



# TS13002

## High Voltage NPN Transistor

TO-92



Pin assignment:

1. Emitter
2. Collector
3. Base

**$BV_{CEO} = 400V$**

**$BV_{CBO} = 700V$**

**$I_C = 0.2A$**

**$V_{CE(SAT)} = 0.5V @ I_C / I_B = 100mA / 10mA$**

### Features

- ◇ High voltage.
- ◇ High speed switching

### Structure

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

### Ordering Information

Part No.	Packing	Package
TS13002CT B0	Bulk	TO-92
TS13002CT 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	0.2	A
	Pulse	0.5	
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	$^\circ C$

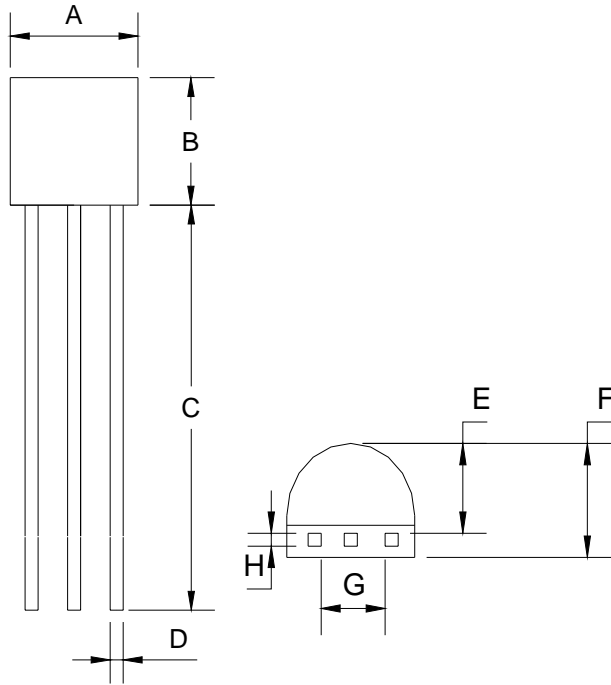
Note: 1. Single pulse,  $P_w = 5mS$ , Duty  $\leq 10\%$

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

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
<b>Static</b>						
Collector-Base Voltage	$I_C = 10mA, I_B = 0$	$BV_{CBO}$	700	--	--	V
Collector-Emitter Breakdown Voltage	$I_C = 1mA, I_E = 0$	$BV_{CEO}$	400	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 1mA, I_C = 0$	$BV_{EBO}$	9	--	--	V
Collector Cutoff Current	$V_{CB} = 700V, I_E = 0$	$I_{CBO}$	--	--	100	$\mu A$
Emitter Cutoff Current	$V_{EB} = 7V, I_C = 0$	$I_{EBO}$	--	--	10	$\mu A$
Collector-Emitter Saturation Voltage	$I_C / I_B = 200mA / 20mA$ $I_C / I_B = 100mA / 10mA$	$V_{CE(SAT)1}$	--	--	2.5	V
		$V_{CE(SAT)2}$	--	--	0.5	
DC Current Gain	$V_{CE} = 10V, I_C = 10\mu A$	$h_{FE}$	10	--	40	
DC Current Gain	$V_{CE} = 10V, I_C = 100mA$	$h_{FE}$	20	--	40	
DC Current Gain	$V_{CE} = 10V, I_C = 200mA$	$h_{FE}$	10	--	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	$V_{CC} = 125V, I_C = 100mA,$ $I_{B1} = I_{B2} = 20mA,$ $R_L = 125\Omega$	$t_{ON}$	--	1.1	--	$\mu S$
Storage Time		$t_{STG}$	--	--	4	$\mu S$
Fall Time		$t_f$	--	--	0.7	$\mu S$

Note : pulse test: pulse width  $\leq 5mS$ , duty cycle  $\leq 10\%$

## 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