

# Silicon NPN Power Transistors

## BD543/A/B/C

### DESCRIPTION

- 70 W at 25°C Case Temperature
- Complement to Type BD544/A/B/C
- 8 A Continuous Collector Current

### APPLICATIONS

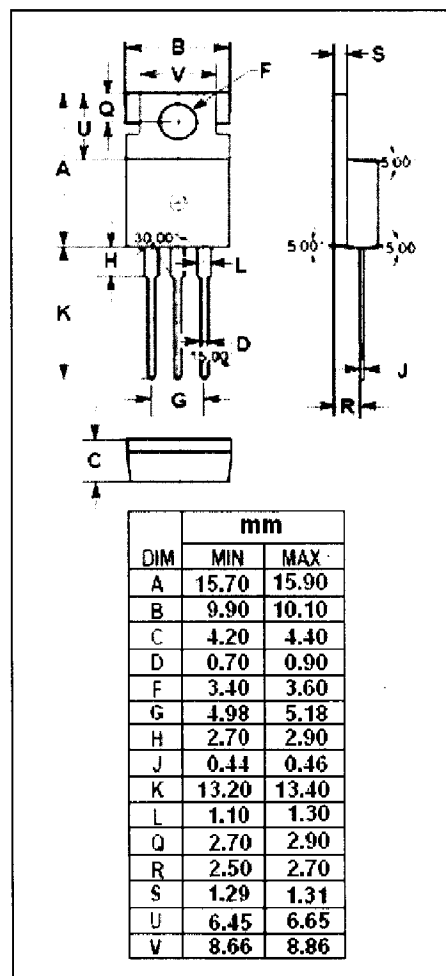
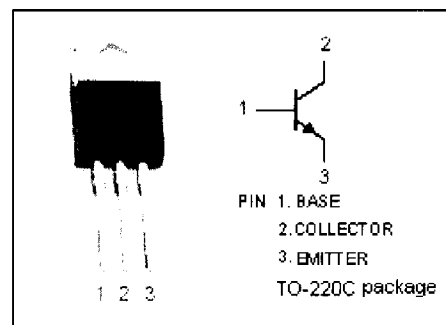
- Designed for high power audio amplifier applications.

### ABSOLUTE MAXIMUM RATINGS( $T_a=25^\circ\text{C}$ )

| SYMBOL    | PARAMETER                                               | VALUE   | UNIT             |
|-----------|---------------------------------------------------------|---------|------------------|
| $V_{CB0}$ | Collector-Base Voltage                                  | BD543   | 40               |
|           |                                                         | BD543A  | 60               |
|           |                                                         | BD543B  | 80               |
|           |                                                         | BD543C  | 100              |
| $V_{CE0}$ | Collector-Emitter Voltage                               | BD543   | 40               |
|           |                                                         | BD543A  | 60               |
|           |                                                         | BD543B  | 80               |
|           |                                                         | BD543C  | 100              |
| $V_{EB0}$ | Emitter-Base Voltage                                    | 5       | V                |
| $I_C$     | Collector Current-Continuous                            | 8       | A                |
| $I_{CM}$  | Collector Current-Peak                                  | 10      | A                |
| $P_C$     | Collector Power Dissipation<br>@ $T_C=25^\circ\text{C}$ | 70      | W                |
|           | Collector Power Dissipation<br>@ $T_a=25^\circ\text{C}$ | 2       |                  |
| $T_J$     | Junction Temperature                                    | 150     | $^\circ\text{C}$ |
| $T_{stg}$ | Storage Temperature Range                               | -65~150 | $^\circ\text{C}$ |

### THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                               | MAX  | UNIT               |
|---------------|-----------------------------------------|------|--------------------|
| $R_{th\ j-c}$ | Thermal Resistance, Junction to Case    | 4.17 | $^\circ\text{C/W}$ |
| $R_{th\ j-a}$ | Thermal Resistance, Junction to Ambient | 62.5 | $^\circ\text{C/W}$ |



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# BD543/A/B/C

## ELECTRICAL CHARACTERISTICS

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

| SYMBOL          | PARAMETER                            |          | CONDITIONS                            | MIN | TYP. | MAX | UNIT |
|-----------------|--------------------------------------|----------|---------------------------------------|-----|------|-----|------|
| $V_{(BR)CEO}$   | Collector-Emitter Breakdown Voltage  | BD543    | $I_C = 30\text{mA}; I_B = 0$          | 40  |      |     | V    |
|                 |                                      | BD543A   |                                       | 60  |      |     |      |
|                 |                                      | BD543B   |                                       | 80  |      |     |      |
|                 |                                      | BD543C   |                                       | 100 |      |     |      |
| $V_{CE(sat)-1}$ | Collector-Emitter Saturation Voltage |          | $I_C = 3\text{A}; I_B = 0.3\text{A}$  |     |      | 0.5 | V    |
| $V_{CE(sat)-2}$ | Collector-Emitter Saturation Voltage |          | $I_C = 5\text{A}; I_B = 1\text{A}$    |     |      | 0.5 | V    |
| $V_{CE(sat)-3}$ | Collector-Emitter Saturation Voltage |          | $I_C = 8\text{A}; I_B = 1.6\text{A}$  |     |      | 1.0 | V    |
| $V_{BE(on)}$    | Base-Emitter On Voltage              |          | $I_C = 5\text{A}; V_{CE} = 4\text{V}$ |     |      | 1.4 | V    |
| $I_{CES}$       | Collector Cutoff Current             | BD543    | $V_{CE} = 40\text{V}; V_{BE} = 0$     |     |      | 0.4 | mA   |
|                 |                                      | BD543A   | $V_{CE} = 60\text{V}; V_{BE} = 0$     |     |      | 0.4 |      |
|                 |                                      | BD543B   | $V_{CE} = 80\text{V}; V_{BE} = 0$     |     |      | 0.4 |      |
|                 |                                      | BD543C   | $V_{CE} = 100\text{V}; V_{BE} = 0$    |     |      | 0.4 |      |
| $I_{CEO}$       | Collector Cutoff Current             | BD543/A  | $V_{CE} = 30\text{V}; I_B = 0$        |     |      | 0.7 | mA   |
|                 |                                      | BD543B/C | $V_{CE} = 60\text{V}; I_B = 0$        |     |      |     |      |
| $I_{EBO}$       | Emitter Cutoff Current               |          | $V_{EB} = 5\text{V}; I_C = 0$         |     |      | 1   | mA   |
| $h_{FE-1}$      | DC Current Gain                      |          | $I_C = 1\text{A}; V_{CE} = 4\text{V}$ | 60  |      |     |      |
| $h_{FE-2}$      | DC Current Gain                      |          | $I_C = 3\text{A}; V_{CE} = 4\text{V}$ | 40  |      |     |      |
| $h_{FE-3}$      | DC Current Gain                      |          | $I_C = 5\text{A}; V_{CE} = 4\text{V}$ | 15  |      |     |      |

## Switching Times

|           |               |                                                                                                 |  |     |  |               |
|-----------|---------------|-------------------------------------------------------------------------------------------------|--|-----|--|---------------|
| $t_{on}$  | Turn-On Time  | $I_C = 6\text{A}; I_{B1} = -I_{B2} = 0.6\text{A};$<br>$V_{BE(off)} = -4\text{V}, R_L = 5\Omega$ |  | 0.6 |  | $\mu\text{s}$ |
| $t_{off}$ | Turn-Off Time |                                                                                                 |  | 1.0 |  | $\mu\text{s}$ |