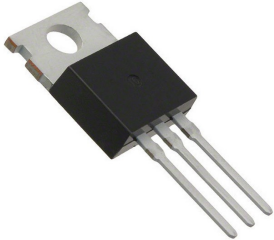


PNP SILICON POWER DARLINGTON

BD650
TO-220
Plastic Package



FEATURES

- Designed for Complimentary use with BD649
- 62.5 W at 25°C Case Temperature
- 8A Continuous Collector Current
- Minimum h_{FE} of 750 at 3V, 3A

MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Collector Base Voltage	V_{CBO}	120	V
Collector Emitter Voltage	V_{CEO}	100	V
Emitter Base Voltage	V_{EBO}	5	V
Continuous collector current	I_C	8	A
Peak collector current ¹⁾	I_{CM}	12	A
Continuous base current	I_B	0.3	A
Continuous device dissipation at (or below) 25°C case temperature ²⁾	P_{tot}	62.5	W
Continuous device dissipation at (or below) 25°C free air temperature ³⁾	P_{tot}	2	W
Unclamped inductive load energy ⁴⁾	$\frac{1}{2}LI_C^2$	50	mJ
Operating junction temperature range	T_j	-65 to 150	°C
Storage temperature range	T_{stg}	-65 to 150	°C
Lead temperature 3.2 mm from case for 10 seconds	T_L	260	°C

NOTES:

1. This value applies for $t_p = 300\mu\text{s}$, duty cycle = 10%
2. Derate linearly to 150°C case temperature at the rate of 0.4 W/°C
3. Derate linearly to 150°C free air temperature at the rate of 16 mW/°C
4. This rating is based on the capability of the transistor to operate safely in a circuit of: $L = 20\text{mH}$, $I_{B(on)} = 5\text{mA}$, $R_{BE} = 100\Omega$, $V_{BE(off)} = 0$, $R_S = 0.1\Omega$, $V_{CC} = 20\text{V}$



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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 30 \text{ mA}, I_B = 0$ ⁵⁾	100		V
Collector cut-off current	I_{CBO}	$V_{CB} = 100\text{V}, I_E = 0$		0.2	mA
		$V_{CB} = 100\text{V}, I_E = 0,$ $T_C = 150^\circ\text{C}$		2.0	mA
Collector cut-off current	I_{CEO}	$V_{CE} = 50\text{V}, I_B = 0$		0.5	mA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$ ^{5,6)}		5	mA
DC current gain	h_{FE}	$V_{CE} = 3\text{V}, I_C = 3\text{A}$ ^{5,6)}	750		
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 3\text{A}, I_B = 12\text{mA}$ ^{5,6)}		2	V
		$I_C = 5\text{A}, I_B = 50\text{mA}$ ^{5,6)}		2.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 5\text{A}, I_B = 50\text{mA}$ ^{5,6)}		3	V

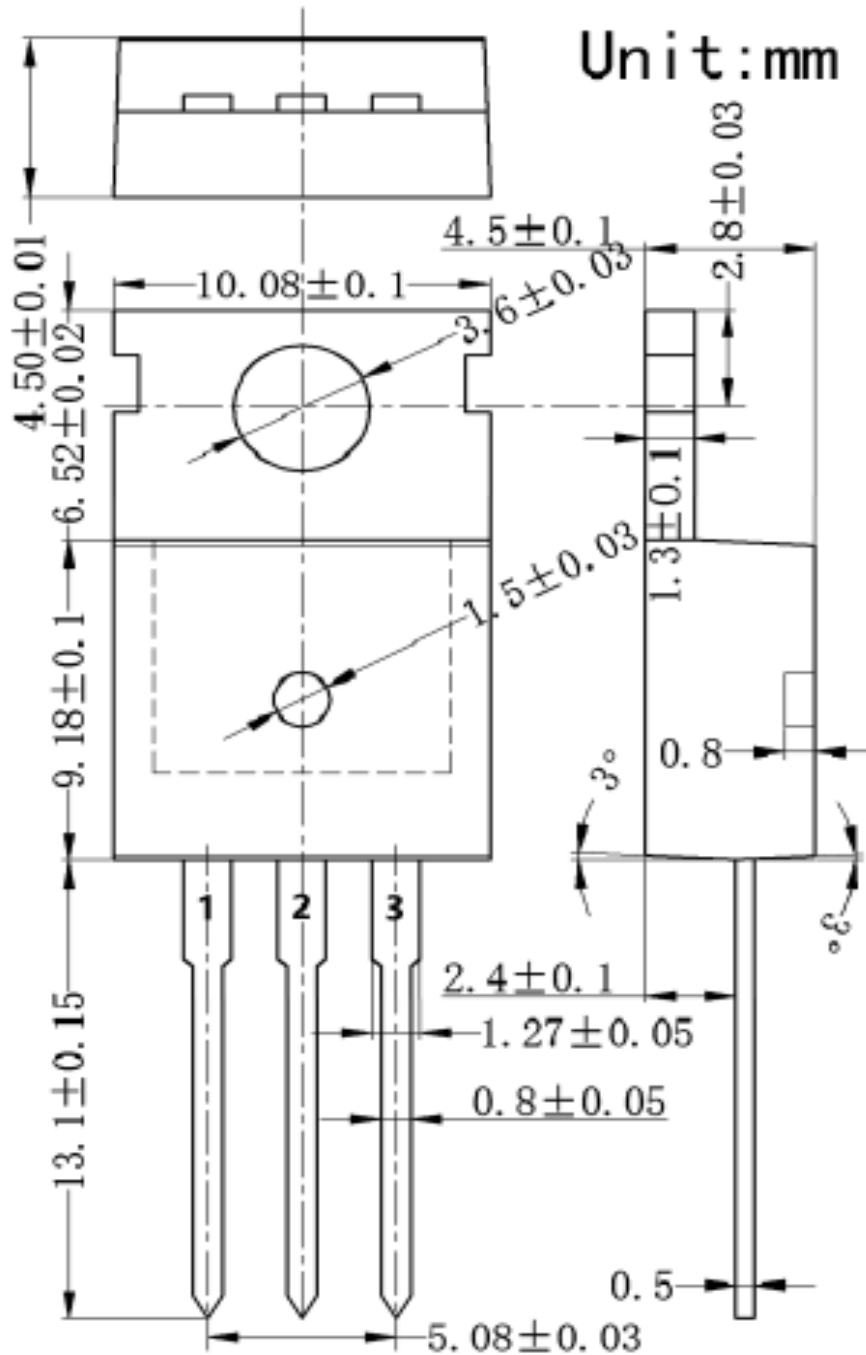
NOTES:

- 5. These parameters must be measured using pulse techniques, $t_p = 300 \mu\text{s}$, duty cycle = 2%
- 6. These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Junction to case thermal resistance	$R_{\theta JC}$	2.0	$^\circ\text{C/W}$
Junction to free air thermal resistance	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

TO-220 PACKAGE OUTLINE AND DIMENSIONS



1. BASE
2. COLLECTOR
3. EMITTER



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Customer Notes:

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

DISCLAIMER

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD is believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).



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