

Low Vcesat NPN Epitaxial Planar Transistor

# BTD1816J3

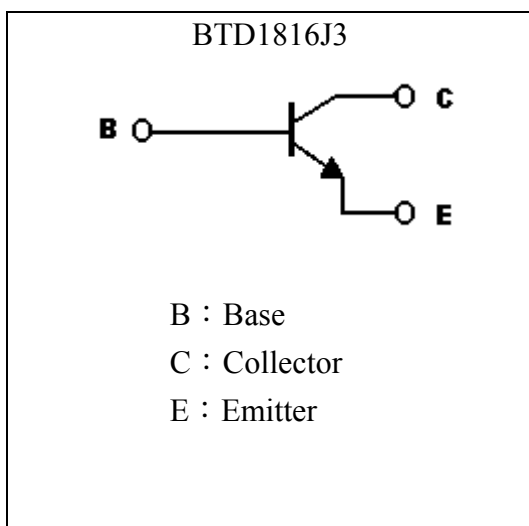
## Features

- Low collector-to-emitter saturation voltage
- High-speed switching
- Large current capability
- Good linearity of hFE
- High ft

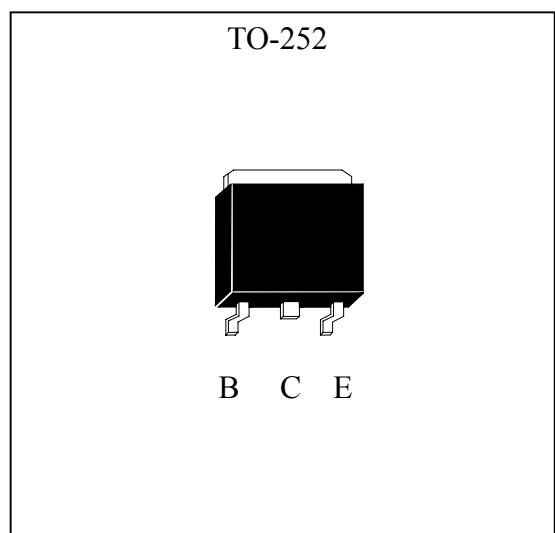
## Applications

- Suitable for relay drivers, high speed inverters, converters, and other high current switching applications.

## Symbol



## Outline



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

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V <sub>CBO</sub>	120	V
Collector-Emitter Voltage	V <sub>CEO</sub>	100	V
Emitter-Base Voltage	V <sub>EBO</sub>	6	V
Collector Current (DC)	I <sub>C</sub>	4	A
Collector Current (Pulse)	I <sub>CP</sub>	8 (Note 1)	
Base Current	I <sub>B</sub>	1.2	A
Power Dissipation @ T <sub>A</sub> =25°C	P <sub>D</sub>	1	W
Power Dissipation @ T <sub>C</sub> =25°C	P <sub>D</sub>	20	
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	125	°C/W
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	6.25	°C/W
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55~+150	°C

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

**Characteristics** (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CBO</sub>	120	-	-	V	I <sub>C</sub> =10μA, I <sub>E</sub> =0
*BV <sub>CEO</sub>	100	-	-	V	I <sub>C</sub> =1mA, I <sub>B</sub> =0
BV <sub>EBO</sub>	6	-	-	V	I <sub>C</sub> =10μA, I <sub>C</sub> =0
I <sub>CBO</sub>	-	-	1	μA	V <sub>CB</sub> =100V, I <sub>E</sub> =0
I <sub>EBO</sub>	-	-	1	μA	V <sub>EB</sub> =4V, I <sub>C</sub> =0
*V <sub>CE(sat)</sub> 1	-	110	200	mV	I <sub>C</sub> =1A, I <sub>B</sub> =50mA
*V <sub>CE(sat)</sub> 2	-	150	400	mV	I <sub>C</sub> =2A, I <sub>B</sub> =200mA
*V <sub>BE(sat)</sub>	-	0.9	1.2	V	I <sub>C</sub> =2A, I <sub>B</sub> =200mA
*h <sub>FE</sub> 1	180	-	820	-	V <sub>CE</sub> =5V, I <sub>C</sub> =500mA
*h <sub>FE</sub> 2	120	-	-	-	V <sub>CE</sub> =5V, I <sub>C</sub> =3A
f <sub>T</sub>	-	180	-	MHz	V <sub>CE</sub> =10V, I <sub>C</sub> =500mA
C <sub>ob</sub>	-	40	-	pF	V <sub>CB</sub> =10V, f=1MHz
t <sub>on</sub>	-	100	-	ns	V <sub>CC</sub> =50V, I <sub>C</sub> =10I <sub>B</sub> I <sub>B</sub> 1=-10I <sub>B</sub> I <sub>B</sub> 2=2A, R <sub>L</sub> =25Ω
t <sub>stg</sub>	-	900	-	ns	
t <sub>f</sub>	-	50	-	ns	

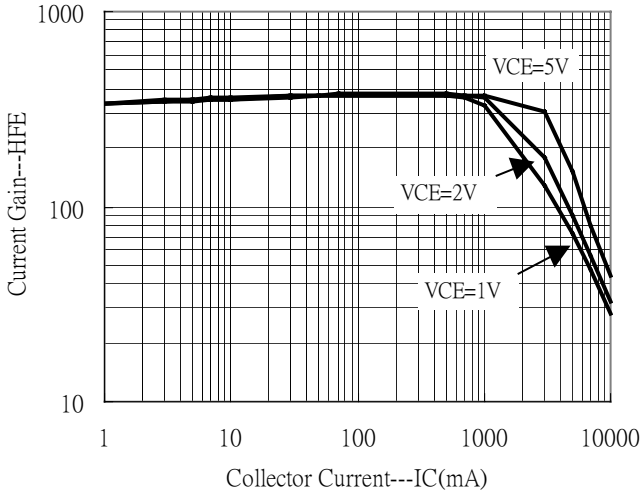
\*Pulse Test : Pulse Width ≤ 380μs, Duty Cycle ≤ 2%

**Classification of h<sub>FE</sub> 1**

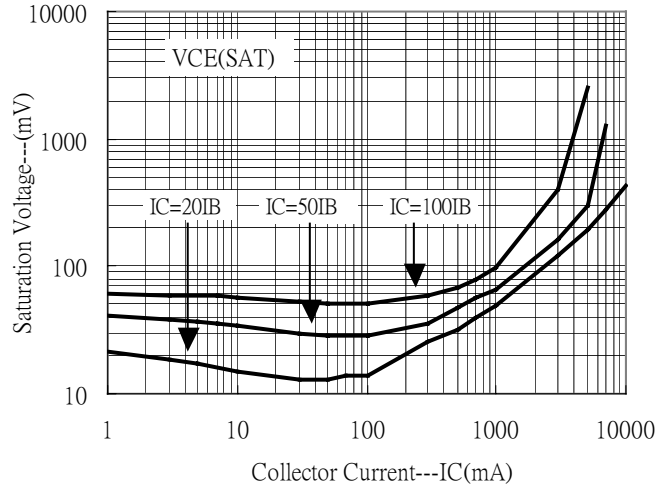
Rank	R	S	T
Range	180~390	270~560	390~820

Characteristics

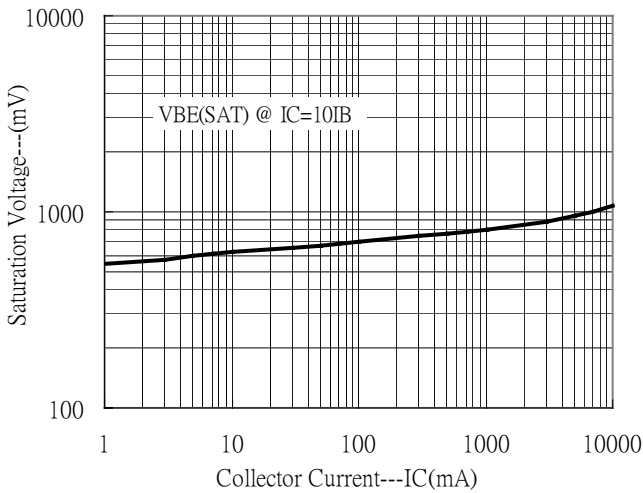
Current Gain vs Collector Current



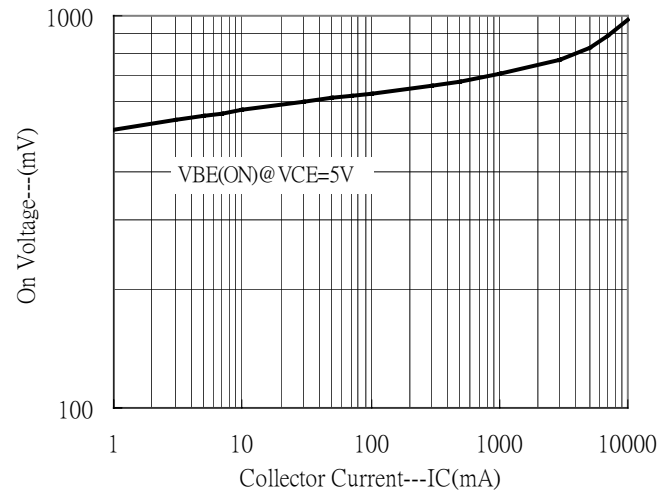
Saturation Voltage vs Collector Current



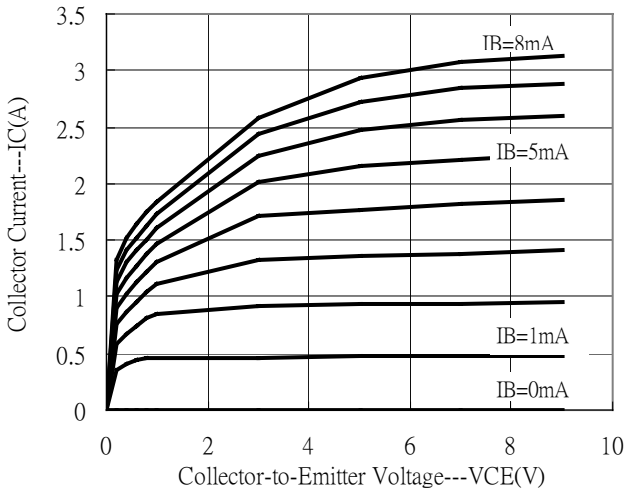
Saturation Voltage vs Collector Current



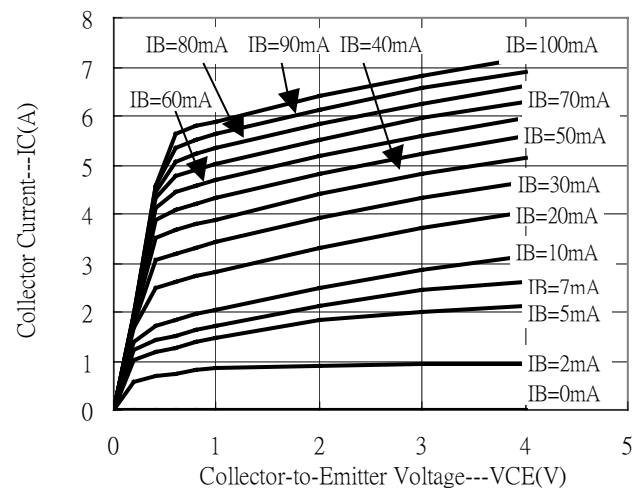
On Voltage vs Collector Current



Grounded Emitter Output Characteristics

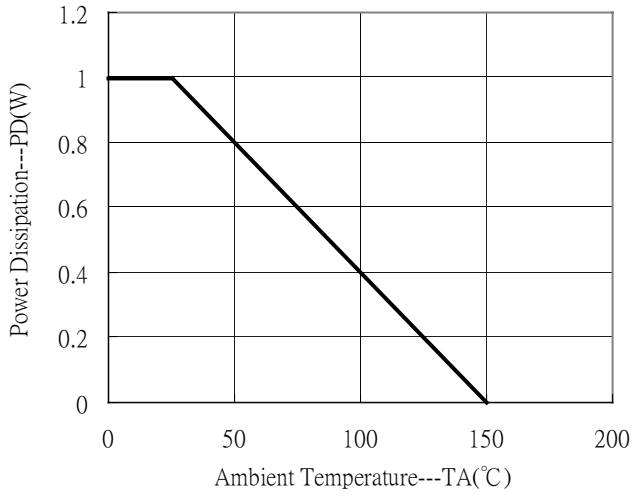


Grounded Emitter Output Characteristics

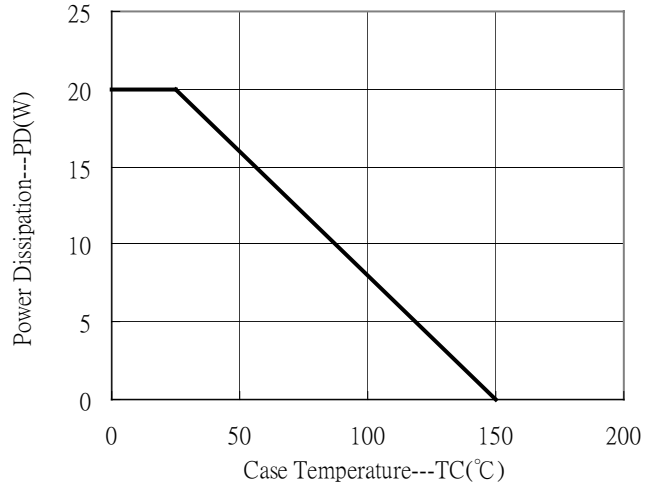


### Characteristics(Cont.)

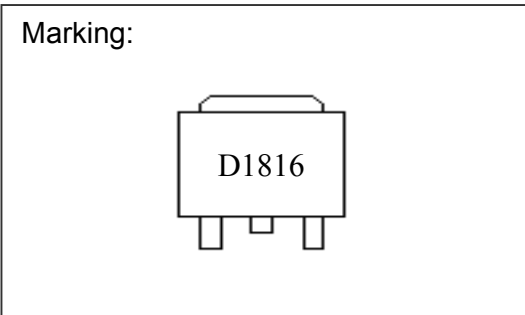
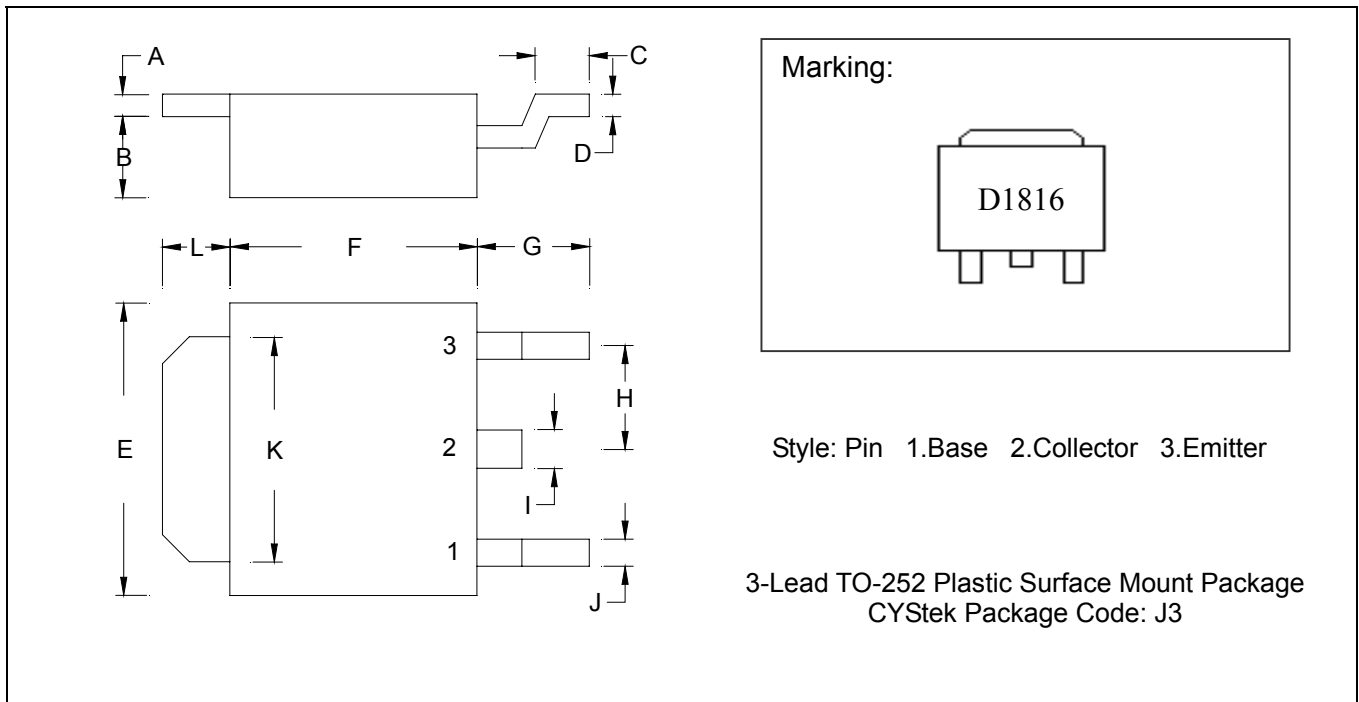
Power Derating Curve



Power Derating Curve



TO-252 Dimension



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

3-Lead TO-252 Plastic Surface Mount Package  
 CYStek Package Code: J3

\*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0177	0.0217	0.45	0.55	G	0.0866	0.1102	2.20	2.80
B	0.0650	0.0768	1.65	1.95	H	-	*0.0906	-	*2.30
C	0.0354	0.0591	0.90	1.50	I	-	0.0354	-	0.90
D	0.0177	0.0236	0.45	0.60	J	-	0.0315	-	0.80
E	0.2520	0.2677	6.40	6.80	K	0.2047	0.2165	5.20	5.50
F	0.2125	0.2283	5.40	5.80	L	0.0551	0.0630	1.40	1.60

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

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