

**Low  $V_{CE(sat)}$  NPN Planar Transistor**

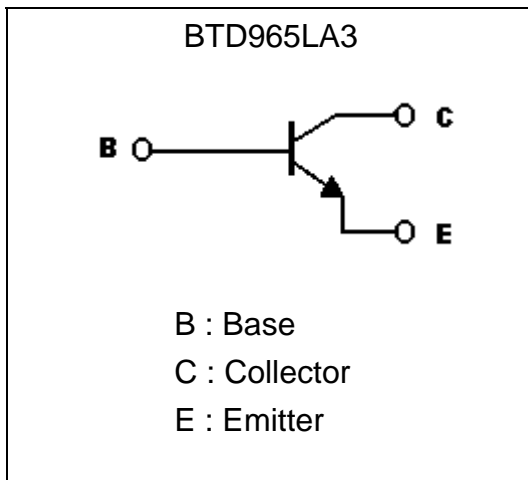
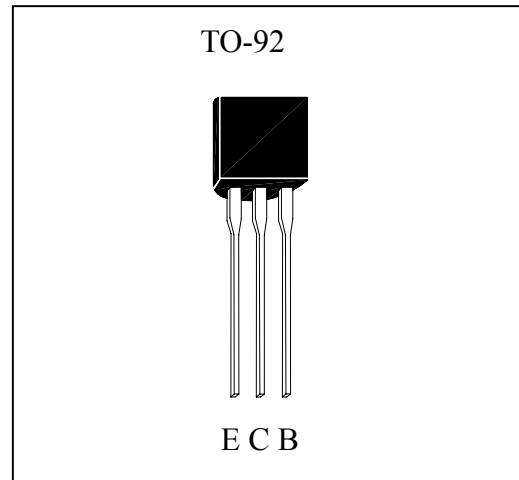
# BTD965LA3

**Features**

- High current capability
- Low collector-to-emitter saturation voltage
- High allowable power dissipation
- Pb-free package

**Applications**

- Relay drivers, lamp drivers, motor drivers, strobes

**Symbol**

**Outline**

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

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	$V_{CBO}$	20	V
Collector-Emitter Voltage	$V_{CEO}$	15	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Collector Current (DC)	$I_C$	5	A
Collector Current (Pulse)	$I_{CP}$	9	A
Collector Power Dissipation (Note)	$P_D$	750	mW
Junction Temperature	$T_j$	150	°C
Storage Temperature	$T_{stg}$	-55~+150	°C

Note : when a device is mounted on a glass epoxy board, measuring 35mm×30mm×1mm.

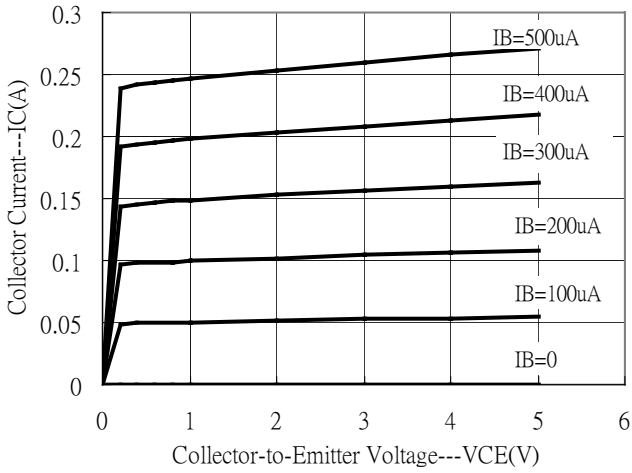
**Characteristics (Ta=25°C)**

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
$BV_{CBO}$	20	-	-	V	$I_C=100\mu A, I_E=0$
$BV_{CEO}$	15	-	-	V	$I_C=1mA, I_B=0$
$BV_{EBO}$	7	-	-	V	$I_E=10\mu A, I_C=0$
$I_{CBO}$	-	-	100	nA	$V_{CB}=15V, I_E=0$
$I_{EBO}$	-	-	100	nA	$V_{EB}=5V, I_C=0$
$*V_{CE(sat)1}$	-	-	180	mV	$I_C=1.5A, I_B=30mA$
$*V_{CE(sat)2}$	-	230	350	mV	$I_C=3A, I_B=60mA$
$*V_{BE(sat)}$	-	0.95	1.2	V	$I_C=1.5A, I_B=30mA$
$*h_{FE1}$	400	-	-	-	$V_{CE}=2V, I_C=500mA$
$*h_{FE2}$	390	-	820	-	$V_{CE}=2V, I_C=2A$
$*h_{FE3}$	185	-	-	-	$V_{CE}=2V, I_C=5A$
$f_T$	-	170	-	MHz	$V_{CE}=6V, I_C=50mA, f=100MHz$
Cob	-	25	-	pF	$V_{CB}=10V, f=1MHz$

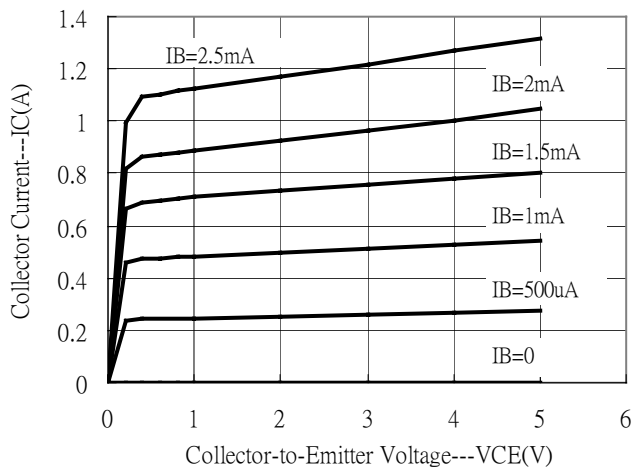
\*Pulse Test: Pulse Width  $\leq 380\mu s$ , Duty Cycles  $\leq 2\%$

**Characteristic Curves**

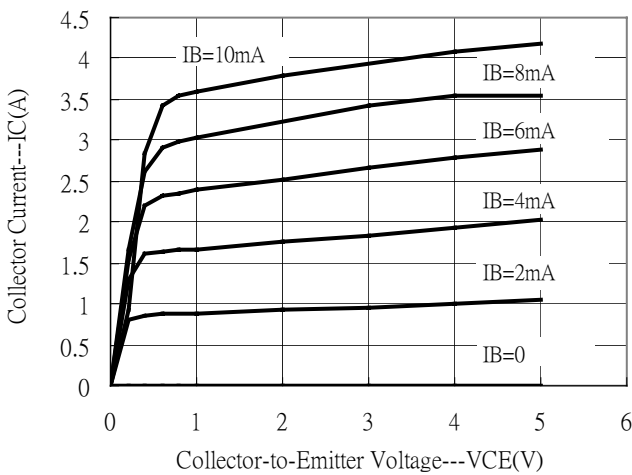
Output Characteristics



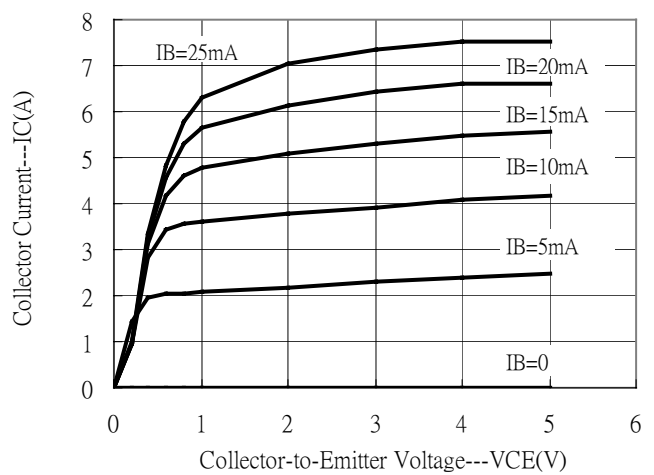
Output Characteristics



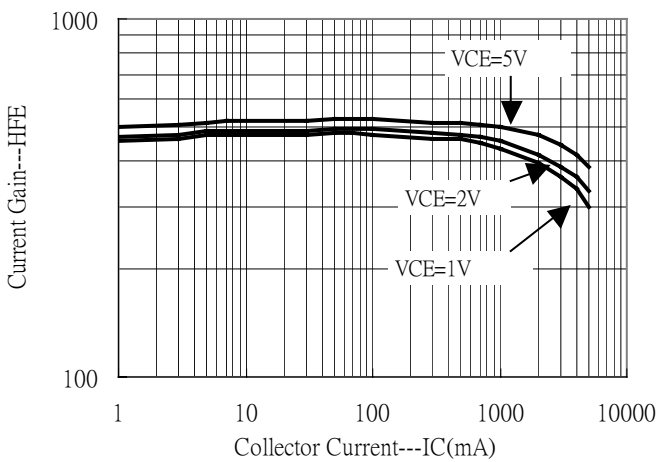
Output Characteristics



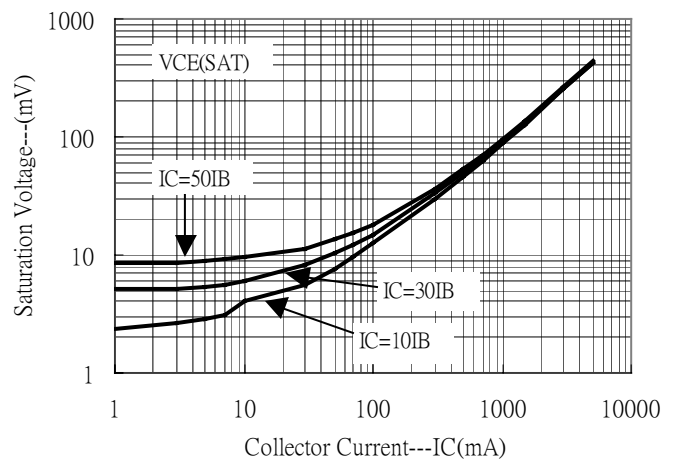
Output Characteristics



Current Gain vs Collector Current

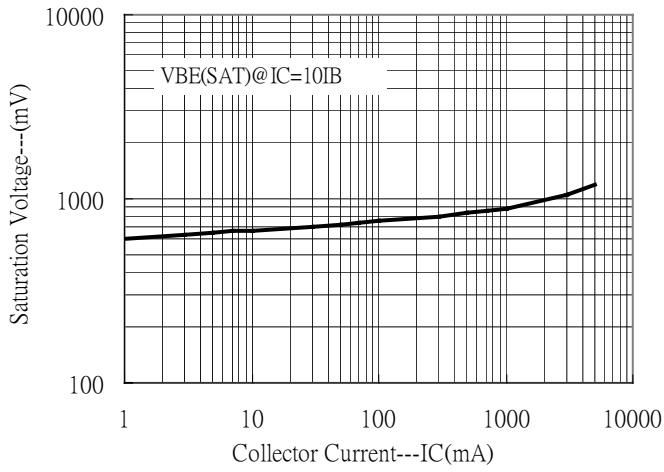


Saturation Voltage vs Collector Current

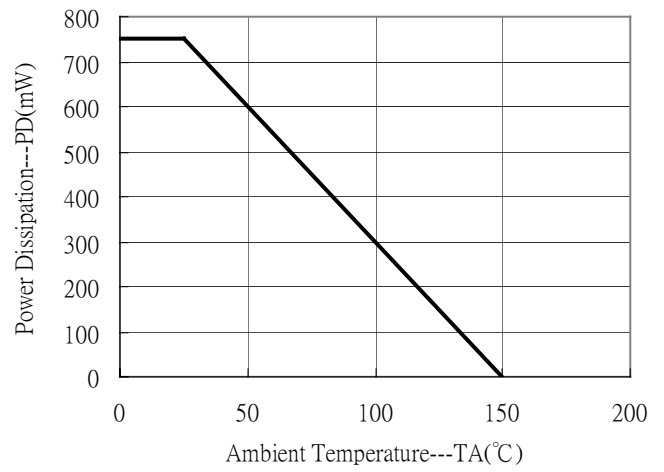




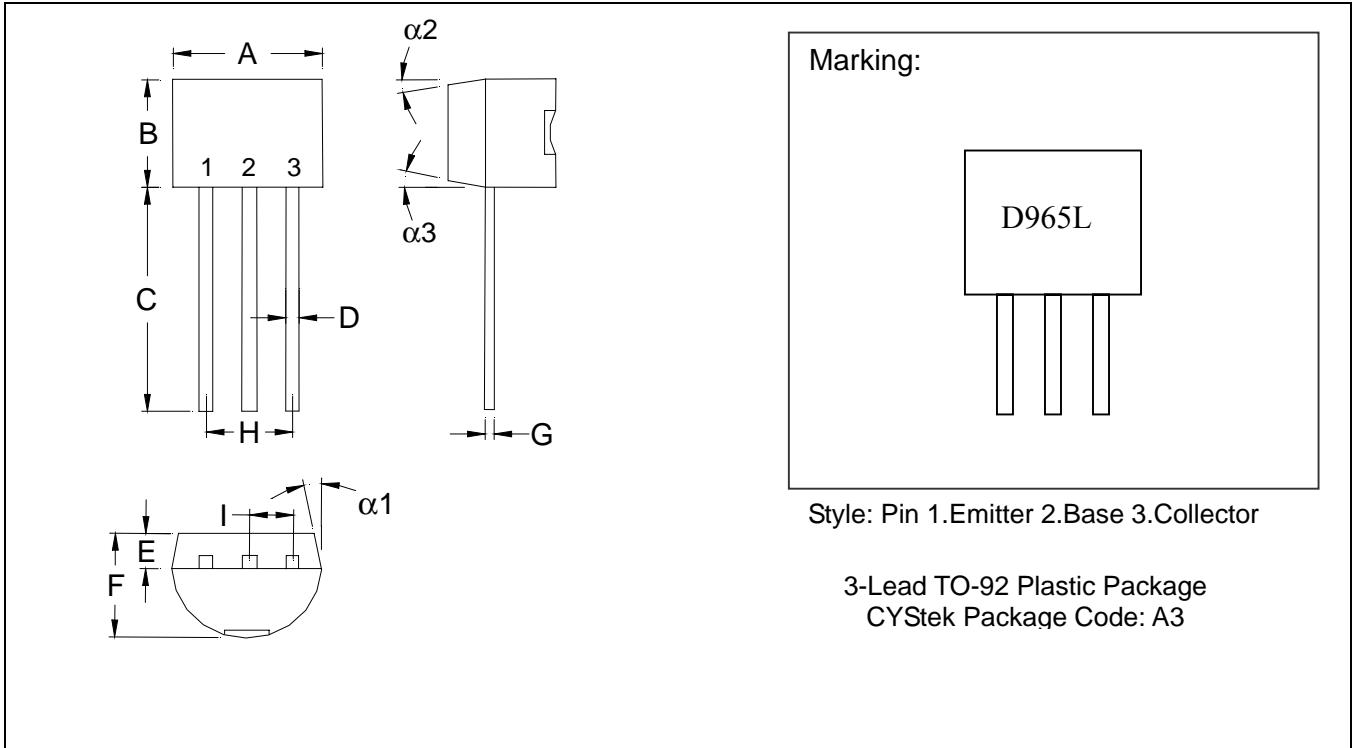
Saturation Voltage vs Collector Current



Power Derating Curve



**TO-92 Dimension**



\*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1704	0.1902	4.33	4.83	G	0.0142	0.0220	0.36	0.56
B	0.1704	0.1902	4.33	4.83	H	-	*0.1000	-	*2.54
C	0.5000	-	12.70	-	I	-	*0.0500	-	*1.27
D	0.0142	0.0220	0.36	0.56	$\alpha 1$	-	*5°	-	*5°
E	-	*0.0500	-	*1.27	$\alpha 2$	-	*2°	-	*2°
F	0.1323	0.1480	3.36	3.76	$\alpha 3$	-	*2°	-	*2°

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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