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## FAST-SWITCHING POWER TRANSISTOR

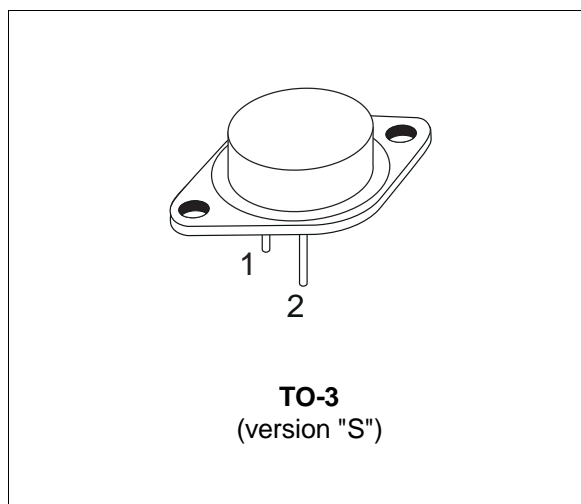
- SGS-THOMSON PREFERRED SALESTYPE
- NPN TRANSISTOR
- $h_{FE} > 10$  AT  $I_C = 35A$
- HIGH EFFICIENCY SWITCHING
- VERY LOW SATURATION VOLTAGE
- RECTANGULAR SAFE OPERATING AREA
- WIDE ACCIDENTAL OVERLOAD AREA

### APPLICATIONS

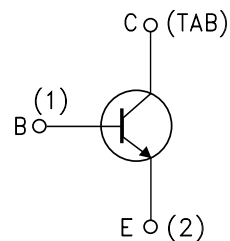
- UNINTERRUPTABLE POWER SUPPLY
- SWITCH MODE POWER SUPPLIES
- MOTOR CONTROL

### DESCRIPTION

The BUT92 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 ( $V_{BE} = -1.5 V$ )	350	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	250	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	7	V
$I_E$	Emitter Current	50	A
$I_{EM}$	Emitter Peak Current	75	A
$I_B$	Base Current	10	A
$I_{BM}$	Base Peak Current	15	A
$P_{tot}$	Total Power Dissipation at $T_{case} \leq 25 ^\circ C$	250	W
$T_{stg}$	Storage Temperature	-65 to 200	$^\circ C$
$T_j$	Junction Temperature	200	$^\circ C$

## BUT92

### THERMAL DATA

R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	0.7	°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> = 10 Ω)	V <sub>CE</sub> = V <sub>CEV</sub> V <sub>CE</sub> = V <sub>CEV</sub> T <sub>c</sub> = 100 °C			0.4 4	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			0.2 2	mA mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 7 V			1	mA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage	I <sub>C</sub> = 0.2 A L = 25 mH	250			V
V <sub>EBO</sub>	Emitter-Base 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> = 35 A I <sub>B</sub> = 3.5 A I <sub>C</sub> = 35 A I <sub>B</sub> = 3.5 A T <sub>j</sub> = 100 °C		0.8 1.25	1.2 1.9	V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 35 A I <sub>B</sub> = 3.5 A I <sub>C</sub> = 35 A I <sub>B</sub> = 3.5 A T <sub>j</sub> = 100 °C		1.2 1.2	1.5 1.5	V V
diC/dt	Rated of Rise on-state Collector Current	V <sub>CC</sub> = 200V I <sub>B1</sub> = 5.25 A R <sub>C</sub> = 0 t <sub>p</sub> = 3μs T <sub>j</sub> = 100 °C	125	200		A/μs
V <sub>CE(3μs)*</sub>	Collector-Emitter Dynamic Voltage	V <sub>CC</sub> = 200V I <sub>B1</sub> = 5.25 A R <sub>C</sub> = 5.7 Ω T <sub>j</sub> = 100 °C		3	6	V
V <sub>CE(5μs)*</sub>	Collector-Emitter Dynamic Voltage	V <sub>CC</sub> = 200V I <sub>B1</sub> = 5.25 A R <sub>C</sub> = 5.7 Ω T <sub>j</sub> = 100 °C		1.8	3	V

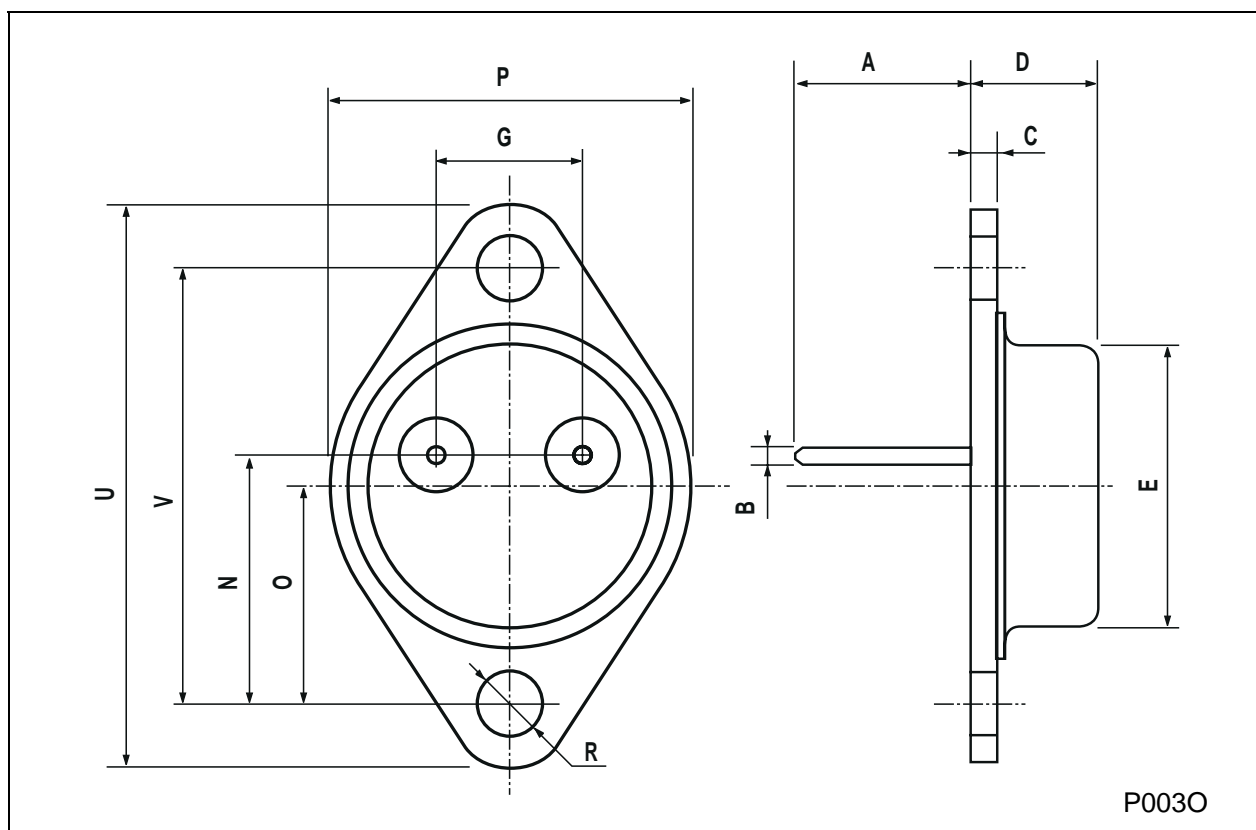
### INDUCTIVE LOAD

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t <sub>s</sub>	Storage Time	V <sub>CC</sub> = 200 V V <sub>Clamp</sub> = 250 V		1.4	3	μs
t <sub>f</sub>	Fall Time	I <sub>C</sub> = 35 A I <sub>B1</sub> = 3.5 A		0.15	0.4	μs
t <sub>c</sub>	Crossover Time	V <sub>BB</sub> = -5 V L <sub>C</sub> = 0.28 mH R <sub>B2</sub> = 0.7 Ω T <sub>j</sub> = 100 °C		0.3	0.7	μs
V <sub>CEW</sub>	Maximum Collector Emitter Voltage without Snubber	V <sub>CC</sub> = 50 V I <sub>CWoff</sub> = 52 A V <sub>BB</sub> = -5 V I <sub>B1</sub> = 3.5 A L <sub>C</sub> = 48 μH R <sub>B2</sub> = 0.7 Ω T <sub>j</sub> = 125 °C	250			V

\* Pulsed : Pulse duration = 300 μs, 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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