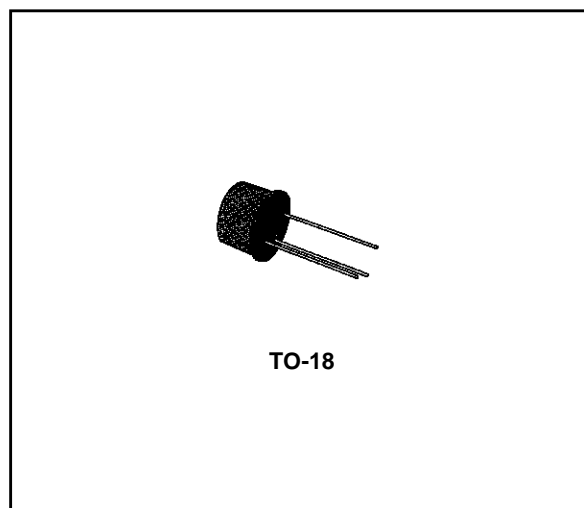


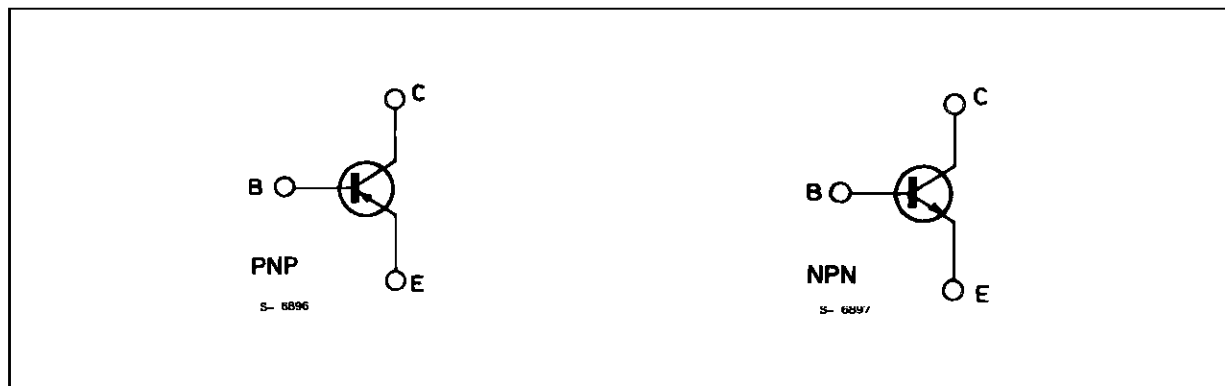
**LOW NOISE GENERAL PURPOSE AUDIO AMPLIFIERS**

**DESCRIPTION**

The BC177, BC178 and BC179 are silicon planar epitaxial PNP transistors in TO-18 metal case. They are suitable for use in driver audio stages, low noise input audio stages and as low power, high gain general purpose transistors. The complementary NPN types are respectively the BC107, BC108 and BC109.



**INTERNAL SCHEMATIC DIAGRAM**



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value			Unit
		BC177	BC178	BC179	
$V_{CES}$	Collector-emitter Voltage ( $V_{BE} = 0$ )	- 50	- 30	- 25	V
$V_{CEO}$	Collector-emitter Voltage ( $I_B = 0$ )	- 45	- 25	- 20	V
$V_{EBO}$	Emitter-base Voltage ( $I_C = 0$ )	- 5			V
$I_C$	Collector Current	- 100			mA
$I_{CM}$	Collector Peak Current	- 200			mA
$P_{tot}$	Total Power Dissipation at $T_{amb} \leq 25\text{ }^\circ\text{C}$	300			mW
$T_{stg}$	Storage Temperature	- 65 to 175			$^\circ\text{C}$
$T_j$	Junction Temperature	175			$^\circ\text{C}$

## BC177-BC178-B179

### THERMAL DATA

$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	200	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	500	°C/W

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

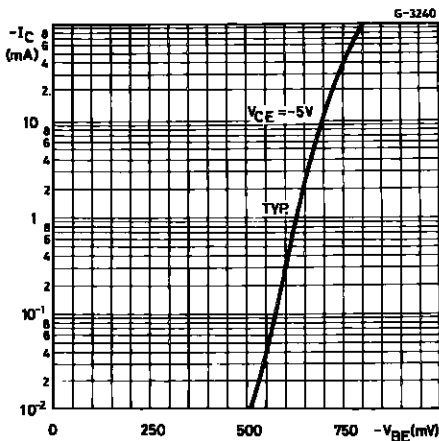
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cutoff Current ( $V_{BE} = 0$ )	$V_{CE} = -20\text{ V}$ $V_{CE} = -20\text{ V}$ $T_{amb} = 150\text{ °C}$		- 1	- 100 - 10	nA μA
$V_{(BR)CEO}^*$	Collector-emitter Breakdown Voltage ( $I_B = 0$ )	$I_C = -2\text{ mA}$ for <b>BC177</b> for <b>BC178</b> for <b>BC179</b>	- 45 - 25 - 20			V V V
$V_{(BR)CES}$	Collector-emitter Breakdown Voltage ( $V_{BE} = 0$ )	$I_C = -10\text{ μA}$ for <b>BC177</b> for <b>BC178</b> for <b>BC179</b>	- 50 - 30 - 25			V V V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage ( $I_C = 0$ )	$I_E = -10\text{ μA}$	- 5			V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = -10\text{ mA}$ $I_B = -0.5\text{ mA}$ $I_C = -100\text{ mA}$ $I_B = -5\text{ mA}$		- 75 - 200	- 250	mV mV
$V_{BE}^*$	Base-emitter Voltage	$I_C = -2\text{ mA}$ $V_{CE} = -5\text{ V}$	- 550	- 640	- 750	mV
$V_{BE(sat)}$	Base-emitter Saturation Voltage	$I_C = -10\text{ mA}$ $I_B = -0.5\text{ mA}$ $I_C = -100\text{ mA}$ $I_B = -5\text{ mA}$		- 720 - 860		mV mV
$h_{fe}$	Small Signal Current Gain	$I_C = -2\text{ mA}$ $V_{CE} = -5\text{ V}$ $f = 1\text{ kHz}$ for <b>BC177</b> Gr. A for <b>BC177</b> Gr. B for <b>BC178</b> Gr. A for <b>BC178</b> Gr. B for <b>BC179</b> Gr. B	125 240 125 240 240		260 500 260 500 500	

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

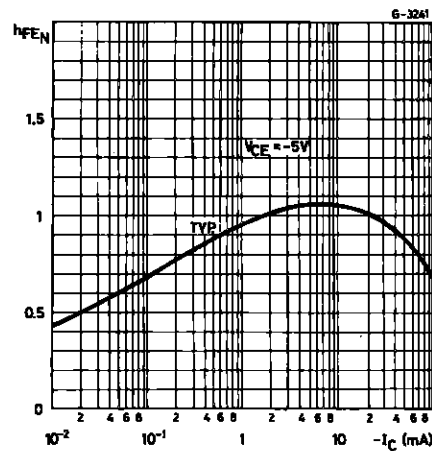
**ELECTRICAL CHARACTERISTICS** (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$f_T$	Transition Frequency	$I_C = -10 \text{ mA}$ $V_{CE} = -5 \text{ V}$ $f = 100 \text{ MHz}$		200		MHz
$C_{CBO}$	Collector-base Capacitance	$I_E = 0$ $V_{CB} = -10 \text{ V}$		5.0		pF
NF	Noise Figure	$I_C = -0.2 \text{ mA}$ $V_{CE} = -5 \text{ V}$ $R_g = 2 \text{ k}\Omega$ $f = 1 \text{ kHz}$ $B = 200 \text{ Hz}$		2	10	dB
		for <b>BC177</b>		2	10	dB
		for <b>BC178</b>		1.2	4	dB
		for <b>BC179</b>				
$h_{ie}$	Input Impedance	$I_C = -2 \text{ mA}$ $V_{CE} = -5 \text{ V}$ $f = 1 \text{ kHz}$		2.7		k $\Omega$
		for <b>BC177</b> Gr. A		5.2		k $\Omega$
		for <b>BC177</b> Gr. B		2.7		k $\Omega$
		for <b>BC178</b> Gr. A		5.2		k $\Omega$
		for <b>BC178</b> Gr. B		5.2		k $\Omega$
		for <b>BC179</b> Gr. B				
$h_{re}$	Reverse Voltage Ratio	$I_C = -2 \text{ mA}$ $V_{CE} = -5 \text{ V}$ $f = 1 \text{ kHz}$		$2.7 \times 10^{-4}$		
		for <b>BC177</b> Gr. A		$4.5 \times 10^{-4}$		
		for <b>BC177</b> Gr. B		$2.7 \times 10^{-4}$		
		for <b>BC178</b> Gr. A		$4.5 \times 10^{-4}$		
		for <b>BC178</b> Gr. B		$4.5 \times 10^{-4}$		
		for <b>BC179</b> Gr. B				
$h_{oe}$	Output Admittance	$I_C = -2 \text{ mA}$ $V_{CE} = -5 \text{ V}$ $f = 1 \text{ kHz}$		25		$\mu\text{S}$
		for <b>BC177</b> Gr. A		35		$\mu\text{S}$
		for <b>BC177</b> Gr. B		25		$\mu\text{S}$
		for <b>BC178</b> Gr. A		35		$\mu\text{S}$
		for <b>BC178</b> Gr. B		35		$\mu\text{S}$
		for <b>BC179</b> Gr. B				

DC Transconductance.

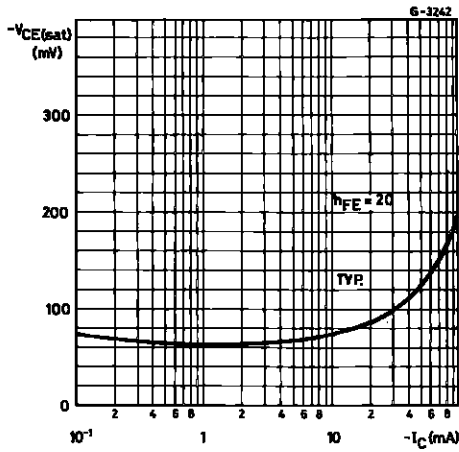


DC Normalized Current Gain.

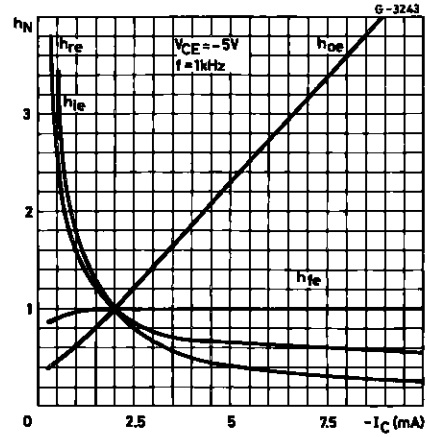


# BC177-BC178-B179

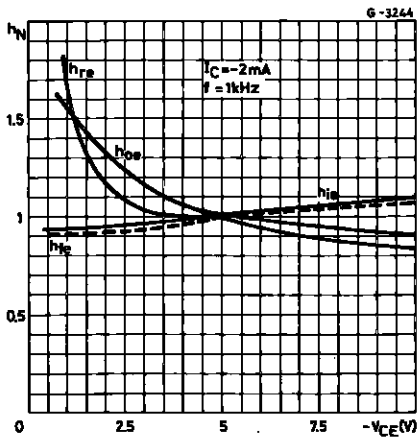
Collector-emitter Saturation Voltage.



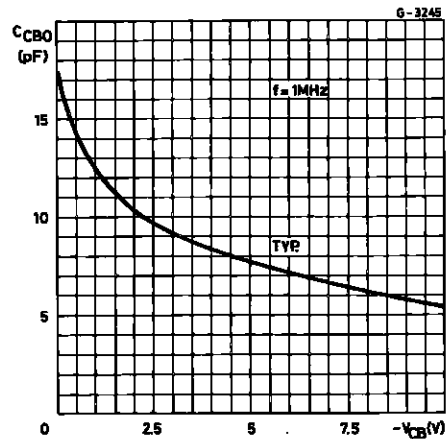
Normalized h Parameters.



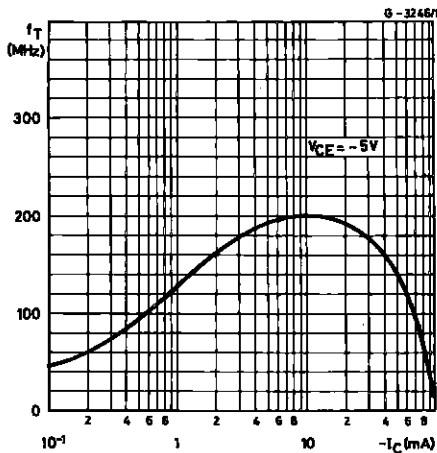
Normalized h Parameters.



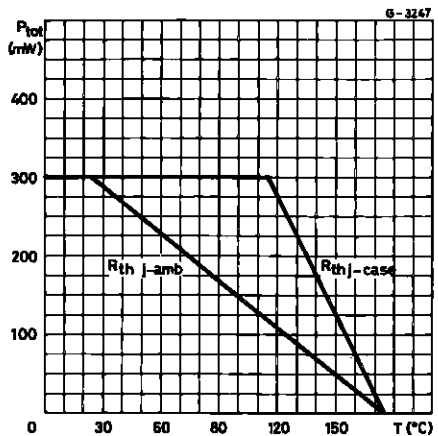
Collector-base Capacitance.



Transition Frequency.

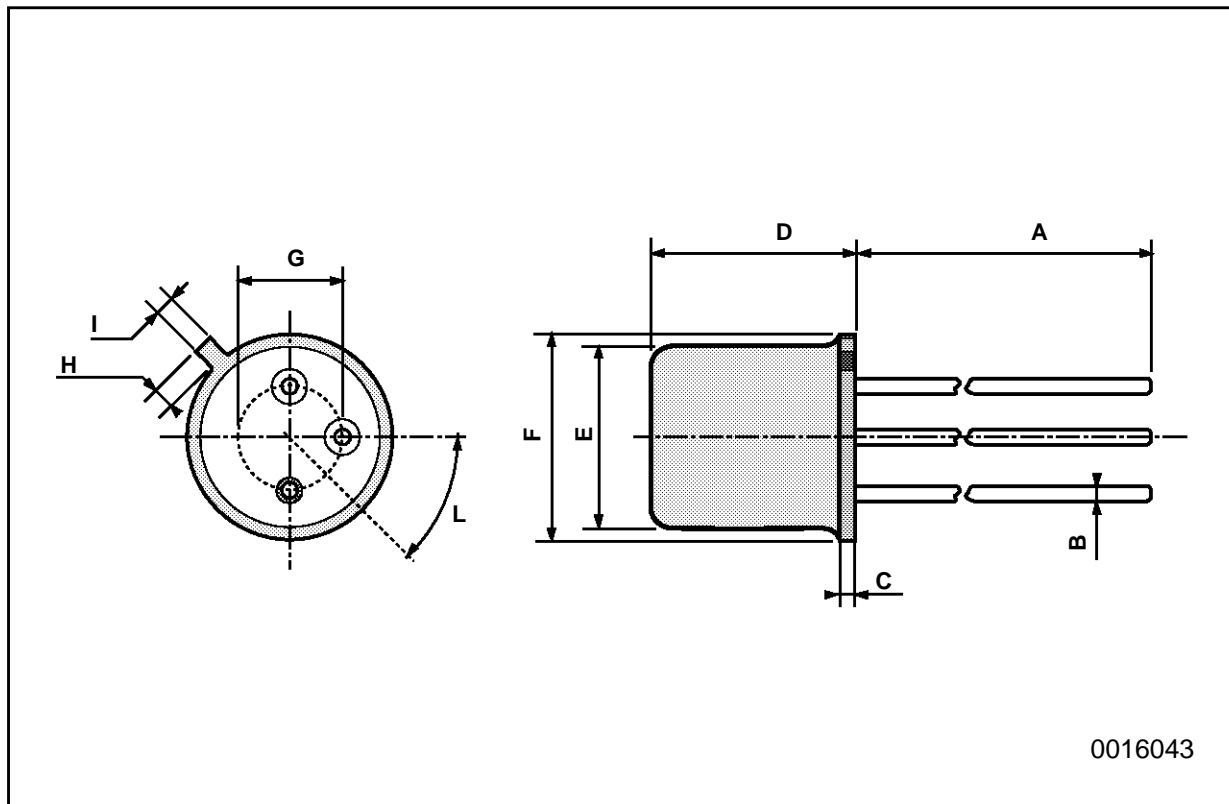


Power Rating Chart.



**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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