

# BDV65B (NPN), BDV64B (PNP)

## Complementary Silicon Plastic Power Darlingtontons

... for use as output devices in complementary general purpose amplifier applications.

- High DC Current Gain – HFE = 1000 (min.) @ 5 Adc
- Monolithic Construction with Built-in Base Emitter Shunt Resistors
- Pb-Free Packages are Available\*

### MAXIMUM RATINGS

Rating	Symbol	Max	Unit
Collector-Emitter Voltage	$V_{CEO}$	100	Vdc
Collector-Base Voltage	$V_{CB}$	100	Vdc
Emitter-Base Voltage	$V_{EB}$	5.0	Vdc
Collector Current – Continuous – Peak	$I_C$	10 20	Adc
Base Current	$I_B$	0.5	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	125 1.0	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.0	$^\circ\text{C}/\text{W}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

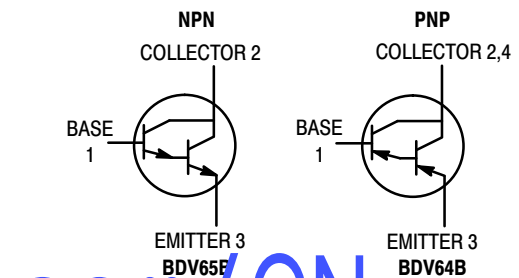
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



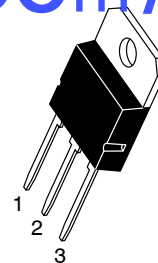
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## 10 AMPERE DARLINGTON COMPLEMENTARY SILICON POWER TRANSISTORS 60-80-100-120 VOLTS, 125 WATTS

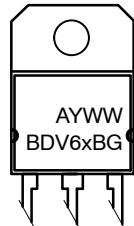


[www.BDTIC.com/ON](http://www.BDTIC.com/ON)



SOT-93  
(TO-218)  
CASE 340D

### MARKING DIAGRAM

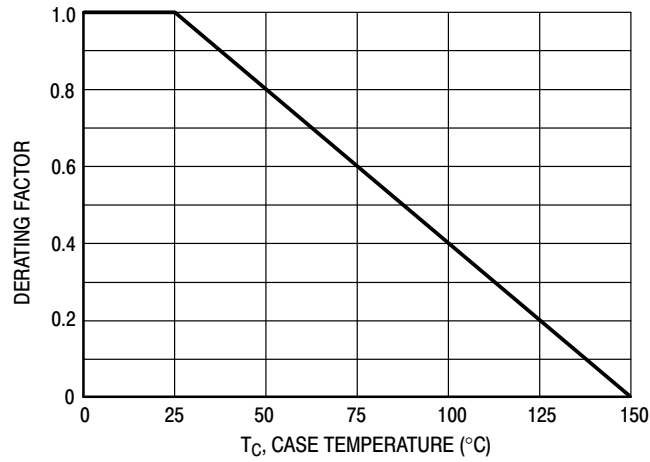


- A = Assembly Location
- Y = Year
- WW = Work Week
- G = Pb-Free Package
- BDV6xB = Device Code
- x = 4 or 5

### ORDERING INFORMATION

Device	Package	Shipping
BDV65B	SOT-93	30 Units / Rail
BDV65BG	SOT-93 (Pb-Free)	30 Units / Rail
BDV64B	SOT-93	30 Units / Rail
BDV64BG	SOT-93 (Pb-Free)	30 Units / Rail

## BDV65B (NPN), BDV64B (PNP)



**Figure 1. Power Derating**

### ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Sustaining Voltage (1) (I <sub>C</sub> = 30 mAdc, I <sub>B</sub> = 0)	V <sub>CEO(sus)</sub>	100	–	Vdc
Collector Cutoff Current (V <sub>CE</sub> = 50 Vdc, I <sub>B</sub> = 0)	I <sub>CEO</sub>	–	1.0	mAdc
Collector Cutoff Current (V <sub>CB</sub> = 100 Vdc, I <sub>E</sub> = 0)	I <sub>CBO</sub>	–	0.4	mAdc
Collector Cutoff Current (V <sub>CB</sub> = 50 Vdc, I <sub>E</sub> = 0, T <sub>c</sub> = 150°C)	I <sub>CBO</sub>	–	2.0	mAdc
Emitter Cutoff Current (V <sub>BE</sub> = 5.0 Vdc, I <sub>C</sub> = 0)	I <sub>EBO</sub>	–	5.0	mAdc
<b>ON CHARACTERISTICS</b>				
DC Current Gain (I <sub>C</sub> = 5.0 Adc, V <sub>CE</sub> = 4.0 Vdc)	h <sub>FE</sub>	1000	–	–
Collector–Emitter Saturation Voltage (I <sub>C</sub> = 5.0 Adc, I <sub>B</sub> = 0.02 Adc)	V <sub>CE(sat)</sub>	–	2.0	Vdc
Base–Emitter Saturation Voltage (I <sub>C</sub> = 5.0 Adc, V <sub>CE</sub> = 4.0 Vdc)	V <sub>BE(on)</sub>	–	2.5	Vdc

# BDV65B (NPN), BDV64B (PNP)

NPN

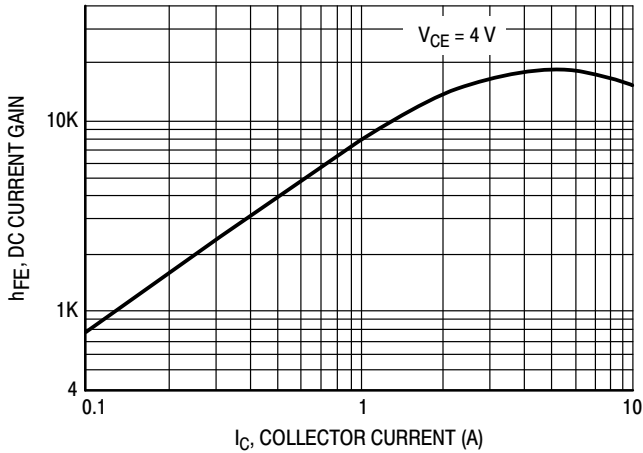


Figure 2. DC Current Gain

PNP

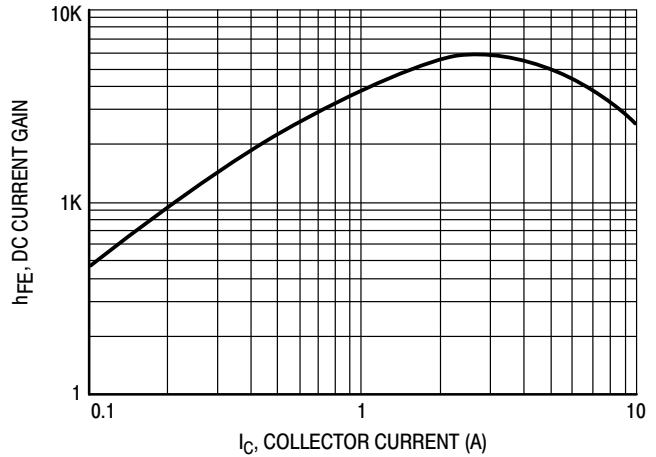


Figure 3. DC Current Gain

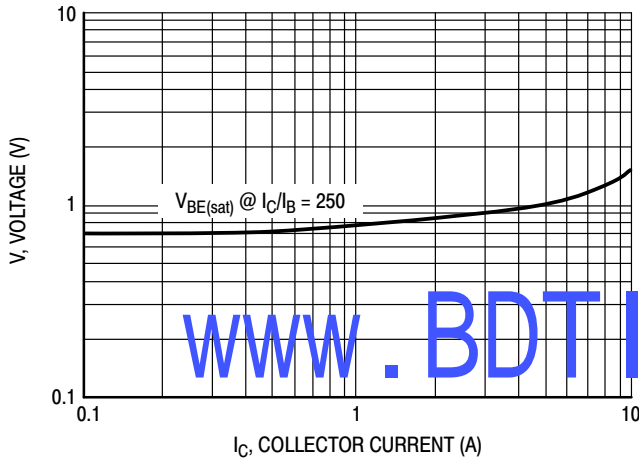


Figure 4. "On" Voltages

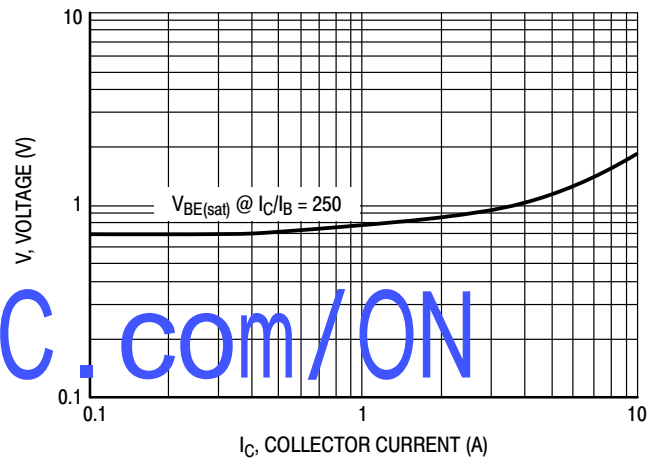


Figure 5. "On" Voltages

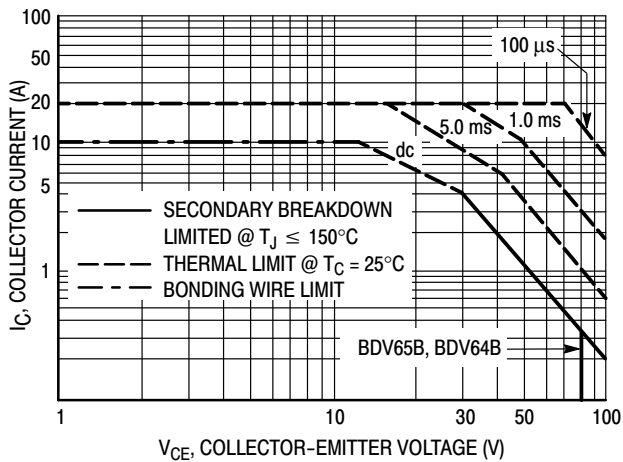


Figure 6. Active Region Safe Operating Area

There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate  $I_C - V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 6 is based on  $T_{J(pk)} = 150^\circ\text{C}$ ,  $T_C$  is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(pk)} \leq 150^\circ\text{C}$ .  $T_{J(pk)}$  may be calculated from the data in Figure 7. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

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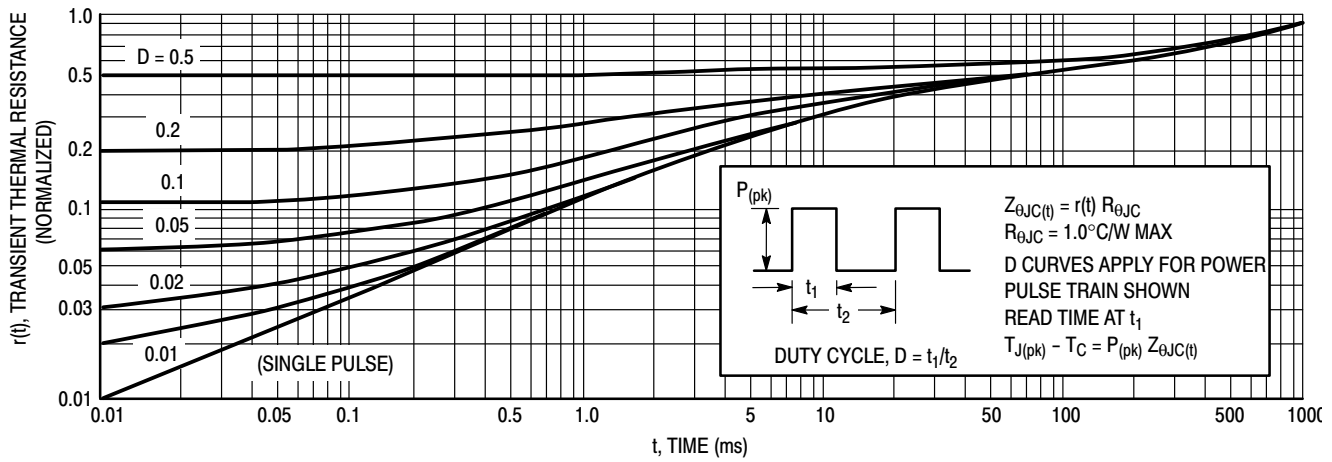
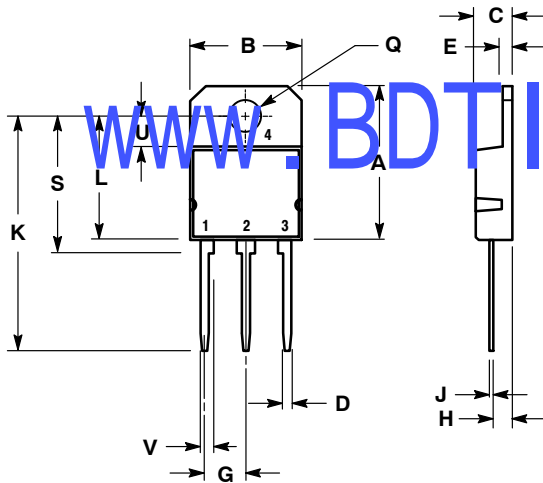


Figure 7. Thermal Response

## PACKAGE DIMENSIONS

SOT-93 (TO-218)  
CASE 340D-02  
ISSUE E



- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: MILLIMETER.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	---	20.35	---	0.81
B	14.70	15.20	0.579	0.6
C	4.70	4.90	0.185	0.193
D	1.10	1.30	0.043	0.051
E	1.17	1.37	0.046	0.054
G	5.40	5.55	0.213	0.219
H	2.00	3.00	0.079	0.118
J	0.50	0.78	0.020	0.031
K	31.00 REF		1.220 REF	
L	---	16.20	---	0.638
Q	4.00	4.10	0.158	0.161
S	17.80	18.20	0.701	0.717
U	4.00 REF		0.157 REF	
V	1.75 REF		0.069	

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