

## Silicon NPN Power Transistors

## BUT12 BUT12A

## 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

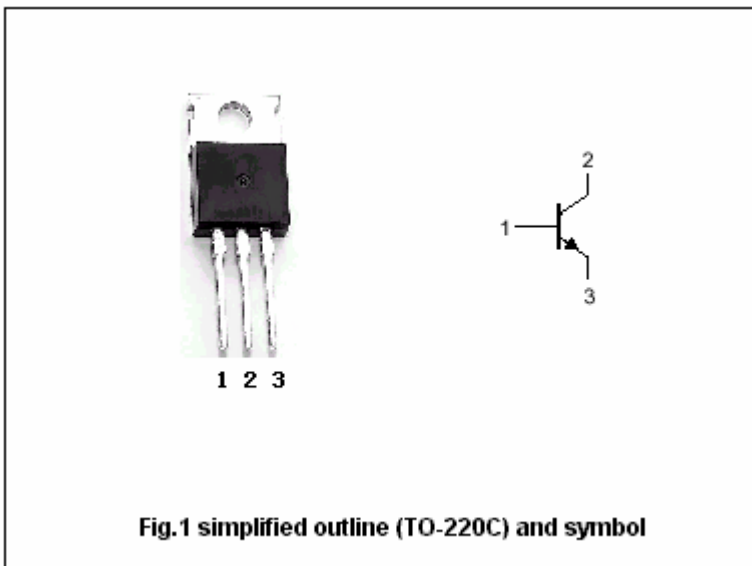


Fig.1 simplified outline (TO-220C) and symbol

## Absolute maximum ratings (Tc=25□)

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
V <sub>CBO</sub>	Collector-base voltage	BUT12	850	V
		BUT12A	1000	
V <sub>CEO</sub>	Collector-emitter voltage	BUT12	400	V
		BUT12A	450	
V <sub>EBO</sub>	Emitter-base voltage	Open collector	9	V
I <sub>C</sub>	Collector current		8	A
I <sub>CM</sub>	Collector current-peak		20	A
I <sub>B</sub>	Base current		4	A
I <sub>BM</sub>	Base current-peak		6	a
P <sub>tot</sub>	Total power dissipation	T <sub>mb</sub> ≤25□	100	W
T <sub>j</sub>	Junction temperature		150	□
T <sub>stg</sub>	Storage temperature		-65~150	□

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	VALUE	UNIT
R <sub>th j-mb</sub>	Thermal resistance from junction to mounting base	1	K/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	BUT12	I <sub>C</sub> =0.1A; I <sub>B</sub> =0, L=25mH	400			V
		BUT12A		450			
V <sub>CEsat</sub>	Collector-emitter saturation voltage	BUT12	I <sub>C</sub> =6A; I <sub>B</sub> =1.2A			1.5	V
		BUT12A	I <sub>C</sub> =5A; I <sub>B</sub> =1A				
V <sub>BEsat</sub>	Base-emitter saturation voltage	BUT12	I <sub>C</sub> =6A; I <sub>B</sub> =1.2A			1.5	V
		BUT12A	I <sub>C</sub> =5A; I <sub>B</sub> =1A				
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 3.0	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> =10mA; V <sub>CE</sub> =5V	10		35	
h <sub>FE-2</sub>	DC current gain		I <sub>C</sub> =1A; V <sub>CE</sub> =5V	10		35	

## Switching times resistive load

t <sub>on</sub>	Turn-on time	For BUT12 I <sub>C</sub> =6A; I <sub>B1</sub> = I <sub>B2</sub> =1.2A  For BUT12A I <sub>C</sub> =5A; I <sub>B1</sub> = I <sub>B2</sub> =1A			1.0	μs
t <sub>s</sub>	Storage time				4.0	μs
t <sub>f</sub>	Fall time				0.8	μs

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PACKAGE OUTLINE



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