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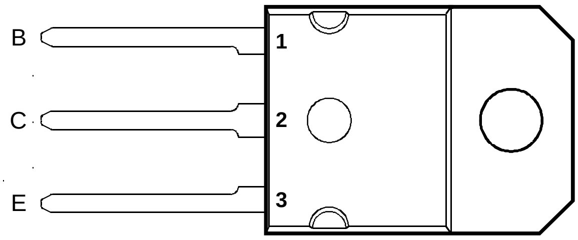
- **Designed for Complementary Use with TIP145, TIP146 and TIP147**
- **125 W at 25°C Case Temperature**
- **10 A Continuous Collector Current**
- **Minimum h_{FE} of 1000 at 4 V, 5 A**

SOT-93 PACKAGE
(TOP VIEW)



Pin 2 is in electrical contact with the mounting base.

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

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage (I_E = 0)	TIP140	V_{CBO}	60	V
	TIP141		80	
	TIP142		100	
Collector-emitter voltage (I_B = 0)	TIP140	V_{CEO}	60	V
	TIP141		80	
	TIP142		100	
Emitter-base voltage		V_{EBO}	5	V
Continuous collector current		I_C	10	A
Peak collector current (see Note 1)		I_{CM}	15	A
Continuous base current		I_B	0.5	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)		P_{tot}	125	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3)		P_{tot}	3.5	W
Unclamped inductive load energy (see Note 4)		$½LI_C^2$	100	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 ≤ 10%.
2. Derate linearly to 150°C case temperature at the rate of 1 W/°C.
3. Derate linearly to 150°C free air temperature at the rate of 28 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 Ω, $V_{BE(off)}$ = 0, R_S = 0.1 Ω, V_{CC} = 20 V.

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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)	$I_B = 0$	TIP140 TIP141 TIP142	60 80 100			V
I_{CEO}	Collector-emitter cut-off current	V_{CE} = 30 V V_{CE} = 40 V V_{CE} = 50 V	$I_B = 0$ $I_B = 0$ $I_B = 0$	TIP140 TIP141 TIP142			2 2 2	mA
I_{CBO}	Collector cut-off current	V_{CB} = 60 V V_{CB} = 80 V V_{CB} = 100 V	$I_E = 0$ $I_E = 0$ $I_E = 0$	TIP140 TIP141 TIP142			1 1 1	mA
I_{EBO}	Emitter cut-off current	V_{EB} = 5 V	$I_C = 0$				2	mA
h_{FE}	Forward current transfer ratio	V_{CE} = 4 V V_{CE} = 4 V	I_C = 5 A I_C = 10 A	(see Notes 5 and 6)	1000 500			
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_B = 10 mA I_B = 40 mA	I_C = 5 A I_C = 10 A	(see Notes 5 and 6)			2 3	V
V_{BE}	Base-emitter voltage	V_{CE} = 4 V	I_C = 10 A	(see Notes 5 and 6)			3	V
V_{EC}	Parallel diode forward voltage	I_E = 10 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 µs, duty cycle ≤ 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 = 10 A	$I_{B(on)}$ = 40 mA	$I_{B(off)}$ = -40 mA		0.9		µs
t_{off}	Turn-off time	$V_{BE(off)}$ = -4.2 V	R_L = 3 Ω	t_p = 20 µs, dc ≤ 2%		11		µs

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

TYPICAL CHARACTERISTICS

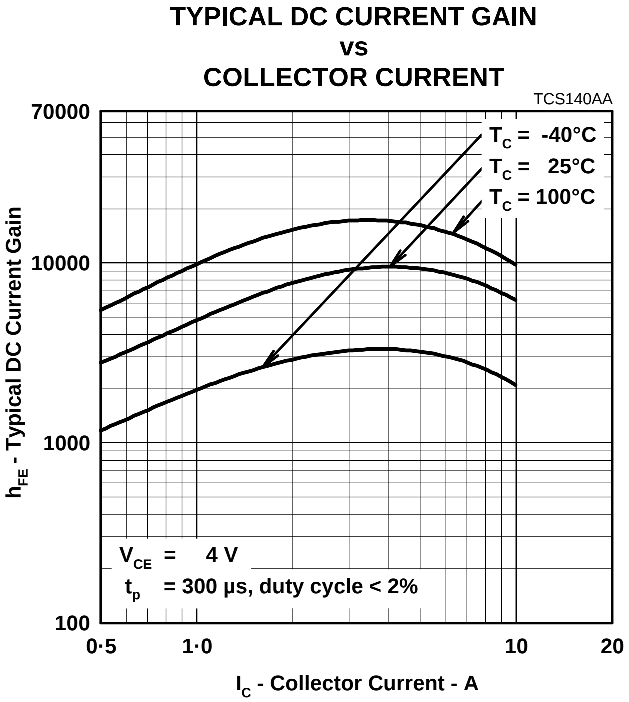

Figure 1.

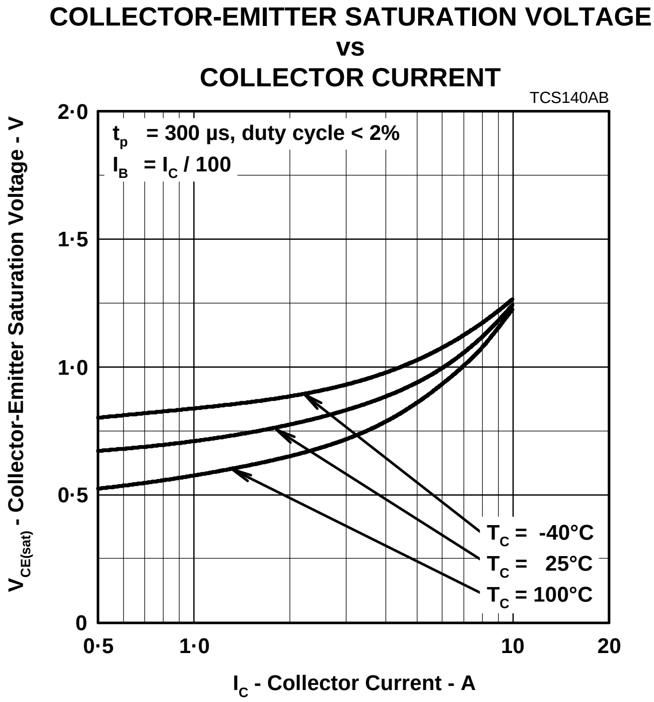

Figure 2.

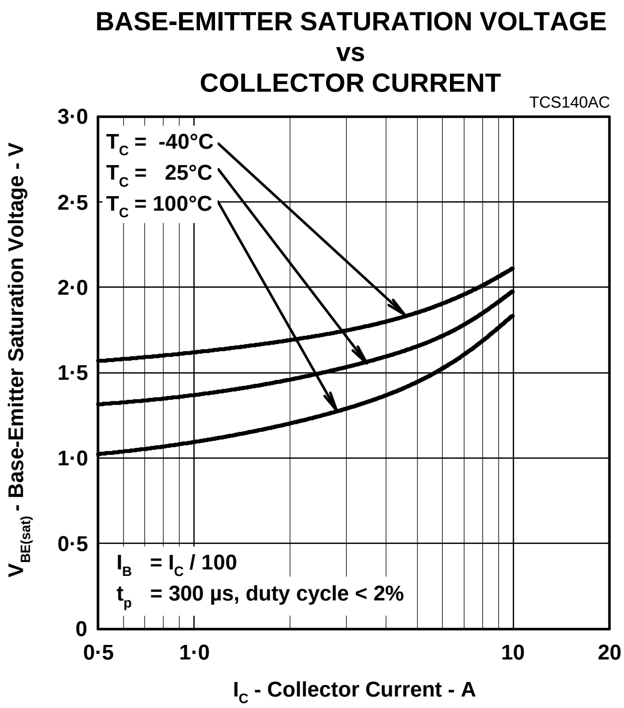

Figure 3.

MAXIMUM SAFE OPERATING REGIONS

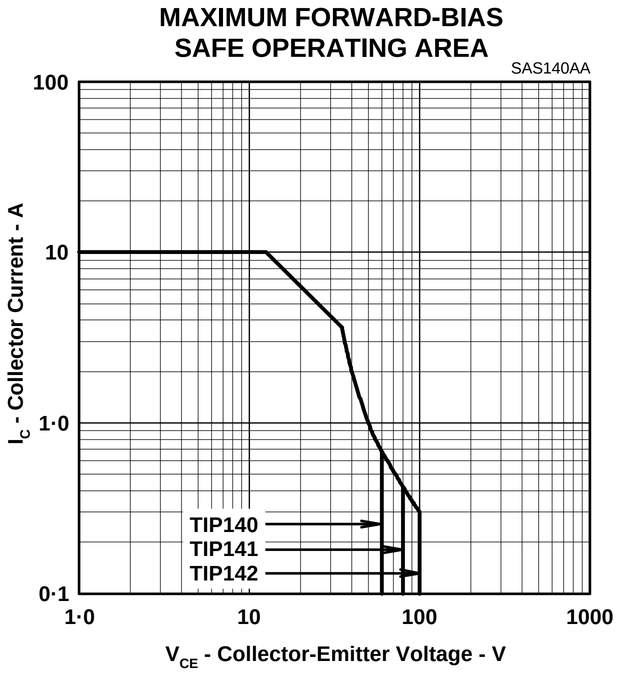

Figure 4.

THERMAL INFORMATION

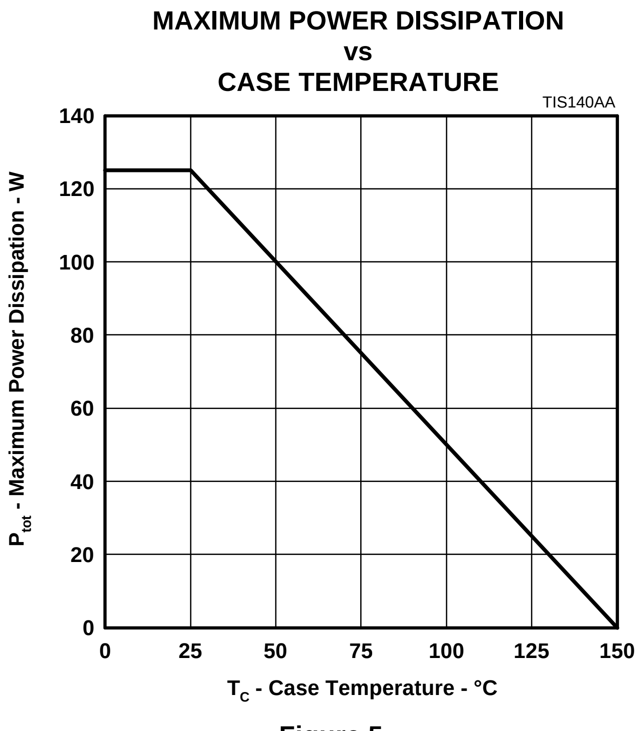

Figure 5.

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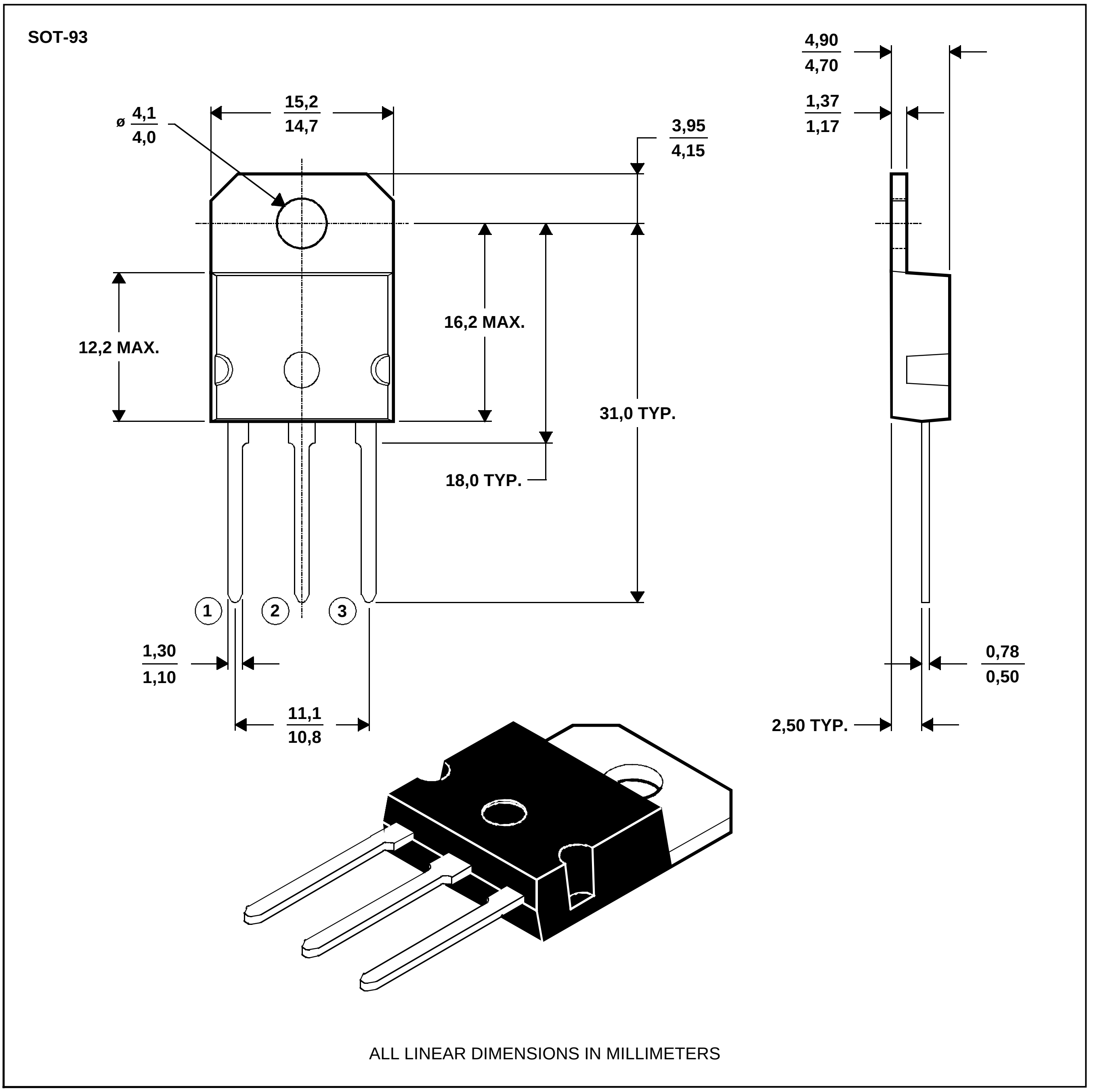
MECHANICAL DATA

SOT-93
3-pin plastic flange-mount package

This single-in-line package consists of a circuit mounted on a lead frame and encapsulated within a plastic compound. The compound will withstand soldering temperature with no deformation, and circuit performance characteristics will remain stable when operated in high humidity conditions. Leads require no additional cleaning or processing when used in soldered assembly.



NOTE A: The centre pin is in electrical contact with the mounting tab.

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