General Purpose NPN Epitaxial Planar Transistor

BTD1768S3

BV_{CEO}	80V
I_C	1A

Description

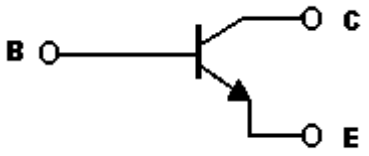
The BTD1768S3 is designed for use in driver and output stages of AF amplifier and general purpose application.

Features

- Low collector saturation voltage
- High breakdown voltage, V_{CEO}=80V (min.)
- High collector current, $I_{C(max)}$=1A (DC)
- Pb-free package

Symbol

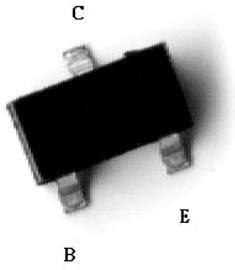
BTD1768S3



B：Base
C：Collector
E：Emitter

Outline

SOT-323



Ordering Information

Device	Package	Shipping
BTD1768S3-X-T1-G	SOT-323 (Pb-free and halogen-free package)	3000 pcs / Tape & Reel

Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products

Packing spec, T1 : 3000 pcs / tape & reel, 7” reel

Product rank, zero for no rank products

Product name

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	180	V
Collector-Emitter Voltage	V_{CEO}	80	V
Emitter-Base Voltage	V_{EBO}	7	V
Collector Current (DC)	I_C	1	A
Collector Current (Pulse)	I_{CP}	2 (Note)	A
Power Dissipation	P_D	200	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	625	°C/W
Operating Junction Temperature Range	Tj	-55~+150	°C
Storage Temperature	Tstg	-55~+150	°C

Note : Pulse test, Pw ≤ 10ms, Duty ≤ 2%.

Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	180	-	-	V	I_C=50μA
BV_{CEO}	80	-	-	V	I_C=1mA
BV_{EBO}	7	-	-	V	I_E=50μA
I_{CBO}	-	-	100	nA	V_{CB}=180V, I_E=0
I_{EBO}	-	-	100	nA	V_{EB}=7V, I_C=0
*$V_{CE(SAT)}$ 1	-	0.15	0.3	V	I_C=500mA, I_B=20mA
*$V_{CE(SAT)}$ 2	-	0.3	0.5	V	I_C=1A, I_B=50mA
*$V_{BE(SAT)}$	-	0.96	1.2	V	I_C=1A, I_B=50mA
*$V_{BE(ON)}$	0.6	0.66	0.7	V	V_{CE}=2V, I_C=50mA
*h_{FE} 1	180	-	560	-	V_{CE}=2V, I_C=100mA
*h_{FE} 2	60	-	-	-	V_{CE}=2V, I_C=500mA
*h_{FE} 3	20	-	-	-	V_{CE}=2V, I_C=1A
f_T	-	250	-	MHz	V_{CE}=10V, I_C=50mA, f=100MHz
Cob	-	6	15	pF	V_{CB}=10V, I_E=0A, f=1MHz

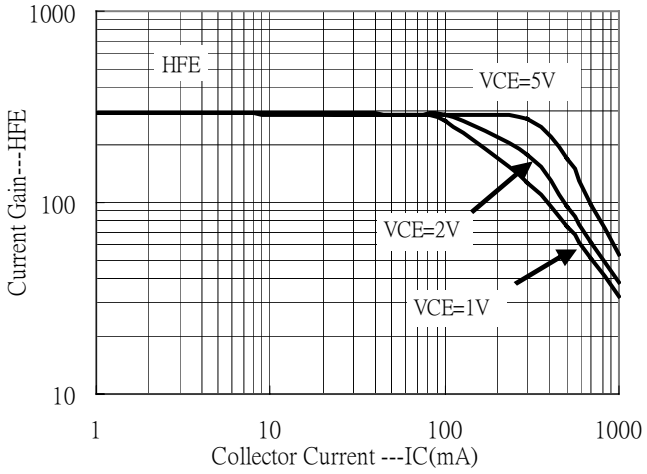
*Pulse Test: Pulse Width ≤380μs, Duty Cycle≤2%

Classification Of h_{FE} 1

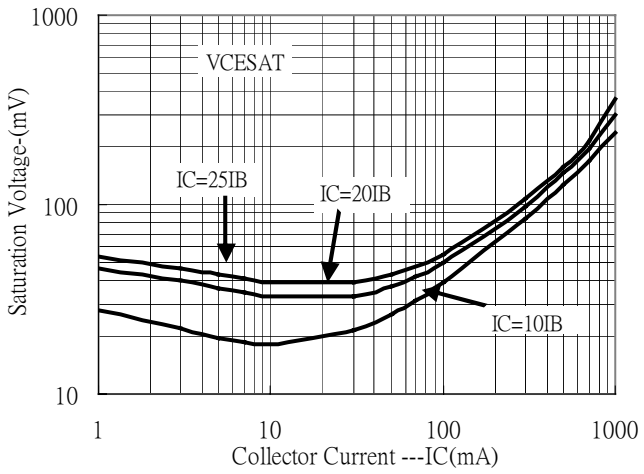
Rank	R	S
Range	180~390	270~560

Typical Characteristics

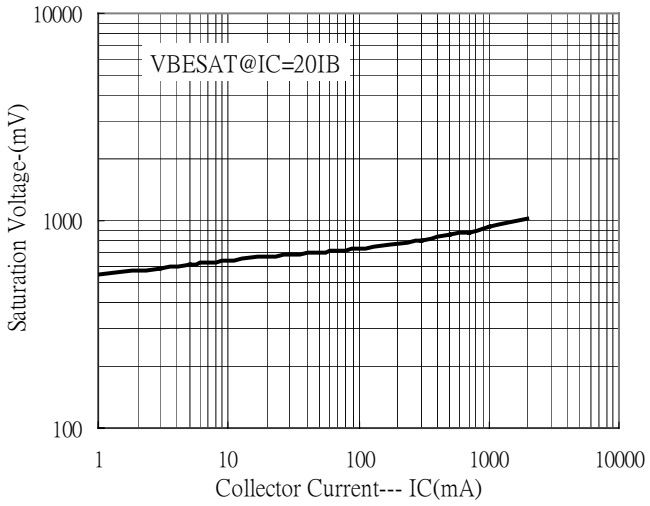
Current Gain vs Collector Current



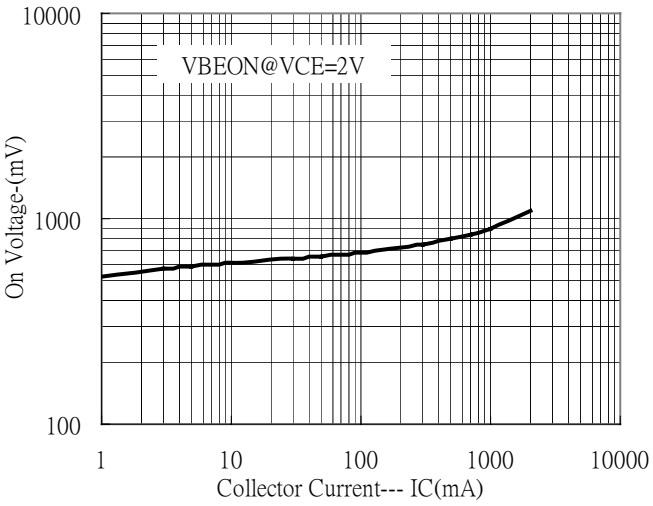
Saturation Voltage vs Collector Current



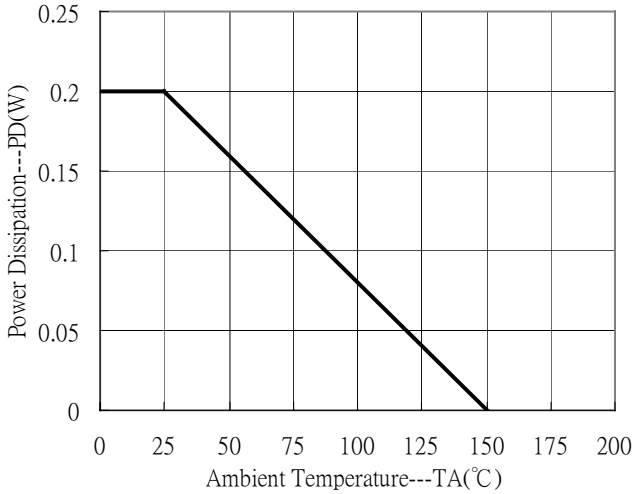
Saturation Voltage vs Collector Current



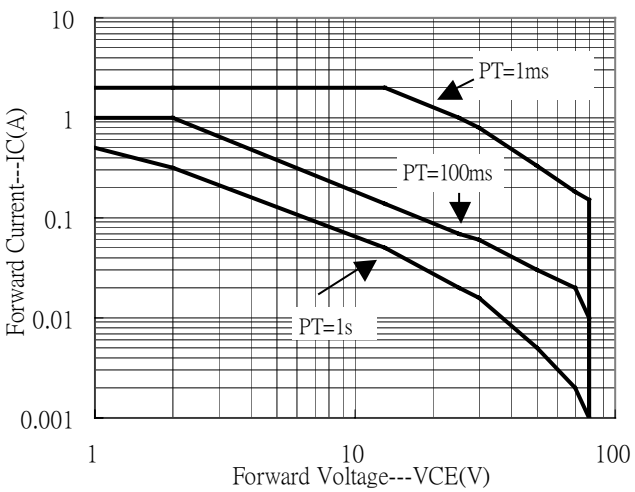
On Voltage vs Collector Current



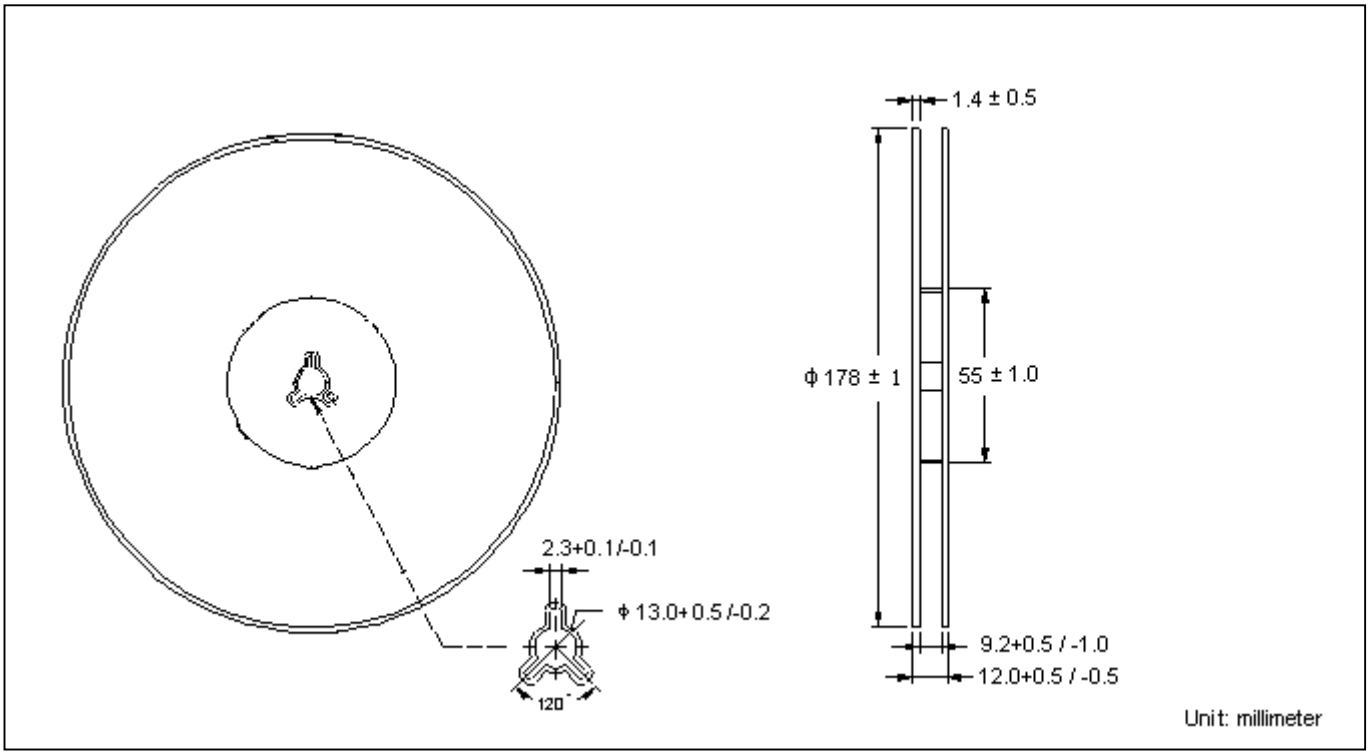
Power Derating Curve



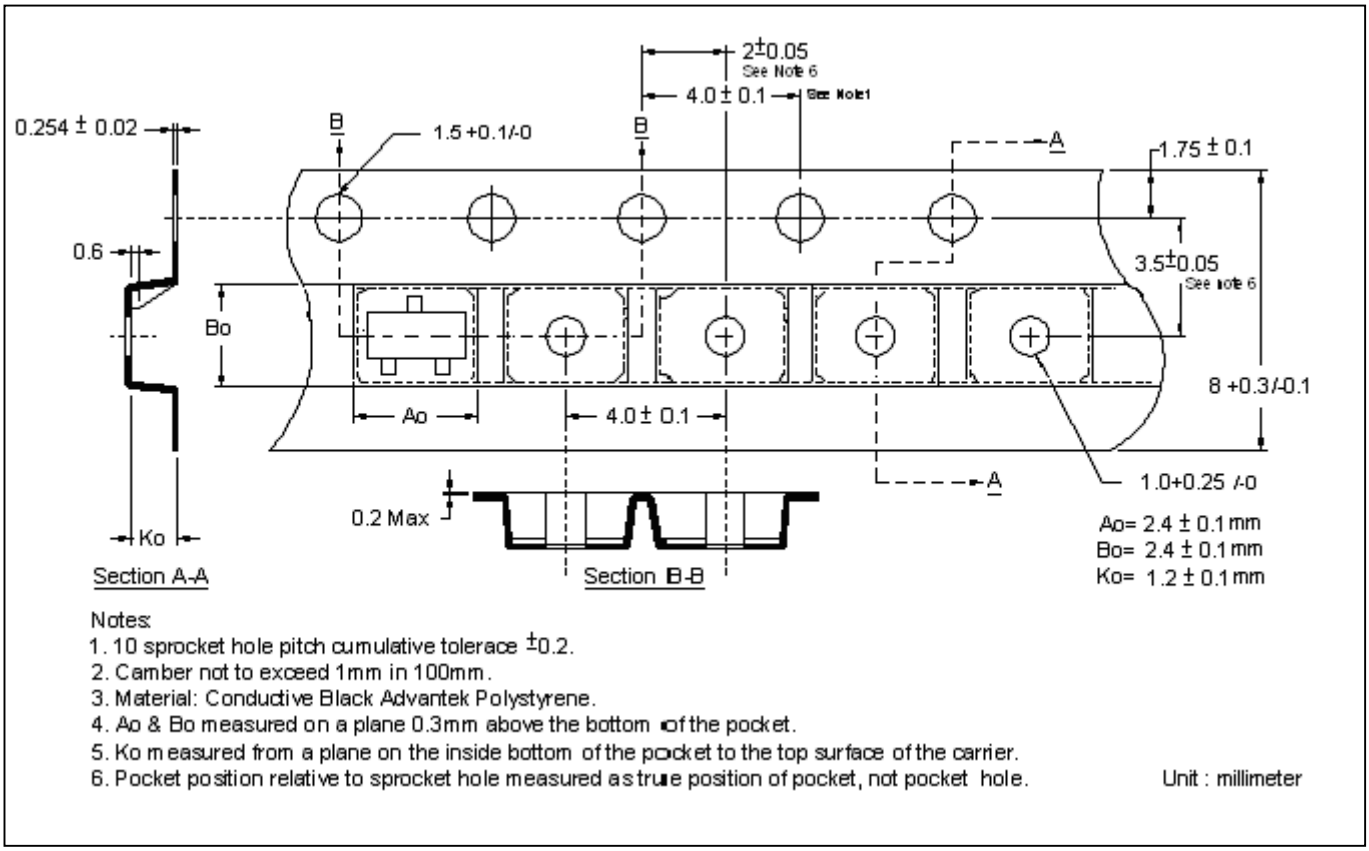
Safe Operating Area



Reel Dimension



Carrier Tape Dimension



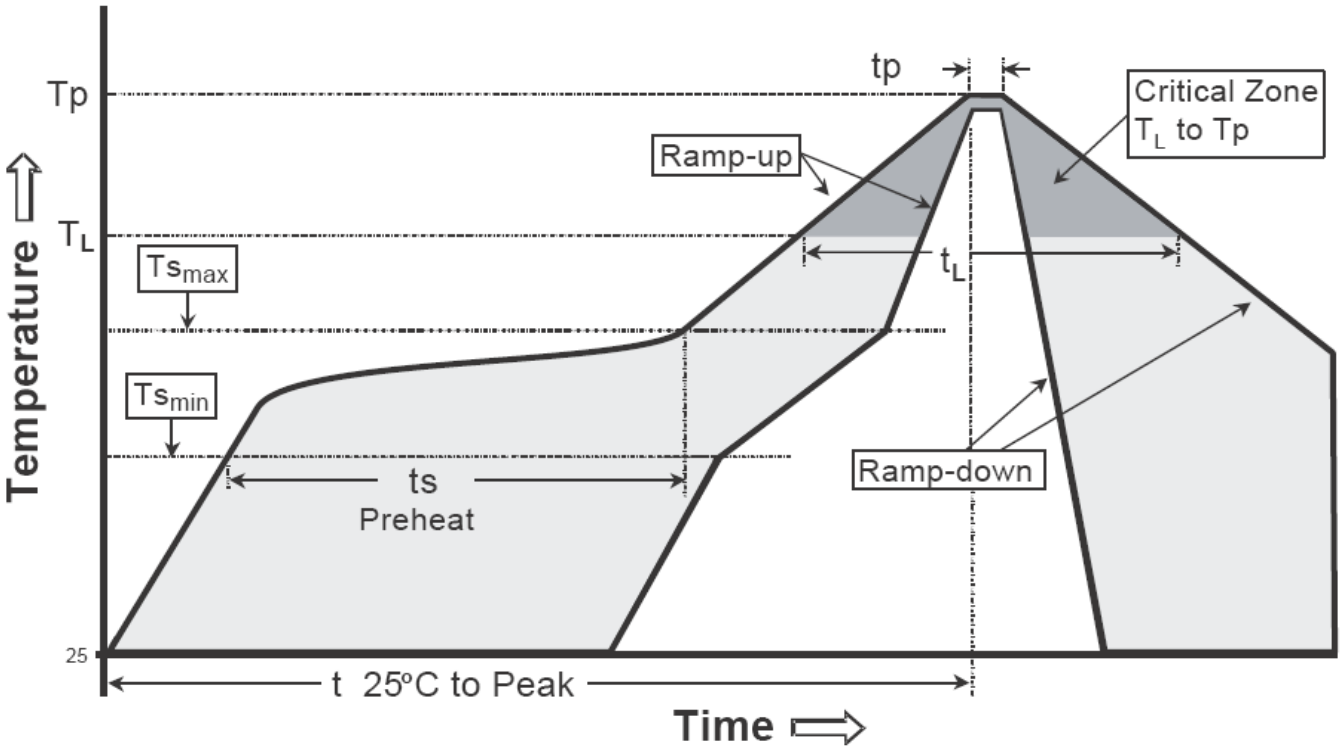
Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

Recommended wave soldering condition

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

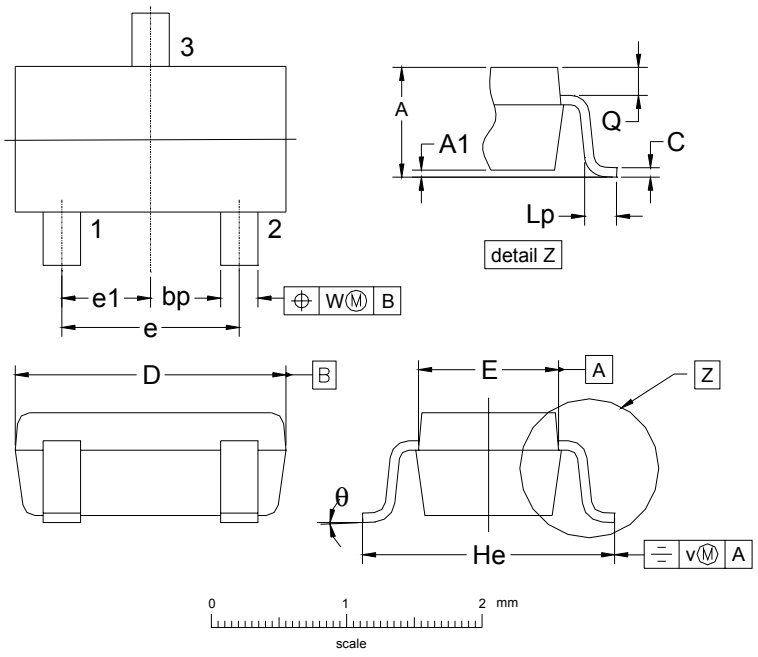
Recommended temperature profile for IR reflow



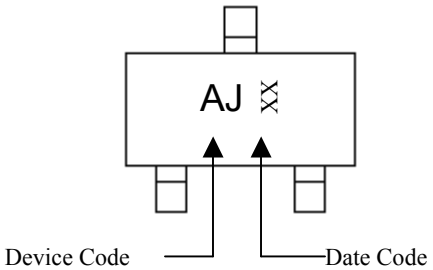
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	 183°C 60-150 seconds	 217°C 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 :1. All temperatures refer to topside of the package, measured on the package body surface.
2.For devices mounted on FR-4 PCB of 1.6mm or equivalent grade PCB. If other grade PCB is used, care should be taken to match the coefficients of thermal expansion between components and PCB. If they are not matched well, the solder joints may crack or the bodies of the parts may crack or shatter as the assembly cools.

SOT-323 Dimension



Marking:



3-Lead SOT-323 Plastic
Surface Mounted Package
CYStek Package Code: S3

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

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0315	0.0433	0.80	1.10	e1	0.0256*		0.65*	
A1	0.0000	0.0039	0.00	0.10	He	0.0846	0.0965	2.15	2.45
bp	0.0078	0.0157	0.20	0.40	Lp	0.0105	0.0181	0.26	0.46
C	0.0031	0.0059	0.08	0.15	Q	0.0051	0.0091	0.13	0.23
D	0.0709	0.0866	1.80	2.20	v	0.0079	-	0.2	-
E	0.0453	0.0531	1.15	1.35	w	0.0079	-	0.2	-
e	0.0472	0.0551	1.20	1.40	θ	0°	8°	0°	8°

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.