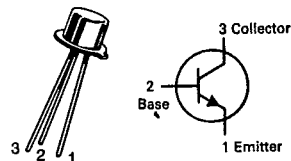


T-29-21

BC107, A, B, C thru BC109, A, B, C

CASE 22-03, STYLE 1
TO-18 (TO-206AA)



TRANSISTORS
NPN SILICON

MAXIMUM RATINGS

Rating	Symbol	BC 107	BC 108	BC 109	Unit
Collector-Emitter Voltage	V_{CEO}	45	25	25	Vdc
Collector-Base Voltage	V_{CBO}	50	30	30	Vdc
Emitter-Base Voltage	V_{EBO}	6	5	5	Vdc
Collector Current - Continuous	I_C	0.2			Amp
Total Device Dissipation $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	0.6 2.28			Watt mW/ $^\circ\text{C}$
Total Device Dissipation $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$ Derate above 25°C	P_D	1 6.67			Watt mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200			$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	175	$^\circ\text{C}/\text{W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector Base Leakage Current ($I_E = 0, V_{CB} = 45\text{ V}$) ($I_E = 0, V_{CB} = 45\text{ V}, T_{Amb} = 125^\circ\text{C}$) ($I_E = 0, V_{CB} = 25\text{ V}$) ($I_E = 0, V_{CB} = 25\text{ V}, T_{Amb} = 125^\circ\text{C}$)	BC107 BC107 BC108/109 BC108/109	I_{CBO}		15 4 15 4	nA μA nA μA
Emitter Base Breakdown Voltage ($I_E = 10\text{ }\mu\text{A}, I_C = 0$)	BC107 BC108/109	$V_{(BR)EBO}$	6 5		V
Collector Emitter Breakdown Voltage ($I_C = 2\text{ mA}, I_E = 0$)	BC107 BC108/109	$V_{(BR)CEO}$	45 25		V

ON CHARACTERISTICS

DC Current gain ($V_{CE} = 5\text{ V}, I_C = 2\text{ mA}$) ($V_{CE} = 5\text{ V}, I_C = 10\text{ }\mu\text{A}$)	BC107 BC108 BC109 A group B group C group B group C group	h_{FE}	110 110 200 110 200 420 40 100		450 800 800 220 450 800	
Base Emitter Saturation Voltage ($I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$) ($I_C = 100\text{ mA}, I_B = 5\text{ mA}$)		$V_{BE(sat)}$		0.7 1.0	0.83 1.05	V
Collector Emitter Saturation Voltage ($I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$) ($I_C = 100\text{ mA}, I_B = 5\text{ mA}$)		$V_{CE(sat)}$			0.25 0.60	V
Base Emitter on Voltage ($I_C = 2\text{ mA}, V_{CE} = 5\text{ V}$) ($I_C = 10\text{ mA}, V_{CE} = 5\text{ V}$)		$V_{BE(on)}$	0.55		0.70 0.77	V
Collector Knee Voltage ($I_C = 10\text{ mA}, I_B = \text{the value for which } I_C = 11\text{ mA at } V_{CE} = 1\text{ V}$)		$V_{CE(K)}$		0.4	0.6	V

DYNAMIC CHARACTERISTICS

Transition Frequency ($I_C = 10\text{ mA}, f = 100\text{ MHz}, V_{CE} = 5\text{ V}$)		f_T	150	300		MHz
Noise Figure ($V_{CE} = 5\text{ V}, I_C = 0.2\text{ mA}, R_g = 2\text{ K}\Omega$) F = 30 Hz to 15 kHz F = 1 kHz, $\Delta F = 200\text{ Hz}$	BC109 BC109 BC107/108	NF			4 4 10	dB

MOTOROLA SMALL-SIGNAL TRANSISTORS, FETs AND DIODES

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

Characteristic	Symbol	Min	Typ	Max	Unit
Output Capacitance ($V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$)	C_{ob}			4.5	pF
h_{21e} Parameters ($V_{CE} = 5\text{ V}$, $I_C = 2\text{ mA}$, $f = 1\text{ kHz}$)	h_{21e}				
BC107/108		125		500	
BC109		240		900	
A group		125		260	
B group		240		500	
C group		450		900	
h_{11e} Parameters ($V_{CE} = 5\text{ V}$, $I_C = 2\text{ mA}$, $f = 1\text{ kHz}$)	h_{11e}				$K\Omega$
A group		1.6		4.5	
B group		3.2		8.5	
C group		6.0		15	
h_{22e} Parameters ($V_{CE} = 5\text{ V}$, $I_C = 2\text{ mA}$, $f = 1\text{ kHz}$)	h_{22e}				μhos
A group				30	
B group				60	
C group				110	

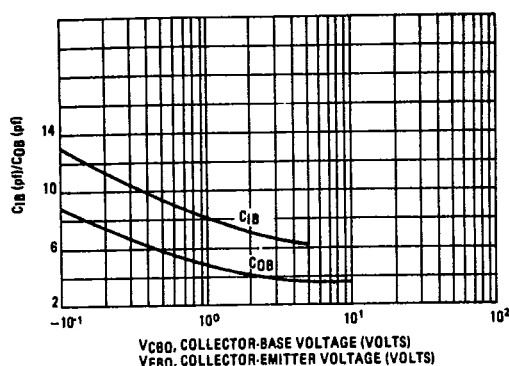
FIGURE 1 — EMITTER-BASE CAPACITANCE
COLLECTOR-BASE CAPACITANCE

FIGURE 2 — CURRENT GAIN — BANDWIDTH PRODUCT

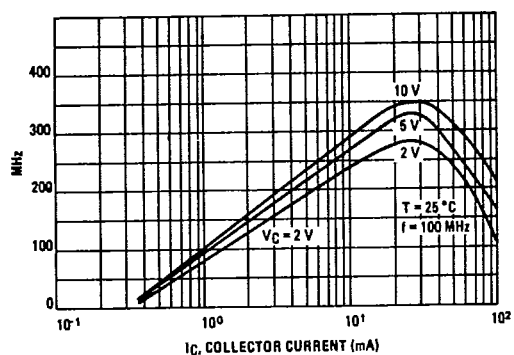


FIGURE 3 — TOTAL PERMISSIBLE POWER DISSIPATION

