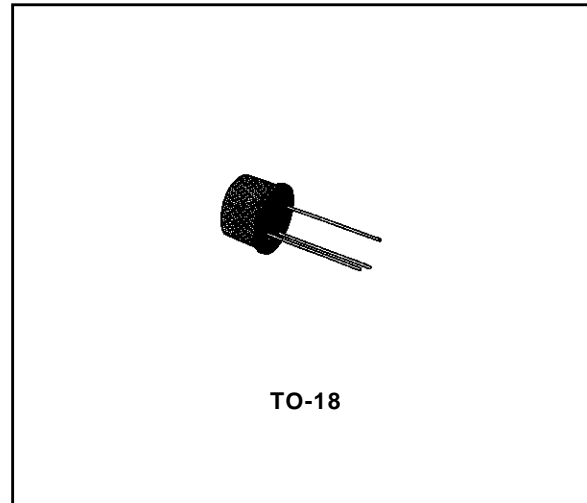


LOW NOISE AUDIO AMPLIFIERS

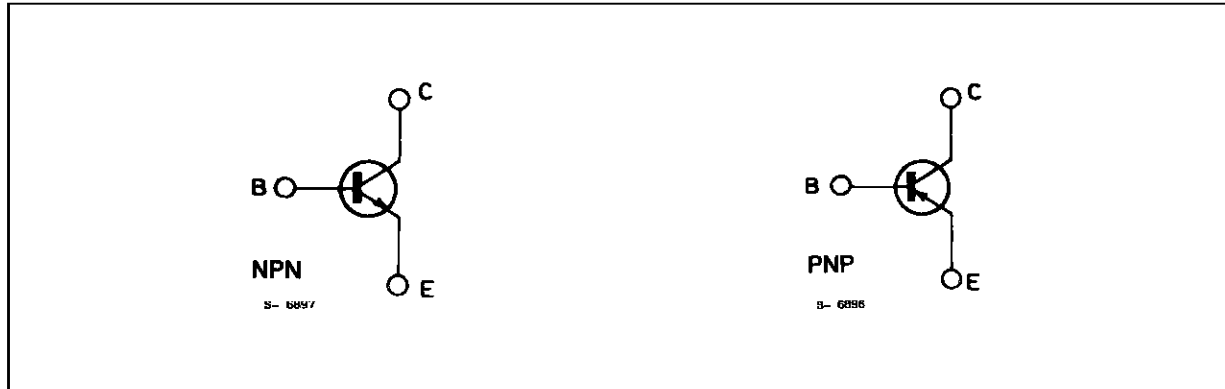
DESCRIPTION

The BCY78 and BCY79 are 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 types are respectively the BCY58 and BCY59.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BCY78	BCY79	
V_{CES}	Collector-emitter Voltage ($V_{BE} = 0$)	- 32	- 45	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	- 32	- 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 Power 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}, T_j	Storage and Junction Temperature	- 65 to 200		$^\circ\text{C}$

BCY78-BCY79

THERMAL DATA

$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	150	$^{\circ}C/W$
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	450	$^{\circ}C/W$

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cutoff Current ($V_{BE} = 0$)	For BCY78 $V_{CE} = -25\ V$ $V_{CE} = -32\ V$ $V_{CE} = -25\ V$ $T_{amb} = 150\ ^{\circ}C$ For BCY79 $V_{CE} = -35\ V$ $V_{CE} = -45\ V$ $V_{CE} = -35\ V$ $T_{amb} = 150\ ^{\circ}C$		- 2	- 20 - 100 - 10	nA nA μA
I_{CEX}	Collector Cutoff Current ($V_{BE} = 0.2\ V$)	For BCY78 $V_{CE} = -32\ V$ $T_{amb} = 100\ ^{\circ}C$ For BCY79 $V_{CE} = -45\ V$ $T_{amb} = 100\ ^{\circ}C$			- 20 - 20	μA μA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = -4\ V$			- 20	nA
$V_{(BR)CES}$	Collector-emitter Breakdown Voltage ($V_{BE} = 0$)	$I_C = -10\ \mu A$ For BCY78 For BCY79	- 32 - 45			V V
$V_{(BR)CEO}^*$	Collector-emitter Breakdown Voltage ($I_B = 0$)	$I_C = -2\ mA$ For BCY78 For BCY79	- 32 - 45			V 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}^*	Base-emitter 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
$V_{BE(sat)}^*$	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

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

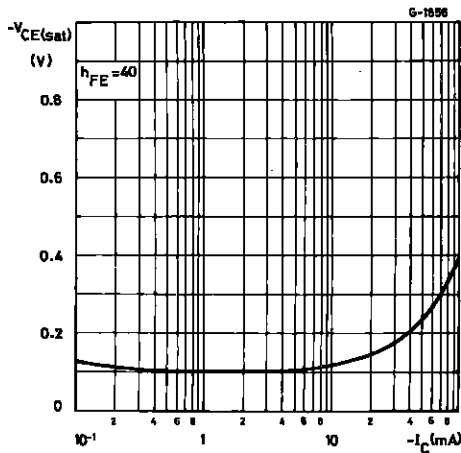
BCY78-BCY79

ELECTRICAL CHARACTERISTICS (continued)

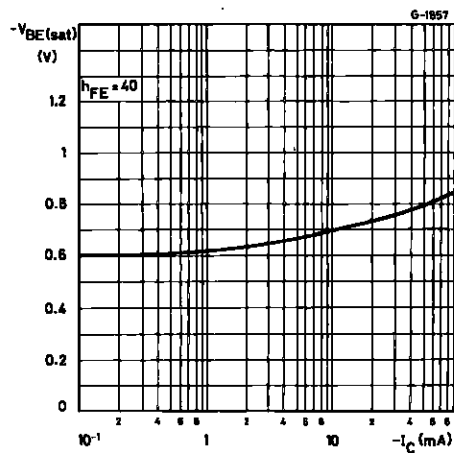
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
h_{oe}	Output Admittance	$I_C = -2 \text{ mA}$ $V_{CE} = -5 \text{ V}$ $f = 1 \text{ kHz}$ Gr.VII Gr.VIII Gr.IX For BCY78 Only Gr.X		18 24 30 50	30 50 60 100	μS μS μS μS
t_d	Delay Time	$I_C = -10 \text{ mA}$ $V_{CC} = -10 \text{ V}$ $I_{B1} = -1 \text{ mA}$ $I_C = -100 \text{ mA}$ $V_{CC} = -10 \text{ V}$ $I_{B1} = -10 \text{ mA}$		35 5		ns ns
t_r	Rise Time	$I_C = -10 \text{ mA}$ $V_{CC} = -10 \text{ V}$ $I_{B1} = -1 \text{ mA}$ $I_C = -100 \text{ mA}$ $V_{CC} = -10 \text{ V}$ $I_{B1} = -10 \text{ mA}$		50 50		ns ns
t_s	Storage Time	$I_C = -10 \text{ mA}$ $V_{CC} = -10 \text{ V}$ $I_{B1} = -I_{B2} = -1 \text{ mA}$ $I_C = -100 \text{ mA}$ $V_{CC} = -10 \text{ V}$ $I_{B1} = -I_{B2} = -10 \text{ mA}$		400 250		ns ns
t_f	Fall Time	$I_C = -10 \text{ mA}$ $V_{CC} = -10 \text{ V}$ $I_{B1} = -I_{B2} = -1 \text{ mA}$ $I_C = -100 \text{ mA}$ $V_{CC} = -10 \text{ V}$ $I_{B1} = -I_{B2} = -10 \text{ mA}$		80 200		ns ns
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	$I_C = -10 \text{ mA}$ $V_{CC} = -10 \text{ V}$ $I_{B1} = -I_{B2} = -1 \text{ mA}$ $I_C = -100 \text{ mA}$ $V_{CC} = -10 \text{ V}$ $I_{B1} = -I_{B2} = -10 \text{ mA}$		480 450	800 800	ns ns

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

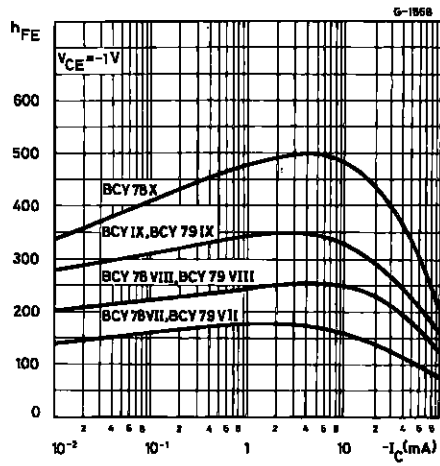
Collector-emitter Saturation Voltage.



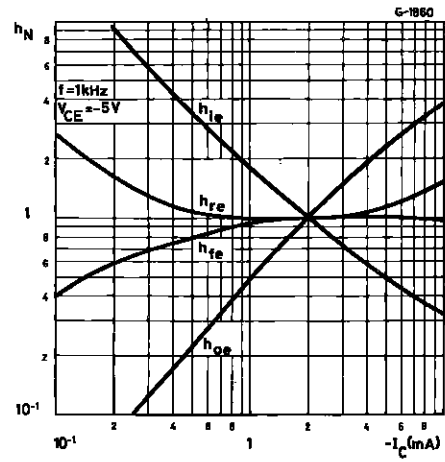
Base-emitter Saturation Voltage.



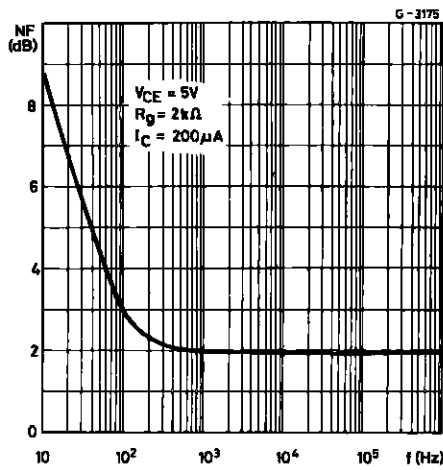
DC Current Gain.



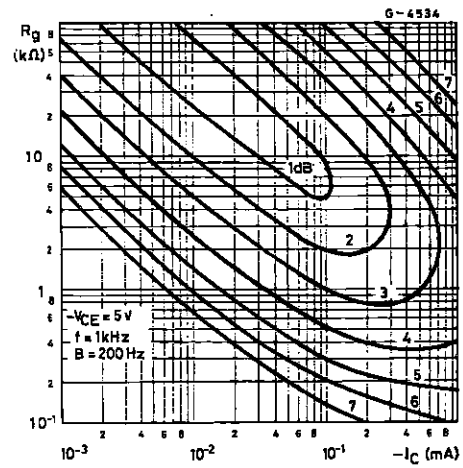
Normalized h Parameters.



Noise Figure vs. Frequency.

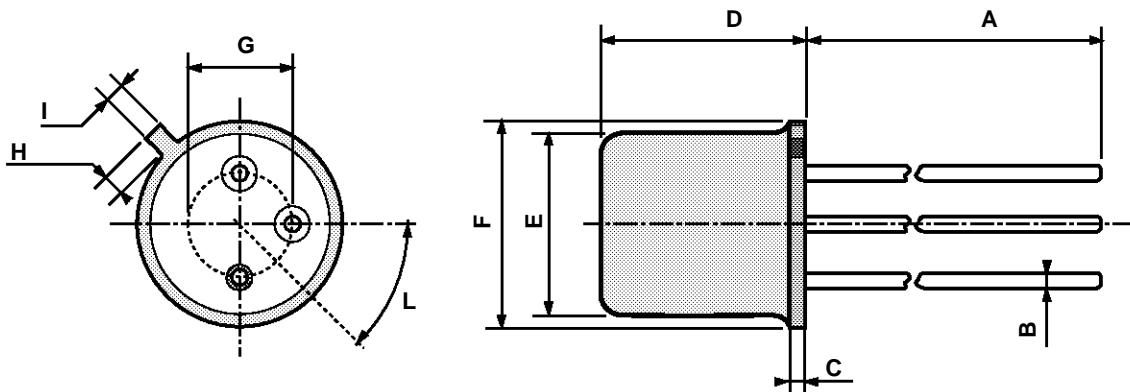


Noise Figure ($f = 1$ kHz).



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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