

Dual General Purpose PNP Transistors

HBP3906S6R

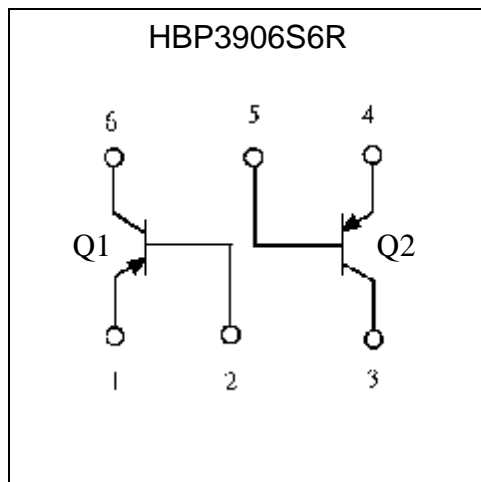
Description

The HBP3906S6R is a spin-off of our popular SOT-23/SOT-323 three-leaded devices. It is designed for general purpose amplifier applications and is housed in the SOT-363R six-leaded surface mount package. By putting two discrete devices in one package, this device is ideal for low power surface mount applications where board space is at a premium.

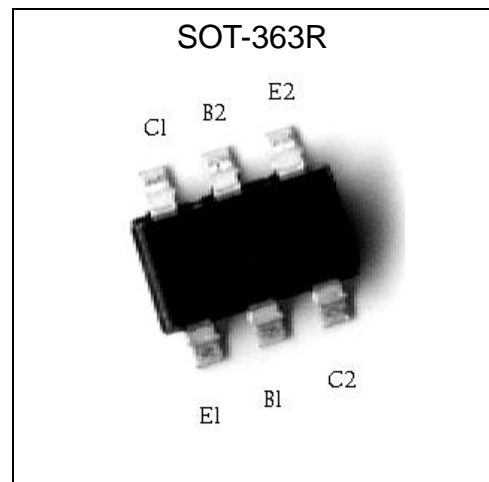
Features

- H_{FE}, 100--300
- LOW V_{CE(sat)}, ≤0.4V
- Pb-free lead plating and halogen-free package
- Reduces board space.
- Reduces component count
- Simplifies circuit design

Equivalent Circuit

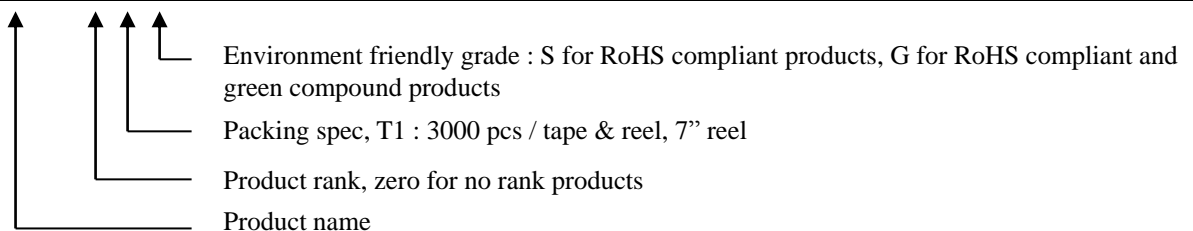


Outline



Ordering Information

Device	Package	Shipping
HBP3906S6R-0-T1-G	SOT-363 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel





The following characteristics apply to both Tr 1 and Tr 2

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V _{CB0}	-40	V
Collector-Emitter Voltage	V _{CEO}	-40	V
Emitter-Base Voltage	V _{EBO}	-5	V
Collector Current	I _C	-200	mA
Total Package Dissipation @T _A =25°C	P _D	200 (Note 1)	mW
Operating Junction Temperature Range	T _j	-55~+150	°C
Storage Temperature Range	T _{stg}	-55~+150	°C

Note 1: Device is mounted on a FR-4 glass epoxy PCB with area measuring 1.0x0.75x0.062 in. 150 mW per element can't be exceeded

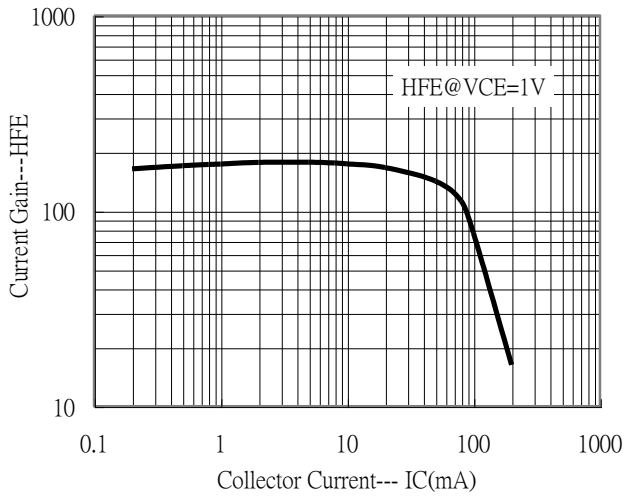
Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CB0}	-40	-	-	V	I _C =-10μA
BV _{CEO}	-40	-	-	V	I _C =-1mA
BV _{EBO}	-5	-	-	V	I _E =-10μA
I _{CB0}	-	-	-100	nA	V _{CB} =-30V
I _{CEX}	-	-	-50	nA	V _{CE} =-30V, V _{EB} =-3V
I _{EBO}	-	-	-100	nA	V _{EB} =-4V
V _{CE(sat)}	-	-	-0.25	V	I _C =-10mA, I _B =-1mA
*V _{CE(sat)}	-	-	-0.4	V	I _C =-50mA, I _B =-5mA
V _{BE(sat)}	-	-	-0.85	V	I _C =-10mA, I _B =-1mA
*V _{BE(sat)}	-	-	-0.95	V	I _C =-50mA, I _B =-5mA
h _{FE}	60	-	-	-	V _{CE} =-1V, I _C =-100μA
h _{FE}	80	-	-	-	V _{CE} =-1V, I _C =-1mA
h _{FE}	100	-	300	-	V _{CE} =-1V, I _C =-10mA
*h _{FE}	60	-	-	-	V _{CE} =-1V, I _C =-50mA
*h _{FE}	30	-	-	-	V _{CE} =-1V, I _C =-100mA
f _T	250	-	-	MHz	V _{CE} =-20V, I _C =-10mA, f=100MHz
C _{ob}	-	-	4.5	pF	V _{CB} =-5V, f=1MHz
td	-	-	35	ns	V _{CC} =-3V, V _{BE} =0.5V, I _C =-10mA,
tr	-	-	35	ns	I _{B1} =-1mA
tstg	-	-	200	ns	V _{CC} =-3V, I _C =-10mA, I _{B1} =-I _{B2} =-1mA
tf	-	-	50	ns	

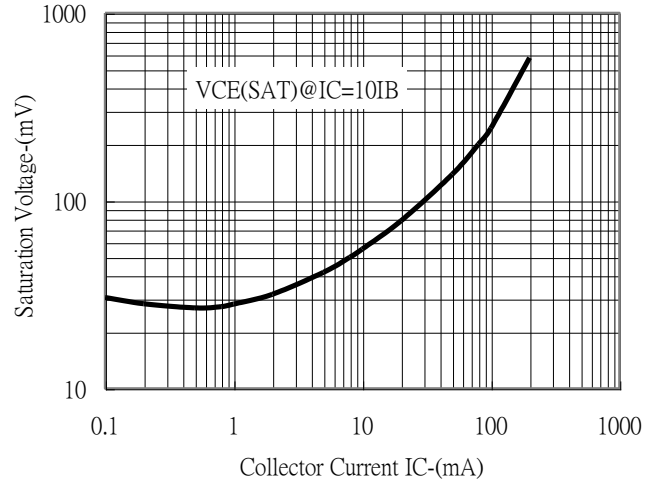
*Pulse Test: Pulse Width ≤380us, Duty Cycle ≤2%

Typical Characteristics

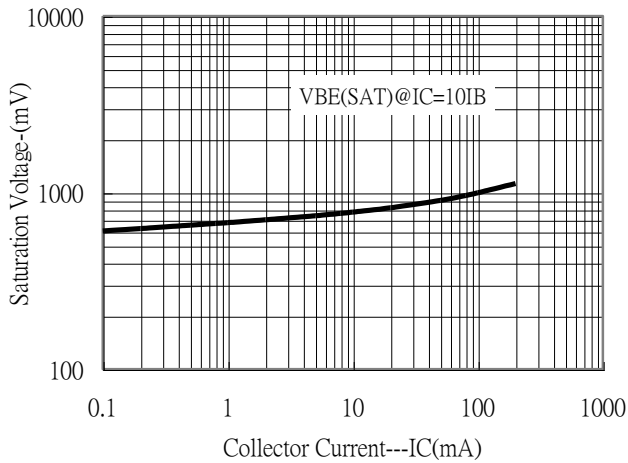
Current Gain vs Collector Current



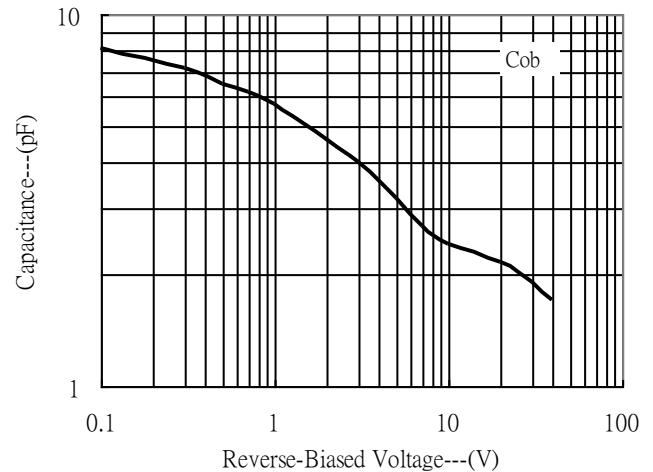
Saturation Voltage vs Collector Current



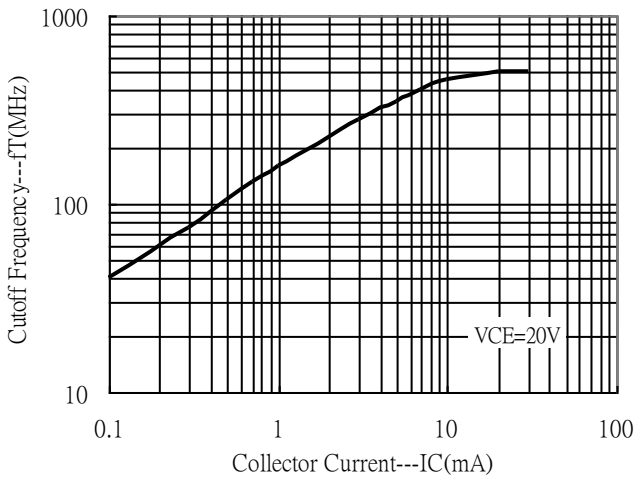
Saturation Voltage vs Collector Current



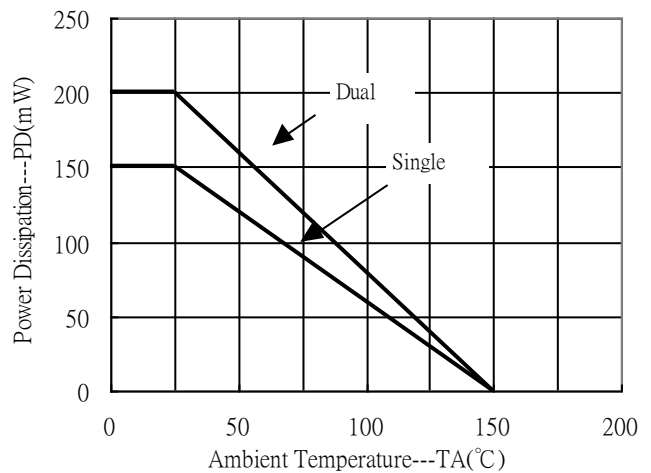
Capacitance vs Reverse-Biased Voltage



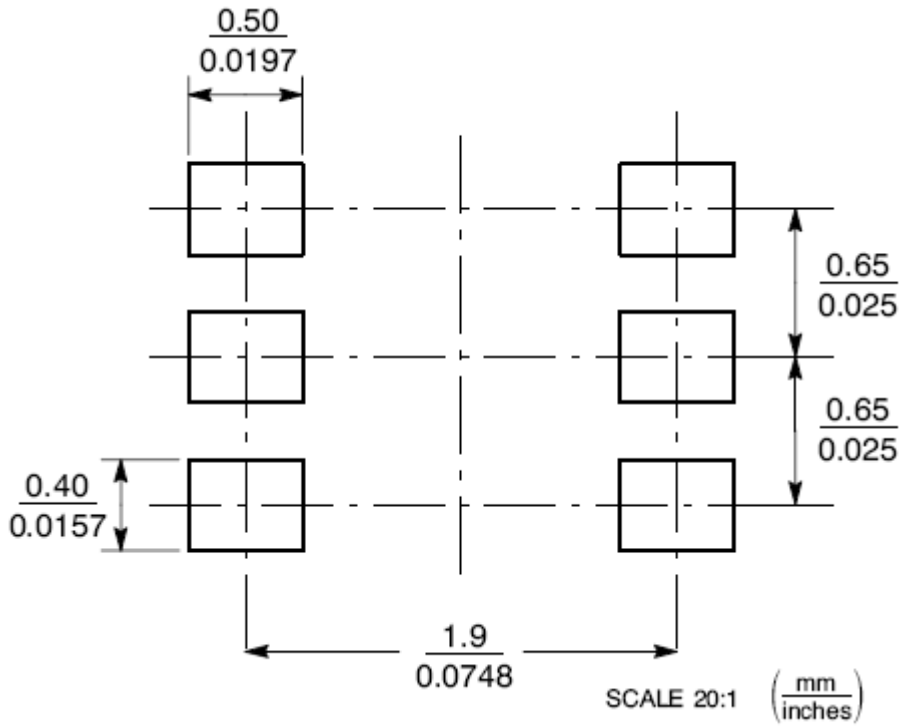
Cutoff frequency vs Collector Current



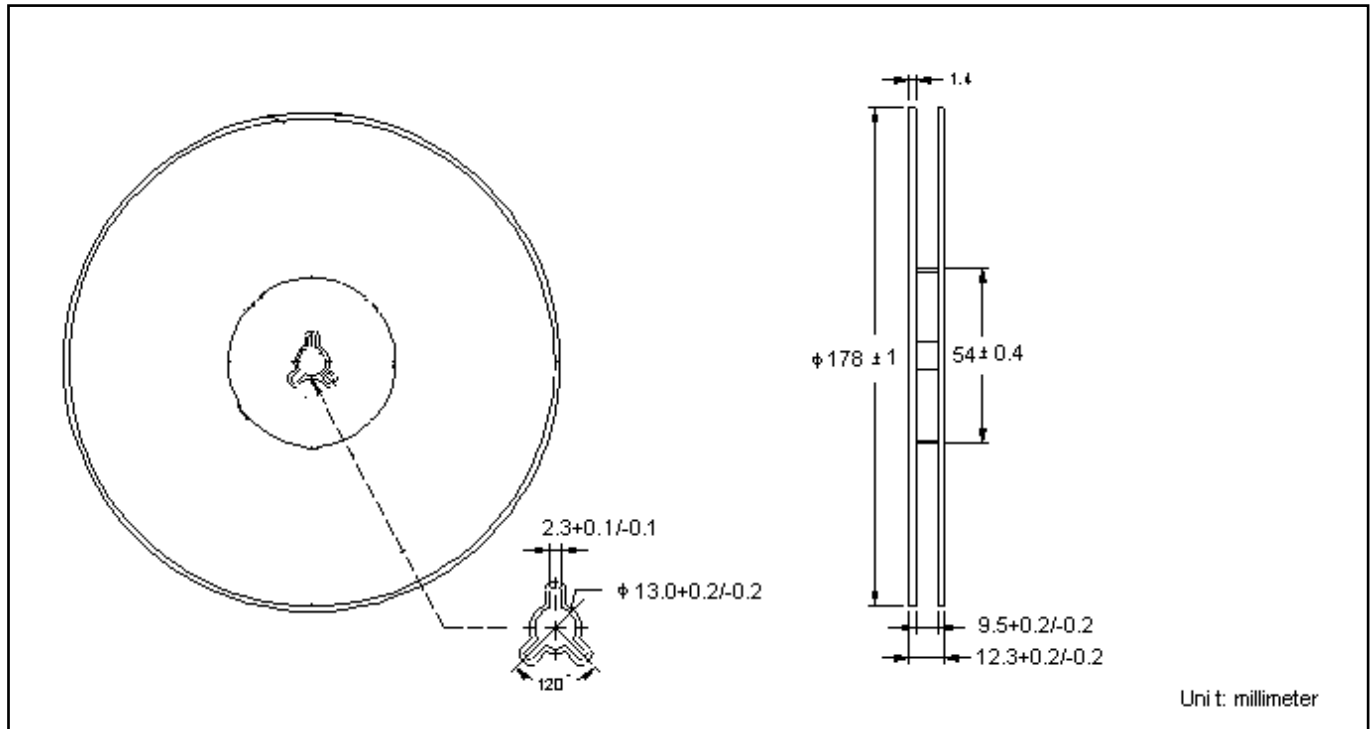
Power Derating Curve



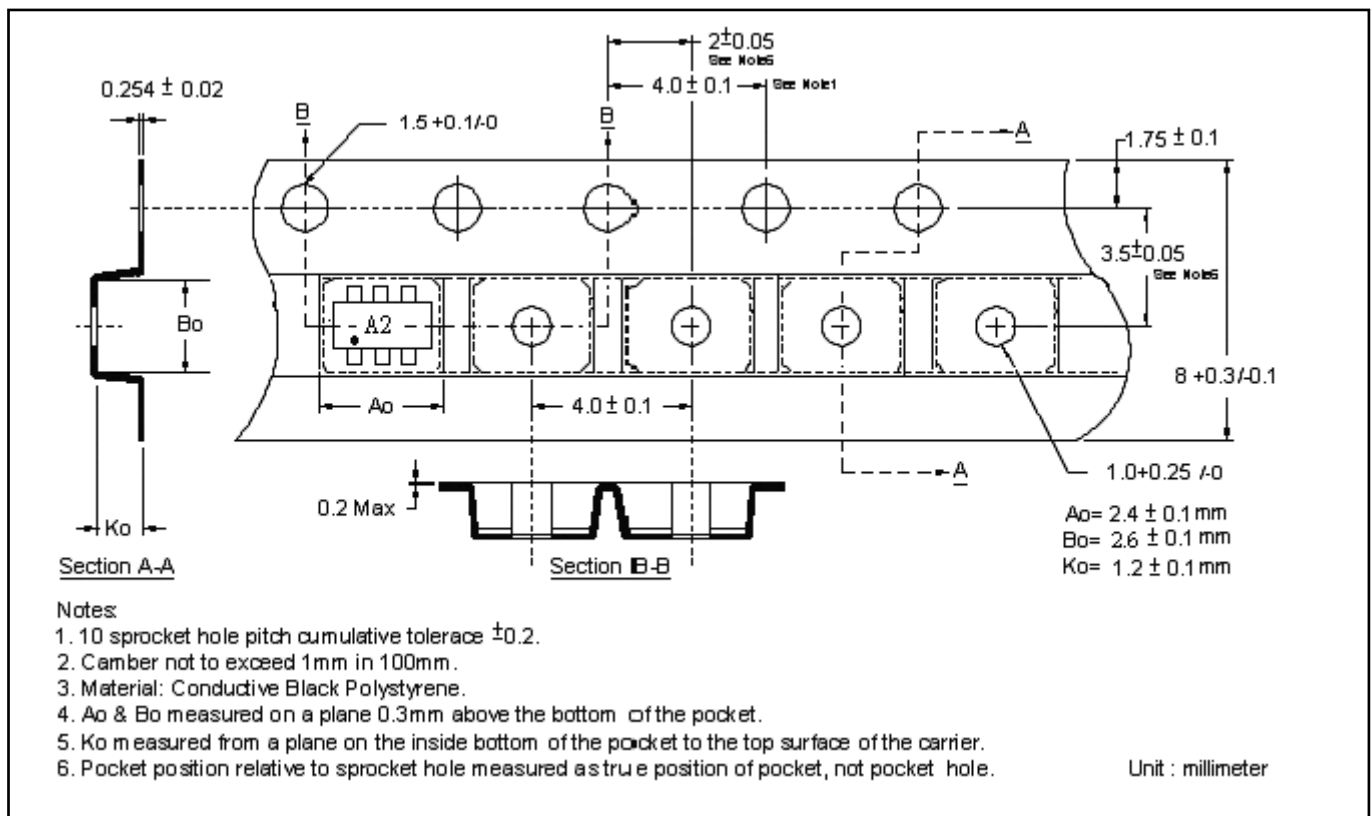
Recommended Soldering Footprint



Reel Dimension



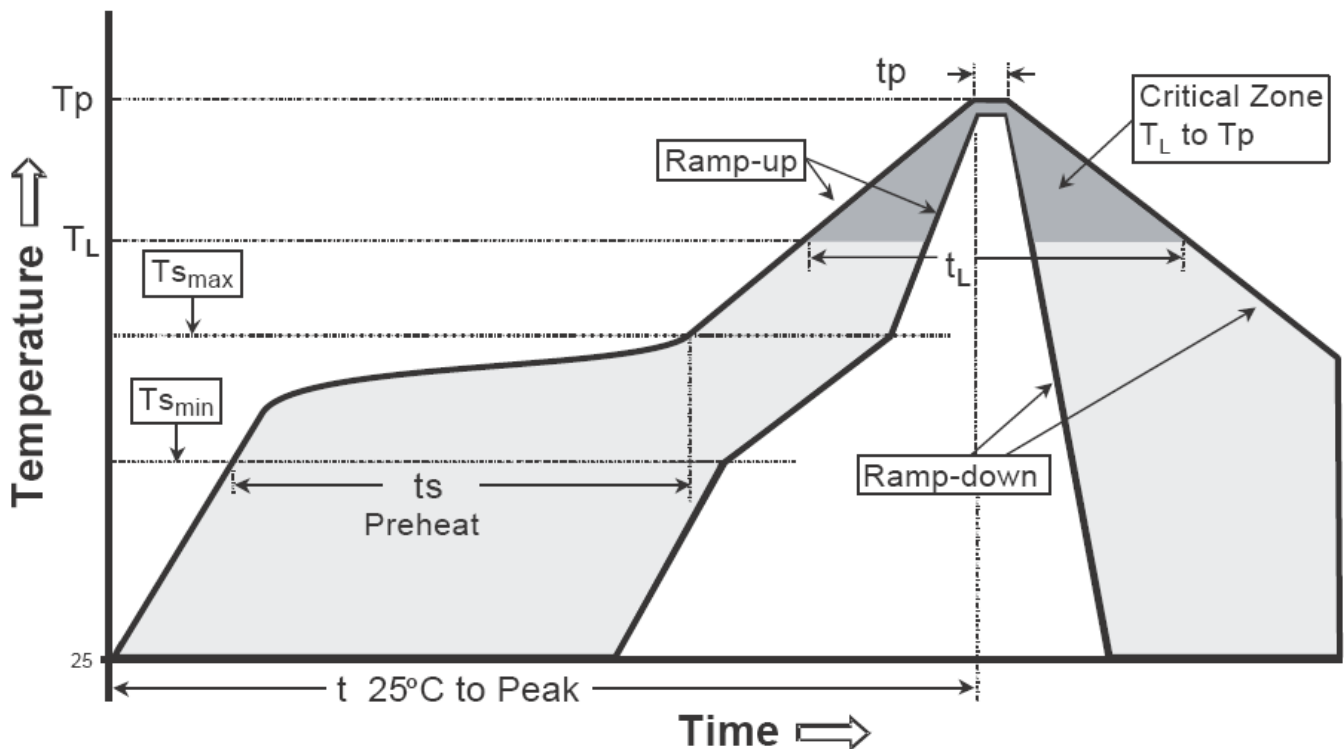
Carrier Tape Dimension



Recommended wave soldering condition

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

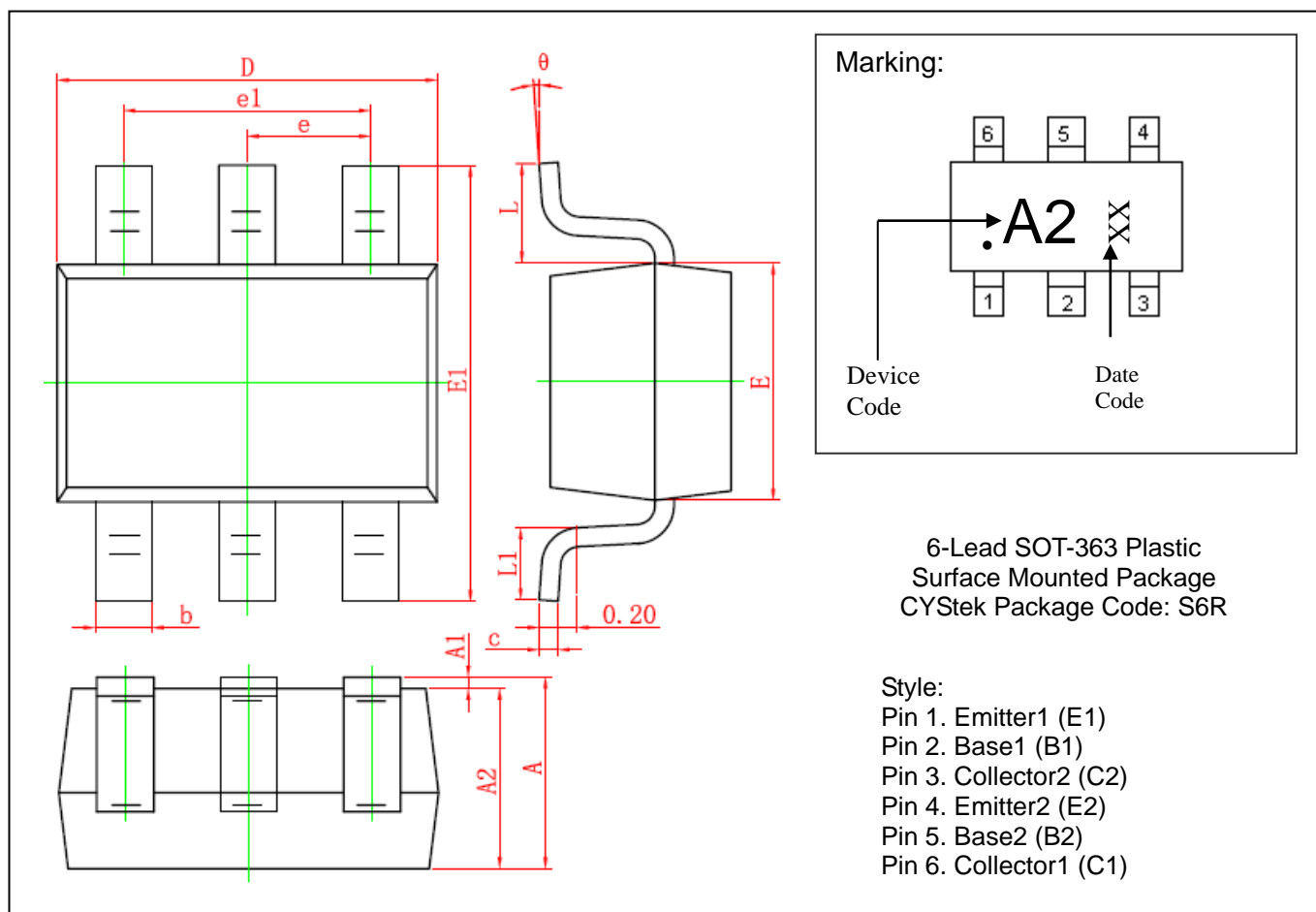
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T _{s min})	100°C	150°C
-Temperature Max(T _{s max})	150°C	200°C
-Time(t _{s min} to t _{s max})	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T _L)	183°C	217°C
- Time (t _L)	60-150 seconds	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-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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