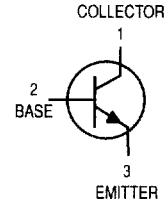
Amplifier Transistors
NPN Silicon

BC546, B
BC547, A, B, C
BC548, A, B, C



CASE 29–04, STYLE 17
TO–92 (TO–226AA)

MAXIMUM RATINGS

Rating	Symbol	BC546	BC547	BC548	Unit
Collector–Emitter Voltage	V_{CEO}	65	45	30	Vdc
Collector–Base Voltage	V_{CBO}	80	50	30	Vdc
Emitter–Base Voltage	V_{EBO}	6.0			Vdc
Collector Current — Continuous	I_C	100			mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	625 5.0			mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.5 12			Watt mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +150			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage (I_C = 1.0 mA, I_B = 0)	BC546 BC547 BC548	$V_{(BR)CEO}$	65 45 30	— — —	— — —	V
Collector–Base Breakdown Voltage (I_C = 100 μAdc)	BC546 BC547 BC548	$V_{(BR)CBO}$	80 50 30	— — —	— — —	V
Emitter–Base Breakdown Voltage (I_E = 10 μA, I_C = 0)	BC546 BC547 BC548	$V_{(BR)EBO}$	6.0 6.0 6.0	— — —	— — —	V
Collector Cutoff Current (V_{CE} = 70 V, V_{BE} = 0) (V_{CE} = 50 V, V_{BE} = 0) (V_{CE} = 35 V, V_{BE} = 0) (V_{CE} = 30 V, T_A = 125°C)	 BC546 BC547 BC548 BC546/547/548	I_{CES}	 — — — —	 0.2 0.2 0.2 —	 15 15 15 4.0	 nA μA

REV 1

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic		Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				—
(I_C = 10 μA, V_{CE} = 5.0 V)	BC547A/548A		—	90	—	
	BC546B/547B/548B		—	150	—	
	BC548C		—	270	—	
(I_C = 2.0 mA, V_{CE} = 5.0 V)	BC546		110	—	450	
	BC547		110	—	800	
	BC548		110	—	800	
	BC547A/548A		110	180	220	
	BC546B/547B/548B		200	290	450	
	BC547C/BC548C		420	520	800	
(I_C = 100 mA, V_{CE} = 5.0 V)	BC547A/548A		—	120	—	
	BC546B/547B/548B		—	180	—	
	BC548C		—	300	—	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$				V
(I_C = 10 mA, I_B = 0.5 mA)			—	0.09	0.25	
(I_C = 100 mA, I_B = 5.0 mA)			—	0.2	0.6	
(I_C = 10 mA, I_B = See Note 1)			—	0.3	0.6	
Base–Emitter Saturation Voltage		$V_{BE(sat)}$	—	0.7	—	V
(I_C = 10 mA, I_B = 0.5 mA)						
Base–Emitter On Voltage		$V_{BE(on)}$				V
(I_C = 2.0 mA, V_{CE} = 5.0 V)			0.55	—	0.7	
(I_C = 10 mA, V_{CE} = 5.0 V)			—	—	0.77	
SMALL–SIGNAL CHARACTERISTICS						
Current–Gain — Bandwidth Product		f_T				MHz
(I_C = 10 mA, V_{CE} = 5.0 V, f = 100 MHz)	BC546		150	300	—	
	BC547		150	300	—	
	BC548		150	300	—	
Output Capacitance		C_{obo}	—	1.7	4.5	pF
(V_{CB} = 10 V, I_C = 0, f = 1.0 MHz)						
Input Capacitance		C_{ibo}	—	10	—	pF
(V_{EB} = 0.5 V, I_C = 0, f = 1.0 MHz)						
Small–Signal Current Gain		h_{fe}				—
(I_C = 2.0 mA, V_{CE} = 5.0 V, f = 1.0 kHz)	BC546		125	—	500	
	BC547/548		125	—	900	
	BC547A/548A		125	220	260	
	BC546B/547B/548B		240	330	500	
	BC547C/548C		450	600	900	
Noise Figure		NF				dB
(I_C = 0.2 mA, V_{CE} = 5.0 V, R_S = 2 kΩ,	BC546		—	2.0	10	
f = 1.0 kHz, Δf = 200 Hz)	BC547		—	2.0	10	
	BC548		—	2.0	10	

Note 1: I_B is value for which I_C = 11 mA at V_{CE} = 1.0 V.

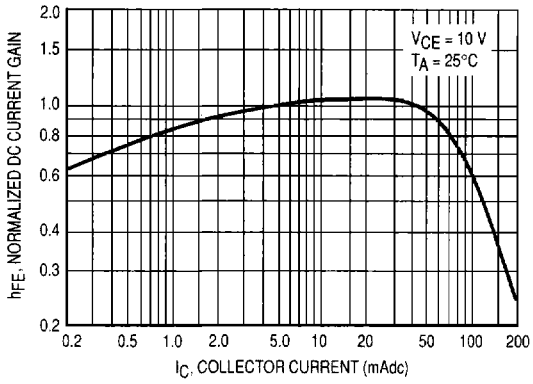


Figure 1. Normalized DC Current Gain

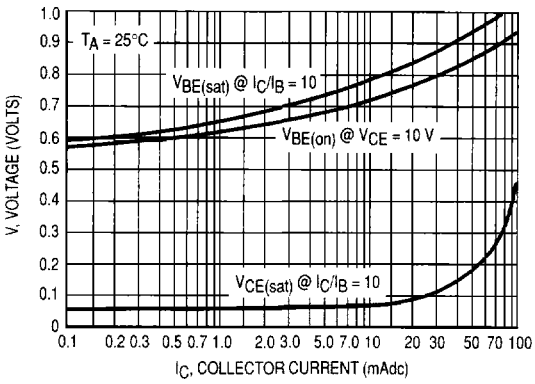


Figure 2. "Saturation" and "On" Voltages

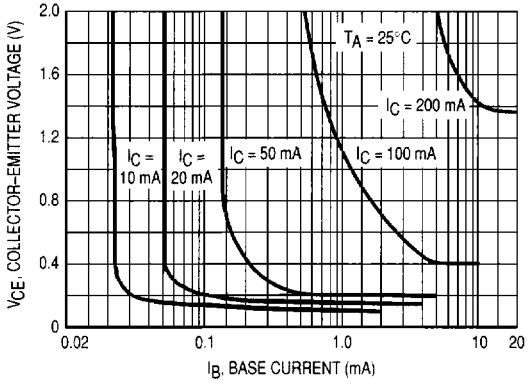


Figure 3. Collector Saturation Region

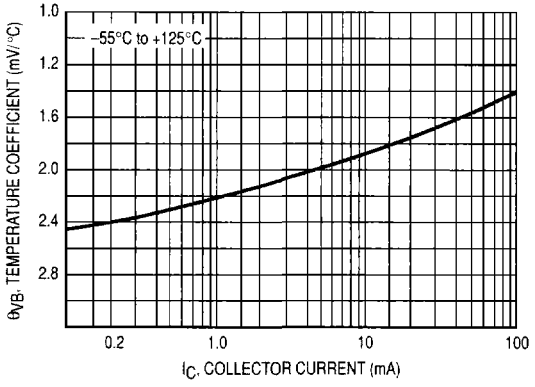


Figure 4. Base–Emitter Temperature Coefficient

BC547/BC548

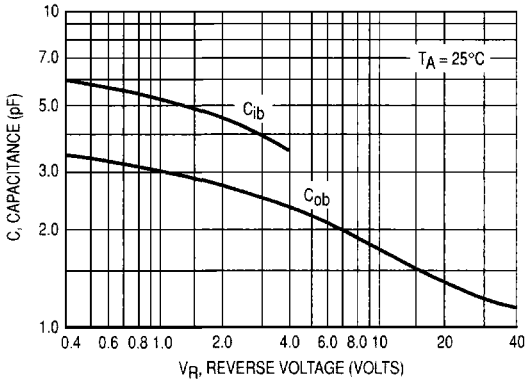


Figure 5. Capacitances

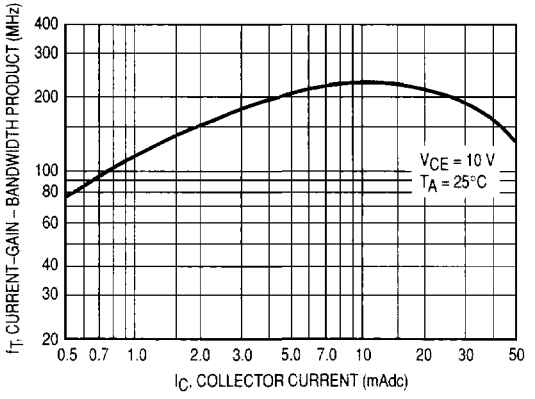


Figure 6. Current–Gain – Bandwidth Product

BC547/BC548

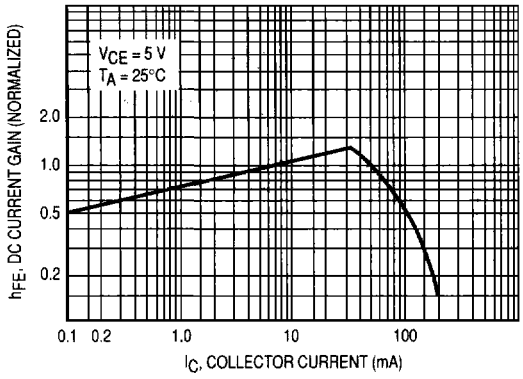


Figure 7. DC Current Gain

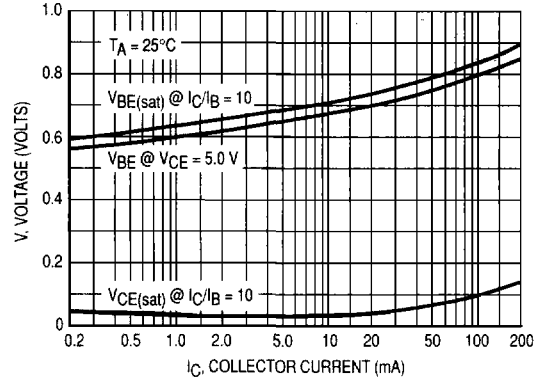


Figure 8. "On" Voltage

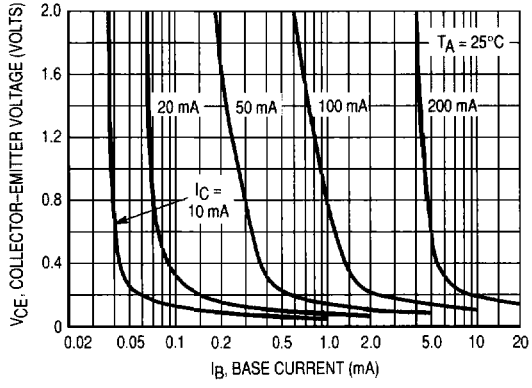


Figure 9. Collector Saturation Region

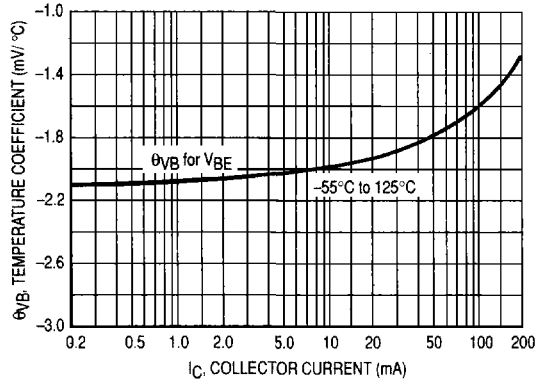


Figure 10. Base–Emitter Temperature Coefficient

BC546

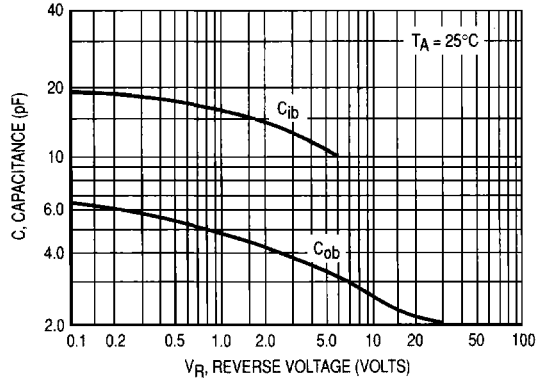


Figure 11. Capacitance

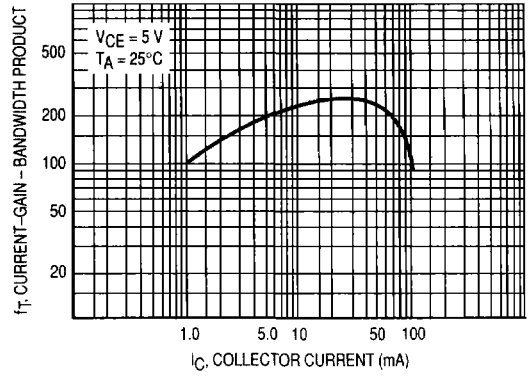


Figure 12. Current–Gain – Bandwidth Product