



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 (Ta = 25 °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	°C
Operating Junction and Storage Temperature Range	T_{STG}	- 55 to +150	°C

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

Electrical Characteristics (Ta = 25 °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	$I_C / I_B = 1.5A / 0.5A$ $I_C / I_B = 0.5A / 0.1A$	$V_{CE(SAT)1}$	--	--	3	V
		$V_{CE(SAT)2}$	--	--	0.8	
DC Current Gain	$V_{CE} = 2V, I_C = 0.43A$ $V_{CE} = 2V, I_C = 1.0A$ $V_{CE} = 5V, I_C = 10\mu A$	h_{FE}	23	--	40	
			8	--	40	
			6	--	40	
Frequency	$V_{CE} = 10V, I_C = 0.1A$	f_T	4			MHz
Output Capacitance	$V_{CB} = 10V, f = 0.1MHz$	Cob		21		pF
Turn On Time	$V_{CC} = 125V, I_C = 1A,$ $I_{B1} = 0.2A, I_{B2} = - 0.2A,$ $R_L = 125ohm$	t_{ON}		1.1		μS
Storage Time		t_{STG}		4		μS
Fall Time		t_f			0.7	

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

Electrical Characteristics Curve

Figure 1. Static Characteristic

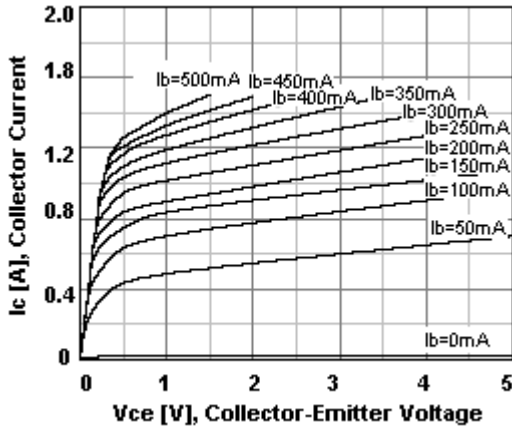


Figure 2. DC Current Gain

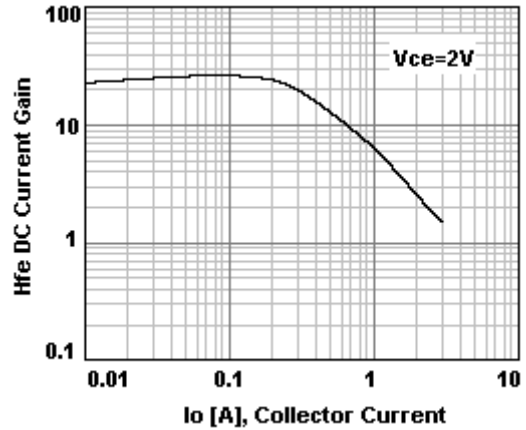


Figure 3. Vce(sat) v.s. Vbe(sat)

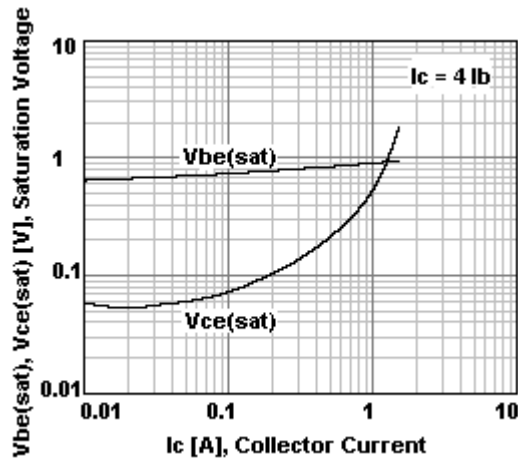


Figure 4. Switching Time

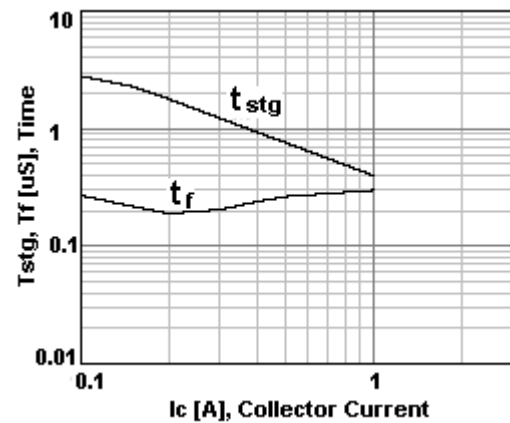


Figure 5. Safe Operating Area

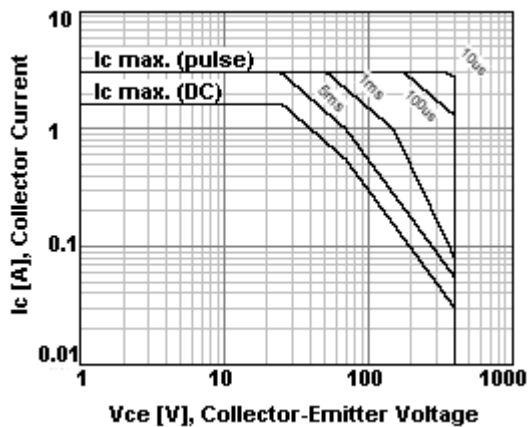
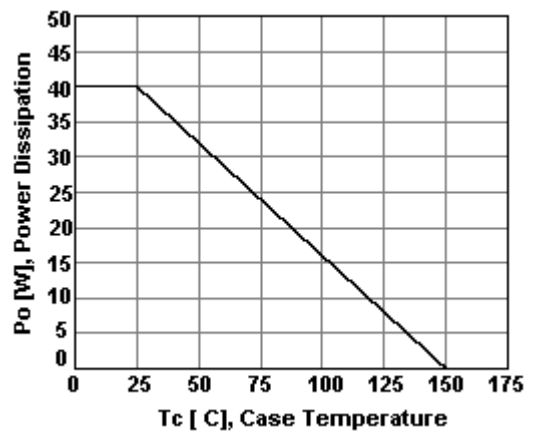
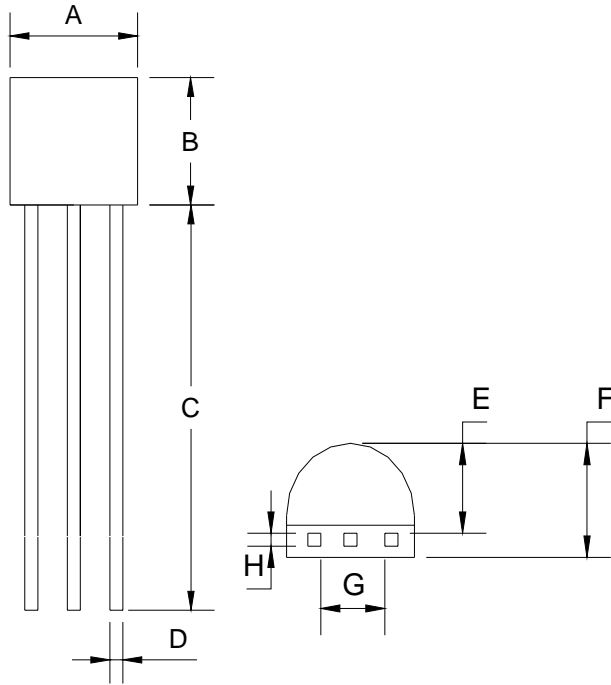


Figure 6. Power Derating



TO-92 Mechanical Drawing



TO-92 DIMENSION				
DIM	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