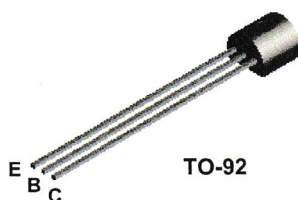
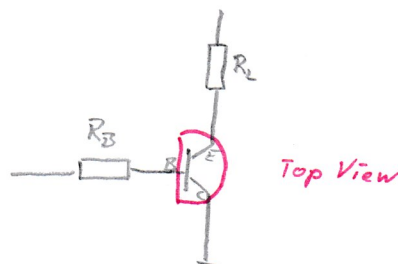


**BC547  
BC547A  
BC547B  
BC547C**



## NPN General Purpose Amplifier

This device is designed for use as general purpose amplifiers and switches requiring collector currents to 300 mA. Sourced from Process 10. See PN100A for characteristics.

### Absolute Maximum Ratings\*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CEO</sub>	Collector-Emitter Voltage	45	V
V <sub>CES</sub>	Collector-Base Voltage	50	V
V <sub>EBO</sub>	Emitter-Base Voltage	6.0	V
I <sub>C</sub>	Collector Current - Continuous	500	mA
T <sub>J</sub> , T <sub>stg</sub>	Operating and Storage Junction Temperature Range	-55 to +150	°C

\*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

#### NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		BC547 / A / B / C	
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	625 5.0	mW mW/°C
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	83.3	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	200	°C/W

# NPN General Purpose Amplifier (continued)

## Electrical Characteristics

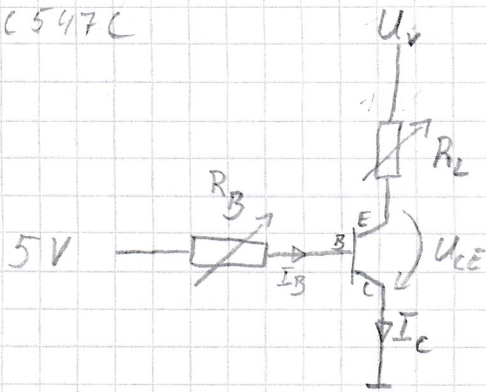
TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHARACTERISTICS					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 1.0 \text{ mA}, I_B = 0$	45		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10 \text{ } \mu\text{A}, I_E = 0$	50		V
$V_{(BR)CES}$	Collector-Base Breakdown Voltage	$I_C = 10 \text{ } \mu\text{A}, I_E = 0$	50		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \text{ } \mu\text{A}, I_C = 0$	6.0		V
$I_{CBO}$	Collector Cutoff Current	$V_{CB} = 30 \text{ V}, I_E = 0$ $V_{CB} = 30 \text{ V}, I_E = 0, T_A = +150 \text{ } ^\circ\text{C}$		15 5.0	nA $\mu\text{A}$
ON CHARACTERISTICS					
$h_{FE}$	DC Current Gain	$V_{CE} = 5.0 \text{ V}, I_C = 2.0 \text{ mA}$ <b>547</b> <b>547A</b> <b>547B</b> <b>547C</b>	110 110 200 420	800 220 450 800	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$ $I_C = 100 \text{ mA}, I_B = 5.0 \text{ mA}$		0.25 0.60	V V
$V_{BE(on)}$	Base-Emitter On Voltage	$V_{CE} = 5.0 \text{ V}, I_C = 2.0 \text{ mA}$ $V_{CE} = 5.0 \text{ V}, I_C = 10 \text{ mA}$	0.58	0.70 0.77	V V
SMALL SIGNAL CHARACTERISTICS					
$h_{fe}$	Small-Signal Current Gain	$I_C = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 1.0 \text{ kHz}$	125	900	
NF	Noise Figure	$V_{CE} = 5.0 \text{ V}, I_C = 200 \text{ } \mu\text{A},$ $R_S = 2.0 \text{ k}\Omega, f = 1.0 \text{ kHz},$ $B_W = 200 \text{ Hz}$		10	dB

BC547 / BC547A / BC547B / BC547C



BC547C



$$R_L = 3\text{ k}\Omega \quad U_V = 12\text{ V}$$

$R_B$	$I_B$	$U_{BC}$	$U_{CE}$	$I_C$
$\infty$	0	0V	12V	0
112M $\Omega$	0,42 $\mu$ A	0,582V	11,39V	204 $\mu$ A
5M $\Omega$	0,9 $\mu$ A	0,603V	10,47V	495 $\mu$ A
2,5M $\Omega$	1,73 $\mu$ A	0,621V	8,85V	1,04mA
1M $\Omega$	4,39 $\mu$ A	0,644V	4,528V	2,51mA
500k $\Omega$	8,7 $\mu$ A	0,664V	0,178V	3,96mA
100k $\Omega$	43,4 $\mu$ A	0,671V	82,5mV	3,99mA
50k $\Omega$	86,5 $\mu$ A	0,676V	60,5mV	4mA

$$R_L = 1,5\text{ k}\Omega \quad U_V = 12\text{ V}$$

$R_B$	$I_B$	$U_{BC}$	$U_{CE}$	$I_C$
$\infty$	0	0	12V	0
112M $\Omega$	0,41 $\mu$ A	0,582V	11,7V	204,5 $\mu$ A
5M $\Omega$	0,9 $\mu$ A	0,603V	11,21V	496,8 $\mu$ A
2,5M $\Omega$	1,78 $\mu$ A	0,619V	10,36V	1,05mA
1M $\Omega$	4,39 $\mu$ A	0,641V	8,13V	2,6mA
500k $\Omega$	8,7 $\mu$ A	0,657V	4,473V	5,03mA
100k $\Omega$	43,26 $\mu$ A	0,698V	0,117V	7,93mA
50k $\Omega$	86,15 $\mu$ A	0,695V	0,008V	7,95mA

$$R_L = 500\Omega \quad U_V = 12\text{ V}$$

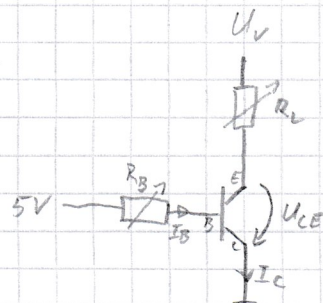
$R_B$	$I_B$	$U_{BC}$	$U_{CE}$	$I_C$
$\infty$	0	0	12V	0
112M $\Omega$	0,41 $\mu$ A	0,582V	11,3V	0,22mA
5M $\Omega$	0,9 $\mu$ A	0,603V	11,75V	0,52mA
2,5M $\Omega$	1,73 $\mu$ A	0,619V	11,48V	1,05mA
1M $\Omega$	4,39 $\mu$ A	0,637V	10,68V	2,67mA
500k $\Omega$	8,73 $\mu$ A	0,646V	9,32V	5,39mA
100k $\Omega$	43,06 $\mu$ A	0,706V	1,012V	21,92mA
50k $\Omega$	86,56 $\mu$ A	0,728V	0,24V	23,52mA
10k $\Omega$	213,9 $\mu$ A	0,735V	0,123V	23,7mA
5k $\Omega$	283,9 $\mu$ A	0,737V	0,110V	23,73mA

$$R_L = 100\Omega \quad U_V = 12\text{ V}$$

$R_B$	$I_B$	$U_{BC}$	$U_{CE}$	$I_C$
$\infty$	0	0	12V	0
112M $\Omega$	0,42 $\mu$ A	0,579V	11,96V	205 $\mu$ A
5M $\Omega$	0,89 $\mu$ A	0,603V	11,85V	498,5 $\mu$ A
2,5M $\Omega$	1,78 $\mu$ A	0,619V	11,69V	1,06mA
1M $\Omega$	4,35 $\mu$ A	0,635V	11,47V	2,67mA
500k $\Omega$	8,56 $\mu$ A	0,645V	10,92V	5,37mA
100k $\Omega$	39,43 $\mu$ A	0,655V	7V	24,95mA
50k $\Omega$	72,8 $\mu$ A	0,668V	3,73V	40,9mA
10k $\Omega$	212 $\mu$ A	0,743V	0,907	54,84mA
5k $\Omega$	281 $\mu$ A	0,77V	0,541	56,65mA



BC547C

 $R_L = 3\text{ k}\Omega$   $U_V = 5\text{ V}$ 

$R_B$	$I_B$	$U_{BC}$	$U_{CE}$	$I_C$
$\infty$	0	0	5V	0
11,2 M $\Omega$	0,42 $\mu\text{A}$	0,582V	4,920V	135,9 $\mu\text{A}$
5 M $\Omega$	0,9 $\mu\text{A}$	0,605V	4,734V	475,9 $\mu\text{A}$
2,5 M $\Omega$	1,78 $\mu\text{A}$	0,623V	4,429V	984 $\mu\text{A}$
1 M $\Omega$	4,39 $\mu\text{A}$	0,646V	3,541V	2,466 mA
500 k $\Omega$	8,7 $\mu\text{A}$	0,664V	2,128V	4,823 mA
100 k $\Omega$	43,14 $\mu\text{A}$	0,698V	0,134V	9,76 mA
50 k $\Omega$	85,38 $\mu\text{A}$	0,703V	0,1V	9,82 mA
10 k $\Omega$	425,67 $\mu\text{A}$	0,721V	0,051V	9,92 mA
5 k $\Omega$	837,3 $\mu\text{A}$	0,734V	0,039V	9,95 mA

 $R_L = 1,5\text{ k}\Omega$   $U_V = 5\text{ V}$ 

$R_B$	$I_B$	$U_{BC}$	$U_{CE}$	$I_C$
$\infty$	0	0	5V	0
11,2 M $\Omega$	0,44 $\mu\text{A}$	0,582V	4,922V	0,21 mA
5 M $\Omega$	0,9 $\mu\text{A}$	0,605V	4,781V	0,49 mA
2,5 M $\Omega$	1,77 $\mu\text{A}$	0,623V	4,529V	1 mA
1 M $\Omega$	4,23 $\mu\text{A}$	0,645V	3,808V	2,43 mA
500 k $\Omega$	8,48 $\mu\text{A}$	0,663V	2,640V	4,76 mA
100 k $\Omega$	42,13 $\mu\text{A}$	0,697V	0,135V	9,76 mA
50 k $\Omega$	84,17 $\mu\text{A}$	0,703V	0,101V	9,82 mA
10 k $\Omega$	416,33 $\mu\text{A}$	0,721V	0,052V	9,92 mA
5 k $\Omega$	816,2 $\mu\text{A}$	0,733V	0,04V	9,95 mA

 $R_L = 500\Omega$   $U_V = 5\text{ V}$ 

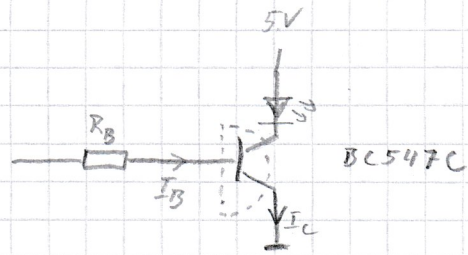
$R_B$	$I_B$	$U_{BC}$	$U_{CE}$	$I_C$
$\infty$	0	0	5V	0
11,2 M $\Omega$	0,4 $\mu\text{A}$	0,581V	4,92V	0,22 mA
5 M $\Omega$	0,88 $\mu\text{A}$	0,604V	4,788V	0,48 mA
2,5 M $\Omega$	1,74 $\mu\text{A}$	0,622V	4,541V	0,98 mA
1 M $\Omega$	4,27 $\mu\text{A}$	0,645V	3,813V	2,42 mA
500 k $\Omega$	8,47 $\mu\text{A}$	0,662V	2,646V	4,76 mA
100 k $\Omega$	42,04 $\mu\text{A}$	0,697V	0,136V	9,76 mA
50 k $\Omega$	83,65 $\mu\text{A}$	0,702V	0,101V	9,82 mA
10 k $\Omega$	413 $\mu\text{A}$	0,72V	0,052V	9,92 mA
5 k $\Omega$	810 $\mu\text{A}$	0,733V	0,04V	9,95 mA

 $R_L = 100\Omega$   $U_V = 5\text{ V}$ 

$R_B$	$I_B$	$U_{BC}$	$U_{CE}$	$I_C$
$\infty$	0	0	5V	0
11,2 M $\Omega$	0,4 $\mu\text{A}$	0,577V	5V	0,21 mA
5 M $\Omega$	0,87 $\mu\text{A}$	0,604V	4,973V	0,48 mA
2,5 M $\Omega$	1,75 $\mu\text{A}$	0,622V	4,922V	0,98 mA
1 M $\Omega$	4,28 $\mu\text{A}$	0,644V	4,772V	2,45 mA
500 k $\Omega$	8,46 $\mu\text{A}$	0,658V	4,523V	4,88 mA
100 k $\Omega$	41,83 $\mu\text{A}$	0,695V	2,66V	23,05 mA
50 k $\Omega$	83,15 $\mu\text{A}$	0,72V	1,202V	37,36 mA
10 k $\Omega$	408,3 $\mu\text{A}$	0,772V	0,176V	47,4 mA
5 k $\Omega$	806,5 $\mu\text{A}$	0,786V	0,133V	47,81 mA



Arduino 5V



$$R_B = 470 \text{ k}\Omega$$

$$I_B = 9 \mu\text{A}$$

$$I_C = 5 \text{ mA}$$

(reicht für RGB SMD LED)

$$R_B = 100 \text{ k}\Omega$$

$$I_B = 36,4 \mu\text{A}$$

$$I_C = 20 \text{ mA}$$