

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

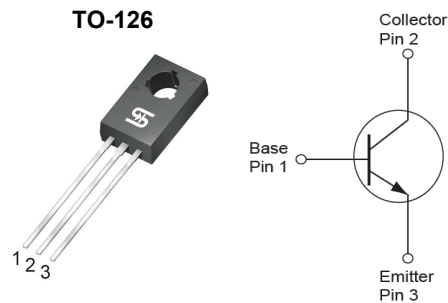
KEY PERFORMANCE PARAMETERS

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



✓
RoHS
COMPLIANT

HALOGEN
FREE



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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 ($t_p < 5ms$)	I_{CM}	6	A
Base Current	I_B	1.5	A
Base Peak Current ($t_p < 5ms$)	I_{BM}	3	A
Power Total Dissipation @ $T_C=25^\circ\text{C}$	P_{DTOT}	20	W
Maximum Operating Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$

THERMAL PERFORMANCE

PARAMETER	SYMBOL	LIMIT	UNIT
Junction to Case Thermal Resistance	$R_{\theta JC}$	6.25	$^\circ\text{C/W}$

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:

- Pulse test: $\leq 380\mu\text{s}$, duty cycle $\leq 2\%$
- 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

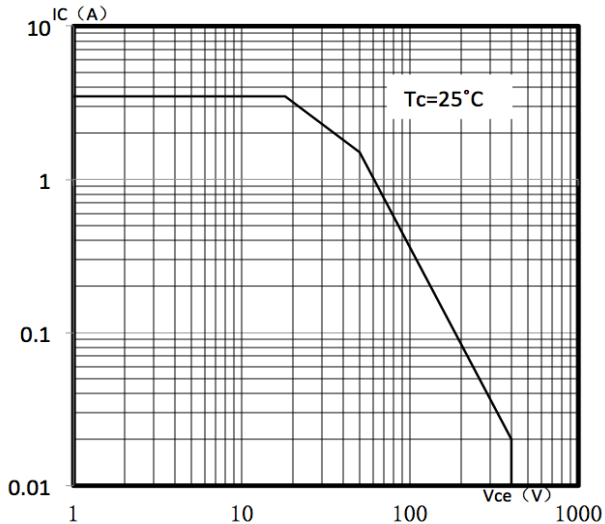


Figure 2. DC Current Gain

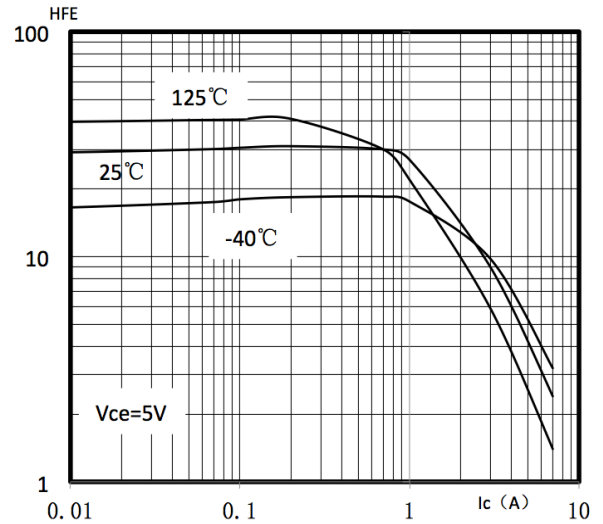


Figure 3. Vce(sat) vs. IC

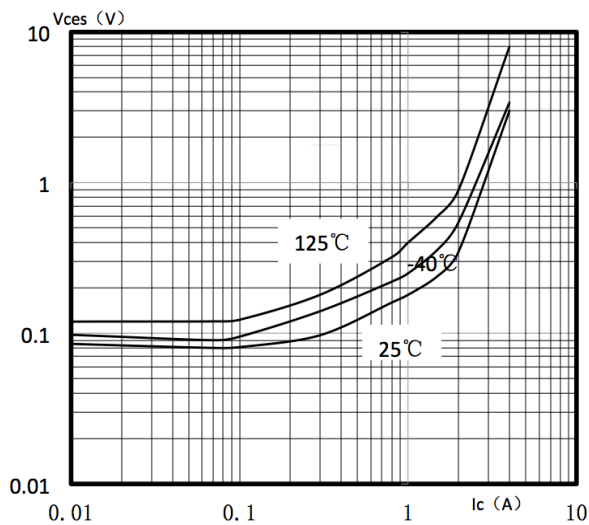


Figure 4. Vbe(sat) vs. IC

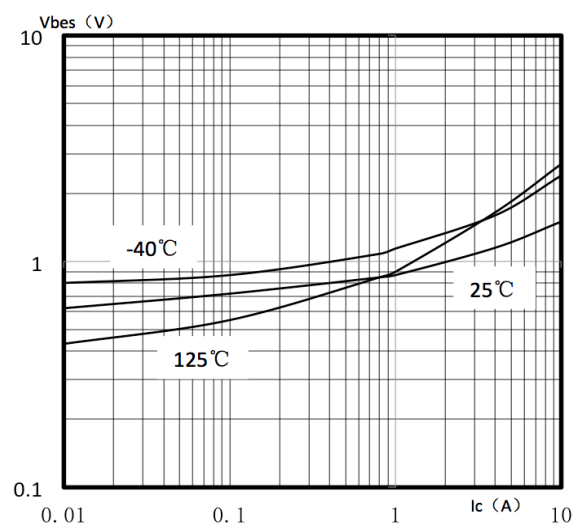
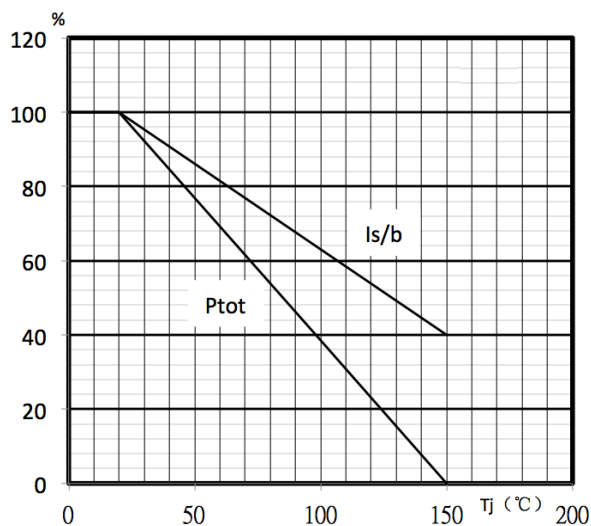
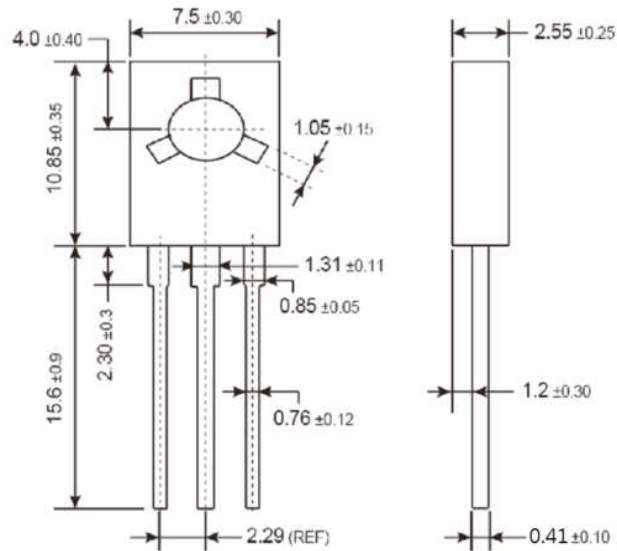


Figure 5. Power Derating

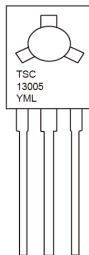


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

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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