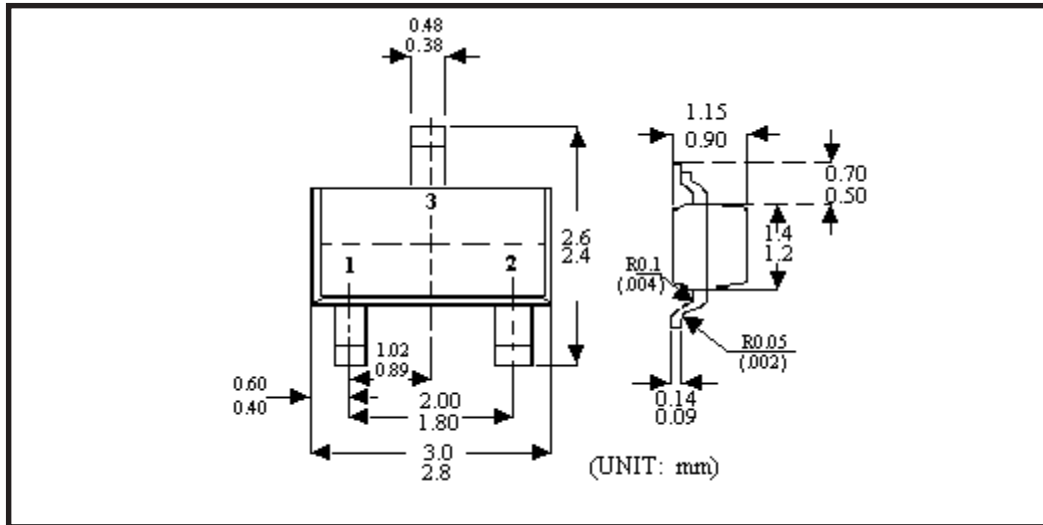


**RECTRON****SEMICONDUCTOR**

TECHNICAL SPECIFICATION

See below  
for  
Part #

## SOT-23 - Power Transistor and Darlington



### Maximum Ratings      Electrical Characteristics (at Ta = 25°C unless otherwise specified)

| Part # | Polarity | V <sub>CBO</sub><br>(V)<br>Min | V <sub>CEO</sub><br>(V)<br>Min | V <sub>EBO</sub><br>(V)<br>Min | P <sub>D</sub><br>(W)<br>@ 25 °C | I <sub>C</sub><br>(A) | I <sub>CBO</sub><br>(uA)<br>Max | @ V <sub>CB</sub> | h <sub>FE</sub><br>Min | h <sub>FE</sub><br>Max | @ I <sub>C</sub><br>(A) | V <sub>CE</sub><br>(V) | V <sub>CE(SAT)</sub><br>(V)<br>Max | V <sub>BE(SAT)</sub><br>(V)<br>min - max | @ I <sub>C</sub><br>(A) | f <sub>T</sub><br>(MHz)<br>Min | @ I <sub>C</sub><br>(mA) |
|--------|----------|--------------------------------|--------------------------------|--------------------------------|----------------------------------|-----------------------|---------------------------------|-------------------|------------------------|------------------------|-------------------------|------------------------|------------------------------------|------------------------------------------|-------------------------|--------------------------------|--------------------------|
| *BC807 | PNP      | 50 <sup>1</sup>                | 45                             | 5                              | 0.25                             | 0.5                   | 100                             | 20                | 100                    | 600                    | 100                     | 1                      | 0.70                               |                                          | 500                     |                                | 10                       |
| *BC808 | PNP      | 30 <sup>1</sup>                | 25                             | 5                              | 0.25                             | 0.5                   | 100                             | 20                | 100                    | 600                    | 100                     | 1                      | 0.70                               |                                          | 500                     |                                | 10                       |
| *BC817 | NPN      | 50 <sup>1</sup>                | 45                             | 5                              | 0.25                             | 0.5                   | 100                             | 20                | 100                    | 600                    | 100                     | 1                      | 0.70                               |                                          | 500                     |                                | 10                       |
| *BC818 | NPN      | 30 <sup>1</sup>                | 25                             | 5                              | 0.25                             | 0.5                   | 100                             | 20                | 100                    | 600                    | 100                     | 1                      | 0.70                               |                                          | 500                     |                                | 10                       |
| *BC846 | NPN      | 80                             | 65                             | 6                              | 0.25                             | 0.1                   | 15                              | 30                | 110                    | 450                    | 2                       | 5                      | 0.60                               |                                          | 100                     |                                | 10                       |
| *BC847 | NPN      | 50                             | 45                             | 6                              | 0.25                             | 0.1                   | 15                              | 30                | 110                    | 800                    | 2                       | 5                      | 0.60                               |                                          | 100                     |                                | 10                       |
| *BC848 | NPN      | 30                             | 30                             | 5                              | 0.25                             | 0.1                   | 15                              | 30                | 110                    | 800                    | 2                       | 5                      | 0.60                               |                                          | 100                     |                                | 10                       |
| *BC849 | NPN      | 30                             | 30                             | 5                              | 0.25                             | 0.1                   | 15                              | 30                | 200                    | 800                    | 2                       | 5                      | 0.60                               |                                          | 100                     |                                | 10                       |
| *BC850 | NPN      | 50                             | 45                             | 5                              | 0.25                             | 0.1                   | 15                              | 30                | 200                    | 800                    | 2                       | 5                      | 0.60                               |                                          | 100                     |                                | 10                       |
| *BC856 | PNP      | 80                             | 65                             | 5                              | 0.25                             | 0.1                   | 15                              | 30                | 125                    | 475                    | 2                       | 5                      | 0.65                               |                                          | 100                     |                                | 10                       |
| *BC857 | PNP      | 50                             | 45                             | 5                              | 0.25                             | 0.1                   | 15                              | 30                | 125                    | 800                    | 2                       | 5                      | 0.65                               |                                          | 100                     |                                | 10                       |
| *BC858 | PNP      | 30                             | 30                             | 5                              | 0.25                             | 0.1                   | 15                              | 30                | 125                    | 800                    | 2                       | 5                      | 0.65                               |                                          | 100                     |                                | 10                       |
| *BC859 | PNP      | 30                             | 30                             | 5                              | 0.25                             | 0.1                   | 15                              | 30                | 125                    | 800                    | 2                       | 5                      | 0.65                               |                                          | 100                     |                                | 10                       |
| *BC860 | PNP      | 50                             | 45                             | 5                              | 0.25                             | 0.1                   | 15                              | 30                | 125                    | 800                    | 2                       | 5                      | 0.65                               |                                          | 100                     |                                | 10                       |
| BF820  | NPN      | 300                            | 300 <sup>2</sup>               | 5                              | 0.25                             | 0.05                  | 10                              | 200               | 50                     |                        | 25                      | 20                     | 0.60                               |                                          | 30                      |                                | 10                       |
| BF821  | PNP      | 300                            | 300 <sup>2</sup>               | 5                              | 0.25                             | 0.05                  | 10                              | 200               | 50                     |                        | 25                      | 20                     | 0.80                               |                                          | 30                      |                                | 10                       |
| BF822  | NPN      | 250                            | 250                            | 5                              | 0.25                             | 0.05                  | 10                              | 200               | 50                     |                        | 25                      | 20                     | 0.60                               |                                          | 30                      |                                | 10                       |
| BF823  | PNP      | 250                            | 250                            | 5                              | 0.25                             | 0.05                  | 10                              | 200               | 50                     |                        | 25                      | 20                     | 0.80                               |                                          | 30                      |                                | 10                       |
| BF840  | NPN      | 40                             | 40                             | 4                              | 0.25                             | 0.025                 | 100                             | 20                | 67                     | 222                    | 1                       | 10                     |                                    |                                          |                         | 380                            | 1                        |
| BF841  | NPN      | 40                             | 40                             | 4                              | 0.25                             | 0.025                 | 100                             | 20                | 36                     | 125                    | 1                       | 10                     |                                    |                                          |                         | 380                            | 1                        |

\* $h_{FE}$     <sup>1</sup> $V_{CES}$     <sup>2</sup> $V_{CER}$     <sup>3</sup> $I_{CEX}$     <sup>4</sup>MIN    <sup>5</sup>MAX

| Part #    | Polarity | V <sub>CBO</sub><br>(V)<br>Min | V <sub>CEO</sub><br>(V)<br>Min | V <sub>EBO</sub><br>(V)<br>Min | P <sub>D</sub><br>(W) | I <sub>C</sub><br>(A) | I <sub>CBO</sub><br>(uA)<br>Max | @ V <sub>CB</sub><br>(V) | h <sub>FE</sub><br>Min | h <sub>FE</sub> @<br>Max | I <sub>C</sub><br>(A) | V <sub>CE</sub><br>(V) | V <sub>CE(SAT)</sub><br>(V)<br>Max | V <sub>BE(SAT)</sub><br>(V)<br>Mn-Mx   | @ I <sub>C</sub><br>(mA) | f <sub>T</sub><br>(MHz) | @ I <sub>C</sub><br>(mA) |
|-----------|----------|--------------------------------|--------------------------------|--------------------------------|-----------------------|-----------------------|---------------------------------|--------------------------|------------------------|--------------------------|-----------------------|------------------------|------------------------------------|----------------------------------------|--------------------------|-------------------------|--------------------------|
| CMBT918   | NPN      | 30                             | 15                             | 3                              | 0.225                 | 0.35                  | 50                              | 15                       | 20                     |                          | 3                     | 1                      | 0.40                               | -<br>1.00 <sup>4</sup>                 | 10                       | -                       | 4                        |
| CMBT2222A | NPN      | 75                             | 40                             | 6                              | 0.25                  | 0.6                   | 10                              | 60                       | 100                    | 300                      | 150                   | 10                     | 0.30                               | 0.60 <sup>4</sup><br>1.20 <sup>5</sup> | 150                      | -                       | 20                       |
| CMBT2907A | PNP      | 60                             | 60                             | 5                              | 0.25                  | 0.6                   | 10                              | 50                       | 100                    | 300                      | 150                   | 10                     | 0.40                               | -<br>1.30 <sup>5</sup>                 | 150                      | -                       | 50                       |
| CMBT3904  | NPN      | 60                             | 40                             | 6                              | 0.25                  | 0.2                   | 50 <sup>3</sup>                 | 30                       | 100                    | 300                      | 10                    | 1                      | 0.20                               | 0.65 <sup>4</sup><br>0.85 <sup>5</sup> | 10                       | -                       | 10                       |
| CMBT3906  | PNP      | 40                             | 40                             | 5                              | 0.25                  | 0.2                   | 50 <sup>3</sup>                 | 30                       | 100                    | 300                      | 10                    | 1                      | 0.25                               | 0.65 <sup>4</sup><br>0.85 <sup>5</sup> | 10                       | -                       | 10                       |
| CMBT4401  | NPN      | 60                             | 40                             | 6                              | 0.25                  | 0.6                   | 100 <sup>3</sup>                | 35                       | 100                    | 300                      | 150                   | 1                      | 0.40                               | 0.75 <sup>4</sup><br>0.95 <sup>5</sup> | 150                      | -                       | 20                       |
| CMBT4403  | PNP      | 40                             | 40                             | 5                              | 0.25                  | 0.6                   | 100 <sup>3</sup>                | 35                       | 100                    | 300                      | 150                   | 2                      | 0.40                               | 0.75 <sup>4</sup><br>0.95 <sup>5</sup> | 150                      | -                       | 20                       |
| CMBT5401  | PNP      | 160                            | 150                            | 5                              | 0.25                  | 0.5                   | 50                              | 120                      | 60                     | 240                      | 10                    | 5                      | 0.20                               | -<br>1.00 <sup>5</sup>                 | 10                       | 300 <sup>5</sup>        | 10                       |
| CMBT5551  | NPN      | 180                            | 160                            | 6                              | 0.25                  | 0.6                   | 50                              | 120                      | 80                     | 250                      | 10                    | 5                      | 0.15                               | -<br>1.00 <sup>5</sup>                 | 10                       | 300 <sup>5</sup>        | 10                       |
| CMBTA05   | NPN      | 60                             | 60                             | 4                              | 0.25                  | 0.5                   | 100                             | 60                       | 100                    | -                        | 100                   | 1                      | 0.25                               | -                                      | 100                      | -                       | 10                       |
| CMBTA06   | NPN      | 80                             | 80                             | 4                              | 0.25                  | 0.5                   | 100                             | 80                       | 100                    | -                        | 100                   | 1                      | 0.25                               | -                                      | 100                      | -                       | 10                       |
| CMBTA13   | NPN      | 30                             | 30 <sup>1</sup>                | 10                             | 0.25                  | 0.3                   | 100                             | 30                       | 10k                    | -                        | 100                   | 5                      | 1.50                               | -                                      | 100                      | -                       | 10                       |
| CMBTA14   | NPN      | 30                             | 30 <sup>1</sup>                | 10                             | 0.25                  | 0.3                   | 100                             | 30                       | 20k                    | -                        | 100                   | 5                      | 1.50                               | -<br>-                                 | 100                      | -                       | 10                       |
| CMBTA42   | NPN      | 300                            | 300                            | 6                              | 0.25                  | 0.5                   | 100                             | 200                      | 40                     | -                        | 10                    | 10                     | 0.50                               | -<br>0.90 <sup>5</sup>                 | 20                       | -                       | 10                       |
| CMBTA55   | PNP      | 60                             | 60                             | 4                              | 0.25                  | 0.5                   | 100                             | 60                       | 100                    | -                        | 100                   | 1                      | 0.25                               | -                                      | 100                      | -                       | 100                      |
| CMBTA56   | PNP      | 80                             | 80                             | 4                              | 0.25                  | 0.5                   | 100                             | 80                       | 100                    | -                        | 100                   | 1                      | 0.25                               | -                                      | 100                      | -                       | 100                      |
| CMBTA92   | PNP      | 300                            | 300                            | 5                              | 0.25                  | 0.5                   | 250                             | 200                      | 40                     | -                        | 10                    | 10                     | 0.50                               | -<br>0.90 <sup>5</sup>                 | 20                       | -                       | 10                       |
| CMMT451   | NPN      | 80                             | 60                             | 5                              | 0.5                   | 1.0                   | 100                             | 60                       | 50                     | 150                      | 150                   | 10                     | 0.35                               | -<br>1.10 <sup>5</sup>                 | 150                      | -                       | 50                       |
| CMMT491   | NPN      | 80                             | 60                             | 5                              | 0.5                   | 1.0                   | 100                             | 60                       | 100                    | 300                      | 500                   | 5                      | 0.25                               | -                                      | 500                      | -                       | 50                       |
| CMMT551   | PNP      | 80                             | 60                             | 5                              | 0.5                   | 1.0                   | 100                             | 60                       | 50                     | 150                      | 150                   | 10                     | 0.35                               | -<br>1.10 <sup>5</sup>                 | 150                      | -                       | 50                       |
| CMMT591   | PNP      | 80                             | 60                             | 5                              | 0.5                   | 1.0                   | 100                             | 60                       | 100                    | 300                      | 500                   | 5                      | 0.30                               | -                                      | 500                      | -                       | 50                       |
| CSA1162GR | PNP      | 50                             | 50                             | 5                              | 0.15                  | 0.15                  | 100                             | 50                       | 200                    | 400                      | 2                     | 6                      | 0.30                               | -                                      | 100                      | -                       | 1                        |
| CSA1362GR | PNP      | 15                             | 15                             | 5                              | 0.2                   | 0.80                  | 100                             | 15                       | 200                    | 400                      | 100                   | 1                      | 0.25                               | -                                      | 400                      | 120 <sup>4</sup>        | 10                       |
| CSC2712GR | NPN      | 60                             | 50                             | 5                              | 0.15                  | 0.15                  | 100                             | 60                       | 200                    | 400                      | 2                     | 6                      | 0.25                               | -                                      | 100                      | -                       | 1                        |
| CSD1306E  | NPN      | 30                             | 15                             | 5                              | 0.2                   | 0.70                  | 100-<br>0                       | 20                       | 400                    | 800                      | 150                   | 1                      | 0.50                               | -                                      | 500                      | 250 <sup>4</sup>        | 150                      |

<sup>1</sup>I<sub>CEO</sub>    <sup>2</sup>I<sub>CBO</sub>    <sup>3</sup>V<sub>CES</sub>    <sup>4</sup>I<sub>CER</sub>    <sup>5</sup>f<sub>T</sub> Typical Values

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