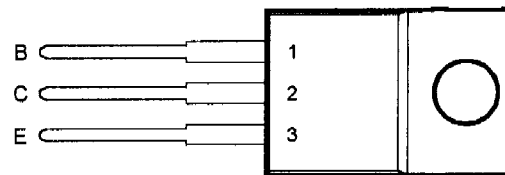


**BDW64, BDW64A, BDW64B, BDW64C, BDW64D**  
**PNP SILICON POWER DARLINGTONS**

- Designed for Complementary Use with BDW63, BDW63A, BDW63B, BDW63C and BDW63D
- 60 W at 25°C Case Temperature
- 6 A Continuous Collector Current
- Minimum  $h_{FE}$  of 750 at 3 V, 2 A

TO-220 PACKAGE  
(TOP VIEW)

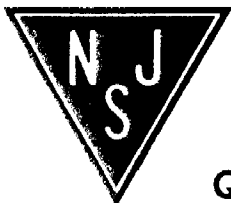


Pin 2 is in electrical contact with the mounting base.

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

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage ( $I_E = 0$ )	BDW64	$V_{CBO}$	-45	V
	BDW64A		-60	
	BDW64B		-80	
	BDW64C		-100	
	BDW64D		-120	
Collector-emitter voltage ( $I_B = 0$ ) (see Note 1)	BDW64	$V_{CEO}$	-45	V
	BDW64A		-60	
	BDW64B		-80	
	BDW64C		-100	
	BDW64D		-120	
Emitter-base voltage		$V_{EBO}$	-5	V
Continuous collector current		$I_C$	-6	A
Continuous base current		$I_B$	-0.1	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)		$P_{tot}$	60	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3)		$P_{tot}$	2	W
Unclamped inductive load energy (see Note 4)		$\frac{1}{2}LI_C^2$	50	mJ
Operating junction temperature range		$T_J$	-65 to +150	°C
Operating temperature range		$T_{stg}$	-65 to +150	°C
Operating free-air temperature range		$T_A$	-65 to +150	°C

- NOTES: 1. These values apply when the base-emitter diode is open circuited.  
2. Derate linearly to 150°C case temperature at the rate of 0.48 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:  $L = 20$  mH,  $I_{B(on)} = -5$  mA,  $R_{BE} = 100 \Omega$ ,  $V_{BE(off)} = 0$ ,  $R_S = 0.1 \Omega$ ,  $V_{CC} = -20$  V.



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# BDW64, BDW64A, BDW64B, BDW64C, BDW64D

## PNP SILICON POWER DARLINGTONS

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

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$ Collector-emitter breakdown voltage	$I_C = -30 \text{ mA}$ $I_B = 0$ (see Note 5)	BDW64			V
		BDW64A	-45		
		BDW64B	-60		
		BDW64C	-80		
		BDW64D	-100		
$I_{CEO}$ Collector-emitter cut-off current	$V_{CE} = -30 \text{ V}$ $I_B = 0$ $V_{CE} = -30 \text{ V}$ $I_B = 0$ $V_{CE} = -40 \text{ V}$ $I_B = 0$ $V_{CE} = -50 \text{ V}$ $I_B = 0$ $V_{CE} = -60 \text{ V}$ $I_B = 0$	BDW64		-0.5	mA
		BDW64A		-0.5	
		BDW64B		-0.5	
		BDW64C		-0.5	
		BDW64D		-0.5	
$I_{CBO}$ Collector cut-off current	$V_{CB} = -45 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -60 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -80 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -100 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -120 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -45 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -60 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -80 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -100 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -120 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$	BDW64		-0.2	mA
		BDW64A		-0.2	
		BDW64B		-0.2	
		BDW64C		-0.2	
		BDW64D		-0.2	
		BDW64		-5	
		BDW64A		-5	
		BDW64B		-5	
		BDW64C		-5	
		BDW64D		-5	
$I_{EBO}$ Emitter cut-off current	$V_{EB} = -5 \text{ V}$ $I_C = 0$			-2	mA
$h_{FE}$ Forward current transfer ratio	$V_{CE} = -3 \text{ V}$ $I_C = -2 \text{ A}$ (see Notes 5 and 6) $V_{CE} = -3 \text{ V}$ $I_C = -6 \text{ A}$	750		20000	
		100			
$V_{BE(on)}$ Base-emitter voltage	$V_{CE} = -3 \text{ V}$ $I_C = -2 \text{ A}$ (see Notes 5 and 6)			-2.5	V
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = -12 \text{ mA}$ $I_C = -2 \text{ A}$ (see Notes 5 and 6) $I_B = -60 \text{ mA}$ $I_C = -6 \text{ A}$			-2.5	V
				-4	
$V_{EC}$ Parallel diode forward voltage	$I_E = -6 \text{ A}$ $I_B = 0$			-3.5	V

NOTES: 5. These parameters must be measured using pulse techniques,  $t_p = 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .

6. 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			2.08	$^\circ\text{C/W}$
$R_{\theta JA}$ Junction to free air thermal resistance			62.5	$^\circ\text{C/W}$

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

PARAMETER	TEST CONDITIONS †	MIN	TYP	MAX	UNIT
$t_{on}$ Turn-on time	$I_C = -3 \text{ A}$ $I_{B(on)} = -12 \text{ mA}$ $I_{B(off)} = 12 \text{ mA}$		1		$\mu\text{s}$
$t_{off}$ Turn-off time	$V_{BE(off)} = 4.5 \text{ V}$ $R_L = 10 \Omega$ $t_p = 20 \mu\text{s}$ , dc $\leq 2\%$		5		$\mu\text{s}$

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