New Jersey Semi-Conductor Products, Inc.

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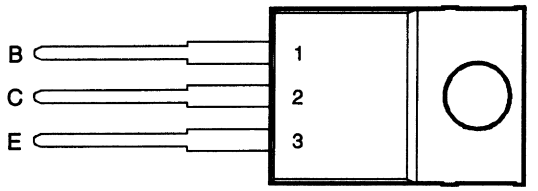
BDT60, BDT60A, BDT60B, BDT60C
PNP SILICON POWER DARLINGTONS

- **Designed for Complementary Use with BDT61, BDT61A, BDT61B and BDT61C**
- **50 W at 25°C Case Temperature**
- **4 A Continuous Collector Current**
- **Minimum h_{FE} of 750 at 1.5 V, 3 A**

TO-220 PACKAGE
(TOP VIEW)



Pin 2 is in electrical contact with the mounting base.

absolute maximum ratings **at 25°C case temperature (unless otherwise noted)**

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage (I_E = 0)	BDT60	V_{CBO}	-60	V
	BDT60A		-80	
	BDT60B		-100	
	BDT60C		-120	
Collector-emitter voltage (I_B = 0)	BDT60	V_{CEO}	-60	V
	BDT60A		-80	
	BDT60B		-100	
	BDT60C		-120	
Emitter-base voltage		V_{EBO}	-5	V
Continuous collector current		I_C	-4	A
Continuous base current		I_B	-0.1	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 1)		P_{tot}	50	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 2)		P_{tot}	2	W
Operating junction temperature range		T_j	-65 to +150	°C
Storage temperature range		T_{stg}	-65 to +150	°C
Operating free-air temperature range		T_A	-65 to +150	°C

NOTES: 1. Derate linearly to 150°C case temperature at the rate of 0.4 W/°C.
2. Derate linearly to 150°C free air temperature at the rate of 16 mW/°C.

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electrical characteristics at 25°C case temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS				MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	I_C = -30 mA	I_B = 0	(see Note 3)	BDT60	-60			V
					BDT60A	-80			
					BDT60B	-100			
					BDT60C	-120			
I_{CEO}	Collector-emitter cut-off current	V_{CE} = -30 V	I_B = 0		BDT60			-0.5	mA
		V_{CE} = -40 V	I_B = 0		BDT60A			-0.5	
		V_{CE} = -50 V	I_B = 0		BDT60B			-0.5	
		V_{CE} = -60 V	I_B = 0		BDT60C			-0.5	
I_{CBO}	Collector cut-off current	V_{CB} = -60 V	I_E = 0		BDT60			-0.2	mA
		V_{CB} = -80 V	I_E = 0		BDT60A			-0.2	
		V_{CB} = -100 V	I_E = 0		BDT60B			-0.2	
		V_{CB} = -120 V	I_E = 0		BDT60C			-0.2	
		V_{CB} = -30 V	I_E = 0	T_C = 150°C	BDT60			-2.0	
		V_{CB} = -40 V	I_E = 0	T_C = 150°C	BDT60A			-2.0	
		V_{CB} = -50 V	I_E = 0	T_C = 150°C	BDT60B			-2.0	
		V_{CB} = -60 V	I_E = 0	T_C = 150°C	BDT60C			-2.0	
I_{EBO}	Emitter cut-off current	V_{EB} = -5 V	I_C = 0					-5	mA
h_{FE}	Forward current transfer ratio	V_{CE} = -3 V	I_C = -1.5 A	(see Notes 3 and 4)		750			
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_B = -6 mA	I_C = -1.5 A	(see Notes 3 and 4)				-2.5	V
$V_{BE(on)}$	Base-emitter voltage	V_{CE} = -3 V	I_C = -1.5 A	(see Notes 3 and 4)				-2.5	V
V_{EC}	Parallel diode forward voltage	I_E = -1.5 A	I_B = 0					-2.0	V

NOTES: 3. These parameters must be measured using pulse techniques, t_p = 300 µs, duty cycle ≤ 2%.
4. These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

thermal characteristics

PARAMETER		MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to case thermal resistance			2.5	°C/W
$R_{\theta JA}$	Junction to free air thermal resistance			62.5	°C/W

resistive-load-switching characteristics at 25°C case temperature

PARAMETER		TEST CONDITIONS †			MIN	TYP	MAX	UNIT
t_{on}	Turn-on time	I_C = -2 A	$I_{B(on)}$ = -8 mA	$I_{B(off)}$ = 8 mA		1		µs
t_{off}	Turn-off time	$V_{BE(off)}$ = 5 V	R_L = 20 Ω	t_p = 20 µs, dc ≤ 2%		4.5		µs

† Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.