

TIP110, TIP111, TIP112

NPN SILICON POWER DARLINGTONS

BOURNS®

electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$ Collector-emitter breakdown voltage	$I_C = 30 \text{ mA}$ $I_B = 0$ TIP110 (see Note 5) TIP111 TIP112	60 80 100			V
I_{CEO} Collector-emitter cut-off current	$V_{CE} = 30 \text{ V}$ $I_B = 0$ TIP110 $V_{CE} = 40 \text{ V}$ $I_B = 0$ TIP111 $V_{CE} = 50 \text{ V}$ $I_B = 0$ TIP112			2 2 2	mA
I_{CBO} Collector cut-off current	$V_{CB} = 60 \text{ V}$ $I_E = 0$ TIP110 $V_{CB} = 80 \text{ V}$ $I_E = 0$ TIP111 $V_{CB} = 100 \text{ V}$ $I_E = 0$ TIP112			1 1 1	mA
I_{EBO} Emitter cut-off current	$V_{EB} = 5 \text{ V}$ $I_C = 0$			2	mA
h_{FE} Forward current transfer ratio	$V_{CE} = 4 \text{ V}$ $I_C = 1 \text{ A}$ (see Notes 5 and 6) $V_{CE} = 4 \text{ V}$ $I_C = 2 \text{ A}$	1000 500			
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = 8 \text{ mA}$ $I_C = 2 \text{ A}$ (see Notes 5 and 6)			2.5	V
V_{BE} Base-emitter voltage	$V_{CE} = 4 \text{ V}$ $I_C = 2 \text{ A}$ (see Notes 5 and 6)			2.8	V
V_{EC} Parallel diode forward voltage	$I_E = 4 \text{ A}$ $I_B = 0$ (see Notes 5 and 6)			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.

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

PARAMETER	TEST CONDITIONS †	MIN	TYP	MAX	UNIT
t_{on} Turn-on time	$I_C = 2 \text{ A}$ $I_{B(on)} = 8 \text{ mA}$ $I_{B(off)} = -8 \text{ mA}$		2.6		μs
t_{off} Turn-off time	$V_{BE(off)} = -5 \text{ V}$ $R_L = 15 \Omega$ $t_p = 20 \mu\text{s}$, dc $\leq 2\%$		4.5		μs

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

PRODUCT INFORMATION

DECEMBER 1971 - REVISED SEPTEMBER 2002
Specifications are subject to change without notice.

TYPICAL CHARACTERISTICS

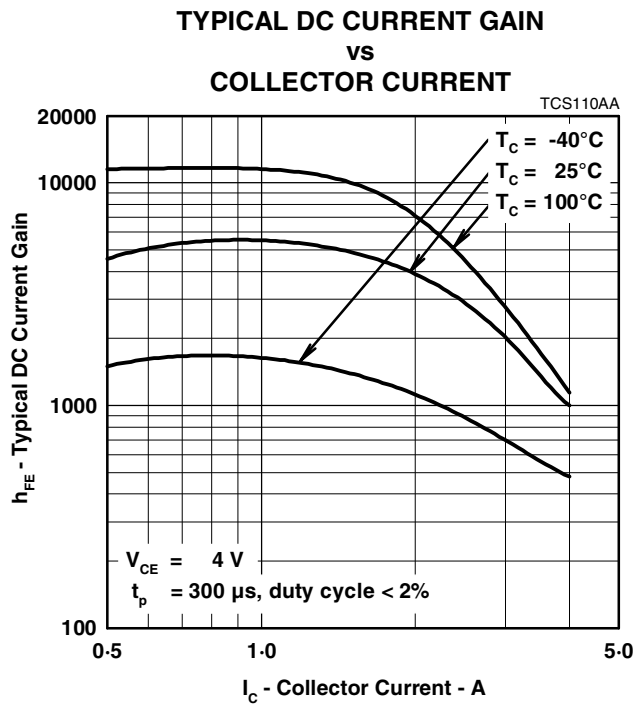


Figure 1.

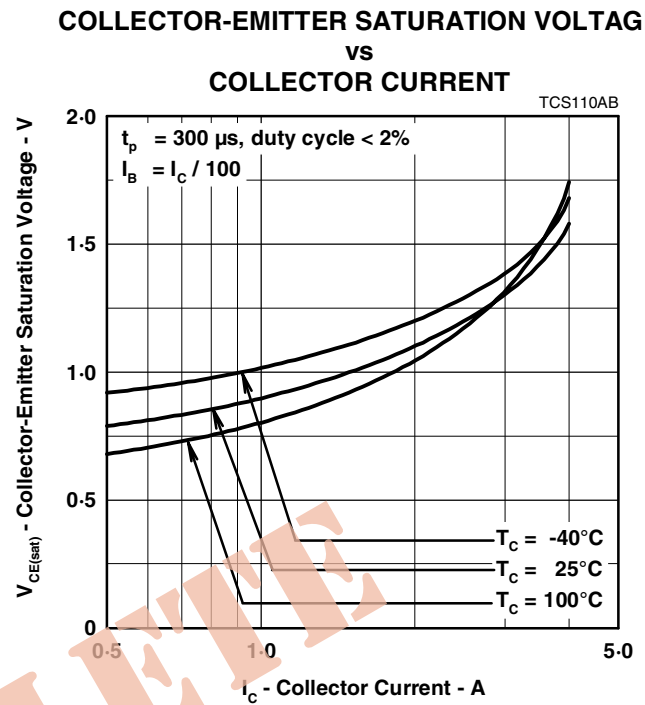


Figure 2.

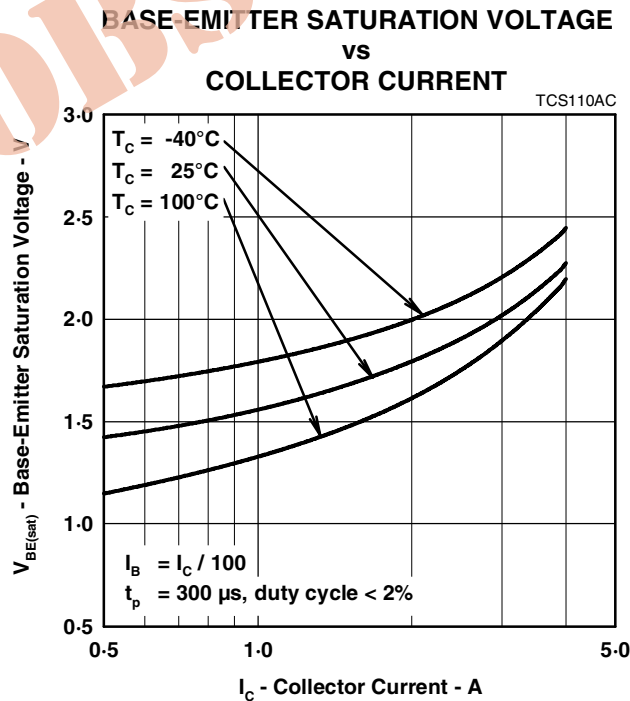


Figure 3.

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MAXIMUM SAFE OPERATING REGIONS

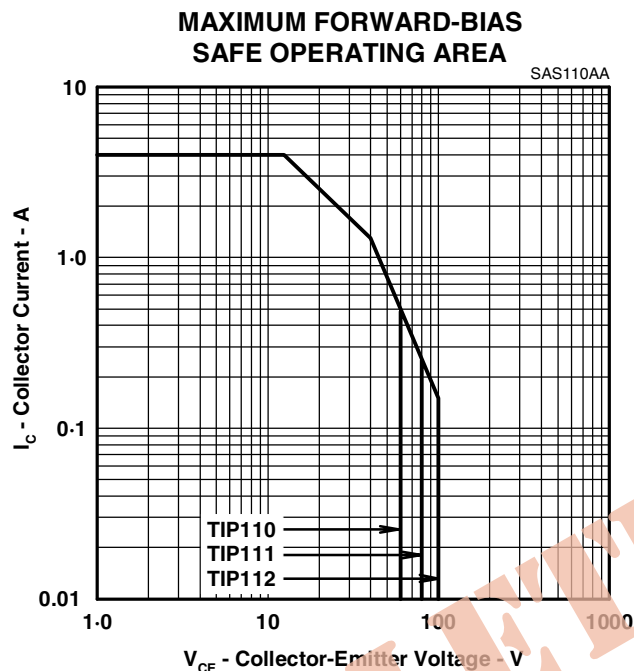


Figure 4.

THERMAL INFORMATION

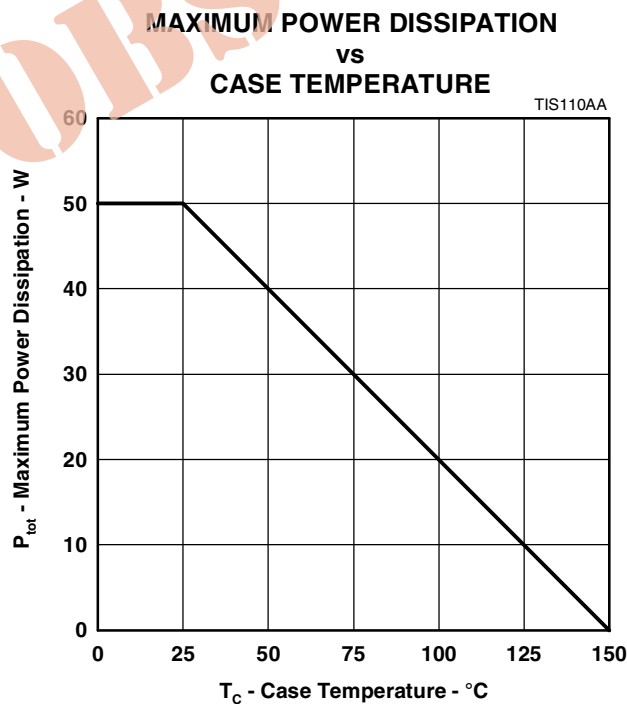


Figure 5.

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