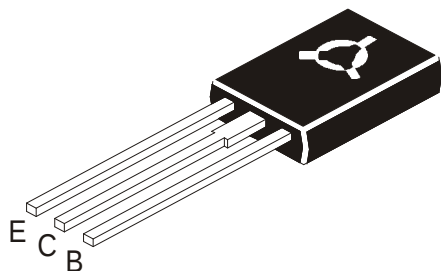


## EPITAXIAL SILICON POWER TRANSISTORS



|       |       |
|-------|-------|
| BD433 | BD434 |
| BD435 | BD436 |
| BD437 | BD438 |
| BD439 | BD440 |
| BD441 | BD442 |
| NPN   | PNP   |

TO126  
Plastic Package

Intended for use in Medium Power Linear and Switching Applications

### ABSOLUTE MAXIMUM RATINGS

| DESCRIPTION                                                                   | SYMBOL         | BD433<br>BD434 | BD435<br>BD436 | BD437<br>BD438 | BD439<br>BD440 | BD441<br>BD442 | UNIT                      |
|-------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------------------|
| Collector Base Voltage                                                        | $V_{CBO}$      | 22             | 32             | 45             | 60             | 80             | V                         |
| Collector Emitter Voltage                                                     | $V_{CES}$      | 22             | 32             | 45             | 60             | 80             | V                         |
| Collector Emitter Voltage                                                     | $V_{CEO}$      | 22             | 32             | 45             | 60             | 80             | V                         |
| Emitter Base Voltage                                                          | $V_{EBO}$      | 5.0            |                |                |                |                | V                         |
| Collector Current                                                             | $I_C$          | 4.0            |                |                |                |                | A                         |
| Collector Peak Current (t=10ms)                                               | $I_{CM}$       | 7.0            |                |                |                |                | A                         |
| Base Current                                                                  | $I_B$          | 1.0            |                |                |                |                | A                         |
| Total Dissipation @ $T_C=25^\circ\text{C}$                                    | $P_D$          | 36.0           |                |                |                |                | W                         |
| Total Dissipation @ $T_a=25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 1.25<br>10     |                |                |                |                | W<br>mW/ $^\circ\text{C}$ |
| Operating And Storage<br>Junction Temperature Range                           | $T_j, T_{stg}$ | - 65 to 150    |                |                |                |                | $^\circ\text{C}$          |

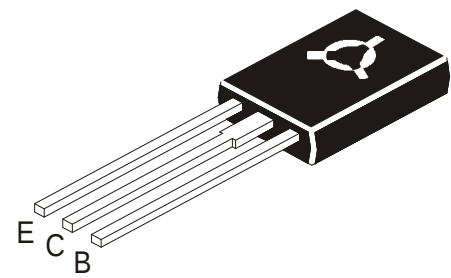
### THERMAL RESISTANCE

|                                 |               |     |                    |
|---------------------------------|---------------|-----|--------------------|
| Junction to Case                | $R_{th(j-c)}$ | 3.5 | $^\circ\text{C/W}$ |
| Junction to Ambient in free air | $R_{th(j-a)}$ | 100 | $^\circ\text{C/W}$ |

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

| DESCRIPTION                             | SYMBOL          | TEST CONDITION                           | BD433<br>BD434 | BD435<br>BD436 | BD437<br>BD438 | BD439<br>BD440 | BD441<br>BD442 | UNIT          |
|-----------------------------------------|-----------------|------------------------------------------|----------------|----------------|----------------|----------------|----------------|---------------|
| Collector Cut Off Current               | $I_{CBO}$       | $V_{CB}=\text{Rated } V_{CBO}, I_E=0$    | <100           | <100           | <100           | <100           | <100           | $\mu\text{A}$ |
| Collector Cut Off Current               | $I_{CES}$       | $V_{BE}=0, V_{CE}=\text{Rated } V_{CES}$ | <100           | <100           | <100           | <100           | <100           | $\mu\text{A}$ |
| Emitter Cut Off Current                 | $I_{EBO}$       | $V_{EB}=5V, I_C=0$                       | <1.0           | <1.0           | <1.0           | <1.0           | <1.0           | mA            |
| Collector Emitter Sustaining<br>Voltage | $*V_{CEO(sus)}$ | $I_C=100\text{mA}, I_B=0$                | >22            | >32            | >45            | >60            | >80            | V             |
| Collector Emitter Saturation<br>Voltage | $*V_{CE(sat)}$  | $I_C=2.0A, I_B=0.2A$                     | <0.5           | <0.5           | <0.6           | <0.8           | <0.8           | V             |
| Base Emitter On Voltage                 | $*V_{BE(on)}$   | $I_C=10\text{mA}, V_{CE}=5V$ ALL         | typ 0.58       |                |                |                |                | V             |
|                                         |                 | $I_C=2.0A, V_{CE}=1V$                    | <1.1           | <1.1           | <1.2           | <1.5           | <1.5           | V             |

EPITAXIAL SILICON POWER TRANSISTORS



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| BD441 | BD442 |
| NPN   | PNP   |

TO126  
 Plastic Package

ELECTRICAL CHARACTERISTICS (T<sub>C</sub>=25°C unless specified otherwise)

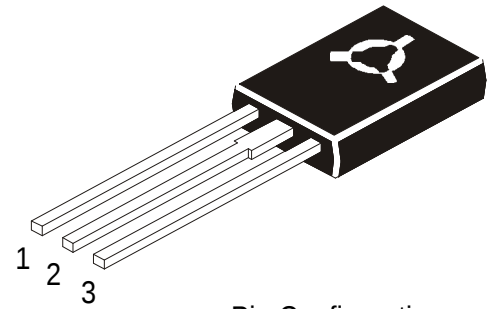
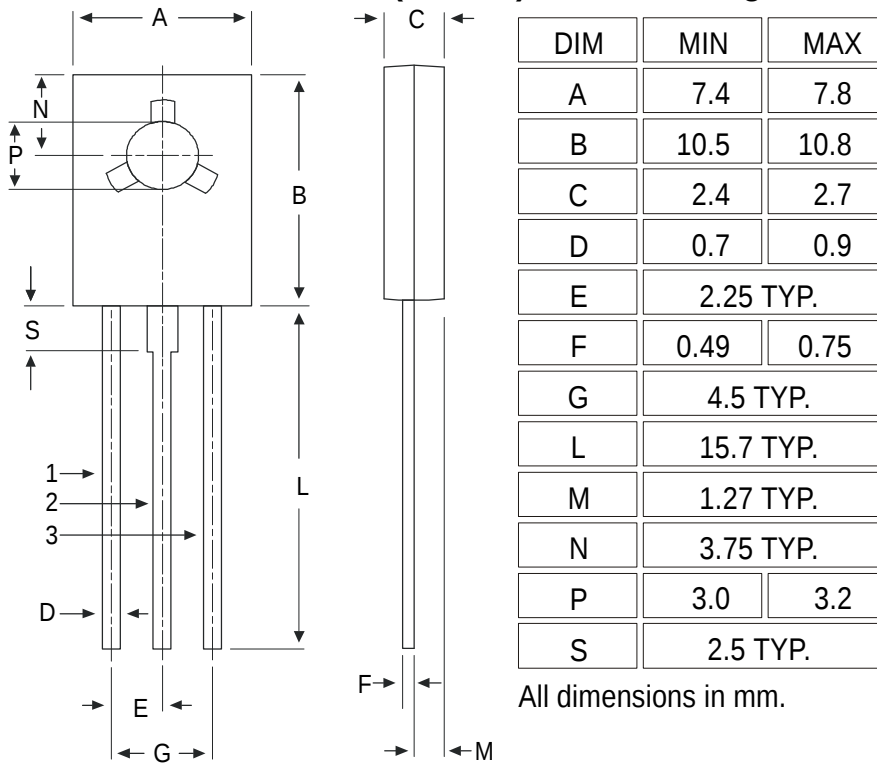
| DESCRIPTION                    | SYMBOL         | TEST CONDITION                                 | BD433<br>BD434 | BD435<br>BD436 | BD437<br>BD438 | BD439<br>BD440 | BD441<br>BD442 | UNIT |
|--------------------------------|----------------|------------------------------------------------|----------------|----------------|----------------|----------------|----------------|------|
| DC Current Gain                | $*h_{FE}$      | I <sub>C</sub> =10mA, V <sub>CE</sub> =5V      | >40            | >40            | >30            | >20            | >15            |      |
|                                |                | I <sub>C</sub> =500mA, V <sub>CE</sub> =1V     | >85            | >85            | >85            | >40            | >40            |      |
|                                |                | I <sub>C</sub> =2.0A, V <sub>CE</sub> =1V      | >50            | >50            | >40            | >25            | >15            |      |
| $*h_{FE1} / h_{FE2}$           | Matched Pairs  | I <sub>C</sub> =500mA, V <sub>CE</sub> =1V ALL | <1.4           |                |                |                |                |      |
| Current Gain Bandwidth Product | f <sub>T</sub> | I <sub>C</sub> =250mA, V <sub>CE</sub> =1V ALL | >3.0           |                |                |                |                | MHz  |

\*Pulsed Pulse Duration=300ms, Duty Cycle=1.5%

|       |       |
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## TO126 Plastic Package

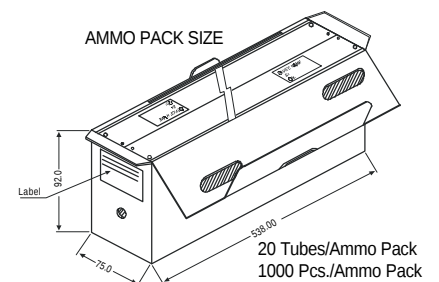
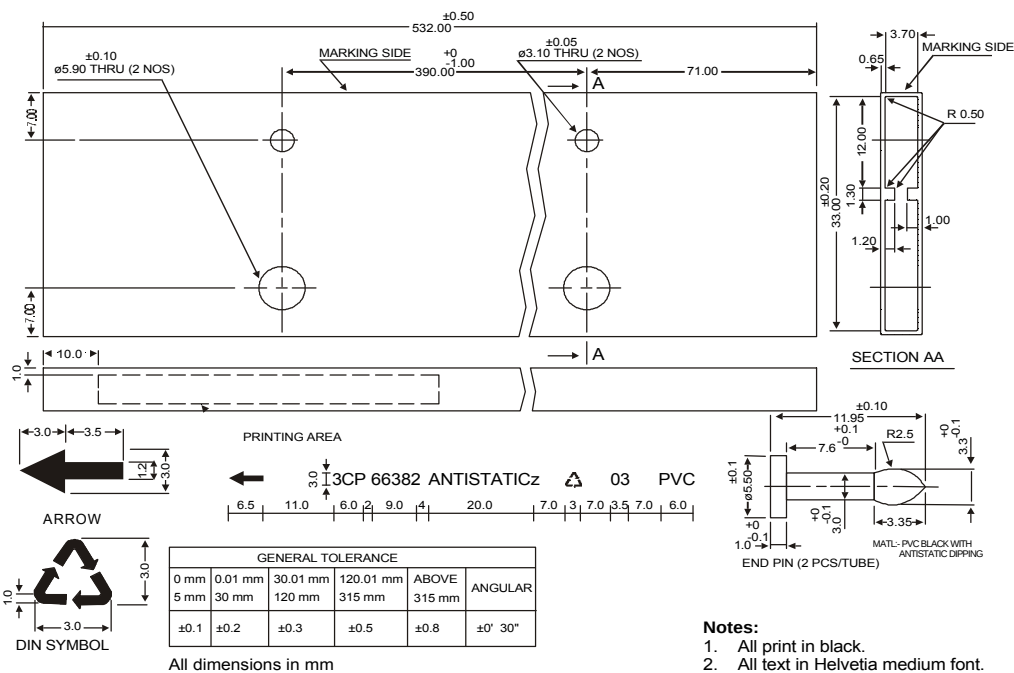
### TO-126 (SOT-32) Plastic Package



#### Pin Configuration

1. Emitter
2. Collector
3. Base

### TO-126 TUBE PACKING



#### Packing Detail

| PACKAGE     | STANDARD PACK   |                | INNER CARTON BOX  |     | OUTER CARTON BOX  |     |        |
|-------------|-----------------|----------------|-------------------|-----|-------------------|-----|--------|
|             | Details         | Net Weight/Qty | Size              | Qty | Size              | Qty | Gr Wt  |
| TO-126 Bulk | 500 pcs/polybag | 340 gm/500 pcs | 3" x 7.5" x 7.5"  | 2K  | 17" x 15" x 13.5" | 32K | 31 kgs |
| TO-126 Tube | 50 pcs/tube     | 73 gm/50 pcs   | 3" x 3.7" x 21.5" | 1K  | 19" x 19" x 19"   | 10K | 15 kgs |

|       |       |
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TO126  
Plastic Package

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