

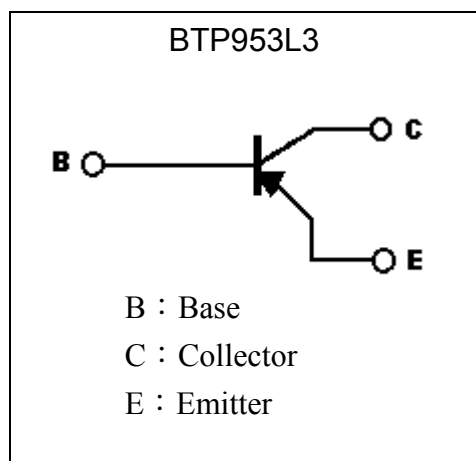
**PNP Epitaxial Planar High Current (High Performance) Transistor**

# BTP953L3

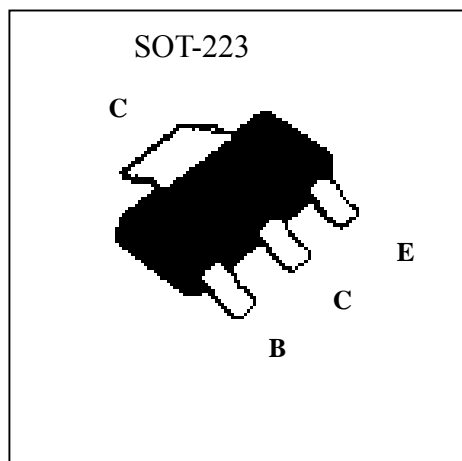
## Features

- 5 Amps continuous current, up to 10 Amps peak current
- Very low saturation voltage
- Excellent gain characteristics specified up to 10 Amps
- Ptot=3Watts
- Extremely low equivalent on resistance,  $R_{CE(SAT)}=70m\Omega$  at 4A
- Pb-free lead plating and halogen-free package

## Symbol

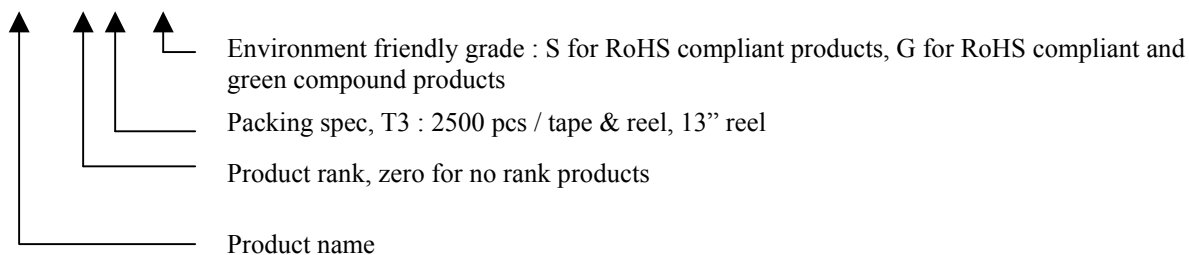


## Outline



## Ordering Information

Device	Package	Shipping
BTP953L3-0-T3-G	SOT-223 (Pb-free lead plating and halogen-free package)	2500 pcs / tape & reel





**Absolute Maximum Ratings** (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V <sub>CB0</sub>	-140	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-100	V
Emitter-Base Voltage	V <sub>EBO</sub>	-6	V
Continuous Collector Current	I <sub>C</sub>	-5	A
Peak Collector Current	I <sub>CP</sub>	-10	A
Base Current	I <sub>B</sub>	-1	A
Power Dissipation @Ta=25°C	P <sub>d</sub>	3 (Note)	W
Operating and Storage Temperature Range	T <sub>j</sub> ; T <sub>stg</sub>	-55 ~ +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 4 square inch minimum.

**Characteristics** (Ta=25°C, unless otherwise specified)

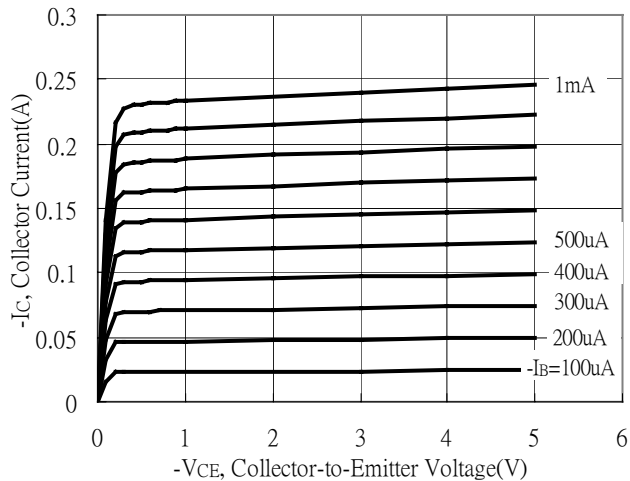
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CB0</sub>	-140	-170	-	V	I <sub>C</sub> =-100μA
BV <sub>CER</sub>	-140	-170	-	V	I <sub>C</sub> =-1μA, R <sub>BE</sub> ≤1kΩ
BV <sub>CEO</sub>	-100	-120	-	V	I <sub>C</sub> =-10mA
BV <sub>EBO</sub>	-6	-8	-	V	I <sub>E</sub> =-100μA
I <sub>CB0</sub>	-	-	-50	nA	V <sub>CB</sub> =-100V
I <sub>CER</sub>	-	-	-50	nA	V <sub>CE</sub> =-100V, R <sub>BE</sub> ≤1kΩ
I <sub>EBO</sub>	-	-	-10	nA	V <sub>EB</sub> =-5V
*V <sub>CE(sat)1</sub>	-	-18	-50	mV	I <sub>C</sub> =-100mA, I <sub>B</sub> =-10mA
*V <sub>CE(sat)2</sub>	-	-85	-115	mV	I <sub>C</sub> =-1A, I <sub>B</sub> =-100mA
*V <sub>CE(sat)3</sub>	-	-155	-220	mV	I <sub>C</sub> =-2A, I <sub>B</sub> =-200mA
*V <sub>CE(sat)4</sub>	-	-280	-420	mV	I <sub>C</sub> =-4A, I <sub>B</sub> =-400mA
*V <sub>BE(sat)</sub>	-	-990	-1170	mV	I <sub>C</sub> =-4A, I <sub>B</sub> =-400mA
*V <sub>BE(on)</sub>	-	-910	-1160	mV	V <sub>CE</sub> =-1V, I <sub>C</sub> =-4A
h <sub>FE1</sub>	100	200	-	-	V <sub>CE</sub> =-1V, I <sub>C</sub> =-10mA
h <sub>FE2</sub>	100	200	300	-	V <sub>CE</sub> =-1V, I <sub>C</sub> =-1A
*h <sub>FE3</sub>	50	90	320	-	V <sub>CE</sub> =-1V, I <sub>C</sub> =-3A
*h <sub>FE4</sub>	30	50	-	-	V <sub>CE</sub> =-1V, I <sub>C</sub> =-4A
*h <sub>FE5</sub>	-	15	-	-	V <sub>CE</sub> =-1V, I <sub>C</sub> =-10A
f <sub>T</sub>	-	125	-	MHz	V <sub>CE</sub> =-10V, I <sub>C</sub> =-100mA, f=50MHz
C <sub>ob</sub>	-	65	-	pF	V <sub>CB</sub> =-10V, f=1MHz
ton		110		ns	I <sub>C</sub> =-2A, I <sub>B1</sub> =-200mA, I <sub>B2</sub> =200mA,
toff		460		ns	V <sub>CC</sub> =-10V

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

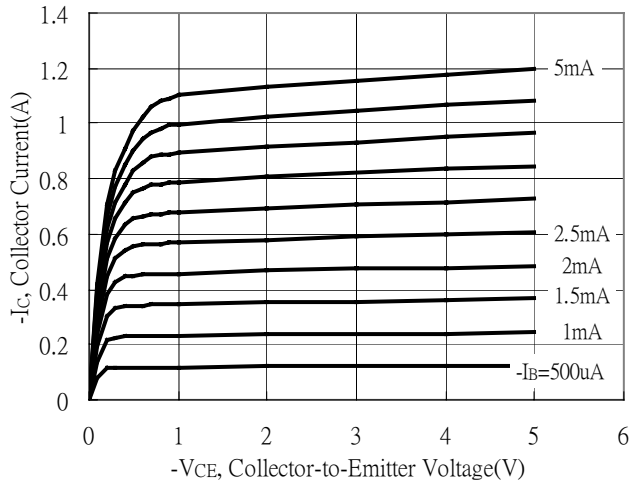


### Typical Characteristics

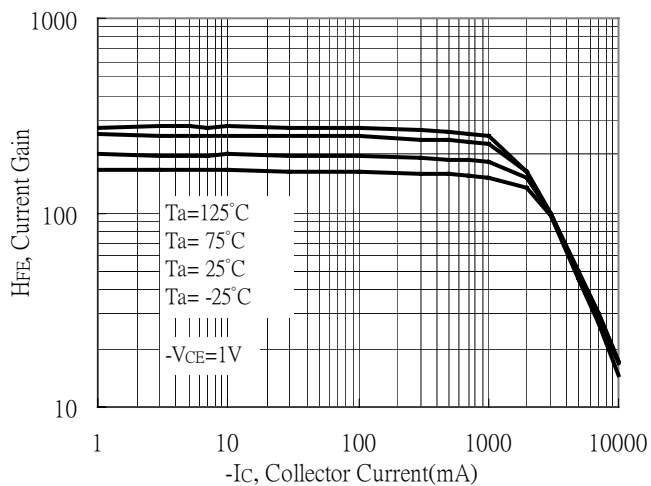
Emitter Grounded Output Characteristics



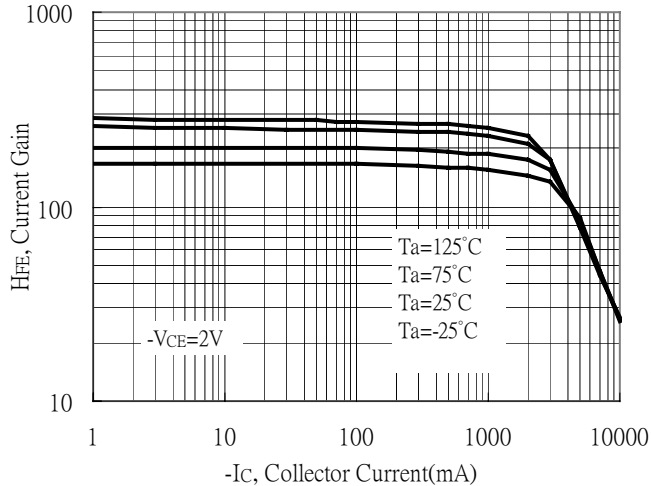
Emitter Grounded Output Characteristics



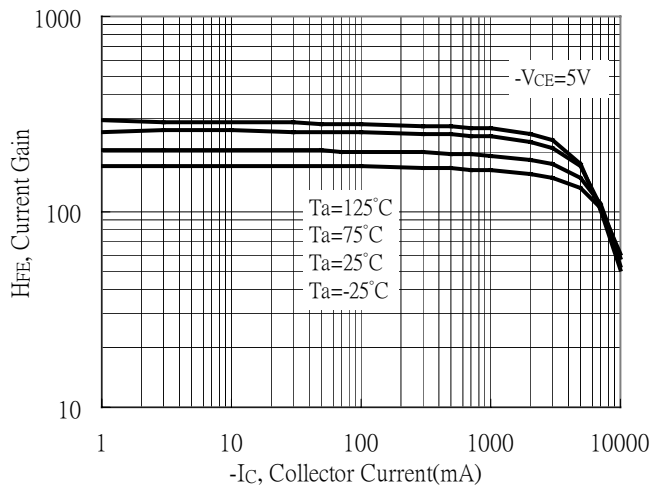
Current Gain vs Collector Current



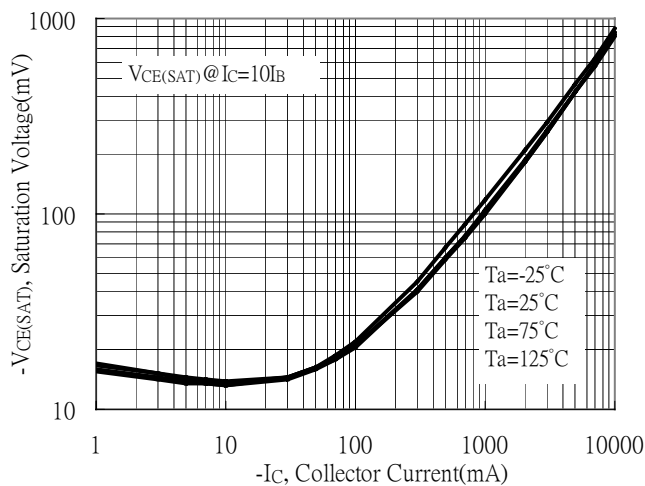
Current Gain vs Collector Current



Current Gain vs Collector Current

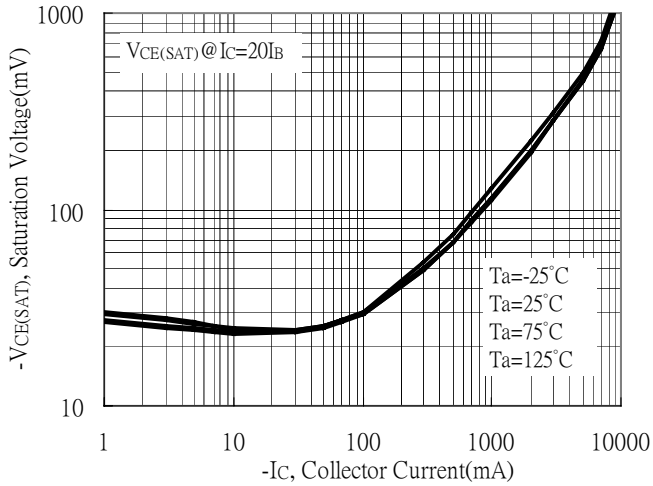


Saturation Voltage vs Collector Current

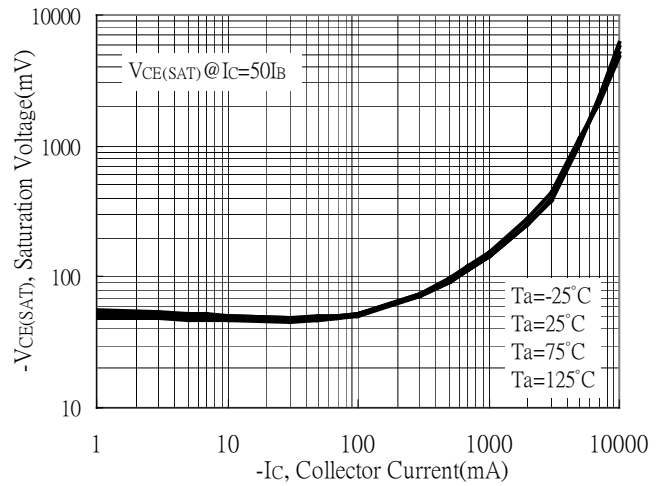


**Typical Characteristics(Cont.)**

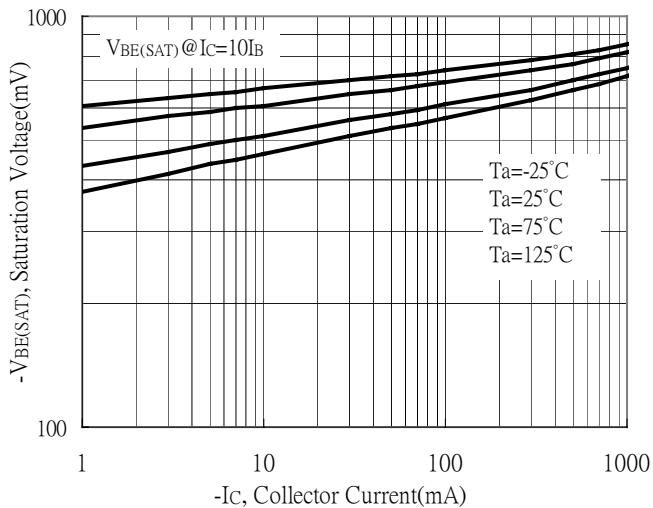
Saturation Voltage vs Collector Current



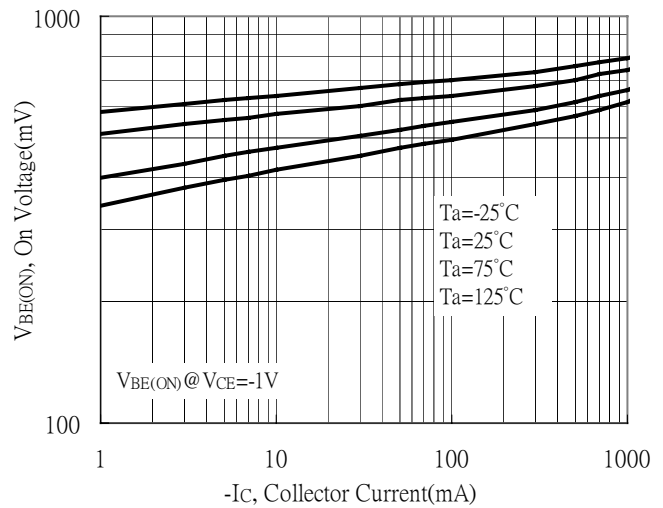
Saturation Voltage vs Collector Current



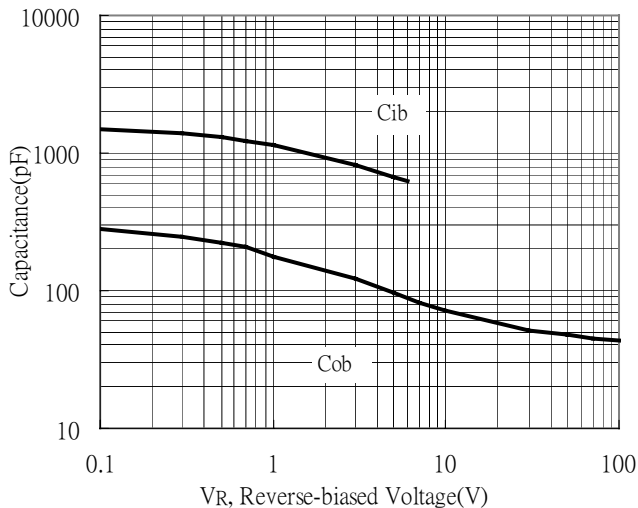
Saturation Voltage vs Collector Current



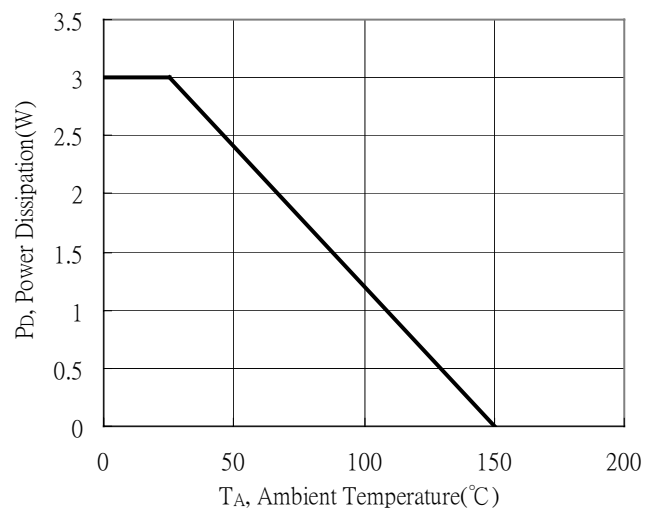
On Voltage vs Collector Current



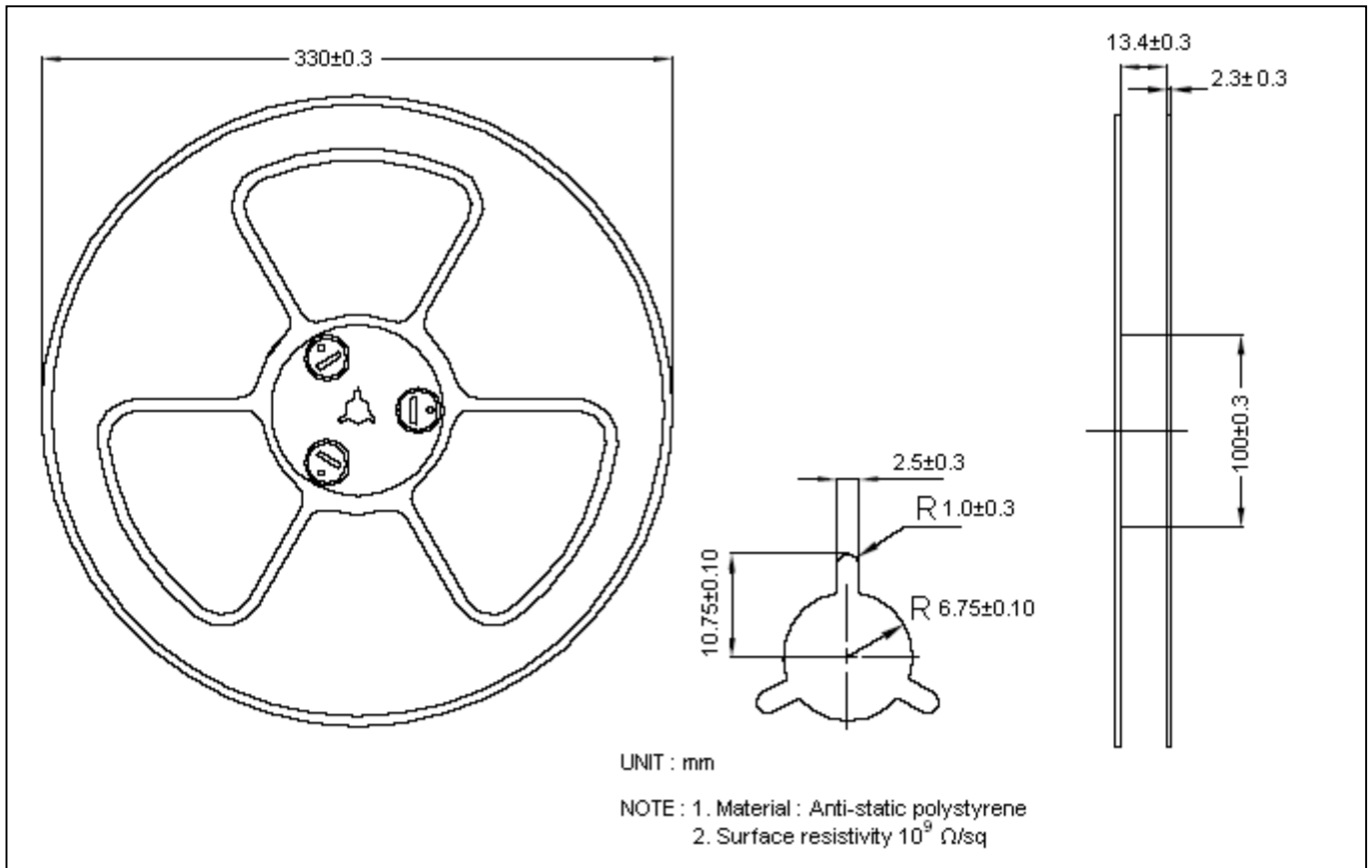
Capacitance vs Reverse-biased Voltage



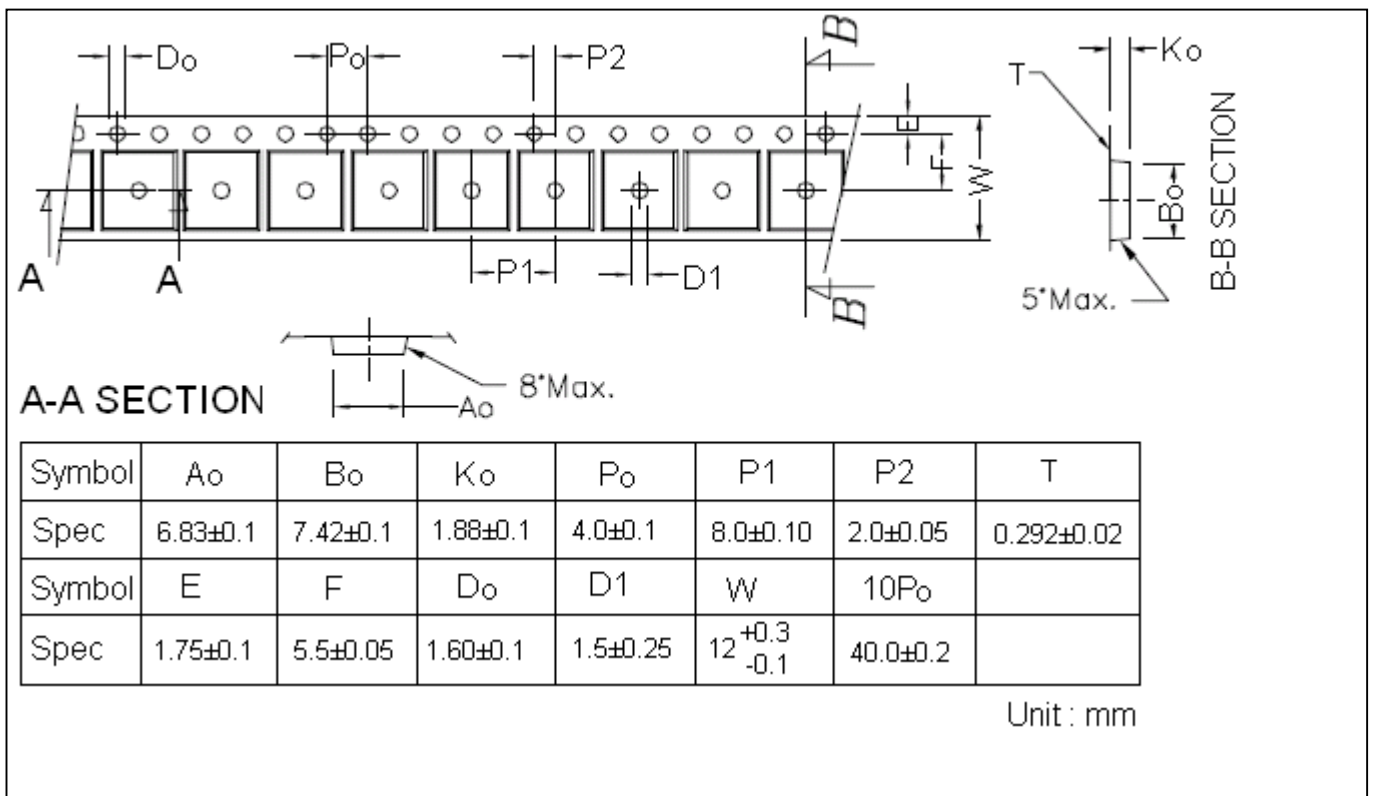
Power Derating Curve



**Reel Dimension**



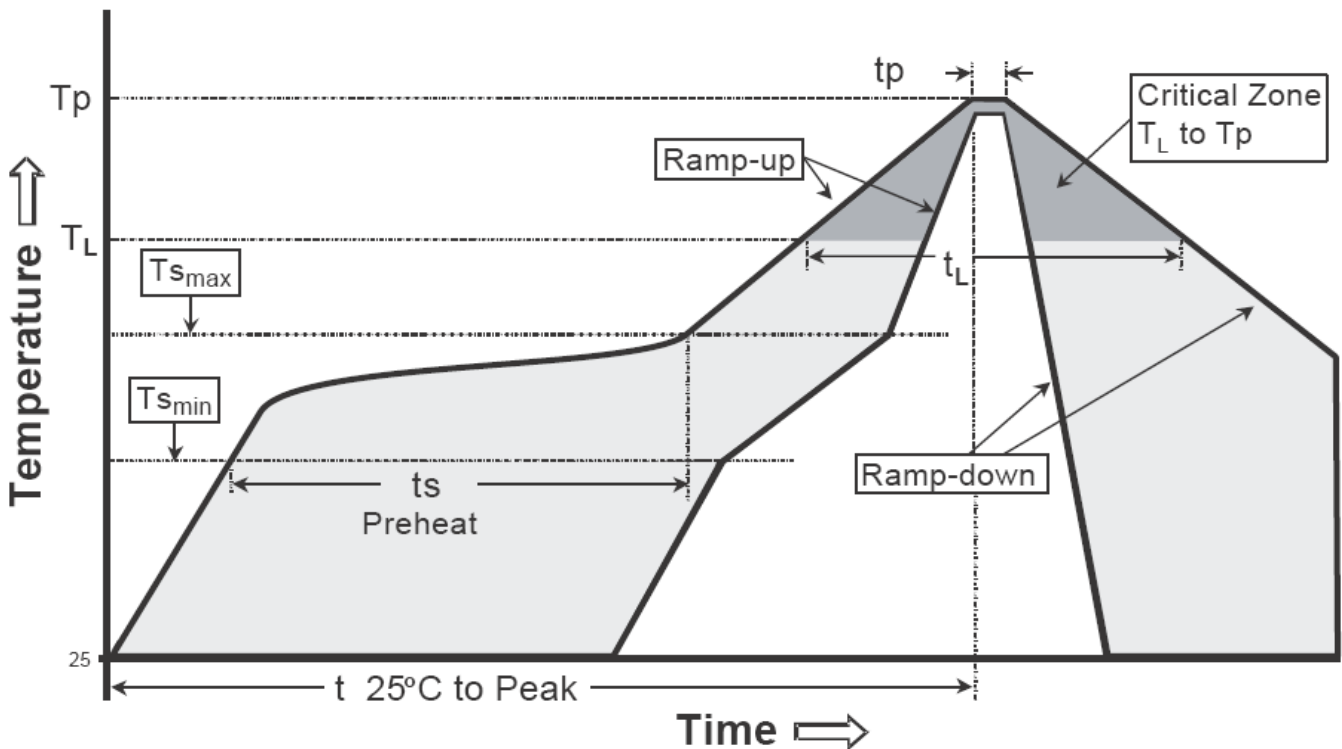
**Carrier Tape Dimension**



**Recommended wave soldering condition**

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

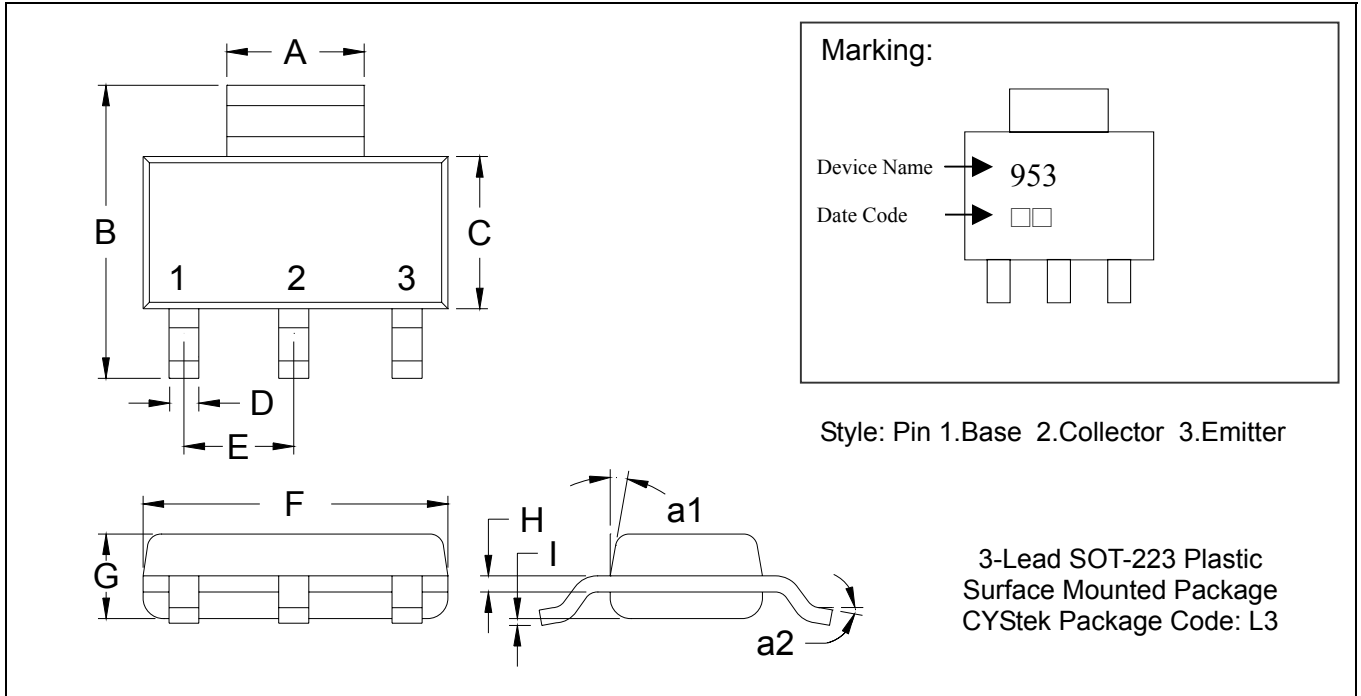
**Recommended temperature profile for IR reflow**



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

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

**SOT-223 Dimension**



\*: 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.

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