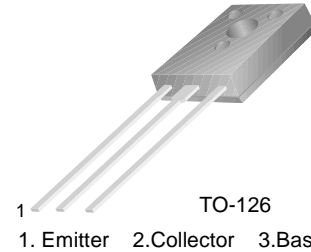


# BD439/441

## Medium Power Linear and Switching Applications

- Complement to BD440, BD442 respectively



## NPN Epitaxial Silicon Transistor

### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$V_{CB0}$	Collector-Base Voltage		
	: BD439	60	V
	: BD441	80	V
$V_{CES}$	Collector-Emitter Voltage		
	: BD439	60	V
	: BD441	80	V
$V_{CEO}$	Collector-Emitter Voltage		
	: BD439	60	V
	: BD441	80	V
$V_{EBO}$	Emitter-Base Voltage	5	V
$I_C$	Collector Current (DC)	4	A
$I_{CP}$	*Collector Current (Pulse)	7	A
$I_B$	Base Current	1	A
$P_C$	Collector Dissipation ( $T_C=25^\circ\text{C}$ )	36	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 65 ~ 150	$^\circ\text{C}$

### Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{CEO(sus)}$	* Collector-Emitter Sustaining Voltage					
	: BD439	$I_C = 100\text{mA}, I_B = 0$	60			V
	: BD441		80			V
$I_{CBO}$	Collector Cut-off Current					
	: BD439	$V_{CB} = 60\text{V}, I_E = 0$			100	$\mu\text{A}$
	: BD441	$V_{CB} = 80\text{V}, I_E = 0$			100	$\mu\text{A}$
$I_{CES}$	Collector Cut-off Current					
	: BD439	$V_{CE} = 60\text{V}, V_{BE} = 0$			100	$\mu\text{A}$
	: BD441	$V_{CE} = 80\text{V}, V_{BE} = 0$			100	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 5\text{V}, I_C = 0$			1	mA
$h_{FE}$	* DC Current Gain					
	: BD439	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$	20	130		
	: BD441		15	130		
	: BD439	$V_{CE} = 1\text{V}, I_C = 500\text{mA}$	40	140		
	: BD441		40	140		
	: BD439	$V_{CE} = 1\text{V}, I_C = 2\text{A}$	25			
	: BD441		15			
$V_{CE(sat)}$	* Collector-Emitter Saturation Voltage	$I_C = 2\text{A}, I_B = 0.2\text{A}$			0.8	V
$V_{BE(on)}$	* Base-Emitter ON Voltage					
	: BD439	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$		0.58		V
	: BD441	$V_{CE} = 1\text{V}, I_C = 2\text{A}$			1.5	V
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 1\text{V}, I_C = 250\text{mA}$	3			MHz

\* Pulse Test: PW=300 $\mu\text{s}$ , duty Cycle=1.5% Pulsed

# Typical Characteristics

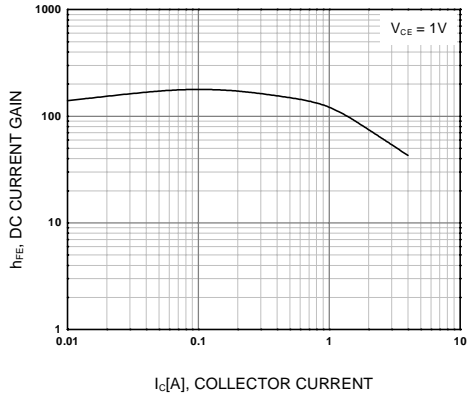


Figure 1. DC current Gain

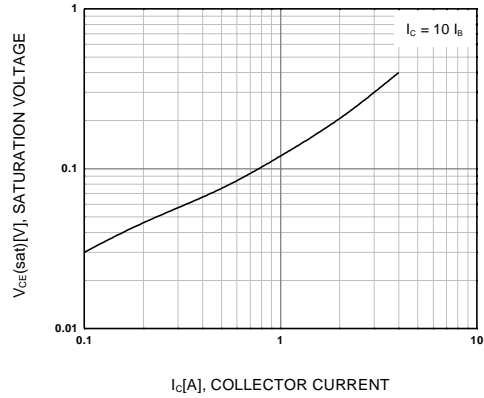


Figure 2. Collector-Emitter Saturation Voltage

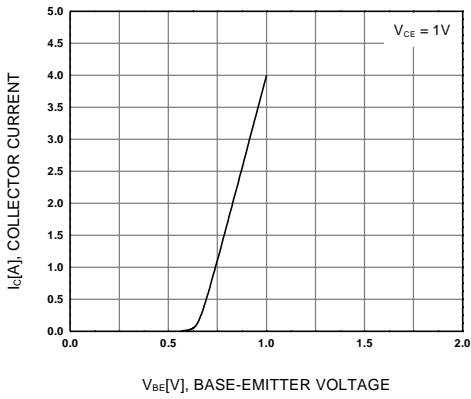


Figure 3. Base-Emitter On Voltage

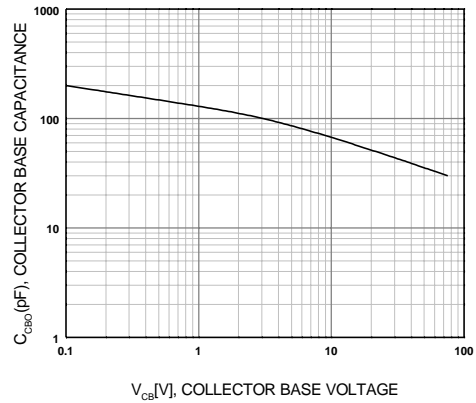


Figure 4. Collector-Base Capacitance

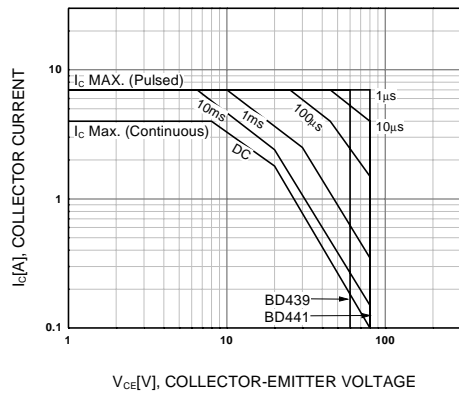


Figure 5. Safe Operating Area

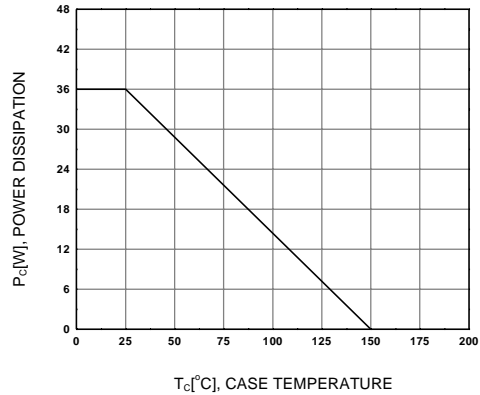


Figure 6. Power Derating

# Package Dimensions

BD439/441

## TO-126



Dimensions in Millimeters

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Bottomless™	FAST <sup>r</sup> ™	PACMAN™	SuperSOT™-6
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EcoSPARK™	ISOPLANAR™	QT Optoelectronics™	UltraFET <sup>®</sup>
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