Low Vcesat NPN Epitaxial Planar Transistor

BTD2150L3

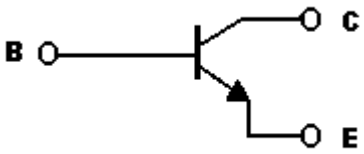
BV_{CEO}	50V
I_C	3A
$R_{CESAT\ (Max)}$	145mΩ

Features

- Low $V_{CE(sat)}$, $V_{CE(sat)}$= 0.22V (typical), at I_C/I_B=2A/0.2A
- Excellent current gain characteristics
- Complementary to BTB1424L3
- Pb-free lead plating and halogen-free package

Symbol

BTD2150L3



B：Base
C：Collector
E：Emitter

Outline

SOT-223

B C E

Ordering Information

Device	Package	Shipping
BTD2150L3-0-T3-X	SOT-223 (Pb-free lead plating package)	2500 pcs / tape & reel

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

Packing spec, T3 : 2500 pcs / tape & reel, 13” 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}	60	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current(DC)	I_C	3	A
Peak Collector Current	I_{CM}	5	A
Peak Base Current	I_{BM}	1	A
Power Dissipation @T_A=25℃ (Note)	P_D	1.5	W
Power Dissipation @T_C=25℃	P_D	5	W
Operating Junction and Storage Temperature Range	Tj ; Tstg	-65~+150	°C

Note :The power which can be dissipated assuming the device is mounted in a typical manner on a P.C.B. with copper equal to 1 square centimeter minimum.

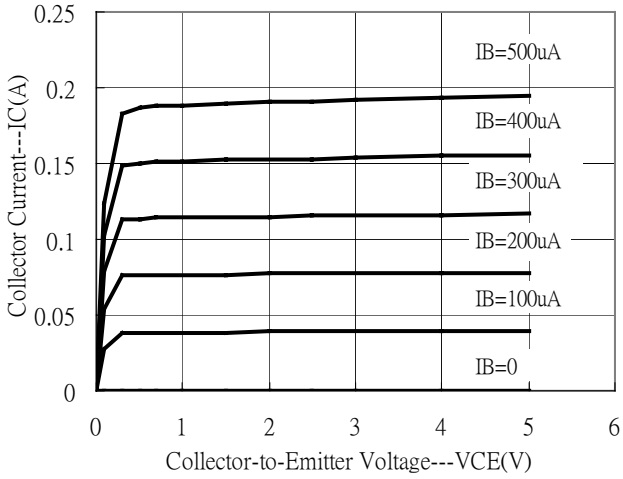
Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	60	-	-	V	I_C=50μA, I_E=0
BV_{CEO}	50	-	-	V	I_C=1mA, I_B=0
BV_{EBO}	5	-	-	V	I_E=50μA, I_C=0
I_{CBO}	-	-	100	nA	V_{CB}=50V, I_E=0
I_{EBO}	-	-	100	nA	V_{EB}=6V, I_C=0
*$V_{CE(sat)}$ 1	-	-	90	mV	I_C=500mA, I_B=50mA
*$V_{CE(sat)}$ 2	-	120	170	mV	I_C=1A, I_B=50mA
*$V_{CE(sat)}$ 3	-	220	290	mV	I_C=2A, I_B=0.2A
*$R_{CE(sat)}$	-	110	145	mΩ	I_C=2A, I_B=0.2A
*$V_{BE(sat)}$	-	1	1.2	V	I_C=2A, I_B=0.2A
*$V_{BE(on)}$	-	0.8	1	V	V_{CE}=2V, I_C=1A
*h_{FE}1	270	-	560	-	V_{CE}=2V, I_C=500mA
*h_{FE}2	200	-	-	-	V_{CE}=2V, I_C=1A
*h_{FE}3	100	-	-	-	V_{CE}=2V, I_C=2A
f_T	100	-	-	MHz	V_{CE}=5V, I_C=0.1A, f =100MHz
Cob	-	15	30	pF	V_{CB}=10V, f=1MHz

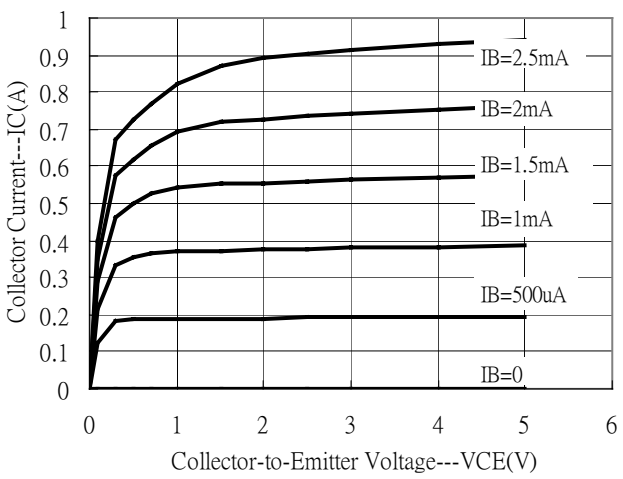
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

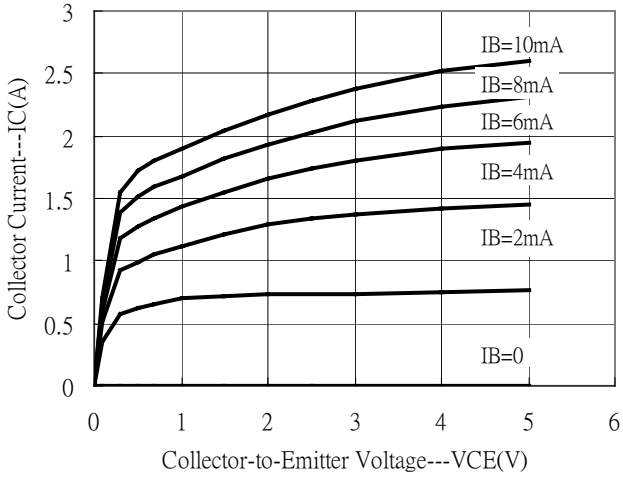
Emitter Grounded Output Characteristics



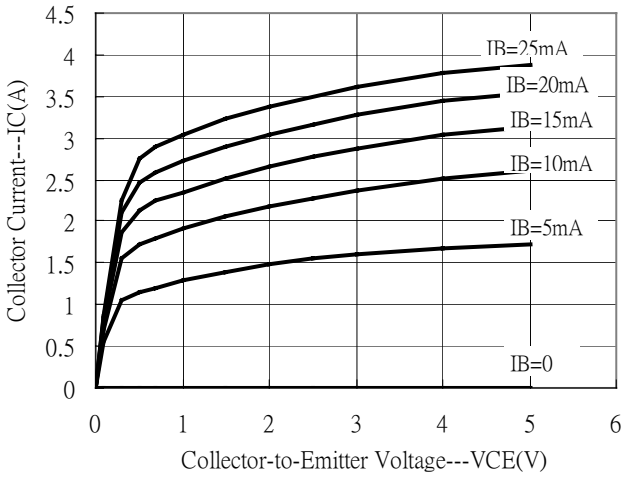
Emitter Grounded Output Characteristics



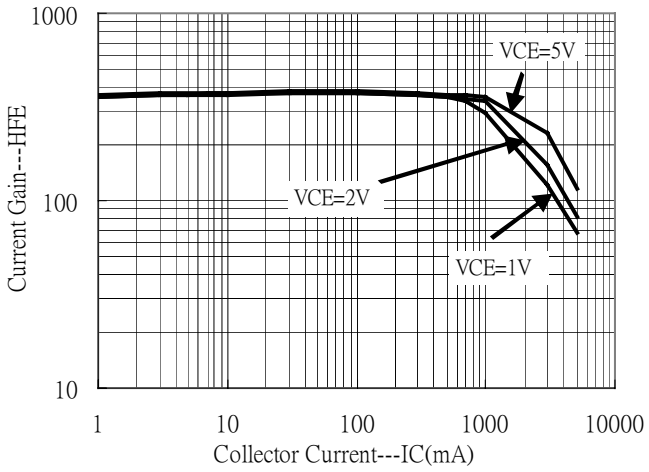
Emitter Grounded Output Characteristics



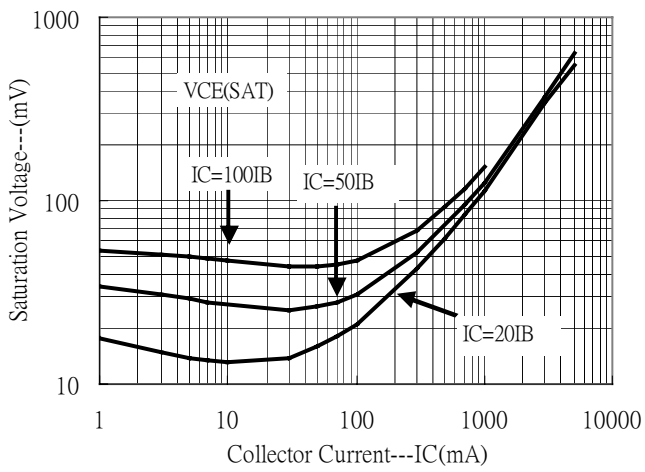
Emitter Grounded Output Characteristics



Current Gain vs Collector Current

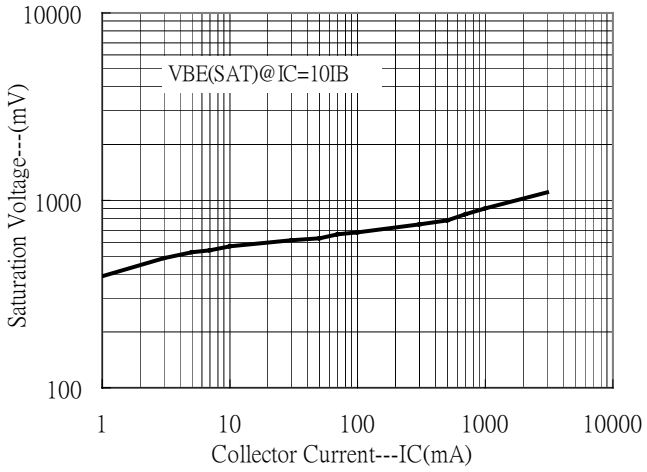


Saturation Voltage vs Collector Current

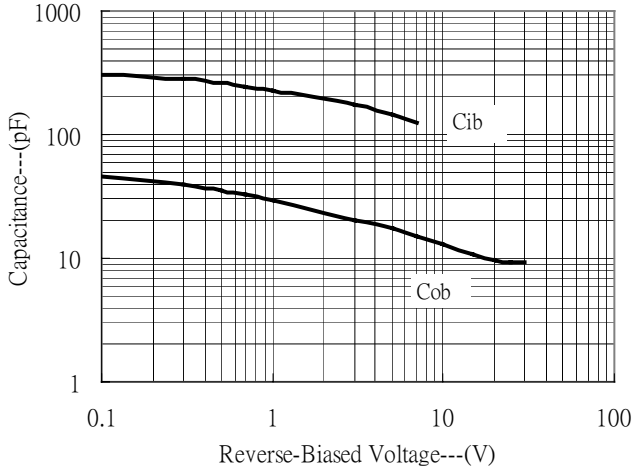


Typical Characteristics(Cont.)

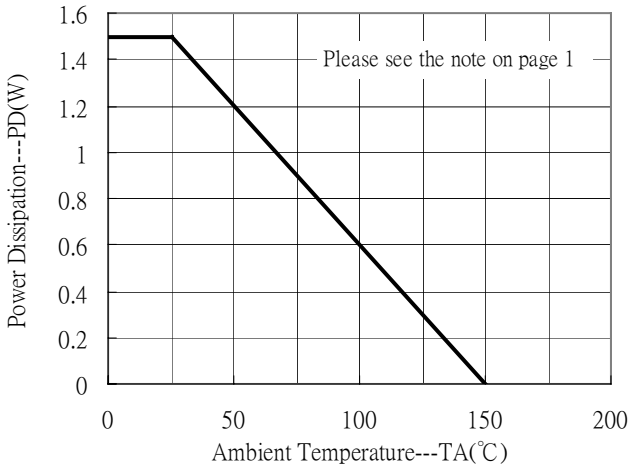
Saturation Voltage vs Collector Current



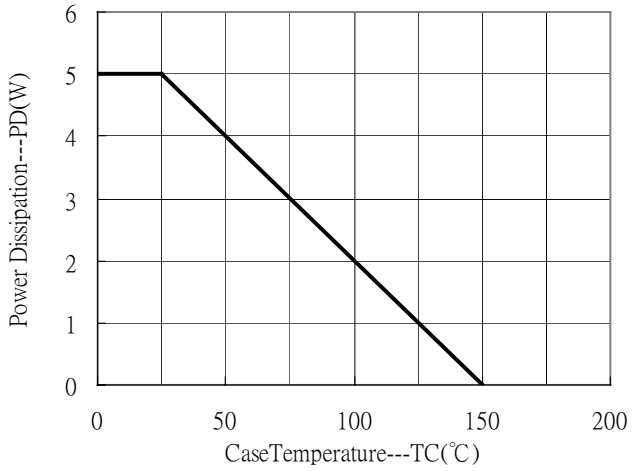
Capacitance vs Reverse-Biased Voltage



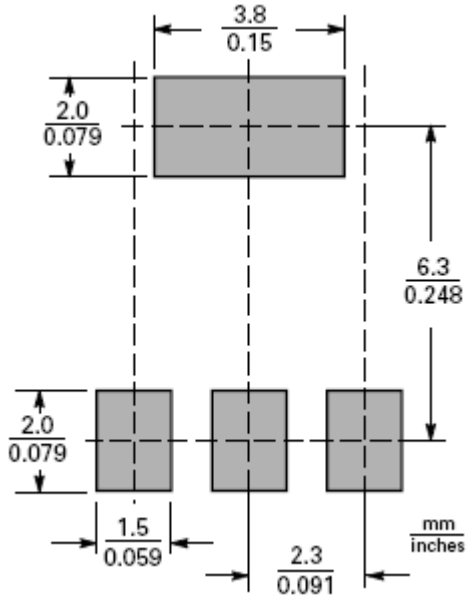
Power Derating Curve



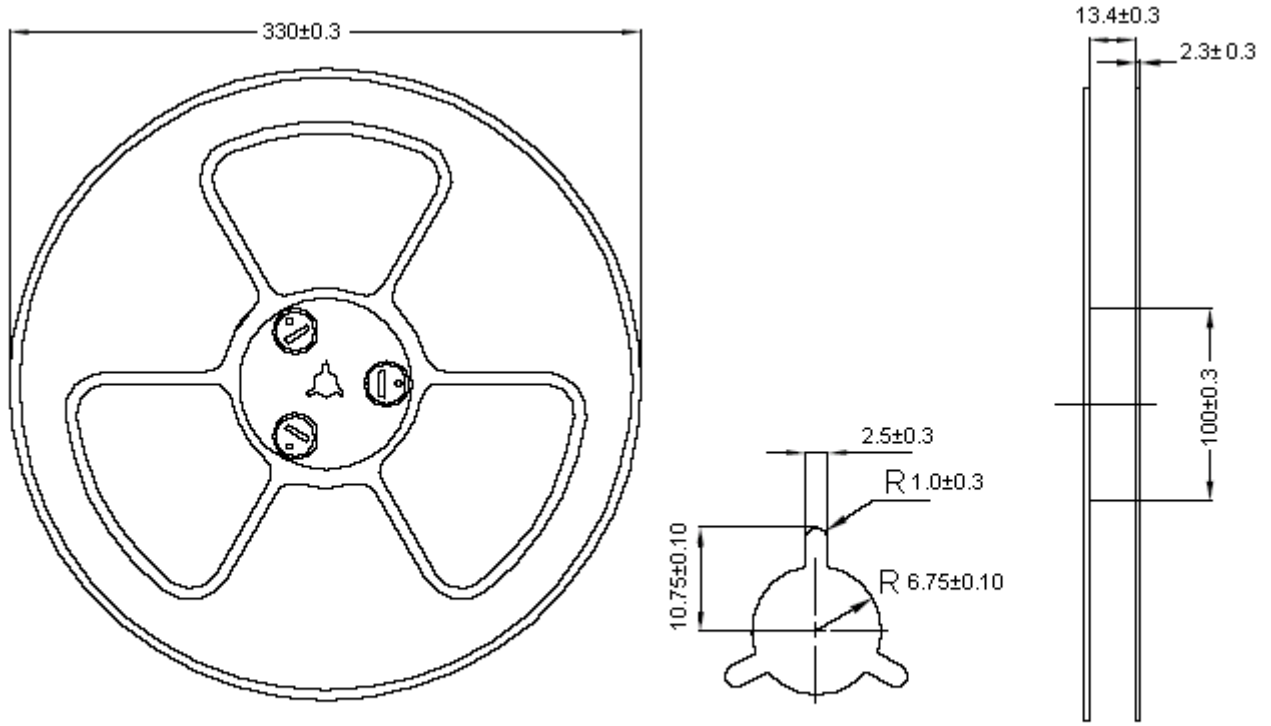
Power Derating Curve



Recommended soldering footprint



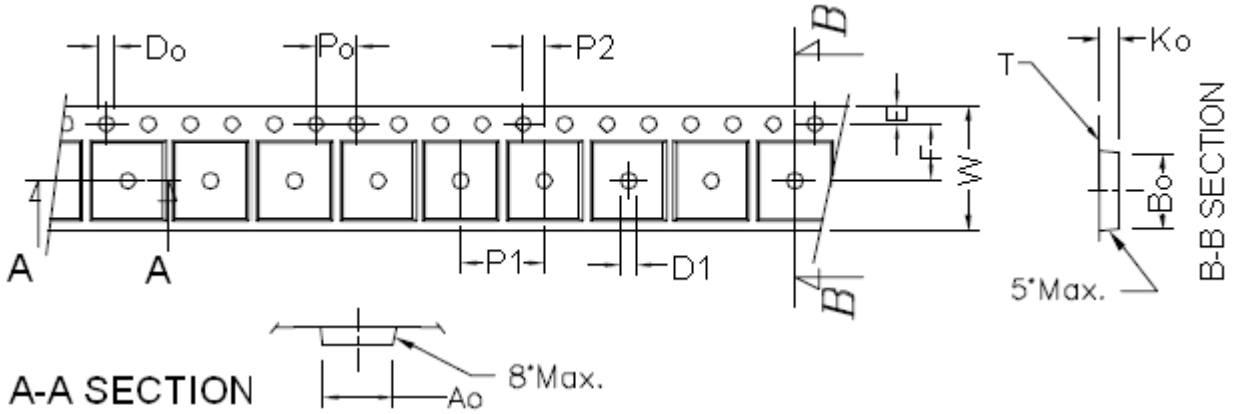
Reel Dimension



UNIT : mm

NOTE : 1. Material : Anti-static polystyrene
2. Surface resistivity 10^9 Ω/sq

Carrier Tape Dimension



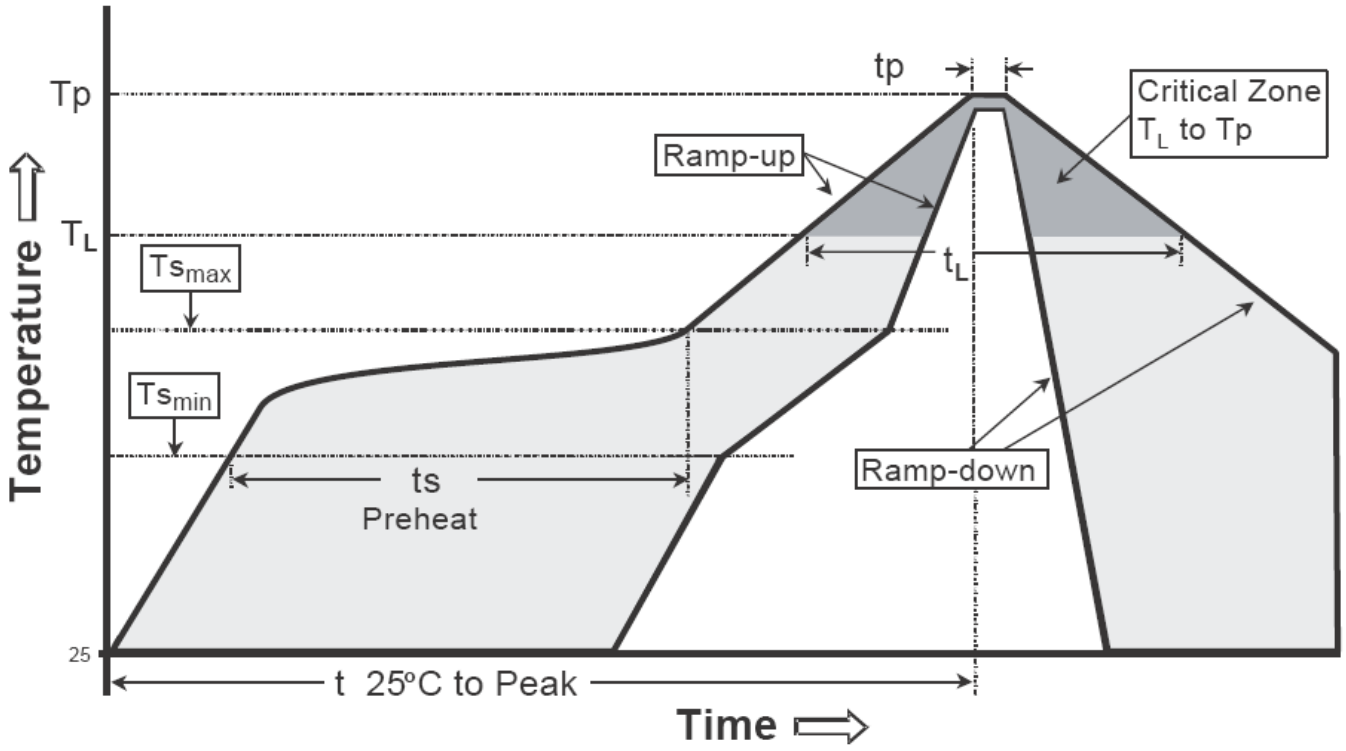
Symbol	Ao	Bo	Ko	Po	P1	P2	T
Spec	6.83±0.1	7.42±0.1	1.88±0.1	4.0±0.1	8.0±0.10	2.0±0.05	0.292±0.02
Symbol	E	F	Do	D1	W	10Po	
Spec	1.75±0.1	5.5±0.05	1.60±0.1	1.5±0.25	$12^{+0.3}_{-0.1}$	40.0±0.2	

Unit : mm

Recommended wave soldering condition

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

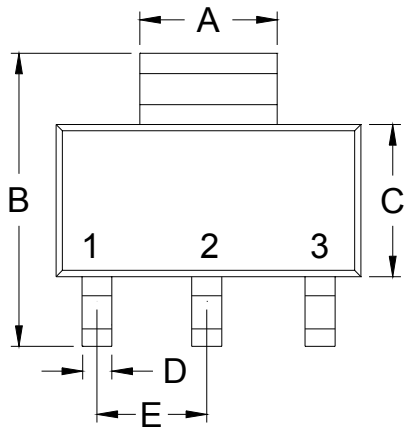
Recommended temperature profile for IR reflow

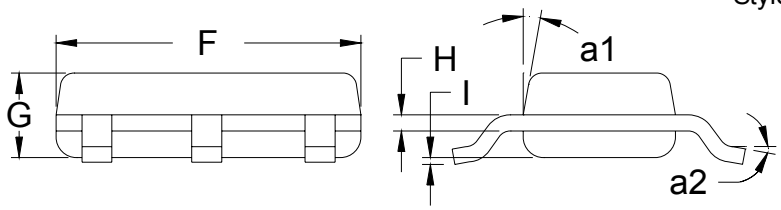


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL) − Time (tL)	 183°C 60-150 seconds	 217°C 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.

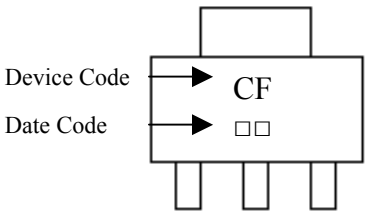
Note : All temperatures refer to topside of the package, measured on the package body surface.

SOT-223 Dimension





Marking:



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

3-Lead SOT-223 Plastic
Surface Mounted Package
CYStek Package Code: L3

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1142	0.1220	2.90	3.10	G	0.0551	0.0709	1.40	1.80
B	0.2638	0.2874	6.70	7.30	H	0.0098	0.0138	0.25	0.35
C	0.1299	0.1457	3.30	3.70	I	0.0008	0.0039	0.02	0.10
D	0.0236	0.0315	0.60	0.80	a1	*13°	-	*13°	-
E	*0.0906	-	*2.30	-	a2	0°	10°	0°	10°
F	0.2480	0.2638	6.30	6.70					

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.