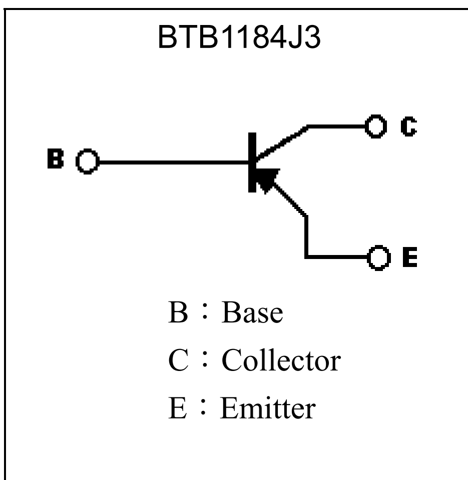
## Low Vcesat PNP Epitaxial Planar Transistor

# BTB1184J3

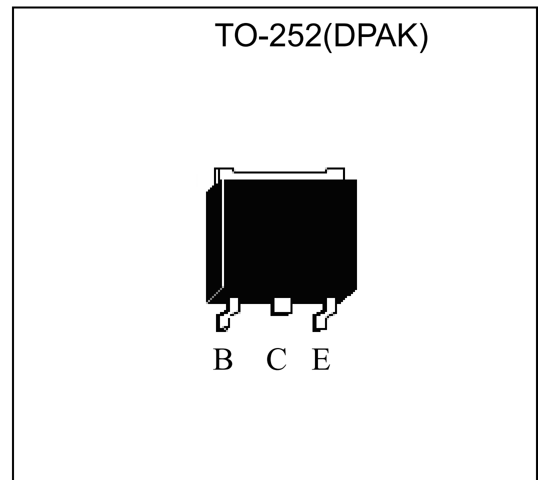
## Features

- Low VCE(sat)
- Excellent current gain characteristics
- Complementary to BTD1760J3
- Pb-free lead plating and halogen-free package

## Symbol

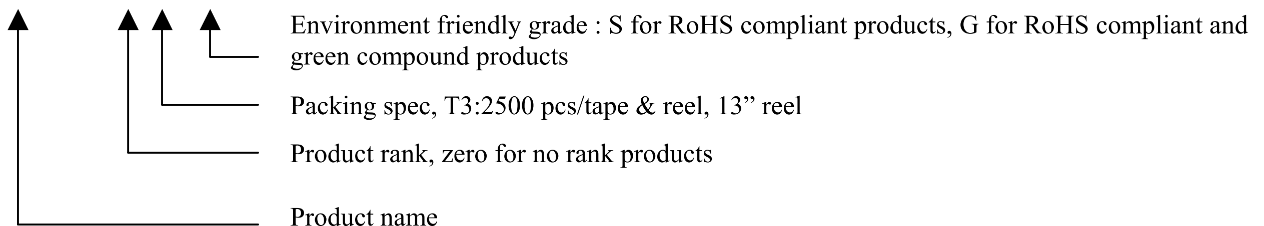



## Outline




## Ordering Information

| Device | Package | Shipping |
| --- | --- | --- |
| BTB1184J3-X-T3-G | TO-252<br>(RoHS compliant and halogen-free package) | 2500 pcs / Tape & Reel |



## Absolute Maximum Ratings (Ta=25°C)

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | -60 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | -50 | V |
| Emitter-Base Voltage | $V_{EBO}$ | -6 | V |
| Collector Current(DC) | $I_C$ | -3 | A |
| Collector Current(Pulse) | $I_{CP}$ | -7 *1 | A |
| Power Dissipation ($T_A$=25℃) | Pd($T_A$=25℃) | 1 | W |
| Power Dissipation ($T_C$=25℃) | Pd($T_C$=25℃) | 15 *2 | W |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 125 | °C/W |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 8.33 *2 | °C/W |
| Operating Junction and Storage Temperature Range | Tj,Tstg | -55~+150 | °C |

Note : *1. Single Pulse Pw=10ms

*2 . Printed circuit board, 1.7mm thick, collector copper plating 10mm*10mm or larger.

## Characteristics (Ta=25°C)

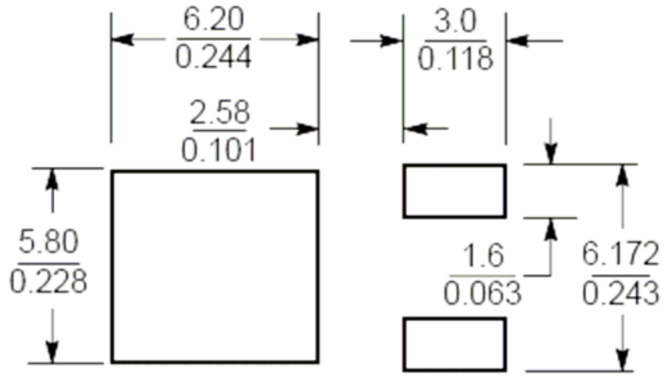
| Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|
| $BV_{CBO}$ | -60 | - | - | V | $I_C$=-50μA, $I_E$=0 |
| $BV_{CEO}$ | -50 | - | - | V | $I_C$=-1mA, $I_B$=0 |
| $BV_{EBO}$ | -6 | - | - | V | $I_E$=-50μA, $I_C$=0 |
| $I_{CBO}$ | - | - | -1 | μA | $V_{CB}$=-40V, $I_E$=0 |
| $I_{EBO}$ | - | - | -1 | μA | $V_{EB}$=-4V, $I_C$=0 |
| *$V_{CE(sat)}$ | - | -0.26 | -0.5 | V | $I_C$=-2A, $I_B$=-0.1A |
| *$V_{BE(sat)}$ | - | -0.96 | -1.2 | V | $I_C$=-2A, $I_B$=-0.1A |
| *$h_{FE}1$ | 120 | - | - | - | $V_{CE}$=-2V, $I_C$=-20mA |
| *$h_{FE}2$ | 180 | - | 560 | - | $V_{CE}$=-3V, $I_C$=-500mA |
| *$h_{FE}3$ | 80 | - | - | - | $V_{CE}$=-2V, $I_C$=-1A |
| $f_T$ | - | 80 | - | MHz | $V_{CE}$=-5V, $I_C$=-0.1A, f=100MHz |
| Cob | - | 35 | - | pF | $V_{CB}$=-10V, f=1MHz |

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

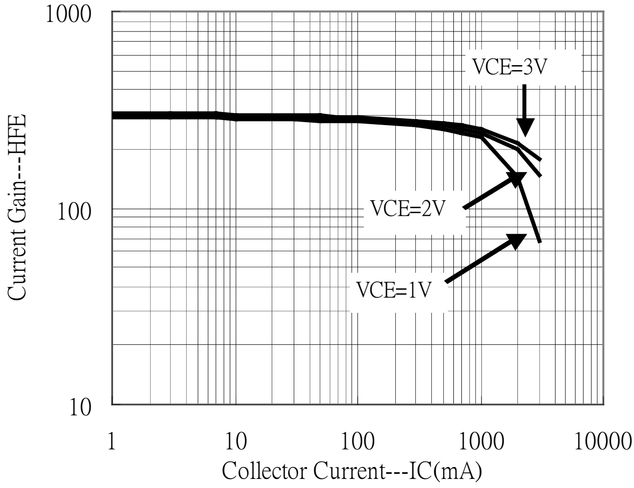
## Classification Of $h_{FE}2$

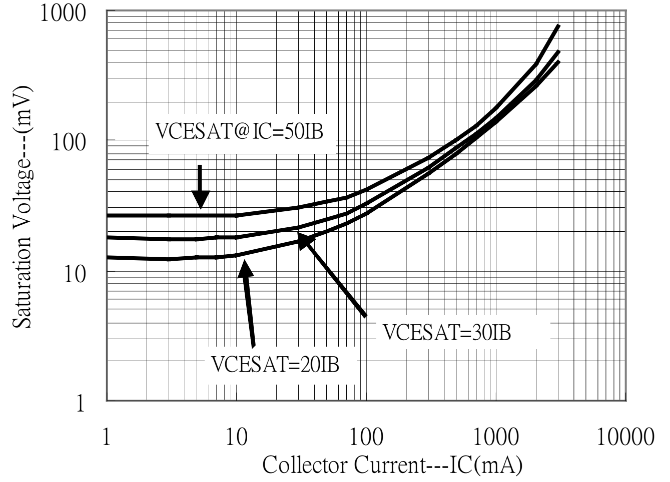
| Rank | R | S |
|---|---|---|
| Range | 180~390 | 270~560 |

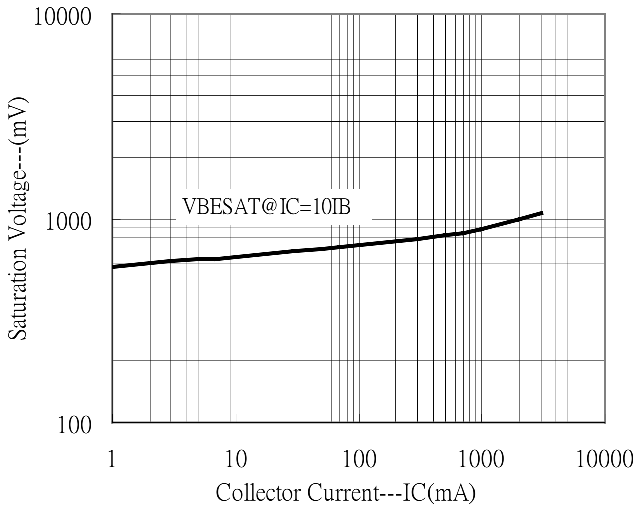
## Recommended soldering footprint

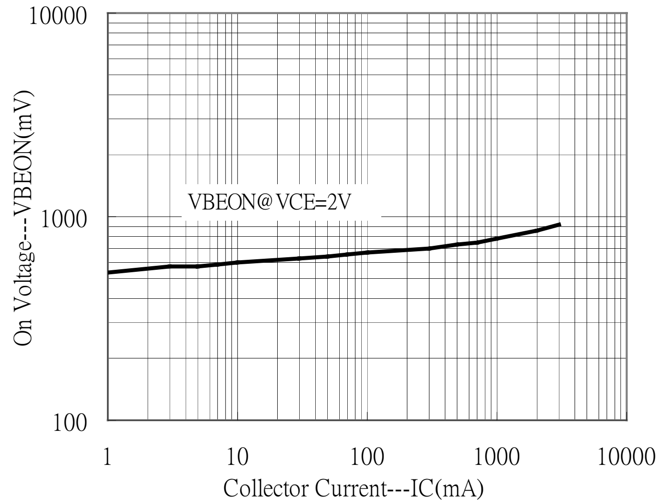


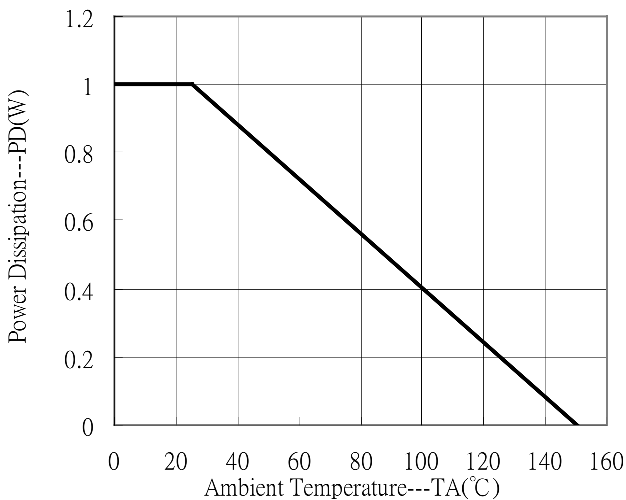
## Typical Characteristics

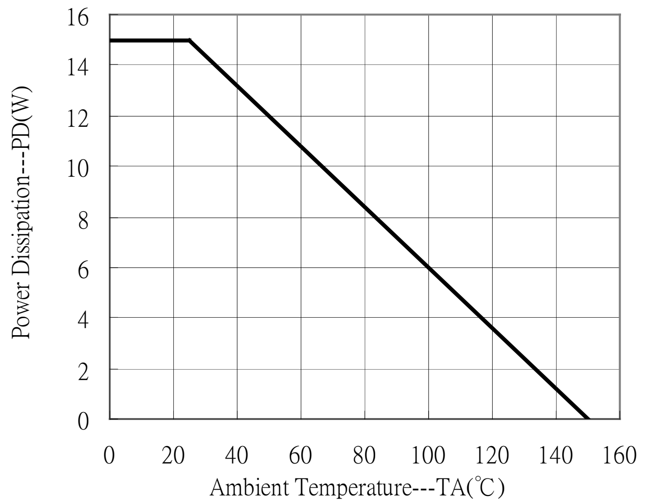


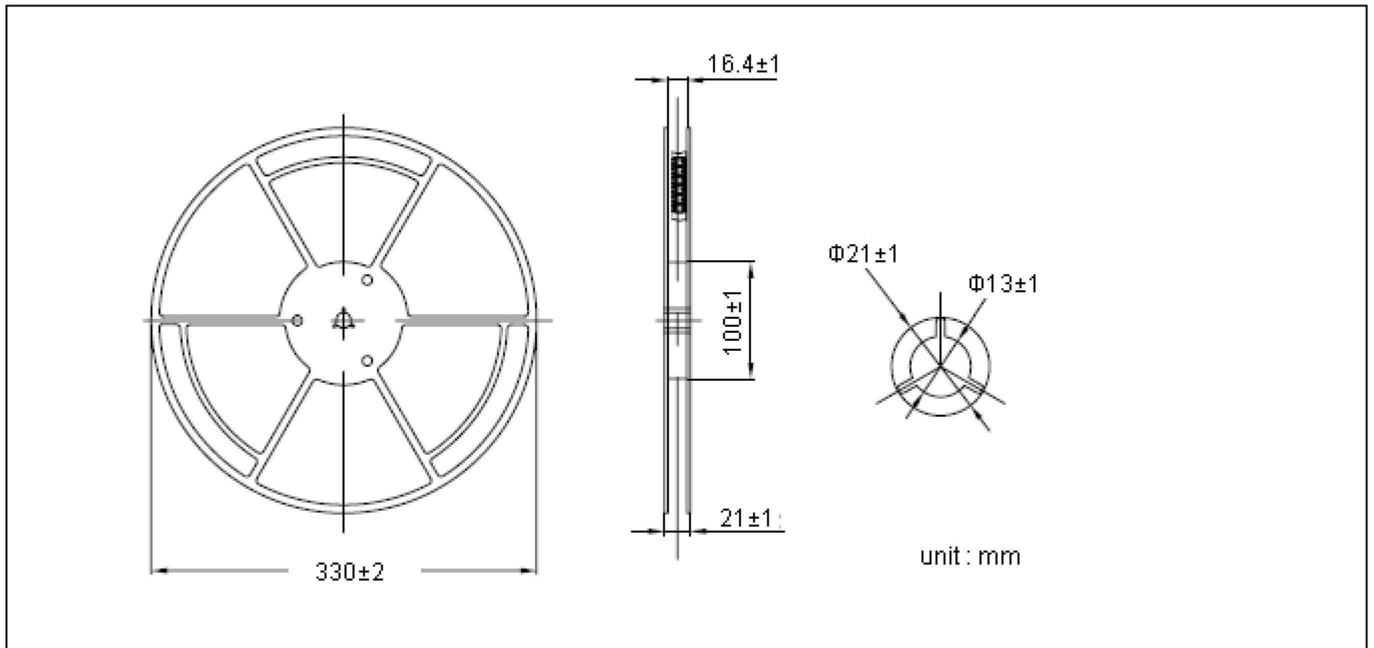



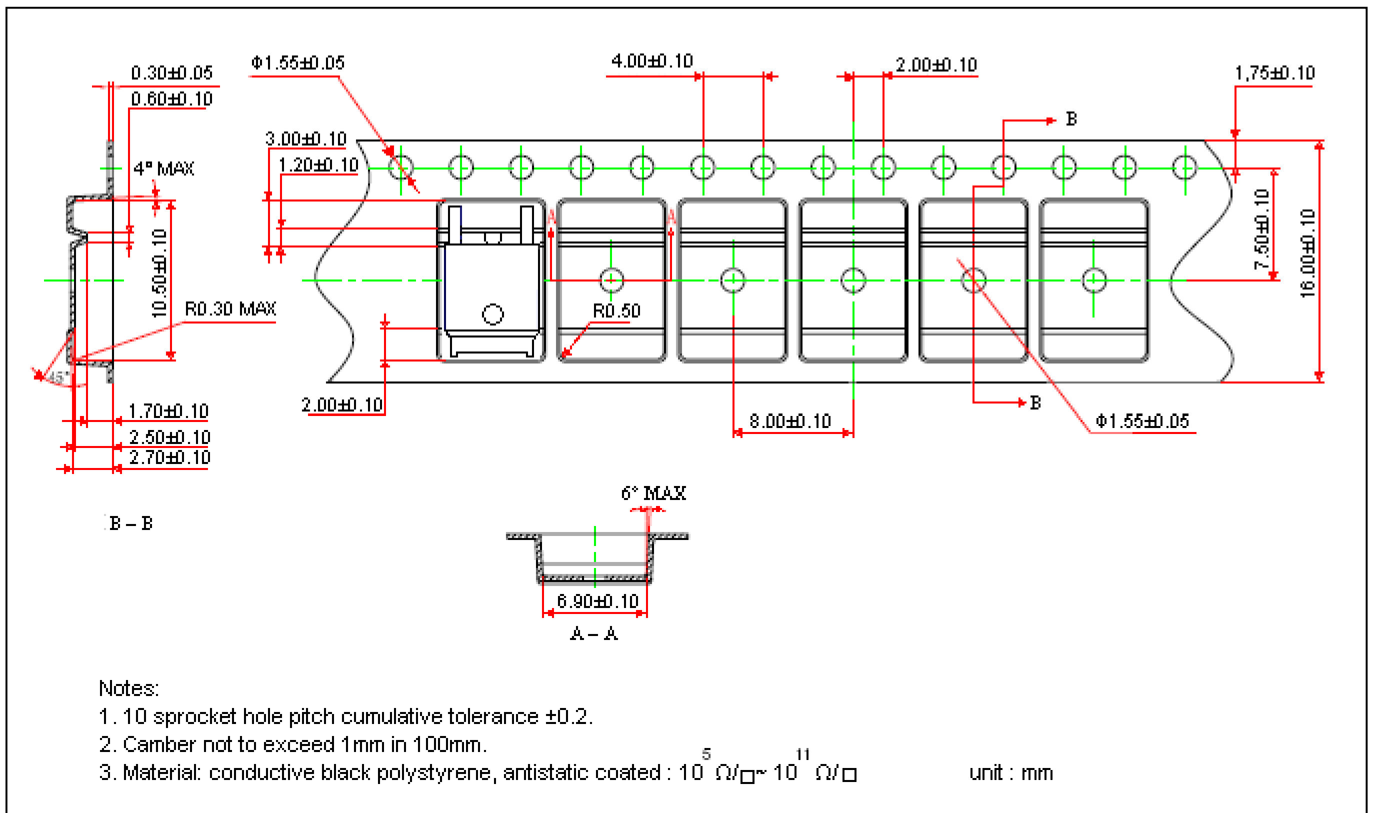



## Reel Dimension




## Carrier Tape Dimension




Notes:

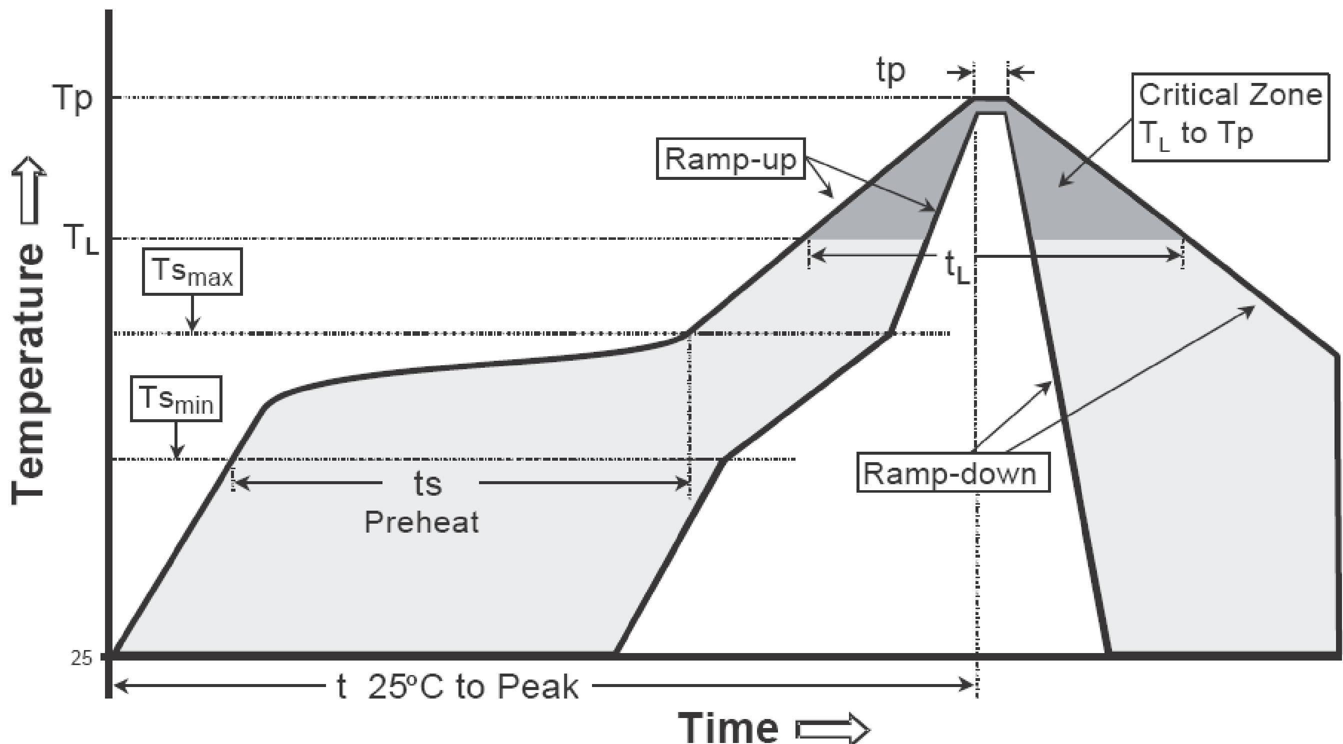
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene, antistatic coated : $10^{5}$ Ω/□ ~ $10^{11}$ Ω/□

unit : mm

## Recommended wave soldering condition

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

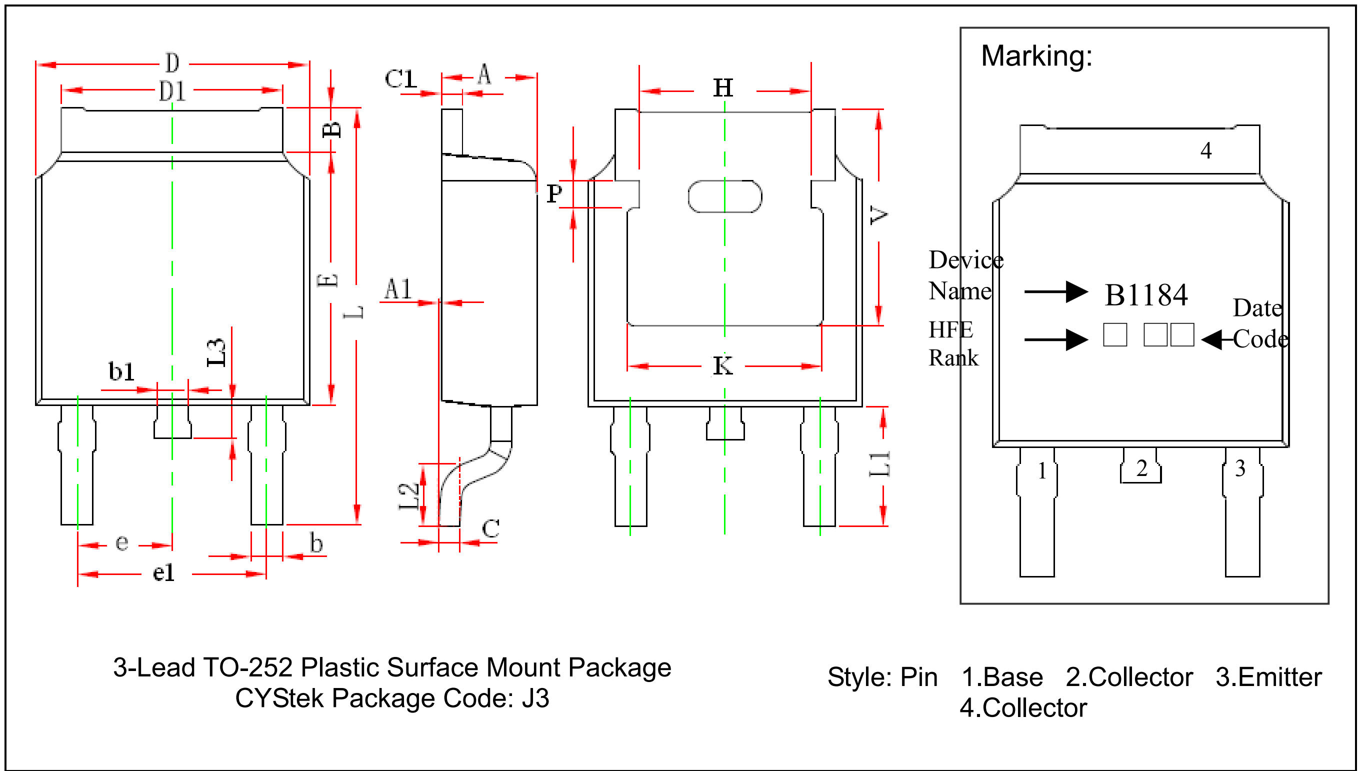
## Recommended temperature profile for IR reflow




| 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<br>−Temperature Min($T_S$ min)<br>−Temperature Max($T_S$ max)<br>−Time($ts_{min}$ to $ts_{max}$) | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>−Temperature ($T_L$)<br>− Time ($t_L$) | 183°C<br>60-150 seconds | 217°C<br>60-150 seconds |
| Peak Temperature($T_P$) | 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-252 Dimension




3-Lead TO-252 Plastic Surface Mount Package
CYStek Package Code: J3

Style: Pin 1.Base 2.Collector 3.Emitter 4.Collector

| DIM | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.087 | 0.094 | 2.200 | 2.400 | e | 0.086 | 0.094 | 2.186 | 2.386 |
| A1 | 0.000 | 0.005 | 0.000 | 0.127 | e1 | 0.172 | 0.188 | 4.372 | 4.772 |
| B | 0.039 | 0.048 | 0.990 | 1.210 | H | 0.163 | REF | 4.140 | REF |
| b | 0.026 | 0.034 | 0.660 | 0.860 | K | 0.190 | REF | 4.830 | REF |
| b1 | 0.026 | 0.034 | 0.660 | 0.860 | L | 0.386 | 0.409 | 9.800 | 10.400 |
| C | 0.018 | 0.023 | 0.460 | 0.580 | L1 | 0.114 | REF | 2.900 | REF |
| C1 | 0.018 | 0.023 | 0.460 | 0.580 | L2 | 0.055 | 0.067 | 1.400 | 1.700 |
| D | 0.256 | 0.264 | 6.500 | 6.700 | L3 | 0.024 | 0.039 | 0.600 | 1.000 |
| D1 | 0.201 | 0.215 | 5.100 | 5.460 | P | 0.026 | REF | 0.650 | REF |
| E | 0.236 | 0.244 | 6.000 | 6.200 | V | 0.211 | REF | 5.350 | REF |

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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