

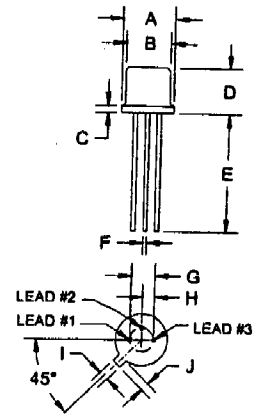
**BCY59C**  
NPN Silicon Transistor  
LOW NOISE AUDIO AMPLIFIER

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
V <sub>CEs</sub>	Collector-emitter Voltage (V <sub>BE</sub> = 0)	45	V
V <sub>CE0</sub>	Collector-emitter Voltage (I <sub>B</sub> = 0)	45	V
V <sub>EBO</sub>	Emitter-base Voltage (I <sub>C</sub> = 0)	7	V
I <sub>C</sub>	Collector Current	200	mA
I <sub>B</sub>	Base Current	50	mA
P <sub>tot</sub>	Total Power Dissipation at T <sub>amb</sub> ≤ 25 °C at T <sub>case</sub> ≤ 45 °C	0.39 1	mW W
T <sub>stg</sub> , T <sub>J</sub>	Storage and Junction Temperature	65 to 200	°C

SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A (DIA)	0.209	0.230	5.31	5.84
B (DIA)	0.178	0.195	4.52	4.95
C	-	0.030	-	0.76
D	0.170	0.210	4.32	5.33
E	0.500	-	12.70	-
F (DIA)	0.018	0.019	0.41	0.48
G (DIA)	0.100	-	2.54	-
H	0.050	-	1.27	-
I	0.038	0.048	0.91	1.17
J	0.028	0.048	0.71	1.22

TO-18 (REV: R1)



**THERMAL DATA**

R <sub>th j-case</sub>	Thermal Resistance Junction-case	Max	150	°C/W
R <sub>th j-amb</sub>	Thermal Resistance Junction-ambient	Max	450	°C/W

**ELECTRICAL CHARACTERISTICS (T<sub>amb</sub> = 25 °C unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CEs</sub>	Collector Cutoff Current (V <sub>BE</sub> = 0)	V <sub>CE</sub> = 45 V V <sub>CE</sub> = 45 V T <sub>amb</sub> = 150 °C		0.1	10	nA μA
I <sub>CEX</sub>	Collector Cutoff Current (V <sub>BE</sub> = -0.2 V)	V <sub>CE</sub> = 45 V T <sub>amb</sub> = 100 °C			20	μA
I <sub>EBO</sub>	Emitter cutoff Current Voltage (I <sub>B</sub> = 0)	V <sub>EB</sub> = 5 V	45		10	nA V
(BR)EBO*	Emitter-base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = 10 μA	7			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 10 mA I <sub>B</sub> = 0.25 mA I <sub>C</sub> = 100 mA I <sub>B</sub> = 2.5 mA		0.12 0.4	0.35 0.7	V V
V <sub>BE</sub>	Base-emitter Voltage	I <sub>C</sub> = 2 mA V <sub>CE</sub> = 5 V I <sub>C</sub> = 100 mA V <sub>CE</sub> = 1 V	0.55	0.65 0.75	0.7	V V
V <sub>BE(sat)*</sub>	Base-emitter Saturation Voltage	I <sub>C</sub> = 10 mA I <sub>B</sub> = 0.25 mA I <sub>C</sub> = 100 mA I <sub>B</sub> = 2.5 mA	0.6 0.75	0.7 0.9	0.85 1.2	V V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 10 μA V <sub>CE</sub> = 5 V  I <sub>C</sub> = 10 mA V <sub>CE</sub> = 1 V  I <sub>C</sub> = 100 mA V <sub>CE</sub> = 1 V	250 180 40	350 365	460	
h <sub>fe</sub>	Small Signal Current Gain	I <sub>C</sub> = 2 mA f = 1 kHz V <sub>CE</sub> = 5 V	250		500	
f <sub>T</sub>	Transition Frequency	I <sub>C</sub> = 10 mA f = 100 MHz V <sub>CE</sub> = 5 V		200		MHz
C <sub>EBO</sub>	Emitter-base Capacitance	I <sub>C</sub> = 0 f = 1 MHz V <sub>EB</sub> = 0.5 V		11	15	pF
C <sub>CB0</sub>	Collector-base Capacitance	I <sub>E</sub> = 0 f = 1 MHz V <sub>CB</sub> = 10 V		3.5	6	pF
NF	Noise Figure	I <sub>C</sub> = 0.2 mA V <sub>CE</sub> = 5 V R <sub>g</sub> = 2 kΩ f = 1 kHz		2	6	dB
t <sub>on</sub>	Turn-on Time	I <sub>C</sub> = 10 mA V <sub>CC</sub> = 10 V I <sub>B1</sub> = 1 mA I <sub>C</sub> = 100 mA V <sub>CC</sub> = 10 V I <sub>B1</sub> = 10 mA		85 55	150 150	ns ns
t <sub>off</sub>	Turn-off Time	I <sub>C</sub> = 10 mA V <sub>CC</sub> = 10 V I <sub>B1</sub> = -I <sub>B2</sub> = 1 mA I <sub>C</sub> = 100 mA V <sub>CC</sub> = 10 V I <sub>B1</sub> = -I <sub>B2</sub> = 10 mA		480 480	800 800	ns ns

\* Pulsed : pulse duration = 300 μs, duty cycle = 1 %.

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