

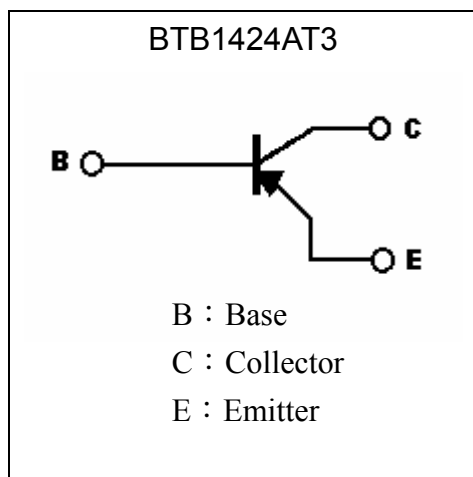
**Low Vcesat PNP Epitaxial Planar Transistor**

# BTB1424AT3

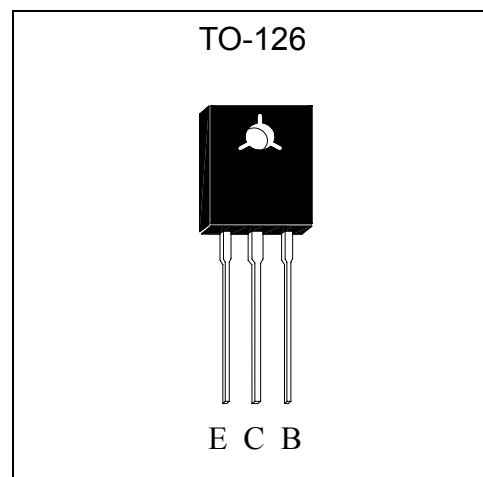
## Features

- Low  $V_{CE(sat)}$ , typically -0.3V at  $I_c / I_B = -2A / -0.1A$
- Excellent current gain characteristics
- Complementary to BTB2150AT3
- Pb-free lead plating package

## Symbol

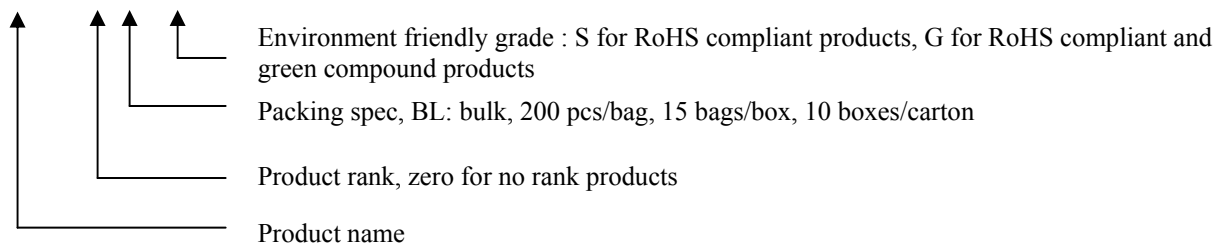


## Outline



## Ordering Information

| Device            | Package   | Shipping  |
|-------------------|---|---|
| BTB1424AT3-R-BL-X | TO-126<br>(Pb-free lead plating and halogen-free package) | 200 pcs / bag, 3,000 pcs/box<br>30,000 pcs/carton |



**Absolute Maximum Ratings** (Ta=25°C)

| Parameter                 | Symbol                 | Limit    | Unit |
|---------------------------|------------------------|----------|------|
| Collector-Base Voltage    | V <sub>CBO</sub>       | -50      | V    |
| Collector-Emitter Voltage | V <sub>CEO</sub>       | -50      | V    |
| Emitter-Base Voltage      | V <sub>EBO</sub>       | -6       | V    |
| Collector Current         | I <sub>C</sub> (DC)    | -3       | A    |
|                           | I <sub>C</sub> (pulse) | -7 *1    | A    |
| Power Dissipation         | Pd(Ta=25°C)            | 1        | W    |
|                           | Pd(Tc=25°C)            | 10       |      |
| Junction Temperature      | T <sub>j</sub>         | 150      | °C   |
| Storage Temperature       | T <sub>stg</sub>       | -55~+150 | °C   |

Note : \*1. Single Pulse Pw ≤ 350μs, Duty ≤ 2%.

**Characteristics** (Ta=25°C)

| Symbol                | Min. | Typ. | Max. | Unit | Test Conditions                                       |
|-----------------------|------|------|------|------|---|
| BV <sub>CBO</sub>     | -50  | -    | -    | V    | I <sub>C</sub> =-50μA, I <sub>E</sub> =0              |
| BV <sub>CEO</sub>     | -50  | -    | -    | 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>CBO</sub>      | -    | -    | -0.1 | μA   | V <sub>CB</sub> =-40V                                 |
| I <sub>EBO</sub>      | -    | -    | -0.1 | μA   | V <sub>EB</sub> =-5V                                  |
| *V <sub>CE(sat)</sub> | -    | -0.3 | -0.5 | V    | I <sub>C</sub> =-2A, I <sub>B</sub> =-0.1A            |
| *V <sub>BE(sat)</sub> | -    | -1   | -1.5 | V    | I <sub>C</sub> =-2A, I <sub>B</sub> =-0.2A            |
| *h <sub>FE1</sub>     | 120  | -    | -    | -    | V <sub>CE</sub> =-2V, I <sub>C</sub> =-20mA           |
| *h <sub>FE2</sub>     | 180  | -    | 390  | -    | V <sub>CE</sub> =-2V, I <sub>C</sub> =-500mA          |
| *h <sub>FE3</sub>     | 100  | -    | -    | -    | V <sub>CE</sub> =-2V, I <sub>C</sub> =-1A             |
| f <sub>T</sub>        | -    | 240  | -    | MHz  | V <sub>CE</sub> =-2V, I <sub>C</sub> =-0.5A, f=100MHz |
| C <sub>ob</sub>       | -    | 35   | -    | pF   | V <sub>CB</sub> =-10V, f=1MHz                         |

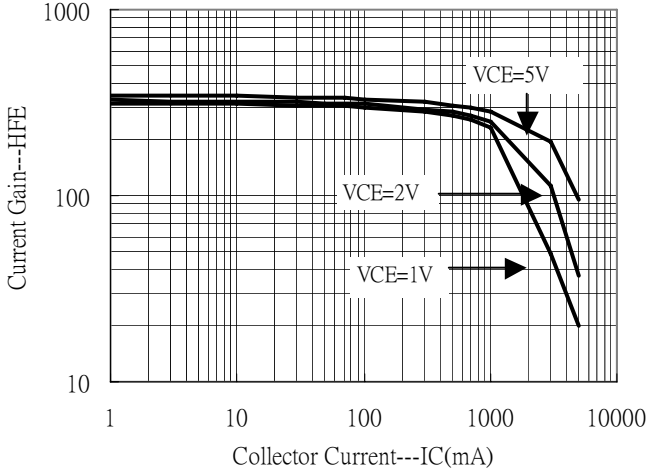
\*Pulse Test : Pulse Width ≤ 380μs, Duty Cycle ≤ 2%

**Classification Of hFE 2**

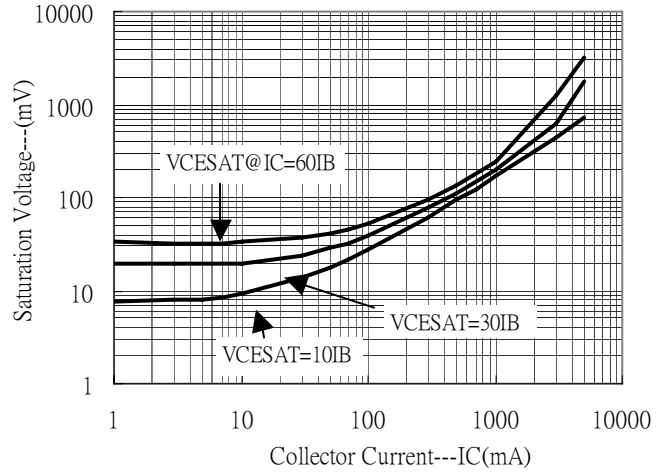
|       |         |
|-------|---------|
| Rank  | R       |
| Range | 180~390 |

**Characteristic Curves**

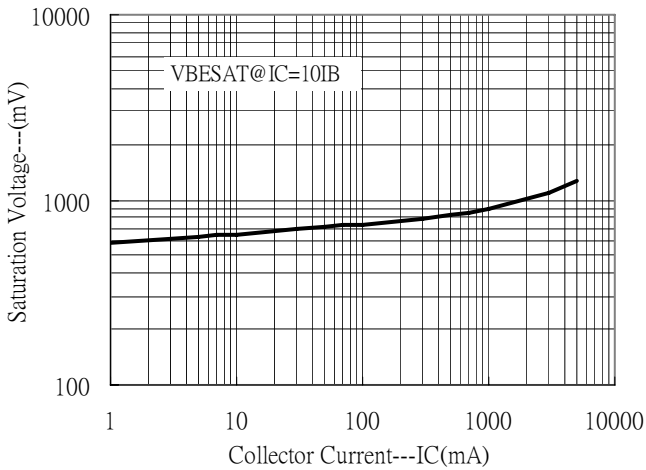
Current Gain vs Collector Current



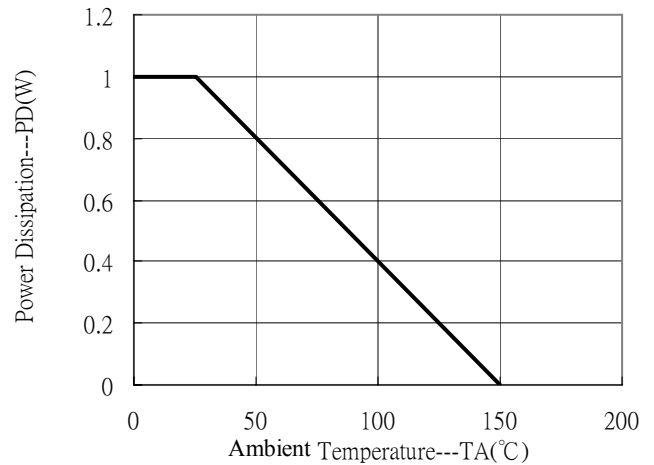
Saturation Voltage vs Collector Current



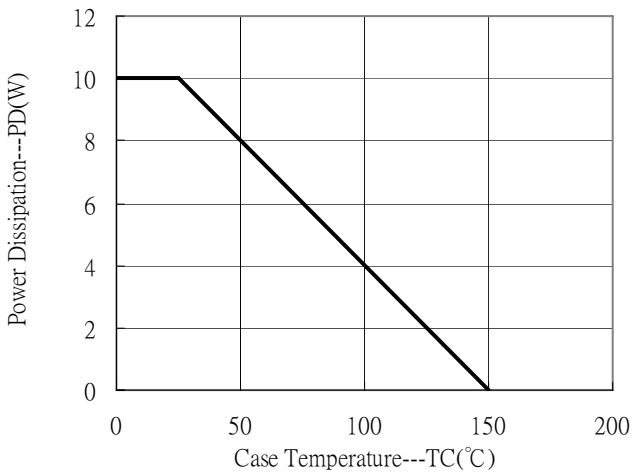
Saturation Voltage vs Collector Current



Power Derating Curve



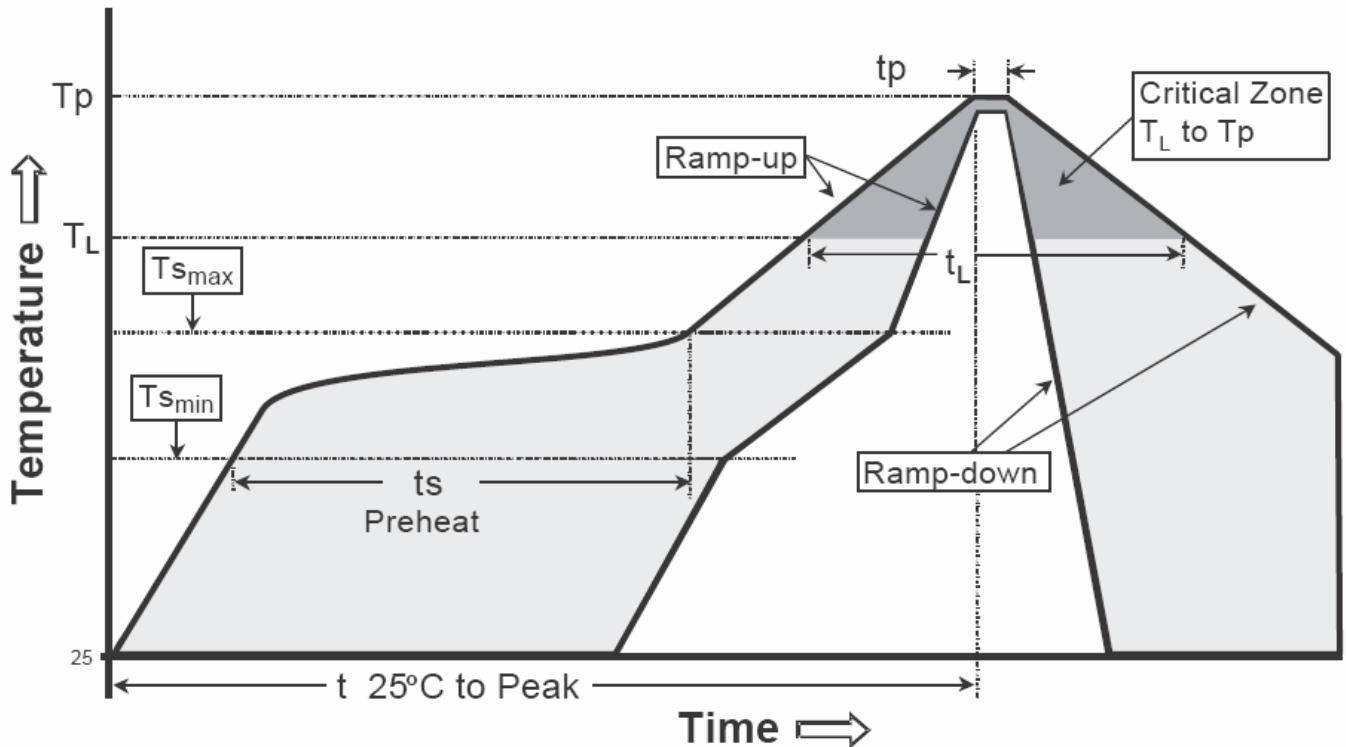
Power Derating Curve



**Recommended wave soldering condition**

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

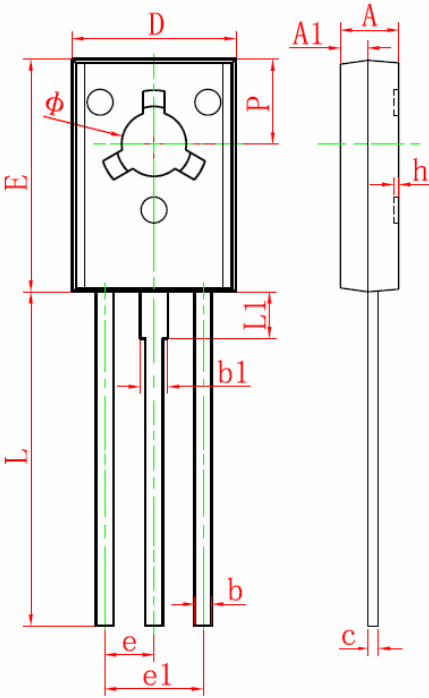
**Recommended temperature profile for IR reflow**



| Profile feature   | Sn-Pb eutectic Assembly | Pb-free Assembly |
|---|-------------------------|------------------|
| Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> ) | 3°C/second max.         | 3°C/second max.  |
| Preheat   |                         |                  |
| -Temperature Min(T <sub>s min</sub> )                       | 100°C                   | 150°C            |
| -Temperature Max(T <sub>s max</sub> )                       | 150°C                   | 200°C            |
| -Time(t <sub>s min</sub> to t <sub>s max</sub> )            | 60-120 seconds          | 60-180 seconds   |
| Time maintained above:                                      |                         |                  |
| -Temperature (T <sub>L</sub> )                              | 183°C                   | 217°C            |
| - Time (t <sub>L</sub> )                                    | 60-150 seconds          | 60-150 seconds   |
| Peak Temperature(T <sub>P</sub> )                           | 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.

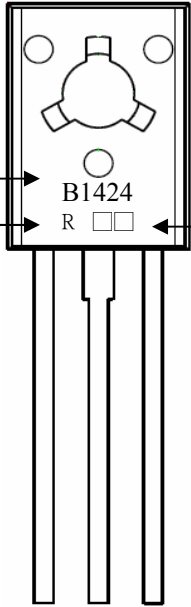
**TO-126 Dimension**



Style: Pin 1. Emitter 2. Collector 3. Base

3-Lead TO-126 Plastic Package  
 CYStek Package Code: T3

**Marking:**



Device name → B1424  
 HFE rank → R □ □ ← Date Code

Date Code : Year Code + Month Code  
 Year Code : 2011→1, 2012→2, ..., 2020→0,  
 2021→1, 2022→2, ..., etc  
 Month Code : Jan →1, Feb → 2, ..., Sep→9,  
 Oct→A, Nov→B, Dec→C

\*: Typical

| DIM | Millimeters |        | Inches |       | DIM | Millimeters |        | Inches |       |
|-----|-------------|--------|--------|-------|-----|-------------|--------|--------|-------|
|     | Min.        | Max.   | Min.   | Max.  |     | Min.        | Max.   | Min.   | Max.  |
| A   | 2.500       | 2.900  | 0.098  | 0.114 | e   | *2.290      |        | *0.090 |       |
| A1  | 1.100       | 1.500  | 0.043  | 0.059 | e1  | 4.480       | 4.680  | 0.176  | 0.184 |
| b   | 0.660       | 0.860  | 0.026  | 0.034 | h   | 0.000       | 0.300  | 0.000  | 0.012 |
| b1  | 1.170       | 1.370  | 0.046  | 0.054 | L   | 15.300      | 15.700 | 0.602  | 0.618 |
| c   | 0.450       | 0.600  | 0.018  | 0.024 | L1  | 2.100       | 2.300  | 0.083  | 0.091 |
| D   | 7.400       | 7.800  | 0.291  | 0.307 | P   | 3.900       | 4.100  | 0.154  | 0.161 |
| E   | 10.600      | 11.000 | 0.417  | 0.433 | Φ   | 3.000       | 3.200  | 0.118  | 0.126 |

**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: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

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