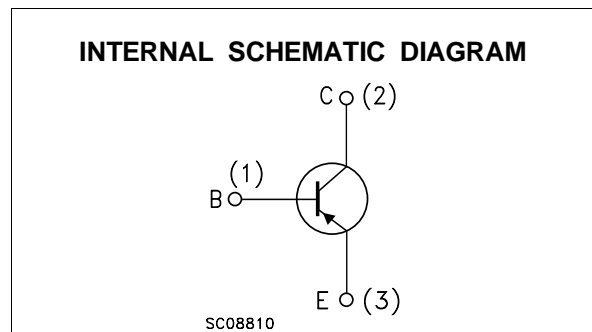
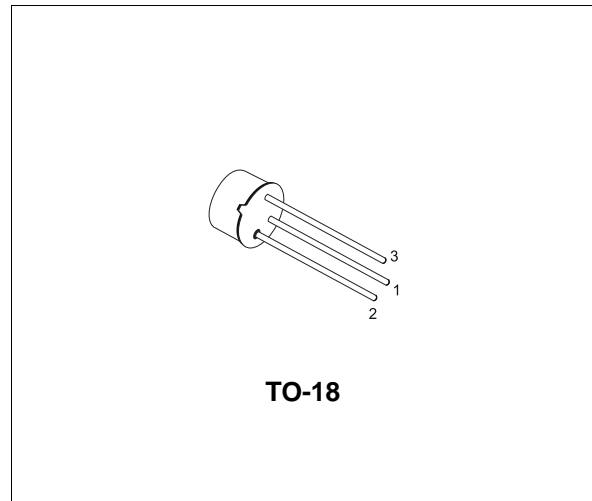


## LOW NOISE AUDIO AMPLIFIER

### DESCRIPTION

The BCY79 is a silicon Planar Epitaxial PNP transistor in Jedec TO-18 metal case. It is intended for use in audio input stages, driver stages and low-noise input stages.

The NPN complementary type is BCY59.



### 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 ( $I_C = 0$ )	-5	V
$I_C$	Collector Current	-200	mA
$I_B$	Base Current	-20	mA
$P_{tot}$	Total Dissipation at $T_{amb} \leq 25\text{ }^\circ\text{C}$ at $T_C \leq 25\text{ }^\circ\text{C}$	390 1	mW W
$T_{stg}$	Storage Temperature	-55 to 175	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	175	$^\circ\text{C}$

**THERMAL DATA**

R <sub>thj-case</sub>	Thermal Resistance Junction-Case	Max	150	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-Ambient	Max	450	°C/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CES</sub>	Collector Cut-off Current (V <sub>BE</sub> = 0)	V <sub>CE</sub> = -35 V V <sub>CE</sub> = -35 V T <sub>C</sub> = 150 °C		-2	-20 -100 -10	nA nA μA
I <sub>CEx</sub>	Collector Cut-off Current (V <sub>BE</sub> = -2 V)	V <sub>CE</sub> = -45 V T <sub>C</sub> = 100 °C			-20	μA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = -4 V			-20	nA
V <sub>(BR)CES</sub>	Collector-Emitter Breakdown Voltage (V <sub>BE</sub> = 0)	I <sub>C</sub> = -10 μA	-45			V
V <sub>(BR)CEO*</sub>	Collector-Emitter Breakdown Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = -2 mA	-45			V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = -1 μA	-5			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	-0.25 -0.8	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 -0.7	-0.7 -0.85	-0.85 -1.2	V V
V <sub>BE(ON)*</sub>	Base-Emitter (On) Voltage	I <sub>C</sub> = -10 μA V <sub>CE</sub> = -5 V I <sub>C</sub> = -2 mA 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	-0.6	-0.55 -0.65 -0.68 -0.75	-0.75	V V V V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = -10 μA V <sub>CE</sub> = -5 V Gr. VIII Gr. IX Gr. X I <sub>C</sub> = -2 mA V <sub>CE</sub> = -5 V Gr. VIII Gr. IX Gr. X I <sub>C</sub> = -10 mA V <sub>CE</sub> = -1 V Gr. VIII Gr. IX Gr. X I <sub>C</sub> = -100 mA V <sub>CE</sub> = -1 V Gr. VIII Gr. IX Gr. X	30 40 100	200 270 340	310 460 630	
h <sub>fe*</sub>	Small Signal Current Gain	I <sub>C</sub> = -2 mA V <sub>CE</sub> = -5 V f = 1 KHz Gr. VIII Gr. IX Gr. X	175 250 350	260 330 520	350 500 700	
f <sub>T</sub>	Transition Frequency	I <sub>C</sub> = -10 mA V <sub>CE</sub> = -5 V f = 100 MHz		180		MHz

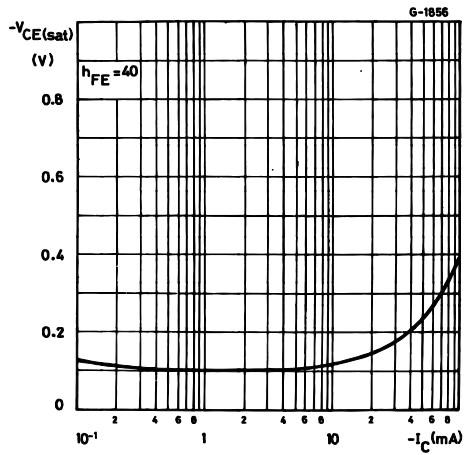
\* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 1 %

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

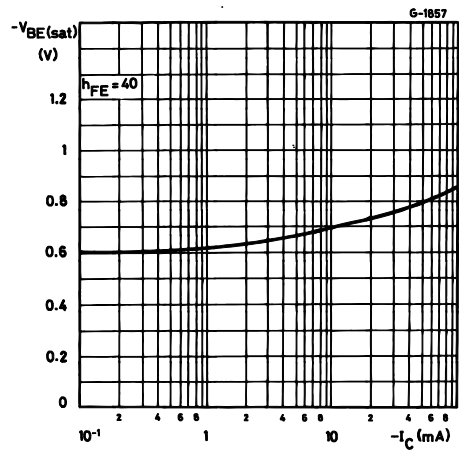
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$C_{\text{CBO}}$	Collector-Base Capacitance	$I_{\text{E}} = 0$ $V_{\text{CB}} = -10\text{ V}$ $f = 1\text{ MHz}$		4.5	7	pF
$C_{\text{EBO}}$	Emitter-Base Capacitance	$I_{\text{C}} = 0$ $V_{\text{EB}} = -0.5\text{ V}$ $f = 1\text{ MHz}$		11	15	pF
NF	Noise Figure	$I_{\text{C}} = -0.2\text{ mA}$ $V_{\text{CE}} = -5\text{ V}$ $f = 1\text{ KHz}$ $R_{\text{g}} = 2\text{ K}\Omega$ $\Delta f = 200\text{ Hz}$		2	6	dB
$h_{\text{ie}}$	Input Impedance	$I_{\text{C}} = -2\text{ mA}$ $V_{\text{CE}} = -5\text{ V}$ $f = 1\text{ KHz}$ Gr. VIII Gr. IX Gr. X		3.6 4.5 7.5		K $\Omega$ K $\Omega$ K $\Omega$
$h_{\text{re}}$	Reverse Voltage Ratio	$I_{\text{C}} = -2\text{ mA}$ $V_{\text{CE}} = -5\text{ V}$ $f = 1\text{ KHz}$ Gr. VIII Gr. IX Gr. X		2 2 3		$10^{-4}$ $10^{-4}$ $10^{-4}$
$h_{\text{oe}}$	Output Admittance	$I_{\text{C}} = -2\text{ mA}$ $V_{\text{CE}} = -5\text{ V}$ $f = 1\text{ KHz}$ Gr. VIII Gr. IX Gr. X		24 30 50	50 60 100	$\mu\text{S}$ $\mu\text{S}$ $\mu\text{S}$
$t_{\text{d}}$	Delay Time	$V_{\text{CC}} = -10\text{ V}$ $I_{\text{C}} = -10\text{ mA}$ $I_{\text{B1}} = -1\text{ mA}$ $I_{\text{C}} = -100\text{ mA}$ $I_{\text{B1}} = -10\text{ mA}$		50 50		ns ns
$t_{\text{r}}$	Rise Time	$V_{\text{CC}} = -10\text{ V}$ $I_{\text{C}} = -10\text{ mA}$ $I_{\text{B1}} = -1\text{ mA}$ $I_{\text{C}} = -100\text{ mA}$ $I_{\text{B1}} = -10\text{ mA}$		35 5		ns ns
$t_{\text{s}}$	Storage Time	$V_{\text{CC}} = -10\text{ V}$ $I_{\text{C}} = -10\text{ mA}$ $I_{\text{B1}} = -I_{\text{B2}} = 1\text{ mA}$ $I_{\text{C}} = -100\text{ mA}$ $I_{\text{B1}} = -I_{\text{B2}} = 10\text{ mA}$		400 250		ns ns
$t_{\text{f}}$	Fall Time	$V_{\text{CC}} = -10\text{ V}$ $I_{\text{C}} = -10\text{ mA}$ $I_{\text{B1}} = -I_{\text{B2}} = 1\text{ mA}$ $I_{\text{C}} = -100\text{ mA}$ $I_{\text{B1}} = -I_{\text{B2}} = 10\text{ mA}$		80 200		ns ns
$t_{\text{on}}$	Turn-on Time	$V_{\text{CC}} = -10\text{ V}$ $I_{\text{C}} = -10\text{ mA}$ $I_{\text{B1}} = -1\text{ mA}$ $I_{\text{C}} = -100\text{ mA}$ $I_{\text{B1}} = -10\text{ mA}$		85 55	150 150	ns ns
$t_{\text{off}}$	Turn-off Time	$V_{\text{CC}} = -10\text{ V}$ $I_{\text{C}} = -10\text{ mA}$ $I_{\text{B1}} = -I_{\text{B2}} = 1\text{ mA}$ $I_{\text{C}} = -100\text{ mA}$ $I_{\text{B1}} = -I_{\text{B2}} = 10\text{ mA}$		480 480	800 800	ns ns

# BCY79

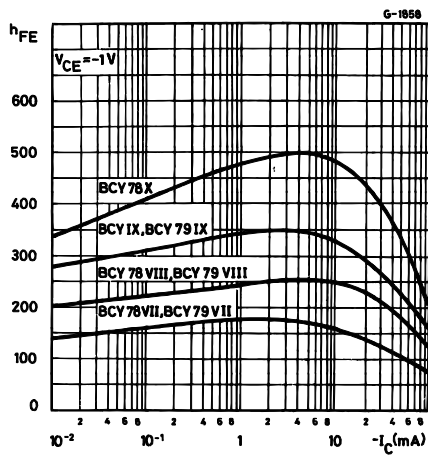
Collector-Emitter Saturation Voltage



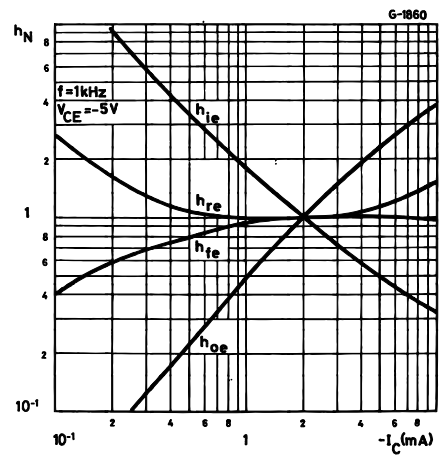
Base-Emitter Saturation Voltage



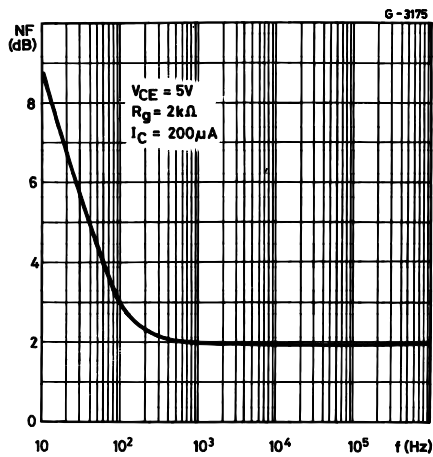
DC Current Gain



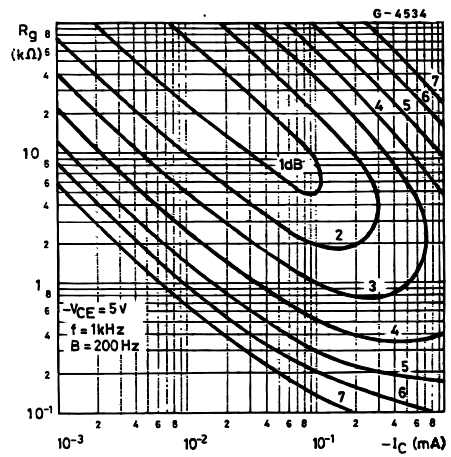
Normalized h Parameters



Noise Figure vs. Frequency

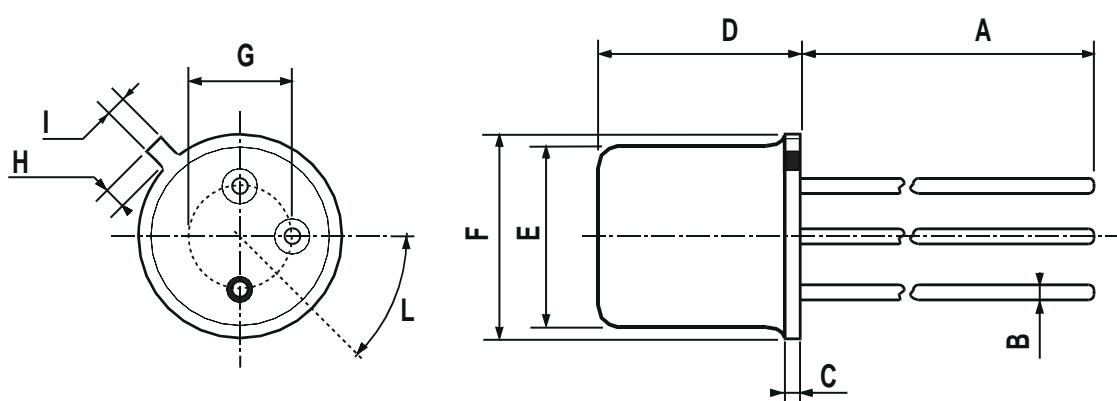


Noise Figure (f = 1 KHz)



## TO-18 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		12.7			0.500	
B			0.49			0.019
D			5.3			0.208
E			4.9			0.193
F			5.8			0.228
G	2.54			0.100		
H			1.2			0.047
I			1.16			0.045
L	45°			45°		



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