Low Vcesat NPN Epitaxial Planar Transistor

BTD1805F3

Description

The device is manufactured in NPN planar technology by using a “Base Island” layout. The resulting transistor shows exceptional high gain performance coupled with very low saturation voltage.

Features

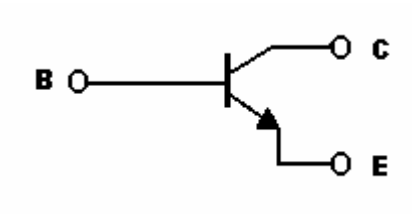
- Very low collector-to-emitter saturation voltage
- Fast switching speed
- High current gain characteristic
- Large current capability
- RoHS compliant package

Applications

- CCFL drivers
- Voltage regulators
- Relay drivers
- High efficiency low voltage switching applications

Symbol

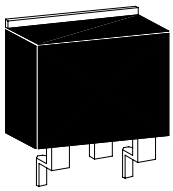
BTD1805F3



B：Base
C：Collector
E：Emitter

Outline

TO-263



B C E

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage (I_E=0)	V_{CBO}	150	V
Collector-Emitter Voltage (I_B=0)	V_{CEO}	60	V
Emitter-Base Voltage (I_C=0)	V_{EBO}	7	V
Collector Current (DC)	I_C	7	A
Collector Current (Pulse)	I_{CP}	12 (Note 1)	
Base Current	I_B	2	A
Power Dissipation @ T_A=25℃	P_D	1.65	W
Power Dissipation @ T_C=25℃	P_D	40	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	75.8	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	3.125	°C/W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55~+150	°C

Note : 1. Single Pulse , Pw≦380μs,Duty≦2%.

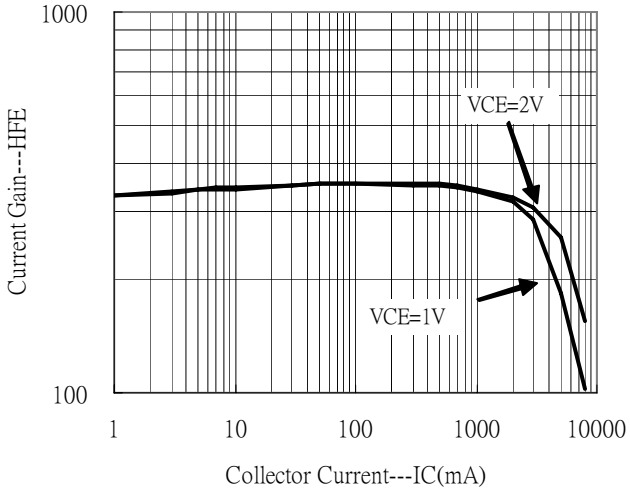
Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	150	-	-	V	I_C=100μA, I_E=0
*BV_{CEO}	60	-	-	V	I_C=1mA, I_B=0
BV_{EBO}	7	-	-	V	I_C=100μA, I_C=0
I_{CBO}	-	-	100	nA	V_{CB}=150V, I_E=0
I_{EBO}	-	-	100	nA	V_{EB}=7V, I_C=0
*$V_{CE(sat)}$ 1	-	-	50	mV	I_C=100mA, I_B=5mA
*$V_{CE(sat)}$ 2	-	200	300	mV	I_C=2A, I_B=50mA
*$V_{CE(sat)}$ 3	-	240	320	mV	I_C=3A, I_B=150mA
*$V_{CE(sat)}$ 4	-	-	400	mV	I_C=5A, I_B=200mA
*$V_{BE(sat)}$	-	0.9	1.2	V	I_C=2A, I_B=100mA
*h_{FE} 1	200	-	400	-	V_{CE}=2V, I_C=100mA
*h_{FE} 2	100	-	-	-	V_{CE}=2V, I_C=5A
*h_{FE} 3	40	-	-	-	V_{CE}=2V, I_C=10A
f_T	-	150	-	MHz	V_{CE}=10V, I_C=50mA
Cob	-	50	-	pF	V_{CB}=10V, f=1MHz
t_{on}	-	50	-	ns	V_{CC}=30V, I_C=10I_{B1}=-10I_{B2}=1A, R_L=30Ω
t_{stg}	-	1.35	-	μs	
t_f	-	120	-	ns	

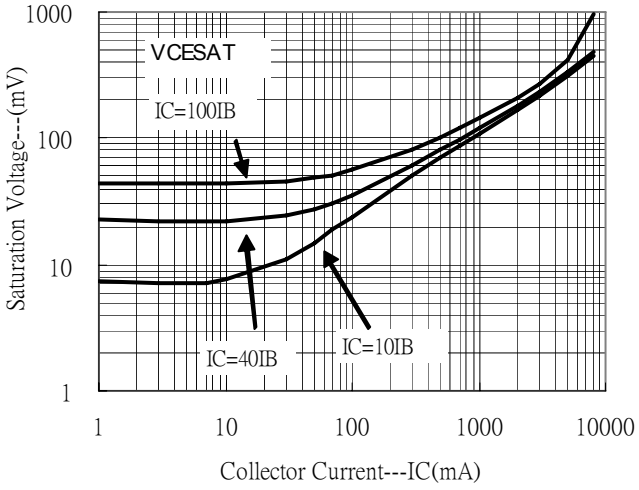
*Pulse Test : Pulse Width ≤380μs, Duty Cycle≤2%

Typical Characteristics

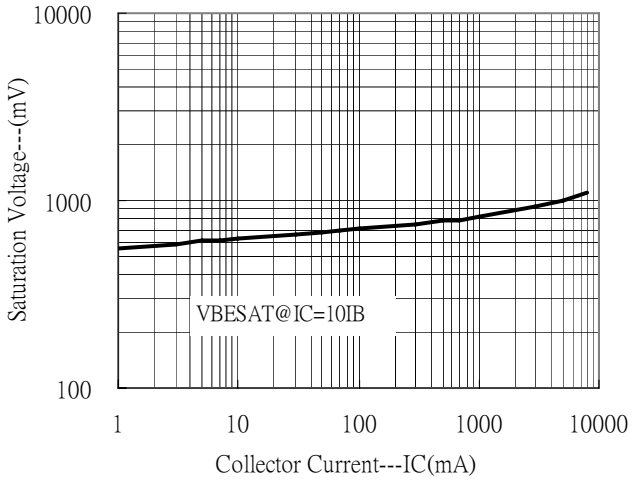
Current Gain vs Collector Current



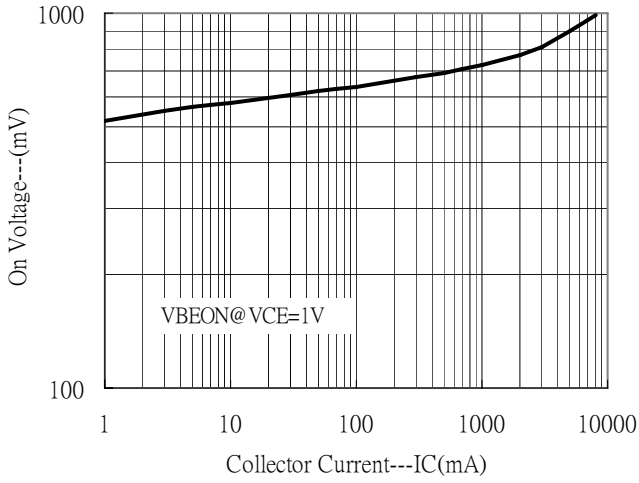
Saturation Voltage vs Collector Current



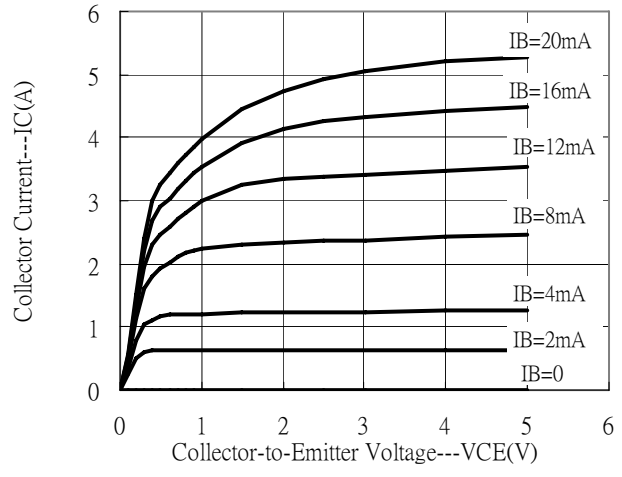
Saturation Voltage vs Collector Current



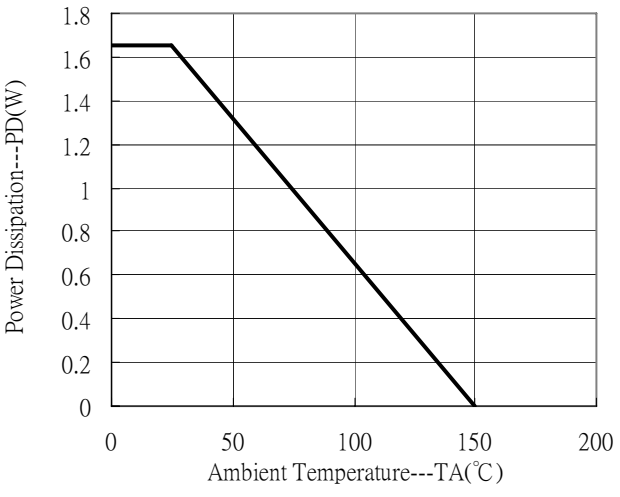
On Voltage vs Collector Current



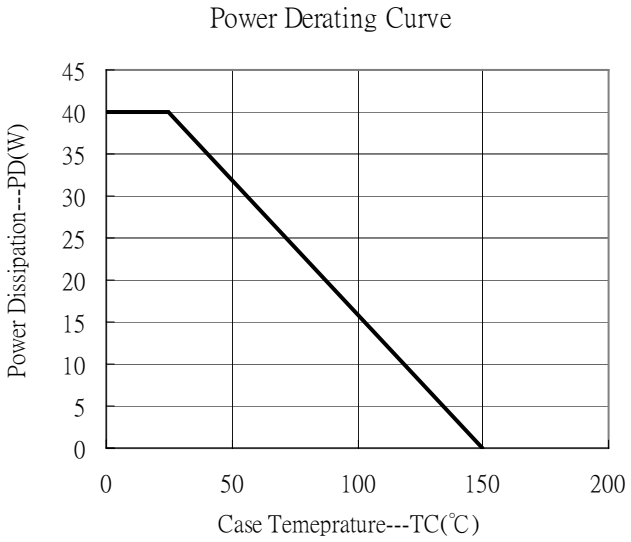
Output Characteristics



Power Derating Curve



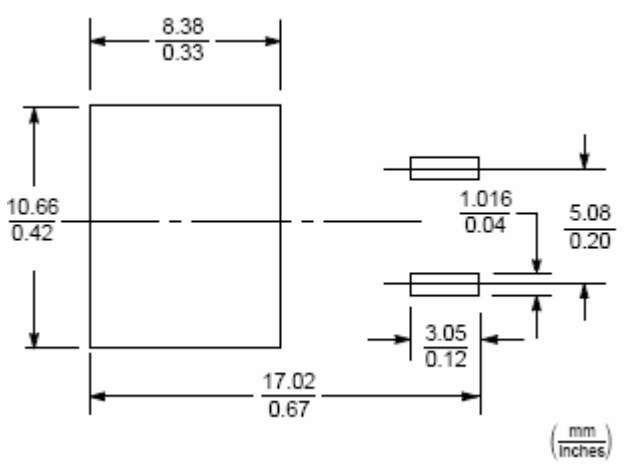
Typical Characteristics(Cont.)



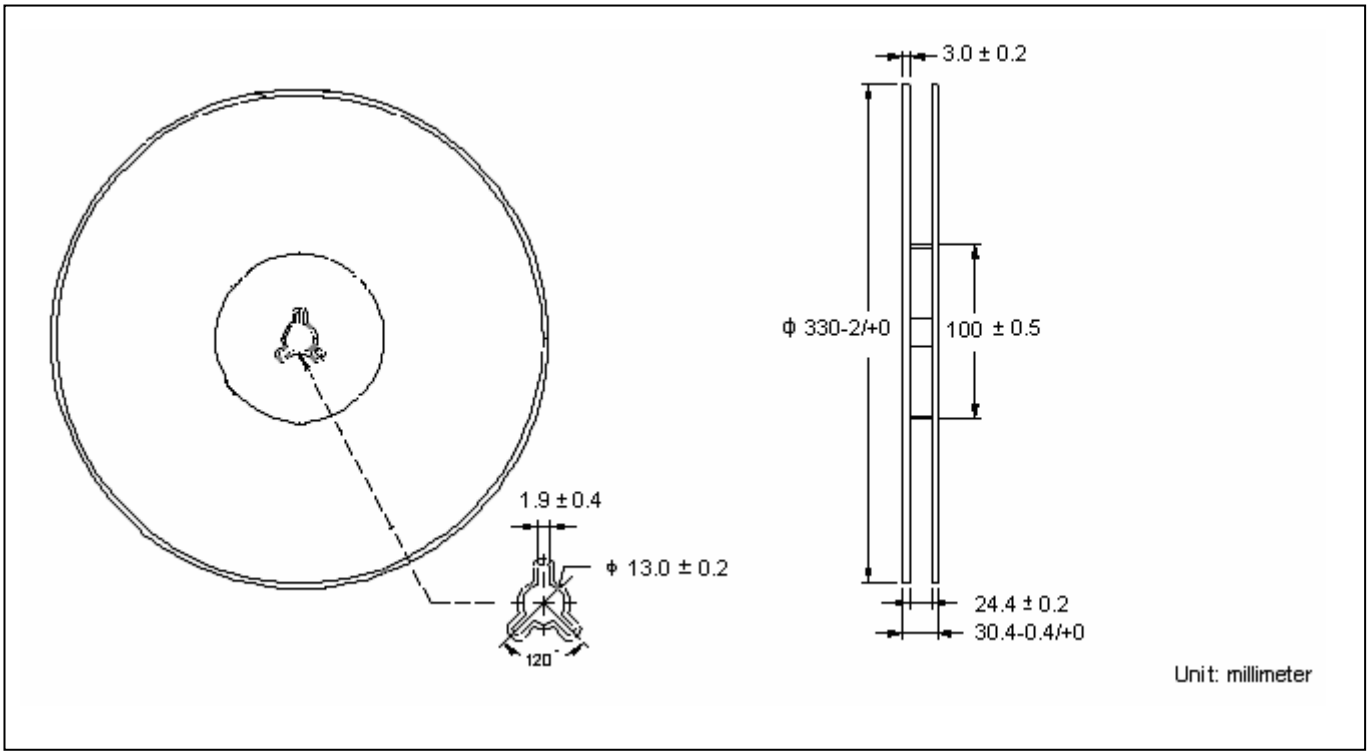
Ordering Information

Device	Package	Shipping
BTD1805F3	TO-263 (Pb-free lead plating)	800pcs / tape & reel

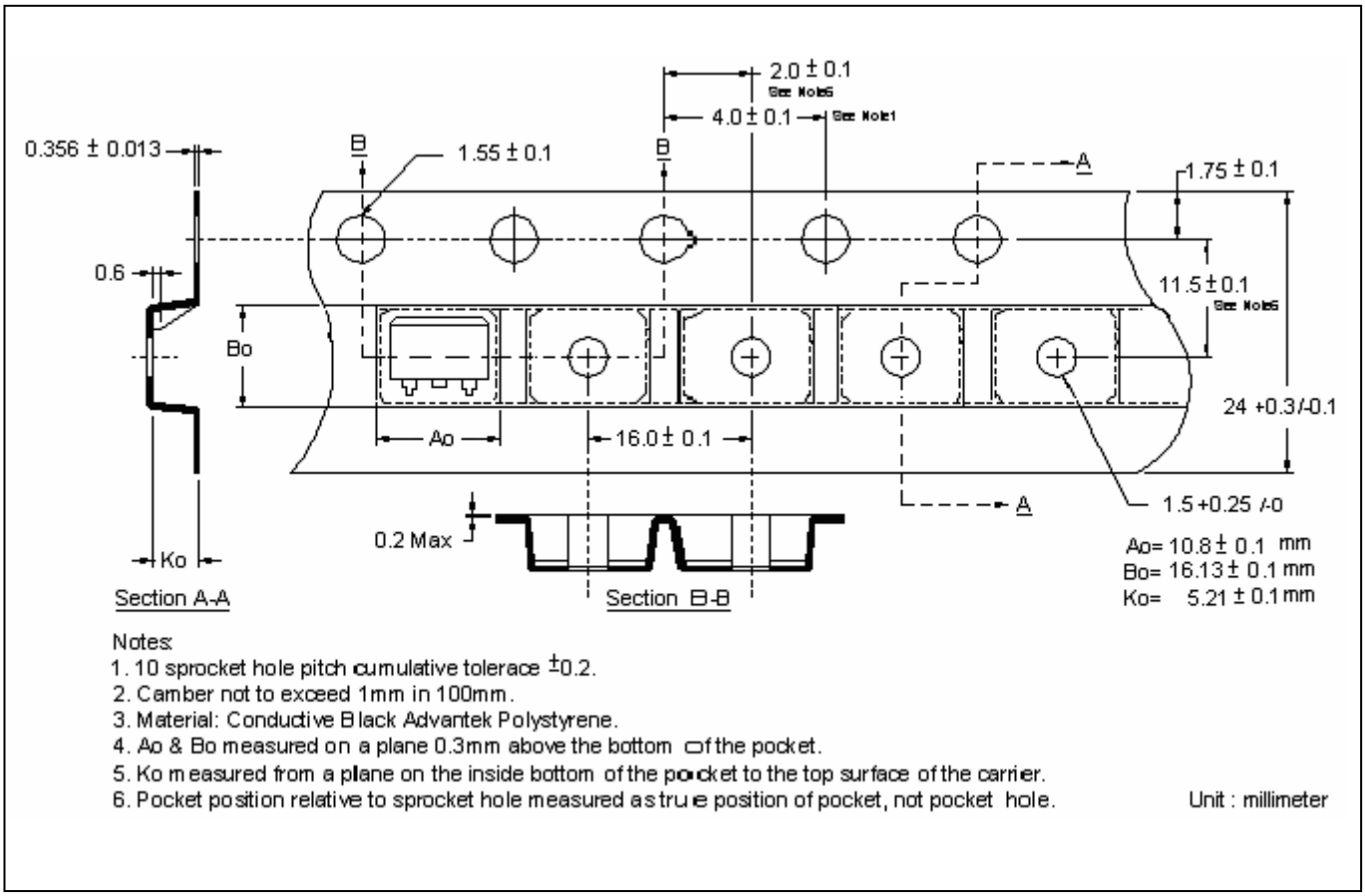
Recommended Soldering Footprint



Reel Dimension



Carrier Tape Dimension



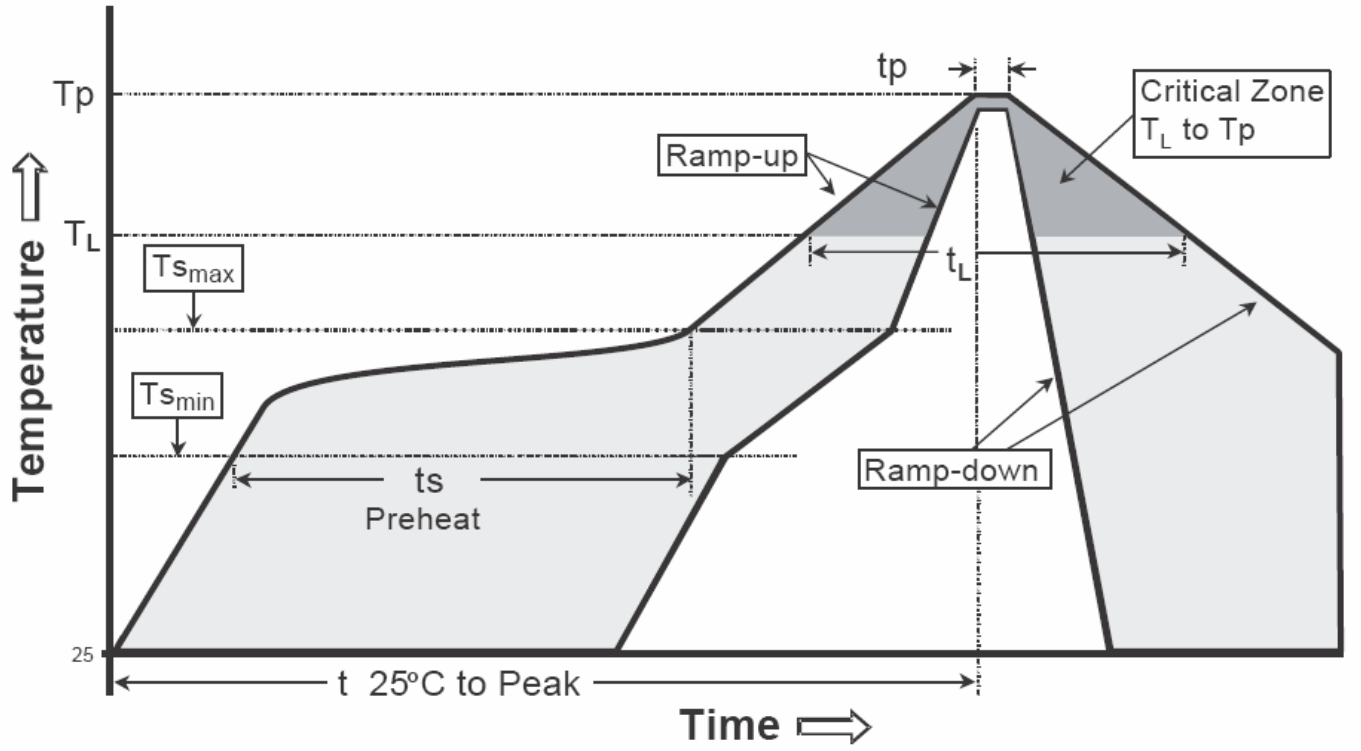
Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of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

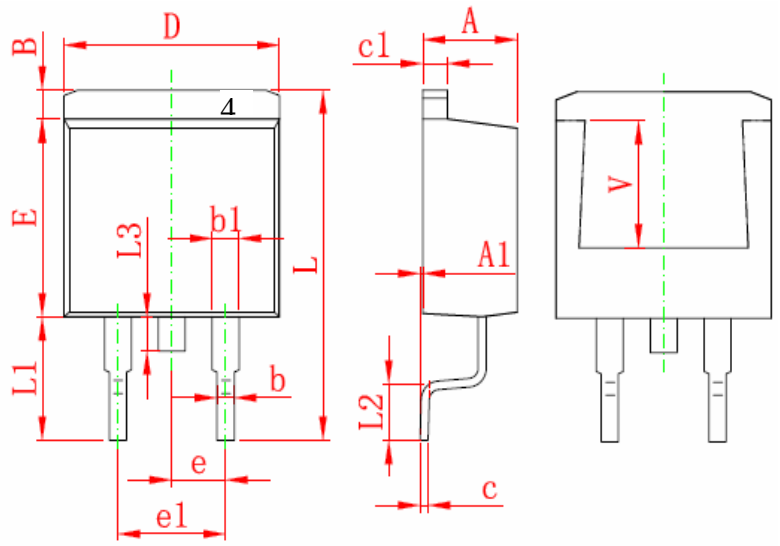
Recommended temperature profile for IR reflow



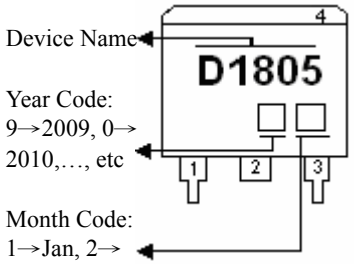
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL)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

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

TO-263 Dimension



Marking :



Style : Pin 1.Base 2.Collector 3.Emitter 4.Collector

3-Lead Plastic Surface Mounted Package
CYStek Package Code : F3

*:Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	4.060	4.830	0.160	0.190	E	8.380	9.400	0.330	0.370
A1	0.000	0.150	0.000	0.006	e	*2.540		*0.100	
B	1.170	1.400	0.046	0.055	e1	4.980	5.180	0.196	0.204
b	0.510	0.990	0.020	0.039	L	14.610	15.880	0.575	0.625
b1	1.140	1.400	0.045	0.055	L1	5.080	5.480	0.200	0.216
c	0.310	0.740	0.012	0.029	L2	2.290	2.790	0.090	0.110
c1	1.140	1.400	0.045	0.055	L3	1.270	1.780	0.050	0.070
D	9.650	10.310	0.380	0.406	V	5.600 REF		0.220 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.