

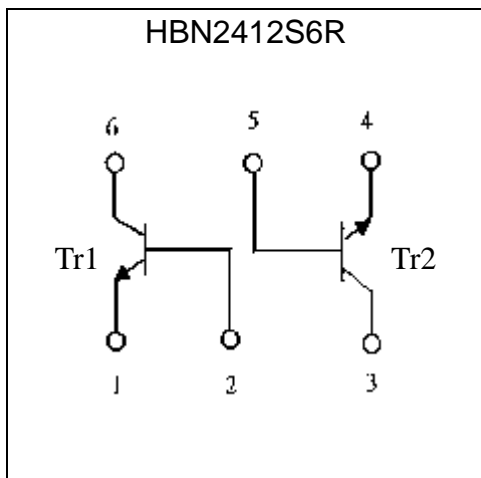
**General Purpose NPN Epitaxial Planar Transistors  
 (dual transistors)**

# HBN2412S6R

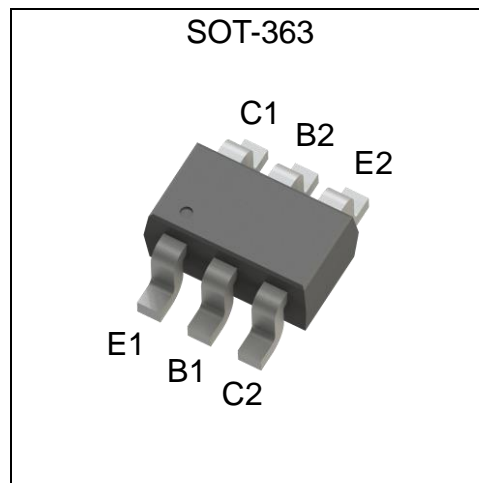
**Features**

- Two BTC2412 chips in a SOT-363R package.
- Mounting possible with SOT-323 automatic mounting machines.
- Transistor elements are independent, eliminating interference.
- Mounting cost and area can be cut in half.
- Low Cob. Typ. Cob=2.0pF.
- Complementary to HBP1037S6R.
- Pb-free lead plating and halogen-free package.

**Equivalent Circuit**



**Outline**



**Ordering Information**

Device	Package	Shipping
HBN2412S6R-0-T1-G	SOT-363 (Pb-free lead plating 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

**The following characteristics apply to both Tr1 and Tr2****Absolute Maximum Ratings** (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V <sub>CBO</sub>	60	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	6	V
Collector Current	I <sub>C</sub>	200	mA
Power Dissipation	P <sub>d</sub>	200(total) (Note)	mW
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55~+150	°C

Note : 150mW per element must not be exceeded.

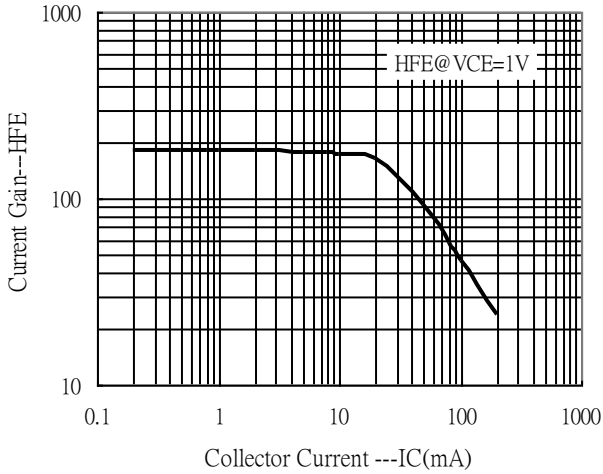
**Characteristics** (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CBO</sub>	60	-	-	V	I <sub>C</sub> =100μA
BV <sub>CEO</sub>	50	-	-	V	I <sub>C</sub> =1mA
BV <sub>EBO</sub>	6	-	-	V	I <sub>E</sub> =50μA
I <sub>CBO</sub>	-	-	100	nA	V <sub>CB</sub> =60V
I <sub>EBO</sub>	-	-	100	nA	V <sub>EB</sub> =5V
V <sub>CE(sat)</sub>	-	-	0.3	V	I <sub>C</sub> =100mA, I <sub>B</sub> =10mA
V <sub>BE(sat)</sub>	-	-	1	V	I <sub>C</sub> =100mA, I <sub>B</sub> =10mA
h <sub>FE</sub>	200	-	560	-	V <sub>CE</sub> =6V, I <sub>C</sub> =1mA
h <sub>FE</sub>	25	-	-	-	V <sub>CE</sub> =6V, I <sub>C</sub> =150mA
f <sub>T</sub>	300	-	-	MHz	V <sub>CE</sub> =20V, I <sub>C</sub> =10mA, f=100MHz
C <sub>ob</sub>	-	-	4	pF	V <sub>CB</sub> =5V, f=1MHz

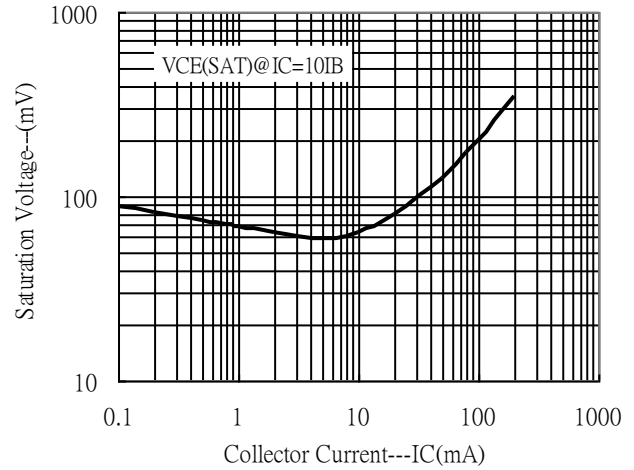
\*Pulse Test: Pulse Width ≤380μs, Duty Cycle≤2%

## Typical Characteristics

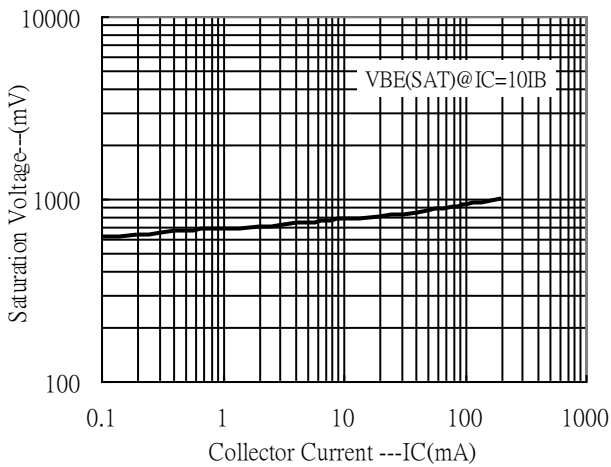
Current Gain vs Collector Current



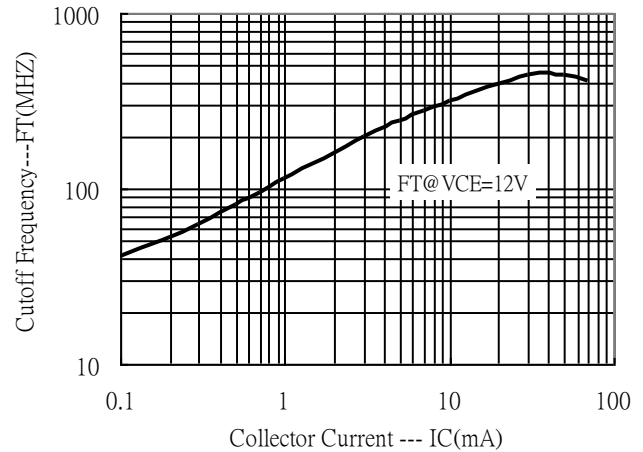
Saturation Voltage vs Collector Current



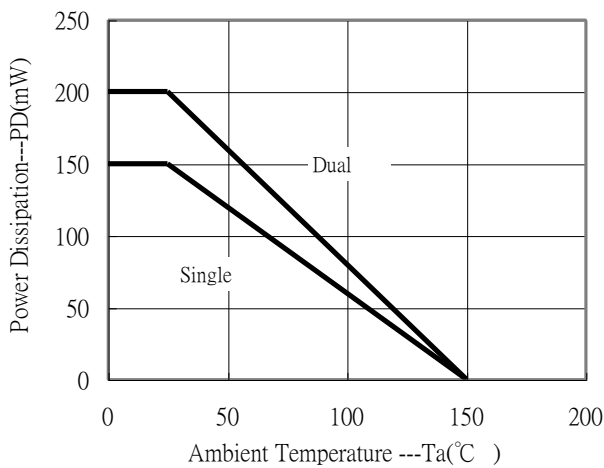
Saturation Voltage vs Collector Current



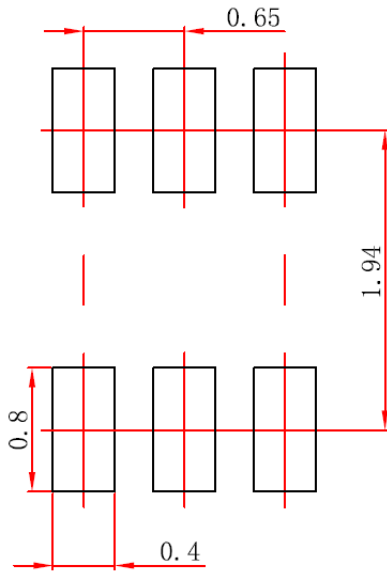
Cutoff Frequency vs Collector Current



Power Derating Curves

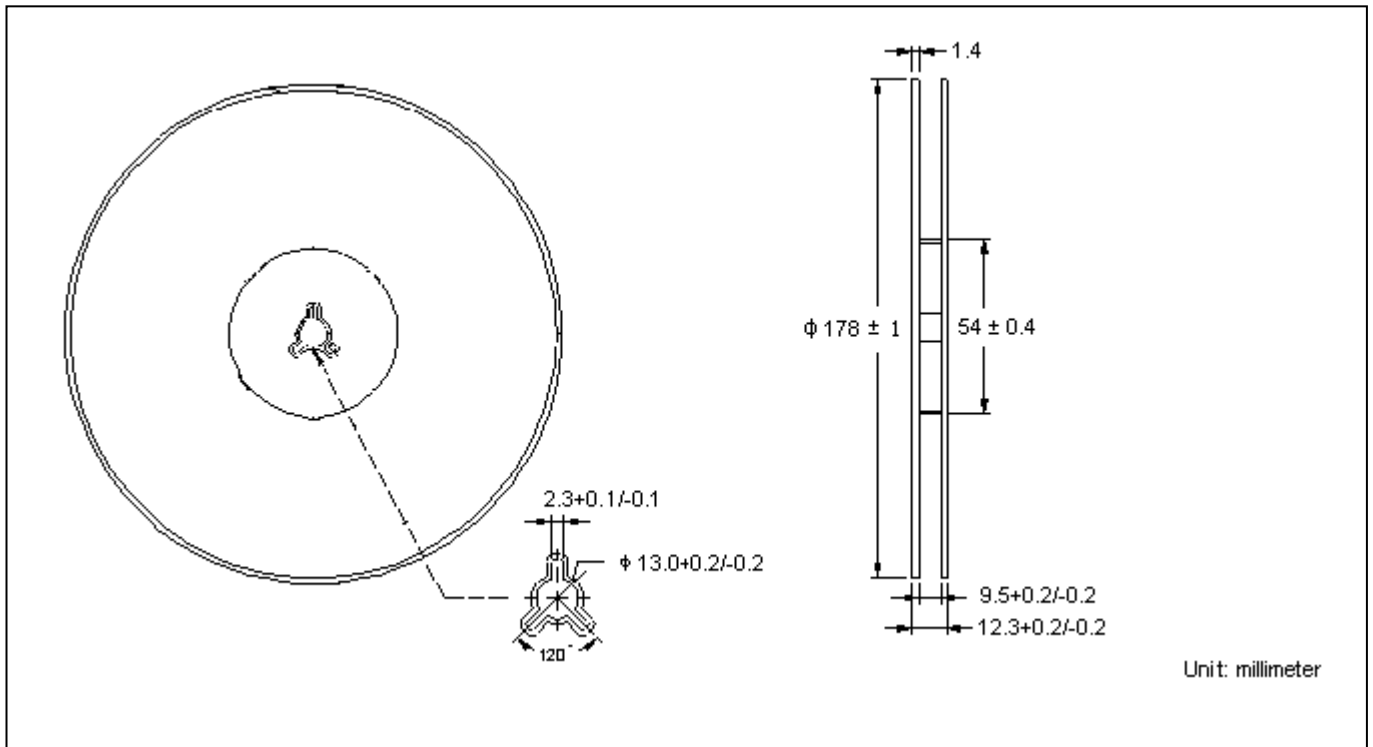


### Recommended Soldering Footprint

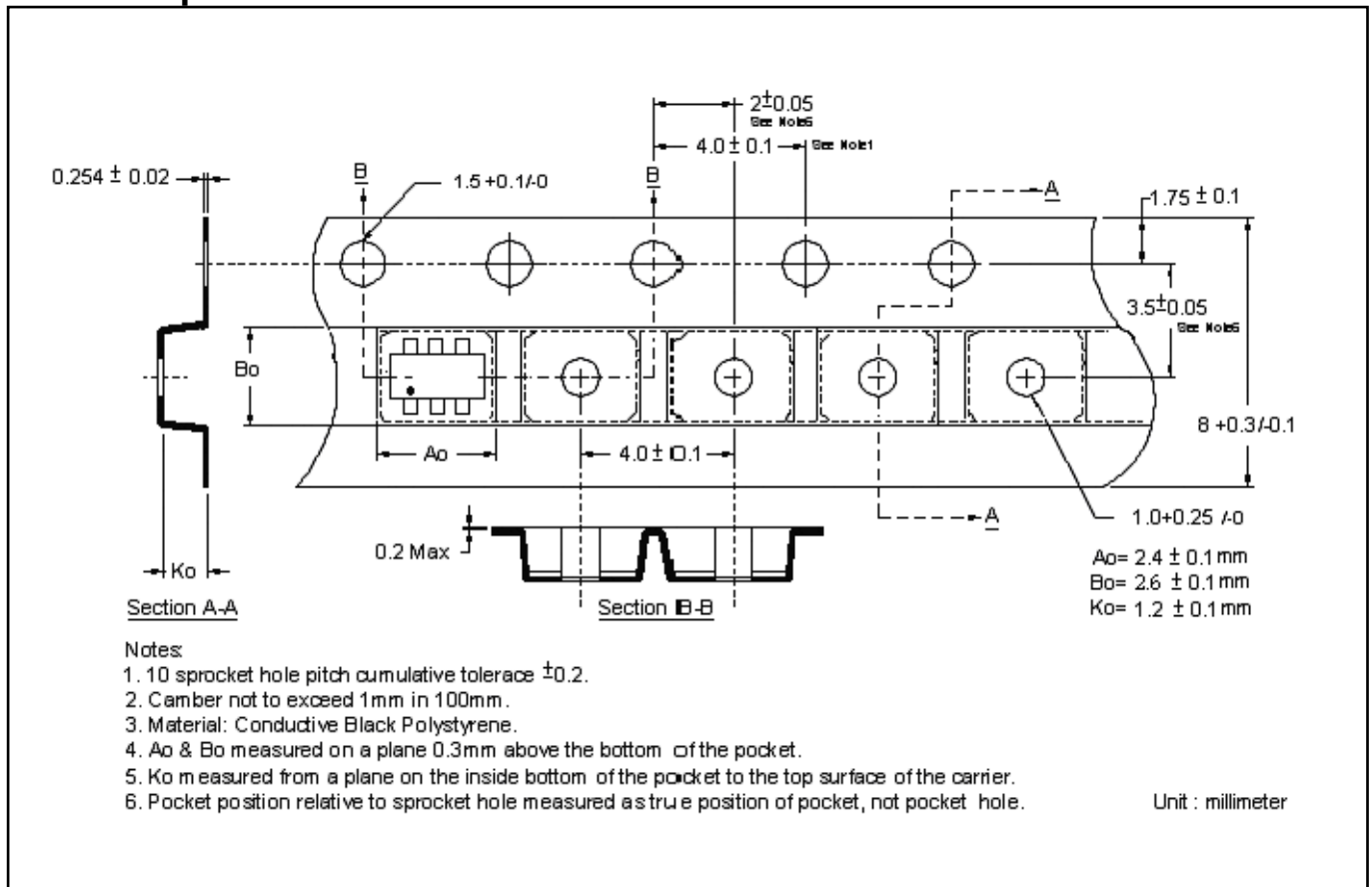


Unit:mm

**Reel Dimension**



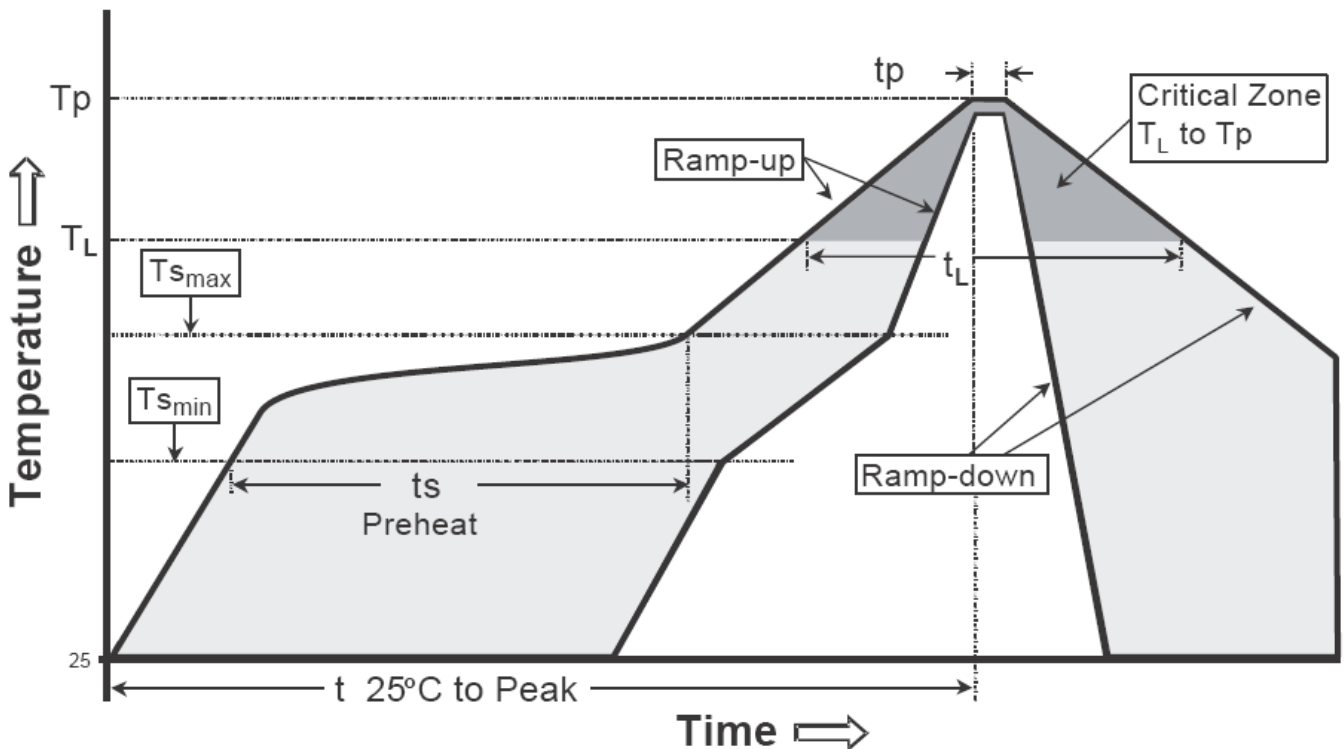
**Carrier Tape Dimension**



**Recommended wave soldering condition**

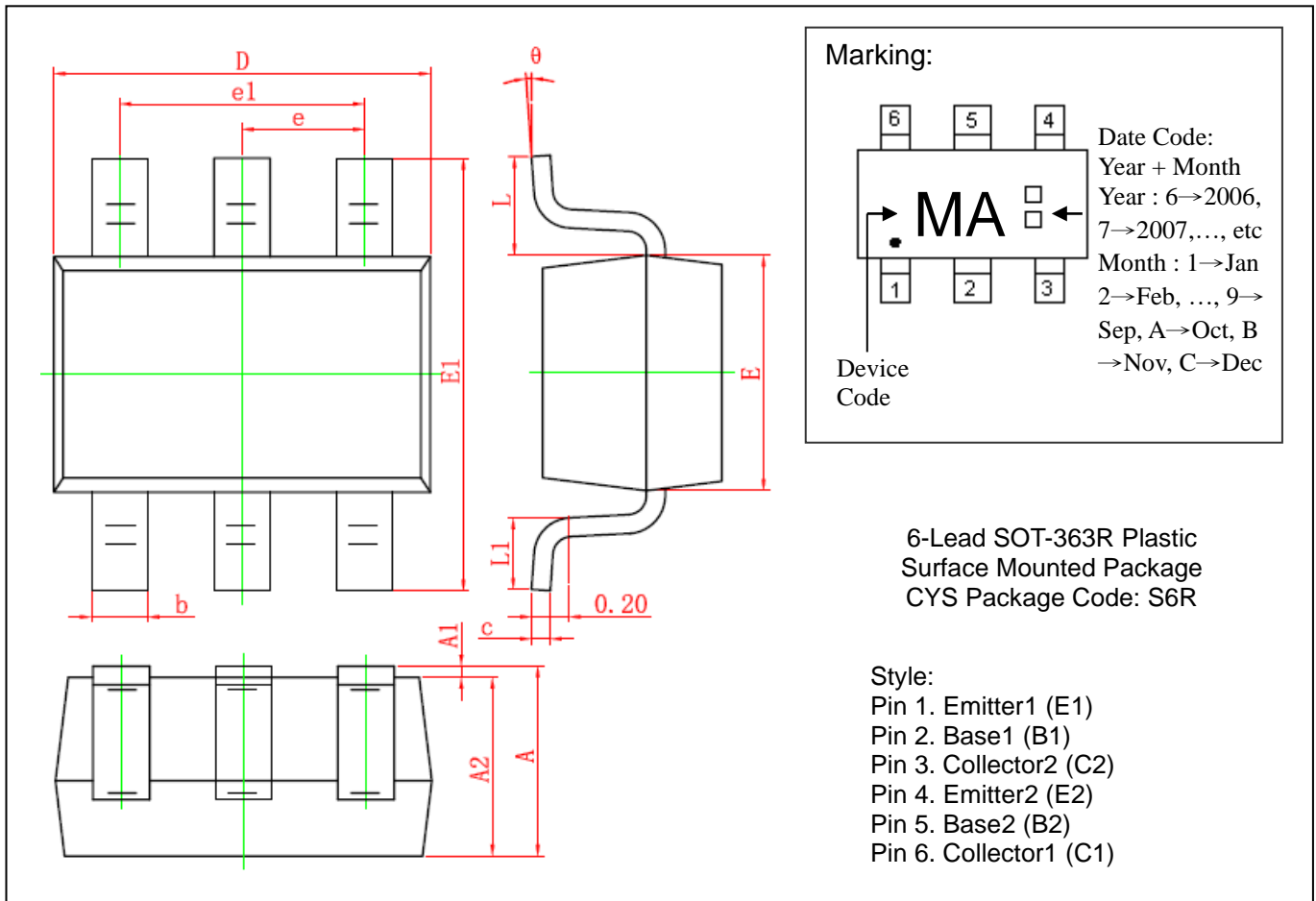
Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Ts <sub>max</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(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.

**SOT-363 Dimension**



DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043	E1	2.150	2.450	0.085	0.096
A1	0.000	0.100	0.000	0.004	e	0.650 TYP		0.026 TYP	
A2	0.900	1.000	0.035	0.039	e1	1.200	1.400	0.047	0.055
b	0.150	0.350	0.006	0.014	L	0.525 REF		0.021 REF	
c	0.080	0.150	0.003	0.006	L1	0.260	0.460	0.010	0.018
D	2.000	2.200	0.079	0.087	θ	0°	8°	0°	8°
E	1.150	1.350	0.045	0.053					

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.

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