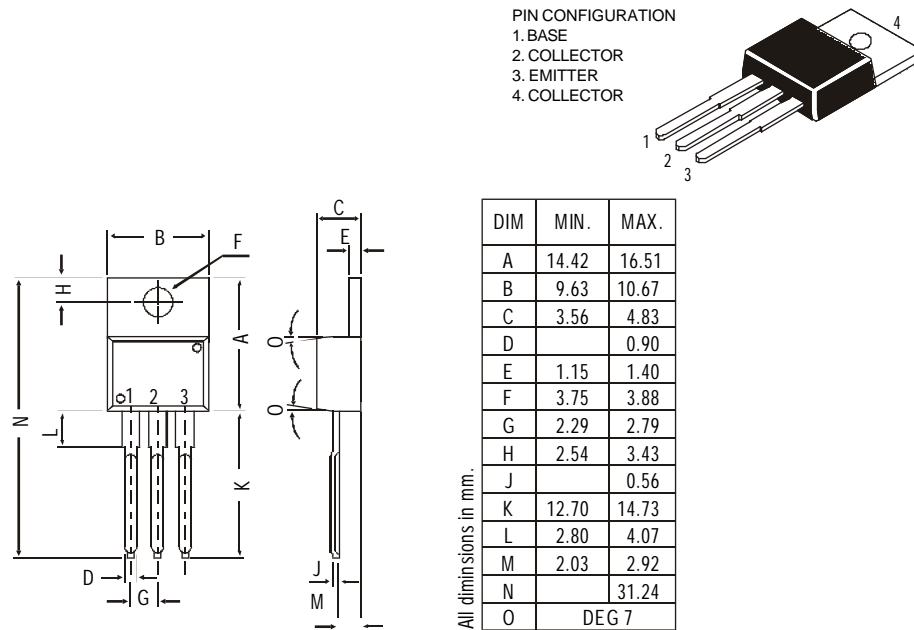


TO-220 Plastic Package

**BD239, BD239A, BD239B, BD239C
BD240, BD240A, BD240B, BD240C**

*BD239, 239A, 239B, 239C NPN PLASTIC POWER TRANSISTORS
BD240, 240A, 240B, 240C PNP PLASTIC POWER TRANSISTORS
General Purpose Amplifier and Switching Applications*



ABSOLUTE MAXIMUM RATINGS

| | | 239 | 239A | 239B | 239C | |
|--|-------------|------------|-------------|-------------|-------------|------------|
| | | 240 | 240A | 240B | 240C | |
| Collector-base voltage (open emitter) | V_{CBO} | max. 55 | 70 | 90 | 115 | V |
| Collector-emitter voltage (open base) | V_{CEO} | max. 45 | 60 | 80 | 100 | V |
| Collector current | I_C | max. | | 2.0 | | A |
| Total power dissipation up to $T_C = 25^\circ C$ | P_{tot} | max. | | 30 | | W |
| Junction temperature | T_j | max. | | 150 | | $^\circ C$ |
| Collector-emitter saturation voltage $I_C = 1 A; I_B = 0.2 A$ | V_{CEsat} | max. | | 0.7 | | V |
| D.C. current gain $I_C = 0.2 A; V_{CE} = 4 V$ | h_{FE} | min. | | 40 | | |

RATINGS (at $T_A=25^\circ C$ unless otherwise specified)

| | | 239 | 239A | 239B | 239C | |
|---------------------------------------|-----------|------------|-------------|-------------|-------------|---|
| | | 240 | 240A | 240B | 240C | |
| Collector-base voltage (open emitter) | V_{CBO} | max. 55 | 70 | 90 | 115 | V |
| Collector-emitter voltage (open base) | V_{CEO} | max. 45 | 60 | 80 | 100 | V |
| Emitter-base voltage (open collector) | V_{EBO} | max. | | 5.0 | | V |

**BD239, BD239A, BD239B, BD239C
BD240, BD240A, BD240B, BD240C**

| | | | | |
|---|-----------|------|-------------|--------------------|
| Collector current | I_C | max. | 2.0 | A |
| Collector current (Peak value) | I_{CM} | max. | 4.0 | A |
| Base current | I_B | max. | 0.6 | A |
| Total power dissipation upto $T_A=25^\circ\text{C}$ | P_{tot} | max. | 2.0 | W |
| Derate above 25°C | | max. | 0.016 | W $^\circ\text{C}$ |
| Total power dissipation upto $T_C=25^\circ\text{C}$ | P_{tot} | max. | 30 | W |
| Derate above 25°C | | max. | 0.24 | W $^\circ\text{C}$ |
| Junction temperature | T_j | max. | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | | -65 to +150 | $^\circ\text{C}$ |

THERMAL RESISTANCE

| | | | | |
|--------------------------|-------------|--|-------|--------------------|
| From junction to case | R_{thj-c} | | 4.167 | $^\circ\text{C/W}$ |
| From junction to ambient | R_{thj-a} | | 62.5 | $^\circ\text{C/W}$ |

CHARACTERISTICS

$T_{amb} = 25^\circ\text{C}$ unless otherwise specified

| | | | 239 | 239A | 239B | 239C | |
|--|------------------|------|------------|-------------|-------------|-------------|-----|
| | | | 240 | 240A | 240B | 240C | |
| Collector cutoff current | | | | | | | |
| $I_B = 0; V_{CE} = 30\text{ V}$ | I_{CEO} | max. | 0.3 | 0.3 | - | - | mA |
| $I_B = 0; V_{CE} = 60\text{ V}$ | I_{CEO} | max. | - | - | 0.3 | 0.3 | mA |
| $V_{BE} = 0; V_{CE} = V_{CEO}$ | I_{CES} | max. | | 0.2 | | | mA |
| Emitter cut-off current | | | | | | | |
| $I_C = 0; V_{EB} = 5\text{ V}$ | I_{EBO} | max. | | 1.0 | | | mA |
| Breakdown voltages | | | | | | | |
| $I_C = 30\text{ mA}; I_B = 0$ | $V_{CEO(sus)}^*$ | min. | 45 | 60 | 80 | 100 | V |
| $I_C = 1\text{ mA}; I_E = 0$ | V_{CBO} | min. | 55 | 70 | 90 | 115 | V |
| $I_E = 1\text{ mA}; I_C = 0$ | V_{EBO} | min. | | 5.0 | | | V |
| Saturation voltage | | | | | | | |
| $I_C = 1\text{ A}; I_B = 0.2\text{ A}$ | V_{CEsat}^* | max. | | 0.7 | | | V |
| Base emitter on voltage | | | | | | | |
| $I_C = 1\text{ A}; V_{CE} = 4\text{ V}$ | $V_{BE(on)}^*$ | max. | | 1.3 | | | V |
| D.C. current gain | | | | | | | |
| $I_C = 0.2\text{ A}; V_{CE} = 4\text{ V}$ | h_{FE}^* | min. | | 40 | | | |
| $I_C = 1\text{ A}; V_{CE} = 4\text{ V}$ | h_{FE}^* | min. | | 15 | | | |
| Small signal current gain | | | | | | | |
| $I_C = 0.2\text{ A}; V_{CE} = 10\text{ V}; f = 1\text{ KHz}$ | h_{fe} | min. | | 20 | | | |
| Transition frequency | | | | | | | |
| $I_C = 0.2\text{ A}; V_{CE} = 10\text{ V}; f = 1\text{ MHz}$ | $f_T(1)$ | min. | | 3 | | | MHz |

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

(1) $f_T = |h_{fe}| \cdot f_{test}$

Notes

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Discrete Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished on the CDIL Web Site/ CD is believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Discrete Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

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