

# BC107/BC108/ BC109



## Low Power Bipolar Transistors

### TO-18

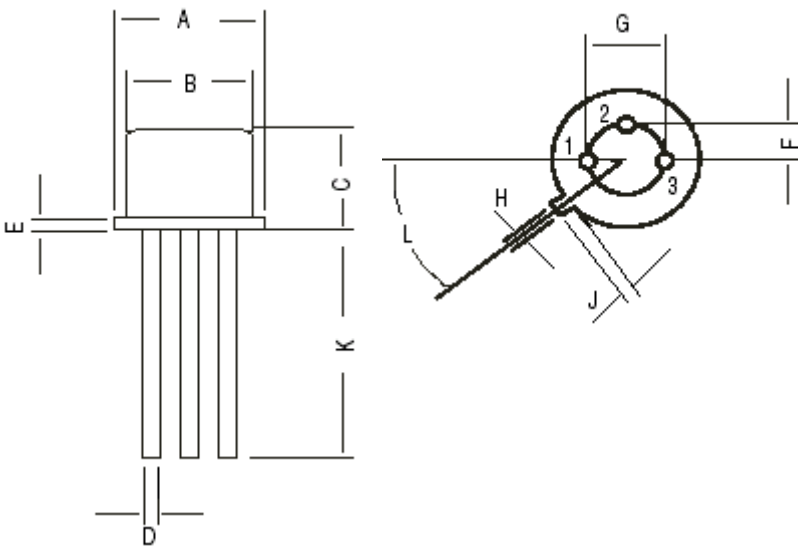


### Features:

NPN Silicon Planar Epitaxial Transistors.

Suitable for applications requiring low noise and good  $h_{FE}$  linearity, eg. audio pre-amplifiers, and instrumentation.

### TO-18 Metal Can Package

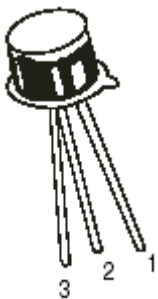


Dimension	Minimum	Maximum
A	5.24	5.84
B	4.52	4.97
C	4.31	5.33
D	0.40	0.53
E	-	0.76
F	-	1.27
G	-	2.97
H	0.91	1.17
J	0.71	1.21
K	12.70	-
L	45°	

Dimensions : Millimetres

### Pin Configuration

1. Emitter.
2. Base.
3. Collector.



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### Absolute Maximum Ratings

DESCRIPTION	SYMBOL	BC107	BC108	BC109	UNIT
Collector-Emitter Voltage	$V_{CEO}$	45	25	25	V
Collector-Base Voltage	$V_{CBO}$	50	30	30	V
Emitter-Base Voltage	$V_{EBO}$	6.0	5.0	5.0	V
Collector Current Continuous	$I_C$		0.2		A
Power Dissipation at $T_a = 25^\circ\text{C}$	$P_D$		0.6		W
Derate Above $25^\circ\text{C}$			2.28		mW/ $^\circ\text{C}$
Power Dissipation at $T_c = 25^\circ\text{C}$	$P_D$		1.0		W
Derate Above $25^\circ\text{C}$			6.67		mW/ $^\circ\text{C}$
Operating And Storage Junction	$T_j, T_{stg}$		-65 to +200		$^\circ\text{C}$
Temperature Range					
<b>Thermal Resistance</b>					
Junction to Case	$R_{th(j-c)}$		175		$^\circ\text{C/W}$

### Electrical Characteristics ( $T_a = 25^\circ\text{C}$ Unless Otherwise Specified)

Description	Symbol	Test Condition	Minimum	Maximum	Unit	
Collector-Emitter Voltage	$V_{CEO}$	$I_C = 2\text{mA}, I_B = 0$	BC107	45	V	
			BC108/109	20	V	
Emitter-Base Voltage	$V_{EBO}$	$I_E = 10\mu\text{A}, I_C = 0$	BC107	6.0	V	
			BC108/109	5.0	V	
Collector-Cut off Current	$I_{CBO}$	$V_{CB} = 45\text{V}, I_E = 0$	BC107	15	nA	
		$V_{CB} = 25\text{V}, I_E = 0$	BC108/109	15	nA	
		$T_{amb} = 125^\circ\text{C}$				
		$V_{CB} = 45\text{V}, I_E = 0$	BC107	4.0	$\mu\text{A}$	
		$V_{CB} = 25\text{V}, I_E = 0$	BC108/109	4.0	$\mu\text{A}$	

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Description	Symbol	Test Condition	Minimum	Maximum	Unit	
DC Current	$h_{FE}$	$I_C = 10\mu A, V_{CE} = 5V$	B Group	40		
			C Group	100		
		$I_C = 2mA, V_{CE} = 5V$	BC107	110	450	
			BC108	110	800	
			BC109	200	800	
			A Group	110	220	
B Group	200	450				
C Group	420	800				
Base Emitter Saturation Voltage	$V_{BE(Sat)}$	$I_C = 10mA, I_B = 0.5mA$		0.83	V	
		$I_C = 100mA, I_B = 5mA$		1.05	V	
Collector Emitter Saturation Voltage	$V_{CE(Sat)}$	$I_C = 10mA, I_B = 0.5mA$		0.25	V	
		$I_C = 100mA, I_B = 5mA$		0.60	V	
Base Emitter on Voltage	$V_{BE(on)}$	$I_C = 2mA, V_{CE} = 5V$	0.55	0.70	V	
		$I_C = 10mA, V_{CE} = 5V$		0.77	V	
Collector Knee Voltage	$V_{CE(K)}$	$I_C = 10mA, I_B = \text{The Value for which } I_C = 11mA, \text{ at } V_{CE} = 1V$		0.60	V	
Transition Frequency	$f_t$	$V_{CE} = 5V, I_C = 10mA, f = 100MHz$	150		MHz	
Noise Figure	NF	$V_{CE} = 5V, I_C = 0.2mA$ $R_g = 2kohms,$ $F = 30Hz \text{ to } 15 KHz$ $F = 1kHz, B = 200Hz$	BC109	4.0	dB	
			BC109	4.0	dB	
			BC107/108	10	dB	
Output Capacitance	$C_{obo}$	$V_{CB} = 10V, f = 1MHz$		4.5	pF	
Small Signal Current Gain	$h_{FE}$	ALL $f = 1kHz$ $I_C = 2mA, V_{CE} = 5V$	BC107	125	500	
			BC108	125	900	
			BC109	240	900	
			A Group	125	260	
			B Group	240	500	
			C Group	450	900	
Input Impedance	$h_{ie}$	ALL $f = 1kHz$ $I_C = 2mA, V_{CE} = 5V$	A Group	1.6	4.5	K $\Omega$
			B Group	3.2	8.5	K $\Omega$
			C Group	6.0	15	K $\Omega$
Output Admittance	$h_{oe}$	ALL $f = 1kHz$ $I_C = 2mA, V_{CE} = 5V$	A Group		30	umhos
			B Group		60	umhos
			C Group		110	umhos

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### Specifications

V <sub>CEO</sub> maximum (V)	V <sub>CBO</sub> maximum (V)	I <sub>C</sub> maximum (A)	h <sub>FE</sub> minimum at I <sub>C</sub> = 2 (mA)	Noise Figure maximum (dB)	Transition Frequency minimum (MHz)	P <sub>tot</sub> at T <sub>a</sub> = 25°C (mW)	Package and pin out	Part Number (NPN)
45	50	0.2	125	10	150	600	TO-18	BC107
								BC107A
BC107B								
BC108								
25	30		240	4				BC108B
								BC108C
								BC109
								BC109B
							BC109C	

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