



TS13003B

High Voltage NPN Transistor

TO-92



Pin assignment:

1. Emitter
2. Collector
3. Base

$BV_{CEO} = 400V$

$BV_{CBO} = 700V$

$I_C = 1.5A$

$V_{CE(SAT)} = 0.8V @ I_C / I_B = 0.5A / 0.1A$

Features

- ✧ High voltage.
- ✧ High speed switching

Structure

- ✧ Silicon triple diffused type.
- ✧ NPN silicon transistor

Ordering Information

Part No.	Packing	Package
TS13003BCT B0	Bulk Pack	TO-92
TS13003BCT A3	Ammo Pack	TO-92

Absolute Maximum Rating ($T_a = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V_{CBO}	700V	V
Collector-Emitter Voltage	V_{CEO}	400V	V
Emitter-Base Voltage	V_{EBO}	9	V
Collector Current	DC	1.5	A
	Pulse	3	
Collector Power Dissipation	P_D	0.6	W
Operating Junction Temperature	T_J	+150	$^\circ C$
Operating Junction and Storage Temperature Range	T_{STG}	- 55 to +150	$^\circ C$

Note: 1. Single pulse, $P_w = 300\mu S$, Duty $\leq 2\%$

Electrical Characteristics ($T_a = 25^\circ C$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Collector-Base Voltage	$I_C = 10mA, I_B = 0$	BV_{CBO}	700	--	--	V
Collector-Emitter Breakdown Voltage	$I_C = 10mA, I_E = 0$	BV_{CEO}	400	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 1mA, I_C = 0$	BV_{EBO}	9	--	--	V
Collector Cutoff Current	$V_{CB} = 700V, I_E = 0$	I_{CBO}	--	--	10	μA
Emitter Cutoff Current	$V_{EB} = 9V, I_C = 0$	I_{EBO}	--	--	10	μA
Collector-Emitter Saturation Voltage	$I_C / I_B = 1.5A / 0.5A$	$V_{CE(SAT)1}$	--	--	3	V
	$I_C / I_B = 0.5A / 0.1A$	$V_{CE(SAT)2}$	--	--	0.8	
DC Current Gain	$V_{CE} = 2V, I_C = 0.43A$	h_{FE}	23	--	40	
	$V_{CE} = 2V, I_C = 1.0A$		8	--	40	
	$V_{CE} = 5V, I_C = 10\mu A$		6	--	40	
Frequency	$V_{CE} = 10V, I_C = 0.1A$	f_T	4			MHz
Output Capacitance	$V_{CB} = 10V, f = 0.1MHz$	C_{ob}		21		pF
Turn On Time	$V_{CC} = 125V, I_C = 1A,$	t_{ON}		1.1		μS
Storage Time	$I_{B1} = 0.2A, I_{B2} = - 0.2A,$	t_{STG}			4	μS
Fall Time	$R_L = 125ohm$	t_f			0.7	μS

Note : pulse test: pulse width $\leq 300\mu S$, duty cycle $\leq 2\%$

Electrical Characteristics Curve

Figure 1. Static Characteristic

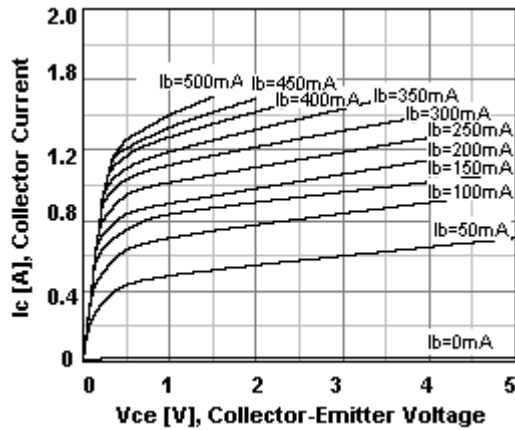


Figure 2. DC Current Gain

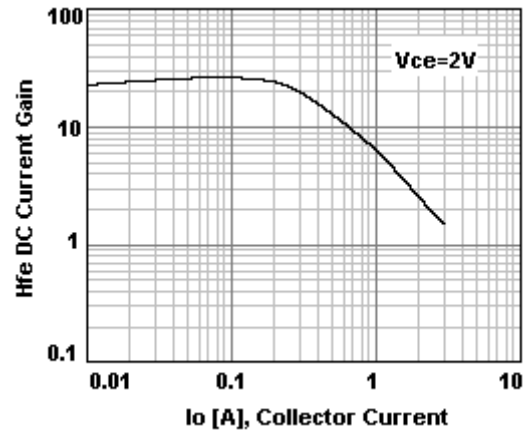


Figure 3. $V_{ce(sat)}$ v.s. $V_{be(sat)}$

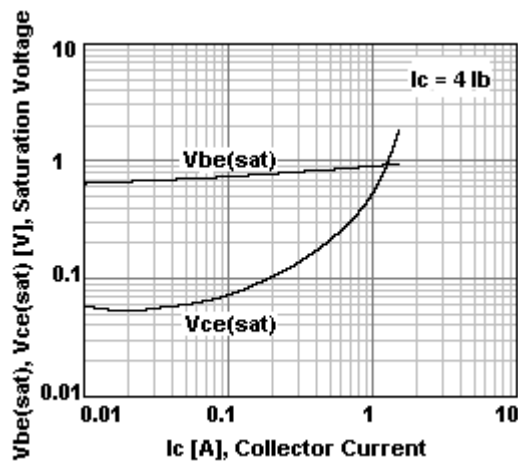


Figure 4. Switching Time

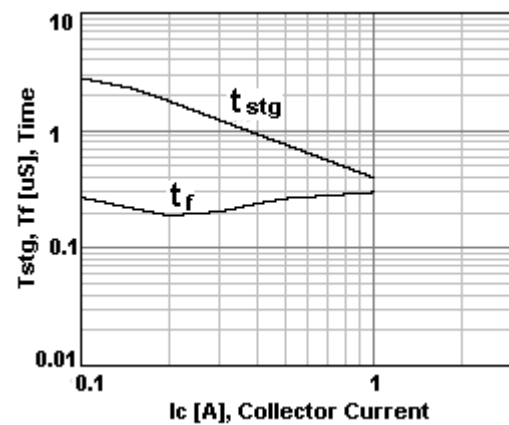


Figure 5. Safe Operating Area

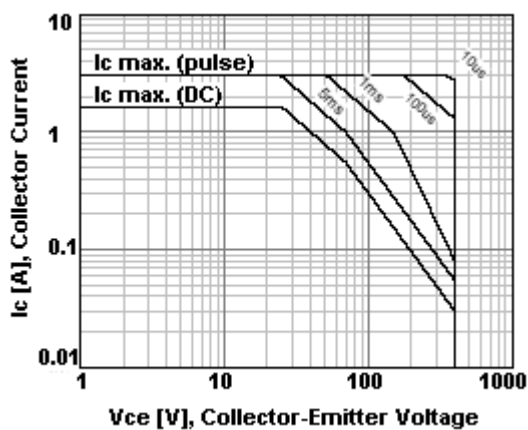
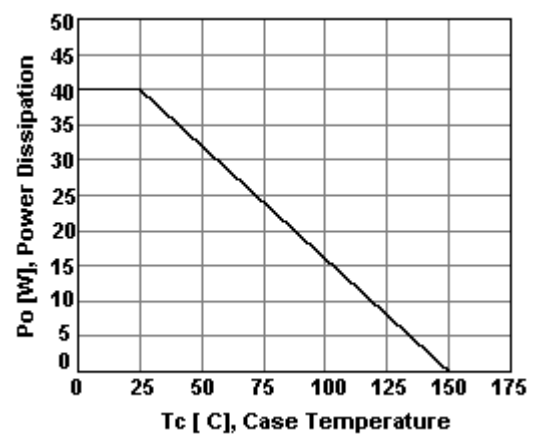
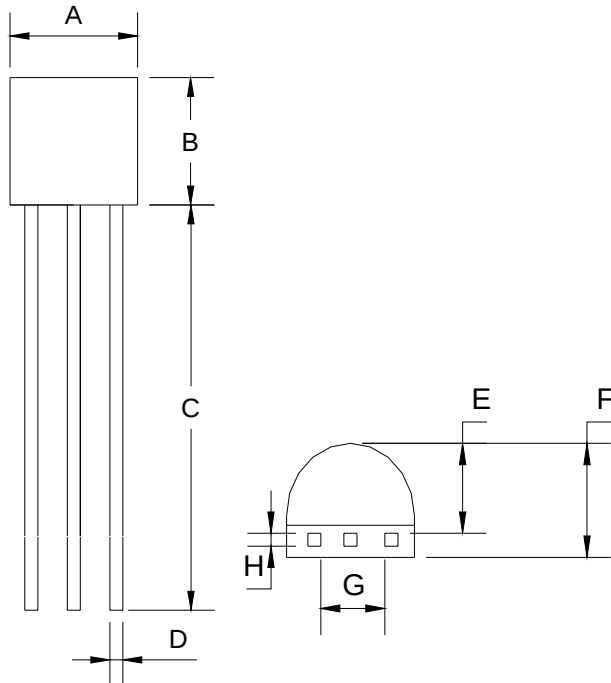


Figure 6. Power Derating



TO-92 Mechanical Drawing



DIM	TO-92 DIMENSION			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
B	4.30	4.70	0.169	0.185
C	14.30(typ)		0.563(typ)	
D	0.43	0.49	0.017	0.019
E	2.19	2.81	0.086	0.111
F	3.30	3.70	0.130	0.146
G	2.42	2.66	0.095	0.105
H	0.37	0.43	0.015	0.017