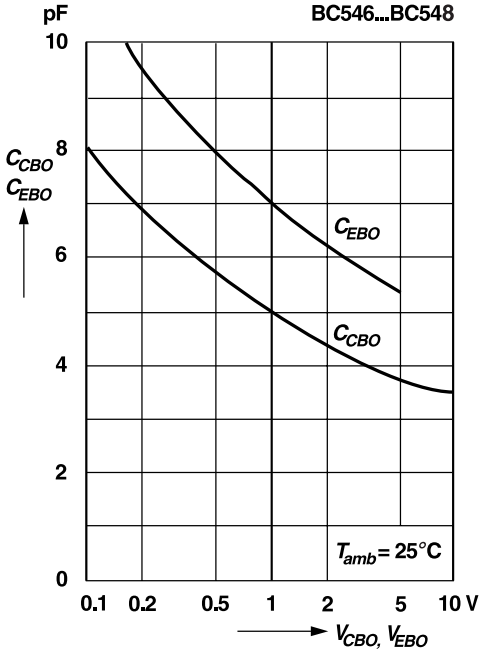
Collector current versus base-emitter voltage



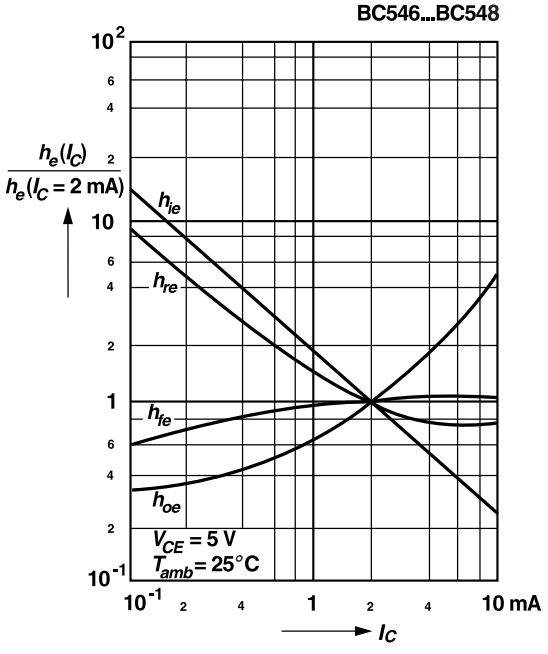
Collector saturation voltage versus collector current



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



Relative h-parameters versus collector current



Ratings and Characteristic Curves (TA = 25°C unless otherwise noted)

Gain-bandwidth product versus collector current