



## NPN BD239 – A – B – C

### MEDIUM POWER LINEAR AND SWITCHING APPLICATIONS.

The BD239, A, B, C are mounted in Jedec TO-220 plastic package.  
 They are the silicon epitaxial-base Power Transistors for use in medium power linear and switching applications.  
 The PNP complements are BD240, A, B, C.  
 Compliance to RoHS.

#### ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit
$V_{CEO}$	Collector-Emitter Voltage	BD239	45	V
		BD239A	60	
		BD239B	80	
		BD239C	100	
$V_{CER}$	Collector-Emitter Voltage ( $R_{BE} = 100 \Omega$ )	BD239	55	V
		BD239A	70	
		BD239B	90	
		BD239C	115	
$V_{CBO}$	Collector-Base Voltage	BD239	45	V
		BD239A	60	
		BD239B	80	
		BD239C	100	
$V_{EBO}$	Emitter-Base Voltage		5.0	V
$I_C$	Collector Current	$I_C$	3	A
		$I_{CM}$	7	
$I_B$	Base Current		0.5	A
$P_T$	Power Dissipation	@ $T_{amb} = 25^\circ C$	30	W
		@ $T_{case} = 25^\circ C$	30	W
$T_J$	Junction Temperature		150	$^\circ C$
$T_S$	Storage Temperature		-65 to +150	

#### THERMAL CHARACTERISTICS

Symbol	Ratings	Value	Unit
$R_{thJ-amb}$	Thermal Resistance, Junction-ambient	70	$^\circ C/W$
$R_{thJ-case}$	Thermal Resistance, Junction-case	4.17	$^\circ C/W$

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### ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

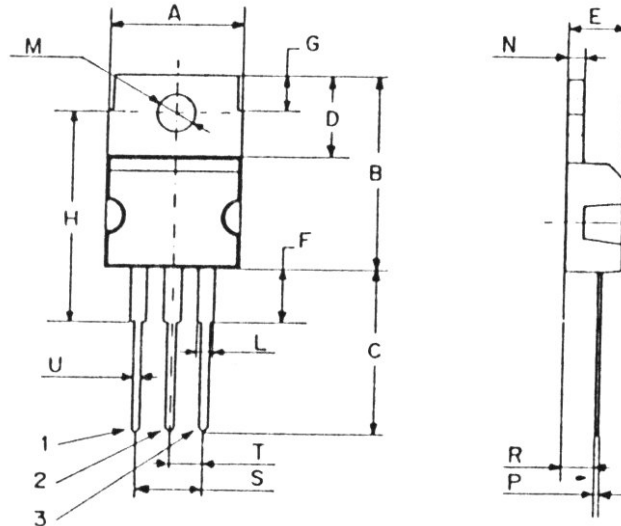
Symbol	Ratings	Test Condition(s)		Min	Typ	Max	Unit
$I_{CEO}$	Collector Cutoff Current	$V_{CE}=30\text{ V}$	BD239	-	-	0.3	mA
		$V_{CE}=30\text{ V}$	BD239A	-	-		
		$V_{CE}=60\text{ V}$	BD239B	-	-		
		$V_{CE}=60\text{ V}$	BD239C	-	-		
$I_{EBO}$	Emitter Cutoff Current	$V_{BE}=5\text{ V}$	BD239	-	-	1.0	mA
			BD239A	-	-		
			BD239B	-	-		
			BD239C	-	-		
$I_{CES}$	Collector Cutoff Current ( $V_{BE} = 0$ )	$V_{CE}=45\text{ V}$	BD239	-	-	0.2	mA
		$V_{CE}=60\text{ V}$	BD239A	-	-		
		$V_{CE}=80\text{ V}$	BD239B	-	-		
		$V_{CE}=100\text{ V}$	BD239C	-	-		
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage ( $I_B = 0$ ) (*)	$I_C = 30\text{mA}$	BD239	45			V
			BD239A	60			
			BD239B	80			
			BD239C	100			
$h_{FE}$	DC Current Gain (*)	$V_{CE}=4\text{ V}$ $I_C=0.2\text{ A}$	BD239	40	-	-	-
			BD239A				
			BD239B				
			BD239C				
		$V_{CE}=4\text{ V}$ $I_C=1\text{ A}$	BD239	15	-	-	
			BD239A				
			BD239B				
			BD239C				
$V_{CE(SAT)}$	Collector-Emitter saturation Voltage (*)	$I_C=1\text{ A}$ $I_B=200\text{ mA}$	BD239	-	-	0.6	V
			BD239A				
			BD239B				
			BD239C				
$V_{BE(on)}$	Base-Emitter Voltage (*)	$V_{CE}=4\text{ V}$ $I_C=1\text{ A}$	BD239	-	-	1.3	V
			BD239A				
			BD239B				
			BD239C				
$h_{fe}$	Small Signal Current Gain	$V_{CE}=10\text{ V}$ $I_C=0.2\text{ A}$ $f = 1\text{KHz}$	BD239	20	-	-	
			BD239A				
			BD239B				
			BD239C				
		$V_{CE}=10\text{ V}$ $I_C=0.2\text{ A}$ $f = 1\text{MHz}$	BD239	3	-	-	
			BD239A				
			BD239B				
			BD239C				
$f_T$	Transistor frequency	$V_{CE}=10\text{ V}, I_C=0.2\text{ A}, f = 1\text{MHz}$		3	-	-	MHz

(\*) Pulse Width  $\approx 300\ \mu\text{s}$ , Duty Cycle  $\angle 2.0\%$

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### MECHANICAL DATA CASE TO-220

DIMENSIONS (mm)		
	Min.	Max.
A	9,90	10,30
B	15,65	15,90
C	13,20	13,40
D	6,45	6,65
E	4,30	4,50
F	2,70	3,15
G	2,60	3,00
H	15,75	17,15
L	1,15	1,40
M	3,50	3,70
N	-	1,37
P	0,46	0,55
R	2,50	2,70
S	4,98	5,08
T	2,49	2,54
U	0,70	0,90



Pin 1 :	Base
Pin 2 :	Collector
Pin 3 :	Emitter
Case :	Collector

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