

## 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.

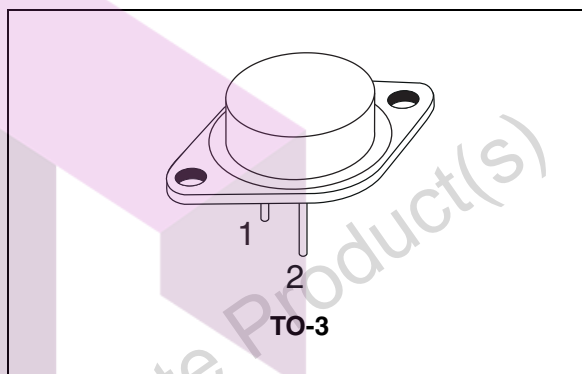


Figure 1. Internal schematic diagram

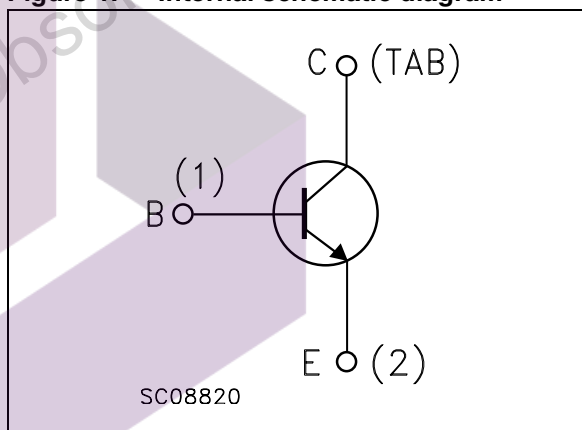


Table 1. Device summary

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

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# 1 Absolute maximum ratings

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value		Unit
		BUX48	BUX48A	Unit
$V_{CER}$	Collector-emitter voltage ( $R_{BE} = 10\Omega$ )	850	1000	V
$V_{CES}$	Collector-emitter voltage ( $V_{BE} = 0$ )	850	1000	V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	400	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 non repetitive ( $t_p < 20 \mu s$ )	20		A
$P_{TOT}$	Total dissipation at $T_C = 25^\circ C$	175		W
$T_{stg}$	Storage temperature	-65 to 200		$^\circ C$
$T_J$	Max. operating junction temperature	200		$^\circ C$

**Table 3. Thermal data**

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

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## 2 Electrical characteristics

( $T_{\text{case}} = 25^{\circ}\text{C}$ ; unless otherwise specified)

**Table 4. Electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{\text{CES}}$	Collector cut-off current ( $V_{\text{BE}} = 0$ )	$V_{\text{CE}} = \text{rated } V_{\text{CES}}$ $V_{\text{CE}} = \text{rated } V_{\text{CES}}, T_{\text{c}} = 125^{\circ}\text{C}$			200 2	$\mu\text{A}$ mA
$I_{\text{CER}}$	Collector cut-off current ( $R_{\text{BE}} = 10\Omega$ )	$V_{\text{CE}} = \text{rated } V_{\text{CER}}$ $V_{\text{CE}} = \text{rated } V_{\text{CER}}, T_{\text{c}} = 125^{\circ}\text{C}$			500 4	$\mu\text{A}$ mA
$I_{\text{EBO}}$	Emitter cut-off current ( $I_{\text{C}} = 0$ )	$V_{\text{EB}} = 5 \text{ V}$			1	mA
$V_{\text{CEO(sus)}}^{(1)}$	Collector-emitter sustaining voltage ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = 200 \text{ mA}$ for <b>BUX48</b> for <b>BUX48A</b>	400 450			V V
$V_{\text{EBO}}$	Emitter-base voltage ( $I_{\text{C}} = 0$ )	$I_{\text{E}} = 50 \text{ mA}$	7		30	V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	for <b>BUX48</b> $I_{\text{C}} = 10 \text{ A}$ $I_{\text{B}} = 2 \text{ A}$ $I_{\text{C}} = 15 \text{ A}$ $I_{\text{B}} = 4 \text{ A}$ $I_{\text{C}} = 15 \text{ A}$ $I_{\text{B}} = 3 \text{ A}$ for <b>BUX48A</b> $I_{\text{C}} = 8 \text{ A}$ $I_{\text{B}} = 1.6 \text{ A}$ $I_{\text{C}} = 12 \text{ A}$ $I_{\text{B}} = 2.4 \text{ A}$			1.5 3.5 5 1.5 5	V V V V V
$V_{\text{BE(sat)}}^{(1)}$	Base-emitter saturation voltage	for <b>BUX48</b> $I_{\text{C}} = 10 \text{ A}$ $I_{\text{B}} = 2 \text{ A}$ for <b>BUX48A</b> $I_{\text{C}} = 8 \text{ A}$ $I_{\text{B}} = 1.6 \text{ A}$			1.6 1.6	V V

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Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$t_{on}$ $t_s$ $t_f$	Resistive load Turn-on time Storage time Fall time	for <b>BUX48</b> $V_{CC} = 150\text{ V}$ $I_C = 10\text{ A}$ $I_{B1} = -I_{B2} = 2\text{ A}$ for <b>BUX48A</b> $V_{CC} = 150\text{ V}$ $I_C = 8\text{ A}$ $I_{B1} = -I_{B2} = 1.6\text{ A}$			1 3 0.8	$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
$t_s$ $t_f$	Inductive load Storage time Fall time	for <b>BUX48</b> $V_{CC} = 300\text{ V}$ $I_C = 10\text{ A}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 2\text{ A}$ $L_B = 3\text{ }\mu\text{H}$		2.7 0.16		$\mu\text{s}$ $\mu\text{s}$
$t_s$ $t_f$	Inductive load Storage time Fall time	for <b>BUX48</b> $V_{CC} = 300\text{ V}$ $I_C = 10\text{ A}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 2\text{ A}$ $L_B = 3\text{ }\mu\text{H}$ $T_C = 125\text{ }^\circ\text{C}$			5 0.4	$\mu\text{s}$ $\mu\text{s}$
$t_s$ $t_f$	Inductive load Storage time Fall time	for <b>BUX48A</b> $V_{CC} = 300\text{ V}$ $I_C = 8\text{ A}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 1.6\text{ A}$ $L_B = 3\text{ }\mu\text{H}$		3 0.13		$\mu\text{s}$ $\mu\text{s}$
$t_s$ $t_f$	Inductive load Storage time Fall time	for <b>BUX48A</b> $V_{CC} = 300\text{ V}$ $I_C = 8\text{ A}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 1.6\text{ A}$ $L_B = 3\text{ }\mu\text{H}$ $T_C = 125\text{ }^\circ\text{C}$			5 0.4	$\mu\text{s}$ $\mu\text{s}$

1. Pulsed duration = 300 ms, duty cycle  $\leq 2\%$ .

## 2.1 Test circuits

Figure 2. Resistive load switching test circuit

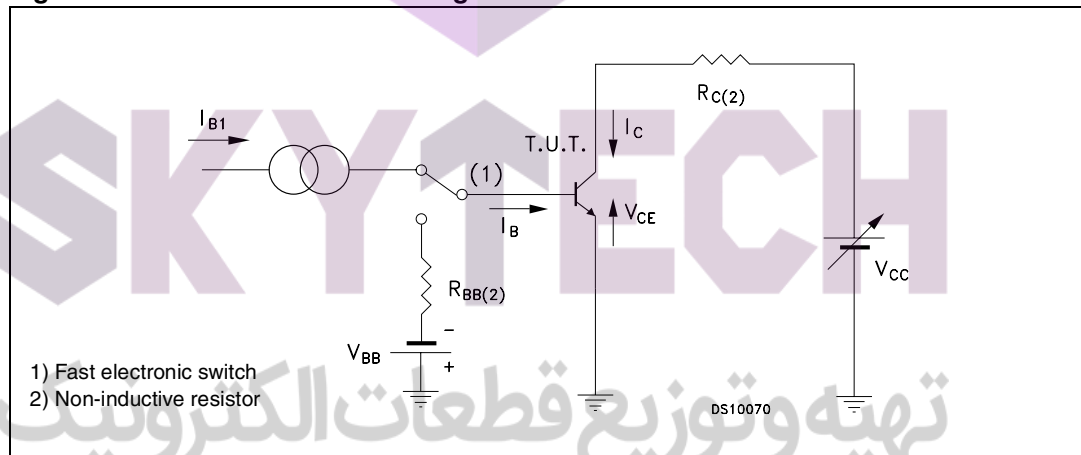
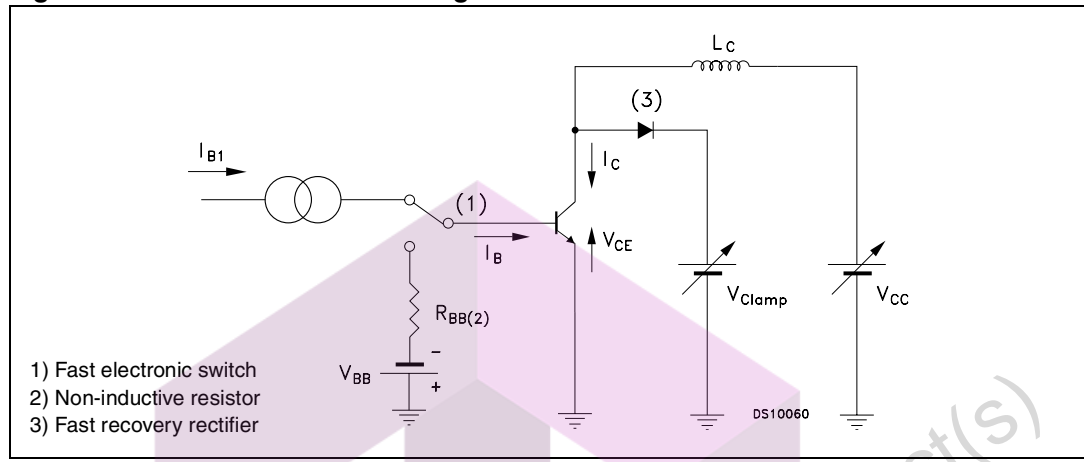


Figure 3. Inductive load switching test circuit



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### 3 Package mechanical data

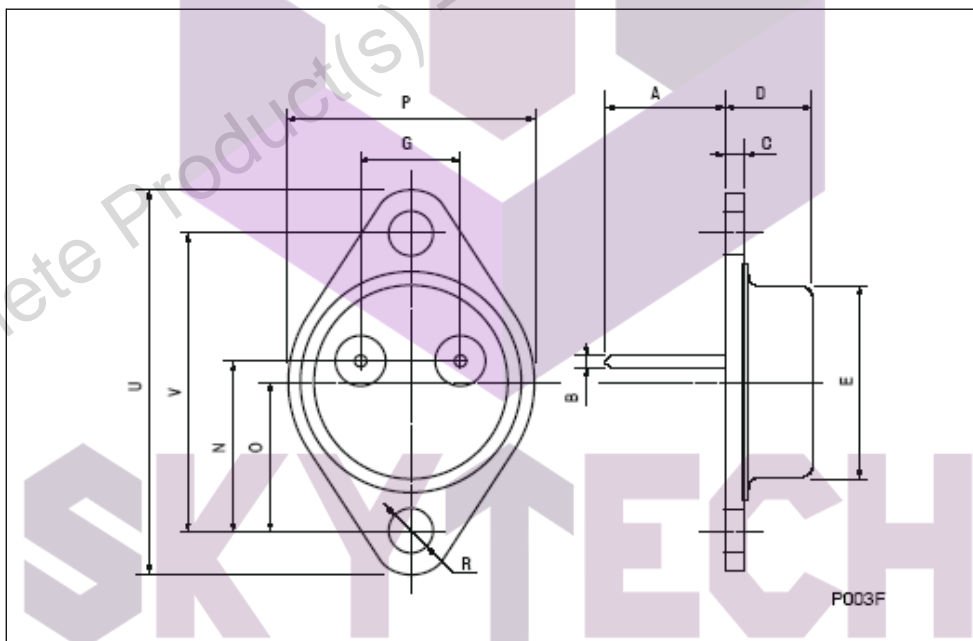
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TO-3 mechanical data			
DIM.	mm.		
	min.	typ	max.
A	11.00		13.10
B	0.97		1.15
C	1.50		1.65
D	8.32		8.92
E	19.00		20.00
G	10.70		11.10
N	16.50		17.20
P	25.00		26.00
R	4.00		4.09
U	38.50		39.30
V	30.00		30.30



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## 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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