

**Silicon NPN Power Transistors**

**BUT11 BUT11A**

**DESCRIPTION**

- With TO-220C package
- High voltage ,high speed

**APPLICATIONS**

- Converters
- Inverters
- Switching regulators
- Motor control systems

**PINNING**

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

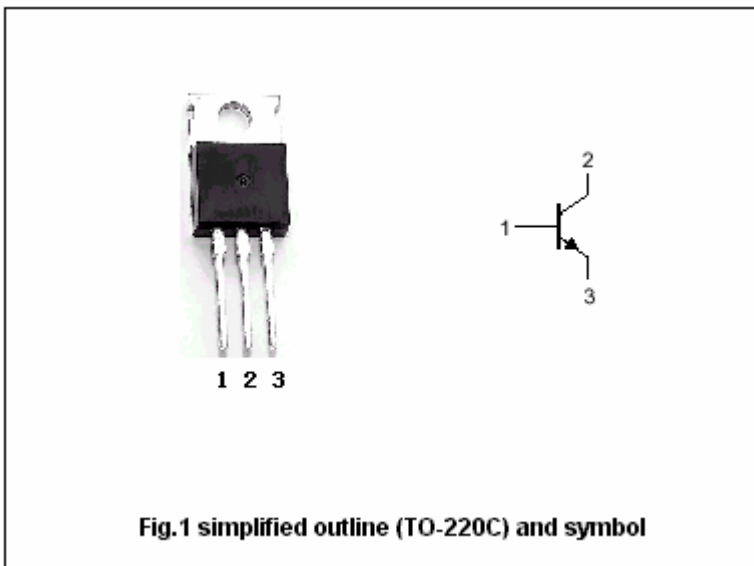


Fig.1 simplified outline (TO-220C) and symbol

**Absolute maximum ratings (Tc=25°C)**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
V <sub>CBO</sub>	Collector-base voltage	BUT11	850	V
		BUT11A	1000	
V <sub>CEO</sub>	Collector-emitter voltage	BUT11	400	V
		BUT11A	450	
V <sub>EBO</sub>	Emitter-base voltage	Open collector	7	V
I <sub>C</sub>	Collector current (DC)		5	A
I <sub>CM</sub>	Collector current-Peak		10	A
I <sub>B</sub>	Base current		2	A
P <sub>tot</sub>	Total power dissipation	T <sub>mb</sub> ≤25°C	100	W
T <sub>f</sub>	Fall time		0.8	μs
T <sub>j</sub>	Junction temperature		150	°C
T <sub>stg</sub>	Storage temperature		-65~150	°C

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	VALUE	UNIT
R <sub>th j-mb</sub>	Thermal resistance from junction to mounting base	1.25	K/W

## Silicon NPN Power Transistors

## BUT11 BUT11A

## 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	BUT11	I <sub>C</sub> =0.1A; I <sub>B</sub> =0, L=25mH			V
		BUT11A				
V <sub>CEsat</sub>	Collector-emitter saturation voltage	BUT11	I <sub>C</sub> =3A; I <sub>B</sub> =0.6A		1.5	V
		BUT11A				
V <sub>BEsat</sub>	Base-emitter saturation voltage	BUT11	I <sub>C</sub> =3A; I <sub>B</sub> =0.6A		1.3	V
		BUT11A				
I <sub>CES</sub>	Collector cut-off current	V <sub>CE</sub> =Rated V <sub>CEs</sub> ; V <sub>BE</sub> =0 T <sub>j</sub> =125°C			1.0 2.0	mA
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> =9V; I <sub>C</sub> =0			10	mA
h <sub>FE-1</sub>	DC current gain	I <sub>C</sub> =5mA; V <sub>CE</sub> =5V	10		35	
h <sub>FE-2</sub>	DC current gain	I <sub>C</sub> =0.5A; V <sub>CE</sub> =5V	10		35	

## Switching times resistive load

t <sub>on</sub>	Turn-on time	For BUT11 I <sub>C</sub> =3A; I <sub>B1</sub> =- I <sub>B2</sub> =0.6A  For BUT11A I <sub>C</sub> =2.5A; I <sub>B1</sub> =- I <sub>B2</sub> =0.5A			1.0	μs
t <sub>s</sub>	Storage time				4.0	μs
t <sub>f</sub>	Fall time				0.8	μs

## Switching times inductive load

t <sub>s</sub>	Storage time	For BUT11 I <sub>C</sub> =3A; I <sub>B</sub> =0.6A			1.4	μs
t <sub>f</sub>	Fall time	For BUT11A I <sub>C</sub> =2.5A; I <sub>B</sub> =0.5A			0.15	μs

Silicon NPN Power Transistors

BUT11 BUT11A

PACKAGE OUTLINE



Fig.2 Outline dimensions (unindicated tolerance:±0.10 mm)