



# BUT70W

## HIGH POWER NPN TRANSISTOR

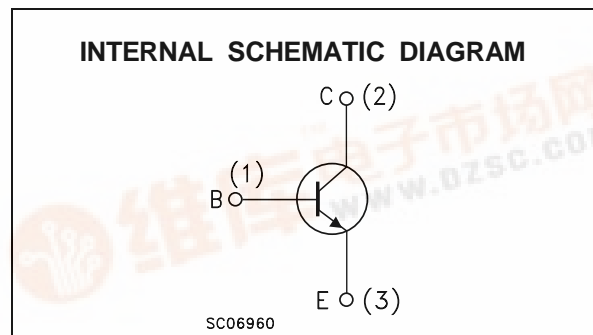
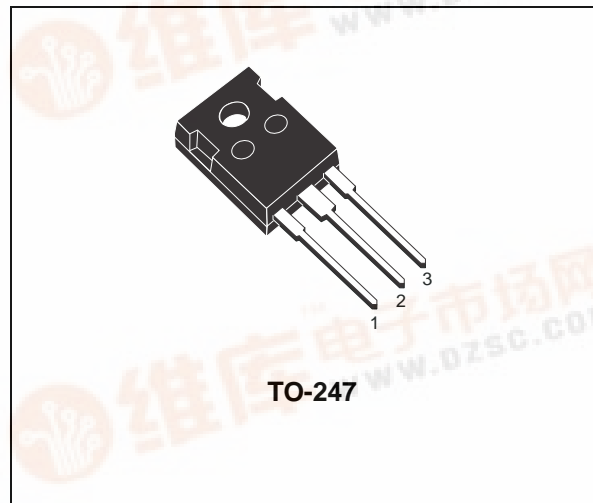
- STMicroelectronics PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH CURRENT CAPABILITY
- FAST SWITCHING SPEED
- VERY LOW SATURATION VOLTAGE AND HIGH GAIN

### APPLICATION

- SWITCHING REGULATORS
- MOTOR CONTROL
- HIGH FREQUENCY AND EFFICENCY CONVERTERS

### DESCRIPTION

The BUT70W is a Multiepitaxial planar NPN transistor in TO-247 package. It's intended for use in high frequency and efficiency converters such us motor controllers and industrial equipment.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CEV}$	Collector-emitter Voltage ( $V_{BE} = -1.5V$ )	200	V
$V_{CEO}$	Collector-emitter Voltage ( $I_B = 0$ )	125	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	7	V
$I_{E(RMS)}$	Emitter Current	40	A
$I_{EM}$	Emitter Peak Current	120	A
$I_B$	Base Current	8	A
$I_{BM}$	Base Peak Current	24	A
$P_{tot}$	Total Power Dissipation at $T_{case} < 25\text{ }^\circ\text{C}$	200	W
$T_{stg}$	Storage Temperature	-65 to 150	$^\circ\text{C}$
$T_j$	Max Operating Junction Temperature	150	$^\circ\text{C}$

## BUT70W

### THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	Max	0.63	$^{\circ}C/W$
----------------	----------------------------------	-----	------	---------------

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CER}$	Collector Cut-off Current ( $R_{BE} = 5\Omega$ )	$V_{CE} = 200 V$			1	mA
		$V_{CE} = 200 V$ $T_C = 100^{\circ}C$			5	mA
$I_{CEV}$	Collector Cut-off Current ( $V_{BE} = -1.5V$ )	$V_{CE} = 200 V$			1	mA
		$V_{CE} = 200 V$ $T_C = 100^{\circ}C$			4	mA
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 5 V$			1	mA
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 0.2 A$ $L = 25 mH$	125			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_C = 0$ )	$I_E = 50 mA$	7			V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 70 A$ $I_B = 7 A$			0.9	V
		$I_C = 70 A$ $I_B = 7 A$ $T_C = 100^{\circ}C$			1.5	V
		$I_C = 35 A$ $I_B = 1.75 A$			0.9	V
		$I_C = 35 A$ $I_B = 1.75 A$ $T_C = 100^{\circ}C$			1.2	V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = 70 A$ $I_B = 7 A$			1.8	V
		$I_C = 70 A$ $I_B = 7 A$ $T_C = 100^{\circ}C$			1.9	V
		$I_C = 35 A$ $I_B = 1.75 A$			1.4	V
		$I_C = 35 A$ $I_B = 1.75 A$ $T_C = 100^{\circ}C$			1.4	V
$di_c/dt^*$	Rated of Rise of on-state Collector Current	$V_{CC} = 100 V$ $R_C = 0$ $I_{B1} = 3.5 A$ $t_p = 3 \mu s$ $T_C = 100^{\circ}C$	140			A/ $\mu s$

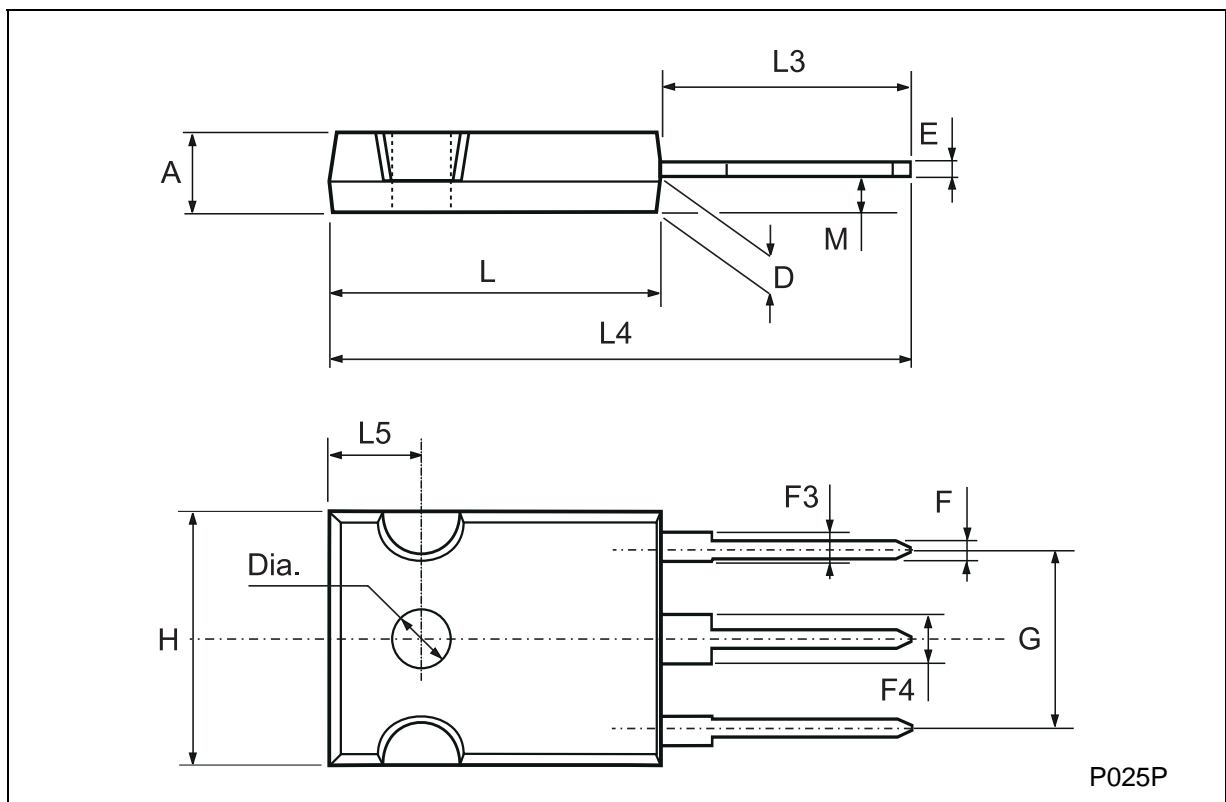
\* Pulsed: Pulse duration = 300  $\mu s$ , duty cycle < 2 %

### INDUCTIVE LOAD

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_s$	Storage Time	$I_C = 35 A$ $V_{CC} = 90 V$			1.8	$\mu s$
$t_f$	Fall Time	$V_{BB} = -5 V$ $R_{B2} = 1.4 \Omega$			0.2	$\mu s$
$t_c$	Cross Over Time	$I_{B1} = 1.75 A$ $L_C = 0.15 mH$ $V_{CLAMP} = 125V$ $T_C = 100^{\circ}C$			0.35	$\mu s$

**TO-247 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.7		5.3	0.185		0.209
D	2.2		2.6	0.087		0.102
E	0.4		0.8	0.016		0.031
F	1		1.4	0.039		0.055
F3	2		2.4	0.079		0.094
F4	3		3.4	0.118		0.134
G		10.9			0.429	
H	15.3		15.9	0.602		0.626
L	19.7		20.3	0.776		0.779
L3	14.2		14.8	0.559		0.582
L4		34.6			1.362	
L5		5.5			0.217	
M	2		3	0.079		0.118



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a trademark of STMicroelectronics

© 2002 STMicroelectronics – Printed in Italy – All Rights Reserved  
STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco -  
Singapore - Spain - Sweden - Switzerland - United Kingdom - United States.

<http://www.st.com>