

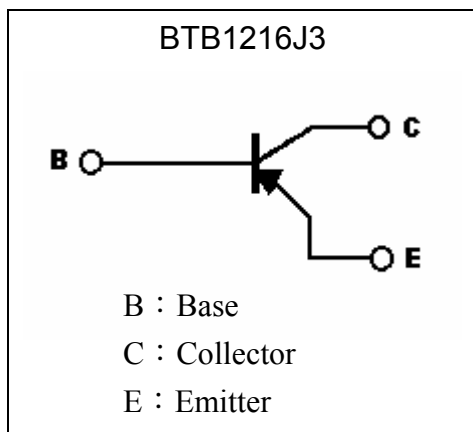
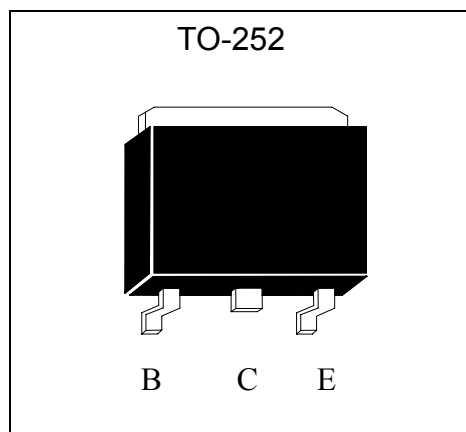
**PNP Epitaxial Planar High Current (High Performance) Transistor**

# BTB1216J3

$BV_{CEO}$	-140V
$I_C$	-4A
$R_{CE(SAT)}$	90m $\Omega$ typ.

**Features**

- 4 Amps continuous current, up to 10 Amps peak current
- Very low saturation voltage
- Excellent gain characteristics specified up to 3 Amps
- Extremely low equivalent on resistance,  $R_{CE(SAT)}=90m\Omega$  at 3A
- RoHS compliant package

**Symbol**

**Outline**

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

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	$V_{CB0}$	-180	V
Collector-Emitter Voltage	$V_{CEO}$	-140	V
Emitter-Base Voltage	$V_{EB0}$	-6	V
Continuous Collector Current	$I_C$	-4	A
Peak Collector Current	$I_{CP}$	-10 (Note 1)	A
Base Current	$I_B$	-1	A
Power Dissipation @ $T_A=25^{\circ}C$	$P_d$	1	W
Power Dissipation @ $T_C=25^{\circ}C$		20	
Operating and Storage Temperature Range	$T_j ; T_{stg}$	-55 ~ +150	$^{\circ}C$

 Note: 1.Single pulse,  $P_w \leq 10ms$

**Characteristics** (Ta=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CB0</sub>	-180	-210	-	V	I <sub>C</sub> =-100μA
*BV <sub>CEO</sub>	-140	-170	-	V	I <sub>C</sub> =-10mA
BV <sub>EBO</sub>	-6	-8	-	V	I <sub>E</sub> =-100μA
I <sub>CB0</sub>	-	-	-50	nA	V <sub>CB</sub> =-150V
I <sub>EBO</sub>	-	-	-10	nA	V <sub>EB</sub> =-6V
*V <sub>CE(sat)1</sub>	-	-40	-60	mV	I <sub>C</sub> =-100mA, I <sub>B</sub> =-5mA
*V <sub>CE(sat)2</sub>	-	-70	-120	mV	I <sub>C</sub> =-500mA, I <sub>B</sub> =-50mA
*V <sub>CE(sat)3</sub>	-	-110	-150	mV	I <sub>C</sub> =-1A, I <sub>B</sub> =-100mA
*V <sub>CE(sat)4</sub>	-	-270	-370	mV	I <sub>C</sub> =-3A, I <sub>B</sub> =-300mA
*V <sub>BE(sat)</sub>	-	-930	-1110	mV	I <sub>C</sub> =-3A, I <sub>B</sub> =-300mA
*V <sub>BE(on)</sub>	-	-830	-950	mV	V <sub>CE</sub> =-5V, I <sub>C</sub> =-3A
h <sub>FE1</sub>	100	200	-	-	V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA
*h <sub>FE2</sub>	150	200	400	-	V <sub>CE</sub> =-5V, I <sub>C</sub> =-1A
*h <sub>FE3</sub>	75	140	-	-	V <sub>CE</sub> =-5V, I <sub>C</sub> =-3A
*h <sub>FE4</sub>	-	10	-	-	V <sub>CE</sub> =-5V, I <sub>C</sub> =-10A
f <sub>T</sub>	-	110	-	MHz	V <sub>CE</sub> =-10V, I <sub>C</sub> =-100mA, f=50MHz
Cob	-	40	-	pF	V <sub>CB</sub> =-20V, f=1MHz

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

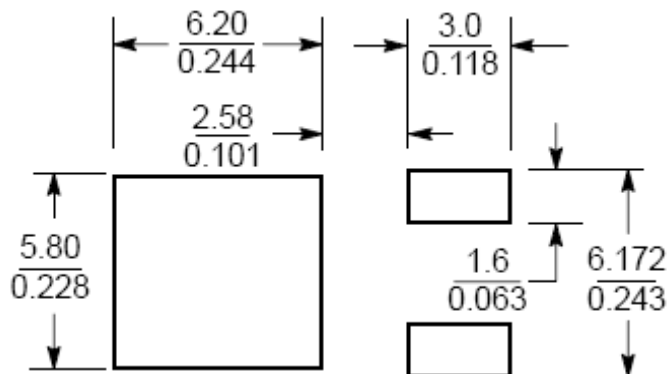
**Classification Of h<sub>FE2</sub>**

Rank	R	S
Range	150~300	200~400

**Ordering Information**

Device	Package	Shipping	Marking
BTB1216J3	TO-252 (RoHS compliant)	2500 pcs / Tape & Reel	B1216

**Recommended soldering footprint**

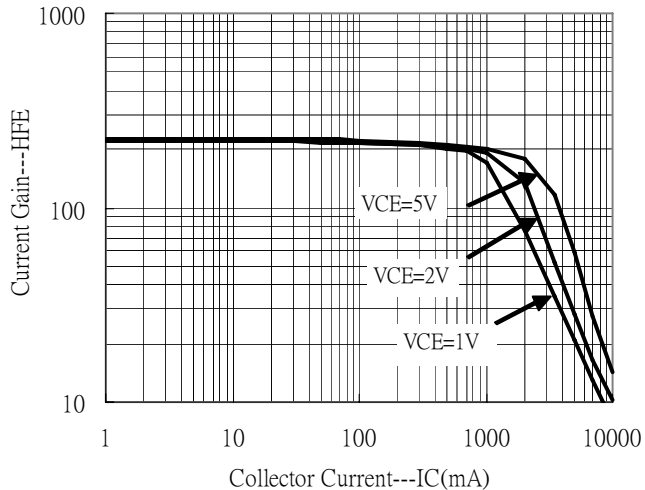


Unit (  $\frac{\text{mm}}{\text{inch}}$  )

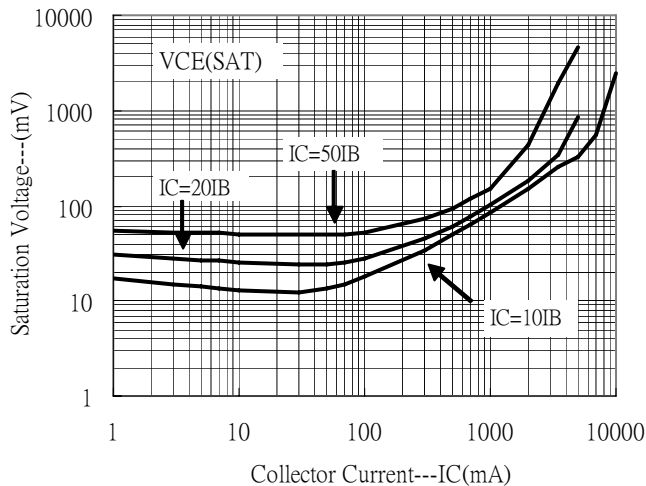


### Characteristic Curves

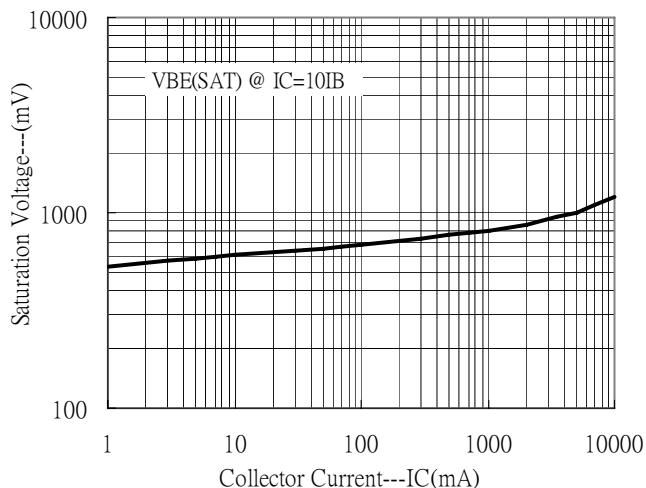
Current Gain vs Collector Current



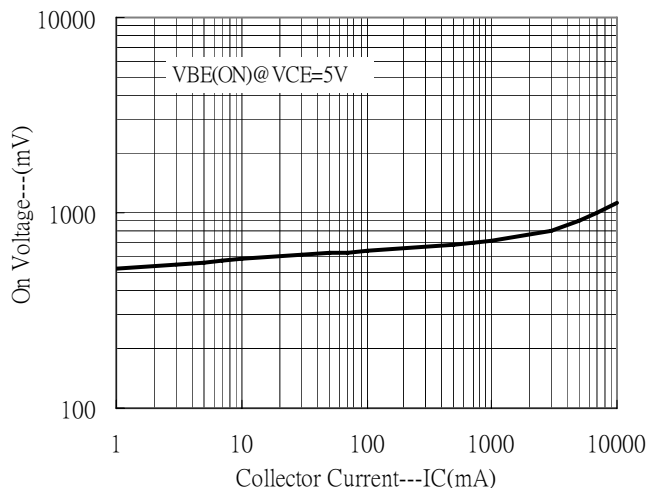
Saturation Voltage vs Collector Current



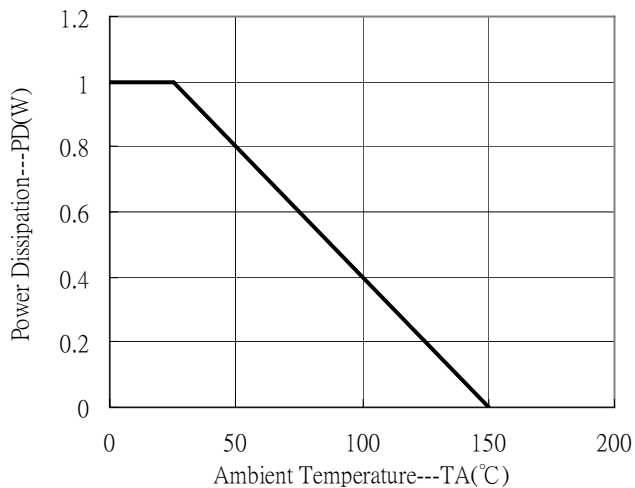
Saturation Voltage vs Collector Current



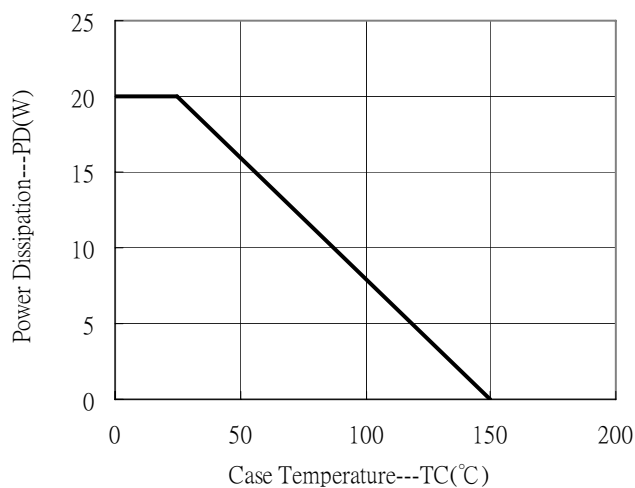
On Voltage vs Collector Current



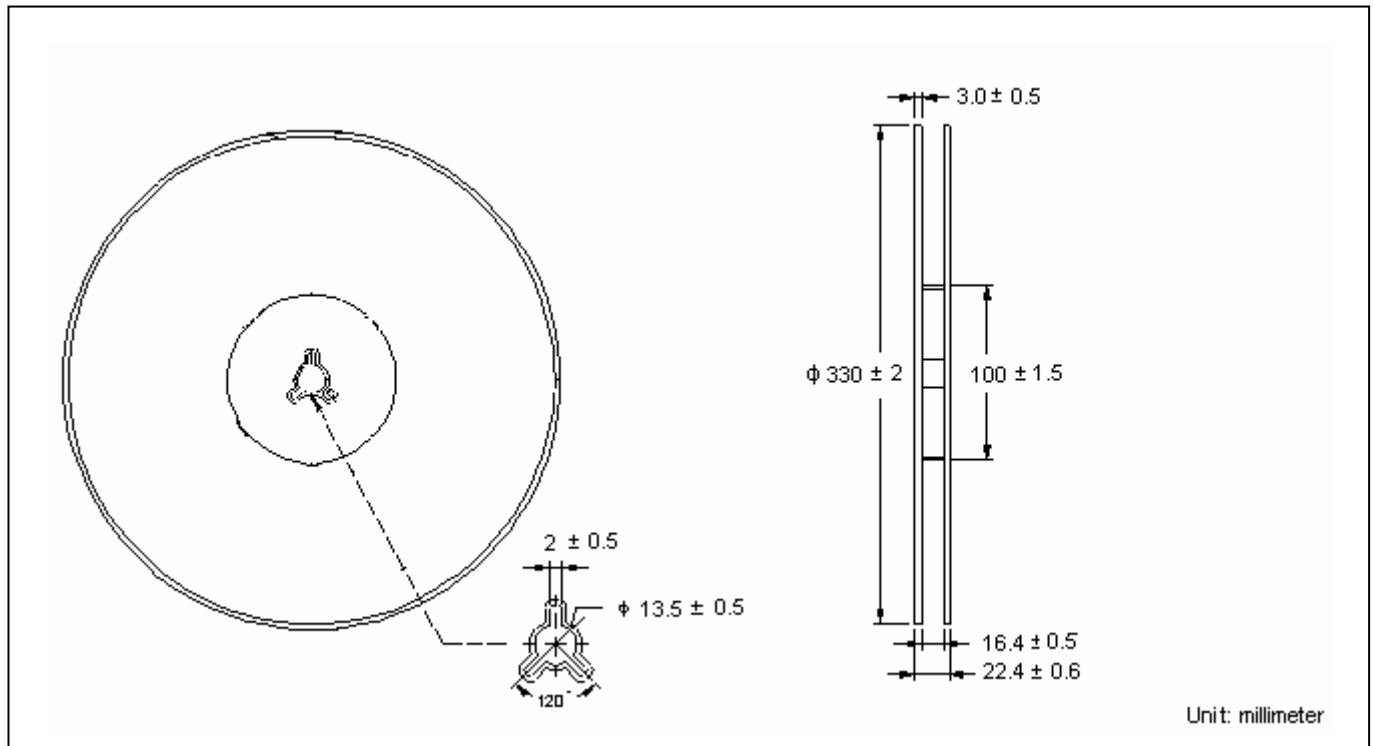
Power Derating Curve



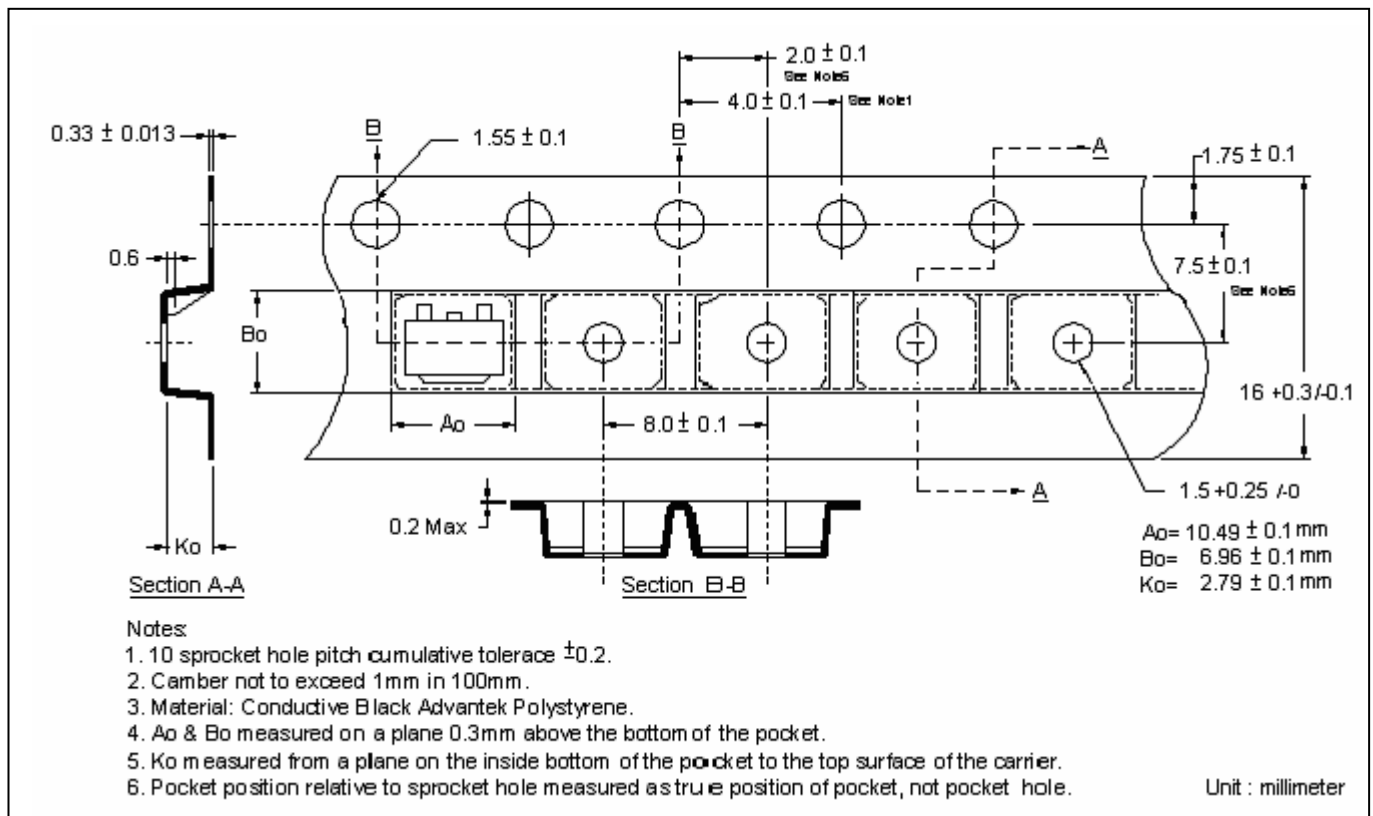
Power Derating Curve



### Reel Dimension



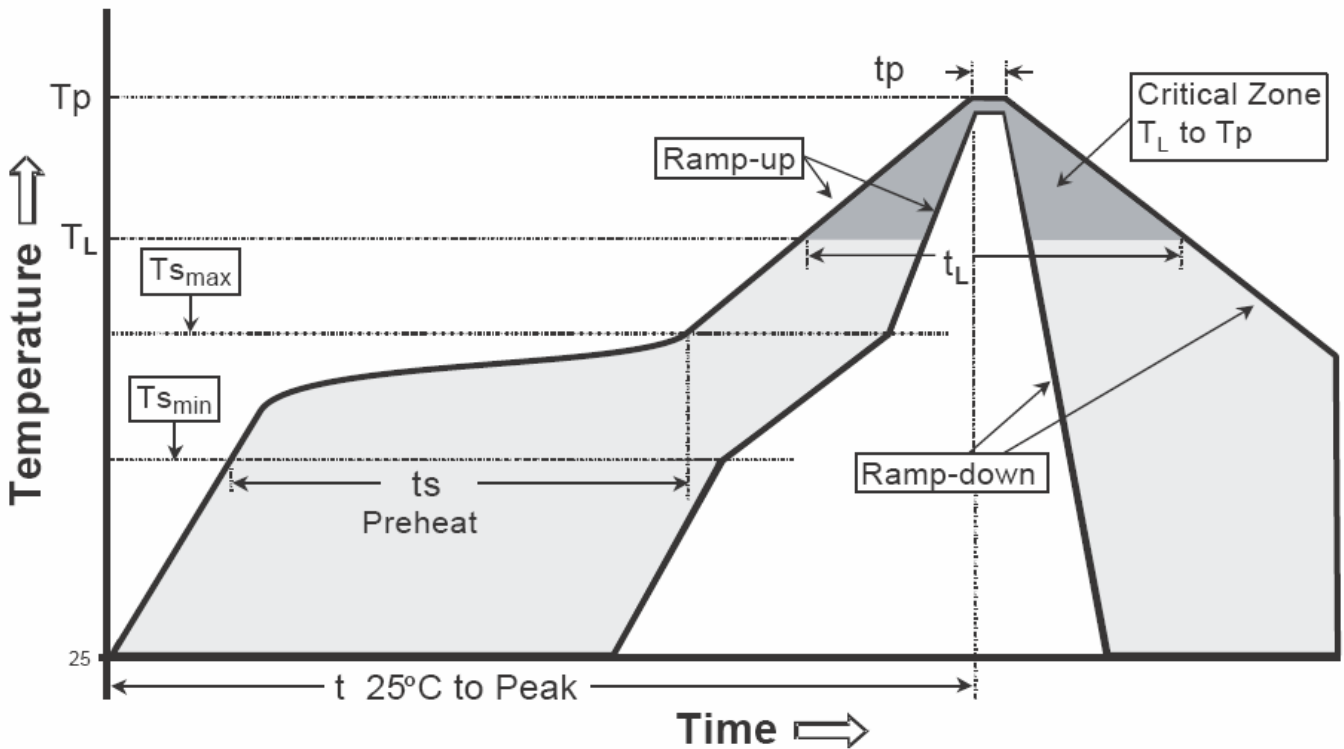
### Carrier Tape Dimension



**Recommended wave soldering condition**

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

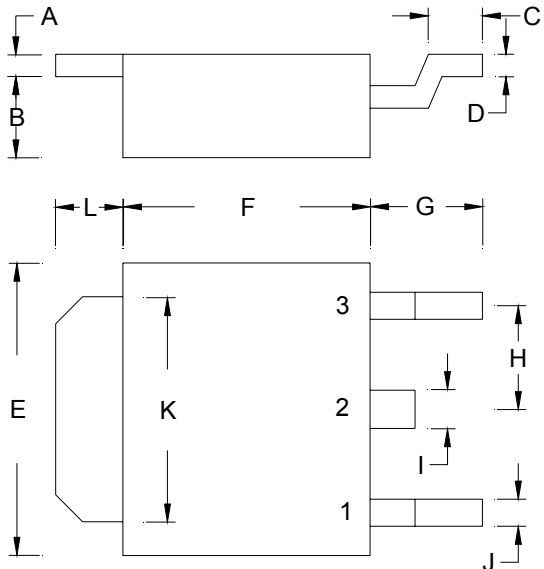
**Recommended temperature profile for IR reflow**



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-252 Dimension**



**Marking:**

Device Name → B1216  
 HFE rank → □ □ ← Date Code

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

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

\*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0177	0.0217	0.45	0.55	G	0.0866	0.1102	2.20	2.80
B	0.0650	0.0768	1.65	1.95	H	-	*0.0906	-	*2.30
C	0.0354	0.0591	0.90	1.50	I	-	0.0449	-	1.14
D	0.0177	0.0236	0.45	0.60	J	-	0.0346	-	0.88
E	0.2441	0.2677	6.20	6.80	K	0.2047	0.2165	5.20	5.50
F	0.2125	0.2283	5.40	5.80	L	0.0551	0.0630	1.40	1.60

- 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 : KFC; pure tin plated
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

**Important Notice:**

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of CYStek.
- CYStek reserves the right to make changes to its products without notice.
- CYStek **semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.**
- CYStek assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.