

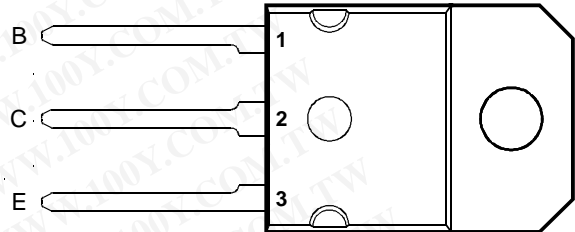
# BDV65, BDV65A, BDV65B, BDV65C NPN SILICON POWER DARLINGTONS

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JUNE 1993 - REVISED MARCH 1997

- Designed for Complementary Use with BDV64, BDV64A, BDV64B and BDV64C
- 125 W at 25°C Case Temperature
- 12 A Continuous Collector Current
- Minimum  $h_{FE}$  of 1000 at 4 V, 5 A

SOT-93 PACKAGE  
(TOP VIEW)



Pin 2 is in electrical contact with the mounting base.

MDTRA4

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

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage ( $I_E = 0$ )	BDV65	$V_{CBO}$	60	V
	BDV65A		80	
	BDV65B		100	
	BDV65C		120	
Collector-emitter voltage ( $I_B = 0$ )	BDV65	$V_{CEO}$	60	V
	BDV65A		80	
	BDV65B		100	
	BDV65C		120	
Emitter-base voltage		$V_{EBO}$	5	V
Continuous collector current		$I_C$	12	A
Peak collector current (see Note 1)		$I_{CM}$	15	A
Continuous base current		$I_B$	0.5	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)		$P_{tot}$	125	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3)		$P_{tot}$	3.5	W
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  $t_p \leq 0.1$  ms, duty cycle  $\leq 10\%$   
 2. Derate linearly to 150°C case temperature at the rate of 0.56 W/°C.  
 3. Derate linearly to 150°C free air temperature at the rate of 28 mW/°C.

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## PRODUCT INFORMATION

Information is current as of publication date. Products conform to specifications in accordance with the terms of Power Innovations standard warranty. Production processing does not necessarily include testing of all parameters.

# BDV65, BDV65A, BDV65B, BDV65C

## NPN SILICON POWER DARLINGTONS

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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	$I_C = 30 \text{ mA}$	$I_B = 0$	(see Note 4)	BDV65 BDV65A BDV65B BDV65C	60 80 100 120		V
$I_{CEO}$ Collector-emitter cut-off current	$V_{CB} = 30 \text{ V}$ $V_{CB} = 40 \text{ V}$ $V_{CB} = 50 \text{ V}$ $V_{CB} = 60 \text{ V}$	$I_B = 0$ $I_B = 0$ $I_B = 0$ $I_B = 0$		BDV65 BDV65A BDV65B BDV65C		2 2 2 2	mA
$I_{CBO}$ Collector cut-off current	$V_{CB} = 60 \text{ V}$ $V_{CB} = 80 \text{ V}$ $V_{CB} = 100 \text{ V}$ $V_{CB} = 120 \text{ V}$ $V_{CB} = 30 \text{ V}$ $V_{CB} = 40 \text{ V}$ $V_{CB} = 50 \text{ V}$ $V_{CB} = 60 \text{ V}$	$I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$	$T_C = 150^\circ\text{C}$ $T_C = 150^\circ\text{C}$ $T_C = 150^\circ\text{C}$ $T_C = 150^\circ\text{C}$	BDV65 BDV65A BDV65B BDV65C BDV65 BDV65A BDV65B BDV65C		0.4 0.4 0.4 0.4 2 2 2 2	mA
$I_{EBO}$ Emitter cut-off current	$V_{EB} = 5 \text{ V}$	$I_C = 0$				5	mA
$h_{FE}$ Forward current transfer ratio	$V_{CE} = 4 \text{ V}$	$I_C = 5 \text{ A}$	(see Notes 4 and 5)		1000		
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = 20 \text{ mA}$	$I_C = 5 \text{ A}$	(see Notes 4 and 5)			2	V
$V_{BE}$ Base-emitter voltage	$V_{CE} = 4 \text{ V}$	$I_C = 5 \text{ A}$	(see Notes 4 and 5)			2.5	V
$V_{EC}$ Parallel diode forward voltage	$I_E = 10 \text{ A}$	$I_B = 0$	(see Notes 4 and 5)			3.5	V

NOTES: 4. These parameters must be measured using pulse techniques,  $t_p = 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .

5. 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			1	$^\circ\text{C/W}$
$R_{\theta JA}$ Junction to free air thermal resistance			35.7	$^\circ\text{C/W}$

TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN  
vs  
COLLECTOR CURRENT

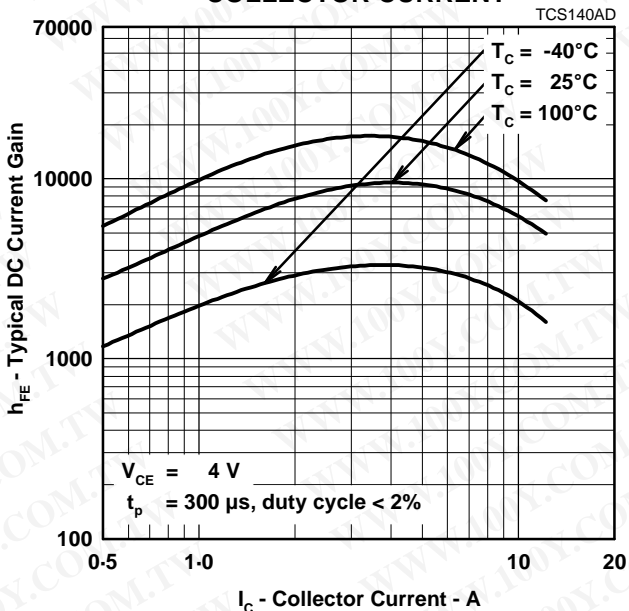


Figure 1.

COLLECTOR-EMITTER SATURATION VOLTAGE  
vs  
COLLECTOR CURRENT

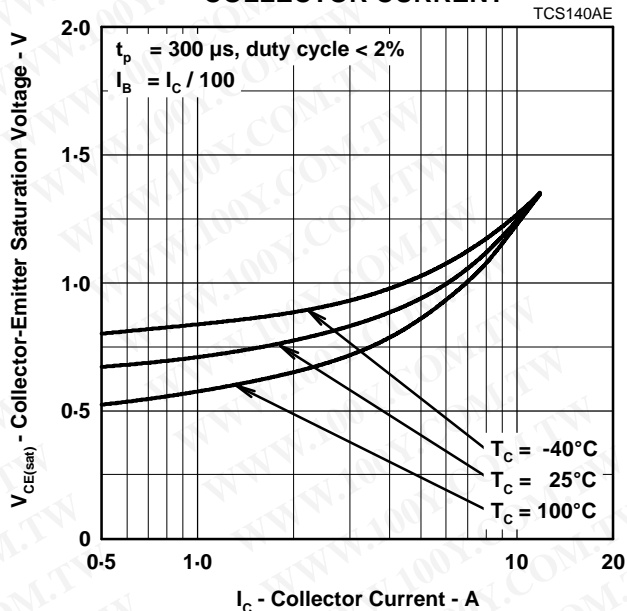


Figure 2.

BASE-EMITTER SATURATION VOLTAGE  
vs  
COLLECTOR CURRENT

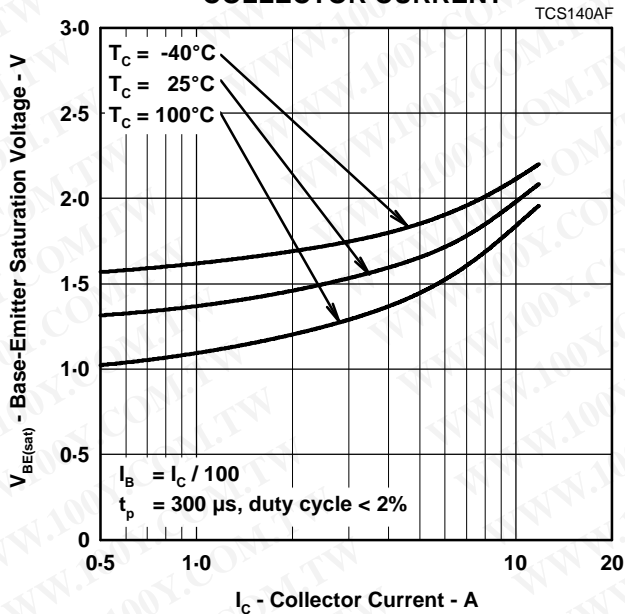


Figure 3.

# BDV65, BDV65A, BDV65B, BDV65C NPN SILICON POWER DARLINGTONS

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## THERMAL INFORMATION

### MAXIMUM POWER DISSIPATION VS CASE TEMPERATURE

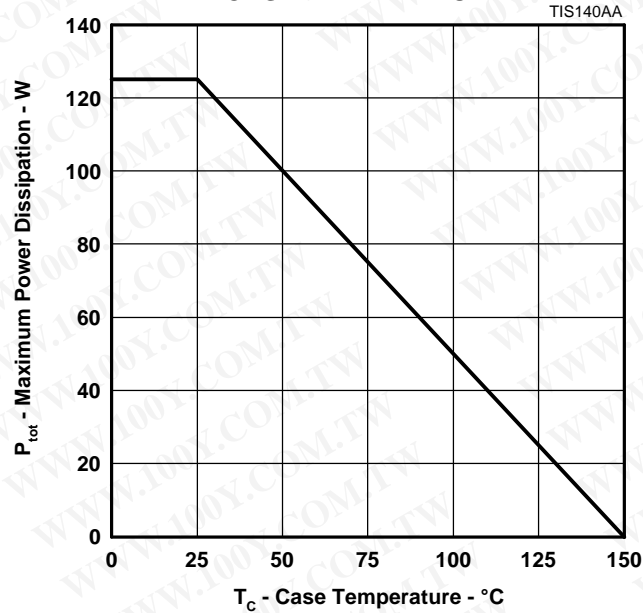


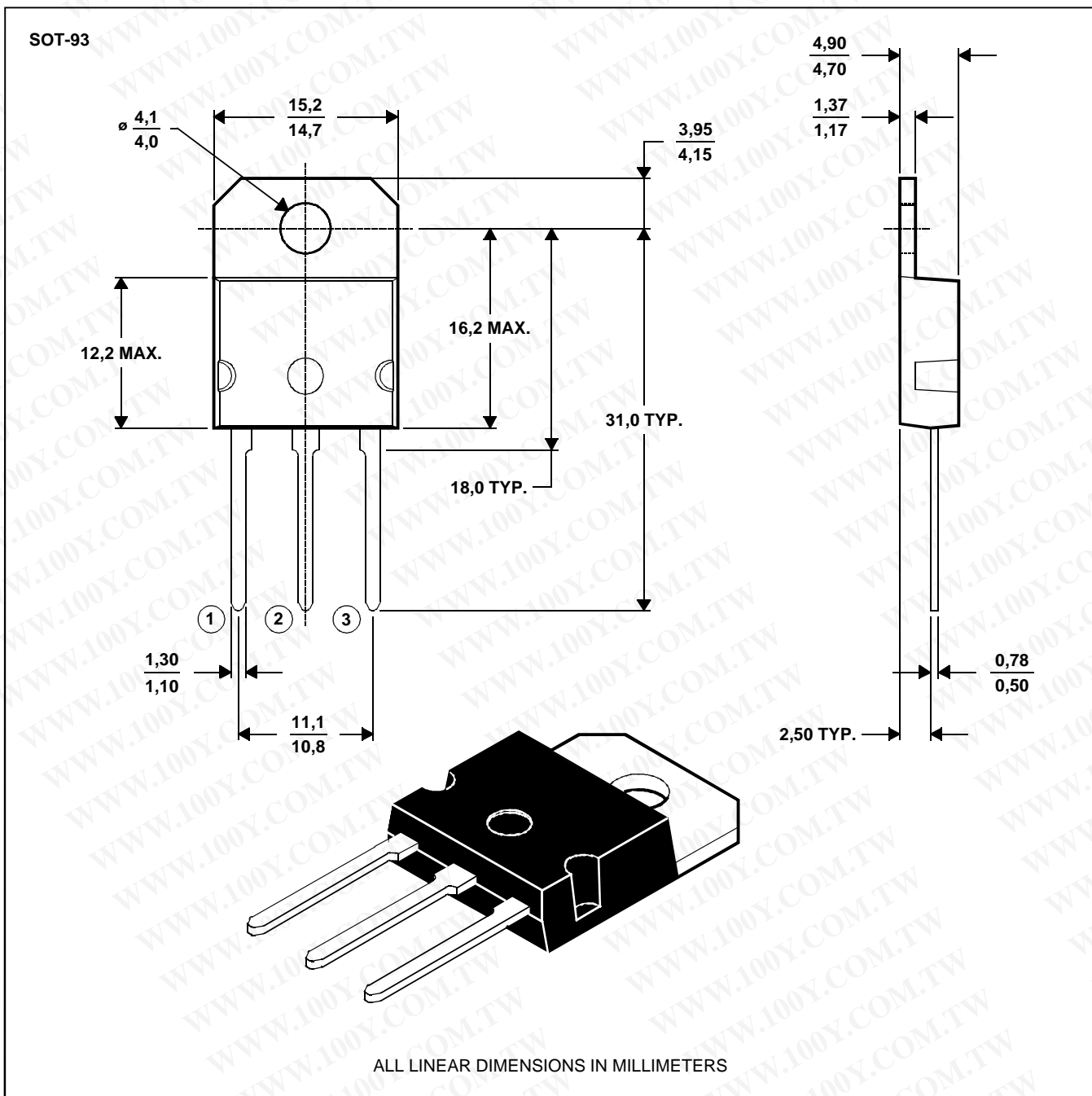
Figure 4.

MECHANICAL DATA

SOT-93

3-pin plastic flange-mount package

This single-in-line package consists of a circuit mounted on a lead frame and encapsulated within a plastic compound. The compound will withstand soldering temperature with no deformation, and circuit performance characteristics will remain stable when operated in high humidity conditions. Leads require no additional cleaning or processing when used in soldered assembly.



NOTE A: The centre pin is in electrical contact with the mounting tab.

MDXXAW

# **BDV65, BDV65A, BDV65B, BDV65C**

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