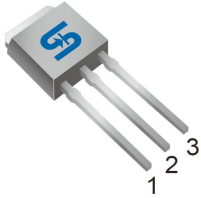
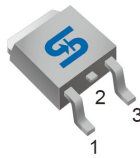


TO-251
(IPAK)



TO-252
(DPAK)



Pin Definition:

1. Base
2. Collector
3. Emitter

PRODUCT SUMMARY

BV_{CEO}	400V
BV_{CBO}	700V
I_C	2A
$V_{CE(SAT)}$	1.1V @ $I_C=1A$, $I_B=0.25A$

Features

- Build-in Free-wheeling Diode Makes Efficient Anti-saturation Operation
- No Need to Interest h_{FE} Value Because of Low Variable Storage-time Spread Even Though Comer Spirit Product.
- Low Base Drive Requirement
- Suitable for Half Bridge Light Ballast Application

Structure

- Silicon Triple Diffused Type
- NPN Silicon Transistor with Diode

Ordering Information

Part No.	Package	Packing
TSC5302DCP ROG	TO-252	2.5kpcs / 13" Reel
TSC5302DCH C5G	TO-251	75pcs / Tube

Note: "G" denote for Halogen Free Product

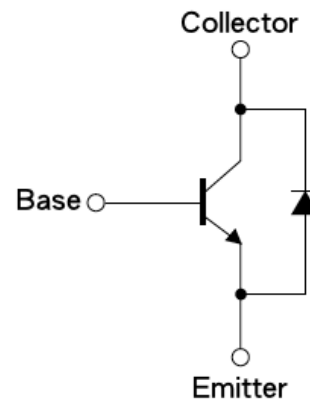
Absolute Maximum Ratings (Ta = 25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V_{CBO}	700	V
Collector-Emitter Voltage	V_{CEO}	400	V
Emitter-Base Voltage	V_{EBO}	10	V
Collector Current	I_C	2	A
Collector Peak Current (tp < 5ms)	I_{CM}	4	A
Base Current	I_B	1	A
Base Peak Current (tp < 5ms)	I_{BM}	2	A
Total Dissipation @ Tc ≤ 25°C	TO-251	1.5	W
	TO-252	25	
Maximum Operating Junction Temperature	T_J	+150	°C
Storage Temperature Range	T_{STG}	-65 to +150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Junction to Case Thermal Resistance	$R\theta_{JC}$	6.25	°C/W
Junction to Ambient Thermal Resistance	$R\theta_{JA}$	100	°C/W

Block Diagram



Electrical Specifications (Ta = 25°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 ^a	$I_C = 10\text{mA}, I_E = 0$	BV_{CEO}	400	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 1\text{mA}, I_C = 0$	BV_{EBO}	10	--	--	V
Collector Cutoff Current	$V_{CB} = 700\text{V}, I_E = 0$	I_{CBO}	--	--	1	μA
Emitter Cutoff Current	$V_{EB} = 9\text{V}, I_C = 0$	I_{EBO}	--	--	1	μA
Collector-Emitter Saturation Voltage ^a	$I_C = 0.5\text{A}, I_B = 0.1\text{A}$	$V_{CE(SAT)1}$	--	--	0.5	V
	$I_C = 1\text{A}, I_B = 0.25\text{A}$	$V_{CE(SAT)2}$	--	1.1	1.5	
Base-Emitter Saturation Voltage ^a	$I_C = 0.5\text{A}, I_B = 0.1\text{A}$	$V_{BE(SAT)1}$	--	--	1.1	V
	$I_C = 1\text{A}, I_B = 0.25\text{A}$	$V_{BE(SAT)2}$	--	--	1.2	
DC Current Gain	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$	$h_{FE} 1$	10	--	--	
	$V_{CE} = 5\text{V}, I_C = 400\text{mA}$	$h_{FE} 2$	10	--	30	
	$V_{CE} = 5\text{V}, I_C = 1\text{A}$	$h_{FE} 3$	5	--	--	
Turn On Time	$V_{CC} = 250\text{V}, I_C = 1\text{A},$ $I_{B1} = I_{B2} = 0.2\text{A}, t_p = 25\mu\text{s}$	t_{ON}	--	0.15	0.3	μs
Storage Time		t_{STG}	--	0.5	0.9	μs
Fall Time	Duty Cycle < 1%	t_f	--	0.2	0.4	μs
Diode						
Fall Time	$I_C = 1\text{A}$	t_f	--	--	800	μs
Forward Voltage Drop	$I_C = 1\text{A}$	V_f	--	--	1.4	V

Notes: Pulsed duration = 300μs, duty cycle ≤ 2%

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

Figure 1. Static Characteristics

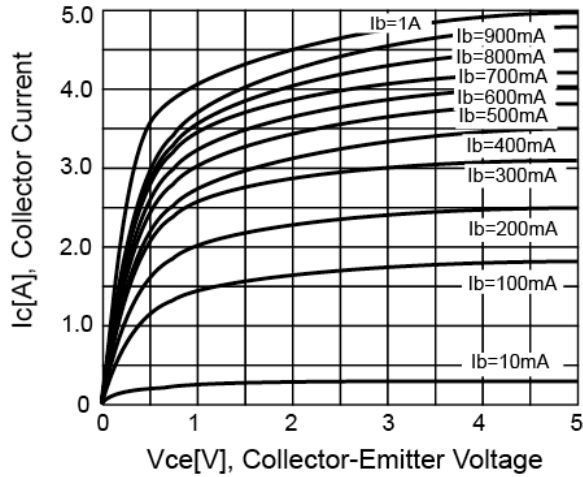


Figure 2. DC Current Gain

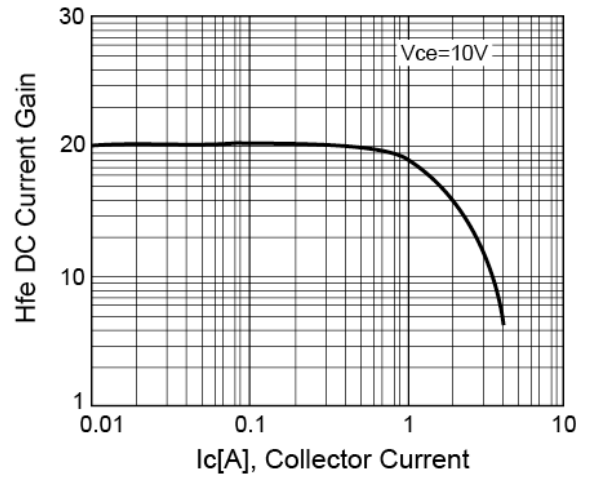


Figure 3. $V_{ce(sat)}$ vs. $V_{be(sat)}$

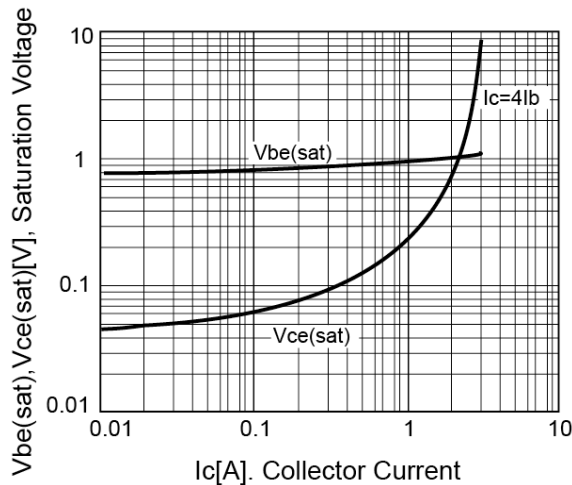


Figure 4. Power Derating

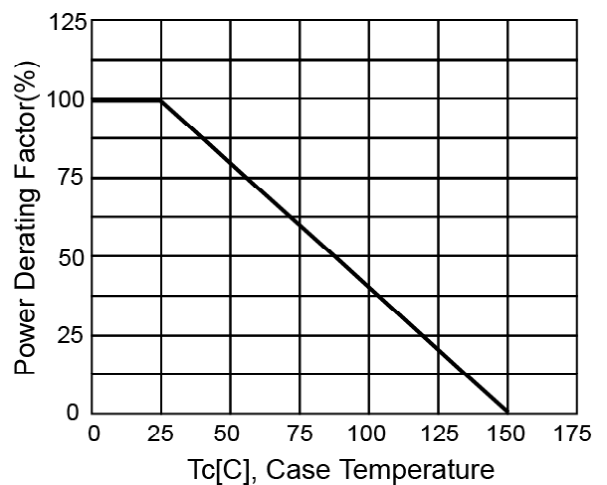


Figure 5. Reverse Bias SOA

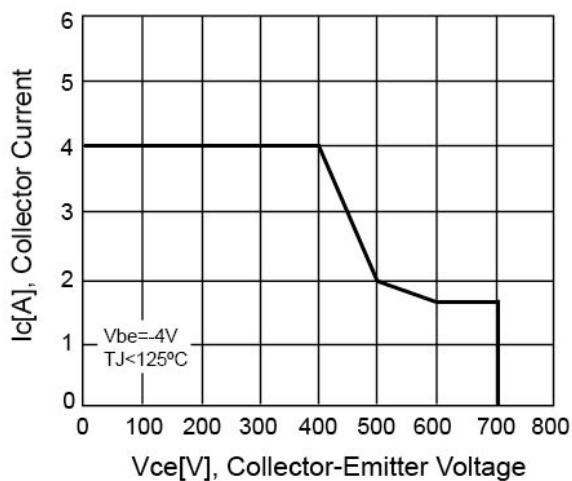
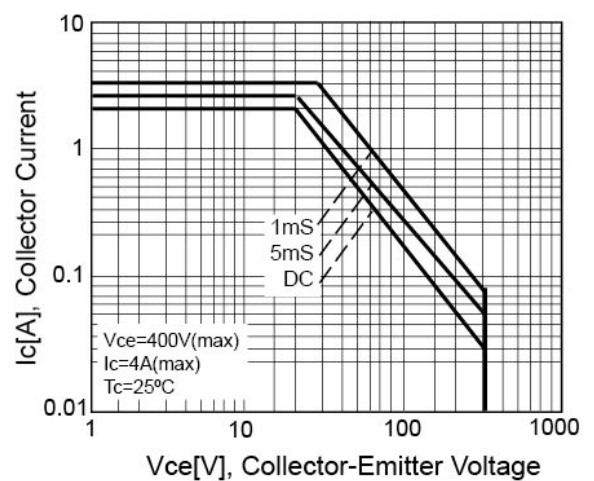
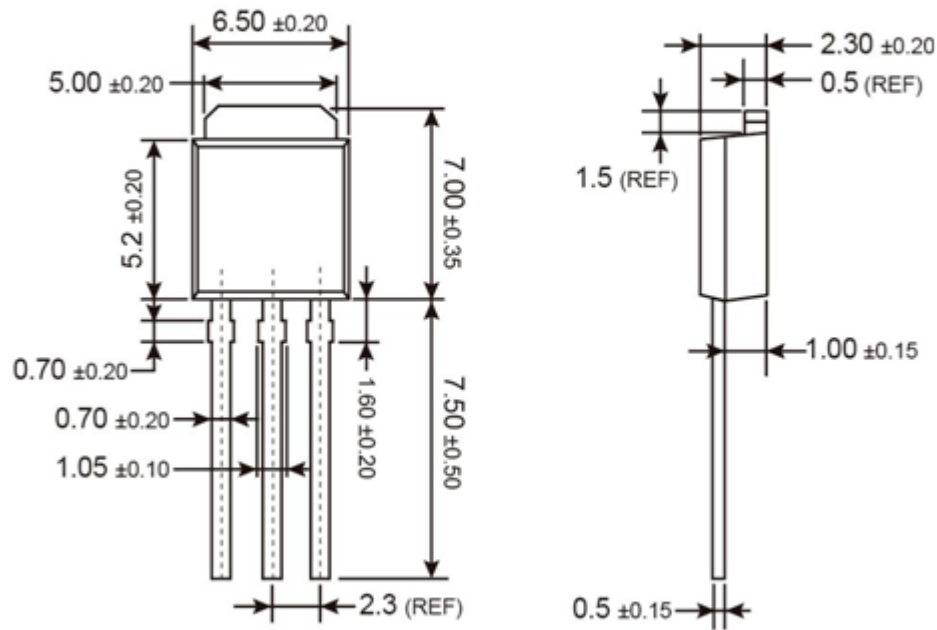


Figure 6. Safe Operating Area

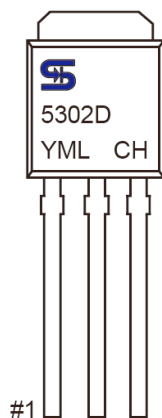


TO-251 Mechanical Drawing



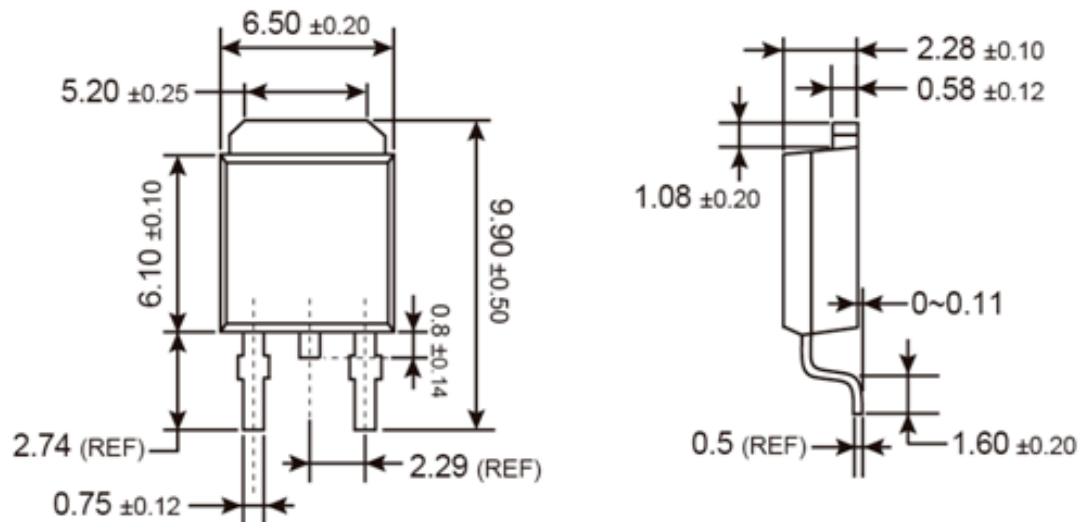
Unit: Millimeters

Marking Diagram



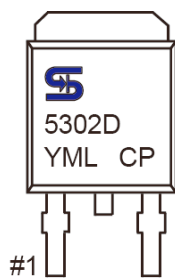
- Y** = Year Code
- M** = Month Code for Halogen Free Product
(O=Jan, P=Feb, Q=Mar, R=Apl, S=May, T=Jun, U=Jul, V=Aug, W=Sep, X=Oct, Y=Nov, Z=Dec)
- L** = Lot Code

TO-252 Mechanical Drawing



Unit: Millimeters

Marking Diagram



- Y** = Year Code
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(O=Jan, P=Feb, Q=Mar, R=Apl, S=May, T=Jun, U=Jul, V=Aug, W=Sep, X=Oct, Y=Nov, Z=Dec)
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TSC5302D

High Voltage NPN Transistor with Diode

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