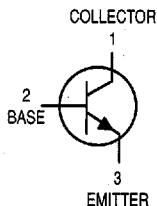


Amplifier Transistors

NPN Silicon

BC237,A,B,C
BC238B,C
BC239,C



CASE 29-04, STYLE 17
TO-18 (TO-226AA)

MAXIMUM RATINGS

Rating	Symbol	BC237	BC238	BC239	Unit
Collector-Emitter Voltage	V_{CEO}	45	25	25	Vdc
Collector-Emitter Voltage	V_{CES}	50	30	30	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	5.0	5.0	Vdc
Collector Current — Continuous	I_C	100			mA dc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8			mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0 8.0			Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150			$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	357	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	125	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 2.0 \text{ mA}, I_B = 0$)	BC237 BC238 BC239	$V_{(BR)CEO}$	45 25 25	— — —	— — —	V
Emitter-Base Breakdown Voltage ($I_E = 100 \mu\text{A}, I_C = 0$)	BC237 BC238 BC239	$V_{(BR)EBO}$	6.0 5.0 5.0	— — —	— — —	V
Collector Cutoff Current ($V_{CE} = 30 \text{ V}, V_{BE} = 0$)	BC238 BC239	I_{CES}	— —	0.2 0.2	15 15	nA
($V_{CE} = 50 \text{ V}, V_{BE} = 0$)	BC237		—	0.2	15	
($V_{CE} = 30 \text{ V}, V_{BE} = 0$) $T_A = 125^\circ\text{C}$	BC238 BC239		— —	0.2 0.2	4.0 4.0	μA
($V_{CE} = 50 \text{ V}, V_{BE} = 0$) $T_A = 125^\circ\text{C}$	BC237		—	0.2	4.0	

BC237,A,B,C BC238B,C BC239,C**ELECTRICAL CHARACTERISTICS** ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain ($I_C = 10\ \mu\text{A}$, $V_{CE} = 5.0\ \text{V}$)	BC237A BC237B/238B BC237C/238C/239C	h_{FE}	— — —	90 150 270	—
($I_C = 2.0\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$)	BC237 BC239 BC237A BC237B/238B BC237C/238C/239C	120 120 120 200 380	— — 170 290 500	800 800 220 460 800	—
($I_C = 100\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$)	BC237A BC237B/238B BC237C/238C/239C	— — —	120 180 300	— — —	—
Collector-Emitter On Voltage ($I_C = 10\ \text{mA}$, $I_B = 0.5\ \text{mA}$) ($I_C = 100\ \text{mA}$, $I_B = 5.0\ \text{mA}$)	BC237/BC238/BC239 BC237/BC239 BC238	$V_{CE(sat)}$	— —	0.07 0.2	0.2 0.6 0.8
Base-Emitter Saturation Voltage ($I_C = 10\ \text{mA}$, $I_B = 0.5\ \text{mA}$) ($I_C = 100\ \text{mA}$, $I_B = 5.0\ \text{mA}$)		$V_{BE(sat)}$	— —	0.6 —	0.83 1.05
Base-Emitter On Voltage ($I_C = 100\ \mu\text{A}$, $V_{CE} = 5.0\ \text{V}$) ($I_C = 2.0\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$) ($I_C = 100\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$)		$V_{BE(on)}$	— 0.55 —	0.5 0.62 0.83	— 0.7 —

DYNAMIC CHARACTERISTICS

Current-Gain — Bandwidth Product ($I_C = 0.5\ \text{mA}$, $V_{CE} = 3.0\ \text{V}$, $f = 100\ \text{MHz}$)	BC237 BC238 BC239	f_T	— — —	100 120 140	—	MHz
($I_C = 10\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$, $f = 100\ \text{MHz}$)	BC237 BC238 BC239		150 150 150	200 240 280	— — —	
Collector-Base Capacitance ($V_{CB} = 10\ \text{V}$, $I_C = 0$, $f = 1.0\ \text{MHz}$)		C_{obo}	—	—	4.5	pF
Emitter-Base Capacitance ($V_{EB} = 0.5\ \text{V}$, $I_C = 0$, $f = 1.0\ \text{MHz}$)		C_{ibo}	—	8.0	—	pF
Noise Figure ($I_C = 0.2\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$, $R_S = 2.0\ \text{k}\Omega$, $f = 1.0\ \text{kHz}$)	BC239	NF	—	2.0	4.0	dB
($I_C = 0.2\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$, $R_S = 2.0\ \text{k}\Omega$, $f = 1.0\ \text{kHz}$, $\Delta f = 200\ \text{Hz}$)	BC237 BC238 BC239		— — —	2.0 2.0 2.0	10 10 4.0	

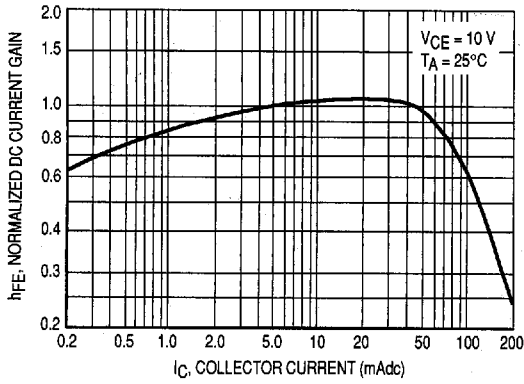


Figure 1. Normalized DC Current Gain

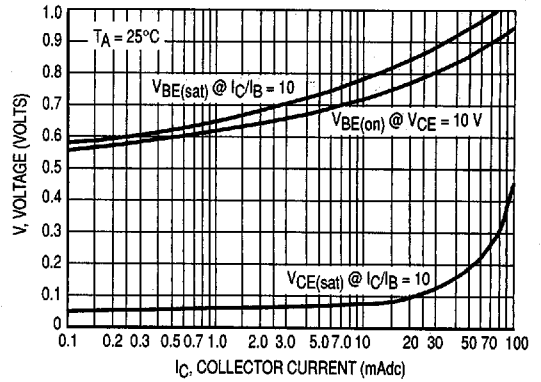


Figure 2. "Saturation" and "On" Voltages

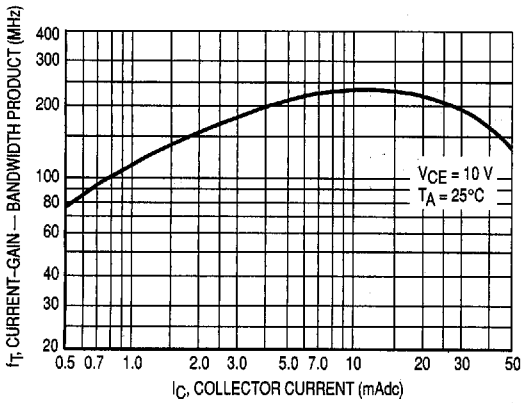


Figure 3. Current-Gain — Bandwidth Product

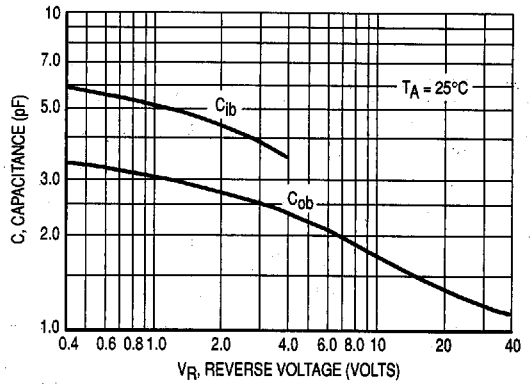


Figure 4. Capacitances

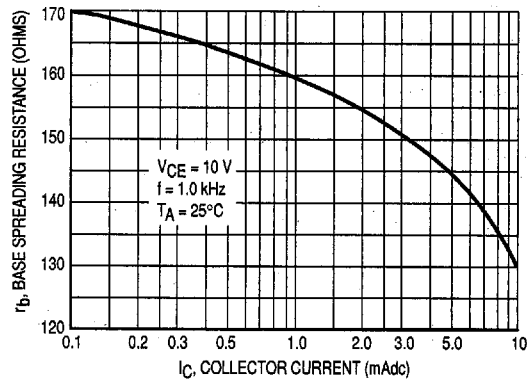


Figure 5. Base Spreading Resistance