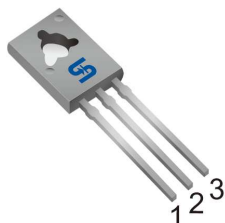


TS13005CK/RCK

High Voltage NPN Transistor

TO-126



Pin Definition:

TS13005CK

1. Base
2. Collector
3. Emitter

TS13005RCK

1. Emitter
2. Collector
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

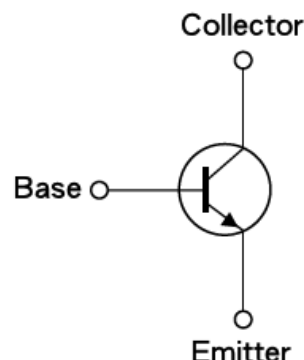
- Ballast Lighting
- Charger

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 ($T_A=25^{\circ}\text{C}$ 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	$I_C=10\text{mA}, I_E=0$	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	μA
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
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: Pulsed duration $\leq 380\mu\text{s}$, duty cycle $\leq 2\%$

Electrical Characteristics Curves

Figure 1. Safe Operation Area

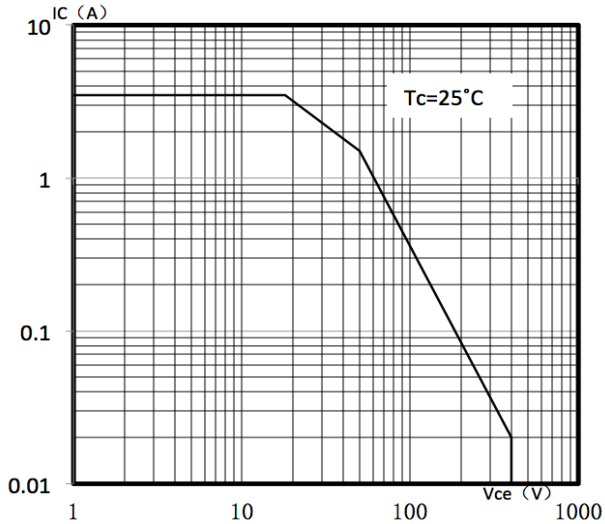


Figure 2. DC Current Gain

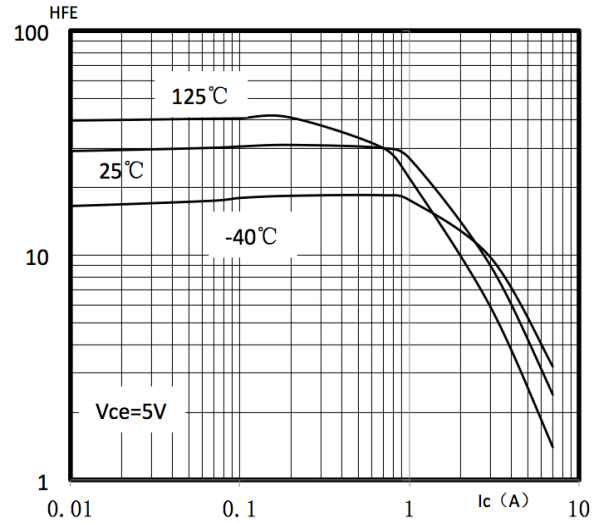


Figure 3. $V_{ce(sat)}$ vs. I_C

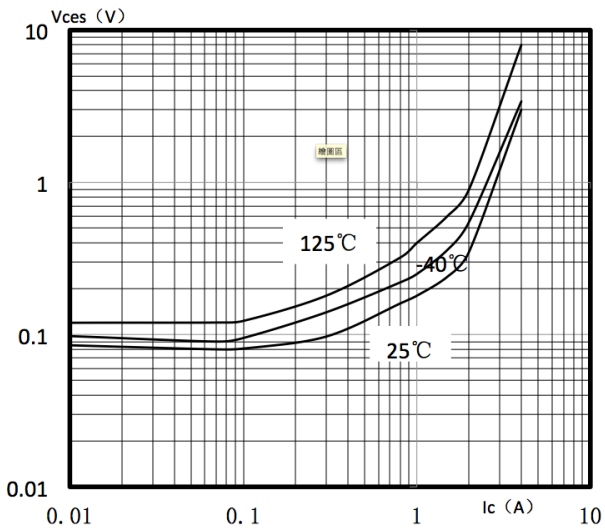


Figure 4. $V_{be(sat)}$ vs. I_C

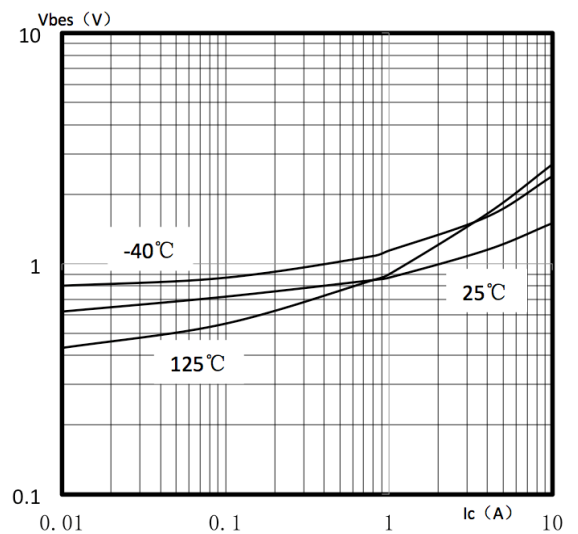
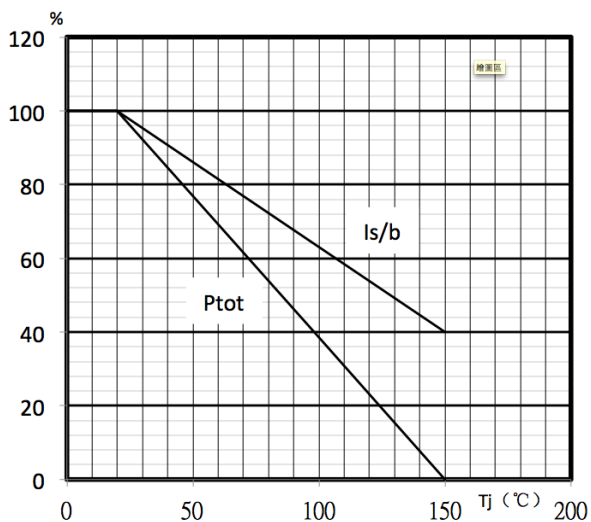
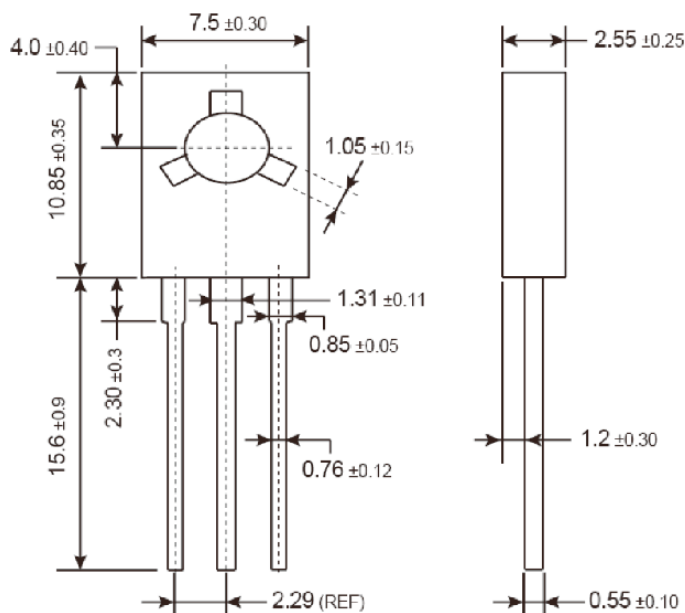


Figure 5. Power Derating



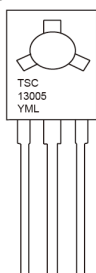
TO-18 Mechanical Drawing



Unit: Millimeters

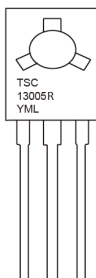
Marking Diagram

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



TS13005CK/RCK

High Voltage NPN Transistor

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