

**Silicon NPN Power Transistors**

**2SC3039**

**DESCRIPTION**

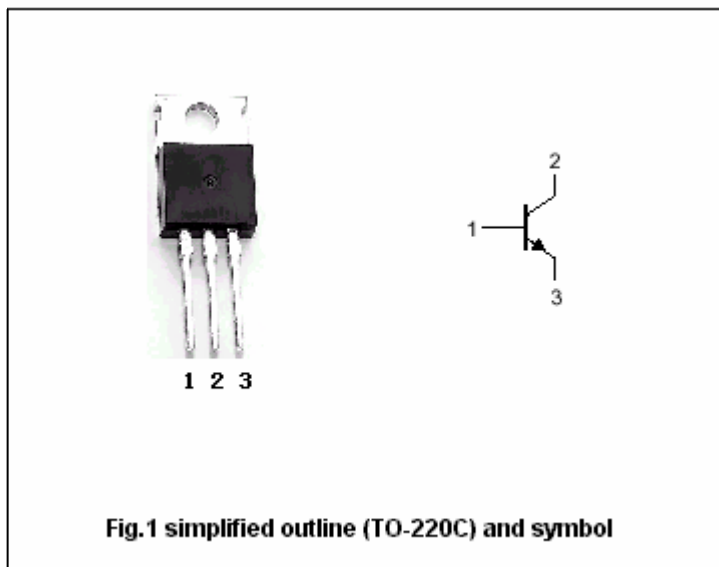
- With TO-220C package
- High breakdown voltage ( $V_{CBO} \geq 500V$ ).
- Fast switching speed.
- Wide area of safe operation

**APPLICATIONS**

- 400V/7A switching regulator applications

**PINNING**

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



**Absolute maximum ratings( $T_a=25^\circ$ )**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$V_{CBO}$	Collector-base voltage	Open emitter	500	V
$V_{CEO}$	Collector-emitter voltage	Open base	400	V
$V_{EBO}$	Emitter-base voltage	Open collector	7	V
$I_C$	Collector current (DC)		7	A
$I_{CM}$	Collector current-peak		14	A
$I_B$	Base current		3	A
$P_C$	Collector dissipation	$T_a=25^\circ$	1.75	W
		$T_c=25^\circ$	50	
$T_j$	Junction temperature		150	$^\circ$
$T_{stg}$	Storage temperature		-50~150	$^\circ$

## Silicon NPN Power Transistors

## 2SC3039

## 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> =5mA ; 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> =4A ; I <sub>B</sub> =0.8A			1.0	V
V <sub>BEsat</sub>	Base-emitter saturation voltage	I <sub>C</sub> =4A ; I <sub>B</sub> =0.8A			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> =0.8A ; V <sub>CE</sub> =5V	15		50	
h <sub>FE-2</sub>	DC current gain	I <sub>C</sub> =4A ; V <sub>CE</sub> =5V	8			
f <sub>T</sub>	Transition frequency	I <sub>C</sub> =0.8A ; V <sub>CE</sub> =10V		20		MHz
C <sub>ob</sub>	Collector output capacitance	f=1MHz ; V <sub>CB</sub> =10V		80		pF

## Switching times

t <sub>on</sub>	Turn-on time	I <sub>C</sub> =5A, I <sub>B1</sub> =1A I <sub>B2</sub> =-1A; V <sub>CC</sub> =200V R <sub>L</sub> =40Ω			1.0	μs
t <sub>s</sub>	Storage time				2.5	μs
t <sub>f</sub>	Fall time				1.0	μs

◆ h<sub>FE-1</sub> classifications

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

Silicon NPN Power Transistors

2SC3039

PACKAGE OUTLINE

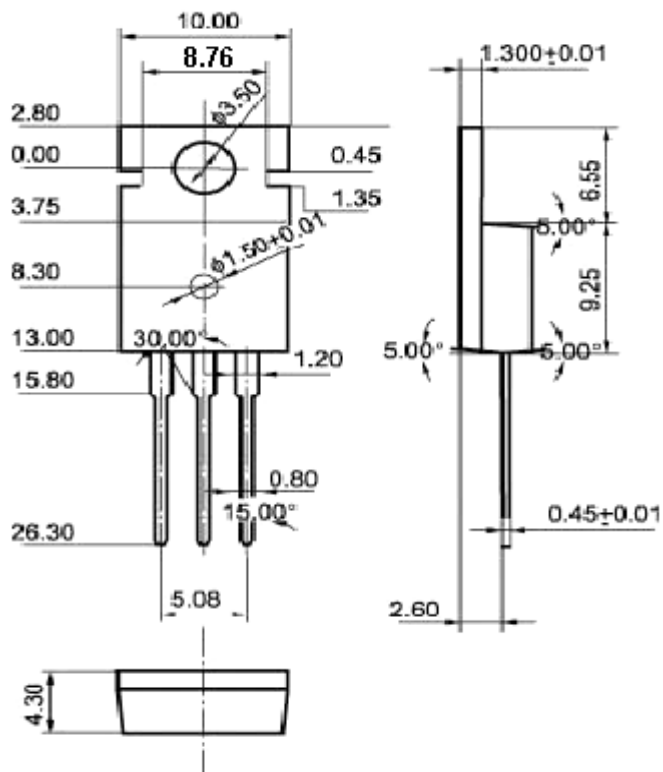


Fig.2 Outline dimensions (unindicated tolerance:  $\pm 0.10$  mm)

Silicon NPN Power Transistors

2SC3039

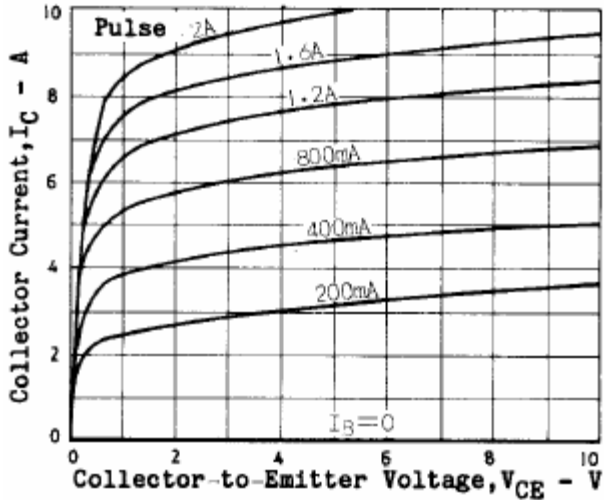


Fig.3 Static Characteristic

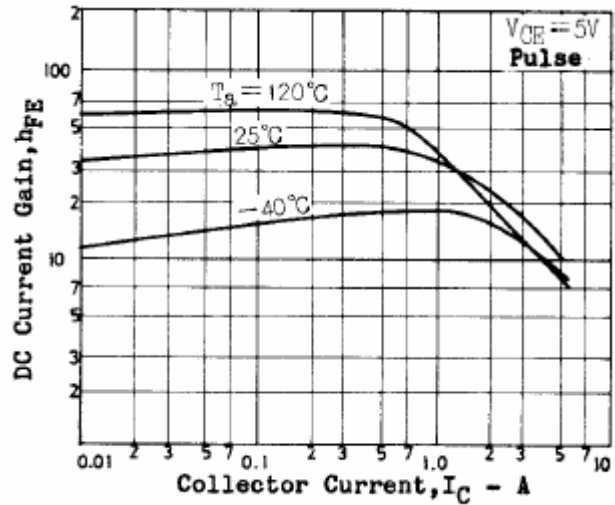


Fig.4 DC current Gain

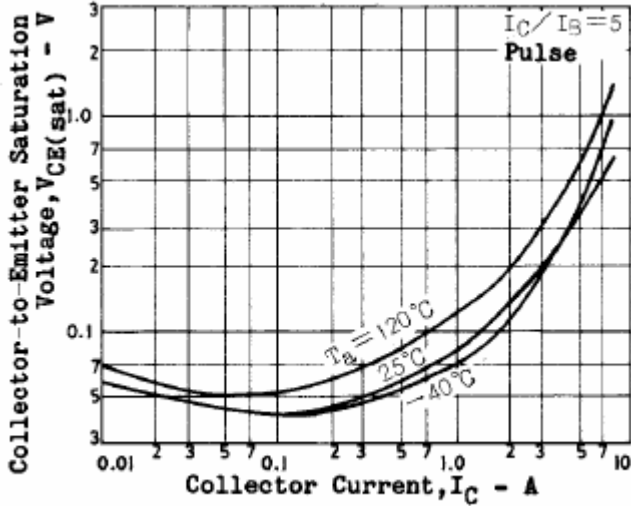


Fig.5 Collector-Emitter Saturation Voltage

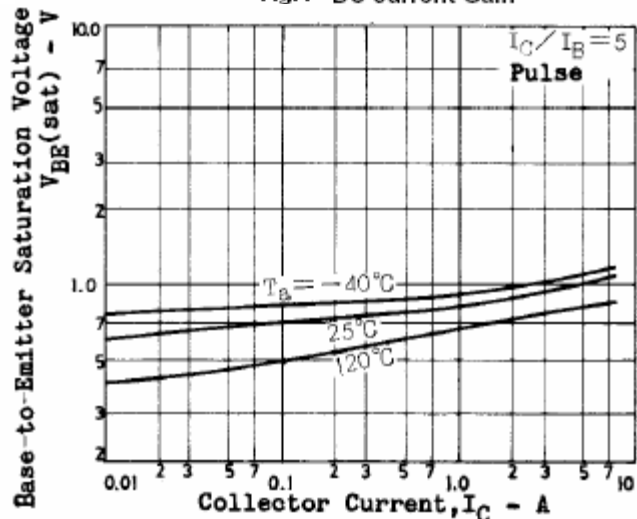


Fig.6 Base-Emitter Saturation Voltage

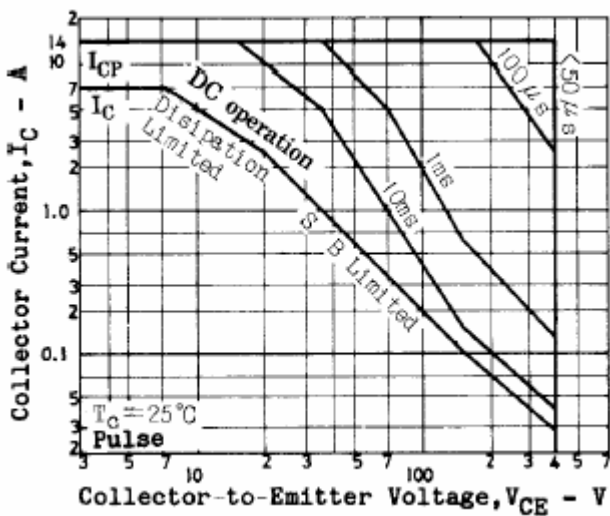


Fig.7 Safe Operating Area