

Low Power Bipolar Transistors



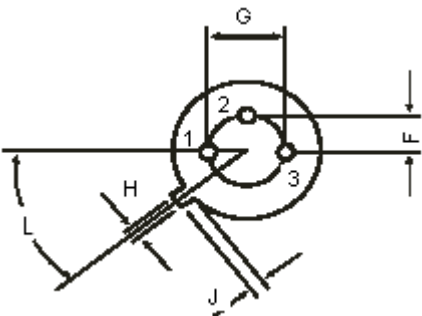
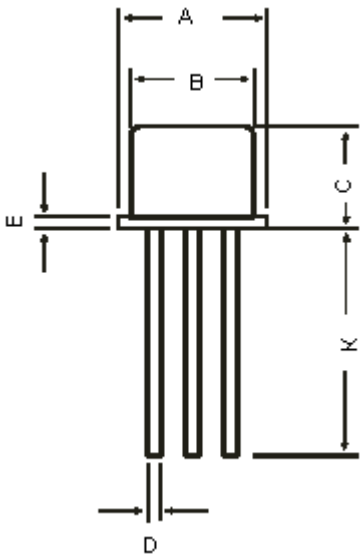
BC109 Series



Feature:

- NPN Silicon Planar Epitaxial Transistors

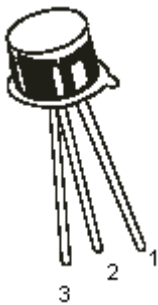
TO-18 Metal Can Package



Specification Table

Dimensions	Minimum	Maximum
A	5.24	5.84
B	4.52	4.97
C	4.31	5.33
D	0.4	0.53
E	-	0.76
F	-	1.27
G	-	2.97
H	0.91	1.17
J	0.71	1.21
K	12.7	-
L	45°	

Dimensions : Millimetres



Pin Configuration:

- Emitter
- Base
- Collector

Absolute Maximum Ratings

Description	Symbol	BC109	Unit
Collector - Emitter Voltage	V_{CEO}	25	V
Collector - Base Voltage	V_{CBO}	30	
Emitter-Base Voltage	V_{EBO}	5	
Collector Current Continuous	I_C	0.2	A



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Absolute Maximum Ratings

Description	Symbol	BC109	Unit
Power Dissipation at $T_a = 25^\circ\text{C}$ Derate above 25°C	P_D	0.6 2.28	W mW / $^\circ\text{C}$
Power Dissipation at $T_C = 25^\circ\text{C}$ Derate above 25°C		1 6.67	
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$
Thermal Resistance			
Junction to Case	$R_{th(j-c)}$	175	$^\circ\text{C} / \text{W}$

Electrical Characteristics ($T_a = 25^\circ\text{C}$ unless otherwise specified)

Description	Symbol	Test Condition	Minimum	Maximum	Unit
Collector - Emitter Voltage	V_{CEO}	$I_C = 2 \text{ mA}, I_B = 0$	25	-	V
Emitter Base Voltage	V_{EBO}	$I_E = 10 \mu\text{A}, I_C = 0$	5	-	
Collector Cut off Current	I_{CBO}	$V_{CB} = 25 \text{ V}, I_E = 0$ $T_{amb} = 125^\circ\text{C}$	-	15	nA
		$V_{CB} = 25 \text{ V}, I_E = 0$	-	4	μA
DC Current	h_{FE}	$I_C = 10 \mu\text{A}, V_{CE} = 5 \text{ V}$ B Group	40	-	-
		C Group	100		
		$I_C = 2 \text{ mA}, V_{CE} = 5 \text{ V}$ B Group	200	800	
		C Group	200 420	450 800	
Base Emitter Saturation Voltage	$V_{BE(Sat)}$	$I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$ $I_C = 100 \text{ mA}, I_B = 5 \text{ mA}$	-	0.83 1.05	V
Collector Emitter Saturation Voltage	$V_{CE(Sat)}$		-	0.25 0.6	
Base Emitter On Voltage	$V_{BE(on)}$	$I_C = 2 \text{ mA}, V_{CE} = 5 \text{ V}$	0.55	0.7	
		$I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}$	-	0.77	
Collector Knee Voltage	$V_{CE(K)}$	$I_C = 10 \text{ mA}, I_B = \text{The value for which } I_C = 11 \text{ mA at } V_{CE} = 1 \text{ V}$	-	0.6	
Transition Frequency	f_t	$V_{CE} = 5 \text{ V}, I_C = 10 \text{ mA}, f = 100 \text{ MHz}$	150	-	MHz
Noise Figure	NF	$V_{CE} = 5 \text{ V}, I_C = 0.2 \text{ mA}$ $R_g = 2 \text{ k}\Omega$	-	4	dB
		$F = 30 \text{ Hz to } 15 \text{ KHz}$ $F = 1 \text{ kHz}, B = 200 \text{ Hz}$		4	dB
Output Capacitance	C_{obo}	$V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$	-	4.5	pF
Small Signal Current Gain	h_{fe}	ALL $f = 1 \text{ kHz}$ $I_C = 2 \text{ mA}, V_{CE} = 5 \text{ V}$	240	900	-
		B Group	240	500	
		C Group	450	900	

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Electrical Characteristics ($T_a = 25^\circ\text{C}$ unless otherwise specified)

Description	Symbol	Test Condition	Minimum	Maximum	Unit
Input Impedance	h_{ie}	$I_C = 2 \text{ mA}$, $V_{CE} = 5 \text{ V}$ B Group C Group	3.2 6	8.5 15	$K\Omega$ $K\Omega$
Output Admittance	h_{oe}	$I_C = 2 \text{ mA}$, $V_{CE} = 5 \text{ V}$ B Group C Group	-	60 110	$\mu\Omega$

Part Number Table

Package	Part Number
Transistor, NPN, TO-18	BC109
Transistor, NPN, TO-18	BC109B
Transistor, NPN, TO-18	BC109C

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