

## HIGH POWER NPN SILICON TRANSISTOR

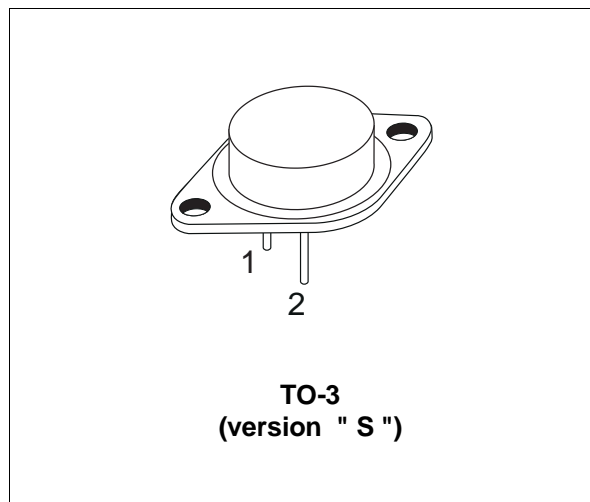
- SGS-THOMSON PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH CURRENT CAPABILITY
- FAST SWITCHING SPEED
- HIGH RUGGEDNESS

### APPLICATION

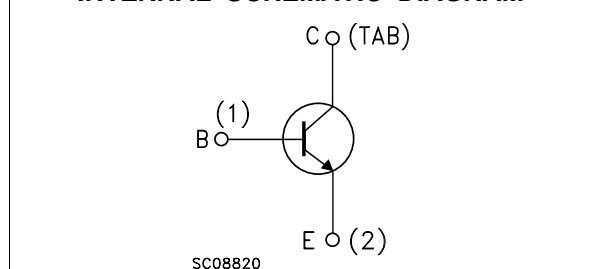
- MOTOR CONTROL
- UNINTERRUPTABLE POWER SUPPLY

### DESCRIPTION

The BUT100 is a Multiepitaxial Planar NPN Transistor in TO-3 package. It is intended for use in high frequency and efficiency converters, switching regulators and motor control.



### INTERNAL SCHEMATIC DIAGRAM



### 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
$I_E$	Emitter Current	50	A
$I_{EM}$	Emitter Peak Current	150	A
$I_B$	Base Current	10	A
$I_{BM}$	Base Peak Current	30	A
$P_{tot}$	Total Dissipation at $T_c < 25^\circ C$	300	W
$T_{stg}$	Storage Temperature	-65 to 200	$^\circ C$
$T_j$	Max. Operating Junction Temperature	200	$^\circ C$

# BUT100

## THERMAL DATA

R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	0.58	°C/W
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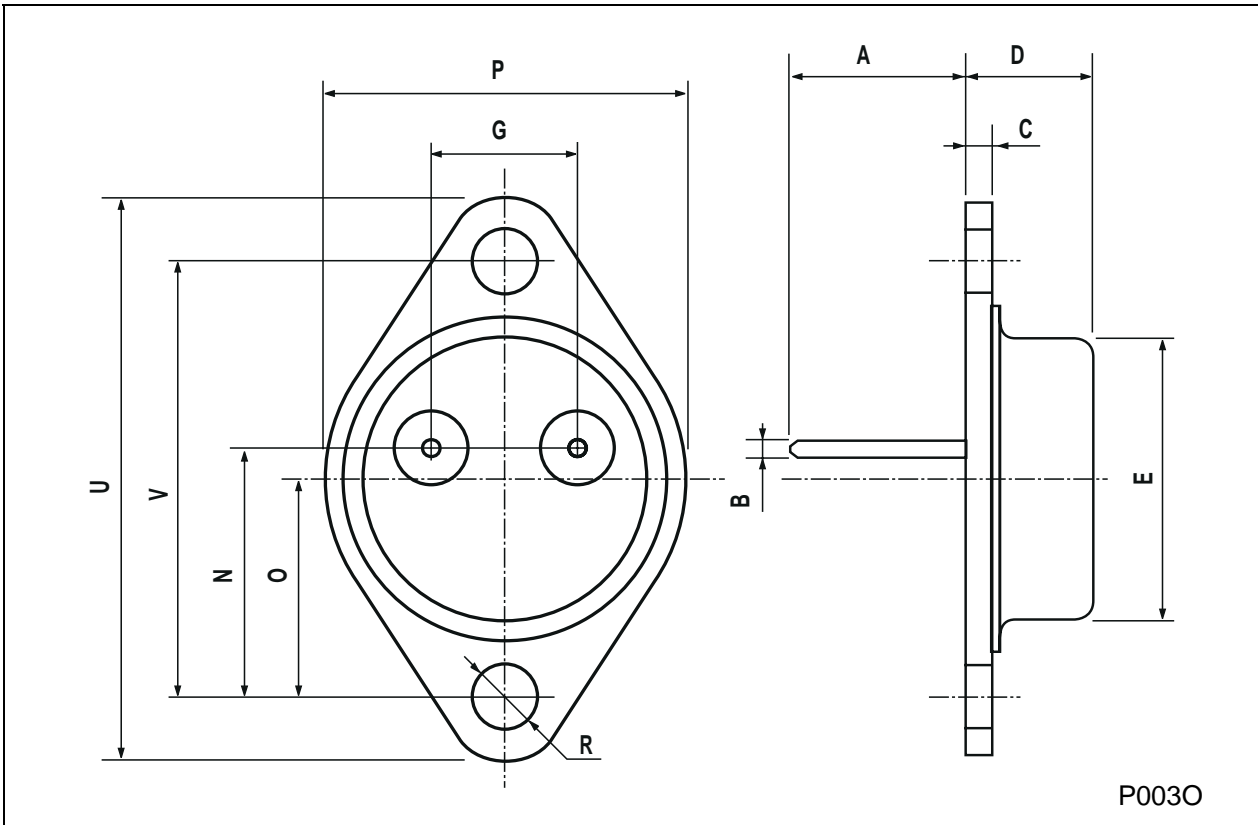
## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

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> = V <sub>CEV</sub> V <sub>CE</sub> = V <sub>CEV</sub> T <sub>C</sub> = 100°C			1 5	mA mA
I <sub>CEV</sub>	Collector Cut-off Current	V <sub>CE</sub> = V <sub>CEV</sub> V <sub>BE</sub> = -1.5V V <sub>CE</sub> = V <sub>CEV</sub> V <sub>BE</sub> = -1.5V T <sub>C</sub> = 100°C			1 4	mA 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>C</sub> = 0.2 A L = 25mH	125			V
V <sub>EBO</sub>	Emitter-Base Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = 50mA	7			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 50A I <sub>B</sub> = 2.5A I <sub>C</sub> = 100A I <sub>B</sub> = 10A I <sub>C</sub> = 50A I <sub>B</sub> = 2.5A T <sub>j</sub> = 100°C I <sub>C</sub> = 100A I <sub>B</sub> = 10A T <sub>j</sub> = 100°C			0.9 0.9 1.2 1.5	V V V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 50A I <sub>B</sub> = 2.5A I <sub>C</sub> = 100A I <sub>B</sub> = 10A I <sub>C</sub> = 50A I <sub>B</sub> = 2.5A T <sub>j</sub> = 100°C I <sub>C</sub> = 100A I <sub>B</sub> = 10A T <sub>j</sub> = 100°C			1.4 2 1.4 2.1	V V V V
di <sub>C</sub> /dt	Rate of Rise of on-state Collector Current	V <sub>CC</sub> = 100V R <sub>C</sub> = 0 I <sub>B1</sub> = 5A T <sub>p</sub> = 3μs T <sub>j</sub> = 100°C	180			A/μs
t <sub>s</sub> t <sub>f</sub> t <sub>c</sub>	INDUCTIVE LOAD Storage time Fall Time Crossover Time	V <sub>CC</sub> = 90V V <sub>clamp</sub> = 125 V I <sub>C</sub> = 50A I <sub>B1</sub> = 2.5A V <sub>BB</sub> = - 5V L <sub>C</sub> = 80μH R <sub>B2</sub> = 1 Ω T <sub>j</sub> = 100°C			2 0.2 0.35	μs μs μs
V <sub>CEW</sub>	Maximum Collector Emitter Voltage without Snubber	V <sub>CC</sub> = 90V I <sub>CWoff</sub> = 150A V <sub>BB</sub> = - 5V I <sub>B1</sub> = 10A L <sub>C</sub> = 30μH R <sub>B2</sub> = 1Ω T <sub>j</sub> = 125°C	125			V

\* Pulsed: Pulse duration = 3μs, duty cycle = 2 %

**TO-3 (version S) MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	11.00		13.10	0.433		0.516
B	1.47		1.60	0.058		0.063
C	1.50		1.65	0.059		0.065
D	8.32		8.92	0.327		0.351
E	19.00		20.00	0.748		0.787
G	10.70		11.10	0.421		0.437
N	16.50		17.20	0.649		0.677
P	25.00		26.00	0.984		1.023
R	4.00		4.09	0.157		0.161
U	38.50		39.30	1.515		1.547
V	30.00		30.30	1.187		1.193



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