

High Voltage NPN Transistor

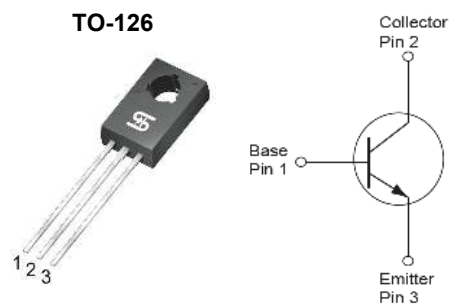
FEATURES

- Low spread of dynamic parameters
- High switching speed
- Low base drive requirement
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC.
- Halogen-free according to IEC 61249-2-21

APPLICATION

- Ballast Lighting
- Charger

KEY PERFORMANCE PARAMETERS			
PARAMETER		VALUE	UNIT
BV _{CEO}		400	V
BV _{CBO}		700	V
I _C		3	A
V _{CE(SAT)}	I _C =1A, I _B =0.2A	0.17	V



ABSOLUTE MAXIMUM RATINGS (T _A = 25°C unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Collector-Base Voltage	V _{CBO}	700	V
Collector-Emitter Voltage @ V _{BE} =0V	V _{CES}	700	V
Collector-Emitter Voltage	V _{CEO}	400	V
Emitter-Base Voltage	V _{EBO}	9	V
Collector Current	I _C	3	A
Collector Peak Current (tp <5ms)	I _{CM}	6	A
Base Current	I _B	1.5	A
Base Peak Current (tp <5ms)	I _{BM}	3	A
Power Total Dissipation @ T _C =25°C	P _{DTOT}	20	W
Maximum Operating Junction Temperature	T _J	+150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction to Case Thermal Resistance	R _{θJC}	6.25	°C/W

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static (Note 1)						
Collector-Base Voltage	$I_C = 1\text{mA}, I_B = 0$	BV_{CBO}	700	--	--	V
Collector-Emitter Breakdown Voltage	$I_C = 10\text{mA}, I_E = 0$	BV_{CEO}	400	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 1\text{mA}, I_C = 0$	BV_{EBO}	9	--	--	V
Collector Cutoff Current	$V_{CB} = 700\text{V}, I_E = 0$	I_{CBO}	--	--	10	A
Collector Cutoff Current	$V_{CE} = 400\text{V}, I_B = 0$	I_{CEO}	--	--	10	μA
Emitter Cutoff Current	$V_{EB} = 7\text{V}, I_C = 0$	I_{EBO}	--	--	10	μA
Collector-Emitter Saturation Voltage	$I_C = 0.4\text{A}, I_B = 0.1\text{A}$	$V_{CE(SAT)1}$	--	0.10	0.7	V
	$I_C = 1\text{A}, I_B = 0.2\text{A}$	$V_{CE(SAT)2}$	--	0.17	1.0	
	$I_C = 2.5\text{A}, I_B = 0.5\text{A}$	$V_{CE(SAT)3}$	--	0.55	1.5	
Base-Emitter Saturation Voltage	$I_C = 1\text{A}, I_B = 0.2\text{A}$	$V_{BE(SAT)1}$	--	--	1.1	V
	$I_C = 2\text{A}, I_B = 0.5\text{A}$	$V_{BE(SAT)2}$	--	--	1.2	
DC Current Gain	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$	h_{FE}	10	--	--	
	$V_{CE} = 5\text{V}, I_C = 1\text{A}$		15	--	30	
	$V_{CE} = 5\text{V}, I_C = 2\text{A}$		5	--	--	
	$V_{CE} = 2\text{V}, I_C = 0.425\text{A}$		24	--	--	
Forward Voltage Drop	$I_F = 2\text{A}$	V_F	--	--	2.0	V
Resistive Load Switching Time (Note 2)						
Turn On Time	$V_{CC} = 250\text{V}, I_C = 1\text{A}, I_{B1} = I_{B2} = 0.2\text{A}, t_p = 25\mu\text{s}$ Duty Cycle < 1%	t_{ON}	--	0.2	0.6	μs
Storage Time		t_{STG}	--	2.7	4.5	μs
Fall Time		t_f	--	0.16	0.3	μs

Notes:

1. Pulse test: $\leq 380\mu\text{s}$, duty cycle $\leq 2\%$
2. For DESIGN AID ONLY, not subject to production testing.

ORDERING INFORMATION

PART NO.	PACKAGE	PACKING
TS13005CK C0G	TO-126	50pcs / Tube

ELECTRICAL CHARACTERISTICS CURVES ($T_A=25^\circ\text{C}$, unless otherwise noted)

Figure 1. Safe Operation Area

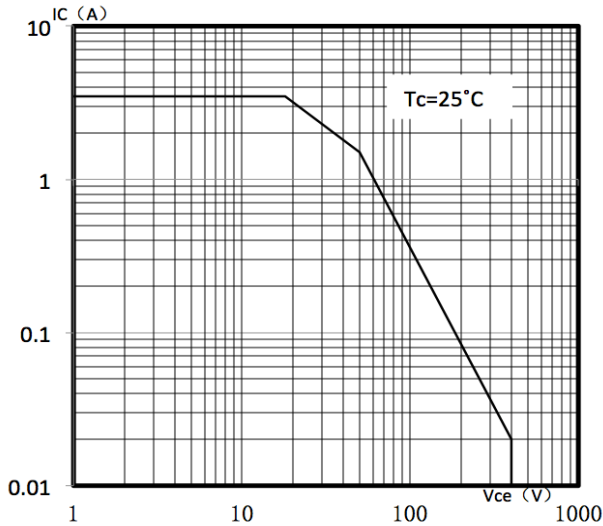


Figure 2. DC Current Gain

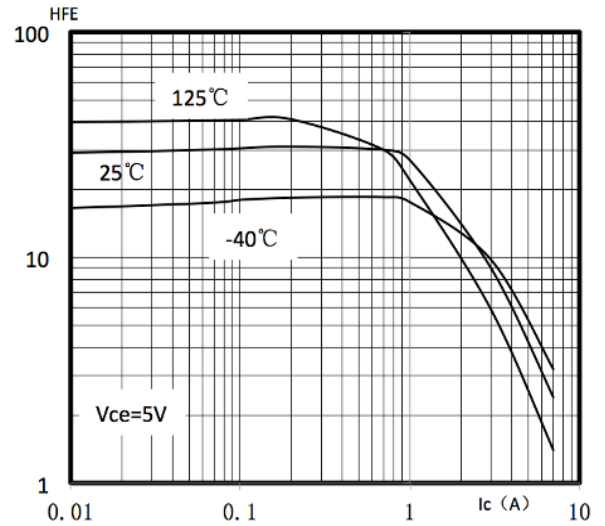


Figure 3. Vce(sat) vs. IC

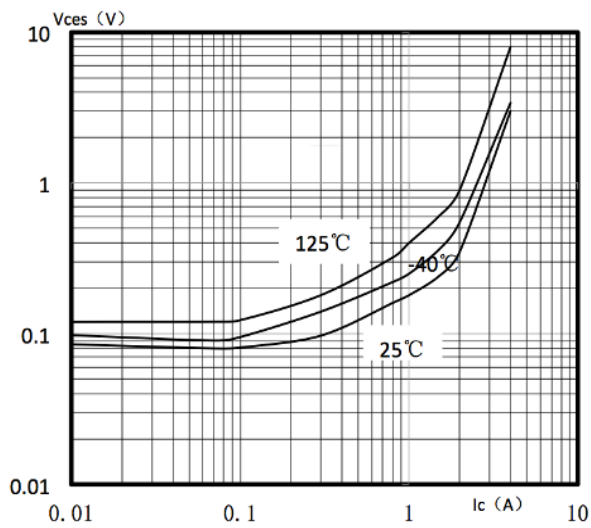


Figure 4. Vbe(sat) vs. IC

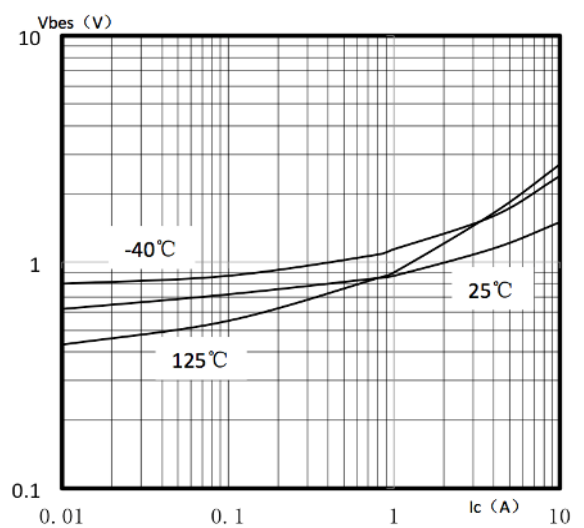
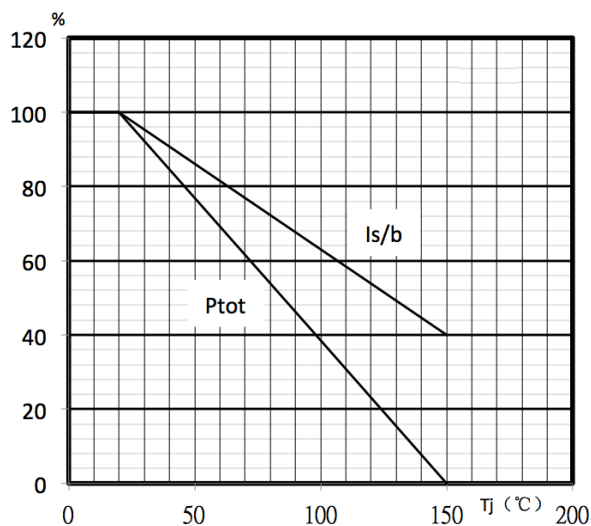
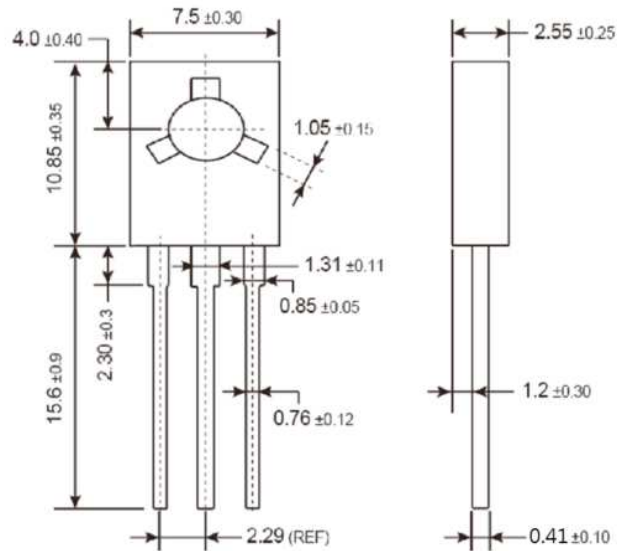


Figure 5. Power Derating

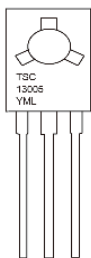


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

TO-126



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

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