

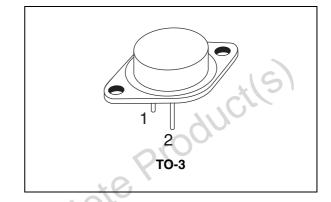
## High voltage fast-switching NPN power transistors

#### **Features**

- NPN transistors
- High voltage capability
- High current capability
- Fast switching speed

#### **Applications**

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



### **Description**

The BUX48 and BUX48A are multi epitaxial mesa NPN transistors mounted in TO-3 metal can. They are intended for switching and industrial applications for single and three-phase mains.

Figure 1. Internal schematic diagram

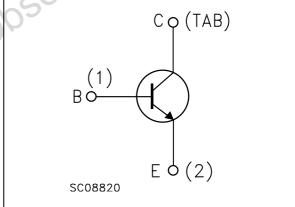


Table 1. Device summary

Order code	Marking	Package	Packaging
BUX48	BUX48	TO-3	trov
BUX48A	BUX48A	TO-3	tray

November 2007 Rev 1 1/9

# 1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Va	Unit	
Syllibol	Farameter	BUX48	BUX48A	Unit
V <sub>CER</sub>	Collector-emitter voltage ( $R_{BE} = 10\Omega$ )	850	1000	V
V <sub>CES</sub>	Collector-emitter voltage (V <sub>BE</sub> = 0)	850	1000	V
V <sub>CEO</sub>	Collector-emitter voltage (I <sub>B</sub> = 0)	400	450	V
V <sub>EBO</sub>	Emitter-base voltage (I <sub>C</sub> = 0)	-	7	CV
I <sub>C</sub>	Collector current	1	5	Α
I <sub>CM</sub>	Collector peak current	3	0	Α
I <sub>CP</sub>	Collector peak current non repetitive (t <sub>p</sub> < 20 µs)	5	5	Α
Ι <sub>Β</sub>	Base current	4	1	Α
I <sub>BM</sub>	Base peak current non repetitive (t <sub>p</sub> < 20 µs)	2	0	Α
P <sub>TOT</sub>	Total dissipation at T <sub>c</sub> = 25 °C 175		W	
T <sub>stg</sub>	Storage temperature	-65 to	200	°C
TJ	Max. operating junction temperature	200		°C

Table 3. Thermal data

	Symbol	Paramete	r	Value	Unit
	R <sub>thj-case</sub>	Thermal resistance junction-case	max	1	°C/W
Obsole	ReP	40°			

## 2 Electrical characteristics

(T<sub>case</sub> = 25°C; unless otherwise specified)

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
lone	Collector cut-off current	V <sub>CE</sub> = rated V <sub>CES</sub>			200	μΑ
I <sub>CES</sub>	$(V_{BE} = 0)$	V <sub>CE</sub> = rated V <sub>CES</sub> , T <sub>c</sub> = 125°C			2	mA
I <sub>CER</sub>	Collector cut-off current	V <sub>CE</sub> = rated V <sub>CER</sub>			500	μΑ
'CER	$(R_{BE} = 10\Omega)$	$V_{CE}$ = rated $V_{CER}$ , $T_c$ = 125°C			4	mA
I <sub>EBO</sub>	Emitter cut-off current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 5 V		110	1	mA
	Collector-emitter	I <sub>C</sub> = 200 mA		).		
V <sub>CEO(sus)</sub> <sup>(1)</sup>	sustaining voltage	for BUX48	400			V
	$(I_B = 0)$	for BUX48A	450			V
V <sub>EBO</sub>	Emitter-base voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = 50 mA	7		30	V
		for BUX48				
		$I_C = 10 \text{ A}$ $I_B = 2 \text{ A}$			1.5	V
	Collector-emitter saturation voltage	$I_C = 15 \text{ A}$ $I_B = 4 \text{ A}$			3.5	V
V <sub>CE(sat)</sub> <sup>(1)</sup>		$I_C = 15 \text{ A}$ $I_B = 3 \text{ A}$			5	V
	Saturation Voltage	for BUX48A				
	G.	$I_C = 8 \text{ A}$ $I_B = 1.6 \text{ A}$			1.5	V
	90,	$I_C = 12 \text{ A}$ $I_B = 2.4 \text{ A}$			5	V
01	J -	for BUX48				
V==, , (1)	Base-emitter saturation	$I_C = 10 \text{ A}$ $I_B = 2 \text{ A}$			1.6	V
V <sub>BE(sat)</sub> (1)	voltage	for BUX48A				
		$I_C = 8 \text{ A}$ $I_B = 1.6 \text{ A}$			1.6	V

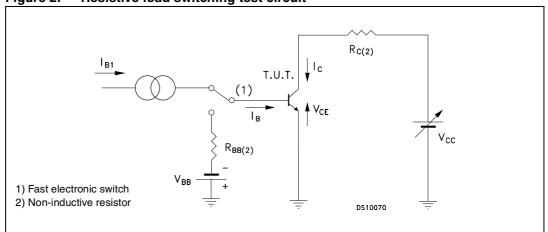
Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
t <sub>on</sub> t <sub>s</sub> t <sub>f</sub>	Resistive load Turn-on time Storage time Fall time	for <b>BUX48</b> $V_{CC} = 150 \text{ V} \qquad I_{C} = 10 \text{ A}$ $I_{B1} = -I_{B2} = 2 \text{ A}$ for <b>BUX48A</b> $V_{CC} = 150 \text{ V} \qquad I_{C} = 8 \text{ A}$ $I_{B1} = -I_{B2} = 1.6 \text{ A}$			1 3 0.8	he he
t <sub>s</sub>	Inductive load Storage time Fall time	for <b>BUX48</b> $V_{CC} = 300 \text{ V}$ $I_{C} = 10 \text{ A}$ $V_{BE} = -5 \text{ V}$ $I_{B1} = 2 \text{ A}$ $I_{B} = 3 \mu\text{H}$		2.7 0.16	*(6	µs µs
t <sub>s</sub>	Inductive load Storage time Fall time	for <b>BUX48</b> $V_{CC} = 300 \text{ V}$ $I_{C} = 10 \text{ A}$ $V_{BE} = -5 \text{ V}$ $I_{B1} = 2 \text{ A}$ $I_{C} = 125 ^{\circ}\text{C}$	(00		5 0.4	ps hs
t <sub>s</sub>	Inductive load Storage time Fall time	for <b>BUX48A</b> $V_{CC} = 300 \text{ V}$ $I_{C} = 8 \text{ A}$ $V_{BE} = -5 \text{ V}$ $I_{B1} = 1.6 \text{ A}$ $I_{B} = 3 \mu\text{H}$		3 0.13		µs µs
t <sub>s</sub>	Inductive load Storage time Fall time	for <b>BUX48A</b> $V_{CC} = 300 \text{ V}$ $I_{C} = 8 \text{ A}$ $V_{BE} = -5 \text{ V}$ $I_{B1} = 1.6 \text{ A}$ $I_{C} = 125 \text{ °C}$			5 0.4	µs µs

<sup>1.</sup> Pulsed duration = 300 ms, duty cycle **2**%.

## 2.1 Test circuits

Figure 2. Resistive load switching test circuit



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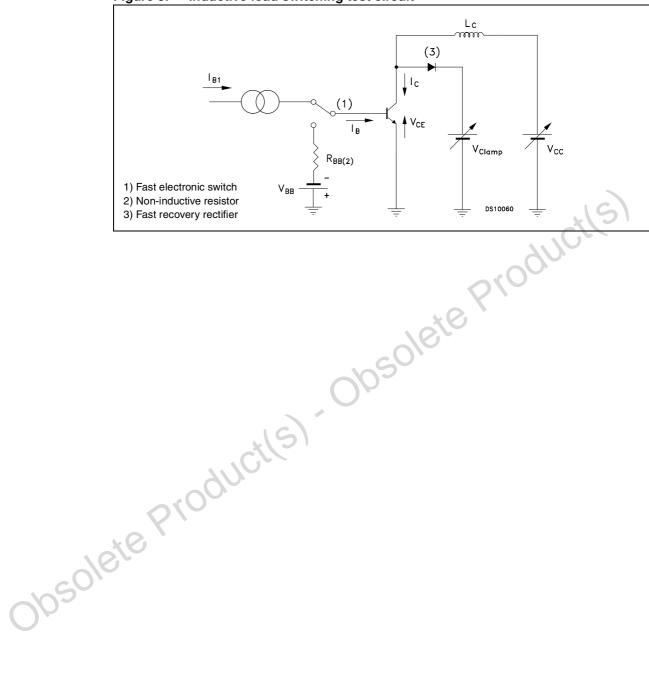


Figure 3. Inductive load switching test circuit

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## 3 Package mechanical data

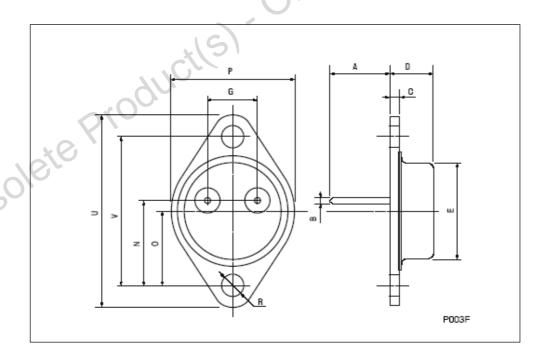
In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

Obsolete Product(s).

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#### TO-3 mechanical data

DIM.		mm.	
DIW.	min.	typ	max.
Α	11.00		13.10
В	0.97		1.15
С	1.50		1.65
D	8.32		8.92
E	19.00		20.00
G	10.70		11.10
N	16.50		17.20
Р	25.00		26.00
R	4.00	10	4.09
U	38.50	c0/0	39.30
V	30.00	003	30.30



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Revision history BUX48 BUX48A

# 4 Revision history

Table 5. Document revision history

Date	Revision	Changes
13-Nov-2007	1	Initial Release

Obsolete Product(s). Obsolete Product(s)

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