

# TO-92 Plastic Package Transistors (PNP)

| Maximum Ratings |                             |                             |                             |                                |                    | Electrical Characteristics (Ta=25°C, Unless Otherwise Specified) |                          |                              |                          |                        |          |                          |                     |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|-----------------|-----------------------------|-----------------------------|-----------------------------|--------------------------------|--------------------|------------------------------------------------------------------|--------------------------|------------------------------|--------------------------|------------------------|----------|--------------------------|---------------------|---------------------------------|---------------------------------|----------------------------|-----------------------------|-----------------------------|----------|----------------------------|-----------------------------|----------------------------|----------------------|----------------------------|-----------------|---------|
| Type No.        | V <sub>CBO</sub> (V)<br>Min | V <sub>CEO</sub> (V)<br>Min | V <sub>EBO</sub> (V)<br>Min | P <sub>D</sub> (W)<br>@Tc=25°C | I <sub>C</sub> (A) | I <sub>CBO</sub> (μA)<br>Max                                     | V <sub>CB</sub> (V)<br>@ | I <sub>CES</sub> (μA)<br>Max | V <sub>CE</sub> (V)<br>@ | h <sub>FE</sub><br>Min | β<br>Max | I <sub>C</sub> &<br>(mA) | V <sub>CE</sub> (V) | V <sub>CE(SAT)</sub> (V)<br>Max | V <sub>BE(SAT)</sub> (V)<br>Min | I <sub>C</sub> (mA)<br>Max | C <sub>ob</sub> (pF)<br>Typ | f <sub>T</sub> (MHz)<br>Min | β<br>Typ | I <sub>C</sub> (mA)<br>Max | t <sub>on</sub> (ns)<br>Max | N <sub>F</sub> (dB)<br>Max | Q<br>@ Freq<br>(MHz) | C <sub>m</sub> (pF)<br>Max | CDIL Case Style |         |
| BC369           | 25                          | 20                          | 5                           | 0.8                            | 1                  | 10                                                               | 25                       |                              |                          | 50                     |          | 5                        | 10                  | 0.5                             |                                 | 1000                       |                             | 45                          | 65       |                            | 10                          |                            |                      |                            |                 | TO-92-1 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 85                     | 375      | 500                      | 10                  |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 60                     |          | 1000                     | 1                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC415           | 45                          | 35                          | 5                           | 0.35                           | 0.1                | 0.015                                                            | 30                       |                              |                          | 100                    |          | 0.01                     | 5                   | 0.25                            |                                 | 10                         |                             |                             | 250      |                            | 10                          |                            | 2                    |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 180                    | 800      | 2                        | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC415B          | 45                          | 35                          | 5                           | 0.35                           | 0.1                | 0.015                                                            | 30                       |                              |                          | 100                    |          | 0.01                     | 5                   | 0.25                            |                                 | 10                         | 2.5                         |                             | 250      |                            | 10                          |                            | 2 <sup>ON</sup>      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 180                    | 460      | 2                        | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC415C          | 45                          | 35                          | 5                           | 0.35                           | 0.1                | 0.015                                                            | 30                       |                              |                          | 100                    |          | 0.01                     | 5                   | 0.25                            |                                 | 10                         | 2.5                         |                             | 250      |                            | 10                          |                            | 2                    |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 380                    | 800      | 2                        | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC416           | 50                          | 45                          | 5                           | 0.35                           | 0.1                | 0.015                                                            | 30                       |                              |                          | 120                    | 800      | 2                        | 5                   | 0.25                            |                                 | 10                         | 2.5                         |                             | 250      |                            | 10                          |                            | 2                    |                            |                 | TO-92-4 |
| BC416B          | 50                          | 45                          | 5                           | 0.35                           | 0.1                | 0.015                                                            | 30                       |                              |                          | 100                    |          | 0.01                     | 5                   | 0.25                            |                                 | 10                         | 2.5                         |                             | 250      |                            | 10                          |                            | 2                    |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 180                    | 460      | 2                        | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC416C          | 50                          | 45                          | 5                           | 0.35                           | 0.1                | 0.015                                                            | 30                       |                              |                          | 100                    |          | 0.01                     | 5                   | 0.25                            |                                 | 10                         | 2.5                         |                             | 250      |                            | 10                          |                            | 2                    |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 380                    | 800      | 2                        | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC446           | 60                          | 60                          | 5                           | 0.625                          | 0.3                | 0.1                                                              | 40                       |                              |                          | 50                     | 460      | 2                        | 5                   | 0.25                            |                                 | 100                        |                             |                             | 100      |                            | 50                          |                            |                      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 50                     |          | 10                       | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 50                     |          | 100                      | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC446A          | 60                          | 60                          | 5                           | 0.625                          | 0.3                | 0.1                                                              | 40                       |                              |                          | 120                    | 220      | 2                        | 5                   | 0.25                            |                                 | 100                        |                             |                             | 100      |                            | 50                          |                            |                      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 100                    |          | 10                       | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 60                     |          | 100                      | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC446B          | 60                          | 60                          | 5                           | 0.625                          | 0.3                | 0.1                                                              | 40                       |                              |                          | 180                    | 460      | 2                        | 5                   | 0.25                            |                                 | 100                        |                             |                             | 100      |                            | 50                          |                            |                      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 160                    |          | 10                       | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 90                     |          | 100                      | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC448           | 80                          | 80                          | 5                           | 0.625                          | 0.3                | 0.1                                                              | 60                       |                              |                          | 50                     | 460      | 2                        | 5                   | 0.25                            |                                 | 100                        |                             |                             | 100      |                            | 50                          |                            |                      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 50                     |          | 10                       | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 50                     |          | 100                      | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC448A          | 80                          | 80                          | 5                           | 0.625                          | 0.3                | 0.1                                                              | 60                       |                              |                          | 120                    | 220      | 2                        | 5                   | 0.25                            |                                 | 100                        |                             |                             | 100      |                            | 50                          |                            |                      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 100                    |          | 10                       | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 60                     |          | 100                      | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC448B          | 80                          | 80                          | 5                           | 0.625                          | 0.1                | 0.1                                                              | 60                       |                              |                          | 460                    |          | 2                        | 5                   | 0.25                            |                                 | 100                        |                             |                             | 100      |                            | 50                          |                            |                      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 160                    |          | 10                       | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 90                     |          | 100                      | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC450           | 100                         | 100                         | 5                           | 0.625                          | 0.3                | 0.1                                                              | 80                       |                              |                          | 50                     | 460      | 2                        | 5                   | 0.25                            |                                 | 100                        |                             |                             | 100      |                            | 50                          |                            |                      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 50                     |          | 10                       | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 50                     |          | 100                      | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC450A          | 100                         | 100                         | 5                           | 0.625                          | 0.3                | 0.1                                                              | 80                       |                              |                          | 120                    | 220      | 2                        | 5                   | 0.25                            |                                 | 100                        |                             |                             | 100      |                            | 50                          |                            |                      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 100                    |          | 10                       | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 60                     |          | 100                      | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC450B          | 100                         | 100                         | 5                           | 0.625                          | 0.3                | 0.1                                                              | 80                       |                              |                          | 180                    | 460      | 2                        | 5                   | 0.25                            |                                 | 100                        |                             |                             | 100      |                            | 50                          |                            |                      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 160                    |          | 10                       | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 90                     |          | 100                      | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC486           | 45                          | 45                          | 4                           | 0.625                          | 1                  | 0.1                                                              | 30                       |                              |                          | 40                     |          | 10                       | 2                   | 0.5                             |                                 | 1.2                        | 500                         | 9                           |          | 150                        |                             | 50                         |                      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 60                     | 400      | 100                      | 2                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 15                     |          | 1000                     | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC486A          | 45                          | 45                          | 4                           | 0.625                          | 1                  | 0.1                                                              | 30                       |                              |                          | 40                     |          | 10                       | 2                   | 0.5                             |                                 | 1.2                        | 500                         | 9                           |          | 150                        |                             | 50                         |                      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 100                    | 250      | 100                      | 2                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 15                     |          | 1000                     | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
| BC486B          | 45                          | 45                          | 4                           | 0.625                          | 1                  | 0.1                                                              | 30                       |                              |                          | 40                     |          | 10                       | 2                   | 0.5                             |                                 | 1.2                        | 500                         | 9                           |          | 150                        |                             | 50                         |                      |                            |                 | TO-92-4 |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 160                    | 400      | 100                      | 2                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |
|                 |                             |                             |                             |                                |                    |                                                                  |                          |                              |                          | 15                     |          | 1000                     | 5                   |                                 |                                 |                            |                             |                             |          |                            |                             |                            |                      |                            |                 |         |