

## TO-92 Plastic-Encapsulate Transistors

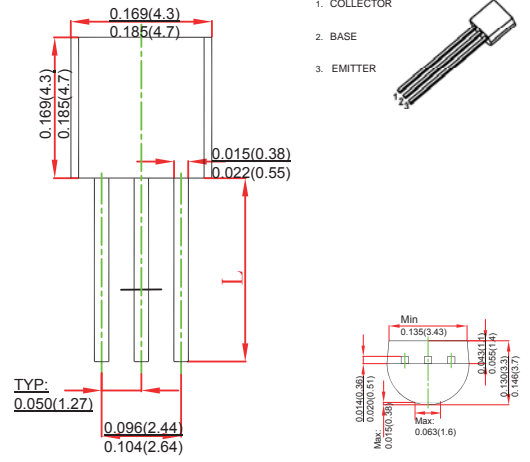
### FEATURES

- Amplifier dissipation NPN Silicon

### MECHANICAL DATA

- Case style: TO-92 molded plastic
- Mounting position: any

### TO-92



## MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

Symbol	Parameter	Value	Unit	
$V_{CEO}$	Collector-Emitter Voltage	BC237	45	V
		BC238/239	25	
$V_{EBO}$	Emitter-Base Voltage	BC237	6	V
		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	°C / W	
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125	°C / W	
$T_j$	Junction Temperature	150	°C	
$T_{stg}$	Storage Temperature	-55~150	°C	

**ELECTRICAL CHARACTERISTICS**  $T_a=25\text{ }^\circ\text{C}$  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	50			V
		BC238/239	30			
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=2\text{mA}, I_B=0$ BC237	45			V
		BC238/239	25			
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=100\mu\text{A}, I_C=0$ BC237	6			V
		BC238/239	5			
Collector cut-off current	$I_{CBO}$	$V_{CE}=50\text{V}, V_{BE}=0$ BC237 $V_{CB}=30\text{V}, I_E=0$ BC238/239			15	nA
DC current gain	$h_{FE(1)}$	$V_{CE}=5\text{V}, I_C=10\mu\text{A}$ BC237A		90		
		BC237B/238B		150		
		BC237C/238C/239C		270		
	$h_{FE(2)}$	$V_{CE}=5\text{V}, I_C=2\text{mA}$ BC237	120		800	
BC239		120		800		
BC237A		120		220		
BC237B/238B		200		460		
		BC237C/238C/239C	380		800	
$h_{FE(3)}$	$V_{CE}=5\text{V}, I_C=100\text{mA}$ BC237A		120			
	BC237B/238B		180			
	BC237C/238C/239C		300			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=10\text{mA}, I_B=0.5\text{mA}$ BC237/238/239			0.2	V
		$I_C=100\text{mA}, I_B=5\text{mA}$ BC237/239			0.6	
		BC238			0.8	
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	$V_{BE}$	$V_{CE}=5\text{V}, I_C=0.1\text{mA}$		0.5		V
		$V_{CE}=5\text{V}, I_C=2\text{mA}$	0.55		0.7	
		$V_{CE}=5\text{V}, I_C=100\text{mA}$		0.83		
Transition frequency	$f_T$	$V_{CE}=3\text{V}, I_C=0.5\text{mA}, f=100\text{MHz}$ BC237		100		MHz
		BC238		120		
		BC239		140		
		$V_{CE}=5\text{V}, I_C=10\text{mA}, f=100\text{MHz}$ BC237	150	200		
		BC238	150	240		
		BC239	150	280		
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		2	4	dB
		$V_{CE}=5\text{V}, I_C=0.2\text{mA},$ $f=1\text{kHz}, R_s=2\text{K}\Omega, \Delta f=200\text{Hz}$ BC237		2	10	
		BC238		2	10	
		BC239		2	4	