

TO-126



Pin Definition:

1. Base
2. Collector
3. Emitter

PRODUCT SUMMARY

BV_{CEO}	450V
BV_{CBO}	700V
I_C	2A
$V_{CE(SAT)}$	0.5V @ $I_C=1A, I_B=0.25A$

Features

- High Voltage
- High Speed Switching

Structure

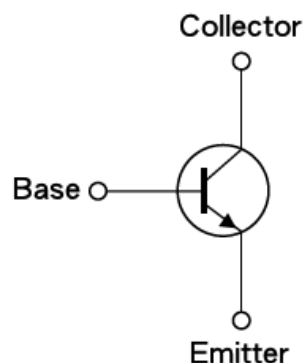
- Silicon Triple Diffused Type
- NPN Silicon Transistor

Ordering Information

Part No.	Package	Packing
TS13003ACK B0G	TO-126	1kpcs / Bulk
TS13003ACK C0G	TO-126	50pcs / Tube

Note: "G" denote for Halogen free

Block Diagram



Absolute Maximum Ratings ($T_A=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V_{CBO}	700	V
Collector-Emitter Voltage	V_{CEO}	450	V
Emitter-Base Voltage	V_{EBO}	9	V
Collector Current	I_C	2	A
Total Power Dissipation @ $T_C=25^{\circ}C$	P_{TOT}	50	W
Operating Junction Temperature	T_J	+150	$^{\circ}C$
Operating Junction and Storage Temperature Range	T_{STG}	- 55 to +150	$^{\circ}C$

Thermal Performance

Parameter	Symbol	Limit	Unit
Junction to Case Thermal Resistance	$R_{\theta JC}$	2.5	$^{\circ}C/W$
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	96.2	$^{\circ}C/W$

Electrical Specifications ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Collector-Base Voltage	$I_C = 1\text{mA}, I_B = 0$	BV_{CBO}	700	--	--	V
Collector-Emitter Breakdown Voltage	$I_C = 1\text{mA}, V_{BE} = 0\text{V}$	BV_{CES}	700	--	--	V
Collector-Emitter Breakdown Voltage	$I_C = 10\text{mA}, I_E = 0$	BV_{CEO}	450	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 10\text{mA}, I_C = 0$	BV_{EBO}	9	--	--	V
Collector-Base Cutoff Current	$V_{CB} = 700\text{V}, I_E = 0$	I_{CBO}	--	--	100	μA
Collector-Emitter Cutoff Current	$V_{CE} = 450\text{V}, I_C = 0$	I_{CEO}	--	--	100	μA
Emitter-Base Cutoff Current	$V_{EB} = 9\text{V}, I_C = 0$	I_{EBO}	--	--	100	μA
Collector-Emitter Saturation Voltage*	$I_C=1\text{A}, I_B=0.25\text{A}$	$V_{CE(SAT) 1}$	--	0.25	0.5	V
	$I_C=1.5\text{A}, I_B=0.5\text{A}$	$V_{CE(SAT) 2}$		0.3	0.6	V
Base-Emitter Saturation Voltage*	$I_C=1\text{A}, I_B=0.25\text{A}$	$V_{BE(SAT)}$		0.9	1.2	V
DC Current Gain*	$V_{CE} = 5\text{V}, I_C = 500\text{mA}$	$h_{FE 1}$	15	--	35	
	$V_{CE} = 5\text{V}, I_C = 2\text{A}$	$h_{FE 2}$	5	--	--	
Dynamic Characteristics						
Frequency	$V_{CE} = 10\text{V}, I_C = 0.1\text{A}$	f_T	5	--	--	MHz
Output Capacitance	$V_{CB} = 10\text{V}, f = 0.1\text{MHz}$	C_{ob}	--	21	--	pF
Resistive Load Switching Time (Ratings)						
Storage Time	$V_{CC} = 125\text{V}, I_C = 0.25\text{A},$ Duty Cycle $\leq 1\%$	t_{STG}	2	--	5	μs
Fall Time		t_f	--	--	1	μs

* **Note:** pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

Electrical Characteristics Curves ($T_a = 25^\circ\text{C}$, unless otherwise noted)

Figure 1. Safe Operation Area

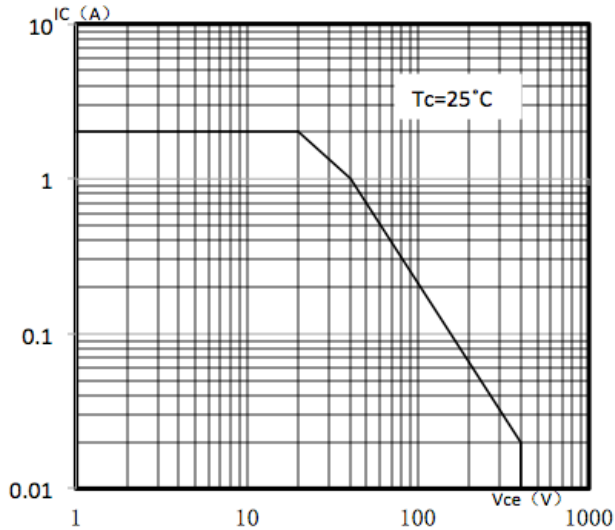


Figure 2. DC Current Gain

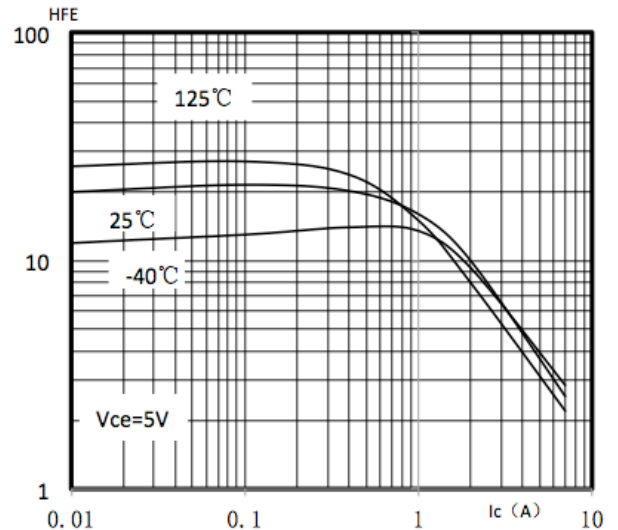


Figure 3. $V_{ce(sat)}$ vs. I_C

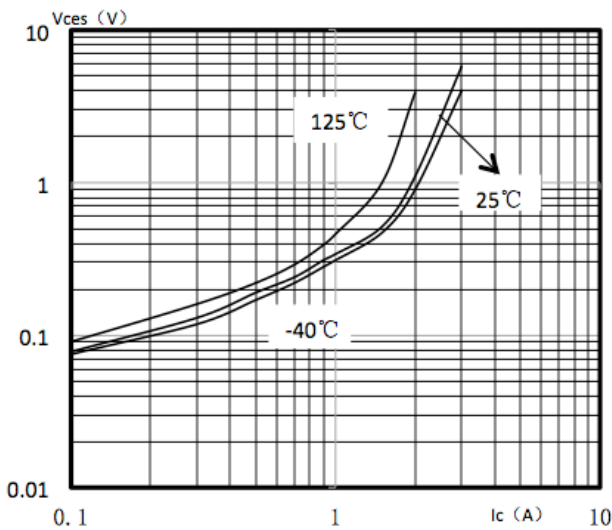


Figure 4. $V_{be(sat)}$ vs. I_C

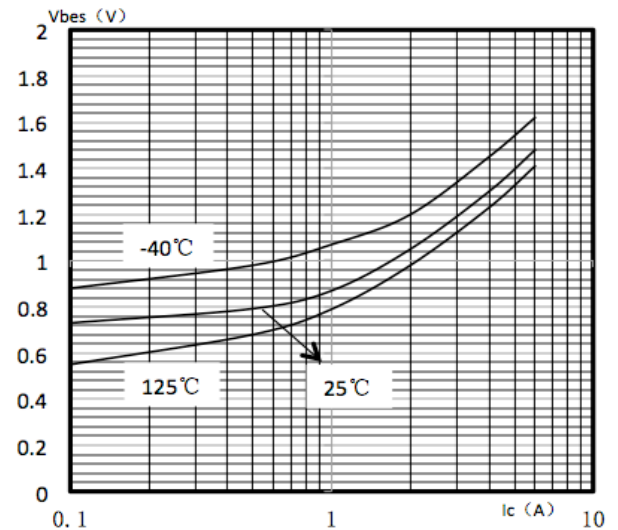
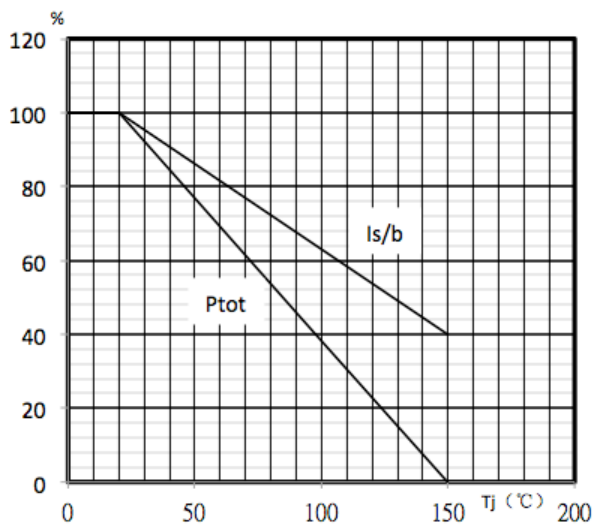
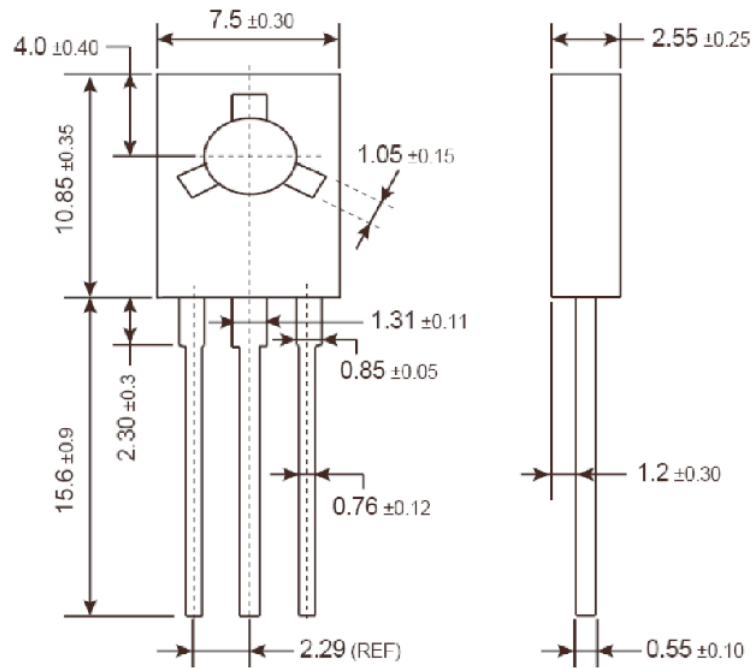


Figure 5. Power Derating

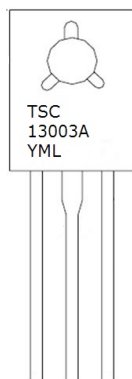


TO-126 Mechanical Drawing



Unit: Millimeters

Marking Diagram



- Y** = Year Code
- M** = Month Code for Halogen Free Product
(**O**=Jan, **P**=Feb, **Q**=Mar, **R**=Apr, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep,
X=Oct, **Y**=Nov, **Z**=Dec)
- L** = Lot Code

Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.