



BD239 BD240
 BD239A BD240A
 BD239B BD240B
 BD239C BD240C

EPITAXIAL-BASE NPN/PNP

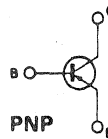
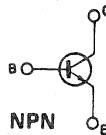
MEDIUM POWER LINEAR AND SWITCHING APPLICATIONS

The BD239, BD239A, BD239B and BD239C are silicon epitaxial-base NPN power transistors in Jeduc TO-220 plastic package, intended for use in medium power linear and switching applications. The complementary PNP types are BD240, BD240A, BD240B and BD240C respectively.

ABSOLUTE MAXIMUM RATINGS		NPN PNP*	BD239 BD240	BD239A BD240A	BD239B BD240B	BD239C BD240C
V_{CER}	Collector-emitter voltage ($R_{BE} = 100\Omega$)		55V	70V	90V	115V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)		45V	60V	80V	100V
V_{EBO}	Emitter-base voltage ($I_C = 0$)				5V	
I_C	Collector current				2A	
I_{CM}	Collector peak current				4A	
I_B	Base current				0.6A	
P_{tot}	Total power dissipation at $T_{case} \leq 25^\circ C$ $T_{amb} \leq 25^\circ C$				30W	
T_{stg}	Storage temperature				-65 to 150°C	
T_J	Junction temperature				150°C	

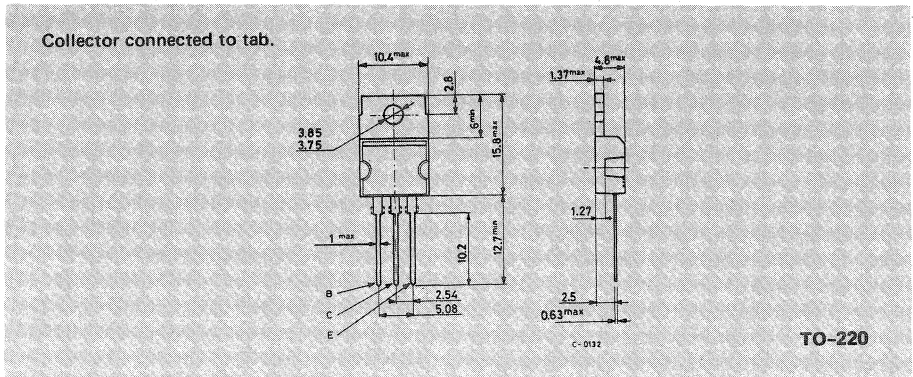
* For PNP types voltage and current values are negative

INTERNAL SCHEMATIC DIAGRAMS



MECHANICAL DATA

Dimensions in mm





BD239 **BD240**
BD239A **BD240A**
BD239B **BD240B**
BD239C **BD240C**

THERMAL DATA

$R_{thj-case}$	Thermal resistance junction-case	max	4.17	$^{\circ}\text{C}/\text{W}$
$R_{thj-amb}$	Thermal resistance junction-ambient	max	62.5	$^{\circ}\text{C}/\text{W}$

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

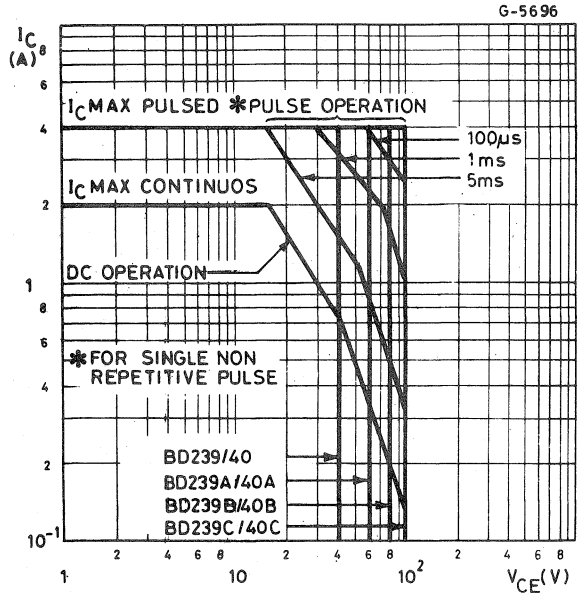
Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CEO} Collector cutoff current ($I_B = 0$)	for BD239/40/39A/40A $V_{CE} = 30\text{V}$ for BD239B/40B/39C/40C $V_{CE} = 60\text{V}$			0.3	mA
I_{CES} Collector cutoff current ($V_{BE} = 0$)	for BD239/40 $V_{CE} = 45\text{V}$ for BD239A/40A $V_{CE} = 60\text{V}$ 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
$V_{CEO(sus)}$ * 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			V
$V_{CE(sat)}$ * Collector-emitter saturation voltage	$I_C = 1\text{A}$ $I_B = 0.2\text{A}$			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			—
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 = $300\mu\text{s}$, duty cycle $\leq 2\%$.



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Safe operating areas



For the others characteristics curves see TIP31/TIP32 series.