

TSC 	TS13003 High Voltage NPN Transistor																																														
TO-126  1 2 3 TO-92  1 2 3 Pin assignment: 1. Emitter 2. Collector 3. Emitter		$BV_{CEO} = 400V$ $BV_{CBO} = 700V$ $I_c = 1.5A$ $V_{CE(SAT)}, = 0.8V @ I_c / I_b = 0.5A / 0.1A$																																													
Features ✧ High voltage. ✧ High speed switching		Ordering Information <table><tr><th>Part No.</th><th>Packing</th><th>Package</th></tr><tr><td>TS13003CT</td><td rowspan="2">Bulk</td><td>TO-92</td></tr><tr><td>TS13003CK</td><td>TO-126</td></tr></table>		Part No.	Packing	Package	TS13003CT	Bulk	TO-92	TS13003CK	TO-126																																				
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Structure ✧ Silicon triple diffused type. ✧ NPN silicon transistor																																															
Absolute Maximum Rating (Ta = 25 °C unless otherwise noted) <table><tr><th>Parameter</th><th></th><th>Symbol</th><th>Limit</th><th>Unit</th></tr><tr><td>Collector-Base Voltage</td><td></td><td>V_{CBO}</td><td>700V</td><td>V</td></tr><tr><td>Collector-Emitter Voltage</td><td></td><td>V_{CEO}</td><td>400V</td><td>V</td></tr><tr><td>Emitter-Base Voltage</td><td></td><td>V_{EBO}</td><td>9</td><td>V</td></tr><tr><td rowspan="2">Collector Current</td><td>DC</td><td rowspan="2">I_c</td><td>1.5</td><td rowspan="2">A</td></tr><tr><td>Pulse</td><td>3</td></tr><tr><td rowspan="2">Collector Power Dissipation</td><td>TO-92</td><td rowspan="2">P_D</td><td>0.6</td><td rowspan="2">W</td></tr><tr><td>TO-126</td><td>20</td></tr><tr><td>Operating Junction Temperature</td><td></td><td>T_J</td><td>+150</td><td>°C</td></tr><tr><td>Operating Junction and Storage Temperature Range</td><td></td><td>T_{STG}</td><td>- 55 to +150</td><td>°C</td></tr></table>				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	I_c	1.5	A	Pulse	3	Collector Power Dissipation	TO-92	P_D	0.6	W	TO-126	20	Operating Junction Temperature		T_J	+150	°C	Operating Junction and Storage Temperature Range		T_{STG}	- 55 to +150	°C
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Note: 1. Single pulse, Pw = 5mS, Duty <= 10%

Electrical Characteristics						
Ta = 25 °C unless otherwise noted						
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Collector-Base Voltage	I _C = 5mA, I _B = 0	BV _{CBO}	700			V
Collector-Emitter Breakdown Voltage	I _C = 5mA, 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	uA
Emitter Cutoff Current	V _{EB} = 9V, I _C = 0	I _{EBO}			10	uA
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}			0.5	
DC Current Gain	V _{CE} = 2V, I _C = 0.5A	h _{FE}	8		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		uS
Storage Time		t _{STG}			4	uS
Fall Time		t _f			0.7	uS

Note : pulse test: pulse width <=5mS, duty cycle <=10%

Electrical Characteristics Curve

Figure 1. Static Characteristic

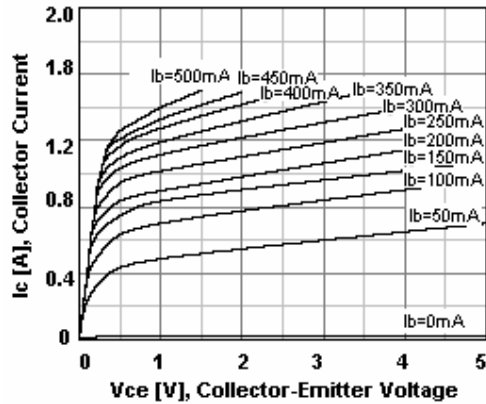


Figure 2. DC Current Gain

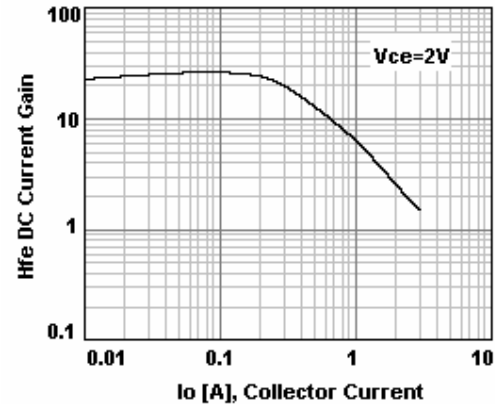


Figure 3. Vce(sat) v.s. Vbe(sat)

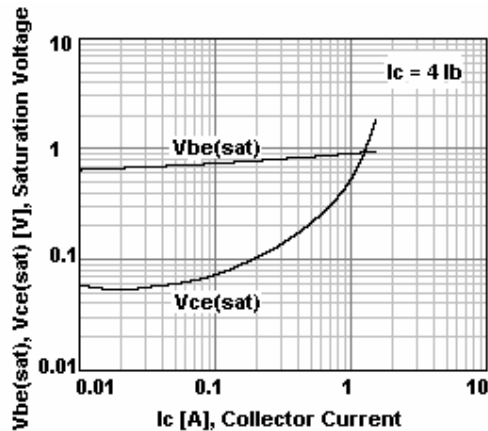


Figure 4. Switching Time

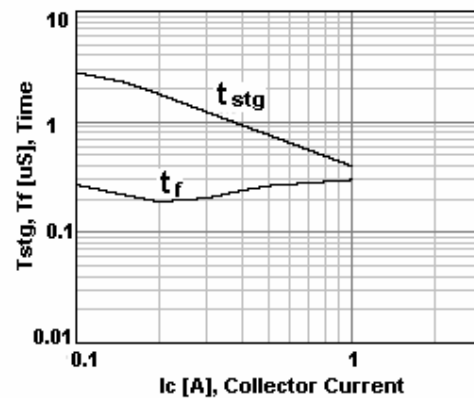


Figure 5. Safe Operating Area

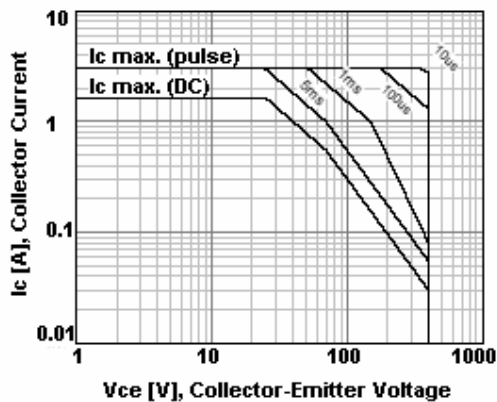
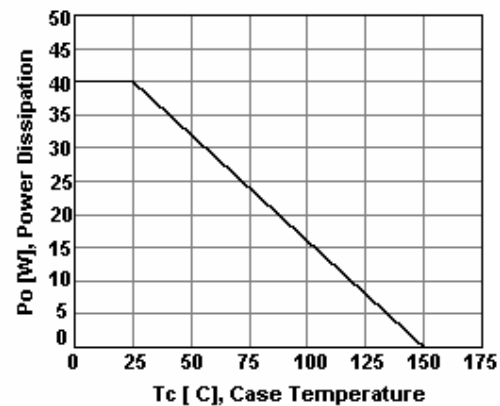
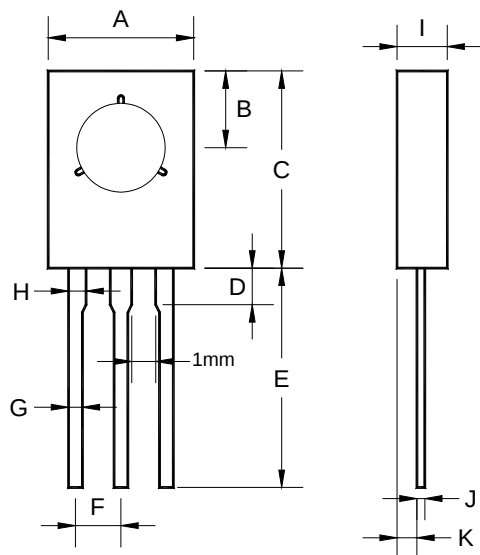


Figure 6. Power Derating

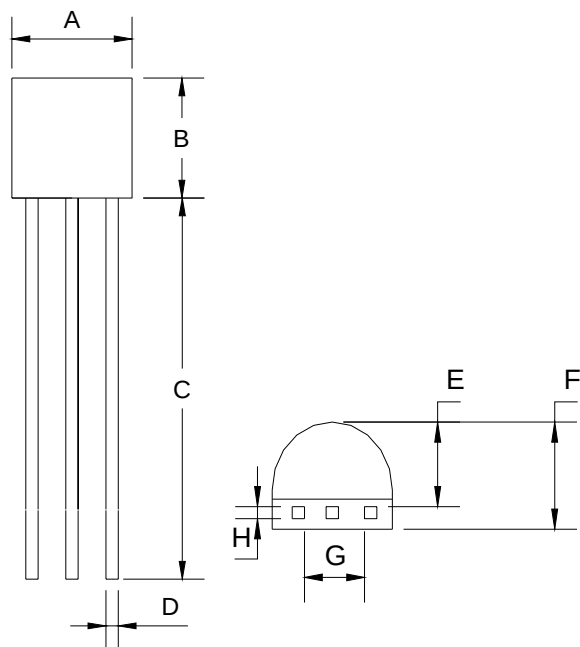


TO-126 Mechanical Drawing



TO-126 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.00 (typ)		0.315(typ)	
B	4.20 (typ)		0.165 (typ)	
C	10.58	11.00	0.417	0.433
D	2.00 (typ)		0.079 (typ)	
E	12.00(typ)		0.472(typ)	
F	2.50(typ)		0.098 (typ)	
G	0.74	0.78	0.029	0.031
H	0.8 (typ)		0.031(typ)	
I	2.56	3.00	0.101	0.118
J	0.38	0.50	0.015	0.020
K	1.1 (typ)		0.043 (typ)	

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