

Silicon NPN Power Transistors

TIP160/161/162

DESCRIPTION

- With TO-3PN package
- DARLINGTON
- 10A rated continuous collector current

APPLICATIONS

- For use in automotive ignition,switching and motor control applications

PINNING

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

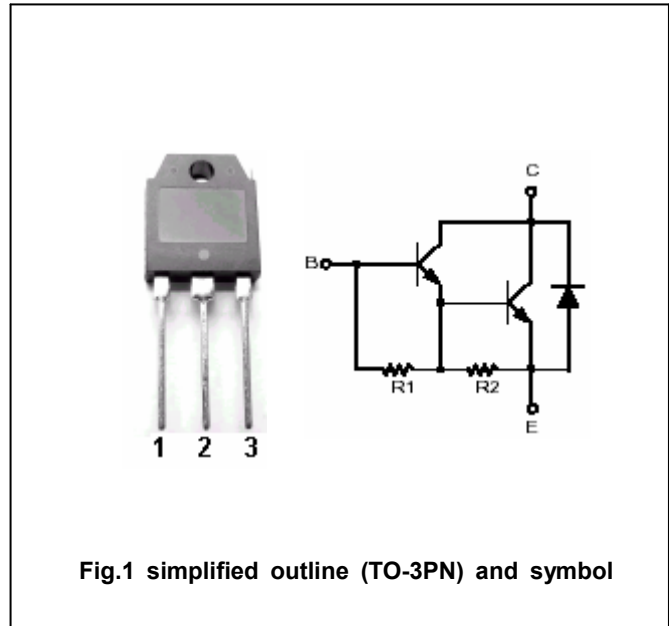


Fig.1 simplified outline (TO-3PN) and symbol

ABSOLUTE MAXIMUM RATINGS(Tc=25°C)

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
V <sub>CBO</sub>	Collector-base voltage	TIP160	320	V
		TIP161	350	
		TIP162	380	
V <sub>CEO</sub>	Collector-emitter voltage	TIP160	320	V
		TIP161	350	
		TIP162	380	
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		1	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

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## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V <sub>(BR)CEO</sub>	Collector-emitter breakdown voltage	TIP160	320			V
		TIP161	350			
		TIP162	380			
V <sub>CE(sat)-1</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =6.5A, I <sub>B</sub> =0.1A			2.8	V
V <sub>CE(sat)-2</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =10A, I <sub>B</sub> =1A			2.9	V
V <sub>BE(sat)</sub>	Base-emitter saturation voltage	I <sub>C</sub> =6.5A, I <sub>B</sub> =0.1A			2.2	V
V <sub>F</sub>	Diode forward voltage	I <sub>F</sub> =10A			3.5	V
I <sub>CEO</sub>	Collector cut-off current	TIP160			1.0	mA
		TIP161	V <sub>CE</sub> =320V, I <sub>B</sub> =0			
		TIP162	V <sub>CE</sub> =350V, I <sub>B</sub> =0			
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> =5V; I <sub>C</sub> =0			100	mA
h <sub>FE</sub>	DC current gain	I <sub>C</sub> =4A; V <sub>CE</sub> =2.2V	200			

## Switching times

t <sub>d</sub>	Delay time	V <sub>CC</sub> = 33 V, I <sub>C</sub> = 6.5 A, I <sub>B1</sub> = -I <sub>B2</sub> = 100 mA t <sub>p</sub> = 20 μs ; Duty Cycle ≤ 2.0%		0.3		μs
t <sub>r</sub>	Rise time			1.5		μs
t <sub>s</sub>	Storage time			2.3		μs
t <sub>f</sub>	Fall time			2.8		μs

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PACKAGE OUTLINE

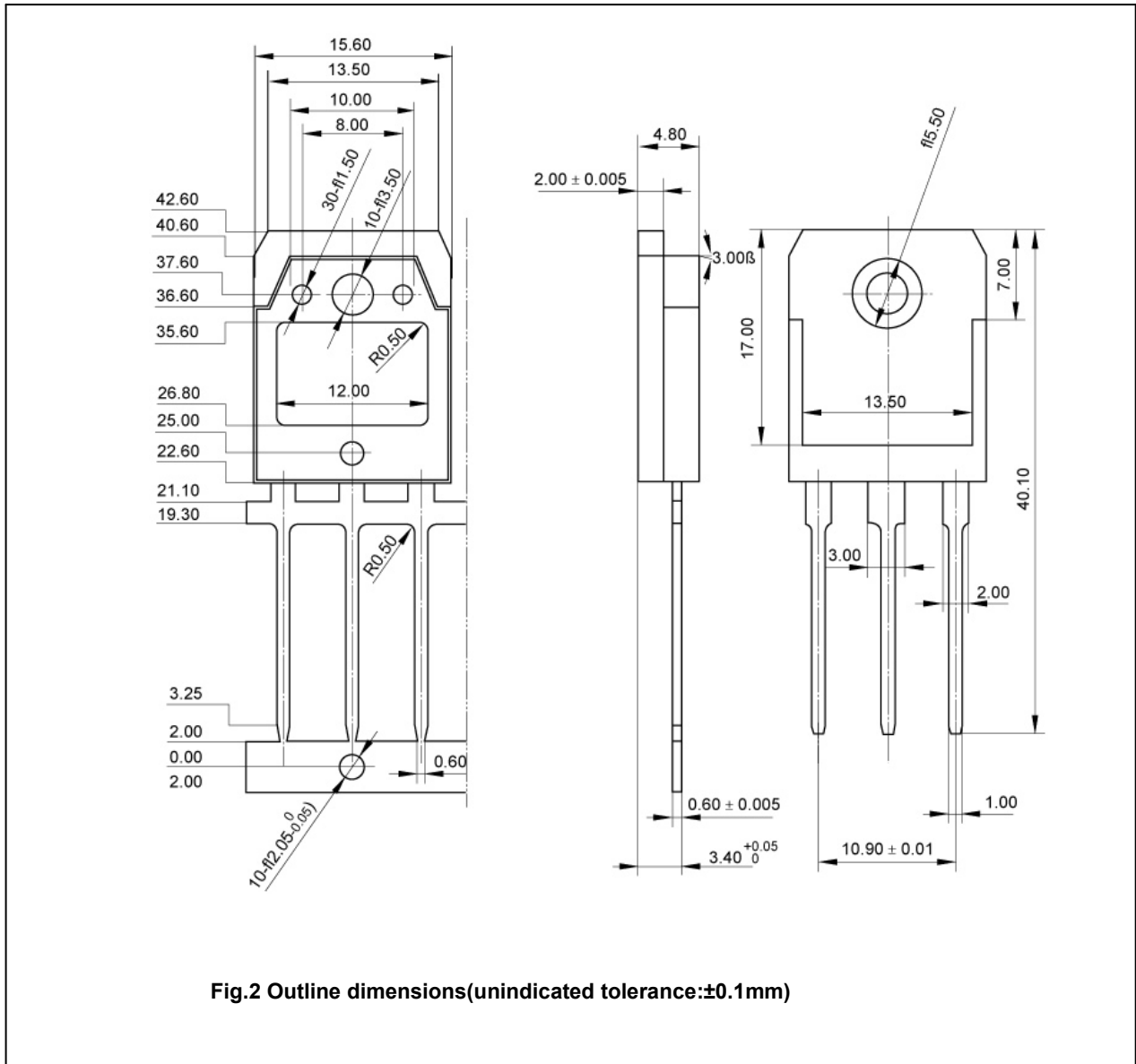


Fig.2 Outline dimensions(unindicated tolerance:±0.1mm)