

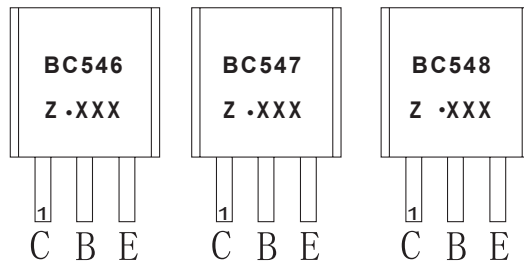
## TO-92 Plastic-Encapsulate Transistors

### BC546 / BC547 / BC548 TRANSISTOR (NPN)

#### FEATURES

- High Voltage
- Complement to BC556,BC557,BC558

#### MARKING



BC546,BC547,BC548=Device code

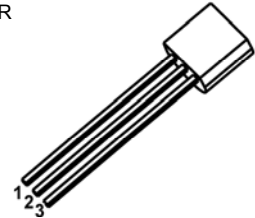
Solid dot=Green molding compound device,  
if none,the normal device

Z=Rank of  $h_{FE}$

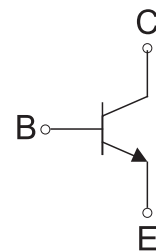
XXX=Code

#### TO-92

1. COLLECTOR
2. BASE
3. EMITTER



#### Equivalent Circuit



#### ORDERING INFORMATION

| Part Number | Package | Packing Method | Pack Quantity |
|-------------|---------|----------------|---------------|
| BC546       | TO-92   | Bulk           | 1000pcs/Bag   |
| BC546-TA    | TO-92   | Tape           | 2000pcs/Box   |
| BC547       | TO-92   | Bulk           | 1000pcs/Bag   |
| BC547-TA    | TO-92   | Tape           | 2000pcs/Box   |
| BC548       | TO-92   | Bulk           | 1000pcs/Bag   |
| BC548-TA    | TO-92   | Tape           | 2000pcs/Box   |

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

| Symbol          | Parameter                                   | Value    | Unit                        |
|-----------------|---------------------------------------------|----------|-----------------------------|
| $V_{CBO}$       | Collector-Base Voltage                      | BC546    | 80                          |
|                 |                                             | BC547    | 50                          |
|                 |                                             | BC548    | 30                          |
| $V_{CEO}$       | Collector-Emitter Voltage                   | BC546    | 65                          |
|                 |                                             | BC547    | 45                          |
|                 |                                             | BC548    | 30                          |
| $V_{EBO}$       | Emitter-Base Voltage                        | BC546    | 6                           |
|                 |                                             | BC547    | 6                           |
|                 |                                             | BC548    | 5                           |
| $I_C$           | Collector Current-Continuous                | 0.1      | A                           |
| $P_C$           | Collector Power Dissipation                 | 625      | mW                          |
| $R_{\theta JA}$ | Thermal Resistance from Junction to Ambient | 200      | $^{\circ}\text{C}/\text{W}$ |
| $T_J$           | Junction Temperature                        | 150      | $^{\circ}\text{C}$          |
| $T_{stg}$       | Storage Temperature                         | -55~+150 | $^{\circ}\text{C}$          |

## ELECTRICAL CHARACTERISTICS

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

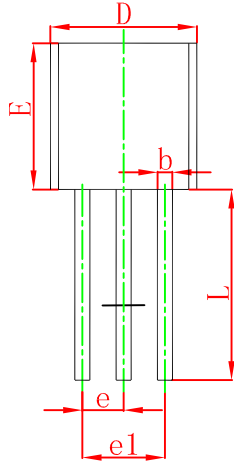
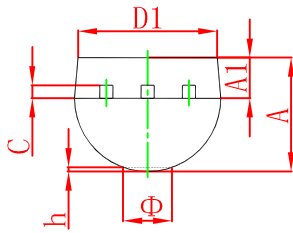
### ELECTRICAL CHARACTERISTICS ( $T_a=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter                            |       | Symbol        | Test conditions                                      | Min  | Typ | Max  | Unit          |
|--------------------------------------|-------|---------------|------------------------------------------------------|------|-----|------|---------------|
| Collector-base breakdown voltage     | BC546 | $V_{(BR)CBO}$ | $I_C=0.1\text{mA}, I_E=0$                            | 80   |     |      | V             |
|                                      | BC547 |               |                                                      | 50   |     |      |               |
|                                      | BC548 |               |                                                      | 30   |     |      |               |
| Collector-emitter breakdown voltage  | BC546 | $V_{(BR)CEO}$ | $I_C=1\text{mA}, I_B=0$                              | 65   |     |      | V             |
|                                      | BC547 |               |                                                      | 45   |     |      |               |
|                                      | BC548 |               |                                                      | 30   |     |      |               |
| Emitter-base breakdown voltage       | BC546 | $V_{(BR)EBO}$ | $I_E=10\mu\text{A}, I_C=0$                           | 6    |     |      | V             |
|                                      | BC547 |               |                                                      | 6    |     |      |               |
|                                      | BC548 |               |                                                      | 5    |     |      |               |
| Collector cut-off current            | BC546 | $I_{CBO}$     | $V_{CB}=70\text{V}, I_E=0$                           |      |     | 0.1  | $\mu\text{A}$ |
|                                      | BC547 |               | $V_{CB}=50\text{V}, I_E=0$                           |      |     | 0.1  | $\mu\text{A}$ |
|                                      | BC548 |               | $V_{CB}=30\text{V}, I_E=0$                           |      |     | 0.1  | $\mu\text{A}$ |
| Collector cut-off current            | BC546 | $I_{CEO}$     | $V_{CE}=60\text{V}, I_B=0$                           |      |     | 0.1  | $\mu\text{A}$ |
|                                      | BC547 |               | $V_{CE}=45\text{V}, I_B=0$                           |      |     | 0.1  | $\mu\text{A}$ |
|                                      | BC548 |               | $V_{CE}=30\text{V}, I_B=0$                           |      |     | 0.1  | $\mu\text{A}$ |
| Emitter cut-off current              |       | $I_{EBO}$     | $V_{EB}=5\text{V}, I_C=0$                            |      |     | 0.1  | $\mu\text{A}$ |
| DC current gain                      |       | $h_{FE}^*$    | $V_{CE}=5\text{V}, I_C=2\text{mA}$                   | 110  |     | 800  |               |
| Collector-emitter saturation voltage |       | $V_{CE(sat)}$ | $I_C=100\text{mA}, I_B=5\text{mA}$                   |      |     | 0.3  | V             |
| Base-emitter saturation voltage      |       | $V_{BE(sat)}$ | $I_C=100\text{mA}, I_B=5\text{mA}$                   |      |     | 1.1  | V             |
| Base-emitter voltage                 |       | $V_{BE}$      | $V_{CE}=5\text{V}, I_C=2\text{mA}$                   | 0.58 |     | 0.7  | V             |
|                                      |       |               | $V_{CE}=5\text{V}, I_C=10\text{mA}$                  |      |     | 0.75 | V             |
| Collector output capacitance         |       | $C_{ob}$      | $V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$            |      |     | 4.5  | pF            |
| Transition frequency                 |       | $f_T$         | $V_{CE}=5\text{V}, I_C=10\text{mA}, f=100\text{MHz}$ | 150  |     |      | MH            |

### CLASSIFICATION of $h_{FE}$

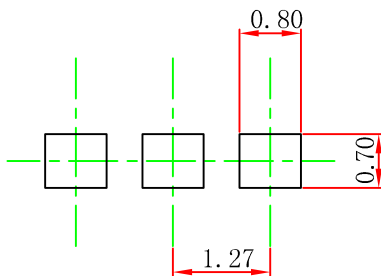
| RANK  | A       | B       | C       |
|-------|---------|---------|---------|
| RANGE | 110-220 | 200-450 | 420-800 |

## TO-92 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min                       | Max    | Min                  | Max   |
| A      | 3.300                     | 3.700  | 0.130                | 0.146 |
| A1     | 1.100                     | 1.400  | 0.043                | 0.055 |
| b      | 0.380                     | 0.550  | 0.015                | 0.022 |
| c      | 0.360                     | 0.510  | 0.014                | 0.020 |
| D      | 4.300                     | 4.700  | 0.169                | 0.185 |
| D1     | 3.430                     |        | 0.135                |       |
| E      | 4.300                     | 4.700  | 0.169                | 0.185 |
| e      | 1.270 TYP                 |        | 0.050 TYP            |       |
| e1     | 2.440                     | 2.640  | 0.096                | 0.104 |
| L      | 14.100                    | 14.500 | 0.555                | 0.571 |
| Φ      |                           | 1.600  |                      | 0.063 |
| h      | 0.000                     | 0.380  | 0.000                | 0.015 |

## TO-92 Suggested Pad Layout



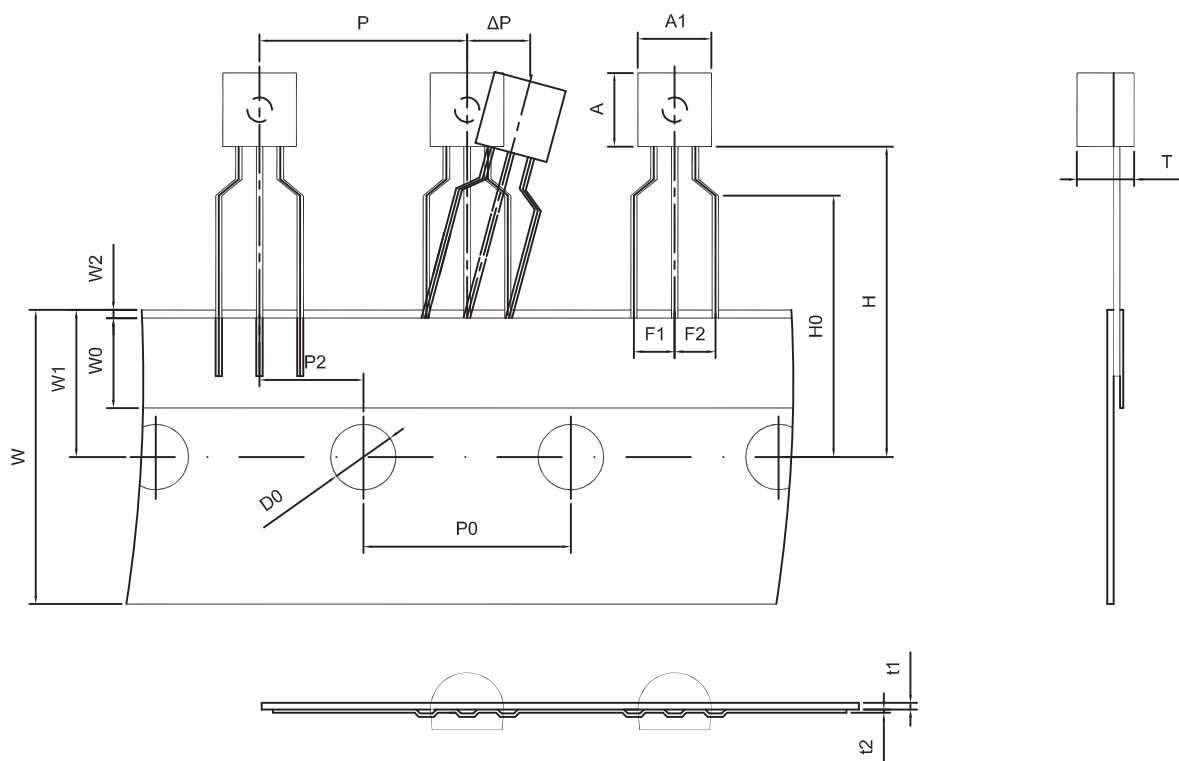
Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

### NOTICE

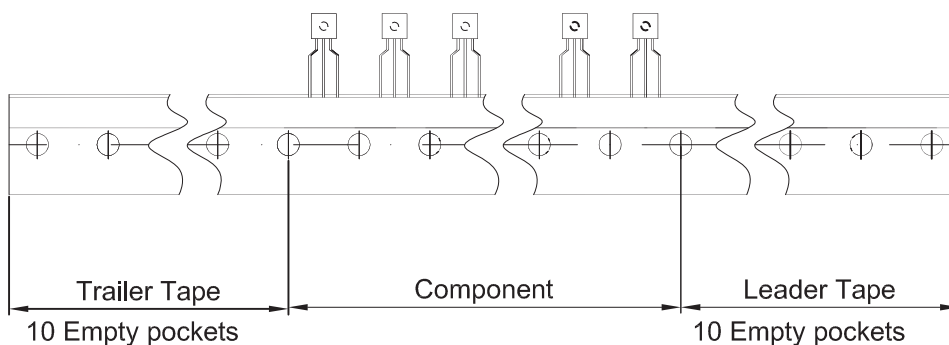
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# TO-92 PACKAGE TAPING DIMENSION



Dimiensions are in millimeter

| A1  | A   | T        | P    | P0   | P2   | F1  | F2  | W    |
|-----|-----|----------|------|------|------|-----|-----|------|
| 4.5 | 4.5 | 3.5      | 12.7 | 12.7 | 6.35 | 2.5 | 2.5 | 18.0 |
| W0  | W1  | W2       | H    | H0   | D0   | t1  | t2  | ΔP   |
| 6.0 | 9.0 | 1.0 MAX. | 19.0 | 16.0 | 4.0  | 0.4 | 0.2 | 0    |



| Package | Box      | Box Size(mm) | Carton     | Carton Size(mm) |
|---------|----------|--------------|------------|-----------------|
| TO-92   | 2000 pcs | 333×162×43   | 20,000 pcs | 350×340×250     |