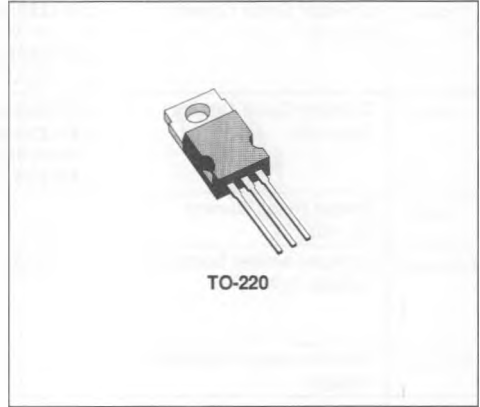


MEDIUM POWER LINEAR AND SWITCHING APPLICATIONS

DESCRIPTION

The BD239, BD239A, BD239B and BD239C are silicon epitaxial-base NPN power transistors in Jedec TO-220 plastic package, intended for use in medium power linear and switching applications.

The complementary PNP types are the BD240, BD240A, BD240B and BD240C respectively.



INTERNAL SCHEMATIC DIAGRAMS



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP*	Value				Unit
			BD239 BD240	BD239A BD240A	BD239B BD240B	BD239C BD240C	
V_{CEr}	Collector-emitter Voltage ($R_{BE} = 100 \Omega$)		55	70	90	115	V
V_{CE0}	Collector-emitter Voltage ($I_B = 0$)		45	60	80	100	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)		5				V
I_C	Collector Current		2				A
I_{CM}	Collector Peak Current		4				A
I_B	Base Current		0.6				A
P_{Tot}	Total Power Dissipation at $T_{case} \leq 25^\circ C$ $T_{amb} \leq 25^\circ C$		30				W
			2				W
T_{sig}	Storage Temperature		- 65 to 150				$^\circ C$
T_j	Junction Temperature		150				$^\circ C$

* For PNP types voltage and current values are negative.

THERMAL DATA

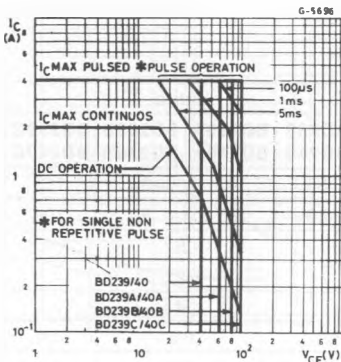
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	4.17	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	62.5	°C/W

ELECTRICAL CHARACTERISTICS ($T_{case} = 25\text{ °C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEO}	Collector Cutoff Current ($I_B = 0$)	for BD239/40/39A/40A $V_{CE} = 30\text{ V}$ for BD239B/40B/39C/40C $V_{CE} = 60\text{ V}$			0.3	mA
I_{CES}	Collector Cutoff Current ($V_{BE} = 0$)	for BD239/40 $V_{CE} = 45\text{ V}$ for BD239A/40A $V_{CE} = 60\text{ V}$ for BD239B/40B $V_{CE} = 80\text{ V}$ for BD239C/40C $V_{CE} = 100\text{ V}$			0.2	mA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5\text{ V}$			1	mA
$V_{CE(0sus)^*}$	Collector-emitter Sustaining Voltage ($I_B = 0$)	$I_C = 30\text{ mA}$ for BD239/40 for BD239A/40A for BD239B/40B for BD239C/40C	45 60 80 100			V
$V_{CE(sat)^*}$	Collector-emitter Saturation Voltage	$I_C = 1\text{ A}$ $I_B = 0.2\text{ mA}$			0.7	V
$V_{BE(on)^*}$	Base-emitter Voltage	$I_C = 1\text{ A}$ $V_{CE} = 4\text{ V}$			1.3	V
h_{FE}^*	DC Current Gain	$I_C = 0.2\text{ A}$ $V_{CE} = 4\text{ V}$ $I_C = 1\text{ A}$ $V_{CE} = 4\text{ V}$	40 15			
h_{fe}	Small Signal Current Gain	$I_C = 0.2\text{ A}$ $V_{CE} = 10\text{ V}$ $f = 1\text{ KHz}$ $I_C = 0.2\text{ A}$ $V_{CE} = 10\text{ V}$ $f = 1\text{ MHz}$	20 3			

* Pulsed : pulse duration = 300 μs , duty cycle $\leq 2\%$.

Safe Operating Areas.



For the others characteristics curves see TIP31/TIP32 series.