General Purpose NPN Epitaxial Planar Transistor

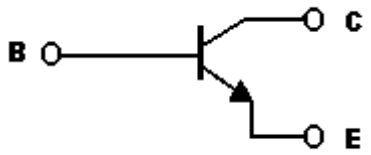
BTC4081S3

Description

- The BTC4081S3 is designed for using in driver stage of AF amplifier and general purpose amplification.
- Low Cob, Typ. Cob=2.0pF
- Complementary to BTA1576S3
- Pb-free lead plating and halogen-free package

Symbol

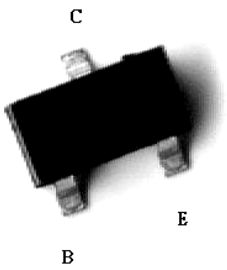
BTC4081S3



B：Base
C：Collector
E：Emitter

Outline

SOT-323



Ordering Information

Device	Package	Shipping
BTC4081S3-R-T1-G	SOT-323 (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

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	100	V
Collector-Emitter Voltage	V_{CEO}	65	V
Emitter-Base Voltage	V_{EBO}	7	V
Collector Current	I_C	150	mA
Peak Collector Current	I_{CM}	300	mA
Peak Base Current	I_{BM}	100	mA
Power Dissipation	P_D	225	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	555	°C/W
Operating Junction and Storage Temperature range	Tj ; Tstg	-65~+150	°C

Characteristics (Ta=25°C)

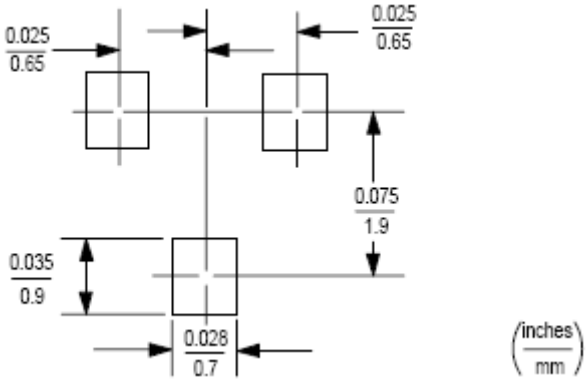
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	100	-	-	V	I_C=100μA
BV_{CEO}	65	-	-	V	I_C=1mA
BV_{EBO}	7	-	-	V	I_E=50μA
I_{CBO}	-	-	30	nA	V_{CB}=100V
I_{EBO}	-	-	30	nA	V_{EB}=7V
*$V_{CE(sat)}$	-	47	80	mV	I_C=110μA, I_B=10μA
*$V_{CE(sat)}$	-	58	95	mV	I_C=10mA, I_B=0.5mA
*$V_{CE(sat)}$	-	79	120	mV	I_C=50mA, I_B=5mA
*$V_{CE(sat)}$	-	123	180	mV	I_C=100mA, I_B=10mA
*$V_{CE(sat)}$	-	148	225	mV	I_C=100mA, I_B=5mA
*$V_{BE(sat)}$	-	711	930	mV	I_C=10mA, I_B=0.5mA
*$V_{BE(sat)}$	-	867	980	mV	I_C=100mA, I_B=10mA
*$V_{BE(sat)}$	-	853	960	mV	I_C=100mA, I_B=5mA
*$V_{BE(on)}$	600	646	700	mV	V_{CE}=5V, I_C=2mA
*$V_{BE(on)}$	-	692	750	mV	V_{CE}=5V, I_C=10mA
*h_{FE} 1	160	-	-	-	V_{CE}=5V, I_C=10μA
*h_{FE} 2	200	290	450	-	V_{CE}=6V, I_C=1mA
f_T	80	180	-	MHz	V_{CE}=12V, I_C=2mA, f=100MHz
Cob	-	2	3.5	pF	V_{CB}=10V, f=1MHz
Cib	-	13.7	20	pF	V_{EB}=0.5V, f=1MHz

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

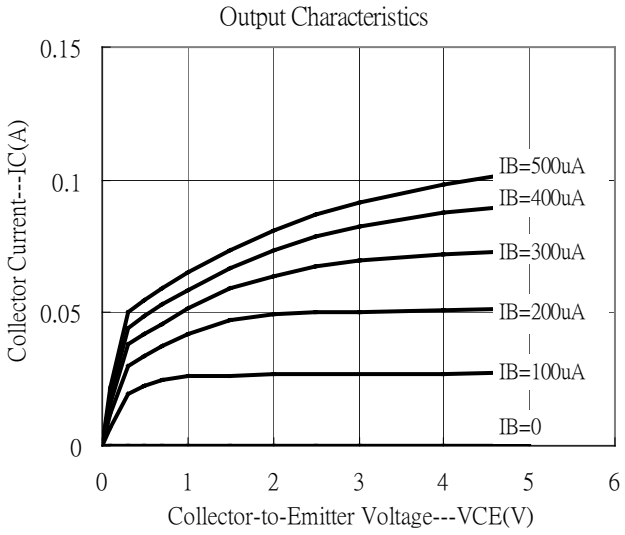
Classification Of h_{FE} 2

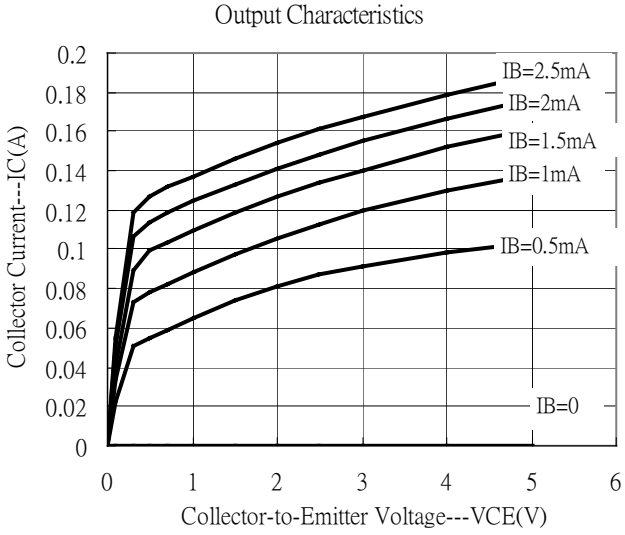
Rank	R
Range	200~450

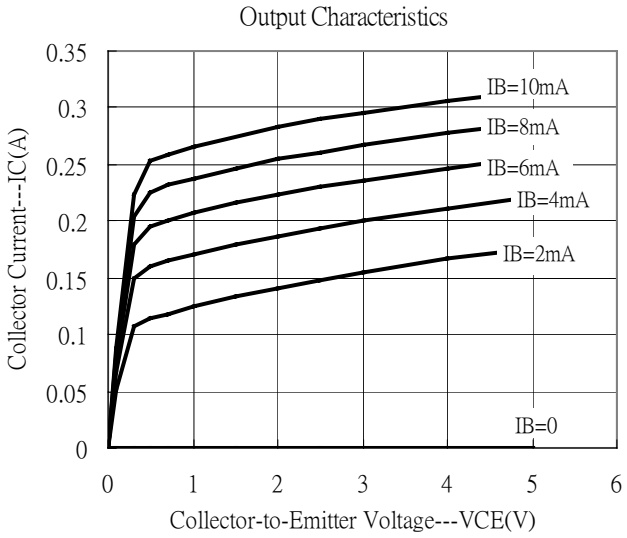
Recommended Footprint

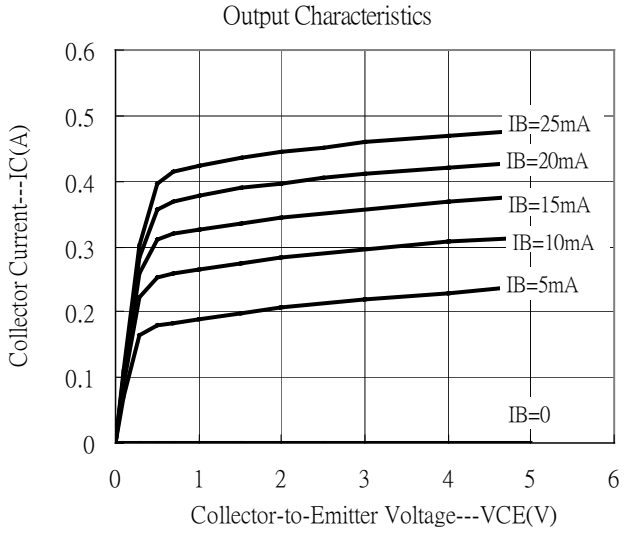


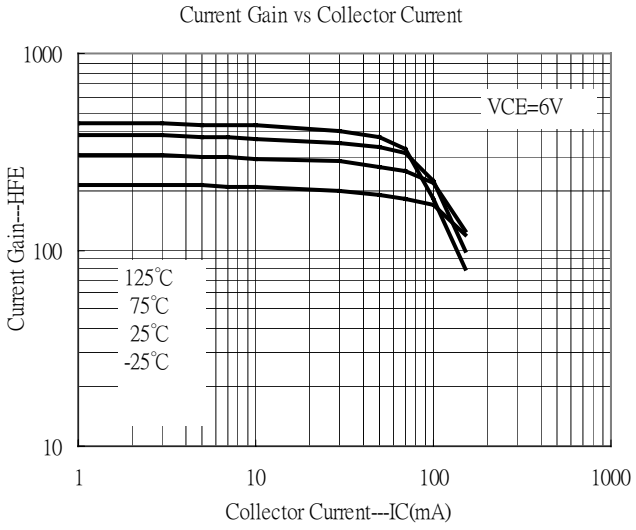
Typical Characteristics

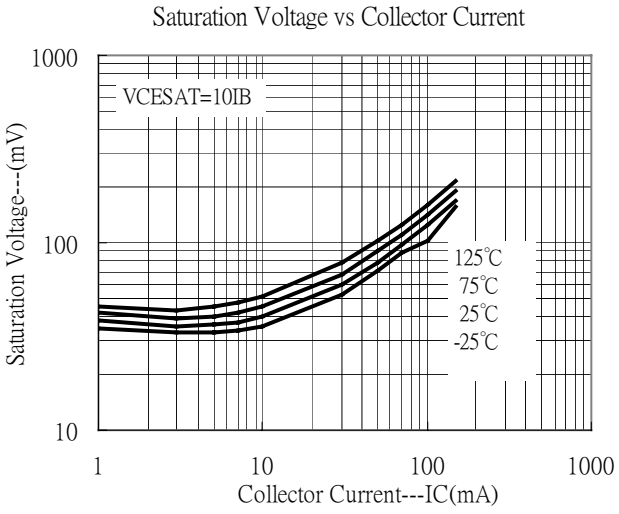






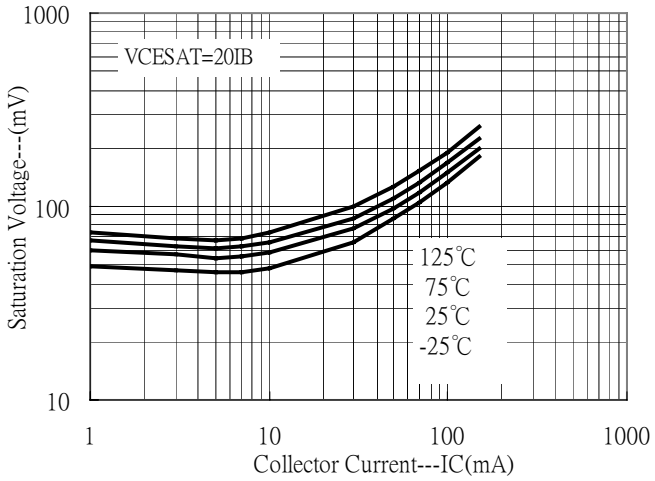




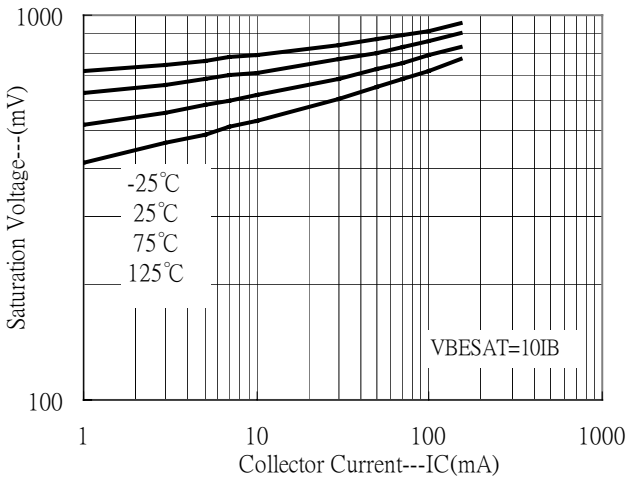


Typical Characteristics(Cont.)

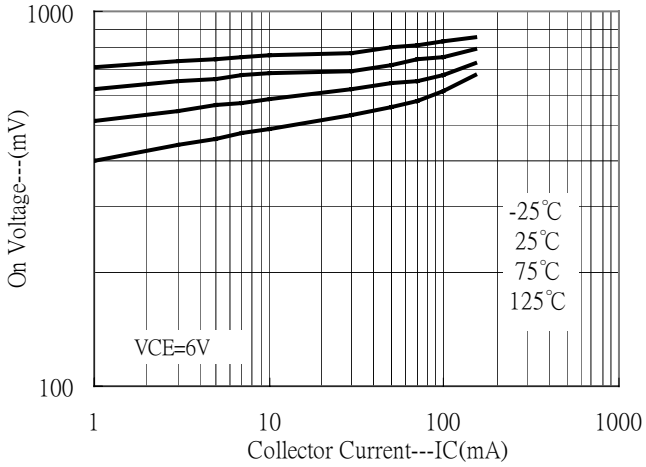
Saturation Voltage vs Collector Current



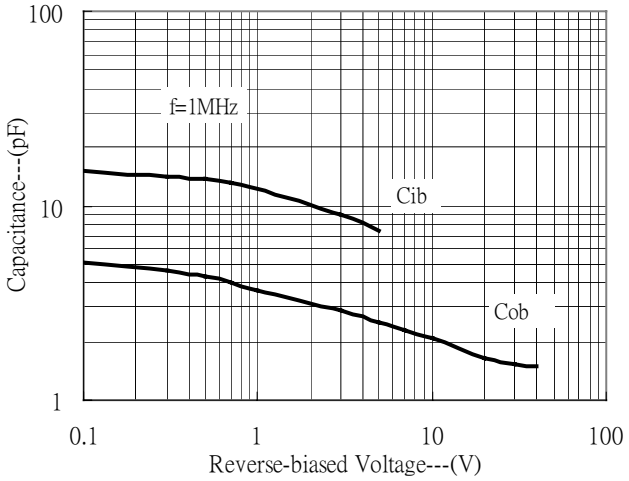
Saturation Voltage vs Collector Current



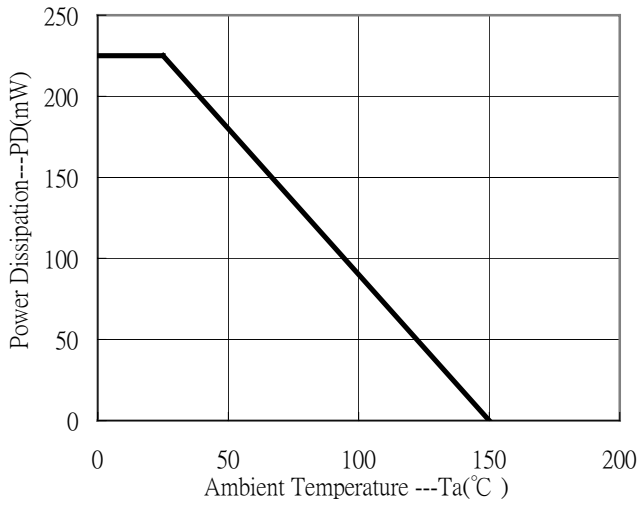
On Voltage vs Collector Current



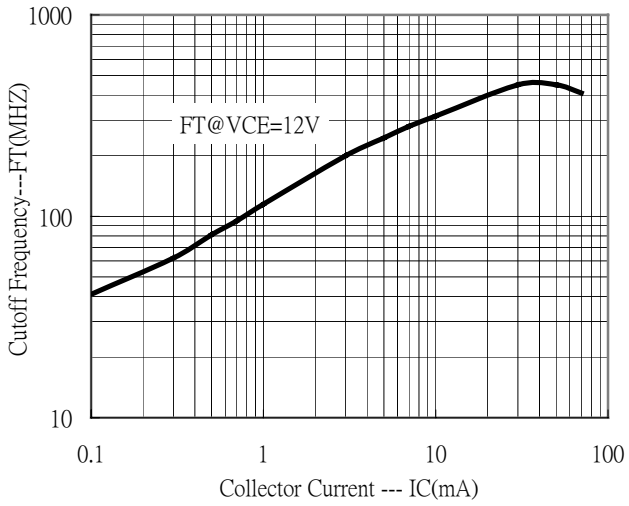
Capacitance Characteristics



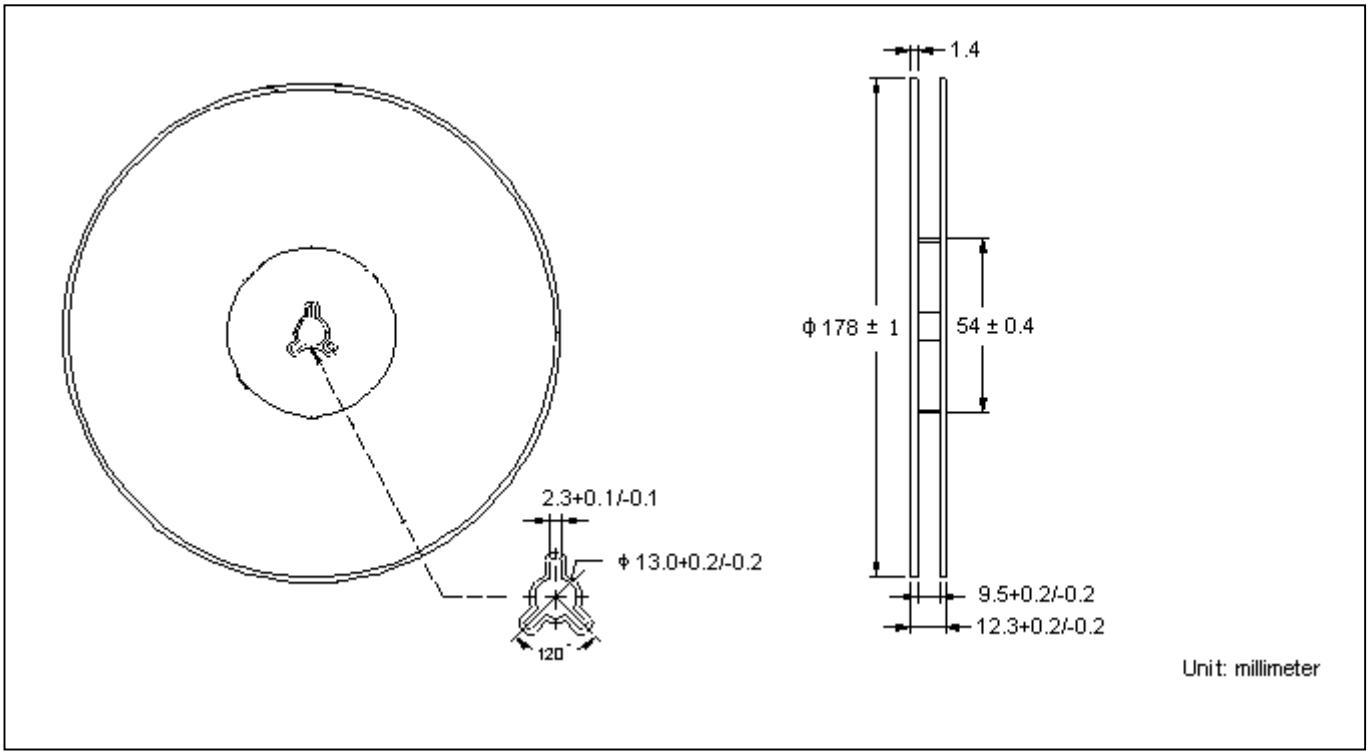
Power Derating Curve



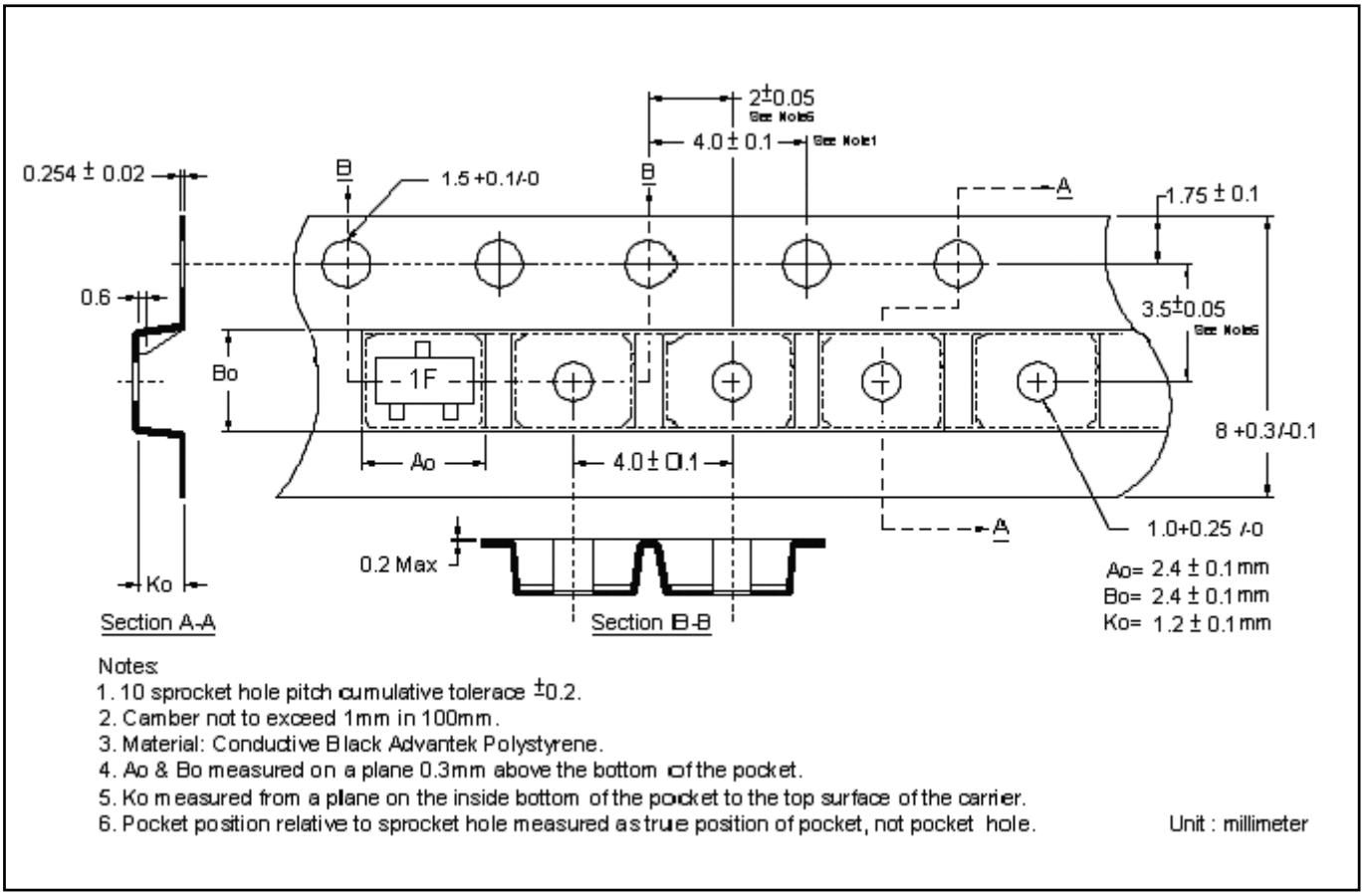
Cutoff Frequency vs Collector Current



Reel Dimension



Carrier Tape Dimension



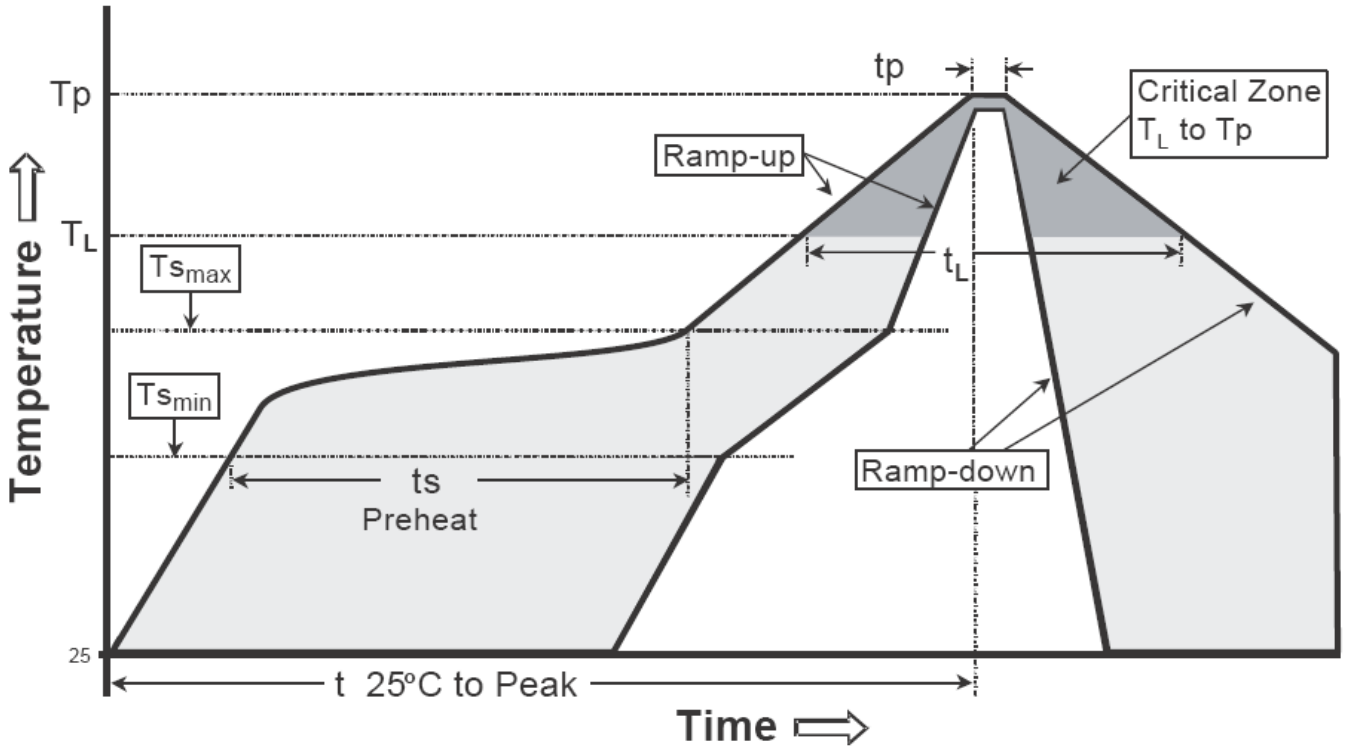
Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of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

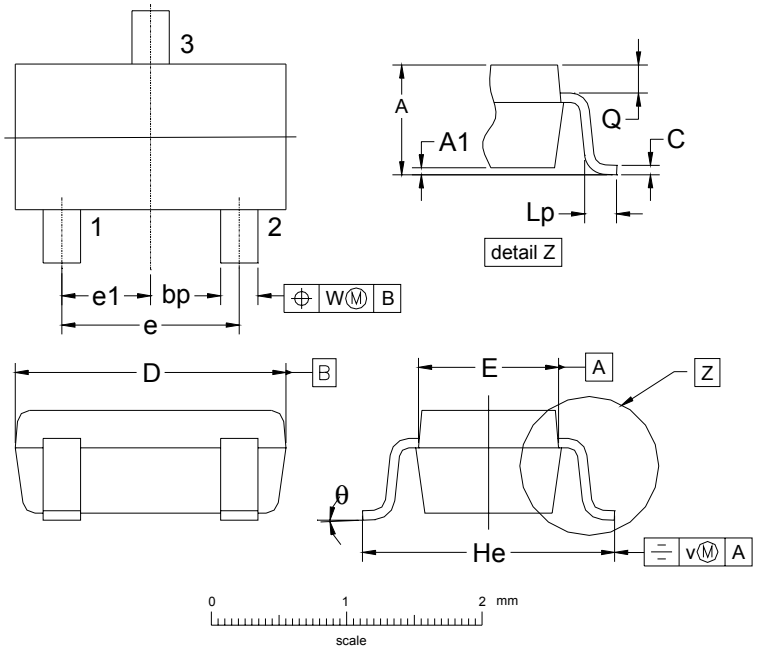
Recommended temperature profile for IR reflow

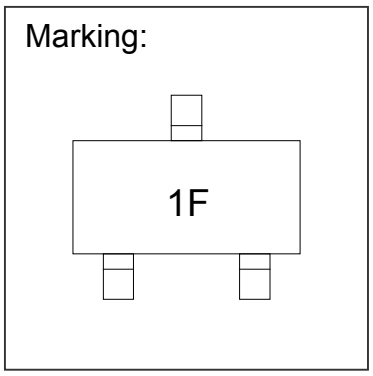


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − 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-323 Dimension





3-Lead SOT-323 Pastic
Surface Mounted Package
CYStek Package Code: S3

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

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0315	0.0433	0.80	1.10	e1	0.0256*		0.65*	
A1	0.0000	0.0039	0.00	0.10	He	0.0846	0.0965	2.15	2.45
bp	0.0078	0.0157	0.20	0.40	Lp	0.0105	0.0181	0.26	0.46
C	0.0031	0.0059	0.08	0.15	Q	0.0051	0.0091	0.13	0.23
D	0.0709	0.0866	1.80	2.20	v	0.0079	-	0.2	-
E	0.0453	0.0531	1.15	1.35	w	0.0079	-	0.2	-
e	0.0472	0.0551	1.20	1.40	θ	0°	8°	0°	8°

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.