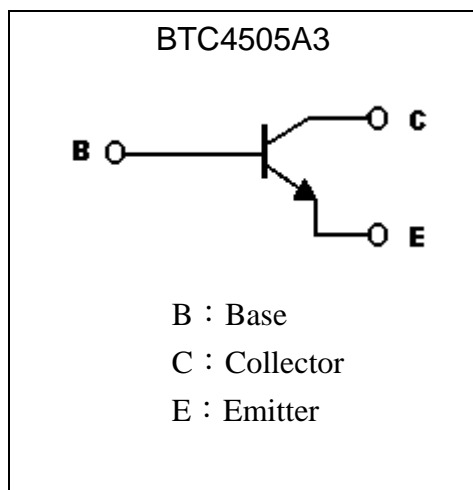
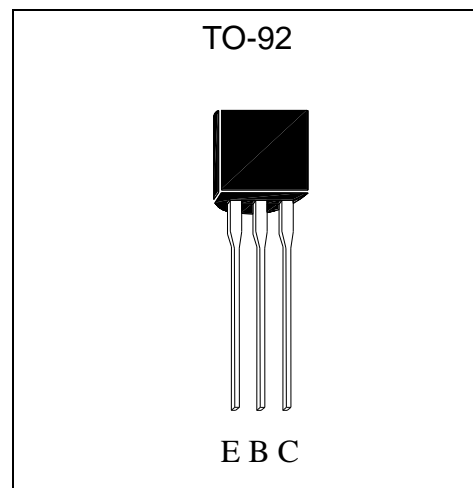


**High Voltage NPN Epitaxial Planar Transistor**

# BTC4505A3

**Features**

- High breakdown voltage. ( $BV_{CEO} = 400V$ )
- Low saturation voltage, typically  $V_{CE(sat)} = 0.1V$  at  $I_C / I_B = 10mA / 1mA$ .
- Complementary to BTA1759A3
- RoHS compliant package
- Pb-free lead plating package

**Symbol**

**Outline**

**Absolute Maximum Ratings** ( $T_a = 25^\circ C$ )

| Parameter                 | Symbol    | Limit    | Unit       |
|---------------------------|-----------|----------|------------|
| Collector-Base Voltage    | $V_{CBO}$ | 400      | V          |
| Collector-Emitter Voltage | $V_{CEO}$ | 400      | V          |
| Emitter-Base Voltage      | $V_{EBO}$ | 6        | V          |
| Collector Current         | $I_C$     | 300      | mA         |
| Power Dissipation         | $P_d$     | 625      | mW         |
| Junction Temperature      | $T_j$     | 150      | $^\circ C$ |
| Storage Temperature       | $T_{stg}$ | -55~+150 | $^\circ C$ |



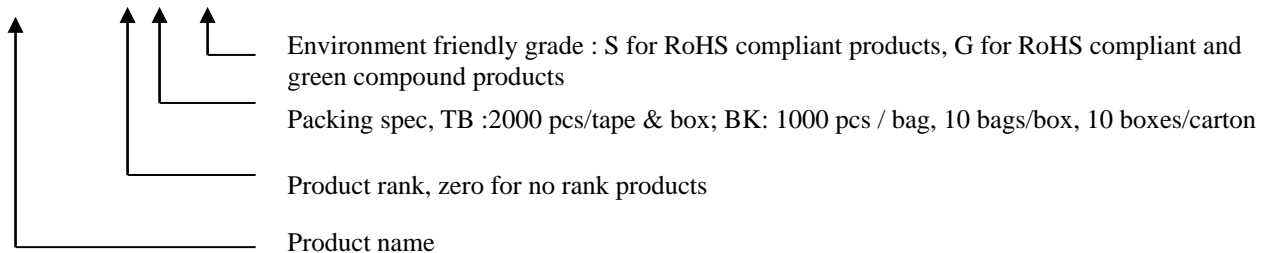
## Characteristics (Ta=25°C)

| Symbol                | Min. | Typ. | Max. | Unit | Test Conditions                                     |
|-----------------------|------|------|------|------|---|
| BV <sub>CB0</sub>     | 400  | -    | -    | V    | I <sub>C</sub> =50μA, I <sub>E</sub> =0             |
| BV <sub>CEO</sub>     | 400  | -    | -    | V    | I <sub>C</sub> =1mA, I <sub>B</sub> =0              |
| BV <sub>EBO</sub>     | 6    | -    | -    | V    | I <sub>E</sub> =50μA, I <sub>C</sub> =0             |
| I <sub>CB0</sub>      | -    | -    | 100  | nA   | V <sub>CB</sub> =400V, I <sub>E</sub> =0            |
| I <sub>CER</sub>      | -    | -    | 20   | nA   | V <sub>CE</sub> =300V, R <sub>EB</sub> =4kΩ         |
| I <sub>EBO</sub>      | -    | -    | 100  | nA   | V <sub>EB</sub> =6V, I <sub>C</sub> =0              |
| *V <sub>CE(sat)</sub> | -    | 0.1  | 0.5  | V    | I <sub>C</sub> =10mA, I <sub>B</sub> =1mA           |
| *V <sub>BE(sat)</sub> | -    | -    | 1.5  | V    | I <sub>C</sub> =10mA, I <sub>B</sub> =1mA           |
| h <sub>FE</sub>       | 100  | -    | 270  | -    | V <sub>CE</sub> =10V, I <sub>C</sub> =10mA          |
| f <sub>T</sub>        | -    | 20   | -    | MHz  | V <sub>CE</sub> =10V, I <sub>C</sub> =10mA, f=10MHz |
| Cob                   | -    | 7    | -    | pF   | V <sub>CB</sub> =10V, f=1MHz                        |

\*Pulse Test : Pulse Width ≤380μs, Duty Cycle≤2%

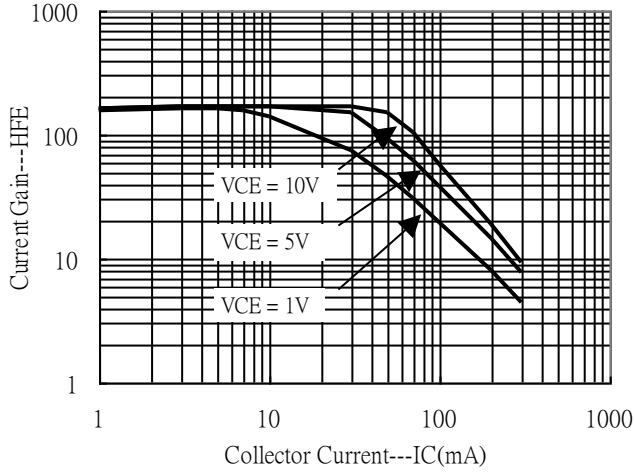
## Ordering Information

| Device           | Package                                 | Shipping                                      |
|------------------|---|---|
| BTC4505A3-0-TB-G | TO-92<br>(Pb-free lead plating package) | 2000 pcs / Tape & Box                         |
| BTC4505A3-0-BK-G | TO-92<br>(Pb-free lead plating package) | 1000 pcs/ bag, 10 bags/box,<br>10boxes/carton |

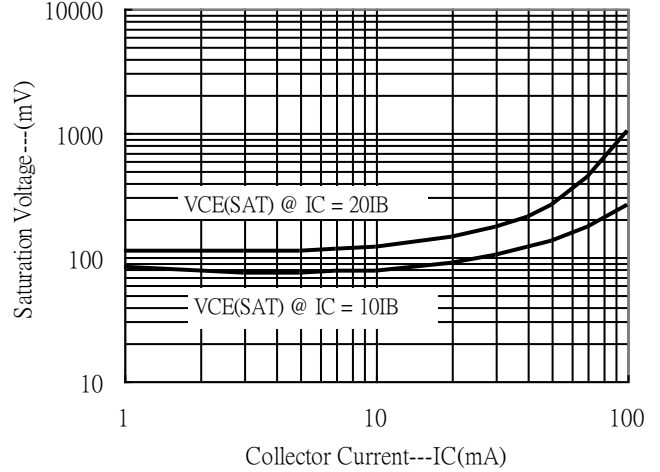


## Characteristic Curves

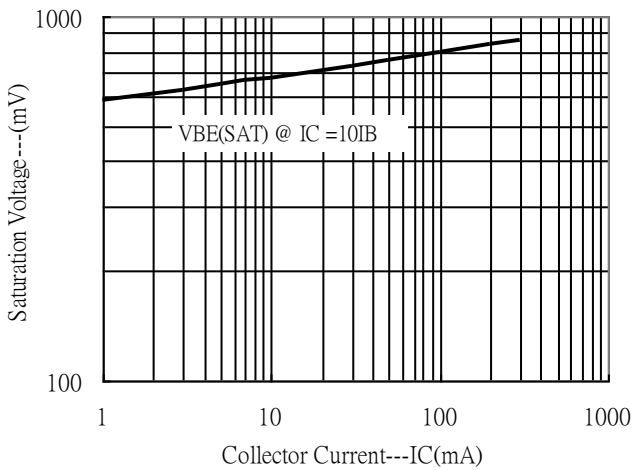
Current Gain vs Collector Current



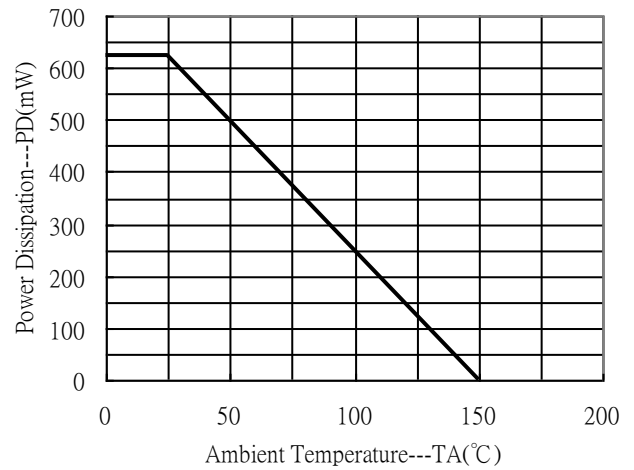
Saturation Voltage vs Collector Current



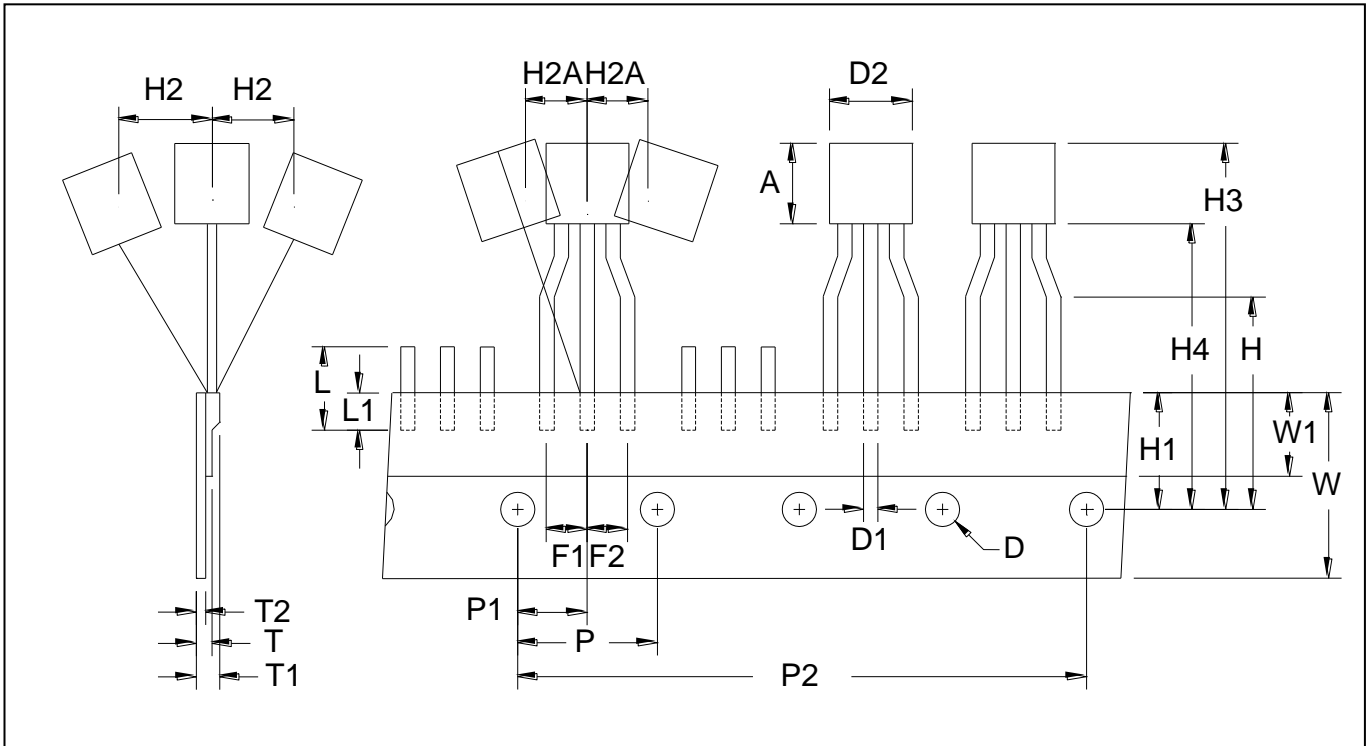
Saturation Voltage vs Collector Current



Power Derating Curve



**TO-92 Taping Outline**

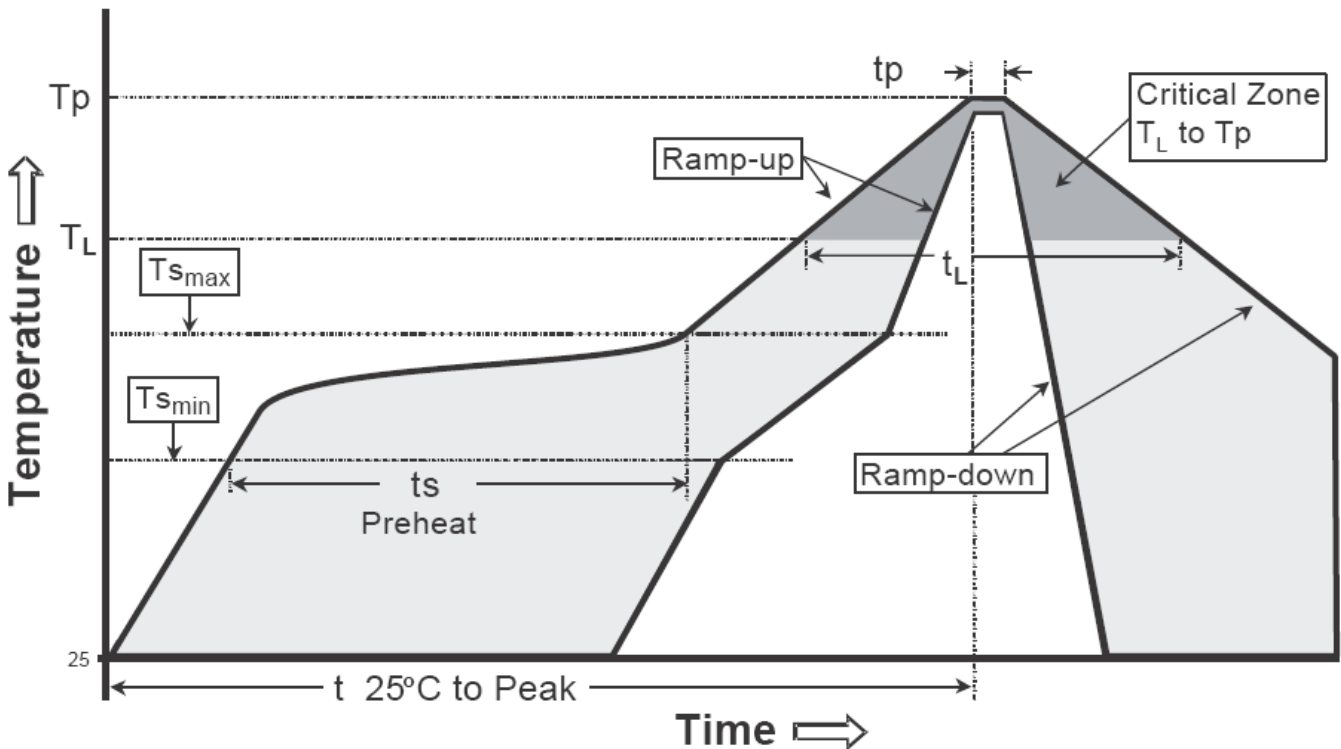


| DIM   | Item                                | Millimeters |       |
|-------|-------------------------------------|-------------|-------|
|       |                                     | Min.        | Max.  |
| A     | Component body height               | 4.33        | 4.83  |
| D     | Tape Feed Diameter                  | 3.80        | 4.20  |
| D1    | Lead Diameter                       | 0.36        | 0.53  |
| D2    | Component Body Diameter             | 4.33        | 4.83  |
| F1,F2 | Component Lead Pitch                | 2.40        | 2.90  |
| F1,F2 | F1-F2                               | -           | ±0.3  |
| H     | Height Of Seating Plane             | 15.50       | 16.50 |
| H1    | Feed Hole Location                  | 8.50        | 9.50  |
| H2    | Front To Rear Deflection            | -           | 1     |
| H2A   | Deflection Left Or Right            | -           | 1     |
| H3    | Component Height                    | -           | 27    |
| H4    | Feed Hole To Bottom Of Component    | -           | 21    |
| L     | Lead Length After Component Removal | -           | 11    |
| L1    | Lead Wire Enclosure                 | 2.50        | -     |
| P     | Feed Hole Pitch                     | 12.50       | 12.90 |
| P1    | Center Of Seating Plane Location    | 5.95        | 6.75  |
| P2    | 4 Feed Hole Pitch                   | 50.30       | 51.30 |
| T     | Over All Tape Thickness             | -           | 0.55  |
| T1    | Total Taped Package Thickness       | -           | 1.42  |
| T2    | Carrier Tape Thickness              | 0.36        | 0.68  |
| W     | Tape Width                          | 17.50       | 19.00 |
| W1    | Adhesive Tape Width                 | 5.00        | 7.00  |
| -     | 20 pcs Pitch                        | 253         | 255   |

**Recommended wave soldering condition**

|                 |                  |                 |
|-----------------|------------------|-----------------|
| Product         | Peak Temperature | Soldering Time  |
| Pb-free devices | 260 +0/-5 °C     | 5 +1/-1 seconds |

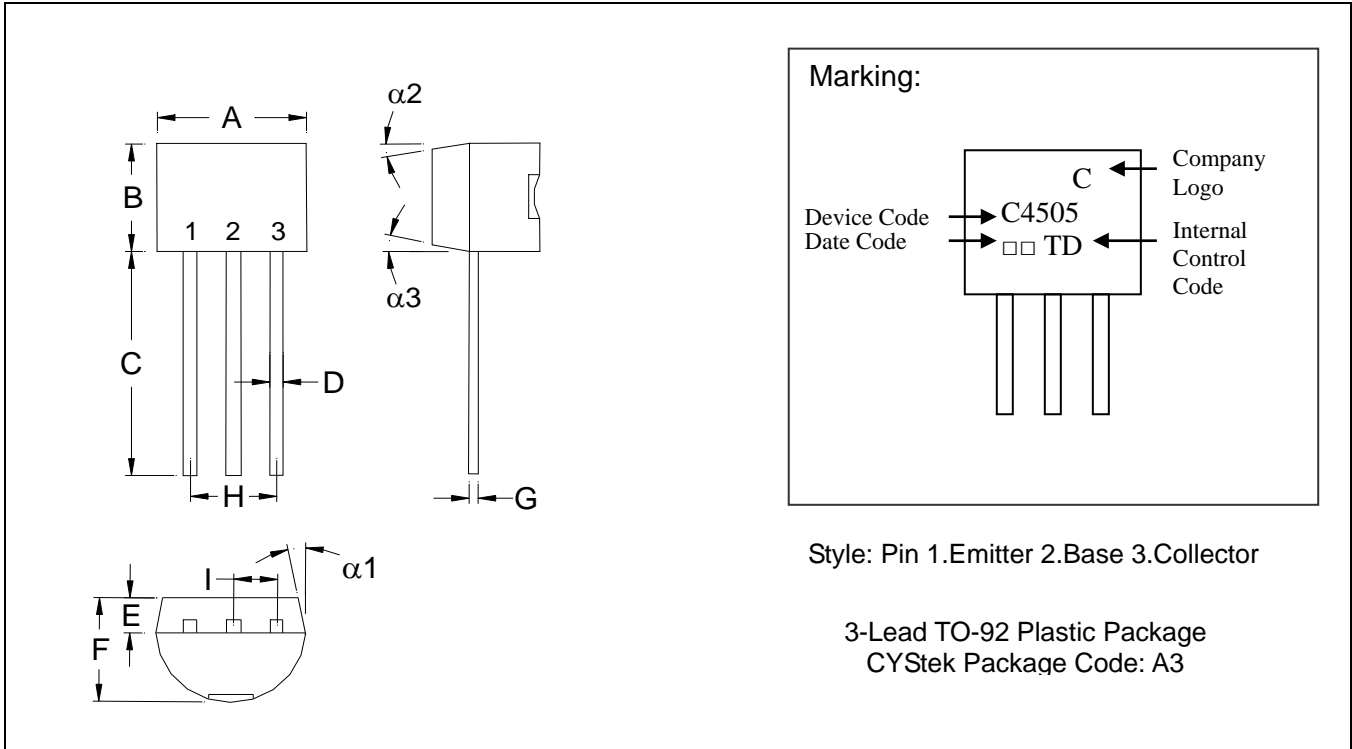
**Recommended temperature profile for IR reflow**



| Profile feature                                | Sn-Pb eutectic Assembly | Pb-free Assembly |
|--|-------------------------|------------------|
| Average ramp-up rate (Tsmax to Tp)             | 3°C/second max.         | 3°C/second max.  |
| Preheat  |                         |                  |
| -Temperature Min(Ts min)                       | 100°C                   | 150°C            |
| -Temperature Max(Ts max)                       | 150°C                   | 200°C            |
| -Time(ts min to ts max)                        | 60-120 seconds          | 60-180 seconds   |
| Time maintained above:                         |                         |                  |
| -Temperature (Tl)                              | 183°C                   | 217°C            |
| - Time (tL)                                    | 60-150 seconds          | 60-150 seconds   |
| Peak Temperature(Tp)                           | 240 +0/-5 °C            | 260 +0/-5 °C     |
| Time within 5°C of actual peak temperature(tp) | 10-30 seconds           | 20-40 seconds    |
| Ramp down rate                                 | 6°C/second max.         | 6°C/second max.  |
| Time 25 °C to peak temperature                 | 6 minutes max.          | 8 minutes max.   |

Note : All temperatures refer to topside of the package, measured on the package body surface.

**TO-92 Dimension**



\*: Typical

| DIM | Inches |         | Millimeters |       | DIM        | Inches |         | Millimeters |       |
|-----|--------|---------|-------------|-------|------------|--------|---------|-------------|-------|
|     | Min.   | Max.    | Min.        | Max.  |            | Min.   | Max.    | Min.        | Max.  |
| A   | 0.1704 | 0.1902  | 4.33        | 4.83  | G          | 0.0142 | 0.0220  | 0.36        | 0.56  |
| B   | 0.1704 | 0.1902  | 4.33        | 4.83  | H          | -      | *0.1000 | -           | *2.54 |
| C   | 0.5000 | -       | 12.70       | -     | I          | -      | *0.0500 | -           | *1.27 |
| D   | 0.0142 | 0.0220  | 0.36        | 0.56  | $\alpha 1$ | -      | *5°     | -           | *5°   |
| E   | -      | *0.0500 | -           | *1.27 | $\alpha 2$ | -      | *2°     | -           | *2°   |
| F   | 0.1323 | 0.1480  | 3.36        | 3.76  | $\alpha 3$ | -      | *2°     | -           | *2°   |

Notes: 1. Controlling dimension: millimeters.  
 2. Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 3. If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material:**

- Lead: 42 Alloy ; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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