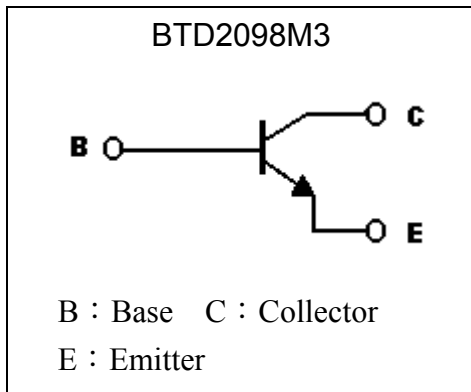
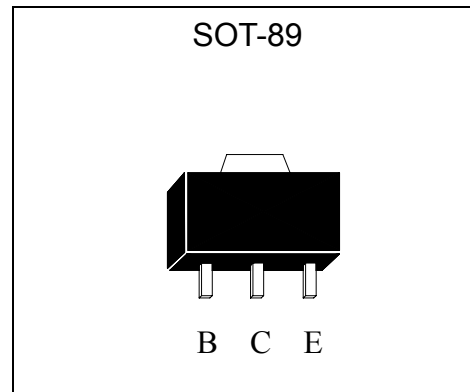


**Low Vcesat NPN Epitaxial Planar Transistor**

# BTD2098M3

**Features**

- Low  $V_{CE(sat)}$ ,  $V_{CE(sat)}=0.35$  V (typical), at  $I_C / I_B = 3A / 0.1A$
- Excellent DC current gain characteristics
- Complementary to BTB1386M3
- Pb-free lead plating and halogen-free package

**Symbol**

**Outline**

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

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	$V_{CB0}$	40	V
Collector-Emitter Voltage	$V_{CEO}$	30	V
Emitter-Base Voltage	$V_{EBO}$	6	V
Collector Current (DC)	$I_C$	5	A
Collector Current (Pulse)		8    *1	A
Power Dissipation	$P_d$	0.6	W
		1    *2	
		2    *3	
Thermal resistance, junction to ambient	$R_{\theta JA}$	125    *2	$^{\circ}C/W$
		62.5    *3	
Thermal resistance, junction to case	$R_{\theta JC}$	16	
Junction Temperature	$T_j$	150	$^{\circ}C$
Storage Temperature	$T_{stg}$	-55~+150	$^{\circ}C$

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

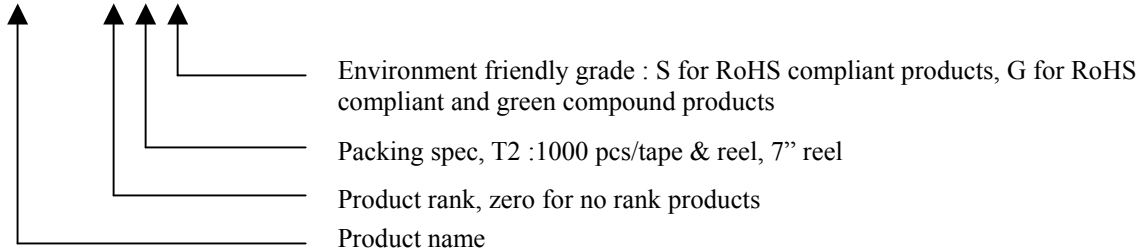
\*2 Printed circuit board, glass epoxy board, 1.7mm thick with collector copper plating 10mm\*10mm.

\*3 When mounted on a 40\*40\*0.7mm ceramic board.



Ordering Information

Device	Package	Shipping
BTD2098M3-S-T2-G	SOT-89 (Pb-free lead plating and halogen-free package)	1000 pcs / Tape & Reel



Characteristics (Ta=25°C)

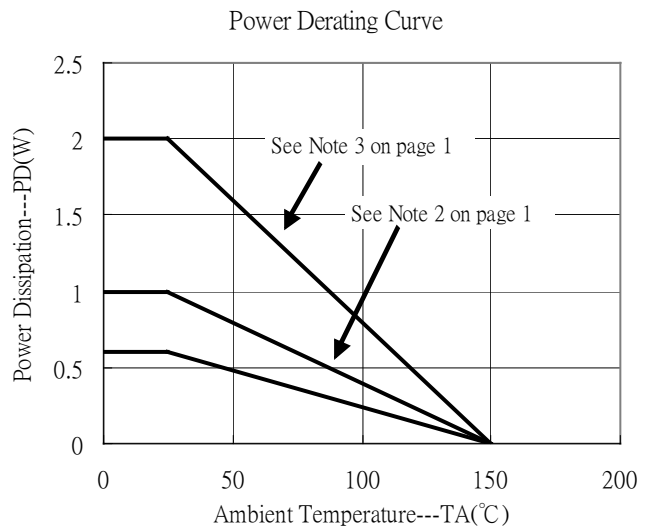
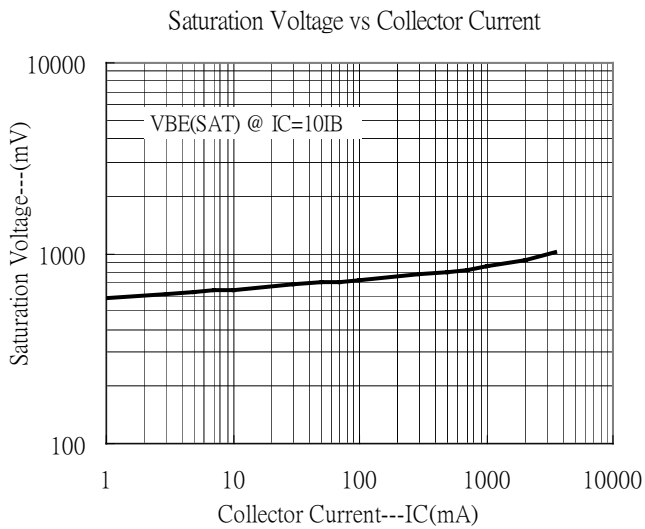
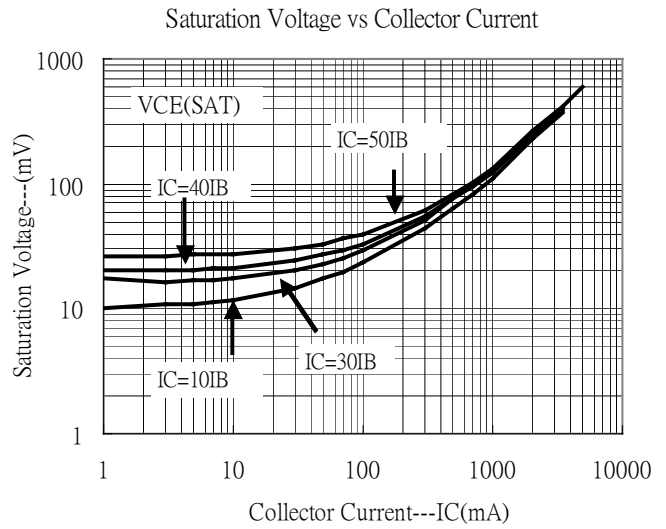
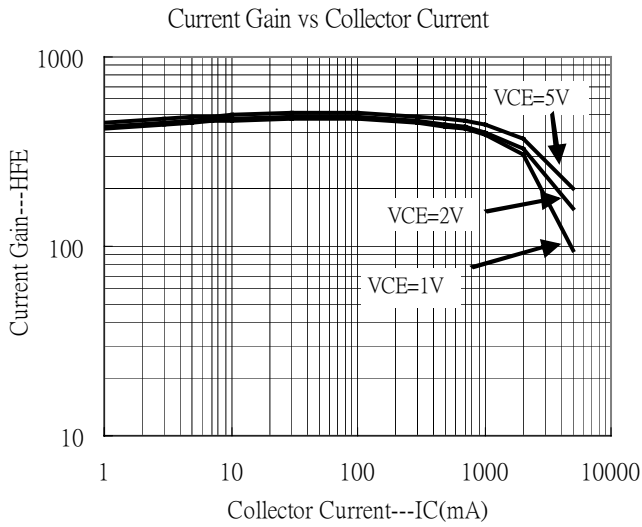
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CB0</sub>	40	-	-	V	I <sub>C</sub> =50μA, I <sub>E</sub> =0
BV <sub>CE0</sub>	30	-	-	V	I <sub>C</sub> =1mA, I <sub>B</sub> =0
BV <sub>EBO</sub>	6	-	-	V	I <sub>E</sub> =50μA, I <sub>C</sub> =0
I <sub>CB0</sub>	-	-	0.5	μA	V <sub>CB</sub> =40V, I <sub>E</sub> =0
I <sub>EBO</sub>	-	-	0.5	μA	V <sub>EB</sub> =5V, I <sub>C</sub> =0
*V <sub>CE(sat)</sub>	-	0.35	1.0	V	I <sub>C</sub> =3A, I <sub>B</sub> =0.1A
*h <sub>FE</sub>	250	-	-	-	V <sub>CE</sub> =2V, I <sub>C</sub> =20mA
*h <sub>FE</sub>	270	-	560	-	V <sub>CE</sub> =2V, I <sub>C</sub> =500mA
*h <sub>FE</sub>	150	-	-	-	V <sub>CE</sub> =2V, I <sub>C</sub> =2A
f <sub>T</sub>	-	150	-	MHz	V <sub>CE</sub> =6V, I <sub>C</sub> =50mA, f=100MHz
Cob	-	30	50	pF	V <sub>CB</sub> =20V, I <sub>E</sub> =0A, f=1MHz

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

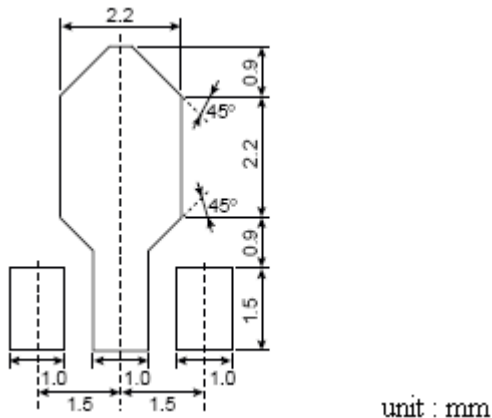
Classification Of hFE

Rank	S
Range	270~560

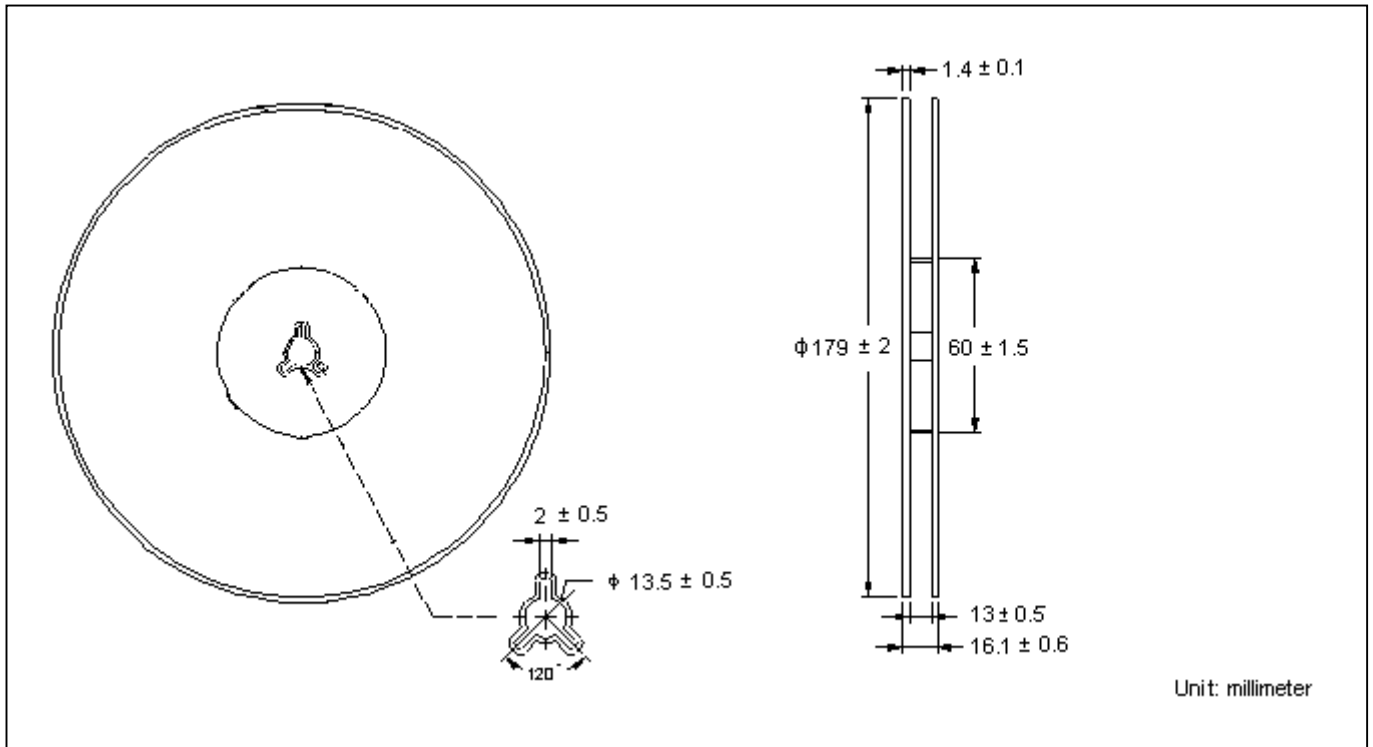
**Typical Characteristics**



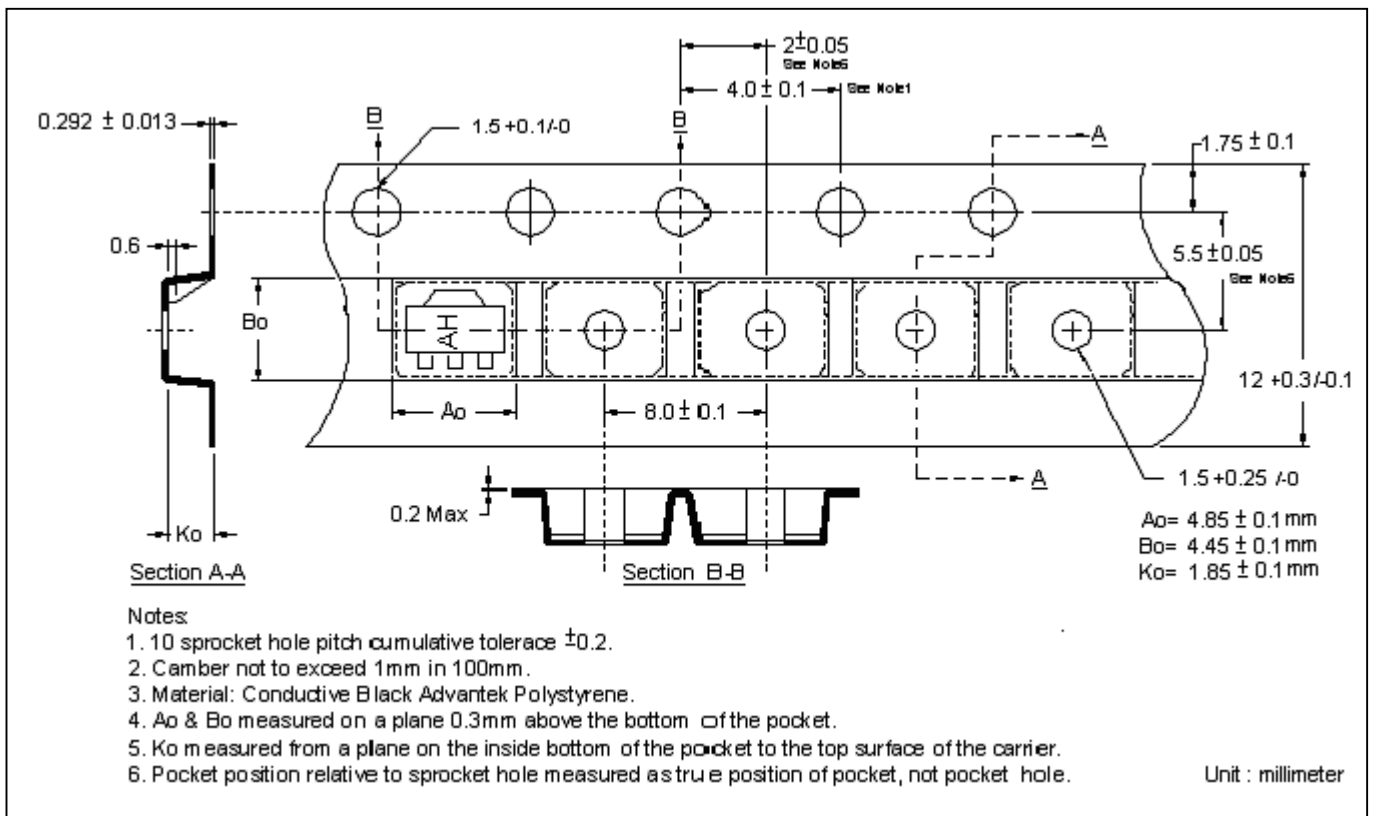
**Recommended soldering footprint**



**Reel Dimension**



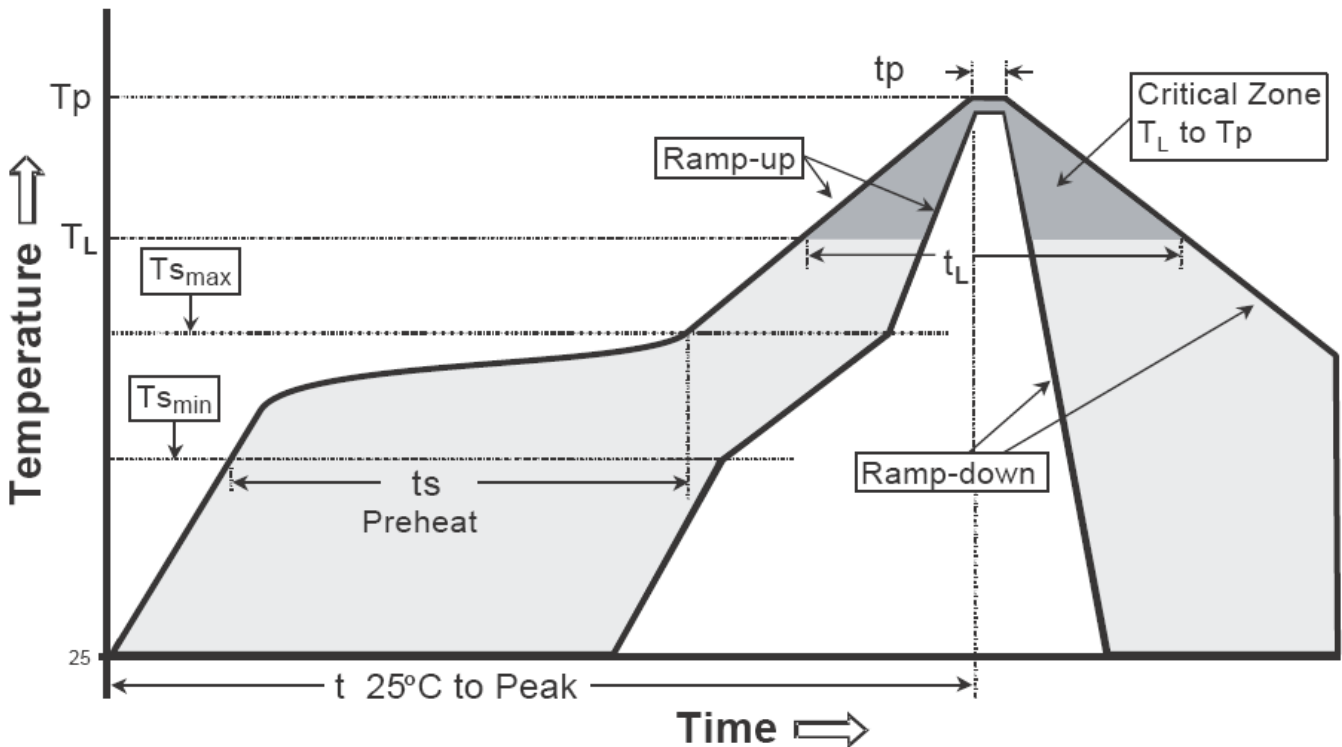
**Carrier Tape Dimension**



**Recommended wave soldering condition**

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

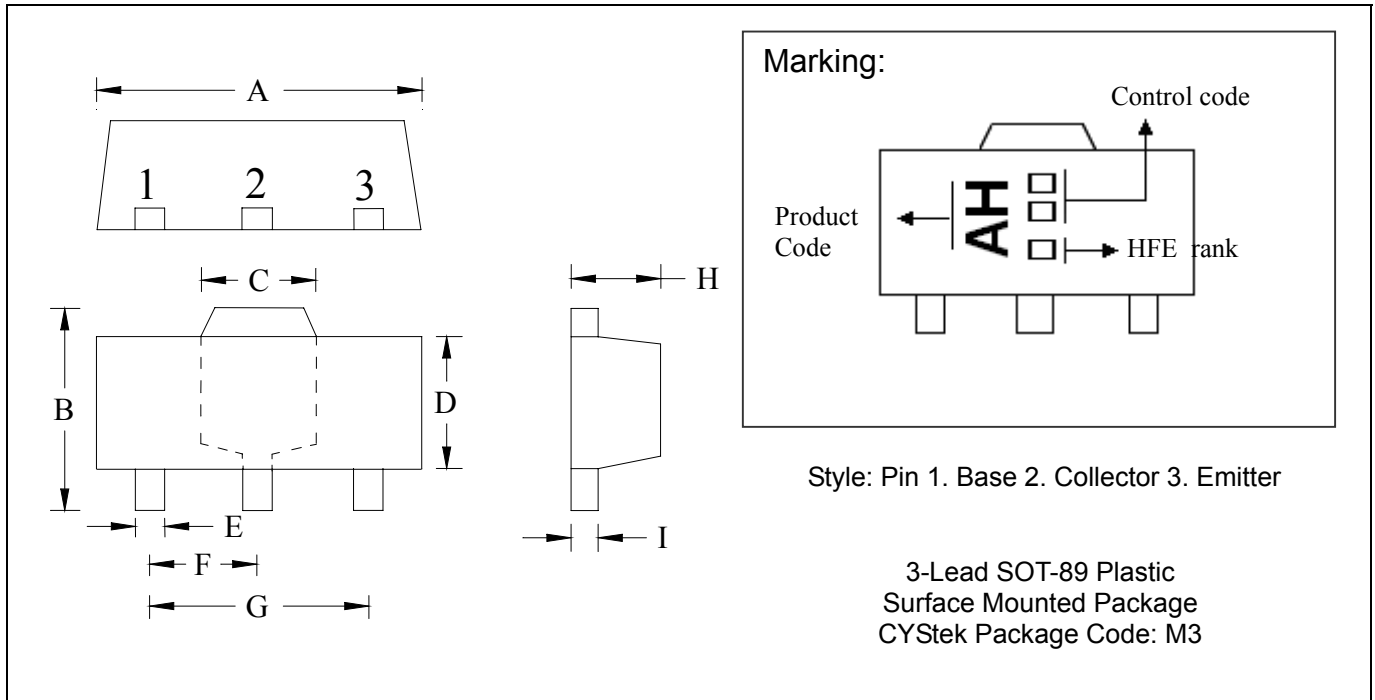
**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (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.

**SOT-89 Dimension**



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1732	0.1811	4.40	4.60	F	0.0591	TYP	1.50	TYP
B	0.1551	0.1673	3.94	4.25	G	0.1181	TYP	3.00	TYP
C	0.0610	REF	1.55	REF	H	0.0551	0.0630	1.40	1.60
D	0.0906	0.1024	2.30	2.60	I	0.0138	0.0173	0.35	0.44
E	0.0126	0.0205	0.32	0.52					

- Notes:**
- Controlling dimension: millimeters.
  - Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
  - 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

**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.