



BUT90

HIGH POWER NPN SILICON TRANSISTOR

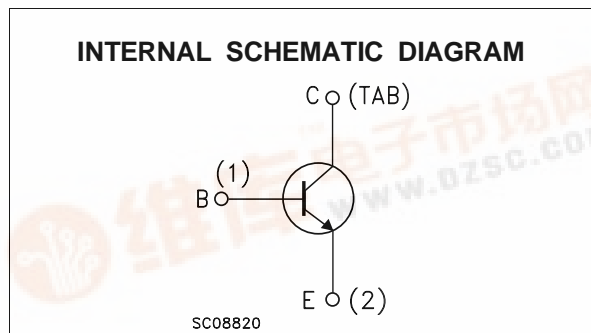
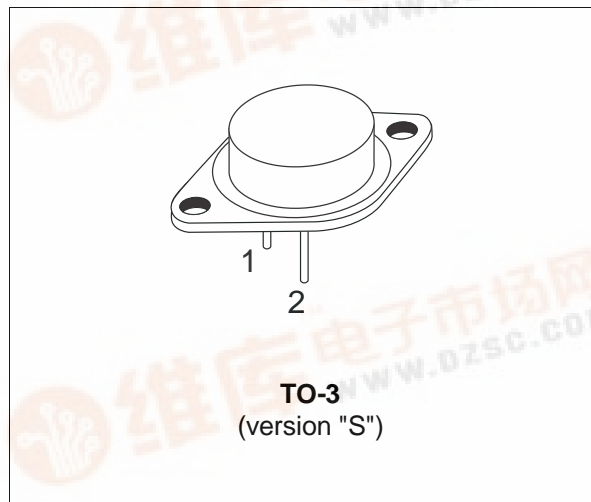
- SGS-THOMSON PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH CURRENT CAPABILITY
- FAST SWITCHING SPEED
- HIGH RUGGEDNESS
- LOW COLLECTOR EMITTER SATURATION

APPLICATIONS

- UNINTERRUPTABLE POWER SUPPLY
- MOTOR CONTROL
- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

DESCRIPTION

The BUT90 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.



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEV}	Collector-Emitter Voltage ($V_{BE} = -1.5\text{ V}$)	200	V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	125	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	10	V
I_C	Collector Current	50	A
I_{CM}	Collector Peak Current	120	A
I_B	Base Current	12	A
I_{BM}	Base Peak Current	32	A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25\text{ }^\circ\text{C}$	250	W
T_{stg}	Storage Temperature	-65 to 200	$^\circ\text{C}$
T_j	Junction Temperature	200	$^\circ\text{C}$

BUT90

THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	Max	1.17	$^{\circ}\text{C}/\text{W}$
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CER}	Collector Cut-off Current ($R_{BE} = 10 \Omega$)	$V_{CE} = V_{CEV}$ $V_{CE} = V_{CEV} \quad T_c = 100^{\circ}\text{C}$			0.4 4	mA mA
I_{CEV}	Collector Cut-off Current	$V_{CE} = V_{CEV} \quad V_{BE} = -1.5\text{V}$ $V_{CE} = V_{CEV} \quad V_{BE} = -1.5\text{V} \quad T_c = 100^{\circ}\text{C}$			0.2 2	mA mA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 7 \text{ V}$			1	mA
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage	$I_C = 0.2 \text{ A} \quad L = 25 \text{ mH}$	125			V
V_{EB0}	Emitter-Base Voltage ($I_C = 0$)	$I_E = 50 \text{ mA}$	10			V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 35 \text{ A} \quad I_B = 1.75 \text{ A}$ $I_C = 70 \text{ A} \quad I_B = 7 \text{ A} \quad T_c = 100^{\circ}\text{C}$ $I_C = 35 \text{ A} \quad I_B = 1.75 \text{ A}$ $I_C = 70 \text{ A} \quad I_B = 7 \text{ A} \quad T_c = 100^{\circ}\text{C}$		0.55 0.8 0.75 1.2	0.9 0.9 1.2 1.5	V V V V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = 35 \text{ A} \quad I_B = 1.75 \text{ A}$ $I_C = 70 \text{ A} \quad I_B = 7 \text{ A} \quad T_c = 100^{\circ}\text{C}$ $I_C = 35 \text{ A} \quad I_B = 1.75 \text{ A}$ $I_C = 70 \text{ A} \quad I_B = 7 \text{ A} \quad T_c = 100^{\circ}\text{C}$		1 1.45 1 1.65	1.3 1.8 1.4 2	V V V V

RESISTIVE LOAD

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_r	Rise Time	$V_{CC} = 100 \text{ V} \quad I_C = 70 \text{ A}$		0.8	1.2	μs
t_s	Storage Time	$I_{B1} = - I_{B2} = 7 \text{ A} \quad t_p = 30 \mu\text{s}$		0.9	1.5	μs
t_f	Fall Time			0.2	0.4	μs
t_r	Rise Time	$V_{CC} = 100 \text{ V} \quad I_C = 70 \text{ A}$		1.1	1.6	μs
t_s	Storage Time	$I_{B1} = - I_{B2} = 7 \text{ A} \quad t_p = 30 \mu\text{s}$		1.2	2	μs
t_f	Fall Time	$T_c = 100^{\circ}\text{C}$		0.3	0.6	μs

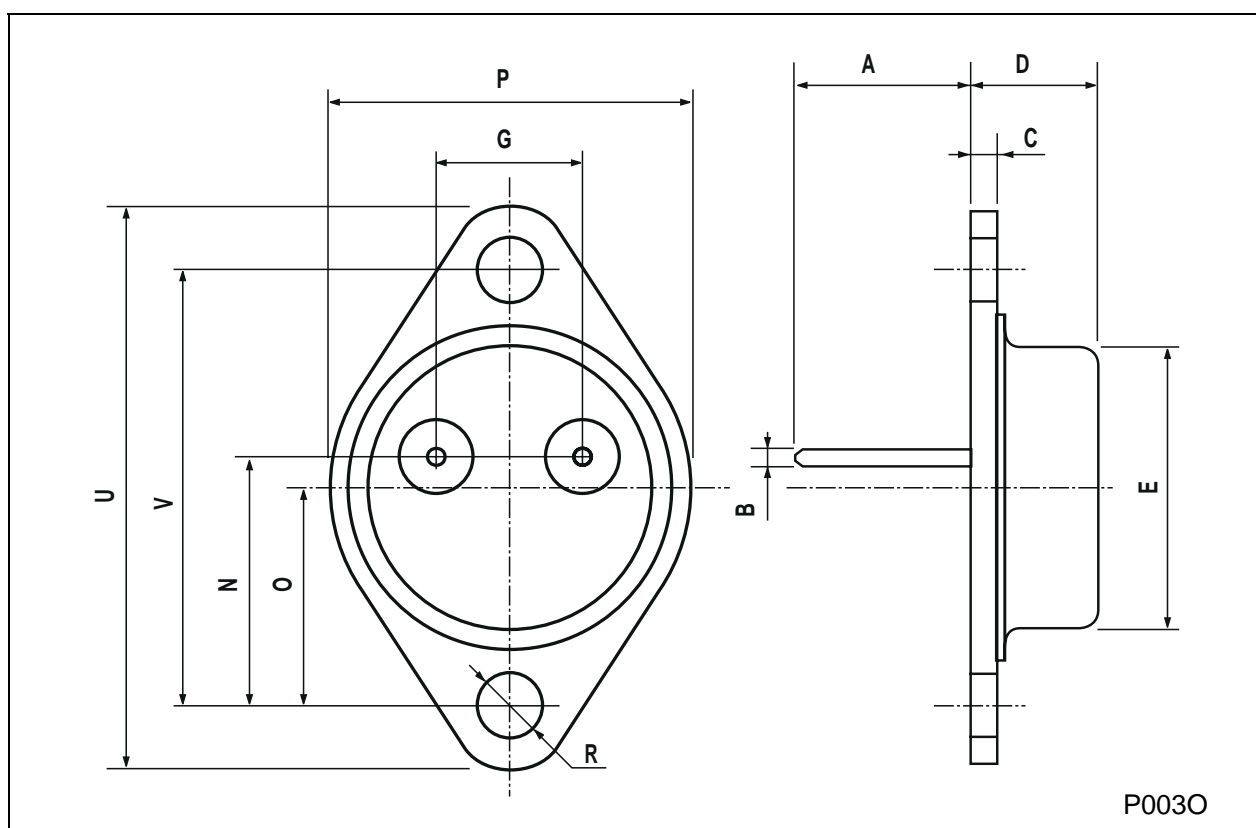
INDUCTIVE LOAD

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_s	Storage Time	$V_{CC} = 100 \text{ V} \quad V_{Clamp} = 125 \text{ V}$		1.25	2	ms
t_f	Fall Time	$I_C = 70 \text{ A} \quad I_{B1} = - I_{B2} = 7 \text{ A}$ $L_C = 70 \mu\text{H}$		0.16	0.3	μs
t_s	Storage Time	$V_{CC} = 100 \text{ V} \quad V_{Clamp} = 125 \text{ V}$		1.5	2.2	μs
t_f	Fall Time	$I_C = 70 \text{ A} \quad I_{B1} = - I_{B2} = 7 \text{ A}$ $L_C = 70 \mu\text{H} \quad T_c = 100^{\circ}\text{C}$		0.25	0.5	μs

* 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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