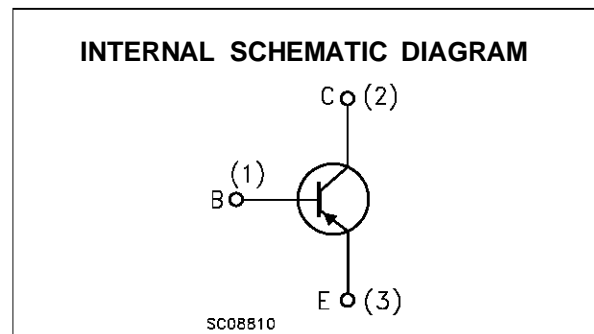
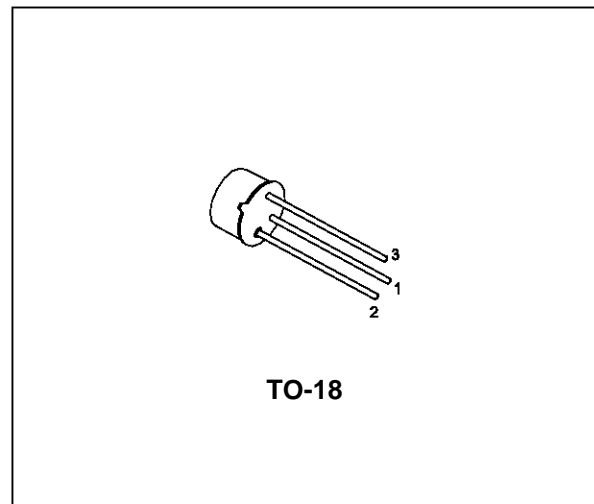


## LOW NOISE AUDIO AMPLIFIERS

### DESCRIPTION

The BCY79 is a silicon planar epitaxial PNP transistors in Jedec TO-18 metal case. They are designed for use in audio driver and low-noise input stages.

The complementary NPN type is the 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
$I_{CM}$	Collector Peak Current	-20	mA
$P_{tot}$	Total Dissipation at $T_{amb} \leq 25\text{ }^\circ\text{C}$ at $T_{case} \leq 45\text{ }^\circ\text{C}$	390	mW
		1	W
$T_{stg}$	Storage Temperature	-65 to 150	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	150	$^\circ\text{C}$

# BCY79

## THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-Case	Max	150	$^{\circ}C/W$
$R_{thj-amb}$	Thermal Resistance Junction-Ambient	Max	450	$^{\circ}C/W$

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0$ )	$V_{CE} = -35 V$ $V_{CE} = -45 V$ $V_{CE} = -35 V$ $T_{amb} = 150^{\circ}C$		-2	-20 -100 -10	nA nA $\mu A$
$I_{CEX}$	Collector Cut-off Current ( $V_{BE} = -2V$ )	$V_{CE} = -45 V$ $T_{amb} = 100^{\circ}C$			-20	$\mu A$
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = -4 V$			-20	nA
$V_{(BR)CES}^*$	Collector-Emitter Breakdown Voltage ( $V_{BE} = 0$ )	$I_C = -10 \mu A$	-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 ( $I_C = 0$ )	$I_E = -1 \mu A$	-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
$V_{BE(sat)}^*$	Collector-Base 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	$I_C = -10 \mu A$ $V_{CE} = -5 V$ $I_C = -2 mA$ $V_{CE} = -5 V$ $I_C = -10 mA$ $V_{CE} = -1 V$ $I_C = -100 mA$ $V_{CE} = -1 V$	-0.6	-0.55 -0.65 -0.68 -0.75	-0.75	V V V V
$h_{FE}^*$	DC Current Gain	$I_C = -10 \mu A$ $V_{CE} = -5 V$ Gr. VII Gr. VIII Gr. IX $I_C = -2 mA$ $V_{CE} = -5 V$ Gr. VII Gr. VIII Gr. IX $I_C = -10 mA$ $V_{CE} = -1 V$ Gr. VII Gr. VIII Gr. IX $I_C = -100 mA$ $V_{CE} = -1 V$ Gr. VII Gr. VIII Gr. IX				
$h_{fe}^*$	Small Signal Current Gain	$I_C = -2 mA$ $V_{CE} = -5 V$ $f = 1KHz$ Gr. VII Gr. VIII Gr. IX	125 175 250	200 260 330	250 350 500	

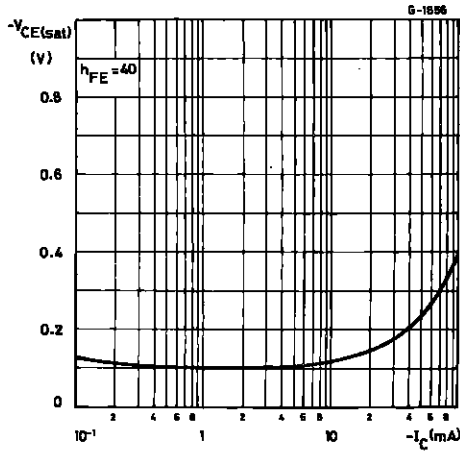
\* Pulsed: Pulse duration = 300  $\mu s$ , duty cycle  $\leq 2\%$

## ELECTRICAL CHARACTERISTICS (continued)

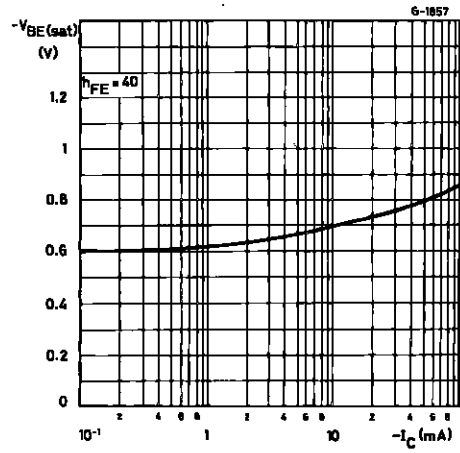
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$f_T$	Transition Frequency	$I_C = -10 \text{ mA}$ $V_{CE} = -5 \text{ V}$ $f = 100 \text{ MHz}$		180		MHz
$C_{EBO}$	Emitter Base Capacitance	$I_C = 0$ $V_{EB} = -0.5 \text{ V}$ $f = 1 \text{ MHz}$		11	15	pF
$C_{CBO}$	Collector Base Capacitance	$I_E = 0$ $V_{CB} = -10 \text{ V}$ $f = 1 \text{ MHz}$		4.5	7	pF
NF	Noise Figure	$I_C = -0.2 \text{ mA}$ $V_{CE} = -5 \text{ V}$ $f = 1 \text{ KHz}$ $R_g = 2 \text{ K}\Omega$		2	6	dB
$h_{ie}$	Input Impedance	$I_C = -2 \text{ mA}$ $V_{CE} = -5 \text{ V}$ $f = 1 \text{ KHz}$ Gr. VII Gr. VIII Gr. IX		2.7 3.6 4.5		$\text{K}\Omega$ $\text{K}\Omega$ $\text{K}\Omega$
$h_{re}$	Reverse Voltage Ratio	$I_C = -2 \text{ mA}$ $V_{CE} = -5 \text{ V}$ $f = 1 \text{ KHz}$ Gr. VII Gr. VIII Gr. IX		1.5 2 2		$10^{-4}$ $10^{-4}$ $10^{-4}$
$h_{oe}$	Output Admittance	$I_C = -2 \text{ mA}$ $V_{CE} = -5 \text{ V}$ $f = 1 \text{ KHz}$ Gr. VII Gr. VIII Gr. IX		18 24 30	30 50 60	$\mu\text{S}$ $\mu\text{S}$ $\mu\text{S}$
$t_d$	Delay Time	$V_{CC} = -10 \text{ V}$ $I_C = -10 \text{ mA}$ $I_{B1} = -1 \text{ mA}$ $I_C = -100 \text{ mA}$ $I_{B1} = -10 \text{ mA}$		35 5		ns ns
$t_r$	Rise Time	$V_{CC} = -10 \text{ V}$ $I_C = -10 \text{ mA}$ $I_{B1} = -1 \text{ mA}$ $I_C = -100 \text{ mA}$ $I_{B1} = -10 \text{ mA}$		50 50		ns ns
$t_s$	Storage Time	$V_{CC} = -10 \text{ V}$ $I_C = -10 \text{ mA}$ $I_{B1} = -I_{B2} = 1 \text{ mA}$ $I_C = -100 \text{ mA}$ $I_{B1} = -I_{B2} = 10 \text{ mA}$		400 250		ns ns
$t_f$	Fall Time	$V_{CC} = -10 \text{ V}$ $I_C = -10 \text{ mA}$ $I_{B1} = -I_{B2} = 1 \text{ mA}$ $I_C = -100 \text{ mA}$ $I_{B1} = -I_{B2} = 10 \text{ mA}$		80 200		ns ns
$t_{on}$	Turn-on Time	$V_{CC} = -10 \text{ V}$ $I_C = -10 \text{ mA}$ $I_{B1} = -1 \text{ mA}$ $I_C = -100 \text{ mA}$ $I_{B1} = -10 \text{ mA}$		85 55	150 150	ns ns
$t_{off}$	Turn-off Time	$V_{CC} = -10 \text{ V}$ $I_C = -10 \text{ mA}$ $I_{B1} = -I_{B2} = 1 \text{ mA}$ $I_C = -100 \text{ mA}$ $I_{B1} = -I_{B2} = 10 \text{ mA}$		480 450	800 800	ns ns

\* Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle  $\leq 1\%$

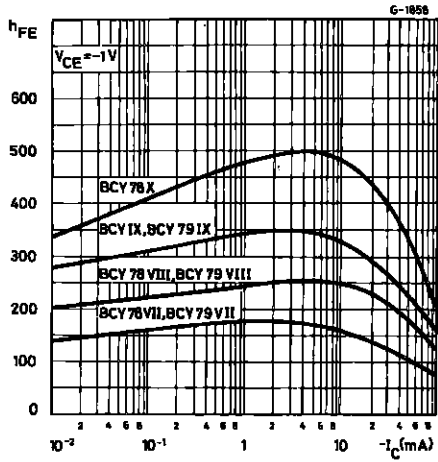
Collector-emitter Saturation Voltage.



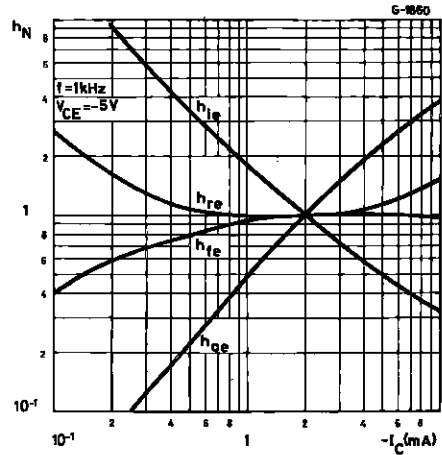
Base-emitter Saturation Voltage.



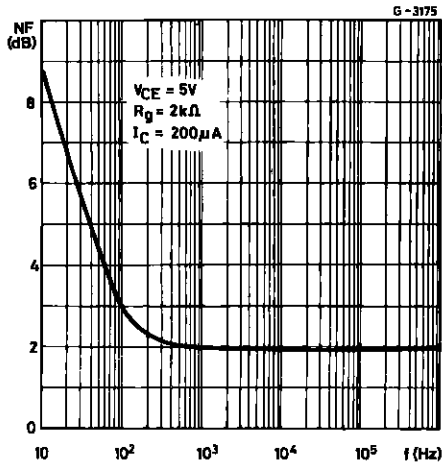
DC Current Gain.



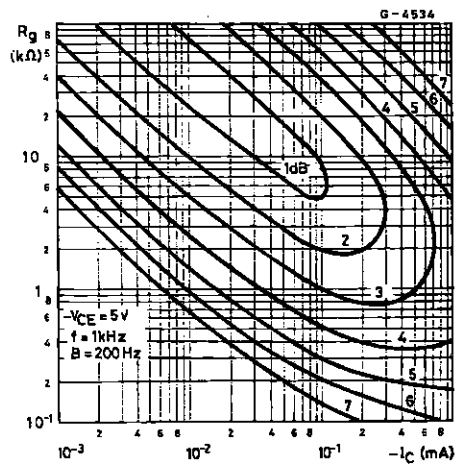
Normalized h Parameters.



Noise Figure vs. Frequency.

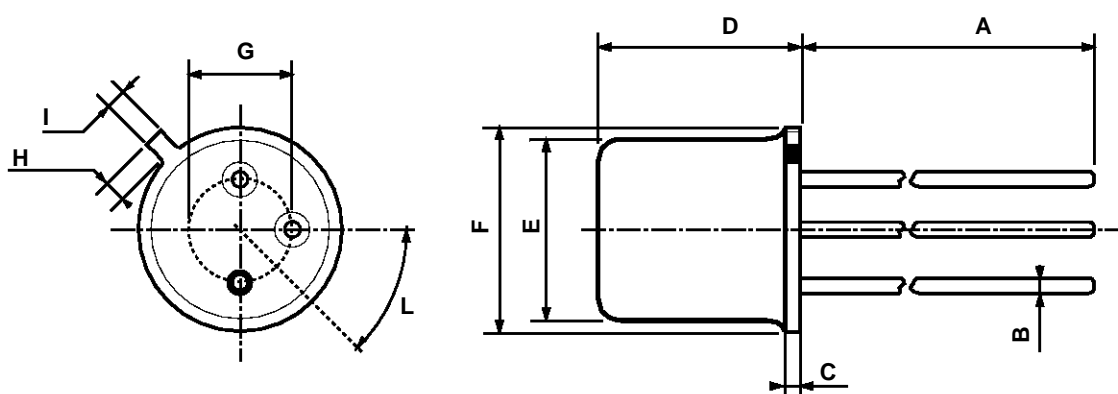


Noise Figure (f = 1 kHz).



## 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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