

High voltage fast switching NPN power transistor

Features

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

Applications

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

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.

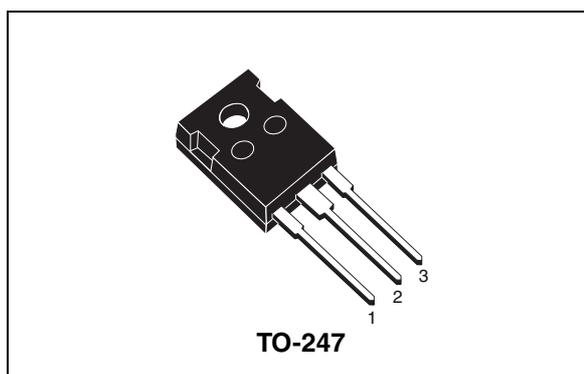


Figure 1. Internal schematic diagram

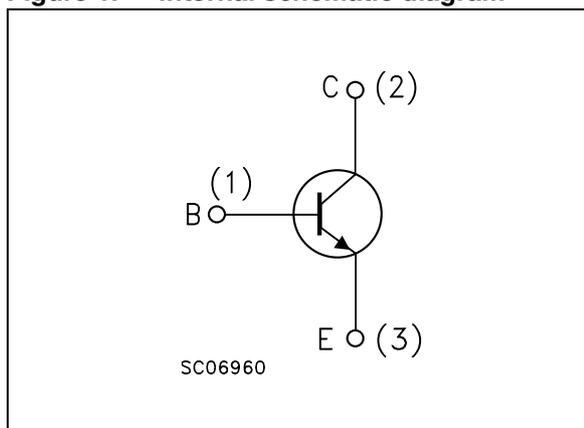


Table 1. Device summary

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 $T_{case} = 25^\circ C$	125	W
T_{stg}	Storage temperature	-65 to 150	$^\circ C$
T_J	Max. operating junction temperature	150	$^\circ C$

Table 3. Thermal data

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

2 Electrical characteristics

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

Table 4. Electrical characteristics

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

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

2.1 Test circuit

Figure 2. Resistive load switching test circuit

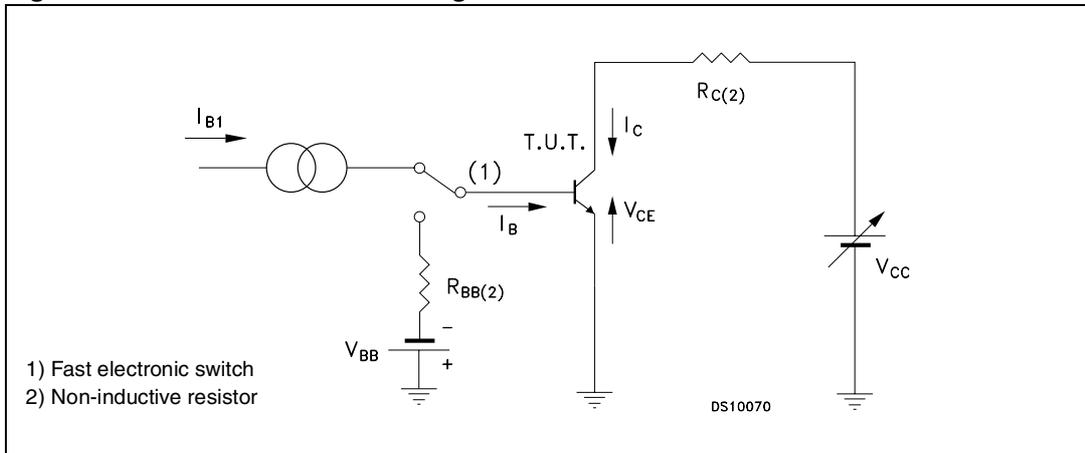
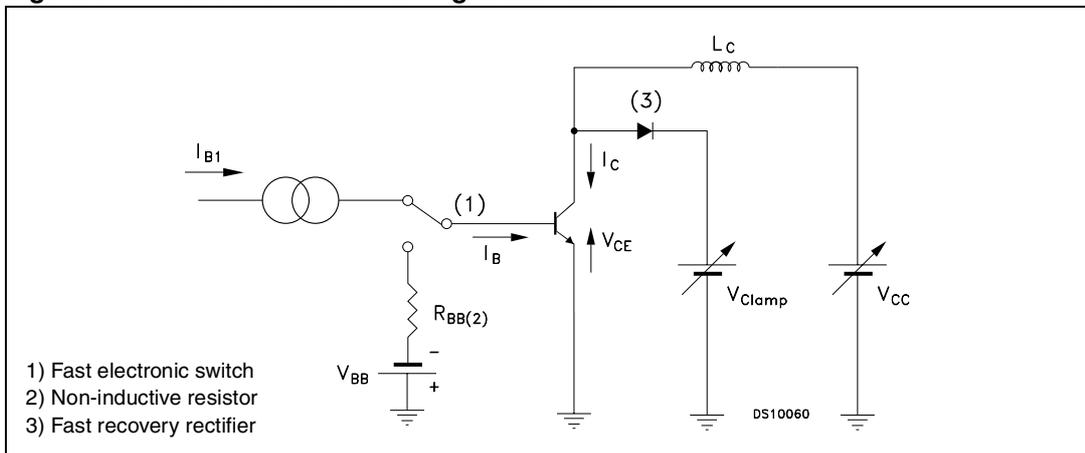


Figure 3. Inductive load switching test circuit

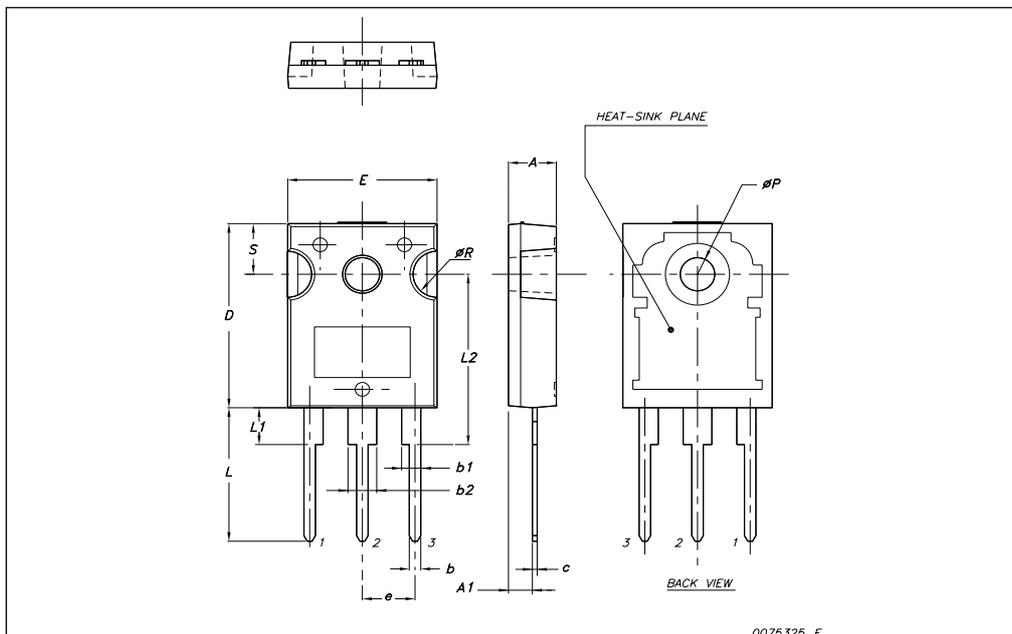


3 Package mechanical data

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-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
02-Jan-2000	7	
29-Oct-2007	8	Package change from TO-218 to TO-247.

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