

HIGH POWER NPN SILICON TRANSISTOR

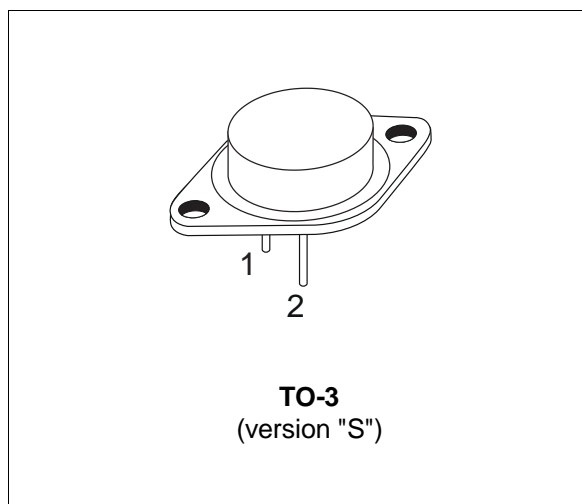
- SGS-THOMSON PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH CURRENT CAPABILITY
- FAST SWITCHING SPEED
- HIGH RUGGEDNESS
- LOW COLLECTOR-EMITTER SATURATION

APPLICATIONS

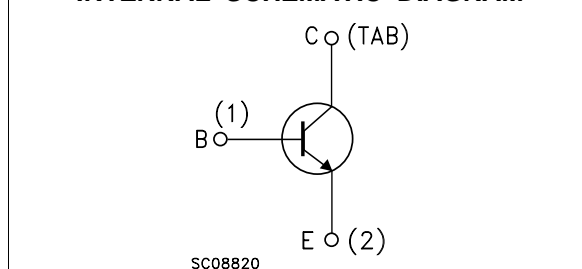
- UNINTERRUPTABLE POWER SUPPLY
- MOTOR CONTROL
- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

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.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|-----------|--|------------|------|
| V_{CEV} | Collector-Emitter Voltage ($V_{BE} = -1.5$ 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 $T_{case} \leq 25$ °C | 250 | W |
| T_{stg} | Storage Temperature | -65 to 200 | °C |
| T_j | Junction Temperature | 200 | °C |

BUT90

THERMAL DATA

| | | | | |
|-----------------------|----------------------------------|-----|------|------|
| R _{thj-case} | Thermal Resistance Junction-case | Max | 1.17 | °C/W |
|-----------------------|----------------------------------|-----|------|------|

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|------------------------|--|--|------|------|----------|----------|
| I _{CER} | Collector Cut-off Current (R _{BE} = 10 Ω) | V _{CE} = V _{CEV} V _{CE} = V _{CEV} T _c = 100 °C | | | 0.4 4 | mA mA |
| I _{CEV} | Collector Cut-off Current | V _{CE} = V _{CEV} V _{BE} = -1.5V V _{CE} = V _{CEV} V _{BE} = -1.5V T _c = 100 °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 L = 25 mH | 125 | | | V |
| V _{EBO} | Emitter-Base Voltage (I _C = 0) | I _E = 50 mA | 10 | | | V |
| V _{CE(sat)*} | Collector-Emitter Saturation Voltage | I _C = 35 A I _B = 1.75 A | | 0.55 | 0.9 | V |
| | | I _C = 70 A I _B = 7 A T _c = 100 °C | | 0.8 | 0.9 | V |
| | | I _C = 35 A I _B = 1.75 A | | 0.75 | 1.2 | V |
| | | I _C = 70 A I _B = 7 A T _c = 100 °C | | 1.2 | 1.5 | V |
| V _{BE(sat)*} | Base-Emitter Saturation Voltage | I _C = 35 A I _B = 1.75 A | | 1 | 1.3 | V |
| | | I _C = 70 A I _B = 7 A T _c = 100 °C | | 1.45 | 1.8 | V |
| | | I _C = 35 A I _B = 1.75 A | | 1 | 1.4 | V |
| | | I _C = 70 A I _B = 7 A T _c = 100 °C | | 1.65 | 2 | V |

RESISTIVE LOAD

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|----------------|--------------|--|------|------|------|------|
| t _r | Rise Time | V _{CC} = 100 V I _C = 70 A | | 0.8 | 1.2 | μs |
| t _s | Storage Time | I _{B1} = - I _{B2} = 7 A t _p = 30 μs | | 0.9 | 1.5 | μs |
| t _f | Fall Time | | | 0.2 | 0.4 | μs |
| t _r | Rise Time | V _{CC} = 100 V I _C = 70 A | | 1.1 | 1.6 | μs |
| t _s | Storage Time | I _{B1} = - I _{B2} = 7 A t _p = 30 μs | | 1.2 | 2 | μs |
| t _f | Fall Time | T _c = 100 °C | | 0.3 | 0.6 | μs |

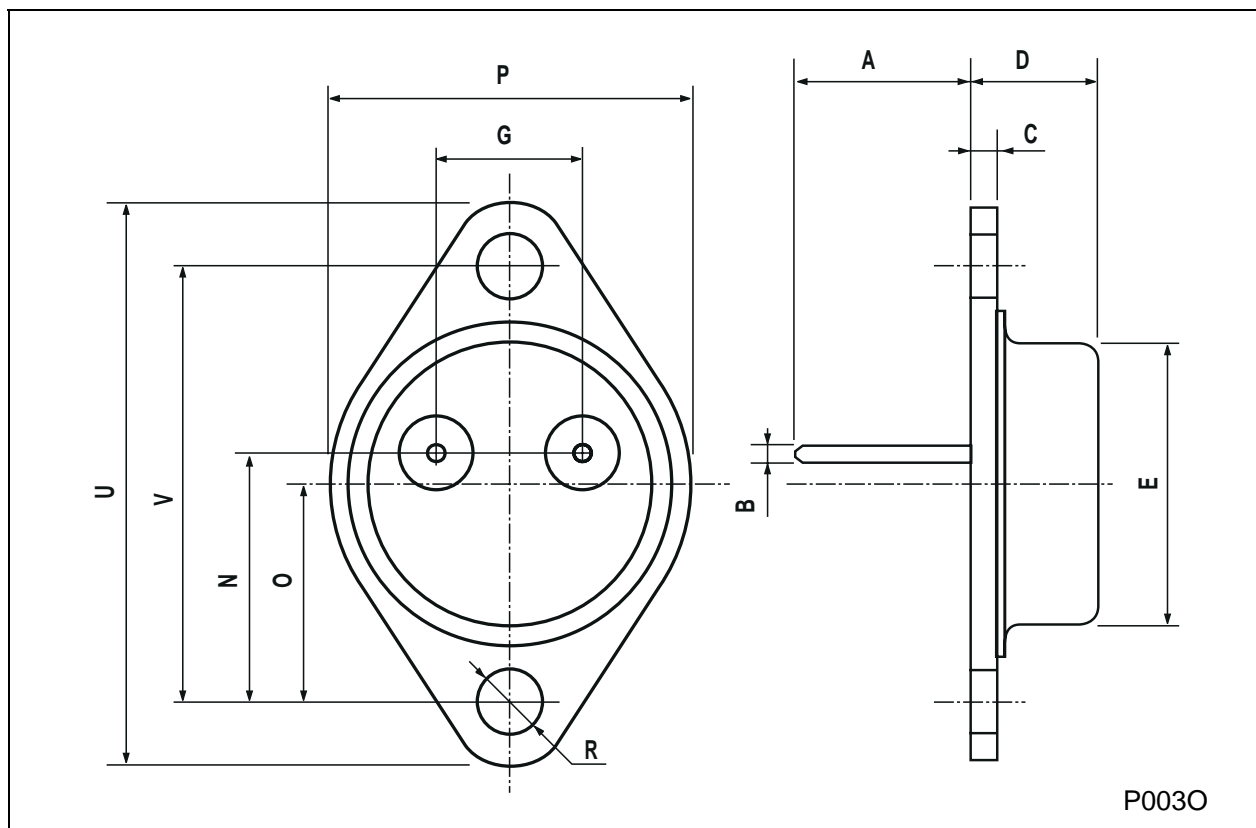
INDUCTIVE LOAD

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|----------------|--------------|---|------|------|------|------|
| t _s | Storage Time | V _{CC} = 100 V V _{Clamp} = 125 V | | 1.25 | 2 | ms |
| t _f | Fall Time | I _C = 70 A I _{B1} = - I _{B2} = 7 A | | 0.16 | 0.3 | μs |
| | | L _C = 70 μH | | | | |
| t _s | Storage Time | V _{CC} = 100 V V _{Clamp} = 125 V | | 1.5 | 2.2 | μs |
| t _f | Fall Time | I _C = 70 A I _{B1} = - I _{B2} = 7 A | | 0.25 | 0.5 | μs |
| | | L _C = 70 μH T _c = 100 °C | | | | |

* 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 |



Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1997 SGS-THOMSON Microelectronics - Printed in Italy - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES
Australia - Brazil - Canada - China - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A
...



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

LittleDiode.com

Looking forward to providing you with the best possible service.