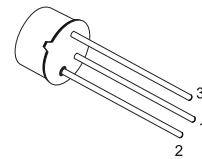


LOW NOISE AUDIO AMPLIFIER

DESCRIPTION

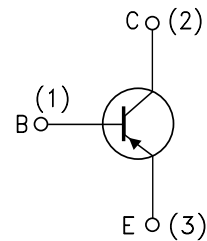
The BCY79 is a silicon Planar Epitaxial PNP transistor in Jedec TO-18 metal case. It is intended for use in audio input stages, driver stages and low-noise input stages.

The NPN complementary type is BCY59.



TO-18

INTERNAL SCHEMATIC DIAGRAM



SC08810

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 _{thj-case}	Thermal Resistance Junction-Case	Max	150	°C/W
R _{thj-amb}	Thermal Resistance Junction-Ambient	Max	450	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CES}	Collector Cut-off Current (V _{BE} = 0)	V _{CE} = -35 V V _{CE} = -35 V T _C = 150 °C		-2	-20 -100 -10	nA nA μA
I _{CEx}	Collector Cut-off Current (V _{BE} = -2 V)	V _{CE} = -45 V T _C = 100 °C			-20	μA
I _{EBO}	Emitter Cut-off Current (I _C = 0)	V _{EB} = -4 V			-20	nA
V _{(BR)CES}	Collector-Emitter Breakdown Voltage (V _{BE} = 0)	I _C = -10 μA	-45			V
V _{(BR)CEO*}	Collector-Emitter Breakdown Voltage (I _B = 0)	I _C = -2 mA	-45			V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage (I _C = 0)	I _E = -1 μA	-5			V
V _{CE(sat)*}	Collector-Emitter Saturation Voltage	I _C = -10 mA I _B = -0.25 mA I _C = -100 mA I _B = -2.5 mA		-0.12 -0.4	-0.25 -0.8	V V
V _{BE(sat)*}	Base-Emitter Saturation Voltage	I _C = -10 mA I _B = -0.25 mA I _C = -100 mA I _B = -2.5 mA	-0.6 -0.7	-0.7 -0.85	-0.85 -1.2	V V
V _{BE(ON)*}	Base-Emitter (On) Voltage	I _C = -10 μA V _{CE} = -5 V I _C = -2 mA V _{CE} = -5 V I _C = -10 mA V _{CE} = -1 V I _C = -100 mA V _{CE} = -1 V	-0.6	-0.55 -0.65 -0.68 -0.75	-0.75	V V V V
h _{FE*}	DC Current Gain	I _C = -10 μA V _{CE} = -5 V Gr. VIII Gr. IX Gr. X I _C = -2 mA V _{CE} = -5 V Gr. VIII Gr. IX Gr. X I _C = -10 mA V _{CE} = -1 V Gr. VIII Gr. IX Gr. X I _C = -100 mA V _{CE} = -1 V Gr. VIII Gr. IX Gr. X	30 40 100	200 270 340	310 460 630	
h _{fe*}	Small Signal Current Gain	I _C = -2 mA V _{CE} = -5 V f = 1 KHz Gr. VIII Gr. IX Gr. X	175 250 350	260 330 520	350 500 700	
f _T	Transition Frequency	I _C = -10 mA V _{CE} = -5 V f = 100 MHz		180		MHz

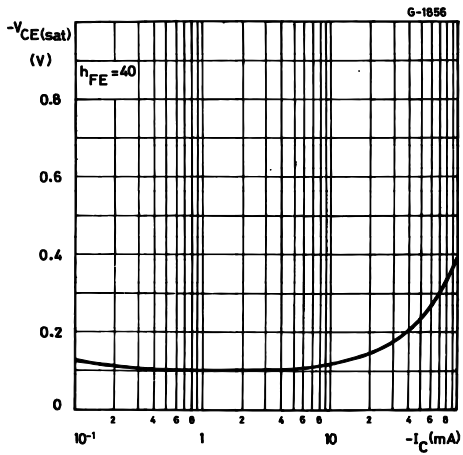
* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 1 %

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

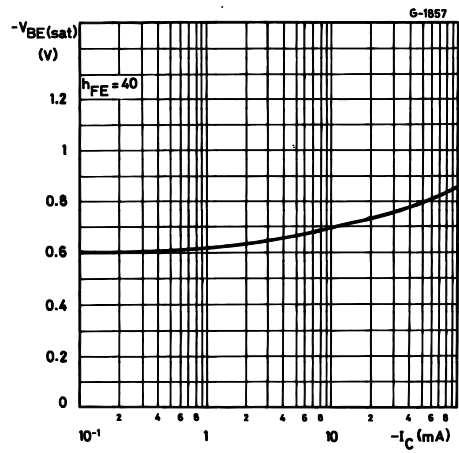
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C_{CBO}	Collector-Base Capacitance	$I_{\text{E}} = 0$ $V_{\text{CB}} = -10\text{ V}$ $f = 1\text{ MHz}$		4.5	7	pF
C_{EBO}	Emitter-Base Capacitance	$I_{\text{C}} = 0$ $V_{\text{EB}} = -0.5\text{ V}$ $f = 1\text{ MHz}$		11	15	pF
NF	Noise Figure	$I_{\text{C}} = -0.2\text{ mA}$ $V_{\text{CE}} = -5\text{ V}$ $f = 1\text{ KHz}$ $R_{\text{g}} = 2\text{ K}\Omega$ $\Delta f = 200\text{ Hz}$		2	6	dB
h_{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 Ω K Ω K Ω
h_{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_{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	μS μS μS
t_{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_{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_{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_{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_{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_{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

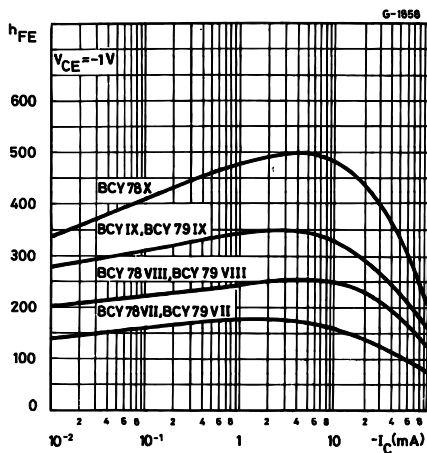
Collector-Emitter Saturation Voltage



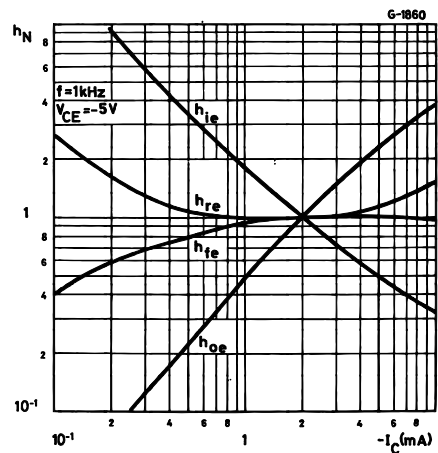
Base-Emitter Saturation Voltage



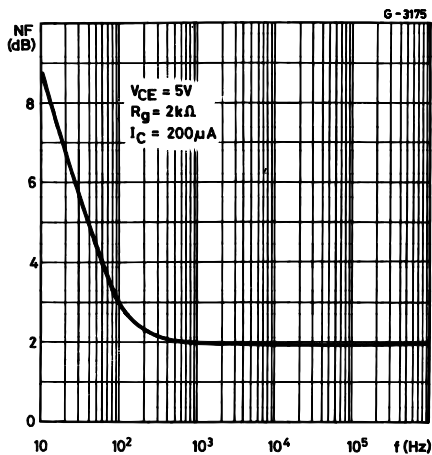
DC Current Gain



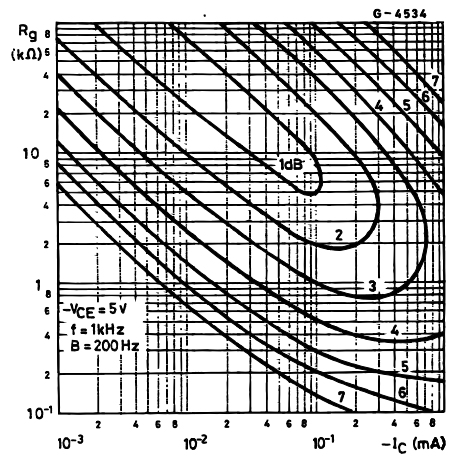
Normalized h Parameters



Noise Figure vs. Frequency

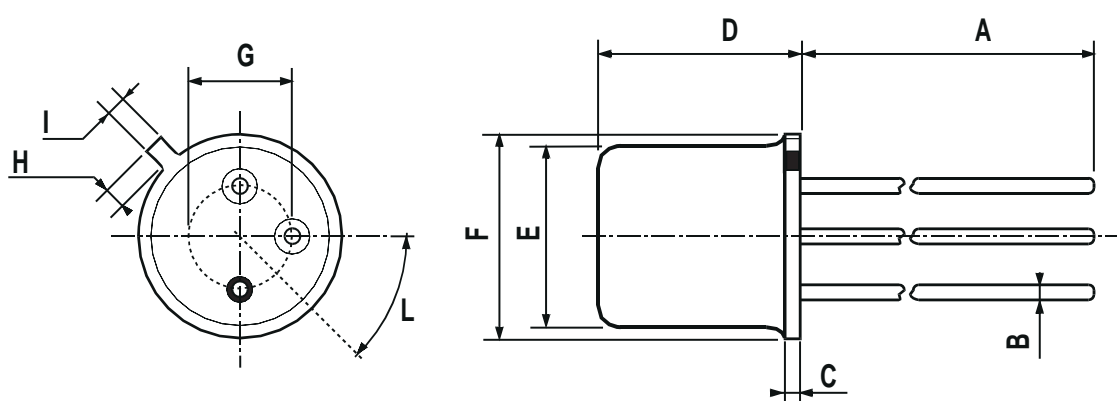


Noise Figure (f = 1 KHz)



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°		



0016043

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