



勝特力材料 886-3-5753170  
勝特力电子(上海) 86-21-34970699  
勝特力电子(深圳) 86-755-83298787  
Http://www.100y.com.tw

# BUV48A

## High voltage fast switching NPN power transistor

### Features

- High current capability
- Fast switching speed

### Applications

- Switching mode power supplies
- Flyback and forward single transistor low power converter

### Description

The device is a multiepitaxial mesa NPN transistor mounted in TO-247 plastic package. It is intended for switching and industrial applications from single and three-phase mains.

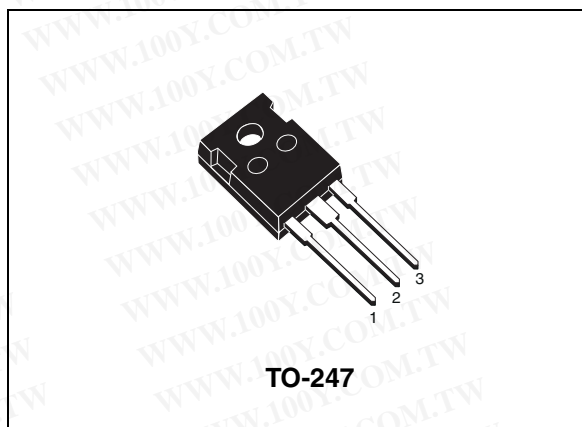


Figure 1. Internal schematic diagram

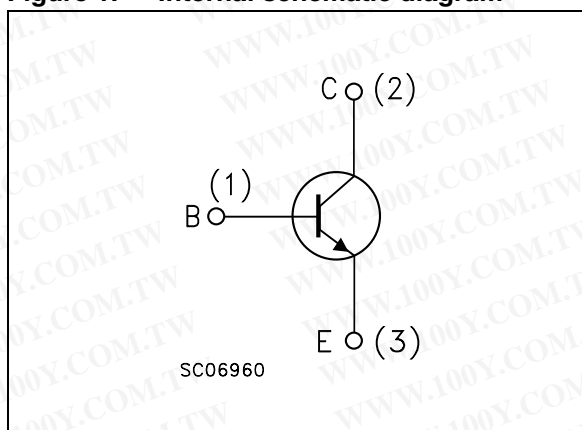


Table 1. Device summary

Order code	Marking	Package	Packaging
BUV48A	BUV48A	TO-247	Tube

# 1 Absolute maximum ratings

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_{CER}$	Collector-emitter voltage ( $R_{BE} = 10 \Omega$ )	1000	V
$V_{CES}$	Collector-emitter voltage ( $V_{BE} = 0$ )	1000	V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	450	V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	7	V
$I_C$	Collector current	15	A
$I_{CM}$	Collector peak current	30	A
$I_{CP}$	Collector peak current non repetitive ( $t_p < 20 \mu s$ )	55	A
$I_B$	Base current	4	A
$I_{BM}$	Base peak current	20	A
$P_{TOT}$	Total dissipation at $T_{case} = 25 \text{ }^\circ\text{C}$	125	W
$T_{STG}$	Storage temperature	-65 to 150	$^\circ\text{C}$
$T_J$	Max. operating junction temperature	150	$^\circ\text{C}$

**Table 3. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thJC}$	Thermal resistance junction-case max	1	$^\circ\text{C/W}$

## 2 Electrical characteristics

$T_{case} = 25\text{ °C}$ ; unless otherwise specified.

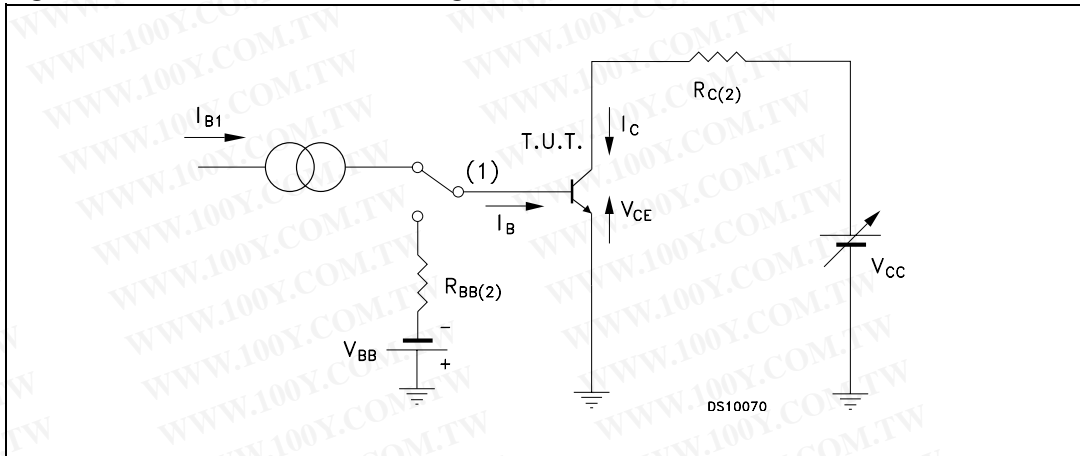
**Table 4. Electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector cut-off current ( $V_{BE} = 0$ )	$V_{CE} = 1000\text{ V}$ $V_{CE} = 1000\text{ V}$ $T_c = 125\text{ °C}$			200 2	$\mu\text{A}$ mA
$I_{CER}$	Collector cut-off current ( $R_{BE} = 10\Omega$ )	$V_{CE} = 1000\text{ V}$ $V_{CE} = 1000\text{ V}$ $T_c = 125\text{ °C}$			500 4	$\mu\text{A}$ mA
$I_{EBO}$	Emitter cut-off current ( $I_C = 0$ )	$V_{EB} = 5\text{ V}$			1	mA
$V_{CEO(sus)}^{(1)}$	Collector-emitter sustaining voltage ( $I_B = 0$ )	$I_C = 200\text{ mA}$	450			V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	$I_E = 50\text{ mA}$	7		30	V
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 8\text{ A}$ $I_B = 1.6\text{ A}$ $I_C = 12\text{ A}$ $I_B = 2.4\text{ A}$			1.5 5	V V
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 8\text{ A}$ $I_B = 1.6\text{ A}$			1.6	V
$h_{FE}^{(1)}$	DC current gain	$I_C = 8\text{ A}$ $V_{CE} = 5\text{ V}$	8			
$t_{on}$ $t_s$ $t_f$	Resistive load Turn-on time Storage time Fall time	$V_{CC} = 150\text{ V}$ $I_C = 8\text{ A}$ $I_{B1} = -I_{B2} = 1.6\text{ A}$			1 3 0.8	$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
$t_s$ $t_f$	Inductive load Storage time Fall time	$V_{CC} = 300\text{ V}$ $I_C = 8\text{ A}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 1.6\text{ A}$ $L_B = 3\text{ }\mu\text{H}$		3 0.13		$\mu\text{s}$ $\mu\text{s}$
$t_s$ $t_f$	Inductive load Storage time Fall time	$V_{CC} = 300\text{ V}$ $I_C = 8\text{ A}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 1.6\text{ A}$ $L_B = 3\text{ }\mu\text{H}$ $T_C = 125\text{ °C}$			5 0.4	$\mu\text{s}$ $\mu\text{s}$

1. Pulse test: pulse duration  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

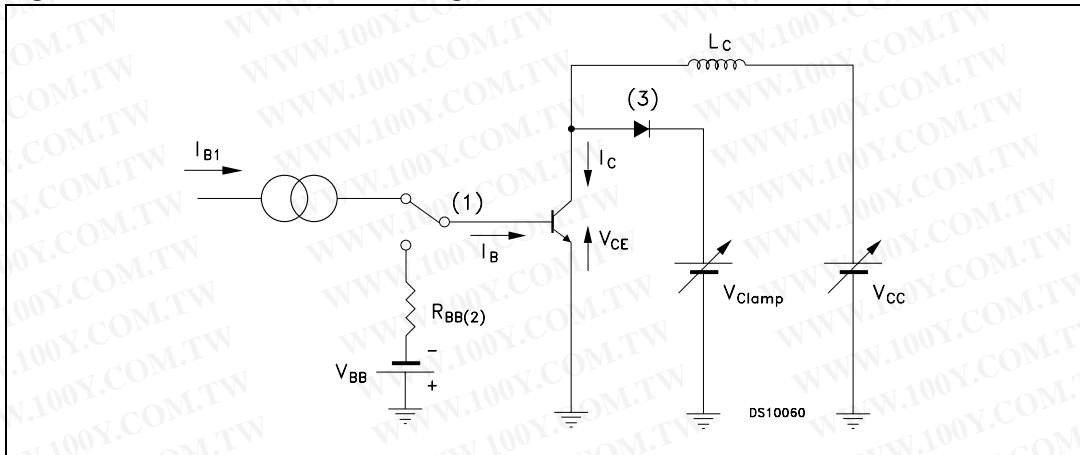
## 2.1 Test circuit

**Figure 2. Resistive load switching test circuit**



1. Fast electronic switch
2. Non-inductive resistor

**Figure 3. Inductive load switching test circuit**



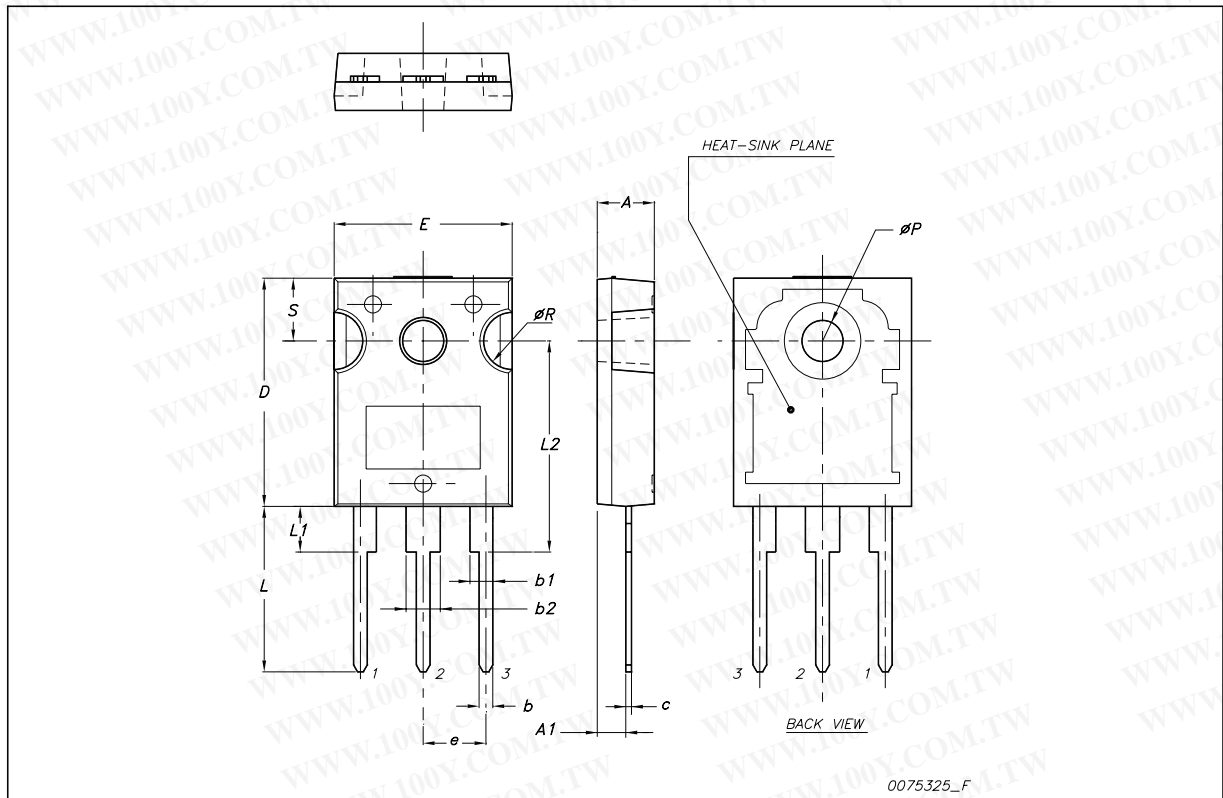
1. Fast electronic switch
2. Non-inductive resistor
3. Fast recovery rectifier

### 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK® is an ST trademark.

**TO-247 mechanical data**

Dim.	mm.		
	Min.	Typ.	Max.
A	4.85		5.15
A1	2.20		2.60
b	1.0		1.40
b1	2.0		2.40
b2	3.0		3.40
c	0.40		0.80
D	19.85		20.15
E	15.45		15.75
e		5.45	
L	14.20		14.80
L1	3.70		4.30
L2		18.50	
øP	3.55		3.65
øR	4.50		5.50
S		5.50	





## 4 Revision history

**Table 5. Document revision history**

Date	Revision	Changes
29-Oct-2007	8	Package change from TO-218 to TO-247.
16-Nov-2009	9	Added $h_{FE}$ specification <a href="#">Table 4 on page 3</a> .

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