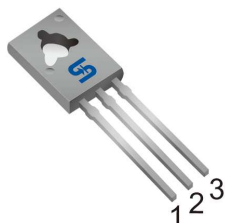


TS13005CK/RCK

High Voltage NPN Transistor

TO-126



Pin Definition:

TS13005CK	TS13005RCK
1. Base	1. Emitter
2. Collector	2. Collector
3. Emitter	3. Base

PRODUCT SUMMARY

BV_{CEO}	400V
BV_{CBO}	700V
I_C	3A
$V_{CE(SAT)}$	0.17V @ $I_C=1A, I_B=0.2A$

Features

- Low spread of dynamic parameters
- High switching speed
- Low base drive requirement

Application

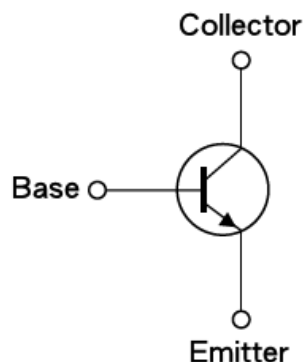
- Ballast Lighting
- Charger

Ordering Information

Part No.	Package	Packing
TS13005CK C0G	TO-126	50pcs / Tube
TS13005RCK C0G	TO-126	50pcs / Tube

Note: "G" denotes for Halogen- and Antimony-free as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds

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 @ $V_{BE}=0V$	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 @ $T_C=25^{\circ}C$	P_{DTOT}	20	W
Maximum Operating Junction Temperature	T_J	+150	$^{\circ}C$
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}C$

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\theta JC}$	6.25	$^{\circ}C/W$

Electrical Specifications (T_A=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Collector-Base Voltage	I _C = 1mA, I _B = 0	BV _{CB0}	700	--	--	V
Collector-Emitter Breakdown Voltage	I _C = 10mA, 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 _{CB0}	--	--	10	μA
Collector Cutoff Current	V _{CE} = 400V, I _B = 0	I _{CEO}	--	--	10	μA
Emitter Cutoff Current	V _{EB} = 7V, I _C = 0	I _{EBO}	--	--	10	μA
Collector-Emitter Saturation Voltage	I _C = 0.4A, I _B = 0.1A	V _{CE(SAT)1}	--	0.10	0.7	V
	I _C = 1A, I _B = 0.2A	V _{CE(SAT)2}	--	0.17	1.0	
	I _C = 2.5A, I _B = 0.5A	V _{CE(SAT)3}	--	0.55	1.5	
Base-Emitter Saturation Voltage	I _C = 1A, I _B = 0.2A	V _{BE(SAT)1}	--	--	1.1	V
	I _C = 2A, I _B = 0.5A	V _{BE(SAT)2}	--	--	1.2	
DC Current Gain	V _{CE} = 5V, I _C = 10mA	h _{FE}	10	--	--	
	V _{CE} = 5V, I _C = 1A		15	--	30	
	V _{CE} = 5V, I _C = 2A		5	--	--	
	V _{CE} = 2V, I _C = 0.425A		24	--	--	
Forward Voltage Drop	I _F = 2A	V _F	--	--	2.0	V
Turn On Time	V _{CC} = 250V, I _C = 1A,	t _{ON}	--	0.2	0.6	μs
Storage Time	I _{B1} = I _{B2} = 0.2A, t _p = 25μs	t _{STG}	--	2.7	4.5	μs
Fall Time	Duty Cycle < 1%	t _f	--	0.16	0.3	μs

Notes: Pulsed duration ≤ 380μs, duty cycle ≤ 2%

Electrical Characteristics Curves

Figure 1. Safe Operation Area

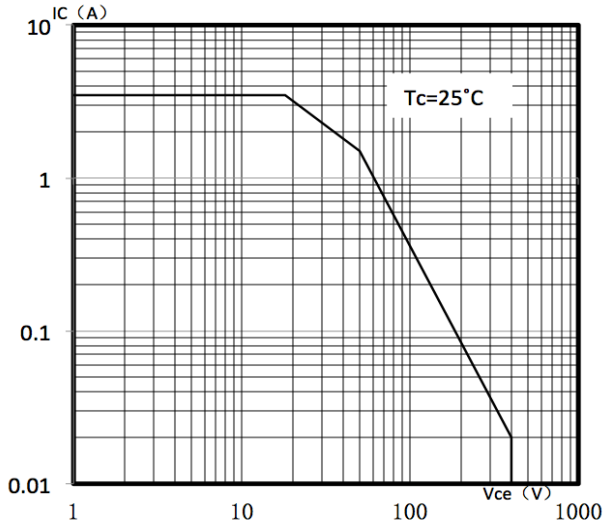


Figure 2. DC Current Gain

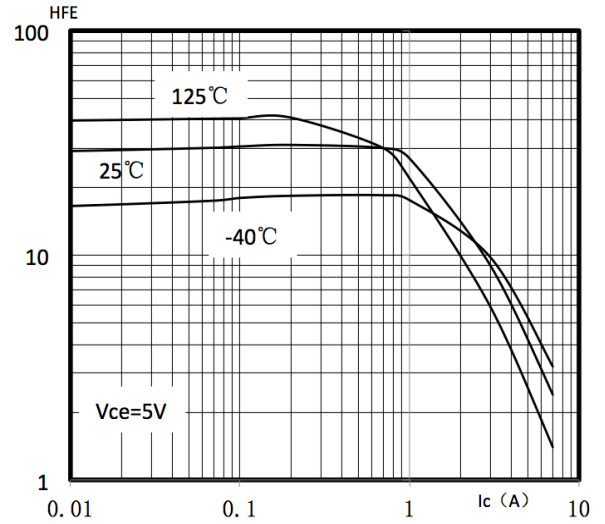


Figure 3. Vce(sat) vs. IC

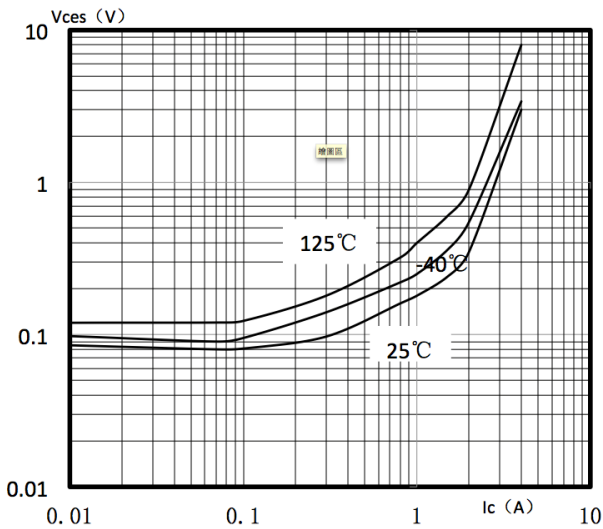


Figure 4. Vbe(sat) vs. IC

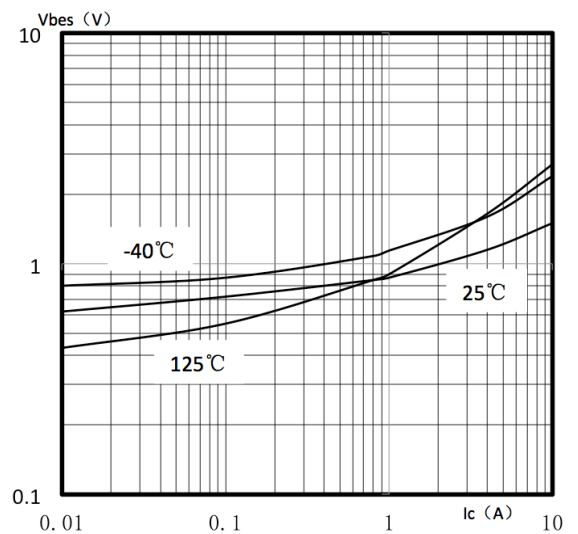
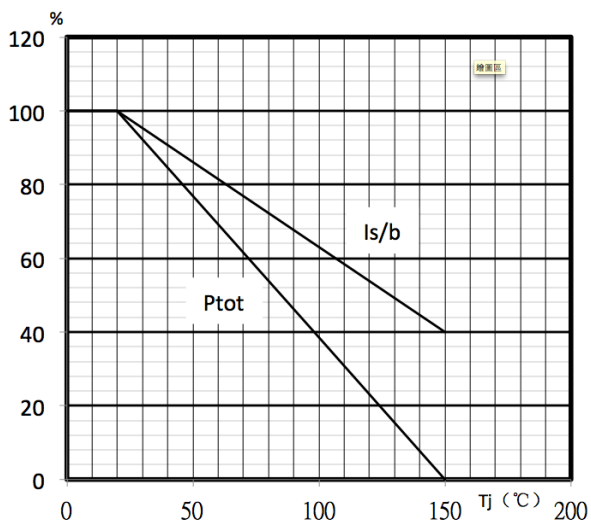
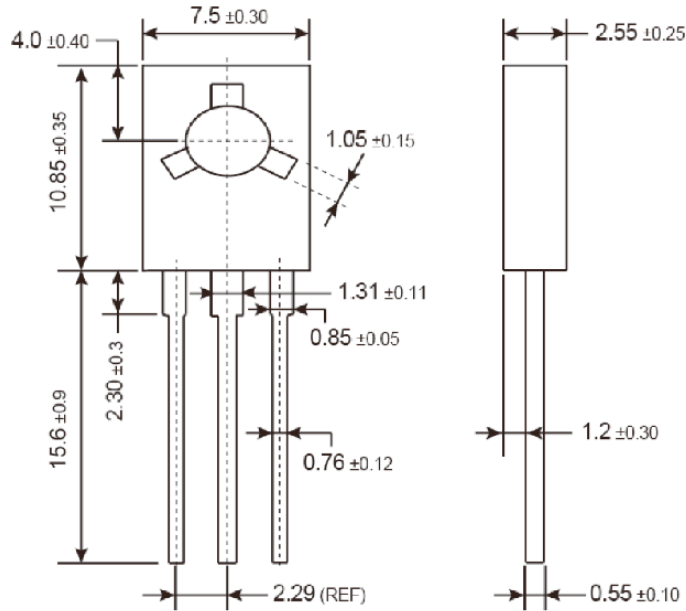


Figure 5. Power Derating



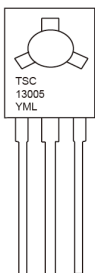
TO-18 Mechanical Drawing



Unit: Millimeters

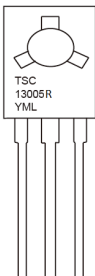
Marking Diagram

TS13005CK



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

TS13005RCK



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