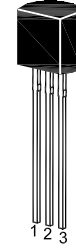


# 13003

## NPN Silicon Epitaxial Planar Transistor



1. Emitter 2. Collector 3. Base  
TO-92 Plastic Package

### Applications

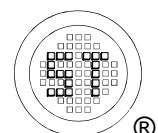
- For high voltage and high speed switching

### Absolute Maximum Ratings ( $T_a = 25\text{ }^\circ\text{C}$ )

Parameter	Symbol	Value	Unit
Collector Base Voltage	$V_{CBO}$	800	V
Collector Emitter Voltage	$V_{CEO}$	430	V
Emitter Base Voltage	$V_{EBO}$	9	V
Collector Current (DC)	$I_C$	1.5	A
Collector Current (Pulse)	$I_{CP}$	3	A
Total Power Dissipation	$P_{tot}$	0.8	W
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	- 65 to + 150	$^\circ\text{C}$

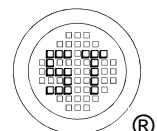
### Thermal Resistance Ratings

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	156	$^\circ\text{C/W}$



## Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain at $V_{CE} = 2\text{ V}$ , $I_C = 0.5\text{ A}$ at $V_{CE} = 2\text{ V}$ , $I_C = 1\text{ A}$ at $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ }\mu\text{A}$	$h_{FE}$ $h_{FE}$ $h_{FE}$	8 5 6	40 - 40	- - -
Collector Base Cutoff Current at $V_{CB} = 700\text{ V}$	$I_{CBO}$	-	10	$\mu\text{A}$
Emitter Base Cutoff Current at $V_{EB} = 9\text{ V}$	$I_{EBO}$	-	10	$\mu\text{A}$
Collector Base Breakdown Voltage at $I_C = 500\text{ }\mu\text{A}$	$V_{(BR)CBO}$	800	-	V
Collector Emitter Breakdown Voltage at $I_C = 5\text{ mA}$	$V_{(BR)CEO}$	430	-	V
Emitter Base Breakdown Voltage at $I_E = 500\text{ }\mu\text{A}$	$V_{(BR)EBO}$	9	-	V
Collector Emitter Saturation Voltage at $I_C = 0.5\text{ A}$ , $I_B = 0.1\text{ A}$ at $I_C = 1\text{ A}$ , $I_B = 0.25\text{ A}$ at $I_C = 1.5\text{ A}$ , $I_B = 0.5\text{ A}$	$V_{CE(sat)}$	- - -	0.5 1 3	V
Base Emitter Saturation Voltage at $I_C = 0.5\text{ A}$ , $I_B = 0.1\text{ A}$ at $I_C = 1\text{ A}$ , $I_B = 0.25\text{ A}$	$V_{BE(sat)}$	- -	1 1.2	V
Transition Frequency at $V_{CE} = 10\text{ V}$ , $I_C = 100\text{ mA}$	$f_T$	4	-	MHz
Turn On Time at $V_{CC} = 125\text{ V}$ , $I_C = 1\text{ A}$ , $I_B = -I_{B2} = 0.2\text{ A}$ , $R_L = 125\text{ }\Omega$	$t_{on}$	-	1.1	$\mu\text{s}$
Storage Time at $V_{CC} = 125\text{ V}$ , $I_C = 1\text{ A}$ , $I_B = -I_{B2} = 0.2\text{ A}$ , $R_L = 125\text{ }\Omega$	$t_s$	-	4	$\mu\text{s}$
Fall Time at $V_{CC} = 125\text{ V}$ , $I_C = 1\text{ A}$ , $I_B = -I_{B2} = 0.2\text{ A}$ , $R_L = 125\text{ }\Omega$	$t_f$	-	0.7	$\mu\text{s}$



Electrical Characteristics Curves

Fig. 1 Output Characteristics Curve

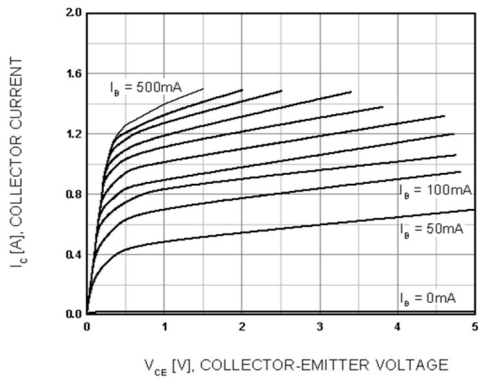


Fig. 2 DC Current Gain vs. Collector Current

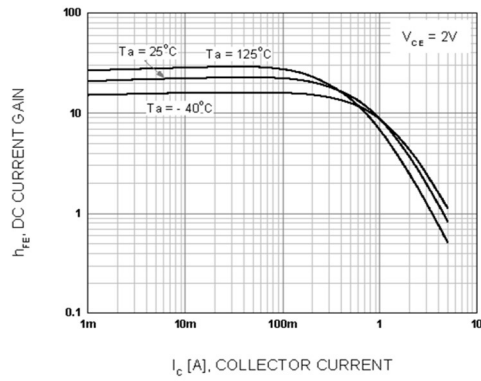


Fig. 3  $V_{CESAT}$  vs. Collector Current

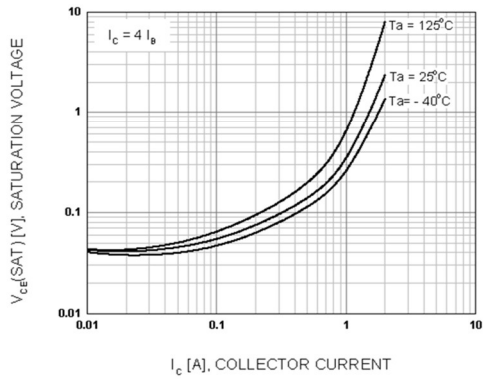


Fig. 4  $V_{BESAT}$  vs. Collector Current

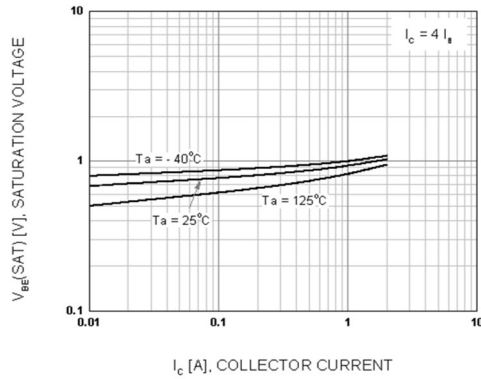
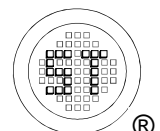
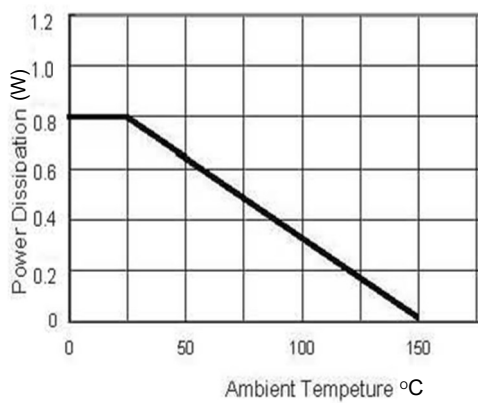
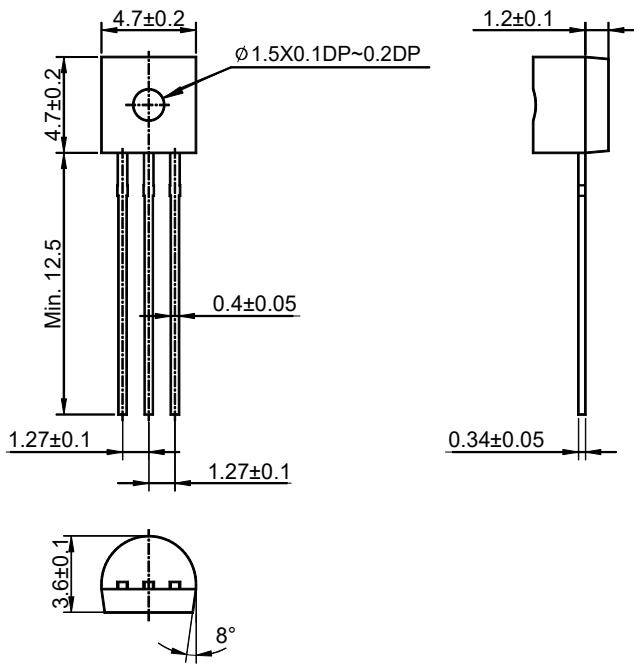


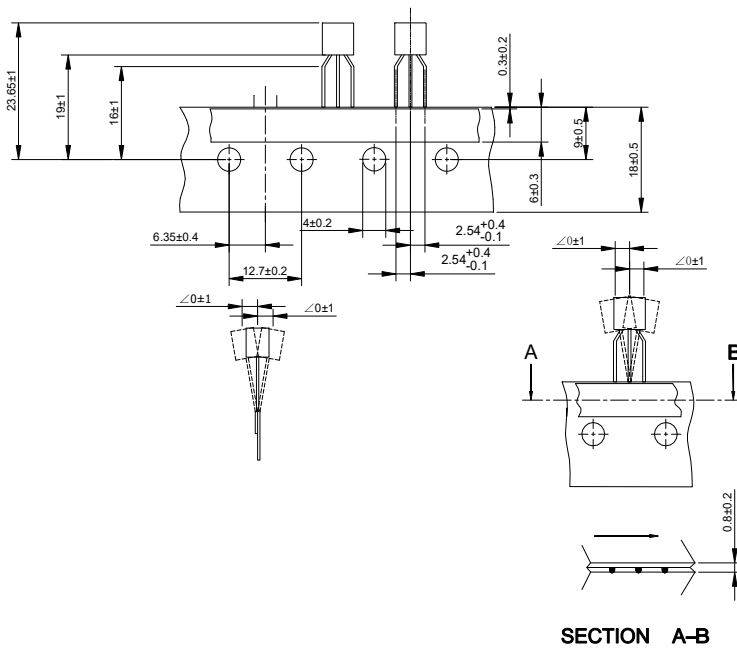
Fig. 5 Power Derating Curve



**TO-92 Package Outline (Dimensions in millimeters)**



**TO-92 Ammo-Pack Outline (Dimensions in millimeters)**



**Packing information**

Package	Bulk Packing			Ammo-Packing	
	Per Bag Qty	Per Box Qty	Per Carton Qty	Per Box Qty	Per Carton Qty
TO-92	1,000	5,000	50,000	4,000	20,000

