

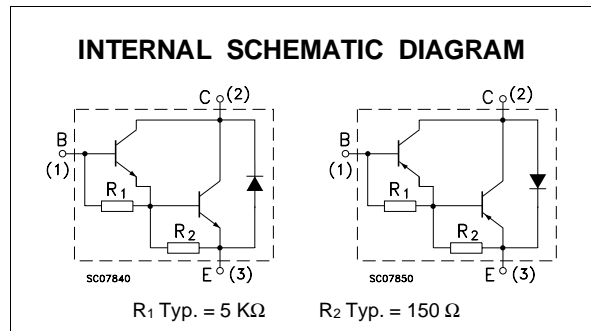
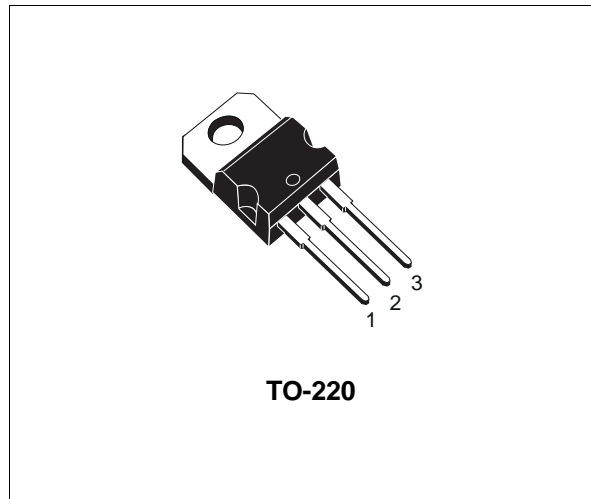
COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

■ SGS-THOMSON PREFERRED SALESTYPES

DESCRIPTION

The TIP120, TIP121 and TIP122 are silicon epitaxial-base NPN power transistors in monolithic Darlington configuration Jedec TO-220 plastic package, intended for use in power linear and switching applications.

The complementary PNP types are TIP125, TIP126 and TIP127.



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | | | | Unit |
|-----------|--|-------|------------|--------|--------|------------------|
| | | NPN | TIP120 | TIP121 | TIP122 | |
| | | PNP | TIP125 | TIP126 | TIP127 | |
| 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 | | 5 | | | A |
| I_{CM} | Collector Peak Current | | 8 | | | A |
| I_B | Base Current | | 0.1 | | | A |
| P_{tot} | Total Dissipation at $T_{case} \leq 25\text{ }^\circ\text{C}$ $T_{amb} \leq 25\text{ }^\circ\text{C}$ | | 65 | | | W |
| | | | 2 | | | W |
| T_{stg} | Storage Temperature | | -65 to 150 | | | $^\circ\text{C}$ |
| T_j | Max. Operating Junction Temperature | | 150 | | | $^\circ\text{C}$ |

* For PNP types voltage and current values are negative.

TIP120/TIP121/TIP122/TIP125/TIP126/TIP127

THERMAL DATA

| | | | | |
|----------------|-------------------------------------|-----|------|---------------|
| $R_{thj-case}$ | Thermal Resistance Junction-case | Max | 1.92 | $^{\circ}C/W$ |
| $R_{thj-amb}$ | Thermal Resistance Junction-ambient | Max | 62.5 | $^{\circ}C/W$ |

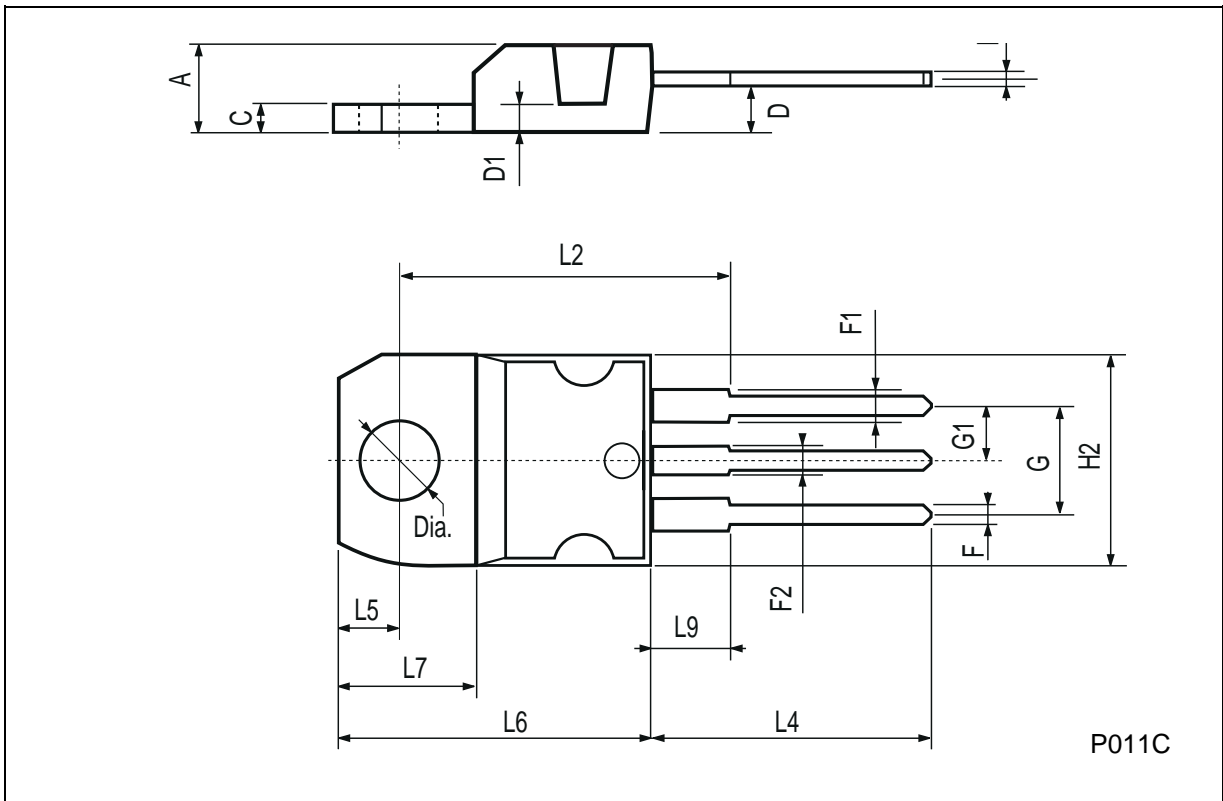
ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|------------------|--|--|-----------------|------|-------------------|----------------|
| I_{CEO} | Collector Cut-off Current ($I_B = 0$) | for TIP120/125 $V_{CE} = 30 V$ for TIP121/126 $V_{CE} = 40 V$ for TIP122/127 $V_{CE} = 50 V$ | | | 0.5 0.5 0.5 | mA mA mA |
| I_{CBO} | Collector Cut-off Current ($I_B = 0$) | for TIP120/125 $V_{CE} = 60 V$ for TIP121/126 $V_{CE} = 80 V$ for TIP122/127 $V_{CE} = 100 V$ | | | 0.2 0.2 0.2 | mA mA mA |
| I_{EBO} | Emitter Cut-off Current ($I_C = 0$) | $V_{EB} = 5 V$ | | | 2 | mA |
| $V_{CEO(sus)}^*$ | Collector-Emitter Sustaining Voltage ($I_B = 0$) | $I_C = 30 mA$ for TIP120/125 for TIP121/126 for TIP122/127 | 60 80 100 | | | V V V |
| $V_{CE(sat)}^*$ | Collector-Emitter Saturation Voltage | $I_C = 3 A$ $I_B = 12 mA$ $I_C = 5 A$ $I_B = 20 mA$ | | | 2 4 | V V |
| $V_{BE(on)}^*$ | Base-Emitter Voltage | $I_C = 3 A$ $V_{CE} = 3 V$ | | | 2.5 | V |
| h_{FE}^* | DC Current Gain | $I_C = 0.5 A$ $V_{CE} = 3 V$ $I_C = 3 A$ $V_{CE} = 3 V$ | 1000 1000 | | | |

* 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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