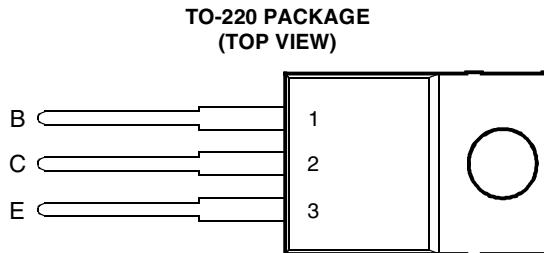


- Designed for Complementary Use with the TIP41 Series
- 65 W at 25°C Case Temperature
- 6 A Continuous Collector Current
- 10 A Peak Collector Current
- Customer-Specified Selections Available



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 ($I_E = 0$)	TIP42 TIP42A TIP42B TIP42C	V_{CBO}	-80 -100 -120 -140	V
Collector-emitter voltage ($I_B = 0$)	TIP42 TIP42A TIP42B TIP42C	V_{CEO}	-40 -60 -80 -100	V
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)	$\frac{1}{2}L I_C^2$		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 $\leq 10\%$.

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, $R_{BE} = 100 \Omega$,

$V_{BE(off)} = 0$, $R_S = 0.1 \Omega$, $V_{CC} = -20$ V.

PRODUCT INFORMATION

electrical characteristics at 25°C case temperature

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

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			1.92	°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	$I_C = -6 \text{ A}$	$I_{B(on)} = -0.6 \text{ A}$	$I_{B(off)} = 0.6 \text{ A}$		0.4		μs
t_{off} Turn-off time	$V_{BE(off)} = 4 \text{ V}$	$R_L = 5 \Omega$	$t_p = 20 \mu\text{s}, dc \leq 2\%$		0.7		μs

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

PRODUCT INFORMATION

TYPICAL CHARACTERISTICS

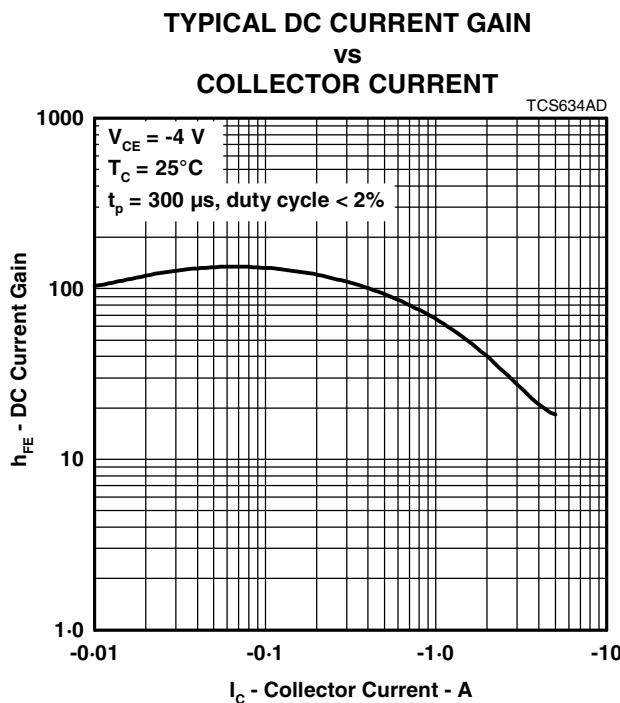


Figure 1.

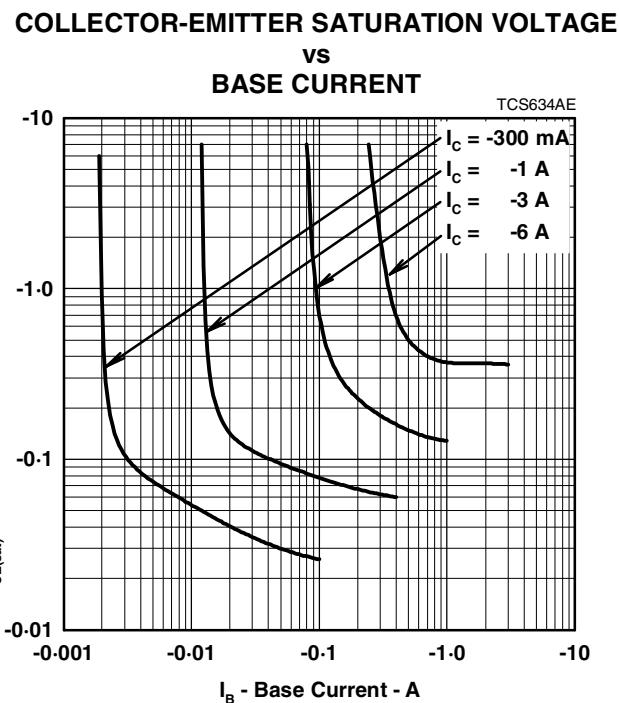


Figure 2.

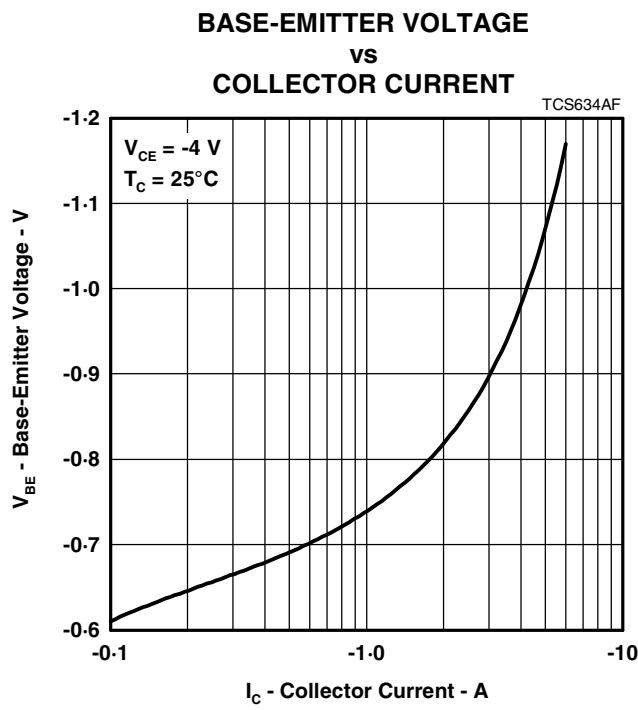


Figure 3.

PRODUCT INFORMATION

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MAXIMUM SAFE OPERATING REGIONS

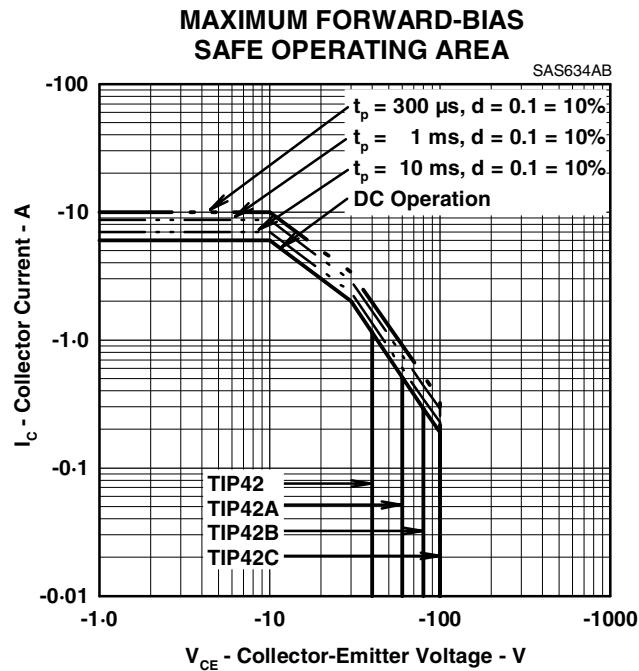


Figure 4.

THERMAL INFORMATION

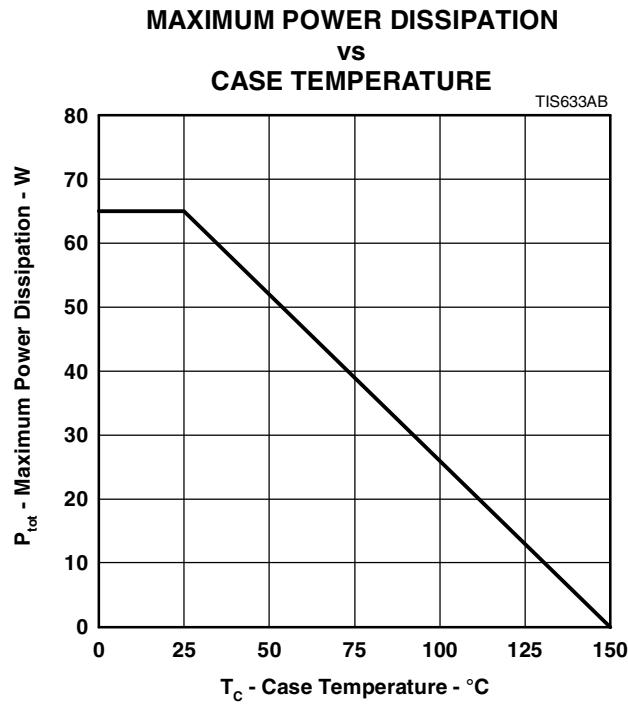


Figure 5.

PRODUCT INFORMATION

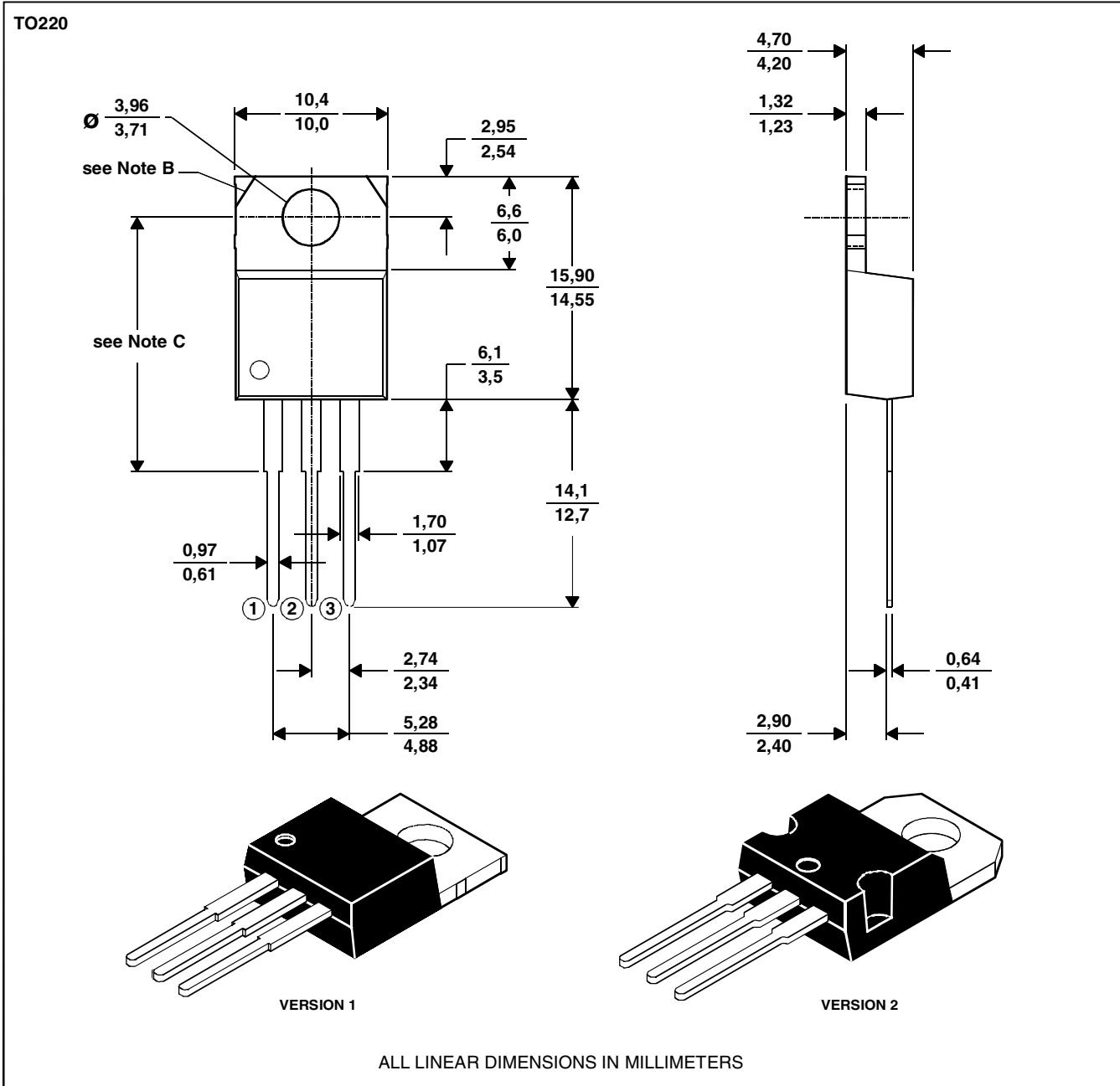
DECEMBER 1970 - REVISED SEPTEMBER 2002
Specifications are subject to change without notice.

MECHANICAL DATA

TO-220

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.



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

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B. Mounting tab corner profile according to package version.

C. Typical fixing hole centre stand off height according to package version.

Version 1, 18.0 mm. Version 2, 17.6 mm.

PRODUCT INFORMATION