

## HIGH POWER NPN SILICON TRANSISTOR

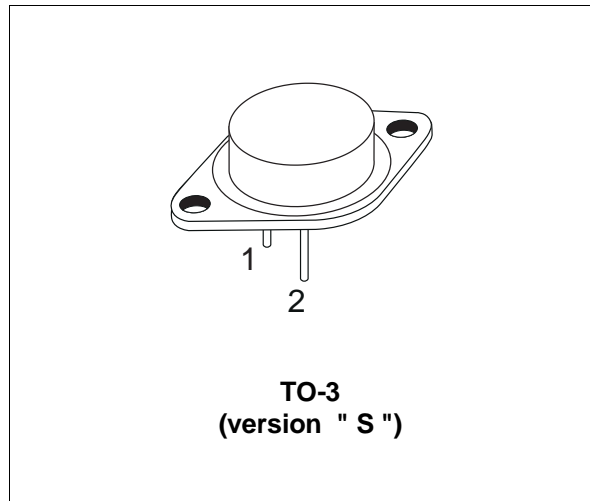
- SGS-THOMSON PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH CURRENT CAPABILITY
- FAST SWITCHING SPEED
- HIGH RUGGEDNESS

### APPLICATION

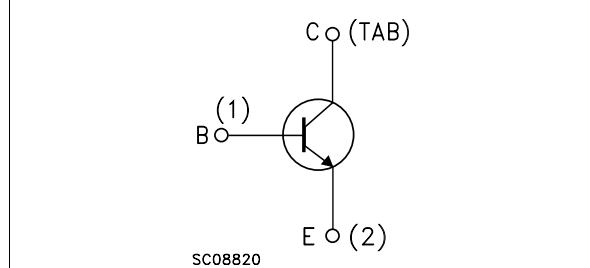
- MOTOR CONTROL
- UNINTERRUPTABLE POWER SUPPLY

### 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

$R_{thj-case}$	Thermal Resistance Junction-case	Max	0.58	$^{\circ}C/W$
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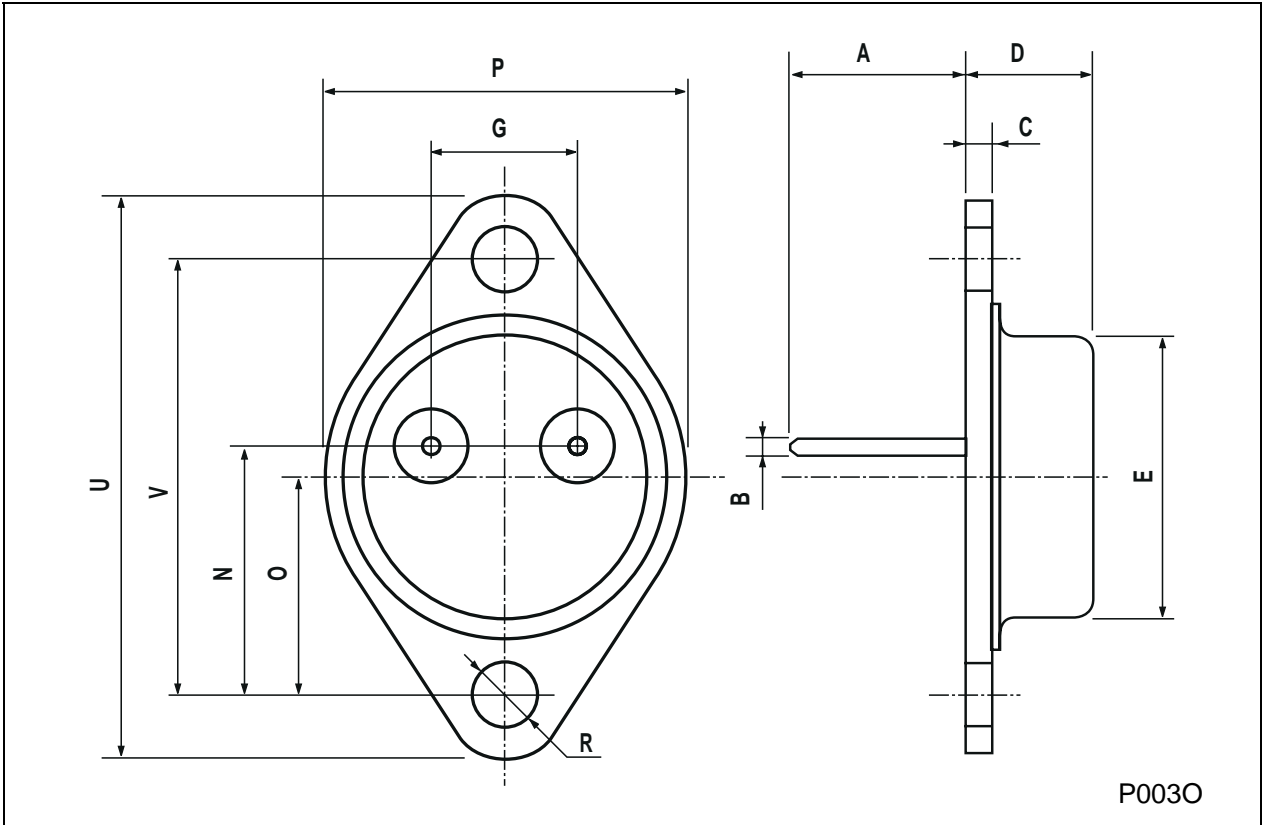
## ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CER}$	Collector Cut-off Current ( $R_{BE} = 5\Omega$ )	$V_{CE} = V_{CEV}$ $V_{CE} = V_{CEV} \quad T_C = 100^{\circ}C$			1 5	mA mA
$I_{CEV}$	Collector Cut-off Current	$V_{CE} = V_{CEV} \quad V_{BE} = -1.5V$ $V_{CE} = V_{CEV} \quad V_{BE} = -1.5V \quad T_C = 100^{\circ}C$			1 4	mA mA
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 5V$			1	mA
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage	$I_C = 0.2A$ $L = 25mH$	125			V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	$I_E = 50mA$	7			V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 50A \quad I_B = 2.5A$ $I_C = 100A \quad I_B = 10A$ $I_C = 50A \quad I_B = 2.5A \quad T_j = 100^{\circ}C$ $I_C = 100A \quad I_B = 10A \quad T_j = 100^{\circ}C$			0.9 0.9 1.2 1.5	V V V V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = 50A \quad I_B = 2.5A$ $I_C = 100A \quad I_B = 10A$ $I_C = 50A \quad I_B = 2.5A \quad T_j = 100^{\circ}C$ $I_C = 100A \quad I_B = 10A \quad T_j = 100^{\circ}C$			1.4 2 1.4 2.1	V V V V
$di_C/dt$	Rate of Rise of on-state Collector Current	$V_{CC} = 100V \quad R_C = 0$ $T_p = 3\mu s$ $I_{B1} = 5A$ $T_j = 100^{\circ}C$	180			A/ $\mu s$
$t_s$ $t_f$ $t_c$	INDUCTIVE LOAD Storage time Fall Time Crossover Time	$V_{CC} = 90V \quad V_{clamp} = 125V$ $I_C = 50A \quad I_{B1} = 2.5A$ $V_{BB} = -5V \quad L_C = 80\mu H$ $R_{B2} = 1\Omega \quad T_j = 100^{\circ}C$			2 0.2 0.35	$\mu s$ $\mu s$ $\mu s$
$V_{CEW}$	Maximum Collector Emitter Voltage without Snubber	$V_{CC} = 90V \quad I_{Cwoff} = 150A$ $V_{BB} = -5V \quad I_{B1} = 10A$ $L_C = 30\mu H \quad R_{B2} = 1\Omega$ $T_j = 125^{\circ}C$	125			V

\* Pulsed: Pulse duration = 3 $\mu s$ , 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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