

## Silicon NPN Power Transistors

## TIP33/33A/33B/33C

## DESCRIPTION

- With TO-3PN package
- Complement to type TIP34/34A/34B/34C
- DC current gain  $h_{FE}=40(\text{Min})@I_C=1.0\text{A}$

## APPLICATIONS

- Designed for use in general purpose power amplifier and switching applications.

## PINNING

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

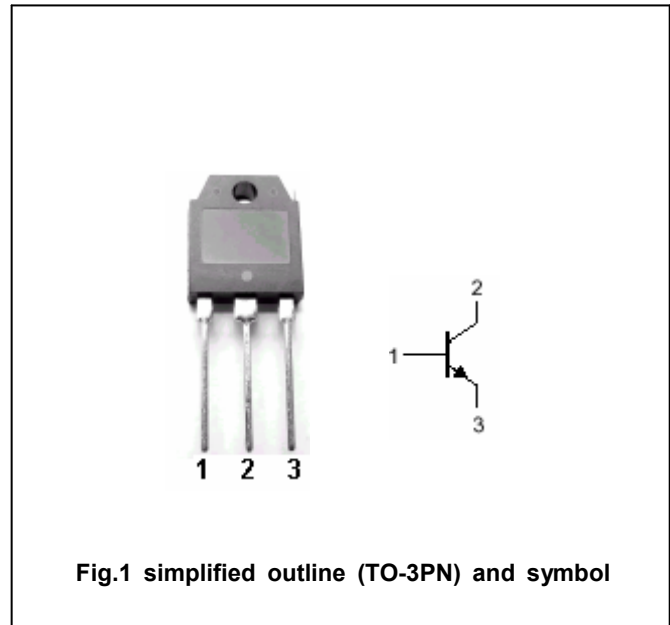


Fig.1 simplified outline (TO-3PN) and symbol

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

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$V_{CBO}$	Collector-base voltage	TIP33	40	V
		TIP33A	60	
		TIP33B	80	
		TIP33C	100	
$V_{CEO}$	Collector-emitter voltage	TIP33	40	V
		TIP33A	60	
		TIP33B	80	
		TIP33C	100	
$V_{EBO}$	Emitter-base voltage	Open collector	5	V
$I_C$	Collector current		10	A
$I_{CM}$	Collector current-peak		15	A
$I_B$	Base current		3	A
$P_C$	Collector power dissipation	$T_C=25^\circ\text{C}$	80	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	1.56	$^\circ\text{C}/\text{W}$

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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	TIP33	I <sub>C</sub> =30mA ; I <sub>B</sub> =0	40			V
		TIP33A		60			
		TIP33B		80			
		TIP33C		100			
V <sub>CE(sat)-1</sub>	Collector-emitter saturation voltage		I <sub>C</sub> =3A ; I <sub>B</sub> =0.3A			1.0	V
V <sub>CE(sat)-2</sub>	Collector-emitter saturation voltage		I <sub>C</sub> =10A ; I <sub>B</sub> =2.5A			4.0	V
V <sub>BE-1</sub>	Base-emitter on voltage		I <sub>C</sub> =3A ; V <sub>CE</sub> =4V			1.6	V
V <sub>BE-2</sub>	Base-emitter on voltage		I <sub>C</sub> =10A ; V <sub>CE</sub> =4V			3.0	V
I <sub>CEO</sub>	Collector cut-off current	TIP33/33A	V <sub>CE</sub> =30V ; I <sub>B</sub> =0			0.7	mA
		TIP33B/33C	V <sub>CE</sub> =60V ; I <sub>B</sub> =0				
I <sub>CES</sub>	Collector cut-off current	TIP33	V <sub>CE</sub> =40V ; V <sub>EB</sub> =0			0.4	mA
		TIP33A	V <sub>CE</sub> =60V ; V <sub>EB</sub> =0				
		TIP33B	V <sub>CE</sub> =80V ; V <sub>EB</sub> =0				
		TIP33C	V <sub>CE</sub> =100V ; V <sub>EB</sub> =0				
I <sub>EBO</sub>	Emitter cut-off current		V <sub>EB</sub> =5V ; I <sub>C</sub> =0			1.0	mA
h <sub>FE-1</sub>	DC current gain		I <sub>C</sub> =1A ; V <sub>CE</sub> =4V	40			
h <sub>FE-2</sub>	DC current gain		I <sub>C</sub> =3A ; V <sub>CE</sub> =4V	20		100	
f <sub>T</sub>	Transition frequency		I <sub>C</sub> =0.5A ; V <sub>CE</sub> =10V ; f=1MHz	3.0			MHz

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PACKAGE OUTLINE

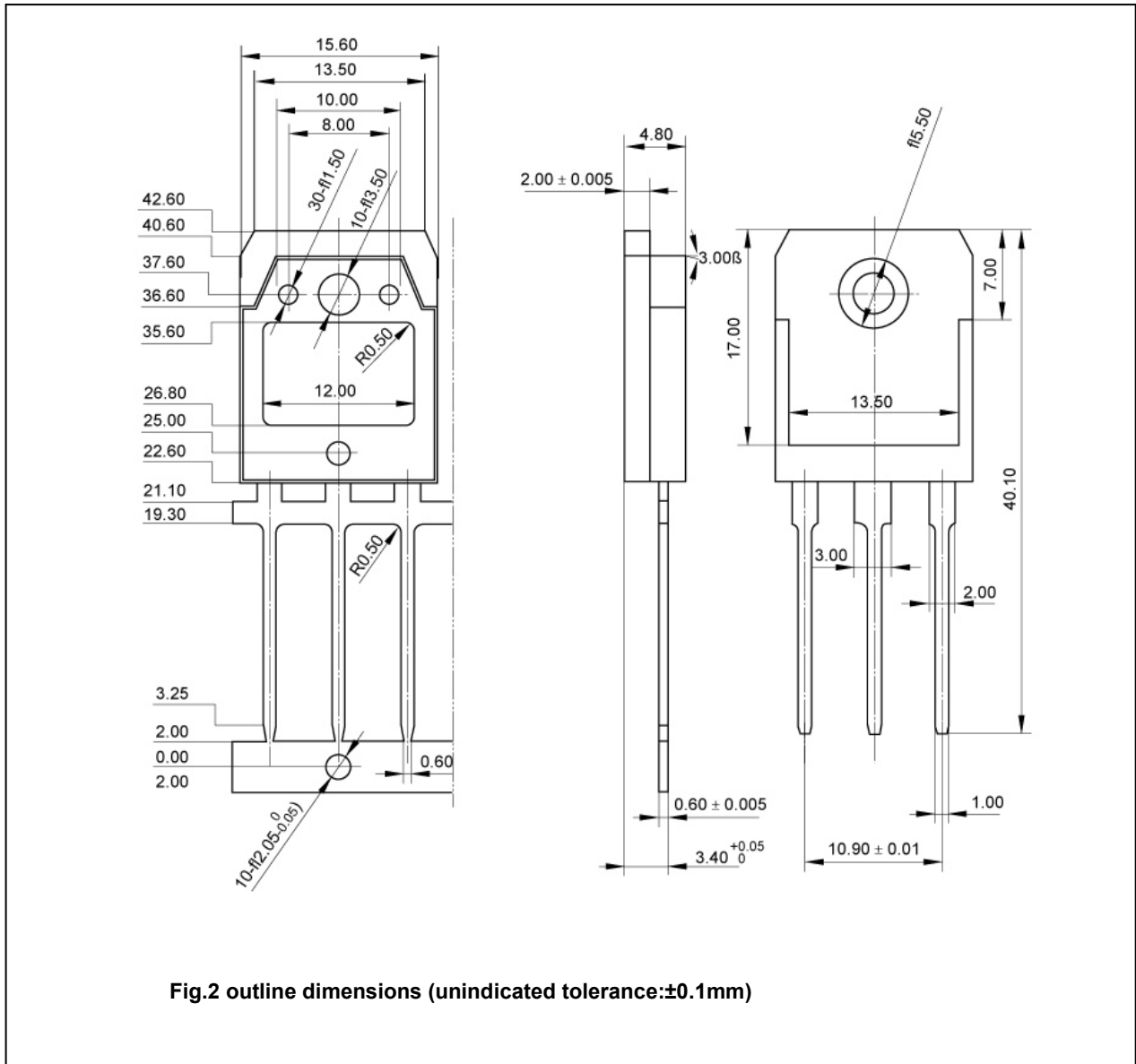


Fig.2 outline dimensions (unindicated tolerance:±0.1mm)