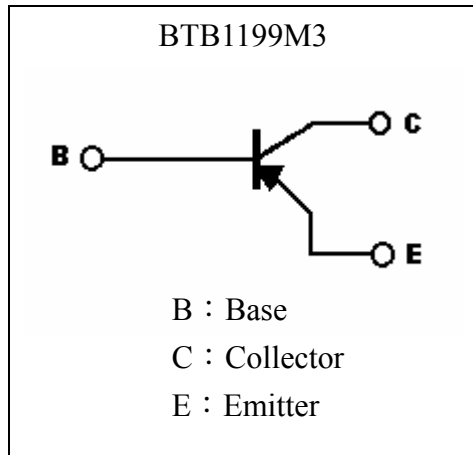
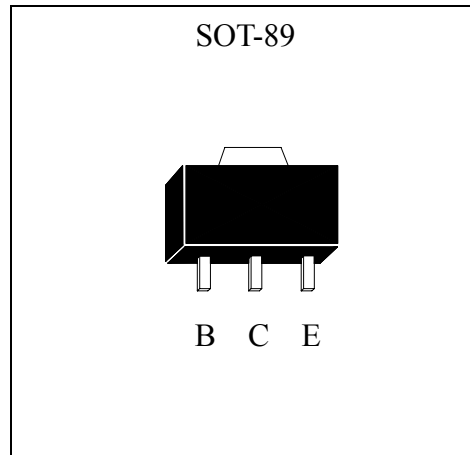


**Low Vcesat PNP Epitaxial Planar Transistor**

# BTB1199M3

**Features**

- Low  $V_{CE(sat)}$ ,  $V_{CE(sat)} = -0.24V$  (typical), at  $I_C / I_B = -500mA / -20mA$
- Pb-free package

**Symbol**

**Outline**

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

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	$V_{CBO}$	-40	V
Collector-Emitter Voltage	$V_{CEO}$	-25	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current(DC)	$I_C$	-2	A
Peak Collector Current	$I_{CM}$	-4	A
Peak Base Current	$I_{BM}$	-200	mA
Power Dissipation	$P_d$	0.6	W
		1 *2	
		2 *3	
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature	$T_{stg}$	-55~+150	$^\circ C$

 Note : \*1 Single pulse,  $P_w = 10ms$ 

 \*2 When mounted on FR-4 PCB with area measuring  $10 \times 10 \times 1 mm$ 

 \*3 When mounted on ceramic with area measuring  $40 \times 40 \times 1 mm$

**Characteristics (Ta=25°C)**

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CB0</sub>	-40	-	-	V	I <sub>C</sub> =-50μA, I <sub>E</sub> =0
BV <sub>CE0</sub>	-25	-	-	V	I <sub>C</sub> =-1mA, I <sub>B</sub> =0
BV <sub>EBO</sub>	-5	-	-	V	I <sub>E</sub> =-50μA, I <sub>C</sub> =0
I <sub>CB0</sub>	-	-	-100	nA	V <sub>CB</sub> =-40V, I <sub>E</sub> =0
I <sub>EBO</sub>	-	-	-100	nA	V <sub>EB</sub> =-5V, I <sub>C</sub> =0
*V <sub>CE(sat)</sub>	-	-0.24	-0.4	V	I <sub>C</sub> =-500mA, I <sub>B</sub> =-20mA
*V <sub>BE(on)</sub>	-0.5	-	-0.8	V	V <sub>CE</sub> =-1V, I <sub>C</sub> =-10mA
*h <sub>FE 1</sub>	120	-	390	-	V <sub>CE</sub> =-1V, I <sub>C</sub> =-100mA
*h <sub>FE 2</sub>	40	-	-	-	V <sub>CE</sub> =-1V, I <sub>C</sub> =-700mA
f <sub>T</sub>	-	120	-	MHz	V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA, f=100MHz
Cob	-	19	-	pF	V <sub>CB</sub> =-10V, f=1MHz

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

**Classification of hFE 1**

Rank	Q	R
Range	120~270	180~390

**Ordering Information**

Device	Package	Shipping	Marking
BTB1199M3	SOT-89 (Pb-free)	1000 pcs / Tape & Reel	BA

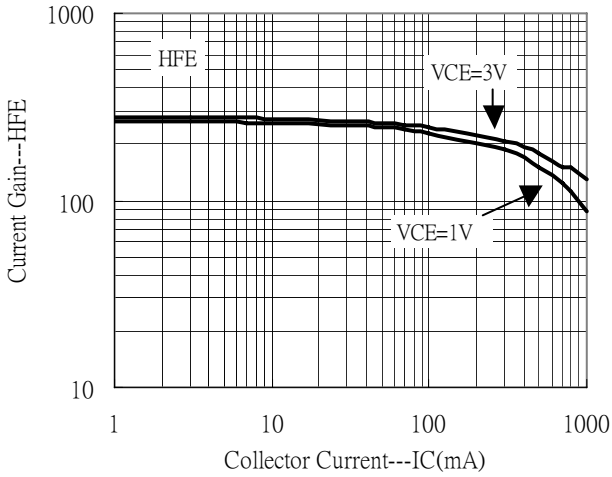
**Recommended Storage Condition:**

Temperature : ≤ 30 °C

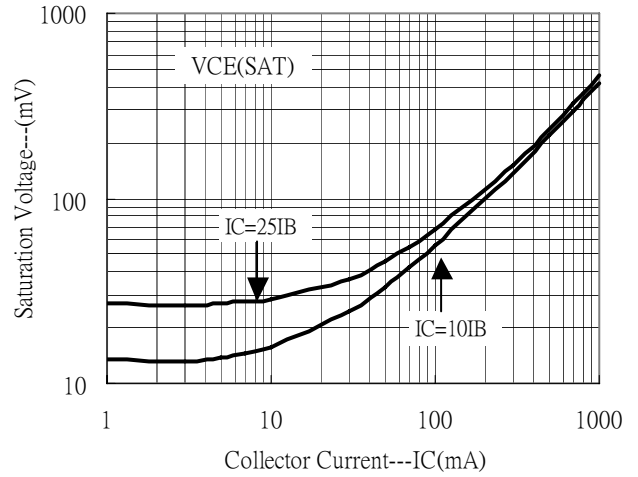
Humidity : ≤ 60% RH

**Characteristic Curves**

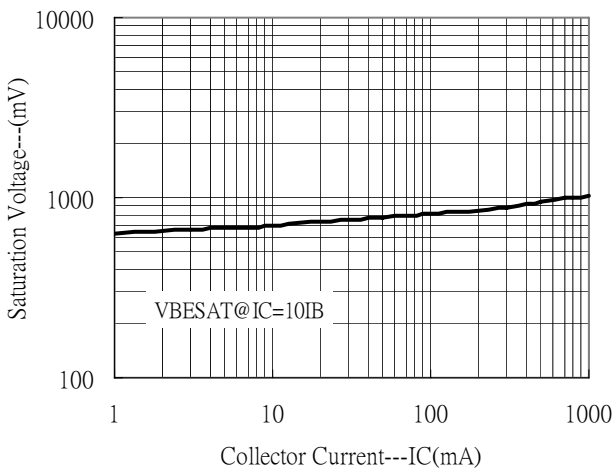
Current Gain vs Collector Current



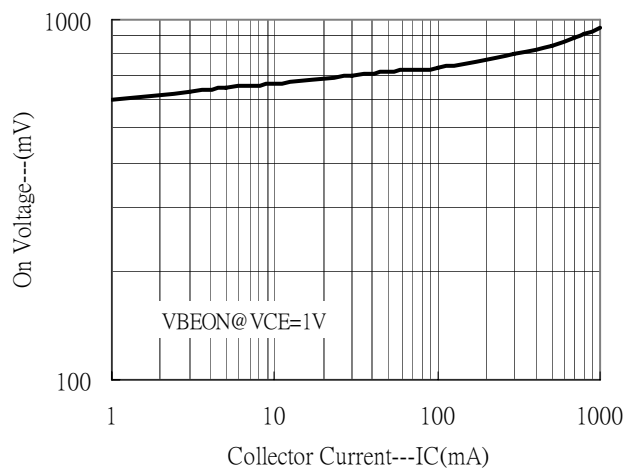
Saturation Voltage vs Collector Current



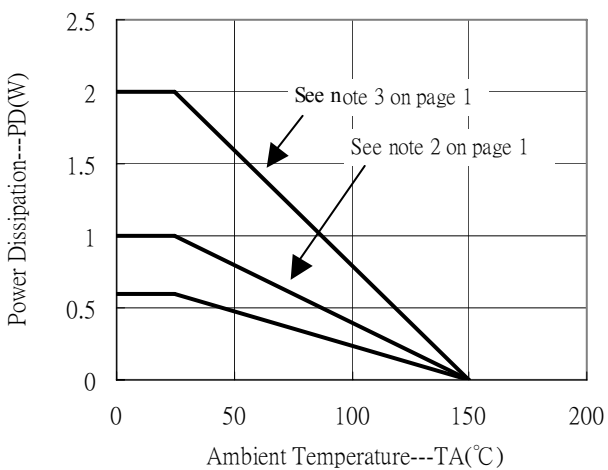
Saturation Voltage vs Collector Current



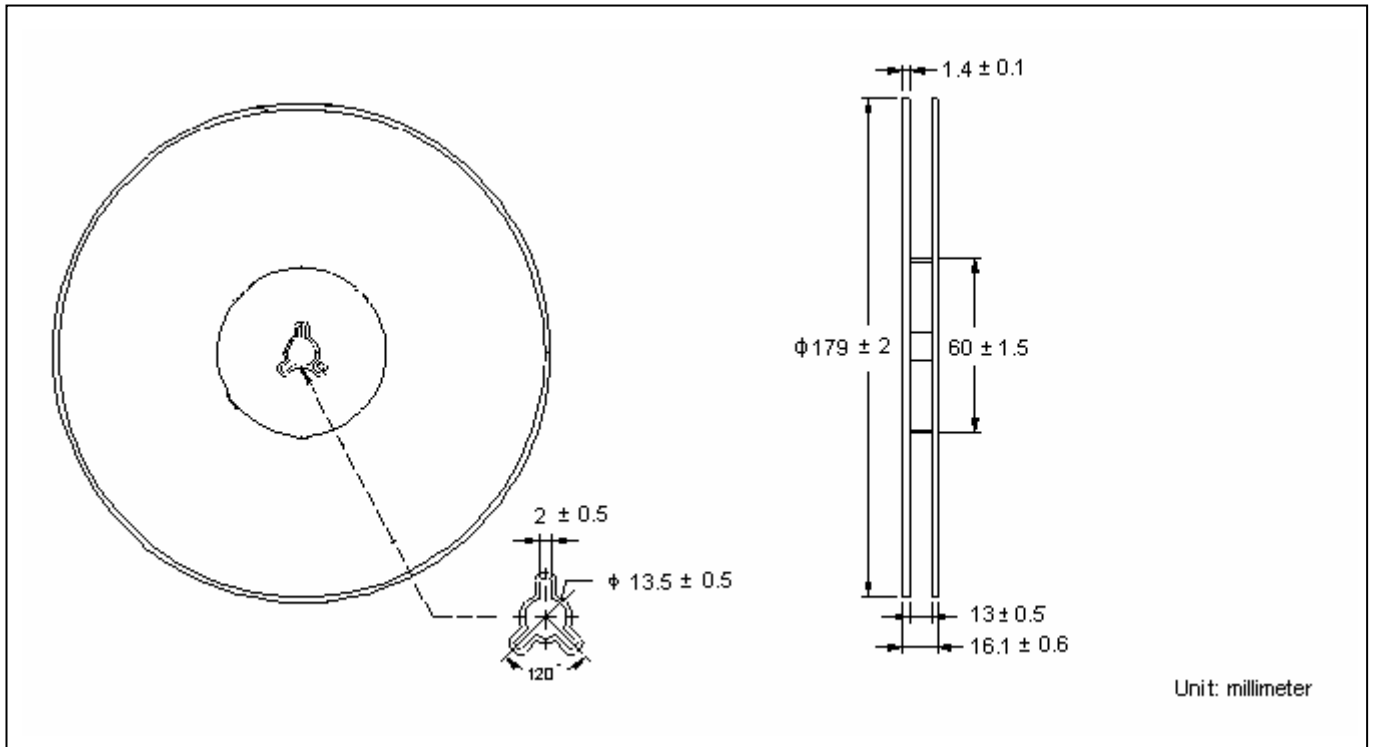
On Voltage vs Collector Current



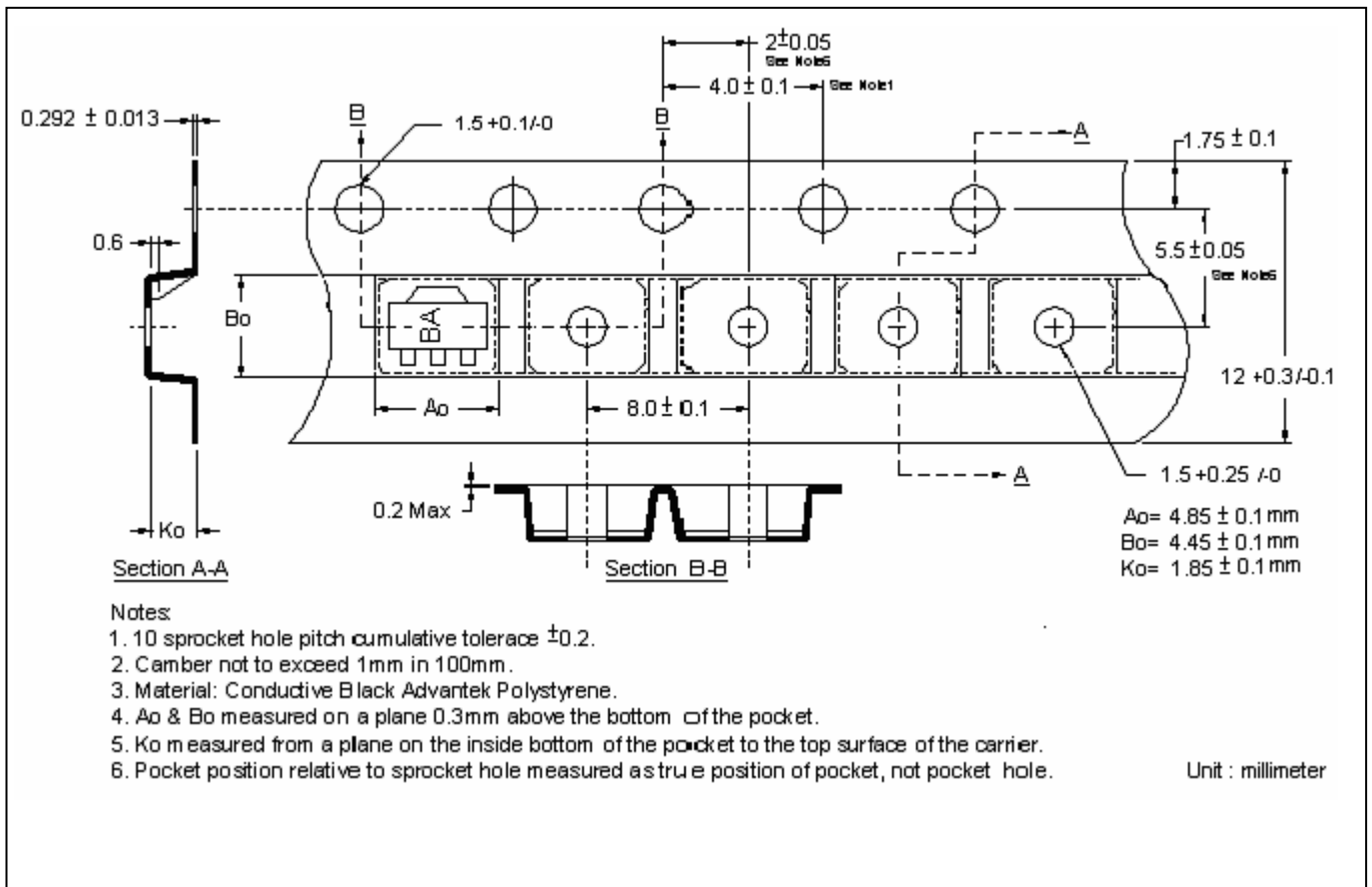
Power Derating Curves



### Reel Dimension



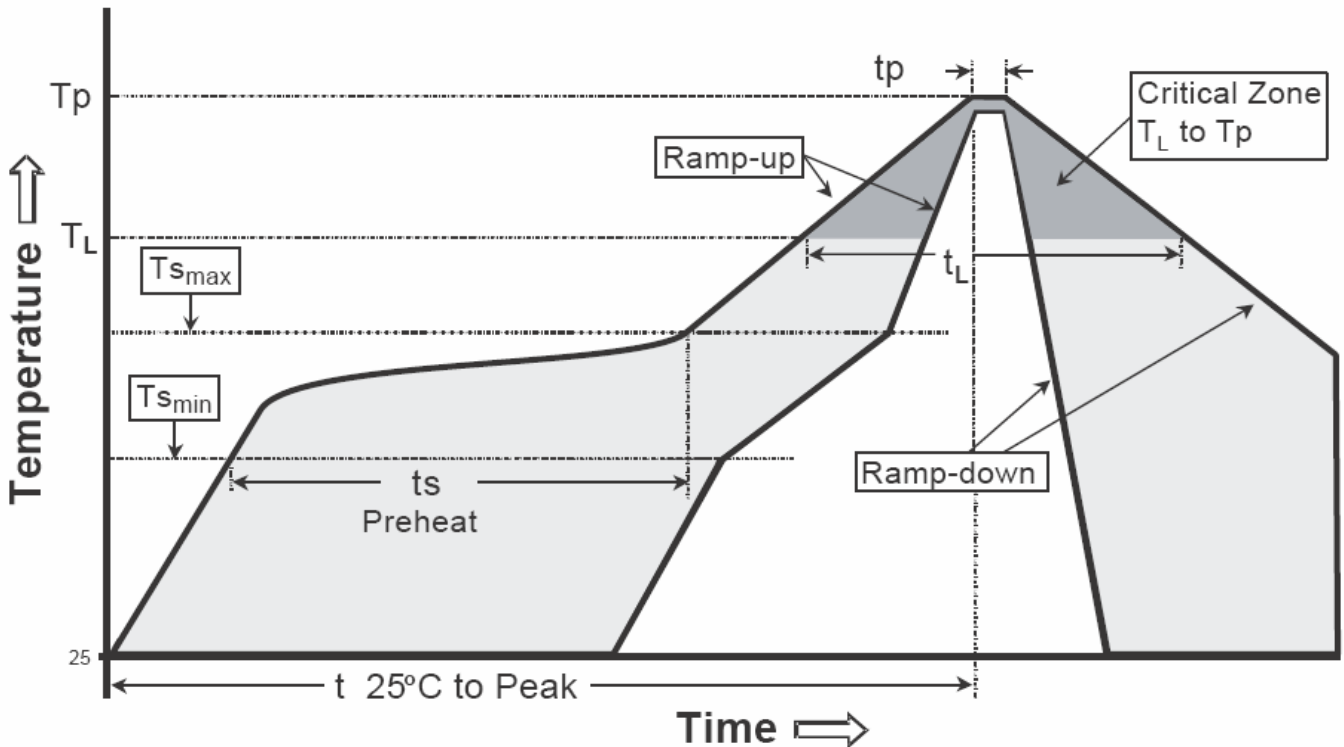
### Carrier Tape Dimension



**Recommended wave soldering condition**

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

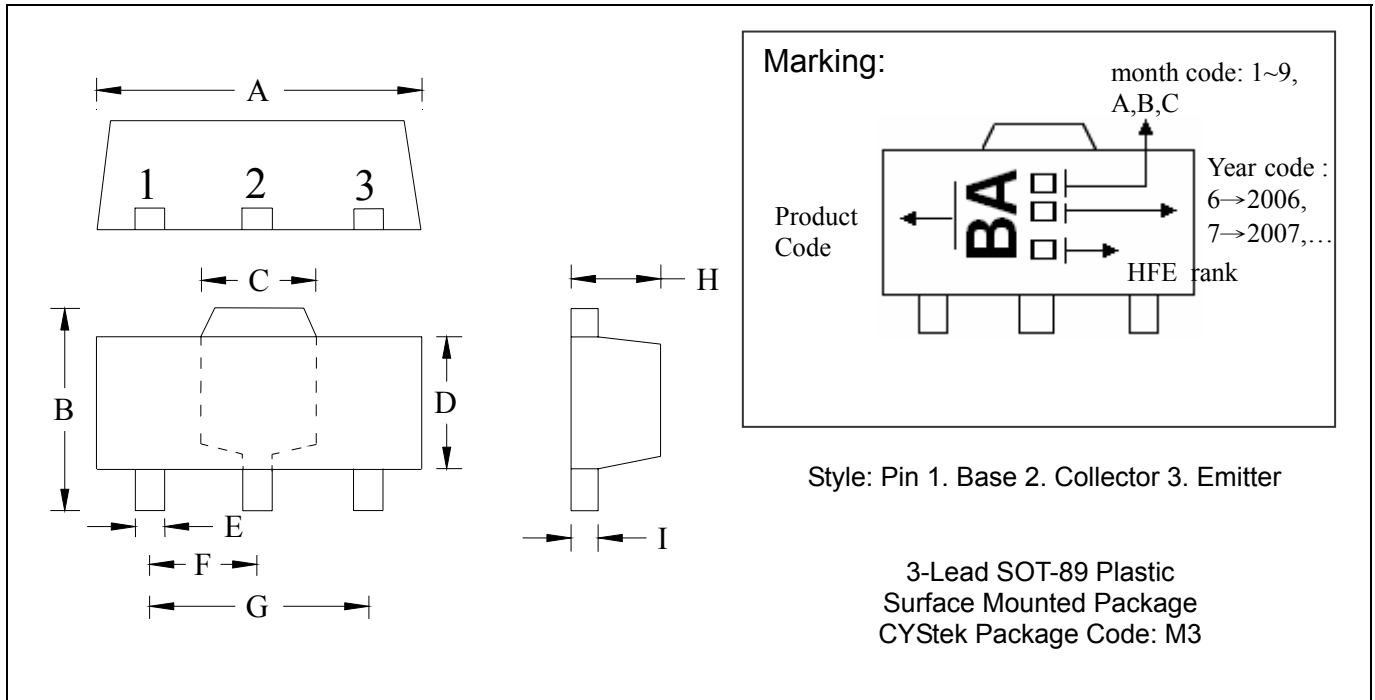
**Recommended temperature profile for IR reflow**



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(t <sub>p</sub> )	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.

**SOT-89 Dimension**



\*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1732	0.1811	4.40	4.60	F	0.0583	0.0598	1.48	1.527
B	0.1594	0.1673	4.05	4.25	G	0.1165	0.1197	2.96	3.04
C	0.0591	0.0663	1.50	1.70	H	0.0551	0.0630	1.40	1.60
D	0.0945	0.1024	2.40	2.60	I	0.0138	0.0161	0.35	0.41
E	0.01417	0.0201	0.36	0.51					

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

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