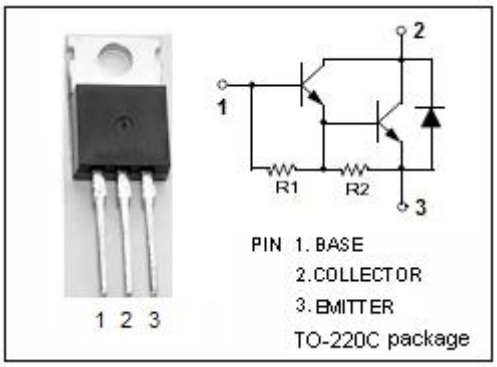
# isc Silicon NPN Darlington Power Transistor BDW53

## DESCRIPTION

- High DC Current Gain
  : $h_{FE}$= 750(Min.)@ $I_C$= 1.5A, $V_{CE}$= 3V
- High Collector-Emitter Breakdown Voltage-
  : $V_{(BR)CEO}$ = 45V(Min)
- Low Collector Saturation Voltage
- Complement to Type BDW54
- Minimum Lot-to-Lot variations for robust device performance and reliable operation

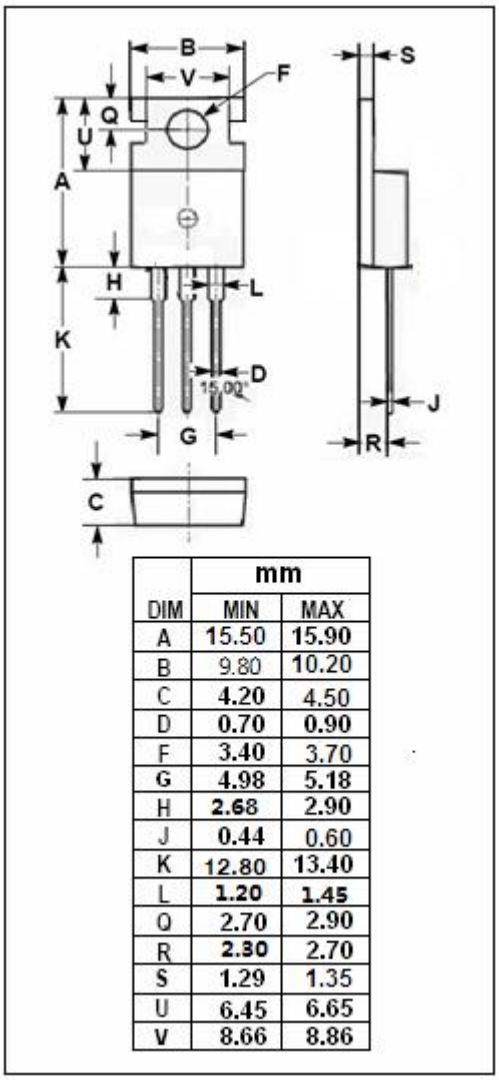



## APPLICATIONS

- Designed for general purpose amplifier and low speed switching applications.

## ABSOLUTE MAXIMUM RATINGS($T_a$=25℃)

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 45 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 45 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 5 | V |
| $I_C$ | Collector Current-Continuous | 4 | A |
| $I_B$ | Base Current- Continuous | 50 | mA |
| $P_C$ | Collector Power Dissipation @$T_C$=25℃ | 40 | W |
| | Collector Power Dissipation @$T_a$=25℃ | 2 | |
| $T_j$ | Junction Temperature | 150 | ℃ |
| $T_{stg}$ | Storage Temperature Range | -65~150 | ℃ |




| DIM | mm MIN | MAX |
|---|---|---|
| A | 15.50 | 15.90 |
| B | 9.80 | 10.20 |
| C | 4.20 | 4.50 |
| D | 0.70 | 0.90 |
| F | 3.40 | 3.70 |
| G | 4.98 | 5.18 |
| H | 2.68 | 2.90 |
| J | 0.44 | 0.60 |
| K | 12.80 | 13.40 |
| L | 1.20 | 1.45 |
| Q | 2.70 | 2.90 |
| R | 2.30 | 2.70 |
| S | 1.29 | 1.35 |
| U | 6.45 | 6.65 |
| V | 8.66 | 8.86 |

## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | MAX | UNIT |
|---|---|---|---|
| $R_{th\ j\text{-}c}$ | Thermal Resistance,Junction to Case | 3.125 | ℃/W |
| $R_{th\ j\text{-}a}$ | Thermal Resistance,Junction to Ambient | 62.5 | ℃/W |

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## ELECTRICAL CHARACTERISTICS

**$T_C$=25℃ unless otherwise specified**

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | $I_C$= 30mA, $I_B$= 0 | 45 | | | V |
| $V_{CE(sat)-1}$ | Collector-Emitter Saturation Voltage | $I_C$= 1.5A ,$I_B$= 30mA | | | 2.5 | V |
| $V_{CE(sat)-2}$ | Collector-Emitter Saturation Voltage | $I_C$= 4A ,$I_B$= 40mA | | | 4.0 | V |
| $V_{BE(on)}$ | Base-Emitter On Voltage | $I_C$= 1.5A ; $V_{CE}$= 3V | | | 2.5 | V |
| $I_{CBO}$ | Collector Cutoff current | $V_{CB}$= 45V, $I_E$= 0 | | | 0.2 | mA |
| $I_{CEO}$ | Collector Cutoff Current | $V_{CE}$= 45V, $I_B$= 0 | | | 0.5 | mA |
| $I_{EBO}$ | Emitter Cutoff Current | $V_{EB}$= 5V; $I_C$= 0 | | | 2 | mA |
| $h_{FE-1}$ | DC Current Gain | $I_C$= 1.5A ; $V_{CE}$= 3V | 750 | | 20000 | |
| $h_{FE-2}$ | DC Current Gain | $I_C$= 4A ; $V_{CE}$= 2V | 100 | | | |
| Switching Times | | | | | | |
| $t_{on}$ | Turn-On Time | $I_C$ = 2A, $I_{B1}$ = $I_{B2}$= 8mA; $R_L$= 15Ω ; $V_{CC}$≈ 5V | | 1.0 | | μs |
| $t_{off}$ | Turn-Off Time | | | 4.5 | | μs |

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