

Low Vcesat PNP Epitaxial Planar Transistor

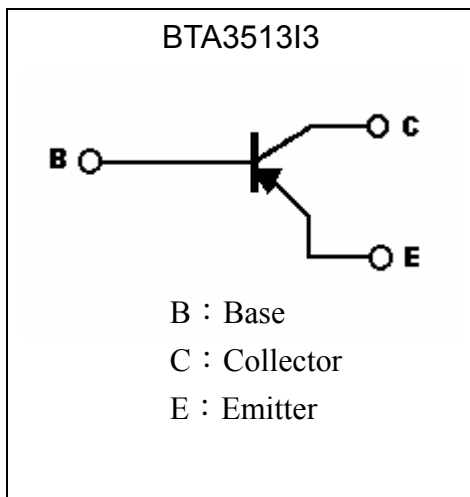
BTA3513I3

BV_{CEO}	-80V
I_C	-10A
R_{CESAT}	75mΩ typ.

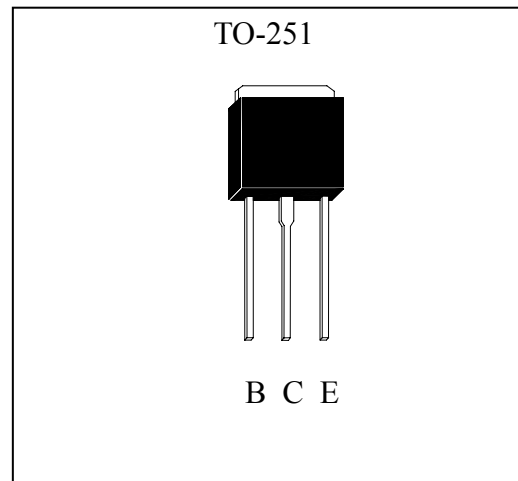
Features

- Low $V_{CE(sat)}$
- High BV_{CEO}
- Excellent current gain characteristics
- RoHS compliant package

Symbol



Outline



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	-100	V
Collector-Emitter Voltage	V_{CEO}	-80	V
Emitter-Base Voltage	V_{EBO}	-7	V
Collector Current (DC)	I_C	-10	A
Collector Current (Pulse)	I_{CP}	-16 (Note 1)	
Power Dissipation @ Ta=25°C	P_D	1.75 (Note 2)	W
Power Dissipation @ Tc=25°C	P_D	20	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	71.4 (Note 2)	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	6.25	°C/W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	-55~+150	°C

Note : 1. Single Pulse , $P_w \leq 300\mu s$, $Duty \leq 2\%$.
2. When mounted on a PCB with the minimum pad size.



Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CEO(SUS)}	-80	-	-	V	I _C =-30mA, I _B =0
I _{CEO}	-	-	-1	μA	V _{CE} =-80V, I _B =0
I _{CES}	-	-	-1	μA	V _{CE} =-80V, V _{BE} =0
I _{EBO}	-	-	-100	nA	V _{EB} =-7V, I _C =0
*V _{CE(sat)} 1	-	-0.2	-0.3	V	I _C =-3A, I _B =-150mA
*V _{CE(sat)} 2	-	-0.3	-0.5	V	I _C =-5A, I _B =-250mA
*V _{CE(sat)} 3	-	-0.6	-1.0	V	I _C =-8A, I _B =-0.4A
*R _{CE(sat)}	-	75	125	mΩ	I _C =-8A, I _B =-0.4A
*V _{BE(sat)} 1	-	-0.85	-1.0	V	I _C =-3A, I _B =-150mA
*V _{BE(sat)} 2	-	-0.9	-1.2	V	I _C =-5A, I _B =-250mA
*V _{BE(sat)} 3	-	-1.0	-1.5	V	I _C =-8A, I _B =-0.8A
*h _{FE} 1	160	-	-	-	V _{CE} =-2V, I _C =-500mA
*h _{FE} 2	180	-	360	-	V _{CE} =-2V, I _C =-1A
*h _{FE} 3	100	-	-	-	V _{CE} =-2V, I _C =-3A
f _T	-	80	-	MHz	V _{CE} =-10V, I _C =-500mA, f=20MHz
C _{ob}	-	98	-	pF	V _{CB} =-10V, f=1MHz
ton	-	135	-	ns	I _C =-5A, I _{B1} =-I _{B2} =-0.5A
tstg	-	500	-	ns	
tf	-	100	-	ns	

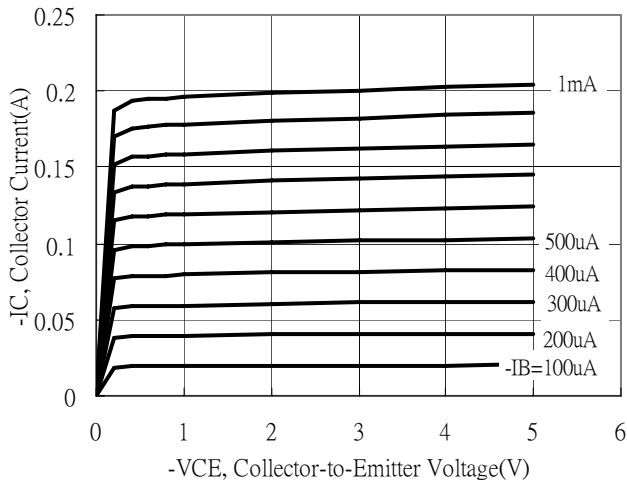
*Pulse Test : Pulse Width ≤300μs, Duty Cycle ≤2%

Ordering Information

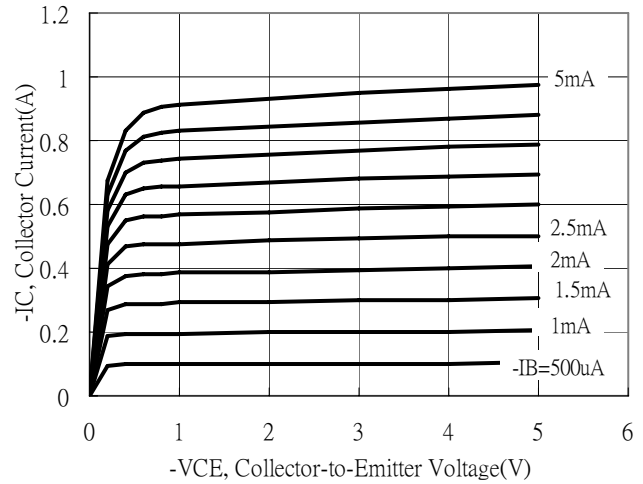
Device	Package	Shipping	Marking
BTA3513I3	TO-251 (RoHS compliant)	80 pcs / tube, 50 tubes / box	A3513

Typical Characteristics

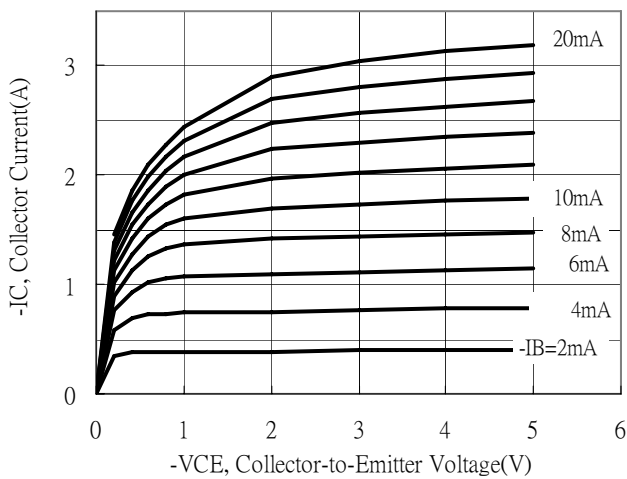
Emitter Grounded Output Characteristics



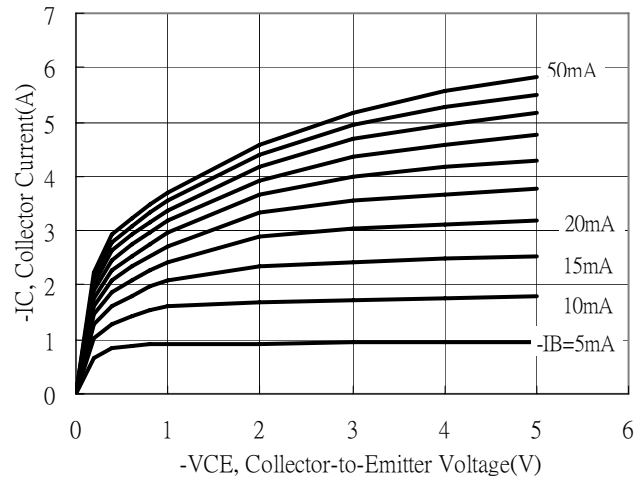
Emitter Grounded Output Characteristics



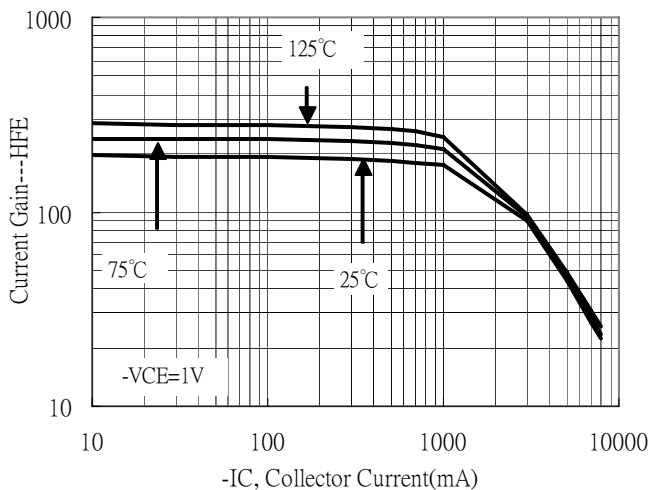
Emitter Grounded Output Characteristics



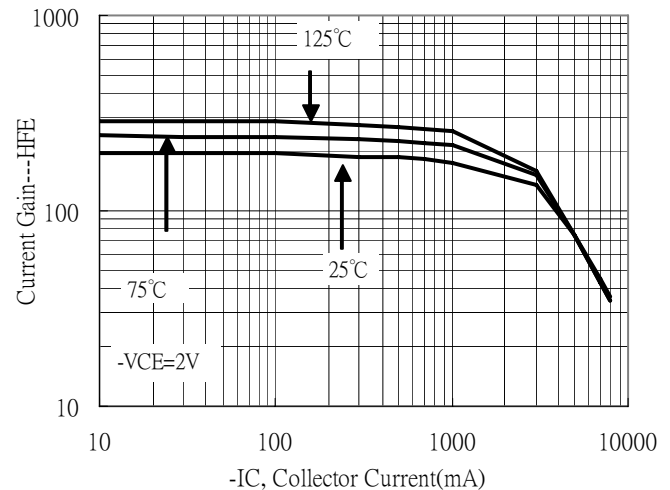
Emitter Grounded Output Characteristics



Current Gain vs Collector Current

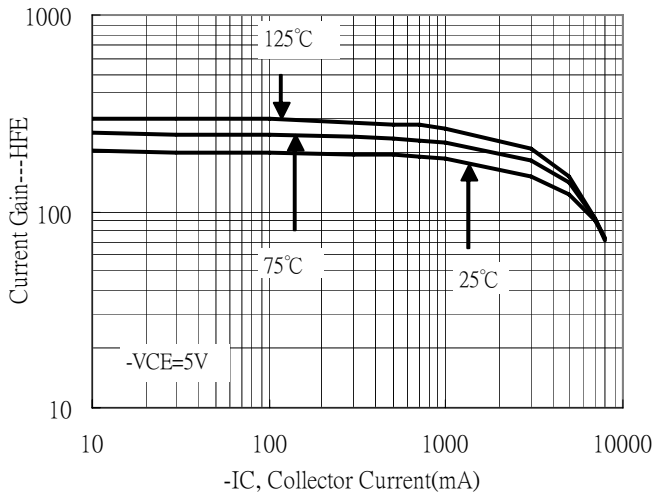


Current Gain vs Collector Current

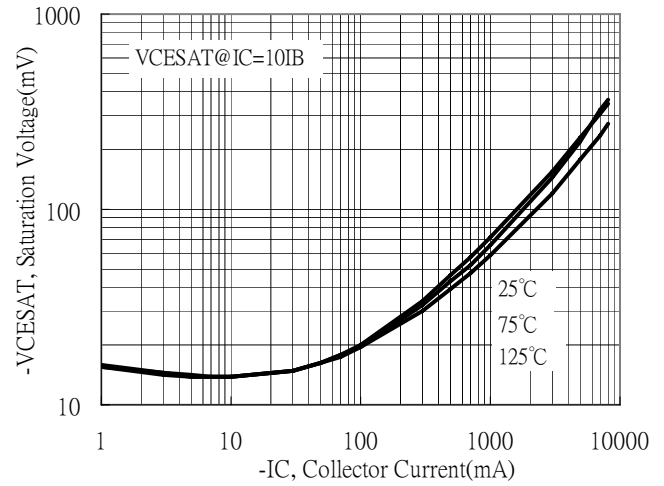


Typical Characteristics(Cont.)

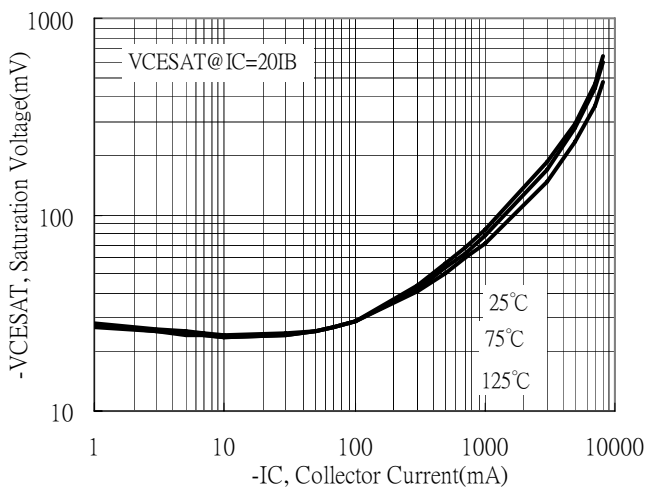
Current Gain vs Collector Current



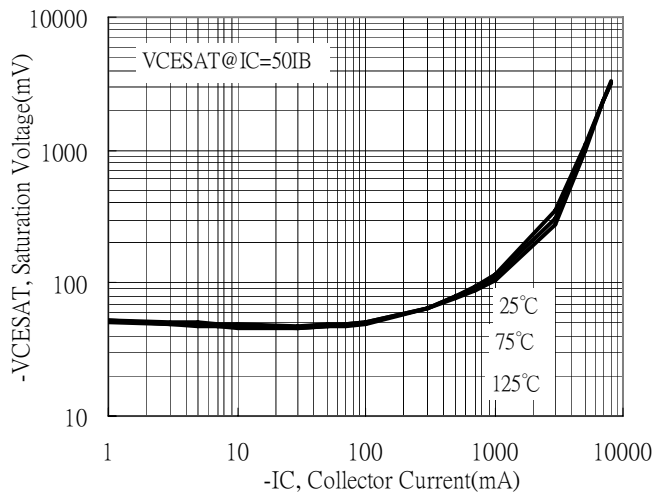
Saturation Voltage vs Collector Current



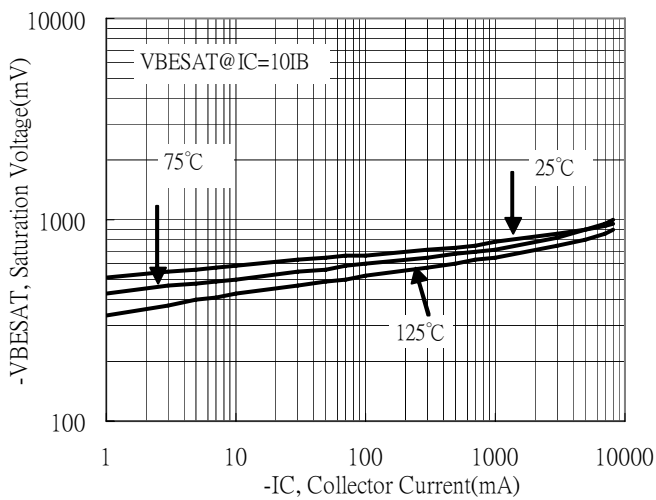
Saturation Voltage vs Collector Current



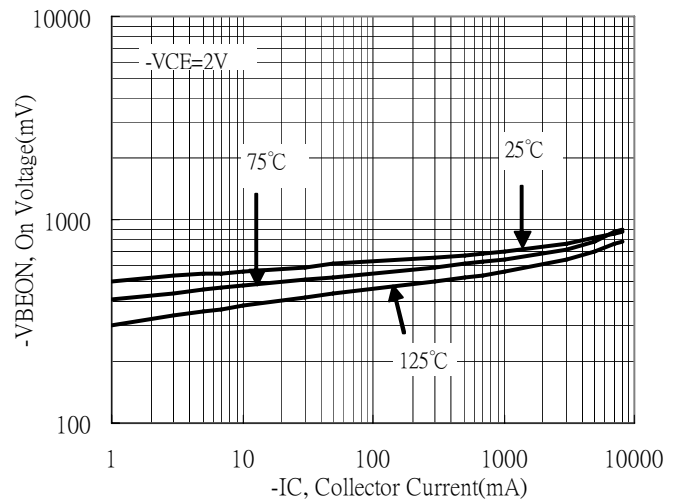
Saturation Voltage vs Collector Current



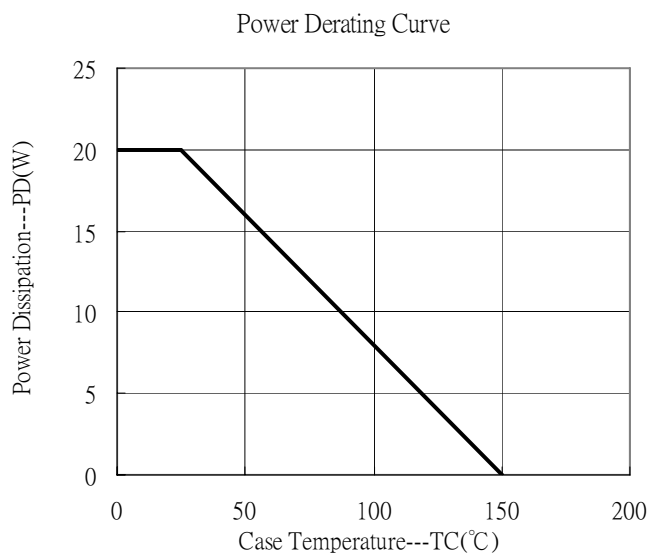
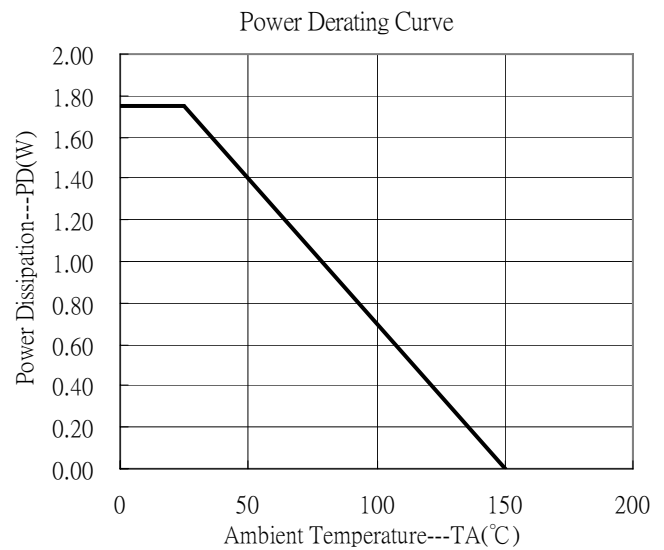
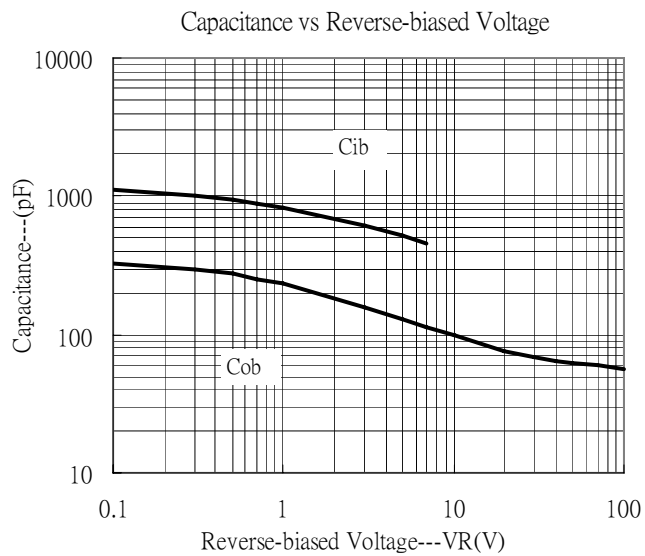
Saturation Voltage vs Collector Current



On Voltage vs Collector Current



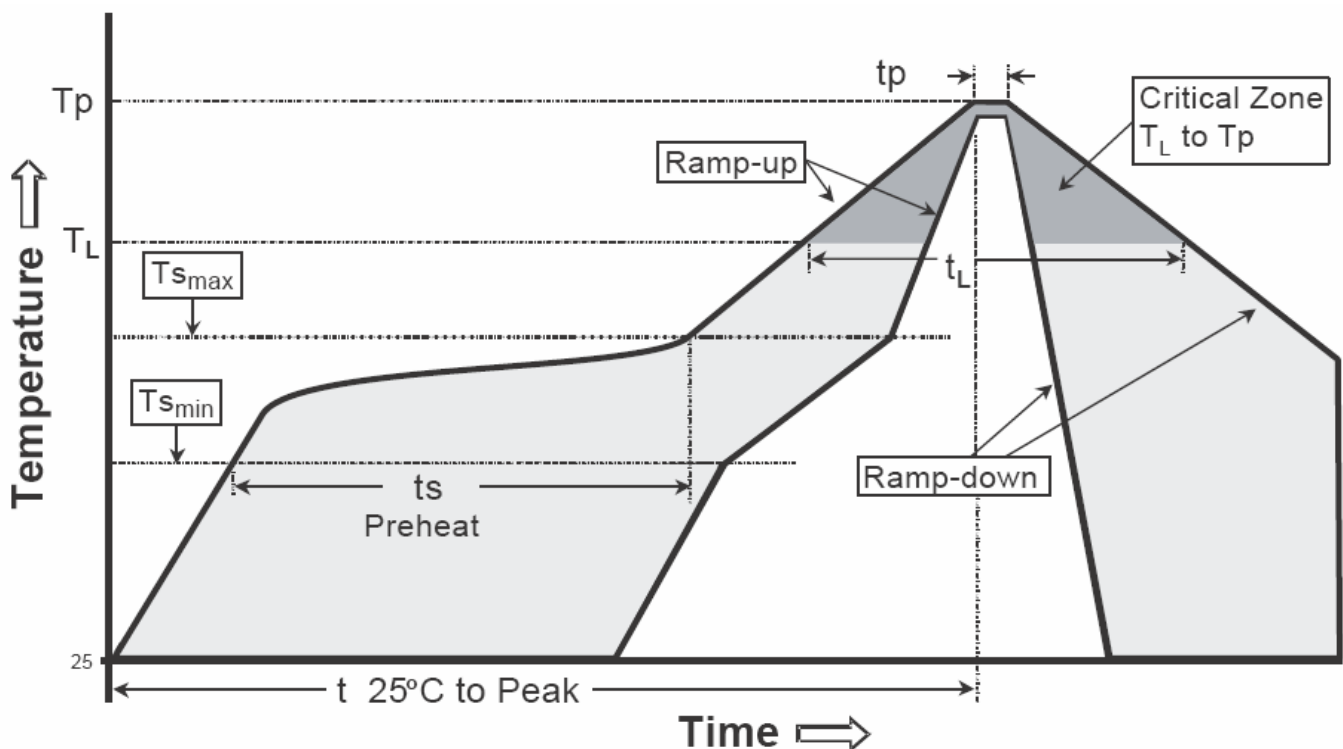
Typical Characteristics(Cont.)



Recommended wave soldering condition

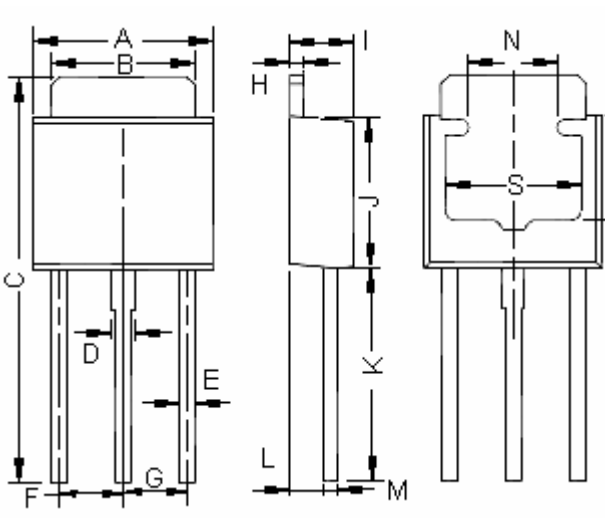
Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow



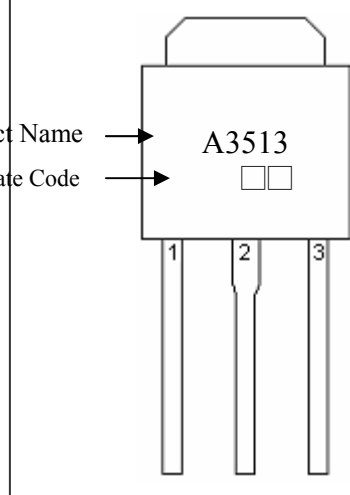
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (Tl)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

TO-251 Dimension



Technical drawings of the TO-251 package showing top, side, and bottom views with dimension labels A through T.

Marking:



Product Name → A3513
 Date Code → □□

1 2 3

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

3-Lead TO-251 Plastic Package
 CYStek Package Code: I3

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.250	0.262	6.350	6.650	I	0.087	0.094	2.200	2.400
B	0.205	0.213	5.200	5.400	J	0.213	0.224	5.400	5.700
C	0.571	0.587	14.500	14.900	K	0.295	0.311	7.500	7.900
D	0.028	0.035	0.700	0.900	L	0.042	0.054	1.050	1.350
E	0.020	0.028	0.500	0.700	M	0.017	0.023	0.430	0.580
F	0.091 TYP		2.300 TYP		N	0.118 REF		3.000 REF	
G	0.091 TYP		2.300 TYP		S	0.197 REF		5.000 REF	
H	0.017	0.023	0.430	0.580	T	0.150 REF		3.800 REF	

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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