



**TIP102**  
**TIP107**

## COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

- STMicroelectronics PREFERRED SALESTYPES
- COMPLEMENTARY PNP - NPN DEVICES
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE

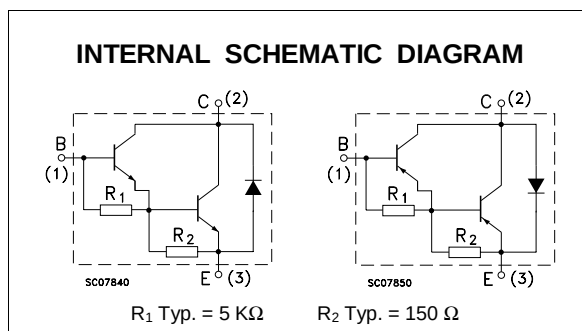
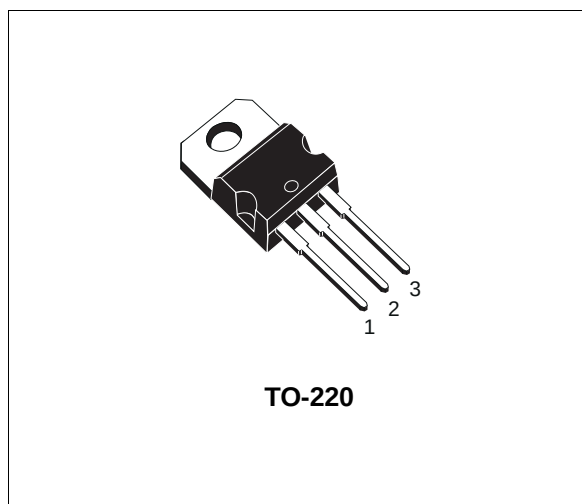
### APPLICATIONS

- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT
- AUDIO POWER AMPLIFIER
- GENERAL POWER SWITCHING
- DC-AC CONVERTER
- EASY DRIVER FOR LOW VOLTAGE DC MOTOR

### DESCRIPTION

The TIP102 is a silicon Epitaxial-Base NPN power transistor in monolithic Darlington configuration mounted in TO-220 plastic package. It is intended for use in power linear and switching applications.

The complementary PNP type is TIP107.



### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter                                                                    | NPN | Value      | Unit       |
|-----------|------------------------------------------------------------------------------|-----|------------|------------|
|           |                                                                              | PNP | TIP107     |            |
| $V_{CBO}$ | Collector-Base Voltage ( $I_E = 0$ )                                         |     | 100        | V          |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )                                      |     | 100        | V          |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )                                           |     | 5          | V          |
| $I_C$     | Collector Current                                                            |     | 8          | A          |
| $I_{CM}$  | Collector Peak Current                                                       |     | 15         | A          |
| $I_B$     | Base Current                                                                 |     | 1          | A          |
| $P_{tot}$ | Total Dissipation at $T_{case} \leq 25^\circ C$<br>$T_{amb} \leq 25^\circ C$ |     | 80<br>2    | W<br>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.

# TIP102 / TIP107

## THERMAL DATA

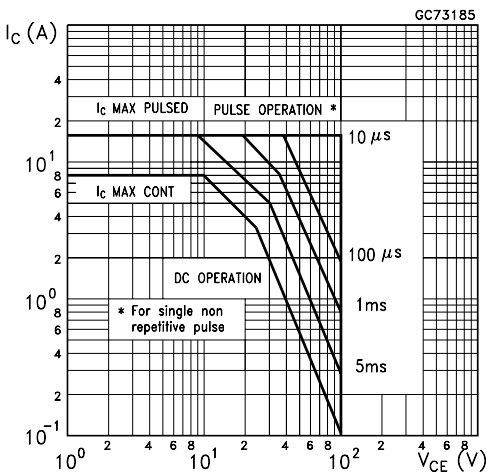
|                       |                                     |     |      |      |
|-----------------------|-------------------------------------|-----|------|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case    | Max | 1.56 | °C/W |
| R <sub>thj-amb</sub>  | Thermal Resistance Junction-ambient | Max | 62.5 | °C/W |

## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

| Symbol                  | Parameter                                                 | Test Conditions                               | Min.        | Typ. | Max.     | Unit   |
|-------------------------|-----------------------------------------------------------|-----------------------------------------------|-------------|------|----------|--------|
| I <sub>CEO</sub>        | Collector Cut-off Current (I <sub>B</sub> = 0)            | V <sub>CE</sub> = 50 V                        |             |      | 50       | μA     |
| I <sub>CBO</sub>        | Collector Cut-off Current (I <sub>E</sub> = 0)            | V <sub>CB</sub> = 100 V                       |             |      | 50       | μA     |
| I <sub>EBO</sub>        | Emitter Cut-off Current (I <sub>C</sub> = 0)              | V <sub>EB</sub> = 5 V                         |             |      | 8        | mA     |
| V <sub>CEO(sus)</sub> * | Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0) | I <sub>C</sub> = 30 mA                        | 100         |      |          | V      |
| V <sub>CE(sat)</sub> *  | Collector-Emitter Saturation Voltage                      | I <sub>C</sub> = 3 A<br>I <sub>C</sub> = 8 A  |             |      | 2<br>2.5 | V<br>V |
| V <sub>BE</sub> *       | Base-Emitter Voltage                                      | I <sub>C</sub> = 8 A<br>V <sub>CE</sub> = 4 V |             |      | 2.8      | V      |
| h <sub>FE</sub> *       | DC Current Gain                                           | I <sub>C</sub> = 3 A<br>I <sub>C</sub> = 8 A  | 1000<br>200 |      | 20000    |        |
| V <sub>F</sub> *        | Forward Voltage of Commutation Diode (I <sub>B</sub> = 0) | I <sub>F</sub> = - I <sub>C</sub> = 10 A      |             |      | 2.8      | V      |

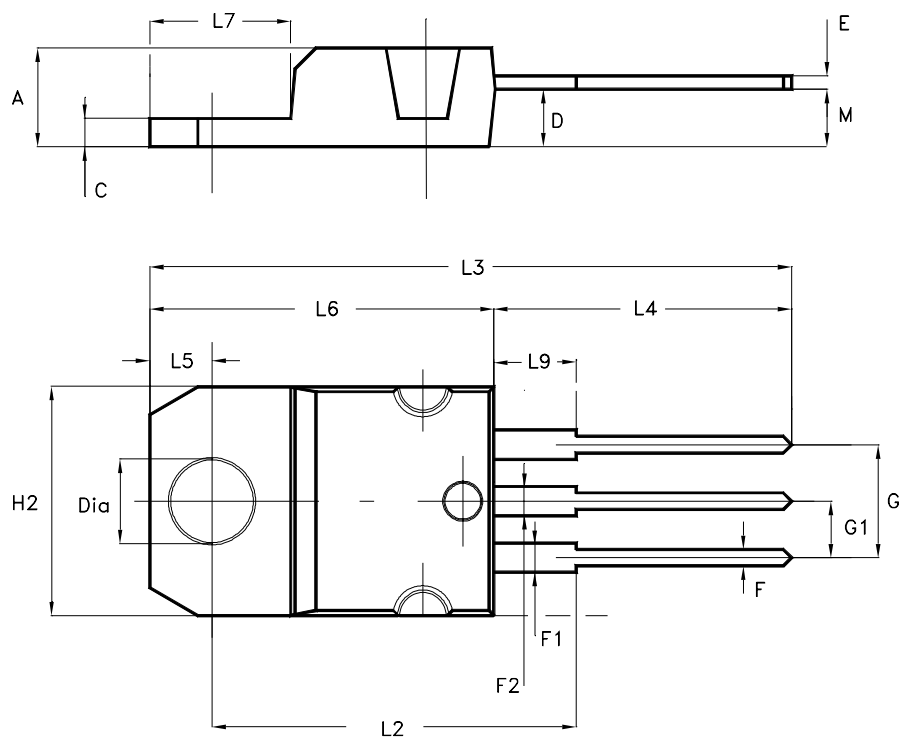
\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %  
For PNP types voltage and current values are negative.

## Safe Operating Area



## 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 |       | 0.052 |
| D    | 2.40  |       | 2.72  | 0.094 |       | 0.107 |
| 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 |       | 0.202 |
| G1   | 2.40  |       | 2.70  | 0.094 |       | 0.106 |
| H2   | 10.00 |       | 10.40 | 0.394 |       | 0.409 |
| L2   |       | 16.40 |       |       | 0.645 |       |
| L4   | 13.00 |       | 14.00 | 0.511 |       | 0.551 |
| L5   | 2.65  |       | 2.95  | 0.104 |       | 0.116 |
| L6   | 15.25 |       | 15.75 | 0.600 |       | 0.620 |
| L7   | 6.20  |       | 6.60  | 0.244 |       | 0.260 |
| L9   | 3.50  |       | 3.93  | 0.137 |       | 0.154 |
| M    |       | 2.60  |       |       | 0.102 |       |
| DIA. | 3.75  |       | 3.85  | 0.147 |       | 0.151 |



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