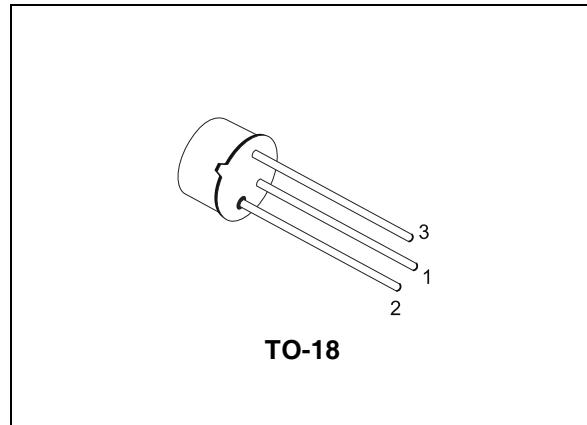


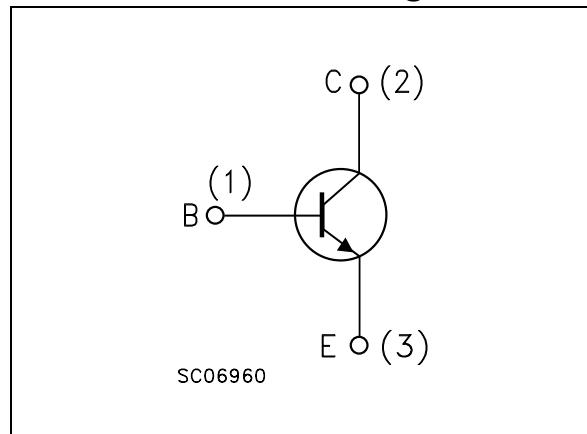
## Description

The BC107 and BC107B 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 receivers. The PNP complementary types are BC177 and BC177B respectively.



## Internal schematic diagram



## Order codes

Part Number	Marking	Package	Packing
BC107	BC107	TO-18	Bag
BC107A	BC107B	TO-18	Bag

# 1 Electrical ratings

**Table 1. Absolute maximum rating**

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-emitter voltage ( $I_E = 0$ )	50	V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	45	V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	6	V
$I_C$	Collector current	100	mA
$P_{tot}$	Total dissipation at $T_{amb} \leq 25^\circ C$ at $T_{case} \leq 25^\circ C$	0.3 0.75	W W
$T_{stg}$	Storage temperature	-55 to 175	°C
$T_J$	Max. operating junction temperature	175	°C

**Table 2. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Thermal resistance junction-case	max	°C/W
$R_{thj-amb}$	Thermal resistance junction-ambient	max	°C/W

## 2 Electrical characteristics

( $T_{CASE} = 25^\circ\text{C}$ ; unless otherwise specified)

Table 3. Electrical characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector cut-off current ( $I_E = 0$ )	$V_{CB} = 40\text{V}$ $V_{CB} = 40\text{V}$ $T_C = 150^\circ\text{C}$			15 15	nA $\mu\text{A}$
$V_{(BR)CBO}$	Collector-base breakdown voltage ( $I_E = 0$ )	$I_C = 10\mu\text{A}$	50			V
$V_{(BR)CEO}^{(1)}$	Collector-emitter breakdown voltage ( $I_B = 0$ )	$I_C = 10\text{mA}$	45			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage ( $I_C = 0$ )	$I_E = 10\mu\text{A}$	6			V
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 10\text{mA}$ $I_B = 0.5\text{mA}$ $I_C = 100\text{mA}$ $I_B = 5\text{mA}$		70 200	250 600	mV mV
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 10\text{mA}$ $I_B = 0.5\text{mA}$ $I_C = 100\text{mA}$ $I_B = 5\text{mA}$		750 950		mV mV
$V_{BE(on)}^{(1)}$	Base-emitter on voltage	$I_C = 2\text{mA}$ $V_{CE} = 5\text{V}$ $I_C = 10\text{mA}$ $V_{CE} = 5\text{V}$	550	650 700	700 770	mV mV
$h_{FE}$	DC current gain	$I_C = 2\text{mA}$ $V_{CE} = 5\text{V}$ <b>for BC107</b> <b>for BC107B</b> $I_C = 10\mu\text{A}$ $V_{CE} = 5\text{V}$ <b>for BC107</b> <b>for BC107B</b>	110 200 40		450 450 120 150	
$h_{fe}$	Small signal current gain	$I_C = 2\text{mA}$ $V_{CE} = 5\text{V}$ $f = 1\text{kHz}$ <b>for BC107</b> <b>for BC107B</b> $I_C = 10\text{mA}$ $V_{CE} = 5\text{V}$ $f = 100\text{MHz}$		250 300 2		
$C_{CBO}$	Collector-base capacitance	$I_E = 0$ $V_{CB} = 10\text{V}$ $f = 1\text{MHz}$		4	6	pF
$C_{EBO}$	Emitter-base capacitance	$I_C = 0$ $V_{EB} = 0.5\text{V}$ $f = 1\text{MHz}$		12		pF
$NF$	Noise figure	$I_C = 0.2\text{mA}$ $V_{CE} = 5\text{V}$ $f = 1\text{kHz}$ $R_G = 2\text{k}\Omega$ $B = 200\text{Hz}$		2	10	dB
$h_{ie}$	Input impedance	$I_C = 2\text{mA}$ $V_{CE} = 5\text{V}$ $f = 1\text{kHz}$ <b>for BC107</b> <b>for BC107B</b>		4 4.8		$\text{k}\Omega$ $\text{k}\Omega$

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$h_{re}$	Reverse voltage ratio	$I_C = 2\text{mA}$ $V_{CE} = 5\text{V}$ $f = 1\text{kHz}$ <b>for BC107</b> <b>for BC107B</b>		2.2 2.7		$10^{-4}$ $10^{-4}$
$h_{oe}$	Output admittance	$I_C = 2\text{mA}$ $V_{CE} = 5\text{V}$ $f = 1\text{kHz}$ <b>for BC107</b> <b>for BC107B</b>		30 26		$\mu\text{S}$ $\mu\text{S}$

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

## 2.1 Electrical characteristics (curves)

Figure 1. DC normalized current gain

Figure 2. Collector-emitter saturation voltage

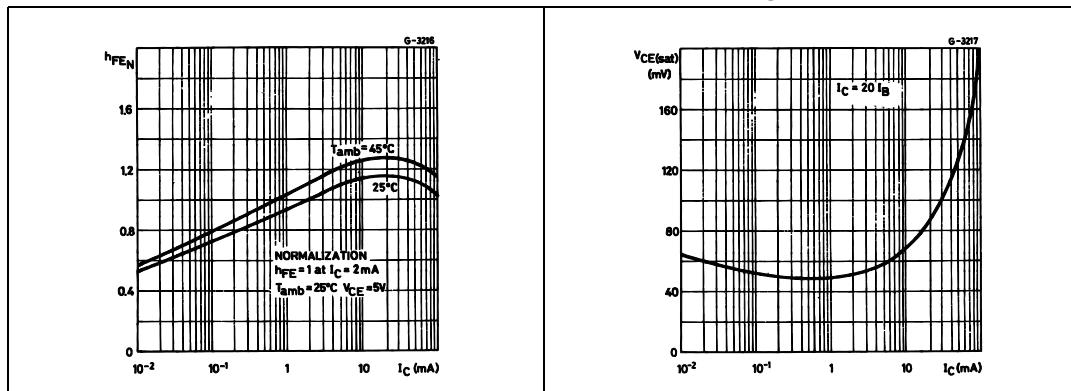
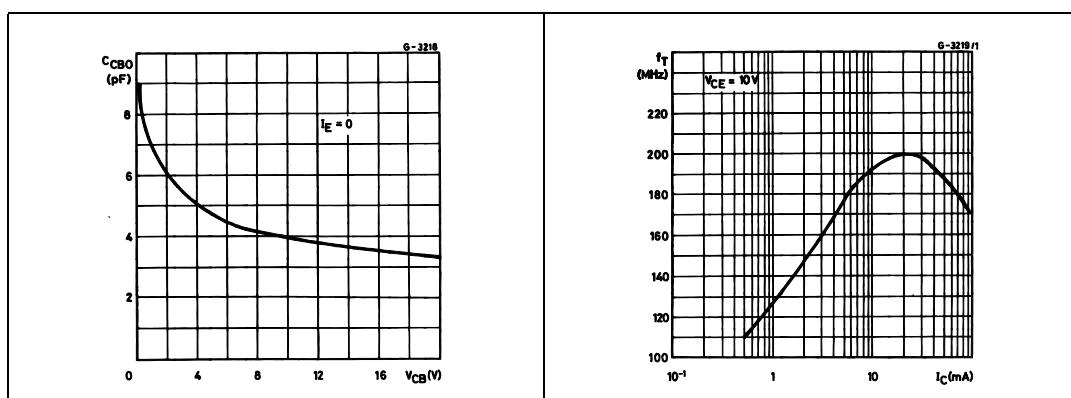
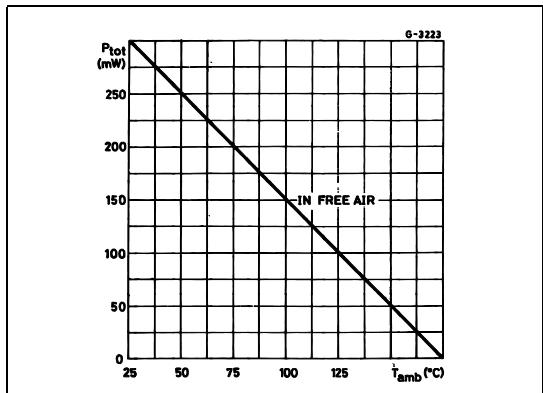


Figure 3. Collector-base capacitance

Figure 4. Transition frequency



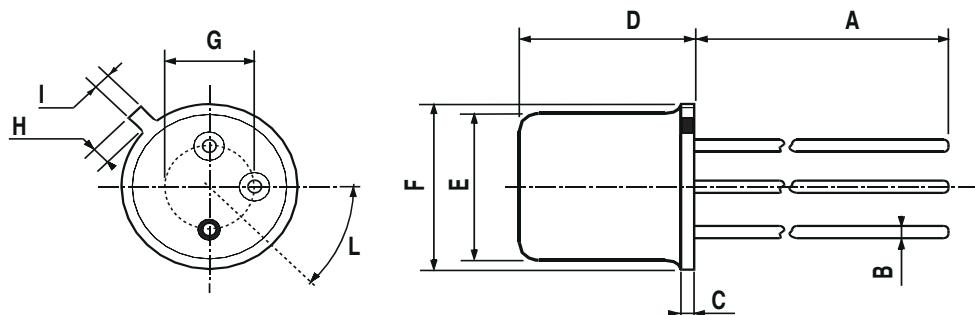
**Figure 5. Power rating chart**

### 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com)

## 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

## 4 Revision history

**Table 4. Revision history**

Date	Revision	Changes
01-Dec-2002	1	First release
06-Nov-2006	2	The document has been reformatted

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