

BD646, BD648, BD650, BD652

PNP SILICON POWER DARLINGTONS

BOURNS®

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) BD646 BD648 BD650 BD652	-60 -80 -100 -120			V
I_{CEO} Collector-emitter cut-off current	$V_{CE} = -30 \text{ V}$ $I_B = 0$ $V_{CE} = -40 \text{ V}$ $I_B = 0$ $V_{CE} = -50 \text{ V}$ $I_B = 0$ $V_{CE} = -60 \text{ V}$ $I_B = 0$ BD646 BD648 BD650 BD652			-0.5 -0.5 -0.5 -0.5	mA
I_{CBO} Collector cut-off current	$V_{CB} = -60 \text{ V}$ $I_E = 0$ $V_{CB} = -80 \text{ V}$ $I_E = 0$ $V_{CB} = -100 \text{ V}$ $I_E = 0$ $V_{CB} = -120 \text{ V}$ $I_E = 0$ $V_{CB} = -40 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -50 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -60 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -70 \text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ BD646 BD648 BD650 BD652 BD646 BD648 BD650 BD652			-0.2 -0.2 -0.2 -0.2 -2.0 -2.0 -2.0 -2.0	mA
I_{EBO} Emitter cut-off current	$V_{EB} = -5 \text{ V}$ $I_C = 0$ (see Notes 5 and 6)			-5	mA
h_{FE} Forward current transfer ratio	$V_{CE} = -3 \text{ V}$ $I_C = -3 \text{ A}$ (see Notes 5 and 6)	750			
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = -12 \text{ mA}$ $I_C = -3 \text{ A}$ $I_B = -50 \text{ mA}$ $I_C = -5 \text{ A}$ (see Notes 5 and 6)			-2 -2.5	V
$V_{BE(sat)}$ Base-emitter saturation voltage	$I_B = -50 \text{ mA}$ $I_C = -5 \text{ A}$ (see Notes 5 and 6)			-3	V
$V_{BE(on)}$ Base-emitter voltage	$V_{CE} = -3 \text{ V}$ $I_C = -3 \text{ A}$ (see Notes 5 and 6)			-2.5	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			2.0	$^\circ\text{C/W}$
$R_{\theta JA}$ Junction to free air thermal resistance			62.5	$^\circ\text{C/W}$

PRODUCT INFORMATION

MAY 1993 - REVISED SEPTEMBER 2002

Specifications are subject to change without notice.

TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN
vs
COLLECTOR CURRENT

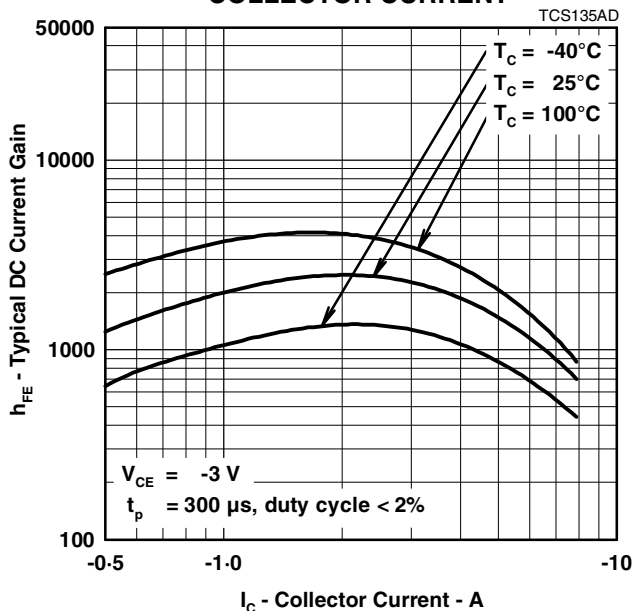


Figure 1.

COLLECTOR-EMITTER SATURATION VOLTAGE
vs
COLLECTOR CURRENT

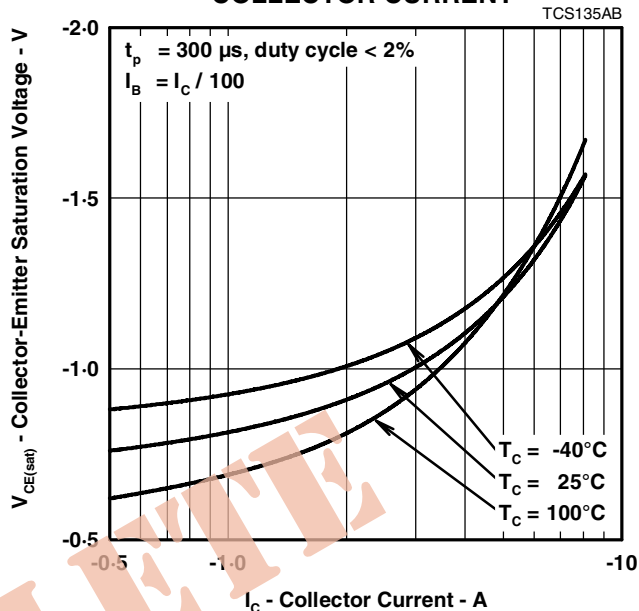


Figure 2.

BASE-EMITTER SATURATION VOLTAGE
vs
COLLECTOR CURRENT

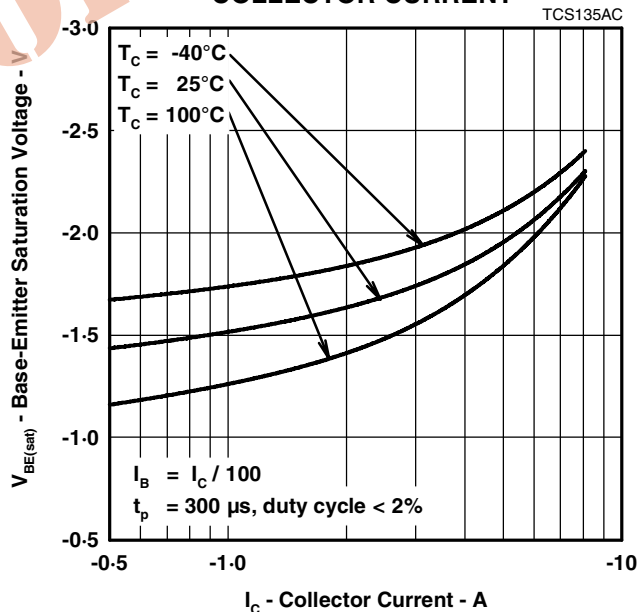


Figure 3.

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MAXIMUM SAFE OPERATING REGIONS

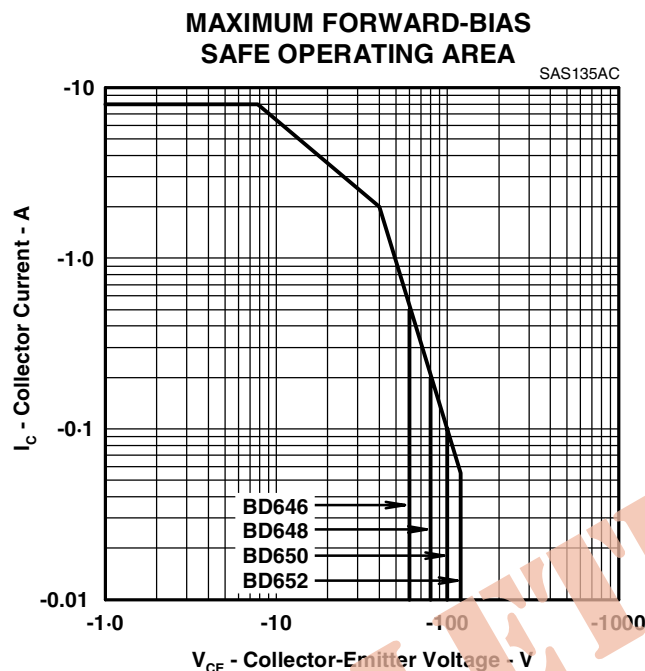


Figure 4.

THERMAL INFORMATION

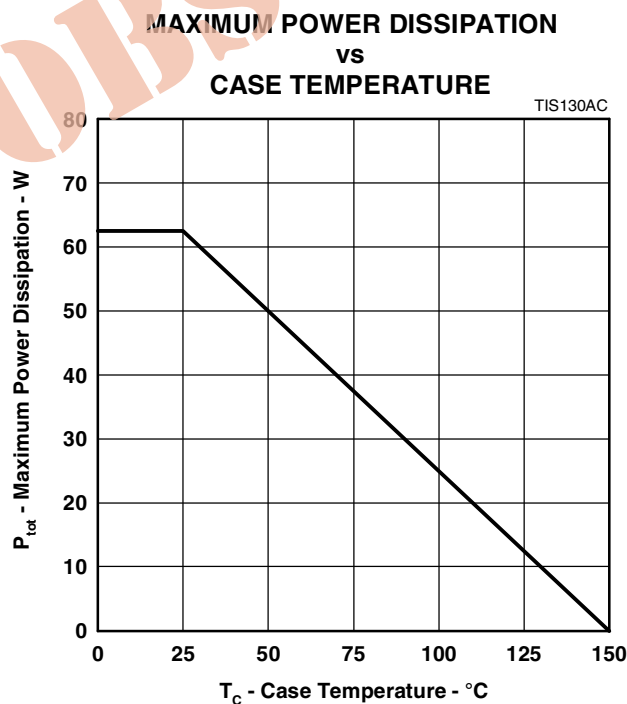


Figure 5.

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