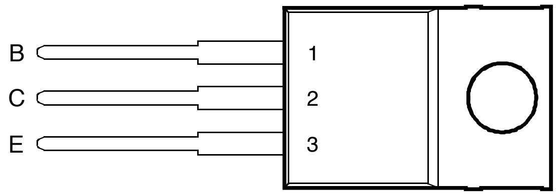
BOURNS®

- **Designed for Complementary Use with the TIP41 Series**
- **65 W at 25°C Case Temperature**
- **6 A Continuous Collector Current**
- **10 A Peak Collector Current**
- **Customer-Specified Selections Available**

This series is obsolete and not recommended for new designs.

TO-220 PACKAGE (TOP VIEW)



Pin 2 is in electrical contact with the mounting base.

MDTRACA

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

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage (I_E = 0)	TIP42	V_{CBO}	-80	V
	TIP42A		-100	
	TIP42B		-120	
	TIP42C		-140	
Collector-emitter voltage (I_B = 0)	TIP42	V_{CEO}	-40	V
	TIP42A		-60	
	TIP42B		-80	
	TIP42C		-100	
Emitter-base voltage		V_{EBO}	-5	V
Continuous collector current		I_C	-6	A
Peak collector current (see Note 1)		I_{CM}	-10	A
Continuous base current		I_B	-3	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)		P_{tot}	65	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)		$½LI_C^2$	62.5	mJ
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	250	°C

NOTES: 1. This value applies for $t_p \leq$ 0.3 ms, duty cycle ≤ 10%.
2. Derate linearly to 150°C case temperature at the rate of 0.52 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, $I_{B(on)}$ = -0.4 A, R_{BE} = 100 Ω, $V_{BE(off)}$ = 0, R_S = 0.1 Ω, V_{CC} = -20 V.

electrical characteristics at 25°C case temperature

PARAMETER		TEST CONDITIONS			MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	I_C = -30 mA (see Note 5)	I_B = 0	TIP42 TIP42A TIP42B TIP42C	-40 -60 -80 -100			V
I_{CES}	Collector-emitter cut-off current	V_{CE} = -80 V V_{CE} = -100 V V_{CE} = -120 V V_{CE} = -140 V	V_{BE} = 0 V_{BE} = 0 V_{BE} = 0 V_{BE} = 0	TIP42 TIP42A TIP42B TIP42C			-0.4 -0.4 -0.4 -0.4	mA
I_{CEO}	Collector cut-off current	V_{CE} = -30 V V_{CE} = -60 V	I_B = 0 I_B = 0	TIP42/42A TIP42B/42C			-0.7 -0.7	mA
I_{EBO}	Emitter cut-off current	V_{EB} = -5 V	I_C = 0				-1	mA
h_{FE}	Forward current transfer ratio	V_{CE} = -4 V V_{CE} = -4 V	I_C = -0.3 A I_C = - 3A	(see Notes 5 and 6)	30 15		 75	
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_B = -0.6 A	I_C = -6 A	(see Notes 5 and 6)			-1.5	V
V_{BE}	Base-emitter voltage	V_{CE} = -4 V	I_C = -6 A	(see Notes 5 and 6)			-2	V
h_{fe}	Small signal forward current transfer ratio	V_{CE} = -10 V	I_C = -0.5 A	f = 1 kHz	20			
$\|h_{fe}\|$	Small signal forward current transfer ratio	V_{CE} = -10 V	I_C = -0.5 A	f = 1 MHz	3			

NOTES: 5. These parameters must be measured using pulse techniques, t_p = 300 µs, duty cycle ≤ 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			1.92	°C/W
$R_{\theta JA}$	Junction to free air thermal resistance			62.5	°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 = -6 A	$I_{B(on)}$ = -0.6 A	$I_{B(off)}$ = 0.6 A		0.4		µs
t_{off}	Turn-off time	$V_{BE(off)}$ = 4 V	R_L = 5 Ω	t_p = 20 µs, dc ≤ 2%		0.7		µs

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

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TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN vs COLLECTOR CURRENT

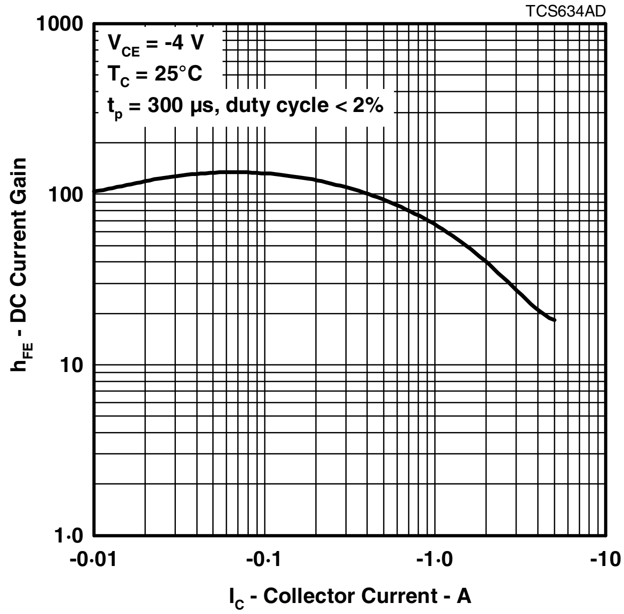

Figure 1.

COLLECTOR-EMITTER SATURATION VOLTAGE vs BASE CURRENT

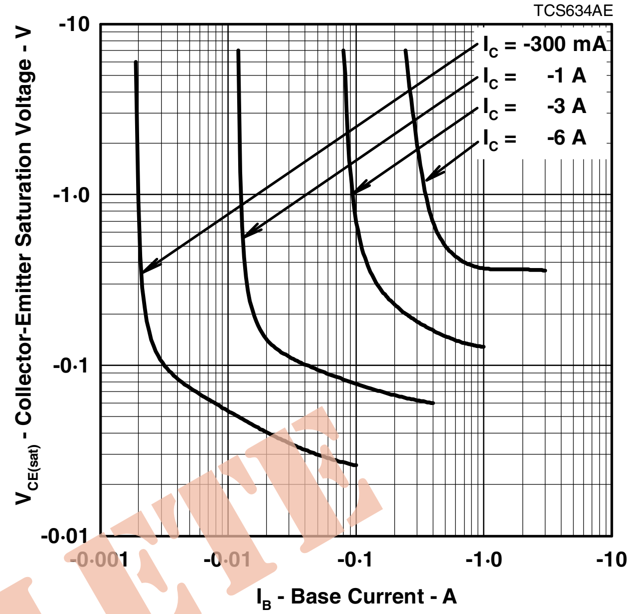

Figure 2.

BASE-EMITTER VOLTAGE vs COLLECTOR CURRENT

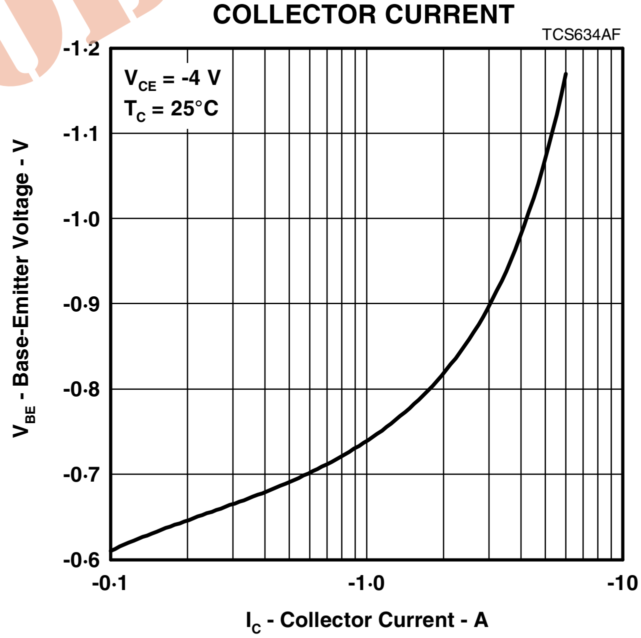

Figure 3.

MAXIMUM SAFE OPERATING REGIONS

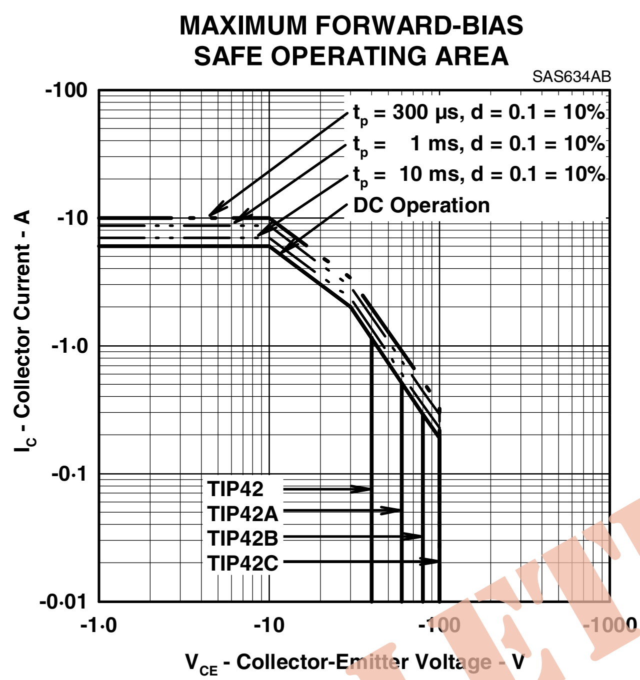

Figure 4.

THERMAL INFORMATION

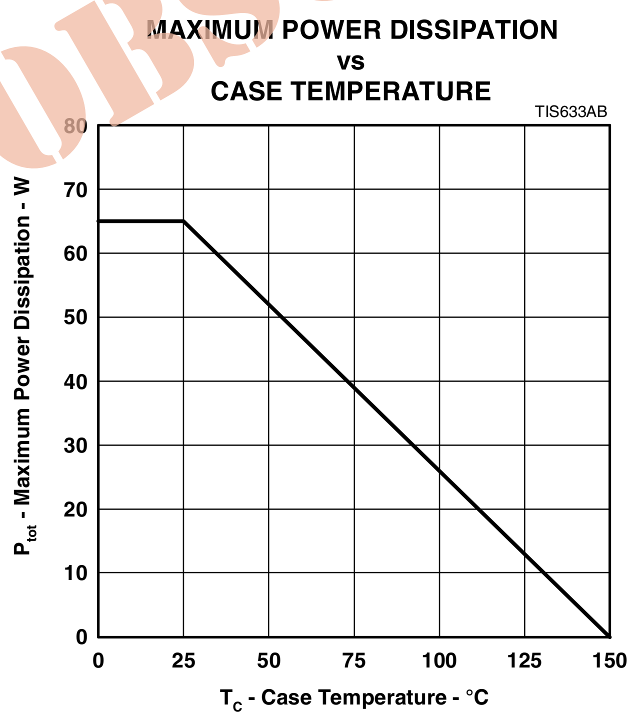

Figure 5.