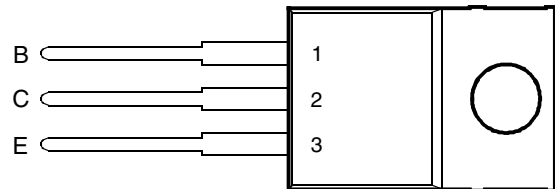


- Designed for Complementary Use with TIP130, TIP131 and TIP132
- 70 W at 25°C Case Temperature
- 8 A Continuous Collector Current
- Minimum  $h_{FE}$  of 1000 at 4 V, 4 A



This series is obsolete and not recommended for new designs.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 ( $I_E = 0$ )	TIP135	$V_{CBO}$	-60	V
	TIP136		-80	
	TIP137		-100	
Collector-emitter voltage ( $I_B = 0$ )	TIP135	$V_{CEO}$	-60	V
	TIP136		-80	
	TIP137		-100	
Emitter-base voltage		$V_{EBO}$	-5	V
Continuous collector current		$I_C$	-8	A
Peak collector current (see Note 1)		$I_{CM}$	-12	A
Continuous base current		$I_B$	-0.3	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)		$P_{tot}$	70	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)		$\frac{1}{2}LI_C^2$	75	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		$T_L$	260	°C

- NOTES: 1. This value applies for  $t_p \leq 0.3$  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 16 mW/°C.  
 4. This rating is based on the capability of the transistor to operate safely in a circuit of:  $L = 20$  mH,  $I_{B(on)} = -5$  mA,  $R_{BE} = 100 \Omega$ ,  $V_{BE(off)} = 0$ ,  $R_S = 0.1 \Omega$ ,  $V_{CC} = -20$  V.

**PRODUCT INFORMATION**

**electrical characteristics at 25°C case temperature**

PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$ Collector-emitter breakdown voltage	$I_C = -30 \text{ mA}$	$I_B = 0$	(see Note 5)	TIP135 -60 TIP136 -80 TIP137 -100			V
$I_{CEO}$ Collector-emitter cut-off current	$V_{CE} = -30 \text{ V}$ $V_{CE} = -40 \text{ V}$ $V_{CE} = -50 \text{ V}$	$I_B = 0$ $I_B = 0$ $I_B = 0$		TIP135 TIP136 TIP137		-0.5 -0.5 -0.5	mA
$I_{CBO}$ Collector cut-off current	$V_{CB} = -60 \text{ V}$ $V_{CB} = -80 \text{ V}$ $V_{CB} = -100 \text{ V}$ $V_{CB} = -60 \text{ V}$ $V_{CB} = -80 \text{ V}$ $V_{CB} = -100 \text{ V}$	$I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$	$T_C = 100^\circ\text{C}$ $T_C = 100^\circ\text{C}$ $T_C = 100^\circ\text{C}$	TIP135 TIP136 TIP137 TIP135 TIP136 TIP137		-0.2 -0.2 -0.2 -1 -1 -1	mA
$I_{EBO}$ Emitter cut-off current	$V_{EB} = -5 \text{ V}$	$I_C = 0$				-5	mA
$h_{FE}$ Forward current transfer ratio	$V_{CE} = -4 \text{ V}$ $V_{CE} = -4 \text{ V}$	$I_C = -1 \text{ A}$ $I_C = -4 \text{ A}$	(see Notes 5 and 6)	500 1000		15000	
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = -16 \text{ mA}$ $I_B = -30 \text{ mA}$	$I_C = -4 \text{ A}$ $I_C = -6 \text{ A}$	(see Notes 5 and 6)			-2 -3	V
$V_{BE}$ Base-emitter voltage	$V_{CE} = -4 \text{ V}$	$I_C = -4 \text{ A}$	(see Notes 5 and 6)			-2.5	V
$C_{obo}$ Output capacitance	$V_{CB} = -10 \text{ V}$	$I_E = 0$				200	pF
$V_{EC}$ Parallel diode forward voltage	$I_E = -8 \text{ A}$	$I_B = 0$	(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  $\leq 2\%$ .

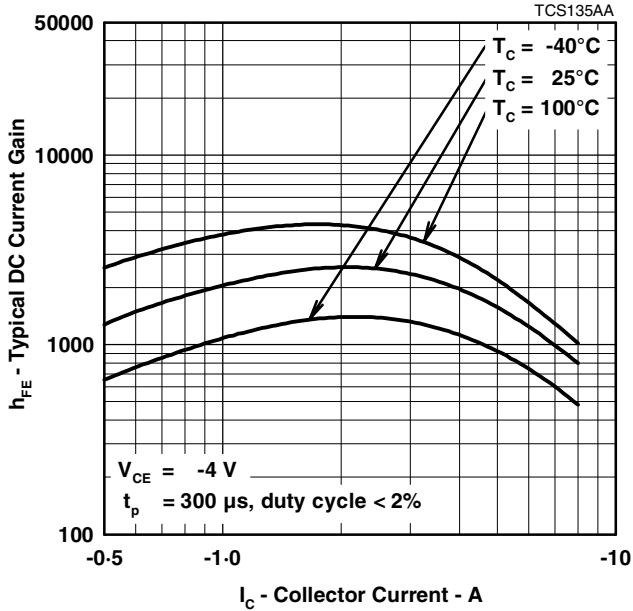
6. These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

**thermal characteristics**

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JC}$ Junction to case thermal resistance			1.78	$^\circ\text{C/W}$
$R_{\theta JA}$ Junction to free air thermal resistance			62.5	$^\circ\text{C/W}$

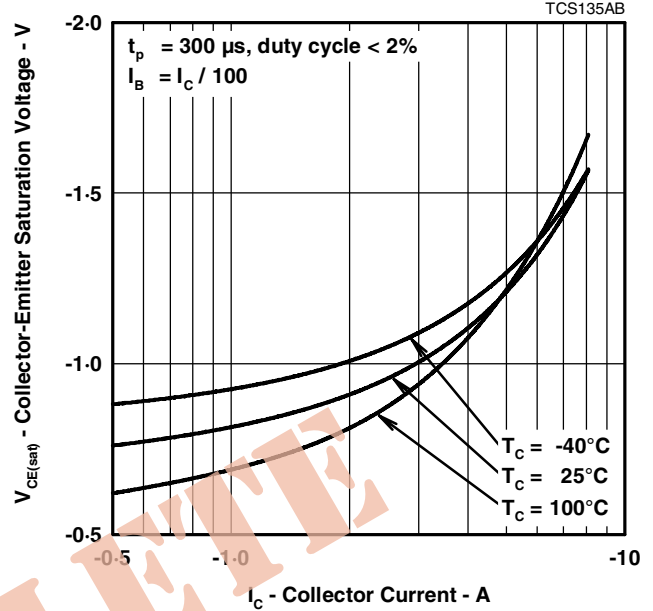
**TYPICAL CHARACTERISTICS**

**TYPICAL DC CURRENT GAIN  
VS  
COLLECTOR CURRENT**



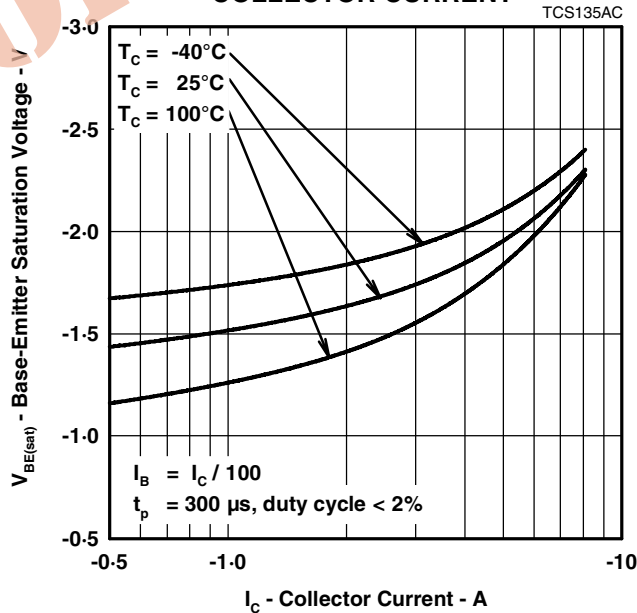
**Figure 1.**

**COLLECTOR-EMITTER SATURATION VOLTAGE  
VS  
COLLECTOR CURRENT**



**Figure 2.**

**BASE-EMITTER SATURATION VOLTAGE  
VS  
COLLECTOR CURRENT**



**Figure 3.**

**PRODUCT INFORMATION**

**MAXIMUM SAFE OPERATING REGIONS**

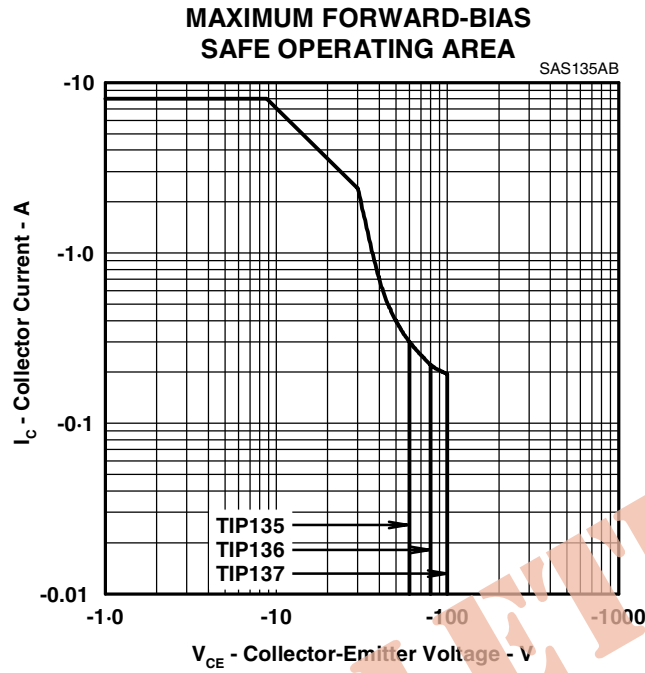


Figure 4.

**THERMAL INFORMATION**

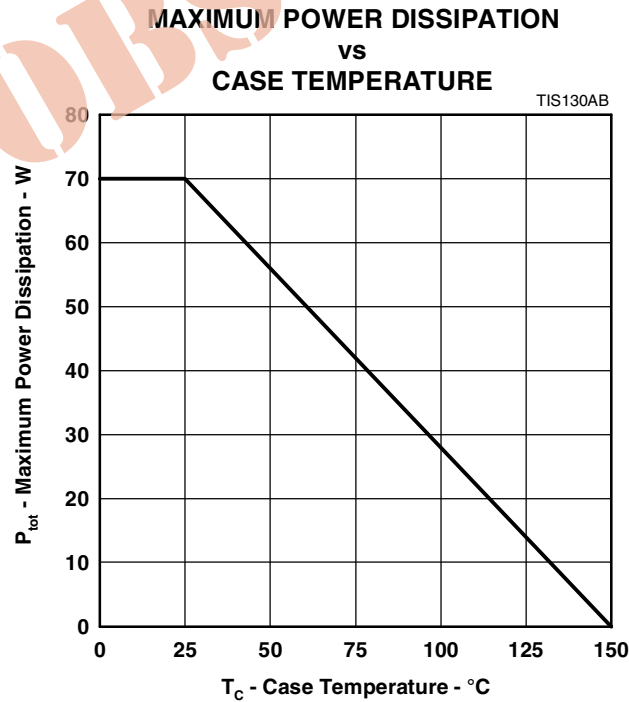


Figure 5.

**PRODUCT INFORMATION**