

# SPECIFICATION FOR APPROVAL

CUSTOMER \_\_\_\_\_

PART NAME Power Transistors  
\_\_\_\_\_

SPEC BD135-6/10/16  
BD137-6/10/16  
BD139-6/10/16  
\_\_\_\_\_

PART NO  
\_\_\_\_\_

DATE 2024-06-21  
\_\_\_\_\_

CUSTOMER APPROVE

DRAWING

PREPARED

CHECKED

APPROVED

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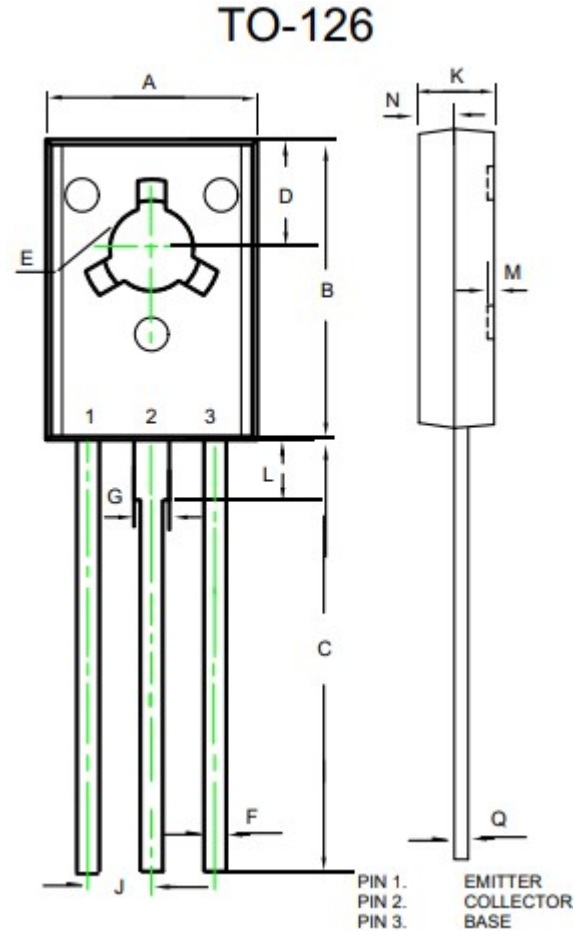
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**FEATURES**

- ◆ Halogen free available upon request by adding suffix "-HF"
- ◆ Lead Free Finish/RoHS Compliant (Note1) ("P" Suffix designates RoHS Compliant. See ordering information)
- ◆ Epoxy meets UL 94 V-0 flammability rating
- ◆ Moisture Sensitivity Level 1
- ◆ DC Current Gain -  $h_{FE} = 40$  (Min) @  $I_C = 150\text{mA}$
- ◆ Complementary with BD136, BD138, BD140

**Maximum Ratings**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	BD135	45	Vdc
	BD137	60	
	BD139	80	
Collector-Base Voltage	BD135	45	Vdc
	BD137	60	
	BD139	80	
Emitter-Base Voltage	$V_{EBO}$	5.0	Vdc
Collector Current	$I_C$	1.5	Adc
Base Current	$I_B$	0.5	Adc
Total Device Dissipation @ $T_A=25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.25	Watt
		10	mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C=25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	12.5	Watt
		100	mW/ $^\circ\text{C}$
Operating & Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$
Maximum Thermal Resistance Junction to Case	$R_{\theta JA}$	10	$^\circ\text{C}/\text{W}$
Maximum Thermal Resistance Junction to Ambient Air	$R_{\theta JA}$	100	$^\circ\text{C}/\text{W}$



**Electrical Characteristics @  $25^\circ\text{C}$  unless otherwise specified**

Symbol	Parameter	Min	Max	Units
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**OFF CHARACTERISTICS**

$V_{CEO}$	Collector-Emitter Sustaining Voltage* ( $I_C=30\text{mA}, I_B=0$ )	BD135 BD137 BD139	45 60 80	Vdc
$I_{CBO}$	Collector Cutoff Current ( $V_{CB}=30\text{Vdc}, I_E=0$ ) ( $V_{CB}=30\text{Vdc}, I_E=0, T_C=125^\circ\text{C}$ )		0.1 10	$\mu\text{Adc}$
$I_{EBO}$	Emitter Cutoff Current ( $V_{BE}=5.0\text{Vdc}, I_C=0$ )		10	$\mu\text{Adc}$
$h_{FE(1)}$	DC Current Gain* ( $I_C=5\text{mA}, V_{CE}=2\text{Vdc}$ )		25	
$h_{FE(2)}$	( $I_C=0.5\text{Adc}, V_{CE}=2\text{Vdc}$ )		25	
$h_{FE(3)}$	( $I_C=150\text{mA}, V_{CE}=2\text{Vdc}$ )		40	250
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ( $I_C=500\text{mA}, I_B=50\text{mA}$ )		0.5	Vdc
$V_{BE(on)}$	Base-Emitter ON Voltage ( $V_{CE}=2\text{V}, I_C=0.5\text{A}$ )		1	Vdc

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.291	0.307	7.40	7.80	
B	0.417	0.433	10.60	11.00	
C	0.602	0.618	15.30	15.70	
D	0.154	0.161	3.90	4.10	
E	0.118	0.126	3.00	3.20	
F	0.026	0.034	0.66	0.86	
G	0.046	0.054	1.17	1.37	
J	0.090TYP		2.290TYP		
K	0.098	0.114	2.50	2.90	
L	0.083	0.091	2.10	2.30	
M	0.000	0.012	0.00	0.30	
N	0.043	0.059	1.10	1.50	
Q	0.018	0.024	0.45	0.60	

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## CLASSIFICATION OF $H_{FE3}$

Rank	6	10	16
Range	40-100	63-160	100-250

\*Pulse test: Pulse width 300  $\mu$ sec, Duty cycle 2%

Notes: 1. High Temperature Solder Exemption Applied, see EU Directive Annex Notes 7

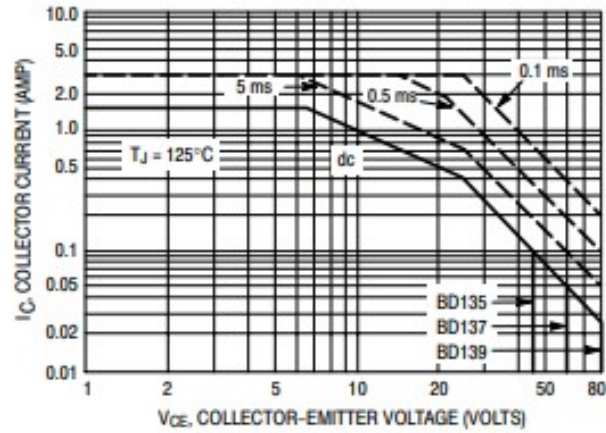


Figure 1. Active-Region Safe Operating Area

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