TSC5302D

High Voltage NPN Transistor with Diode

TO-251 (IPAK)



TO-252 (DPAK)



Pin Definition:
1. Base
2. Collector
3. Emitter

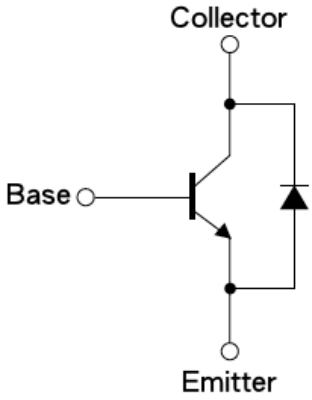
PRODUCT SUMMARY

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

Features

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

Block Diagram



Structure

- Silicon Triple Diffused Type
- NPN Silicon Transistor with Diode

Ordering Information

Part No.	Package	Packing
TSC5302DCP RO	TO-252	2.5Kpcs / 13” Reel
TSC5302DCP ROG	TO-252	2.5Kpcs / 13” Reel
TSC5302DCH C5	TO-251	75pcs / Tube
TSC5302DCH C5G	TO-251	75pcs / Tube

Note: “G” denote for Halogen Free Product

Absolute Maximum Rating (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	P_{tot}	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

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

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Collector-Base Voltage	I_C = 1mA, I_B = 0	BV_{CBO}	700	--	--	V
Collector-Emitter Breakdown Voltage[a]	I_C = 10mA, I_E = 0	BV_{CEO}	400	--	--	V
Emitter-Base Breakdown Voltage	I_E = 1mA, I_C = 0	BV_{EBO}	10	--	--	V
Collector Cutoff Current	V_{CB} = 700V, I_E = 0	I_{CBO}	--	--	1	uA
Emitter Cutoff Current	V_{EB} = 9V, I_C = 0	I_{EBO}	--	--	1	uA
Collector-Emitter Saturation Voltage[a]	I_C =0.5A, I_B =0.1A	$V_{CE(SAT)1}$	--	--	0.5	V
	I_C =1A, I_B =0.25A	$V_{CE(SAT)2}$	--	1.1	1.5	
Base-Emitter Saturation Voltage[a]	I_C =0.5A, I_B =0.1A	$V_{BE(SAT)1}$	--	--	1.1	V
	I_C =1A, I_B =0.25A	$V_{BE(SAT)2}$	--	--	1.2	
DC Current Gain	V_{CE} =5V, I_C =10mA	h_{FE} 1	10	--	--	
	V_{CE} =5V, I_C =400mA	h_{FE} 2	10	--	30	
	V_{CE} =5V, I_C =1A	h_{FE} 3	5	--	--	
Turn On Time	V_{CC} =250V, I_C =1A, I_{B1}=I_{B2} =0.2A, t_p =25uS Duty Cycle<1%	t_{ON}	--	0.15	0.3	uS
Storage Time		t_{STG}	--	0.5	0.9	uS
Fall Time		t_f	--	0.2	0.4	uS
Diode						
Fall Time	I_C =1A	t_F	--	--	800	uS
Forward Voltage Drop	I_C =1A	Vf	--	--	1.4	V

Notes:
a. Pulsed duration = 300uS, duty cycle ≤2%

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Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

Figure 1. Static Characteristics

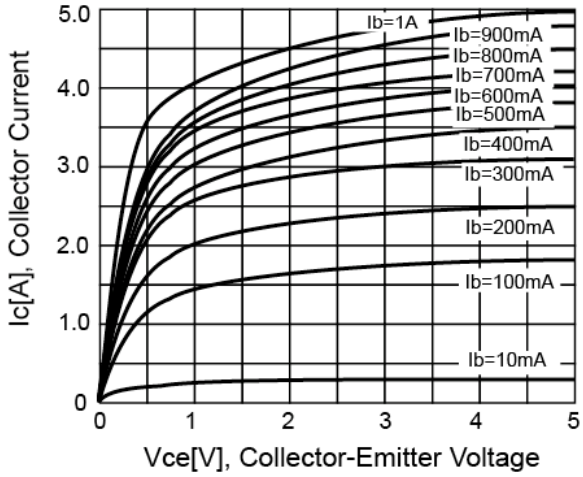


Figure 2. DC Current Gain

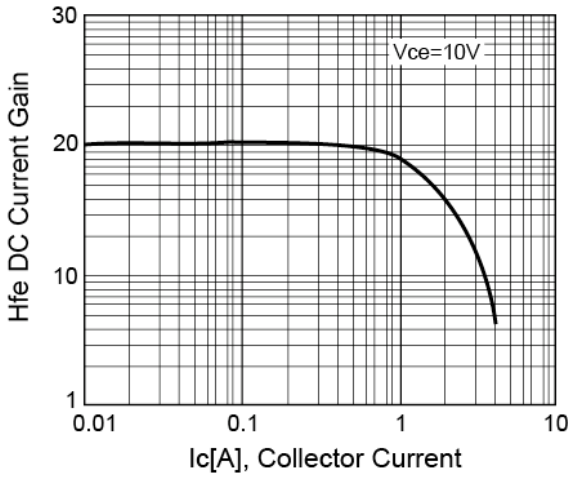


Figure 3. Vce(sat) v.s. Vbe(sat)

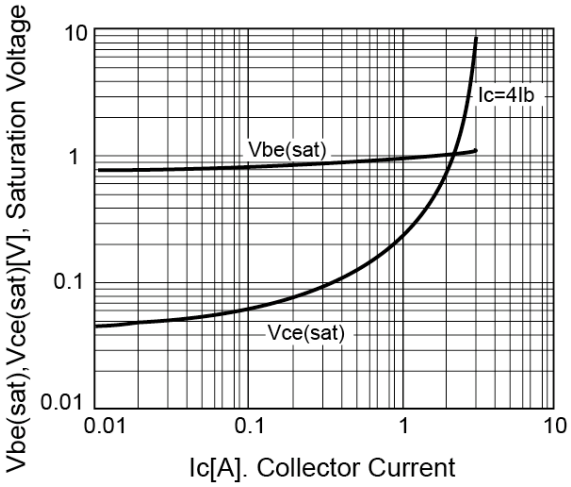


Figure 4. Power Derating

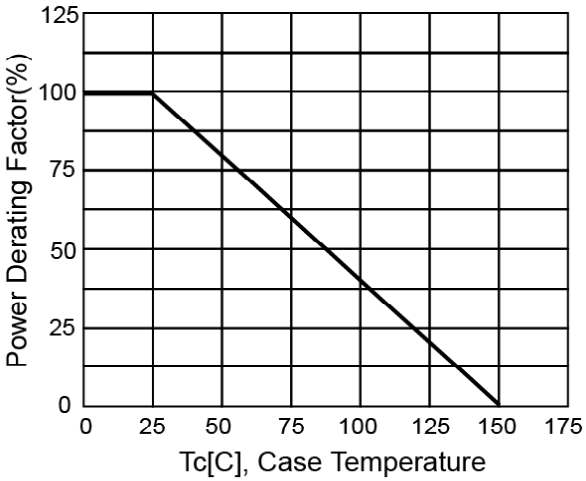


Figure 5. Reverse Bias SOA

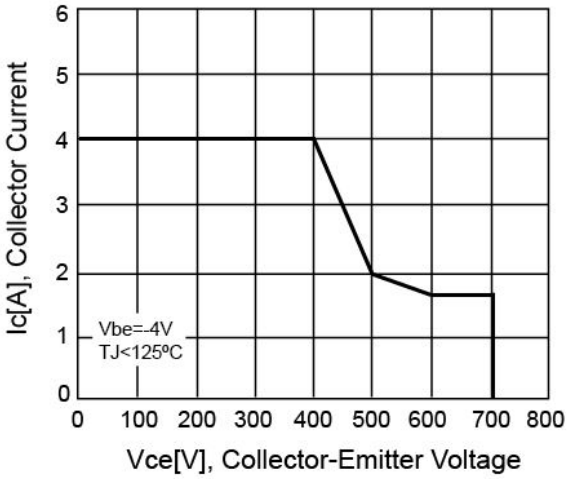
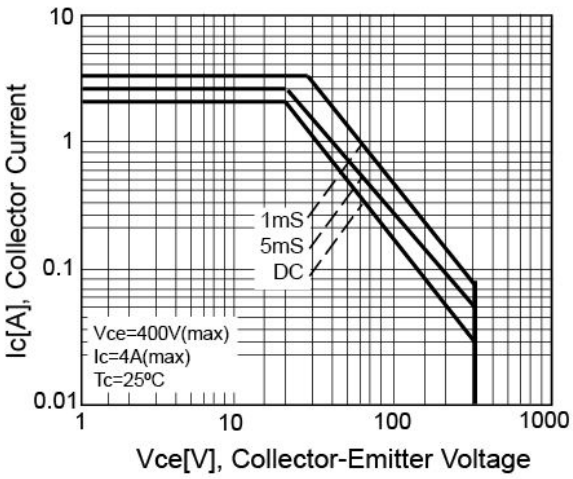


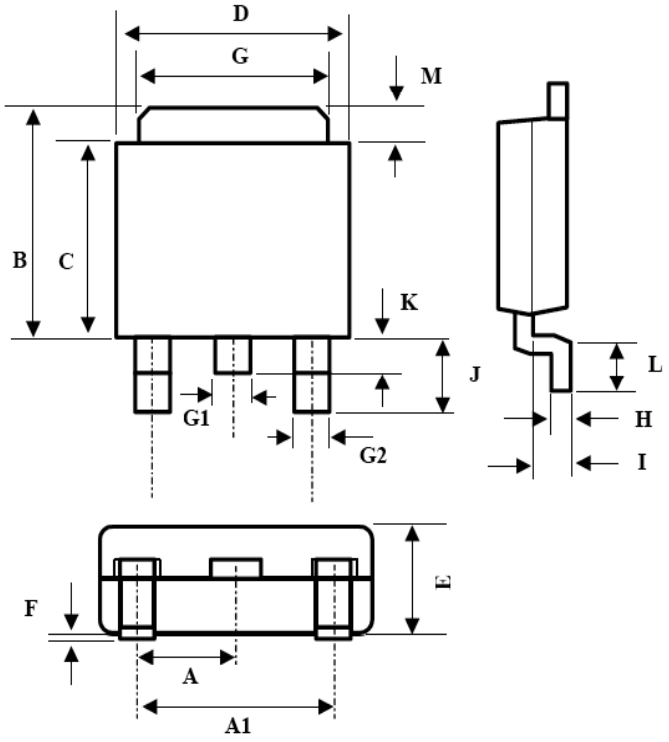
Figure 6. Safety Operating Area



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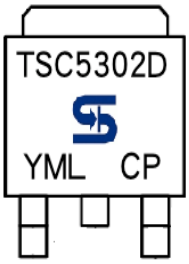
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TO-252 Mechanical Drawing



TO-252 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.290 BSC		0.090 BSC	
A1	4.600 BSC		0.180 BSC	
B	7.000	7.200	0.275	0.283
C	6.000	6.200	0.236	0.244
D	6.400	6.604	0.252	0.260
E	2.210	2.387	0.087	0.094
F	0.010	0.127	0.000	0.005
G	5.232	5.436	0.206	0.214
G1	0.666	0.889	0.026	0.035
G2	0.633	0.889	0.025	0.035
H	0.508 REF		0.020 REF	
I	0.900	1.500	0.035	0.059
J	2.743 REF		0.108 REF	
K	0.660	0.940	0.026	0.037
L	1.397	1.651	0.055	0.065
M	1.100 REF		0.043 REF	

Marking Diagram



Y = Year Code

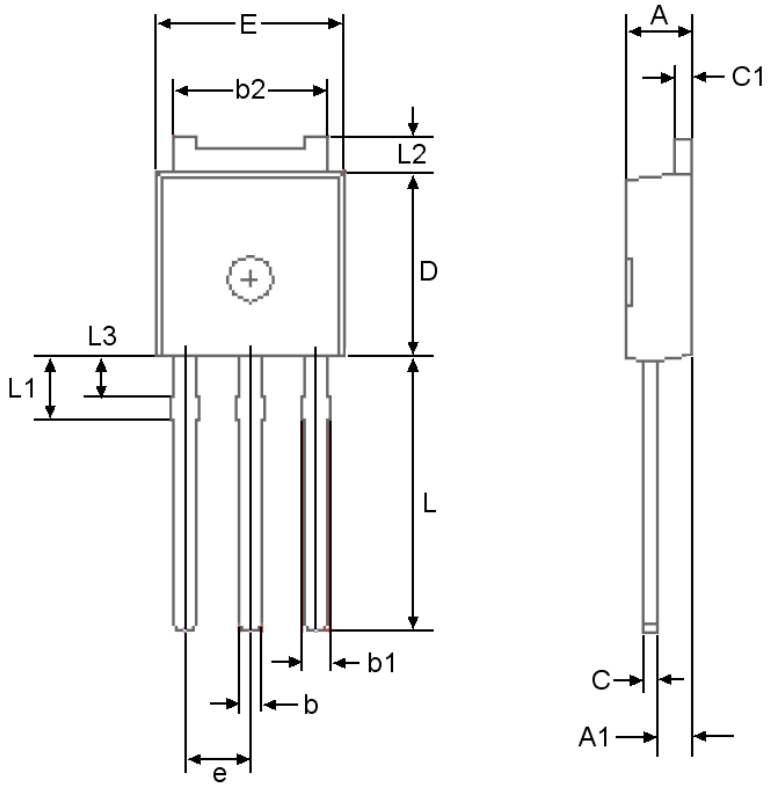
M = Month Code
(**A**=Jan, **B**=Feb, **C**=Mar, **D**=Apl, **E**=May, **F**=Jun, **G**=Jul, **H**=Aug, **I**=Sep, **J**=Oct, **K**=Nov, **L**=Dec)
= Month Code for Halogen Free Product
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L = Lot Code

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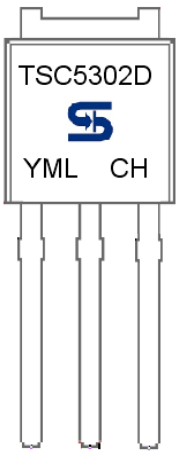
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TO-251 Mechanical Drawing



TO-251 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.19	2.38	0.086	0.094
A1	0.89	1.14	0.035	0.045
b	0.64	0.89	0.025	0.035
b1	0.76	1.14	0.030	0.045
b2	5.21	5.46	0.205	0.215
C	0.46	0.58	0.018	0.023
C1	0.46	0.58	0.018	0.023
D	5.97	6.10	0.235	0.240
E	6.35	6.73	0.250	0.265
e	2.28 BSC.		0.90 BSC.	
L	8.89	9.65	0.350	0.380
L1	1.91	2.28	0.075	0.090
L2	0.89	1.27	0.035	0.050
L3	1.15	1.52	0.045	0.060

Marking Diagram



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L = Lot Code

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