

isc Silicon NPN Power Transistors

BDT81F/83F/85F/87F

DESCRIPTION

- DC Current Gain  $-h_{FE} = 40(\text{Min}) @ I_C = 5A$
- Collector-Emitter Sustaining Voltage-  
:  $V_{CEO(\text{SUS})} = 60V(\text{Min})$ - BDT81F;  $80V(\text{Min})$ - BDT83F;  
 $100V(\text{Min})$ - BDT85F;  $120V(\text{Min})$ - BDT87F
- Complement to Type BDT82F/84F/86F/88F

APPLICATIONS

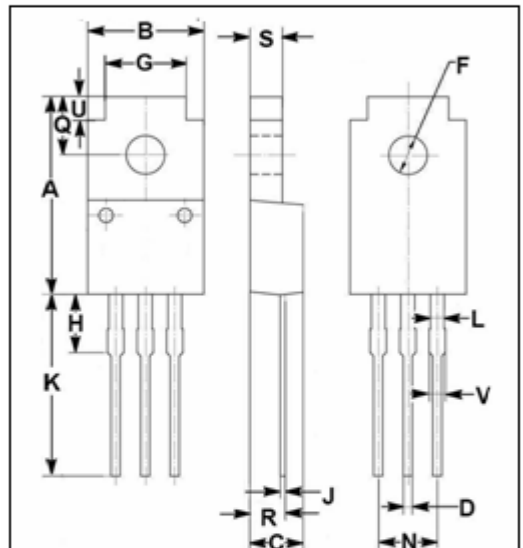
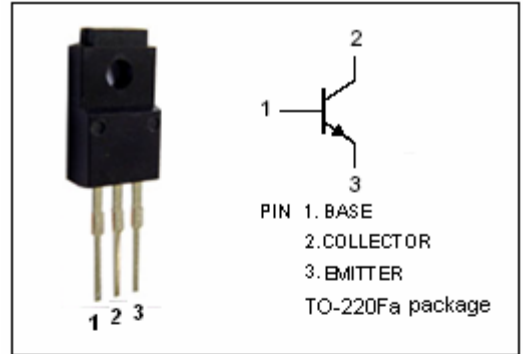
- Designed for use in audio output stages and general amplifier and switching applications

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

| SYMBOL    | PARAMETER   | VALUE   | UNIT             |   |
|-----------|---|---------|------------------|---|
| $V_{CBO}$ | Collector-Base Voltage                                | BDT81F  | 60               | V |
|           |   | BDT83F  | 80               |   |
|           |   | BDT85F  | 100              |   |
|           |   | BDT87F  | 120              |   |
| $V_{CEO}$ | Collector-Emitter Voltage                             | BDT81F  | 60               | V |
|           |   | BDT83F  | 80               |   |
|           |   | BDT85F  | 100              |   |
|           |   | BDT87F  | 120              |   |
| $V_{EBO}$ | Emitter-Base Voltage                                  | 7       | V                |   |
| $I_C$     | Collector Current-Continuous                          | 15      | A                |   |
| $I_{CM}$  | Collector Current-Peak                                | 20      | A                |   |
| $I_B$     | Base Current  | 4       | A                |   |
| $P_C$     | Collector Power Dissipation<br>$T_C=25^\circ\text{C}$ | 36      | 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 | 6   | $^\circ\text{C/W}$ |



| DIM | mm    |       |
|-----|-------|-------|
|     | MIN   | MAX   |
| A   | 16.85 | 17.15 |
| B   | 9.90  | 10.10 |
| C   | 4.35  | 4.65  |
| D   | 0.75  | 0.80  |
| F   | 3.20  | 3.40  |
| G   | 6.90  | 7.10  |
| H   | 5.15  | 5.45  |
| J   | 0.45  | 0.75  |
| K   | 13.35 | 13.65 |
| L   | 1.10  | 1.30  |
| N   | 4.98  | 5.18  |
| Q   | 4.85  | 5.15  |
| R   | 2.95  | 3.25  |
| S   | 2.70  | 2.90  |
| U   | 1.75  | 2.05  |
| V   | 1.30  | 1.50  |

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## BDT81F/83F/85F/87F

## 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 | BDT81F                               | 60  |      |     | V    |
|                 |                                      | BDT83F                               |     |      |     |      |
|                 |                                      | BDT85F                               |     |      |     |      |
|                 |                                      | BDT87F                               |     |      |     |      |
|                 |                                      | $I_C=30\text{mA}; I_B=0$             |     |      |     |      |
| $V_{CE(sat)-1}$ | Collector-Emitter Saturation Voltage | $I_C=5\text{A}; I_B=0.5\text{A}$     |     |      | 1.0 | V    |
| $V_{CE(sat)-2}$ | Collector-Emitter Saturation Voltage | $I_C=7\text{A}; I_B=0.7\text{A}$     |     |      | 1.6 | V    |
| $V_{BE(on)}$    | Base-Emitter On Voltage              | $I_C=5\text{A}; V_{CE}=4\text{V}$    |     |      | 1.5 | V    |
| $I_{CES}$       | Collector Cutoff Current             | $V_{CE}=0.8V_{CB0max}; V_{BE}=0$     |     |      | 1   | mA   |
| $I_{CBO}$       | Collector Cutoff Current             | $V_{CB}=V_{CB0max}; I_E=0$           |     |      | 0.2 | mA   |
| $I_{EBO}$       | Emitter Cutoff Current               | $V_{EB}=7\text{V}; I_C=0$            |     |      | 0.1 | mA   |
| $h_{FE-1}$      | DC Current Gain                      | $I_C=50\text{mA}; V_{CE}=10\text{V}$ | 40  |      |     |      |
| $h_{FE-2}$      | DC Current Gain                      | $I_C=5\text{A}; V_{CE}=4\text{V}$    | 40  |      |     |      |
| $f_T$           | Current-Gain—Bandwidth Product       | $I_C=0.5\text{A}; V_{CE}=10\text{V}$ |     | 10   |     | MHz  |

## Switching Times

|           |               |   |  |  |   |               |
|-----------|---------------|---|--|--|---|---------------|
| $t_{on}$  | Turn-On Time  | $I_C=7\text{A}; I_{B1}=-I_{B2}=0.7\text{A}$ |  |  | 1 | $\mu\text{s}$ |
| $t_{off}$ | Turn-Off Time |   |  |  | 2 | $\mu\text{s}$ |