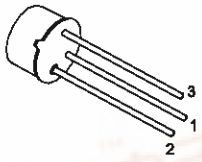
SGS-THOMSON MICROELECTRONICS

BC107
BC108

LOW NOISE GENERAL PURPOSE AUDIO AMPLIFIERS

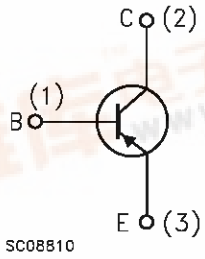
DESCRIPTION

The BC107 and BC108 are silicon planar epitaxial NPN transistors in TO-18 metal case. They are suitable for use in driver stages, low noise input stages and signal processing circuits of television reveivers. The PNP complemet for BC107 is BC177.



TO-18

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BC107	BC108	
V_{CBO}	Collector-Base Voltage (I_E = 0)	50	30	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	45	20	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	6	5	V
I_C	Collector Current	100		mA
P_{tot}	Total Dissipation at $T_{amb} \leq 25\ ^oC$ at $T_{case} \leq 25\ ^oC$	0.3 0.75		W W
T_{stg}	Storage Temperature	-55 to 175		^oC
T_j	Max. Operating Junction Temperature	175		^oC

THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-Case Max	200	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient Max	500	°C/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	for **BC107**				
		V_{CB} = 40 V			15	nA
		V_{CB} = 40 V T_{case} = 150 °C			15	µA
		for **BC108**				
		V_{CB} = 20 V			15	µA
		V_{CB} = 20 V T_{case} = 150 °C			15	µA
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage (IE = 0)	I_C = 10 µA				
		for **BC107**	50			V
		for **BC108**	30			V
$V_{(BR)CEO}$*	Collector-Emitter Breakdown Voltage (I_B = 0)	I_C = 10 mA				
		for **BC107**	45			V
		for **BC108**	20			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_C = 0)	I_E = 10 µA				
		for **BC107**	6			V
		for **BC108**	5			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 10 mA I_B = 0.5 mA		70	250	mV
		I_C = 100 mA I_B = 5 mA		200	600	mV
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 10 mA I_B = 0.5 mA		750		mV
		I_C = 100 mA I_B = 5 mA		950		mV
$V_{BE(on)}$*	Base-Emitter On Voltage	I_C = 2 mA V_{CE} = 5 V	550	650	700	mV
		I_C = 10 mA V_{CE} = 5 V		700	770	mV
h_{FE}*	DC Current Gain	I_C = 2 mA V_{CE} = 5 V				
		for **BC107**	110		450	
		for **BC107** Gr. A	110		220	
		for **BC107** Gr. B	200		450	
		for **BC108**	110		800	
		for **BC108** Gr. A	110		220	
		for **BC108** Gr. B	200		450	
		for **BC108** Gr. C	420		800	
		I_C = 10 µA V_{CE} = 5 V				
		for **BC107**		120		
		for **BC107** Gr. A		90		
		for **BC107** Gr. B	40	150		
		for **BC108**		120		
		for **BC108** Gr. A		90		
		for **BC108** Gr. B	40	150		
		for **BC108** Gr. C	100	270		
h_{fe}*	Small Signal Current Gain	I_C = 2 mA V_{CE} = 5 V f = 1KHz				
		for **BC107**		250		
		for **BC107** Gr. A		190		
		for **BC107** Gr. B		300		
		for **BC108**		370		
		for **BC108** Gr. A		190		
		for **BC108** Gr. B		300		
		for **BC108** Gr. C		500		
		I_C = 10 mA V_{CE} = 10 V f = 100 MHz		2		

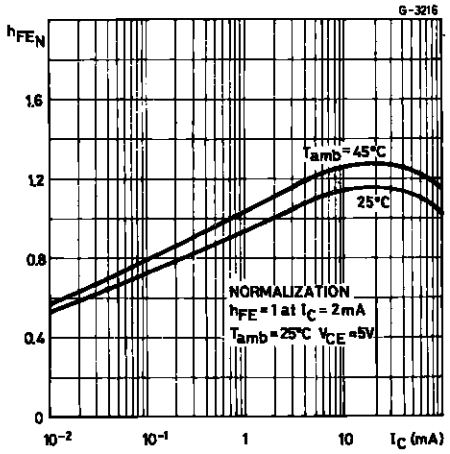
* Pulsed: Pulse duration = 300 µs, duty cycle ≤ 1 %

ELECTRICAL CHARACTERISTICS (continued)

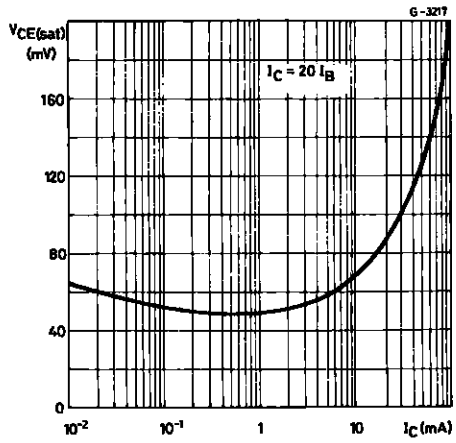
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C_{CBO}	Collector Base Capacitance	$I_E = 0$ $V_{CB} = 10$ V f = 1MHz		4	6	pF
C_{EBO}	Emitter Base Capacitance	$I_C = 0$ $V_{EB} = 0.5$ V f = 1MHz		12		pF
NF	Noise Figure	$I_C = 0.2$ mA $V_{CE} = 5$ V f = 1KHz $R_g = 2K\Omega$ B = 200Hz		2	10	dB
h_{ie}	Input Impedance	$I_C = 2$ mA $V_{CE} = 5$ V f = 1KHz				
		for **BC107**		4		KΩ
		for **BC107** Gr. A		3		KΩ
		for **BC107** Gr. B		4.8		KΩ
		for **BC108**		5.5		KΩ
		for **BC108** Gr. A		3		KΩ
		for **BC108** Gr. B		4.8		KΩ
		for **BC108** Gr. C		7		KΩ
h_{re}	Reverse Voltage Ratio	$I_C = 2$ mA $V_{CE} = 5$ V f = 1KHz				
		for **BC107**		2.2		10^{-4}
		for **BC107** Gr. A		1.7		10^{-4}
		for **BC107** Gr. B		2.7		10^{-4}
		for **BC108**		3.1		10^{-4}
		for **BC108** Gr. A		1.7		10^{-4}
		for **BC108** Gr. B		2.7		10^{-4}
		for **BC108** Gr. C		3.8		10^{-4}
h_{oe}	Output Admittance	$I_C = 2$ mA $V_{CE} = 5$ V f = 1KHz				
		for **BC107**		30		µS
		for **BC107** Gr. A		13		µS
		for **BC107** Gr. B		26		µS
		for **BC108**		30		µS
		for **BC108** Gr. A		13		µS
		for **BC108** Gr. B		26		µS
		for **BC108** Gr. C		34		µS

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

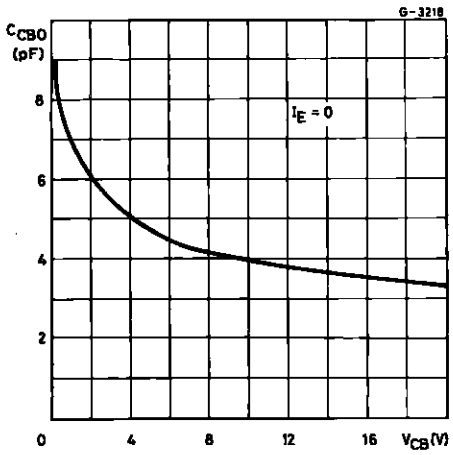
DC Normalized Current Gain.



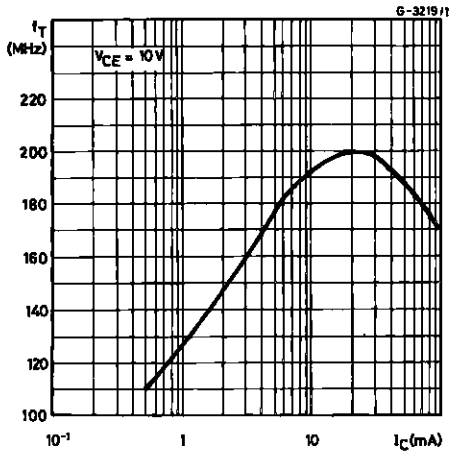
Collector--emitter Saturation Voltage.



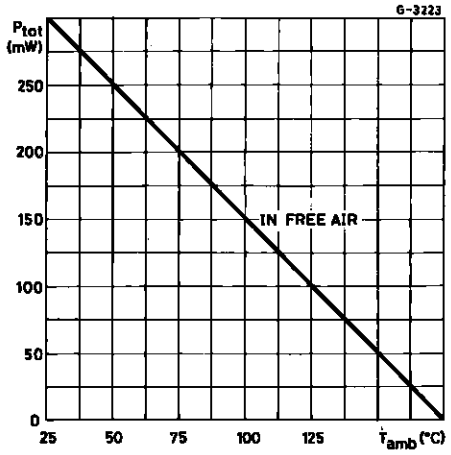
Collector-base Capacitance.



Transition Frequency.

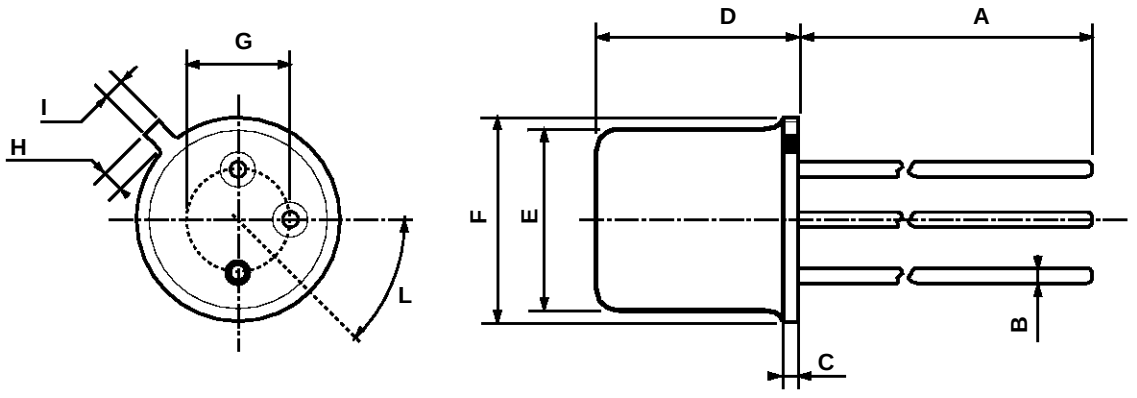


Power Rating Chart.



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^o			45^o		



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