

## FAST-SWITCHING POWER TRANSISTOR

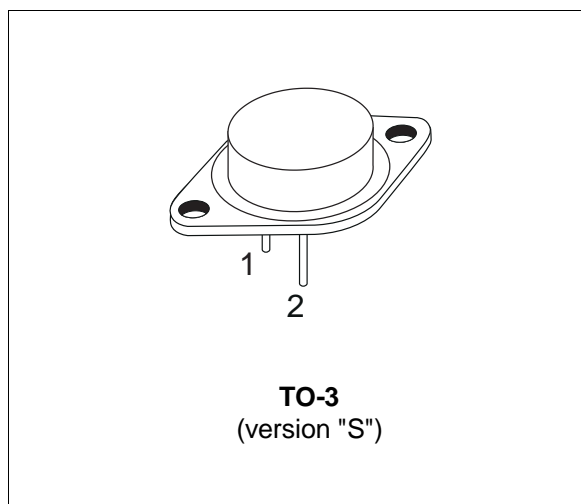
- SGS-THOMSON PREFERRED SALESTYPE
- NPN TRANSISTOR
- $h_{FE} > 10$  AT  $I_C = 35A$
- HIGH EFFICIENCY SWITCHING
- VERY LOW SATURATION VOLTAGE
- RECTANGULAR SAFE OPERATING AREA
- WIDE ACCIDENTAL OVERLOAD AREA

### APPLICATIONS

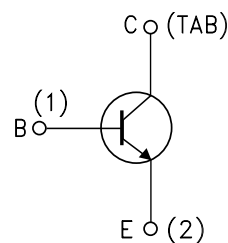
- UNINTERRUPTABLE POWER SUPPLY
- SWITCH MODE POWER SUPPLIES
- MOTOR CONTROL

### 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

$R_{thj-case}$	Thermal Resistance Junction-case	Max	0.7	$^{\circ}C/W$
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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 ( $R_{BE} = 10 \Omega$ )	$V_{CE} = V_{CEV}$ $V_{CE} = V_{CEV} \quad T_c = 100^{\circ}C$			0.4 4	mA mA
$I_{CEV}$	Collector Cut-off Current	$V_{CE} = V_{CEV} \quad V_{BE} = -1.5V$ $V_{CE} = V_{CEV} \quad V_{BE} = -1.5V \quad T_c = 100^{\circ}C$			0.2 2	mA mA
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 7 V$			1	mA
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage	$I_C = 0.2 A \quad L = 25 mH$	250			V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	$I_E = 50 mA$	7			V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 35 A \quad I_B = 3.5 A$ $I_C = 35 A \quad I_B = 3.5 A \quad T_j = 100^{\circ}C$		0.8 1.25	1.2 1.9	V V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = 35 A \quad I_B = 3.5 A$ $I_C = 35 A \quad I_B = 3.5 A \quad T_j = 100^{\circ}C$		1.2 1.2	1.5 1.5	V V
$di_c/dt$	Rated of Rise on-state Collector Current	$V_{CC} = 200V \quad I_{B1} = 5.25 A \quad R_C = 0$ $t_p = 3\mu s \quad T_j = 100^{\circ}C$	125	200		A/ $\mu s$
$V_{CE(3\mu s)*}$	Collector-Emitter Dynamic Voltage	$V_{CC} = 200V \quad I_{B1} = 5.25 A$ $R_C = 5.7 \Omega \quad T_j = 100^{\circ}C$		3	6	V
$V_{CE(5\mu s)*}$	Collector-Emitter Dynamic Voltage	$V_{CC} = 200V \quad I_{B1} = 5.25 A$ $R_C = 5.7 \Omega \quad T_j = 100^{\circ}C$		1.8	3	V

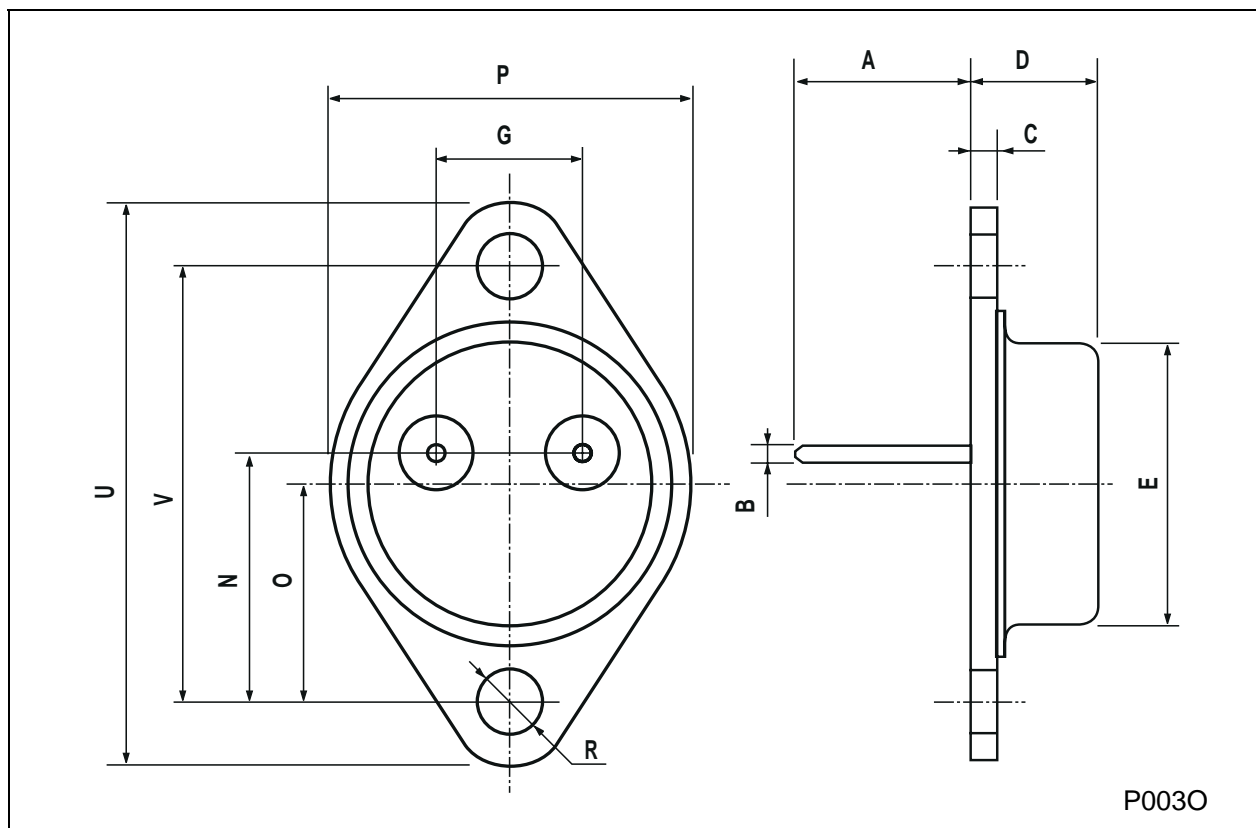
### INDUCTIVE LOAD

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_s$	Storage Time	$V_{CC} = 200 V \quad V_{Clamp} = 250 V$		1.4	3	$\mu s$
$t_f$	Fall Time	$I_C = 35 A \quad I_{B1} = 3.5 A$		0.15	0.4	$\mu s$
$t_c$	Crossover Time	$V_{BB} = -5 V \quad L_C = 0.28 mH$ $R_{B2} = 0.7 \Omega \quad T_j = 100^{\circ}C$		0.3	0.7	$\mu s$
$V_{CEW}$	Maximum Collector Emitter Voltage without Snubber	$V_{CC} = 50 V \quad I_{Cwoff} = 52 A$ $V_{BB} = -5 V \quad I_{B1} = 3.5 A$ $L_C = 48 \mu H \quad R_{B2} = 0.7 \Omega$ $T_j = 125^{\circ}C$	250			V

\* Pulsed : Pulse duration = 300  $\mu s$ , 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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