

## Silicon PNP Darlington Power Transistors

## TIP145/146/147

**DESCRIPTION**

- With TO-3PN package
- DARLINGTON
- High DC current gain
- Complement to type TIP140/141/142

**APPLICATIONS**

- Designed for general-purpose amplifier and low frequency switching applications.

**PINNING**

PIN	DESCRIPTION
1	Base
2	Collector;connected to mounting base
3	Emitter

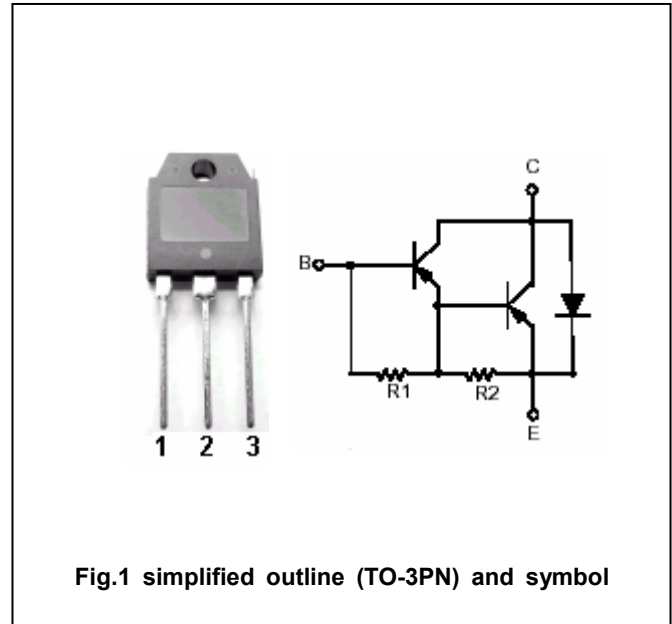


Fig.1 simplified outline (TO-3PN) and symbol

**ABSOLUTE MAXIMUM RATINGS( $T_C=25^\circ\text{C}$ )**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$V_{CBO}$	Collector-base voltage	TIP145	-60	V
		TIP146	-80	
		TIP147	-100	
$V_{CEO}$	Collector-emitter voltage	TIP145	-60	V
		TIP146	-80	
		TIP147	-100	
$V_{EBO}$	Emitter-base voltage	Open collector	-5	V
$I_C$	Collector current-DC		-10	A
$I_{CM}$	Collector current-peak		-15	A
$I_B$	Base current-DC		-0.5	A
$P_C$	Collector power dissipation	$T_C=25^\circ\text{C}$	125	W
$T_j$	Junction temperature		150	$^\circ\text{C}$
$T_{stg}$	Storage temperature		-65~150	$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	MAX	UNIT
$R_{th\ j-c}$	Thermal resistance junction to case	1.0	$^\circ\text{C}/\text{W}$
$R_{th\ j-A}$	Thermal resistance case to ambient	35.7	$^\circ\text{C}/\text{W}$

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## CHARACTERISTICS

T<sub>j</sub>=25 °C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT	
V <sub>CEO(SUS)</sub>	Collector-emitter sustaining voltage	TIP145	-60			V	
		TIP146	-80				
		TIP147	-100				
V <sub>CE(sat)-1</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =-5A, I <sub>B</sub> =-10mA			-2.0	V	
V <sub>CE(sat)-2</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =-10A, I <sub>B</sub> =-40mA			-3.0	V	
V <sub>BE(sat)</sub>	Base-emitter saturation voltage	I <sub>C</sub> =-10A, I <sub>B</sub> =-40mA			-3.5	V	
V <sub>BE</sub>	Base-emitter on voltage	I <sub>C</sub> =-10A; V <sub>CE</sub> =-4V			-3.0	V	
I <sub>CBO</sub>	Collector cut-off current	TIP145	V <sub>CB</sub> =-60V, I <sub>E</sub> =0			-1	mA
		TIP146	V <sub>CB</sub> =-80V, I <sub>E</sub> =0				
		TIP147	V <sub>CB</sub> =-100V, I <sub>E</sub> =0				
I <sub>CEO</sub>	Collector cut-off current	TIP145	V <sub>CE</sub> =-30V, I <sub>B</sub> =0			-2	mA
		TIP146	V <sub>CE</sub> =-40V, I <sub>B</sub> =0				
		TIP147	V <sub>CE</sub> =-50V, I <sub>B</sub> =0				
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> =-5V; I <sub>C</sub> =0			-2	mA	
h <sub>FE-1</sub>	DC current gain	I <sub>C</sub> =-5A; V <sub>CE</sub> =-4V	1000				
h <sub>FE-2</sub>	DC current gain	I <sub>C</sub> =-10A; V <sub>CE</sub> =-4V	500				

## Switching times

t <sub>d</sub>	Delay time	V <sub>CC</sub> = -30 V, I <sub>C</sub> = -5.0 A, I <sub>B</sub> = -20 mA ;Duty Cycle ≤ 20% I <sub>B1</sub> = I <sub>B2</sub> , R <sub>C</sub> & R <sub>B</sub> Varied, T <sub>J</sub> = 25 °C		0.15		μs
t <sub>r</sub>	Rise time			0.55		μs
t <sub>stg</sub>	Storage time			2.5		μs
t <sub>f</sub>	Fall time			2.5		μs

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PACKAGE OUTLINE

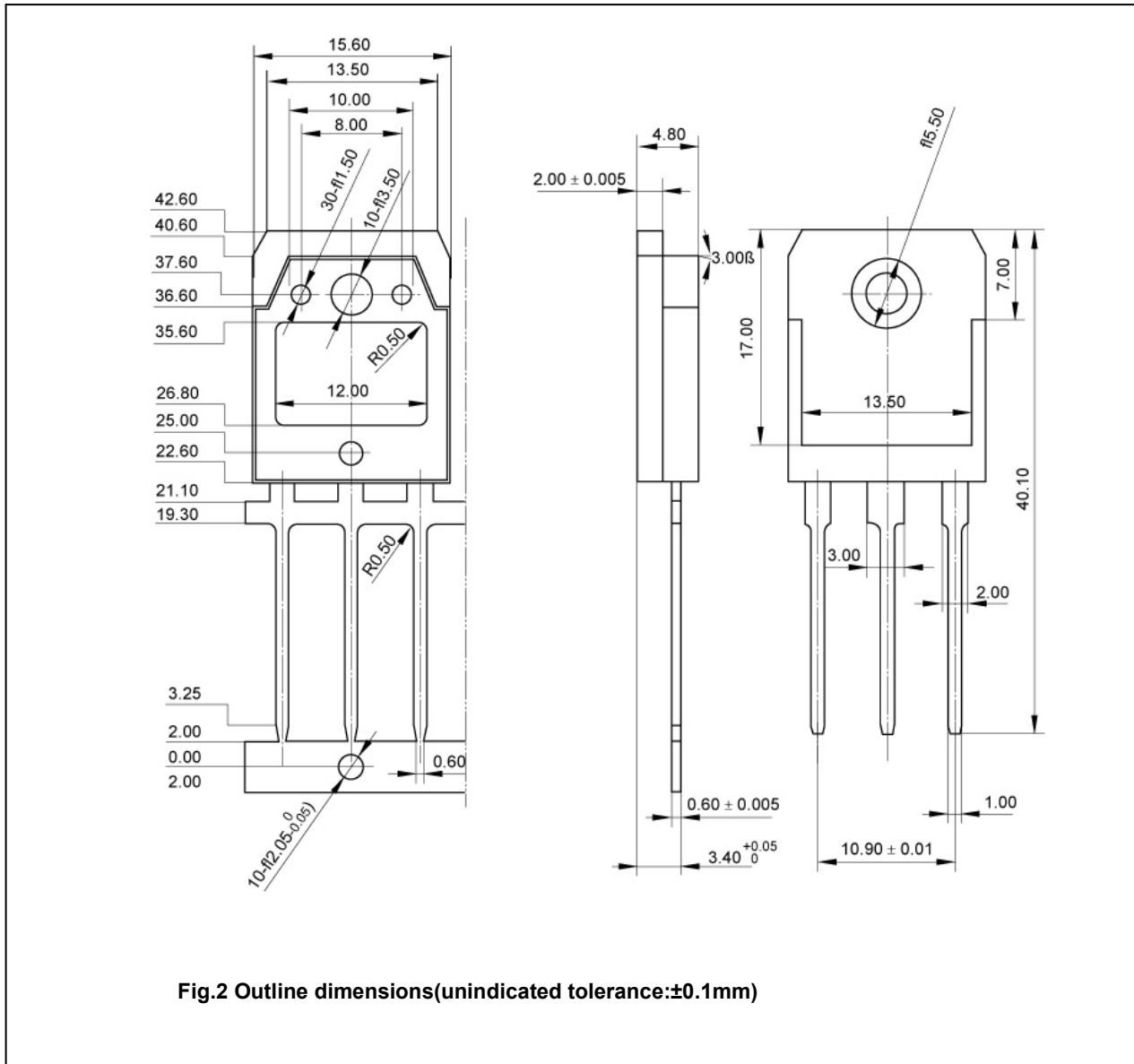


Fig.2 Outline dimensions(unindicated tolerance:±0.1mm)

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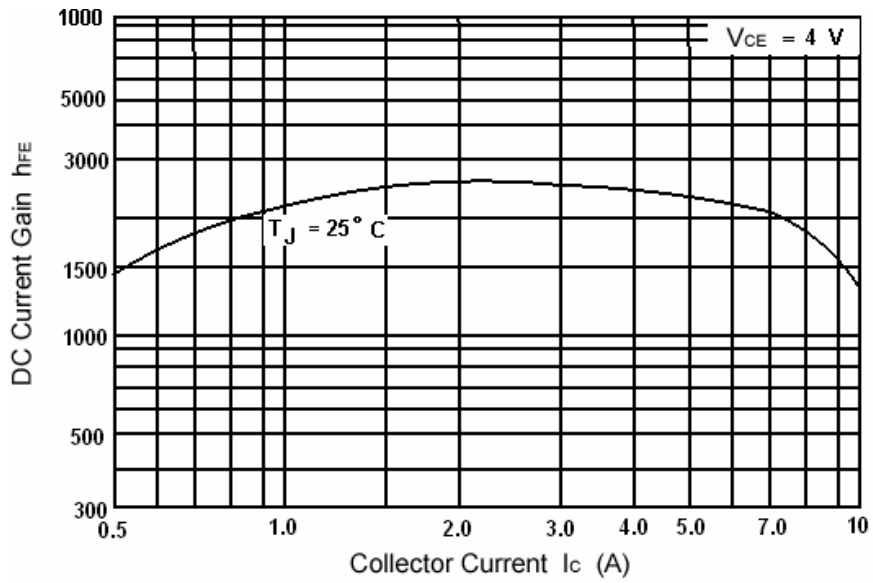


Fig.3 DC current Gain

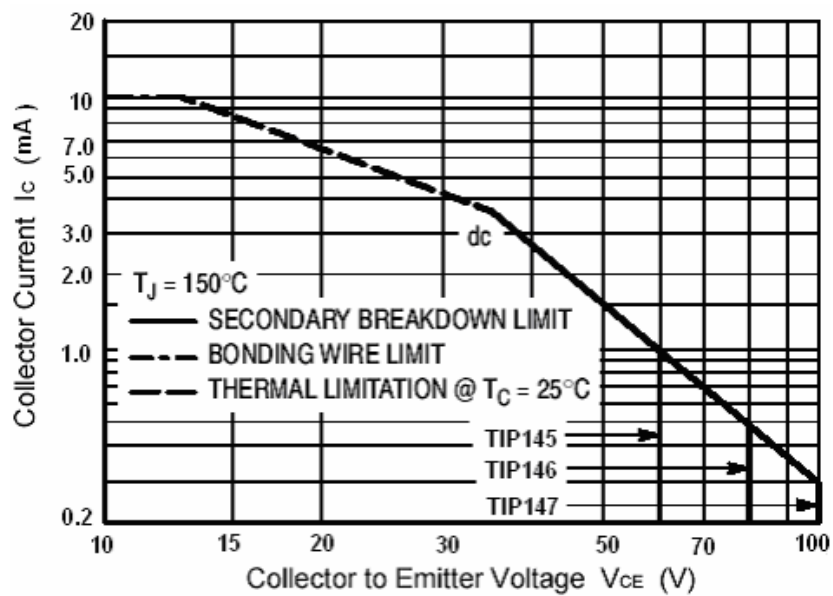


Fig.4 Safe Operating Area