



**POWER SKY (H.K.) LTD.**

## TO-126 Plastic-Encapsulate Transistors

### **BD433/435/437** TRANSISTOR (NPN)

#### **FEATURES**

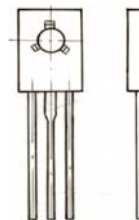
Amplifier and switching applications

#### **MAXIMUM RATINGS** ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Symbol    | Parameter                     | Value    | Units            |
|-----------|-------------------------------|----------|------------------|
| $V_{CBO}$ | Collector-Base Voltage        | BD433 22 | V                |
|           |                               | BD435 32 |                  |
|           |                               | BD437 45 |                  |
| $V_{CEO}$ | Collector-Emitter Voltage     | BD433 22 | V                |
|           |                               | BD435 32 |                  |
|           |                               | BD437 45 |                  |
| $V_{EBO}$ | Emitter-Base Voltage          | 5        | V                |
| $I_C$     | Collector Current –Continuous | 4        | A                |
| $P_C$     | Collector Power Dissipation   | 1.25     | W                |
| $T_J$     | Junction Temperature          | 150      | $^\circ\text{C}$ |
| $T_{stg}$ | Storage Temperature           | -55-150  | $^\circ\text{C}$ |

#### **TO-126**

1. EMITTER  
2. COLLECTOR  
3. BASE



1 2 3

#### **ELECTRICAL CHARACTERISTICS** ( $T_{amb}=25^\circ\text{C}$ unless otherwise specified)

| Parameter                            | Symbol              | Test conditions                                 | MIN      | TYP | MAX | UNIT          |
|--------------------------------------|---------------------|-------------------------------------------------|----------|-----|-----|---------------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$       | BD433 $I_C=100\mu\text{A}, I_E=0$               | 22       |     |     | V             |
|                                      |                     | BD435                                           | 32       |     |     |               |
|                                      |                     | BD437                                           | 45       |     |     |               |
| Collector-emitter breakdown voltage  | $V_{CE(SUS)}^{(1)}$ | BD433 $I_C=100\text{mA}, I_B=0$                 | 22       |     |     | V             |
|                                      |                     | BD435                                           | 32       |     |     |               |
|                                      |                     | BD437                                           | 45       |     |     |               |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$       | $I_E=100\mu\text{A}, I_C=0$                     | 5        |     |     | V             |
| Collector cut-off current            | $I_{CBO}$           | BD433 $V_{CB}=22\text{V}, I_E=0$                |          |     | 1   | $\mu\text{A}$ |
|                                      |                     | BD435 $V_{CB}=32\text{V}, I_E=0$                |          |     |     |               |
|                                      |                     | BD437 $V_{CB}=45\text{V}, I_E=0$                |          |     |     |               |
| Collector cut-off current            | $I_{CEO}$           | BD433 $V_{CE}=22\text{V}, I_E=0$                |          |     | 10  | $\mu\text{A}$ |
|                                      |                     | BD435 $V_{CE}=32\text{V}, I_E=0$                |          |     |     |               |
|                                      |                     | BD437 $V_{CE}=45\text{V}, I_E=0$                |          |     |     |               |
| Emitter cut-off current              | $I_{EBO}$           | $V_{EB}=5\text{V}, I_E=0$                       |          |     | 1   | $\mu\text{A}$ |
| DC current gain                      | $h_{FE(1)}^{(1)}$   | $V_{CE}=1\text{V}, I_C=500\text{mA}$            | 85       |     |     |               |
|                                      | $h_{FE(2)}^{(1)}$   | $V_{CE}=5\text{V}, I_C=10\text{mA}$ BD433/BD435 | 40       |     |     |               |
|                                      |                     |                                                 | BD437 30 |     |     |               |
|                                      | $h_{FE(3)}^{(1)}$   | $V_{CE}=1\text{V}, I_C=2\text{A}$ BD433/BD435   | 50       |     |     |               |
|                                      |                     |                                                 | BD437 40 |     |     |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}^{(1)}$ | $I_C=2\text{A}, I_B=0.2\text{A}$ BD433/BD435    |          |     | 0.5 | V             |
|                                      |                     | BD437                                           |          |     | 0.6 |               |
| Base-emitter voltage                 | $V_{BE}^{(1)}$      | $V_{CE}=1\text{V}, I_C=2\text{A}$ BD433/BD435   |          |     | 1.1 | V             |
|                                      |                     | BD437                                           |          |     | 1.2 |               |
| Transition frequency                 | $f_T$               | $V_{CE}=1\text{V}, I_C=250\text{mA}$            | 3        |     |     | MHz           |

<sup>(1)</sup>Pulse test.

# Typical Characteristics

BD433,435,437

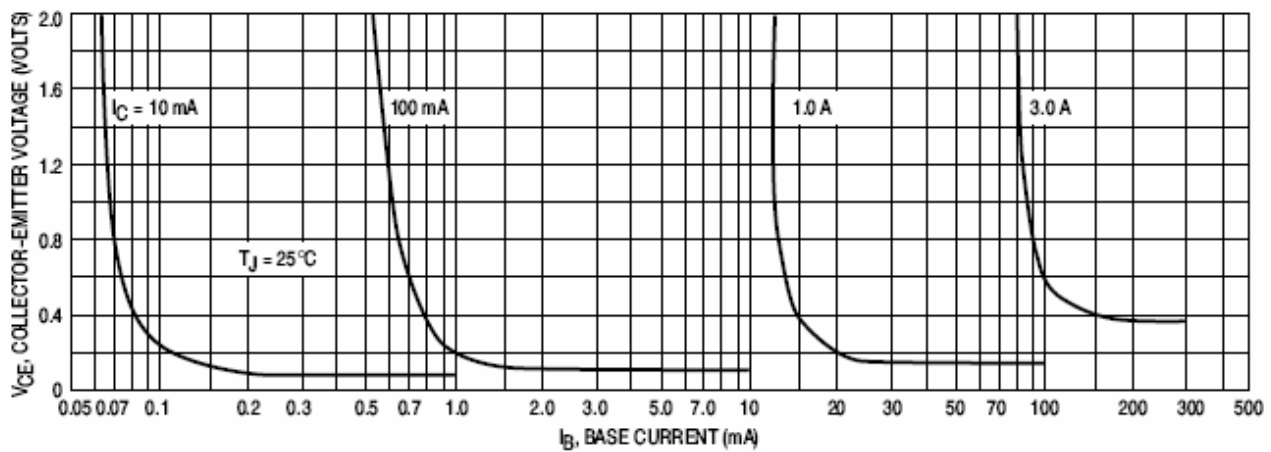


Figure 1. Collector Saturation Region

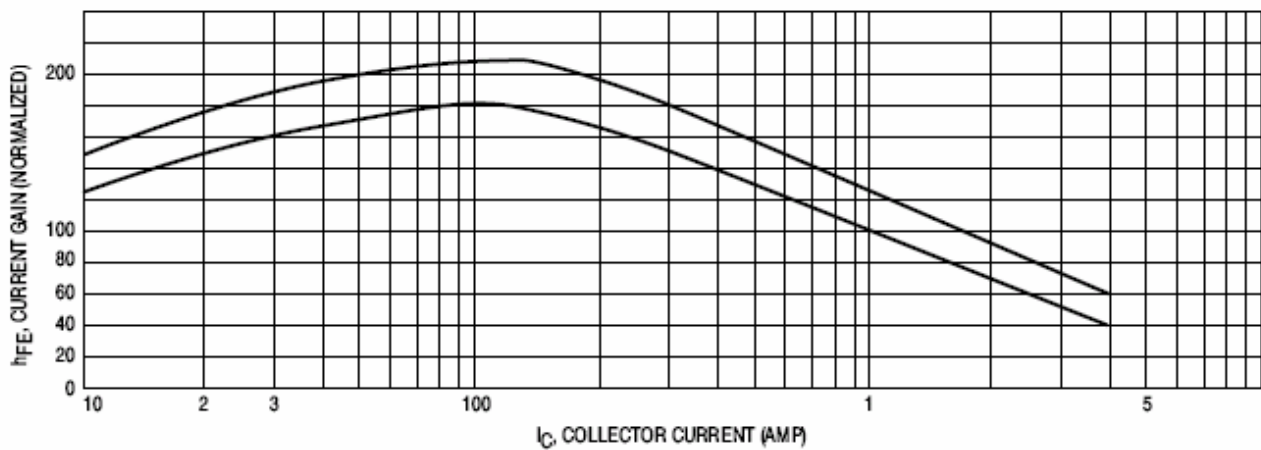


Figure 2. Current Gain

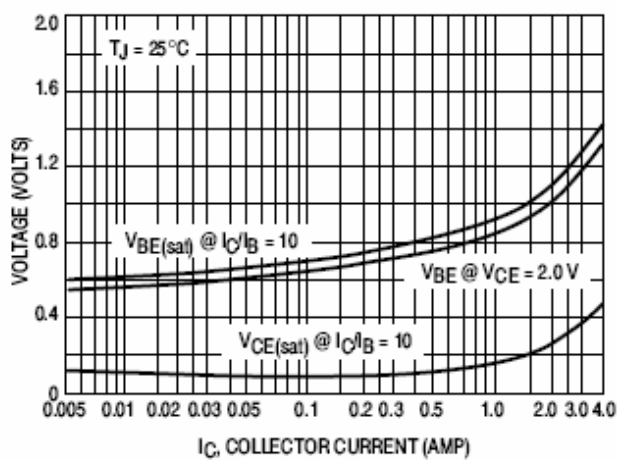


Figure 3. "On" Voltage

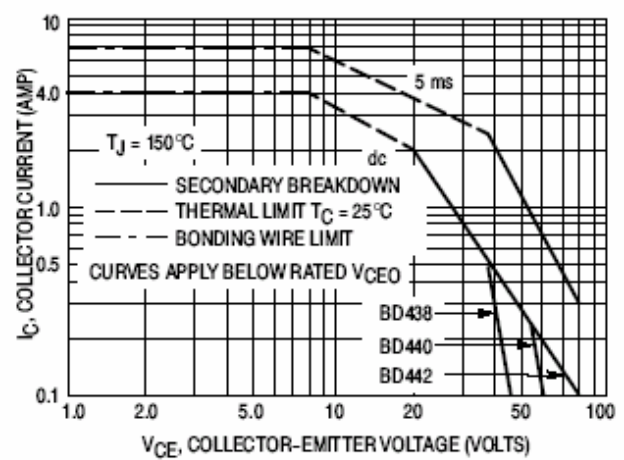


Figure 4. Active Region Safe Operating Area