

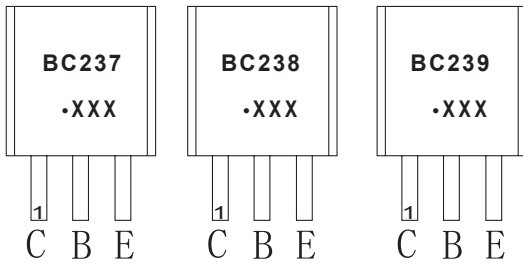
TO-92 Plastic-Encapsulate Transistors

BC237 / BC238 / BD239 TRANSISTOR (NPN)

FEATURES

Amplifier dissipation NPN Silicon

MARKING



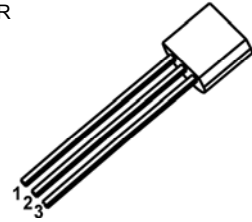
BC237,BC238,BC239=Device code

Solid dot=Green molding compound device,
if none,the normal device

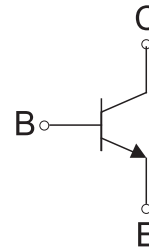
XXX=Code

TO-92

1. COLLECTOR
2. BASE
3. EMITTER



Equivalent Circuit



ORDERING INFORMATION

Part Number	Package	Packing Method	Pack Quantity
BC237	TO-92	Bulk	1000pcs/Bag
BC237-TA	TO-92	Tape	2000pcs/Box
BC238	TO-92	Bulk	1000pcs/Bag
BC238-TA	TO-92	Tape	2000pcs/Box
BC239	TO-92	Bulk	1000pcs/Bag
BC239-TA	TO-92	Tape	2000pcs/Box

MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-Emitter Voltage	BC237	45
		BC238/239	25
V_{EBO}	Emitter-Base Voltage	BC237	6
		BC238/239	5
I_C	Collector Current -Continuous	0.1	A
P_C	Collector Power Dissipation	350	mW
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125	$^{\circ}\text{C}/\text{W}$
T_J	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55~150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS

$T_a=25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=100\mu\text{A}$, $I_E=0$ BC237 BC238/239	50 30			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=2\text{mA}$, $I_B=0$ BC237 BC238/239	45 25			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=100\mu\text{A}$, $I_C=0$ BC237 BC238/239	6 5			V
Collector cut-off current	I_{CBO}	$V_{CE}=50\text{V}$, $V_{BE}=0$ $V_{CB}=30\text{V}$, $I_E=0$ BC237 BC238/239			15	nA
DC current gain	$h_{FE(1)}$	$V_{CE}=5\text{V}$, $I_C=10\mu\text{A}$ BC237A BC237B/238B BC237C/238C/239C		90 150 270		
	$h_{FE(2)}$	$V_{CE}=5\text{V}$, $I_C=2\text{mA}$ BC237 BC239 BC237A BC237B/238B BC237C/238C/239C	120 120 120 200 380		800 800 220 460 800	
	$h_{FE(3)}$	$V_{CE}=5\text{V}$, $I_C=100\text{mA}$ BC237A BC237B/238B BC237C/238C/239C		120 180 300		
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=10\text{mA}$, $I_B=0.5\text{mA}$ $I_C=100\text{mA}$, $I_B=5\text{mA}$ BC237/238/239 BC237/239 BC238			0.2 0.6 0.8	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=10\text{mA}$, $I_B=0.5\text{mA}$ $I_C=100\text{mA}$, $I_B=5\text{mA}$			0.83 1.05	V
Base-emitter voltage	V_{BE}	$V_{CE}=5\text{V}$, $I_C=0.1\text{mA}$ $V_{CE}=5\text{V}$, $I_C=2\text{mA}$ $V_{CE}=5\text{V}$, $I_C=100\text{mA}$	0.55	0.5 0.83	0.7	V
Transition frequency	f_T	$V_{CE}=3\text{V}$, $I_C=0.5\text{mA}$, $f=100\text{MHz}$ BC237 BC238 BC239 $V_{CE}=5\text{V}$, $I_C=10\text{mA}$, $f=100\text{MHz}$ BC237 BC238 BC239		100 120 140 150 150 150		MHz
Collector output capacitance	C_{ob}	$V_{CB}=10\text{V}$, $I_E=0$, $f=1\text{MHz}$			4.5	pF
Emitter-base capacitance	C_{ib}	$V_{EB}=0.5\text{V}$, $I_C=0$, $f=1\text{MHz}$		8		Pf
Noise figure	NF	$V_{CE}=5\text{V}$, $I_C=0.2\text{mA}$, $f=1\text{kHz}$, $R_s=2\text{K}\Omega$ BC239 $V_{CE}=5\text{V}$, $I_C=0.2\text{mA}$, $f=1\text{kHz}$, $R_s=2\text{K}\Omega$, $\Delta f=200\text{Hz}$ BC237 BC238 BC239		2 2 2	4 10 10 4	dB

TO-92 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

TO-92 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

NOTICE

JCET reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JCET does not assume any liability arising out of the application or use of any product described herein.

TO-92 PACKAGE TAPING DIMENSION



Dimensions are in millimeter								
A1	A	T	P	P0	P2	F1	F2	W
4.5	4.5	3.5	12.7	12.7	6.35	2.5	2.5	18.0
W0	W1	W2	H	H0	D0	t1	t2	ΔP
6.0	9.0	1.0 MAX.	19.0	16.0	4.0	0.4	0.2	0



Package	Box	Box Size(mm)	Carton	Carton Size(mm)
TO-92	2000 pcs	333×162×43	20,000 pcs	350×340×250