

**Silicon NPN Darlington Power Transistors**

**TIP140/141/142**

**DESCRIPTION**

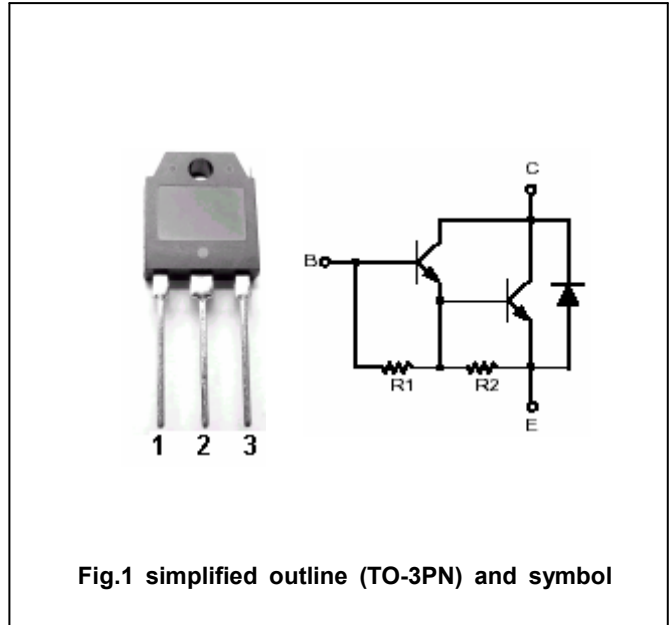
- With TO-3PN package
- DARLINGTON
- High DC current gain
- Complement to type TIP145/146/147

**APPLICATIONS**

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

**PINNING**

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



**ABSOLUTE MAXIMUM RATINGS(Tc=25°C)**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
V <sub>CBO</sub>	Collector-base voltage	TIP140	60	V
		TIP141	80	
		TIP142	100	
V <sub>CEO</sub>	Collector-emitter voltage	TIP140	60	V
		TIP141	80	
		TIP142	100	
V <sub>EBO</sub>	Emitter-base voltage	Open collector	5	V
I <sub>C</sub>	Collector current-DC		10	A
I <sub>CM</sub>	Collector current-Pulse		15	A
I <sub>B</sub>	Base current-DC		0.5	A
P <sub>C</sub>	Collector power dissipation	T <sub>C</sub> =25°C	125	W
T <sub>j</sub>	Junction temperature		150	°C
T <sub>stg</sub>	Storage temperature		-65~150	°C

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	MAX	UNIT
R <sub>th j-c</sub>	Thermal resistance junction to case	1.0	°C/W
R <sub>th j-A</sub>	Thermal resistance case to ambient	35.7	°C/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	TIP140	I <sub>C</sub> =30mA, I <sub>B</sub> =0	60			V
		TIP141		80			
		TIP142		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	TIP140			1	mA	
		TIP141					V <sub>CB</sub> =80V, I <sub>E</sub> =0
		TIP142					V <sub>CB</sub> =100V, I <sub>E</sub> =0
I <sub>CEO</sub>	Collector cut-off current	TIP140			2	mA	
		TIP141					V <sub>CE</sub> =40V, I <sub>B</sub> =0
		TIP142					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

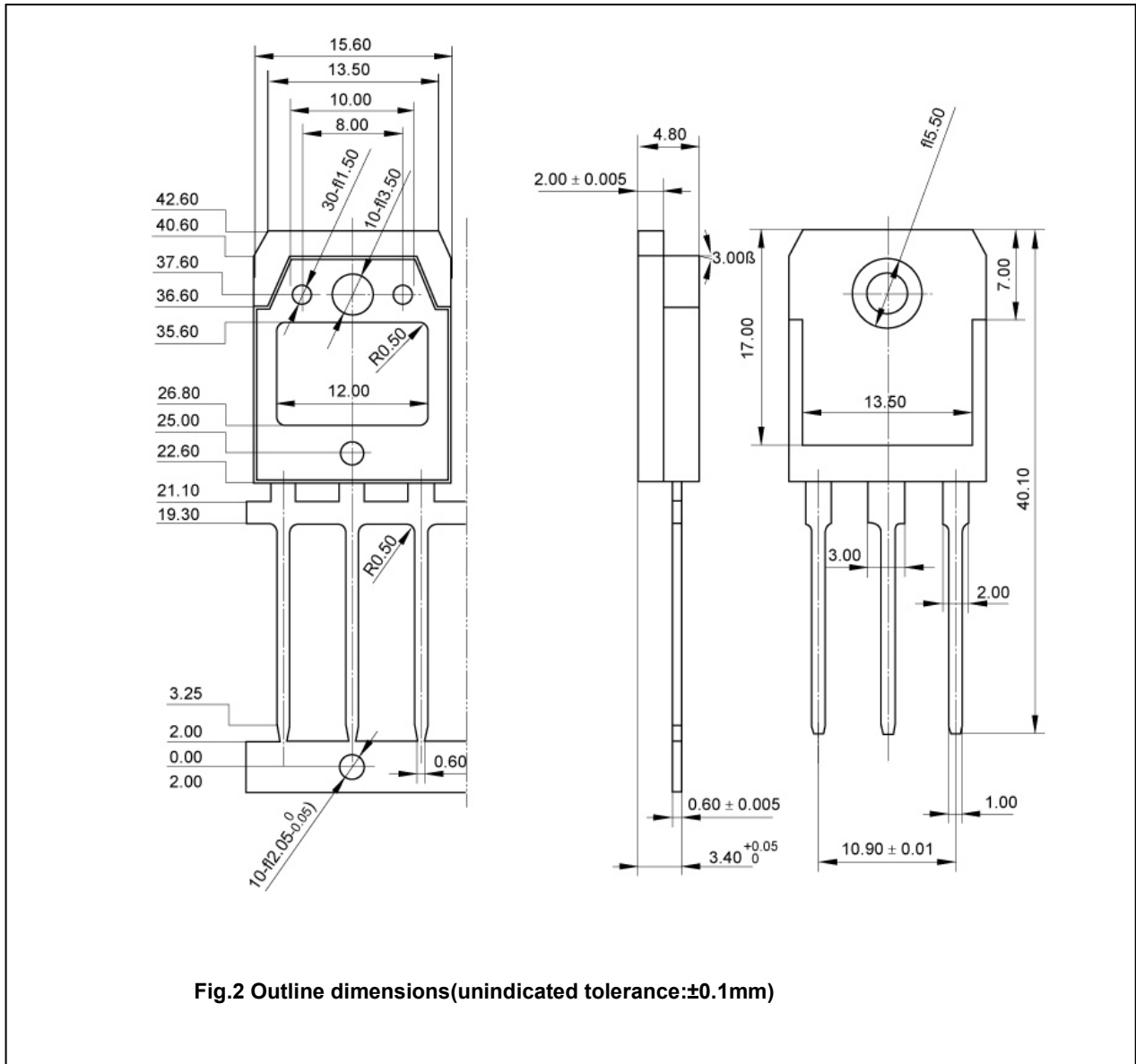


Fig.2 Outline dimensions(unindicated tolerance: $\pm 0.1$ mm)

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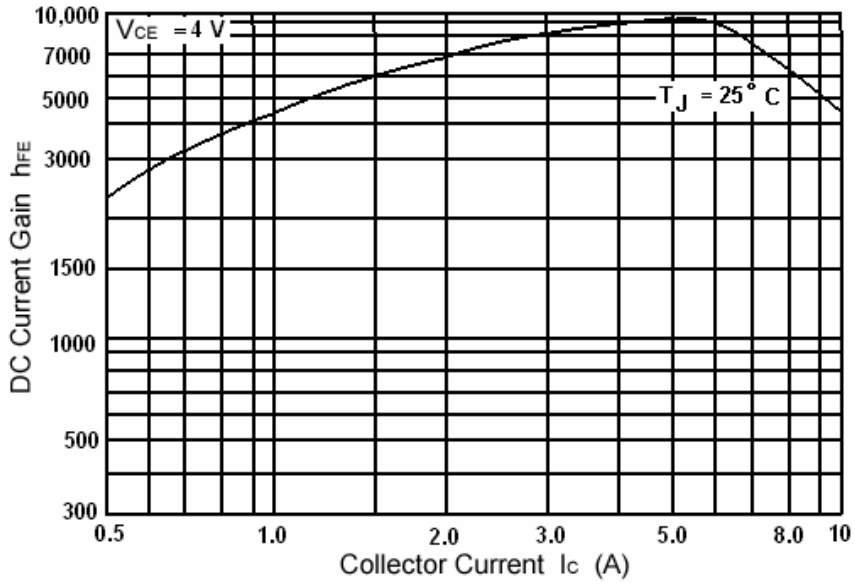


Fig.3 DC current Gain

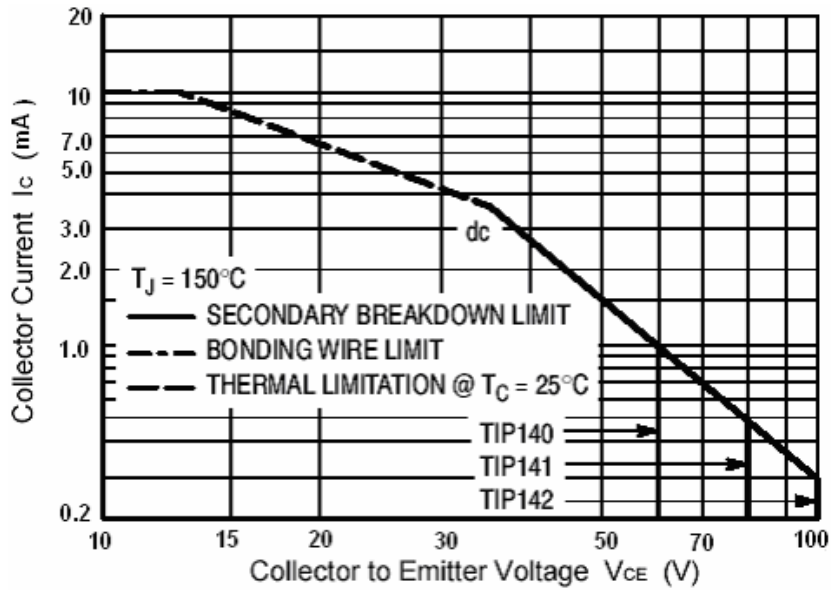


Fig.4 Safe Operating Area