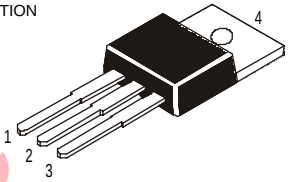
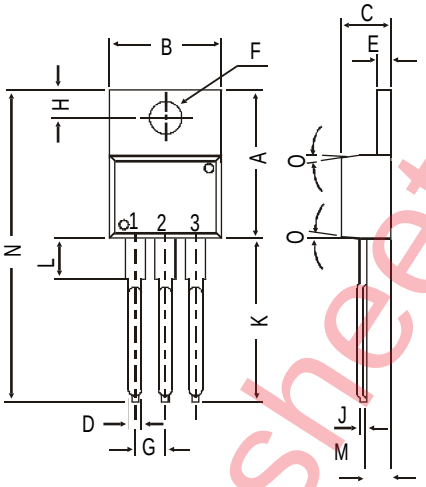
# Boca Semiconductor Corp.

*TIP120, 121, 122 NPN PLASTIC POWER TRANSISTORS*
*TIP125, 126, 127 PNP PLASTIC POWER TRANSISTORS*
*Power **Darlingtons** for Linear and Switching Applications*

PIN CONFIGURATION
1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR




All diminsions in mm.

| DIM | MIN. | MAX. |
|---|---|---|
| A | 14.42 | 16.51 |
| B | 9.63 | 10.67 |
| C | 3.56 | 4.83 |
| D | | 0.90 |
| E | 1.15 | 1.40 |
| F | 3.75 | 3.88 |
| G | 2.29 | 2.79 |
| H | 2.54 | 3.43 |
| J | | 0.56 |
| K | 12.70 | 14.73 |
| L | 2.80 | 4.07 |
| M | 2.03 | 2.92 |
| N | | 31.24 |
| O | DEG 7 | |

***ABSOLUTE MAXIMUM RATINGS***

| | | | ***120 125*** | ***121 126*** | ***122 127*** | |
|---|---|---|---|---|---|---|
| *Collector-base voltage (open emitter)* | $V_{CBO}$ | *max.* | *60* | *80* | *100* | *V* |
| *Collector-emitter voltage (open base)* | $V_{CEO}$ | *max.* | *60* | *80* | *100* | *V* |
| *Collector current* | $I_C$ | *max.* | | *5.0* | | *A* |
| *Total power dissipation up to $T_C$ = 25°C* | $P_{tot}$ | *max.* | | *65* | | *W* |
| *Junction temperature* | $T_j$ | *max.* | | *150* | | *°C* |
| *Collector-emitter saturation voltage* | | | | | | |
| *$I_C$ = 3 A; $I_B$ = 12 mA* | $V_{CEsat}$ | *max.* | | *2.0* | | *V* |
| *D.C. current gain* | | | | | | |
| *$I_C$ = 0.5 A; $V_{CE}$ = 3 V* | $h_{FE}$ | *min.* | | *1.0* | | |

***RATINGS*** *(at $T_A$=25°C unless otherwise specified)*

| | | | ***120 125*** | ***121 126*** | ***122 127*** | |
|---|---|---|---|---|---|---|
| *Collector-base voltage (open emitter)* | $V_{CBO}$ | *max.* | *60* | *80* | *100* | *V* |
| *Collector-emitter voltage (open base)* | $V_{CEO}$ | *max.* | *60* | *80* | *100* | *V* |
| *Emitter-base voltage (open collector)* | $V_{EBO}$ | *max.* | | *5.0* | | *V* |

**TIP120, TIP121, TIP122**
**TIP125, TIP126, TIP127**

| | | | | | | |
|---|---|---|---|---|---|---|
| *Collector current* | $I_C$ | *max.* | | *5.0* | | *A* |
| *Collector current (peak)* | $I_{CM}$ | *max.* | | *8* | | *A* |
| *Base current* | $I_B$ | *max.* | | *120* | | *mA* |
| *Total power dissipation up to $T_C$ = 25°C* | $P_{tot}$ | *max.* | | *65* | | *W* |
| *Derate above 25°C* | | *max* | | *0.52* | | *W/°C* |
| *Total power dissipation up to $T_A$ = 25°C* | $P_{tot}$ | *max.* | | *2* | | *W* |
| *Derate above 25°C* | | *max* | | *0.016* | | *W/°C* |
| *Junction temperature* | $T_j$ | *max.* | | *150* | | *°C* |
| *Storage temperature* | $T_{stg}$ | | | *–65 to +150* | | *°C* |
| ***THERMAL RESISTANCE*** | | | | | | |
| *From junction to ambient* | $R_{th\ j-a}$ | | | *62.5* | | *°C/W* |
| *From junction to case* | $R_{th\ j-c}$ | | | *1.92* | | *°C/W* |
| ***CHARACTERISTICS*** | | | | | | |
| *$T_{amb}$ = 25°C unless otherwise specified* | | | ***120*** | ***121*** | ***122*** | |
| | | | ***125*** | ***126*** | ***127*** | |
| *Collector cutoff current* | | | | | | |
| *$I_E$ = 0; $V_{CB}$ = 60 V* | $I_{CBO}$ | *max.* | *0.2* | *–* | *–* | *mA* |
| *$I_E$ = 0; $V_{CB}$ = 80 V* | $I_{CBO}$ | *max.* | *–* | *0.2* | *–* | *mA* |
| *$I_E$ = 0; $V_{CB}$ = 100 V* | $I_{CBO}$ | *max.* | *–* | *–* | *0.2* | *mA* |
| *$I_B$ = 0; $V_{CE}$ = 30V* | $I_{CEO}$ | *max.* | *0.5* | *–* | *–* | *mA* |
| *$I_B$ = 0; $V_{CE}$ = 40V* | $I_{CEO}$ | *max.* | *–* | *0.5* | *–* | *mA* |
| *$I_B$ = 0; $V_{CE}$ = 50V* | $I_{CEO}$ | *max.* | *–* | *–* | *0.5* | *mA* |
| *Emitter cut-off current* | | | | | | |
| *$I_C$ = 0; $V_{EB}$ = 5 V* | $I_{EBO}$ | *max.* | | *2.0* | | *mA* |
| *Breakdown voltages* | | | | | | |
| *$I_C$ = 100 mA; $I_B$ = 0* | $V_{CEO(sus)}$* | *min.* | *60* | *80* | *100* | *V* |
| *$I_C$ = 1 mA; $I_E$ = 0* | $V_{CBO}$ | *min.* | *60* | *80* | *100* | *V* |
| *$I_E$ = 1 mA; $I_C$ = 0* | $V_{EBO}$ | *min.* | | *5.0* | | *V* |
| *Saturation voltages* | | | | | | |
| *$I_C$ = 3.0 A; $I_B$ = 12 mA* | $V_{CEsat}$* | *max.* | | *2.0* | | *V* |
| *$I_C$ = 5.0 A; $I_B$ = 20 mA* | $V_{CEsat}$* | *max.* | | *4.0* | | *V* |
| *Base-emitter on voltage* | | | | | | |
| *$I_C$ = 3A; $V_{CE}$ = 3V* | $V_{BE(on)}$* | *max.* | | *2.5* | | *V* |
| *D.C. current gain* | | | | | | |
| *$I_C$ = 0.5A; $V_{CE}$ = 3V* | $h_{FE}$* | *min.* | | *1.0* | | |
| *$I_C$ = 3A; $V_{CE}$ = 3V* | | *min.* | | *1.0* | | |
| *Small signal current gain* | | | | | | |
| *$I_C$ = 3A; $V_{CE}$ = 4V; f = 1 MHz* | $\|h_{fe}\|$ | *min.* | | *4.0* | | |
| *Output capacitance at f = 0.1 MHz* | | | | | | |
| *$I_E$ = 0; $V_{CB}$ = 10V* ***PNP*** | $C_o$ | *max.* | | *300* | | *pF* |
| ***NPN*** | $C_o$ | *max.* | | *200* | | *pF* |

* *Pulse test: pulse width ≤ 300 µs; duty cycle ≤ 2%.*