General Purpose PNP Epitaxial Planar Transistor

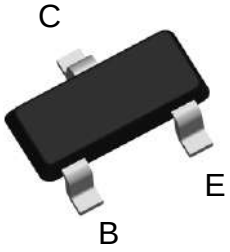
Description

- The KWA1514 is designed for general purpose application requiring high breakdown voltage.
- Large I_C , $I_{C(Max)}$ = -0.6A
- High BV_{CEO}, BV_{CEO}= -160V
- Complementary to KWC3906.
- Pb-free lead plating and halogen-free package

BV_{CEO}	-160V
I_C	-0.6A
$V_{CESAT(MAX)}$	-0.3V

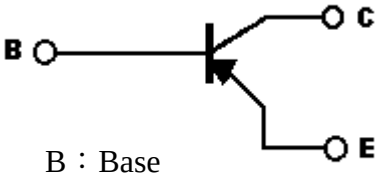
Outline

SOT-23



Symbol

KWA1514



B：Base
C：Collector
E：Emitter

Ordering Information

Device	Package	Shipping
KWA1514	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	-180	V
Collector-Emitter Voltage	V_{CEO}	-160	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-0.6	A
Power Dissipation	P_D	225	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	°C/W
ESD susceptibility		8000 (Note)	V
Operating Junction and Storage Temperature Range	Tj ; Tstg	-55~+150	°C

Note : Human body model, 1.5kΩ in series with 100pF

Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	-180	-	-	V	I_C=-50μA
BV_{CEO}	-160	-	-	V	I_C=-1mA
BV_{EBO}	-5	-	-	V	I_E=-50μA
I_{CBO}	-	-	-50	nA	V_{CB}=-120V
I_{EBO}	-	-	-50	nA	V_{EB}=-4V
*$V_{CE(sat)}$ 1	-	0.11	-0.16	V	I_C=-10mA, I_B=-1mA
*$V_{CE(sat)}$ 2	-	0.25	-0.3	V	I_C=-50mA, I_B=-5mA
*$V_{BE(sat)}$ 1	-	-	-1	V	I_C=-10mA, I_B=-1mA
*$V_{BE(sat)}$ 2	-	-	-1	V	I_C=-50mA, I_B=-5mA
h_{FE} 1	100	-	-	-	V_{CE}=-5V, I_C=-1mA
h_{FE} 2	100	-	-	-	V_{CE}=-5V, I_C=-10mA
h_{FE} 3	50	-	-	-	V_{CE}=-5V, I_C=-50mA
h_{FE} 4	120	-	390	-	V_{CE}=-6V, I_C=-2mA
f_T	100	-	-	MHz	V_{CE}=-30V, I_C=-10mA, f=100MHz
Cob	-	-	6	pF	V_{CB}=-10V, f=1MHz

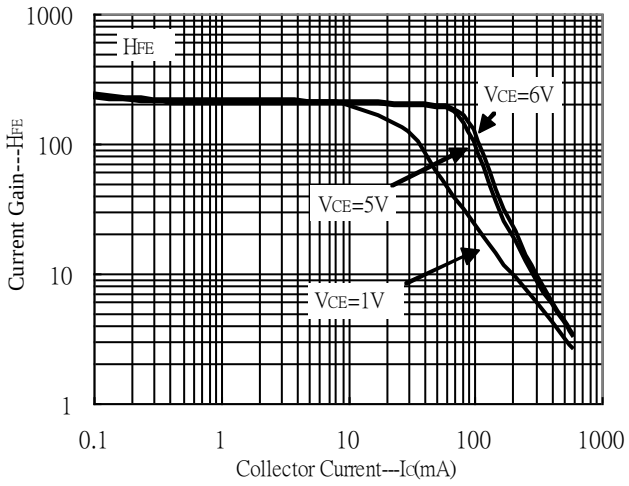
*Pulse Test: Pulse Width ≤380μs, Duty Cycle≤2%

Classification Of h_{FE} 4

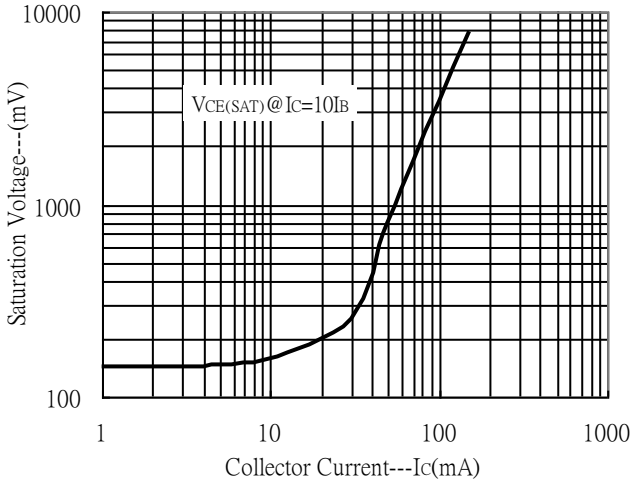
Rank	Q	R
Range	120~270	180~390

Typical Characteristics

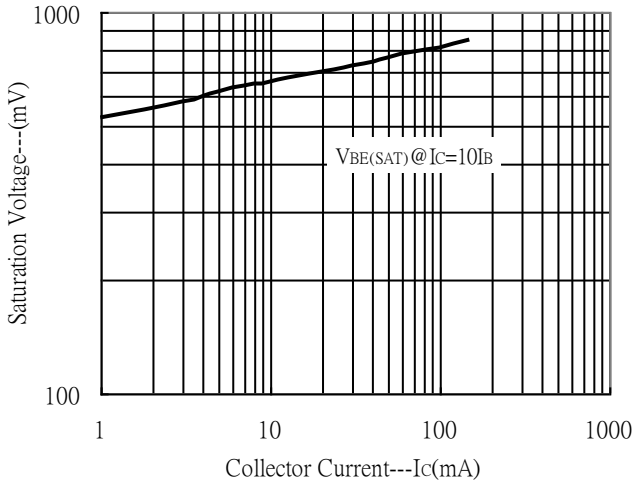
Current Gain vs Collector Current



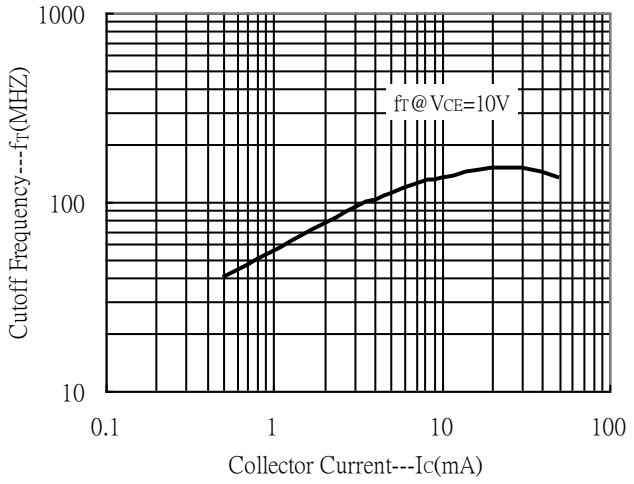
Saturation Voltage vs Collector Current



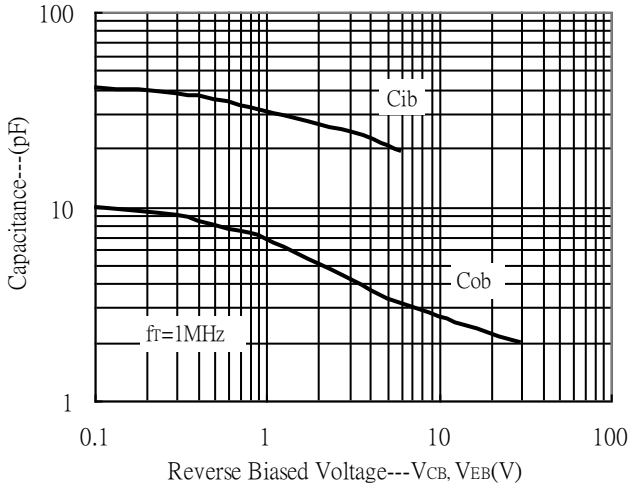
Saturation Voltage vs Collector Current



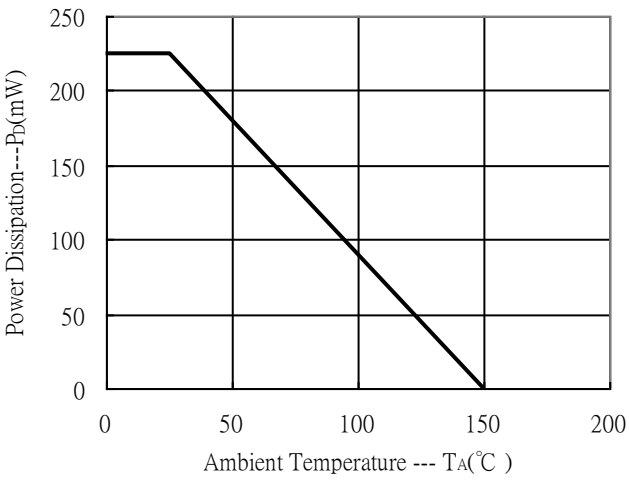
Cutoff Frequency vs Collector Current



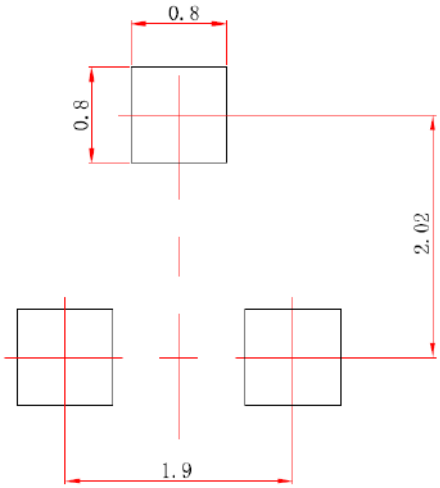
Capacitance Characteristics



Power Derating Curve

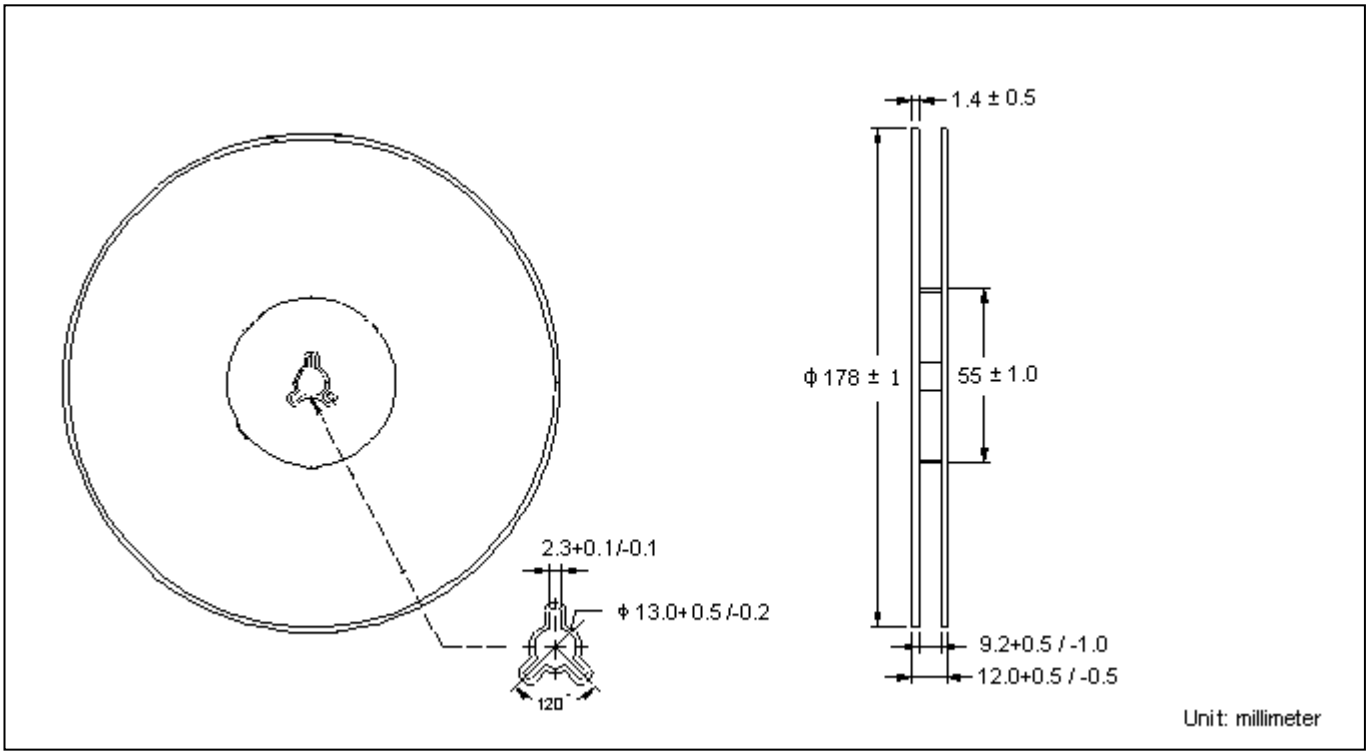


Recommended Soldering Footprint

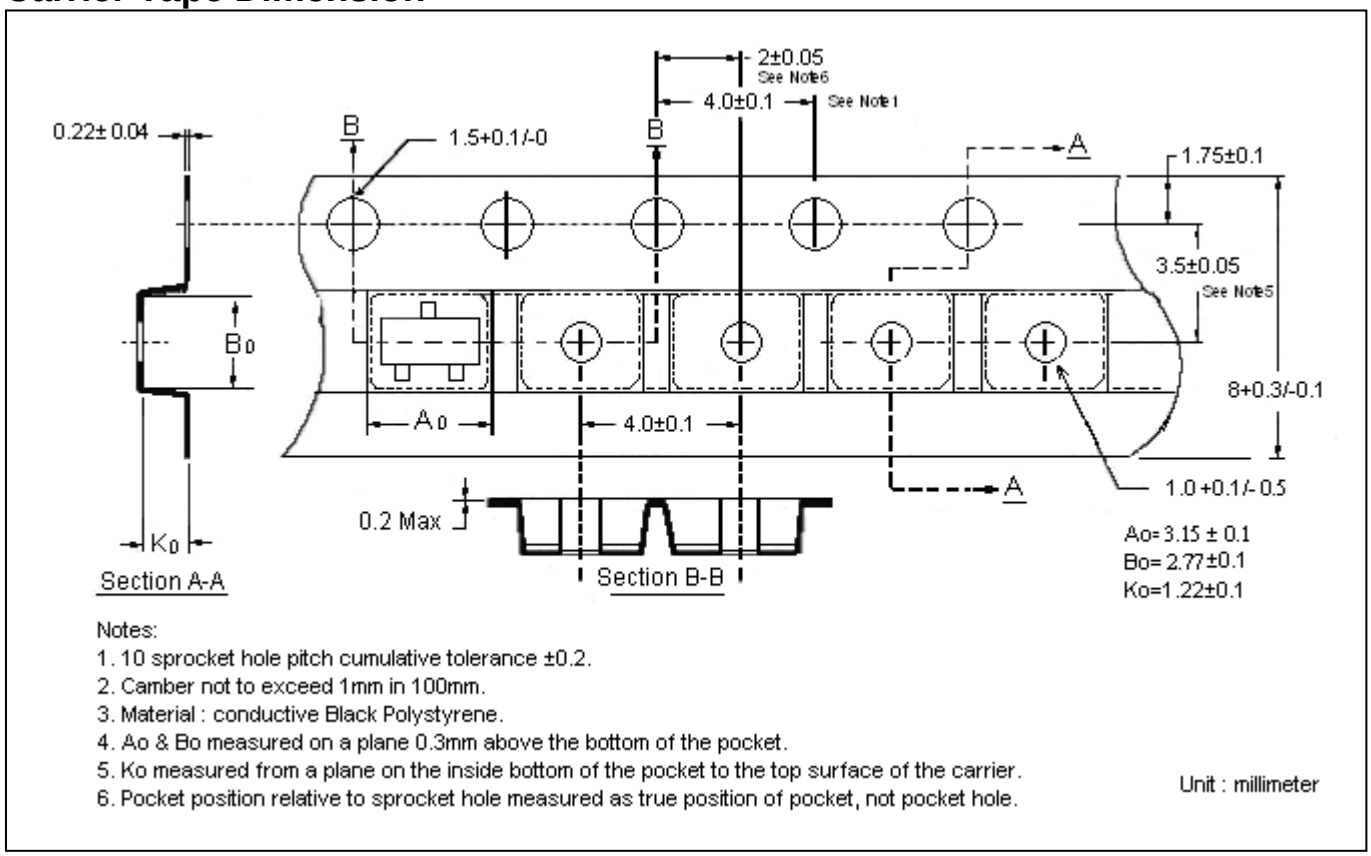


Unit : mm

Reel Dimension



Carrier Tape Dimension



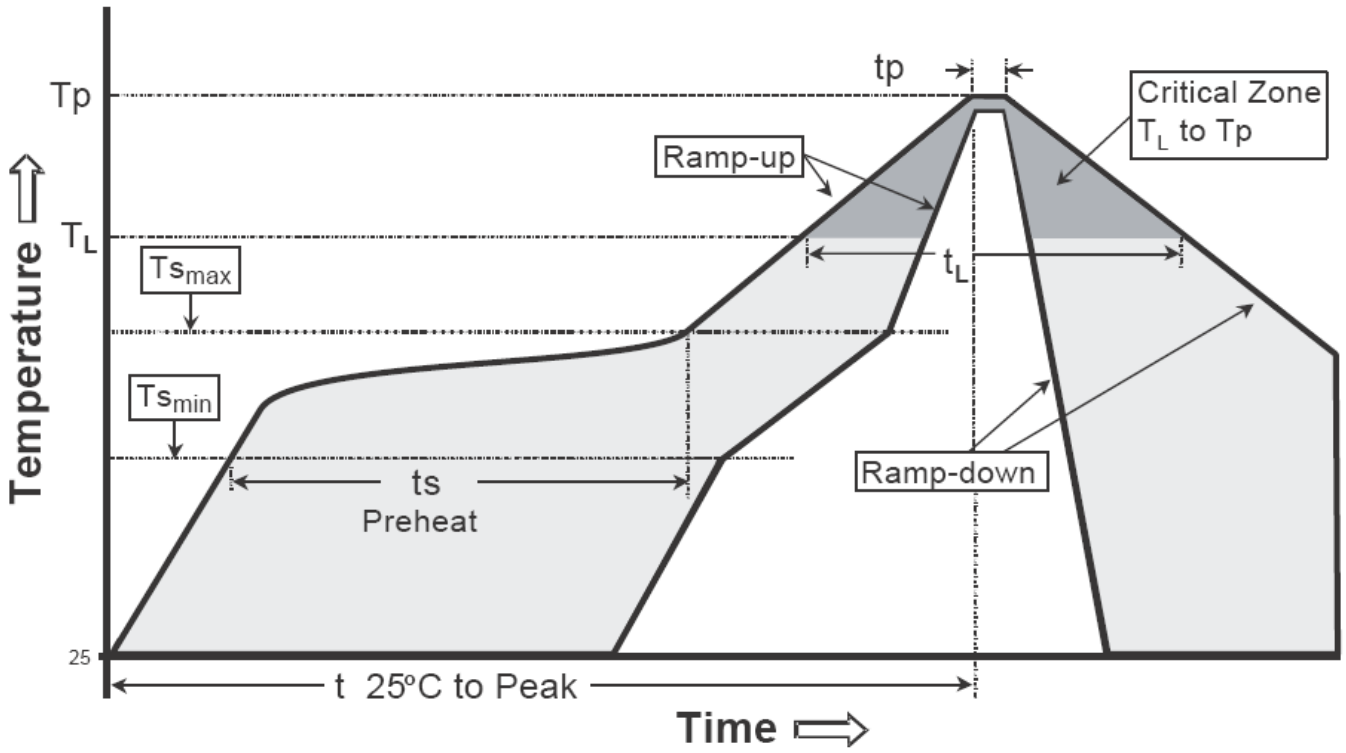
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
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

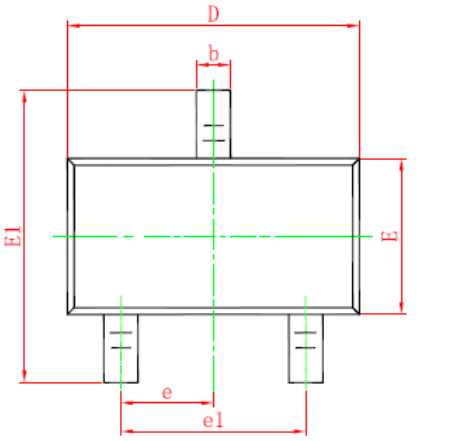
Recommended temperature profile for IR reflow

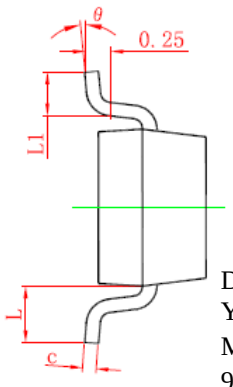


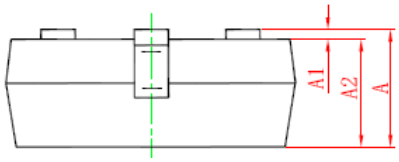
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (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 : All temperatures refer to topside of the package, measured on the package body surface.

SOT-23 Dimension

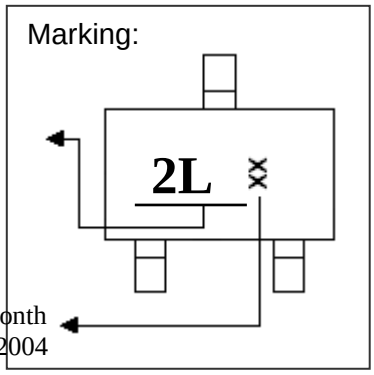






Product Code

Marking:



Date Code: Year+Month
Year: 3→2003, 4→2004
Month: 1→1, 2→2, • • •
9→9, A→10, B→11, C→12

3-Lead SOT-23 Plastic
Surface Mounted Package

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

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.035	0.045	0.900	1.150	E1	0.089	0.100	2.250	2.550
A1	0.000	0.004	0.000	0.100	e	0.037 TYP.		0.950 TYP.	
A2	0.035	0.041	0.900	1.050	e1	0.071	0.079	1.800	2.000
b	0.012	0.020	0.300	0.500	L	0.022 REF.		0.550 REF.	
c	0.003	0.006	0.080	0.150	L1	0.012	0.020	0.300	0.500
D	0.110	0.118	2.800	3.000	θ	0°	8°	0°	8°
E	0.047	0.055	1.200	1.400					

Notes: 1.Controlling dimension: millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0