

**Silicon NPN Power Transistors**

**2N5989 2N5990 2N5991**

**DESCRIPTION**

- With TO-3PN package
- Complement to type 2N5986 2N5987 2N5988
- Low collector-emitter saturation voltage

**APPLICATIONS**

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

**PINNING**

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

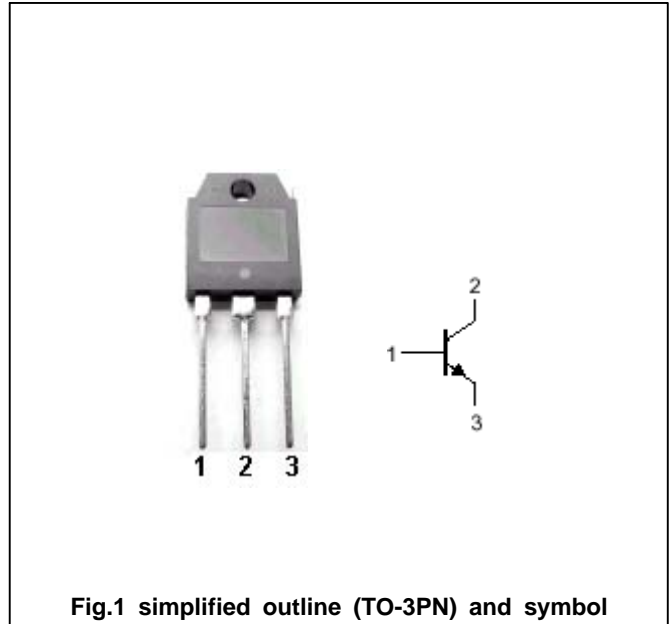


Fig.1 simplified outline (TO-3PN) and symbol

**Absolute maximum ratings(Ta= )**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
V <sub>CBO</sub>	Collector-base voltage	2N5989	60	V
		2N5990	80	
		2N5991	100	
V <sub>CEO</sub>	Collector-emitter voltage	2N5989	40	V
		2N5990	60	
		2N5991	80	
V <sub>EBO</sub>	Emitter-base voltage	Open collector	5	V
I <sub>C</sub>	Collector current		12	A
I <sub>CM</sub>	Collector current-peak		20	A
I <sub>B</sub>	Base current		4	A
P <sub>C</sub>	Collector power dissipation	T <sub>C</sub> =25	100	W
T <sub>j</sub>	Junction temperature		150	
T <sub>stg</sub>	Storage temperature		-65~150	

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	MAX	UNIT
R <sub>th j-c</sub>	Thermal resistance junction to case	1.25	/W

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## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V <sub>CEO</sub>	Collector-emitter sustaining voltage	2N5989	40			V
		2N5990	60			
		2N5991	80			
		I <sub>C</sub> =0.2A ; I <sub>B</sub> =0				
V <sub>CEsat-1</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =6A ; I <sub>B</sub> =0.6A			0.6	V
V <sub>CEsat-2</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =12A ; I <sub>B</sub> =1.8A			1.7	V
V <sub>BEsat</sub>	Base-emitter saturation voltage	I <sub>C</sub> =12A ; I <sub>B</sub> =1.8A			2.5	V
V <sub>BE</sub>	Base-emitter on voltage	I <sub>C</sub> =6A ; V <sub>CE</sub> =2V			1.4	V
I <sub>CEO</sub>	Collector cut-off current	2N5989			2.0	mA
		2N5990	V <sub>CE</sub> =20V ; I <sub>B</sub> =0			
		2N5991	V <sub>CE</sub> =30V ; I <sub>B</sub> =0			
		V <sub>CE</sub> =40V ; I <sub>B</sub> =0				
I <sub>CEX</sub>	Collector cut-off current	V <sub>CE</sub> =RatedV <sub>CE</sub> ; V <sub>BE</sub> =-1.5V T <sub>C</sub> =125			0.2 2.0	mA
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> =1.5A ; V <sub>CE</sub> =2V	40			
h <sub>FE-2</sub>	DC current gain	I <sub>C</sub> =6A ; V <sub>CE</sub> =2V	20		120	
h <sub>FE-3</sub>	DC current gain	I <sub>C</sub> =12A ; V <sub>CE</sub> =2V	7.0			
C <sub>OB</sub>	Output capacitance	I <sub>E</sub> =0 ; V <sub>CB</sub> =10V ; f=1MHz			300	pF
f <sub>T</sub>	Transition frequency	I <sub>C</sub> =0.5A ; V <sub>CE</sub> =10V ; f=1MHz	2.0			MHz

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PACKAGE OUTLINE

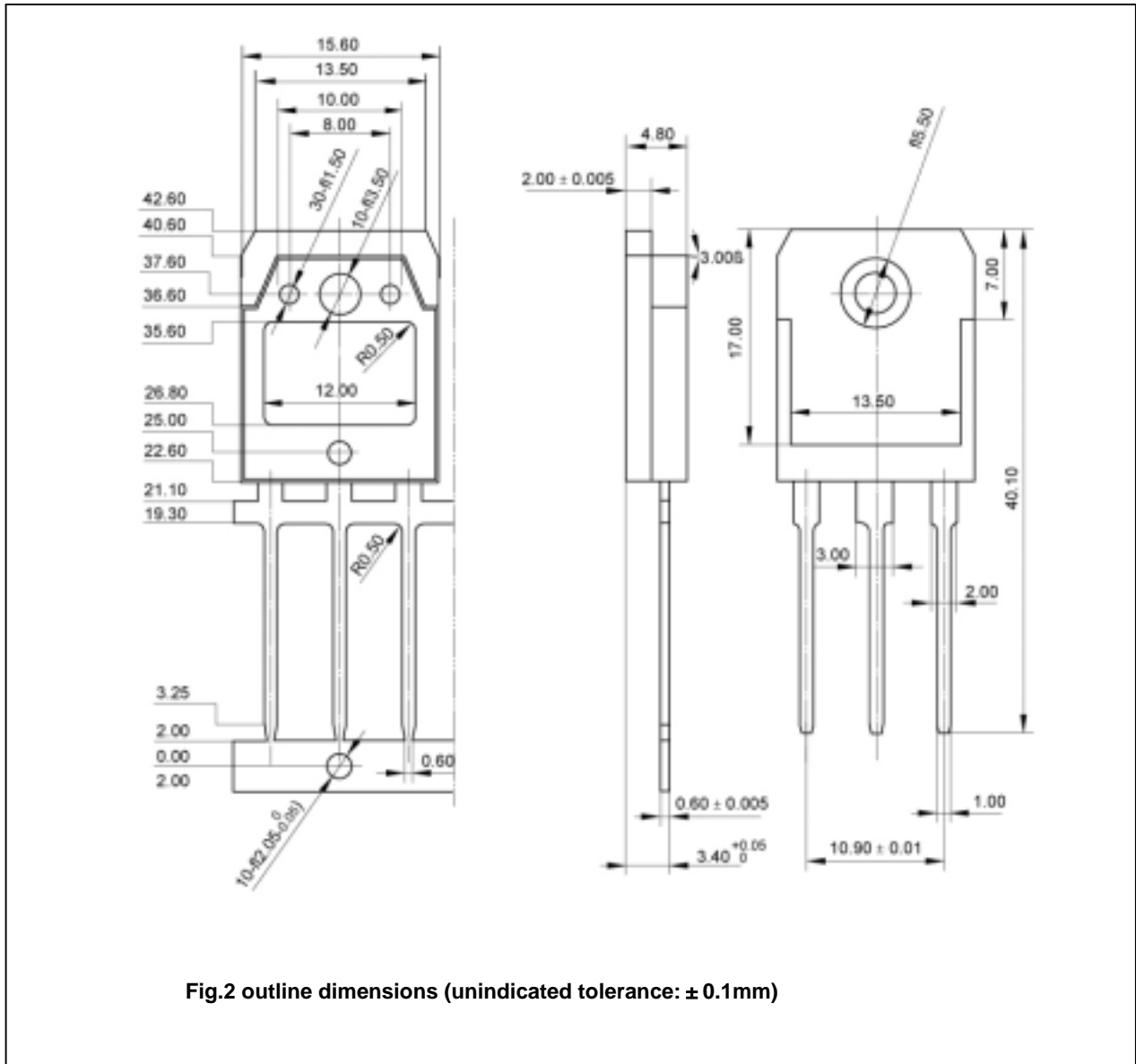


Fig.2 outline dimensions (unindicated tolerance: ± 0.1mm)