

# isc Silicon NPN Power Transistors

# BDT29F/AF/BF/CF/DF

## DESCRIPTION

- DC Current Gain  $-h_{FE} = 40(\text{Min})@ I_C = 0.4\text{A}$
- Collector-Emitter Sustaining Voltage-  
:  $V_{CEO(\text{SUS})} = 40\text{V}(\text{Min})$ - BDT29F;  $60\text{V}(\text{Min})$ - BDT29AF  
 $80\text{V}(\text{Min})$ - BDT29BF;  $100\text{V}(\text{Min})$ - BDT29CF  
 $120\text{V}(\text{Min})$ - BDT29DF
- Complement to Type BDT30F/AF/BF/CF/DF
- Minimum Lot-to-Lot variations for robust device performance and reliable operation

## APPLICATIONS

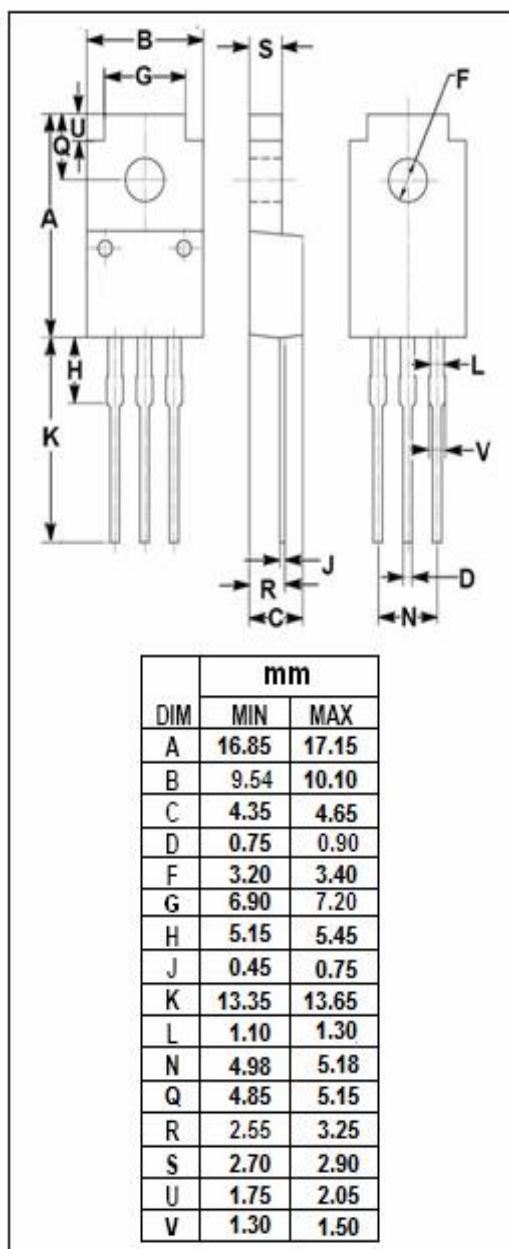
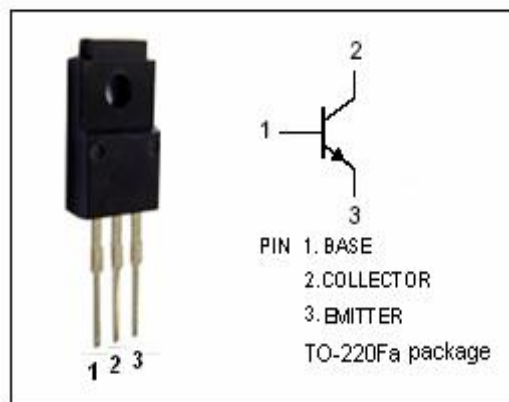
- Designed for use in audio output stages , general purpose amplifier and high speed switching applications

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

| SYMBOL    | PARAMETER                                             | VALUE   | UNIT             |
|-----------|-------------------------------------------------------|---------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                                | BDT29F  | 80               |
|           |                                                       | BDT29AF | 100              |
|           |                                                       | BDT29BF | 120              |
|           |                                                       | BDT29CF | 140              |
|           |                                                       | BDT29DF | 160              |
| $V_{CEO}$ | Collector-Emitter Voltage                             | BDT29F  | 40               |
|           |                                                       | BDT29AF | 60               |
|           |                                                       | BDT29BF | 80               |
|           |                                                       | BDT29CF | 100              |
|           |                                                       | BDT29DF | 120              |
| $V_{EBO}$ | Emitter-Base Voltage                                  | 5       | V                |
| $I_C$     | Collector Current-Continuous                          | 1       | A                |
| $I_{CM}$  | Collector Current-Peak                                | 3       | A                |
| $I_B$     | Base Current                                          | 0.4     | A                |
| $P_C$     | Collector Power Dissipation<br>$T_C=25^\circ\text{C}$ | 19      | W                |
| $T_j$     | 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    | 9.17 | $^\circ\text{C/W}$ |
| $R_{th\ j-a}$ | Thermal Resistance, Junction to Ambient | 55   | $^\circ\text{C/W}$ |



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## ELECTRICAL CHARACTERISTICS

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

| SYMBOL          | PARAMETER                            |            | CONDITIONS                         | MIN | TYP. | MAX | UNIT    |
|-----------------|--------------------------------------|------------|------------------------------------|-----|------|-----|---------|
| $V_{CEO(SUS)}$  | Collector-Emitter Sustaining Voltage | BDT29F     | $I_C= 30mA; I_B= 0$                | 40  |      |     | V       |
|                 |                                      | BDT29AF    |                                    | 60  |      |     |         |
|                 |                                      | BDT29BF    |                                    | 80  |      |     |         |
|                 |                                      | BDT29CF    |                                    | 100 |      |     |         |
|                 |                                      | BDT29DF    |                                    | 120 |      |     |         |
| $V_{CE(sat)}$   | Collector-Emitter Saturation Voltage |            | $I_C= 1A; I_B= 0.125A$             |     |      | 0.7 | V       |
| $V_{BE(on)}$    | Base-Emitter On Voltage              |            | $I_C= 1A; V_{CE}= 4V$              |     |      | 1.3 | V       |
| $I_{CES}$       | Collector Cutoff Current             |            | $V_{CE}= V_{CEOmax}; V_{BE}= 0$    |     |      | 0.2 | mA      |
| $I_{CEO}$       | Collector Cutoff Current             | BDT29F/AF  | $V_{CE}= 30V; I_B= 0$              |     |      | 0.1 | mA      |
|                 |                                      | BDT29BF/CF | $V_{CE}= 60V; I_B= 0$              |     |      |     |         |
|                 |                                      | BDT29DF    | $V_{CE}= 90V; I_B= 0$              |     |      |     |         |
| $I_{EBO}$       | Emitter Cutoff Current               |            | $V_{EB}= 5V; I_C= 0$               |     |      | 0.2 | mA      |
| $h_{FE-1}$      | DC Current Gain                      |            | $I_C= 0.2A; V_{CE}= 4V$            | 40  |      |     |         |
| $h_{FE-2}$      | DC Current Gain                      |            | $I_C= 1A; V_{CE}= 4V$              | 15  |      | 75  |         |
| $f_T$           | Current-Gain—Bandwidth Product       |            | $I_C= 0.2A; V_{CE}= 10V$           | 3   |      |     | MHz     |
| Switching Times |                                      |            |                                    |     |      |     |         |
| $t_{on}$        | Turn-On Time                         |            | $I_C= 1.0A; I_{B1}= -I_{B2}= 0.1A$ |     | 0.3  |     | $\mu s$ |
| $t_{off}$       | Turn-Off Time                        |            |                                    |     | 1.0  |     | $\mu s$ |

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