

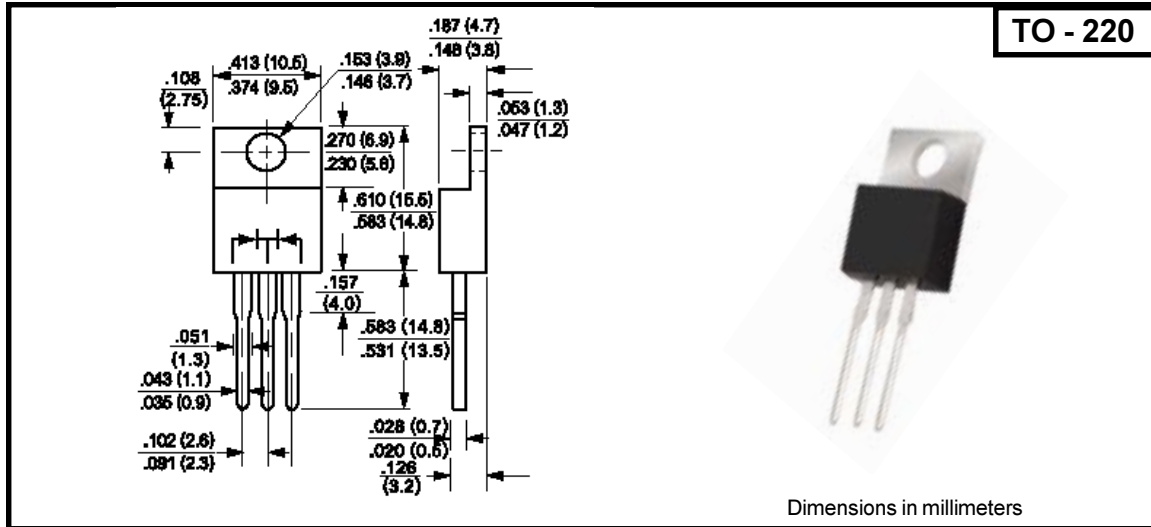


# SEMICONDUCTOR

## TECHNICAL SPECIFICATION

# TIP125

### TO-220 - PNP Plastic Power Transistors



#### Absolute Max. Ratings (Ta=25oC)

|                                                                              | Symbol        |      | Ratings | Unit             |
|------------------------------------------------------------------------------|---------------|------|---------|------------------|
| Collector-base voltage (open emitter)                                        | $V_{CBO}$     | max. | 60      | V                |
| Collector-emmitor voltage (open base)                                        | $V_{CEO}$     | max. | 60      | V                |
| Collector current                                                            | $I_C$         | max. |         | A                |
| Total Power Dissipation up to $T_C = 25^\circ\text{C}$                       | $P_{tot}$     | max. |         | W                |
| Junction Temperature                                                         | $T_j$         | max. |         | $^\circ\text{C}$ |
| Collector-emitter saturation voltage $I_C = 3\text{A}$ ; $I_B = 12\text{mA}$ | $V_{CE(sat)}$ | max. |         | V                |
| D.C. current gain $I_C = 0.5\text{A}$ ; $V_{CE} = 3\text{V}$                 | $h_{FE}$      | min  |         | K                |

#### Chara. Ratings (at Ta = 25°C unless otherw ise specified)

|                                                       | Symbol    |      | Ratings     | Unit                 |
|-------------------------------------------------------|-----------|------|-------------|----------------------|
| Collector-base voltage (open emitter)                 | $V_{CBO}$ | max. | 60          | V                    |
| Collector-emitter voltage (open base)                 | $V_{CEO}$ | max. | 60          | V                    |
| Emitter-base voltage (open collector)                 | $V_{EBO}$ | max. |             | V                    |
| Collector current                                     | $I_C$     | max. | 5           | A                    |
| Collector current (peak)                              | $I_{CM}$  | max. | 8           | A                    |
| Base current                                          | $I_B$     | max. | 120         | mA                   |
| Total power dissipation up to $TC = 25^\circ\text{C}$ | $P_{TOT}$ | max. | 65          | W                    |
| Debrate above 25°C                                    |           | max. | 0.52        | W / $^\circ\text{C}$ |
| Total power dissipation up to $TA = 25^\circ\text{C}$ | $P_{TOT}$ | max. | 2           | W                    |
| Debrate above 25°C                                    |           | max. | 0.016       | W / $^\circ\text{C}$ |
| Storage temperature                                   | $T_{STG}$ | max. | -65 to +150 | $^\circ\text{C}$     |
| Junction temperature                                  | $T_J$     | max. | 150         | $^\circ\text{C}$     |

**Chara. Ratings** (at  $T_a = 25^\circ\text{C}$  unless otherwise specified)**Symbol****Ratings****Unit**

|                                                                                                                                                                                                                                             |                                                                            |                                              |                                |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------|--------------------------------|------------------------------|
| Collector cutoff current<br>$I_E = 0; V_{CB} = 60\text{ V}$<br>$I_E = 0; V_{CB} = 80\text{ V}$<br>$I_E = 0; V_{CB} = 100\text{ V}$<br>$I_B = 0; V_{CE} = 30\text{ V}$<br>$I_B = 0; V_{CE} = 40\text{ V}$<br>$I_B = 0; V_{CE} = 50\text{ V}$ | $I_{CBO}$<br>$I_{CBO}$<br>$I_{CBO}$<br>$I_{CEO}$<br>$I_{CEO}$<br>$I_{CEO}$ | max.<br>max.<br>max.<br>max.<br>max.<br>max. | 0.2<br><br><br>0.5<br><br><br> | mA<br><br><br>mA<br><br><br> |
| Emitter cut-off current<br>$I_C = 0; V_{EB} = 5\text{ V}$                                                                                                                                                                                   | $I_{EBO}$                                                                  | max.                                         | 2                              | mA                           |
| Breakdown Voltages<br>$I_C = 100\text{ mA}; I_B = 0$<br>$I_C = 1\text{ mA}; I_E = 0$<br>$I_E = 1\text{ mA}; I_C = 0$                                                                                                                        | $V_{CEO(sus)}^*$<br>$V_{CBO}$<br>$V_{EBO}$                                 | min.<br>min.<br>min.                         | 60<br>60<br>                   | V<br>V<br>V                  |
| Saturation Voltages<br>$I_C = 3.0\text{ A}; I_{EB} = 12\text{ mA}$<br>$I_C = 5.0\text{ A}; I_{EB} = 20\text{ mA}$                                                                                                                           | $V_{CEsat}^*$<br>$V_{CEsat}^*$                                             | max.<br>max.                                 | 2<br>4                         | V<br>V                       |
| Base-emitter on voltage<br>$I_C = 3\text{ A}; V_{CE} = 3\text{ V}$                                                                                                                                                                          | $V_{BE(on)}^*$                                                             | max.                                         | 2.5                            | V                            |
| D.C. current gain<br>$I_C = 0.5\text{ A}; V_{CE} = 3\text{ V}$<br>$I_C = 3\text{ A}; V_{CE} = 3\text{ V}$                                                                                                                                   | $h_{FE}^*$                                                                 | min.<br>min.                                 | 1<br>1                         | K<br>K                       |
| Small signal current gain<br>$I_C = 3.0\text{ A}; V_{CE} = 4\text{ V}; f = 1\text{ MHz}$                                                                                                                                                    | $h_{FE}$                                                                   | min.                                         | 4                              |                              |
| Output Capacitance at $f = 0.1\text{ MHz}$<br>$I_E = 0; V_{CB} = 10\text{ V}$                                                                                                                                                               | $C_O$                                                                      | max.                                         | 300                            | pF                           |

\*Pulse test: pulse width  $\leq 300\text{ }\mu\text{s}$ ; duty cycle  $\leq 2\%$ **THERMAL RESISTANCE**

|                          |               |  |      |                             |
|--------------------------|---------------|--|------|-----------------------------|
| From junction to ambient | $R_{th\ j-a}$ |  | 62.5 | $^\circ\text{C} / \text{W}$ |
| From junction to case    | $R_{th\ j-c}$ |  | 1.92 | $^\circ\text{C} / \text{W}$ |

**RECTRON**