BUX48
BUX48A

High voltage fast-switching NPN power transistors

Features

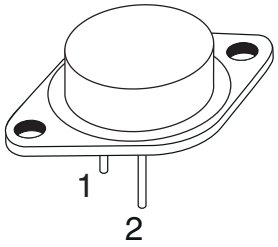
- NPN transistors
- High voltage capability
- High current capability
- Fast switching speed

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.



TO-3

Figure 1. Internal schematic diagram

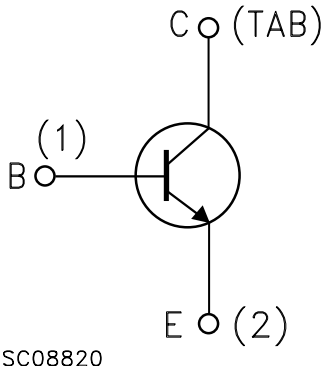


Table 1. Device summary

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

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value		Unit
		BUX48	BUX48A	Unit
V_{CER}	Collector-emitter voltage (R_{BE} = 10Ω)	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 µs)	55		A
I_B	Base current	4		A
I_{BM}	Base peak current non repetitive (t_p < 20 µs)	20		A
P_{TOT}	Total dissipation at T_c = 25 °C	175		W
T_{stg}	Storage temperature	-65 to 200		°C
T_J	Max. operating junction temperature	200		°C

Table 3. Thermal data

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

2 Electrical characteristics

(T_{case} = 25°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} = rated V_{CES} V_{CE} = rated V_{CES}, T_c = 125°C			200 2	µA mA
I_{CER}	Collector cut-off current (R_{BE} = 10Ω)	V_{CE} = rated V_{CER} V_{CE} = rated V_{CER}, T_c = 125°C			500 4	µA mA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 5 V			1	mA
$V_{CEO(sus)}$ (1)	Collector-emitter sustaining voltage (I_B = 0)	I_C = 200 mA for **BUX48** for **BUX48A**	 400 450			 V V
V_{EBO}	Emitter-base voltage (I_C = 0)	I_E = 50 mA	7		30	V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	for **BUX48** I_C = 10 A I_B = 2 A I_C = 15 A I_B = 4 A I_C = 15 A I_B = 3 A for **BUX48A** I_C = 8 A I_B = 1.6 A I_C = 12 A I_B = 2.4 A			 1.5 3.5 5 1.5 5	 V V V V V
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	for **BUX48** I_C = 10 A I_B = 2 A for **BUX48A** I_C = 8 A I_B = 1.6 A			 1.6 1.6	 V V

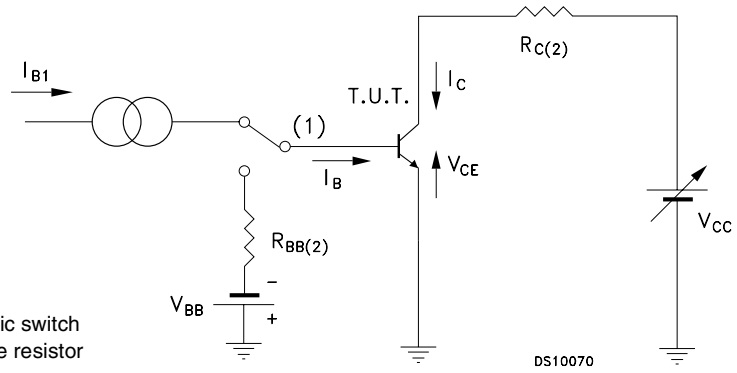
Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
t_{on} t_s t_f	Resistive load Turn-on time Storage time Fall time	for **BUX48** V_{CC} = 150 V I_C = 10 A I_{B1} = -I_{B2} = 2 A for **BUX48A** V_{CC} = 150 V I_C = 8 A I_{B1} = -I_{B2} = 1.6 A			1 3 0.8	µs µs µs
t_s t_f	Inductive load Storage time Fall time	for **BUX48** V_{CC} = 300 V I_C = 10 A V_{BE} = -5 V I_{B1} = 2 A L_B = 3 µH		2.7 0.16		µs µs
t_s t_f	Inductive load Storage time Fall time	for **BUX48** V_{CC} = 300 V I_C = 10 A V_{BE} = -5 V I_{B1} = 2 A L_B = 3 µH T_C = 125 °C			5 0.4	µs µs
t_s t_f	Inductive load Storage time Fall time	for **BUX48A** V_{CC} = 300 V I_C = 8 A V_{BE} = -5 V I_{B1} = 1.6 A L_B = 3 µH		3 0.13		µs µs
t_s t_f	Inductive load Storage time Fall time	for **BUX48A** V_{CC} = 300 V I_C = 8 A V_{BE} = -5 V I_{B1} = 1.6 A L_B = 3 µH T_C = 125 °C			5 0.4	µs µs

1. Pulsed duration = 300 ms, duty cycle ≤2%.

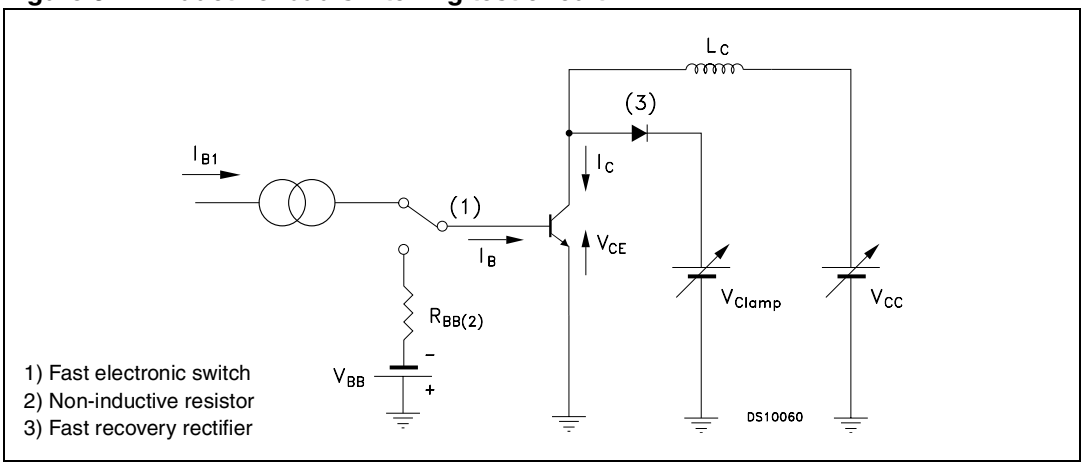
2.1 Test circuits

Figure 2. Resistive load switching test circuit



1) Fast electronic switch
2) Non-inductive resistor

Figure 3. Inductive load switching test circuit

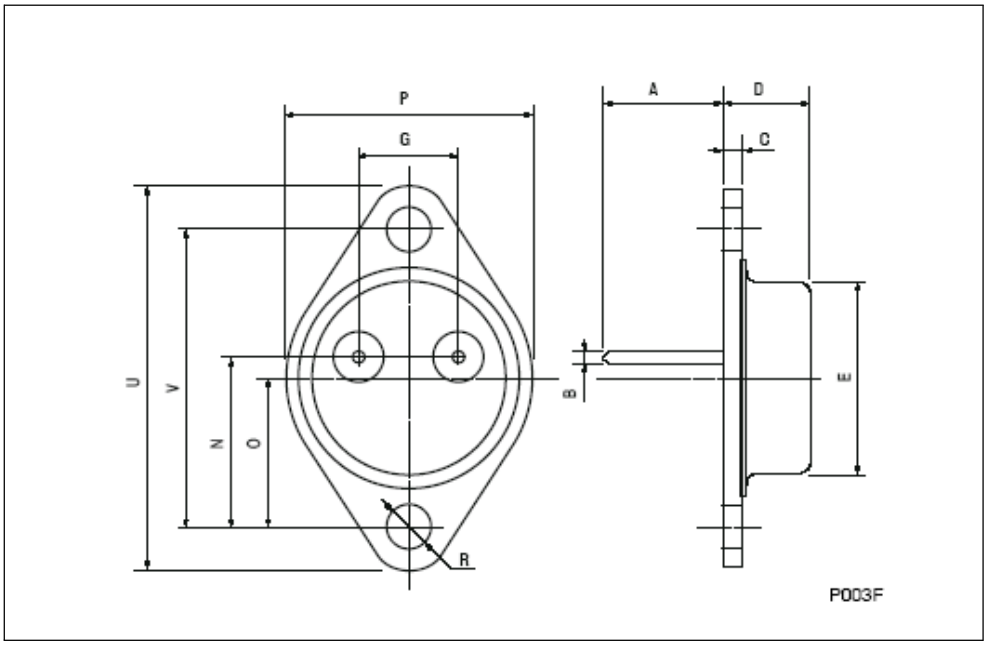


3 Package mechanical data

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

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



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
13-Nov-2007	1	Initial Release

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