



**BUT70W**

## HIGH POWER NPN TRANSISTOR

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

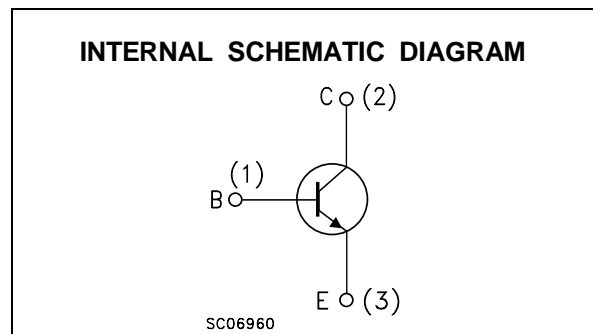
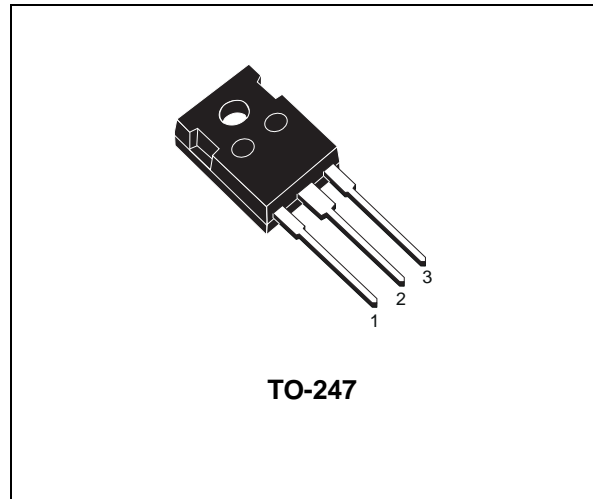
### APPLICATION

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

### DESCRIPTION

The BUT70W is a Multiepitaxial planar NPN transistor in TO-247 plastic package.

It's intended for use in high frequency and efficiency converters such as 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 <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	0.63	°C/W
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### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CEr</sub>	Collector Cut-off Current (R <sub>BE</sub> = 5Ω)	V <sub>CE</sub> = 200 V			1	mA
		V <sub>CE</sub> = 200 V T <sub>C</sub> = 100°C			5	mA
I <sub>CEV</sub>	Collector Cut-off Current (V <sub>BE</sub> = -1.5V)	V <sub>CE</sub> = 200 V			1	mA
		V <sub>CE</sub> = 200 V T <sub>C</sub> = 100°C			4	mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 5 V			1	mA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 0.2 A L = 25 mH	125			V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = 50 mA	7			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 70 A I <sub>B</sub> = 7 A			0.9	V
		I <sub>C</sub> = 70 A I <sub>B</sub> = 7 A T <sub>C</sub> = 100°C			1.5	V
		I <sub>C</sub> = 35 A I <sub>B</sub> = 1.75 A			0.9	V
		I <sub>C</sub> = 35 A I <sub>B</sub> = 1.75 A T <sub>C</sub> = 100°C			1.2	V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 70 A I <sub>B</sub> = 7 A			1.8	V
		I <sub>C</sub> = 70 A I <sub>B</sub> = 7 A T <sub>C</sub> = 100°C			1.9	V
		I <sub>C</sub> = 35 A I <sub>B</sub> = 1.75 A			1.4	V
		I <sub>C</sub> = 35 A I <sub>B</sub> = 1.75 A T <sub>C</sub> = 100°C			1.4	V
di <sub>c</sub> /dt*	Rated of Rise of on-state Collector Current	V <sub>CC</sub> = 100 V R <sub>C</sub> = 0 I <sub>B1</sub> = 3.5 A t <sub>p</sub> = 3 μs T <sub>C</sub> = 100°C	140			A/μs

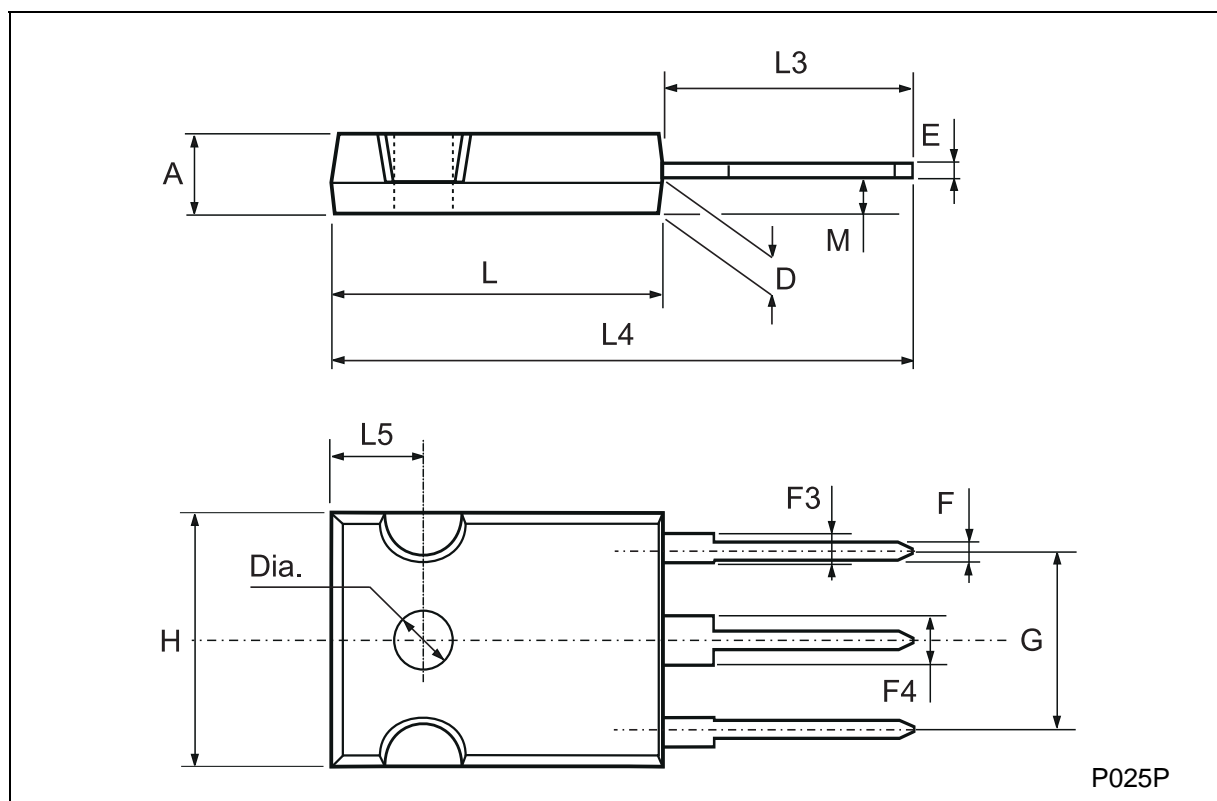
\* Pulsed: Pulse duration = 300 μs, duty cycle < 2 %

### INDUCTIVE LOAD

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t <sub>s</sub>	Storage Time	I <sub>C</sub> = 35 A V <sub>CC</sub> = 90 V			1.8	μs
t <sub>f</sub>	Fall Time	V <sub>BB</sub> = -5 V R <sub>B2</sub> = 1.4 Ω			0.2	μs
t <sub>c</sub>	Cross Over Time	I <sub>B1</sub> = 1.75 A L <sub>C</sub> = 0.15 mH V <sub>CLAMP</sub> = 125V T <sub>C</sub> = 100°C			0.35	μs

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



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