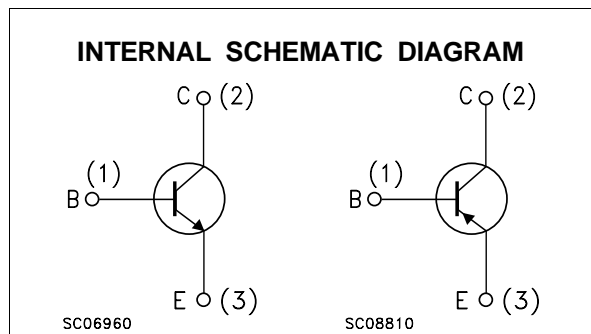
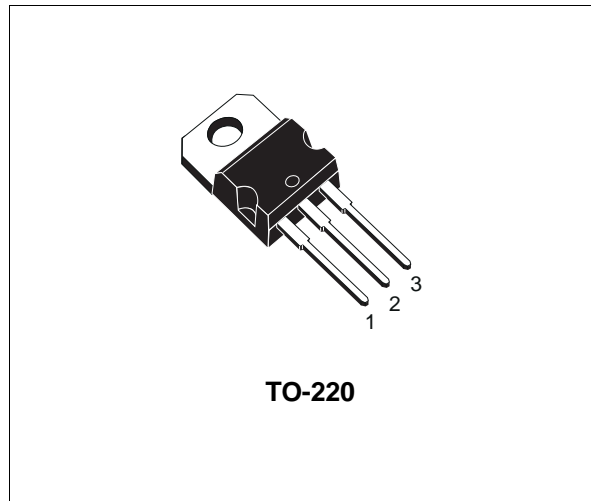


COMPLEMENTARY SILICON POWER TRANSISTORS

- TIP31A, TIP31C, TIP32A AND TIP32C ARE SGS-THOMSON PREFERRED SALESTYPES

DESCRIPTION

The TIP31A, TIP31B and TIP31C are silicon epitaxial-base NPN power transistors in Jedec TO-220 plastic package, intended for use in medium power linear and switching applications. The complementary PNP types are TIP32A, TIP32B and TIP32C.



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | | | Unit | |
|-----------|--|-------|------------|--------|--------|------------|
| | | NPN | TIP29A | TIP29B | | TIP29C |
| | | PNP | TIP30A | TIP30B | TIP30C | |
| V_{CBO} | Collector-Base Voltage ($I_E = 0$) | | 60 | 80 | 100 | V |
| V_{CEO} | Collector-Emitter Voltage ($I_B = 0$) | | 60 | 80 | 100 | V |
| V_{EBO} | Emitter-Base Voltage ($I_C = 0$) | | 5 | | | V |
| I_C | Collector Current | | 1 | | | A |
| I_{CM} | Collector Peak Current | | 3 | | | A |
| I_B | Base Current | | 0.4 | | | A |
| P_{tot} | Total Dissipation at $T_{case} \leq 25^\circ C$ $T_{amb} \leq 25^\circ C$ | | 30 | | | W |
| | | | 2 | | | W |
| T_{stg} | Storage Temperature | | -65 to 150 | | | $^\circ C$ |
| T_j | Max. Operating Junction Temperature | | 150 | | | $^\circ C$ |

For PNP types voltage and current values are negative.

TIP29A/TIP29B/TIP29C/TIP30A/TIP30B/TIP30C

THERMAL DATA

| | | | | |
|-----------------------|-------------------------------------|-----|------|------|
| R _{thj-case} | Thermal Resistance Junction-case | Max | 4.17 | °C/W |
| R _{thj-amb} | Thermal Resistance Junction-ambient | Max | 62.5 | °C/W |

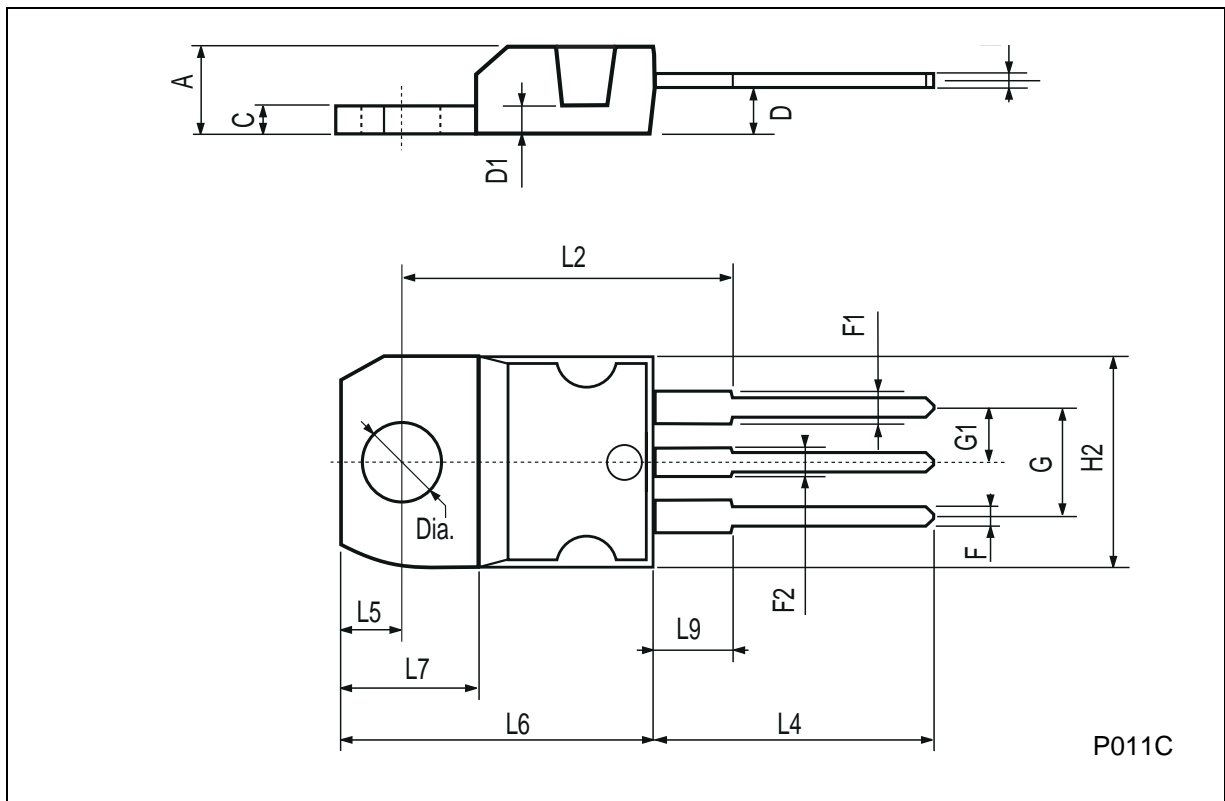
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------------------|---|---|-----------------|------|------|-------------|
| I _{CBO} | Collector Cut-off Current (I _B = 0) | for TIP29A/30A V _{CE} = 30 V for TIP29B/29C/30B/30C V _{CB} = 60 V | | | 0.3 | mA |
| I _{CES} | Collector Cut-off Current (V _{BE} = 0) | for TIP29A/30A V _{CE} = 60 V for TIP29B/30B V _{CE} = 80 V for TIP29C/30C V _{CE} = 100 V | | | 0.2 | mA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | V _{EB} = 5 V | | | 1 | mA |
| V _{CEO(sus)} * | Collector-Emitter Sustaining Voltage (I _B = 0) | I _C = 30 mA for TIP29A/30A for TIP29B/30B for TIP29C/30C | 60 80 100 | | | V V V |
| V _{CE(sat)} * | Collector-Emitter Saturation Voltage | I _C = 1 A I _B = 125 mA | | | 0.7 | V |
| V _{BE(on)} * | Base-Emitter Voltage | I _C = 1 A V _{CE} = 4 V | | | 1.3 | V |
| h _{FE} * | DC Current Gain | I _C = 0.2 A V _{CE} = 4 V I _C = 1 A V _{CE} = 4 V | 40 15 | | 75 | |
| h _{fe} | Small Signal Current Gain | I _C = 0.2 A V _{CE} = 10 V f = 1 KHz I _C = 0.2 A V _{CE} = 10 V f = 1 MHz | 20 3 | | | |

* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 2 %
For PNP types voltage and current values are negative.

TO-220 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|-------|------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 4.40 | | 4.60 | 0.173 | | 0.181 |
| C | 1.23 | | 1.32 | 0.048 | | 0.051 |
| D | 2.40 | | 2.72 | 0.094 | | 0.107 |
| D1 | | 1.27 | | | 0.050 | |
| E | 0.49 | | 0.70 | 0.019 | | 0.027 |
| F | 0.61 | | 0.88 | 0.024 | | 0.034 |
| F1 | 1.14 | | 1.70 | 0.044 | | 0.067 |
| F2 | 1.14 | | 1.70 | 0.044 | | 0.067 |
| G | 4.95 | | 5.15 | 0.194 | | 0.203 |
| G1 | 2.4 | | 2.7 | 0.094 | | 0.106 |
| H2 | 10.0 | | 10.40 | 0.393 | | 0.409 |
| L2 | | 16.4 | | | 0.645 | |
| L4 | 13.0 | | 14.0 | 0.511 | | 0.551 |
| L5 | 2.65 | | 2.95 | 0.104 | | 0.116 |
| L6 | 15.25 | | 15.75 | 0.600 | | 0.620 |
| L7 | 6.2 | | 6.6 | 0.244 | | 0.260 |
| L9 | 3.5 | | 3.93 | 0.137 | | 0.154 |
| DIA. | 3.75 | | 3.85 | 0.147 | | 0.151 |



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