

**Silicon NPN Power Transistors**

**2SC4109**

**DESCRIPTION**

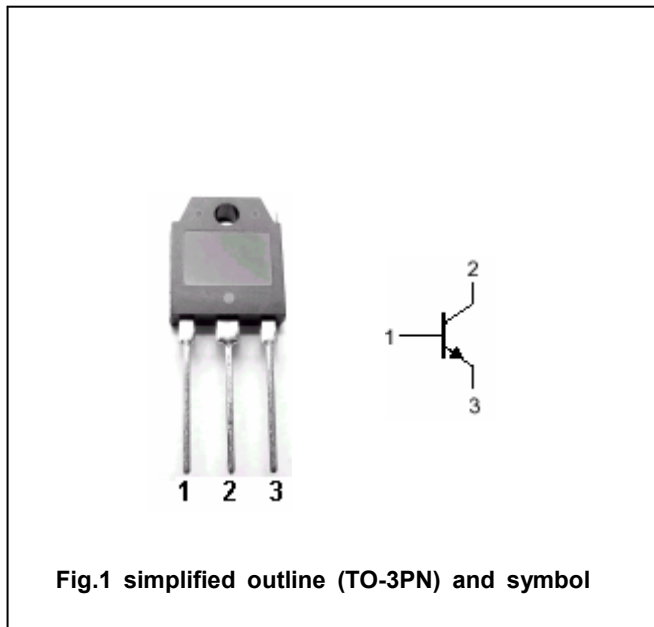
- With TO-3PN package
- High reliability
- High breakdown voltage
- Fast switching speed
- Wide area of safe operation

**APPLICATIONS**

- 400V/16A switching regulator applications

**PINNING**

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



**Absolute maximum ratings(Ta=□)**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
V <sub>CBO</sub>	Collector-base voltage	Open emitter	500	V
V <sub>CEO</sub>	Collector-emitter voltage	Open base	400	V
V <sub>EBO</sub>	Emitter-base voltage	Open collector	7	V
I <sub>C</sub>	Collector current		16	A
I <sub>CP</sub>	Collector current-pulse		32	A
I <sub>B</sub>	Base current		6	A
P <sub>C</sub>	Collector power dissipation	T <sub>a</sub> =□	2.5	W
		T <sub>C</sub> =25□	140	
T <sub>j</sub>	Junction temperature		150	□
T <sub>stg</sub>	Storage temperature		-55~150	□

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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	I <sub>C</sub> =10mA ; R <sub>BE</sub> =∞	400			V
V <sub>(BR)CBO</sub>	Collector-base breakdown voltage	I <sub>C</sub> =1mA ; I <sub>E</sub> =0	500			V
V <sub>(BR)EBO</sub>	Emitter-base breakdown voltage	I <sub>E</sub> =1mA ; I <sub>C</sub> =0	7			V
V <sub>CEsat</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =10A ; I <sub>B</sub> =2A			0.8	V
V <sub>BEsat</sub>	Base-emitter saturation voltage	I <sub>C</sub> =10A ; I <sub>B</sub> =2A			1.5	V
I <sub>CBO</sub>	Collector cut-off current	V <sub>CB</sub> =400V ; I <sub>E</sub> =0			10	μA
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> =5V ; I <sub>C</sub> =0			10	μA
h <sub>FE-1</sub>	DC current gain	I <sub>C</sub> =2A ; V <sub>CE</sub> =5V	15		50	
h <sub>FE-2</sub>	DC current gain	I <sub>C</sub> =10A ; V <sub>CE</sub> =5V	10			
h <sub>FE-3</sub>	DC current gain	I <sub>C</sub> =10mA ; V <sub>CE</sub> =5V	10			
f <sub>T</sub>	Transition frequency	I <sub>C</sub> =2A ; V <sub>CE</sub> =10V		20		MHz
C <sub>OB</sub>	Collector output capacitance	f=1MHz ; V <sub>CB</sub> =10V		230		pF

## Switching times

t <sub>on</sub>	Turn-on time	I <sub>C</sub> =12A ; I <sub>B1</sub> =2.4A ; I <sub>B2</sub> =-4.8A ; R <sub>L</sub> =16.6Ω V <sub>CC</sub> =200V			0.5	μs
t <sub>stg</sub>	Storage time				2.5	μs
t <sub>f</sub>	Fall time				0.3	μs

◆ h<sub>FE-1</sub> classifications

L	M	N
15-30	20-40	30-50

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PACKAGE OUTLINE

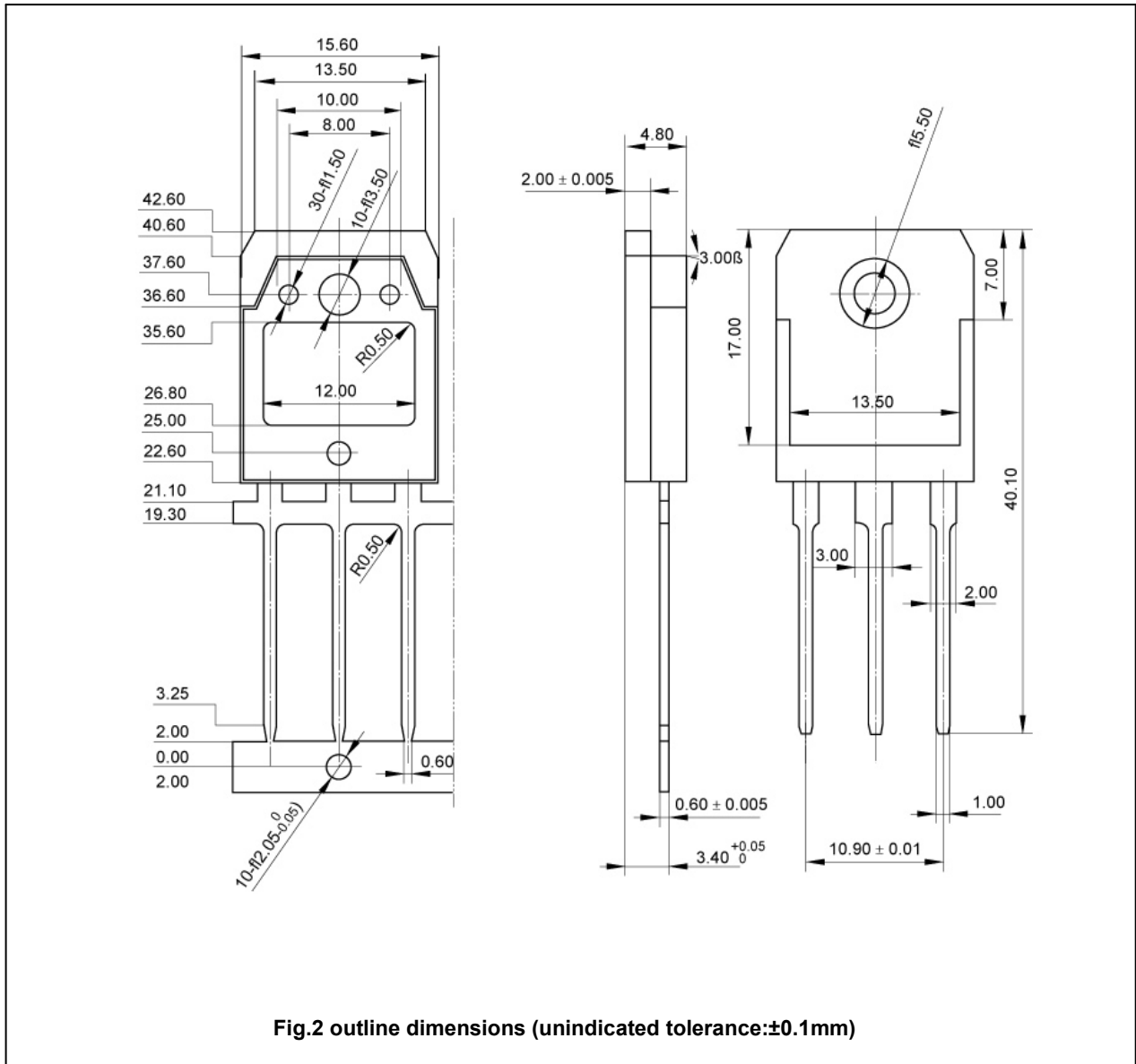


Fig.2 outline dimensions (unindicated tolerance:±0.1mm)

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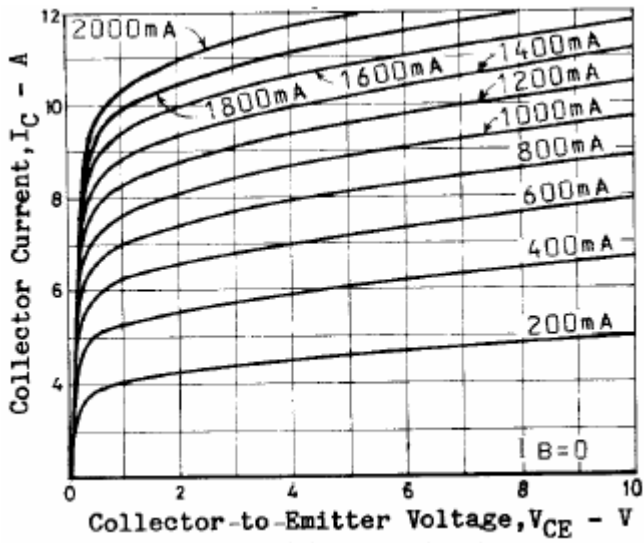


Fig.3 Static Characteristic

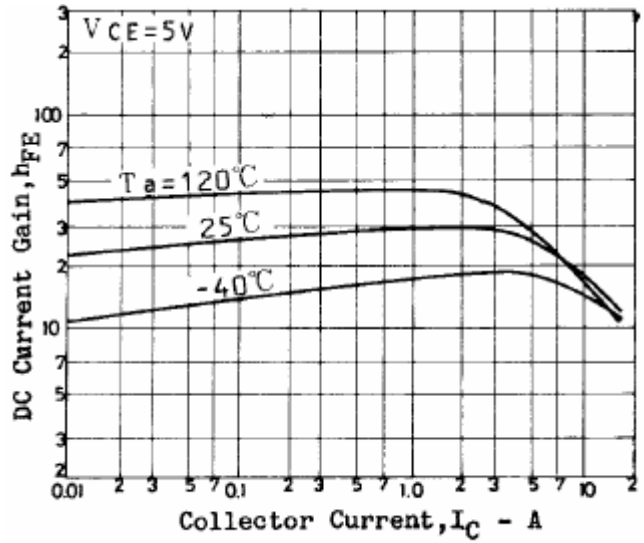


Fig.4 DC current Gain

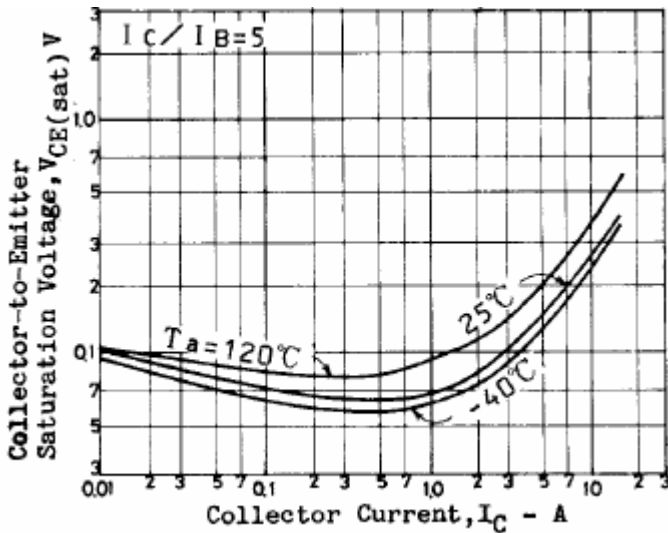


Fig.5 Collector-Emitter Saturation Voltage

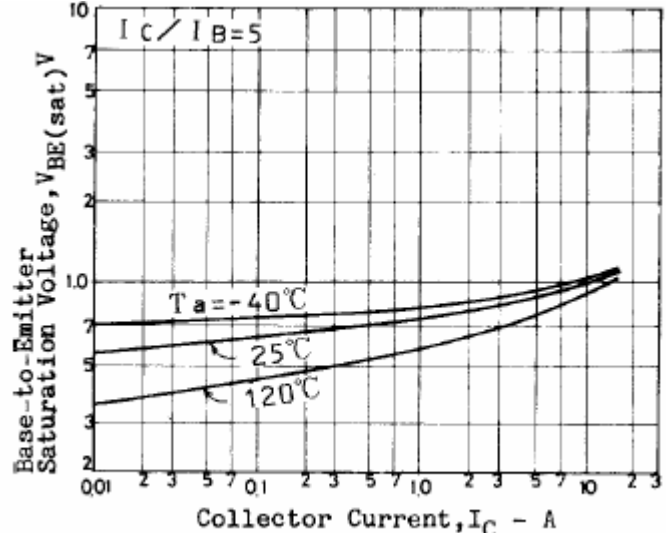


Fig.6 Base-Emitter Saturation Voltage

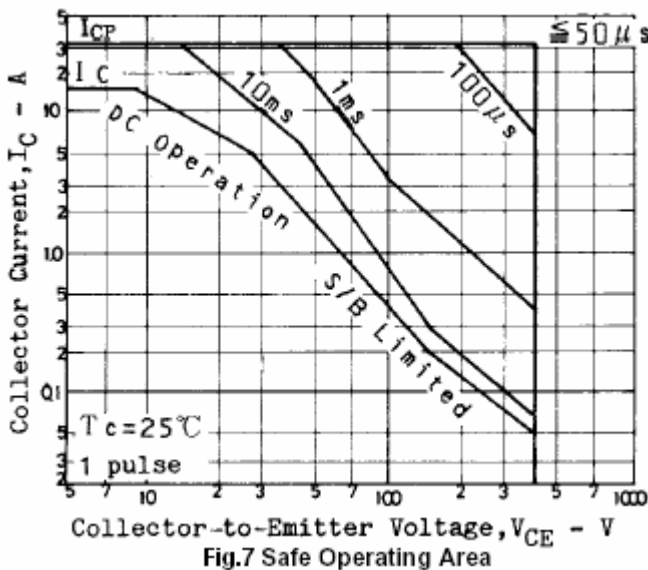


Fig.7 Safe Operating Area