

New Jersey Semi-Conductor Products, Inc.

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SPRINGFIELD, NEW JERSEY 071
U.S.A.

BCY59C NPN Silicon Transistor LOW NOISE AUDIO AMPLIFIER

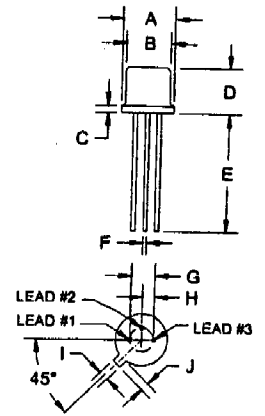
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ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-emitter Voltage ($V_{BE} = 0$)	45	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	45	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	7	V
I_C	Collector Current	200	mA
I_B	Base Current	50	mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25^\circ\text{C}$ at $T_{case} \leq 45^\circ\text{C}$	0.39 1	mW W
T_{stg}, T_j	Storage and Junction Temperature	65 to 200	$^\circ\text{C}$

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

Symbol	Parameter	Max	Value	Unit
$R_{th(j-case)}$	Thermal Resistance Junction-case	Max	150	$^\circ\text{C/W}$
$R_{th(j-amb)}$	Thermal Resistance Junction-ambient	Max	450	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cutoff Current ($V_{BE} = 0$)	$V_{CE} = 45\text{ V}$ $V_{CE} = 45\text{ V}$ $T_{amb} = 150^\circ\text{C}$		0.1 0.1	10 10	nA μA
I_{CEX}	Collector Cutoff Current ($V_{BE} = -0.2\text{ V}$)	$V_{CE} = 45\text{ V}$ $T_{amb} = 100^\circ\text{C}$			20	μA
I_{EBO}	Emitter cutoff Current Voltage ($I_B = 0$)	$V_{EB} = 5\text{ V}$	45		10	nA V
$(BR)EBO^*$	Emitter-base Breakdown Voltage ($I_C = 0$)	$I_E = 10\ \mu\text{A}$	7			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 10\text{ mA}$ $I_B = 0.25\text{ mA}$ $I_C = 100\text{ mA}$ $I_B = 2.5\text{ mA}$		0.12 0.4	0.35 0.7	V V
V_{BE}	Base-emitter Voltage	$I_C = 2\text{ mA}$ $V_{CE} = 5\text{ V}$ $I_C = 100\text{ mA}$ $V_{CE} = 1\text{ V}$	0.55	0.65 0.75	0.7 V	V V
$V_{BE(sat)}^*$	Base-emitter Saturation Voltage	$I_C = 10\text{ mA}$ $I_B = 0.25\text{ mA}$ $I_C = 100\text{ mA}$ $I_B = 2.5\text{ mA}$	0.6 0.75	0.7 0.9	0.85 1.2	V V
h_{FE}^*	DC Current Gain	$I_C = 10\ \mu\text{A}$ $V_{CE} = 5\text{ V}$	250	350	460	
		$I_C = 10\text{ mA}$ $V_{CE} = 1\text{ V}$	180	365		
		$I_C = 100\text{ mA}$ $V_{CE} = 1\text{ V}$	40 60			
h_{fe}	Small Signal Current Gain	$I_C = 2\text{ mA}$ $V_{CE} = 5\text{ V}$ $f = 1\text{ kHz}$	250		500	
f_T	Transition Frequency	$I_C = 10\text{ mA}$ $V_{CE} = 5\text{ V}$ $f = 100\text{ MHz}$		200		MHz
C_{EBO}	Emitter-base Capacitance	$I_C = 0$ $V_{EB} = 0.5\text{ V}$ $f = 1\text{ MHz}$		11	15	pF
C_{CBO}	Collector-base Capacitance	$I_E = 0$ $V_{CB} = 10\text{ V}$ $f = 1\text{ MHz}$		3.5	6	pF
NF	Noise Figure	$I_C = 0.2\text{ mA}$ $V_{CE} = 5\text{ V}$ $R_g = 2\text{ k}\Omega$ $f = 1\text{ kHz}$		2	6	dB
t_{on}	Turn-on Time	$I_C = 10\text{ mA}$ $V_{CC} = 10\text{ V}$ $I_{B1} = 1\text{ mA}$ $I_C = 100\text{ mA}$ $V_{CC} = 10\text{ V}$ $I_{B1} = 10\text{ mA}$		85 55	150 150	ns ns
t_{off}	Turn-off Time	$I_C = 10\text{ mA}$ $V_{CC} = 10\text{ V}$ $I_{B1} = -I_{B2} = 1\text{ mA}$ $I_C = 100\text{ mA}$ $V_{CC} = 10\text{ V}$ $I_{B1} = -I_{B2} = 10\text{ mA}$		480	800	ns ns

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

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