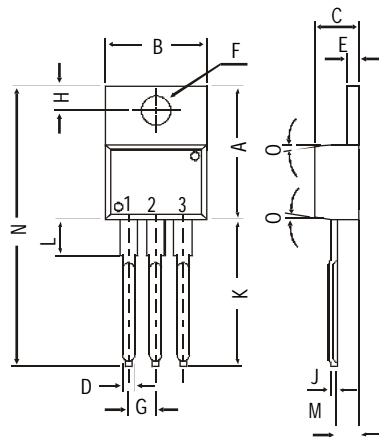
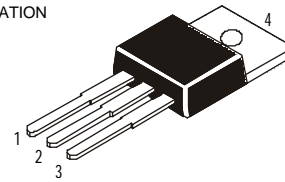


**TO-220 Plastic Package**

**BD949, BD951, BD953, BD955  
BD950, BD952, BD954, BD956**

*BD949, 951, 953, 955 NPN PLASTIC POWER TRANSISTORS*  
*BD950, 952, 954, 956 PNP PLASTIC POWER TRANSISTORS*  
*Power Amplifier and Switching Applications*

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



| 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 |       |

All dimensions in mm.

**ABSOLUTE MAXIMUM RATINGS**

|   |             | <b>949</b> | <b>951</b> | <b>953</b> | <b>955</b> |            |
|---|-------------|------------|------------|------------|------------|------------|
|   |             | <b>950</b> | <b>952</b> | <b>954</b> | <b>956</b> |            |
| Collector-base voltage (open emitter)               | $V_{CBO}$   | max. 60    | 80         | 100        | 120        | V          |
| Collector-emitter voltage (open base)               | $V_{CEO}$   | max. 60    | 80         | 100        | 120        | V          |
| Collector current                                   | $I_C$       | max.       |            | 5.0        |            | A          |
| Total power dissipation up to $T_{mb} = 25^\circ C$ | $P_{tot}$   | max.       |            | 40         |            | W          |
| Junction temperature                                | $T_j$       | max.       |            | 150        |            | $^\circ C$ |
| Collector-emitter saturation voltage                |             |            |            |            |            |            |
| $I_C = 2 A; I_B = 0.2 A$                            | $V_{CEsat}$ | max.       |            | 1.0        |            | V          |
| D.C. current gain                                   |             |            |            |            |            |            |
| $I_C = 2 A; V_{CE} = 4 V$                           | $h_{FE}$    | min.       |            | 20         |            |            |

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

|                                       |           | <b>949</b> | <b>951</b> | <b>953</b> | <b>955</b> |   |
|---------------------------------------|-----------|------------|------------|------------|------------|---|
|                                       |           | <b>950</b> | <b>952</b> | <b>954</b> | <b>956</b> |   |
| Limiting values                       |           |            |            |            |            |   |
| Collector-base voltage (open emitter) | $V_{CBO}$ | max. 60    | 80         | 100        | 120        | V |
| Collector-emitter voltage (open base) | $V_{CEO}$ | max. 60    | 80         | 100        | 120        | V |
| Emitter-base voltage (open collector) | $V_{EBO}$ | max.       |            | 5.0        |            | V |
| Collector current                     | $I_C$     | max.       |            | 5.0        |            | A |

**BD949, BD951, BD953, BD955  
BD950, BD952, BD954, BD956**

|   |           |      |             |             |
|---|-----------|------|-------------|-------------|
| Collector current (Peak value)                    | $I_{CM}$  | max. | 8.0         | A           |
| Total power dissipation upto $T_{mb}=25^{\circ}C$ | $P_{tot}$ | max. | 40          | W           |
| Junction temperature                              | $T_j$     | max. | 150         | $^{\circ}C$ |
| Storage temperature                               | $T_{stg}$ |      | -65 to +150 | $^{\circ}C$ |

**THERMAL RESISTANCE**

|                                |                |  |      |     |
|--------------------------------|----------------|--|------|-----|
| From junction to ambient       | $R_{th\ j-a}$  |  | 70   | K/W |
| From junction to mounting base | $R_{th\ j-mb}$ |  | 3.12 | K/W |

**CHARACTERISTICS**

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

|   |                |      | <b>949</b> | <b>951</b> | <b>953</b> | <b>955</b> |         |
|---|----------------|------|------------|------------|------------|------------|---------|
|   |                |      | <b>950</b> | <b>952</b> | <b>954</b> | <b>956</b> |         |
| Collector cutoff current                                    |                |      |            |            |            |            |         |
| $I_E = 0; V_{CB} = V_{CBO}$                                 | $I_{CBO}$      | max. |            | 50         |            |            | $\mu A$ |
| $I_E = 0; V_{CB} = \frac{1}{2} V_{CBO}; T_j = 150^{\circ}C$ | $I_{CBO}$      | max. |            | 1.0        |            |            | mA      |
| $I_B = 0; V_{CE} = \frac{1}{2} V_{CEO}$                     | $I_{CEO}$      | max. |            | 0.1        |            |            | mA      |
| Emitter cut-off current                                     |                |      |            |            |            |            |         |
| $I_C = 0; V_{EB} = 5\ V$                                    | $I_{EBO}$      | max. |            | 0.2        |            |            | mA      |
| Breakdown voltages  |                |      |            |            |            |            |         |
| $I_C = 1\ mA; I_B = 0$                                      | $V_{CEO}$      | min. | 60         | 80         | 100        | 120        | V       |
| $I_C = 1\ mA; I_E = 0$                                      | $V_{CBO}$      | min. | 60         | 80         | 100        | 120        | V       |
| $I_E = 1\ mA; I_C = 0$                                      | $V_{EBO}$      | min. |            | 5.0        |            |            | V       |
| Saturation voltage  |                |      |            |            |            |            |         |
| $I_C = 2\ A; I_B = 0.2\ A$                                  | $V_{CEsat}^*$  | max. |            | 1.0        |            |            | V       |
| Base emitter on voltage                                     |                |      |            |            |            |            |         |
| $I_C = 2\ A; V_{CE} = 4\ V$                                 | $V_{BE(on)}^*$ | max. |            | 1.4        |            |            | V       |
| D.C. current gain   |                |      |            |            |            |            |         |
| $I_C = 0.5\ A; V_{CE} = 4\ V$                               | $h_{FE}^*$     | min. |            | 40         |            |            |         |
| $I_C = 2\ A; V_{CE} = 4\ V$                                 | $h_{FE}^*$     | min. |            | 20         |            |            |         |
| Transition frequency  |                |      |            |            |            |            |         |
| $I_C = 0.5\ A; V_{CE} = 4\ V; f = 1\ MHz$                   | $f_T$          | min. |            | 3          |            |            | MHz     |

**Switching time**

$V_{CC} = 20\ V; I_C = 1\ A$   
 $I_{con} = 1A; I_{Bon} = -I_{Boff} = 0.1A$   
 $R_L = 20\ \Omega$

|               |            |           |      |     |         |
|---------------|------------|-----------|------|-----|---------|
| Turn on time  | <b>NPN</b> | $t_{on}$  | typ. | 0.3 | $\mu s$ |
| Turn off time | <b>NPN</b> | $t_{off}$ | typ. | 1.5 | $\mu s$ |
|               | <b>PNP</b> | $t_{on}$  | typ. | 0.1 | $\mu s$ |
|               | <b>PNP</b> | $t_{off}$ | typ. | 0.4 | $\mu s$ |

\* Measured under pulse conditions:  $t_p \leq 300\ \mu s$ ; duty cycle  $\leq 2\%$

## Notes

### Disclaimer

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