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March 2011

# BDX53/A/B/C

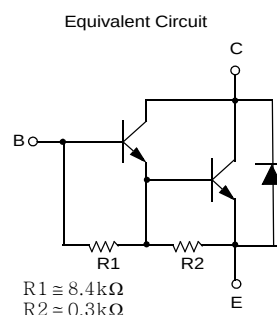
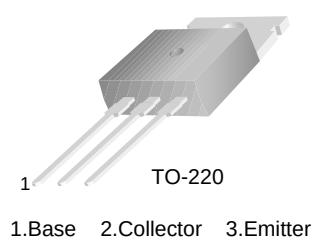
## NPN Epitaxial Silicon Transistor

### Applications

- Hammer Drivers, Audio Amplifiers Applications
- Power Liner and Switching Applications

### Features

- Power Darlington TR
- Complement to BDX54, BDX54A, BDX54B and BDX54C respectively



### Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ unless otherwise noted

| Symbol    | Parameter                                          | Value       | Units            |
|-----------|----------------------------------------------------|-------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage : BDX53                     | 45          | V                |
|           | : BDX53A                                           | 60          | V                |
|           | : BDX53B                                           | 80          | V                |
|           | : BDX53C                                           | 100         | V                |
| $V_{CEO}$ | Collector-Emitter Voltage : BDX53                  | 45          | V                |
|           | : BDX53A                                           | 60          | V                |
|           | : BDX53B                                           | 80          | V                |
|           | : BDX53C                                           | 100         | V                |
| $V_{EBO}$ | Emitter-Base Voltage                               | 5           | V                |
| $I_C$     | Collector Current (DC)                             | 8           | A                |
| $I_{CP}$  | *Collector Current (Pulse)                         | 12          | A                |
| $I_B$     | Base Current                                       | 0.2         | A                |
| $P_C$     | Collector Dissipation ( $T_C = 25^\circ\text{C}$ ) | 60          | W                |
| $T_J$     | Junction Temperature                               | 150         | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                                | - 65 to 150 | $^\circ\text{C}$ |

**Electrical Characteristics**  $T_C = 25^\circ\text{C}$  unless otherwise noted

| Symbol         | Parameter                                                                             | Test Condition                                                                                                                        | Min.                  | Typ.       | Max.                     | Units                                                            |
|----------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------|--------------------------|------------------------------------------------------------------|
| $V_{CEO(sus)}$ | * Collector-Emitter Sustaining Voltage<br>: BDX53<br>: BDX53A<br>: BDX53B<br>: BDX53C | $I_C = 100\text{mA}, I_B = 0$                                                                                                         | 45<br>60<br>80<br>100 |            |                          | V<br>V<br>V<br>V                                                 |
| $I_{CBO}$      | Collector Cut-off Current : BDX53<br>: BDX53A<br>: BDX53B<br>: BDX53C                 | $V_{CB} = 45\text{V}, I_E = 0$<br>$V_{CB} = 60\text{V}, I_E = 0$<br>$V_{CB} = 80\text{V}, I_E = 0$<br>$V_{CB} = 100\text{V}, I_E = 0$ |                       |            | 200<br>200<br>200<br>200 | $\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |
| $I_{CEO}$      | Collector Cut-off Current : BDX53<br>: BDX53A<br>: BDX53B<br>: BDX53C                 | $V_{CE} = 22\text{V}, I_B = 0$<br>$V_{CE} = 30\text{V}, I_B = 0$<br>$V_{CE} = 40\text{V}, I_B = 0$<br>$V_{CE} = 50\text{V}, I_B = 0$  |                       |            | 500<br>500<br>500<br>500 | $\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |
| $I_{EBO}$      | Emitter Cut-off Current                                                               | $V_{EB} = 5\text{V}, I_C = 0$                                                                                                         |                       |            | 2                        | mA                                                               |
| $h_{FE}$       | * DC Current Gain                                                                     | $V_{CE} = 3\text{V}, I_C = 3\text{A}$                                                                                                 | 750                   |            |                          |                                                                  |
| $V_{CE(sat)}$  | * Collector-Emitter Saturation Voltage                                                | $I_C = 3\text{A}, I_B = 12\text{mA}$                                                                                                  |                       |            | 2                        | V                                                                |
| $V_{BE(sat)}$  | * Base-Emitter Saturation Voltage                                                     | $I_C = 3\text{A}, I_B = 12\text{mA}$                                                                                                  |                       |            | 2.5                      | V                                                                |
| $V_F$          | * Parallel Diode Forward Voltage                                                      | $I_F = 3\text{A}$<br>$I_F = 8\text{A}$                                                                                                |                       | 1.8<br>2.5 | 2.5                      | V<br>V                                                           |

\* Pulse Test:  $PW=300\mu\text{s}$ , duty Cycle = 1.5% Pulsed

## Typical Performance Characteristics

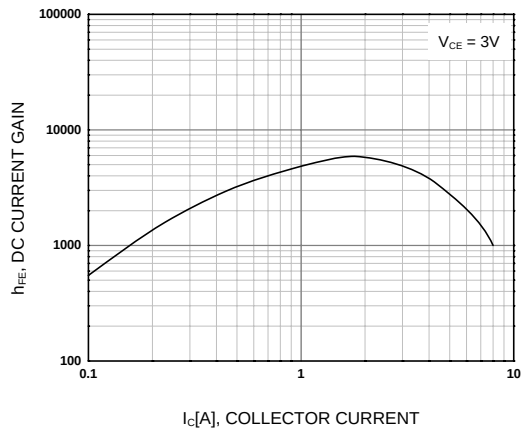


Figure 1. DC current Gain

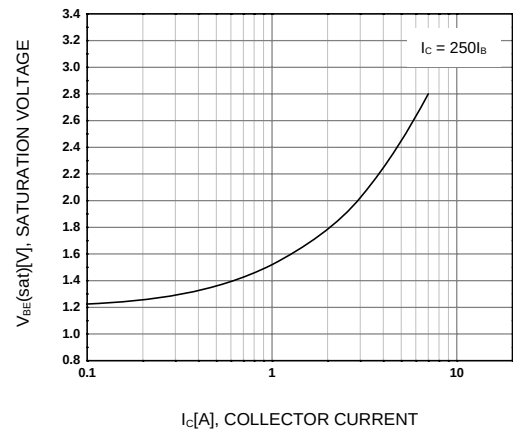


Figure 2. Base-Emitter Saturation Voltage

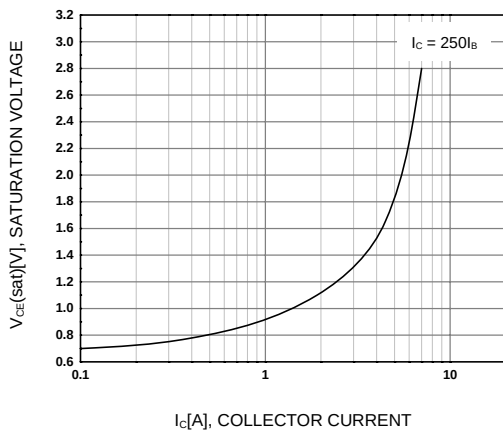


Figure 3. Collector-Emitter Saturation Voltage

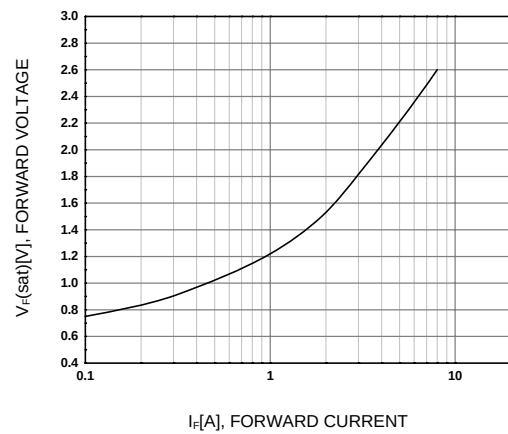


Figure 4. Damper Diode Forward Voltage

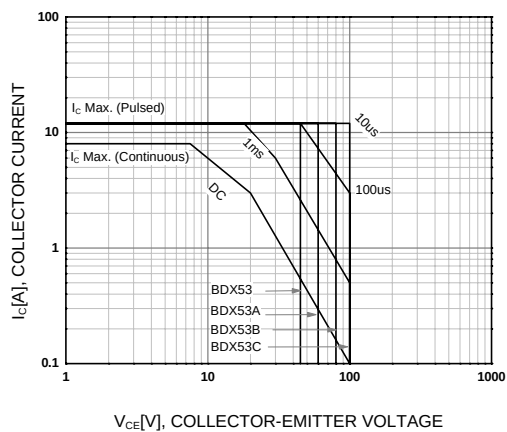


Figure 5. Safe Operating Area

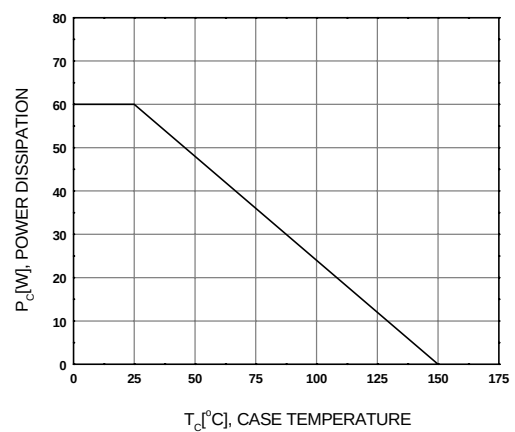
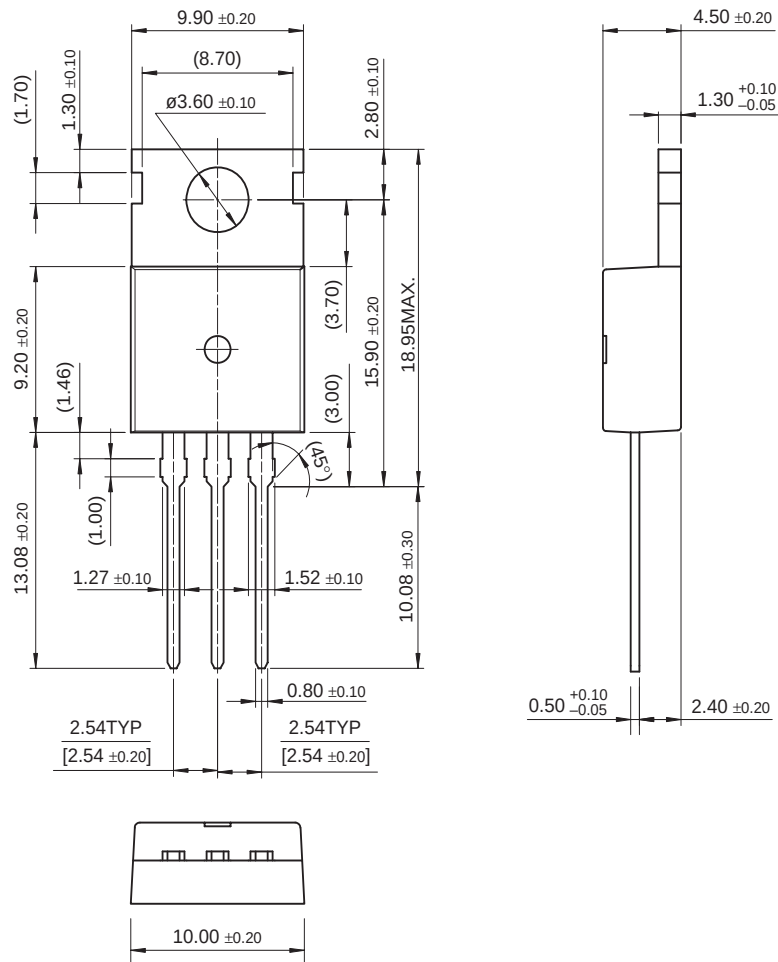


Figure 6. Power Derating

# Physical Dimensions

## TO-220



Dimensions in Millimeters



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| Current Transfer Logic™                                                                      | ISOPLANAR™                                                                                 |  ™                | TinyPower™                                                                                  |
| DEUXPEED®                                                                                    | MegaBuck™                                                                                  | Saving our world, 1mW/W/kW at a time™                                                              | TinyPWM™                                                                                    |
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| EcoSPARK®                                                                                    | MicroFET™                                                                                  | SmartMax™                                                                                          | TriFault Detect™                                                                            |
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| Fairchild Semiconductor®                                                                     | MotionMax™                                                                                 | SuperFET®                                                                                          | UHC®                                                                                        |
| FACT Quiet Series™                                                                           | Motion-SPM™                                                                                | SuperSOT™-3                                                                                        | Ultra FRFET™                                                                                |
| FACT®                                                                                        | mWSaver™                                                                                   | SuperSOT™-6                                                                                        | UniFET™                                                                                     |
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| FETBench™                                                                                    | OPTOPLANAR®                                                                                | SyncFET™                                                                                           | XS™                                                                                         |
| FlashWriter®*                                                                                |  PDP SPM™ | Sync-Lock™                                                                                         |                                                                                             |
| FPS™                                                                                         |                                                                                            |  SYSTEM GENERAL®* |                                                                                             |

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