NPN Epitaxial Planar High Current (High Performance) Transistor

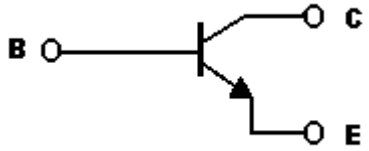
BTD6055M3

Features

- Low $V_{CE(SAT)}$
- Low $R_{CE(SAT)}$, $R_{CE(SAT)}$=50 mΩ (typically) at I_C=5A
- Low operating collector voltage
- Excellent current gain characteristics at very low V_{CE}
- Suitable for low dropout voltage application
- Pb-free package

Symbol

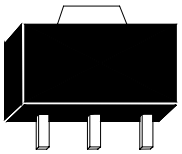
BTD6055M3



B：Base
C：Collector
E：Emitter

Outline

SOT-89



B C E

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	15	V
Collector-Emitter Voltage	V_{CEO}	10	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	6	A
Peak Collector Current	I_{CP}	9	A
Power Dissipation	Pd	0.6	W
		1 (Note 1)	
		2 (Note 2)	
Operating and Storage Temperature Range	Tj ; Tstg	-55 ~ +150	°C

Note : 1. When mounted on FR-4 PCB with area measuring 10×10×1 mm
2. When mounted on ceramic with area measuring 40×40×1 mm

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CEO}	10	-	-	V	I_C=1mA, I_B=0
I_{CBO}	-	-	100	nA	V_{CB}=12V, I_E=0
I_{EBO}	-	-	100	nA	V_{EB}=7V, I_C=0
*$V_{CE(sat)}$	-	-	0.2	V	I_C=3A, I_B=20mA
*$V_{CE(sat)}$	-	-	0.35	V	I_C=5A, I_B=20mA
*$V_{BE(sat)}$	-	-	1.2	V	I_C=3A, I_B=60mA
*$V_{BE(on)}$	-	-	1.2	V	V_{CE}=0.3V, I_C=3A
*h_{FE}	450	-	-	-	V_{CE}=0.3V, I_C=500mA
*h_{FE}	400	-	-	-	V_{CE}=0.3V, I_C=1A
*h_{FE}	250	-	-	-	V_{CE}=0.3V, I_C=5A
f_T	100	-	-	MHz	V_{CE}=6V, I_C=500mA, f=20MHz
Cob	-	-	50	pF	V_{CB}=10V, f=1MHz

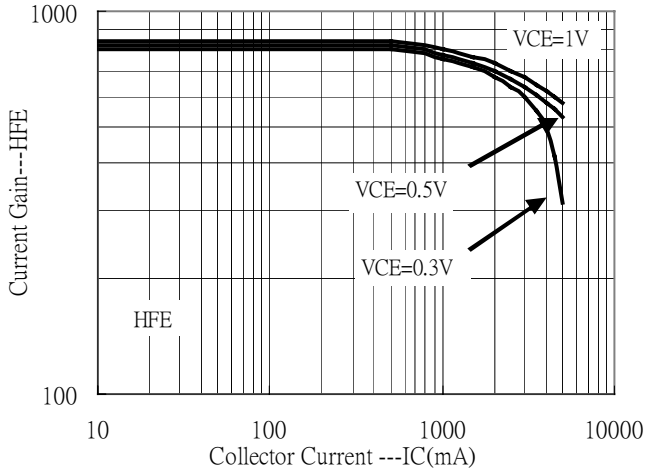
*Pulse Test: Pulse Width ≤300μs, Duty Cycle≤2%

Ordering Information

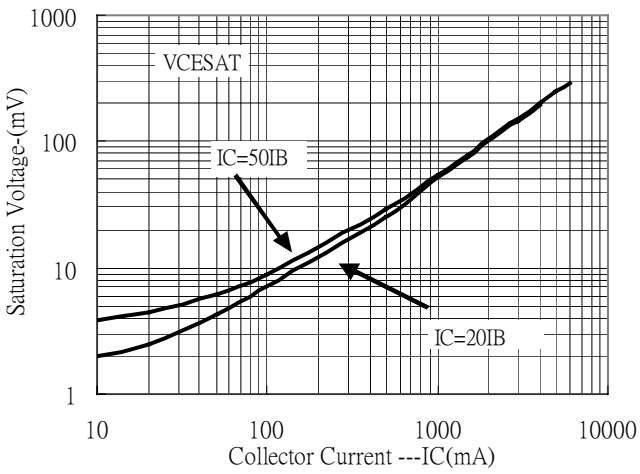
Device	Package	Shipping	Marking
BTD6055M3	SOT-89 (Pb-free)	1000 pcs / Tape & Reel	D6055

Characteristic Curves

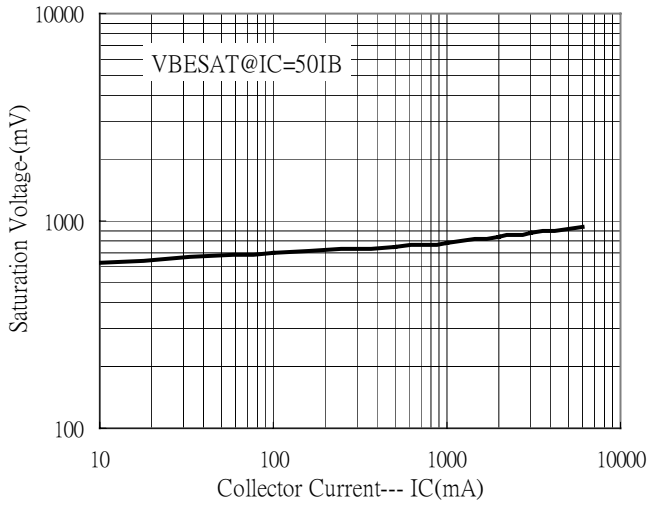
Current Gain vs Collector Current



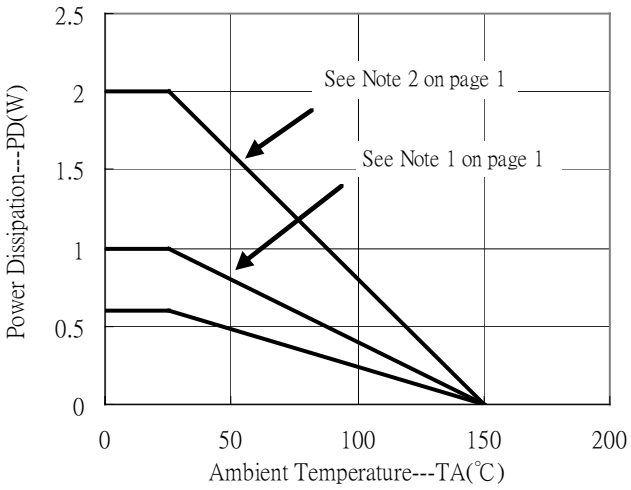
Saturation Voltage vs Collector Current



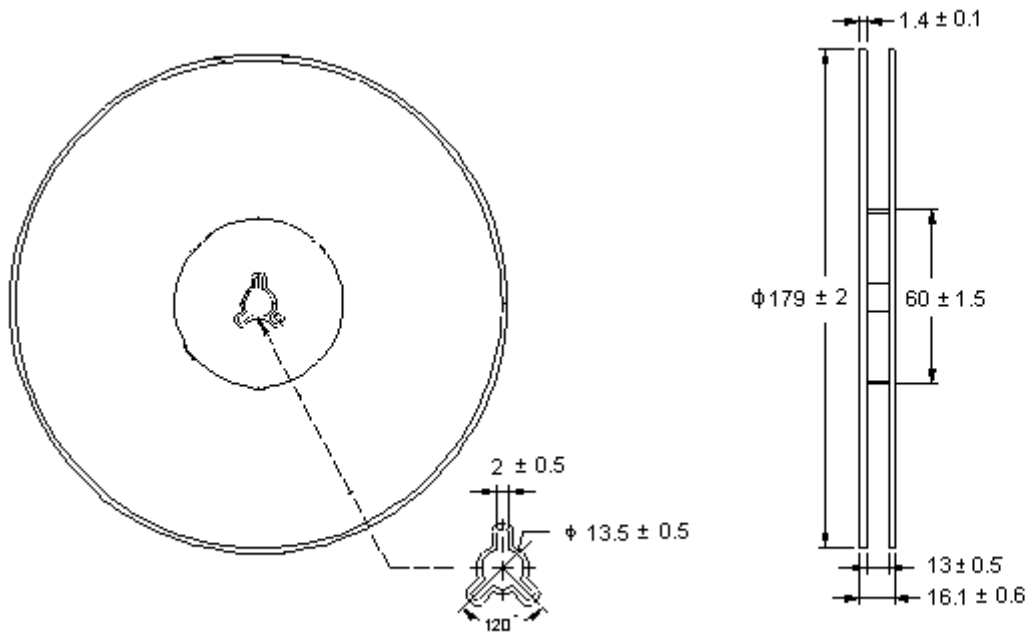
Saturation Voltage vs Collector Current



Power Derating Curve

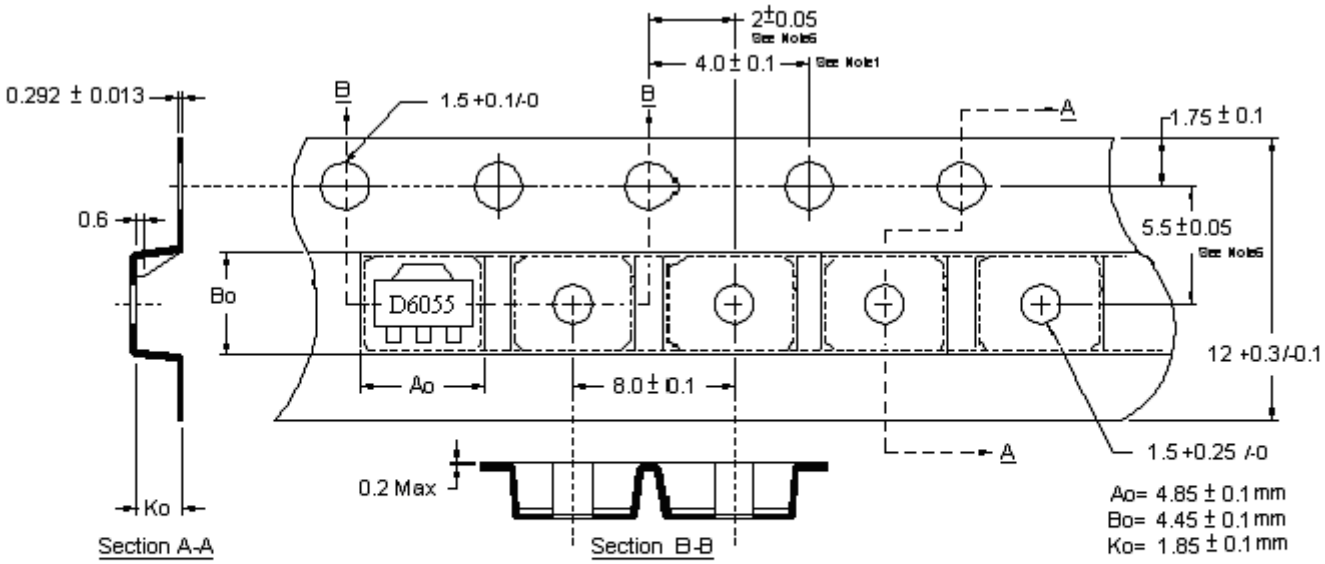


Reel Dimension



Unit: millimeter

Carrier Tape Dimension



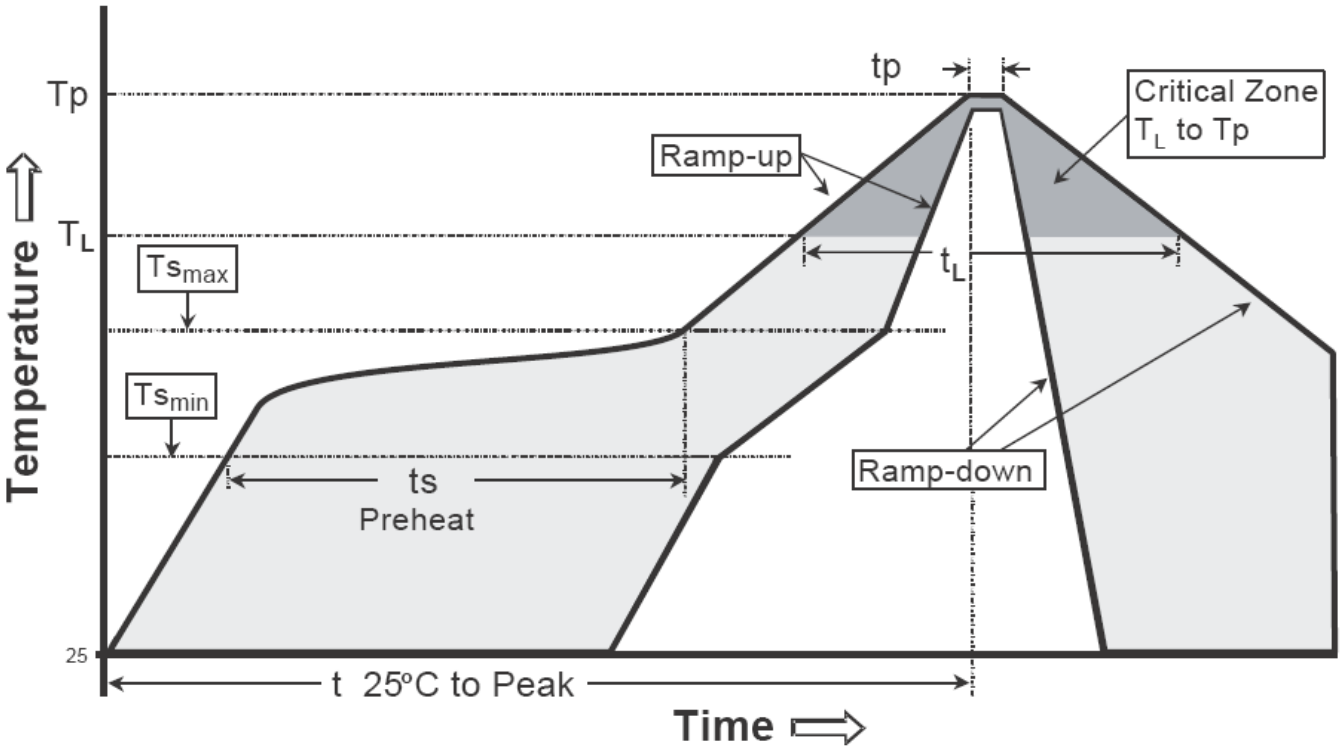
Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of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

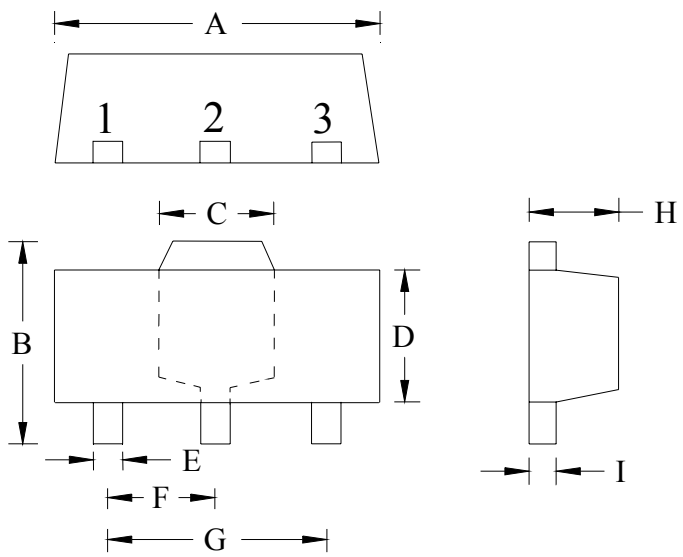
Recommended temperature profile for IR reflow



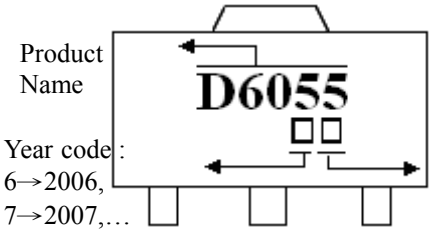
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (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-89 Dimension



Marking:



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

3-Lead SOT-89 Plastic
Surface Mounted Package
CYStek Package Code: M3

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1732	0.1811	4.40	4.60	F	0.0583	0.0598	1.48	1.527
B	0.1594	0.1673	4.05	4.25	G	0.1165	0.1197	2.96	3.04
C	0.0591	0.0663	1.50	1.70	H	0.0551	0.0630	1.40	1.60
D	0.0945	0.1024	2.40	2.60	I	0.0138	0.0161	0.35	0.41
E	0.01417	0.0201	0.36	0.51					

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: KFC ; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0